

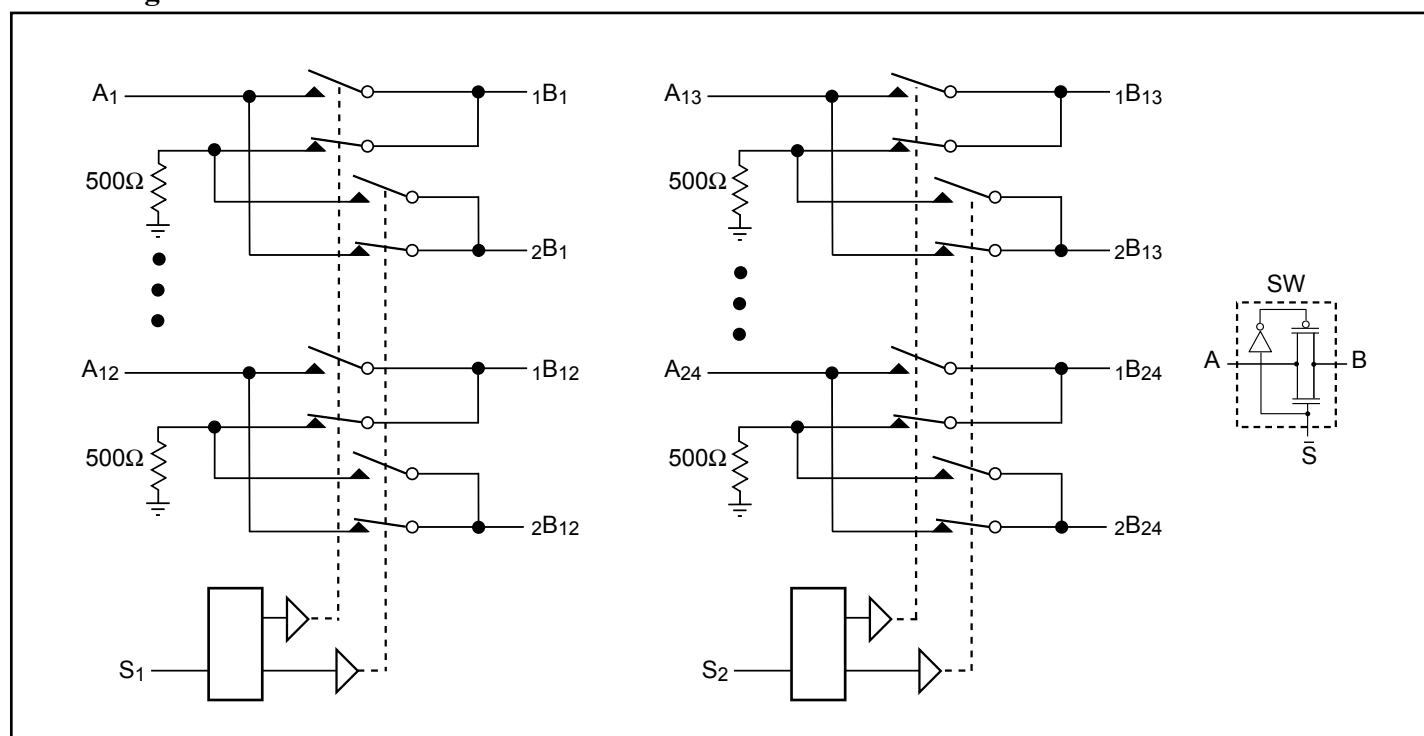
Features

- Near-Zero propagation delay
- R_{ON} is 5 Ω typical at 3.3V
- Fast switching speed: 4.5ns (max.)
- V_{CC} operating range: 3.0V to 3.6V
- 500 Ω pulldown to the unconnected B port
- Industrial operating temperature: -40°C to +85°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

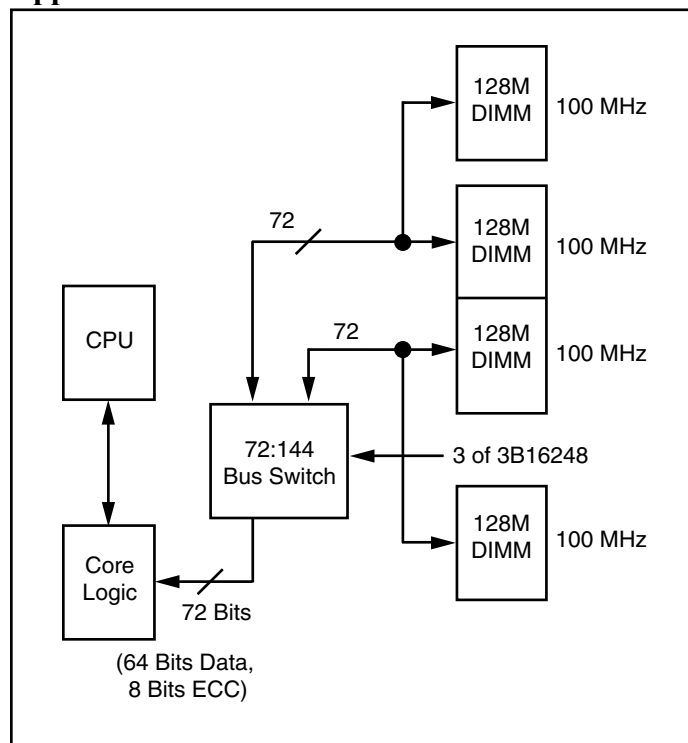
Note:

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

Pin Configuration

S1	1	80	1B1
A1	2	79	2B1
1B2	3	78	A2
2B2	4	77	1B3
A3	5	76	2B3
GND	6	75	A4
1B4	7	74	1B5
2B4	8	73	2B5
A5	9	72	A6
1B6	10	71	1B7
2B6	11	70	2B7
A7	12	69	VCC
1B8	13	68	A8
2B8	14	67	GND
A9	15	66	1B9
1B10	16	65	2B9
2B10	17	64	A10
A11	18	63	1B11
1B1	19	62	2B11
2B12	20	61	A12
S2	21	60	1B13
A13	22	59	2B13
1B14	23	58	A14
2B14	24	57	1B15
A15	25	56	2B15
GND	26	55	A16
1B16	27	54	1B17
2B16	28	53	2B17
A17	29	52	A18
1B18	30	51	1B19
2B18	31	50	2B19
A19	32	49	VCC
1B20	33	48	A20
2B20	34	47	GND
A21	35	46	1B21
1B22	36	45	2B21
2B22	37	44	A22
A23	38	43	1B23
1B24	39	42	2B23
2B24	40	41	A24

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.

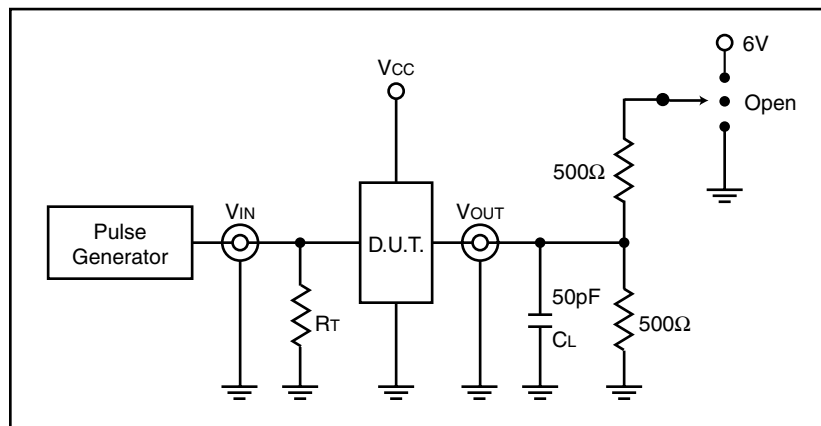
Electrical Characteristics ($V_{CC} = 3.0\text{V}$ to 3.6V , $T_A = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$)

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

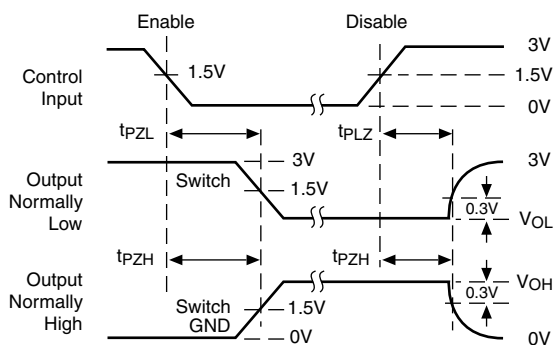
Test	Switch
Disable LOW	6V
Enable LOW	6V
Disable HIGH	GND
Enable HIGH	GND
t _{PD}	Open

Definitions:

C_L = Load capacitance (includes jig and probe capacitance)

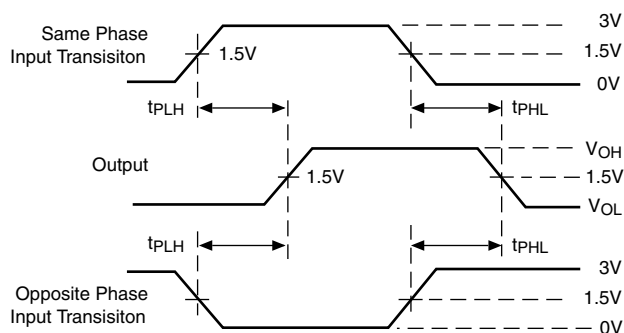
R_T = Termination resistance (should be equal to Z_{OUT} of the pulse generator)

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} ≤ 50Ω; t_F, t_R ≤ 2.5ns

Propagation Delay Diagram



Applications Information

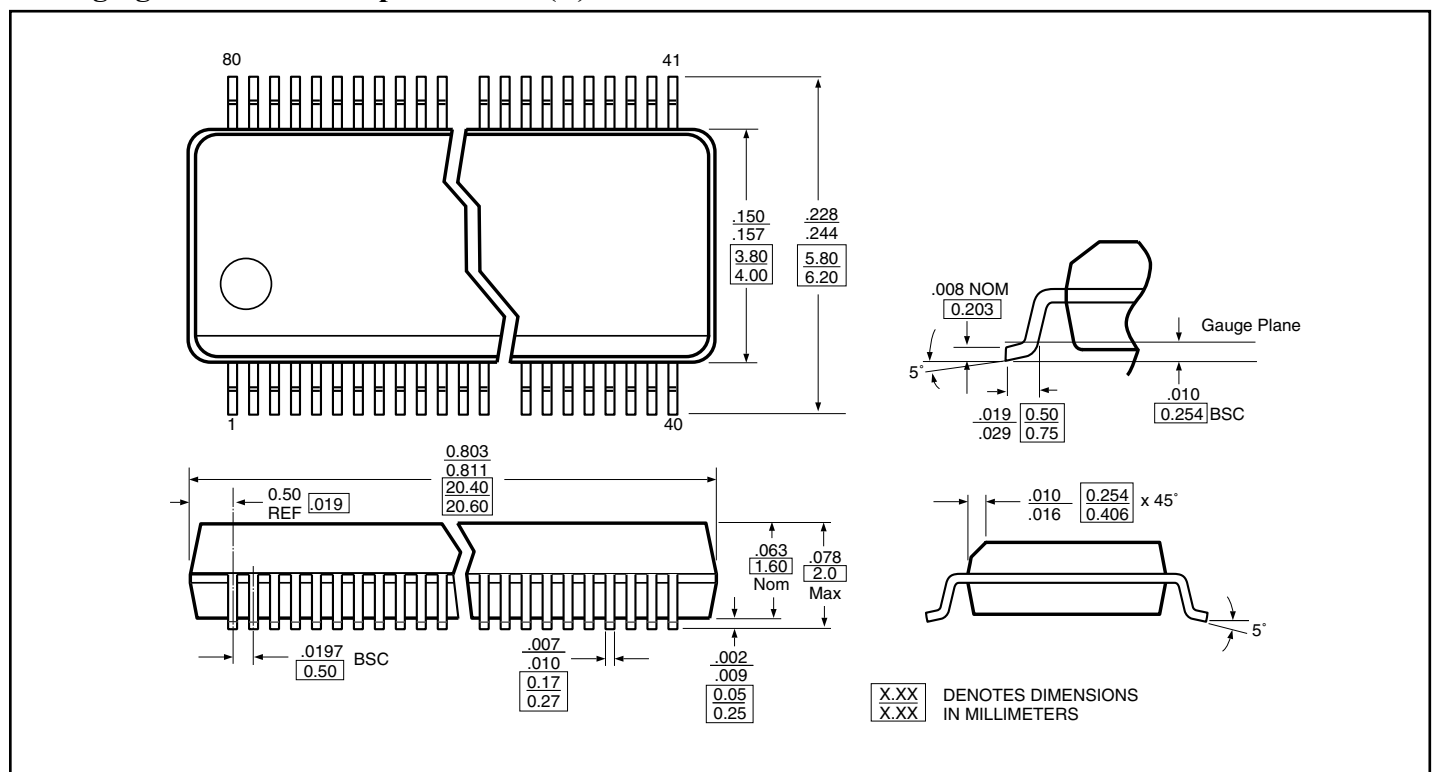
Logic Inputs

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