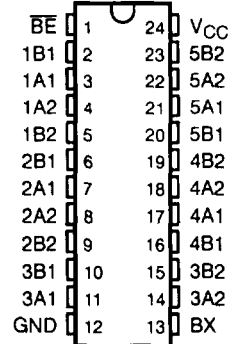


SN54CBT3383, SN74CBT3383 10-BIT BUS-EXCHANGE SWITCH

SCDS003C - NOVEMBER 1992 - REVISED MAY 1995

- Functionally Equivalent to QS3383 and QS3L383
- 5-Ω Switch Connection Between Two Ports
- TTL-Compatible Input and Output Levels
- Package Options Include Plastic Shrink Small-Outline (DB), Small-Outline (DW), Thin Shrink Small-Outline (PW), Ceramic DIPs (JT), and Ceramic Flat (W) Packages

SN54CBT3383 . . . JT OR W PACKAGE
SN74CBT3383 . . . DB, DW, OR PW PACKAGE
(TOP VIEW)



description

The 'CBT3383 provide ten bits of high-speed TTL-compatible bus switching or exchanging. The low on-state resistance of the switch allows connections to be made with minimal propagation delay.

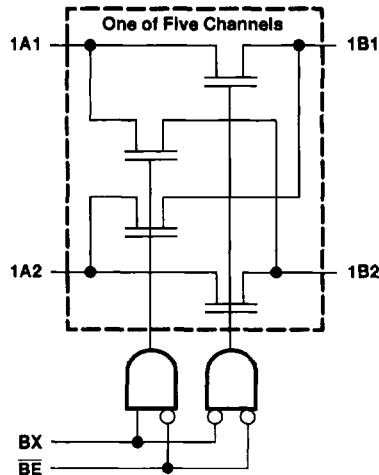
The devices operate as a 10-bit bus switch or a 5-bit bus exchanger, which provides swapping of the A and B pairs of signals. The bus-exchange function is selected when BX is high. The switches are connected when \overline{BE} is low.

The SN54CBT3383 is characterized for operation from -55°C to 125°C . The SN74CBT3383 is characterized for operation from 0°C to 70°C .

FUNCTION TABLE

\overline{BE}	BX	1A1-5A1	1A2-5A2
L	L	1B1-5B1	1B2-5B2
L	H	1B2-5B2	1B1-5B1
H	X	Z	Z

logic diagram



PRODUCTION DATA Information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

 **TEXAS
INSTRUMENTS**

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SN54CBT3383, SN74CBT3383 10-BIT BUS-EXCHANGE SWITCH

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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 6 V	
Continuous channel current	128 mA	
Input clamp current, I_{IK} ($V_{I/O} < 0$)	–50 mA	
Maximum power dissipation at $T_A = 55^\circ\text{C}$ (in still air) (see Note 2):	DB package	0.6 W
	DW package	1.6 W
	PW package	0.7 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 maximum package power dissipation is calculated using a junction temperature of 150°C and a board trace length of 750 mils. For more information, refer to the *Package Thermal Considerations* application note in the 1994 *ABT Advanced BiCMOS Technology Data Book*, literature number SCBD002B.

recommended operating conditions

		SN54CBT3383		SN74CBT3383		UNIT
		MIN	MAX	MIN	MAX	
V_{CC}	Supply voltage	4.5	5.5	4.5	5.5	V
V_{IH}	High-level control input voltage	2		2		V
V_{IL}	Low-level control input voltage	0.8		0.8		V
T_A	Operating free-air temperature	–55	125	0	70	°C

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

PARAMETER	TEST CONDITIONS	SN54CBT3383		SN74CBT3383		UNIT	
		MIN	TYP‡	MAX	MIN		TYP‡
V_{IK}	$V_{CC} = \text{MIN}\$, I_I = -18 \text{ mA}$			–1.2		–1.2	V
I_I	$V_{CC} = \text{MAX}\$, V_I = V_{CC} \text{ MAX or GND}$			±5		±5	µA
I_{CC}	$V_{CC} = \text{MAX}\$, V_I = V_{CC} \text{ or GND}, I_O = 0,$			50		50	µA
$\Delta I_{CC}\text{¶}$	Control pins $V_{CC} = \text{MAX}\$, \text{One input at } 3.4 \text{ V, Other inputs at } V_{CC} \text{ or GND}$			2.5		2.5	mA
C_i	Control pins $V_I = 3 \text{ V or } 0$					3	pF
	$V_I = 2.5 \text{ V}$			5			
$C_{io}(\text{OFF})$	$V_O = 3 \text{ V or } 0, \overline{BE} = V_{CC}$					6	pF
	$V_O = 2.5 \text{ V}, \overline{BE} = V_{CC}$			6			
$t_{on}\#$	$V_{CC} = \text{MIN}\$, V_I = 0, I_I = 64 \text{ mA}$	5	9.2	5	7	Ω	
	$V_{CC} = \text{MIN}\$, V_I = 0, I_I = 30 \text{ mA}$			5	7		
	$V_{CC} = \text{MIN}\$, V_I = 2.4 \text{ V}, I_I = 15 \text{ mA}$	10	17	10	15		

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

§ For conditions shown as MIN or MAX use the appropriate values under recommended operating conditions.

¶ 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 input terminal and the output terminal at the indicated current through the switch. On-state resistance is determined by the lower of the voltages of the two terminals.



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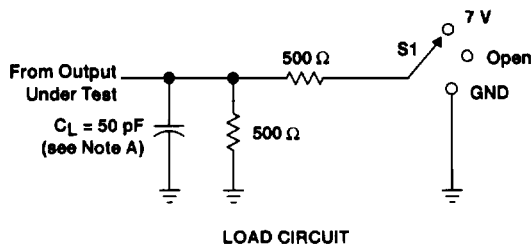
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switching characteristics over recommended operating free-air temperature range, $C_L = 50$ pF (unless otherwise noted) (see Figure 1)

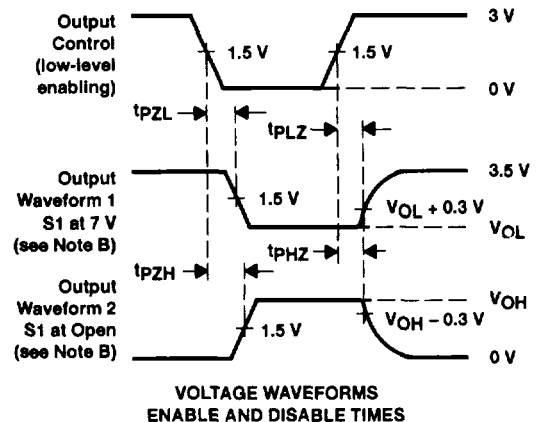
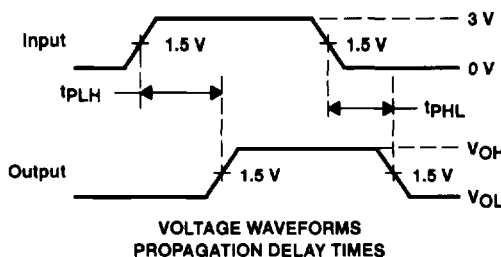
PARAMETER	FROM (INPUT)	TO (OUTPUT)	SN54CBT3383		SN74CBT3383		UNIT
			MIN	MAX	MIN	MAX	
t_{pd}^\dagger	A or B	B or A		1.5		0.25	ns
t_{en}	BX	A or B	1	10.2	1	9.2	ns
t_{en}	\overline{BE}	A or B	1	10.8	1	8.6	ns
t_{dis}	\overline{BE}	A or B	1	8.2	1	7.5	ns

[†] This parameter is characterized but not tested. This propagation delay is based on the RC time constant of the typical on-state resistance of the switch and a load capacitance of 50 pF.

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 \leq 10 MHz, $Z_O = 50 \Omega$, $t_r \leq 2.5$ ns, $t_f \leq 2.5$ ns.
 D. The outputs are measured one at a time with one 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