Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

Fast CMOS 3.3V 16-Bit Register (3-State)

Features

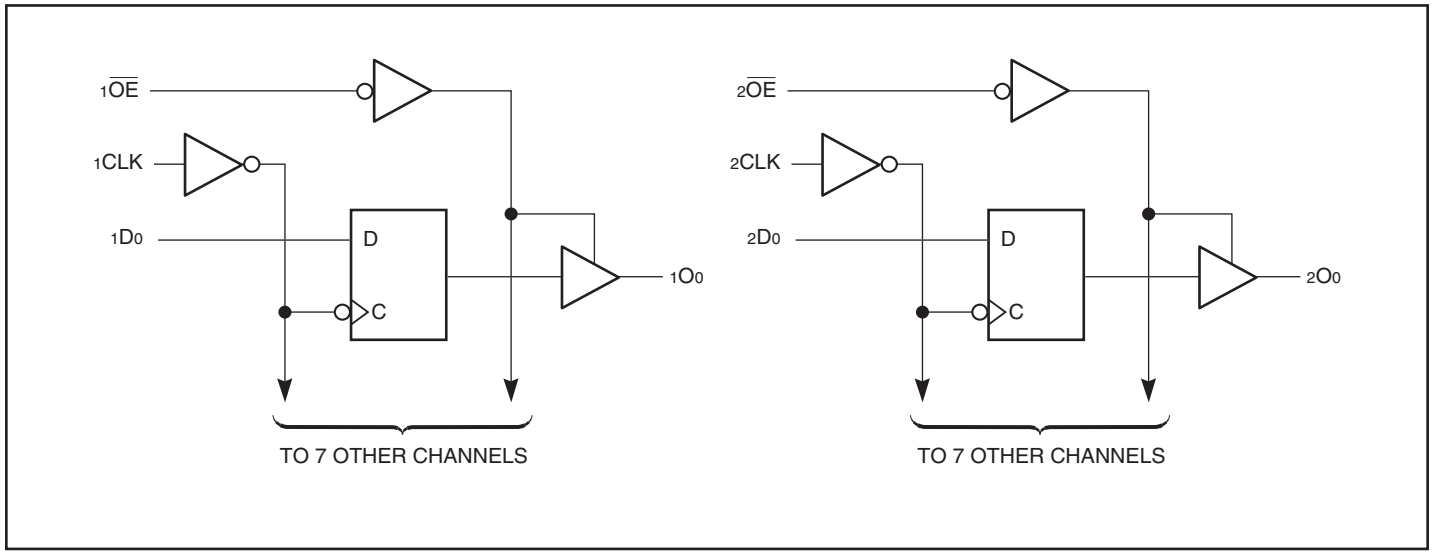
- Compatible with LCX™ and LVT™ families of products
- Supports 5V Tolerant Mixed Signal Mode Operation
  - Input can be 3V or 5V
  - Output can be 3V or connected to 5V bus
- Advanced Low Power CMOS Operation
- Excellent output drive capability:
  Balanced drives (24 mA sink and source)
- Pin compatible with industry standard double-density pinouts
- Low ground bounce outputs
- Hysteresis on all inputs
- ESD Protection exceeds 2000V
- Industrial operating temperature range: –40°C to +85°C
- Multiple center pins and distributed V_{CC}/GND pins minimize switching noise
- Packaging (Pb-free & Green available):
  – 48-pin 240-mil wide plastic TSSOP (A)
  – 48-pin 300-mil wide plastic SSOP (V)

Description

Pericom Semiconductor's PI74LPT16374 is a 16-bit octal register designed with 16 D-type flip-flops with a buffered common clock and 3-state outputs. The Output Enable ($x\overline{OE}$) and clock (xCLK) controls are organized to operate as two 8-bit registers or one 16-bit register. When $\overline{OE}$ is HIGH, the outputs are in the high impedance state. Input data meeting the setup and hold time requirements of the D inputs is transferred to the O outputs on the LOW-to-HIGH transition of the clock input.

The PI74LPT16374 can be driven from either 3.3V or 5.0V devices allowing this device to be used as a translator in a mixed 3.3/5.0V system.

Block Diagram



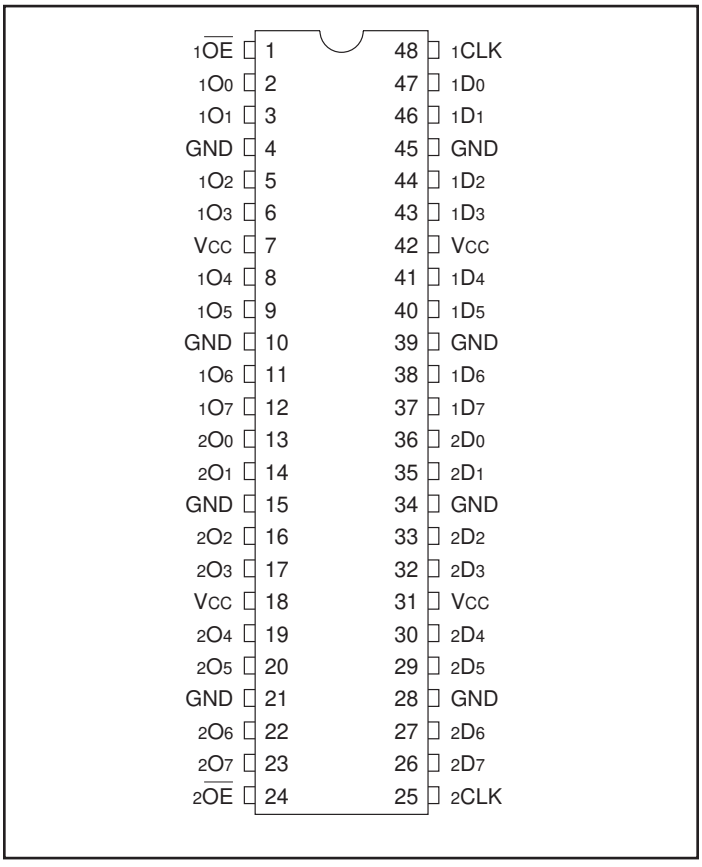
Maximum Ratings

(Above which the useful life may be impaired. For user guidelines, not tested.)

Storage Temperature	–55°C to +125°C
Ambient Temperature with Power Applied	–40°C to +85°C
Supply Voltage to Ground Potential (Inputs & V_{CC} Only)	–0.5V to +7.0V
Supply Voltage to Ground Potential (Outputs & D/O Only)	–0.5V to +7.0V
DC Input Voltage	–0.5V to +7.0V
DC Output Current	120 mA
Power Dissipation	1.0W

Note:
Stresses greater than those listed under MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

Pin Configuration



Truth Table

Function	Inputs(1)			Outputs(1)
	xDx	xCLK	xOE	xOx
High-Z	X	L	H	Z
	X	H	H	Z
Load Register	L		L	L
	H		L	H
	L		H	Z
	H		H	Z

Notes:
1. H = High Voltage Level, X = Don't Care,
L = Low Voltage Level, Z = High Impedance

Pin Description

Pin Name	Description
x$\overline{OE}$	3-State Output Enable Inputs (Active LOW)
xCLK	Clock Inputs
xDx	Data Inputs
xOx	3-State Outputs
GND	Ground
V_{CC}	Power

Capacitance (T_A = 25°C, f = 1 MHz)

Parameters[1]	Description	Test Conditions	Typ	Max.	Units
C_{IN}	Input Capacitance	V_{IN} = 0V	4.5	6	pF
C_{OUT}	Output Capacitance	V_{OUT} = 0V	5.5	8	

Notes:
1. This parameter is determined by device characterization but is not production tested.

DC Electrical Characteristics (Over the Operating Range, T_A = –40°C to +85°C, V_{CC} = 2.7V to 3.6V)

Parameters	Description	Test Conditions[1]		Min.	Typ[2]	Max.	Units
V_{IH}	Input HIGH Voltage (Input pins)	Guaranteed Logic HIGH Level		2.2		5.5	V
	Input HIGH Voltage (I/O pins)			2.0		5.5	
V_{IL}	Input LOW Voltage (Input and I/O pins)	Guaranteed Logic LOW Level		–0.5		0.8	
I_{IH}	Input HIGH Current (Input pins)	V_{CC} = Max.	V_{IN} = 5.5V			±1	µA
	Input HIGH Current (I/O pins)	V_{CC} = Max.	V_{IN} = V_{CC}			±1	
IIL	Input LOW Current (Input pins)	V_{CC} = Max.	V_{IN} = GND			±1	
	Input LOW Current (I/O pins)	V_{CC} = Max.	V_{IN} = GND			±1	
I_{OZH}	High Impedance Output Current	V_{CC} = Max.	V_{OUT} = 5.5V			±1	
I_{OZL}	(3-State Output pins)	V_{CC} = Max.	V_{OUT} = GND			±1	
V_{IK}	Clamp Diode Voltage	V_{CC} = Min., I_{IN} = –18 mA			–0.7	–1.2	V
I_{ODH}	Output HIGH Current	V_{CC}= 3.3V, V_{IN} = V_{IH} or V_{IL}, V_O = 1.5V[3]		–36	–60	–110	mA
I_{ODL}	Output LOW Current	V_{CC} = 3.3V, V_{IN} = V_{IH} or V_{IL}, V_O = 1.5V[3]		50	90	200	
V_{OH}	Output HIGH Voltage	V_{CC} = Min. V_{IN} = V_{IH} or V_{IL}	I_{OH} = –0.1 mA	V_{CC}-0.2			V
			I_{OH} = –3 mA	2.4	3.0		
		V_{CC} = 3.0V, V_{IN} = V_{IH} or V_{IL}	I_{OH} = –8 mA	2.4[5]	3.0		
			I_{OH} = –24 mA	2.0			
V_{OL}	Output LOW Voltage	V_{CC} = Min.	I_{OL} = 0.1 mA			0.2	
		V_{IN} = V_{IH} or V_{IL}	I_{OL} = 16 mA		0.2	0.4	
			I_{OL} = 24 mA		0.3	0.5	
I_{OS}	Short Circuit Current[4]	V_{CC} = Max.[3], V_{OUT} = GND		–60	–85	–240	mA
I_{OFF}	Power Down Disable	V_{CC} = 0V, V_{IN} or $V_{OUT} \leq$ 4.5V				±100	µA
V_H	Input Hysteresis				150		mV

Notes:
1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at V_{CC} = 3.3V, +25°C ambient and maximum loading.
3. Not more than one output should be shorted at one time. Duration of the test should not exceed one second.
4. This parameter is guaranteed but not tested.
5. V_{OH} = V_{CC} – 0.6V at rated current.

Power Supply Characteristics

Parameters	Description	Test Conditions(1)		Min.	Typ(2)	Max.	Units
I_{CC}	Quiescent Power Supply Current	V_{CC} = Max.	V_{IN} = GND or V_{CC}		0.1	10	mA
ΔI_{CC}	Quiescent Power Supply Current TTL Inputs HIGH	V_{CC} = Max.	V_{IN} = V_{CC} – 0.6V(3)			500	
I_{CCD}	Dynamic Power Supply(4)	V_{CC} = Max., Outputs Open x$\overline{OE}$ = GND xLE = V_{CC} One Bit Toggling 50% Duty Cycle	V_{IN} = V_{CC} V_{IN} = GND		50	75	µA/ MHz
I_C	Total Power Supply Current(6)	V_{CC} = Max., Outputs Open fi = 10 MHz 50% Duty Cycle x$\overline{OE}$ = GND One Bit Toggling	V_{IN} = V_{CC} – 0.6V V_{IN} = GND		0.6	2.3	mA
		V_{CC} = Max., Outputs Open fi = 2.5 MHz 50% Duty Cycle x$\overline{OE}$ = GND 16 Bits Toggling	V_{IN} = V_{CC} – 0.6V V_{IN} = GND		2.1	4.7(5)	

Notes:

1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device.
2. Typical values are at Vcc = 3.3V, +25°C ambient.
3. Per TTL driven input; all other inputs at Vcc or GND.
4. This parameter is not directly testable, but is derived for use in Total Power Supply Calculations.
5. Values for these conditions are examples of the Icc formula. These limits are guaranteed but not tested.
6. $I_C = I_{QUIESCENT} + I_{INPUTS} + I_{DYNAMIC}$
   $I_C = I_{CC} + \Delta I_{CC} D_H N_T + I_{CCD} (f_{CP}/2 + f_i N_I)$
   I_{CC} = Quiescent Current (I_{CCL}, I_{CCH} and I_{CCZ})
   ΔI_{CC} = Power Supply Current for a TTL High Input
   D_H = Duty Cycle for TTL Inputs High
   N_T = Number of TTL Inputs at D_H
   I_{CCD} = Dynamic Current Caused by an Input Transition Pair (HLH or LHL)
   f_{CP} = Clock Frequency for Register Devices (Zero for Non-Register Devices)
   N_{CP} = Number of Clock Inputs at f_{CP}
   f_i = Input Frequency
   N_I = Number of Inputs at f_i
   All currents are in milliamps and all frequencies are in megahertz.

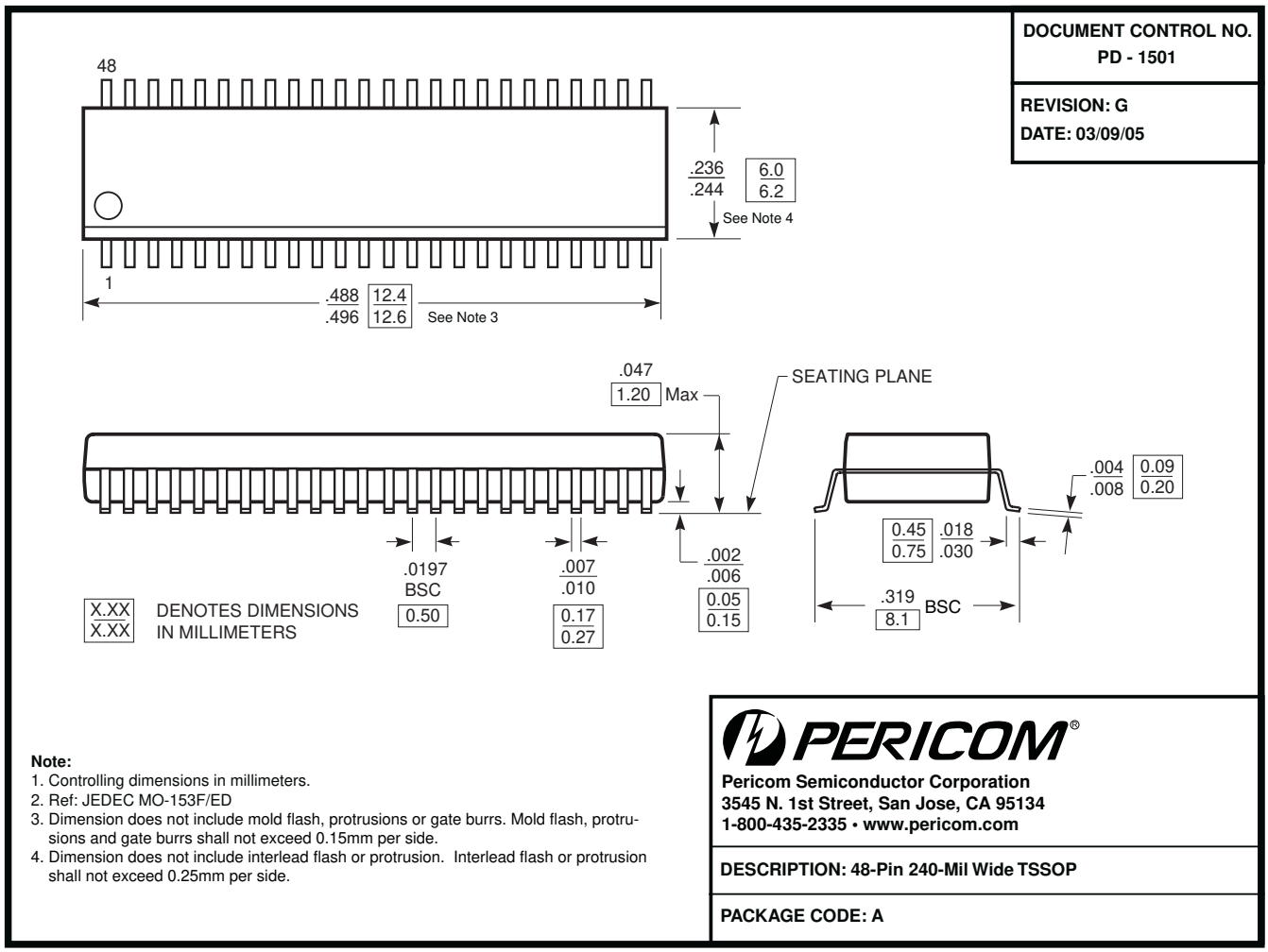
Switching Characteristics over Operating Range[1]

Parameters	Description	Test Conditions[2]	LPT16374		LPT16374A		LPT16374C		Units
			Com.		Com.		Com.		
			Min.[3]	Max.	Min.[3]	Max.	Min.[3]	Max.	
t_{PLH} t_{PHL}	Propagation Delay xCLK to xOx	C_L = 50pF RL = 500Ω	2.0	7.0	2.0	6.5	2.0	5.2	ns
t_{PZH} t_{PZL}	Output Enable Time xOE to xOx		1.5	7.2	1.5	6.5	1.5	5.5	
t_{PHZ} t_{PLZ}	Output Disable Time[4] xOE to xOx		1.5	7.2	1.5	5.5	1.5	5.0	
t_{SU}	Setup Time HIGH or LOW, xDx to xCLK		2.0		2.0		2.0		
t_H	Hold Time HIGH or LOW, xDx to xCLK		1.5		1.5		1.5		
t_W	xCLK Pulse Width[4] HIGH		7.0		5.0		5.0		
$t_{SK(O)}$	Output Skew[5]			0.5		0.5		0.5	

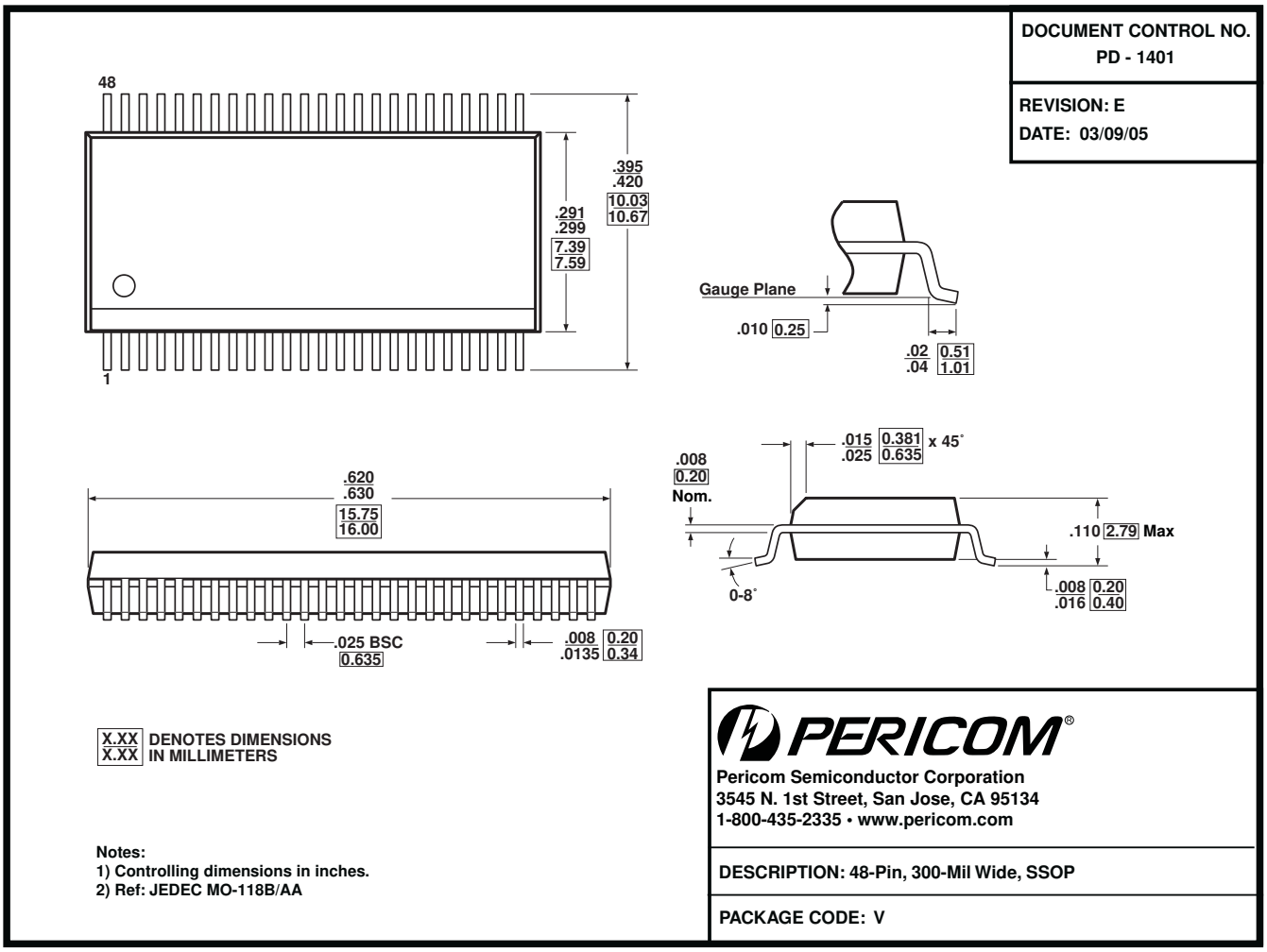
Notes:

1. Propagation Delays and Enable/Disable times are with Vcc = 3.3V ±0.3V, normal range. For V_{CC} = 2.7V, extended range, all Propagation Delays and Enable/Disable times should be degraded by 20%.
2. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device.
3. Minimum limits are guaranteed but not tested on Propagation Delays.
4. This parameter is guaranteed but not production tested.
5. Skew between any two outputs, of the same package, switching in the same direction. This parameter is guaranteed by design.

Packaging Mechanical: 48-pin TSSOP (A)



Packaging Mechanical: 48-pin SSOP (V)



Ordering Information

Ordering Code	Package Code	Description
PI74LPT16374AE	A	Pb-free & Green, 48-pin 173-mil wide plastic TSSOP
PI74LPT16374VE	V	Pb-free & Green, 48-pin 300-mil wide plastic SSOP
PI74LPT16374AAE	A	Pb-free & Green, 48-pin 173-mil wide plastic TSSOP
PI74LPT16374CAE	A	Pb-free & Green, 48-pin 173-mil wide plastic TSSOP
PI74LPT16374CVE	V	Pb-free & Green, 48-pin 300-mil wide plastic SSOP

Notes:

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