Features

- Near zero propagation delay
- 5 Ohm switches connect inputs to outputs
- Fast Switching Speed - 4ns max.
- Ultra Low Quiescent Power (0.1μA Typical)
  – Ideally suited for notebook applications
- Packages available:
  – 14-pin 150 mil wide plastic SOIC (W)
  – 14-pin 170 mil wide plastic TSSOP (L)
 – 16-pin 150 mil wide plastic QSOP (Q)

Description

Diodes' PI3B series of logic circuits are produced using the Company's advanced sub micron CMOS technology, achieving industry leading speed grades.

The PI3B3125 and PI3B3126 are 3.3 Volt, 4-bit bus switches 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 ($\overline{BE}$) 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 PI3B3125 device has active LOW enables, and the PI3B3126 has active HIGH enables.

PI3B3125 Logic Block Diagram
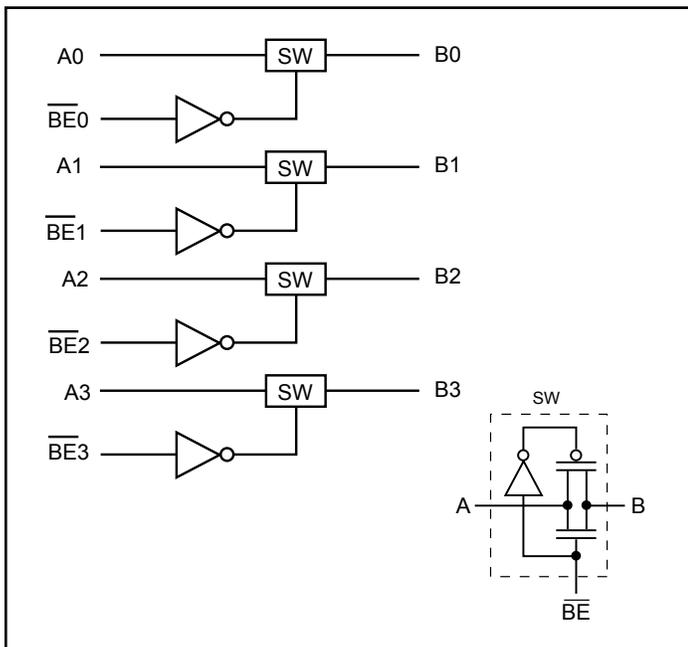

PI3B3126 Logic Block Diagram
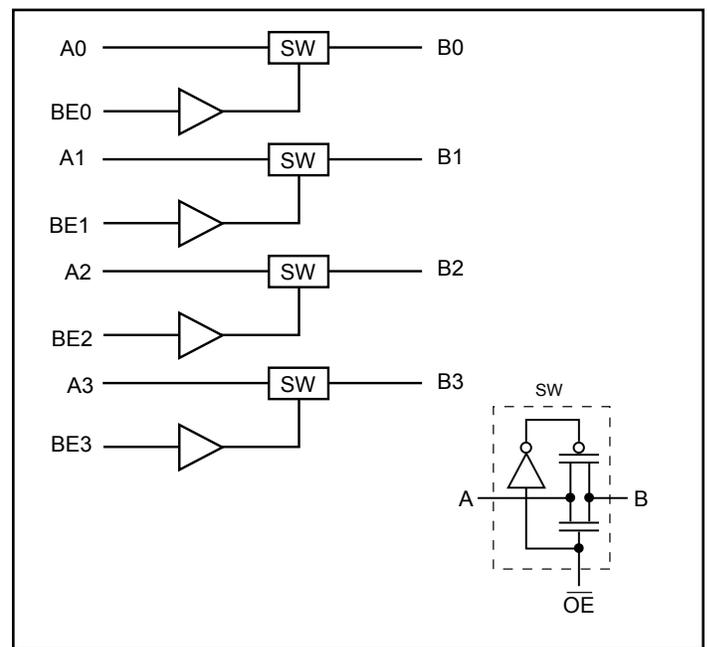
PI3B3125
14-Pin Product Configuration

```
         ___
         BE0 ┌1      14┐ V_CC
          A0 ┌2      13┐ BE3
          B0 ┌3      12┐ A3
         ___
         BE1 ┌4      11┐ B3
          A1 ┌5      10┐ BE2
          B1 ┌6       9┐ A2
         GND ┌7       8┐ B2
```
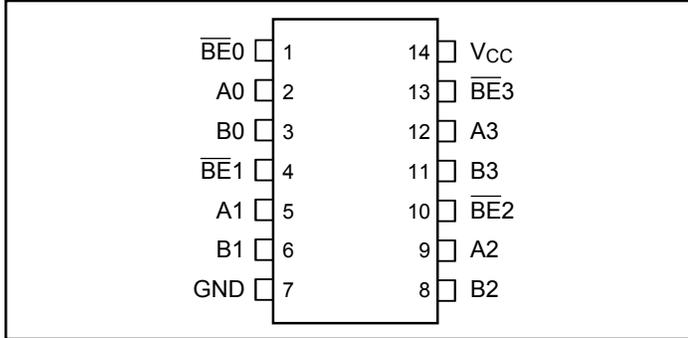
PI3B3126
14-Pin Product Configuration

```
         BE0 ┌1      14┐ V_CC
          A0 ┌2      13┐ BE3
          B0 ┌3      12┐ A3
         BE1 ┌4      11┐ B3
          A1 ┌5      10┐ BE2
          B1 ┌6       9┐ A2
         GND ┌7       8┐ B2
```
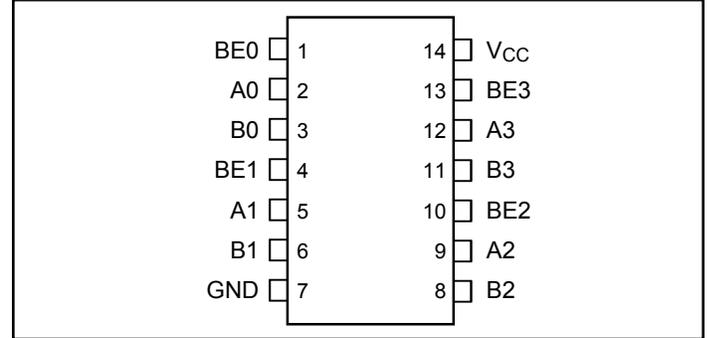
PI3B3125
16-Pin Product Configuration

```
          NC ┌1      16┐ V_CC
         BE0 ┌2      15┐ BE3
          A0 ┌3      14┐ A3
          B0 ┌4      13┐ B3
         BE1 ┌5      12┐ BE2
          A1 ┌6      11┐ A2
          B1 ┌7      10┐ B2
         GND ┌8       9┐ NC
```
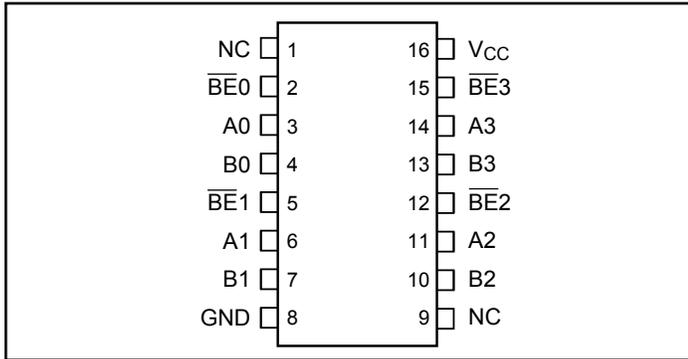
PI3B3126
16-Pin Product Configuration

```
          NC ┌1      16┐ V_CC
         BE0 ┌2      15┐ BE3
          A0 ┌3      14┐ A3
          B0 ┌4      13┐ B3
         BE1 ┌5      12┐ BE2
          A1 ┌6      11┐ A2
          B1 ┌7      10┐ B2
         GND ┌8       9┐ NC
```
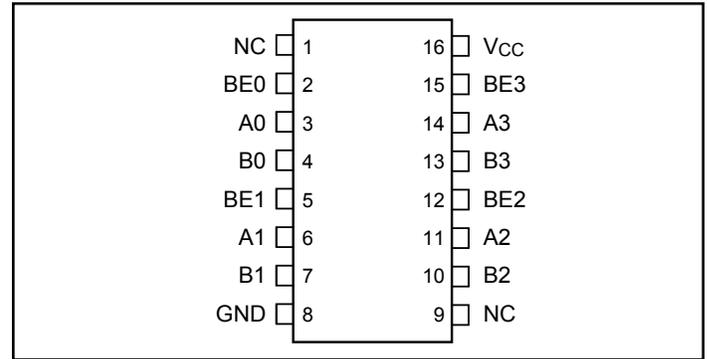
Pin Description

Pin Name	Description
$\overline{BE}n$	Switch Enable (PI3B3125)
BEn	Switch Enable (PI3B3126)
A3-A0	Bus A
B3-B0	Bus B
V_{CC}	Power
GND	Ground

Truth Table[1]

PI3B3125 $\overline{BE}n$	PI3B3126 BEn	An	Bn	V_{CC}	Function
X[2]	X	Hi-Z	Hi-Z	GND	Disconnect
H	L	Hi-Z	Hi-Z	V_{CC}	Disconnect
L	H	Bn	An	V_{CC}	Connect

Notes:

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

2. A pull-up resistor should be provided for power-up protection.

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.......................................−0.5V to +4.6V

DC Input Voltage ....−0.5V to +4.6V

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 the 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 Logic HIGH Level	2.0			V
V_{IL}	Input LOW Voltage	Guaranteed Logic LOW Level	-0.5		0.8	V
I_{IH}	Input HIGH Current	V_{CC} = Max., V_{IN} = Vcc			±1	MA
I_{IL}	Input LOW Current	V_{CC} = Max., V_{IN} = GND			±1	MA
I_{OFF}	Off Current	V_{CC} = 0, V_{OUT} = 3 to 3.6V			10	MA
V_{IK}	Clamp Diode Voltage	V_{CC} = Min., I_{IN} = −18mA			-1.2	V
R_{ON}	Switch On Resistance[3]	V_{CC} = Min., V_{IN} = 0.0V, I_{ON} = 48mA or 60mA		5	8	Ω
		V_{CC} = Min., V_{IN} = 2.4V, I_{ON} = 15mA		10	17	

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 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)

Parameter[1]	Description	Test Conditions	Min.	Typ.	Max.	Units
C_{IN}	Input Capacitance	V_{IN} = 0V		3.5		pF
C_{OFF}	A/B Capacitance, Switch Off	V_{IN} = 0V		8		pF

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

Power Supply Chatacteristics

Parameter	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	3	µA
ΔI_{CC}	Supply Current per Input HIGH	V_{CC} = Max.	V_{IN} = 3.0V[3]			750	µA

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 inputs only); A and B pins do not contribute to I_{CC}.

PI3B3125 Switching Characteristics over Operating Range

Parameter	Description	Conditions[1]	PI3B3125 Com. Min.	PI3B3125 Com. Max.	Units
t_{PLH} t_{PHL}	Propagation Delay[2,3] Ax to Bx, Bx to Ax	$C_L = 50pF$ $R_L = 500\Omega$		0.25	ns
t_{PZH} t_{PZL}	Bus Enable Time	$C_L = 50pF$ $R_L = 500\Omega$	1.0	3.0	ns
t_{PHZ} t_{PLZ}	Bus Disable Time	$R_L = 500\Omega$	1.0	4.0	ns

PI3B3126 Switching Characteristics over Operating Range

Parameter	Description	Conditions[1]	PI3B3126 Com. Min.	PI3B3126 Com. Max.	Units
t_{PLH} t_{PHL}	Propagation Delay[2,3] Ax to Bx, Bx to Ax	$C_L = 50pF$ $R_L = 500\Omega$		0.25	ns
t_{PZH} t_{PZL}	Bus Enable Time	$C_L = 50pF$ $R_L = 500\Omega$	1.0	2.5	ns
t_{PHZ} t_{PLZ}	Bus Disable Time	$R_L = 500\Omega$	1.0	4.0	ns

Notes:
1. See test circuit and waveforms.
2. This parameter is guaranteed but not tested on Propagation Delays.
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 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.

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, IN may be driven low to 0V and high to 3.6V. Driving IN Rail-to-Rail® minimizes power consumption.

Power-Supply Sequencing and Hot-Plug Information
Proper power-supply sequencing is recommended for all CMOS devices. Always apply V_{CC} and GND before applying signals to input/output or control pins.

*Rail-to-Rail is a registeredtrademark of Nippon Motorola, Ltd.*

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PERICOM®

Packaging Mechanical: 14-pin TSSOP (L)
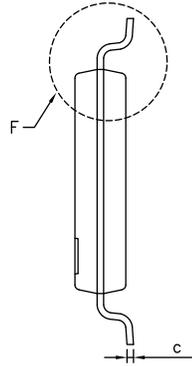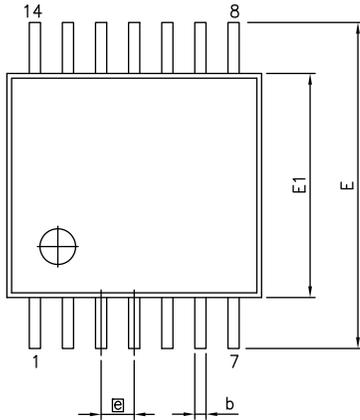
SYMBOLS	MIN.	NOM.	MAX.
A	–	–	1.20
A1	0.05	–	0.15
A2	0.80	1.00	1.05
b	0.19	–	0.30
c	0.09	–	0.20
D	4.90	5.00	5.10
E1	4.30	4.40	4.50
E	6.20	6.40	6.60
e	0.65 BSC		
L1	1.00 REF		
L	0.45	0.60	0.75
S	0.20	–	–
θ	0°	–	8°

DETAIL F

GAUGE PLANE
SEATING PLANE

PERICOM®
Enabling Serial Connectivity

DATE: 03/24/16

DESCRIPTION: 14-Pin, 173mil Wide TSSOP

PACKAGE CODE: L (L14)

DOCUMENT CONTROL #: PD-1309   **REVISION: E**
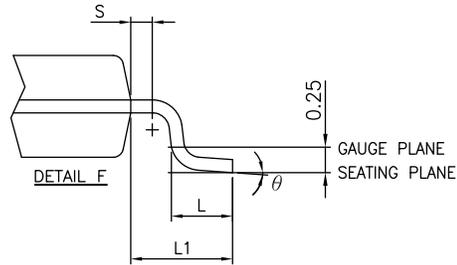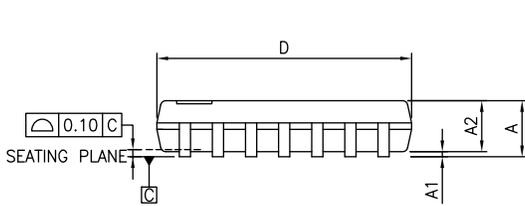
NOTES:
1. ALL DIMENSIONS IN MILLIMETERS. ANGLES IN DEGREES.
2. JEDEC MO–153F
3. DIMENSIONS DOES NOT INCLUDE MOLD FLASH,
   PROTRUSIONS OR GATE BURRS.

16-0060

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PERICOM®

Packaging Mechanical: 14-pin SOIC (W)

SYMBOLS	MIN.	NOM.	MAX.
A	—	—	1.75
A1	0.10	—	0.25
A2	1.25	—	—
b	0.31	—	0.51
c	0.10	—	0.25
D	8.55	8.65	8.75
E	5.80	6.00	6.20
E1	3.70	3.90	4.10
e	1.27 BSC		
L	0.40	—	1.27
L1	1.04 REF		
h	0.25	—	0.50
θ°	0	—	8

hX45°

c

0.10 C

SEATING PLANE

C

GAUGE PLANE
SEATING PLANE

0.25

θ°

L

L1

PERICOM®
Enabling *Serial* Connectivity

DATE: 03/24/16

DESCRIPTION: 14-Pin, 150mil Wide SOIC

PACKAGE CODE: W (W14)

DOCUMENT CONTROL #: PD-1002   **REVISION: E**

NOTES:
1. ALL DIMENSIONS ARE IN mm. ANGLES IN DEGREES.
2. JEDEC MS−012
3. DIMENSIONS DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

16-0055

17-0007

www.diodes.com   01/09/17

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PERICOM®

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

SEATING PLANE

DETAIL A

GAUGE PLANE
SEATING PLANE

PERICOM®
Enabling Serial Connectivity

DATE: 04/08/16

DESCRIPTION: 16-Pin, 150mil Wide QSOP

PACKAGE CODE: Q (Q16)

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

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

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

A product Line of
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Ordering Information

Ordering Code	Package Code	Package Description
PI3B3125LE	L	14-Pin, 173mil Wide (TSSOP)
PI3B3125LEX	L	14-Pin, 173mil Wide (TSSOP), Tape & Reel
PI3B3125WE	W	14-Pin, 150mil Wide (SOIC)
PI3B3125WEX	W	14-Pin, 150mil Wide (SOIC), Tape & Reel
PI3B3125QE	Q	16-Pin, 150mil Wide(QSOP)
PI3B3125QEX	Q	16-Pin, 150mil Wide(QSOP), Tape & Reel
PI3B3126LE	L	14-Pin, 173mil Wide (TSSOP)
PI3B3126LEX	L	14-Pin, 173mil Wide (TSSOP), Tape & Reel
PI3B3126WE	W	14-Pin, 150mil Wide (SOIC)
PI3B3126WEX	W	14-Pin, 150mil Wide (SOIC), Tape & Reel
PI3B3126QE	Q	16-Pin, 150mil Wide(QSOP)
PI3B3126QEX	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" denotes Pb-free and Green

• Adding an "X" at the end of the ordering code denotes tape and reel packaging

IMPORTANT NOTICE

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Largest Supplier of Electrical and Electronic Components

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PI3C3305UEX PI3B3861QE PI3B3245QEX PI3B3245QE PI3CH800ZHEX PI3CH1000LE PI3CH400ZBEX PI3CH401LE PI3CH401LEX

 TC7WBL3305CFK(5L,F 74CB3Q3125DBQRE4 TC7WBL3305CFK,LF SN74CBT16245CDGGR 72V90823PQFG PI3B3861QEX

PI3C3245QE PI5C3384QE PI3CH281QE PI3C3306LE PI3C3305LE PI5C3245LE PI3CH400LE PI3B3245LEX PI3B3245LE

PI3C3306LEX PI5C3245LEX PI3B3126LE PI3B3126LEX 74CBTLV3862PGG QS3VH126QG QS3VH16861PAG QS3VH126S1G

QS3L384QG