



PI3B16248

3.3V, 24-Bit to 48-Bit Mux/DeMux NanoSwitch™

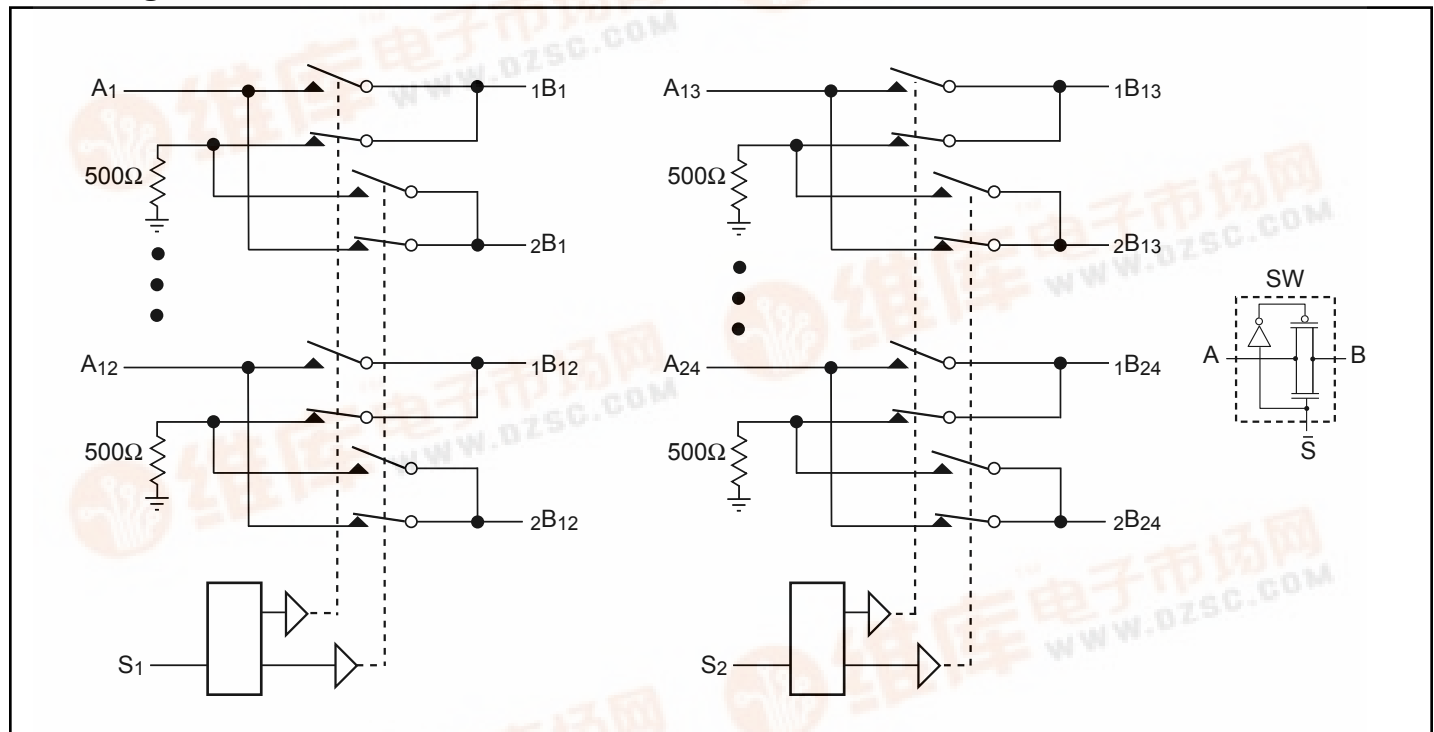
Features

- 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:

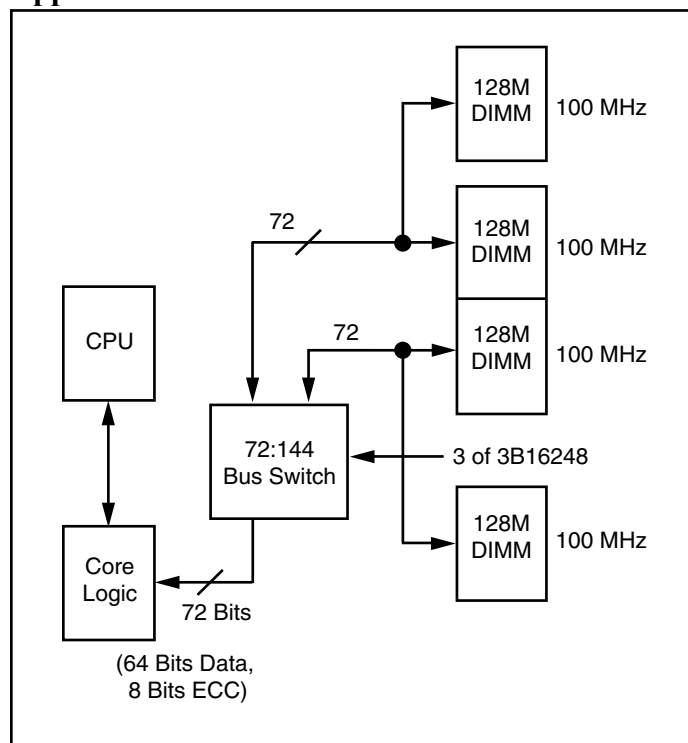
1. H = High Voltage Level, L = Low Voltage Level



Pin Configuration

S ₁	1	80	1B ₁
A ₁	2	79	2B ₁
1B ₂	3	78	A ₂
2B ₂	4	77	1B ₃
A ₃	5	76	2B ₃
GND	6	75	A ₄
1B ₄	7	74	1B ₅
2B ₄	8	73	2B ₅
A ₅	9	72	A ₆
1B ₆	10	71	1B ₇
2B ₆	11	70	2B ₇
A ₇	12	69	V _{CC}
1B ₈	13	68	A ₈
2B ₈	14	67	GND
A ₉	15	66	1B ₉
1B ₁₀	16	65	2B ₉
2B ₁₀	17	64	A ₁₀
A ₁₁	18	63	1B ₁₁
1B ₁	19	62	2B ₁₁
2B ₁₂	20	61	A ₁₂
S ₂	21	60	1B ₁₃
A ₁₃	22	59	2B ₁₃
1B ₁₄	23	58	A ₁₄
2B ₁₄	24	57	1B ₁₅
A ₁₅	25	56	2B ₁₅
GND	26	55	A ₁₆
1B ₁₆	27	54	1B ₁₇
2B ₁₆	28	53	2B ₁₇
A ₁₇	29	52	A ₁₈
1B ₁₈	30	51	1B ₁₉
2B ₁₈	31	50	2B ₁₉
A ₁₉	32	49	V _{CC}
1B ₂₀	33	48	A ₂₀
2B ₂₀	34	47	GND
A ₂₁	35	46	1B ₂₁
1B ₂₂	36	45	2B ₂₁
2B ₂₂	37	44	A ₂₂
A ₂₃	38	43	1B ₂₃
1B ₂	39	42	2B ₂₃
2B ₂₄	40	41	A ₂₄

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	$V_{CC} = 0\text{V}, 25^{\circ}\text{C}, f = 1\text{MHz}$			3.0	pF
C_{ON}	Output Capacitance	$V_{CC} = 0\text{V}, 25^{\circ}\text{C}, f = 1\text{MHz}$			25.0	
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:

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

Notes:

- 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.
- See test circuit and waveforms.

Logic Inputs

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.

Technical drawing of a 40-pin connector. The drawing includes three views: a top view, a side view, and a detail view of the contact tip.

Top View: Shows a rectangular component with 40 pins (20 on each side). Pin 1 is on the left, and pin 40 is on the right. Dimensions include:

- Pin pitch: 0.50 REF
- Pin width: 0.197 BSC
- Pin height: 0.007, 0.010, 0.17, 0.27
- Overall width: 0.803, 0.811, 20.40, 20.60
- Overall height: 0.150, 0.157, 3.80, 4.00, 0.228, 0.244, 5.80, 6.20

Side View: Shows the profile of the component. Dimensions include:

- Pin height: 0.063, 1.60 Nom, 0.078, 2.0 Max
- Pin width: 0.10, 0.254 BSC

Detail View: Shows the contact tip with a 5° angle. Dimensions include:

- Tip height: 0.008 NOM, 0.203
- Tip width: 0.019, 0.029, 0.50, 0.75
- Tip angle: 5°

Legend: X.XX DENOTES DIMENSIONS IN MILLIMETERS

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

1. Thermal characteristics can be found on the company web site at www.pericom.com/packaging/