

PI3L110

3.3V Quad, 2:1 Mux/DeMux Fast Ethernet LAN Switch w/ Single Enable

Features

- R_{ON} is 4Ω typical
- Low crosstalk: $-27dB @ 250 MHz$
- Near-Zero propagation delay: 250ps
- Switching speed: 9ns
- Channel On capacitance: 9pF (typical)
- V_{CC} Operating Range: +3.0V to +3.6V
- $>2kV$ ESD protection (human body model)
- $>350 MHz$ bandwidth (or data frequency)
- Switching on Data I/O Ports (0 to 5V)
- I_{OFF} supports Partial-Power-Down mode operation
- Data and Control Inputs have Undershoot Clamp Diodes
- Packaging (Pb-free & Green available)
 - 16-pin 150-mil wide plastic QSOP (Q)
 - 16-pin 173-mil wide plastic TSSOP (L)

Applications

- Dual Physical Layer Device sharing to one interface connector
- Routes signals for 10/100 Mbit Ethernet

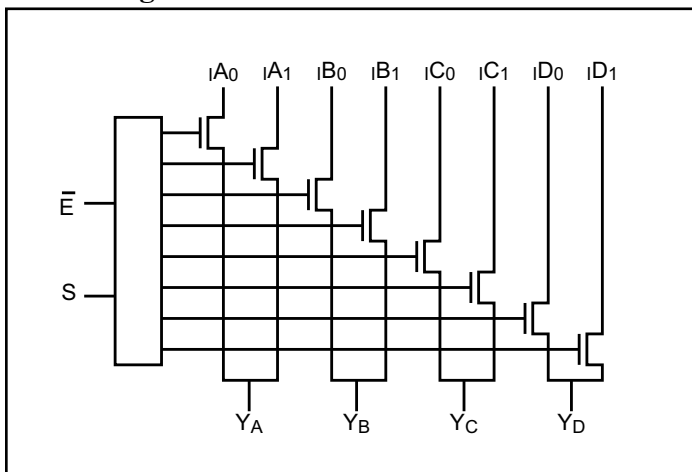
Description

The PI3L110 is a 8- to 4-bit multiplexer/demultiplexer LAN Switch with Hi-Z outputs. Industry leading advantages include a propagation delay of less than 250ps, resulting from its low channel resistance and I/O capacitance. The device multiplexes differential outputs from a Fast Ethernet transceiver (PHY) device to one of two corresponding outputs. The switch is bidirectional and offers little or no attenuation of the high-speed signals at the outputs. It is designed for low bit-to-bit skew, high channel-to-channel noise isolation and is compatible with various standards, such as 10/100 Base-T (Ethernet).

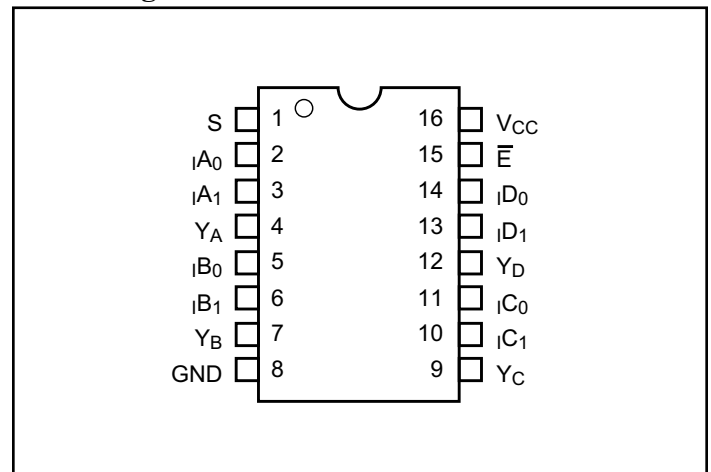
Generally, this part can be used to replace mechanical relays in low-voltage LAN applications that interface a physical layer over CAT 5 or CAT 6 unshielded twisted pair cable through an isolation transformer.

The PI3L110 is fully specified for partial-power-down applications using I_{OFF} . The I_{OFF} feature ensures that damaging current will not backflow throughout the device when it is powered down. The device has isolation during Power Off.

Block Diagram



Pin Configuration



PI3L110

Truth Table⁽¹⁾

\bar{E}	S	YA	YB	YC	YD	Function
H	X	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Disable
L	L	I _{A0}	I _{B0}	I _{C0}	I _{D0}	S = 0
L	H	I _{A1}	I _{B1}	I _{C1}	I _{D1}	S = 1

Note:

- H = High Voltage Level
L = Low Voltage Level
X = Don't Care

Pin Description

Pin Name	Description
I _{AN} -I _{DN}	Data Inputs
S	Select Inputs
\bar{E}	Enable
YA-YD	Data Outputs
GND	Ground
V _{CC}	Power

Maximum Ratings

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

Storage Temperature	-65°C to +150°C
Supply Voltage to Ground Potential	-0.5V to +4.0V
DC Input Voltage	-0.5V to +5.5V
DC Output Current.....	120mA
Power Dissipation.....	0.5W

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.

DC Electrical Characteristics for 10/100 Base-T Ethernet Switching over Operating Range

(T_A = -40°C to +85°C, V_{CC} = 3.3V ±10%)

Parameter	Description	Test Conditions ⁽¹⁾	Min.	Typ. ⁽²⁾	Max.	Units
V _{IH}	Input HIGH Voltage	Guaranteed HIGH level	2.0			V
V _{IL}	Input LOW Voltage	Guaranteed LOW level	-0.5		0.8	
V _{IK}	Clamp Diode Voltage	V _{CC} = Max., I _{IN} = -18mA		-0.7	-1.2	
I _{IH}	Input HIGH Current	V _{CC} = Max., V _{IN} = V _{CC}			±5	μA
I _{IL}	Input LOW Current	V _{CC} = Max., V _{IN} = GND			±5	μA
I _{OFF}	Current while I/O disabled	V _{CC} = 0, V _O = 0 to 5V			1	μA
R _{ON}	Switch On-Resistance ⁽³⁾	V _{CC} = Min., 1.25V ≤ V _{IN} ≤ V _{CC} , I _{IN} = -10mA to -30mA		4.0	8.0	Ω
R _{FLAT(ON)}	On-Resistance Flatness ⁽⁴⁾	V _{CC} = Min., V _{IN} @ 1.25V and V _{CC} , I _{IN} = -10mA to -30mA		1		
ΔR _{ON}	On-Resistance match from center ports to any other port ⁽⁴⁾	V _{CC} = Min., 1.25V ≤ V _{IN} ≤ V _{CC} , I _{IN} = -10mA to -30mA		0.9	2.0	

Notes:

- For max. or min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
- Typical values are at V_{CC} = 3.3V, T_A = 25°C ambient and maximum loading.
- Measured by the voltage drop between I_N and Y_N pins at indicated current through the switch. On-Resistance is determined by the lower of the voltages on the two (I_N & Y_N) pins.
- This parameter is determined by device characterization but is not production tested.

PI3L110
Capacitance ($T_A = 25^\circ\text{C}$, $f = 1\text{ MHz}$)

Parameters ⁽¹⁾	Description	Test Conditions	Typ.	Max.	Units
C_{IN}	Input Capacitance	$V_{IN} = 0V$	2	3	pF
$C_{OFF(IN)}$	Port I_N Capacitance, Switch OFF		4	6	
C_{ON}	Y_N/I_N Capacitance, Switch ON		9	10	

Notes:

- This parameter is determined by device characterization but is not production tested.

Power Supply Characteristics

Parameters	Description	Test Conditions ⁽¹⁾	Min.	Typ. ⁽²⁾	Max.	Units
I_{CC}	Quiescent Power Supply Current	$V_{CC} = \text{Max.}, V_{IN} = \text{GND or } V_{CC}$			800	μA

Notes:

- For max. or min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
- Typical values are at $V_{CC} = 3.3V$, $T_A = 25^\circ\text{C}$ ambient and maximum loading.

Dynamic Electrical Characteristics Over the Operating Range

 ($T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$, $V_{CC} = 3.3V \pm 10\%$, $\text{GND} = 0V$)

Parameter	Description	Test Conditions	Min.	Typ.	Max.	Units
X_{TALK}	Crosstalk	$R_L = 50\Omega, f = 250\text{ MHz}$		-40		dB
O_{IRR}	OFF Isolation			-30		
BW	Bandwidth -3dB	$R_L = 50\Omega$		350		MHz

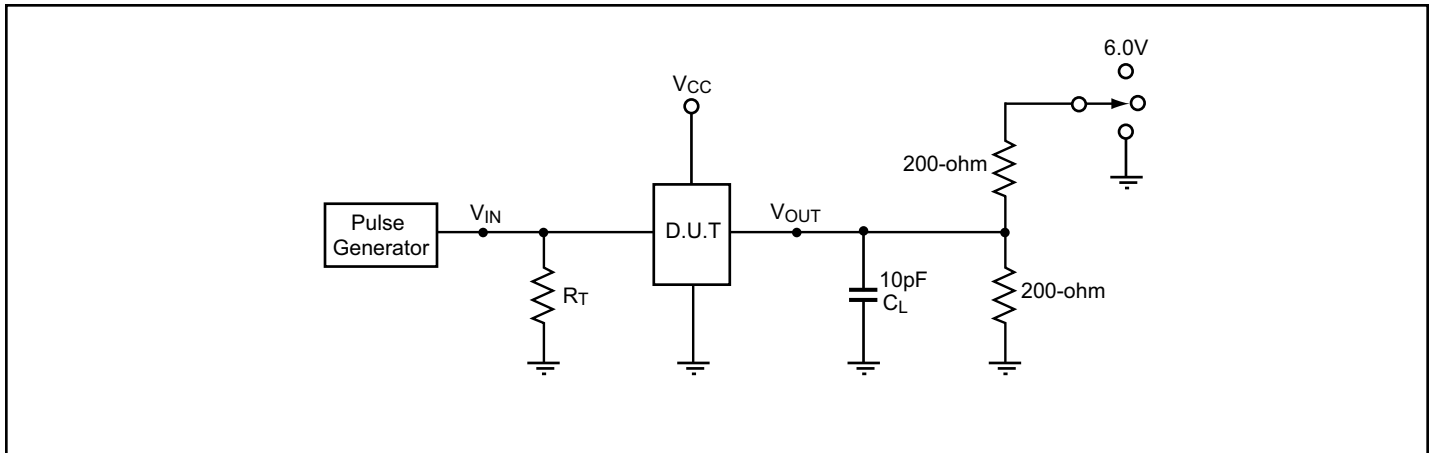
Characteristics

Parameter	Description	Test Conditions	Min.	Typ. ⁽¹⁾	Max.	Units
t_{PD}	Propagation Delay ^(2,3)			0.25		ns
t_{PZH}, t_{PZL}	Line Enable Time - S or \bar{E} to Y_N, I_N		0.5		15	
t_{PHZ}, t_{PLZ}	Line Disable Time - S to \bar{E} to Y_N, I_N		0.5		9	
$t_{SK(p)}$	Skew between opposite transitions of the same output ($t_{PHL} - t_{PLH}$) ⁽²⁾			0.1	0.2	

Notes:

- For max. or min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
- Guaranteed by design.
- The bus switch contributes no propagational delay other than the RC delay of the On-Resistance of the switch and the load capacitance. The time constant for the switch alone is of the order of 0.25ns for 10pF load. Since this time constant is much smaller than the rise/fall times of typical driving signals, it adds very little propagational delay to the system. Propagational delay of the bus switch when used in a system is determined by the driving circuit on the driving side of the switch and its interactions with the load on the driven side.

Test Circuit for Electrical Characteristics



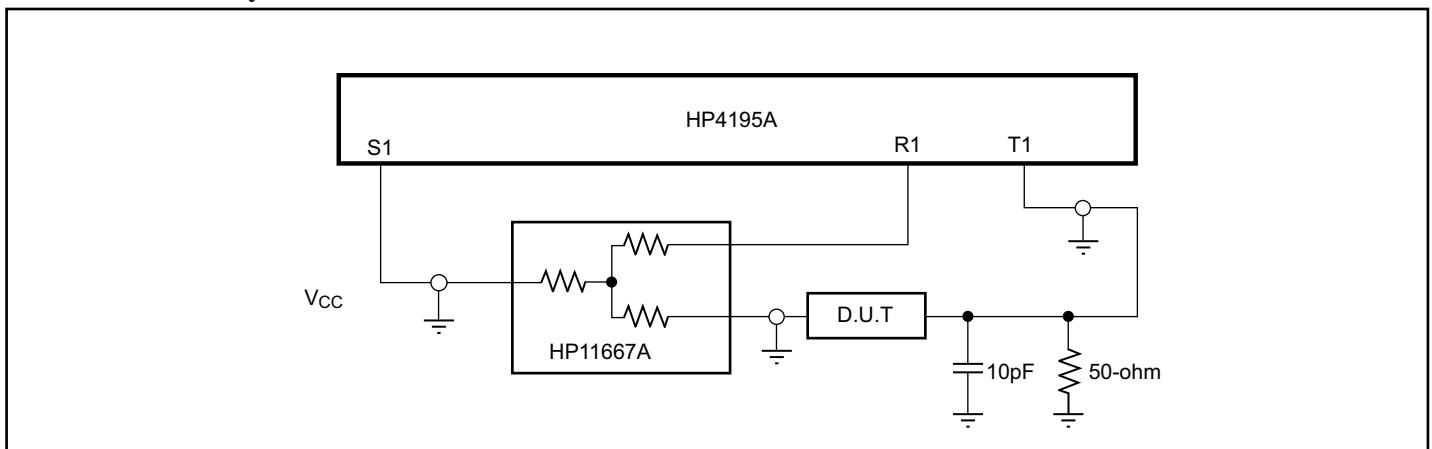
Notes:

- C_L = Load capacitance: includes jig and probe capacitance.
- R_T = Termination resistance: should be equal to Z_{OUT} of the Pulse Generator
- Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control.
- Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
- All input impulses are supplied by generators having the following characteristics: $PRR \leq 10$ MHz, $Z_O = 50\Omega$, $t_R \leq 2.5$ ns, $t_F \leq 2.5$ ns.
- The outputs are measured one at a time with one transition per measurement.

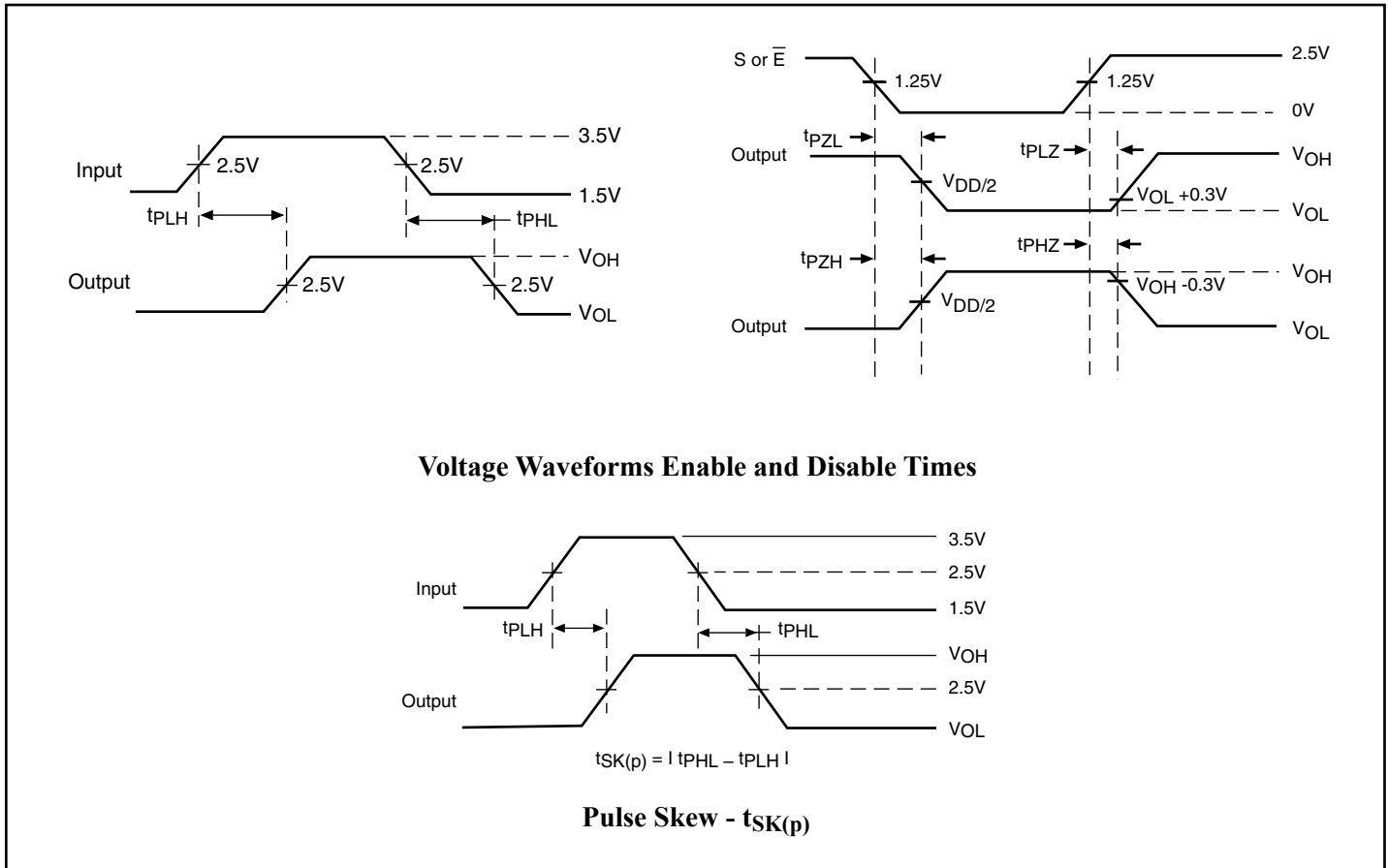
Switch Positions

Test	Switch
t_{PLZ} , t_{PZL}	6.0V
t_{PHZ} , t_{PZH}	GND
Prop Delay	Open

Test Circuit for Dynamic Electrical Characteristics



Switching Waveforms



Applications Information

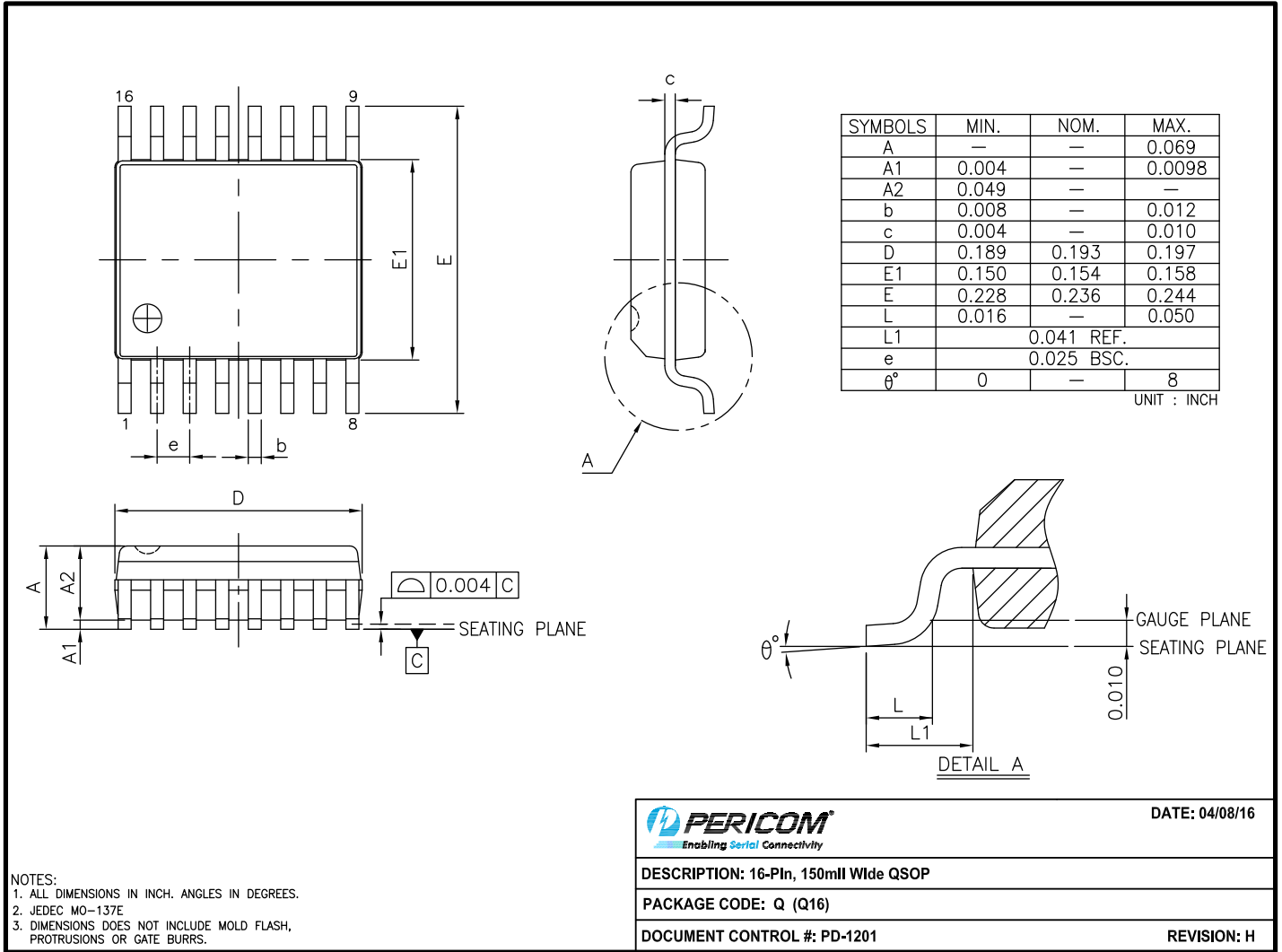
Logic Inputs

The logic control inputs can be driven up to +3.6V regardless of the supply voltage. For example, given a +3.3V supply, the output enables or select pins may be driven low to 0V and high to 3.6V. Driving the control inputs Rail-to-Rail[®] minimizes power consumption.

Rail-to-Rail is a registered trademark of Nippon Motorola, Ltd.

PI3L110

Packaging Mechanical: 16-Pin QSOP (Q)



16-0056

PI3L110

Packaging Mechanical: 16-Pin TSSOP (L)

SYMBOLS	MIN.	NOM.	MAX.
A	–	–	1.20
A1	0.05	–	0.15
A2	0.80	1.00	1.05
b	0.19	–	0.30
c	0.09	–	0.20
D	4.90	5.00	5.10
E1	4.30	4.40	4.50
E	6.20	6.40	6.60
e	0.65 BSC		
L1	1.00 REF		
L	0.45	0.60	0.75
S	0.20	–	–
θ	0°	–	8°

NOTES:
 1. ALL DIMENSIONS IN MILLIMETERS. ANGLES IN DEGREES.
 2. JEDEC MO-153F
 3. DIMENSIONS DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

16-0061

		DATE: 03/24/16
DESCRIPTION: 16-Pin, 173mil Wide TSSOP		
PACKAGE CODE: L (L16)		
DOCUMENT CONTROL #: PD-1310	REVISION: G	

Note: For latest package info, please check: <http://www.pericom.com/support/packaging/packaging-mechanicals-and-thermal-characteristics/>

Ordering Information

Ordering Code	Package Code	Package Description
PI3L110QE	Q	16-pin, 150-mil Wide (QSOP)
PI3L110QEX	Q	16-pin, 150-mil Wide (QSOP), Tape & Reel
PI3L110LE	L	16-pin, 173-mil Wide (TSSOP)
PI3L110LEX	L	16-pin, 173-mil Wide (TSSOP), Tape & Reel

Notes:

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

IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.

Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and definitive format released by Diodes Incorporated.

LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

A. Life support devices or systems are devices or systems which:

1. are intended to implant into the body, or

2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2016, Diodes Incorporated
www.diodes.com

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Diodes Incorporated:](#)

[PI3L110LE](#) [PI3L110LEX](#) [PI3L110QE](#) [PI3L110QEX](#) [PI3L110LE-2017](#) [PI3L110LEX-2017](#) [PI3L110QE-2017](#)
[PI3L110QEX-2017](#)



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.