

# **SN54150, SN54151A, SN54LS151, SN54S151, SN74150, SN74151A, SN74LS151, SN74S151 DATA SELECTORS/MULTIPLEXERS**

DECEMBER 1972—REVISED MARCH 1988

- '150 Selects One-of-Sixteen Data Sources
- Others Select One-of-Eight Data Sources
- All Perform Parallel-to-Serial Conversion
- All Permit Multiplexing from N Lines to One Line
- Also For Use as Boolean Function Generator
- Input-Clamping Diodes Simplify System Design
- Fully Compatible with Most TTL Circuits

| TYPE   | TYPICAL AVERAGE<br>PROPAGATION DELAY TIME<br>DATA INPUT TO W OUTPUT | TYPICAL<br>POWER<br>DISSIPATION |
|--------|---|---------------------------------|
| '150   | 13 ns   | 200 mW                          |
| '151A  | 8 ns  | 145 mW                          |
| 'LS151 | 13 ns   | 30 mW                           |
| 'S151  | 4.5 ns  | 225 mW                          |

## description

These monolithic data selectors/multiplexers contain full on-chip binary decoding to select the desired data source. The '150 selects one-of-sixteen data sources; the '151A, 'LS151, and 'S151 select one-of-eight data sources. The '150, '151A, 'LS151, and 'S151 have a strobe input which must be at a low logic level to enable these devices. A high level at the strobe forces the W output high, and the Y output (as applicable) low.

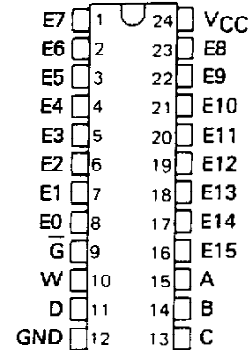
The '150 has only an inverted W output; the '151A, 'LS151, and 'S151 feature complementary W and Y outputs.

The '151A and '152A incorporate address buffers that have symmetrical propagation delay times through the complementary paths. This reduces the possibility of transients occurring at the output(s) due to changes made at the select inputs, even when the '151A outputs are enabled (i.e., strobe low).

### SN54150 . . . J OR W PACKAGE

#### SN74150 . . . N PACKAGE

##### (TOP VIEW)

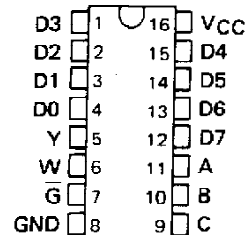


### SN54151A, SN54LS151, SN54S151 . . . J OR W PACKAGE

#### SN74151A . . . N PACKAGE

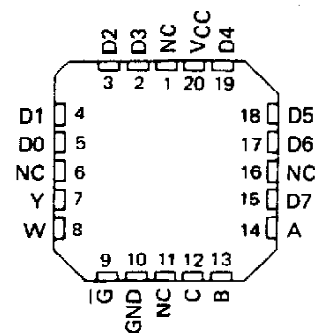
#### SN74LS151, SN74S151 . . . D OR N PACKAGE

##### (TOP VIEW)



### SN54LS151, SN54S151 . . . FK PACKAGE

##### (TOP VIEW)



NC - No internal connection

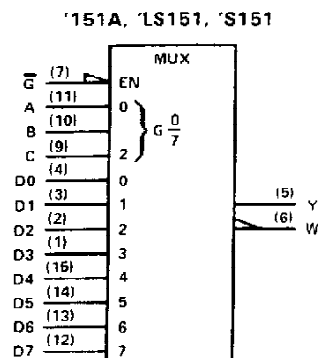
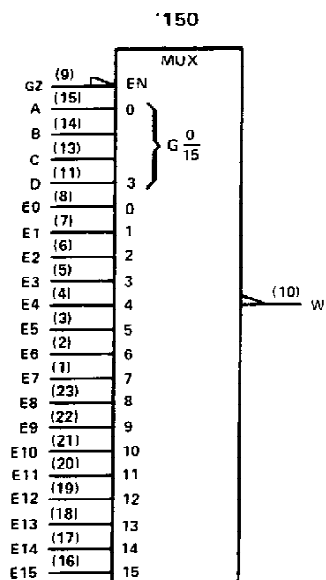
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**SN54150, SN54151A, SN54LS151, SN54S151,  
SN74150, SN74151A, SN74LS151, SN74S151  
DATA SELECTORS/MULTIPLEXERS**

logic symbols†



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

**'150**

**FUNCTION TABLE**

| INPUTS |   |   |   |             | OUTPUT<br>W      |
|--------|---|---|---|-------------|------------------|
| SELECT |   |   |   | STROBE<br>G |                  |
| D      | C | B | A | G           |                  |
| X      | X | X | X | H           | H                |
| L      | L | L | L | L           | $\overline{E0}$  |
| L      | L | L | H | L           | $\overline{E1}$  |
| L      | L | H | L | L           | $\overline{E2}$  |
| L      | L | H | H | L           | $\overline{E3}$  |
| L      | H | L | L | L           | $\overline{E4}$  |
| L      | H | L | H | L           | $\overline{E5}$  |
| L      | H | H | L | L           | $\overline{E6}$  |
| L      | H | H | H | L           | $\overline{E7}$  |
| H      | L | L | L | L           | $\overline{E8}$  |
| H      | L | L | H | L           | $\overline{E9}$  |
| H      | L | H | L | L           | $\overline{E10}$ |
| H      | L | H | H | L           | $\overline{E11}$ |
| H      | H | L | L | L           | $\overline{E12}$ |
| H      | H | L | H | L           | $\overline{E13}$ |
| H      | H | H | L | L           | $\overline{E14}$ |
| H      | H | H | H | L           | $\overline{E15}$ |

**'151A, 'LS151, 'S151**

**FUNCTION TABLE**

| INPUTS |   |   |             | OUTPUTS |                 |
|--------|---|---|-------------|---------|-----------------|
| SELECT |   |   | STROBE<br>G | Y       | W               |
| C      | B | A | G           |         |                 |
| X      | X | X | H           | L       | H               |
| L      | L | L | L           | D0      | $\overline{D0}$ |
| L      | L | H | L           | D1      | $\overline{D1}$ |
| L      | H | L | L           | D2      | $\overline{D2}$ |
| L      | H | H | L           | D3      | $\overline{D3}$ |
| H      | L | L | L           | D4      | $\overline{D4}$ |
| H      | L | H | L           | D5      | $\overline{D5}$ |
| H      | H | L | L           | D6      | $\overline{D6}$ |
| H      | H | H | L           | D7      | $\overline{D7}$ |

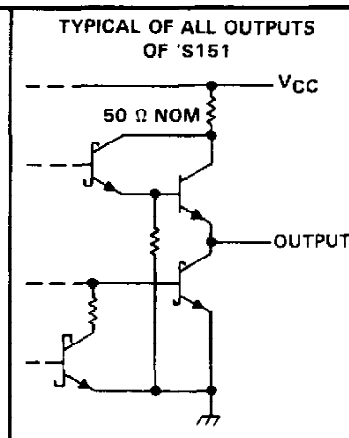
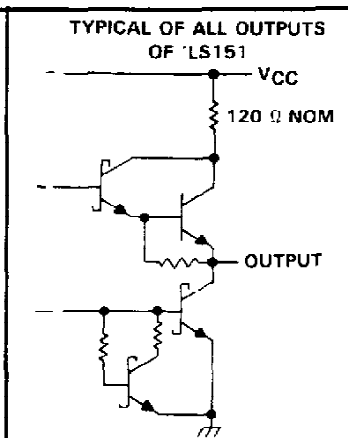
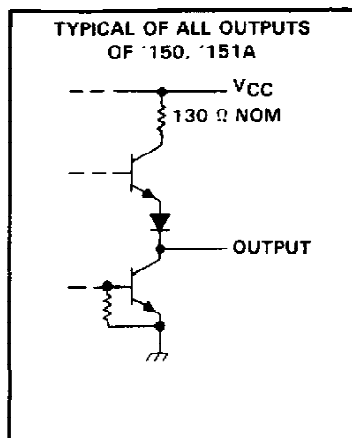
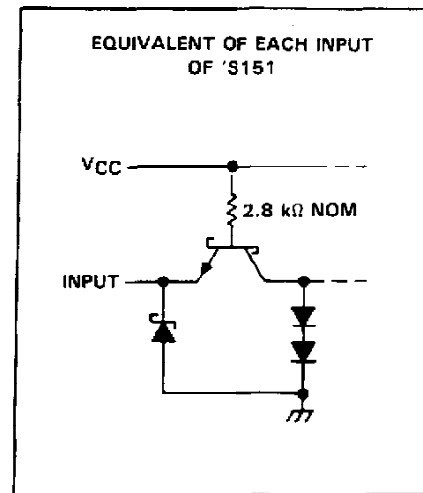
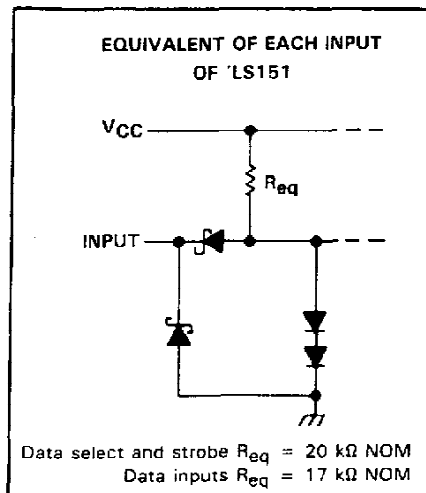
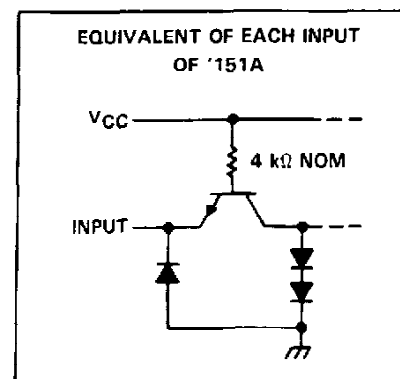
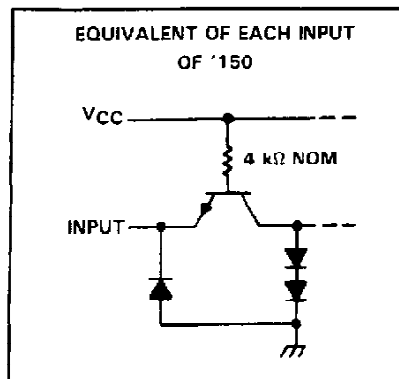
H = high level, L = low level, X = irrelevant  
 $\overline{E0}$ ,  $\overline{E1}$  . . .  $\overline{E15}$  = the complement of the level of the respective E input  
D0, D1 . . . D7 = the level of the D respective input

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**SN54150, SN54151A, SN54LS151, SN54S151  
SN74150, SN74151A, SN74LS151, SN74S151  
DATA SELECTORS/MULTIPLEXERS**

schematics of inputs and outputs



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# SN54150, SN54151A, SN74150, SN74151A

## DATA SELECTORS/MULTIPLEXERS

### recommended operating conditions

|                                       | SN54' |     |      | SN74' |     |      | UNIT         |
|---------------------------------------|-------|-----|------|-------|-----|------|--------------|
|                                       | MIN   | NOM | MAX  | MIN   | NOM | MAX  |              |
| Supply voltage, $V_{CC}$              | 4.5   | 5   | 5.5  | 4.75  | 5   | 5.25 | V            |
| High-level output current, $I_{OH}$   |       |     | -800 |       |     | -800 | $\mu$ A      |
| Low-level output current, $I_{OL}$    |       |     | 16   |       |     | 16   | mA           |
| Operating free-air temperature, $T_A$ | -55   |     | 125  | 0     |     | 70   | $^{\circ}$ C |

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

| PARAMETER  | TEST CONDITIONS <sup>†</sup>  | '150  |                  |      | '151A |                  |      | UNIT    |
|--|---|-------|------------------|------|-------|------------------|------|---------|
|  |   | MIN   | TYP <sup>‡</sup> | MAX  | MIN   | TYP <sup>‡</sup> | MAX  |         |
| $V_{IH}$ High-level input voltage                  |   | 2     |                  |      | 2     |                  |      | V       |
| $V_{IL}$ Low-level input voltage                   |   |       |                  | 0.8  |       |                  | 0.8  | V       |
| $V_{IK}$ Input clamp voltage                       | $V_{CC} = \text{MIN.}$ , $I_I = -8 \text{ mA}$  |       |                  | -1.5 |       |                  | -1.5 | V       |
| $V_{OH}$ High-level output voltage                 | $V_{CC} = \text{MIN.}$ , $V_{IH} = 2 \text{ V}$ ,<br>$V_{IL} = 0.8 \text{ V}$ , $I_{OH} = -800 \mu\text{A}$ | 2.4   | 3.4              |      | 2.4   | 3.4              |      | V       |
| $V_{OL}$ Low-level output voltage                  | $V_{CC} = \text{MIN.}$ , $V_{IH} = 2 \text{ V}$ ,<br>$V_{IL} = 0.8 \text{ V}$ , $I_{OL} = 16 \text{ mA}$    |       | 0.2              | 0.4  |       | 0.2              | 0.4  | V       |
| $I_I$ Input current at maximum input voltage       | $V_{CC} = \text{MAX.}$ , $V_I = 5.5 \text{ V}$  |       |                  | 1    |       |                  | 1    | mA      |
| $I_{IH}$ High-level input current                  | $V_{CC} = \text{MAX.}$ , $V_I = 2.4 \text{ V}$  |       |                  | 40   |       |                  | 40   | $\mu$ A |
| $I_{IL}$ Low-level input current                   | $V_{CC} = \text{MAX.}$ , $V_I = 0.4 \text{ V}$  |       |                  | -1.6 |       |                  | -1.6 | mA      |
| $I_{OS}$ Short-circuit output current <sup>§</sup> | $V_{CC} = \text{MAX.}$  | SN54' | -20              | -55  | -20   | -55              |      | mA      |
|  |   | SN74' | -18              | -55  | -18   | -55              |      |         |
| $I_{CC}$ Supply current                            | $V_{CC} = \text{MAX.}$ See Note 3   |       | 40               | 68   |       | 29               | 48   | mA      |

<sup>†</sup> For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.

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

<sup>§</sup> Not more than one output of the '151A should be shorted at a time.

NOTE 3:  $I_{CC}$  is measured with the strobe and data select inputs at 4.5 V, all other inputs and outputs open.

### switching characteristics, $V_{CC} = 5 \text{ V}$ , $T_A = 25^{\circ}\text{C}$

| PARAMETER <sup>¶</sup> | FROM<br>(INPUT)               | TO<br>(OUTPUT) | TEST<br>CONDITIONS   | '150 |     |     | '151A |     |     | UNIT |
|------------------------|-------------------------------|----------------|--|------|-----|-----|-------|-----|-----|------|
|                        |                               |                |  | MIN  | TYP | MAX | MIN   | TYP | MAX |      |
| t <sub>PLH</sub>       | A, B, or C<br>(4 levels)      | Y              | C <sub>L</sub> = 15 pF,<br>R <sub>L</sub> = 400 Ω,<br>See Note 4 i |      |     |     | 25    | 38  | ns  |      |
| t <sub>PHL</sub>       |                               |                |  |      |     |     | 25    | 38  |     |      |
| t <sub>PLH</sub>       | A, B, C, or D<br>(3 levels)   | W              |  | 23   | 35  | 17  | 26    | ns  |     |      |
| t <sub>PHL</sub>       |                               |                |  | 22   | 33  | 19  | 30    |     |     |      |
| t <sub>PLH</sub>       | Strobe $\overline{G}$         | Y              |  |      |     | 21  | 33    | ns  |     |      |
| t <sub>PHL</sub>       |                               |                |  |      |     | 22  | 33    |     |     |      |
| t <sub>PLH</sub>       | Strobe $\overline{G}$         | W              |  | 15.5 | 24  | 14  | 21    | ns  |     |      |
| t <sub>PHL</sub>       |                               |                |  | 21   | 30  | 15  | 23    |     |     |      |
| t <sub>PLH</sub>       | D0 thru D7                    | Y              |  |      |     | 13  | 20    | ns  |     |      |
| t <sub>PHL</sub>       |                               |                |  |      |     | 18  | 27    |     |     |      |
| t <sub>PLH</sub>       | E0 thru E15, or<br>D0 thru D7 | W              | 8.5  | 14   | 8   | 14  | ns    |     |     |      |
| t <sub>PHL</sub>       |                               |                | 13   | 20   | 8   | 14  |       |     |     |      |

<sup>¶</sup>  $t_{PLH}$  = propagation delay time, low-to-high-level output

$t_{PHL}$  = propagation delay time, high-to-low-level output

NOTE 4: Load circuits and voltage waveforms are shown in Section 1.

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# SN54LS151, SN74LS151 DATA SELECTORS/MULTIPLEXERS

## recommended operating conditions

|                                       | SN54LS151 |     |      | SN74LS151 |     |      | UNIT        |
|---------------------------------------|-----------|-----|------|-----------|-----|------|-------------|
|                                       | MIN       | NOM | MAX  | MIN       | NOM | MAX  |             |
| Supply voltage, $V_{CC}$              | 4.5       | 5   | 5.5  | 4.75      | 5   | 5.25 | V           |
| High-level output current, $I_{OH}$   |           |     | -400 |           |     | -400 | $\mu A$     |
| Low-level output current, $I_{OL}$    |           |     | 4    |           |     | 8    | mA          |
| Operating free-air temperature, $T_A$ | -55       |     | 125  | 0         |     | 70   | $^{\circ}C$ |

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

| PARAMETER   | TEST CONDITIONS†  | SN54LS151              |      |      | SN74LS151 |      |      | UNIT |
|---|---|------------------------|------|------|-----------|------|------|------|
|   |   | MIN                    | TYP‡ | MAX  | MIN       | TYP‡ | MAX  |      |
| V <sub>IH</sub> High-level input voltage              |   | 2                      |      |      | 2         |      |      | V    |
| V <sub>IL</sub> Low-level input voltage               |   |                        |      | 0.7  |           |      | 0.8  | V    |
| V <sub>IK</sub> Input clamp voltage                   | V <sub>CC</sub> = MIN, I <sub>I</sub> = -18 mA  |                        |      | -1.5 |           |      | -1.5 | V    |
| V <sub>OH</sub> High-level output voltage             | V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V,<br>V <sub>IL</sub> = V <sub>ILmax</sub> , I <sub>OH</sub> = -400 μA | 2.5                    | 3.4  |      | 2.7       | 3.4  |      | V    |
| V <sub>OL</sub> Low-level output voltage              | V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V,<br>V <sub>IL</sub> = V <sub>ILmax</sub>                             | I <sub>OL</sub> = 4 mA |      | 0.25 | 0.4       | 0.25 | 0.4  | V    |
|   |   | I <sub>OL</sub> = 8 mA |      |      |           | 0.35 | 0.5  |      |
| I <sub>I</sub> Input current at maximum input voltage | V <sub>CC</sub> = MAX, V <sub>I</sub> = 7 V   |                        |      | 0.1  |           |      | 0.1  | mA   |
| I <sub>IH</sub> High-level input current              | V <sub>CC</sub> = MAX, V <sub>I</sub> = 2.7 V   |                        |      | 20   |           |      | 20   | μA   |
| I <sub>IL</sub> Low-level input current               | V <sub>CC</sub> = MAX, V <sub>I</sub> = 0.4 V   |                        |      | -0.4 |           |      | -0.4 | mA   |
| I <sub>OS</sub> Short-circuit output current§         | V <sub>CC</sub> = MAX   | -20                    |      | -100 | -20       |      | -100 | mA   |
| I <sub>CC</sub> Supply current                        | V <sub>CC</sub> = MAX, Outputs open,<br>All inputs at 4.5 V   |                        | 6.0  | 10   |           | 6.0  | 10   | mA   |

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.

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

§ Not more than one output should be shorted at a time and duration of short-circuit should not exceed one second.

## switching characteristics, $V_{CC} = 5 \text{ V}$ , $T_A = 25^{\circ}C$

| PARAMETER† | FROM<br>(INPUT)          | TO<br>(OUTPUT) | TEST CONDITIONS                         | MIN | TYP | MAX | UNIT |
|------------|--------------------------|----------------|---|-----|-----|-----|------|
| tPLH       | A, B, or C<br>(4 levels) | Y              | CL = 15 pF,<br>RL = 2 kΩ,<br>See Note 4 |     | 27  | 43  | ns   |
| tPHL       |                          |                |   |     | 18  | 30  |      |
| tPLH       | A, B, or C<br>(3 levels) | W              |   |     | 14  | 23  | ns   |
| tPHL       |                          |                |   |     | 20  | 32  |      |
| tPLH       | Strobe $\overline{G}$    | Y              |   |     | 26  | 42  | ns   |
| tPHL       |                          |                |   |     | 20  | 32  |      |
| tPLH       | Strobe $\overline{G}$    | W              |   |     | 15  | 24  | ns   |
| tPHL       |                          |                |   |     | 18  | 30  |      |
| tPLH       | Any D                    | Y              |   |     | 20  | 32  | ns   |
| tPHL       |                          |                |   |     | 16  | 26  |      |
| tPLH       | Any D                    | W              |   |     | 13  | 21  | ns   |
| tPHL       |                          |                |   |     | 12  | 20  |      |

†  $t_{PLH}$  = propagation delay time, low-to-high-level output

$t_{PHL}$  = propagation delay time, high-to-low-level output

NOTE 4: Load circuits and voltage waveforms are shown in Section 1.

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# SN54S151, SN74S151

## DATA SELECTORS/MULTIPLEXERS

### recommended operating conditions

|                                       | SN54S151 |     |     | SN74S151 |     |      | UNIT |
|---------------------------------------|----------|-----|-----|----------|-----|------|------|
|                                       | MIN      | NOM | MAX | MIN      | NOM | MAX  |      |
| Supply voltage, $V_{CC}$              | 4.5      | 5   | 5.5 | 4.75     | 5   | 5.25 | V    |
| High-level output current, $I_{OH}$   |          |     | -1  |          |     | -1   | mA   |
| Low-level output current, $I_{OL}$    |          |     | 20  |          |     | 20   | mA   |
| Operating free-air temperature, $T_A$ | -55      |     | 125 | 0        |     | 70   | °C   |

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

| PARAMETER                                    | TEST CONDITIONS†   | MIN      | TYP‡ | MAX  | UNIT |
|--|--|----------|------|------|------|
| $V_{IH}$ High-level input voltage            |  | 2        |      |      | V    |
| $V_{IL}$ Low-level input voltage             |  |          |      | 0.8  | V    |
| $V_{IK}$ Input clamp voltage                 | $V_{CC} = \text{MIN}, I_I = -18 \text{ mA}$  |          |      | -1.2 | V    |
| $V_{OH}$ High-level output voltage           | $V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V},$<br>$V_{IL} = 0.8 \text{ V}, I_{OH} = -1 \text{ mA}$ | SN54S151 | 2.5  | 3.4  | V    |
|  |  | SN74S151 | 2.7  | 3.4  |      |
| $V_{OL}$ Low-level output voltage            | $V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V},$<br>$V_{IL} = 0.8 \text{ V}, I_{OL} = 20 \text{ mA}$ |          |      | 0.5  | V    |
|  |  |          |      |      |      |
| $I_I$ Input current at maximum input voltage | $V_{CC} = \text{MAX}, V_I = 5.5 \text{ V}$   |          |      | 1    | mA   |
| $I_{IH}$ High-level input current            | $V_{CC} = \text{MAX}, V_I = 2.7 \text{ V}$   |          |      | 50   | µA   |
| $I_{IL}$ Low-level input current             | $V_{CC} = \text{MAX}, V_I = 0.5 \text{ V}$   |          |      | -2   | mA   |
| $I_{OS}$ Short-circuit output current§       | $V_{CC} = \text{MAX}$  | -40      |      | -100 | mA   |
| $I_{CC}$ Supply current                      | $V_{CC} = \text{MAX},$ All inputs at 4.5 V,<br>All outputs open                                  |          | 45   | 70   | mA   |

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.

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

§ Not more than one output should be shorted at a time, and duration of the short-circuit should not exceed one second.

### switching characteristics, $V_{CC} = 5 \text{ V}, T_A = 25^\circ \text{C}$

| PARAMETER <sup>1</sup> | FROM<br>(INPUT)          | TO<br>(OUTPUT) | TEST CONDITIONS   | MIN | TYP | MAX  | UNIT |
|------------------------|--------------------------|----------------|---|-----|-----|------|------|
| t <sub>PLH</sub>       | A, B, or C<br>(4 levels) | Y              | C <sub>L</sub> = 15 pF,<br>R <sub>L</sub> = 280 kΩ,<br>See Note 4 |     | 12  | 18   | ns   |
| t <sub>PHL</sub>       |                          |                |   |     | 12  | 18   |      |
| t <sub>PLH</sub>       | A, B, or C<br>(3 levels) | W              |   |     | 10  | 15   | ns   |
| t <sub>PHL</sub>       |                          |                |   |     | 9   | 13.5 |      |
| t <sub>PLH</sub>       | Any D                    | Y              |   |     | 8   | 12   | ns   |
| t <sub>PHL</sub>       |                          |                |   |     | 8   | 12   |      |
| t <sub>PLH</sub>       | Any D                    | W              |   |     | 4.5 | 7    | ns   |
| t <sub>PHL</sub>       |                          |                |   |     | 4.5 | 7    |      |
| t <sub>PLH</sub>       | Strobe $\overline{G}$    | Y              |   |     | 11  | 16.5 | ns   |
| t <sub>PHL</sub>       |                          |                |   |     | 12  | 18   |      |
| t <sub>PLH</sub>       | Strobe $\overline{G}$    | W              |   |     | 9   | 13   | ns   |
| t <sub>PHL</sub>       |                          |                |   |     | 8.5 | 12   |      |

†  $t_{PLH}$  = propagation delay time, low-to-high-level output

$t_{PHL}$  = propagation delay time, high-to-low-level output

NOTE 4: Load circuits and voltage waveforms are shown in Section 1.



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## 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                 |
|------------------|---------------|--------------|-----------------|------|-------------|-------------------------|--------------------------------------|----------------------|--------------|-------------------------------|-------------------------|
| 76010012A        | ACTIVE        | LCCC         | FK              | 20   | 55          | Non-RoHS<br>& Green     | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 76010012A<br>SNJ54LS<br>151FK | <a href="#">Samples</a> |
| 7601001EA        | ACTIVE        | CDIP         | J               | 16   | 25          | Non-RoHS<br>& Green     | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 7601001EA<br>SNJ54LS151J      | <a href="#">Samples</a> |
| JM38510/07901BEA | ACTIVE        | CDIP         | J               | 16   | 25          | Non-RoHS<br>& Green     | SNPB                                 | N / A for Pkg Type   | -55 to 125   | JM38510/<br>07901BEA          | <a href="#">Samples</a> |
| JM38510/07901BFA | ACTIVE        | CFP          | W               | 16   | 25          | Non-RoHS &<br>Non-Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | JM38510/<br>07901BFA          | <a href="#">Samples</a> |
| JM38510/30901B2A | ACTIVE        | LCCC         | FK              | 20   | 55          | Non-RoHS<br>& Green     | SNPB                                 | N / A for Pkg Type   | -55 to 125   | JM38510/<br>30901B2A          | <a href="#">Samples</a> |
| JM38510/30901BEA | ACTIVE        | CDIP         | J               | 16   | 25          | Non-RoHS<br>& Green     | SNPB                                 | N / A for Pkg Type   | -55 to 125   | JM38510/<br>30901BEA          | <a href="#">Samples</a> |
| JM38510/30901BFA | ACTIVE        | CFP          | W               | 16   | 25          | Non-RoHS<br>& Green     | SNPB                                 | N / A for Pkg Type   | -55 to 125   | JM38510/<br>30901BFA          | <a href="#">Samples</a> |
| M38510/07901BEA  | ACTIVE        | CDIP         | J               | 16   | 25          | Non-RoHS<br>& Green     | SNPB                                 | N / A for Pkg Type   | -55 to 125   | JM38510/<br>07901BEA          | <a href="#">Samples</a> |
| M38510/07901BFA  | ACTIVE        | CFP          | W               | 16   | 25          | Non-RoHS<br>& Green     | SNPB                                 | N / A for Pkg Type   | -55 to 125   | JM38510/<br>07901BFA          | <a href="#">Samples</a> |
| M38510/30901B2A  | ACTIVE        | LCCC         | FK              | 20   | 55          | Non-RoHS<br>& Green     | SNPB                                 | N / A for Pkg Type   | -55 to 125   | JM38510/<br>30901B2A          | <a href="#">Samples</a> |
| M38510/30901BEA  | ACTIVE        | CDIP         | J               | 16   | 25          | Non-RoHS<br>& Green     | SNPB                                 | N / A for Pkg Type   | -55 to 125   | JM38510/<br>30901BEA          | <a href="#">Samples</a> |
| M38510/30901BFA  | ACTIVE        | CFP          | W               | 16   | 25          | Non-RoHS<br>& Green     | SNPB                                 | N / A for Pkg Type   | -55 to 125   | JM38510/<br>30901BFA          | <a href="#">Samples</a> |
| SN54LS151J       | ACTIVE        | CDIP         | J               | 16   | 25          | Non-RoHS<br>& Green     | SNPB                                 | N / A for Pkg Type   | -55 to 125   | SN54LS151J                    | <a href="#">Samples</a> |
| SN54S151J        | ACTIVE        | CDIP         | J               | 16   | 25          | Non-RoHS<br>& Green     | SNPB                                 | N / A for Pkg Type   | -55 to 125   | SN54S151J                     | <a href="#">Samples</a> |
| SN74LS151DR      | ACTIVE        | SOIC         | D               | 16   | 2500        | RoHS & Green            | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | LS151                         | <a href="#">Samples</a> |
| SN74LS151N       | ACTIVE        | PDIP         | N               | 16   | 25          | RoHS & Green            | NIPDAU                               | N / A for Pkg Type   | 0 to 70      | SN74LS151N                    | <a href="#">Samples</a> |
| SN74LS151NE4     | ACTIVE        | PDIP         | N               | 16   | 25          | RoHS & Green            | NIPDAU                               | N / A for Pkg Type   | 0 to 70      | SN74LS151N                    | <a href="#">Samples</a> |

| Orderable Device | Status<br>(1) | Package Type | Package<br>Drawing | Pins | Package<br>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                 |
|------------------|---------------|--------------|--------------------|------|----------------|---------------------|--------------------------------------|----------------------|--------------|-------------------------------|-------------------------|
| SN74LS151NSR     | ACTIVE        | SO           | NS                 | 16   | 2000           | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | 74LS151                       | <a href="#">Samples</a> |
| SNJ54LS151FK     | ACTIVE        | LCCC         | FK                 | 20   | 55             | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 76010012A<br>SNJ54LS<br>151FK | <a href="#">Samples</a> |
| SNJ54LS151J      | ACTIVE        | CDIP         | J                  | 16   | 25             | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 7601001EA<br>SNJ54LS151J      | <a href="#">Samples</a> |
| SNJ54S151J       | ACTIVE        | CDIP         | J                  | 16   | 25             | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | SNJ54S151J                    | <a href="#">Samples</a> |
| SNJ54S151W       | ACTIVE        | CFP          | W                  | 16   | 25             | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | SNJ54S151W                    | <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.

**OBSELETE:** TI has discontinued the production of the device.

(2) **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.

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

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

(5) 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.

(6) 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 SN54LS151, SN74LS151 :**

- Catalog : [SN74LS151](#)
- Military : [SN54LS151](#)

**NOTE: Qualified Version Definitions:**

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

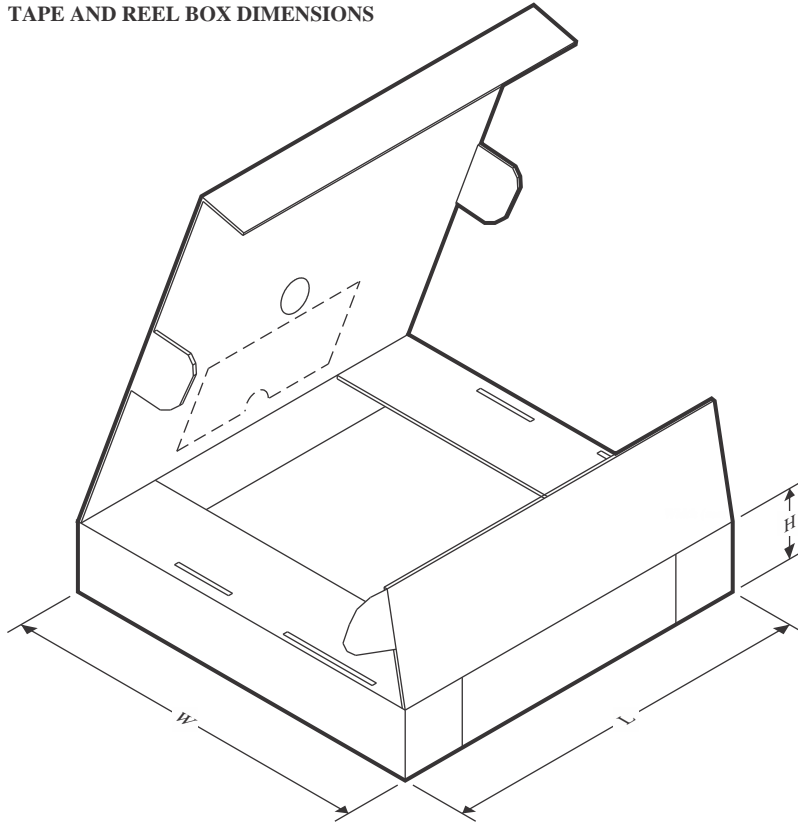
## TAPE AND REEL INFORMATION



\*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 |
|--------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| SN74LS151DR  | SOIC         | D               | 16   | 2500 | 330.0              | 16.4               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |
| SN74LS151NSR | SO           | NS              | 16   | 2000 | 330.0              | 16.4               | 8.2     | 10.5    | 2.5     | 12.0    | 16.0   | Q1            |

## TAPE AND REEL BOX DIMENSIONS



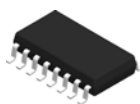
\*All dimensions are nominal

| Device       | Package Type | Package Drawing | Pins | SPQ  | Length (mm) | Width (mm) | Height (mm) |
|--------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74LS151DR  | SOIC         | D               | 16   | 2500 | 340.5       | 336.1      | 32.0        |
| SN74LS151NSR | SO           | NS              | 16   | 2000 | 356.0       | 356.0      | 35.0        |

**TUBE**


\*All dimensions are nominal

| Device           | Package Name | Package Type | Pins | SPQ | L (mm) | W (mm) | T (μm) | B (mm) |
|------------------|--------------|--------------|------|-----|--------|--------|--------|--------|
| 76010012A        | FK           | LCCC         | 20   | 55  | 506.98 | 12.06  | 2030   | NA     |
| JM38510/07901BFA | W            | CFP          | 16   | 25  | 506.98 | 26.16  | 6220   | NA     |
| JM38510/30901B2A | FK           | LCCC         | 20   | 55  | 506.98 | 12.06  | 2030   | NA     |
| JM38510/30901BFA | W            | CFP          | 16   | 25  | 506.98 | 26.16  | 6220   | NA     |
| M38510/07901BFA  | W            | CFP          | 16   | 25  | 506.98 | 26.16  | 6220   | NA     |
| M38510/30901B2A  | FK           | LCCC         | 20   | 55  | 506.98 | 12.06  | 2030   | NA     |
| M38510/30901BFA  | W            | CFP          | 16   | 25  | 506.98 | 26.16  | 6220   | NA     |
| SN74LS151N       | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |
| SN74LS151N       | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |
| SN74LS151NE4     | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |
| SN74LS151NE4     | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |
| SNJ54LS151FK     | FK           | LCCC         | 20   | 55  | 506.98 | 12.06  | 2030   | NA     |

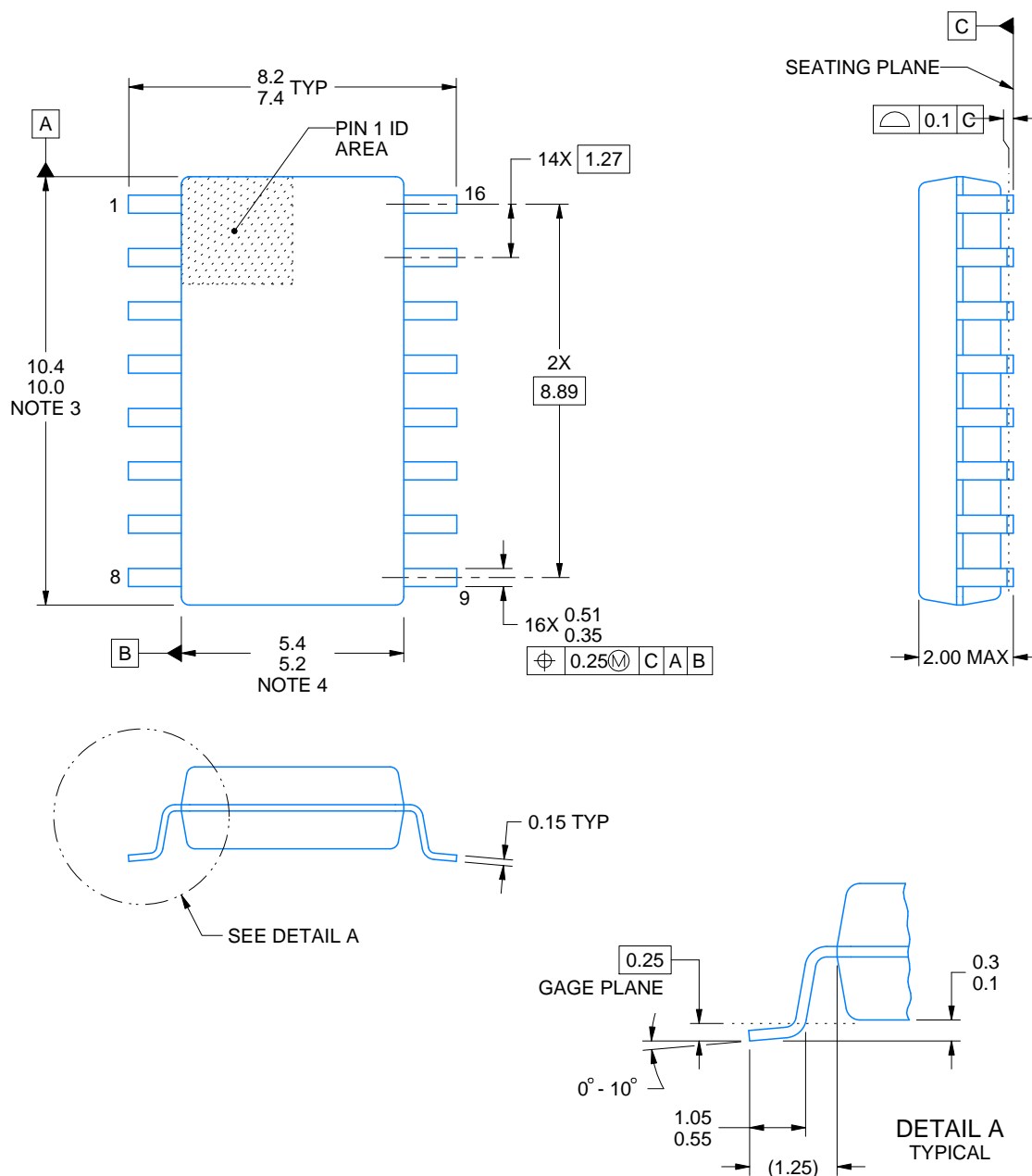


**NS0016A**

# PACKAGE OUTLINE

**SOP - 2.00 mm max height**

SOP



4220735/A 12/2021

## 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.

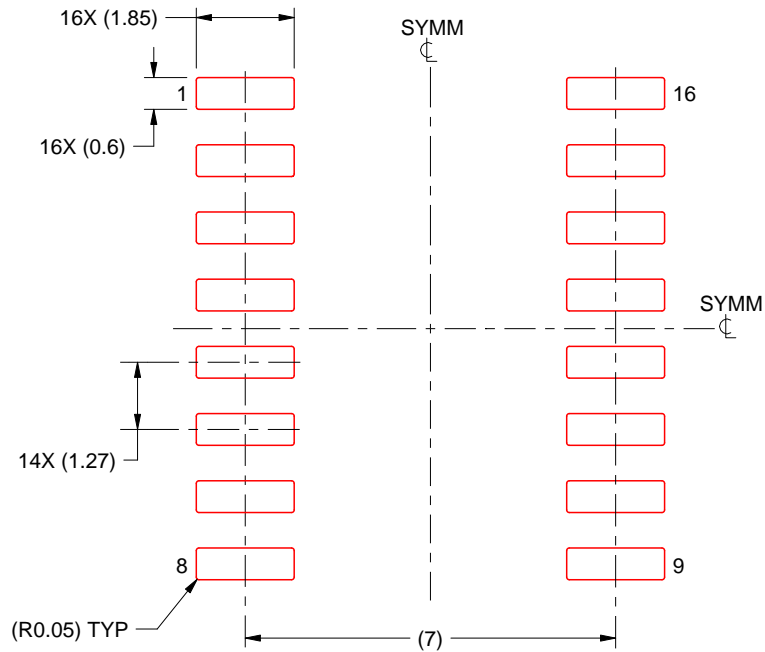


# EXAMPLE STENCIL DESIGN

NS0016A

SOP - 2.00 mm max height

SOP



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

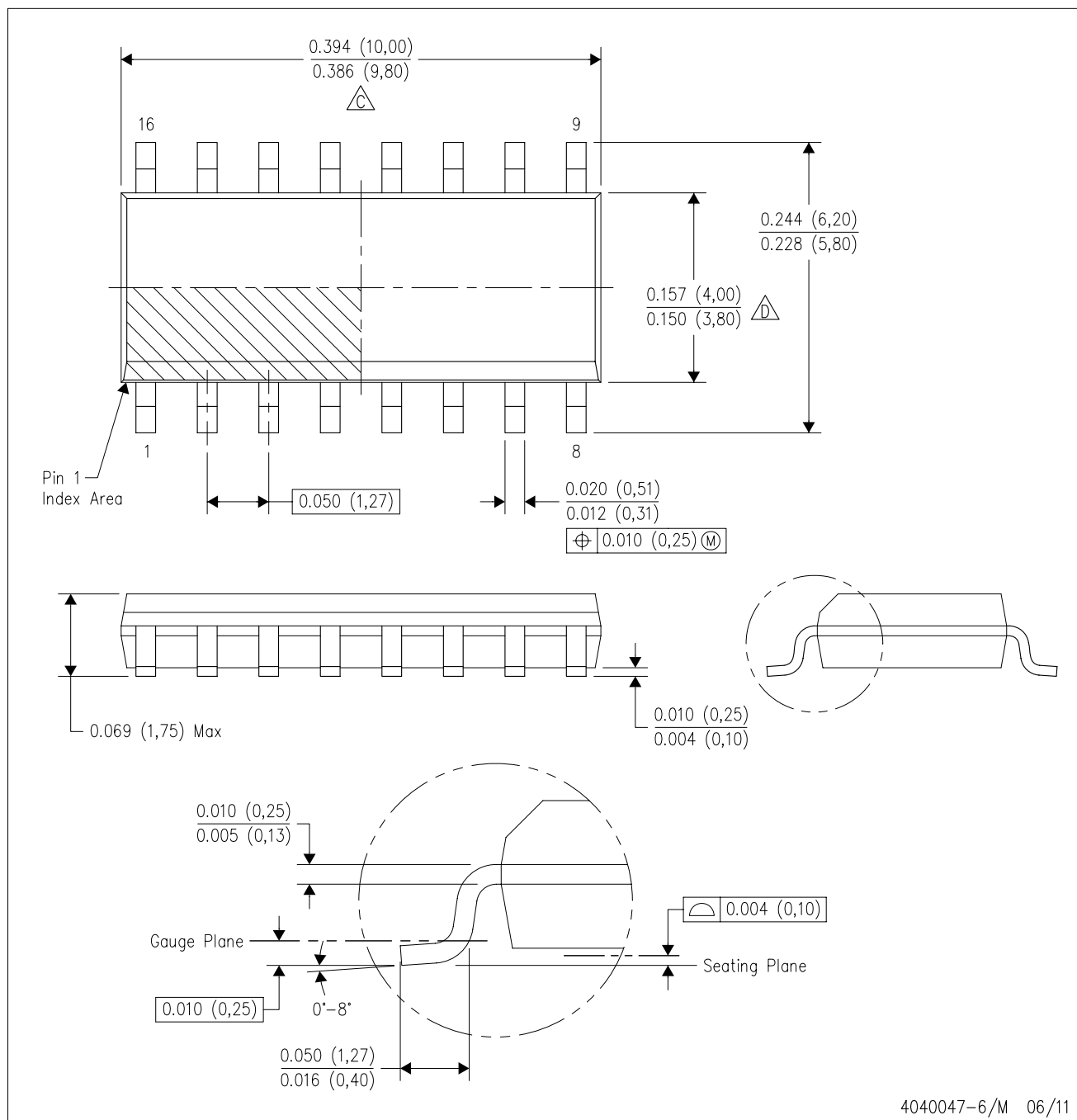
4220735/A 12/2021

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



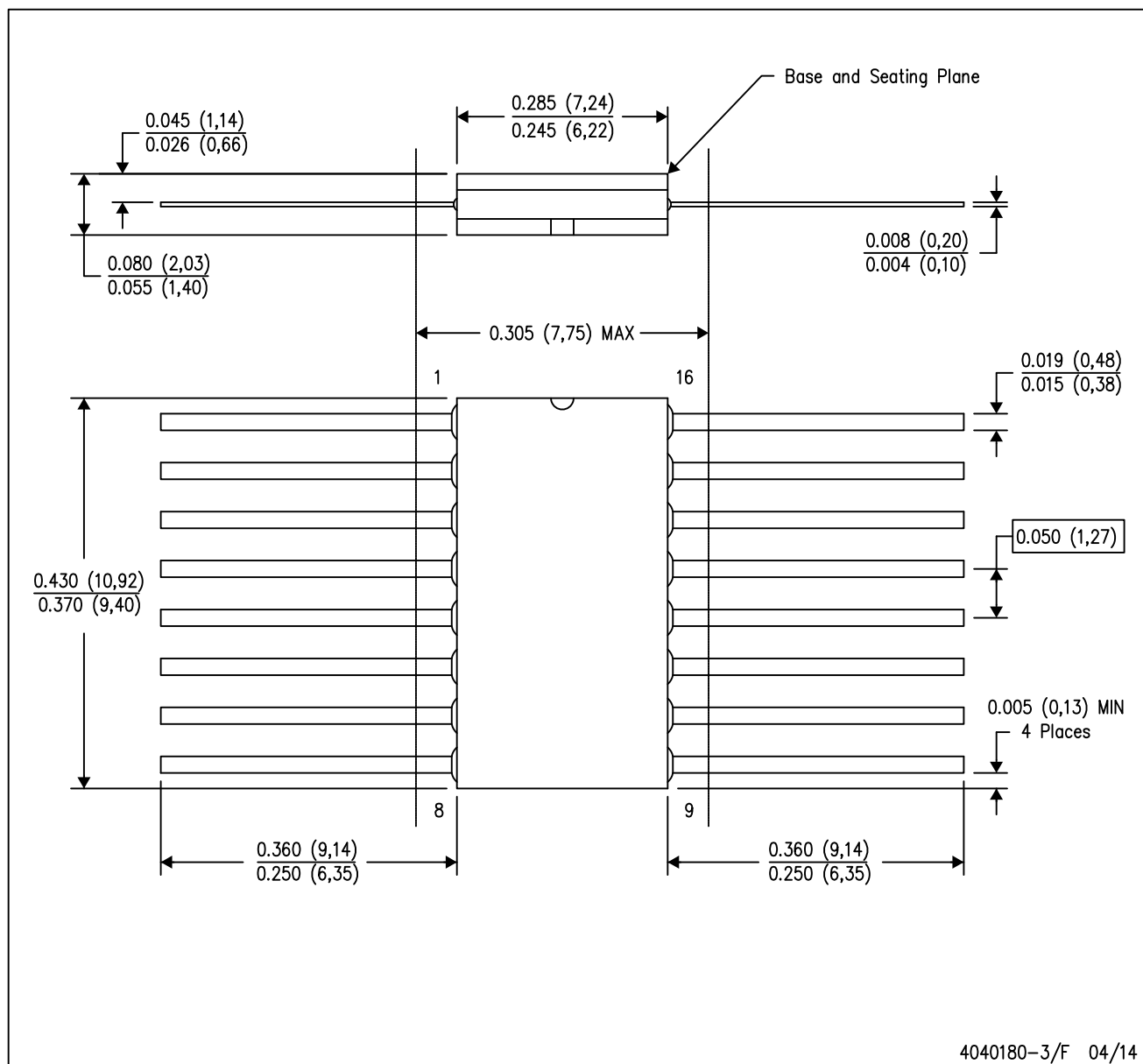
| DIM \ PINS ** | 14    | 16    | 20    | 24    |
|---------------|-------|-------|-------|-------|
| A MAX         | 10,50 | 10,50 | 12,90 | 15,30 |
| A MIN         | 9,90  | 9,90  | 12,30 | 14,70 |

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:

- All linear dimensions are in inches (millimeters).
- This drawing is subject to change without notice.
- This package can be hermetically sealed with a ceramic lid using glass frit.
- Index point is provided on cap for terminal identification only.
- Falls within MIL STD 1835 GDFP2-F16

## GENERIC PACKAGE VIEW

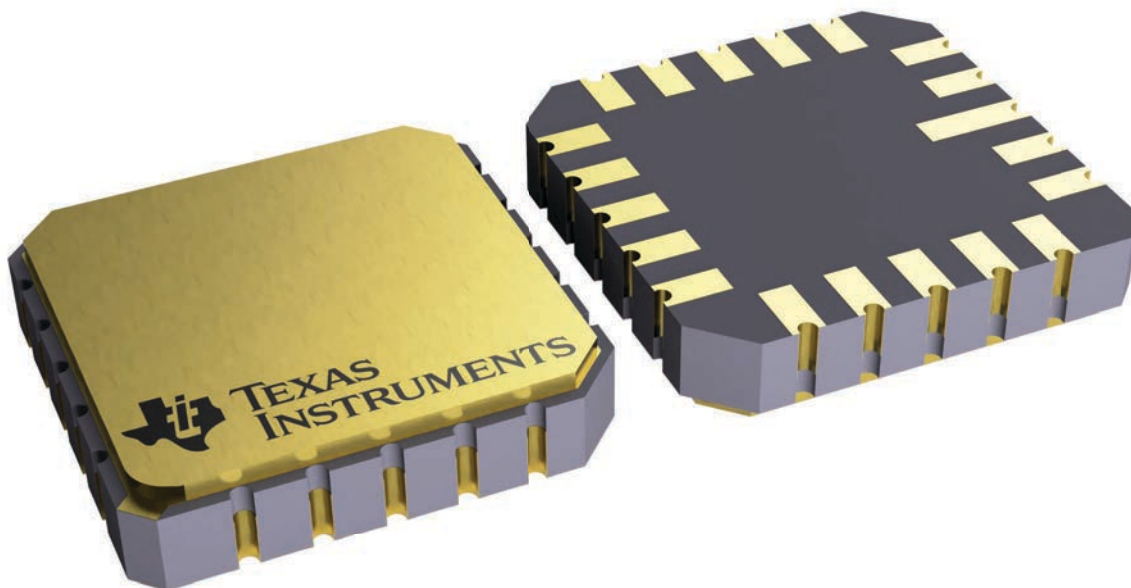
**FK 20**

**LCCC - 2.03 mm max height**

8.89 x 8.89, 1.27 mm pitch

LEADLESS CERAMIC CHIP CARRIER

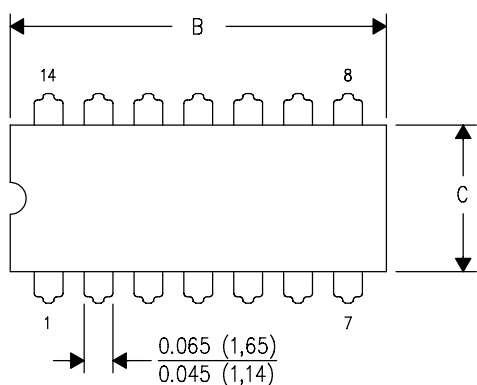
This image is a representation of the package family, actual package may vary.  
Refer to the product data sheet for package details.



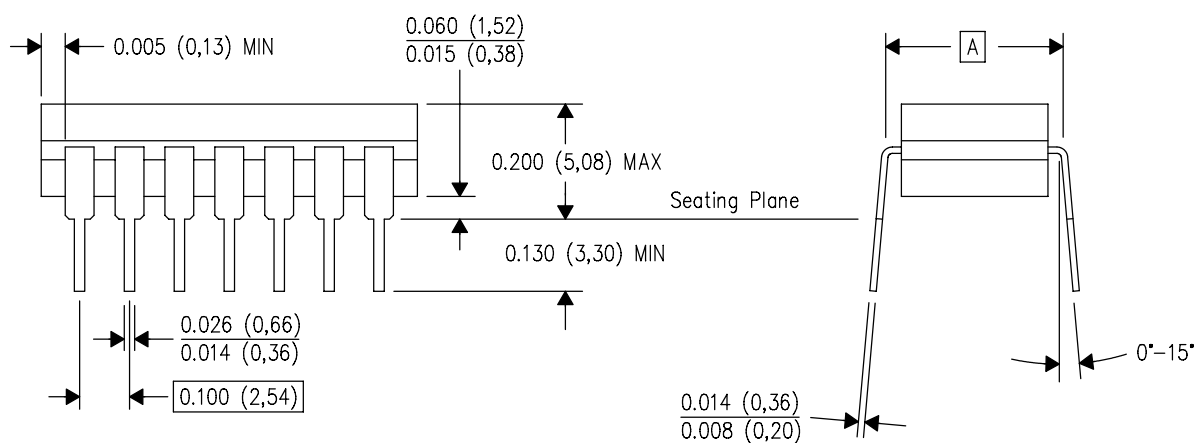
4229370VA\

14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



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



4040083/F 03/03

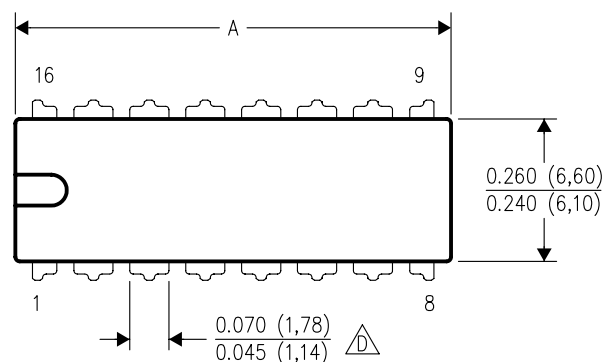
NOTES:

- 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.

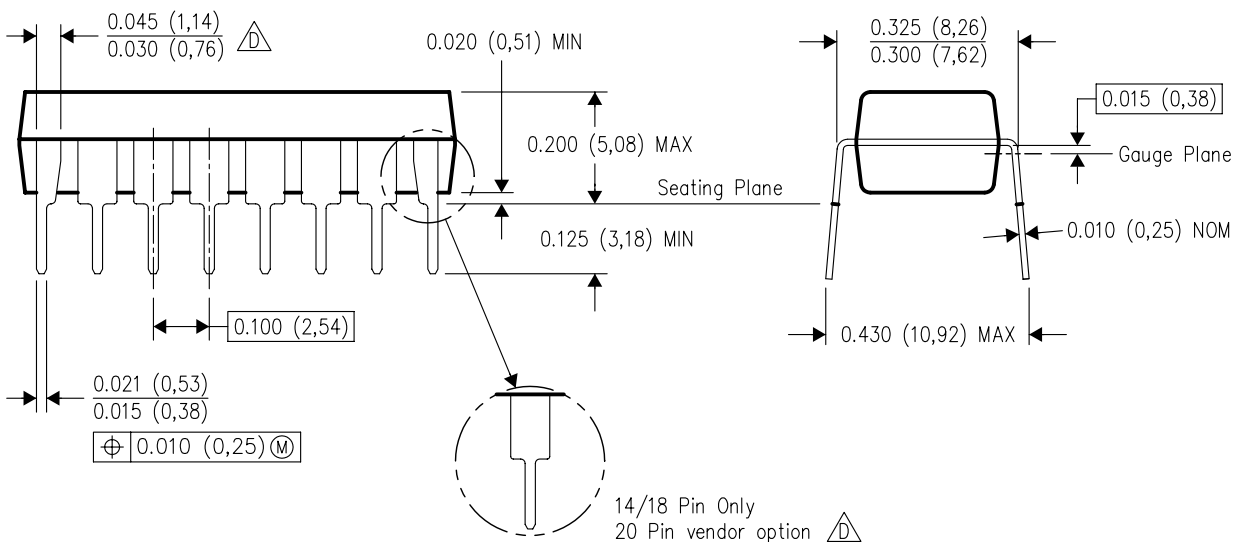
N (R-PDIP-T\*\*)

16 PINS SHOWN

## PLASTIC DUAL-IN-LINE PACKAGE





| PINS **<br>DIM      | 14               | 16               | 18               | 20               |
|---------------------|------------------|------------------|------------------|------------------|
| A MAX               | 0.775<br>(19,69) | 0.775<br>(19,69) | 0.920<br>(23,37) | 1.060<br>(26,92) |
| A MIN               | 0.745<br>(18,92) | 0.745<br>(18,92) | 0.850<br>(21,59) | 0.940<br>(23,88) |
| MS-001<br>VARIATION | 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.
-  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.

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