A product Line of
Diodes Incorporated

PI3C3126

2.5V/3.3V, High Bandwidth, Hot Insertion,4-Bit, 2-Port Bus Switch with Individual Enables

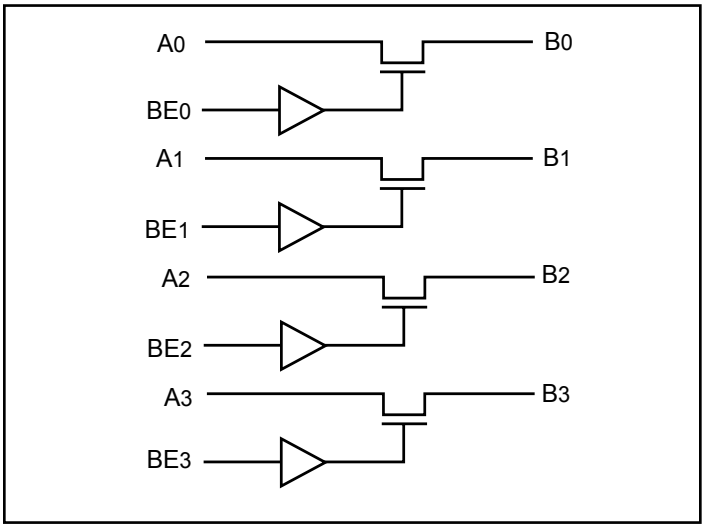
Features

- Near-Zero propagation delay
- 5-ohm switches connect inputs to outputs
- High Bandwidth (>400 MHz)
- 2.5V/3.3V Supply Voltage Operation
- Rail-to-Rail, or 2.5V or 3.3V Switching
- 5V I/O Tolerant
- Permits Hot Insertion
- Packaging (Pb-free & Green available):
  – 14-pin 170-mil wide plastic TSSOP (L)
  – 16-pin 150-mil wide plastic QSOP (Q)

Applications

- High Bandwidth Data Switching
- Hot Docking

Block Diagram

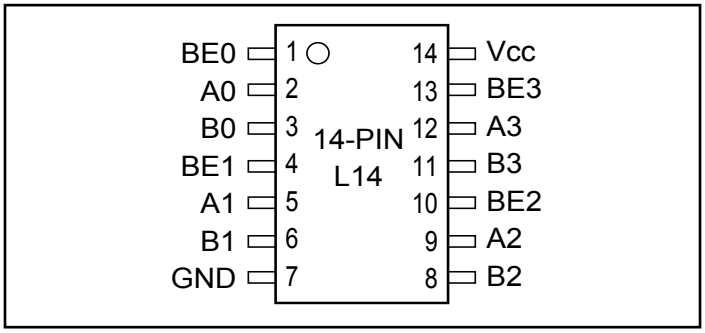


Description

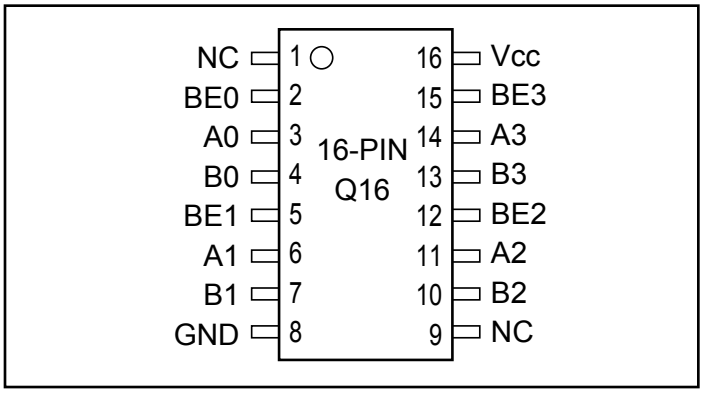
Pericom Semiconductor's PI3C3126 is a 2.5 volt or 3.3 volt, 4-bit bus switch designed with four individual 5-ohm bus switches with fast indiviual enables in an industry standard 74XX125/126 pinout. When enabled via the associated Bus Enable pin, the "A" pin is directly connected to the "B" pin for that particular gate. The bus switch introduces no additional propagation delay or additional ground bounce noise.

The PI3C3126 has active HIGH enables. It is very useful in switching signals that have high bandwidth (>400 MHz).

14-Pin Configuration



16-Pin Configuration



Pin Description

Pin Name	Description
BEn	Switch Enable
A3 - A0	Bus A
B3 - B0	Bus B
V_{CC}	Power
GND	Ground

Truth Table(1)

BEn	An	Bn	V_{CC}	Function
X	Hi-Z	Hi-Z	GND	Disconnect
L	Hi-Z	Hi-Z	V_{CC}	Disconnect
H	Bn	An	V_{CC}	Connect

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

Maximum Ratings

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

Storage Temperature	–65°C to +150°C
Ambient Temperature with Power Applied	–40°C to +85°C
Supply Voltage to Ground Potential (Inputs & V_{CC} Only)	–0.5V to +4.6V
Supply Voltage to Ground Potential (Outputs & D/O Only)	–0.5V to +4.6V
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 (Over Operating Range, T_A = –40°C to +85°C, V_{CC} = 3.3V ±10%)

Parameters	Description	Test Conditions(1)	Min.	Typ.(2)	Max	Units
V_{IH}	Input HIGH Voltage	Guearanteed Logic HIGH Level	2.0			V
V_{IL}	Input LOW Voltage	Guaranteed Logic LOW Level –0.5		0.8		
I_{IH}	Input HIGH current	V_{CC} = Max., V_{IN} = V_{CC}			±1	µA
I_{IL}	Input LOW Current	V_{CC} = Max., V_{IN} = GND			±1	
I_{OZH}(3)	High Impedance Output Current	0 ≤ A, B ≤ V_{CC}			±1	
V_{IK}	Clamp Diode Voltage	V_{CC} = Min., I_{IN} = –18mA		–0.73	–1.2	V
R_{ON}	Switch ON Resistance(4)	V_{CC} = Min., V_{IN} = 0.0V, I_{ON} = 48mA or 60mA V_{CC} = Min., V_{IN} = 2.4V, I_{ON} = 15mA		5 8	7 15	Ω

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. Not more than one output should be shorted at one time. Duration of the test should not exceed one second.
4. Measured by the voltage drop between A and B pin at indicated current through the switch. ON resistance is determined by the lower of the voltages on the two (A,B) pins.

Capacitance (T_A = 25°C, f = 1 MHz)

Parameters(1)	Description	Test Conditions	Typ.	Units
C_{IN}	Input Capacitance	VIN = 0V	3.5	pF
C_{OFF}	A/B Capacitance, Switch Off	VIN = 0V	5.0	
C_{ON}	A/B Capacitance, Switch On	VIN = 0V	10.0	

Notes:

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

Power Supply Characteristics

Parameters	Description	Test Conditions		Min.	Typ.(2)	Max.	Units
I_{CC}	Quiescent Power Supply Current	V_{CC} = Max	V_{IN} = GND or V_{CC}		260	500	µA
ΔI_{CC}	Supply Current per Input HIGH	V_{CC} = Max	V_{IN} = 3.0V(3)			750	

Notes:

1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device.
2. Typical values are at V_{CC} = 3.3V, +25°C ambient.
3. Per driven input (control input only); A and B pins do not contribute to ΔI_{CC}.

Switching Characteristics over 3.3V Operating Range

Parameters	Description	Conditions	Com.		Units
			Min.	Max.	
t_{PLH} t_{PHL}	Propogation Delay(1,2) A to B, B to A	C_L =50pF R_L = 500Ω		0.25	ns
t_{PZH} t_{PZL}	Bus Enable Time	C_L =50pF R_L = 500Ω R = 500Ω	1.5	6.5	
t_{PHZ} t_{PLZ}	Bus Disable Time		1.5	5.5	

Notes:

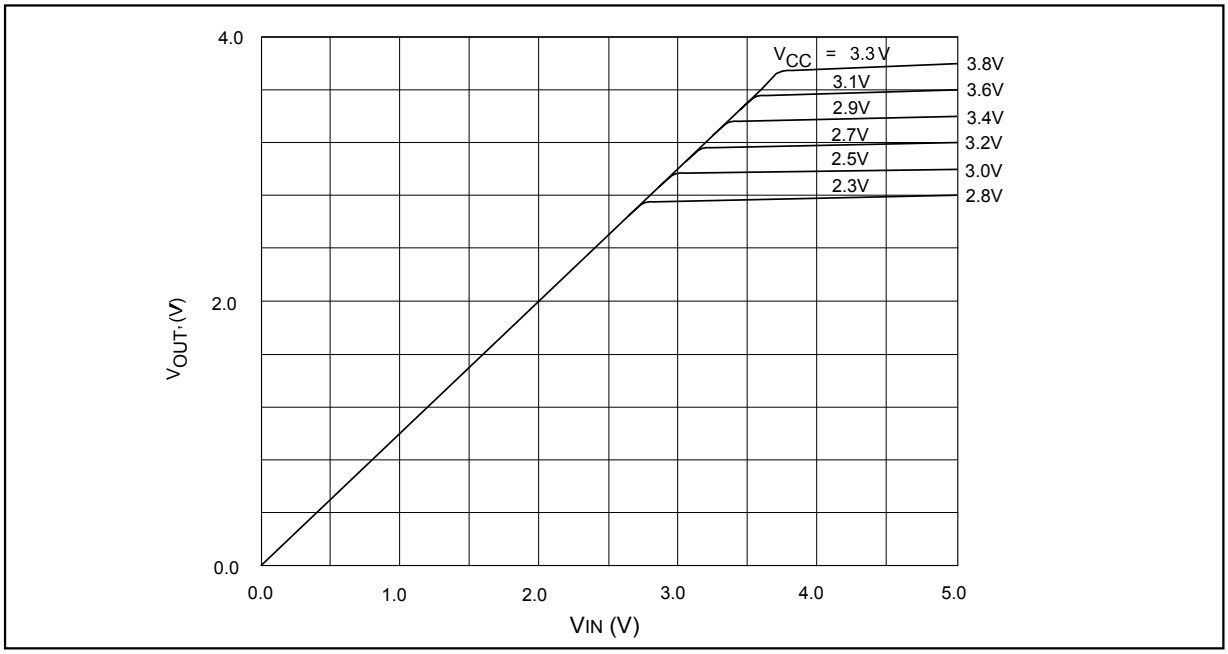
1. This parameter is guaranteed but not tested on Propagation Delays.
2. The bus switch contributes no propagational delay other than the RC delay of the ON resistance of the switch and the load capacitance. The time constant for the switch alone is of the order of 0.25ns for 50pF load. Since this time 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 interaction with the load on the driven side.

Switching Characteristics over 2.5V Operating Range

Parameters	Description	Conditions	Com.		Units
			Min.	Max.	
t_{PLH} t_{PHL}	Propogation Delay(1,2) A to B, B to A	C_L =50pF R_L = 500Ω		0.25	ns
t_{PZH} t_{PZL}	Bus Enable Time	C_L =50pF R_L = 500Ω R = 500Ω	1.5	9.8	
t_{PHZ} t_{PLZ}	Bus Disable Time		1.5	8.3	

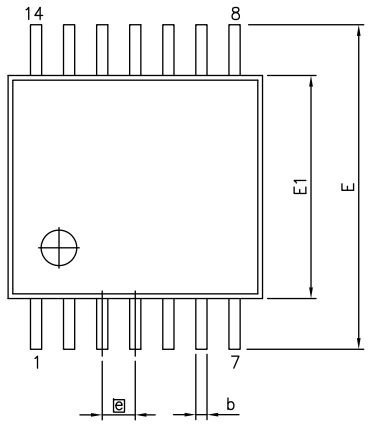
Notes:

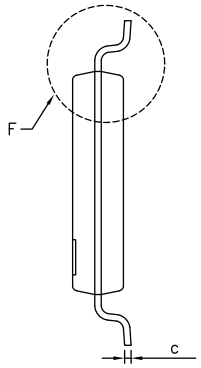
1. This parameter is guaranteed but not tested on Propagation Delays.
2. The bus switch contributes no propagational delay other than the RC delay of the ON resistance of the switch and the load capacitance. The time constant for the switch alone is of the order of 0.25ns for 50pF load. Since this time 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 interaction with the load on the driven side.



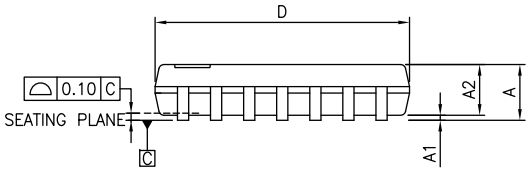
Switch Output Voltage vs. Input Voltage over Various Supply Voltages

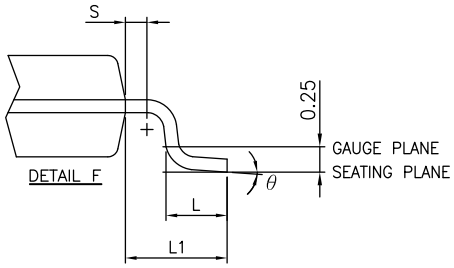
Packaging Mechanical: 14-Pin TSSOP (L14)





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.

PERICOM Enabling Serial Connectivity

DATE: 03/24/16

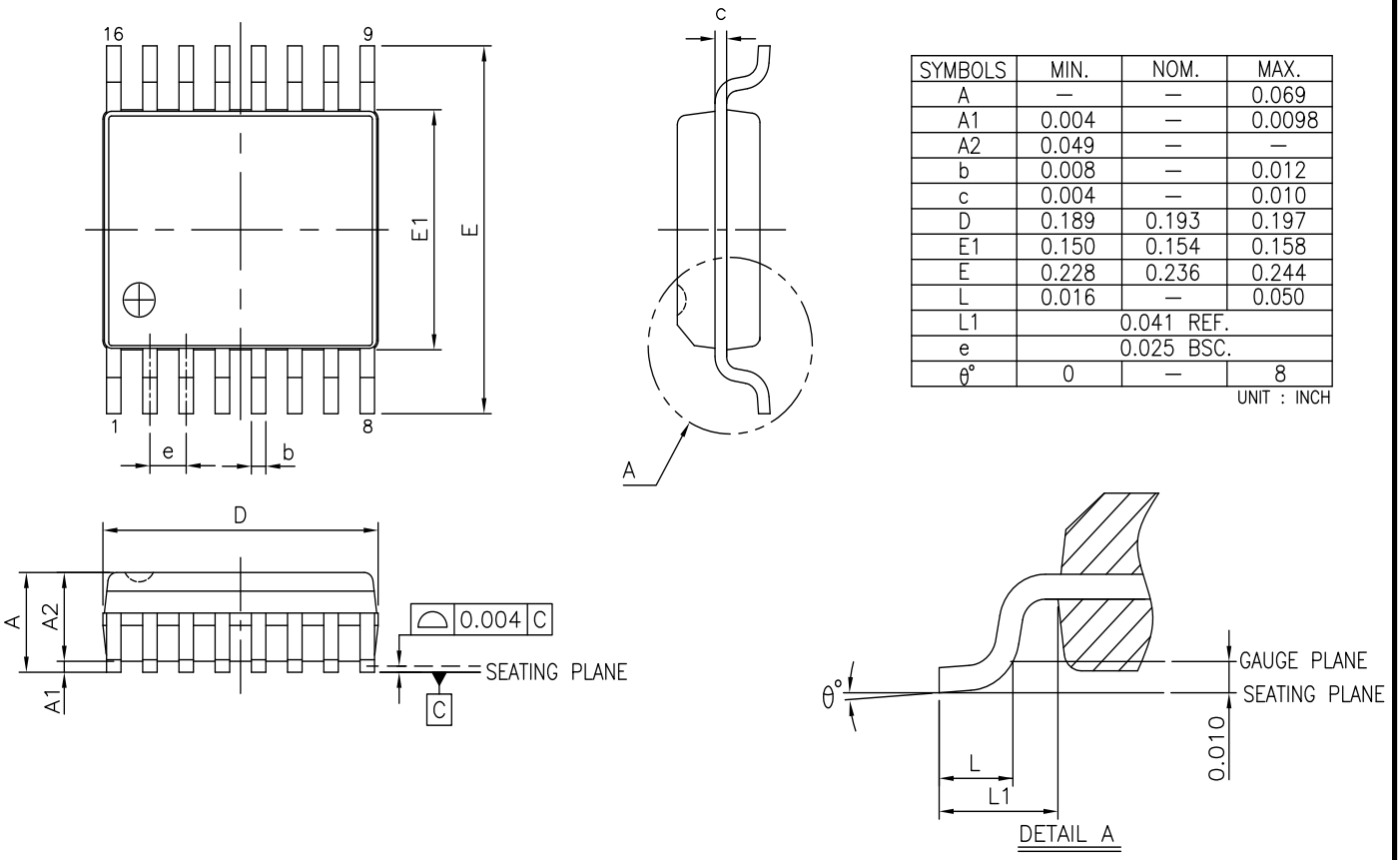
DESCRIPTION: 14-Pin, 173mil Wide TSSOP

PACKAGE CODE: L (L14)

DOCUMENT CONTROL #: PD-1309 REVISION: E

16-0060

Packaging Mechanical: 16-Pin QSOP (Q16)



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

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

PERICOM Enabling Serial Connectivity — DATE: 04/08/16

DESCRIPTION: 16-Pin, 150mil Wide QSOP

PACKAGE CODE: Q (Q16)

DOCUMENT CONTROL #: PD-1201 — REVISION: H

16-0056

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

Ordering Information

Ordering Code	Packaging Code	Package Type
PI3C3126LE	L	14-pin, 173mil Wide (TSSOP)
PI3C3126LEX	L	14-pin, 173mil Wide (TSSOP), Tape & Reel
PI3C3126QE	Q	16-pin, 150mil Wide (QSOP)
PI3C3126QEX	Q	16-pin, 150mil Wide (QSOP), 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