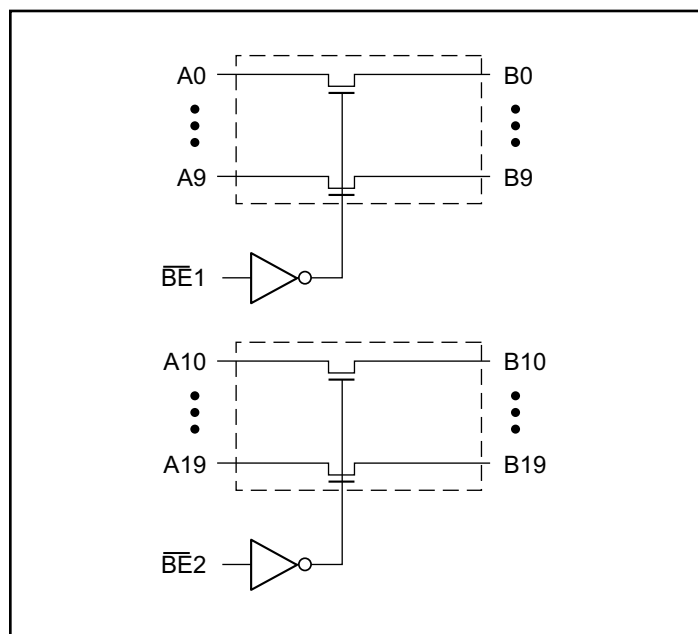


20-Bit, 2-Port Bus Switch

Features

- Near-Zero propagation delay
- 5Ω or 25Ω switches connect inputs to outputs
- Direct bus connection when switches are ON
- 32X384 function with flow through pinout make board layout easier
- Ultra-low quiescent power (0.2μA typical)
 - Ideally suited for notebook applications
- Industrial operating temperature: -40°C to +85°C
- Packaging (Pb-free & Green):
 - 48-pin 240-mil wide plastic TSSOP (A)

Block Diagram



Truth Table⁽¹⁾

Function	BEx	A19-A0
Disconnect	H	Hi-Z
Connect	$\overline{L}$	B19-B0

Note:

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

Description

Pericom Semiconductor's PI5C16861 is configured as a 20-bit, 2-port bus switch designed with a low On-Resistance (5Ω) allowing inputs to be connected directly to outputs. The bus switch creates no additional propagational delay or additional ground bounce noise. The switches are turned ON by the Bus Enable ($\overline{BEx}$) input signal.

Pin Configuration

NC	1	48	VCC
A0	2	47	$\overline{BEx1}$
A1	3	46	B0
A2	4	45	B1
A3	5	44	B2
A4	6	43	B3
A5	7	42	B4
A6	8	41	B5
A7	9	40	B6
A8	10	39	B7
A9	11	38	B8
GND	12	37	B9
NC	13	36	VCC
A10	14	35	$\overline{BEx2}$
A11	15	34	B10
A12	16	33	B11
A13	17	32	B12
A14	18	31	B13
A15	19	30	B14
A16	20	29	B15
A17	21	28	B16
A18	22	27	B17
A19	23	26	B18
GND	24	25	B19

Pin Description

Pin Name	Description
BEx	Bus Enable Inputs (Active LOW)
A19-A0	Bus A
B19-B0	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 (Inputs & V _{CC} Only).....	–0.5V to +7.0V
Supply Voltage to Ground Potential (Outputs & D/O Only) ...	–0.5V to +7.0V
DC Input Voltage	–0.5V to +7.0V
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°C to +85°C, V_{CC} = 5V ±10%)

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 _{IH}	Input HIGH Current	V _{CC} = Max., V _{IN} = V _{CC}			±1	μA
I _{IL}	Input LOW Current	V _{CC} = Max., V _{IN} = GND			±1	
I _{OZH}	High Impedance Output Current	0 ≤ A, B ≤ V _{CC}			±1	
V _{IK}	Clamp Diode Voltage	V _{CC} = Min., I _{IN} = –18mA		–0.7	–1.2	V
I _{ON}	Short Circuit Current ⁽³⁾	A (B) = 0V, B (A) = V _{CC}	100			mA
V _H	Input Hysteresis at Control Pins			150		mV
R _{ON}	Switch On-Resistance ⁽⁴⁾	V _{CC} = Min., V _{IN} = 0.0V		5	7	Ω
		V _{CC} = Min., V _{IN} = 2.4V		10	15	

Notes:

- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
- Typical values are at V_{CC} = 5.0V, T_A = 25°C ambient and maximum loading.
- Not more than one output should be shorted at one time. Duration of the test should not exceed one second.
- 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	6	pF
C _{OFF}	A/B Capacitance, Switch Off		6	
C _{ON}	A/B Capacitance, Switch On		8	

Notes:

- 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}		0.1	10	μA
ΔI _{CC}	Supply Current per Input @ TTL HIGH	V _{CC} = Max.	V _{IN} = 3.4V ⁽³⁾			2.5	mA
I _{CCD}	Supply Current per Input per MHz ⁽⁴⁾	V _{CC} = Max., A and B Pins Open B _{EX} = GND, Control Input Toggling 50% Duty Cycle				0.25	mA/ MHz

Notes:

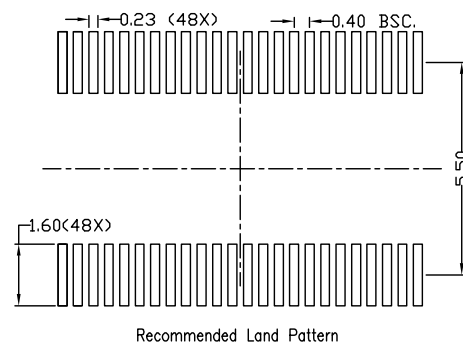
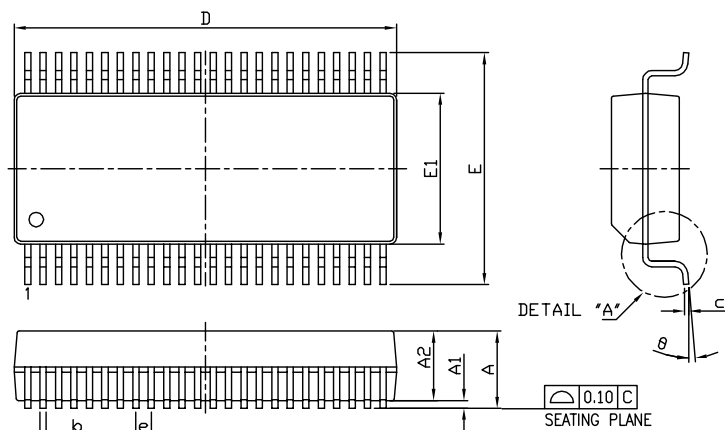
- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device.
- Typical values are at V_{CC} = 5.0V, +25°C ambient.
- Per TTL driven input (V_{IN} = 3.4V, control inputs only); A and B pins do not contribute to I_{CC}.
- This current applies 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.

PI5C16861 Switching Characteristics over Operating Range

Parameters	Description	Conditions	PI5C16861		Unit
			Com.		
			Min.	Max.	
t _{PLH} t _{PHL}	Propagation Delay ^(1,2) Ax to Bx, Bx to Ax	C _L = 50pF R _L = 500Ω		1.25	ns
t _{PZH} t _{PZL}	Bus Enable Time B _{EX} to Ax or Bx		1.5	6.5	
t _{PHZ} t _{PLZ}	Bus Disable Time B _{EX} to Ax or Bx		1.5	5.5	

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.

Packaging Mechanical: 48-pin BSQOP (B)


SYMBOL	DIMENSION IN MM		
	MIN.	NOM.	MAX.
A			2.00
A1	0.05		0.25
A2	1.45	1.60	1.75
c	0.09		0.20
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
L	0.50	0.60	0.75
L1	0.25 BASIC		
θ	0		8
b	0.13		0.23
e	0.40 BASIC		
D	9.80	9.90	10.00
R1	0.09		

Notes:

1. Controlling Dimension in Millimeters. Angle in Degrees.
2. Refer JEDEC MO-154/AB
3. Package Outline Exclusive of Mold Flash and Metal Burr


DATE: 10/15/08
DESCRIPTION: 48-Pin, 154-Mil Wide BQSOP
PACKAGE CODE: B48
DOCUMENT CONTROL #: PD-1210
REVISION: F

08-0522

Ordering Information

Ordering Code	Package Type	Package Description
PI5C16861AE	A	Pb-free & Green, 48-Pin, TSSOP

Notes:

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

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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9