

**2-Bit Bus Switch with Individual Enables**

**Features**

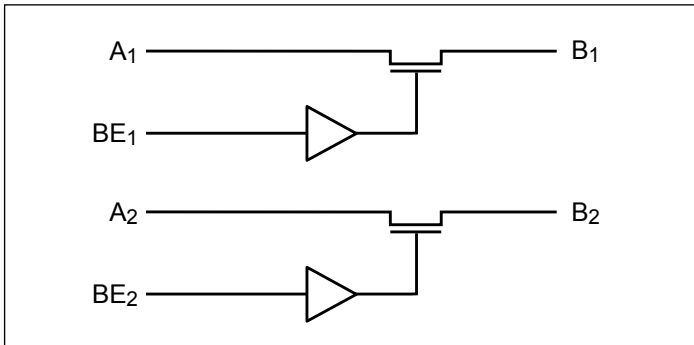
- Near-Zero propagation delay
- 5Ω switches connect inputs to outputs
- Direct bus connection when switches are ON
- Ultra Low Quiescent Power (0.2μA typical)
  - Ideally suited for notebook applications
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. “Green” Device (Note 3)
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative.  
<https://www.diodes.com/quality/product-definitions/>
- Packaging (Pb-free & Green available):
  - 8-pin, 173-mil wide plastic TSSOP (L)

**Description**

PI5C3305 is a 2-bit bus switch designed with two individual 5Ω switches with fast individual enables. When enabled via the associated Bus Enable (BE) pin, the “A” pin is directly connected to the “B” pin for that particular gate. The bus switch introduces no additional propagation delay or additional ground bounce noise.

The PI5C3305 device has active HIGH enables.

**Block Diagram**



**Truth Table<sup>(1)</sup>**

BE <sub>n</sub>	A <sub>n</sub>	B <sub>n</sub>	V <sub>CC</sub>	Function
X <sup>(2)</sup>	Hi-Z	Hi-Z	GND	Disconnect
L	Hi-Z	Hi-Z	V <sub>CC</sub>	Disconnect
H	B <sub>n</sub>	A <sub>n</sub>	V <sub>CC</sub>	Connect

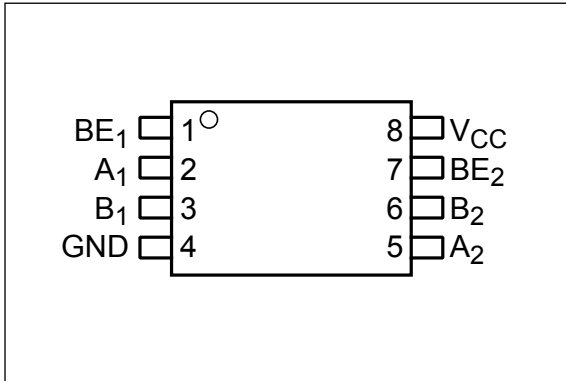
**Notes:**

1. H = High Voltage Level, L = Low Voltage Level  
Hi-Z = High Impedance, X = Don't Care
2. A pull-up resistor should be provided for power-up protection.

**Notes:**

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

### Pin Configuration



### Pin Description

Pin Name	Description
BE <sub>n</sub>	Switch Enable
A <sub>2</sub> -A <sub>1</sub>	Bus A
B <sub>2</sub> -B <sub>1</sub>	Bus B
V <sub>CC</sub>	Power
GND	Ground

### 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 +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<sub>A</sub> = -40°C to +85°C, V<sub>CC</sub> = 4V to 5.5V)

Parameters	Description	Test Conditions <sup>(1)</sup>	Min.	Typ <sup>(2)</sup>	Max.	Units
V <sub>IH</sub>	Input HIGH Voltage	Guaranteed Logic HIGH Level		2.0		V
V <sub>IL</sub>	Input LOW Voltage	Guaranteed Logic LOW Level		-0.5	0.8	
I <sub>IH</sub>	Input HIGH Current	V <sub>CC</sub> = Max., V <sub>IN</sub> = V <sub>CC</sub>			±1	μA
I <sub>IL</sub>	Input LOW Current	V <sub>CC</sub> = Max., V <sub>IN</sub> = GND			±1	
I <sub>OZ</sub>	High Impedance Output Current	0 ≤ A, B ≤ V <sub>CC</sub>			±1	
I <sub>ON</sub>	Low Impedance Output Current	0 ≤ A, B ≤ V <sub>CC</sub>			±1	
V <sub>H</sub>	Input Hysteresis at Control Pins			250		mV
R <sub>ON</sub>	Switch On-Resistance <sup>(3)</sup>	V <sub>CC</sub> = 4.5V, V <sub>IN</sub> = 0.0V, I <sub>ON</sub> = 30mA or 64mA		4	7	Ω
		V <sub>CC</sub> = 4.5V, V <sub>IN</sub> = 2.4V, I <sub>ON</sub> = -15mA		8	15	

**Notes:**

- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
- Typical values are at V<sub>CC</sub> = 5.0V, T<sub>A</sub> = 25°C ambient and maximum loading.
- 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<sub>A</sub> = 25°C, f = 1 MHz)

Parameters <sup>(1)</sup>	Description	Test Conditions	Typ.	Units
C <sub>IN</sub>	Input Capacitance	V <sub>IN</sub> = 0V	3	pF
C <sub>OFF</sub>	A/B Capacitance, Switch Off		5	
C <sub>ON</sub>	A/B Capacitance, Switch On		10	

**Notes:**

- This parameter is determined by device characterization but is not production tested.

### Power Supply Characteristics

Parameters	Description	Test Conditions <sup>(1)</sup>	Min.	Typ. <sup>(2)</sup>	Max.	Units
$I_{CC}$	Quiescent Power Supply Current	$V_{CC} = \text{Max.}$		0.1	3.0	$\mu\text{A}$
$\Delta I_{CC}$	Supply Current per Input @ TTL HIGH					

**Notes:**

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

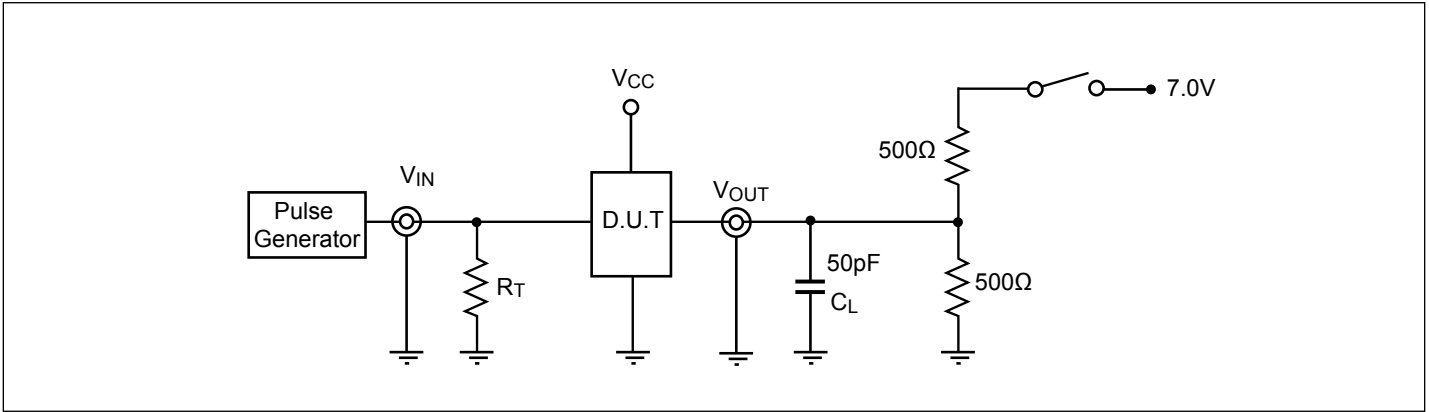
### Switching Characteristics Over Operating Range

Parameters	Description	Test Conditions <sup>(1)</sup>	$V_{CC} = 5\text{V} \pm 10\%$		$V_{CC} = 4\text{V}$		Units
			Min.	Max.	Min.	Max.	
$t_{PLH}$ $t_{PHL}$	Propagation Delay <sup>(2, 3)</sup> A to B, B to A	$C_L = 50\text{pF}$ $R_L = 500\Omega$		0.25		0.25	ns
$t_{PZH}$ $t_{PZL}$	Bus Enable Time		1.0	4.9		5.5	
$t_{PHZ}$ $t_{PLZ}$	Bus Disable Time		1.0	4.2		4.5	

**Notes:**

- See test circuit and waveforms.
- 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.

**Test Circuit**



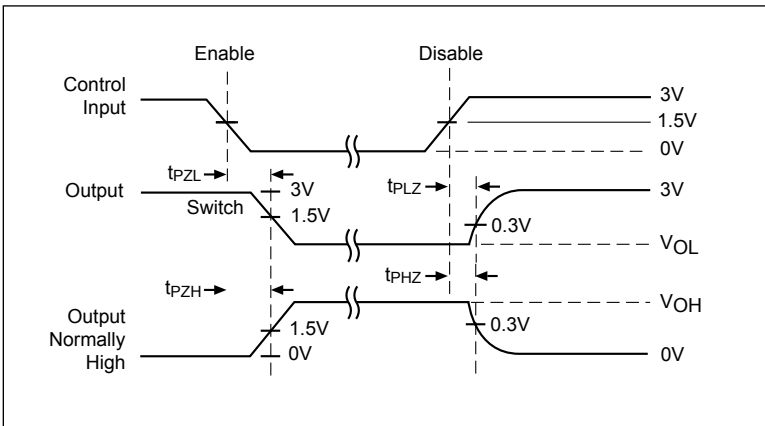
**Switch Positions<sup>(1)</sup>**

Test	Switch
Open Drain Disable LOW Enable LOW	7V
All Other Inputs	Open

**Notes:**

- $C_L$  = Load Capacitance: includes jig and probe capacitance.  
 $R_T$  = Termination Resistance: should be equal to the  $Z_{OUT}$  of the Pulse Generator.

**Enable and Disable Timing**



**Notes:**

- Input Control Enable = Low; Input Control Disable = High
- Pulse Generator for All Pulses: Rate  $\leq$  1.0 MHz;  $Z_{OUT} \leq 50\Omega$ ;  $t_F, t_R \leq 2.5ns$

**Part Marking**

Top mark not available at this time. To obtain advance information regarding the top mark, please contact your local sales representative.

**PI5C3305**

**Packaging Mechanical: 8-TSSOP (L)**

SYMBOLS	MIN.	NOM.	MAX.
A	—	—	1.20
A1	0.05	—	0.15
A2	0.80	1.00	1.05
b	0.19	—	0.30
c	0.09	—	0.20
D	2.90	3.00	3.10
E	6.20	6.40	6.60
e	0.65 BSC		
E1	4.30	4.40	4.50
L	0.45	0.60	0.75
L1	1.00 REF		
S	0.20	—	—
θ*	0	—	8

UNIT : MM

NOTES:  
 1. ALL DIMENSIONS IN MILLIMETERS. ANGLES IN DEGREES.  
 2. JEDEC MO-153F/AA  
 3. DIMENSIONS DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

PERICOM  
Enabling Serial Connectivity

DATE: 03/24/16

DESCRIPTION: 8-Pin, 173mil Wide TSSOP

PACKAGE CODE: L (L8)

DOCUMENT CONTROL #: PD-1308

REVISION: G

16-0062

**For latest package info.**

please check: <http://www.diodes.com/design/support/packaging/pericom-packaging/packaging-mechanicals-and-thermal-characteristics/>

**Ordering Information**

Ordering Code	Package Code	Package Description
PI5C3305LEX	L	8-Pin, 173mil Wide (TSSOP)

**Notes:**

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. E = Pb-free and Green
5. X suffix = Tape/Reel

**IMPORTANT NOTICE**

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.

Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and definitive format released by Diodes Incorporated.

**LIFE SUPPORT**

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

A. Life support devices or systems are devices or systems which:

1. are intended to implant into the body, or
  2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.
- B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2020, Diodes Incorporated  
[www.diodes.com](http://www.diodes.com)