# SN54LS139A, SN54S139, SN74LS139A, SN74S139A
# DUAL 2-LINE TO 4-LINE DECODERS/DEMULTIPLEXERS

SDLS013A

DECEMBER 1972 – REVISED MARCH 1988

- **Designed Specifically for High-Speed:**
  **Memory Decoders**
  **Data Transmission Systems**
- **Two Fully Independent 2- to 4-Line Decoders/Demultiplexers**
- **Schottky Clamped for High Performance**

## description

These Schottky-clamped TTL MSI circuits are designed to be used in high-performance memory-decoding or data-routing applications requiring very short propagation delay times. In high-performance memory systems, these decoders can be used to minimize the effects of system decoding. When employed with high-speed memories utilizing a fast-enable circuit, the delay times of these decoders and the enable time of the memory are usually less than the typical access time of the memory. This means that the effective system delay introduced by the Schottky-clamped system decoder is negligible.

The circuit comprises two individual two-line to four-line decoders in a single package. The active-low enable input can be used as a data line in demultiplexing applications.

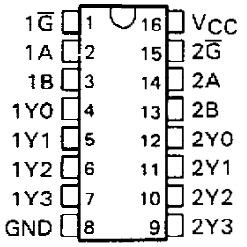
All of these decoders/demultiplexers feature fully buffered inputs, each of which represents only one normalized load to its driving circuit. All inputs are clamped with high-performance Schottky diodes to suppress line-ringing and to simplify system design. The SN54LS139A and SN54S139 are characterized for operation range of −55°C to 125°C. The SN74LS139A and SN74S139A are characterized for operation from 0°C to 70°C.

**FUNCTION TABLE**

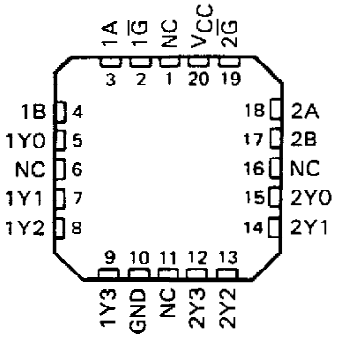
| INPUTS | | | OUTPUTS | | | |
|---|---|---|---|---|---|---|
| ENABLE | SELECT | | | | | |
| $\overline{G}$ | B | A | Y0 | Y1 | Y2 | Y3 |
| H | X | X | H | H | H | H |
| L | L | L | L | H | H | H |
| L | L | H | H | L | H | H |
| L | H | L | H | H | L | H |
| L | H | H | H | H | H | L |

H = high level, L = low level, X = irrelevant

**SN54LS139A, SN54S139 . . . J OR W PACKAGE**
**SN74LS139A, SN74S139A . . . D OR N PACKAGE**
**(TOP VIEW)**

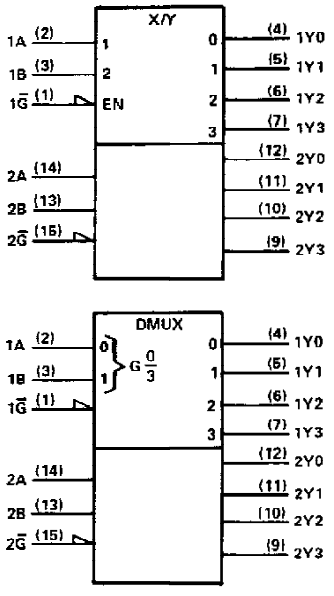



**SN54LS139A, SN54S139 . . . FK PACKAGE**
**(TOP VIEW)**



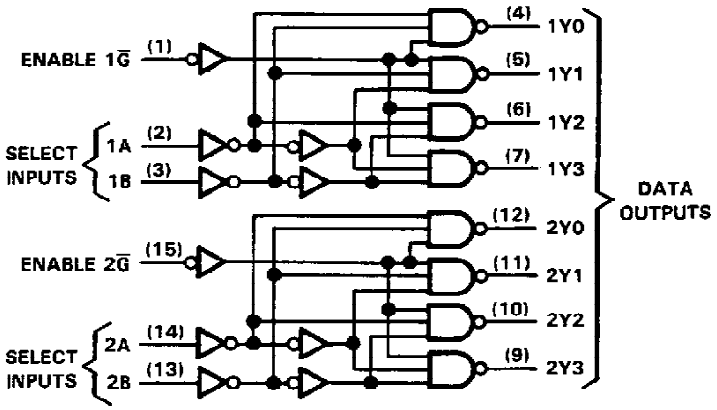

NC—No internal connection

**logic symbols (alternatives)†**



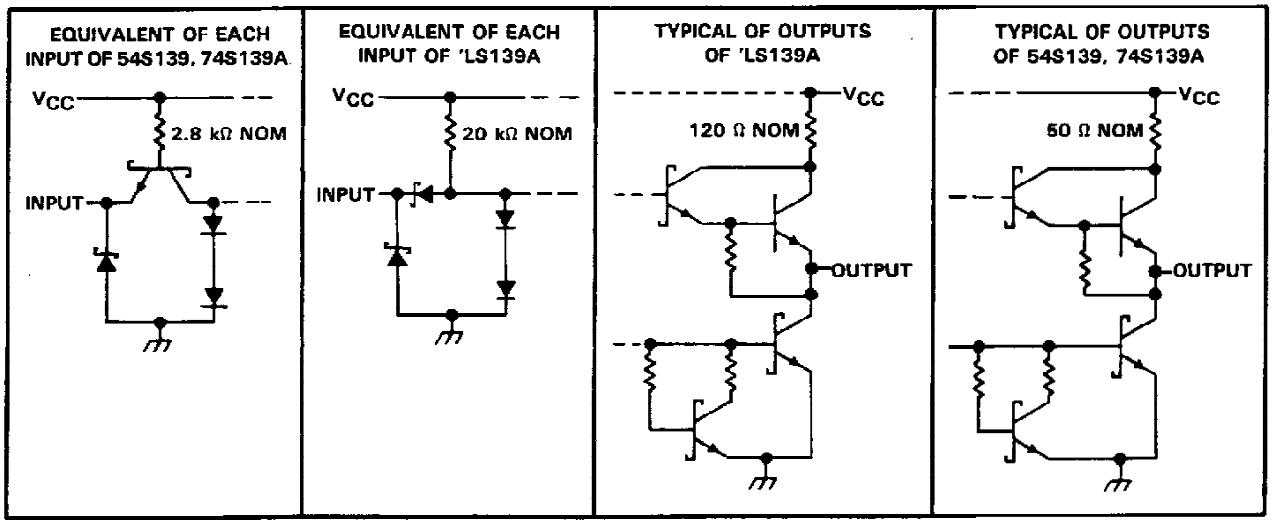

†These symbols are in accordance with ANSI/IEEE Std. 91-1984 and IEC Publication 617-12.
Pin numbers shown are for D, J, N, and W packages.

### logic diagram (positive logic)




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

### schematics of inputs and outputs




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

Supply voltage, $V_{CC}$ (See Note 1) . . . . . 7 V
Input voltage: 'LS139A . . . . . 7 V
54S139, 74S139A . . . . . 5.5 V
Operating free-air temperature range: SN54LS139A, SN54S139 . . . . . −55°C to 125°C
SN74LS139A, SN74S139A . . . . . 0° C to 70°C
Storage temperature range . . . . . −65°C to 150°C

NOTE 1: Voltage values are with respect to network ground terminal.

## recommended operating conditions

| | | SN54LS139A | | | SN74LS139A | | | UNIT |
|---|---|---|---|---|---|---|---|---|
| | | MIN | NOM | MAX | MIN | NOM | MAX | |
| $V_{CC}$ | Supply voltage | 4.5 | 5 | 5.5 | 4.75 | 5 | 5.25 | V |
| $V_{IH}$ | High-level input voltage | 2 | | | 2 | | | V |
| $V_{IL}$ | Low-level input voltage | | | 0.7 | | | 0.8 | V |
| $I_{OH}$ | High-level output current | | | −0.4 | | | −0.4 | mA |
| $I_{OL}$ | Low-level output current | | | 4 | | | 8 | mA |
| $T_A$ | Operating free-air temperature | −55 | | 125 | 0 | | 70 | °C |

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

| PARAMETER | TEST CONDITIONS† | | SN54LS139A | | | SN74LS139A | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| $V_{IK}$ | $V_{CC}$ = MIN, $I_I$ = −18 mA | | | | −1.5 | | | −1.5 | V |
| $V_{OH}$ | $V_{CC}$ = MIN, $V_{IH}$ = 2 V, $V_{IL}$ = MAX, $I_{OH}$ = −0.4 mA | | 2.5 | 3.4 | | 2.7 | 3.4 | | V |
| $V_{OL}$ | $V_{CC}$ = MIN, $V_{IH}$ = 2 V, $V_{IL}$ = MAX | $I_{OL}$ = 4 mA | | 0.25 | 0.4 | | 0.25 | 0.4 | V |
| | | $I_{OL}$ = 8 mA | | | | | 0.35 | 0.5 | |
| $I_I$ | $V_{CC}$ = MAX, $V_I$ = 7 V | | | | 0.1 | | | 0.1 | mA |
| $I_{IH}$ | $V_{CC}$ = MAX, $V_I$ = 2.7 V | | | | 20 | | | 20 | μA |
| $I_{IL}$ | $V_{CC}$ = MAX, $V_I$ = 0.4 V | | | | −0.4 | | | −0.4 | mA |
| $I_{OS}$§ | $V_{CC}$ = MAX | | −20 | | −100 | −20 | | −100 | mA |
| $I_{CC}$ | $V_{CC}$ = MAX, Outputs enabled and open | | | 6.8 | 11 | | 6.8 | 11 | mA |

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
‡ All typical values are at $V_{CC}$ = 5 V, $T_A$ = 25°C.
§ Not more than one output should be shorted at a time, and duration of the short circuit test should not exceed one second.

## switching characteristics, $V_{CC}$ = 5 V, $T_A$ = 25°C (see Note 2)

| PARAMETER¶ | FROM (INPUT) | TO (OUTPUT) | LEVELS OF DELAY | TEST CONDITIONS | SN54LS139A SN74LS139A | | | UNIT |
|---|---|---|---|---|---|---|---|---|
| | | | | | MIN | TYP | MAX | |
| $t_{PLH}$ | Binary Select | Any | 2 | $R_L$ = 2 kΩ, $C_L$ = 15 pF | | 13 | 20 | ns |
| $t_{PHL}$ | | | | | | 22 | 33 | ns |
| $t_{PLH}$ | | | 3 | | | 18 | 29 | ns |
| $t_{PHL}$ | | | | | | 25 | 38 | ns |
| $t_{PLH}$ | Enable | Any | 2 | | | 16 | 24 | ns |
| $t_{PHL}$ | | | | | | 21 | 32 | ns |

¶ $t_{PLH}$ = propagation delay time, low-to-high-level output
$t_{PHL}$ = propagation delay time, high-to-low-level output
NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

## recommended operating conditions

| | | SN54S139 | | | SN74S139A | | | UNIT |
|---|---|---|---|---|---|---|---|---|
| | | MIN | NOM | MAX | MIN | NOM | MAX | |
| $V_{CC}$ | Supply voltage | 4.5 | 5 | 5.5 | 4.75 | 5 | 5.25 | V |
| $V_{IH}$ | High-level input voltage | 2 | | | 2 | | | V |
| $V_{IL}$ | Low-level input voltage | | | 0.8 | | | 0.8 | V |
| $I_{OH}$ | High-level output current | | | −1 | | | −1 | mA |
| $I_{OL}$ | Low-level output current | | | 20 | | | 20 | mA |
| $T_A$ | Operating free-air temperature | −55 | | 125 | 0 | | 70 | °C |

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

| PARAMETER | TEST CONDITIONS† | | SN54S139 SN74S139A | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP‡ | MAX | |
| $V_{IK}$ | $V_{CC}$ = MIN, $I_I$ = −18 mA | | | | −1.2 | V |
| $V_{OH}$ | $V_{CC}$ = MIN, $V_{IH}$ = 2 V, $V_{IL}$ = 0.8 V, $I_{OH}$ = −1 mA | SN54S' | 2.5 | 3.4 | | V |
| | | SN74S' | 2.7 | 3.4 | | |
| $V_{OL}$ | $V_{CC}$ = MIN, $V_{IH}$ = 2 V, $V_{IL}$ = 0.8 V, $I_{OL}$ = 20 mA | | | | 0.5 | V |
| $I_I$ | $V_{CC}$ = MAX, $V_I$ = 5.5 V | | | | 1 | mA |
| $I_{IH}$ | $V_{CC}$ = MAX, $V_I$ = 2.7 V | | | | 50 | μA |
| $I_{IL}$ | $V_{CC}$ = MAX, $V_I$ = 0.5 V | | | | −2 | mA |
| $I_{OS}$§ | $V_{CC}$ = MAX | | −40 | | −100 | mA |
| $I_{CC}$ | $V_{CC}$ = MAX, Outputs enabled and open | | | 60 | 90 | mA |

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
‡ All typical values are at $V_{CC}$ = 5 V, $T_A$ = 25°C.
§ Not more than one output should be shorted at a time, and duration of the short circuit test should not exceed one second.

## switching characteristics, $V_{CC}$ = 5 V, $T_A$ = 25°C (see Note 2)

| PARAMETER¶ | FROM (INPUT) | TO (OUTPUT) | LEVELS OF DELAY | TEST CONDITIONS | SN54S139 SN74S139A | | | UNIT |
|---|---|---|---|---|---|---|---|---|
| | | | | | MIN | TYP | MAX | |
| $t_{PLH}$ | Binary Select | Any | 2 | $R_L$ = 280 Ω, $C_L$ = 15 pF | | 5 | 7.5 | ns |
| $t_{PHL}$ | | | | | | 6.5 | 10 | ns |
| $t_{PLH}$ | | | 3 | | | 7 | 12 | ns |
| $t_{PHL}$ | | | | | | 8 | 12 | ns |
| $t_{PLH}$ | Enable | Any | 2 | | | 5 | 8 | ns |
| $t_{PHL}$ | | | | | | 6.5 | 10 | ns |

¶ $t_{PLH}$ = propagation delay time, low-to-high-level output
$t_{PHL}$ = propagation delay time, high-to-low-level output
NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

## PACKAGING INFORMATION

| Orderable part number | Status (1) | Material type (2) | Package \| Pins | Package qty \| Carrier | RoHS (3) | Lead finish/ Ball material (4) | MSL rating/ Peak reflow (5) | Op temp (°C) | Part marking (6) |
|---|---|---|---|---|---|---|---|---|---|
| 76007012A | Active | Production | LCCC (FK) \| 20 | 55 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 76007012A SNJ54LS 139AFK |
| 7600701EA | Active | Production | CDIP (J) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 7600701EA SNJ54LS139AJ |
| 7600701FA | Active | Production | CFP (W) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 7600701FA SNJ54LS139AW |
| 7700401EA | Active | Production | CDIP (J) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 7700401EA SNJ54S139J |
| 7700401FA | Active | Production | CFP (W) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 7700401FA SNJ54S139W |
| JM38510/30702B2A | Active | Production | LCCC (FK) \| 20 | 55 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 30702B2A |
| JM38510/30702B2A.A | Active | Production | LCCC (FK) \| 20 | 55 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 30702B2A |
| JM38510/30702BEA | Active | Production | CDIP (J) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 30702BEA |
| JM38510/30702BEA.A | Active | Production | CDIP (J) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 30702BEA |
| JM38510/30702BFA | Active | Production | CFP (W) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 30702BFA |
| JM38510/30702BFA.A | Active | Production | CFP (W) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 30702BFA |
| JM38510/30702SEA | Active | Production | CDIP (J) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 30702SEA |
| JM38510/30702SEA.A | Active | Production | CDIP (J) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 30702SEA |
| JM38510/30702SFA | Active | Production | CFP (W) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 30702SFA |
| JM38510/30702SFA.A | Active | Production | CFP (W) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 30702SFA |
| M38510/30702B2A | Active | Production | LCCC (FK) \| 20 | 55 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 30702B2A |

| Orderable part number | Status (1) | Material type (2) | Package \| Pins | Package qty \| Carrier | RoHS (3) | Lead finish/ Ball material (4) | MSL rating/ Peak reflow (5) | Op temp (°C) | Part marking (6) |
|---|---|---|---|---|---|---|---|---|---|
| M38510/30702BEA | Active | Production | CDIP (J) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 30702BEA |
| M38510/30702BFA | Active | Production | CFP (W) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 30702BFA |
| M38510/30702SEA | Active | Production | CDIP (J) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 30702SEA |
| M38510/30702SFA | Active | Production | CFP (W) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 30702SFA |
| SN54LS139AJ | Active | Production | CDIP (J) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | SN54LS139AJ |
| SN54LS139AJ.A | Active | Production | CDIP (J) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | SN54LS139AJ |
| SN54S139J | Active | Production | CDIP (J) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | SN54S139J |
| SN54S139J.A | Active | Production | CDIP (J) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | SN54S139J |
| SN74LS139AD | Obsolete | Production | SOIC (D) \| 16 | - | - | Call TI | Call TI | 0 to 70 | LS139A |
| SN74LS139ADR | Active | Production | SOIC (D) \| 16 | 2500 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS139A |
| SN74LS139ADR.A | Active | Production | SOIC (D) \| 16 | 2500 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS139A |
| SN74LS139ADRE4 | Active | Production | SOIC (D) \| 16 | 2500 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS139A |
| SN74LS139AN | Active | Production | PDIP (N) \| 16 | 25 \| TUBE | Yes | NIPDAU | N/A for Pkg Type | 0 to 70 | SN74LS139AN |
| SN74LS139AN.A | Active | Production | PDIP (N) \| 16 | 25 \| TUBE | Yes | NIPDAU | N/A for Pkg Type | 0 to 70 | SN74LS139AN |
| SN74LS139ANE4 | Active | Production | PDIP (N) \| 16 | 25 \| TUBE | Yes | NIPDAU | N/A for Pkg Type | 0 to 70 | SN74LS139AN |
| SN74LS139ANSR | Active | Production | SOP (NS) \| 16 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS139A |
| SN74LS139ANSR.A | Active | Production | SOP (NS) \| 16 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS139A |
| SN74S139AD | Active | Production | SOIC (D) \| 16 | 40 \| TUBE | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | S139A |
| SN74S139AD.A | Active | Production | SOIC (D) \| 16 | 40 \| TUBE | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | S139A |
| SN74S139AN | Active | Production | PDIP (N) \| 16 | 25 \| TUBE | Yes | NIPDAU | N/A for Pkg Type | 0 to 70 | SN74S139AN |
| SN74S139AN.A | Active | Production | PDIP (N) \| 16 | 25 \| TUBE | Yes | NIPDAU | N/A for Pkg Type | 0 to 70 | SN74S139AN |
| SNJ54LS139AFK | Active | Production | LCCC (FK) \| 20 | 55 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 76007012A SNJ54LS 139AFK |
| SNJ54LS139AFK.A | Active | Production | LCCC (FK) \| 20 | 55 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 76007012A SNJ54LS 139AFK |
| SNJ54LS139AJ | Active | Production | CDIP (J) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 7600701EA SNJ54LS139AJ |

| Orderable part number | Status (1) | Material type (2) | Package \| Pins | Package qty \| Carrier | RoHS (3) | Lead finish/ Ball material (4) | MSL rating/ Peak reflow (5) | Op temp (°C) | Part marking (6) |
|---|---|---|---|---|---|---|---|---|---|
| SNJ54LS139AJ.A | Active | Production | CDIP (J) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 7600701EA SNJ54LS139AJ |
| SNJ54LS139AW | Active | Production | CFP (W) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 7600701FA SNJ54LS139AW |
| SNJ54LS139AW.A | Active | Production | CFP (W) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 7600701FA SNJ54LS139AW |
| SNJ54S139J | Active | Production | CDIP (J) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 7700401EA SNJ54S139J |
| SNJ54S139J.A | Active | Production | CDIP (J) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 7700401EA SNJ54S139J |
| SNJ54S139W | Active | Production | CFP (W) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 7700401FA SNJ54S139W |
| SNJ54S139W.A | Active | Production | CFP (W) \| 16 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 7700401FA SNJ54S139W |

(1) **Status:** For more details on status, see our product life cycle.

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

(4) **Lead finish/Ball material:** Parts 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.

(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

**OTHER QUALIFIED VERSIONS OF SN54LS139A, SN54LS139A-SP, SN74LS139A :**

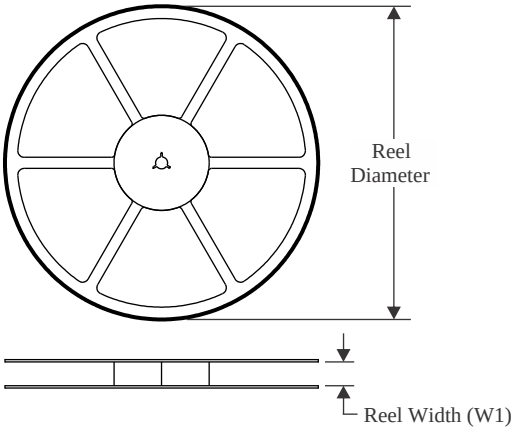
- Catalog : SN74LS139A, SN54LS139A
- Military : SN54LS139A
- Space : SN54LS139A-SP

NOTE: Qualified Version Definitions:

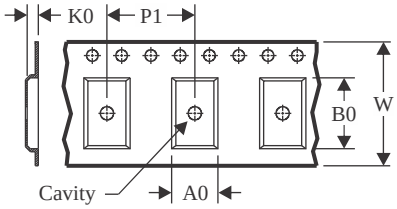
- Catalog - TI's standard catalog product
- Military - QML certified for Military and Defense Applications
- Space - Radiation tolerant, ceramic packaging and qualified for use in Space-based application

## TAPE AND REEL INFORMATION

**REEL DIMENSIONS**

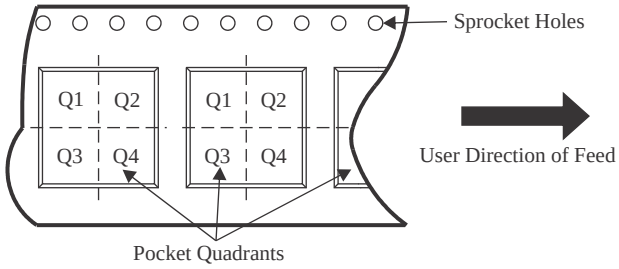



**TAPE DIMENSIONS**




| | |
|---|---|
| A0 | Dimension designed to accommodate the component width |
| B0 | 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 |

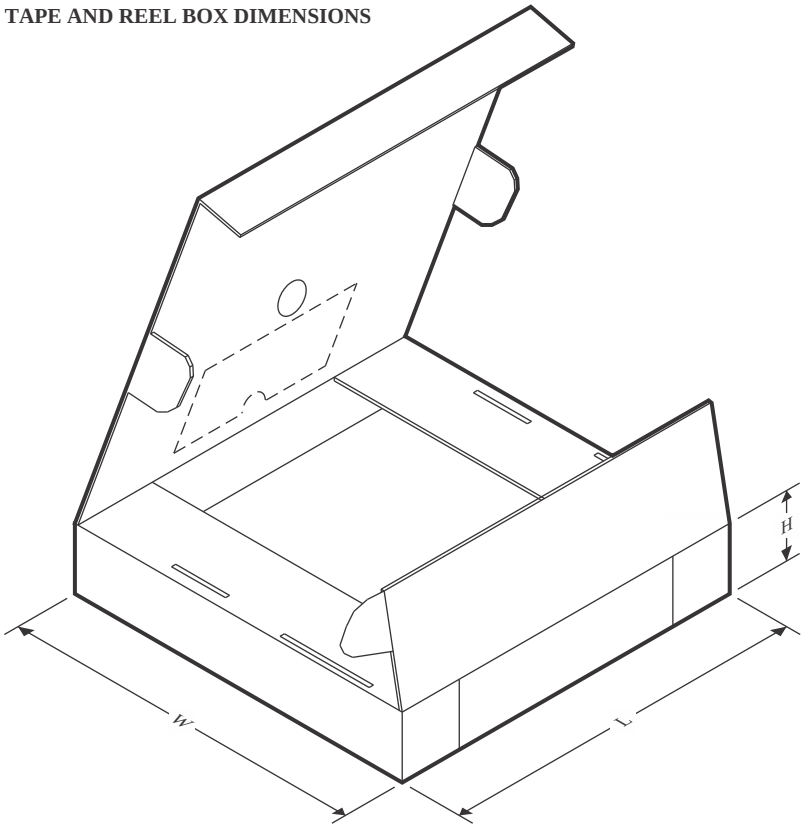
**QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE**




*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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SN74LS139ADR | SOIC | D | 16 | 2500 | 330.0 | 16.4 | 6.5 | 10.3 | 2.1 | 8.0 | 16.0 | Q1 |
| SN74LS139ANSR | SOP | NS | 16 | 2000 | 330.0 | 16.4 | 8.1 | 10.4 | 2.5 | 12.0 | 16.0 | Q1 |

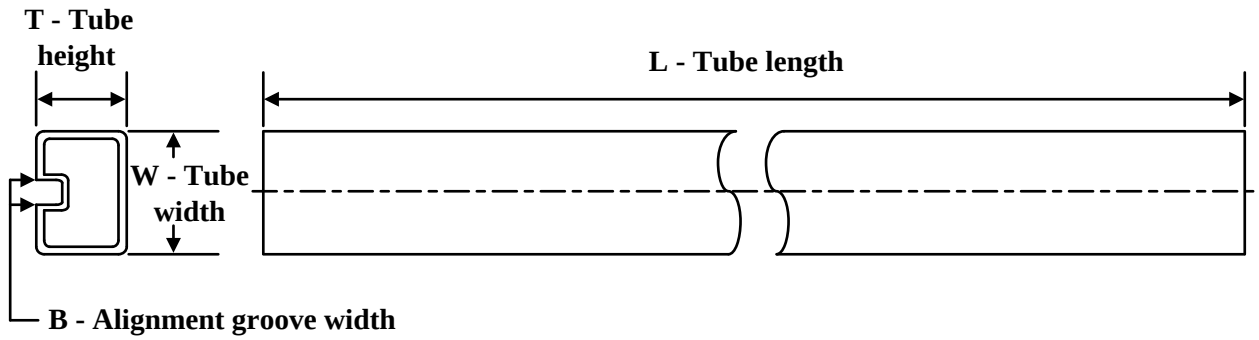
TAPE AND REEL BOX DIMENSIONS




*All dimensions are nominal

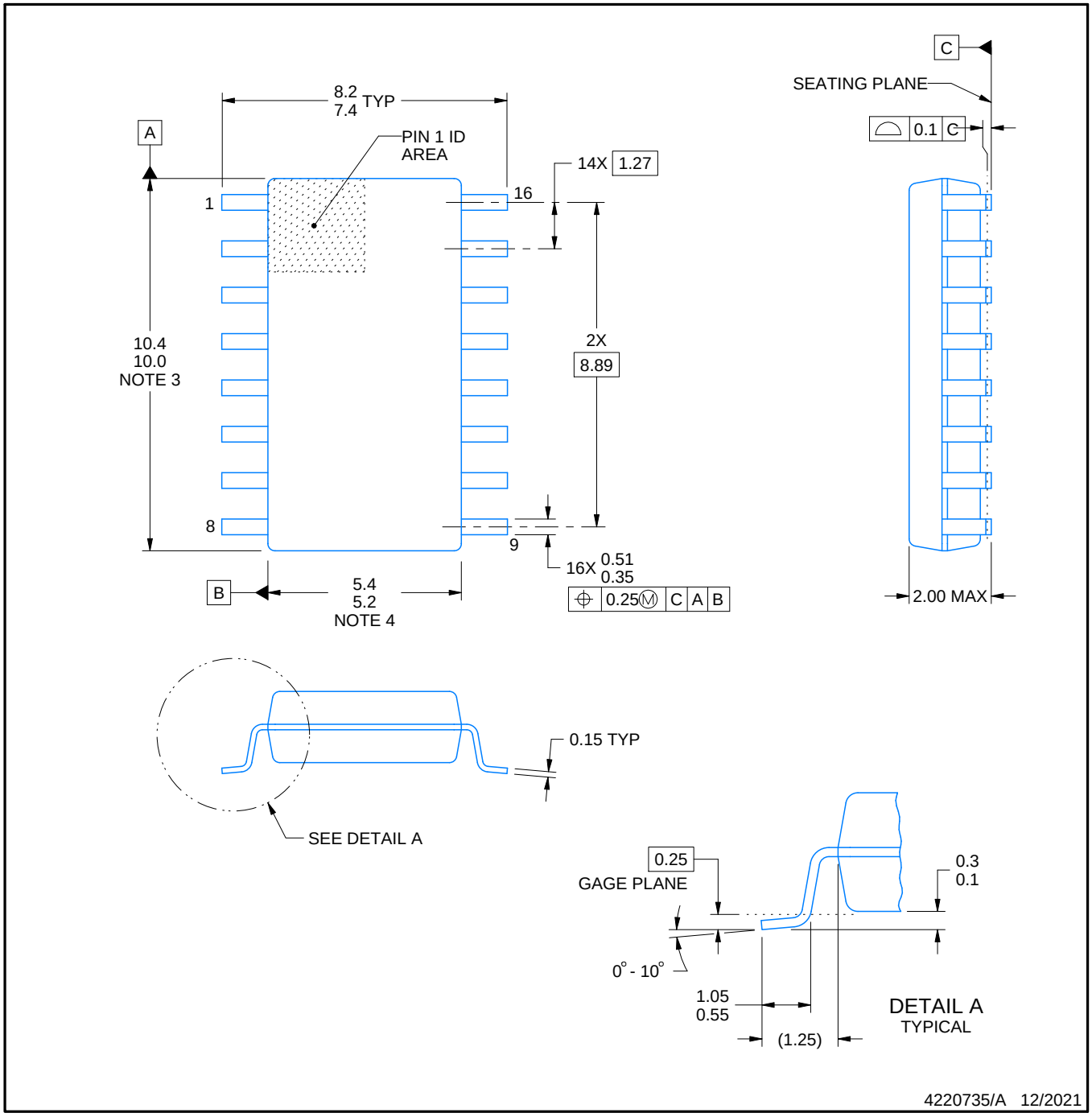
| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|---|---|---|---|---|---|---|---|
| SN74LS139ADR | SOIC | D | 16 | 2500 | 353.0 | 353.0 | 32.0 |
| SN74LS139ANSR | SOP | NS | 16 | 2000 | 353.0 | 353.0 | 32.0 |

## TUBE



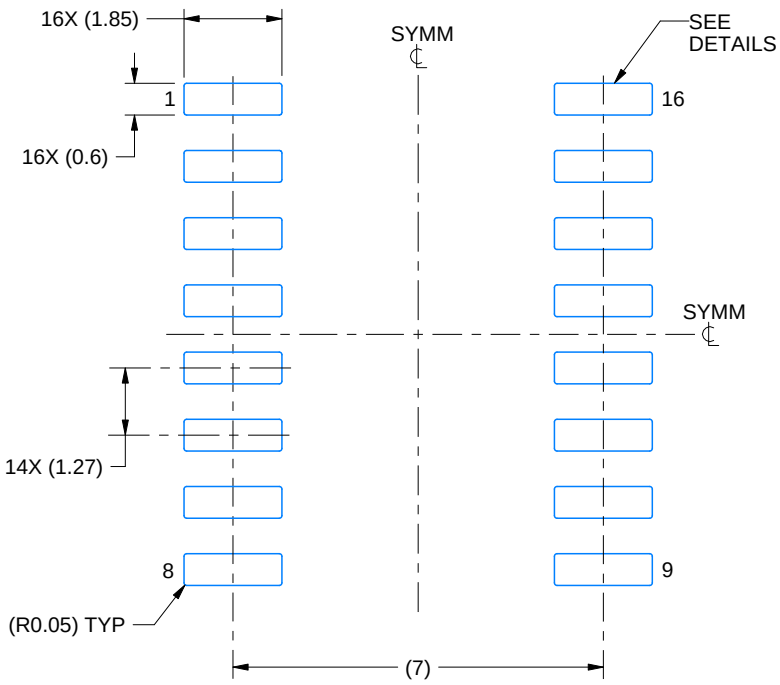

*All dimensions are nominal

| Device | Package Name | Package Type | Pins | SPQ | L (mm) | W (mm) | T (µm) | B (mm) |
|---|---|---|---|---|---|---|---|---|
| 76007012A | FK | LCCC | 20 | 55 | 506.98 | 12.06 | 2030 | NA |
| 7600701FA | W | CFP | 16 | 25 | 506.98 | 26.16 | 6220 | NA |
| JM38510/30702B2A | FK | LCCC | 20 | 55 | 506.98 | 12.06 | 2030 | NA |
| JM38510/30702B2A.A | FK | LCCC | 20 | 55 | 506.98 | 12.06 | 2030 | NA |
| JM38510/30702BFA | W | CFP | 16 | 25 | 506.98 | 26.16 | 6220 | NA |
| JM38510/30702BFA.A | W | CFP | 16 | 25 | 506.98 | 26.16 | 6220 | NA |
| JM38510/30702SFA | W | CFP | 16 | 25 | 506.98 | 26.16 | 6220 | NA |
| JM38510/30702SFA.A | W | CFP | 16 | 25 | 506.98 | 26.16 | 6220 | NA |
| M38510/30702B2A | FK | LCCC | 20 | 55 | 506.98 | 12.06 | 2030 | NA |
| M38510/30702BFA | W | CFP | 16 | 25 | 506.98 | 26.16 | 6220 | NA |
| M38510/30702SFA | W | CFP | 16 | 25 | 506.98 | 26.16 | 6220 | NA |
| SN74LS139AN | N | PDIP | 16 | 25 | 506 | 13.97 | 11230 | 4.32 |
| SN74LS139AN | N | PDIP | 16 | 25 | 506 | 13.97 | 11230 | 4.32 |
| SN74LS139AN.A | N | PDIP | 16 | 25 | 506 | 13.97 | 11230 | 4.32 |
| SN74LS139AN.A | N | PDIP | 16 | 25 | 506 | 13.97 | 11230 | 4.32 |
| SN74LS139ANE4 | N | PDIP | 16 | 25 | 506 | 13.97 | 11230 | 4.32 |
| SN74LS139ANE4 | N | PDIP | 16 | 25 | 506 | 13.97 | 11230 | 4.32 |
| SN74S139AD | D | SOIC | 16 | 40 | 507 | 8 | 3940 | 4.32 |
| SN74S139AD.A | D | SOIC | 16 | 40 | 507 | 8 | 3940 | 4.32 |
| SN74S139AN | N | PDIP | 16 | 25 | 506 | 13.97 | 11230 | 4.32 |
| SN74S139AN | N | PDIP | 16 | 25 | 506 | 13.97 | 11230 | 4.32 |
| SN74S139AN.A | N | PDIP | 16 | 25 | 506 | 13.97 | 11230 | 4.32 |
| SN74S139AN.A | N | PDIP | 16 | 25 | 506 | 13.97 | 11230 | 4.32 |
| SNJ54LS139AFK | FK | LCCC | 20 | 55 | 506.98 | 12.06 | 2030 | NA |
| SNJ54LS139AFK.A | FK | LCCC | 20 | 55 | 506.98 | 12.06 | 2030 | NA |
| SNJ54LS139AW | W | CFP | 16 | 25 | 506.98 | 26.16 | 6220 | NA |
| SNJ54LS139AW.A | W | CFP | 16 | 25 | 506.98 | 26.16 | 6220 | NA |

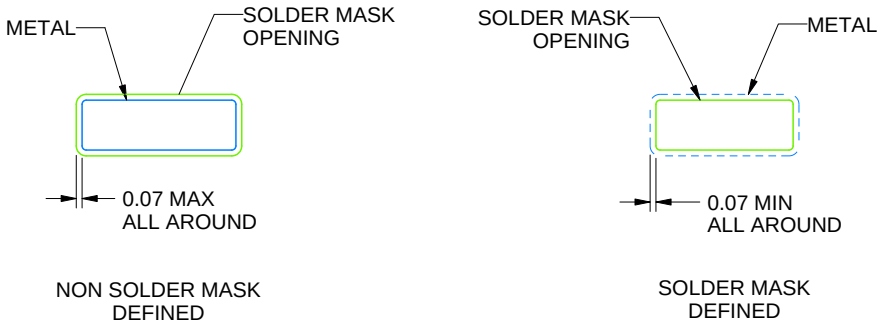



NOTES:

1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm, per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm, per side.




LAND PATTERN EXAMPLE
SCALE:7X




SOLDER MASK DETAILS

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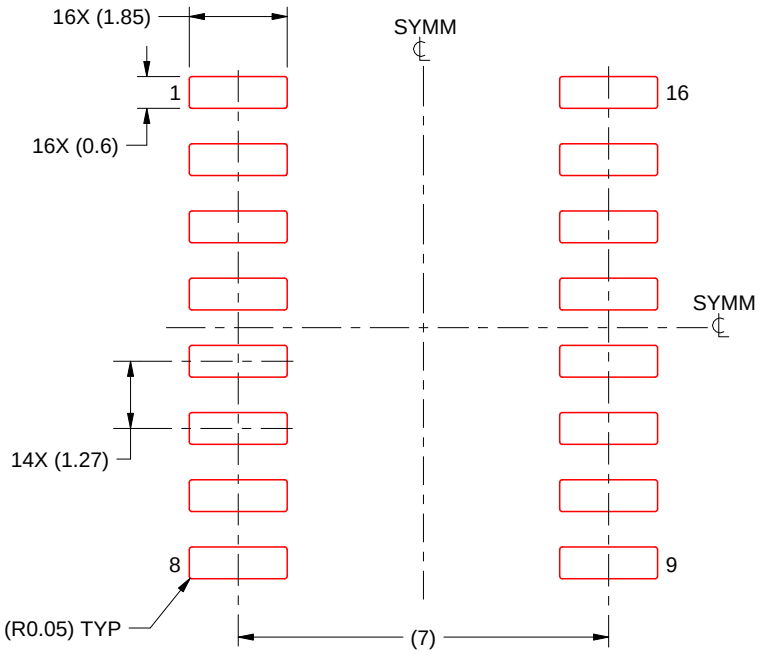
NOTES: (continued)

5. Publication IPC-7351 may have alternate designs.
6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.




SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE:7X

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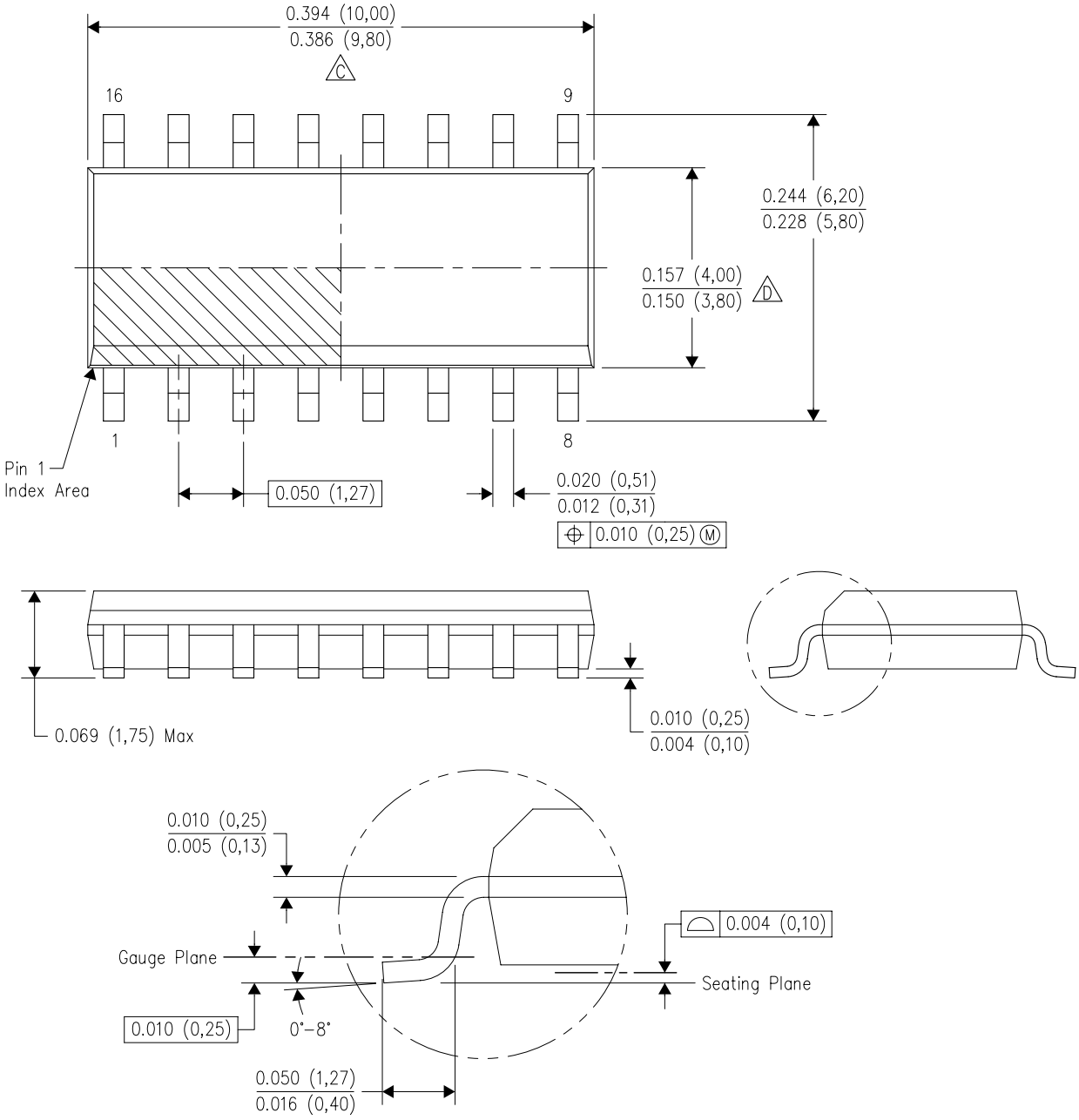
NOTES: (continued)

7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
8. Board assembly site may have different recommendations for stencil design.

D (R–PDSO–G16) PLASTIC SMALL OUTLINE

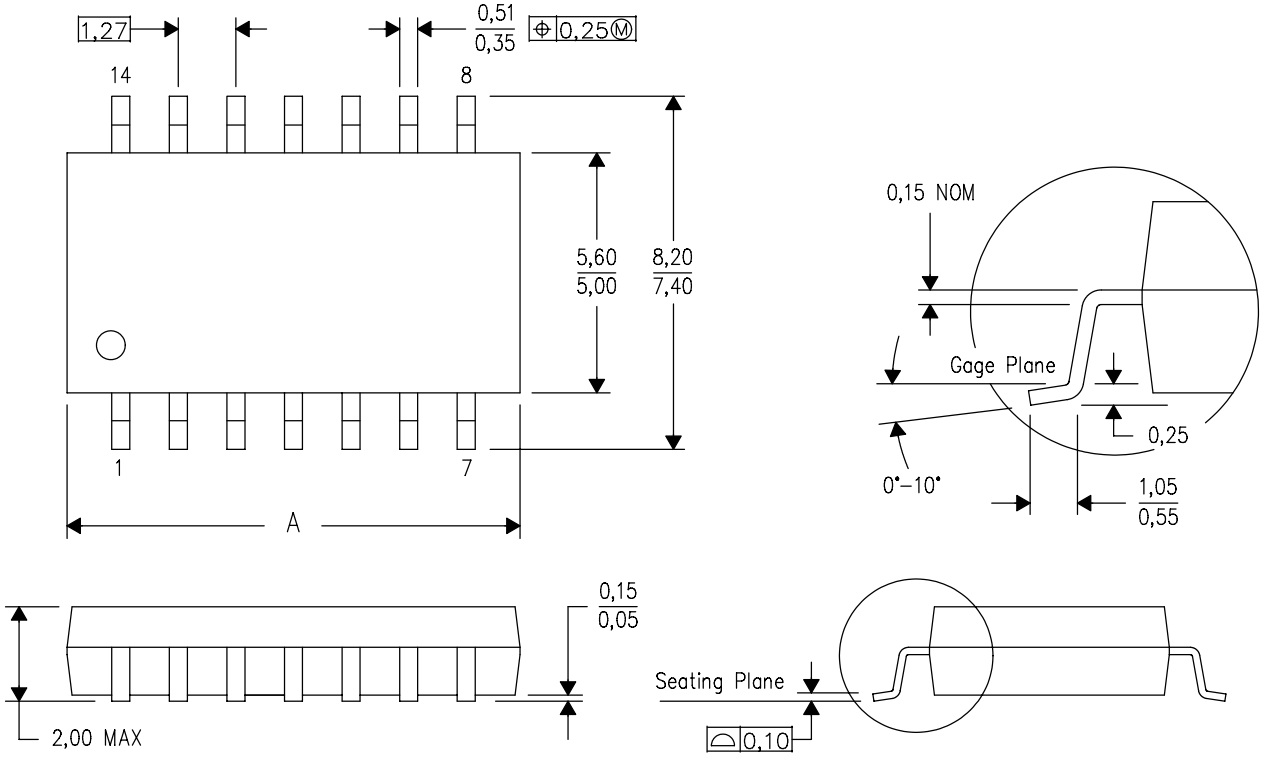



NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
D. Body width does not include interlead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

## MECHANICAL DATA

**NS (R-PDSO-G**)** **PLASTIC SMALL-OUTLINE PACKAGE**

**14-PINS SHOWN**

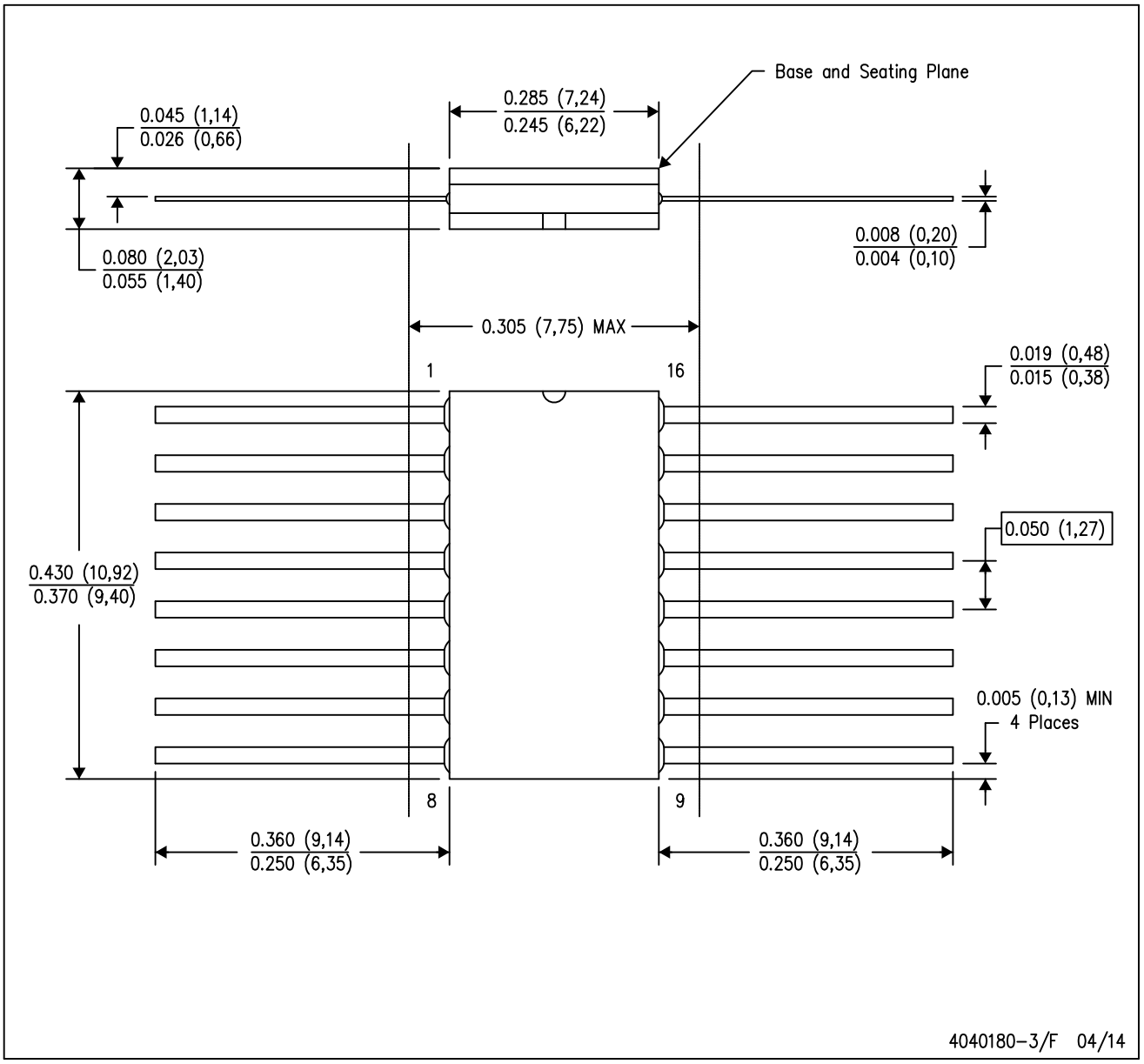



| DIM \ PINS ** | 14 | 16 | 20 | 24 |
|---|---|---|---|---|
| A MAX | 10,50 | 10,50 | 12,90 | 15,30 |
| A MIN | 9,90 | 9,90 | 12,30 | 14,70 |

4040062/C 03/03

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–F16) 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 GDFP2–F16

# GENERIC PACKAGE VIEW

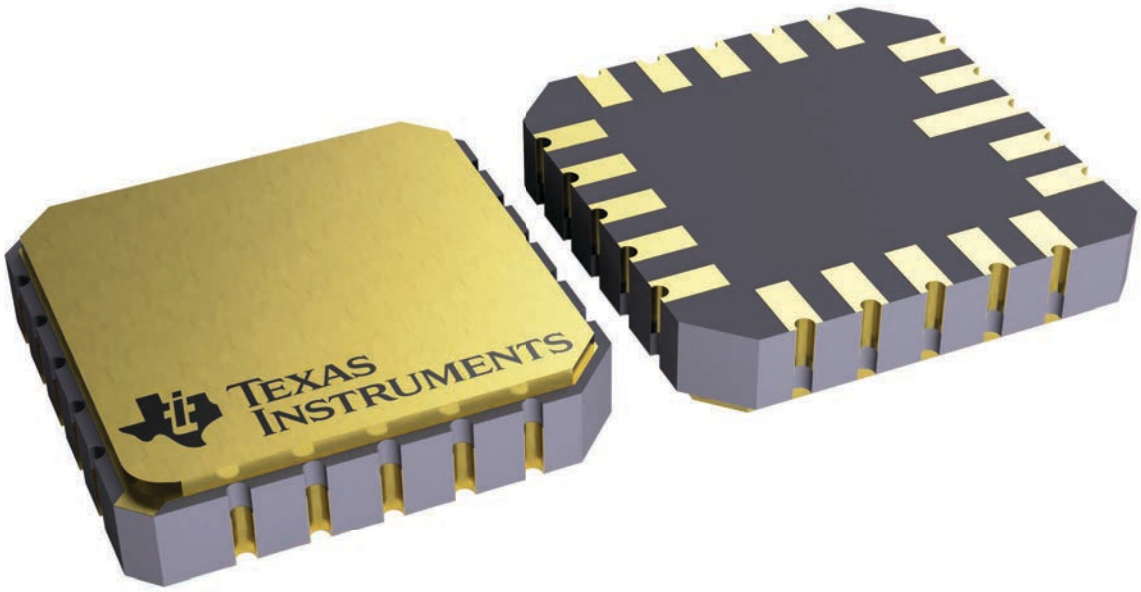
## FK 20

## LCCC - 2.03 mm max height

**8.89 x 8.89, 1.27 mm pitch**

LEADLESS CERAMIC CHIP CARRIER

This image is a representation of the package family, actual package may vary.
Refer to the product data sheet for package details.

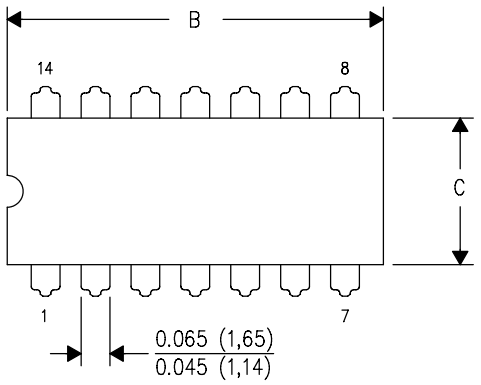



4229370VA\

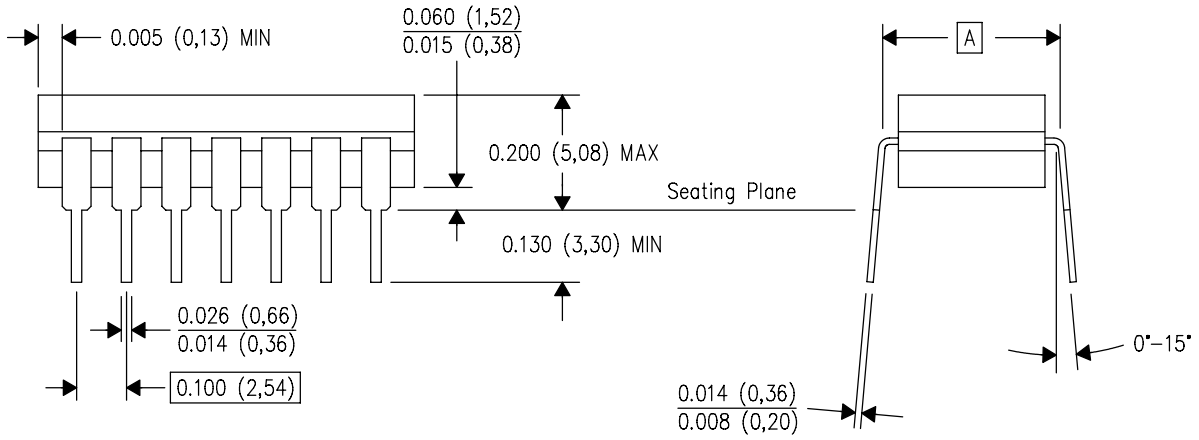
J (R–GDIP–T**)

14 LEADS SHOWN

# CERAMIC DUAL IN–LINE PACKAGE




| DIM \ PINS ** | 14 | 16 | 18 | 20 |
|---|---|---|---|---|
| A | 0.300 (7,62) BSC | 0.300 (7,62) BSC | 0.300 (7,62) BSC | 0.300 (7,62) BSC |
| B MAX | 0.785 (19,94) | .840 (21,34) | 0.960 (24,38) | 1.060 (26,92) |
| B MIN | — | — | — | — |
| C MAX | 0.300 (7,62) | 0.300 (7,62) | 0.310 (7,87) | 0.300 (7,62) |
| C MIN | 0.245 (6,22) | 0.245 (6,22) | 0.220 (5,59) | 0.245 (6,22) |



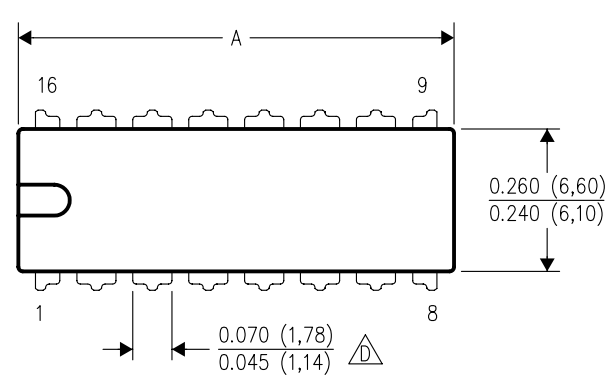

4040083/F 03/03

NOTES:
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.

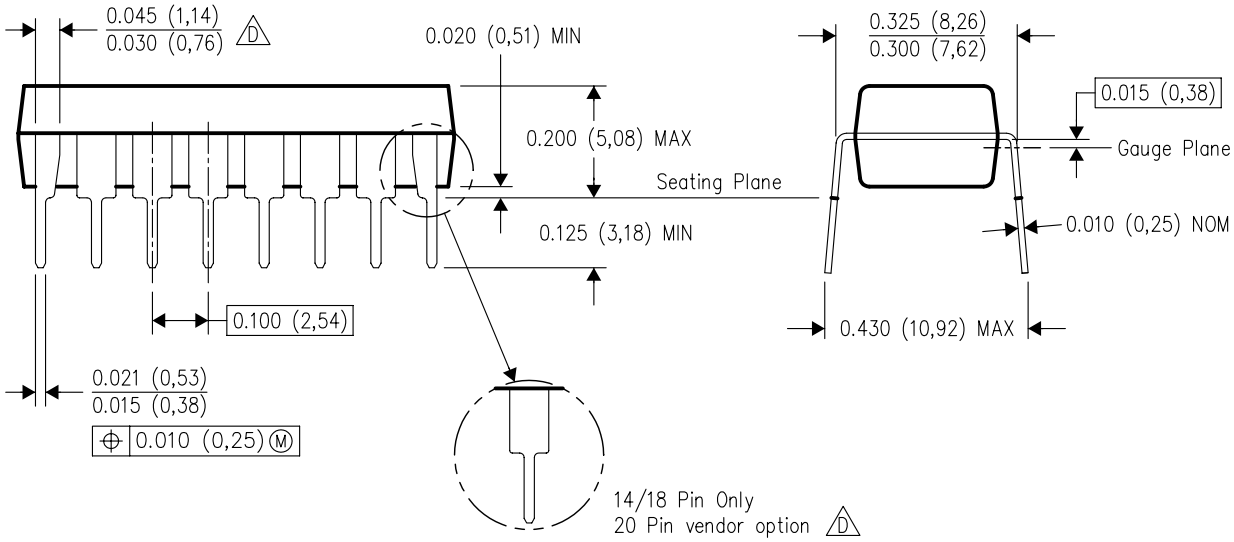
## N (R–PDIP–T**)

## PLASTIC DUAL–IN–LINE PACKAGE

16 PINS SHOWN




| DIM \ PINS ** | 14 | 16 | 18 | 20 |
|---|---|---|---|---|
| A MAX | 0.775 (19,69) | 0.775 (19,69) | 0.920 (23,37) | 1.060 (26,92) |
| A MIN | 0.745 (18,92) | 0.745 (18,92) | 0.850 (21,59) | 0.940 (23,88) |
| MS–001 VARIATION (C) | AA | BB | AC | AD |




4040049/E 12/2002

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.

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