

Absolute Maximum Ratings

Supply Voltage (V_{CC})	−0.3V to +4V
Input Voltage (D_{IN})	−0.3V to ($V_{CC} + 0.3V$)
Enable Input Voltage ($EN, \overline{EN}$)	−0.3V to ($V_{CC} + 0.3V$)
Output Voltage (D_{OUT+}, D_{OUT-})	−0.3V to +3.9V
Short Circuit Duration (D_{OUT+}, D_{OUT-})	Continuous
Maximum Package Power Dissipation @ +25°C	
M Package	1088mW
MTC Package	866mW
Derate M Package	8.5 mW/°C above +25°C
Derate MTC Package	6.9 mW/°C above +25°C
Storage Temperature Range	−65°C to +150°C

Lead Temperature Range	
Soldering (4 seconds)	+260°C
Maximum Junction Temperature	+150°C
ESD Rating ⁽¹⁰⁾	
(HBM, 1.5kW, 100pF)	≥10kV
(EIAJ, 0W, 200pF)	≥1200V

Recommended Operating Conditions

	Min	Typ	Max	Units
Supply Voltage (V_{CC})	+3.0	+3.3	+3.6	V
Operating Free Air Temperature (T_A)	−40	+25	+85	°C

Electrical Characteristics

Over supply voltage and operating temperature ranges, unless otherwise specified^(2,3,4).

Symbol	Parameter	Test Conditions	Pin	Min.	Typ.	Max.	Units
V_{OD1}	Differential output voltage magnitude	$R_L = 100 \text{ ohms (LV047A)}$ See Figure 1	D_{OUT-} D_{OUT+}	250	310	450	mV
ΔV_{OD1}	Change in Magnitude of V_{OD1} for complementary output states				1	35	mV
V_{OS}	Offset voltage			1.125	1.2	1.375	V
ΔV_{OS}	Change in magnitude of V_{OS} for complementary output states				1	25	mV
V_{OH}	Output high voltage				1.33	1.6	V
V_{OL}	Output low voltage			0.90	1.02		
V_{IH}	Input high voltage		$D_{IN},$ $EN,$ $\overline{EN}$	2.0		V_{CC}	V
V_{IL}	Input low voltage			GND		0.8	
I_{IH}	Input high current	$V_{IN} = V_{CC} \text{ or } 2.5V$		−20	2	+20	μA
I_{IL}	Input low current	$V_{IN} = GND \text{ or } 0.4V$		−10	−2	+10	μA
V_{CL}	Input clamp voltage	$I_{CL} = -18mA$		−1.5	−0.8		V
I_{OS}	Output short circuit current ⁽¹¹⁾	Enabled, $D_{IN} = V_{CC},$ $D_{OUT+} = 0V$ or $D_{IN} = GND, D_{OUT-} = 0V$	D_{OUT-} D_{OUT+}		−4.2	−10	mA
I_{OSD}	Differential output short circuit current ⁽¹¹⁾	Enabled, $V_{OD} = 0V$			−4.2	−10	
I_{OFF}	Power-off leakage	$V_{OUT} = 0V \text{ or } 3.6V, V_{CC} = 0V \text{ or Open}$		−20	±1	+20	μA
I_{OZ}	Output 3-State current	$EN = 0.8V \text{ and } \overline{EN} = 2.0V,$ $V_{OUT} = 0V \text{ or } V_{CC}$		−10	±1	+10	
I_{CC}	No load supply current drivers enabled	$D_{IN} = V_{CC} \text{ or GND}$	V_{CC}		4.0	8.0	mA
I_{CCL}	Loaded supply current drivers enabled	$R_L = 100 \text{ ohms, (all channels)}$ $D_{IN} = V_{CC} \text{ or GND (all inputs)}$			20	30	
I_{CCZ}	No load supply current drivers disabled	$D_{IN} = V_{CC} \text{ or GND},$ $EN = GND, \overline{EN} = V_{CC}$			2.2	8.0	

Switching Characteristics

 $V_{CC} = +3.3V \pm 10\%$, $T_A = -40^\circ C^{(3,9,12)}$

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
t_{PHLD}	Differential Propagation Delay High to Low	$R_L = 100\text{ohms (LV047)}$ $C_L = 15\text{pF}$ (Figures 2 and 3)	0.5	0.8	1.9	
t_{PLHD}	Differential Propagation Delay Low to High		0.5	1.2	1.9	
t_{SKD1}	Differential Pulse Skew $t_{PHLD} - t_{PLHD}^{(5)}$		0	0.3	0.4	
t_{SKD2}	Channel-to-Channel Skew ⁽⁶⁾		0	0.4	0.5	
t_{SKD3}	Differential Part-to-Part Skew ⁽⁷⁾		0		1.0	
t_{SKD4}	Differential Part-to-Part Skew ⁽⁸⁾		0		1.2	
t_{TLH}	Rise Time			0.5	1.5	
t_{THL}	Fall Time			0.5	1.5	
t_{PHZ}	Disable Time High to Z	$R_L = 100\text{ohms (LV047)}$ $C_L = 15\text{pF}$ (Figures 4 and 5)			5	
t_{PLZ}	Disable Time Low to Z				5	
t_{PZH}	Enable Time Z to High				7	
t_{PZL}	Enable Time Z to Low				7	
f_{MAX}	Maximum Operating Frequency ⁽¹⁴⁾					MHz

Notes

- “Absolute Maximum Ratings” are those values beyond which the safety of the device cannot be guaranteed. They are not meant to imply that the devices should be operated at these limits. The table of “Electrical Characteristics” specifies conditions of device operation.
- Current into device pins is defined as positive. Current out of device pins is defined as negative. All voltages are referenced to ground except: V_{OD1} and ΔV_{OD1} .
- All typicals are given for: $V_{CC} = +3.3V$, $T_A = +25^\circ C$.
- The PI90LV047A is a current mode device and only functions within datasheet specifications when a resistive load is applied to the driver outputs typical range is (90 ohms to 110 ohms).
- $t_{SKD1} |t_{PHLD} - t_{PLHD}|$ is the magnitude difference in differential propagation delay time between the positive going edge and the negative going edge of the same channel.
- t_{SKD2} is the Differential Channel-to-Channel Skew of any event on the same device.
- t_{SKD3} , Differential Part to Part Skew, is defined as the difference between the minimum and maximum specified differential propagation delays. This specification applies to devices at the same V_{CC} and within $5^\circ C$ of each other within the operating temperature range.
- t_{SKD4} , part to part skew, is the differential channel-to-channel skew of any event between devices. This specification applies to devices over recommended operating temperature and voltage ranges, and across process distribution. t_{SKD4} is defined as $|Max - Min|$ differential propagation delay.
- Generator waveform for all tests unless otherwise specified: $f = 1 \text{ MHz}$, $Z_O = 50 \text{ ohms}$, $t_r \leq 1 \text{ ns}$, and $t_f \leq 1 \text{ ns}$.
- ESD Ratings:
HBM (1.5 kohms, 100pF) $\geq 10\text{kV}$
EIAJ (0 ohm, 200pF) $\geq 1200V$
- Output short circuit current (I_{OS}) is specified as magnitude only, minus sign indicates direction only.
- C_L includes probe and jig capacitance.
- All input voltages are for one channel unless otherwise specified. Other inputs are set to GND.
- f_{MAX} generator input conditions: $t_r = t_f < 1\text{ns}$ (0% to 100%), 50% duty cycle, 0V to 3V.
Output Criteria: duty cycle = 45%/55%, $V_{OD} > 250\text{mV}$, all channels switching.

Parameter Measurement Information

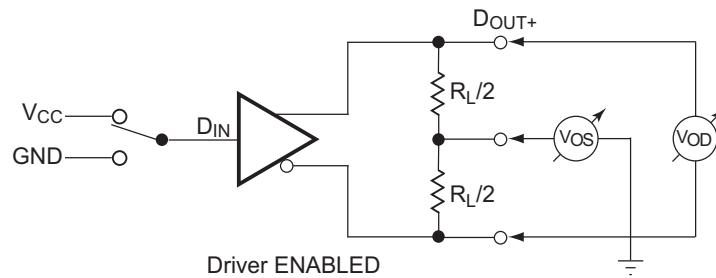


Figure 1. Driver V_{OD} and V_{OS} Test Circuit

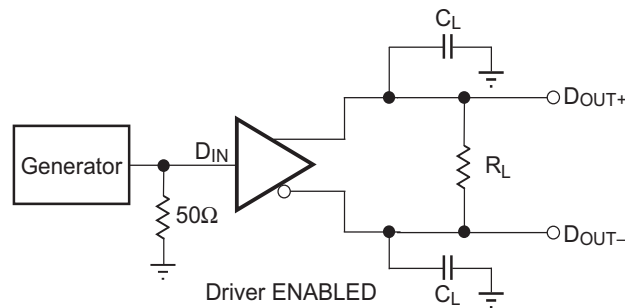


Figure 2. Driver Propagation Delay & Transition Time Test Circuit

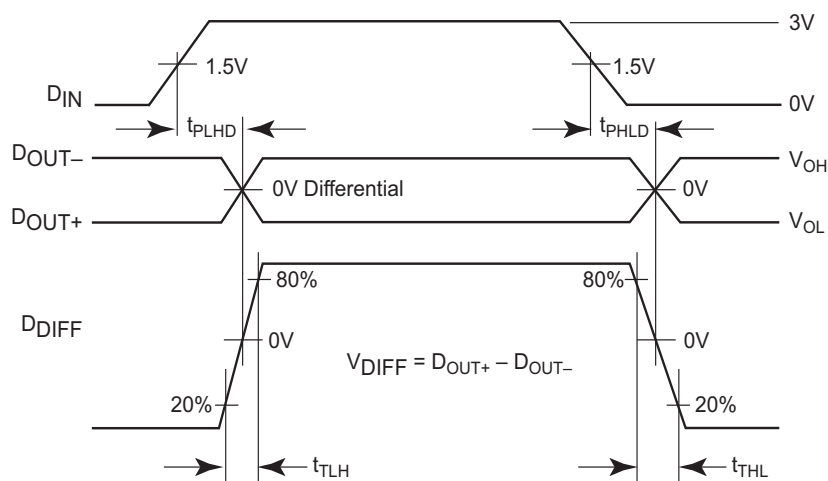


Figure 3. Driver Propagation Delay and Transition Time Waveforms

Parameter Measurement Information (continued)

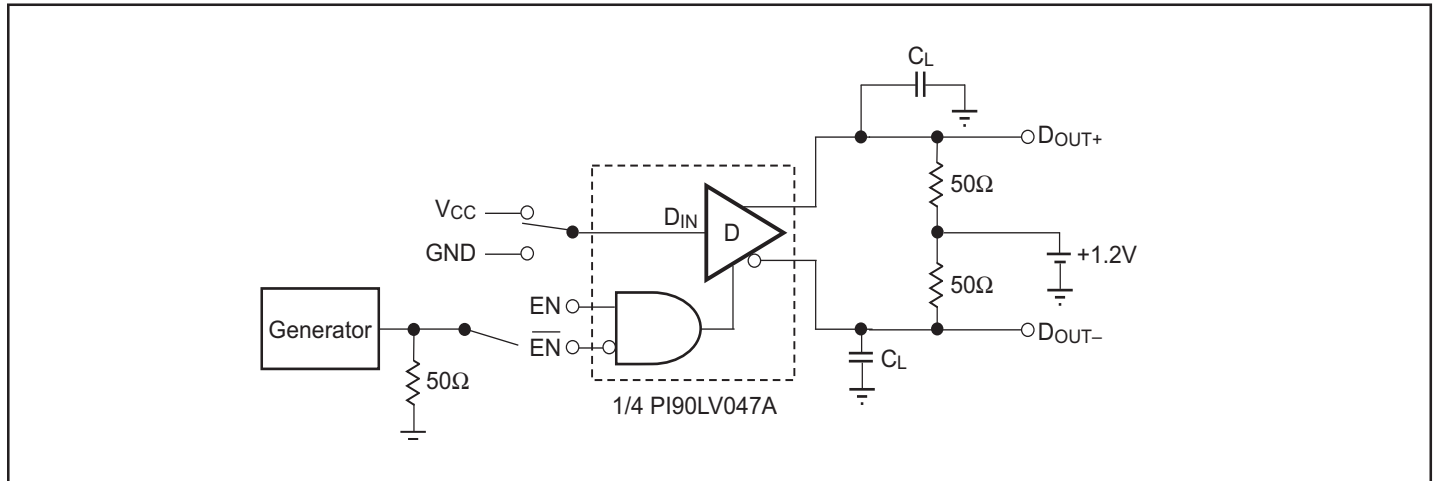


Figure 4. Drive 3-State Delay Test Circuit

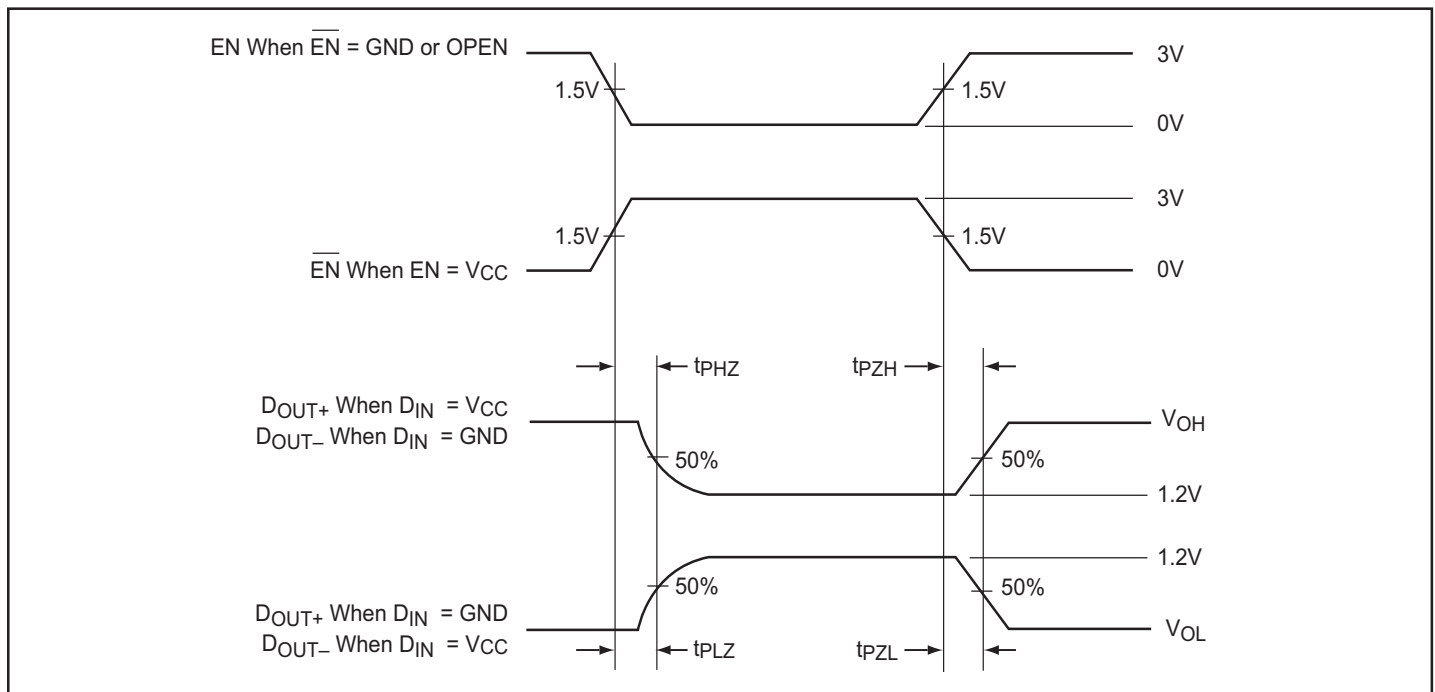


Figure 5. Driver 3-State Delay Waveform

Typical Application

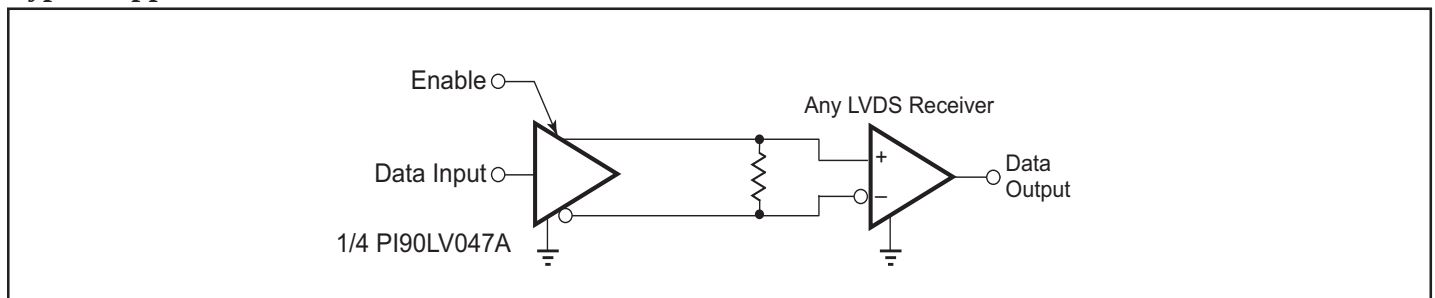
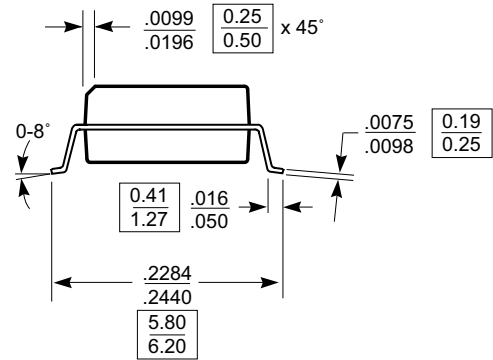
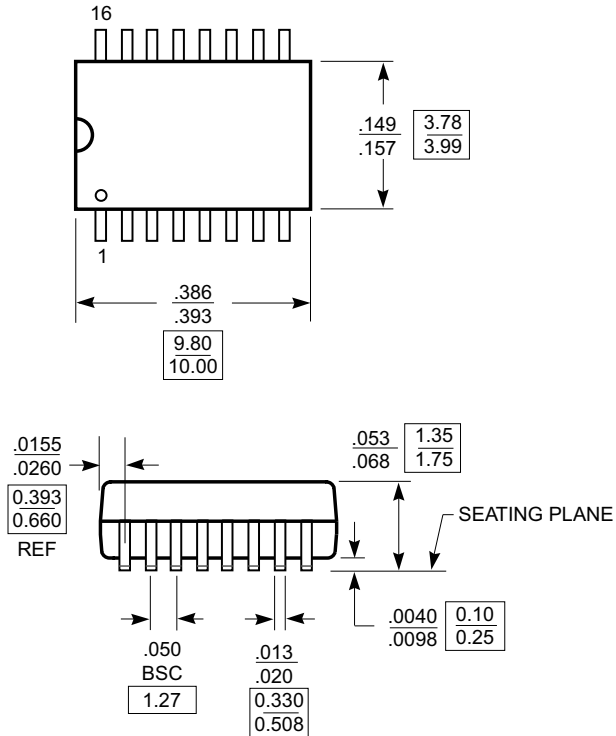


Figure 6. Point-to-Point Application

Packaging Mechanical: 16-Pin SOIC (W)

DOCUMENT CONTROL NO.
PD - 1004

REVISION: E
DATE: 03/09/05



X.XX DENOTES DIMENSIONS
X.XX IN MILLIMETERS

Notes:

- 1) Controlling dimensions in millimeters.
- 2) Ref: JEDEC MS-012D/AC

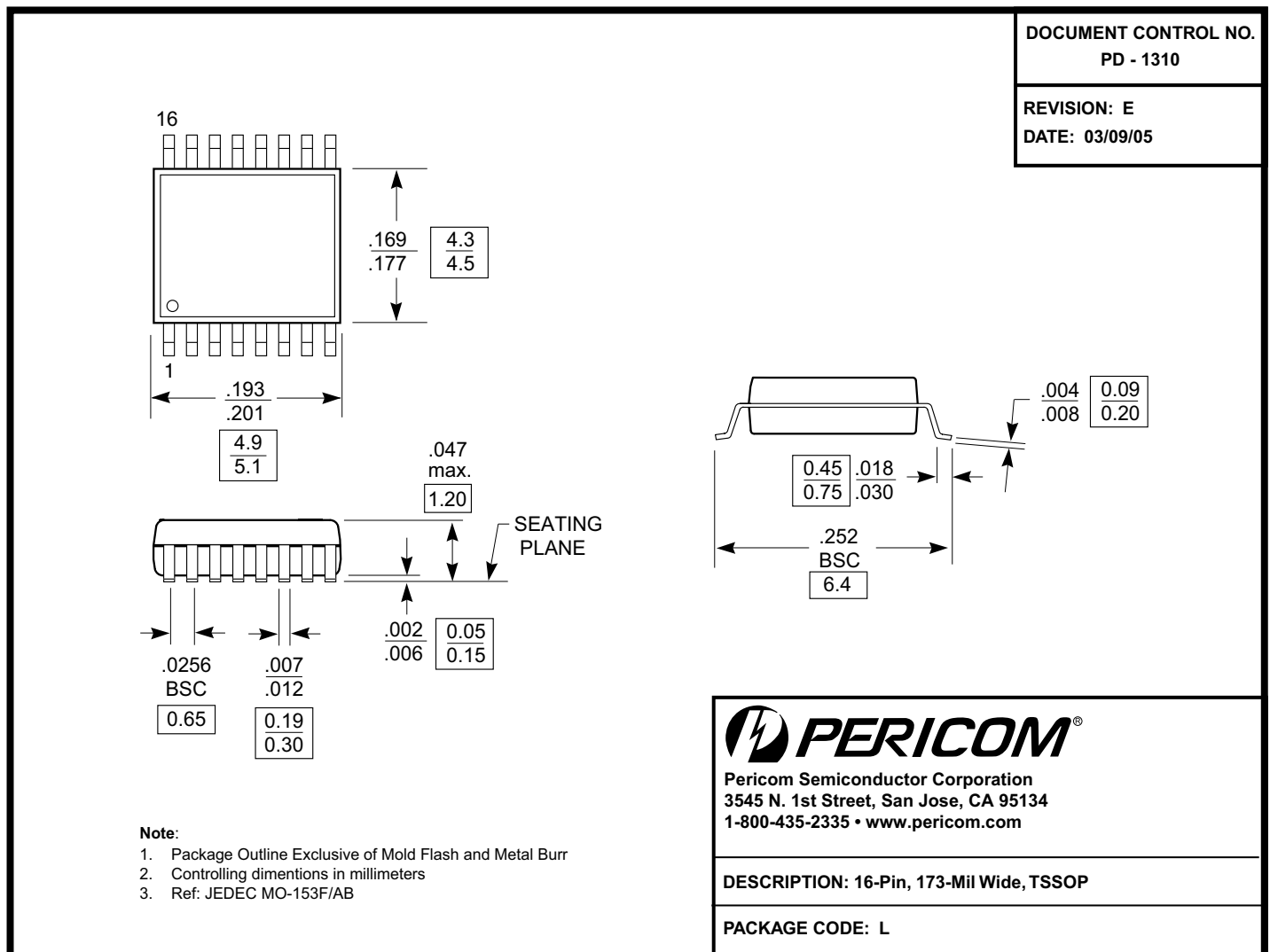


Pericom Semiconductor Corporation
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1-800-435-2335 • www.pericom.com

DESCRIPTION: 16-Pin, 150-Mil Wide, SOIC

PACKAGE CODE: W

Packaging Mechanical: 16-Pin TSSOP (L)



Ordering Information

Ordering Code	Package Code	Package Type
PI90LV047AWE	W	Pb-free & Green, 16-pin SOIC
PI90LV047ALE	L	Pb-free & Green, 16-pin TSSOP

Notes:

- Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
- E = Pb-free and Green
- X = Tape and reel