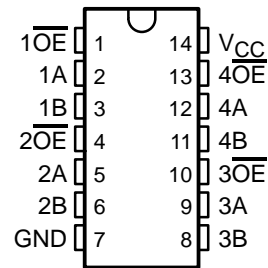


- Standard '125-Type Pinout
- 5- $\Omega$  Switch Connection Between Two Ports
- TTL-Compatible Input and Output Levels
- Package Options Include Plastic Small-Outline (D), Shrink Small-Outline (DB), and Thin Shrink Small-Outline (PW) Packages

D, DB, OR PW PACKAGE  
(TOP VIEW)



## description

The SN74CBT3125 quadruple bus switch features independent line switches. Each switch is disabled when the associated output-enable ( $\overline{\text{OE}}$ ) input is high.

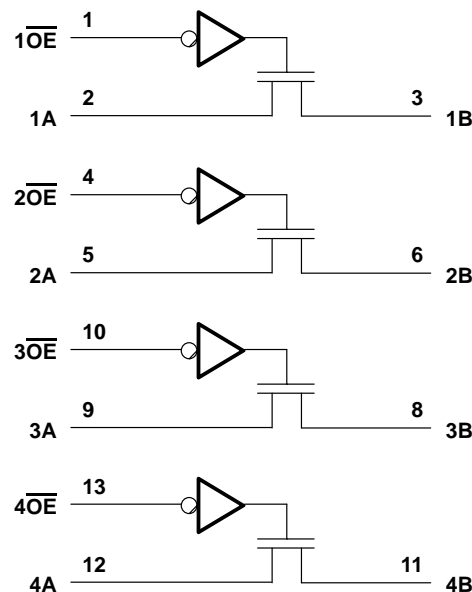
The SN74CBT3125 is available in TI's shrink small-outline (DB) and thin shrink small-outline (PW) packages, which provide the same I/O pin count and functionality of standard small-outline packages in less than half the printed-circuit-board area.

The SN74CBT3125 is characterized for operation from  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ .

FUNCTION TABLE

INPUT $\overline{\text{OE}}$	INPUTS/ OUTPUTS
	A, B
L	A = B
H	Z

## 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.

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# SN74CBT3125

## QUADRUPLE BUS SWITCH

SCDS021B – MAY 1995 – REVISED JUNE 1996

### absolute maximum ratings over operating free-air temperature range (unless otherwise noted)<sup>†</sup>

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
Input clamp current, $I_K$ ( $V_{I/O} < 0$ )	–50 mA
Maximum power dissipation at $T_A = 55^\circ\text{C}$ (in still air) (see Note 2): D package	1.25 W
DB package	0.5 W
PW package	0.5 W
Storage temperature range, $T_{stg}$	–65°C to 150°C

<sup>†</sup> 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 *ABT Advanced BiCMOS Technology Data Book*.

### recommended operating conditions

	MIN	MAX	UNIT
$V_{CC}$ Supply voltage	4	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	–40	85	°C

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

PARAMETER	TEST CONDITIONS	MIN	TYP <sup>‡</sup>	MAX	UNIT
$V_{IK}$	$V_{CC} = 4\text{ V}$ , $I_I = -18\text{ mA}$			–1.2	V
$I_I$	$V_{CC} = 5.5\text{ V}$ , $V_I = 5.5\text{ V}$ or GND			±1	μA
$I_{CC}$	$V_{CC} = 5.5\text{ V}$ , $I_O = 0$ , $V_I = V_{CC}$ or GND			3	μA
$\Delta I_{CC}$ <sup>§</sup> Control pins	$V_{CC} = 5.5\text{ V}$ , One input at 3.4 V, Other inputs at $V_{CC}$ or GND			2.5	mA
$C_i$ Control pins	$V_I = 3\text{ V}$ or 0			3	pF
$C_{io(OFF)}$	$V_O = 3\text{ V}$ or 0, $\overline{OE} = V_{CC}$			4	pF
$r_{on}$ <sup>¶</sup>	$V_{CC} = 4\text{ V}$ , $V_I = 2.4\text{ V}$ , $I_I = 15\text{ mA}$			16	Ω
	$V_I = 0$ , $I_I = 64\text{ mA}$			5	
	$V_{CC} = 4.5\text{ V}$ , $V_I = 0$ , $I_I = 30\text{ mA}$			5	
	$V_I = 2.4\text{ V}$ , $I_I = 15\text{ mA}$			10	

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

<sup>§</sup> This is the increase in supply current for each input that is at the specified TTL voltage level rather than  $V_{CC}$  or GND.

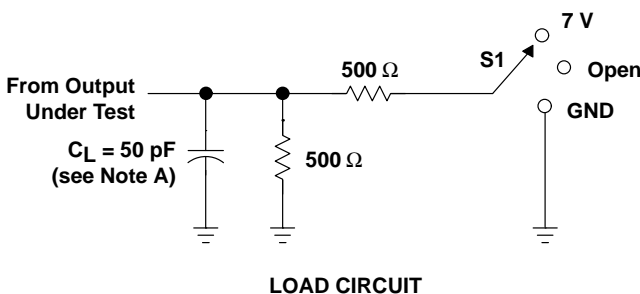
<sup>¶</sup> Measured by the voltage drop between the A and the B terminals at the indicated current through the switch. On-state resistance is determined by the lower of the voltages of the two (A or B) terminals.

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

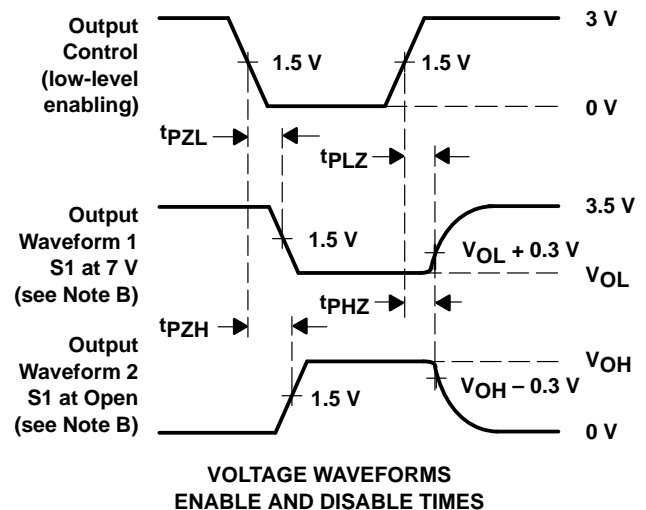
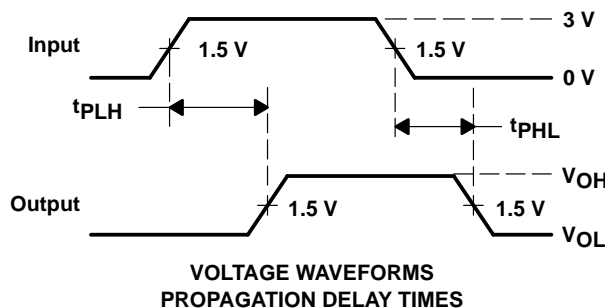
PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 5\text{ V} \pm 0.5\text{ V}$		$V_{CC} = 4\text{ V}$		UNIT
			MIN	MAX	MIN	MAX	
$t_{pd}^\dagger$	A or B	B or A	0.25		0.25		ns
$t_{en}$	$\overline{OE}$	A or B	1.6	5.4	6		ns
$t_{dis}$	$\overline{OE}$	A or B	1	4.7	5.1		ns

<sup>†</sup> This parameter is warranted but not production tested. The 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, when driven by an ideal voltage source (zero output impedance).

## PARAMETER MEASUREMENT INFORMATION



TEST	S1
$t_{pd}$	Open
$t_{PLZ}/t_{PZL}$	7 V
$t_{PHZ}/t_{PZH}$	Open



- NOTES:
- $C_L$  includes probe and jig capacitance.
  - 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.
  - All input pulses are supplied by generators having the following characteristics:  $PRR \leq 10\text{ MHz}$ ,  $Z_O = 50\text{ }\Omega$ ,  $t_r \leq 2.5\text{ ns}$ ,  $t_f \leq 2.5\text{ ns}$ .
  - The outputs are measured one at a time with one transition per measurement.
  - $t_{PLZ}$  and  $t_{PHZ}$  are the same as  $t_{dis}$ .
  - $t_{PZL}$  and  $t_{PZH}$  are the same as  $t_{en}$ .
  - $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{pd}$ .

Figure 1. Load Circuit and Voltage Waveforms

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