



**PI3B16292
PI3B162292 (25Ω)**

3.3Volt, 24-Bit

Mux/Demux BusSwitch

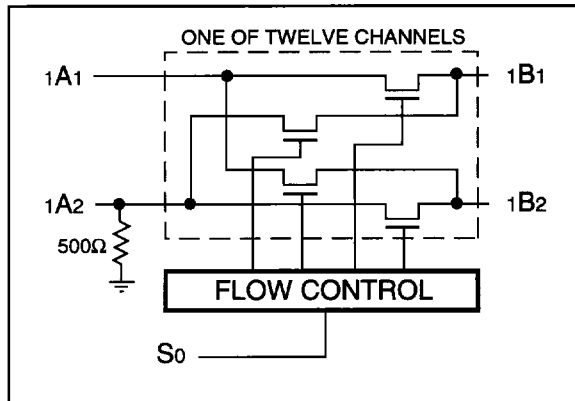
Features

- Near-zero propagation delay
- 5Ω switches connect inputs to outputs
- Fast Switching Speed - 5ns (max.)(16292)
- Internal 500Ω pull-down on A2 ports
- Ultra-low quiescent power (0.2 μA typical) – Ideally suited for notebook applications
- Vcc Operating Range : 2.3V to 3.6V
- Industrial operating temperature: -40°C to +85°C
- Make-before-break switching
- Packages available:
 - 56-pin 240-mil wide thin plastic TSSOP (A56)
 - 56-pin 300-mil wide plastic SSOP (V56)

Applications

- Memory switching

Logic Block Diagram



Truth Table

| Function | S0 | A1 | A2 |
|--------------------|----|----|----|
| A1 to B1, A2 to B2 | L | B1 | B2 |
| A1 to B2, A2 to B1 | H | B2 | B1 |

Note:

1. H = High Voltage Level
L = Low Voltage Level
Z = High Impedance

Description

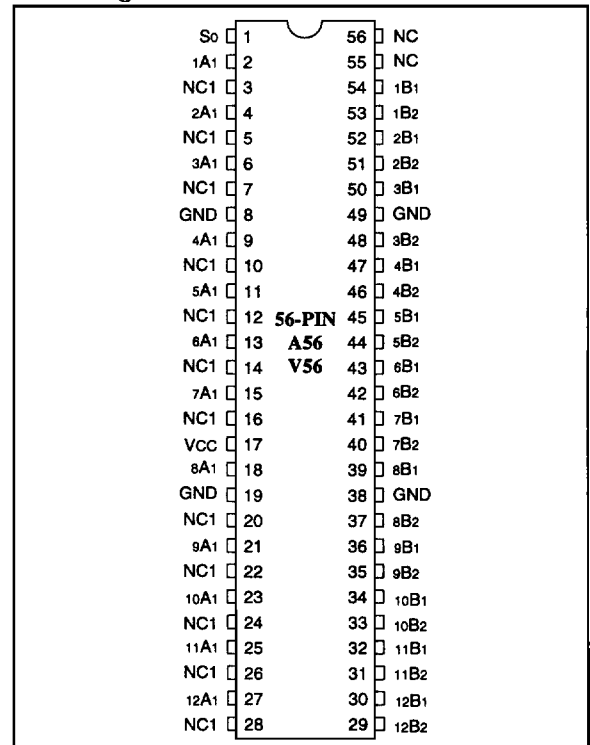
Pericom Semiconductor's PI3B series of logic circuits are produced in the Company's advanced 0.35 micron CMOS technology.

The PI3B 16292 and PI3B 162292 are 3.3 volt 12-bit to 24-bit Mux/Demux Bus switches designed with a low ON resistance allowing inputs to be connected directly to outputs.

The PI3B162292 device has a built-in 25-ohm series resistor to reduce noise resulting from reflections, thus eliminating the need for an external terminating resistor.

A2 port is not externally connected and, as a result, has an internal 500-ohm pulldown resistor to ground.

Pin Configuration



Product Pin Description

| Pin Name | I/O | Description |
|----------|-----|--|
| S0 | I | Select Inputs |
| xA1 | I/O | Bus A |
| xBx | I/O | Bus B |
| NC | | Internally pulled up thru 4.7kΩ resistor |
| NC1 | | Leave it unconnected |



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 | -0°C to +85°C |
| Supply Voltage Range | -0.5V to +4.6V |
| DC Input Voltage | -0.5V to +4.6V |
| DC Output Current | 120 mA |
| Power Dissipation | 0.5Watt |

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.

Recommended Operating Condition

| Parameter | Description | Min. | Max. | Units |
|-----------------|--------------------------------|------|------|-------|
| V _{CC} | Supply Voltage | 2.3 | 3.6 | V |
| T _A | Operating Free-Air Temperature | -40 | 85 | °C |

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 _I | Input Current | V _{CC} = Max., V _{IN} = V _{CC} or GND | — | — | ±1 | μA | |
| | | V _{CC} = 0, V _{IN} = V _{CC} | — | — | 10 | μA | |
| V _{IK} V | Clamp Diode Voltage | V _{CC} = Min., I _{IN} = -18 mA | | — | -0.7 | -1.2 | |
| RON | Switch On Resistance ⁽³⁾ | V _{CC} = Min., V _{IN} = 0.0V, I _{ON} = 64 mA | 16292 162292 | — 20 | 5 28 | 7 40 | Ω |
| | | V _{CC} = Min., V _{IN} = 2.4V, I _{ON} = 15 mA | 16292 162292 | — 20 | 10 35 | 15 48 | Ω |

Capacitance (T_A = 25°C, f = 1 MHz)

| Parameters ⁽⁴⁾ | Description | Test Conditions | Max. | Units |
|---------------------------|----------------------------|----------------------|------|-------|
| C _{IN} | Input Capacitance | V _{IN} = 0V | | pF |
| C _{ON} | A/B Capacitance, Switch On | V _{IN} = 0V | | pF |

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, T_A = 25°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} = MAX. | V _{IN} = GND or V _{CC} | — | — | 10 | μA |
| ΔI _{CC} ⁽³⁾ | Supply Current for S0 @ TTL HIGH | V _{CC} = MAX. | V _{IN} = 3.0 V ⁽⁴⁾ Other Inputs at V _{CC} OR GND | — | — | 750 | μA |
| I _{CCD} | Supply Current for S0 per MHz ⁽⁵⁾ Toggling 50% Duty Cycle | V _{CC} = Max., A and B Pins Open | | — | — | 0.25 | mA/ MHz |

Notes:

1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for applicable device.
2. Typical values are at V_{CC} = 3.3V, +25°C ambient.
3. This is the increase in supply current for S0 at the specified TTL voltage level rather than V_{CC} or GND.
4. Per driven input (S0 only); A and B pins do not contribute to I_{CC}.
5. 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.

PI3B16292 Switching Characteristics over Operating Range

| Parameters | Description | Conditions ⁽¹⁾ | Com. | | Unit |
|------------------|---------------------------------------|--|------|------|------|
| | | | Min | Max | |
| t _{PLH} | Propagation Delay ^(2,3) | C _L = 50 pF R _L = 500Ω R = 500Ω to 6V ⁽⁴⁾ | — | 0.25 | ns |
| t _{PHL} | xA1 to xBx, xBx to xA1 | | | | |
| t _{PZH} | Bus Enable time | | 1 | 4 | ns |
| t _{PZL} | S to xA1 or xBx | | | | |
| t _{PHZ} | Bus Disable time | | 1 | 4.5 | ns |
| t _{PLZ} | S to xA1 or xBx | | | | |
| t _m | Make-before-break time ⁽²⁾ | | 0 | 2 | ns |

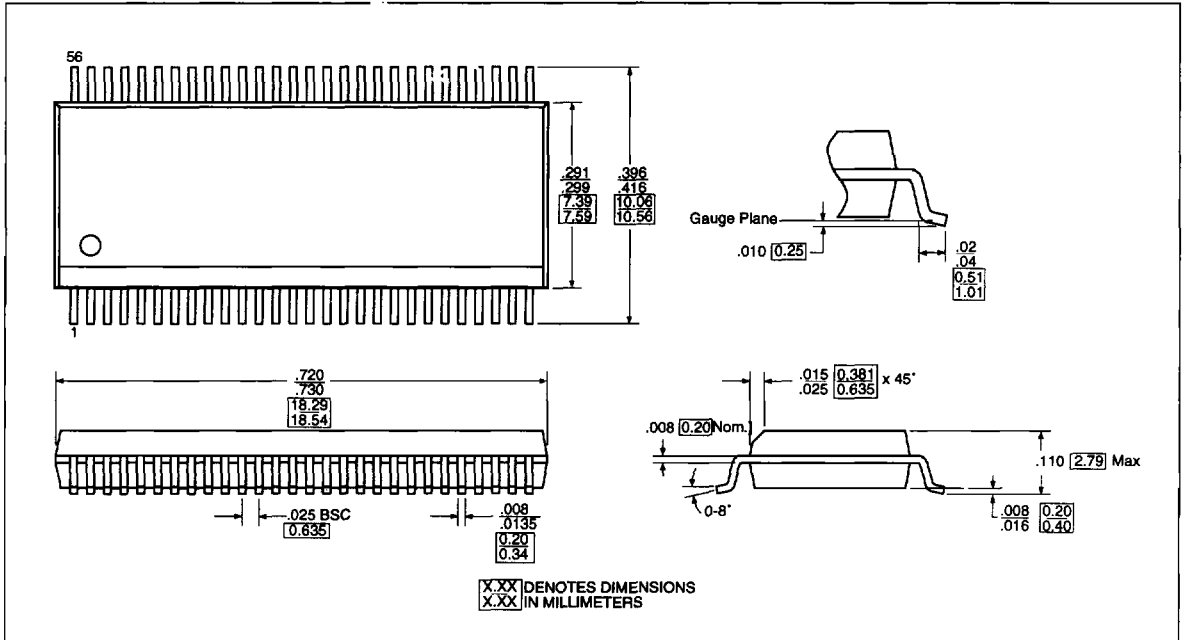
PI3B162292 Switching Characteristics over Operating Range

| Parameters | Description | Conditions ⁽¹⁾ | Com. | | Unit |
|------------------|---------------------------------------|--|------|------|------|
| | | | Min | Max | |
| t _{PLH} | Propagation Delay ^(2,3) | C _L = 50 pF R _L = 500Ω R = 500Ω to 4.6V ⁽⁴⁾ | — | 1.25 | ns |
| t _{PHL} | xA1 to xBx, xBx to xA1 | | | | |
| t _{PZH} | Bus Enable Time | | 1 | 5 | ns |
| t _{PZL} | S to xA1 or xBx | | | | |
| t _{PHZ} | Bus Disable Time | | 1 | 5.5 | ns |
| t _{PLZ} | S to xA1 or xBx | | | | |
| t _m | Make-before-break time ⁽²⁾ | | 0 | 2 | ns |

Notes:

1. See test circuit and wave forms.
2. This parameter is guaranteed but not tested.
3. The bus switch contributes no propagational delay other than the RC delay of the ON resistance of the switch and 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 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.
4. Applies to t_{PLZ} and t_{PZL}.

56-Pin SSOP (300 MIL WIDE) - Package Code: V56



56-Pin TSSOP (240 MIL WIDE) - Package Code: A56

