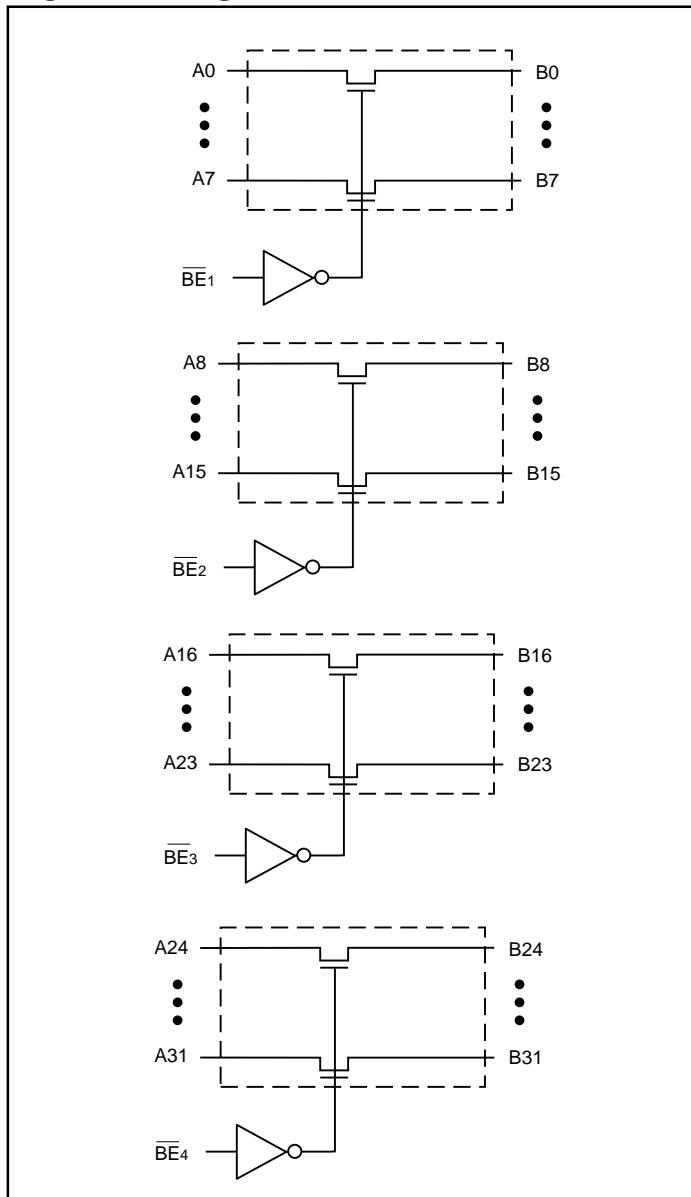


2.5V/3.3V, High Bandwidth, Hot Insertion 32-Bit, 2-Port, Bus Switch

Product Features

- Near zero propagation delay
- 5-ohm switches connect inputs to outputs
- 2.5V Supply Voltage Operation
- Permits Hot Insertion
- 5V I/O Tolerant
- High Bandwidth Operation (>400 MHz)
- Packages available:
 - 80-pin 150 mil wide plastic BQSOP (B)
 - 80-pin plastic very fine pitch dual flat no lead (DFN) (Z)

Logic Block Diagram



Product Description

Pericom Semiconductor's PI3C series of logic circuits are produced using the Company's advanced submicron CMOS technology, achieving industry leading performance.

The PI3C34X245 is a 2.5V or 3.3V, 32-bit, 2-port bus switch designed with a low ON resistance (5 ohms) 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}) input signal. It is very useful in switching signals that have high bandwidth (>400 MHz).

Product Pin Configuration

NC	1		80	Vcc
A0	2		79	$\overline{BE1}$
A1	3		78	B0
A2	4		77	B1
A3	5		76	B2
A4	6		75	B3
A5	7		74	B4
A6	8		73	B5
A7	9		72	B6
GND	10		71	B7
NC	11		70	Vcc
A8	12		69	$\overline{BE2}$
A9	13		68	B8
A10	14		67	B9
A11	15		66	B10
A12	16	80-Pin	65	B11
A13	17	B, Z	64	B12
A14	18		63	B13
A15	19		62	B14
GND	20		61	B15
NC	21		60	Vcc
A16	22		59	$\overline{BE3}$
A17	23		58	B16
A18	24		57	B17
A19	25		56	B18
A20	26		55	B19
A21	27		54	B20
A22	28		53	B21
A23	29		52	B22
GND	30		51	B23
NC	31		50	Vcc
A24	32		49	$\overline{BE4}$
A25	33		48	B24
A26	34		47	B25
A27	35		46	B26
A28	36		45	B27
A29	37		44	B28
A30	38		43	B29
A31	39		42	B30
GND	40		41	B31

Product Pin Description

Pin Name	Description
$\overline{BE}n$	Bus Enable Input (Active LOW)
A0 – A31	Bus A
B0 – B31	Bus B



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

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	
I_{IH}	Input HIGH Current	$V_{CC} = \text{Max.}, V_{IN} = V_{CC}$			± 1	μA
I_{IL}	Input LOW Current	$V_{CC} = \text{Max.}, V_{IN} = \text{GND}$			± 1	
I_{OZH}	High Impedance Output Current	$0 \leq A, B \leq V_{CC}$			± 1	
V_{IK}	Clamp Diode Voltage	$V_{CC} = \text{Min.}, I_{IN} = -18\text{mA}$		-0.73	-1.2	V
R_{ON}	Switch On Resistance ⁽³⁾	$V_{CC} = \text{Min.}, V_{IN} = 0.0\text{V}, I_{ON} = 48\text{mA}$ $V_{CC} = \text{Min.}, V_{IN} = 2.4\text{V}, I_{ON} = 15\text{mA}$		5 8	7 15	Ω

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

Parameters ⁽⁴⁾	Description	Test Conditions	Typ.	Units
C_{IN}	Input Capacitance	$V_{IN} = 0\text{V}$	3.5	pF
C_{OFF}	A/B Capacitance, Switch Off		5.0	
C_{ON}	A/B Capacitance, Switch On		10.0	

Notes:

1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at $V_{CC} = 3.3\text{V}$, $T_A = 25^\circ\text{C}$ 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.
4. 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	$V_{CC} = \text{Max.}$	$V_{IN} = \text{GND or } V_{CC}$	—	1.0	2.0	mA
ΔI_{CC}	Supply Current per Input @ TTL HIGH		$V_{IN} = 3.4\text{V}^{(3)}$	—	—	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 $V_{CC} = 3.3\text{V}$, $+25^\circ\text{C}$ 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

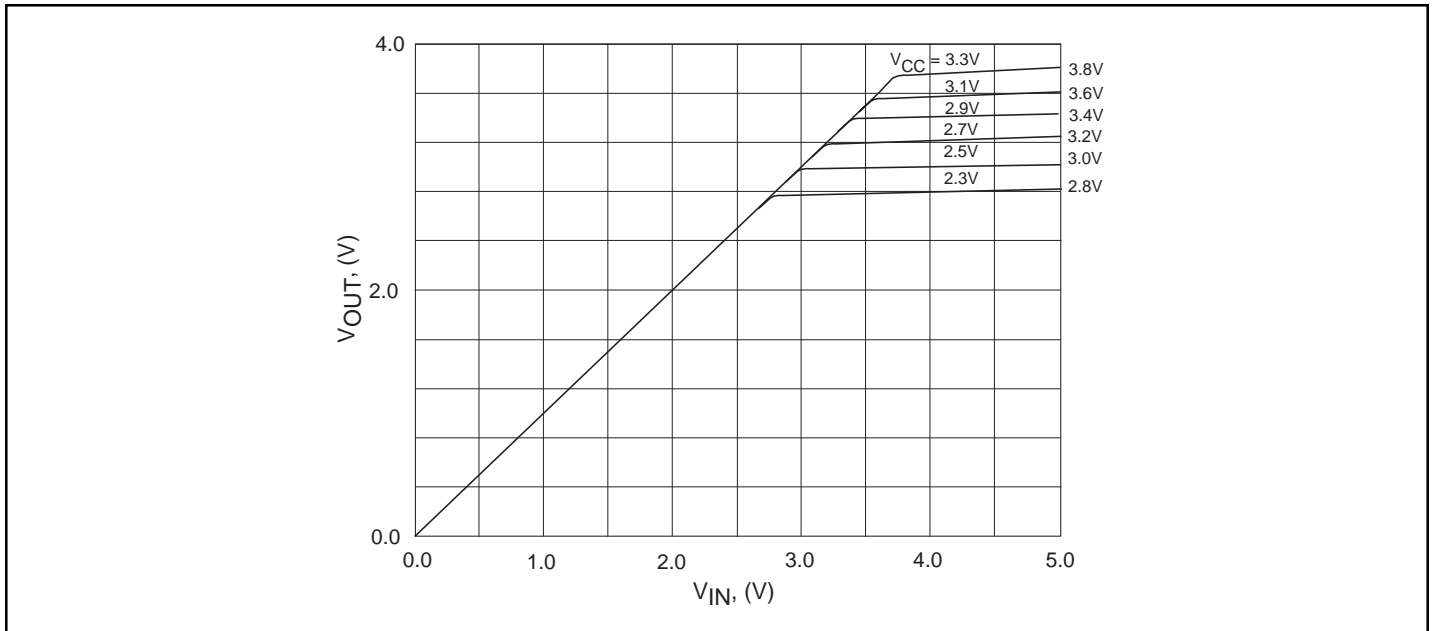
Parameters	Description	Conditions	PI3C34X245		Units
			Com.		
			Min.	Max.	
t_{PLH} t_{PHL}	Propagation Delay ^(2,3) Ax to Bx	$C_L = 50\text{pF}$ $R_L = 500 \text{ ohms}$		0.25	ns
t_{PZH} t_{PZL}	Bus Enable Time $\overline{\text{BE}}$ to Ax or Bx	$C_L = 50\text{pF}$ $R_L = 500 \text{ ohms}$	1.5	6.5	
t_{PHZ} t_{PLZ}	Bus Disable Time $\overline{\text{BE}}$ to Ax or Bx	$R = 500 \text{ ohms}$	1.5	5.5	

Switching Characteristics over 2.5V Operating Range

Parameters	Description	Conditions	PI3C34X245		Units
			Com.		
			Min.	Max.	
t_{PLH} t_{PHL}	Propagation Delay ^(2,3) Ax to Bx	$C_L = 50\text{pF}$ $R_L = 500 \text{ ohms}$		0.25	ns
t_{PZH} t_{PZL}	Bus Enable Time $\overline{\text{BE}}$ to Ax or Bx	$C_L = 50\text{pF}$ $R_L = 500 \text{ ohms}$	1.5	9.8	
t_{PHZ} t_{PLZ}	Bus Disable Time $\overline{\text{BE}}$ to Ax or Bx	$R = 500 \text{ ohms}$	1.5	8.3	

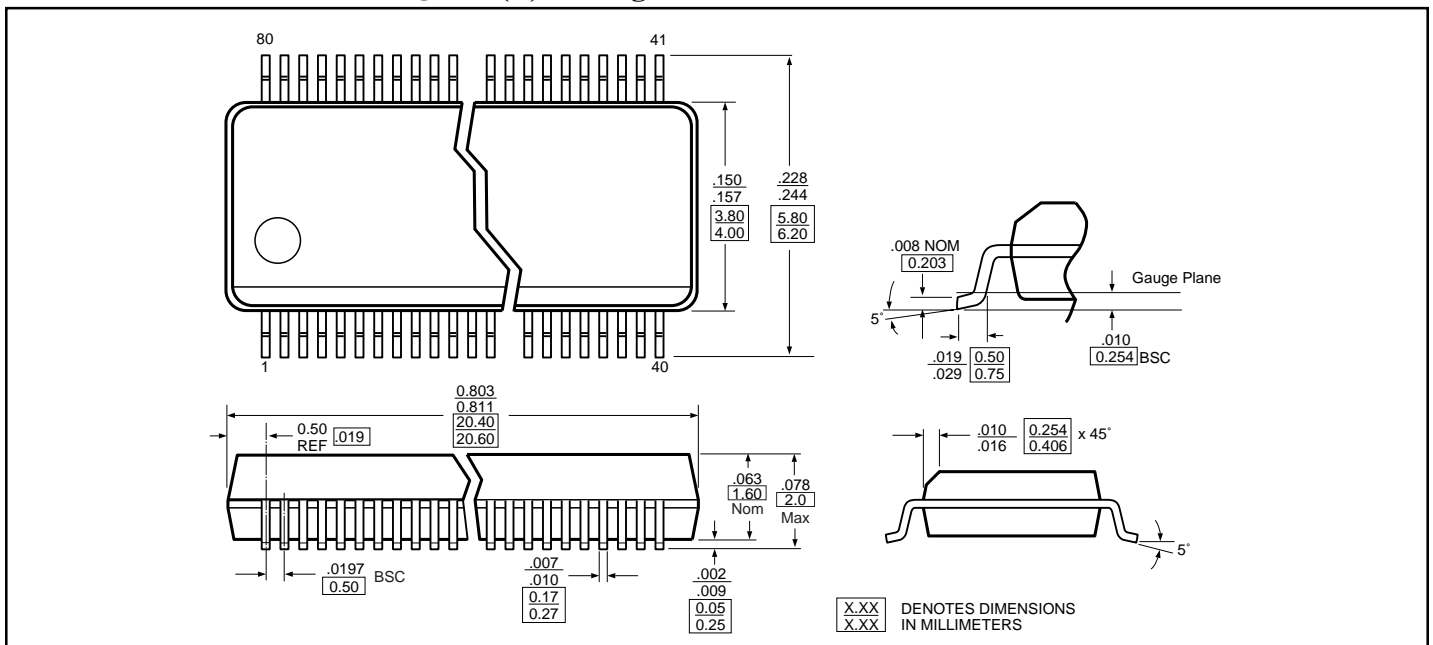
Notes:

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 0.25ns 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.

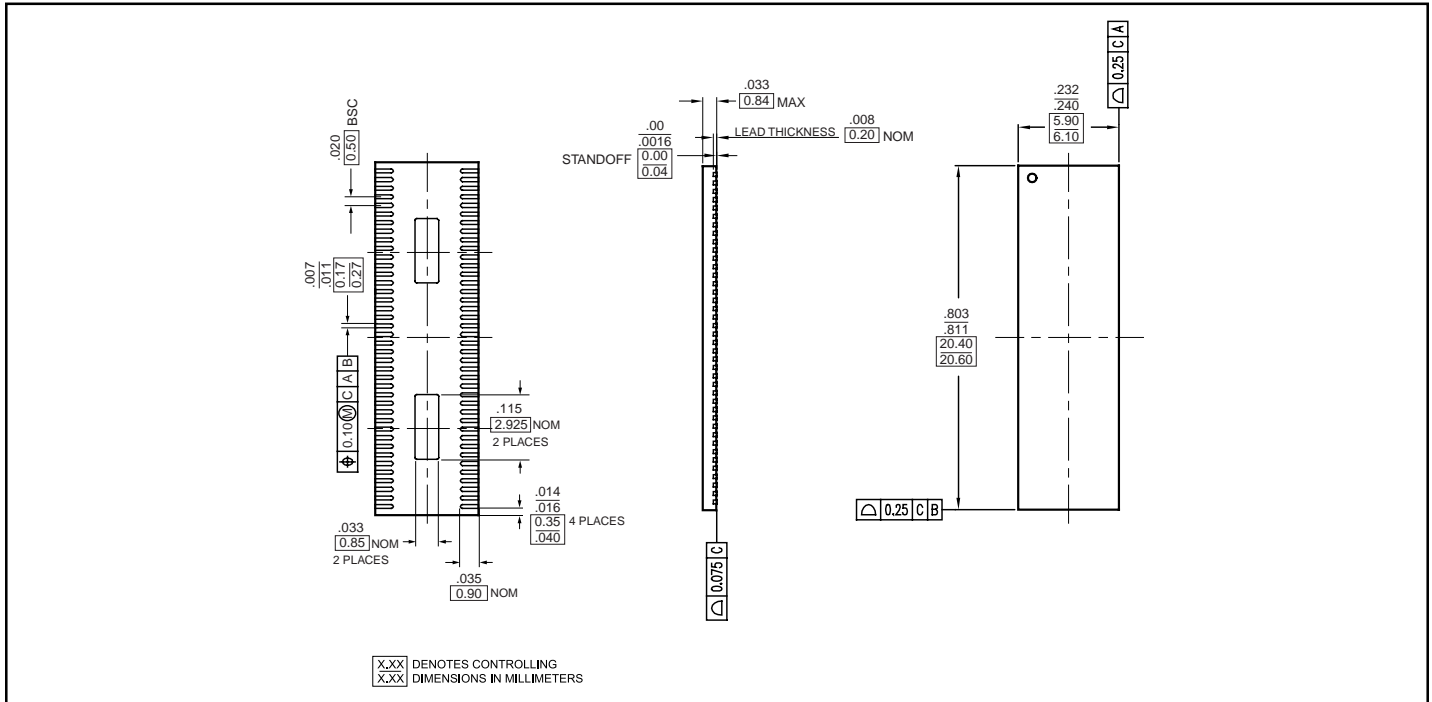


Output Voltage vs. Input Voltage over Various Supply Voltages

80-Pin 150 Mil Wide Plastic BQSOP (B) Package



80-Pin Plastic Very Fine Pitch Dual Flat No lead (DFN) (Z) Package



Ordering Information

Part	Pin - Package	Dimensions
PI3C34X245B	80 -BQSOP (B)	-40°C to +85°C
PI3C34X245Z	80 -DFN (Z)	