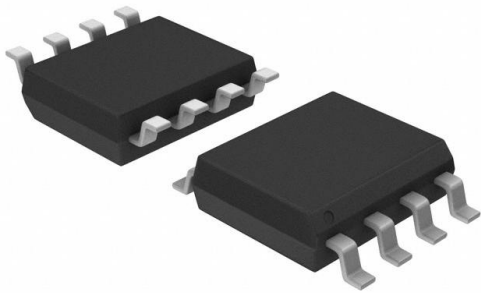


SY10EP11UZG-TR Datasheet

www.digi-electronics.com



| | |
|------------------------------|--|
| DiGi Electronics Part Number | SY10EP11UZG-TR-DG |
| Manufacturer | Microchip Technology |
| Manufacturer Product Number | SY10EP11UZG-TR |
| Description | IC CLK BUFFER 1:2 3GHZ 8SOIC |
| Detailed Description | Clock Fanout Buffer (Distribution) IC 1:2 3 GHz 8-SO IC (0.154", 3.90mm Width) |

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



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:

SY10EP11UZG-TR

Series:

100EP, ECL Pro®

Type:

Fanout Buffer (Distribution)

Ratio - Input:Output:

1:2

Input:

LVECL, LVPECL

Frequency - Max:

3 GHz

Operating Temperature:

-40°C ~ 85°C

Package / Case:

8-SOIC (0.154", 3.90mm Width)

Base Product Number:

SY10EP11

Manufacturer:

Microchip Technology

Product Status:

Active

Number of Circuits:

1

Differential - Input:Output:

Yes/Yes

Output:

LVECL, LVPECL

Voltage - Supply:

2.375V ~ 5.5V

Mounting Type:

Surface Mount

Supplier Device Package:

8-SOIC

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8542.39.0001

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99



2.5V/3.3V/5V 1:2 DIFFERENTIAL PECL/LVPECL/ECL FANOUT BUFFER

ECL Pro™
SY10EP11U
SY100EP11U

FEATURES

- 2.5V, 3.3V and 5V power supply options
- Guaranteed AC parameters over temperature:
 - $f_{MAX} > 3.0\text{GHz}$
 - $< 20\text{ps}$ output-to-output skew
 - $< 200\text{ps}$ t_r / t_f
 - $< 300\text{ps}$ propagation delay
- Wide temperature range: -40°C to $+85^\circ\text{C}$
- Available in 8-pin (3mm) MSOP and SOIC packages



ECL Pro™

DESCRIPTION

The SY10/100EP11U is a precision, high-speed 1:2 differential fanout buffer. Having within-device skews and output transition times significantly improved over the EL11V, the EP11U is ideally suited for those applications which require the ultimate in AC performance.

The differential inputs of the EP11U employ clamping circuitry to maintain stability under open input conditions. If the inputs are left open, the Q outputs will go LOW.

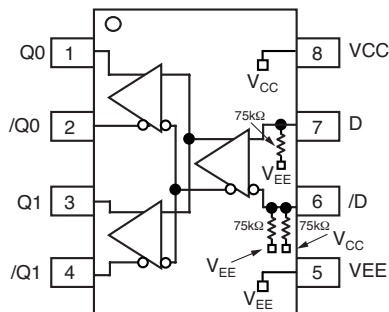
CROSS REFERENCE TABLE

| Micrel Semiconductor | ON Semiconductor |
|----------------------|------------------|
| SY10EP11UZI/KI | MC10EP11D/DT |
| SY10EP11UZI/KI | MC10LVEP11D/DT |
| SY100EP11UZI/KI | MC100EP11D/DT |
| SY100EP11UZI/KI | MC100LVEP11D/DT |

PIN NAMES

| Pin | Function |
|--------------------|--|
| D | PECL, LVPECL, ECL, LVECL Clock or Data Input: Internal $75\text{k}\Omega$ pulldown resistor. If left floating, pin defaults LOW, Q_{OUT} goes LOW. |
| /D | PECL, LVPECL, ECL, LVECL complementary Clock or Data Input: Internal $75\text{k}\Omega$ pull-up and down resistors. If left open, default is $V_{CC}/2$. When the input is not used, it can be left open. |
| Q0, /Q0 Q1, /Q1 | PECL, LVPECL, ECL, LVECL Outputs: Terminates to $V_{CC} - 2V$. |
| V_{CC} | Positive Power Supply: Bypass with $0.1\mu\text{F}/0.01\mu\text{F}$ low ESR capacitors. |
| V_{EE} | Negative Power Supply: For PECL operation, connect to GND. |

PACKAGE/ORDERING INFORMATION



8-pin MSOP and SOIC Packages

Ordering Information⁽¹⁾

| Part Number | Package Type | Operating Range | Package Marking | Lead Finish |
|----------------------------------|--------------|-----------------|---|-------------------|
| SY10EP11UKC | K8-1 | Commercial | HP11 | Sn-Pb |
| SY10EP11UKCTR ⁽²⁾ | K8-1 | Commercial | HP11 | Sn-Pb |
| SY100EP11UKC | K8-1 | Commercial | XP11 | Sn-Pb |
| SY100EP11UKCTR ⁽²⁾ | K8-1 | Commercial | XP11 | Sn-Pb |
| SY10EP11UZC | Z8-1 | Commercial | HEP11U | Sn-Pb |
| SY10EP11UZCTR ⁽²⁾ | Z8-1 | Commercial | HEP11U | Sn-Pb |
| SY100EP11UZC | Z8-1 | Commercial | XEP11U | Sn-Pb |
| SY100EP11UZCTR ⁽²⁾ | Z8-1 | Commercial | XEP11U | Sn-Pb |
| SY10EP11UKI | K8-1 | Industrial | HP11 | Sn-Pb |
| SY10EP11UKITR ⁽²⁾ | K8-1 | Industrial | HP11 | Sn-Pb |
| SY100EP11UKI | K8-1 | Industrial | XP11 | Sn-Pb |
| SY100EP11UKITR ⁽²⁾ | K8-1 | Industrial | XP11 | Sn-Pb |
| SY10EP11UZI | Z8-1 | Industrial | HEP11U | Sn-Pb |
| SY10EP11UZITR ⁽²⁾ | Z8-1 | Industrial | HEP11U | Sn-Pb |
| SY100EP11UZI | Z8-1 | Industrial | XEP11U | Sn-Pb |
| SY100EP11UZITR ⁽²⁾ | Z8-1 | Industrial | XEP11U | Sn-Pb |
| SY10EP11UKG ⁽³⁾ | K8-1 | Industrial | HP11 with Pb-Free bar-line indicator | Pb-Free NiPdAu |
| SY10EP11UKGTR ^(2, 3) | K8-1 | Industrial | HP11 with Pb-Free bar-line indicator | Pb-Free NiPdAu |
| SY100EP11UKG ⁽³⁾ | K8-1 | Industrial | XP11 with Pb-Free bar-line indicator | Pb-Free NiPdAu |
| SY100EP11UKGTR ^(2, 3) | K8-1 | Industrial | XP11 with Pb-Free bar-line indicator | Pb-Free NiPdAu |
| SY10EP11UZG ⁽³⁾ | Z8-1 | Industrial | HEP11U with Pb-Free bar-line indicator | Pb-Free NiPdAu |
| SY10EP11UZGTR ^(2, 3) | Z8-1 | Industrial | HEP11U with Pb-Free bar-line indicator | Pb-Free NiPdAu |
| SY100EP11UZG ⁽³⁾ | Z8-1 | Industrial | XEP11U with Pb-Free bar-line indicator | Pb-Free NiPdAu |
| SY100EP11UZGTR ^(2, 3) | Z8-1 | Industrial | XEP11U with Pb-Free bar-line indicator | Pb-Free NiPdAu |

Notes:

1. Contact factory for die availability. Dice are guaranteed at $T_A = 25^\circ\text{C}$, DC Electricals only.
2. Tape and Reel.
3. Pb-Free package is recommended for new designs.

Micrel, Inc.

ABSOLUTE MAXIMUM RATINGS⁽¹⁾

| Symbol | Rating | Value | Unit |
|-------------------|--|--------------------------|--------------|
| $V_{CC} - V_{EE}$ | Power Supply Voltage | 6V | V |
| V_{IN} | Input Voltage ($V_{CC} = 0V$, V_{IN} not more negative than V_{EE}) Input Voltage ($V_{EE} = 0V$, V_{IN} not more positive than V_{CC}) | -6.0 to 0 +6.0 to 0 | V V |
| I_{OUT} | Output Current -Continuous -Surge | 50 100 | mA |
| T_A | Operating Temperature Range | -40 to +85 | °C |
| T_{LEAD} | Lead Temperature (soldering, 20sec.) | 260 | °C |
| T_{store} | Storage Temperature Range | -65 to +150 | °C |
| θ_{JA} | Package Thermal Resistance (Junction-to-Ambient) -Still-Air (SOIC) -500lfpm (SOIC) -Still-Air (MSOP) -500lfpm (MSOP) | 160 109 206 155 | °C/W °C/W |
| θ_{JC} | Package Thermal Resistance (Junction-to-Case) (SOIC) (MSOP) | 39 39 | °C/W |

Note:

- Permanent device damage may occur if absolute maximum ratings are exceeded. This is a stress rating only and functional operation is not implied at conditions other than those detailed in the operational sections of this data sheet. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

DC ELECTRICAL CHARACTERISTICS⁽¹⁾

| Symbol | Parameter | $T_A = -40^\circ\text{C}$ | | | $T_A = +25^\circ\text{C}$ | | | $T_A = +85^\circ\text{C}$ | | | Unit | Condition |
|----------|--|-----------------------------|--------------------------|-----------------------------|-----------------------------|--------------------------|-----------------------------|-----------------------------|--------------------------|-----------------------------|--------------------------------|--|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | | |
| V_{CC} | Power Supply Voltage (PECL) (LVPECL) (ECL) (LVECL) | 4.5 2.37 -5.5 -3.8 | 5.0 — -5.0 -3.3 | 5.5 3.8 -4.5 -2.37 | 4.5 2.37 -5.5 -3.8 | 5.0 — -5.0 -3.3 | 5.5 3.8 -4.5 -2.37 | 4.5 2.37 -5.5 -3.8 | 5.0 — -5.0 -3.3 | 5.5 3.8 -4.5 -2.37 | V | |
| I_{EE} | Power Supply Current SY10EP11U SY100EP11U | — — | — — | 37 44 | — — | 25 30 | 39 44 | — — | — — | 40 44 | mA mA | |
| I_{IH} | Input HIGH Current | — | — | 150 | — | — | 150 | — | — | 150 | μA | $V_{IN} = V_{IH}$ |
| I_{IL} | Input LOW Current D /D | 0.5 -150 | — — | — — | 0.5 -150 | — — | — — | 0.5 -150 | — — | — — | μA μA | $V_{IN} = V_{IL}$ $V_{IN} = V_{IL}$ |
| C_{IN} | Input Capacitance (MSOP) (SOIC) | — — | — — | — — | — — | 1.0 1.35 | — — | — — | — — | — — | pF pF | |

Note:

- 10/100KEP circuits are designed to meet the DC specifications shown in the above table after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and traverse airflow greater than 500lfpm is maintained.

Micrel, Inc.

(10KEP) LVPECL DC ELECTRICAL CHARACTERISTICS⁽¹⁾ $V_{CC} = 2.5V \pm 5\%$, $V_{EE} = 0V$.

| Symbol | Parameter | $T_A = -40^\circ C$ | | | $T_A = +25^\circ C$ | | | $T_A = +85^\circ C$ | | | Unit | Condition |
|-------------|--|---------------------|------|----------|---------------------|------|----------|---------------------|------|----------|------|---------------------------|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | | |
| V_{OL} | Output LOW Voltage | 565 | 690 | 815 | 630 | 755 | 880 | 690 | 815 | 940 | mV | 50Ω to $V_{CC}-2V$ |
| V_{OH} | Output HIGH Voltage | 1365 | 1490 | 1615 | 1430 | 1555 | 1680 | 1490 | 1615 | 1740 | mV | 50Ω to $V_{CC}-2V$ |
| V_{IHCMR} | Input HIGH Voltage ⁽²⁾ Common Mode Range | 1.2 | — | V_{CC} | 1.2 | — | V_{CC} | 1.2 | — | V_{CC} | V | |

(10KEP) LVPECL DC ELECTRICAL CHARACTERISTICS⁽¹⁾ $V_{CC} = 3.3V \pm 10\%$, $V_{EE} = 0V$.

| Symbol | Parameter | $T_A = -40^\circ C$ | | | $T_A = +25^\circ C$ | | | $T_A = +85^\circ C$ | | | Unit | Condition |
|-------------|--|---------------------|------|----------|---------------------|------|----------|---------------------|------|----------|------|---------------------------|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | | |
| V_{IL} | Input LOW Voltage (Single-Ended) | 1365 | — | 1690 | 1430 | — | 1755 | 1490 | — | 1815 | mV | |
| V_{IH} | Input HIGH Voltage (Single-Ended) | 2090 | — | 2415 | 2155 | — | 2480 | 2215 | — | 2540 | mV | |
| V_{OL} | Output LOW Voltage | 1365 | 1490 | 1615 | 1430 | 1555 | 1680 | 1490 | 1615 | 1740 | mV | 50Ω to $V_{CC}-2V$ |
| V_{OH} | Output HIGH Voltage | 2165 | 2290 | 2415 | 2230 | 2355 | 2480 | 2290 | 2415 | 2540 | mV | 50Ω to $V_{CC}-2V$ |
| V_{IHCMR} | Input HIGH Voltage ⁽²⁾ Common Mode Range | 1.2 | — | V_{CC} | 1.2 | — | V_{CC} | 1.2 | — | V_{CC} | V | |

(10KEP) PECL DC ELECTRICAL CHARACTERISTICS⁽¹⁾ $V_{CC} = 5.0V \pm 10\%$, $V_{EE} = 0V$.

| Symbol | Parameter | $T_A = -40^\circ C$ | | | $T_A = +25^\circ C$ | | | $T_A = +85^\circ C$ | | | Unit | Condition |
|-------------|--|---------------------|------|----------|---------------------|------|----------|---------------------|------|----------|------|---------------------------|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | | |
| V_{IL} | Input LOW Voltage (Single-Ended) | 3065 | — | 3390 | 3130 | — | 3455 | 3190 | — | 3515 | mV | |
| V_{IH} | Input HIGH Voltage (Single-Ended) | 3790 | — | 4115 | 3855 | — | 4180 | 3915 | — | 4240 | mV | |
| V_{OL} | Output LOW Voltage | 3065 | 3190 | 3315 | 3130 | 3255 | 3380 | 3190 | 3315 | 3440 | mV | 50Ω to $V_{CC}-2V$ |
| V_{OH} | Output HIGH Voltage | 3865 | 3990 | 4115 | 3930 | 4055 | 4180 | 3990 | 4115 | 4240 | mV | 50Ω to $V_{CC}-2V$ |
| V_{IHCMR} | Input HIGH Voltage ⁽²⁾ Common Mode Range | 1.2 | — | V_{CC} | 1.2 | — | V_{CC} | 1.2 | — | V_{CC} | V | |

No tes:

- 10KEP circuits are designed to meet the DC specifications shown in the above table after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and traverse airflow greater than 500lfpm is maintained. Input and output parameters are at $V_{CC} = 2.5V$. They vary 1:1 with V_{CC} .
- The V_{IHCMR} range is referenced to the most positive side of the differential input signal. See "Input Waveform" section. Single-ended input CLK pin operation is limited to $V_{CC} \geq 3.0V$ in PECL mode.

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(10KEP) ECL/LVECL DC ELECTRICAL CHARACTERISTICS⁽³⁾ $V_{CC} = 0V$, $V_{EE} = -5.5V$ to $-2.375V$.

| Symbol | Parameter | $T_A = -40^\circ C$ | | | $T_A = +25^\circ C$ | | | $T_A = +85^\circ C$ | | | Unit | Condition |
|-------------|---|---------------------|-------|-------|---------------------|-------|-------|---------------------|-------|-------|------|--------------------|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | | |
| V_{IL} | Input LOW Voltage (Single-Ended) | -1935 | — | -1610 | -1870 | — | -1545 | -1810 | — | -1485 | mV | |
| V_{IH} | Input HIGH Voltage (Single-Ended) | -1210 | — | -885 | -1145 | — | -820 | -1085 | — | -760 | mV | |
| V_{OL} | Output LOW Voltage | -1935 | -1810 | -1685 | -1870 | -1745 | -1620 | -1810 | -1685 | -1560 | mV | 50Ω to $V_{CC}-2V$ |
| V_{OH} | Output HIGH Voltage | -1135 | -1010 | -885 | -1070 | -945 | -820 | -1010 | -885 | -760 | mV | 50Ω to $V_{CC}-2V$ |
| V_{IHCMR} | Input HIGH Voltage ⁽⁴⁾ Common Mode Range | $V_{EE} + 1.2$ | | 0.0 | $V_{EE} + 1.2$ | | 0.0 | $V_{EE} + 1.2$ | | 0.0 | V | |

(100KEP) LVPECL DC ELECTRICAL CHARACTERISTICS⁽³⁾ $V_{CC} = 2.5V \pm 5\%$.

| Symbol | Parameter | $T_A = -40^\circ C$ | | | $T_A = +25^\circ C$ | | | $T_A = +85^\circ C$ | | | Unit | Condition |
|-------------|---|---------------------|------|----------|---------------------|------|----------|---------------------|------|----------|------|--------------------|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | | |
| V_{OL} | Output LOW Voltage | 555 | 680 | 805 | 555 | 680 | 805 | 555 | 680 | 805 | mV | 50Ω to $V_{CC}-2V$ |
| V_{OH} | Output HIGH Voltage | 1355 | 1480 | 1605 | 1355 | 1480 | 1605 | 1355 | 1480 | 1605 | mV | 50Ω to $V_{CC}-2V$ |
| V_{IHCMR} | Input HIGH Voltage ⁽⁴⁾ Common Mode Range | 1.2 | — | V_{CC} | 1.2 | — | V_{CC} | 1.2 | — | V_{CC} | V | |

(100KEP) LVPECL DC ELECTRICAL CHARACTERISTICS⁽³⁾ $V_{CC} = 3.3V \pm 10\%$, $V_{EE} = 0V$.

| Symbol | Parameter | $T_A = -40^\circ C$ | | | $T_A = +25^\circ C$ | | | $T_A = +85^\circ C$ | | | Unit | Condition |
|-------------|---|---------------------|------|----------|---------------------|------|----------|---------------------|------|----------|------|--------------------|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | | |
| V_{IL} | Input LOW Voltage (Single-Ended) | 1355 | — | 1675 | 1355 | — | 1675 | 1355 | — | 1675 | mV | |
| V_{IH} | Input HIGH Voltage (Single-Ended) | 2075 | — | 2420 | 2075 | — | 2420 | 2075 | — | 2420 | mV | |
| V_{OL} | Output LOW Voltage | 1355 | 1480 | 1605 | 1355 | 1480 | 1605 | 1355 | 1480 | 1605 | mV | 50Ω to $V_{CC}-2V$ |
| V_{OH} | Output HIGH Voltage | 2155 | 2280 | 2405 | 2155 | 2280 | 2405 | 2155 | 2280 | 2405 | mV | 50Ω to $V_{CC}-2V$ |
| V_{IHCMR} | Input HIGH Voltage ⁽⁴⁾ Common Mode Range | 1.2 | — | V_{CC} | 1.2 | — | V_{CC} | 1.2 | — | V_{CC} | V | |

Notes:

- 10KEP circuits are designed to meet the DC specifications shown in the above table after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and traverse airflow greater than 500lfpm is maintained.
- The V_{IHCMR} range is referenced to the most positive side of the differential input signal. See "Input Waveform" section. Single-ended input CLK pin operation is limited to $V_{EE} \leq -3.0V$ in ECL/LVECL mode.

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(100KEP) PECL DC ELECTRICAL CHARACTERISTICS⁽⁵⁾ $V_{CC} = 5.0V \pm 10\%$, $V_{EE} = 0V$.

| Symbol | Parameter | $T_A = -40^\circ\text{C}$ | | | $T_A = +25^\circ\text{C}$ | | | $T_A = +85^\circ\text{C}$ | | | Unit | Condition |
|-------------|---|---------------------------|------|----------|---------------------------|------|----------|---------------------------|------|----------|------|---------------------------|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | | |
| V_{IL} | Input LOW Voltage (Single-Ended) | 3055 | — | 3375 | 3055 | — | 3375 | 3055 | — | 3375 | mV | |
| V_{IH} | Input HIGH Voltage (Single-Ended) | 3775 | — | 4120 | 3775 | — | 4120 | 3775 | — | 4120 | mV | |
| V_{OL} | Output LOW Voltage | 3055 | 3180 | 3305 | 3055 | 3180 | 3305 | 3055 | 3180 | 3305 | mV | 50Ω to $V_{CC}-2V$ |
| V_{OH} | Output HIGH Voltage | 3855 | 3980 | 4105 | 3855 | 3980 | 4105 | 3855 | 3980 | 4105 | mV | 50Ω to $V_{CC}-2V$ |
| V_{IHCMR} | Input HIGH Voltage ⁽⁶⁾ Common Mode Range | 2.0 | — | V_{CC} | 2.0 | — | V_{CC} | 2.0 | — | V_{CC} | V | |

Notes:

- 100KEP circuits are designed to meet the DC specifications shown in the above table after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and traverse airflow greater than 500fpm is maintained. Input and output parameters are at $V_{CC} = 5.0V$. They vary 1:1 with V_{CC} .
- The V_{IHCMR} range is referenced to the most positive side of the differential input signal. See "Input Waveform" section. Single-ended input CLK pin operation is limited to $V_{CC} \geq 3.0V$ in PECL mode.

(100KEP) ECL/LVECL DC ELECTRICAL CHARACTERISTICS⁽⁷⁾ $V_{CC} = 0V$, $V_{EE} = -5.5V$ to $-2.375V$.

| Symbol | Parameter | $T_A = -40^\circ\text{C}$ | | | $T_A = +25^\circ\text{C}$ | | | $T_A = +85^\circ\text{C}$ | | | Unit | Condition |
|-------------|---|---------------------------|-------|-------|---------------------------|-------|-------|---------------------------|-------|-------|------|---------------------------|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | | |
| V_{IL} | Input LOW Voltage (Single-Ended) | -1945 | — | -1625 | -1945 | — | -1625 | -1945 | — | -1625 | mV | |
| V_{IH} | Input HIGH Voltage (Single-Ended) | -1225 | — | -880 | -1225 | — | -880 | -1225 | — | -880 | mV | |
| V_{OL} | Output LOW Voltage | -1945 | -1820 | -1695 | -1945 | -1820 | -1695 | -1945 | -1820 | -1695 | mV | 50Ω to $V_{CC}-2V$ |
| V_{OH} | Output HIGH Voltage | -1145 | -1020 | -895 | -1145 | -1020 | -895 | -1145 | -1020 | -895 | mV | 50Ω to $V_{CC}-2V$ |
| V_{IHCMR} | Input HIGH Voltage ⁽⁸⁾ Common Mode Range | $V_{EE} + 1.2$ | | 0.0 | $V_{EE} + 1.2$ | | 0.0 | $V_{EE} + 1.2$ | | 0.0 | V | |

Notes:

- 100KEP circuits are designed to meet the DC specifications shown in the above table after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and traverse airflow greater than 500fpm is maintained.
- The V_{IHCMR} range is referenced to the most positive side of the differential input signal. See "Input Waveform" section. Single-ended input CLK pin operation is limited to $V_{EE} \leq -3.0V$ in ECL/LVECL mode.

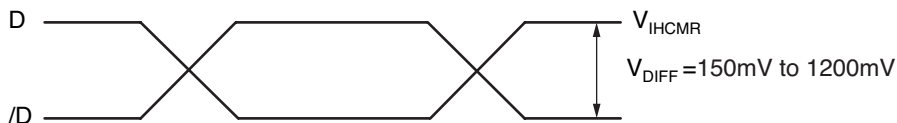
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AC ELECTRICAL CHARACTERISTICS $V_{CC} = 0V$; $V_{EE} = -5.5V$ to $-2.375V$ or $V_{CC} = 2.375V$ to $5.5V$, $V_{EE} = 0V$.

| Symbol | Parameter | $T_A = -40^\circ C$ | | | $T_A = +25^\circ C$ | | | $T_A = +85^\circ C$ | | | Unit | Condition |
|------------------------|--|---------------------|------------|------------|---------------------|------------|------------|---------------------|------------|------------|-------------------|--------------------------------------|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | | |
| f_{MAX} | Max. Toggle Frequency ⁽⁹⁾ | 3 | — | — | 3 | — | — | 3 | — | — | GHz | |
| t_{PLH} t_{PHL} | Propagation Delay (Differential) D to Q, /Q D to Q, /Q | 140 170 | 200 230 | 250 300 | 160 180 | 220 240 | 270 310 | 180 210 | 240 270 | 300 360 | ps ps | $V_{CC} = 3.3/5V$ $V_{CC} = 2.5V$ |
| t_{SKEW} | Within-Device Skew ⁽¹⁰⁾ Q, /Q | — | 5 | 20 | — | 5 | 20 | — | 5 | 20 | ps | |
| | Part-to-Part Skew ⁽¹⁰⁾ | — — | — — | 130 110 | — — | — — | 130 110 | — — | — — | 150 120 | ps ps | $V_{CC} = 3.3/5V$ $V_{CC} = 2.5V$ |
| t_{JITTER} | Cycle-to-Cycle Jitter (RMS) | — | 0.2 | < 1 | — | 0.2 | < 1 | — | 0.2 | < 1 | ps _{RMS} | |
| V_{DIFF} | Input Swing ⁽¹¹⁾ | 150 | 800 | 1200 | 150 | 800 | 1200 | 150 | 800 | 1200 | mV | |
| t_r, t_f | Output Rise/Fall Time (20% to 80%) | 70 | 110 | 170 | 80 | 120 | 180 | 100 | 140 | 200 | ps | |

Notes:

9. Measured with 750mV input signal, 50% duty cycle. All loading with a 50Ω to $V_{CC} - 2.0V$.
10. Skew is measured between outputs under identical transitions. Duty cycle skew is defined only for differential operation when the delays are measured from the cross point of the inputs to the cross point of the outputs.
11. See "Input Waveform."

INPUT WAVEFORM

TERMINATION RECOMMENDATIONS

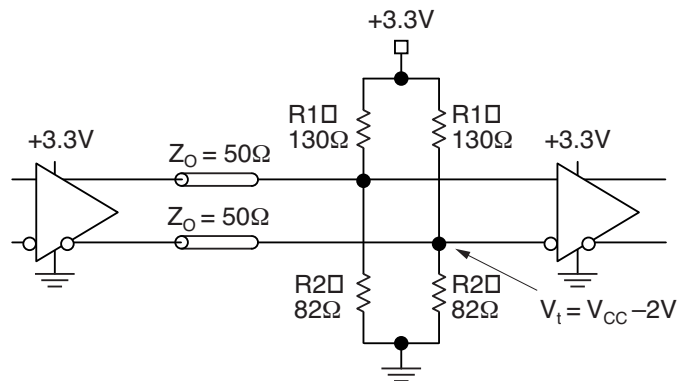


Figure 1. Parallel Termination–Thevenin Equivalent

Notes:

1. For +2.5V systems: $R_1 = 250\Omega$, $R_2 = 62.5\Omega$.
2. For +5.0V systems: $R_1 = 82\Omega$.

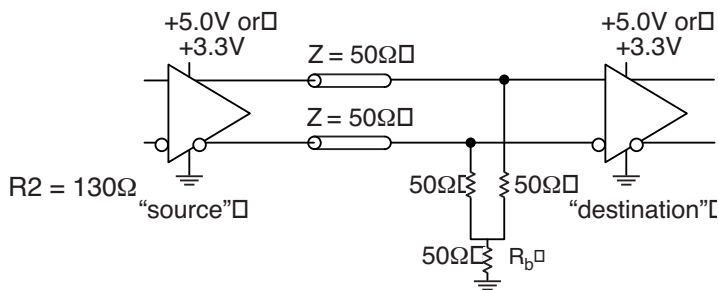
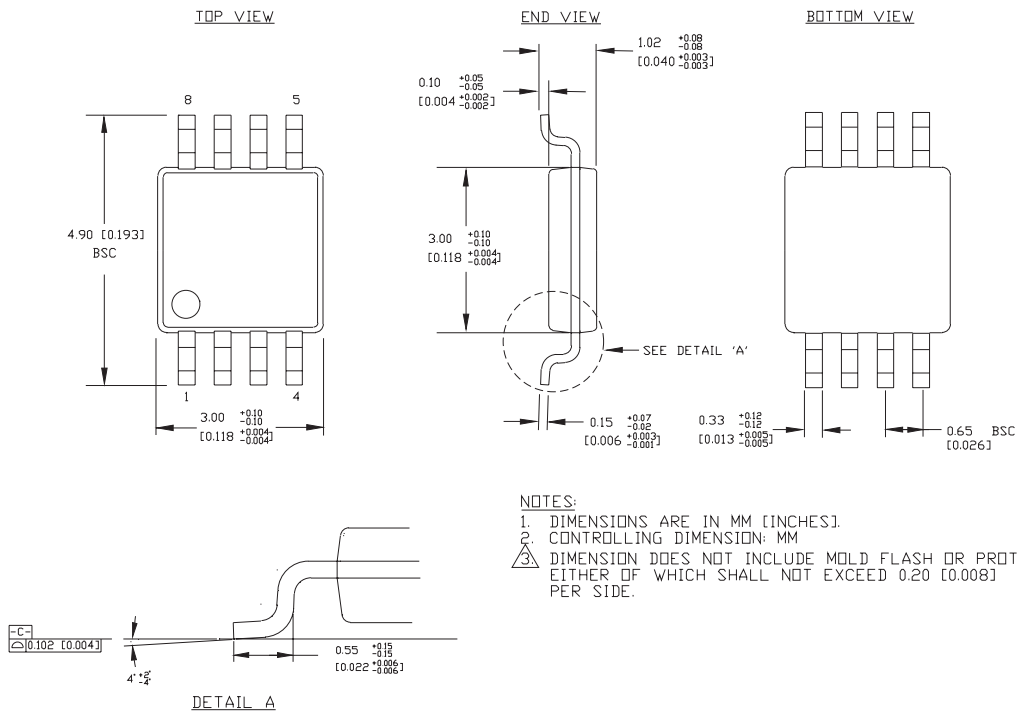


Figure 2. Three-Resistor "Y-Termination"

Notes:

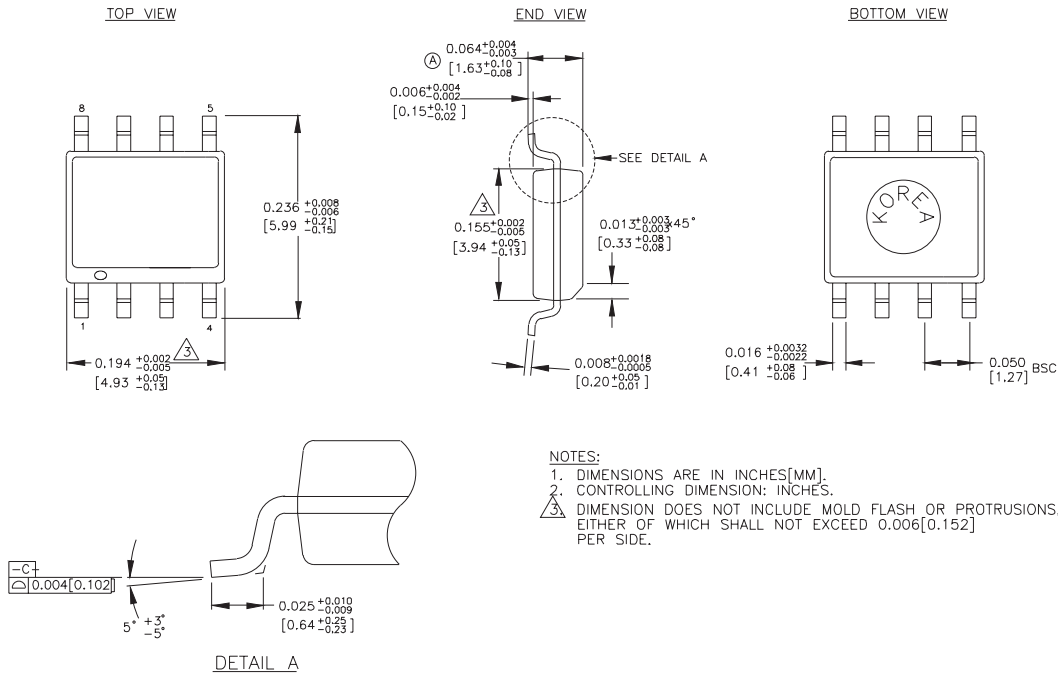
1. Power-saving alternative to Thevenin termination.
2. Place termination resistors as close to destination inputs as possible.
3. R_b resistor sets the DC bias voltage equal to V_t . For +3.3V systems $R_b = 46\Omega$ to 50Ω . For +5V systems, $R_b = 110\Omega$.

8-PIN MSOP (K8-1)



Rev. 01

8-PIN SOIC (Z8-1)



Rev. 03

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