

SN54CBT16244, SN74CBT16244 16-BIT FET BUS SWITCHES

SCDS031G – MAY 1996 – REVISED SEPTEMBER 1998

- Standard '16244-Type Pinout
- 5-Ω Switch Connection Between Two Ports
- TTL-Compatible Input Levels
- Package Options Include Plastic Thin Shrink Small-Outline (DGG), Thin Very Small-Outline (DGV), and Shrink Small-Outline (DL) Packages, and Ceramic Flat (WD) Package

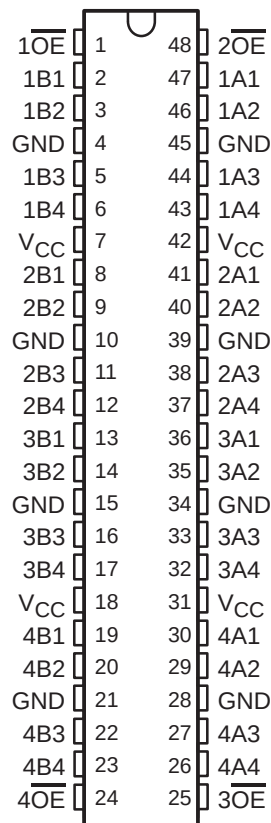
description

The 'CBT16244 devices provide 16 bits of high-speed TTL-compatible bus switching in a standard '16244 device pinout. The low on-state resistance of the switch allows connections to be made with minimal propagation delay.

These devices are organized as four 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 SN54CBT16244 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74CBT16244 is characterized for operation from -40°C to 85°C .

SN54CBT16244 . . . WD PACKAGE
SN74CBT16244 . . . DGG, DGV, OR DL PACKAGE
(TOP VIEW)



FUNCTION TABLE
(each 4-bit bus switch)

INPUT $\overline{OE}$	OUTPUTS A, B
L	A port = B port
H	Z



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

PARAMETER	TEST CONDITIONS	SN54CBT16244			SN74CBT16244			UNIT
		MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}	$V_{CC} = 4.5\text{ V}$, $I_I = -18\text{ mA}$			-1.2			-1.2	V
I_I	$V_{CC} = 0$ $V_I = 5.5\text{ V}$			10			10	μA
	$V_{CC} = 5.5\text{ V}$ $V_I = 5.5\text{ V or GND}$			± 1			± 1	
I_{CC}	$V_{CC} = 5.5\text{ V}$, $V_I = V_{CC}\text{ or GND}$ $I_O = 0$,			3.2			3	μA
$\Delta I_{CC}^\ddagger$	Control inputs $V_{CC} = 5.5\text{ V}$, Other inputs at $V_{CC}\text{ or GND}$ One input at 3.4 V ,			2.5			2.5	mA
C_i	Control inputs $V_I = 3\text{ V or } 0$			2.5			2.5	pF
$C_{io}(\text{OFF})$	$V_O = 3\text{ V or } 0$, $\overline{OE} = V_{CC}$			4.5			4.5	pF
$r_{on}^\S$	$V_{CC} = 4\text{ V}$	$V_I = 2.4\text{ V}$, $I_I = 15\text{ mA}$		20			20	Ω
		$V_I = 0$, $I_I = 64\text{ mA}$		5 10			5 7	
	$V_{CC} = 4.5\text{ V}$	$V_I = 0$, $I_I = 30\text{ mA}$		5 10			5 7	
		$V_I = 2.4\text{ V}$, $I_I = 15\text{ mA}$		8 14			8 12	

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

‡ 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 B terminals at the indicated current through the switch. On-state resistance is determined by the lower of the voltages of the two (A or B) terminals.

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	SN54CBT16244				SN74CBT16244				UNIT
			V _{CC} = 4 V		V _{CC} = 5 V ± 0.5 V		V _{CC} = 4 V		V _{CC} = 5 V ± 0.5 V		
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t _{pd} [¶]	A or B	B or A			0.8*		0.35		0.25		ns
t _{en}	$\overline{\text{OE}}$	A or B	10.3		1	9.2	5.5		1	5.1	ns
t _{dis}	$\overline{\text{OE}}$	A or B	9.7		1	8.2	5.2		1	5.4	ns

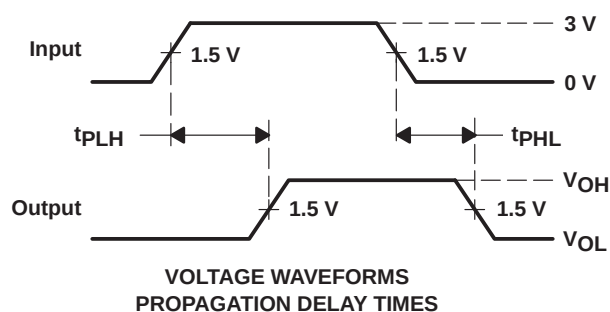
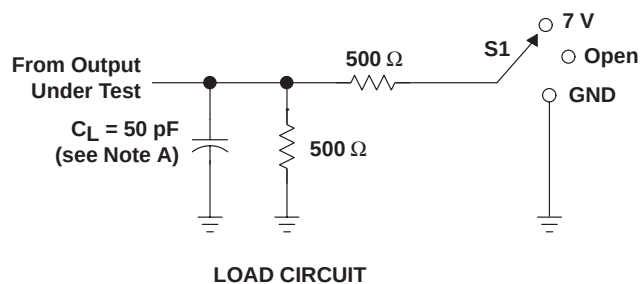
* On products compliant to MIL-PRF-38535, this parameter is not production tested.

¶ 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).

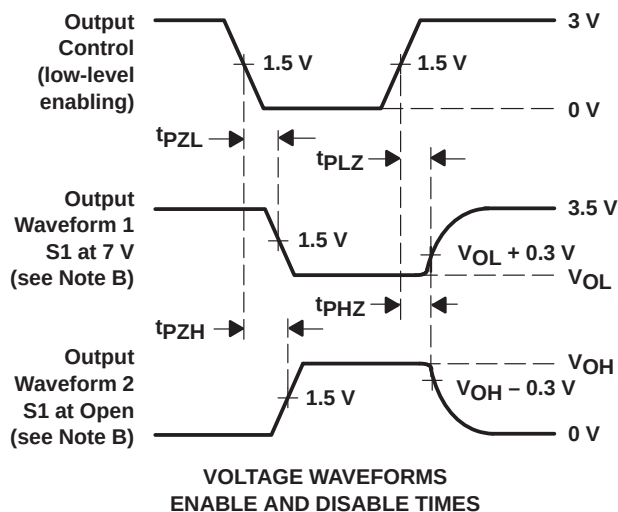
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PARAMETER MEASUREMENT INFORMATION



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: $PRR \leq 10 \text{ MHz}$, $Z_O = 50 \Omega$, $t_r \leq 2.5 \text{ ns}$, $t_f \leq 2.5 \text{ ns}$.
 - 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

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