PI3C32X245

2.5V/3.3V, High Bandwidth, Hot Insertion 16-Bit, 2-Port, Bus Switch

Features

→ Near-Zero propagation delay

→ 5-ohm switches connect inputs to outputs

→ Permits Hot Insertion

→ Capable of Hot-Swapping

→ 5V I/O Tolerant

→ 2.5V Supply Voltage Operation

→ Rail-to-Rail 3.3V or 2.5V Switching

→ High Bandwidth Operation (>400 MHz)

→ Packaging (Pb-free & Green):

  ▫ 40-pin, 150-mil-wide plastic BQSOP (B)

Description

Pericom Semiconductor's PI3C32X245 is a 2.5V or 3.3V 16-bit, 2-port bus switch designed with a low On-Resistance (5-ohm) allowing inputs to be connected directly to outputs. The bus switch creates no additional propagational delay or additional ground bounce noise. The switches are turned ON by the Bus Enable ($\overline{BE}_N$) input signal. It is very useful in switching signals that have high bandwidth (>400 MHz).
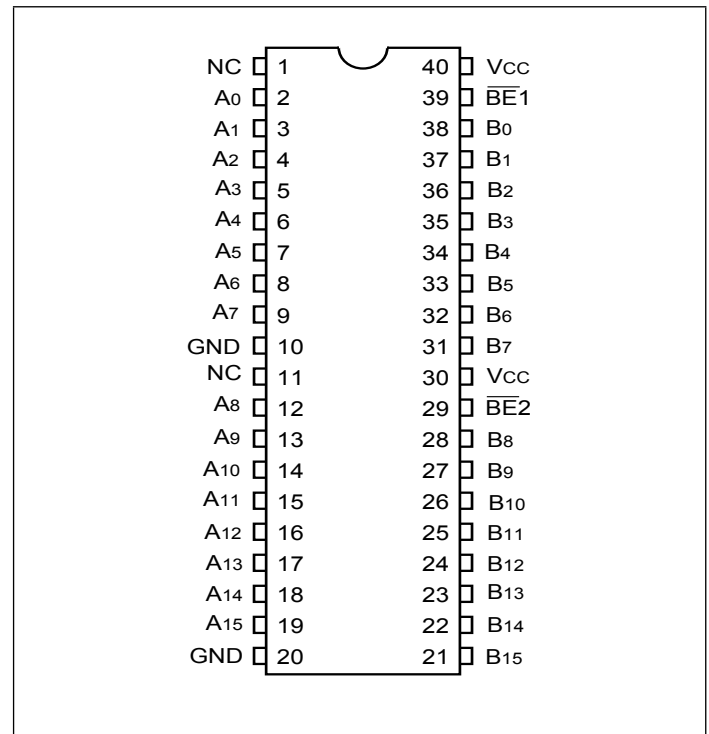
Block Diagram
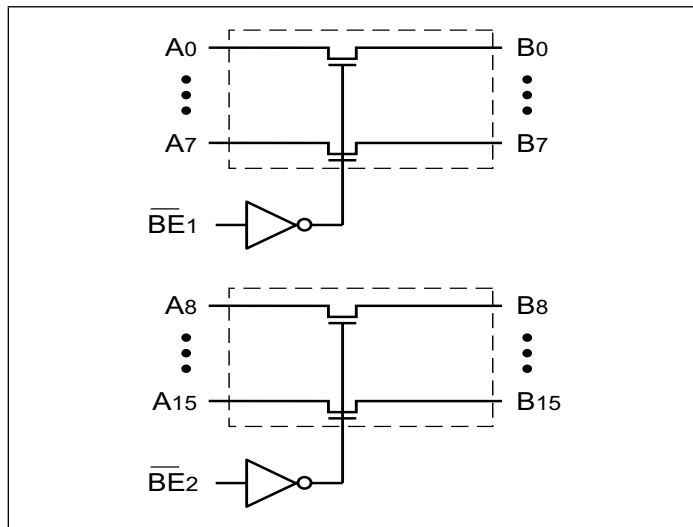
Pin Configuration

Truth Table[1]

Function	$\overline{BE}_N$	A0-15
Disconnect	H	Hi-Z
Connect	L	B0-15

Note: H   = High Voltage Level

  L   = Low Voltage Level

  Hi-Z = High Impedance

Pin Description

Pin Name	Description
$\overline{BE}_N$	Bus Enable Input (Active LOW)
A0-15	Bus A
B0-15	Bus B

Absolute Maximum Ratings

Parameter	Min.	Max.	Units
Storage Temperature	-65	150	°C
Ambient Temperature with Power Applied	-40	85	°C
Supply Voltage to Ground Potential (Inputs & V_{CC} Only)	-0.5	4.6	V
Supply Voltage to Ground Potential (Outputs & D/O Only)	-0.5	4.6	V
DC Input Voltage	-0.5	5.5	V
DC Output Current	-	120	mA
Power Dissipation	-	0.5	W

Stress beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device.

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

Parameters	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., $V_{IN} = V_{CC}$			±1	
I_{IL}	Input LOW Current	V_{CC} = Max., V_{IN} = GND			±1	µA
I_{OZH}	High Impedance Output Current	$0 \leq A, B \leq V_{CC}$			±1	
V_{IK}	Clamp Diode Voltage	V_{CC} = Min., $I_{IN} = -18$ mA		-0.73	-1.2	V
R_{ON}	Switch On Resistance[4]	V_{CC} = Min., V_{IN} = 0.0V, I_{ON} = 48mA		5	7	Ω
		V_{CC} = Min, V_{IN} = 2.4V, I_{ON} = 15mA		8	15	

Capacitance ($T_A = 25°C$, f = 1 MHz)

Parameters[5]	Description	Test Conditions	Typ	Units
C_{IN}	Input Capacitance	V_{IN} = 0V	3.5	pF
C_{OFF}	A/B Capacitance, Switch Off	V_{IN} = 0V	5.0	pF
C_{ON}	A/B Capacitance, Switch On	V_{IN} = 0V	10.0	pF

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.

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}		0.5	1.0	mA
ΔI_{CC}	Supply Current per Input HIGH	V_{CC} = Max.	V_{IN} = 3.0V[3]			2.5	

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 TTL driven input (control input only); A and B pins do not contribute to ΔI_{CC}.

## Switching Characteristics over 3.3V Operating Range

Parameters	Description	Test Conditions	P13C32X245 Com.		Units
			Min	Max	
t_{PLH} t_{PHL}	Propagation Delay[2,3] Ax to Bx	C_L = 50 pF R_L = 500Ω		0.25	ns
t_{PZH} t_{PZL}	Bus Enable Time $\overline{BE}$ to Ax or Bx	C_L = 50 pF R_L = 500Ω R = 500Ω	1.5	6.5	
t_{PHZ} t_{PLZ}	Bus Disable Time $\overline{BE}$ to Ax or Bx		1.5	5.5	

Switching Characteristics over 2.5V Operating Range

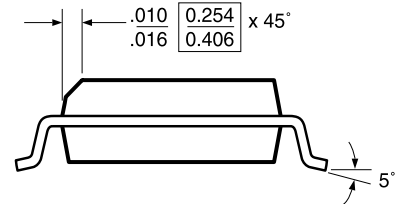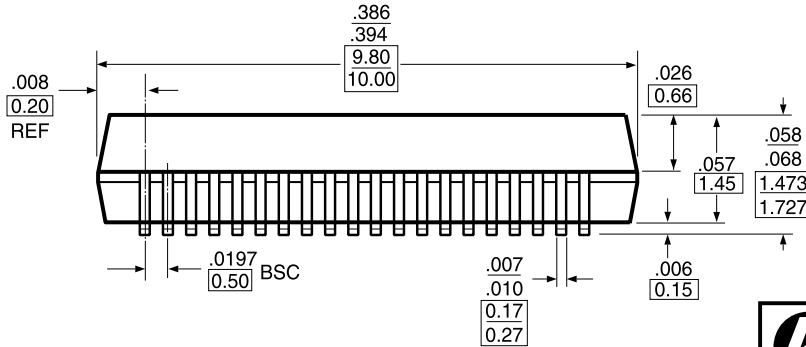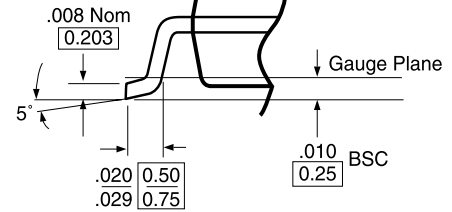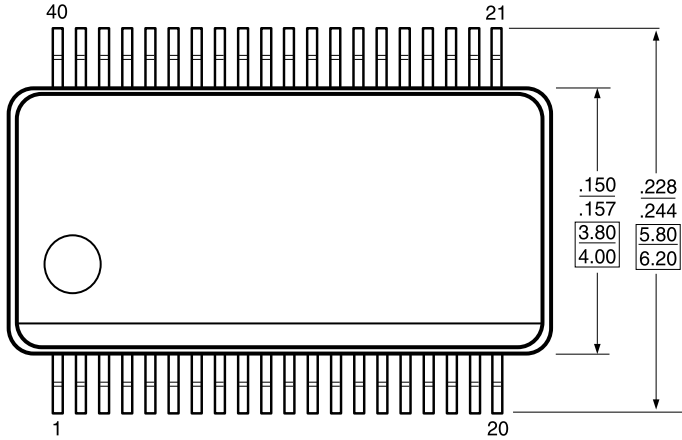| Parameters	Description	Test Conditions	P13C32X245 Com.		Units
			Min	Max	
t_{PLH} t_{PHL}	Propagation Delay[2,3] Ax to Bx	C_L = 50 pF R_L = 500Ω		0.25	ns
t_{PZH} t_{PZL}	Bus Enable Time $\overline{BE}$ to Ax or Bx	C_L = 50 pF R_L = 500Ω R = 500Ω	1.5	9.8	
t_{PHZ} t_{PLZ}	Bus Disable Time $\overline{BE}$ to Ax or Bx		1.5	8.3	

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 0.25 ns for 50 pF 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.

PERICOM®

Output Voltage vs. Input Voltage over Various Supply Voltages
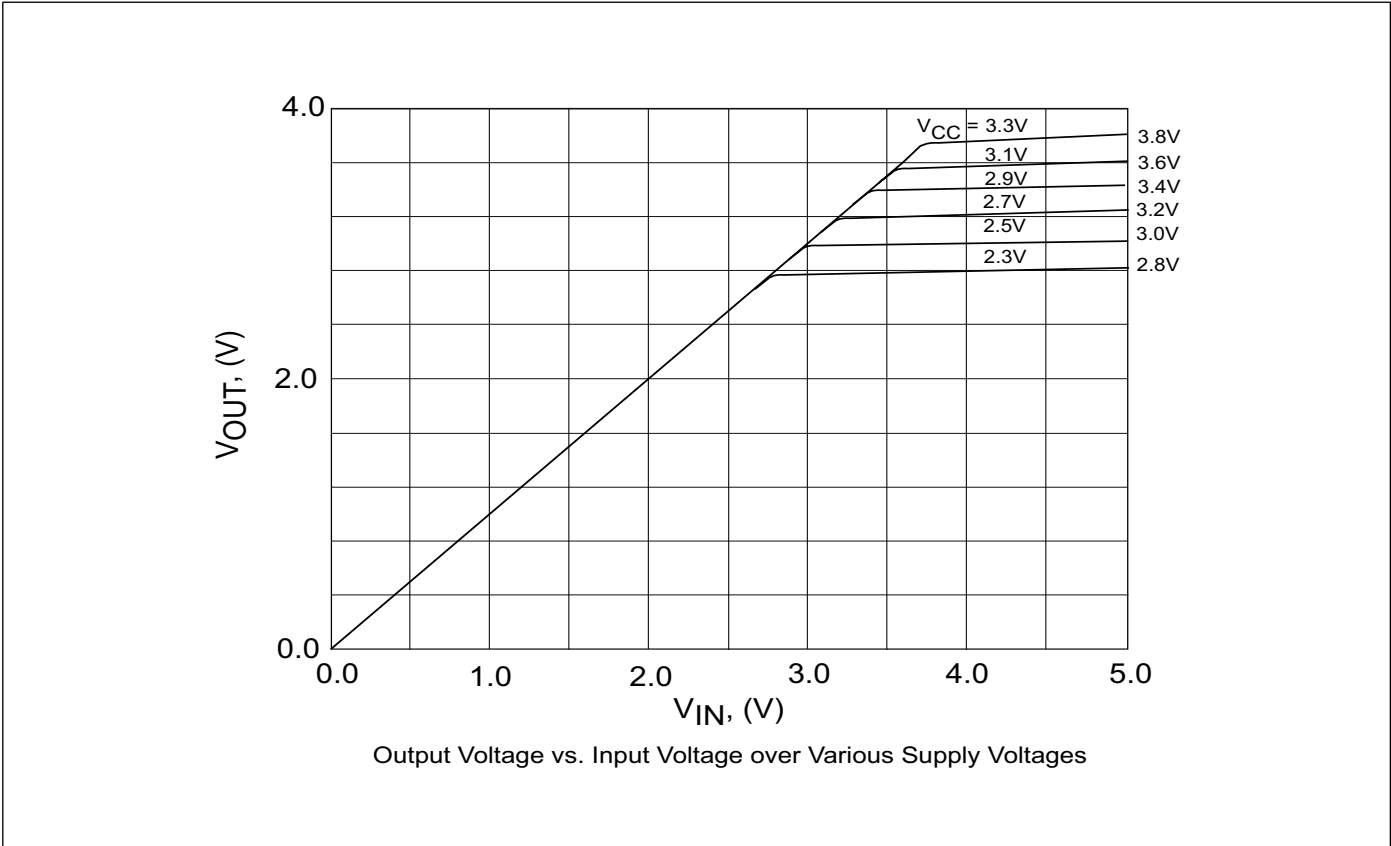
Output Voltage vs. Input Voltage over Various Supply Voltages

Packaging Mechanical: 40-pin BQSOP (B)

DOCUMENT CONTROL NO.
PD - 1209

REVISION: F
DATE: 03/09/05

.150 / .157
3.80 / 4.00

.228 / .244
5.80 / 6.20

.008 Nom
0.203

Gauge Plane

5°

.010 BSC
0.25

.020 / .029
0.50 / 0.75

.386 / .394
9.80 / 10.00

.026
0.66

.058 / .068
1.473 / 1.727

.057
1.45

.008 REF
0.20

.010 / .016
0.254 / 0.406 x 45°

5°

.0197 BSC
0.50

.007 / .010
0.17 / 0.27

.006
0.15

X.XX / X.XX DENOTES DIMENSION IN MILLIMETERS

Notes:
1. Controlling dimensions in millimeters
2. Ref.: JEDEC MO - 154C/BB
3. Package Outline Exclusive of Mold Flash and Metal Burr

Pericom Semiconductor Corporation
3545 N. 1st Street, San Jose, CA 95134
1-800-435-2335 • www.pericom.com

DESCRIPTION: 40-Pin, 150-Mil Wide BQSOP

PACKAGE CODE: B

Ordering Information

Ordering Code	Package Code	Package Type
PI3C32X245BEX	B	Pb-free & Green, 40-pin BQSOP

1. Thermal characteristics can be found on the company web site at www.pericom.com/packaging/

Mouser Electronics

Authorized Distributor

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

[Diodes Incorporated]():

  PI3C32X245BEX PI3C3384QEX PI3C3245LE PI3C3861-AQEX PI3C3245LEX PI5C3301TEX PI3C3126WE
PI5C16210KE PI5C16245VE PI3C3126QEX PI5C34X245BE PI5C16210VE PI5C16245BE PI5C6800CQE
PI5C3301CEX PI3VT34X245BE PI5C6800CLE PI5C16210AE PI5C16210AEX PI5C16245AE PI5C16245AEX
PI3B16244AE PI3B3125LE PI3B3125WE PI3B3125WEX PI5C6800CLEX PI3VT34X245BEX PI5C6800CQEX
PI5C34X245BEX PI3B16245AEX PI3B3384QEX PI5C16210VEX PI3C3861-ALE PI3C3305LEX PI5C16245VEX
PI5C3244SEX PI5C16211KE