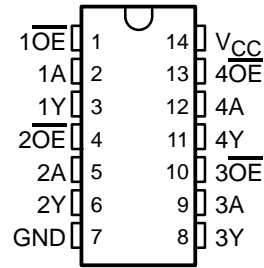


# SN64BCT125A QUADRUPLE BUS BUFFER GATE WITH 3-STATE OUTPUTS

SCBS052B – JULY 1990 – REVISED MAY 1994

- State-of-the-Art BiCMOS Design Significantly Reduces  $I_{CCZ}$
- High-Impedance State During Power-Up and Power-Down
- 3-State Outputs Drive Bus Lines or Buffer-Memory Address Registers
- ESD Protection Exceeds 2000 V Per MIL-STD-883C Method 3015
- Package Options Include Plastic Small-Outline (D) Packages and Standard Plastic 300-mil DIPs (N)

D OR N PACKAGE  
(TOP VIEW)



## description

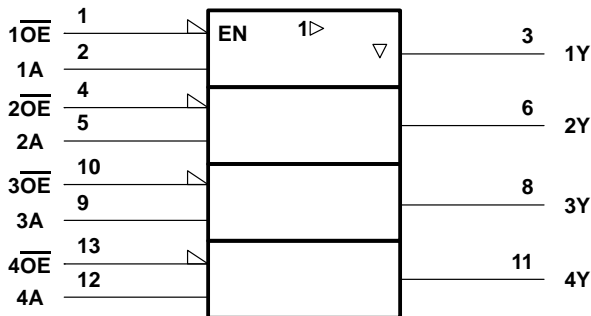
The SN64BCT125A bus buffer features independent line drivers with 3-state outputs. Each output is disabled when the associated output-enable ( $\overline{OE}$ ) input is high.

The SN64BCT125A is characterized for operation from  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$  and  $0^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ .

FUNCTION TABLE  
(each buffer)

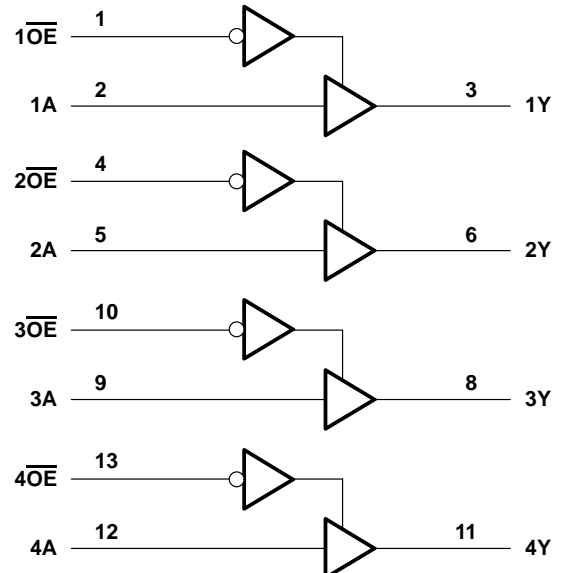
INPUTS		OUTPUT
$\overline{OE}$	A	Y
L	H	H
L	L	L
H	X	Z

## logic symbol†



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

## logic diagram (positive logic)



# SN64BCT125A

## QUADRUPLE BUS BUFFER GATE

### WITH 3-STATE OUTPUTS

SCBS052B – JULY 1990 – REVISED MAY 1994

#### 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
Voltage range applied to any output in the disabled or power-off state, $V_O$	– 0.5 V to 5.5 V
Voltage range applied to any output in the high state, $V_O$	– 0.5 V to $V_{CC}$
Current into any output in the low state	128 mA
Operating free-air temperature range	– 40°C to 85°C
Storage temperature range	– 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.

NOTE 1: The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

#### recommended operating conditions

	MIN	NOM	MAX	UNIT
$V_{CC}$ Supply voltage	4.5	5	5.5	V
$V_{IH}$ High-level input voltage	2			V
$V_{IL}$ Low-level input voltage			0.8	V
$I_{IK}$ Input clamp current			–18	mA
$I_{OH}$ High-level output current			–15	mA
$I_{OL}$ Low-level output current			64	mA
$T_A$ 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
$V_{IK}$	$V_{CC} = 4.5$ V,	$I_I = -18$ mA			–1.2	V
$V_{OH}$	$V_{CC} = 4.5$ V	$I_{OH} = -3$ mA	2.4	3.3		V
		$I_{OH} = -15$ mA	2	3.1		
$V_{OL}$	$V_{CC} = 4.5$ V,	$I_{OH} = 64$ mA		0.42	0.55	V
$I_{OZH}$	$V_{CC} = 5.5$ V,	$V_O = 2.7$ V			50	μA
$I_{OZL}$	$V_{CC} = 5.5$ V,	$V_O = 0.5$ V			–50	μA
$I_{OZ}$	$V_{CC} = 0$ to 1.3 V (power up)	$V_O = 2.7$ V or 0.5 V, $\overline{OE}$ at 0.8 V			± 50	μA
	$V_{CC} = 1.3$ V to 0 (power down)				± 50	
$I_I$	$V_{CC} = 0$ ,	$V_I = 7$ V			0.1	mA
$I_{IH}$	$V_{CC} = 5.5$ V,	$V_I = 2.7$ V			25	μA
$I_{IL}$	$V_{CC} = 5.5$ V,	$V_I = 0.5$ V			–20	μA
$I_{OS}^{\S}$	$V_{CC} = 5.5$ V,	$V_O = 0$	–100		–225	mA
$I_{CCL}$	$V_{CC} = 5.5$ V			46	49	mA
$I_{CCH}$	$V_{CC} = 5.5$ V			19	31	mA
$I_{CCZ}$	$V_{CC} = 5.5$ V			6	14	mA
$C_i$	$V_{CC} = 5$ V,	$V_I = 2.5$ V or 0.5 V		4		pF
$C_o$	$V_{CC} = 5$ V,	$V_O = 2.5$ V or 0.5 V		9		pF

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

<sup>\S</sup> Not more than one output should be tested at a time, and the duration of the test should not exceed one second.



**SN64BCT125A**  
**QUADRUPLE BUS BUFFER GATE**  
**WITH 3-STATE OUTPUTS**

SCBS052B – JULY 1990 – REVISED MAY 1994

**switching characteristics (see Note 2)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V <sub>CC</sub> = 5 V, C <sub>L</sub> = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T <sub>A</sub> = 25°C			V <sub>CC</sub> = 4.5 V to 5.5 V, C <sub>L</sub> = 50 pF, R1 = 500 Ω, R2 = 500 Ω				UNIT
						T <sub>A</sub> = –40°C to 85°C		T <sub>A</sub> = 0°C to 70°C		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	A	Y	1.6	3.5	5.2	1.6	6	1.6	5.7	ns
t <sub>PHL</sub>			2.7	5	6.9	2.7	8	2.7	7.7	
t <sub>PZH</sub>	$\overline{\text{OE}}$	Y	3.4	6.7	9	3.4	11.1	3.4	10.3	ns
t <sub>PZL</sub>			5	8.2	10.4	5	12.8	5	11.7	
t <sub>PHZ</sub>	$\overline{\text{OE}}$	Y	3	5.8	7.4	3	9.4	3	8.9	ns
t <sub>PLZ</sub>			2.8	5.5	7.3	2.8	9.9	2.8	8.6	

NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

## **IMPORTANT NOTICE**

Texas Instruments (TI) reserves the right to make changes to its products or to discontinue any semiconductor product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

TI warrants performance of its semiconductor products and related software 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, INTENDED, AUTHORIZED, OR WARRANTED TO BE SUITABLE FOR USE IN LIFE-SUPPORT APPLICATIONS, DEVICES OR SYSTEMS OR OTHER CRITICAL APPLICATIONS.**

Inclusion of TI products in such applications is understood to be fully at the risk of the customer. Use of TI products in such applications requires the written approval of an appropriate TI officer. Questions concerning potential risk applications should be directed to TI through a local SC sales office.

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

TI assumes no liability for applications assistance, customer product design, software performance, or infringement of patents or services described herein. Nor does TI 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.