

January 2003 Revised January 2003

### 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<sub>CC</sub> 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:

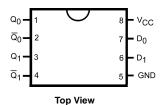
Human Body Model > 2000V Machine Model > 200V

### **Ordering Code:**

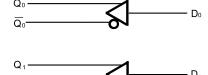
|                             |         | Product  |                                                                             |
|-----------------------------|---------|----------|-----------------------------------------------------------------------------|
| Order Number                | Package | Code     | Package Description                                                         |
|                             | Number  | Top Mark |                                                                             |
| 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**



# Logic Diagram



#### **Pin Descriptions**

| Pin Name                        | Description               |  |  |  |  |  |  |
|---------------------------------|---------------------------|--|--|--|--|--|--|
| $Q_n, \overline{Q}_n$           | PECL Differential Outputs |  |  |  |  |  |  |
| D <sub>0</sub> , D <sub>1</sub> | TTL Inputs                |  |  |  |  |  |  |
| V <sub>CC</sub>                 | Positive Supply           |  |  |  |  |  |  |
| GND                             | Ground                    |  |  |  |  |  |  |

#### **Absolute Maximum Ratings**(Note 1)

 $\label{eq:supply Voltage VCC} Supply \mbox{ Voltage (V}_{CC}) & 0.0V \mbox{ to } +7.0V \\ \mbox{Input Voltage (V}_{I}) \mbox{ } V_{I} \leq \mbox{ } V_{CC} \\ \mbox{ } 0.0V \mbox{ to } +7.0V \\ \mbox{ } 0.0V \mbox{$ 

DC Output Current (I<sub>OUT</sub>)

Continuous 50 mA Surge 100 mA

Storage Temperature ( $T_{STG}$ )  $-65^{\circ}C$  to  $+ 150^{\circ}C$ 

# Recommended Operating Conditions

Power Supply Operating  $V_{CC} = 4.2 \text{V to } 5.5 \text{V}$  TTL Input Voltage  $0.0 \text{V to } V_{CC}$ 

Free Air Operating Temperature ( $T_A$ )  $-40^{\circ}C$  to  $+85^{\circ}C$ 

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<sub>CC</sub> = 5.0V; GND = 0.0V (Note 2)

| Symbol          | Parameter                    | −40°C |      |      |      | 25°C |      |      | Units |      |       |
|-----------------|------------------------------|-------|------|------|------|------|------|------|-------|------|-------|
| Symbol          | Parameter                    | Min   | Тур  | Max  | Min  | Тур  | Max  | Min  | Тур   | Max  | Units |
| I <sub>CC</sub> | Power Supply Current         |       |      | 30   |      |      | 30   |      |       | 30   | mA    |
| V <sub>OH</sub> | Output HIGH Voltage (Note 3) | 3915  | 3995 | 4120 | 3975 | 4045 | 4120 | 3975 | 4050  | 4120 | mV    |
| VOL             | 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  $50\Omega$  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 | Тур | Max  | Units | Condition                 |
|-----------------|---------------------|-----|-----|------|-------|---------------------------|
| I <sub>IH</sub> | Input HIGH Current  |     |     | 20   | ^     | V <sub>IN</sub> = 2.7V    |
|                 |                     |     |     | 100  | μΑ    | $V_{IN} = V_{CC}$         |
| I <sub>IL</sub> | Input LOW Current   |     |     | -200 | μΑ    | V <sub>IN</sub> = 0.5V    |
| V <sub>IK</sub> | Clamp Diode Voltage |     |     | -1.2 | V     | $I_{IN} = -18 \text{ mA}$ |
| V <sub>IH</sub> | Input HIGH Voltage  | 2.0 |     |      | V     |                           |
| V <sub>IL</sub> | Input LOW Voltage   |     |     | 0.8  | V     |                           |

Note 4: V<sub>CC</sub> can vary +0.5V/-0.8V.

#### AC Electrical Characteristics V<sub>CC</sub> = 5.0V; GND = 0.0V (Note 5)

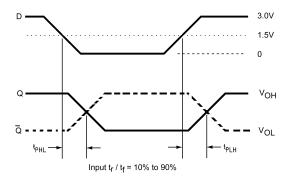
| Symbol                              | Parameter                                   | -40°C |     |     | 25°C |     |     | 85°C |     |     | Units | Figure   |
|-------------------------------------|---------------------------------------------|-------|-----|-----|------|-----|-----|------|-----|-----|-------|----------|
| - Cyllibol                          | rarameter                                   | Min   | Тур | Max | Min  | Тур | Max | Min  | Тур | Max | Oille | Number   |
| f <sub>MAX</sub>                    | Maximum Input Frequency                     |       | TBD |     |      | TBD |     |      | TBD |     | MHz   |          |
| t <sub>JITTER</sub>                 | Cycle-to-Cycle Jitter                       |       | TBD |     |      | TBD |     |      | TBD |     | ps    |          |
| t <sub>PLH</sub> , t <sub>PHL</sub> | Propagation Delay to Output (Note 6)        | 100   |     | 600 | 100  |     | 600 | 100  |     | 600 | ps    | Figure 1 |
| t <sub>r</sub> , t <sub>f</sub>     | Output Rise Time/Fall Times<br>(20% to 80%) | 200   |     | 500 | 200  |     | 500 | 200  |     | 500 | ns    | Figure 2 |
| t <sub>skpp</sub>                   | Part to Part Skew                           |       |     | 500 |      |     | 500 |      |     | 500 | ps    |          |
| t <sub>skew</sub>                   | Within Device Skew (Note 7)                 |       |     | 100 |      |     | 100 |      |     | 100 | ps    |          |

Note 5: V<sub>CC</sub> 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<sub>M</sub> varies 1:1 with V<sub>EE</sub>

FIGURE 1. TTL to Differential PECL Propagation Delay

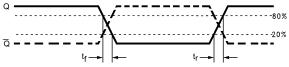
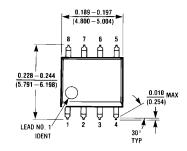
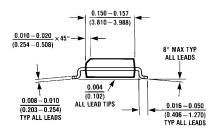
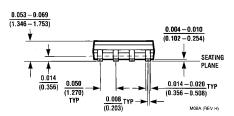


FIGURE 2. Differential Output Edge Rates

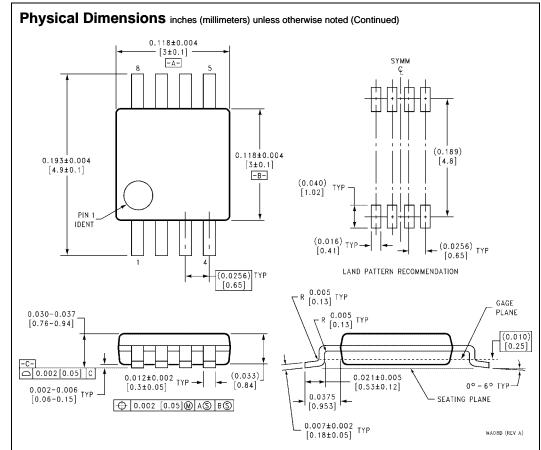
## Physical Dimensions inches (millimeters) unless otherwise noted







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



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

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