

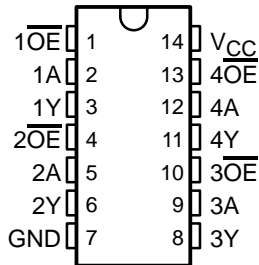
# SN54BCT125A, SN74BCT125A QUADRUPLE BUS BUFFER GATES WITH 3-STATE OUTPUTS

SCBS032F – SEPTEMBER 1988 – REVISED MARCH 2003

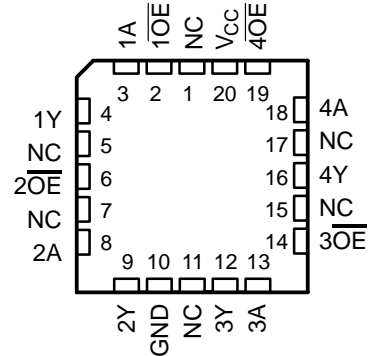
- Operating Voltage Range of 4.5 V to 5.5 V
- State-of-the-Art BiCMOS Design Significantly Reduces  $I_{CCZ}$

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

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



SN54BCT125A . . . FK PACKAGE  
(TOP VIEW)



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 ( $\overline{OE}$ ) 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 |
|----------------|-----------|---------------|-----------------------|------------------|
| 0°C to 70°C    | PDIP – N  | Tube          | SN74BCT125AN          | SN74BCT125AN     |
|                | SOIC – D  | Tube          | SN74BCT125AD          | BCT125A          |
|                |           | Tape and reel | SN74BCT125ADR         |                  |
|                | SOP – NS  | Tape and reel | SN74BCT125ANSR        | BCT125A          |
| –55°C to 125°C | CDIP – J  | Tube          | SNJ54BCT125AJ         | SNJ54BCT125AJ    |
|                | 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](http://www.ti.com/sc/package).

FUNCTION TABLE  
(each buffer)

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



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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.

 **TEXAS  
INSTRUMENTS**

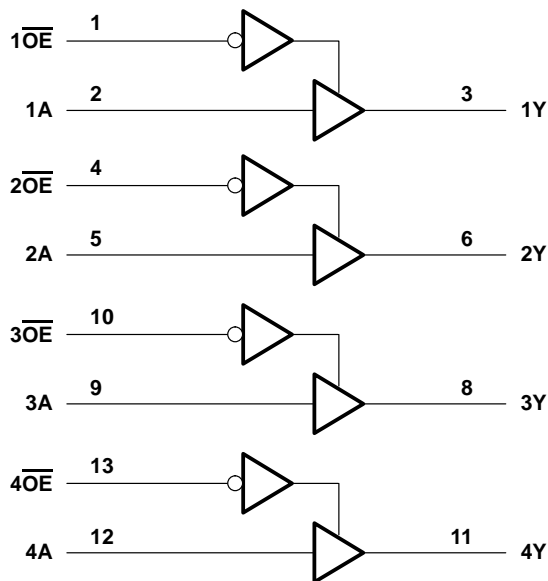
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On products compliant to MIL-PRF-38535, all parameters are tested unless otherwise noted. On all other products, production processing does not necessarily include testing of all parameters.

# SN54BCT125A, SN74BCT125A QUADRUPLE BUS BUFFER GATES WITH 3-STATE OUTPUTS

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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, $V_{CC}$ .....  | -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 $V_{CC}$ |
| Input clamp current, $I_{IK}$ ( $V_I < 0$ ) .....                                   | -30 mA             |
| Current into any output in the low state, $I_O$ : SN54BCT125A .....                 | 96 mA              |
| SN74BCT125A .....   | 128 mA             |
| Package thermal impedance, $\theta_{JA}$ (see Note 2): D package .....              | 86°C/W             |
| N package .....   | 80°C/W             |
| NS package .....  | 76°C/W             |
| Storage temperature range, $T_{stg}$ .....  | -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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# SN54BCT125A, SN74BCT125A QUADRUPLE BUS BUFFER GATES WITH 3-STATE OUTPUTS

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## recommended operating conditions (see Note 3)

|          |                                | SN54BCT125A |     |     | SN74BCT125A |     |     | UNIT |
|----------|--------------------------------|-------------|-----|-----|-------------|-----|-----|------|
|          |                                | MIN         | NOM | MAX | MIN         | NOM | MAX |      |
| $V_{CC}$ | Supply voltage                 | 4.5         | 5   | 5.5 | 4.5         | 5   | 5.5 | V    |
| $V_{IH}$ | High-level input voltage       | 2           |     |     | 2           |     |     | V    |
| $V_{IL}$ | Low-level input voltage        |             |     | 0.8 |             |     | 0.8 | V    |
| $I_{IK}$ | Input clamp current            |             |     | -18 |             |     | -18 | mA   |
| $I_{OH}$ | High-level output current      |             |     | -12 |             |     | -15 | mA   |
| $I_{OL}$ | Low-level output current       |             |     | 48  |             |     | 64  | mA   |
| $T_A$    | 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)

| PARAMETER         | TEST CONDITIONS           |  | SN54BCT125A |      | SN74BCT125A |      | UNIT |               |     |
|-------------------|---------------------------|--|-------------|------|-------------|------|------|---------------|-----|
|                   |                           |  | MIN         | TYP† | MAX         | MIN  |      | TYP†          | MAX |
| $V_{IK}$          | $V_{CC} = 4.5\text{ V}$ , | $I_I = -18\text{ mA}$                  |             |      | -1.2        |      | -1.2 | V             |     |
| $V_{OH}$          | $V_{CC} = 4.5\text{ V}$   | $I_{OH} = -3\text{ mA}$                | 2.4         | 3.3  | 2.4         | 3.3  | V    |               |     |
|                   |                           | $I_{OH} = -12\text{ mA}$               | 2           | 3.2  |             |      |      |               |     |
|                   |                           | $I_{OH} = -15\text{ mA}$               |             |      | 2           | 3.1  |      |               |     |
| $V_{OL}$          | $V_{CC} = 4.5\text{ V}$   | $I_{OL} = 48\text{ mA}$                |             | 0.38 | 0.55        |      | V    |               |     |
|                   |                           | $I_{OL} = 64\text{ mA}$                |             |      |             | 0.42 |      | 0.55          |     |
| $I_I$             | $V_{CC} = 0$ ,            | $V_I = 7\text{ V}$                     |             |      | 0.1         |      | 0.1  | mA            |     |
| $I_{IH}$          | $V_{CC} = 5.5\text{ V}$ , | $V_I = 2.7\text{ V}$                   |             |      | 35          |      | 25   | $\mu\text{A}$ |     |
| $I_{IL}$          | $V_{CC} = 5.5\text{ V}$ , | $V_I = 0.5\text{ V}$                   |             |      | -20         |      | -20  | $\mu\text{A}$ |     |
| $I_{OZH}$         | $V_{CC} = 5.5\text{ V}$ , | $V_O = 2.7\text{ V}$                   |             |      | 50          |      | 50   | $\mu\text{A}$ |     |
| $I_{OZL}$         | $V_{CC} = 5.5\text{ V}$ , | $V_O = 0.5\text{ V}$                   |             |      | -50         |      | -50  | $\mu\text{A}$ |     |
| $I_{OS}^\ddagger$ | $V_{CC} = 5.5\text{ V}$ , | $V_O = 0$                              | -100        |      | -225        | -100 | -225 | mA            |     |
| $I_{CCH}$         | $V_{CC} = 5.5\text{ V}$ , | Outputs open                           |             | 19   | 31          |      | 19   | 31            | mA  |
| $I_{CCL}$         | $V_{CC} = 5.5\text{ V}$ , | Outputs open                           |             | 46   | 49          |      | 46   | 49            | mA  |
| $I_{CCZ}$         | $V_{CC} = 5.5\text{ V}$ , | Outputs open                           |             | 6    | 14          |      | 6    | 14            | mA  |
| $C_i$             | $V_{CC} = 5\text{ V}$ ,   | $V_I = 2.5\text{ V}$ or $0.5\text{ V}$ |             | 4    |             |      | 4    | pF            |     |
| $C_o$             | $V_{CC} = 5\text{ V}$ ,   | $V_O = 2.5\text{ V}$ or $0.5\text{ V}$ |             | 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

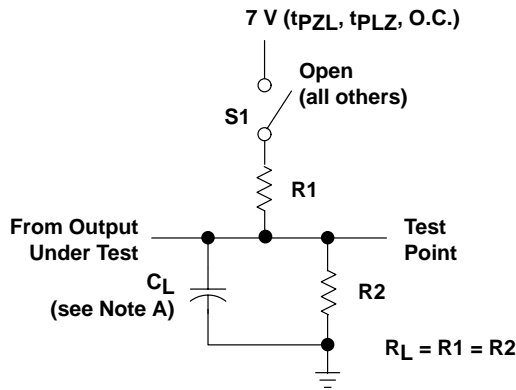
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## switching characteristics (see Figure 1)

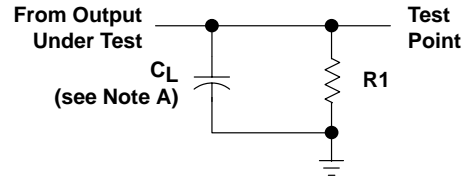
| PARAMETER        | FROM<br>(INPUT) | TO<br>(OUTPUT) | V <sub>CC</sub> = 5 V,<br>C <sub>L</sub> = 50 pF,<br>R1 = 500 Ω,<br>R2 = 500 Ω,<br>T <sub>A</sub> = 25°C |     |      | V <sub>CC</sub> = 4.5 V to 5.5 V,<br>C <sub>L</sub> = 50 pF,<br>R1 = 500 Ω,<br>R2 = 500 Ω,<br>T <sub>A</sub> = MIN to MAX <sup>§</sup> |      |             | UNIT |     |
|------------------|-----------------|----------------|--|-----|------|--|------|-------------|------|-----|
|                  |                 |                | 'BCT125A   |     |      | SN54BCT125A  |      | SN74BCT125A |      |     |
|                  |                 |                | 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> | $\overline{OE}$ | 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> | $\overline{OE}$ | 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  |     |

<sup>§</sup> For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

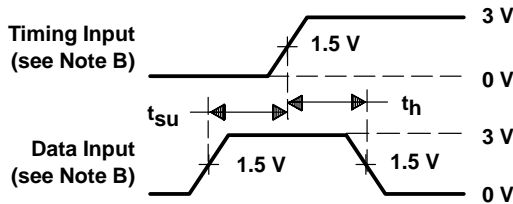
PARAMETER MEASUREMENT INFORMATION



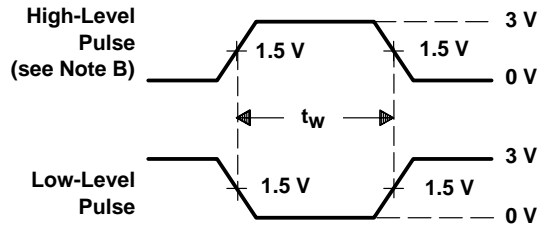
LOAD CIRCUIT FOR 3-STATE AND OPEN-COLLECTOR OUTPUTS



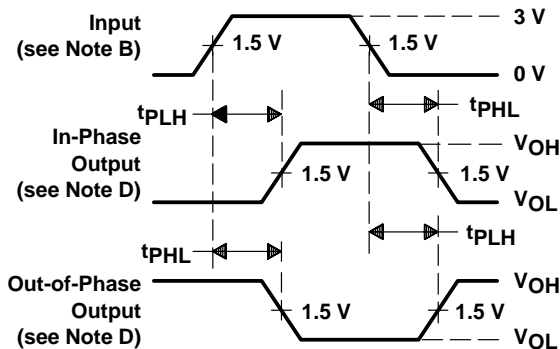
LOAD CIRCUIT FOR TOTEM-POLE OUTPUTS



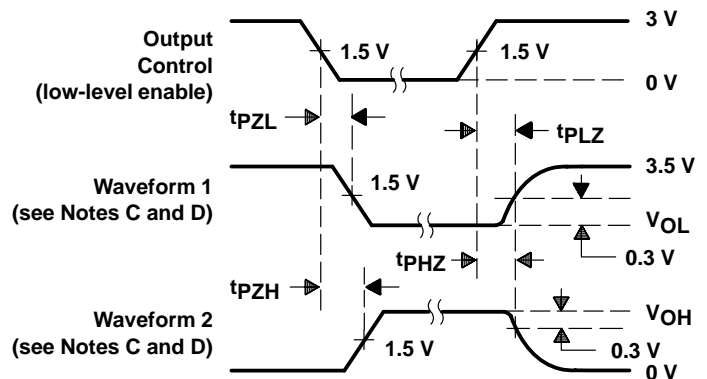
VOLTAGE WAVEFORMS SETUP AND HOLD TIMES



VOLTAGE WAVEFORMS PULSE DURATION



VOLTAGE WAVEFORMS PROPAGATION DELAY TIMES (see Note D)



VOLTAGE WAVEFORMS ENABLE AND DISABLE TIMES, 3-STATE OUTPUTS

- NOTES: A.  $C_L$  includes probe and jig capacitance.  
 B. All input pulses are supplied by generators having the following characteristics:  $PRR \leq 10$  MHz,  $t_r = t_f \leq 2.5$  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

**PACKAGING INFORMATION**

| Orderable Device | Status<br>(1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan<br>(2)  | Lead finish/<br>Ball material<br>(6) | MSL Peak Temp<br>(3) | Op Temp (°C) | Device Marking<br>(4/5)              | Samples                 |
|------------------|---------------|--------------|-----------------|------|-------------|------------------|--------------------------------------|----------------------|--------------|--------------------------------------|-------------------------|
| 5962-9093701M2A  | ACTIVE        | LCCC         | FK              | 20   | 1           | Non-RoHS & Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 5962-9093701M2A<br>SNJ54BCT125AFK    | <a href="#">Samples</a> |
| 5962-9093701MCA  | ACTIVE        | CDIP         | J               | 14   | 1           | Non-RoHS & Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 5962-9093701MC<br>A<br>SNJ54BCT125AJ | <a href="#">Samples</a> |
| 5962-9093701MDA  | ACTIVE        | CFP          | W               | 14   | 1           | Non-RoHS & Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 5962-9093701MD<br>A<br>SNJ54BCT125AW | <a href="#">Samples</a> |
| SN54BCT125AJ     | ACTIVE        | CDIP         | J               | 14   | 1           | Non-RoHS & Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | SN54BCT125AJ                         | <a href="#">Samples</a> |
| SN74BCT125AD     | ACTIVE        | SOIC         | D               | 14   | 50          | RoHS & Green     | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | BCT125A                              | <a href="#">Samples</a> |
| SN74BCT125ADG4   | ACTIVE        | SOIC         | D               | 14   | 50          | RoHS & Green     | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | BCT125A                              | <a href="#">Samples</a> |
| SN74BCT125ADR    | ACTIVE        | SOIC         | D               | 14   | 2500        | RoHS & Green     | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | BCT125A                              | <a href="#">Samples</a> |
| SN74BCT125AN     | ACTIVE        | PDIP         | N               | 14   | 25          | RoHS & Green     | NIPDAU                               | N / A for Pkg Type   | 0 to 70      | SN74BCT125AN                         | <a href="#">Samples</a> |
| SN74BCT125ANSR   | ACTIVE        | SO           | NS              | 14   | 2000        | RoHS & Green     | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | BCT125A                              | <a href="#">Samples</a> |
| SNJ54BCT125AFK   | ACTIVE        | LCCC         | FK              | 20   | 1           | Non-RoHS & Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 5962-9093701M2A<br>SNJ54BCT125AFK    | <a href="#">Samples</a> |
| SNJ54BCT125AJ    | ACTIVE        | CDIP         | J               | 14   | 1           | Non-RoHS & Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 5962-9093701MC<br>A<br>SNJ54BCT125AJ | <a href="#">Samples</a> |
| SNJ54BCT125AW    | ACTIVE        | CFP          | W               | 14   | 1           | Non-RoHS & Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 5962-9093701MD<br>A<br>SNJ54BCT125AW | <a href="#">Samples</a> |

(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.

<sup>(2)</sup> **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

**RoHS Exempt:** TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

**Green:** TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

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

<sup>(4)</sup> There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

<sup>(5)</sup> Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

<sup>(6)</sup> Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

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**OTHER QUALIFIED VERSIONS OF SN54BCT125A, SN74BCT125A :**

● Catalog : [SN74BCT125A](#)

● Military : [SN54BCT125A](#)

NOTE: Qualified Version Definitions:

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

**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 |
|----------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| 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            |

**TAPE AND REEL BOX DIMENSIONS**


\*All dimensions are nominal

| Device         | Package Type | Package Drawing | Pins | SPQ  | Length (mm) | Width (mm) | Height (mm) |
|----------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74BCT125ADR  | SOIC         | D               | 14   | 2500 | 356.0       | 356.0      | 35.0        |
| SN74BCT125ANSR | SO           | NS              | 14   | 2000 | 367.0       | 367.0      | 38.0        |

**TUBE**


\*All dimensions are nominal

| Device          | Package Name | Package Type | Pins | SPQ | L (mm) | W (mm) | T (μm) | B (mm) |
|-----------------|--------------|--------------|------|-----|--------|--------|--------|--------|
| 5962-9093701M2A | FK           | LCCC         | 20   | 1   | 506.98 | 12.06  | 2030   | NA     |
| SN74BCT125AD    | D            | SOIC         | 14   | 50  | 506.6  | 8      | 3940   | 4.32   |
| SN74BCT125ADG4  | D            | SOIC         | 14   | 50  | 506.6  | 8      | 3940   | 4.32   |
| SN74BCT125AN    | N            | PDIP         | 14   | 25  | 506    | 13.97  | 11230  | 4.32   |
| SN74BCT125AN    | N            | PDIP         | 14   | 25  | 506    | 13.97  | 11230  | 4.32   |
| SNJ54BCT125AFK  | FK           | LCCC         | 20   | 1   | 506.98 | 12.06  | 2030   | NA     |

FK (S-CQCC-N\*\*)

LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN



| NO. OF TERMINALS ** | A                |                  | B                |                  |
|---------------------|------------------|------------------|------------------|------------------|
|                     | MIN              | MAX              | MIN              | MAX              |
| 20                  | 0.342<br>(8,69)  | 0.358<br>(9,09)  | 0.307<br>(7,80)  | 0.358<br>(9,09)  |
| 28                  | 0.442<br>(11,23) | 0.458<br>(11,63) | 0.406<br>(10,31) | 0.458<br>(11,63) |
| 44                  | 0.640<br>(16,26) | 0.660<br>(16,76) | 0.495<br>(12,58) | 0.560<br>(14,22) |
| 52                  | 0.740<br>(18,78) | 0.761<br>(19,32) | 0.495<br>(12,58) | 0.560<br>(14,22) |
| 68                  | 0.938<br>(23,83) | 0.962<br>(24,43) | 0.850<br>(21,6)  | 0.858<br>(21,8)  |
| 84                  | 1.141<br>(28,99) | 1.165<br>(29,59) | 1.047<br>(26,6)  | 1.063<br>(27,0)  |



4040140/D 01/11

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

# 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.

W (R-GDFP-F14)

CERAMIC DUAL FLATPACK



- NOTES:
- 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

J 14

**GENERIC PACKAGE VIEW**  
**CDIP - 5.08 mm max height**  
CERAMIC DUAL IN LINE PACKAGE



Images above are just a representation of the package family, actual package may vary.  
Refer to the product data sheet for package details.

4040083-5/G

J0014A



# PACKAGE OUTLINE

CDIP - 5.08 mm max height

CERAMIC DUAL IN LINE PACKAGE



4214771/A 05/2017

NOTES:

1. All controlling linear dimensions are in inches. Dimensions in brackets are in millimeters. Any dimension in brackets or parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This package is hermetically sealed with a ceramic lid using glass frit.
4. Index point is provided on cap for terminal identification only and on press ceramic glass frit seal only.
5. Falls within MIL-STD-1835 and GDIP1-T14.

# EXAMPLE BOARD LAYOUT

J0014A

CDIP - 5.08 mm max height

CERAMIC DUAL IN LINE PACKAGE



LAND PATTERN EXAMPLE  
NON-SOLDER MASK DEFINED  
SCALE: 5X



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D (R-PDSO-G14)

PLASTIC SMALL OUTLINE



- NOTES:
- 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.

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.
  - C Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
  - D The 20 pin end lead shoulder width is a vendor option, either half or full width.

4040049/E 12/2002

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