



## T73LVP12

## 3.3V LVTTTL/LVCMOS-to-Differential LVPECL Translator with Output Enable

## Applications

- LVPECL clock source

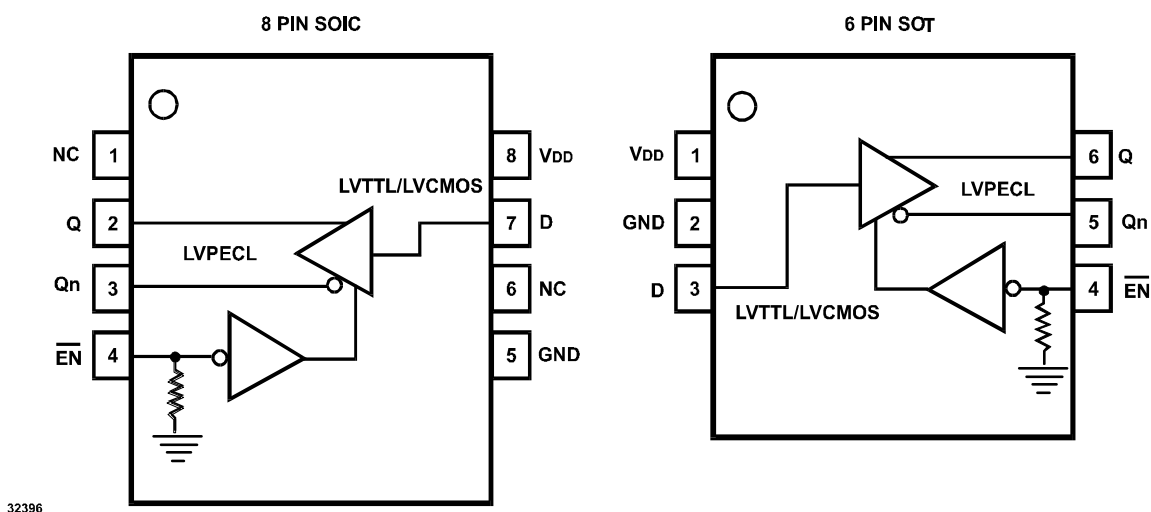
## General Description

The TLSI T73LVP12 is a general-purpose LVTTTL/LVCMOS-to-differential LVPECL translator operating from a single +3.3V supply. The device accepts an LVTTTL or LVCMOS input and provides differential LVPECL outputs referenced to the positive supply rail. An output enable ( $\overline{\text{EN}}$ ) pin is provided, which tri-states the outputs, for applications such as muxing several clock or data inputs onto a single differential pair. The T73LVP12 is 100K PECL compatible.

## Features

- 350pS typical propagation delay
- Operating Frequency > 1 GHz
- Differential LVPECL outputs
- Flow-through pinout
- Q output defaults low with input (D) open
- ESD rating >2000V (Human Body Model) or >200V (Machine Model)
- -40 °C to +85 °C operating temperature range
- Available as die, in tiny 6-pin SOT or standard 8-pin SOIC packages

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



See pages 4 & 5 for package outline drawings and ordering information.

Table 1. Pin Description

Name	Description	Type	8-SOIC Pin #	6-SOT Pin #
NC	No Connection	-	1, 6	-
Q	PECL data output	O	2	6
Q <sub>n</sub>	PECL complementary data output	O	3	5
V <sub>DD</sub>	Connect to +3.3V	P	8	1
D	LVTTTL/LVCMOS data input	I	7	3
GND	Connect to ground	P	5	2
$\overline{\text{EN}}$	TTL/CMOS active LOW enable input with pull-down resistor = 150 Kohms <sup>(1)</sup> .	I	4	4

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

## Notes:

1. When the EN pin is pulled HIGH, both Q and Q<sub>n</sub> outputs are tri-stated. In addition, for systems that require a power save mode, the T73LVP12 draws less than 500  $\mu\text{A}$  when disabled (EN pin HIGH). See Table 4 on Page 3.

Table 2. Absolute Maximum Ratings

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

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

$T_A = -40^{\circ}\text{C}$  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	
$I_{IH}$	Input HIGH Current	$V_{IN} = +2.7\text{V}$			100	$\mu\text{A}$	
$I_{IL}$	Input LOW Current	$V_{IN} = +0.5\text{V}$			1	$\mu\text{A}$	
$V_{IK}$	Input Clamp Diode Voltage	$I_{IN} = -18\text{mA}$			-1.2	V	
$V_{OH}$	Output HIGH Voltage <sup>(1, 2)</sup>	-40°C	$V_{DD} = +3.3\text{V}$	2220	2320	2420	mV
		+25°C		2220	2320	2420	mV
		+85°C		2220	2320	2420	mV
$V_{OL}$	Output LOW Voltage <sup>(1, 2)</sup>	-40°C	$V_{DD} = +3.3\text{V}$	1420	1520	1620	mV
		+25°C		1420	1520	1620	mV
		+85°C		1420	1520	1620	mV
$I_{DD}$	Power Supply Current	No Load, Device Enabled		23		mA	
$I_{DD}$	Power Supply Current <sup>(3)</sup>	Device Disabled			500	$\mu\text{A}$	

- Notes:**
1. The T73LVP12 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 and Qn outputs are loaded with 50 ohms to  $V_{DD}-2$  volts.
  3. When the EN pin is pulled HIGH, both Q and Qn outputs are tri-stated. In addition, for systems that require a power save mode, the T73LVP12 draws less than 500  $\mu\text{A}$  when disabled (EN pin HIGH).

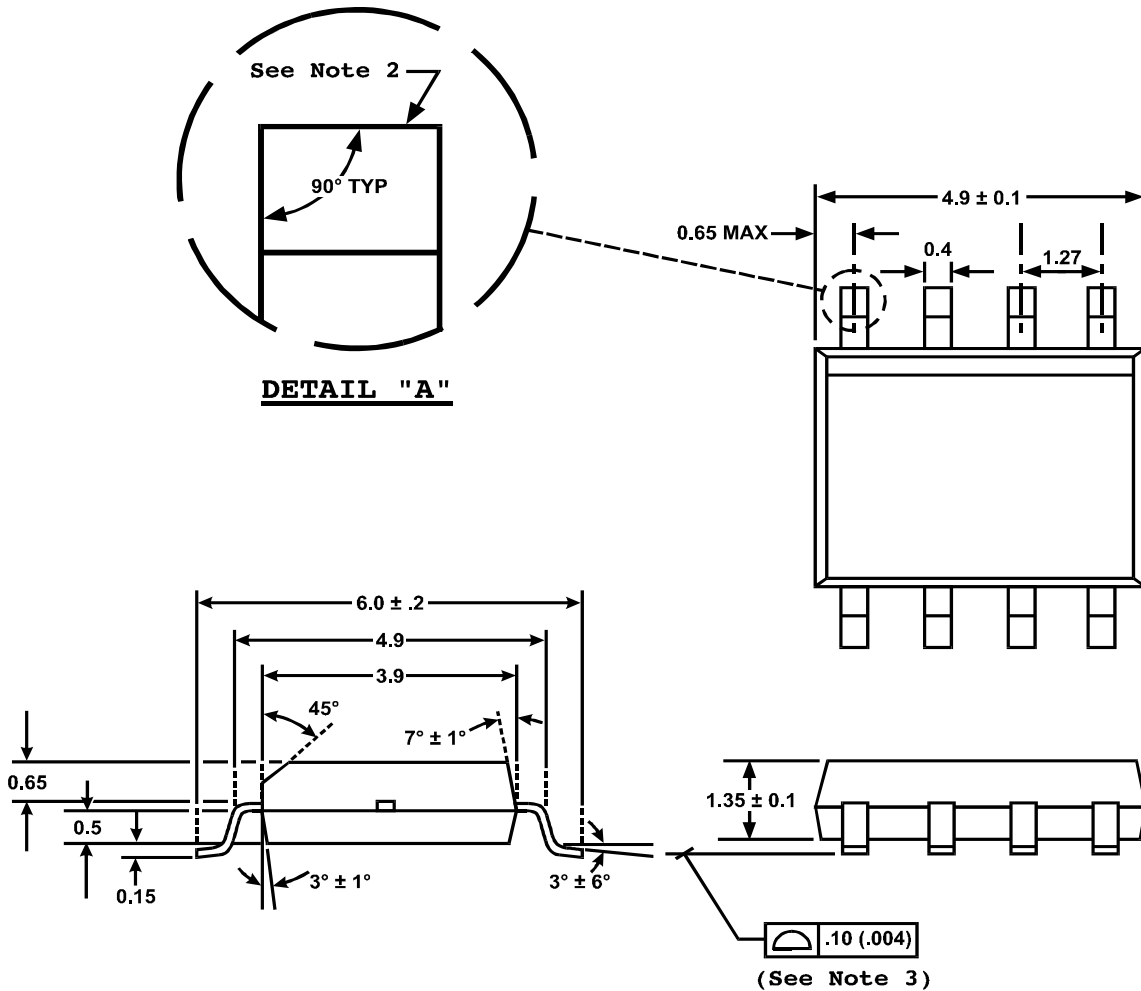
Table 5. AC Characteristics

$T_A = -40^{\circ}\text{C}$  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, Qn	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 and Qn outputs are loaded with 50 ohms to  $V_{DD}-2$  volts.
  2. Measured using a 750mV peak-to-peak, 50% duty cycle clock source.

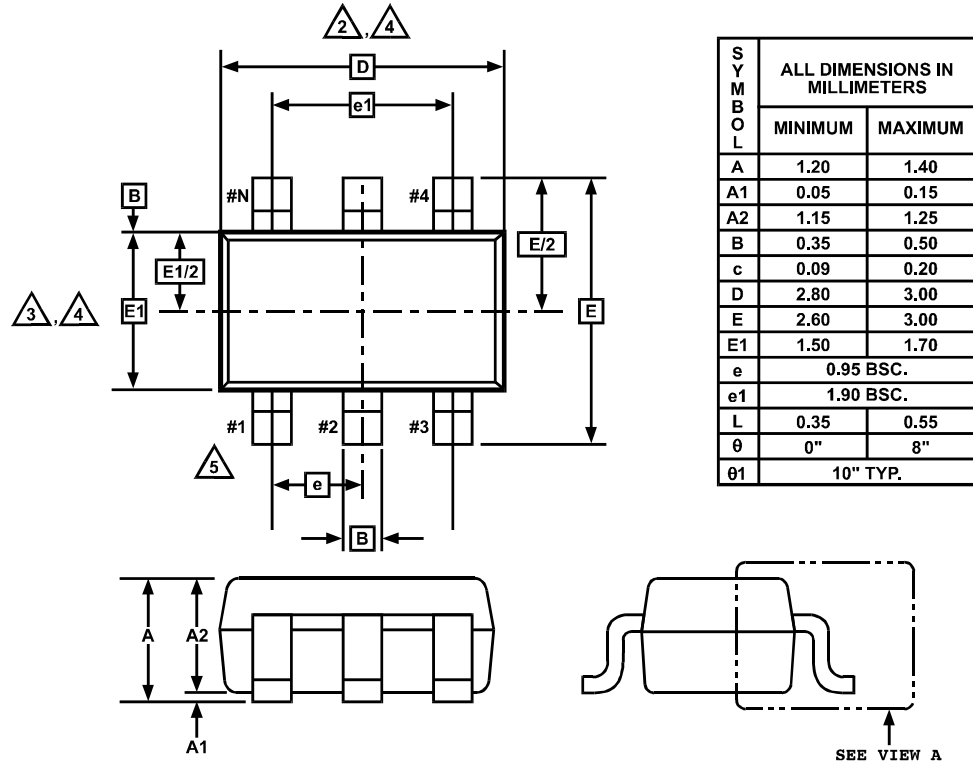
Figure 2. Package Outline (8-pin SOIC)



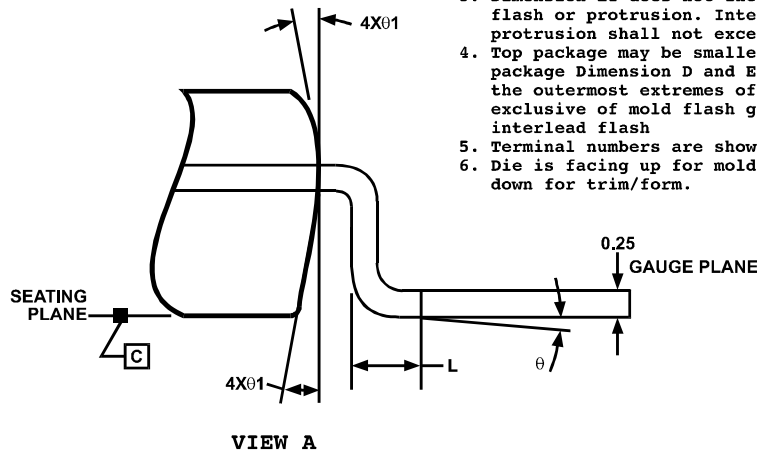
- Note:** 1) All dimensions are in mm.  
 2) All leads must be blunt cut. (See DETAIL "A")  
 3) Lead coplanarity not to exceed 0.004" maximum.

32381

Figure 3. Package Outline (6-pin SOT)



1. Dimensions are in millimeters.
2. Dimension D does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 0.15 mm per side.
3. Dimension E1 does not include interlead flash or protrusion. Interlead flash or protrusion shall not exceed 0.15 mm per side.
4. Top package may be smaller than the bottom package. Dimension D and E1 are determined at the outermost extremes of the plastic body exclusive of mold flash, gate burrs and interlead flash.
5. Terminal numbers are shown for reference only.
6. Die is facing up for molding. Die is facing down for trim/form.



32382

Table 6. Ordering Information

Part Number	Marking	Shipping/Packaging	No. of Pins	Package	Temperature
T73LVP12-S08	T73LVP12	Tubes	8	SOIC	-40°C to +85°C
T73LVP12-S08-TNR	T73LVP12	Tape & Reel	8	SOIC	-40°C to +85°C
T73LVP12-SOT	LVP12	Tubes	6	SOT	-40°C to +85°C
T73LVP12-SOT-TNR	LVP12	Tape & Reel	6	SOT	-40°C to +85°C
T73LVP12-DIE	N/A	Die in Waffle Packs	6	N/A	-40°C to +85°C