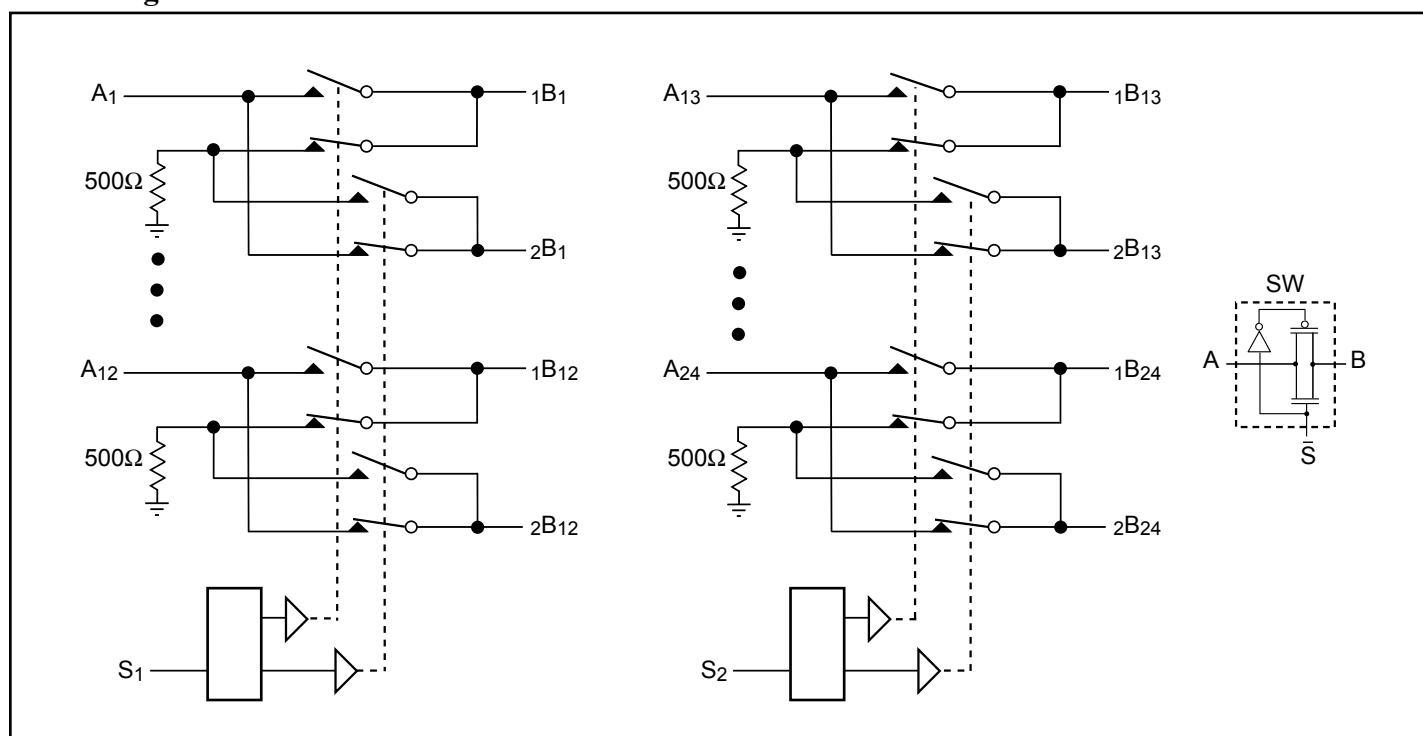


Features

- Near-Zero propagation delay
- R_{ON} is 5Ω typical at 3.3V
- Fast switching speed: 4.5ns (max.)
- V_{CC} operating range: 3.0V to 3.6V
- 500Ω pulldown to the unconnected B port
- Industrial operating temperature: -40°C to $+85^{\circ}\text{C}$
- Make-before-break action
- Packaging (Pb-free & Green):
 - 80-pin BQSOP (B)

Description

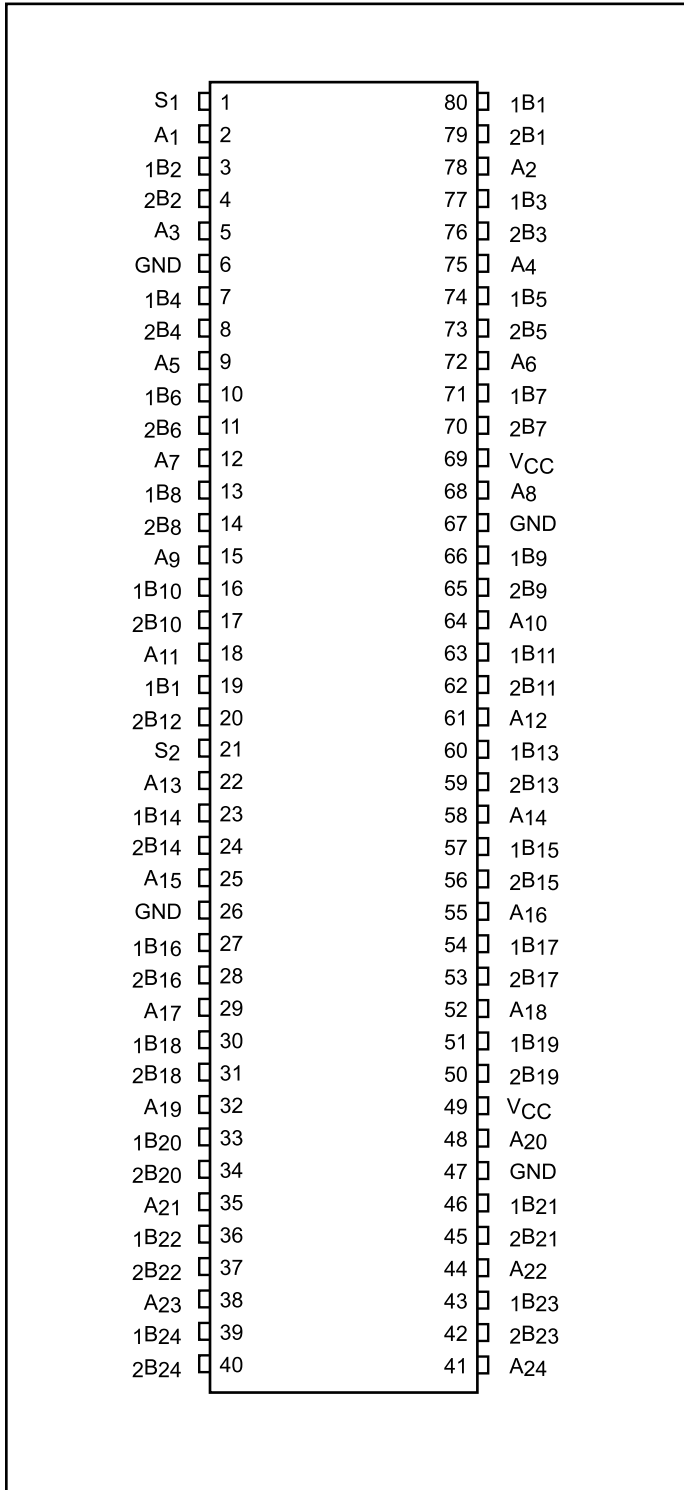
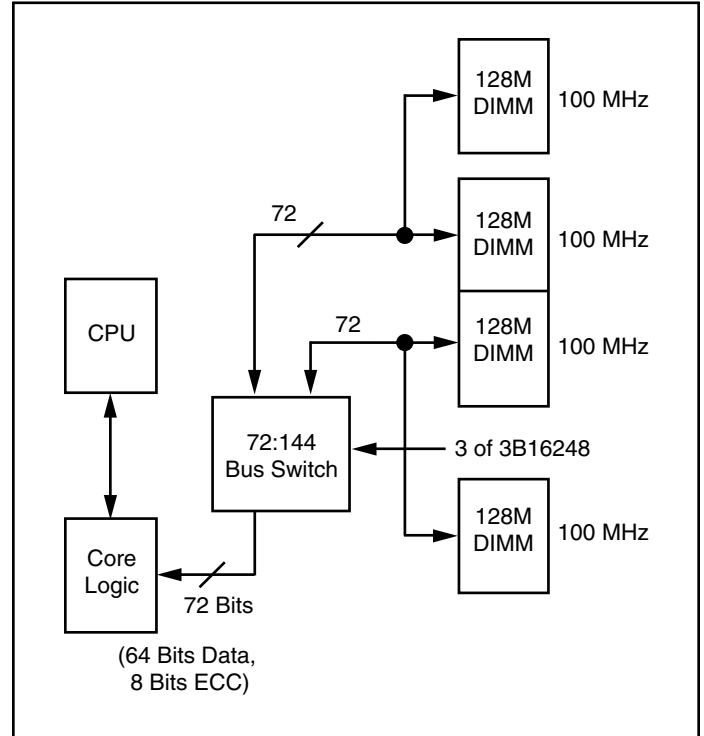
Pericom Semiconductor's PI3B16248 is a 3.3V, 24-bit to 48-bit Mux/DeMux Bus Switch designed with a low On-Resistance allowing inputs to be connected directly to outputs.

Block Diagram

Truth Table⁽¹⁾

Function	S2/S1	A
A to 1B	L	1B
A to 2B	H	2B

Note:

1. H = High Voltage Level, L = Low Voltage Level

Pin Configuration

Application Circuit

Memory Switching Application

Maximum Ratings

(Above which 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 Range	-0.5V to +4.6V
DC Input Voltage	-0.5V to +4.6V
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, $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$, $V_{CC} = 3.0$ to 3.6V)

Parameters	Description	Test Conditions ⁽¹⁾	Min.	Typ. ⁽²⁾	Max.	Units
V_{IH}	Input HIGH Voltage	S1, S2	2.0			V
V_{IL}	Input LOW Voltage	S1, S2	-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	
R_{ON}	Switch On-Resistance	$V_{CC} = \text{Min.}, V_{IN} = 0\text{V}, I_{ON} = 24\text{mA}$		5	8	Ω
		$V_{CC} = \text{Min.}, V_{IN} = 0\text{V}, I_{ON} = 12\text{mA}$		10	15	
C_{IN}	Input Capacitance	$V_{CC} = 0\text{V}, 25^\circ\text{C}, f = 1\text{MHz}$			3.5	pF
C_{ON}	Output Capacitance	$V_{CC} = 0\text{V}, 25^\circ\text{C}, f = 1\text{MHz}$			32	
I_{CC}	Power Supply Quiescent	$V_{CC} = \text{Max.}, V_{IN} = \text{GND or } V_{CC}$			20	μA
I_{OZH}	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

Note:

1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are shown at $V_{CC} = 3.3\text{V}$, $+25^\circ\text{C}$ ambient and maximum loading.

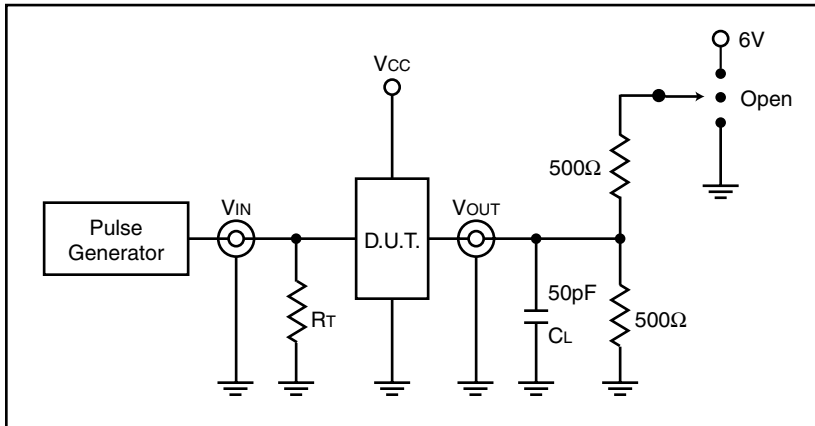
Electrical Characteristics ($V_{CC} = 3.0\text{V}$ to 3.6V , $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$)

Parameters	Description	Test Conditions ⁽¹⁾	Com.		Units
			Min.	Max.	
t_{PLH}	Propagation Delay A_X to B_X ^(2,3)	$C_L = 50\text{pF}, R_L = 500\Omega$		250	ps
t_{EN}	Bus Enable	$C_L = 50\text{pF}$ $R_L = 500\Omega$ $R = 500\Omega$	1	4.5	ns
t_{DIS}	Bus Disable		1	5.0	
t_M	Make-before-break time		0	2	

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.

Test Circuit



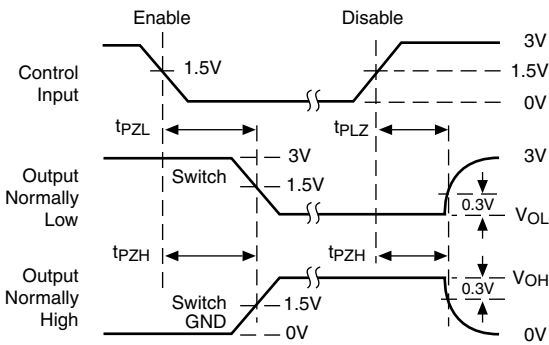
Switch Position

Test	Switch
Disable LOW	6V
Enable LOW	6V
Disable HIGH	GND
Enable HIGH	GND
t_{PD}	Open

Definitions:

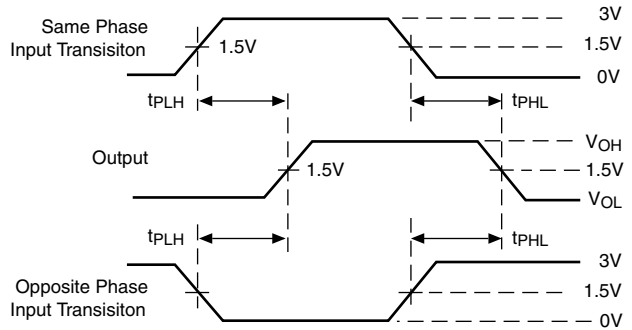
C_L = Load capacitance (includes jig and probe capacitance)
 R_T = Termination resistance (should be equal to Z_{OUT} of the pulse generator)

Enable and Disable Timing



1. Input Control Enable = Low; Input Control Disable = High
2. Pulse Generator for all pulses:
 Rate ≤ 1.0 MHz; $Z_{OUT} \leq 50\Omega$; $t_F, t_R \leq 2.5$ ns

Propagation Delay Diagram



Applications Information

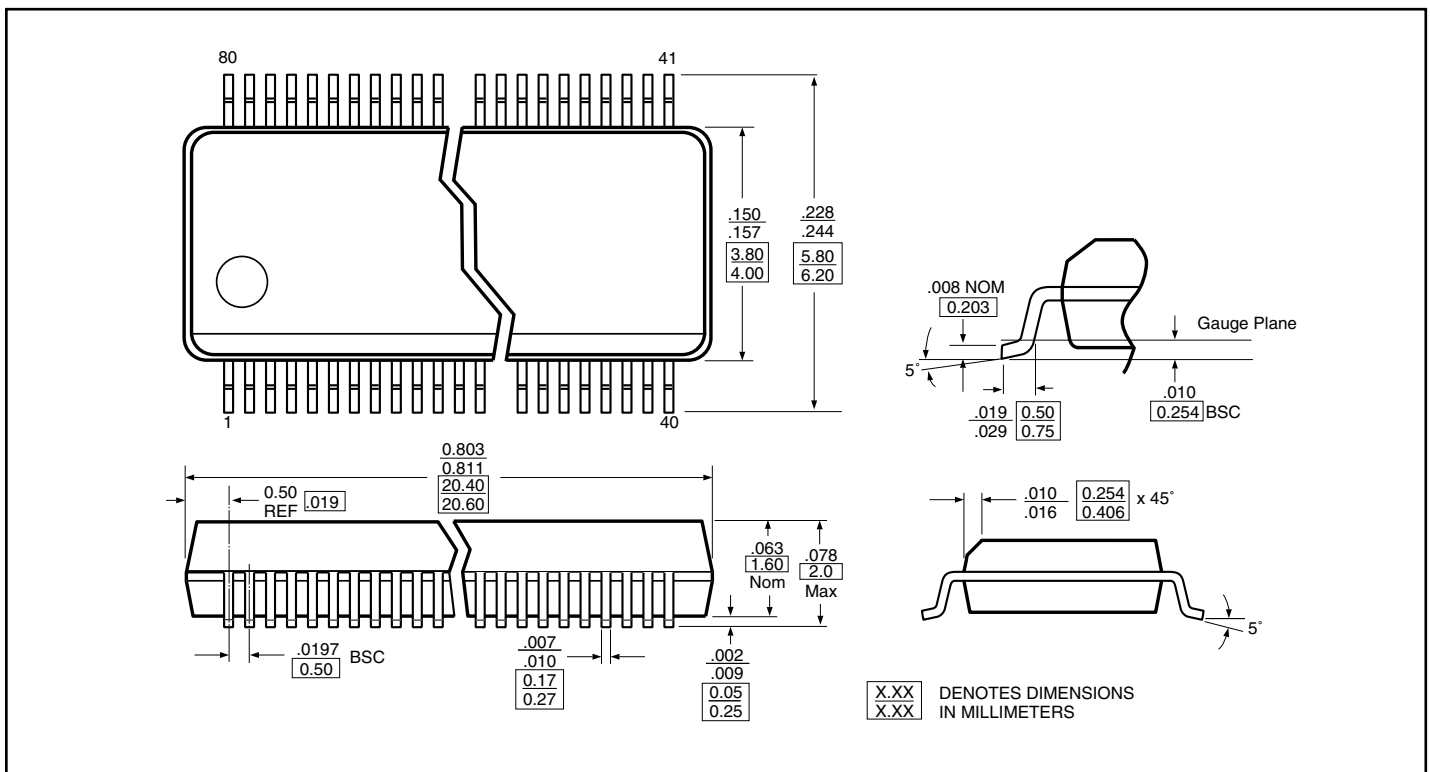
Logic Inputs

Logic control inputs can be driven up to +5.5V regardless of the supply voltage. For example, given a 5.0V supply, the control or select pins may be driven low to 0V and high to 5.5V. Driving the control or select pins Rail-toRail® minimizes power consumption.

Power-Supply Sequencing and Hot Plug Information

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

Packaging Mechanical: 80-pin BQSOP (B)



Ordering Information

Ordering Code	Package Code	Package Description
PI3B16248B	B	80-pin BQSOP
PI3B16248BE	B	Pb-free & Green, 80-pin BQSOP

Notes:

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