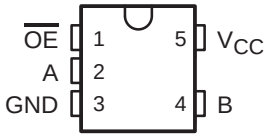
- **5-Ω Switch Connection Between Two Ports**
- **TTL-Compatible Control Input Levels**
- **ESD Protection Exceeds 2000 V Per MIL-STD-883, Method 3015; Exceeds 200 V Using Machine Model (C = 200 pF, R = 0)**
- **Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II**
- **Packaged in Plastic Small-Outline Transistor (DBV, DCK) Packages**

DBV OR DCK PACKAGE
(TOP VIEW)



description

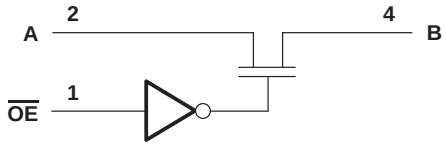
The SN74CBTD1G125 features a single high-speed line switch. The switch is disabled when the output-enable ($\overline{OE}$) input is high. A diode to V_{CC} is integrated on the chip to allow for level shifting between 5-V inputs and 3.3-V outputs.

The SN74CBTD1G125 is characterized for operation from –40°C to 85°C.

FUNCTION TABLE

INPUT $\overline{OE}$	FUNCTION
L	A port = B port
H	Disconnect

logic diagram (positive logic)



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absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage range, V_{CC} . . . . . –0.5 V to 7 V
Input voltage range, V_I (see Note 1) . . . . . –0.5 V to 7 V
Continuous channel current . . . . . 128 mA
Input clamp current, I_{IK} ($V_{I/O} < 0$) . . . . . –50 mA
Package thermal impedance, θ_{JA} (see Note 2): DBV package . . . . . 347°C/W
DCK package . . . . . 389°C/W
Storage temperature range, T_{stg} . . . . . –65°C to 150°C

† Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTES: 1. The input and output negative-voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
2. The package thermal impedance is calculated in accordance with JESD 51.

recommended operating conditions (see Note 3)

		MIN	MAX	UNIT
V_{CC}	Supply voltage	4.5	5.5	V
V_{IH}	High-level control input voltage	2		V
V_{IL}	Low-level control input voltage		0.8	V
T_A	Operating free-air temperature	–40	85	°C

NOTE 3: All unused control inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER		TEST CONDITIONS			MIN	TYP‡	MAX	UNIT
V_{IK}		V_{CC} = 4.5 V,	I_I = –18 mA				–1.2	V
V_{OH}		See Figure 2						
I_I		V_{CC} = 5.5 V,	V_I = 5.5 V or GND				±1	µA
I_{CC}		V_{CC} = 5.5 V,	I_O = 0,	$V_I = V_{CC}$ or GND			1.5	mA
ΔI_{CC}§	Control input	V_{CC} = 5.5 V,	One input at 3.4 V,	Other inputs at V_{CC} or GND			2.5	mA
C_i	Control input	V_I = 3 V or 0				2		pF
$C_{io(OFF)}$		V_O = 3 V or 0,	$\overline{OE} = V_{CC}$			3.5		pF
r_{on}¶		V_{CC} = 4.5 V	V_I = 0	I_I = 64 mA		5	7	Ω
				I_I = 30 mA		5	7	
			V_I = 2.4 V,	I_I = 15 mA		35	50	

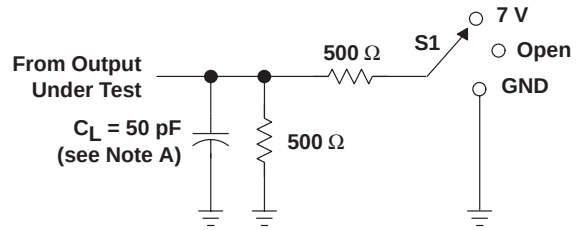
‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.
§ This is the increase in supply current for each input that is at the specified TTL voltage level rather than V_{CC} or GND.
¶ Measured by the voltage drop between the A and the B terminals at the indicated current through the switch. On-state resistance is determined by the lower voltage of the two (A or B) terminals.

switching characteristics over recommended operating free-air temperature range, C_L = 50 pF (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	MIN	MAX	UNIT
t_{pd}†	A or B	B or A		0.25	ns
t_{en}	$\overline{OE}$	A or B	2	5.9	ns
t_{dis}	$\overline{OE}$	A or B	1	4.7	ns

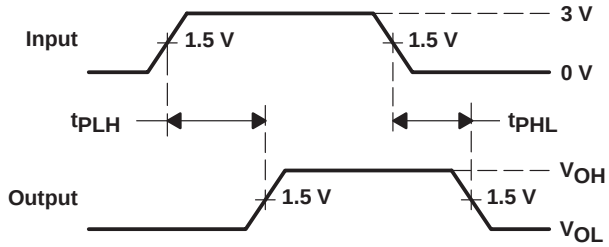
† The propagation delay is the calculated RC time constant of the typical on-state resistance of the switch and the specified load capacitance, when driven by an ideal voltage source (zero output impedance).

PARAMETER MEASUREMENT INFORMATION

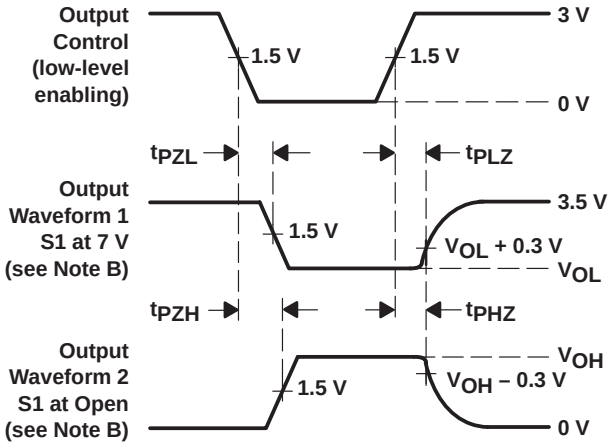


LOAD CIRCUIT

TEST	S1
t_{pd}	Open
t_{PLZ}/t_{PZL}	7 V
t_{PHZ}/t_{PZH}	Open



VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES



VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES

NOTES: A. C_L includes probe and jig capacitance.
B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
C. All input pulses are supplied by generators having the following characteristics: PRR ≤ 10 MHz, Z_O = 50 Ω, t_r ≤ 2.5 ns, t_f ≤ 2.5 ns.
D. The output is measured with one input transition per measurement.
E. t_{PLZ} and t_{PHZ} are the same as t_{dis}.
F. t_{PZL} and t_{PZH} are the same as t_{en}.
G. t_{PLH} and t_{PHL} are the same as t_{pd}.

Figure 1. Load Circuit and Voltage Waveforms

TYPICAL CHARACTERISTICS

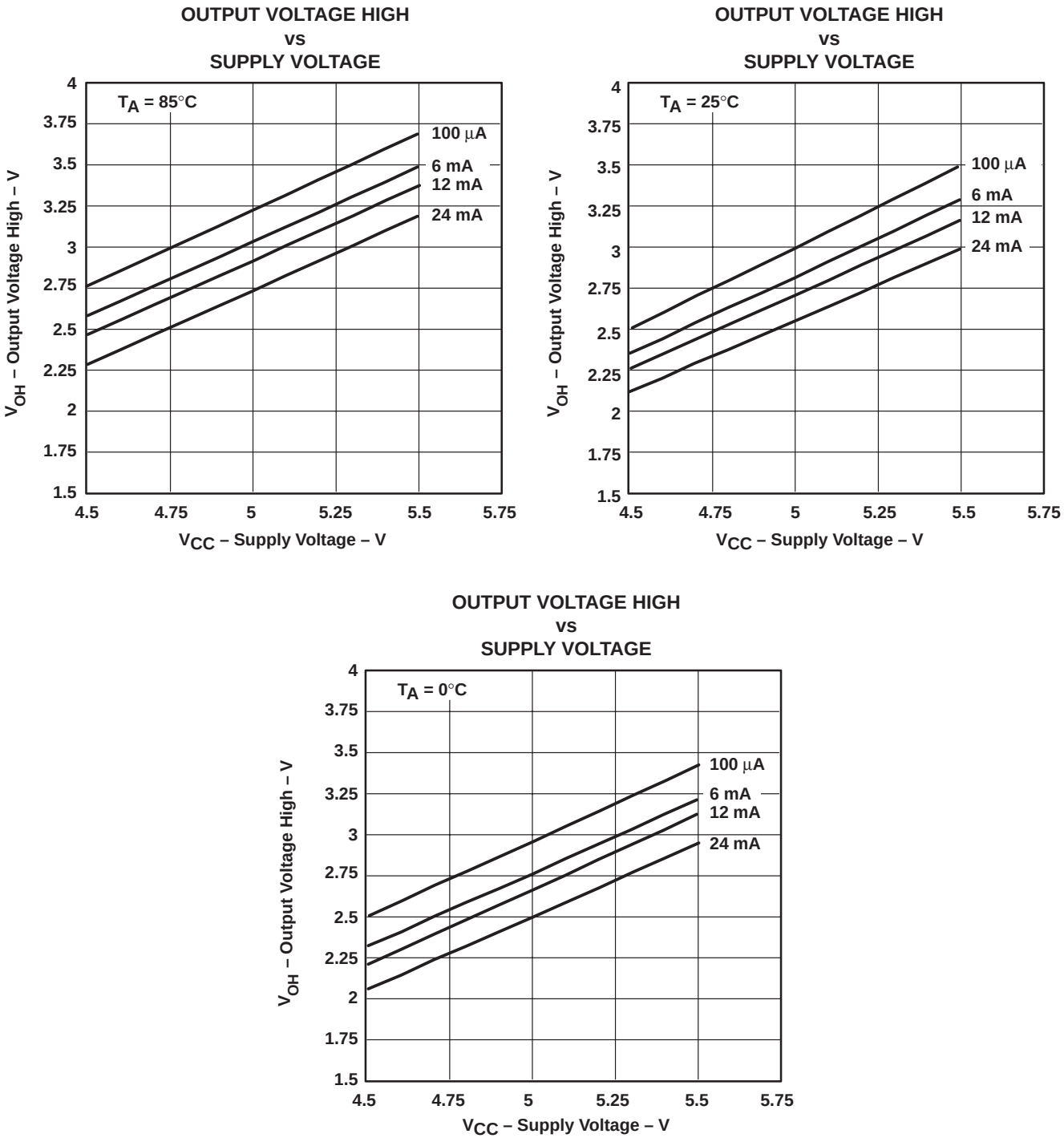


Figure 2. V_{OH} Values

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