

100LVELT22

3.3V Dual LVTTTL/LVCMOS to Differential LVPECL Translator

General Description

The 100LVELT22 is a LVTTTL/LVCMOS to differential LVPECL translator operating from a single +3.3V supply.

Both outputs of a differential pair should be terminated in 50Ω to $V_{CC} - 2.0V$ even if only one output is being used. If an output pair is unused both outputs can be left open (un-terminated).

The 100 series is temperature compensated.

Features

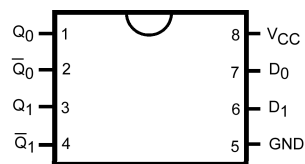
- Typical propagation delay of 350 ps
- <100 ps skew between outputs
- Max I_{CC} of 28 mA at 25°C
- When TTL input is left Open Q output defaults HIGH
- Fairchild MSOP-8 package is a drop-in replacement to ON TSSOP-8
- Flow through pinout
- Meets or exceeds JEDEC specification EIA/JESD78 IC latch-up test
- Moisture Sensitivity Level 1
- ESD Performance:
Human Body Model > 2000V
Machine Model > 200V

Ordering Code:

| Order Number | Package Number | Product Code Top Mark | Package Description |
|-------------------------------|----------------|--------------------------|---|
| 100LVELT22M | M08A | KVT22 | 8-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow |
| 100LVELT22M8 (Preliminary) | MA08D | KR22 | 8-Lead Molded Small Outline Package (MSOP), JEDEC MO-187, 3.0mm Wide |

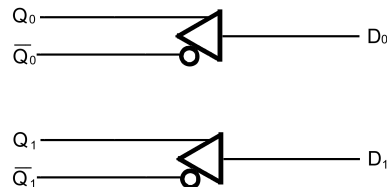
Devices also available in Tape and Reel. Specify by appending suffix letter "X" to the ordering code.

Connection Diagram



Top View

Logic Diagram



Pin Descriptions

| Pin Name | Description |
|------------------|-----------------------------|
| Q_n, \bar{Q}_n | LVPECL Differential Outputs |
| D_0, D_1 | LVTTTL/LVCMOS Inputs |
| V_{CC} | Positive Supply |
| GND | Ground |

Absolute Maximum Ratings (Note 1)

| | |
|---|-----------------|
| Supply Voltage (V_{CC}) | 0.0V to +7.0V |
| Input Voltage (V_I) $V_I \leq V_{CC}$ | 0.0V to +7.0V |
| DC Output Current (I_{OUT}) | |
| Continuous | 50 mA |
| Surge | 100 mA |
| Storage Temperature (T_{STG}) | -65°C to +150°C |

Recommended Operating Conditions

| | |
|--|-------------------------|
| Power Supply Operating | $V_{CC} = 3.0V$ to 3.8V |
| LVTTTL/LVCMOS Input Voltage | 0.0V to V_{CC} |
| Free Air Operating Temperature (T_A) | -40°C to +85°C |

Note 1: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum rating. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

LVPECL DC Electrical Characteristics $V_{CC} = 3.3V$; GND = 0.0V (Note 2)

| Symbol | Parameter | -40°C | | | 25°C | | | 85°C | | | Units |
|----------|------------------------------|-------|-----|------|------|-----|------|------|-----|------|-------|
| | | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | |
| I_{CC} | Power Supply Current | | | 28 | | | 28 | | | 29 | mA |
| V_{OH} | Output HIGH Voltage (Note 3) | 2215 | | 2420 | 2275 | | 2420 | 2275 | | 2420 | mV |
| V_{OL} | Output LOW Voltage (Note 3) | 1470 | | 1745 | 1490 | | 1680 | 1490 | | 1680 | mV |

Note 2: Output parameters vary 1 to 1 with V_{CC} . V_{CC} can vary $\pm 0.15V$.

Note 3: Outputs are terminated through a 50 Ω resistor to $V_{CC} - 2.0V$.

Note: Devices are designed to meet the DC specifications after thermal equilibrium has been established. Circuit is tested with air flow greater than 500LFPM maintained.

LVTTTL/LVCMOS DC Electrical Characteristics $V_{CC} = 3.3V$; GND = 0.0V (Note 4)

| Symbol | Parameter | $T_A = -40^\circ C$ to $85^\circ C$ | | | Units | Condition |
|----------|---------------------|-------------------------------------|-----|-----------|---------|--------------------------------------|
| | | Min | Typ | Max | | |
| I_{IH} | Input HIGH Current | | | 20 100 | μA | $V_{IN} = 2.7V$ $V_{IN} = V_{CC}$ |
| I_{IL} | Input LOW Current | | | -200 | μA | $V_{IN} = 0.5V$ |
| V_{IK} | Clamp Diode Voltage | | | -1.2 | V | $I_{IN} = -18 mA$ |
| V_{IH} | Input HIGH Voltage | 2.0 | | | V | |
| V_{IL} | Input LOW Voltage | | | 0.8 | V | |

Note 4: V_{CC} can vary $\pm 0.15V$.

Note: Devices are designed to meet the DC specifications after thermal equilibrium has been established. Circuit is tested with air flow greater than 500LFPM maintained.

AC Electrical Characteristics $V_{CC} = 3.3V$; GND = 0.0V (Note 5)

| Symbol | Parameter | -40°C | | | 25°C | | | 85°C | | | Units | Figure Number |
|---------------------|---------------------------------------|-------|-----|------------|------|-----|------------|------|-----|------------|-------|---------------|
| | | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | | |
| f_{MAX} | Maximum Toggle Frequency | | | TBD | | | TBD | | | TBD | MHz | |
| t_{JITTER} | Cycle-to-Cycle Jitter | | | TBD | | | TBD | | | TBD | ps | |
| t_{PLH} / t_{PHL} | Propagation Delay (Note 6) | 200 | 350 | 600 | 200 | 350 | 600 | 200 | 350 | 600 | ps | Figure 1 |
| t_{SKEW} | Skew Output-to-Output Part-to-Part | | 30 | 100 400 | | 30 | 100 400 | | 30 | 100 400 | ps | |
| t_r, t_f | Output Rise Time Q (20% to 80%) | 200 | | 550 | 200 | | 500 | 200 | | 500 | ns | Figure 2 |

Note 5: V_{CC} can vary $\pm 0.15V$.

Note 6: Specifications for standard LVTTTL input signal (see Figure 1).

Switching Waveforms

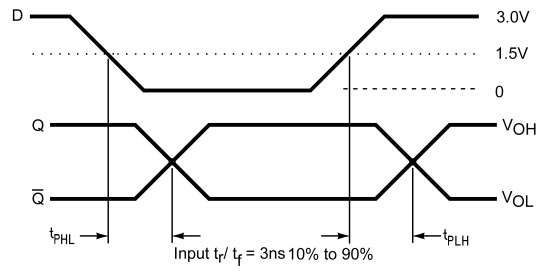


FIGURE 1. LVTTTL to Differential LVPECL Propagation Delay

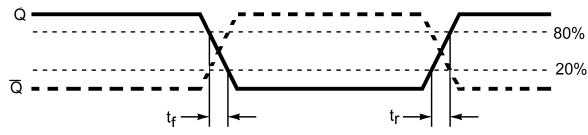
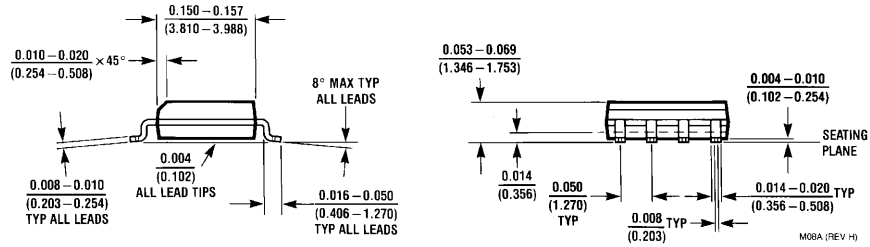
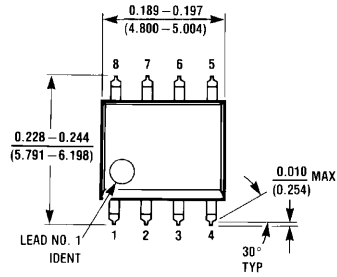


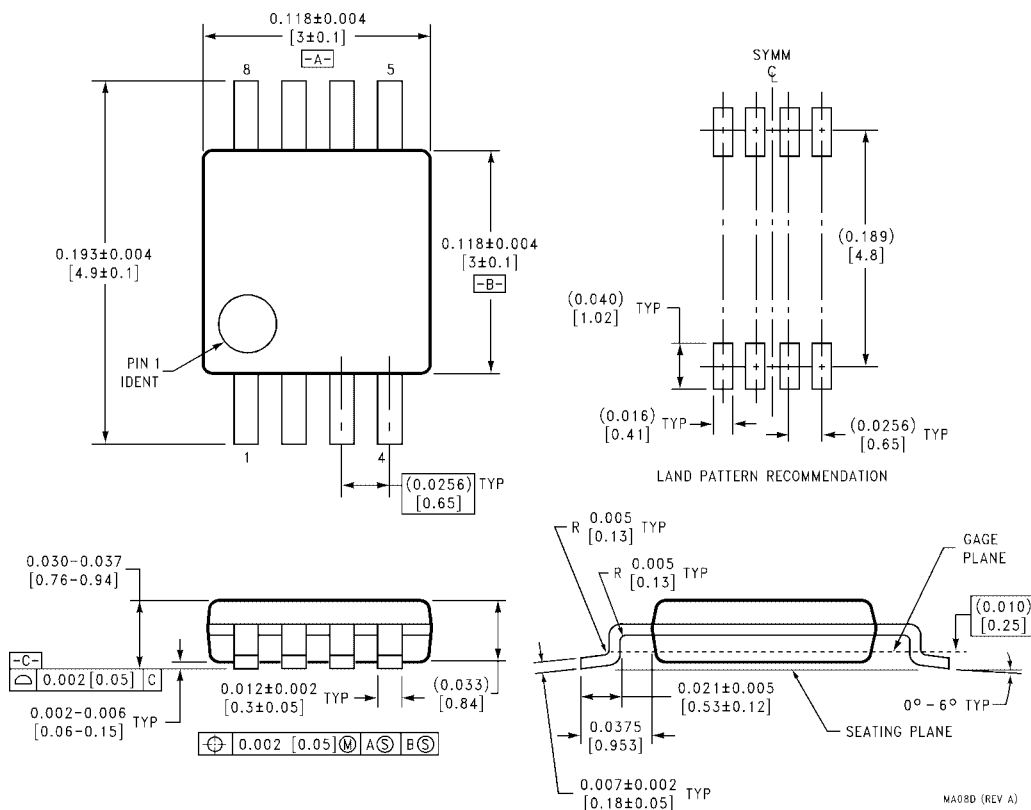
FIGURE 2. Differential Output Edge Rates

Physical Dimensions inches (millimeters) unless otherwise noted



**8-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow
Package Number M08A**

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



**8-Lead Molded Small Outline Package (MSOP), JEDEC MO-187, 3.0mm Wide
Package Number MA08D**

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