# PI5C3245

8-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 (0.2μA typical)

   ▫ Ideally suited for notebook applications

➤ Pin compatible with 74 Series 245 logic devices

➤ Packaging (Pb-free & Green):

   ▫ 20-pin 173-mil wide plastic TSSOP (L)

   ▫ 20-pin 150-mil wide plastic QSOP (Q)

Description

Pericom Semiconductor's PI5C3245 is a 8-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 ($\overline{\text{BE}}$) input signal. The pinout is compatible with PI74FCT245T (Octal Bidirectional Transceiver).

Block Diagram
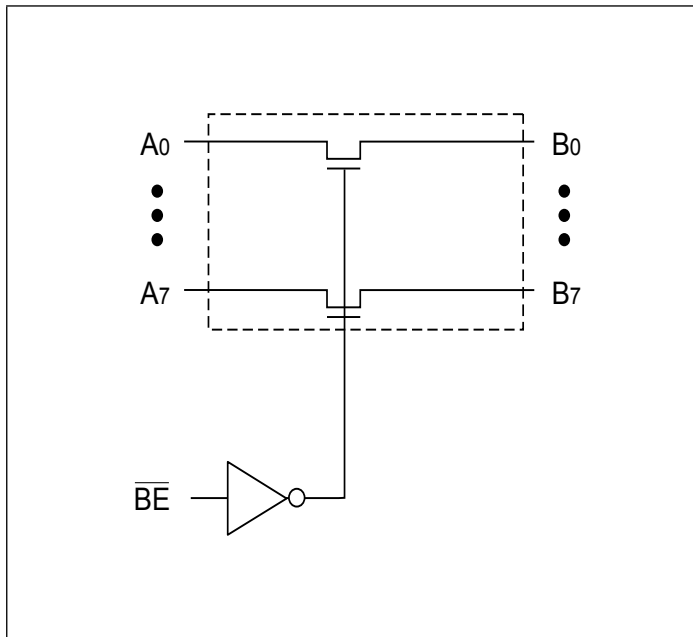
Pin Configuration
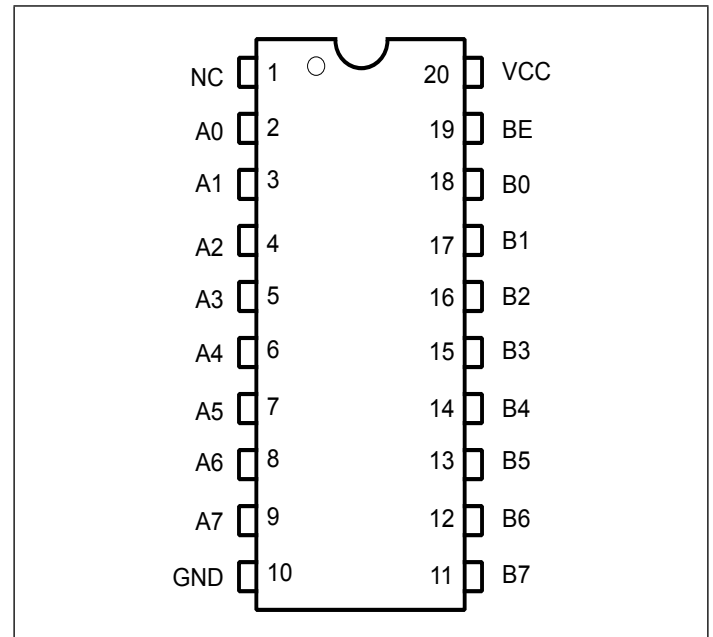
Truth Table[1]

Function	$\overline{\text{BE}}$	A0-7
Disconnect	H	Hi-Z
Connect	L	B0-7

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

Pin Description

Pin Name	Description
$\overline{\text{BE}}$	Bus Enable Input (Active LOW)
A0-7	Bus A
B0-7	Bus B
GND	Ground
V_{CC}	Power

Absolute Maximum Ratings

Parameter	Min.	Max.	Units
Storage Temperature	-65	150	ºC
Ambient Temperature with Power Applied	-40	85	ºC
Supply Voltage to Ground Potential (Inputs & Vcc Only)	-0.5	7.0	V
Supply Voltage to Ground Potential (Outputs & D/O Only)	-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, $T_A = -40°C$ to $+85°C$, $V_{CC} = 5V \pm 5\%$)

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	µA
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	µA
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
V_H	Input Hysteresis at Control Pins			150		mV
R_{ON}	Switch On Resistance[4]	V_{CC} = Min, V_{IN} = 0.0V, I_{ON} = 48 mA		5	7	Ω
		V_{CC} = Min, V_{IN} = 2.4V, I_{ON} = 15 mA		10	15	

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	Typ	Units
C_{IN}	Input Capacitance	V_{IN} = 0V	6	pF
C_{OFF}	A/B Capacitance, Switch Off	V_{IN} = 0V	6	pF
C_{ON}	A/B Capacitance, Switch On	V_{IN} = 0V	8	pF

Notes:

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

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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 @ Input 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 and B Pins Open $\overline{BE}$ = 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_{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 Icc.
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

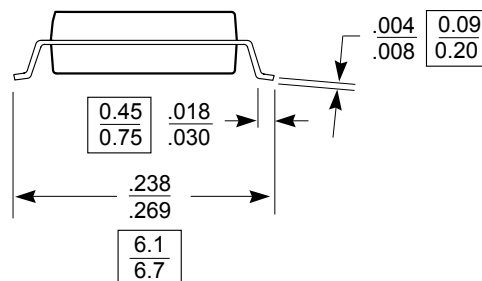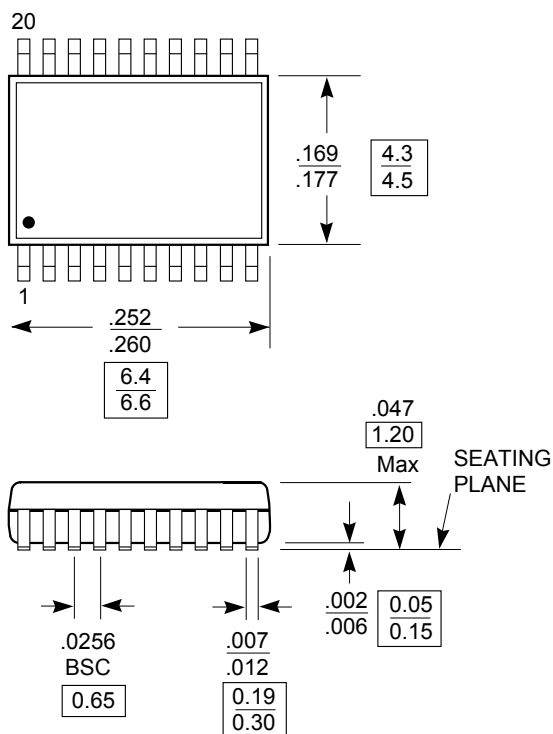| Parameters	Description	Test Conditions	Com.		Units
			Min	Max	
t_{PLH} t_{PHL}	Propagation Delay[1,2] Ax to Bx, Bx to Ax	C_L = 50 pF R_L = 500Ω		0.25	ns
t_{PZH} t_{PZL}	Bus Enable Time $\overline{BE}$ to Ax or Bx		1.5	6.5	
t_{PHZ} t_{PLZ}	Bus Disable Time $\overline{BE}$ to Ax or Bx		1.5	5.5	

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 0.25 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.

Packaging Mechanical: 20-pin TSSOP (L20)

DOCUMENT CONTROL NO.
PD - 1311

REVISION: E
DATE: 03/09/05

20

.169 / .177 | 4.3 / 4.5

1

.252 / .260 | 6.4 / 6.6

.047 / 1.20
Max

SEATING PLANE

.002 / .006 | 0.05 / 0.15

.0256 BSC | 0.65

.007 / .012 | 0.19 / 0.30

.004 / .008 | 0.09 / 0.20

0.45 / 0.75 | .018 / .030

.238 / .269 | 6.1 / 6.7

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Pericom Semiconductor Corporation
3545 N. 1st Street, San Jose, CA 95134
1-800-435-2336 • www.pericom.com

DESCRIPTION: 20-Pin, 173-Mil Wide, TSSOP

PACKAGE CODE: L

Note:
1. Package Outline Exclusive of Mold Flash and Metal Burr
2. Controlling dimentions in millimeters
3. Ref: JEDEC MO-153F/AC

Packaging Mechanical: 20-pin QSOP (Q20)

DOCUMENT CONTROL NO.
PD - 1202

REVISION: H
DATE: 10/22/07

20

$\frac{.150}{.157}$ $\frac{3.81}{3.99}$

1

$\frac{.337}{.344}$ $\frac{8.56}{8.74}$

15°
MAX.

$\frac{.008}{}$ $\frac{0.20}{MIN.}$

$\frac{.008}{.013}$ $\frac{0.20}{0.33}$

Guage Plane

$\frac{.010}{0.254}$

15°
MAX.

$\frac{.016}{.035}$ $\frac{0.41}{0.89}$

0°-6°

Detail A

$\frac{.041}{1.04}$ REF

.058 REF
$\boxed{1.47}$

$\frac{.053}{.069}$ $\frac{1.35}{1.75}$

SEATING
PLANE

.025
BSC
$\boxed{0.635}$

$\frac{.008}{.012}$ $\frac{0.203}{0.305}$

$\frac{.004}{.010}$ $\frac{0.101}{0.254}$

.015 x 45°
$\boxed{0.38}$

Detail A

$\frac{.007}{.010}$ $\frac{0.178}{0.254}$

$\frac{.228}{.244}$

$\frac{5.79}{6.19}$
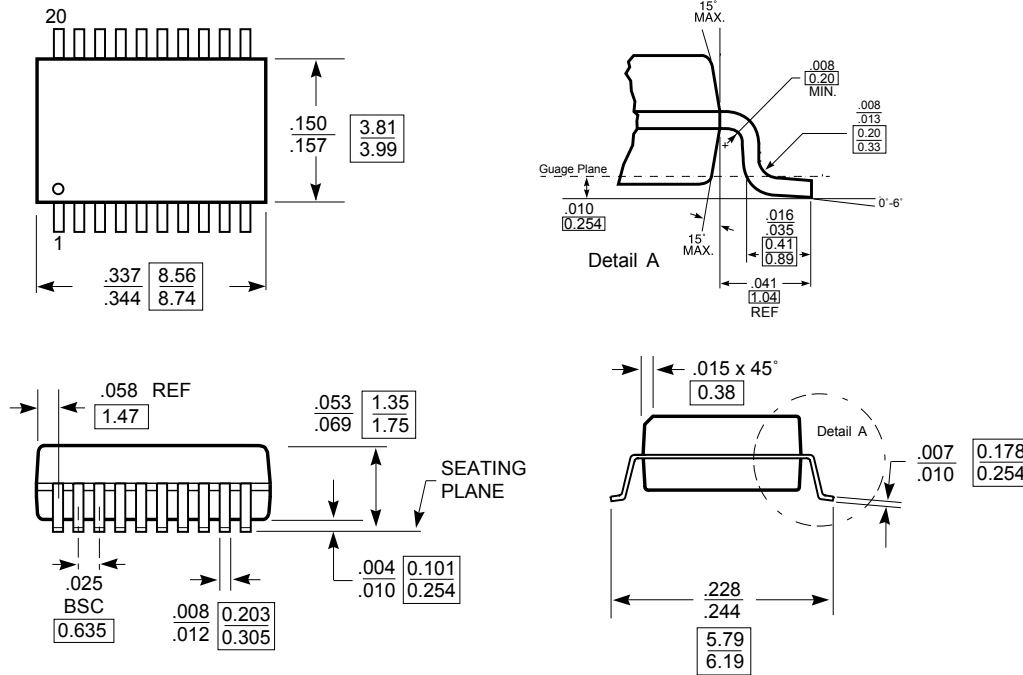
$\boxed{\frac{X.XX}{X.XX}}$ DENOTES DIMENSIONS
IN MILLIMETERS

Note:
1) Controlling dimensions in inches.
2) Ref: JEDEC MO-137B/AD
3) Dimensions do not include mold flash, protrusions or gate burrs

Pericom Semiconductor Corporation
3545 N. 1st Street, San Jose, CA 95134
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DESCRIPTION: 20-Pin, 150-Mil Wide, QSOP

PACKAGE CODE: Q

Ordering Information

Ordering Code	Package Code	Package Type
PI5C3245LE	L	Pb-free & Green, 20-pin 173-mil wide plastic TSSOP
PI5C3245QE	Q	Pb-free & Green, 20-pin 150-mil wide plastic QSOP

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

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