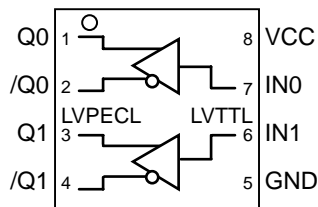


PACKAGE/ORDERING INFORMATION



8-Pin MLF®

Ultra-Small Outline (2mm × 2mm)

Ordering Information

| Part Number | Package Type | Operating Range | Package Marking | Lead Finish |
|-----------------------------|--------------|-----------------|-------------------------------------|----------------|
| SY89322VMITR | MLF-8 | Industrial | 322 | Sn-Pb |
| SY89322VMGTR ⁽¹⁾ | MLF-8 | Industrial | 322 with Pb-Free bar-line indicator | Pb-Free NiPdAu |

Note:

1. Pb-Free package is recommended for new designs.

PIN DESCRIPTION

| Pin Number | Pin Name | Type | Pin Function |
|------------|------------------|------------------|---|
| 1, 2, 3, 4 | Q0, /Q0, Q1, /Q1 | 100k ECL Output | Differential LVPECL Outputs: Default to LOW if IN input left open. See "Output Interface Applications" section for recommendations on terminations. |
| 5 | GND, Exposed Pad | Ground | GND and exposed pad must be tied to ground plane. |
| 6, 7 | IN1, IN0 | TTL/LVTTTL Input | Single-ended TTL Inputs. |
| 8 | VCC | Power | Positive Power Supply: Bypass with 0.1μF//0.01μF low ESR capacitors. |

Absolute Maximum Ratings⁽¹⁾

| | |
|---------------------------------------|-------------------|
| Supply Voltage (V_{CC}) | −0.5V to +6.0V |
| Input Voltage (V_{IN}) | −0.5V to V_{CC} |
| LVPECL Output Current (I_{OUT}) | |
| Continuous | 50mA |
| Surge | 100mA |
| Input Current | |
| Source or sink current on IN, /IN | ±50mA |
| Lead Temperature (soldering, 20 sec.) | +260°C |
| Storage Temperature (T_S) | −65°C to +150°C |

Operating Ratings⁽²⁾

| | |
|---|----------------|
| Supply Voltage (V_{CC}) | +3.0V to +3.6V |
| | +4.5V to +5.5V |
| Ambient Temperature (T_A) | −40°C to +85°C |
| Package Thermal Resistance ⁽³⁾ | |
| MLF [®] (θ_{JA}) | |
| Still-Air | 93°C/W |
| 500lfpm | 87°C/W |
| MLF [®] (Ψ_{JB}) | |
| Junction-to-Board | 60°C/W |

DC ELECTRICAL CHARACTERISTICS $T_A = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$

| Symbol | Parameter | Condition | Min | Typ | Max | Units |
|----------|----------------------|-----------|-----|-----|-----|-------|
| V_{CC} | Power Supply Voltage | | 3.0 | | 3.6 | V |
| | | | 4.5 | | 5.5 | V |
| I_{CC} | Power Supply Current | | | | 25 | mA |

TTL DC ELECTRICAL CHARACTERISTICS $V_{CC} = +3.3\text{V} \pm 10\%$ or $+5.0\text{V} \pm 10\%$; $T_A = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$, unless otherwise noted.

| Symbol | Parameter | Condition | Min | Typ | Max | Units |
|----------|---------------------|-------------------------|-----|-----|------|---------------|
| V_{IH} | Input HIGH Voltage | | 2.0 | | | V |
| V_{IL} | Input LOW Voltage | | | | 0.8 | V |
| I_{IH} | Input HIGH Current | $V_{IN} = 2.7\text{V}$ | | | 20 | μA |
| | | $V_{IN} = V_{CC}$ | | | 100 | μA |
| I_{IL} | Input LOW Current | $V_{IN} = 0.5\text{V}$ | | | −0.2 | mA |
| V_{IK} | Input Clamp Voltage | $I_{IN} = -18\text{mA}$ | | | −1.2 | V |

PECL DC ELECTRICAL CHARACTERISTICS $V_{CC} = +3.3\text{V} \pm 10\%$ or $+5\text{V} \pm 10\%$; $R_L = 50\Omega$ to $V_{CC} - 2\text{V}$; $T_A = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$, unless otherwise noted.

| Symbol | Parameter | Condition | Min | Typ | Max | Units |
|----------|--------------------|-----------|------------------|-----|------------------|-------|
| V_{OH} | Output HIGH | | $V_{CC} - 1.080$ | | $V_{CC} - 0.880$ | V |
| V_{OL} | Output LOW Voltage | | $V_{CC} - 1.83$ | | $V_{CC} - 1.550$ | V |

Notes:

1. 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.
2. The data sheet limits are not guaranteed if the device is operated beyond the operating ratings.
3. Package thermal resistance assumes exposed pad is soldered (or equivalent) to the devices most negative potential on the PCB.

AC ELECTRICAL CHARACTERISTICS

V_{CC} = +3.3V ±10% or +5.0V ±10%; R_L = 50Ω to V_{CC} - 2V, T_A = -40°C to +85°C, unless otherwise noted.

| Symbol | Parameter | Condition | Min | Typ | Max | Units |
|---------------------------------|------------------------------------|-----------|-----|-----|-----|-------------------|
| f _{MAX} | Maximum Toggle Frequency | | | | 800 | MHz |
| t _{PD} | Propagation Delay | IN-to-Q | 100 | | 600 | ps |
| t _{SKEW} | Within-Device Skew | Note 4 | | | 100 | ps |
| | Part-to-Part Jitter | Note 4 | | | 500 | ps |
| t _{Jitter} | Cycle-to-Cycle Jitter | Note 5 | | | 2 | ps _{RMS} |
| | Total Jitter | Note 6 | | | 25 | ps _{PP} |
| t _r , t _f | Output Rise/Fall Time (20% to 80%) | | 200 | | 500 | ps |

- Notes:
- 4. Same transition at common V_{CC} levels.
 - 5. Cycle-to-cycle jitter definition: The variation of periods between adjacent cycles, T_n - T_{n-1}, where T is the time between rising edges of the output signal.
 - 6. Total jitter definition: with an ideal clock input of frequency ≤ f_{MAX}, no more than one output edge in 10¹² output edge will deviate by more than the specified peak-to-peak jitter value.

LVPECL OUTPUT INTERFACE APPLICATIONS

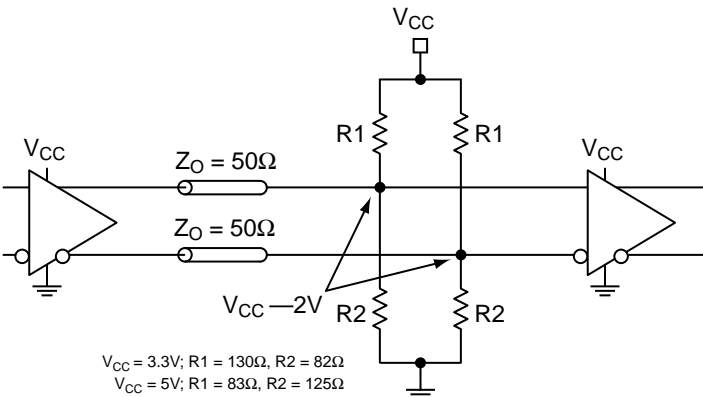


Figure 1a. Parallel Thevenin-Equivalent Termination

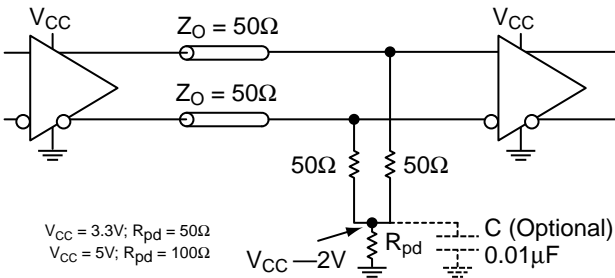


Figure 1b. Three Resistor "Y Termination"

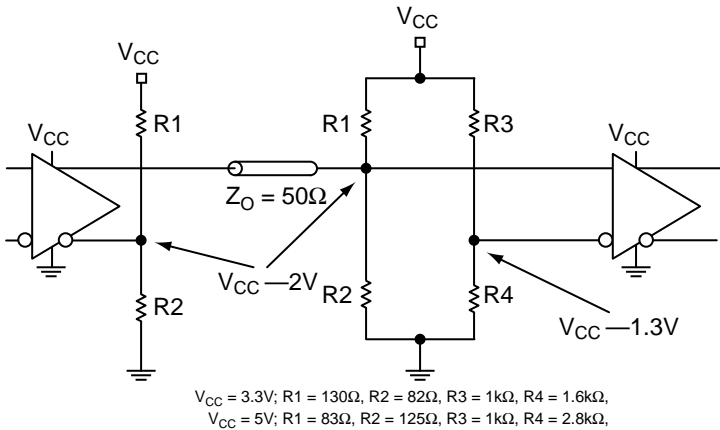
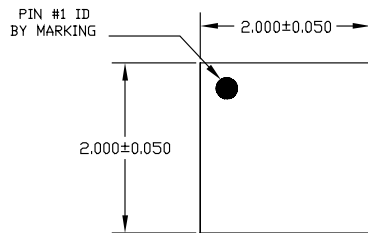
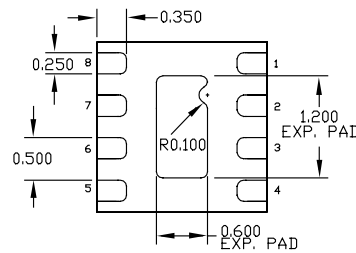


Figure 1c. Terminating Unused I/O

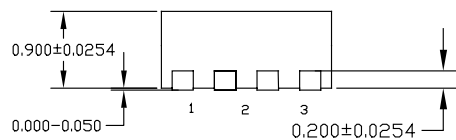
8-PIN ULTRA-SMALL EPAD-MicroLeadFrame® (MLF-8)



TOP VIEW



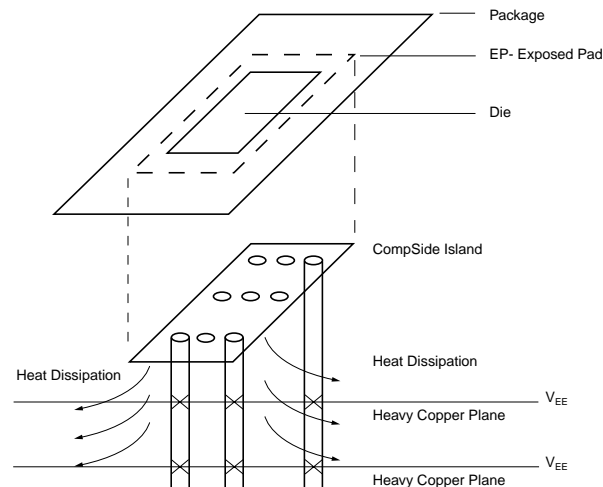
BOTTOM VIEW



SIDE VIEW

NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. MAX. PACKAGE WARPAGE IS 0.05 mm.
3. MAXIMUM ALLOWABLE BURRS IS 0.076 mm IN ALL DIRECTIONS.
4. PIN #1 ID ON TOP WILL BE LASER/INK MARKED.



PCB Thermal Consideration for 8-Pin MLF® Package

Package Notes:

1. Package meets Level 2 qualification.
2. All parts are dry-packaged before shipment.
3. Exposed pads must be soldered to a ground for proper thermal management.

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