

## High-Speed CMOS Logic Quad 2-Input Multiplexers

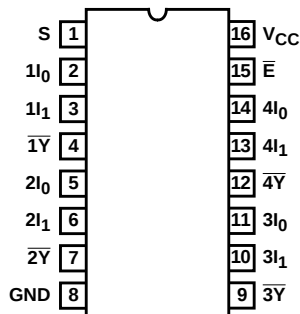
September 1997 - Revised October 2003

### Features

- Common Select Inputs
- Separate Enable Inputs
- Buffered inputs and Outputs
- Fanout (Over Temperature Range)
  - Standard Outputs . . . . . 10 LSTTL Loads
  - Bus Driver Outputs . . . . . 15 LSTTL Loads
- Wide Operating Temperature Range . . . -55°C to 125°C
- Balanced Propagation Delay and Transition Times
- Significant Power Reduction Compared to LSTTL Logic ICs
- HC Types
  - 2V to 6V Operation
  - High Noise Immunity:  $N_{IL} = 30\%$ ,  $N_{IH} = 30\%$  of  $V_{CC}$  at  $V_{CC} = 5V$
- HCT Types
  - 4.5V to 5.5V Operation
  - Direct LSTTL Input Logic Compatibility,  $V_{IL} = 0.8V$  (Max),  $V_{IH} = 2V$  (Min)
  - CMOS Input Compatibility,  $I_I \leq 1\mu A$  at  $V_{OL}$ ,  $V_{OH}$

### Pinout

CD54HC157, CD54HCT157, CD54HC158, CD54HCT158  
(CERDIP)  
CD74HC157, CD74HCT157, CD74HC158  
(PDIP, SOIC)  
CD74HCT158  
(PDIP)  
TOP VIEW



### Description

The 'HC157, 'HCT157, 'HC158, and 'HCT158 are quad 2-input multiplexers which select four bits of data from two sources under the control of a common Select input (S). The Enable input ( $\bar{E}$ ) is active Low. When ( $\bar{E}$ ) is High, all of the outputs in the 158, the inverting type, ( $1\bar{Y}$ - $4\bar{Y}$ ) are forced High and in the 157, the non-inverting type, all of the outputs ( $1Y$ - $4Y$ ) are forced Low, regardless of all other input conditions.

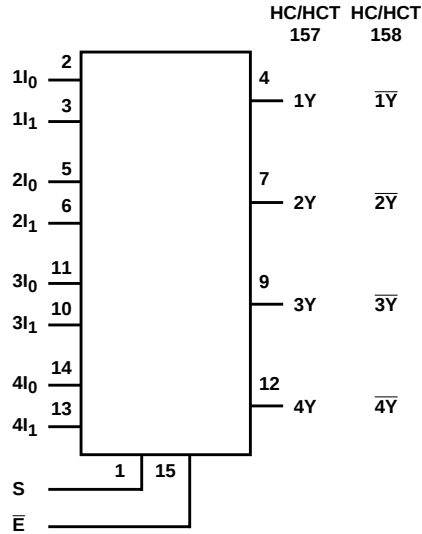
Moving data from two groups of registers to four common output buses is a common use of these devices. The state of the Select input determines the particular register from which the data comes. They can also be used as function generators.

### Ordering Information

| PART NUMBER   | TEMP. RANGE (°C) | PACKAGE      |
|---------------|------------------|--------------|
| CD54HC157F3A  | -55 to 125       | 16 Ld CERDIP |
| CD54HCT157F3A | -55 to 125       | 16 Ld CERDIP |
| CD54HCT158F3A | -55 to 125       | 16 Ld CERDIP |
| CD74HC157E    | -55 to 125       | 16 Ld PDIP   |
| CD74HC157M    | -55 to 125       | 16 Ld SOIC   |
| CD74HC157MT   | -55 to 125       | 16 Ld SOIC   |
| CD74HC157M96  | -55 to 125       | 16 Ld SOIC   |
| CD74HCT157E   | -55 to 125       | 16 Ld PDIP   |
| CD74HCT157M   | -55 to 125       | 16 Ld SOIC   |
| CD74HCT157MT  | -55 to 125       | 16 Ld SOIC   |
| CD74HCT157M96 | -55 to 125       | 16 Ld SOIC   |
| CD74HCT158E   | -55 to 125       | 16 Ld PDIP   |

NOTE: When ordering, use the entire part number. The suffix 96 denotes tape and reel. The suffix T denotes a small-quantity reel of 250.

Functional Diagram



TRUTH TABLE

| ENABLE         | SELECT<br>INPUT | DATA INPUTS |    | OUTPUT |                |
|----------------|-----------------|-------------|----|--------|----------------|
|                |                 |             |    | 157    | 158            |
| $\overline{E}$ | S               | I0          | I1 | Y      | $\overline{Y}$ |
| H              | X               | X           | X  | L      | H              |
| L              | L               | L           | X  | L      | H              |
| L              | L               | H           | X  | H      | L              |
| L              | H               | X           | L  | L      | H              |
| L              | H               | X           | H  | H      | L              |

H = High Voltage Level, L = Low Voltage Level, X = Don't Care

# CD54/74HC157, CD54/74HCT157, CD54/74HC158, CD54/74HCT158

## Absolute Maximum Ratings

DC Supply Voltage,  $V_{CC}$  ..... -0.5V to 7V  
 DC Input Diode Current,  $I_{IK}$   
 For  $V_I < -0.5V$  or  $V_I > V_{CC} + 0.5V$  .....  $\pm 20mA$   
 DC Output Diode Current,  $I_{OK}$   
 For  $V_O < -0.5V$  or  $V_O > V_{CC} + 0.5V$  .....  $\pm 20mA$   
 DC Output Source or Sink Current per Output Pin,  $I_O$   
 For  $V_O > -0.5V$  or  $V_O < V_{CC} + 0.5V$  .....  $\pm 25mA$   
 DC  $V_{CC}$  or Ground Current,  $I_{CC}$  or  $I_{GND}$  .....  $\pm 50mA$

## Thermal Information

Thermal Resistance (Typical, Note 1)  $\theta_{JA}$  ( $^{\circ}C/W$ )  
 E (PDIP) Package ..... 67  
 M (SOIC) Package ..... 73  
 Maximum Junction Temperature .....  $150^{\circ}C$   
 Maximum Storage Temperature Range .....  $-65^{\circ}C$  to  $150^{\circ}C$   
 Maximum Lead Temperature (Soldering 10s) .....  $300^{\circ}C$   
 (SOIC - Lead Tips Only)

## Operating Conditions

Temperature Range ( $T_A$ ) .....  $-55^{\circ}C$  to  $125^{\circ}C$   
 Supply Voltage Range,  $V_{CC}$   
 HC Types ..... 2V to 6V  
 HCT Types ..... 4.5V to 5.5V  
 DC Input or Output Voltage,  $V_I$ ,  $V_O$  ..... 0V to  $V_{CC}$   
 Input Rise and Fall Time  
 2V ..... 1000ns (Max)  
 4.5V ..... 500ns (Max)  
 6V ..... 400ns (Max)

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

### NOTE:

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

## DC Electrical Specifications

| PARAMETER                               | SYMBOL          | TEST CONDITIONS                    |                     | V <sub>CC</sub> (V)    | 25°C |      |      | -40°C TO 85°C |      | -55°C TO 125°C |      | UNITS |     |    |
|-----------------------------------------|-----------------|------------------------------------|---------------------|------------------------|------|------|------|---------------|------|----------------|------|-------|-----|----|
|                                         |                 | V <sub>I</sub> (V)                 | I <sub>O</sub> (mA) |                        | MIN  | TYP  | MAX  | MIN           | MAX  | MIN            | MAX  |       |     |    |
| HC TYPES                                |                 |                                    |                     |                        |      |      |      |               |      |                |      |       |     |    |
| High Level Input Voltage                | V <sub>IH</sub> | -                                  | -                   | 2                      | 1.5  | -    | -    | 1.5           | -    | 1.5            | -    | V     |     |    |
|                                         |                 |                                    |                     | 4.5                    | 3.15 | -    | -    | 3.15          | -    | 3.15           | -    | V     |     |    |
|                                         |                 |                                    |                     | 6                      | 4.2  | -    | -    | 4.2           | -    | 4.2            | -    | V     |     |    |
| Low Level Input Voltage                 | V <sub>IL</sub> | -                                  | -                   | 2                      | -    | -    | 0.5  | -             | 0.5  | -              | 0.5  | V     |     |    |
|                                         |                 |                                    |                     | 4.5                    | -    | -    | 1.35 | -             | 1.35 | -              | 1.35 | V     |     |    |
|                                         |                 |                                    |                     | 6                      | -    | -    | 1.8  | -             | 1.8  | -              | 1.8  | V     |     |    |
| High Level Output Voltage<br>CMOS Loads | V <sub>OH</sub> | V <sub>IH</sub> or V <sub>IL</sub> | -0.02               | 2                      | 1.9  | -    | -    | 1.9           | -    | 1.9            | -    | V     |     |    |
|                                         |                 |                                    | -0.02               | 4.5                    | 4.4  | -    | -    | 4.4           | -    | 4.4            | -    | V     |     |    |
|                                         |                 |                                    | -0.02               | 6                      | 5.9  | -    | -    | 5.9           | -    | 5.9            | -    | V     |     |    |
| -                                       |                 |                                    | -                   | -                      | -    | -    | -    | -             | -    | -              | V    |       |     |    |
| -4                                      |                 |                                    | 4.5                 | 3.98                   | -    | -    | 3.84 | -             | 3.7  | -              | V    |       |     |    |
| -5.2                                    |                 |                                    | 6                   | 5.48                   | -    | -    | 5.34 | -             | 5.2  | -              | V    |       |     |    |
| High Level Output Voltage<br>TTL Loads  | V <sub>OL</sub> | V <sub>IH</sub> or V <sub>IL</sub> | 0.02                | 2                      | -    | -    | 0.1  | -             | 0.1  | -              | 0.1  | V     |     |    |
|                                         |                 |                                    | 0.02                | 4.5                    | -    | -    | 0.1  | -             | 0.1  | -              | 0.1  | V     |     |    |
|                                         |                 |                                    | 0.02                | 6                      | -    | -    | 0.1  | -             | 0.1  | -              | 0.1  | V     |     |    |
| -                                       |                 |                                    | -                   | -                      | -    | -    | -    | -             | -    | -              | V    |       |     |    |
| 4                                       |                 |                                    | 4.5                 | -                      | -    | 0.26 | -    | 0.33          | -    | 0.4            | V    |       |     |    |
| 5.2                                     |                 |                                    | 6                   | -                      | -    | 0.26 | -    | 0.33          | -    | 0.4            | V    |       |     |    |
| Low Level Output Voltage<br>CMOS Loads  | V <sub>OL</sub> | V <sub>IH</sub> or V <sub>IL</sub> | 0.02                | 2                      | -    | -    | 0.1  | -             | 0.1  | -              | 0.1  | V     |     |    |
|                                         |                 |                                    | 0.02                | 4.5                    | -    | -    | 0.1  | -             | 0.1  | -              | 0.1  | V     |     |    |
|                                         |                 |                                    | 0.02                | 6                      | -    | -    | 0.1  | -             | 0.1  | -              | 0.1  | V     |     |    |
| -                                       |                 |                                    | -                   | -                      | -    | -    | -    | -             | -    | -              | V    |       |     |    |
| 4                                       |                 |                                    | 4.5                 | -                      | -    | 0.26 | -    | 0.33          | -    | 0.4            | V    |       |     |    |
| 5.2                                     |                 |                                    | 6                   | -                      | -    | 0.26 | -    | 0.33          | -    | 0.4            | V    |       |     |    |
| Low Level Output Voltage<br>TTL Loads   | V <sub>OL</sub> | V <sub>IH</sub> or V <sub>IL</sub> | -                   | -                      | -    | -    | -    | -             | -    | -              | -    | V     |     |    |
|                                         |                 |                                    | 4                   | 4.5                    | -    | -    | 0.26 | -             | 0.33 | -              | 0.4  | V     |     |    |
|                                         |                 |                                    | 5.2                 | 6                      | -    | -    | 0.26 | -             | 0.33 | -              | 0.4  | V     |     |    |
| Input Leakage Current                   |                 |                                    | I <sub>I</sub>      | V <sub>CC</sub> or GND | -    | 6    | -    | -             | ±0.1 | -              | ±1   | -     | ±1  | μA |
| Quiescent Device Current                |                 |                                    | I <sub>CC</sub>     | V <sub>CC</sub> or GND | 0    | 6    | -    | -             | 8    | -              | 80   | -     | 160 | μA |

**CD54/74HC157, CD54/74HCT157, CD54/74HC158, CD54/74HCT158**

**DC Electrical Specifications (Continued)**

| PARAMETER                                                      | SYMBOL                    | TEST CONDITIONS                    |                     | V <sub>CC</sub> (V) | 25°C |     |      | -40°C TO 85°C |      | -55°C TO 125°C |     | UNITS |
|----------------------------------------------------------------|---------------------------|------------------------------------|---------------------|---------------------|------|-----|------|---------------|------|----------------|-----|-------|
|                                                                |                           | V <sub>I</sub> (V)                 | I <sub>O</sub> (mA) |                     | MIN  | TYP | MAX  | MIN           | MAX  | MIN            | MAX |       |
| HCT TYPES                                                      |                           |                                    |                     |                     |      |     |      |               |      |                |     |       |
| High Level Input Voltage                                       | V <sub>IH</sub>           | -                                  | -                   | 4.5 to 5.5          | 2    | -   | -    | 2             | -    | 2              | -   | V     |
| Low Level Input Voltage                                        | V <sub>IL</sub>           | -                                  | -                   | 4.5 to 5.5          | -    | -   | 0.8  | -             | 0.8  | -              | 0.8 | V     |
| High Level Output Voltage<br>CMOS Loads                        | V <sub>OH</sub>           | V <sub>IH</sub> or V <sub>IL</sub> | -0.02               | 4.5                 | 4.4  | -   | -    | 4.4           | -    | 4.4            | -   | V     |
| High Level Output Voltage<br>TTL Loads                         |                           |                                    | -4                  | 4.5                 | 3.98 | -   | -    | 3.84          | -    | 3.7            | -   | V     |
| Low Level Output Voltage<br>CMOS Loads                         | V <sub>OL</sub>           | V <sub>IH</sub> or V <sub>IL</sub> | 0.02                | 4.5                 | -    | -   | 0.1  | -             | 0.1  | -              | 0.1 | V     |
| Low Level Output Voltage<br>TTL Loads                          |                           |                                    | 4                   | 4.5                 | -    | -   | 0.26 | -             | 0.33 | -              | 0.4 | V     |
| Input Leakage Current                                          | I <sub>I</sub>            | V <sub>CC</sub> and GND            | 0                   | 5.5                 | -    |     | ±0.1 | -             | ±1   | -              | ±1  | μA    |
| Quiescent Device Current                                       | I <sub>CC</sub>           | V <sub>CC</sub> or GND             | 0                   | 5.5                 | -    | -   | 8    | -             | 80   | -              | 160 | μA    |
| Additional Quiescent Device Current Per Input Pin: 1 Unit Load | ΔI <sub>CC</sub> (Note 2) | V <sub>CC</sub> -2.1               | -                   | 4.5 to 5.5          | -    | 100 | 360  | -             | 450  | -              | 490 | μA    |

NOTE:

2. For dual-supply systems theoretical worst case (V<sub>I</sub> = 2.4V, V<sub>CC</sub> = 5.5V) specification is 1.8mA.

**HCT Input Loading Table**

| INPUT     | UNIT LOADS |        |
|-----------|------------|--------|
|           | HCT157     | HCT158 |
| I (All)   | 0.95       | 0.4    |
| $\bar{E}$ | 0.6        | 0.6    |
| S         | 3          | 2.8    |

NOTE: Unit Load is ΔI<sub>CC</sub> limit specified in DC Electrical Table, e.g., 360μA max at 25°C.

**Switching Specifications** Input t<sub>r</sub>, t<sub>f</sub> = 6ns

| PARAMETER                    | SYMBOL                              | TEST CONDITIONS       | V <sub>CC</sub> (V) | 25°C |     |     | -40°C TO 85°C |     | -55°C TO 125°C |     | UNITS |
|------------------------------|-------------------------------------|-----------------------|---------------------|------|-----|-----|---------------|-----|----------------|-----|-------|
|                              |                                     |                       |                     | MIN  | TYP | MAX | MIN           | MAX | MIN            | MAX |       |
| HC/HCT157 TYPES              |                                     |                       |                     |      |     |     |               |     |                |     |       |
| Propagation Delay (Figure 1) | t <sub>PLH</sub> , t <sub>PHL</sub> | C <sub>L</sub> = 50pF | 2                   | -    | -   | 125 | -             | 155 | -              | 190 | ns    |
| Data to Output               |                                     |                       | 4.5                 | -    | -   | 25  | -             | 31  | -              | 38  | ns    |
| HC157                        |                                     | C <sub>L</sub> =15pF  | 5                   | -    | 10  | -   | -             | -   | -              | -   | ns    |
| HCT157                       |                                     |                       |                     | -    | 12  | -   | -             | -   | -              | -   | ns    |
|                              |                                     | C <sub>L</sub> = 50pF | 6                   | -    | -   | 21  | -             | 26  | -              | 32  | ns    |

**CD54/74HC157, CD54/74HCT157, CD54/74HC158, CD54/74HCT158**

**Switching Specifications** Input  $t_r, t_f = 6\text{ns}$  (Continued)

| PARAMETER                                  | SYMBOL                              | TEST CONDITIONS       | V <sub>CC</sub> (V) | 25°C |     |     | -40°C TO 85°C |     | -55°C TO 125°C |     | UNITS |
|--------------------------------------------|-------------------------------------|-----------------------|---------------------|------|-----|-----|---------------|-----|----------------|-----|-------|
|                                            |                                     |                       |                     | MIN  | TYP | MAX | MIN           | MAX | MIN            | MAX |       |
| Enable to Output                           | t <sub>PLH</sub> , t <sub>PHL</sub> | C <sub>L</sub> = 50pF | 2                   | -    | -   | 135 | -             | 170 | -              | 205 | ns    |
|                                            |                                     |                       | 4.5                 | -    | -   | 27  | -             | 34  | -              | 41  | ns    |
| C <sub>L</sub> =15pF                       |                                     | 5                     | -                   | 11   | -   | -   | -             | -   | -              | ns  |       |
|                                            |                                     |                       | -                   | 12   | -   | -   | -             | -   | -              | ns  |       |
| HC157                                      |                                     | C <sub>L</sub> = 50pF | 6                   | -    | -   | 23  | -             | 29  | -              | 35  | ns    |
| HCT157                                     |                                     |                       |                     | -    | -   | -   | -             | -   | -              | ns  |       |
| Select to Output                           | t <sub>PLH</sub> , t <sub>PHL</sub> | C <sub>L</sub> = 50pF | 2                   | -    | -   | 145 | -             | 180 | -              | 220 | ns    |
|                                            |                                     |                       | 4.5                 | -    | -   | 29  | -             | 36  | -              | 44  | ns    |
| C <sub>L</sub> =15pF                       |                                     | 5                     | -                   | 12   | -   | -   | -             | -   | -              | ns  |       |
|                                            |                                     |                       | -                   | 15   | -   | -   | -             | -   | -              | ns  |       |
| HC157                                      |                                     | C <sub>L</sub> = 50pF | 6                   | -    | -   | 25  | -             | 31  | -              | 38  | ns    |
| HCT157                                     |                                     |                       |                     | -    | -   | -   | -             | -   | -              | ns  |       |
| Power Dissipation Capacitance (Notes 3, 4) | C <sub>PD</sub>                     | -                     | 5                   |      |     |     |               |     |                |     |       |
| HC157                                      |                                     |                       |                     | -    | 62  | -   | -             | -   | -              | -   | pF    |
| HCT157                                     |                                     |                       |                     | -    | 70  | -   | -             | -   | -              | -   | pF    |
| HC/HCT158 TYPES                            |                                     |                       |                     |      |     |     |               |     |                |     |       |
| Data to Output                             | t <sub>PLH</sub> , t <sub>PHL</sub> | C <sub>L</sub> = 50pF | 2                   | -    | -   | 140 | -             | 175 | -              | 210 | ns    |
|                                            |                                     |                       | 4.5                 | -    | -   | 28  | -             | 35  | -              | 42  |       |
| HC158                                      |                                     | C <sub>L</sub> =15pF  | 5                   | -    | 11  | -   | -             | -   | -              | -   | ns    |
| HCT 158                                    |                                     |                       |                     | -    | 13  | -   | -             | -   | -              | -   | ns    |
|                                            |                                     | C <sub>L</sub> = 50pF | 6                   | -    | -   | 24  | -             | 30  | -              | 36  | ns    |
| Enable to Output                           | t <sub>PLH</sub> , t <sub>PHL</sub> | C <sub>L</sub> = 50pF | 2                   | -    | -   | 160 | -             | 200 | -              | 240 | ns    |
|                                            |                                     |                       | 4.5                 | -    | -   | 32  | -             | 40  | -              | 48  | ns    |
| HC158                                      |                                     | C <sub>L</sub> =15pF  | 5                   | -    | 13  | -   | -             | -   | -              | -   | ns    |
| HCT 158                                    |                                     |                       |                     | -    | 15  | -   | -             | -   | -              | -   | ns    |
|                                            |                                     | C <sub>L</sub> = 50pF | 6                   | -    | -   | 27  | -             | 34  | -              | 41  | ns    |
| Select to Output                           | t <sub>PLH</sub> , t <sub>PHL</sub> | C <sub>L</sub> = 50pF | 2                   | -    | -   | 150 | -             | 190 | -              | 225 | ns    |
|                                            |                                     |                       | 4.5                 | -    | -   | 30  | -             | 38  | -              | 45  | ns    |
| HC158                                      |                                     | C <sub>L</sub> =15pF  | 5                   | -    | 12  | -   | -             | -   | -              | -   | ns    |
| HCT 158                                    |                                     |                       |                     | -    | 14  | -   | -             | -   | -              | -   | ns    |
|                                            |                                     | C <sub>L</sub> = 50pF | 6                   | -    | -   | 26  | -             | 33  | -              | 38  | ns    |
|                                            |                                     |                       |                     |      |     |     |               |     |                |     |       |
| Output Transition Time                     | t <sub>TLH</sub> , t <sub>THL</sub> | C <sub>L</sub> = 50pF | 2                   | -    | -   | 75  | -             | 95  | -              | 110 | ns    |
|                                            |                                     |                       | 4.5                 | -    | -   | 15  | -             | 19  | -              | 22  | ns    |
|                                            |                                     |                       | 6                   | -    | -   | 13  | -             | 16  | -              | 19  | ns    |
| Power Dissipation Capacitance (Notes 3, 4) | C <sub>PD</sub>                     | -                     | 5                   |      |     |     |               |     |                |     |       |
| HC158                                      |                                     |                       |                     | -    | 35  | -   | -             | -   | -              | -   | pF    |
| HCT 158                                    |                                     |                       |                     | -    | 35  | -   | -             | -   | -              | -   | pF    |
| Input Capacitance                          | C <sub>IN</sub>                     | C <sub>L</sub> = 50pF | -                   | -    | -   | 10  | -             | 10  | -              | 10  | pF    |

**NOTES:**

3.  $C_{PD}$  is used to determine the dynamic power consumption, per multiplexer.
4.  $P_D = V_{CC}^2 f_i (C_{PD} + C_L)$  where  $f_i$  = input frequency,  $C_L$  = output load capacitance,  $V_{CC}$  = supply voltage.

## Test Circuits and Waveforms

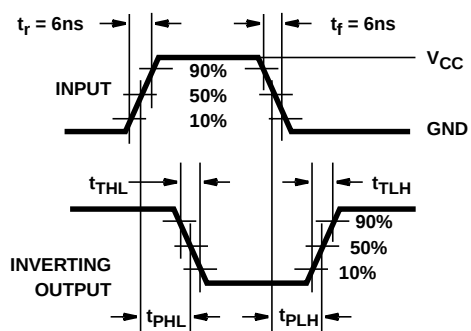


FIGURE 1. HC AND HCU TRANSITION TIMES AND PROPAGATION DELAY TIMES, COMBINATION LOGIC

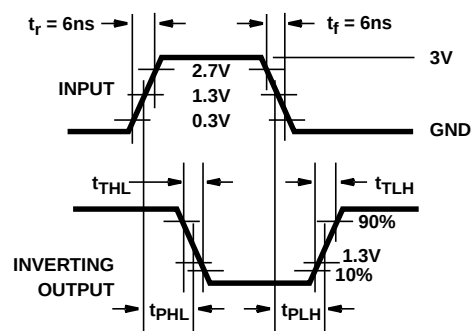


FIGURE 2. HCT TRANSITION TIMES AND PROPAGATION DELAY TIMES, COMBINATION LOGIC

**PACKAGING INFORMATION**

| Orderable Device | Status <sup>(1)</sup> | Package Type | Package Drawing | Pins | Package Qty | Eco Plan <sup>(2)</sup> | Lead/Ball Finish | MSL Peak Temp <sup>(3)</sup> |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|------------------------------|
| 5962-9070201MEA  | ACTIVE                | CDIP         | J               | 16   | 1           | TBD                     | A42              | N / A for Pkg Type           |
| 5962-9070301MEA  | ACTIVE                | CDIP         | J               | 16   | 1           | TBD                     | A42              | N / A for Pkg Type           |
| CD54HC157F       | ACTIVE                | CDIP         | J               | 16   | 1           | TBD                     | A42              | N / A for Pkg Type           |
| CD54HC157F3A     | ACTIVE                | CDIP         | J               | 16   | 1           | TBD                     | A42              | N / A for Pkg Type           |
| CD54HCT157F3A    | ACTIVE                | CDIP         | J               | 16   | 1           | TBD                     | A42              | N / A for Pkg Type           |
| CD54HCT158F3A    | ACTIVE                | CDIP         | J               | 16   | 1           | TBD                     | A42              | N / A for Pkg Type           |
| CD74HC157E       | ACTIVE                | PDIP         | N               | 16   | 25          | Pb-Free (RoHS)          | CU NIPDAU        | N / A for Pkg Type           |
| CD74HC157EE4     | ACTIVE                | PDIP         | N               | 16   | 25          | Pb-Free (RoHS)          | CU NIPDAU        | N / A for Pkg Type           |
| CD74HC157M       | ACTIVE                | SOIC         | D               | 16   | 40          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| CD74HC157M96     | ACTIVE                | SOIC         | D               | 16   | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| CD74HC157M96E4   | ACTIVE                | SOIC         | D               | 16   | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| CD74HC157M96G4   | ACTIVE                | SOIC         | D               | 16   | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| CD74HC157ME4     | ACTIVE                | SOIC         | D               | 16   | 40          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| CD74HC157MG4     | ACTIVE                | SOIC         | D               | 16   | 40          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| CD74HC157MT      | ACTIVE                | SOIC         | D               | 16   | 250         | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| CD74HC157MTE4    | ACTIVE                | SOIC         | D               | 16   | 250         | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| CD74HC157MTG4    | ACTIVE                | SOIC         | D               | 16   | 250         | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| CD74HCT157E      | ACTIVE                | PDIP         | N               | 16   | 25          | Pb-Free (RoHS)          | CU NIPDAU        | N / A for Pkg Type           |
| CD74HCT157EE4    | ACTIVE                | PDIP         | N               | 16   | 25          | Pb-Free (RoHS)          | CU NIPDAU        | N / A for Pkg Type           |
| CD74HCT157M      | ACTIVE                | SOIC         | D               | 16   | 40          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| CD74HCT157M96    | ACTIVE                | SOIC         | D               | 16   | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| CD74HCT157M96E4  | ACTIVE                | SOIC         | D               | 16   | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| CD74HCT157M96G4  | ACTIVE                | SOIC         | D               | 16   | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| CD74HCT157ME4    | ACTIVE                | SOIC         | D               | 16   | 40          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| CD74HCT157MG4    | ACTIVE                | SOIC         | D               | 16   | 40          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| CD74HCT157MT     | ACTIVE                | SOIC         | D               | 16   | 250         | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| CD74HCT157MTE4   | ACTIVE                | SOIC         | D               | 16   | 250         | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |

| Orderable Device | Status <sup>(1)</sup> | Package Type | Package Drawing | Pins | Package Qty | Eco Plan <sup>(2)</sup> | Lead/Ball Finish | MSL Peak Temp <sup>(3)</sup> |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|------------------------------|
| CD74HCT157MTG4   | ACTIVE                | SOIC         | D               | 16   | 250         | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| CD74HCT158E      | ACTIVE                | PDIP         | N               | 16   | 25          | Pb-Free (RoHS)          | CU NIPDAU        | N / A for Pkg Type           |
| CD74HCT158EE4    | ACTIVE                | PDIP         | N               | 16   | 25          | Pb-Free (RoHS)          | CU NIPDAU        | N / A for Pkg Type           |

<sup>(1)</sup> 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.

<sup>(2)</sup> Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

**TBD:** The Pb-Free/Green conversion plan has not been defined.

**Pb-Free (RoHS):** TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

**Pb-Free (RoHS Exempt):** This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

**Green (RoHS & no Sb/Br):** TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

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

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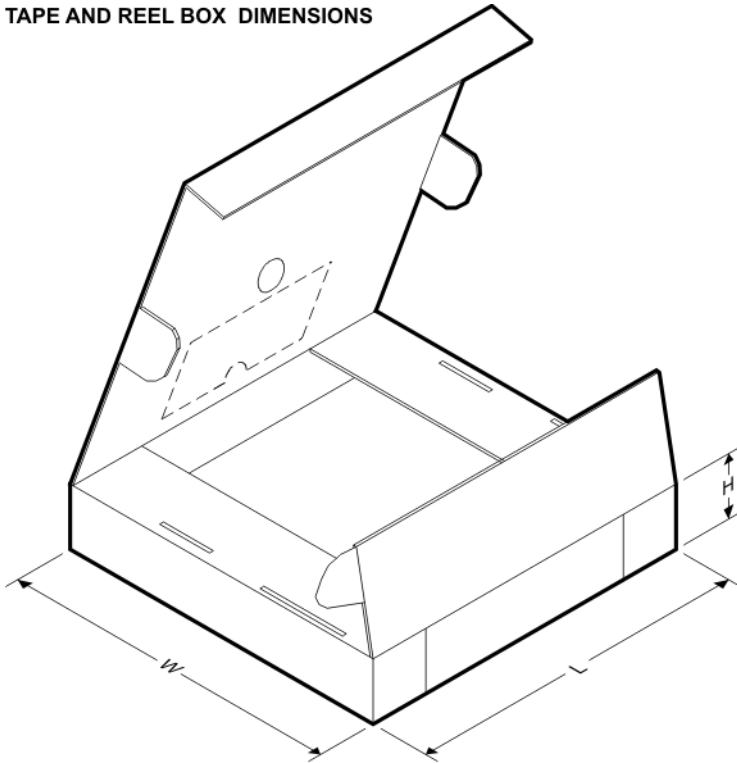
**TAPE AND REEL INFORMATION**



\*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 |
|---------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| CD74HC157M96  | SOIC         | D               | 16   | 2500 | 330.0              | 16.4               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |
| CD74HCT157M96 | SOIC         | D               | 16   | 2500 | 330.0              | 16.4               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |

## TAPE AND REEL BOX DIMENSIONS



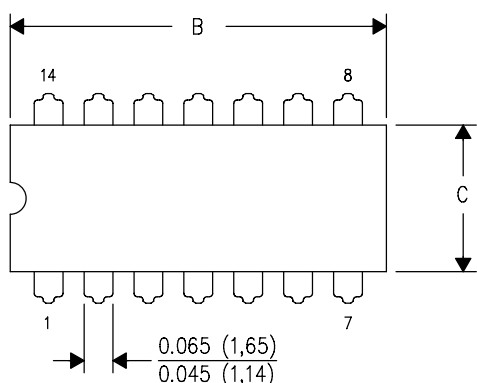
\*All dimensions are nominal

| Device        | Package Type | Package Drawing | Pins | SPQ  | Length (mm) | Width (mm) | Height (mm) |
|---------------|--------------|-----------------|------|------|-------------|------------|-------------|
| CD74HC157M96  | SOIC         | D               | 16   | 2500 | 333.2       | 345.9      | 28.6        |
| CD74HCT157M96 | SOIC         | D               | 16   | 2500 | 333.2       | 345.9      | 28.6        |

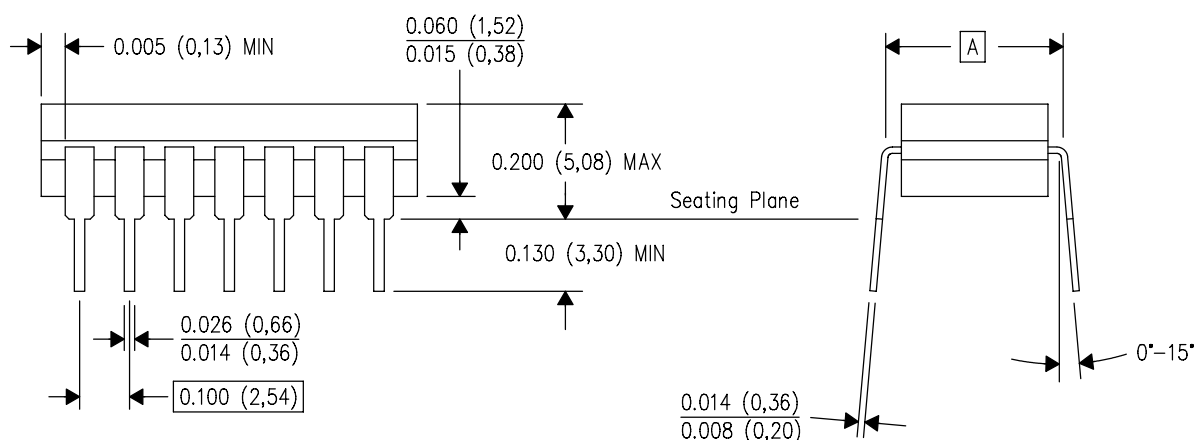
J (R-GDIP-T\*\*)

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)        |



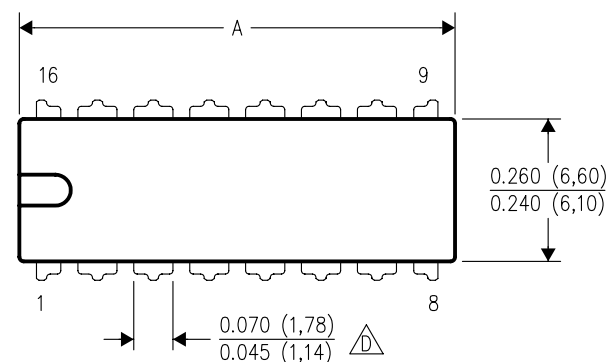
4040083/F 03/03

- 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.

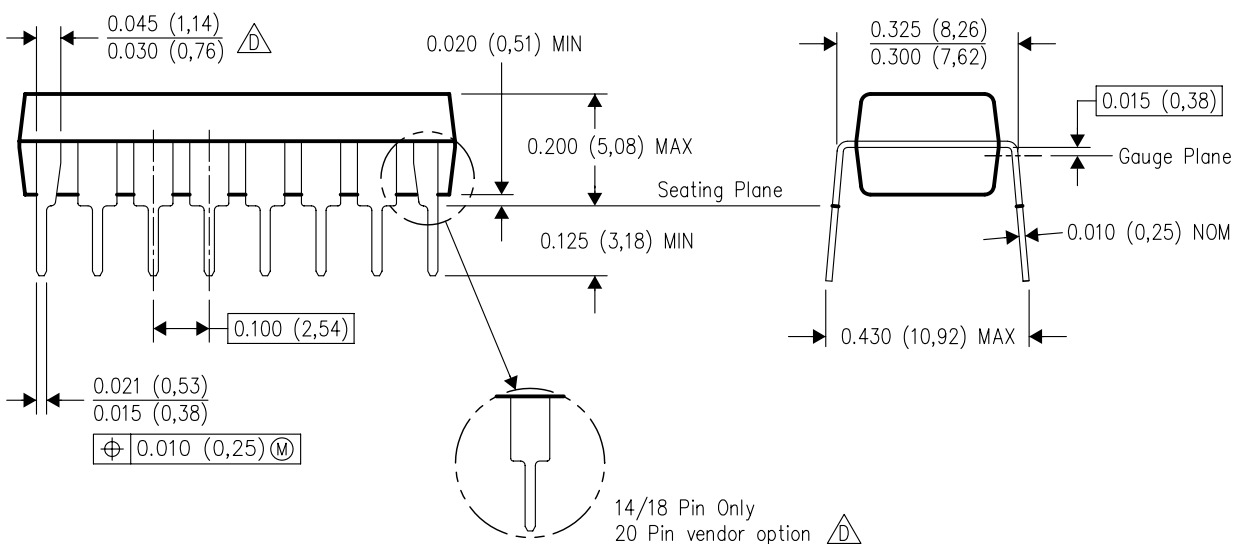
## N (R-PDIP-T\*\*)

16 PINS SHOWN

## PLASTIC DUAL-IN-LINE PACKAGE



| PINS **             | 14               | 16               | 18               | 20               |
|---------------------|------------------|------------------|------------------|------------------|
| DIM                 |                  |                  |                  |                  |
| 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               |

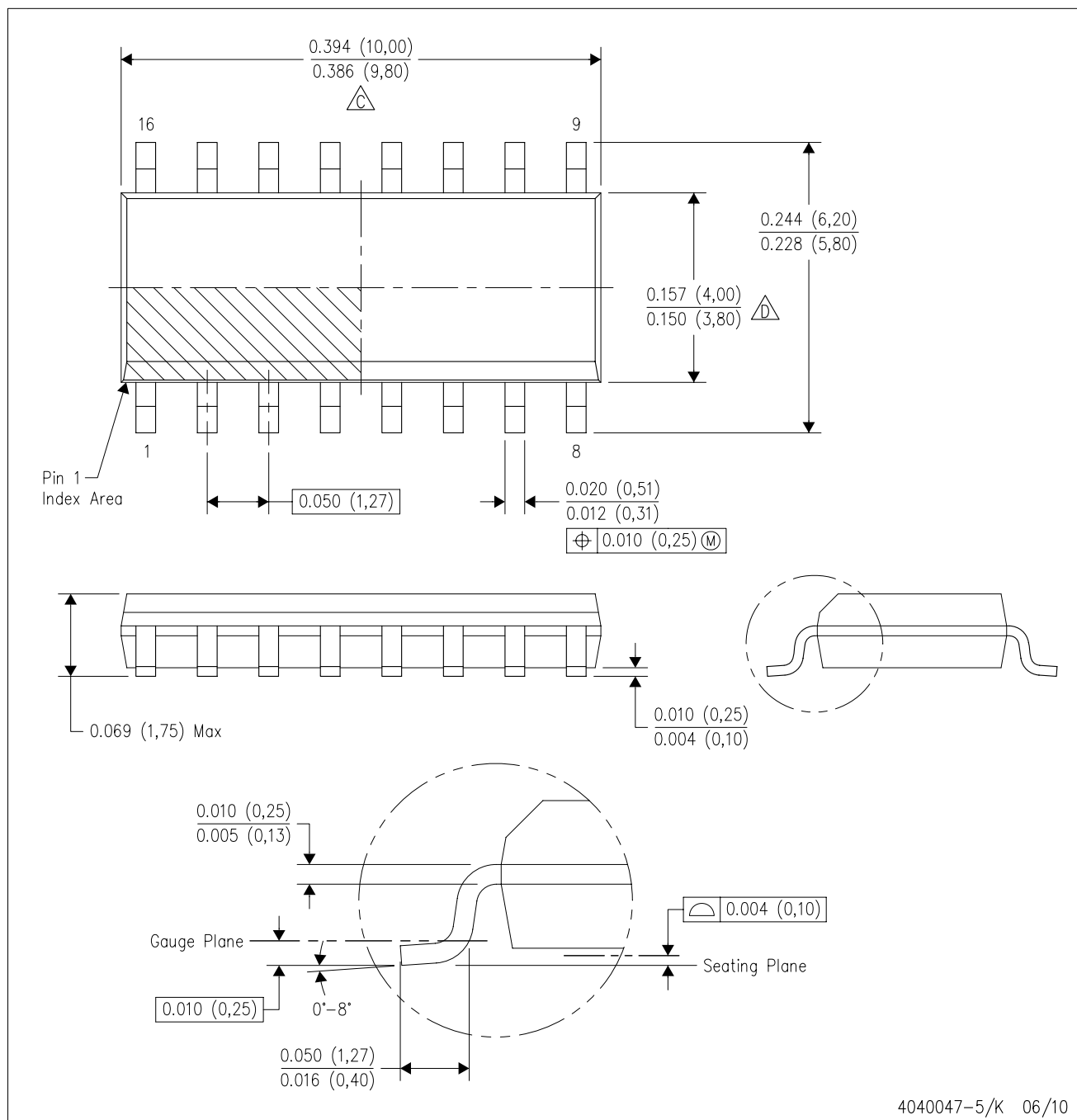


4040049/E 12/2002

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

D (R-PDSO-G16)

PLASTIC SMALL-OUTLINE PACKAGE



NOTES:

- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- $\triangle C$  Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed .006 (0,15) per end.
- $\triangle D$  Body width does not include interlead flash. Interlead flash shall not exceed .017 (0,43) per side.
- E. Reference JEDEC MS-012 variation AC.

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