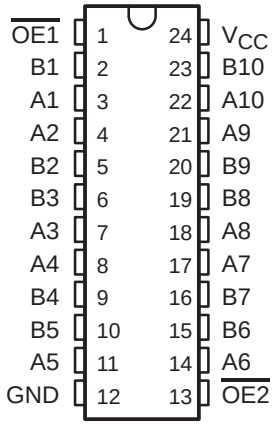
SCDS004B – NOVEMBER 1992 – REVISED JUNE 1994

- **Functionally Equivalent to QS3384 and QS3L384**
- **5-Ω Switch Connection Between Two Ports**
- **TTL-Compatible Input and Output Levels**
- **Package Options Include Plastic Small-Outline (DW), Shrink Small-Outline (DB), and Thin Shrink Small-Outline (PW) Packages**

DB, DW, OR PW PACKAGE
(TOP VIEW)



description

The SN74CBT3384 provides ten bits of high-speed TTL-compatible bus switching. The low on resistance of the switch allows connections to be made without adding propagation delay.

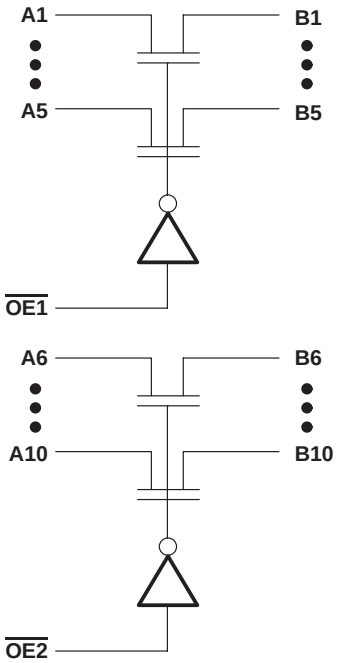
The device is organized as two 5-bit switches with separate output-enable ($\overline{OE}$) inputs. When $\overline{OE}$ is low, the switch is on and port A is connected to port B. When $\overline{OE}$ is high, the switch is open and a high-impedance state exists between the two ports.

The SN74CBT3384 is characterized for operation from 0°C to 70°C.

FUNCTION TABLE

$\overline{OE1}$	$\overline{OE2}$	B1 – B5	B6 – B10
L	L	A1 – A5	A6 – A10
L	H	A1 – A5	Z
H	L	Z	A6 – A10
H	H	Z	Z

logic diagram



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°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 . . . . . –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.

recommended operating conditions

		MIN	MAX	UNIT
V_{CC}	Supply voltage	4.75	5.25	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	0	70	°C

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} = 5.25 V,	V_I = 5.25 V or GND				±5	µA
I_{OS}		V_{CC} = 4.75 V,	$V_{I(A)}$ = 0,	$V_{I(B)}$ = 4.75 V		250		mA
I_{CC}		V_{CC} = 5.5 V,	I_O = 0,	V_I = V_{CC} or GND			50	µA
ΔI_{CC}‡	Control pins	V_{CC} = 5.25 V,	One input at 3.4 V,	Other inputs at V_{CC} or GND			2.5	mA
C_i	Control pins	V_I = 3 V or 0				3		pF
$C_{io(OFF)}$		V_O = 3 V or 0,	$\overline{OE}$ = V_{CC}			6		pF
r_{on}§		V_{CC} = 4.75 V	V_I = 0,	I_I = 64 mA		5	7	Ω
			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, 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 B pin at the indicated current through the switch. On resistance is determined by the lower of the voltages of the two (A or B) pins.

switching characteristics over recommended operating free-air temperature range, C_L = 50 pF (unless otherwise noted) (see Note 3)

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	1	8.5	ns
t_{dis}	$\overline{OE}$	A or B	1	8.5	ns

¶ This parameter is characterized but not tested. This propagation delay is based on the RC time constant of the typical on resistance of the switch and a load capacitance of 50 pF.
NOTE 3: Load circuit and voltage waveforms are shown in Section 1.

IMPORTANT NOTICE

Texas Instruments and its subsidiaries (TI) reserve the right to make changes to their products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgement, including those pertaining to warranty, patent infringement, and limitation of liability.

TI warrants performance of its semiconductor products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

CERTAIN APPLICATIONS USING SEMICONDUCTOR PRODUCTS MAY INVOLVE POTENTIAL RISKS OF DEATH, PERSONAL INJURY, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE ("CRITICAL APPLICATIONS"). TI SEMICONDUCTOR PRODUCTS ARE NOT DESIGNED, AUTHORIZED, OR WARRANTED TO BE SUITABLE FOR USE IN LIFE-SUPPORT DEVICES OR SYSTEMS OR OTHER CRITICAL APPLICATIONS. INCLUSION OF TI PRODUCTS IN SUCH APPLICATIONS IS UNDERSTOOD TO BE FULLY AT THE CUSTOMER'S RISK.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards must be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance or customer product design. TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such semiconductor products or services might be or are used. TI's publication of information regarding any third party's products or services does not constitute TI's approval, warranty or endorsement thereof.