

- **5-Ω Switch Connection Between Two Ports**
- **TTL-Compatible Input Levels**
- **Latch-Up Performance Exceeds 250 mA Per JESD 17**
- **Package Options Include Plastic Small-Outline (DW), Shrink Small-Outline (DBQ), and Thin Shrink Small-Outline (PW) Packages**

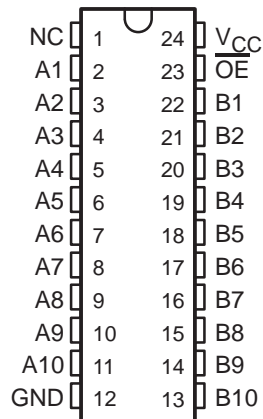
description

The SN74CBT3861 provides ten bits of high-speed TTL-compatible bus switching. The low on-state resistance of the switch allows connections to be made with minimal propagation delay.

The device is organized as one 10-bit switch with a single output-enable (\overline{OE}) input. When \overline{OE} is low, the 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.

The SN74CBT3861 is characterized for operation from -40°C to 85°C .

**DBQ, DW, OR PW PACKAGE
(TOP VIEW)**

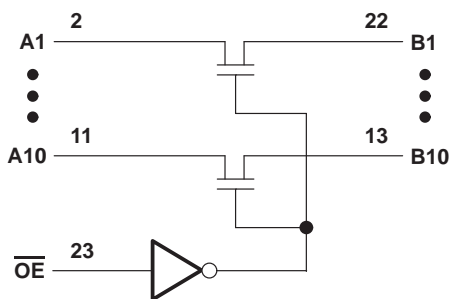


NC – No internal connection

FUNCTION TABLE

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

logic diagram (positive logic)



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SN74CBT3861

10-BIT FET BUS SWITCH

SCDS061B – APRIL 1998 – REVISED AUGUST 1998

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):	
DBQ package	113°C/W
DW package	81°C/W
PW package	120°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	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
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			3	µA
ΔI_{CC} §	Control inputs	$V_{CC} = 5.5$ V, One input at 3.4 V, Other inputs at V_{CC} or GND			2.5	mA
C_i	Control inputs	$V_I = 3$ V or 0			3	pF
$C_{iO(OFF)}$	$V_O = 3$ V or 0,	$\overline{OE} = V_{CC}$			5	pF
r_{on} ¶	$V_{CC} = 4$ V, TYP at $V_{CC} = 4$ V	$V_I = 2.4$ V,	$I_I = 15$ mA	14	22	Ω
		$V_I = 0$	$I_I = 64$ mA	5	7	
	$V_{CC} = 4.5$ V	$V_I = 0$	$I_I = 30$ mA	5	7	
		$V_I = 2.4$ V,	$I_I = 15$ mA	10	15	

‡ All typical values are at $V_{CC} = 5$ V (unless otherwise noted), $T_A = 25^\circ\text{C}$.

§ 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 B terminals at the indicated current through the switch. On-state resistance is determined by the lowest voltage of the two (A or B) terminals.

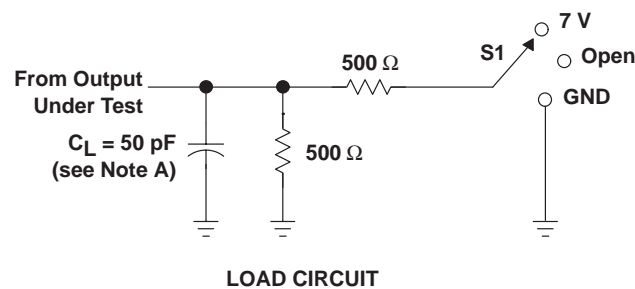


switching characteristics over recommended operating free-air temperature range (unless otherwise noted) (see Figure 1)

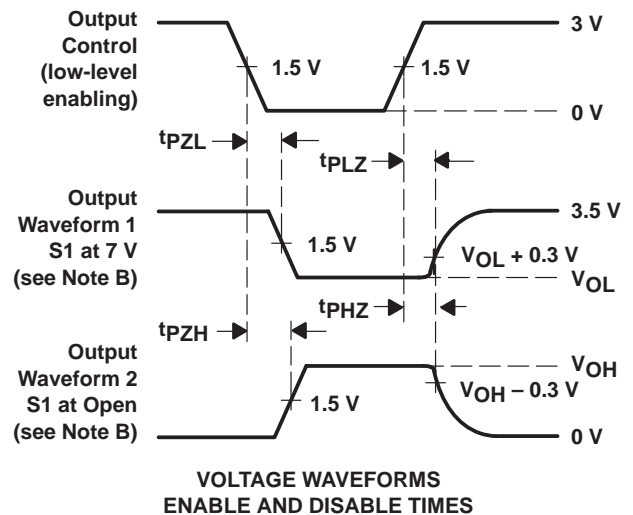
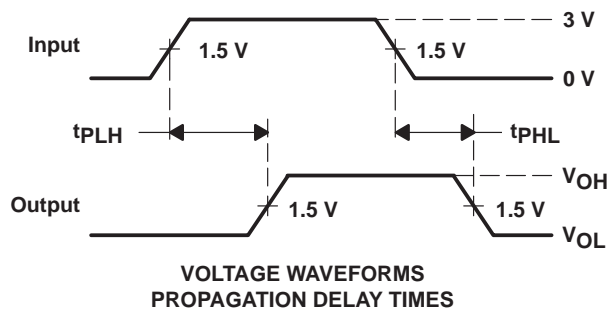
PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC} = 4 V		V _{CC} = 5 V ± 0.5 V		UNIT
			MIN	MAX	MIN	MAX	
t _{pd} [†]	A or B	B or A	0.35		0.25		ns
t _{en}	\overline{OE}	A or B	8.1		3.8	7.5	ns
t _{dis}	\overline{OE}	A or B	6.3		3.4	6.6	ns

[†] 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



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



- 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 outputs are measured one at a time with one transition per measurement.
 - E. t_{PLZ} and t_{PZH} 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

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