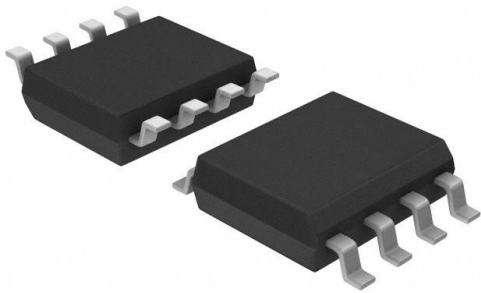


ICS553MIT Datasheet

www.digi-electronics.com



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	ICS553MIT-DG
Manufacturer	Renesas Electronics Corporation
Manufacturer Product Number	ICS553MIT
Description	IC CLK BUFFER 1:4 200MHZ 8SOIC
Detailed Description	Clock Fanout Buffer (Distribution) IC 1:4 200 MHz 8-SOIC (0.154", 3.90mm Width)

This model ICS553MIT is available at DiGi Electronics.

DiGi Electronics offers a global database of semiconductor and electronic component datasheets.

We welcome your inquiries regarding pricing, lead time, or other product-related questions.

 [Request a Quote](#)

 [Datasheet Search](#)



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.

Purchase and inquiry

Manufacturer Product Number:

ICS553MIT

Series:

ClockBlocks™

Type:

Fanout Buffer (Distribution)

Ratio - Input:Output:

1:4

Input:

CMOS

Frequency - Max:

200 MHz

Operating Temperature:

-40°C ~ 85°C

Package / Case:

8-SOIC (0.154", 3.90mm Width)

Base Product Number:

ICS553

Manufacturer:

Renesas Electronics Corporation

Product Status:

Obsolete

Number of Circuits:

1

Differential - Input:Output:

No/No

Output:

CMOS

Voltage - Supply:

2.375V ~ 5.25V

Mounting Type:

Surface Mount

Supplier Device Package:

8-SOIC

Environmental & Export classification

RoHS Status:

RoHS non-compliant

REACH Status:

REACH Unaffected

HTSUS:

8542.39.0001

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99



LOW SKEW 1 TO 4 CLOCK BUFFER

ICS553

Description

The ICS553 is a low skew, single input to four output, clock buffer. Part of IDT's ClockBlocks™ family, this is our lowest skew, small clock buffer.

See the ICS552-02 for a 1 to 8 low skew buffer. For more than eight outputs, see the MK74CBxxx Buffalo™ series of clock drivers.

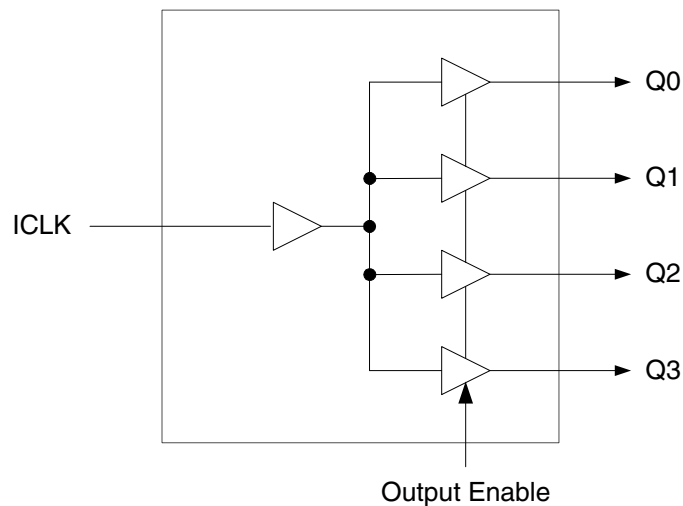
IDT makes many non-PLL and PLL based low skew output devices as well as Zero Delay Buffers to synchronize clocks. Contact us for all of your clocking needs.

Features

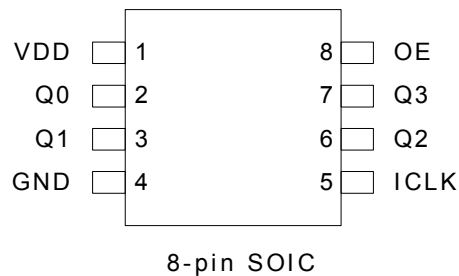
- Extremely low skew outputs (50 ps maximum)
- Packaged in 8-pin SOIC
- Available in Pb (lead) free package
- Low power CMOS technology
- Operating voltages of 2.5 V to 5 V
- Output Enable pin tri-states outputs
- 5 V tolerant input clock
- Commercial (0 to +70°C) and Industrial (-40 to +85°C) temperature ranges available

NOTE: EOL for non-green parts to occur on 5/13/10 per PDN U-09-01

Block Diagram



Pin Assignment



Pin Descriptions

Pin Number	Pin Name	Pin Type	Pin Description
1	VDD	Power	Connect to +2.5 V, +3.3 V or +5.0 V.
2	Q0	Output	Clock output 0.
3	Q1	Output	Clock output 1.
4	GND	Power	Connect to ground.
5	ICLK	Input	Clock input, 5 V tolerant input.
6	Q2	Output	Clock Output 2.
7	Q3	Output	Clock Output 3.
8	OE	Input	Output Enable. Tri-states outputs when low. Connect to VDD for normal operation.

External Components

A minimum number of external components are required for proper operation. A decoupling capacitor of 0.01 μ F should be connected between VDD on pin 1 and GND on pin 4, as close to the device as possible. A 33 Ω series terminating resistor may be used on each clock output if the trace is longer than 1 inch.

To achieve the low output skew that the ICS553 is capable of, careful attention must be paid to board layout. Essentially, all four outputs must have identical terminations, identical loads and identical trace geometries. If they do not, the output skew will be degraded. For example, using a 30 Ω series termination on one output (with 33 Ω on the others) will cause at least 15 ps of skew.

Absolute Maximum Ratings

Stresses above the ratings listed below can cause permanent damage to the ICS553. These ratings, which are standard values for IDT commercially rated parts, are stress ratings only. Functional operation of the device at these or any other conditions above those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods can affect product reliability. Electrical parameters are guaranteed only over the recommended operating temperature range.

Item	Rating
Supply Voltage, VDD	7 V
Output Enable and All Outputs	-0.5 V to VDD+0.5 V
ICLK	-0.5 V to 5.5 V
Ambient Operating Temperature (commercial)	0 to +70° C
Ambient Operating Temperature (industrial)	-40 to +85° C
Storage Temperature	-65 to +150° C
Junction Temperature	125° C
Soldering Temperature	260° C

Recommended Operation Conditions

Parameter	Min.	Typ.	Max.	Units
Ambient Operating Temperature (commercial)	0		+70	° C
Ambient Operating Temperature (industrial)	-40		+85	° C
Power Supply Voltage (measured in respect to GND)	+2.375		+5.25	V

DC Electrical Characteristics

VDD=2.5 V ±5%, Ambient temperature -40 to +85° C, unless stated otherwise

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Operating Voltage	VDD		2.375		2.625	V
Input High Voltage, ICLK	V _{IH}	Note 1	VDD/2+0.5		5.5	V
Input Low Voltage, ICLK	V _{IL}	Note 1			VDD/2-0.5	V
Input High Voltage, OE	V _{IH}		1.8		VDD	V
Input Low Voltage, OE	V _{IL}				0.7	V
Output High Voltage	V _{OH}	I _{OH} = -16 mA	2			V
Output Low Voltage	V _{OL}	I _{OL} = 16 mA			0.4	V
Operating Supply Current	IDD	No load, 135 MHz		25		mA
Nominal Output Impedance	Z _O			20		Ω
Input Capacitance	C _{IN}	ICLK, OE pin		5		pF
Short Circuit Current	I _{OS}			±28		mA

DC Electrical Characteristics (continued)**VDD=3.3 V ±5%** , Ambient temperature -40 to +85° C, unless stated otherwise

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Operating Voltage	VDD		3.15		3.45	V
Input High Voltage, ICLK	V _{IH}	Note 1	VDD/2+0.7		5.5	V
Input Low Voltage, ICLK	V _{IL}	Note 1			VDD/2-0.7	V
Input High Voltage, OE	V _{IH}		2		VDD	V
Input Low Voltage, OE	V _{IL}				0.8	V
Output High Voltage	V _{OH}	I _{OH} = -25 mA	2.4			V
Output Low Voltage	V _{OL}	I _{OL} = 25 mA			0.4	V
Output High Voltage (CMOS Level)	V _{OH}	I _{OH} = -12 mA	VDD-0.4			V
Operating Supply Current	IDD	No load, 135 MHz		35		mA
Nominal Output Impedance	Z _O			20		Ω
Input Capacitance	C _{IN}	ICLK, OE pin		5		pF
Short Circuit Current	I _{OS}			±50		mA

VDD=5 V ±5% , Ambient temperature -40 to +85° C, unless stated otherwise

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Operating Voltage	VDD		4.75		5.25	V
Input High Voltage, ICLK	V _{IH}	Note 1	VDD/2+1		5.5	V
Input Low Voltage, ICLK	V _{IL}	Note 1			VDD/2-1	V
Input High Voltage, OE	V _{IH}		2		VDD	V
Input Low Voltage, OE	V _{IL}				0.8	V
Output High Voltage	V _{OH}	I _{OH} = -35 mA	2.4			V
Output Low Voltage	V _{OL}	I _{OL} = 35 mA			0.4	V
Output High Voltage (CMOS Level)	V _{OH}	I _{OH} = -12 mA	VDD-0.4			V
Operating Supply Current	IDD	No load, 135 MHz		45		mA
Nominal Output Impedance	Z _O			20		Ω
Input Capacitance	C _{IN}	ICLK, OE pin		5		pF
Short Circuit Current	I _{OS}			±80		mA

Notes: 1. Nominal switching threshold is VDD/2

AC Electrical Characteristics

VDD = 2.5 V ±5%, Ambient Temperature -40 to +85° C, unless stated otherwise

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Input Frequency			0		200	MHz
Output Rise Time	t _{OR}	0.8 to 2.0 V, C _L =15 pF		1.0	1.5	ns
Output Fall Time	t _{OF}	2.0 to 0.8 V, C _L =15 pF		1.0	1.5	ns
Propagation Delay	Note 1		2.2	3	5	ns
Additive Period Jitter					1	ps
Output to Output Skew	Note 2	Rising edges at VDD/2		0	50	ps
Device to Device Skew		Rising edges at VDD/2			500	ps

VDD = 3.3 V ±5%, Ambient Temperature -40 to +85° C, unless stated otherwise

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Input Frequency			0		200	MHz
Output Rise Time	t _{OR}	0.8 to 2.0 V, C _L =15 pF		0.6	1.0	ns
Output Fall Time	t _{OF}	2.0 to 0.8 V, C _L =15 pF		0.6	1.0	ns
Propagation Delay	Note 1		2.0	2.4	4	ns
Additive Period Jitter					1	ps
Output to Output Skew	Note 2	Rising edges at VDD/2		0	50	ps
Device to Device Skew		Rising edges at VDD/2			500	ps

VDD = 5 V ±5%, Ambient Temperature -40 to +85° C, unless stated otherwise

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Input Frequency			0		200	MHz
Output Rise Time	t _{OR}	0.8 to 2.0 V, C _L =15 pF		0.3	0.7	ns
Output Fall Time	t _{OF}	2.0 to 0.8 V, C _L =15 pF		0.3	0.7	ns
Propagation Delay	Note 1		1.8	2.5	4	ns
Additive Period Jitter					1	ps
Output to Output Skew	Note 2	Rising edges at VDD/2		0	50	ps
Device to Device Skew		Rising edges at VDD/2			500	ps

Notes: 1. With rail to rail input clock

2. Between any 2 outputs with equal loading.

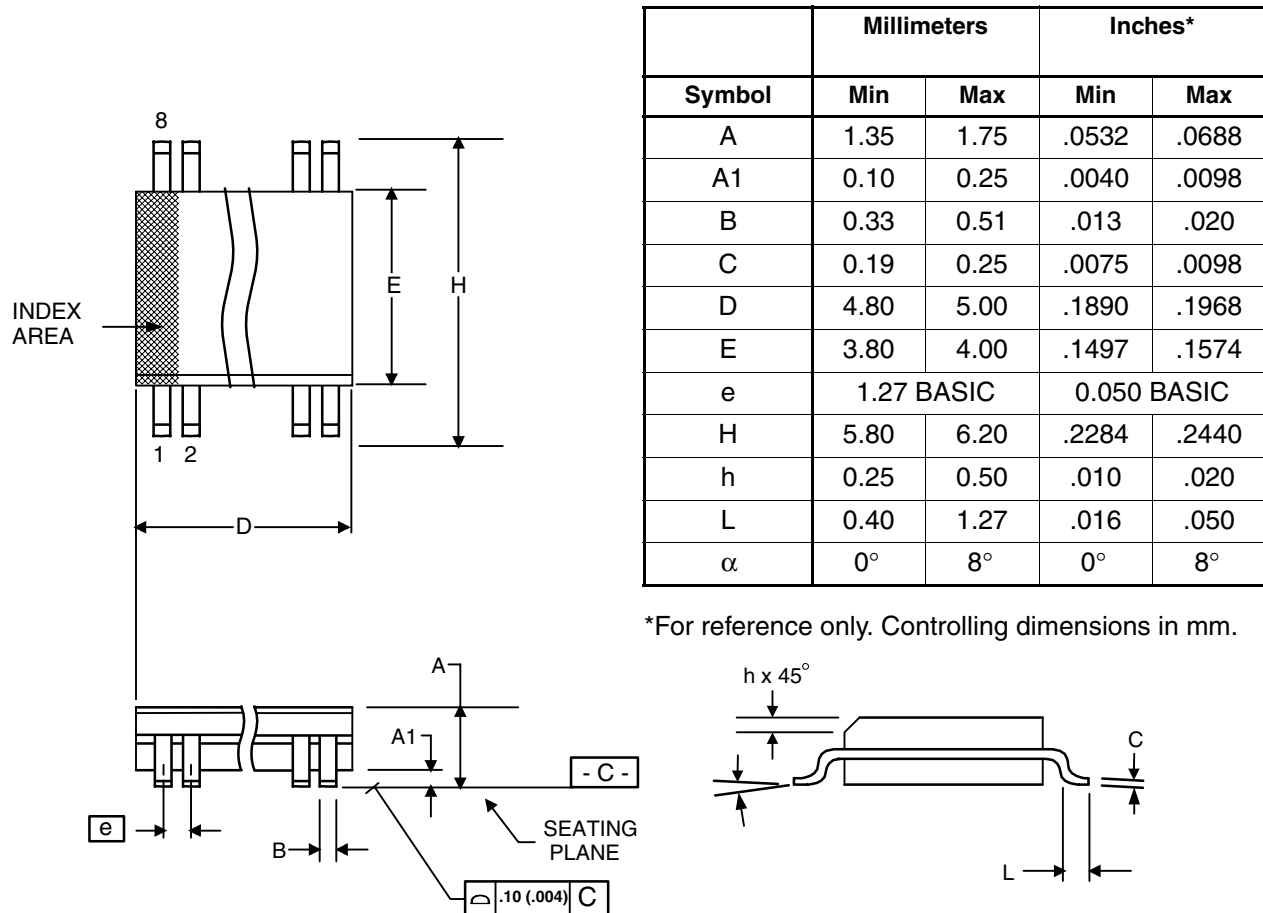
3. Duty cycle on outputs will match incoming clock duty cycle. Consult IDT for tight duty cycle clock generators.

Thermal Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Thermal Resistance Junction to Ambient	θ_{JA}	Still air		150		°C/W
	θ_{JA}	1 m/s air flow		140		°C/W
	θ_{JA}	3 m/s air flow		120		°C/W
Thermal Resistance Junction to Case	θ_{JC}			40		°C/W

Package Outline and Package Dimensions (8-pin SOIC, 150 Mil. Narrow Body)

Package dimensions are kept current with JEDEC Publication No. 95



Ordering Information

Part / Order Number	Marking	Shipping Packaging	Package	Temperature
553MLF	553MLF	Tubes	8-pin SOIC	0 to +70° C
553MLFT	553MLF	Tape and Reel	8-pin SOIC	0 to +70° C
553MI*	553MI	Tubes	8-pin SOIC	-40 to +85 ° C
553MIT*	553MI	Tape and Reel	8-pin SOIC	-40 to +85 ° C
553MILF	553MILF	Tubes	8-pin SOIC	-40 to +85 ° C
553MILFT	553MILF	Tape and Reel	8-pin SOIC	-40 to +85 ° C

*NOTE: EOL for non-green parts to occur on 5/13/10 per PDN U-09-01

Parts that are ordered with a "LF" suffix to the part number are the Pb-Free configuration and are RoHS compliant.

While the information presented herein has been checked for both accuracy and reliability, Integrated Device Technology (IDT) result from its use. No other circuits, patents, or licenses are implied. This product is intended for use in normal commercial applications. Any other applications such as those requiring extended temperature range, high reliability, or other extraordinary environmental requirements are not recommended without additional processing by IDT. IDT reserves the right to change any circuitry or specifications without notice. IDT does not authorize or warrant any IDT product for use in life support devices or critical medical instruments.

ICS553

LOW SKEW 1 TO 4 CLOCK BUFFER

FAN OUT BUFFER

Innovate with IDT and accelerate your future networks. Contact:

www.IDT.com

For Sales

800-345-7015
408-284-8200
Fax: 408-284-2775

For Tech Support

www.idt.com/go/clockhelp

Corporate Headquarters

Integrated Device Technology, Inc.
www.idt.com



www.IDT.com

OUR CERTIFICATE

DiGi provide top-quality products and perfect service for customer worldwide through standardization, technological innovation and continuous improvement. DiGi through third-party certification, we stricly control the quality of products and services. Welcome your RFQ to

Email: Info@DiGi-Electronics.com



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.