



PI3VT34X245

32-Bit, 2-Port, Low Voltage Translator Bus Switch

Product Features

- Near zero propagation delay
- Low ON resistance switches connect inputs to outputs
- 2.5V Supply Voltage Operation
- 2.5V or 1.8V switching
- Packages available:
 - 80-pin, 150 mil wide plastic BQSOP (B)

Applications

- 3.3V to 2.5V level shifting (voltage translation)
- 2.5V to 1.8V level shifting (voltage translation)

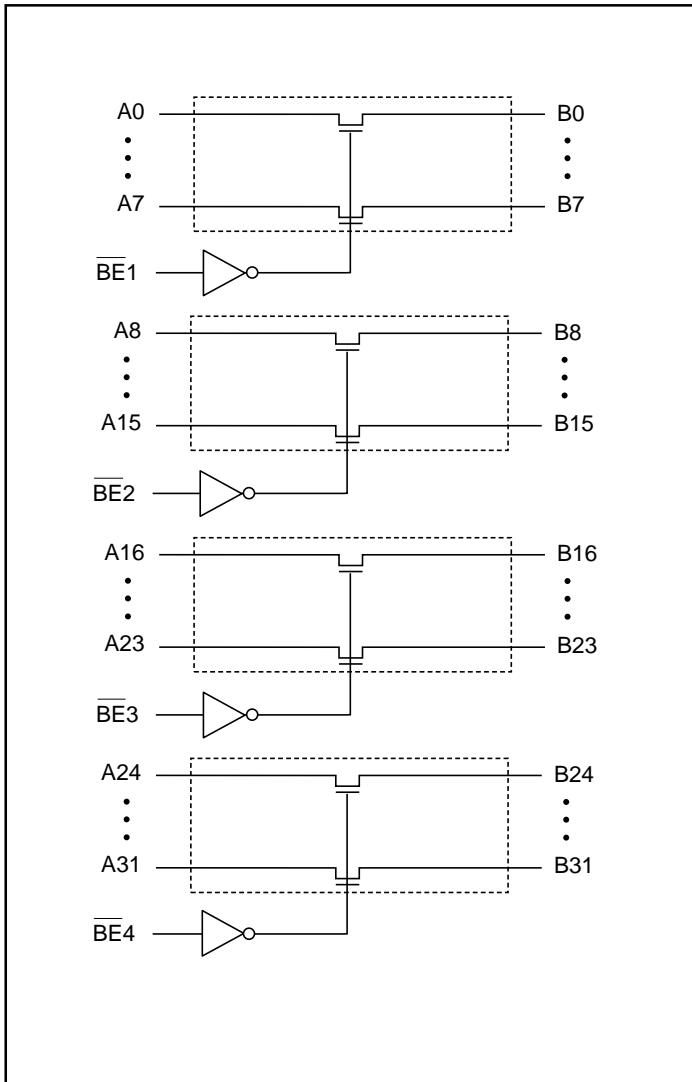
Product Description

Pericom Semiconductor's PI3VT series of logic circuits are produced using the Company's advanced submicron CMOS technology, achieving industry leading performance.

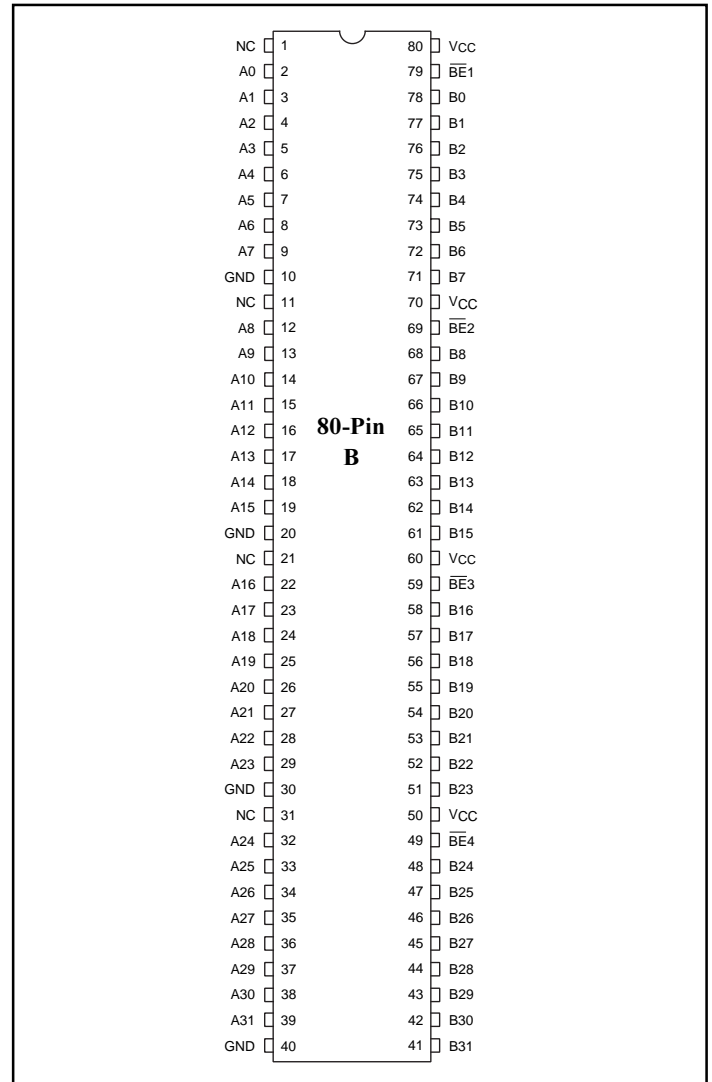
The PI3VT34X245, is a 2.5V or 3.3V 8-bit, 2-port bus switch, is designed with a low ON resistance (5 ohms). The switches are turned ON or enabled by the Bus Enable ($\overline{BE}n$) input signal.

Given a 3.3V supply and an input voltage of 3.3V, the switch translates to an output voltage of 2.5V. Similarly, when operated with a 2.5V supply and given 2.5V inputs, the device translates the outputs to 1.8V.

Logic Block Diagram



Product Pin Configuration



Truth Table⁽¹⁾

Function	\overline{BEN}	A0-31
Disconnect	H	Hi-Z
Connect	L	B0-31

Notes:

1. H = High Voltage Level
 L = Low Voltage Level
 Hi-Z = High Impedance

Product Pin Description

Pin Name	I/O	Description
\overline{BEN}	I	Bus Enable Input (Active LOW)
A0-A31	I/O	Bus A
B0-B31	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	-0.5V to +4.6V
DC Input Voltage	-0.5V to +5.5V
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 Operating Range, $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$, $V_{CC} = 3.3\text{V} \pm 10\%$)

Parameters	Description	Test Conditions ⁽¹⁾	Min.	Typ. ⁽²⁾	Max.	Units
V_{IH}	Input HIGH Voltage	Guaranteed Logic HIGH Level	1.8		$V_{CC} + 0.3\text{V}$	V
V_{IL}	Input LOW Voltage	Guaranteed Logic LOW Level	-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	
I_{OZH}	High Impedance Output Current	$0 \leq A, B \leq V_{CC}$			± 1	
R_{ON}	Switch ON Resistance	$V_{CC} = \text{Min.}, V_{IN} = 0.0\text{V}, I_{ON} = 8\text{mA}$		5	8	Ω
		$V_{CC} = \text{Min.}, V_{IN} = 1.7\text{V}, I_{ON} = 8\text{mA}$		10	22	
		$V_{CC} = 2.3\text{V}, V_{IN} = 0.0\text{V}, I_{ON} = 8\text{mA}$		6	9	
		$V_{CC} = 2.3\text{V}, V_{IN} = 1.3\text{V}, I_{ON} = 8\text{mA}$		25	30	
V_P	Pass Voltage	$V_{IN} = V_{CC} = 3.3\text{V}, I_{OUT} = -5\mu\text{A}$	2.3	2.5	2.9	V
		$V_{IN} = V_{CC} = 2.5\text{V}, I_{OUT} = -5\mu\text{A}$		1.8		

Capacitance ($T_A = 25^\circ\text{C}$, $f = 1\text{ MHz}$)

Parameters ⁽⁵⁾	Description	Test Conditions	Typ.	Units
C_{IN}	Input Capacitance	$V_{IN} = 0\text{V}$	3.5	pF
C_{OFF}	A/B Capacitance, Switch Off		5.0	
C_{ON}	A/B Capacitance, Switch On		10.0	

Notes:

1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at $V_{CC} = 3.3\text{V}$, $T_A = 25^\circ\text{C}$ ambient and maximum loading.
3. Not more than one output should be shorted at one time. Duration of the test should not exceed one second.
4. 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.
5. 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	$V_{CC} = \text{Max.}$	$V_{IN} = \text{GND or } V_{CC}$			12	μA
ΔI_{CC}	Supply Current per Input HIGH		$V_{IN} = 3\text{V}^{(3)}$			50	

Notes:

1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device.
2. Typical values are at $V_{CC} = 3.3\text{V}$, $+25^\circ\text{C}$ ambient.
3. Per driven input (control input only); A and B pins do not contribute to ΔI_{CC} .

Switching Characteristics over $3.3\text{V} \pm 0.3\text{V}$ Operating Range

Parameter	Test Conditions	Conditions ⁽¹⁾	Com.		Units
			Min.	Max.	
t_{PLH} t_{PHL}	Propagation Delay ^(2,3) , Ax to Bx	$C_L = 50\text{pF}$ $R_L = 500\text{ ohms}$	—	0.25	ns
t_{PZH} t_{PZL}	Bus Enable Time; $\overline{\text{BE}}$ to Ax or Bx	$C_L = 50\text{pF}$ $R_L = 500\text{ ohms}$ $R = 500\text{ ohms}$	1.5	6.5	
t_{PHZ} t_{PLZ}	Bus Disable Time; $\overline{\text{BE}}$ to Ax or Bx		1.5	5.5	

