

## 100ELT22

### 5V Dual TTL to Differential PECL Translator

#### General Description

The 100ELT22 is a TTL to differential PECL translator operating from a single +5V supply.

Both outputs of a differential pair should be terminated in  $50\Omega$  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

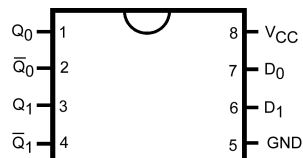
- Typical propagation delay of 300 ps
- <100 ps between outputs
- Max  $I_{CC}$  of 30 mA
- Fairchild MSOP-8 package is a drop-in replacement to ON TSSOP-8
- Flow through pinout
- Meets or exceeds JEDEC specification EIA/JESD78 IC latch-up test
- Moisture Sensitivity Level 1
- ESD Performance:
  - Human Body Model > 2000V
  - Machine Model > 200V

#### Ordering Code:

| Order Number                | Package Number | Product Code<br>Top Mark | Package Description                                                         |
|-----------------------------|----------------|--------------------------|-----------------------------------------------------------------------------|
| 100ELT22M                   | M08A           | KLT22                    | 8-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow |
| 100ELT22M8<br>(Preliminary) | MA08D          | KT22                     | 8-Lead Molded Small Outline Package (MSOP), JEDEC MO-187, 3.0mm Wide        |

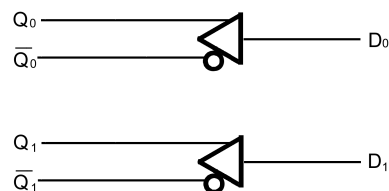
Devices also available in Tape and Reel. Specify by appending suffix letter "X" to the ordering code.

#### Connection Diagram



Top View

#### Logic Diagram



#### Pin Descriptions

| Pin Name         | Description               |
|------------------|---------------------------|
| $Q_n, \bar{Q}_n$ | PECL Differential Outputs |
| $D_0, D_1$       | TTL Inputs                |
| $V_{CC}$         | Positive Supply           |
| GND              | Ground                    |

100ELT22 5V Dual TTL to Differential PECL Translator

**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                   | $V_{CC} = 4.2V$ to 5.5V |
| TTL 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.

**PECL DC Electrical Characteristics**  $V_{CC} = 5.0V$ ; 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         |       |      | 30   |      |      | 30   |      |      | 30   | mA    |
| $V_{OH}$ | Output HIGH Voltage (Note 3) | 3915  | 3995 | 4120 | 3975 | 4045 | 4120 | 3975 | 4050 | 4120 | mV    |
| $V_{OL}$ | Output LOW Voltage (Note 3)  | 3170  | 3305 | 3445 | 3190 | 3295 | 3380 | 3190 | 3295 | 3380 | mV    |

**Note 2:** Output parameters vary 1 to 1 with  $V_{CC}$ .  $V_{CC}$  can vary +0.5V/-0.8V.

**Note 3:** Outputs are terminated through a 50Ω 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.

**TTL DC Electrical Characteristics**  $V_{CC} = 5.0V$ ; GND = 0.0V (Note 4);  $T_A = -40°C$  to +85°C

| Symbol   | Parameter           | Min | Typ | Max       | Units   | Condition                            |
|----------|---------------------|-----|-----|-----------|---------|--------------------------------------|
| $I_{IH}$ | Input HIGH Current  |     |     | 20<br>100 | $\mu A$ | $V_{IN} = 2.7V$<br>$V_{IN} = V_{CC}$ |
| $I_{IL}$ | Input LOW Current   |     |     | -200      | $\mu A$ | $V_{IN} = 0.5V$                      |
| $V_{IK}$ | 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 +0.5V/-0.8V.

**AC Electrical Characteristics**  $V_{CC} = 5.0V$ ; GND = 0.0V (Note 5)

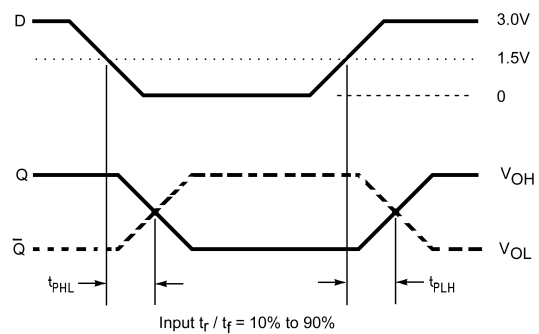
| Symbol             | Parameter                                | -40°C |     |     | 25°C |     |     | 85°C |     |     | Units | Figure Number |
|--------------------|------------------------------------------|-------|-----|-----|------|-----|-----|------|-----|-----|-------|---------------|
|                    |                                          | Min   | Typ | Max | Min  | Typ | Max | Min  | Typ | Max |       |               |
| $f_{MAX}$          | Maximum Input Frequency                  |       |     | TBD |      |     | TBD |      |     | TBD | MHz   |               |
| $t_{JITTER}$       | Cycle-to-Cycle Jitter                    |       |     | TBD |      |     | TBD |      |     | TBD | ps    |               |
| $t_{PLH}, t_{PHL}$ | Propagation Delay to Output (Note 6)     | 100   |     | 600 | 100  |     | 600 | 100  |     | 600 | ps    | Figure 1      |
| $t_r, t_f$         | Output Rise Time/Fall Times (20% to 80%) | 200   |     | 500 | 200  |     | 500 | 200  |     | 500 | ns    | Figure 2      |
| $t_{skpp}$         | Part to Part Skew                        |       |     | 500 |      |     | 500 |      |     | 500 | ps    |               |
| $t_{skew}$         | Within Device Skew (Note 7)              |       |     | 100 |      |     | 100 |      |     | 100 | ps    |               |

**Note 5:**  $V_{CC}$  can vary +0.5V/-0.8V.

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

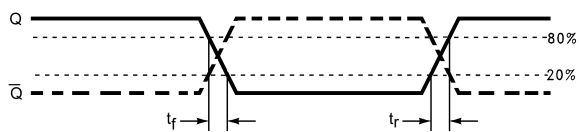
**Note 7:** Within-device skew is defined as identical transitions on similar paths through a device.

## Switching Waveforms



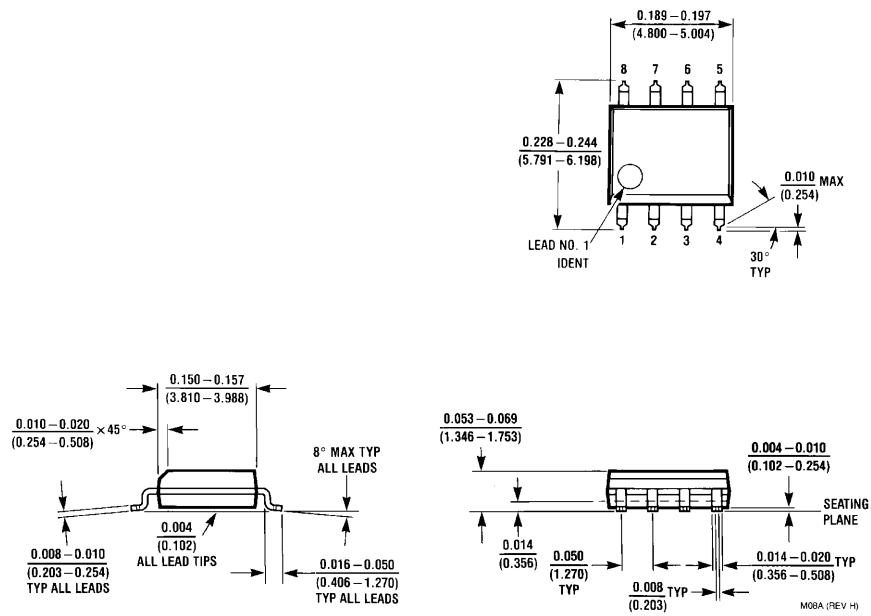
Note:  $V_M$  varies 1:1 with  $V_{EE}$

**FIGURE 1. TTL to Differential PECL Propagation Delay**

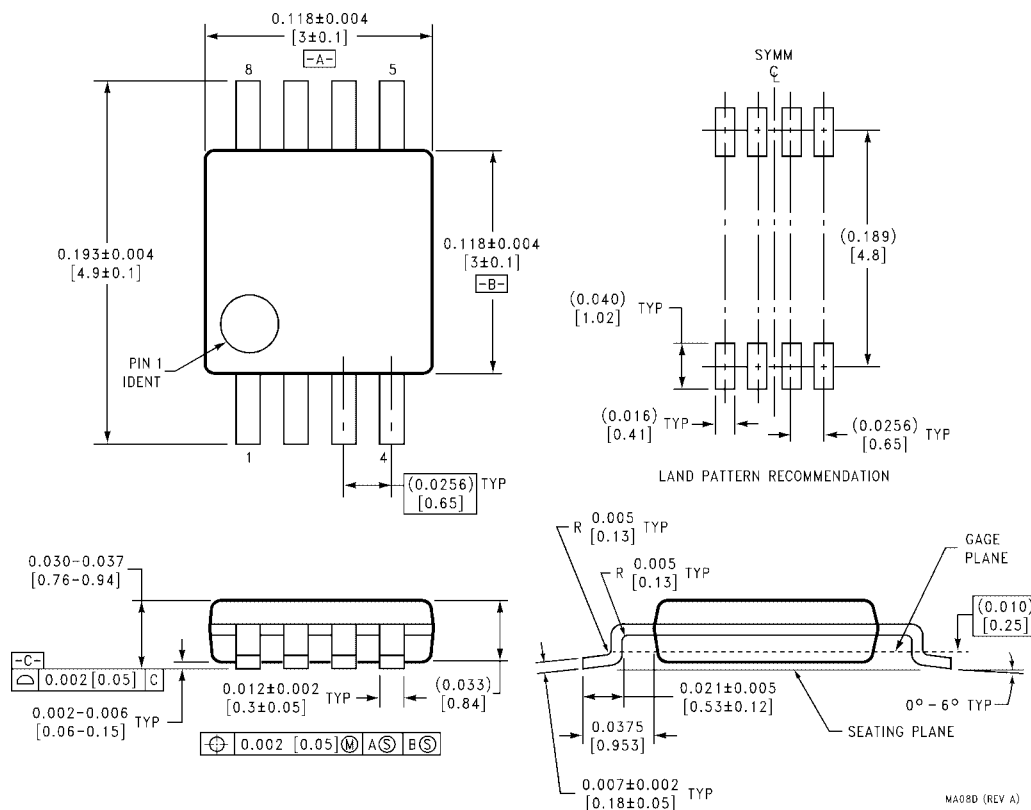


**FIGURE 2. Differential Output Edge Rates**

# 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**

Fairchild does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and Fairchild reserves the right at any time without notice to change said circuitry and specifications.

## LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
  2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.
- www.fairchildsemi.com**

www.fairchildsemi.com