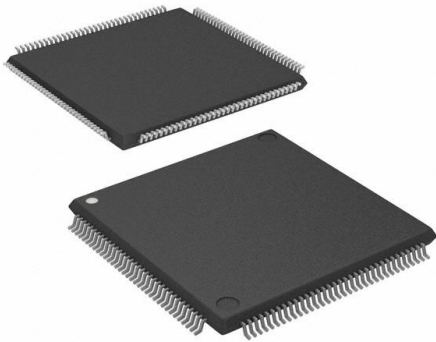


# CY91F525KHCPMC1-GSE1 Datasheet

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|                              |   |
|------------------------------|---|
| DiGi Electronics Part Number | CY91F525KHCPMC1-GSE1-DG   |
| Manufacturer                 | <a href="#">Infineon Technologies</a>   |
| Manufacturer Product Number  | CY91F525KHCPMC1-GSE1  |
| Description                  | IC MCU 32BIT 832KB FLASH 144LQFP  |
| Detailed Description         | FR81S FR MB91520 Microcontroller IC 32-Bit Single-Core 80MHz 832KB (832K x 8) FLASH 144-LQFP (20x 20) |

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## Purchase and inquiry

Manufacturer Product Number:

CY91F525KHCPMC1-GSE1

Series:

FR MB91520

DiGi-Electronics Programmable:

Not Verified

Core Size:

32-Bit Single-Core

Connectivity:

CANbus, CSIO, EBI/EMI, I2C, LINbus, SPI, UART/USART

Number of I/O:

120

Program Memory Type:

FLASH

RAM Size:

102K x 8

Data Converters:

A/D 48x12b; D/A 2x8b

Operating Temperature:

-40°C ~ 105°C (TA)

Package / Case:

144-LQFP

Base Product Number:

CY91F525

Manufacturer:

Infineon Technologies

Product Status:

Obsolete

Core Processor:

FR81S

Speed:

80MHz

Peripherals:

DMA, LVD, POR, PWM, WDT

Program Memory Size:

832KB (832K x 8)

EEPROM Size:

64K x 8

Voltage - Supply (Vcc/Vdd):

2.7V ~ 5.5V

Oscillator Type:

External

Mounting Type:

Surface Mount

Supplier Device Package:

144-LQFP (20x20)

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8542.31.0001

Moisture Sensitivity Level (MSL):

3 (168 Hours)

ECCN:

3A991A2



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**Continuity of ordering part numbers**

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## CY91520 Series

# 32-bit FR81S Microcontroller

The CY91520 series is a Cypress 32-bit microcontroller designed for automotive devices. This series contains the FR81S CPU which is compatible with the FR family.

**Note:** This series is a composition of the end of the above-mentioned each name of articles of presence, According to Presence of sub-clock, CSV initial value and LVD initial value. See "Ordering Information" for details.

## Features

### FR81S CPU Core

- 32-bit RISC, load/store architecture, pipeline 5-stage structure
- Maximum operating frequency: 80 MHz (Source oscillation = 4.0 MHz and 20 multiplied (PLL clock multiplication system))
- General-purpose register : 32 bits × 16 sets
- 16-bit fixed length instructions (basic instruction), 1 instruction per cycle
- Instructions appropriate to embedded applications
  - Memory-to-memory transfer instruction
  - Bit processing instruction
  - Barrel shift order etc.
- High-level language support instructions
- Function entry/exit instructions
- Register content multi-load and store instructions
- Bit search instructions  
Logical 1 detection, 0 detection, and change-point detection
- Branch instructions with delay slot
- Overhead reduction during branch process
- Register interlock function
- Easy assembler writing
- The support at the built-in / instruction level of the multiplier
- Signed 32-bit multiplication: 5 cycles
- Signed 16-bit multiplication: 3 cycles
- Interrupt (PC/PS saving)  
6 cycles (16 priority levels)
- The Harvard architecture allows simultaneous execution of program and data access.
- Instruction compatibility with the FR Family
- Built-in memory protection function (MPU)
  - Eight protection areas can be specified commonly for instructions and the data.
  - Control access privilege in both privilege mode and user mode.
- Built-in FPU (floating point arithmetic)
  - IEEE754 compliant
  - Floating-point register 32-bit × 16 sets

### Peripheral Functions

- Clock generation (equipped with SSCG function)
  - Main oscillation (4 MHz to 16 MHz)
  - Sub oscillation (32 kHz) or none sub oscillation
  - PLL multiplication rate : 1 to 20 times
  - Equipped with a 100 kHz CR oscillator
- Built-in program flash memory capacity
  - CY91F522: 256 + 64 KB
  - CY91F523: 384 + 64 KB
  - CY91F524: 512 + 64 KB
  - CY91F525: 768 + 64 KB
  - CY91F526: 1024 + 64 KB
- Flash memory for built-in data (WorkFlash) 64 KB
- Built-in RAM capacity
  - Main RAM
    - CY91F522: 48 KB
    - CY91F523: 48 KB
    - CY91F524: 64 KB
    - CY91F525: 96 KB
    - CY91F526: 128 KB
  - Backup RAM 8 KB
- General-purpose ports:
  - CY91F52xB 44 sets (No sub oscillation), 42 sets (sub oscillation)
  - CY91F52xD 56 sets (No sub oscillation), 54 sets (sub oscillation)
  - CY91F52xF 76 sets (No sub oscillation), 74 sets (sub oscillation)
  - CY91F52xJ 96 sets (No sub oscillation), 94 sets (sub oscillation)
  - CY91F52xK 120 sets (No sub oscillation), 118 sets (sub oscillation)
  - CY91F52xL 152 sets (No sub oscillation), 150 sets (sub oscillation)
  - Included I<sup>2</sup>C open drain corresponding ports: 16 sets
- External bus interface
  - 22-bit address, 16-bit data
- DMA Controller
  - Up to 16 channels can be started simultaneously.
  - 2 transfer factors (Internal peripheral request and software)
- A/D converter (successive approximation type)
  - 12-bit resolution : Max. 48 ch (32 ch + 16 ch)
  - Conversion time : 1.4 μs
- D/A converter (R-2R type)
  - 8-bit resolution : 2 ch



- External interrupt input: 8 channels × 2 units total  
16 channels
  - Level ("H" / "L"), or edge detection (rising or falling) enabled
- Multi-function serial communication (built-in transmission/reception FIFO memory) : Max.12 channels
  - 5 V tolerant input: 4 channels ch.6, ch.8, ch.9, ch.11 CMOS hysteresis input < UART (Asynchronous serial interface) >
  - Full-duplex double buffering system, 64-step transmission FIFO memory, 64-step reception FIFO memory
  - Parity or no parity is selectable.
  - Built-in dedicated baud rate generator
  - An external clock can be used as the transfer clock
  - Parity, frame, and overrun error detection functions provided
  - DMA transfer support <CSIO (Synchronous serial interface) >
  - Full-duplex double buffering system, 64-step transmission FIFO memory, 64-step reception FIFO memory
  - SPI supported; master and slave systems supported; 5 to 16, 20, 24, 32-bit data length can be set.
  - Built-in dedicated baud rate generator (Master operation)
  - An external clock can be entered. (Slave operation)
  - Overrun error detection function is provided
  - DMA transfer support
  - Serial chip select SPI function <LIN (Asynchronous Serial Interface for LIN) >
  - Full-duplex double buffering system, 64-step transmission FIFO memory, 64-step reception FIFO memory
  - LIN protocol revision 2.1 supported
  - Master and slave systems supported
  - Framing error and overrun error detection
  - LIN synch break generation and detection; LIN synch delimiter generation
  - Built-in dedicated baud rate generator
  - An external clock can be adjusted by the reload counter
  - DMA transfer support
  - Hard assist function < I<sup>2</sup>C >
  - 2 channels ch.3 , ch.4 Standard mode/fast mode supported.
  - 6 channels ch.5 to ch.8, ch.10, ch.11 Standard mode supported.
  - Full-duplex double buffering system, 64-step transmission FIFO memory, 64-step reception FIFO memory
  - Standard mode (Max. 100 kbps) / fast mode (Max. 400 kbps) supported
  - DMA transfer supported (for transmission only)
- CAN Controller (CAN) : 3 channels
  - Transfer speed : Up to 1 Mbps
  - 128-transmission/reception message buffering : 1 channel (ch.0), 64-transmission/reception message buffering : 2 channels (ch.1 and ch.2)
- PPG: 16-bit × Max. 48 channels
  - LED drive output 4 channels 11 ch to 14 ch
  - Reload timer : 16-bit × Max.8 channels
  - Free-run timer : 16-bit × 3 channels 32-bit × Max 3 channels
- Input capture : 16-bit × 4 channels (linked to the free-run timer) 32-bit × Max 6 channels (linked to the free-run timer)
- Output compare : 16-bit × 6 channels (linked to the free-run timer) 32-bit × Max 6 channels (linked to the free-run timer)
- Waveform generator : 6 channels
- Up/Down counter
  - 8-/16-bit Up/Down counter × 2 channels
- Real-time clock (RTC) (for day, hours, minutes, seconds)
  - Main or sub oscillation frequency can be selected for the operation clock
- Calibration: Real-time clock (RTC) of the subclock drive
  - The main clock to sub clock ratio can be corrected by setting the real-time clock prescaler
- Clock Supervisor
  - Monitoring abnormality (by damaged quartz, etc.) of suboscillation (32 kHz) (dual clock products) of the outside and main oscillation (4 MHz)
  - When abnormality is detected, it switches to the CR clock.
  - Initial value ON/OFF can be selected by the part number.
- Base timer : Max.2 channels
  - 16-bit timer
  - Any of four PWM/PPG/PWC/reload timer functions can be selected and used
  - As for the PWC function and the reload timer function, a pair of 16-bit timers can be used as one 32-bit timer in the cascade mode
- CRC generation
- Watchdog timer
  - Hardware watchdog
  - Software watchdog (possible to set the valid range for counter clearing)
- NMI (non-maskable interrupt)
- Interrupt controller
- Interrupt request batch read
  - The interrupt existence from two or more peripherals can be read by a series of register.
- I/O relocation
  - Peripheral function pins can be reassigned.
- Low-power consumption mode
  - Sleep / Stop / Watch / Sub RUN mode
  - Stop (power shutdown) / Watch (power shutdown) mode
- Power-on reset



- Low-voltage detection reset (independently monitor the external power supply and the internal power supply)
  - The external power supply can select initial value ON/OFF by the part number.
- Device Package : 176/144/120/100/80/64
- CMOS 90 nm Technology
- Power supplies
  - 5 V Power supply
  - The internal 1.2 V is generated from 5 V with the voltage step-down circuit



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## 1. Product Lineup

### Product Lineup Comparison 64 Pins

|  | CY91F522B  | CY91F523B   | CY91F524B   | CY91F525B   | CY91F526B    |
|--|--|-------------|-------------|-------------|--------------|
| System Clock                                       | On chip PLL Clock multiple method                |             |             |             |              |
| Minimum instruction execution time                 | 12.5 ns (80 MHz)                                 |             |             |             |              |
| Flash Capacity (Program)                           | (256+64) KB                                      | (384+64) KB | (512+64) KB | (768+64) KB | (1024+64) KB |
| Flash Capacity (Data)                              | 64 KB  |             |             |             |              |
| RAM Capacity                                       | (48+8) KB  | (64+8) KB   | (96+8) KB   | (128+8) KB  |              |
| External BUS I/F<br>(22 address/16 data/4 cs)      | None   |             |             |             |              |
| DMA Transfer                                       | 16 ch  |             |             |             |              |
| 16-bit Base Timer                                  | None   |             |             |             |              |
| Free-run Timer                                     | 16 bit × 3 ch, 32 bit × 1 ch                     |             |             |             |              |
| Input capture                                      | 16 bit × 4 ch, 32 bit × 5 ch                     |             |             |             |              |
| Output Compare                                     | 16 bit × 6 ch, 32 bit × 4 ch                     |             |             |             |              |
| 16-bit Reload Timer                                | 7 ch   |             |             |             |              |
| PPG  | 16 bit × 21 ch                                   |             |             |             |              |
| Up/down Counter                                    | 2 ch   |             |             |             |              |
| Clock Supervisor                                   | Yes  |             |             |             |              |
| External Interrupt                                 | 8 ch × 2 units                                   |             |             |             |              |
| A/D converter                                      | 12 bit × 13 ch (1 unit), 12 bit × 13 ch (1 unit) |             |             |             |              |
| D/A converter (8 bit)                              | 1 ch   |             |             |             |              |
| Multi-Function Serial Interface                    | 8 ch <sup>*1</sup>                               |             |             |             |              |
| CAN  | 64 msg × 2 ch/128 msg × 1 ch                     |             |             |             |              |
| Hardware Watchdog Timer                            | Yes  |             |             |             |              |
| CRC Formation                                      | Yes  |             |             |             |              |
| Low-voltage detection reset                        | Yes  |             |             |             |              |
| Flash Security                                     | Yes  |             |             |             |              |
| ECC Flash/WorkFlash                                | Yes  |             |             |             |              |
| ECC RAM  | Yes  |             |             |             |              |
| Memory Protection Function (MPU)                   | Yes  |             |             |             |              |
| Floating point arithmetic (FPU)                    | Yes  |             |             |             |              |
| Real Time Clock (RTC)                              | Yes  |             |             |             |              |
| General-purpose port (#GPIOs)                      | 44 ports   |             |             |             |              |
| SSCG   | Yes  |             |             |             |              |
| Sub clock  | Yes  |             |             |             |              |
| CR oscillator                                      | Yes  |             |             |             |              |
| OCD (On Chip Debug)                                | Yes  |             |             |             |              |
| TPU (Timing Protection Unit)                       | Yes  |             |             |             |              |
| Key code register                                  | Yes  |             |             |             |              |
| Waveform generator                                 | 6 ch   |             |             |             |              |
| NMI request function                               | Yes  |             |             |             |              |
| Operation guaranteed temperature (T <sub>A</sub> ) | -40 °C to +125 °C                                |             |             |             |              |
| Power supply                                       | 2.7 V to 5.5 V <sup>*2</sup>                     |             |             |             |              |
| Package  | LQD064   |             |             |             |              |

\*1: Only channel 5, channel 6 and channel 11 support the I<sup>2</sup>C (standard mode).

\*2: The initial detection voltage of the external low voltage detection is 2.8 V ± 8 % (2.576 V to 3.024 V). This LVD setting and internal LVD cannot be used to reliably generate a reset before voltage dips below minimum guaranteed operation voltage, as these detection levels are below the minimum guaranteed MCU operation voltage. Below the minimum guaranteed MCU operation voltage, MCU operations are not guaranteed with the exception of LVD.

### Product Lineup Comparison 80 Pins



## CY91520 Series

|   | CY91F522D  | CY91F523D   | CY91F524D   | CY91F525D   | CY91F526D    |
|---|--|-------------|-------------|-------------|--------------|
| System Clock  | On chip PLL Clock multiple method                |             |             |             |              |
| Minimum instruction execution time                    | 12.5 ns (80 MHz)                                 |             |             |             |              |
| Flash Capacity (Program)                              | (256+64) KB                                      | (384+64) KB | (512+64) KB | (768+64) KB | (1024+64) KB |
| Flash Capacity (Data)                                 | 64 KB  |             |             |             |              |
| RAM Capacity  | (48+8) KB  |             | (64+8) KB   | (96+8) KB   | (128+8) KB   |
| External BUS I/F<br>(22 address/16 data/4 cs)         | None   |             |             |             |              |
| DMA Transfer  | 16 ch  |             |             |             |              |
| 16-bit Base Timer                                     | 1 ch   |             |             |             |              |
| Free-run Timer  | 16 bit × 3 ch, 32 bit × 2 ch                     |             |             |             |              |
| Input capture   | 16 bit × 4 ch, 32 bit × 5 ch                     |             |             |             |              |
| Output Compare  | 16 bit × 6 ch, 32 bit × 4 ch                     |             |             |             |              |
| 16-bit Reload Timer                                   | 7 ch   |             |             |             |              |
| PPG   | 16 bit × 27 ch                                   |             |             |             |              |
| Up/down Counter                                       | 2 ch   |             |             |             |              |
| Clock Supervisor                                      | Yes  |             |             |             |              |
| External Interrupt                                    | 8 ch × 2 units                                   |             |             |             |              |
| A/D converter   | 12 bit × 16 ch (1 unit), 12 bit × 16 ch (1 unit) |             |             |             |              |
| D/A converter (8 bit)                                 | 1 ch   |             |             |             |              |
| Multi-Function Serial Interface                       | 9 ch <sup>*1</sup>                               |             |             |             |              |
| CAN   | 64 msg × 2 ch/128 msg × 1 ch                     |             |             |             |              |
| Hardware Watchdog Timer                               | Yes  |             |             |             |              |
| CRC Formation   | Yes  |             |             |             |              |
| Low-voltage detection reset                           | Yes  |             |             |             |              |
| Flash Security  | Yes  |             |             |             |              |
| ECC Flash/WorkFlash                                   | Yes  |             |             |             |              |
| ECC RAM   | Yes  |             |             |             |              |
| Memory Protection Function (MPU)                      | Yes  |             |             |             |              |
| Floating point arithmetic (FPU)                       | Yes  |             |             |             |              |
| Real Time Clock (RTC)                                 | Yes  |             |             |             |              |
| General-purpose port (#GPIOs)                         | 56 ports   |             |             |             |              |
| SSCG  | Yes  |             |             |             |              |
| Sub clock   | Yes  |             |             |             |              |
| CR oscillator   | Yes  |             |             |             |              |
| NMI request function                                  | Yes  |             |             |             |              |
| OCD (On Chip Debug)                                   | Yes  |             |             |             |              |
| TPU (Timing Protection Unit)                          | Yes  |             |             |             |              |
| Key code register                                     | Yes  |             |             |             |              |
| Waveform generator                                    | 6 ch   |             |             |             |              |
| Operation guaranteed temperature<br>(T <sub>A</sub> ) | -40 °C to +125 °C                                |             |             |             |              |
| Power supply  | 2.7 V to 5.5 V <sup>*2</sup>                     |             |             |             |              |
| Package   | LQH080   |             |             |             |              |

\*1: Only channel 5, channel 6 and channel 11 support the I<sup>2</sup>C (standard mode).

\*2: The initial detection voltage of the external low voltage detection is 2.8 V ± 8 % (2.576 V to 3.024 V). This LVD setting and internal LVD cannot be used to reliably generate a reset before voltage dips below minimum guaranteed operation voltage, as these detection levels are below the minimum guaranteed MCU operation voltage. Below the minimum guaranteed MCU operation voltage, MCU operations are not guaranteed with the exception of LVD.



## Product Lineup Comparison 100 Pins

|   | CY91F522F  | CY91F523F   | CY91F524F   | CY91F525F   | CY91F526F    |
|---|--|-------------|-------------|-------------|--------------|
| System Clock  | On chip PLL Clock multiple method                |             |             |             |              |
| Minimum instruction execution time                    | 12.5 ns (80 MHz)                                 |             |             |             |              |
| Flash Capacity (Program)                              | (256+64) KB                                      | (384+64) KB | (512+64) KB | (768+64) KB | (1024+64) KB |
| Flash Capacity (Data)                                 | 64 KB  |             |             |             |              |
| RAM Capacity  | (48+8) KB  | (64+8) KB   | (96+8) KB   | (128+8) KB  |              |
| External BUS I/F<br>(22 address/16 data/4 cs)         | None   |             |             |             |              |
| DMA Transfer  | 16 ch  |             |             |             |              |
| 16-bit Base Timer                                     | 1 ch   |             |             |             |              |
| Free-run Timer  | 16 bit × 3 ch, 32 bit × 3 ch                     |             |             |             |              |
| Input capture   | 16 bit × 4 ch, 32 bit × 6 ch                     |             |             |             |              |
| Output Compare  | 16 bit × 6 ch, 32 bit × 6 ch                     |             |             |             |              |
| 16-bit Reload Timer                                   | 8 ch   |             |             |             |              |
| PPG   | 16 bit × 34 ch                                   |             |             |             |              |
| Up/down Counter                                       | 2 ch   |             |             |             |              |
| Clock Supervisor                                      | Yes  |             |             |             |              |
| External Interrupt                                    | 8 ch × 2 units                                   |             |             |             |              |
| A/D converter   | 12 bit × 21 ch (1 unit), 12 bit × 16 ch (1 unit) |             |             |             |              |
| D/A converter (8 bit)                                 | 2 ch   |             |             |             |              |
| Multi-Function Serial Interface                       | 12 ch <sup>*1</sup>                              |             |             |             |              |
| CAN   | 64 msg × 2 ch/128 msg × 1 ch                     |             |             |             |              |
| Hardware Watchdog Timer                               | Yes  |             |             |             |              |
| CRC Formation   | Yes  |             |             |             |              |
| Low-voltage detection reset                           | Yes  |             |             |             |              |
| Flash Security  | Yes  |             |             |             |              |
| ECC Flash/WorkFlash                                   | Yes  |             |             |             |              |
| ECC RAM   | Yes  |             |             |             |              |
| Memory Protection Function (MPU)                      | Yes  |             |             |             |              |
| Floating point arithmetic (FPU)                       | Yes  |             |             |             |              |
| Real Time Clock (RTC)                                 | Yes  |             |             |             |              |
| General-purpose port (#GPIOs)                         | 76 ports   |             |             |             |              |
| SSCG  | Yes  |             |             |             |              |
| Sub clock   | Yes  |             |             |             |              |
| CR oscillator   | Yes  |             |             |             |              |
| NMI request function                                  | Yes  |             |             |             |              |
| OCD (On Chip Debug)                                   | Yes  |             |             |             |              |
| TPU (Timing Protection Unit)                          | Yes  |             |             |             |              |
| Key code register                                     | Yes  |             |             |             |              |
| Waveform generator                                    | 6 ch   |             |             |             |              |
| Operation guaranteed temperature<br>(T <sub>A</sub> ) | -40 °C to +125 °C                                |             |             |             |              |
| Power supply  | 2.7 V to 5.5 V <sup>*2</sup>                     |             |             |             |              |
| Package   | LQ100  |             |             |             |              |

\*1: Only channel 5, channel 6, channel 7, channel 8 and channel 11 support the I2C (standard mode).

\*2: The initial detection voltage of the external low voltage detection is 2.8 V ± 8 % (2.576 V to 3.024 V). This LVD setting and internal LVD cannot be used to reliably generate a reset before voltage dips below minimum guaranteed operation voltage, as these detection levels are below the minimum guaranteed MCU operation voltage. Below the minimum guaranteed MCU operation voltage, MCU operations are not guaranteed with the exception of LVD.



## Product Lineup Comparison 120 Pins

|  | CY91F522J  | CY91F523J   | CY91F524J   | CY91F525J   | CY91F526J    |
|--|--|-------------|-------------|-------------|--------------|
| System Clock                                       | On chip PLL Clock multiple method                |             |             |             |              |
| Minimum instruction execution time                 | 12.5 ns (80 MHz)                                 |             |             |             |              |
| Flash Capacity (Program)                           | (256+64) KB                                      | (384+64) KB | (512+64) KB | (768+64) KB | (1024+64) KB |
| Flash Capacity (Data)                              | 64 KB  |             |             |             |              |
| RAM Capacity                                       | (48+8) KB  | (64+8) KB   | (96+8) KB   | (128+8) KB  |              |
| External BUS I/F<br>(22 address/16 data/4 cs)      | None   |             |             |             |              |
| DMA Transfer                                       | 16 ch  |             |             |             |              |
| 16-bit Base Timer                                  | 2 ch   |             |             |             |              |
| Free-run Timer                                     | 16 bit × 3 ch, 32 bit × 3 ch                     |             |             |             |              |
| Input capture                                      | 16 bit × 4 ch, 32 bit × 6 ch                     |             |             |             |              |
| Output Compare                                     | 16 bit × 6 ch, 32 bit × 6 ch                     |             |             |             |              |
| 16-bit Reload Timer                                | 8 ch   |             |             |             |              |
| PPG  | 16 bit × 38 ch                                   |             |             |             |              |
| Up/down Counter                                    | 2 ch   |             |             |             |              |
| Clock Supervisor                                   | Yes  |             |             |             |              |
| External Interrupt                                 | 8 ch × 2 units                                   |             |             |             |              |
| A/D converter                                      | 12 bit × 26 ch (1 unit), 12 bit × 16 ch (1 unit) |             |             |             |              |
| D/A converter (8 bit)                              | 2 ch   |             |             |             |              |
| Multi-Function Serial Interface                    | 12 ch <sup>*1</sup>                              |             |             |             |              |
| CAN  | 64 msg × 2 ch/128 msg × 1 ch                     |             |             |             |              |
| Hardware Watchdog Timer                            | Yes  |             |             |             |              |
| CRC Formation                                      | Yes  |             |             |             |              |
| Low-voltage detection reset                        | Yes  |             |             |             |              |
| Flash Security                                     | Yes  |             |             |             |              |
| ECC Flash/WorkFlash                                | Yes  |             |             |             |              |
| ECC RAM  | Yes  |             |             |             |              |
| Memory Protection Function (MPU)                   | Yes  |             |             |             |              |
| Floating point arithmetic (FPU)                    | Yes  |             |             |             |              |
| Real Time Clock (RTC)                              | Yes  |             |             |             |              |
| General-purpose port (#GPIOs)                      | 96 ports   |             |             |             |              |
| SSCG   | Yes  |             |             |             |              |
| Sub clock  | Yes  |             |             |             |              |
| CR oscillator                                      | Yes  |             |             |             |              |
| NMI request function                               | Yes  |             |             |             |              |
| OCD (On Chip Debug)                                | Yes  |             |             |             |              |
| TPU (Timing Protection Unit)                       | Yes  |             |             |             |              |
| Key code register                                  | Yes  |             |             |             |              |
| Waveform generator                                 | 6 ch   |             |             |             |              |
| Operation guaranteed temperature (T <sub>A</sub> ) | -40 °C to +125 °C                                |             |             |             |              |
| Power supply                                       | 2.7 V to 5.5 V <sup>*2</sup>                     |             |             |             |              |
| Package  | LQM120   |             |             |             |              |

\*1: Only channel 3 and channel 4 support the I<sup>2</sup>C (fast mode/standard mode).

Only channel 5, channel 6, channel 7, channel 8 and channel 11 support the I<sup>2</sup>C (standard mode).

\*2: The initial detection voltage of the external low voltage detection is 2.8 V ± 8 % (2.576 V to 3.024 V). This LVD setting and internal LVD cannot be used to reliably generate a reset before voltage dips below minimum guaranteed operation voltage, as these detection levels are below the minimum guaranteed MCU operation voltage. Below the minimum guaranteed MCU operation voltage, MCU operations are not guaranteed with the exception of LVD.



## Product Lineup Comparison 144 Pins

|  | CY91F522K  | CY91F523K   | CY91F524K   | CY91F525K   | CY91F526K    |
|--|--|-------------|-------------|-------------|--------------|
| System Clock                                       | On chip PLL Clock multiple method                |             |             |             |              |
| Minimum instruction execution time                 | 12.5 ns (80 MHz)                                 |             |             |             |              |
| Flash Capacity (Program)                           | (256+64) KB                                      | (384+64) KB | (512+64) KB | (768+64) KB | (1024+64) KB |
| Flash Capacity (Data)                              | 64 KB  |             |             |             |              |
| RAM Capacity                                       | (48+8) KB  | (64+8) KB   | (96+8) KB   | (128+8) KB  |              |
| External BUS I/F<br>(22 address/16 data/4 cs)      | Yes  |             |             |             |              |
| DMA Transfer                                       | 16 ch  |             |             |             |              |
| 16-bit Base Timer                                  | 2 ch   |             |             |             |              |
| Free-run Timer                                     | 16 bit × 3 ch, 32 bit × 3 ch                     |             |             |             |              |
| Input capture                                      | 16 bit × 4 ch, 32 bit × 6 ch                     |             |             |             |              |
| Output Compare                                     | 16 bit × 6 ch, 32 bit × 6 ch                     |             |             |             |              |
| 16-bit Reload Timer                                | 8 ch   |             |             |             |              |
| PPG  | 16 bit × 44 ch                                   |             |             |             |              |
| Up/down Counter                                    | 2 ch   |             |             |             |              |
| Clock Supervisor                                   | Yes  |             |             |             |              |
| External Interrupt                                 | 8 ch × 2 units                                   |             |             |             |              |
| A/D converter                                      | 12 bit × 32 ch (1 unit), 12 bit × 16 ch (1 unit) |             |             |             |              |
| D/A converter (8 bit)                              | 2 ch   |             |             |             |              |
| Multi-Function Serial Interface                    | 12 ch <sup>*1</sup>                              |             |             |             |              |
| CAN  | 64 msg × 2 ch/128 msg × 1 ch                     |             |             |             |              |
| Hardware Watchdog Timer                            | Yes  |             |             |             |              |
| CRC Formation                                      | Yes  |             |             |             |              |
| Low-voltage detection reset                        | Yes  |             |             |             |              |
| Flash Security                                     | Yes  |             |             |             |              |
| ECC Flash/WorkFlash                                | Yes  |             |             |             |              |
| ECC RAM  | Yes  |             |             |             |              |
| Memory Protection Function (MPU)                   | Yes  |             |             |             |              |
| Floating point arithmetic (FPU)                    | Yes  |             |             |             |              |
| Real Time Clock (RTC)                              | Yes  |             |             |             |              |
| General-purpose port (#GPIOs)                      | 120 ports  |             |             |             |              |
| SSCG   | Yes  |             |             |             |              |
| Sub clock  | Yes  |             |             |             |              |
| CR oscillator                                      | Yes  |             |             |             |              |
| NMI request function                               | Yes  |             |             |             |              |
| OCD (On Chip Debug)                                | Yes  |             |             |             |              |
| TPU (Timing Protection Unit)                       | Yes  |             |             |             |              |
| Key code register                                  | Yes  |             |             |             |              |
| Waveform generator                                 | 6 ch   |             |             |             |              |
| Operation guaranteed temperature (T <sub>A</sub> ) | -40 °C to +125 °C                                |             |             |             |              |
| Power supply                                       | 2.7 V to 5.5 V <sup>*2</sup>                     |             |             |             |              |
| Package  | LQS144, LQN144                                   |             |             |             |              |

\*1: Only channel 3 and channel 4 support the I<sup>2</sup>C (fast mode/standard mode).

Only channel 5, channel 6, channel 7, channel 8, channel 10 and channel 11 support the I<sup>2</sup>C (standard mode).

\*2: The initial detection voltage of the external low voltage detection is 2.8 V ± 8 % (2.576 V to 3.024 V). This LVD setting and internal LVD cannot be used to reliably generate a reset before voltage dips below minimum guaranteed operation voltage, as these detection levels are below the minimum guaranteed MCU operation voltage. Below the minimum guaranteed MCU operation voltage, MCU operations are not guaranteed with the exception of LVD.



## Product Lineup Comparison 176 Pins

|  | CY91F522L  | CY91F523L   | CY91F524L   | CY91F525L   | CY91F526L    |
|--|--|-------------|-------------|-------------|--------------|
| System Clock                                       | On chip PLL Clock multiple method                |             |             |             |              |
| Minimum instruction execution time                 | 12.5 ns (80 MHz)                                 |             |             |             |              |
| Flash Capacity (Program)                           | (256+64) KB                                      | (384+64) KB | (512+64) KB | (768+64) KB | (1024+64) KB |
| Flash Capacity (Data)                              | 64 KB  |             |             |             |              |
| RAM Capacity                                       | (48+8) KB  | (64+8) KB   | (96+8) KB   | (128+8) KB  |              |
| External BUS I/F<br>(22 address/16 data/4 cs)      | Yes  |             |             |             |              |
| DMA Transfer                                       | 16 ch  |             |             |             |              |
| 16-bit Base Timer                                  | 2 ch   |             |             |             |              |
| Free-run Timer                                     | 16 bit × 3 ch, 32 bit × 3 ch                     |             |             |             |              |
| Input capture                                      | 16 bit × 4 ch, 32 bit × 6 ch                     |             |             |             |              |
| Output Compare                                     | 16 bit × 6 ch, 32 bit × 6 ch                     |             |             |             |              |
| 16-bit Reload Timer                                | 8 ch   |             |             |             |              |
| PPG  | 16 bit × 48 ch                                   |             |             |             |              |
| Up/down Counter                                    | 2 ch   |             |             |             |              |
| Clock Supervisor                                   | Yes  |             |             |             |              |
| External Interrupt                                 | 8 ch × 2 units                                   |             |             |             |              |
| A/D converter                                      | 12 bit × 32 ch (1 unit), 12 bit × 16 ch (1 unit) |             |             |             |              |
| D/A converter (8 bit)                              | 2 ch   |             |             |             |              |
| Multi-Function Serial Interface                    | 12 ch <sup>*1</sup>                              |             |             |             |              |
| CAN  | 64 msg × 2 ch/128 msg × 1 ch                     |             |             |             |              |
| Hardware Watchdog Timer                            | Yes  |             |             |             |              |
| CRC Formation                                      | Yes  |             |             |             |              |
| Low-voltage detection reset                        | Yes  |             |             |             |              |
| Flash Security                                     | Yes  |             |             |             |              |
| ECC Flash/WorkFlash                                | Yes  |             |             |             |              |
| ECC RAM  | Yes  |             |             |             |              |
| Memory Protection Function (MPU)                   | Yes  |             |             |             |              |
| Floating point arithmetic (FPU)                    | Yes  |             |             |             |              |
| Real Time Clock (RTC)                              | Yes  |             |             |             |              |
| General-purpose port (#GPIOs)                      | 152 ports  |             |             |             |              |
| SSCG   | Yes  |             |             |             |              |
| Sub clock  | Yes  |             |             |             |              |
| CR oscillator                                      | Yes  |             |             |             |              |
| NMI request function                               | Yes  |             |             |             |              |
| OCD (On Chip Debug)                                | Yes  |             |             |             |              |
| TPU (Timing Protection Unit)                       | Yes  |             |             |             |              |
| Key code register                                  | Yes  |             |             |             |              |
| Waveform generator                                 | 6 ch   |             |             |             |              |
| Operation guaranteed temperature (T <sub>A</sub> ) | -40 °C to +125 °C                                |             |             |             |              |
| Power supply                                       | 2.7 V to 5.5 V <sup>*2</sup>                     |             |             |             |              |
| Package  | LQP176   |             |             |             |              |

\*1: Only channel 3 and channel 4 support the I<sup>2</sup>C (fast mode/standard mode).

Only channel 5, channel 6, channel 7, channel 8, channel 10 and channel 11 support the I<sup>2</sup>C (standard mode).

\*2: The initial detection voltage of the external low voltage detection is 2.8 V ± 8 % (2.576 V to 3.024 V). This LVD setting and internal LVD cannot be used to reliably generate a reset before voltage dips below minimum guaranteed operation voltage, as these detection levels are below the minimum guaranteed MCU operation voltage. Below the minimum guaranteed MCU operation voltage, MCU operations are not guaranteed with the exception of LVD.



## CY91520 Series

Table for Clock Supervisor and External Low Voltage Detection Reset Initial Value ON/OFF

| Clock  | CSV Initial Value | LVD Initial Value | Function |
|--------|-------------------|-------------------|----------|
| Single | ON                | ON                | S        |
|        |                   | OFF               | U        |
|        | OFF               | ON                | H        |
|        |                   | OFF               | K        |
| Dual   | ON                | ON                | W        |
|        |                   | OFF               | Y        |
|        | OFF               | ON                | J        |
|        |                   | OFF               | L        |

CY91F52X□△○

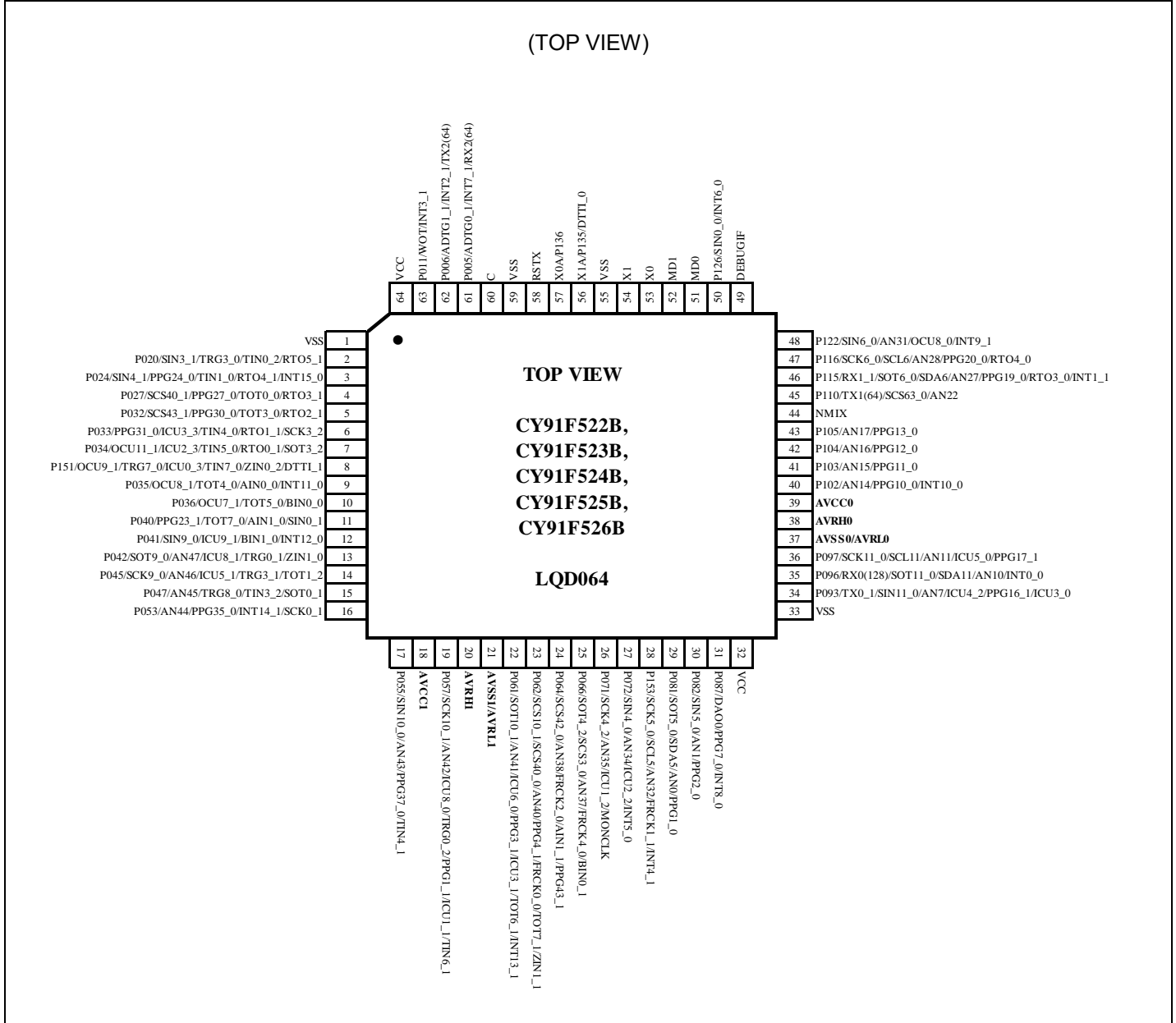
↳ Revision: B, C, D, E  
 ↳ Function: See the table for clock supervisor and external low voltage detection reset initial value ON/OFF.  
 ↳ PKG Type: B 64 pin  
           D 80 pin  
           F 100 pin  
           J 120 pin  
           K 144 pin  
           L 176 pin  
 ↳ Memory Size: 2 256KB  
                   3 384KB  
                   4 512KB  
                   5 768KB  
                   6 1MB



## 2. Pin Assignment

### CY91F52xB

CY91F522B, CY91F523B, CY91F524B, CY91F525B, CY91F526B



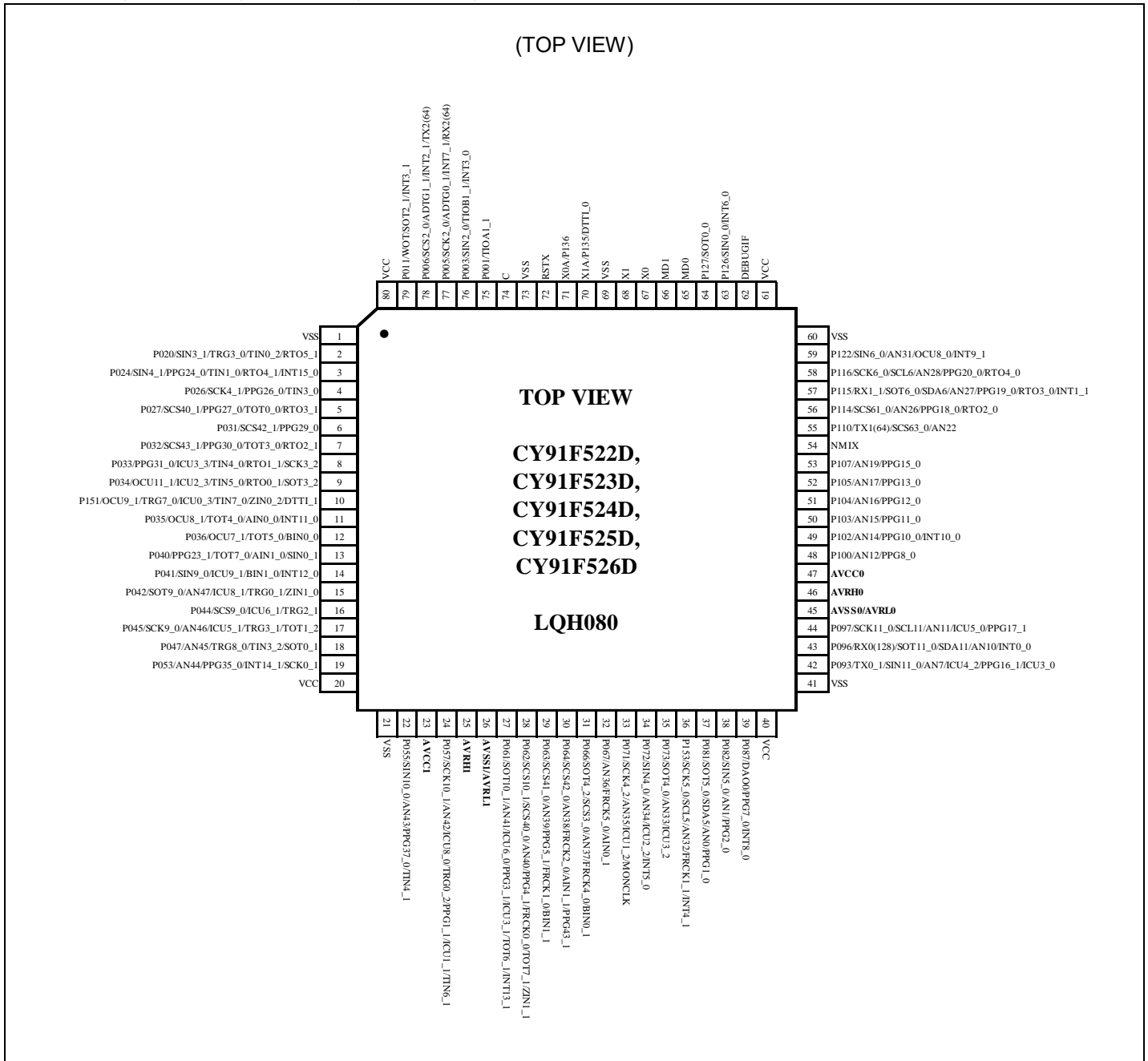
\* In a single clock product, pin 56 and pin 57 are the general-purpose ports.



**CY91520 Series**

**CY91F52xD**

CY91F522D, CY91F523D, CY91F524D, CY91F525D, CY91F526D



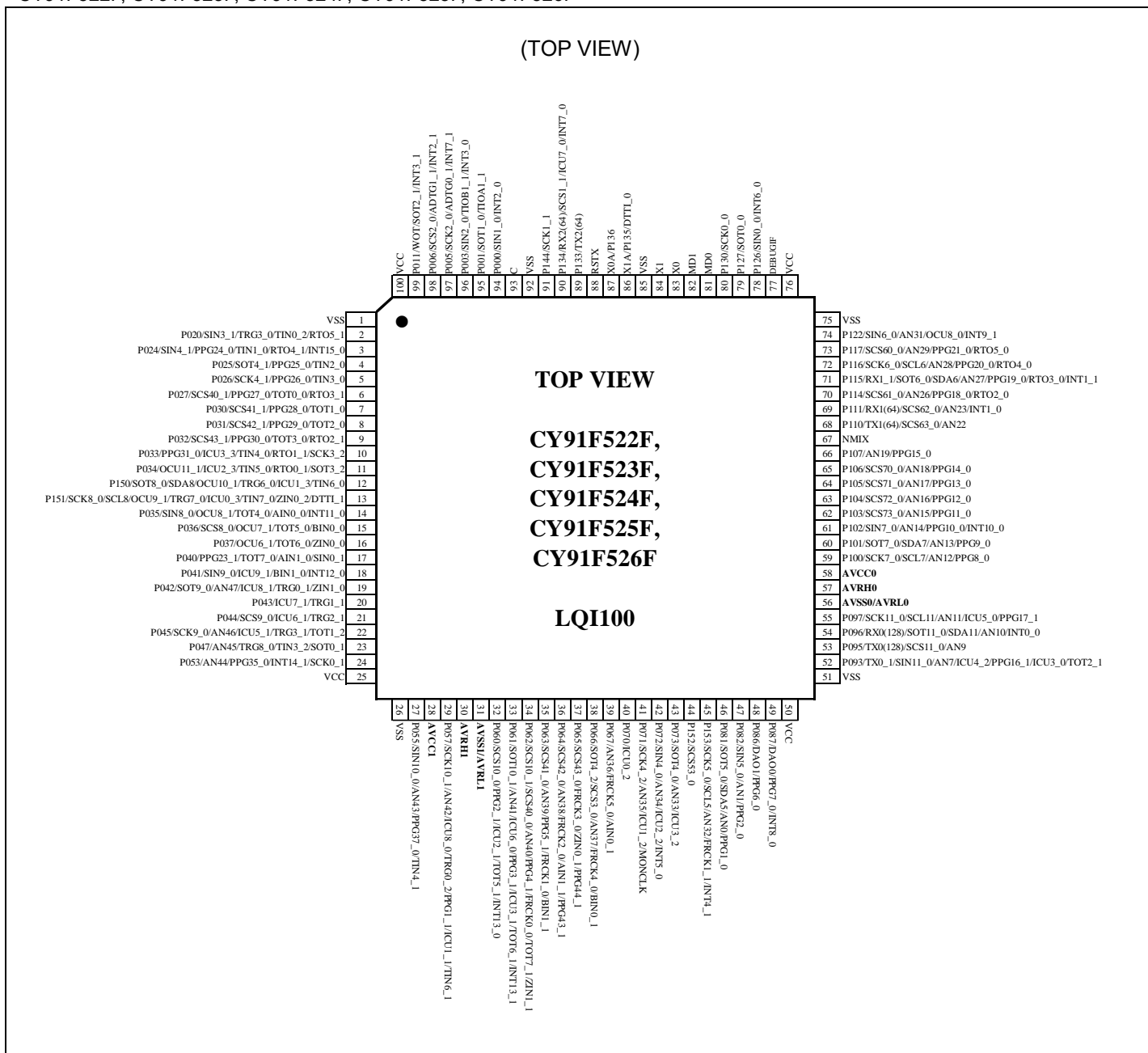
\* In a single clock product, pin 70 and pin 71 are the general-purpose ports.



# CY91520 Series

## CY91F52xF

CY91F522F, CY91F523F, CY91F524F, CY91F525F, CY91F526F



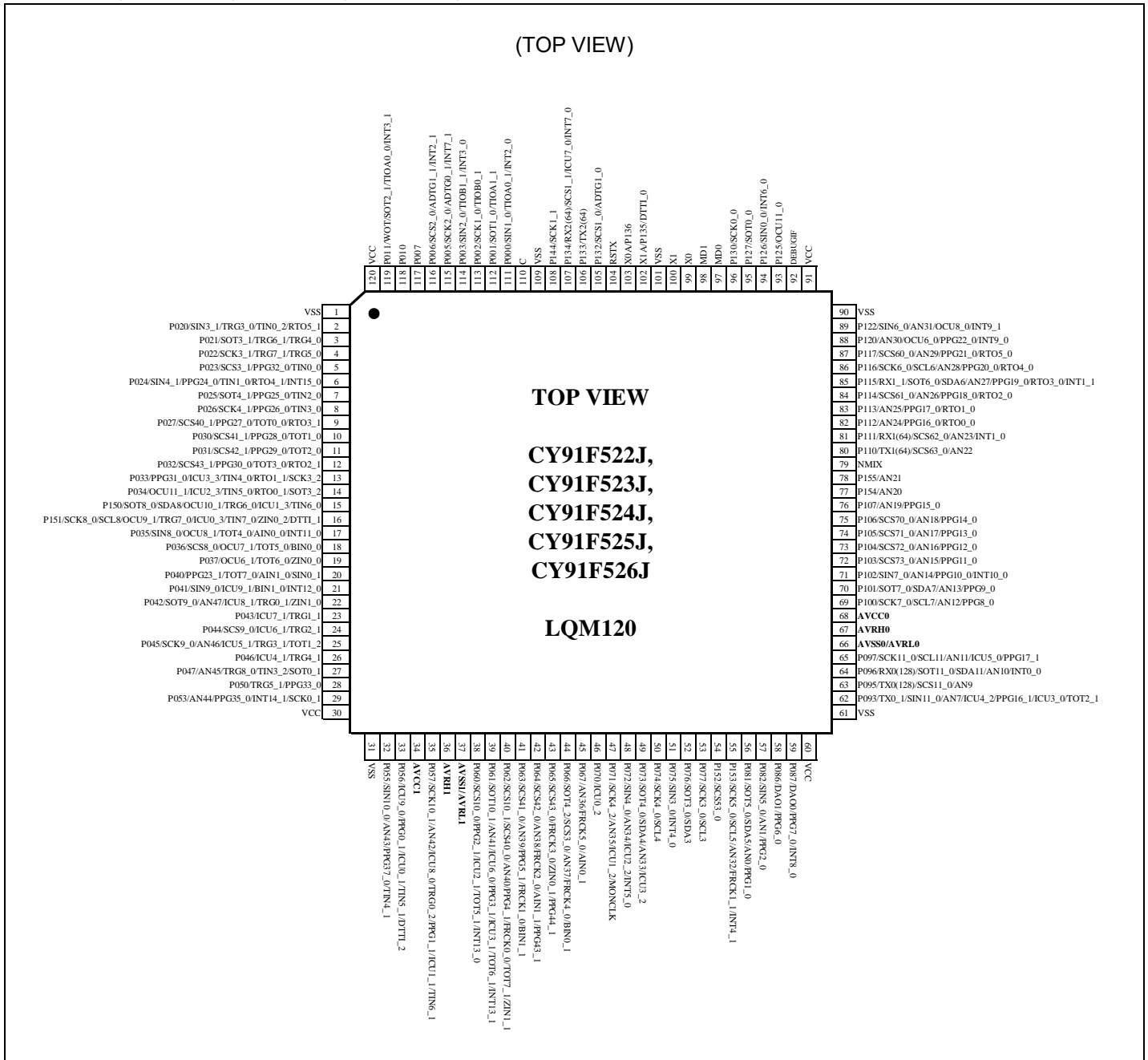
\* In a single clock product, pin 86 and pin 87 are the general-purpose ports.



**CY91520 Series**

**CY91F52xJ**

CY91F522J, CY91F523J, CY91F524J, CY91F525J, CY91F526J

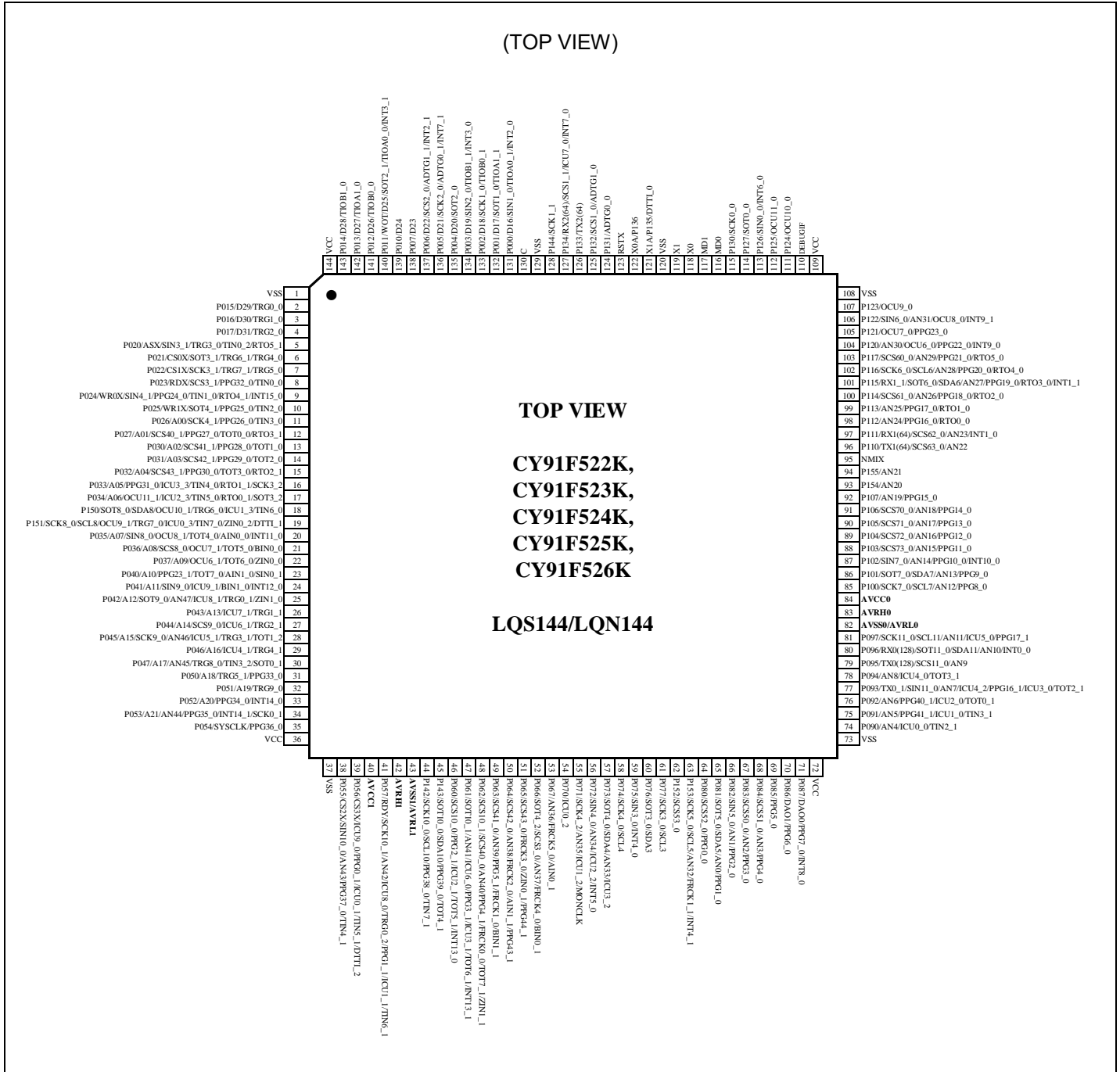


\* In a single clock product, pin 102 and pin 103 are the general-purpose ports.



**CY91520 Series**

**CY91F52xK**  
 CY91F522K, CY91F523K, CY91F524K, CY91F525K, CY91F526K



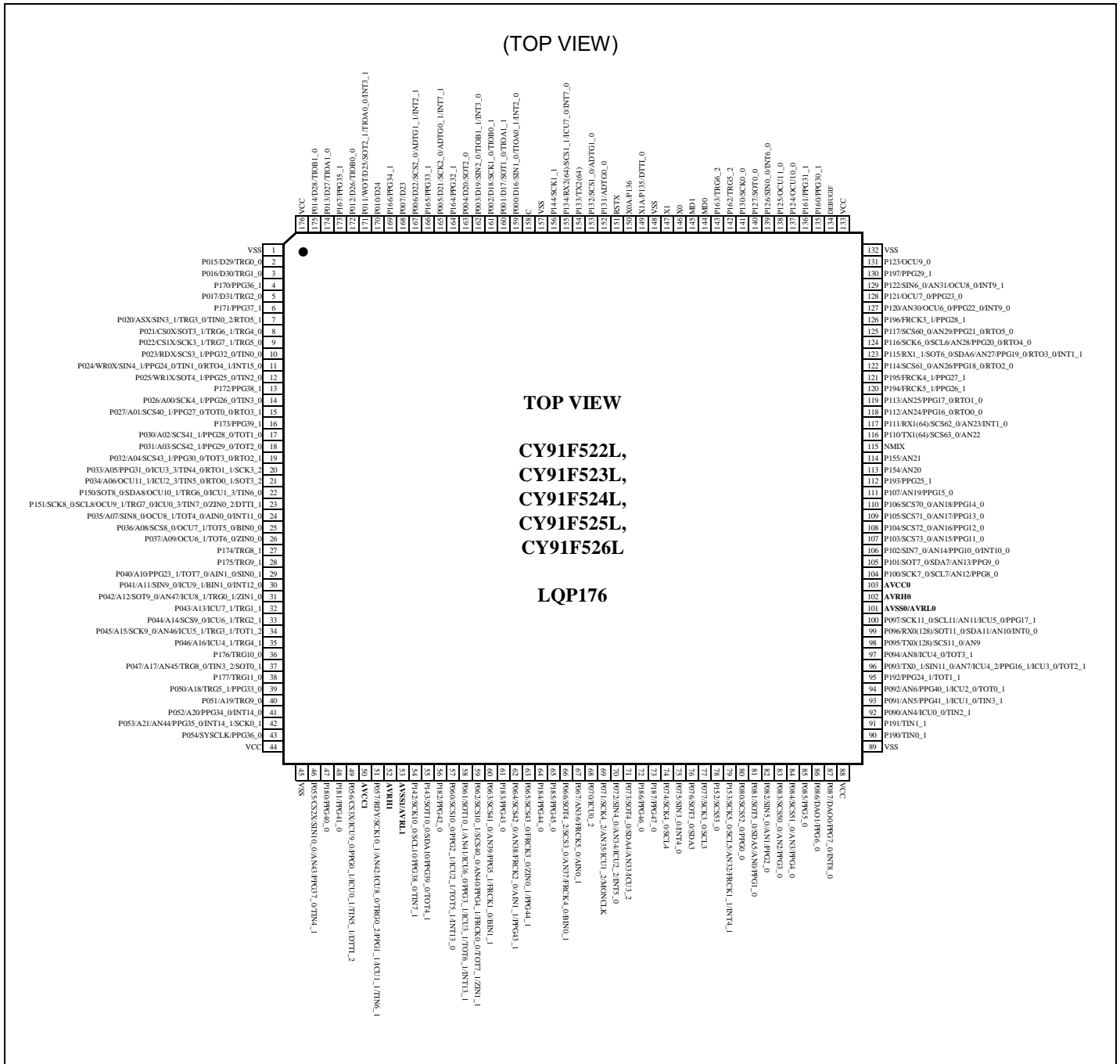
\* In a single clock product, pin 121 and pin 122 are the general-purpose ports.



CY91520 Series

CY91F52xL

CY91F522L, CY91F523L, CY91F524L, CY91F525L, CY91F526L



\* In a single clock product, pin 149 and pin 150 are the general-purpose ports.



### 3. Pin Description

| Pin No. |     |     |     |     |     | Pin Name           | Polarity | I/O Circuit Types*8 | Function*9  |
|---------|-----|-----|-----|-----|-----|--------------------|----------|---------------------|---|
| 64      | 80  | 100 | 120 | 144 | 176 |                    |          |                     |   |
| -       | -   | -   | -   | 2   | 2   | P015               | -        | A                   | General-purpose I/O port                          |
| -       | -   | -   | -   | -   | -   | D29                | -        |                     | External bus data bit29 I/O (0)                   |
| -       | -   | -   | -   | -   | -   | TRG0_0             | -        |                     | PPG trigger 0 input (0)                           |
| -       | -   | -   | -   | 3   | 3   | P016               | -        | A                   | General-purpose I/O port                          |
| -       | -   | -   | -   | -   | -   | D30                | -        |                     | External bus data bit30 I/O (0)                   |
| -       | -   | -   | -   | -   | -   | TRG1_0             | -        |                     | PPG trigger 1 input (0)                           |
| -       | -   | -   | -   | -   | 4   | P170               | -        | A                   | General-purpose I/O port                          |
| -       | -   | -   | -   | -   | -   | PPG36_1            | -        |                     | PPG ch.36 output (1)                              |
| -       | -   | -   | -   | 4   | 5   | P017               | -        | A                   | General-purpose I/O port                          |
| -       | -   | -   | -   | -   | -   | D31                | -        |                     | External bus data bit31 I/O (0)                   |
| -       | -   | -   | -   | -   | -   | TRG2_0             | -        |                     | PPG trigger 2 input (0)                           |
| -       | -   | -   | -   | -   | 6   | P171               | -        | A                   | General-purpose I/O port                          |
| -       | -   | -   | -   | -   | -   | PPG37_1            | -        |                     | PPG ch.37 output (1)                              |
| 2*1     | 2*1 | 2*1 | 2*1 | 5   | 7   | P020               | -        | F                   | General-purpose I/O port                          |
| -       | -   | -   | -   | -   | -   | ASX *2, *3, *4, *5 | -        |                     | External bus/Address strobe output                |
| -       | -   | -   | -   | -   | -   | SIN3_1             | -        |                     | Multi-function serial ch.3 serial data input (1)  |
| -       | -   | -   | -   | -   | -   | TRG3_0             | -        |                     | PPG trigger 3 input (0)                           |
| -       | -   | -   | -   | -   | -   | TIN0_2             | -        |                     | Reload timer ch.0 event input (2)                 |
| -       | -   | -   | -   | -   | -   | RTO5_1             | -        |                     | Waveform generator ch.5 output pin (1)            |
| -       | -   | -   | 3*1 | 6   | 8   | P021               | -        | A                   | General-purpose I/O port                          |
| -       | -   | -   | -   | -   | -   | CS0X *5            | -        |                     | External bus chip select 0 output                 |
| -       | -   | -   | -   | -   | -   | SOT3_1             | -        |                     | Multi-function serial ch.3 serial data output (1) |
| -       | -   | -   | -   | -   | -   | TRG6_1             | -        |                     | PPG trigger 6 input (1)                           |
| -       | -   | -   | -   | -   | -   | TRG4_0             | -        |                     | PPG trigger 4 input (0)                           |
| -       | -   | -   | 4*1 | 7   | 9   | P022               | -        | F                   | General-purpose I/O port                          |
| -       | -   | -   | -   | -   | -   | CS1X *5            | -        |                     | External bus chip select 1 output                 |
| -       | -   | -   | -   | -   | -   | SCK3_1             | -        |                     | Multi-function serial ch.3 clock I/O (1)          |
| -       | -   | -   | -   | -   | -   | TRG7_1             | -        |                     | PPG trigger 7 input (1)                           |
| -       | -   | -   | -   | -   | -   | TRG5_0             | -        |                     | PPG trigger 5 input (0)                           |
| -       | -   | -   | 5*1 | 8   | 10  | P023               | -        | A                   | General-purpose I/O port                          |
| -       | -   | -   | -   | -   | -   | RDX *5             | -        |                     | External bus/Read strobe output                   |
| -       | -   | -   | -   | -   | -   | SCS3_1             | -        |                     | Serial chip select 3 output (1)                   |
| -       | -   | -   | -   | -   | -   | PPG32_0            | -        |                     | PPG ch.32 output (0)                              |
| -       | -   | -   | -   | -   | -   | TIN0_0             | -        |                     | Reload timer ch.0 event input (0)                 |



## CY91520 Series

| Pin No. |     |     |      |     |     | Pin Name            | Polarity | I/O Circuit Types*8 | Function*9  |
|---------|-----|-----|------|-----|-----|---------------------|----------|---------------------|---|
| 64      | 80  | 100 | 120  | 144 | 176 |                     |          |                     |   |
| 3**     | 3** | 3** | 6**  | 9   | 11  | P024                | -        | F                   | General-purpose I/O port                          |
|         |     |     |      |     |     | WR0X *2, *3, *4, *5 | -        |                     | External bus/Write strobe 0 output                |
|         |     |     |      |     |     | SIN4_1              | -        |                     | Multi-function serial ch.4 serial data input (1)  |
|         |     |     |      |     |     | PPG24_0             | -        |                     | PPG ch.24 output (0)                              |
|         |     |     |      |     |     | TIN1_0              | -        |                     | Reload timer ch.1 event input (0)                 |
|         |     |     |      |     |     | RTO4_1              | -        |                     | Waveform generator ch.4 output pin (1)            |
|         |     |     |      |     |     | INT15_0             | -        |                     | INT15 External interrupt input (0)                |
| -       | -   | 4** | 7**  | 10  | 12  | P025                | -        | A                   | General-purpose I/O port                          |
|         |     |     |      |     |     | WR1X *4, *5         | -        |                     | External bus/Write strobe 1 output                |
|         |     |     |      |     |     | SOT4_1              | -        |                     | Multi-function serial ch.4 serial data output (1) |
|         |     |     |      |     |     | PPG25_0             | -        |                     | PPG ch.25 output (0)                              |
|         |     |     |      |     |     | TIN2_0              | -        |                     | Reload timer ch.2 event input (0)                 |
| -       | -   | -   | -    | -   | 13  | P172                | -        | A                   | General-purpose I/O port                          |
|         |     |     |      |     |     | PPG38_1             | -        |                     | PPG ch.38 output (1)                              |
| -       | 4** | 5** | 8**  | 11  | 14  | P026                | -        | F                   | General-purpose I/O port                          |
|         |     |     |      |     |     | A00 *3, *4, *5      | -        |                     | External bus/Address bit0 output (0)              |
|         |     |     |      |     |     | SCK4_1              | -        |                     | Multi-function serial ch.4 clock I/O (1)          |
|         |     |     |      |     |     | PPG26_0             | -        |                     | PPG ch.26 output (0)                              |
|         |     |     |      |     |     | TIN3_0              | -        |                     | Reload timer ch.3 event input (0)                 |
| 4**     | 5** | 6** | 9**  | 12  | 15  | P027                | -        | A                   | General-purpose I/O port                          |
|         |     |     |      |     |     | A01 *2, *3, *4, *5  | -        |                     | External bus/Address bit1 output (0)              |
|         |     |     |      |     |     | SCS40_1             | -        |                     | Serial chip select 40 I/O (1)                     |
|         |     |     |      |     |     | PPG27_0             | -        |                     | PPG ch.27 output (0)                              |
|         |     |     |      |     |     | TOT0_0              | -        |                     | Reload timer ch.0 output (0)                      |
|         |     |     |      |     |     | RTO3_1              | -        |                     | Waveform generator ch.3 output pin (1)            |
| -       | -   | -   | -    | -   | 16  | P173                | -        | A                   | General-purpose I/O port                          |
|         |     |     |      |     |     | PPG39_1             | -        |                     | PPG ch.39 output (1)                              |
| -       | -   | 7** | 10** | 13  | 17  | P030                | -        | A                   | General-purpose I/O port                          |
|         |     |     |      |     |     | A02 *4, *5          | -        |                     | External bus/Address bit2 output (0)              |
|         |     |     |      |     |     | SCS41_1             | -        |                     | Serial chip select 41 output (1)                  |
|         |     |     |      |     |     | PPG28_0             | -        |                     | PPG ch.28 output (0)                              |
|         |     |     |      |     |     | TOT1_0              | -        |                     | Reload timer ch.1 output (0)                      |
| -       | 6** | 8** | 11** | 14  | 18  | P031                | -        | A                   | General-purpose I/O port                          |
|         |     |     |      |     |     | A03 *3, *4, *5      | -        |                     | External bus/Address bit3 output (0)              |
|         |     |     |      |     |     | SCS42_1             | -        |                     | Serial chip select 42 output (1)                  |
|         |     |     |      |     |     | PPG29_0             | -        |                     | PPG ch.29 output (0)                              |
|         |     |     |      |     |     | TOT2_0 *3           | -        |                     | Reload timer ch.2 output (0)                      |



## CY91520 Series

| Pin No. |      |      |      |     |     | Pin Name               | Polarity | I/O Circuit Types*8 | Function*9  |
|---------|------|------|------|-----|-----|------------------------|----------|---------------------|---|
| 64      | 80   | 100  | 120  | 144 | 176 |                        |          |                     |   |
| 5*1     | 7*1  | 9*1  | 12*1 | 15  | 19  | P032                   | -        | A                   | General-purpose I/O port  |
|         |      |      |      |     |     | A04 *2, *3, *4, *5     | -        |                     | External bus/Address bit4 output (0)  |
|         |      |      |      |     |     | SCS43_1                | -        |                     | Serial chip select 43 output (1)  |
|         |      |      |      |     |     | PPG30_0                | -        |                     | PPG ch.30 output (0)  |
|         |      |      |      |     |     | TOT3_0                 | -        |                     | Reload timer ch.3 output (0)  |
|         |      |      |      |     |     | RTO2_1                 | -        |                     | Waveform generator ch.2 output pin (1)  |
| 6*1     | 8*1  | 10*1 | 13*1 | 16  | 20  | P033                   | -        | A                   | General-purpose I/O port  |
|         |      |      |      |     |     | A05 *2, *3, *4, *5     | -        |                     | External bus/Address bit5 output (0)  |
|         |      |      |      |     |     | PPG31_0                | -        |                     | PPG ch.31 output (0)  |
|         |      |      |      |     |     | ICU3_3                 | -        |                     | Input capture ch.3 input (3)  |
|         |      |      |      |     |     | TIN4_0                 | -        |                     | Reload timer ch.4 event input (0)   |
|         |      |      |      |     |     | RTO1_1                 | -        |                     | Waveform generator ch.1 output pin (1)  |
|         |      |      |      |     |     | SCK3_2                 | -        |                     | Multi-function serial ch.3 clock I/O (2)  |
| 7*1     | 9*1  | 11*1 | 14*1 | 17  | 21  | P034                   | -        | A                   | General-purpose I/O port  |
|         |      |      |      |     |     | A06 *2, *3, *4, *5     | -        |                     | External bus/Address bit6 output (0)  |
|         |      |      |      |     |     | OCU11_1                | -        |                     | Output compare ch.11 output (1)   |
|         |      |      |      |     |     | ICU2_3                 | -        |                     | Input capture ch.2 input (3)  |
|         |      |      |      |     |     | TIN5_0                 | -        |                     | Reload timer ch.5 event input (0)   |
|         |      |      |      |     |     | RTO0_1                 | -        |                     | Waveform generator ch.0 output pin (1)  |
|         |      |      |      |     |     | SOT3_2                 | -        |                     | Multi-function serial ch.3 serial data output (2)                                       |
| -       | -    | 12   | 15   | 18  | 22  | P150                   | -        | F                   | General-purpose I/O port  |
|         |      |      |      |     |     | SOT8_0/<br>SDA8        | -        |                     | Multi-function serial ch.8 serial data output (0)/ I <sup>2</sup> C bus serial data I/O |
|         |      |      |      |     |     | OCU10_1                | -        |                     | Output compare ch.10 output (1)   |
|         |      |      |      |     |     | TRG6_0                 | -        |                     | PPG trigger 6 input (0)   |
|         |      |      |      |     |     | ICU1_3                 | -        |                     | Input capture ch.1 input (3)  |
|         |      |      |      |     |     | TIN6_0                 | -        |                     | Reload timer ch.6 event input (0)   |
| 8*1     | 10*1 | 13   | 16   | 19  | 23  | P151                   | -        | F                   | General-purpose I/O port  |
|         |      |      |      |     |     | SCK8_0/<br>SCL8 *2, *3 | -        |                     | Multi-function serial ch.8 clock I/O (0)/ I <sup>2</sup> C bus serial clock I/O         |
|         |      |      |      |     |     | OCU9_1                 | -        |                     | Output compare ch.9 output (1)  |
|         |      |      |      |     |     | TRG7_0                 | -        |                     | PPG trigger 7 input (0)   |
|         |      |      |      |     |     | ICU0_3                 | -        |                     | Input capture ch.0 input (3)  |
|         |      |      |      |     |     | TIN7_0                 | -        |                     | Reload timer ch.7 event input (0)   |
|         |      |      |      |     |     | ZIN0_2                 | -        |                     | U/D counter ch.0 ZIN input (2)  |
|         |      |      |      |     |     | DTTI_1                 | -        |                     | Waveform generator ch.1 input pin (1)   |



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| Pin No. |      |      |      |     |     | Pin Name           | Polarity | I/O Circuit Types*8 | Function*9  |
|---------|------|------|------|-----|-----|--------------------|----------|---------------------|---|
| 64      | 80   | 100  | 120  | 144 | 176 |                    |          |                     |   |
| 9*1     | 11*1 | 14*1 | 17*1 | 20  | 24  | P035               | -        | I                   | General-purpose I/O port                          |
|         |      |      |      |     |     | A07 *2, *3, *4, *5 | -        |                     | External bus/Address bit7 output                  |
|         |      |      |      |     |     | SIN8_0 *2, *3      | -        |                     | Multi-function serial ch.8 serial data input (0)  |
|         |      |      |      |     |     | OCU8_1             | -        |                     | Output compare ch.8 output (1)                    |
|         |      |      |      |     |     | TOT4_0             | -        |                     | Reload timer ch.4 output (0)                      |
|         |      |      |      |     |     | AIN0_0             | -        |                     | U/D counter ch.0 AIN input (0)                    |
|         |      |      |      |     |     | INT11_0            | -        |                     | INT11 External interrupt input (0)                |
| 10*1    | 12*1 | 15*1 | 18*1 | 21  | 25  | P036               | -        | A                   | General-purpose I/O port                          |
|         |      |      |      |     |     | A08 *2, *3, *4, *5 | -        |                     | External bus/Address bit8 output (0)              |
|         |      |      |      |     |     | SCS8_0 *2, *3      | -        |                     | Serial chip select 8 I/O (0)                      |
|         |      |      |      |     |     | OCU7_1             | -        |                     | Output compare ch.7 output (1)                    |
|         |      |      |      |     |     | TOT5_0             | -        |                     | Reload timer ch.5 output (0)                      |
|         |      |      |      |     |     | BIN0_0             | -        |                     | U/D counter ch.0 BIN input (0)                    |
| -       | -    | 16*1 | 19*1 | 22  | 26  | P037               | -        | A                   | General-purpose I/O port                          |
|         |      |      |      |     |     | A09 *4, *5         | -        |                     | External bus/Address bit9 output (0)              |
|         |      |      |      |     |     | OCU6_1             | -        |                     | Output compare ch.6 output (1)                    |
|         |      |      |      |     |     | TOT6_0             | -        |                     | Reload timer ch.6 output (0)                      |
|         |      |      |      |     |     | ZIN0_0             | -        |                     | U/D counter ch.0 ZIN input (0)                    |
| -       | -    | -    | -    | -   | 27  | P174               | -        | A                   | General-purpose I/O port                          |
|         |      |      |      |     |     | TRG8_1             | -        |                     | PPG trigger 8 input (1)                           |
| -       | -    | -    | -    | -   | 28  | P175               | -        | A                   | General-purpose I/O port                          |
|         |      |      |      |     |     | TRG9_1             | -        |                     | PPG trigger 9 input (1)                           |
| 11*1    | 13*1 | 17*1 | 20*1 | 23  | 29  | P040               | -        | A                   | General-purpose I/O port                          |
|         |      |      |      |     |     | A10 *2, *3, *4, *5 | -        |                     | External bus/Address bit10 output (0)             |
|         |      |      |      |     |     | PPG23_1            | -        |                     | PPG ch.23 output (1)                              |
|         |      |      |      |     |     | TOT7_0             | -        |                     | Reload timer ch.7 output (0)                      |
|         |      |      |      |     |     | AIN1_0             | -        |                     | U/D counter ch.1 AIN input (0)                    |
|         |      |      |      |     |     | SIN0_1             | -        |                     | Multi-function serial ch.0 serial data input (1)  |
| 12*1    | 14*1 | 18*1 | 21*1 | 24  | 30  | P041               | -        | I                   | General-purpose I/O port                          |
|         |      |      |      |     |     | A11 *2, *3, *4, *5 | -        |                     | External bus/Address bit11 output (0)             |
|         |      |      |      |     |     | SIN9_0             | -        |                     | Multi-function serial ch.9 serial data input (0)  |
|         |      |      |      |     |     | ICU9_1             | -        |                     | Input capture ch.9 input (1)                      |
|         |      |      |      |     |     | BIN1_0             | -        |                     | U/D counter ch.1 BIN input (0)                    |
|         |      |      |      |     |     | INT12_0            | -        |                     | INT12 External interrupt input (0)                |
| 13*1    | 15*1 | 19*1 | 22*1 | 25  | 31  | P042               | -        | B                   | General-purpose I/O port                          |
|         |      |      |      |     |     | A12 *2, *3, *4, *5 | -        |                     | External bus/Address bit12 output                 |
|         |      |      |      |     |     | SOT9_0             | -        |                     | Multi-function serial ch.9 serial data output (0) |
|         |      |      |      |     |     | AN47               | -        |                     | ADC analog 47 input                               |
|         |      |      |      |     |     | ICU8_1             | -        |                     | Input capture ch.8 input (1)                      |
|         |      |      |      |     |     | TRG0_1             | -        |                     | PPG trigger 0 input (1)                           |
|         |      |      |      |     |     | ZIN1_0             | -        |                     | U/D counter ch.1 ZIN input (0)                    |



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| Pin No. |      |      |      |     |     | Pin Name          | Polarity | I/O Circuit Types*8 | Function*9  |
|---------|------|------|------|-----|-----|-------------------|----------|---------------------|---|
| 64      | 80   | 100  | 120  | 144 | 176 |                   |          |                     |   |
| -       | -    | 20*1 | 23*1 | 26  | 32  | P043              | -        | A                   | General-purpose I/O port                          |
|         |      |      |      |     |     | A13*4, *5         | -        |                     | External bus/Address bit13 output (0)             |
|         |      |      |      |     |     | ICU7_1            | -        |                     | Input capture ch.7 input (1)                      |
|         |      |      |      |     |     | TRG1_1            | -        |                     | PPG trigger 1 input (1)                           |
| -       | 16*1 | 21*1 | 24*1 | 27  | 33  | P044              | -        | A                   | General-purpose I/O port                          |
|         |      |      |      |     |     | A14*3, *4, *5     | -        |                     | External bus/Address bit14 output (0)             |
|         |      |      |      |     |     | SCS9_0            | -        |                     | Serial chip select 9 I/O (0)                      |
|         |      |      |      |     |     | ICU6_1            | -        |                     | Input capture ch.6 input (1)                      |
|         |      |      |      |     |     | TRG2_1            | -        |                     | PPG trigger 2 input (1)                           |
| 14*1    | 17*1 | 22*1 | 25*1 | 28  | 34  | P045              | -        | G                   | General-purpose I/O port                          |
|         |      |      |      |     |     | A15*2, *3, *4, *5 | -        |                     | External bus/Address bit15 output (0)             |
|         |      |      |      |     |     | SCK9_0            | -        |                     | Multi-function serial ch.9 clock I/O (0)          |
|         |      |      |      |     |     | AN46              | -        |                     | ADC analog 46 input                               |
|         |      |      |      |     |     | ICU5_1            | -        |                     | Input capture ch.5 input (1)                      |
|         |      |      |      |     |     | TRG3_1            | -        |                     | PPG trigger 3 input (1)                           |
|         |      |      |      |     |     | TOT1_2            | -        |                     | Reload timer ch.1 output (2)                      |
| -       | -    | -    | 26*1 | 29  | 35  | P046              | -        | A                   | General-purpose I/O port                          |
|         |      |      |      |     |     | A16*5             | -        |                     | External bus/Address bit16 output (0)             |
|         |      |      |      |     |     | ICU4_1            | -        |                     | Input capture ch.4 input (1)                      |
|         |      |      |      |     |     | TRG4_1            | -        |                     | PPG trigger 4 input (1)                           |
| -       | -    | -    | -    | -   | 36  | P176              | -        | A                   | General-purpose I/O port                          |
|         |      |      |      |     |     | TRG10_0           | -        |                     | PPG trigger 10 input (0)                          |
| 15*1    | 18*1 | 23*1 | 27*1 | 30  | 37  | P047              | -        | B                   | General-purpose I/O port                          |
|         |      |      |      |     |     | A17*2, *3, *4, *5 | -        |                     | External bus/Address bit17 output (0)             |
|         |      |      |      |     |     | AN45              | -        |                     | ADC analog 45 input                               |
|         |      |      |      |     |     | TRG8_0            | -        |                     | PPG trigger 8 input (0)                           |
|         |      |      |      |     |     | TIN3_2            | -        |                     | Reload timer ch.3 event input (2)                 |
|         |      |      |      |     |     | SOT0_1            | -        |                     | Multi-function serial ch.0 serial data output (1) |
| -       | -    | -    | -    | -   | 38  | P177              | -        | A                   | General-purpose I/O port                          |
|         |      |      |      |     |     | TRG11_0           | -        |                     | PPG trigger 11 input (0)                          |
| -       | -    | -    | 28*1 | 31  | 39  | P050              | -        | A                   | General-purpose I/O port                          |
|         |      |      |      |     |     | A18*5             | -        |                     | External bus/Address bit18 output                 |
|         |      |      |      |     |     | TRG5_1            | -        |                     | PPG trigger 5 input (1)                           |
|         |      |      |      |     |     | PPG33_0           | -        |                     | PPG ch.33 output (0)                              |
| -       | -    | -    | -    | 32  | 40  | P051              | -        | A                   | General-purpose I/O port                          |
|         |      |      |      |     |     | A19               | -        |                     | External bus/Address bit19 output                 |
|         |      |      |      |     |     | TRG9_0            | -        |                     | PPG trigger 9 input (0)                           |
| -       | -    | -    | -    | 33  | 41  | P052              | -        | A                   | General-purpose I/O port                          |
|         |      |      |      |     |     | A20               | -        |                     | External bus/Address bit20 output                 |
|         |      |      |      |     |     | PPG34_0           | -        |                     | PPG ch.34 output (0)                              |
|         |      |      |      |     |     | INT14_0           | -        |                     | INT14 External interrupt input (0)                |



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| Pin No.  |          |  |          |     |     | Pin Name            | Polarity | I/O Circuit Types*8 | Function*9  |
|----------|----------|--|----------|-----|-----|---------------------|----------|---------------------|---|
| 64       | 80       | 100  | 120      | 144 | 176 |                     |          |                     |   |
| 16<br>*1 | 19<br>*1 | 24<br>*1                                   | 29<br>*1 | 34  | 42  | P053                | -        | B                   | General-purpose I/O port  |
|          |          |  |          |     |     | A21 *2, *3, *4, *5  | -        |                     | External bus/Address bit21 output   |
|          |          |  |          |     |     | AN44                | -        |                     | ADC analog 44 input   |
|          |          |  |          |     |     | PPG35_0             | -        |                     | PPG ch.35 output (0)  |
|          |          |  |          |     |     | INT14_1             | -        |                     | INT14 External interrupt input (1)  |
|          |          |  |          |     |     | SCK0_1              | -        |                     | Multi-function serial ch.0 clock I/O (1)  |
| -        | -        | -  | -        | 35  | 43  | P054                | -        | A                   | General-purpose I/O port  |
|          |          |  |          |     |     | SYSClk              | -        |                     | External bus/System clock output  |
|          |          |  |          |     |     | PPG36_0             | -        |                     | PPG ch.36 output (0)  |
| 17<br>*1 | 22<br>*1 | 27<br>*1                                   | 32<br>*1 | 38  | 46  | P055                | -        | G                   | General-purpose I/O port  |
|          |          |  |          |     |     | CS2X *2, *3, *4, *5 | -        |                     | External bus chip select 2 output   |
|          |          |  |          |     |     | SIN10_0             | -        |                     | Multi-function serial ch.10 serial data input (0)                                   |
|          |          |  |          |     |     | AN43                | -        |                     | ADC analog 43 input   |
|          |          |  |          |     |     | PPG37_0             | -        |                     | PPG ch.37 output (0)  |
|          |          |  |          |     |     | TIN4_1              | -        |                     | Reload timer ch.4 event input (1)   |
| -        | -        | -  | -        | -   | 47  | P180                | -        | A                   | General-purpose I/O port  |
|          |          |  |          |     |     | PPG40_0             | -        |                     | PPG ch.40 output (0)  |
| -        | -        | -  | -        | -   | 48  | P181                | -        | A                   | General-purpose I/O port  |
|          |          |  |          |     |     | PPG41_0             | -        |                     | PPG ch.41 output (0)  |
| -        | -        | -  | 33<br>*1 | 39  | 49  | P056                | -        | A                   | General-purpose I/O port  |
|          |          |  |          |     |     | CS3X *5             | -        |                     | External bus chip select 3 output   |
|          |          |  |          |     |     | ICU9_0              | -        |                     | Input capture ch.9 input (0)  |
|          |          |  |          |     |     | PPG0_1              | -        |                     | PPG ch.0 output (1)   |
|          |          |  |          |     |     | ICU0_1              | -        |                     | Input capture ch.0 input (1)  |
|          |          |  |          |     |     | TIN5_1              | -        |                     | Reload timer ch.5 event input (1)   |
| DTTI_2   | -        | Waveform generator ch.0-ch.5 input pin (2) |          |     |     |                     |          |                     |   |
| 19<br>*1 | 24<br>*1 | 29<br>*1                                   | 35<br>*1 | 41  | 51  | P057                | -        | G                   | General-purpose I/O port  |
|          |          |  |          |     |     | RDY *2, *3, *4, *5  | -        |                     | External bus/Ready input (0)  |
|          |          |  |          |     |     | SCK10_1             | -        |                     | Multi-function serial ch.10 clock I/O (1)   |
|          |          |  |          |     |     | AN42                | -        |                     | ADC analog 42 input   |
|          |          |  |          |     |     | ICU8_0              | -        |                     | Input capture ch.8 input (0)  |
|          |          |  |          |     |     | TRG0_2              | -        |                     | PPG trigger 0 input (2)   |
|          |          |  |          |     |     | PPG1_1              | -        |                     | PPG ch.1 output (1)   |
|          |          |  |          |     |     | ICU1_1              | -        |                     | Input capture ch.1 input (1)  |
|          |          |  |          |     |     | TIN6_1              | -        |                     | Reload timer ch.6 event input (1)   |
| -        | -        | -  | -        | 44  | 54  | P142                | -        | F                   | General-purpose I/O port  |
|          |          |  |          |     |     | SCK10_0/<br>SCL10   | -        |                     | Multi-function serial ch.10 clock I/O (0)/<br>I <sup>2</sup> C bus serial clock I/O |
|          |          |  |          |     |     | PPG38_0             | -        |                     | PPG ch.38 output (0)  |
|          |          |  |          |     |     | TIN7_1              | -        |                     | Reload timer ch.7 event input (1)   |



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| Pin No. |    |     |     |     |     | Pin Name      | Polarity | I/O Circuit Types*8 | Function*9   |
|---------|----|-----|-----|-----|-----|---------------|----------|---------------------|--|
| 64      | 80 | 100 | 120 | 144 | 176 |               |          |                     |  |
| -       | -  | -   | -   | 45  | 55  | P143          | -        | F                   | General-purpose I/O port   |
|         |    |     |     |     |     | SOT10_0/SDA10 | -        |                     | Multi-function serial ch.10 serial data output (0)/ I <sup>2</sup> C bus serial data I/O |
|         |    |     |     |     |     | PPG39_0       | -        |                     | PPG ch.39 output (0)   |
|         |    |     |     |     |     | TOT4_1        | -        |                     | Reload timer ch.4 output (1)   |
| -       | -  | -   | -   | -   | 56  | P182          | -        | A                   | General-purpose I/O port   |
|         |    |     |     |     |     | PPG42_0       | -        |                     | PPG ch.42 output (0)   |
| -       | -  | 32  | 38  | 46  | 57  | P060          | -        | A                   | General-purpose I/O port   |
|         |    |     |     |     |     | SCS10_0       | -        |                     | Serial chip select 10 I/O (0)  |
|         |    |     |     |     |     | PPG2_1        | -        |                     | PPG ch.2 output (1)  |
|         |    |     |     |     |     | ICU2_1        | -        |                     | Input capture ch.2 input (1)   |
|         |    |     |     |     |     | TOT5_1        | -        |                     | Reload timer ch.5 output (1)   |
|         |    |     |     |     |     | INT13_0       | -        |                     | INT13 External interrupt input (0)   |
| 22      | 27 | 33  | 39  | 47  | 58  | P061          | -        | B                   | General-purpose I/O port   |
|         |    |     |     |     |     | SOT10_1       | -        |                     | Multi-function serial ch.10 serial data output (1)                                       |
|         |    |     |     |     |     | AN41          | -        |                     | ADC analog 41 input  |
|         |    |     |     |     |     | ICU6_0        | -        |                     | Input capture ch.6 input (0)   |
|         |    |     |     |     |     | PPG3_1        | -        |                     | PPG ch.3 output (1)  |
|         |    |     |     |     |     | ICU3_1        | -        |                     | Input capture ch.3 input (1)   |
|         |    |     |     |     |     | TOT6_1        | -        |                     | Reload timer ch.6 output (1)   |
|         |    |     |     |     |     | INT13_1       | -        |                     | INT13 External interrupt input (1)   |
| 23      | 28 | 34  | 40  | 48  | 59  | P062          | -        | B                   | General-purpose I/O port   |
|         |    |     |     |     |     | SCS10_1       | -        |                     | Serial chip select 10 I/O (1)  |
|         |    |     |     |     |     | SCS40_0       | -        |                     | Serial chip select 40 I/O (0)  |
|         |    |     |     |     |     | AN40          | -        |                     | ADC analog 40 input  |
|         |    |     |     |     |     | PPG4_1        | -        |                     | PPG ch.4 output (1)  |
|         |    |     |     |     |     | FRCK0_0       | -        |                     | Free-run timer 0 clock input (0)   |
|         |    |     |     |     |     | TOT7_1        | -        |                     | Reload timer ch.7 output (1)   |
|         |    |     |     |     |     | ZIN1_1        | -        |                     | U/D counter ch.1 ZIN input (1)   |
| -       | 29 | 35  | 41  | 49  | 60  | P063          | -        | B                   | General-purpose I/O port   |
|         |    |     |     |     |     | SCS41_0       | -        |                     | Serial chip select 41 output (0)   |
|         |    |     |     |     |     | AN39          | -        |                     | ADC analog 39 input  |
|         |    |     |     |     |     | PPG5_1        | -        |                     | PPG ch.5 output (1)  |
|         |    |     |     |     |     | FRCK1_0       | -        |                     | Free-run timer 1 clock input (0)   |
|         |    |     |     |     |     | BIN1_1        | -        |                     | U/D counter ch.1 BIN input (1)   |
| -       | -  | -   | -   | -   | 61  | P183          | -        | A                   | General-purpose I/O port   |
|         |    |     |     |     |     | PPG43_0       | -        |                     | PPG ch.43 output (0)   |



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| Pin No. |    |     |     |     |     | Pin Name | Polarity | I/O Circuit Types*8 | Function*9  |
|---------|----|-----|-----|-----|-----|----------|----------|---------------------|---|
| 64      | 80 | 100 | 120 | 144 | 176 |          |          |                     |   |
| 24      | 30 | 36  | 42  | 50  | 62  | P064     | -        | B                   | General-purpose I/O port                          |
|         |    |     |     |     |     | SCS42_0  | -        |                     | Serial chip select 42 output (0)                  |
|         |    |     |     |     |     | AN38     | -        |                     | ADC analog 38 input                               |
|         |    |     |     |     |     | FRCK2_0  | -        |                     | Free-run timer 2 clock input (0)                  |
|         |    |     |     |     |     | AIN1_1   | -        |                     | U/D counter ch.1 AIN input (1)                    |
|         |    |     |     |     |     | PPG43_1  | -        |                     | PPG ch.43 output (1)                              |
| -       | -  | 37  | 43  | 51  | 63  | P065     | -        | A                   | General-purpose I/O port                          |
|         |    |     |     |     |     | SCS43_0  | -        |                     | Serial chip select 43 output (0)                  |
|         |    |     |     |     |     | FRCK3_0  | -        |                     | Free-run timer 3 clock input (0)                  |
|         |    |     |     |     |     | ZIN0_1   | -        |                     | U/D counter ch.0 ZIN input (1)                    |
|         |    |     |     |     |     | PPG44_1  | -        |                     | PPG ch.44 output (1)                              |
| -       | -  | -   | -   | -   | 64  | P184     | -        | A                   | General-purpose I/O port                          |
|         |    |     |     |     |     | PPG44_0  | -        |                     | PPG ch.44 output (0)                              |
| -       | -  | -   | -   | -   | 65  | P185     | -        | A                   | General-purpose I/O port                          |
|         |    |     |     |     |     | PPG45_0  | -        |                     | PPG ch.45 output (0)                              |
| 25      | 31 | 38  | 44  | 52  | 66  | P066     | -        | B                   | General-purpose I/O port                          |
|         |    |     |     |     |     | SOT4_2   | -        |                     | Multi-function serial ch.4 serial data output (2) |
|         |    |     |     |     |     | SCS3_0   | -        |                     | Serial chip select 3 I/O (0)                      |
|         |    |     |     |     |     | AN37     | -        |                     | ADC analog 37 input                               |
|         |    |     |     |     |     | FRCK4_0  | -        |                     | Free-run timer 4 clock input (0)                  |
|         |    |     |     |     |     | BIN0_1   | -        |                     | U/D counter ch.0 BIN input (1)                    |
| -       | 32 | 39  | 45  | 53  | 67  | P067     | -        | B                   | General-purpose I/O port                          |
|         |    |     |     |     |     | AN36     | -        |                     | ADC analog 36 input                               |
|         |    |     |     |     |     | FRCK5_0  | -        |                     | Free-run timer 5 clock input (0)                  |
|         |    |     |     |     |     | AIN0_1   | -        |                     | U/D counter ch.0 AIN input (1)                    |
| -       | -  | 40  | 46  | 54  | 68  | P070     | -        | A                   | General-purpose I/O port                          |
|         |    |     |     |     |     | ICU0_2   | -        |                     | Input capture ch.0 input (2)                      |
| 26      | 33 | 41  | 47  | 55  | 69  | P071     | -        | G                   | General-purpose I/O port                          |
|         |    |     |     |     |     | SCK4_2   | -        |                     | Multi-function serial ch.4 clock I/O (2)          |
|         |    |     |     |     |     | AN35     | -        |                     | ADC analog 35 input                               |
|         |    |     |     |     |     | ICU1_2   | -        |                     | Input capture ch.1 input (2)                      |
|         |    |     |     |     |     | MONCLK   | -        |                     | Clock monitor output pin                          |
| 27      | 34 | 42  | 48  | 56  | 70  | P072     | -        | G                   | General-purpose I/O port                          |
|         |    |     |     |     |     | SIN4_0   | -        |                     | Multi-function serial ch.4 serial data input (0)  |
|         |    |     |     |     |     | AN34     | -        |                     | ADC analog 34 input                               |
|         |    |     |     |     |     | ICU2_2   | -        |                     | Input capture ch.2 input (2)                      |
|         |    |     |     |     |     | INT5_0   | -        |                     | INT5 External interrupt input (0)                 |



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| Pin No. |          |          |     |     |     | Pin Name               | Polarity | I/O Circuit Types*8 | Function*9   |
|---------|----------|----------|-----|-----|-----|------------------------|----------|---------------------|--|
| 64      | 80       | 100      | 120 | 144 | 176 |                        |          |                     |  |
| -       | 35<br>*3 | 43<br>*4 | 49  | 57  | 71  | P073                   | -        | D                   | General-purpose I/O port   |
|         |          |          |     |     |     | SOT4_0/<br>SDA4 *3, *4 | -        |                     | Multi-function serial ch.4 serial data output (0)/I <sup>2</sup> C bus serial data I/O |
|         |          |          |     |     |     | AN33                   | -        |                     | ADC analog 33 input  |
|         |          |          |     |     |     | ICU3_2                 | -        |                     | Input capture ch.3 input (2)   |
| -       | -        | -        | -   | -   | 72  | P186                   | -        | A                   | General-purpose I/O port   |
|         |          |          |     |     |     | PPG46_0                | -        |                     | PPG ch.46 output (0)   |
| -       | -        | -        | -   | -   | 73  | P187                   | -        | A                   | General-purpose I/O port   |
|         |          |          |     |     |     | PPG47_0                | -        |                     | PPG ch.47 output (0)   |
| -       | -        | -        | 50  | 58  | 74  | P074                   | -        | E                   | General-purpose I/O port   |
|         |          |          |     |     |     | SCK4_0/<br>SCL4        | -        |                     | Multi-function serial ch.4 clock I/O (0)/<br>I <sup>2</sup> C bus serial clock I/O     |
| -       | -        | -        | 51  | 59  | 75  | P075                   | -        | F                   | General-purpose I/O port   |
|         |          |          |     |     |     | SIN3_0                 | -        |                     | Multi-function serial ch.3 serial data input (0)                                       |
|         |          |          |     |     |     | INT4_0                 | -        |                     | INT4 External interrupt input (0)  |
| -       | -        | -        | 52  | 60  | 76  | P076                   | -        | E                   | General-purpose I/O port   |
|         |          |          |     |     |     | SOT3_0/<br>SDA3        | -        |                     | Multi-function serial ch.3 serial data output (0)/I <sup>2</sup> C bus serial data I/O |
| -       | -        | -        | 53  | 61  | 77  | P077                   | -        | E                   | General-purpose I/O port   |
|         |          |          |     |     |     | SCK3_0/<br>SCL3        | -        |                     | Multi-function serial ch.3 clock I/O (0)/<br>I <sup>2</sup> C bus serial clock I/O     |
| -       | -        | 44       | 54  | 62  | 78  | P152                   | -        | A                   | General-purpose I/O port   |
|         |          |          |     |     |     | SCS53_0                | -        |                     | Serial chip select 53 output (0)   |
| 28      | 36       | 45       | 55  | 63  | 79  | P153                   | -        | G                   | General-purpose I/O port   |
|         |          |          |     |     |     | SCK5_0/<br>SCL5        | -        |                     | Multi-function serial ch.5 clock I/O (0)/<br>I <sup>2</sup> C bus serial clock I/O     |
|         |          |          |     |     |     | AN32                   | -        |                     | ADC analog 32 input  |
|         |          |          |     |     |     | FRCK1_1                | -        |                     | Free-run timer 1 clock input (1)   |
|         |          |          |     |     |     | INT4_1                 | -        |                     | INT4 External interrupt input (1)  |
| -       | -        | -        | -   | 64  | 80  | P080                   | -        | A                   | General-purpose I/O port   |
|         |          |          |     |     |     | SCS52_0                | -        |                     | Serial chip select 52 output (0)   |
|         |          |          |     |     |     | PPG0_0                 | -        |                     | PPG ch.0 output (0)  |
| 29      | 37       | 46       | 56  | 65  | 81  | P081                   | -        | G                   | General-purpose I/O port   |
|         |          |          |     |     |     | SOT5_0/<br>SDA5        | -        |                     | Multi-function serial ch.5 serial data output (0)/I <sup>2</sup> C bus serial data I/O |
|         |          |          |     |     |     | AN0                    | -        |                     | ADC analog 0 input   |
|         |          |          |     |     |     | PPG1_0                 | -        |                     | PPG ch.1 output (0)  |
| 30      | 38       | 47       | 57  | 66  | 82  | P082                   | -        | G                   | General-purpose I/O port   |
|         |          |          |     |     |     | SIN5_0                 | -        |                     | Multi-function serial ch.5 serial data input (0)                                       |
|         |          |          |     |     |     | AN1                    | -        |                     | ADC analog 1 input   |
|         |          |          |     |     |     | PPG2_0                 | -        |                     | PPG ch.2 output (0)  |



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| Pin No. |    |     |     |     |     | Pin Name | Polarity | I/O Circuit Types*8 | Function*9                        |
|---------|----|-----|-----|-----|-----|----------|----------|---------------------|-----------------------------------|
| 64      | 80 | 100 | 120 | 144 | 176 |          |          |                     |                                   |
| -       | -  | -   | -   | 67  | 83  | P083     | -        | B                   | General-purpose I/O port          |
| -       | -  | -   | -   | 67  | 83  | SCS50_0  | -        |                     | Serial chip select 50 I/O (0)     |
| -       | -  | -   | -   | 67  | 83  | AN2      | -        |                     | ADC analog 2 input                |
| -       | -  | -   | -   | 67  | 83  | PPG3_0   | -        |                     | PPG ch.3 output (0)               |
| -       | -  | -   | -   | 68  | 84  | P084     | -        | B                   | General-purpose I/O port          |
| -       | -  | -   | -   | 68  | 84  | SCS51_0  | -        |                     | Serial chip select 51 output (0)  |
| -       | -  | -   | -   | 68  | 84  | AN3      | -        |                     | ADC analog 3 input                |
| -       | -  | -   | -   | 68  | 84  | PPG4_0   | -        |                     | PPG ch.4 output (0)               |
| -       | -  | -   | -   | 69  | 85  | P085     | -        | A                   | General-purpose I/O port          |
| -       | -  | -   | -   | 69  | 85  | PPG5_0   | -        |                     | PPG ch.5 output (0)               |
| -       | -  | 48  | 58  | 70  | 86  | P086     | -        | C                   | General-purpose I/O port          |
| -       | -  | 48  | 58  | 70  | 86  | DAO1     | -        |                     | DAC analog 1 output               |
| -       | -  | 48  | 58  | 70  | 86  | PPG6_0   | -        |                     | PPG ch.6 output (0)               |
| 31      | 39 | 49  | 59  | 71  | 87  | P087     | -        | C                   | General-purpose I/O port          |
| 31      | 39 | 49  | 59  | 71  | 87  | DAO0     | -        |                     | DAC analog 0 output               |
| 31      | 39 | 49  | 59  | 71  | 87  | PPG7_0   | -        |                     | PPG ch.7 output (0)               |
| 31      | 39 | 49  | 59  | 71  | 87  | INT8_0   | -        |                     | INT8 External interrupt input (0) |
| -       | -  | -   | -   | -   | 90  | P190     | -        | A                   | General-purpose I/O port          |
| -       | -  | -   | -   | -   | 90  | TIN0_1   | -        |                     | Reload timer ch.0 event input (1) |
| -       | -  | -   | -   | -   | 91  | P191     | -        | A                   | General-purpose I/O port          |
| -       | -  | -   | -   | -   | 91  | TIN1_1   | -        |                     | Reload timer ch.1 event input (1) |
| -       | -  | -   | -   | 74  | 92  | P090     | -        | B                   | General-purpose I/O port          |
| -       | -  | -   | -   | 74  | 92  | AN4      | -        |                     | ADC analog 4 input                |
| -       | -  | -   | -   | 74  | 92  | ICU0_0   | -        |                     | Input capture ch.0 input (0)      |
| -       | -  | -   | -   | 74  | 92  | TIN2_1   | -        |                     | Reload timer ch.2 event input (1) |
| -       | -  | -   | -   | 75  | 93  | P091     | -        | B                   | General-purpose I/O port          |
| -       | -  | -   | -   | 75  | 93  | AN5      | -        |                     | ADC analog 5 input                |
| -       | -  | -   | -   | 75  | 93  | PPG41_1  | -        |                     | PPG ch.41 output (1)              |
| -       | -  | -   | -   | 75  | 93  | ICU1_0   | -        |                     | Input capture ch.1 input (0)      |
| -       | -  | -   | -   | 75  | 93  | TIN3_1   | -        |                     | Reload timer ch.3 event input (1) |
| -       | -  | -   | -   | 76  | 94  | P092     | -        | B                   | General-purpose I/O port          |
| -       | -  | -   | -   | 76  | 94  | AN6      | -        |                     | ADC analog 6 input                |
| -       | -  | -   | -   | 76  | 94  | PPG40_1  | -        |                     | PPG ch.40 output (1)              |
| -       | -  | -   | -   | 76  | 94  | ICU2_0   | -        |                     | Input capture ch.2 input (0)      |
| -       | -  | -   | -   | 76  | 94  | TOT0_1   | -        |                     | Reload timer ch.0 output (1)      |
| -       | -  | -   | -   | -   | 95  | P192     | -        | A                   | General-purpose I/O port          |
| -       | -  | -   | -   | -   | 95  | PPG24_1  | -        |                     | PPG ch.24 output (1)              |
| -       | -  | -   | -   | -   | 95  | TOT1_1   | -        |                     | Reload timer ch.1 output (1)      |



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| Pin No.  |          |     |     |     |     | Pin Name           | Polarity | I/O Circuit Types*8 | Function*9  |
|----------|----------|-----|-----|-----|-----|--------------------|----------|---------------------|---|
| 64       | 80       | 100 | 120 | 144 | 176 |                    |          |                     |   |
| 34<br>*1 | 42<br>*1 | 52  | 62  | 77  | 96  | P093               | -        | J                   | General-purpose I/O port  |
|          |          |     |     |     |     | TX0_1              | -        |                     | CAN transmission data 0 output (1)  |
|          |          |     |     |     |     | SIN11_0            | -        |                     | Multi-function serial ch.11 serial data input (0)                                       |
|          |          |     |     |     |     | AN7                | -        |                     | ADC analog 7 input  |
|          |          |     |     |     |     | ICU4_2             | -        |                     | Input capture ch.4 input (2)  |
|          |          |     |     |     |     | PPG16_1            | -        |                     | PPG ch.16 output (1)  |
|          |          |     |     |     |     | ICU3_0             | -        |                     | Input capture ch.3 input (0)  |
|          |          |     |     |     |     | TOT2_1 *2, *3      | -        |                     | Reload timer ch.2 output (1)  |
| -        | -        | -   | -   | 78  | 97  | P094               | -        | B                   | General-purpose I/O port  |
|          |          |     |     |     |     | AN8                | -        |                     | ADC analog 8 input  |
|          |          |     |     |     |     | ICU4_0             | -        |                     | Input capture ch.4 input (0)  |
|          |          |     |     |     |     | TOT3_1             | -        |                     | Reload timer ch.3 output (1)  |
| -        | -        | 53  | 63  | 79  | 98  | P095               | -        | B                   | General-purpose I/O port  |
|          |          |     |     |     |     | TX0(128)           | -        |                     | CAN transmission data 0 output  |
|          |          |     |     |     |     | SCS11_0            | -        |                     | Serial chip select 11 I/O (0)   |
|          |          |     |     |     |     | AN9                | -        |                     | ADC analog 9 input  |
| 35       | 43       | 54  | 64  | 80  | 99  | P096               | -        | G                   | General-purpose I/O port  |
|          |          |     |     |     |     | RX0(128)           | -        |                     | CAN reception data 0 input  |
|          |          |     |     |     |     | SOT11_0/<br>SDA11  | -        |                     | Multi-function serial ch.11 serial data output (0)/I <sup>2</sup> C bus serial data I/O |
|          |          |     |     |     |     | AN10               | -        |                     | ADC analog 10 input   |
|          |          |     |     |     |     | INT0_0             | -        |                     | INT0 External interrupt input (0)   |
| 36       | 44       | 55  | 65  | 81  | 100 | P097               | -        | G                   | General-purpose I/O port  |
|          |          |     |     |     |     | SCK11_0/<br>SCL11  | -        |                     | Multi-function serial ch.11 clock I/O (0)/ I <sup>2</sup> C bus serial clock I/O        |
|          |          |     |     |     |     | AN11               | -        |                     | ADC analog 11 input   |
|          |          |     |     |     |     | ICU5_0             | -        |                     | Input capture ch.5 input (0)  |
|          |          |     |     |     |     | PPG17_1            | -        |                     | PPG ch.17 output (1)  |
|          |          |     |     |     |     |                    |          |                     |   |
| -        | 48<br>*1 | 59  | 69  | 85  | 104 | P100               | -        | G                   | General-purpose I/O port  |
|          |          |     |     |     |     | SCK7_0/<br>SCL7 *3 | -        |                     | Multi-function serial ch.7 clock I/O (0)/ I <sup>2</sup> C bus serial clock I/O         |
|          |          |     |     |     |     | AN12               | -        |                     | ADC analog 12 input   |
|          |          |     |     |     |     | PPG8_0             | -        |                     | PPG ch.8 output (0)   |
| -        | -        | 60  | 70  | 86  | 105 | P101               | -        | G                   | General-purpose I/O port  |
|          |          |     |     |     |     | SOT7_0/<br>SDA7    | -        |                     | Multi-function serial ch.7 serial data output (0)/I <sup>2</sup> C bus serial data I/O  |
|          |          |     |     |     |     | AN13               | -        |                     | ADC analog 13 input   |
|          |          |     |     |     |     | PPG9_0             | -        |                     | PPG ch.9 output (0)   |
| 40<br>*1 | 49<br>*1 | 61  | 71  | 87  | 106 | P102               | -        | G                   | General-purpose I/O port  |
|          |          |     |     |     |     | SIN7_0 *2, *3      | -        |                     | Multi-function serial ch.7 serial data input (0)  |
|          |          |     |     |     |     | AN14               | -        |                     | ADC analog 14 input   |
|          |          |     |     |     |     | PPG10_0            | -        |                     | PPG ch.10 output (0)  |
|          |          |     |     |     |     | INT10_0            | -        |                     | INT10 External interrupt input (0)  |



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| Pin No.  |          |     |     |     |     | Pin Name     | Polarity | I/O Circuit Types*8 | Function*9                              |
|----------|----------|-----|-----|-----|-----|--------------|----------|---------------------|---|
| 64       | 80       | 100 | 120 | 144 | 176 |              |          |                     |   |
| 41<br>*1 | 50<br>*1 | 62  | 72  | 88  | 107 | P103         | -        | H                   | General-purpose I/O port                |
|          |          |     |     |     |     | SCS73_0*2,*3 | -        |                     | Serial chip select 73 output (0)        |
|          |          |     |     |     |     | AN15         | -        |                     | ADC analog 15 input                     |
|          |          |     |     |     |     | PPG11_0      | -        |                     | PPG ch.11 output (0)                    |
| 42<br>*1 | 51<br>*1 | 63  | 73  | 89  | 108 | P104         | -        | H                   | General-purpose I/O port                |
|          |          |     |     |     |     | SCS72_0*2,*3 | -        |                     | Serial chip select 72 output (0)        |
|          |          |     |     |     |     | AN16         | -        |                     | ADC analog 16 input                     |
|          |          |     |     |     |     | PPG12_0      | -        |                     | PPG ch.12 output (0)                    |
| 43<br>*1 | 52<br>*1 | 64  | 74  | 90  | 109 | P105         | -        | H                   | General-purpose I/O port                |
|          |          |     |     |     |     | SCS71_0*2,*3 | -        |                     | Serial chip select 71 output (0)        |
|          |          |     |     |     |     | AN17         | -        |                     | ADC analog 17 input                     |
|          |          |     |     |     |     | PPG13_0      | -        |                     | PPG ch.13 output (0)                    |
| -        | -        | 65  | 75  | 91  | 110 | P106         | -        | H                   | General-purpose I/O port                |
|          |          |     |     |     |     | SCS70_0      | -        |                     | Serial chip select 70 I/O (0)           |
|          |          |     |     |     |     | AN18         | -        |                     | ADC analog 18 input                     |
|          |          |     |     |     |     | PPG14_0      | -        |                     | PPG ch.14 output (0)                    |
| -        | 53       | 66  | 76  | 92  | 111 | P107         | -        | B                   | General-purpose I/O port                |
|          |          |     |     |     |     | AN19         | -        |                     | ADC analog 19 input                     |
|          |          |     |     |     |     | PPG15_0      | -        |                     | PPG ch.15 output (0)                    |
| -        | -        | -   | -   | -   | 112 | P193         | -        | A                   | General-purpose I/O port                |
|          |          |     |     |     |     | PPG25_1      | -        |                     | PPG ch.25 output (1)                    |
| -        | -        | -   | 77  | 93  | 113 | P154         | -        | B                   | General-purpose I/O port                |
|          |          |     |     |     |     | AN20         | -        |                     | ADC analog 20 input                     |
| -        | -        | -   | 78  | 94  | 114 | P155         | -        | B                   | General-purpose I/O port                |
|          |          |     |     |     |     | AN21         | -        |                     | ADC analog 21 input                     |
| 44       | 54       | 67  | 79  | 95  | 115 | NMIX         | N        | M                   | Non-masking interrupt input             |
| 45       | 55       | 68  | 80  | 96  | 116 | P110         | -        | B                   | General-purpose I/O port                |
|          |          |     |     |     |     | TX1(64)      | -        |                     | CAN transmission data 1 output          |
|          |          |     |     |     |     | SCS63_0      | -        |                     | Serial chip select 63 output (0)        |
|          |          |     |     |     |     | AN22         | -        |                     | ADC analog 22 input                     |
| -        | -        | 69  | 81  | 97  | 117 | P111         | -        | G                   | General-purpose I/O port                |
|          |          |     |     |     |     | RX1(64)      | -        |                     | CAN reception data 1 input              |
|          |          |     |     |     |     | SCS62_0      | -        |                     | Serial chip select 62 output (0)        |
|          |          |     |     |     |     | AN23         | -        |                     | ADC analog 23 input                     |
|          |          |     |     |     |     | INT1_0       | -        |                     | INT1 External interrupt input (0)       |
| -        | -        | -   | 82  | 98  | 118 | P112         | -        | B                   | General-purpose I/O port                |
|          |          |     |     |     |     | AN24         | -        |                     | ADC analog 24 input                     |
|          |          |     |     |     |     | PPG16_0      | -        |                     | PPG ch.16 output (0)                    |
|          |          |     |     |     |     | RTO0_0       | -        |                     | Waveform generator ch. 0 output pin (0) |



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| Pin No. |    |     |     |     |     | Pin Name        | Polarity | I/O Circuit Types*8 | Function*9   |
|---------|----|-----|-----|-----|-----|-----------------|----------|---------------------|--|
| 64      | 80 | 100 | 120 | 144 | 176 |                 |          |                     |  |
| -       | -  | -   | 83  | 99  | 119 | P113            | -        | B                   | General-purpose I/O port   |
| -       | -  | -   | 83  | 99  | 119 | AN25            | -        |                     | ADC analog 25 input  |
| -       | -  | -   | 83  | 99  | 119 | PPG17_0         | -        |                     | PPG ch.17 output (0)   |
| -       | -  | -   | 83  | 99  | 119 | RTO1_0          | -        |                     | Waveform generator ch. 1 output pin (0)  |
| -       | -  | -   | -   | -   | 120 | P194            | -        | A                   | General-purpose I/O port   |
| -       | -  | -   | -   | -   | 120 | FRCK5_1         | -        |                     | Free-run timer 5 clock input (1)   |
| -       | -  | -   | -   | -   | 120 | PPG26_1         | -        |                     | PPG ch.26 output (1)   |
| -       | -  | -   | -   | -   | 121 | P195            | -        | A                   | General-purpose I/O port   |
| -       | -  | -   | -   | -   | 121 | FRCK4_1         | -        |                     | Free-run timer 4 clock input (1)   |
| -       | -  | -   | -   | -   | 121 | PPG27_1         | -        |                     | PPG ch.27 output (1)   |
| -       | 56 | 70  | 84  | 100 | 122 | P114            | -        | B                   | General-purpose I/O port   |
| -       | 56 | 70  | 84  | 100 | 122 | SCS61_0         | -        |                     | Serial chip select 61 output (0)   |
| -       | 56 | 70  | 84  | 100 | 122 | AN26            | -        |                     | ADC analog 26 input  |
| -       | 56 | 70  | 84  | 100 | 122 | PPG18_0         | -        |                     | PPG ch.18 output (0)   |
| -       | 56 | 70  | 84  | 100 | 122 | RTO2_0          | -        |                     | Waveform generator ch.2 output pin (0)   |
| 46      | 57 | 71  | 85  | 101 | 123 | P115            | -        | G                   | General-purpose I/O port   |
| 46      | 57 | 71  | 85  | 101 | 123 | RX1_1           | -        |                     | CAN reception data 1 input (1)   |
| 46      | 57 | 71  | 85  | 101 | 123 | SOT6_0/<br>SDA6 | -        |                     | Multi-function serial ch.6 serial data output (0)/I <sup>2</sup> C bus serial data I/O |
| 46      | 57 | 71  | 85  | 101 | 123 | AN27            | -        |                     | ADC analog 27 input  |
| 46      | 57 | 71  | 85  | 101 | 123 | PPG19_0         | -        |                     | PPG ch.19 output (0)   |
| 46      | 57 | 71  | 85  | 101 | 123 | RTO3_0          | -        |                     | Waveform generator ch.3 output pin (0)   |
| 46      | 57 | 71  | 85  | 101 | 123 | INT1_1          | -        |                     | INT1 External interrupt input (1)  |
| 47      | 58 | 72  | 86  | 102 | 124 | P116            | -        | G                   | General-purpose I/O port   |
| 47      | 58 | 72  | 86  | 102 | 124 | SCK6_0/<br>SCL6 | -        |                     | Multi-function serial ch.6 clock I/O (0)/ I <sup>2</sup> C bus serial clock I/O        |
| 47      | 58 | 72  | 86  | 102 | 124 | AN28            | -        |                     | ADC analog 28 input  |
| 47      | 58 | 72  | 86  | 102 | 124 | PPG20_0         | -        |                     | PPG ch.20 output (0)   |
| 47      | 58 | 72  | 86  | 102 | 124 | RTO4_0          | -        |                     | Waveform generator ch.4 output pin (0)   |
| -       | -  | 73  | 87  | 103 | 125 | P117            | -        | B                   | General-purpose I/O port   |
| -       | -  | 73  | 87  | 103 | 125 | SCS60_0         | -        |                     | Serial chip select 60 I/O (0)  |
| -       | -  | 73  | 87  | 103 | 125 | AN29            | -        |                     | ADC analog 29 input  |
| -       | -  | 73  | 87  | 103 | 125 | PPG21_0         | -        |                     | PPG ch.21 output (0)   |
| -       | -  | 73  | 87  | 103 | 125 | RTO5_0          | -        |                     | Waveform generator ch.5 output pin (0)   |
| -       | -  | -   | -   | -   | 126 | P196            | -        | A                   | General-purpose I/O port   |
| -       | -  | -   | -   | -   | 126 | FRCK3_1         | -        |                     | Free-run timer 3 clock input (1)   |
| -       | -  | -   | -   | -   | 126 | PPG28_1         | -        |                     | PPG ch.28 output (1)   |
| -       | -  | -   | 88  | 104 | 127 | P120            | -        | B                   | General-purpose I/O port   |
| -       | -  | -   | 88  | 104 | 127 | AN30            | -        |                     | ADC analog 30 input  |
| -       | -  | -   | 88  | 104 | 127 | OCU6_0          | -        |                     | Output compare ch.6 output (0)   |
| -       | -  | -   | 88  | 104 | 127 | PPG22_0         | -        |                     | PPG ch.22 output (0)   |
| -       | -  | -   | 88  | 104 | 127 | INT9_0          | -        |                     | INT9 External interrupt input (0)  |



## CY91520 Series

| Pin No. |    |     |     |     |     | Pin Name | Polarity | I/O Circuit Types*8 | Function*9  |
|---------|----|-----|-----|-----|-----|----------|----------|---------------------|---|
| 64      | 80 | 100 | 120 | 144 | 176 |          |          |                     |   |
| -       | -  | -   | -   | 105 | 128 | P121     | -        | A                   | General-purpose I/O port                          |
| -       | -  | -   | -   | -   | -   | OCU7_0   | -        |                     | Output compare ch.7 output (0)                    |
| -       | -  | -   | -   | -   | -   | PPG23_0  | -        |                     | PPG ch.23 output (0)                              |
| 48      | 59 | 74  | 89  | 106 | 129 | P122     | -        | J                   | General-purpose I/O port                          |
| -       | -  | -   | -   | -   | -   | SIN6_0   | -        |                     | Multi-function serial ch.6 serial data input (0)  |
| -       | -  | -   | -   | -   | -   | AN31     | -        |                     | ADC analog 31 input                               |
| -       | -  | -   | -   | -   | -   | OCU8_0   | -        |                     | Output compare ch.8 output (0)                    |
| -       | -  | -   | -   | -   | -   | INT9_1   | -        |                     | INT9 External interrupt input (1)                 |
| -       | -  | -   | -   | -   | 130 | P197     | -        | A                   | General-purpose I/O port                          |
| -       | -  | -   | -   | -   | -   | PPG29_1  | -        |                     | PPG ch.29 output (1)                              |
| -       | -  | -   | -   | 107 | 131 | P123     | -        | A                   | General-purpose I/O port                          |
| -       | -  | -   | -   | -   | -   | OCU9_0   | -        |                     | Output compare ch.9 output (0)                    |
| 49      | 62 | 77  | 92  | 110 | 134 | DEBUGIF  | -        | L                   | MDI I/O for debugger (OCD)                        |
| -       | -  | -   | -   | -   | 135 | P160     | -        | A                   | General-purpose I/O port                          |
| -       | -  | -   | -   | -   | -   | PPG30_1  | -        |                     | PPG ch.30 output (1)                              |
| -       | -  | -   | -   | -   | 136 | P161     | -        | A                   | General-purpose I/O port                          |
| -       | -  | -   | -   | -   | -   | PPG31_1  | -        |                     | PPG ch.31 output (1)                              |
| -       | -  | -   | -   | 111 | 137 | P124     | -        | A                   | General-purpose I/O port                          |
| -       | -  | -   | -   | -   | -   | OCU10_0  | -        |                     | Output compare ch.10 output (0)                   |
| -       | -  | -   | 93  | 112 | 138 | P125     | -        | A                   | General-purpose I/O port                          |
| -       | -  | -   | -   | -   | -   | OCU11_0  | -        |                     | Output compare ch.11 output (0)                   |
| 50      | 63 | 78  | 94  | 113 | 139 | P126     | -        | F                   | General-purpose I/O port                          |
| -       | -  | -   | -   | -   | -   | SIN0_0   | -        |                     | Multi-function serial ch.0 serial data input (0)  |
| -       | -  | -   | -   | -   | -   | INT6_0   | -        |                     | INT6 External interrupt input (0)                 |
| -       | 64 | 79  | 95  | 114 | 140 | P127     | -        | A                   | General-purpose I/O port                          |
| -       | -  | -   | -   | -   | -   | SOT0_0   | -        |                     | Multi-function serial ch.0 serial data output (0) |
| -       | -  | 80  | 96  | 115 | 141 | P130     | -        | F                   | General-purpose I/O port                          |
| -       | -  | -   | -   | -   | -   | SCK0_0   | -        |                     | Multi-function serial ch.0 clock I/O (0)          |
| -       | -  | -   | -   | -   | 142 | P162     | -        | A                   | General-purpose I/O port                          |
| -       | -  | -   | -   | -   | -   | TRG5_2   | -        |                     | PPG trigger 5 input (2)                           |
| -       | -  | -   | -   | -   | 143 | P163     | -        | A                   | General-purpose I/O port                          |
| -       | -  | -   | -   | -   | -   | TRG6_2   | -        |                     | PPG trigger 6 input (2)                           |
| 51      | 65 | 81  | 97  | 116 | 144 | MD0      | -        | K                   | Mode pin 0  |
| 52      | 66 | 82  | 98  | 117 | 145 | MD1      | -        | K                   | Mode pin 1  |
| 53      | 67 | 83  | 99  | 118 | 146 | X0       | -        | N                   | Main clock oscillation input                      |
| 54      | 68 | 84  | 100 | 119 | 147 | X1       | -        | N                   | Main clock oscillation output                     |
| 56      | 70 | 86  | 102 | 121 | 149 | P135     | -        | A                   | General-purpose I/O port                          |
| -       | -  | -   | -   | -   | -   | DTTI_0   | -        |                     | Waveform generator ch.0-ch.5 input pin (0)        |
| -       | -  | -   | -   | -   | -   | X1A      | -        |                     | Sub clock oscillation output                      |
| 57      | 71 | 87  | 103 | 122 | 150 | P136     | -        | A                   | General-purpose I/O port                          |
| -       | -  | -   | -   | -   | -   | X0A      | -        |                     | Sub clock oscillation input                       |



## CY91520 Series

| Pin No. |      |      |       |     |     | Pin Name    | Polarity | I/O Circuit Types*8 | Function*9  |
|---------|------|------|-------|-----|-----|-------------|----------|---------------------|---|
| 64      | 80   | 100  | 120   | 144 | 176 |             |          |                     |   |
| 58      | 72   | 88   | 104   | 123 | 151 | RSTX        | N        | M                   | External reset input                              |
| -       | -    | -    | -     | 124 | 152 | P131        | -        | A                   | General-purpose I/O port                          |
| -       | -    | -    | -     | -   | -   | ADTG0_0     | -        |                     | A/D converter external trigger input 0 (0)        |
| -       | -    | -    | 105   | 125 | 153 | P132        | -        | A                   | General-purpose I/O port                          |
| -       | -    | -    | -     | -   | -   | SCS1_0      | -        |                     | Serial chip select 1 I/O (0)                      |
| -       | -    | -    | -     | -   | -   | ADTG1_0     | -        |                     | A/D converter external trigger input 1 (0)        |
| -       | -    | 89   | 106   | 126 | 154 | P133        | -        | A                   | General-purpose I/O port                          |
| -       | -    | -    | -     | -   | -   | TX2(64)     | -        |                     | CAN transmission data 2 output                    |
| -       | -    | 90   | 107   | 127 | 155 | P134        | -        | F                   | General-purpose I/O port                          |
| -       | -    | -    | -     | -   | -   | RX2(64)     | -        |                     | CAN reception data 2 input                        |
| -       | -    | -    | -     | -   | -   | SCS1_1      | -        |                     | Serial chip select 1 I/O (1)                      |
| -       | -    | -    | -     | -   | -   | ICU7_0      | -        |                     | Input capture ch.7 input (0)                      |
| -       | -    | -    | -     | -   | -   | INT7_0      | -        |                     | INT7 External interrupt input (0)                 |
| -       | -    | 91   | 108   | 128 | 156 | P144        | -        | F                   | General-purpose I/O port                          |
| -       | -    | -    | -     | -   | -   | SCK1_1      | -        |                     | Multi-function serial ch.1 clock I/O (1)          |
| -       | -    | 94*1 | 111*1 | 131 | 159 | P000        | -        | F                   | General-purpose I/O port                          |
| -       | -    | -    | -     | -   | -   | D16*4,*5    | -        |                     | External bus data bit16 I/O (0)                   |
| -       | -    | -    | -     | -   | -   | SIN1_0      | -        |                     | Multi-function serial ch.1 serial data input (0)  |
| -       | -    | -    | -     | -   | -   | TIOA0_1*4   | -        |                     | TIOA output of Base timer ch.0 (1)                |
| -       | -    | -    | -     | -   | -   | INT2_0      | -        |                     | INT2 External interrupt input (0)                 |
| -       | 75*1 | 95*1 | 112*1 | 132 | 160 | P001        | -        | A                   | General-purpose I/O port                          |
| -       | -    | -    | -     | -   | -   | D17*3,*4,*5 | -        |                     | External bus data bit17 I/O                       |
| -       | -    | -    | -     | -   | -   | SOT1_0*3    | -        |                     | Multi-function serial ch.1 serial data output (0) |
| -       | -    | -    | -     | -   | -   | TIOA1_1     | -        |                     | TIOA I/O of Base timer ch.1 (1)                   |
| -       | -    | -    | 113*1 | 133 | 161 | P002        | -        | F                   | General-purpose I/O port                          |
| -       | -    | -    | -     | -   | -   | D18*5       | -        |                     | External bus data bit18 I/O                       |
| -       | -    | -    | -     | -   | -   | SCK1_0      | -        |                     | Multi-function serial ch.1 clock I/O (0)          |
| -       | -    | -    | -     | -   | -   | TIOB0_1     | -        |                     | TIOB input of Base timer ch.0 (1)                 |
| -       | 76*1 | 96*1 | 114*1 | 134 | 162 | P003        | -        | F                   | General-purpose I/O port                          |
| -       | -    | -    | -     | -   | -   | D19*3,*4,*5 | -        |                     | External bus data bit19 I/O                       |
| -       | -    | -    | -     | -   | -   | SIN2_0      | -        |                     | Multi-function serial ch.2 serial data input (0)  |
| -       | -    | -    | -     | -   | -   | TIOB1_1     | -        |                     | TIOB input of Base timer ch.1 (1)                 |
| -       | -    | -    | -     | -   | -   | INT3_0      | -        |                     | INT3 External interrupt input (0)                 |
| -       | -    | -    | -     | 135 | 163 | P004        | -        | A                   | General-purpose I/O port                          |
| -       | -    | -    | -     | -   | -   | D20         | -        |                     | External bus data bit20 I/O (0)                   |
| -       | -    | -    | -     | -   | -   | SOT2_0      | -        |                     | Multi-function serial ch.2 serial data output (0) |
| -       | -    | -    | -     | -   | 164 | P164        | -        | A                   | General-purpose I/O port                          |
| -       | -    | -    | -     | -   | -   | PPG32_1     | -        |                     | PPG ch.32 output (1)                              |



## CY91520 Series

| Pin No.  |          |          |           |           |           | Pin Name               | Polarity | I/O Circuit Types*8 | Function*9  |
|----------|----------|----------|-----------|-----------|-----------|------------------------|----------|---------------------|---|
| 64       | 80       | 100      | 120       | 144       | 176       |                        |          |                     |   |
| 61<br>*1 | 77<br>*1 | 97<br>*1 | 115<br>*1 | 136<br>*1 | 165<br>*1 | P005                   | -        | F                   | General-purpose I/O port                          |
|          |          |          |           |           |           | D21 *2, *3, *4, *5     | -        |                     | External bus data bit21 I/O (0)                   |
|          |          |          |           |           |           | SCK2_0 *2              | -        |                     | Multi-function serial ch.2 clock I/O (0)          |
|          |          |          |           |           |           | ADTG0_1                | -        |                     | A/D converter external trigger input 0 (1)        |
|          |          |          |           |           |           | INT7_1                 | -        |                     | INT7 External interrupt input (1)                 |
|          |          |          |           |           |           | RX2(64) *4, *5, *6, *7 | -        |                     | CAN reception data 2 input                        |
| -        | -        | -        | -         | -         | 166       | P165                   | -        | A                   | General-purpose I/O port                          |
| -        | -        | -        | -         | -         | 166       | PPG33_1                | -        | A                   | PPG ch.33 output (1)                              |
| 62<br>*1 | 78<br>*1 | 98<br>*1 | 116<br>*1 | 137<br>*1 | 167<br>*1 | P006                   | -        | A                   | General-purpose I/O port                          |
|          |          |          |           |           |           | D22 *2, *3, *4, *5     | -        |                     | External bus data bit22 I/O (0)                   |
|          |          |          |           |           |           | SCS2_0 *2              | -        |                     | Serial chip select 2 I/O (0)                      |
|          |          |          |           |           |           | ADTG1_1                | -        |                     | A/D converter external trigger input 1 (1)        |
|          |          |          |           |           |           | INT2_1                 | -        |                     | INT2 External interrupt input (1)                 |
|          |          |          |           |           |           | TX2(64) *4, *5, *6, *7 | -        |                     | CAN transmission data 2 output                    |
| -        | -        | -        | 117<br>*1 | 138       | 168       | P007                   | -        | A                   | General-purpose I/O port                          |
| -        | -        | -        | 117<br>*1 | 138       | 168       | D23 *5                 | -        | A                   | External bus data bit23 I/O                       |
| -        | -        | -        | -         | -         | 169       | P166                   | -        | A                   | General-purpose I/O port                          |
| -        | -        | -        | -         | -         | 169       | PPG34_1                | -        | A                   | PPG ch.34 output (1)                              |
| -        | -        | -        | 118<br>*1 | 139       | 170       | P010                   | -        | A                   | General-purpose I/O port                          |
| -        | -        | -        | 118<br>*1 | 139       | 170       | D24 *5                 | -        | A                   | External bus data bit24 I/O                       |
| 63<br>*1 | 79<br>*1 | 99<br>*1 | 119<br>*1 | 140       | 171       | P011                   | -        | A                   | General-purpose I/O port                          |
|          |          |          |           |           |           | WOT                    | -        |                     | RTC output signal                                 |
|          |          |          |           |           |           | D25 *2, *3, *4, *5     | -        |                     | External bus data bit25 I/O                       |
|          |          |          |           |           |           | SOT2_1 *2              | -        |                     | Multi-function serial ch.2 serial data output (1) |
|          |          |          |           |           |           | TIOA0_0 *2, *3, *4     | -        |                     | TIOA output of Base timer ch.0 (0)                |
|          |          |          |           |           |           | INT3_1                 | -        |                     | INT3 External interrupt input (1)                 |
| -        | -        | -        | -         | 141       | 172       | P012                   | -        | A                   | General-purpose I/O port                          |
| -        | -        | -        | -         | 141       | 172       | D26                    | -        | A                   | External bus data bit26 I/O                       |
| -        | -        | -        | -         | 141       | 172       | TIOB0_0                | -        | A                   | TIOB input of Base timer ch.0 (0)                 |
| -        | -        | -        | -         | -         | 173       | P167                   | -        | A                   | General-purpose I/O port                          |
| -        | -        | -        | -         | -         | 173       | PPG35_1                | -        | A                   | PPG ch.35 output (1)                              |
| -        | -        | -        | -         | 142       | 174       | P013                   | -        | A                   | General-purpose I/O port                          |
| -        | -        | -        | -         | 142       | 174       | D27                    | -        |                     | External bus data bit27 I/O                       |
| -        | -        | -        | -         | 142       | 174       | TIOA1_0                | -        |                     | TIOA I/O of Base timer ch.1 (0)                   |
| -        | -        | -        | -         | 143       | 175       | P014                   | -        | A                   | General-purpose I/O port                          |
| -        | -        | -        | -         | 143       | 175       | D28                    | -        |                     | External bus data bit28 I/O                       |
| -        | -        | -        | -         | 143       | 175       | TIOB1_0                | -        | A                   | TIOB input of Base timer ch.1 (0)                 |
| 18       | 23       | 28       | 34        | 40        | 50        | AVCC1                  | -        | -                   | Analog power supply for AD/DA convertor unit1     |
| 39       | 47       | 58       | 68        | 84        | 103       | AVCC0                  | -        | -                   | Analog power supply for AD/DA convertor unit0     |



## CY91520 Series

| Pin No. |    |     |     |     |     | Pin Name        | Polarity | I/O Circuit Types*8 | Function*9  |
|---------|----|-----|-----|-----|-----|-----------------|----------|---------------------|---|
| 64      | 80 | 100 | 120 | 144 | 176 |                 |          |                     |   |
| 20      | 25 | 30  | 36  | 42  | 52  | AVRH1           | -        | -                   | Upper limit reference voltage for AD convertor unit1                                  |
| 38      | 46 | 57  | 67  | 83  | 102 | AVRH0           | -        | -                   | Upper limit reference voltage for AD convertor unit0                                  |
| 21      | 26 | 31  | 37  | 43  | 53  | AVSS1/<br>AVRL1 | -        | -                   | GND for AD/DA convertor unit1<br>Lower limit reference voltage for AD convertor unit1 |
| 37      | 45 | 56  | 66  | 82  | 101 | AVSS0/<br>AVRL0 | -        | -                   | GND for AD/DA convertor unit0<br>Lower limit reference voltage for AD convertor unit0 |
| 60      | 74 | 93  | 110 | 130 | 158 | C               | -        | -                   | External capacity connection output   |
| -       | 20 | 25  | 30  | 36  | 44  | VCC             | -        | -                   | +5.0V power supply  |
| 32      | 40 | 50  | 60  | 72  | 88  |                 |          |                     |   |
| -       | 61 | 76  | 91  | 109 | 133 |                 |          |                     |   |
| 64      | 80 | 100 | 120 | 144 | 176 |                 |          |                     |   |
| 1       | 1  | 1   | 1   | 1   | 1   | VSS             | -        | -                   | GND   |
| -       | 21 | 26  | 31  | 37  | 45  |                 |          |                     |   |
| 33      | 41 | 51  | 61  | 73  | 89  |                 |          |                     |   |
| -       | 60 | 75  | 90  | 108 | 132 |                 |          |                     |   |
| 55      | 69 | 85  | 101 | 120 | 148 |                 |          |                     |   |
| 59      | 73 | 92  | 109 | 129 | 157 |                 |          |                     |   |

\*1: There is a restriction of pin functions. See "Pin Name" of this table.

\*2: not supported in 64 pin

\*3: not supported in 80 pin

\*4: not supported in 100 pin

\*5: not supported in 120 pin

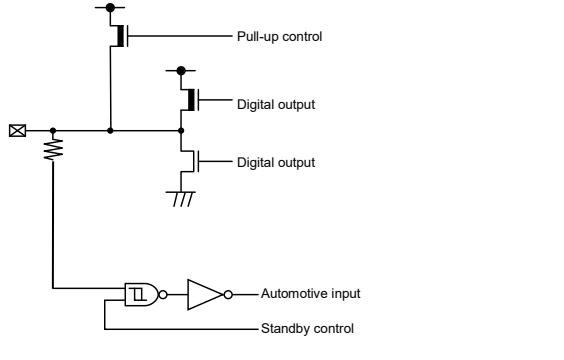
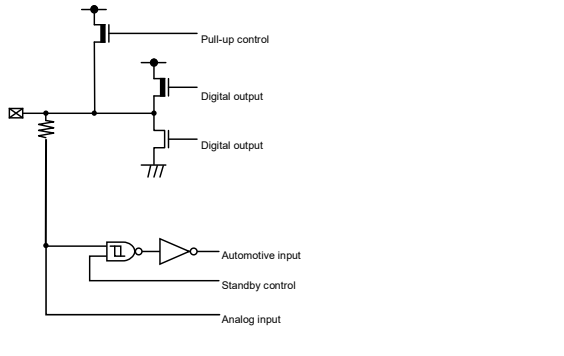
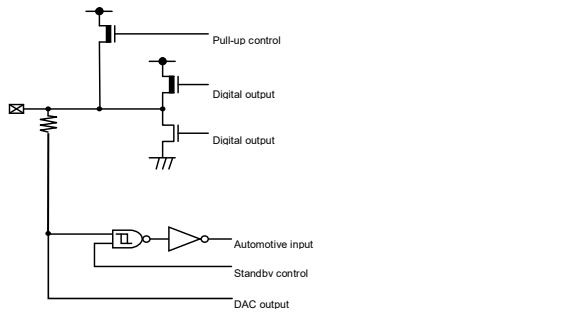
\*6: not supported in 144 pin

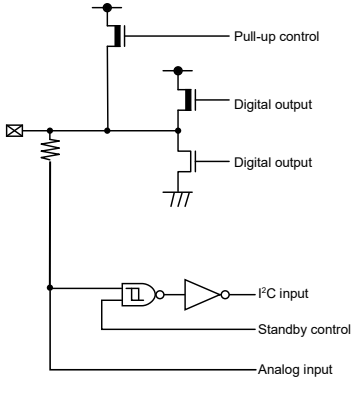
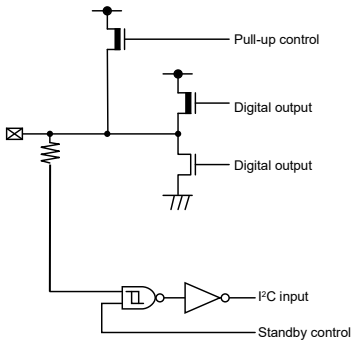
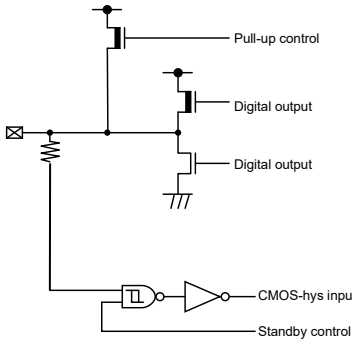
\*7: not supported in 176 pin

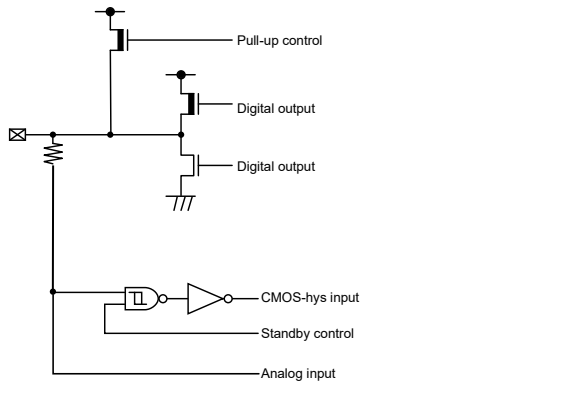
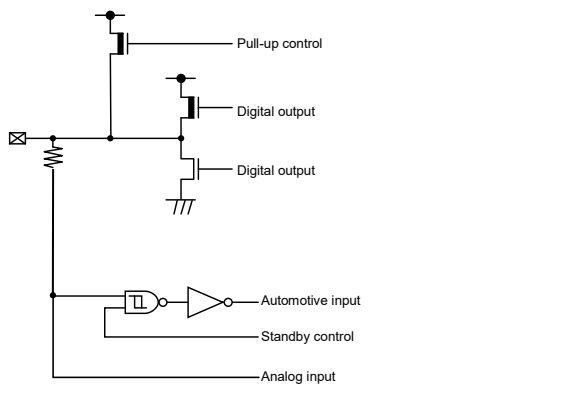
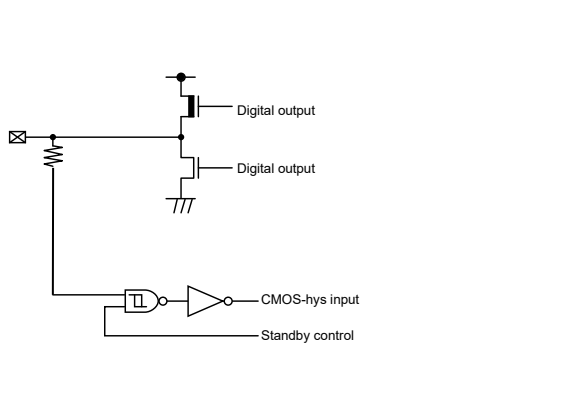
\*8: For the I/O circuit types, see [I/O Circuit Type](#).

\*9: For switching, see "I/O Port" in HARDWARE MANUAL.

## 4. I/O Circuit Type

| Type | Circuit   | Remarks   |
|------|---|---|
| A    |    | <ul style="list-style-type: none"> <li>•General-purpose I/O port</li> <li>•Output 4 mA</li> <li>•Pull-up resistor control 50 k<math>\Omega</math></li> <li>•Automotive input</li> </ul>               |
| B    |   | <ul style="list-style-type: none"> <li>•Analog input, General-purpose I/O port</li> <li>•Output 4 mA</li> <li>•Pull-up resistor control 50 k<math>\Omega</math></li> <li>•Automotive input</li> </ul> |
| C    |  | <ul style="list-style-type: none"> <li>•DAC output, General-purpose I/O port</li> <li>•Output 4 mA</li> <li>•Pull-up resistor control 50 k<math>\Omega</math></li> <li>•Automotive input</li> </ul>   |

| Type | Circuit   | Remarks   |
|------|---|---|
| D    |    | <ul style="list-style-type: none"> <li>•I²C Analog input, General-purpose I/O port</li> <li>•Output 3 mA</li> <li>•Pull-up resistor control 50 kΩ</li> <li>•I²C hysteresis input</li> </ul> |
| E    |   | <ul style="list-style-type: none"> <li>•I²C, General-purpose I/O port</li> <li>•Output 3 mA</li> <li>•Pull-up resistor control 50 kΩ</li> <li>•I²C hysteresis input</li> </ul>              |
| F    |  | <ul style="list-style-type: none"> <li>•General-purpose I/O port</li> <li>•Output 4 mA</li> <li>•Pull-up resistor control 50 kΩ</li> <li>•CMOS hysteresis input</li> </ul>                  |

| Type | Circuit   | Remarks   |
|------|---|---|
| G    |    | <ul style="list-style-type: none"> <li>•Analog input, General-purpose I/O port</li> <li>•Output 4 mA</li> <li>•Pull-up resistor control 50 k<math>\Omega</math></li> <li>• CMOS hysteresis input</li> </ul> |
| H    |   | <ul style="list-style-type: none"> <li>•Analog input, General-purpose I/O port</li> <li>•Output 12 mA</li> <li>•Pull-up resistor control 50 k<math>\Omega</math></li> <li>•Automotive input</li> </ul>      |
| I    |  | <ul style="list-style-type: none"> <li>• General-purpose I/O port (5 V tolerant)</li> <li>• Output 4 mA</li> <li>• CMOS hysteresis input</li> </ul>   |



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| Type | Circuit | Remarks   |
|------|---------|---|
| J    |         | <ul style="list-style-type: none"> <li>• Analog input, General-purpose I/O port (5 V tolerant)</li> <li>• Output 4 mA</li> <li>• CMOS hysteresis input</li> </ul> |
| K    |         | <ul style="list-style-type: none"> <li>• Mode I/O</li> <li>• CMOS hysteresis input</li> </ul>   |
| L    |         | <ul style="list-style-type: none"> <li>• Open-drain I/O</li> <li>• Output 25 mA (Nch open-drain)</li> <li>• TTL input</li> </ul>                                  |
| M    |         | <ul style="list-style-type: none"> <li>• CMOS hysteresis input</li> <li>• Pull-up resistor 50 kΩ</li> </ul>   |
| N    |         | <ul style="list-style-type: none"> <li>• Main oscillation I/O</li> </ul>  |



| Type | Circuit | Remarks  |
|------|---------|--|
| O    |         | <ul style="list-style-type: none"> <li>•Sub oscillation I/O</li> </ul> |



## 5. Handling Precautions

Any semiconductor devices have inherently a certain rate of failure. The possibility of failure is greatly affected by the conditions in which they are used (circuit conditions, environmental conditions, etc.). This page describes precautions that must be observed to minimize the chance of failure and to obtain higher reliability from your Cypress semiconductor devices.

### 1. Precautions for Product Design

This section describes precautions when designing electronic equipment using semiconductor devices.

#### ■ Absolute Maximum Ratings

Semiconductor devices can be permanently damaged by application of stress (voltage, current, temperature, etc.) in excess of certain established limits, called absolute maximum ratings. Do not exceed these ratings.

#### ■ Recommended Operating Conditions

Recommended operating conditions are normal operating ranges for the semiconductor device. All the device's electrical characteristics are warranted when operated within these ranges.

Always use semiconductor devices within the recommended operating conditions. Operation outside these ranges may adversely affect reliability and could result in device failure.

No warranty is made with respect to uses, operating conditions, or combinations not represented on the data sheet. Users considering application outside the listed conditions are advised to contact their sales representative beforehand.

#### ■ Processing and Protection of Pins

These precautions must be followed when handling the pins which connect semiconductor devices to power supply and input/output functions.

#### (1) Preventing Over-Voltage and Over-Current Conditions

Exposure to voltage or current levels in excess of maximum ratings at any pin is likely to cause deterioration within the device, and in extreme cases leads to permanent damage of the device. Try to prevent such overvoltage or over-current conditions at the design stage.

#### (2) Protection of Output Pins

Shorting of output pins to supply pins or other output pins, or connection to large capacitance can cause large current flows. Such conditions if present for extended periods of time can damage the device. Therefore, avoid this type of connection.

#### (3) Handling of Unused Input Pins

Unconnected input pins with very high impedance levels can adversely affect stability of operation. Such pins should be connected through an appropriate resistance to a power supply pin or ground pin.

#### ■ Latch-up

Semiconductor devices are constructed by the formation of P-type and N-type areas on a substrate. When subjected to abnormally high voltages, internal parasitic PNP junctions (called thyristor structures) may be formed, causing large current levels in excess of several hundred mA to flow continuously at the power supply pin. This condition is called latch-up.

**CAUTION:** The occurrence of latch-up not only causes loss of reliability in the semiconductor device, but can cause injury or damage from high heat, smoke or flame. To prevent this from happening, do the following:

- (1) Be sure that voltages applied to pins do not exceed the absolute maximum ratings. This should include attention to abnormal noise, surge levels, etc.
- (2) Be sure that abnormal current flows do not occur during the power-on sequence.

#### ■ Observance of Safety Regulations and Standards



Most countries in the world have established standards and regulations regarding safety, protection from electromagnetic interference, etc. Customers are requested to observe applicable regulations and standards in the design of products.

### ■ Fail-Safe Design

Any semiconductor devices have inherently a certain rate of failure. You must protect against injury, damage or loss from such failures by incorporating safety design measures into your facility and equipment such as redundancy, fire protection, and prevention of over-current levels and other abnormal operating conditions.

### ■ Precautions Related to Usage of Devices

Cypress semiconductor devices are intended for use in standard applications (computers, office automation and other office equipment, industrial, communications, and measurement equipment, personal or household devices, etc.).

**CAUTION:** Customers considering the use of our products in special applications where failure or abnormal operation may directly affect human lives or cause physical injury or property damage, or where extremely high levels of reliability are demanded (such as aerospace systems, atomic energy controls, sea floor repeaters, vehicle operating controls, medical devices for life support, etc.) are requested to consult with sales representatives before such use. The company will not be responsible for damages arising from such use without prior approval.

## 2. Precautions for Package Mounting

Package mounting may be either lead insertion type or surface mount type. In either case, for heat resistance during soldering, you should only mount under Cypress's recommended conditions. For detailed information about mount conditions, contact your sales representative.

### ■ Lead Insertion Type

Mounting of lead insertion type packages onto printed circuit boards may be done by two methods: direct soldering on the board, or mounting by using a socket.

Direct mounting onto boards normally involves processes for inserting leads into through-holes on the board and using the flow soldering (wave soldering) method of applying liquid solder. In this case, the soldering process usually causes leads to be subjected to thermal stress in excess of the absolute ratings for storage temperature. Mounting processes should conform to Cypress recommended mounting conditions.

If socket mounting is used, differences in surface treatment of the socket contacts and IC lead surfaces can lead to contact deterioration after long periods. For this reason it is recommended that the surface treatment of socket contacts and IC leads be verified before mounting.

### ■ Surface Mount Type

Surface mount packaging has longer and thinner leads than lead-insertion packaging, and therefore leads are more easily deformed or bent. The use of packages with higher pin counts and narrower pin pitch results in increased susceptibility to open connections caused by deformed pins, or shorting due to solder bridges.

You must use appropriate mounting techniques. Cypress recommends the solder reflow method, and has established a ranking of mounting conditions for each product. Users are advised to mount packages in accordance with Cypress ranking of recommended conditions.

### ■ Lead-Free Packaging

**CAUTION:** When ball grid array (BGA) packages with Sn-Ag-Cu balls are mounted using Sn-Pb eutectic soldering, junction strength may be reduced under some conditions of use.

### ■ Storage of Semiconductor Devices

Because plastic chip packages are formed from plastic resins, exposure to natural environmental conditions will cause absorption of moisture. During mounting, the application of heat to a package that has absorbed moisture can cause surfaces to peel, reducing moisture resistance and causing packages to crack. To prevent, do the following:



- (1) Avoid exposure to rapid temperature changes, which cause moisture to condense inside the product. Store products in locations where temperature changes are slight.
- (2) Use dry boxes for product storage. Products should be stored below 70 % relative humidity, and at temperatures between 5 °C and 30 °C.  
When you open Dry Package that recommends humidity 40 % to 70 % relative humidity.
- (3) When necessary, Cypress packages semiconductor devices in highly moisture-resistant aluminum laminate bags, with a silica gel desiccant. Devices should be sealed in their aluminum laminate bags for storage.
- (4) Avoid storing packages where they are exposed to corrosive gases or high levels of dust.

#### ■ Baking

Packages that have absorbed moisture may be de-moisturized by baking (heat drying). Follow the Cypress recommended conditions for baking.

Condition: 125 °C/24 h

#### ■ Static Electricity

Because semiconductor devices are particularly susceptible to damage by static electricity, you must take the following precautions:

- (1) Maintain relative humidity in the working environment between 40 % and 70 %. Use of an apparatus for ion generation may be needed to remove electricity.
- (2) Electrically ground all conveyors, solder vessels, soldering irons and peripheral equipment.
- (3) Eliminate static body electricity by the use of rings or bracelets connected to ground through high resistance (on the level of 1 MΩ).  
Wearing of conductive clothing and shoes, use of conductive floor mats and other measures to minimize shock loads is recommended.
- (4) Ground all fixtures and instruments, or protect with anti-static measures.
- (5) Avoid the use of styrofoam or other highly static-prone materials for storage of completed board assemblies.

### 3. Precautions for Use Environment

Reliability of semiconductor devices depends on ambient temperature and other conditions as described above.

For reliable performance, do the following:

#### (1) Humidity

Prolonged use in high humidity can lead to leakage in devices as well as printed circuit boards. If high humidity levels are anticipated, consider anti-humidity processing.

#### (2) Discharge of Static Electricity

When high-voltage charges exist close to semiconductor devices, discharges can cause abnormal operation. In such cases, use anti-static measures or processing to prevent discharges.

#### (3) Corrosive Gases, Dust, or Oil

Exposure to corrosive gases or contact with dust or oil may lead to chemical reactions that will adversely affect the device. If you use devices in such conditions, consider ways to prevent such exposure or to protect the devices.

#### (4) Radiation, Including Cosmic Radiation

Most devices are not designed for environments involving exposure to radiation or cosmic radiation. Users should provide shielding as appropriate.

#### (5) Smoke, Flame

**CAUTION:** Plastic molded devices are flammable, and therefore should not be used near combustible substances. If devices begin to smoke or burn, there is danger of the release of toxic gases.



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Customers considering the use of Cypress products in other special environmental conditions should consult with sales representatives.

## 6. Handling Devices

This section explains the latch-up prevention and pin processing.

### ■ For latch-up prevention

If a voltage higher than VCC or a voltage lower than VSS is applied to an I/O pin, or if a voltage exceeding the ratings is applied between VCC and VSS pins, a latch-up may occur in CMOS IC. If the latch-up occurs, the power supply current increases excessively and device elements may be damaged by heat. Take care to prevent any voltage from exceeding the maximum ratings in device application.

Also, the analog power supply (AVCC, AVRH) and analog input must not be exceeded the digital power supply (VCC) when the power supply to the analog system is turned on or off.

In the correct power-on sequence of the microcontroller, turn on the digital power supply (VCC) and analog power supplies (AVCC, AVRH) simultaneously. Or, turn on the digital power supply (VCC), and then turn on analog power supplies (AVCC, AVRH).

### ■ Treatment of unused pins

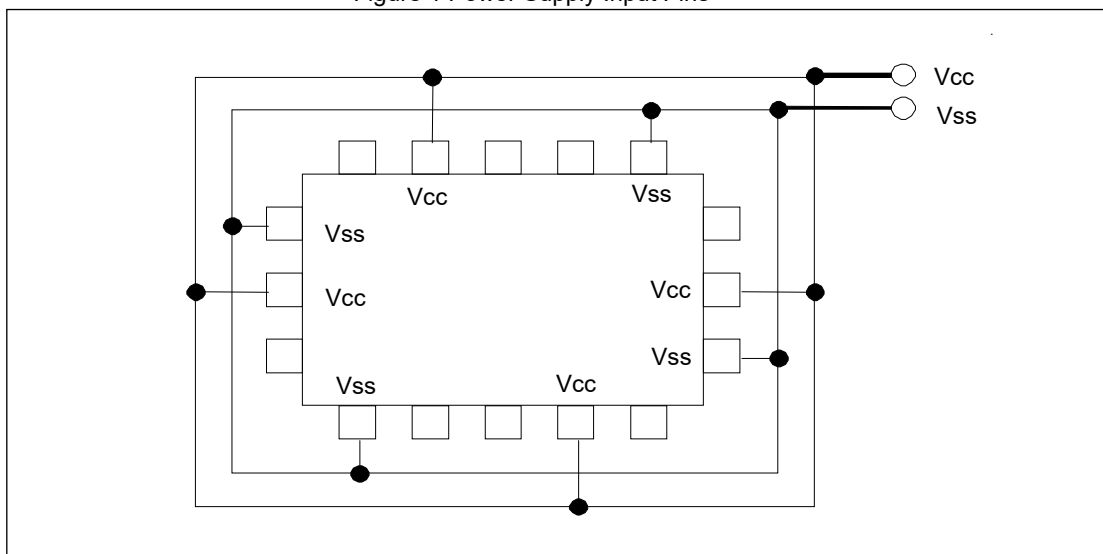
If unused input pins are left open, they may cause a permanent damage to the device due to malfunction or latch-up. Connect at least a 2 k $\Omega$  resistor to each of the unused pins for pull-up or pull-down processing.

Also, if I/O pins are not used, they must be set to the output state for releasing or they must be set to the input state and treated in the same way as for the input pins.

### ■ Power supply pins

The device is designed to ensure that if the device contains multiple VCC or VSS pins, the pins that should be at the same potential are interconnected to prevent latch-up or other malfunctions. Further, connect these pins to an external power supply or ground to reduce unwanted radiation, prevent strobe signals from malfunctioning due to a raised ground level, and fulfill the total output current standard, etc. As shown in figure 1, all Vss power supply pins must be treated in the similar way. If multiple Vcc or Vss systems are connected, the device cannot operate correctly even within the guaranteed operating range.

Figure 1 Power Supply Input Pins



The power supply pins should be connected to VCC and VSS pins of this device at the low impedance from the power supply source.

In the area close to this device, a ceramic capacitor having the capacitance larger than the capacitor of C pin is recommended to use as a bypass capacitor between VCC and VSS pins.



#### ■ Crystal oscillation circuit

An external noise to the X0 or X1 pin may cause a device malfunction. The printed circuit board must be designed to lay out X0 and X1 pins, crystal oscillator (or ceramic resonator), and the bypass capacitor to be grounded to the close position to the device.

The printed circuit board artwork is recommended to surround the X0 and X1 pins by ground circuits.

#### ■ Mode pins (MD1, MD0)

Connect the MD1 and MD0 mode pins to the VCC or VSS pin directly. To prevent an erroneous selection of test mode caused by the noise, reduce the pattern length between each mode pin and VCC or VSS pin on the printed circuit board. Also, use the low-impedance pin connection.

#### ■ During power-on

To prevent a malfunction of the voltage step-down circuit built in the device, the voltage rising must be monotonic during power-on.

#### ■ Notes during PLL clock operation

When the PLL clock is selected and if the oscillator is disconnected or if the input is stopped, this clock may continue to operate at the free running frequency of the self-oscillator circuit built in the PLL clock. This operation is not guaranteed.

#### ■ Treatment of A/D converter power supply pins

Connect the pins to have  $AVCC = AVRH = VCC$  and  $AVSS/AVRL = VSS$  even if the A/D converter is not used.

#### ■ Notes on using external clock

An external clock is not supported. None of the external direct clock input can be used for both main clock and sub clock.

#### ■ Power-on sequence of A/D converter analog inputs

Be sure to turn on the digital power supply (Vcc) first, and then turn on the A/D converter power supplies (AVcc, AVRH, AVRL) and analog inputs (AN0 to AN47). Also, turn off the A/D converter power supplies and analog inputs first, and then turn off the digital power supply (Vcc). When the AVRH pin voltage is turned on or off, it must not exceed AVCC. Even if a common analog input pin is used as an input port, its input voltage must not exceed AVcc. (However, the analog power supply and digital power supply can be turned on or off simultaneously.)

#### ■ Treatment of C pin

This device contains a voltage step-down circuit. A capacitor must always be connected to the C pin to assure the internal stabilization of the device. For the standard values, see the "Recommended Operating Conditions" of the latest data sheet.

**Note:** See the latest data sheet for a detailed specification of the operation voltage.

#### ■ Function switching of a multiplexed port

To switch between the port function and the multiplexed pin function, use the PFR (port function register). However, if a pin is also used for an external bus, its function is switched by the external bus setting. For details, see "I/O PORTS" in the hardware manual.

#### ■ Low-power consumption mode

To transit to the sleep mode, watch mode, stop mode, watch mode(power-off) or stop mode(power-off), follow the procedure explained in "Activating the sleep mode, watch mode, or stop mode" or "Activating the watch mode (power-off) or stop mode(power-off)" of "POWER CONSUMPTION CONTROL" in the hardware manual.

Take the following notes when using a monitor debugger.

- Do not set a break point for the low-power consumption transition program.
- Do not execute an operation step for the low-power consumption transition program.

**■ Notes When Writing Data in a Register Having the Status Flag**

When writing data in the register that has a status flag (especially, an interrupt request flag) to control function, taking care not to clear its status flag erroneously must be followed.

The program must be written not to clear the flag to the status bit, and then to set the control bits to have the desired value.

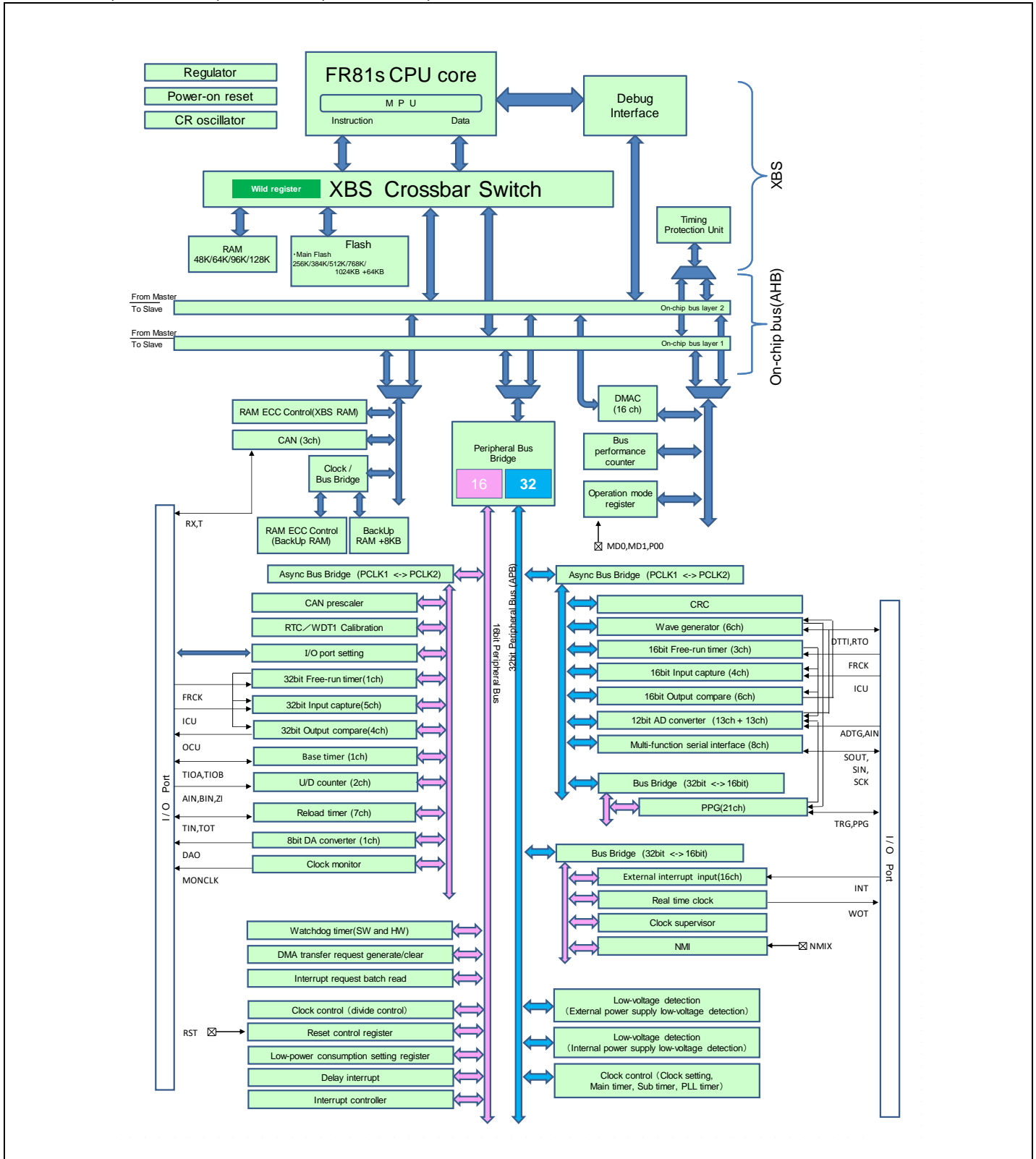
Especially, if multiple control bits are used, the bit instruction cannot be used. (The bit instruction can access to a single bit only.) By the Byte, Half-word, or Word access, data is written to the control bits and status flag simultaneously. During this time, take care not to clear other bits (in this case, the bits of status flag) erroneously.

**Note:** These points can be ignored because the bit instructions are already taken the points into consideration.



### 7. Block Diagram

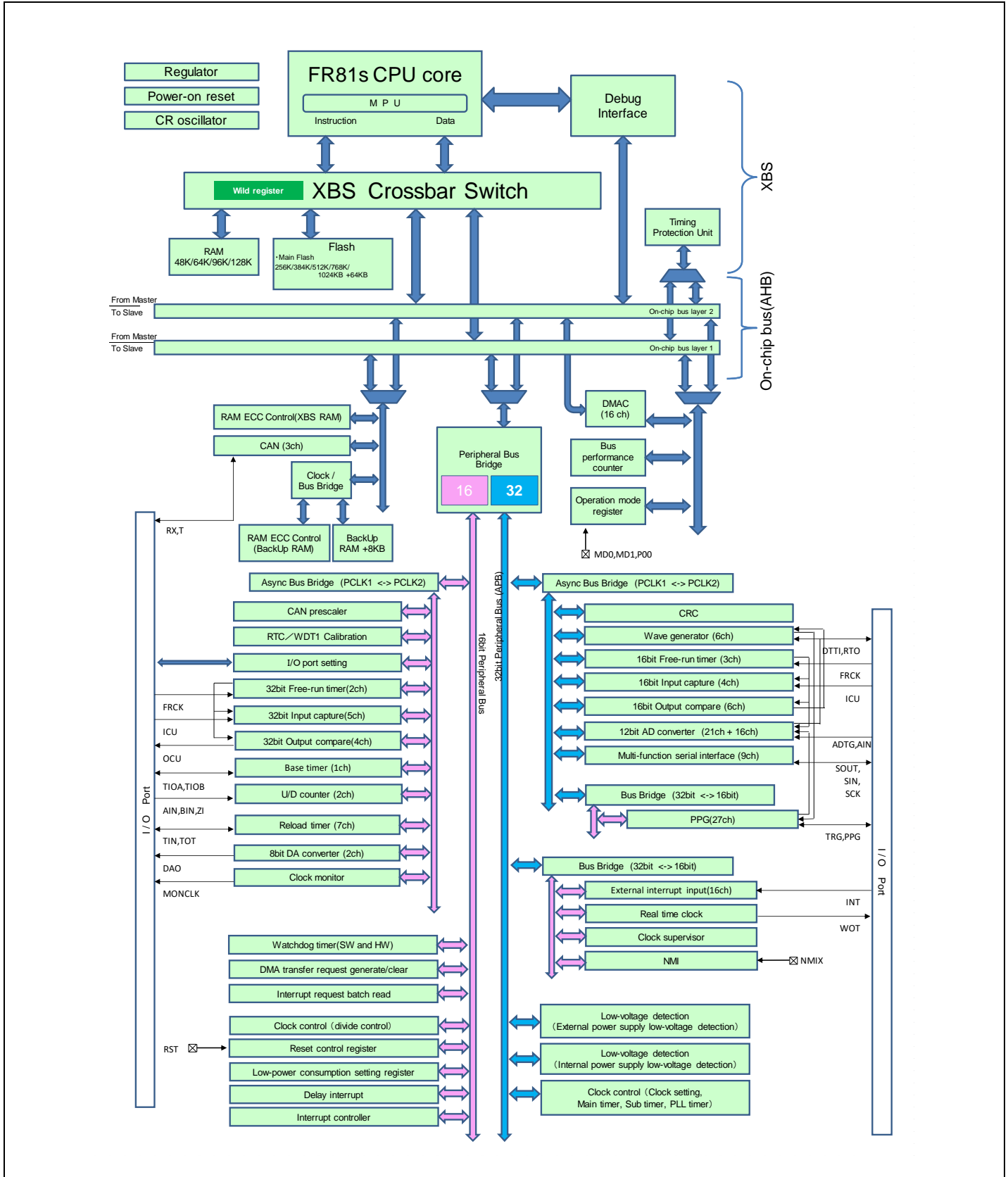
CY91F522B, CY91F523B, CY91F524B, CY91F525B, CY91F526B



CY91F522D, CY91F523D, CY91F524D, CY91F525D, CY91F526D



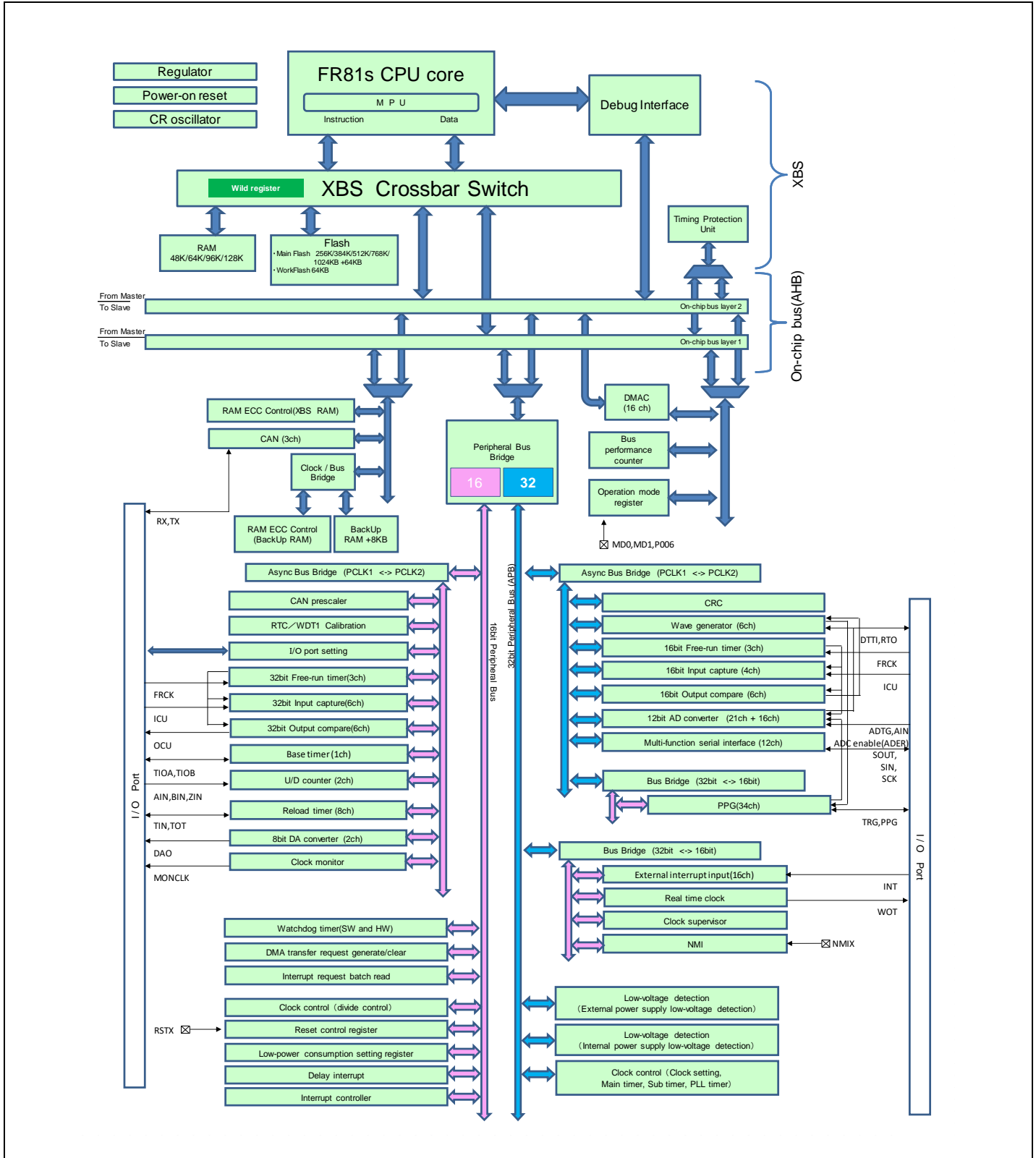
# CY91520 Series



CY91F522F, CY91F523F, CY91F524F, CY91F525F, CY91F526F



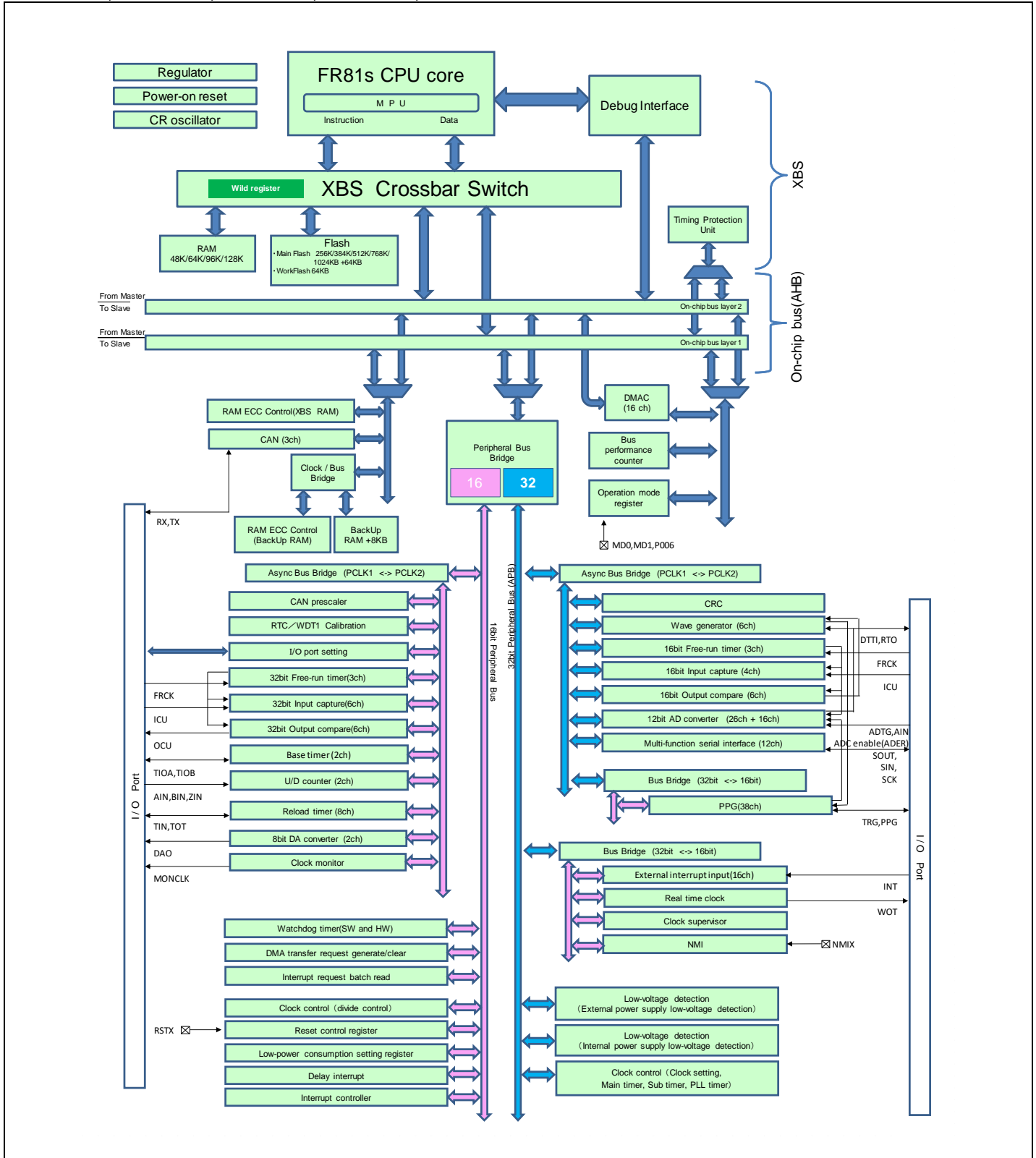
CY91520 Series





CY91520 Series

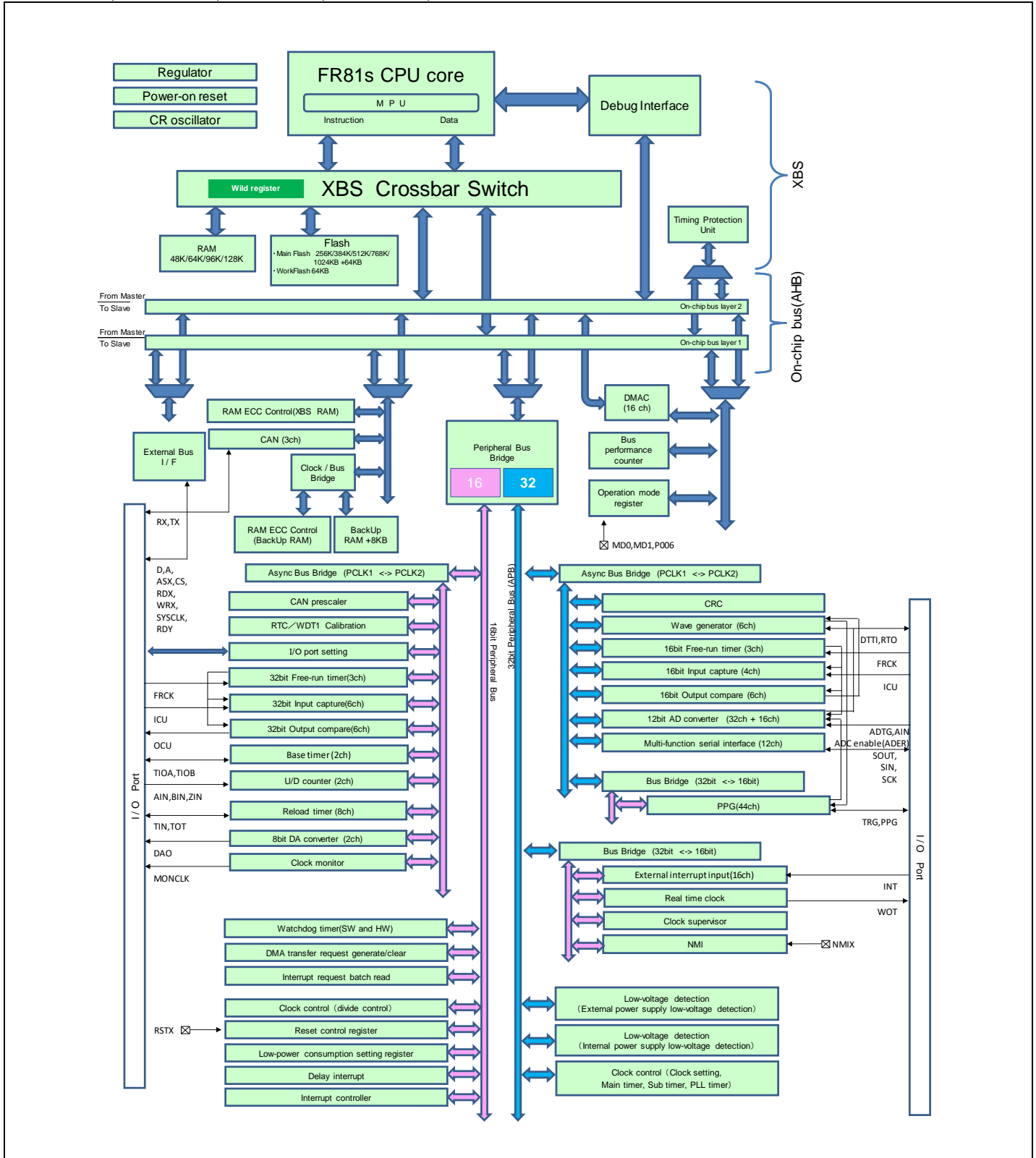
CY91F522J, CY91F523J, CY91F524J, CY91F525J, CY91F526J





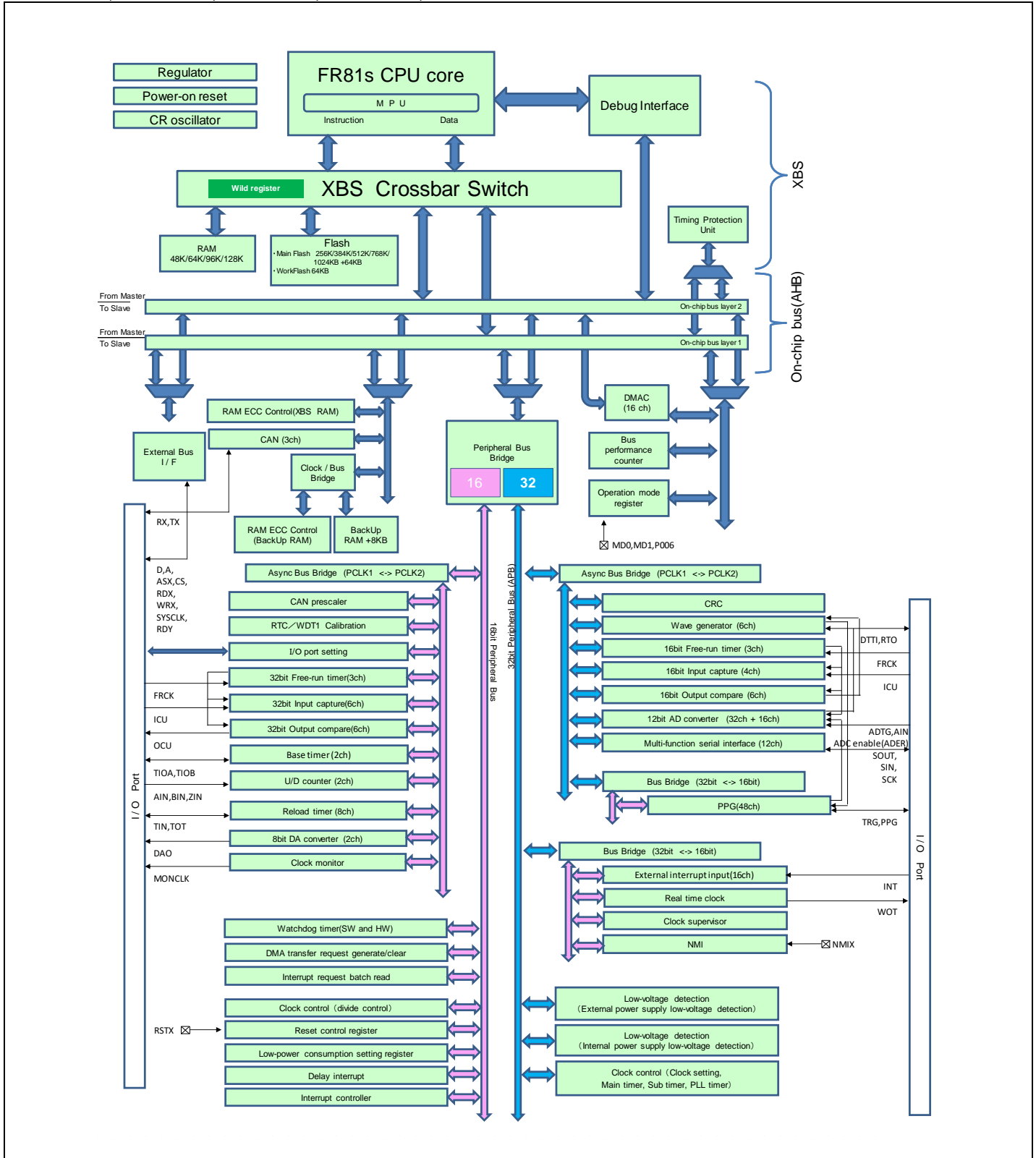
CY91520 Series

CY91F522K, CY91F523K, CY91F524K, CY91F525K, CY91F526K





CY91F522L, CY91F523L, CY91F524L, CY91F525L, CY91F526L





## 8. Memory Map

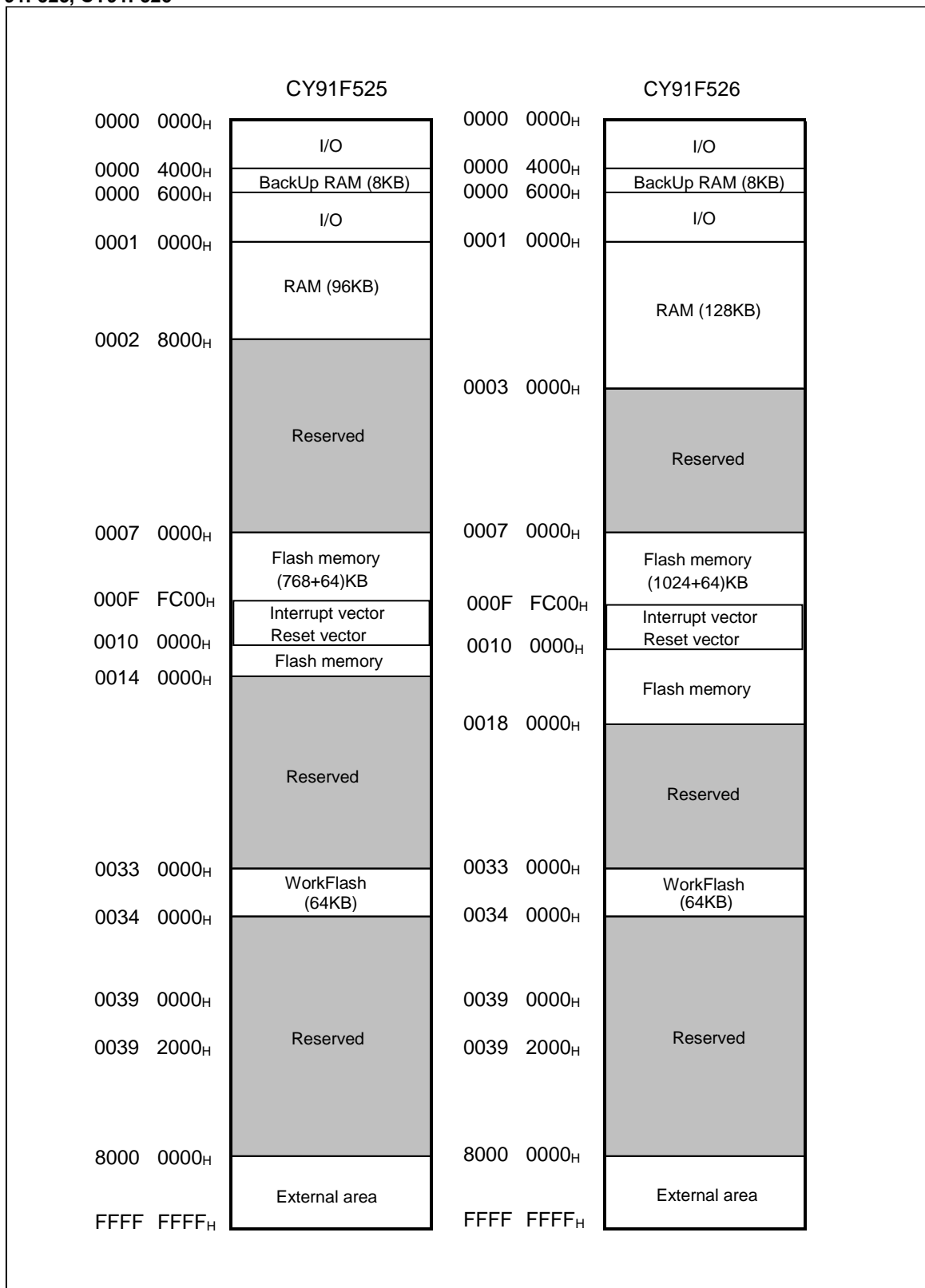
### CY91F522, CY91F523, CY91F524

| CY91F522 |                                  | CY91F523 |                                  | CY91F524 |                                  |
|----------|----------------------------------|----------|----------------------------------|----------|----------------------------------|
| 0000     | 0000 <sub>H</sub>                | 0000     | 0000 <sub>H</sub>                | 0000     | 0000 <sub>H</sub>                |
|          | I/O                              |          | I/O                              |          | I/O                              |
| 0000     | 4000 <sub>H</sub>                | 0000     | 4000 <sub>H</sub>                | 0000     | 4000 <sub>H</sub>                |
| 0000     | 6000 <sub>H</sub>                | 0000     | 6000 <sub>H</sub>                | 0000     | 6000 <sub>H</sub>                |
|          | BackUp RAM (8KB)                 |          | BackUp RAM (8KB)                 |          | BackUp RAM (8KB)                 |
|          | I/O                              |          | I/O                              |          | I/O                              |
| 0001     | 0000 <sub>H</sub>                | 0001     | 0000 <sub>H</sub>                | 0001     | 0000 <sub>H</sub>                |
|          | RAM (48KB)                       |          | RAM (48KB)                       |          | RAM (64KB)                       |
| 0001     | C000 <sub>H</sub>                | 0001     | C000 <sub>H</sub>                | 0002     | 0000 <sub>H</sub>                |
|          | Reserved                         |          | Reserved                         |          | Reserved                         |
| 0007     | 0000 <sub>H</sub>                | 0007     | 0000 <sub>H</sub>                | 0007     | 0000 <sub>H</sub>                |
|          | Flash memory (256+64)KB          |          | Flash memory (384+64)KB          |          | Flash memory (512+64)KB          |
| 000C     | 0000 <sub>H</sub>                | 000E     | 0000 <sub>H</sub>                | 000F     | FC00 <sub>H</sub>                |
|          | Reserved                         |          | Reserved                         |          | Interrupt vector<br>Reset vector |
| 000F     | FC00 <sub>H</sub>                | 000F     | FC00 <sub>H</sub>                | 0010     | 0000 <sub>H</sub>                |
|          | Interrupt vector<br>Reset vector |          | Interrupt vector<br>Reset vector |          | Reserved                         |
| 0010     | 0000 <sub>H</sub>                | 0010     | 0000 <sub>H</sub>                |          | Reserved                         |
|          | Reserved                         |          | Reserved                         |          | Reserved                         |
| 0033     | 0000 <sub>H</sub>                | 0033     | 0000 <sub>H</sub>                | 0033     | 0000 <sub>H</sub>                |
|          | WorkFlash (64KB)                 |          | WorkFlash (64KB)                 |          | WorkFlash (64KB)                 |
| 0034     | 0000 <sub>H</sub>                | 0034     | 0000 <sub>H</sub>                | 0034     | 0000 <sub>H</sub>                |
|          | Reserved                         |          | Reserved                         |          | Reserved                         |
|          | Reserved                         | 0039     | 0000 <sub>H</sub>                | 0039     | 0000 <sub>H</sub>                |
|          | Reserved                         |          | Reserved                         |          | Reserved                         |
|          | Reserved                         | 0039     | 2000 <sub>H</sub>                | 0039     | 2000 <sub>H</sub>                |
|          | Reserved                         |          | Reserved                         |          | Reserved                         |
| 8000     | 0000 <sub>H</sub>                | 8000     | 0000 <sub>H</sub>                | 8000     | 0000 <sub>H</sub>                |
|          | External area                    |          | External area                    |          | External area                    |
| FFFF     | FFFF <sub>H</sub>                | FFFF     | FFFF <sub>H</sub>                | FFFF     | FFFF <sub>H</sub>                |



## CY91520 Series

### CY91F525, CY91F526





## 9. I/O Map

The following I/O map shows the relationship between memory space and registers for peripheral resources.

Legend of I/O Map

Read/Write attribute (R: Read W: Write)

| Address             | Address offset value/ register name       |                                |   |                                | Block         |
|---------------------|---|--------------------------------|---|--------------------------------|---------------|
|                     | +0  | +1                             | +2  | +3                             |               |
| 000090 <sub>H</sub> | BT1TMR[R] H<br>0000000000000000           |                                | BT1TMCR[R/W]B,H,W<br>00000000 00000000              |                                | Base timer 1  |
| 000094 <sub>H</sub> | -   | BT1STC[R/W] B<br>00000000      | -   | -                              |               |
| 000098 <sub>H</sub> | BT1PCSR/BT1PRL[R/W] H<br>0000000000000000 |                                | BT1PDU T/BT1PRLH/BT1DTBF[R/W] H<br>0000000000000000 |                                |               |
| 00009C <sub>H</sub> | BTSEL[R/W] B<br>---000 0                  | -                              | BTSSSR[W] B,H<br>-----11                            |                                |               |
| 0000A0 <sub>H</sub> | ADERH [R/W]B, H, W<br>00000000 00000000   |                                | ADERL [R/W]B, H, W<br>00000000 00000000             |                                | A/D converter |
| 0000A4 <sub>H</sub> | ADCS1 [R/W] B, H,W<br>00000000            | ADCS0 [R/W] B, H,W<br>00000000 | ADCR1 [R] B, H,W ---<br>---XX                       | ADCR0 [R] B, H,W<br>XXXXX XXX  |               |
| 0000A8 <sub>H</sub> | ADCT1 [R/W] B, H,W<br>00010000            | ADCT0 [R/W] B, H,W<br>00101100 | ADSCH [R/W] B, H,W<br>---00000                      | ADECH [R/W] B, H,W<br>---00000 |               |

Data access attribute  
 B: Byte  
 H: Half-word  
 W: Word  
 (Note)The access by the data access attribute not described is disabled.

Initial register value after reset

The initial register value after reset indicates as follows:

- . "1": Initial value "1"
- . "0": Initial value "0"
- . "X": Initial value undefined
- . "-": Reserved bit/Undefined bit
- . "\*": Initial value "0" or "1" according to the setting
- .

**Note:** The access to address not described is disabled.



## CY91520 Series

| Address  | Address Offset Value / Register Name    |                                  |  |                                   | Block                                  |
|--|---|----------------------------------|--|-----------------------------------|--|
|  | +0                                      | +1                               | +2   | +3                                |  |
| 000000 <sub>H</sub>                              | PDR00 [R/W] B,H,W<br>XXXXXXXXXX         | PDR01 [R/W] B,H,W<br>XXXXXXXXXX  | PDR02 [R/W] B,H,W<br>XXXXXXXXXX                | PDR03 [R/W] B,H,W<br>XXXXXXXXXX   | Port Data Register                     |
| 000004 <sub>H</sub>                              | PDR04 [R/W] B,H,W<br>XXXXXXXXXX         | PDR05 [R/W] B,H,W<br>XXXXXXXXXX  | PDR06 [R/W] B,H,W<br>XXXXXXXXXX                | PDR07 [R/W] B,H,W<br>XXXXXXXXXX   |  |
| 000008 <sub>H</sub>                              | PDR08 [R/W] B,H,W<br>XXXXXXXXXX         | PDR09 [R/W] B,H,W<br>XXXXXXXXXX  | PDR10 [R/W] B,H,W<br>XXXXXXXXXX                | PDR11 [R/W] B,H,W<br>XXXXXXXXXX   |  |
| 00000C <sub>H</sub>                              | PDR12 [R/W] B,H,W<br>XXXXXXXXXX         | PDR13 [R/W] B,H,W<br>-XXXXXXXX   | PDR14 [R/W] B,H,W<br>---XXX--                  | PDR15 [R/W] B,H,W<br>--XXXXXX     |  |
| 000010 <sub>H</sub>                              | —                                       | —                                | —  | —                                 |  |
| 000014 <sub>H</sub>                              | —                                       | —                                | —  | —                                 |  |
| 000018 <sub>H</sub>                              | PDR16 [R/W] B,H,W<br>XXXXXXXXXX         | PDR17 [R/W] B,H,W<br>XXXXXXXXXX  | PDR18 [R/W] B,H,W<br>XXXXXXXXXX                | PDR19 [R/W] B,H,W<br>XXXXXXXXXX   | Reserved                               |
| 00001C <sub>H</sub><br>to<br>000034 <sub>H</sub> | —                                       | —                                | —  | —                                 |  |
| 000038 <sub>H</sub>                              | WDTECR0 [R/W]<br>B,H,W<br>---00000      | —                                | —  | —                                 | Watchdog Timer<br>[S]                  |
| 00003C <sub>H</sub>                              | WDTCSR0 [R/W]<br>B,H,W<br>-0--0000      | WDTCSR0 [W]<br>B,H,W<br>00000000 | WDTCSR1 [R]<br>B,H,W<br>----0110               | WDTCSR1 [W]<br>B,H,W<br>00000000  |  |
| 000040 <sub>H</sub>                              | —                                       | —                                | —  | —                                 | Reserved                               |
| 000044 <sub>H</sub>                              | DICR [R/W]<br>B,H,W<br>-----0           | —                                | —  | —                                 | Delayed Interrupt                      |
| 000048 <sub>H</sub><br>to<br>00005C <sub>H</sub> | —                                       | —                                | —  | —                                 | Reserved                               |
| 000060 <sub>H</sub>                              | TMRLRA0 [R/W] H<br>XXXXXXXXXX XXXXXXXXX | —                                | TMR0 [R] H<br>XXXXXXXXXX XXXXXXXXX             | —                                 | Reload Timer 0                         |
| 000064 <sub>H</sub>                              | TMRLRB0 [R/W] H<br>XXXXXXXXXX XXXXXXXXX | —                                | TMCSR0 [R/W] B,H,W<br>00000000 0-000000        | —                                 |  |
| 000068 <sub>H</sub>                              | TMRLRA7 [R/W] H<br>XXXXXXXXXX XXXXXXXXX | —                                | TMR7 [R] H<br>XXXXXXXXXX XXXXXXXXX             | —                                 | Reload Timer 7                         |
| 00006C <sub>H</sub>                              | TMRLRB7 [R/W] H<br>XXXXXXXXXX XXXXXXXXX | —                                | TMCSR7 [R/W] B,H,W<br>00000000 0-000000        | —                                 |  |
| 000070 <sub>H</sub>                              | —                                       | —                                | FRS8 [R/W] B,H,W<br>--00--00 --00--00 --00--00 | —                                 | Free-run timer selection<br>register 8 |
| 000074 <sub>H</sub>                              | —                                       | —                                | FRS9 [R/W] B,H,W<br>--00--00 --00--00 --00--00 | —                                 | Free-run timer selection<br>register 9 |
| 000078 <sub>H</sub>                              | —                                       | —                                | —  | OCLS67 [R/W]<br>B,H,W<br>----0000 | OCU67 Output level control<br>register |
| 00007C <sub>H</sub>                              | —                                       | —                                | —  | OCLS89 [R/W]<br>B,H,W<br>----0000 | OCU89 Output level control<br>register |
| 000080 <sub>H</sub>                              | BT0TMR [R] H<br>00000000 00000000       | —                                | BT0TMCR [R/W] H<br>-000--00 -000-000           | —                                 | Base Timer 0                           |



## CY91520 Series

| Address  | Address Offset Value / Register Name                 |                            |  |                                   | Block  |
|--|--|----------------------------|--|-----------------------------------|--|
|  | +0   | +1                         | +2   | +3                                |  |
| 000084 <sub>H</sub>                              | BT0TMCR2 [R/W] B<br>-----0                           | BT0STC [R/W] B<br>-0-0-0-0 | —  | —                                 |  |
| 000088 <sub>H</sub>                              | BT0PCSR/BT0PRLL [R/W] H<br>00000000 00000000         |                            | BT0PDUT/BT0PRLH/BT0DTBF [R/W] H<br>00000000 00000000 |                                   |  |
| 00008C <sub>H</sub>                              | —  | —                          | —  | —                                 | Reserved   |
| 000090 <sub>H</sub>                              | BT1TMR [R] H<br>00000000 00000000                    |                            | BT1TMCR [R/W] H<br>-000--00 -000-000                 |                                   | Base Timer 1   |
| 000094 <sub>H</sub>                              | BT1TMCR2 [R/W] B<br>-----0                           | BT1STC [R/W] B<br>-0-0-0-0 | —  | —                                 |  |
| 000098 <sub>H</sub>                              | BT1PCSR/BT1PRLL [R/W] H<br>00000000 00000000         |                            | BT1PDUT/BT1PRLH/BT1DTBF [R/W] H<br>00000000 00000000 |                                   |  |
| 00009C <sub>H</sub>                              | BTSEL01 [R/W] B<br>----0000                          | —                          | BTSSSR [W] B,H<br>-----11                            |                                   | Base Timer 0,1   |
| 0000A0 <sub>H</sub><br>to<br>0000FC <sub>H</sub> | —  | —                          | —  | —                                 | Reserved   |
| 000100 <sub>H</sub>                              | TMRLRA1 [R/W] H<br>XXXXXXXX XXXXXXXX                 |                            | TMR1 [R] H<br>XXXXXXXX XXXXXXXX                      |                                   | Reload Timer 1   |
| 000104 <sub>H</sub>                              | TMRLRB1 [R/W] H<br>XXXXXXXX XXXXXXXX                 |                            | TMCSR1 [R/W] B, H,W<br>00000000 0-000000             |                                   |  |
| 000108 <sub>H</sub>                              | TMRLRA2 [R/W] H<br>XXXXXXXX XXXXXXXX                 |                            | TMR2 [R] H<br>XXXXXXXX XXXXXXXX                      |                                   | Reload Timer 2   |
| 00010C <sub>H</sub>                              | TMRLRB2 [R/W] H<br>XXXXXXXX XXXXXXXX                 |                            | TMCSR2 [R/W] B,H,W<br>00000000 0-000000              |                                   |  |
| 000110 <sub>H</sub>                              | TMRLRA3 [R/W] H<br>XXXXXXXX XXXXXXXX                 |                            | TMR3 [R] H<br>XXXXXXXX XXXXXXXX                      |                                   | Reload Timer 3   |
| 000114 <sub>H</sub>                              | TMRLRB3 [R/W] H<br>XXXXXXXX XXXXXXXX                 |                            | TMCSR3 [R/W] B,H,W<br>00000000 0-000000              |                                   |  |
| 000118 <sub>H</sub>                              | MSCY4 [R] H,W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |                            |  |                                   | Input Capture 4,5<br>Cycle measurement data<br>register 45 |
| 00011C <sub>H</sub>                              | MSCY5 [R] H,W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |                            |  |                                   |  |
| 000120 <sub>H</sub>                              | OCCP6 [R/W] W<br>00000000 00000000 00000000 00000000 |                            |  |                                   | Output<br>Compare 6,7<br>32-bit OCU                        |
| 000124 <sub>H</sub>                              | OCCP7 [R/W] W<br>00000000 00000000 00000000 00000000 |                            |  |                                   |  |
| 000128 <sub>H</sub>                              | —  | —                          | OCSH67 [R/W]<br>B,H,W<br>--0--00                     | OCSL67 [R/W]<br>B,H,W<br>0000--00 |  |
| 00012C <sub>H</sub>                              | OCCP8 [R/W] W<br>00000000 00000000 00000000 00000000 |                            |  |                                   | Output<br>Compare 8,9<br>32-bit OCU                        |
| 000130 <sub>H</sub>                              | OCCP9 [R/W] W<br>00000000 00000000 00000000 00000000 |                            |  |                                   |  |
| 000134 <sub>H</sub>                              | —  | —                          | OCSH89 [R/W]<br>B,H,W<br>--0--00                     | OCSL89 [R/W]<br>B,H,W<br>0000--00 |  |
| 000138 <sub>H</sub><br>to<br>0001B4 <sub>H</sub> | —  | —                          | —  | —                                 | Reserved   |



## CY91520 Series

| Address  | Address Offset Value / Register Name                  |                                   |  |                                   | Block                           |
|--|---|-----------------------------------|--|-----------------------------------|---------------------------------|
|  | +0  | +1                                | +2                                       | +3                                |                                 |
| 0001B8 <sub>H</sub>                              | EPFR64 [R/W]<br>B,H,W<br>----00-                      | EPFR65 [R/W]<br>B,H,W<br>0000-000 | EPFR66 [R/W]<br>B,H,W<br>--000000        | EPFR67 [R/W]<br>B,H,W<br>----0000 | Extended port function register |
| 0001BC <sub>H</sub>                              | EPFR68 [R/W]<br>B,H,W<br>----0000                     | EPFR69 [R/W]<br>B,H,W<br>----0000 | EPFR70 [R/W]<br>B,H,W<br>---00000        | EPFR71 [R/W]<br>B,H,W<br>-0-0-0-0 |                                 |
| 0001C0 <sub>H</sub>                              | EPFR72 [R/W]<br>B,H,W<br>000000-0                     | EPFR73 [R/W]<br>B,H,W<br>00000000 | EPFR74 [R/W]<br>B,H,W<br>00000000        | EPFR75 [R/W]<br>B,H,W<br>00000000 |                                 |
| 0001C4 <sub>H</sub>                              | EPFR76 [R/W]<br>B,H,W<br>00000000                     | EPFR77 [R/W]<br>B,H,W<br>--000000 | EPFR78 [R/W]<br>B,H,W<br>-----00         | EPFR79 [R/W]<br>B,H,W<br>00000000 |                                 |
| 0001C8 <sub>H</sub>                              | EPFR80 [R/W]<br>B,H,W<br>---00000                     | EPFR81 [R/W]<br>B,H,W<br>00000000 | EPFR82 [R/W]<br>B,H,W<br>00000000        | EPFR83 [R/W]<br>B,H,W<br>-0000000 |                                 |
| 0001CC <sub>H</sub>                              | EPFR84 [R/W]<br>B,H,W<br>00000000                     | EPFR85 [R/W]<br>B,H,W<br>--000000 | EPFR86 [R/W]<br>B,H,W<br>---00000        | EPFR87 [R/W]<br>B,H,W<br>-----00  |                                 |
| 0001D0 <sub>H</sub>                              | EPFR88 [R/W]<br>B,H,W<br>-----0                       | —                                 | —  | —                                 |                                 |
| 0001D4 <sub>H</sub>                              | —   | —                                 | —  | —                                 | Reserved                        |
| 0001D8 <sub>H</sub>                              | TMRLRA4 [R/W] H<br>XXXXXXXXXXXXXXXXXXXX               |                                   | TMR4 [R] H<br>XXXXXXXXXXXXXXXXXXXX       |                                   | Reload Timer 4                  |
| 0001DC <sub>H</sub>                              | TMRLRB4 [R/W] H<br>XXXXXXXXXXXXXXXXXXXX               |                                   | TMCSR4 [R/W] B, H,W<br>00000000 0-000000 |                                   |                                 |
| 0001E0 <sub>H</sub><br>to<br>0001EC <sub>H</sub> | —   | —                                 | —  | —                                 | Reserved                        |
| 0001F0 <sub>H</sub>                              | TMRLRA5 [R/W] H<br>XXXXXXXXXXXXXXXXXXXX               |                                   | TMR5 [R] H<br>XXXXXXXXXXXXXXXXXXXX       |                                   | Reload Timer 5                  |
| 0001F4 <sub>H</sub>                              | TMRLRB5 [R/W] H<br>XXXXXXXXXXXXXXXXXXXX               |                                   | TMCSR5 [R/W] B, H,W<br>00000000 0-000000 |                                   |                                 |
| 0001F8 <sub>H</sub>                              | TMRLRA6 [R/W] H<br>XXXXXXXXXXXXXXXXXXXX               |                                   | TMR6 [R] H<br>XXXXXXXXXXXXXXXXXXXX       |                                   | Reload Timer 6                  |
| 0001FC <sub>H</sub>                              | TMRLRB6 [R/W] H<br>XXXXXXXXXXXXXXXXXXXX               |                                   | TMCSR6 [R/W] B, H,W<br>00000000 0-000000 |                                   |                                 |
| 000200 <sub>H</sub><br>to<br>000238 <sub>H</sub> | —   | —                                 | —  | —                                 | Reserved                        |
| 00023C <sub>H</sub>                              | DACR0 [R/W] B,H,W<br>-----0                           | DADR0 [R/W] B,H,W<br>XXXXXXXXXX   | DACR1 [R/W] B,H,W<br>-----0              | DADR1 [R/W] B,H,W<br>XXXXXXXXXX   | DA Converter                    |
| 000240 <sub>H</sub>                              | CPCLR3 [R/W] W<br>11111111 11111111 11111111 11111111 |                                   |  |                                   | Free-run Timer 3<br>32-bit FRT  |
| 000244 <sub>H</sub>                              | TCDT3 [R/W] W<br>00000000 00000000 00000000 00000000  |                                   |  |                                   |                                 |
| 000248 <sub>H</sub>                              | TCCSH3 [R/W]<br>B,H,W<br>0----00                      | TCCSL3 [R/W]<br>B,H,W<br>-1-00000 | —  | —                                 |                                 |
| 00024C <sub>H</sub>                              | CPCLR4 [R/W] W<br>11111111 11111111 11111111 11111111 |                                   |  |                                   | Free-run Timer 4<br>32-bit FRT  |
| 000250 <sub>H</sub>                              | TCDT4 [R/W] W<br>00000000 00000000 00000000 00000000  |                                   |  |                                   |                                 |
| 000254 <sub>H</sub>                              | TCCSH4 [R/W]<br>B,H,W<br>0----00                      | TCCSL4 [R/W]<br>B,H,W<br>-1-00000 | —  | —                                 |                                 |



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| Address                   | Address Offset Value / Register Name                 |    |                                    |    | Block  |
|---------------------------|--|----|------------------------------------|----|--|
|                           | +0   | +1 | +2                                 | +3 |  |
| 000258H<br>to<br>0002C0H  | —  | —  | —                                  | —  | Reserved   |
| 0002C4H<br>to<br>0002FC H | —  | —  | —                                  | —  | Reserved   |
| 000300H<br>to<br>00030CH  | —  | —  | —                                  | —  | Reserved   |
| 000310H                   | —  | —  | MPUCR [R/W] H<br>000000-0 ----0100 |    | MPU [S]<br>(Only CPU core can access<br>this area) |
| 000314H                   | —  | —  | —                                  | —  |  |
| 000318H                   | —  |    |                                    |    |  |
| 00031CH                   | —  | —  | —                                  | —  |  |
| 000320H                   | DPVAR [R] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX   |    |                                    |    |  |
| 000324H                   | —  | —  | DPVSR [R/W] H<br>----- 00000--0    |    |  |
| 000328H                   | DEAR [R] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX    |    |                                    |    |  |
| 00032CH                   | —  | —  | DESR [R/W] H<br>----- 00000--0     |    |  |
| 000330H                   | PABR0 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXX0000 |    |                                    |    |  |
| 000334H                   | —  | —  | PACR0 [R/W] H<br>000000-0 00000--0 |    |  |
| 000338H                   | PABR1 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXX0000 |    |                                    |    |  |
| 00033CH                   | —  | —  | PACR1 [R/W] H<br>000000-0 00000--0 |    |  |
| 000340H                   | PABR2 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXX0000 |    |                                    |    |  |
| 000344H                   | —  | —  | PACR2 [R/W] H<br>000000-0 00000--0 |    |  |
| 000348H                   | PABR3 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXX0000 |    |                                    |    |  |
| 00034CH                   | —  | —  | PACR3 [R/W] H<br>000000-0 00000--0 |    |  |
| 000350H                   | PABR4 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXX0000 |    |                                    |    |  |
| 000354H                   | —  | —  | PACR4 [R/W] H<br>000000-0 00000--0 |    |  |
| 000358H                   | PABR5 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXX0000 |    |                                    |    |  |
| 00035CH                   | —  | —  | PACR5 [R/W] H<br>000000-0 00000--0 |    |  |
| 000360H                   | PABR6 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXX0000 |    |                                    |    |  |
| 000364H                   | —  | —  | PACR6 [R/W] H<br>000000-0 00000--0 |    |  |



## CY91520 Series

| Address  | Address Offset Value / Register Name                 |                                    |                                    |                                   | Block   |
|--|--|------------------------------------|------------------------------------|-----------------------------------|---|
|  | +0   | +1                                 | +2                                 | +3                                |   |
| 000368 <sub>H</sub>                              | PABR7 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXX0000 |                                    |                                    |                                   | MPU [S]<br>(Only CPU core can access this area) |
| 00036C <sub>H</sub>                              | —  | —                                  | PACR7 [R/W] H<br>000000-0 00000--0 |                                   |   |
| 000370 <sub>H</sub><br>to<br>0003AC <sub>H</sub> | —  |                                    |                                    |                                   | Reserved [S]                                    |
| 0003B0 <sub>H</sub><br>to<br>0003FC <sub>H</sub> | —  | —                                  | —                                  | —                                 | Reserved [S]                                    |
| 000400 <sub>H</sub>                              | ICSEL0 [R/W] B,H,W<br>----000                        | ICSEL1 [R/W] B,H,W<br>----000      | ICSEL2 [R/W] B,H,W<br>-----0       | ICSEL3 [R/W] B,H,W<br>-----0      | DMA request generation and clear                |
| 000404 <sub>H</sub>                              | —  | ICSEL5 [R/W] B,H,W<br>----000      | ICSEL6 [R/W] B,H,W<br>----0000     | ICSEL7 [R/W] B,H,W<br>----0000    |   |
| 000408 <sub>H</sub>                              | ICSEL8 [R/W] B,H,W<br>----00                         | ICSEL9 [R/W] B,H,W<br>----00       | ICSEL10 [R/W]<br>B,H,W<br>----00   | ICSEL11 [R/W]<br>B,H,W<br>----000 |   |
| 00040C <sub>H</sub>                              | —  | ICSEL13 [R/W]<br>B,H,W<br>----00   | ICSEL14 [R/W]<br>B,H,W<br>----00   | ICSEL15 [R/W]<br>B,H,W<br>----00  |   |
| 000410 <sub>H</sub>                              | ICSEL16 [R/W]<br>B,H,W<br>---0000                    | ICSEL17 [R/W]<br>B,H,W<br>----00   | ICSEL18 [R/W]<br>B,H,W<br>--00000  | ICSEL19 [R/W]<br>B,H,W<br>----000 |   |
| 000414 <sub>H</sub>                              | ICSEL20 [R/W]<br>B,H,W<br>----000                    | ICSEL21 [R/W]<br>B,H,W<br>----00   | ICSEL22 [R/W]<br>B,H,W<br>----00   | ICSEL23 [R/W]<br>B,H,W<br>----00  |   |
| 000418 <sub>H</sub>                              | IRPR0H [R] B,H,W<br>00-----                          | IRPR0L [R] B,H,W<br>00-----        | IRPR1H [R] B,H,W<br>00-----        | IRPR1L [R] B,H,W<br>00-----       |   |
| 00041C <sub>H</sub>                              | —  | —                                  | IRPR3H [R] B,H,W<br>000000--       | IRPR3L [R] B,H,W<br>000000--      |   |
| 000420 <sub>H</sub>                              | IRPR4H [R] B,H,W<br>0000----                         | IRPR4L [R] B,H,W<br>0000----       | IRPR5H [R] B,H,W<br>0000----       | IRPR5L [R] B,H,W<br>000-----      |   |
| 000424 <sub>H</sub>                              | IRPR6H [R] B,H,W<br>--00----                         | IRPR6L [R] B,H,W<br>0000----       | IRPR7H [R] B,H,W<br>-0-00---       | IRPR7L [R] B,H,W<br>-----00       |   |
| 000428 <sub>H</sub>                              | IRPR8H [R] B,H,W<br>--0-----                         | IRPR8L [R] B,H,W<br>-00-----       | IRPR9H [R] B,H,W<br>-0-----        | IRPR9L [R] B,H,W<br>-0-----       |   |
| 00042C <sub>H</sub>                              | IRPR10H [R] B,H,W<br>-0-----                         | IRPR10L [R] B,H,W<br>-0-----       | IRPR11H [R] B,H,W<br>0-----        | IRPR11L [R] B,H,W<br>0-----       |   |
| 000430 <sub>H</sub>                              | IRPR12H [R] B,H,W<br>--0000--                        | IRPR12L [R] B,H,W<br>----00--      | IRPR13H [R] B,H,W<br>00-----       | IRPR13L [R] B,H,W<br>00-----      |   |
| 000434 <sub>H</sub>                              | IRPR14H [R] B,H,W<br>00000000                        | IRPR14L [R] B,H,W<br>00000000      | IRPR15H [R] B,H,W<br>000-----      | IRPR15L [R] B,H,W<br>0000000-     |   |
| 000438 <sub>H</sub>                              | ICSEL24 [R/W]<br>B,H,W<br>-----00                    | ICSEL25 [R/W]<br>B,H,W<br>---00000 | ICSEL26 [R/W]<br>B,H,W<br>-----0   | ICSEL27 [R/W]<br>B,H,W<br>-----0  | DMA request generation and clear                |
| 00043C <sub>H</sub>                              | —  | —                                  | —                                  | —                                 | Reserved [S]                                    |



## CY91520 Series

| Address  | Address Offset Value / Register Name |                                  |                                      |                                | Block   |
|--|--------------------------------------|----------------------------------|--------------------------------------|--------------------------------|---|
|  | +0                                   | +1                               | +2                                   | +3                             |   |
| 000440 <sub>H</sub>                              | ICR00 [R/W] B,H,W<br>---11111        | ICR01 [R/W] B,H,W<br>---11111    | ICR02 [R/W] B,H,W<br>---11111        | ICR03 [R/W] B,H,W<br>---11111  | Interrupt Controller [S]  |
| 000444 <sub>H</sub>                              | ICR04 [R/W] B,H,W<br>---11111        | ICR05 [R/W] B,H,W<br>---11111    | ICR06 [R/W] B,H,W<br>---11111        | ICR07 [R/W] B,H,W<br>---11111  |   |
| 000448 <sub>H</sub>                              | ICR08 [R/W] B,H,W<br>---11111        | ICR09 [R/W] B,H,W<br>---11111    | ICR10 [R/W] B,H,W<br>---11111        | ICR11 [R/W] B,H,W<br>---11111  |   |
| 00044C <sub>H</sub>                              | ICR12 [R/W] B,H,W<br>---11111        | ICR13 [R/W] B,H,W<br>---11111    | ICR14 [R/W] B,H,W<br>---11111        | ICR15 [R/W] B,H,W<br>---11111  |   |
| 000450 <sub>H</sub>                              | ICR16 [R/W] B,H,W<br>---11111        | ICR17 [R/W] B,H,W<br>---11111    | ICR18 [R/W] B,H,W<br>---11111        | ICR19 [R/W] B,H,W<br>---11111  |   |
| 000454 <sub>H</sub>                              | ICR20 [R/W] B,H,W<br>---11111        | ICR21 [R/W] B,H,W<br>---11111    | ICR22 [R/W] B,H,W<br>---11111        | ICR23 [R/W] B,H,W<br>---11111  |   |
| 000458 <sub>H</sub>                              | ICR24 [R/W] B,H,W<br>---11111        | ICR25 [R/W] B,H,W<br>---11111    | ICR26 [R/W] B,H,W<br>---11111        | ICR27 [R/W] B,H,W<br>---11111  |   |
| 00045C <sub>H</sub>                              | ICR28 [R/W] B,H,W<br>---11111        | ICR29 [R/W] B,H,W<br>---11111    | ICR30 [R/W] B,H,W<br>---11111        | ICR31 [R/W] B,H,W<br>---11111  |   |
| 000460 <sub>H</sub>                              | ICR32 [R/W] B,H,W<br>---11111        | ICR33 [R/W] B,H,W<br>---11111    | ICR34 [R/W] B,H,W<br>---11111        | ICR35 [R/W] B,H,W<br>---11111  |   |
| 000464 <sub>H</sub>                              | ICR36 [R/W] B,H,W<br>---11111        | ICR37 [R/W] B,H,W<br>---11111    | ICR38 [R/W] B,H,W<br>---11111        | ICR39 [R/W] B,H,W<br>---11111  |   |
| 000468 <sub>H</sub>                              | ICR40 [R/W] B,H,W<br>---11111        | ICR41 [R/W] B,H,W<br>---11111    | ICR42 [R/W] B,H,W<br>---11111        | ICR43 [R/W] B,H,W<br>---11111  |   |
| 00046C <sub>H</sub>                              | ICR44 [R/W] B,H,W<br>---11111        | ICR45 [R/W] B,H,W<br>---11111    | ICR46 [R/W] B,H,W<br>---11111        | ICR47 [R/W] B,H,W<br>---11111  |   |
| 000470 <sub>H</sub><br>to<br>00047C <sub>H</sub> | —                                    | —                                | —                                    | —                              |   |
| 000480 <sub>H</sub>                              | RSTRR [R]<br>B,H,W<br>XXXX--XX       | RSTCR [R/W]<br>B,H,W<br>111----0 | STBCR [R/W]<br>B,H,W *<br>000---11   | —                              | Reset Control [S]<br>Power Control [S]<br>*: Writing STBCR by DMA is<br>forbidden |
| 000484 <sub>H</sub>                              | —                                    | —                                | —                                    | —                              | Reserved [S]  |
| 000488 <sub>H</sub>                              | DIVR0 [R/W] B,H,W<br>000----         | DIVR1 [R/W] B,H,W<br>0001----    | DIVR2 [R/W] B,H,W<br>0011----        | —                              | Clock Control [S]   |
| 00048C <sub>H</sub>                              | —                                    | —                                | —                                    | —                              | Reserved [S]  |
| 000490 <sub>H</sub>                              | IORR0 [R/W] B,H,W<br>-0000000        | IORR1 [R/W] B,H,W<br>-0000000    | IORR2 [R/W] B,H,W<br>-0000000        | IORR3 [R/W] B,H,W<br>-0000000  | DMA request by<br>peripheral [S]  |
| 000494 <sub>H</sub>                              | IORR4 [R/W] B,H,W<br>-0000000        | IORR5 [R/W] B,H,W<br>-0000000    | IORR6 [R/W] B,H,W<br>-0000000        | IORR7 [R/W] B,H,W<br>-0000000  |   |
| 000498 <sub>H</sub>                              | IORR8 [R/W] B,H,W<br>-0000000        | IORR9 [R/W] B,H,W<br>-0000000    | IORR10 [R/W] B,H,W<br>-0000000       | IORR11 [R/W] B,H,W<br>-0000000 |   |
| 00049C <sub>H</sub>                              | IORR12 [R/W] B,H,W<br>-0000000       | IORR13 [R/W] B,H,W<br>-0000000   | IORR14 [R/W] B,H,W<br>-0000000       | IORR15 [R/W] B,H,W<br>-0000000 | DMA request by<br>peripheral [S]  |
| 0004A0 <sub>H</sub>                              | —                                    | —                                | —                                    | —                              | Reserved  |
| 0004A4 <sub>H</sub>                              | CANPRE [R/W]<br>B,H,W<br>---00000    | —                                | —                                    | —                              | CAN prescaler   |
| 0004A8 <sub>H</sub>                              | —                                    | —                                | CSCCFG[R/W]B,H,W<br>---0----         | CMCFG[R/W]B,H,W<br>00000000    | Clock monitor control<br>register   |
| 0004AC <sub>H</sub>                              | ADERH0[R/W] B,H<br>11111111 11111111 |                                  | ADERL0[R/W] B,H<br>11111111 11111111 |                                | Analog input control register<br>0  |



## CY91520 Series

| Address  | Address Offset Value / Register Name                |                                     |  |                                     | Block                              |
|--|---|-------------------------------------|--|-------------------------------------|------------------------------------|
|  | +0  | +1                                  | +2                                     | +3                                  |                                    |
| 0004B0 <sub>H</sub>                              | —   |                                     | ADERL1 [R/W] B,H<br>11111111 11111111  |                                     | Analog input control register<br>1 |
| 0004B4 <sub>H</sub>                              | —   | —                                   | —                                      | —                                   | Reserved                           |
| 0004B8 <sub>H</sub>                              | CUCR0 [R/W] B,H,W<br>----- 0--00                    |                                     | CUTD0 [R/W] B,H,W<br>10000000 00000000 |                                     | RTC/WDT1 calibration               |
| 0004BC <sub>H</sub>                              | CUTR0 [R] B,H,W<br>----- 00000000 00000000 00000000 |                                     |  |                                     |                                    |
| 0004C0 <sub>H</sub>                              | —   | —                                   | —                                      | —                                   |                                    |
| 0004C4 <sub>H</sub>                              | CUCR1 [R/W] B,H,W<br>----- 0--00                    |                                     | CUTD1 [R/W] B,H,W<br>11000111 01010000 |                                     |                                    |
| 0004C8 <sub>H</sub>                              | CUTR1 [R] B,H,W<br>----- 00000000 00000000 00000000 |                                     |  |                                     | Reserved                           |
| 0004CC <sub>H</sub><br>to<br>00050C <sub>H</sub> | —   | —                                   | —                                      | —                                   |                                    |
| 000510 <sub>H</sub>                              | CSELR [R/W] B,H,W<br>001---00                       | CMONR [R] B,H,W<br>001---00         | MTMCR [R/W]<br>B,H,W<br>00001111       | STMCR [R/W] B,H,W<br>0000-111       | Clock Control [S]                  |
| 000514 <sub>H</sub>                              | PLLCR [R/W] B,H,W<br>----- 11110000                 |                                     | CSTBR [R/W] B,H,W<br>-0000000          | PTMCR [R/W] B,H,W<br>00-----        |                                    |
| 000518 <sub>H</sub>                              | —   | —                                   | CPUAR [R/W] B,H,W<br>0----XXX          | —                                   | Reset Control [S]                  |
| 00051C <sub>H</sub>                              | —   | —                                   | —                                      | —                                   | Reserved [S]                       |
| 000520 <sub>H</sub>                              | CCPSSELR [R/W]<br>B,H,W<br>-----0                   | —                                   | —                                      | CCPSDIVR [R/W]<br>B,H,W<br>-000-000 | Clock Control 2 [S]                |
| 000524 <sub>H</sub>                              | —   | CCPLLFBR [R/W]<br>B,H,W<br>-0000000 | CCSSFBR0 [R/W]<br>B,H,W<br>--000000    | CCSSFBR1 [R/W]<br>B,H,W<br>---00000 |                                    |
| 000528 <sub>H</sub>                              | —   | CCSSCCR0 [R/W]<br>B,H,W<br>----0000 | CCSSCCR1 [R/W] H,W<br>000-----         |                                     |                                    |
| 00052C <sub>H</sub>                              | —   | CCCGRCR0 [R/W]<br>B,H,W<br>00----00 | CCCGRCR1 [R/W]<br>B,H,W<br>00000000    | CCCGRCR2 [R/W]<br>B,H,W<br>00000000 |                                    |
| 000530 <sub>H</sub>                              | CCRTSELR [R/W]<br>B,H,W<br>0-----0                  | —                                   | CCPMUCR0 [R/W]<br>B,H,W<br>0----00     | CCPMUCR1 [R/W]<br>B,H,W<br>0--00000 | Clock Control 2 [S]                |
| 000534 <sub>H</sub><br>to<br>00054C <sub>H</sub> | —   | —                                   | —                                      | —                                   |                                    |
| 000550 <sub>H</sub>                              | EIRR0 [R/W] B,H,W<br>XXXXXXXX                       | ENIR0 [R/W] B,H,W<br>00000000       | ELVR0 [R/W] B,H,W<br>00000000 00000000 |                                     | External Interrupt<br>(INT0 to 7)  |
| 000554 <sub>H</sub>                              | EIRR1 [R/W] B,H,W<br>XXXXXXXX                       | ENIR1 [R/W] B,H,W<br>00000000       | ELVR1 [R/W] B,H,W<br>00000000 00000000 |                                     | External Interrupt<br>(INT8 to 15) |
| 000558 <sub>H</sub>                              | —   | —                                   | —                                      | —                                   | Reserved                           |



## CY91520 Series

| Address  | Address Offset Value / Register Name                 |                                     |                                     |                             | Block  |
|--|--|-------------------------------------|-------------------------------------|-----------------------------|--|
|  | +0   | +1                                  | +2                                  | +3                          |  |
| 00055C <sub>H</sub>                              | —  | —                                   | WTDR [R/W] H<br>00000000 00000000   |                             | Real Time Clock (RTC)                        |
| 000560 <sub>H</sub>                              | —  | WTCRH [R/W] B<br>-----00            | WTCRM [R/W] B,H<br>00000000         | WTCRL [R/W] B,H<br>----00-0 |  |
| 000564 <sub>H</sub>                              | —  | WTBRH [R/W] B<br>--XXXXXX           | WTBRM [R/W] B<br>XXXXXXXXXX         | WTBRL [R/W] B<br>XXXXXXXXXX |  |
| 000568 <sub>H</sub>                              | WTHR [R/W] B,H<br>---00000                           | WTMR [R/W] B,H<br>--000000          | WTSR [R/W] B<br>--000000            | —                           |  |
| 00056C <sub>H</sub>                              | —  | CSVCR [R/W] B<br>000111--           | —                                   | —                           | Clock Supervisor                             |
| 000570 <sub>H</sub><br>to<br>00057C <sub>H</sub> | —  | —                                   | —                                   | —                           | Reserved                                     |
| 000580 <sub>H</sub>                              | REGSEL [R/W]<br>B,H,W<br>0110011-                    | —                                   | —                                   | —                           | Regulator Control / Low<br>Voltage Detection |
| 000584 <sub>H</sub>                              | LVD5R [R/W]<br>B,H,W<br>-----1                       | LVD5F [R/W]<br>B,H,W<br>00000001    | LVD [R/W]<br>B,H,W<br>01000--0      | —                           |  |
| 000588 <sub>H</sub><br>to<br>00058C <sub>H</sub> | —  | —                                   | —                                   | —                           | Reserved                                     |
| 000590 <sub>H</sub>                              | PMUSTR [R/W]<br>B,H,W<br>0----1X                     | PMUCTLR [R/W]<br>B,H,W<br>0-00----  | PWRTMCTL [R/W]<br>B,H,W<br>----011  | —                           | PMU  |
| 000594 <sub>H</sub>                              | PMUINTF0 [R/W]<br>B,H,W<br>00000000                  | PMUINTF1 [R/W]<br>B,H,W<br>00000000 | PMUINTF2 [R/W]<br>B,H,W<br>0000---- | —                           |  |
| 000598 <sub>H</sub>                              | —  | —                                   | —                                   | —                           |  |
| 00059C <sub>H</sub><br>to<br>0005BC <sub>H</sub> | —  | —                                   | —                                   | —                           | Reserved                                     |
| 0005C0 <sub>H</sub><br>to<br>0005FC <sub>H</sub> | —  | —                                   | —                                   | —                           | Reserved                                     |
| 000600 <sub>H</sub>                              | ASR0 [R/W] W<br>00000000 00000000 ----- 1111-001     |                                     |                                     |                             | External Bus<br>Interface [S]                |
| 000604 <sub>H</sub>                              | ASR1 [R/W] W<br>XXXXXXXXXX XXXXXXXXXX ----- XXXX-XX0 |                                     |                                     |                             |  |
| 000608 <sub>H</sub>                              | ASR2 [R/W] W<br>XXXXXXXXXX XXXXXXXXXX ----- XXXX-XX0 |                                     |                                     |                             |  |
| 00060C <sub>H</sub>                              | ASR3 [R/W] W<br>XXXXXXXXXX XXXXXXXXXX ----- XXXX-XX0 |                                     |                                     |                             |  |
| 000610 <sub>H</sub><br>to<br>00063C <sub>H</sub> | —  | —                                   | —                                   | —                           | Reserved [S]                                 |



## CY91520 Series

| Address  | Address Offset Value / Register Name                              |  |  |                         | Block                      |
|--|---|--|--|-------------------------|----------------------------|
|  | +0  | +1                                     | +2                                     | +3                      |                            |
| 000640H  | ACR0 [R/W] W<br>----- 01--00--                                    |  |  |                         | External Bus Interface [S] |
| 000644H  | ACR1 [R/W] W<br>----- XX--XX--                                    |  |  |                         |                            |
| 000648H  | ACR2 [R/W] W<br>----- XX--XX--                                    |  |  |                         |                            |
| 00064CH  | ACR3 [R/W] W<br>----- XX--XX--                                    |  |  |                         |                            |
| 000650H<br>to<br>00067CH                         | —   | —                                      | —                                      | —                       | Reserved [S]               |
| 000680H  | AWR0 [R/W] W<br>----1111 00000000 11110000 00000-0-               |  |  |                         | External Bus Interface [S] |
| 000684H  | AWR1 [R/W] W<br>---XXXX XXXXXXXX XXXXXXXX XXXXX-X-                |  |  |                         |                            |
| 000688H  | AWR2 [R/W] W<br>---XXXX XXXXXXXX XXXXXXXX XXXXX-X-                |  |  |                         | External Bus Interface [S] |
| 00068CH  | AWR3 [R/W] W<br>---XXXX XXXXXXXX XXXXXXXX XXXXX-X-                |  |  |                         |                            |
| 000690H<br>to<br>0006FC <sub>H</sub>             | —   | —                                      | —                                      | —                       | Reserved [S]               |
| 000700H<br>to<br>00070C <sub>H</sub>             | —   | —                                      | —                                      | —                       | Reserved                   |
| 000710H  | BPCCR <sub>A</sub> [R/W] B<br>00000000                            | BPCCR <sub>B</sub> [R/W] B<br>00000000 | BPCCR <sub>C</sub> [R/W] B<br>00000000 | —                       | Bus Performance Counter    |
| 000714H  | BPCTR <sub>A</sub> [R/W] W<br>00000000 00000000 00000000 00000000 |  |  |                         |                            |
| 000718H  | BPCTR <sub>B</sub> [R/W] W<br>00000000 00000000 00000000 00000000 |  |  |                         |                            |
| 00071C <sub>H</sub>                              | BPCTR <sub>C</sub> [R/W] W<br>00000000 00000000 00000000 00000000 |  |  |                         |                            |
| 000720H<br>to<br>0007F8 <sub>H</sub>             | —   | —                                      | —                                      | —                       | Reserved                   |
| 0007FC <sub>H</sub>                              | BMODR [R] B, H, W<br>XXXXXXXX                                     | —                                      | —                                      | —                       | Mode Register              |
| 000800H<br>to<br>00083C <sub>H</sub>             | —   | —                                      | —                                      | —                       | Reserved [S]               |
| 000840H  | FCTLR [R/W] H<br>-0--1000 0--0----                                |  | —                                      | FSTR [R/W] B<br>----001 | Flash Memory Register [S]  |
| 000844H<br>to<br>000854H                         | —   | —                                      | —                                      | —                       | Reserved [S]               |
| 000858H  | —   | —                                      | WREN [R/W] H<br>00000000 00000000      |                         | Wild Register [S]          |
| 00085C <sub>H</sub><br>to<br>00087C <sub>H</sub> | —   | —                                      | —                                      | —                       | Reserved [S]               |



| Address | Address Offset Value / Register Name |   |    |    | Block             |
|---------|--------------------------------------|---|----|----|-------------------|
|         | +0                                   | +1  | +2 | +3 |                   |
| 000880H |                                      | WRAR00 [R/W] W<br>----- --XXXXXX XXXXXXXX XXXXXX--    |    |    | Wild Register [S] |
| 000884H |                                      | WRDR00 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |    |                   |
| 000888H |                                      | WRAR01 [R/W] W<br>----- --XXXXXX XXXXXXXX XXXXXX--    |    |    |                   |
| 00088CH |                                      | WRDR01 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |    |                   |
| 000890H |                                      | WRAR02 [R/W] W<br>----- --XXXXXX XXXXXXXX XXXXXX--    |    |    | Wild Register [S] |
| 000894H |                                      | WRDR02 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |    |                   |
| 000898H |                                      | WRAR03 [R/W] W<br>----- --XXXXXX XXXXXXXX XXXXXX--    |    |    |                   |
| 00089CH |                                      | WRDR03 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |    |                   |
| 0008A0H |                                      | WRAR04 [R/W] W<br>----- --XXXXXX XXXXXXXX XXXXXX--    |    |    |                   |
| 0008A4H |                                      | WRDR04 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |    |                   |
| 0008A8H |                                      | WRAR05 [R/W] W<br>----- --XXXXXX XXXXXXXX XXXXXX--    |    |    |                   |
| 0008ACH |                                      | WRDR05 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |    |                   |
| 0008B0H |                                      | WRAR06 [R/W] W<br>----- --XXXXXX XXXXXXXX XXXXXX--    |    |    |                   |
| 0008B4H |                                      | WRDR06 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |    |                   |
| 0008B8H |                                      | WRAR07 [R/W] W<br>----- --XXXXXX XXXXXXXX XXXXXX--    |    |    |                   |
| 0008BCH |                                      | WRDR07 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |    |                   |
| 0008C0H |                                      | WRAR08 [R/W] W<br>----- --XXXXXX XXXXXXXX XXXXXX--    |    |    |                   |
| 0008C4H |                                      | WRDR08 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |    |                   |
| 0008C8H |                                      | WRAR09 [R/W] W<br>----- --XXXXXX XXXXXXXX XXXXXX--    |    |    |                   |
| 0008CCH |                                      | WRDR09 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |    |                   |
| 0008D0H |                                      | WRAR10 [R/W] W<br>----- --XXXXXX XXXXXXXX XXXXXX--    |    |    |                   |
| 0008D4H |                                      | WRDR10 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |    |                   |
| 0008D8H |                                      | WRAR11 [R/W] W<br>----- --XXXXXX XXXXXXXX XXXXXX--    |    |    |                   |
| 0008DCH |                                      | WRDR11 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |    |                   |
| 0008E0H |                                      | WRAR12 [R/W] W<br>----- --XXXXXX XXXXXXXX XXXXXX--    |    |    |                   |



## CY91520 Series

| Address                  | Address Offset Value / Register Name                        |    |                                  |    | Block                    |
|--------------------------|---|----|----------------------------------|----|--------------------------|
|                          | +0  | +1 | +2                               | +3 |                          |
| 0008E4H                  | WRDR12 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX       |    |                                  |    | Wild Register [S]        |
| 0008E8H                  | WRAR13 [R/W] W<br>----- --XXXXXX XXXXXXXX XXXXXX--          |    |                                  |    |                          |
| 0008ECH                  | WRDR13 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX       |    |                                  |    |                          |
| 0008F0H                  | WRAR14 [R/W] W<br>----- --XXXXXX XXXXXXXX XXXXXX--          |    |                                  |    |                          |
| 0008F4H                  | WRDR14 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX       |    |                                  |    | Wild Register [S]        |
| 0008F8H                  | WRAR15 [R/W] W<br>----- --XXXXXX XXXXXXXX XXXXXX--          |    |                                  |    |                          |
| 0008FCH                  | WRDR15 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX       |    |                                  |    |                          |
| 000900H                  | TPUUNLOCK [R/W] W<br>00000000 00000000 00000000 00000000    |    |                                  |    | Time Protection Unit [S] |
| 000904H                  | TPULST [R] B,H,W<br>-----0                                  | —  | TPUVST [R/W]<br>B,H,W<br>----000 | —  |                          |
| 000908H                  | TPUCFG [R/W] B,H,W<br>-----0 0-000000 ----- 0               |    |                                  |    |                          |
| 00090CH                  | TPUTIR [R] B,H,W<br>00000000                                | —  | —                                | —  |                          |
| 000910H                  | TPUTST [R] B,H,W<br>00000000                                | —  | —                                | —  |                          |
| 000914H                  | TPUTIE [R/W] B,H,W<br>00000000                              | —  | —                                | —  |                          |
| 000918H                  | TPUTMID [R] B,H,W<br>00000000 00000000 00000000 00000000    |    |                                  |    |                          |
| 00091CH<br>to<br>00092CH | —   | —  | —                                | —  |                          |
| 000930H                  | TPUTCN00 [R/W] B,H,W<br>000000-- 00000000 00000000 00000000 |    |                                  |    |                          |
| 000934H                  | TPUTCN01 [R/W] B,H,W<br>000000-- 00000000 00000000 00000000 |    |                                  |    |                          |
| 000938H                  | TPUTCN02 [R/W] B,H,W<br>000000-- 00000000 00000000 00000000 |    |                                  |    |                          |
| 00093CH                  | TPUTCN03 [R/W] B,H,W<br>000000-- 00000000 00000000 00000000 |    |                                  |    |                          |
| 000940H                  | TPUTCN04 [R/W] B,H,W<br>000000-- 00000000 00000000 00000000 |    |                                  |    |                          |
| 000944H                  | TPUTCN05 [R/W] B,H,W<br>000000-- 00000000 00000000 00000000 |    |                                  |    |                          |
| 000948H                  | TPUTCN06 [R/W] B,H,W<br>000000-- 00000000 00000000 00000000 |    |                                  |    |                          |
| 00094CH                  | TPUTCN07 [R/W] B,H,W<br>000000-- 00000000 00000000 00000000 |    |                                  |    |                          |
| 000950H                  | TPUTCN10 [R/W]<br>B,H,W<br>---00000                         | —  | —                                | —  |                          |



## CY91520 Series

| Address  | Address Offset Value / Register Name                  |    |                                     |    | Block                       |
|--|---|----|-------------------------------------|----|-----------------------------|
|  | +0  | +1 | +2                                  | +3 |                             |
| 000954 <sub>H</sub>                              | TPUTCN11 [R/W]<br>B,H,W<br>---00000                   | —  | —                                   | —  | Time Protection<br>Unit [S] |
| 000958 <sub>H</sub>                              | TPUTCN12 [R/W]<br>B,H,W<br>---00000                   | —  | —                                   | —  |                             |
| 00095C <sub>H</sub>                              | TPUTCN13 [R/W]<br>B,H,W<br>---00000                   | —  | —                                   | —  |                             |
| 000960 <sub>H</sub>                              | TPUTCN14 [R/W]<br>B,H,W<br>---00000                   | —  | —                                   | —  |                             |
| 000964 <sub>H</sub>                              | TPUTCN15 [R/W]<br>B,H,W<br>---00000                   | —  | —                                   | —  |                             |
| 000968 <sub>H</sub>                              | TPUTCN16 [R/W]<br>B,H,W<br>---00000                   | —  | —                                   | —  |                             |
| 00096C <sub>H</sub>                              | TPUTCN17 [R/W]<br>B,H,W<br>---00000                   | —  | —                                   | —  |                             |
| 000970 <sub>H</sub>                              | TPUTCC0 [R] B,H,W<br>----- 00000000 00000000 00000000 |    |                                     |    |                             |
| 000974 <sub>H</sub>                              | TPUTCC1 [R] B,H,W<br>----- 00000000 00000000 00000000 |    |                                     |    |                             |
| 000978 <sub>H</sub>                              | TPUTCC2 [R] B,H,W<br>----- 00000000 00000000 00000000 |    |                                     |    |                             |
| 00097C <sub>H</sub>                              | TPUTCC3 [R] B,H,W<br>----- 00000000 00000000 00000000 |    |                                     |    |                             |
| 000980 <sub>H</sub>                              | TPUTCC4 [R] B,H,W<br>----- 00000000 00000000 00000000 |    |                                     |    |                             |
| 000984 <sub>H</sub>                              | TPUTCC5 [R] B,H,W<br>----- 00000000 00000000 00000000 |    |                                     |    |                             |
| 000988 <sub>H</sub>                              | TPUTCC6 [R] B,H,W<br>----- 00000000 00000000 00000000 |    |                                     |    |                             |
| 00098C <sub>H</sub>                              | TPUTCC7 [R] B,H,W<br>----- 00000000 00000000 00000000 |    |                                     |    |                             |
| 000990 <sub>H</sub><br>to<br>0009FC <sub>H</sub> | —   | —  | —                                   | —  |                             |
| 000A00 <sub>H</sub><br>to<br>000BEC <sub>H</sub> | —   | —  | —                                   | —  |                             |
| 000BF0 <sub>H</sub>                              | HSCFR [R/W] B,H,W<br>----- -----00 00000000 00000000  |    |                                     |    | OCDU                        |
| 000BF4 <sub>H</sub>                              | —   | —  | —                                   | —  |                             |
| 000BF8 <sub>H</sub>                              | —   | —  | MBR [R/W] B,H,W<br>00----- XXXXXXXX |    | OCDU                        |
| 000BFC <sub>H</sub>                              | —   | —  | UER [W] B,H,W<br>----- -----X       |    |                             |



## CY91520 Series

| Address | Address Offset Value / Register Name                 |    |                                    |    | Block                    |
|---------|--|----|------------------------------------|----|--------------------------|
|         | +0   | +1 | +2                                 | +3 |                          |
| 000C00H | DCCR0 [R/W] W<br>0----000 --00--00 00000000 0-000000 |    |                                    |    | DMA<br>Controller<br>[S] |
| 000C04H | DCSR0 [R/W] H<br>0----- -----000                     |    | DTCR0 [R/W] H<br>00000000 00000000 |    |                          |
| 000C08H | DSAR0 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |                                    |    |                          |
| 000C0CH | DDAR0 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |                                    |    |                          |
| 000C10H | DCCR1 [R/W] W<br>0----000 --00--00 00000000 0-000000 |    |                                    |    |                          |
| 000C14H | DCSR1 [R/W] H<br>0----- -----000                     |    | DTCR1 [R/W] H<br>00000000 00000000 |    |                          |
| 000C18H | DSAR1 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |                                    |    |                          |
| 000C1CH | DDAR1 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |                                    |    |                          |
| 000C20H | DCCR2 [R/W] W<br>0----000 --00--00 00000000 0-000000 |    |                                    |    |                          |
| 000C24H | DCSR2 [R/W] H<br>0----- -----000                     |    | DTCR2 [R/W] H<br>00000000 00000000 |    |                          |
| 000C28H | DSAR2 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |                                    |    |                          |
| 000C2CH | DDAR2 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |                                    |    |                          |
| 000C30H | DCCR3 [R/W] W<br>0----000 --00--00 00000000 0-000000 |    |                                    |    |                          |
| 000C34H | DCSR3 [R/W] H<br>0----- -----000                     |    | DTCR3 [R/W] H<br>00000000 00000000 |    |                          |
| 000C38H | DSAR3 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |                                    |    |                          |
| 000C3CH | DDAR3 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |                                    |    |                          |
| 000C40H | DCCR4 [R/W] W<br>0----000 --00--00 00000000 0-000000 |    |                                    |    |                          |
| 000C44H | DCSR4 [R/W] H<br>0----- -----000                     |    | DTCR4 [R/W] H<br>00000000 00000000 |    |                          |
| 000C48H | DSAR4 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |                                    |    |                          |
| 000C4CH | DDAR4 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |                                    |    |                          |
| 000C50H | DCCR5 [R/W] W<br>0----000 --00--00 00000000 0-000000 |    |                                    |    |                          |
| 000C54H | DCSR5 [R/W] H<br>0----- -----000                     |    | DTCR5 [R/W] H<br>00000000 00000000 |    |                          |
| 000C58H | DSAR5 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |                                    |    |                          |
| 000C5CH | DDAR5 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |                                    |    |                          |
| 000C60H | DCCR6 [R/W] W<br>0----000 --00--00 00000000 0-000000 |    |                                    |    |                          |



## CY91520 Series

| Address             | Address Offset Value / Register Name                  |    |                                     |    | Block                    |
|---------------------|---|----|-------------------------------------|----|--------------------------|
|                     | +0  | +1 | +2                                  | +3 |                          |
| 000C64 <sub>H</sub> | DCSR6 [R/W] H<br>0----- -----000                      |    | DTCR6 [R/W] H<br>00000000 00000000  |    | DMA<br>Controller<br>[S] |
| 000C68 <sub>H</sub> | DSAR6 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX  |    |                                     |    |                          |
| 000C6C <sub>H</sub> | DDAR6 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX  |    |                                     |    |                          |
| 000C70 <sub>H</sub> | DCCR7 [R/W] W<br>0----000 --00--00 00000000 0-000000  |    |                                     |    |                          |
| 000C74 <sub>H</sub> | DCSR7 [R/W] H<br>0----- -----000                      |    | DTCR7 [R/W] H<br>00000000 00000000  |    |                          |
| 000C78 <sub>H</sub> | DSAR7 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX  |    |                                     |    |                          |
| 000C7C <sub>H</sub> | DDAR7 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX  |    |                                     |    |                          |
| 000C80 <sub>H</sub> | DCCR8 [R/W] W<br>0----000 --00--00 00000000 0-000000  |    |                                     |    |                          |
| 000C84 <sub>H</sub> | DCSR8 [R/W] H<br>0----- -----000                      |    | DTCR8 [R/W] H<br>00000000 00000000  |    |                          |
| 000C88 <sub>H</sub> | DSAR8 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX  |    |                                     |    |                          |
| 000C8C <sub>H</sub> | DDAR8 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX  |    |                                     |    |                          |
| 000C90 <sub>H</sub> | DCCR9 [R/W] W<br>0----000 --00--00 00000000 0-000000  |    |                                     |    |                          |
| 000C94 <sub>H</sub> | DCSR9 [R/W] H<br>0----- -----000                      |    | DTCR9 [R/W] H<br>00000000 00000000  |    |                          |
| 000C98 <sub>H</sub> | DSAR9 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX  |    |                                     |    |                          |
| 000C9C <sub>H</sub> | DDAR9 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX  |    |                                     |    |                          |
| 000CA0 <sub>H</sub> | DCCR10 [R/W] W<br>0----000 --00--00 00000000 0-000000 |    |                                     |    |                          |
| 000CA4 <sub>H</sub> | DCSR10 [R/W] H<br>0----- -----000                     |    | DTCR10 [R/W] H<br>00000000 00000000 |    |                          |
| 000CA8 <sub>H</sub> | DSAR10 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |                                     |    |                          |
| 000CAC <sub>H</sub> | DDAR10 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |                                     |    |                          |
| 000CB0 <sub>H</sub> | DCCR11 [R/W] W<br>0----000 --00--00 00000000 0-000000 |    |                                     |    |                          |
| 000CB4 <sub>H</sub> | DCSR11 [R/W] H<br>0----- -----000                     |    | DTCR11 [R/W] H<br>00000000 00000000 |    |                          |
| 000CB8 <sub>H</sub> | DSAR11 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |                                     |    |                          |
| 000CBC <sub>H</sub> | DDAR11 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |                                     |    |                          |
| 000CC0 <sub>H</sub> | DCCR12 [R/W] W<br>0----000 --00--00 00000000 0-000000 |    |                                     |    |                          |
| 000CC4 <sub>H</sub> | DCSR12 [R/W] H<br>0----- -----000                     |    | DTCR12 [R/W] H<br>00000000 00000000 |    |                          |



## CY91520 Series

| Address                  | Address Offset Value / Register Name                  |                                     |                               |                               | Block                      |
|--------------------------|---|-------------------------------------|-------------------------------|-------------------------------|----------------------------|
|                          | +0  | +1                                  | +2                            | +3                            |                            |
| 000CC8H                  | DSAR12 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |                                     |                               |                               | DMA<br>Controller<br>[S]   |
| 000CCCH                  | DDAR12 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |                                     |                               |                               |                            |
| 000CD0H                  | DCCR13 [R/W] W<br>0----000 --00--00 00000000 0-000000 |                                     |                               |                               |                            |
| 000CD4H                  | DCSR13 [R/W] H<br>0----- ----000                      | DTCR13 [R/W] H<br>00000000 00000000 |                               |                               |                            |
| 000CD8H                  | DSAR13 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |                                     |                               |                               |                            |
| 000CDCH                  | DDAR13 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |                                     |                               |                               |                            |
| 000CE0H                  | DCCR14 [R/W] W<br>0----000 --00--00 00000000 0-000000 |                                     |                               |                               |                            |
| 000CE4H                  | DCSR14 [R/W] H<br>0----- ----000                      | DTCR14 [R/W] H<br>00000000 00000000 |                               |                               |                            |
| 000CE8H                  | DSAR14 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |                                     |                               |                               |                            |
| 000CECH                  | DDAR14 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |                                     |                               |                               |                            |
| 000CF0H                  | DCCR15 [R/W] W<br>0----000 --00--00 00000000 0-000000 |                                     |                               |                               |                            |
| 000CF4H                  | DCSR15 [R/W] H<br>0----- ----000                      | DTCR15 [R/W] H<br>00000000 00000000 |                               |                               |                            |
| 000CF8H                  | DSAR15 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |                                     |                               |                               |                            |
| 000CFCH                  | DDAR15 [R/W] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |                                     |                               |                               |                            |
| 000D00H<br>to<br>000DF0H | —   | —                                   | —                             | —                             | Reserved [S]               |
| 000DF4H                  | —   | —                                   | DNMIR [R/W] B<br>0-----0      | DILVR [R/W] B<br>---1111      | DMA<br>Controller<br>[S]   |
| 000DF8H                  | DMACR[R/W] W<br>0----- 0-----                         |                                     |                               |                               |                            |
| 000DFCH                  | —   | —                                   | —                             | —                             | Reserved [S]               |
| 000E00H                  | DDR0 [R/W] B,H,W<br>00000000                          | DDR01 [R/W] B,H,W<br>00000000       | DDR02 [R/W] B,H,W<br>00000000 | DDR03 [R/W] B,H,W<br>00000000 | Data Direction<br>Register |
| 000E04H                  | DDR04 [R/W] B,H,W<br>00000000                         | DDR05 [R/W] B,H,W<br>00000000       | DDR06 [R/W] B,H,W<br>00000000 | DDR07 [R/W] B,H,W<br>00000000 |                            |
| 000E08H                  | DDR08 [R/W] B,H,W<br>00000000                         | DDR09 [R/W] B,H,W<br>00000000       | DDR10 [R/W] B,H,W<br>00000000 | DDR11 [R/W] B,H,W<br>00000000 | Data Direction<br>Register |
| 000E0CH                  | DDR12 [R/W] B,H,W<br>00000000                         | DDR13 [R/W] B,H,W<br>-0000000       | DDR14 [R/W] B,H,W<br>---000-- | DDR15 [R/W] B,H,W<br>--000000 |                            |
| 000E10H                  | —   | —                                   | —                             | —                             |                            |
| 000E14H                  | —   | —                                   | —                             | —                             |                            |
| 000E18H                  | DDR16 [R/W] B,H,W<br>00000000                         | DDR17 [R/W] B,H,W<br>00000000       | DDR18 [R/W] B,H,W<br>00000000 | DDR19 [R/W] B,H,W<br>00000000 |                            |
| 000E1CH                  | —   | —                                   | —                             | —                             | Reserved                   |



## CY91520 Series

| Address | Address Offset Value / Register Name |                                   |                                   |                                   | Block                           |
|---------|--------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|---------------------------------|
|         | +0                                   | +1                                | +2                                | +3                                |                                 |
| 000E20H | PFR00 [R/W] B,H,W<br>00000000        | PFR01 [R/W] B,H,W<br>00000000     | PFR02 [R/W] B,H,W<br>00000000     | PFR03 [R/W] B,H,W<br>00000000     | Port Function Register          |
| 000E24H | PFR04 [R/W] B,H,W<br>00000000        | PFR05 [R/W] B,H,W<br>00000000     | PFR06 [R/W] B,H,W<br>00000000     | PFR07 [R/W] B,H,W<br>00000000     |                                 |
| 000E28H | PFR08 [R/W] B,H,W<br>00000000        | PFR09 [R/W] B,H,W<br>00000000     | PFR10 [R/W] B,H,W<br>00000000     | PFR11 [R/W] B,H,W<br>00000000     |                                 |
| 000E2CH | PFR12 [R/W] B,H,W<br>00000000        | PFR13 [R/W] B,H,W<br>-0000000     | PFR14 [R/W] B,H,W<br>---000--     | PFR15 [R/W] B,H,W<br>--000000     |                                 |
| 000E30H | —                                    | —                                 | —                                 | —                                 |                                 |
| 000E34H | —                                    | —                                 | —                                 | —                                 |                                 |
| 000E38H | PFR16 [R/W] B,H,W<br>00000000        | PFR17 [R/W] B,H,W<br>00000000     | PFR18 [R/W] B,H,W<br>00000000     | PFR19 [R/W] B,H,W<br>00000000     |                                 |
| 000E3CH | —                                    | —                                 | —                                 | —                                 | Reserved                        |
| 000E40H | PDDR00 [R] B,H,W<br>XXXXXXXXXX       | PDDR01 [R] B,H,W<br>XXXXXXXXXX    | PDDR02 [R] B,H,W<br>XXXXXXXXXX    | PDDR03 [R] B,H,W<br>XXXXXXXXXX    | Port Direct Read Register       |
| 000E44H | PDDR04 [R] B,H,W<br>XXXXXXXXXX       | PDDR05 [R] B,H,W<br>XXXXXXXXXX    | PDDR06 [R] B,H,W<br>XXXXXXXXXX    | PDDR07 [R] B,H,W<br>XXXXXXXXXX    |                                 |
| 000E48H | PDDR08 [R] B,H,W<br>XXXXXXXXXX       | PDDR09 [R] B,H,W<br>XXXXXXXXXX    | PDDR10 [R] B,H,W<br>XXXXXXXXXX    | PDDR11 [R] B,H,W<br>XXXXXXXXXX    |                                 |
| 000E4CH | PDDR12 [R] B,H,W<br>XXXXXXXXXX       | PDDR13 [R] B,H,W<br>-XXXXXXXXX    | PDDR14 [R] B,H,W<br>---XXX--      | PDDR15 [R] B,H,W<br>--XXXXXX      |                                 |
| 000E50H | —                                    | —                                 | —                                 | —                                 |                                 |
| 000E54H | —                                    | —                                 | —                                 | —                                 |                                 |
| 000E58H | PDDR16 [R] B,H,W<br>XXXXXXXXXX       | PDDR17 [R] B,H,W<br>XXXXXXXXXX    | PDDR18 [R] B,H,W<br>XXXXXXXXXX    | PDDR19 [R] B,H,W<br>XXXXXXXXXX    |                                 |
| 000E5CH | —                                    | —                                 | —                                 | —                                 | Reserved                        |
| 000E60H | EPFR00 [R/W]<br>B,H,W<br>00000000    | EPFR01 [R/W]<br>B,H,W<br>-0-0-000 | EPFR02 [R/W]<br>B,H,W<br>----0000 | EPFR03 [R/W]<br>B,H,W<br>---000-0 | Extended Port Function Register |
| 000E64H | EPFR04 [R/W]<br>B,H,W<br>----00-0    | EPFR05 [R/W]<br>B,H,W<br>----0000 | EPFR06 [R/W]<br>B,H,W<br>----000- | EPFR07 [R/W]<br>B,H,W<br>---00000 |                                 |
| 000E68H | EPFR08 [R/W]<br>B,H,W<br>---00000    | EPFR09 [R/W]<br>B,H,W<br>----00-  | EPFR10 [R/W]<br>B,H,W<br>----0000 | EPFR11 [R/W]<br>B,H,W<br>---0000  |                                 |
| 000E6CH | EPFR12 [R/W]<br>B,H,W<br>----0000    | EPFR13 [R/W]<br>B,H,W<br>-----00  | EPFR14 [R/W]<br>B,H,W<br>-----00  | EPFR15 [R/W]<br>B,H,W<br>-----000 |                                 |
| 000E70H | —                                    | —                                 | —                                 | —                                 |                                 |
| 000E74H | —                                    | —                                 | —                                 | —                                 |                                 |
| 000E78H | —                                    | —                                 | EPFR26 [R/W]<br>B,H,W<br>00000000 | EPFR27 [R/W]<br>B,H,W<br>---0---- |                                 |
| 000E7CH | EPFR28 [R/W]<br>B,H,W<br>--000-0-    | EPFR29 [R/W]<br>B,H,W<br>00000000 | —                                 | —                                 |                                 |
| 000E80H | —                                    | EPFR33 [R/W]<br>B,H,W<br>-----00- | EPFR34 [R/W]<br>B,H,W<br>-----00- | EPFR35 [R/W]<br>B,H,W<br>---00000 |                                 |



| Address                  | Address Offset Value / Register Name |                                   |                                   |                                   | Block                                |
|--------------------------|--------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|
|                          | +0                                   | +1                                | +2                                | +3                                |                                      |
| 000E84H                  | EPFR36 [R/W]<br>B,H,W<br>----000-    | —                                 | —                                 | —                                 | Extended Port<br>Function Register   |
| 000E88H                  | —                                    | —                                 | EPFR42 [R/W]<br>B,H,W<br>-----00  | EPFR43 [R/W]<br>B,H,W<br>0--0000- |                                      |
| 000E8CH                  | EPFR44 [R/W]<br>B,H,W<br>-00--0-     | EPFR45 [R/W]<br>B,H,W<br>-0000000 | —                                 | —                                 |                                      |
| 000E90H                  | —                                    | —                                 | —                                 | —                                 |                                      |
| 000E94H                  | —                                    | —                                 | —                                 | —                                 |                                      |
| 000E98H                  | EPFR56 [R/W]<br>B,H,W<br>----0-0     | EPFR57 [R/W]<br>B,H,W<br>----00-0 | EPFR58 [R/W]<br>B,H,W<br>----00-0 | EPFR59 [R/W]<br>B,H,W<br>----00-0 |                                      |
| 000E9CH                  | EPFR60 [R/W]<br>B,H,W<br>----00-0    | EPFR61 [R/W]<br>B,H,W<br>----00-  | EPFR62 [R/W]<br>B,H,W<br>----00-  | EPFR63 [R/W]<br>B,H,W<br>---0000- |                                      |
| 000EA0H<br>to<br>000EBCH | —                                    | —                                 | —                                 | —                                 | Reserved                             |
| 000EC0H                  | PPER00 [R/W]<br>B,H,W<br>00000000    | PPER01 [R/W]<br>B,H,W<br>00000000 | PPER02 [R/W]<br>B,H,W<br>00000000 | PPER03 [R/W]<br>B,H,W<br>00000000 | Port Pull-up/down<br>Enable Register |
| 000EC4H                  | PPER04 [R/W]<br>B,H,W<br>00000000    | PPER05 [R/W]<br>B,H,W<br>00000000 | PPER06 [R/W]<br>B,H,W<br>00000000 | PPER07 [R/W]<br>B,H,W<br>00000000 |                                      |
| 000EC8H                  | PPER08 [R/W]<br>B,H,W<br>00000000    | PPER09 [R/W]<br>B,H,W<br>00000000 | PPER10 [R/W]<br>B,H,W<br>00000000 | PPER11 [R/W]<br>B,H,W<br>00000000 |                                      |
| 000ECC <sub>H</sub>      | PPER12 [R/W]<br>B,H,W<br>00000000    | PPER13 [R/W]<br>B,H,W<br>-0000000 | PPER14 [R/W]<br>B,H,W<br>---000-- | PPER15 [R/W]<br>B,H,W<br>--000000 |                                      |
| 000ED0H                  | —                                    | —                                 | —                                 | —                                 |                                      |
| 000ED4H                  | —                                    | —                                 | —                                 | —                                 |                                      |
| 000ED8H                  | PPER16 [R/W]<br>B,H,W<br>00000000    | PPER17 [R/W]<br>B,H,W<br>00000000 | PPER18 [R/W]<br>B,H,W<br>00000000 | PPER19 [R/W]<br>B,H,W<br>00000000 |                                      |
| 000EDCH<br>to<br>000F3CH | —                                    | —                                 | —                                 | —                                 | Reserved                             |
| 000F40H                  | PORTEN [R/W]<br>B,H,W<br>-----0      | —                                 | —                                 | —                                 | Port Enable Register                 |
| 000F44H                  | KEYCDR [R/W] H<br>00000000 00000000  |                                   | —                                 | —                                 | KeyCodeRegister                      |
| 000F48H<br>to<br>000F64H | —                                    | —                                 | —                                 | —                                 | Reserved                             |



## CY91520 Series

| Address                  | Address Offset Value / Register Name                  |                               |                                     |                                     | Block  |
|--------------------------|---|-------------------------------|-------------------------------------|-------------------------------------|--|
|                          | +0  | +1                            | +2                                  | +3                                  |  |
| 000F68H                  | MSCY6 [R] H,W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX  |                               |                                     |                                     | Input Capture 6,7<br>Cycle measurement data register 67                            |
| 000F6CH                  | MSCY7 [R] H,W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX  |                               |                                     |                                     |  |
| 000F70H                  | RCRH0 [W] H,W<br>XXXXXXXX                             | RCRL0 [W] B,H,W<br>XXXXXXXX   | UDCRH0 [R] H,W<br>00000000          | UDCRL0 [R] B,H,W<br>00000000        | Up/Down Counter 0  |
| 000F74H                  | CCR0 [R/W] B,H<br>00000000 -0001000                   |                               | —                                   | CSR0 [R/W] B<br>00000000            |  |
| 000F78H<br>to<br>000F7CH | —   | —                             | —                                   | —                                   | Reserved   |
| 000F80H                  | RCRH1 [W] H,W<br>XXXXXXXX                             | RCRL1 [W] B,H,W<br>XXXXXXXX   | UDCRH1 [R] H,W<br>00000000          | UDCRL1 [R] B,H,W<br>00000000        | Up/Down Counter 1  |
| 000F84H                  | CCR1 [R/W] B,H<br>00000000 -0001000                   |                               | —                                   | CSR1 [R/W] B<br>00000000            |  |
| 000F88H                  | —   | —                             | MSCH45 [R]<br>B,H,W<br>00000000     | MSCL45 [R/W]<br>B,H,W<br>-----00    | Input Capture 4,5<br>32-bit ICU<br>Cycle and pulse width<br>measurement control 45 |
| 000F8CH                  | —   | —                             | MSCH67 [R]<br>B,H,W<br>00000000     | MSCL67 [R/W]<br>B,H,W<br>-----00    | Input Capture 6,7<br>32-bit ICU<br>Cycle and pulse width<br>measurement control 67 |
| 000F90H                  | OCCP10 [R/W] W<br>00000000 00000000 00000000 00000000 |                               |                                     |                                     | Output Compare 10,11<br>32-bit OCU   |
| 000F94H                  | OCCP11 [R/W] W<br>00000000 00000000 00000000 00000000 |                               |                                     |                                     |  |
| 000F98H                  | —   | —                             | OCSH1011 [R/W]<br>B,H,W<br>---0--00 | OCSL1011 [R/W]<br>B,H,W<br>0000--00 | Output Compare 10,11<br>32-bit OCU   |
| 000F9CH                  | —   | —                             | —                                   | OCLS1011 [R/W]<br>B,H,W<br>----0000 | OCU1011<br>Output level control register   |
| 000FA0H                  | CPCLR5 [R/W] W<br>11111111 11111111 11111111 11111111 |                               |                                     |                                     | Free-run Timer 5<br>32-bit FRT   |
| 000FA4H                  | TCDT5 [R/W] W<br>00000000 00000000 00000000 00000000  |                               |                                     |                                     |  |
| 000FA8H                  | TCCSH5<br>[R/W]B,H,W<br>0----00                       | TCCSL5 [R/W]B,H,W<br>-1-00000 | —                                   | —                                   |  |
| 000FACH<br>to<br>000FCCH | —   | —                             | —                                   | —                                   | Reserved   |
| 000FD0H                  | IPCP4 [R] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX    |                               |                                     |                                     | Input Capture 4,5<br>32-bit ICU  |
| 000FD4H                  | IPCP5 [R] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX    |                               |                                     |                                     |  |
| 000FD8H                  | —   | —                             | LSYNS1 [R/W]<br>B,H,W<br>00000000   | ICS45 [R/W] B,H,W<br>00000000       |  |



## CY91520 Series

| Address  | Address Offset Value / Register Name                       |                              |                                      |                               | Block   |
|--|--|------------------------------|--------------------------------------|-------------------------------|---|
|  | +0   | +1                           | +2                                   | +3                            |   |
| 000FDC <sub>H</sub>                              | ICP6 [R] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX          |                              |                                      |                               | Input Capture 6,7<br>32-bit ICU                                       |
| 000FE0 <sub>H</sub>                              | ICP7 [R] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX          |                              |                                      |                               |   |
| 000FE4 <sub>H</sub>                              | —  | —                            | —                                    | ICS67 [R/W] B,H,W<br>00000000 |   |
| 000FE8 <sub>H</sub>                              | ICP8 [R] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX          |                              |                                      |                               | Input Capture 8,9<br>32-bit ICU                                       |
| 000FEC <sub>H</sub>                              | ICP9 [R] W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX          |                              |                                      |                               |   |
| 000FF0 <sub>H</sub>                              | —  | —                            | —                                    | ICS89 [R/W] B,H,W<br>00000000 |   |
| 000FF4 <sub>H</sub>                              | MSCY8 [R] H,W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX       |                              |                                      |                               | Input Capture 8,9<br>32-bit ICU<br>Cycle measurement data register 89 |
| 000FF8 <sub>H</sub>                              | MSCY9 [R] H,W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX       |                              |                                      |                               |   |
| 000FFC <sub>H</sub>                              | —  | —                            | MSCH89 [R] B,H,W<br>00000000         | MSCL89 [R/W] B,H,W<br>-----00 | Cycle and pulse width measurement control 89                          |
| 001000 <sub>H</sub>                              | SACR [R/W] B,H,W<br>-----0                                 | PICD [R/W] B,H,W<br>----0011 | —                                    | —                             | Clock Control   |
| 001004 <sub>H</sub><br>to<br>00112C <sub>H</sub> | —  | —                            | —                                    | —                             | Reserved  |
| 001130 <sub>H</sub>                              | —  | —                            | —                                    | CRCCR [R/W] B,H,W<br>-0000000 | CRC calculation unit  |
| 001134 <sub>H</sub>                              | CRCINIT [R/W] B,H,W<br>11111111 11111111 11111111 11111111 |                              |                                      |                               |   |
| 001138 <sub>H</sub>                              | CRCIN [R/W] B,H,W<br>00000000 00000000 00000000 00000000   |                              |                                      |                               |   |
| 00113C <sub>H</sub>                              | CRCR [R] B,H,W<br>11111111 11111111 11111111 11111111      |                              |                                      |                               |   |
| 001140 <sub>H</sub><br>to<br>0011FC <sub>H</sub> | —  | —                            | —                                    | —                             | Reserved  |
| 001200 <sub>H</sub>                              | TCGS [R/W] B,H,W<br>-----00                                | —                            | —                                    | TCGSE [R/W] B,H,W<br>-----000 | 16-bit Free-run timer synchronous activation                          |
| 001204 <sub>H</sub>                              | CPCLRB0/CPCLR0 [W] H,W<br>11111111 11111111                |                              | TCDT0 [R/W] H,W<br>00000000 00000000 |                               | 16-bit Free-run Timer 0   |
| 001208 <sub>H</sub>                              | TCCS0 [R/W] B,H,W<br>00000000 01000000 ----0000 -----      |                              |                                      |                               |   |
| 00120C <sub>H</sub>                              | CPCLRB1/CPCLR1 [W] H,W<br>11111111 11111111                |                              | TCDT1 [R/W] H,W<br>00000000 00000000 |                               | 16-bit Free-run Timer 1   |
| 001210 <sub>H</sub>                              | TCCS1 [R/W] B,H,W<br>00000000 01000000 ----0000 -----      |                              |                                      |                               |   |
| 001214 <sub>H</sub>                              | CPCLRB2/CPCLR2 [W] H,W<br>11111111 11111111                |                              | TCDT2 [R/W] H,W<br>00000000 00000000 |                               | 16-bit Free-run Timer 2   |
| 001218 <sub>H</sub>                              | TCCS2 [R/W] B,H,W<br>00000000 01000000 ----0000 -----      |                              |                                      |                               |   |



## CY91520 Series

| Address  | Address Offset Value / Register Name                    |                                       |   |                                   | Block                           |
|--|---|---------------------------------------|---|-----------------------------------|---------------------------------|
|  | +0  | +1                                    | +2  | +3                                |                                 |
| 00121C <sub>H</sub><br>to<br>001230 <sub>H</sub> | —   | —                                     | —   | —                                 | Reserved                        |
| 001234 <sub>H</sub>                              | FRS0 [R/W] B,H,W<br>----- --00--00 --00--00 --00--00    |                                       |   |                                   | 16-bit Free-run timer selection |
| 001238 <sub>H</sub>                              | —   | FRS1 [R/W] B,H,W<br>--00--00 --00--00 |   |                                   |                                 |
| 00123C <sub>H</sub>                              | FRS2 [R/W] B,H,W<br>--00--00 --00--00 --00--00 --00--00 |                                       |   |                                   |                                 |
| 001240 <sub>H</sub>                              | FRS3 [R/W] B,H,W<br>--00--00 --00--00 --00--00 --00--00 |                                       |   |                                   |                                 |
| 001244 <sub>H</sub>                              | FRS4 [R/W] B,H,W<br>--00--00 --00--00 --00--00 --00--00 |                                       |   |                                   |                                 |
| 001248 <sub>H</sub>                              | —   | —                                     | —   | —                                 | Reserved                        |
| 00124C <sub>H</sub>                              | OCCPB0/OCCP0 [R/W] H,W<br>00000000 00000000             |                                       | OCCPB1/OCCP1 [R/W] H,W<br>00000000 00000000 |                                   | 16-bit Output compare 0/1       |
| 001250 <sub>H</sub>                              | OCS01 [R/W] B,H,W<br>-110--00 00001100                  |                                       | —   | OCMOD01 [R/W]<br>B,H,W<br>-----00 |                                 |
| 001254 <sub>H</sub>                              | OCCPB2/OCCP2 [R/W] H,W<br>00000000 00000000             |                                       | OCCPB3/OCCP3 [R/W] H,W<br>00000000 00000000 |                                   | 16-bit Output compare 2/3       |
| 001258 <sub>H</sub>                              | OCS23 [R/W] B,H,W<br>-110--00 00001100                  |                                       | —   | OCMOD23 [R/W]<br>B,H,W<br>-----00 |                                 |
| 00125C <sub>H</sub>                              | OCCPB4/OCCP4 [R/W] H,W<br>00000000 00000000             |                                       | OCCPB5/OCCP5 [R/W] H,W<br>00000000 00000000 |                                   | 16-bit Output compare 4/5       |
| 001260 <sub>H</sub>                              | OCS45 [R/W] B,H,W<br>-110--00 00001100                  |                                       | —   | OCMOD45 [R/W]<br>B,H,W<br>-----00 |                                 |
| 001264 <sub>H</sub><br>to<br>001278 <sub>H</sub> | —   | —                                     | —   | —                                 | Reserved                        |
| 00127C <sub>H</sub>                              | IPCP0 [R] H,W<br>00000000 00000000                      |                                       | IPCP1 [R] H,W<br>00000000 00000000          |                                   | 16-bit Input capture 0/1        |
| 001280 <sub>H</sub>                              | ICS01 [R/W] B,H,W<br>-----00 00000000                   |                                       | —   | LSYNS [R/W] B,H,W<br>----0000     |                                 |
| 001284 <sub>H</sub>                              | IPCP2 [R] H,W<br>00000000 00000000                      |                                       | IPCP3 [R] H,W<br>00000000 00000000          |                                   | 16-bit Input capture 2/3        |
| 001288 <sub>H</sub>                              | ICS23 [R/W] B,H,W<br>-----00 00000000                   |                                       | —   | —                                 |                                 |
| 00128C <sub>H</sub><br>to<br>001298 <sub>H</sub> | —   | —                                     | —   | —                                 | Reserved                        |
| 00129C <sub>H</sub>                              | —   | —                                     | —   | —                                 | Reserved                        |



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| Address  | Address Offset Value / Register Name                     |                                    |  |                                    | Block  |
|--|--|------------------------------------|--|------------------------------------|--|
|  | +0   | +1                                 | +2   | +3                                 |  |
| 0012A0 <sub>H</sub>                              | TMRR0 [R/W] H,W<br>00000000 00000001                     |                                    | TMRR1 [R/W] H,W<br>00000000 00000001             |                                    | Waveform generator<br>0/1/2                                  |
| 0012A4 <sub>H</sub>                              | TMRR2 [R/W] H,W<br>00000000 00000001                     |                                    | —  | —                                  |  |
| 0012A8 <sub>H</sub>                              | DTSCR0 [R/W]<br>B,H,W<br>00000000                        | DTSCR1 [R/W]<br>B,H,W<br>00000000  | DTSCR2 [R/W]<br>B,H,W<br>00000000                | —                                  |  |
| 0012AC <sub>H</sub>                              | —  | DTIR0 [R/W] B,H,W<br>000000--      | —  | DTMNS0 [R/W]<br>B,H,W<br>00--000   |  |
| 0012B0 <sub>H</sub>                              | —  | SIGCR10 [R/W]<br>B,H,W<br>00000000 | —  | SIGCR20 [R/W]<br>B,H,W<br>000000-1 |  |
| 0012B4 <sub>H</sub>                              | PICS0 [R/W] B,H,W<br>000000-- -----                      |                                    |  |                                    |  |
| 0012B8 <sub>H</sub><br>to<br>0012CC <sub>H</sub> | —  | —                                  | —  | —                                  | Reserved   |
| 0012D0 <sub>H</sub>                              | FRS5 [R/W] B,H,W<br>--00--00 --00--00 --00--00 --00--00  |                                    |  |                                    | 16-bit Free-run timer<br>selection<br>A/D activation compare |
| 0012D4 <sub>H</sub>                              | FRS6 [R/W] B,H,W<br>--00--00 --00--00 --00--00 --00--00  |                                    |  |                                    | 16-bit Free-run timer<br>selection<br>A/D activation compare |
| 0012D8 <sub>H</sub>                              | FRS7 [R/W] B,H,W<br>--00--00 --00--00 --00--00 --00--00  |                                    |  |                                    |  |
| 0012DC <sub>H</sub><br>to<br>0012FC <sub>H</sub> | —  | —                                  | —  | —                                  | Reserved   |
| 001300 <sub>H</sub>                              | —  |                                    |  |                                    | Reserved   |
| 001304 <sub>H</sub>                              | ADTSS0[R/W]<br>B,H,W<br>-----0                           | —                                  | —  | —                                  | 12-bit A/D converter 1/2 unit                                |
| 001308 <sub>H</sub>                              | ADTSE0[R/W] B,H,W<br>00000000 00000000 00000000 00000000 |                                    |  |                                    |  |
| 00130C <sub>H</sub>                              | ADCOMP0/ADCOMPB0[R/W] H,W<br>00000000 00000000           |                                    | ADCOMP1/ADCOMPB1[R/W] H,W<br>00000000 00000000   |                                    |  |
| 001310 <sub>H</sub>                              | ADCOMP2/ADCOMPB2[R/W] H,W<br>00000000 00000000           |                                    | ADCOMP3/ADCOMPB3[R/W] H,W<br>00000000 00000000   |                                    |  |
| 001314 <sub>H</sub>                              | ADCOMP4/ADCOMPB4[R/W] H,W<br>00000000 00000000           |                                    | ADCOMP5/ADCOMPB5[R/W] H,W<br>00000000 00000000   |                                    |  |
| 001318 <sub>H</sub>                              | ADCOMP6/ADCOMPB6[R/W] H,W<br>00000000 00000000           |                                    | ADCOMP7/ADCOMPB7[R/W] H,W<br>00000000 00000000   |                                    |  |
| 00131C <sub>H</sub>                              | ADCOMP8/ADCOMPB8[R/W] H,W<br>00000000 00000000           |                                    | ADCOMP9/ADCOMPB9[R/W] H,W<br>00000000 00000000   |                                    |  |
| 001320 <sub>H</sub>                              | ADCOMP10/ADCOMPB10[R/W] H,W<br>00000000 00000000         |                                    | ADCOMP11/ADCOMPB11[R/W] H,W<br>00000000 00000000 |                                    |  |
| 001324 <sub>H</sub>                              | ADCOMP12/ADCOMPB12[R/W] H,W<br>00000000 00000000         |                                    | ADCOMP13/ADCOMPB13[R/W] H,W<br>00000000 00000000 |                                    |  |
| 001328 <sub>H</sub>                              | ADCOMP14/ADCOMPB14[R/W] H,W<br>00000000 00000000         |                                    | ADCOMP15/ADCOMPB15[R/W] H,W<br>00000000 00000000 |                                    |  |



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| Address             | Address Offset Value / Register Name             |    |  |    | Block                         |
|---------------------|--|----|--|----|-------------------------------|
|                     | +0   | +1 | +2   | +3 |                               |
| 00132C <sub>H</sub> | ADCOMP16/ADCOMPB16[R/W] H,W<br>00000000 00000000 |    | ADCOMP17/ADCOMPB17[R/W] H,W<br>00000000 00000000 |    | 12-bit A/D converter 1/2 unit |
| 001330 <sub>H</sub> | ADCOMP18/ADCOMPB18[R/W] H,W<br>00000000 00000000 |    | ADCOMP19/ADCOMPB19[R/W] H,W<br>00000000 00000000 |    |                               |
| 001334 <sub>H</sub> | ADCOMP20/ADCOMPB20[R/W] H,W<br>00000000 00000000 |    | ADCOMP21/ADCOMPB21[R/W] H,W<br>00000000 00000000 |    |                               |
| 001338 <sub>H</sub> | ADCOMP22/ADCOMPB22[R/W] H,W<br>00000000 00000000 |    | ADCOMP23/ADCOMPB23[R/W] H,W<br>00000000 00000000 |    |                               |
| 00133C <sub>H</sub> | ADCOMP24/ADCOMPB24[R/W] H,W<br>00000000 00000000 |    | ADCOMP25/ADCOMPB25[R/W] H,W<br>00000000 00000000 |    |                               |
| 001340 <sub>H</sub> | ADCOMP26/ADCOMPB26[R/W] H,W<br>00000000 00000000 |    | ADCOMP27/ADCOMPB27[R/W] H,W<br>00000000 00000000 |    |                               |
| 001344 <sub>H</sub> | ADCOMP28/ADCOMPB28[R/W] H,W<br>00000000 00000000 |    | ADCOMP29/ADCOMPB29[R/W] H,W<br>00000000 00000000 |    |                               |
| 001348 <sub>H</sub> | ADCOMP30/ADCOMPB30[R/W] H,W<br>00000000 00000000 |    | ADCOMP31/ADCOMPB31[R/W] H,W<br>00000000 00000000 |    |                               |
| 00134C <sub>H</sub> | ADTCS0[R/W] B,H,W<br>00000000 0010----           |    | ADTCS1[R/W] B,H,W<br>00000000 0010----           |    |                               |
| 001350 <sub>H</sub> | ADTCS2[R/W] B,H,W<br>00000000 0010----           |    | ADTCS3[R/W] B,H,W<br>00000000 0010----           |    |                               |
| 001354 <sub>H</sub> | ADTCS4[R/W] B,H,W<br>00000000 0010----           |    | ADTCS5[R/W] B,H,W<br>00000000 0010----           |    |                               |
| 001358 <sub>H</sub> | ADTCS6[R/W] B,H,W<br>00000000 0010----           |    | ADTCS7[R/W] B,H,W<br>00000000 0010----           |    |                               |
| 00135C <sub>H</sub> | ADTCS8[R/W] B,H,W<br>00000000 0010----           |    | ADTCS9[R/W] B,H,W<br>00000000 0010----           |    |                               |
| 001360 <sub>H</sub> | ADTCS10[R/W] B,H,W<br>00000000 0010----          |    | ADTCS11[R/W] B,H,W<br>00000000 0010----          |    |                               |
| 001364 <sub>H</sub> | ADTCS12[R/W] B,H,W<br>00000000 0010----          |    | ADTCS13[R/W] B,H,W<br>00000000 0010----          |    |                               |
| 001368 <sub>H</sub> | ADTCS14[R/W] B,H,W<br>00000000 0010----          |    | ADTCS15[R/W] B,H,W<br>00000000 0010----          |    |                               |
| 00136C <sub>H</sub> | ADTCS16[R/W] B,H,W<br>00000000 0010----          |    | ADTCS17[R/W] B,H,W<br>00000000 0010----          |    |                               |
| 001370 <sub>H</sub> | ADTCS18[R/W] B,H,W<br>00000000 0010----          |    | ADTCS19[R/W] B,H,W<br>00000000 0010----          |    |                               |
| 001374 <sub>H</sub> | ADTCS20[R/W] B,H,W<br>00000000 0010----          |    | ADTCS21[R/W] B,H,W<br>00000000 0010----          |    |                               |
| 001378 <sub>H</sub> | ADTCS22[R/W] B,H,W<br>00000000 0010----          |    | ADTCS23[R/W] B,H,W<br>00000000 0010----          |    |                               |
| 00137C <sub>H</sub> | ADTCS24[R/W] B,H,W<br>00000000 0010----          |    | ADTCS25[R/W] B,H,W<br>00000000 0010----          |    |                               |
| 001380 <sub>H</sub> | ADTCS26[R/W] B,H,W<br>00000000 0010----          |    | ADTCS27[R/W] B,H,W<br>00000000 0010----          |    |                               |
| 001384 <sub>H</sub> | ADTCS28[R/W] B,H,W<br>00000000 0010----          |    | ADTCS29[R/W] B,H,W<br>00000000 0010----          |    |                               |
| 001388 <sub>H</sub> | ADTCS30[R/W] B,H,W<br>00000000 0010----          |    | ADTCS31[R/W] B,H,W<br>00000000 0010----          |    |                               |
| 00138C <sub>H</sub> | ADTCD0[R] B,H,W<br>10--0000 00000000             |    | ADTCD1[R] B,H,W<br>10--0000 00000000             |    |                               |



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| Address             | Address Offset Value / Register Name   |    |  |    | Block                         |
|---------------------|--|----|--|----|-------------------------------|
|                     | +0                                     | +1 | +2                                     | +3 |                               |
| 001390 <sub>H</sub> | ADTCD2[R] B,H,W<br>10--0000 00000000   |    | ADTCD3[R] B,H,W<br>10--0000 00000000   |    | 12-bit A/D converter 1/2 unit |
| 001394 <sub>H</sub> | ADTCD4[R] B,H,W<br>10--0000 00000000   |    | ADTCD5[R] B,H,W<br>10--0000 00000000   |    |                               |
| 001398 <sub>H</sub> | ADTCD6[R] B,H,W<br>10--0000 00000000   |    | ADTCD7[R] B,H,W<br>10--0000 00000000   |    |                               |
| 00139C <sub>H</sub> | ADTCD8[R] B,H,W<br>10--0000 00000000   |    | ADTCD9[R] B,H,W<br>10--0000 00000000   |    |                               |
| 0013A0 <sub>H</sub> | ADTCD10[R] B,H,W<br>10--0000 00000000  |    | ADTCD11[R] B,H,W<br>10--0000 00000000  |    |                               |
| 0013A4 <sub>H</sub> | ADTCD12[R] B,H,W<br>10--0000 00000000  |    | ADTCD13[R] B,H,W<br>10--0000 00000000  |    |                               |
| 0013A8 <sub>H</sub> | ADTCD14[R] B,H,W<br>10--0000 00000000  |    | ADTCD15[R] B,H,W<br>10--0000 00000000  |    |                               |
| 0013AC <sub>H</sub> | ADTCD16[R] B,H,W<br>10--0000 00000000  |    | ADTCD17[R] B,H,W<br>10--0000 00000000  |    |                               |
| 0013B0 <sub>H</sub> | ADTCD18[R] B,H,W<br>10--0000 00000000  |    | ADTCD19[R] B,H,W<br>10--0000 00000000  |    |                               |
| 0013B4 <sub>H</sub> | ADTCD20[R] B,H,W<br>10--0000 00000000  |    | ADTCD21[R] B,H,W<br>10--0000 00000000  |    |                               |
| 0013B8 <sub>H</sub> | ADTCD22[R] B,H,W<br>10--0000 00000000  |    | ADTCD23[R] B,H,W<br>10--0000 00000000  |    |                               |
| 0013BC <sub>H</sub> | ADTCD24[R] B,H,W<br>10--0000 00000000  |    | ADTCD25[R] B,H,W<br>10--0000 00000000  |    |                               |
| 0013C0 <sub>H</sub> | ADTCD26[R] B,H,W<br>10--0000 00000000  |    | ADTCD27[R] B,H,W<br>10--0000 00000000  |    |                               |
| 0013C4 <sub>H</sub> | ADTCD28[R] B,H,W<br>10--0000 00000000  |    | ADTCD29[R] B,H,W<br>10--0000 00000000  |    |                               |
| 0013C8 <sub>H</sub> | ADTCD30[R] B,H,W<br>10--0000 00000000  |    | ADTCD31[R] B,H,W<br>10--0000 00000000  |    |                               |
| 0013CC <sub>H</sub> | ADTECS0[R/W] B,H,W<br>-----0 ---00000  |    | ADTECS1[R/W] B,H,W<br>-----0 ---00000  |    |                               |
| 0013D0 <sub>H</sub> | ADTECS2[R/W] B,H,W<br>-----0 ---00000  |    | ADTECS3[R/W] B,H,W<br>-----0 ---00000  |    |                               |
| 0013D4 <sub>H</sub> | ADTECS4[R/W] B,H,W<br>-----0 ---00000  |    | ADTECS5[R/W] B,H,W<br>-----0 ---00000  |    |                               |
| 0013D8 <sub>H</sub> | ADTECS6[R/W] B,H,W<br>-----0 ---00000  |    | ADTECS7[R/W] B,H,W<br>-----0 ---00000  |    |                               |
| 0013DC <sub>H</sub> | ADTECS8[R/W] B,H,W<br>-----0 ---00000  |    | ADTECS9[R/W] B,H,W<br>-----0 ---00000  |    |                               |
| 0013E0 <sub>H</sub> | ADTECS10[R/W] B,H,W<br>-----0 ---00000 |    | ADTECS11[R/W] B,H,W<br>-----0 ---00000 |    |                               |
| 0013E4 <sub>H</sub> | ADTECS12[R/W] B,H,W<br>-----0 ---00000 |    | ADTECS13[R/W] B,H,W<br>-----0 ---00000 |    |                               |
| 0013E8 <sub>H</sub> | ADTECS14[R/W] B,H,W<br>-----0 ---00000 |    | ADTECS15[R/W] B,H,W<br>-----0 ---00000 |    |                               |
| 0013EC <sub>H</sub> | ADTECS16[R/W] B,H,W<br>-----0 ---00000 |    | ADTECS17[R/W] B,H,W<br>-----0 ---00000 |    |                               |
| 0013F0 <sub>H</sub> | ADTECS18[R/W] B,H,W<br>-----0 ---00000 |    | ADTECS19[R/W] B,H,W<br>-----0 ---00000 |    |                               |



## CY91520 Series

| Address             | Address Offset Value / Register Name                      |                                    |  |                                    | Block                         |
|---------------------|---|------------------------------------|--|------------------------------------|-------------------------------|
|                     | +0  | +1                                 | +2                                     | +3                                 |                               |
| 0013F4 <sub>H</sub> | ADTECS20[R/W] B,H,W<br>-----0 ---00000                    |                                    | ADTECS21[R/W] B,H,W<br>-----0 ---00000 |                                    | 12-bit A/D converter 1/2 unit |
| 0013F8 <sub>H</sub> | ADTECS22[R/W] B,H,W<br>-----0 ---00000                    |                                    | ADTECS23[R/W] B,H,W<br>-----0 ---00000 |                                    |                               |
| 0013FC <sub>H</sub> | ADTECS24[R/W] B,H,W<br>-----0 ---00000                    |                                    | ADTECS25[R/W] B,H,W<br>-----0 ---00000 |                                    |                               |
| 001400 <sub>H</sub> | ADTECS26[R/W] B,H,W<br>-----0 ---00000                    |                                    | ADTECS27[R/W] B,H,W<br>-----0 ---00000 |                                    |                               |
| 001404 <sub>H</sub> | ADTECS28[R/W] B,H,W<br>-----0 ---00000                    |                                    | ADTECS29[R/W] B,H,W<br>-----0 ---00000 |                                    |                               |
| 001408 <sub>H</sub> | ADTECS30[R/W] B,H,W<br>-----0 ---00000                    |                                    | ADTECS31[R/W] B,H,W<br>-----0 ---00000 |                                    |                               |
| 00140C <sub>H</sub> | ADRCUT0[R/W] B,H,W<br>---0000 00000000                    |                                    | ADRCLT0[R/W] B,H,W<br>---0000 00000000 |                                    |                               |
| 001410 <sub>H</sub> | ADRCUT1[R/W] B,H,W<br>---0000 00000000                    |                                    | ADRCLT1[R/W] B,H,W<br>---0000 00000000 |                                    |                               |
| 001414 <sub>H</sub> | ADRCUT2[R/W] B,H,W<br>---0000 00000000                    |                                    | ADRCLT2[R/W] B,H,W<br>---0000 00000000 |                                    |                               |
| 001418 <sub>H</sub> | ADRCUT3[R/W] B,H,W<br>---0000 00000000                    |                                    | ADRCLT3[R/W] B,H,W<br>---0000 00000000 |                                    |                               |
| 00141C <sub>H</sub> | ADRCCS0[R/W]<br>B,H,W<br>00000000                         | ADRCCS1[R/W]<br>B,H,W<br>00000000  | ADRCCS2[R/W]<br>B,H,W<br>00000000      | ADRCCS3[R/W]<br>B,H,W<br>00000000  |                               |
| 001420 <sub>H</sub> | ADRCCS4[R/W]<br>B,H,W<br>00000000                         | ADRCCS5[R/W]<br>B,H,W<br>00000000  | ADRCCS6[R/W]<br>B,H,W<br>00000000      | ADRCCS7[R/W]<br>B,H,W<br>00000000  |                               |
| 001424 <sub>H</sub> | ADRCCS8[R/W]<br>B,H,W<br>00000000                         | ADRCCS9[R/W]<br>B,H,W<br>00000000  | ADRCCS10[R/W]<br>B,H,W<br>00000000     | ADRCCS11[R/W]<br>B,H,W<br>00000000 |                               |
| 001428 <sub>H</sub> | ADRCCS12[R/W]<br>B,H,W<br>00000000                        | ADRCCS13[R/W]<br>B,H,W<br>00000000 | ADRCCS14[R/W]<br>B,H,W<br>00000000     | ADRCCS15[R/W]<br>B,H,W<br>00000000 |                               |
| 00142C <sub>H</sub> | ADRCCS16[R/W]<br>B,H,W<br>00000000                        | ADRCCS17[R/W]<br>B,H,W<br>00000000 | ADRCCS18[R/W]<br>B,H,W<br>00000000     | ADRCCS19[R/W]<br>B,H,W<br>00000000 |                               |
| 001430 <sub>H</sub> | ADRCCS20[R/W]<br>B,H,W<br>00000000                        | ADRCCS21[R/W]<br>B,H,W<br>00000000 | ADRCCS22[R/W]<br>B,H,W<br>00000000     | ADRCCS23[R/W]<br>B,H,W<br>00000000 |                               |
| 001434 <sub>H</sub> | ADRCCS24[R/W]<br>B,H,W<br>00000000                        | ADRCCS25[R/W]<br>B,H,W<br>00000000 | ADRCCS26[R/W]<br>B,H,W<br>00000000     | ADRCCS27[R/W]<br>B,H,W<br>00000000 |                               |
| 001438 <sub>H</sub> | ADRCCS28[R/W]<br>B,H,W<br>00000000                        | ADRCCS29[R/W]<br>B,H,W<br>00000000 | ADRCCS30[R/W]<br>B,H,W<br>00000000     | ADRCCS31[R/W]<br>B,H,W<br>00000000 |                               |
| 00143C <sub>H</sub> | ADRCOT0[R] B,H,W<br>00000000 00000000 00000000 00000000   |                                    |  |                                    |                               |
| 001440 <sub>H</sub> | ADRCIF0[R,W] B,H,W<br>00000000 00000000 00000000 00000000 |                                    |  |                                    |                               |
| 001444 <sub>H</sub> | ADSCANS0[R/W]<br>B,H,W<br>000-----                        | —                                  | —                                      | —                                  |                               |



## CY91520 Series

| Address  | Address Offset Value / Register Name                    |                                    |  |                                    | Block                         |
|--|---|------------------------------------|--|------------------------------------|-------------------------------|
|  | +0  | +1                                 | +2   | +3                                 |                               |
| 001448 <sub>H</sub>                              | ADNCS0[R/W]<br>B,H,W<br>0-000-00                        | ADNCS1[R/W]<br>B,H,W<br>0-000-00   | ADNCS2[R/W]<br>B,H,W<br>0-000-00                 | ADNCS3[R/W]<br>B,H,W<br>0-000-00   | 12-bit A/D converter 1/2 unit |
| 00144C <sub>H</sub>                              | ADNCS4[R/W]<br>B,H,W<br>0-000-00                        | ADNCS5[R/W]<br>B,H,W<br>0-000-00   | ADNCS6[R/W]<br>B,H,W<br>0-000-00                 | ADNCS7[R/W]<br>B,H,W<br>0-000-00   |                               |
| 001450 <sub>H</sub>                              | ADNCS8[R/W]<br>B,H,W<br>0-000-00                        | ADNCS9[R/W]<br>B,H,W<br>0-000-00   | ADNCS10[R/W]<br>B,H,W<br>0-000-00                | ADNCS11[R/W]<br>B,H,W<br>0-000-00  |                               |
| 001454 <sub>H</sub>                              | ADNCS12[R/W]<br>B,H,W<br>0-000-00                       | ADNCS13[R/W]<br>B,H,W<br>0-000-00  | ADNCS14[R/W]<br>B,H,W<br>0-000-00                | ADNCS15[R/W]<br>B,H,W<br>0-000-00  |                               |
| 001458 <sub>H</sub>                              | ADPRTF0[R] B,H,W<br>00000000 00000000 00000000 00000000 |                                    |  |                                    |                               |
| 00145C <sub>H</sub>                              | ADEOCF0[R] B,H,W<br>11111111 11111111 11111111 11111111 |                                    |  |                                    |                               |
| 001460 <sub>H</sub>                              | ADCS0[R] B,H,W<br>0-----                                |                                    | ADCH0[R] B,H,W<br>---00000                       | ADMDO[R/W] B,H,W<br>0---0000       |                               |
| 001464 <sub>H</sub>                              | ADSTPCS0[R/W]<br>B,H,W<br>00000000                      | ADSTPCS1[R/W]<br>B,H,W<br>00000000 | ADSTPCS2[R/W]<br>B,H,W<br>00000000               | ADSTPCS3[R/W]<br>B,H,W<br>00000000 |                               |
| 001468 <sub>H</sub>                              | ADSTPCS4[R/W]<br>B,H,W<br>00000000                      | ADSTPCS5[R/W]<br>B,H,W<br>00000000 | ADSTPCS6[R/W]<br>B,H,W<br>00000000               | ADSTPCS7[R/W]<br>B,H,W<br>00000000 |                               |
| 00146C <sub>H</sub>                              | —   |                                    |  |                                    |                               |
| 001470 <sub>H</sub>                              | ADTSS1[R/W]<br>B,H,W<br>-----0                          | —                                  | —  | —                                  | 12-bit A/D converter 2/2 unit |
| 001474 <sub>H</sub>                              | ADTSE1[R/W] B,H,W<br>----- 00000000 00000000            |                                    |  |                                    |                               |
| 001478 <sub>H</sub>                              | ADCOMP32/ADCOMPB32[R/W] H,W<br>00000000 00000000        |                                    | ADCOMP33/ADCOMPB33[R/W] H,W<br>00000000 00000000 |                                    |                               |
| 00147C <sub>H</sub>                              | ADCOMP34/ADCOMPB34[R/W] H,W<br>00000000 00000000        |                                    | ADCOMP35/ADCOMPB35[R/W] H,W<br>00000000 00000000 |                                    | 12-bit A/D converter 2/2 unit |
| 001480 <sub>H</sub>                              | ADCOMP36/ADCOMPB36[R/W] H,W<br>00000000 00000000        |                                    | ADCOMP37/ADCOMPB37[R/W] H,W<br>00000000 00000000 |                                    |                               |
| 001484 <sub>H</sub>                              | ADCOMP38/ADCOMPB38[R/W] H,W<br>00000000 00000000        |                                    | ADCOMP39/ADCOMPB39[R/W] H,W<br>00000000 00000000 |                                    |                               |
| 001488 <sub>H</sub>                              | ADCOMP40/ADCOMPB40[R/W] H,W<br>00000000 00000000        |                                    | ADCOMP41/ADCOMPB41[R/W] H,W<br>00000000 00000000 |                                    |                               |
| 00148C <sub>H</sub>                              | ADCOMP42/ADCOMPB42[R/W] H,W<br>00000000 00000000        |                                    | ADCOMP43/ADCOMPB43[R/W] H,W<br>00000000 00000000 |                                    |                               |
| 001490 <sub>H</sub>                              | ADCOMP44/ADCOMPB44[R/W] H,W<br>00000000 00000000        |                                    | ADCOMP45/ADCOMPB45[R/W] H,W<br>00000000 00000000 |                                    |                               |
| 001494 <sub>H</sub>                              | ADCOMP46/ADCOMPB46[R/W] H,W<br>00000000 00000000        |                                    | ADCOMP47/ADCOMPB47[R/W] H,W<br>00000000 00000000 |                                    |                               |
| 001498 <sub>H</sub><br>to<br>0014B4 <sub>H</sub> | —   | —                                  | —  | —                                  |                               |



## CY91520 Series

| Address  | Address Offset Value / Register Name    |    |   |    | Block                         |
|--|---|----|---|----|-------------------------------|
|  | +0                                      | +1 | +2                                      | +3 |                               |
| 0014B8 <sub>H</sub>                              | ADTCS32[R/W] B,H,W<br>00000000 0010---- |    | ADTCS33[R/W] B,H,W<br>00000000 0010---- |    | 12-bit A/D converter 2/2 unit |
| 0014BC <sub>H</sub>                              | ADTCS34[R/W] B,H,W<br>00000000 0010---- |    | ADTCS35[R/W] B,H,W<br>00000000 0010---- |    |                               |
| 0014C0 <sub>H</sub>                              | ADTCS36[R/W] B,H,W<br>00000000 0010---- |    | ADTCS37[R/W] B,H,W<br>00000000 0010---- |    |                               |
| 0014C4 <sub>H</sub>                              | ADTCS38[R/W] B,H,W<br>00000000 0010---- |    | ADTCS39[R/W] B,H,W<br>00000000 0010---- |    |                               |
| 0014C8 <sub>H</sub>                              | ADTCS40[R/W] B,H,W<br>00000000 0010---- |    | ADTCS41[R/W] B,H,W<br>00000000 0010---- |    |                               |
| 0014CC <sub>H</sub>                              | ADTCS42[R/W] B,H,W<br>00000000 0010---- |    | ADTCS43[R/W] B,H,W<br>00000000 0010---- |    |                               |
| 0014D0 <sub>H</sub>                              | ADTCS44[R/W] B,H,W<br>00000000 0010---- |    | ADTCS45[R/W] B,H,W<br>00000000 0010---- |    |                               |
| 0014D4 <sub>H</sub>                              | ADTCS46[R/W] B,H,W<br>00000000 0010---- |    | ADTCS47[R/W] B,H,W<br>00000000 0010---- |    |                               |
| 0014D8 <sub>H</sub><br>to<br>0014F4 <sub>H</sub> | —                                       | —  | —                                       | —  | Reserved                      |
| 0014F8 <sub>H</sub>                              | ADTCD32[R] B,H,W<br>10--0000 00000000   |    | ADTCD33[R] B,H,W<br>10--0000 00000000   |    | 12-bit A/D converter 2/2 unit |
| 0014FC <sub>H</sub>                              | ADTCD34[R] B,H,W<br>10--0000 00000000   |    | ADTCD35[R] B,H,W<br>10--0000 00000000   |    |                               |
| 001500 <sub>H</sub>                              | ADTCD36[R] B,H,W<br>10--0000 00000000   |    | ADTCD37[R] B,H,W<br>10--0000 00000000   |    | 12-bit A/D converter 2/2 unit |
| 001504 <sub>H</sub>                              | ADTCD38[R] B,H,W<br>10--0000 00000000   |    | ADTCD39[R] B,H,W<br>10--0000 00000000   |    |                               |
| 001508 <sub>H</sub>                              | ADTCD40[R] B,H,W<br>10--0000 00000000   |    | ADTCD41[R] B,H,W<br>10--0000 00000000   |    |                               |
| 00150C <sub>H</sub>                              | ADTCD42[R] B,H,W<br>10--0000 00000000   |    | ADTCD43[R] B,H,W<br>10--0000 00000000   |    |                               |
| 001510 <sub>H</sub>                              | ADTCD44[R] B,H,W<br>10--0000 00000000   |    | ADTCD45[R] B,H,W<br>10--0000 00000000   |    |                               |
| 001514 <sub>H</sub>                              | ADTCD46[R] B,H,W<br>10--0000 00000000   |    | ADTCD47[R] B,H,W<br>10--0000 00000000   |    |                               |
| 001518 <sub>H</sub><br>to<br>001534 <sub>H</sub> | —                                       | —  | —                                       | —  | Reserved                      |



## CY91520 Series

| Address  | Address Offset Value / Register Name          |                                    |  |                                    | Block                         |
|--|---|------------------------------------|--|------------------------------------|-------------------------------|
|  | +0  | +1                                 | +2                                     | +3                                 |                               |
| 001538 <sub>H</sub>                              | ADTECS32[R/W] B,H,W<br>-----0 ---0000         |                                    | ADTECS33[R/W] B,H,W<br>-----0 ---0000  |                                    | 12-bit A/D converter 2/2 unit |
| 00153C <sub>H</sub>                              | ADTECS34[R/W] B,H,W<br>-----0 ---0000         |                                    | ADTECS35[R/W] B,H,W<br>-----0 ---0000  |                                    |                               |
| 001540 <sub>H</sub>                              | ADTECS36[R/W] B,H,W<br>-----0 ---0000         |                                    | ADTECS37[R/W] B,H,W<br>-----0 ---0000  |                                    |                               |
| 001544 <sub>H</sub>                              | ADTECS38[R/W] B,H,W<br>-----0 ---0000         |                                    | ADTECS39[R/W] B,H,W<br>-----0 ---0000  |                                    |                               |
| 001548 <sub>H</sub>                              | ADTECS40[R/W] B,H,W<br>-----0 ---0000         |                                    | ADTECS41[R/W] B,H,W<br>-----0 ---0000  |                                    |                               |
| 00154C <sub>H</sub>                              | ADTECS42[R/W] B,H,W<br>-----0 ---0000         |                                    | ADTECS43[R/W] B,H,W<br>-----0 ---0000  |                                    |                               |
| 001550 <sub>H</sub>                              | ADTECS44[R/W] B,H,W<br>-----0 ---0000         |                                    | ADTECS45[R/W] B,H,W<br>-----0 ---0000  |                                    |                               |
| 001554 <sub>H</sub>                              | ADTECS46[R/W] B,H,W<br>-----0 ---0000         |                                    | ADTECS47[R/W] B,H,W<br>-----0 ---0000  |                                    |                               |
| 001558 <sub>H</sub><br>to<br>001574 <sub>H</sub> | —   | —                                  | —                                      | —                                  | Reserved                      |
| 001578 <sub>H</sub>                              | ADRCUT4[R/W] B,H,W<br>---0000 00000000        |                                    | ADRCLT4[R/W] B,H,W<br>---0000 00000000 |                                    | 12-bit A/D converter 2/2 unit |
| 00157C <sub>H</sub>                              | ADRCUT5[R/W] B,H,W<br>---0000 00000000        |                                    | ADRCLT5[R/W] B,H,W<br>---0000 00000000 |                                    |                               |
| 001580 <sub>H</sub>                              | ADRCUT6[R/W] B,H,W<br>---0000 00000000        |                                    | ADRCLT6[R/W] B,H,W<br>---0000 00000000 |                                    |                               |
| 001584 <sub>H</sub>                              | ADRCUT7[R/W] B,H,W<br>---0000 00000000        |                                    | ADRCLT7[R/W] B,H,W<br>---0000 00000000 |                                    |                               |
| 001588 <sub>H</sub>                              | ADRCCS32[R/W]<br>B,H,W<br>00000000            | ADRCCS33[R/W]<br>B,H,W<br>00000000 | ADRCCS34[R/W]<br>B,H,W<br>00000000     | ADRCCS35[R/W]<br>B,H,W<br>00000000 | 12-bit A/D converter 2/2 unit |
| 00158C <sub>H</sub>                              | ADRCCS36[R/W]<br>B,H,W<br>00000000            | ADRCCS37[R/W]<br>B,H,W<br>00000000 | ADRCCS38[R/W]<br>B,H,W<br>00000000     | ADRCCS39[R/W]<br>B,H,W<br>00000000 |                               |
| 001590 <sub>H</sub>                              | ADRCCS40[R/W]<br>B,H,W<br>00000000            | ADRCCS41[R/W]<br>B,H,W<br>00000000 | ADRCCS42[R/W]<br>B,H,W<br>00000000     | ADRCCS43[R/W]<br>B,H,W<br>00000000 |                               |
| 001594 <sub>H</sub>                              | ADRCCS44[R/W]<br>B,H,W<br>00000000            | ADRCCS45[R/W]<br>B,H,W<br>00000000 | ADRCCS46[R/W]<br>B,H,W<br>00000000     | ADRCCS47[R/W]<br>B,H,W<br>00000000 |                               |
| 001598 <sub>H</sub><br>to<br>0015A4 <sub>H</sub> | —   | —                                  | —                                      | —                                  | Reserved                      |
| 0015A8 <sub>H</sub>                              | ADRCOT1 [R] B,H,W<br>-----00000000 00000000   |                                    |  |                                    | 12-bit A/D converter 2/2 unit |
| 0015AC <sub>H</sub>                              | ADRCIF1 [R,W] B,H,W<br>-----00000000 00000000 |                                    |  |                                    |                               |
| 0015B0 <sub>H</sub>                              | ADSCANS1 [R/W]<br>B,H,W<br>000----            | —                                  | —                                      | —                                  |                               |



## CY91520 Series

| Address  | Address Offset Value / Register Name                 |   |  |  | Block                         |   |
|--|--|---|--|--|-------------------------------|---|
|  | +0   | +1  | +2   | +3   |                               |   |
| 0015B4 <sub>H</sub>                              | ADNCS16 [R/W]<br>B,H,W<br>0-000-00                   | ADNCS17 [R/W]<br>B,H,W<br>0-000-00                  | ADNCS18 [R/W]<br>B,H,W<br>0-000-00                   | ADNCS19 [R/W]<br>B,H,W<br>0-000-00                             | 12-bit A/D converter 2/2 unit |   |
| 0015B8 <sub>H</sub>                              | ADNCS20 [R/W]<br>B,H,W<br>0-000-00                   | ADNCS21 [R/W]<br>B,H,W<br>0-000-00                  | ADNCS22 [R/W]<br>B,H,W<br>0-000-00                   | ADNCS23 [R/W]<br>B,H,W<br>0-000-00                             |                               |   |
| 0015BC <sub>H</sub>                              | —  | —   | —  | —  |                               |   |
| 0015C0 <sub>H</sub>                              | —  | —   | —  | —  |                               |   |
| 0015C4 <sub>H</sub>                              | ADPRTF1 [R] B,H,W<br>----- 00000000 00000000         |   |  |  |                               |   |
| 0015C8 <sub>H</sub>                              | ADEOCF1 [R] B,H,W<br>----- 11111111 11111111         |   |  |  |                               |   |
| 0015CC <sub>H</sub>                              | ADCS1 [R] B,H,W<br>0-----                            |   | ADCH1 [R] B,H,W<br>---00000                          | ADMD1 [R/W] B,H,W<br>0---0000                                  |                               |   |
| 0015D0 <sub>H</sub>                              | ADSTPCS8 [R/W]<br>B,H,W<br>00000000                  | ADSTPCS9 [R/W]<br>B,H,W<br>00000000                 | ADSTPCS10 [R/W]<br>B,H,W<br>00000000                 | ADSTPCS11 [R/W]<br>B,H,W<br>00000000                           |                               |   |
| 0015D4 <sub>H</sub><br>to<br>00174C <sub>H</sub> | —  | —   | —  | —  |                               | Reserved  |
| 001750 <sub>H</sub>                              | SCR0/(IBCR0)[R/W]<br>B,H,W<br>0-00000                | SMR0[R/W]<br>B,H,W<br>000-00-0                      | SSR0[R/W]<br>B,H,W<br>0-000011                       | ESCR0/(IBSR0)[R/W]<br>] B,H,W<br>00000000                      |                               | Multi-UART0<br>*1: Byte access is possible only for access to lower 8 bits.<br>*2: Reserved because I <sup>2</sup> C mode is not set immediately after reset.<br>*3: Reserved because CSIO mode is not set immediately after reset.<br>*4: Reserved because LIN2.1 mode is not set immediately after reset. |
| 001754 <sub>H</sub>                              | —/(RDR10/(TDR10))[R/W] B,H,W<br>----- *3             |   | RDR00/(TDR00)[R/W] B,H,W<br>-----0 00000000 *1       |  |                               |   |
| 001758 <sub>H</sub>                              | SACSR0[R/W] B,H,W<br>0---000 00000000                |   | STMR0[R] B,H,W<br>00000000 00000000                  |  |                               |   |
| 00175C <sub>H</sub>                              | STMCR0[R/W] B,H,W<br>00000000 00000000               |   | —/(SCSCR0/SFURO)[R/W] B,H,W<br>----- *3 *4           |  |                               |   |
| 001760 <sub>H</sub>                              | —/(SCSTR30)/<br>(LAMSR0)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR20)/<br>(LAMCR0)<br>[R/W] B,H,W<br>----- *3 | —/(SCSTR10)<br>(SFLR10)<br>[R/W] B,H,W<br>----- *3   | —/(SCSTR00)/<br>(SFLR00)<br>[R/W] B,H,W<br>----- *3            |                               |   |
| 001764 <sub>H</sub>                              | —  | —/(SCSFR20)<br>[R/W] B,H,W<br>----- *3              | —/(SCSFR10)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR00)<br>[R/W] B,H,W<br>----- *3                         |                               |   |
| 001768 <sub>H</sub>                              | —/(TBYTE30)/<br>(LAMESR0)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE20)<br>(LAMERT0)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE10)/<br>(LAMIER0)<br>[R/W] B,H,W<br>----- *3 | TBYTE00/(LAMRID0)<br>/<br>(LAMTID0)<br>[R/W] B,H,W<br>00000000 |                               |   |
| 00176C <sub>H</sub>                              | BGR0[R/W] H, W<br>00000000 00000000                  |   | —/(ISMK0)<br>[R/W] B,H,W<br>----- *2                 | —/(ISBA0)<br>[R/W] B,H,W<br>----- *2                           |                               |   |
| 001770 <sub>H</sub>                              | FCR10[R/W]<br>B,H,W<br>---00100                      | FCR00[R/W]<br>B,H,W<br>-0000000                     | FBYTE0[R/W] B,H,W<br>00000000 00000000               |  |                               |   |
| 001774 <sub>H</sub>                              | FTICR0[R/W] B,H,W<br>00000000 00000000               |   | —  | —  |                               |   |



## CY91520 Series

| Address             | Address Offset Value / Register Name                 |  |  |  | Block  |
|---------------------|--|--|--|--|--|
|                     | +0   | +1   | +2   | +3   |  |
| 001778 <sub>H</sub> | SCR1/(IBCR1) [R/W]<br>B,H,W<br>0--00000              | SMR1[R/W] B,H,W<br>000-00-0                          | SSR1[R/W] B,H,W<br>0-000011                          | ESCR1/(IBSR1)[R/W]<br>] B,H,W<br>00000000                      | Multi-UART1  |
| 00177C <sub>H</sub> | —/(RDR11/(TDR11))[R/W] B,H,W<br>----- *3             |  | RDR01/(TDR01)[R/W] B,H,W<br>-----0 00000000 *1       |  |  |
| 001780 <sub>H</sub> | SACSR1[R/W] B,H,W<br>0---000 00000000                |  | STMR1[R] B,H,W<br>00000000 00000000                  |  | Multi-UART1  |
| 001784 <sub>H</sub> | STMCR1[R/W] B,H,W<br>00000000 00000000               |  | —/(SCSCR1/SFUR1)[R/W] B,H,W<br>----- *3 *4           |  |  |
| 001788 <sub>H</sub> | —/(SCSTR31)/<br>(LAMSR1)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR21)/<br>(LAMCR1)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR11)/<br>(SFLR11)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR01)/<br>(SFLR01)<br>[R/W] B,H,W<br>----- *3            | *1: Byte access is possible<br>only for access to lower 8<br>bits.<br><br>*2: Reserved because I <sup>2</sup> C<br>mode is not set immediately<br>after reset. |
| 00178C <sub>H</sub> | —  | —/(SCSFR21)[R/W]<br>B,H,W<br>----- *3                | —/(SCSFR11)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR01)<br>[R/W] B,H,W<br>----- *3                         |  |
| 001790 <sub>H</sub> | —/(TBYTE31)/<br>(LAMESR1)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE21)/<br>(LAMERT1)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE11)/<br>(LAMIER1)<br>[R/W] B,H,W<br>----- *3 | TBYTE01/(LAMRID1)<br>/<br>(LAMTID1)<br>[R/W] B,H,W<br>00000000 | Multi-UART1<br><br>*3: Reserved because CSIO<br>mode is not set immediately<br>after reset.  |
| 001794 <sub>H</sub> | BGR1[R/W] H,W<br>00000000 00000000                   |  | —/(ISMK1)[R/W]<br>B,H,W<br>----- *2                  | —/(ISBA1)[R/W]<br>B,H,W<br>----- *2                            |  |
| 001798 <sub>H</sub> | FCR11[R/W]<br>B,H,W<br>---00100                      | FCR01[R/W]<br>B,H,W<br>-0000000                      | FBYTE1[R/W] B,H,W<br>00000000 00000000               |  | *4: Reserved because<br>LIN2.1 mode is not set<br>immediately after reset.   |
| 00179C <sub>H</sub> | FTICR1[R/W] B,H,W<br>00000000 00000000               |  | —  | —  |  |



## CY91520 Series

| Address             | Address Offset Value / Register Name                 |  |  |  | Block   |
|---------------------|--|--|--|--|---|
|                     | +0   | +1   | +2   | +3   |   |
| 0017A0 <sub>H</sub> | SCR2/(IBCR2)[R/W]<br>B,H,W<br>0-00000                | SMR2[R/W] B,H,W<br>000-00-0                          | SSR2[R/W] B,H,W<br>0-000011                          | ESCR2/(IBSR2)[R/W]<br>] B,H,W<br>00000000                      | Multi-UART2<br><br>*1: Byte access is possible only for access to lower 8 bits.<br><br>*2: Reserved because I <sup>2</sup> C mode is not set immediately after reset.<br><br>*3: Reserved because CSIO mode is not set immediately after reset.<br><br>*4: Reserved because LIN2.1 mode is not set immediately after reset. |
| 0017A4 <sub>H</sub> | —/(RDR12/(TDR12))[R/W] B,H,W<br>----- *3             |  | RDR02/(TDR02)[R/W] B,H,W<br>-----0 00000000 *1       |  |   |
| 0017A8 <sub>H</sub> | SACSR2[R/W] B,H,W<br>0---000 00000000                |  | STMR2[R] B,H,W<br>00000000 00000000                  |  |   |
| 0017AC <sub>H</sub> | STMCR2[R/W] B,H,W<br>00000000 00000000               |  | —/(SCSCR2/SFUR2)[R/W] B,H,W<br>----- *3 *4           |  |   |
| 0017B0 <sub>H</sub> | —/(SCSTR32)/<br>(LAMSR2)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR22)/<br>(LAMCR2)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR12)/<br>(SFLR12)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR02)/<br>(SFLR02)<br>[R/W] B,H,W<br>----- *3            |   |
| 0017B4 <sub>H</sub> | —  | —/(SCSFR22)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR12)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR02)<br>[R/W] B,H,W<br>----- *3                         |   |
| 0017B8 <sub>H</sub> | —/(TBYTE32)/<br>(LAMESR2)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE22)/<br>(LAMERT2)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE12)/<br>(LAMIER2)<br>[R/W] B,H,W<br>----- *3 | TBYTE02/(LAMRID2)<br>/<br>(LAMTID2)<br>[R/W] B,H,W<br>00000000 |   |
| 0017BC <sub>H</sub> | BGR2[R/W] H, W<br>00000000 00000000                  |  | —/(ISMK2)[R/W]<br>B,H,W<br>----- *2                  | —/(ISBA2)[R/W]<br>B,H,W<br>----- *2                            |   |
| 0017C0 <sub>H</sub> | FCR12[R/W]<br>B,H,W<br>---00100                      | FCR02[R/W]<br>B,H,W<br>-0000000                      | FBYTE2[R/W] B,H,W<br>00000000 00000000               |  |   |
| 0017C4 <sub>H</sub> | FTICR2[R/W] B,H,W<br>00000000 00000000               |  | —  | —  |   |



## CY91520 Series

| Address             | Address Offset Value / Register Name                 |  |  |  | Block   |
|---------------------|--|--|--|--|---|
|                     | +0   | +1   | +2   | +3   |   |
| 0017C8 <sub>H</sub> | SCR3/(IBCR3) [R/W]<br>B,H,W<br>0-00000               | SMR3[R/W] B,H,W<br>000-00-0                          | SSR3[R/W] B,H,W<br>0-000011                          | ESCR3/(IBSR3)[R/W]<br>] B,H,W<br>00000000                      | Multi-UART3<br><br>*1: Byte access is possible only for access to lower 8 bits.<br><br>*2: Reserved because I <sup>2</sup> C mode is not set immediately after reset.<br><br>*3: Reserved because CSIO mode is not set immediately after reset.<br><br>*4: Reserved because LIN2.1 mode is not set immediately after reset. |
| 0017CC <sub>H</sub> | —/(RDR13/(TDR13))[R/W] B,H,W<br>----- *3             |  | RDR03/(TDR03)[R/W] B,H,W<br>-----0 00000000 *1       |  |   |
| 0017D0 <sub>H</sub> | SACSR3[R/W] B,H,W<br>0---000 00000000                |  | STMR3[R] B,H,W<br>00000000 00000000                  |  |   |
| 0017D4 <sub>H</sub> | STMCR3[R/W] B,H,W<br>00000000 00000000               |  | —/(SCSCR3/SFUR3)[R/W] B,H,W<br>----- *3 *4           |  |   |
| 0017D8 <sub>H</sub> | —/(SCSTR33)/<br>(LAMSR3)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR23)/<br>(LAMCR3)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR13)/<br>(SFLR13)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR03)/<br>(SFLR03)<br>[R/W] B,H,W<br>----- *3            |   |
| 0017DC <sub>H</sub> | —  | —/(SCSFR23)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR13)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR03)<br>[R/W] B,H,W<br>----- *3                         |   |
| 0017E0 <sub>H</sub> | —/(TBYTE33)/<br>(LAMESR3)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE23)/<br>(LAMERT3)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE13)/<br>(LAMIER3)<br>[R/W] B,H,W<br>----- *3 | TBYTE03/(LAMRID3)<br>/<br>(LAMTID3)<br>[R/W] B,H,W<br>00000000 |   |
| 0017E4 <sub>H</sub> | BGR3[R/W] H, W<br>00000000 00000000                  |  | —/(ISMK3)[R/W]<br>B,H,W<br>----- *2                  | —/(ISBA3)[R/W]<br>B,H,W<br>----- *2                            |   |
| 0017E8 <sub>H</sub> | FCR13[R/W]<br>B,H,W<br>---00100                      | FCR03[R/W]<br>B,H,W<br>-0000000                      | FBYTE3[R/W] B,H,W<br>00000000 00000000               |  |   |
| 0017EC <sub>H</sub> | FTICR3[R/W] B,H,W<br>00000000 00000000               |  | —  | —  |   |
| 0017F0 <sub>H</sub> | SCR4/(IBCR4) [R/W]<br>B,H,W<br>0-00000               | SMR4[R/W] B,H,W<br>000-00-0                          | SSR4[R/W] B,H,W<br>0-000011                          | ESCR4/(IBSR4)[R/W]<br>] B,H,W<br>00000000                      | Multi-UART4<br><br>*1: Byte access is possible only for access to lower 8 bits.<br><br>*2: Reserved because I <sup>2</sup> C mode is not set immediately after reset.   |
| 0017F4 <sub>H</sub> | —/(RDR14/(TDR14))[R/W] B,H,W<br>----- *3             |  | RDR04/(TDR04)[R/W] B,H,W<br>-----0 00000000 *1       |  |   |
| 0017F8 <sub>H</sub> | SACSR4[R/W] B,H,W<br>0---000 00000000                |  | STMR4[R] B,H,W<br>00000000 00000000                  |  |   |
| 0017FC <sub>H</sub> | STMCR4[R/W] B,H,W<br>00000000 00000000               |  | —/(SCSCR4/SFUR4)[R/W] B,H,W<br>----- *3 *4           |  |   |
| 001800 <sub>H</sub> | —/(SCSTR34)/<br>(LAMSR4)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR24)/<br>(LAMCR4)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR14)/<br>(SFLR14)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR04)/<br>(SFLR04)<br>[R/W] B,H,W<br>----- *3            |   |



## CY91520 Series

| Address             | Address Offset Value / Register Name                 |  |  |  | Block   |
|---------------------|--|--|--|--|---|
|                     | +0   | +1   | +2   | +3   |   |
| 001804 <sub>H</sub> | —  | —/(SCSFR24)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR14)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR04)<br>[R/W] B,H,W<br>----- *3                         | Multi-UART4<br><br>*3: Reserved because CSIO mode is not set immediately after reset.<br><br>*4: Reserved because LIN2.1 mode is not set immediately after reset.   |
| 001808 <sub>H</sub> | —/(TBYTE34)/<br>(LAMESR4)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE24)/<br>(LAMERT4)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE14)/<br>(LAMIER4)<br>[R/W] B,H,W<br>----- *3 | TBYTE04/(LAMRID4)<br>/<br>(LAMTID4)<br>[R/W] B,H,W<br>00000000 |   |
| 00180C <sub>H</sub> | BGR4[R/W] H, W<br>00000000 00000000                  |  | —/(ISMK4)[R/W]<br>B,H,W<br>----- *2                  | —/(ISBA4)[R/W]<br>B,H,W<br>----- *2                            |   |
| 001810 <sub>H</sub> | FCR14[R/W]<br>B,H,W<br>---00100                      | FCR04[R/W]<br>B,H,W<br>-0000000                      | FBYTE4[R/W] B,H,W<br>00000000 00000000               |  |   |
| 001814 <sub>H</sub> | FTICR4[R/W] B,H,W<br>00000000 00000000               |  | —  | —  |   |
| 001818 <sub>H</sub> | SCR5/(IBCR5) [R/W]<br>B,H,W<br>0-00000               | SMR5[R/W] B,H,W<br>000-00-0                          | SSR5[R/W] B,H,W<br>0-000011                          | ESCR5/(IBSR5)[R/W]<br>] B,H,W<br>00000000                      | Multi-UART5<br><br>*1: Byte access is possible only for access to lower 8 bits.<br><br>*2: Reserved because I <sup>2</sup> C mode is not set immediately after reset.<br><br>*3: Reserved because CSIO mode is not set immediately after reset.<br><br>*4: Reserved because LIN2.1 mode is not set immediately after reset. |
| 00181C <sub>H</sub> | —/(RDR15/(TDR15))[R/W] B,H,W<br>----- *3             |  | RDR05/(TDR05)[R/W] B,H,W<br>-----0 00000000 *1       |  |   |
| 001820 <sub>H</sub> | SACSR5[R/W] B,H,W<br>0---000 00000000                |  | STMR5[R] B,H,W<br>00000000 00000000                  |  |   |
| 001824 <sub>H</sub> | STMCR5[R/W] B,H,W<br>00000000 00000000               |  | —/(SCSCR5/SFUR5)[R/W] B,H,W<br>----- *3 *4           |  |   |
| 001828 <sub>H</sub> | —/(SCSTR35)/<br>(LAMSR5)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR25)/<br>(LAMCR5)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR15)/<br>(SFLR15)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR05)/<br>(SFLR05)<br>[R/W] B,H,W<br>----- *3            |   |
| 00182C <sub>H</sub> | —  | —/(SCSFR25)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR15)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR05)<br>[R/W] B,H,W<br>----- *3                         |   |
| 001830 <sub>H</sub> | —/(TBYTE35)/<br>(LAMESR5)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE25)/<br>(LAMERT5)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE15)/<br>(LAMIER5)<br>[R/W] B,H,W<br>----- *3 | TBYTE05/(LAMRID5)<br>/<br>(LAMTID5)<br>[R/W] B,H,W<br>00000000 |   |
| 001834 <sub>H</sub> | BGR5[R/W] H, W<br>00000000 00000000                  |  | —/(ISMK5)[R/W]<br>B,H,W<br>----- *2                  | —/(ISBA5)[R/W]<br>B,H,W<br>----- *2                            |   |
| 001838 <sub>H</sub> | FCR15[R/W]<br>B,H,W<br>---00100                      | FCR05[R/W]<br>B,H,W<br>-0000000                      | FBYTE5[R/W] B,H,W<br>00000000 00000000               |  |   |
| 00183C <sub>H</sub> | FTICR5[R/W] B,H,W<br>00000000 00000000               |  | —  | —  |   |
| 001840 <sub>H</sub> | SCR6/(IBCR6) [R/W]<br>B,H,W<br>0-00000               | SMR6[R/W] B,H,W<br>000-00-0                          | SSR6[R/W] B,H,W<br>0-000011                          | ESCR6/(IBSR6)[R/W]<br>] B,H,W<br>00000000                      | Multi-UART6   |



## CY91520 Series

| Address             | Address Offset Value / Register Name                 |  |  |  | Block  |
|---------------------|--|--|--|--|--|
|                     | +0   | +1   | +2   | +3   |  |
| 001844 <sub>H</sub> | —/(RDR16/(TDR16))[R/W] B,H,W<br>----- *3             |  | RDR06/(TDR06)[R/W] B,H,W<br>-----0 00000000 *1       |  | Multi-UART6  |
| 001848 <sub>H</sub> | SACSR6[R/W] B,H,W<br>0---000 00000000                |  | STMR6[R] B,H,W<br>00000000 00000000                  |  |  |
| 00184C <sub>H</sub> | STMCR6[R/W] B,H,W<br>00000000 00000000               |  | —/(SCSCR6/SFUR6)[R/W] B,H,W<br>----- *3 *4           |  |  |
| 001850 <sub>H</sub> | —/(SCSTR36)/<br>(LAMSR6)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR26)/<br>(LAMCR6)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR16)/<br>(SFLR16)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR06)/<br>(SFLR06)<br>[R/W] B,H,W<br>----- *3            |  |
| 001854 <sub>H</sub> | —  | —/(SCSFR26)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR16)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR06)<br>[R/W] B,H,W<br>----- *3                         |  |
| 001858 <sub>H</sub> | —/(TBYTE36)/<br>(LAMESR6)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE26)/<br>(LAMERT6)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE16)/<br>(LAMIER6)<br>[R/W] B,H,W<br>----- *3 | TBYTE06/(LAMRID6)<br>/<br>(LAMTID6)<br>[R/W] B,H,W<br>00000000 |  |
| 00185C <sub>H</sub> | BGR6[R/W] H, W<br>00000000 00000000                  |  | —/(ISMK6)[R/W]<br>B,H,W<br>----- *2                  | —/(ISBA6)[R/W]<br>B,H,W<br>----- *2                            |  |
| 001860 <sub>H</sub> | FCR16[R/W]<br>B,H,W<br>---00100                      | FCR06[R/W]<br>B,H,W<br>-0000000                      | FBYTE6[R/W] B,H,W<br>00000000 00000000               |  |  |
| 001864 <sub>H</sub> | FTICR6[R/W] B,H,W<br>00000000 00000000               |  | —  | —  |  |
| 001868 <sub>H</sub> | SCR7/(IBCR7) [R/W]<br>B,H,W<br>0-00000               | SMR7[R/W] B,H,W<br>000-00-0                          | SSR7[R/W] B,H,W<br>0-000011                          | ESCR7/(IBSR7)[R/W]<br>] B,H,W<br>00000000                      |  |
| 00186C <sub>H</sub> | —/(RDR17/(TDR17))[R/W] B,H,W<br>----- *3             |  | RDR07/(TDR07)[R/W] B,H,W<br>-----0 00000000 *1       |  | *1: Byte access is possible only for access to lower 8 bits.                   |
| 001870 <sub>H</sub> | SACSR7[R/W] B,H,W<br>0---000 00000000                |  | STMR7[R] B,H,W<br>00000000 00000000                  |  | *2: Reserved because I <sup>2</sup> C mode is not set immediately after reset. |
| 001874 <sub>H</sub> | STMCR7[R/W] B,H,W<br>00000000 00000000               |  | —/(SCSCR7/SFUR7)[R/W] B,H,W<br>----- *3 *4           |  |  |
| 001878 <sub>H</sub> | —/(SCSTR37)/<br>(LAMSR7)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR27)/<br>(LAMCR7)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR17)/<br>(SFLR17)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR07)/<br>(SFLR07)<br>[R/W] B,H,W<br>----- *3            | Multi-UART7  |
| 00187C <sub>H</sub> | —  | —/(SCSFR27)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR17)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR07)<br>[R/W] B,H,W<br>----- *3                         | *3: Reserved because CSIO mode is not set immediately after reset.             |
| 001880 <sub>H</sub> | —/(TBYTE37)/<br>(LAMESR7)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE27)/<br>(LAMERT7)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE17)/<br>(LAMIER7)<br>[R/W] B,H,W<br>----- *3 | TBYTE07/(LAMRID7)<br>/<br>(LAMTID7)<br>[R/W] B,H,W<br>00000000 | *4: Reserved because LIN2.1 mode is not set immediately after reset.           |



## CY91520 Series

| Address             | Address Offset Value / Register Name                 |  |  |  | Block   |
|---------------------|--|--|--|--|---|
|                     | +0   | +1   | +2   | +3   |   |
| 001884 <sub>H</sub> | BGR7[R/W] H, W<br>00000000 00000000                  |  | —/(ISMK7)[R/W]<br>B,H,W<br>----- *2                  | —/(ISBA7)[R/W]<br>B,H,W<br>----- *2                            | Multi-UART7   |
| 001888 <sub>H</sub> | FCR17[R/W]<br>B,H,W<br>---00100                      | FCR07[R/W]<br>B,H,W<br>-0000000                      | FBYTE7[R/W] B,H,W<br>00000000 00000000               |  |   |
| 00188C <sub>H</sub> | FTICR7[R/W] B,H,W<br>00000000 00000000               |  | —  | —  |   |
| 001890 <sub>H</sub> | SCR8/(IBCR8) [R/W]<br>B,H,W<br>0-00000               | SMR8[R/W] B,H,W<br>000-00-0                          | SSR8[R/W] B,H,W<br>0-000011                          | ESCR8/(IBSR8)[R/W]<br>] B,H,W<br>00000000                      | Multi-UART8<br><br>*1: Byte access is possible only for access to lower 8 bits.<br><br>*2: Reserved because I <sup>2</sup> C mode is not set immediately after reset.<br><br>*3: Reserved because CSIO mode is not set immediately after reset.<br><br>*4: Reserved because LIN2.1 mode is not set immediately after reset. |
| 001894 <sub>H</sub> | —/(RDR18/(TDR18))[R/W] B,H,W<br>----- *3             |  | RDR08/(TDR08)[R/W] B,H,W<br>-----0 00000000 *1       |  |   |
| 001898 <sub>H</sub> | SACSR8[R/W] B,H,W<br>0---000 00000000                |  | STMR8[R] B,H,W<br>00000000 00000000                  |  |   |
| 00189C <sub>H</sub> | STMCR8[R/W] B,H,W<br>00000000 00000000               |  | —/(SCSCR8/SFUR8)[R/W] B,H,W<br>----- *3 *4           |  |   |
| 0018A0 <sub>H</sub> | —/(SCSTR38)/<br>(LAMSR8)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR28)/<br>(LAMCR8)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR18)/<br>(SFLR18)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR08)/<br>(SFLR08)<br>[R/W] B,H,W<br>----- *3            |   |
| 0018A4 <sub>H</sub> | —  | —/(SCSFR28)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR18)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR08)<br>[R/W] B,H,W<br>----- *3                         |   |
| 0018A8 <sub>H</sub> | —/(TBYTE38)/<br>(LAMESR8)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE28)/<br>(LAMERT8)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE18)/<br>(LAMIER8)<br>[R/W] B,H,W<br>----- *3 | TBYTE08/(LAMRID8)<br>/<br>(LAMTID8)<br>[R/W] B,H,W<br>00000000 |   |
| 0018AC <sub>H</sub> | BGR8[R/W] H,W<br>00000000 00000000                   |  | —/(ISMK8)[R/W]<br>B,H,W<br>----- *2                  | —/(ISBA8)[R/W]<br>B,H,W<br>----- *2                            |   |
| 0018B0 <sub>H</sub> | FCR18[R/W]<br>B,H,W<br>---00100                      | FCR08[R/W]<br>B,H,W<br>-0000000                      | FBYTE8[R/W] B,H,W<br>00000000 00000000               |  | Multi-UART8   |
| 0018B4 <sub>H</sub> | FTICR8[R/W] B,H,W<br>00000000 00000000               |  | —  | —  |   |



## CY91520 Series

| Address             | Address Offset Value / Register Name                 |  |  |  | Block   |
|---------------------|--|--|--|--|---|
|                     | +0   | +1   | +2   | +3   |   |
| 0018B8 <sub>H</sub> | SCR9/(IBCR9) [R/W]<br>B,H,W<br>0-00000               | SMR9[R/W] B,H,W<br>000-00-0                          | SSR9[R/W] B,H,W<br>0-000011                          | ESCR9/(IBSR9)[R/W]<br>] B,H,W<br>00000000                      | Multi-UART9<br>*1: Byte access is possible only for access to lower 8 bits.<br>*2: Reserved because I <sup>2</sup> C mode is not set immediately after reset.<br>*3: Reserved because CSIO mode is not set immediately after reset.<br>*4: Reserved because LIN2.1 mode is not set immediately after reset. |
| 0018BC <sub>H</sub> | —/(RDR19/(TDR19))[R/W] B,H,W<br>----- *3             |  | RDR09/(TDR09)[R/W] B,H,W<br>-----0 00000000 *1       |  |   |
| 0018C0 <sub>H</sub> | SACSR9[R/W] B,H,W<br>0---000 00000000                |  | STMR9[R] B,H,W<br>00000000 00000000                  |  |   |
| 0018C4 <sub>H</sub> | STMCR9[R/W] B,H,W<br>00000000 00000000               |  | —/(SCSCR9/SFUR9)[R/W] B,H,W<br>----- *3 *4           |  |   |
| 0018C8 <sub>H</sub> | —/(SCSTR39)/<br>(LAMSR9)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR29)/<br>(LAMCR9)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR19)/<br>(SFLR19)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR09)/<br>(SFLR09)<br>[R/W] B,H,W<br>----- *3            |   |
| 0018CC <sub>H</sub> | —  | —/(SCSFR29)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR19)<br>[R/W] B,H,W<br>----- *3               | —/(SCSFR09)<br>[R/W] B,H,W<br>----- *3                         |   |
| 0018D0 <sub>H</sub> | —/(TBYTE39)/<br>(LAMESR9)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE29)/<br>(LAMERT9)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE19)/<br>(LAMIER9)<br>[R/W] B,H,W<br>----- *3 | TBYTE09/(LAMRID9)<br>/<br>(LAMTID9)<br>[R/W] B,H,W<br>00000000 |   |
| 0018D4 <sub>H</sub> | BGR9[R/W] H, W<br>00000000 00000000                  |  | —/(ISMK9)[R/W]<br>B,H,W<br>----- *2                  | —/(ISBA9)[R/W]<br>B,H,W<br>----- *2                            |   |
| 0018D8 <sub>H</sub> | FCR19[R/W]<br>B,H,W<br>---00100                      | FCR09[R/W]<br>B,H,W<br>-0000000                      | FBYTE9[R/W] B,H,W<br>00000000 00000000               |  |   |
| 0018DC <sub>H</sub> | FTICR9[R/W] B,H,W<br>00000000 00000000               |  | —  | —  |   |
| 0018E0 <sub>H</sub> | SCR10/(IBCR10)<br>[R/W] B,H,W<br>0-00000             | SMR10[R/W] B,H,W<br>000-00-0                         | SSR10[R/W] B,H,W<br>0-000011                         | ESCR10/(IBSR10)<br>[R/W] B,H,W<br>00000000                     | Multi-UART10<br>*1: Byte access is possible only for access to lower 8 bits.<br>*2: Reserved because I <sup>2</sup> C mode is not set immediately after reset.  |
| 0018E4 <sub>H</sub> | —/(RDR110/(TDR110))[R/W] B,H,W<br>----- *3           |  | RDR010/(TDR010)[R/W] B,H,W<br>-----0 00000000 *1     |  |   |
| 0018E8 <sub>H</sub> | SACSR10[R/W] B,H,W<br>0---000 00000000               |  | STMR10[R] B,H,W<br>00000000 00000000                 |  |   |
| 0018EC <sub>H</sub> | STMCR10[R/W] B,H,W<br>00000000 00000000              |  | —/(SCSCR10/SFUR10)[R/W] B,H,W<br>----- *3 *4         |  |   |



## CY91520 Series

| Address                  | Address Offset Value / Register Name                   |  |  |   | Block  |
|--------------------------|--|--|--|---|--|
|                          | +0   | +1   | +2   | +3  |  |
| 0018F0H                  | —/(SCSTR310)/<br>(LAMSR10)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR210)/<br>(LAMCR10)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR110)/<br>(SFLR110)[R/W]<br>B,H,W<br>----- *3   | —/(SCSTR010)/<br>(SFLR010)[R/W]<br>B,H,W<br>----- *3      | Multi-UART10<br><br>*3: Reserved because CSIO mode is not set immediately after reset.<br><br>*4: Reserved because LIN2.1 mode is not set immediately after reset.   |
| 0018F4H                  | —  | —/(SCSFR210)<br>[R/W] B,H,W<br>----- *3                | —/(SCSFR110)<br>[R/W] B,H,W<br>----- *3                | —/(SCSFR010)<br>[R/W] B,H,W<br>----- *3                   |  |
| 0018F8H                  | —/(TBYTE310)/<br>(LAMESR10)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE210)/<br>(LAMERT10)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE110)/<br>(LAMIER10)<br>[R/W] B,H,W<br>----- *3 | TBYTE010/(LAMRID10)/(LAMTID10)<br>[R/W] B,H,W<br>00000000 |  |
| 0018FCH                  | BGR10[R/W] H, W<br>00000000 00000000                   |  | —/(ISMK10)[R/W]<br>B,H,W<br>----- *2                   | —/(ISBA10)[R/W]<br>B,H,W<br>----- *2                      |  |
| 001900H                  | FCR110[R/W]<br>B,H,W<br>---00100                       | FCR010[R/W]<br>B,H,W<br>-0000000                       | FBYTE10[R/W] B,H,W<br>00000000 00000000                |   |  |
| 001904H                  | FTICR10[R/W] B,H,W<br>00000000 00000000                |  | —  | —   |  |
| 001908H                  | SCR11/(IBCR11)<br>[R/W] B,H,W<br>0--00000              | SMR11[R/W] B,H,W<br>000-00-0                           | SSR11[R/W] B,H,W<br>0-000011                           | ESCR11/(IBSR11)<br>[R/W] B,H,W<br>00000000                | Multi-UART11<br><br>*1: Byte access is possible only for access to lower 8 bits.<br><br>*2: Reserved because I <sup>2</sup> C mode is not set immediately after reset.<br><br>*3: Reserved because CSIO mode is not set immediately after reset.<br><br>*4: Reserved because LIN2.1 mode is not set immediately after reset. |
| 00190CH                  | —/(RDR111/(TDR111))[R/W] B,H,W<br>----- *3             |  | RDR011/(TDR011)[R/W] B,H,W<br>-----0 00000000 *1       |   |  |
| 001910H                  | SACSR11[R/W] B,H,W<br>0---000 00000000                 |  | STMR11[R] B,H,W<br>00000000 00000000                   |   |  |
| 001914H                  | STMCR11[R/W] B,H,W<br>00000000 00000000                |  | —/(SCSCR11/SFUR11)[R/W] B,H,W<br>----- *3 *4           |   |  |
| 001918H                  | —/(SCSTR311)/<br>(LAMSR11)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR211)/<br>(LAMCR11)<br>[R/W] B,H,W<br>----- *3  | —/(SCSTR111)/<br>(SFLR111)[R/W]<br>B,H,W<br>----- *3   | —/(SCSTR011)/<br>(SFLR011)[R/W]<br>B,H,W<br>----- *3      |  |
| 00191CH                  | —  | —/(SCSFR211)<br>[R/W] B,H,W<br>----- *3                | —/(SCSFR111)<br>[R/W] B,H,W<br>----- *3                | —/(SCSFR011)<br>[R/W] B,H,W<br>----- *3                   |  |
| 001920H                  | —/(TBYTE311)/<br>(LAMESR11)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE211)/<br>(LAMERT11)<br>[R/W] B,H,W<br>----- *3 | —/(TBYTE111)/<br>(LAMIER11)<br>[R/W] B,H,W<br>----- *3 | TBYTE011/(LAMRID11)/(LAMTID11)<br>[R/W] B,H,W<br>00000000 |  |
| 001924H                  | BGR11[R/W] H, W<br>00000000 00000000                   |  | —/(ISMK11)[R/W]<br>B,H,W<br>----- *2                   | —/(ISBA11)[R/W]<br>B,H,W<br>----- *2                      |  |
| 001928H                  | FCR111[R/W]<br>B,H,W<br>---00100                       | FCR011[R/W]<br>B,H,W<br>-0000000                       | FBYTE11[R/W] B,H,W<br>00000000 00000000                |   | Multi-UART11   |
| 00192CH                  | FTICR11[R/W] B,H,W<br>00000000 00000000                |  | —  | —   |  |
| 001930H<br>to<br>0019D8H | —  | —  | —  | —   | Reserved   |



## CY91520 Series

| Address  | Address Offset Value / Register Name    |                                  |   |                                  | Block                       |
|--|---|----------------------------------|---|----------------------------------|-----------------------------|
|  | +0                                      | +1                               | +2                                      | +3                               |                             |
| 0019DC <sub>H</sub>                              | —                                       | GATEC0 [R/W]<br>B,H,W<br>-----00 | —                                       | GATEC2 [R/W]<br>B,H,W<br>-----00 | PPG GATE control            |
| 0019E0 <sub>H</sub>                              | —                                       | GATEC4 [R/W]<br>B,H,W<br>-----00 | —                                       | —                                |                             |
| 0019E4 <sub>H</sub>                              | —                                       | —                                | —                                       | —                                | Reserved                    |
| 0019E8 <sub>H</sub>                              | GTRS0 [R/W] B,H,W<br>-0000000 -0000000  |                                  | GTRS1 [R/W] B,H,W<br>-0000000 -0000000  |                                  | PPG controller              |
| 0019EC <sub>H</sub>                              | GTRS2 [R/W] B,H,W<br>-0000000 -0000000  |                                  | GTRS3 [R/W] B,H,W<br>-0000000 -0000000  |                                  |                             |
| 0019F0 <sub>H</sub>                              | GTRS4 [R/W] B,H,W<br>-0000000 -0000000  |                                  | GTRS5 [R/W] B,H,W<br>-0000000 -0000000  |                                  |                             |
| 0019F4 <sub>H</sub>                              | GTRS6 [R/W] B,H,W<br>-0000000 -0000000  |                                  | GTRS7 [R/W] B,H,W<br>-0000000 -0000000  |                                  |                             |
| 0019F8 <sub>H</sub>                              | GTRS8 [R/W] B,H,W<br>-0000000 -0000000  |                                  | GTRS9 [R/W] B,H,W<br>-0000000 -0000000  |                                  | PPG controller              |
| 0019FC <sub>H</sub>                              | GTRS10 [R/W] B,H,W<br>-0000000 -0000000 |                                  | GTRS11 [R/W] B,H,W<br>-0000000 -0000000 |                                  |                             |
| 001A00 <sub>H</sub>                              | GTRS12 [R/W] B,H,W<br>-0000000 -0000000 |                                  | GTRS13 [R/W] B,H,W<br>-0000000 -0000000 |                                  |                             |
| 001A04 <sub>H</sub>                              | GTRS14 [R/W] B,H,W<br>-0000000 -0000000 |                                  | GTRS15 [R/W] B,H,W<br>-0000000 -0000000 |                                  |                             |
| 001A08 <sub>H</sub>                              | GTRS16 [R/W] B,H,W<br>-0000000 -0000000 |                                  | GTRS17 [R/W] B,H,W<br>-0000000 -0000000 |                                  |                             |
| 001A0C <sub>H</sub>                              | GTRS18 [R/W] B,H,W<br>-0000000 -0000000 |                                  | GTRS19 [R/W] B,H,W<br>-0000000 -0000000 |                                  |                             |
| 001A10 <sub>H</sub>                              | GTRS20 [R/W] B,H,W<br>-0000000 -0000000 |                                  | GTRS21 [R/W] B,H,W<br>-0000000 -0000000 |                                  |                             |
| 001A14 <sub>H</sub>                              | GTRS22 [R/W] B,H,W<br>-0000000 -0000000 |                                  | GTRS23 [R/W] B,H,W<br>-0000000 -0000000 |                                  |                             |
| 001A18 <sub>H</sub><br>to<br>001A2C <sub>H</sub> | —                                       | —                                | —                                       | —                                | Reserved                    |
| 001A30 <sub>H</sub>                              | —                                       | —                                | —                                       | —                                | Reserved                    |
| 001A34 <sub>H</sub>                              | —                                       | —                                | —                                       | —                                |                             |
| 001A38 <sub>H</sub>                              | GTREN0 [R/W] H,W<br>00000000 00000000   |                                  | GTREN1 [R/W] H,W<br>00000000 00000000   |                                  | PPG controller              |
| 001A3C <sub>H</sub>                              | GTREN2 [R/W] H,W<br>00000000 00000000   |                                  | —                                       | —                                |                             |
| 001A40 <sub>H</sub>                              | PCN0 [R/W] B,H,W<br>00000000 000000-0   |                                  | PCSR0 [W] H,W<br>XXXXXXXX XXXXXXXXX     |                                  | PPG0<br>* for communication |
| 001A44 <sub>H</sub>                              | PDU0 [W] H,W<br>XXXXXXXX XXXXXXXXX      |                                  | PTMR0 [R] H,W<br>11111111 11111111      |                                  |                             |
| 001A48 <sub>H</sub>                              | PCN200 [R/W] B,H,W<br>--000000 ----110  |                                  | PSDR0 [R/W] H,W<br>00000000 00000000    |                                  |                             |
| 001A4C <sub>H</sub>                              | PTPC0 [R/W] H,W<br>00000000 00000000    |                                  | PCMDWD0 [R/W] B,H,W<br>----- ----0000   |                                  |                             |
| 001A50 <sub>H</sub>                              | PHCSR0 [W] H,W<br>XXXXXXXX XXXXXXXXX    |                                  | PLCSR0 [W] H,W<br>XXXXXXXX XXXXXXXXX    |                                  |                             |



## CY91520 Series

| Address             | Address Offset Value / Register Name   |    |                                       |    | Block                       |
|---------------------|--|----|---------------------------------------|----|-----------------------------|
|                     | +0                                     | +1 | +2                                    | +3 |                             |
| 001A54H             | PHDUT0 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PLDUT0 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG0<br>* for communication |
| 001A58H             | PCMDDT0 [R/W] H,W<br>00000000 00000000 |    | —                                     | —  |                             |
| 001A5CH             | PCN1 [R/W] B,H,W<br>00000000 000000-0  |    | PCSR1 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PPG1<br>* for communication |
| 001A60H             | PDUT1 [W] H,W<br>XXXXXXXX XXXXXXXX     |    | PTMR1 [R] H,W<br>11111111 11111111    |    |                             |
| 001A64H             | PCN201 [R/W] B,H,W<br>--000000 ----110 |    | PSDR1 [R/W] H,W<br>00000000 00000000  |    | PPG1<br>* for communication |
| 001A68H             | PTPC1 [R/W] H,W<br>00000000 00000000   |    | PCMDWD1 [R/W] B,H,W<br>----- ----0000 |    |                             |
| 001A6CH             | PHCSR1 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PLCSR1 [W] H,W<br>XXXXXXXX XXXXXXXX   |    |                             |
| 001A70H             | PHDUT1 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PLDUT1 [W] H,W<br>XXXXXXXX XXXXXXXX   |    |                             |
| 001A74H             | PCMDDT1 [R/W] H,W<br>00000000 00000000 |    | —                                     | —  |                             |
| 001A78H             | PCN2 [R/W] B,H,W<br>00000000 000000-0  |    | PCSR2 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PPG2<br>* for communication |
| 001A7CH             | PDUT2 [W] H,W<br>XXXXXXXX XXXXXXXX     |    | PTMR2 [R] H,W<br>11111111 11111111    |    |                             |
| 001A80H             | PCN202 [R/W] B,H,W<br>--000000 ----110 |    | PSDR2 [R/W] H,W<br>00000000 00000000  |    | PPG2<br>* for communication |
| 001A84H             | PTPC2 [R/W] H,W<br>00000000 00000000   |    | PCMDWD2 [R/W] B,H,W<br>----- ----0000 |    |                             |
| 001A88H             | PHCSR2 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PLCSR2 [W] H,W<br>XXXXXXXX XXXXXXXX   |    |                             |
| 001A8CH             | PHDUT2 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PLDUT2 [W] H,W<br>XXXXXXXX XXXXXXXX   |    |                             |
| 001A90H             | PCMDDT2 [R/W] H,W<br>00000000 00000000 |    | —                                     | —  |                             |
| 001A94H             | PCN3 [R/W] B,H,W<br>00000000 000000-0  |    | PCSR3 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PPG3<br>* for communication |
| 001A98H             | PDUT3 [W] H,W<br>XXXXXXXX XXXXXXXX     |    | PTMR3 [R] H,W<br>11111111 11111111    |    |                             |
| 001A9CH             | PCN203 [R/W] B,H,W<br>--000000 ----110 |    | PSDR3 [R/W] H,W<br>00000000 00000000  |    |                             |
| 001AA0H             | PTPC3 [R/W] H,W<br>00000000 00000000   |    | PCMDWD3 [R/W] B,H,W<br>----- ----0000 |    |                             |
| 001AA4H             | PHCSR3 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PLCSR3 [W] H,W<br>XXXXXXXX XXXXXXXX   |    |                             |
| 001AA8H             | PHDUT3 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PLDUT3 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG4                        |
| 001AAC <sub>H</sub> | PCMDDT3 [R/W] H,W<br>00000000 00000000 |    | —                                     | —  |                             |
| 001AB0 <sub>H</sub> | PCN4 [R/W] B,H,W<br>00000000 000000-0  |    | PCSR4 [W] H,W<br>XXXXXXXX XXXXXXXX    |    |                             |
| 001AB4 <sub>H</sub> | PDUT4 [W] H,W<br>XXXXXXXX XXXXXXXX     |    | PTMR4 [R] H,W<br>11111111 11111111    |    |                             |



## CY91520 Series

| Address             | Address Offset Value / Register Name   |    |                                      |    | Block |
|---------------------|--|----|--------------------------------------|----|-------|
|                     | +0                                     | +1 | +2                                   | +3 |       |
| 001AB8 <sub>H</sub> | PCN204 [R/W] B,H,W<br>--000000 ----110 |    | PSDR4 [R/W] H,W<br>00000000 00000000 |    | PPG4  |
| 001ABC <sub>H</sub> | PTPC4 [R/W] H,W<br>00000000 00000000   |    | —                                    | —  |       |
| 001AC0 <sub>H</sub> | PCN5 [R/W] B,H,W<br>00000000 000000-0  |    | PCSR5 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG5  |
| 001AC4 <sub>H</sub> | PDUT5 [W] H,W<br>XXXXXXXX XXXXXXXX     |    | PTMR5 [R] H,W<br>11111111 11111111   |    |       |
| 001AC8 <sub>H</sub> | PCN205 [R/W] B,H,W<br>--000000 ----110 |    | PSDR5 [R/W] H,W<br>00000000 00000000 |    |       |
| 001ACC <sub>H</sub> | PTPC5 [R/W] H,W<br>00000000 00000000   |    | —                                    | —  |       |
| 001AD0 <sub>H</sub> | PCN6 [R/W] B,H,W<br>00000000 000000-0  |    | PCSR6 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG6  |
| 001AD4 <sub>H</sub> | PDUT6 [W] H,W<br>XXXXXXXX XXXXXXXX     |    | PTMR6 [R] H,W<br>11111111 11111111   |    |       |
| 001AD8 <sub>H</sub> | PCN206 [R/W] B,H,W<br>--000000 ----110 |    | PSDR6 [R/W] H,W<br>00000000 00000000 |    |       |
| 001ADC <sub>H</sub> | PTPC6 [R/W] H,W<br>00000000 00000000   |    | —                                    | —  |       |
| 001AE0 <sub>H</sub> | PCN7 [R/W] B,H,W<br>00000000 000000-0  |    | PCSR7 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG7  |
| 001AE4 <sub>H</sub> | PDUT7 [W] H,W<br>XXXXXXXX XXXXXXXX     |    | PTMR7 [R] H,W<br>11111111 11111111   |    |       |
| 001AE8 <sub>H</sub> | PCN207 [R/W] B,H,W<br>--000000 ----110 |    | PSDR7 [R/W] H,W<br>00000000 00000000 |    |       |
| 001AEC <sub>H</sub> | PTPC7 [R/W] H,W<br>00000000 00000000   |    | —                                    | —  |       |
| 001AF0 <sub>H</sub> | PCN8 [R/W] B,H,W<br>00000000 000000-0  |    | PCSR8 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG8  |
| 001AF4 <sub>H</sub> | PDUT8 [W] H,W<br>XXXXXXXX XXXXXXXX     |    | PTMR8 [R] H,W<br>11111111 11111111   |    |       |
| 001AF8 <sub>H</sub> | PCN208 [R/W] B,H,W<br>--000000 ----110 |    | PSDR8 [R/W] H,W<br>00000000 00000000 |    |       |
| 001AFC <sub>H</sub> | PTPC8 [R/W] H,W<br>00000000 00000000   |    | —                                    | —  |       |
| 001B00 <sub>H</sub> | PCN9 [R/W] B,H,W<br>00000000 000000-0  |    | PCSR9 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG9  |
| 001B04 <sub>H</sub> | PDUT9 [W] H,W<br>XXXXXXXX XXXXXXXX     |    | PTMR9 [R] H,W<br>11111111 11111111   |    |       |
| 001B08 <sub>H</sub> | PCN209 [R/W] B,H,W<br>--000000 ----110 |    | PSDR9 [R/W] H,W<br>00000000 00000000 |    |       |
| 001B0C <sub>H</sub> | PTPC9 [R/W] H,W<br>00000000 00000000   |    | —                                    | —  |       |
| 001B10 <sub>H</sub> | PCN10 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR10 [W] H,W<br>XXXXXXXX XXXXXXXX  |    | PPG10 |
| 001B14 <sub>H</sub> | PDUT10 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR10 [R] H,W<br>11111111 11111111  |    |       |



## CY91520 Series

| Address             | Address Offset Value / Register Name   |    |                                       |    | Block |
|---------------------|--|----|---------------------------------------|----|-------|
|                     | +0                                     | +1 | +2                                    | +3 |       |
| 001B18 <sub>H</sub> | PCN210 [R/W] B,H,W<br>--000000 ----110 |    | PSDR10 [R/W] H,W<br>00000000 00000000 |    | PPG10 |
| 001B1C <sub>H</sub> | PTPC10 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001B20 <sub>H</sub> | PCN11 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR11 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG11 |
| 001B24 <sub>H</sub> | PDUT11 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR11 [R] H,W<br>11111111 11111111   |    | PPG11 |
| 001B28 <sub>H</sub> | PCN211 [R/W] B,H,W<br>--000000 ----110 |    | PSDR11 [R/W] H,W<br>00000000 00000000 |    |       |
| 001B2C <sub>H</sub> | PTPC11 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  | PPG12 |
| 001B30 <sub>H</sub> | PCN12 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR12 [W] H,W<br>XXXXXXXX XXXXXXXX   |    |       |
| 001B34 <sub>H</sub> | PDUT12 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR12 [R] H,W<br>11111111 11111111   |    | PPG12 |
| 001B38 <sub>H</sub> | PCN212 [R/W] B,H,W<br>--000000 ----110 |    | PSDR12 [R/W] H,W<br>00000000 00000000 |    |       |
| 001B3C <sub>H</sub> | PTPC12 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  | PPG13 |
| 001B40 <sub>H</sub> | PCN13 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR13 [W] H,W<br>XXXXXXXX XXXXXXXX   |    |       |
| 001B44 <sub>H</sub> | PDUT13 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR13 [R] H,W<br>11111111 11111111   |    | PPG13 |
| 001B48 <sub>H</sub> | PCN213 [R/W] B,H,W<br>--000000 ----110 |    | PSDR13 [R/W] H,W<br>00000000 00000000 |    |       |
| 001B4C <sub>H</sub> | PTPC13 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  | PPG14 |
| 001B50 <sub>H</sub> | PCN14 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR14 [W] H,W<br>XXXXXXXX XXXXXXXX   |    |       |
| 001B54 <sub>H</sub> | PDUT14 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR14 [R] H,W<br>11111111 11111111   |    | PPG14 |
| 001B58 <sub>H</sub> | PCN214 [R/W] B,H,W<br>--000000 ----110 |    | PSDR14 [R/W] H,W<br>00000000 00000000 |    |       |
| 001B5C <sub>H</sub> | PTPC14 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  | PPG15 |
| 001B60 <sub>H</sub> | PCN15 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR15 [W] H,W<br>XXXXXXXX XXXXXXXX   |    |       |
| 001B64 <sub>H</sub> | PDUT15 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR15 [R] H,W<br>11111111 11111111   |    | PPG15 |
| 001B68 <sub>H</sub> | PCN215 [R/W] B,H,W<br>--000000 ----110 |    | PSDR15 [R/W] H,W<br>00000000 00000000 |    |       |
| 001B6C <sub>H</sub> | PTPC15 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  | PPG16 |
| 001B70 <sub>H</sub> | PCN16 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR16 [W] H,W<br>XXXXXXXX XXXXXXXX   |    |       |
| 001B74 <sub>H</sub> | PDUT16 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR16 [R] H,W<br>11111111 11111111   |    | PPG16 |



## CY91520 Series

| Address             | Address Offset Value / Register Name   |    |                                       |    | Block |
|---------------------|--|----|---------------------------------------|----|-------|
|                     | +0                                     | +1 | +2                                    | +3 |       |
| 001B78 <sub>H</sub> | PCN216 [R/W] B,H,W<br>--000000 ----110 |    | PSDR16 [R/W] H,W<br>00000000 00000000 |    | PPG16 |
| 001B7C <sub>H</sub> | PTPC16 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001B80 <sub>H</sub> | PCN17 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR17 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG17 |
| 001B84 <sub>H</sub> | PDUT17 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR17 [R] H,W<br>11111111 11111111   |    |       |
| 001B88 <sub>H</sub> | PCN217 [R/W] B,H,W<br>--000000 ----110 |    | PSDR17 [R/W] H,W<br>00000000 00000000 |    |       |
| 001B8C <sub>H</sub> | PTPC17 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  | PPG18 |
| 001B90 <sub>H</sub> | PCN18 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR18 [W] H,W<br>XXXXXXXX XXXXXXXX   |    |       |
| 001B94 <sub>H</sub> | PDUT18 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR18 [R] H,W<br>11111111 11111111   |    |       |
| 001B98 <sub>H</sub> | PCN218 [R/W] B,H,W<br>--000000 ----110 |    | PSDR18 [R/W] H,W<br>00000000 00000000 |    |       |
| 001B9C <sub>H</sub> | PTPC18 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  | PPG19 |
| 001BA0 <sub>H</sub> | PCN19 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR19 [W] H,W<br>XXXXXXXX XXXXXXXX   |    |       |
| 001BA4 <sub>H</sub> | PDUT19 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR19 [R] H,W<br>11111111 11111111   |    |       |
| 001BA8 <sub>H</sub> | PCN219 [R/W] B,H,W<br>--000000 ----110 |    | PSDR19 [R/W] H,W<br>00000000 00000000 |    |       |
| 001BAC <sub>H</sub> | PTPC19 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  | PPG20 |
| 001BB0 <sub>H</sub> | PCN20 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR20 [W] H,W<br>XXXXXXXX XXXXXXXX   |    |       |
| 001BB4 <sub>H</sub> | PDUT20 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR20 [R] H,W<br>11111111 11111111   |    |       |
| 001BB8 <sub>H</sub> | PCN220 [R/W] B,H,W<br>--000000 ----110 |    | PSDR20 [R/W] H,W<br>00000000 00000000 |    |       |
| 001BBC <sub>H</sub> | PTPC20 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  | PPG21 |
| 001BC0 <sub>H</sub> | PCN21 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR21 [W] H,W<br>XXXXXXXX XXXXXXXX   |    |       |
| 001BC4 <sub>H</sub> | PDUT21 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR21 [R] H,W<br>11111111 11111111   |    |       |
| 001BC8 <sub>H</sub> | PCN221 [R/W] B,H,W<br>--000000 ----110 |    | PSDR21 [R/W] H,W<br>00000000 00000000 |    |       |
| 001BCC <sub>H</sub> | PTPC21 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  | PPG21 |



## CY91520 Series

| Address             | Address Offset Value / Register Name   |    |                                       |    | Block |
|---------------------|--|----|---------------------------------------|----|-------|
|                     | +0                                     | +1 | +2                                    | +3 |       |
| 001BD0 <sub>H</sub> | PCN22 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR22 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG22 |
| 001BD4 <sub>H</sub> | PDUT22 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR22 [R] H,W<br>11111111 11111111   |    |       |
| 001BD8 <sub>H</sub> | PCN222 [R/W] B,H,W<br>--000000 ----110 |    | PSDR22 [R/W] H,W<br>00000000 00000000 |    |       |
| 001BDC <sub>H</sub> | PTPC22 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001BE0 <sub>H</sub> | PCN23 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR23 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG23 |
| 001BE4 <sub>H</sub> | PDUT23 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR23 [R] H,W<br>11111111 11111111   |    |       |
| 001BE8 <sub>H</sub> | PCN223 [R/W] B,H,W<br>--000000 ----110 |    | PSDR23 [R/W] H,W<br>00000000 00000000 |    |       |
| 001BEC <sub>H</sub> | PTPC23 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001BF0 <sub>H</sub> | PCN24 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR24 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG24 |
| 001BF4 <sub>H</sub> | PDUT24 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR24 [R] H,W<br>11111111 11111111   |    |       |
| 001BF8 <sub>H</sub> | PCN224 [R/W] B,H,W<br>--000000 ----110 |    | PSDR24 [R/W] H,W<br>00000000 00000000 |    |       |
| 001BFC <sub>H</sub> | PTPC24 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001C00 <sub>H</sub> | PCN25 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR25 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG25 |
| 001C04 <sub>H</sub> | PDUT25 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR25 [R] H,W<br>11111111 11111111   |    |       |
| 001C08 <sub>H</sub> | PCN225 [R/W] B,H,W<br>--000000 ----110 |    | PSDR25 [R/W] H,W<br>00000000 00000000 |    |       |
| 001C0C <sub>H</sub> | PTPC25 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001C10 <sub>H</sub> | PCN26 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR26 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG26 |
| 001C14 <sub>H</sub> | PDUT26 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR26 [R] H,W<br>11111111 11111111   |    |       |
| 001C18 <sub>H</sub> | PCN226 [R/W] B,H,W<br>--000000 ----110 |    | PSDR26 [R/W] H,W<br>00000000 00000000 |    |       |
| 001C1C <sub>H</sub> | PTPC26 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001C20 <sub>H</sub> | PCN27 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR27 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG27 |
| 001C24 <sub>H</sub> | PDUT27 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR27 [R] H,W<br>11111111 11111111   |    | PPG27 |
| 001C28 <sub>H</sub> | PCN227 [R/W] B,H,W<br>--000000 ----110 |    | PSDR27 [R/W] H,W<br>00000000 00000000 |    |       |
| 001C2C <sub>H</sub> | PTPC27 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  | PPG27 |



## CY91520 Series

| Address             | Address Offset Value / Register Name   |    |                                       |    | Block |
|---------------------|--|----|---------------------------------------|----|-------|
|                     | +0                                     | +1 | +2                                    | +3 |       |
| 001C30 <sub>H</sub> | PCN28 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR28 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG28 |
| 001C34 <sub>H</sub> | PDUT28 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR28 [R] H,W<br>11111111 11111111   |    |       |
| 001C38 <sub>H</sub> | PCN228 [R/W] B,H,W<br>--000000 ----110 |    | PSDR28 [R/W] H,W<br>00000000 00000000 |    |       |
| 001C3C <sub>H</sub> | PTPC28 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001C40 <sub>H</sub> | PCN29 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR29 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG29 |
| 001C44 <sub>H</sub> | PDUT29 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR29 [R] H,W<br>11111111 11111111   |    |       |
| 001C48 <sub>H</sub> | PCN229 [R/W] B,H,W<br>--000000 ----110 |    | PSDR29 [R/W] H,W<br>00000000 00000000 |    |       |
| 001C4C <sub>H</sub> | PTPC29 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001C50 <sub>H</sub> | PCN30 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR30 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG30 |
| 001C54 <sub>H</sub> | PDUT30 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR30 [R] H,W<br>11111111 11111111   |    |       |
| 001C58 <sub>H</sub> | PCN230 [R/W] B,H,W<br>--000000 ----110 |    | PSDR30 [R/W] H,W<br>00000000 00000000 |    |       |
| 001C5C <sub>H</sub> | PTPC30 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001C60 <sub>H</sub> | PCN31 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR31 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG31 |
| 001C64 <sub>H</sub> | PDUT31 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR31 [R] H,W<br>11111111 11111111   |    |       |
| 001C68 <sub>H</sub> | PCN231 [R/W] B,H,W<br>--000000 ----110 |    | PSDR31 [R/W] H,W<br>00000000 00000000 |    |       |
| 001C6C <sub>H</sub> | PTPC31 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001C70 <sub>H</sub> | PCN32 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR32 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG32 |
| 001C74 <sub>H</sub> | PDUT32 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR32 [R] H,W<br>11111111 11111111   |    |       |
| 001C78 <sub>H</sub> | PCN232 [R/W] B,H,W<br>--000000 ----110 |    | PSDR32 [R/W] H,W<br>00000000 00000000 |    | PPG32 |
| 001C7C <sub>H</sub> | PTPC32 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001C80 <sub>H</sub> | PCN33 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR33 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG33 |
| 001C84 <sub>H</sub> | PDUT33 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR33 [R] H,W<br>11111111 11111111   |    |       |
| 001C88 <sub>H</sub> | PCN233 [R/W] B,H,W<br>--000000 ----110 |    | PSDR33 [R/W] H,W<br>00000000 00000000 |    | PPG33 |
| 001C8C <sub>H</sub> | PTPC33 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |



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| Address             | Address Offset Value / Register Name   |    |                                       |    | Block |
|---------------------|--|----|---------------------------------------|----|-------|
|                     | +0                                     | +1 | +2                                    | +3 |       |
| 001C90H             | PCN34 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR34 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG34 |
| 001C94H             | PDUT34 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR34 [R] H,W<br>11111111 11111111   |    |       |
| 001C98H             | PCN234 [R/W] B,H,W<br>--000000 ----110 |    | PSDR34 [R/W] H,W<br>00000000 00000000 |    |       |
| 001C9CH             | PTPC34 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001CA0H             | PCN35 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR35 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG35 |
| 001CA4H             | PDUT35 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR35 [R] H,W<br>11111111 11111111   |    |       |
| 001CA8H             | PCN235 [R/W] B,H,W<br>--000000 ----110 |    | PSDR35 [R/W] H,W<br>00000000 00000000 |    |       |
| 001CAC <sub>H</sub> | PTPC35 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001CB0H             | PCN36 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR36 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG36 |
| 001CB4H             | PDUT36 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR36 [R] H,W<br>11111111 11111111   |    |       |
| 001CB8H             | PCN236 [R/W] B,H,W<br>--000000 ----110 |    | PSDR36 [R/W] H,W<br>00000000 00000000 |    |       |
| 001CBC <sub>H</sub> | PTPC36 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001CC0H             | PCN37 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR37 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG37 |
| 001CC4H             | PDUT37 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR37 [R] H,W<br>11111111 11111111   |    |       |
| 001CC8H             | PCN237 [R/W] B,H,W<br>--000000 ----110 |    | PSDR37 [R/W] H,W<br>00000000 00000000 |    |       |
| 001CCC <sub>H</sub> | PTPC37 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001CD0H             | PCN38 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR38 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG38 |
| 001CD4H             | PDUT38 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR38 [R] H,W<br>11111111 11111111   |    |       |
| 001CD8H             | PCN238 [R/W] B,H,W<br>--000000 ----110 |    | PSDR38 [R/W] H,W<br>00000000 00000000 |    |       |
| 001CDC <sub>H</sub> | PTPC38 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001CE0H             | PCN39 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR39 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG39 |
| 001CE4H             | PDUT39 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR39 [R] H,W<br>11111111 11111111   |    | PPG39 |
| 001CE8H             | PCN239 [R/W] B,H,W<br>--000000 ----110 |    | PSDR39 [R/W] H,W<br>00000000 00000000 |    |       |
| 001CEC <sub>H</sub> | PTPC39 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |



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| Address             | Address Offset Value / Register Name   |    |                                       |    | Block |
|---------------------|--|----|---------------------------------------|----|-------|
|                     | +0                                     | +1 | +2                                    | +3 |       |
| 001CF0 <sub>H</sub> | PCN40 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR40 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG40 |
| 001CF4 <sub>H</sub> | PDUT40 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR40 [R] H,W<br>11111111 11111111   |    |       |
| 001CF8 <sub>H</sub> | PCN240 [R/W] B,H,W<br>--000000 ----110 |    | PSDR40 [R/W] H,W<br>00000000 00000000 |    |       |
| 001CFC <sub>H</sub> | PTPC40 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001D00 <sub>H</sub> | PCN41 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR41 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG41 |
| 001D04 <sub>H</sub> | PDUT41 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR41 [R] H,W<br>11111111 11111111   |    |       |
| 001D08 <sub>H</sub> | PCN241 [R/W] B,H,W<br>--000000 ----110 |    | PSDR41 [R/W] H,W<br>00000000 00000000 |    |       |
| 001D0C <sub>H</sub> | PTPC41 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001D10 <sub>H</sub> | PCN42 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR42 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG42 |
| 001D14 <sub>H</sub> | PDUT42 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR42 [R] H,W<br>11111111 11111111   |    |       |
| 001D18 <sub>H</sub> | PCN242 [R/W] B,H,W<br>--000000 ----110 |    | PSDR42 [R/W] H,W<br>00000000 00000000 |    |       |
| 001D1C <sub>H</sub> | PTPC42 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001D20 <sub>H</sub> | PCN43 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR43 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG43 |
| 001D24 <sub>H</sub> | PDUT43 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR43 [R] H,W<br>11111111 11111111   |    |       |
| 001D28 <sub>H</sub> | PCN243 [R/W] B,H,W<br>--000000 ----110 |    | PSDR43 [R/W] H,W<br>00000000 00000000 |    |       |
| 001D2C <sub>H</sub> | PTPC43 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001D30 <sub>H</sub> | PCN44 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR44 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG44 |
| 001D34 <sub>H</sub> | PDUT44 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR44 [R] H,W<br>11111111 11111111   |    |       |
| 001D38 <sub>H</sub> | PCN244 [R/W] B,H,W<br>--000000 ----110 |    | PSDR44 [R/W] H,W<br>00000000 00000000 |    |       |
| 001D3C <sub>H</sub> | PTPC44 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |
| 001D40 <sub>H</sub> | PCN45 [R/W] B,H,W<br>00000000 000000-0 |    | PCSR45 [W] H,W<br>XXXXXXXX XXXXXXXX   |    | PPG45 |
| 001D44 <sub>H</sub> | PDUT45 [W] H,W<br>XXXXXXXX XXXXXXXX    |    | PTMR45 [R] H,W<br>11111111 11111111   |    |       |
| 001D48 <sub>H</sub> | PCN245 [R/W] B,H,W<br>--000000 ----110 |    | PSDR45 [R/W] H,W<br>00000000 00000000 |    |       |
| 001D4C <sub>H</sub> | PTPC45 [R/W] H,W<br>00000000 00000000  |    | —                                     | —  |       |



## CY91520 Series

| Address                  | Address Offset Value / Register Name      |    |   |    | Block            |
|--------------------------|---|----|---|----|------------------|
|                          | +0  | +1 | +2  | +3 |                  |
| 001D50H                  | PCN46 [R/W] B,H,W<br>00000000 000000-0    |    | PCSR46 [W] H,W<br>XXXXXXXX XXXXXXXX       |    | PPG46            |
| 001D54H                  | PDUT46 [W] H,W<br>XXXXXXXX XXXXXXXX       |    | PTMR46 [R] H,W<br>11111111 11111111       |    |                  |
| 001D58H                  | PCN246 [R/W] B,H,W<br>--000000 ----110    |    | PSDR46 [R/W] H,W<br>00000000 00000000     |    |                  |
| 001D5CH                  | PTPC46 [R/W] H,W<br>00000000 00000000     |    | —   | —  |                  |
| 001D60H                  | PCN47 [R/W] B,H,W<br>00000000 000000-0    |    | PCSR47 [W] H,W<br>XXXXXXXX XXXXXXXX       |    | PPG47            |
| 001D64H                  | PDUT47 [W] H,W<br>XXXXXXXX XXXXXXXX       |    | PTMR47 [R] H,W<br>11111111 11111111       |    |                  |
| 001D68H                  | PCN247 [R/W] B,H,W<br>--000000 ----110    |    | PSDR47 [R/W] H,W<br>00000000 00000000     |    |                  |
| 001D6CH                  | PTPC47 [R/W] H,W<br>00000000 00000000     |    | —   | —  |                  |
| 001D70H<br>to<br>001FFCH | —   | —  | —   | —  | Reserved         |
| 002000H                  | CTRLR0 [R/W] B,H,W<br>----- 000-0001      |    | STATR0 [R/W] B,H,W<br>----- 00000000      |    | CAN0<br>(128msb) |
| 002004H                  | ERRCNT0 [R] B,H,W<br>00000000 00000000    |    | BTR0 [R/W] B,H,W<br>-0100011 00000001     |    |                  |
| 002008H                  | INTR0 [R] B,H,W<br>00000000 00000000      |    | TESTR0 [R/W] B,H,W<br>----- X00000--      |    |                  |
| 00200CH                  | BRPER0 [R/W] B,H,W<br>----- ----0000      |    | —   | —  |                  |
| 002010H                  | IF1CREQ0 [R/W] B,H,W<br>0----- 00000001   |    | IF1CMSK0 [R/W] B,H,W<br>----- 00000000    |    |                  |
| 002014H                  | IF1MSK20 [R/W] B,H,W<br>11-11111 11111111 |    | IF1MSK10 [R/W] B,H,W<br>11111111 11111111 |    |                  |
| 002018H                  | IF1ARB20 [R/W] B,H,W<br>00000000 00000000 |    | IF1ARB10 [R/W] B,H,W<br>00000000 00000000 |    |                  |
| 00201CH                  | IF1MCTR0 [R/W] B,H,W<br>00000000 0---0000 |    | —   | —  |                  |
| 002020H                  | IF1DTA10 [R/W] B,H,W<br>00000000 00000000 |    | IF1DTA20 [R/W] B,H,W<br>00000000 00000000 |    |                  |
| 002024H                  | IF1DTB10 [R/W] B,H,W<br>00000000 00000000 |    | IF1DTB20 [R/W] B,H,W<br>00000000 00000000 |    |                  |
| 002028H                  | —   | —  | —   | —  |                  |
| 00202CH                  | —   | —  | —   | —  |                  |
| 002030H,<br>002034H      | Reserved(IF1 data mirror)                 |    |   |    |                  |
| 002038H                  | —   | —  | —   | —  |                  |
| 00203CH                  | —   | —  | —   | —  |                  |
| 002040H                  | IF2CREQ0 [R/W] B,H,W<br>0----- 00000001   |    | IF2CMSK0 [R/W] B,H,W<br>----- 00000000    |    |                  |
| 002044H                  | IF2MSK20 [R/W] B,H,W<br>11-11111 11111111 |    | IF2MSK10 [R/W] B,H,W<br>11111111 11111111 |    |                  |
| 002048H                  | IF2ARB20 [R/W] B,H,W<br>00000000 00000000 |    | IF2ARB10 [R/W] B,H,W<br>00000000 00000000 |    |                  |



## CY91520 Series

| Address  | Address Offset Value / Register Name      |    |   |    | Block            |
|--|---|----|---|----|------------------|
|  | +0  | +1 | +2  | +3 |                  |
| 00204C <sub>H</sub>                              | IF2MCTR0 [R/W] B,H,W<br>00000000 0---0000 |    | —   | —  | CAN0<br>(128msb) |
| 002050 <sub>H</sub>                              | IF2DTA10 [R/W] B,H,W<br>00000000 00000000 |    | IF2DTA20 [R/W] B,H,W<br>00000000 00000000 |    |                  |
| 002054 <sub>H</sub>                              | IF2DTB10 [R/W] B,H,W<br>00000000 00000000 |    | IF2DTB20 [R/W] B,H,W<br>00000000 00000000 |    |                  |
| 002058 <sub>H</sub>                              | —   | —  | —   | —  |                  |
| 00205C <sub>H</sub>                              | —   | —  | —   | —  |                  |
| 002060 <sub>H</sub> ,<br>002064 <sub>H</sub>     | Reserved(IF2 data mirror)                 |    |   |    |                  |
| 002068 <sub>H</sub><br>to<br>00207C <sub>H</sub> | —   |    |   |    |                  |
| 002080 <sub>H</sub>                              | TREQR20 [R] B,H,W<br>00000000 00000000    |    | TREQR10 [R] B,H,W<br>00000000 00000000    |    |                  |
| 002084 <sub>H</sub>                              | TREQR40 [R] B,H,W<br>00000000 00000000    |    | TREQR30 [R] B,H,W<br>00000000 00000000    |    |                  |
| 002088 <sub>H</sub>                              | TREQR60 [R] B,H,W<br>00000000 00000000    |    | TREQR50 [R] B,H,W<br>00000000 00000000    |    |                  |
| 00208C <sub>H</sub>                              | TREQR80 [R] B,H,W<br>00000000 00000000    |    | TREQR70 [R] B,H,W<br>00000000 00000000    |    |                  |
| 002090 <sub>H</sub>                              | NEWDT20 [R] B,H,W<br>00000000 00000000    |    | NEWDT10 [R] B,H,W<br>00000000 00000000    |    |                  |
| 002094 <sub>H</sub>                              | NEWDT40 [R] B,H,W<br>00000000 00000000    |    | NEWDT30 [R] B,H,W<br>00000000 00000000    |    |                  |
| 002098 <sub>H</sub>                              | NEWDT60 [R] B,H,W<br>00000000 00000000    |    | NEWDT50 [R] B,H,W<br>00000000 00000000    |    |                  |
| 00209C <sub>H</sub>                              | NEWDT80 [R] B,H,W<br>00000000 00000000    |    | NEWDT70 [R] B,H,W<br>00000000 00000000    |    |                  |
| 0020A0 <sub>H</sub>                              | INTPND20 [R] B,H,W<br>00000000 00000000   |    | INTPND10 [R] B,H,W<br>00000000 00000000   |    |                  |
| 0020A4 <sub>H</sub>                              | INTPND40 [R] B,H,W<br>00000000 00000000   |    | INTPND30 [R] B,H,W<br>00000000 00000000   |    |                  |
| 0020A8 <sub>H</sub>                              | INTPND60 [R] B,H,W<br>00000000 00000000   |    | INTPND50 [R] B,H,W<br>00000000 00000000   |    |                  |
| 0020AC <sub>H</sub>                              | INTPND80 [R] B,H,W<br>00000000 00000000   |    | INTPND70 [R] B,H,W<br>00000000 00000000   |    |                  |
| 0020B0 <sub>H</sub>                              | MSGVAL20 [R] B,H,W<br>00000000 00000000   |    | MSGVAL10 [R] B,H,W<br>00000000 00000000   |    |                  |
| 0020B4 <sub>H</sub>                              | MSGVAL40 [R] B,H,W<br>00000000 00000000   |    | MSGVAL30 [R] B,H,W<br>00000000 00000000   |    |                  |
| 0020B8 <sub>H</sub>                              | MSGVAL60 [R] B,H,W<br>00000000 00000000   |    | MSGVAL50 [R] B,H,W<br>00000000 00000000   |    |                  |
| 0020BC <sub>H</sub>                              | MSGVAL80 [R] B,H,W<br>00000000 00000000   |    | MSGVAL70 [R] B,H,W<br>00000000 00000000   |    |                  |
| 0020C0 <sub>H</sub><br>to<br>0020FC <sub>H</sub> | —   |    |   |    | CAN0<br>(128msb) |



## CY91520 Series

| Address  | Address Offset Value / Register Name      |    |   |    | Block           |
|--|---|----|---|----|-----------------|
|  | +0  | +1 | +2  | +3 |                 |
| 002100 <sub>H</sub>                              | CTRLR1 [R/W] B,H,W<br>----- 000-0001      |    | STATR1 [R/W] B,H,W<br>----- 00000000      |    | CAN1<br>(64msb) |
| 002104 <sub>H</sub>                              | ERRCNT1 [R] B,H,W<br>00000000 00000000    |    | BTR1 [R/W] B,H,W<br>-0100011 00000001     |    |                 |
| 002108 <sub>H</sub>                              | INTR1 [R] B,H,W<br>00000000 00000000      |    | TESTR1 [R/W] B,H,W<br>----- X00000--      |    |                 |
| 00210C <sub>H</sub>                              | BRPER1 [R/W] B,H,W<br>----- ----0000      |    | —   | —  |                 |
| 002110 <sub>H</sub>                              | IF1CREQ1 [R/W] B,H,W<br>0----- 00000001   |    | IF1CMSK1 [R/W] B,H,W<br>----- 00000000    |    |                 |
| 002114 <sub>H</sub>                              | IF1MSK21 [R/W] B,H,W<br>11-11111 11111111 |    | IF1MSK11 [R/W] B,H,W<br>11111111 11111111 |    |                 |
| 002118 <sub>H</sub>                              | IF1ARB21 [R/W] B,H,W<br>00000000 00000000 |    | IF1ARB11 [R/W] B,H,W<br>00000000 00000000 |    |                 |
| 00211C <sub>H</sub>                              | IF1MCTR1 [R/W] B,H,W<br>00000000 0---0000 |    | —   | —  |                 |
| 002120 <sub>H</sub>                              | IF1DTA11 [R/W] B,H,W<br>00000000 00000000 |    | IF1DTA21 [R/W] B,H,W<br>00000000 00000000 |    |                 |
| 002124 <sub>H</sub>                              | IF1DTB11 [R/W] B,H,W<br>00000000 00000000 |    | IF1DTB21 [R/W] B,H,W<br>00000000 00000000 |    |                 |
| 002128 <sub>H</sub>                              | —   | —  | —   | —  |                 |
| 00212C <sub>H</sub>                              | —   | —  | —   | —  |                 |
| 002130 <sub>H</sub> ,<br>002134 <sub>H</sub>     | Reserved (IF1 data mirror)                |    |   |    |                 |
| 002138 <sub>H</sub>                              | —   | —  | —   | —  |                 |
| 00213C <sub>H</sub>                              | —   | —  | —   | —  |                 |
| 002140 <sub>H</sub>                              | IF2CREQ1 [R/W] B,H,W<br>0----- 00000001   |    | IF2CMSK1 [R/W] B,H,W<br>----- 00000000    |    |                 |
| 002144 <sub>H</sub>                              | IF2MSK21 [R/W] B,H,W<br>11-11111 11111111 |    | IF2MSK11 [R/W] B,H,W<br>11111111 11111111 |    |                 |
| 002148 <sub>H</sub>                              | IF2ARB21 [R/W] B,H,W<br>00000000 00000000 |    | IF2ARB11 [R/W] B,H,W<br>00000000 00000000 |    |                 |
| 00214C <sub>H</sub>                              | IF2MCTR1 [R/W] B,H,W<br>00000000 0---0000 |    | —   | —  |                 |
| 002150 <sub>H</sub>                              | IF2DTA11 [R/W] B,H,W<br>00000000 00000000 |    | IF2DTA21 [R/W] B,H,W<br>00000000 00000000 |    |                 |
| 002154 <sub>H</sub>                              | IF2DTB11 [R/W] B,H,W<br>00000000 00000000 |    | IF2DTB21 [R/W] B,H,W<br>00000000 00000000 |    |                 |
| 002158 <sub>H</sub>                              | —   | —  | —   | —  |                 |
| 00215C <sub>H</sub>                              | —   | —  | —   | —  |                 |
| 002160 <sub>H</sub> ,<br>002164 <sub>H</sub>     | Reserved (IF2 data mirror)                |    |   |    |                 |
| 002168 <sub>H</sub><br>to<br>00217C <sub>H</sub> | —   |    |   |    |                 |
| 002180 <sub>H</sub>                              | TREQR21 [R] B,H,W<br>00000000 00000000    |    | TREQR11 [R] B,H,W<br>00000000 00000000    |    |                 |
| 002184 <sub>H</sub>                              | TREQR41 [R] B,H,W<br>00000000 00000000    |    | TREQR31 [R] B,H,W<br>00000000 00000000    |    |                 |
| 002188 <sub>H</sub>                              | —   | —  | —   | —  |                 |
| 00218C <sub>H</sub>                              | —   | —  | —   | —  |                 |



## CY91520 Series

| Address  | Address Offset Value / Register Name      |    |   |    | Block           |
|--|---|----|---|----|-----------------|
|  | +0  | +1 | +2  | +3 |                 |
| 002190 <sub>H</sub>                              | NEWDT21 [R] B,H,W<br>00000000 00000000    |    | NEWDT11 [R] B,H,W<br>00000000 00000000    |    | CAN1<br>(64msb) |
| 002194 <sub>H</sub>                              | NEWDT41 [R] B,H,W<br>00000000 00000000    |    | NEWDT31 [R] B,H,W<br>00000000 00000000    |    |                 |
| 002198 <sub>H</sub>                              | —   | —  | —   | —  |                 |
| 00219C <sub>H</sub>                              | —   | —  | —   | —  |                 |
| 0021A0 <sub>H</sub>                              | INTPND21 [R] B,H,W<br>00000000 00000000   |    | INTPND11 [R] B,H,W<br>00000000 00000000   |    |                 |
| 0021A4 <sub>H</sub>                              | INTPND41 [R] B,H,W<br>00000000 00000000   |    | INTPND31 [R] B,H,W<br>00000000 00000000   |    |                 |
| 0021A8 <sub>H</sub>                              | —   | —  | —   | —  |                 |
| 0021AC <sub>H</sub>                              | —   | —  | —   | —  |                 |
| 0021B0 <sub>H</sub>                              | MSGVAL21 [R] B,H,W<br>00000000 00000000   |    | MSGVAL11 [R] B,H,W<br>00000000 00000000   |    |                 |
| 0021B4 <sub>H</sub>                              | MSGVAL41 [R] B,H,W<br>00000000 00000000   |    | MSGVAL31 [R] B,H,W<br>00000000 00000000   |    |                 |
| 0021B8 <sub>H</sub>                              | —   | —  | —   | —  |                 |
| 0021BC <sub>H</sub>                              | —   | —  | —   | —  |                 |
| 0021C0 <sub>H</sub><br>to<br>0021FC <sub>H</sub> | —   |    |   |    |                 |
| 002200 <sub>H</sub>                              | CTRLR2 [R/W] B,H,W<br>----- 000-0001      |    | STATR2 [R/W] B,H,W<br>----- 00000000      |    |                 |
| 002204 <sub>H</sub>                              | ERRCNT2 [R] B,H,W<br>00000000 00000000    |    | BTR2 [R/W] B,H,W<br>-0100011 00000001     |    |                 |
| 002208 <sub>H</sub>                              | INTR2 [R] B,H,W<br>00000000 00000000      |    | TESTR2 [R/W] B,H,W<br>----- X00000--      |    |                 |
| 00220C <sub>H</sub>                              | BRPER2 [R/W] B,H,W<br>----- ----0000      |    | —   |    |                 |
| 002210 <sub>H</sub>                              | IF1CREQ2 [R/W] B,H,W<br>0----- 00000001   |    | IF1CMSK2 [R/W] B,H,W<br>----- 00000000    |    |                 |
| 002214 <sub>H</sub>                              | IF1MSK22 [R/W] B,H,W<br>11-11111 11111111 |    | IF1MSK12 [R/W] B,H,W<br>11111111 11111111 |    |                 |
| 002218 <sub>H</sub>                              | IF1ARB22 [R/W] B,H,W<br>00000000 00000000 |    | IF1ARB12 [R/W] B,H,W<br>00000000 00000000 |    |                 |
| 00221C <sub>H</sub>                              | IF1MCTR2 [R/W] B,H,W<br>00000000 0---0000 |    | —   |    |                 |
| 002220 <sub>H</sub>                              | IF1DTA12 [R/W] B,H,W<br>00000000 00000000 |    | IF1DTA22 [R/W] B,H,W<br>00000000 00000000 |    |                 |
| 002224 <sub>H</sub>                              | IF1DTB12 [R/W] B,H,W<br>00000000 00000000 |    | IF1DTB22 [R/W] B,H,W<br>00000000 00000000 |    |                 |
| 002228 <sub>H</sub>                              | —   | —  | —   | —  |                 |
| 00222C <sub>H</sub>                              | —   | —  | —   | —  |                 |
| 002230 <sub>H</sub> ,<br>002234 <sub>H</sub>     | Reserved (IF1 data mirror)                |    |   |    |                 |
| 002238 <sub>H</sub>                              | —   | —  | —   | —  |                 |
| 00223C <sub>H</sub>                              | —   | —  | —   | —  |                 |
| 002240 <sub>H</sub>                              | IF2CREQ2 [R/W] B,H,W<br>0----- 00000001   |    | IF2CMSK2 [R/W] B,H,W<br>----- 00000000    |    |                 |



## CY91520 Series

| Address  | Address Offset Value / Register Name      |    |   |                                  | Block             |
|--|---|----|---|----------------------------------|-------------------|
|  | +0  | +1 | +2  | +3                               |                   |
| 002244 <sub>H</sub>                              | IF2MSK22 [R/W] B,H,W<br>11-11111 11111111 |    | IF2MSK12 [R/W] B,H,W<br>11111111 11111111 |                                  | CAN2<br>(64msb)   |
| 002248 <sub>H</sub>                              | IF2ARB22 [R/W] B,H,W<br>00000000 00000000 |    | IF2ARB12 [R/W] B,H,W<br>00000000 00000000 |                                  |                   |
| 00224C <sub>H</sub>                              | IF2MCTR2 [R/W] B,H,W<br>00000000 0---0000 |    | —   |                                  |                   |
| 002250 <sub>H</sub>                              | IF2DTA12 [R/W] B,H,W<br>00000000 00000000 |    | IF2DTA22 [R/W] B,H,W<br>00000000 00000000 |                                  |                   |
| 002254 <sub>H</sub>                              | IF2DTB12 [R/W] B,H,W<br>00000000 00000000 |    | IF2DTB22 [R/W] B,H,W<br>00000000 00000000 |                                  |                   |
| 002258 <sub>H</sub>                              | —   | —  | —   | —                                |                   |
| 00225C <sub>H</sub>                              | —   | —  | —   | —                                |                   |
| 002260 <sub>H</sub> ,<br>002264 <sub>H</sub>     | Reserved (IF2 data mirror)                |    |   |                                  |                   |
| 002268 <sub>H</sub><br>to<br>00227C <sub>H</sub> | —   |    |   |                                  |                   |
| 002280 <sub>H</sub>                              | TREQR22 [R] B,H,W<br>00000000 00000000    |    | TREQR12 [R] B,H,W<br>00000000 00000000    |                                  |                   |
| 002284 <sub>H</sub>                              | TREQR42 [R] B,H,W<br>00000000 00000000    |    | TREQR32 [R] B,H,W<br>00000000 00000000    |                                  |                   |
| 002288 <sub>H</sub>                              | —   | —  | —   | —                                |                   |
| 00228C <sub>H</sub>                              | —   | —  | —   | —                                |                   |
| 002290 <sub>H</sub>                              | NEWDT22 [R] B,H,W<br>00000000 00000000    |    | NEWDT12 [R] B,H,W<br>00000000 00000000    |                                  |                   |
| 002294 <sub>H</sub>                              | NEWDT42 [R] B,H,W<br>00000000 00000000    |    | NEWDT32 [R] B,H,W<br>00000000 00000000    |                                  |                   |
| 002298 <sub>H</sub>                              | —   | —  | —   | —                                |                   |
| 00229C <sub>H</sub>                              | —   | —  | —   | —                                |                   |
| 0022A0 <sub>H</sub>                              | INTPND22 [R] B,H,W<br>00000000 00000000   |    | INTPND12 [R] B,H,W<br>00000000 00000000   |                                  |                   |
| 0022A4 <sub>H</sub>                              | INTPND42 [R] B,H,W<br>00000000 00000000   |    | INTPND32 [R] B,H,W<br>00000000 00000000   |                                  |                   |
| 0022A8 <sub>H</sub>                              | —   | —  | —   | —                                |                   |
| 0022AC <sub>H</sub>                              | —   | —  | —   | —                                |                   |
| 0022B0 <sub>H</sub>                              | MSGVAL22 [R] B,H,W<br>00000000 00000000   |    | MSGVAL12 [R] B,H,W<br>00000000 00000000   |                                  |                   |
| 0022B4 <sub>H</sub>                              | MSGVAL42 [R] B,H,W<br>00000000 00000000   |    | MSGVAL32 [R] B,H,W<br>00000000 00000000   |                                  |                   |
| 0022B8 <sub>H</sub>                              | —   | —  | —   | —                                |                   |
| 0022BC <sub>H</sub>                              | —   | —  | —   | —                                |                   |
| 0022C0 <sub>H</sub><br>to<br>0022FC <sub>H</sub> | —   |    |   |                                  |                   |
| 002300 <sub>H</sub>                              | DFCTLR [R/W] B,H,W<br>-0-----             |    | —   | DFSTR [R/W] B,H,W<br>-----001    | WorkFlash         |
| 002304 <sub>H</sub>                              | —   | —  | —   | —                                |                   |
| 002308 <sub>H</sub>                              | FLIFCTLR [R/W]<br>B,H,W<br>---0--00       | —  | FLIFFER1 [R/W]<br>B,H,W<br>-----          | FLIFFER2 [R/W]<br>B,H,W<br>----- | Flash / WorkFlash |



## CY91520 Series

| Address  | Address Offset Value / Register Name          |  |   |                                   | Block                        |
|--|---|--|---|-----------------------------------|------------------------------|
|  | +0  | +1   | +2                                      | +3                                |                              |
| 00230C <sub>H</sub><br>to<br>0023FC <sub>H</sub> | —   |  |   |                                   | Reserved                     |
| 002400 <sub>H</sub>                              | SEEARX [R] B,H,W<br>-0000000 00000000         |  | DEEARX [R] B,H,W<br>-0000000 00000000   |                                   | XBS RAM<br>ECC control       |
| 002404 <sub>H</sub>                              | EECSR <sub>X</sub> [R/W]<br>B,H,W<br>----00-- | —  | EFEARX [R/W] B,H,W<br>-0000000 00000000 |                                   |                              |
| 002408 <sub>H</sub>                              | —   | EFECRX [R/W] B,H,W<br>-----0 00000000 00000000 |   |                                   |                              |
| 00240C <sub>H</sub><br>to<br>002FFC <sub>H</sub> | —   |  |   |                                   | Reserved                     |
| 003000 <sub>H</sub>                              | SEEARA [R] B,H,W<br>-----000 00000000         |  | DEEARA [R] B,H,W<br>-----000 00000000   |                                   | Backup RAM<br>ECC control    |
| 003004 <sub>H</sub>                              | EECSRA [R/W]<br>B,H,W<br>----00--             | —  | EFEARA [R/W] B,H,W<br>-----000 00000000 |                                   |                              |
| 003008 <sub>H</sub>                              | —   | EFECRA [R/W] B,H,W<br>-----0 00000000 00000000 |   |                                   |                              |
| 00300C <sub>H</sub>                              | TEAR0X[R] B,H,W<br>000----- -0000000 00000000 |  |   |                                   | RAM/ diagnosis<br>XBS RAM    |
| 003010 <sub>H</sub>                              | TEAR1X[R] B,H,W<br>000----- -0000000 00000000 |  |   |                                   |                              |
| 003014 <sub>H</sub>                              | TEAR2X[R] B,H,W<br>000----- -0000000 00000000 |  |   |                                   |                              |
| 003018 <sub>H</sub>                              | TAEARX [R/W] B,H,W<br>-1111111 11111111       |  | TASARX [R/W] B,H,W<br>-0000000 00000000 |                                   |                              |
| 00301C <sub>H</sub>                              | TFECRX [R/W]<br>B,H,W<br>----0000             | TICRX [R/W]<br>B,H,W<br>----0000               | TTCRX [R/W] B,H,W<br>-----00 00001100   |                                   |                              |
| 003020 <sub>H</sub>                              | TSRCRX [W]<br>B,H,W<br>0-----                 | —  | —                                       | TKCCRX [R/W]<br>B,H,W<br>00----00 |                              |
| 003024 <sub>H</sub><br>to<br>00302C <sub>H</sub> | —   |  |   |                                   | Reserved                     |
| 003030 <sub>H</sub>                              | TEAR0A[R] B,H,W<br>000----- -000 00000000     |  |   |                                   | RAM/ diagnosis<br>Backup RAM |
| 003034 <sub>H</sub>                              | TEAR1A[R] B,H,W<br>000----- -000 00000000     |  |   |                                   |                              |
| 003038 <sub>H</sub>                              | TEAR2A[R] B,H,W<br>000----- -000 00000000     |  |   |                                   |                              |
| 00303C <sub>H</sub>                              | TAEARA[R/W] B,H,W<br>----111 11111111         |  | TASARA[R/W] B,H,W<br>-----000 00000000  |                                   |                              |
| 003040 <sub>H</sub>                              | TFECRA [R/W]<br>B,H,W<br>----0000             | TICRA [R/W]<br>B,H,W<br>----0000               | TTCRA [R/W] B,H,W<br>-----00 00001100   |                                   | RAM/ diagnosis<br>Backup RAM |
| 003044 <sub>H</sub>                              | TSRCRA [R/W]<br>B,H,W<br>0-----               | —  | —                                       | TKCCRA [R/W]<br>B,H,W<br>00----00 |                              |



## CY91520 Series

| Address  | Address Offset Value / Register Name                    |    |   |    | Block           |
|--|---|----|---|----|-----------------|
|  | +0  | +1 | +2                                      | +3 |                 |
| 003048 <sub>H</sub><br>to<br>0030FC <sub>H</sub> | —   |    |   |    | Reserved        |
| 003100 <sub>H</sub>                              | BUSDIGSR0[R/W] H,W<br>00000000 0-----00                 |    | BUSDIGSR1[R/W] H,W<br>00000000 0-----00 |    | BUS diagnosis   |
| 003104 <sub>H</sub>                              | BUSDIGSR2[R/W] H,W<br>00000000 0-----00                 |    | BUSTSTR0[R/W] H,W<br>00--0000 00000000  |    |                 |
| 003108 <sub>H</sub>                              | BUSADR0 [R] W<br>00000000 00000000 00000000 00000000    |    |   |    |                 |
| 00310C <sub>H</sub>                              | BUSADR1 [R] W<br>00000000 00000000 00000000 00000000    |    |   |    |                 |
| 003110 <sub>H</sub>                              | BUSADR2 [R] W<br>00000000 00000000 00000000 00000000    |    |   |    |                 |
| 003114 <sub>H</sub>                              | —   | —  | BUSDIGSR3[R/W] H,W<br>00000000 0-----00 |    |                 |
| 003118 <sub>H</sub>                              | BUSDIGSR4[R/W] H,W<br>00000000 0-----00                 |    | BUSTSTR1[R/W] H,W<br>00--000- 00000000  |    |                 |
| 00311C <sub>H</sub>                              | —   | —  | —                                       | —  |                 |
| 003120 <sub>H</sub>                              | BUSADR3 [R] W<br>00000000 00000000 00000000 00000000    |    |   |    |                 |
| 003124 <sub>H</sub>                              | BUSADR4 [R] W<br>00000000 00000000 00000000 00000000    |    |   |    |                 |
| 003128 <sub>H</sub><br>to<br>003FFC <sub>H</sub> | —   |    |   |    | Reserved        |
| 004000 <sub>H</sub><br>to<br>005FFC <sub>H</sub> | Backup-RAM  |    |   |    | Backup RAM area |
| 006000 <sub>H</sub><br>to<br>00EFC <sub>H</sub>  | —   | —  | —                                       | —  | Reserved        |
| 00F000 <sub>H</sub><br>to<br>00FEFC <sub>H</sub> | —   | —  | —                                       | —  | Reserved [S]    |
| 00FF00 <sub>H</sub>                              | DSUCR [R/W] B,H,W<br>-----0                             |    | —                                       | —  | OCDU [S]        |
| 00FF04 <sub>H</sub><br>to<br>00FF0C <sub>H</sub> | —   |    |   |    | Reserved [S]    |
| 00FF10 <sub>H</sub>                              | PCSR [R/W] B,H,W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |   |    | OCDU [S]        |
| 00FF14 <sub>H</sub>                              | PSSR [R/W] B,H,W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX |    |   |    | OCDU [S]        |
| 00FF18 <sub>H</sub><br>to<br>00FFF4 <sub>H</sub> | —   |    |   |    | Reserved [S]    |
| 00FFF8 <sub>H</sub>                              | EDIR1 [R] B,H,W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX  |    |   |    | OCDU [S]        |
| 00FFFC <sub>H</sub>                              | EDIR0 [R] B,H,W<br>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX  |    |   |    |                 |



[S]: It is a system register. The illegal instruction exception (data access error) is generated in these registers in the user mode when reading and writing to it.



## 10. Interrupt Vector Table

This list shows the assignments of interrupt factors and interrupt vectors/interrupt control registers.

### Interrupt Vector 64 Pins

| Interrupt Factor  | Interrupt Number |              | Interrupt Level               | Offset           | Default Address for TBR | RN   |
|---|------------------|--------------|-------------------------------|------------------|-------------------------|------|
|   | Decimal          | Hexa Decimal |                               |                  |                         |      |
| Reset   | 0                | 0            | -                             | 3FC <sub>H</sub> | 000FFFFC <sub>H</sub>   | -    |
| System reserved   | 1                | 1            | -                             | 3F8 <sub>H</sub> | 000FFFF8 <sub>H</sub>   | -    |
| System reserved   | 2                | 2            | -                             | 3F4 <sub>H</sub> | 000FFFF4 <sub>H</sub>   | -    |
| System reserved   | 3                | 3            | -                             | 3F0 <sub>H</sub> | 000FFFF0 <sub>H</sub>   | -    |
| System reserved   | 4                | 4            | -                             | 3EC <sub>H</sub> | 000FFFE <sub>C</sub>    | -    |
| FPU exception   | 5                | 5            | -                             | 3E8 <sub>H</sub> | 000FFFE8 <sub>H</sub>   | -    |
| Exception of instruction access protection violation          | 6                | 6            | -                             | 3E4 <sub>H</sub> | 000FFFE4 <sub>H</sub>   | -    |
| Exception of data access protection violation                 | 7                | 7            | -                             | 3E0 <sub>H</sub> | 000FFFE0 <sub>H</sub>   | -    |
| Data access error interrupt                                   | 8                | 8            | -                             | 3DC <sub>H</sub> | 000FFFD <sub>C</sub>    | -    |
| INTE instruction  | 9                | 9            | -                             | 3D8 <sub>H</sub> | 000FFFD8 <sub>H</sub>   | -    |
| Instruction break   | 10               | 0A           | -                             | 3D4 <sub>H</sub> | 000FFFD4 <sub>H</sub>   | -    |
| System reserved   | 11               | 0B           | -                             | 3D0 <sub>H</sub> | 000FFFD0 <sub>H</sub>   | -    |
| System reserved   | 12               | 0C           | -                             | 3CC <sub>H</sub> | 000FFFC <sub>C</sub>    | -    |
| System reserved   | 13               | 0D           | -                             | 3C8 <sub>H</sub> | 000FFFC8 <sub>H</sub>   | -    |
| Exception of invalid instruction                              | 14               | 0E           | -                             | 3C4 <sub>H</sub> | 000FFFC4 <sub>H</sub>   | -    |
| NMI request   | 15               | 0F           | 15 (F <sub>H</sub> )<br>Fixed | 3C0 <sub>H</sub> | 000FFFC0 <sub>H</sub>   | -    |
| Error generation during internal bus diagnosis                |                  |              |                               |                  |                         |      |
| XBS RAM double-bit error generation                           |                  |              |                               |                  |                         |      |
| Backup RAM double-bit error generation                        |                  |              |                               |                  |                         |      |
| TPU violation   |                  |              |                               |                  |                         |      |
| External interrupt 0-7  | 16               | 10           | ICR00                         | 3BC <sub>H</sub> | 000FFFB <sub>C</sub>    | 0    |
| External interrupt 8-15                                       | 17               | 11           | ICR01                         | 3B8 <sub>H</sub> | 000FFFB8 <sub>H</sub>   | 1*7  |
| External low-voltage detection interrupt                      |                  |              |                               |                  |                         |      |
| Reload timer 0/1/4/5  | 18               | 12           | ICR02                         | 3B4 <sub>H</sub> | 000FFFB4 <sub>H</sub>   | 2*2  |
| Reload timer 3/6/7  | 19               | 13           | ICR03                         | 3B0 <sub>H</sub> | 000FFFB0 <sub>H</sub>   | 3*2  |
| Multi-function serial interface ch.0 (reception completed)    | 20               | 14           | ICR04                         | 3AC <sub>H</sub> | 000FFFA <sub>C</sub>    | 4*1  |
| Multi-function serial interface ch.0 (status)                 |                  |              |                               |                  |                         |      |
| Multi-function serial interface ch.0 (transmission completed) | 21               | 15           | ICR05                         | 3A8 <sub>H</sub> | 000FFFA8 <sub>H</sub>   | 5*1  |
| -   | 22               | 16           | ICR06                         | 3A4 <sub>H</sub> | 000FFFA4 <sub>H</sub>   | _*6  |
| -   | 23               | 17           | ICR07                         | 3A0 <sub>H</sub> | 000FFFA0 <sub>H</sub>   | _*6  |
| -   | 24               | 18           | ICR08                         | 39C <sub>H</sub> | 000FFF9 <sub>C</sub>    | _*6  |
| -   | 25               | 19           | ICR09                         | 398 <sub>H</sub> | 000FFF98 <sub>H</sub>   | _*6  |
| Multi-function serial interface ch.3 (reception completed)    | 26               | 1A           | ICR10                         | 394 <sub>H</sub> | 000FFF94 <sub>H</sub>   | 10*1 |
| Multi-function serial interface ch.3 (status)                 |                  |              |                               |                  |                         |      |
| Multi-function serial interface ch.3 (transmission completed) | 27               | 1B           | ICR11                         | 390 <sub>H</sub> | 000FFF90 <sub>H</sub>   | 11   |



| Interrupt Factor  | Interrupt Number |              | Interrupt Level | Offset           | Default Address for TBR | RN               |
|---|------------------|--------------|-----------------|------------------|-------------------------|------------------|
|   | Decimal          | Hexa Decimal |                 |                  |                         |                  |
| Multi-function serial interface ch.4 (reception completed)    | 28               | 1C           | ICR12           | 38C <sub>H</sub> | 000FFF8C <sub>H</sub>   | 12* <sup>1</sup> |
| Multi-function serial interface ch.4 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.4 (transmission completed) | 29               | 1D           | ICR13           | 388 <sub>H</sub> | 000FFF88 <sub>H</sub>   | 13               |
| Multi-function serial interface ch.5 (reception completed)    | 30               | 1E           | ICR14           | 384 <sub>H</sub> | 000FFF84 <sub>H</sub>   | 14* <sup>1</sup> |
| Multi-function serial interface ch.5 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.5 (transmission completed) | 31               | 1F           | ICR15           | 380 <sub>H</sub> | 000FFF80 <sub>H</sub>   | 15               |
| Multi-function serial interface ch.6 (reception completed)    | 32               | 20           | ICR16           | 37C <sub>H</sub> | 000FFF7C <sub>H</sub>   | 16* <sup>1</sup> |
| Multi-function serial interface ch.6 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.6 (transmission completed) | 33               | 21           | ICR17           | 378 <sub>H</sub> | 000FFF78 <sub>H</sub>   | 17               |
| CAN0  | 34               | 22           | ICR18           | 374 <sub>H</sub> | 000FFF74 <sub>H</sub>   | -                |
| CAN1  | 35               | 23           | ICR19           | 370 <sub>H</sub> | 000FFF70 <sub>H</sub>   | -                |
| RAM diagnosis end   |                  |              |                 |                  |                         |                  |
| RAM initialization completion                                 |                  |              |                 |                  |                         |                  |
| Error generation during RAM diagnosis                         |                  |              |                 |                  |                         |                  |
| Backup RAM diagnosis end                                      |                  |              |                 |                  |                         |                  |
| Backup RAM initialization completion                          |                  |              |                 |                  |                         |                  |
| Error generation during Backup RAM diagnosis                  |                  |              |                 |                  |                         |                  |
| CAN2  | 36               | 24           | ICR20           | 36C <sub>H</sub> | 000FFF6C <sub>H</sub>   | -                |
| Up/down counter 0   |                  |              |                 |                  |                         |                  |
| Up/down counter 1   |                  |              |                 |                  |                         |                  |
| Real time clock   | 37               | 25           | ICR21           | 368 <sub>H</sub> | 000FFF68 <sub>H</sub>   | -                |
| -   | 38               | 26           | ICR22           | 364 <sub>H</sub> | 000FFF64 <sub>H</sub>   | -* <sup>6</sup>  |
| 16-bit Free-run timer 0 (0 detection) / (compare clear)       | 39               | 27           | ICR23           | 360 <sub>H</sub> | 000FFF60 <sub>H</sub>   | 23               |
| PPG 1/10/11/20/30/31  | 40               | 28           | ICR24           | 35C <sub>H</sub> | 000FFF5C <sub>H</sub>   | 24* <sup>3</sup> |
| 16-bit Free-run timer 1 (0 detection) / (compare clear)       |                  |              |                 |                  |                         |                  |
| PPG 2/3/12/13/23/43   | 41               | 29           | ICR25           | 358 <sub>H</sub> | 000FFF58 <sub>H</sub>   | 25* <sup>3</sup> |
| 16-bit Free-run timer 2 (0 detection) / (compare clear)       |                  |              |                 |                  |                         |                  |
| PPG 4/24/35   | 42               | 2A           | ICR26           | 354 <sub>H</sub> | 000FFF54 <sub>H</sub>   | 26* <sup>3</sup> |
| PPG 7/16/17/27/37   | 43               | 2B           | ICR27           | 350 <sub>H</sub> | 000FFF50 <sub>H</sub>   | 27* <sup>3</sup> |
| PPG 19  | 44               | 2C           | ICR28           | 34C <sub>H</sub> | 000FFF4C <sub>H</sub>   | 28* <sup>3</sup> |
| 16-bit ICU 0 (fetching) / 16-bit ICU 1 (fetching)             | 45               | 2D           | ICR29           | 348 <sub>H</sub> | 000FFF48 <sub>H</sub>   | 29               |
| Main timer  | 46               | 2E           | ICR30           | 344 <sub>H</sub> | 000FFF44 <sub>H</sub>   | 30               |
| Sub timer   |                  |              |                 |                  |                         |                  |
| PLL timer   |                  |              |                 |                  |                         |                  |
| 16-bit ICU 2 (fetching) /16-bit ICU 3 (fetching)              |                  |              |                 |                  |                         |                  |



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| Interrupt Factor   | Interrupt Number |              | Interrupt Level | Offset           | Default Address for TBR | RN                  |
|--|------------------|--------------|-----------------|------------------|-------------------------|---------------------|
|  | Decimal          | Hexa Decimal |                 |                  |                         |                     |
| Clock calibration unit (sub oscillation)                       | 47               | 2F           | ICR31           | 340 <sub>H</sub> | 000FFF40 <sub>H</sub>   | 31 <sup>*1,*4</sup> |
| Multi-function serial interface ch.9 (reception completed)     |                  |              |                 |                  |                         |                     |
| Multi-function serial interface ch.9 (status)                  |                  |              |                 |                  |                         |                     |
| A/D converter<br>0/1/7/10/11/14/15/16/17/22/27/28/31           | 48               | 30           | ICR32           | 33C <sub>H</sub> | 000FFF3C <sub>H</sub>   | 32                  |
| Clock calibration unit (CR oscillation)                        | 49               | 31           | ICR33           | 338 <sub>H</sub> | 000FFF38 <sub>H</sub>   | 33                  |
| Multi-function serial interface ch.9 (transmission completed)  |                  |              |                 |                  |                         |                     |
| 16-bit OCU 0 (match) / 16-bit OCU 1 (match)                    |                  |              |                 |                  |                         |                     |
| 32-bit Free-run timer 4  | 50               | 32           | ICR34           | 334 <sub>H</sub> | 000FFF34 <sub>H</sub>   | 34 <sup>*5</sup>    |
| 16-bit OCU 2 (match) / 16-bit OCU 3 (match)                    |                  |              |                 |                  |                         |                     |
| 16-bit OCU 4 (match) / 16-bit OCU 5 (match)                    |                  |              |                 |                  |                         |                     |
| 32-bit ICU6 (fetching/measurement)                             | 52               | 34           | ICR36           | 32C <sub>H</sub> | 000FFF2C <sub>H</sub>   | 36 <sup>*1</sup>    |
| Multi-function serial interface ch.10 (reception completed)    |                  |              |                 |                  |                         |                     |
| Multi-function serial interface ch.10 (status)                 |                  |              |                 |                  |                         |                     |
| Multi-function serial interface ch.10 (transmission completed) | 53               | 35           | ICR37           | 328 <sub>H</sub> | 000FFF28 <sub>H</sub>   | 37                  |
| 32-bit ICU8 (fetching/measurement)                             | 54               | 36           | ICR38           | 324 <sub>H</sub> | 000FFF24 <sub>H</sub>   | 38 <sup>*1</sup>    |
| Multi-function serial interface ch.11 (reception completed)    |                  |              |                 |                  |                         |                     |
| Multi-function serial interface ch.11 (status)                 |                  |              |                 |                  |                         |                     |
| 32-bit ICU9 (fetching/measurement)                             | 55               | 37           | ICR39           | 320 <sub>H</sub> | 000FFF20 <sub>H</sub>   | 39                  |
| WG dead timer underflow 0 / 1/ 2                               |                  |              |                 |                  |                         |                     |
| WG dead timer reload 0 / 1/ 2                                  |                  |              |                 |                  |                         |                     |
| WG DTTI 0  |                  |              |                 |                  |                         |                     |
| 32-bit ICU4 (fetching/measurement)                             | 56               | 38           | ICR40           | 31C <sub>H</sub> | 000FFF1C <sub>H</sub>   | 40                  |
| Multi-function serial interface ch.11 (transmission completed) |                  |              |                 |                  |                         |                     |
| 32-bit ICU5 (fetching/measurement)                             |                  |              |                 |                  |                         |                     |
| A/D converter<br>32/34/35/37/38/40/41/42/43/44/45/46/47        | 57               | 39           | ICR41           | 318 <sub>H</sub> | 000FFF18 <sub>H</sub>   | 41                  |
| 32-bit OCU7/11 (match)   | 58               | 3A           | ICR42           | 314 <sub>H</sub> | 000FFF14 <sub>H</sub>   | 42                  |
| 32-bit OCU8/9 (match)  | 59               | 3B           | ICR43           | 310 <sub>H</sub> | 000FFF10 <sub>H</sub>   | 43                  |
| -  | 60               | 3C           | ICR44           | 30C <sub>H</sub> | 000FFF0C <sub>H</sub>   | - <sup>*6</sup>     |
| -  | 61               | 3D           | ICR45           | 308 <sub>H</sub> | 000FFF08 <sub>H</sub>   | -                   |
| -  |                  |              |                 |                  |                         |                     |
| DMAC0/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15                      | 62               | 3E           | ICR46           | 304 <sub>H</sub> | 000FFF04 <sub>H</sub>   | -                   |
| Delay interrupt  | 63               | 3F           | ICR47           | 300 <sub>H</sub> | 000FFF00 <sub>H</sub>   | -                   |
| System reserved<br>(Used for REALOS <sup>TM*8</sup> )          | 64               | 40           | -               | 2FC <sub>H</sub> | 000FFEFC <sub>H</sub>   | -                   |
| System reserved<br>(Used for REALOS)                           | 65               | 41           | -               | 2F8 <sub>H</sub> | 000FFE8 <sub>H</sub>    | -                   |



| Interrupt Factor              | Interrupt Number |               | Interrupt Level | Offset                                    | Default Address for TBR                           | RN |
|-------------------------------|------------------|---------------|-----------------|---|---|----|
|                               | Decimal          | Hexa Decimal  |                 |   |   |    |
| Used with the INT instruction | 66<br> <br>255   | 42<br> <br>FF | -               | 2F4 <sub>H</sub><br> <br>000 <sub>H</sub> | 000FFE4 <sub>H</sub><br> <br>000FFC0 <sub>H</sub> | -  |

**Note:** It does not support a DMA transfer request caused by an interrupt generated from a peripheral to which no RN (Resource Number) is assigned.

\*1: It does not support a DMA transfer by the status of the multi-function serial interface and I<sup>2</sup>C reception.

\*2: Reload timer ch.4 to ch.7 do not support a DMA transfer by the interrupt.

\*3: PPG ch.24 to ch.47 do not support a DMA transfer by the interrupt.

\*4: The clock calibration unit does not support a DMA transfer by the interrupt.

\*5: 32-bit Free-run timer ch.3, ch.4 and ch.5 do not support a DMA transfer by the interrupt.

\*6: There is no resource corresponding to the interrupt level.

\*7: It does not support a DMA transfer by the external low-voltage detection interrupt.

\*8: REALOS is a trademark of Cypress.



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| Interrupt Factor  | Interrupt Number |              | Interrupt Level               | Offset           | Default Address for TBR | RN   |
|---|------------------|--------------|-------------------------------|------------------|-------------------------|------|
|   | Decimal          | Hexa Decimal |                               |                  |                         |      |
| Reset   | 0                | 0            | -                             | 3FC <sub>H</sub> | 000FFFFC <sub>H</sub>   | -    |
| System reserved   | 1                | 1            | -                             | 3F8 <sub>H</sub> | 000FFFF8 <sub>H</sub>   | -    |
| System reserved   | 2                | 2            | -                             | 3F4 <sub>H</sub> | 000FFFF4 <sub>H</sub>   | -    |
| System reserved   | 3                | 3            | -                             | 3F0 <sub>H</sub> | 000FFFF0 <sub>H</sub>   | -    |
| System reserved   | 4                | 4            | -                             | 3EC <sub>H</sub> | 000FFFE <sub>C</sub>    | -    |
| FPU exception   | 5                | 5            | -                             | 3E8 <sub>H</sub> | 000FFFE8 <sub>H</sub>   | -    |
| Exception of instruction access protection violation          | 6                | 6            | -                             | 3E4 <sub>H</sub> | 000FFFE4 <sub>H</sub>   | -    |
| Exception of data access protection violation                 | 7                | 7            | -                             | 3E0 <sub>H</sub> | 000FFFE0 <sub>H</sub>   | -    |
| Data access error interrupt                                   | 8                | 8            | -                             | 3DC <sub>H</sub> | 000FFFD <sub>C</sub>    | -    |
| INTE instruction  | 9                | 9            | -                             | 3D8 <sub>H</sub> | 000FFFD8 <sub>H</sub>   | -    |
| Instruction break   | 10               | 0A           | -                             | 3D4 <sub>H</sub> | 000FFFD4 <sub>H</sub>   | -    |
| System reserved   | 11               | 0B           | -                             | 3D0 <sub>H</sub> | 000FFFD0 <sub>H</sub>   | -    |
| System reserved   | 12               | 0C           | -                             | 3CC <sub>H</sub> | 000FFFC <sub>C</sub>    | -    |
| System reserved   | 13               | 0D           | -                             | 3C8 <sub>H</sub> | 000FFFC8 <sub>H</sub>   | -    |
| Exception of invalid instruction                              | 14               | 0E           | -                             | 3C4 <sub>H</sub> | 000FFFC4 <sub>H</sub>   | -    |
| NMI request   | 15               | 0F           | 15 (F <sub>H</sub> )<br>Fixed | 3C0 <sub>H</sub> | 000FFFC0 <sub>H</sub>   | -    |
| Error generation during internal bus diagnosis                |                  |              |                               |                  |                         |      |
| XBS RAM double-bit error generation                           |                  |              |                               |                  |                         |      |
| Backup RAM double-bit error generation                        |                  |              |                               |                  |                         |      |
| TPU violation   |                  |              |                               |                  |                         |      |
| External interrupt 0-7  | 16               | 10           | ICR00                         | 3BC <sub>H</sub> | 000FFFB <sub>C</sub>    | 0    |
| External interrupt 8-15                                       | 17               | 11           | ICR01                         | 3B8 <sub>H</sub> | 000FFFB8 <sub>H</sub>   | 1*7  |
| External low-voltage detection interrupt                      |                  |              |                               |                  |                         |      |
| Reload timer 0/1/4/5  | 18               | 12           | ICR02                         | 3B4 <sub>H</sub> | 000FFFB4 <sub>H</sub>   | 2*2  |
| Reload timer 3/6/7  | 19               | 13           | ICR03                         | 3B0 <sub>H</sub> | 000FFFB0 <sub>H</sub>   | 3*2  |
| Multi-function serial interface ch.0 (reception completed)    | 20               | 14           | ICR04                         | 3AC <sub>H</sub> | 000FFFA <sub>C</sub>    | 4*1  |
| Multi-function serial interface ch.0 (status)                 |                  |              |                               |                  |                         |      |
| Multi-function serial interface ch.0 (transmission completed) | 21               | 15           | ICR05                         | 3A8 <sub>H</sub> | 000FFFA8 <sub>H</sub>   | 5*1  |
| -   | 22               | 16           | ICR06                         | 3A4 <sub>H</sub> | 000FFFA4 <sub>H</sub>   | -*6  |
| -   | 23               | 17           | ICR07                         | 3A0 <sub>H</sub> | 000FFFA0 <sub>H</sub>   | -*6  |
| Multi-function serial interface ch.2 (reception completed)    | 24               | 18           | ICR08                         | 39C <sub>H</sub> | 000FFF9 <sub>C</sub>    | 8*1  |
| Multi-function serial interface ch.2 (status)                 |                  |              |                               |                  |                         |      |
| Multi-function serial interface ch.2 (transmission completed) | 25               | 19           | ICR09                         | 398 <sub>H</sub> | 000FFF98 <sub>H</sub>   | 9*1  |
| Multi-function serial interface ch.3 (reception completed)    | 26               | 1A           | ICR10                         | 394 <sub>H</sub> | 000FFF94 <sub>H</sub>   | 10*1 |
| Multi-function serial interface ch.3 (status)                 |                  |              |                               |                  |                         |      |
| Multi-function serial interface ch.3 (transmission completed) | 27               | 1B           | ICR11                         | 390 <sub>H</sub> | 000FFF90 <sub>H</sub>   | 11   |



| Interrupt Factor  | Interrupt Number |              | Interrupt Level | Offset           | Default Address for TBR | RN               |
|---|------------------|--------------|-----------------|------------------|-------------------------|------------------|
|   | Decimal          | Hexa Decimal |                 |                  |                         |                  |
| Multi-function serial interface ch.4 (reception completed)    | 28               | 1C           | ICR12           | 38C <sub>H</sub> | 000FFF8C <sub>H</sub>   | 12* <sup>1</sup> |
| Multi-function serial interface ch.4 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.4 (transmission completed) | 29               | 1D           | ICR13           | 388 <sub>H</sub> | 000FFF88 <sub>H</sub>   | 13               |
| Multi-function serial interface ch.5 (reception completed)    | 30               | 1E           | ICR14           | 384 <sub>H</sub> | 000FFF84 <sub>H</sub>   | 14* <sup>1</sup> |
| Multi-function serial interface ch.5 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.5 (transmission completed) | 31               | 1F           | ICR15           | 380 <sub>H</sub> | 000FFF80 <sub>H</sub>   | 15               |
| Multi-function serial interface ch.6 (reception completed)    | 32               | 20           | ICR16           | 37C <sub>H</sub> | 000FFF7C <sub>H</sub>   | 16* <sup>1</sup> |
| Multi-function serial interface ch.6 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.6 (transmission completed) | 33               | 21           | ICR17           | 378 <sub>H</sub> | 000FFF78 <sub>H</sub>   | 17               |
| CAN0  | 34               | 22           | ICR18           | 374 <sub>H</sub> | 000FFF74 <sub>H</sub>   | -                |
| CAN1  | 35               | 23           | ICR19           | 370 <sub>H</sub> | 000FFF70 <sub>H</sub>   | -                |
| RAM diagnosis end   |                  |              |                 |                  |                         |                  |
| RAM initialization completion                                 |                  |              |                 |                  |                         |                  |
| Error generation during RAM diagnosis                         |                  |              |                 |                  |                         |                  |
| Backup RAM diagnosis end                                      |                  |              |                 |                  |                         |                  |
| Backup RAM initialization completion                          |                  |              |                 |                  |                         |                  |
| Error generation during Backup RAM diagnosis                  |                  |              |                 |                  |                         |                  |
| CAN2  | 36               | 24           | ICR20           | 36C <sub>H</sub> | 000FFF6C <sub>H</sub>   | -                |
| Up/down counter 0   |                  |              |                 |                  |                         |                  |
| Up/down counter 1   |                  |              |                 |                  |                         |                  |
| Real time clock   | 37               | 25           | ICR21           | 368 <sub>H</sub> | 000FFF68 <sub>H</sub>   | -                |
| -   | 38               | 26           | ICR22           | 364 <sub>H</sub> | 000FFF64 <sub>H</sub>   | -* <sup>6</sup>  |
| 16-bit Free-run timer 0 (0 detection) / (compare clear)       | 39               | 27           | ICR23           | 360 <sub>H</sub> | 000FFF60 <sub>H</sub>   | 23               |
| PPG 1/10/11/20/30/31  |                  |              |                 |                  |                         |                  |
| 16-bit Free-run timer 1 (0 detection) / (compare clear)       | 40               | 28           | ICR24           | 35C <sub>H</sub> | 000FFF5C <sub>H</sub>   | 24* <sup>3</sup> |
| PPG 2/3/12/13/23/43   |                  |              |                 |                  |                         |                  |
| 16-bit Free-run timer 2 (0 detection) / (compare clear)       | 41               | 29           | ICR25           | 358 <sub>H</sub> | 000FFF58 <sub>H</sub>   | 25* <sup>3</sup> |
| PPG 4/5/15/24/35  |                  |              |                 |                  |                         |                  |
| PPG 7/16/17/26/27/37  | 42               | 2A           | ICR26           | 354 <sub>H</sub> | 000FFF54 <sub>H</sub>   | 26* <sup>3</sup> |
| PPG 8/18/19/29  | 43               | 2B           | ICR27           | 350 <sub>H</sub> | 000FFF50 <sub>H</sub>   | 27* <sup>3</sup> |
| PPG 8/18/19/29  | 44               | 2C           | ICR28           | 34C <sub>H</sub> | 000FFF4C <sub>H</sub>   | 28* <sup>3</sup> |
| 16-bit ICU 0 (fetching) / 16-bit ICU 1 (fetching)             | 45               | 2D           | ICR29           | 348 <sub>H</sub> | 000FFF48 <sub>H</sub>   | 29               |
| Main timer  | 46               | 2E           | ICR30           | 344 <sub>H</sub> | 000FFF44 <sub>H</sub>   | 30               |
| Sub timer   |                  |              |                 |                  |                         |                  |
| PLL timer   |                  |              |                 |                  |                         |                  |
| 16-bit ICU 2 (fetching) /16-bit ICU 3 (fetching)              |                  |              |                 |                  |                         |                  |



## CY91520 Series

| Interrupt Factor   | Interrupt Number |              | Interrupt Level | Offset           | Default Address for TBR | RN                  |
|--|------------------|--------------|-----------------|------------------|-------------------------|---------------------|
|  | Decimal          | Hexa Decimal |                 |                  |                         |                     |
| Clock calibration unit (sub oscillation)                         | 47               | 2F           | ICR31           | 340 <sub>H</sub> | 000FFF40 <sub>H</sub>   | 31 <sup>*1,*4</sup> |
| Multi-function serial interface ch.9 (reception completed)       |                  |              |                 |                  |                         |                     |
| Multi-function serial interface ch.9 (status)                    |                  |              |                 |                  |                         |                     |
| A/D converter<br>0/1/7/10/11/12/14/15/16/17/19/22/26/27/28/31    | 48               | 30           | ICR32           | 33C <sub>H</sub> | 000FFF3C <sub>H</sub>   | 32                  |
| Clock calibration unit (CR oscillation)                          | 49               | 31           | ICR33           | 338 <sub>H</sub> | 000FFF38 <sub>H</sub>   | 33                  |
| Multi-function serial interface ch.9 (transmission completed)    |                  |              |                 |                  |                         |                     |
| 16-bit OCU 0 (match) / 16-bit OCU 1 (match)                      |                  |              |                 |                  |                         |                     |
| 32-bit Free-run timer 4  | 50               | 32           | ICR34           | 334 <sub>H</sub> | 000FFF34 <sub>H</sub>   | 34 <sup>*5</sup>    |
| 16-bit OCU 2 (match) / 16-bit OCU 3 (match)                      |                  |              |                 |                  |                         |                     |
| 32-bit Free-run timer 5  | 51               | 33           | ICR35           | 330 <sub>H</sub> | 000FFF30 <sub>H</sub>   | 35 <sup>*5</sup>    |
| 16-bit OCU 4 (match) / 16-bit OCU 5 (match)                      |                  |              |                 |                  |                         |                     |
| 32-bit ICU6 (fetching/measurement)                               | 52               | 34           | ICR36           | 32C <sub>H</sub> | 000FFF2C <sub>H</sub>   | 36 <sup>*1</sup>    |
| Multi-function serial interface ch.10 (reception completed)      |                  |              |                 |                  |                         |                     |
| Multi-function serial interface ch.10 (status)                   |                  |              |                 |                  |                         |                     |
| Multi-function serial interface ch.10 (transmission completed)   | 53               | 35           | ICR37           | 328 <sub>H</sub> | 000FFF28 <sub>H</sub>   | 37                  |
| 32-bit ICU8 (fetching/measurement)                               |                  |              |                 |                  |                         |                     |
| Multi-function serial interface ch.11 (reception completed)      | 54               | 36           | ICR38           | 324 <sub>H</sub> | 000FFF24 <sub>H</sub>   | 38 <sup>*1</sup>    |
| Multi-function serial interface ch.11 (status)                   |                  |              |                 |                  |                         |                     |
| 32-bit ICU9 (fetching/measurement)                               |                  |              |                 |                  |                         |                     |
| WG dead timer underflow 0 / 1/ 2                                 | 55               | 37           | ICR39           | 320 <sub>H</sub> | 000FFF20 <sub>H</sub>   | 39                  |
| WG dead timer reload 0 / 1/ 2                                    |                  |              |                 |                  |                         |                     |
| WG DTTI 0  |                  |              |                 |                  |                         |                     |
| 32-bit ICU4 (fetching/measurement)                               | 56               | 38           | ICR40           | 31C <sub>H</sub> | 000FFF1C <sub>H</sub>   | 40                  |
| Multi-function serial interface ch.11 (transmission completed)   |                  |              |                 |                  |                         |                     |
| 32-bit ICU5 (fetching/measurement)                               | 57               | 39           | ICR41           | 318 <sub>H</sub> | 000FFF18 <sub>H</sub>   | 41                  |
| A/D converter<br>32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47 |                  |              |                 |                  |                         |                     |
| 32-bit OCU7/11 (match)   |                  |              |                 |                  |                         |                     |
| 32-bit OCU8/9 (match)  | 58               | 3A           | ICR42           | 314 <sub>H</sub> | 000FFF14 <sub>H</sub>   | 42                  |
| -  | 59               | 3B           | ICR43           | 310 <sub>H</sub> | 000FFF10 <sub>H</sub>   | 43                  |
| -  | 60               | 3C           | ICR44           | 30C <sub>H</sub> | 000FFF0C <sub>H</sub>   | - <sup>*6</sup>     |
| Base timer 1 IRQ0  | 61               | 3D           | ICR45           | 308 <sub>H</sub> | 000FFF08 <sub>H</sub>   | 45                  |
| Base timer 1 IRQ1  |                  |              |                 |                  |                         |                     |
| -  |                  |              |                 |                  |                         |                     |
| DMAC<br>0/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15                    | 62               | 3E           | ICR46           | 304 <sub>H</sub> | 000FFF04 <sub>H</sub>   | -                   |
| Delay interrupt  | 63               | 3F           | ICR47           | 300 <sub>H</sub> | 000FFF00 <sub>H</sub>   | -                   |



| Interrupt Factor                     | Interrupt Number |              | Interrupt Level | Offset               | Default Address for TBR   | RN |
|--------------------------------------|------------------|--------------|-----------------|----------------------|---------------------------|----|
|                                      | Decimal          | Hexa Decimal |                 |                      |                           |    |
| System reserved<br>(Used for REALOS) | 64               | 40           | -               | 2FC <sub>H</sub>     | 000FFEFC <sub>H</sub>     | -  |
| System reserved<br>(Used for REALOS) | 65               | 41           | -               | 2F8 <sub>H</sub>     | 000FFE8 <sub>H</sub>      | -  |
| Used with the INT instruction        | 66               | 42           | -               | 2F4 <sub>H</sub>     | 000FEF4 <sub>H</sub>      | -  |
|                                      | <br>255          | <br>FF       |                 | <br>000 <sub>H</sub> | <br>000FFC00 <sub>H</sub> |    |

Note: It does not support a DMA transfer request caused by an interrupt generated from a peripheral to which no RN (Resource Number) is assigned.

- \*1: It does not support a DMA transfer by the status of the multi-function serial interface and I<sup>2</sup>C reception.
- \*2: Reload timer ch.4 to ch.7 do not support a DMA transfer by the interrupt.
- \*3: PPG ch.24 to ch.47 do not support a DMA transfer by the interrupt.
- \*4: The clock calibration unit does not support a DMA transfer by the interrupt.
- \*5: 32-bit Free-run timer ch.3, ch.4 and ch.5 do not support a DMA transfer by the interrupt.
- \*6: There is no resource corresponding to the interrupt level.
- \*7: It does not support a DMA transfer by the external low-voltage detection interrupt.



## 100 Pins

| Interrupt Factor  | Interrupt number |              | Interrupt Level               | Offset           | Default Address for TBR | RN               |
|---|------------------|--------------|-------------------------------|------------------|-------------------------|------------------|
|   | Decimal          | Hexa Decimal |                               |                  |                         |                  |
| Reset   | 0                | 0            | -                             | 3FC <sub>H</sub> | 000FFFFC <sub>H</sub>   | -                |
| System reserved   | 1                | 1            | -                             | 3F8 <sub>H</sub> | 000FFFF8 <sub>H</sub>   | -                |
| System reserved   | 2                | 2            | -                             | 3F4 <sub>H</sub> | 000FFFF4 <sub>H</sub>   | -                |
| System reserved   | 3                | 3            | -                             | 3F0 <sub>H</sub> | 000FFFF0 <sub>H</sub>   | -                |
| System reserved   | 4                | 4            | -                             | 3EC <sub>H</sub> | 000FFFE <sub>C</sub>    | -                |
| FPU exception   | 5                | 5            | -                             | 3E8 <sub>H</sub> | 000FFFE8 <sub>H</sub>   | -                |
| Exception of instruction access protection violation          | 6                | 6            | -                             | 3E4 <sub>H</sub> | 000FFFE4 <sub>H</sub>   | -                |
| Exception of data access protection violation                 | 7                | 7            | -                             | 3E0 <sub>H</sub> | 000FFFE0 <sub>H</sub>   | -                |
| Data access error interrupt                                   | 8                | 8            | -                             | 3DC <sub>H</sub> | 000FFFD <sub>C</sub>    | -                |
| INTE instruction  | 9                | 9            | -                             | 3D8 <sub>H</sub> | 000FFFD8 <sub>H</sub>   | -                |
| Instruction break   | 10               | 0A           | -                             | 3D4 <sub>H</sub> | 000FFFD4 <sub>H</sub>   | -                |
| System reserved   | 11               | 0B           | -                             | 3D0 <sub>H</sub> | 000FFFD0 <sub>H</sub>   | -                |
| System reserved   | 12               | 0C           | -                             | 3CC <sub>H</sub> | 000FFFC <sub>C</sub>    | -                |
| System reserved   | 13               | 0D           | -                             | 3C8 <sub>H</sub> | 000FFFC8 <sub>H</sub>   | -                |
| Exception of invalid instruction                              | 14               | 0E           | -                             | 3C4 <sub>H</sub> | 000FFFC4 <sub>H</sub>   | -                |
| NMI request   | 15               | 0F           | 15 (F <sub>H</sub> )<br>Fixed | 3C0 <sub>H</sub> | 000FFFC0 <sub>H</sub>   | -                |
| Error generation during internal bus diagnosis                |                  |              |                               |                  |                         |                  |
| XBS RAM double-bit error generation                           |                  |              |                               |                  |                         |                  |
| Backup RAM double-bit error generation                        |                  |              |                               |                  |                         |                  |
| TPU violation   |                  |              |                               |                  |                         |                  |
| External interrupt 0-7  | 16               | 10           | ICR00                         | 3BC <sub>H</sub> | 000FFFB <sub>C</sub>    | 0                |
| External interrupt 8-15                                       | 17               | 11           | ICR01                         | 3B8 <sub>H</sub> | 000FFFB8 <sub>H</sub>   | 1* <sup>7</sup>  |
| External low-voltage detection interrupt                      |                  |              |                               |                  |                         |                  |
| Reload timer 0/1/4/5  | 18               | 12           | ICR02                         | 3B4 <sub>H</sub> | 000FFFB4 <sub>H</sub>   | 2* <sup>2</sup>  |
| Reload timer 2/3/6/7  | 19               | 13           | ICR03                         | 3B0 <sub>H</sub> | 000FFFB0 <sub>H</sub>   | 3* <sup>2</sup>  |
| Multi-function serial interface ch.0 (reception completed)    | 20               | 14           | ICR04                         | 3AC <sub>H</sub> | 000FFFA <sub>C</sub>    | 4* <sup>1</sup>  |
| Multi-function serial interface ch.0 (status)                 |                  |              |                               |                  |                         |                  |
| Multi-function serial interface ch.0 (transmission completed) | 21               | 15           | ICR05                         | 3A8 <sub>H</sub> | 000FFFA8 <sub>H</sub>   | 5* <sup>1</sup>  |
| Multi-function serial interface ch.1 (reception completed)    | 22               | 16           | ICR06                         | 3A4 <sub>H</sub> | 000FFFA4 <sub>H</sub>   | 6* <sup>1</sup>  |
| Multi-function serial interface ch.1 (status)                 |                  |              |                               |                  |                         |                  |
| Multi-function serial interface ch.1 (transmission completed) | 23               | 17           | ICR07                         | 3A0 <sub>H</sub> | 000FFFA0 <sub>H</sub>   | 7* <sup>1</sup>  |
| Multi-function serial interface ch.2 (reception completed)    | 24               | 18           | ICR08                         | 39C <sub>H</sub> | 000FFF9 <sub>C</sub>    | 8* <sup>1</sup>  |
| Multi-function serial interface ch.2 (status)                 |                  |              |                               |                  |                         |                  |
| Multi-function serial interface ch.2 (transmission completed) | 25               | 19           | ICR09                         | 398 <sub>H</sub> | 000FFF98 <sub>H</sub>   | 9* <sup>1</sup>  |
| Multi-function serial interface ch.3 (reception completed)    | 26               | 1A           | ICR10                         | 394 <sub>H</sub> | 000FFF94 <sub>H</sub>   | 10* <sup>1</sup> |
| Multi-function serial interface ch.3 (status)                 |                  |              |                               |                  |                         |                  |



| Interrupt Factor  | Interrupt number |              | Interrupt Level | Offset           | Default Address for TBR | RN               |
|---|------------------|--------------|-----------------|------------------|-------------------------|------------------|
|   | Decimal          | Hexa Decimal |                 |                  |                         |                  |
| Multi-function serial interface ch.3 (transmission completed) | 27               | 1B           | ICR11           | 390 <sub>H</sub> | 000FFF90 <sub>H</sub>   | 11               |
| Multi-function serial interface ch.4 (reception completed)    | 28               | 1C           | ICR12           | 38C <sub>H</sub> | 000FFF8C <sub>H</sub>   | 12* <sup>1</sup> |
| Multi-function serial interface ch.4 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.4 (transmission completed) | 29               | 1D           | ICR13           | 388 <sub>H</sub> | 000FFF88 <sub>H</sub>   | 13               |
| Multi-function serial interface ch.5 (reception completed)    | 30               | 1E           | ICR14           | 384 <sub>H</sub> | 000FFF84 <sub>H</sub>   | 14* <sup>1</sup> |
| Multi-function serial interface ch.5 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.5 (transmission completed) | 31               | 1F           | ICR15           | 380 <sub>H</sub> | 000FFF80 <sub>H</sub>   | 15               |
| Multi-function serial interface ch.6 (reception completed)    | 32               | 20           | ICR16           | 37C <sub>H</sub> | 000FFF7C <sub>H</sub>   | 16* <sup>1</sup> |
| Multi-function serial interface ch.6 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.6 (transmission completed) | 33               | 21           | ICR17           | 378 <sub>H</sub> | 000FFF78 <sub>H</sub>   | 17               |
| CAN0  | 34               | 22           | ICR18           | 374 <sub>H</sub> | 000FFF74 <sub>H</sub>   | -                |
| CAN1  | 35               | 23           | ICR19           | 370 <sub>H</sub> | 000FFF70 <sub>H</sub>   | -                |
| RAM diagnosis end   |                  |              |                 |                  |                         |                  |
| RAM initialization completion                                 |                  |              |                 |                  |                         |                  |
| Error generation during RAM diagnosis                         |                  |              |                 |                  |                         |                  |
| Backup RAM diagnosis end                                      |                  |              |                 |                  |                         |                  |
| Backup RAM initialization completion                          |                  |              |                 |                  |                         |                  |
| Error generation during Backup RAM diagnosis                  |                  |              |                 |                  |                         |                  |
| CAN2  | 36               | 24           | ICR20           | 36C <sub>H</sub> | 000FFF6C <sub>H</sub>   | -                |
| Up/down counter 0   |                  |              |                 |                  |                         |                  |
| Up/down counter 1   |                  |              |                 |                  |                         |                  |
| Real time clock   | 37               | 25           | ICR21           | 368 <sub>H</sub> | 000FFF68 <sub>H</sub>   | -                |
| Multi-function serial interface ch.7 (reception completed)    | 38               | 26           | ICR22           | 364 <sub>H</sub> | 000FFF64 <sub>H</sub>   | 22* <sup>1</sup> |
| Multi-function serial interface ch.7 (status)                 |                  |              |                 |                  |                         |                  |
| 16-bit Free-running timer 0 (0 detection) / (compare clear)   | 39               | 27           | ICR23           | 360 <sub>H</sub> | 000FFF60 <sub>H</sub>   | 23               |
| Multi-function serial interface ch.7 (transmission completed) |                  |              |                 |                  |                         |                  |
| PPG 1/10/11/20/21/30/31                                       | 40               | 28           | ICR24           | 35C <sub>H</sub> | 000FFF5C <sub>H</sub>   | 24* <sup>3</sup> |
| 16-bit Free-run timer 1 (0 detection) / (compare clear)       |                  |              |                 |                  |                         |                  |
| PPG 2/3/12/13/23/32/43  | 41               | 29           | ICR25           | 358 <sub>H</sub> | 000FFF58 <sub>H</sub>   | 25* <sup>3</sup> |
| 16-bit Free-run timer 2 (0 detection) / (compare clear)       |                  |              |                 |                  |                         |                  |
| PPG 4/5/14/15/24/25/35/44                                     | 42               | 2A           | ICR26           | 354 <sub>H</sub> | 000FFF54 <sub>H</sub>   | 26* <sup>3</sup> |
| PPG 6/7/16/17/26/27/37  | 43               | 2B           | ICR27           | 350 <sub>H</sub> | 000FFF50 <sub>H</sub>   | 27* <sup>3</sup> |
| PPG 8/9/18/19/28/29   | 44               | 2C           | ICR28           | 34C <sub>H</sub> | 000FFF4C <sub>H</sub>   | 28* <sup>3</sup> |



| Interrupt Factor   | Interrupt number |              | Interrupt Level | Offset           | Default Address for TBR | RN          |
|--|------------------|--------------|-----------------|------------------|-------------------------|-------------|
|  | Decimal          | Hexa Decimal |                 |                  |                         |             |
| Multi-function serial interface ch.8 (reception completed)               | 45               | 2D           | ICR29           | 348 <sub>H</sub> | 000FFF48 <sub>H</sub>   | 29*1        |
| Multi-function serial interface ch.8 (status)                            |                  |              |                 |                  |                         |             |
| 16-bit ICU 0 (fetching) / 16-bit ICU 1 (fetching)                        |                  |              |                 |                  |                         |             |
| Main timer   | 46               | 2E           | ICR30           | 344 <sub>H</sub> | 000FFF44 <sub>H</sub>   | 30          |
| Sub timer  |                  |              |                 |                  |                         |             |
| PLL timer  |                  |              |                 |                  |                         |             |
| Multi-function serial interface ch.8 (transmission completed)            |                  |              |                 |                  |                         |             |
| 16-bit ICU 2 (fetching) / 16-bit ICU 3 (fetching)                        | 47               | 2F           | ICR31           | 340 <sub>H</sub> | 000FFF40 <sub>H</sub>   | 31*1,<br>*4 |
| Clock calibration unit (sub oscillation)                                 |                  |              |                 |                  |                         |             |
| Multi-function serial interface ch.9 (reception completed)               |                  |              |                 |                  |                         |             |
| Multi-function serial interface ch.9 (status)                            | 48               | 30           | ICR32           | 33C <sub>H</sub> | 000FFF3C <sub>H</sub>   | 32          |
| A/D converter 0/1/7/9/10/11/12/13/14/15/16 17/18/19/22/23/26/27/28/29/31 |                  |              |                 |                  |                         |             |
| Clock calibration unit (CR oscillation)                                  |                  |              |                 |                  |                         |             |
| Multi-function serial interface ch.9 (transmission completed)            | 49               | 31           | ICR33           | 338 <sub>H</sub> | 000FFF38 <sub>H</sub>   | 33          |
| 16-bit OCU 0 (match) / 16-bit OCU 1 (match)                              |                  |              |                 |                  |                         |             |
| 32-bit Free-run timer 4  | 50               | 32           | ICR34           | 334 <sub>H</sub> | 000FFF34 <sub>H</sub>   | 34*5        |
| 16-bit OCU 2 (match) / 16-bit OCU 3 (match)                              |                  |              |                 |                  |                         |             |
| 32-bit Free-run timer 3/5  | 51               | 33           | ICR35           | 330 <sub>H</sub> | 000FFF30 <sub>H</sub>   | 35*5        |
| 16-bit OCU 4 (match) / 16-bit OCU 5 (match)                              |                  |              |                 |                  |                         |             |
| 32-bit ICU6 (fetching/measurement)                                       | 52               | 34           | ICR36           | 32C <sub>H</sub> | 000FFF2C <sub>H</sub>   | 36*1        |
| Multi-function serial interface ch.10 (reception completed)              |                  |              |                 |                  |                         |             |
| Multi-function serial interface ch.10 (status)                           |                  |              |                 |                  |                         |             |
| 32-bit ICU7 (fetching/measurement)                                       | 53               | 35           | ICR37           | 328 <sub>H</sub> | 000FFF28 <sub>H</sub>   | 37          |
| Multi-function serial interface ch.10 (transmission completed)           |                  |              |                 |                  |                         |             |
| 32-bit ICU8 (fetching/measurement)                                       | 54               | 36           | ICR38           | 324 <sub>H</sub> | 000FFF24 <sub>H</sub>   | 38*1        |
| Multi-function serial interface ch.11 (reception completed)              |                  |              |                 |                  |                         |             |
| Multi-function serial interface ch.11 (status)                           |                  |              |                 |                  |                         |             |
| 32-bit ICU9 (fetching/measurement)                                       | 55               | 37           | ICR39           | 320 <sub>H</sub> | 000FFF20 <sub>H</sub>   | 39          |
| WG dead timer underflow 0/1/2  |                  |              |                 |                  |                         |             |
| WG dead timer reload 0/1/2   |                  |              |                 |                  |                         |             |
| WG DTTI 0  | 56               | 38           | ICR40           | 31C <sub>H</sub> | 000FFF1C <sub>H</sub>   | 40          |
| 32-bit ICU4 (fetching/measurement)                                       |                  |              |                 |                  |                         |             |
| Multi-function serial interface ch.11 (transmission completed)           |                  |              |                 |                  |                         |             |



| Interrupt Factor   | Interrupt number |              | Interrupt Level | Offset               | Default Address for TBR   | RN |
|--|------------------|--------------|-----------------|----------------------|---------------------------|----|
|  | Decimal          | Hexa Decimal |                 |                      |                           |    |
| 32-bit ICU5 (fetching/measurement)                                   | 57               | 39           | ICR41           | 318 <sub>H</sub>     | 000FFF18 <sub>H</sub>     | 41 |
| A/D converter<br>32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/<br>47 |                  |              |                 |                      |                           |    |
| 32-bit OCU 6/7/10/11 (match)   | 58               | 3A           | ICR42           | 314 <sub>H</sub>     | 000FFF14 <sub>H</sub>     | 42 |
| 32-bit OCU 8/9 (match)   | 59               | 3B           | ICR43           | 310 <sub>H</sub>     | 000FFF10 <sub>H</sub>     | 43 |
| -  | 60               | 3C           | ICR44           | 30C <sub>H</sub>     | 000FFF0C <sub>H</sub>     | 44 |
| -  |                  |              |                 |                      |                           |    |
| Base timer 1 IRQ0  | 61               | 3D           | ICR45           | 308 <sub>H</sub>     | 000FFF08 <sub>H</sub>     | 45 |
| Base timer 1 IRQ1  |                  |              |                 |                      |                           |    |
| -  |                  |              |                 |                      |                           |    |
| -  |                  |              |                 |                      |                           |    |
| DMAC 0/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15                           | 62               | 3E           | ICR46           | 304 <sub>H</sub>     | 000FFF04 <sub>H</sub>     | -  |
| Delay interrupt  | 63               | 3F           | ICR47           | 300 <sub>H</sub>     | 000FFF00 <sub>H</sub>     | -  |
| System reserved<br>(Used for REALOS)                                 | 64               | 40           | -               | 2FC <sub>H</sub>     | 000FFEFC <sub>H</sub>     | -  |
| System reserved<br>(Used for REALOS)                                 | 65               | 41           | -               | 2F8 <sub>H</sub>     | 000FFE8 <sub>H</sub>      | -  |
| Used with the INT instruction  | 66               | 42           | -               | 2F4 <sub>H</sub>     | 000FFE4 <sub>H</sub>      | -  |
|  | <br>255          | <br>FF       |                 | <br>000 <sub>H</sub> | <br>000FFC00 <sub>H</sub> |    |

Note: It does not support a DMA transfer request caused by an interrupt generated from a peripheral to which no RN (Resource Number) is assigned.

\*1: It does not support a DMA transfer by the status of the multi-function serial interface and I<sup>2</sup>C reception.

\*2: Reload timer ch.4 to ch.7 do not support a DMA transfer by the interrupt.

\*3: PPG ch.24 to ch.47 do not support a DMA transfer by the interrupt.

\*4: The clock calibration unit does not support a DMA transfer by the interrupt.

\*5: 32-bit Free-run timer ch.3, ch.4 and ch.5 do not support a DMA transfer by the interrupt.

\*6: There is no resource corresponding to the interrupt level.

\*7: It does not support a DMA transfer by the external low-voltage detection interrupt.



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| Interrupt Factor  | Interrupt Number |              | Interrupt Level               | Offset           | Default Address for TBR | RN   |
|---|------------------|--------------|-------------------------------|------------------|-------------------------|------|
|   | Decimal          | Hexa Decimal |                               |                  |                         |      |
| Reset   | 0                | 0            | -                             | 3FC <sub>H</sub> | 000FFFFC <sub>H</sub>   | -    |
| System reserved   | 1                | 1            | -                             | 3F8 <sub>H</sub> | 000FFFF8 <sub>H</sub>   | -    |
| System reserved   | 2                | 2            | -                             | 3F4 <sub>H</sub> | 000FFFF4 <sub>H</sub>   | -    |
| System reserved   | 3                | 3            | -                             | 3F0 <sub>H</sub> | 000FFFF0 <sub>H</sub>   | -    |
| System reserved   | 4                | 4            | -                             | 3EC <sub>H</sub> | 000FFFE <sub>C</sub>    | -    |
| FPU exception   | 5                | 5            | -                             | 3E8 <sub>H</sub> | 000FFFE8 <sub>H</sub>   | -    |
| Exception of instruction access protection violation          | 6                | 6            | -                             | 3E4 <sub>H</sub> | 000FFFE4 <sub>H</sub>   | -    |
| Exception of data access protection violation                 | 7                | 7            | -                             | 3E0 <sub>H</sub> | 000FFFE0 <sub>H</sub>   | -    |
| Data access error interrupt                                   | 8                | 8            | -                             | 3DC <sub>H</sub> | 000FFFD <sub>C</sub>    | -    |
| INTE instruction  | 9                | 9            | -                             | 3D8 <sub>H</sub> | 000FFFD8 <sub>H</sub>   | -    |
| Instruction break   | 10               | 0A           | -                             | 3D4 <sub>H</sub> | 000FFFD4 <sub>H</sub>   | -    |
| System reserved   | 11               | 0B           | -                             | 3D0 <sub>H</sub> | 000FFFD0 <sub>H</sub>   | -    |
| System reserved   | 12               | 0C           | -                             | 3CC <sub>H</sub> | 000FFFC <sub>C</sub>    | -    |
| System reserved   | 13               | 0D           | -                             | 3C8 <sub>H</sub> | 000FFFC8 <sub>H</sub>   | -    |
| Exception of invalid instruction                              | 14               | 0E           | -                             | 3C4 <sub>H</sub> | 000FFFC4 <sub>H</sub>   | -    |
| NMI request   | 15               | 0F           | 15 (F <sub>H</sub> )<br>Fixed | 3C0 <sub>H</sub> | 000FFFC0 <sub>H</sub>   | -    |
| Error generation during internal bus diagnosis                |                  |              |                               |                  |                         |      |
| XBS RAM double-bit error generation                           |                  |              |                               |                  |                         |      |
| Backup RAM double-bit error generation                        |                  |              |                               |                  |                         |      |
| TPU violation   |                  |              |                               |                  |                         |      |
| External interrupt 0-7  | 16               | 10           | ICR00                         | 3BC <sub>H</sub> | 000FFFB <sub>C</sub>    | 0    |
| External interrupt 8-15                                       | 17               | 11           | ICR01                         | 3B8 <sub>H</sub> | 000FFFB8 <sub>H</sub>   | 1*7  |
| External low-voltage detection interrupt                      |                  |              |                               |                  |                         |      |
| Reload timer 0/1/4/5  | 18               | 12           | ICR02                         | 3B4 <sub>H</sub> | 000FFFB4 <sub>H</sub>   | 2*2  |
| Reload timer 2/3/6/7  | 19               | 13           | ICR03                         | 3B0 <sub>H</sub> | 000FFFB0 <sub>H</sub>   | 3*2  |
| Multi-function serial interface ch.0 (reception completed)    | 20               | 14           | ICR04                         | 3AC <sub>H</sub> | 000FFFA <sub>C</sub>    | 4*1  |
| Multi-function serial interface ch.0 (status)                 |                  |              |                               |                  |                         |      |
| Multi-function serial interface ch.0 (transmission completed) | 21               | 15           | ICR05                         | 3A8 <sub>H</sub> | 000FFFA8 <sub>H</sub>   | 5*1  |
| Multi-function serial interface ch.1 (reception completed)    | 22               | 16           | ICR06                         | 3A4 <sub>H</sub> | 000FFFA4 <sub>H</sub>   | 6*1  |
| Multi-function serial interface ch.1 (status)                 |                  |              |                               |                  |                         |      |
| Multi-function serial interface ch.1 (transmission completed) | 23               | 17           | ICR07                         | 3A0 <sub>H</sub> | 000FFFA0 <sub>H</sub>   | 7*1  |
| Multi-function serial interface ch.2 (reception completed)    | 24               | 18           | ICR08                         | 39C <sub>H</sub> | 000FFF9 <sub>C</sub>    | 8*1  |
| Multi-function serial interface ch.2 (status)                 |                  |              |                               |                  |                         |      |
| Multi-function serial interface ch.2 (transmission completed) | 25               | 19           | ICR09                         | 398 <sub>H</sub> | 000FFF98 <sub>H</sub>   | 9*1  |
| Multi-function serial interface ch.3 (reception completed)    | 26               | 1A           | ICR10                         | 394 <sub>H</sub> | 000FFF94 <sub>H</sub>   | 10*1 |
| Multi-function serial interface ch.3 (status)                 |                  |              |                               |                  |                         |      |
| Multi-function serial interface ch.3 (transmission completed) | 27               | 1B           | ICR11                         | 390 <sub>H</sub> | 000FFF90 <sub>H</sub>   | 11   |



| Interrupt Factor  | Interrupt Number |              | Interrupt Level | Offset           | Default Address for TBR | RN               |
|---|------------------|--------------|-----------------|------------------|-------------------------|------------------|
|   | Decimal          | Hexa Decimal |                 |                  |                         |                  |
| Multi-function serial interface ch.4 (reception completed)    | 28               | 1C           | ICR12           | 38C <sub>H</sub> | 000FFF8C <sub>H</sub>   | 12* <sup>1</sup> |
| Multi-function serial interface ch.4 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.4 (transmission completed) | 29               | 1D           | ICR13           | 388 <sub>H</sub> | 000FFF88 <sub>H</sub>   | 13               |
| Multi-function serial interface ch.5 (reception completed)    | 30               | 1E           | ICR14           | 384 <sub>H</sub> | 000FFF84 <sub>H</sub>   | 14* <sup>1</sup> |
| Multi-function serial interface ch.5 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.5 (transmission completed) | 31               | 1F           | ICR15           | 380 <sub>H</sub> | 000FFF80 <sub>H</sub>   | 15               |
| Multi-function serial interface ch.6 (reception completed)    | 32               | 20           | ICR16           | 37C <sub>H</sub> | 000FFF7C <sub>H</sub>   | 16* <sup>1</sup> |
| Multi-function serial interface ch.6 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.6 (transmission completed) | 33               | 21           | ICR17           | 378 <sub>H</sub> | 000FFF78 <sub>H</sub>   | 17               |
| CAN0  | 34               | 22           | ICR18           | 374 <sub>H</sub> | 000FFF74 <sub>H</sub>   | -                |
| CAN1  | 35               | 23           | ICR19           | 370 <sub>H</sub> | 000FFF70 <sub>H</sub>   | -                |
| RAM diagnosis end   |                  |              |                 |                  |                         |                  |
| RAM initialization completion                                 |                  |              |                 |                  |                         |                  |
| Error generation during RAM diagnosis                         |                  |              |                 |                  |                         |                  |
| Backup RAM diagnosis end                                      |                  |              |                 |                  |                         |                  |
| Backup RAM initialization completion                          |                  |              |                 |                  |                         |                  |
| Error generation during Backup RAM diagnosis                  |                  |              |                 |                  |                         |                  |
| CAN2  | 36               | 24           | ICR20           | 36C <sub>H</sub> | 000FFF6C <sub>H</sub>   | -                |
| Up/down counter 0   |                  |              |                 |                  |                         |                  |
| Up/down counter 1   |                  |              |                 |                  |                         |                  |
| Real time clock   | 37               | 25           | ICR21           | 368 <sub>H</sub> | 000FFF68 <sub>H</sub>   | -                |
| Multi-function serial interface ch.7 (reception completed)    | 38               | 26           | ICR22           | 364 <sub>H</sub> | 000FFF64 <sub>H</sub>   | 22* <sup>1</sup> |
| Multi-function serial interface ch.7 (status)                 |                  |              |                 |                  |                         |                  |
| 16-bit Free-run timer 0 (0 detection) / (compare clear)       | 39               | 27           | ICR23           | 360 <sub>H</sub> | 000FFF60 <sub>H</sub>   | 23               |
| Multi-function serial interface ch.7 (transmission completed) |                  |              |                 |                  |                         |                  |
| PPG 0/1/10/11/20/21/30/31                                     | 40               | 28           | ICR24           | 35C <sub>H</sub> | 000FFF5C <sub>H</sub>   | 24* <sup>3</sup> |
| 16-bit Free-run timer 1 (0 detection) / (compare clear)       |                  |              |                 |                  |                         |                  |
| PPG 2/3/12/13/22/23/32/33/43                                  | 41               | 29           | ICR25           | 358 <sub>H</sub> | 000FFF58 <sub>H</sub>   | 25* <sup>3</sup> |
| 16-bit Free-run timer 2 (0 detection) / (compare clear)       |                  |              |                 |                  |                         |                  |
| PPG 4/5/14/15/24/25/35/44                                     | 42               | 2A           | ICR26           | 354 <sub>H</sub> | 000FFF54 <sub>H</sub>   | 26* <sup>3</sup> |
| PPG 6/7/16/17/26/27/37  | 43               | 2B           | ICR27           | 350 <sub>H</sub> | 000FFF50 <sub>H</sub>   | 27* <sup>3</sup> |
| PPG 8/9/18/19/28/29   | 44               | 2C           | ICR28           | 34C <sub>H</sub> | 000FFF4C <sub>H</sub>   | 28* <sup>3</sup> |



| Interrupt Factor   | Interrupt Number |              | Interrupt Level | Offset           | Default Address for TBR | RN       |
|--|------------------|--------------|-----------------|------------------|-------------------------|----------|
|  | Decimal          | Hexa Decimal |                 |                  |                         |          |
| Multi-function serial interface ch.8 (reception completed)                                     | 45               | 2D           | ICR29           | 348 <sub>H</sub> | 000FFF48 <sub>H</sub>   | 29*1     |
| Multi-function serial interface ch.8 (status)  |                  |              |                 |                  |                         |          |
| 16-bit ICU 0 (fetching) / 16-bit ICU 1 (fetching)  |                  |              |                 |                  |                         |          |
| Main timer   | 46               | 2E           | ICR30           | 344 <sub>H</sub> | 000FFF44 <sub>H</sub>   | 30       |
| Sub timer  |                  |              |                 |                  |                         |          |
| PLL timer  |                  |              |                 |                  |                         |          |
| Multi-function serial interface ch.8 (transmission completed)                                  |                  |              |                 |                  |                         |          |
| 16-bit ICU 2 (fetching) / 16-bit ICU 3 (fetching)  | 47               | 2F           | ICR31           | 340 <sub>H</sub> | 000FFF40 <sub>H</sub>   | 31*1, *4 |
| Clock calibration unit (sub oscillation)   |                  |              |                 |                  |                         |          |
| Multi-function serial interface ch.9 (reception completed)                                     |                  |              |                 |                  |                         |          |
| Multi-function serial interface ch.9 (status)  | 48               | 30           | ICR32           | 33C <sub>H</sub> | 000FFF3C <sub>H</sub>   | 32       |
| A/D converter<br>0/1/7/9/10/11/12/13/14/15/16/<br>17/18/19/20/21/22/23/24/25/26/27/28/29/30/31 |                  |              |                 |                  |                         |          |
| Clock calibration unit ( CR oscillation)   |                  |              |                 |                  |                         |          |
| Multi-function serial interface ch.9 (transmission completed)                                  | 49               | 31           | ICR33           | 338 <sub>H</sub> | 000FFF38 <sub>H</sub>   | 33       |
| 16-bit OCU 0 (match) / 16-bit OCU 1 (match)  |                  |              |                 |                  |                         |          |
| 32-bit Free-run timer 4  | 50               | 32           | ICR34           | 334 <sub>H</sub> | 000FFF34 <sub>H</sub>   | 34*5     |
| 16-bit OCU 2 (match) / 16-bit OCU 3 (match)  |                  |              |                 |                  |                         |          |
| 32-bit Free-run timer 3/5  | 51               | 33           | ICR35           | 330 <sub>H</sub> | 000FFF30 <sub>H</sub>   | 35*5     |
| 16-bit OCU 4 (match) / 16-bit OCU 5 (match)  |                  |              |                 |                  |                         |          |
| 32-bit ICU6 (fetching/measurement)   | 52               | 34           | ICR36           | 32C <sub>H</sub> | 000FFF2C <sub>H</sub>   | 36*1     |
| Multi-function serial interface ch.10 (reception completed)                                    |                  |              |                 |                  |                         |          |
| Multi-function serial interface ch.10 (status)   |                  |              |                 |                  |                         |          |
| 32-bit ICU7 (fetching/measurement)   | 53               | 35           | ICR37           | 328 <sub>H</sub> | 000FFF28 <sub>H</sub>   | 37       |
| Multi-function serial interface ch.10 (transmission completed)                                 |                  |              |                 |                  |                         |          |
| 32-bit ICU8 (fetching/measurement)   | 54               | 36           | ICR38           | 324 <sub>H</sub> | 000FFF24 <sub>H</sub>   | 38*1     |
| Multi-function serial interface ch.11 (reception completed)                                    |                  |              |                 |                  |                         |          |
| Multi-function serial interface ch.11 (status)   |                  |              |                 |                  |                         |          |
| 32-bit ICU9 (fetching/measurement)   | 55               | 37           | ICR39           | 320 <sub>H</sub> | 000FFF20 <sub>H</sub>   | 39       |
| WG dead timer underflow 0/1/2  |                  |              |                 |                  |                         |          |
| WG dead timer reload 0/1/2   |                  |              |                 |                  |                         |          |
| WG DTTI 0  | 56               | 38           | ICR40           | 31C <sub>H</sub> | 000FFF1C <sub>H</sub>   | 40       |
| 32-bit ICU4 (fetching/measurement)   |                  |              |                 |                  |                         |          |
| Multi-function serial interface ch.11 (transmission completed)                                 |                  |              |                 |                  |                         |          |



| Interrupt Factor   | Interrupt Number |              | Interrupt Level | Offset           | Default Address for TBR | RN |
|--|------------------|--------------|-----------------|------------------|-------------------------|----|
|  | Decimal          | Hexa Decimal |                 |                  |                         |    |
| 32-bit ICU5 (fetching/measurement)                               | 57               | 39           | ICR41           | 318 <sub>H</sub> | 000FFF18 <sub>H</sub>   | 41 |
| A/D converter<br>32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47 |                  |              |                 |                  |                         |    |
| 32-bit OCU 6/7/10/11 (match)                                     | 58               | 3A           | ICR42           | 314 <sub>H</sub> | 000FFF14 <sub>H</sub>   | 42 |
| 32-bit OCU 8/9 (match)   | 59               | 3B           | ICR43           | 310 <sub>H</sub> | 000FFF10 <sub>H</sub>   | 43 |
| -  | 60               | 3C           | ICR44           | 30C <sub>H</sub> | 000FFF0C <sub>H</sub>   | 44 |
| -  |                  |              |                 |                  |                         |    |
| Base timer 1 IRQ0  | 61               | 3D           | ICR45           | 308 <sub>H</sub> | 000FFF08 <sub>H</sub>   | 45 |
| Base timer 1 IRQ1  |                  |              |                 |                  |                         |    |
| -  | 62               | 3E           | ICR46           | 304 <sub>H</sub> | 000FFF04 <sub>H</sub>   | -  |
| -  |                  |              |                 |                  |                         |    |
| DMAC0/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15                        | 62               | 3E           | ICR46           | 304 <sub>H</sub> | 000FFF04 <sub>H</sub>   | -  |
| Delay interrupt  | 63               | 3F           | ICR47           | 300 <sub>H</sub> | 000FFF00 <sub>H</sub>   | -  |
| System reserved<br>(Used for REALOS)                             | 64               | 40           | -               | 2FC <sub>H</sub> | 000FFEFC <sub>H</sub>   | -  |
| System reserved<br>(Used for REALOS)                             | 65               | 41           | -               | 2F8 <sub>H</sub> | 000FFE8 <sub>H</sub>    | -  |
| Used with the INT instruction                                    | 66               | 42           | -               | 2F4 <sub>H</sub> | 000FEF4 <sub>H</sub>    | -  |
|  |                  |              | -               |                  |                         | -  |
|  | 255              | FF           |                 | 000 <sub>H</sub> | 000FFC00 <sub>H</sub>   |    |

**Note:** It does not support a DMA transfer request caused by an interrupt generated from a peripheral to which no RN (Resource Number) is assigned.

- \*1: It does not support a DMA transfer by the status of the multi-function serial interface and I<sup>2</sup>C reception.
- \*2: Reload timer ch.4 to ch.7 do not support a DMA transfer by the interrupt.
- \*3: PPG ch.24 to ch.47 do not support a DMA transfer by the interrupt.
- \*4: The clock calibration unit does not support a DMA transfer by the interrupt.
- \*5: 32-bit Free-run timer ch.3, ch.4 and ch.5 do not support a DMA transfer by the interrupt.
- \*6: There is no resource corresponding to the interrupt level.
- \*7: It does not support a DMA transfer by the external low-voltage detection interrupt.



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| Interrupt Factor  | Interrupt Number |              | Interrupt Level               | Offset           | Default Address for TBR | RN               |
|---|------------------|--------------|-------------------------------|------------------|-------------------------|------------------|
|   | Decimal          | Hexa Decimal |                               |                  |                         |                  |
| Reset   | 0                | 0            | -                             | 3FC <sub>H</sub> | 000FFFFC <sub>H</sub>   | -                |
| System reserved   | 1                | 1            | -                             | 3F8 <sub>H</sub> | 000FFFF8 <sub>H</sub>   | -                |
| System reserved   | 2                | 2            | -                             | 3F4 <sub>H</sub> | 000FFFF4 <sub>H</sub>   | -                |
| System reserved   | 3                | 3            | -                             | 3F0 <sub>H</sub> | 000FFFF0 <sub>H</sub>   | -                |
| System reserved   | 4                | 4            | -                             | 3EC <sub>H</sub> | 000FFFE <sub>C</sub>    | -                |
| FPU exception   | 5                | 5            | -                             | 3E8 <sub>H</sub> | 000FFFE8 <sub>H</sub>   | -                |
| Exception of instruction access protection violation          | 6                | 6            | -                             | 3E4 <sub>H</sub> | 000FFFE4 <sub>H</sub>   | -                |
| Exception of data access protection violation                 | 7                | 7            | -                             | 3E0 <sub>H</sub> | 000FFFE0 <sub>H</sub>   | -                |
| Data access error interrupt                                   | 8                | 8            | -                             | 3DC <sub>H</sub> | 000FFFD <sub>C</sub>    | -                |
| INTE instruction  | 9                | 9            | -                             | 3D8 <sub>H</sub> | 000FFFD8 <sub>H</sub>   | -                |
| Instruction break   | 10               | 0A           | -                             | 3D4 <sub>H</sub> | 000FFFD4 <sub>H</sub>   | -                |
| System reserved   | 11               | 0B           | -                             | 3D0 <sub>H</sub> | 000FFFD0 <sub>H</sub>   | -                |
| System reserved   | 12               | 0C           | -                             | 3CC <sub>H</sub> | 000FFFC <sub>C</sub>    | -                |
| System reserved   | 13               | 0D           | -                             | 3C8 <sub>H</sub> | 000FFFC8 <sub>H</sub>   | -                |
| Exception of invalid instruction                              | 14               | 0E           | -                             | 3C4 <sub>H</sub> | 000FFFC4 <sub>H</sub>   | -                |
| NMI request   | 15               | 0F           | 15 (F <sub>H</sub> )<br>Fixed | 3C0 <sub>H</sub> | 000FFFC0 <sub>H</sub>   | -                |
| Error generation during internal bus diagnosis                |                  |              |                               |                  |                         |                  |
| XBS RAM double-bit error generation                           |                  |              |                               |                  |                         |                  |
| Backup RAM double-bit error generation                        |                  |              |                               |                  |                         |                  |
| TPU violation   |                  |              |                               |                  |                         |                  |
| External interrupt 0-7  | 16               | 10           | ICR00                         | 3BC <sub>H</sub> | 000FFFB <sub>C</sub>    | 0                |
| External interrupt 8-15                                       | 17               | 11           | ICR01                         | 3B8 <sub>H</sub> | 000FFFB8 <sub>H</sub>   | 1* <sup>7</sup>  |
| External low-voltage detection interrupt                      |                  |              |                               |                  |                         |                  |
| Reload timer 0/1/4/5  | 18               | 12           | ICR02                         | 3B4 <sub>H</sub> | 000FFFB4 <sub>H</sub>   | 2* <sup>2</sup>  |
| Reload timer 2/3/6/7  | 19               | 13           | ICR03                         | 3B0 <sub>H</sub> | 000FFFB0 <sub>H</sub>   | 3* <sup>2</sup>  |
| Multi-function serial interface ch.0 (reception completed)    | 20               | 14           | ICR04                         | 3AC <sub>H</sub> | 000FFFA <sub>C</sub>    | 4* <sup>1</sup>  |
| Multi-function serial interface ch.0 (status)                 |                  |              |                               |                  |                         |                  |
| Multi-function serial interface ch.0 (transmission completed) | 21               | 15           | ICR05                         | 3A8 <sub>H</sub> | 000FFFA8 <sub>H</sub>   | 5* <sup>1</sup>  |
| Multi-function serial interface ch.1 (reception completed)    | 22               | 16           | ICR06                         | 3A4 <sub>H</sub> | 000FFFA4 <sub>H</sub>   | 6* <sup>1</sup>  |
| Multi-function serial interface ch.1 (status)                 |                  |              |                               |                  |                         |                  |
| Multi-function serial interface ch.1 (transmission completed) | 23               | 17           | ICR07                         | 3A0 <sub>H</sub> | 000FFFA0 <sub>H</sub>   | 7* <sup>1</sup>  |
| Multi-function serial interface ch.2 (reception completed)    | 24               | 18           | ICR08                         | 39C <sub>H</sub> | 000FFF9 <sub>C</sub>    | 8* <sup>1</sup>  |
| Multi-function serial interface ch.2 (status)                 |                  |              |                               |                  |                         |                  |
| Multi-function serial interface ch.2 (transmission completed) | 25               | 19           | ICR09                         | 398 <sub>H</sub> | 000FFF98 <sub>H</sub>   | 9* <sup>1</sup>  |
| Multi-function serial interface ch.3 (reception completed)    | 26               | 1A           | ICR10                         | 394 <sub>H</sub> | 000FFF94 <sub>H</sub>   | 10* <sup>1</sup> |
| Multi-function serial interface ch.3 (status)                 |                  |              |                               |                  |                         |                  |



## CY91520 Series

| Interrupt Factor  | Interrupt Number |              | Interrupt Level | Offset           | Default Address for TBR | RN               |
|---|------------------|--------------|-----------------|------------------|-------------------------|------------------|
|   | Decimal          | Hexa Decimal |                 |                  |                         |                  |
| Multi-function serial interface ch.3 (transmission completed) | 27               | 1B           | ICR11           | 390 <sub>H</sub> | 000FFF90 <sub>H</sub>   | 11               |
| Multi-function serial interface ch.4 (reception completed)    | 28               | 1C           | ICR12           | 38C <sub>H</sub> | 000FFF8C <sub>H</sub>   | 12* <sup>1</sup> |
| Multi-function serial interface ch.4 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.4 (transmission completed) | 29               | 1D           | ICR13           | 388 <sub>H</sub> | 000FFF88 <sub>H</sub>   | 13               |
| Multi-function serial interface ch.5 (reception completed)    | 30               | 1E           | ICR14           | 384 <sub>H</sub> | 000FFF84 <sub>H</sub>   | 14* <sup>1</sup> |
| Multi-function serial interface ch.5 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.5 (transmission completed) | 31               | 1F           | ICR15           | 380 <sub>H</sub> | 000FFF80 <sub>H</sub>   | 15               |
| Multi-function serial interface ch.6 (reception completed)    | 32               | 20           | ICR16           | 37C <sub>H</sub> | 000FFF7C <sub>H</sub>   | 16* <sup>1</sup> |
| Multi-function serial interface ch.6 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.6 (transmission completed) | 33               | 21           | ICR17           | 378 <sub>H</sub> | 000FFF78 <sub>H</sub>   | 17               |
| CAN0  | 34               | 22           | ICR18           | 374 <sub>H</sub> | 000FFF74 <sub>H</sub>   | -                |
| CAN1  | 35               | 23           | ICR19           | 370 <sub>H</sub> | 000FFF70 <sub>H</sub>   | -                |
| RAM diagnosis end   |                  |              |                 |                  |                         |                  |
| RAM initialization completion                                 |                  |              |                 |                  |                         |                  |
| Error generation during RAM diagnosis                         |                  |              |                 |                  |                         |                  |
| Backup RAM diagnosis end                                      |                  |              |                 |                  |                         |                  |
| Backup RAM initialization completion                          |                  |              |                 |                  |                         |                  |
| Error generation during Backup RAM diagnosis                  |                  |              |                 |                  |                         |                  |
| CAN2  | 36               | 24           | ICR20           | 36C <sub>H</sub> | 000FFF6C <sub>H</sub>   | -                |
| Up/down counter 0   |                  |              |                 |                  |                         |                  |
| Up/down counter 1   |                  |              |                 |                  |                         |                  |
| Real time clock   | 37               | 25           | ICR21           | 368 <sub>H</sub> | 000FFF68 <sub>H</sub>   | -                |
| Multi-function serial interface ch.7 (reception completed)    | 38               | 26           | ICR22           | 364 <sub>H</sub> | 000FFF64 <sub>H</sub>   | 22* <sup>1</sup> |
| Multi-function serial interface ch.7 (status)                 |                  |              |                 |                  |                         |                  |
| 16-bit Free-run timer 0 (0 detection) / (compare clear)       | 39               | 27           | ICR23           | 360 <sub>H</sub> | 000FFF60 <sub>H</sub>   | 23               |
| Multi-function serial interface ch.7 (transmission completed) |                  |              |                 |                  |                         |                  |
| PPG 0/1/10/11/20/21/30/31/40/41                               | 40               | 28           | ICR24           | 35C <sub>H</sub> | 000FFF5C <sub>H</sub>   | 24* <sup>3</sup> |
| 16-bit Free-run timer 1 (0 detection) / (compare clear)       |                  |              |                 |                  |                         |                  |
| PPG 2/3/12/13/22/23/32/33/43                                  | 41               | 29           | ICR25           | 358 <sub>H</sub> | 000FFF58 <sub>H</sub>   | 25* <sup>3</sup> |
| 16-bit Free-run timer 2 (0 detection) / (compare clear)       |                  |              |                 |                  |                         |                  |
| PPG 4/5/14/15/24/25/34/35/44                                  | 42               | 2A           | ICR26           | 354 <sub>H</sub> | 000FFF54 <sub>H</sub>   | 26* <sup>3</sup> |
| PPG 6/7/16/17/26/27/36/37                                     | 43               | 2B           | ICR27           | 350 <sub>H</sub> | 000FFF50 <sub>H</sub>   | 27* <sup>3</sup> |
| PPG 8/9/18/19/28/29/38/39                                     | 44               | 2C           | ICR28           | 34C <sub>H</sub> | 000FFF4C <sub>H</sub>   | 28* <sup>3</sup> |



## CY91520 Series

| Interrupt Factor  | Interrupt Number |              | Interrupt Level | Offset           | Default Address for TBR | RN                                |
|---|------------------|--------------|-----------------|------------------|-------------------------|-----------------------------------|
|   | Decimal          | Hexa Decimal |                 |                  |                         |                                   |
| Multi-function serial interface<br>ch.8 (reception completed)   | 45               | 2D           | ICR29           | 348 <sub>H</sub> | 000FFF48 <sub>H</sub>   | 29* <sup>1</sup>                  |
| Multi-function serial interface<br>ch.8 (status)  |                  |              |                 |                  |                         |                                   |
| 16-bit ICU 0 (fetching) / 16-bit ICU 1 (fetching)   |                  |              |                 |                  |                         |                                   |
| Main timer  | 46               | 2E           | ICR30           | 344 <sub>H</sub> | 000FFF44 <sub>H</sub>   | 30                                |
| Sub timer   |                  |              |                 |                  |                         |                                   |
| PLL timer   |                  |              |                 |                  |                         |                                   |
| Multi-function serial interface<br>ch.8 (transmission completed)  |                  |              |                 |                  |                         |                                   |
| 16-bit ICU 2 (fetching) / 16-bit ICU 3 (fetching)   | 47               | 2F           | ICR31           | 340 <sub>H</sub> | 000FFF40 <sub>H</sub>   | 31* <sup>1</sup> , * <sup>4</sup> |
| Clock calibration unit (sub oscillation)  |                  |              |                 |                  |                         |                                   |
| Multi-function serial interface<br>ch.9 (reception completed)   |                  |              |                 |                  |                         |                                   |
| Multi-function serial interface<br>ch.9 (status)  | 48               | 30           | ICR32           | 33C <sub>H</sub> | 000FFF3C <sub>H</sub>   | 32                                |
| A/D converter<br>0/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/16<br>17/18/19/20/21/22/23/24/25/26/27/28/29/30/31 |                  |              |                 |                  |                         |                                   |
| Clock calibration unit ( CR oscillation)  |                  |              |                 |                  |                         |                                   |
| Multi-function serial interface<br>ch.9 (transmission completed)  | 49               | 31           | ICR33           | 338 <sub>H</sub> | 000FFF38 <sub>H</sub>   | 33                                |
| 16-bit OCU 0 (match) / 16-bit OCU 1 (match)   |                  |              |                 |                  |                         |                                   |
| 32-bit Free-run timer 4   | 50               | 32           | ICR34           | 334 <sub>H</sub> | 000FFF34 <sub>H</sub>   | 34* <sup>5</sup>                  |
| 16-bit OCU 2 (match) / 16-bit OCU 3 (match)   |                  |              |                 |                  |                         |                                   |
| 32-bit Free-run timer 3/5   | 51               | 33           | ICR35           | 330 <sub>H</sub> | 000FFF30 <sub>H</sub>   | 35* <sup>5</sup>                  |
| 16-bit OCU 4 (match) / 16-bit OCU 5 (match)   |                  |              |                 |                  |                         |                                   |
| 32-bit ICU 6 (fetching/measurement)   | 52               | 34           | ICR36           | 32C <sub>H</sub> | 000FFF2C <sub>H</sub>   | 36* <sup>1</sup>                  |
| Multi-function serial interface<br>ch.10 (reception completed)  |                  |              |                 |                  |                         |                                   |
| Multi-function serial interface<br>ch.10 (status)   |                  |              |                 |                  |                         |                                   |
| 32-bit ICU7 (fetching/measurement)  | 53               | 35           | ICR37           | 328 <sub>H</sub> | 000FFF28 <sub>H</sub>   | 37                                |
| Multi-function serial interface<br>ch.10 (transmission completed)   |                  |              |                 |                  |                         |                                   |
| 32-bit ICU8 (fetching/measurement)  |                  |              |                 |                  |                         |                                   |
| Multi-function serial interface<br>ch.11 (reception completed)  | 54               | 36           | ICR38           | 324 <sub>H</sub> | 000FFF24 <sub>H</sub>   | 38* <sup>1</sup>                  |
| Multi-function serial interface<br>ch.11 (status)   |                  |              |                 |                  |                         |                                   |
| 32-bit ICU9 (fetching/measurement)  | 55               | 37           | ICR39           | 320 <sub>H</sub> | 000FFF20 <sub>H</sub>   | 39                                |
| WG dead timer underflow 0 / 1/ 2  |                  |              |                 |                  |                         |                                   |
| WG dead timer reload 0 / 1/ 2   |                  |              |                 |                  |                         |                                   |
| WG DTTI 0   | 56               | 38           | ICR40           | 31C <sub>H</sub> | 000FFF1C <sub>H</sub>   | 40                                |
| 32-bit ICU4 (fetching/measurement)  |                  |              |                 |                  |                         |                                   |
| Multi-function serial interface<br>ch.11 (transmission completed)   |                  |              |                 |                  |                         |                                   |



| Interrupt Factor   | Interrupt Number |              | Interrupt Level | Offset               | Default Address for TBR   | RN |
|--|------------------|--------------|-----------------|----------------------|---------------------------|----|
|  | Decimal          | Hexa Decimal |                 |                      |                           |    |
| 32-bit ICU5 (fetching/measurement)                               | 57               | 39           | ICR41           | 318 <sub>H</sub>     | 000FFF18 <sub>H</sub>     | 41 |
| A/D converter<br>32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47 |                  |              |                 |                      |                           |    |
| 32-bit OCU 6/7/10/11 (match)                                     | 58               | 3A           | ICR42           | 314 <sub>H</sub>     | 000FFF14 <sub>H</sub>     | 42 |
| 32-bit OCU8/9 (match)  | 59               | 3B           | ICR43           | 310 <sub>H</sub>     | 000FFF10 <sub>H</sub>     | 43 |
| Base timer 0 IRQ0  | 60               | 3C           | ICR44           | 30C <sub>H</sub>     | 000FFF0C <sub>H</sub>     | 44 |
| Base timer 0 IRQ1  |                  |              |                 |                      |                           |    |
| Base timer 1 IRQ0  | 61               | 3D           | ICR45           | 308 <sub>H</sub>     | 000FFF08 <sub>H</sub>     | 45 |
| Base timer 1 IRQ1  |                  |              |                 |                      |                           |    |
| -  |                  |              |                 |                      |                           |    |
| -  |                  |              |                 |                      |                           |    |
| DMAC 0/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15                       | 62               | 3E           | ICR46           | 304 <sub>H</sub>     | 000FFF04 <sub>H</sub>     | -  |
| Delay interrupt  | 63               | 3F           | ICR47           | 300 <sub>H</sub>     | 000FFF00 <sub>H</sub>     | -  |
| System reserved<br>(Used for REALOS)                             | 64               | 40           | -               | 2FC <sub>H</sub>     | 000FFEFC <sub>H</sub>     | -  |
| System reserved<br>(Used for REALOS)                             | 65               | 41           | -               | 2F8 <sub>H</sub>     | 000FFE8 <sub>H</sub>      | -  |
| Used with the INT instruction                                    | 66               | 42           | -               | 2F4 <sub>H</sub>     | 000FFE4 <sub>H</sub>      | -  |
|  | <br>255          | <br>FF       |                 | <br>000 <sub>H</sub> | <br>000FFC00 <sub>H</sub> |    |

**Note:** It does not support a DMA transfer request caused by an interrupt generated from a peripheral to which no RN (Resource Number) is assigned.

- \*1: It does not support a DMA transfer by the status of the multi-function serial interface and I<sup>2</sup>C reception.
- \*2: Reload timer ch.4 to ch.7 do not support a DMA transfer by the interrupt.
- \*3: PPG ch.24 to ch.47 do not support a DMA transfer by the interrupt.
- \*4: The clock calibration unit does not support a DMA transfer by the interrupt.
- \*5: 32-bit Free-run timer ch.3, ch.4 and ch.5 do not support a DMA transfer by the interrupt.
- \*6: There is no resource corresponding to the interrupt level.
- \*7: It does not support a DMA transfer by the external low-voltage detection interrupt.



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| Interrupt Factor  | Interrupt Number |              | Interrupt Level               | Offset           | Default Address for TBR | RN   |
|---|------------------|--------------|-------------------------------|------------------|-------------------------|------|
|   | Decimal          | Hexa Decimal |                               |                  |                         |      |
| Reset   | 0                | 0            | -                             | 3FC <sub>H</sub> | 000FFFFC <sub>H</sub>   | -    |
| System reserved   | 1                | 1            | -                             | 3F8 <sub>H</sub> | 000FFFF8 <sub>H</sub>   | -    |
| System reserved   | 2                | 2            | -                             | 3F4 <sub>H</sub> | 000FFFF4 <sub>H</sub>   | -    |
| System reserved   | 3                | 3            | -                             | 3F0 <sub>H</sub> | 000FFFF0 <sub>H</sub>   | -    |
| System reserved   | 4                | 4            | -                             | 3EC <sub>H</sub> | 000FFFECH               | -    |
| FPU exception   | 5                | 5            | -                             | 3E8 <sub>H</sub> | 000FFFE8 <sub>H</sub>   | -    |
| Exception of instruction access protection violation          | 6                | 6            | -                             | 3E4 <sub>H</sub> | 000FFFE4 <sub>H</sub>   | -    |
| Exception of data access protection violation                 | 7                | 7            | -                             | 3E0 <sub>H</sub> | 000FFFE0 <sub>H</sub>   | -    |
| Data access error interrupt                                   | 8                | 8            | -                             | 3DC <sub>H</sub> | 000FFFDCH               | -    |
| INTE instruction  | 9                | 9            | -                             | 3D8 <sub>H</sub> | 000FFFD8 <sub>H</sub>   | -    |
| Instruction break   | 10               | 0A           | -                             | 3D4 <sub>H</sub> | 000FFFD4 <sub>H</sub>   | -    |
| System reserved   | 11               | 0B           | -                             | 3D0 <sub>H</sub> | 000FFFD0 <sub>H</sub>   | -    |
| System reserved   | 12               | 0C           | -                             | 3CC <sub>H</sub> | 000FFFCCH               | -    |
| System reserved   | 13               | 0D           | -                             | 3C8 <sub>H</sub> | 000FFFC8 <sub>H</sub>   | -    |
| Exception of invalid instruction                              | 14               | 0E           | -                             | 3C4 <sub>H</sub> | 000FFFC4 <sub>H</sub>   | -    |
| NMI request   | 15               | 0F           | 15 (F <sub>H</sub> )<br>Fixed | 3C0 <sub>H</sub> | 000FFFC0 <sub>H</sub>   | -    |
| Error generation during internal bus diagnosis                |                  |              |                               |                  |                         |      |
| XBS RAM double-bit error generation                           |                  |              |                               |                  |                         |      |
| Backup RAM double-bit error generation                        |                  |              |                               |                  |                         |      |
| TPU violation   |                  |              |                               |                  |                         |      |
| External interrupt 0-7  | 16               | 10           | ICR00                         | 3BC <sub>H</sub> | 000FFFCB <sub>H</sub>   | 0    |
| External interrupt 8-15                                       | 17               | 11           | ICR01                         | 3B8 <sub>H</sub> | 000FFFB8 <sub>H</sub>   | 1*7  |
| External low-voltage detection interrupt                      |                  |              |                               |                  |                         |      |
| Reload timer 0/1/4/5  | 18               | 12           | ICR02                         | 3B4 <sub>H</sub> | 000FFFB4 <sub>H</sub>   | 2*2  |
| Reload timer 2/3/6/7  | 19               | 13           | ICR03                         | 3B0 <sub>H</sub> | 000FFFB0 <sub>H</sub>   | 3*2  |
| Multi-function serial interface ch.0 (reception completed)    | 20               | 14           | ICR04                         | 3AC <sub>H</sub> | 000FFFACh               | 4*1  |
| Multi-function serial interface ch.0 (status)                 |                  |              |                               |                  |                         |      |
| Multi-function serial interface ch.0 (transmission completed) | 21               | 15           | ICR05                         | 3A8 <sub>H</sub> | 000FFFA8 <sub>H</sub>   | 5*1  |
| Multi-function serial interface ch.1 (reception completed)    | 22               | 16           | ICR06                         | 3A4 <sub>H</sub> | 000FFFA4 <sub>H</sub>   | 6*1  |
| Multi-function serial interface ch.1 (status)                 |                  |              |                               |                  |                         |      |
| Multi-function serial interface ch.1 (transmission completed) | 23               | 17           | ICR07                         | 3A0 <sub>H</sub> | 000FFFA0 <sub>H</sub>   | 7*1  |
| Multi-function serial interface ch.2 (reception completed)    | 24               | 18           | ICR08                         | 39C <sub>H</sub> | 000FFF9C <sub>H</sub>   | 8*1  |
| Multi-function serial interface ch.2 (status)                 |                  |              |                               |                  |                         |      |
| Multi-function serial interface ch.2 (transmission completed) | 25               | 19           | ICR09                         | 398 <sub>H</sub> | 000FFF98 <sub>H</sub>   | 9*1  |
| Multi-function serial interface ch.3 (reception completed)    | 26               | 1A           | ICR10                         | 394 <sub>H</sub> | 000FFF94 <sub>H</sub>   | 10*1 |
| Multi-function serial interface ch.3 (status)                 |                  |              |                               |                  |                         |      |



| Interrupt Factor  | Interrupt Number |              | Interrupt Level | Offset           | Default Address for TBR | RN               |
|---|------------------|--------------|-----------------|------------------|-------------------------|------------------|
|   | Decimal          | Hexa Decimal |                 |                  |                         |                  |
| Multi-function serial interface ch.3 (transmission completed) | 27               | 1B           | ICR11           | 390 <sub>H</sub> | 000FFF90 <sub>H</sub>   | 11               |
| Multi-function serial interface ch.4 (reception completed)    | 28               | 1C           | ICR12           | 38C <sub>H</sub> | 000FFF8C <sub>H</sub>   | 12* <sup>1</sup> |
| Multi-function serial interface ch.4 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.4 (transmission completed) | 29               | 1D           | ICR13           | 388 <sub>H</sub> | 000FFF88 <sub>H</sub>   | 13               |
| Multi-function serial interface ch.5 (reception completed)    | 30               | 1E           | ICR14           | 384 <sub>H</sub> | 000FFF84 <sub>H</sub>   | 14* <sup>1</sup> |
| Multi-function serial interface ch.5 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.5 (transmission completed) | 31               | 1F           | ICR15           | 380 <sub>H</sub> | 000FFF80 <sub>H</sub>   | 15               |
| Multi-function serial interface ch.6 (reception completed)    | 32               | 20           | ICR16           | 37C <sub>H</sub> | 000FFF7C <sub>H</sub>   | 16* <sup>1</sup> |
| Multi-function serial interface ch.6 (status)                 |                  |              |                 |                  |                         |                  |
| Multi-function serial interface ch.6 (transmission completed) | 33               | 21           | ICR17           | 378 <sub>H</sub> | 000FFF78 <sub>H</sub>   | 17               |
| CAN0  | 34               | 22           | ICR18           | 374 <sub>H</sub> | 000FFF74 <sub>H</sub>   | -                |
| CAN1  | 35               | 23           | ICR19           | 370 <sub>H</sub> | 000FFF70 <sub>H</sub>   | -                |
| RAM diagnosis end   |                  |              |                 |                  |                         |                  |
| RAM initialization completion                                 |                  |              |                 |                  |                         |                  |
| Error generation during RAM diagnosis                         |                  |              |                 |                  |                         |                  |
| Backup RAM diagnosis end                                      |                  |              |                 |                  |                         |                  |
| Backup RAM initialization completion                          |                  |              |                 |                  |                         |                  |
| Error generation during Backup RAM diagnosis                  |                  |              |                 |                  |                         |                  |
| CAN2  | 36               | 24           | ICR20           | 36C <sub>H</sub> | 000FFF6C <sub>H</sub>   | -                |
| Up/down counter 0   |                  |              |                 |                  |                         |                  |
| Up/down counter 1   |                  |              |                 |                  |                         |                  |
| Real time clock   | 37               | 25           | ICR21           | 368 <sub>H</sub> | 000FFF68 <sub>H</sub>   | -                |
| Multi-function serial interface ch.7 (reception completed)    | 38               | 26           | ICR22           | 364 <sub>H</sub> | 000FFF64 <sub>H</sub>   | 22* <sup>1</sup> |
| Multi-function serial interface ch.7 (status)                 |                  |              |                 |                  |                         |                  |
| 16-bit Free-run timer 0 (0 detection) / (compare clear)       | 39               | 27           | ICR23           | 360 <sub>H</sub> | 000FFF60 <sub>H</sub>   | 23               |
| Multi-function serial interface ch.7 (transmission completed) |                  |              |                 |                  |                         |                  |
| PPG 0/1/10/11/20/21/30/31/40/41                               | 40               | 28           | ICR24           | 35C <sub>H</sub> | 000FFF5C <sub>H</sub>   | 24* <sup>3</sup> |
| 16-bit Free-run timer 1 (0 detection) / (compare clear)       |                  |              |                 |                  |                         |                  |
| PPG 2/3/12/13/22/23/32/33/43                                  | 41               | 29           | ICR25           | 358 <sub>H</sub> | 000FFF58 <sub>H</sub>   | 25* <sup>3</sup> |
| 16-bit Free-run timer 2 (0 detection) / (compare clear)       |                  |              |                 |                  |                         |                  |
| PPG 4/5/14/15/24/25/34/35/44/45                               | 42               | 2A           | ICR26           | 354 <sub>H</sub> | 000FFF54 <sub>H</sub>   | 26* <sup>3</sup> |
| PPG 6/7/16/17/26/27/36/37/46/47                               | 43               | 2B           | ICR27           | 350 <sub>H</sub> | 000FFF50 <sub>H</sub>   | 27* <sup>3</sup> |
| PPG 8/9/18/19/28/29/38/39                                     | 44               | 2C           | ICR28           | 34C <sub>H</sub> | 000FFF4C <sub>H</sub>   | 28* <sup>3</sup> |



## CY91520 Series

| Interrupt Factor  | Interrupt Number |              | Interrupt Level | Offset           | Default Address for TBR | RN       |
|---|------------------|--------------|-----------------|------------------|-------------------------|----------|
|   | Decimal          | Hexa Decimal |                 |                  |                         |          |
| Multi-function serial interface ch.8 (reception completed)  | 45               | 2D           | ICR29           | 348 <sub>H</sub> | 000FFF48 <sub>H</sub>   | 29*1     |
| Multi-function serial interface ch.8 (status)   |                  |              |                 |                  |                         |          |
| 16-bit ICU 0 (fetching) / 16-bit ICU 1 (fetching)   |                  |              |                 |                  |                         |          |
| Main timer  | 46               | 2E           | ICR30           | 344 <sub>H</sub> | 000FFF44 <sub>H</sub>   | 30       |
| Sub timer   |                  |              |                 |                  |                         |          |
| PLL timer   |                  |              |                 |                  |                         |          |
| Multi-function serial interface ch.8 (transmission completed)                                       |                  |              |                 |                  |                         |          |
| 16-bit ICU 2 (fetching) / 16-bit ICU 3 (fetching)   | 47               | 2F           | ICR31           | 340 <sub>H</sub> | 000FFF40 <sub>H</sub>   | 31*1, *4 |
| Clock calibration unit (sub oscillation)  |                  |              |                 |                  |                         |          |
| Multi-function serial interface ch.9 (reception completed)  |                  |              |                 |                  |                         |          |
| Multi-function serial interface ch.9 (status)   | 48               | 30           | ICR32           | 33C <sub>H</sub> | 000FFF3C <sub>H</sub>   | 32       |
| A/D converter 0/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/16 17/18/19/20/21/22/23/24/25/26/27/28/29/30/31 |                  |              |                 |                  |                         |          |
| Clock calibration unit (CR oscillation)   |                  |              |                 |                  |                         |          |
| Multi-function serial interface ch.9 (transmission completed)                                       | 49               | 31           | ICR33           | 338 <sub>H</sub> | 000FFF38 <sub>H</sub>   | 33       |
| 16-bit OCU 0 (match) / 16-bit OCU 1 (match)   |                  |              |                 |                  |                         |          |
| 32-bit Free-run timer 4   | 50               | 32           | ICR34           | 334 <sub>H</sub> | 000FFF34 <sub>H</sub>   | 34*5     |
| 16-bit OCU 2 (match) / 16-bit OCU 3 (match)   |                  |              |                 |                  |                         |          |
| 32-bit Free-run timer 3/5   | 51               | 33           | ICR35           | 330 <sub>H</sub> | 000FFF30 <sub>H</sub>   | 35*5     |
| 16-bit OCU 4 (match) / 16-bit OCU 5 (match)   |                  |              |                 |                  |                         |          |
| 32-bit ICU6 (fetching/measurement)  | 52               | 34           | ICR36           | 32C <sub>H</sub> | 000FFF2C <sub>H</sub>   | 36*1     |
| Multi-function serial interface ch.10 (reception completed)   |                  |              |                 |                  |                         |          |
| Multi-function serial interface ch.10 (status)  |                  |              |                 |                  |                         |          |
| 32-bit ICU7 (fetching/measurement)  | 53               | 35           | ICR37           | 328 <sub>H</sub> | 000FFF28 <sub>H</sub>   | 37       |
| Multi-function serial interface ch.10 (transmission completed)                                      |                  |              |                 |                  |                         |          |
| 32-bit ICU8 (fetching/measurement)  | 54               | 36           | ICR38           | 324 <sub>H</sub> | 000FFF24 <sub>H</sub>   | 38*1     |
| Multi-function serial interface ch.11 (reception completed)   |                  |              |                 |                  |                         |          |
| Multi-function serial interface ch.11 (status)  |                  |              |                 |                  |                         |          |
| 32-bit ICU9 (fetching/measurement)  | 55               | 37           | ICR39           | 320 <sub>H</sub> | 000FFF20 <sub>H</sub>   | 39       |
| WG dead timer underflow 0/1/2   |                  |              |                 |                  |                         |          |
| WG dead timer reload 0/1/2  |                  |              |                 |                  |                         |          |
| WG DTTI 0   | 56               | 38           | ICR40           | 31C <sub>H</sub> | 000FFF1C <sub>H</sub>   | 40       |
| 32-bit ICU4 (fetching/measurement)  |                  |              |                 |                  |                         |          |
| Multi-function serial interface ch.11 (transmission completed)                                      |                  |              |                 |                  |                         |          |



| Interrupt Factor   | Interrupt Number |              | Interrupt Level | Offset               | Default Address for TBR   | RN |
|--|------------------|--------------|-----------------|----------------------|---------------------------|----|
|  | Decimal          | Hexa Decimal |                 |                      |                           |    |
| 32-bit ICU5 (fetching/measurement)                                   | 57               | 39           | ICR41           | 318 <sub>H</sub>     | 000FFF18 <sub>H</sub>     | 41 |
| A/D converter<br>32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/<br>47 |                  |              |                 |                      |                           |    |
| 32-bit OCU 6/7/10/11 (match)   | 58               | 3A           | ICR42           | 314 <sub>H</sub>     | 000FFF14 <sub>H</sub>     | 42 |
| 32-bit OCU 8/9 (match)   | 59               | 3B           | ICR43           | 310 <sub>H</sub>     | 000FFF10 <sub>H</sub>     | 43 |
| Base timer 0 IRQ0  | 60               | 3C           | ICR44           | 30C <sub>H</sub>     | 000FFF0C <sub>H</sub>     | 44 |
| Base timer 0 IRQ1  |                  |              |                 |                      |                           |    |
| Base timer 1 IRQ0  | 61               | 3D           | ICR45           | 308 <sub>H</sub>     | 000FFF08 <sub>H</sub>     | 45 |
| Base timer 1 IRQ1  |                  |              |                 |                      |                           |    |
| -  |                  |              |                 |                      |                           |    |
| -  |                  |              |                 |                      |                           |    |
| DMAC 0/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15                           | 62               | 3E           | ICR46           | 304 <sub>H</sub>     | 000FFF04 <sub>H</sub>     | -  |
| Delay interrupt  | 63               | 3F           | ICR47           | 300 <sub>H</sub>     | 000FFF00 <sub>H</sub>     | -  |
| System reserved<br>(Used for REALOS)                                 | 64               | 40           | -               | 2FC <sub>H</sub>     | 000FFEFC <sub>H</sub>     | -  |
| System reserved<br>(Used for REALOS)                                 | 65               | 41           | -               | 2F8 <sub>H</sub>     | 000FFE8 <sub>H</sub>      | -  |
| Used with the INT instruction  | 66               | 42           | -               | 2F4 <sub>H</sub>     | 000FFE4 <sub>H</sub>      | -  |
|  | <br>255          | <br>FF       |                 | <br>000 <sub>H</sub> | <br>000FFC00 <sub>H</sub> |    |

**Note:** It does not support a DMA transfer request caused by an interrupt generated from a peripheral to which no RN (Resource Number) is assigned.

\*1: It does not support a DMA transfer by the status of the multi-function serial interface and I<sup>2</sup>C reception.

\*2: Reload timer ch.4 to ch.7 do not support a DMA transfer by the interrupt.

\*3: PPG ch.24 to ch.47 do not support a DMA transfer by the interrupt.

\*4: The clock calibration unit does not support a DMA transfer by the interrupt.

\*5: 32-bit Free-run timer ch.3, ch.4 and ch.5 do not support a DMA transfer by the interrupt.

\*6: There is no resource corresponding to the interrupt level.

\*7: It does not support a DMA transfer by the external low-voltage detection interrupt.



## 11. Electrical Characteristics

### Absolute Maximum Ratings

| Parameter                           | Symbol   | Rating       |              | Unit             | Remarks                            |    |
|-------------------------------------|--|--------------|--------------|------------------|------------------------------------|----|
|                                     |  | Min          | Max          |                  |                                    |    |
| Power supply voltage *1,*2          | $V_{CC}$   | $V_{SS}-0.3$ | $V_{SS}+6.0$ | V                |                                    |    |
| Analog power supply voltage *1,*2   | $AV_{CC}$  | $V_{SS}-0.3$ | $V_{SS}+6.0$ | V                | $AV_{RH} \leq AV_{CC} \leq V_{CC}$ |    |
| Analog reference voltage *1         | $AV_{RH}$  | $V_{SS}-0.3$ | $V_{SS}+6.0$ | V                | $AV_{RH} \leq AV_{CC}$             |    |
| Input voltage *1                    | $V_I$  | $V_{SS}-0.3$ | $V_{CC}+0.3$ | V                |                                    |    |
| Analog pin input voltage *1         | $V_{IA5}$  | $V_{SS}-0.3$ | $V_{CC}+0.3$ | V                |                                    |    |
| Output voltage *1                   | $V_o$  | $V_{SS}-0.3$ | $V_{CC}+0.3$ | V                |                                    |    |
| Maximum clamp current               | $I_{CLAMP}$  | -            | 4.0          | mA               | *6                                 |    |
| Total maximum clamp current         | $\sum  I_{CLAMP} $   | -            | 20           | mA               | *6                                 |    |
| "L" level maximum output current *3 | $I_{OL1}$  | -            | 15           | mA               |                                    |    |
|                                     | $I_{OL2}$  | -            | 30           | mA               |                                    |    |
| "L" level average output current *4 | $I_{OLAV1}$  | -            | 4            | mA               | *9                                 |    |
|                                     | $I_{OLAV2}$  | -            | 12           | mA               | *10                                |    |
| "L" level total output current *5   | $\sum I_{OL1}$   | -            | 100          | mA               |                                    |    |
|                                     | $\sum I_{OL2}$   | -            | 120          | mA               |                                    |    |
| "H" level maximum output current*3  | $I_{OH1}$  | -            | -15          | mA               |                                    |    |
|                                     | $I_{OH2}$  | -            | -30          | mA               |                                    |    |
| "H" level average output current*4  | $I_{OHAV1}$  | -            | -4           | mA               | *9                                 |    |
|                                     | $I_{OHAV2}$  | -            | -12          | mA               | *10                                |    |
| "H" level total output current *5   | $\sum I_{OH1}$   | -            | -100         | mA               |                                    |    |
|                                     | $\sum I_{OH2}$   | -            | -120         | mA               |                                    |    |
| Power consumption                   | $T_A: -40\text{ }^\circ\text{C to }+105\text{ }^\circ\text{C}$ | $P_D$        | -            | 882              | mW                                 | *8 |
|                                     | $T_A: -40\text{ }^\circ\text{C to }+125\text{ }^\circ\text{C}$ |              | -            | 675              | mW                                 | *8 |
| Operating temperature               | $T_A$  | -40          | +105         | $^\circ\text{C}$ |                                    |    |
|                                     |  | -40          | +125         | $^\circ\text{C}$ | *7                                 |    |
| Storage temperature                 | $T_{stg}$  | -55          | +150         | $^\circ\text{C}$ |                                    |    |

\*1: These parameters are based on the condition that  $V_{SS} = AV_{SS} = 0.0\text{ V}$

\*2: Caution must be taken that  $AV_{CC}$ ,  $AV_{RH}$  do not exceed  $V_{CC}$  upon power-on and under other circumstances.

\*3: The maximum output current is defined as the value of the peak current flowing through any one of the corresponding pins.

\*4: The average output current is defined as the value of the average current flowing through any one of the corresponding pins for a 10 ms period. The average value is the operation current  $\times$  the operation ratio.

\*5: The total output current is defined as the maximum current value flowing through all of corresponding pins.

\*6: · Corresponding pins: all general-purpose ports except P035, 041, 093, 122.

· Use within recommended operating conditions.

· Use at DC voltage (current).

· The + B signal should always be applied by connecting a limiting resistor between the + B signal and the microcontroller.

· The value of the limiting resistor should be set so that the current input to the microcontroller pin does not exceed rated values at any time regardless of instantaneously or constantly when the + B signal is input.

· Note that when the microcontroller drive current is low, such as in the low power consumption modes, the + B input potential can increase the potential at the  $V_{CC}$  pin via a protective diode, possibly affecting other devices.

· Note that if the + B signal is input when the microcontroller is off (not fixed at 0 V), since the power is supplied through the pin, the microcontroller may operate incompletely.

· Note that if the +B signal is input at power-on, since the power is supplied through the pin, the power-on reset may not function in the power supply voltage.

· Do not leave + B input pins open.

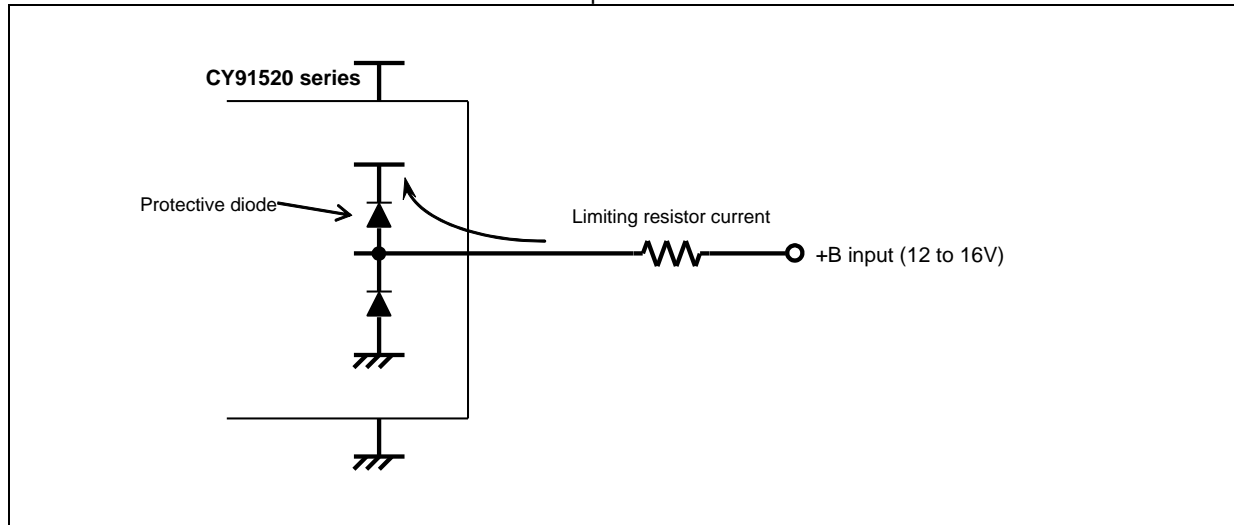
\*7: When it is used under this condition, contact your sales representative.

\*8: It is a standard when four-layer substrate is used.

\*9: Corresponding pins: General-purpose ports other than those of P103, P104, P105 and P106.

\*10: Corresponding pins: General-purpose ports of P103, P104, P105 and P106.

Sample Recommended Circuit



**<WARNING>**

Semiconductor devices may be permanently damaged by application of stress (including, without limitation, voltage, current or temperature) in excess of absolute maximum ratings. Do not exceed any of these ratings.

**Recommended Operating Conditions**

( $V_{SS} = AV_{SS} = 0.0\text{ V}$ )

| Parameter                         | Symbol                  | Value                                 |      | Unit               | Remarks   |
|-----------------------------------|-------------------------|---------------------------------------|------|--------------------|---|
|                                   |                         | Min                                   | Max  |                    |   |
| Power supply voltage              | $V_{CC}$ ,<br>$AV_{CC}$ | 4.5                                   | 5.5  | V                  | Recommended operation guarantee range (When 5.0 V is used)  |
|                                   |                         | 3.0                                   | 3.6  | V                  | Recommended operation guarantee range (When 3.3 V is used)  |
|                                   |                         | 2.7                                   | 5.5  | V                  | Operation guarantee range <sup>*1</sup>   |
| Smoothing capacitor <sup>*2</sup> | $C_S$                   | 4.7<br>(tolerance within $\pm 50\%$ ) |      | $\mu\text{F}$      | Use a ceramic capacitor or a capacitor that has the similar frequency characteristics. Use a capacitor with a capacitance greater than $C_S$ as the smoothing capacitor on the VCC pin. |
| Operating temperature             | $T_A$                   | -40                                   | +105 | $^{\circ}\text{C}$ |   |
|                                   |                         | -40                                   | +125 | $^{\circ}\text{C}$ | *3  |

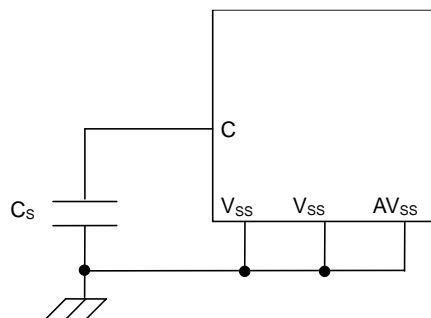
\*1: When it is used outside recommended operation guarantee range (range of the operation guarantee), contact your sales representative.

The initial detection voltage of the external low voltage detection is  $2.8\text{ V} \pm 8\%$  (2.576 V to 3.024 V). This LVD setting and internal LVD cannot be used to reliably generate a reset before voltage dips below minimum guaranteed operation voltage, as these detection levels are below the minimum guaranteed MCU operation voltage. Below the minimum guaranteed MCU operation voltage, MCU operations are not guaranteed with the exception of LVD.

\*2: See the following diagram for details on the connection of smoothing capacitor  $C_S$ .

\*3: When it is used under this condition, contact your sales representative.

## · C Pin Connection Diagram

**<WARNING>**

The recommended operating conditions are required in order to ensure the normal operation of the semiconductor device. All of the device's electrical characteristics are warranted when the device is operated under these conditions.

Any use of semiconductor devices will be under their recommended operating condition. Operation under any conditions other than these conditions may adversely affect reliability of device and could result in device failure. No warranty is made with respect to any use, operating conditions or combinations not represented on this data sheet. If you are considering application under any conditions other than listed herein, contact sales representatives beforehand.



## DC Characteristics

(T<sub>A</sub>: -40 °C to +105 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter  | Symbol                | Pin Name   | Conditions   | Value  |      |      | Unit                      | Remarks                                       |
|--|-----------------------|--|--|--|------|------|---------------------------|---|
|  |                       |  |  | Min  | Typ  | Max  |                           |   |
| Power supply current                                 | I <sub>CC5</sub>      | VCC  | Operating frequency F <sub>CP</sub> = 80 MHz, F <sub>cpp</sub> = 40 MHz, at normal operation | -  | 60   | 80   | mA                        |   |
|  |                       |  | Operating frequency F <sub>CP</sub> = 80 MHz, F <sub>cpp</sub> = 40 MHz, at Flash write      | -  | 70   | 90   | mA                        |   |
|  |                       |  | Operating frequency F <sub>CP</sub> = 80 MHz, F <sub>cpp</sub> = 40 MHz, at Flash erase      | -  | 70   | 90   | mA                        |   |
|  |                       |  | Operating frequency F <sub>CP</sub> = 64 MHz, F <sub>cpp</sub> = 32 MHz, at normal operation | -  | 54   | 71   | mA                        |   |
|  |                       |  | Operating frequency F <sub>CP</sub> = 64 MHz, F <sub>cpp</sub> = 32 MHz, at Flash write      | -  | 64   | 81   | mA                        |   |
|  |                       |  | Operating frequency F <sub>CP</sub> = 64 MHz, F <sub>cpp</sub> = 32 MHz, at Flash erase      | -  | 64   | 81   | mA                        |   |
|  |                       |  | Operating frequency F <sub>CP</sub> = 48 MHz, F <sub>cpp</sub> = 24 MHz, at normal operation | -  | 46   | 62   | mA                        |   |
|  |                       |  | Operating frequency F <sub>CP</sub> = 48 MHz, F <sub>cpp</sub> = 24 MHz, at Flash write      | -  | 56   | 72   | mA                        |   |
|  |                       |  | Operating frequency F <sub>CP</sub> = 48 MHz, F <sub>cpp</sub> = 24 MHz, at Flash erase      | -  | 56   | 72   | mA                        |   |
|  |                       |  | I <sub>CCS5</sub>  | Operating frequency F <sub>CP</sub> = 80 MHz, F <sub>cpp</sub> = 40 MHz, at CPU sleep mode | -    | 45   | 61                        | mA  |
|  | I <sub>CCBS5</sub>    | Operating frequency F <sub>CP</sub> = 80 MHz, F <sub>cpp</sub> = 40 MHz, at bus sleep mode | -  | 23   | 51   | mA   |                           |   |
|  | I <sub>CCt5</sub>     | Watch mode   | When using crystal 4 MHz T <sub>A</sub> = +25 °C*  | -  | 1500 | 2610 | μA                        |   |
|  |                       |  | When using built-in CR clock 50 kHz T <sub>A</sub> = +25 °C*                                 | -  | 450  | 2000 |                           |   |
|  |                       |  | When using sub clock 32 kHz T <sub>A</sub> = +25 °C*   | -  | 460  | 2000 |                           |   |
|  | I <sub>CCH5</sub>     | Stop mode  | T <sub>A</sub> = +25 °C*   | -  | 450  | 2000 | μA                        |   |
|  | I <sub>CCt52</sub>    | Watch mode (power off)   | When using crystal 4 MHz T <sub>A</sub> = +25 °C*  | -  | 1100 | 1300 | μA                        | LVD/ RTC operation, Backup RAM 8 KB retention |
|  |                       |  | When using built-in CR clock 50 kHz, T <sub>A</sub> = +25 °C*                                | -  | 77   | 267  |                           |   |
| When using sub clock 32 kHz T <sub>A</sub> = +25 °C* |                       |  | -  | 100  | 285  |      |                           |   |
| I <sub>CCH52</sub>                                   | Stop mode (power off) | T <sub>A</sub> = +25 °C*   | -  | 74   | 265  | μA   | Backup RAM 8 KB retention |   |

(T<sub>A</sub>: -40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter  | Symbol             | Pin Name                                       | Conditions   | Value |      |      | Unit                      | Remarks                                      |
|--|--------------------|--|--|-------|------|------|---------------------------|--|
|  |                    |  |  | Min   | Typ  | Max  |                           |  |
| Power supply current                                 | I <sub>CC5</sub>   | VCC  | Operating frequency F <sub>CP</sub> = 80 MHz, F <sub>CPP</sub> = 40 MHz, at normal operation | -     | 60   | 102  | mA                        |  |
|  |                    |  | Operating frequency F <sub>CP</sub> = 80 MHz, F <sub>CPP</sub> = 40 MHz, at Flash write      | -     | 70   | 115  | mA                        |  |
|  |                    |  | Operating frequency F <sub>CP</sub> = 80 MHz, F <sub>CPP</sub> = 40 MHz, at Flash erase      | -     | 70   | 115  | mA                        |  |
|  |                    |  | Operating frequency F <sub>CP</sub> = 64 MHz, F <sub>CPP</sub> = 32 MHz, at normal operation | -     | 54   | 92   | mA                        |  |
|  |                    |  | Operating frequency F <sub>CP</sub> = 64 MHz, F <sub>CPP</sub> = 32 MHz, at Flash write      | -     | 64   | 105  | mA                        |  |
|  |                    |  | Operating frequency F <sub>CP</sub> = 64 MHz, F <sub>CPP</sub> = 32 MHz, at Flash erase      | -     | 64   | 105  | mA                        |  |
|  |                    |  | Operating frequency F <sub>CP</sub> = 48 MHz, F <sub>CPP</sub> = 24 MHz, at normal operation | -     | 46   | 82   | mA                        |  |
|  |                    |  | Operating frequency F <sub>CP</sub> = 48 MHz, F <sub>CPP</sub> = 24 MHz, at Flash write      | -     | 56   | 95   | mA                        |  |
|  |                    |  | Operating frequency F <sub>CP</sub> = 48 MHz, F <sub>CPP</sub> = 24 MHz, at Flash erase      | -     | 56   | 95   | mA                        |  |
|  | I <sub>CCS5</sub>  |  | Operating frequency F <sub>CP</sub> = 80 MHz, F <sub>CPP</sub> = 40 MHz, at CPU sleep mode   | -     | 45   | 82   | mA                        |  |
|  | I <sub>CCBS5</sub> |  | Operating frequency F <sub>CP</sub> = 80 MHz, F <sub>CPP</sub> = 40 MHz, at bus sleep mode   | -     | 23   | 72   | mA                        |  |
|  | I <sub>CCt5</sub>  | Watch mode                                     | When using crystal 4 MHz T <sub>A</sub> = +25 °C*  | -     | 1500 | 2610 | μA                        |  |
|  |                    |  | When using built-in CR clock 50 kHz T <sub>A</sub> = +25 °C*                                 | -     | 450  | 2000 |                           |  |
|  |                    |  | When using sub clock 32 kHz T <sub>A</sub> = +25 °C*   | -     | 460  | 2000 |                           |  |
|  | I <sub>CCH5</sub>  |  | Stop mode T <sub>A</sub> = +25 °C*   | -     | 450  | 2000 | μA                        |  |
|  | I <sub>CCt52</sub> | Watch mode (power off)                         | When using crystal 4 MHz T <sub>A</sub> = +25 °C*  | -     | 1100 | 1300 | μA                        | LVD/RTC operation, Backup RAM 8 KB retention |
|  |                    |  | When using built-in CR clock 50 kHz, T <sub>A</sub> = +25 °C*                                | -     | 77   | 267  |                           |  |
| When using sub clock 32 kHz T <sub>A</sub> = +25 °C* |                    |  | -  | 100   | 285  |      |                           |  |
| I <sub>CCH52</sub>                                   |                    | Stop mode (power off) T <sub>A</sub> = +25 °C* | -  | 74    | 265  | μA   | Backup RAM 8 KB retention |  |

(T<sub>A</sub>: -40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                | Symbol           | Pin Name   | Conditions   | Value                   |                 |                 | Unit | Remarks |
|--------------------------|------------------|--|--|-------------------------|-----------------|-----------------|------|---------|
|                          |                  |  |  | Min                     | Typ             | Max             |      |         |
| Input leak current       | I <sub>IL</sub>  | All input pins   | V <sub>CC</sub> = AV <sub>CC</sub> = 5.5 V<br>V <sub>SS</sub> < V <sub>I</sub> < V <sub>CC</sub> | -5                      | -               | 5               | μA   |         |
| Input capacitance 1      | C <sub>IN1</sub> | Other than V <sub>CC</sub> , V <sub>SS</sub> , AV <sub>CC</sub> , AV <sub>SS</sub> , C | -  | -                       | 5               | 15              | pF   |         |
| Pull-up resistance       | R <sub>UP1</sub> | RSTX, NMIX   | V <sub>CC</sub> = 5.0 V ± 10 %   | 25                      | -               | 100             | kΩ   |         |
|                          |                  |  | V <sub>CC</sub> = 3.3 V ± 0.3 V  | 45                      | -               | 140             |      |         |
|                          | R <sub>UP2</sub> | P073,074<br>076,077  | V <sub>CC</sub> = 5.0 V ± 10 %   | 25                      | -               | 60              |      |         |
|                          |                  |  | V <sub>CC</sub> = 3.3 V ± 0.3 V  | 33                      | -               | 90              |      |         |
|                          | R <sub>UP3</sub> | Port pin other than P035,<br>041,073,074,<br>076,077,093,<br>122                       | V <sub>CC</sub> = 5.0 V ± 10 %   | 25                      | -               | 100             | kΩ   |         |
|                          |                  |  | V <sub>CC</sub> = 3.3 V ± 0.3 V  | 45                      | -               | 140             |      |         |
| "H" level output voltage | V <sub>OH1</sub> | Normal output pin  | V <sub>CC</sub> = 4.5 V<br>I <sub>OH</sub> = -4.0 mA   | V <sub>CC</sub><br>-0.5 | -               | V <sub>CC</sub> | V    |         |
|                          |                  |  | V <sub>CC</sub> = 3.0 V<br>I <sub>OH</sub> = -2.0 mA   |                         |                 |                 |      |         |
|                          | V <sub>OH2</sub> | P073,074,076,<br>077   | V <sub>CC</sub> = 4.5 V<br>I <sub>OH</sub> = -3.0 mA   | V <sub>CC</sub><br>-0.5 | -               | V <sub>CC</sub> | V    |         |
| V <sub>OH3</sub>         | P103 to 106      | V <sub>CC</sub> = 4.5 V<br>I <sub>OH</sub> = -12.0 mA                                  | V <sub>CC</sub><br>-0.5  | -                       | V <sub>CC</sub> | V               |      |         |
|                          |                  | V <sub>CC</sub> = 3.0 V<br>I <sub>OH</sub> = -8.0 mA                                   |  |                         |                 |                 |      |         |
| "L" level output voltage | V <sub>OL1</sub> | Normal output pin  | V <sub>CC</sub> = 4.5 V<br>I <sub>OL</sub> = 4.0 mA  | 0                       | -               | 0.4             | V    |         |
|                          |                  |  | V <sub>CC</sub> = 3.0 V<br>I <sub>OL</sub> = 2.0 mA  |                         |                 |                 |      |         |
|                          | V <sub>OL2</sub> | P073,074,076,<br>077   | V <sub>CC</sub> = 4.5 V<br>I <sub>OL</sub> = 3.0 mA  | 0                       | -               | 0.4             | V    |         |
|                          |                  |  | V <sub>CC</sub> = 3.0 V<br>I <sub>OL</sub> = 2.0 mA  |                         |                 |                 |      |         |
|                          | V <sub>OL3</sub> | P103 to 106  | V <sub>CC</sub> = 4.5 V<br>I <sub>OL</sub> = 12.0 mA   | 0                       | -               | 0.4             | V    |         |
|                          |                  |  | V <sub>CC</sub> = 3.0 V<br>I <sub>OL</sub> = 8.0 mA  |                         |                 |                 |      |         |



| Parameter               | Symbol    | Pin Name  | Conditions                  | Value               |     |                     | Unit | Remarks |
|-------------------------|-----------|---|-----------------------------|---------------------|-----|---------------------|------|---------|
|                         |           |   |                             | Min                 | Typ | Max                 |      |         |
| "H" level input voltage | $V_{IH1}$ | P000,002,003, 005,020,022, 024,026,150, 151,035,041, 045,055,057, 071-077,081, 082,093,096, 097,100-102, 111,115,116, 122,126,130, 134,142,143, 144,153 | CMOS hysteresis input level | $0.7 \times V_{CC}$ | -   | $V_{CC}$            | V    |         |
|                         | $V_{IH3}$ | Port other than $V_{IH1}$   | Automotive input level      | $0.8 \times V_{CC}$ | -   | $V_{CC}$            | V    |         |
|                         | $V_{IH5}$ | RSTX,NMIX,MD 0,MD1  | CMOS hysteresis input level | $0.8 \times V_{CC}$ | -   | $V_{CC}$            | V    |         |
|                         | $V_{IHT}$ | DEBUGIF   | TTL input level             | 2                   | -   | $V_{CC}$            | V    |         |
| "L" level input voltage | $V_{IL1}$ | P000,002,003, 005,020,022, 024,026,150, 151,035,041, 045,055,057, 071-077,081, 082,093,096, 097,100-102, 111,115,116, 122,126,130, 134,142,143, 144,153 | CMOS hysteresis input level | $V_{SS}$            | -   | $0.3 \times V_{CC}$ | V    |         |
|                         | $V_{IL3}$ | Port other than $V_{IH1}$   | Automotive input level      | $V_{SS}$            | -   | $0.5 \times V_{CC}$ | V    |         |
|                         | $V_{IL5}$ | RSTX,NMIX,MD 0,MD1  | CMOS hysteresis input level | $V_{SS}$            | -   | $0.2 \times V_{CC}$ | V    |         |
|                         | $V_{ILT}$ | DEBUGIF   | TTL input level             | $V_{SS}$            | -   | 0.8                 | V    |         |

\*: It is a standard in BRAMSC (Backup RAM sleep control bit) = 1 (Enter the state of the sleep at the standby mode) condition.



## AC Characteristics

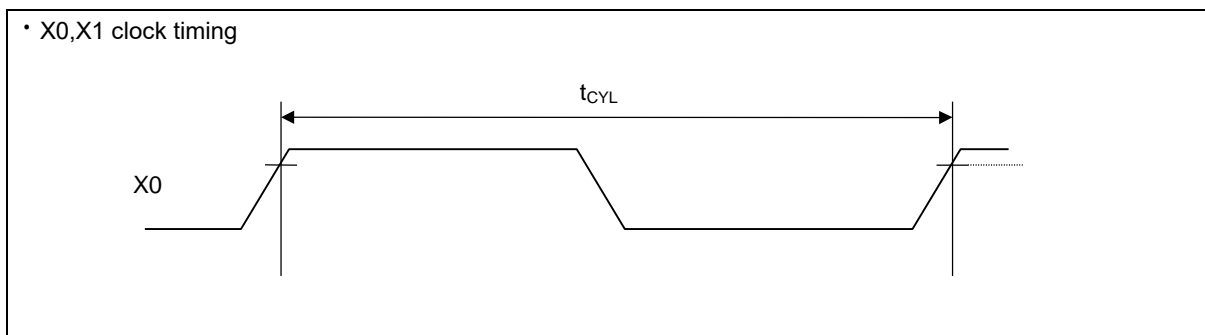
### (1) Main Clock Timing

(T<sub>A</sub>: -40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                             | Symbol           | Pin Name | Conditions | Value |     |      | Unit | Remarks  |
|---------------------------------------|------------------|----------|------------|-------|-----|------|------|--|
|                                       |                  |          |            | Min   | Typ | Max  |      |  |
| Source oscillation clock frequency    | F <sub>C</sub>   | X0, X1   |            | -     | 4   | 16   | MHz  |  |
| Source oscillation clock cycle time   | t <sub>CYL</sub> | X0, X1   |            | 62.5  | 250 | -    | ns   |  |
| Internal operating clock frequency*1  | F <sub>CP</sub>  | -        | -          | 2     | -   | 80   | MHz  | CPU clock  |
|                                       | F <sub>CPP</sub> |          |            | 1     |     | 40   |      | Peripheral bus clock   |
|                                       | F <sub>CPT</sub> |          |            | 1     |     | 40   |      | External bus clock (When V <sub>CC</sub> = 5.0 V is used) *2 |
|                                       |                  |          |            | 1     |     | 32   |      | External bus clock (When V <sub>CC</sub> = 3.3 V is used)    |
| Internal operating clock cycle time*1 | t <sub>CP</sub>  | -        | -          | 12.5  | -   | 500  | ns   | CPU clock  |
|                                       | t <sub>CPP</sub> |          |            | 25    |     | 1000 |      | Peripheral bus clock   |
|                                       | t <sub>CPT</sub> |          |            | 25    |     | 1000 |      | External bus clock (When V <sub>CC</sub> = 5.0 V is used)    |
|                                       |                  |          |            | 31.25 |     | 1000 |      | External bus clock (When V <sub>CC</sub> = 3.3 V is used)    |
| CAN PLL jitter (during lock)          | t <sub>PJ</sub>  | -        |            | -10   | -   | 10   | ns   | F <sub>CP</sub> = 80 MHz (4 MHz □ Multiplied by 20)          |
| Built-in CR oscillation frequency     | F <sub>CCR</sub> | -        |            | 50    | 100 | 150  | kHz  |  |

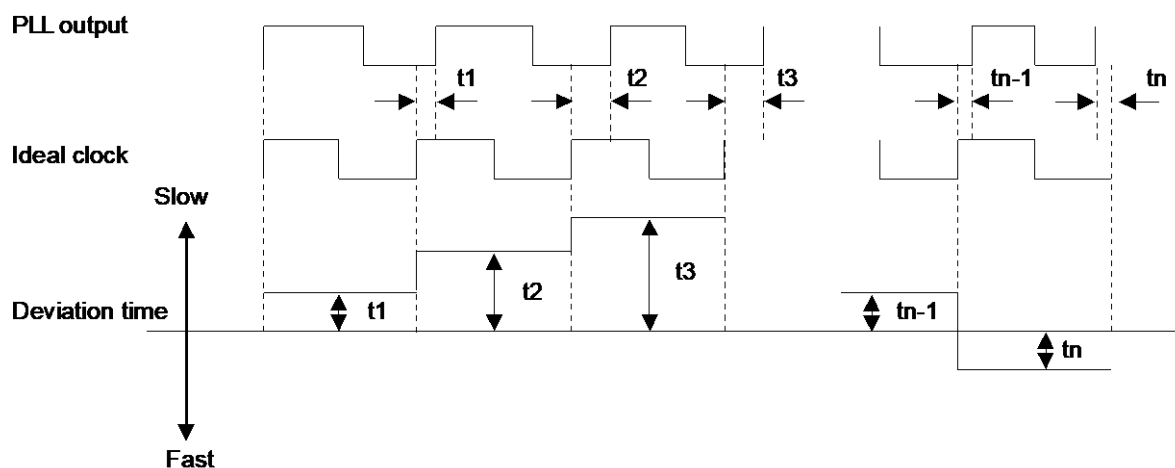
\*1: The maximum / minimum value is defined when using the main clock and PLL clock.

\*2: Use it with external load capacity 12 pF or less for V<sub>CC</sub> = 3.3 V ± 0.3 V (40 MHz operation).



- CAN PLL jitter

Deviation time from the ideal clock is assured per cycle out of 20, 000 cycles.



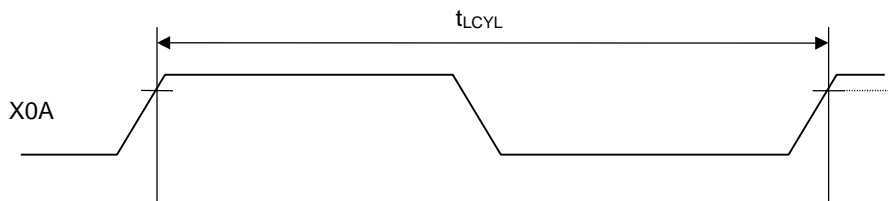


(1-2) Sub clock timing

(TA: -40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

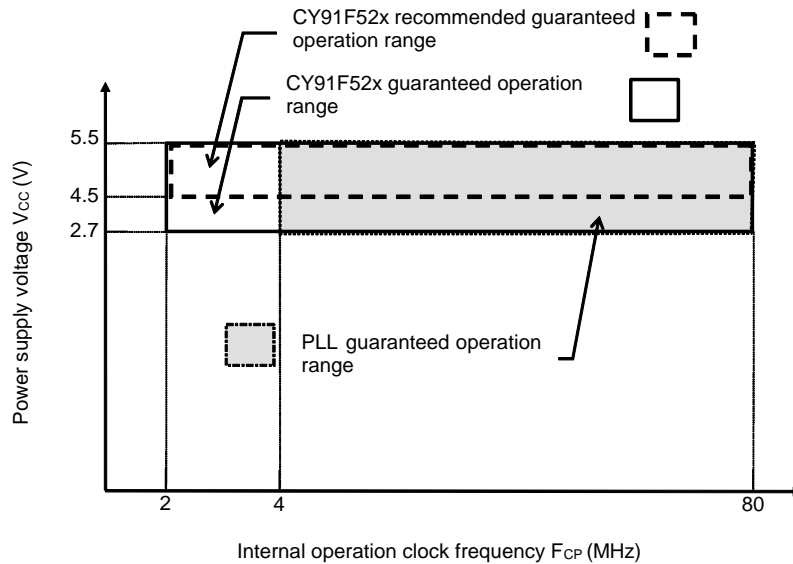
| Parameter                           | Symbol            | Pin Name | Conditions | Value |        |     | Unit | Remarks |
|-------------------------------------|-------------------|----------|------------|-------|--------|-----|------|---------|
|                                     |                   |          |            | Min   | Typ    | Max |      |         |
| Source oscillation clock frequency  | F <sub>CL</sub>   | X0A, X1A | -          | -     | 32.768 | -   | kHz  |         |
| Source oscillation clock cycle time | t <sub>LCYL</sub> | X0A, X1A |            | -     | 30.52  | -   | μs   |         |

· X0A,X1A clock timing



- Guaranteed operation range

## Internal operation clock frequency vs. Power supply voltage

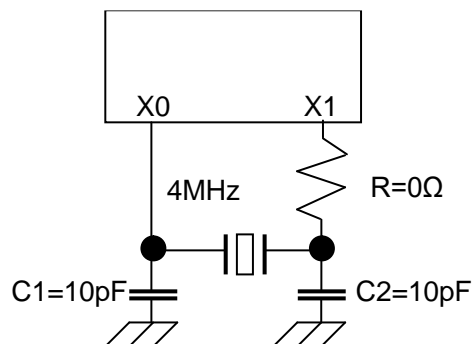


**Note:** The power supply voltage, which is the low-voltage detection setting voltage or lower, is in the reset state.

Oscillation clock frequency vs. Internal operation clock frequency

|                             |       | Internal operation clock frequency |                 |                 |                 |                 |     |                  |                  |
|-----------------------------|-------|------------------------------------|-----------------|-----------------|-----------------|-----------------|-----|------------------|------------------|
|                             |       | Main Clock                         | PLL clock       |                 |                 |                 |     |                  |                  |
|                             |       |                                    | Multiplied by 1 | Multiplied by 2 | Multiplied by 3 | Multiplied by 4 | ... | Multiplied by 19 | Multiplied by 20 |
| Oscillation clock frequency | 4 MHz | 2 MHz                              | 4 MHz           | 8 MHz           | 12 MHz          | 16 MHz          | ... | 76 MHz           | 80 MHz           |

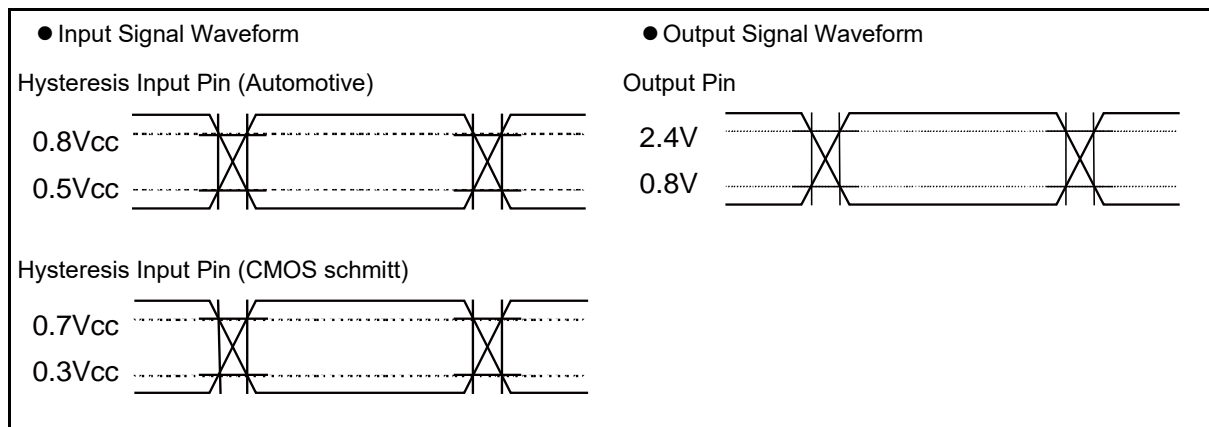
- Example of oscillation circuit



**Note:** As to the product with its clock supervisor's initial value is "ON", when the oscillator is unable to start within 20 ms from the stop state the clock supervisor will detect the oscillation stop. As a result, the CPU moves to the fail safe operation.

Design your print circuit board so that the oscillator can start oscillation within 20 ms. Moreover, it is recommended to be designed after the match evaluation of the circuit is requested to the departure pendulum maker when the oscillation circuit is composed.

AC characteristics are specified by the following measurement reference voltage values.





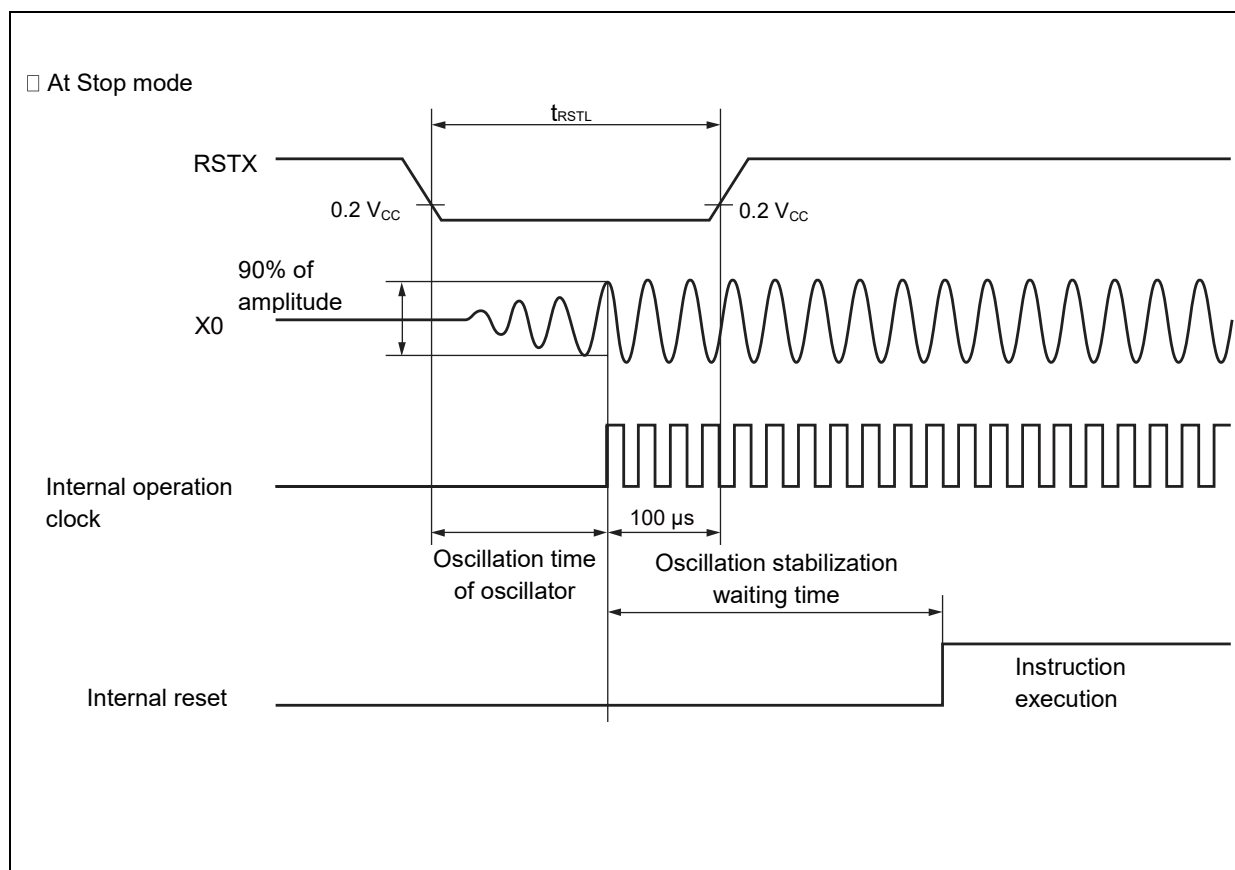
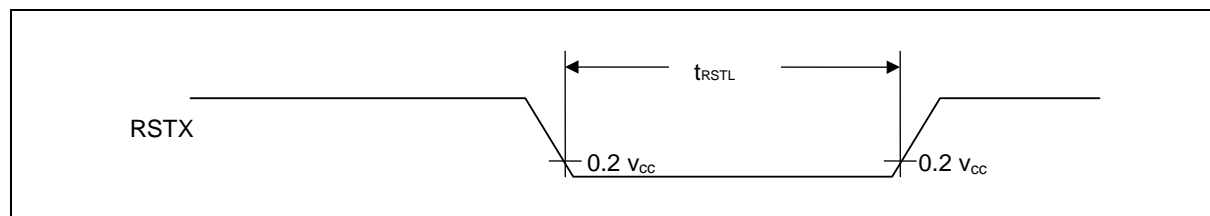
## (2) Reset Input

(TA: -40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                     | Symbol            | Pin Name | Conditions | Value                                |     | Unit | Remarks               |   |
|-------------------------------|-------------------|----------|------------|--------------------------------------|-----|------|-----------------------|---|
|                               |                   |          |            | Min                                  | Max |      |                       |   |
| Reset input time              | t <sub>RSTL</sub> | RSTX     | -          | 10                                   | -   | μs   | When normal operation |   |
|                               |                   |          |            | Oscillation time of oscillator* +100 |     | -    | μs                    | At Stop mode<br>At Power-on* <sup>2</sup> |
|                               |                   |          |            | 100                                  | -   | μs   | At Watch mode         |   |
| Width for reset input removal |                   |          |            | 1                                    | -   | μs   |                       |   |

\*1: The oscillation time of the oscillator is the time it takes for the amplitude of the oscillations to reach 90 %. For crystal oscillators, this time is between several ms and several tens of ms, for ceramic oscillators the time is between several hundred μs and several ms, and for an external clock, the time is 0 ms.

\*2: In case of using CY91F52xxxD or CY91F52xxxE and corresponding to note in (3) Power-on Conditions of next subsection, assert RSTX with power-on.





## (3) Power-on Conditions

(3-1) [CY9152xxxB/CY9152xxxC/CY9152xxxD]

(T<sub>A</sub>: -40 °C to +125 °C, V<sub>SS</sub> = 0.0 V)

| Parameter                        | Symbol           | Pin Name        | Conditions                            | Value |     |       | Unit  | Remarks |
|----------------------------------|------------------|-----------------|---------------------------------------|-------|-----|-------|-------|---------|
|                                  |                  |                 |                                       | Min   | Typ | Max   |       |         |
| Level detection voltage          | –                | V <sub>CC</sub> | –                                     | 2.024 | 2.2 | 2.376 | V     |         |
| Level detection hysteresis width | –                | V <sub>CC</sub> | –                                     | –     | 100 | –     | mV    |         |
| Level detection time             | –                | –               | –                                     | –     | –   | 30    | μs    | *1      |
| Power off time                   | t <sub>OFF</sub> | V <sub>CC</sub> | –                                     | 50    | –   | –     | ms    | *2      |
| Power ramp rate                  | dV/dt            | V <sub>CC</sub> | V <sub>CC</sub> :<br>0.2 V to 2.376 V | –     | –   | 4     | mV/μs | *3      |
| C pin voltage at Power-on        | –                | C               | –                                     | –     | –   | 60    | mV    | *4      |

\*1: This spec is at 4 mV/μs of power ramp rate. If the power ramp rate is faster than 4mV/μs, there is the possibility to generate or release after the power supply voltage has exceeded the detection voltage range.

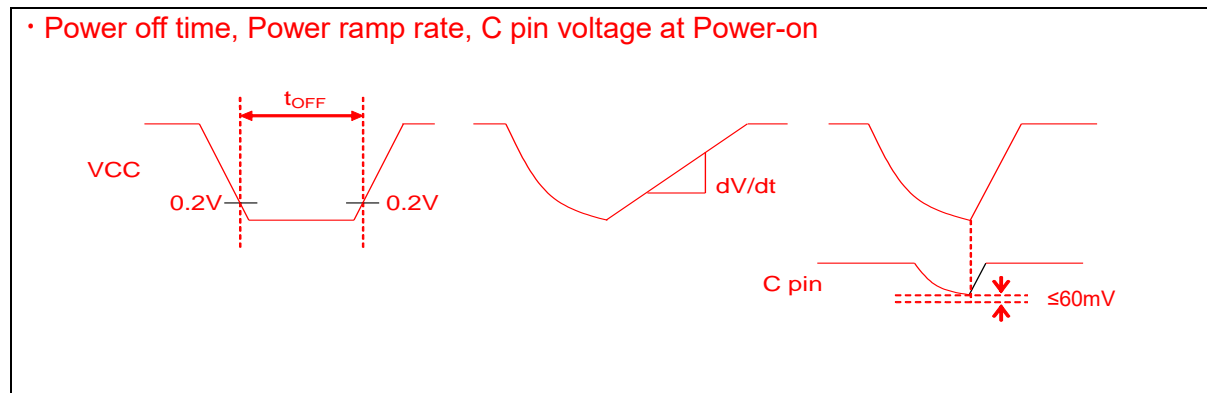
\*2: V<sub>CC</sub> must be held below 0.2 V for a minimum period of t<sub>OFF</sub>.

\*3: Power-on can detect by satisfying power ramp rate when power off time is not satisfied.

\*4: C-pin voltage is below 60 mV when V<sub>CC</sub> is turned on again.

## Note:

When using CY91F52xxxB/C, either \*2 or \*3 or \*4 must be satisfied. When neither \*2 nor \*3 nor \*4 can be satisfied, use CY91F52xxxD and assert external reset (RSTX) at power-up and at any brownout event.





(3-2) [CY9152xxxE]

(TA: -40 °C to +125 °C, V<sub>SS</sub> = 0.0 V)

| Parameter   | Symbol            | Pin Name        | Conditions  | Value |     |       | Unit  | Remarks |
|---|-------------------|-----------------|---|-------|-----|-------|-------|---------|
|   |                   |                 |   | Min   | Typ | Max   |       |         |
| Level detection voltage                                     | –                 | V <sub>CC</sub> | –   | 2.024 | 2.2 | 2.376 | V     |         |
| Level detection hysteresis width                            | –                 | V <sub>CC</sub> | –   | –     | 100 | –     | mV    |         |
| Level detection time  | –                 | –               | –   | –     | –   | 30    | μs    | *1      |
| Power off time  | t <sub>OFF1</sub> | V <sub>CC</sub> | V <sub>CC</sub> ≤ 0.2 V   | 50    | –   | –     | ms    | *2      |
|   | t <sub>OFF2</sub> | V <sub>CC</sub> | V <sub>CC</sub> ≤ 1.3 V   | 100   | –   | –     | μs    | *4      |
| Power ramp rate   | dV/dt             | V <sub>CC</sub> | V <sub>CC</sub> :<br>0.2 V to 2.376 V<br>(t <sub>OFF1</sub> < 50 ms)  | –     | –   | 50    | mV/μs | *3      |
|   | dV/dt             | V <sub>CC</sub> | V <sub>CC</sub> :<br>1.3 V to 2.376 V<br>(t <sub>OFF2</sub> ≥ 100 μs) | –     | –   | 1000  | mV/μs | *4      |
| C pin voltage at Power-on                                   | –                 | C               | –   | –     | –   | 60    | mV    | *5      |
| Maximum ramp rate guaranteed to not generate power-on reset | dV/dt             | V <sub>CC</sub> | V <sub>CC</sub> :<br>Between 2.4 V and 4.5 V                          | –     | –   | 50    | mV/μs | *6      |

\*1: The specified level detection time applies only for power ramp rate of 1000 mV/μs or less.

\*2: V<sub>CC</sub> must be held below 0.2 V for a minimum period of t<sub>OFF1</sub>.

\*3: Power-on can detect by satisfying power ramp rate when t<sub>OFF1</sub> is not satisfied.

\*4: V<sub>CC</sub> must be held below 1.3 V for a minimum period of t<sub>OFF2</sub>.

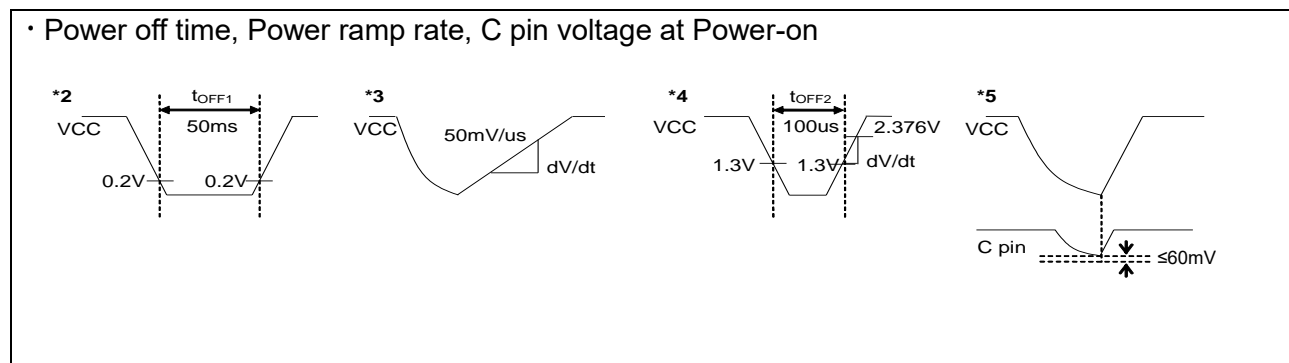
Power ramp rate must be 1000 mV/μs or less from 1.3 V to 2.376 V.

Power-on can detect by satisfying power ramp rate and power off time.

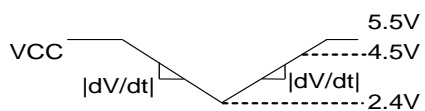
\*5: C-pin voltage is below 60 mV when V<sub>CC</sub> is turned on again.

\*6: This specification is specified the power supply fluctuation after power on detection. When V<sub>CC</sub> voltage is between 2.4 V and 4.5 V, the power supply fluctuation is below 50 mV/us, the detection of power-on is suppressed. The power-on does not detect in any power fluctuation between 4.5 V and 5.5 V.

Note: When using CY91F52xxxE, either \*2 or \*3 or \*4 or \*5 must be satisfied. When neither \*2 nor \*3 nor \*4 nor \*5 can be satisfied, assert external reset (RSTX) at power-up and at any brownout event.



- Maximum ramp rate guaranteed to not generate power-on reset





## (4) Multi-function Serial

## (4-1) CSIO timing

(4-1-1) Bit setting: SMR: MD2 = 0, SMR: MD1 = 1, SMR : MD0 = 0, SMR: SCINV = 0, SCR:SPI = 0

(TA: -40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V±0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                    | Symbol             | Pin Name  | Conditions | Value                 |     | Unit | Remarks   |
|------------------------------|--------------------|---|------------|-----------------------|-----|------|---|
|                              |                    |   |            | Min                   | Max |      |   |
| Serial clock cycle time      | t <sub>SCYC</sub>  | SCK0 to SCK11   | -          | 4t <sub>CPP</sub>     | -   | ns   | Internal shift clock mode output pin : C <sub>L</sub> = 50 pF |
| SCK ↓ → SOT delay time       | t <sub>SLOVI</sub> | SCK0 to SCK2, SCK5 to SCK11 SOT0 to SOT2, SOT5 to SOT11 | -          | -30                   | 30  | ns   |   |
|                              |                    | SCK3 , SCK4 SOT3 , SOT4                                 | -          | -300                  | 300 | ns   |   |
| Valid SIN → SCK ↑ setup time | t <sub>IVSHI</sub> | SCK0 to SCK2, SCK5 to SCK11 SIN0 to SIN2, SIN5 to SIN11 | -          | 34                    | -   | ns   |   |
|                              |                    | SCK3 , SCK4 SIN3 , SIN4                                 | -          | 300                   | -   | ns   |   |
| SCK ↑ → Valid SIN hold time  | t <sub>SHIXI</sub> | SCK0 to SCK11 SIN0 to SIN11                             | -          | 0                     | -   | ns   |   |
| Serial clock "H" pulse width | t <sub>SHSL</sub>  | SCK0 to SCK11   | -          | t <sub>CPP</sub> +10  | -   | ns   | External shift clock mode output pin: C <sub>L</sub> = 50 pF  |
| Serial clock "L" pulse width | t <sub>SLSH</sub>  |   |            | 2t <sub>CPP</sub> -10 | -   | ns   |   |
| SCK ↓ → SOT delay time       | t <sub>SLOVE</sub> | SCK0 to SCK2, SCK5 to SCK11 SOT0 to SOT2, SOT5 to SOT11 | -          | -                     | 33  | ns   |   |
|                              |                    | SCK3 , SCK4 SOT3 , SOT4                                 | -          | -                     | 300 | ns   |   |
| Valid SIN → SCK ↑ setup time | t <sub>IVSHE</sub> | SCK0 to SCK11 SIN0 to SIN11                             | -          | 10                    | -   | ns   |   |
| SCK ↑ → Valid SIN hold time  | t <sub>SHIXE</sub> |   |            | 20                    | -   | ns   |   |
| SCK fall time                | t <sub>F</sub>     | SCK0 to SCK11   | -          | -                     | 5   | ns   |   |
| SCK rise time                | t <sub>R</sub>     | SCK0 to SCK11   | -          | -                     | 5   | ns   |   |

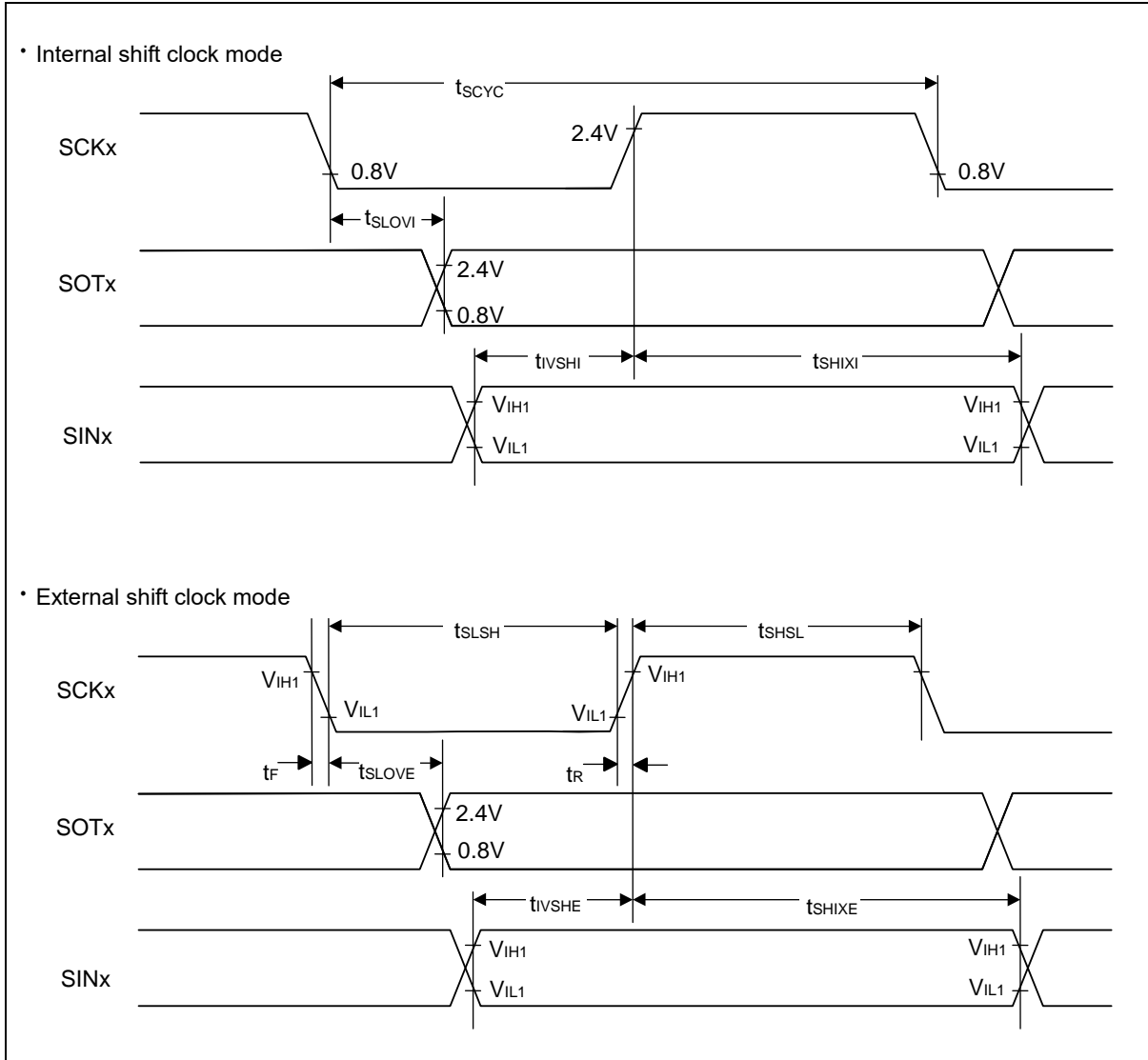
**Notes:**

AC characteristic in CLK synchronized mode.

C<sub>L</sub> is the load capacitance applied to pins during testing.

The maximum baud rate is limited by internal operation clock used and other parameters. Use ch.3 and ch.4 with maximum baud rate 400 kbps or less.

See Hardware Manual for details.





(4-1-2) Bit setting: SMR: MD2 = 0, SMR: MD1 = 1, SMR : MD0 = 0, SMR: SCINV = 1, SCR:SPI = 0

(TA: -40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                    | Symbol             | Pin Name  | Conditions | Value                 |     | Unit | Remarks   |
|------------------------------|--------------------|---|------------|-----------------------|-----|------|---|
|                              |                    |   |            | Min                   | Max |      |   |
| Serial clock cycle time      | t <sub>SCYC</sub>  | SCK0 to SCK11   | -          | 4t <sub>CPP</sub>     | -   | ns   | Internal shift clock mode output pin : C <sub>L</sub> = 50 pF |
| SCK ↑ → SOT delay time       | t <sub>SHOVI</sub> | SCK0 to SCK2, SCK5 to SCK11 SOT0 to SOT2, SOT5 to SOT11 | -          | -30                   | 30  | ns   |   |
|                              |                    | SCK3, SCK4 SOT3, SOT4                                   | -          | -300                  | 300 | ns   |   |
| Valid SIN → SCK ↓ setup time | t <sub>IVSLI</sub> | SCK0 to SCK2, SCK5 to SCK11 SIN0 to SIN2, SIN5 to SIN11 | -          | 34                    | -   | ns   |   |
|                              |                    | SCK3, SCK4 SIN3, SIN4                                   | -          | 300                   | -   | ns   |   |
| SCK ↓ → Valid SIN hold time  | t <sub>SLIXI</sub> | SCK0 to SCK11 SIN0 to SIN11                             | -          | 0                     | -   | ns   |   |
| Serial clock "H" pulse width | t <sub>SHSL</sub>  | SCK0 to SCK11   | -          | t <sub>CPP</sub> +10  | -   | ns   | External shift clock mode output pin: C <sub>L</sub> = 50 pF  |
| Serial clock "L" pulse width | t <sub>SLSH</sub>  |   | -          | 2t <sub>CPP</sub> -10 | -   | ns   |   |
| SCK ↑ → SOT delay time       | t <sub>SHOVE</sub> | SCK0 to SCK2, SCK5 to SCK11 SOT0 to SOT2, SOT5 to SOT11 | -          | -                     | 33  | ns   |   |
|                              |                    | SCK3, SCK4 SOT3, SOT4                                   | -          | -                     | 300 | ns   |   |
| Valid SIN → SCK ↓ setup time | t <sub>IVSLE</sub> | SCK0 to SCK11 SIN0 to SIN11                             | -          | 10                    | -   | ns   |   |
| SCK ↓ → Valid SIN hold time  | t <sub>SLIXE</sub> |   | -          | 20                    | -   | ns   |   |
| SCK fall time                | t <sub>F</sub>     | SCK0 to SCK11   | -          | -                     | 5   | ns   |   |
| SCK rise time                | t <sub>R</sub>     | SCK0 to SCK11   | -          | -                     | 5   | ns   |   |

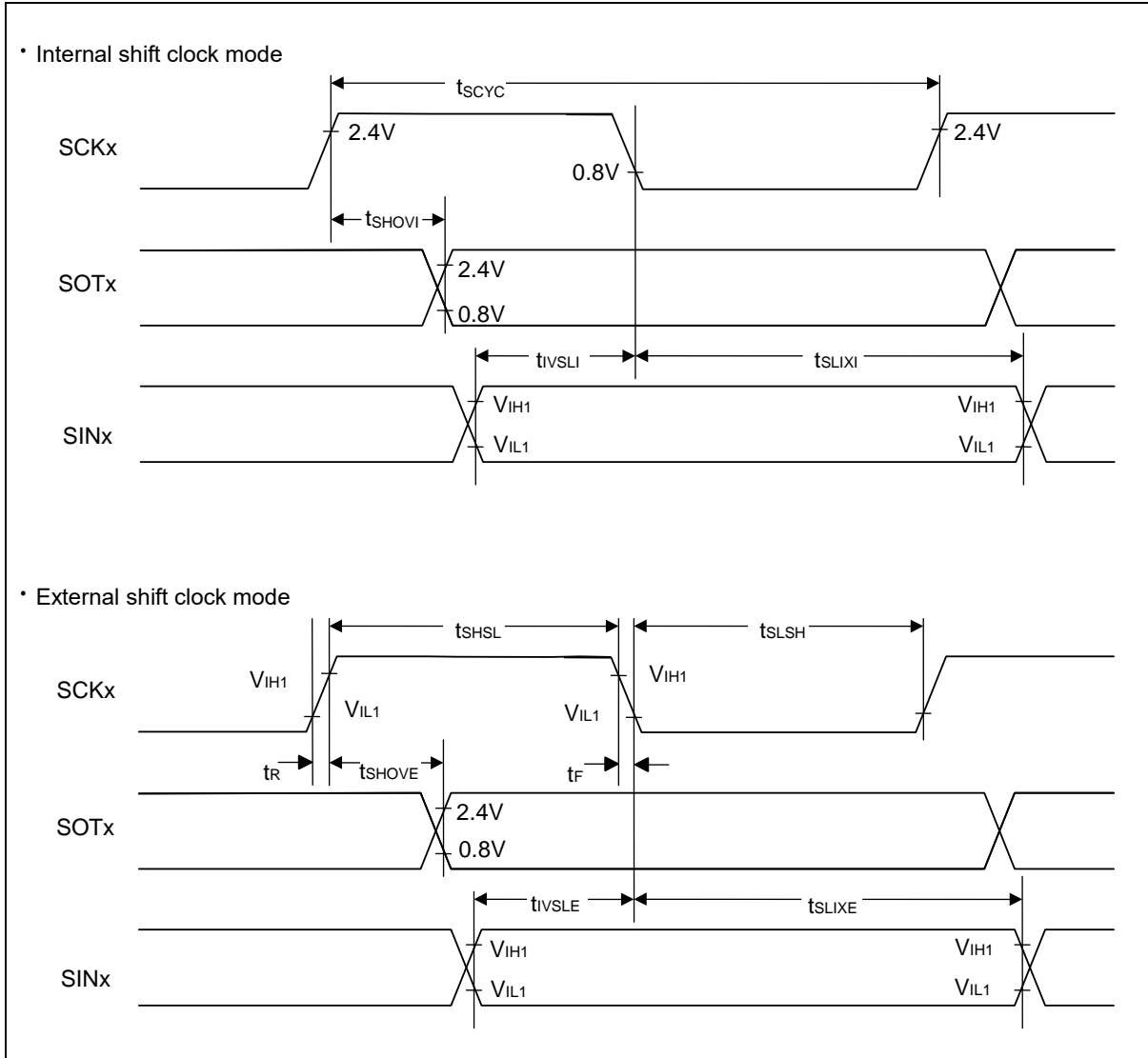
#### Notes:

AC characteristic in CLK synchronized mode.

C<sub>L</sub> is the load capacitance applied to pins during testing.

The maximum baud rate is limited by internal operation clock used and other parameters. Use ch.3 and ch.4 with maximum baud rate 400 kbps or less.

See Hardware Manual for details.





(4-1-3) Bit setting: SMR : MD2 = 0, SMR:MD1 = 1, SMR : MD0 = 0, SMR:SCINV = 0, SCR:SPI = 1

(TA:-40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0V)

| Parameter                       | Symbol             | Pin Name   | Conditions | Value                    |     | Unit | Remarks  |
|---------------------------------|--------------------|--|------------|--------------------------|-----|------|--|
|                                 |                    |  |            | Min                      | Max |      |  |
| Serial clock cycle time         | t <sub>SCYC</sub>  | SCK0 to SCK11  |            | 4t <sub>CPP</sub>        | -   | ns   | Internal shift clock mode output pin :<br>C <sub>L</sub> = 50 pF |
| SCK ↑ →<br>SOT delay time       | t <sub>SHOVI</sub> | SCK0 to SCK2,<br>SCK5 to SCK11<br>SOT0 to SOT2,<br>SOT5 to SOT11 |            | -30                      | 30  | ns   |  |
|                                 |                    | SCK3 , SCK4<br>SOT3 , SOT4                                       |            | -300                     | 300 | ns   |  |
| Valid SIN →<br>SCK ↓ setup time | t <sub>IVSLI</sub> | SCK0 to SCK2,<br>SCK5 to SCK11<br>SIN0 to SIN2,<br>SIN5 to SIN11 | -          | 34                       | -   | ns   |  |
|                                 |                    | SCK3 , SCK4<br>SIN3 , SIN4                                       |            | 300                      | -   | ns   |  |
| SCK ↓ →<br>Valid SIN hold time  | t <sub>SLIXI</sub> | SCK0 to SCK11<br>SIN0 to SIN11                                   |            | 0                        | -   | ns   |  |
| SOT→SCK↓<br>delay time          | t <sub>SOVLI</sub> | SCK0 to SCK11<br>SOT0 to SOT11                                   |            | 2t <sub>CPP</sub><br>-30 | -   | ns   |  |
| Serial clock<br>"H"pulse width  | t <sub>SHSL</sub>  | SCK0 to SCK11  |            | t <sub>CPP+</sub><br>10  | -   | ns   | External shift clock mode output pin:<br>C <sub>L</sub> = 50 pF  |
| Serial clock<br>"L" pulse width | t <sub>LSLH</sub>  |  |            | 2t <sub>CPP</sub><br>-10 | -   | ns   |  |
| SCK ↑ →<br>SOT delay time       | t <sub>SHOVE</sub> | SCK0 to SCK2,<br>SCK5 to SCK11<br>SOT0 to SOT2,<br>SOT5 to SOT11 |            | -                        | 33  | ns   |  |
|                                 |                    | SCK3 , SCK4<br>SOT3 , SOT4                                       |            | -                        | 300 | ns   |  |
| Valid SIN →<br>SCK ↓ setup time | t <sub>IVSHE</sub> | SCK0 to SCK11<br>SIN0 to SIN11                                   |            | 10                       | -   | ns   |  |
| SCK ↓ →<br>Valid SIN hold time  | t <sub>SLIXE</sub> |  |            | 20                       | -   | ns   |  |
| SCK fall time                   | t <sub>F</sub>     | SCK0 to SCK11  |            | -                        | 5   | ns   |  |
| SCK rise time                   | t <sub>R</sub>     | SCK0 to SCK11  |            | -                        | 5   | ns   |  |

**Notes:**

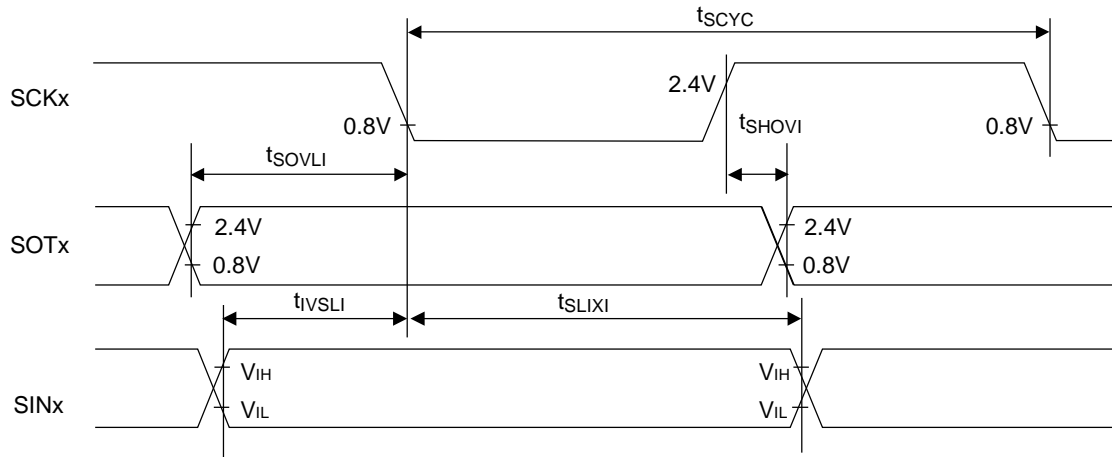
AC characteristic in CLK synchronized mode.

C<sub>L</sub> is the load capacitance applied to pins during testing.

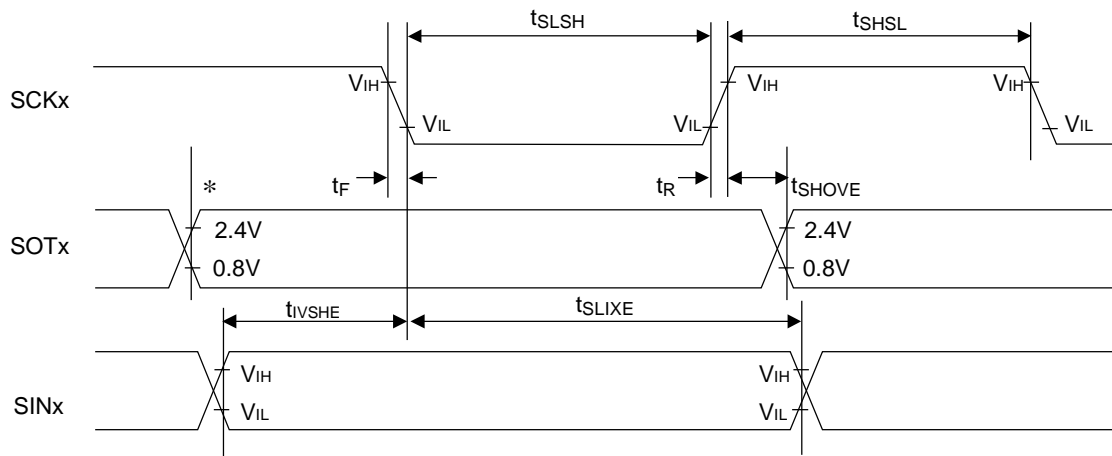
The maximum baud rate is limited by internal operation clock used and other parameters. Use ch.3 and ch.4 with maximum baud rate 400 kbps or less.

See Hardware Manual for details.

- Internal shift clock mode



- External shift clock mode



\*: It writes in the TDR register and, then, it changes.



(4-1-4) Bit setting: SMR : MD2 = 0, SMR:MD1 = 1, SMR : MD0 = 0, SMR:SCINV = 1, SCR:SPI = 1

(TA: -40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0V)

| Parameter                       | Symbol             | Pin Name   | Conditions | Value                 |     | Unit | Remarks  |
|---------------------------------|--------------------|--|------------|-----------------------|-----|------|--|
|                                 |                    |  |            | Min                   | Max |      |  |
| Serial clock cycle time         | t <sub>SCYC</sub>  | SCK0 to SCK11  | -          | 4t <sub>CPP</sub>     | -   | ns   | Internal shift clock mode output pin :<br>C <sub>L</sub> = 50 pF |
| SCK↓→<br>SOT delay time         | t <sub>SLOVI</sub> | SCK0 to SCK2,<br>SCK5 to SCK11<br>SOT0 to SOT2,<br>SOT5 to SOT11 | -          | -30                   | 30  | ns   |  |
|                                 |                    | SCK3 , SCK4<br>SOT3 , SOT4                                       | -          | -300                  | 300 | ns   |  |
| Valid SIN →<br>SCK↑setup time   | t <sub>IVSHI</sub> | SCK0 to SCK2,<br>SCK5 to SCK11<br>SIN0 to SIN2,<br>SIN5 to SIN11 | -          | 34                    | -   | ns   |  |
|                                 |                    | SCK3 , SCK4<br>SIN3 , SIN4                                       | -          | 300                   | -   | ns   |  |
| SCK↑→<br>Valid SIN hold time    | t <sub>SHIXI</sub> | SCK0 to SCK11<br>SIN0 to SIN11                                   | -          | 0                     | -   | ns   |  |
| SOT→SCK↑<br>delay time          | t <sub>SOVHI</sub> | SCK0 to SCK11<br>SOT0 to SOT11                                   | -          | 2t <sub>CPP</sub> -30 | -   | ns   |  |
| Serial clock<br>"H" pulse width | t <sub>SHSL</sub>  | SCK0 to SCK11  | -          | t <sub>CPP</sub> +10  | -   | ns   | External shift clock mode output pin:<br>C <sub>L</sub> = 50 pF  |
| Serial clock<br>"L" pulse width | t <sub>LSLH</sub>  |  | -          | 2t <sub>CPP</sub> -10 | -   | ns   |  |
| SCK↓→<br>SOT delay time         | t <sub>SLOVE</sub> | SCK0 to SCK2,<br>SCK5 to SCK11<br>SOT0 to SOT2,<br>SOT5 to SOT11 | -          | -                     | 33  | ns   |  |
|                                 |                    | SCK3 , SCK4<br>SOT3 , SOT4                                       | -          | -                     | 300 | ns   |  |
| Valid SIN →<br>SCK↑setup time   | t <sub>IVSHE</sub> | SCK0 to SCK11<br>SIN0 to SIN11                                   | -          | 10                    | -   | ns   |  |
| SCK↑→<br>Valid SIN hold time    | t <sub>SHIXE</sub> |  | -          | 20                    | -   | ns   |  |
| SCK fall time                   | t <sub>F</sub>     | SCK0 to SCK11  | -          | -                     | 5   | ns   |  |
| SCK rise time                   | t <sub>R</sub>     | SCK0 to SCK11  | -          | -                     | 5   | ns   |  |

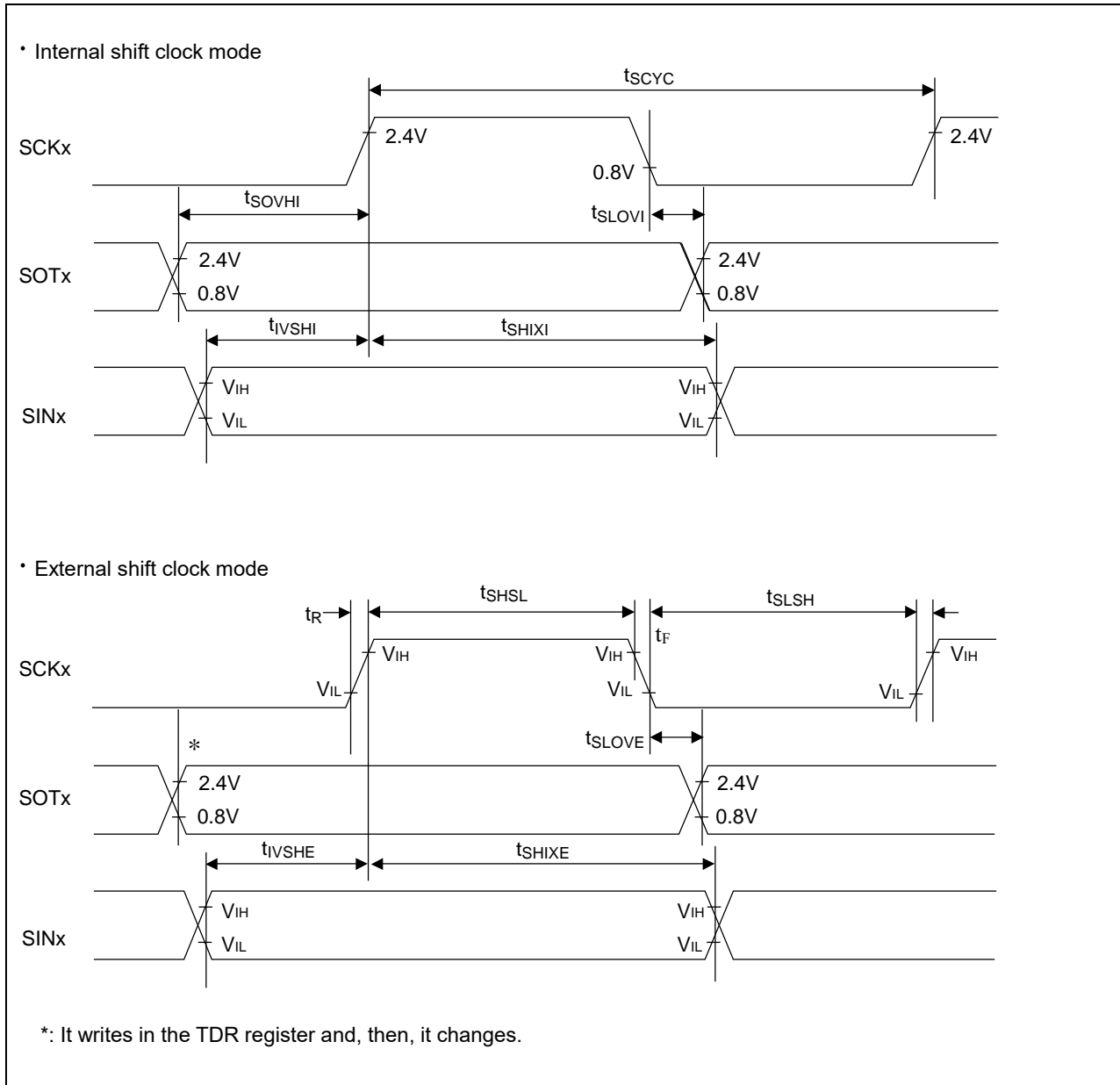
**Notes:**

AC characteristic in CLK synchronized mode.

C<sub>L</sub> is the load capacitance applied to pins during testing.

The maximum baud rate is limited by internal operation clock used and other parameters. Use ch.3 and ch.4 with maximum baud rate 400 kbps or less.

See Hardware Manual for details.





(4-1-5) Bit setting: SMR:MD2 = 0, SMR:MD1 = 1, SMR:MD0 = 0,

When Serial chip select is used : SCSCR:CSEN = 1,

Serial clock output mark level "H" : SMR,SCSFR:SCINV = 0,

Serial chip select Inactive level "H" : SCSCR,SCSFR:CSLVL = 1

(TA:-40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V±0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0V)

| Parameter               | Symbol            | Pin Name  | Conditions | Value                        |                              | Unit | Remarks  |
|-------------------------|-------------------|---|------------|------------------------------|------------------------------|------|--|
|                         |                   |   |            | Min                          | Max                          |      |  |
| SCS↓→SCK↓<br>setup time | t <sub>cssi</sub> | SCK1, SCK2,<br>SCK5 to SCK11<br>SCS1, SCS2,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11 | -          | t <sub>cssu</sub> -50<br>*1  | t <sub>cssu</sub> +0<br>*1   | ns   | Internal shift<br>clock mode<br>output pin :<br>C <sub>L</sub> = 50 pF |
|                         |                   | SCK3, SCK4<br>SCS3,<br>SCS40 to SCS43   |            | t <sub>cssu</sub> -50<br>*1  | t <sub>cssu</sub> +300<br>*1 | ns   |  |
| SCK↑→SCS↑<br>hold time  | t <sub>csHI</sub> | SCK1, SCK2,<br>SCK5 to SCK11<br>SCS1, SCS2,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11 |            | t <sub>csHD</sub> -10<br>*2  | t <sub>csHD</sub> +50<br>*2  | ns   |  |
|                         |                   | SCK3, SCK4<br>SCS3,<br>SCS40 to SCS43   |            | t <sub>csHD</sub> -300<br>*2 | t <sub>csHD</sub> +50<br>*2  | ns   |  |
| SCS<br>deselect time    | t <sub>csDI</sub> | SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11            |            | t <sub>csDS</sub> -50<br>*3  | t <sub>csDS</sub> +50<br>*3  | ns   |  |



| Parameter                         | Symbol            | Pin Name  | Conditions | Value                  |                       | Unit | Remarks  |
|-----------------------------------|-------------------|---|------------|------------------------|-----------------------|------|--|
|                                   |                   |   |            | Min                    | Max                   |      |  |
| SCS↓→SCK↓<br>setup time           | t <sub>CSSE</sub> | SCK1 to SCK11<br>SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11                               | -          | 3t <sub>CPP</sub> +30  | -                     | ns   | External shift<br>clock mode<br>output pin:<br>C <sub>L</sub> = 50 pF                    |
| SCK↑→SCS↑<br>hold time            | t <sub>CSHE</sub> | SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11  | -          | +0                     | -                     | ns   |  |
| SCS<br>deselect time              | t <sub>CSDE</sub> | SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11  | -          | 3t <sub>CPP</sub> +30  | -                     | ns   |  |
| SCS↓→SOT<br>delay time            | t <sub>DSE</sub>  | SCK1 , SCK2,<br>SCK5 to SCK11<br>SCS1 , SCS2,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11<br>SOT1 , SOT2 ,<br>SOT5 to SOT11 | -          | -                      | 40                    | ns   |  |
|                                   |                   | SCS3,<br>SCS40 to SCS43<br>SOT3 , SOT4  | -          | -                      | 300                   | ns   |  |
| SCS↑→SOT<br>delay time            | t <sub>DEE</sub>  | SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11<br>SOT1 to SOT11                               | -          | +0                     | -                     | ns   | External shift<br>clock mode<br>output pin:<br>C <sub>L</sub> = 50 pF                    |
| SCK↓→SCS↓<br>clock switch<br>time | t <sub>SCC</sub>  | SCK1 , SCK2,<br>SCK5 to SCK11<br>SCS1 , SCS2,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11                                   | -          | 3t <sub>CPP</sub> -10  | 3t <sub>CPP</sub> +50 | ns   | Internal shift<br>clock mode<br>Round operation<br>output pin:<br>C <sub>L</sub> = 50 pF |
|                                   |                   | SCK3 , SCK4<br>SCS3 ,<br>SCS40 to SCS43   | -          | 3t <sub>CPP</sub> -300 | 3t <sub>CPP</sub> +50 | ns   |  |

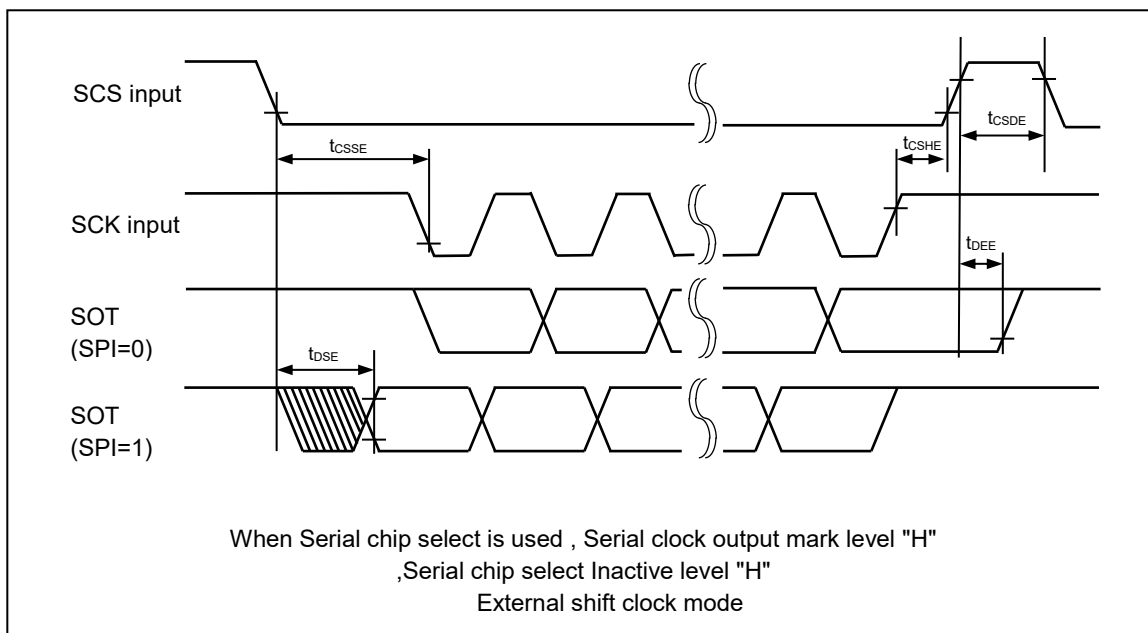
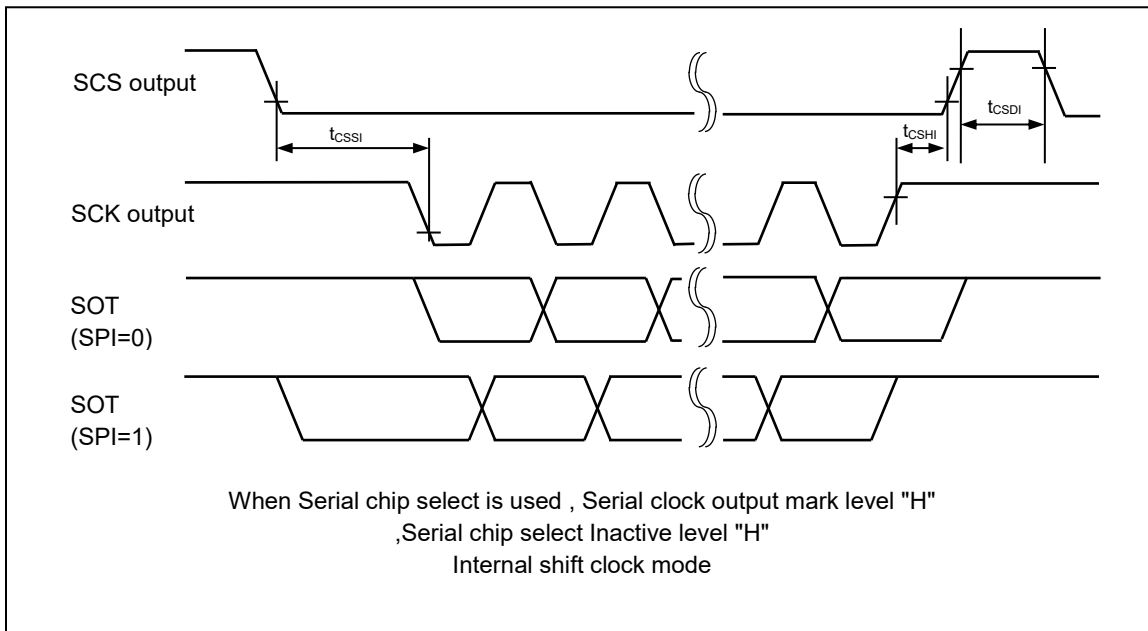
\*1: t<sub>CSSU</sub> = SCSTR:CSSU7-0×Serial chip select timing operating clock

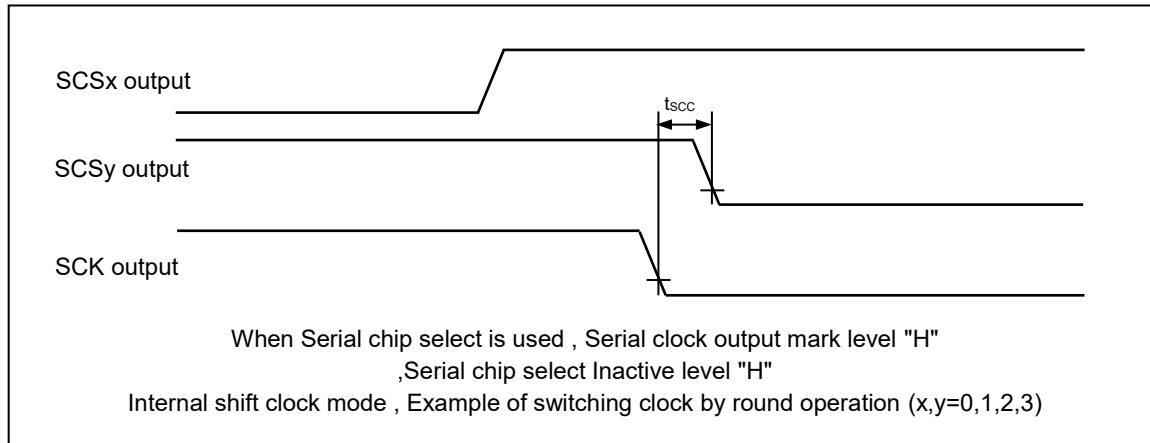
\*2: t<sub>CSHD</sub> = SCSTR:CSD7-0×Serial chip select timing operating clock

\*3: t<sub>CSDS</sub> = SCSTR:CSDS15-0×Serial chip select timing operating clock

Regardless of the deselect time setting, once after the serial chip select pin becomes inactive, it will take at least five peripheral bus clock cycles to be active again

See the hardware manual for details of above-mentioned \*1,\*2, and \*3.







(4-1-6) Bit setting: SMR:MD2 = 0, SMR:MD1 = 1, SMR:MD0 = 0,

When Serial chip select is used : SCSCR:CSEN = 1,

Serial clock output mark level "L" : SMR,SCSFR:SCINV = 1,

Serial chip select Inactive level "H" : SCSCR,SCSFR:CSLVL = 1

(TA:-40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0V)

| Parameter               | Symbol            | Pin Name  | Conditions | Value                        |                              | Unit | Remarks  |
|-------------------------|-------------------|---|------------|------------------------------|------------------------------|------|--|
|                         |                   |   |            | Min                          | Max                          |      |  |
| SCS↓→SCK↑<br>setup time | t <sub>cssi</sub> | SCK1 , SCK2,<br>SCK5 to SCK11<br>SCS1 , SCS2,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11 | -          | t <sub>cssu</sub> -50<br>*1  | t <sub>cssu</sub> +0<br>*1   | ns   | Internal shift<br>clock mode<br>output pin :<br>C <sub>L</sub> = 50 pF |
|                         |                   | SCK3 , SCK4<br>SCS3 ,<br>SCS40 to SCS43   |            | t <sub>cssu</sub> -50<br>*1  | t <sub>cssu</sub> +300<br>*1 | ns   |  |
| SCK↓→SCS↑<br>hold time  | t <sub>csHi</sub> | SCK1 , SCK2,<br>SCK5 to SCK11<br>SCS1 , SCS2,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11 |            | t <sub>csHD</sub> -10<br>*2  | t <sub>csHD</sub> +50<br>*2  | ns   |  |
|                         |                   | SCK3 , SCK4<br>SCS3 ,<br>SCS40 to SCS43   |            | t <sub>csHD</sub> -300<br>*2 | t <sub>csHD</sub> +50<br>*2  | ns   |  |
| SCS<br>deselect time    | t <sub>csDi</sub> | SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11              |            | t <sub>csDs</sub> -50<br>*3  | t <sub>csDs</sub> +50<br>*3  | ns   |  |



| Parameter                         | Symbol            | Pin Name  | Conditions | Value                  |                       | Unit | Remarks   |
|-----------------------------------|-------------------|---|------------|------------------------|-----------------------|------|---|
|                                   |                   |   |            | Min                    | Max                   |      |   |
| SCS↓→SCK↑<br>setup time           | t <sub>CSSE</sub> | SCK1 to SCK11<br>SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11 | -          | 3t <sub>CPP</sub> +30  | -                     | ns   | External shift<br>clock mode<br>output pin:<br>C <sub>L</sub> = 50 pF                       |
| SCK↓→SCS↑<br>hold time            | t <sub>CSHE</sub> | SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11                  | -          | +0                     | -                     | ns   |   |
| SCS<br>deselect time              | t <sub>CSDE</sub> | SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11                  | -          | 3t <sub>CPP</sub> +30  | -                     | ns   |   |
| SCS↓→SOT<br>delay time            | t <sub>DSE</sub>  | SCS1 , SCS2,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11<br>SOT1 , SOT2,<br>SOT5 to SOT11     | -          | -                      | 40                    | ns   |   |
|                                   |                   | SCS3,<br>SCS40 to SCS43<br>SOT3 , SOT4  | -          | -                      | 300                   | ns   |   |
| SCS↑→SOT<br>delay time            | t <sub>DEE</sub>  | SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11<br>SOT1 to SOT11 | -          | +0                     | -                     | ns   | External shift<br>clock mode<br>output pin:<br>C <sub>L</sub> = 50 pF                       |
| SCK↑→SCS↓<br>clock switch<br>time | t <sub>SCC</sub>  | SCK1 , SCK2,<br>SCK5 to SCK11<br>SCS1 , SCS2,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11     | -          | 3t <sub>CPP</sub> -10  | 3t <sub>CPP</sub> +50 | ns   | Internal shift<br>clock mode<br>Round<br>operation<br>output pin:<br>C <sub>L</sub> = 50 pF |
|                                   |                   | SCK3 , SCK4<br>SCS3 ,<br>SCS40 to SCS43   | -          | 3t <sub>CPP</sub> -300 | 3t <sub>CPP</sub> +50 | ns   |   |

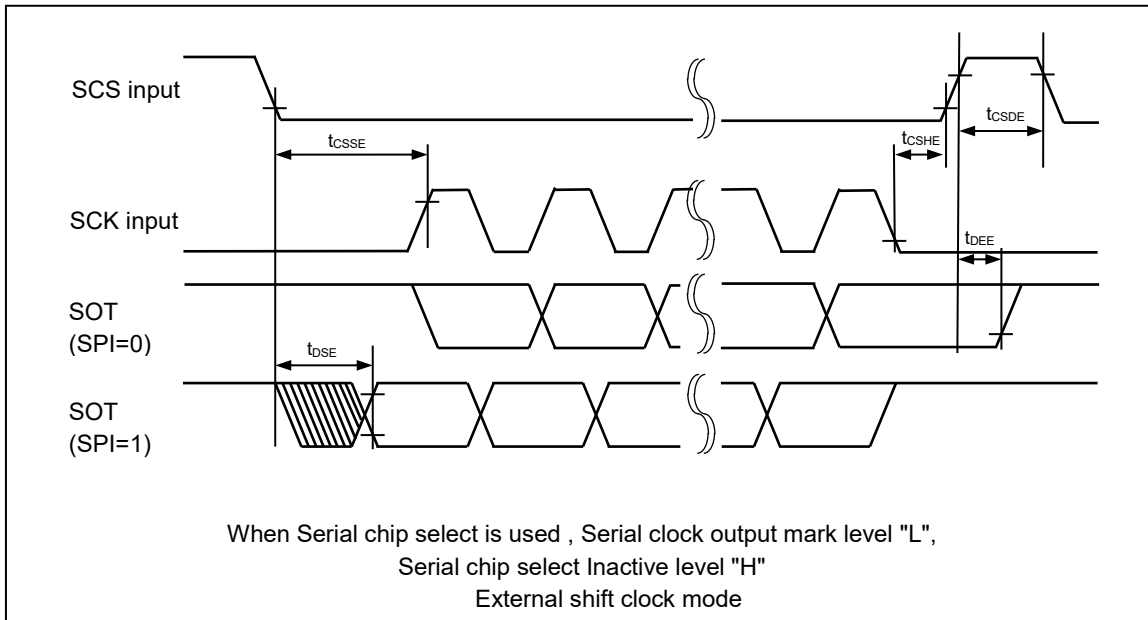
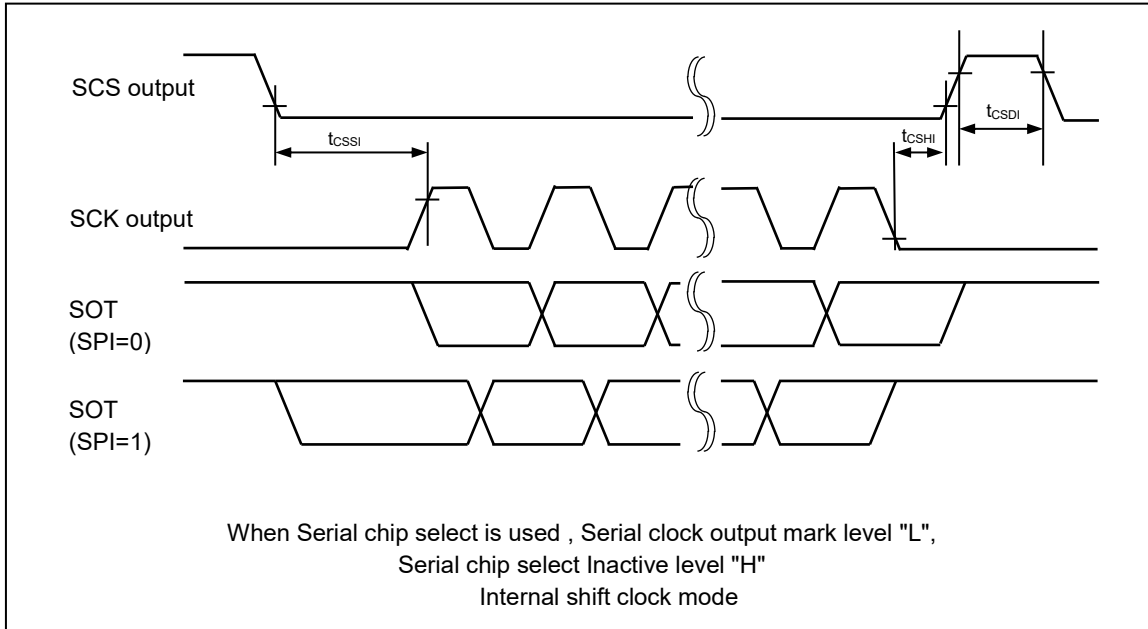
\*1: t<sub>CSSU</sub> = SCSTR:CSSU7-0 × Serial chip select timing operating clock

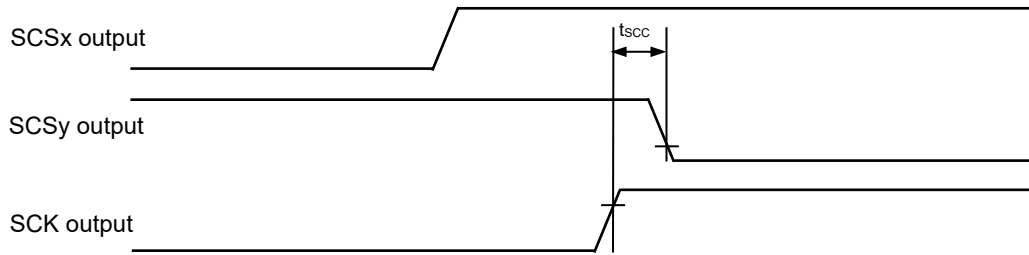
\*2: t<sub>CSHD</sub> = SCSTR:CSD7-0 × Serial chip select timing operating clock

\*3: t<sub>CSDS</sub> = SCSTR:CSDS15-0 × Serial chip select timing operating clock

Regardless of the deselect time setting, once after the serial chip select pin becomes inactive, it will take at least five peripheral bus clock cycles to be active again

See the hardware manual for details of above-mentioned \*1,\*2, and \*3





When Serial chip select is used , Serial clock output mark level "L",  
Serial chip select Inactive level "H"  
Internal shift clock mode , Example of switching clock by round operation (x,y=0,1,2,3)



(4-1-7) Bit setting: SMR:MD2 = 0, SMR:MD1 = 1, SMR:MD0 = 0,

When Serial chip select is used : SCSCR:CSSEN = 1,

Serial clock output mark level "H" : SMR,SCSFR:SCINV = 0,

Serial chip select Inactive level "L" : SCSCR,SCSFR:CSLVL = 0

(TA: -40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3V±0.3V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0V)

| Parameter               | Symbol            | Pin Name   | Conditions | Value                        |                                 | Unit | Remarks  |
|-------------------------|-------------------|--|------------|------------------------------|---------------------------------|------|--|
|                         |                   |  |            | Min                          | Max                             |      |  |
| SCS↑→SCK↓<br>setup time | t <sub>CSSI</sub> | SCK1 , SCK2,<br>SCK5 to SCK11<br>SCS1 , SCS2,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11  | -          | t <sub>CSSU</sub> -50<br>*1  | t <sub>CSSU</sub> +0<br>*1      | ns   | Internal shift<br>clock mode<br>output pin :<br>C <sub>L</sub> = 50 pF |
|                         |                   | SCK3 , SCK4<br>SCS3 ,<br>SCS40 to SCS43  |            | t <sub>CSSU</sub> -50<br>*1  | t <sub>CSSU</sub><br>+300<br>*1 | ns   |  |
| SCK↑→SCS↓<br>hold time  | t <sub>CSDI</sub> | SCK1 to SCK2,<br>SCK5 to SCK11<br>SCS1 , SCS2,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11 |            | t <sub>CSDH</sub> -10<br>*2  | t <sub>CSDH</sub> +50<br>*2     | ns   |  |
|                         |                   | SCK3 , SCK4<br>SCS3 ,<br>SCS40 to SCS43  |            | t <sub>CSDH</sub> -300<br>*2 | t <sub>CSDH</sub> +50<br>*2     | ns   |  |
| SCS<br>deselect time    | t <sub>CSDI</sub> | SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11               |            | t <sub>CSDS</sub> -50<br>*3  | t <sub>CSDS</sub> +50<br>*3     | ns   |  |



| Parameter  | Symbol            | Pin Name   | Conditions | Value                      |                           | Unit | Remarks  |
|--|-------------------|--|------------|----------------------------|---------------------------|------|--|
|  |                   |  |            | Min                        | Max                       |      |  |
| SCS $\uparrow$ →SCK $\downarrow$<br>setup time           | t <sub>CSSE</sub> | SCK1 to SCK11<br>SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11  | -          | 3t <sub>CPP</sub> +3<br>0  | -                         | ns   | External shift<br>clock mode<br>output pin:<br>C <sub>L</sub> = 50 pF                    |
| SCK $\uparrow$ →SCS $\downarrow$<br>hold time            | t <sub>CSHE</sub> | SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11                   | -          | +0                         | -                         | ns   |  |
| SCS<br>deselect time                                     | t <sub>CSDE</sub> | SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11                   | -          | 3t <sub>CPP</sub> +3<br>0  | -                         | ns   |  |
| SCS $\uparrow$ →SOT<br>delay time                        | t <sub>DSE</sub>  | SCS1 , SCS2,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11<br>SOT1 , SOT2,<br>SOT5 to SOT11      | -          | -                          | 40                        | ns   |  |
|  |                   | SCS3 ,<br>SCS40 to SCS43<br>SOT3 , SOT4  | -          | -                          | 300                       | ns   |  |
| SCS $\downarrow$ →SOT<br>delay time                      | t <sub>DEE</sub>  | SCS1 to ~SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11<br>SOT1 to SOT11 | -          | +0                         | -                         | ns   | External shift<br>clock mode<br>output pin:<br>C <sub>L</sub> = 50 pF                    |
| SCK $\downarrow$ →SCS $\uparrow$<br>clock switch<br>time | t <sub>SCC</sub>  | SCK1 , SCK2,<br>SCK5 to SCK11<br>SCS1 , SCS2,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11      | -          | 3t <sub>CPP</sub> -10      | 3t <sub>CPP</sub> +5<br>0 | ns   | Internal shift<br>clock mode<br>Round operation<br>output pin:<br>C <sub>L</sub> = 50 pF |
|  |                   | SCK3 , SCK4<br>SCS3 ,<br>SCS40 to SCS43  | -          | 3t <sub>CPP</sub> -<br>300 | 3t <sub>CPP</sub> +5<br>0 | ns   |  |

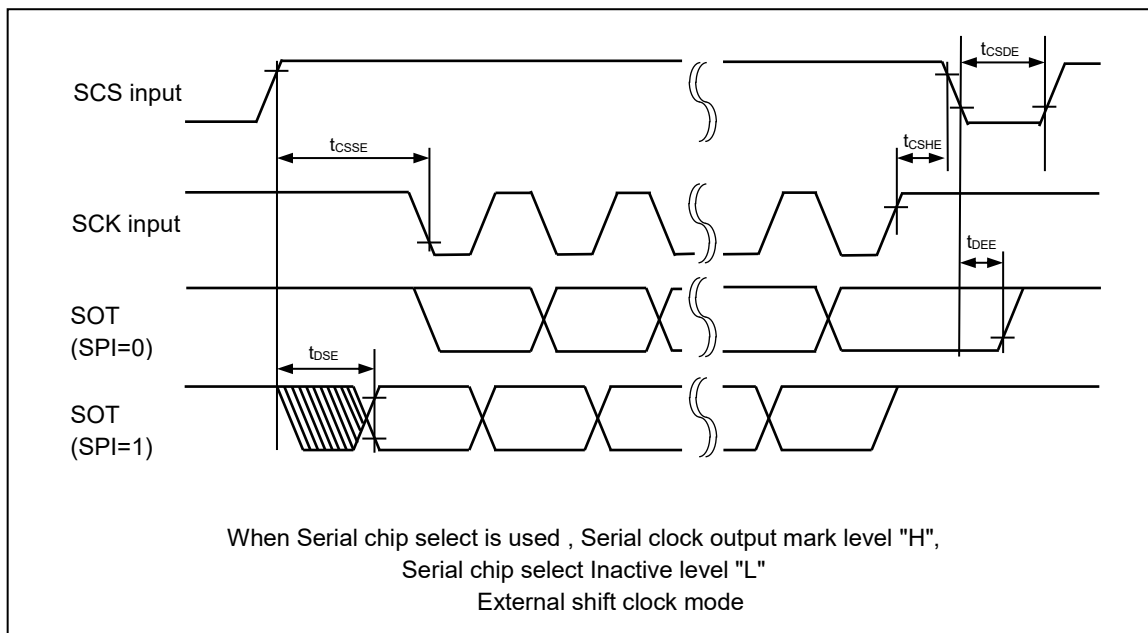
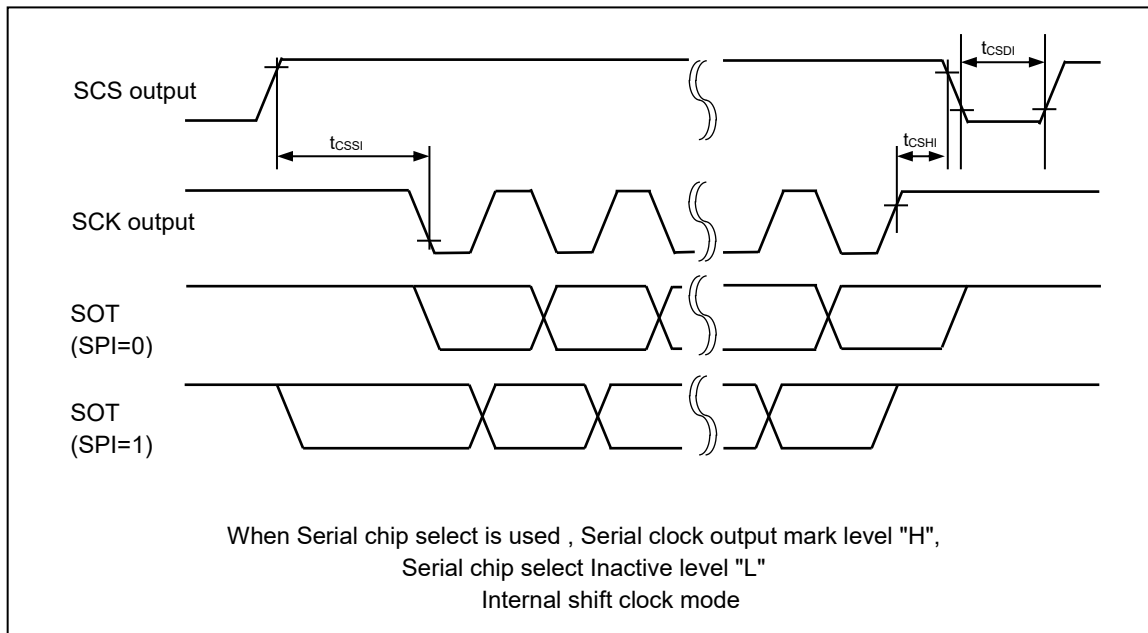
\*1: t<sub>CSSU</sub> = SCSTR:CSSU7-0 × Serial chip select timing operating clock

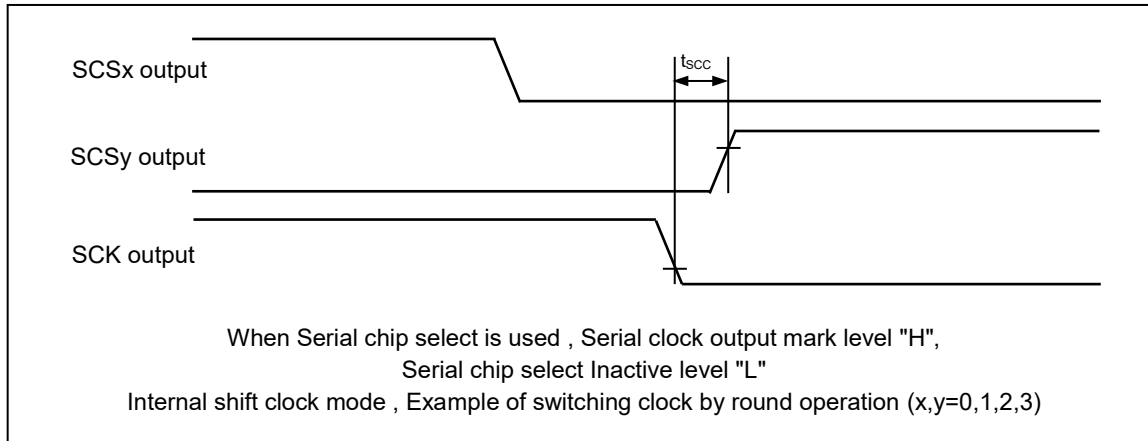
\*2: t<sub>CSHD</sub> = SCSTR:CSD7-0 × Serial chip select timing operating clock

\*3: t<sub>CSDS</sub> = SCSTR:CSDS15-0 × Serial chip select timing operating clock

Regardless of the deselect time setting, once after the serial chip select pin becomes inactive, it will take at least five peripheral bus clock cycles to be active again

See the hardware manual for details of above-mentioned \*1,\*2, and \*3.







(4-1-8) Bit setting: SMR:MD2 = 0, SMR:MD1 = 1, SMR:MD0 = 0,

When Serial chip select is used: SCSCR:CSEN = 1,

Serial clock output mark level "L" : SMR,SCSFR:SCINV = 1,

Serial chip select Inactive level "L" : SCSCR,SCSFR:CSLVL = 0

(TA: -40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter               | Symbol            | Pin Name  | Conditions | Value                        |                              | Unit | Remarks  |
|-------------------------|-------------------|---|------------|------------------------------|------------------------------|------|--|
|                         |                   |   |            | Min                          | Max                          |      |  |
| SCS↑→SCK↑<br>setup time | t <sub>CSSI</sub> | SCK1 , SCK2,<br>SCK5 to SCK11<br>SCS1 , SCS2,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11 | -          | t <sub>CSSU</sub> -50<br>*1  | t <sub>CSSU</sub> +0<br>*1   | ns   | Internal shift<br>clock mode<br>output pin :<br>C <sub>L</sub> = 50 pF |
|                         |                   | SCK3 , SCK4<br>SCS3 ,<br>SCS40 to SCS43   |            | t <sub>CSSU</sub> -50<br>*1  | t <sub>CSSU</sub> +300<br>*1 | ns   |  |
| SCK↓→SCS↓<br>hold time  | t <sub>CSDI</sub> | SCK1 , SCK2,<br>SCK5 to SCK11<br>SCS1 , SCS2,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11 |            | t <sub>CSDH</sub> -10<br>*2  | t <sub>CSDH</sub> +50<br>*2  | ns   |  |
|                         |                   | SCK3 , SCK4<br>SCS3 ,<br>SCS40 to SCS43   |            | t <sub>CSDH</sub> -300<br>*2 | t <sub>CSDH</sub> +50<br>*2  | ns   |  |
| SCS<br>deselect time    | t <sub>CSDI</sub> | SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11              |            | t <sub>CSDS</sub> -50<br>*3  | t <sub>CSDS</sub> +50<br>*3  | ns   |  |



| Parameter  | Symbol            | Pin Name  | Conditions | Value                  |                       | Unit | Remarks  |
|--|-------------------|---|------------|------------------------|-----------------------|------|--|
|  |                   |   |            | Min                    | Max                   |      |  |
| SCS $\uparrow$ →SCK $\uparrow$<br>setup time           | t <sub>CSSE</sub> | SCK1 to SCK11<br>SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11 | -          | 3t <sub>CPP</sub> +30  | -                     | ns   | External shift<br>clock mode<br>output pin:<br>C <sub>L</sub> = 50 pF                    |
| SCK $\downarrow$ →SCS $\downarrow$<br>hold time        | t <sub>CSHE</sub> | SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11                  | -          | +0                     | -                     | ns   |  |
| SCS<br>deselect time                                   | t <sub>CSDE</sub> | SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11                  | -          | 3t <sub>CPP</sub> +30  | -                     | ns   |  |
| SCS $\uparrow$ →SOT<br>delay time                      | t <sub>DSE</sub>  | SCS1 , SCS2,<br>SCS50~SCS53,<br>SCS60~SCS63,<br>SCS70~SCS73,<br>SCS8~SCS11<br>SOT1 , SOT2,<br>SOT5~SOT11                    | -          | -                      | 40                    | ns   |  |
|  |                   | SCS3 ,<br>SCS40~SCS43<br>SOT3 ,SOT4   | -          | -                      | 300                   | ns   |  |
| SCS $\downarrow$ →SOT<br>delay time                    | t <sub>DEE</sub>  | SCS1 to SCS3,<br>SCS40 to SCS43,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11<br>SOT1 to SOT11 | -          | +0                     | -                     | ns   | External shift<br>clock mode<br>output pin:<br>C <sub>L</sub> = 50 pF                    |
| SCK $\uparrow$ →SCS $\uparrow$<br>clock switch<br>time | t <sub>SCC</sub>  | SCK1 , SCK2,<br>SCK5 to SCK11<br>SCS1 , SCS2,<br>SCS50 to SCS53,<br>SCS60 to SCS63,<br>SCS70 to SCS73,<br>SCS8 to SCS11     | -          | 3t <sub>CPP</sub> -10  | 3t <sub>CPP</sub> +50 | ns   | Internal shift<br>clock mode<br>Round operation<br>output pin:<br>C <sub>L</sub> = 50 pF |
|  |                   | SCK3 , SCK4<br>SCS3 ,<br>SCS40 to SCS43   | -          | 3t <sub>CPP</sub> -300 | 3t <sub>CPP</sub> +50 |      |  |

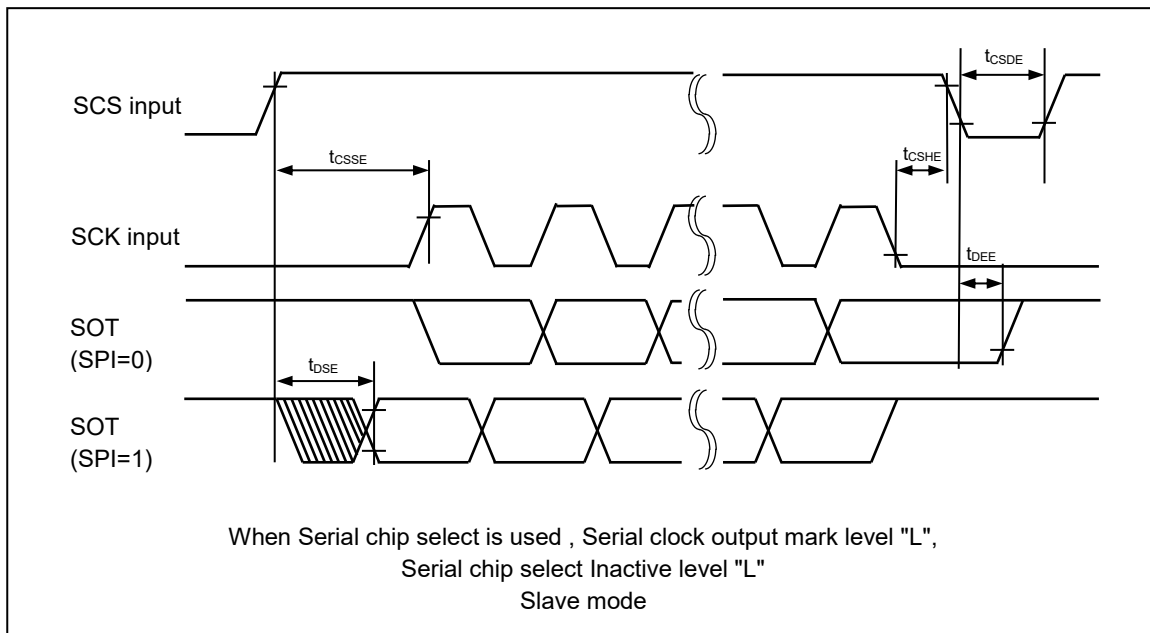
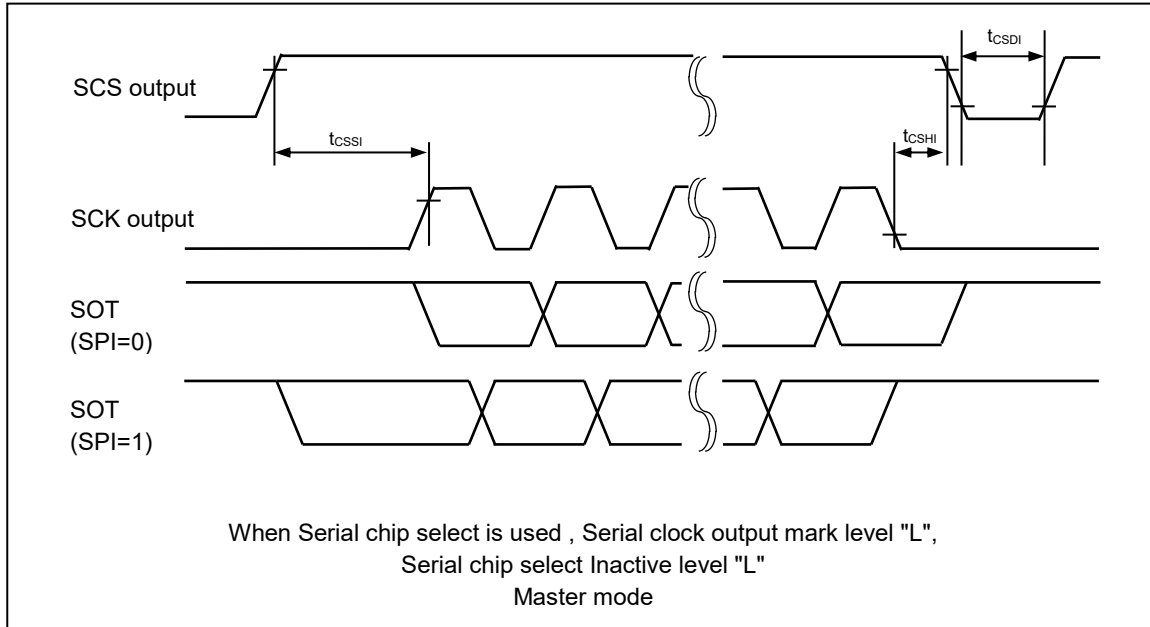
\*1: t<sub>CSSU</sub> = SCSTR:CSSU7-0 × Serial chip select timing operating clock

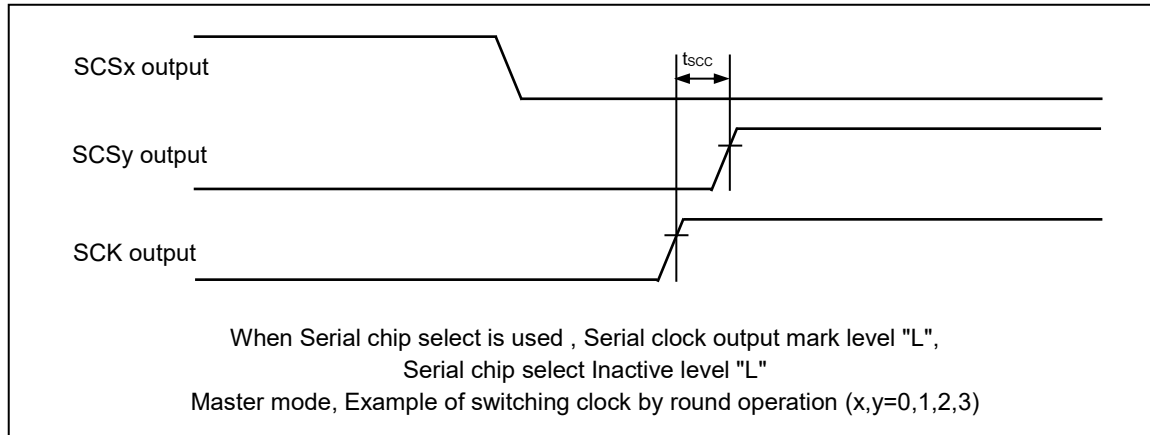
\*2: t<sub>CSHD</sub> = SCSTR:CSD7-0 × Serial chip select timing operating clock

\*3: t<sub>CSDS</sub> = SCSTR:CSDS15-0 × Serial chip select timing operating clock

Regardless of the deselect time setting, once after the serial chip select pin becomes inactive, it will take at least five peripheral bus clock cycles to be active again

See the hardware manual for details of above-mentioned \*1,\*2, and \*3.







## (4-2) UART (Asynchronous serial interface) timing

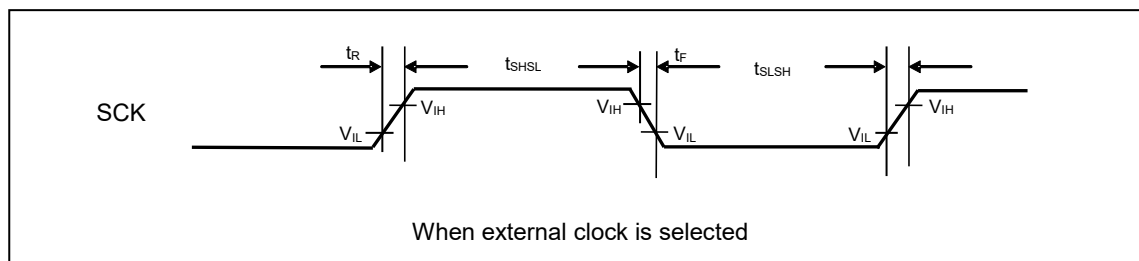
Bit setting: SMR : MD2 = 0, SMR:MD1 = 0, SMR : MD0 = 0

Bit setting: SMR : MD2 = 0, SMR:MD1 = 0, SMR : MD0 = 1

When external clock is selected (BGR:EXT = 1)

(TA: -40 °C to +125°C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0V)

| Parameter                       | Symbol            | Pin Name      | Conditions | Value                |     | Unit | Remarks                               |
|---------------------------------|-------------------|---------------|------------|----------------------|-----|------|---------------------------------------|
|                                 |                   |               |            | Min                  | Max |      |                                       |
| Serial clock<br>"L" pulse width | t <sub>SLSH</sub> | SCK0 to SCK11 | -          | t <sub>CPP</sub> +10 | -   | ns   | output pin:<br>C <sub>L</sub> = 50 pF |
| Serial clock<br>"H" pulse width | t <sub>SHSL</sub> |               |            | t <sub>CPP</sub> +10 | -   | ns   |                                       |
| SCK fall time                   | t <sub>F</sub>    |               |            | -                    | 5   | ns   |                                       |
| SCK rise time                   | t <sub>R</sub>    |               |            | -                    | 5   | ns   |                                       |



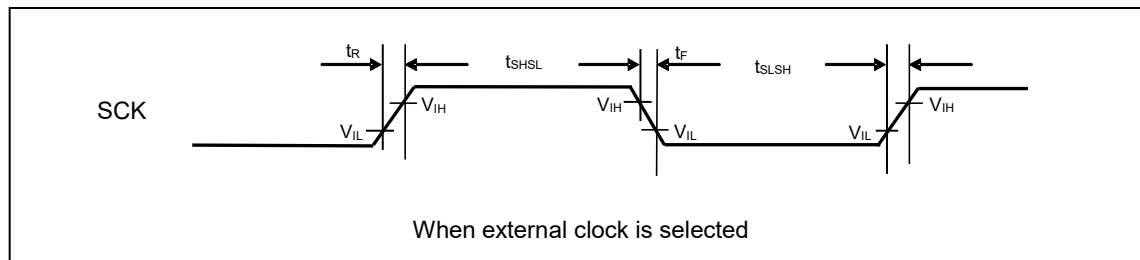


## (4-3) LIN Interface (v2.1)( Asynchronous Serial Interface for LIN (v2.1)) timing

Bit setting: SMR : MD2 = 0, SMR:MD1 = 1, SMR : MD0 = 1

(T<sub>A</sub>: -40°C to +125°C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                       | Symbol            | Pin Name      | Conditions | Value                |     | Unit | Remarks                               |
|---------------------------------|-------------------|---------------|------------|----------------------|-----|------|---------------------------------------|
|                                 |                   |               |            | Min                  | Max |      |                                       |
| Serial clock<br>"L" pulse width | t <sub>SLSH</sub> | SCK0 to SCK11 | -          | t <sub>CPP</sub> +10 | -   | ns   | output pin:<br>C <sub>L</sub> = 50 pF |
| Serial clock<br>"H" pulse width | t <sub>SHSL</sub> |               |            | t <sub>CPP</sub> +10 | -   | ns   |                                       |
| SCK fall time                   | t <sub>F</sub>    |               |            | -                    | 5   | ns   |                                       |
| SCK rise time                   | t <sub>R</sub>    |               |            | -                    | 5   | ns   |                                       |



(4-4) I<sup>2</sup>C timing(TA: -40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter  | Symbol             | Pin Name                                     | Conditions   | Standard Mode        |        | Fast Mode*3          |       | Unit | Remarks |
|--|--------------------|--|--|----------------------|--------|----------------------|-------|------|---------|
|  |                    |  |  | Min                  | Max    | Min                  | Max   |      |         |
| SCL clock frequency  | f <sub>SCL</sub>   | SCK3 to SCK11                                |  | 0                    | 100    | 0                    | 400   | kHz  |         |
| Repeat "start" condition hold time<br>SDA ↓ → SCL ↓          | t <sub>HDSTA</sub> | SOT3 to SOT11, (SDA)<br>SCK3 to SCK11, (SCL) |  | 4.0                  | –      | 0.6                  | –     | μs   |         |
| Period of "L" for SCL clock                                  | t <sub>LOW</sub>   | SCK3 to SCK11, (SCL)                         |  | 4.7                  | –      | 1.3                  | –     | μs   |         |
| Period of "H" for SCL clock                                  | t <sub>HIGH</sub>  | SCK3 to SCK11, (SCL)                         |  | 4.0                  | –      | 0.6                  | –     | μs   |         |
| Repeat "start" condition setup time<br>SCL ↑ → SDA ↓         | t <sub>SUSTA</sub> | SCK3 to SCK11, (SCL)                         |  | 4.7                  | –      | 0.6                  | –     | μs   |         |
| Data hold time<br>SCL ↓ → SDA ↓ ↑                            | t <sub>HDDAT</sub> | SOT3 to SOT11, (SDA)<br>SCK3 to SCK11, (SCL) | C <sub>L</sub> = 50 pF<br>R = (V <sub>P</sub> /I <sub>OL</sub> )*1 | 0                    | 3.45*2 | 0                    | 0.9*3 | μs   |         |
| Data setup time<br>SDA ↓ ↑ → SCL ↑                           | t <sub>SUDAT</sub> | SOT3 to SOT11, (SDA)<br>SCK3 to SCK11, (SCL) |  | 250                  | –      | 100                  | –     | ns   |         |
| "Stop" condition setup time<br>SCL ↑ → SDA ↑                 | t <sub>SUSTO</sub> | SOT3 to SOT11, (SDA)<br>SCK3 to SCK11, (SCL) |  | 4.0                  | –      | 0.6                  | –     | μs   |         |
| Bus-free time between "stop" condition and "start" condition | t <sub>BUF</sub>   | –  |  | 4.7                  | –      | 1.3                  | –     | μs   |         |
| Noise filter   | t <sub>SP</sub>    | –  | –  | 2t <sub>CPP</sub> *4 | –      | 2t <sub>CPP</sub> *4 | –     | ns   |         |

Notes: Only ch.3 and ch.4 are standard mode/fast mode correspondence. In ch.5-ch.8, ch.10, and ch.11, only a standard mode is correspondences.

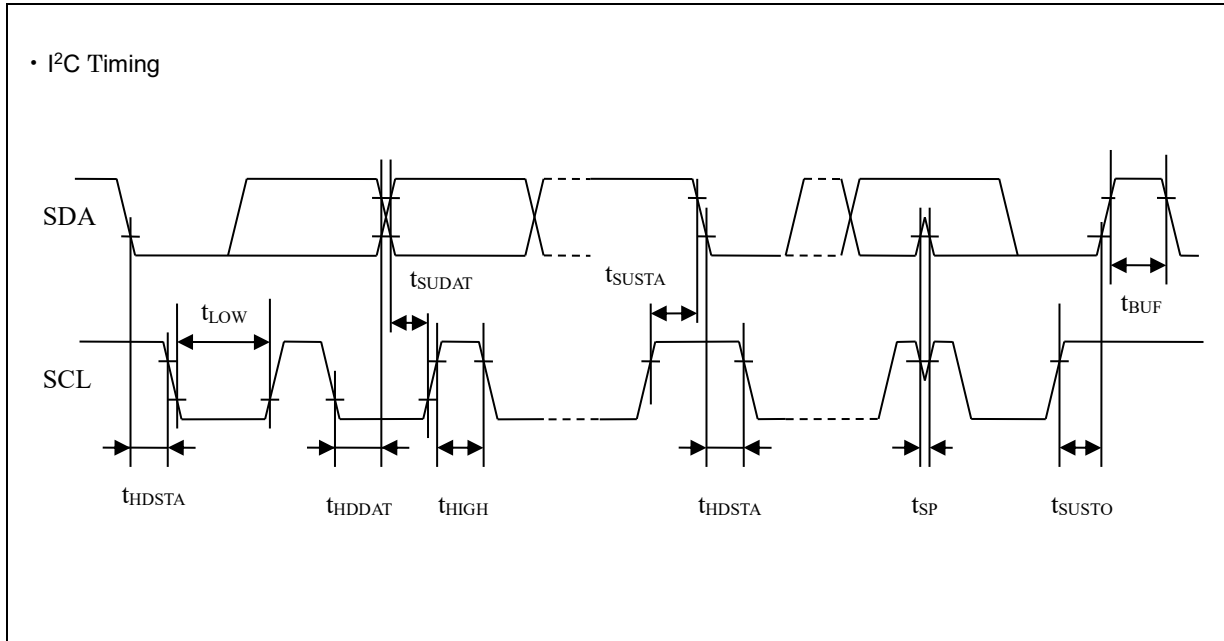
\*1: R and C<sub>L</sub> represent the pull-up resistance and load capacitance of the SCL and SDA output lines, respectively.

V<sub>p</sub> shows that the power-supply voltage of the pull-up resistor and I<sub>OL</sub> shows the V<sub>OL</sub> guarantee current.

\*2: The maximum t<sub>HDDAT</sub> only has to be met if the device does not extend the "L" width (t<sub>LOW</sub>) of the SCL signal.

\*3: A fast mode I<sup>2</sup>C bus device can be used on a standard mode I<sup>2</sup>C bus system as long as the device satisfies the requirement of "t<sub>SUDAT</sub> ≥ 250 ns".

\*4:  $t_{CPP}$  is the peripheral clock cycle time. Adjust the clock of the bus in the surrounding to 8 MHz or more when use I<sup>2</sup>C.



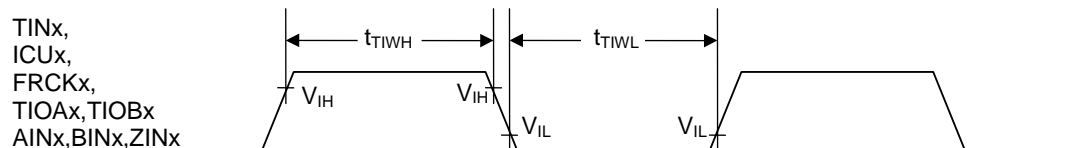


## (5) Timer input timing

(TA: -40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter         | Symbol                                   | Pin Name   | Conditions | Value             |     | Unit | Remarks |
|-------------------|--|--|------------|-------------------|-----|------|---------|
|                   |  |  |            | Min               | Max |      |         |
| Input pulse width | t <sub>TIWH</sub> ,<br>t <sub>TIWL</sub> | TIN0 to TIN7<br>ICU0 to ICU9<br>FRCK0 to FRCK5<br>TIOA0, TIOA1,<br>TIOB0, TIOB1,<br>AIN0, AIN1,<br>BIN0, BIN1,<br>ZIN0, ZIN1 | –          | 4t <sub>CPP</sub> | –   | ns   |         |

## • Timer Input Timing

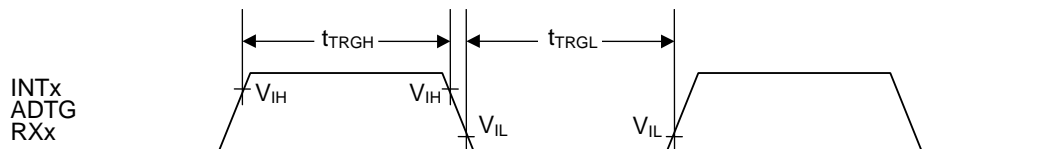


## (6) Trigger input timing

(TA: -40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter         | Symbol                                   | Pin Name  | Conditions | Value             |     | Unit | Remarks      |
|-------------------|--|---|------------|-------------------|-----|------|--------------|
|                   |  |   |            | Min               | Max |      |              |
| Input pulse width | t <sub>TRGH</sub> ,<br>t <sub>TRGL</sub> | INT0 to<br>INT15,<br>ADTG,<br>RX0,<br>RX1,<br>RX2 | –          | 5t <sub>CPP</sub> | –   | ns   |              |
|                   |  |   |            | 1                 | –   | µs   | At stop mode |

## • Trigger Input Timing

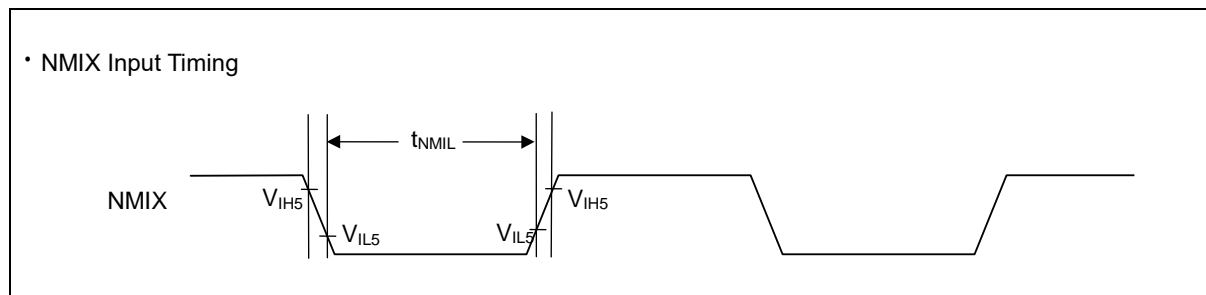




## (7) NMI input timing

(T<sub>A</sub>: -40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter         | Symbol            | Pin Name | Conditions | Value             |     | Unit | Remarks |
|-------------------|-------------------|----------|------------|-------------------|-----|------|---------|
|                   |                   |          |            | Min               | Max |      |         |
| Input pulse width | t <sub>NMIL</sub> | NMIX     | –          | 4t <sub>CPP</sub> | –   | ns   |         |



## (8) Low voltage detection (External low-voltage detection)

(T<sub>A</sub>: -40 °C to +125 °C, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                       | Symbol           | Pin Name | Conditions | Value |                 |     | Unit | Remarks  |
|---------------------------------|------------------|----------|------------|-------|-----------------|-----|------|--|
|                                 |                  |          |            | Min   | Typ             | Max |      |  |
| Power supply voltage range      | V <sub>DP5</sub> |          | –          | 2.7   | –               | 5.5 | V    |  |
| Detection voltage <sup>*3</sup> | V <sub>DL</sub>  | VCC      | *1         | -8%   | LVD5F_SEL [3:0] | +8% | V    | LVD5F_SEL[3:0] are programmable. Refer to the hardware manual. |
| Hysteresis width                | V <sub>HYS</sub> |          | –          | –     | 0.1             | –   | V    | When power-supply voltage rises                                |
| Low voltage detection time      | T <sub>d</sub>   | –        | –          | –     | –               | 30  | μs   |  |
| Power supply voltage regulation | –                | VCC      | –          | -2    | –               | 2   | V/ms | *2   |

\*1: If the fluctuation of the power supply is faster than the low voltage detection time, there is a possibility to generate or release after the power supply voltage has exceeded the detection voltage range.

\*2: Suppress the change of the power supply within the range of the power-supply voltage regulation to do a low voltage detection by detecting voltage (V<sub>DL</sub>).

\*3: The initial detection voltage of the external low voltage detection is 2.8 V ± 8 % (2.576 V to 3.024 V).

This LVD setting cannot be used to reliably generate a reset before voltage dips below minimum guaranteed MCU operation voltage, as this detection level is below the minimum guaranteed MCU operation voltage (2.7 V).

Below the minimum guaranteed MCU operation voltage, MCU operations are not guaranteed with the exception of LVD.



## (9) Low voltage detection (Internal low-voltage detection)

(TA: -40 °C to +125 °C, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                       | Symbol            | Pin Name | Conditions | Value |     |     | Unit | Remarks                         |
|---------------------------------|-------------------|----------|------------|-------|-----|-----|------|---------------------------------|
|                                 |                   |          |            | Min   | Typ | Max |      |                                 |
| Power supply voltage range      | V <sub>RDP5</sub> |          | -          | 0.6   | -   | 1.4 | V    |                                 |
| Detection voltage <sup>*2</sup> | V <sub>RDL</sub>  | -        | *1         | 0.8   | 0.9 | 1.0 | V    | When power-supply voltage falls |
| Hysteresis width                | V <sub>RHYS</sub> |          | -          | -     | 0.1 | -   | V    | When power-supply voltage rises |
| Low voltage detection time      | -                 | -        | -          | -     | -   | 30  | μs   |                                 |

\*1: If the fluctuation of the power supply is faster than the low voltage detection time, there is a possibility to generate or release after the power supply voltage has exceeded the detection voltage range.

\*2: The detection voltage of the internal low voltage detection is 0.9 V ± 0.1 V.

This LVD cannot be used to reliably generate a reset before voltage dips below minimum guaranteed MCU operation voltage, as this detection level is below the minimum guaranteed MCU operation voltage.

Below the minimum guaranteed MCU operation voltage, MCU operations are not guaranteed with the exception of LVD.

## (10) External bus I/F (synchronous mode) timing

(TA: -40 °C to +105 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

(external load capacitance 50 pF)

| Parameter                | Symbol                                     | Pin Name                  | Value                        |     | Unit | Remarks                                      |
|--------------------------|--|---------------------------|------------------------------|-----|------|--|
|                          |  |                           | Min                          | Max |      |  |
| Cycle time               | t <sub>CYC</sub>                           | SYSCLK                    | 25                           | -   | ns   | V <sub>CC</sub> = 5.0 V ± 10 % <sup>*1</sup> |
|                          |  |                           | 31.25                        |     |      | V <sub>CC</sub> = 3.3 V ± 0.3 V              |
| ASX delay time           | t <sub>CHASL</sub> ,<br>t <sub>CHASH</sub> | SYSCLK<br>ASX             | 0.5                          | 18  | ns   |  |
| CS0X to CS3X delay time  | t <sub>CHCSL</sub> ,<br>t <sub>CHCSH</sub> | SYSCLK<br>CS0X to<br>CS3X | 0.5                          | 18  | ns   |  |
| A00 to A21 delay time    | t <sub>CHAV</sub> ,<br>t <sub>CHAX</sub>   | SYSCLK<br>A00 to A21      | 0.5                          | 18  | ns   |  |
| RDX delay time           | t <sub>CHRL</sub> ,<br>t <sub>CHRH</sub>   | SYSCLK<br>RDX             | 0.5                          | 18  | ns   |  |
| RDX minimum pulse        | t <sub>RLRH</sub>                          | RDX                       | t <sub>CYC</sub> ×<br>2 - 20 | -   | ns   | RWT = 1, set RWT to 1 or more. <sup>*2</sup> |
| Data setup →<br>RDX↑time | t <sub>DSRH</sub>                          | RDX<br>D16 to D31         | 18+t <sub>CYC</sub>          | -   | ns   | Same as above                                |
| RDX↑→<br>data hold       | t <sub>RHDH</sub>                          |                           | 0                            | -   | ns   |  |
| WRnX delay               | t <sub>CHWL</sub>                          | SYSCLK                    | 0.5                          | 18  | ns   |  |



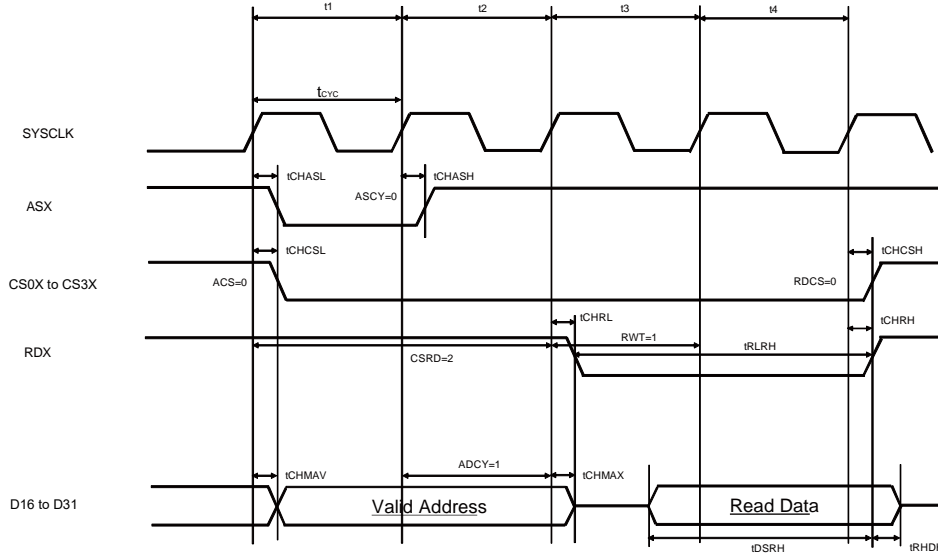
| Parameter                                     | Symbol      | Pin Name             | Value          |     | Unit | Remarks   |
|---|-------------|----------------------|----------------|-----|------|---|
|   |             |                      | Min            | Max |      |   |
| time  | $t_{CHWH}$  | WR0X,<br>WR1X        |                |     |      |   |
| WRnX<br>minimum pulse                         | $t_{WLWH}$  | WR0X,<br>WR1X        | $t_{CYC} - 10$ | -   | ns   | WWT = 0 *2  |
| SYSCLK $\uparrow$ →<br>data output<br>time    | $t_{CHDV}$  | SYSCLK<br>D16 to D31 | 0.5            | 18  | ns   |   |
| SYSCLK $\uparrow$ →<br>data hold time         | $t_{CHDX}$  |                      | -              | 18  | ns   | Set WRCS to 1 or more.  |
| SYSCLK $\uparrow$ →<br>address output<br>time | $t_{CHMAV}$ | SYSCLK<br>D16 to D31 | 0.5            | 18  | ns   |   |
| SYSCLK $\uparrow$ →<br>address hold<br>time   | $t_{CHMAX}$ |                      | -              | 18  | ns   | In multiplex mode, set as follows:<br><input type="checkbox"/> Set CSWR and CSRD to 2 or more.<br><input type="checkbox"/> ASCY must satisfy the following conditions because of setting $ADCY > ASCY$ and protocol violation prevention.<br>$ADCY + 1 \leq ACS + CSRD$<br>$ADCY + 1 \leq ACS + CSWR$<br>$ASCY + 1 \leq ACS + CSRD$<br>$ASCY + 1 \leq ACS + CSWR$<br>See Hardware Manual for details. |

\*1: Use it with external load capacity 12 pF or less for  $VCC = 3.3 V \pm 0.3 V$  (40 MHz operation).

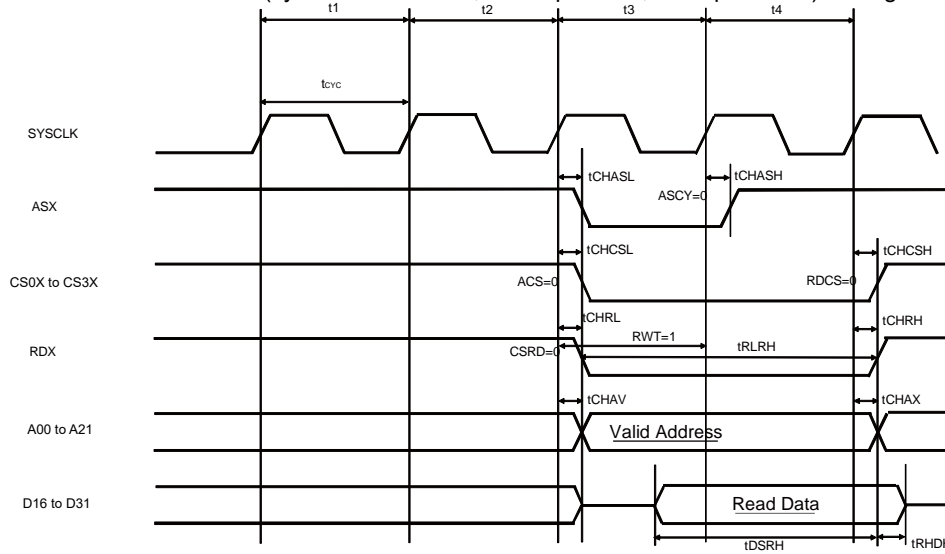
\*2: If the bus is expanded by automatic wait insertion or RDY input, add time ( $t_{CYC} \times$  the number of expanded cycles) to the rated value.

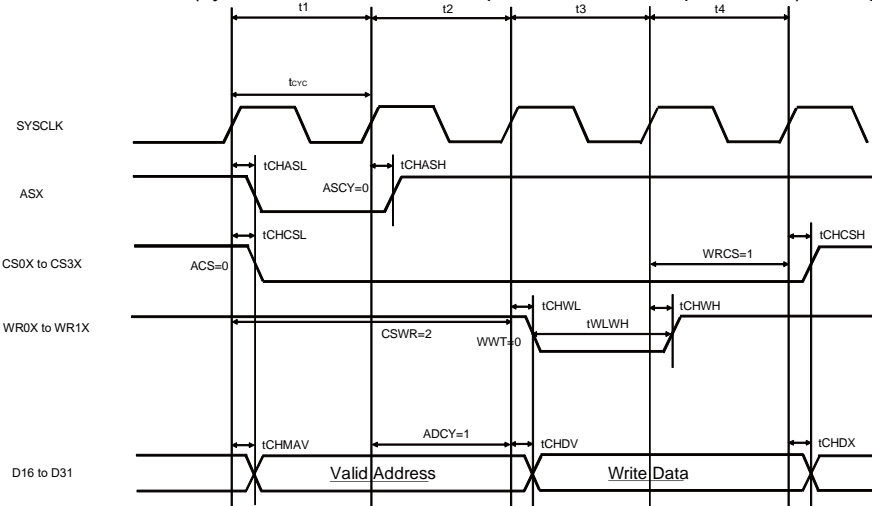
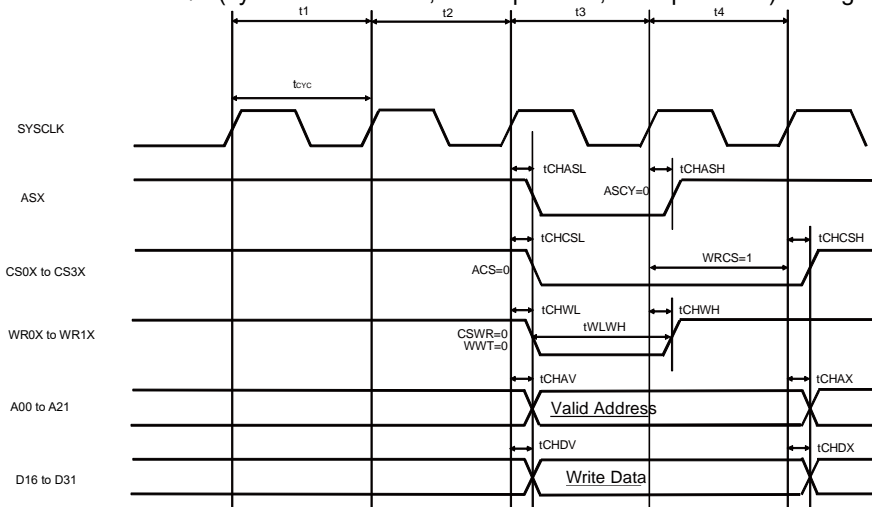


External bus I/F (synchronous mode, read operation, and multiplex mode) Timing



External bus I/F (synchronous mode, read operation, and split mode) Timing



**External bus I/F (synchronous mode, write operation, and multiplex mode) Timing**

**External bus I/F (synchronous mode, write operation, and split mode) Timing**




## (11) External bus I/F (asynchronous mode) timing

(TA: -40 °C to +105 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

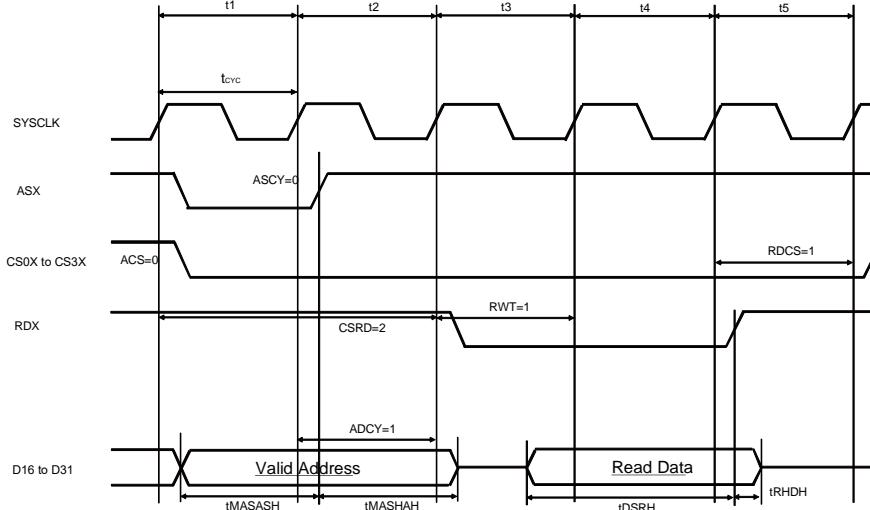
(external load capacitance 50pF)

| Parameter                | Symbol              | Pin Name                      | Value                   |                         | Unit | Remarks  |
|--------------------------|---------------------|-------------------------------|-------------------------|-------------------------|------|--|
|                          |                     |                               | Min                     | Max                     |      |  |
| Cycle time               | t <sub>CYC</sub>    | SYSCLK                        | 25                      | -                       | ns   | V <sub>CC</sub> = 5.0 V ± 10 % <sup>*1</sup>   |
|                          |                     |                               | 31.25                   |                         |      | V <sub>CC</sub> = 3.3 V ± 0.3 V  |
| Address setup → RDX↑time | t <sub>ASRH</sub>   | RDX<br>A00 to A21             | 2×t <sub>CYC</sub> - 12 | 2×t <sub>CYC</sub> + 12 | ns   | RWT = 1,<br>set RWT to 1 or more. <sup>*2</sup>  |
| RDX↑→ Address hold       | t <sub>RHAH</sub>   |                               | t <sub>CYC</sub> - 12   | t <sub>CYC</sub> + 12   | ns   | Set RDCS to 1 or more.   |
| Data setup→ RDX↑time     | t <sub>DSRH</sub>   | RDX<br>D16 to D31             | 18 + t <sub>CYC</sub>   | -                       | ns   | RWT = 1,<br>set RWT to 1 or more.  |
| RDX↑→ Data hold          | t <sub>RHDH</sub>   |                               | 0                       | -                       | ns   |  |
| Address setup→ WRnX↑time | t <sub>ASWH</sub>   | WR0X to<br>WR1X<br>A00 to A21 | t <sub>CYC</sub> - 12   | t <sub>CYC</sub> + 12   | ns   | WWT = 0 <sup>*2</sup>  |
| WRnX↑→ Address hold      | t <sub>WHAH</sub>   |                               | t <sub>CYC</sub> - 12   | t <sub>CYC</sub> + 12   | ns   | Set WRCS to 1 or more.   |
| Data setup→ WRnX↑time    | t <sub>DSWH</sub>   | WR0X to<br>WR1X<br>D16 to D31 | t <sub>CYC</sub> - 16   | t <sub>CYC</sub> + 16   | ns   | WWT = 0 <sup>*2</sup>  |
| WRnX↑→ Data hold         | t <sub>WHDH</sub>   |                               | t <sub>CYC</sub> - 16   | t <sub>CYC</sub> + 16   | ns   | Set WRCS to 1 or more.   |
| Address setup → ASX↑time | t <sub>MASASH</sub> | ASX<br>D16 to D31             | t <sub>CYC</sub> -16    | t <sub>CYC</sub> + 16   | ns   | ASCY = 0   |
| ASX↑→Address hold        | t <sub>MASHAH</sub> |                               | t <sub>CYC</sub> -16    | t <sub>CYC</sub> + 16   | ns   | In multiplex mode, set as follows:<br><ul style="list-style-type: none"> <li>Set CSWR and CSRD to 2 or more.</li> <li>ASCY must satisfy the following conditions because of setting ADCY &gt; ASCY and protocol violation prevention.<br/>           ADCY + 1 ≤ ACS + CSRD<br/>           ADCY + 1 ≤ ACS + CSWR<br/>           ASCY + 1 ≤ ACS + CSRD<br/>           ASCY + 1 ≤ ACS + CSWR<br/>           See Hardware Manual for details.</li> </ul> |

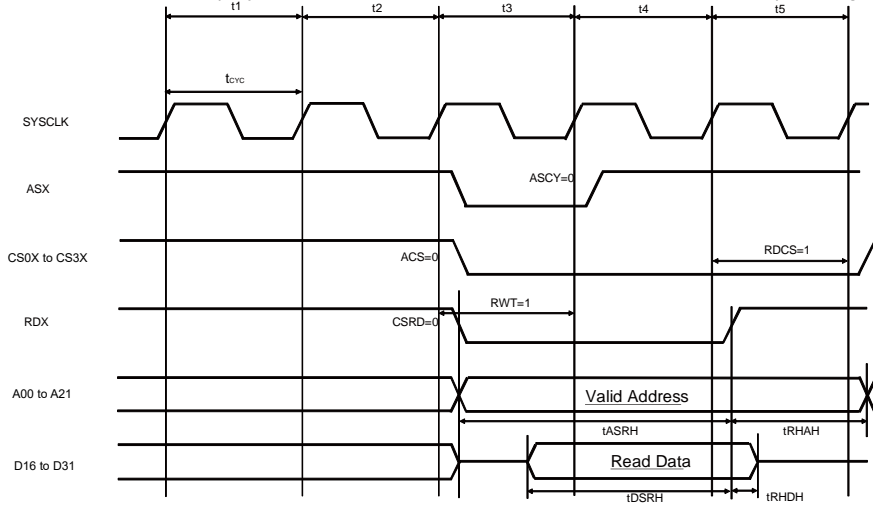
\*1: Use it with external load capacity 12 pF or less for V<sub>CC</sub> = 3.3 V ± 0.3 V (40 MHz operation).\*2: If the bus is expanded by automatic wait insertion or RDY input, add time (t<sub>CYC</sub> × the number of expanded cycles) to the rated value.



External bus I/F (asynchronous mode, read operation, and multiplex mode) Timing

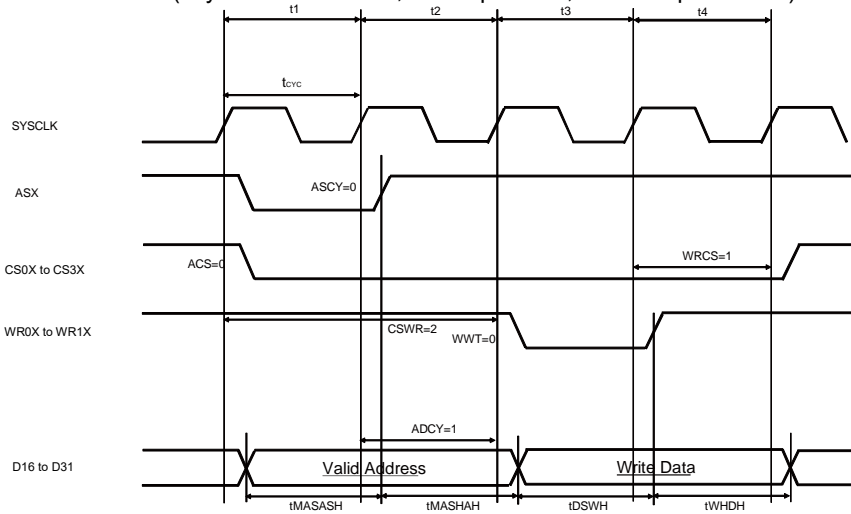


External bus I/F (asynchronous mode, read operation, and split mode) Timing

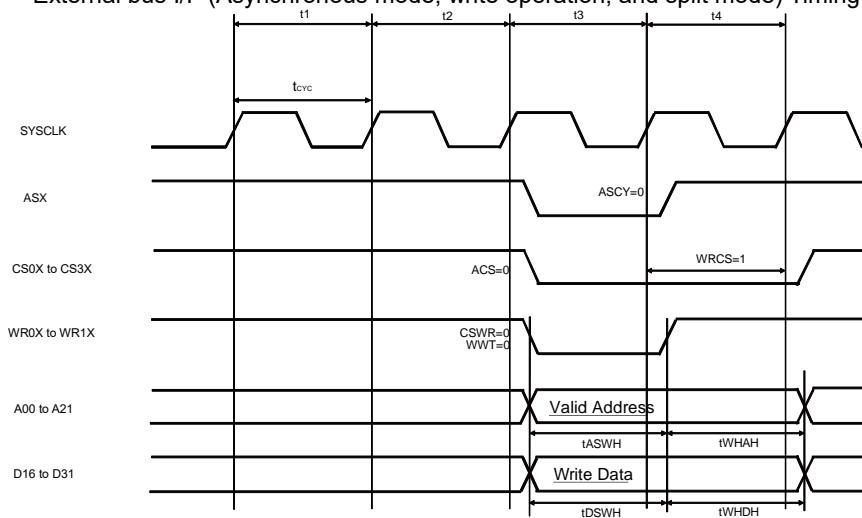




External bus I/F (asynchronous mode, write operation, and multiplex mode) Timing



External bus I/F (Asynchronous mode, write operation, and split mode) Timing



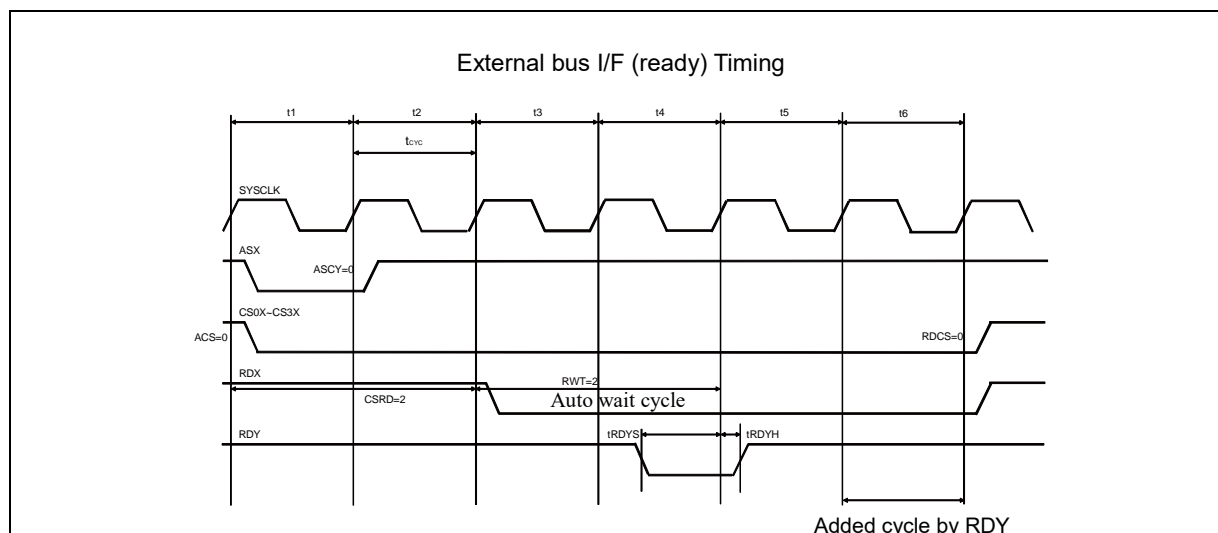


## (12) External bus I/F (ready) Timing

(TA: -40 °C to +105 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

(external load capacitance 50 pF)

| Parameter                   | Symbol            | Pin Name       | Value |     | Unit | Remarks                                     |
|-----------------------------|-------------------|----------------|-------|-----|------|---|
|                             |                   |                | Min   | Max |      |   |
| Cycle time                  | t <sub>CYC</sub>  | SYSCLK         | 50    | -   | ns   | If using RDY, set SYSCLK to 20 MHz or less. |
| RDY setup time →<br>SYSCLK↑ | t <sub>RDYS</sub> | SYSCLK,<br>RDY | 28    | -   | ns   |   |
| SYSCLK↑→<br>RDY hold time   | t <sub>RDYH</sub> | SYSCLK,<br>RDY | 0     | -   | ns   |   |





## A/D Converter

### (1) 12-bit A/D Converter Electrical Characteristics

(T<sub>A</sub>: -40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                     | Symbol           | Pin Name      | Value        |      |              | Unit | Remarks  |
|-------------------------------|------------------|---------------|--------------|------|--------------|------|--|
|                               |                  |               | Min          | Typ  | Max          |      |  |
| Resolution                    | -                | -             | -            | -    | 12           | bit  |  |
| Total error                   | -                | -             | -            | -    | ±12          | LSB  |  |
| Linearity error               | -                | -             | -            | -    | ± 4.0        | LSB  |  |
| Differential linearity error  | -                | -             | -            | -    | ± 1.9        | LSB  |  |
| Zero transition voltage       | V <sub>OT</sub>  | AN0 to AN47   | AVRL-11.5LSB | -    | AVRL+12.5LSB | V    | 1LSB = (V <sub>FST</sub> -V <sub>OT</sub> )/4094         |
| Full-scale transition voltage | V <sub>FST</sub> | AN0 to AN47   | AVRH-13.5LSB | -    | AVRH+10.5LSB | V    |  |
| Sampling time                 | t <sub>SMP</sub> | -             | 0.7          | -    | -            | µs   | *1   |
| Compare time                  | t <sub>CMP</sub> | -             | 0.7          | -    | -            | µs   | *1   |
| A/D conversion time           | t <sub>CNV</sub> | -             | 1.4          | -    | -            | µs   | *1   |
| Analog port input current     | I <sub>AIN</sub> | AN0 to AN47   | -1.0         | -    | +1.0         | µA   | V <sub>AVSS</sub> ≤ V <sub>AIN</sub> ≤ V <sub>AVCC</sub> |
| Analog input voltage          | V <sub>AIN</sub> | AN0 to AN47   | AVRL         | -    | AVRH         | V    |  |
| Reference voltage             | AVRH             | AVRH          | 3.0          | -    | 5.5          | V    |  |
|                               | AVRL             | AVSS/<br>AVRL | -            | 0.0  | -            | V    |  |
| Power supply current          | I <sub>A</sub>   | AVCC*3        | -            | 0.47 | 0.63         | mA   | Per unit<br>T <sub>A</sub> : +105 °C                     |
|                               |                  |               | -            | 0.47 | 0.7          | mA   | Per unit<br>T <sub>A</sub> : +125 °C                     |
|                               | I <sub>AH</sub>  |               | -            | -    | 2.5          | µA   | *2   |
|                               | I <sub>R</sub>   | AVRH          | -            | 1    | 1.96         | mA   | Per unit   |
| -                             |                  |               | -            | 1.6  | µA           | *2   |  |
| Variation between channels    | -                | AN0 to AN47   | -            | -    | 4            | LSB  |  |

\*1: Time for each channel.

\*2: Power supply current (V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V) is specified if A/D converter is not operating and CPU is stopped.

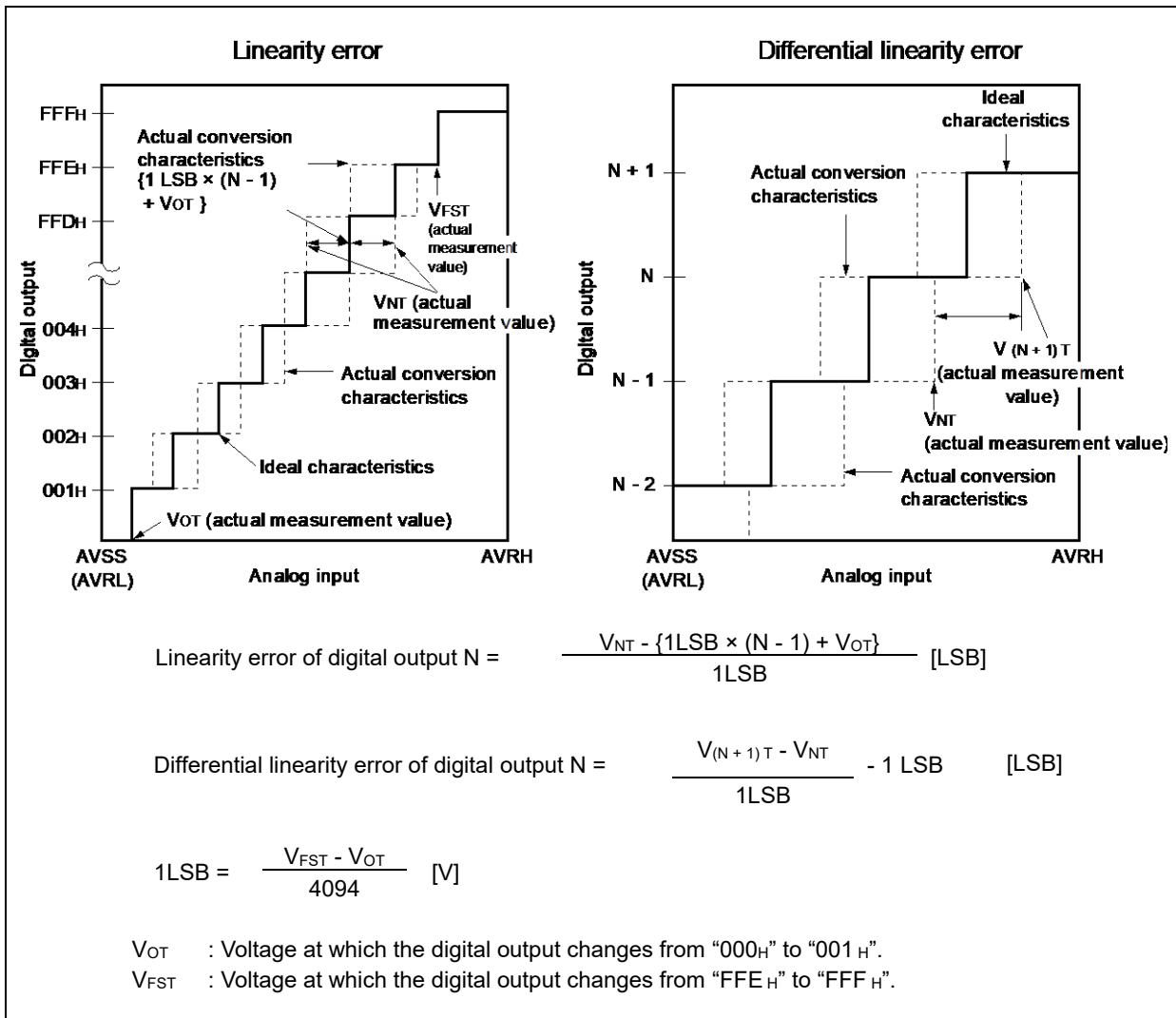
\*3: The power supply current described only current value on A/D converter.

The total AV<sub>CC</sub> current value must be calculated the power supply current for A/D converter and D/A converter.

**Note:** Use the clock of 0.5 MHz-20 MHz for the output clock of A/D converter to guarantee accuracy.

## (2) Definition of A/D Converter Terms

- Resolution** : Analog variation that is recognized by an A/D converter.
- Linearity error** : Deviation of the actual conversion characteristics from a straight line that connects the zero transition point ("0000 0000 0000" ← → "0000 0000 0001") to the full-scale transition point ("1111 1111 1110" ← → "1111 1111 1111").
- Differential linearity error** : Deviation of the input voltage from the ideal value that is required to change the output code by 1LSB.

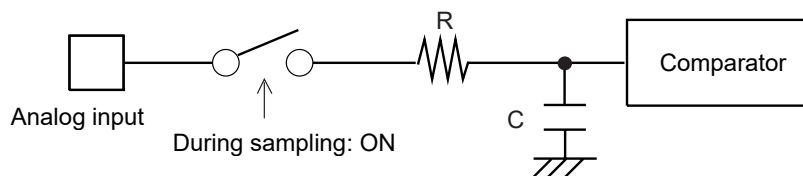


### (3) Notes on Using A/D Converter

<About the output impedance of the analog input of external circuit>

When the external impedance is too high, the sampling period for analog voltages may not be sufficient. In this case, it is recommended to connect the capacitor (approx. 0.1  $\mu\text{F}$ ) to the analog input pin.

- Analog input circuit model



|            | R                    | C             |  |
|------------|----------------------|---------------|--|
| 12-bit A/D | 1.9 k $\Omega$ (Max) | 8.30 pF (Max) | (4.5 V $\leq$ AV <sub>CC</sub> $\leq$ 5.5 V) |
|            | 4.3 k $\Omega$ (Max) | 8.30 pF (Max) | (3.0 V $\leq$ AV <sub>CC</sub> $\leq$ 3.6 V) |

**Note:** Listed values must be considered as reference values.



## Flash Memory

## (1) Electrical Characteristics

| Parameter                                       | Value   |     |      | Unit | Remarks  |
|---|---|-----|------|------|--|
|   | Min   | Typ | Max  |      |  |
| Sector erase time                               | –   | 200 | 800  | ms   | 8 Kbytes sector* <sup>1</sup> ,<br>excluding internal preprogramming time  |
|   | –   | 300 | 1100 | ms   | 8 Kbytes sector* <sup>1</sup> ,<br>including internal preprogramming time  |
|   | –   | 400 | 2000 | ms   | 64 Kbytes sector* <sup>1</sup> ,<br>excluding internal preprogramming time |
|   | –   | 700 | 3700 | ms   | 64 Kbytes sector* <sup>1</sup> ,<br>including internal preprogramming time |
| 8-bit writing time                              | –   | 9   | 288  | μs   | Exclusive of overhead time at<br>system level* <sup>1</sup>                |
| 16-bit writing time                             | –   | 12  | 384  | μs   | Exclusive of overhead time at<br>system level* <sup>1</sup>                |
| ECC writing time                                | –   | 9   | 288  | μs   | Exclusive of overhead time at<br>system level* <sup>1</sup>                |
| Erase cycle* <sup>2</sup> /<br>Data retain time | 1,000 cycles/<br>20 years,<br>10,000 cycles/<br>10 years,<br>100,000 cycles/<br>5 years | –   | –    | –    | Average T <sub>A</sub> = +85 °C* <sup>3</sup>                              |

\*1: The guaranteed value for erasure up to 100,000 cycles.

\*2: Number of erase cycles for each sector.

\*3: This value comes from the technology qualification (using Arrhenius equation to translate high temperature measurements into normalized value at + 85 °C).

## (2) Notes

While the Flash memory is written or erased, shutdown of the external power (V<sub>CC</sub>) is prohibited.

In the application system where V<sub>CC</sub> might be shut down while writing or erasing, be sure to turn the power off by using an external voltage detection function.

To put it concretely, after the external power supply voltage falls below the detection voltage (V<sub>DL</sub>), hold V<sub>CC</sub> at 2.7 V or more within the duration calculated by the following expression:

$$T_d^*[\mu\text{s}] + (\text{period of PCLK}[\mu\text{s}] \times 257) + 50[\mu\text{s}]$$

\*: See “4.AC Characteristics (8) Low-voltage detection (External low-voltage detection)”

**D/A Converter**(T<sub>A</sub>: -40 °C to +125 °C, V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V ± 10 %/V<sub>CC</sub> = AV<sub>CC</sub> = 3.3 V ± 0.3 V, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                    | Symbol         | Pin Name    | Condition | Value |      |       | Unit | Remarks                        |
|------------------------------|----------------|-------------|-----------|-------|------|-------|------|--------------------------------|
|                              |                |             |           | Min   | Typ  | Max   |      |                                |
| Resolution                   | -              | -           | -         | -     | -    | 8     | bit  |                                |
| Differential linearity error | -              | -           | -         | -     | -    | ± 3.0 | LSB  |                                |
| Conversion time              | -              | -           | -         | 0.47  | 0.58 | 0.69  | μs   | C <sub>L</sub> = 20            |
|                              |                |             | -         | 2.37  | 2.90 | 3.43  | μs   | C <sub>L</sub> = 100           |
| Output impedance             | R <sub>o</sub> | DA0,<br>DA1 | -         | 3.1   | 3.8  | 4.5   | kΩ   |                                |
| Power supply current<br>*1   | IA             | AVCC        | -         | -     | 475  | 580   | μA   | Each channel                   |
|                              | IAH            | AVCC        | -         | -     | -    | 7.5   | μA   | When powerdown<br>Each channel |

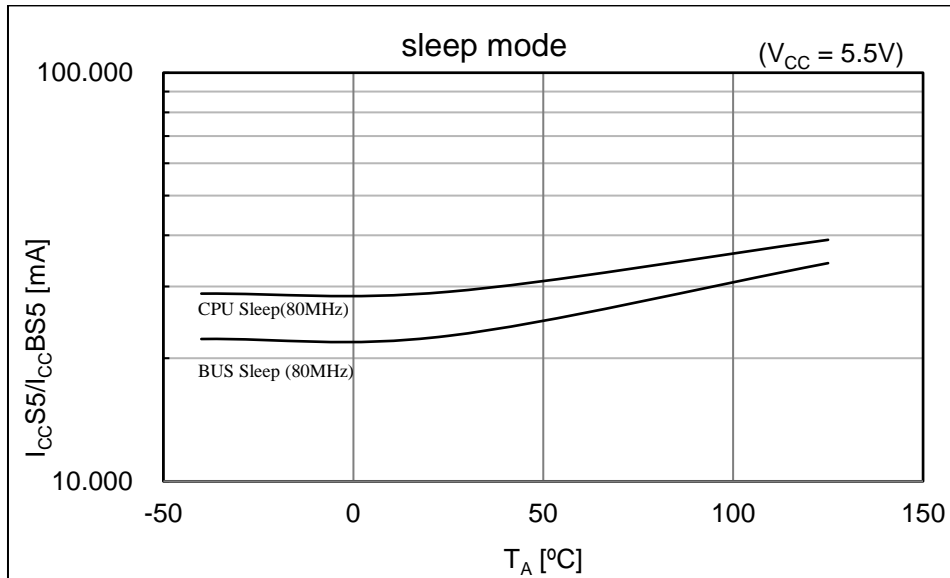
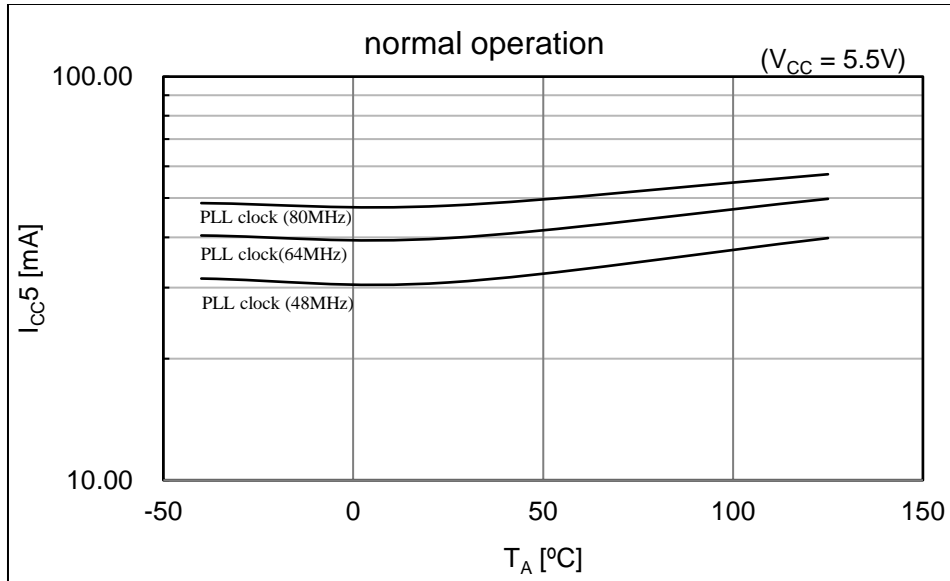
\*1: The power supply current described only current value on D/A converter.

The total AV<sub>CC</sub> current value must be calculated the power supply current for D/A converter and A/D converter.

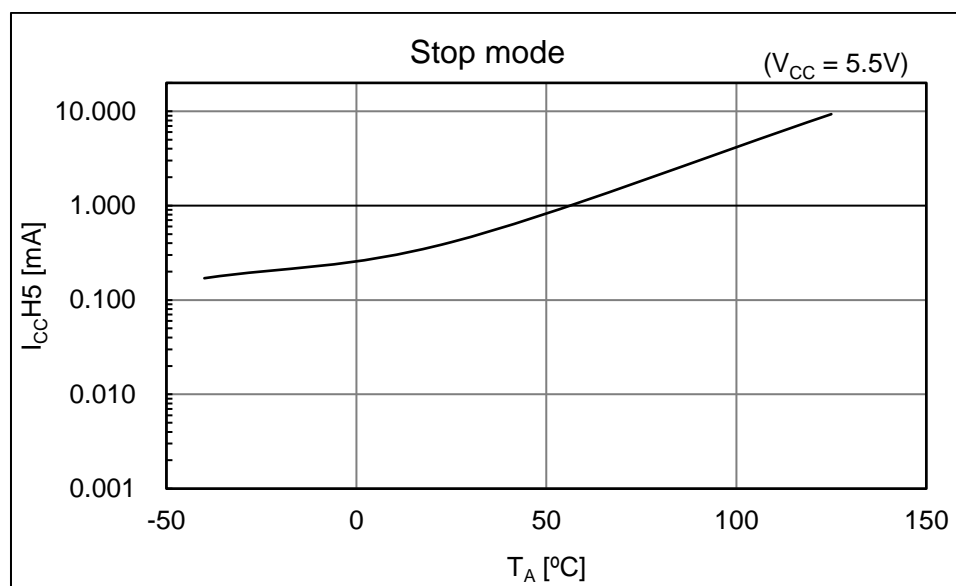
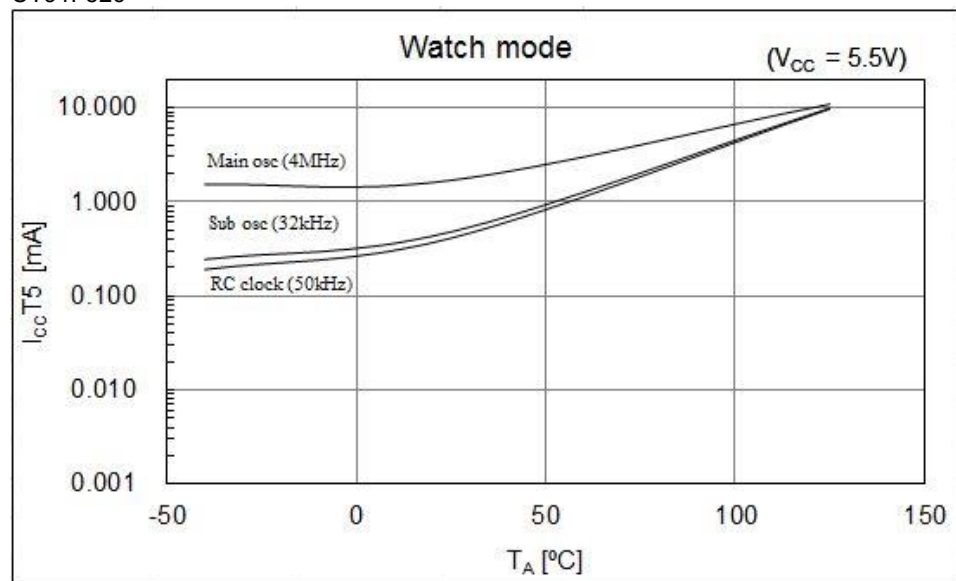
## 12. Example Characteristics

This characteristic is an actual value of the arbitrary sample. It is not the guaranteed value.

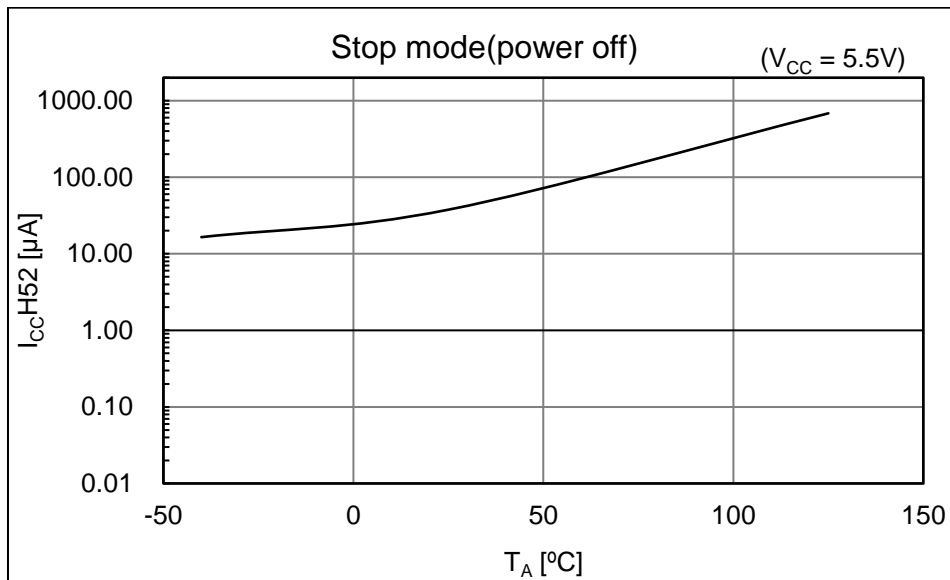
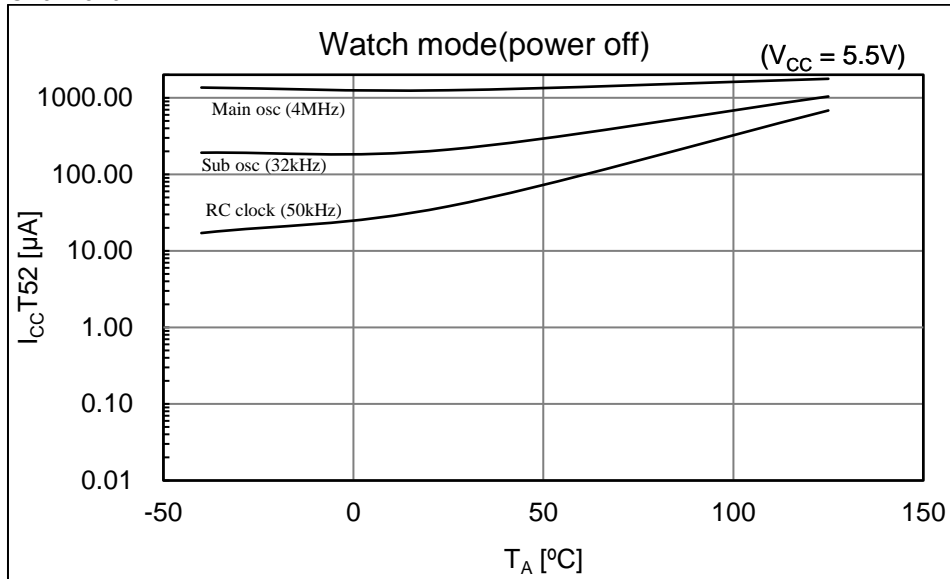
CY91F526



## CY91F526



CY91F526





## 13. Ordering Information CY91F52xxxB\*1

| Part Number    | Sub Clock | CSV Initial Value | LVD Initial Value | Package*2 |
|----------------|-----------|-------------------|-------------------|-----------|
| CY91F526LWBPMC | Yes       | ON                | ON                | LQP176    |
| CY91F526LYBPMC |           | OFF               | OFF               |           |
| CY91F526LJBPMC |           | OFF               | ON                |           |
| CY91F526LLBPMC |           | OFF               | OFF               |           |
| CY91F525LWBPMC |           | ON                | ON                |           |
| CY91F525LYBPMC |           | OFF               | OFF               |           |
| CY91F525LJBPMC |           | OFF               | ON                |           |
| CY91F525LLBPMC |           | OFF               | OFF               |           |
| CY91F524LWBPMC |           | ON                | ON                |           |
| CY91F524LYBPMC |           | OFF               | OFF               |           |
| CY91F524LJBPMC |           | OFF               | ON                |           |
| CY91F524LLBPMC |           | OFF               | OFF               |           |
| CY91F523LWBPMC |           | ON                | ON                |           |
| CY91F523LYBPMC |           | OFF               | OFF               |           |
| CY91F523LJBPMC |           | OFF               | ON                |           |
| CY91F523LLBPMC |           | OFF               | OFF               |           |
| CY91F522LWBPMC |           | ON                | ON                |           |
| CY91F522LYBPMC |           | OFF               | OFF               |           |
| CY91F522LJBPMC |           | OFF               | ON                |           |
| CY91F522LLBPMC |           | OFF               | OFF               |           |
| CY91F526LSBPMC | None      | ON                | ON                |           |
| CY91F526LUBPMC |           | OFF               | OFF               |           |
| CY91F526LHBPMC |           | OFF               | ON                |           |
| CY91F526LKBPMC |           | OFF               | OFF               |           |
| CY91F525LSBPMC |           | ON                | ON                |           |
| CY91F525LUBPMC |           | OFF               | OFF               |           |
| CY91F525LHBPMC |           | OFF               | ON                |           |
| CY91F525LKBPMC |           | OFF               | OFF               |           |
| CY91F524LSBPMC |           | ON                | ON                |           |
| CY91F524LUBPMC |           | OFF               | OFF               |           |
| CY91F524LHBPMC |           | OFF               | ON                |           |
| CY91F524LKBPMC |           | OFF               | OFF               |           |
| CY91F523LSBPMC |           | ON                | ON                |           |
| CY91F523LUBPMC |           | OFF               | OFF               |           |
| CY91F523LHBPMC |           | OFF               | ON                |           |
| CY91F523LKBPMC |           | OFF               | OFF               |           |
| CY91F522LSBPMC |           | ON                | ON                |           |
| CY91F522LUBPMC |           | OFF               | OFF               |           |
| CY91F522LHBPMC |           | OFF               | ON                |           |
| CY91F522LKBPMC |           | OFF               | OFF               |           |



## CY91520 Series

| Part Number     | Sub Clock | CSV Initial Value | LVD Initial Value | Package*2 |
|-----------------|-----------|-------------------|-------------------|-----------|
| CY91F526KWBPMP  | Yes       | ON                | ON                | LQS144    |
| CY91F526KYBPMP  |           |                   | OFF               |           |
| CY91F526KJBPMPC |           | OFF               | ON                |           |
| CY91F526KLBPMPC |           |                   | OFF               |           |
| CY91F525KWBPMP  |           | ON                | ON                |           |
| CY91F525KYBPMP  |           |                   | OFF               |           |
| CY91F525KJBPMPC |           | OFF               | ON                |           |
| CY91F525KLBPMPC |           |                   | OFF               |           |
| CY91F524KWBPMP  |           | ON                | ON                |           |
| CY91F524KYBPMP  |           |                   | OFF               |           |
| CY91F524KJBPMPC |           | OFF               | ON                |           |
| CY91F524KLBPMPC |           |                   | OFF               |           |
| CY91F523KWBPMP  |           | ON                | ON                |           |
| CY91F523KYBPMP  |           |                   | OFF               |           |
| CY91F523KJBPMPC |           | OFF               | ON                |           |
| CY91F523KLBPMPC |           |                   | OFF               |           |
| CY91F522KWBPMP  |           | ON                | ON                |           |
| CY91F522KYBPMP  |           |                   | OFF               |           |
| CY91F522KJBPMPC |           | OFF               | ON                |           |
| CY91F522KLBPMPC |           |                   | OFF               |           |
| CY91F526KSBPMPC | None      | ON                | ON                |           |
| CY91F526KUBPMPC |           |                   | OFF               |           |
| CY91F526KHBPMPC |           | OFF               | ON                |           |
| CY91F526KKBPMP  |           |                   | OFF               |           |
| CY91F525KSBPMPC |           | ON                | ON                |           |
| CY91F525KUBPMPC |           |                   | OFF               |           |
| CY91F525KHBPMPC |           | OFF               | ON                |           |
| CY91F525KKBPMP  |           |                   | OFF               |           |
| CY91F524KSBPMPC |           | ON                | ON                |           |
| CY91F524KUBPMPC |           |                   | OFF               |           |
| CY91F524KHBPMPC |           | OFF               | ON                |           |
| CY91F524KKBPMP  |           |                   | OFF               |           |
| CY91F523KSBPMPC |           | ON                | ON                |           |
| CY91F523KUBPMPC |           |                   | OFF               |           |
| CY91F523KHBPMPC |           | OFF               | ON                |           |
| CY91F523KKBPMP  |           |                   | OFF               |           |
| CY91F522KSBPMPC |           | ON                | ON                |           |
| CY91F522KUBPMPC |           |                   | OFF               |           |
| CY91F522KHBPMPC |           | OFF               | ON                |           |
| CY91F522KKBPMP  |           |                   | OFF               |           |



## CY91520 Series

| Part Number     | Sub Clock | CSV Initial Value | LVD Initial Value | Package*2 |
|-----------------|-----------|-------------------|-------------------|-----------|
| CY91F526KWBPMC1 | Yes       | ON                | ON                | LQN144    |
| CY91F526KYBPMC1 |           | OFF               | OFF               |           |
| CY91F526KJBPMC1 |           | OFF               | ON                |           |
| CY91F526KLBPMC1 |           | OFF               | OFF               |           |
| CY91F525KWBPMC1 |           | ON                | ON                |           |
| CY91F525KYBPMC1 |           | OFF               | OFF               |           |
| CY91F525KJBPMC1 |           | OFF               | ON                |           |
| CY91F525KLBPMC1 |           | OFF               | OFF               |           |
| CY91F524KWBPMC1 |           | ON                | ON                |           |
| CY91F524KYBPMC1 |           | OFF               | OFF               |           |
| CY91F524KJBPMC1 |           | OFF               | ON                |           |
| CY91F524KLBPMC1 |           | OFF               | OFF               |           |
| CY91F523KWBPMC1 |           | ON                | ON                |           |
| CY91F523KYBPMC1 |           | OFF               | OFF               |           |
| CY91F523KJBPMC1 |           | OFF               | ON                |           |
| CY91F523KLBPMC1 |           | OFF               | OFF               |           |
| CY91F522KWBPMC1 |           | ON                | ON                |           |
| CY91F522KYBPMC1 |           | OFF               | OFF               |           |
| CY91F522KJBPMC1 |           | OFF               | ON                |           |
| CY91F522KLBPMC1 |           | OFF               | OFF               |           |
| CY91F526KSBPMC1 | None      | ON                | ON                |           |
| CY91F526KUBPMC1 |           | OFF               | OFF               |           |
| CY91F526KHBPMC1 |           | OFF               | ON                |           |
| CY91F526KKBPMC1 |           | OFF               | OFF               |           |
| CY91F525KSBPMC1 |           | ON                | ON                |           |
| CY91F525KUBPMC1 |           | OFF               | OFF               |           |
| CY91F525KHBPMC1 |           | OFF               | ON                |           |
| CY91F525KKBPMC1 |           | OFF               | OFF               |           |
| CY91F524KSBPMC1 |           | ON                | ON                |           |
| CY91F524KUBPMC1 |           | OFF               | OFF               |           |
| CY91F524KHBPMC1 |           | OFF               | ON                |           |
| CY91F524KKBPMC1 |           | OFF               | OFF               |           |
| CY91F523KSBPMC1 |           | ON                | ON                |           |
| CY91F523KUBPMC1 |           | OFF               | OFF               |           |
| CY91F523KHBPMC1 |           | OFF               | ON                |           |
| CY91F523KKBPMC1 |           | OFF               | OFF               |           |
| CY91F522KSBPMC1 |           | ON                | ON                |           |
| CY91F522KUBPMC1 |           | OFF               | OFF               |           |
| CY91F522KHBPMC1 |           | OFF               | ON                |           |
| CY91F522KKBPMC1 |           | OFF               | OFF               |           |



## CY91520 Series

| Part Number    | Sub Clock | CSV Initial Value | LVD Initial Value | Package*2 |
|----------------|-----------|-------------------|-------------------|-----------|
| CY91F526JWBPMC | Yes       | ON                | ON                | LQM120    |
| CY91F526JYBPMC |           |                   | OFF               |           |
| CY91F526JJBPMC |           | OFF               | ON                |           |
| CY91F526JLBPMC |           |                   | OFF               |           |
| CY91F525JWBPMC |           | ON                | ON                |           |
| CY91F525JYBPMC |           |                   | OFF               |           |
| CY91F525JJBPMC |           | OFF               | ON                |           |
| CY91F525JLBPMC |           |                   | OFF               |           |
| CY91F524JWBPMC |           | ON                | ON                |           |
| CY91F524JYBPMC |           |                   | OFF               |           |
| CY91F524JJBPMC |           | OFF               | ON                |           |
| CY91F524JLBPMC |           |                   | OFF               |           |
| CY91F523JWBPMC |           | ON                | ON                |           |
| CY91F523JYBPMC |           |                   | OFF               |           |
| CY91F523JJBPMC |           | OFF               | ON                |           |
| CY91F523JLBPMC |           |                   | OFF               |           |
| CY91F522JWBPMC |           | ON                | ON                |           |
| CY91F522JYBPMC |           |                   | OFF               |           |
| CY91F522JJBPMC |           | OFF               | ON                |           |
| CY91F522JLBPMC |           |                   | OFF               |           |
| CY91F526JSBPMC | None      | ON                | ON                |           |
| CY91F526JUBPMC |           |                   | OFF               |           |
| CY91F526JHBPMC |           | OFF               | ON                |           |
| CY91F526JKBPMC |           |                   | OFF               |           |
| CY91F525JSBPMC |           | ON                | ON                |           |
| CY91F525JUBPMC |           |                   | OFF               |           |
| CY91F525JHBPMC |           | OFF               | ON                |           |
| CY91F525JKBPMC |           |                   | OFF               |           |
| CY91F524JSBPMC |           | ON                | ON                |           |
| CY91F524JUBPMC |           |                   | OFF               |           |
| CY91F524JHBPMC |           | OFF               | ON                |           |
| CY91F524JKBPMC |           |                   | OFF               |           |
| CY91F523JSBPMC |           | ON                | ON                |           |
| CY91F523JUBPMC |           |                   | OFF               |           |
| CY91F523JHBPMC |           | OFF               | ON                |           |
| CY91F523JKBPMC |           |                   | OFF               |           |
| CY91F522JSBPMC |           | ON                | ON                |           |
| CY91F522JUBPMC |           |                   | OFF               |           |
| CY91F522JHBPMC |           | OFF               | ON                |           |
| CY91F522JKBPMC |           |                   | OFF               |           |



## CY91520 Series

| Part Number    | Sub Clock | CSV Initial Value | LVD Initial Value | Package*2 |
|----------------|-----------|-------------------|-------------------|-----------|
| CY91F526FWBPMC | Yes       | ON                | ON                | LQ1100    |
| CY91F526FYBPMC |           |                   | OFF               |           |
| CY91F526FJBPMC |           | OFF               | ON                |           |
| CY91F526FLBPMC |           |                   | OFF               |           |
| CY91F525FWBPMC |           | ON                | ON                |           |
| CY91F525FYBPMC |           |                   | OFF               |           |
| CY91F525FJBPMC |           | OFF               | ON                |           |
| CY91F525FLBPMC |           |                   | OFF               |           |
| CY91F524FWBPMC |           | ON                | ON                |           |
| CY91F524FYBPMC |           |                   | OFF               |           |
| CY91F524FJBPMC |           | OFF               | ON                |           |
| CY91F524FLBPMC |           |                   | OFF               |           |
| CY91F523FWBPMC |           | ON                | ON                |           |
| CY91F523FYBPMC |           |                   | OFF               |           |
| CY91F523FJBPMC |           | OFF               | ON                |           |
| CY91F523FLBPMC |           |                   | OFF               |           |
| CY91F522FWBPMC |           | ON                | ON                |           |
| CY91F522FYBPMC |           |                   | OFF               |           |
| CY91F522FJBPMC |           | OFF               | ON                |           |
| CY91F522FLBPMC |           |                   | OFF               |           |
| CY91F526FSBPMC | None      | ON                | ON                |           |
| CY91F526FUBPMC |           |                   | OFF               |           |
| CY91F526FHBPMC |           | OFF               | ON                |           |
| CY91F526FKBPMC |           |                   | OFF               |           |
| CY91F525FSBPMC |           | ON                | ON                |           |
| CY91F525FUBPMC |           |                   | OFF               |           |
| CY91F525FHBPMC |           | OFF               | ON                |           |
| CY91F525FKBPMC |           |                   | OFF               |           |
| CY91F524FSBPMC |           | ON                | ON                |           |
| CY91F524FUBPMC |           |                   | OFF               |           |
| CY91F524FHBPMC |           | OFF               | ON                |           |
| CY91F524FKBPMC |           |                   | OFF               |           |
| CY91F523FSBPMC |           | ON                | ON                |           |
| CY91F523FUBPMC |           |                   | OFF               |           |
| CY91F523FHBPMC |           | OFF               | ON                |           |
| CY91F523FKBPMC |           |                   | OFF               |           |
| CY91F522FSBPMC |           | ON                | ON                |           |
| CY91F522FUBPMC |           |                   | OFF               |           |
| CY91F522FHBPMC |           | OFF               | ON                |           |
| CY91F522FKBPMC |           |                   | OFF               |           |



## CY91520 Series

| Part Number    | Sub Clock | CSV Initial Value | LVD Initial Value | Package*2 |
|----------------|-----------|-------------------|-------------------|-----------|
| CY91F526DWBPMC | Yes       | ON                | ON                | LQH080    |
| CY91F526DYBPMC |           | OFF               | OFF               |           |
| CY91F526DJBPMC |           | OFF               | ON                |           |
| CY91F526DLBPMC |           | OFF               | OFF               |           |
| CY91F525DWBPMC |           | ON                | ON                |           |
| CY91F525DYBPMC |           | OFF               | OFF               |           |
| CY91F525DJBPMC |           | OFF               | ON                |           |
| CY91F525DLBPMC |           | OFF               | OFF               |           |
| CY91F524DWBPMC |           | ON                | ON                |           |
| CY91F524DYBPMC |           | OFF               | OFF               |           |
| CY91F524DJBPMC |           | OFF               | ON                |           |
| CY91F524DLBPMC |           | OFF               | OFF               |           |
| CY91F523DWBPMC |           | ON                | ON                |           |
| CY91F523DYBPMC |           | OFF               | OFF               |           |
| CY91F523DJBPMC |           | OFF               | ON                |           |
| CY91F523DLBPMC |           | OFF               | OFF               |           |
| CY91F522DWBPMC |           | ON                | ON                |           |
| CY91F522DYBPMC |           | OFF               | OFF               |           |
| CY91F522DJBPMC |           | OFF               | ON                |           |
| CY91F522DLBPMC |           | OFF               | OFF               |           |
| CY91F526DSBPMC | None      | ON                | ON                |           |
| CY91F526DUBPMC |           | OFF               | OFF               |           |
| CY91F526DHBPMC |           | OFF               | ON                |           |
| CY91F526DKBPMC |           | OFF               | OFF               |           |
| CY91F525DSBPMC |           | ON                | ON                |           |
| CY91F525DUBPMC |           | OFF               | OFF               |           |
| CY91F525DHBPMC |           | OFF               | ON                |           |
| CY91F525DKBPMC |           | OFF               | OFF               |           |
| CY91F524DSBPMC |           | ON                | ON                |           |
| CY91F524DUBPMC |           | OFF               | OFF               |           |
| CY91F524DHBPMC |           | OFF               | ON                |           |
| CY91F524DKBPMC |           | OFF               | OFF               |           |
| CY91F523DSBPMC |           | ON                | ON                |           |
| CY91F523DUBPMC |           | OFF               | OFF               |           |
| CY91F523DHBPMC |           | OFF               | ON                |           |
| CY91F523DKBPMC |           | OFF               | OFF               |           |
| CY91F522DSBPMC |           | ON                | ON                |           |
| CY91F522DUBPMC |           | OFF               | OFF               |           |
| CY91F522DHBPMC |           | OFF               | ON                |           |
| CY91F522DKBPMC |           | OFF               | OFF               |           |



## CY91520 Series

| Part Number     | Sub Clock | CSV Initial Value | LVD Initial Value | Package*2 |
|-----------------|-----------|-------------------|-------------------|-----------|
| CY91F526BWBPMC1 | Yes       | ON                | ON                | LQD064    |
| CY91F526BYBPMC1 |           | OFF               | OFF               |           |
| CY91F526BJBPMC1 |           | OFF               | ON                |           |
| CY91F526BLBPMC1 |           | OFF               | OFF               |           |
| CY91F525BWBPMC1 |           | ON                | ON                |           |
| CY91F525BYBPMC1 |           | OFF               | OFF               |           |
| CY91F525BJBPMC1 |           | OFF               | ON                |           |
| CY91F525BLBPMC1 |           | OFF               | OFF               |           |
| CY91F524BWBPMC1 |           | ON                | ON                |           |
| CY91F524BYBPMC1 |           | OFF               | OFF               |           |
| CY91F524BJBPMC1 |           | OFF               | ON                |           |
| CY91F524BLBPMC1 |           | OFF               | OFF               |           |
| CY91F523BWBPMC1 |           | ON                | ON                |           |
| CY91F523BYBPMC1 |           | OFF               | OFF               |           |
| CY91F523BJBPMC1 |           | OFF               | ON                |           |
| CY91F523BLBPMC1 |           | OFF               | OFF               |           |
| CY91F522BWBPMC1 |           | ON                | ON                |           |
| CY91F522BYBPMC1 |           | OFF               | OFF               |           |
| CY91F522BJBPMC1 |           | OFF               | ON                |           |
| CY91F522BLBPMC1 |           | OFF               | OFF               |           |
| CY91F526BSBPMC1 | None      | ON                | ON                |           |
| CY91F526BUBPMC1 |           | OFF               | OFF               |           |
| CY91F526BHBPMC1 |           | OFF               | ON                |           |
| CY91F526BKBPMC1 |           | OFF               | OFF               |           |
| CY91F525BSBPMC1 |           | ON                | ON                |           |
| CY91F525BUBPMC1 |           | OFF               | OFF               |           |
| CY91F525BHBPMC1 |           | OFF               | ON                |           |
| CY91F525BKBPMC1 |           | OFF               | OFF               |           |
| CY91F524BSBPMC1 |           | ON                | ON                |           |
| CY91F524BUBPMC1 |           | OFF               | OFF               |           |
| CY91F524BHBPMC1 |           | OFF               | ON                |           |
| CY91F524BKBPMC1 |           | OFF               | OFF               |           |
| CY91F523BSBPMC1 |           | ON                | ON                |           |
| CY91F523BUBPMC1 |           | OFF               | OFF               |           |
| CY91F523BHBPMC1 |           | OFF               | ON                |           |
| CY91F523BKBPMC1 |           | OFF               | OFF               |           |
| CY91F522BSBPMC1 |           | ON                | ON                |           |
| CY91F522BUBPMC1 |           | OFF               | OFF               |           |
| CY91F522BHBPMC1 |           | OFF               | ON                |           |
| CY91F522BKBPMC1 |           | OFF               | OFF               |           |

\*1: It is only supported for customers who have already adopted it now. We do not recommend adopting new products.

\*2: For details of the package, see [Package Dimensions](#).



## 14. Ordering Information CY91F52xxxC\*1

| Part Number    | Sub Clock | CSV Initial Value | LVD Initial Value | Package*2 |
|----------------|-----------|-------------------|-------------------|-----------|
| CY91F526LWCPMC | Yes       | ON                | ON                | LQP176    |
| CY91F526LYCPMC |           |                   | OFF               |           |
| CY91F526LJCPMC |           | OFF               | ON                |           |
| CY91F526LLCPMC |           |                   | OFF               |           |
| CY91F525LWCPMC |           | ON                | ON                |           |
| CY91F525LYCPMC |           |                   | OFF               |           |
| CY91F525LJCPMC |           | OFF               | ON                |           |
| CY91F525LLCPMC |           |                   | OFF               |           |
| CY91F524LWCPMC |           | ON                | ON                |           |
| CY91F524LYCPMC |           |                   | OFF               |           |
| CY91F524LJCPMC |           | OFF               | ON                |           |
| CY91F524LLCPMC |           |                   | OFF               |           |
| CY91F523LWCPMC |           | ON                | ON                |           |
| CY91F523LYCPMC |           |                   | OFF               |           |
| CY91F523LJCPMC |           | OFF               | ON                |           |
| CY91F523LLCPMC |           |                   | OFF               |           |
| CY91F522LWCPMC |           | ON                | ON                |           |
| CY91F522LYCPMC |           |                   | OFF               |           |
| CY91F522LJCPMC |           | OFF               | ON                |           |
| CY91F522LLCPMC |           |                   | OFF               |           |
| CY91F526LSCPMP | None      | ON                | ON                |           |
| CY91F526LUCPMP |           |                   | OFF               |           |
| CY91F526LHCPMP |           | OFF               | ON                |           |
| CY91F526LKCPMP |           |                   | OFF               |           |
| CY91F525LSCPMP |           | ON                | ON                |           |
| CY91F525LUCPMP |           |                   | OFF               |           |
| CY91F525LHCPMP |           | OFF               | ON                |           |
| CY91F525LKCPMP |           |                   | OFF               |           |
| CY91F524LSCPMP |           | ON                | ON                |           |
| CY91F524LUCPMP |           |                   | OFF               |           |
| CY91F524LHCPMP |           | OFF               | ON                |           |
| CY91F524LKCPMP |           |                   | OFF               |           |
| CY91F523LSCPMP |           | ON                | ON                |           |
| CY91F523LUCPMP |           |                   | OFF               |           |
| CY91F523LHCPMP |           | OFF               | ON                |           |
| CY91F523LKCPMP |           |                   | OFF               |           |
| CY91F522LSCPMP |           | ON                | ON                |           |
| CY91F522LUCPMP |           |                   | OFF               |           |
| CY91F522LHCPMP |           | OFF               | ON                |           |
| CY91F522LKCPMP |           |                   | OFF               |           |



## CY91520 Series

| Part Number    | Sub Clock | CSV Initial Value | LVD Initial Value | Package <sup>2</sup> |
|----------------|-----------|-------------------|-------------------|----------------------|
| CY91F526KWCPMC | Yes       | ON                | ON                | LQS144               |
| CY91F526KYCPMC |           |                   | OFF               |                      |
| CY91F526KJCPMC |           | OFF               | ON                |                      |
| CY91F526KLCPMC |           |                   | OFF               |                      |
| CY91F525KWCPMC |           | ON                | ON                |                      |
| CY91F525KYCPMC |           |                   | OFF               |                      |
| CY91F525KJCPMC |           | OFF               | ON                |                      |
| CY91F525KLCPMC |           |                   | OFF               |                      |
| CY91F524KWCPMC |           | ON                | ON                |                      |
| CY91F524KYCPMC |           |                   | OFF               |                      |
| CY91F524KJCPMC |           | OFF               | ON                |                      |
| CY91F524KLCPMC |           |                   | OFF               |                      |
| CY91F523KWCPMC |           | ON                | ON                |                      |
| CY91F523KYCPMC |           |                   | OFF               |                      |
| CY91F523KJCPMC |           | OFF               | ON                |                      |
| CY91F523KLCPMC |           |                   | OFF               |                      |
| CY91F522KWCPMC |           | ON                | ON                |                      |
| CY91F522KYCPMC |           |                   | OFF               |                      |
| CY91F522KJCPMC |           | OFF               | ON                |                      |
| CY91F522KLCPMC |           |                   | OFF               |                      |
| CY91F526KSCPMC | None      | ON                | ON                |                      |
| CY91F526KUCPMC |           |                   | OFF               |                      |
| CY91F526KHCPMC |           | OFF               | ON                |                      |
| CY91F526KKCPMC |           |                   | OFF               |                      |
| CY91F525KSCPMC |           | ON                | ON                |                      |
| CY91F525KUCPMC |           |                   | OFF               |                      |
| CY91F525KHCPMC |           | OFF               | ON                |                      |
| CY91F525KKCPMC |           |                   | OFF               |                      |
| CY91F524KSCPMC |           | ON                | ON                |                      |
| CY91F524KUCPMC |           |                   | OFF               |                      |
| CY91F524KHCPMC |           | OFF               | ON                |                      |
| CY91F524KKCPMC |           |                   | OFF               |                      |
| CY91F523KSCPMC |           | ON                | ON                |                      |
| CY91F523KUCPMC |           |                   | OFF               |                      |
| CY91F523KHCPMC |           | OFF               | ON                |                      |
| CY91F523KKCPMC |           |                   | OFF               |                      |
| CY91F522KSCPMC |           | ON                | ON                |                      |
| CY91F522KUCPMC |           |                   | OFF               |                      |
| CY91F522KHCPMC |           | OFF               | ON                |                      |
| CY91F522KKCPMC |           |                   | OFF               |                      |



## CY91520 Series

| Part Number     | Sub Clock | CSV Initial Value | LVD Initial Value | Package <sup>*2</sup> |
|-----------------|-----------|-------------------|-------------------|-----------------------|
| CY91F526KWCPMC1 | Yes       | ON                | ON                | LQN144                |
| CY91F526KYCPMC1 |           |                   | OFF               |                       |
| CY91F526KJCPMC1 |           | OFF               | ON                |                       |
| CY91F526KLCPMC1 |           |                   | OFF               |                       |
| CY91F525KWCPMC1 |           | ON                | ON                |                       |
| CY91F525KYCPMC1 |           |                   | OFF               |                       |
| CY91F525KJCPMC1 |           | OFF               | ON                |                       |
| CY91F525KLCPMC1 |           |                   | OFF               |                       |
| CY91F524KWCPMC1 |           | ON                | ON                |                       |
| CY91F524KYCPMC1 |           |                   | OFF               |                       |
| CY91F524KJCPMC1 |           | OFF               | ON                |                       |
| CY91F524KLCPMC1 |           |                   | OFF               |                       |
| CY91F523KWCPMC1 |           | ON                | ON                |                       |
| CY91F523KYCPMC1 |           |                   | OFF               |                       |
| CY91F523KJCPMC1 |           | OFF               | ON                |                       |
| CY91F523KLCPMC1 |           |                   | OFF               |                       |
| CY91F522KWCPMC1 |           | ON                | ON                |                       |
| CY91F522KYCPMC1 |           |                   | OFF               |                       |
| CY91F522KJCPMC1 |           | OFF               | ON                |                       |
| CY91F522KLCPMC1 |           |                   | OFF               |                       |
| CY91F526KSCPMC1 | None      | ON                | ON                |                       |
| CY91F526KUCPMC1 |           |                   | OFF               |                       |
| CY91F526KHCPMC1 |           | OFF               | ON                |                       |
| CY91F526KKCPMC1 |           |                   | OFF               |                       |
| CY91F525KSCPMC1 |           | ON                | ON                |                       |
| CY91F525KUCPMC1 |           |                   | OFF               |                       |
| CY91F525KHCPMC1 |           | OFF               | ON                |                       |
| CY91F525KKCPMC1 |           |                   | OFF               |                       |
| CY91F524KSCPMC1 |           | ON                | ON                |                       |
| CY91F524KUCPMC1 |           |                   | OFF               |                       |
| CY91F524KHCPMC1 |           | OFF               | ON                |                       |
| CY91F524KKCPMC1 |           |                   | OFF               |                       |
| CY91F523KSCPMC1 |           | ON                | ON                |                       |
| CY91F523KUCPMC1 |           |                   | OFF               |                       |
| CY91F523KHCPMC1 |           | OFF               | ON                |                       |
| CY91F523KKCPMC1 |           |                   | OFF               |                       |
| CY91F522KSCPMC1 |           | ON                | ON                |                       |
| CY91F522KUCPMC1 |           |                   | OFF               |                       |
| CY91F522KHCPMC1 |           | OFF               | ON                |                       |
| CY91F522KKCPMC1 |           |                   | OFF               |                       |



## CY91520 Series

| Part Number    | Sub Clock | CSV Initial Value | LVD Initial Value | Package <sup>*2</sup> |
|----------------|-----------|-------------------|-------------------|-----------------------|
| CY91F526JWCPMC | Yes       | ON                | ON                | LQM120                |
| CY91F526JYCPMC |           |                   | OFF               |                       |
| CY91F526JJCPMC |           | OFF               | ON                |                       |
| CY91F526JLCPMC |           |                   | OFF               |                       |
| CY91F525JWCPMC |           | ON                | ON                |                       |
| CY91F525JYCPMC |           |                   | OFF               |                       |
| CY91F525JJCPMC |           | OFF               | ON                |                       |
| CY91F525JLCPMC |           |                   | OFF               |                       |
| CY91F524JWCPMC |           | ON                | ON                |                       |
| CY91F524JYCPMC |           |                   | OFF               |                       |
| CY91F524JJCPMC |           | OFF               | ON                |                       |
| CY91F524JLCPMC |           |                   | OFF               |                       |
| CY91F523JWCPMC |           | ON                | ON                |                       |
| CY91F523JYCPMC |           |                   | OFF               |                       |
| CY91F523JJCPMC |           | OFF               | ON                |                       |
| CY91F523JLCPMC |           |                   | OFF               |                       |
| CY91F522JWCPMC |           | ON                | ON                |                       |
| CY91F522JYCPMC |           |                   | OFF               |                       |
| CY91F522JJCPMC |           | OFF               | ON                |                       |
| CY91F522JLCPMC |           |                   | OFF               |                       |
| CY91F526JSCPMP | None      | ON                | ON                |                       |
| CY91F526JUCPMP |           |                   | OFF               |                       |
| CY91F526JHCPMP |           | OFF               | ON                |                       |
| CY91F526JKCPMP |           |                   | OFF               |                       |
| CY91F525JSCPMP |           | ON                | ON                |                       |
| CY91F525JUCPMP |           |                   | OFF               |                       |
| CY91F525JHCPMP |           | OFF               | ON                |                       |
| CY91F525JKCPMP |           |                   | OFF               |                       |
| CY91F524JSCPMP |           | ON                | ON                |                       |
| CY91F524JUCPMP |           |                   | OFF               |                       |
| CY91F524JHCPMP |           | OFF               | ON                |                       |
| CY91F524JKCPMP |           |                   | OFF               |                       |
| CY91F523JSCPMP |           | ON                | ON                |                       |
| CY91F523JUCPMP |           |                   | OFF               |                       |
| CY91F523JHCPMP |           | OFF               | ON                |                       |
| CY91F523JKCPMP |           |                   | OFF               |                       |
| CY91F522JSCPMP |           | ON                | ON                |                       |
| CY91F522JUCPMP |           |                   | OFF               |                       |
| CY91F522JHCPMP |           | OFF               | ON                |                       |
| CY91F522JKCPMP |           |                   | OFF               |                       |



## CY91520 Series

| Part Number    | Sub Clock | CSV Initial Value | LVD Initial Value | Package <sup>*2</sup> |
|----------------|-----------|-------------------|-------------------|-----------------------|
| CY91F526FWCPMC | Yes       | ON                | ON                | LQ1100                |
| CY91F526FYCPMC |           |                   | OFF               |                       |
| CY91F526FJCPMC |           | OFF               | ON                |                       |
| CY91F526FLCPMC |           |                   | OFF               |                       |
| CY91F525FWCPMC |           | ON                | ON                |                       |
| CY91F525FYCPMC |           |                   | OFF               |                       |
| CY91F525FJCPMC |           | OFF               | ON                |                       |
| CY91F525FLCPMC |           |                   | OFF               |                       |
| CY91F524FWCPMC |           | ON                | ON                |                       |
| CY91F524FYCPMC |           |                   | OFF               |                       |
| CY91F524FJCPMC |           | OFF               | ON                |                       |
| CY91F524FLCPMC |           |                   | OFF               |                       |
| CY91F523FWCPMC |           | ON                | ON                |                       |
| CY91F523FYCPMC |           |                   | OFF               |                       |
| CY91F523FJCPMC |           | OFF               | ON                |                       |
| CY91F523FLCPMC |           |                   | OFF               |                       |
| CY91F522FWCPMC |           | ON                | ON                |                       |
| CY91F522FYCPMC |           |                   | OFF               |                       |
| CY91F522FJCPMC |           | OFF               | ON                |                       |
| CY91F522FLCPMC |           |                   | OFF               |                       |
| CY91F526FSCPMC | None      | ON                | ON                |                       |
| CY91F526FUCPMC |           |                   | OFF               |                       |
| CY91F526FHCPMC |           | OFF               | ON                |                       |
| CY91F526FKCPMC |           |                   | OFF               |                       |
| CY91F525FSCPMC |           | ON                | ON                |                       |
| CY91F525FUCPMC |           |                   | OFF               |                       |
| CY91F525FHCPMC |           | OFF               | ON                |                       |
| CY91F525FKCPMC |           |                   | OFF               |                       |
| CY91F524FSCPMC |           | ON                | ON                |                       |
| CY91F524FUCPMC |           |                   | OFF               |                       |
| CY91F524FHCPMC |           | OFF               | ON                |                       |
| CY91F524FKCPMC |           |                   | OFF               |                       |
| CY91F523FSCPMC |           | ON                | ON                |                       |
| CY91F523FUCPMC |           |                   | OFF               |                       |
| CY91F523FHCPMC |           | OFF               | ON                |                       |
| CY91F523FKCPMC |           |                   | OFF               |                       |
| CY91F522FSCPMC |           | ON                | ON                |                       |
| CY91F522FUCPMC |           |                   | OFF               |                       |
| CY91F522FHCPMC |           | OFF               | ON                |                       |
| CY91F522FKCPMC |           |                   | OFF               |                       |



## CY91520 Series

| Part Number    | Sub Clock | CSV Initial Value | LVD Initial Value | Package <sup>*2</sup> |
|----------------|-----------|-------------------|-------------------|-----------------------|
| CY91F526DWCPMC | Yes       | ON                | ON                | LQH080                |
| CY91F526DYCPMC |           |                   | OFF               |                       |
| CY91F526DJCPMC |           | OFF               | ON                |                       |
| CY91F526DLCPMC |           |                   | OFF               |                       |
| CY91F525DWCPMC |           | ON                | ON                |                       |
| CY91F525DYCPMC |           |                   | OFF               |                       |
| CY91F525DJCPMC |           | OFF               | ON                |                       |
| CY91F525DLCPMC |           |                   | OFF               |                       |
| CY91F524DWCPMC |           | ON                | ON                |                       |
| CY91F524DYCPMC |           |                   | OFF               |                       |
| CY91F524DJCPMC |           | OFF               | ON                |                       |
| CY91F524DLCPMC |           |                   | OFF               |                       |
| CY91F523DWCPMC |           | ON                | ON                |                       |
| CY91F523DYCPMC |           |                   | OFF               |                       |
| CY91F523DJCPMC |           | OFF               | ON                |                       |
| CY91F523DLCPMC |           |                   | OFF               |                       |
| CY91F522DWCPMC |           | ON                | ON                |                       |
| CY91F522DYCPMC |           |                   | OFF               |                       |
| CY91F522DJCPMC |           | OFF               | ON                |                       |
| CY91F522DLCPMC |           |                   | OFF               |                       |
| CY91F526DSCPMC | None      | ON                | ON                |                       |
| CY91F526DUCPMC |           |                   | OFF               |                       |
| CY91F526DHCPMC |           | OFF               | ON                |                       |
| CY91F526DKCPMC |           |                   | OFF               |                       |
| CY91F525DSCPMC |           | ON                | ON                |                       |
| CY91F525DUCPMC |           |                   | OFF               |                       |
| CY91F525DHCPMC |           | OFF               | ON                |                       |
| CY91F525DKCPMC |           |                   | OFF               |                       |
| CY91F524DSCPMC |           | ON                | ON                |                       |
| CY91F524DUCPMC |           |                   | OFF               |                       |
| CY91F524DHCPMC |           | OFF               | ON                |                       |
| CY91F524DKCPMC |           |                   | OFF               |                       |
| CY91F523DSCPMC |           | ON                | ON                |                       |
| CY91F523DUCPMC |           |                   | OFF               |                       |
| CY91F523DHCPMC |           | OFF               | ON                |                       |
| CY91F523DKCPMC |           |                   | OFF               |                       |
| CY91F522DSCPMC |           | ON                | ON                |                       |
| CY91F522DUCPMC |           |                   | OFF               |                       |
| CY91F522DHCPMC |           | OFF               | ON                |                       |
| CY91F522DKCPMC |           |                   | OFF               |                       |



## CY91520 Series

| Part Number     | Sub Clock | CSV Initial Value | LVD Initial Value | Package <sup>*2</sup> |
|-----------------|-----------|-------------------|-------------------|-----------------------|
| CY91F526BWCPMC1 | Yes       | ON                | ON                | LQD064                |
| CY91F526BYCPMC1 |           | OFF               | OFF               |                       |
| CY91F526BJCPMC1 |           | OFF               | ON                |                       |
| CY91F526BLCPMC1 |           | OFF               | OFF               |                       |
| CY91F525BWCPMC1 |           | ON                | ON                |                       |
| CY91F525BYCPMC1 |           | OFF               | OFF               |                       |
| CY91F525BJCPMC1 |           | OFF               | ON                |                       |
| CY91F525BLCPMC1 |           | OFF               | OFF               |                       |
| CY91F524BWCPMC1 |           | ON                | ON                |                       |
| CY91F524BYCPMC1 |           | OFF               | OFF               |                       |
| CY91F524BJCPMC1 |           | OFF               | ON                |                       |
| CY91F524BLCPMC1 |           | OFF               | OFF               |                       |
| CY91F523BWCPMC1 |           | ON                | ON                |                       |
| CY91F523BYCPMC1 |           | OFF               | OFF               |                       |
| CY91F523BJCPMC1 |           | OFF               | ON                |                       |
| CY91F523BLCPMC1 |           | OFF               | OFF               |                       |
| CY91F522BWCPMC1 |           | ON                | ON                |                       |
| CY91F522BYCPMC1 |           | OFF               | OFF               |                       |
| CY91F522BJCPMC1 |           | OFF               | ON                |                       |
| CY91F522BLCPMC1 |           | OFF               | OFF               |                       |
| CY91F526BSCPMC1 | None      | ON                | ON                |                       |
| CY91F526BUCPMC1 |           | OFF               | OFF               |                       |
| CY91F526BHCPMC1 |           | OFF               | ON                |                       |
| CY91F526BKCPMC1 |           | OFF               | OFF               |                       |
| CY91F525BSCPMC1 |           | ON                | ON                |                       |
| CY91F525BUCPMC1 |           | OFF               | OFF               |                       |
| CY91F525BHCPMC1 |           | OFF               | ON                |                       |
| CY91F525BKCPMC1 |           | OFF               | OFF               |                       |
| CY91F524BSCPMC1 |           | ON                | ON                |                       |
| CY91F524BUCPMC1 |           | OFF               | OFF               |                       |
| CY91F524BHCPMC1 |           | OFF               | ON                |                       |
| CY91F524BKCPMC1 |           | OFF               | OFF               |                       |
| CY91F523BSCPMC1 |           | ON                | ON                |                       |
| CY91F523BUCPMC1 |           | OFF               | OFF               |                       |
| CY91F523BHCPMC1 |           | OFF               | ON                |                       |
| CY91F523BKCPMC1 |           | OFF               | OFF               |                       |
| CY91F522BSCPMC1 |           | ON                | ON                |                       |
| CY91F522BUCPMC1 |           | OFF               | OFF               |                       |
| CY91F522BHCPMC1 |           | OFF               | ON                |                       |
| CY91F522BKCPMC1 |           | OFF               | OFF               |                       |

\*1: It is only supported for customers who have already adopted it now. We do not recommend adopting new products.

\*2: For details of the package, see [Package Dimensions](#).



## 15. Ordering Information CY91F52xxxD

| Part Number    | Sub Clock | CSV Initial Value | LVD Initial Value | Package* |
|----------------|-----------|-------------------|-------------------|----------|
| CY91F526LWDPMC | Yes       | ON                | ON                | LQP176   |
| CY91F526LJDPMC |           | OFF               | ON                |          |
| CY91F525LWDPMC |           | ON                | ON                |          |
| CY91F525LJDPMC |           | OFF               | ON                |          |
| CY91F524LWDPMC |           | ON                | ON                |          |
| CY91F524LJDPMC |           | OFF               | ON                |          |
| CY91F523LWDPMC |           | ON                | ON                |          |
| CY91F523LJDPMC |           | OFF               | ON                |          |
| CY91F522LWDPMC |           | ON                | ON                |          |
| CY91F522LJDPMC |           | OFF               | ON                |          |
| CY91F526LSDPMC |           | None              | ON                |          |
| CY91F526LHDPMC | OFF       |                   | ON                |          |
| CY91F525LSDPMC | ON        |                   | ON                |          |
| CY91F525LHDPMC | OFF       |                   | ON                |          |
| CY91F524LSDPMC | ON        |                   | ON                |          |
| CY91F524LHDPMC | OFF       |                   | ON                |          |
| CY91F523LSDPMC | ON        |                   | ON                |          |
| CY91F523LHDPMC | OFF       |                   | ON                |          |
| CY91F522LSDPMC | ON        |                   | ON                |          |
| CY91F522LHDPMC | OFF       |                   | ON                |          |
| CY91F526KWDPMC | Yes       |                   | ON                |          |
| CY91F526KJDPMC |           | OFF               | ON                |          |
| CY91F525KWDPMC |           | ON                | ON                |          |
| CY91F525KJDPMC |           | OFF               | ON                |          |
| CY91F524KWDPMC |           | ON                | ON                |          |
| CY91F524KJDPMC |           | OFF               | ON                |          |
| CY91F523KWDPMC |           | ON                | ON                |          |
| CY91F523KJDPMC |           | OFF               | ON                |          |
| CY91F522KWDPMC |           | ON                | ON                |          |
| CY91F522KJDPMC |           | OFF               | ON                |          |
| CY91F526KSDPMC |           | None              | ON                | ON       |
| CY91F526KHDPHC | OFF       |                   | ON                |          |
| CY91F525KSDPMC | ON        |                   | ON                |          |
| CY91F525KHDPHC | OFF       |                   | ON                |          |
| CY91F524KSDPMC | ON        |                   | ON                |          |
| CY91F524KHDPHC | OFF       |                   | ON                |          |
| CY91F523KSDPMC | ON        |                   | ON                |          |
| CY91F523KHDPHC | OFF       |                   | ON                |          |
| CY91F522KSDPMC | ON        |                   | ON                |          |
| CY91F522KHDPHC | OFF       |                   | ON                |          |



## CY91520 Series

| Part Number     | Sub Clock | CSV Initial Value | LVD Initial Value | Package* |
|-----------------|-----------|-------------------|-------------------|----------|
| CY91F526KWDPMC1 | Yes       | ON                | ON                | LQN144   |
| CY91F526KJDPMC1 |           | OFF               | ON                |          |
| CY91F525KWDPMC1 |           | ON                | ON                |          |
| CY91F525KJDPMC1 |           | OFF               | ON                |          |
| CY91F524KWDPMC1 |           | ON                | ON                |          |
| CY91F524KJDPMC1 |           | OFF               | ON                |          |
| CY91F523KWDPMC1 |           | ON                | ON                |          |
| CY91F523KJDPMC1 |           | OFF               | ON                |          |
| CY91F522KWDPMC1 |           | ON                | ON                |          |
| CY91F522KJDPMC1 |           | OFF               | ON                |          |
| CY91F526KSDPMC1 | None      | ON                | ON                |          |
| CY91F526KHDPMC1 |           | OFF               | ON                |          |
| CY91F525KSDPMC1 |           | ON                | ON                |          |
| CY91F525KHDPMC1 |           | OFF               | ON                |          |
| CY91F524KSDPMC1 |           | ON                | ON                |          |
| CY91F524KHDPMC1 |           | OFF               | ON                |          |
| CY91F523KSDPMC1 |           | ON                | ON                |          |
| CY91F523KHDPMC1 |           | OFF               | ON                |          |
| CY91F522KSDPMC1 |           | ON                | ON                |          |
| CY91F522KHDPMC1 |           | OFF               | ON                |          |
| CY91F526JWDPMC  | Yes       | ON                | ON                | LQM120   |
| CY91F526JJDPMC  |           | OFF               | ON                |          |
| CY91F525JWDPMC  |           | ON                | ON                |          |
| CY91F525JJDPMC  |           | OFF               | ON                |          |
| CY91F524JWDPMC  |           | ON                | ON                |          |
| CY91F524JJDPMC  |           | OFF               | ON                |          |
| CY91F523JWDPMC  |           | ON                | ON                |          |
| CY91F523JJDPMC  |           | OFF               | ON                |          |
| CY91F522JWDPMC  |           | ON                | ON                |          |
| CY91F522JJDPMC  |           | OFF               | ON                |          |
| CY91F526JSDPMC  | None      | ON                | ON                |          |
| CY91F526JHDPMC  |           | OFF               | ON                |          |
| CY91F525JSDPMC  |           | ON                | ON                |          |
| CY91F525JHDPMC  |           | OFF               | ON                |          |
| CY91F524JSDPMC  |           | ON                | ON                |          |
| CY91F524JHDPMC  |           | OFF               | ON                |          |
| CY91F523JSDPMC  |           | ON                | ON                |          |
| CY91F523JHDPMC  |           | OFF               | ON                |          |
| CY91F522JSDPMC  |           | ON                | ON                |          |
| CY91F522JHDPMC  |           | OFF               | ON                |          |



## CY91520 Series

| Part Number    | Sub Clock | CSV Initial Value | LVD Initial Value | Package* |
|----------------|-----------|-------------------|-------------------|----------|
| CY91F526FWDPMC | Yes       | ON                | ON                | LQI100   |
| CY91F526FJDPMC |           | OFF               | ON                |          |
| CY91F525FWDPMC |           | ON                | ON                |          |
| CY91F525FJDPMC |           | OFF               | ON                |          |
| CY91F524FWDPMC |           | ON                | ON                |          |
| CY91F524FJDPMC |           | OFF               | ON                |          |
| CY91F523FWDPMC |           | ON                | ON                |          |
| CY91F523FJDPMC |           | OFF               | ON                |          |
| CY91F522FWDPMC |           | ON                | ON                |          |
| CY91F522FJDPMC |           | OFF               | ON                |          |
| CY91F526FSDPMC | None      | ON                | ON                |          |
| CY91F526FHDPMC |           | OFF               | ON                |          |
| CY91F525FSDPMC |           | ON                | ON                |          |
| CY91F525FHDPMC |           | OFF               | ON                |          |
| CY91F524FSDPMC |           | ON                | ON                |          |
| CY91F524FHDPMC |           | OFF               | ON                |          |
| CY91F523FSDPMC |           | ON                | ON                |          |
| CY91F523FHDPMC |           | OFF               | ON                |          |
| CY91F522FSDPMC |           | ON                | ON                |          |
| CY91F522FHDPMC |           | OFF               | ON                |          |
| CY91F526DWDPMC | Yes       | ON                | ON                | LQH080   |
| CY91F526DJDPDC |           | OFF               | ON                |          |
| CY91F525DWDPMC |           | ON                | ON                |          |
| CY91F525DJDPDC |           | OFF               | ON                |          |
| CY91F524DWDPMC |           | ON                | ON                |          |
| CY91F524DJDPDC |           | OFF               | ON                |          |
| CY91F523DWDPMC |           | ON                | ON                |          |
| CY91F523DJDPDC |           | OFF               | ON                |          |
| CY91F522DWDPMC |           | ON                | ON                |          |
| CY91F522DJDPDC |           | OFF               | ON                |          |
| CY91F526DSDPMC | None      | ON                | ON                |          |
| CY91F526DHDPMC |           | OFF               | ON                |          |
| CY91F525DSDPMC |           | ON                | ON                |          |
| CY91F525DHDPMC |           | OFF               | ON                |          |
| CY91F524DSDPMC |           | ON                | ON                |          |
| CY91F524DHDPMC |           | OFF               | ON                |          |
| CY91F523DSDPMC |           | ON                | ON                |          |
| CY91F523DHDPMC |           | OFF               | ON                |          |
| CY91F522DSDPMC |           | ON                | ON                |          |
| CY91F522DHDPMC |           | OFF               | ON                |          |



## CY91520 Series

| Part Number     | Sub Clock | CSV Initial Value | LVD Initial Value | Package* |
|-----------------|-----------|-------------------|-------------------|----------|
| CY91F526BWDPMC1 | Yes       | ON                | ON                | LQD064   |
| CY91F526BJDPMC1 |           | OFF               | ON                |          |
| CY91F525BWDPMC1 |           | ON                | ON                |          |
| CY91F525BJDPMC1 |           | OFF               | ON                |          |
| CY91F524BWDPMC1 |           | ON                | ON                |          |
| CY91F524BJDPMC1 |           | OFF               | ON                |          |
| CY91F523BWDPMC1 |           | ON                | ON                |          |
| CY91F523BJDPMC1 |           | OFF               | ON                |          |
| CY91F522BWDPMC1 |           | ON                | ON                |          |
| CY91F522BJDPMC1 |           | OFF               | ON                |          |
| CY91F526BSDPMC1 |           | None              | ON                |          |
| CY91F526BHDPMC1 | OFF       |                   | ON                |          |
| CY91F525BSDPMC1 | ON        |                   | ON                |          |
| CY91F525BHDPMC1 | OFF       |                   | ON                |          |
| CY91F524BSDPMC1 | ON        |                   | ON                |          |
| CY91F524BHDPMC1 | OFF       |                   | ON                |          |
| CY91F523BSDPMC1 | ON        |                   | ON                |          |
| CY91F523BHDPMC1 | OFF       |                   | ON                |          |
| CY91F522BSDPMC1 | ON        |                   | ON                |          |
| CY91F522BHDPMC1 | OFF       |                   | ON                |          |

\*: For details of the package, see [Package Dimensions](#).



## 16. Ordering Information CY91F52xxxE

| Part Number    | Sub Clock | CSV Initial Value | LVD Initial Value | Package* |        |
|----------------|-----------|-------------------|-------------------|----------|--------|
| CY91F526LWEPMC | Yes       | ON                | ON                | LQP176   |        |
| CY91F526LJEPMC |           | OFF               | ON                |          |        |
| CY91F525LWEPMC |           | ON                | ON                |          |        |
| CY91F525LJEPMC |           | OFF               | ON                |          |        |
| CY91F524LWEPMC |           | ON                | ON                |          |        |
| CY91F524LJEPMC |           | OFF               | ON                |          |        |
| CY91F523LWEPMC |           | ON                | ON                |          |        |
| CY91F523LJEPMC |           | OFF               | ON                |          |        |
| CY91F522LWEPMC |           | ON                | ON                |          |        |
| CY91F522LJEPMC |           | OFF               | ON                |          |        |
| CY91F526LSEPMC |           | None              | ON                |          | ON     |
| CY91F526LHEPMC | OFF       |                   | ON                |          |        |
| CY91F526LKEPMC | OFF       |                   | OFF               |          |        |
| CY91F525LSEPMC | ON        |                   | ON                |          |        |
| CY91F525LHEPMC | OFF       |                   | ON                |          |        |
| CY91F524LSEPMC | ON        |                   | ON                |          |        |
| CY91F524LHEPMC | OFF       |                   | ON                |          |        |
| CY91F523LSEPMC | ON        |                   | ON                |          |        |
| CY91F523LHEPMC | OFF       |                   | ON                |          |        |
| CY91F522LSEPMC | ON        |                   | ON                |          |        |
| CY91F522LHEPMC | OFF       |                   | ON                |          |        |
| CY91F526KWEPMC | Yes       | ON                | ON                |          | LQS144 |
| CY91F526KJEPMC |           | OFF               | ON                |          |        |
| CY91F525KWEPMC |           | ON                | ON                |          |        |
| CY91F525KJEPMC |           | OFF               | ON                |          |        |
| CY91F524KWEPMC |           | ON                | ON                |          |        |
| CY91F524KJEPMC |           | OFF               | ON                |          |        |
| CY91F523KWEPMC |           | ON                | ON                |          |        |
| CY91F523KJEPMC |           | OFF               | ON                |          |        |
| CY91F522KWEPMC |           | ON                | ON                |          |        |
| CY91F522KJEPMC |           | OFF               | ON                |          |        |
| CY91F526KSEPMC |           | None              | ON                | ON       |        |
| CY91F526KHEPMC | OFF       |                   | ON                |          |        |
| CY91F525KSEPMC | ON        |                   | ON                |          |        |
| CY91F525KHEPMC | OFF       |                   | ON                |          |        |
| CY91F524KSEPMC | ON        |                   | ON                |          |        |
| CY91F524KHEPMC | OFF       |                   | ON                |          |        |
| CY91F523KSEPMC | ON        |                   | ON                |          |        |
| CY91F523KHEPMC | OFF       |                   | ON                |          |        |
| CY91F522KSEPMC | ON        |                   | ON                |          |        |
| CY91F522KHEPMC | OFF       |                   | ON                |          |        |



## CY91520 Series

| Part Number     | Sub Clock | CSV Initial Value | LVD Initial Value | Package* |
|-----------------|-----------|-------------------|-------------------|----------|
| CY91F526KWEPMC1 | Yes       | ON                | ON                | LQN144   |
| CY91F526KJEPMC1 |           | OFF               | ON                |          |
| CY91F525KWEPMC1 |           | ON                | ON                |          |
| CY91F525KJEPMC1 |           | OFF               | ON                |          |
| CY91F524KWEPMC1 |           | ON                | ON                |          |
| CY91F524KJEPMC1 |           | OFF               | ON                |          |
| CY91F523KWEPMC1 |           | ON                | ON                |          |
| CY91F523KJEPMC1 |           | OFF               | ON                |          |
| CY91F522KWEPMC1 |           | ON                | ON                |          |
| CY91F522KJEPMC1 |           | OFF               | ON                |          |
| CY91F526KSEPMC1 | None      | ON                | ON                |          |
| CY91F526KHEPMC1 |           | OFF               | ON                |          |
| CY91F525KSEPMC1 |           | ON                | ON                |          |
| CY91F525KHEPMC1 |           | OFF               | ON                |          |
| CY91F524KSEPMC1 |           | ON                | ON                |          |
| CY91F524KHEPMC1 |           | OFF               | ON                |          |
| CY91F523KSEPMC1 |           | ON                | ON                |          |
| CY91F523KHEPMC1 |           | OFF               | ON                |          |
| CY91F522KSEPMC1 |           | ON                | ON                |          |
| CY91F522KHEPMC1 |           | OFF               | ON                |          |
| CY91F526JWEPMC  | Yes       | ON                | ON                | LQM120   |
| CY91F526JJEPMC  |           | OFF               | ON                |          |
| CY91F525JWEPMC  |           | ON                | ON                |          |
| CY91F525JJEPMC  |           | OFF               | ON                |          |
| CY91F524JWEPMC  |           | ON                | ON                |          |
| CY91F524JJEPMC  |           | OFF               | ON                |          |
| CY91F523JWEPMC  |           | ON                | ON                |          |
| CY91F523JJEPMC  |           | OFF               | ON                |          |
| CY91F522JWEPMC  |           | ON                | ON                |          |
| CY91F522JJEPMC  |           | OFF               | ON                |          |
| CY91F526JSEPMC  | None      | ON                | ON                |          |
| CY91F526JHEPMC  |           | OFF               | ON                |          |
| CY91F525JSEPMC  |           | ON                | ON                |          |
| CY91F525JHEPMC  |           | OFF               | ON                |          |
| CY91F524JSEPMC  |           | ON                | ON                |          |
| CY91F524JHEPMC  |           | OFF               | ON                |          |
| CY91F523JSEPMC  |           | ON                | ON                |          |
| CY91F523JHEPMC  |           | OFF               | ON                |          |
| CY91F522JSEPMC  |           | ON                | ON                |          |
| CY91F522JHEPMC  |           | OFF               | ON                |          |



## CY91520 Series

| Part Number    | Sub Clock | CSV Initial Value | LVD Initial Value | Package* |
|----------------|-----------|-------------------|-------------------|----------|
| CY91F526FWEPMC | Yes       | ON                | ON                | LQI100   |
| CY91F526FJEPMC |           | OFF               | ON                |          |
| CY91F525FWEPMC |           | ON                | ON                |          |
| CY91F525FJEPMC |           | OFF               | ON                |          |
| CY91F524FWEPMC |           | ON                | ON                |          |
| CY91F524FJEPMC |           | OFF               | ON                |          |
| CY91F523FWEPMC |           | ON                | ON                |          |
| CY91F523FJEPMC |           | OFF               | ON                |          |
| CY91F522FWEPMC |           | ON                | ON                |          |
| CY91F522FJEPMC |           | OFF               | ON                |          |
| CY91F526FSEPMC | None      | ON                | ON                |          |
| CY91F526FHEPMC |           | OFF               | ON                |          |
| CY91F525FSEPMC |           | ON                | ON                |          |
| CY91F525FHEPMC |           | OFF               | ON                |          |
| CY91F524FSEPMC |           | ON                | ON                |          |
| CY91F524FHEPMC |           | OFF               | ON                |          |
| CY91F523FSEPMC |           | ON                | ON                |          |
| CY91F523FHEPMC |           | OFF               | ON                |          |
| CY91F522FSEPMC |           | ON                | ON                |          |
| CY91F522FHEPMC |           | OFF               | ON                |          |
| CY91F526DWEPMC | Yes       | ON                | ON                | LQH080   |
| CY91F526DJEPMC |           | OFF               | ON                |          |
| CY91F525DWEPMC |           | ON                | ON                |          |
| CY91F525DJEPMC |           | OFF               | ON                |          |
| CY91F524DWEPMC |           | ON                | ON                |          |
| CY91F524DJEPMC |           | OFF               | ON                |          |
| CY91F523DWEPMC |           | ON                | ON                |          |
| CY91F523DJEPMC |           | OFF               | ON                |          |
| CY91F522DWEPMC |           | ON                | ON                |          |
| CY91F522DJEPMC |           | OFF               | ON                |          |
| CY91F526DSEPMC | None      | ON                | ON                |          |
| CY91F526DHEPMC |           | OFF               | ON                |          |
| CY91F525DSEPMC |           | ON                | ON                |          |
| CY91F525DHEPMC |           | OFF               | ON                |          |
| CY91F524DSEPMC |           | ON                | ON                |          |
| CY91F524DHEPMC |           | OFF               | ON                |          |
| CY91F523DSEPMC |           | ON                | ON                |          |
| CY91F523DHEPMC |           | OFF               | ON                |          |
| CY91F522DSEPMC |           | ON                | ON                |          |
| CY91F522DHEPMC |           | OFF               | ON                |          |



## CY91520 Series

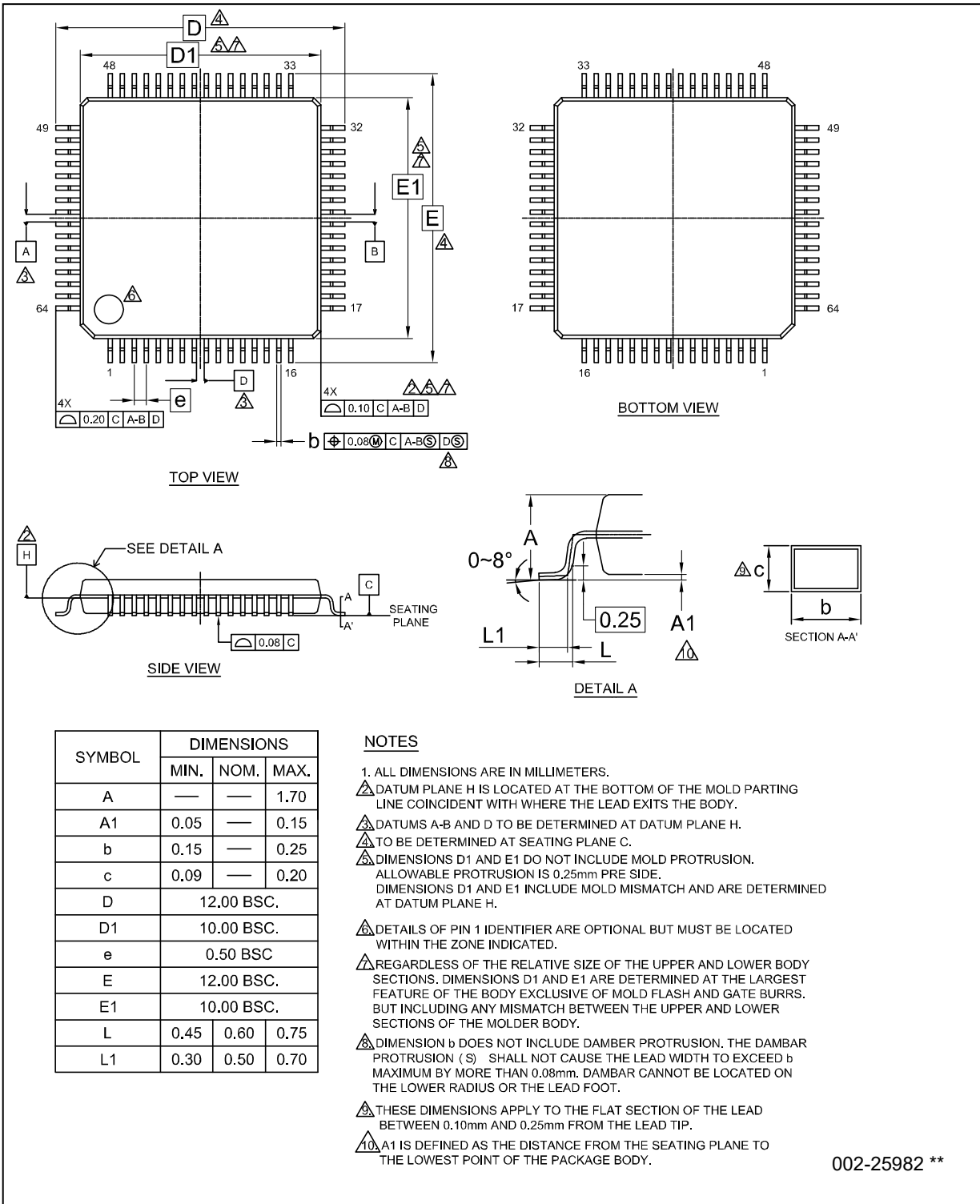
| Part Number     | Sub Clock | CSV Initial Value | LVD Initial Value | Package* |
|-----------------|-----------|-------------------|-------------------|----------|
| CY91F526BWEPMC1 | Yes       | ON                | ON                | LQD064   |
| CY91F526BJEPMC1 |           | OFF               | ON                |          |
| CY91F525BWEPMC1 |           | ON                | ON                |          |
| CY91F525BJEPMC1 |           | OFF               | ON                |          |
| CY91F524BWEPMC1 |           | ON                | ON                |          |
| CY91F524BJEPMC1 |           | OFF               | ON                |          |
| CY91F523BWEPMC1 |           | ON                | ON                |          |
| CY91F523BJEPMC1 |           | OFF               | ON                |          |
| CY91F522BWEPMC1 |           | ON                | ON                |          |
| CY91F522BJEPMC1 |           | OFF               | ON                |          |
| CY91F526BSEPMC1 |           | None              | ON                |          |
| CY91F526BHEPMC1 | OFF       |                   | ON                |          |
| CY91F525BSEPMC1 | ON        |                   | ON                |          |
| CY91F525BHEPMC1 | OFF       |                   | ON                |          |
| CY91F524BSEPMC1 | ON        |                   | ON                |          |
| CY91F524BHEPMC1 | OFF       |                   | ON                |          |
| CY91F523BSEPMC1 | ON        |                   | ON                |          |
| CY91F523BHEPMC1 | OFF       |                   | ON                |          |
| CY91F522BSEPMC1 | ON        |                   | ON                |          |
| CY91F522BHEPMC1 | OFF       |                   | ON                |          |

\*: For details of the package, see [Package Dimensions](#).



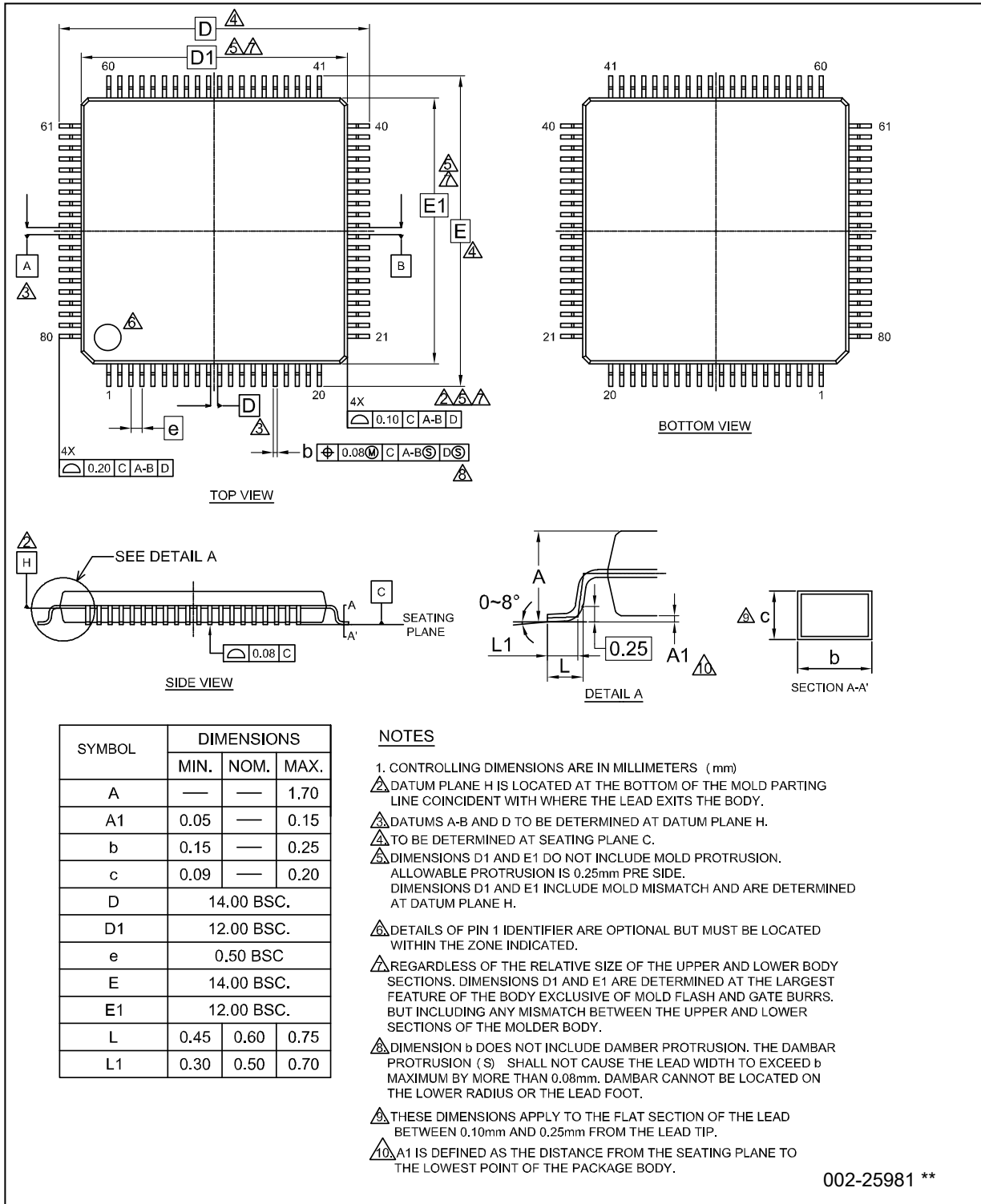
17. Package Dimensions

| Package Type | Package Code |
|--------------|--------------|
| LQFP 64pin   | LQD064       |





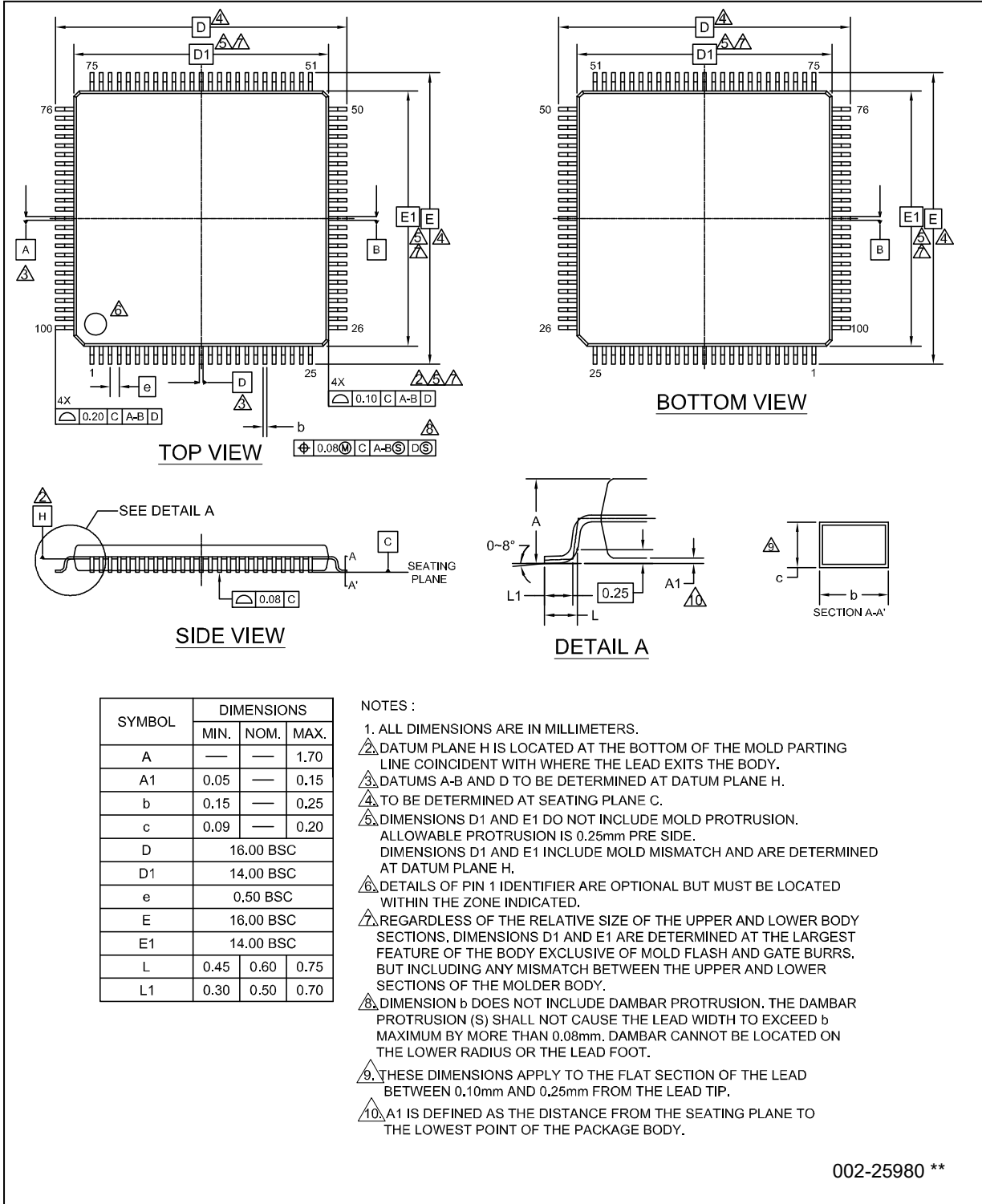
| Package Type | Package Code |
|--------------|--------------|
| LQFP 80pin   | LQH080       |





**CY91520 Series**

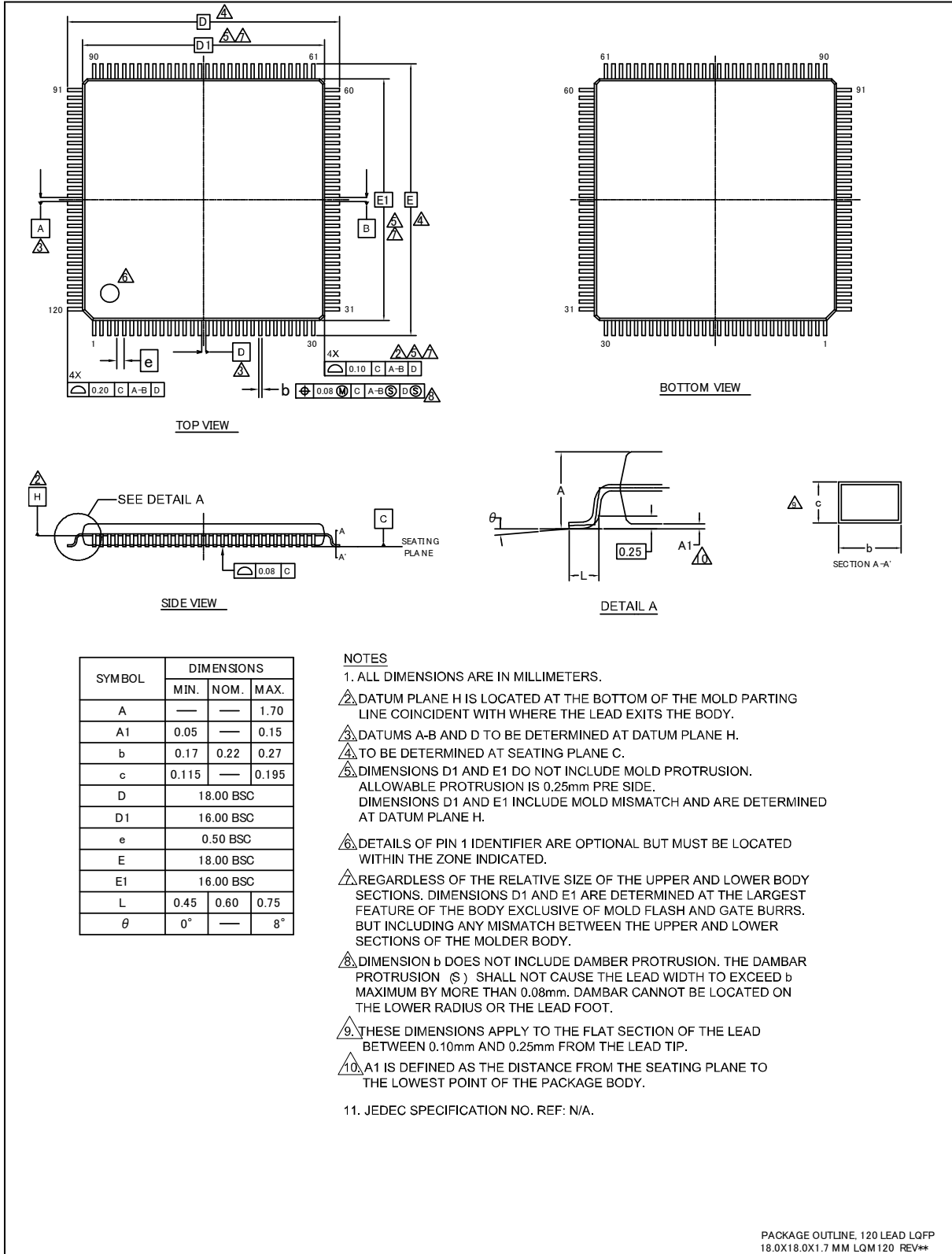
| Package Type | Package Code |
|--------------|--------------|
| LQFP 100pin  | LQI100       |





CY91520 Series

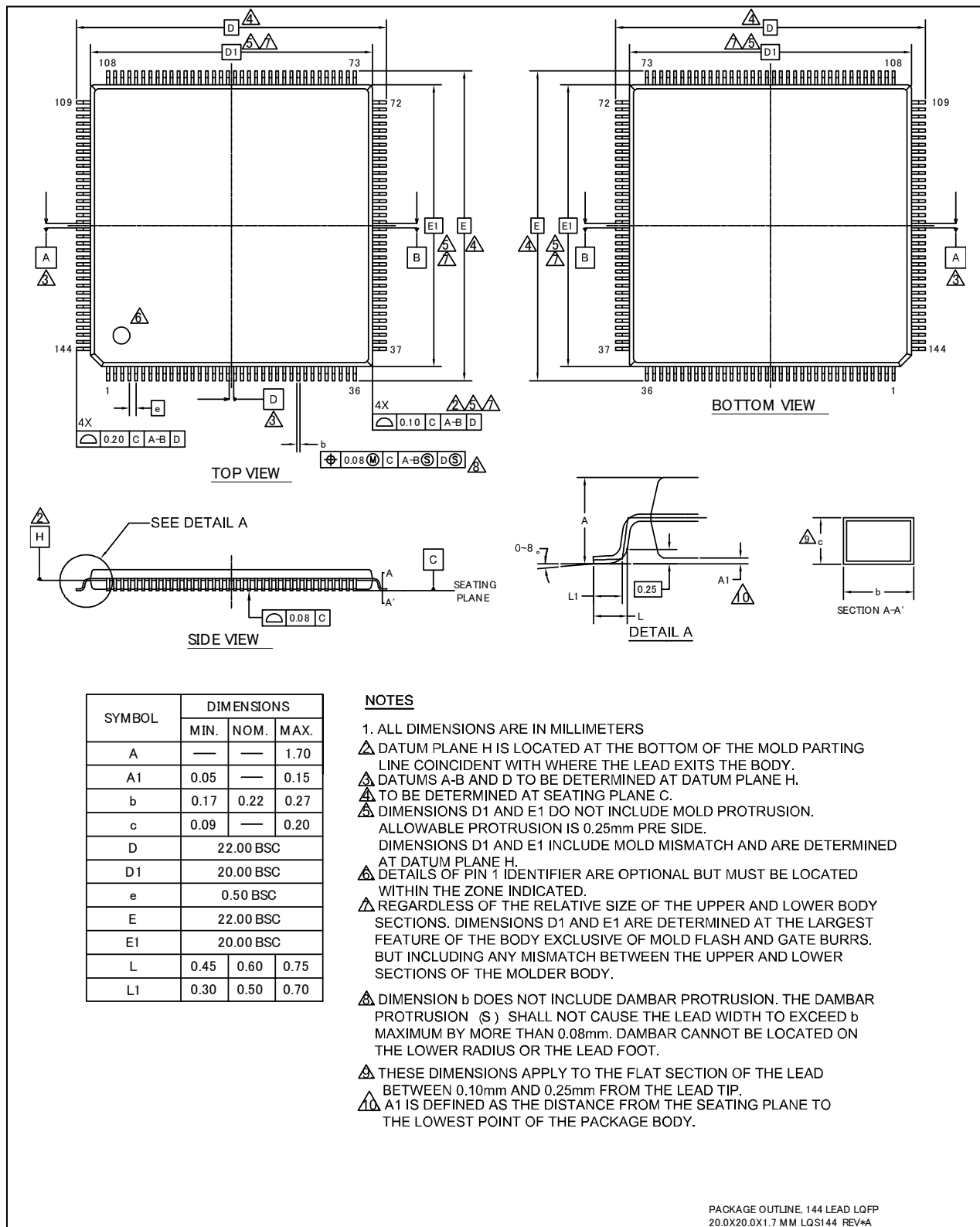
| Package Type | Package Code |
|--------------|--------------|
| LQFP 120pin  | LQM120       |





## CY91520 Series

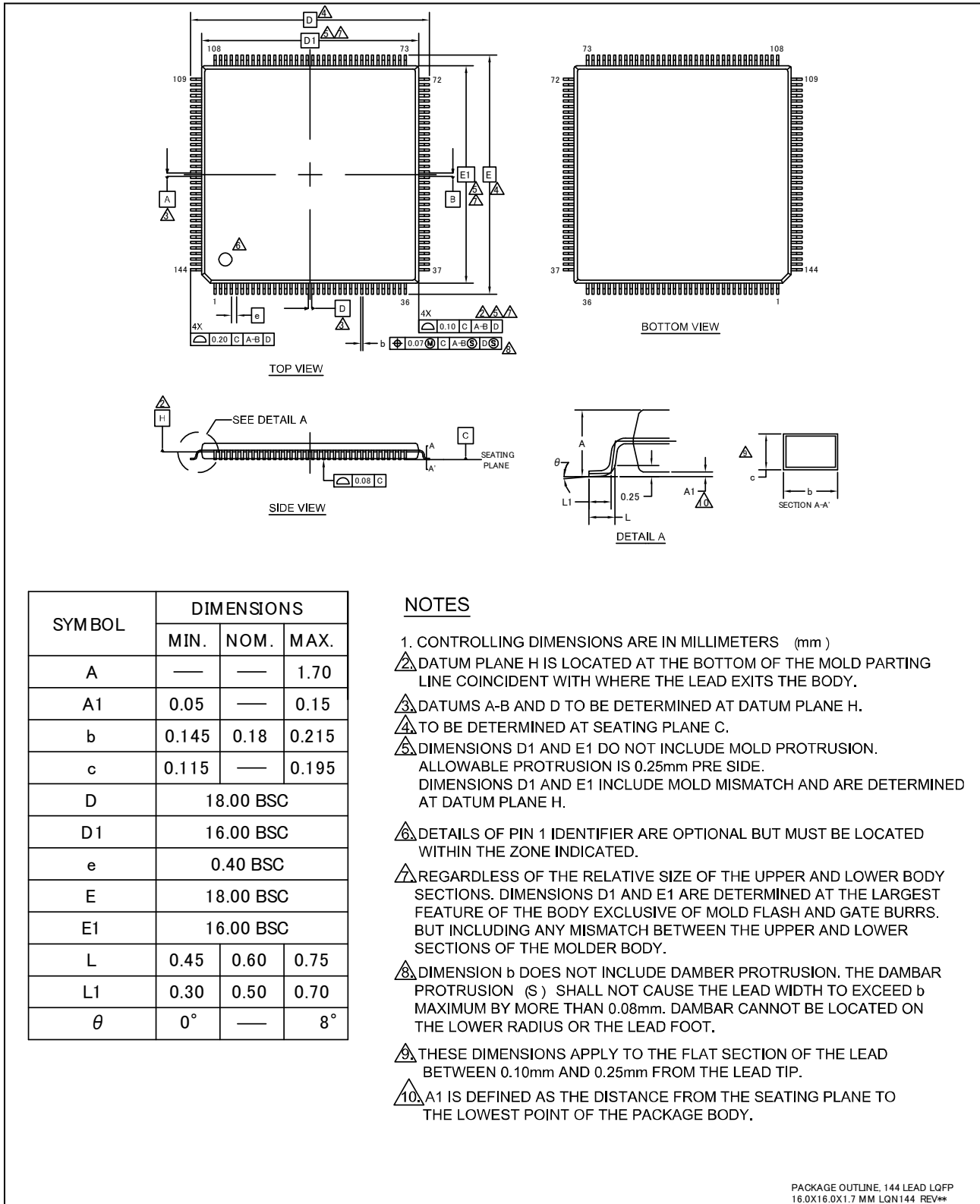
| Package Type | Package Code |
|--------------|--------------|
| LQFP 144pin  | LQS144       |





## CY91520 Series

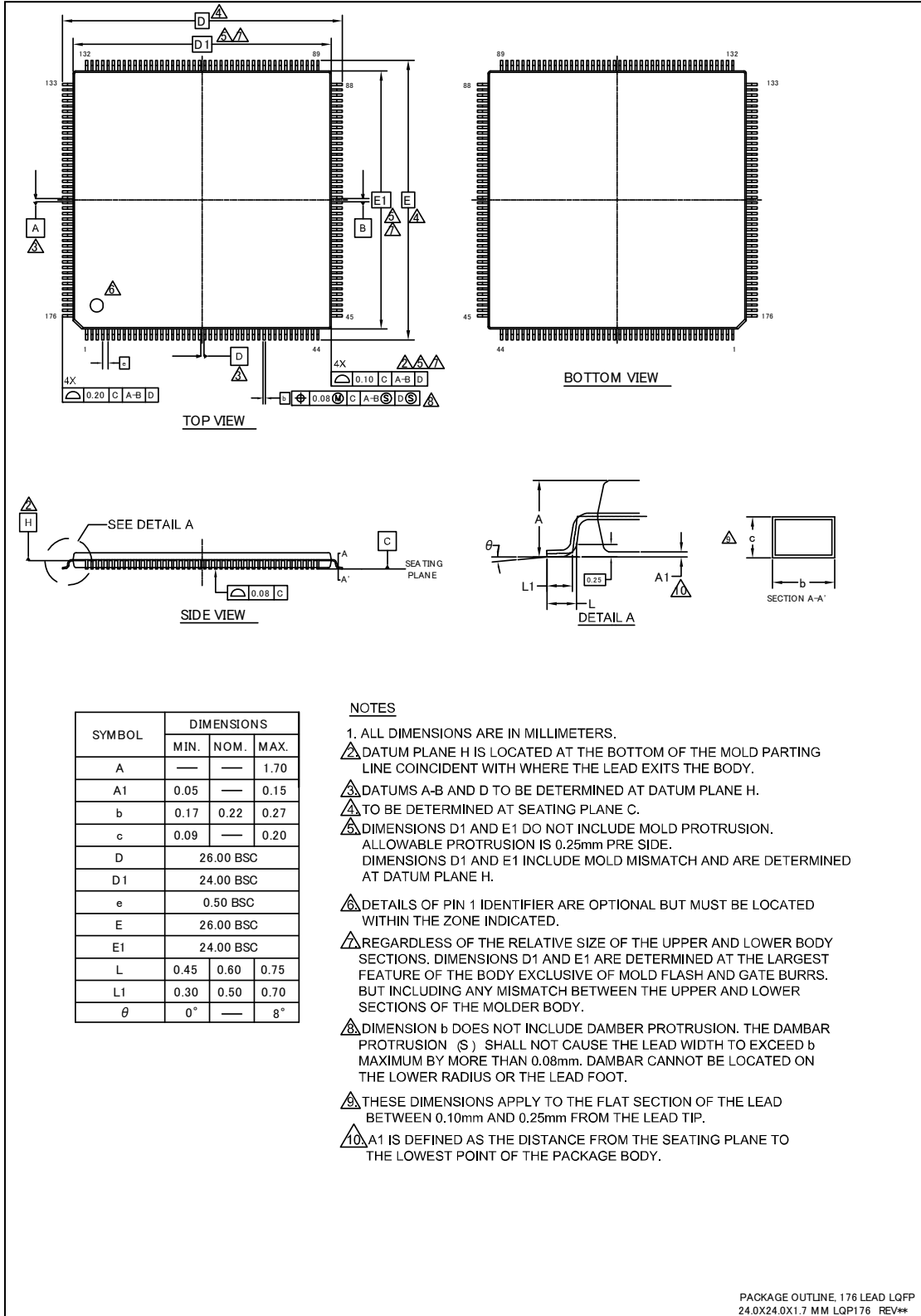
| Package Type | Package Code |
|--------------|--------------|
| LQFP 144pin  | LQN144       |





**CY91520 Series**

| Package Type | Package Code |
|--------------|--------------|
| LQFP 176pin  | LQP176       |





## 18. Errata

This section describes the errata for the CY91520 Series. Details include errata trigger conditions, scope of impact, available workarounds, and silicon revision applicability. Contact your local Cypress Sales Representative if you have questions.

### Part Numbers Affected

| Part Number         |
|---------------------|
| CY91F522B/D/F/J/K/L |
| CY91F523B/D/F/J/K/L |
| CY91F524B/D/F/J/K/L |
| CY91F525B/D/F/J/K/L |
| CY91F526B/D/F/J/K/L |

### CY91F522/3/4/5/6 Qualification Status

Product Status: Production

### Errata Summary

The following table defines the errata applicability to available CY91520 Series devices.

| Items   | Part Number   | Silicon Revision | Fix Status                                       |
|---|---|------------------|--|
| [1]. Power-on Conditions is not enough in the Datasheet Specification | CY91F522B/D/F/J/K/L<br>CY91F523B/D/F/J/K/L<br>CY91F524B/D/F/J/K/L | B, C             | Will be fixed in production silicon version D, E |
| [2]. Limitation for Watch mode (power off)                            | CY91F525B/D/F/J/K/L<br>CY91F526B/D/F/J/K/L                        | B, C, D, E       | -  |

#### 1. Power-on Conditions is not enough in the Datasheet Specification

##### ■ Problem Definition

If the Power-On-Reset and Internal Low Voltage Detection are not generated, some port functions will not be available.

##### ■ Parameters Affected

$t_{OFF}$  for Power off time on Power-on Conditions

VCC Power ramp rate on Power-on Conditions

##### ■ Trigger Condition

When the power supply voltage to the MCU has been turned off but has not reached 0 V when the power supply voltage is turned on again, MCU does not generate an internal power-on-reset signal (Power-On reset or Internal LVD reset). Then, some port functions will not be available.

If below condition (1) or (2) or (3) is satisfied, Power-On Reset (Initialization-Reset signal) is generated and no problem occurs.

- (1) The VCC voltage is less than 200 mV for 50 ms or longer ( $t_{OFF}$ )
- (2) VCC Power ramp rate less than 4 mV/ $\mu$ s (dV/dt) until a voltage level for a safe Power-On detection is reached
- (3) C-pin voltage is below 60 mV when VCC is turned on again



### ■ Scope of Impact

For the affected parts, when the Power-On Reset and Internal Low Voltage Detection are not generated, the MCU may set invalid package and sub clock option information. Therefore, the MCU may operate with an invalid pin configuration.

### ■ Workaround

For the affected parts, it is necessary to satisfy at least one of the Power-On Reset requirements for any Power-On event as given below:

- (1) The VCC voltage is less than 200 mV for 50 ms or longer ( $t_{OFF}$ )
- (2) VCC Power ramp rate is less than 4 mV/ $\mu$ s (dV/dt) until a voltage level for a safe Power-On detection is reached
- (3) C-pin voltage is below 60 mV when VCC is turned on again

If the customer system does not satisfy the condition above-mentioned, Cypress will release new version D, so Cypress recommends the version D for CY91F52x. The new version prevents the limitation when an external reset signal is asserted at pin RSTX anytime the supply voltage (VCC) is turned on.

### ■ Fix Status

Will be fixed in production silicon version D, E

## 2. Limitation for Watch mode (power off)

### ■ Problem Definition

If the below all trigger conditions (1) to (3) are satisfied, the below registers will be initialized after MCU recovers from watch mode (power off).

### ■ Trigger Conditions

- (1) Using the watch mode (power off)
  - (2) Interrupt levels that are used as sources for recovering from the watch mode (power off) are '16' to '30', or using NMIX pin as source for recovering from the watch mode (power off)
  - (3) The sources for recovering from the watch mode (power off) are generated between PCLK 1 cycle and PMUCLK 3 cycles (\*), after CPU state changes to the watch mode (power off)
- (\*): In case of PCLK = 0.5 MHz and PMUCLK = 32 kHz, it is approx. 2  $\mu$ s to 100  $\mu$ s

### ■ Scope of Impact

If the all trigger conditions (1) to (3) are satisfied, the below registers will be initialized after MCU recovers from watch mode (power off).

WTCRH, WTCRM, WTCRL  
 CSELR.SCEN  
 CMONR.SCRDY  
 CCRTSELR.CST  
 CCRTSELR.CSC

**■ Workaround**

It is necessary to satisfy the below both conditions of (1) and (2).

- (1) Interrupt levels that are used as sources for recovering from the watch mode (power off) are '31', before CPU state changes to the watch mode (power off)
- (2) Don't use NMIX pin as source for recovering from the watch mode (power off)

**■ Fix Status**

Will not be planned



## 19. Major Changes

Spanion Publication Number: MB91F526L\_DS705-00011

| Page         | Section  | Change Results   |
|--------------|--|--|
| Revision 1.0 |  |  |
| -            | -  | Initial release  |
| Revision 2.0 |  |  |
| 3            | ■FEATURES  | Corrected the following description.<br>5V tolerant input: 4 channels ch.6, ch.8, ch.9, ch.11 Automotive input<br>↓<br>5V tolerant input: 4 channels ch.6, ch.8, ch.9, ch.11 CMOS hysteresis input   |
| 33 to 36     | ■I/O CIRCUIT TYPE  | Corrected the following description to "Type F, G, I, J, K, M".<br>Schmitt input → CMOS hysteresis input<br>Corrected the following description to "Type D, E".<br>I <sup>2</sup> C Schmitt input → I <sup>2</sup> C hysteresis input  |
| 44 to 49     | ■BLOCK DIAGRAM   | Corrected the following description.<br>●MB91F522B, MB91F523B, MB91F524B, MB91F525B, MB91F526B<br>●MB91F522D, MB91F523D, MB91F524D, MB91F525D, MB91F526D<br>●MB91F522F, MB91F523F, MB91F524F, MB91F525F, MB91F526F<br>●MB91F522J, MB91F523J, MB91F524J, MB91F525J, MB91F526J<br>●MB91F522K, MB91F523K, MB91F524K, MB91F525K, MB91F526K<br>●MB91F522L, MB91F523L, MB91F524L, MB91F525L, MB91F526L |
| 138          | ■ELECTRICAL CHARACTERISTICS<br>2. Recommended operating conditions | Added the following description.<br>*1 : When it is used outside recommended operation guarantee range (range of the operation guarantee), contact your sales representative. Moreover, minimum value with an effective external low-voltage detection reset becomes a voltage until generating low-voltage detection reset  |
| 139,140      | ■ELECTRICAL CHARACTERISTICS<br>3.DC characteristics                | Corrected the value of "ICCT5 When using sub clock 32kHz TA=+25°C". Max 1420μA → Max 2000μA  |
| 139          | ■ELECTRICAL CHARACTERISTICS<br>3.DC characteristics                | Corrected the value of "Power supply voltage range".<br>(TA:-40°C to +105°C, Vcc=AVcc=2.7V to 5.5V, VSS=AVSS=0.0V)<br>↓<br>(TA:-40°C to +105°C, Vcc=AVcc=5.0V±10%/3.3V±0.3V, VSS=AVSS=0.0V)  |
| 140,141      | ■ELECTRICAL CHARACTERISTICS<br>3.DC characteristics                | Corrected the value of "Power supply voltage range".<br>(TA:-40°C to +125°C, Vcc=AVcc=2.7V to 5.5V, VSS=AVSS=0.0V)<br>↓<br>(TA:-40°C to +125°C, Vcc=AVcc=5.0V±10%/3.3V±0.3V, VSS=AVSS=0.0V)  |
| 141          | ■ELECTRICAL CHARACTERISTICS<br>3.DC characteristics                | Corrected the value of " Pull-up resistance R <sub>UP1</sub> ".<br>Vcc=3.3V±0.3V Min 49 Max 140 →Min 45 Max 140  |
| 141          | ■ELECTRICAL CHARACTERISTICS<br>3.DC characteristics                | Corrected the following description.<br>Pull-up resistance R <sub>UP2</sub><br>Port pin other than P035,041,093,122 → P073,074,076,077   |
| 141          | ■ELECTRICAL CHARACTERISTICS<br>3.DC characteristics                | Corrected the value of " Pull-up resistance R <sub>UP2</sub> ".<br>VCC=5.0V±10% Min 25 Max 100 →Min 25 Max 60<br>VCC=3.3V±0.3V Min 49 Max 140 →Min 33 Max 90   |
| 141          | ■ELECTRICAL CHARACTERISTICS<br>3.DC characteristics                | Added the value of " Pull-up resistance R <sub>UP3</sub> ".<br>Pin name : Port pin other than P035,041,073,074,076,077,093,122<br>VCC=5.0V±10% Min 25 Max 100<br>VCC=3.3V±0.3V Min 45 Max 140  |



| Page               | Section  | Change Results  |
|--------------------|--|---|
| 150, 152, 154, 156 | <p>■ELECTRICAL CHARACTERISTICS</p> <p>4. AC characteristics</p> <p>(4) Multi-function Serial</p> <p>(4-1) CSIO timing</p> <p>(4-1-1),(4-1-2),(4-1-3),(4-1-4)</p> | <p>(4-1-1),(4-1-4)SCK<sub>↓</sub>⇒SOT delay time <math>t_{SLOVI}</math></p> <p>(4-1-2),(4-1-3)SCK<sub>↑</sub>⇒SOT delay time <math>t_{SHOVI}</math></p> <p>Corrected the following description.</p> <p>Pin name: SCK0 to SCK11</p> <p>SOT0 to SOT11</p> <p>Value: Min -30 Max 30</p> <p>↓</p> <p>Pin name: SCK0 to SCK2,SCK5 to SCK11</p> <p>SOT0 to SOT2,SOT5 to SOT11</p> <p>Value: Min -30 Max 30</p> <p>Pin name: SCK3,SCK4</p> <p>SOT3,SOT4</p> <p>Value: Min -300 Max 300</p> |
| 150, 152, 154, 156 | <p>■ELECTRICAL CHARACTERISTICS</p> <p>4. AC characteristics</p> <p>(4) Multi-function Serial</p> <p>(4-1) CSIO timing</p> <p>(4-1-1),(4-1-2),(4-1-3),(4-1-4)</p> | <p>(4-1-1),(4-1-4)Valid SIN⇒SCK<sub>↑</sub> setup time <math>t_{VSHI}</math></p> <p>(4-1-2),(4-1-3)Valid SIN⇒SCK<sub>↓</sub> setup time <math>t_{VSLI}</math></p> <p>Corrected the following description.</p> <p>Pin name: SCK0 to SCK11 SIN0 to SIN11</p> <p>Value: Min 34 Max -</p> <p>↓</p> <p>Pin name: SCK0 to SCK2,SCK5 to SCK11 SIN0 to SIN2,SIN5 to SIN11</p> <p>Value: Min 34 Max -</p> <p>Pin name: SCK3,SCK4,SIN3,SIN4</p> <p>Value: Min 300 Max -</p>                   |
| 150, 152, 154, 156 | <p>■ELECTRICAL CHARACTERISTICS</p> <p>4. AC characteristics</p> <p>(4) Multi-function Serial</p> <p>(4-1) CSIO timing</p> <p>(4-1-1),(4-1-2),(4-1-3),(4-1-4)</p> | <p>(4-1-1),(4-1-4)SCK<sub>↓</sub>⇒SOT delay time <math>t_{SLOVE}</math></p> <p>(4-1-2),(4-1-3)SCK<sub>↑</sub>⇒SOT delay time <math>t_{SHOVE}</math></p> <p>Corrected the following description.</p> <p>Pin name: SCK0 to SCK11</p> <p>SOT0 to SOT11</p> <p>Value: Min - Max 33</p> <p>↓</p> <p>Pin name: SCK0 to SCK2,SCK5 to SCK11</p> <p>SOT0 to SOT2,SOT5 to SOT11</p> <p>Value: Min - Max 33</p> <p>Pin name: SCK3,SCK4 SOT3,SOT4</p> <p>Value: Min - Max 300</p>               |
| 150, 152, 154, 156 | <p>■ELECTRICAL CHARACTERISTICS</p> <p>4. AC characteristics</p> <p>(4) Multi-function Serial</p> <p>(4-1) CSIO timing</p> <p>(4-1-1),(4-1-2),(4-1-3),(4-1-4)</p> | <p>(4-1-1),(4-1-2),(4-1-3),(4-1-4)SCK fall time <math>t_f</math></p> <p>Corrected the following description.</p> <p>Pin name: SCK0 to SCK2,SCK5 to SCK11</p> <p>Value: Min - Max 5</p> <p>Pin name: SCK3,SCK4</p> <p>Value: Min - Max 250</p> <p>↓</p> <p>Pin name: SCK0 to SCK11</p> <p>Value: Min - Max 5</p>   |



| Page                | Section  | Change Results   |
|---------------------|--|--|
| 158,161,<br>164,167 | <p>■ELECTRICAL CHARACTERISTICS</p> <p>4. AC characteristics</p> <p>(4) Multi-function Serial</p> <p>(4-1) CSIO timing</p> <p>(4-1-5),(4-1-6),(4-1-7),(4-1-8)</p> | <p>(4-1-5)SCS↓⇒SCK↓ setup time <math>t_{CSSI}</math></p> <p>(4-1-6)SCS↓⇒SCK↑ setup time <math>t_{CSSI}</math></p> <p>(4-1-7)SCS↑⇒SCK↓ setup time <math>t_{CSSI}</math></p> <p>(4-1-8)SCS↑⇒SCK↑ setup time <math>t_{CSSI}</math></p> <p>Corrected the following description.</p> <p>Pin name: SCK1 to SCK11</p> <p>SCS1 to SCS3,SCS40 to SCS43,SCS50 to SCS53,SCS60 to SCS63,SCS70 to SCS73,SCS8 to SCS11</p> <p>Value: Min <math>t_{CSSU}+0</math> Max <math>t_{CSSU}+50</math></p> <p>↓</p> <p>Pin name: SCK1,SCK2,SCK5 to SCK11</p> <p>SCS1,SCS2,SCS50 to SCS53,SCS60 to SCS63,SCS70 to SCS73,SCS8 to SCS11</p> <p>Value: Min <math>t_{CSSU}-50</math> Max <math>t_{CSSU}+0</math></p> <p>Pin name: SCK3,SCK4 SCS3,SCS40 to SCS43</p> <p>Value: Min <math>t_{CSSU}-50</math> Max <math>t_{CSSU}+300</math></p> |
| 158,161,<br>164,167 | <p>■ELECTRICAL CHARACTERISTICS</p> <p>4. AC characteristics</p> <p>(4) Multi-function Serial</p> <p>(4-1) CSIO timing</p> <p>(4-1-5),(4-1-6),(4-1-7),(4-1-8)</p> | <p>(4-1-5)SCK↑⇒SCS↑hold time <math>t_{CSHI}</math></p> <p>(4-1-6)SCK↓⇒SCS↑hold time <math>t_{CSHI}</math></p> <p>(4-1-7)SCK↑⇒SCS↓hold time <math>t_{CSHI}</math></p> <p>(4-1-8)SCK↓⇒SCS↓hold time <math>t_{CSHI}</math></p> <p>Corrected the following description.</p> <p>Pin name: SCK1 to SCK11</p> <p>SCS1 to SCS3,SCS40 to SCS43,SCS50 to SCS53,SCS60 to SCS63,SCS70 to SCS73,SCS8 to SCS11</p> <p>Value: Min <math>t_{CSHD}-50</math> Max <math>t_{CSHD}+0</math></p> <p>↓</p> <p>Pin name: SCK1,SCK2,SCK5 to SCK11</p> <p>SCS1,SCS2,SCS50 to SCS53,SCS60 to SCS63,SCS70 to SCS73,SCS8 to SCS11</p> <p>Value: Min <math>t_{CSHD}-10</math> Max <math>t_{CSHD}+50</math></p> <p>Pin name: SCK3,SCK4 SCS3,SCS40 to SCS43</p> <p>Value: Min <math>t_{CSHD}-300</math> Max <math>t_{CSHD}+50</math></p>        |
| 158,161,<br>164,167 | <p>■ELECTRICAL CHARACTERISTICS</p> <p>4. AC characteristics</p> <p>(4) Multi-function Serial</p> <p>(4-1) CSIO timing</p> <p>(4-1-5),(4-1-6),(4-1-7),(4-1-8)</p> | <p>(4-1-5),(4-1-6)SCS↓⇒SOT delay time <math>t_{DSE}</math></p> <p>(4-1-7),(4-1-8)SCS↑⇒SOT delay time <math>t_{DSE}</math></p> <p>Corrected the following description.</p> <p>Pin name: SCS1 to SCS3,SCS40 to SCS43,SCS50 to SCS53,SCS60 to SCS63,SCS70 to SCS73,SCS8 to SCS11</p> <p>SOT1 to SOT11</p> <p>Value: Min - Max 40</p> <p>↓</p> <p>Pin name: SCS1,SCS2,SCS50 to SCS53,SCS60 to SCS63,SCS70 to SCS73,SCS8 to SCS11</p> <p>SOT1,SOT2,SOT5 to SOT11</p> <p>Value: Min - Max 40</p> <p>Pin name: SCS3,SCS40 to SCS43</p> <p>SOT3,SOT4</p> <p>Value: Min - Max 300</p>   |



| Page                | Section  | Change Results  |
|---------------------|--|---|
| 159,162,<br>165,168 | <p>■ELECTRICAL CHARACTERISTICS</p> <p>4. AC characteristics</p> <p>(4) Multi-function Serial</p> <p>(4-1) CSIO timing</p> <p>(4-1-5),(4-1-6),(4-1-7),(4-1-8)</p> | <p>(4-1-5)SCK↓⇒SCS↓ clock switch time <math>t_{SCC}</math></p> <p>(4-1-6)SCK↑⇒SCS↓ clock switch time <math>t_{SCC}</math></p> <p>(4-1-7)SCK↓⇒SCS↑ clock switch time <math>t_{SCC}</math></p> <p>(4-1-8)SCK↑⇒SCS↑ clock switch time <math>t_{SCC}</math></p> <p>Corrected the following description.</p> <p>Pin name: SCK1 to SCK11</p> <p>SCS1 to SCS3,SCS40 to SCS43,SCS50 to SCS53,SCS60 to SCS63,SCS70 to SCS73,SCS8 to SCS11</p> <p>Value: Min <math>3t_{C_{PP}}+0</math> Max <math>3t_{C_{PP}}+50</math></p> <p>↓</p> <p>Pin name: SCK1,SCK2,SCK5 to SCK11</p> <p>SCS1,SCS2,SCS50 to SCS53,SCS60 to SCS63,SCS70 to SCS73,SCS8 to SCS11</p> <p>Value: Min <math>3t_{C_{PP}}-10</math> Max <math>3t_{C_{PP}}+50</math></p> <p>Pin name: SCK3,SCK4 SCS3,SCS40 to SCS43</p> <p>Value: Min <math>3t_{C_{PP}}-300</math> Max <math>3t_{C_{PP}}+50</math></p> |
| 159,162,<br>165,168 | <p>■ELECTRICAL CHARACTERISTICS</p> <p>4. AC characteristics</p> <p>(4) Multi-function Serial</p> <p>(4-1) CSIO timing</p> <p>(4-1-5),(4-1-6),(4-1-7),(4-1-8)</p> | <p>Added the following description.</p> <p>Regardless of the deselect time setting, once after the serial chip select pin becomes inactive, it will take at least five peripheral bus clock cycles to be active again</p>   |
| 184                 | <p>■ELECTRICAL CHARACTERISTICS</p> <p>5.A/D Converter</p> <p>(1) 12-bit A/D Converter</p> <p>Electrical Characteristics</p>                                      | <p>Added the value of "Total error".</p> <p>Total error value Min – Typ – Max <math>\pm 12</math> LSB</p>   |
| 184                 | <p>■ELECTRICAL CHARACTERISTICS</p> <p>5.A/D Converter</p> <p>(1) 12-bit A/D Converter</p> <p>Electrical Characteristics</p>                                      | <p>Corrected the value of "Zero transition voltage".</p> <p>Min <math>AV_{RL}+0.5LSB-20mV</math> Max <math>AV_{RL}+0.5LSB+20mV</math></p> <p>↓</p> <p>Min <math>AV_{RL}-11.5LSB</math> Max <math>AV_{RL}+12.5LSB</math></p>   |
| 184                 | <p>■ELECTRICAL CHARACTERISTICS</p> <p>5.A/D Converter</p> <p>(1) 12-bit A/D Converter</p> <p>Electrical Characteristics</p>                                      | <p>Corrected the value of "Full-scale transition voltage".</p> <p>Min <math>AV_{RH}-1.5LSB-20mV</math> Max <math>AV_{RH}-1.5LSB+20mV</math></p> <p>↓</p> <p>Min <math>AV_{RH}-13.5LSB</math> Max <math>AV_{RH}+10.5LSB</math></p>   |
| 184                 | <p>■ELECTRICAL CHARACTERISTICS</p> <p>5.A/D Converter</p> <p>(1) 12-bit A/D Converter</p> <p>Electrical Characteristics</p>                                      | <p>Added the following description.</p> <p>Parameter : Power supply current <math>I_A AV_{CC}^*3</math></p> <p>*3: The power supply current described only current value on A/D converter. The total <math>AV_{CC}</math> current value must be calculated the power supply current for A/D converter and D/A converter.</p>  |
| 188                 | <p>■ELECTRICAL CHARACTERISTICS</p> <p>7.D/A Converter</p>  | <p>Added the following description.</p> <p>Parameter : Power supply current *1</p> <p>*1: The power supply current described only current value on D/A converter.The total <math>AV_{CC}</math> current value must be calculated the power supply current for D/A converter and A/D converter.</p>  |
| 187                 | <p>■ELECTRICAL CHARACTERISTICS</p> <p>6.Flash memory</p>   | <p>Parameter: Erase cycle*2/Data retain time</p> <p>Deleted the following description.</p> <p>Remarks :</p> <p>"Temperature at writing/erasing <math>T_j &lt; +105^{\circ}C</math>"</p>   |



| Page       | Section  | Change Results  |
|------------|--|---|
| 188        | ■ELECTRICAL CHARACTERISTICS<br>7.D/A Converter | Corrected the following description.<br>Parameter : Power supply current<br>Symbol IA Pin name AV <sub>CC</sub><br>Symbol IAH Pin name AV <sub>CC</sub><br>↓<br>Symbol IA Pin name AV <sub>CC</sub><br>Symbol IAH Pin name AV <sub>CC</sub> |
| 190        | ■EXAMPLE CHARACTERISTICS                       | Corrected the following description.<br>Watch mode  |
| 192        | ■ORDERING INFORMATION                          | Corrected the following description.<br>■ORDERING INFORMATION<br>↓<br>■ORDERING INFORMATION MB91F52xxxB* <sup>1</sup><br>Package<br>↓<br>Package* <sup>2</sup>  |
| 198        | ■ORDERING INFORMATION                          | Added the following description.<br>* <sup>1</sup> : It is only supported for customers who have already adopted it now. We do not recommend adopting new products.   |
| 198        | ■ORDERING INFORMATION                          | Corrected the following description.<br>For details of the package, see "■ PACKAGE DIMENSIONS ".<br>↓<br>* <sup>2</sup> : For details of the package, see "■ PACKAGE DIMENSIONS ".  |
| 199 to 205 | ■ORDERING INFORMATION                          | Added the following description.<br>■ORDERING INFORMATION MB91F52xxxC   |
| -          | -  | Company name and layout design change   |



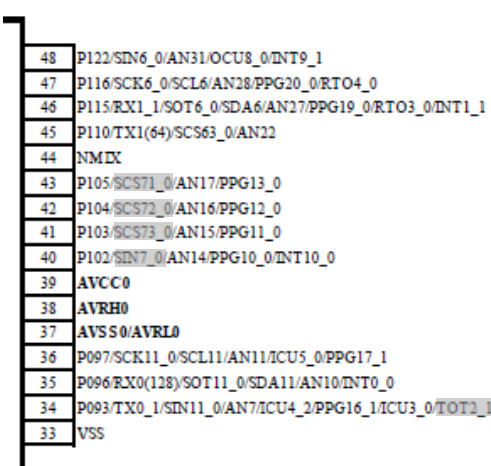
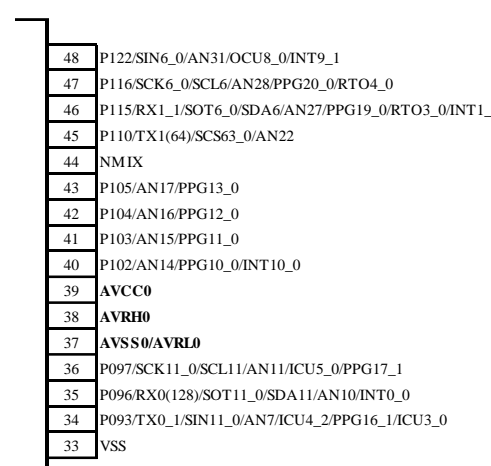
| Page                               | Section         | Change Results  |                                 |      |                                 |        |
|------------------------------------|-----------------|---|---------------------------------|------|---------------------------------|--------|
| Cypress Document Number: 002-04662 |                 |   |                                 |      |                                 |        |
| Rev *B                             |                 |   |                                 |      |                                 |        |
| 1                                  | ■Features       | <p>Corrected the following description.</p> <ul style="list-style-type: none"> <li>· Clock generation (equipped with SSCG function) <ul style="list-style-type: none"> <li>· Main oscillation (4MHz to 16MHz)</li> <li>· Sub oscillation (32kHz to 100kHz) or none sub oscillation</li> <li>· PLL multiplication rate : 1 to 20 times</li> </ul> </li> </ul> <p>↓</p> <ul style="list-style-type: none"> <li>· Clock generation (equipped with SSCG function) <ul style="list-style-type: none"> <li>· Main oscillation (4MHz to 16MHz)</li> <li>· Sub oscillation (32kHz) or no sub oscillation</li> <li>· PLL multiplication rate : 1 to 20 times</li> <li>· Equipped with a 100kHz CR oscillator</li> </ul> </li> </ul>                          |                                 |      |                                 |        |
| 2                                  | ■Features       | <p>Corrected the following description.</p> <ul style="list-style-type: none"> <li>· Base timer : Max. 2 channels <ul style="list-style-type: none"> <li>· 16-bit timer</li> <li>· Any of four PWM/PPG/PWC/reload timer functions can be selected and used</li> <li>· A 32-bit timer can be used in 2 channels of cascade mode</li> </ul> </li> </ul> <p>↓</p> <ul style="list-style-type: none"> <li>· Base timer : Max. 2 channels <ul style="list-style-type: none"> <li>· 16-bit timer</li> <li>· Any of four PWM/PPG/PWC/reload timer functions can be selected and used</li> <li>· As for the PWC function and the reload timer function, a pair of 16-bit timers can be used as one 32-bit timer in the cascaded mode</li> </ul> </li> </ul> |                                 |      |                                 |        |
| 6                                  | ■Product Lineup | <p>Corrected the following description for Product lineup comparison(64 pin).</p> <table border="1"> <tr> <td>Multi-Function Serial Interface</td> <td>8ch</td> </tr> </table> <p>↓</p> <table border="1"> <tr> <td>Multi-Function Serial Interface</td> <td>8ch*1</td> </tr> </table>  | Multi-Function Serial Interface | 8ch  | Multi-Function Serial Interface | 8ch*1  |
| Multi-Function Serial Interface    | 8ch             |   |                                 |      |                                 |        |
| Multi-Function Serial Interface    | 8ch*1           |   |                                 |      |                                 |        |
| 6                                  | ■Product Lineup | <p>Added the following sentences under Product lineup comparison(64 pin)</p> <p>*1: Only channel 5, channel 6 and channel 11 support the I<sup>2</sup>C (standard mode).</p>  |                                 |      |                                 |        |
| 7                                  | ■Product Lineup | <p>Corrected the following description for Product lineup comparison(80 pin).</p> <table border="1"> <tr> <td>Multi-Function Serial Interface</td> <td>9ch</td> </tr> </table> <p>↓</p> <table border="1"> <tr> <td>Multi-Function Serial Interface</td> <td>9ch*1</td> </tr> </table>  | Multi-Function Serial Interface | 9ch  | Multi-Function Serial Interface | 9ch*1  |
| Multi-Function Serial Interface    | 9ch             |   |                                 |      |                                 |        |
| Multi-Function Serial Interface    | 9ch*1           |   |                                 |      |                                 |        |
| 7                                  | ■Product Lineup | <p>Added the following sentences under Product lineup comparison(80 pin)</p> <p>*1: Only channel 5, channel 6 and channel 11 support the I<sup>2</sup>C (standard mode).</p>  |                                 |      |                                 |        |
| 8                                  | ■Product Lineup | <p>Corrected the following description for Product lineup comparison(100 pin).</p> <table border="1"> <tr> <td>Multi-Function Serial Interface</td> <td>12ch</td> </tr> </table> <p>↓</p> <table border="1"> <tr> <td>Multi-Function Serial Interface</td> <td>12ch*1</td> </tr> </table>   | Multi-Function Serial Interface | 12ch | Multi-Function Serial Interface | 12ch*1 |
| Multi-Function Serial Interface    | 12ch            |   |                                 |      |                                 |        |
| Multi-Function Serial Interface    | 12ch*1          |   |                                 |      |                                 |        |
| 8                                  | ■Product Lineup | <p>Added the following sentences under Product lineup comparison(100 pin)</p> <p>*1: Only channel 5, channel 6, channel 7, channel 8 and channel 11 support the I<sup>2</sup>C (standard mode).</p>   |                                 |      |                                 |        |



| Page                            | Section         | Change Results   |                                 |      |   |  |                                 |        |
|---------------------------------|-----------------|--|---------------------------------|------|---|--|---------------------------------|--------|
| 9                               | ■Product Lineup | <p>Corrected the following description for Product lineup comparison(120 pin).</p> <table border="1"> <tr> <td>Multi-Function Serial Interface</td> <td>12ch</td> </tr> <tr> <td style="text-align: center;">↓</td> <td></td> </tr> <tr> <td>Multi-Function Serial Interface</td> <td>12ch*1</td> </tr> </table> | Multi-Function Serial Interface | 12ch | ↓ |  | Multi-Function Serial Interface | 12ch*1 |
| Multi-Function Serial Interface | 12ch            |  |                                 |      |   |  |                                 |        |
| ↓                               |                 |  |                                 |      |   |  |                                 |        |
| Multi-Function Serial Interface | 12ch*1          |  |                                 |      |   |  |                                 |        |
| 9                               | ■Product Lineup | <p>Added the following sentences under Product lineup comparison(120 pin)<br/>*1: Only channel 3 and channel 4 support the I<sup>2</sup>C (high-speed mode/standard mode).<br/>Only channel 5, channel 6, channel 7, channel 8 and channel 11 support the I<sup>2</sup>C (standard mode).</p>                    |                                 |      |   |  |                                 |        |
| 10                              | ■Product Lineup | <p>Corrected the following description for Product lineup comparison(144 pin).</p> <table border="1"> <tr> <td>Multi-Function Serial Interface</td> <td>12ch</td> </tr> <tr> <td style="text-align: center;">↓</td> <td></td> </tr> <tr> <td>Multi-Function Serial Interface</td> <td>12ch*1</td> </tr> </table> | Multi-Function Serial Interface | 12ch | ↓ |  | Multi-Function Serial Interface | 12ch*1 |
| Multi-Function Serial Interface | 12ch            |  |                                 |      |   |  |                                 |        |
| ↓                               |                 |  |                                 |      |   |  |                                 |        |
| Multi-Function Serial Interface | 12ch*1          |  |                                 |      |   |  |                                 |        |
| 10                              | ■Product Lineup | <p>Added the following sentences under Product lineup comparison(144 pin)<br/>*1: Only channel 3 and channel 4 support the I<sup>2</sup>C (high-speed mode/standard mode).<br/>Only channel 5, channel 6, channel 7, channel 8, channel 10 and channel 11 support the I<sup>2</sup>C (standard mode).</p>        |                                 |      |   |  |                                 |        |
| 11                              | ■Product Lineup | <p>Corrected the following description for Product lineup comparison(176 pin).</p> <table border="1"> <tr> <td>Multi-Function Serial Interface</td> <td>12ch</td> </tr> <tr> <td style="text-align: center;">↓</td> <td></td> </tr> <tr> <td>Multi-Function Serial Interface</td> <td>12ch*1</td> </tr> </table> | Multi-Function Serial Interface | 12ch | ↓ |  | Multi-Function Serial Interface | 12ch*1 |
| Multi-Function Serial Interface | 12ch            |  |                                 |      |   |  |                                 |        |
| ↓                               |                 |  |                                 |      |   |  |                                 |        |
| Multi-Function Serial Interface | 12ch*1          |  |                                 |      |   |  |                                 |        |
| 11                              | ■Product Lineup | <p>Added the following sentences under Product lineup comparison(176 pin)<br/>*1: Only channel 3 and channel 4 support the I<sup>2</sup>C (high-speed mode/standard mode).<br/>Only channel 5, channel 6, channel 7, channel 8, channel 10 and channel 11 support the I<sup>2</sup>C (standard mode).</p>        |                                 |      |   |  |                                 |        |



| Page  | Section                           | Change Results  |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
|---|-----------------------------------|---|-----|---|----------------------------------|---|---|---|------------------------------------|---|------------------------------------|---|--|---|--|---|-------------------------|----------|--|---|----------------------------------|----|-----------------------------------|----|-----------------------------------|----|---------------------------------------|----|---------------------------------------|----|--------------------------------|----|----------------------------------|----|-----|---|----------------------------------|---|---|---|------------------------------------|---|------------------------------------|---|--|---|--|---|---|---|-----------------------------------|---|---------------------------|----|-----------------------------------|----|-----------------------------------|----|---------------------------------------|----|---------------------------------------|----|--------------------------------|----|----------------------------------|----|
| 13  | <p>■ Pin Assignment MB91F52xB</p> | <p>Signals indicated by the shading below deleted in Figure.<br/>                     - Left side</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>VSS</td><td>1</td></tr> <tr><td>P020/SIN3_1/TRG3_0/TIN0_2/RTO5_1</td><td>2</td></tr> <tr><td>P024/SIN4_1/PPG24_0/TIN1_0/RTO4_1/INT15_0</td><td>3</td></tr> <tr><td>P027/SCS40_1/PPG27_0/TOT0_0/RTO3_1</td><td>4</td></tr> <tr><td>P032/SCS43_1/PPG30_0/TOT3_0/RTO2_1</td><td>5</td></tr> <tr><td>P033/PPG31_0/ICU3_3/TIN4_0/RTO1_1/SCK3_2</td><td>6</td></tr> <tr><td>P034/OCU11_1/ICU2_3/TIN5_0/RTO0_1/SOT3_2</td><td>7</td></tr> <tr><td><b>P151/SCK8_0/SCL8</b></td><td><b>8</b></td></tr> <tr><td>P035/SIN8_0/OCU8_1/TOT4_0/AIN0_0/INT11_0</td><td>9</td></tr> <tr><td>P036/SCS8_0/OCU7_1/TOT5_0/BIN0_0</td><td>10</td></tr> <tr><td>P040/PPG23_1/TOT7_0/AIN1_0/SIN0_1</td><td>11</td></tr> <tr><td>P041/SIN9_0/ICU9_1/BIN1_0/INT12_0</td><td>12</td></tr> <tr><td>P042/SOT9_0/AN47/ICU8_1/TRG0_1/ZIN1_0</td><td>13</td></tr> <tr><td>P045/SCK9_0/AN46/ICU5_1/TRG3_1/TOT1_2</td><td>14</td></tr> <tr><td>P047/AN45/TRG8_0/TIN3_2/SOT0_1</td><td>15</td></tr> <tr><td>P053/AN44/PPG35_0/INT14_1/SCK0_1</td><td>16</td></tr> </table> <p style="text-align: center;">↓</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>VSS</td><td>1</td></tr> <tr><td>P020/SIN3_1/TRG3_0/TIN0_2/RTO5_1</td><td>2</td></tr> <tr><td>P024/SIN4_1/PPG24_0/TIN1_0/RTO4_1/INT15_0</td><td>3</td></tr> <tr><td>P027/SCS40_1/PPG27_0/TOT0_0/RTO3_1</td><td>4</td></tr> <tr><td>P032/SCS43_1/PPG30_0/TOT3_0/RTO2_1</td><td>5</td></tr> <tr><td>P033/PPG31_0/ICU3_3/TIN4_0/RTO1_1/SCK3_2</td><td>6</td></tr> <tr><td>P034/OCU11_1/ICU2_3/TIN5_0/RTO0_1/SOT3_2</td><td>7</td></tr> <tr><td>P151/OCU9_1/TRG7_0/ICU0_3/TIN7_0/ZIN0_2/DTTL1</td><td>8</td></tr> <tr><td>P035/OCU8_1/TOT4_0/AIN0_0/INT11_0</td><td>9</td></tr> <tr><td>P036/OCU7_1/TOT5_0/BIN0_0</td><td>10</td></tr> <tr><td>P040/PPG23_1/TOT7_0/AIN1_0/SIN0_1</td><td>11</td></tr> <tr><td>P041/SIN9_0/ICU9_1/BIN1_0/INT12_0</td><td>12</td></tr> <tr><td>P042/SOT9_0/AN47/ICU8_1/TRG0_1/ZIN1_0</td><td>13</td></tr> <tr><td>P045/SCK9_0/AN46/ICU5_1/TRG3_1/TOT1_2</td><td>14</td></tr> <tr><td>P047/AN45/TRG8_0/TIN3_2/SOT0_1</td><td>15</td></tr> <tr><td>P053/AN44/PPG35_0/INT14_1/SCK0_1</td><td>16</td></tr> </table> | VSS | 1 | P020/SIN3_1/TRG3_0/TIN0_2/RTO5_1 | 2 | P024/SIN4_1/PPG24_0/TIN1_0/RTO4_1/INT15_0 | 3 | P027/SCS40_1/PPG27_0/TOT0_0/RTO3_1 | 4 | P032/SCS43_1/PPG30_0/TOT3_0/RTO2_1 | 5 | P033/PPG31_0/ICU3_3/TIN4_0/RTO1_1/SCK3_2 | 6 | P034/OCU11_1/ICU2_3/TIN5_0/RTO0_1/SOT3_2 | 7 | <b>P151/SCK8_0/SCL8</b> | <b>8</b> | P035/SIN8_0/OCU8_1/TOT4_0/AIN0_0/INT11_0 | 9 | P036/SCS8_0/OCU7_1/TOT5_0/BIN0_0 | 10 | P040/PPG23_1/TOT7_0/AIN1_0/SIN0_1 | 11 | P041/SIN9_0/ICU9_1/BIN1_0/INT12_0 | 12 | P042/SOT9_0/AN47/ICU8_1/TRG0_1/ZIN1_0 | 13 | P045/SCK9_0/AN46/ICU5_1/TRG3_1/TOT1_2 | 14 | P047/AN45/TRG8_0/TIN3_2/SOT0_1 | 15 | P053/AN44/PPG35_0/INT14_1/SCK0_1 | 16 | VSS | 1 | P020/SIN3_1/TRG3_0/TIN0_2/RTO5_1 | 2 | P024/SIN4_1/PPG24_0/TIN1_0/RTO4_1/INT15_0 | 3 | P027/SCS40_1/PPG27_0/TOT0_0/RTO3_1 | 4 | P032/SCS43_1/PPG30_0/TOT3_0/RTO2_1 | 5 | P033/PPG31_0/ICU3_3/TIN4_0/RTO1_1/SCK3_2 | 6 | P034/OCU11_1/ICU2_3/TIN5_0/RTO0_1/SOT3_2 | 7 | P151/OCU9_1/TRG7_0/ICU0_3/TIN7_0/ZIN0_2/DTTL1 | 8 | P035/OCU8_1/TOT4_0/AIN0_0/INT11_0 | 9 | P036/OCU7_1/TOT5_0/BIN0_0 | 10 | P040/PPG23_1/TOT7_0/AIN1_0/SIN0_1 | 11 | P041/SIN9_0/ICU9_1/BIN1_0/INT12_0 | 12 | P042/SOT9_0/AN47/ICU8_1/TRG0_1/ZIN1_0 | 13 | P045/SCK9_0/AN46/ICU5_1/TRG3_1/TOT1_2 | 14 | P047/AN45/TRG8_0/TIN3_2/SOT0_1 | 15 | P053/AN44/PPG35_0/INT14_1/SCK0_1 | 16 |
| VSS   | 1                                 |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P020/SIN3_1/TRG3_0/TIN0_2/RTO5_1              | 2                                 |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P024/SIN4_1/PPG24_0/TIN1_0/RTO4_1/INT15_0     | 3                                 |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P027/SCS40_1/PPG27_0/TOT0_0/RTO3_1            | 4                                 |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P032/SCS43_1/PPG30_0/TOT3_0/RTO2_1            | 5                                 |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P033/PPG31_0/ICU3_3/TIN4_0/RTO1_1/SCK3_2      | 6                                 |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P034/OCU11_1/ICU2_3/TIN5_0/RTO0_1/SOT3_2      | 7                                 |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| <b>P151/SCK8_0/SCL8</b>                       | <b>8</b>                          |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P035/SIN8_0/OCU8_1/TOT4_0/AIN0_0/INT11_0      | 9                                 |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P036/SCS8_0/OCU7_1/TOT5_0/BIN0_0              | 10                                |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P040/PPG23_1/TOT7_0/AIN1_0/SIN0_1             | 11                                |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P041/SIN9_0/ICU9_1/BIN1_0/INT12_0             | 12                                |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P042/SOT9_0/AN47/ICU8_1/TRG0_1/ZIN1_0         | 13                                |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P045/SCK9_0/AN46/ICU5_1/TRG3_1/TOT1_2         | 14                                |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P047/AN45/TRG8_0/TIN3_2/SOT0_1                | 15                                |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P053/AN44/PPG35_0/INT14_1/SCK0_1              | 16                                |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| VSS   | 1                                 |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P020/SIN3_1/TRG3_0/TIN0_2/RTO5_1              | 2                                 |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P024/SIN4_1/PPG24_0/TIN1_0/RTO4_1/INT15_0     | 3                                 |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P027/SCS40_1/PPG27_0/TOT0_0/RTO3_1            | 4                                 |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P032/SCS43_1/PPG30_0/TOT3_0/RTO2_1            | 5                                 |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P033/PPG31_0/ICU3_3/TIN4_0/RTO1_1/SCK3_2      | 6                                 |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P034/OCU11_1/ICU2_3/TIN5_0/RTO0_1/SOT3_2      | 7                                 |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P151/OCU9_1/TRG7_0/ICU0_3/TIN7_0/ZIN0_2/DTTL1 | 8                                 |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P035/OCU8_1/TOT4_0/AIN0_0/INT11_0             | 9                                 |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P036/OCU7_1/TOT5_0/BIN0_0                     | 10                                |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P040/PPG23_1/TOT7_0/AIN1_0/SIN0_1             | 11                                |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P041/SIN9_0/ICU9_1/BIN1_0/INT12_0             | 12                                |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P042/SOT9_0/AN47/ICU8_1/TRG0_1/ZIN1_0         | 13                                |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P045/SCK9_0/AN46/ICU5_1/TRG3_1/TOT1_2         | 14                                |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P047/AN45/TRG8_0/TIN3_2/SOT0_1                | 15                                |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |
| P053/AN44/PPG35_0/INT14_1/SCK0_1              | 16                                |   |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |                         |          |  |   |                                  |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |     |   |                                  |   |   |   |                                    |   |                                    |   |  |   |  |   |   |   |                                   |   |                           |    |                                   |    |                                   |    |                                       |    |                                       |    |                                |    |                                  |    |

| Page | Section                    | Change Results  |
|------|----------------------------|---|
| 13   | ■ Pin Assignment MB91F52xB | <p>- Right side</p>  <p>↓</p>  |



| Page | Section                           | Change Results   |
|------|-----------------------------------|--|
| 13   | <p>■ Pin Assignment MB91F52xB</p> | <p>- Top</p>   |
| 13   | <p>■ Pin Assignment MB91F52xB</p> | <p>The following note added on the bottom left of Figure.<br/>                 * In a single clock product, pin 56 and pin 57 are the general-purpose ports.</p> |

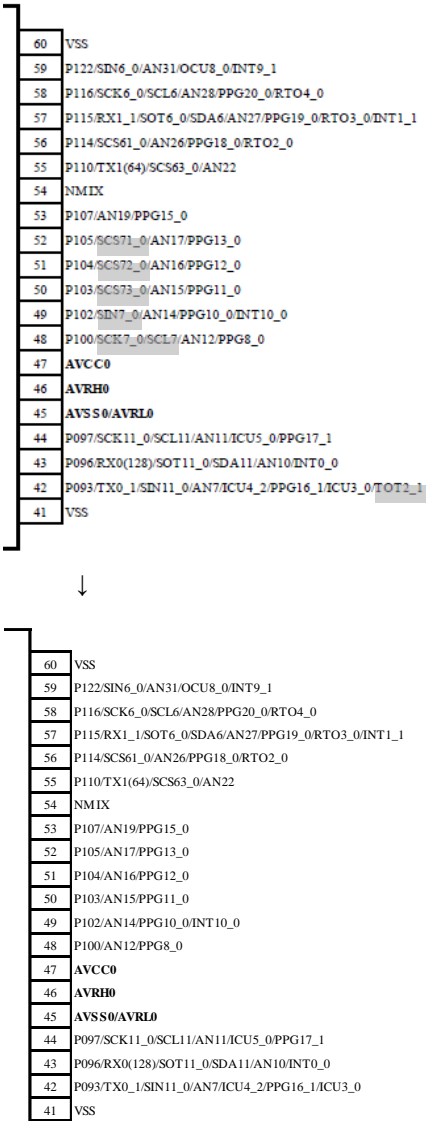


| Page | Section                    | Change Results   |
|------|----------------------------|--|
| 14   | ■ Pin Assignment MB91F52xD | <p>Signals indicated by the shading below deleted in Figure.<br/>                     - Left side</p> <p>↓</p> |



CY91520 Series

| Page | Section   | Change Results  |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
|------|---|---|----|-----|----|------------------------|----|-----------------------|----|---------------------------|----|-----------------------------------|----|----------------------------|----|------------------------------|----|-------------------------------|----|------------------------|----|--------------------------------------|----|--|----|--|----|---|----|--|----|-------------|----|-------|----|---|----|-------|----|---------------------------------|----|-----|
| 14   | <p>■ Pin Assignment MB91F52xD</p>                     | <p>- Bottom</p> <table border="1"> <tr><td>40</td><td>VCC</td></tr> <tr><td>39</td><td>P067DA00.PPG7_0.INTR_0</td></tr> <tr><td>38</td><td>P062SIN5_0.AN1.PPG2_0</td></tr> <tr><td>37</td><td>P061SOT5_0SDA5.AN0.PPG1_0</td></tr> <tr><td>36</td><td>P153SCK5_0SCL5.AN32.FRCK1.JINT4_1</td></tr> <tr><td>35</td><td>P073SOT4_0SDA4.AN33.ICU3_2</td></tr> <tr><td>34</td><td>P072SIN4_0AN34.ICU2_2.INT5_0</td></tr> <tr><td>33</td><td>P071SCK4_2.AN35.ICU1_2.MONCLK</td></tr> <tr><td>32</td><td>P067AN36.FRCK5_0.AN0_1</td></tr> <tr><td>31</td><td>P066SOT4_2SCK3_0.AN37.FRCK4_0.BIN0_1</td></tr> <tr><td>30</td><td>P064SCK42_0.AN38.FRCK2_0.AN1_1.PPG43_1</td></tr> <tr><td>29</td><td>P063SCK41_0.AN39.PPG5_1.FRCK1_0.BIN1_1</td></tr> <tr><td>28</td><td>P062SCK10_1SCK540_0.AN40.PPG4_1.FRCK0_0.TOT7_1.ZIN1_1</td></tr> <tr><td>27</td><td>P061SOT10_1.AN41.ICU6_0.PPG3_1.ICU3_1.TOT6_1.JINT3_1</td></tr> <tr><td>26</td><td>AVSS1A.VRL1</td></tr> <tr><td>25</td><td>AVRH1</td></tr> <tr><td>24</td><td>P067SCK10_1.AN42.ICU8_0.TRG0_2.PPG1_1.ICU1_1.TIN6_1</td></tr> <tr><td>23</td><td>AVCCI</td></tr> <tr><td>22</td><td>P065SIN10_0.AN43.PPG37_0.TIN4_1</td></tr> <tr><td>21</td><td>VSS</td></tr> </table> | 40 | VCC | 39 | P067DA00.PPG7_0.INTR_0 | 38 | P062SIN5_0.AN1.PPG2_0 | 37 | P061SOT5_0SDA5.AN0.PPG1_0 | 36 | P153SCK5_0SCL5.AN32.FRCK1.JINT4_1 | 35 | P073SOT4_0SDA4.AN33.ICU3_2 | 34 | P072SIN4_0AN34.ICU2_2.INT5_0 | 33 | P071SCK4_2.AN35.ICU1_2.MONCLK | 32 | P067AN36.FRCK5_0.AN0_1 | 31 | P066SOT4_2SCK3_0.AN37.FRCK4_0.BIN0_1 | 30 | P064SCK42_0.AN38.FRCK2_0.AN1_1.PPG43_1 | 29 | P063SCK41_0.AN39.PPG5_1.FRCK1_0.BIN1_1 | 28 | P062SCK10_1SCK540_0.AN40.PPG4_1.FRCK0_0.TOT7_1.ZIN1_1 | 27 | P061SOT10_1.AN41.ICU6_0.PPG3_1.ICU3_1.TOT6_1.JINT3_1 | 26 | AVSS1A.VRL1 | 25 | AVRH1 | 24 | P067SCK10_1.AN42.ICU8_0.TRG0_2.PPG1_1.ICU1_1.TIN6_1 | 23 | AVCCI | 22 | P065SIN10_0.AN43.PPG37_0.TIN4_1 | 21 | VSS |
| 40   | VCC   |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 39   | P067DA00.PPG7_0.INTR_0                                |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 38   | P062SIN5_0.AN1.PPG2_0                                 |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 37   | P061SOT5_0SDA5.AN0.PPG1_0                             |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 36   | P153SCK5_0SCL5.AN32.FRCK1.JINT4_1                     |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 35   | P073SOT4_0SDA4.AN33.ICU3_2                            |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 34   | P072SIN4_0AN34.ICU2_2.INT5_0                          |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 33   | P071SCK4_2.AN35.ICU1_2.MONCLK                         |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 32   | P067AN36.FRCK5_0.AN0_1                                |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 31   | P066SOT4_2SCK3_0.AN37.FRCK4_0.BIN0_1                  |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 30   | P064SCK42_0.AN38.FRCK2_0.AN1_1.PPG43_1                |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 29   | P063SCK41_0.AN39.PPG5_1.FRCK1_0.BIN1_1                |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 28   | P062SCK10_1SCK540_0.AN40.PPG4_1.FRCK0_0.TOT7_1.ZIN1_1 |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 27   | P061SOT10_1.AN41.ICU6_0.PPG3_1.ICU3_1.TOT6_1.JINT3_1  |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 26   | AVSS1A.VRL1   |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 25   | AVRH1   |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 24   | P067SCK10_1.AN42.ICU8_0.TRG0_2.PPG1_1.ICU1_1.TIN6_1   |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 23   | AVCCI   |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 22   | P065SIN10_0.AN43.PPG37_0.TIN4_1                       |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |
| 21   | VSS   |   |    |     |    |                        |    |                       |    |                           |    |                                   |    |                            |    |                              |    |                               |    |                        |    |                                      |    |  |    |  |    |   |    |  |    |             |    |       |    |   |    |       |    |                                 |    |     |

| Page | Section                    | Change Results   |
|------|----------------------------|--|
| 14   | ■ Pin Assignment MB91F52xD | <p>- Right side</p>  <p>60 VSS</p> <p>59 P122/SIN6_0/AN31/OCU8_0/INT9_1</p> <p>58 P116/SCK6_0/SCL6/AN28/PPG20_0/RT04_0</p> <p>57 P115/RX1_1/SOT6_0/SDA6/AN27/PPG19_0/RT03_0/INT1_1</p> <p>56 P114/SCS61_0/AN26/PPG18_0/RT02_0</p> <p>55 P110/TX1(64)/SCS63_0/AN22</p> <p>54 NMIX</p> <p>53 P107/AN19/PPG15_0</p> <p>52 P105/SCS71_0/AN17/PPG13_0</p> <p>51 P104/SCS72_0/AN16/PPG12_0</p> <p>50 P103/SCS73_0/AN15/PPG11_0</p> <p>49 P102/SIN7_0/AN14/PPG10_0/INT10_0</p> <p>48 P100/SCK7_0/SCL7/AN12/PPG8_0</p> <p>47 AVCC0</p> <p>46 AVRH0</p> <p>45 AVSS0/AVRL0</p> <p>44 P097/SCK11_0/SCL11/AN11/ICU5_0/PPG17_1</p> <p>43 P096/RX0(128)/SOT11_0/SDA11/AN10/INT0_0</p> <p>42 P093/TX0_1/SIN11_0/AN7/ICU4_2/PPG16_1/ICU3_0/TOT2_1</p> <p>41 VSS</p> <p>↓</p> <p>60 VSS</p> <p>59 P122/SIN6_0/AN31/OCU8_0/INT9_1</p> <p>58 P116/SCK6_0/SCL6/AN28/PPG20_0/RT04_0</p> <p>57 P115/RX1_1/SOT6_0/SDA6/AN27/PPG19_0/RT03_0/INT1_1</p> <p>56 P114/SCS61_0/AN26/PPG18_0/RT02_0</p> <p>55 P110/TX1(64)/SCS63_0/AN22</p> <p>54 NMIX</p> <p>53 P107/AN19/PPG15_0</p> <p>52 P105/AN17/PPG13_0</p> <p>51 P104/AN16/PPG12_0</p> <p>50 P103/AN15/PPG11_0</p> <p>49 P102/AN14/PPG10_0/INT10_0</p> <p>48 P100/AN12/PPG8_0</p> <p>47 AVCC0</p> <p>46 AVRH0</p> <p>45 AVSS0/AVRL0</p> <p>44 P097/SCK11_0/SCL11/AN11/ICU5_0/PPG17_1</p> <p>43 P096/RX0(128)/SOT11_0/SDA11/AN10/INT0_0</p> <p>42 P093/TX0_1/SIN11_0/AN7/ICU4_2/PPG16_1/ICU3_0</p> <p>41 VSS</p> |



| Page | Section                           | Change Results   |
|------|-----------------------------------|--|
| 14   | <p>■ Pin Assignment MB91F52xD</p> | <p>- Top</p>   |
| 14   | <p>■ Pin Assignment MB91F52xD</p> | <p>The following note added on the bottom left of Figure.<br/>                 * In a single clock product, pin 71 and pin 72 are the general-purpose ports.</p> |



| Page | Section  | Change Results  |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
|------|--|---|----|-----|----|-------------------------|----|------------------|----|-------------------------|----|-----------------------------|----|--------------------------------------|----|--------------|----|------------------------------|----|--------------------------------|----|--------------------------------|----|-------------|----|--------------------------|----|--|----|-------------------------------------|----|--|----|---|----|--|----|---|----|---|----|--------------|----|--------|----|--|----|--------|----|----------------------------------|----|-----|----|-----|----|-------------------------|----|------------------|----|-------------------------|----|-----------------------------|----|--------------------------------------|----|--------------|----|------------------|----|--------------------------------|----|--------------------------------|----|-------------|----|--------------------------|----|--|----|-------------------------------------|----|--|----|---|----|--|----|---|----|---|----|--------------|----|--------|----|--|----|--------|----|----------------------------------|----|-----|
| 15   | ■ Pin Assignment MB91F52xF                             | <p>Signals indicated by the shading below deleted in Figure.</p> <p>(Error)<br/>- Bottom</p> <table border="1"> <tr><td>50</td><td>VCC</td></tr> <tr><td>49</td><td>P087/DA00/PPG7_0/INT8_0</td></tr> <tr><td>48</td><td>P086/DA01/PPG6_0</td></tr> <tr><td>47</td><td>P082/SIN5_0/ANI1/PPG2_0</td></tr> <tr><td>46</td><td>P081/SOT5_0/SDA5/AN0/PPG1_0</td></tr> <tr><td>45</td><td>P153/SCK5_0/SCL5/AN32/FRCK1_1/INT4_1</td></tr> <tr><td>44</td><td>P152/SCS53_0</td></tr> <tr><td>43</td><td>P073/SOT4_0/SDA4/AN33/ICU3_2</td></tr> <tr><td>42</td><td>P072/SIN4_0/AN34/ICU2_2/INT5_0</td></tr> <tr><td>41</td><td>P071/SCK4_2/AN35/ICU1_2/MONCLK</td></tr> <tr><td>40</td><td>P070/ICU0_2</td></tr> <tr><td>39</td><td>P067/AN36/FRCK5_0/AIN0_1</td></tr> <tr><td>38</td><td>P066/SOT4_2/SCS3_0/AN37/FRCK4_0/BIN0_1</td></tr> <tr><td>37</td><td>P065/SCS43_0/FRCK3_0/ZIN0_1/PPG44_1</td></tr> <tr><td>36</td><td>P064/SCS42_0/AN38/FRCK2_0/AIN1_1/PPG43_1</td></tr> <tr><td>35</td><td>P063/SCS41_0/AN39/PPG5_1/FRCK1_0/BIN1_1</td></tr> <tr><td>34</td><td>P062/SCS10_1/SCS40_0/AN40/PPG4_1/FRCK0_0/TOT7_1/ZIN1_1</td></tr> <tr><td>33</td><td>P061/SOT10_1/AN41/ICU6_0/PPG3_1/ICU3_1/TOT6_1/INT13_1</td></tr> <tr><td>32</td><td>P060/SCS10_0/PPG2_1/ICU2_1/TOT5_1/INT13_0</td></tr> <tr><td>31</td><td>AVSSI/AVRLL1</td></tr> <tr><td>30</td><td>AVRHH1</td></tr> <tr><td>29</td><td>P057/SCK10_1/AN42/ICU8_0/TRG0_2/PPG1_1/ICU1_1/TIN6_1</td></tr> <tr><td>28</td><td>AVCCI1</td></tr> <tr><td>27</td><td>P055/SIN10_0/AN43/PPG37_0/TIN4_1</td></tr> <tr><td>26</td><td>VSS</td></tr> </table><br><table border="1"> <tr><td>50</td><td>VCC</td></tr> <tr><td>49</td><td>P087/DA00/PPG7_0/INT8_0</td></tr> <tr><td>48</td><td>P086/DA01/PPG6_0</td></tr> <tr><td>47</td><td>P082/SIN5_0/ANI1/PPG2_0</td></tr> <tr><td>46</td><td>P081/SOT5_0/SDA5/AN0/PPG1_0</td></tr> <tr><td>45</td><td>P153/SCK5_0/SCL5/AN32/FRCK1_1/INT4_1</td></tr> <tr><td>44</td><td>P152/SCS53_0</td></tr> <tr><td>43</td><td>P073/AN33/ICU3_2</td></tr> <tr><td>42</td><td>P072/SIN4_0/AN34/ICU2_2/INT5_0</td></tr> <tr><td>41</td><td>P071/SCK4_2/AN35/ICU1_2/MONCLK</td></tr> <tr><td>40</td><td>P070/ICU0_2</td></tr> <tr><td>39</td><td>P067/AN36/FRCK5_0/AIN0_1</td></tr> <tr><td>38</td><td>P066/SOT4_2/SCS3_0/AN37/FRCK4_0/BIN0_1</td></tr> <tr><td>37</td><td>P065/SCS43_0/FRCK3_0/ZIN0_1/PPG44_1</td></tr> <tr><td>36</td><td>P064/SCS42_0/AN38/FRCK2_0/AIN1_1/PPG43_1</td></tr> <tr><td>35</td><td>P063/SCS41_0/AN39/PPG5_1/FRCK1_0/BIN1_1</td></tr> <tr><td>34</td><td>P062/SCS10_1/SCS40_0/AN40/PPG4_1/FRCK0_0/TOT7_1/ZIN1_1</td></tr> <tr><td>33</td><td>P061/SOT10_1/AN41/ICU6_0/PPG3_1/ICU3_1/TOT6_1/INT13_1</td></tr> <tr><td>32</td><td>P060/SCS10_0/PPG2_1/ICU2_1/TOT5_1/INT13_0</td></tr> <tr><td>31</td><td>AVSSI/AVRLL1</td></tr> <tr><td>30</td><td>AVRHH1</td></tr> <tr><td>29</td><td>P057/SCK10_1/AN42/ICU8_0/TRG0_2/PPG1_1/ICU1_1/TIN6_1</td></tr> <tr><td>28</td><td>AVCCI1</td></tr> <tr><td>27</td><td>P055/SIN10_0/AN43/PPG37_0/TIN4_1</td></tr> <tr><td>26</td><td>VSS</td></tr> </table> | 50 | VCC | 49 | P087/DA00/PPG7_0/INT8_0 | 48 | P086/DA01/PPG6_0 | 47 | P082/SIN5_0/ANI1/PPG2_0 | 46 | P081/SOT5_0/SDA5/AN0/PPG1_0 | 45 | P153/SCK5_0/SCL5/AN32/FRCK1_1/INT4_1 | 44 | P152/SCS53_0 | 43 | P073/SOT4_0/SDA4/AN33/ICU3_2 | 42 | P072/SIN4_0/AN34/ICU2_2/INT5_0 | 41 | P071/SCK4_2/AN35/ICU1_2/MONCLK | 40 | P070/ICU0_2 | 39 | P067/AN36/FRCK5_0/AIN0_1 | 38 | P066/SOT4_2/SCS3_0/AN37/FRCK4_0/BIN0_1 | 37 | P065/SCS43_0/FRCK3_0/ZIN0_1/PPG44_1 | 36 | P064/SCS42_0/AN38/FRCK2_0/AIN1_1/PPG43_1 | 35 | P063/SCS41_0/AN39/PPG5_1/FRCK1_0/BIN1_1 | 34 | P062/SCS10_1/SCS40_0/AN40/PPG4_1/FRCK0_0/TOT7_1/ZIN1_1 | 33 | P061/SOT10_1/AN41/ICU6_0/PPG3_1/ICU3_1/TOT6_1/INT13_1 | 32 | P060/SCS10_0/PPG2_1/ICU2_1/TOT5_1/INT13_0 | 31 | AVSSI/AVRLL1 | 30 | AVRHH1 | 29 | P057/SCK10_1/AN42/ICU8_0/TRG0_2/PPG1_1/ICU1_1/TIN6_1 | 28 | AVCCI1 | 27 | P055/SIN10_0/AN43/PPG37_0/TIN4_1 | 26 | VSS | 50 | VCC | 49 | P087/DA00/PPG7_0/INT8_0 | 48 | P086/DA01/PPG6_0 | 47 | P082/SIN5_0/ANI1/PPG2_0 | 46 | P081/SOT5_0/SDA5/AN0/PPG1_0 | 45 | P153/SCK5_0/SCL5/AN32/FRCK1_1/INT4_1 | 44 | P152/SCS53_0 | 43 | P073/AN33/ICU3_2 | 42 | P072/SIN4_0/AN34/ICU2_2/INT5_0 | 41 | P071/SCK4_2/AN35/ICU1_2/MONCLK | 40 | P070/ICU0_2 | 39 | P067/AN36/FRCK5_0/AIN0_1 | 38 | P066/SOT4_2/SCS3_0/AN37/FRCK4_0/BIN0_1 | 37 | P065/SCS43_0/FRCK3_0/ZIN0_1/PPG44_1 | 36 | P064/SCS42_0/AN38/FRCK2_0/AIN1_1/PPG43_1 | 35 | P063/SCS41_0/AN39/PPG5_1/FRCK1_0/BIN1_1 | 34 | P062/SCS10_1/SCS40_0/AN40/PPG4_1/FRCK0_0/TOT7_1/ZIN1_1 | 33 | P061/SOT10_1/AN41/ICU6_0/PPG3_1/ICU3_1/TOT6_1/INT13_1 | 32 | P060/SCS10_0/PPG2_1/ICU2_1/TOT5_1/INT13_0 | 31 | AVSSI/AVRLL1 | 30 | AVRHH1 | 29 | P057/SCK10_1/AN42/ICU8_0/TRG0_2/PPG1_1/ICU1_1/TIN6_1 | 28 | AVCCI1 | 27 | P055/SIN10_0/AN43/PPG37_0/TIN4_1 | 26 | VSS |
| 50   | VCC  |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 49   | P087/DA00/PPG7_0/INT8_0                                |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 48   | P086/DA01/PPG6_0                                       |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 47   | P082/SIN5_0/ANI1/PPG2_0                                |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 46   | P081/SOT5_0/SDA5/AN0/PPG1_0                            |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 45   | P153/SCK5_0/SCL5/AN32/FRCK1_1/INT4_1                   |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 44   | P152/SCS53_0   |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 43   | P073/SOT4_0/SDA4/AN33/ICU3_2                           |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 42   | P072/SIN4_0/AN34/ICU2_2/INT5_0                         |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 41   | P071/SCK4_2/AN35/ICU1_2/MONCLK                         |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 40   | P070/ICU0_2  |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 39   | P067/AN36/FRCK5_0/AIN0_1                               |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 38   | P066/SOT4_2/SCS3_0/AN37/FRCK4_0/BIN0_1                 |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 37   | P065/SCS43_0/FRCK3_0/ZIN0_1/PPG44_1                    |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 36   | P064/SCS42_0/AN38/FRCK2_0/AIN1_1/PPG43_1               |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 35   | P063/SCS41_0/AN39/PPG5_1/FRCK1_0/BIN1_1                |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 34   | P062/SCS10_1/SCS40_0/AN40/PPG4_1/FRCK0_0/TOT7_1/ZIN1_1 |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 33   | P061/SOT10_1/AN41/ICU6_0/PPG3_1/ICU3_1/TOT6_1/INT13_1  |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 32   | P060/SCS10_0/PPG2_1/ICU2_1/TOT5_1/INT13_0              |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 31   | AVSSI/AVRLL1   |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 30   | AVRHH1   |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 29   | P057/SCK10_1/AN42/ICU8_0/TRG0_2/PPG1_1/ICU1_1/TIN6_1   |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 28   | AVCCI1   |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 27   | P055/SIN10_0/AN43/PPG37_0/TIN4_1                       |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 26   | VSS  |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 50   | VCC  |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 49   | P087/DA00/PPG7_0/INT8_0                                |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 48   | P086/DA01/PPG6_0                                       |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 47   | P082/SIN5_0/ANI1/PPG2_0                                |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 46   | P081/SOT5_0/SDA5/AN0/PPG1_0                            |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 45   | P153/SCK5_0/SCL5/AN32/FRCK1_1/INT4_1                   |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 44   | P152/SCS53_0   |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 43   | P073/AN33/ICU3_2                                       |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 42   | P072/SIN4_0/AN34/ICU2_2/INT5_0                         |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 41   | P071/SCK4_2/AN35/ICU1_2/MONCLK                         |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 40   | P070/ICU0_2  |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 39   | P067/AN36/FRCK5_0/AIN0_1                               |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 38   | P066/SOT4_2/SCS3_0/AN37/FRCK4_0/BIN0_1                 |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 37   | P065/SCS43_0/FRCK3_0/ZIN0_1/PPG44_1                    |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 36   | P064/SCS42_0/AN38/FRCK2_0/AIN1_1/PPG43_1               |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 35   | P063/SCS41_0/AN39/PPG5_1/FRCK1_0/BIN1_1                |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 34   | P062/SCS10_1/SCS40_0/AN40/PPG4_1/FRCK0_0/TOT7_1/ZIN1_1 |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 33   | P061/SOT10_1/AN41/ICU6_0/PPG3_1/ICU3_1/TOT6_1/INT13_1  |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 32   | P060/SCS10_0/PPG2_1/ICU2_1/TOT5_1/INT13_0              |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 31   | AVSSI/AVRLL1   |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 30   | AVRHH1   |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 29   | P057/SCK10_1/AN42/ICU8_0/TRG0_2/PPG1_1/ICU1_1/TIN6_1   |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 28   | AVCCI1   |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 27   | P055/SIN10_0/AN43/PPG37_0/TIN4_1                       |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |
| 26   | VSS  |   |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                              |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |    |     |    |                         |    |                  |    |                         |    |                             |    |                                      |    |              |    |                  |    |                                |    |                                |    |             |    |                          |    |  |    |                                     |    |  |    |   |    |  |    |   |    |   |    |              |    |        |    |  |    |        |    |                                  |    |     |



| Page                | Section                    | Change Results   |                     |            |                     |            |
|---------------------|----------------------------|--|---------------------|------------|---------------------|------------|
| 15                  | ■ Pin Assignment MB91F52xF | <p>- Top</p> <p>100 VCC<br/>99 P011/WOT/SOT2_1/TIOA0_0/INT3_1<br/>98 P006/SCS2_0/ADTG1_1/INT2_1<br/>97 P005/SCK2_0/ADTG0_1/INT7_1<br/>96 P003/SIN2_0/TIOB1_1/INT3_0<br/>95 P001/SOT1_0/TIOA1_1<br/>94 P000/SIN1_0/TIOA0_1/INT2_0<br/>93 C<br/>92 VSS<br/>91 P144/SCK1_1<br/>90 P134/RX2(64)/SCS1_1/ICU7_0/INT7_0<br/>89 P133/TX2(64)<br/>88 RSTX<br/>87 X0/AP136<br/>86 XI/AP135/DTTI_0<br/>85 VSS<br/>84 XI<br/>83 X0<br/>82 MD1<br/>81 MD0<br/>80 P130/SCK0_0<br/>79 P127/SOT0_0<br/>78 P126/SIN0_0/INT6_0<br/>77 DEBUGIF<br/>76 VCC</p> <p>100 VCC<br/>99 P011/WOT/SOT2_1/INT3_1<br/>98 P006/SCS2_0/ADTG1_1/INT2_1<br/>97 P005/SCK2_0/ADTG0_1/INT7_1<br/>96 P003/SIN2_0/TIOB1_1/INT3_0<br/>95 P001/SOT1_0/TIOA1_1<br/>94 P000/SIN1_0/INT2_0<br/>93 C<br/>92 VSS<br/>91 P144/SCK1_1<br/>90 P134/RX2(64)/SCS1_1/ICU7_0/INT7_0<br/>89 P133/TX2(64)<br/>88 RSTX<br/>87 X0/AP136<br/>86 XI/AP135/DTTI_0<br/>85 VSS<br/>84 XI<br/>83 X0<br/>82 MD1<br/>81 MD0<br/>80 P130/SCK0_0<br/>79 P127/SOT0_0<br/>78 P126/SIN0_0/INT6_0<br/>77 DEBUGIF<br/>76 VCC</p> |                     |            |                     |            |
| 15                  | ■ Pin Assignment MB91F52xF | The following note added on the bottom left of Figure.<br>* In a single clock product, pin 86 and pin 87 are the general-purpose ports.  |                     |            |                     |            |
| 16                  | ■ Pin Assignment MB91F52xJ | The following note added on the bottom left of Figure.<br>* In a single clock product, pin 102 and pin 103 are the general-purpose ports.  |                     |            |                     |            |
| 17                  | ■ Pin Assignment MB91F52xK | The following note added on the bottom left of Figure.<br>* In a single clock product, pin 121 and pin 122 are the general-purpose ports.  |                     |            |                     |            |
| 18                  | ■ Pin Assignment MB91F52xL | The following note added on the bottom left of Figure.<br>* In a single clock product, pin 149 and pin 150 are the general-purpose ports.  |                     |            |                     |            |
| 19 to 35            | ■ PIN Description          | <p>A List of "Pin Description" modified.</p> <table border="1"> <tr> <td>I/O Circuit types*1</td> <td>Function*2</td> </tr> <tr> <td>I/O Circuit types*8</td> <td>Function*9</td> </tr> </table>   | I/O Circuit types*1 | Function*2 | I/O Circuit types*8 | Function*9 |
| I/O Circuit types*1 | Function*2                 |  |                     |            |                     |            |
| I/O Circuit types*8 | Function*9                 |  |                     |            |                     |            |



| Page    | Section          | Change Results  |         |     |     |          |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|---------|------------------|---|---------|-----|-----|----------|--|--|----------|----|----|-----|-----|-----|-----|---|---|---|---|---|---|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|---|---|---|---|---|---|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|---|---|---|---|---|---|------|--|--|--|--|--|--|---------|---|---|---|---|---|---|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|---|---|---|---|---|---|------|--|--|--|--|--|--|---------|---|---|---|---|---|---|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|---|---|---|---|---|---|------|--|--|--|--|--|--|------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|---|---|---|---|---|---|------|--|--|--|--|--|--|------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|---|---|---|---|---|----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|---|---|---|---|---|----|------|--|--|--|--|--|--|------|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|
| 19      | ■PIN Description | <p>A List of "Pin Description" modified.</p> <p>(Error)</p> <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th rowspan="2">Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> </tr> </thead> <tbody> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>2</td> <td>2</td> <td>P015</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>D29</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG0_0</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>3</td> <td>3</td> <td>P016</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>D30</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG1_0</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>4</td> <td>P170</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG36_1</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>4</td> <td>5</td> <td>P017</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>D31</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG2_0</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>6</td> <td>P171</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG37_1</td> </tr> <tr> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>5</td> <td>7</td> <td>P020</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ASX</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SIN3_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG3_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIN0_2</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>RTO5_1</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>3</td> <td>6</td> <td>8</td> <td>P021</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>CS0X</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SOT3_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG6_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG4_0</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>4</td> <td>7</td> <td>9</td> <td>P022</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>CS1X</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCK3_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG7_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG5_0</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>5</td> <td>8</td> <td>10</td> <td>P023</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>RDX</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCS3_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG32_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIN0_0</td> </tr> <tr> <td>3</td> <td>3</td> <td>3</td> <td>6</td> <td>9</td> <td>11</td> <td>P024</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>WROX</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SIN4_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG24_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIN1_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>RTO4_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>INT15_0</td> </tr> </tbody> </table> | Pin no. |     |     |          |  |  | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 | - | - | - | - | 2 | 2 | P015 |  |  |  |  |  |  | D29 |  |  |  |  |  |  | TRG0_0 | - | - | - | - | 3 | 3 | P016 |  |  |  |  |  |  | D30 |  |  |  |  |  |  | TRG1_0 | - | - | - | - | - | 4 | P170 |  |  |  |  |  |  | PPG36_1 | - | - | - | - | 4 | 5 | P017 |  |  |  |  |  |  | D31 |  |  |  |  |  |  | TRG2_0 | - | - | - | - | - | 6 | P171 |  |  |  |  |  |  | PPG37_1 | 2 | 2 | 2 | 2 | 5 | 7 | P020 |  |  |  |  |  |  | ASX |  |  |  |  |  |  | SIN3_1 |  |  |  |  |  |  | TRG3_0 |  |  |  |  |  |  | TIN0_2 |  |  |  |  |  |  | RTO5_1 | - | - | - | 3 | 6 | 8 | P021 |  |  |  |  |  |  | CS0X |  |  |  |  |  |  | SOT3_1 |  |  |  |  |  |  | TRG6_1 |  |  |  |  |  |  | TRG4_0 | - | - | - | 4 | 7 | 9 | P022 |  |  |  |  |  |  | CS1X |  |  |  |  |  |  | SCK3_1 |  |  |  |  |  |  | TRG7_1 |  |  |  |  |  |  | TRG5_0 | - | - | - | 5 | 8 | 10 | P023 |  |  |  |  |  |  | RDX |  |  |  |  |  |  | SCS3_1 |  |  |  |  |  |  | PPG32_0 |  |  |  |  |  |  | TIN0_0 | 3 | 3 | 3 | 6 | 9 | 11 | P024 |  |  |  |  |  |  | WROX |  |  |  |  |  |  | SIN4_1 |  |  |  |  |  |  | PPG24_0 |  |  |  |  |  |  | TIN1_0 |  |  |  |  |  |  | RTO4_1 |  |  |  |  |  |  | INT15_0 |
| Pin no. |                  |   |         |     |     | Pin Name |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
| 64      | 80               | 100   | 120     | 144 | 176 |          |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
| -       | -                | -   | -       | 2   | 2   | P015     |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | D29      |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TRG0_0   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
| -       | -                | -   | -       | 3   | 3   | P016     |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | D30      |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TRG1_0   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
| -       | -                | -   | -       | -   | 4   | P170     |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | PPG36_1  |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
| -       | -                | -   | -       | 4   | 5   | P017     |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | D31      |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TRG2_0   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
| -       | -                | -   | -       | -   | 6   | P171     |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | PPG37_1  |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
| 2       | 2                | 2   | 2       | 5   | 7   | P020     |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | ASX      |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | SIN3_1   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TRG3_0   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TIN0_2   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | RTO5_1   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
| -       | -                | -   | 3       | 6   | 8   | P021     |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | CS0X     |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | SOT3_1   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TRG6_1   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TRG4_0   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
| -       | -                | -   | 4       | 7   | 9   | P022     |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | CS1X     |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | SCK3_1   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TRG7_1   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TRG5_0   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
| -       | -                | -   | 5       | 8   | 10  | P023     |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | RDX      |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | SCS3_1   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | PPG32_0  |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TIN0_0   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
| 3       | 3                | 3   | 6       | 9   | 11  | P024     |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | WROX     |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | SIN4_1   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | PPG24_0  |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TIN1_0   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | RTO4_1   |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | INT15_0  |  |  |          |    |    |     |     |     |     |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |         |   |   |   |   |   |   |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |   |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |



| Page | Section          | Change Results  |                 |                 |                 |     |     |  |          |    |    |     |     |     |     |   |   |   |   |   |   |                       |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |                 |                 |                 |                 |   |   |   |   |   |   |                 |   |   |  |   |   |   |                 |   |   |  |   |   |   |                 |   |    |  |                 |                 |                 |                 |   |    |  |
|------|------------------|---|-----------------|-----------------|-----------------|-----|-----|--|----------|----|----|-----|-----|-----|-----|---|---|---|---|---|---|-----------------------|---|---|---|---|---|---|-----------------------|---|---|---|---|---|---|-----------------|---|---|---|---|---|---|-----------------------|---|---|---|---|---|---|-----------------|-----------------|-----------------|-----------------|-----------------|---|---|---|---|---|---|-----------------|---|---|--|---|---|---|-----------------|---|---|--|---|---|---|-----------------|---|----|--|-----------------|-----------------|-----------------|-----------------|---|----|--|
| 19   | ■PIN Description | (Continued)<br>(Correct)  |                 |                 |                 |     |     |  |          |    |    |     |     |     |     |   |   |   |   |   |   |                       |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |                 |                 |                 |                 |   |   |   |   |   |   |                 |   |   |  |   |   |   |                 |   |   |  |   |   |   |                 |   |    |  |                 |                 |                 |                 |   |    |  |
|      |                  | <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th rowspan="2">Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> </tr> </thead> <tbody> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>2</td> <td>2</td> <td>P015<br/>D29<br/>TRG0_0</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>3</td> <td>3</td> <td>P016<br/>D30<br/>TRG1_0</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>4</td> <td>P170<br/>PPG36_1</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>4</td> <td>5</td> <td>P017<br/>D31<br/>TRG2_0</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>6</td> <td>P171<br/>PPG37_1</td> </tr> <tr> <td>2<sup>*1</sup></td> <td>2<sup>*1</sup></td> <td>2<sup>*1</sup></td> <td>2<sup>*1</sup></td> <td>5</td> <td>7</td> <td>P020<br/>ASX<sup>*2, *3, *4, *5</sup><br/>SIN3_1<br/>TRG3_0<br/>TIN0_2<br/>RTO5_1</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>3<sup>*1</sup></td> <td>6</td> <td>8</td> <td>P021<br/>CS0X<sup>*5</sup><br/>SOT3_1<br/>TRG6_1<br/>TRG4_0</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>4<sup>*1</sup></td> <td>7</td> <td>9</td> <td>P022<br/>CS1X<sup>*5</sup><br/>SCK3_1<br/>TRG7_1<br/>TRG5_0</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>5<sup>*1</sup></td> <td>8</td> <td>10</td> <td>P023<br/>RDX<sup>*5</sup><br/>SCS3_1<br/>PPG32_0<br/>TIN0_0</td> </tr> <tr> <td>3<sup>*1</sup></td> <td>3<sup>*1</sup></td> <td>3<sup>*1</sup></td> <td>6<sup>*1</sup></td> <td>9</td> <td>11</td> <td>P024<br/>WR0X<sup>*2, *3, *4, *5</sup><br/>SIN4_1<br/>PPG24_0<br/>TIN1_0<br/>RTO4_1<br/>INT15_0</td> </tr> </tbody> </table> | Pin no.         |                 |                 |     |     |  | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 | - | - | - | - | 2 | 2 | P015<br>D29<br>TRG0_0 | - | - | - | - | 3 | 3 | P016<br>D30<br>TRG1_0 | - | - | - | - | - | 4 | P170<br>PPG36_1 | - | - | - | - | 4 | 5 | P017<br>D31<br>TRG2_0 | - | - | - | - | - | 6 | P171<br>PPG37_1 | 2 <sup>*1</sup> | 2 <sup>*1</sup> | 2 <sup>*1</sup> | 2 <sup>*1</sup> | 5 | 7 | P020<br>ASX <sup>*2, *3, *4, *5</sup><br>SIN3_1<br>TRG3_0<br>TIN0_2<br>RTO5_1 | - | - | - | 3 <sup>*1</sup> | 6 | 8 | P021<br>CS0X <sup>*5</sup><br>SOT3_1<br>TRG6_1<br>TRG4_0 | - | - | - | 4 <sup>*1</sup> | 7 | 9 | P022<br>CS1X <sup>*5</sup><br>SCK3_1<br>TRG7_1<br>TRG5_0 | - | - | - | 5 <sup>*1</sup> | 8 | 10 | P023<br>RDX <sup>*5</sup><br>SCS3_1<br>PPG32_0<br>TIN0_0 | 3 <sup>*1</sup> | 3 <sup>*1</sup> | 3 <sup>*1</sup> | 6 <sup>*1</sup> | 9 | 11 | P024<br>WR0X <sup>*2, *3, *4, *5</sup><br>SIN4_1<br>PPG24_0<br>TIN1_0<br>RTO4_1<br>INT15_0 |
|      |                  | Pin no.   |                 |                 |                 |     |     | Pin Name   |          |    |    |     |     |     |     |   |   |   |   |   |   |                       |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |                 |                 |                 |                 |   |   |   |   |   |   |                 |   |   |  |   |   |   |                 |   |   |  |   |   |   |                 |   |    |  |                 |                 |                 |                 |   |    |  |
|      |                  | 64  | 80              | 100             | 120             | 144 | 176 |  |          |    |    |     |     |     |     |   |   |   |   |   |   |                       |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |                 |                 |                 |                 |   |   |   |   |   |   |                 |   |   |  |   |   |   |                 |   |   |  |   |   |   |                 |   |    |  |                 |                 |                 |                 |   |    |  |
|      |                  | -   | -               | -               | -               | 2   | 2   | P015<br>D29<br>TRG0_0  |          |    |    |     |     |     |     |   |   |   |   |   |   |                       |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |                 |                 |                 |                 |   |   |   |   |   |   |                 |   |   |  |   |   |   |                 |   |   |  |   |   |   |                 |   |    |  |                 |                 |                 |                 |   |    |  |
|      |                  | -   | -               | -               | -               | 3   | 3   | P016<br>D30<br>TRG1_0  |          |    |    |     |     |     |     |   |   |   |   |   |   |                       |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |                 |                 |                 |                 |   |   |   |   |   |   |                 |   |   |  |   |   |   |                 |   |   |  |   |   |   |                 |   |    |  |                 |                 |                 |                 |   |    |  |
|      |                  | -   | -               | -               | -               | -   | 4   | P170<br>PPG36_1  |          |    |    |     |     |     |     |   |   |   |   |   |   |                       |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |                 |                 |                 |                 |   |   |   |   |   |   |                 |   |   |  |   |   |   |                 |   |   |  |   |   |   |                 |   |    |  |                 |                 |                 |                 |   |    |  |
|      |                  | -   | -               | -               | -               | 4   | 5   | P017<br>D31<br>TRG2_0  |          |    |    |     |     |     |     |   |   |   |   |   |   |                       |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |                 |                 |                 |                 |   |   |   |   |   |   |                 |   |   |  |   |   |   |                 |   |   |  |   |   |   |                 |   |    |  |                 |                 |                 |                 |   |    |  |
|      |                  | -   | -               | -               | -               | -   | 6   | P171<br>PPG37_1  |          |    |    |     |     |     |     |   |   |   |   |   |   |                       |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |                 |                 |                 |                 |   |   |   |   |   |   |                 |   |   |  |   |   |   |                 |   |   |  |   |   |   |                 |   |    |  |                 |                 |                 |                 |   |    |  |
|      |                  | 2 <sup>*1</sup>   | 2 <sup>*1</sup> | 2 <sup>*1</sup> | 2 <sup>*1</sup> | 5   | 7   | P020<br>ASX <sup>*2, *3, *4, *5</sup><br>SIN3_1<br>TRG3_0<br>TIN0_2<br>RTO5_1              |          |    |    |     |     |     |     |   |   |   |   |   |   |                       |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |                 |                 |                 |                 |   |   |   |   |   |   |                 |   |   |  |   |   |   |                 |   |   |  |   |   |   |                 |   |    |  |                 |                 |                 |                 |   |    |  |
|      |                  | -   | -               | -               | 3 <sup>*1</sup> | 6   | 8   | P021<br>CS0X <sup>*5</sup><br>SOT3_1<br>TRG6_1<br>TRG4_0                                   |          |    |    |     |     |     |     |   |   |   |   |   |   |                       |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |                 |                 |                 |                 |   |   |   |   |   |   |                 |   |   |  |   |   |   |                 |   |   |  |   |   |   |                 |   |    |  |                 |                 |                 |                 |   |    |  |
|      |                  | -   | -               | -               | 4 <sup>*1</sup> | 7   | 9   | P022<br>CS1X <sup>*5</sup><br>SCK3_1<br>TRG7_1<br>TRG5_0                                   |          |    |    |     |     |     |     |   |   |   |   |   |   |                       |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |                 |                 |                 |                 |   |   |   |   |   |   |                 |   |   |  |   |   |   |                 |   |   |  |   |   |   |                 |   |    |  |                 |                 |                 |                 |   |    |  |
|      |                  | -   | -               | -               | 5 <sup>*1</sup> | 8   | 10  | P023<br>RDX <sup>*5</sup><br>SCS3_1<br>PPG32_0<br>TIN0_0                                   |          |    |    |     |     |     |     |   |   |   |   |   |   |                       |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |                 |                 |                 |                 |   |   |   |   |   |   |                 |   |   |  |   |   |   |                 |   |   |  |   |   |   |                 |   |    |  |                 |                 |                 |                 |   |    |  |
|      |                  | 3 <sup>*1</sup>   | 3 <sup>*1</sup> | 3 <sup>*1</sup> | 6 <sup>*1</sup> | 9   | 11  | P024<br>WR0X <sup>*2, *3, *4, *5</sup><br>SIN4_1<br>PPG24_0<br>TIN1_0<br>RTO4_1<br>INT15_0 |          |    |    |     |     |     |     |   |   |   |   |   |   |                       |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |   |   |   |   |   |   |                       |   |   |   |   |   |   |                 |                 |                 |                 |                 |   |   |   |   |   |   |                 |   |   |  |   |   |   |                 |   |   |  |   |   |   |                 |   |    |  |                 |                 |                 |                 |   |    |  |



| Page    | Section          | Change Results  |         |     |     |          |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|---------|------------------|---|---------|-----|-----|----------|--|--|----------|----|----|-----|-----|-----|-----|--|---|---|---|---|----|----|------|--|--|--|--|--|--|------|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|---|---|---|---|---|----|------|--|--|--|--|--|--|---------|--|--|--|--|--|--|------|--|--|--|--|--|--|-----|---|---|---|---|----|----|--------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|--|--|--|--|--|--|------|--|--|--|--|--|--|-----|---|---|---|---|----|----|---------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|---|---|---|---|---|----|------|--|--|--|--|--|--|---------|--|--|--|--|--|--|------|--|--|--|--|--|--|-----|---|---|---|----|----|----|---------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|--|--|--|--|--|--|------|--|--|--|--|--|--|-----|---|---|---|----|----|----|---------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|--|--|--|--|--|--|------|--|--|--|--|--|--|-----|---|---|---|----|----|----|---------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|------|--|--|--|--|--|--|-----|---|---|----|----|----|----|---------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|
| 20      | ■PIN Description | <p>A List of "Pin Description" modified.</p> <p>(Error)</p> <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th>Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> <th></th> </tr> </thead> <tbody> <tr> <td>-</td> <td>-</td> <td>4</td> <td>7</td> <td>10</td> <td>12</td> <td>P025</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>WR1X</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SOT4_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG25_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIN2_0</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>13</td> <td>P172</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG38_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P026</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A00</td> </tr> <tr> <td>-</td> <td>4</td> <td>5</td> <td>8</td> <td>11</td> <td>14</td> <td>SCK4_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG26_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIN3_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P027</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A01</td> </tr> <tr> <td>4</td> <td>5</td> <td>6</td> <td>9</td> <td>12</td> <td>15</td> <td>SCS40_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG27_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TOT0_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>RTO3_1</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>16</td> <td>P173</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG39_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P030</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A02</td> </tr> <tr> <td>-</td> <td>-</td> <td>7</td> <td>10</td> <td>13</td> <td>17</td> <td>SCS41_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG28_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TOT1_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P031</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A03</td> </tr> <tr> <td>-</td> <td>6</td> <td>8</td> <td>11</td> <td>14</td> <td>18</td> <td>SCS42_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG29_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TOT2_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P032</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A04</td> </tr> <tr> <td>5</td> <td>7</td> <td>9</td> <td>12</td> <td>15</td> <td>19</td> <td>SCS43_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG30_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TOT3_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>RTO2_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P033</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A05</td> </tr> <tr> <td>6</td> <td>8</td> <td>10</td> <td>13</td> <td>16</td> <td>20</td> <td>PPG31_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU3_3</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIN4_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>RTO1_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCK3_2</td> </tr> </tbody> </table> | Pin no. |     |     |          |  |  | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 |  | - | - | 4 | 7 | 10 | 12 | P025 |  |  |  |  |  |  | WR1X |  |  |  |  |  |  | SOT4_1 |  |  |  |  |  |  | PPG25_0 |  |  |  |  |  |  | TIN2_0 | - | - | - | - | - | 13 | P172 |  |  |  |  |  |  | PPG38_1 |  |  |  |  |  |  | P026 |  |  |  |  |  |  | A00 | - | 4 | 5 | 8 | 11 | 14 | SCK4_1 |  |  |  |  |  |  | PPG26_0 |  |  |  |  |  |  | TIN3_0 |  |  |  |  |  |  | P027 |  |  |  |  |  |  | A01 | 4 | 5 | 6 | 9 | 12 | 15 | SCS40_1 |  |  |  |  |  |  | PPG27_0 |  |  |  |  |  |  | TOT0_0 |  |  |  |  |  |  | RTO3_1 | - | - | - | - | - | 16 | P173 |  |  |  |  |  |  | PPG39_1 |  |  |  |  |  |  | P030 |  |  |  |  |  |  | A02 | - | - | 7 | 10 | 13 | 17 | SCS41_1 |  |  |  |  |  |  | PPG28_0 |  |  |  |  |  |  | TOT1_0 |  |  |  |  |  |  | P031 |  |  |  |  |  |  | A03 | - | 6 | 8 | 11 | 14 | 18 | SCS42_1 |  |  |  |  |  |  | PPG29_0 |  |  |  |  |  |  | TOT2_0 |  |  |  |  |  |  | P032 |  |  |  |  |  |  | A04 | 5 | 7 | 9 | 12 | 15 | 19 | SCS43_1 |  |  |  |  |  |  | PPG30_0 |  |  |  |  |  |  | TOT3_0 |  |  |  |  |  |  | RTO2_1 |  |  |  |  |  |  | P033 |  |  |  |  |  |  | A05 | 6 | 8 | 10 | 13 | 16 | 20 | PPG31_0 |  |  |  |  |  |  | ICU3_3 |  |  |  |  |  |  | TIN4_0 |  |  |  |  |  |  | RTO1_1 |  |  |  |  |  |  | SCK3_2 |
| Pin no. |                  |   |         |     |     | Pin Name |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| 64      | 80               | 100   | 120     | 144 | 176 |          |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| -       | -                | 4   | 7       | 10  | 12  | P025     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | WR1X     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | SOT4_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | PPG25_0  |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | TIN2_0   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| -       | -                | -   | -       | -   | 13  | P172     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | PPG38_1  |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | P026     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | A00      |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| -       | 4                | 5   | 8       | 11  | 14  | SCK4_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | PPG26_0  |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | TIN3_0   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | P027     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | A01      |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| 4       | 5                | 6   | 9       | 12  | 15  | SCS40_1  |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | PPG27_0  |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | TOT0_0   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | RTO3_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| -       | -                | -   | -       | -   | 16  | P173     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | PPG39_1  |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | P030     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | A02      |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| -       | -                | 7   | 10      | 13  | 17  | SCS41_1  |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | PPG28_0  |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | TOT1_0   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | P031     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | A03      |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| -       | 6                | 8   | 11      | 14  | 18  | SCS42_1  |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | PPG29_0  |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | TOT2_0   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | P032     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | A04      |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| 5       | 7                | 9   | 12      | 15  | 19  | SCS43_1  |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | PPG30_0  |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | TOT3_0   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | RTO2_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | P033     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | A05      |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| 6       | 8                | 10  | 13      | 16  | 20  | PPG31_0  |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | ICU3_3   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | TIN4_0   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | RTO1_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |   |         |     |     | SCK3_2   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |   |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |   |    |    |    |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |     |   |   |    |    |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |



| Page | Section          | Change Results           |                 |                  |                  |     |          |  |
|------|------------------|--------------------------|-----------------|------------------|------------------|-----|----------|--|
| 20   | ■PIN Description | (Continued)<br>(Correct) |                 |                  |                  |     |          |  |
|      |                  | Pin no.                  |                 |                  |                  |     | Pin Name |  |
|      |                  | 64                       | 80              | 100              | 120              | 144 | 176      |  |
|      |                  | -                        | -               | 4 <sup>*1</sup>  | 7 <sup>*1</sup>  | 10  | 12       | P025<br>WR1X <sup>*4, *5</sup><br>SOT4_1<br>PPG25_0<br>TIN2_0                            |
|      |                  | -                        | -               | -                | -                | -   | 13       | P172<br>PPG38_1  |
|      |                  | -                        | 4 <sup>*1</sup> | 5 <sup>*1</sup>  | 8 <sup>*1</sup>  | 11  | 14       | P026<br>A00 <sup>*3, *4, *5</sup><br>SCK4_1<br>PPG26_0<br>TIN3_0                         |
|      |                  | 4 <sup>*1</sup>          | 5 <sup>*1</sup> | 6 <sup>*1</sup>  | 9 <sup>*1</sup>  | 12  | 15       | P027<br>A01 <sup>*2, *3, *4, *5</sup><br>SCS40_1<br>PPG27_0<br>TOT0_0<br>RTO3_1          |
|      |                  | -                        | -               | -                | -                | -   | 16       | P173<br>PPG39_1  |
|      |                  | -                        | -               | 7 <sup>*1</sup>  | 10 <sup>*1</sup> | 13  | 17       | P030<br>A02 <sup>*4, *5</sup><br>SCS41_1<br>PPG28_0<br>TOT1_0                            |
|      |                  | -                        | 6 <sup>*1</sup> | 8 <sup>*1</sup>  | 11 <sup>*1</sup> | 14  | 18       | P031<br>A03 <sup>*3, *4, *5</sup><br>SCS42_1<br>PPG29_0<br>TOT2_0 <sup>*3</sup>          |
|      |                  | 5 <sup>*1</sup>          | 7 <sup>*1</sup> | 9 <sup>*1</sup>  | 12 <sup>*1</sup> | 15  | 19       | P032<br>A04 <sup>*2, *3, *4, *5</sup><br>SCS43_1<br>PPG30_0<br>TOT3_0<br>RTO2_1          |
|      |                  | 6 <sup>*1</sup>          | 8 <sup>*1</sup> | 10 <sup>*1</sup> | 13 <sup>*1</sup> | 16  | 20       | P033<br>A05 <sup>*2, *3, *4, *5</sup><br>PPG31_0<br>ICU3_3<br>TIN4_0<br>RTO1_1<br>SCK3_2 |





| Page   | Section          | Change Results   |         |       |       |                    |     |                        |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|--------|------------------|--|---------|-------|-------|--------------------|-----|------------------------|----------|----|----|-----|-----|-----|-----|--|--|--|--|--|--|--|------|--|--|--|--|--|--|--------------------|------|------|-------|-------|----|----|---------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--|--|--|--|--|--|--|------|--|--|--|--|--|--|------------------------|------|-------|----|----|----|----|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|------|--|--|--|--|--|--|--------------------|------|-------|-------|-------|----|----|---------------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|--|--|--|--|--|--|------|--|--|--|--|--|--|--------------------|-------|-------|-------|-------|----|----|---------------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|------|--|--|--|--|--|--|------------|---|---|-------|-------|----|----|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|------|---|---|---|---|---|----|--------|
| 21, 22 | ■PIN Description | (Continued)<br>(Correct)   |         |       |       |                    |     |                        |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  | <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th>Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P034</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A06 *2, *3, *4, *5</td> </tr> <tr> <td>7 *1</td> <td>9 *1</td> <td>11 *1</td> <td>14 *1</td> <td>17</td> <td>21</td> <td>OCU11_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU2_3</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIN5_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>RTO0_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SOT3_2</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P151</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCK8_0/<br/>SCL8 *2, *3</td> </tr> <tr> <td>8 *1</td> <td>10 *1</td> <td>13</td> <td>16</td> <td>19</td> <td>23</td> <td>OCU9_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG7_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU0_3</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIN7_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ZIN0_2</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>DTTI_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P035</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A07 *2, *3, *4, *5</td> </tr> <tr> <td>9 *1</td> <td>11 *1</td> <td>14 *1</td> <td>17 *1</td> <td>20</td> <td>24</td> <td>SIN8_0 *2, *3</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>OCU8_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TOT4_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AIN0_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>INT11_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P036</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A08 *2, *3, *4, *5</td> </tr> <tr> <td>10 *1</td> <td>12 *1</td> <td>15 *1</td> <td>18 *1</td> <td>21</td> <td>25</td> <td>SCS8_0 *2, *3</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>OCU7_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TOT5_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>BIN0_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P037</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A09 *4, *5</td> </tr> <tr> <td>-</td> <td>-</td> <td>16 *1</td> <td>19 *1</td> <td>22</td> <td>26</td> <td>OCU6_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TOT6_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ZIN0_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P174</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>27</td> <td>TRG8_1</td> </tr> </tbody> </table> | Pin no. |       |       |                    |     |                        | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 |  |  |  |  |  |  |  | P034 |  |  |  |  |  |  | A06 *2, *3, *4, *5 | 7 *1 | 9 *1 | 11 *1 | 14 *1 | 17 | 21 | OCU11_1 |  |  |  |  |  |  | ICU2_3 |  |  |  |  |  |  | TIN5_0 |  |  |  |  |  |  | RTO0_1 |  |  |  |  |  |  | SOT3_2 |  |  |  |  |  |  |  |  |  |  |  |  |  | P151 |  |  |  |  |  |  | SCK8_0/<br>SCL8 *2, *3 | 8 *1 | 10 *1 | 13 | 16 | 19 | 23 | OCU9_1 |  |  |  |  |  |  | TRG7_0 |  |  |  |  |  |  | ICU0_3 |  |  |  |  |  |  | TIN7_0 |  |  |  |  |  |  | ZIN0_2 |  |  |  |  |  |  | DTTI_1 |  |  |  |  |  |  | P035 |  |  |  |  |  |  | A07 *2, *3, *4, *5 | 9 *1 | 11 *1 | 14 *1 | 17 *1 | 20 | 24 | SIN8_0 *2, *3 |  |  |  |  |  |  | OCU8_1 |  |  |  |  |  |  | TOT4_0 |  |  |  |  |  |  | AIN0_0 |  |  |  |  |  |  | INT11_0 |  |  |  |  |  |  | P036 |  |  |  |  |  |  | A08 *2, *3, *4, *5 | 10 *1 | 12 *1 | 15 *1 | 18 *1 | 21 | 25 | SCS8_0 *2, *3 |  |  |  |  |  |  | OCU7_1 |  |  |  |  |  |  | TOT5_0 |  |  |  |  |  |  | BIN0_0 |  |  |  |  |  |  | P037 |  |  |  |  |  |  | A09 *4, *5 | - | - | 16 *1 | 19 *1 | 22 | 26 | OCU6_1 |  |  |  |  |  |  | TOT6_0 |  |  |  |  |  |  | ZIN0_0 |  |  |  |  |  |  | P174 | - | - | - | - | - | 27 | TRG8_1 |
|        |                  | Pin no.  |         |       |       |                    |     | Pin Name               |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  | 64   | 80      | 100   | 120   | 144                | 176 |                        |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | P034                   |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | A06 *2, *3, *4, *5     |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  | 7 *1   | 9 *1    | 11 *1 | 14 *1 | 17                 | 21  | OCU11_1                |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | ICU2_3                 |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | TIN5_0                 |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | RTO0_1                 |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | SOT3_2                 |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     |                        |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | P151                   |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | SCK8_0/<br>SCL8 *2, *3 |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  | 8 *1   | 10 *1   | 13    | 16    | 19                 | 23  | OCU9_1                 |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | TRG7_0                 |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | ICU0_3                 |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | TIN7_0                 |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | ZIN0_2                 |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | DTTI_1                 |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | P035                   |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | A07 *2, *3, *4, *5     |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  | 9 *1   | 11 *1   | 14 *1 | 17 *1 | 20                 | 24  | SIN8_0 *2, *3          |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | OCU8_1                 |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | TOT4_0                 |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | AIN0_0                 |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       |                    |     | INT11_0                |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       | P036               |     |                        |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       | A08 *2, *3, *4, *5 |     |                        |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
| 10 *1  | 12 *1            | 15 *1  | 18 *1   | 21    | 25    | SCS8_0 *2, *3      |     |                        |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       | OCU7_1             |     |                        |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       | TOT5_0             |     |                        |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       | BIN0_0             |     |                        |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       | P037               |     |                        |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       | A09 *4, *5         |     |                        |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
| -      | -                | 16 *1  | 19 *1   | 22    | 26    | OCU6_1             |     |                        |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       | TOT6_0             |     |                        |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       | ZIN0_0             |     |                        |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
|        |                  |  |         |       |       | P174               |     |                        |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |
| -      | -                | -  | -       | -     | 27    | TRG8_1             |     |                        |          |    |    |     |     |     |     |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |      |       |       |    |    |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |                        |      |       |    |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |      |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |       |       |       |       |    |    |               |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |            |   |   |       |       |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |      |   |   |   |   |   |    |        |



| Page    | Section          | Change Results  |         |     |     |          |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|---------|------------------|---|---------|-----|-----|----------|--|--|----------|----|----|-----|-----|-----|-----|--|---|---|---|---|---|----|------|--|--|--|--|--|--|--------|----|----|----|----|----|----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|----|----|----|----|----|----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|----|----|----|----|----|----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|---|---|----|----|----|----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|---|----|----|----|----|----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|----|----|----|----|----|----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|---|---|---|----|----|----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|---|---|---|---|---|----|------|--|--|--|--|--|--|---------|
| 22, 23  | ■PIN Description | <p>A List of "Pin Description" modified.</p> <p>(Error)</p> <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th>Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> <th></th> </tr> </thead> <tbody> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>28</td> <td>P175</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG9_1</td> </tr> <tr> <td>11</td> <td>13</td> <td>17</td> <td>20</td> <td>23</td> <td>29</td> <td>P040</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A10</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG23_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TOT7_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AIN1_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SIN0_1</td> </tr> <tr> <td>12</td> <td>14</td> <td>18</td> <td>21</td> <td>24</td> <td>30</td> <td>P041</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A11</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SIN9_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU9_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>BIN1_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>INT12_0</td> </tr> <tr> <td>13</td> <td>15</td> <td>19</td> <td>22</td> <td>25</td> <td>31</td> <td>P042</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A12</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SOT9_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN47</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU8_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG0_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ZIN1_0</td> </tr> <tr> <td>-</td> <td>-</td> <td>20</td> <td>23</td> <td>26</td> <td>32</td> <td>P043</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A13</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU7_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG1_1</td> </tr> <tr> <td>-</td> <td>16</td> <td>21</td> <td>24</td> <td>27</td> <td>33</td> <td>P044</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A14</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCS9_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU6_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG2_1</td> </tr> <tr> <td>14</td> <td>17</td> <td>22</td> <td>25</td> <td>28</td> <td>34</td> <td>P045</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A15</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCK9_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN46</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU5_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG3_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TOT1_2</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>26</td> <td>29</td> <td>35</td> <td>P046</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A16</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU4_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG4_1</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>36</td> <td>P176</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG10_0</td> </tr> </tbody> </table> | Pin no. |     |     |          |  |  | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 |  | - | - | - | - | - | 28 | P175 |  |  |  |  |  |  | TRG9_1 | 11 | 13 | 17 | 20 | 23 | 29 | P040 |  |  |  |  |  |  | A10 |  |  |  |  |  |  | PPG23_1 |  |  |  |  |  |  | TOT7_0 |  |  |  |  |  |  | AIN1_0 |  |  |  |  |  |  | SIN0_1 | 12 | 14 | 18 | 21 | 24 | 30 | P041 |  |  |  |  |  |  | A11 |  |  |  |  |  |  | SIN9_0 |  |  |  |  |  |  | ICU9_1 |  |  |  |  |  |  | BIN1_0 |  |  |  |  |  |  | INT12_0 | 13 | 15 | 19 | 22 | 25 | 31 | P042 |  |  |  |  |  |  | A12 |  |  |  |  |  |  | SOT9_0 |  |  |  |  |  |  | AN47 |  |  |  |  |  |  | ICU8_1 |  |  |  |  |  |  | TRG0_1 |  |  |  |  |  |  | ZIN1_0 | - | - | 20 | 23 | 26 | 32 | P043 |  |  |  |  |  |  | A13 |  |  |  |  |  |  | ICU7_1 |  |  |  |  |  |  | TRG1_1 | - | 16 | 21 | 24 | 27 | 33 | P044 |  |  |  |  |  |  | A14 |  |  |  |  |  |  | SCS9_0 |  |  |  |  |  |  | ICU6_1 |  |  |  |  |  |  | TRG2_1 | 14 | 17 | 22 | 25 | 28 | 34 | P045 |  |  |  |  |  |  | A15 |  |  |  |  |  |  | SCK9_0 |  |  |  |  |  |  | AN46 |  |  |  |  |  |  | ICU5_1 |  |  |  |  |  |  | TRG3_1 |  |  |  |  |  |  | TOT1_2 | - | - | - | 26 | 29 | 35 | P046 |  |  |  |  |  |  | A16 |  |  |  |  |  |  | ICU4_1 |  |  |  |  |  |  | TRG4_1 | - | - | - | - | - | 36 | P176 |  |  |  |  |  |  | TRG10_0 |
| Pin no. |                  |   |         |     |     | Pin Name |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
| 64      | 80               | 100   | 120     | 144 | 176 |          |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
| -       | -                | -   | -       | -   | 28  | P175     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TRG9_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
| 11      | 13               | 17  | 20      | 23  | 29  | P040     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | A10      |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | PPG23_1  |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TOT7_0   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | AIN1_0   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | SIN0_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
| 12      | 14               | 18  | 21      | 24  | 30  | P041     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | A11      |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | SIN9_0   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | ICU9_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | BIN1_0   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | INT12_0  |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
| 13      | 15               | 19  | 22      | 25  | 31  | P042     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | A12      |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | SOT9_0   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | AN47     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | ICU8_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TRG0_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | ZIN1_0   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
| -       | -                | 20  | 23      | 26  | 32  | P043     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | A13      |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | ICU7_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TRG1_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
| -       | 16               | 21  | 24      | 27  | 33  | P044     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | A14      |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | SCS9_0   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | ICU6_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TRG2_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
| 14      | 17               | 22  | 25      | 28  | 34  | P045     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | A15      |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | SCK9_0   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | AN46     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | ICU5_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TRG3_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TOT1_2   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
| -       | -                | -   | 26      | 29  | 35  | P046     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | A16      |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | ICU4_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TRG4_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
| -       | -                | -   | -       | -   | 36  | P176     |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |
|         |                  |   |         |     |     | TRG10_0  |  |  |          |    |    |     |     |     |     |  |   |   |   |   |   |    |      |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |



| Page             | Section          | Change Results   |                  |                  |                  |                               |          |                               |
|------------------|------------------|------------------|------------------|------------------|------------------|-------------------------------|----------|-------------------------------|
| 22, 23           | ■PIN Description | (Continued)      |                  |                  |                  |                               |          |                               |
|                  |                  | (Correct)        |                  |                  |                  |                               |          |                               |
|                  |                  | Pin no.          |                  |                  |                  |                               | Pin Name |                               |
|                  |                  | 64               | 80               | 100              | 120              | 144                           | 176      |                               |
|                  |                  | -                | -                | -                | -                | -                             | 28       | P175                          |
|                  |                  |                  |                  |                  |                  |                               |          | TRG9_1                        |
|                  |                  |                  |                  |                  |                  |                               |          | P040                          |
|                  |                  |                  |                  |                  |                  |                               |          | A10 <sup>*2, *3, *4, *5</sup> |
|                  |                  | 11 <sup>*1</sup> | 13 <sup>*1</sup> | 17 <sup>*1</sup> | 20 <sup>*1</sup> | 23                            | 29       | PPG23_1                       |
|                  |                  |                  |                  |                  |                  |                               |          | TOT7_0                        |
|                  |                  |                  |                  |                  |                  |                               |          | AIN1_0                        |
|                  |                  |                  |                  |                  |                  |                               |          | SIN0_1                        |
|                  |                  |                  |                  |                  |                  |                               |          | P041                          |
|                  |                  |                  |                  |                  |                  |                               |          | A11 <sup>*2, *3, *4, *5</sup> |
|                  |                  | 12 <sup>*1</sup> | 14 <sup>*1</sup> | 18 <sup>*1</sup> | 21 <sup>*1</sup> | 24                            | 30       | SIN9_0                        |
|                  |                  |                  |                  |                  |                  |                               |          | ICU9_1                        |
|                  |                  |                  |                  |                  |                  |                               |          | BIN1_0                        |
|                  |                  |                  |                  |                  |                  |                               |          | INT12_0                       |
|                  |                  |                  |                  |                  |                  |                               |          | P042                          |
|                  |                  |                  |                  |                  |                  |                               |          | A12 <sup>*2, *3, *4, *5</sup> |
|                  |                  | 13 <sup>*1</sup> | 15 <sup>*1</sup> | 19 <sup>*1</sup> | 22 <sup>*1</sup> | 25                            | 31       | SOT9_0                        |
|                  |                  |                  |                  |                  |                  |                               |          | AN47                          |
|                  |                  |                  |                  |                  |                  |                               |          | ICU8_1                        |
|                  |                  |                  |                  |                  |                  |                               |          | TRG0_1                        |
|                  |                  |                  |                  |                  |                  |                               |          | ZIN1_0                        |
|                  |                  |                  |                  |                  |                  |                               |          | P043                          |
|                  |                  | -                | -                | 20 <sup>*1</sup> | 23 <sup>*1</sup> | 26                            | 32       | A13 <sup>*4, *5</sup>         |
|                  |                  |                  |                  |                  |                  |                               |          | ICU7_1                        |
|                  |                  |                  |                  |                  |                  |                               |          | TRG1_1                        |
|                  |                  |                  |                  |                  |                  | P044                          |          |                               |
|                  |                  |                  |                  |                  |                  | A14 <sup>*3, *4, *5</sup>     |          |                               |
| -                | 16 <sup>*1</sup> | 21 <sup>*1</sup> | 24 <sup>*1</sup> | 27               | 33               | SCS9_0                        |          |                               |
|                  |                  |                  |                  |                  |                  | ICU6_1                        |          |                               |
|                  |                  |                  |                  |                  |                  | TRG2_1                        |          |                               |
|                  |                  |                  |                  |                  |                  | P045                          |          |                               |
|                  |                  |                  |                  |                  |                  | A15 <sup>*2, *3, *4, *5</sup> |          |                               |
| 14 <sup>*1</sup> | 17 <sup>*1</sup> | 22 <sup>*1</sup> | 25 <sup>*1</sup> | 28               | 34               | SCK9_0                        |          |                               |
|                  |                  |                  |                  |                  |                  | AN46                          |          |                               |
|                  |                  |                  |                  |                  |                  | ICU5_1                        |          |                               |
|                  |                  |                  |                  |                  |                  | TRG3_1                        |          |                               |
|                  |                  |                  |                  |                  |                  | TOT1_2                        |          |                               |
|                  |                  |                  |                  |                  |                  | P046                          |          |                               |
| -                | -                | -                | 26 <sup>*1</sup> | 29               | 35               | A16 <sup>*5</sup>             |          |                               |
|                  |                  |                  |                  |                  |                  | ICU4_1                        |          |                               |
|                  |                  |                  |                  |                  |                  | TRG4_1                        |          |                               |
| -                | -                | -                | -                | -                | 36               | P176                          |          |                               |
|                  |                  |                  |                  |                  |                  | TRG10_0                       |          |                               |



| Page    | Section          | Change Results   |         |     |     |          |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|---------|------------------|--|---------|-----|-----|----------|--|--|----------|----|----|-----|-----|-----|-----|--|----|----|----|----|----|----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|---|---|---|---|---|----|------|--|--|--|--|--|--|---------|--|--|--|--|--|--|------|--|--|--|----|----|----|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|--|--|--|--|----|----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|----|----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|---------|--|--|--|--|--|--|---------|----|----|----|----|----|----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|------|--|--|--|--|--|--|---------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|--|--|--|--|----|----|------|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|----|----|----|----|----|----|------|--|--|--|--|--|--|------|--|--|--|--|--|--|---------|--|--|--|--|--|--|------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|--|--|--|--|--|--|------|--|--|--|--|--|--|------|--|--|--|----|----|----|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|
| 23, 24  | ■PIN Description | <p>A List of "Pin Description" modified.</p> <p>(Error)</p> <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th>Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> <th></th> </tr> </thead> <tbody> <tr> <td>15</td> <td>18</td> <td>23</td> <td>27</td> <td>30</td> <td>37</td> <td>P047</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A17</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN45</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG8_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIN3_2</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SOT0_1</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>38</td> <td>P177</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG11_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P050</td> </tr> <tr> <td></td> <td></td> <td></td> <td>28</td> <td>31</td> <td>39</td> <td>A18</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG5_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG33_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>32</td> <td>40</td> <td>P051</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A19</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG9_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>33</td> <td>41</td> <td>P052</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A20</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG34_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>INT14_0</td> </tr> <tr> <td>16</td> <td>19</td> <td>24</td> <td>29</td> <td>34</td> <td>42</td> <td>P053</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A21</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN44</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG35_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>INT14_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCK0_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>35</td> <td>43</td> <td>P054</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SYSCLK</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG36_0</td> </tr> <tr> <td>17</td> <td>22</td> <td>27</td> <td>32</td> <td>38</td> <td>46</td> <td>P055</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>CS2X</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SIN10_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN43</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG37_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIN4_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P056</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>CS3X</td> </tr> <tr> <td></td> <td></td> <td></td> <td>33</td> <td>39</td> <td>49</td> <td>ICU9_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG0_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU0_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIN5_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>DTTI_2</td> </tr> </tbody> </table> | Pin no. |     |     |          |  |  | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 |  | 15 | 18 | 23 | 27 | 30 | 37 | P047 |  |  |  |  |  |  | A17 |  |  |  |  |  |  | AN45 |  |  |  |  |  |  | TRG8_0 |  |  |  |  |  |  | TIN3_2 |  |  |  |  |  |  | SOT0_1 | - | - | - | - | - | 38 | P177 |  |  |  |  |  |  | TRG11_0 |  |  |  |  |  |  | P050 |  |  |  | 28 | 31 | 39 | A18 |  |  |  |  |  |  | TRG5_1 |  |  |  |  |  |  | PPG33_0 |  |  |  |  | 32 | 40 | P051 |  |  |  |  |  |  | A19 |  |  |  |  |  |  | TRG9_0 |  |  |  |  | 33 | 41 | P052 |  |  |  |  |  |  | A20 |  |  |  |  |  |  | PPG34_0 |  |  |  |  |  |  | INT14_0 | 16 | 19 | 24 | 29 | 34 | 42 | P053 |  |  |  |  |  |  | A21 |  |  |  |  |  |  | AN44 |  |  |  |  |  |  | PPG35_0 |  |  |  |  |  |  | INT14_1 |  |  |  |  |  |  | SCK0_1 |  |  |  |  | 35 | 43 | P054 |  |  |  |  |  |  | SYSCLK |  |  |  |  |  |  | PPG36_0 | 17 | 22 | 27 | 32 | 38 | 46 | P055 |  |  |  |  |  |  | CS2X |  |  |  |  |  |  | SIN10_0 |  |  |  |  |  |  | AN43 |  |  |  |  |  |  | PPG37_0 |  |  |  |  |  |  | TIN4_1 |  |  |  |  |  |  | P056 |  |  |  |  |  |  | CS3X |  |  |  | 33 | 39 | 49 | ICU9_0 |  |  |  |  |  |  | PPG0_1 |  |  |  |  |  |  | ICU0_1 |  |  |  |  |  |  | TIN5_1 |  |  |  |  |  |  | DTTI_2 |
| Pin no. |                  |  |         |     |     | Pin Name |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| 64      | 80               | 100  | 120     | 144 | 176 |          |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| 15      | 18               | 23   | 27      | 30  | 37  | P047     |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | A17      |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | AN45     |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | TRG8_0   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | TIN3_2   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | SOT0_1   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| -       | -                | -  | -       | -   | 38  | P177     |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | TRG11_0  |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | P050     |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  | 28      | 31  | 39  | A18      |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | TRG5_1   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | PPG33_0  |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         | 32  | 40  | P051     |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | A19      |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | TRG9_0   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         | 33  | 41  | P052     |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | A20      |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | PPG34_0  |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | INT14_0  |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| 16      | 19               | 24   | 29      | 34  | 42  | P053     |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | A21      |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | AN44     |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | PPG35_0  |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | INT14_1  |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | SCK0_1   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         | 35  | 43  | P054     |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | SYSCLK   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | PPG36_0  |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| 17      | 22               | 27   | 32      | 38  | 46  | P055     |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | CS2X     |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | SIN10_0  |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | AN43     |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | PPG37_0  |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | TIN4_1   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | P056     |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | CS3X     |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  | 33      | 39  | 49  | ICU9_0   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | PPG0_1   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | ICU0_1   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | TIN5_1   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | DTTI_2   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |    |    |    |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |    |    |    |    |    |    |      |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |      |  |  |  |    |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |



| Page             | Section          | Change Results  |                  |                  |                  |                                |     |                               |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|------------------|------------------|---|------------------|------------------|------------------|--------------------------------|-----|-------------------------------|----------|----|----|-----|-----|-----|-----|--|--|--|--|--|--|------|--|--|--|--|--|--|-------------------------------|------------------|------------------|------------------|------------------|----|----|------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|---|---|---|---|---|----|------|--|--|--|--|--|--|---------|--|--|--|--|--|--|------|--|--|--|------------------|----|----|-------------------|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|--|--|--|--|----|----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|----|----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|---------|--|--|--|--|--|--|---------|--|--|--|--|--|--|------|------------------|------------------|------------------|------------------|----|----|-------------------------------|--|--|--|--|--|--|------|--|--|--|--|--|--|---------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|--|--|--|--|----|----|------|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|--|--|--|--|--|--|------|------------------|------------------|------------------|------------------|----|----|--------------------------------|--|--|--|--|--|--|---------|--|--|--|--|--|--|------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|--|--|--|--|--|--|------|--|--|--|--|--|--|--------------------|--|--|--|------------------|----|----|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|
| 23, 24           | ■PIN Description | (Continued)<br>(Correct)  |                  |                  |                  |                                |     |                               |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  | <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th rowspan="2">Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P047</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A17<sup>*2, *3, *4, *5</sup></td> </tr> <tr> <td>15<sup>*1</sup></td> <td>18<sup>*1</sup></td> <td>23<sup>*1</sup></td> <td>27<sup>*1</sup></td> <td>30</td> <td>37</td> <td>AN45</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG8_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIN3_2</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SOT0_1</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>38</td> <td>P177</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG11_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P050</td> </tr> <tr> <td></td> <td></td> <td></td> <td>28<sup>*1</sup></td> <td>31</td> <td>39</td> <td>A18<sup>*5</sup></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG5_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG33_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>32</td> <td>40</td> <td>P051</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A19</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG9_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>33</td> <td>41</td> <td>P052</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A20</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG34_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>INT14_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P053</td> </tr> <tr> <td>16<sup>*1</sup></td> <td>19<sup>*1</sup></td> <td>24<sup>*1</sup></td> <td>29<sup>*1</sup></td> <td>34</td> <td>42</td> <td>A21<sup>*2, *3, *4, *5</sup></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN44</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG35_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>INT14_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCK0_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>35</td> <td>43</td> <td>P054</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SYSCLK</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG36_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P055</td> </tr> <tr> <td>17<sup>*1</sup></td> <td>22<sup>*1</sup></td> <td>27<sup>*1</sup></td> <td>32<sup>*1</sup></td> <td>38</td> <td>46</td> <td>CS2X<sup>*2, *3, *4, *5</sup></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SIN10_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN43</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG37_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIN4_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>P056</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>CS3X<sup>*5</sup></td> </tr> <tr> <td></td> <td></td> <td></td> <td>33<sup>*1</sup></td> <td>39</td> <td>49</td> <td>ICU9_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG0_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU0_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIN5_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>DTTI_2</td> </tr> </tbody> </table> | Pin no.          |                  |                  |                                |     |                               | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 |  |  |  |  |  |  | P047 |  |  |  |  |  |  | A17 <sup>*2, *3, *4, *5</sup> | 15 <sup>*1</sup> | 18 <sup>*1</sup> | 23 <sup>*1</sup> | 27 <sup>*1</sup> | 30 | 37 | AN45 |  |  |  |  |  |  | TRG8_0 |  |  |  |  |  |  | TIN3_2 |  |  |  |  |  |  | SOT0_1 | - | - | - | - | - | 38 | P177 |  |  |  |  |  |  | TRG11_0 |  |  |  |  |  |  | P050 |  |  |  | 28 <sup>*1</sup> | 31 | 39 | A18 <sup>*5</sup> |  |  |  |  |  |  | TRG5_1 |  |  |  |  |  |  | PPG33_0 |  |  |  |  | 32 | 40 | P051 |  |  |  |  |  |  | A19 |  |  |  |  |  |  | TRG9_0 |  |  |  |  | 33 | 41 | P052 |  |  |  |  |  |  | A20 |  |  |  |  |  |  | PPG34_0 |  |  |  |  |  |  | INT14_0 |  |  |  |  |  |  | P053 | 16 <sup>*1</sup> | 19 <sup>*1</sup> | 24 <sup>*1</sup> | 29 <sup>*1</sup> | 34 | 42 | A21 <sup>*2, *3, *4, *5</sup> |  |  |  |  |  |  | AN44 |  |  |  |  |  |  | PPG35_0 |  |  |  |  |  |  | INT14_1 |  |  |  |  |  |  | SCK0_1 |  |  |  |  | 35 | 43 | P054 |  |  |  |  |  |  | SYSCLK |  |  |  |  |  |  | PPG36_0 |  |  |  |  |  |  | P055 | 17 <sup>*1</sup> | 22 <sup>*1</sup> | 27 <sup>*1</sup> | 32 <sup>*1</sup> | 38 | 46 | CS2X <sup>*2, *3, *4, *5</sup> |  |  |  |  |  |  | SIN10_0 |  |  |  |  |  |  | AN43 |  |  |  |  |  |  | PPG37_0 |  |  |  |  |  |  | TIN4_1 |  |  |  |  |  |  | P056 |  |  |  |  |  |  | CS3X <sup>*5</sup> |  |  |  | 33 <sup>*1</sup> | 39 | 49 | ICU9_0 |  |  |  |  |  |  | PPG0_1 |  |  |  |  |  |  | ICU0_1 |  |  |  |  |  |  | TIN5_1 |  |  |  |  |  |  | DTTI_2 |
|                  |                  | Pin no.   |                  |                  |                  |                                |     | Pin Name                      |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  | 64  | 80               | 100              | 120              | 144                            | 176 |                               |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | P047                          |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | A17 <sup>*2, *3, *4, *5</sup> |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  | 15 <sup>*1</sup>  | 18 <sup>*1</sup> | 23 <sup>*1</sup> | 27 <sup>*1</sup> | 30                             | 37  | AN45                          |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | TRG8_0                        |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | TIN3_2                        |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | SOT0_1                        |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  | -   | -                | -                | -                | -                              | 38  | P177                          |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | TRG11_0                       |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | P050                          |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  | 28 <sup>*1</sup> | 31                             | 39  | A18 <sup>*5</sup>             |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | TRG5_1                        |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | PPG33_0                       |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  | 32                             | 40  | P051                          |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | A19                           |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | TRG9_0                        |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  | 33                             | 41  | P052                          |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | A20                           |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | PPG34_0                       |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | INT14_0                       |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | P053                          |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  | 16 <sup>*1</sup>  | 19 <sup>*1</sup> | 24 <sup>*1</sup> | 29 <sup>*1</sup> | 34                             | 42  | A21 <sup>*2, *3, *4, *5</sup> |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | AN44                          |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | PPG35_0                       |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | INT14_1                       |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | SCK0_1                        |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  | 35                             | 43  | P054                          |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | SYSCLK                        |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | PPG36_0                       |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  |                                |     | P055                          |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| 17 <sup>*1</sup> | 22 <sup>*1</sup> | 27 <sup>*1</sup>  | 32 <sup>*1</sup> | 38               | 46               | CS2X <sup>*2, *3, *4, *5</sup> |     |                               |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  | SIN10_0                        |     |                               |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  | AN43                           |     |                               |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  | PPG37_0                        |     |                               |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  | TIN4_1                         |     |                               |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  | P056                           |     |                               |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  | CS3X <sup>*5</sup>             |     |                               |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   | 33 <sup>*1</sup> | 39               | 49               | ICU9_0                         |     |                               |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  | PPG0_1                         |     |                               |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  | ICU0_1                         |     |                               |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  | TIN5_1                         |     |                               |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |                  |                  | DTTI_2                         |     |                               |          |    |    |     |     |     |     |  |  |  |  |  |  |      |  |  |  |  |  |  |                               |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |   |   |   |   |   |    |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |                  |    |    |                   |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |     |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |    |    |      |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |      |                  |                  |                  |                  |    |    |                                |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |                    |  |  |  |                  |    |    |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |

| Page   | Section          | Change Results   |            |                          |  |  |                         |                         |                                      |            |                          |                                       |  |                         |                         |                                      |
|--|------------------|--|------------|--------------------------|--|--|-------------------------|-------------------------|--------------------------------------|------------|--------------------------|---------------------------------------|--|-------------------------|-------------------------|--------------------------------------|
| 24   | ■PIN Description | <p>A List of "Pin Description" modified.</p> <p>(Error)</p> <table border="1" data-bbox="621 422 1162 758"> <tr> <td>Function*2</td> </tr> <tr> <td>General-purpose I/O port</td> </tr> <tr> <td>External Bus chip select 2 output pin(0)</td> </tr> <tr> <td>Multi-function serial ch.10 serial data input pin(0)</td> </tr> <tr> <td>ADC analog 43 input pin</td> </tr> <tr> <td>PPG ch.37 output pin(0)</td> </tr> <tr> <td>Reload timer ch.4 event input pin(1)</td> </tr> </table> <p>(Correct)</p> <table border="1" data-bbox="621 821 1162 1157"> <tr> <td>Function*9</td> </tr> <tr> <td>General-purpose I/O port</td> </tr> <tr> <td>External Bus chip select 2 output pin</td> </tr> <tr> <td>Multi-function serial ch.10 serial data input pin(0)</td> </tr> <tr> <td>ADC analog 43 input pin</td> </tr> <tr> <td>PPG ch.37 output pin(0)</td> </tr> <tr> <td>Reload timer ch.4 event input pin(1)</td> </tr> </table> | Function*2 | General-purpose I/O port | External Bus chip select 2 output pin(0) | Multi-function serial ch.10 serial data input pin(0) | ADC analog 43 input pin | PPG ch.37 output pin(0) | Reload timer ch.4 event input pin(1) | Function*9 | General-purpose I/O port | External Bus chip select 2 output pin | Multi-function serial ch.10 serial data input pin(0) | ADC analog 43 input pin | PPG ch.37 output pin(0) | Reload timer ch.4 event input pin(1) |
| Function*2   |                  |  |            |                          |  |  |                         |                         |                                      |            |                          |                                       |  |                         |                         |                                      |
| General-purpose I/O port                             |                  |  |            |                          |  |  |                         |                         |                                      |            |                          |                                       |  |                         |                         |                                      |
| External Bus chip select 2 output pin(0)             |                  |  |            |                          |  |  |                         |                         |                                      |            |                          |                                       |  |                         |                         |                                      |
| Multi-function serial ch.10 serial data input pin(0) |                  |  |            |                          |  |  |                         |                         |                                      |            |                          |                                       |  |                         |                         |                                      |
| ADC analog 43 input pin                              |                  |  |            |                          |  |  |                         |                         |                                      |            |                          |                                       |  |                         |                         |                                      |
| PPG ch.37 output pin(0)                              |                  |  |            |                          |  |  |                         |                         |                                      |            |                          |                                       |  |                         |                         |                                      |
| Reload timer ch.4 event input pin(1)                 |                  |  |            |                          |  |  |                         |                         |                                      |            |                          |                                       |  |                         |                         |                                      |
| Function*9   |                  |  |            |                          |  |  |                         |                         |                                      |            |                          |                                       |  |                         |                         |                                      |
| General-purpose I/O port                             |                  |  |            |                          |  |  |                         |                         |                                      |            |                          |                                       |  |                         |                         |                                      |
| External Bus chip select 2 output pin                |                  |  |            |                          |  |  |                         |                         |                                      |            |                          |                                       |  |                         |                         |                                      |
| Multi-function serial ch.10 serial data input pin(0) |                  |  |            |                          |  |  |                         |                         |                                      |            |                          |                                       |  |                         |                         |                                      |
| ADC analog 43 input pin                              |                  |  |            |                          |  |  |                         |                         |                                      |            |                          |                                       |  |                         |                         |                                      |
| PPG ch.37 output pin(0)                              |                  |  |            |                          |  |  |                         |                         |                                      |            |                          |                                       |  |                         |                         |                                      |
| Reload timer ch.4 event input pin(1)                 |                  |  |            |                          |  |  |                         |                         |                                      |            |                          |                                       |  |                         |                         |                                      |

| Page   | Section          | Change Results   |            |                          |  |                                 |                        |                                 |                                      |  |            |                          |                                       |                                 |                        |                                 |                                      |  |
|--|------------------|--|------------|--------------------------|--|---------------------------------|------------------------|---------------------------------|--------------------------------------|--|------------|--------------------------|---------------------------------------|---------------------------------|------------------------|---------------------------------|--------------------------------------|--|
| 24   | ■PIN Description | <p>A List of "Pin Description" modified.</p> <p>(Error)</p> <table border="1" data-bbox="621 422 1162 762"> <tr> <td>Function*2</td> </tr> <tr> <td>General-purpose I/O port</td> </tr> <tr> <td>External Bus chip select 3 output pin(0)</td> </tr> <tr> <td>Input capture ch.9 input pin(0)</td> </tr> <tr> <td>PPG ch.0 output pin(1)</td> </tr> <tr> <td>Input capture ch.0 input pin(1)</td> </tr> <tr> <td>Reload timer ch.5 event input pin(1)</td> </tr> <tr> <td>Waveform generator ch.0 to ch.5 input pin(2)</td> </tr> </table> <p>(Correct)</p> <table border="1" data-bbox="621 825 1162 1165"> <tr> <td>Function*9</td> </tr> <tr> <td>General-purpose I/O port</td> </tr> <tr> <td>External Bus chip select 3 output pin</td> </tr> <tr> <td>Input capture ch.9 input pin(0)</td> </tr> <tr> <td>PPG ch.0 output pin(1)</td> </tr> <tr> <td>Input capture ch.0 input pin(1)</td> </tr> <tr> <td>Reload timer ch.5 event input pin(1)</td> </tr> <tr> <td>Waveform generator ch.0 to ch.5 input pin(2)</td> </tr> </table> | Function*2 | General-purpose I/O port | External Bus chip select 3 output pin(0) | Input capture ch.9 input pin(0) | PPG ch.0 output pin(1) | Input capture ch.0 input pin(1) | Reload timer ch.5 event input pin(1) | Waveform generator ch.0 to ch.5 input pin(2) | Function*9 | General-purpose I/O port | External Bus chip select 3 output pin | Input capture ch.9 input pin(0) | PPG ch.0 output pin(1) | Input capture ch.0 input pin(1) | Reload timer ch.5 event input pin(1) | Waveform generator ch.0 to ch.5 input pin(2) |
| Function*2                                   |                  |  |            |                          |  |                                 |                        |                                 |                                      |  |            |                          |                                       |                                 |                        |                                 |                                      |  |
| General-purpose I/O port                     |                  |  |            |                          |  |                                 |                        |                                 |                                      |  |            |                          |                                       |                                 |                        |                                 |                                      |  |
| External Bus chip select 3 output pin(0)     |                  |  |            |                          |  |                                 |                        |                                 |                                      |  |            |                          |                                       |                                 |                        |                                 |                                      |  |
| Input capture ch.9 input pin(0)              |                  |  |            |                          |  |                                 |                        |                                 |                                      |  |            |                          |                                       |                                 |                        |                                 |                                      |  |
| PPG ch.0 output pin(1)                       |                  |  |            |                          |  |                                 |                        |                                 |                                      |  |            |                          |                                       |                                 |                        |                                 |                                      |  |
| Input capture ch.0 input pin(1)              |                  |  |            |                          |  |                                 |                        |                                 |                                      |  |            |                          |                                       |                                 |                        |                                 |                                      |  |
| Reload timer ch.5 event input pin(1)         |                  |  |            |                          |  |                                 |                        |                                 |                                      |  |            |                          |                                       |                                 |                        |                                 |                                      |  |
| Waveform generator ch.0 to ch.5 input pin(2) |                  |  |            |                          |  |                                 |                        |                                 |                                      |  |            |                          |                                       |                                 |                        |                                 |                                      |  |
| Function*9                                   |                  |  |            |                          |  |                                 |                        |                                 |                                      |  |            |                          |                                       |                                 |                        |                                 |                                      |  |
| General-purpose I/O port                     |                  |  |            |                          |  |                                 |                        |                                 |                                      |  |            |                          |                                       |                                 |                        |                                 |                                      |  |
| External Bus chip select 3 output pin        |                  |  |            |                          |  |                                 |                        |                                 |                                      |  |            |                          |                                       |                                 |                        |                                 |                                      |  |
| Input capture ch.9 input pin(0)              |                  |  |            |                          |  |                                 |                        |                                 |                                      |  |            |                          |                                       |                                 |                        |                                 |                                      |  |
| PPG ch.0 output pin(1)                       |                  |  |            |                          |  |                                 |                        |                                 |                                      |  |            |                          |                                       |                                 |                        |                                 |                                      |  |
| Input capture ch.0 input pin(1)              |                  |  |            |                          |  |                                 |                        |                                 |                                      |  |            |                          |                                       |                                 |                        |                                 |                                      |  |
| Reload timer ch.5 event input pin(1)         |                  |  |            |                          |  |                                 |                        |                                 |                                      |  |            |                          |                                       |                                 |                        |                                 |                                      |  |
| Waveform generator ch.0 to ch.5 input pin(2) |                  |  |            |                          |  |                                 |                        |                                 |                                      |  |            |                          |                                       |                                 |                        |                                 |                                      |  |



| Page             | Section          | Change Results  |                  |     |     |                                   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|------------------|------------------|---|------------------|-----|-----|-----------------------------------|--|--|----------|----|----|-----|-----|-----|-----|--|----|----|----|----|----|----|------|--|--|--|--|--|--|-----------------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|---------|--|--|--|--|--|----------|----|----|-----|-----|-----|-----|--------|---|------------------|------------------|----|----|----|--------|--|--|--|--|--|--|-----------------------------------|--|--|--|--|--|--|--------|---------|--|--|--|--|--|----------|----|----|-----|-----|-----|-----|--|------------------|------------------|------------------|------------------|----|----|------|--|--|--|--|--|--|-------------------------------|--|--|--|--|--|--|---------|--|--|--|--|--|--|------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|
| 25               | ■PIN Description | <p>A List of "Pin Description" modified.</p> <p>(Error)</p> <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th>Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> <th></th> </tr> </thead> <tbody> <tr> <td>19</td> <td>24</td> <td>29</td> <td>35</td> <td>41</td> <td>51</td> <td>P057</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>RDY</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCK10_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN42</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU8_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG0_2</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG1_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU1_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIN6_1</td> </tr> </tbody> </table> <p>(Correct)</p> <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th>Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> <th></th> </tr> </thead> <tbody> <tr> <td>19<sup>*1</sup></td> <td>24<sup>*1</sup></td> <td>29<sup>*1</sup></td> <td>35<sup>*1</sup></td> <td>41</td> <td>51</td> <td>P057</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>RDY<sup>*2, *3, *4, *5</sup></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCK10_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN42</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU8_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TRG0_2</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG1_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU1_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIN6_1</td> </tr> </tbody> </table> | Pin no.          |     |     |                                   |  |  | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 |  | 19 | 24 | 29 | 35 | 41 | 51 | P057 |  |  |  |  |  |  | RDY             |  |  |  |  |  |  | SCK10_1 |  |  |  |  |  |  | AN42   |         |  |  |  |  |  | ICU8_0   |    |    |     |     |     |     | TRG0_2 |   |                  |                  |    |    |    | PPG1_1 |  |  |  |  |  |  | ICU1_1                            |  |  |  |  |  |  | TIN6_1 | Pin no. |  |  |  |  |  | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 |  | 19 <sup>*1</sup> | 24 <sup>*1</sup> | 29 <sup>*1</sup> | 35 <sup>*1</sup> | 41 | 51 | P057 |  |  |  |  |  |  | RDY <sup>*2, *3, *4, *5</sup> |  |  |  |  |  |  | SCK10_1 |  |  |  |  |  |  | AN42 |  |  |  |  |  |  | ICU8_0 |  |  |  |  |  |  | TRG0_2 |  |  |  |  |  |  | PPG1_1 |  |  |  |  |  |  | ICU1_1 |  |  |  |  |  |  | TIN6_1 |
| Pin no.          |                  |   |                  |     |     | Pin Name                          |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| 64               | 80               | 100   | 120              | 144 | 176 |                                   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| 19               | 24               | 29  | 35               | 41  | 51  | P057                              |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | RDY                               |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | SCK10_1                           |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | AN42                              |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | ICU8_0                            |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | TRG0_2                            |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | PPG1_1                            |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | ICU1_1                            |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | TIN6_1                            |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| Pin no.          |                  |   |                  |     |     | Pin Name                          |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| 64               | 80               | 100   | 120              | 144 | 176 |                                   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| 19 <sup>*1</sup> | 24 <sup>*1</sup> | 29 <sup>*1</sup>  | 35 <sup>*1</sup> | 41  | 51  | P057                              |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | RDY <sup>*2, *3, *4, *5</sup>     |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | SCK10_1                           |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | AN42                              |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | ICU8_0                            |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | TRG0_2                            |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | PPG1_1                            |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | ICU1_1                            |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | TIN6_1                            |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| 27               | ■PIN Description | <p>A List of "Pin Description" modified.</p> <p>(Error)</p> <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th>Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> <th></th> </tr> </thead> <tbody> <tr> <td>-</td> <td>35</td> <td>43</td> <td>49</td> <td>57</td> <td>71</td> <td>P073</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SOT4_0/<br/>SDA4</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN33</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU3_2</td> </tr> </tbody> </table> <p>(Correct)</p> <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th>Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> <th></th> </tr> </thead> <tbody> <tr> <td>-</td> <td>35<sup>*3</sup></td> <td>43<sup>*4</sup></td> <td>49</td> <td>57</td> <td>71</td> <td>P073</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SOT4_0/<br/>SDA4<sup>*3, *4</sup></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN33</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU3_2</td> </tr> </tbody> </table>   | Pin no.          |     |     |                                   |  |  | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 |  | -  | 35 | 43 | 49 | 57 | 71 | P073 |  |  |  |  |  |  | SOT4_0/<br>SDA4 |  |  |  |  |  |  | AN33    |  |  |  |  |  |  | ICU3_2 | Pin no. |  |  |  |  |  | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 |        | - | 35 <sup>*3</sup> | 43 <sup>*4</sup> | 49 | 57 | 71 | P073   |  |  |  |  |  |  | SOT4_0/<br>SDA4 <sup>*3, *4</sup> |  |  |  |  |  |  | AN33   |         |  |  |  |  |  | ICU3_2   |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| Pin no.          |                  |   |                  |     |     | Pin Name                          |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| 64               | 80               | 100   | 120              | 144 | 176 |                                   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| -                | 35               | 43  | 49               | 57  | 71  | P073                              |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | SOT4_0/<br>SDA4                   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | AN33                              |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | ICU3_2                            |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| Pin no.          |                  |   |                  |     |     | Pin Name                          |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| 64               | 80               | 100   | 120              | 144 | 176 |                                   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
| -                | 35 <sup>*3</sup> | 43 <sup>*4</sup>  | 49               | 57  | 71  | P073                              |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | SOT4_0/<br>SDA4 <sup>*3, *4</sup> |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | AN33                              |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |
|                  |                  |   |                  |     |     | ICU3_2                            |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |         |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |        |   |                  |                  |    |    |    |        |  |  |  |  |  |  |                                   |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |                  |                  |    |    |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |  |  |  |  |  |  |        |



| Page             | Section          | Change Results   |         |     |     |                         |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
|------------------|------------------|--|---------|-----|-----|-------------------------|--|--|----------|----|----|-----|-----|-----|-----|--|----|----|----|----|----|----|------|--|--|--|--|--|--|-------|--|--|--|--|--|--|---------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|--|--|--|--|--|--|--------|---------|--|--|--|--|--|----------|----|----|-----|-----|-----|-----|--|------------------|------------------|----|----|----|----|------|--|--|--|--|--|--|-------|--|--|--|--|--|--|---------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|--|--|--|--|--|--|-------------------------|
| 29               | ■PIN Description | <p>A List of "Pin Description" modified.</p> <p>(Error)</p> <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th>Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> <th></th> </tr> </thead> <tbody> <tr> <td>34</td> <td>42</td> <td>52</td> <td>62</td> <td>77</td> <td>96</td> <td>P093</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TX0_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SIN11_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN7</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU4_2</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG16_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU3_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TOT2_1</td> </tr> </tbody> </table> <p>(Correct)</p> <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th>Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> <th></th> </tr> </thead> <tbody> <tr> <td>34<sup>*1</sup></td> <td>42<sup>*1</sup></td> <td>52</td> <td>62</td> <td>77</td> <td>96</td> <td>P093</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TX0_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SIN11_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN7</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU4_2</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG16_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ICU3_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TOT2_1<sup>*2,*3</sup></td> </tr> </tbody> </table> | Pin no. |     |     |                         |  |  | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 |  | 34 | 42 | 52 | 62 | 77 | 96 | P093 |  |  |  |  |  |  | TX0_1 |  |  |  |  |  |  | SIN11_0 |  |  |  |  |  |  | AN7 |  |  |  |  |  |  | ICU4_2 |  |  |  |  |  |  | PPG16_1 |  |  |  |  |  |  | ICU3_0 |  |  |  |  |  |  | TOT2_1 | Pin no. |  |  |  |  |  | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 |  | 34 <sup>*1</sup> | 42 <sup>*1</sup> | 52 | 62 | 77 | 96 | P093 |  |  |  |  |  |  | TX0_1 |  |  |  |  |  |  | SIN11_0 |  |  |  |  |  |  | AN7 |  |  |  |  |  |  | ICU4_2 |  |  |  |  |  |  | PPG16_1 |  |  |  |  |  |  | ICU3_0 |  |  |  |  |  |  | TOT2_1 <sup>*2,*3</sup> |
| Pin no.          |                  |  |         |     |     | Pin Name                |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
| 64               | 80               | 100  | 120     | 144 | 176 |                         |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
| 34               | 42               | 52   | 62      | 77  | 96  | P093                    |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
|                  |                  |  |         |     |     | TX0_1                   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
|                  |                  |  |         |     |     | SIN11_0                 |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
|                  |                  |  |         |     |     | AN7                     |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
|                  |                  |  |         |     |     | ICU4_2                  |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
|                  |                  |  |         |     |     | PPG16_1                 |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
|                  |                  |  |         |     |     | ICU3_0                  |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
|                  |                  |  |         |     |     | TOT2_1                  |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
| Pin no.          |                  |  |         |     |     | Pin Name                |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
| 64               | 80               | 100  | 120     | 144 | 176 |                         |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
| 34 <sup>*1</sup> | 42 <sup>*1</sup> | 52   | 62      | 77  | 96  | P093                    |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
|                  |                  |  |         |     |     | TX0_1                   |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
|                  |                  |  |         |     |     | SIN11_0                 |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
|                  |                  |  |         |     |     | AN7                     |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
|                  |                  |  |         |     |     | ICU4_2                  |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
|                  |                  |  |         |     |     | PPG16_1                 |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
|                  |                  |  |         |     |     | ICU3_0                  |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |
|                  |                  |  |         |     |     | TOT2_1 <sup>*2,*3</sup> |  |  |          |    |    |     |     |     |     |  |    |    |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |        |         |  |  |  |  |  |          |    |    |     |     |     |     |  |                  |                  |    |    |    |    |      |  |  |  |  |  |  |       |  |  |  |  |  |  |         |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |                         |



| Page             | Section          | Change Results   |         |     |     |                               |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|------------------|------------------|--|---------|-----|-----|-------------------------------|--|--|----------|----|----|-----|-----|-----|-----|--|---|----|----|----|----|-----|------|--|--|--|--|--|--|-----------------|--|--|--|--|--|--|------|--|--|--|--|--|--|--------|----|----|----|----|----|-----|------|--|--|--|--|--|--|--------|--|--|--|--|--|--|------|--|--|--|--|--|--|---------|--|--|--|--|--|--|---------|----|----|----|----|----|-----|------|--|--|--|--|--|--|---------|--|--|--|--|--|--|------|--|--|--|--|--|--|---------|----|----|----|----|----|-----|------|--|--|--|--|--|--|---------|--|--|--|--|--|--|------|--|--|--|--|--|--|---------|----|----|----|----|----|-----|------|--|--|--|--|--|--|---------|--|--|--|--|--|--|------|--|--|--|--|--|--|---------|---------|--|--|--|--|--|----------|----|----|-----|-----|-----|-----|--|---|------------------|----|----|----|-----|------|--|--|--|--|--|--|-------------------------------|--|--|--|--|--|--|------|--|--|--|--|--|--|--------|------------------|------------------|----|----|----|-----|------|--|--|--|--|--|--|-------------------------|--|--|--|--|--|--|------|--|--|--|--|--|--|---------|--|--|--|--|--|--|---------|------------------|------------------|----|----|----|-----|------|--|--|--|--|--|--|--------------------------|--|--|--|--|--|--|------|--|--|--|--|--|--|---------|------------------|------------------|----|----|----|-----|------|--|--|--|--|--|--|--------------------------|--|--|--|--|--|--|------|--|--|--|--|--|--|---------|------------------|------------------|----|----|----|-----|------|--|--|--|--|--|--|--------------------------|--|--|--|--|--|--|------|--|--|--|--|--|--|---------|
| 30               | ■PIN Description | <p>A List of "Pin Description" modified.</p> <p>(Error)</p> <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th>Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> <th></th> </tr> </thead> <tbody> <tr> <td>-</td> <td>48</td> <td>59</td> <td>69</td> <td>85</td> <td>104</td> <td>P100</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCK7_0/<br/>SCL7</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN12</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG8_0</td> </tr> <tr> <td>40</td> <td>49</td> <td>61</td> <td>71</td> <td>87</td> <td>106</td> <td>P102</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SIN7_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN14</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG10_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>INT10_0</td> </tr> <tr> <td>41</td> <td>50</td> <td>62</td> <td>72</td> <td>88</td> <td>107</td> <td>P103</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCS73_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN15</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG11_0</td> </tr> <tr> <td>42</td> <td>51</td> <td>63</td> <td>73</td> <td>89</td> <td>108</td> <td>P104</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCS72_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN16</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG12_0</td> </tr> <tr> <td>43</td> <td>52</td> <td>64</td> <td>74</td> <td>90</td> <td>109</td> <td>P105</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCS71_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN17</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG13_0</td> </tr> </tbody> </table> <p>(Correct)</p> <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th>Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> <th></th> </tr> </thead> <tbody> <tr> <td>-</td> <td>48<sup>*1</sup></td> <td>59</td> <td>69</td> <td>85</td> <td>104</td> <td>P100</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCK7_0/<br/>SCL7<sup>*3</sup></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN12</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG8_0</td> </tr> <tr> <td>40<sup>*1</sup></td> <td>49<sup>*1</sup></td> <td>61</td> <td>71</td> <td>87</td> <td>106</td> <td>P102</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SIN7_0<sup>*2,*3</sup></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN14</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG10_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>INT10_0</td> </tr> <tr> <td>41<sup>*1</sup></td> <td>50<sup>*1</sup></td> <td>62</td> <td>72</td> <td>88</td> <td>107</td> <td>P103</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCS73_0<sup>*2,*3</sup></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN15</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG11_0</td> </tr> <tr> <td>42<sup>*1</sup></td> <td>51<sup>*1</sup></td> <td>63</td> <td>73</td> <td>89</td> <td>108</td> <td>P104</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCS72_0<sup>*2,*3</sup></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN16</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG12_0</td> </tr> <tr> <td>43<sup>*1</sup></td> <td>52<sup>*1</sup></td> <td>64</td> <td>74</td> <td>90</td> <td>109</td> <td>P105</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCS71_0<sup>*2,*3</sup></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>AN17</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG13_0</td> </tr> </tbody> </table> | Pin no. |     |     |                               |  |  | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 |  | - | 48 | 59 | 69 | 85 | 104 | P100 |  |  |  |  |  |  | SCK7_0/<br>SCL7 |  |  |  |  |  |  | AN12 |  |  |  |  |  |  | PPG8_0 | 40 | 49 | 61 | 71 | 87 | 106 | P102 |  |  |  |  |  |  | SIN7_0 |  |  |  |  |  |  | AN14 |  |  |  |  |  |  | PPG10_0 |  |  |  |  |  |  | INT10_0 | 41 | 50 | 62 | 72 | 88 | 107 | P103 |  |  |  |  |  |  | SCS73_0 |  |  |  |  |  |  | AN15 |  |  |  |  |  |  | PPG11_0 | 42 | 51 | 63 | 73 | 89 | 108 | P104 |  |  |  |  |  |  | SCS72_0 |  |  |  |  |  |  | AN16 |  |  |  |  |  |  | PPG12_0 | 43 | 52 | 64 | 74 | 90 | 109 | P105 |  |  |  |  |  |  | SCS71_0 |  |  |  |  |  |  | AN17 |  |  |  |  |  |  | PPG13_0 | Pin no. |  |  |  |  |  | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 |  | - | 48 <sup>*1</sup> | 59 | 69 | 85 | 104 | P100 |  |  |  |  |  |  | SCK7_0/<br>SCL7 <sup>*3</sup> |  |  |  |  |  |  | AN12 |  |  |  |  |  |  | PPG8_0 | 40 <sup>*1</sup> | 49 <sup>*1</sup> | 61 | 71 | 87 | 106 | P102 |  |  |  |  |  |  | SIN7_0 <sup>*2,*3</sup> |  |  |  |  |  |  | AN14 |  |  |  |  |  |  | PPG10_0 |  |  |  |  |  |  | INT10_0 | 41 <sup>*1</sup> | 50 <sup>*1</sup> | 62 | 72 | 88 | 107 | P103 |  |  |  |  |  |  | SCS73_0 <sup>*2,*3</sup> |  |  |  |  |  |  | AN15 |  |  |  |  |  |  | PPG11_0 | 42 <sup>*1</sup> | 51 <sup>*1</sup> | 63 | 73 | 89 | 108 | P104 |  |  |  |  |  |  | SCS72_0 <sup>*2,*3</sup> |  |  |  |  |  |  | AN16 |  |  |  |  |  |  | PPG12_0 | 43 <sup>*1</sup> | 52 <sup>*1</sup> | 64 | 74 | 90 | 109 | P105 |  |  |  |  |  |  | SCS71_0 <sup>*2,*3</sup> |  |  |  |  |  |  | AN17 |  |  |  |  |  |  | PPG13_0 |
| Pin no.          |                  |  |         |     |     | Pin Name                      |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
| 64               | 80               | 100  | 120     | 144 | 176 |                               |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
| -                | 48               | 59   | 69      | 85  | 104 | P100                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | SCK7_0/<br>SCL7               |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | AN12                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | PPG8_0                        |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
| 40               | 49               | 61   | 71      | 87  | 106 | P102                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | SIN7_0                        |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | AN14                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | PPG10_0                       |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | INT10_0                       |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
| 41               | 50               | 62   | 72      | 88  | 107 | P103                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | SCS73_0                       |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | AN15                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | PPG11_0                       |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
| 42               | 51               | 63   | 73      | 89  | 108 | P104                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | SCS72_0                       |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | AN16                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | PPG12_0                       |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
| 43               | 52               | 64   | 74      | 90  | 109 | P105                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | SCS71_0                       |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | AN17                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | PPG13_0                       |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
| Pin no.          |                  |  |         |     |     | Pin Name                      |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
| 64               | 80               | 100  | 120     | 144 | 176 |                               |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
| -                | 48 <sup>*1</sup> | 59   | 69      | 85  | 104 | P100                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | SCK7_0/<br>SCL7 <sup>*3</sup> |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | AN12                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | PPG8_0                        |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
| 40 <sup>*1</sup> | 49 <sup>*1</sup> | 61   | 71      | 87  | 106 | P102                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | SIN7_0 <sup>*2,*3</sup>       |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | AN14                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | PPG10_0                       |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | INT10_0                       |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
| 41 <sup>*1</sup> | 50 <sup>*1</sup> | 62   | 72      | 88  | 107 | P103                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | SCS73_0 <sup>*2,*3</sup>      |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | AN15                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | PPG11_0                       |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
| 42 <sup>*1</sup> | 51 <sup>*1</sup> | 63   | 73      | 89  | 108 | P104                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | SCS72_0 <sup>*2,*3</sup>      |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | AN16                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | PPG12_0                       |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
| 43 <sup>*1</sup> | 52 <sup>*1</sup> | 64   | 74      | 90  | 109 | P105                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | SCS71_0 <sup>*2,*3</sup>      |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | AN17                          |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |
|                  |                  |  |         |     |     | PPG13_0                       |  |  |          |    |    |     |     |     |     |  |   |    |    |    |    |     |      |  |  |  |  |  |  |                 |  |  |  |  |  |  |      |  |  |  |  |  |  |        |    |    |    |    |    |     |      |  |  |  |  |  |  |        |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |    |    |    |    |    |     |      |  |  |  |  |  |  |         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |                  |    |    |    |     |      |  |  |  |  |  |  |                               |  |  |  |  |  |  |      |  |  |  |  |  |  |        |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                         |  |  |  |  |  |  |      |  |  |  |  |  |  |         |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |                  |                  |    |    |    |     |      |  |  |  |  |  |  |                          |  |  |  |  |  |  |      |  |  |  |  |  |  |         |



| Page    | Section          | Change Results  |                   |     |     |                           |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
|---------|------------------|---|-------------------|-----|-----|---------------------------|--|--|----------|----|----|-----|-----|-----|-----|--|---|---|----|-----|-----|-----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|---|----|----|-----|-----|-----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|---------|--|--|--|--|--|----------|----|----|-----|-----|-----|-----|--|---|---|------------------|-------------------|-----|-----|------|--|--|--|--|--|--|-----------------------|--|--|--|--|--|--|--------|--|--|--|--|--|--|-----------------------|--|--|--|--|--|--|--------|---|------------------|------------------|-------------------|-----|-----|------|--|--|--|--|--|--|---------------------------|--|--|--|--|--|--|----------------------|--|--|--|--|--|--|---------|
| 33      | ■PIN Description | <p>A List of "Pin Description" modified.</p> <p>(Error)</p> <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th>Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> <th></th> </tr> </thead> <tbody> <tr> <td>-</td> <td>-</td> <td>94</td> <td>111</td> <td>131</td> <td>159</td> <td>P000</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>D16</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SIN1_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIOA0_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>INT2_0</td> </tr> <tr> <td>-</td> <td>75</td> <td>95</td> <td>112</td> <td>132</td> <td>160</td> <td>P001</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>D17</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SOT1_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIOA1_1</td> </tr> </tbody> </table> <p>(Correct)</p> <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th>Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> <th></th> </tr> </thead> <tbody> <tr> <td>-</td> <td>-</td> <td>94<sup>*1</sup></td> <td>111<sup>*1</sup></td> <td>131</td> <td>159</td> <td>P000</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>D16<sup>*4, *5</sup></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SIN1_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIOA0_1<sup>*4</sup></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>INT2_0</td> </tr> <tr> <td>-</td> <td>75<sup>*1</sup></td> <td>95<sup>*1</sup></td> <td>112<sup>*1</sup></td> <td>132</td> <td>160</td> <td>P001</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>D17<sup>*3, *4, *5</sup></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SOT1_0<sup>*3</sup></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIOA1_1</td> </tr> </tbody> </table> | Pin no.           |     |     |                           |  |  | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 |  | - | - | 94 | 111 | 131 | 159 | P000 |  |  |  |  |  |  | D16 |  |  |  |  |  |  | SIN1_0 |  |  |  |  |  |  | TIOA0_1 |  |  |  |  |  |  | INT2_0 | - | 75 | 95 | 112 | 132 | 160 | P001 |  |  |  |  |  |  | D17 |  |  |  |  |  |  | SOT1_0 |  |  |  |  |  |  | TIOA1_1 | Pin no. |  |  |  |  |  | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 |  | - | - | 94 <sup>*1</sup> | 111 <sup>*1</sup> | 131 | 159 | P000 |  |  |  |  |  |  | D16 <sup>*4, *5</sup> |  |  |  |  |  |  | SIN1_0 |  |  |  |  |  |  | TIOA0_1 <sup>*4</sup> |  |  |  |  |  |  | INT2_0 | - | 75 <sup>*1</sup> | 95 <sup>*1</sup> | 112 <sup>*1</sup> | 132 | 160 | P001 |  |  |  |  |  |  | D17 <sup>*3, *4, *5</sup> |  |  |  |  |  |  | SOT1_0 <sup>*3</sup> |  |  |  |  |  |  | TIOA1_1 |
| Pin no. |                  |   |                   |     |     | Pin Name                  |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
| 64      | 80               | 100   | 120               | 144 | 176 |                           |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
| -       | -                | 94  | 111               | 131 | 159 | P000                      |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
|         |                  |   |                   |     |     | D16                       |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
|         |                  |   |                   |     |     | SIN1_0                    |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
|         |                  |   |                   |     |     | TIOA0_1                   |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
|         |                  |   |                   |     |     | INT2_0                    |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
| -       | 75               | 95  | 112               | 132 | 160 | P001                      |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
|         |                  |   |                   |     |     | D17                       |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
|         |                  |   |                   |     |     | SOT1_0                    |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
|         |                  |   |                   |     |     | TIOA1_1                   |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
| Pin no. |                  |   |                   |     |     | Pin Name                  |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
| 64      | 80               | 100   | 120               | 144 | 176 |                           |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
| -       | -                | 94 <sup>*1</sup>  | 111 <sup>*1</sup> | 131 | 159 | P000                      |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
|         |                  |   |                   |     |     | D16 <sup>*4, *5</sup>     |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
|         |                  |   |                   |     |     | SIN1_0                    |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
|         |                  |   |                   |     |     | TIOA0_1 <sup>*4</sup>     |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
|         |                  |   |                   |     |     | INT2_0                    |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
| -       | 75 <sup>*1</sup> | 95 <sup>*1</sup>  | 112 <sup>*1</sup> | 132 | 160 | P001                      |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
|         |                  |   |                   |     |     | D17 <sup>*3, *4, *5</sup> |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
|         |                  |   |                   |     |     | SOT1_0 <sup>*3</sup>      |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |
|         |                  |   |                   |     |     | TIOA1_1                   |  |  |          |    |    |     |     |     |     |  |   |   |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |         |  |  |  |  |  |          |    |    |     |     |     |     |  |   |   |                  |                   |     |     |      |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |  |  |  |  |  |  |                       |  |  |  |  |  |  |        |   |                  |                  |                   |     |     |      |  |  |  |  |  |  |                           |  |  |  |  |  |  |                      |  |  |  |  |  |  |         |



| Page    | Section          | Change Results   |         |     |     |           |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|---------|------------------|--|---------|-----|-----|-----------|--|--|----------|----|----|-----|-----|-----|-----|--|---|---|---|-----|-----|-----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|---|----|----|-----|-----|-----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|---|---|---|---|-----|-----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|---|---|---|---|---|-----|------|--|--|--|--|--|--|---------|----|----|----|-----|-----|-----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|--|--|--|--|--|--|-----------|---|---|---|---|---|-----|------|--|--|--|--|--|--|---------|----|----|----|-----|-----|-----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|--|--|--|--|--|--|-----------|---|---|---|-----|-----|-----|------|--|--|--|--|--|--|-----|---|---|---|---|---|-----|------|--|--|--|--|--|--|---------|---|---|---|-----|-----|-----|------|--|--|--|--|--|--|-----|----|----|----|-----|-----|-----|------|--|--|--|--|--|--|-----|--|--|--|--|--|--|-----|--|--|--|--|--|--|--------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--------|
| 34, 35  | ■PIN Description | <p>A List of "Pin Description" modified.</p> <p>(Error)</p> <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th>Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> <th></th> </tr> </thead> <tbody> <tr> <td>-</td> <td>-</td> <td>-</td> <td>113</td> <td>133</td> <td>161</td> <td>P002</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>D18</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCK1_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIOB0_1</td> </tr> <tr> <td>-</td> <td>76</td> <td>96</td> <td>114</td> <td>134</td> <td>162</td> <td>P003</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>D19</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SIN2_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIOB1_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>INT3_0</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>135</td> <td>163</td> <td>P004</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>D20</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SOT2_0</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>164</td> <td>P164</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG32_1</td> </tr> <tr> <td>61</td> <td>77</td> <td>97</td> <td>115</td> <td>136</td> <td>165</td> <td>P005</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>D21</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCK2_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ADTG0_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>INT7_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>(RX2(64))</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>166</td> <td>P165</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG33_1</td> </tr> <tr> <td>62</td> <td>78</td> <td>98</td> <td>116</td> <td>137</td> <td>167</td> <td>P006</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>D22</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SCS2_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ADTG1_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>INT2_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>(TX2(64))</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>117</td> <td>138</td> <td>168</td> <td>P007</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>D23</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>169</td> <td>P166</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PPG34_1</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>118</td> <td>139</td> <td>170</td> <td>P010</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>D24</td> </tr> <tr> <td>63</td> <td>79</td> <td>99</td> <td>119</td> <td>140</td> <td>171</td> <td>P011</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>WOT</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>D25</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SOT2_1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>TIOA0_0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>INT3_1</td> </tr> </tbody> </table> | Pin no. |     |     |           |  |  | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 |  | - | - | - | 113 | 133 | 161 | P002 |  |  |  |  |  |  | D18 |  |  |  |  |  |  | SCK1_0 |  |  |  |  |  |  | TIOB0_1 | - | 76 | 96 | 114 | 134 | 162 | P003 |  |  |  |  |  |  | D19 |  |  |  |  |  |  | SIN2_0 |  |  |  |  |  |  | TIOB1_1 |  |  |  |  |  |  | INT3_0 | - | - | - | - | 135 | 163 | P004 |  |  |  |  |  |  | D20 |  |  |  |  |  |  | SOT2_0 | - | - | - | - | - | 164 | P164 |  |  |  |  |  |  | PPG32_1 | 61 | 77 | 97 | 115 | 136 | 165 | P005 |  |  |  |  |  |  | D21 |  |  |  |  |  |  | SCK2_0 |  |  |  |  |  |  | ADTG0_1 |  |  |  |  |  |  | INT7_1 |  |  |  |  |  |  | (RX2(64)) | - | - | - | - | - | 166 | P165 |  |  |  |  |  |  | PPG33_1 | 62 | 78 | 98 | 116 | 137 | 167 | P006 |  |  |  |  |  |  | D22 |  |  |  |  |  |  | SCS2_0 |  |  |  |  |  |  | ADTG1_1 |  |  |  |  |  |  | INT2_1 |  |  |  |  |  |  | (TX2(64)) | - | - | - | 117 | 138 | 168 | P007 |  |  |  |  |  |  | D23 | - | - | - | - | - | 169 | P166 |  |  |  |  |  |  | PPG34_1 | - | - | - | 118 | 139 | 170 | P010 |  |  |  |  |  |  | D24 | 63 | 79 | 99 | 119 | 140 | 171 | P011 |  |  |  |  |  |  | WOT |  |  |  |  |  |  | D25 |  |  |  |  |  |  | SOT2_1 |  |  |  |  |  |  | TIOA0_0 |  |  |  |  |  |  | INT3_1 |
| Pin no. |                  |  |         |     |     | Pin Name  |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
| 64      | 80               | 100  | 120     | 144 | 176 |           |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
| -       | -                | -  | 113     | 133 | 161 | P002      |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | D18       |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | SCK1_0    |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | TIOB0_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
| -       | 76               | 96   | 114     | 134 | 162 | P003      |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | D19       |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | SIN2_0    |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | TIOB1_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | INT3_0    |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
| -       | -                | -  | -       | 135 | 163 | P004      |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | D20       |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | SOT2_0    |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
| -       | -                | -  | -       | -   | 164 | P164      |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | PPG32_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
| 61      | 77               | 97   | 115     | 136 | 165 | P005      |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | D21       |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | SCK2_0    |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | ADTG0_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | INT7_1    |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | (RX2(64)) |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
| -       | -                | -  | -       | -   | 166 | P165      |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | PPG33_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
| 62      | 78               | 98   | 116     | 137 | 167 | P006      |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | D22       |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | SCS2_0    |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | ADTG1_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | INT2_1    |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | (TX2(64)) |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
| -       | -                | -  | 117     | 138 | 168 | P007      |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | D23       |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
| -       | -                | -  | -       | -   | 169 | P166      |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | PPG34_1   |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
| -       | -                | -  | 118     | 139 | 170 | P010      |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | D24       |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
| 63      | 79               | 99   | 119     | 140 | 171 | P011      |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | WOT       |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | D25       |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | SOT2_1    |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | TIOA0_0   |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |
|         |                  |  |         |     |     | INT3_1    |  |  |          |    |    |     |     |     |     |  |   |   |   |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |   |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |   |   |   |   |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |   |   |     |      |  |  |  |  |  |  |         |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |  |  |  |  |  |  |           |   |   |   |     |     |     |      |  |  |  |  |  |  |     |   |   |   |   |   |     |      |  |  |  |  |  |  |         |   |   |   |     |     |     |      |  |  |  |  |  |  |     |    |    |    |     |     |     |      |  |  |  |  |  |  |     |  |  |  |  |  |  |     |  |  |  |  |  |  |        |  |  |  |  |  |  |         |  |  |  |  |  |  |        |



| Page   | Section          | Change Results  |                  |                  |                   |                   |                   |   |          |    |    |     |     |     |     |  |   |   |   |                   |     |     |  |   |                  |                  |                   |     |     |  |   |   |   |   |     |     |                       |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |                   |     |     |                           |   |   |   |   |   |     |                 |   |   |   |                   |     |     |                           |                  |                  |                  |                   |     |     |   |
|--------|------------------|---|------------------|------------------|-------------------|-------------------|-------------------|---|----------|----|----|-----|-----|-----|-----|--|---|---|---|-------------------|-----|-----|--|---|------------------|------------------|-------------------|-----|-----|--|---|---|---|---|-----|-----|-----------------------|---|---|---|---|---|-----|-----------------|------------------|------------------|------------------|-------------------|-------------------|-------------------|---|---|---|---|---|---|-----|-----------------|------------------|------------------|------------------|-------------------|-------------------|-------------------|---|---|---|---|-------------------|-----|-----|---------------------------|---|---|---|---|---|-----|-----------------|---|---|---|-------------------|-----|-----|---------------------------|------------------|------------------|------------------|-------------------|-----|-----|---|
| 34, 35 | ■PIN Description | (Continued)<br>(Correct)  |                  |                  |                   |                   |                   |   |          |    |    |     |     |     |     |  |   |   |   |                   |     |     |  |   |                  |                  |                   |     |     |  |   |   |   |   |     |     |                       |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |                   |     |     |                           |   |   |   |   |   |     |                 |   |   |   |                   |     |     |                           |                  |                  |                  |                   |     |     |   |
|        |                  | <table border="1"> <thead> <tr> <th colspan="6">Pin no.</th> <th>Pin Name</th> </tr> <tr> <th>64</th> <th>80</th> <th>100</th> <th>120</th> <th>144</th> <th>176</th> <th></th> </tr> </thead> <tbody> <tr> <td>-</td> <td>-</td> <td>-</td> <td>113<sup>*1</sup></td> <td>133</td> <td>161</td> <td>P002<br/>D18<sup>*5</sup><br/>SCK1_0<br/>TIOB0_1</td> </tr> <tr> <td>-</td> <td>76<sup>*1</sup></td> <td>96<sup>*1</sup></td> <td>114<sup>*1</sup></td> <td>134</td> <td>162</td> <td>P003<br/>D19<sup>*3, *4, *5</sup><br/>SIN2_0<br/>TIOB1_1<br/>INT3_0</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>135</td> <td>163</td> <td>P004<br/>D20<br/>SOT2_0</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>164</td> <td>P164<br/>PPG32_1</td> </tr> <tr> <td>61<sup>*1</sup></td> <td>77<sup>*1</sup></td> <td>97<sup>*1</sup></td> <td>115<sup>*1</sup></td> <td>136<sup>*1</sup></td> <td>165<sup>*1</sup></td> <td>P005<br/>D21<sup>*2, *3, *4, *5</sup><br/>SCK2_0<sup>*2</sup><br/>ADTG0_1<br/>INT7_1<br/>RX2(64)<sup>*4, *5, *6, *7</sup></td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>166</td> <td>P165<br/>PPG33_1</td> </tr> <tr> <td>62<sup>*1</sup></td> <td>78<sup>*1</sup></td> <td>98<sup>*1</sup></td> <td>116<sup>*1</sup></td> <td>137<sup>*1</sup></td> <td>167<sup>*1</sup></td> <td>P006<br/>D22<sup>*2, *3, *4, *5</sup><br/>SCS2_0<sup>*2</sup><br/>ADTG1_1<br/>INT2_1<br/>TX2(64)<sup>*4, *5, *6, *7</sup></td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>117<sup>*1</sup></td> <td>138</td> <td>168</td> <td>P007<br/>D23<sup>*5</sup></td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>169</td> <td>P166<br/>PPG34_1</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>118<sup>*1</sup></td> <td>139</td> <td>170</td> <td>P010<br/>D24<sup>*5</sup></td> </tr> <tr> <td>63<sup>*1</sup></td> <td>79<sup>*1</sup></td> <td>99<sup>*1</sup></td> <td>119<sup>*1</sup></td> <td>140</td> <td>171</td> <td>P011<br/>WOT<br/>D25<sup>*2, *3, *4, *5</sup><br/>SOT2_1<sup>*2</sup><br/>TIOA0_0<sup>*2, *3, *4</sup><br/>INT3_1</td> </tr> </tbody> </table> | Pin no.          |                  |                   |                   |                   |   | Pin Name | 64 | 80 | 100 | 120 | 144 | 176 |  | - | - | - | 113 <sup>*1</sup> | 133 | 161 | P002<br>D18 <sup>*5</sup><br>SCK1_0<br>TIOB0_1 | - | 76 <sup>*1</sup> | 96 <sup>*1</sup> | 114 <sup>*1</sup> | 134 | 162 | P003<br>D19 <sup>*3, *4, *5</sup><br>SIN2_0<br>TIOB1_1<br>INT3_0 | - | - | - | - | 135 | 163 | P004<br>D20<br>SOT2_0 | - | - | - | - | - | 164 | P164<br>PPG32_1 | 61 <sup>*1</sup> | 77 <sup>*1</sup> | 97 <sup>*1</sup> | 115 <sup>*1</sup> | 136 <sup>*1</sup> | 165 <sup>*1</sup> | P005<br>D21 <sup>*2, *3, *4, *5</sup><br>SCK2_0 <sup>*2</sup><br>ADTG0_1<br>INT7_1<br>RX2(64) <sup>*4, *5, *6, *7</sup> | - | - | - | - | - | 166 | P165<br>PPG33_1 | 62 <sup>*1</sup> | 78 <sup>*1</sup> | 98 <sup>*1</sup> | 116 <sup>*1</sup> | 137 <sup>*1</sup> | 167 <sup>*1</sup> | P006<br>D22 <sup>*2, *3, *4, *5</sup><br>SCS2_0 <sup>*2</sup><br>ADTG1_1<br>INT2_1<br>TX2(64) <sup>*4, *5, *6, *7</sup> | - | - | - | 117 <sup>*1</sup> | 138 | 168 | P007<br>D23 <sup>*5</sup> | - | - | - | - | - | 169 | P166<br>PPG34_1 | - | - | - | 118 <sup>*1</sup> | 139 | 170 | P010<br>D24 <sup>*5</sup> | 63 <sup>*1</sup> | 79 <sup>*1</sup> | 99 <sup>*1</sup> | 119 <sup>*1</sup> | 140 | 171 | P011<br>WOT<br>D25 <sup>*2, *3, *4, *5</sup><br>SOT2_1 <sup>*2</sup><br>TIOA0_0 <sup>*2, *3, *4</sup><br>INT3_1 |
|        |                  | Pin no.   |                  |                  |                   |                   |                   | Pin Name  |          |    |    |     |     |     |     |  |   |   |   |                   |     |     |  |   |                  |                  |                   |     |     |  |   |   |   |   |     |     |                       |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |                   |     |     |                           |   |   |   |   |   |     |                 |   |   |   |                   |     |     |                           |                  |                  |                  |                   |     |     |   |
|        |                  | 64  | 80               | 100              | 120               | 144               | 176               |   |          |    |    |     |     |     |     |  |   |   |   |                   |     |     |  |   |                  |                  |                   |     |     |  |   |   |   |   |     |     |                       |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |                   |     |     |                           |   |   |   |   |   |     |                 |   |   |   |                   |     |     |                           |                  |                  |                  |                   |     |     |   |
|        |                  | -   | -                | -                | 113 <sup>*1</sup> | 133               | 161               | P002<br>D18 <sup>*5</sup><br>SCK1_0<br>TIOB0_1  |          |    |    |     |     |     |     |  |   |   |   |                   |     |     |  |   |                  |                  |                   |     |     |  |   |   |   |   |     |     |                       |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |                   |     |     |                           |   |   |   |   |   |     |                 |   |   |   |                   |     |     |                           |                  |                  |                  |                   |     |     |   |
|        |                  | -   | 76 <sup>*1</sup> | 96 <sup>*1</sup> | 114 <sup>*1</sup> | 134               | 162               | P003<br>D19 <sup>*3, *4, *5</sup><br>SIN2_0<br>TIOB1_1<br>INT3_0  |          |    |    |     |     |     |     |  |   |   |   |                   |     |     |  |   |                  |                  |                   |     |     |  |   |   |   |   |     |     |                       |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |                   |     |     |                           |   |   |   |   |   |     |                 |   |   |   |                   |     |     |                           |                  |                  |                  |                   |     |     |   |
|        |                  | -   | -                | -                | -                 | 135               | 163               | P004<br>D20<br>SOT2_0   |          |    |    |     |     |     |     |  |   |   |   |                   |     |     |  |   |                  |                  |                   |     |     |  |   |   |   |   |     |     |                       |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |                   |     |     |                           |   |   |   |   |   |     |                 |   |   |   |                   |     |     |                           |                  |                  |                  |                   |     |     |   |
|        |                  | -   | -                | -                | -                 | -                 | 164               | P164<br>PPG32_1   |          |    |    |     |     |     |     |  |   |   |   |                   |     |     |  |   |                  |                  |                   |     |     |  |   |   |   |   |     |     |                       |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |                   |     |     |                           |   |   |   |   |   |     |                 |   |   |   |                   |     |     |                           |                  |                  |                  |                   |     |     |   |
|        |                  | 61 <sup>*1</sup>  | 77 <sup>*1</sup> | 97 <sup>*1</sup> | 115 <sup>*1</sup> | 136 <sup>*1</sup> | 165 <sup>*1</sup> | P005<br>D21 <sup>*2, *3, *4, *5</sup><br>SCK2_0 <sup>*2</sup><br>ADTG0_1<br>INT7_1<br>RX2(64) <sup>*4, *5, *6, *7</sup> |          |    |    |     |     |     |     |  |   |   |   |                   |     |     |  |   |                  |                  |                   |     |     |  |   |   |   |   |     |     |                       |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |                   |     |     |                           |   |   |   |   |   |     |                 |   |   |   |                   |     |     |                           |                  |                  |                  |                   |     |     |   |
|        |                  | -   | -                | -                | -                 | -                 | 166               | P165<br>PPG33_1   |          |    |    |     |     |     |     |  |   |   |   |                   |     |     |  |   |                  |                  |                   |     |     |  |   |   |   |   |     |     |                       |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |                   |     |     |                           |   |   |   |   |   |     |                 |   |   |   |                   |     |     |                           |                  |                  |                  |                   |     |     |   |
|        |                  | 62 <sup>*1</sup>  | 78 <sup>*1</sup> | 98 <sup>*1</sup> | 116 <sup>*1</sup> | 137 <sup>*1</sup> | 167 <sup>*1</sup> | P006<br>D22 <sup>*2, *3, *4, *5</sup><br>SCS2_0 <sup>*2</sup><br>ADTG1_1<br>INT2_1<br>TX2(64) <sup>*4, *5, *6, *7</sup> |          |    |    |     |     |     |     |  |   |   |   |                   |     |     |  |   |                  |                  |                   |     |     |  |   |   |   |   |     |     |                       |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |                   |     |     |                           |   |   |   |   |   |     |                 |   |   |   |                   |     |     |                           |                  |                  |                  |                   |     |     |   |
|        |                  | -   | -                | -                | 117 <sup>*1</sup> | 138               | 168               | P007<br>D23 <sup>*5</sup>   |          |    |    |     |     |     |     |  |   |   |   |                   |     |     |  |   |                  |                  |                   |     |     |  |   |   |   |   |     |     |                       |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |                   |     |     |                           |   |   |   |   |   |     |                 |   |   |   |                   |     |     |                           |                  |                  |                  |                   |     |     |   |
|        |                  | -   | -                | -                | -                 | -                 | 169               | P166<br>PPG34_1   |          |    |    |     |     |     |     |  |   |   |   |                   |     |     |  |   |                  |                  |                   |     |     |  |   |   |   |   |     |     |                       |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |                   |     |     |                           |   |   |   |   |   |     |                 |   |   |   |                   |     |     |                           |                  |                  |                  |                   |     |     |   |
|        |                  | -   | -                | -                | 118 <sup>*1</sup> | 139               | 170               | P010<br>D24 <sup>*5</sup>   |          |    |    |     |     |     |     |  |   |   |   |                   |     |     |  |   |                  |                  |                   |     |     |  |   |   |   |   |     |     |                       |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |                   |     |     |                           |   |   |   |   |   |     |                 |   |   |   |                   |     |     |                           |                  |                  |                  |                   |     |     |   |
|        |                  | 63 <sup>*1</sup>  | 79 <sup>*1</sup> | 99 <sup>*1</sup> | 119 <sup>*1</sup> | 140               | 171               | P011<br>WOT<br>D25 <sup>*2, *3, *4, *5</sup><br>SOT2_1 <sup>*2</sup><br>TIOA0_0 <sup>*2, *3, *4</sup><br>INT3_1         |          |    |    |     |     |     |     |  |   |   |   |                   |     |     |  |   |                  |                  |                   |     |     |  |   |   |   |   |     |     |                       |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |   |   |     |                 |                  |                  |                  |                   |                   |                   |   |   |   |   |                   |     |     |                           |   |   |   |   |   |     |                 |   |   |   |                   |     |     |                           |                  |                  |                  |                   |     |     |   |

| Page  | Section          | Change Results  |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
|---|------------------|---|------------|--------------------------|---------------------------------|--|--|-----------------------------------|---|--------------------------|---------------------------------|------------------------------|--|-----------------------------------|---|------------|--------------------------|---------------------------------|--|--|-----------------------------------|----------------------------|--------------------------|---------------------------------|------------------------------|--|-----------------------------------|--------------------------------|
| 34  | ■PIN Description | <p>A List of "Pin Description" modified.</p> <p>(Error)</p> <table border="1" data-bbox="621 422 1159 1020"> <tr> <td>Function*2</td> </tr> <tr> <td>General-purpose I/O port</td> </tr> <tr> <td>External bus data bit21 I/O (0)</td> </tr> <tr> <td>Multi-function serial ch.2 clock I/O (0)</td> </tr> <tr> <td>A/D converter external trigger input 0 (1)</td> </tr> <tr> <td>INT7 External interrupt input (1)</td> </tr> <tr> <td>(CAN reception data 2 input<br/>MB91F52xB ,MB91F52xD only)</td> </tr> <tr> <td>General-purpose I/O port</td> </tr> <tr> <td>External bus data bit22 I/O (0)</td> </tr> <tr> <td>Serial chip select 2 I/O (0)</td> </tr> <tr> <td>A/D converter external trigger input 1 (1)</td> </tr> <tr> <td>INT2 External interrupt input (1)</td> </tr> <tr> <td>(CAN transmission data 2 output<br/>MB91F52xB ,MB91F52xD only)</td> </tr> </table> <p>(Correct)</p> <table border="1" data-bbox="621 1087 1159 1623"> <tr> <td>Function*9</td> </tr> <tr> <td>General-purpose I/O port</td> </tr> <tr> <td>External bus data bit21 I/O (0)</td> </tr> <tr> <td>Multi-function serial ch.2 clock I/O (0)</td> </tr> <tr> <td>A/D converter external trigger input 0 (1)</td> </tr> <tr> <td>INT7 External interrupt input (1)</td> </tr> <tr> <td>CAN reception data 2 input</td> </tr> <tr> <td>General-purpose I/O port</td> </tr> <tr> <td>External bus data bit22 I/O (0)</td> </tr> <tr> <td>Serial chip select 2 I/O (0)</td> </tr> <tr> <td>A/D converter external trigger input 1 (1)</td> </tr> <tr> <td>INT2 External interrupt input (1)</td> </tr> <tr> <td>CAN transmission data 2 output</td> </tr> </table> | Function*2 | General-purpose I/O port | External bus data bit21 I/O (0) | Multi-function serial ch.2 clock I/O (0) | A/D converter external trigger input 0 (1) | INT7 External interrupt input (1) | (CAN reception data 2 input<br>MB91F52xB ,MB91F52xD only) | General-purpose I/O port | External bus data bit22 I/O (0) | Serial chip select 2 I/O (0) | A/D converter external trigger input 1 (1) | INT2 External interrupt input (1) | (CAN transmission data 2 output<br>MB91F52xB ,MB91F52xD only) | Function*9 | General-purpose I/O port | External bus data bit21 I/O (0) | Multi-function serial ch.2 clock I/O (0) | A/D converter external trigger input 0 (1) | INT7 External interrupt input (1) | CAN reception data 2 input | General-purpose I/O port | External bus data bit22 I/O (0) | Serial chip select 2 I/O (0) | A/D converter external trigger input 1 (1) | INT2 External interrupt input (1) | CAN transmission data 2 output |
| Function*2  |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| General-purpose I/O port                                      |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| External bus data bit21 I/O (0)                               |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| Multi-function serial ch.2 clock I/O (0)                      |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| A/D converter external trigger input 0 (1)                    |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| INT7 External interrupt input (1)                             |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| (CAN reception data 2 input<br>MB91F52xB ,MB91F52xD only)     |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| General-purpose I/O port                                      |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| External bus data bit22 I/O (0)                               |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| Serial chip select 2 I/O (0)                                  |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| A/D converter external trigger input 1 (1)                    |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| INT2 External interrupt input (1)                             |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| (CAN transmission data 2 output<br>MB91F52xB ,MB91F52xD only) |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| Function*9  |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| General-purpose I/O port                                      |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| External bus data bit21 I/O (0)                               |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| Multi-function serial ch.2 clock I/O (0)                      |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| A/D converter external trigger input 0 (1)                    |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| INT7 External interrupt input (1)                             |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| CAN reception data 2 input                                    |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| General-purpose I/O port                                      |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| External bus data bit22 I/O (0)                               |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| Serial chip select 2 I/O (0)                                  |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| A/D converter external trigger input 1 (1)                    |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| INT2 External interrupt input (1)                             |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |
| CAN transmission data 2 output                                |                  |   |            |                          |                                 |  |  |                                   |   |                          |                                 |                              |  |                                   |   |            |                          |                                 |  |  |                                   |                            |                          |                                 |                              |  |                                   |                                |

| Page | Section           | Change Results  |
|------|-------------------|---|
| 36   | ■PIN Description  | <p>The following sentences modified under the Table of Pin description.</p> <p>(Error)<br/>           *1: For the I/O circuit types, see "■I/O CIRCUIT TYPE".<br/>           *2: For switching, see "I/O Port" in HARDWARE MANUAL.</p> <p>(Correct)<br/>           *1: There is a restriction of pin functions. See "Pin Name" of this table.<br/>           *2: not supported in 64pin<br/>           *3: not supported in 80pin<br/>           *4: not supported in 100pin<br/>           *5: not supported in 120pin<br/>           *6: not supported in 144pin<br/>           *7: not supported in 176pin<br/>           *8: For the I/O circuit types, see "■I/O CIRCUIT TYPE".<br/>           *9: For switching, see "I/O Port" in HARDWARE MANUAL.</p> |
| 39   | ■I/O Circuit Type | <p>Remarks for Type I in "I/O Circuit Types" modified as follows:</p> <p>(Error)<br/>           - 3V pad power supply (5V tolerant),<br/>           General-purpose I/O port<br/>           - Output 4mA<br/>           - CMOS hysteresis input</p> <p>(Correct)<br/>           - General-purpose I/O port (5V tolerant)<br/>           - Output 4mA<br/>           - CMOS hysteresis input</p>   |
| 40   | ■I/O Circuit Type | <p>Remarks for Type J in "I/O Circuit Types" modified as follows:</p> <p>(Error)<br/>           - 3V pad power supply (5V tolerant),<br/>           Analog input, General-purpose I/O port<br/>           - Output 4mA<br/>           - CMOS hysteresis input</p> <p>(Correct)<br/>           - Analog input, General-purpose I/O port (5V tolerant)<br/>           - Output 4mA<br/>           - CMOS hysteresis input</p>   |



| Page                 | Section                  | Change Results  |                      |                  |                   |           |                  |                   |                  |                      |                   |                  |                      |    |    |           |                  |                   |    |                      |   |   |
|----------------------|--------------------------|---|----------------------|------------------|-------------------|-----------|------------------|-------------------|------------------|----------------------|-------------------|------------------|----------------------|----|----|-----------|------------------|-------------------|----|----------------------|---|---|
| 40                   | ■ I/O Circuit Type       | <p>Remarks for Type L in "I/O Circuit Types" modified as follows:</p> <p>(Error)</p> <ul style="list-style-type: none"> <li>- Open-drain I/O</li> <li>- Output 25mA (NOD)</li> <li>- TTL input</li> </ul> <p>(Correct)</p> <ul style="list-style-type: none"> <li>- Open-drain I/O</li> <li>- Output 25mA (Nch open-drain)</li> <li>- TTL input</li> </ul>  |                      |                  |                   |           |                  |                   |                  |                      |                   |                  |                      |    |    |           |                  |                   |    |                      |   |   |
| 40                   | ■ I/O Circuit Type       | <p>Remarks for Type M in "I/O Circuit Types" modified as follows:</p> <p>(Error)</p> <ul style="list-style-type: none"> <li>- CMOS hysteresis input</li> <li>- Pull-up resistor 50kΩ (5V cont)</li> </ul> <p>(Correct)</p> <ul style="list-style-type: none"> <li>- CMOS hysteresis input</li> <li>- Pull-up resistor 50kΩ</li> </ul>   |                      |                  |                   |           |                  |                   |                  |                      |                   |                  |                      |    |    |           |                  |                   |    |                      |   |   |
| 121                  | ■ Interrupt Vector Table | <p>The following sentence deleted from Interrupt vector 64pins.</p> <p>*5: It does not support the DMA transfer by the interrupt because of the RAM ECC bit error.</p>  |                      |                  |                   |           |                  |                   |                  |                      |                   |                  |                      |    |    |           |                  |                   |    |                      |   |   |
| 124                  | ■ Interrupt Vector Table | <p>The interrupt factor in Interrupt vector 80pin modified as follows:</p> <p>(Error)</p> <table border="1"> <tr> <td>Base timer<br/>1 IRQ0</td> <td rowspan="4">61</td> <td rowspan="4">3D</td> <td rowspan="4">ICR<br/>45</td> <td rowspan="4">308<sub>H</sub></td> <td rowspan="4">000F<br/>FF08<br/>H</td> <td rowspan="4">45*<sup>5</sup></td> </tr> <tr> <td>Base timer<br/>1 IRQ1</td> </tr> <tr> <td>-</td> </tr> <tr> <td>-</td> </tr> </table> <p>(Correct)</p> <table border="1"> <tr> <td>Base timer<br/>1 IRQ0</td> <td rowspan="4">61</td> <td rowspan="4">3D</td> <td rowspan="4">ICR<br/>45</td> <td rowspan="4">308<sub>H</sub></td> <td rowspan="4">000F<br/>FF08<br/>H</td> <td rowspan="4">45</td> </tr> <tr> <td>Base timer<br/>1 IRQ1</td> </tr> <tr> <td>-</td> </tr> <tr> <td>-</td> </tr> </table> | Base timer<br>1 IRQ0 | 61               | 3D                | ICR<br>45 | 308 <sub>H</sub> | 000F<br>FF08<br>H | 45* <sup>5</sup> | Base timer<br>1 IRQ1 | -                 | -                | Base timer<br>1 IRQ0 | 61 | 3D | ICR<br>45 | 308 <sub>H</sub> | 000F<br>FF08<br>H | 45 | Base timer<br>1 IRQ1 | - | - |
| Base timer<br>1 IRQ0 | 61                       | 3D  | ICR<br>45            |                  |                   |           |                  |                   |                  | 308 <sub>H</sub>     | 000F<br>FF08<br>H | 45* <sup>5</sup> |                      |    |    |           |                  |                   |    |                      |   |   |
| Base timer<br>1 IRQ1 |                          |   |                      |                  |                   |           |                  |                   |                  |                      |                   |                  |                      |    |    |           |                  |                   |    |                      |   |   |
| -                    |                          |   |                      |                  |                   |           |                  |                   |                  |                      |                   |                  |                      |    |    |           |                  |                   |    |                      |   |   |
| -                    |                          |   |                      |                  |                   |           |                  |                   |                  |                      |                   |                  |                      |    |    |           |                  |                   |    |                      |   |   |
| Base timer<br>1 IRQ0 | 61                       | 3D  | ICR<br>45            | 308 <sub>H</sub> | 000F<br>FF08<br>H | 45        |                  |                   |                  |                      |                   |                  |                      |    |    |           |                  |                   |    |                      |   |   |
| Base timer<br>1 IRQ1 |                          |   |                      |                  |                   |           |                  |                   |                  |                      |                   |                  |                      |    |    |           |                  |                   |    |                      |   |   |
| -                    |                          |   |                      |                  |                   |           |                  |                   |                  |                      |                   |                  |                      |    |    |           |                  |                   |    |                      |   |   |
| -                    |                          |   |                      |                  |                   |           |                  |                   |                  |                      |                   |                  |                      |    |    |           |                  |                   |    |                      |   |   |
| 125                  | ■ Interrupt Vector Table | <p>The following sentence deleted from Interrupt vector 80pins.</p> <p>(Error)</p> <p>*5: It does not support the DMA transfer by the interrupt because of the RAM ECC bit error.</p>   |                      |                  |                   |           |                  |                   |                  |                      |                   |                  |                      |    |    |           |                  |                   |    |                      |   |   |

| Page                 | Section                  | Change Results   |                      |                  |                   |           |                  |                           |          |                      |                           |                      |        |           |                  |                   |                   |    |                      |   |
|----------------------|--------------------------|--|----------------------|------------------|-------------------|-----------|------------------|---------------------------|----------|----------------------|---------------------------|----------------------|--------|-----------|------------------|-------------------|-------------------|----|----------------------|---|
| 129                  | ■ Interrupt Vector Table | <p>The interrupt factor in Interrupt vector 100pin modified as follows:</p> <p>(Error)</p> <table border="1"> <tr> <td>Base timer 0<br/>IRQ0</td> <td rowspan="2">60</td> <td rowspan="2">3<br/>C</td> <td rowspan="2">ICR<br/>44</td> <td rowspan="2">30C<sub>H</sub></td> <td rowspan="2">000F<br/>FF0C<br/>H</td> <td rowspan="2">44</td> </tr> <tr> <td>Base timer 0<br/>IRQ1</td> </tr> </table> <p>(Correct)</p> <table border="1"> <tr> <td>-</td> <td rowspan="2">60</td> <td rowspan="2">3<br/>C</td> <td rowspan="2">ICR<br/>44</td> <td rowspan="2">30C<sub>H</sub></td> <td rowspan="2">000F<br/>FF0C<br/>H</td> <td rowspan="2">44</td> </tr> <tr> <td>-</td> </tr> </table>  | Base timer 0<br>IRQ0 | 60               | 3<br>C            | ICR<br>44 | 30C <sub>H</sub> | 000F<br>FF0C<br>H         | 44       | Base timer 0<br>IRQ1 | -                         | 60                   | 3<br>C | ICR<br>44 | 30C <sub>H</sub> | 000F<br>FF0C<br>H | 44                | -  |                      |   |
| Base timer 0<br>IRQ0 | 60                       | 3<br>C   | ICR<br>44            |                  |                   |           |                  |                           |          | 30C <sub>H</sub>     | 000F<br>FF0C<br>H         |                      |        |           |                  |                   |                   | 44 |                      |   |
| Base timer 0<br>IRQ1 |                          |  |                      |                  |                   |           |                  |                           |          |                      |                           |                      |        |           |                  |                   |                   |    |                      |   |
| -                    | 60                       | 3<br>C   | ICR<br>44            | 30C <sub>H</sub> | 000F<br>FF0C<br>H | 44        |                  |                           |          |                      |                           |                      |        |           |                  |                   |                   |    |                      |   |
| -                    |                          |  |                      |                  |                   |           |                  |                           |          |                      |                           |                      |        |           |                  |                   |                   |    |                      |   |
| 129                  | ■ Interrupt Vector Table | <p>The interrupt factor in Interrupt vector 100pin modified as follows:</p> <p>(Error)</p> <table border="1"> <tr> <td>Base timer 1<br/>IRQ0</td> <td rowspan="3">61</td> <td rowspan="3">3D</td> <td rowspan="3">ICR<br/>45</td> <td rowspan="3">308<sub>H</sub></td> <td rowspan="3">000F<br/>FF08<sub>H</sub></td> <td rowspan="3">45<br/>*5</td> </tr> <tr> <td>Base timer 1<br/>IRQ1</td> </tr> <tr> <td>-</td> </tr> </table> <p>(Correct)</p> <table border="1"> <tr> <td>Base timer 1<br/>IRQ0</td> <td rowspan="3">61</td> <td rowspan="3">3D</td> <td rowspan="3">ICR<br/>45</td> <td rowspan="3">308<sub>H</sub></td> <td rowspan="3">000F<br/>FF08<br/>H</td> <td rowspan="3">45</td> </tr> <tr> <td>Base timer 1<br/>IRQ1</td> </tr> <tr> <td>-</td> </tr> </table> | Base timer 1<br>IRQ0 | 61               | 3D                | ICR<br>45 | 308 <sub>H</sub> | 000F<br>FF08 <sub>H</sub> | 45<br>*5 | Base timer 1<br>IRQ1 | -                         | Base timer 1<br>IRQ0 | 61     | 3D        | ICR<br>45        | 308 <sub>H</sub>  | 000F<br>FF08<br>H | 45 | Base timer 1<br>IRQ1 | - |
| Base timer 1<br>IRQ0 | 61                       | 3D   | ICR<br>45            |                  |                   |           |                  |                           |          | 308 <sub>H</sub>     | 000F<br>FF08 <sub>H</sub> | 45<br>*5             |        |           |                  |                   |                   |    |                      |   |
| Base timer 1<br>IRQ1 |                          |  |                      |                  |                   |           |                  |                           |          |                      |                           |                      |        |           |                  |                   |                   |    |                      |   |
| -                    |                          |  |                      |                  |                   |           |                  |                           |          |                      |                           |                      |        |           |                  |                   |                   |    |                      |   |
| Base timer 1<br>IRQ0 | 61                       | 3D   | ICR<br>45            | 308 <sub>H</sub> | 000F<br>FF08<br>H | 45        |                  |                           |          |                      |                           |                      |        |           |                  |                   |                   |    |                      |   |
| Base timer 1<br>IRQ1 |                          |  |                      |                  |                   |           |                  |                           |          |                      |                           |                      |        |           |                  |                   |                   |    |                      |   |
| -                    |                          |  |                      |                  |                   |           |                  |                           |          |                      |                           |                      |        |           |                  |                   |                   |    |                      |   |
| 129                  | ■ Interrupt Vector Table | <p>The following sentence deleted from Interrupt vector 100pins.</p> <p>(Error)</p> <p>*5: It does not support the DMA transfer by the interrupt because of the RAM ECC bit error.</p>   |                      |                  |                   |           |                  |                           |          |                      |                           |                      |        |           |                  |                   |                   |    |                      |   |



| Page   | Section                 | Change Results   |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
|--|-------------------------|--|------------------------------------|----------|-------------------|-----------|----------|-------------------|----------|--|---------------------------------|----------|----------------------|-----------|----------|-------------------|----------|--|----|----------------------|---|---|
| 131  | ■Interrupt Vector Table | <p>"42" is deleted as shown below from the interrupt factor in Interrupt vector 120pin.</p> <p>(Error)</p> <table border="1"> <tr> <td>PPG2/3/12/13/22<br/>/23/32/33/42/43</td> <td rowspan="2">41</td> <td rowspan="2">29</td> <td rowspan="2">ICR<br/>25</td> <td rowspan="2">358<br/>H</td> <td rowspan="2">000F<br/>FF58<br/>H</td> <td rowspan="2">25<br/>*3</td> </tr> <tr> <td>16-bit free-run<br/>timer 2 (0<br/>detection) /<br/>(compare clear)</td> </tr> </table> <p>(Correct)</p> <table border="1"> <tr> <td>PPG2/3/12/13/22<br/>/23/32/33/43</td> <td rowspan="2">41</td> <td rowspan="2">29</td> <td rowspan="2">ICR<br/>25</td> <td rowspan="2">358<br/>H</td> <td rowspan="2">000F<br/>FF58<br/>H</td> <td rowspan="2">25<br/>*3</td> </tr> <tr> <td>16-bit free-run<br/>timer 2 (0<br/>detection) /<br/>(compare clear)</td> </tr> </table> | PPG2/3/12/13/22<br>/23/32/33/42/43 | 41       | 29                | ICR<br>25 | 358<br>H | 000F<br>FF58<br>H | 25<br>*3 | 16-bit free-run<br>timer 2 (0<br>detection) /<br>(compare clear) | PPG2/3/12/13/22<br>/23/32/33/43 | 41       | 29                   | ICR<br>25 | 358<br>H | 000F<br>FF58<br>H | 25<br>*3 | 16-bit free-run<br>timer 2 (0<br>detection) /<br>(compare clear) |    |                      |   |   |
| PPG2/3/12/13/22<br>/23/32/33/42/43                               | 41                      | 29   | ICR<br>25                          |          |                   |           |          |                   |          | 358<br>H   | 000F<br>FF58<br>H               |          |                      |           |          |                   |          | 25<br>*3   |    |                      |   |   |
| 16-bit free-run<br>timer 2 (0<br>detection) /<br>(compare clear) |                         |  |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| PPG2/3/12/13/22<br>/23/32/33/43                                  | 41                      | 29   | ICR<br>25                          | 358<br>H | 000F<br>FF58<br>H | 25<br>*3  |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| 16-bit free-run<br>timer 2 (0<br>detection) /<br>(compare clear) |                         |  |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| 133  | ■Interrupt Vector Table | <p>The interrupt factor in Interrupt vector 120pin modified as follows:</p> <p>(Error)</p> <table border="1"> <tr> <td>Base timer 1<br/>IRQ0</td> <td rowspan="4">61</td> <td rowspan="4">3D</td> <td rowspan="4">ICR<br/>45</td> <td rowspan="4">308<br/>H</td> <td rowspan="4">000F<br/>FF08<br/>H</td> <td rowspan="4">45<br/>*5</td> </tr> <tr> <td>Base timer 1<br/>IRQ1</td> </tr> <tr> <td>-</td> </tr> <tr> <td>-</td> </tr> </table> <p>(Correct)</p> <table border="1"> <tr> <td>Base timer 1<br/>IRQ0</td> <td rowspan="4">61</td> <td rowspan="4">3D</td> <td rowspan="4">ICR<br/>45</td> <td rowspan="4">308<br/>H</td> <td rowspan="4">000F<br/>FF08<br/>H</td> <td rowspan="4">45</td> </tr> <tr> <td>Base timer 1<br/>IRQ1</td> </tr> <tr> <td>-</td> </tr> <tr> <td>-</td> </tr> </table>   | Base timer 1<br>IRQ0               | 61       | 3D                | ICR<br>45 | 308<br>H | 000F<br>FF08<br>H | 45<br>*5 | Base timer 1<br>IRQ1   | -                               | -        | Base timer 1<br>IRQ0 | 61        | 3D       | ICR<br>45         | 308<br>H | 000F<br>FF08<br>H  | 45 | Base timer 1<br>IRQ1 | - | - |
| Base timer 1<br>IRQ0   | 61                      | 3D   | ICR<br>45                          |          |                   |           |          |                   |          | 308<br>H   | 000F<br>FF08<br>H               | 45<br>*5 |                      |           |          |                   |          |  |    |                      |   |   |
| Base timer 1<br>IRQ1   |                         |  |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| -  |                         |  |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| -  |                         |  |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| Base timer 1<br>IRQ0   | 61                      | 3D   | ICR<br>45                          | 308<br>H | 000F<br>FF08<br>H | 45        |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| Base timer 1<br>IRQ1   |                         |  |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| -  |                         |  |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| -  |                         |  |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| 133  | ■Interrupt Vector Table | <p>The following sentence deleted from Interrupt vector 120pins.</p> <p>(Error)</p> <p>*5: It does not support the DMA transfer by the interrupt because of the RAM ECC bit error.</p>   |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |

| Page   | Section                  | Change Results   |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
|--|--------------------------|--|------------------------------------|----------|-------------------|-----------|----------|-------------------|----------|--|---------------------------------|----------|----------------------|-----------|----------|-------------------|----------|--|----|----------------------|---|---|
| 135  | ■ Interrupt Vector Table | <p>"42" is deleted as shown below from the interrupt factor in Interrupt vector 144pin.</p> <p>(Error)</p> <table border="1"> <tr> <td>PPG2/3/12/13/22/<br/>23/32/33/42/43</td> <td rowspan="2">41</td> <td rowspan="2">29</td> <td rowspan="2">ICR<br/>25</td> <td rowspan="2">358<br/>H</td> <td rowspan="2">000F<br/>FF58<br/>H</td> <td rowspan="2">25*<br/>3</td> </tr> <tr> <td>16-bit free-run<br/>timer 2 (0<br/>detection) /<br/>(compare clear)</td> </tr> </table> <p>(Correct)</p> <table border="1"> <tr> <td>PPG2/3/12/13/22/<br/>23/32/33/43</td> <td rowspan="2">41</td> <td rowspan="2">29</td> <td rowspan="2">ICR<br/>25</td> <td rowspan="2">358<br/>H</td> <td rowspan="2">000F<br/>FF58<br/>H</td> <td rowspan="2">25*<br/>3</td> </tr> <tr> <td>16-bit free-run<br/>timer 2 (0<br/>detection) /<br/>(compare clear)</td> </tr> </table> | PPG2/3/12/13/22/<br>23/32/33/42/43 | 41       | 29                | ICR<br>25 | 358<br>H | 000F<br>FF58<br>H | 25*<br>3 | 16-bit free-run<br>timer 2 (0<br>detection) /<br>(compare clear) | PPG2/3/12/13/22/<br>23/32/33/43 | 41       | 29                   | ICR<br>25 | 358<br>H | 000F<br>FF58<br>H | 25*<br>3 | 16-bit free-run<br>timer 2 (0<br>detection) /<br>(compare clear) |    |                      |   |   |
| PPG2/3/12/13/22/<br>23/32/33/42/43                               | 41                       | 29   | ICR<br>25                          |          |                   |           |          |                   |          | 358<br>H   | 000F<br>FF58<br>H               |          |                      |           |          |                   |          | 25*<br>3   |    |                      |   |   |
| 16-bit free-run<br>timer 2 (0<br>detection) /<br>(compare clear) |                          |  |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| PPG2/3/12/13/22/<br>23/32/33/43                                  | 41                       | 29   | ICR<br>25                          | 358<br>H | 000F<br>FF58<br>H | 25*<br>3  |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| 16-bit free-run<br>timer 2 (0<br>detection) /<br>(compare clear) |                          |  |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| 137  | ■ Interrupt Vector Table | <p>The interrupt factor in Interrupt vector 144pin modified as follows:</p> <p>(Error)</p> <table border="1"> <tr> <td>Base timer 1<br/>IRQ0</td> <td rowspan="4">61</td> <td rowspan="4">3D</td> <td rowspan="4">ICR<br/>45</td> <td rowspan="4">308<br/>H</td> <td rowspan="4">000F<br/>FF08<br/>H</td> <td rowspan="4">45<br/>*5</td> </tr> <tr> <td>Base timer 1<br/>IRQ1</td> </tr> <tr> <td>-</td> </tr> <tr> <td>-</td> </tr> </table> <p>(Correct)</p> <table border="1"> <tr> <td>Base timer 1<br/>IRQ0</td> <td rowspan="4">61</td> <td rowspan="4">3D</td> <td rowspan="4">ICR<br/>45</td> <td rowspan="4">308<br/>H</td> <td rowspan="4">000F<br/>FF08<br/>H</td> <td rowspan="4">45</td> </tr> <tr> <td>Base timer 1<br/>IRQ1</td> </tr> <tr> <td>-</td> </tr> <tr> <td>-</td> </tr> </table>   | Base timer 1<br>IRQ0               | 61       | 3D                | ICR<br>45 | 308<br>H | 000F<br>FF08<br>H | 45<br>*5 | Base timer 1<br>IRQ1   | -                               | -        | Base timer 1<br>IRQ0 | 61        | 3D       | ICR<br>45         | 308<br>H | 000F<br>FF08<br>H  | 45 | Base timer 1<br>IRQ1 | - | - |
| Base timer 1<br>IRQ0   | 61                       | 3D   | ICR<br>45                          |          |                   |           |          |                   |          | 308<br>H   | 000F<br>FF08<br>H               | 45<br>*5 |                      |           |          |                   |          |  |    |                      |   |   |
| Base timer 1<br>IRQ1   |                          |  |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| -  |                          |  |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| -  |                          |  |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| Base timer 1<br>IRQ0   | 61                       | 3D   | ICR<br>45                          | 308<br>H | 000F<br>FF08<br>H | 45        |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| Base timer 1<br>IRQ1   |                          |  |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| -  |                          |  |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| -  |                          |  |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |
| 137  | ■ Interrupt Vector Table | <p>The following sentence deleted from Interrupt vector 144pins.</p> <p>(Error)</p> <p>*5: It does not support the DMA transfer by the interrupt because of the RAM ECC bit error.</p>   |                                    |          |                   |           |          |                   |          |  |                                 |          |                      |           |          |                   |          |  |    |                      |   |   |

| Page                                   | Section   | Change Results   |                      |            |                   |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
|--|---|--|----------------------|------------|-------------------|-----------|----------|-------------------|----------|----------------------|--|---------|---|---|----|----------------------|---------|----|-----------|----------|-------------------|--|----------------------|---|----|----|---|---------|---|-----|----|--|-----------|------------|--------|--|------|---------|-----|-----|--|---------|---|---|----|----|---------|---|----|----|-----|--|---------|---|----|----|----|---------|---|-----|----|-----|
| 141                                    | ■ Interrupt Vector Table                                    | <p>The interrupt factor in Interrupt vector 176pin modified as follows:</p> <p>(Error)</p> <table border="1"> <tr> <td>Base timer 1<br/>IRQ0</td> <td rowspan="4">61</td> <td rowspan="4">3D</td> <td rowspan="4">ICR<br/>45</td> <td rowspan="4">308<br/>H</td> <td rowspan="4">000F<br/>FF08<br/>H</td> <td>45<br/>*5</td> </tr> <tr> <td>Base timer 1<br/>IRQ1</td> <td></td> </tr> <tr> <td>-</td> <td></td> </tr> <tr> <td>-</td> <td></td> </tr> </table> <p>(Correct)</p> <table border="1"> <tr> <td>Base timer 1<br/>IRQ0</td> <td rowspan="4">61</td> <td rowspan="4">3D</td> <td rowspan="4">ICR<br/>45</td> <td rowspan="4">308<br/>H</td> <td rowspan="4">000F<br/>FF08<br/>H</td> <td>45</td> </tr> <tr> <td>Base timer 1<br/>IRQ1</td> <td></td> </tr> <tr> <td>-</td> <td></td> </tr> <tr> <td>-</td> <td></td> </tr> </table>   | Base timer 1<br>IRQ0 | 61         | 3D                | ICR<br>45 | 308<br>H | 000F<br>FF08<br>H | 45<br>*5 | Base timer 1<br>IRQ1 |  | -       |   | - |    | Base timer 1<br>IRQ0 | 61      | 3D | ICR<br>45 | 308<br>H | 000F<br>FF08<br>H | 45                                     | Base timer 1<br>IRQ1 |   | -  |    | - |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
| Base timer 1<br>IRQ0                   | 61  | 3D   | ICR<br>45            |            |                   |           |          |                   | 308<br>H | 000F<br>FF08<br>H    | 45<br>*5                               |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
| Base timer 1<br>IRQ1                   |   |  |                      |            |                   |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
| -                                      |   |  |                      |            |                   |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
| -                                      |   |  |                      |            |                   |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
| Base timer 1<br>IRQ0                   | 61  | 3D   | ICR<br>45            | 308<br>H   | 000F<br>FF08<br>H | 45        |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
| Base timer 1<br>IRQ1                   |   |  |                      |            |                   |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
| -                                      |   |  |                      |            |                   |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
| -                                      |   |  |                      |            |                   |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
| 141                                    | ■ Interrupt Vector Table                                    | <p>The following sentence deleted from Interrupt vector 176pins.</p> <p>(Error)</p> <p>*5: It does not support the DMA transfer by the interrupt because of the RAM ECC bit error.</p>   |                      |            |                   |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
| 142                                    | ■ Electrical Characteristics<br>1. Absolute Maximum Ratings | <p>The remarks of "L" level average output current" and "H" level average output current" modified as follows.</p> <p>(Error)</p> <table border="1"> <thead> <tr> <th rowspan="2">Parameter</th> <th rowspan="2">Sym<br/>bol</th> <th colspan="2">Rating</th> <th rowspan="2">Unit</th> <th rowspan="2">Remarks</th> </tr> <tr> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td rowspan="2">"L" level average<br/>output current *4</td> <td>IO LAV1</td> <td>-</td> <td>4</td> <td>mA</td> <td></td> </tr> <tr> <td>IO LAV2</td> <td>-</td> <td>12</td> <td>mA</td> <td></td> </tr> <tr> <td rowspan="2">"H" level average<br/>output current *4</td> <td>IO HAV1</td> <td>-</td> <td>-4</td> <td>mA</td> <td></td> </tr> <tr> <td>IO HAV2</td> <td>-</td> <td>-12</td> <td>mA</td> <td></td> </tr> </tbody> </table> <p>(Correct)</p> <table border="1"> <thead> <tr> <th rowspan="2">Parameter</th> <th rowspan="2">Sym<br/>bol</th> <th colspan="2">Rating</th> <th rowspan="2">Unit</th> <th rowspan="2">Remarks</th> </tr> <tr> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td rowspan="2">"L" level average<br/>output current *4</td> <td>IO LAV1</td> <td>-</td> <td>4</td> <td>mA</td> <td>*9</td> </tr> <tr> <td>IO LAV2</td> <td>-</td> <td>12</td> <td>mA</td> <td>*10</td> </tr> <tr> <td rowspan="2">"H" level average<br/>output current *4</td> <td>IO HAV1</td> <td>-</td> <td>-4</td> <td>mA</td> <td>*9</td> </tr> <tr> <td>IO HAV2</td> <td>-</td> <td>-12</td> <td>mA</td> <td>*10</td> </tr> </tbody> </table> | Parameter            | Sym<br>bol | Rating            |           | Unit     | Remarks           | Min      | Max                  | "L" level average<br>output current *4 | IO LAV1 | - | 4 | mA |                      | IO LAV2 | -  | 12        | mA       |                   | "H" level average<br>output current *4 | IO HAV1              | - | -4 | mA |   | IO HAV2 | - | -12 | mA |  | Parameter | Sym<br>bol | Rating |  | Unit | Remarks | Min | Max | "L" level average<br>output current *4 | IO LAV1 | - | 4 | mA | *9 | IO LAV2 | - | 12 | mA | *10 | "H" level average<br>output current *4 | IO HAV1 | - | -4 | mA | *9 | IO HAV2 | - | -12 | mA | *10 |
| Parameter                              | Sym<br>bol  | Rating   |                      |            | Unit              | Remarks   |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
|  |   | Min  | Max                  |            |                   |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
| "L" level average<br>output current *4 | IO LAV1   | -  | 4                    | mA         |                   |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
|  | IO LAV2   | -  | 12                   | mA         |                   |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
| "H" level average<br>output current *4 | IO HAV1   | -  | -4                   | mA         |                   |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
|  | IO HAV2   | -  | -12                  | mA         |                   |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
| Parameter                              | Sym<br>bol  | Rating   |                      | Unit       | Remarks           |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
|  |   | Min  | Max                  |            |                   |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
| "L" level average<br>output current *4 | IO LAV1   | -  | 4                    | mA         | *9                |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
|  | IO LAV2   | -  | 12                   | mA         | *10               |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
| "H" level average<br>output current *4 | IO HAV1   | -  | -4                   | mA         | *9                |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
|  | IO HAV2   | -  | -12                  | mA         | *10               |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |
| 143                                    | ■ Electrical Characteristics<br>1. Absolute Maximum Ratings | <p>The following note added.</p> <p>(Correct)</p> <p>*9: Corresponding pins: General-purpose ports other than those of P103, P104, P105 and P106.</p> <p>*10: Corresponding pins: General-purpose ports of P103, P104, P105 and P106.</p>  |                      |            |                   |           |          |                   |          |                      |  |         |   |   |    |                      |         |    |           |          |                   |  |                      |   |    |    |   |         |   |     |    |  |           |            |        |  |      |         |     |     |  |         |   |   |    |    |         |   |    |    |     |  |         |   |    |    |    |         |   |     |    |     |



| Page                      | Section  | Change Results  |
|---------------------------|--|---|
| 155                       | <ul style="list-style-type: none"> <li>■Electrical Characteristics</li> <li>AC Characteristics</li> <li>(2) Reset Input</li> </ul>         | Added the At power-on <sup>*2</sup> condition to the remarks in Reset input time.   |
| 156                       | <ul style="list-style-type: none"> <li>■Electrical Characteristics</li> <li>AC Characteristics</li> <li>(3) Power-on Conditions</li> </ul> | <p>Deleted the Slope detection undetected specification.</p> <p>Added the Power ramp rate and C pin voltage at Power-on.</p> <p>*1, *2: Changed the sentence.</p> <p>Added *3, *4, Note, Figure at the Power off time, Power ramp rate, C pin voltage at Power-on.</p>  |
| 6 to 11,<br>203 to<br>216 | <ul style="list-style-type: none"> <li>■Product lineup</li> <li>■Ordering information</li> </ul>   | Package description modified to JEDEC description.  |
| 47                        | <ul style="list-style-type: none"> <li>■During Power-on</li> </ul>   | <p>The following sentence modified as fdeleted from Interrupt (Error)</p> <p>To prevent a malfunction of the voltage step-down circuit built in the device, set the voltage rising time to have 50µs or longer (between 0.2V and 2.7V) during power-on.</p> <p>(Correct)</p> <p>To prevent a malfunction of the voltage step-down circuit built in the device, the voltage rising must be monotonic increasing during power-on.</p> <p>Power-on prohibits that the voltage goes up and down and voltage rising stops temporarily.</p> |
| 49, 50                    | <ul style="list-style-type: none"> <li>■Block Diagram</li> </ul>   | <p>The following Block diagram modified as follows:</p> <ul style="list-style-type: none"> <li>●MB91F522B, MB91F523B, MB91F524B, MB91F525B, MB91F526B</li> <li>●MB91F522D, MB91F523D, MB91F524D, MB91F525D, MB91F526D</li> </ul> <p>(Error)</p> <p>CAN (2ch).</p> <p>(Correct)</p> <p>CAN (3ch)</p>   |
| 217 to<br>220             | <ul style="list-style-type: none"> <li>■Ordering Information</li> </ul>  | <p>Added the following description.</p> <ul style="list-style-type: none"> <li>■ORDERING INFORMATION MB91F52xxxD</li> </ul>   |
| 221 to<br>227             | <ul style="list-style-type: none"> <li>■Package Dimensions</li> </ul>  | Package Dimensions modified to JEDEC description.   |



| Page         | Section                          | Change Results   |              |                |              |                   |
|--------------|----------------------------------|--|--------------|----------------|--------------|-------------------|
| Rev *C       |                                  |  |              |                |              |                   |
| 2            | Features<br>Peripheral Functions | <p>The following sentence modified in I2C as following:</p> <p>(Error)<br/>&lt; I2C &gt;<br/>2 channels ch.3 , ch.4 Standard mode/high-speed mode supported.</p> <p>Standard mode (Max. 100kbps) / high-speed mode (Max. 400kbps) supported</p> <p>(Correct)<br/>&lt; I2C &gt;<br/>2 channels ch.3 , ch.4 Standard mode/fast mode supported.</p> <p>Standard mode (Max. 100kbps) / fast mode (Max. 400kbps) supported</p>  |              |                |              |                   |
| 5,6,7,8,9,10 | 1. Product Lineup                | <p>The following *2 added as follows:</p> <p>(Error)</p> <table border="1"> <tr> <td>Power supply</td> <td>2.7 V to 5.5 V</td> </tr> </table> <p>(Correct)</p> <table border="1"> <tr> <td>Power supply</td> <td>2.7 V to 5.5 V *2</td> </tr> </table>   | Power supply | 2.7 V to 5.5 V | Power supply | 2.7 V to 5.5 V *2 |
| Power supply | 2.7 V to 5.5 V                   |  |              |                |              |                   |
| Power supply | 2.7 V to 5.5 V *2                |  |              |                |              |                   |
| 5,6,7,8,9,10 | 1. Product Lineup                | <p>The following sentence added as follows:</p> <p>(Correct)<br/>*2: Detection voltage of the external low voltage detection reset (initial) is 2.8V±8% (2.576V to 3.024V).<br/>This detection voltage (2.576V) is below the minimum operation guarantee voltage (2.7V).<br/>Between this detection voltage and the minimum operation guarantee voltage, MCU functions are not guaranteed except for the low voltage detector.<br/>Note that although the detection level is below the minimum operation guarantee voltage, the LVD reset factor flag is set as the voltage drops below the detection level.</p> |              |                |              |                   |
| 8, 9, 10,    | 1. Product Lineup                | <p>The following sentence modified in the bottom of Product lineup comparison table as following:</p> <p>(Error)<br/>*1: Only channel 3 and channel 4 support the I2C (high-speed mode/standard mode).</p> <p>(Correct)<br/>*1: Only channel 3 and channel 4 support the I2C (fast mode/standard mode).</p>  |              |                |              |                   |
| 11           | 1. Product Lineup                | Added silicon version E  |              |                |              |                   |



| Page              | Section  | Change Results  |                   |  |      |         |     |     |  |  |  |  |             |  |      |         |     |     |  |  |  |  |
|-------------------|--|---|-------------------|--|------|---------|-----|-----|--|--|--|--|-------------|--|------|---------|-----|-----|--|--|--|--|
| 46                | ■ During Power-on  | <p>The following sentence modified as following:</p> <p>(Error)<br/>To prevent a malfunction of the voltage step-down circuit built in the device, the voltage rising must be monotonic increasing during power-on.<br/>Power-on prohibits that the voltage goes up and down and voltage rising stops temporarily.</p> <p>(Correct)<br/>To prevent a malfunction of the voltage step-down circuit built in the device, the voltage rising must be monotonic during power-on.</p>  |                   |  |      |         |     |     |  |  |  |  |             |  |      |         |     |     |  |  |  |  |
| 142,143           | 11. Electrical Characteristics<br>Recommended operating conditions       | <p>The following sentence modified as following:</p> <p>(Error)<br/>*1: When it is used outside recommended operation guarantee range (range of the operation guarantee), contact your sales representative. Moreover, minimum value with an effective external low-voltage detection reset becomes a voltage until generating low-voltage detection reset.</p> <p>(Correct)<br/>*1: When it is used outside recommended operation guarantee range (range of the operation guarantee), contact your sales representative.<br/>Detection voltage of the external low voltage detection reset (initial) is <math>2.8V \pm 8\%</math> (2.576V to 3.024V).<br/>This detection voltage (2.576V) is below the minimum operation guarantee voltage (2.7V).<br/>Between this detection voltage and the minimum operation guarantee voltage,<br/>MCU functions are not guaranteed except for the low voltage detector.<br/>Note that although the detection level is below the minimum operation guarantee voltage,<br/>the LVD reset factor flag is set as the voltage drops below the detection level.</p> |                   |  |      |         |     |     |  |  |  |  |             |  |      |         |     |     |  |  |  |  |
| 156, 157          | 11. Electrical Characteristics<br>AC Characteristics                     | Added (3-2) Power-on Conditions for MB91F52xxxE   |                   |  |      |         |     |     |  |  |  |  |             |  |      |         |     |     |  |  |  |  |
| 184               | 11. Electrical Characteristics<br>AC Characteristics<br>(4-4) I2C timing | <p>The following sentence modified as following:</p> <p>(Error)</p> <table border="1"> <thead> <tr> <th colspan="2">High-speed mode*3</th> <th rowspan="2">Unit</th> <th rowspan="2">Remarks</th> </tr> <tr> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Notes: Only ch.3 and ch.4 are standard mode/high-speed mode correspondence.</p> <p>*3: A high-speed mode I<sup>2</sup>C bus device can be used</p> <p>(Correct)</p> <table border="1"> <thead> <tr> <th colspan="2">Fast mode*3</th> <th rowspan="2">Unit</th> <th rowspan="2">Remarks</th> </tr> <tr> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Notes: Only ch.3 and ch.4 are standard mode/fast mode correspondence.</p> <p>*3: A fast mode I<sup>2</sup>C bus device can be used</p>  | High-speed mode*3 |  | Unit | Remarks | Min | Max |  |  |  |  | Fast mode*3 |  | Unit | Remarks | Min | Max |  |  |  |  |
| High-speed mode*3 |  | Unit  | Remarks           |  |      |         |     |     |  |  |  |  |             |  |      |         |     |     |  |  |  |  |
| Min               | Max  |   |                   |  |      |         |     |     |  |  |  |  |             |  |      |         |     |     |  |  |  |  |
|                   |  |   |                   |  |      |         |     |     |  |  |  |  |             |  |      |         |     |     |  |  |  |  |
| Fast mode*3       |  | Unit  | Remarks           |  |      |         |     |     |  |  |  |  |             |  |      |         |     |     |  |  |  |  |
| Min               | Max  |   |                   |  |      |         |     |     |  |  |  |  |             |  |      |         |     |     |  |  |  |  |
|                   |  |   |                   |  |      |         |     |     |  |  |  |  |             |  |      |         |     |     |  |  |  |  |



| Page       | Section  | Change Results   |       |  |  |      |         |     |     |     |     |   |     |   |  |     |     |     |   |  |       |  |  |      |         |     |     |     |     |   |     |   |  |     |                |     |   |  |
|------------|--|--|-------|--|--|------|---------|-----|-----|-----|-----|---|-----|---|--|-----|-----|-----|---|--|-------|--|--|------|---------|-----|-----|-----|-----|---|-----|---|--|-----|----------------|-----|---|--|
| 187        | 11. Electrical Characteristics<br>(8) Low voltage detection<br>(External low-voltage detection)      | <p>The following sentence modified in the Detection voltage as following:</p> <p>(Error)</p> <table border="1"> <thead> <tr> <th colspan="3">Value</th> <th rowspan="2">Unit</th> <th rowspan="2">Remarks</th> </tr> <tr> <th>Min</th> <th>Typ</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td>2.7</td> <td>-</td> <td>5.5</td> <td>V</td> <td></td> </tr> <tr> <td>-8%</td> <td>2.8</td> <td>+8%</td> <td>V</td> <td>When power-supply voltage falls and detection level is set initially</td> </tr> </tbody> </table> <p>(Correct)</p> <table border="1"> <thead> <tr> <th colspan="3">Value</th> <th rowspan="2">Unit</th> <th rowspan="2">Remarks</th> </tr> <tr> <th>Min</th> <th>Typ</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td>2.7</td> <td>-</td> <td>5.5</td> <td>V</td> <td></td> </tr> <tr> <td>-8%</td> <td>LVD5F_SEL[3:0]</td> <td>+8%</td> <td>V</td> <td>LVD5F_SEL[3:0] are programmable. Refer to the hardware manual.</td> </tr> </tbody> </table> | Value |  |  | Unit | Remarks | Min | Typ | Max | 2.7 | - | 5.5 | V |  | -8% | 2.8 | +8% | V | When power-supply voltage falls and detection level is set initially | Value |  |  | Unit | Remarks | Min | Typ | Max | 2.7 | - | 5.5 | V |  | -8% | LVD5F_SEL[3:0] | +8% | V | LVD5F_SEL[3:0] are programmable. Refer to the hardware manual. |
| Value      |  |  | Unit  | Remarks  |  |      |         |     |     |     |     |   |     |   |  |     |     |     |   |  |       |  |  |      |         |     |     |     |     |   |     |   |  |     |                |     |   |  |
| Min        | Typ  | Max  |       |  |  |      |         |     |     |     |     |   |     |   |  |     |     |     |   |  |       |  |  |      |         |     |     |     |     |   |     |   |  |     |                |     |   |  |
| 2.7        | -  | 5.5  | V     |  |  |      |         |     |     |     |     |   |     |   |  |     |     |     |   |  |       |  |  |      |         |     |     |     |     |   |     |   |  |     |                |     |   |  |
| -8%        | 2.8  | +8%  | V     | When power-supply voltage falls and detection level is set initially |  |      |         |     |     |     |     |   |     |   |  |     |     |     |   |  |       |  |  |      |         |     |     |     |     |   |     |   |  |     |                |     |   |  |
| Value      |  |  | Unit  | Remarks  |  |      |         |     |     |     |     |   |     |   |  |     |     |     |   |  |       |  |  |      |         |     |     |     |     |   |     |   |  |     |                |     |   |  |
| Min        | Typ  | Max  |       |  |  |      |         |     |     |     |     |   |     |   |  |     |     |     |   |  |       |  |  |      |         |     |     |     |     |   |     |   |  |     |                |     |   |  |
| 2.7        | -  | 5.5  | V     |  |  |      |         |     |     |     |     |   |     |   |  |     |     |     |   |  |       |  |  |      |         |     |     |     |     |   |     |   |  |     |                |     |   |  |
| -8%        | LVD5F_SEL[3:0]   | +8%  | V     | LVD5F_SEL[3:0] are programmable. Refer to the hardware manual.       |  |      |         |     |     |     |     |   |     |   |  |     |     |     |   |  |       |  |  |      |         |     |     |     |     |   |     |   |  |     |                |     |   |  |
| 188        | 11. Electrical Characteristics<br>(9) Low voltage detection<br>(RAM retention low-voltage detection) | <p>The following sentence modified as following:</p> <p>(Error)</p> <p>(9) Low voltage detection (Internal low-voltage detection)</p> <p>(Correct)</p> <p>(9) Low voltage detection (RAM retention low-voltage detection)</p>  |       |  |  |      |         |     |     |     |     |   |     |   |  |     |     |     |   |  |       |  |  |      |         |     |     |     |     |   |     |   |  |     |                |     |   |  |
| 220 to 223 | 16. Ordering Information   | <p>Added the following description.</p> <p>■ORDERING INFORMATION MB91F52xxxE</p>   |       |  |  |      |         |     |     |     |     |   |     |   |  |     |     |     |   |  |       |  |  |      |         |     |     |     |     |   |     |   |  |     |                |     |   |  |
| Rev *D     |  |  |       |  |  |      |         |     |     |     |     |   |     |   |  |     |     |     |   |  |       |  |  |      |         |     |     |     |     |   |     |   |  |     |                |     |   |  |
| 1          | Features   | <p>The following sentence should be modified as follows:</p> <p>(Error)</p> <p>Conversion time : 1<math>\mu</math>s</p> <p>(Correct)</p> <p>Conversion time : 1.4<math>\mu</math>s</p>   |       |  |  |      |         |     |     |     |     |   |     |   |  |     |     |     |   |  |       |  |  |      |         |     |     |     |     |   |     |   |  |     |                |     |   |  |



| Page         | Section  | Change Results   |
|--------------|--|--|
| 5,6,7,8,9,10 | 1. Product Lineup  | <p>The following sentence should be modified as follows:</p> <p>(Error)<br/> *2: Detection voltage of the external low voltage detection reset (initial) is 2.8V±8% (2.576V to 3.024V). This detection voltage (2.576V) is below the minimum operation guarantee voltage (2.7V). Between this detection voltage and the minimum operation guarantee voltage, MCU functions are not guaranteed except for the low voltage detector. Note that although the detection level is below the minimum operation guarantee voltage, the LVD reset factor flag is set as the voltage drops below the detection level.</p> <p>(Correct)<br/> *2: The initial detection voltage of the external low voltage detection is 2.8V±8% (2.576V to 3.024V). This LVD setting and internal LVD cannot be used to reliably generate a reset before voltage dips below minimum guaranteed operation voltage, as these detection levels are below the minimum guaranteed MCU operation voltage. Below the minimum guaranteed MCU operation voltage, MCU operations are not guaranteed with the exception of LVD.</p>   |
| 142,143      | 11. Electrical Characteristics<br>Recommended operating conditions | <p>The following sentence should be modified as follows:</p> <p>(Error)<br/> *1: When it is used outside recommended operation guarantee range (range of the operation guarantee), contact your sales representative.<br/> Detection voltage of the external low voltage detection reset (initial) is 2.8V±8% (2.576V to 3.024V). This detection voltage (2.576V) is below the minimum operation guarantee voltage (2.7V). Between this detection voltage and the minimum operation guarantee voltage, MCU functions are not guaranteed except for the low voltage detector. Note that although the detection level is below the minimum operation guarantee voltage, the LVD reset factor flag is set as the voltage drops below the detection level.</p> <p>(Correct)<br/> *1: When it is used outside recommended operation guarantee range (range of the operation guarantee), contact your sales representative.<br/> The initial detection voltage of the external low voltage detection is 2.8V±8% (2.576V to 3.024V). This LVD setting and internal LVD cannot be used to reliably generate a reset before voltage dips below minimum guaranteed operation voltage, as these detection levels are below the minimum guaranteed MCU operation voltage. Below the minimum guaranteed MCU operation voltage, MCU operations are not guaranteed with the exception of LVD.</p> |
| 146          | 11. Electrical Characteristics<br>DC Characteristics               | <p>Pin name of R<sub>UP3</sub> should be modified as follows:</p> <p>(Error)<br/> Port pin other than P035,041,093,122</p> <p>(Correct)<br/> Port pin other than P035,041,073,074,076,077,093,122</p>  |



| Page           | Section   | Change Results   |                   |                           |                   |                   |          |                |      |    |    |                           |                |     |    |                |     |     |
|----------------|---|--|-------------------|---------------------------|-------------------|-------------------|----------|----------------|------|----|----|---------------------------|----------------|-----|----|----------------|-----|-----|
| 187            | 11. Electrical Characteristics<br>(8) Low voltage detection<br>(External low-voltage detection) | <p>Note of Detection voltage should be added as follows:</p> <p>(Correct)<br/>Detection voltage <sup>*3</sup></p> <p><b>*3: The initial detection voltage of the external low voltage detection is 2.8V±8% (2.576V to 3.024V). This LVD setting cannot be used to reliably generate a reset before voltage dips below minimum guaranteed MCU operation voltage, as this detection level is below the minimum guaranteed MCU operation voltage (2.7V). Below the minimum guaranteed MCU operation voltage, MCU operations are not guaranteed with the exception of LVD.</b></p> |                   |                           |                   |                   |          |                |      |    |    |                           |                |     |    |                |     |     |
| 188            | 11. Electrical Characteristics<br>(9) Low voltage detection<br>(Internal low-voltage detection) | <p>The following sentence modified as following:</p> <p>(Error)<br/>(9) Low voltage detection (RAM retention low-voltage detection)</p> <p>(Correct)<br/>(9) Low voltage detection (Internal low-voltage detection)</p>  |                   |                           |                   |                   |          |                |      |    |    |                           |                |     |    |                |     |     |
|                |   | <p>The following symbol should be modified as follows:</p> <p>(Error)<br/>*</p> <p>(Correct)<br/><sup>*1</sup></p>   |                   |                           |                   |                   |          |                |      |    |    |                           |                |     |    |                |     |     |
|                |   | <p>Note of Detection voltage should be added as follows:</p> <p>(Correct)<br/>Detection voltage <sup>*2</sup></p> <p><b>*2: The detection voltage of the internal low voltage detection is 0.9V±0.1V. This LVD cannot be used to reliably generate a reset before voltage dips below minimum guaranteed MCU operation voltage, as this detection level is below the minimum guaranteed MCU operation voltage. Below the minimum guaranteed MCU operation voltage, MCU operations are not guaranteed with the exception of LVD.</b></p>   |                   |                           |                   |                   |          |                |      |    |    |                           |                |     |    |                |     |     |
| 233 to 235     | 18. Errata  | Limitation for Watch mode (power off) should be added in Errata.   |                   |                           |                   |                   |          |                |      |    |    |                           |                |     |    |                |     |     |
| Rev *F         |   |  |                   |                           |                   |                   |          |                |      |    |    |                           |                |     |    |                |     |     |
| 222            | 16. Ordering Information<br>MB91F52xxxE   | <p>The shading part added as below.</p> <table border="1"> <thead> <tr> <th>Part number</th> <th>Sub clock</th> <th>CSV Initial value</th> <th>LVD Initial value</th> <th>Package*</th> </tr> </thead> <tbody> <tr> <td>MB91F526LSEPMC</td> <td rowspan="3">None</td> <td>ON</td> <td>ON</td> <td rowspan="3">LQP · 176 pin,<br/>Plastic</td> </tr> <tr> <td>MB91F526LHEPMC</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>MB91F526LKEPMC</td> <td>OFF</td> <td>OFF</td> </tr> </tbody> </table>   | Part number       | Sub clock                 | CSV Initial value | LVD Initial value | Package* | MB91F526LSEPMC | None | ON | ON | LQP · 176 pin,<br>Plastic | MB91F526LHEPMC | OFF | ON | MB91F526LKEPMC | OFF | OFF |
| Part number    | Sub clock   | CSV Initial value  | LVD Initial value | Package*                  |                   |                   |          |                |      |    |    |                           |                |     |    |                |     |     |
| MB91F526LSEPMC | None  | ON   | ON                | LQP · 176 pin,<br>Plastic |                   |                   |          |                |      |    |    |                           |                |     |    |                |     |     |
| MB91F526LHEPMC |   | OFF  | ON                |                           |                   |                   |          |                |      |    |    |                           |                |     |    |                |     |     |
| MB91F526LKEPMC |   | OFF  | OFF               |                           |                   |                   |          |                |      |    |    |                           |                |     |    |                |     |     |



| Page                           | Section  | Change Results  |    |    |    |                                |                         |                                      |
|--------------------------------|--|---|----|----|----|--------------------------------|-------------------------|--------------------------------------|
| Rev *G                         |  |   |    |    |    |                                |                         |                                      |
| -                              | Marketing Part Numbers changed from an MB prefix to a CY prefix. |   |    |    |    |                                |                         |                                      |
| Rev *H                         |  |   |    |    |    |                                |                         |                                      |
| 13                             | 2. Pin Assignment  | <p>The shading part added for LQH080 as below.</p> <table border="1"> <tr> <td>34</td> <td>35</td> <td>36</td> </tr> <tr> <td>P072/SIN4_0/AN34/ICU2_2/INT5_0</td> <td>P073/SOT4_0/AN33/ICU3_2</td> <td>P153/SCK5_0/SCU5/AN32/FRCK1_1/INT4_1</td> </tr> </table> | 34 | 35 | 36 | P072/SIN4_0/AN34/ICU2_2/INT5_0 | P073/SOT4_0/AN33/ICU3_2 | P153/SCK5_0/SCU5/AN32/FRCK1_1/INT4_1 |
| 34                             | 35   | 36  |    |    |    |                                |                         |                                      |
| P072/SIN4_0/AN34/ICU2_2/INT5_0 | P073/SOT4_0/AN33/ICU3_2  | P153/SCK5_0/SCU5/AN32/FRCK1_1/INT4_1  |    |    |    |                                |                         |                                      |
| 14                             | 2. Pin Assignment  | <p>The shading part added for LQI100 as below.</p> <table border="1"> <tr> <td>42</td> <td>43</td> <td>44</td> </tr> <tr> <td>P072/SIN4_0/AN34/ICU2_2/INT5_0</td> <td>P073/SOT4_0/AN33/ICU3_2</td> <td>P152/SCSS3_0</td> </tr> </table>                         | 42 | 43 | 44 | P072/SIN4_0/AN34/ICU2_2/INT5_0 | P073/SOT4_0/AN33/ICU3_2 | P152/SCSS3_0                         |
| 42                             | 43   | 44  |    |    |    |                                |                         |                                      |
| P072/SIN4_0/AN34/ICU2_2/INT5_0 | P073/SOT4_0/AN33/ICU3_2  | P152/SCSS3_0  |    |    |    |                                |                         |                                      |
| 217                            | 16. Ordering Information<br>CY91F52xxxE                          | <p>The shading part modified as below.</p> <p>Error)<br/>LQE • 64 pin, Plastic</p> <p>Correct)<br/>LQD • 64 pin, Plastic</p>  |    |    |    |                                |                         |                                      |
| Rev *I                         |  |   |    |    |    |                                |                         |                                      |
| 218                            | 17. Package Dimensions   | Updated LQD064 package dimension  |    |    |    |                                |                         |                                      |
| 219                            | 17. Package Dimensions   | Updated LQH080 package dimension  |    |    |    |                                |                         |                                      |
| 220                            | 17. Package Dimensions   | Updated LQI100 package dimension  |    |    |    |                                |                         |                                      |



## Document History

Document Title: CY91520 Series 32-bit FR81S Microcontroller

Document Number: 002-04662

| Revision | ECN | Orig. of Change | Submission Date | Description of Change  |
|----------|-----|-----------------|-----------------|--|
|          | -   | -               | -               | Initial release  |
| **       | -   | -               | 2/20/2014       | <p>Features:<br/>Corrected the following description.<br/>5V tolerant input: 4 channels ch.6, ch.8, ch.9, ch.11 Automotive input<br/>↓<br/>5V tolerant input: 4 channels ch.6, ch.8, ch.9, ch.11 CMOS hysteresis input</p> <p>I/O CIRCUIT TYPE:<br/>Corrected the following description to "Type F, G, I, J, K, M".<br/>Schmitt input → CMOS hysteresis input<br/>Corrected the following description to "Type D, E".<br/>I<sup>2</sup>C Schmitt input → I<sup>2</sup>C hysteresis input</p> <p>Block Diagram<br/>Corrected the following description.<br/> <ul style="list-style-type: none"> <li>• MB91F522B, MB91F523B, MB91F524B, MB91F525B, MB91F526B</li> <li>• MB91F522D, MB91F523D, MB91F524D, MB91F525D, MB91F526D</li> <li>• MB91F522F, MB91F523F, MB91F524F, MB91F525F, MB91F526F</li> <li>• MB91F522J, MB91F523J, MB91F524J, MB91F525J, MB91F526J</li> <li>• MB91F522K, MB91F523K, MB91F524K, MB91F525K, MB91F526K</li> <li>• MB91F522L, MB91F523L, MB91F524L, MB91F525L, MB91F526L</li> </ul> </p> <p>Electrical Characteristics<br/>2. Recommended operating conditions:<br/>*1 : When it is used outside recommended operation guarantee range (range of the operation guarantee), contact your sales representative. Moreover, minimum value with an effective external low-voltage detection reset becomes a voltage until generating low-voltage detection reset</p> <p>Electrical Characteristics<br/>3. DC characteristics<br/>Corrected the value of "ICCT5 When using sub clock 32kHz TA=+25°C". Max 1420μA → Max 2000μA<br/>Corrected the value of "Power supply voltage range".<br/>(TA:-40°C to +105°C, Vcc=AVcc=2.7V to 5.5V, VSS=AVSS=0.0V)<br/>↓<br/>(TA:-40°C to +105°C, Vcc=AVcc=5.0V±10%/3.3V±0.3V, VSS=AVSS=0.0V)<br/>Corrected the value of "Power supply voltage range".<br/>(TA:-40°C to +125°C, Vcc=AVcc=2.7V to 5.5V, VSS=AVSS=0.0V)<br/>↓<br/>(TA:-40°C to +125°C, Vcc=AVcc=5.0V±10%/3.3V±0.3V, VSS=AVSS=0.0V)<br/>Corrected the value of " Pull-up resistance R<sub>UP1</sub>".<br/>Vcc=3.3V±0.3V Min 49 Max 140 → Min 45 Max 140<br/>Corrected the following description.<br/>Pull-up resistance R<sub>UP2</sub><br/>Port pin other than P035,041,093,122 → P073,074,076,077<br/>Corrected the value of " Pull-up resistance R<sub>UP2</sub>".</p> |



| Revision | ECN | Orig. of Change | Submission Date | Description of Change  |
|----------|-----|-----------------|-----------------|--|
|          |     |                 |                 | <p>VCC=5.0V±10% Min 25 Max 100 →Min 25 Max 60<br/> VCC=3.3V±0.3V Min 49 Max 140 →Min 33 Max 90</p> <p>Added the value of " Pull-up resistance <math>R_{UP3}</math>".<br/> Pin name : Port pin other than P035,041,073,074,076,077,093,122<br/> VCC=5.0V±10% Min 25 Max 100<br/> VCC=3.3V±0.3V Min 45 Max 140</p> <p>Electrical Characteristics<br/> 4. AC characteristics<br/> (4) Multi-function Serial<br/> (4-1) CSIO timing<br/> (4-1-1),(4-1-2),(4-1-3),(4-1-4)<br/> (4-1-1),(4-1-4)SCK↓⇒SOT delay time <math>t_{SLOVI}</math><br/> (4-1-2),(4-1-3)SCK↑⇒SOT delay time <math>t_{SHOVI}</math></p> <p>Corrected the following description.<br/> Pin name: SCK0 to SCK11<br/> SOT0 to SOT11<br/> Value: Min -30 Max 30<br/> ↓<br/> Pin name: SCK0 to SCK2,SCK5 to SCK11<br/> SOT0 to SOT2,SOT5 to SOT11<br/> Value: Min -30 Max 30<br/> Pin name: SCK3,SCK4<br/> SOT3,SOT4<br/> Value: Min -300 Max 300<br/> (4-1-1),(4-1-4)Valid SIN⇒SCK↑ setup time <math>t_{VSHI}</math><br/> (4-1-2),(4-1-3)Valid SIN⇒SCK↓ setup time <math>t_{VSLI}</math></p> <p>Corrected the following description.<br/> Pin name: SCK0 to SCK11 SIN0 to SIN11<br/> Value: Min 34 Max -<br/> ↓<br/> Pin name: SCK0 to SCK2,SCK5 to SCK11 SIN0 to SIN2,SIN5 to SIN11<br/> Value: Min 34 Max -<br/> Pin name: SCK3,SCK4,SIN3,SIN4<br/> Value: Min 300 Max -<br/> (4-1-1),(4-1-4)SCK↓⇒SOT delay time <math>t_{SLOVE}</math><br/> (4-1-2),(4-1-3)SCK↑⇒SOT delay time <math>t_{SHOVE}</math></p> <p>Corrected the following description.<br/> Pin name: SCK0 to SCK11<br/> SOT0 to SOT11<br/> Value: Min - Max 33<br/> ↓<br/> Pin name: SCK0 to SCK2,SCK5 to SCK11<br/> SOT0 to SOT2,SOT5 to SOT11<br/> Value: Min - Max 33<br/> Pin name: SCK3,SCK4 SOT3,SOT4<br/> Value: Min - Max 300<br/> (4-1-1),(4-1-2),(4-1-3),(4-1-4)SCK fall time <math>t_F</math><br/> Corrected the following description.<br/> Pin name: SCK0 to SCK2,SCK5 to SCK11<br/> Value: Min - Max 5<br/> Pin name: SCK3,SCK4<br/> Value: Min - Max 250<br/> ↓<br/> Pin name: SCK0 to SCK11</p> |



| Revision | ECN | Orig. of Change | Submission Date | Description of Change   |
|----------|-----|-----------------|-----------------|---|
|          |     |                 |                 | <p>Value: Min - Max 5</p> <p>(4-1-5)SCS<math>\downarrow</math><math>\Rightarrow</math>SCK<math>\downarrow</math> setup time <math>t_{CSS1}</math><br/> (4-1-6)SCS<math>\downarrow</math><math>\Rightarrow</math>SCK<math>\uparrow</math> setup time <math>t_{CSS1}</math><br/> (4-1-7)SCS<math>\uparrow</math><math>\Rightarrow</math>SCK<math>\downarrow</math> setup time <math>t_{CSS1}</math><br/> (4-1-8)SCS<math>\uparrow</math><math>\Rightarrow</math>SCK<math>\uparrow</math> setup time <math>t_{CSS1}</math></p> <p>Corrected the following description.<br/> Pin name: SCK1 to SCK11<br/> SCS1 to SCS3,SCS40 to SCS43,SCS50 to SCS53,SCS60 to SCS63,SCS70 to SCS73,SCS8 to SCS11<br/> Value: Min <math>t_{CSSU}+0</math> Max <math>t_{CSSU}+50</math></p> <p><math>\downarrow</math><br/> Pin name: SCK1,SCK2,SCK5 to SCK11<br/> SCS1,SCS2,SCS50 to SCS53,SCS60 to SCS63,SCS70 to SCS73,SCS8 to SCS11<br/> Value: Min <math>t_{CSSU}-50</math> Max <math>t_{CSSU}+0</math></p> <p>Pin name: SCK3,SCK4 SCS3,SCS40 to SCS43<br/> Value: Min <math>t_{CSSU}-50</math> Max <math>t_{CSSU}+300</math></p> <p>(4-1-5)SCK<math>\uparrow</math><math>\Rightarrow</math>SCS<math>\uparrow</math>hold time <math>t_{CSH1}</math><br/> (4-1-6)SCK<math>\downarrow</math><math>\Rightarrow</math>SCS<math>\uparrow</math>hold time <math>t_{CSH1}</math><br/> (4-1-7)SCK<math>\uparrow</math><math>\Rightarrow</math>SCS<math>\downarrow</math>hold time <math>t_{CSH1}</math><br/> (4-1-8)SCK<math>\downarrow</math><math>\Rightarrow</math>SCS<math>\downarrow</math>hold time <math>t_{CSH1}</math></p> <p>Corrected the following description.<br/> Pin name: SCK1 to SCK11<br/> SCS1 to SCS3,SCS40 to SCS43,SCS50 to SCS53,SCS60 to SCS63,SCS70 to SCS73,SCS8 to SCS11<br/> Value: Min <math>t_{CSHD}-50</math> Max <math>t_{CSHD}+0</math></p> <p><math>\downarrow</math><br/> Pin name: SCK1,SCK2,SCK5 to SCK11<br/> SCS1,SCS2,SCS50 to SCS53,SCS60 to SCS63,SCS70 to SCS73,SCS8 to SCS11<br/> Value: Min <math>t_{CSHD}-10</math> Max <math>t_{CSHD}+50</math></p> <p>Pin name: SCK3,SCK4 SCS3,SCS40 to SCS43<br/> Value: Min <math>t_{CSHD}-300</math> Max <math>t_{CSHD}+50</math></p> <p>(4-1-5),(4-1-6)SCS<math>\downarrow</math><math>\Rightarrow</math>SOT delay time <math>t_{DSE}</math><br/> (4-1-7),(4-1-8)SCS<math>\uparrow</math><math>\Rightarrow</math>SOT delay time <math>t_{DSE}</math></p> <p>Corrected the following description.<br/> Pin name: SCS1 to SCS3,SCS40 to SCS43,SCS50 to SCS53,SCS60 to SCS63,SCS70 to SCS73,SCS8 to SCS11<br/> SOT1 to SOT11<br/> Value: Min - Max 40</p> <p><math>\downarrow</math><br/> Pin name: SCS1,SCS2,SCS50 to SCS53,SCS60 to SCS63,SCS70 to SCS73, SCS8 to SCS11<br/> SOT1,SOT2,SOT5 to SOT11<br/> Value: Min - Max 40</p> <p>Pin name: SCS3,SCS40 to SCS43<br/> SOT3,SOT4<br/> Value: Min - Max 300</p> <p>(4-1-5)SCK<math>\downarrow</math><math>\Rightarrow</math>SCS<math>\downarrow</math> clock switch time <math>t_{SCC}</math><br/> (4-1-6)SCK<math>\uparrow</math><math>\Rightarrow</math>SCS<math>\downarrow</math> clock switch time <math>t_{SCC}</math><br/> (4-1-7)SCK<math>\downarrow</math><math>\Rightarrow</math>SCS<math>\uparrow</math> clock switch time <math>t_{SCC}</math><br/> (4-1-8)SCK<math>\uparrow</math><math>\Rightarrow</math>SCS<math>\uparrow</math> clock switch time <math>t_{SCC}</math></p> <p>Corrected the following description.<br/> Pin name: SCK1 to SCK11<br/> SCS1 to SCS3,SCS40 to SCS43,SCS50 to SCS53,SCS60 to SCS63,SCS70 to SCS73,SCS8 to SCS11</p> |



| Revision | ECN | Orig. of Change | Submission Date | Description of Change  |
|----------|-----|-----------------|-----------------|--|
|          |     |                 |                 | <p>Value: Min <math>3t_{CPP}+0</math> Max <math>3t_{CPP}+50</math></p> <p>↓</p> <p>Pin name: SCK1,SCK2,SCK5 to SCK11<br/>SCS1,SCS2,SCS50 to SCS53,SCS60 to SCS63,SCS70 to SCS73,SCS8 to SCS11</p> <p>Value: Min <math>3t_{CPP}-10</math> Max <math>3t_{CPP}+50</math></p> <p>Pin name: SCK3,SCK4 SCS3,SCS40 to SCS43</p> <p>Value: Min <math>3t_{CPP}-300</math> Max <math>3t_{CPP}+50</math></p> <p>Added the following description.<br/>Regardless of the deselect time setting, once after the serial chip select pin becomes inactive, it will take at least five peripheral bus clock cycles to be active again</p> <p>Electrical Characteristics<br/>5.A/D Converter<br/>(1) 12-bit A/D Converter Electrical Characteristics:<br/>Added the value of "Total error".<br/>Total error value Min – Typ – Max <math>\pm 12</math> LSB<br/>Corrected the value of "Zero transition voltage".<br/>Min AVRL+0.5LSB-20mV Max AVRL+0.5LSB+20mV<br/>↓<br/>Min AVRL-11.5LSB Max AVRL+12.5LSB<br/>Corrected the value of "Full-scale transition voltage".<br/>Min AVRH-1.5LSB-20mV Max AVRH-1.5LSB+20mV<br/>↓<br/>Min AVRH-13.5LSB Max AVRH+10.5LSB</p> <p>Added the following description.<br/>Parameter : Power supply current <math>I_A AVCC^*3</math><br/>*3: The power supply current described only current value on A/D converter. The total AVcc current value must be calculated the power supply current for A/D converter and D/A converter.</p> <p>Electrical Characteristics<br/>7.D/A Converter:<br/>Added the following description.<br/>Parameter : Power supply current *1<br/>*1: The power supply current described only current value on D/A converter. The total Avcc current value must be calculated the power supply current for D/A converter and A/D converter.</p> <p>Electrical Characteristics<br/>6.Flash memory:<br/>Parameter: Erase cycle*2/Data retain time<br/>Deleted the following description.<br/>Remarks :<br/>"Temperature at writing/erasing <math>T_j &lt; +105^\circ\text{C}</math>"</p> <p>Electrical Characteristics<br/>7.D/A Converter:<br/>Corrected the following description.<br/>Parameter : Power supply current<br/>Symbol IA Pin name AV<sub>CC</sub><br/>Symbol IAH Pin name AV<sub>CC</sub><br/>↓<br/>Symbol IA Pin name AVCC</p> |



| Revision | ECN     | Orig. of Change | Submission Date | Description of Change   |
|----------|---------|-----------------|-----------------|---|
|          |         |                 |                 | <p>Symbol IAH Pin name AVCC</p> <p>Example Characteristics</p> <p>Corrected the following description.</p> <p>Watch mode</p> <p>Ordering Information</p> <p>Corrected the following description.</p> <ul style="list-style-type: none"> <li>ORDERING INFORMATION</li> </ul> <p>↓</p> <ul style="list-style-type: none"> <li>ORDERING INFORMATION MB91F52xxxB<sup>*1</sup></li> </ul> <p>Package</p> <p>↓</p> <p>Package<sup>*2</sup></p> <p>Added the following description.</p> <p>*1: It is only supported for customers who have already adopted it now. We do not recommend adopting new products.</p> <p>Corrected the following description.</p> <p>For details of the package, see "■ PACKAGE DIMENSIONS".</p> <p>↓</p> <p>*2: For details of the package, see "■ PACKAGE DIMENSIONS".</p> <p>Added the following description.</p> <ul style="list-style-type: none"> <li>ORDERING INFORMATION MB91F52xxxC</li> </ul> <p>Company name and layout design change</p> |
| *A       | 4999456 | JHMU            | 11/13/2015      | <p>Updated to Cypress template.</p> <p>Added the following note to the remarks of "'L' level average output current" and "'H' level average output current" in "Absolute Maximum Ratings" of "ELECTRICAL CHARACTERISTICS".</p> <p>*9: Corresponding pins: General-purpose ports other than those of P103, P104, P105 and P106.</p> <p>*10: Corresponding pins: General-purpose ports of P103, P104, P105 and P106.</p> <p>Added Errata section.</p>   |
| *B       | 5112138 | KUME            | 01/28/2016      | <p>Fixed some clerical errors.</p> <p>For details, see the chapter 18. Major Changes.</p>   |
| *C       | 5196285 | KUME            | 04/28/2016      | <p>For details, see the chapter 19. Major Changes.</p>  |
| *D       | 5318862 | KUME            | 06/23/2016      | <p>For details, see the chapter 19. Major Changes.</p>  |
| *E       | 5711679 | AESATMP7        | 04/25/2017      | <p>Updated Cypress Logo and Copyright.</p>  |
| *F       | 5984090 | KUME            | 12/05/2017      | <p>For details, see the chapter 19. Major Changes.</p>  |
| *G       | 5990912 | KUME            | 12/12/2017      | <p>Marketing Part Numbers changed from an MB prefix to a CY prefix.</p>   |
| *H       | 6216567 | KUME            | 06/25/2018      | <p>Fixed LQD064 package for Ordering Information CY91F52xxxE.</p> <p>For details, see the chapter 19. Major Changes.</p>  |
| *I       | 6422252 | KUME            | 01/09/2019      | <p>Updated the 100-pin, 80-pin, and 64-pin Package Dimensions</p>   |



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