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Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
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Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

32-Bit, 2-Port Bus Switch with 25Ω Series Resistor

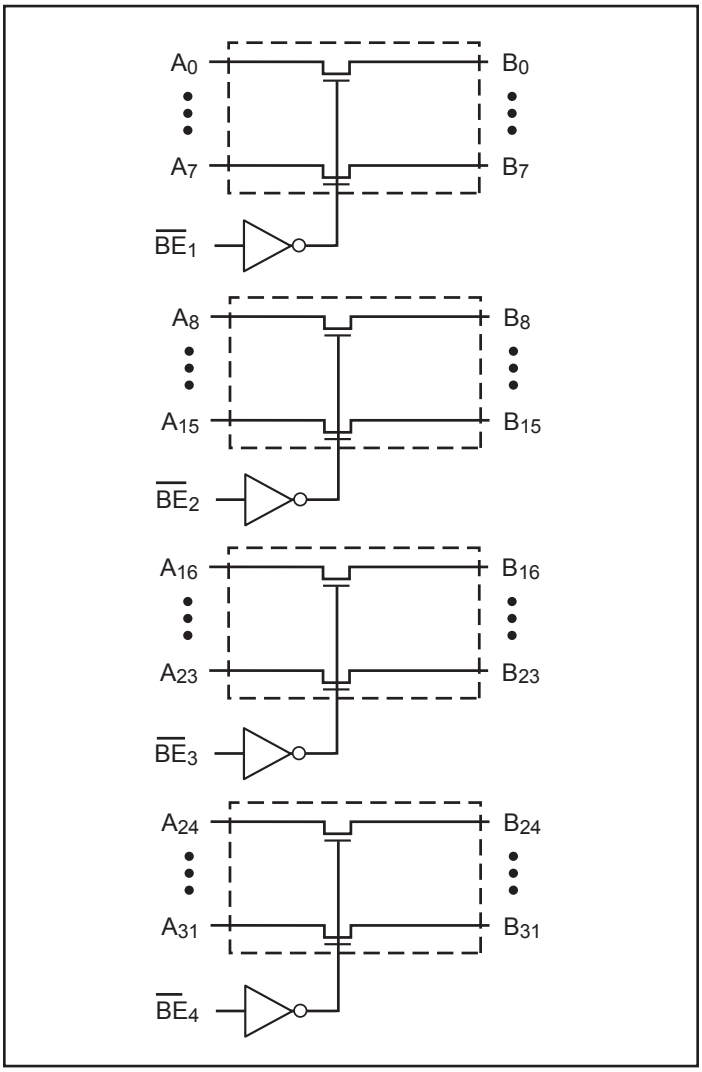
Features

- Near-Zero propagation delay
- 25Ω series resistor termination
- 5Ω switches connect inputs to outputs
- Direct bus connection when switches are ON
- Ultra-low quiescent power (0.2µA typical)
  – Ideally suited for notebook applications
- Pin compatible with QS34X245
- Industrial operating temperature: –40°C to +85°C
- Packaging (Pb-free & Green available):
  – 80-pin 150 mil wide BQSOP (B)

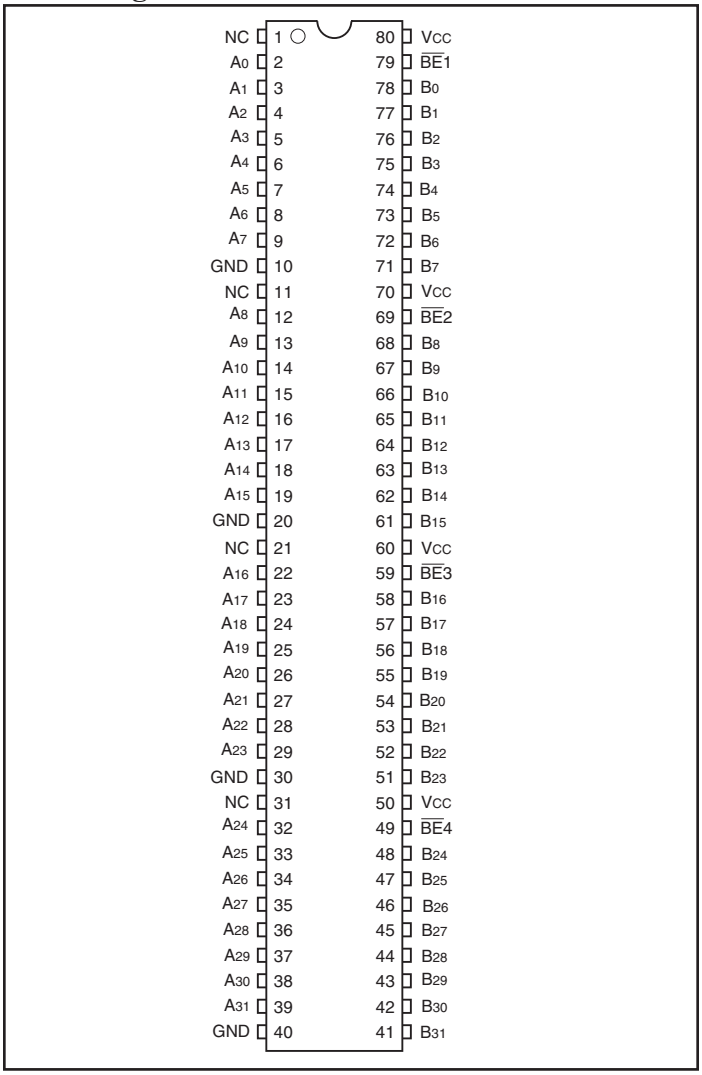
Description

Pericom Semiconductor's PI5C34X2245 is a 32-bit, 2-port bus switch. Four enable signals ($\overline{BE}n$) turn the switches on. The bus switch creates no additional propagational delay or additional ground bounce noise. The device has a built-in 25Ω resistor to reduce noise resulting from reflection, thus eliminating the need for an external terminating resistor.

Block Diagram



Pin Configuration



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 +7.0V
DC Input Voltage	–0.5V to +7.0V
DC Output Current	120 mA
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.

Truth Table(1)

Function	$\overline{BE}$n	A0 – 31
Disconnect	H	Hi-Z
Connect	L	B0 – 3

Notes:
1. H = High Voltage Level, L = Low Voltage Level
   Hi-Z = High Impedance

Pin Description

Pin Name	I/O	Description
$\overline{BE}_X$	I	Bus Enable Input (Active LOW)
A_0-A_{31}	I/O	Bus A
B_0-B_{31}	I/O	Bus B

DC Electrical Characteristics (Over the Operating Range, T_A = –40°C to +85°C, V_{CC} = 5V ±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} = Max., V_{IN} = V_{CC}			±1	µA
I_{IL}	Input LOW Current	V_{CC} = Max., V_{IN} = GND			±1	
I_{OZH}	High Impedance Output Current	0 - A, B - V_{CC}			±1	
V_{IK}	Clamp Diode Voltage	V_{CC} = Min., I_{IN} = –18mA		–0.7	–1.2	V
I_{OS}	Short Circuit Current(3)	A (B) = 0V, B (A) = V_{CC}	100			mA
R_{ON}	Switch On-Resistance(4)	V_{CC} = Min., V_{IN} = 0V, I_{ON} = 48mA		28	40	Ω
		V_{CC} = Min., V_{IN} = 2.4V, I_{ON} = 15mA		35	48	

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} = 5.0V, 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	Type	Units
C_{IN}	Input Capacitance	V_{IN} = 0V	6	pF
C_{OFF}	A/B Capacitance, Switch Off		6	
C_{ON}	A/B Capacitance, Switch On		12	

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}		0.1	3.0	µA
ΔI_{CC}	Supply Current per Input @ TTL HIGH	V_{CC} = Max.	V_{IN} = 3.4V[3]			2.5	mA
I_{CCD}	Supply Current per Input per MHz[4]	V_{CC} = Max., A & B Pins Open BEn = GND, Control Input Toggling 50% Duty Cycle				0.25	mA/ MHz

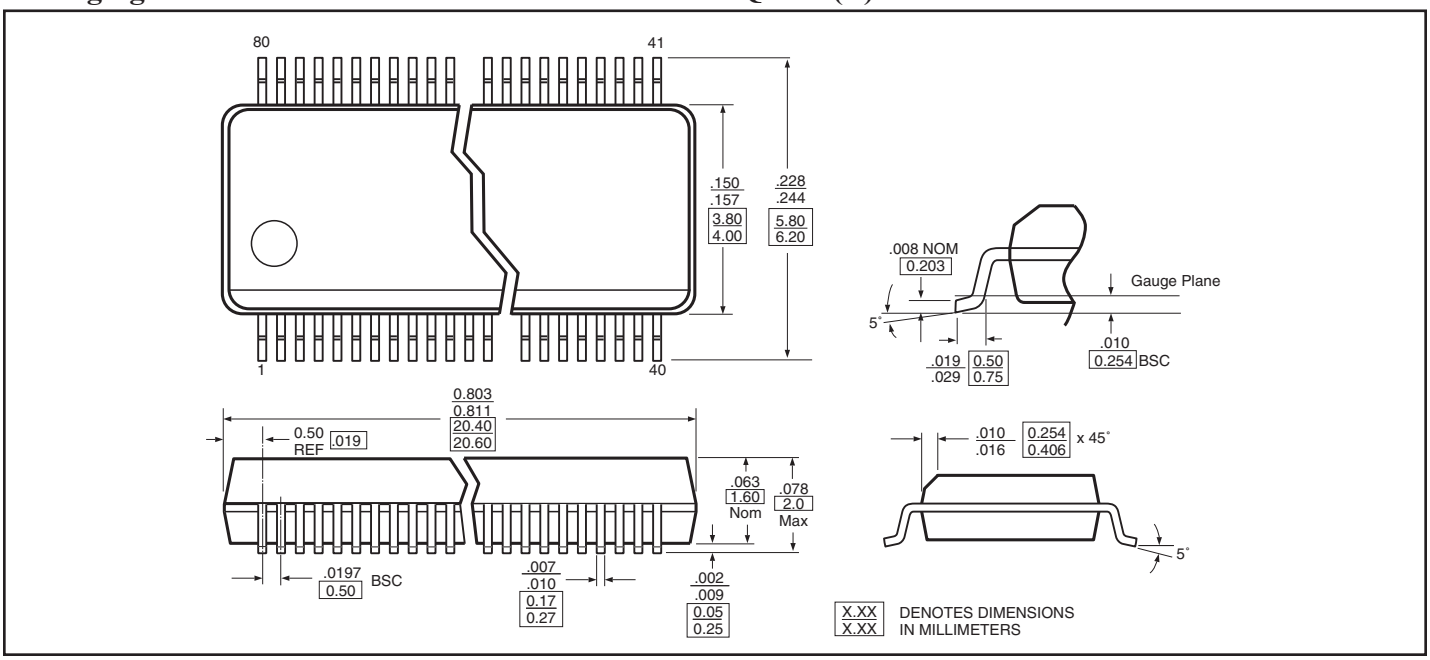
Notes:
1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device.
2. Typical values are at V_{CC} = 5.0V, +25°C ambient.
3. Per TTL driven input (V_{IN} = 3.4V, control inputs only); A and B pins do not contribute to I_{CC}.
4. This current applies to the control inputs only and represent the current required to switch internal capacitance at the specified frequency. The A and B inputs generate no significant AC or DC currents as they transition. This parameter is not tested, but is guaranteed by design.

Switching Characteristics over Operating Range

Parameter	Description	Conditions	Com.		Units
			Min.	Max.	
t_{PLH} t_{PHL}	Propagation Delay[1,2] Ax to Bx, Bx to Ax	C_L = 50pF R_L = 500Ω		1.25	ns
t_{PZH} t_{PZL}	Bus Enable Time $\overline{BE}$x to Ax or Bx		1.5	7.5	
t_{PHZ} t_{PLZ}	Bus Disable Time $\overline{BE}$x to Ax or Bx		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.

Packaging Mechanical: 80-Pin 150 Mil Wide Plastic BQSOP (B)



Ordering Information

Ordering Code	Package Code	Package Description
PI5C34X2245B	B	80-Pin 150 Mil Wide Plastic BQSOP
PI5C34X2245BE	B	Pb-free & Green, 80-Pin 150 Mil Wide Plastic BQSOP

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