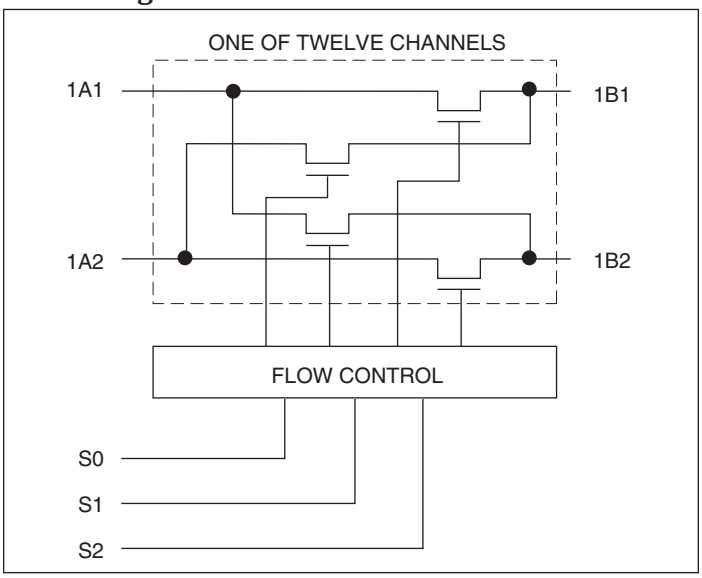
3.3V, 24-Bit Bus Exchange Switch

Features

- Near-zero propagation delay
- 5-ohm switches connect inputs to outputs
- Direct bus connection when switches are ON
- Fast Switching Speed: 5ns (max.)
- V_{CC} Operating Range: 3.0V to 3.6V
- Industrial operating temperature: –40°C to +85°C
- Packages available:
  - – 56-pin 240-mil wide thin plastic TSSOP (A56)
  - – 56-pin 300-mil wide plastic SSOP (V56)

Block Diagram



Truth Table(1)

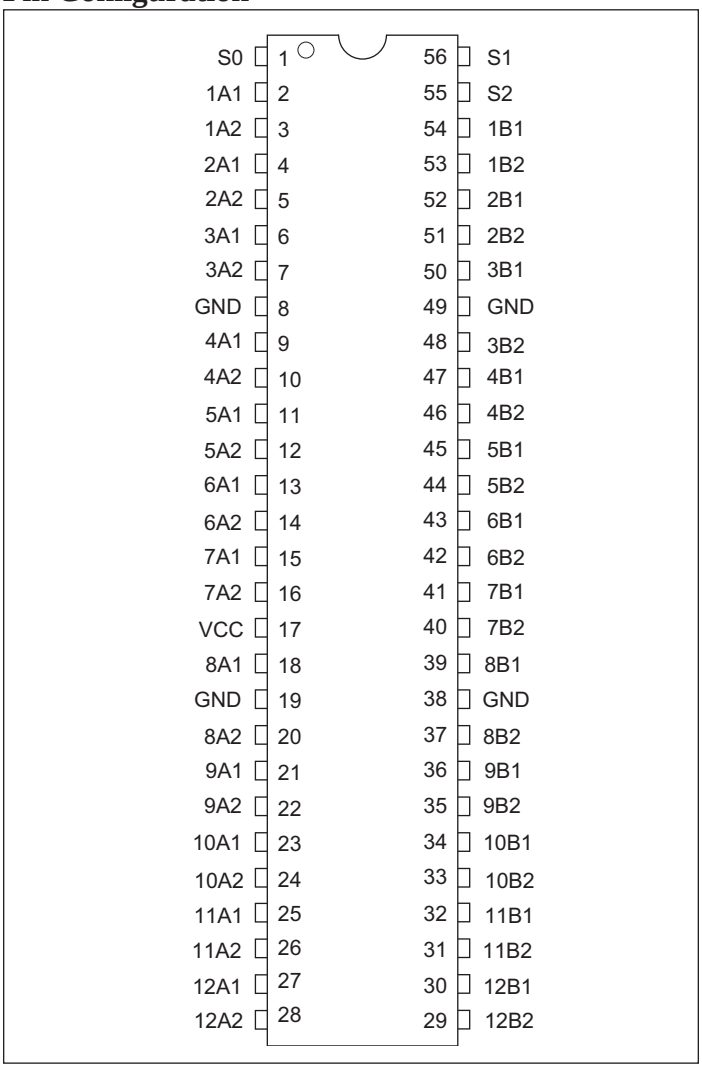
Function	S2	S1	S0	A1	A2
Disconnect	L	L	L	Z	Z
A1 to B1	L	L	H	B1	Z
A1 to B2	L	H	L	B2	Z
A2 to B1	L	H	H	Z	B1
A2 to B2	H	L	L	Z	B2
Disconnect	H	L	H	Z	Z
A1 to B1, A2 to B2	H	H	L	B1	B2
A1 to B2, A2 to B1	H	H	H	B2	B1

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

Description

The PI3B16212 is a 3.3 volt, 24-bit bus exchange switches designed with low ON resistance allowing inputs to be connected directly to outputs. The device operates as a 24-bit bus switch or as a 12-bit exchanger, providing data exchange between the four signal ports via the data select pins (S0-S2).

Pin Configuration



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	120 mA
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} = 3.0V to 3.6V)

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_I	Input Current	V_{CC} = Max.; V_{IN} = V_{CC} or GND			±1	µA
		V_{IN} = V_{CC}			±1	
I_{OZ}	High Impedance Output Current	0< A, B>V_{CC}, Switches OFF			±1	
V_{IK}	Clamp Diode Voltage	V_{CC} = Min, I_{IN} = –18mA	–	–0.7	–1.2	V
R_{ON}	Switch ON Resistance(3)	V_{CC} = Min.; V_{IN} = 0.0V, I_{ON} = –64mA	–	5	8	Ohm
		V_{CC} = Min.; V_{IN} = 2.4V, I_{ON} = –15mA	–	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} = 3.3V, 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.

Capacitance (T_A = 25°C, f = 1 MHz)

Parameters(1)	Description	Test Conditions	Typ.	Units
C_{IN}	Input Capacitance	V_{IN} = 0V	3.0	pF
C_{OFF} 07-0002	A/B Capacitance, Switch Off		14.0	
C_{ON}	A/B Capacitance, Switch On		30.0	

Note:
1. 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 per S0 @ TTL High	V_{CC} = Max.	V_{IN} = 3.0V Other Inputs @ V_{CC} or GND			750	
I_{CCD}	Supply Current per Input per MHz(4) Toggling 50% Duty Cycle	V_{CC} = Max. A & B Pin Open				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 inputs only); A and B pins do not contribute to I_{CC}.
4. 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.

PI3B16212 Switching Characteristics over Operating Range

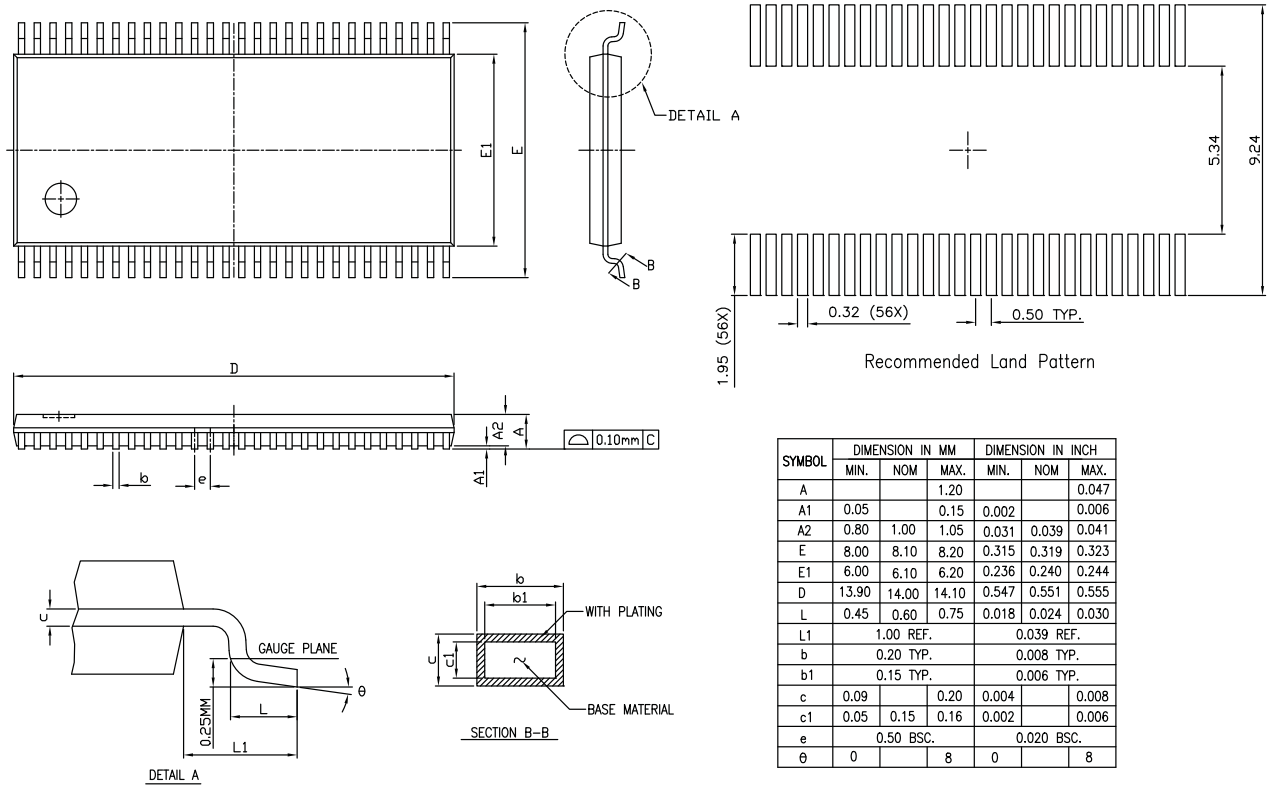
Parameters	Description	Conditions	Com.		Units
			Max.	Min.	
t_{PLH} t_{PHL}	Propogation Delay(1,2) Ax to Bx, Bx to Ax	C_L = 50pF R_L = 500Ω		0.25	ns
t_{PZH} t_{PZL}	Bus Enable Time Sx to Ax or Bx	C_L = 50pF R_L = 500Ω R = 500Ω	1	4.4	
t_{PHZ} t_{PLZ}	Bus Disable Time Sx to Ax or Bx		1	5.0	

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 0.25ns 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.

07-0002

Packaging Mechanical: 56-Pin TSSOP (A) Package



SYMBOL	DIMENSION IN MM			DIMENSION IN INCH		
	MIN.	NOM	MAX.	MIN.	NOM	MAX.
A			1.20			0.047
A1	0.05		0.15	0.002		0.006
A2	0.80	1.00	1.05	0.031	0.039	0.041
E	8.00	8.10	8.20	0.315	0.319	0.323
E1	6.00	6.10	6.20	0.236	0.240	0.244
D	13.90	14.00	14.10	0.547	0.551	0.555
L	0.45	0.60	0.75	0.018	0.024	0.030
L1	1.00 REF.			0.039 REF.		
b	0.20 TYP.			0.008 TYP.		
b1	0.15 TYP.			0.006 TYP.		
c	0.09		0.20	0.004		0.008
c1	0.05	0.15	0.16	0.002		0.006
e	0.50 BSC.			0.020 BSC.		
θ	0		8	0		8

Notes:
1. Controlling dimensions in millimeters.
2. Ref: JEDEC MO-153F/EE
3. Package Outline Exclusive of Mold Flash and Metal Burr

PERICOM Semiconductor Corporation

DATE: 09/11/06

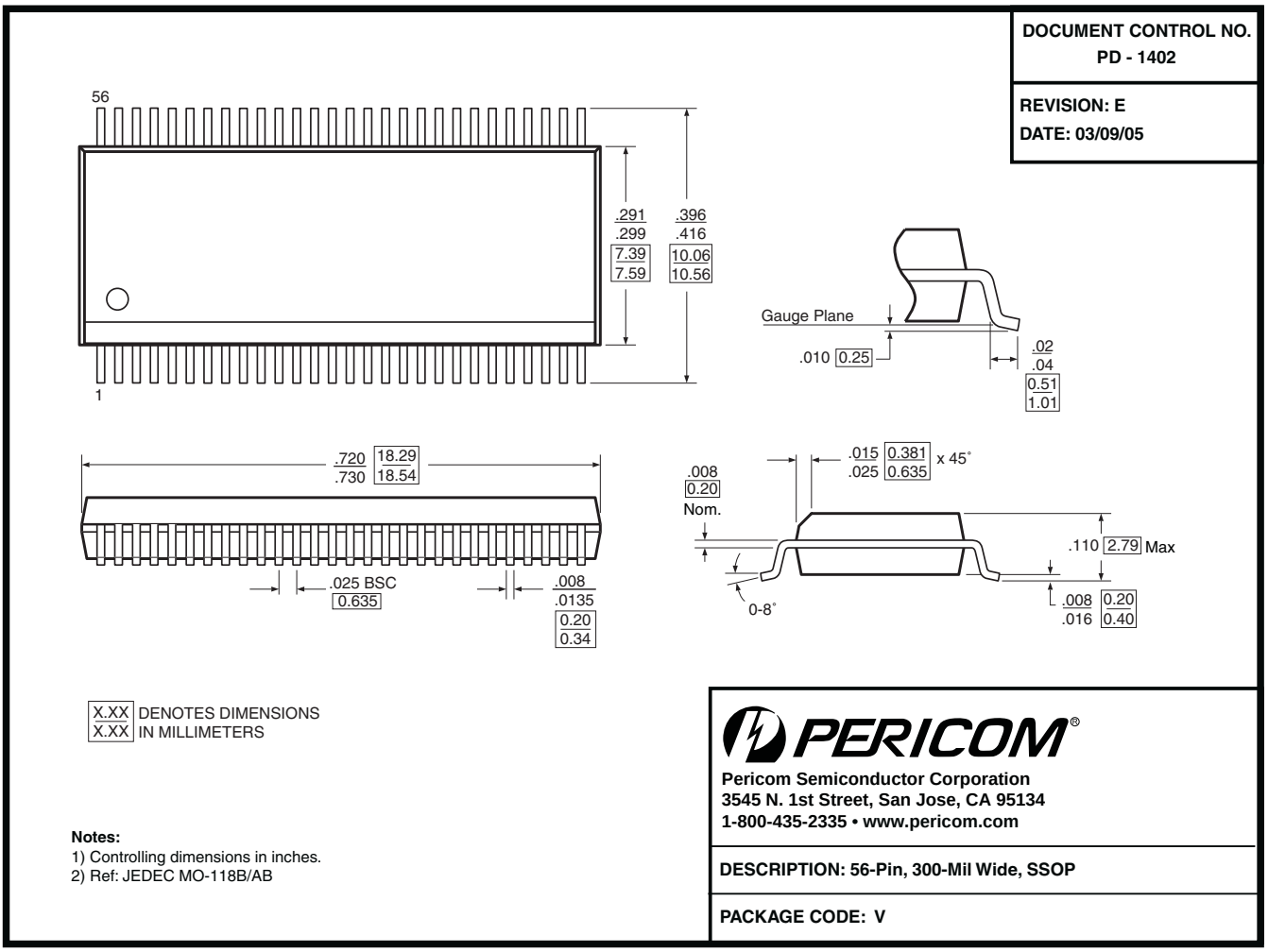
DESCRIPTION: 56-pin, 240-mil wide TSSOP

PACKAGE CODE: A56

DOCUMENT CONTROL #: PD-1502 **REVISION: M**

07-0002

Packaging Mechanical: 56-Pin SSOP (V)



Ordering Information(1-3)

Ordering Code	Packaging Code	Package Type
PI3B16212A	A	56-pin 240-mil wide TSSOP
PI3B16212V	V	56-pin 300-mil wide SSOP

07-0002

Notes:

1. Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
2. Adding an X suffix = Tape/Reel