

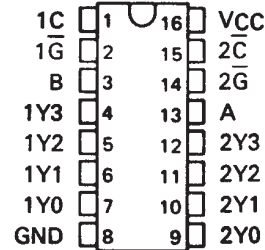
# SN54155, SN54156, SN54LS155A, SN54LS156, SN74155, SN74156, SN74LS155A, SN74LS156 DUAL 2-LINE TO 4-LINE DECODERS/DEMULTIPLEXERS

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- **Applications:**  
Dual 2-to 4-Line Decoder  
Dual 1-to 4-Line Demultiplexer  
3-to 8-Line Decoder  
1-to 8-Line Demultiplexer
- **Individual Strobes Simplify Cascading for Decoding or Demultiplexing Larger Words**
- **Input Clamping Diodes Simplify System Design**
- **Choice of Outputs:**  
Totem Pole ('155, 'LS155A)  
Open-Collector ('156, 'LS156)

SN54155, SN54156, SN54LS155A,  
SN54LS156 . . . J OR W PACKAGE  
SN74155, SN74156 . . . N PACKAGE  
SN74LS155A, SN74LS156 . . . D OR N PACKAGE

(TOP VIEW)



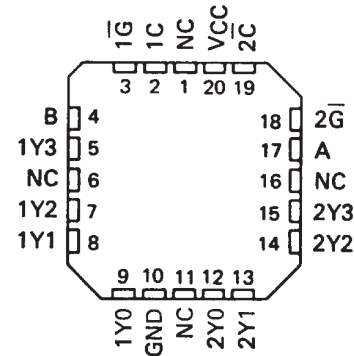
| TYPES      | TYPICAL AVERAGE<br>PROPAGATION DELAY<br>3 GATE LEVELS | TYPICAL<br>POWER<br>DISSIPATION |
|------------|-------------------------------------------------------|---------------------------------|
| '155, '156 | 21 ns                                                 | 125 mW                          |
| 'LS155A    | 18 ns                                                 | 31 mW                           |
| 'LS156     | 32 ns                                                 | 31 mW                           |

## description

These monolithic transistor-transistor-logic (TTL) circuits feature dual 1-line-to-4-line demultiplexers with individual strobes and common binary-address inputs in a single 16-pin package. When both sections are enabled by the strobes, the common binary-address inputs sequentially select and route associated input data to the appropriate output of each section. The individual strobes permit activating or inhibiting each of the 4-bit sections as desired. Data applied to input 1C is inverted at its outputs and data applied at 2C is not inverted through its outputs. The inverter following the 1C data input permits use as a 3-to-8-line decoder or 1-to-8-line demultiplexer without external gating. Input clamping diodes are provided on all of these circuits to minimize transmission-line effects and simplify system design.

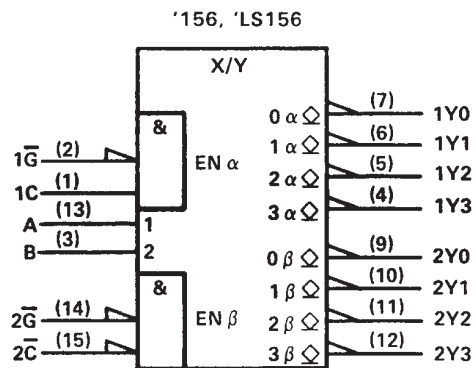
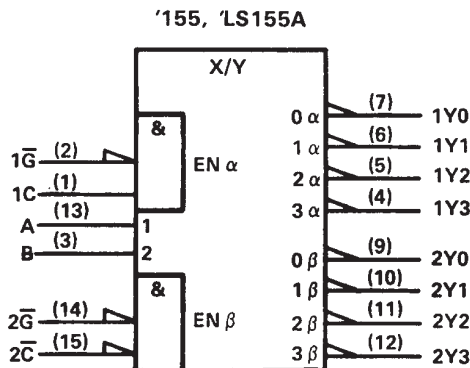
SN54LS155A, SN54LS156 . . . FK PACKAGE

(TOP VIEW)



NC - No internal connection

## logic symbols (2-line to 4-line decoder)<sup>†</sup>



<sup>†</sup>These symbols are in accordance with ANSI/IEEE Std. 91-1984 and IEC Publication 617-12. For alternative symbols for other applications, see the following page.

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

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**

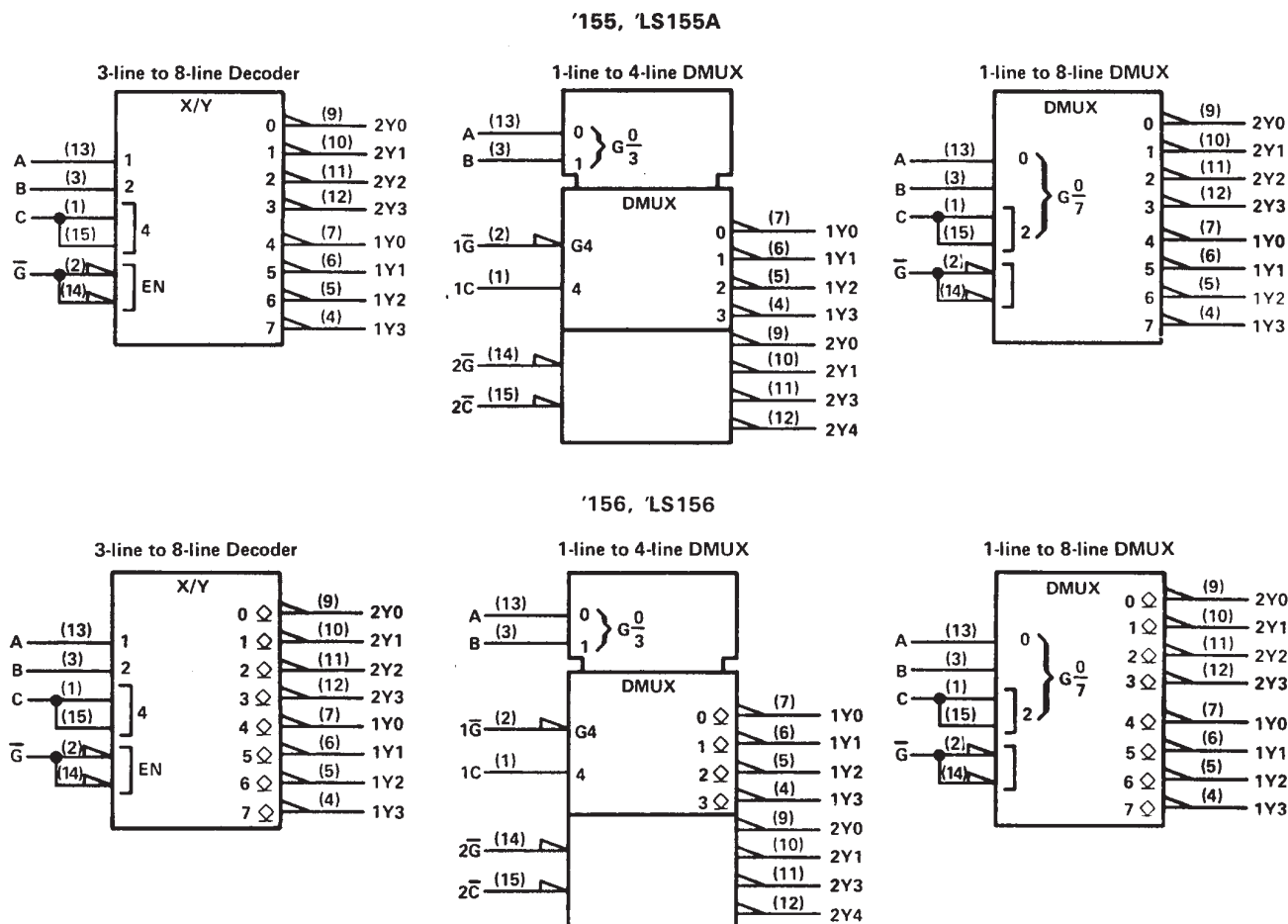
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# SN54155, SN54156, SN54LS155A, SN54LS156, SN74155, SN74156, SN74LS155A, SN74LS156 DUAL 2-LINE TO 4-LINE DECODERS/DEMULTIPLEXERS

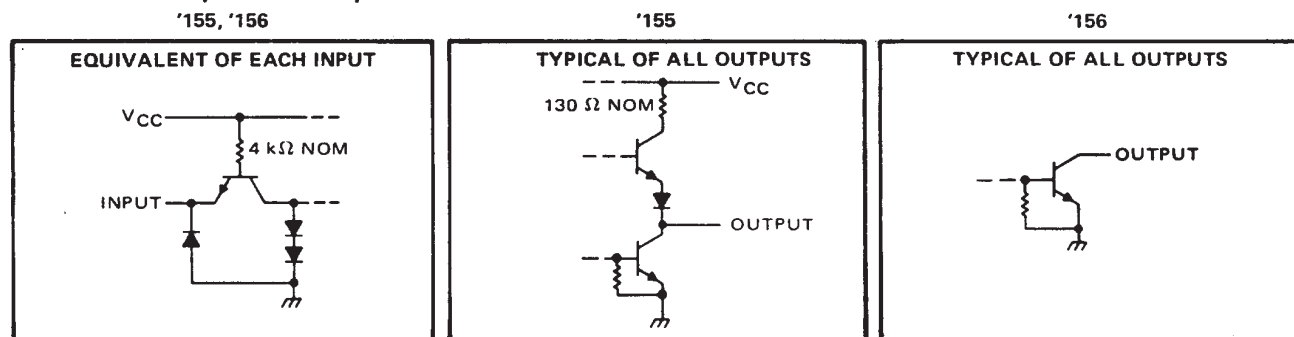
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## additional logic symbols (alternatives)<sup>†</sup>



<sup>†</sup>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.

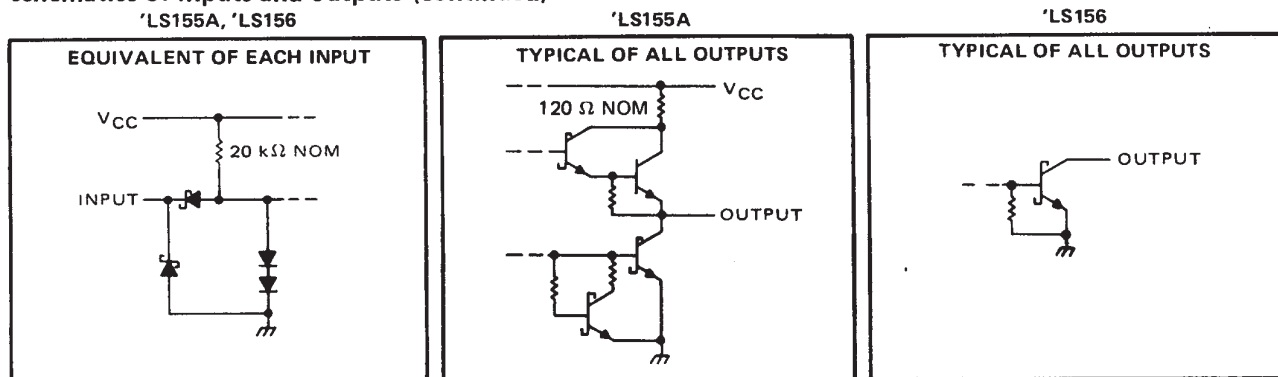
## schematics of inputs and outputs



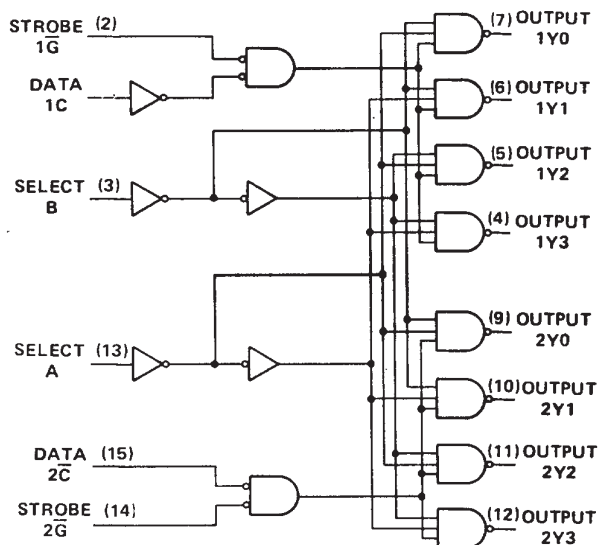
# SN54155, SN54156, SN54LS155A, SN54LS156, SN74155, SN74156, SN74LS155A, SN74LS156 DUAL 2-LINE TO 4-LINE DECODERS/DEMULTIPLEXERS

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## schematics of inputs and outputs (continued)



## logic diagram (positive logic)



## FUNCTION TABLES

### 2-LINE-TO-4-LINE DECODER

#### OR 1-LINE-TO-4-LINE DEMULTIPLEXER

| INPUTS |        |      |  | OUTPUTS |     |     |     |
|--------|--------|------|--|---------|-----|-----|-----|
| SELECT | STROBE | DATA |  | 1Y0     | 1Y1 | 1Y2 | 1Y3 |
| B A    | 1G     | 1C   |  |         |     |     |     |
| X X    | H      | X    |  | H       | H   | H   | H   |
| L L    | L      | H    |  | L       | H   | H   | H   |
| L H    | L      | H    |  | H       | L   | H   | H   |
| H L    | L      | H    |  | H       | H   | L   | H   |
| H H    | L      | H    |  | H       | H   | H   | L   |
| X X    | X      | L    |  | H       | H   | H   | H   |

| INPUTS |        |      |  | OUTPUTS |     |     |     |
|--------|--------|------|--|---------|-----|-----|-----|
| SELECT | STROBE | DATA |  | 2Y0     | 2Y1 | 2Y2 | 2Y3 |
| B A    | 2G     | 2C   |  |         |     |     |     |
| X X    | H      | X    |  | H       | H   | H   | H   |
| L L    | L      | L    |  | L       | H   | H   | H   |
| L H    | L      | L    |  | H       | L   | H   | H   |
| H L    | L      | L    |  | H       | H   | L   | H   |
| H H    | L      | L    |  | H       | H   | H   | L   |
| X X    | X      | H    |  | H       | H   | H   | H   |

## FUNCTION TABLE

### 3-LINE-TO-8-LINE DECODER

#### OR 1-LINE-TO-8-LINE DEMULTIPLEXER

| INPUTS |        |         |  | OUTPUTS |     |     |     |     |     |     |     |
|--------|--------|---------|--|---------|-----|-----|-----|-----|-----|-----|-----|
| SELECT | STROBE | OR DATA |  | (0)     | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| C† B A | OR G‡  |         |  | 2Y0     | 2Y1 | 2Y2 | 2Y3 | 1Y0 | 1Y1 | 1Y2 | 1Y3 |
| X X X  | H      |         |  | H       | H   | H   | H   | H   | H   | H   | H   |
| L L L  | L      |         |  | L       | H   | H   | H   | H   | H   | H   | H   |
| L L H  | L      |         |  | H       | L   | H   | H   | H   | H   | H   | H   |
| L H L  | L      |         |  | H       | H   | L   | H   | H   | H   | H   | H   |
| L H H  | L      |         |  | H       | H   | H   | L   | H   | H   | H   | H   |
| H L L  | L      |         |  | H       | H   | H   | H   | L   | H   | H   | H   |
| H L H  | L      |         |  | H       | H   | H   | H   | H   | L   | H   | H   |
| H H L  | L      |         |  | H       | H   | H   | H   | H   | H   | L   | H   |
| H H H  | L      |         |  | H       | H   | H   | H   | H   | H   | H   | L   |

†C = inputs 1C and 2C connected together

‡G = inputs 1G and 2G connected together

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

**SN54155, SN54156, SN54LS155A, SN54LS156,  
SN74155, SN74156, SN74LS155A, SN74LS156  
DUAL 2-LINE TO 4-LINE DECODERS/DEMULTIPLEXERS**

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

|                                                               |                |
|---------------------------------------------------------------|----------------|
| Supply voltage, $V_{CC}$ (see Note 1)                         | 7 V            |
| Input voltage: '155, '156                                     | 5.5 V          |
| 'LS155A, 'LS156                                               | 7 V            |
| Off-state output voltage: '156                                | 5.5 V          |
| 'LS156                                                        | 7 V            |
| Operating free-air temperature range: SN54', SN54LS' Circuits | –55°C to 125°C |
| SN74', SN74LS' Circuits                                       | 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**

|                                       | SN54155 |     |      | SN74155 |     |      | 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   | °C      |

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

| PARAMETER                                    | TEST CONDITIONS†                                                                                    | SN54155<br>SN74155 |      |      | UNIT    |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------|------|------|---------|
|                                              |                                                                                                     | MIN                | TYP‡ | MAX  |         |
| $V_{IH}$ High-level input voltage            |                                                                                                     | 2                  |      |      | V       |
| $V_{IL}$ Low-level input voltage             |                                                                                                     |                    |      | 0.8  | V       |
| $V_{IK}$ Input clamp voltage                 | $V_{CC} = \text{MIN}, I_I = -8 \text{ mA}$                                                          |                    |      | –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  |      | 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  | 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            | $V_{CC} = \text{MAX}, V_I = 2.4 \text{ V}$                                                          |                    |      | 40   | $\mu$ A |
| $I_{IL}$ Low-level input current             | $V_{CC} = \text{MAX}, V_I = 0.4 \text{ V}$                                                          |                    |      | –1.6 | mA      |
| $I_{OS}$ Short-circuit output current§       | $V_{CC} = \text{MAX}$                                                                               | SN54155            | –20  | –55  | mA      |
|                                              |                                                                                                     | SN74155            | –18  | –57  |         |
| $I_{CC}$ Supply current                      | $V_{CC} = \text{MAX},$<br>See Note 2                                                                | SN54155            | 25   | 35   | mA      |
|                                              |                                                                                                     | SN74155            | 25   | 40   |         |

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

‡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.

NOTE 2:  $I_{CC}$  is measured with outputs open, A, B, and 1C inputs at 4.5 V, and 2C, 1G, and 2G inputs grounded.

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

| PARAMETER | FROM<br>(INPUT)                                                    | TO<br>(OUTPUT) | LEVELS<br>OF LOGIC | TEST CONDITIONS                                             | SN54155<br>SN74155 |     |     | UNIT |
|-----------|--------------------------------------------------------------------|----------------|--------------------|-------------------------------------------------------------|--------------------|-----|-----|------|
|           |                                                                    |                |                    |                                                             | MIN                | TYP | MAX |      |
| $t_{PLH}$ | A, B, 2 $\overline{C}$ ,<br>1 $\overline{G}$ , or 2 $\overline{G}$ | Y              | 2                  | $C_L = 15 \text{ pF},$<br>$R_L = 400 \Omega,$<br>See Note 3 |                    | 13  | 20  | ns   |
| $t_{PHL}$ | A, B, 2 $\overline{C}$ ,<br>1 $\overline{G}$ , or 2 $\overline{G}$ | Y              | 2                  |                                                             |                    | 18  | 27  | ns   |
| $t_{PLH}$ | A or B                                                             | y              | 3                  |                                                             |                    | 21  | 32  | ns   |
| $t_{PHL}$ | A or B                                                             | Y              | 3                  |                                                             |                    | 21  | 32  | ns   |
| $t_{PLH}$ | 1C                                                                 | Y              | 3                  |                                                             |                    | 16  | 24  | ns   |
| $t_{PHL}$ | 1C                                                                 | Y              | 3                  |                                                             |                    | 20  | 30  | ns   |

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.



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# SN54155A, SN74155A

## DUAL 2-LINE TO 4-LINE DECODERS/DEMULTIPLEXERS

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### recommended operating conditions

|                                       | SN54156 |     |     | SN74156 |     |      | 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 voltage, $V_{OH}$   |         |     | 5.5 |         |     | 5.5  | V    |
| Low-level output current, $I_{OL}$    |         |     | 16  |         |     | 16   | 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†                                                                                  |                    | SN54156<br>SN74156 |          | UNIT |
|-----------------|----------------------------------------|---------------------------------------------------------------------------------------------------|--------------------|--------------------|----------|------|
|                 |                                        |                                                                                                   |                    | MIN                | TYP‡     |      |
| V <sub>IH</sub> | High-level input voltage               |                                                                                                   |                    | 2                  |          | V    |
| V <sub>IL</sub> | Low-level input voltage                |                                                                                                   |                    |                    | 0.8      | V    |
| V <sub>IK</sub> | Input clamp voltage                    | V <sub>CC</sub> = MIN, I <sub>I</sub> = −8 mA                                                     |                    |                    | −1.5     | V    |
| I <sub>OH</sub> | High-level output current              | V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V,<br>V <sub>IL</sub> = 0.8 V, V <sub>OH</sub> = 5.5 V |                    |                    | 250      | μA   |
| V <sub>OL</sub> | Low-level output voltage               | V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V,<br>V <sub>IL</sub> = 0.8 V, I <sub>OL</sub> = 16 mA |                    | 0.2                | 0.4      | V    |
| I <sub>I</sub>  | Input current at maximum input voltage | V <sub>CC</sub> = MAX, V <sub>I</sub> = 5.5 V                                                     |                    |                    | 1        | mA   |
| I <sub>IH</sub> | High-level input current               | V <sub>CC</sub> = MAX, V <sub>I</sub> = 2.4 V                                                     |                    |                    | 40       | μA   |
| I <sub>IL</sub> | Low-level input current                | V <sub>CC</sub> = MAX, V <sub>I</sub> = 0.4 V                                                     |                    |                    | −1.6     | mA   |
| I <sub>CC</sub> | Supply current                         | V <sub>CC</sub> = MAX,<br>See Note 2                                                              | SN54156<br>SN74156 | 25<br>25           | 35<br>40 | mA   |

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

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

NOTE 2:  $I_{CC}$  is measured with outputs open, A, B, and 1C inputs at 4.5 V, and 2C, 1G, and 2G inputs grounded.

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

| PARAMETER§ | FROM<br>(INPUT)                                                 | TO<br>(OUTPUT) | LEVELS<br>OF LOGIC | TEST CONDITIONS                                             | SN54156<br>SN74156 |     | UNIT |
|------------|-----------------------------------------------------------------|----------------|--------------------|-------------------------------------------------------------|--------------------|-----|------|
|            |                                                                 |                |                    |                                                             | MIN                | TYP |      |
| $t_{PLH}$  | A, B, $2\overline{C}$ ,<br>$1\overline{G}$ , or $2\overline{G}$ | Y              | 2                  | $C_L = 15 \text{ pF},$<br>$R_L = 400 \Omega,$<br>See Note 3 | 15                 | 23  | ns   |
| $t_{PHL}$  | A, B, $2\overline{C}$ ,<br>$1\overline{G}$ , or $2\overline{G}$ | Y              | 2                  |                                                             | 20                 | 30  | ns   |
| $t_{PLH}$  | A or B                                                          | y              | 3                  |                                                             | 23                 | 34  | ns   |
| $t_{PHL}$  | A or B                                                          | Y              | 3                  |                                                             | 23                 | 34  | ns   |
| $t_{PLH}$  | 1C                                                              | Y              | 3                  |                                                             | 18                 | 27  | ns   |
| $t_{PHL}$  | 1C                                                              | Y              | 3                  |                                                             | 22                 | 33  | ns   |

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

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

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.



# SN54LS155A, SN74LS155A DUAL 2-LINE TO 4-LINE DECODERS/DEMULTIPLEXERS

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## recommended operating conditions

|                                       | SN54LS155A |     |      | SN74LS155A |     |      | 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†                                                                                                   | SN54LS155A             |          | SN74LS155A |          | 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>IL max</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>IL max</sub>                             | I <sub>OL</sub> = 4 mA |          | 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, See Note 2                                                                                  | 6.1 10                 |          | 6.1 10     |          | mA   |

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

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

§ Not more than one output should be shorted at a time.

NOTE 2:  $I_{CC}$  is measured with outputs open, A, B, and 1C inputs at 4.5 V, and 2C, 1G, and 2G inputs grounded.

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

| PARAMETER¶ | FROM (INPUT)                                  | TO (OUTPUT) | LEVELS OF LOGIC | TEST CONDITIONS                                                      | SN54LS155A<br>SN74LS155A |     |     | UNIT |
|------------|-----------------------------------------------|-------------|-----------------|----------------------------------------------------------------------|--------------------------|-----|-----|------|
|            |                                               |             |                 |                                                                      | MIN                      | TYP | MAX |      |
| $t_{PLH}$  | A, B, $2\bar{C}$ , $1\bar{G}$ , or $2\bar{G}$ | Y           | 2               | $C_L = 15 \text{ pF}$ ,<br>$R_L = 2 \text{ k}\Omega$ ,<br>See Note 3 | 10                       | 15  |     | ns   |
| $t_{PHL}$  | A, B, $2\bar{C}$ , $1\bar{G}$ , or $2\bar{G}$ | Y           | 2               |                                                                      | 19                       | 30  |     | ns   |
| $t_{PLH}$  | A or B                                        | Y           | 3               |                                                                      | 17                       | 26  |     | ns   |
| $t_{PHL}$  | A or B                                        | Y           | 3               |                                                                      | 19                       | 30  |     | ns   |
| $t_{PLH}$  | 1C                                            | Y           | 3               |                                                                      | 18                       | 27  |     | ns   |
| $t_{PHL}$  | 1C                                            | Y           | 3               |                                                                      | 18                       | 27  |     | ns   |

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

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

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.



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# SN54LS156A, SN74LS156A

## DUAL 2-LINE TO 4-LINE DECODERS/DEMULTIPLEXERS

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### recommended operating conditions

|                                       | SN54LS156 |     |     | SN74LS156 |     |      | 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 voltage, $V_{OH}$   |           |     | 5.5 |           |     | 5.5  | V    |
| Low-level output current, $I_{OL}$    |           |     | 4   |           |     | 8    | 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†                                                                                             | SN54LS156              |          | SN74LS156 |          | 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    |
| I <sub>OH</sub> High-level output current             | V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, V <sub>IL</sub> = V <sub>IL</sub> max, V <sub>OH</sub> = 5.5 V |                        | 100      |           | 100      | μA   |
| V <sub>OL</sub> Low-level output voltage              | V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, V <sub>IL</sub> = V <sub>IL</sub> max                          | 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>CC</sub> Supply current                        | V <sub>CC</sub> = MAX, See Note 2                                                                            |                        | 6.1 10   |           | 6.1 10   | mA   |

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

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

NOTE 2:  $I_{CC}$  is measured with outputs open, A, B, and 1C inputs at 4.5 V, and 2C, 1G, and 2G inputs grounded.

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

| PARAMETER§ | FROM (INPUT)           | TO (OUTPUT) | LEVELS OF LOGIC | TEST CONDITIONS                                                    | SN54LS156<br>SN74LS156 |     |     | UNIT |
|------------|------------------------|-------------|-----------------|--------------------------------------------------------------------|------------------------|-----|-----|------|
|            |                        |             |                 |                                                                    | MIN                    | TYP | MAX |      |
| $t_{PLH}$  | A, B, 2C<br>1G, or 2G  | Y           | 2               | $C_L = 15 \text{ pF},$<br>$R_L = 2 \text{ k}\Omega,$<br>See Note 3 |                        | 25  | 40  | ns   |
| $t_{PHL}$  | A, B, 2C,<br>1G, or 2G | Y           | 2               |                                                                    |                        | 34  | 51  | ns   |
| $t_{PLH}$  | A or B                 | Y           | 3               |                                                                    |                        | 31  | 46  | ns   |
| $t_{PHL}$  | A or B                 | Y           | 3               |                                                                    |                        | 34  | 51  | ns   |
| $t_{PLH}$  | 1C                     | Y           | 3               |                                                                    |                        | 32  | 48  | ns   |
| $t_{PHL}$  | 1C                     | Y           | 3               |                                                                    |                        | 32  | 48  | ns   |

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

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

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

## PACKAGING INFORMATION

| 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                 |
|------------------|---------------|--------------|--------------------|------|----------------|---------------------|--------------------------------------|----------------------|--------------|-------------------------------------|-------------------------|
| 5962-9750801QEA  | ACTIVE        | CDIP         | J                  | 16   | 1              | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 5962-9750801QE<br>A<br>SNJ54LS155AJ | <a href="#">Samples</a> |
| 5962-9750801QFA  | ACTIVE        | CFP          | W                  | 16   | 1              | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 5962-9750801QF<br>A<br>SNJ54LS155AW | <a href="#">Samples</a> |
| 5962-9750801QFA  | ACTIVE        | CFP          | W                  | 16   | 1              | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 5962-9750801QF<br>A<br>SNJ54LS155AW | <a href="#">Samples</a> |
| SN54LS155AJ      | ACTIVE        | CDIP         | J                  | 16   | 1              | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | SN54LS155AJ                         | <a href="#">Samples</a> |
| SN54LS155AJ      | ACTIVE        | CDIP         | J                  | 16   | 1              | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | SN54LS155AJ                         | <a href="#">Samples</a> |
| SN54LS156J       | ACTIVE        | CDIP         | J                  | 16   | 1              | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | SN54LS156J                          | <a href="#">Samples</a> |
| SN54LS156J       | ACTIVE        | CDIP         | J                  | 16   | 1              | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | SN54LS156J                          | <a href="#">Samples</a> |
| SN74LS155AD      | ACTIVE        | SOIC         | D                  | 16   | 40             | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | LS155A                              | <a href="#">Samples</a> |
| SN74LS155AD      | ACTIVE        | SOIC         | D                  | 16   | 40             | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | LS155A                              | <a href="#">Samples</a> |
| SN74LS155ADG4    | ACTIVE        | SOIC         | D                  | 16   | 40             | TBD                 | Call TI                              | Call TI              | 0 to 70      |                                     | <a href="#">Samples</a> |
| SN74LS155ADG4    | ACTIVE        | SOIC         | D                  | 16   | 40             | TBD                 | Call TI                              | Call TI              | 0 to 70      |                                     | <a href="#">Samples</a> |
| SN74LS155ADR     | ACTIVE        | SOIC         | D                  | 16   | 2500           | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | LS155A                              | <a href="#">Samples</a> |
| SN74LS155ADR     | ACTIVE        | SOIC         | D                  | 16   | 2500           | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | LS155A                              | <a href="#">Samples</a> |
| SN74LS155ADRG4   | ACTIVE        | SOIC         | D                  | 16   | 2500           | TBD                 | Call TI                              | Call TI              | 0 to 70      |                                     | <a href="#">Samples</a> |
| SN74LS155ADRG4   | ACTIVE        | SOIC         | D                  | 16   | 2500           | TBD                 | Call TI                              | Call TI              | 0 to 70      |                                     | <a href="#">Samples</a> |
| SN74LS155AN      | ACTIVE        | PDIP         | N                  | 16   | 25             | RoHS & Green        | NIPDAU                               | N / A for Pkg Type   | 0 to 70      | SN74LS155AN                         | <a href="#">Samples</a> |
| SN74LS155AN      | ACTIVE        | PDIP         | N                  | 16   | 25             | RoHS & Green        | NIPDAU                               | N / A for Pkg Type   | 0 to 70      | SN74LS155AN                         | <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                 |
|------------------|---------------|--------------|--------------------|------|----------------|---------------------|--------------------------------------|----------------------|--------------|-------------------------------------|-------------------------|
| SN74LS155ANE4    | ACTIVE        | PDIP         | N                  | 16   | 25             | RoHS & Green        | NIPDAU                               | N / A for Pkg Type   | 0 to 70      | SN74LS155AN                         | <a href="#">Samples</a> |
| SN74LS155ANE4    | ACTIVE        | PDIP         | N                  | 16   | 25             | RoHS & Green        | NIPDAU                               | N / A for Pkg Type   | 0 to 70      | SN74LS155AN                         | <a href="#">Samples</a> |
| SN74LS155ANSR    | ACTIVE        | SO           | NS                 | 16   | 2000           | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | 74LS155A                            | <a href="#">Samples</a> |
| SN74LS155ANSR    | ACTIVE        | SO           | NS                 | 16   | 2000           | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | 74LS155A                            | <a href="#">Samples</a> |
| SN74LS156D       | ACTIVE        | SOIC         | D                  | 16   | 40             | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | LS156                               | <a href="#">Samples</a> |
| SN74LS156D       | ACTIVE        | SOIC         | D                  | 16   | 40             | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | LS156                               | <a href="#">Samples</a> |
| SN74LS156DR      | ACTIVE        | SOIC         | D                  | 16   | 2500           | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | LS156                               | <a href="#">Samples</a> |
| SN74LS156DR      | ACTIVE        | SOIC         | D                  | 16   | 2500           | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | LS156                               | <a href="#">Samples</a> |
| SN74LS156DRG4    | ACTIVE        | SOIC         | D                  | 16   | 2500           | TBD                 | Call TI                              | Call TI              | 0 to 70      |                                     | <a href="#">Samples</a> |
| SN74LS156DRG4    | ACTIVE        | SOIC         | D                  | 16   | 2500           | TBD                 | Call TI                              | Call TI              | 0 to 70      |                                     | <a href="#">Samples</a> |
| SN74LS156N       | ACTIVE        | PDIP         | N                  | 16   | 25             | RoHS & Green        | NIPDAU                               | N / A for Pkg Type   | 0 to 70      | SN74LS156N                          | <a href="#">Samples</a> |
| SN74LS156N       | ACTIVE        | PDIP         | N                  | 16   | 25             | RoHS & Green        | NIPDAU                               | N / A for Pkg Type   | 0 to 70      | SN74LS156N                          | <a href="#">Samples</a> |
| SN74LS156NE4     | ACTIVE        | PDIP         | N                  | 16   | 25             | RoHS & Green        | NIPDAU                               | N / A for Pkg Type   | 0 to 70      | SN74LS156N                          | <a href="#">Samples</a> |
| SN74LS156NE4     | ACTIVE        | PDIP         | N                  | 16   | 25             | RoHS & Green        | NIPDAU                               | N / A for Pkg Type   | 0 to 70      | SN74LS156N                          | <a href="#">Samples</a> |
| SN74LS156NSR     | ACTIVE        | SO           | NS                 | 16   | 2000           | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | 74LS156                             | <a href="#">Samples</a> |
| SN74LS156NSR     | ACTIVE        | SO           | NS                 | 16   | 2000           | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | 74LS156                             | <a href="#">Samples</a> |
| SNJ54LS155AJ     | ACTIVE        | CDIP         | J                  | 16   | 1              | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 5962-9750801QE<br>A<br>SNJ54LS155AJ | <a href="#">Samples</a> |
| SNJ54LS155AJ     | ACTIVE        | CDIP         | J                  | 16   | 1              | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 5962-9750801QE<br>A<br>SNJ54LS155AJ | <a href="#">Samples</a> |
| SNJ54LS155AW     | ACTIVE        | CFP          | W                  | 16   | 1              | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 5962-9750801QF<br>A<br>SNJ54LS155AW | <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                 |
|------------------|---------------|--------------|--------------------|------|----------------|---------------------|--------------------------------------|----------------------|--------------|-------------------------------------|-------------------------|
| SNJ54LS155AW     | ACTIVE        | CFP          | W                  | 16   | 1              | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 5962-9750801QF<br>A<br>SNJ54LS155AW | <a href="#">Samples</a> |
| SNJ54LS156J      | ACTIVE        | CDIP         | J                  | 16   | 1              | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | SNJ54LS156J                         | <a href="#">Samples</a> |
| SNJ54LS156J      | ACTIVE        | CDIP         | J                  | 16   | 1              | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | SNJ54LS156J                         | <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.

(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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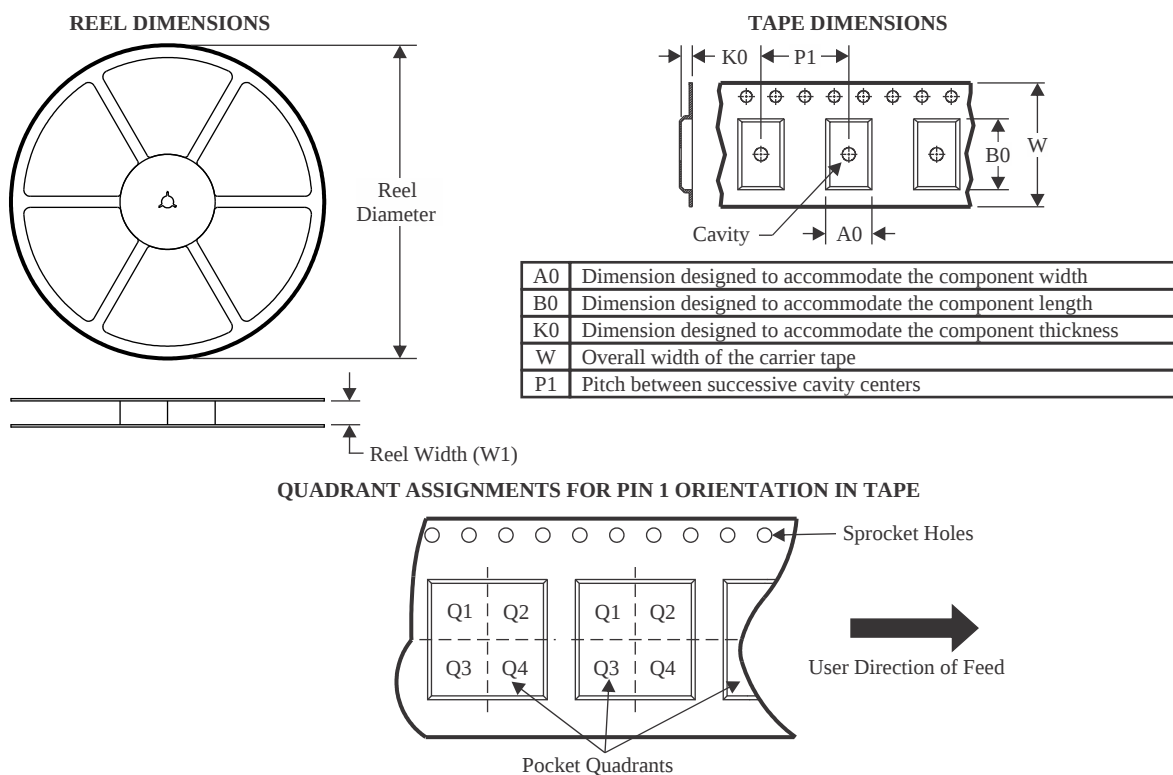
**OTHER QUALIFIED VERSIONS OF SN54LS155A, SN54LS156, SN74LS155A, SN74LS156 :**

- Catalog : [SN74LS155A](#), [SN74LS156](#)
- Military : [SN54LS155A](#), [SN54LS156](#)

NOTE: Qualified Version Definitions:

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

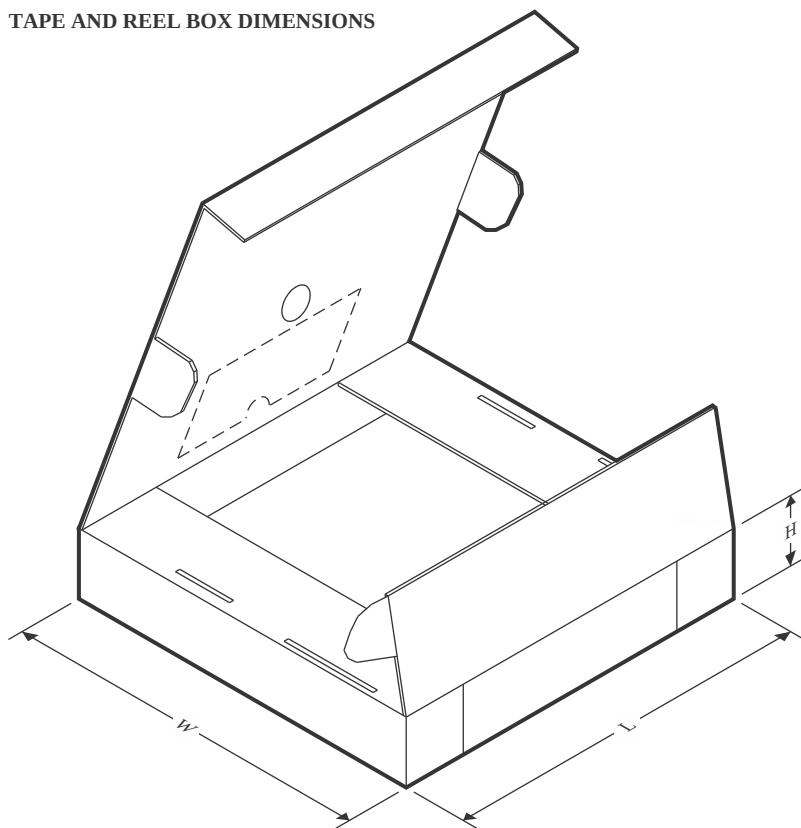
## TAPE AND REEL INFORMATION



\*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 |
|---------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| SN74LS155ADR  | SOIC         | D               | 16   | 2500 | 330.0              | 16.4               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |
| SN74LS155ANSR | SO           | NS              | 16   | 2000 | 330.0              | 16.4               | 8.2     | 10.5    | 2.5     | 12.0    | 16.0   | Q1            |
| SN74LS156DR   | SOIC         | D               | 16   | 2500 | 330.0              | 16.4               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |
| SN74LS156NSR  | SO           | NS              | 16   | 2000 | 330.0              | 16.4               | 8.2     | 10.5    | 2.5     | 12.0    | 16.0   | Q1            |

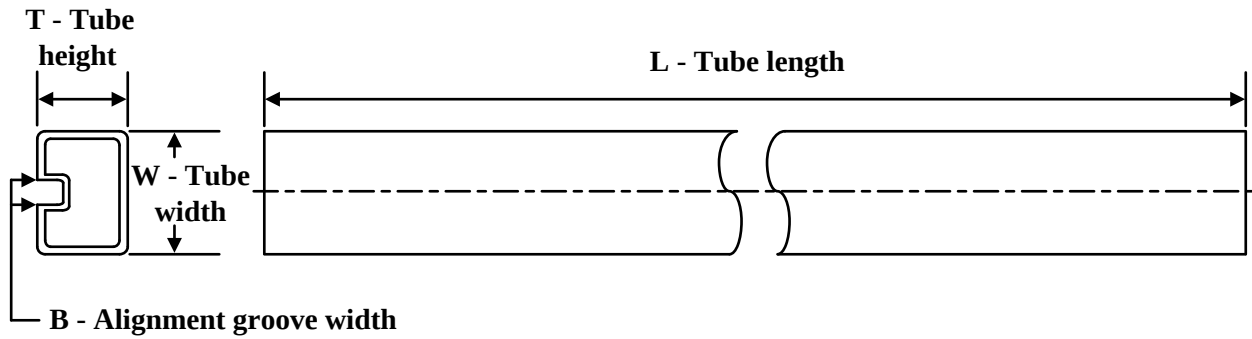
## TAPE AND REEL BOX DIMENSIONS



\*All dimensions are nominal

| Device        | Package Type | Package Drawing | Pins | SPQ  | Length (mm) | Width (mm) | Height (mm) |
|---------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74LS155ADR  | SOIC         | D               | 16   | 2500 | 340.5       | 336.1      | 32.0        |
| SN74LS155ANSR | SO           | NS              | 16   | 2000 | 356.0       | 356.0      | 35.0        |
| SN74LS156DR   | SOIC         | D               | 16   | 2500 | 340.5       | 336.1      | 32.0        |
| SN74LS156NSR  | 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) |
|---------------|--------------|--------------|------|-----|--------|--------|--------|--------|
| SN74LS155AD   | D            | SOIC         | 16   | 40  | 507    | 8      | 3940   | 4.32   |
| SN74LS155ADG4 | D            | SOIC         | 16   | 40  | 507    | 8      | 3940   | 4.32   |
| SN74LS155AN   | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |
| SN74LS155AN   | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |
| SN74LS155ANE4 | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |
| SN74LS155ANE4 | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |
| SN74LS156D    | D            | SOIC         | 16   | 40  | 507    | 8      | 3940   | 4.32   |
| SN74LS156N    | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |
| SN74LS156N    | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |
| SN74LS156NE4  | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |
| SN74LS156NE4  | N            | PDIP         | 16   | 25  | 506    | 13.97  | 11230  | 4.32   |



**SOP - 2.00 mm max height**

SOP

**NS0016A**



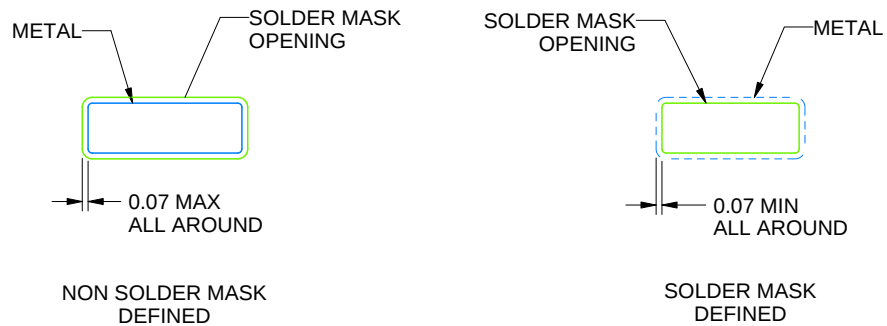
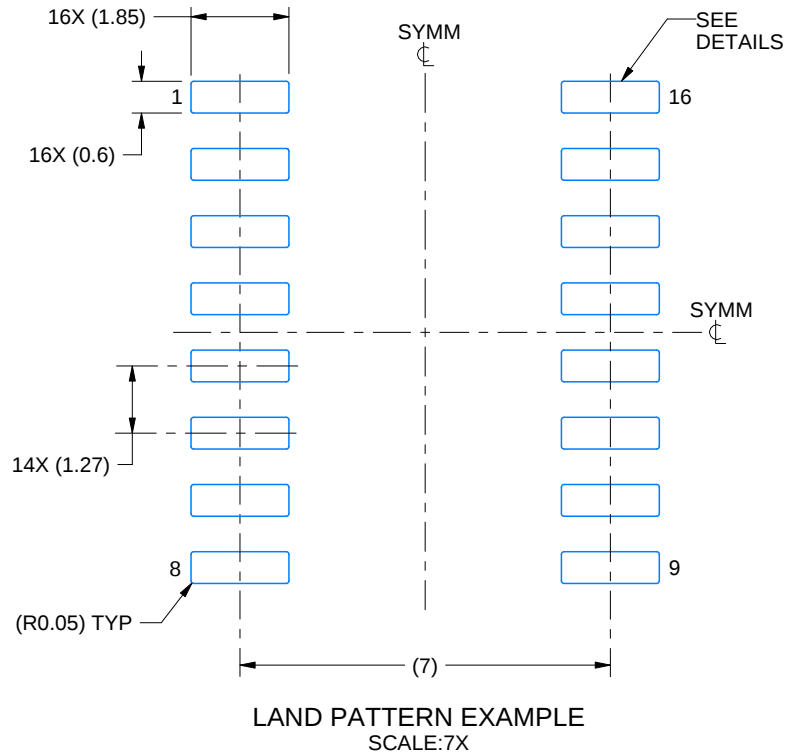
1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate 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 BOARD LAYOUT

NS0016A

SOP - 2.00 mm max height

SOP



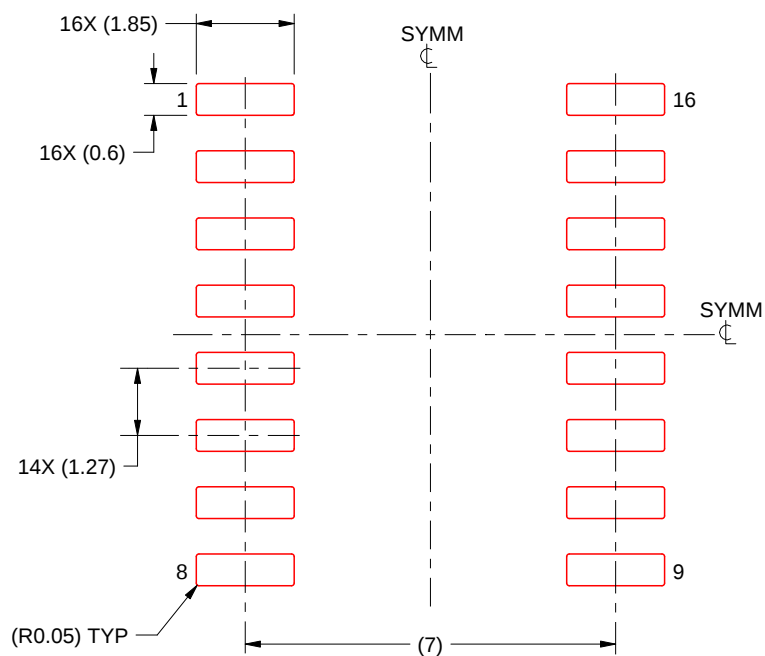
SOLDER MASK DETAILS

4220735/A 12/2021

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

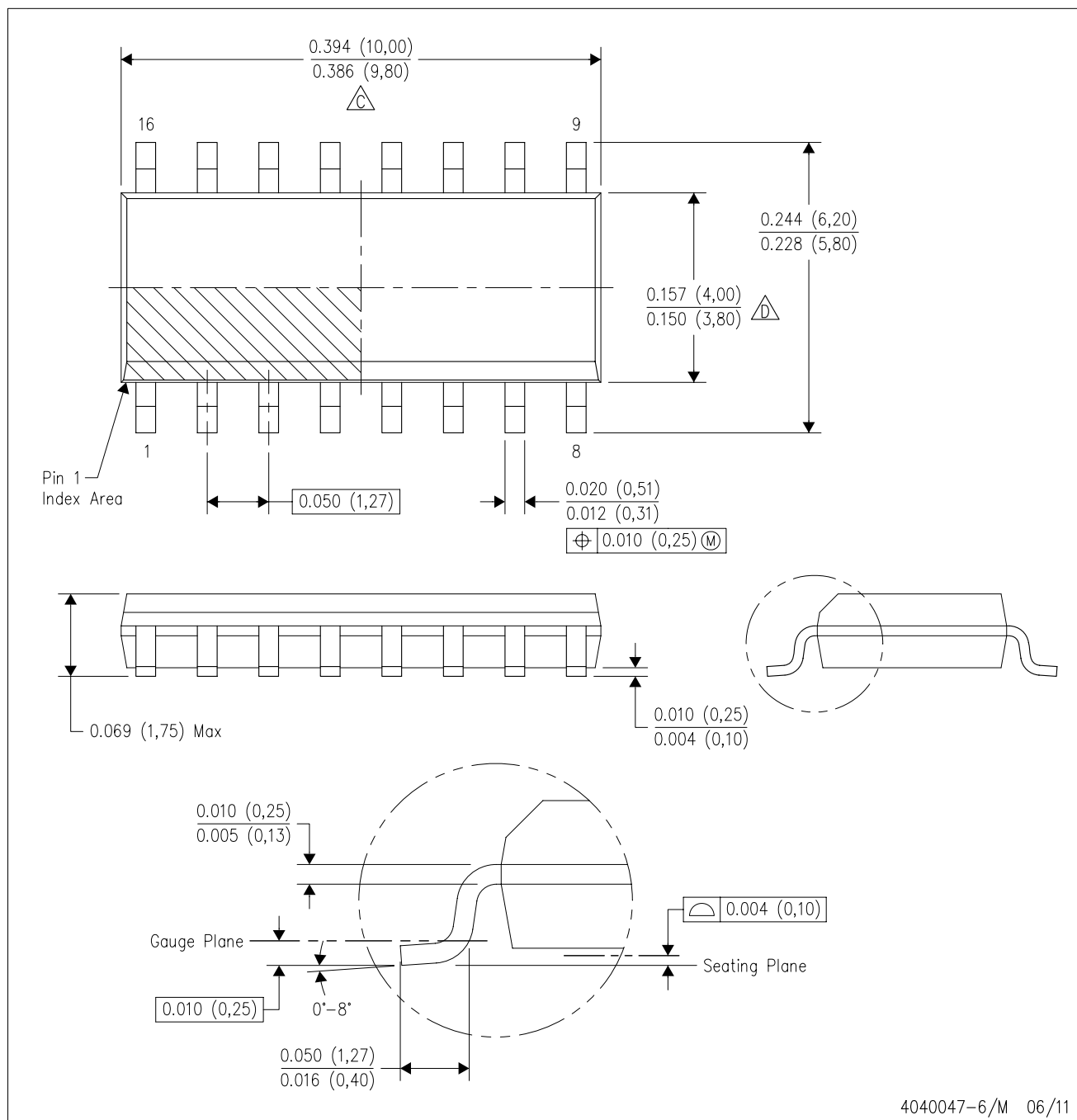
4220735/A 12/2021

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

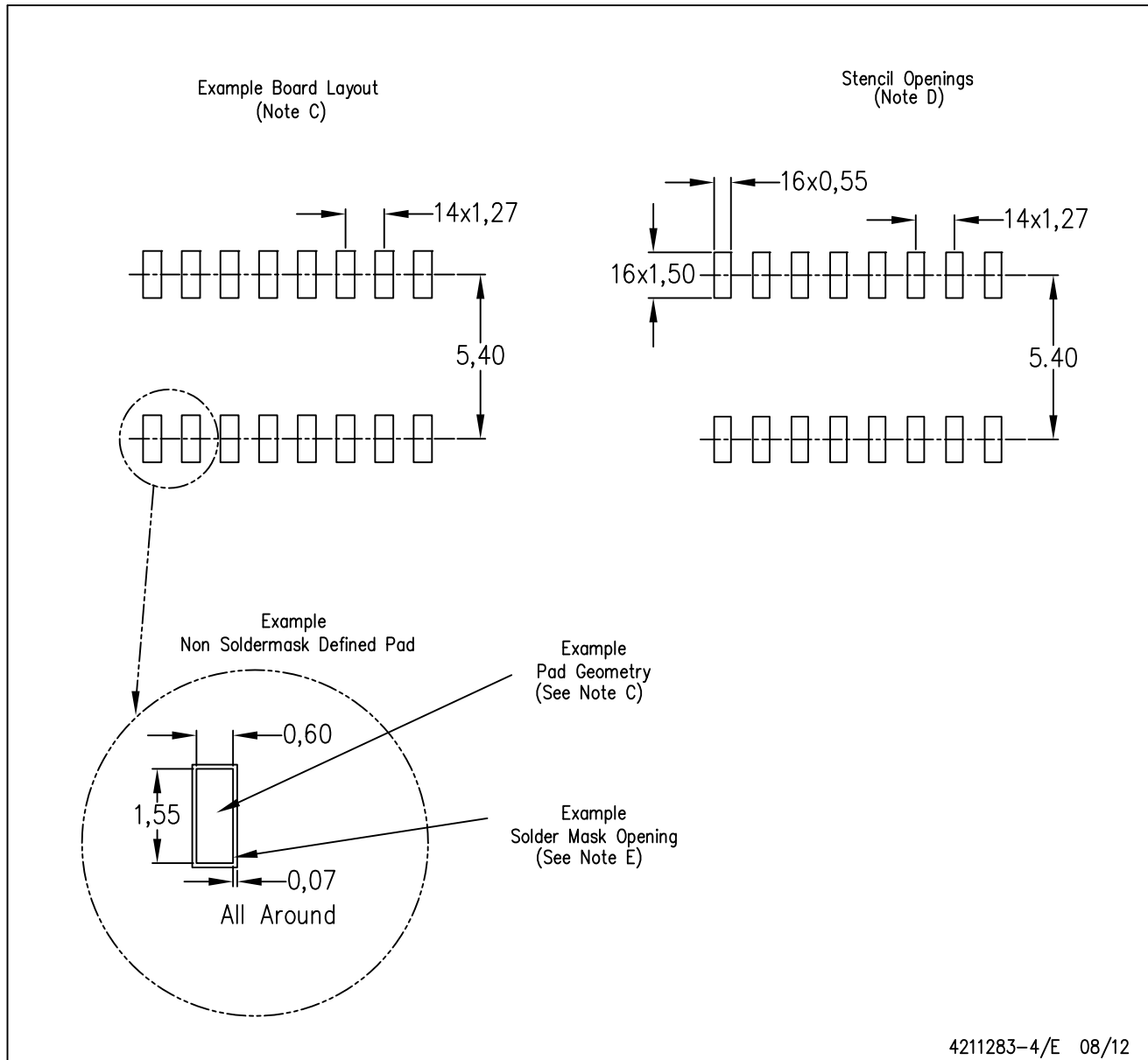


4040047-6/M 06/11

- 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.

D (R-PDSO-G16)

PLASTIC SMALL OUTLINE



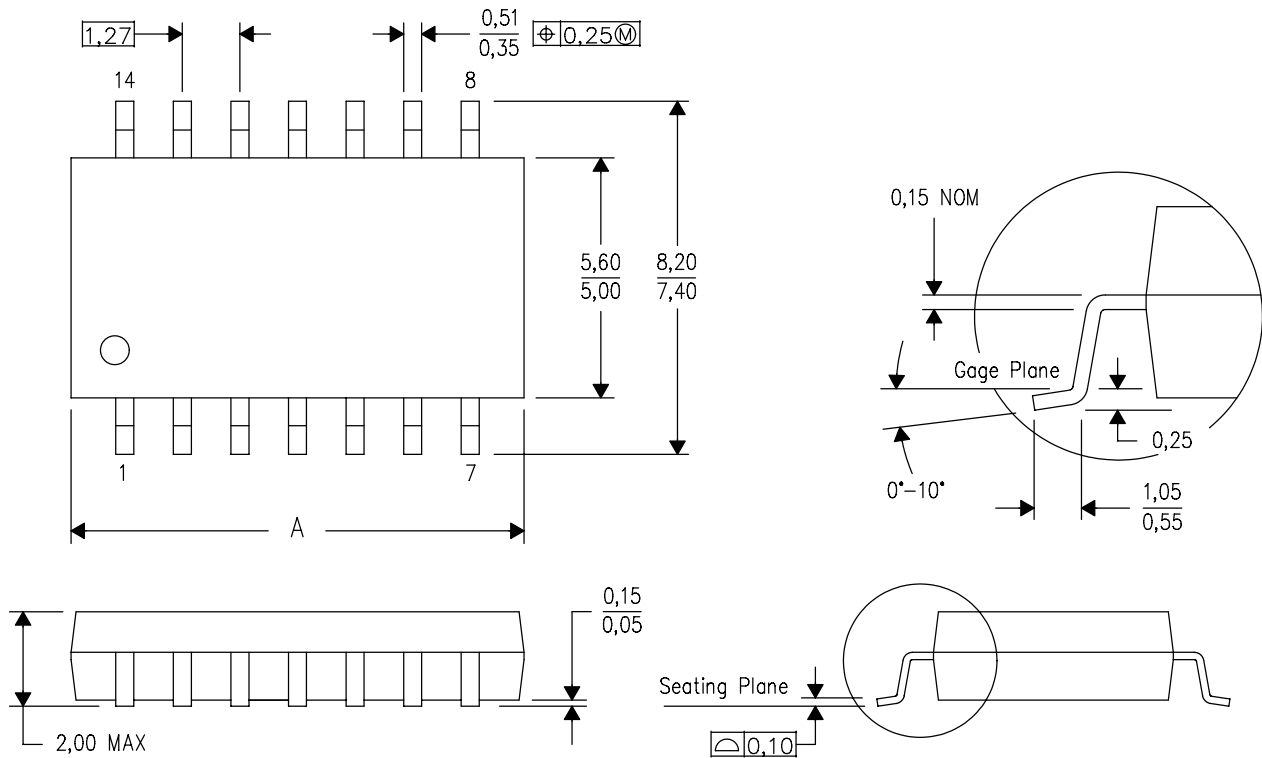
- NOTES:
- All linear dimensions are in millimeters.
  - This drawing is subject to change without notice.
  - Publication IPC-7351 is recommended for alternate designs.
  - Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact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

# MECHANICAL DATA

NS (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN



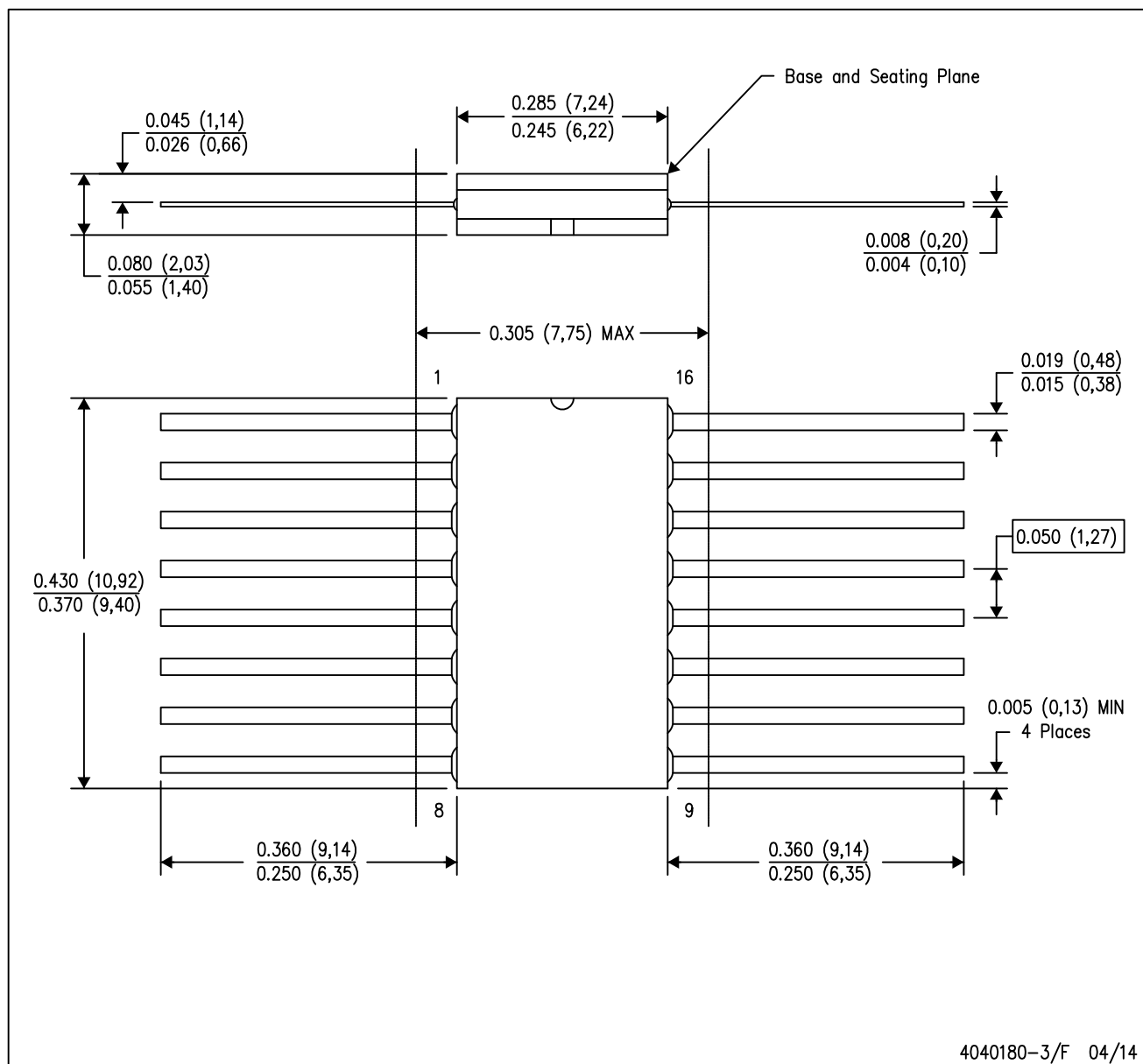
| DIM \ PINS ** | 14    | 16    | 20    | 24    |
|---------------|-------|-------|-------|-------|
| A MAX         | 10,50 | 10,50 | 12,90 | 15,30 |
| A MIN         | 9,90  | 9,90  | 12,30 | 14,70 |

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

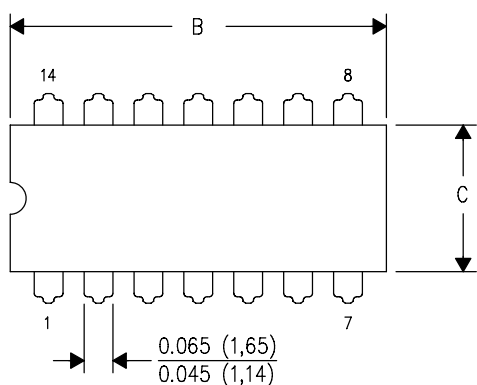


- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - This package can be hermetically sealed with a ceramic lid using glass frit.
  - Index point is provided on cap for terminal identification only.
  - Falls within MIL STD 1835 GDFP2-F16

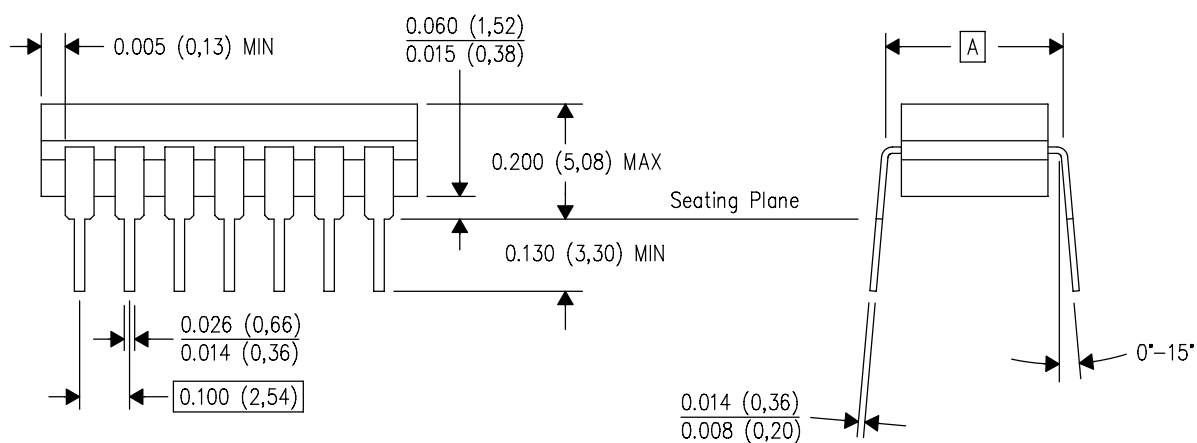
J (R-GDIP-T\*\*)

14 LEADS SHOWN

# CERAMIC DUAL IN-LINE PACKAGE



| PINS **<br>DIM | 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)        |



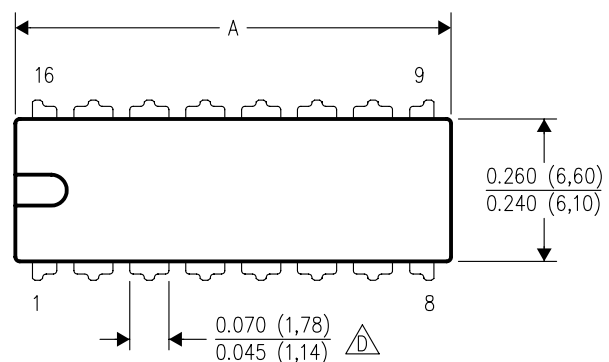
4040083/F 03/03

- 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.

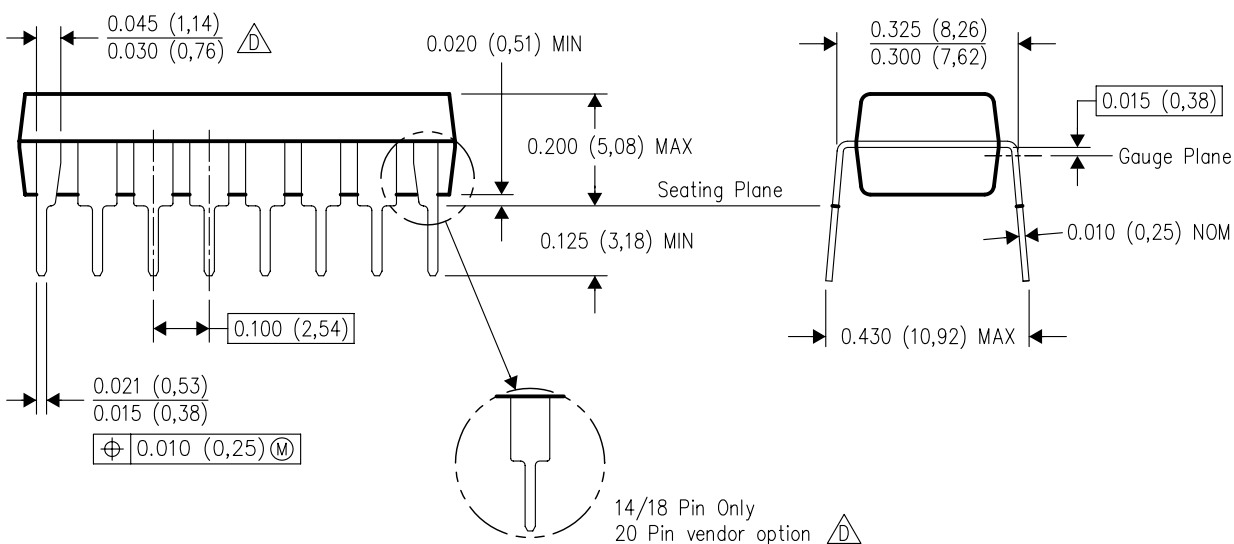
N (R-PDIP-T\*\*)

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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