



## T73LVP22

### Dual 3.3V LVTTTL/LVCMOS-to-Differential LVPECL Translator

#### Applications

- Multiple LVPECL clock sources

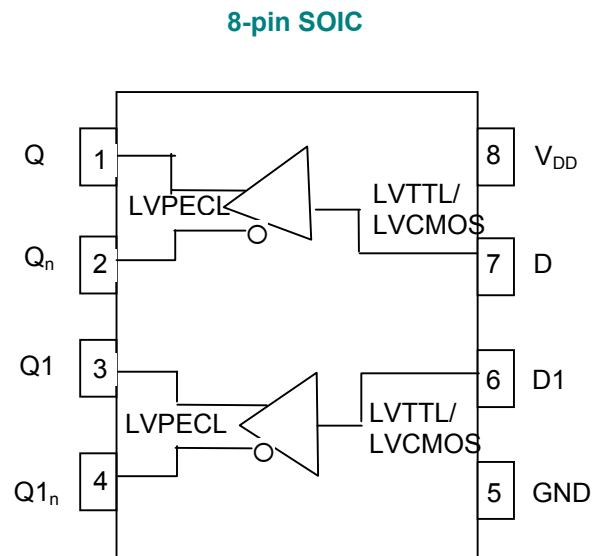
#### General Description

The TSLI T73LVP22 is a general-purpose dual LVTTTL (LVCMOS)-to-differential LVPECL translator operating from a single +3.3V supply. The device has two independent channels that accept an LVTTTL or LVCMOS input and provide differential LVPECL outputs referenced to the positive supply rail. The small 8-pin SOIC package makes it ideal for applications which require the translation of multiple clocks or data signals, and where cost, performance and size are of critical importance. The T73LVP22 is 100K PECL compatible **and is a pin-for-pin replacement for the MC100EPT22D.**

#### Features

- 350pS typical propagation delay
- Operating Frequency > 1 GHz
- Differential LVPECL outputs
- Flow-through pinout
- Q, Q1 outputs default low with input (D) open
- ESD rating >2000V (Human Body Model) or >200V (Machine Model)
- -40 °C to +85 °C operating temperature range
- Available in standard 8-pin SOIC package

**Figure 1. Functional Block Diagrams & Pin Assignments (Top View)**



See page 4 for package outline drawing and ordering information.

Table 1. Pin Description

| Name                             | Description                       | Type | Pin # |
|----------------------------------|-----------------------------------|------|-------|
| Q, Q1                            | LVPECL data outputs               | O    | 1, 3  |
| Q <sub>n</sub> , Q1 <sub>n</sub> | LVPECL complementary data outputs | O    | 2, 4  |
| V <sub>DD</sub>                  | Connect to +3.3V                  | P    | 8     |
| D, D1                            | LVC MOS/LVTTL data inputs         | I    | 7, 6  |
| GND                              | Connect to ground                 | P    | 5     |

Legend: I = Input  
 O = Output  
 P = Power supply connection

Table 2. Absolute Maximum Ratings (each channel)

| Symbol           | Parameter           | Conditions        | Min  | Typ | Max             | Units |
|------------------|---------------------|-------------------|------|-----|-----------------|-------|
| V <sub>DD</sub>  | Supply voltage      | Referenced to GND |      |     | +5.0            | V     |
| V <sub>IN</sub>  | Input voltage       | Referenced to GND | -0.5 |     | V <sub>DD</sub> | V     |
| I <sub>OUT</sub> | Output current      | Continuous        |      |     | 50              | mA    |
| T <sub>STG</sub> | Storage temperature |                   | -65  |     | +150            | °C    |

Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. These ratings are stress specifications only and correct functional operation of the device at these or any other conditions above those listed in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect product reliability.

Table 3. Operating Conditions (each channel)

| Symbol          | Parameter            | Conditions | Min  | Typ  | Max  | Units |
|-----------------|----------------------|------------|------|------|------|-------|
| V <sub>DD</sub> | Power Supply Voltage |            | +3.0 | +3.3 | +3.6 | V     |
| T <sub>A</sub>  | Ambient Temperature  |            | -40  |      | +85  | °C    |
| V <sub>IH</sub> | Input HIGH Voltage   |            | +2.0 |      |      | V     |
| V <sub>IL</sub> | Input LOW Voltage    |            |      |      | +0.8 | V     |

**Table 4. DC Characteristics (each channel)**

$T_A = -40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ ,  $V_{DD} = +3.0\text{V}$  to  $+3.6\text{V}$  unless otherwise stated below.

| Symbol          | Parameter                             | Conditions                   |                         | Min  | Typ  | Max  | Units |
|-----------------|---------------------------------------|------------------------------|-------------------------|------|------|------|-------|
| I <sub>IH</sub> | Input HIGH Current                    | V <sub>IN</sub> =+2.7V       |                         |      |      | 100  | μA    |
| I <sub>IL</sub> | Input LOW Current                     | V <sub>IN</sub> = +0.5V      |                         |      |      | 1    | μA    |
| V <sub>IK</sub> | Input Clamp Diode Voltage             | I <sub>IN</sub> = -18mA      |                         |      |      | -1.2 | V     |
| V <sub>OH</sub> | Output HIGH Voltage <sup>(1, 2)</sup> | -40°C                        | V <sub>DD</sub> = +3.3V | 2220 | 2320 | 2420 | mV    |
|                 |                                       | +25°C                        |                         | 2220 | 2320 | 2420 | mV    |
|                 |                                       | +85°C                        |                         | 2220 | 2320 | 2420 | mV    |
| V <sub>OL</sub> | Output LOW Voltage <sup>(1, 2)</sup>  | -40°C                        | V <sub>DD</sub> = +3.3V | 1420 | 1520 | 1620 | mV    |
|                 |                                       | +25°C                        |                         | 1420 | 1520 | 1620 | mV    |
|                 |                                       | +85°C                        |                         | 1420 | 1520 | 1620 | mV    |
| I <sub>DD</sub> | Power Supply Current                  | Total both channels, no load |                         |      | 46   |      | mA    |

**Notes:** 1. The T73LVP22 is designed to meet these specifications after thermal equilibrium has been established.  
The circuit is in a test socket or mounted on a printed circuit board.  
2. Q, Q1 and Qn, Q1n outputs are loaded with 50 ohms to  $V_{DD}-2$  volts.

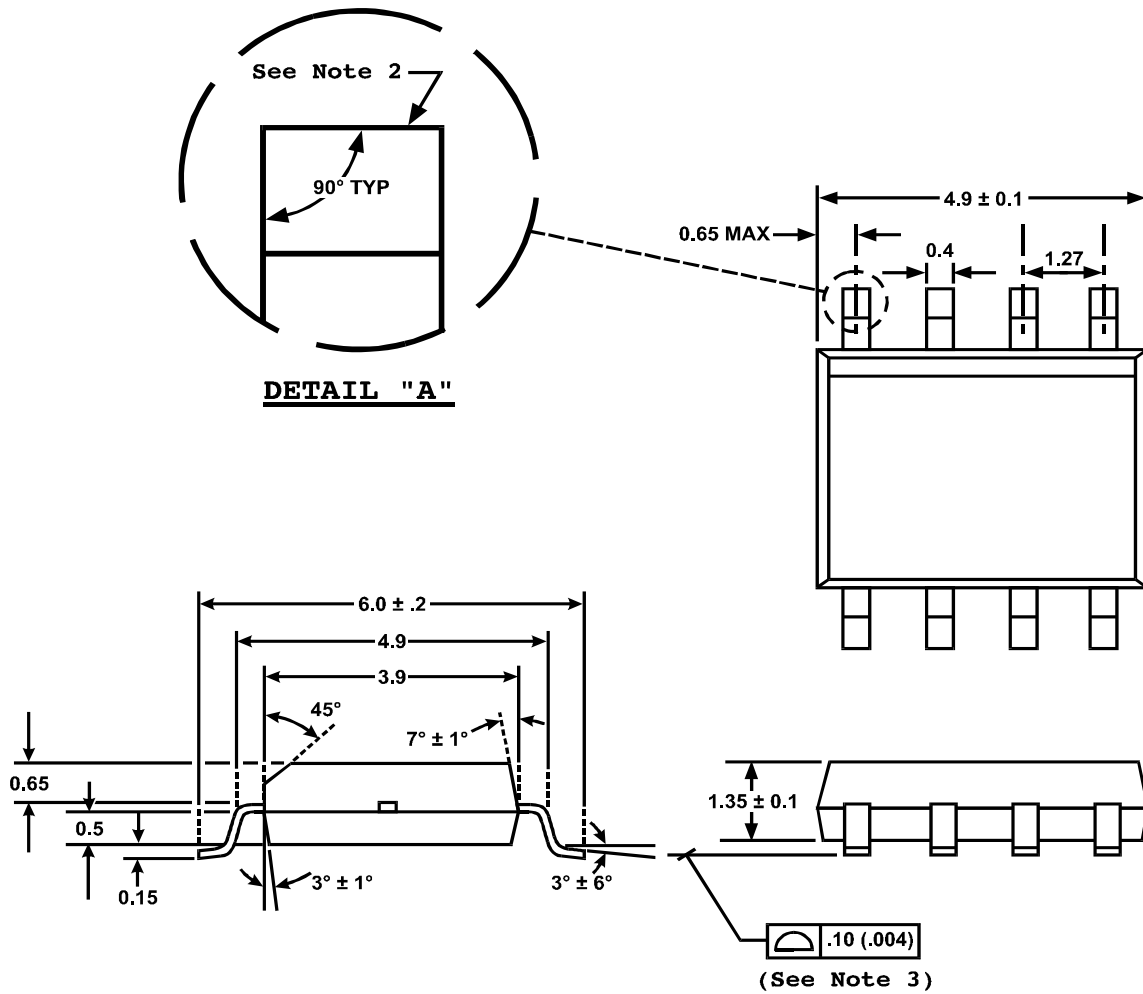
**Table 5. AC Characteristics (each channel)**

$T_A = -40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ ,  $V_{DD} = +3.0\text{V}$  to  $+3.6\text{V}$

| Symbol    | Parameter                              | Conditions                                        | Min | Typ | Max | Units |
|-----------|----------------------------------------|---------------------------------------------------|-----|-----|-----|-------|
| $t_{PLH}$ | Propagation Delay <sup>(1)</sup>       | To Output Differential                            |     | 350 | 500 | ps    |
| $t_{PHL}$ | Propagation Delay <sup>(1)</sup>       | To Output Differential                            |     | 350 | 500 | ps    |
| $t_r/t_f$ | Output Rise/Fall time                  | 20%-80%, Q/Q <sub>n</sub>                         | 80  | 130 | 200 | ps    |
| $f_{MAX}$ | Maximum Input Frequency                | LVTTL or LVCMOS input                             |     | > 1 |     | GHz   |
| $f_{MAX}$ | Maximum Input Frequency <sup>(2)</sup> | 750mV peak-to-peak sine wave centered around 1.5V |     | > 1 |     | GHz   |

**Notes:** 1. Q, Q1 and Qn, Q1n outputs are loaded with 50 ohms to  $V_{DD}-2$  volts.  
2. Measured using a 750mV peak-to-peak, 50% duty cycle clock source.

Figure 2. Package Outline (8-pin SOIC)



- Note: 1) All dimensions are in mm.  
 2) All leads must be blunt cut. (See DETAIL "A")  
 3) Lead coplanarity not to exceed 0.004" maximum.

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Table 6. Ordering Information

| Part Number      | Marking  | Shipping/Packaging | No. of Pins | Package | Temperature    |
|------------------|----------|--------------------|-------------|---------|----------------|
| T73LVP22-S08     | T73LVP22 | Tubes              | 8           | SOIC    | -40°C to +85°C |
| T73LVP22-S08-TNR | T73LVP22 | Tape & Reel        | 8           | SOIC    | -40°C to +85°C |