

LOW-VOLTAGE QUADRUPLE BUS SWITCH

IDT74CBTLV3126

FEATURES:

- · Pin-out compatible with standard '126 Logic products
- 5Ω A/B bi-directional switch
- · Isolation under power-off conditions
- · Over-voltage tolerant
- · Latch-up performance exceeds 100mA
- Vcc = 2.3V 3.6V, Normal Range
- ESD > 2000V per MIL-STD-883, Method 3015;
 > 200V using machine model (C = 200pF, R = 0)
- · Output enable, active high
- · Available in QSOP and TSSOP packages

APPLICATIONS:

· 3.3V High Speed Bus Switching and Bus Isolation

DESCRIPTION:

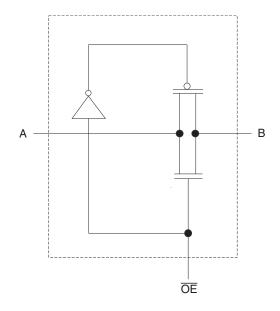
The CBTLV3126 features four independent switches. Each switch is enabled when the associated output-enable (\overline{OE}) input is high.

To ensure the high-impedance state during power up or power down, $\overline{\text{OE}}$ should be tied to GND through a pulldown resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

FUNCTIONAL BLOCK DIAGRAM

1A 2 SW 3 1B 1OE 1 2A 5 SW 6 2B 2OE 4 SW 8 3B 3OE 10 SW 8 3B 4A 12 SW 11 4B 4OE 13

SIMPLIFIED SCHEMATIC, EACH SWITCH



NOTE:

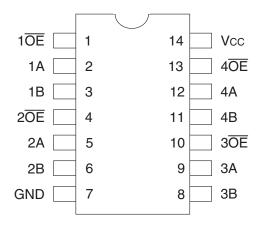
1. Pin numbers shown apply to the 14-pin TSSOP package.

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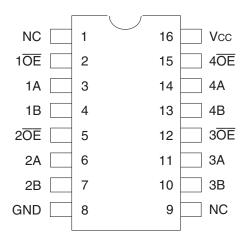
INDUSTRIAL TEMPERATURE RANGE

JULY 2008

PIN CONFIGURATION



TSSOP TOP VIEW



QSOP TOP VIEW

ABSOLUTE MAXIMUM RATINGS(1)

Symbol	Description	Max	Unit
Vcc	SupplyVoltage Range -0.5 to +4.6		٧
Vı	Input Voltage Range	-0.5 to +4.6	V
	Continuous Channel Current	128	mA
lik	Input Clamp Current, VI/O < 0	-50	mA
Tstg	Storage Temperature	-65 to +150	°C

NOTE:

1. Stresses greater than those listed under ABSOLUTE 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.

FUNCTION TABLE(1)

Input OE	Inputs/Outputs
Н	A Port = B Port
L	Disconnect

NOTE:

1. H = HIGH Voltage Level L = LOW Voltage Level

OPERATING CHARACTERISTICS, TA = 25°C(1)

Symbol	Parameter	Test Conditions	Min.	Max.	Unit
Vcc	Supply Voltage		2.3	3.6	V
VIH	High-Level Control Input Voltage	Vcc = 2.3V to 2.7V	1.7	_	V
		Vcc = 2.7V to 3.6V	2	_	
VIL	Low-Level Control Input Voltage	Vcc = 2.3V to 2.7V	_	0.7	V
		Vcc = 2.7V to 3.6V	_	0.8	
TA	Operating Free-Air Temperature		-40	85	°C

NOTE:

1. All unused control inputs of the device must be held at Vcc or GND to ensure proper device operation.

DC ELECTRICAL CHARACTERISTICS OVER OPERATING RANGE

Following Conditions Apply Unless Otherwise Specified:

Operating Conditions: $TA = -40^{\circ}C$ to $+85^{\circ}C$

Symbol	Parameter	Test Conditions		Min.	Typ. ⁽¹⁾	Max.	Unit
Vik	Control Inputs, Data Inputs	Vcc = 3V, II = -18mA		T -	_	-1.2	V
lı	Control Inputs	Vcc = 3.6V, VI = Vcc or GND		_	_	±1	μA
loz	Data I/O	Vcc = 3.6V, Vo = 0 or 3.6V, sw	vitch disabled	_	_	5	μA
loff		Vcc = 0, Vi or Vo = 0 to 3.6V		_	_	50	μA
Icc		Vcc = 3.6V, lo = 0, Vi = Vcc o	Vcc = 3.6V, lo = 0, VI = Vcc or GND		_	10	μA
Δ Icc $^{(2)}$	Control Inputs	Vcc = 3.6V, one input at 3V, other inputs at Vcc or GND		_	_	300	μΑ
Сі	Control Inputs	Vi = 3V or 0		_	4	_	pF
CIO(OFF)		Vo = 3V or 0, OE = Vcc		_	6	_	pF
	Vcc = 2.3V	VI = 0	Io = 64mA	_	5	8	
	Typ. at Vcc = 2.5V		Io = 24mA	_	5	8	
Ron ⁽³⁾		VI = 1.7V	Io = 15mA	_	27	40	Ω
		VI = 0	Io = 64mA	_	5	7	
	Vcc = 3V		Io = 24mA	T -	5	7	1
		VI = 2.4V	Io = 15mA	_	10	15	

NOTES:

- 1. Typical values are at Vcc = 3.3V, +25°C ambient.
- 2. The increase in supply current is attributable to each current that is at the specified voltage level rather than Vcc or GND.
- 3. This is measured by the voltage drop between the A and B terminals at the indicated current through the switch. On-state resistance is determined by the lower of the voltages of the two (A or B) terminals.

SWITCHING CHARACTERISTICS

		$Vcc = 2.5V \pm 0.2V$		Vcc = 3.3V ± 0.3V		
Symbol	Parameter	Min.	Max.	Min.	Max.	Unit
t PD ⁽¹⁾	Propagation Delay	-	0.15	-	0.25	ns
	A to B or B to A					
ten	Output Enable Time	1	4.5	1	4.2	ns
	OE to A or B					
tois	Output Disable Time	1	4.7	1	4.8	ns
	OE to A or B					

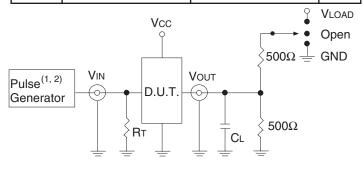
NOTE:

^{1.} The propagation delay is the calculated RC time constant of the typical on-state resistance of the switch and the specified load capacitance driven by an ideal voltage source (zero output impedance).

TEST CIRCUITS AND WAVEFORMS

TEST CONDITIONS

Symbol	$Vcc^{(1)} = 3.3V \pm 0.3V$	Vcc ⁽²⁾ = 2.5V±0.2V	Unit
VLOAD	6	2 x Vcc	V
VIH	3	Vcc	V
VT	1.5	Vcc / 2	V
VLZ	300	150	mV
VHZ	300	150	mV
CL	50	30	pF



Test Circuits for All Outputs

DEFINITIONS:

CL = Load capacitance: includes jig and probe capacitance.

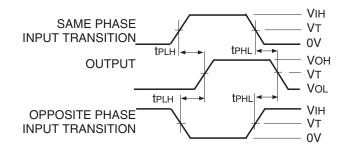
RT = Termination resistance: should be equal to ZouT of the Pulse Generator.

NOTES:

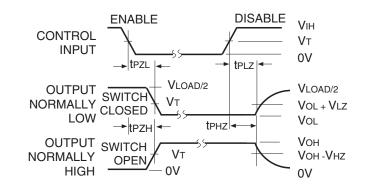
- 1. Pulse Generator for All Pulses: Rate \leq 10MHz; tr \leq 2.5ns; tr \leq 2.5ns.
- 2. Pulse Generator for All Pulses: Rate \leq 10MHz; tF \leq 2ns; tR \leq 2.5ns.

SWITCH POSITION

Test	Switch
tplz/tpzl	Vload
tphz/tpzh	GND
teo	Open

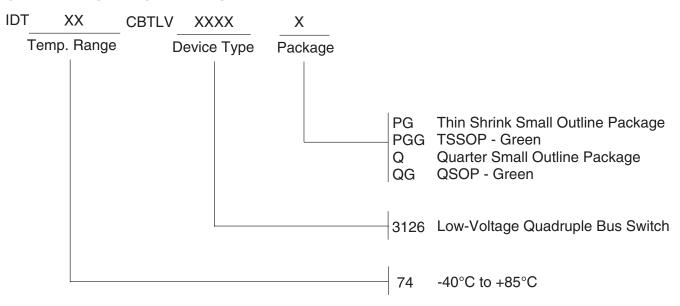


Propagation Delay



Enable and Disable Times

ORDERING INFORMATION



DATASHEET DOCUMENT HISTORY

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