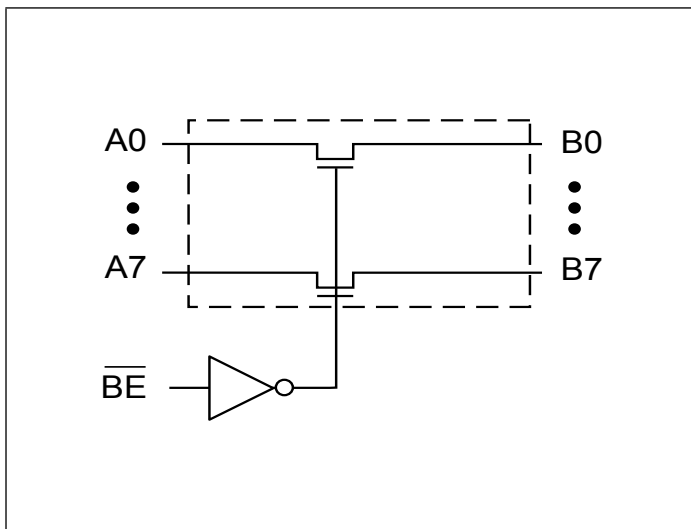


2.5V/3.3V, High Bandwidth, Hot Insertion 8-Bit, 2-Port, Bus Switch

Features

- Near-Zero propagation delay
- 5-ohm switches connect inputs to outputs
- High Bandwidth Operation (>400 MHz)
- Permits Hot Insertion
- 5V I/O Tolerant
- Rail-to-Rail 3.3V or 2.5V Switching
- 2.5V Supply Voltage Operation
- Packaging (Pb-free & Green):
 - 20-pin 150 mil wide plastic QSOP (Q)

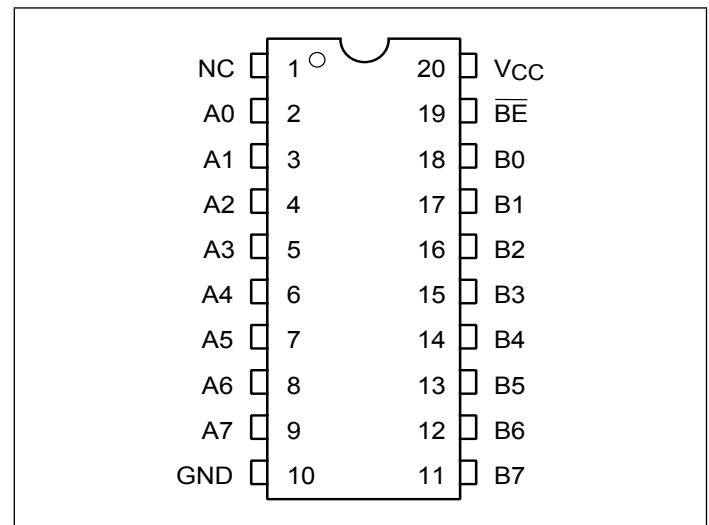
Block Diagram



Description

Pericom Semiconductor's PI3C3245 is a 2.5 volt or 3.3 volt 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{BE}) input signal. It is very useful in switching signals that have high bandwidth (>400 MHz).

Pin Configuration



Truth Table⁽¹⁾

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

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

Pin Description

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

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 ±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 | μA |
| I _{IL} | Input LOW Current | V _{CC} = Max., V _{IN} = GND | | | ±1 | |
| I _{OZH} ⁽³⁾ | High Impedance Output Current | 0 ≤ A, B ≤ 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 | |

Notes:

- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
- Typical values are at V_{CC} = 3.3V, T_A = 25°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.

Capacitance (T_A = 25°C, f = 1 MHz)

| Parameters ⁽¹⁾ | 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:

- 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} | | 260 | 500 | μA |
| ΔI _{CC} | Supply Current per Input HIGH | V _{CC} = Max. | V _{IN} = 3.0V ⁽³⁾ | | | 750 | |

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 ⁽¹⁾ | PI3C3245 | | Units |
|--------------------------------------|-------------------------------------------------|-------------------------------------------------|----------|------|-------|
| | | | Com. | | |
| | | | Min | Max | |
| t _{PLH} t _{PHL} | Propagation Delay ^(1,2) 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 | 1.5 | 6.5 | |
| t _{PHZ} t _{PLZ} | Bus Disable Time \overline{BE} to Ax or Bx | R = 500Ω | 1.5 | 5.5 | |

Notes:

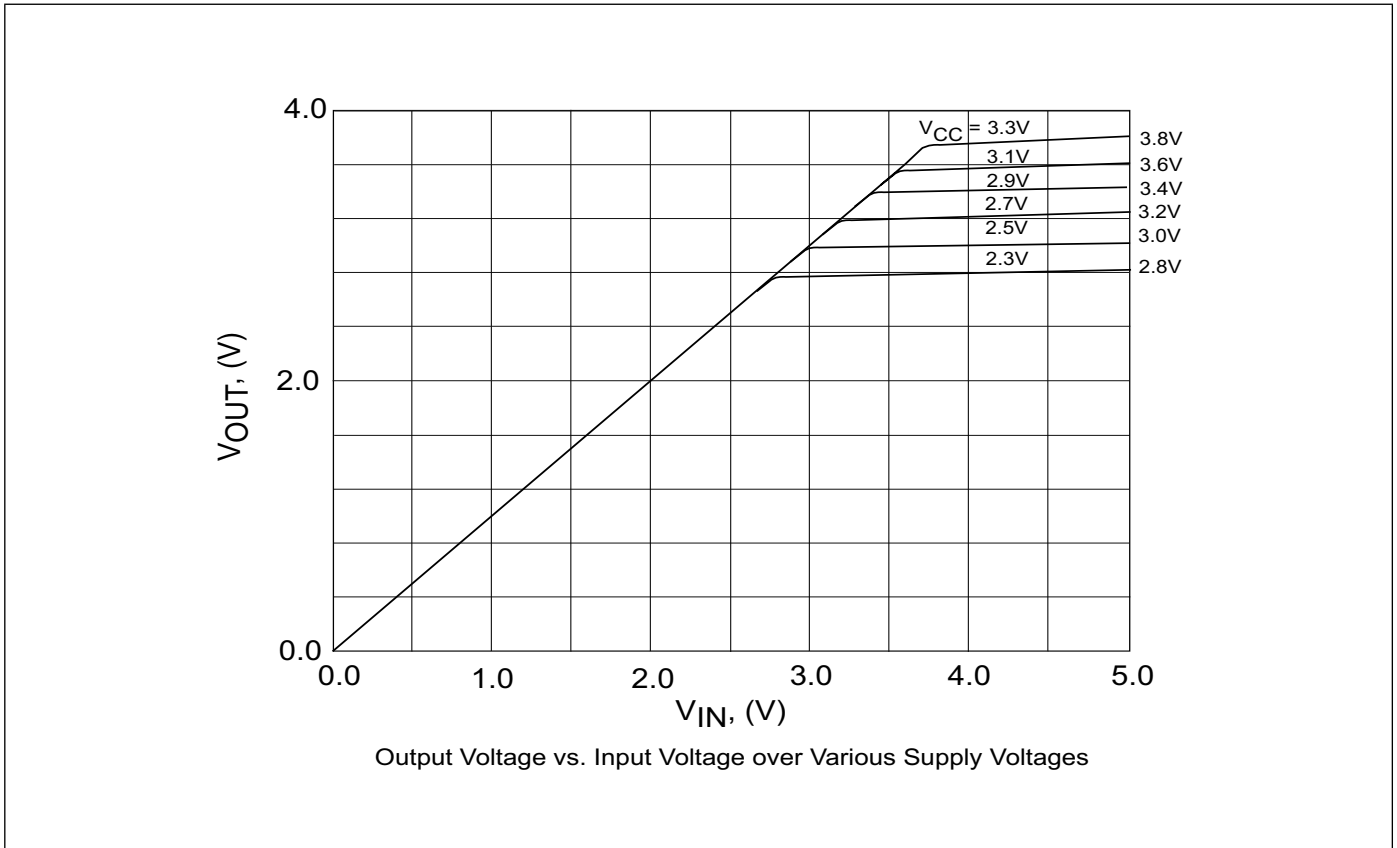
1. This parameter is guaranteed but not tested on Propagation Delays.
2. The bus switch contributes no propagational delay other than the RC delay of the On-Resistance of the switch and the load capacitance. The time constant for the switch alone is of the order of 0.25 ns for 50 pF load. Since this 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.

Switching Characteristics over 2.5V Operating Range

| Parameters | Description | Test Conditions ⁽¹⁾ | PI3C3245 | | Units |
|--------------------------------------|-------------------------------------------------|-------------------------------------------------|----------|------|-------|
| | | | Com. | | |
| | | | Min | Max | |
| t _{PLH} t _{PHL} | Propagation Delay ^(1,2) 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 | 1.5 | 9.8 | |
| t _{PHZ} t _{PLZ} | Bus Disable Time \overline{BE} to Ax or Bx | R = 500Ω | 1.5 | 8.3 | |

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.



Output Voltage vs. Input Voltage over Various Supply Voltages

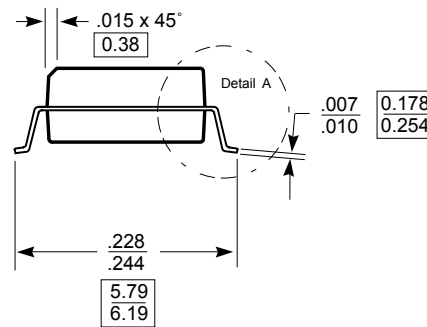
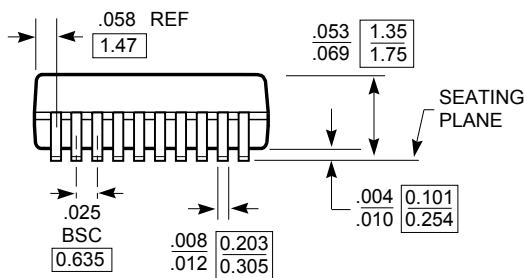
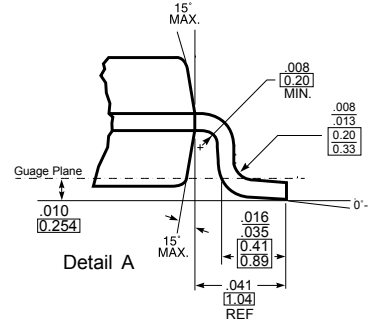
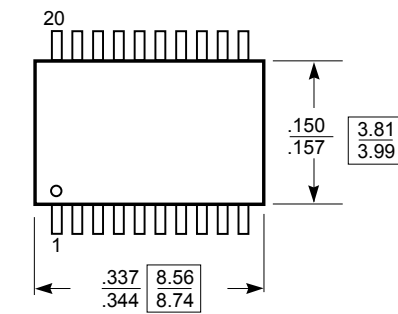
Packaging Mechanical: 20-pin 150-mil wide plastic QSOP (Q)

DOCUMENT CONTROL NO.

PD - 1202

REVISION: H

DATE: 10/22/07



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
 1-800-435-2335 • www.pericom.com

DESCRIPTION: 20-Pin, 150-Mil Wide, QSOP

PACKAGE CODE: Q

Ordering Information

| Ordering Code | Package Code | Package Type |
|---------------|--------------|------------------------------|
| PI3C3245QE | Q | Pb-free & Green, 20-pin QSOP |

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



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