

## CD74HCT4052, CD54/74HC4053, CD54/74HC54053 HIGH-SPEED CMOS LOGIC ANALOG MULTIPLEXERS/DEMULTIPLEXERS

Check for Samples: [CD/74HC4051](#), [CD54/74HCT4051](#), [CD54/74HC4052](#),

### FEATURES

- **Wide Analog Input Voltage Range.** .  $\pm 5$  V Max
- **Low ON Resistance**
  - 70  $\Omega$  Typical ( $V_{CC} - V_{EE} = 4.5$  V)
  - 40  $\Omega$  Typical ( $V_{CC} - V_{EE} = 9$  V)
- **Low Crosstalk Between Switches**
- **Fast Switching and Propagation Speeds**
- **Break-Before-Make Switching**
- **Wide Operating Temperature Range**  
–55°C to 125°C
- **CD54HC/CD74HC Types**
  - **Operation Control Voltage** . . . . . 2 V to 6 V
  - **Switch Voltage** . . . . . 0 V to 10 V
- **CD54HCT/CD74HCT Types**
  - **Operation Control Voltage** . . . 4.5 V to 5.5 V
  - **Switch Voltage** . . . . . 0 V to 10 V

- **Direct LSTTL Input Logic Compatibility**  
 $V_{IL} = 0.8$  V Max,  $V_{IH} = 2$  V Min
- **CMOS Input Compatibility**  
 $I_i \leq 1$   $\mu$ A at  $V_{OL}$ ,  $V_{OH}$

### DESCRIPTION

These devices are digitally controlled analog switches which utilize silicon gate CMOS technology to achieve operating speeds similar to LSTTL with the low power consumption of standard CMOS integrated circuits.

These analog multiplexers/demultiplexers control analog voltages that may vary across the voltage supply range (i.e.,  $V_{CC}$  to  $V_{EE}$ ). They are bidirectional switches thus allowing any analog input to be used as an output and vice-versa. The switches have low ON resistance and low OFF leakages. In addition, all three devices have an enable control which, when high, disables all switches to their OFF state.

### ORDERING INFORMATION<sup>(1)</sup>

| PART NUMBER     | TEMP. RANGE<br>(°C) | PACKAGE      |
|-----------------|---------------------|--------------|
| CD54HC4051F3A   | –55 to 125          | 16 Ld CERDIP |
| CD54HC4052F3A   | –55 to 125          | 16 Ld CERDIP |
| CD54HC4053F3A   | –55 to 125          | 16 Ld CERDIP |
| CD54HCT4051F3A  | –55 to 125          | 16 Ld CERDIP |
| CD74HC4051E     | –55 to 125          | 16 Ld PDIP   |
| CD74HC4051M     | –55 to 125          | 16 Ld SOIC   |
| CD74HC4051MT    | –55 to 125          | 16 Ld SOIC   |
| CD74HC4051M96G3 | –55 to 125          | 16 Ld SOIC   |
| CD74HC4051NSR   | –55 to 125          | 16 Ld SOP    |
| CD74HC4051PWR   | –55 to 125          | 16 Ld TSSOP  |
| CD74HC4051PWT   | –55 to 125          | 16 Ld TSSOP  |
| CD74HC4052E     | –55 to 125          | 16 Ld PDIP   |
| CD74HC4052M     | –55 to 125          | 16 Ld SOIC   |
| CD74HC4052MT    | –55 to 125          | 16 Ld SOIC   |
| CD74HC4052M96G3 | –55 to 125          | 16 Ld SOIC   |
| CD74HC4052NSR   | –55 to 125          | 16 Ld SOP    |
| CD74HC4052PW    | –55 to 125          | 16 Ld TSSOP  |
| CD74HC4052PWR   | –55 to 125          | 16 Ld TSSOP  |

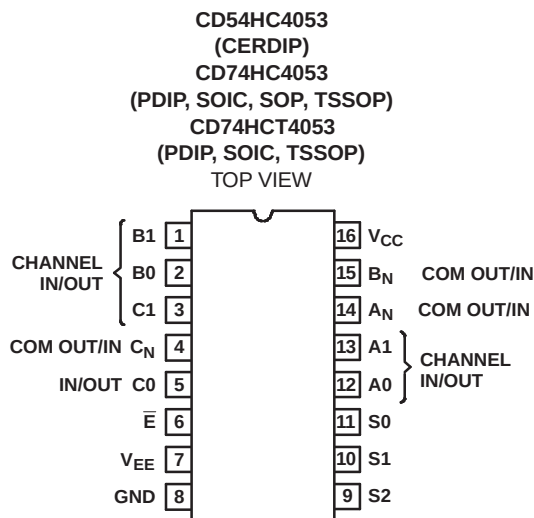
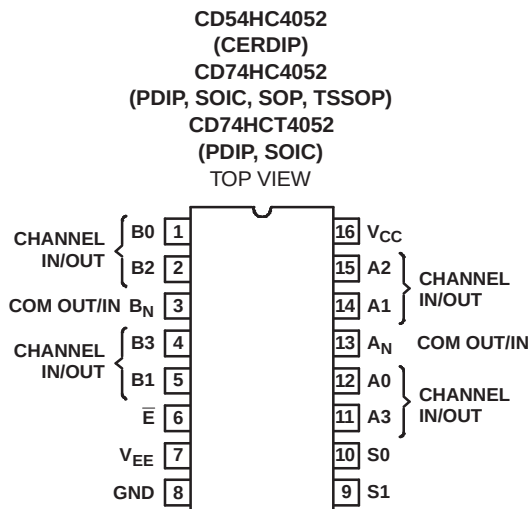
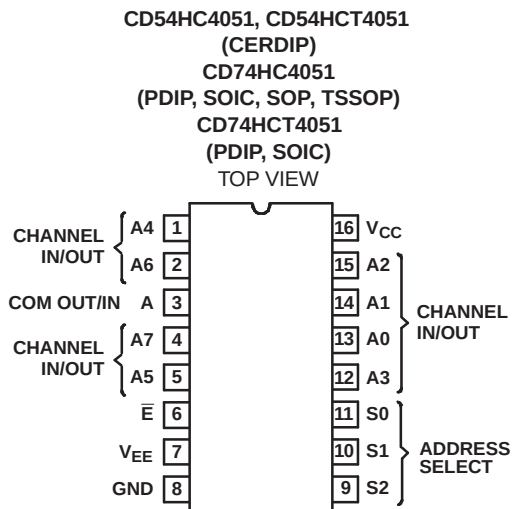
(1) When ordering, use the entire part number. The suffixes 96 and R denote tape and reel. The suffix T denotes a small-quantity reel of 250.

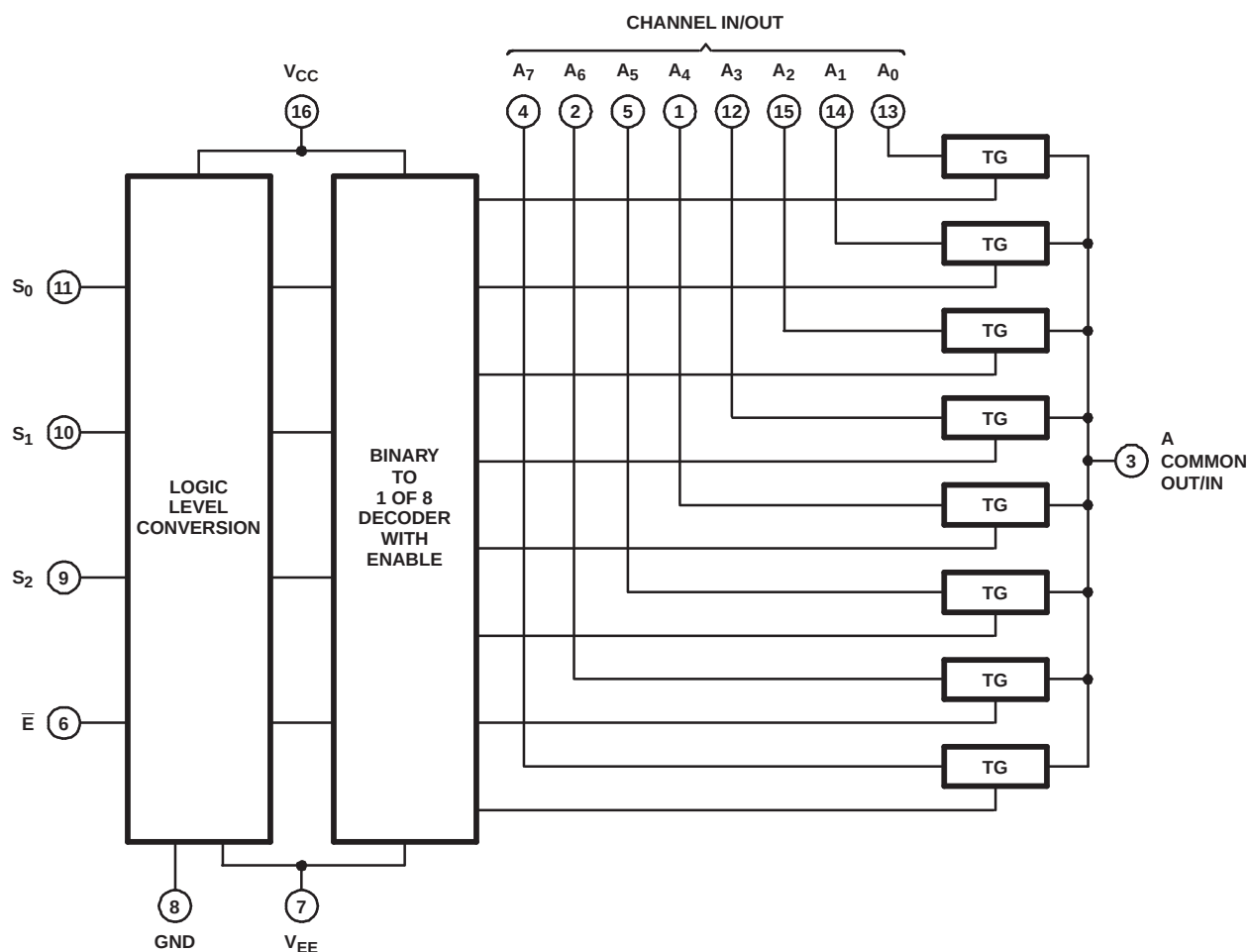


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**ORDERING INFORMATION<sup>(1)</sup> (continued)**

| <b>PART NUMBER</b> | <b>TEMP. RANGE<br/>(°C)</b> | <b>PACKAGE</b> |
|--------------------|-----------------------------|----------------|
| CD74HC4052PWT      | –55 to 125                  | 16 Ld TSSOP    |
| CD74HC4053E        | –55 to 125                  | 16 Ld PDIP     |
| CD74HC4053M        | –55 to 125                  | 16 Ld SOIC     |
| CD74HC4053MT       | –55 to 125                  | 16 Ld SOIC     |
| CD74HC4053M96G3    | –55 to 125                  | 16 Ld SOIC     |
| CD74HC4053NSR      | –55 to 125                  | 16 Ld SOP      |
| CD74HC4053PW       | –55 to 125                  | 16 Ld TSSOP    |
| CD74HC4053PWRG3    | –55 to 125                  | 16 Ld TSSOP    |
| CD74HC4053PWT      | –55 to 125                  | 16 Ld TSSOP    |
| CD74HCT4051E       | –55 to 125                  | 16 Ld PDIP     |
| CD74HCT4051M       | –55 to 125                  | 16 Ld SOIC     |
| CD74HCT4051MT      | –55 to 125                  | 16 Ld SOIC     |
| CD74HCT4051M96     | –55 to 125                  | 16 Ld SOIC     |
| CD74HCT4052E       | –55 to 125                  | 16 Ld PDIP     |
| CD74HCT4052M       | –55 to 125                  | 16 Ld SOIC     |
| CD74HCT4052MT      | –55 to 125                  | 16 Ld SOIC     |
| CD74HCT4052M96     | –55 to 125                  | 16 Ld SOIC     |
| CDHCT4053E         | –55 to 125                  | 16 Ld PDIP     |
| CDHCT4053M         | –55 to 125                  | 16 Ld SOIC     |
| CDHCT4053MT        | –55 to 125                  | 16 Ld SOIC     |
| CDHCT4053M96       | –55 to 125                  | 16 Ld SOIC     |
| CDHCT4053PWR       | –55 to 125                  | 16 Ld TSSOP    |
| CDHCT4053PWT       | –55 to 125                  | 16 Ld TSSOP    |



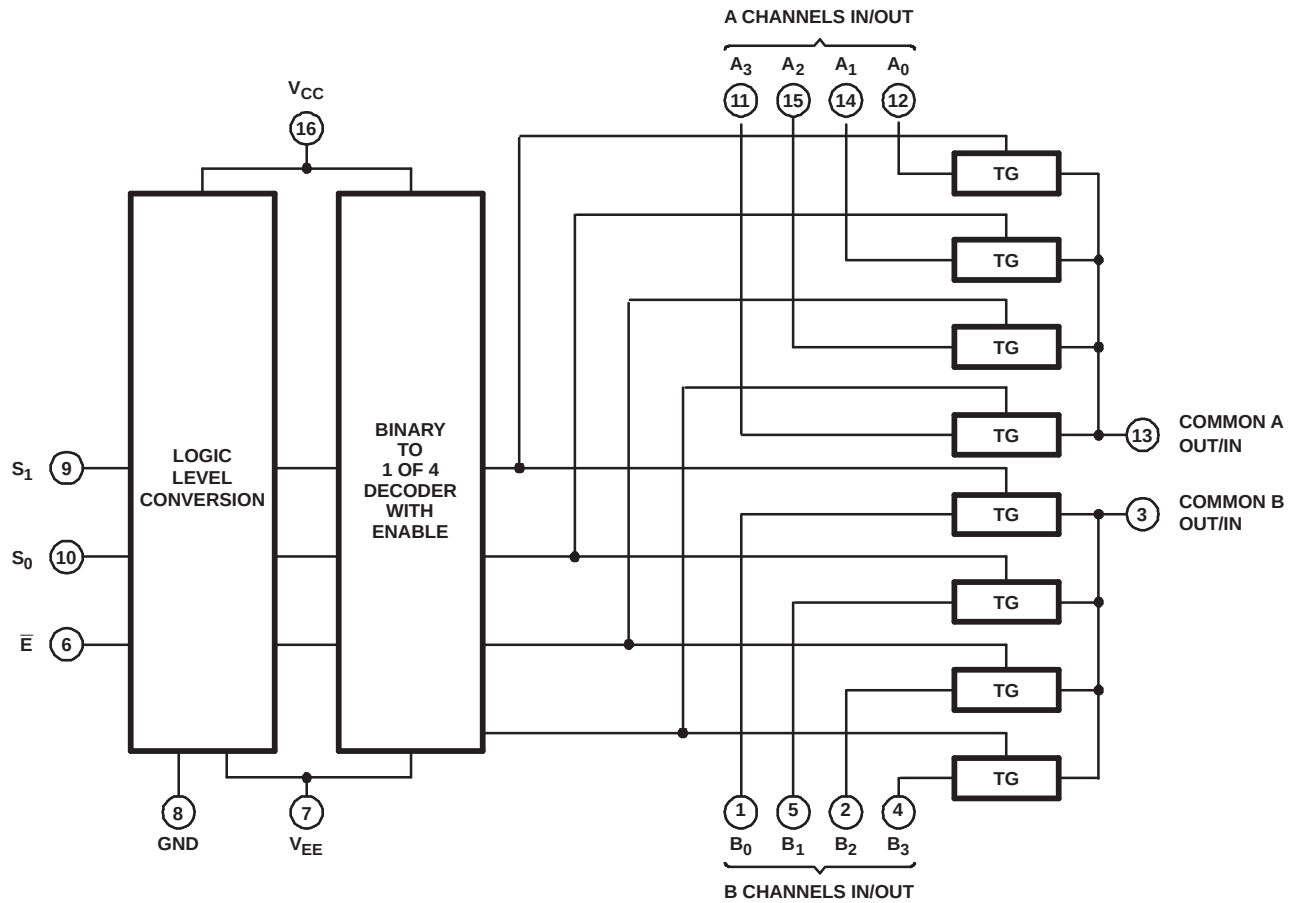
**FUNCTIONAL DIAGRAM OF HC/HCT4051**

**Table 1. TRUTH TABLE**  
**'HC/CD74HCT4051<sup>(1)</sup>**

| INPUT STATES |       |       |       | ON CHANNELS |
|--------------|-------|-------|-------|-------------|
| ENABLE       | $S_2$ | $S_1$ | $S_0$ |             |
| L            | L     | L     | L     | A0          |
| L            | L     | L     | H     | A1          |
| L            | L     | H     | L     | A2          |
| L            | L     | H     | H     | A3          |
| L            | H     | L     | L     | A4          |
| L            | H     | L     | H     | A5          |
| L            | H     | H     | L     | A6          |
| L            | H     | H     | H     | A7          |
| H            | X     | X     | X     | None        |

(1) X = Don't care

**FUNCTIONAL DIAGRAM OF HC4052, CD74HCT4052**

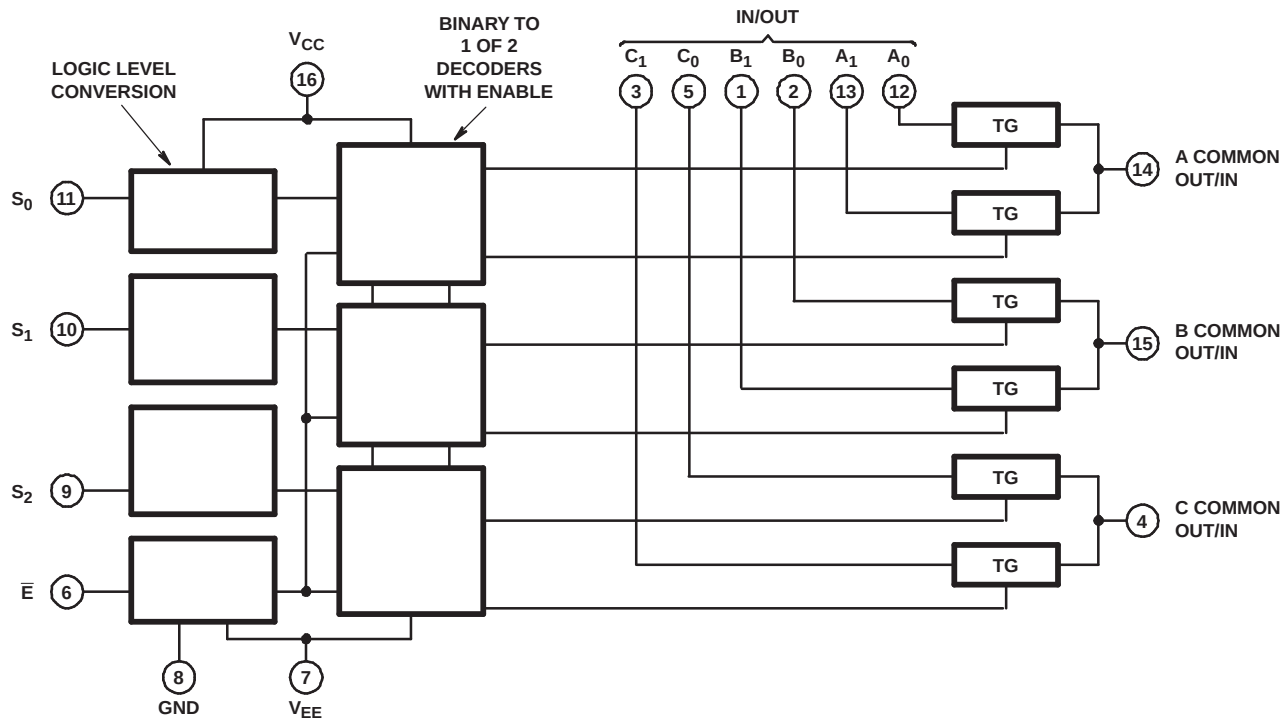


**Table 2. FUNCTION TABLE**  
**'HC4052, CD74HCT4052<sup>(1)</sup>**

| INPUT STATES |                |                | ON CHANNELS |
|--------------|----------------|----------------|-------------|
| ENABLE       | S <sub>1</sub> | S <sub>0</sub> |             |
| L            | L              | L              | A0, B0      |
| L            | L              | H              | A1, B1      |
| L            | H              | L              | A2, B2      |
| L            | H              | H              | A3, B3      |
| H            | X              | X              | None        |

(1) X = Don't care

**FUNCTIONAL DIAGRAM OF 'HC4053, CD74HCT4053**



**Table 3. FUNCTION TABLE**  
**'HC4053, CD74HCT4053<sup>(1)</sup>**

| INPUT STATES |                |                |                | ON CHANNELS |
|--------------|----------------|----------------|----------------|-------------|
| ENABLE       | S <sub>0</sub> | S <sub>1</sub> | S <sub>2</sub> |             |
| L            | L              | L              | L              | C0, B0, A0  |
| L            | H              | L              | L              | C0, B0, A1  |
| L            | L              | H              | L              | C0, B1, A0  |
| L            | H              | H              | L              | C0, B1, A1  |
| L            | L              | L              | H              | C1, B0, A0  |
| L            | H              | L              | H              | C1, B0, A1  |
| L            | L              | H              | H              | C1, B1, A0  |
| L            | H              | H              | H              | C1, B1, A1  |
| H            | X              | X              | X              | None        |

(1) X = Don't care

## Absolute Maximum Ratings<sup>(1) (2)</sup>

over operating free-air temperature range (unless otherwise noted)

|                   |                                           |                                                                | MIN  | MAX      | UNIT |
|-------------------|-------------------------------------------|----------------------------------------------------------------|------|----------|------|
| $V_{CC} - V_{EE}$ | DC supply voltage                         |                                                                | -0.5 | 10.5     | V    |
| $V_{CC}$          | DC supply voltage                         |                                                                | -0.5 | 7        | V    |
| $V_{EE}$          | DC supply voltage                         |                                                                | 0.5  | -7       | V    |
| $I_{IK}$          | DC input diode current                    | $V_I < -0.5\text{ V}$ or $V_I > V_{CC} + 0.5\text{ V}$         |      | $\pm 20$ | mA   |
| $I_{OK}$          | DC switch diode current                   | $V_I < V_{EE} - 0.5\text{ V}$ or $V_I > V_{CC} + 0.5\text{ V}$ |      | $\pm 20$ | mA   |
|                   | DC switch current                         | $V_I > V_{EE} - 0.5\text{ V}$ or $V_I < V_{CC} + 0.5\text{ V}$ |      | $\pm 25$ | mA   |
| $I_{CC}$          | DC $V_{CC}$ or ground current             |                                                                |      | $\pm 50$ | mA   |
| $I_{EE}$          | DC $V_{EE}$ current                       |                                                                |      | -20      | mA   |
| $\theta_{JA}$     | Package thermal impedance <sup>(3)</sup>  | E (PDIP) package                                               |      | 67       | °C/W |
|                   |                                           | M (SOIC) package                                               |      | 73       |      |
|                   |                                           | NS (SOP) package                                               |      | 64       |      |
|                   |                                           | PW (TSSOP) package                                             |      | 108      |      |
|                   | Maximum junction temperature              |                                                                |      | 150      | °C   |
|                   | Maximum storage temperature range         |                                                                | -65  | 150      | °C   |
|                   | Maximum lead temperature (soldering 10 s) |                                                                |      | 300      | °C   |

(1) Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

(2) All voltages referenced to GND unless otherwise specified.

(3) The package thermal impedance is calculated in accordance with JESD 51-7.

## Recommended Operating Conditions

For maximum reliability, nominal operating conditions should be selected so that operation is always within the following ranges.

| PARAMETER               |                                                                   |                                                                      | MIN      | MAX      | UNIT |
|-------------------------|-------------------------------------------------------------------|----------------------------------------------------------------------|----------|----------|------|
| $V_{CC}$ <sup>(1)</sup> | Supply voltage range<br>( $T_A$ = full package temperature range) | CD54/74HC types                                                      | 2        | 6        | V    |
|                         |                                                                   | CD54/74HCT types                                                     | 4.5      | 5.5      |      |
| $V_{CC} - V_{EE}$       | Supply voltage range<br>( $T_A$ = full package temperature range) | CD54/74HC types, CD54/74HCT types<br>(see <a href="#">Figure 1</a> ) | 2        | 10       | V    |
| $V_{EE}$ <sup>(2)</sup> | Supply voltage range<br>( $T_A$ = full package temperature range) | CD54/74HC types, CD54/74HCT types<br>(see <a href="#">Figure 2</a> ) | 0        | -6       | V    |
| $V_I$                   | DC input control voltage                                          |                                                                      | GND      | $V_{CC}$ | V    |
| $V_{IS}$                | Analog switch I/O voltage                                         |                                                                      | $V_{EE}$ | $V_{CC}$ | V    |
| $T_A$                   | Operating temperature                                             |                                                                      | -55      | 125      | °C   |
| $t_r, t_f$              | Input rise and fall times                                         | 2 V                                                                  | 0        | 1000     | ns   |
|                         |                                                                   | 4.5 V                                                                | 0        | 500      |      |
|                         |                                                                   | 6 V                                                                  | 0        | 400      |      |

(1) All voltages referenced to GND unless otherwise specified.

(2) In certain applications, the external load resistor current may include both  $V_{CC}$  and signal line components. To avoid drawing  $V_{CC}$  current when switch current flows into the transmission gate inputs, the voltage drop across the bidirectional switch must not exceed 0.6 V (calculated from  $r_{ON}$  values shown in Electrical Specifications table). No  $V_{CC}$  current will flow through  $R_L$  if the switch current flows into terminal 3 on the HC/HCT4051; terminals 3 and 13 on the HC/HCT4052; terminals 4, 14, and 15 on the HC/HCT4053.

## Recommended Operating Area as a Function of Supply Voltages

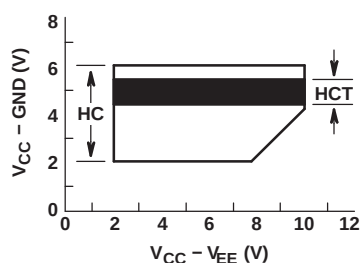


Figure 1.

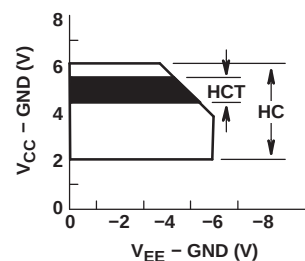


Figure 2.

## DC Electrical Specifications

| PARAMETER        |                                                | TEST CONDITIONS                          |                                                                                                                                                                                                                                                                                              |                                    |                        | AMBIENT TEMPERATURE, T <sub>A</sub> |      |      |               |      |                | UNIT |     |
|------------------|------------------------------------------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------|-------------------------------------|------|------|---------------|------|----------------|------|-----|
|                  |                                                |                                          |                                                                                                                                                                                                                                                                                              |                                    |                        | 25°C                                |      |      | −40°C to 85°C |      | −55°C to 125°C |      |     |
|                  |                                                | V <sub>IS</sub><br>(V)                   | V <sub>I</sub><br>(V)                                                                                                                                                                                                                                                                        | V <sub>EE</sub><br>(V)             | V <sub>CC</sub><br>(V) | MIN                                 | TYP  | MAX  | MIN           | MAX  | MIN            |      | MAX |
| HC Types         |                                                |                                          |                                                                                                                                                                                                                                                                                              |                                    |                        |                                     |      |      |               |      |                |      |     |
| V <sub>IH</sub>  | High-level input voltage                       |                                          |                                                                                                                                                                                                                                                                                              |                                    | 2                      | 1.5                                 |      | 1.5  |               | 1.5  |                | V    |     |
|                  |                                                |                                          |                                                                                                                                                                                                                                                                                              |                                    | 4.5                    | 3.15                                |      | 3.15 |               | 0    |                |      |     |
|                  |                                                |                                          |                                                                                                                                                                                                                                                                                              |                                    | 6                      | 4.2                                 |      | 4.2  |               |      |                |      |     |
| V <sub>IL</sub>  | Low-level input voltage                        |                                          |                                                                                                                                                                                                                                                                                              |                                    | 2                      | 0.5                                 |      | 0.5  |               | 0.5  |                | V    |     |
|                  |                                                |                                          |                                                                                                                                                                                                                                                                                              |                                    | 4.5                    | 1.35                                |      | 1.35 |               | 1.35 |                |      |     |
|                  |                                                |                                          |                                                                                                                                                                                                                                                                                              |                                    | 6                      | 1.8                                 |      | 1.8  |               | 1.8  |                |      |     |
| r <sub>ON</sub>  | ON resistance                                  | I <sub>O</sub> = 1 mA<br>(see Figure 11) | V <sub>CC</sub> or V <sub>EE</sub>                                                                                                                                                                                                                                                           | V <sub>IL</sub> or V <sub>IH</sub> | 0                      | 4.5                                 | 70   | 160  | 200           |      | 240            | Ω    |     |
|                  |                                                |                                          |                                                                                                                                                                                                                                                                                              |                                    | 0                      | 6                                   | 60   | 140  | 175           |      | 210            |      |     |
|                  |                                                |                                          |                                                                                                                                                                                                                                                                                              |                                    | −4.5                   | 4.5                                 | 40   | 120  | 150           |      | 180            |      |     |
|                  |                                                |                                          | 0                                                                                                                                                                                                                                                                                            |                                    | 4.5                    | 90                                  | 180  | 225  |               | 270  |                |      |     |
|                  |                                                |                                          | 0                                                                                                                                                                                                                                                                                            |                                    | 6                      | 80                                  | 160  | 200  |               | 240  |                |      |     |
|                  |                                                |                                          | −4.5                                                                                                                                                                                                                                                                                         |                                    | 4.5                    | 45                                  | 130  | 162  |               | 195  |                |      |     |
| Δr <sub>ON</sub> | Maximum ON resistance between any two channels |                                          |                                                                                                                                                                                                                                                                                              | 0                                  | 4.5                    | 10                                  |      |      |               |      |                | Ω    |     |
|                  |                                                |                                          |                                                                                                                                                                                                                                                                                              | 0                                  | 6                      | 8.5                                 |      |      |               |      |                |      |     |
|                  |                                                |                                          |                                                                                                                                                                                                                                                                                              | −4.5                               | 4.5                    | 5                                   |      |      |               |      |                |      |     |
| I <sub>IZ</sub>  | Switch ON/OFF leakage current                  | 1 and 2 channels                         | For switch OFF:<br>When V <sub>IS</sub> = V <sub>CC</sub> ,<br>V <sub>OS</sub> = V <sub>EE</sub> ,<br>When V <sub>IS</sub> = V <sub>EE</sub> ,<br>V <sub>OS</sub> = V <sub>CC</sub> .<br>For switch ON:<br>All applicable combinations of V <sub>IS</sub> and V <sub>OS</sub> voltage levels | V <sub>IL</sub> or V <sub>IH</sub> | 0                      | 6                                   | ±0.1 |      | ±1            |      | ±1             | μA   |     |
|                  |                                                | 4053                                     |                                                                                                                                                                                                                                                                                              |                                    | −5                     | 5                                   | ±0.1 |      | ±1            |      | ±1             |      |     |
|                  |                                                | 4 channels                               |                                                                                                                                                                                                                                                                                              |                                    | 0                      | 6                                   | ±0.1 |      | ±1            |      | ±1             |      |     |
|                  |                                                | 4052                                     |                                                                                                                                                                                                                                                                                              |                                    | −5                     | 5                                   | ±0.2 |      | ±2            |      | ±2             |      |     |
|                  |                                                | 8 channels                               |                                                                                                                                                                                                                                                                                              |                                    | 0                      | 6                                   | ±0.2 |      | ±2            |      | ±2             |      |     |
|                  |                                                | 4051                                     |                                                                                                                                                                                                                                                                                              |                                    | −5                     | 5                                   | ±0.4 |      | ±4            |      | ±4             |      |     |
| I <sub>IL</sub>  | Control input leakage current                  |                                          | V <sub>CC</sub> or GND                                                                                                                                                                                                                                                                       | 0                                  | 6                      | ±0.1                                |      | ±1   |               | ±1   | μA             |      |     |
| I <sub>CC</sub>  | Quiescent device current                       | I <sub>O</sub> = 0                       | When V <sub>IS</sub> = V <sub>EE</sub> ,<br>V <sub>OS</sub> = V <sub>CC</sub>                                                                                                                                                                                                                | V <sub>CC</sub> or GND             | 0                      | 6                                   | 8    |      | 80            |      | 160            | μA   |     |
|                  |                                                |                                          | When V <sub>IS</sub> = V <sub>CC</sub> ,<br>V <sub>OS</sub> = V <sub>EE</sub>                                                                                                                                                                                                                |                                    | −5                     | 5                                   | 16   |      | 160           |      | 320            | μA   |     |



## DC Electrical Specifications (Continued)

| PARAMETER                       |                                                                | TEST CONDITIONS                          |                                                                                                                                                                                                                                                                                            |                                    |                        | AMBIENT TEMPERATURE, T <sub>A</sub>            |      |     |               |     |                | UNIT |     |
|---------------------------------|----------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------|------------------------------------------------|------|-----|---------------|-----|----------------|------|-----|
|                                 |                                                                |                                          |                                                                                                                                                                                                                                                                                            |                                    |                        | 25°C                                           |      |     | –40°C to 85°C |     | –55°C to 125°C |      |     |
|                                 |                                                                | V <sub>IS</sub><br>(V)                   | V <sub>I</sub><br>(V)                                                                                                                                                                                                                                                                      | V <sub>EE</sub><br>(V)             | V <sub>CC</sub><br>(V) | MIN                                            | TYP  | MAX | MIN           | MAX | MIN            |      | MAX |
| HCT Types                       |                                                                |                                          |                                                                                                                                                                                                                                                                                            |                                    |                        |                                                |      |     |               |     |                |      |     |
| V <sub>IH</sub>                 | High-level input voltage                                       |                                          |                                                                                                                                                                                                                                                                                            |                                    |                        | 4.5 to 5.5                                     | 2    |     | 2             |     | 2              |      | V   |
| V <sub>IL</sub>                 | Low-level input voltage                                        |                                          |                                                                                                                                                                                                                                                                                            |                                    |                        | 4.5 to 5.5                                     | 0.8  |     | 0.8           |     | 0.8            |      | V   |
| r <sub>ON</sub>                 | ON resistance                                                  | I <sub>O</sub> = 1 mA<br>(see Figure 15) | V <sub>CC</sub> or V <sub>EE</sub>                                                                                                                                                                                                                                                         | V <sub>IL</sub> or V <sub>IH</sub> | 0                      | 4.5                                            | 70   | 160 | 200           |     | 240            |      | Ω   |
|                                 |                                                                |                                          |                                                                                                                                                                                                                                                                                            |                                    | –4.5                   | 4.5                                            | 40   | 120 | 150           |     | 180            |      |     |
|                                 |                                                                |                                          | V <sub>CC</sub> to V <sub>EE</sub>                                                                                                                                                                                                                                                         |                                    | 0                      | 4.5                                            | 90   | 180 | 225           |     | 270            |      |     |
|                                 |                                                                |                                          |                                                                                                                                                                                                                                                                                            |                                    | –4.5                   | 4.5                                            | 45   | 130 | 162           |     | 195            |      |     |
|                                 |                                                                |                                          |                                                                                                                                                                                                                                                                                            |                                    | Δr <sub>ON</sub>       | Maximum ON resistance between any two channels |      |     |               | 0   | 4.5            | 10   |     |
|                                 |                                                                |                                          |                                                                                                                                                                                                                                                                                            |                                    |                        |                                                |      |     |               |     |                |      |     |
|                                 |                                                                |                                          |                                                                                                                                                                                                                                                                                            | –4.5                               | 4.5                    | 5                                              |      |     |               |     |                |      |     |
| I <sub>IZ</sub>                 | Switch ON/OFF leakage current                                  | 1 and 2 channels                         | For switch OFF:<br>When V <sub>IS</sub> = V <sub>CC</sub> ,<br>V <sub>OS</sub> = V <sub>EE</sub> ,<br>When V <sub>IS</sub> = V <sub>EE</sub> ,<br>V <sub>OS</sub> = V <sub>CC</sub><br>For switch ON:<br>All applicable combinations of V <sub>IS</sub> and V <sub>OS</sub> voltage levels | V <sub>IL</sub> or V <sub>IH</sub> | 0                      | 6                                              | ±0.1 |     | ±1            |     | ±1             |      | μA  |
|                                 |                                                                | 4053                                     |                                                                                                                                                                                                                                                                                            |                                    | –5                     | 5                                              | ±0.1 |     | ±1            |     | ±1             |      |     |
|                                 |                                                                | 4 channels                               |                                                                                                                                                                                                                                                                                            |                                    | 0                      | 6                                              | ±0.1 |     | ±1            |     | ±1             |      |     |
|                                 |                                                                | 4052                                     |                                                                                                                                                                                                                                                                                            |                                    | –5                     | 5                                              | ±0.2 |     | ±2            |     | ±2             |      |     |
|                                 |                                                                | 8 channels                               |                                                                                                                                                                                                                                                                                            |                                    | 0                      | 6                                              | ±0.2 |     | ±2            |     | ±2             |      |     |
|                                 |                                                                | 4051                                     |                                                                                                                                                                                                                                                                                            |                                    | –5                     | 5                                              | ±0.4 |     | ±4            |     | ±4             |      |     |
| I <sub>IL</sub>                 | Control input leakage current                                  |                                          |                                                                                                                                                                                                                                                                                            | (1)                                |                        | 5.5                                            | ±0.1 |     | ±1            |     | ±1             |      | μA  |
| I <sub>CC</sub>                 | Quiescent device current                                       | I <sub>O</sub> = 0                       | When V <sub>IS</sub> = V <sub>EE</sub> ,<br>V <sub>OS</sub> = V <sub>CC</sub>                                                                                                                                                                                                              | V <sub>CC</sub> or GND             | 0                      | 5.5                                            | 8    |     | 80            |     | 160            |      | μA  |
|                                 |                                                                |                                          | When V <sub>IS</sub> = V <sub>CC</sub> ,<br>V <sub>OS</sub> = V <sub>EE</sub>                                                                                                                                                                                                              |                                    | –4.5                   | 5.5                                            | 16   |     | 160           |     | 320            |      | μA  |
| ΔI <sub>CC</sub> <sup>(2)</sup> | Additional quiescent device current per input pin: 1 unit load |                                          | ΔI <sub>CC</sub> <sup>(2)</sup>                                                                                                                                                                                                                                                            | V <sub>CC</sub> – 2.1              |                        | 4.5 to 5.5                                     | 100  | 360 | 450           |     | 490            |      | μA  |

(1) Any voltage between V<sub>CC</sub> and GND

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

**Table 4. HCT INPUT LOADING TABLE**

| TYPE       | INPUT | UNIT LOADS <sup>(1)</sup> |
|------------|-------|---------------------------|
| 4051, 4053 | All   | 0.5                       |
| 4052       | All   | 0.4                       |

(1) Unit load is  $\Delta I_{CC}$  limit specified in DC Specifications table, e.g., 360 mA MAX at 25°C.

## Switching Specifications

$V_{CC} = 5\text{ V}$ ,  $T_A = 25^\circ\text{C}$ , input  $t_r$ ,  $t_f = 6\text{ ns}$

| PARAMETER                           |                               | TEST CONDITIONS          | CL<br>(pF) | TYPICAL |     |      |     |      |     | UNIT |
|-------------------------------------|-------------------------------|--------------------------|------------|---------|-----|------|-----|------|-----|------|
|                                     |                               |                          |            | 4051    |     | 4052 |     | 4053 |     |      |
|                                     |                               |                          |            | HC      | HCT | HC   | HCT | HC   | HCT |      |
| t <sub>PHL</sub> , t <sub>PLH</sub> | Propagation delay             | Switch IN to OUT         | 15         | 4       | 4   | 4    | 4   | 4    | 4   | ns   |
| t <sub>PHZ</sub> , t <sub>PLZ</sub> |                               | Switch turn-off (S or E) | 15         | 19      | 19  | 21   | 21  | 18   | 18  |      |
| t <sub>PZH</sub> , t <sub>PZL</sub> |                               | Switch turn-on (S or E)  | 15         | 19      | 23  | 27   | 29  | 18   | 20  |      |
| C <sub>PD</sub> <sup>(1)</sup>      | Power dissipation capacitance |                          |            | 50      | 52  | 74   | 76  | 38   | 42  | pF   |

(1)  $C_{PD}$  is used to determine the dynamic power consumption, per package.

$$P_D = C_{PD} V_{CC}^2 f_i + \sum (C_L + C_S) V_{CC}^2 f_O$$

$f_O$  = output frequency

$f_i$  = input frequency

$C_L$  = output load capacitance

$C_S$  = switch capacitance

$V_{CC}$  = supply voltage

## Switching Specifications

 $C_L = 50 \text{ pF}$ , input  $t_r$ ,  $t_f = 6 \text{ ns}$ 

| PARAMETER                              |                                                                          | V <sub>EE</sub><br>(V) | V <sub>CC</sub><br>(V) | AMBIENT TEMPERATURE, T <sub>A</sub> |     |     |     |               |     |     |     |                |     |     |     | UNIT |    |
|----------------------------------------|--------------------------------------------------------------------------|------------------------|------------------------|-------------------------------------|-----|-----|-----|---------------|-----|-----|-----|----------------|-----|-----|-----|------|----|
|                                        |                                                                          |                        |                        | 25°C                                |     |     |     | –40°C to 85°C |     |     |     | –55°C to 125°C |     |     |     |      |    |
|                                        |                                                                          |                        |                        | HC                                  |     | HCT |     | HC            |     | HCT |     | HC             |     | HCT |     |      |    |
|                                        |                                                                          |                        |                        | MIN                                 | MAX | MIN | MAX | MIN           | MAX | MIN | MAX | MIN            | MAX | MIN | MAX |      |    |
| t <sub>PLH</sub> ,<br>t <sub>PHL</sub> | Propagation delay,<br>switch in to out                                   | 0                      | 2                      | 60                                  |     |     |     | 75            |     |     |     | 90             |     |     |     | ns   |    |
|                                        |                                                                          | 0                      | 4.5                    | 12                                  |     | 12  |     | 15            |     | 15  |     | 18             |     | 18  |     |      |    |
|                                        |                                                                          | 0                      | 6                      | 10                                  |     |     |     | 13            |     |     |     | 15             |     |     |     |      |    |
|                                        |                                                                          | –4.5                   | 4.5                    | 8                                   |     | 8   |     | 10            |     | 10  |     | 12             |     | 12  |     |      |    |
| t <sub>PHZ</sub> ,<br>t <sub>PLZ</sub> | Maximum switch turn<br>OFF delay from S or $\bar{E}$ to<br>switch output | 4051                   | 0                      | 2                                   | 225 |     |     |               | 280 |     |     |                | 340 |     |     |      | ns |
|                                        |                                                                          |                        | 0                      | 4.5                                 | 45  |     | 45  |               | 56  |     | 56  |                | 68  |     | 68  |      |    |
|                                        |                                                                          |                        | 0                      | 6                                   | 38  |     |     |               | 48  |     |     |                | 57  |     |     |      |    |
|                                        |                                                                          |                        | –4.5                   | 4.5                                 | 32  |     | 32  |               | 40  |     | 40  |                | 48  |     | 48  |      |    |
|                                        |                                                                          | 4052                   | 0                      | 2                                   | 250 |     |     |               | 315 |     |     |                | 375 |     |     |      |    |
|                                        |                                                                          |                        | 0                      | 4.5                                 | 50  |     | 50  |               | 63  |     | 63  |                | 75  |     | 75  |      |    |
|                                        |                                                                          |                        | 0                      | 6                                   | 43  |     |     |               | 54  |     |     |                | 65  |     |     |      |    |
|                                        |                                                                          |                        | –4.5                   | 4.5                                 | 38  |     | 38  |               | 48  |     | 48  |                | 57  |     | 57  |      |    |
|                                        |                                                                          | 4053                   | 0                      | 2                                   | 210 |     |     |               | 265 |     |     |                | 315 |     |     |      |    |
|                                        |                                                                          |                        | 0                      | 4.5                                 | 42  |     | 44  |               | 53  |     | 55  |                | 63  |     | 66  |      |    |
|                                        |                                                                          |                        | 0                      | 6                                   | 36  |     |     |               | 45  |     |     |                | 54  |     |     |      |    |
|                                        |                                                                          |                        | –4.5                   | 4.5                                 | 29  |     | 31  |               | 36  |     | 39  |                | 44  |     | 47  |      |    |
| t <sub>PZL</sub> ,<br>t <sub>PZH</sub> | Maximum switch turn<br>ON delay from S or $\bar{E}$ to<br>switch output  | 4051                   | 0                      | 2                                   | 225 |     |     |               | 280 |     |     |                | 340 |     |     |      | ns |
|                                        |                                                                          |                        | 0                      | 4.5                                 | 45  |     | 55  |               | 56  |     | 69  |                | 68  |     | 83  |      |    |
|                                        |                                                                          |                        | 0                      | 6                                   | 38  |     |     |               | 48  |     |     |                | 57  |     |     |      |    |
|                                        |                                                                          |                        | –4.5                   | 4.5                                 | 32  |     | 39  |               | 40  |     | 49  |                | 48  |     | 59  |      |    |
|                                        |                                                                          | 4052                   | 0                      | 2                                   | 325 |     |     |               | 405 |     |     |                | 490 |     |     |      |    |
|                                        |                                                                          |                        | 0                      | 4.5                                 | 65  |     | 70  |               | 81  |     | 68  |                | 98  |     | 105 |      |    |
|                                        |                                                                          |                        | 0                      | 6                                   | 55  |     |     |               | 69  |     |     |                | 83  |     |     |      |    |
|                                        |                                                                          |                        | –4.5                   | 4.5                                 | 46  |     | 48  |               | 58  |     | 60  |                | 69  |     | 72  |      |    |
|                                        |                                                                          | 4053                   | 0                      | 2                                   | 220 |     |     |               | 275 |     |     |                | 330 |     |     |      |    |
|                                        |                                                                          |                        | 0                      | 4.5                                 | 44  |     | 48  |               | 55  |     | 60  |                | 66  |     | 72  |      |    |
|                                        |                                                                          |                        | 0                      | 6                                   | 37  |     |     |               | 47  |     |     |                | 56  |     |     |      |    |
|                                        |                                                                          |                        | –4.5                   | 4.5                                 | 31  |     | 34  |               | 39  |     | 43  |                | 47  |     | 51  |      |    |
| C <sub>I</sub>                         | Input (control)<br>capacitance                                           |                        |                        | 10                                  |     | 10  |     | 10            |     | 10  |     | 10             |     | 10  |     | pF   |    |

## Analog Channel Specifications

Typical values at  $T_A = 25^\circ\text{C}$

| PARAMETER                                                                     | TEST CONDITIONS                            | HC/HCT TYPES | $V_{EE}$<br>(V) | $V_{CC}$<br>(V) | HC/HCT | UNIT |
|-------------------------------------------------------------------------------|--------------------------------------------|--------------|-----------------|-----------------|--------|------|
| $C_i$ Switch input capacitance                                                |                                            | All          |                 |                 | 5      | pF   |
| $C_{COM}$ Common output capacitance                                           |                                            | 4051         |                 |                 | 25     | pF   |
|                                                                               |                                            | 4052         |                 |                 | 12     |      |
|                                                                               |                                            | 4053         |                 |                 | 8      |      |
| $f_{MAX}$ Minimum switch frequency response at –3 dB (see Figures 12, 14, 16) | See Figure 3 <sup>(1)</sup> <sup>(2)</sup> | 4051         | –2.25           | 2.25            | 145    | MHz  |
|                                                                               |                                            | 4052         |                 |                 | 165    |      |
|                                                                               |                                            | 4053         |                 |                 | 200    |      |
|                                                                               |                                            | 4051         | –4.5            | 4.5             | 180    |      |
|                                                                               |                                            | 4052         |                 |                 | 185    |      |
|                                                                               |                                            | 4053         |                 |                 | 200    |      |
| Sine-wave distortion                                                          | See Figure 5                               | All          | –2.25           | 2.25            | 0.035  | %    |
|                                                                               |                                            | All          | –4.5            | 4.5             | 0.018  |      |
| Switch OFF signal feedthrough (see Figures 13, 15, 17)                        | See Figure 7 <sup>(2)</sup> <sup>(3)</sup> | 4051         | –2.25           | 2.25            | –73    | dB   |
|                                                                               |                                            | 4052         |                 |                 | –65    |      |
|                                                                               |                                            | 4053         |                 |                 | –64    |      |
|                                                                               |                                            | 4051         | –4.5            | 4.5             | –75    |      |
|                                                                               |                                            | 4052         |                 |                 | –67    |      |
|                                                                               |                                            | 4053         |                 |                 | –66    |      |

(1) Adjust input voltage to obtain 0 dBm at  $V_{OS}$  for  $f_{IN} = 1$  MHz

(2)  $V_{IS}$  is centered at  $(V_{CC} - V_{EE})/2$ .

(3) Adjust input for 0 dBm

## APPLICATION INFORMATION

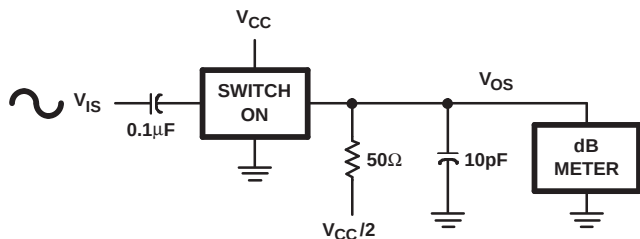


Figure 3. Frequency Response Test Circuit

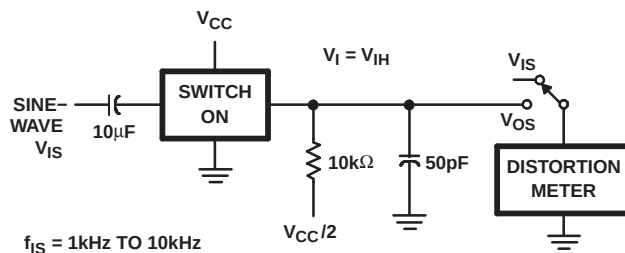


Figure 5. Sine-Wave Distortion Test Circuit

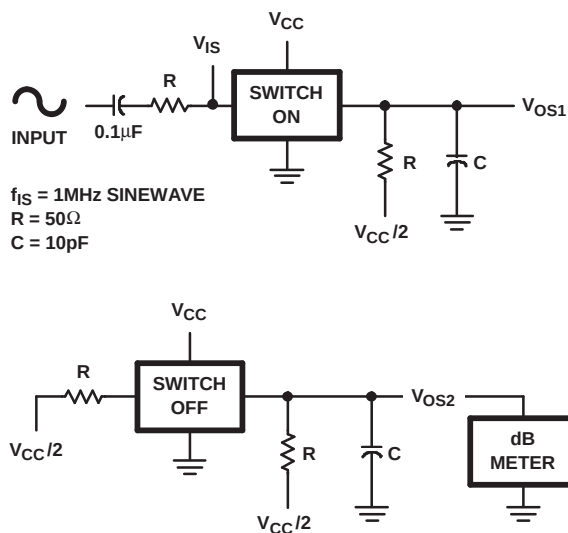


Figure 4. Crosstalk Between Two Switches Test Circuit

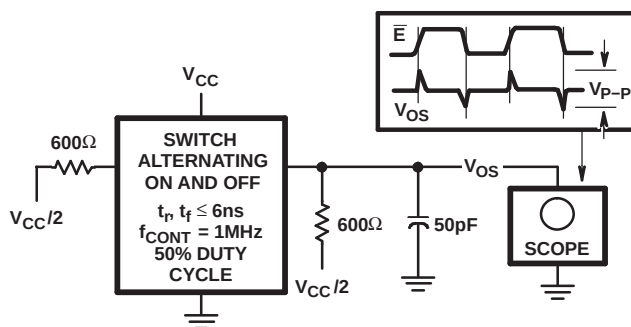


Figure 6. Control to Switch Feedthrough Noise Test Circuit

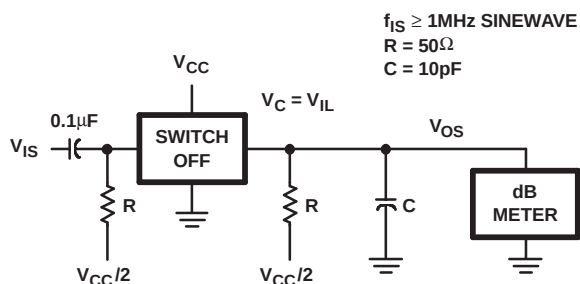


Figure 7. Switch OFF Signal Feedthrough

## APPLICATION INFORMATION

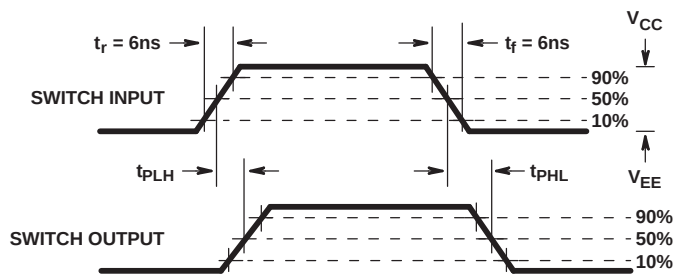


FIGURE 8A.

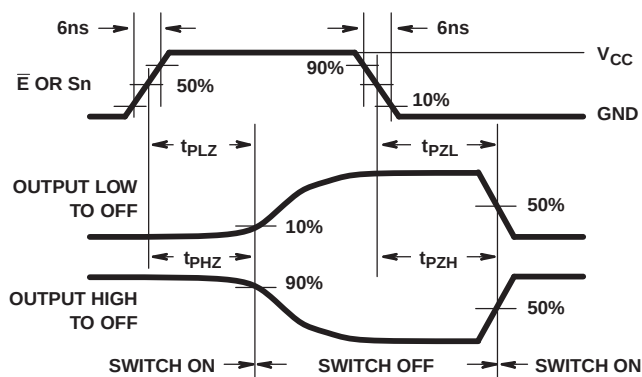


FIGURE 8B. HC TYPES

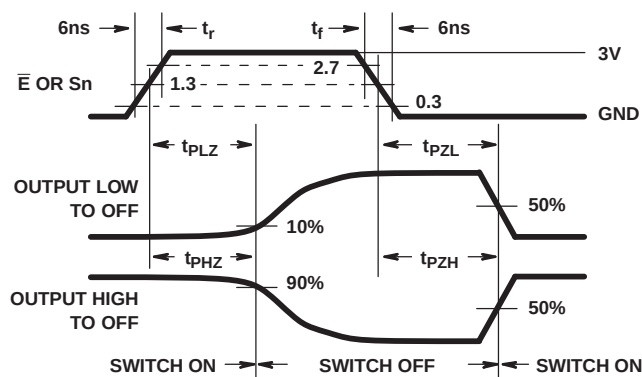


FIGURE 8C. HCT TYPES

Figure 8. Switch Propagation Delay, Turn-On, Turn-Off Times

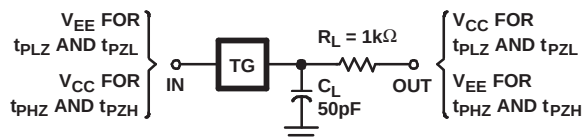


Figure 9. Switch ON/OFF Propagation Delay Test Circuit

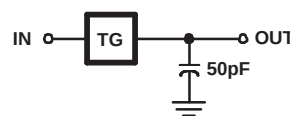
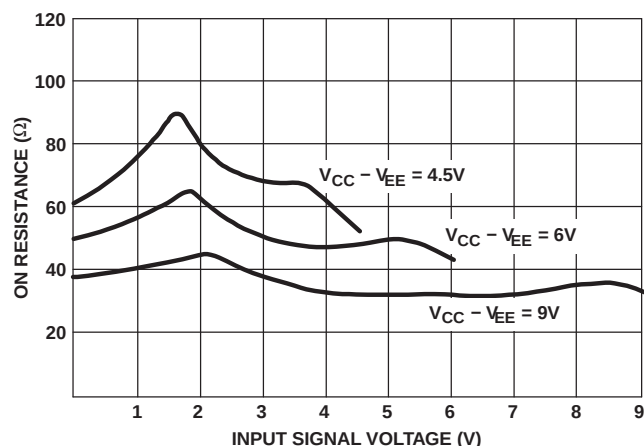
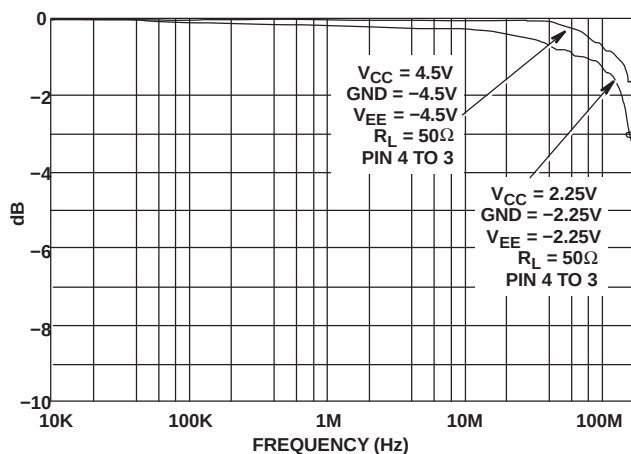


Figure 10. Switch In to Switch Out Propagation Delay Test Circuit

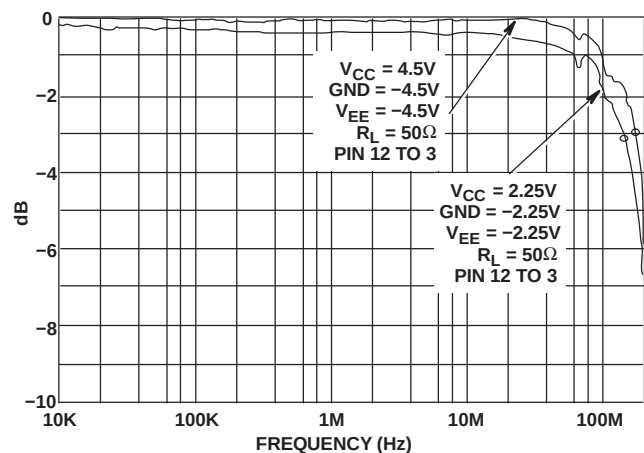
## TYPICAL PERFORMANCE CURVES



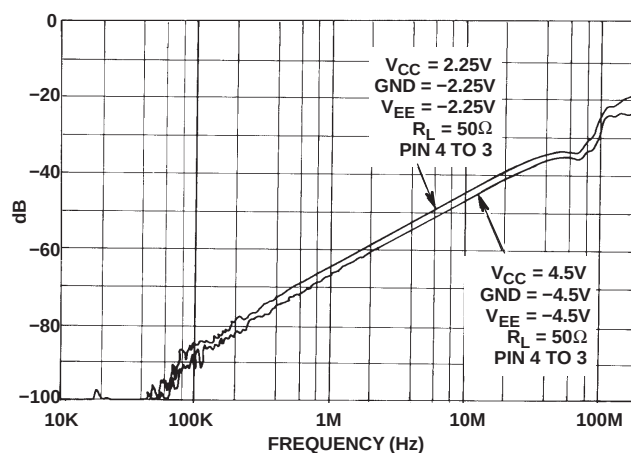
**Figure 11. Typical ON Resistance vs Input Signal Voltage**



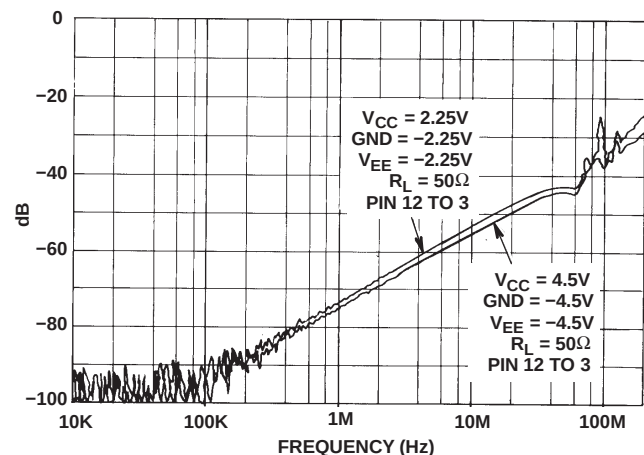
**Figure 14. Channel ON Bandwidth (HC/HCT4052)**



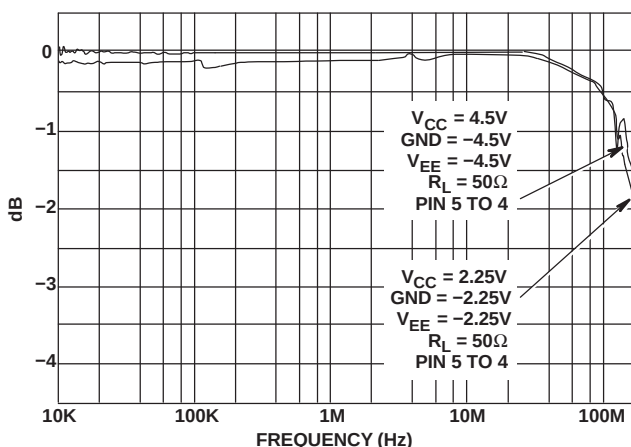
**Figure 12. Channel ON Bandwidth (HC/HCT4051)**



**Figure 15. Channel OFF Feedthrough (HC/HCT4052)**



**Figure 13. Channel OFF Feedthrough (HC/HCT4051)**



**Figure 16. Channel ON Bandwidth (HC/HCT4053)**

## TYPICAL PERFORMANCE CURVES

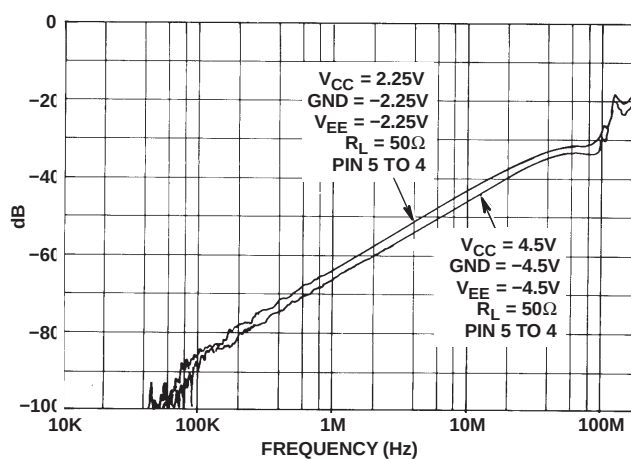


Figure 17. Channel OFF Feedthrough (HC/HCT4053)



**PACKAGING INFORMATION**

| Orderable Device | Status<br>(1) | Package Type | Package<br>Drawing | Pins | Package<br>Qty | Eco Plan<br>(2)            | Lead/Ball Finish | MSL Peak Temp<br>(3) | Op Temp (°C) | Device Marking<br>(4/5)               | Samples                 |
|------------------|---------------|--------------|--------------------|------|----------------|----------------------------|------------------|----------------------|--------------|---------------------------------------|-------------------------|
| 5962-8775401EA   | ACTIVE        | CDIP         | J                  | 16   | 1              | TBD                        | A42              | N / A for Pkg Type   | -55 to 125   | 5962-8775401EA<br>CD54HC4053F3A       | <a href="#">Samples</a> |
| 5962-8855601EA   | ACTIVE        | CDIP         | J                  | 16   | 1              | TBD                        | A42              | N / A for Pkg Type   | -55 to 125   | 5962-8855601EA<br>CD54HC4052F3A       | <a href="#">Samples</a> |
| 5962-9065401MEA  | ACTIVE        | CDIP         | J                  | 16   | 1              | TBD                        | A42              | N / A for Pkg Type   | -55 to 125   | 5962-9065401ME<br>A<br>CD54HCT4051F3A | <a href="#">Samples</a> |
| CD54HC4051F      | ACTIVE        | CDIP         | J                  | 16   | 1              | TBD                        | A42              | N / A for Pkg Type   | -55 to 125   | CD54HC4051F                           | <a href="#">Samples</a> |
| CD54HC4051F3A    | ACTIVE        | CDIP         | J                  | 16   | 1              | TBD                        | A42              | N / A for Pkg Type   | -55 to 125   | CD54HC4051F3A                         | <a href="#">Samples</a> |
| CD54HC4052F      | ACTIVE        | CDIP         | J                  | 16   | 1              | TBD                        | A42              | N / A for Pkg Type   | -55 to 125   | CD54HC4052F                           | <a href="#">Samples</a> |
| CD54HC4052F3A    | ACTIVE        | CDIP         | J                  | 16   | 1              | TBD                        | A42              | N / A for Pkg Type   | -55 to 125   | 5962-8855601EA<br>CD54HC4052F3A       | <a href="#">Samples</a> |
| CD54HC4053F      | ACTIVE        | CDIP         | J                  | 16   | 1              | TBD                        | A42              | N / A for Pkg Type   | -55 to 125   | CD54HC4053F                           | <a href="#">Samples</a> |
| CD54HC4053F3A    | ACTIVE        | CDIP         | J                  | 16   | 1              | TBD                        | A42              | N / A for Pkg Type   | -55 to 125   | 5962-8775401EA<br>CD54HC4053F3A       | <a href="#">Samples</a> |
| CD54HCT4051F3A   | ACTIVE        | CDIP         | J                  | 16   | 1              | TBD                        | A42              | N / A for Pkg Type   | -55 to 125   | 5962-9065401ME<br>A<br>CD54HCT4051F3A | <a href="#">Samples</a> |
| CD74HC4051E      | ACTIVE        | PDIP         | N                  | 16   | 25             | Pb-Free<br>(RoHS)          | CU NIPDAU        | N / A for Pkg Type   | -55 to 125   | CD74HC4051E                           | <a href="#">Samples</a> |
| CD74HC4051EE4    | ACTIVE        | PDIP         | N                  | 16   | 25             | Pb-Free<br>(RoHS)          | CU NIPDAU        | N / A for Pkg Type   | -55 to 125   | CD74HC4051E                           | <a href="#">Samples</a> |
| CD74HC4051M      | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4051M                               | <a href="#">Samples</a> |
| CD74HC4051M96    | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4051M                               | <a href="#">Samples</a> |
| CD74HC4051M96E4  | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4051M                               | <a href="#">Samples</a> |
| CD74HC4051M96G3  | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU SN            | Level-1-260C-UNLIM   | -55 to 125   | HC4051M                               | <a href="#">Samples</a> |
| CD74HC4051M96G4  | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4051M                               | <a href="#">Samples</a> |

| Orderable Device | Status<br>(1) | Package Type | Package<br>Drawing | Pins | Package<br>Qty | Eco Plan<br>(2)            | Lead/Ball Finish | MSL Peak Temp<br>(3) | Op Temp (°C) | Device Marking<br>(4/5) | Samples                 |
|------------------|---------------|--------------|--------------------|------|----------------|----------------------------|------------------|----------------------|--------------|-------------------------|-------------------------|
| CD74HC4051ME4    | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4051M                 | <a href="#">Samples</a> |
| CD74HC4051MG4    | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4051M                 | <a href="#">Samples</a> |
| CD74HC4051MT     | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4051M                 | <a href="#">Samples</a> |
| CD74HC4051MTE4   | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4051M                 | <a href="#">Samples</a> |
| CD74HC4051MTG4   | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4051M                 | <a href="#">Samples</a> |
| CD74HC4051NSR    | ACTIVE        | SO           | NS                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4051M                 | <a href="#">Samples</a> |
| CD74HC4051NSRE4  | ACTIVE        | SO           | NS                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4051M                 | <a href="#">Samples</a> |
| CD74HC4051NSRG4  | ACTIVE        | SO           | NS                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4051M                 | <a href="#">Samples</a> |
| CD74HC4051PWR    | ACTIVE        | TSSOP        | PW                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4051                  | <a href="#">Samples</a> |
| CD74HC4051PWRE4  | ACTIVE        | TSSOP        | PW                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4051                  | <a href="#">Samples</a> |
| CD74HC4051PWRG4  | ACTIVE        | TSSOP        | PW                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4051                  | <a href="#">Samples</a> |
| CD74HC4051PWT    | ACTIVE        | TSSOP        | PW                 | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4051                  | <a href="#">Samples</a> |
| CD74HC4051PWTE4  | ACTIVE        | TSSOP        | PW                 | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4051                  | <a href="#">Samples</a> |
| CD74HC4051PWTG4  | ACTIVE        | TSSOP        | PW                 | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4051                  | <a href="#">Samples</a> |
| CD74HC4052E      | ACTIVE        | PDIP         | N                  | 16   | 25             | Pb-Free<br>(RoHS)          | CU NIPDAU        | N / A for Pkg Type   | -55 to 125   | CD74HC4052E             | <a href="#">Samples</a> |
| CD74HC4052EE4    | ACTIVE        | PDIP         | N                  | 16   | 25             | Pb-Free<br>(RoHS)          | CU NIPDAU        | N / A for Pkg Type   | -55 to 125   | CD74HC4052E             | <a href="#">Samples</a> |
| CD74HC4052M      | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4052M                 | <a href="#">Samples</a> |
| CD74HC4052M96    | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4052M                 | <a href="#">Samples</a> |

| Orderable Device | Status<br>(1) | Package Type | Package<br>Drawing | Pins | Package<br>Qty | Eco Plan<br>(2)            | Lead/Ball Finish | MSL Peak Temp<br>(3) | Op Temp (°C) | Device Marking<br>(4/5) | Samples                 |
|------------------|---------------|--------------|--------------------|------|----------------|----------------------------|------------------|----------------------|--------------|-------------------------|-------------------------|
| CD74HC4052M96E4  | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4052M                 | <a href="#">Samples</a> |
| CD74HC4052M96G4  | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4052M                 | <a href="#">Samples</a> |
| CD74HC4052ME4    | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4052M                 | <a href="#">Samples</a> |
| CD74HC4052MG4    | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4052M                 | <a href="#">Samples</a> |
| CD74HC4052MT     | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4052M                 | <a href="#">Samples</a> |
| CD74HC4052MTE4   | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4052M                 | <a href="#">Samples</a> |
| CD74HC4052MTG4   | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4052M                 | <a href="#">Samples</a> |
| CD74HC4052NSR    | ACTIVE        | SO           | NS                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4052M                 | <a href="#">Samples</a> |
| CD74HC4052NSRE4  | ACTIVE        | SO           | NS                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4052M                 | <a href="#">Samples</a> |
| CD74HC4052NSRG4  | ACTIVE        | SO           | NS                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4052M                 | <a href="#">Samples</a> |
| CD74HC4052PW     | ACTIVE        | TSSOP        | PW                 | 16   | 90             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4052                  | <a href="#">Samples</a> |
| CD74HC4052PWE4   | ACTIVE        | TSSOP        | PW                 | 16   | 90             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4052                  | <a href="#">Samples</a> |
| CD74HC4052PWG4   | ACTIVE        | TSSOP        | PW                 | 16   | 90             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4052                  | <a href="#">Samples</a> |
| CD74HC4052PWR    | ACTIVE        | TSSOP        | PW                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4052                  | <a href="#">Samples</a> |
| CD74HC4052PWRE4  | ACTIVE        | TSSOP        | PW                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4052                  | <a href="#">Samples</a> |
| CD74HC4052PWRG4  | ACTIVE        | TSSOP        | PW                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4052                  | <a href="#">Samples</a> |
| CD74HC4052PWT    | ACTIVE        | TSSOP        | PW                 | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4052                  | <a href="#">Samples</a> |
| CD74HC4052PWTE4  | ACTIVE        | TSSOP        | PW                 | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4052                  | <a href="#">Samples</a> |

| Orderable Device | Status<br>(1) | Package Type | Package<br>Drawing | Pins | Package<br>Qty | Eco Plan<br>(2)            | Lead/Ball Finish | MSL Peak Temp<br>(3) | Op Temp (°C) | Device Marking<br>(4/5) | Samples                 |
|------------------|---------------|--------------|--------------------|------|----------------|----------------------------|------------------|----------------------|--------------|-------------------------|-------------------------|
| CD74HC4052PWTG4  | ACTIVE        | TSSOP        | PW                 | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4052                  | <a href="#">Samples</a> |
| CD74HC4053E      | ACTIVE        | PDIP         | N                  | 16   | 25             | Pb-Free<br>(RoHS)          | CU NIPDAU        | N / A for Pkg Type   | -55 to 125   | CD74HC4053E             | <a href="#">Samples</a> |
| CD74HC4053EE4    | ACTIVE        | PDIP         | N                  | 16   | 25             | Pb-Free<br>(RoHS)          | CU NIPDAU        | N / A for Pkg Type   | -55 to 125   | CD74HC4053E             | <a href="#">Samples</a> |
| CD74HC4053M      | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4053M                 | <a href="#">Samples</a> |
| CD74HC4053M96    | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4053M                 | <a href="#">Samples</a> |
| CD74HC4053M96E4  | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4053M                 | <a href="#">Samples</a> |
| CD74HC4053M96G3  | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU SN            | Level-1-260C-UNLIM   | -55 to 125   | HC4053M                 | <a href="#">Samples</a> |
| CD74HC4053M96G4  | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4053M                 | <a href="#">Samples</a> |
| CD74HC4053ME4    | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4053M                 | <a href="#">Samples</a> |
| CD74HC4053MG4    | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4053M                 | <a href="#">Samples</a> |
| CD74HC4053MT     | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4053M                 | <a href="#">Samples</a> |
| CD74HC4053MTE4   | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4053M                 | <a href="#">Samples</a> |
| CD74HC4053MTG4   | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4053M                 | <a href="#">Samples</a> |
| CD74HC4053NSR    | ACTIVE        | SO           | NS                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4053M                 | <a href="#">Samples</a> |
| CD74HC4053NSRG4  | ACTIVE        | SO           | NS                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HC4053M                 | <a href="#">Samples</a> |
| CD74HC4053PW     | ACTIVE        | TSSOP        | PW                 | 16   | 90             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4053                  | <a href="#">Samples</a> |
| CD74HC4053PWE4   | ACTIVE        | TSSOP        | PW                 | 16   | 90             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4053                  | <a href="#">Samples</a> |
| CD74HC4053PWG4   | ACTIVE        | TSSOP        | PW                 | 16   | 90             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4053                  | <a href="#">Samples</a> |

| Orderable Device | Status<br>(1) | Package Type | Package<br>Drawing | Pins | Package<br>Qty | Eco Plan<br>(2)            | Lead/Ball Finish | MSL Peak Temp<br>(3) | Op Temp (°C) | Device Marking<br>(4/5) | Samples                 |
|------------------|---------------|--------------|--------------------|------|----------------|----------------------------|------------------|----------------------|--------------|-------------------------|-------------------------|
| CD74HC4053PWR    | ACTIVE        | TSSOP        | PW                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4053                  | <a href="#">Samples</a> |
| CD74HC4053PWRE4  | ACTIVE        | TSSOP        | PW                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4053                  | <a href="#">Samples</a> |
| CD74HC4053PWRG4  | ACTIVE        | TSSOP        | PW                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4053                  | <a href="#">Samples</a> |
| CD74HC4053PWT    | ACTIVE        | TSSOP        | PW                 | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4053                  | <a href="#">Samples</a> |
| CD74HC4053PWTE4  | ACTIVE        | TSSOP        | PW                 | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4053                  | <a href="#">Samples</a> |
| CD74HC4053PWTG4  | ACTIVE        | TSSOP        | PW                 | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HJ4053                  | <a href="#">Samples</a> |
| CD74HCT4051E     | ACTIVE        | PDIP         | N                  | 16   | 25             | Pb-Free<br>(RoHS)          | CU NIPDAU        | N / A for Pkg Type   | -55 to 125   | CD74HCT4051E            | <a href="#">Samples</a> |
| CD74HCT4051EE4   | ACTIVE        | PDIP         | N                  | 16   | 25             | Pb-Free<br>(RoHS)          | CU NIPDAU        | N / A for Pkg Type   | -55 to 125   | CD74HCT4051E            | <a href="#">Samples</a> |
| CD74HCT4051M     | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4051M                | <a href="#">Samples</a> |
| CD74HCT4051M96   | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4051M                | <a href="#">Samples</a> |
| CD74HCT4051M96E4 | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4051M                | <a href="#">Samples</a> |
| CD74HCT4051M96G4 | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4051M                | <a href="#">Samples</a> |
| CD74HCT4051ME4   | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4051M                | <a href="#">Samples</a> |
| CD74HCT4051MG4   | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4051M                | <a href="#">Samples</a> |
| CD74HCT4051MT    | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4051M                | <a href="#">Samples</a> |
| CD74HCT4051MTE4  | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4051M                | <a href="#">Samples</a> |
| CD74HCT4051MTG4  | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4051M                | <a href="#">Samples</a> |
| CD74HCT4052E     | ACTIVE        | PDIP         | N                  | 16   | 25             | Pb-Free<br>(RoHS)          | CU NIPDAU        | N / A for Pkg Type   | -55 to 125   | CD74HCT4052E            | <a href="#">Samples</a> |

| Orderable Device | Status<br>(1) | Package Type | Package<br>Drawing | Pins | Package<br>Qty | Eco Plan<br>(2)            | Lead/Ball Finish | MSL Peak Temp<br>(3) | Op Temp (°C) | Device Marking<br>(4/5) | Samples                 |
|------------------|---------------|--------------|--------------------|------|----------------|----------------------------|------------------|----------------------|--------------|-------------------------|-------------------------|
| CD74HCT4052EE4   | ACTIVE        | PDIP         | N                  | 16   | 25             | Pb-Free<br>(RoHS)          | CU NIPDAU        | N / A for Pkg Type   | -55 to 125   | CD74HCT4052E            | <a href="#">Samples</a> |
| CD74HCT4052M     | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4052M                | <a href="#">Samples</a> |
| CD74HCT4052M96   | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4052M                | <a href="#">Samples</a> |
| CD74HCT4052M96E4 | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4052M                | <a href="#">Samples</a> |
| CD74HCT4052M96G4 | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4052M                | <a href="#">Samples</a> |
| CD74HCT4052ME4   | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4052M                | <a href="#">Samples</a> |
| CD74HCT4052MG4   | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4052M                | <a href="#">Samples</a> |
| CD74HCT4052MT    | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4052M                | <a href="#">Samples</a> |
| CD74HCT4052MTE4  | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4052M                | <a href="#">Samples</a> |
| CD74HCT4052MTG4  | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4052M                | <a href="#">Samples</a> |
| CD74HCT4053E     | ACTIVE        | PDIP         | N                  | 16   | 25             | Pb-Free<br>(RoHS)          | CU NIPDAU        | N / A for Pkg Type   | -55 to 125   | CD74HCT4053E            | <a href="#">Samples</a> |
| CD74HCT4053EE4   | ACTIVE        | PDIP         | N                  | 16   | 25             | Pb-Free<br>(RoHS)          | CU NIPDAU        | N / A for Pkg Type   | -55 to 125   | CD74HCT4053E            | <a href="#">Samples</a> |
| CD74HCT4053M     | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4053M                | <a href="#">Samples</a> |
| CD74HCT4053M96   | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4053M                | <a href="#">Samples</a> |
| CD74HCT4053M96E4 | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4053M                | <a href="#">Samples</a> |
| CD74HCT4053M96G4 | ACTIVE        | SOIC         | D                  | 16   | 2500           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4053M                | <a href="#">Samples</a> |
| CD74HCT4053ME4   | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4053M                | <a href="#">Samples</a> |
| CD74HCT4053MG4   | ACTIVE        | SOIC         | D                  | 16   | 40             | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4053M                | <a href="#">Samples</a> |

| Orderable Device | Status<br>(1) | Package Type | Package<br>Drawing | Pins | Package<br>Qty | Eco Plan<br>(2)            | Lead/Ball Finish | MSL Peak Temp<br>(3) | Op Temp (°C) | Device Marking<br>(4/5) | Samples                 |
|------------------|---------------|--------------|--------------------|------|----------------|----------------------------|------------------|----------------------|--------------|-------------------------|-------------------------|
| CD74HCT4053MT    | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4053M                | <a href="#">Samples</a> |
| CD74HCT4053MTE4  | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4053M                | <a href="#">Samples</a> |
| CD74HCT4053MTG4  | ACTIVE        | SOIC         | D                  | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HCT4053M                | <a href="#">Samples</a> |
| CD74HCT4053PWR   | ACTIVE        | TSSOP        | PW                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HK4053                  | <a href="#">Samples</a> |
| CD74HCT4053PWRE4 | ACTIVE        | TSSOP        | PW                 | 16   |                | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HK4053                  | <a href="#">Samples</a> |
| CD74HCT4053PWRG4 | ACTIVE        | TSSOP        | PW                 | 16   | 2000           | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HK4053                  | <a href="#">Samples</a> |
| CD74HCT4053PWT   | ACTIVE        | TSSOP        | PW                 | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HK4053                  | <a href="#">Samples</a> |
| CD74HCT4053PWTE4 | ACTIVE        | TSSOP        | PW                 | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HK4053                  | <a href="#">Samples</a> |
| CD74HCT4053PWTG4 | ACTIVE        | TSSOP        | PW                 | 16   | 250            | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | HK4053                  | <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) 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)

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



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

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

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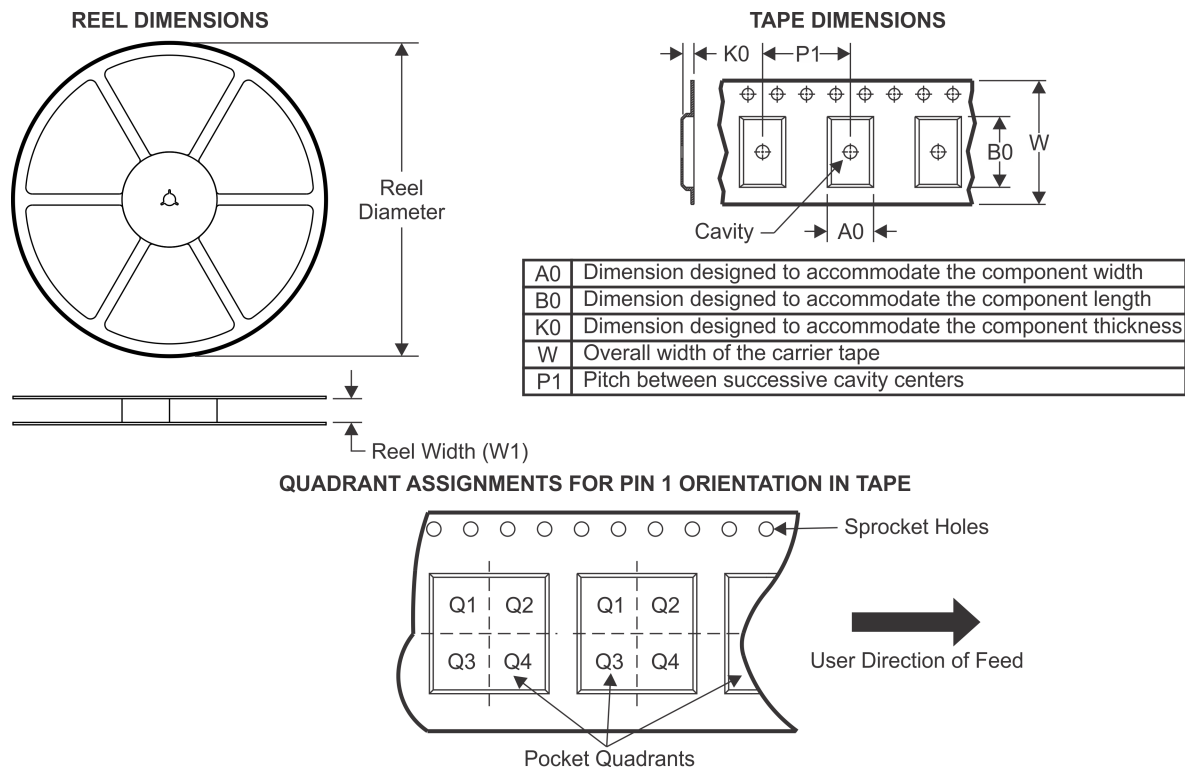
**OTHER QUALIFIED VERSIONS OF CD54HC4051, CD54HC4052, CD54HC4053, CD54HCT4051, CD74HC4051, CD74HC4052, CD74HC4053, CD74HCT4051 :**

- Catalog: [CD74HC4051](#), [CD74HC4052](#), [CD74HC4053](#), [CD74HCT4051](#)
- Automotive: [CD74HC4051-Q1](#), [CD74HCT4051-Q1](#), [CD74HC4051-Q1](#), [CD74HCT4051-Q1](#)
- Enhanced Product: [CD74HC4051-EP](#), [CD74HC4051-EP](#)
- Military: [CD54HC4051](#), [CD54HC4052](#), [CD54HC4053](#), [CD54HCT4051](#)

**NOTE: Qualified Version Definitions:**

- Catalog - TI's standard catalog product
- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects
- Enhanced Product - Supports Defense, Aerospace and Medical Applications
- Military - QML certified for Military and Defense Applications



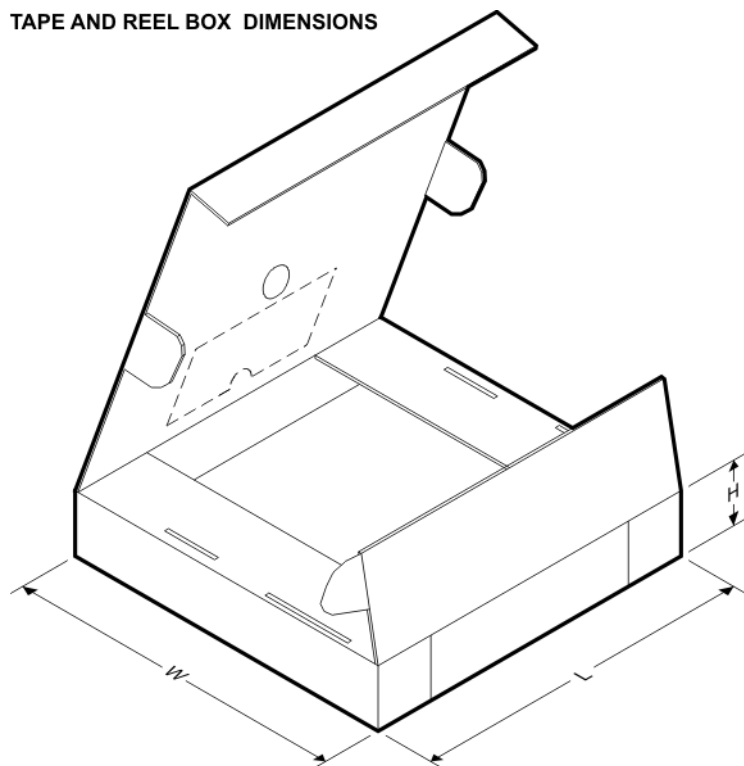
**TAPE AND REEL INFORMATION**


\*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 |
|-----------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| CD74HC4051M96   | SOIC         | D               | 16   | 2500 | 330.0              | 16.8               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |
| CD74HC4051M96G4 | SOIC         | D               | 16   | 2500 | 330.0              | 16.4               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |
| CD74HC4051PWR   | TSSOP        | PW              | 16   | 2000 | 330.0              | 12.4               | 7.0     | 5.6     | 1.6     | 8.0     | 12.0   | Q1            |
| CD74HC4051PWRG4 | TSSOP        | PW              | 16   | 2000 | 330.0              | 12.4               | 6.9     | 5.6     | 1.6     | 8.0     | 12.0   | Q1            |
| CD74HC4051PWT   | TSSOP        | PW              | 16   | 250  | 330.0              | 12.4               | 6.9     | 5.6     | 1.6     | 8.0     | 12.0   | Q1            |
| CD74HC4052M96   | SOIC         | D               | 16   | 2500 | 330.0              | 16.8               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |
| CD74HC4052M96G4 | SOIC         | D               | 16   | 2500 | 330.0              | 16.4               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |
| CD74HC4052NSR   | SO           | NS              | 16   | 2000 | 330.0              | 16.4               | 8.2     | 10.5    | 2.5     | 12.0    | 16.0   | Q1            |
| CD74HC4052PWR   | TSSOP        | PW              | 16   | 2000 | 330.0              | 12.4               | 7.0     | 5.6     | 1.6     | 8.0     | 12.0   | Q1            |
| CD74HC4052PWRG4 | TSSOP        | PW              | 16   | 2000 | 330.0              | 12.4               | 6.9     | 5.6     | 1.6     | 8.0     | 12.0   | Q1            |
| CD74HC4052PWT   | TSSOP        | PW              | 16   | 250  | 330.0              | 12.4               | 6.9     | 5.6     | 1.6     | 8.0     | 12.0   | Q1            |
| CD74HC4053M96   | SOIC         | D               | 16   | 2500 | 330.0              | 16.8               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |
| CD74HC4053M96G4 | SOIC         | D               | 16   | 2500 | 330.0              | 16.4               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |
| CD74HC4053PWR   | TSSOP        | PW              | 16   | 2000 | 330.0              | 12.4               | 7.0     | 5.6     | 1.6     | 8.0     | 12.0   | Q1            |
| CD74HC4053PWRG4 | TSSOP        | PW              | 16   | 2000 | 330.0              | 12.4               | 6.9     | 5.6     | 1.6     | 8.0     | 12.0   | Q1            |
| CD74HC4053PWT   | TSSOP        | PW              | 16   | 250  | 330.0              | 12.4               | 6.9     | 5.6     | 1.6     | 8.0     | 12.0   | Q1            |
| CD74HCT4051M96  | SOIC         | D               | 16   | 2500 | 330.0              | 16.4               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |
| CD74HCT4052M96  | SOIC         | D               | 16   | 2500 | 330.0              | 16.4               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |

| 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 |
|------------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| CD74HCT4053M96   | SOIC         | D               | 16   | 2500 | 330.0              | 16.4               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |
| CD74HCT4053PWR   | TSSOP        | PW              | 16   | 2000 | 330.0              | 12.4               | 7.0     | 5.6     | 1.6     | 8.0     | 12.0   | Q1            |
| CD74HCT4053PWRG4 | TSSOP        | PW              | 16   | 2000 | 330.0              | 12.4               | 6.9     | 5.6     | 1.6     | 8.0     | 12.0   | Q1            |
| CD74HCT4053PWT   | TSSOP        | PW              | 16   | 250  | 330.0              | 12.4               | 6.9     | 5.6     | 1.6     | 8.0     | 12.0   | Q1            |

## TAPE AND REEL BOX DIMENSIONS



\*All dimensions are nominal

| Device          | Package Type | Package Drawing | Pins | SPQ  | Length (mm) | Width (mm) | Height (mm) |
|-----------------|--------------|-----------------|------|------|-------------|------------|-------------|
| CD74HC4051M96   | SOIC         | D               | 16   | 2500 | 364.0       | 364.0      | 27.0        |
| CD74HC4051M96G4 | SOIC         | D               | 16   | 2500 | 333.2       | 345.9      | 28.6        |
| CD74HC4051PWR   | TSSOP        | PW              | 16   | 2000 | 364.0       | 364.0      | 27.0        |
| CD74HC4051PWRG4 | TSSOP        | PW              | 16   | 2000 | 367.0       | 367.0      | 35.0        |
| CD74HC4051PWT   | TSSOP        | PW              | 16   | 250  | 367.0       | 367.0      | 35.0        |
| CD74HC4052M96   | SOIC         | D               | 16   | 2500 | 364.0       | 364.0      | 27.0        |
| CD74HC4052M96G4 | SOIC         | D               | 16   | 2500 | 333.2       | 345.9      | 28.6        |
| CD74HC4052NSR   | SO           | NS              | 16   | 2000 | 367.0       | 367.0      | 38.0        |
| CD74HC4052PWR   | TSSOP        | PW              | 16   | 2000 | 364.0       | 364.0      | 27.0        |
| CD74HC4052PWRG4 | TSSOP        | PW              | 16   | 2000 | 367.0       | 367.0      | 35.0        |
| CD74HC4052PWT   | TSSOP        | PW              | 16   | 250  | 367.0       | 367.0      | 35.0        |
| CD74HC4053M96   | SOIC         | D               | 16   | 2500 | 364.0       | 364.0      | 27.0        |
| CD74HC4053M96G4 | SOIC         | D               | 16   | 2500 | 333.2       | 345.9      | 28.6        |

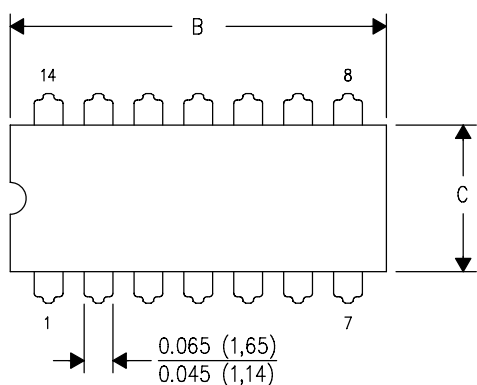
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| Device           | Package Type | Package Drawing | Pins | SPQ  | Length (mm) | Width (mm) | Height (mm) |
|------------------|--------------|-----------------|------|------|-------------|------------|-------------|
| CD74HC4053PWR    | TSSOP        | PW              | 16   | 2000 | 364.0       | 364.0      | 27.0        |
| CD74HC4053PWRG4  | TSSOP        | PW              | 16   | 2000 | 367.0       | 367.0      | 35.0        |
| CD74HC4053PWT    | TSSOP        | PW              | 16   | 250  | 367.0       | 367.0      | 35.0        |
| CD74HCT4051M96   | SOIC         | D               | 16   | 2500 | 333.2       | 345.9      | 28.6        |
| CD74HCT4052M96   | SOIC         | D               | 16   | 2500 | 333.2       | 345.9      | 28.6        |
| CD74HCT4053M96   | SOIC         | D               | 16   | 2500 | 333.2       | 345.9      | 28.6        |
| CD74HCT4053PWR   | TSSOP        | PW              | 16   | 2000 | 364.0       | 364.0      | 27.0        |
| CD74HCT4053PWRG4 | TSSOP        | PW              | 16   | 2000 | 367.0       | 367.0      | 35.0        |
| CD74HCT4053PWT   | TSSOP        | PW              | 16   | 250  | 367.0       | 367.0      | 35.0        |

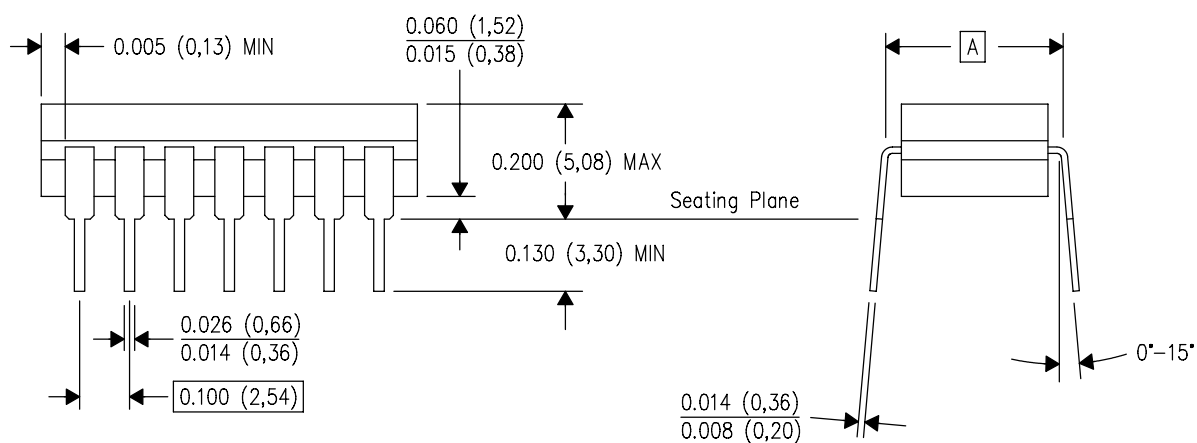
J (R-GDIP-T\*\*)

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)        |



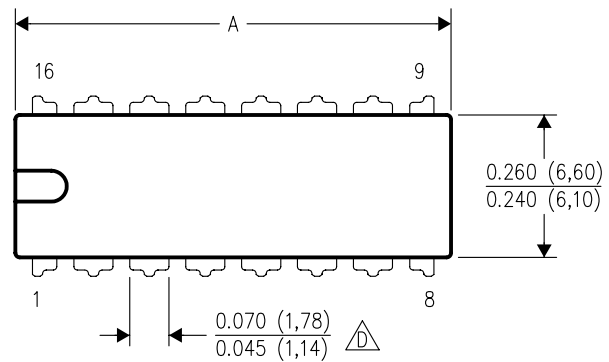
4040083/F 03/03

- 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.

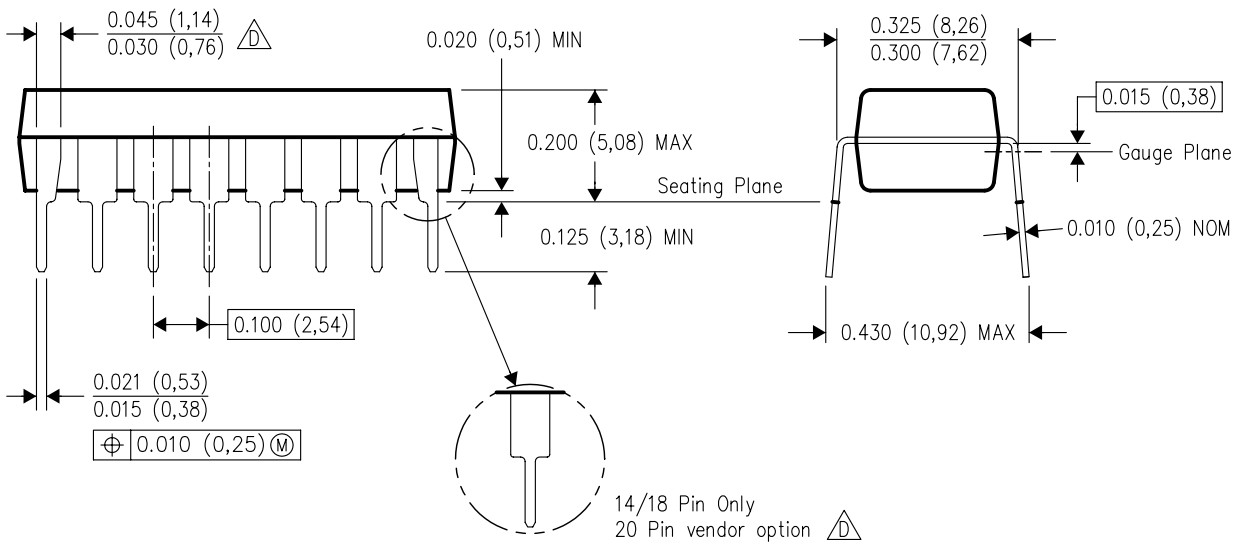
## N (R-PDIP-T\*\*)

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               |



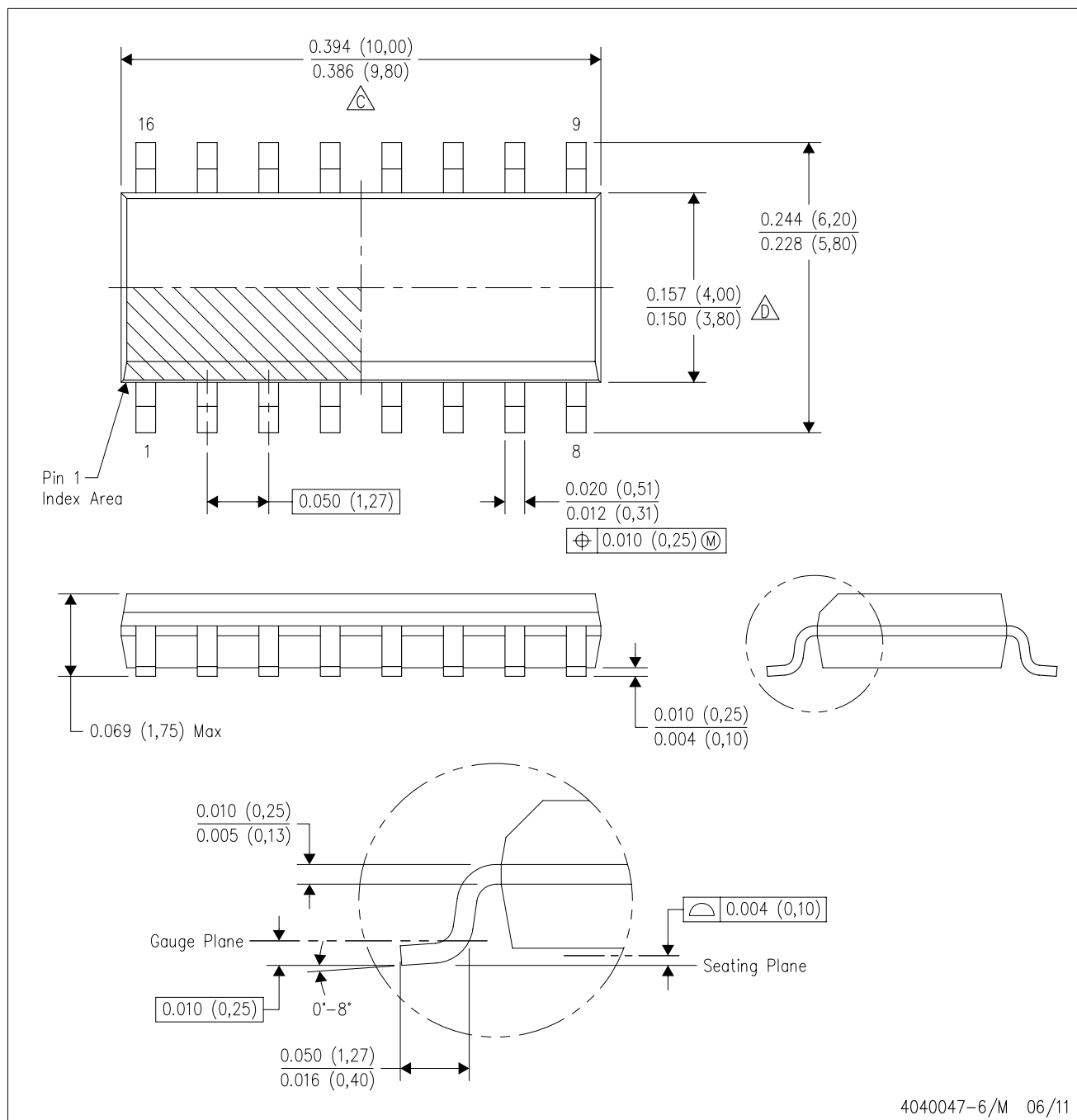
14/18 Pin Only  
20 Pin vendor option

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.

D (R-PDSO-G16)

PLASTIC SMALL OUTLINE

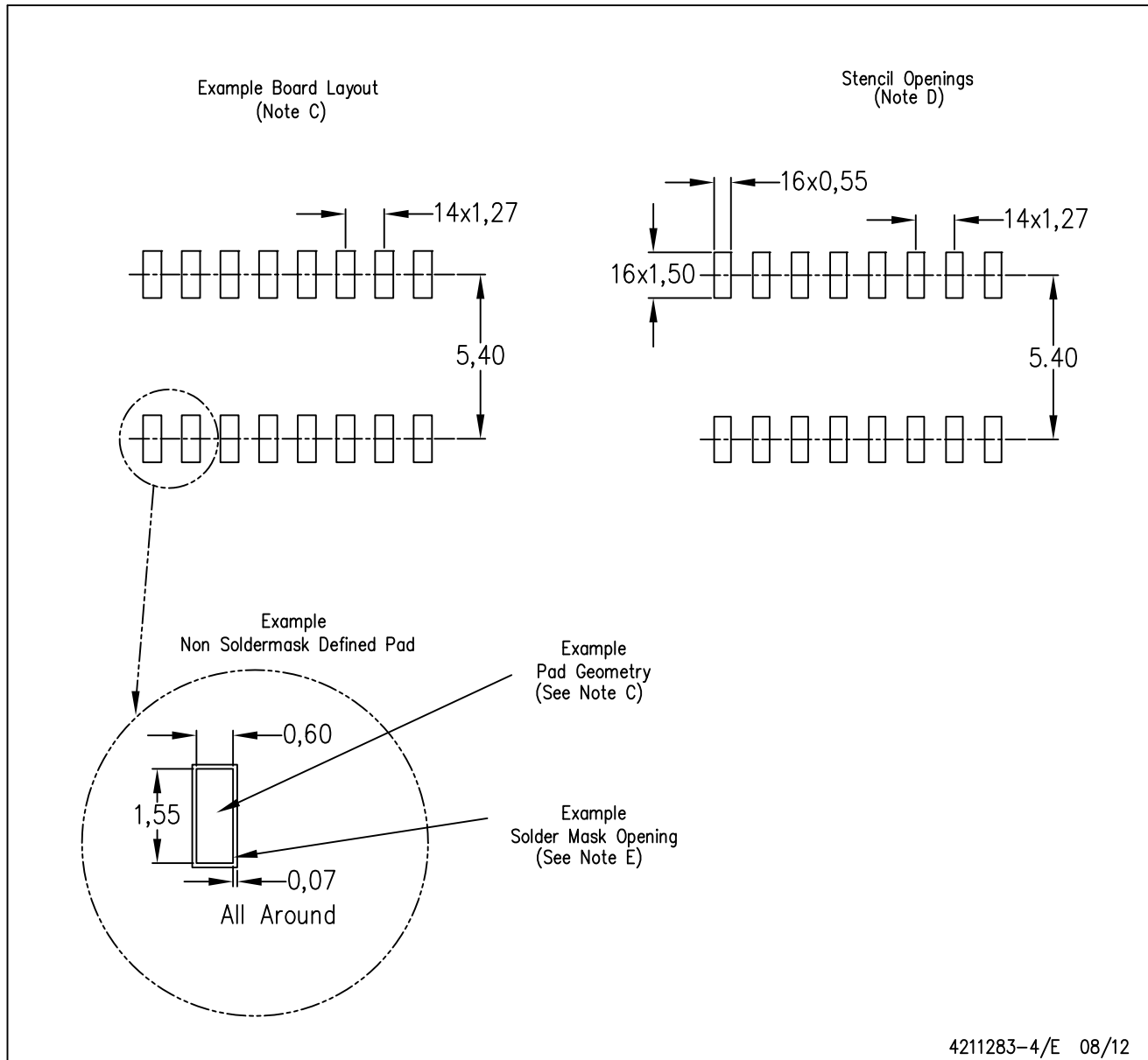


4040047-6/M 06/11

- 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)

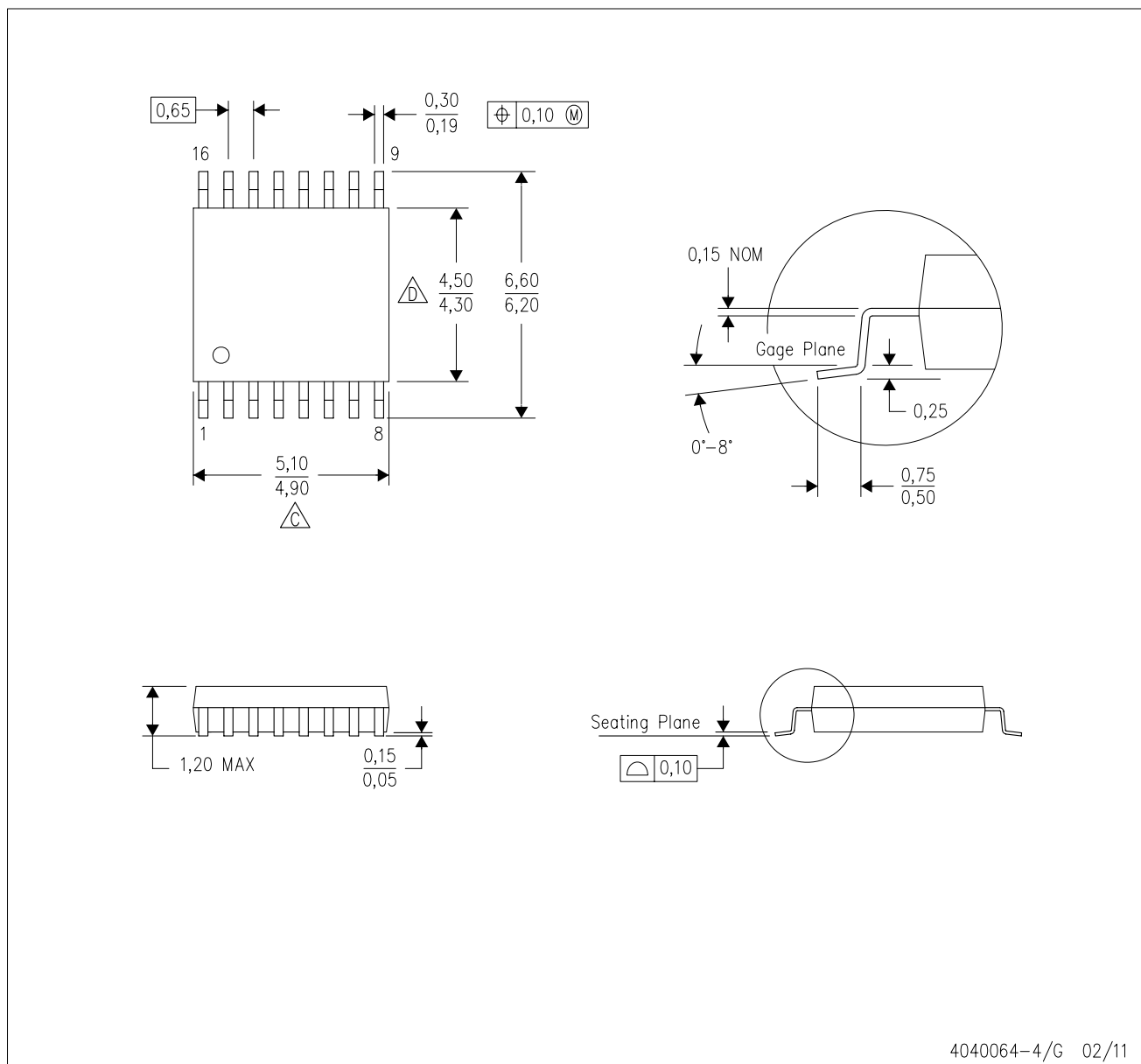
PLASTIC SMALL OUTLINE



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

PW (R-PDSO-G16)

PLASTIC SMALL OUTLINE

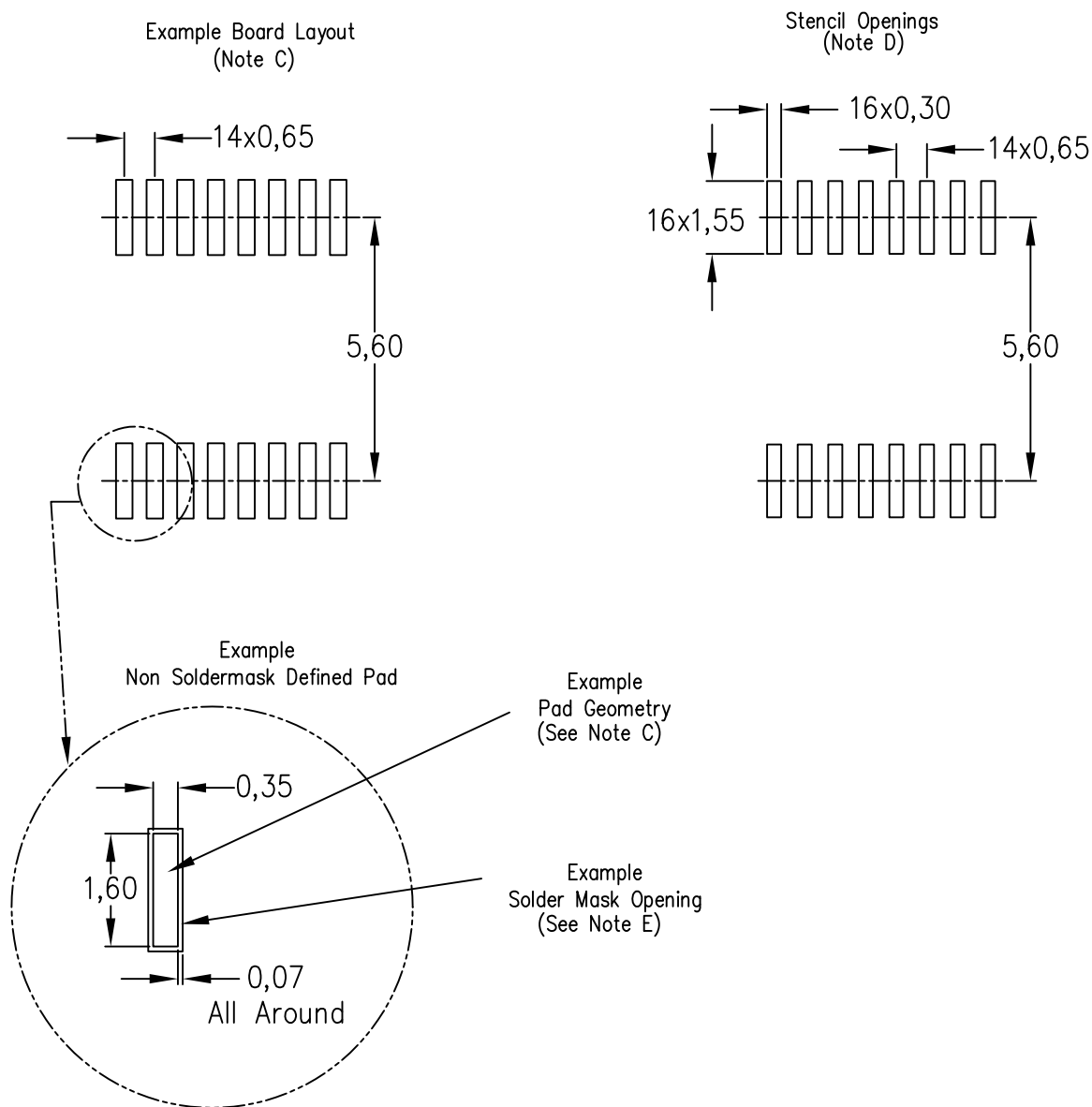


- NOTES:
- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
  - B. This drawing is subject to change without notice.
  - $\Delta$  C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0,15 each side.
  - $\Delta$  D. Body width does not include interlead flash. Interlead flash shall not exceed 0,25 each side.
  - E. Falls within JEDEC MO-153



PW (R-PDSO-G16)

PLASTIC SMALL OUTLINE



4211284-3/F 12/12

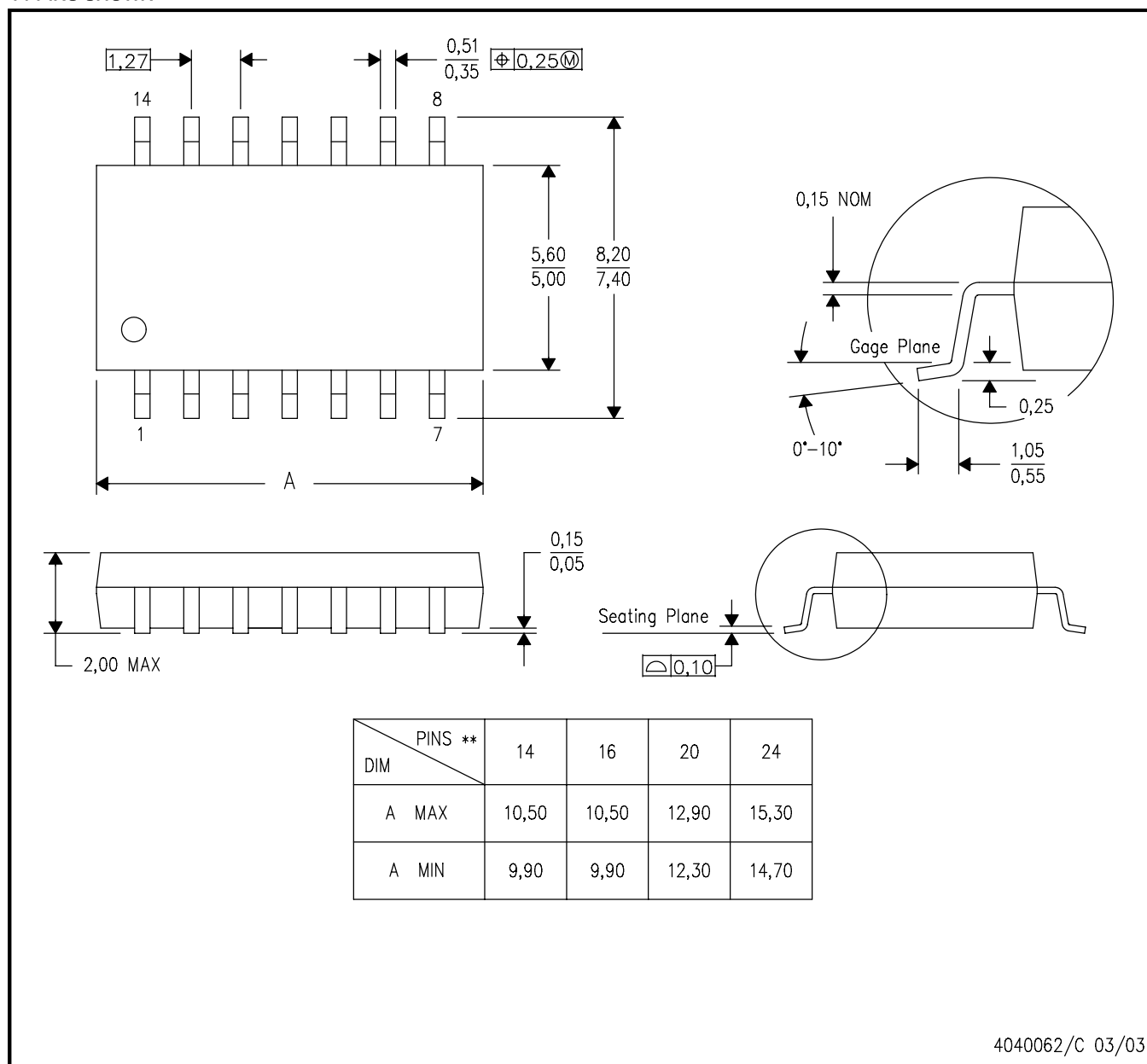
- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Publication IPC-7351 is recommended for alternate designs.
  - D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers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

# MECHANICAL DATA

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

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN



- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

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| DLP® Products                | <a href="http://www.dlp.com">www.dlp.com</a>                                         |
| DSP                          | <a href="http://dsp.ti.com">dsp.ti.com</a>                                           |
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| Interface                    | <a href="http://interface.ti.com">interface.ti.com</a>                               |
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| RFID                         | <a href="http://www.ti-rfid.com">www.ti-rfid.com</a>                                 |
| OMAP Applications Processors | <a href="http://www.ti.com/omap">www.ti.com/omap</a>                                 |
| Wireless Connectivity        | <a href="http://www.ti.com/wirelessconnectivity">www.ti.com/wirelessconnectivity</a> |

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|                               |                                                                                          |
|-------------------------------|------------------------------------------------------------------------------------------|
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| Computers and Peripherals     | <a href="http://www.ti.com/computers">www.ti.com/computers</a>                           |
| Consumer Electronics          | <a href="http://www.ti.com/consumer-apps">www.ti.com/consumer-apps</a>                   |
| Energy and Lighting           | <a href="http://www.ti.com/energy">www.ti.com/energy</a>                                 |
| Industrial                    | <a href="http://www.ti.com/industrial">www.ti.com/industrial</a>                         |
| Medical                       | <a href="http://www.ti.com/medical">www.ti.com/medical</a>                               |
| Security                      | <a href="http://www.ti.com/security">www.ti.com/security</a>                             |
| Space, Avionics and Defense   | <a href="http://www.ti.com/space-avionics-defense">www.ti.com/space-avionics-defense</a> |
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