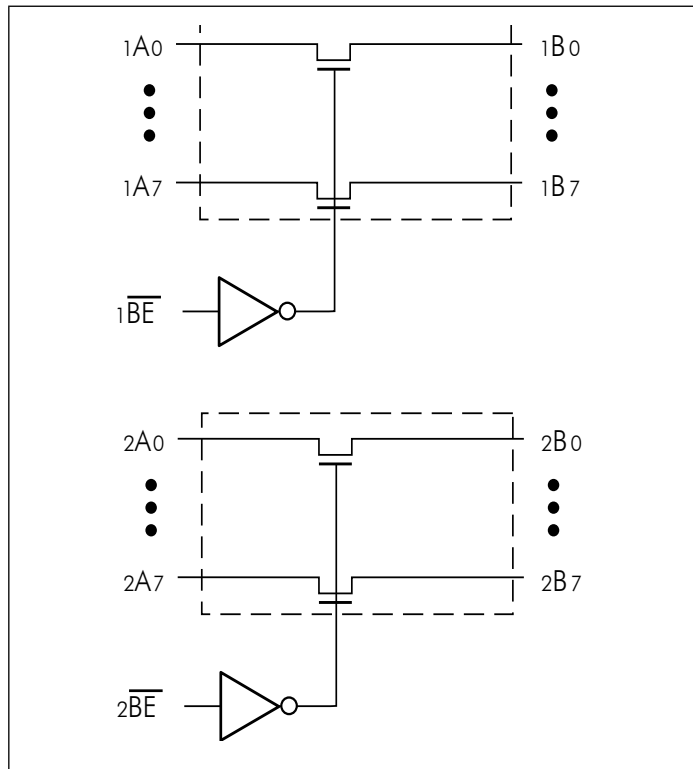


## 16-Bit, 2-Port Bus Switch

### Features

- Near-Zero propagation delay
- 5-ohm switches connect inputs to outputs
- Direct bus connection when switches are ON
- Ultra-low quiescent power (0.2  $\mu$ A typical) – Ideally suited for notebook applications
- Pin compatible with 74 series 16245
- Industrial operating temperature: -40°C to +85°C
- Packaging (Pb-free & Green):
  - 48-pin 240-mil wide thin plastic TSSOP (A)

### Block Diagram



### Truth Table<sup>(1)</sup>

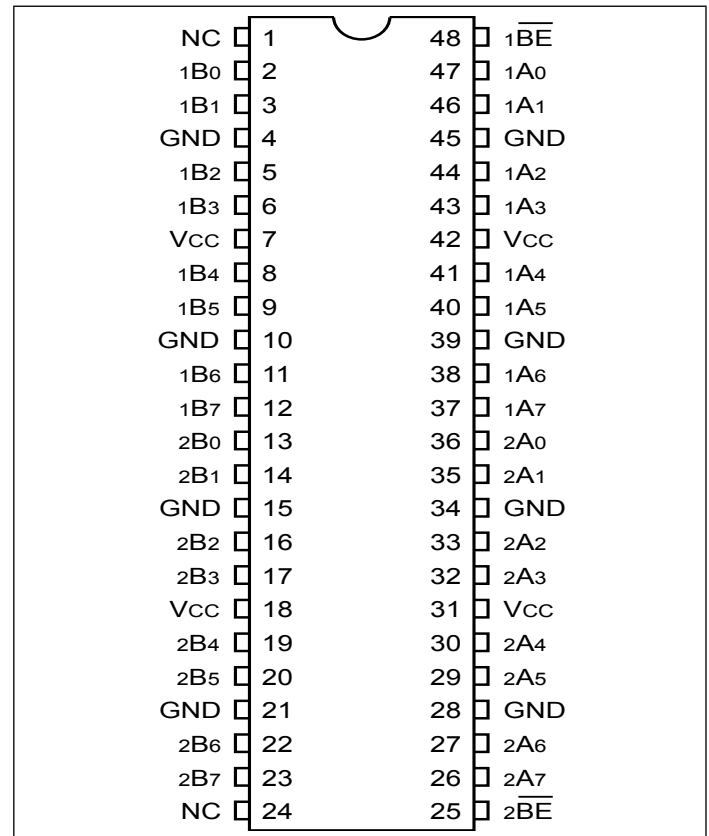
Function	$\overline{nBE}$	$nA0-7$
Disconnect	H	Hi-Z
Connect	L	$nB0-7$

Note: H = High Voltage Level  
 L = Low Voltage Level  
 Hi-Z = High Impedance

### Description

Pericom Semiconductor's PI5C16245 is a 16-bit, 2-port bus switch that is pin compatible with the 74 series 16245 16-bit transceiver. Two enable signals ( $\overline{nBE}$ ) turn the switches on similar to the enable signals of the 16245. The bus switch creates no additional propagation delay or additional ground bounce noise.

### Pin Configuration



### Pin Description

Pin Name	I/O	Description
$\overline{nBE}$	I	Bus Enable Input (Active LOW)
$nA0-nA7$	I/O	Bus A
$nB0-nB7$	I/O	Bus B

### Absolute Maximum Ratings

Parameter	Min.	Max.	Units
Storage Temperature	-55	125	°C
Ambient Temperature with Power Applied	-40	85	°C
Supply Voltage to Ground Potential	-0.5	7.0	V
DC Input Voltage	-0.5	7.0	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, $T_A = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ , $V_{CC} = 5\text{V} \pm 10\%$ )

Parameters	Description	Test Conditions <sup>(1)</sup>	Min	Typ <sup>(2)</sup>	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	$V_{CC} = \text{Max.}, V_{IN} = V_{CC}$			$\pm 1$	$\mu\text{A}$
$I_{IL}$	Input LOW Current	$V_{CC} = \text{Max.}, V_{IN} = \text{GND}$			$\pm 1$	$\mu\text{A}$
$I_{OZH}$	High Impedance Output Current	$0 \leq A, B \leq V_{CC}$			$\pm 1$	$\mu\text{A}$
$V_{IK}$	Clamp Diode Voltage	$V_{CC} = \text{Min.}, I_{IN} = -18 \text{ mA}$		-0.7	-1.2	V
$I_{OS}$	Short Circuit Current <sup>(3)</sup>	A (B) = 0V, B (A) = $V_{CC}$	100			mA
$V_H$	Input Hysteresis at Control Pins			150		mV
$R_{ON}$	Switch On Resistance <sup>(4)</sup>	$V_{CC} = \text{Min.}, V_{IN} = 0.0\text{V}, I_{ON} = 48 \text{ mA}$		5	7	ohm
		$V_{CC} = \text{Min.}, V_{IN} = 2.4\text{V}, I_{ON} = 15 \text{ mA}$		10	5	

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

Parameters <sup>(5)</sup>	Description	Test Conditions	Typ	Max	Units
$C_{IN}$	Input Capacitance	$V_{IN} = 0\text{V}$	6		pF
$C_{OFF}$	A/B Capacitance, Switch Off	$V_{IN} = 0\text{V}$	6		pF
$C_{ON}$	A/B Capacitance, Switch On	$V_{IN} = 0\text{V}$	9		pF

Notes:

- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
- Typical values are at  $V_{CC} = 5.0\text{V}$ ,  $T_A = 25^{\circ}\text{C}$  ambient and maximum loading.
- Not more than one output should be shorted at one time. Duration of the test should not exceed one second.
- 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.
- This parameter is determined by device characterization but is not production tested.

### Power Supply Characteristics

Parameters	Description	Test Conditions <sup>(1)</sup>		Min	Typ <sup>(2)</sup>	Max	Units
I <sub>CC</sub>	Quiescent Power Supply Current	V <sub>CC</sub> = Max.	V <sub>IN</sub> = GND or V <sub>CC</sub>		0.1	3.0	μA
ΔI <sub>CC</sub>	Supply Current per Input @ TTL HIGH	V <sub>CC</sub> = Max.	V <sub>IN</sub> = 3.4V <sup>(3)</sup>			2.5	mA
I <sub>CCD</sub>	Supply Current per Input per MHz <sup>(4)</sup>	V <sub>CC</sub> = Max., A and B Pins Open n $\overline{\text{BE}}$ = 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<sub>CC</sub> = 5.0V, +25°C ambient.
3. Per TTL driven input (V<sub>IN</sub> = 3.4V, control inputs only); A and B pins do not contribute to I<sub>CC</sub>.
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.

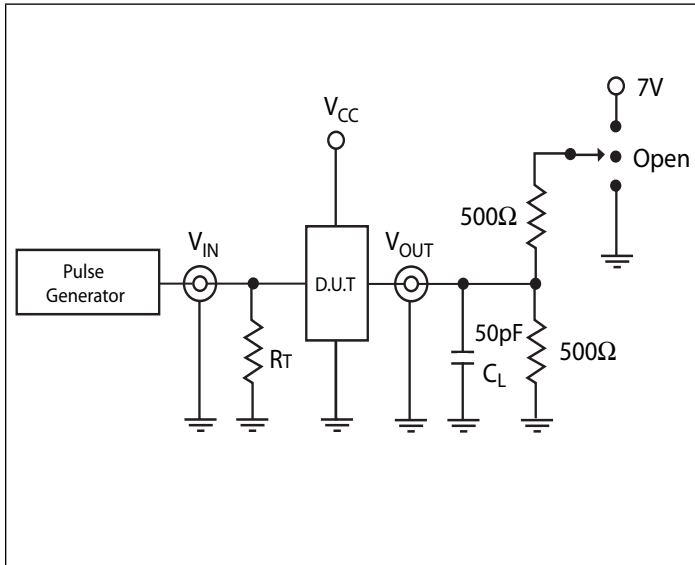
### PI5C16245 Switching Characteristics over Operating Range

Parameters	Description	Test Conditions <sup>(1)</sup>	PI5C16245		Units
			Com.		
			Min	Max	
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay <sup>(2,3)</sup> xAx to xBx, xBx to xAx	CL = 50 pF RL = 500-ohm		0.25	ns
t <sub>PZH</sub> t <sub>PZL</sub>	Bus Enable Time x $\overline{\text{BE}}$ to xAx or xBx		1.5	6.5	ns
t <sub>PHZ</sub> t <sub>PLZ</sub>	Bus Disable Time x $\overline{\text{BE}}$ to xAx or xBx		1.5	5.5	ns

Notes:

1. See test circuit and wave forms.
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.

**Test Circuits**



**Switch Position**

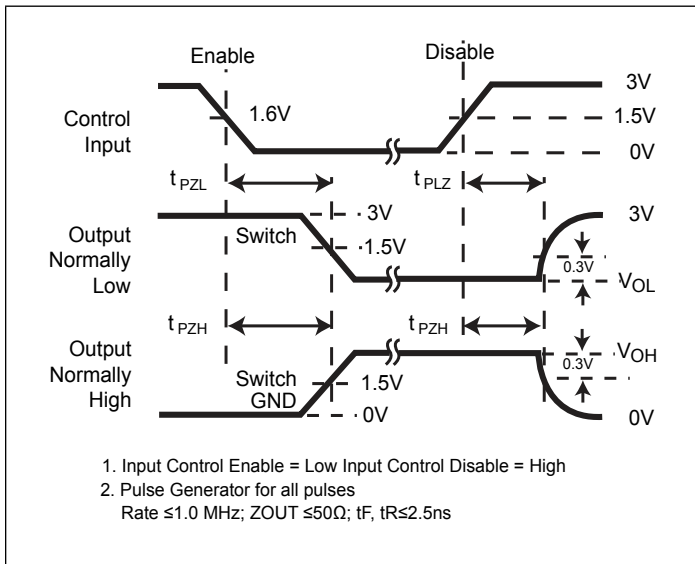
Test	Switch
Disable LOW	Closed
Enable LOW	Closed
t <sub>PD</sub>	Open

Definitions:

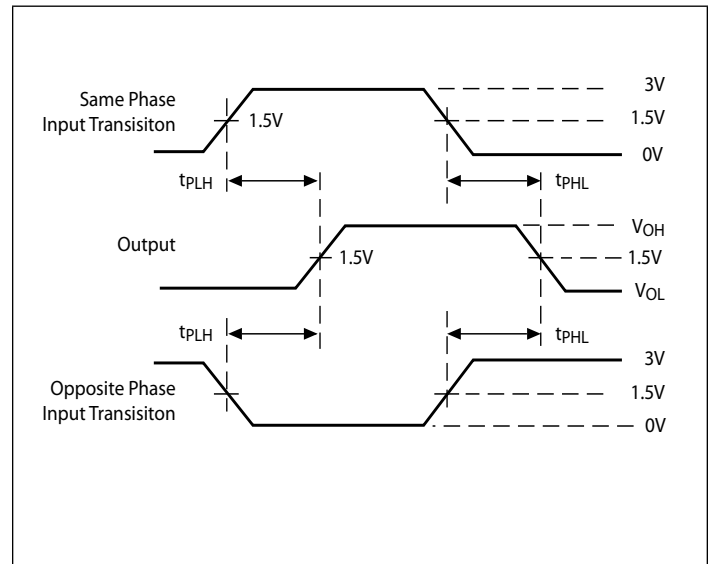
CL = Load capacitance (includes jig and probe capacitance)

RT = Termination resistance (should be equal to Z<sub>OUT</sub> of the pulse generator)

**Enable and Disable Timing**

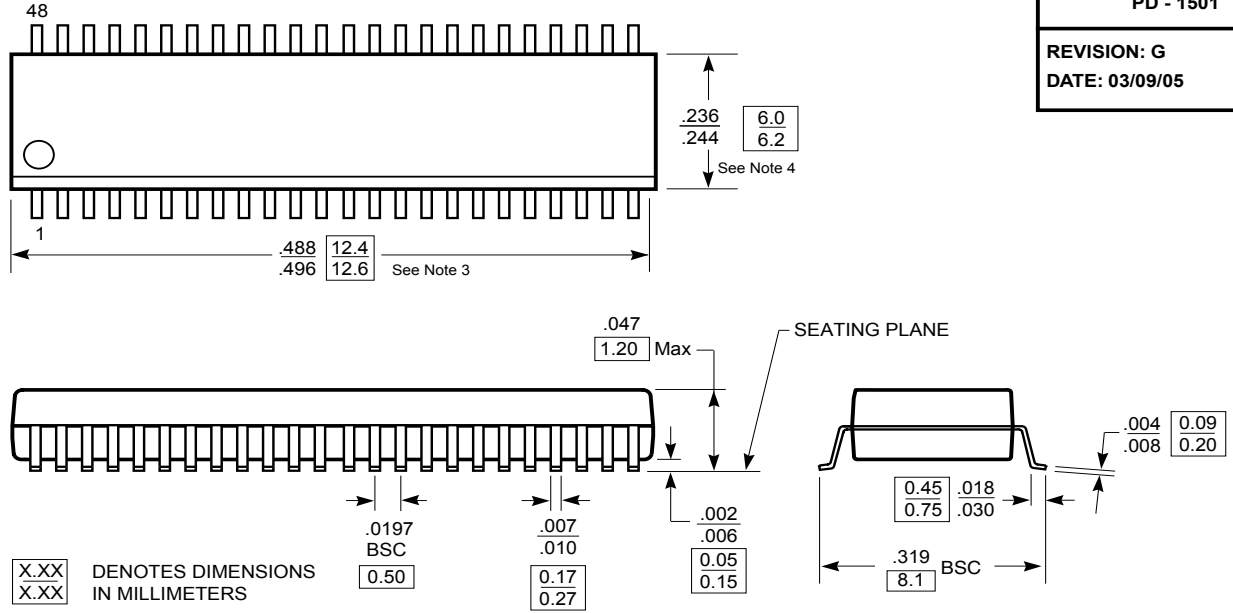


**Propagation Delay**



**Packaging Mechanical: 48-Pin TSSOP (A)**

DOCUMENT CONTROL NO.  
PD - 1501  
REVISION: G  
DATE: 03/09/05



- Note:**
- Controlling dimensions in millimeters.
  - Ref: JEDEC MO-153F/ED
  - Dimension does not include mold flash, protrusions or gate burrs. Mold flash, protrusions and gate burrs shall not exceed 0.15mm per side.
  - Dimension does not include interlead flash or protrusion. Interlead flash or protrusion shall not exceed 0.25mm per side.



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

DESCRIPTION: 48-Pin 240-Mil Wide TSSOP

PACKAGE CODE: A

**Ordering Information**

Ordering Code	Package Code	Package Type	Operating Temperature
PI5C16245AE	A	Pb-free & Green, 48-pin TSSOP	Commercial

1. Thermal characteristics can be found on the company web site at [www.pericom.com/packaging/](http://www.pericom.com/packaging/)