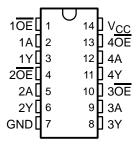
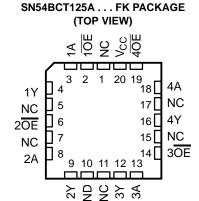
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- Operating Voltage Range of 4.5 V to 5.5 V
- State-of-the-Art BiCMOS Design Significantly Reduces I_{CCZ}

SN54BCT125A . . . J OR W PACKAGE SN74BCT125A . . . D, N, OR NS PACKAGE (TOP VIEW)



3-State Outputs Drive Bus Lines or Buffer Memory Address Registers



NC - No internal connection

description/ordering information

The 'BCT125A bus buffers feature independent line drivers with 3-state outputs. Each output is disabled when the associated output-enable (OE) input is high.

To ensure the high-impedance state during power up or power down, \overline{OE} should be tied to V_{CC} through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

ORDERING INFORMATION

TA	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING	
	PDIP – N	Tube	SN74BCT125AN	SN74BCT125AN	
000 1- 7000	SOIC - D	Tube	SN74BCT125AD	BCT125A	
0°C to 70°C	3010 - 0	Tape and reel	SN74BCT125ADR	BCT125A	
	SOP - NS	Tape and reel	SN74BCT125ANSR	BCT125A	
	CDIP – J	Tube	SNJ54BCT125AJ	SNJ54BCT125AJ	
–55°C to 125°C	CFP – W Tube		SNJ54BCT125AW	SNJ54BCT125AW	
	LCCC – FK	Tube	SNJ54BCT125AFK	SNJ54BCT125AFK	

[†] Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

FUNCTION TABLE (each buffer)

INP	JTS	OUTPUT
OE	Α	Υ
L	Н	Н
L	L	L
Н	Χ	Z

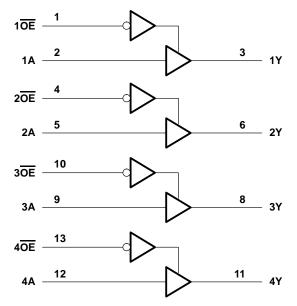


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logic diagram (positive logic)



Pin numbers shown are for the D, J, N, NS, and W packages.

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage range, V _{CC}	
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, VO	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}
Input clamp current, $I_{ K }(V_1 < 0)$	
Current into any output in the low state, IO: SN54BCT125A	96 mA
SN74BCT125A	128 mA
Package thermal impedance, θ_{JA} (see Note 2): D package	86°C/W
N package	80°C/W
NS package	76°C/W
Storage temperature range, T _{stq}	–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.

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

2. The package thermal impedance is calculated in accordance with JESD 51-7.



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recommended operating conditions (see Note 3)

		SN54BCT125A			SN7	UNIT		
		MIN	NOM	MAX	MIN	NOM	MAX	UNII
VCC	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
VIH	High-level input voltage	2			2			V
V _{IL}	Low-level input voltage			0.8			0.8	V
lıĸ	Input clamp current			-18			-18	mA
ЮН	High-level output current			-12			-15	mA
loL	Low-level output current			48			64	mA
TA	Operating free-air temperature	-55		125	0		70	°C

NOTE 3: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, Implications of Slow or Floating CMOS Inputs, literature number SCBA004.

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

DADAMETED		TEST CONDITIONS				SN7	TUALL		
PARAMETER	"5					MIN	TYP†	MAX	UNIT
VIK	$V_{CC} = 4.5 \text{ V},$	I _I = -18 mA			-1.2			-1.2	V
		$I_{OH} = -3 \text{ mA}$	2.4	3.3		2.4	3.3		
Voн	V _{CC} = 4.5 V	$I_{OH} = -12 \text{ mA}$	2	3.2					V
		$I_{OH} = -15 \text{ mA}$				2	3.1		
Voi	V00 - 45 V	$I_{OL} = 48 \text{ mA}$		0.38	0.55				V
VOL	V _{CC} = 4.5 V	$I_{OL} = 64 \text{ mA}$					0.42	0.55	V
ΙĮ	$V_{CC} = 0$,	V _I = 7 V			0.1			0.1	mA
lіН	V _{CC} = 5.5 V,	V _I = 2.7 V			35			25	μΑ
I _{IL}	$V_{CC} = 5.5 \text{ V},$	V _I = 0.5 V			-20			-20	μΑ
^l ozh	$V_{CC} = 5.5 \text{ V},$	V _O = 2.7 V			50			50	μΑ
l _{OZL}	$V_{CC} = 5.5 \text{ V},$	V _O = 0.5 V			-50			-50	μΑ
los [‡]	V _{CC} = 5.5 V,	VO = 0	-100		-225	-100		-225	mA
Іссн	V _{CC} = 5.5 V,	Outputs open		19	31		19	31	mA
^I CCL	V _{CC} = 5.5 V,	Outputs open		46	49		46	49	mA
lccz	V _{CC} = 5.5 V,	Outputs open		6	14		6	14	mA
C _i	V _{CC} = 5 V,	V _I = 2.5 V or 0.5 V		4			4		pF
Co	V _{CC} = 5 V,	V _O = 2.5 V or 0.5 V		9			9		pF

[†] All typical values are at $V_{CC} = 5 \text{ V}$.



[‡] Not more than one output should be tested at a time, and the duration of the test should not exceed one second.

SN54BCT125A, SN74BCT125A QUADRUPLE BUS BUFFER GATES WITH 3-STATE OUTPUTS SCBS032F - SEPTEMBER 1988 - REVISED MARCH 2003

switching characteristics (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	C _I R′ R′ T _/	CC = 5 V = 50 p I = 500 S 2 = 500 S \(= 25^C	F, Ω, Ω,	C R R:	L = 50 pF 1 = 500 Ω 2 = 500 Ω 4 = MIN t	<u>),</u> <u>),</u>		UNIT												
			MIN	TYP	MAX	MIN	MAX	MIN	MAX													
t _{PLH}	Δ.	V	1.6	3.5	5.2	1.6	6	1.6	5.7													
t _{PHL}	Α	Ť	2.7	5	6.9	2.7	8	2.7	7.7	ns												
^t PZH	ŌĒ	V	3.4	6.7	9	3.4	11.1	3.4	10.3	no												
t _{PZL}	OE	Ť	ī	1	ı	ı	1	ı	ı	r	T	Y	Y	Y	5	8.2	10.4	5	12.8	5	11.7	ns
^t PHZ	ŌĒ	V	3	5.8	7.4	3	9.4	3	8.9	ns												
t _{PLZ}	J JL	1	2.8	5.5	7.3	2.8	9.9	2.8	8.6	115												

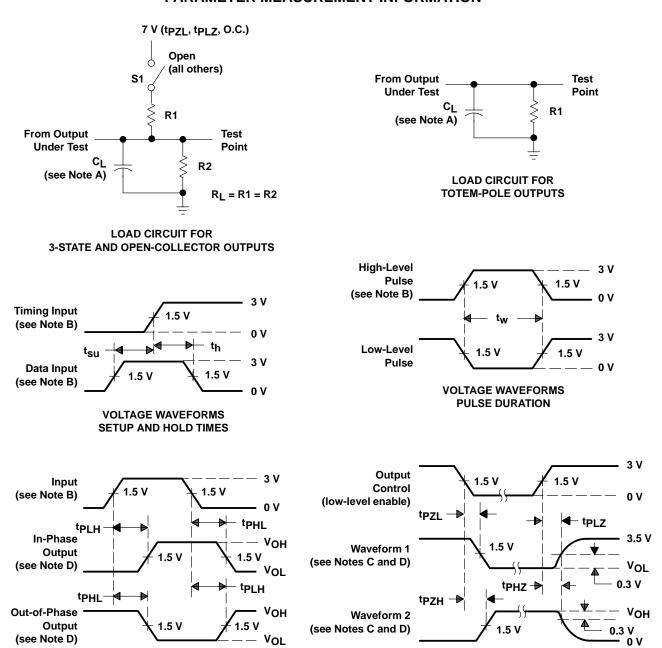
[§] For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.



VOLTAGE WAVEFORMS

ENABLE AND DISABLE TIMES, 3-STATE OUTPUTS

PARAMETER MEASUREMENT INFORMATION



NOTES: A. C_I includes probe and jig capacitance.

VOLTAGE WAVEFORMS PROPAGATION DELAY TIMES (see Note D)

- B. All input pulses are supplied by generators having the following characteristics: PRR \leq 10 MHz, $t_f = t_f \leq 2.5$ ns, duty cycle = 50%.
- C. 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.
- D. The outputs are measured one at a time with one transition per measurement.
- E. When measuring propagation delay times of 3-state outputs, switch S1 is open.
- F. All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuit and Voltage Waveforms



5-Sep-2011

PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/ Ball Finish	MSL Peak Temp ⁽³⁾	Samples (Requires Login)
5962-9093701M2A	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Call TI	
5962-9093701MCA	ACTIVE	CDIP	J	14	1	TBD	Call TI	Call TI	
5962-9093701MDA	ACTIVE	CFP	W	14	1	TBD	Call TI	Call TI	
SN54BCT125AJ	ACTIVE	CDIP	J	14	1	TBD	A42	N / A for Pkg Type	
SN74BCT125AD	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74BCT125ADE4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74BCT125ADG4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74BCT125ADR	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74BCT125ADRE4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74BCT125ADRG4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74BCT125AN	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	
SN74BCT125ANE4	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	
SN74BCT125ANSR	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74BCT125ANSRE4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74BCT125ANSRG4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SNJ54BCT125AFK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	
SNJ54BCT125AJ	ACTIVE	CDIP	J	14	1	TBD	A42	N / A for Pkg Type	
SNJ54BCT125AW	ACTIVE	CFP	W	14	1	TBD	A42	N / A for Pkg Type	

⁽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.



PACKAGE OPTION ADDENDUM

5-Sep-2011

(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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OTHER QUALIFIED VERSIONS OF SN54BCT125A, SN74BCT125A:

Catalog: SN74BCT125A

www.ti.com

Military: SN54BCT125A

NOTE: Qualified Version Definitions:

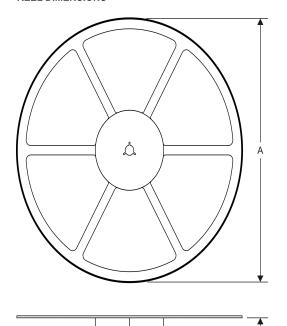
- Catalog TI's standard catalog product
- Military QML certified for Military and Defense Applications

PACKAGE MATERIALS INFORMATION

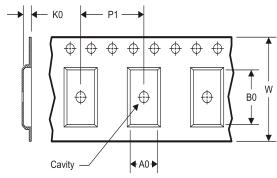
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TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



A0	Dimension designed to accommodate the component width
В0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

TAPE AND REEL INFORMATION

*All dimensions are nominal

Device	Package Type	Package Drawing			Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74BCT125ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74BCT125ANSR	SO	NS	14	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1

PACKAGE MATERIALS INFORMATION

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*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74BCT125ADR	SOIC	D	14	2500	367.0	367.0	38.0
SN74BCT125ANSR	SO	NS	14	2000	367.0	367.0	38.0

14 LEADS SHOWN



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package is hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
- E. Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

W (R-GDFP-F14)

CERAMIC DUAL FLATPACK



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package can be hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification only.
- E. Falls within MIL STD 1835 GDFP1-F14 and JEDEC MO-092AB



FK (S-CQCC-N**)

LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package can be hermetically sealed with a metal lid.
- D. Falls within JEDEC MS-004



N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



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



D (R-PDSO-G14)

PLASTIC SMALL OUTLINE



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
- Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
- E. Reference JEDEC MS-012 variation AB.



D (R-PDSO-G14)

PLASTIC SMALL OUTLINE



- A. All linear dimensions are in millimeters.
- B. This drawing is subject to change without notice.
- C. Publication IPC-7351 is recommended for alternate designs.
- D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525 for other stencil recommendations.
- E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.



MECHANICAL DATA

NS (R-PDSO-G**)

14-PINS SHOWN

PLASTIC SMALL-OUTLINE PACKAGE



- 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.



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