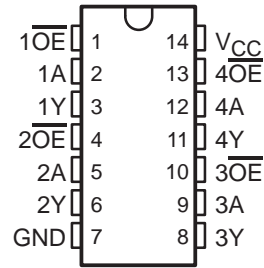


SN64BCT125A QUADRUPLE BUS BUFFER GATE WITH 3-STATE OUTPUTS

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

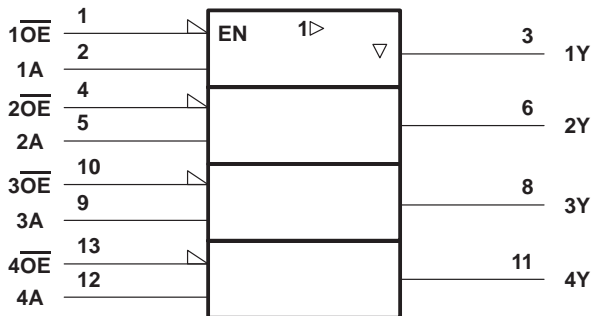
The SN64BCT125A bus buffer features independent line drivers with 3-state outputs. Each output is disabled when the associated output-enable (\overline{OE}) input is high.

The SN64BCT125A is characterized for operation from -40°C to 85°C and 0°C to 70°C .

FUNCTION TABLE
(each buffer)

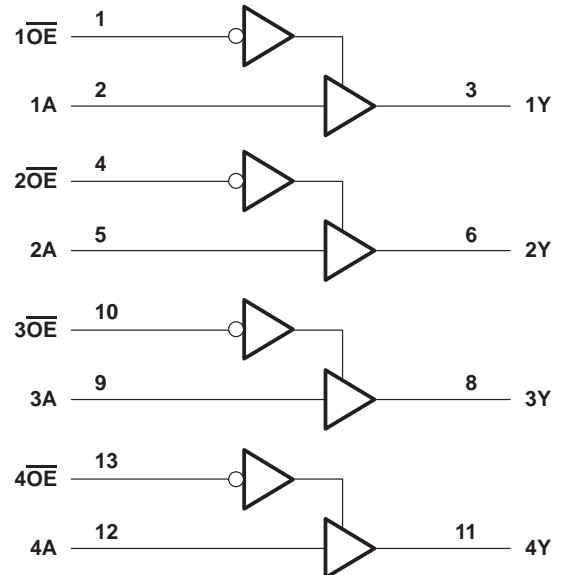
INPUTS		OUTPUT
\overline{OE}	A	Y
L	H	H
L	L	L
H	X	Z

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)†

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

† 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‡	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

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

§ 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 _{CC} = 5 V, C _L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T _A = 25°C			V _{CC} = 4.5 V to 5.5 V, C _L = 50 pF, R1 = 500 Ω, R2 = 500 Ω				UNIT
						T _A = -40°C to 85°C		T _A = 0°C to 70°C		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	A	Y	1.6	3.5	5.2	1.6	6	1.6	5.7	ns
t _{PHL}			2.7	5	6.9	2.7	8	2.7	7.7	
t _{PZH}	$\overline{\text{OE}}$	Y	3.4	6.7	9	3.4	11.1	3.4	10.3	ns
t _{PZL}			5	8.2	10.4	5	12.8	5	11.7	
t _{PHZ}	$\overline{\text{OE}}$	Y	3	5.8	7.4	3	9.4	3	8.9	ns
t _{PLZ}			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.

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PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
SN64BCT125AD	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN64BCT125ADE4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN64BCT125ADG4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN64BCT125ADR	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN64BCT125ADRE4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN64BCT125ADRG4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN64BCT125AN	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN64BCT125ANE4	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN64BCT125ANSR	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN64BCT125ANSRE4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN64BCT125ANSRG4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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TAPE AND REEL INFORMATION



QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN64BCT125ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN64BCT125ANSR	SO	NS	14	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1

TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN64BCT125ADR	SOIC	D	14	2500	346.0	346.0	33.0
SN64BCT125ANSR	SO	NS	14	2000	346.0	346.0	33.0

MECHANICAL DATA

NS (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

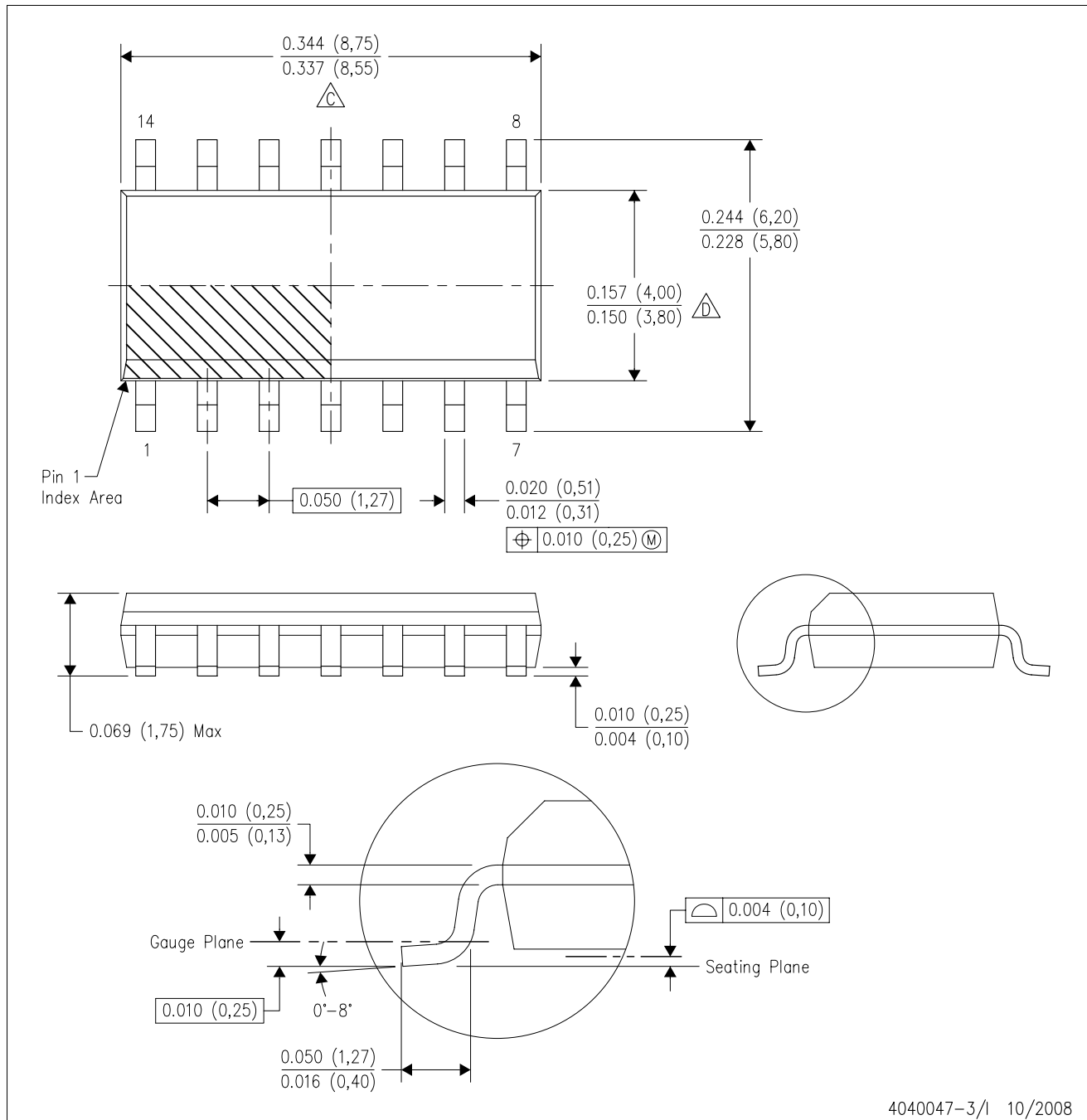
14-PINS SHOWN



- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

D (R-PDSO-G14)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed .006 (0,15) per end.
 - D. Body width does not include interlead flash. Interlead flash shall not exceed .017 (0,43) per side.
 - E. Reference JEDEC MS-012 variation AB.

N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - $\triangle C$ Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
 - $\triangle D$ The 20 pin end lead shoulder width is a vendor option, either half or full width.

4040049/E 12/2002