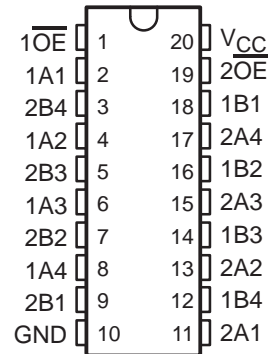


- Functionally Equivalent to QS3244
- Standard '244-Type Pinout
- 5-Ω Switch Connection Between Two Ports
- TTL-Compatible Input Levels
- Package Options Include Plastic Small-Outline (DW), Shrink Small-Outline (DB, DBQ), Thin Very Small-Outline (DGV), and Thin Shrink Small-Outline (PW) Packages

DB, DBQ, DGV, DW, OR PW PACKAGE  
(TOP VIEW)



## description

The SN74CBT3244 provides eight bits of high-speed TTL-compatible bus switching in a standard '244 device pinout. The low on-state resistance of the switch allows connections to be made with minimal propagation delay.

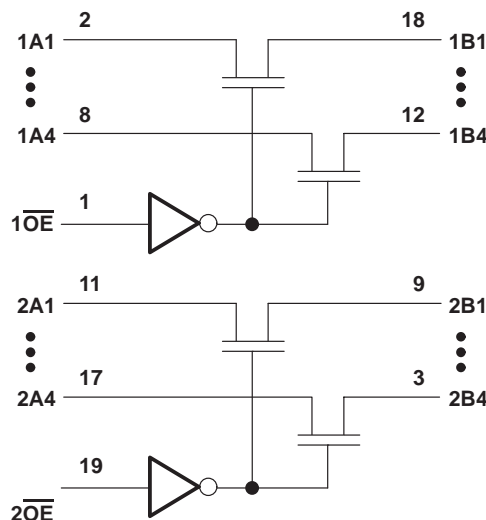
The device is organized as two 4-bit low-impedance switches with separate output-enable ( $\overline{OE}$ ) inputs. When  $\overline{OE}$  is low, the switch is on, and data can flow from port A to port B, or vice versa. When  $\overline{OE}$  is high, the switch is open, and a high-impedance state exists between the two ports.

The SN74CBT3244 is characterized for operation from 0°C to 70 °C.

**FUNCTION TABLE**  
(each 4-bit bus switch)

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

## logic diagram (positive logic)



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

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**

POST OFFICE BOX 655303 • DALLAS, TEXAS 75265

Copyright © 2000, Texas Instruments Incorporated

# SN74CBT3244

## OCTAL FET BUS SWITCH

SCDS0011 – NOVEMBER 1992 – REVISED MAY 2000

### 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
Clamp current, $I_K$ ( $V_{I/O} < 0$ )	–50 mA
Package thermal impedance, $\theta_{JA}$ (see Note 2):	
DB package	70°C/W
DBQ package	68°C/W
DGV package	92°C/W
DW package	58°C/W
PW package	83°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	0	70	°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				±5	µA	
$I_{CC}$	$V_{CC} = 5.5$ V, $I_O = 0$ , $V_I = V_{CC}$ or GND				50	µA	
$\Delta I_{CC}$ §	Control inputs	$V_{CC} = 5.5$ V, One input at 3.4 V, Other inputs at $V_{CC}$ or GND			3.5	mA	
$C_i$	Control inputs	$V_I = 3$ V or 0			3	pF	
$C_{iO(OFF)}$		$V_O = 3$ V or 0, $\overline{OE} = V_{CC}$			6	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	10	15		

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

§ 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 the 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.

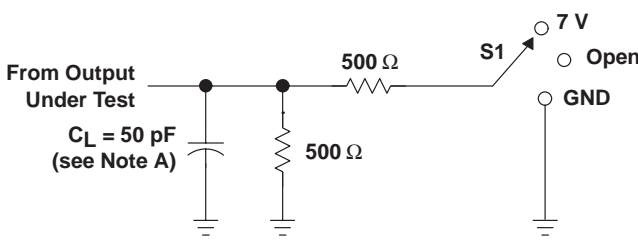


switching characteristics over recommended operating free-air temperature range,  $C_L = 50$  pF (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	MIN	MAX	UNIT
$t_{pd}^\dagger$	A or B	B or A		0.25	ns
$t_{en}$	$\overline{OE}$	A or B	1	8.9	ns
$t_{dis}$	$\overline{OE}$	A or B	1	7.4	ns

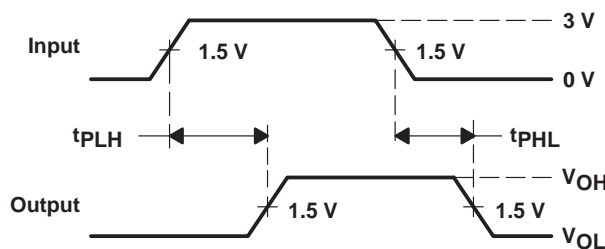
<sup>†</sup>This propagation delay is the calculated RC time constant of the typical on-state resistance of the switch and the specified load capacitance, when driven by an ideal voltage source (zero output impedance).

PARAMETER MEASUREMENT INFORMATION

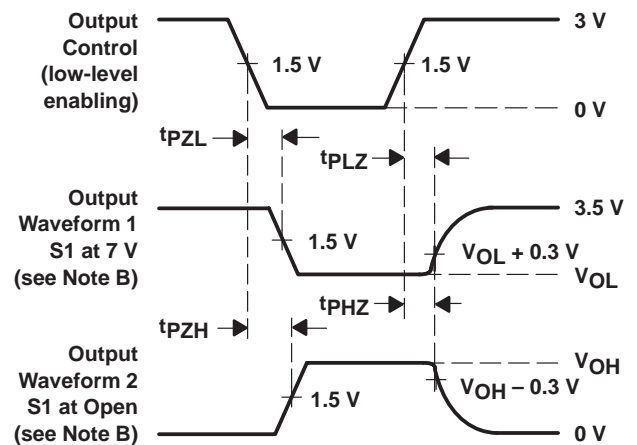


LOAD CIRCUIT

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:  $PRR \leq 10$  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

## **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 acknowledgment, 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.

Customers are responsible for their applications using TI components.

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.

[Advanced Search](#)
 [TI Home](#)
 [TI&ME](#)
 [Employment](#)
 [Tech Support](#)
 [Comments](#)
 [Site Map](#)
 [TI Global](#)
[>> Semiconductor Home](#) > [Products](#) > [Digital Logic](#) > [Bus Switches](#) > [Standard Bus Switches](#) >

## SN74CBT3244, Octal FET Bus Switch

Device Status: Active

- > [Description](#)
- > [Features](#)
- > [Datasheets](#)
- > [Pricing/Samples/Availability](#)
- > [Application Notes](#)
- > [Related Documents](#)
- > [Training](#)

Parameter Name	SN74CBT3244
Voltage Nodes (V)	5
Vcc range (V)	4.5 to 5.5
No. of Bits	8
ron(max) (ohms)	7
tpd(max) (ns)	0.25


## Description

The SN74CBT3244 provides eight bits of high-speed TTL-compatible bus switching in a standard '244 device pinout. The low on-state resistance of the switch allows connections to be made with minimal propagation delay.

The device is organized as two 4-bit low-impedance switches with separate output-enable (OE\ ) inputs. When OE\ is low, the switch is on, and data can flow from port A to port B, or vice versa. When OE\ is high, the switch is open, and a high-impedance state exists between the two ports.

The SN74CBT3244 is characterized for operation from 0°C to 70 °C.

## Features

- Functionally Equivalent to QS3244
- Standard '244-Type Pinout
- 5-  Switch Connection Between Two Ports
- TTL-Compatible Input Levels
- Package Options Include Plastic Small-Outline (DW), Shrink Small-Outline (DB, DBQ), Thin Very Small-Outline (DGV), and Thin Shrink Small-Outline (PW) Packages

To view the following documents, [Acrobat Reader 3.x](#) is required.

To download a document to your hard drive, right-click on the link and choose 'Save'.

## Datasheets

Full datasheet in Acrobat PDF: [scds001i.pdf](#) (59 KB)

Full datasheet in Zipped PostScript: [scds001i.psz](#) (59 KB)

## Pricing/Samples/Availability

<u>Orderable Device</u>	<u>Package</u>	<u>Pins</u>	<u>Temp (°C)</u>	<u>Status</u>	<u>Price/unit USD (100-999)</u>	<u>Pack Qty</u>	<u>Availability / Samples</u>
SN74CBT3244DBLE	<a href="#">DB</a>	20	0 TO 70	OBSOLETE			
SN74CBT3244DBQR	<a href="#">DBQ</a>	20	0 TO 70	ACTIVE	1.00	2500	<a href="#">Check stock or order</a>
SN74CBT3244DBR	<a href="#">DB</a>	20	0 TO 70	ACTIVE	0.84	2000	<a href="#">Check stock or order</a>
SN74CBT3244DGVR	<a href="#">DGV</a>	20	0 TO 70	ACTIVE	1.00	2000	<a href="#">Check stock or order</a>
SN74CBT3244DW	<a href="#">DW</a>	20	0 TO 70	ACTIVE	1.00	25	<a href="#">Check stock or order</a>
SN74CBT3244DWR	<a href="#">DW</a>	20	0 TO 70	ACTIVE	0.87	2000	<a href="#">Check stock or order</a>
SN74CBT3244PWLE	<a href="#">PW</a>	20	0 TO 70	OBSOLETE			
SN74CBT3244PWR	<a href="#">PW</a>	20	0 TO 70	ACTIVE	0.84	2000	<a href="#">Check stock or order</a>

## Application Reports

View Application Reports for [Digital Logic](#)

- [5-V To 3.3-V Translation With The SN74CBTD3384](#) (SCDA003B - Updated: 03/01/1997)
- [Flexible Voltage-Level Translation With CBT Family Devices](#) (SCDA006 - Updated: 07/20/1999)
- [Implications Of Slow Or Floating CMOS Inputs](#) (SCBA004C - Updated: 02/01/1998)
- [Low-Voltage Bus-Switch Technology And Applications](#) (SCDA005 - Updated: 12/01/1997)
- [Migration From 3.3-V To 2.5-V Power Supplies For Logic Devices](#) (SCEA005 - Updated: 12/01/1997)
- [SN74CBTS3384 Bus Switches Provide Fast Connection And Ensure Isolation](#) (SCDA002A - Updated: 08/01/1996)
- [TI Logic Solutions for Memory Interleaving With the Intel440BX Chipset](#) (SCCA001 - Updated: 04/08/1999)
- [Texas Instruments Crossbar Switches](#) (SCDA001A - Updated: 06/01/1995)
- [Texas Instruments Solution for Undershoot Protection for Bus Switches](#) (SCDA007 - Updated: 04/13/2000)
- [Understanding Advanced Bus-Interface Products Design Guide](#) (SCAA029, 253 KB - Updated: 05/01/1996)

## Related Documents

- [Documentation Rules \(SAP\) And Ordering Information](#) (SZZU001B, 4 KB - Updated: 05/06/1999)
- [Logic Selection Guide Second Half 2000](#) (SDYU001N, 5035 KB - Updated: 04/17/2000)
- [MicroStar Junior BGA Design Summary](#) (SCET004, 284 KB - Updated: 07/28/2000)
- [More Power In Less Space - Technical Article](#) (SCAU001A, 850 KB - Updated: 03/01/1996)

**Table Data Updated on: 8/31/2000**

