24-Bit Bus Switch

Product Features

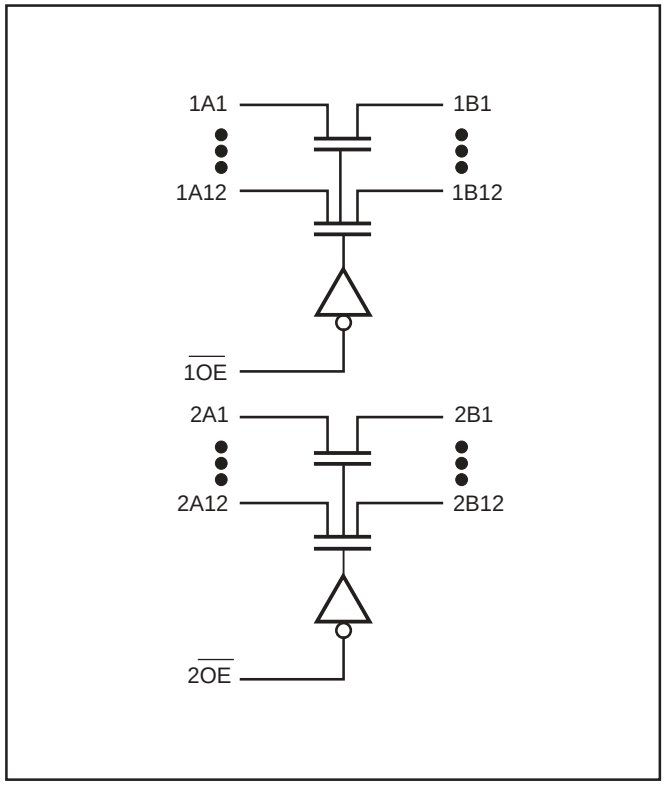
- Near-zero propagation delay
- 5-ohm switches connect inputs to outputs
- Direct bus connection when switches are ON
- Ultra-low quiescent power (0.2 µA typical)
  – Ideally suited for notebook applications
- Industrial operating temperature: –40°C to +85°C
- Packages available:
  – 56-pin 173-mil wide plastic TVSOP (K)
  – 56-pin 240-mil wide thin plastic TSSOP (A)
  – 56-pin 300-mil wide plastic SSOP (V)

Product Description

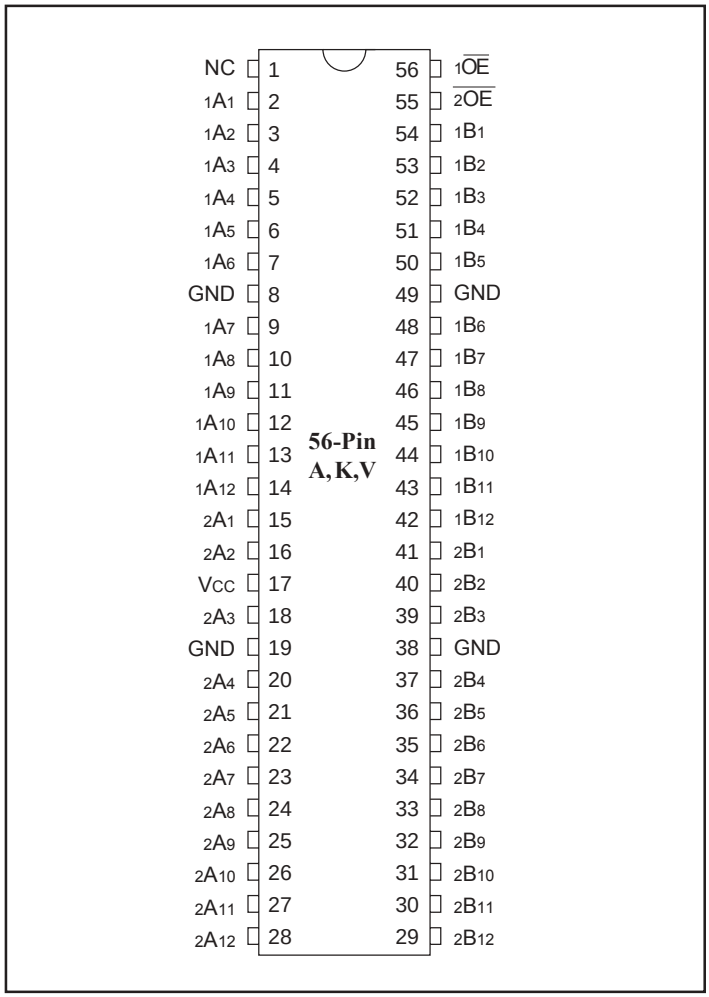
Pericom Semiconductor's PI5C series of logic circuits are produced using the Company's advanced submicron CMOS technology.

The PI5C16211 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.

Logic Block Diagram



Product Pin Configuration



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 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 & Vcc Only)	–0.5V to +7.0V
Supply Voltage to Ground Potential (Outputs & D/O Only)	–0.5V to +7.0V
DC Input Voltage	–0.5V to +7.0V
DC Output Current	120mA
Power Dissipation	1.4W

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 $+85°C$, $V_{CC} = 5V \pm 10\%$)

Parameters	Description	Test Conditions	Min.	Typ(1)	Max.	Units
V_{IK}	Clamp Diode Voltage	$V_{CC} = 4.5V$, $I_I = –18mA$	—	—	–1.2	V
I_I	Input LOW Current	$V_{CC} = 5.5V$, $V_I = V_{CC}$ or GND	—	—	10	µA
		$V_{CC} = 0V$, $V_I = 5.5V$	—	—	±1	
I_{CC}	Quiescent Power Supply Current	$V_{CC} = 5.5V$, $V_I = V_{CC}$ or GND	—	—	3.0	
ΔI_{CC}	Supply Current per Control Input @ TTL High	$V_{CC} = 5.5V$, One input at 3.4V, other inputs at V_{CC} or GND	—	—	2.5	mA
C_I(2)	Control Input Capacitance	$V_I = 3V$ or 0	—	4.5	—	pF
$C_{IO(OFF)}$(2)	A/B Switch OFF Capacitance	$V_O = 3V$ or 0, $\overline{OE} = V_{CC}$	—	5.5	—	
R_{ON}	Switch On Resistance(3)	$V_{CC} = 4.0V$, $V_I = 2.4V$, $I_I = 15mA$	—	14	20	ohm
		$V_{CC} = 4.5V$, $V_I = 0V$, $I_I = 64mA$	—	5	7	
		$V_{CC} = 4.5V$, $V_I = 0V$, $I_I = 30mA$	—	5	7	
		$V_{CC} = 4.5V$, $V_I = 2.4V$, $I_I = 15mA$	—	8	12	

Notes:
1. Typical values are at $V_{CC} = 5.0V$, $T_A = 25°C$ ambient and maximum loading.
2. This parameter is determined by device characterization but is not production tested.
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.

Power Supply Characteristics

Parameters	Description	Min.	Typ(1)	Max.	Units
V_{CC}	Supply Voltage	4.0	—	5.5	V
V_{IH}	High Level Input Voltage	2.0	—	—	V
V_{IL}	Low Level Input Voltage	—	—	0.8	V
T_A	Operating Free-Air temp	-40	—	85	°C

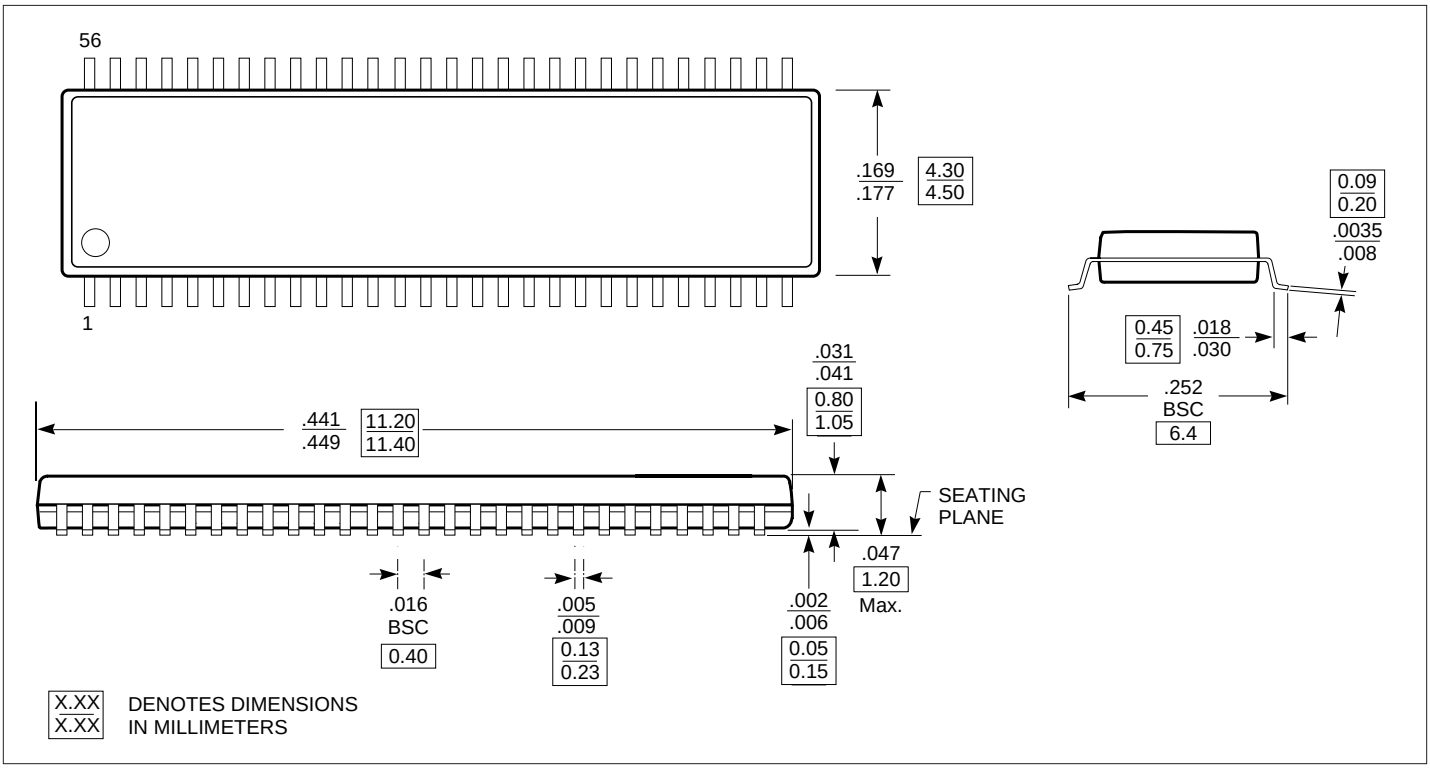
Note:
1. Typical values are at V_{CC} = 5.0V, +25°C ambient.

Switching Characteristics over Operating Range

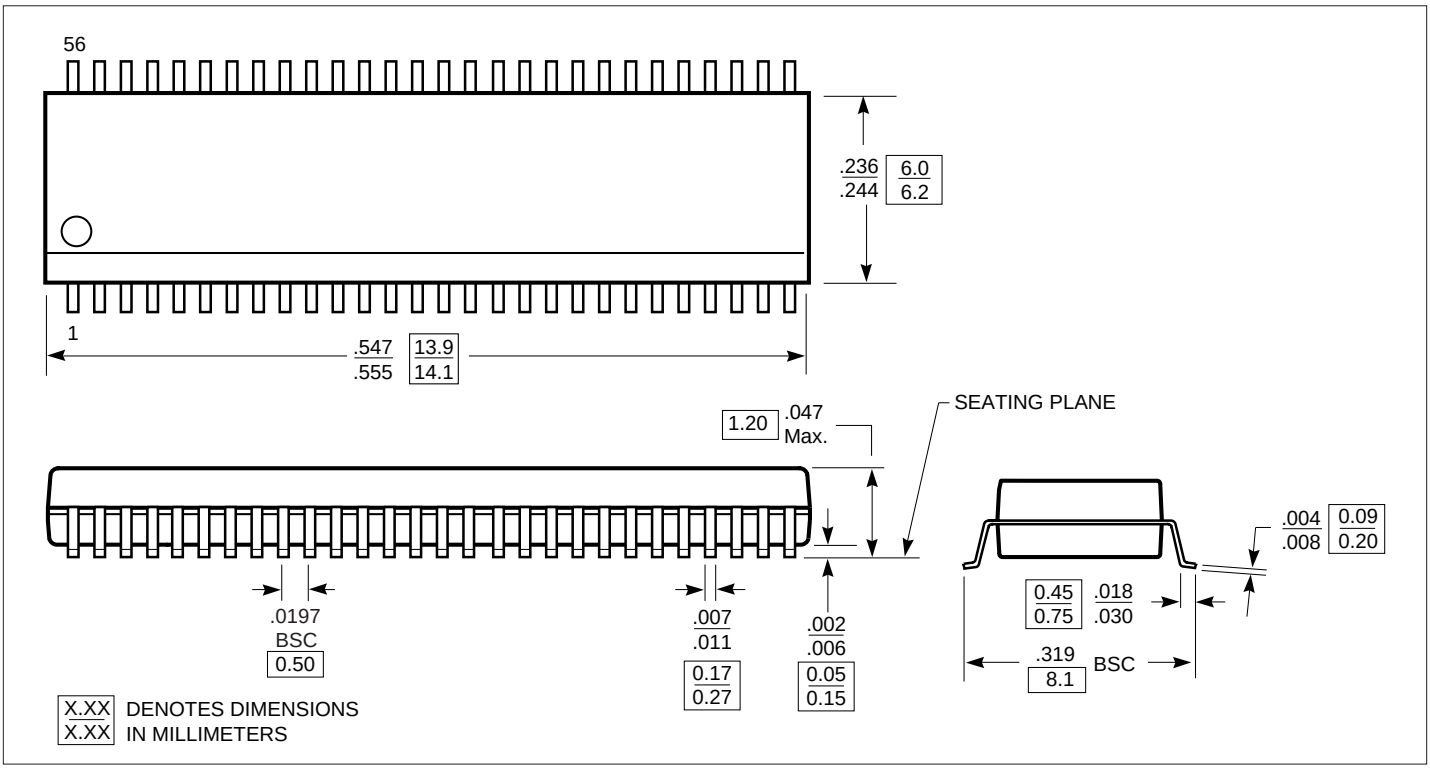
Parameters	From (INPUT)	To (OUTPUT)	Test Conditions	V_{CC} = 5 V ± 0.5 V		V_{CC} = 4 V		Units
				Min.	Max.	Min.	Max.	
t_{PD}(1)	A or B	B or A	C_L = 50pF R_L = 500-ohm	—	0.25	—	0.25	ns
t_{EN}	$\overline{OE}$	A or B		1.5	9.3	—	10.1	
t_{DIS}	$\overline{OE}$	A or B		1.5	8.5	—	7.1	

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

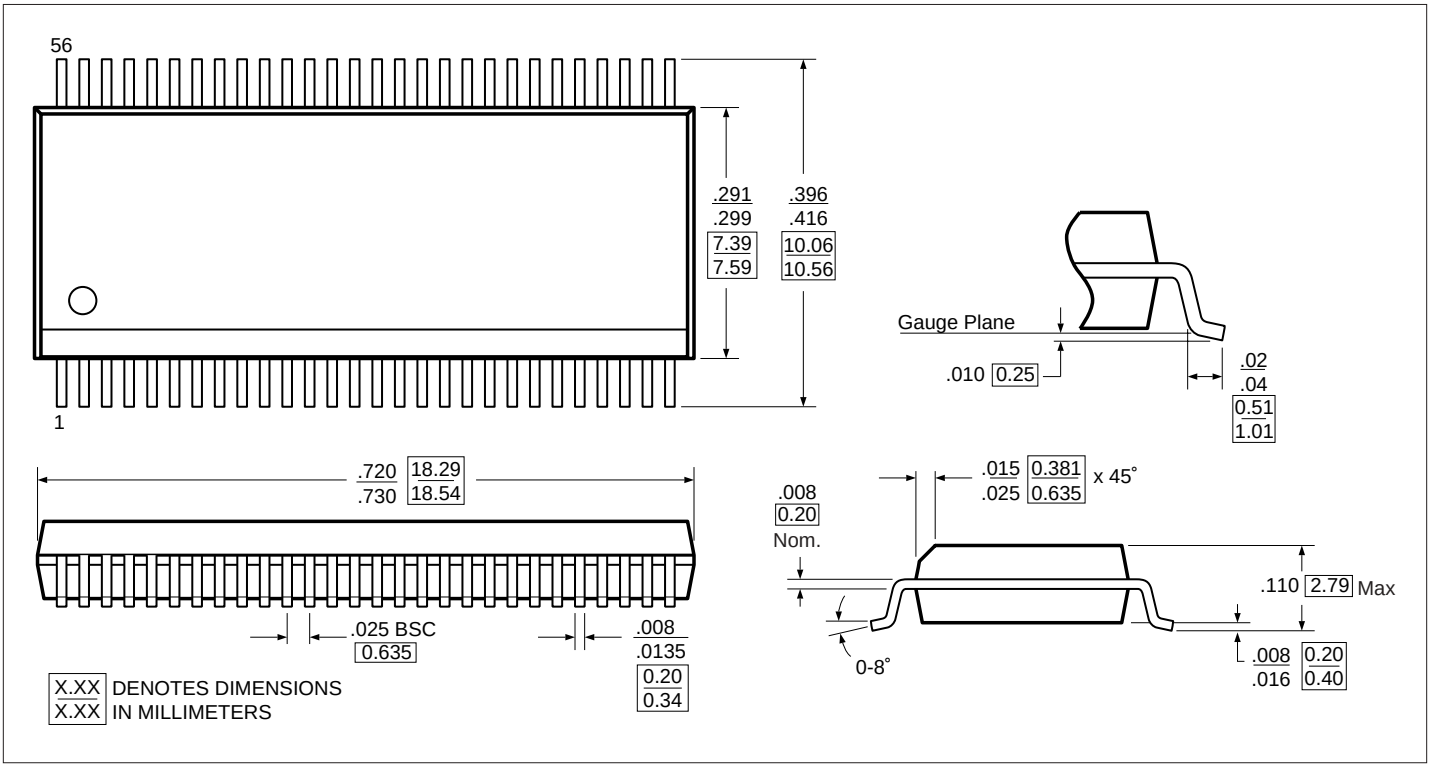
Packaging Mechanical: 56-pin TVSOP (K)



Packaging Mechanical: 56-pin TSSOP (A)



Packaging Mechanical: 56-pin SSOP (V)



Ordering Information

Part	Pin-Package	Temperature
PI5C16211A	56 - TSSOP (A)	–40°C to +85°C
PI5C16211K	56 - TSSOP (K)	–40°C to +85°C
PI5C16211V	56 - TSSOP (V)	–40°C to +85°C