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

A product Line of
Diodes Incorporated

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 thoughout the device when it is powered down. The device has isolation during Power Off.

Block Diagram
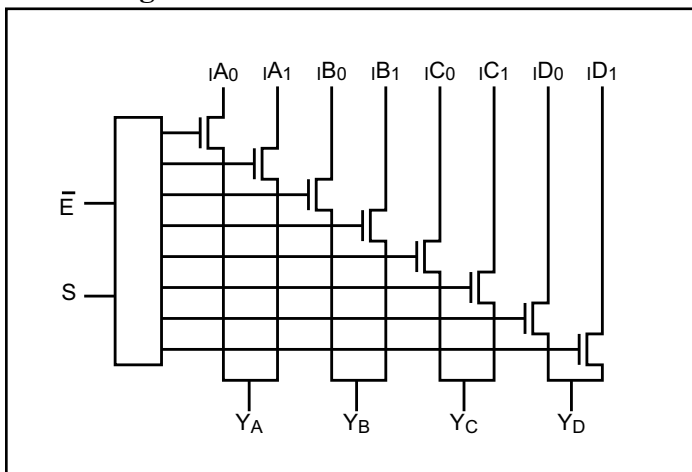
Pin Configuration
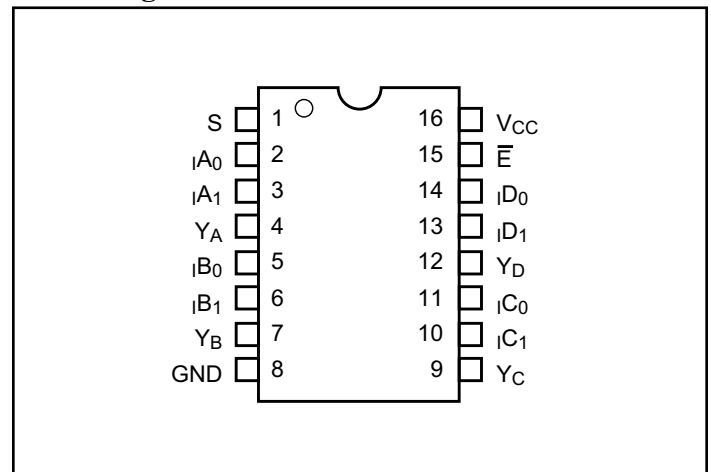
Truth Table[1]

$\overline{E}$	S	YA	YB	YC	YD	Function
H	X	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Disable
L	L	$_IA_0$	$_IB_0$	$_IC_0$	$_ID_0$	S = 0
L	H	$_IA_1$	$_IB_1$	$_IC_1$	$_ID_1$	S = 1

Note:
1. H = High Voltage Level
    L = Low Voltage Level
    X = Don't Care

Pin Description

Pin Name	Description
$_IA_N$-$_ID_N$	Data Inputs
S	Select Inputs
$\overline{E}$	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:
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, T_A = 25°C ambient and maximum loading.
3. 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.
4. This parameter is determined by device characterization but is not production tested.

Capacitance ($T_A = 25°C$, $f = 1$ MHz)

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

Notes:
1. 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} = Max., V_{IN} = GND or V_{CC}			800	µA

Notes:
1. For max. or min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at $V_{CC} = 3.3V$, $T_A = 25°C$ ambient and maximum loading.

Dynamic Electrical Characteristics Over the Operating Range
($T_A = -40°C$ to $+85°C$, $V_{CC} = 3.3V \pm 10\%$, GND = 0V)

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

Characteristics

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

Notes:
1. For max. or min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Guaranteed by design.
3. 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.
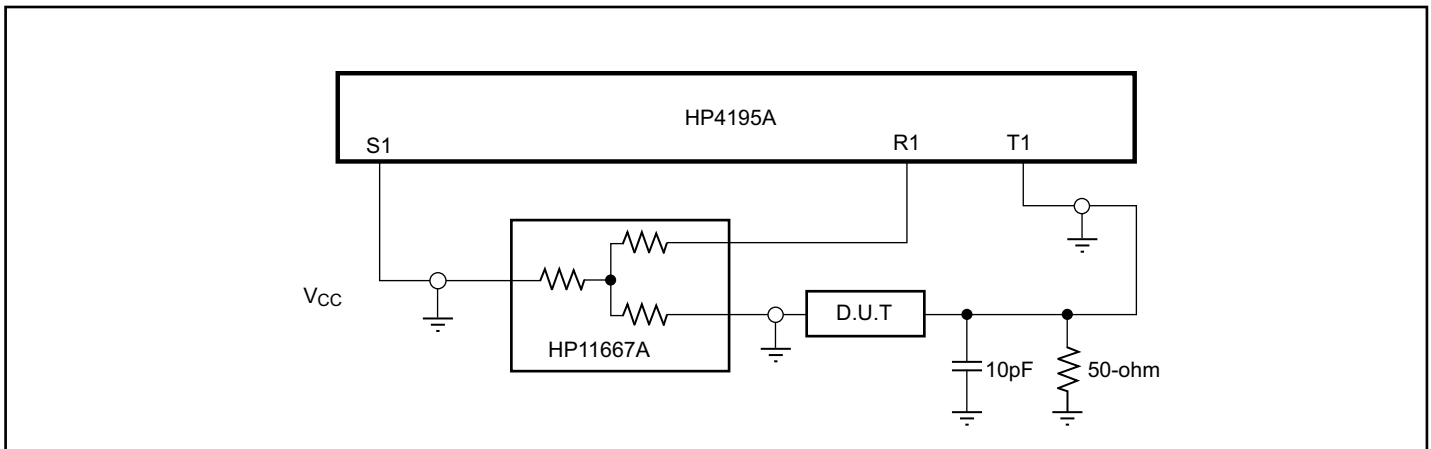
Test Circuit for Electrical Characteristics
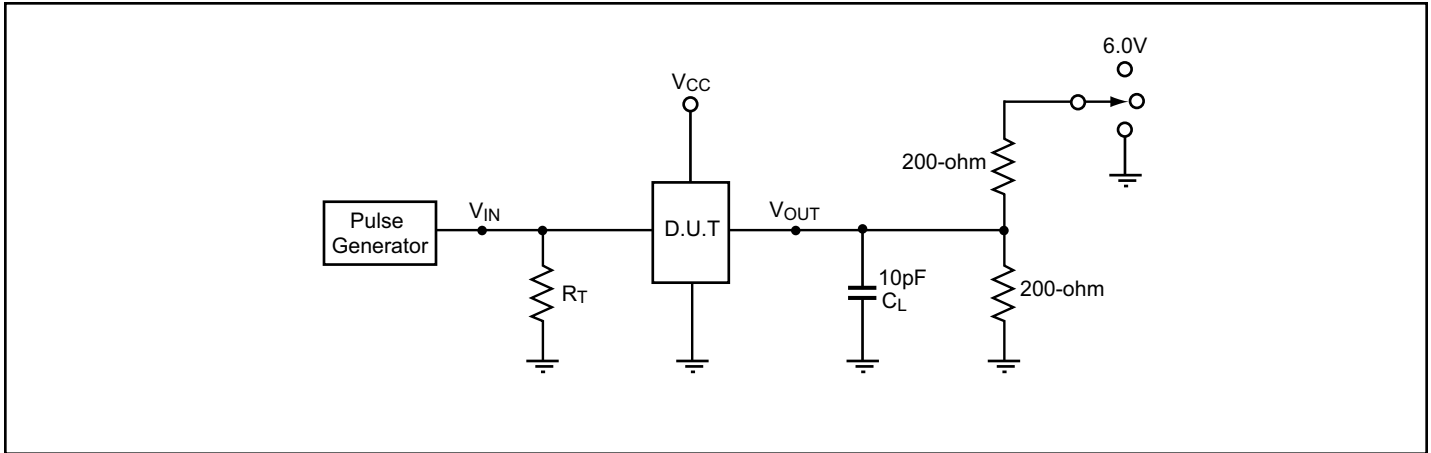
Notes:

- 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 ≤ 10 MHz, Z_O = 50Ω, t_R ≤ 2.5ns, t_F ≤ 2.5ns.
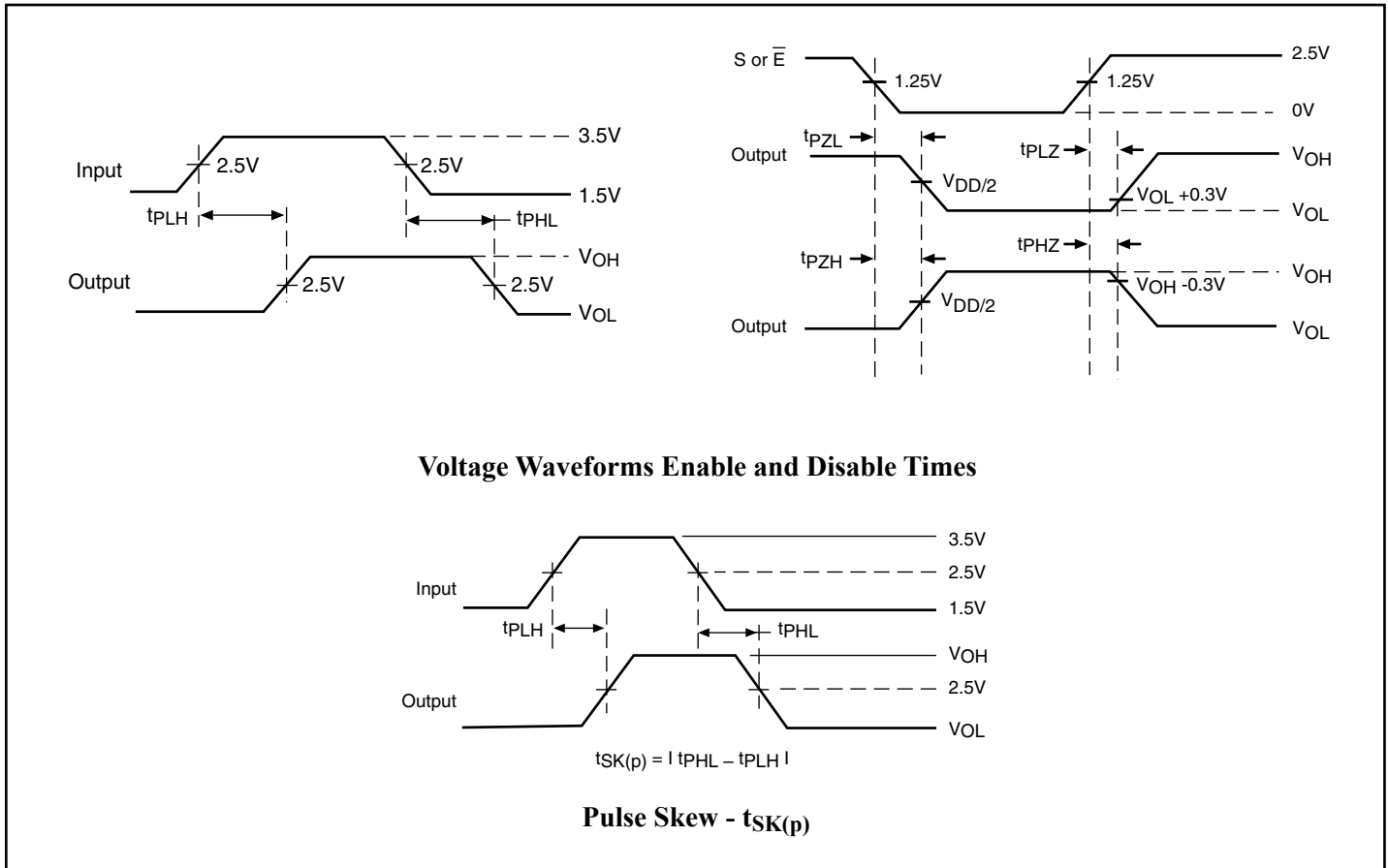- The outputs are measured one at a time with one transition per measurement.

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

Voltage Waveforms Enable and Disable Times

$$t_{SK(p)} = | t_{PHL} - t_{PLH} |$$

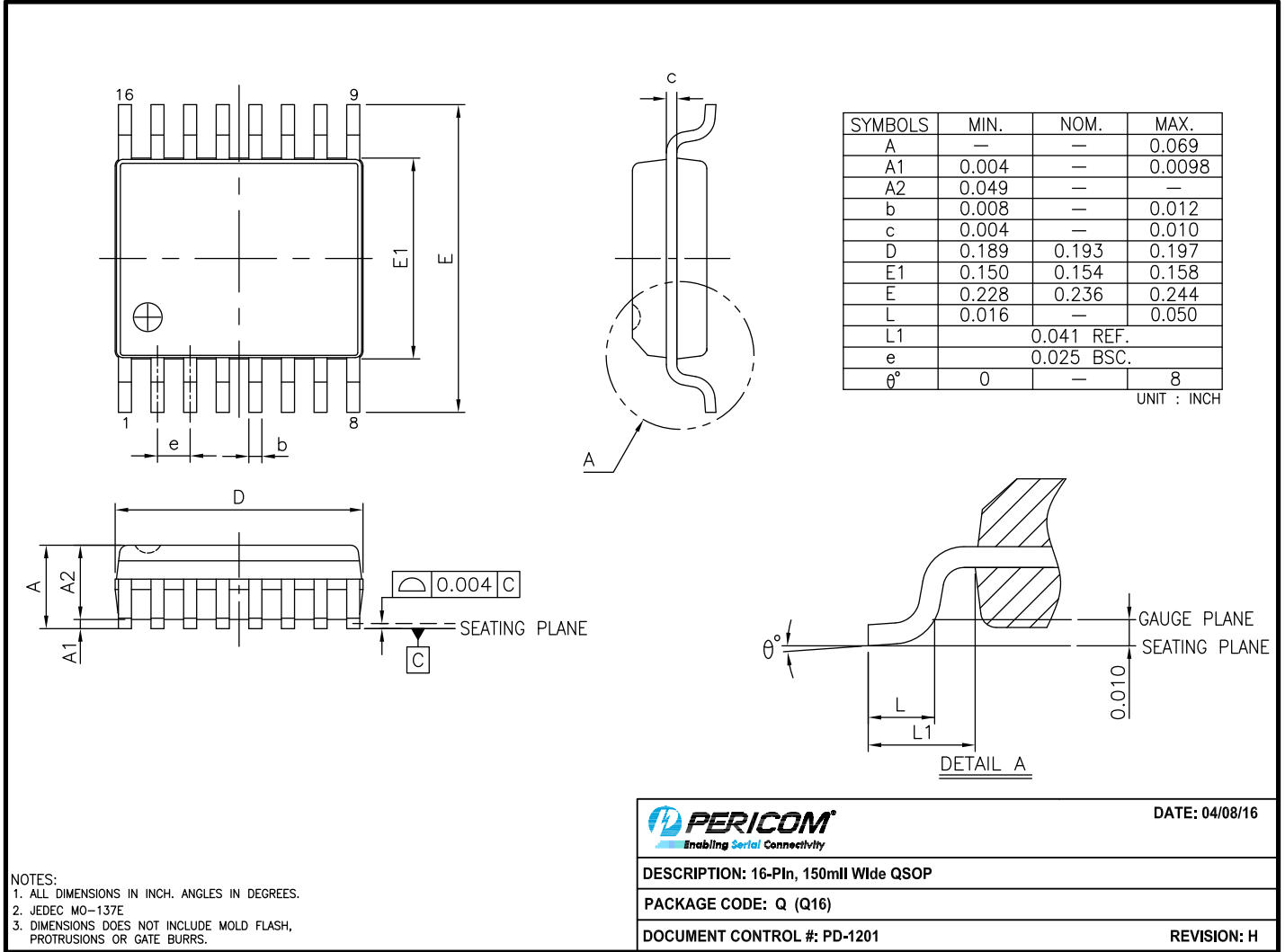**Pulse Skew - $t_{SK(p)}$**

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[R] minimizes power consumption.

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

Packaging Mechanical: 16-Pin QSOP (Q)

SYMBOLS	MIN.	NOM.	MAX.
A	—	—	0.069
A1	0.004	—	0.0098
A2	0.049	—	—
b	0.008	—	0.012
c	0.004	—	0.010
D	0.189	0.193	0.197
E1	0.150	0.154	0.158
E	0.228	0.236	0.244
L	0.016	—	0.050
L1	0.041 REF.		
e	0.025 BSC.		
θ°	0	—	8

UNIT : INCH

0.004 C

SEATING PLANE

C

GAUGE PLANE
SEATING PLANE
0.010

θ°

L
L1

DETAIL A

NOTES:
1. ALL DIMENSIONS IN INCH. ANGLES IN DEGREES.
2. JEDEC MO−137E
3. DIMENSIONS DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

16-0056

PERICOM
Enabling Serial Connectivity

DATE: 04/08/16

DESCRIPTION: 16-Pin, 150mil Wide QSOP

PACKAGE CODE: Q (Q16)

DOCUMENT CONTROL #: PD-1201   **REVISION: H**

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°

SEATING PLANE

0.10 C

DETAIL F

GAUGE PLANE
SEATING PLANE

PERICOM
Enabling Serial Connectivity

DATE: 03/24/16

DESCRIPTION: 16-Pin, 173mil Wide TSSOP

PACKAGE CODE: L (L16)

DOCUMENT CONTROL #: PD-1310   **REVISION: G**

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

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 determinative 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