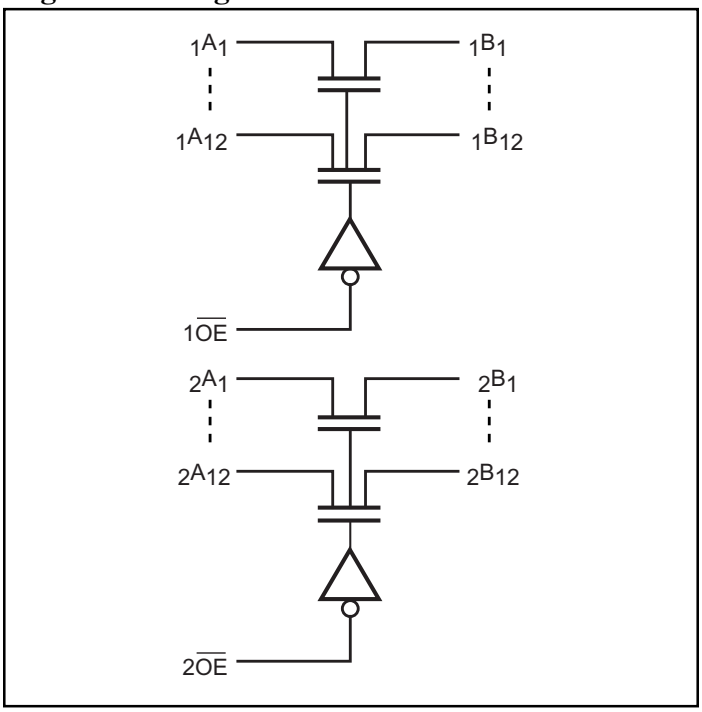
PI3C16211

3.3V, High Bandwidth 24-Bit Bus Switch

Product Features

- Near-zero propagation delay
- 5 Ohm switches connect inputs to outputs
- Direct bus connection when switches are ON
- Ultra-low quiescent power (0.2mA typical)
  – Ideally suited for notebook applications
- Industrial operating temperature: –40°C to +85°C
- Packages available:
  – 56-pin 240-mil wide thin plastic TSSOP (A)
  – 56-pin 300-mil wide plastic SSOP (V)

Logic Block Diagram



Truth Table

$1\overline{OE}$	$2\overline{OE}$	$_1A$, $_1B$ I/Os	$_2A$, $_2B$ I/Os
L	L	$_1A = _1B$	$_2A = _2B$
L	H	$_1A = _1B$	Z
H	L	Z	$_2A = _2B$
H	H	Z	Z

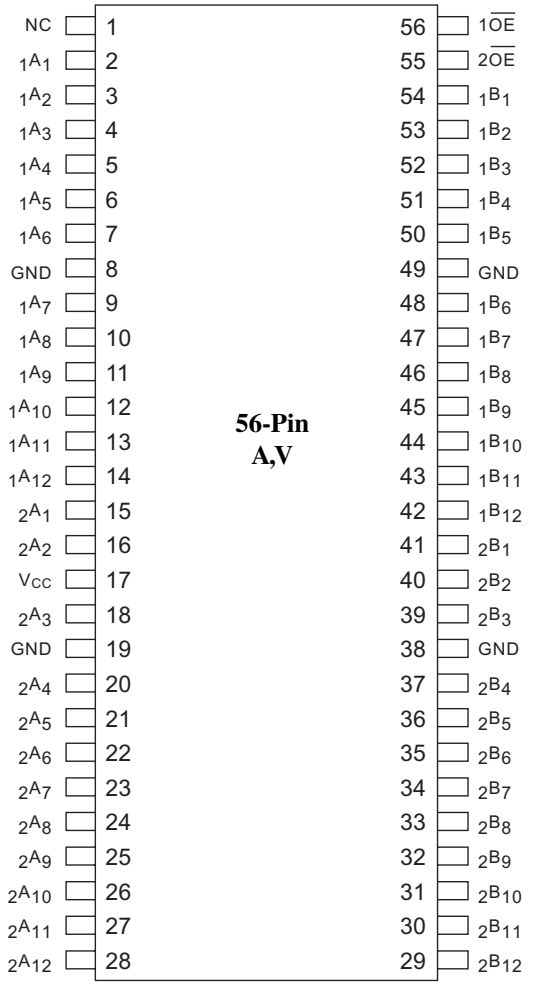
Note: 1. H = High Voltage Level
L = Low Voltage Level
Z = High Impedance

Product Description

Pericom Semiconductor's PI3C series of bus switch circuits are produced using the Company's advanced submicron CMOS technology.

The PI3C16211 is a 24-bit bus switch designed with a low ON resistance allowing inputs to be connected directly to outputs. This device operates as a 24-bit or a 12-bit bus switch, which provides high speed bus switching.

Product Pin Configuration



Product 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	–40°C to +85°C
Supply Voltage to Ground Potential (Inputs & V_{CC} Only)	–0.5V to +4.6V
Supply Voltage to Ground Potential (Outputs & D/O Only)	–0.5V to +4.6V
DC I/O Voltage	–0.5V to +5.5V
DC Output Current	120mA
Power Dissipation	0.5W

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.

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	
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_{OZ}[3]	High-Impedence Output Current	0 ≤ A, B ≤ V_{CC}	—	—	±1	
V_{IK}	Clamp diode Voltage	V_{CC} = Min., I_{IN} = –18mA	—	–0.73	–1.2	V
R_{ON}	Switch On Resistance[4]	V_{CC} = Min., V_{IN} = 0.0V I_{ON} = 48mA or 64mA	—	6.5	8.5	Ω
		V_{CC} = Min., V_{IN} = 2.4V I_{ON} = 15mA	—	10	15	

Capacitance (T_A = 25°C f = 1 MHz)

Parameters[5]	Description	Test Conditions	Typ.	Units
C_{IN}	Input Capacitance	V_{IN} = 0V	3.5	pF
C_{OFF}	A/B Capacitance, Switch Off		4.0	
C_{ON}	A/B Capacitance, Switch On		8.0	

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} = 3.3V, 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.
5. 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	850	µA
DI_{CC}	Supply Current per Input @ TTL HIGH	V_{CC} = Max. V_{IN} = 3.0V(3)	—	—	750	

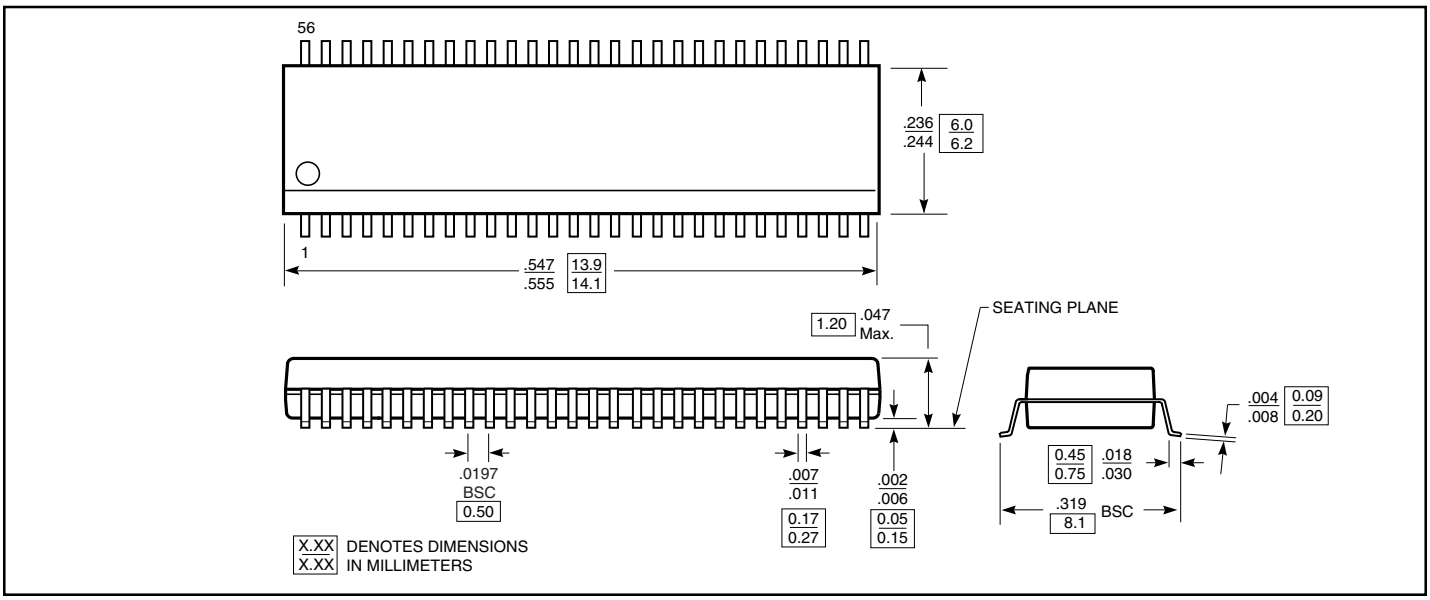
Notes:
1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device.
2. Typical values are at V_{CC} = 3.3V, +25°C ambient.
3. Per TTL driven input (control inputs only); A and B pins do not contribute to I_{CC}.

PI3C16211 Switching Characteristics Over Operating Range

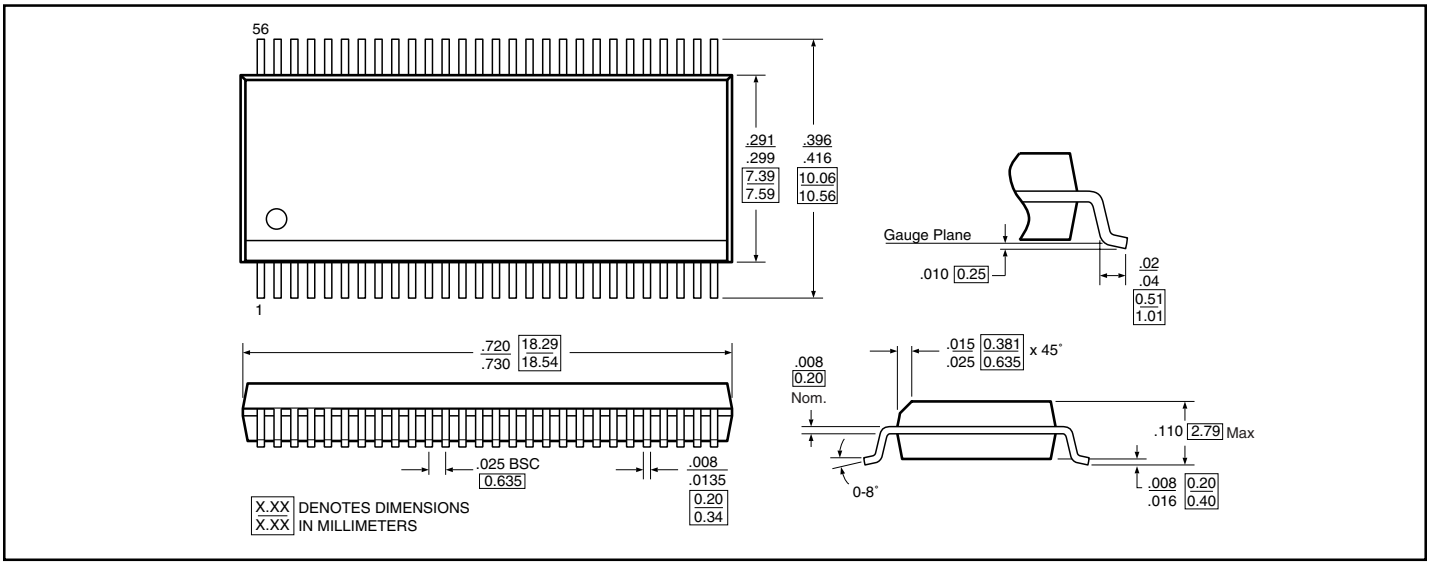
Parameters	Description	Conditions(1)	PI3C16211		
			Com		
			Min.	Max.	Units
t_{PLH} t_{PHL}	Propagation Delay(2,3) A_X to B_X, B_X to A_X	C_L = 50pF R_L = 500Ω	—	0.25	ns
t_{PZH} t_{PZL}	Bus Enable Time $n\overline{OE}$ to A_X or B_X	C_L = 50pF R_L = 500Ω R = 500Ω	1.5	6.5	
t_{PHZ} t_{PLZ}	Bus Disable Time $n\overline{OE}$ to A_X or B_X		1.5	5.5	

Notes:
1. See test circuit and waveforms.
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 0.25ns 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.

56-Pin TSSOP (A) Package



56-Pin SSOP (V) Package



Ordering Information

Part	Pin - Package	Width	Temperature
PI3C16211A	56 - TSSOP (A)	240-mil	0°C to 85°C
PI3C16211V	56 - SSOP (V)	300-mil	

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

Proper power-supply sequencing is recommended for all CMOS devices. Always apply V_{CC} before applying V_{BIAS} and signals to input/output or control pins.

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