

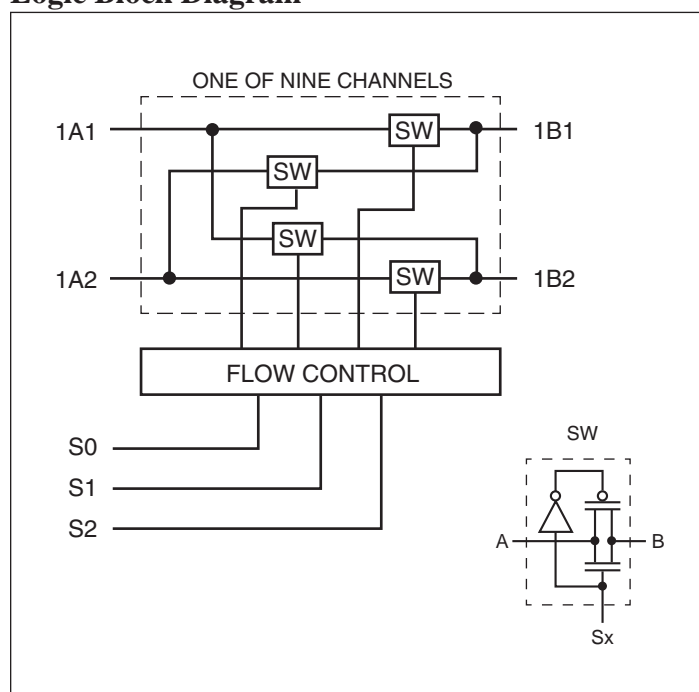
Product Features

- Near-zero propagation delay
- 5-ohm switches connect inputs to outputs
- Fast switching speed: 5ns (max.)
- Operating Range: 3.0V to 3.6V
- Packaging (Pb-free & Green Available):
 - 48-pin, 240-mil wide thin plastic TSSOP (A)

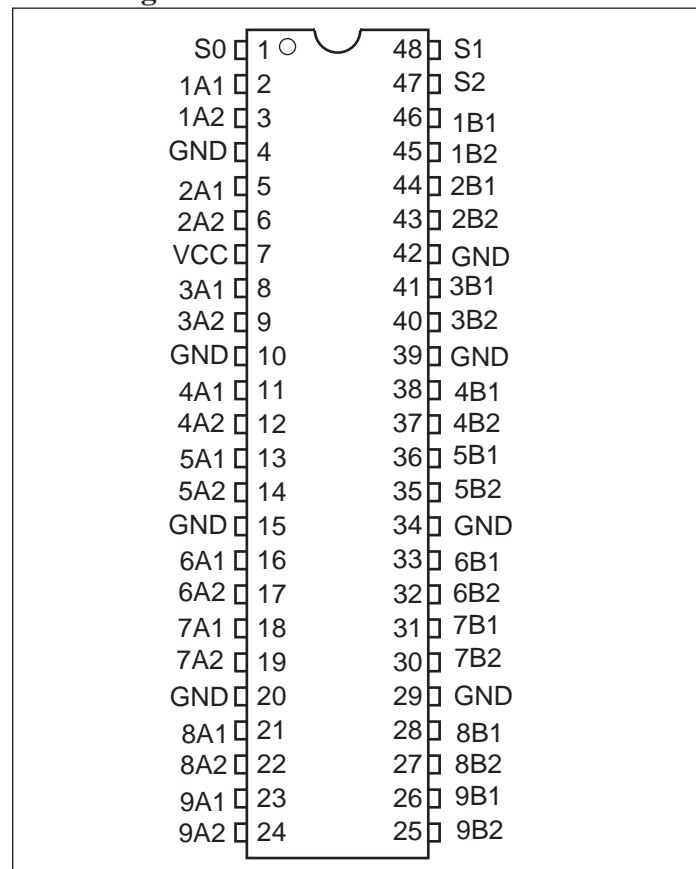
Description

The PI3B16209 is a 3.3 volt, 18-bit bus exchange switch designed with a low On-resistance (5-ohm) allowing inputs to be connected directly to outputs. The device operates as either an 18-bit bus switch or as a 9-bit exchanger, providing data exchange between four signal ports via the data select pins (S0-S2).

Logic Block Diagram



Pin Configuration



Truth Table⁽¹⁾

Function	S2	S1	S0	A1	A2
Disconnect	L	L	L	Z	Z
A1 to B1	L	L	H	B1	Z
A1 to B2	L	H	L	B2	Z
A2 to B1	L	H	H	Z	B1
A2 to B2	H	L	L	Z	B2
Disconnect	H	L	H	Z	Z
A1 to B1, A2 to B2	H	H	L	B1	B2
A1 to B2, A2 to B1	H	H	H	B2	B1

Pin Description

Pin Name	I/O	Description
S0-S2	I	Select Inputs
xAx	I/O	Bus A
xBx	I/O	Bus B

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.....	120mA
Power Dissipation	1.0W

Note:

Stresses greater than those limited 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.

DC Electrical Characteristics (Over the Operating Range, $T_A = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$, $V_{CC} = 3.0\text{V}$ to 3.6V .)

Parameters	Description	Test Conditions ⁽¹⁾	Min.	Typ ⁽²⁾	Max.	Units
V_{IH}	Input HIGH Voltage	Guarantee Logic HIGH Level	2.0			V
V_{IL}	Input LOW Voltage	Guaranteed Logic LOW Level	−0.5		0.8	
I_{IH}	Input High Current	$V_{CC} = \text{Max.}, V_{IN} = V_{CC}$			±1	μA
I_{IL}	Input Low Current	$V_{CC} = \text{Max.}, V_{IN} = \text{GND}$			±1	
I_{OZ}	High Impedance Output Current	$0 \leq A, B, \leq V_{CC}$			±1	
V_{IK}	Clamp Diode Voltage	$V_{CC} = \text{Min.}, I_{IN} = -18\text{mA}$		−0.7	−1.2	V
R_{ON}	Switch ON Resistance ⁽³⁾	$V_{CC} = \text{Min.}, V_{IN} = 0.0\text{V } I_{ON} = 48\text{mA}$		5	8	Ω
		$V_{CC} = \text{Min.}, V_{IN} = 2.4\text{V } I_{ON} = 15\text{mA}$		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 $V_{CC} = 3.3\text{V}$, $T_A = 25^{\circ}\text{C}$ 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.

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

Parameters ⁽¹⁾	Descriptions	Test Conditions	Typ	Units
C_{IN}	Input Capacitance	$V_{IN} = 0\text{V}$	3	pF
C_{OFF}	A/B Capacitance, Switch Off		14	
C_{ON}	A/B Capacitance, Switch On		30	

Note:

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

Power Supply Characteristics

Parameters	Description	Conditions		Min.	Typ ⁽²⁾	Max.	Units
I _{CC}	Quiescent Power Supply Current	V _{CC} = Max.	V _{IN} = GND or V _{CC}			10	μA
ΔI _{CC}	Supply Current per Input @ TTL HIGH	V _{CC} = Max.	V _{IN} = 3.0V ⁽³⁾			750	
I _{CCD}	Supply Current per Input per MZ ⁽⁴⁾	V _{CC} = Max. A & B Pins Open 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} = 3.3V, +25°C ambient.
3. Per TTL driven input (control input only); A and B pins do not contribute to I_{CC}.
4. This current applies to the control inputs only and represents 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	Conditions	Com.		Units
			Min.	Max.	
t _{PLH} t _{PHL}	Propagation Delay ^(1,2) Ax to Bx or Bx to Ax	C _L = 50pF R _L = 500-ohm		0.25	ns
t _{PZH} t _{PZL}	Bus Enable Time Sx to Ax or Bx	C _L = 50pF R _L = 500-ohm	1	4.5	
t _{PHZ} t _{PLZ}	Bus Disable Time Sx to Ax or Bx	R = 500-ohm	1	5	

Notes:

1. This parameter is guaranteed but not tested on Propagation Delays.
2. This 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.

Applications Information

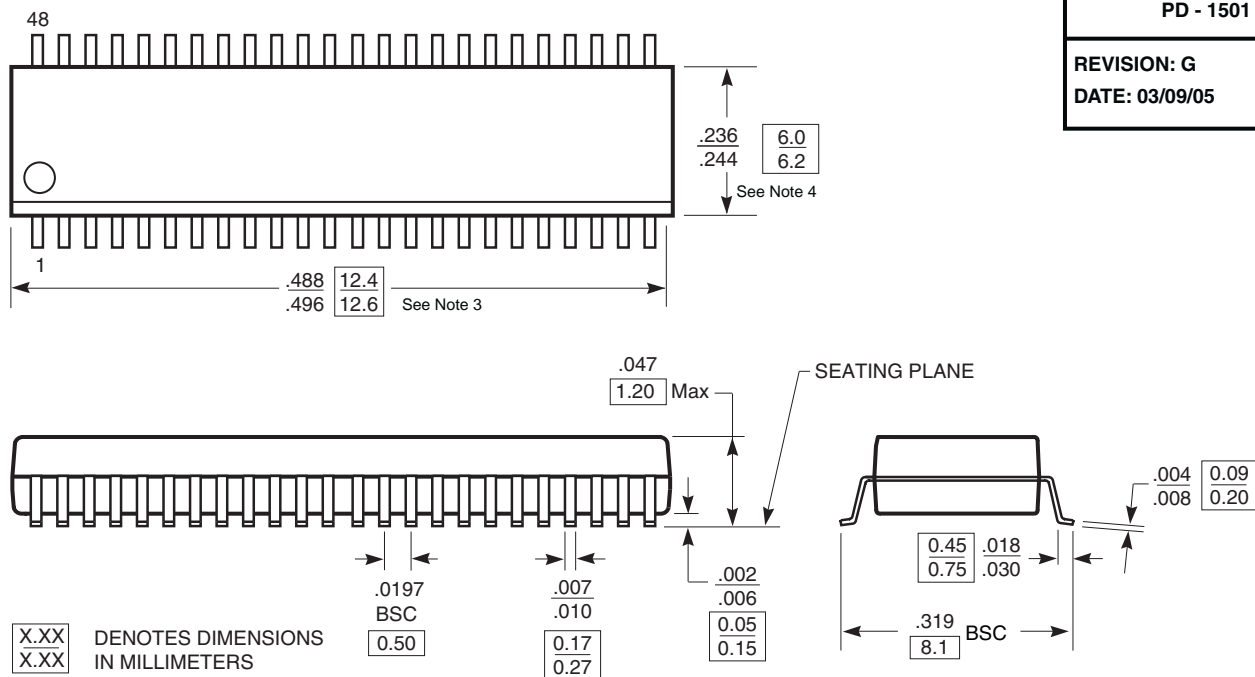
Logic Inputs

The logic control inputs can be driven up to +3.6V regardless of the supply voltage. For Example, given a +3.3V supply, IN may be driven low to 0V and high to 3.6V. Driving IN Rail-to-Rail® minimizes power consumption.

Power-Supply Sequencing and Hot-Plug Information

Proper power-supply sequencing is recommended for all CMOS devices. Always apply VCC and GND before applying signals to input/output or control pins.

Rail-to-Rail is a registered trademark of Nippon Motorola, Ltd.

Package Mechanical: 48-Pin TSSOP (A) Package
DOCUMENT CONTROL NO.
PD - 1501
REVISION: G
DATE: 03/09/05

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 Description
PI3B16209A	A	48-pin 240-mil wide TSSOP
PI3B16209AE	A	Pb-free & Green, 48-pin 240-mil wide TSSOP

Notes:

- Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
- E = Pb-free and Green