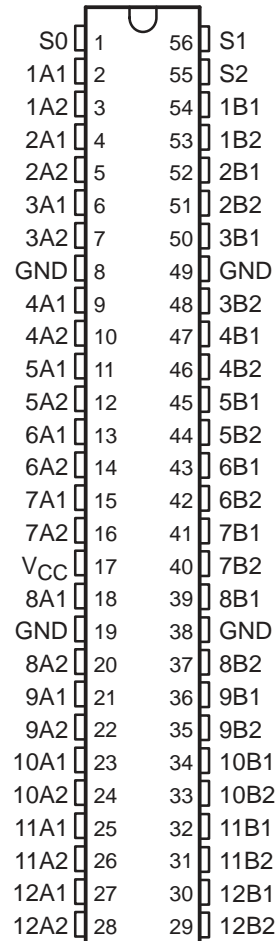


# SN54CBT16212A, SN74CBT16212A 24-BIT FET BUS-EXCHANGE SWITCHES

SCDS007M – NOVEMBER 1992 – REVISED SEPTEMBER 1998

- 5-Ω Switch Connection Between Two Ports
- TTL-Compatible Input Levels
- Latch-Up Performance Exceeds 250 mA Per JEDEC 17
- ESD Protection Exceeds 2000 V Per MIL-STD-883C, Method 3015; Exceeds 200 V Using Machine Model (C = 200 pF, R = 0)
- 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

SN54CBT16212A . . . WD PACKAGE  
SN74CBT16212A . . . DGG, DGV, OR DL PACKAGE  
(TOP VIEW)



## description

The 'CBT16212A devices provide 24 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.

Each device operates as a 24-bit bus switch or a 12-bit bus exchanger, which provides data exchanging between the four signal ports via the data-select (S0, S1, S2) terminals.

The SN54CBT16212A is characterized for operation over the full military temperature range of  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ . The SN74CBT16212A is characterized for operation from  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ .

FUNCTION TABLE

INPUTS			INPUTS/OUTPUTS		FUNCTION
S2	S1	S0	A1	A2	
L	L	L	Z	Z	Disconnect
L	L	H	B1 port	Z	A1 port = B1 port
L	H	L	B2 port	Z	A1 port = B2 port
L	H	H	Z	B1 port	A2 port = B1 port
H	L	L	Z	B2 port	A2 port = B2 port
H	L	H	Z	Z	Disconnect
H	H	L	B1 port	B2 port	A1 port = B1 port A2 port = B2 port
H	H	H	B2 port	B1 port	A1 port = B2 port A2 port = B1 port



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 **TEXAS  
INSTRUMENTS**

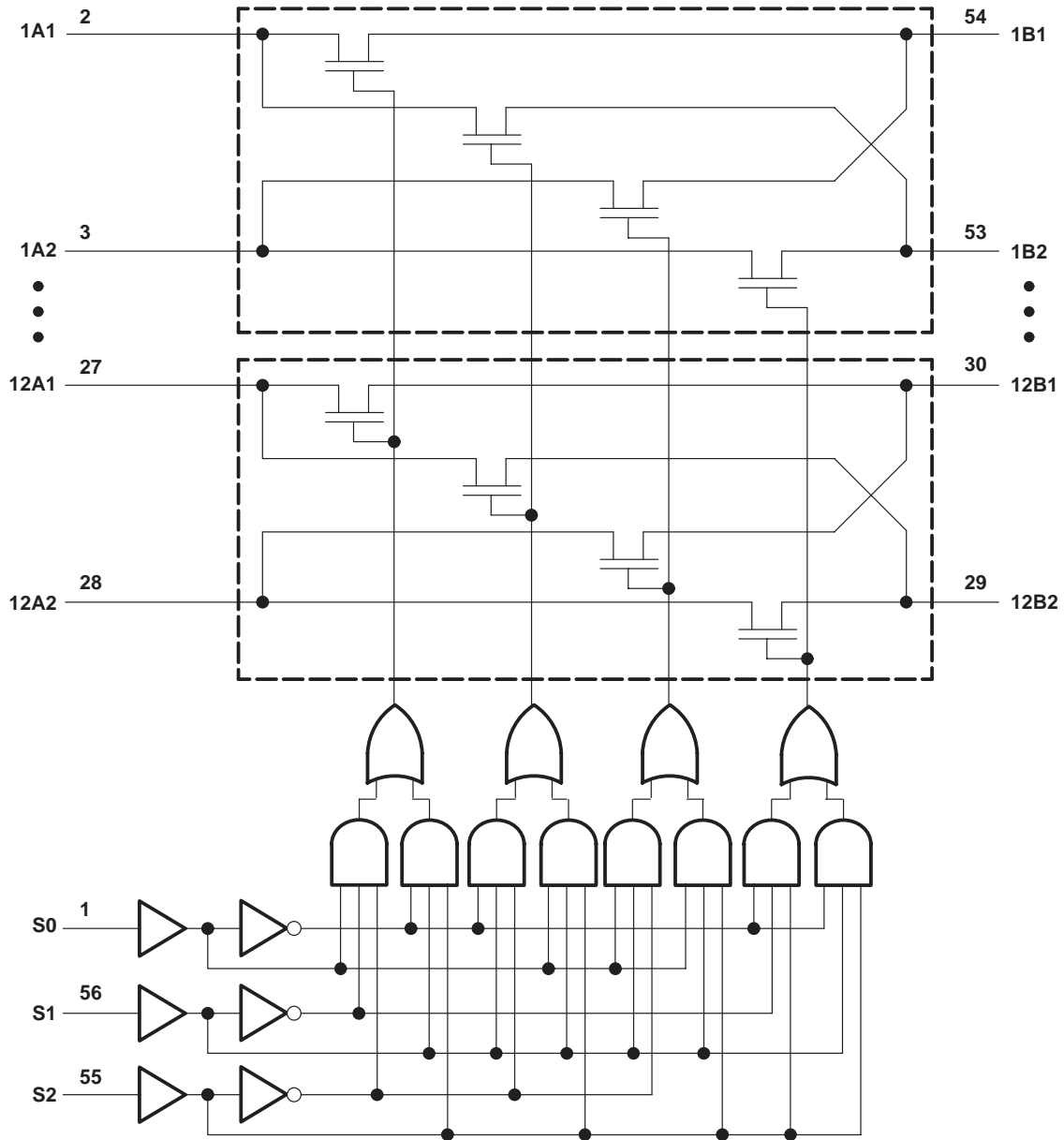
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# SN54CBT16212A, SN74CBT16212A 24-BIT FET BUS-EXCHANGE SWITCHES

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## logic diagram (positive logic)



Pin numbers shown are for the DGG, DGV, and DL packages.



# SN54CBT16212A, SN74CBT16212A 24-BIT FET BUS-EXCHANGE SWITCHES

SCDS007M – NOVEMBER 1992 – REVISED SEPTEMBER 1998

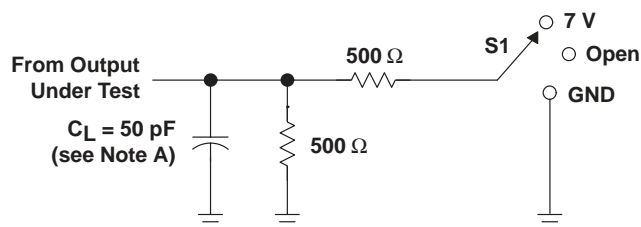
switching characteristics over recommended operating free-air temperature range,  $C_L = 50$  pF (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	SN54CBT16212A				SN74CBT16212A				UNIT
			$V_{CC} = 4$ V		$V_{CC} = 5$ V $\pm 0.5$ V		$V_{CC} = 4$ V		$V_{CC} = 5$ V $\pm 0.5$ V		
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
$t_{pd}^\dagger$	A or B	B or A				0.8*		0.35		0.25	ns
$t_{pd}$	S	A or B		14	1.5	13		10	1.5	9.1	ns
$t_{en}$	S	A or B		15	1.5	13.7		10.4	1.5	9.7	ns
$t_{dis}$	S	A or B		14.2	1.5	13.5		9.2	1.5	8.8	ns

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

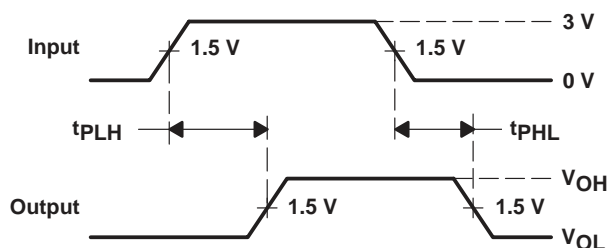
† The propagation delay is the calculated RC time constant of the typical on-state resistance of the switch and the specified load capacitance, when driven by an ideal voltage source (zero output impedance).

## PARAMETER MEASUREMENT INFORMATION

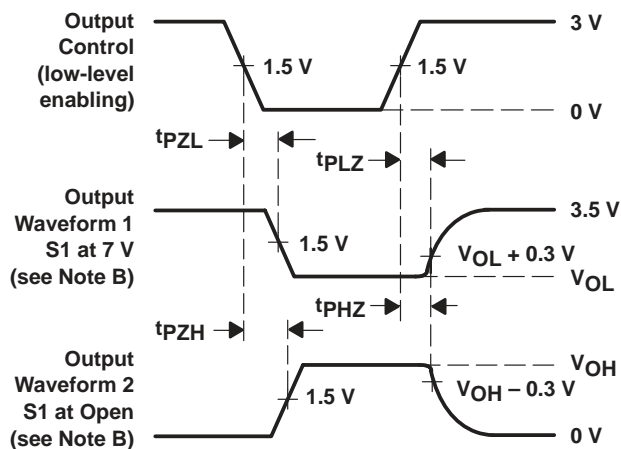


LOAD CIRCUIT

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

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