Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

LOW-VOLTAGE 20-BIT BUS SWITCH WITH PRECHARGED OUTPUTS

IDT74CBTLV16800

FEATURES:

- **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)**
- **Available in TSSOP and TVSOP packages**

APPLICATIONS:

- **3.3V High Speed Bus Switching and Bus Isolation**

DESCRIPTION:

The CBTLV16800 provides 20-bits of high-speed bus switching with low on-state resistance of the switch allowing connections to be made with minimal propagation delay. The device also precharges the B port to a user-selectable bias voltage (BIASV) to minimize live-insertion noise.

The CBTLV16800 is organized as dual 10-bit bus switches with two different output-enable ($\overline{OE}$) control inputs. When $\overline{OE}$ is low, the corresponding 10-bit bus switch is on and port A is connected to port B. When $\overline{OE}$ is high, the switch is open, and a high impedance state exists between the two ports, and port B is precharged to BIASV through the equivalent of a 10-kΩ resistor.

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

FUNCTIONAL BLOCK DIAGRAM
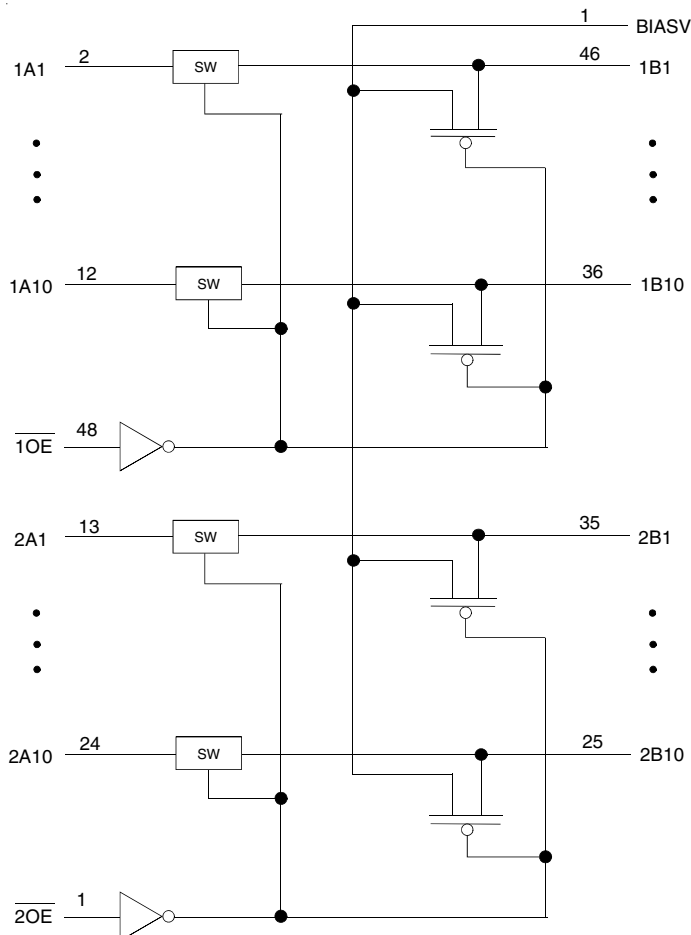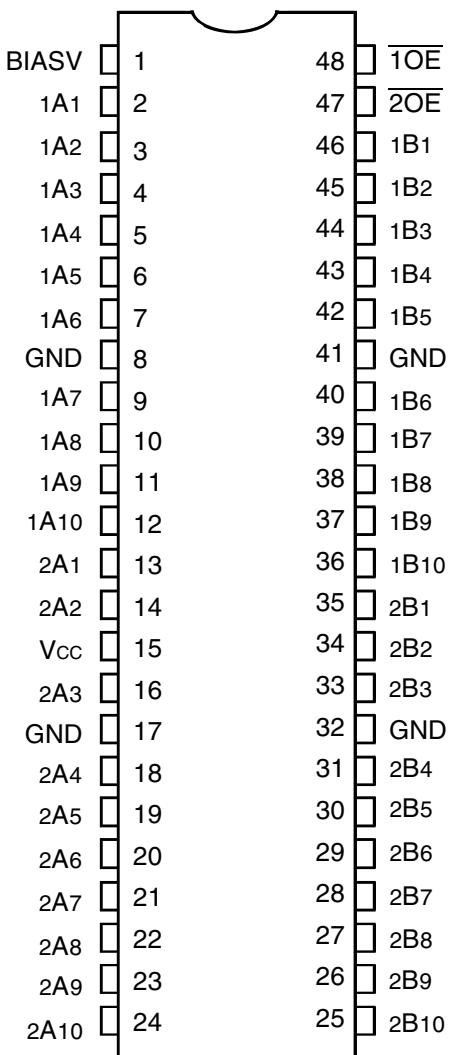

SIMPLIFIED SCHEMATIC, EACH SWITCH
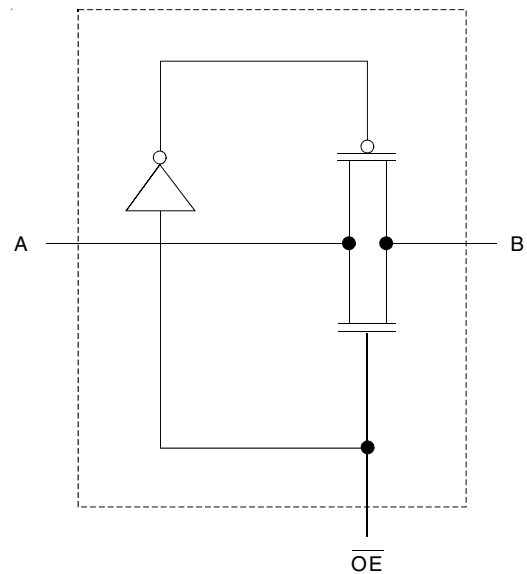
The IDT logo is a registered trademark of Integrated Device Technology, Inc.

INDUSTRIAL TEMPERATURE RANGE

JUNE 2006

DSC-5886/9

PIN CONFIGURATION

BIASV	1	48	$\overline{1OE}$
1A1	2	47	$\overline{2OE}$
1A2	3	46	1B1
1A3	4	45	1B2
1A4	5	44	1B3
1A5	6	43	1B4
1A6	7	42	1B5
GND	8	41	GND
1A7	9	40	1B6
1A8	10	39	1B7
1A9	11	38	1B8
1A10	12	37	1B9
2A1	13	36	1B10
2A2	14	35	2B1
V_{CC}	15	34	2B2
2A3	16	33	2B3
GND	17	32	GND
2A4	18	31	2B4
2A5	19	30	2B5
2A6	20	29	2B6
2A7	21	28	2B7
2A8	22	27	2B8
2A9	23	26	2B9
2A10	24	25	2B10

TSSOP/ TVSOP
TOP VIEW

ABSOLUTE MAXIMUM RATINGS[1]

Symbol	Description	Max.	Unit
V_{CC}	Supply Voltage Range	−0.5 to 4.6	V
BIASV	Bias Voltage Range, V_I	−0.5 to 4.6	V
V_I	Input Voltage Range	−0.5 to 4.6	V
	Continuous Channel Current	128	mA
I_{IK}	Input Clamp Current, $V_{I/O} < 0$	−50	mA
T_{STG}	Storage Temperature Range	−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 (EACH 10-BIT BUS SWITCH)[1]

Input $\overline{OE}$	Inputs/Outputs
L	A-Port = B-Port
H	A-Port = Z
	B-Port = BIASV

NOTE:
1. H = HIGH Voltage Level
   L = LOW Voltage Level
   Z = High-Impedance

OPERATING CHARACTERISTICS[1]

Symbol	Parameter	Test Conditions	Min.	Max.	Unit
V_{CC}	Supply Voltage		2.3	3.6	V
BIASV	Bias Voltage		1.3	V_{CC}	V
V_{IH}	High-Level Control Input Voltage	V_{CC} = 2.3V to 2.7V	1.7	—	V
		V_{CC} = 2.7V to 3.6V	2	—	
V_{IL}	Low-Level Control Input Voltage	V_{CC} = 2.3V to 2.7V	—	0.7	V
		V_{CC} = 2.7V to 3.6V	—	0.8	
T_A	Operating Free-Air Temperature		−40	+85	°C

NOTE:
1. All unused control inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

DC ELECTRICAL CHARACTERISTICS OVER OPERATING RANGE

Following Conditions Apply Unless Otherwise Specified:
Operating Condition: $T_A = -40°C$ to $+85°C$

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
V_{IK}	Control Inputs, Data I/O	$V_{CC} = 3V$, $I_I = -18mA$		—	—	−1.2	V
I_I	Control Inputs	$V_{CC} = 3.6V$, $V_I = V_{CC}$ or GND		—	—	±1	μA
I_{OZ}	Data I/O	$V_{CC} = 3.6V$, $V_O = 0V$ or 3.6V switch disabled		—	—	5	μA
I_{OFF}	A Port	$V_{CC} = 0V$, V_I or $V_O = 0V$ or 3.6V		—	—	10	μA
I_O		$V_{CC} = 3V$, BIASV = 2.4V, $V_O = 0$, $\overline{OE} = V_{CC}$		| 0.25 |	—	—	mA
I_{CC}		$V_{CC} = 3.6V$, $I_O = 0$, $V_I = V_{CC}$ or GND		—	—	10	μA
ΔI_{CC}[1]	Control Inputs	$V_{CC} = 3.6V$, one input at 3V, other inputs at V_{CC} or GND		—	—	300	μA
C_I	Control Inputs	$V_I = 3V$ or 0		—	4	—	pF
$C_{IO(OFF)}$		$V_O = 3V$ or 0, switch off, BIASV = open, $\overline{OE} = V_{CC}$		—	6.5	—	pF
R_{ON}	$V_{CC} = 2.3V$ Typ. at $V_{CC} = 2.5V$	$V_I = 0$	$I_I = 64mA$	—	5	9	Ω
			$I_I = 24mA$	—	5	9	
		$V_I = 1.7V$	$I_I = 15mA$	—	25	35	
	$V_{CC} = 3V$	$V_I = 0$	$I_I = 64mA$	—	5	7	
			$I_I = 24mA$	—	5	7	
		$V_I = 2.4V$	$I_I = 15mA$	—	10	15	

NOTES:

1. The increase in supply current is attributable to each input that is at the specified voltage level rather than V_{CC} or GND.

2. 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

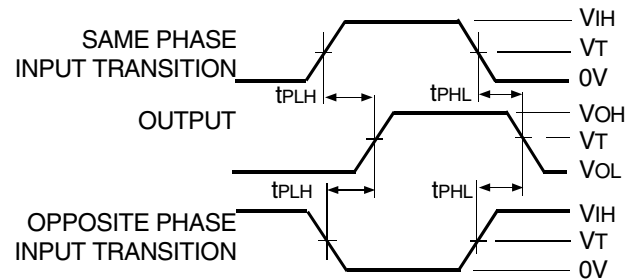| Symbol	Parameter	$V_{CC} = 2.5V ± 0.2V$		$V_{CC} = 3.3V ± 0.3V$		Unit
		Min.	Max.	Min.	Max.	
t_{PD}[1]	Propagation Delay A to B or B to A	—	0.15	—	0.25	ns
t_{PZH}	BIASV = GND $\overline{OE}$ to A or B	2.9	7.7	2.2	5.5	ns
t_{PZL}	BIASV = 3V $\overline{OE}$ to A or B	2.8	6.4	2.1	5.3	ns
t_{PHZ}	BIASV = GND $\overline{OE}$ to A or B	1.4	6.8	2.6	7.6	ns
t_{PLZ}	BIASV = 3V $\overline{OE}$ to A or B	1.3	4.2	1.5	5.1	ns

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 when driven by an ideal voltage source (zero output impededance).
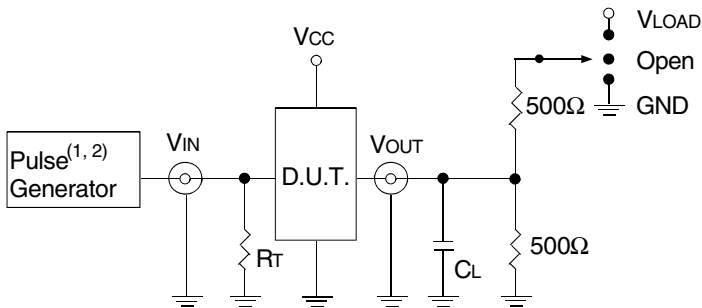
TEST CIRCUITS AND WAVEFORMS

TEST CONDITIONS

Symbol	V_{CC}[1] = 3.3V±0.3V	V_{CC}[2] = 2.5V±0.2V	Unit
V_{LOAD}	6	2 x Vcc	V
V_{IH}	3	Vcc	V
V_T	1.5	Vcc / 2	V
V_{LZ}	300	150	mV
V_{HZ}	300	150	mV
C_L	50	30	pF

Propagation Delay

Test Circuits for All Outputs
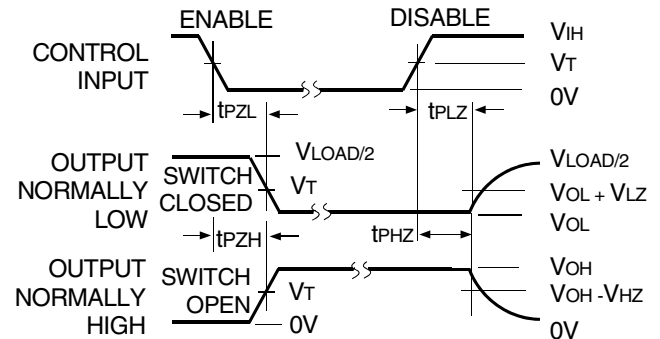
DEFINITIONS:

C_L = Load capacitance: includes jig and probe capacitance.

R_T = Termination resistance: should be equal to Z_{OUT} of the Pulse Generator.

NOTES:

1. Pulse Generator for All Pulses: Rate ≤ 10MHz; t_F ≤ 2.5ns; t_R ≤ 2.5ns.
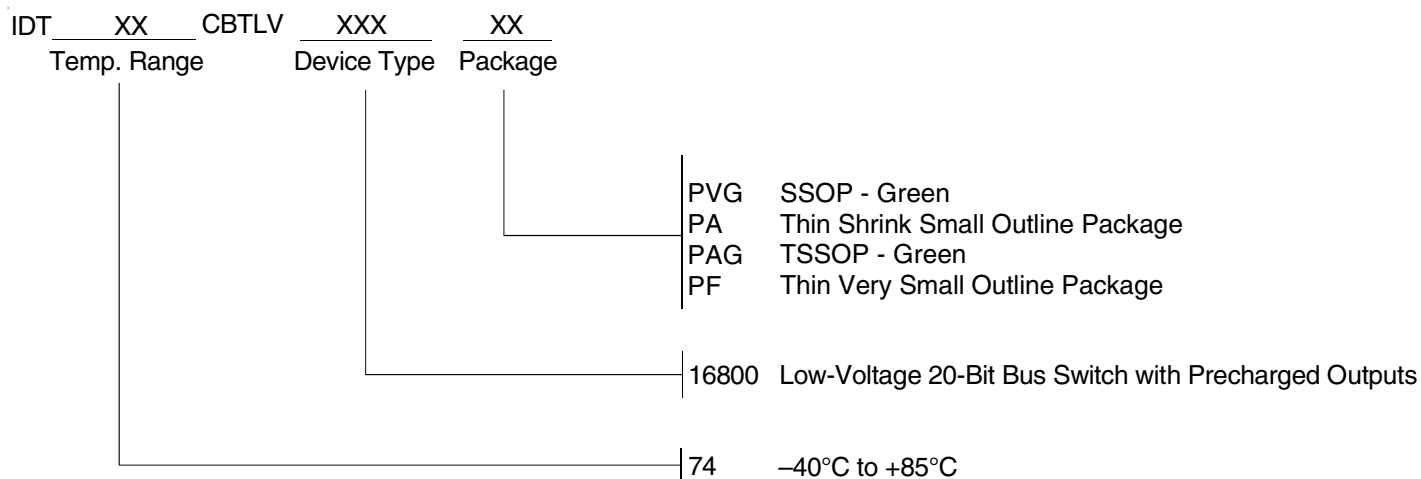2. Pulse Generator for All Pulses: Rate ≤ 10MHz; t_F ≤ 2ns; t_R ≤ 2ns.

NOTE:

1. Diagram shown for input Control Enable-LOW and input Control Disable-HIGH.

Enable and Disable Times

SWITCH POSITION

Test	Switch
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND
t_{PD}	Open

ORDERING INFORMATION

IDT   XX   CBTLV   XXX   XX

Temp. Range   Device Type Package

PVG	SSOP - Green
PA	Thin Shrink Small Outline Package
PAG	TSSOP - Green
PF	Thin Very Small Outline Package

16800	Low-Voltage 20-Bit Bus Switch with Precharged Outputs

74	–40°C to +85°C