

## CMOS 8-Channel Data Selector

High-Voltage Types (20-Volt Rating)

■ CD4512B is an 8-channel data selector featuring a three-state output that can interface directly with, and drive, data lines of bus-oriented systems.

The CD4512B-series types are supplied in 16-lead hermetic dual-in-line ceramic packages (F3A suffix), 16-lead dual-in-line plastic packages (E suffix), 16-lead small-outline packages (M, M96, MT, and NSR suffixes), and 16-lead thin shrink small-outline packages (PW and PWR suffixes).

### RECOMMENDED OPERATING CONDITIONS

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

| CHARACTERISTIC                                                    | LIMITS |      | UNITS |
|-------------------------------------------------------------------|--------|------|-------|
|                                                                   | MIN.   | MAX. |       |
| Supply-Voltage Range (For $T_A$ = Full Package Temperature Range) | 3      | 18   | V     |

### Features:

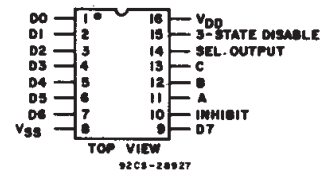
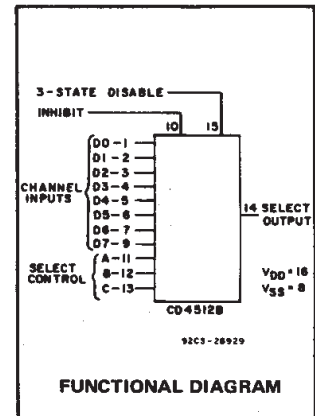
- 3-state output
- Standardized, symmetrical output characteristics
- 100% tested for quiescent current at 20 V
- 5-V, 10-V, and 15-V parametric ratings
- Maximum input current of 1  $\mu$ A at 18 V over full package-temperature range; 100 nA at 18 V and 25°C
- Noise margin (over full package-temperature range):

1 V at  $V_{DD} = 5$  V  
2 V at  $V_{DD} = 10$  V  
2.5 V at  $V_{DD} = 15$  V

- Meets all requirements of JEDEC Tentative Standard No. 13B, "Standard Specifications for Description of 'B' Series CMOS Devices"

### Applications:

- Digital multiplexing
- Number-sequence generation
- Signal gating



TERMINAL ASSIGNMENT

### TRUTH TABLE

| SEL. CONT. |   |   | INH | 3-STATE<br>DISABLE | SEL<br>OUTPUT |
|------------|---|---|-----|--------------------|---------------|
| A          | B | C |     |                    |               |
| 0          | 0 | 0 | 0   | 0                  | D0            |
| 1          | 0 | 0 | 0   | 0                  | D1            |
| 0          | 1 | 0 | 0   | 0                  | D2            |
| 1          | 1 | 0 | 0   | 0                  | D3            |
| 0          | 0 | 1 | 0   | 0                  | D4            |
| 1          | 0 | 1 | 0   | 0                  | D5            |
| 0          | 1 | 1 | 0   | 0                  | D6            |
| 1          | 1 | 1 | 0   | 0                  | D7            |
| X          | X | X | 1   | 0                  | 0             |
| X          | X | X | X   | 1                  | High Z        |

1 = High Level 0 = Low Level  
X = Don't Care

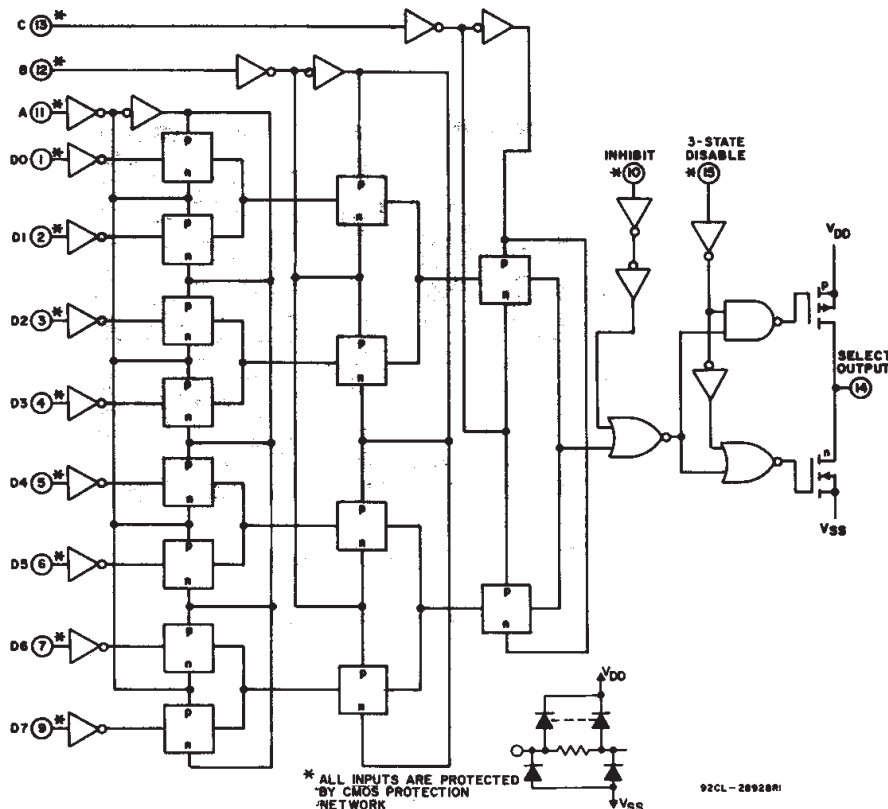


Fig. 1 - Logic diagram.

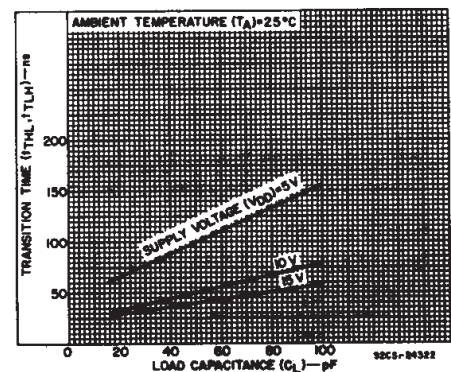


Fig. 2 - Typical transition time as a function of load capacitance.

## CD4512B Types

### MAXIMUM RATINGS, Absolute-Maximum Values:

#### DC SUPPLY-VOLTAGE RANGE, ( $V_{DD}$ )

Voltages referenced to  $V_{SS}$  Terminal) ..... -0.5V to +20V

INPUT VOLTAGE RANGE, ALL INPUTS ..... -0.5V to  $V_{DD} + 0.5V$

DC INPUT CURRENT, ANY ONE INPUT .....  $\pm 10mA$

#### POWER DISSIPATION PER PACKAGE ( $P_D$ ):

For  $T_A = -55^\circ C$  to  $+100^\circ C$  ..... 500mW

For  $T_A = +100^\circ C$  to  $+125^\circ C$  ..... Derate Linearly at 12mW/ $^\circ C$  to 200mW

#### DEVICE DISSIPATION PER OUTPUT TRANSISTOR

FOR  $T_A =$  FULL PACKAGE-TEMPERATURE RANGE (All Package Types) ..... 100mW

OPERATING-TEMPERATURE RANGE ( $T_A$ ) .....  $-55^\circ C$  to  $+125^\circ C$

STORAGE TEMPERATURE RANGE ( $T_{stg}$ ) .....  $-65^\circ C$  to  $+150^\circ C$

#### LEAD TEMPERATURE (DURING SOLDERING):

At distance  $1/16 \pm 1/32$  inch ( $1.59 \pm 0.79mm$ ) from case for 10s max .....  $+265^\circ C$

### STATIC ELECTRICAL CHARACTERISTICS

| CHARACTERISTIC                                       | CONDITIONS            |                        |                        | LIMITS AT INDICATED TEMPERATURES (°C) |       |       |       |       |                   |      | UNITS |
|------------------------------------------------------|-----------------------|------------------------|------------------------|---------------------------------------|-------|-------|-------|-------|-------------------|------|-------|
|                                                      | V <sub>O</sub><br>(V) | V <sub>IN</sub><br>(V) | V <sub>DD</sub><br>(V) | -55                                   | -40   | +85   | +125  | +25   |                   |      |       |
|                                                      |                       |                        |                        |                                       |       |       |       | Min.  | Typ.              | Max. |       |
| Quiescent Device Current, I <sub>DD</sub> Max.       | —                     | 0,5                    | 5                      | 5                                     | 5     | 150   | 150   | —     | 0.04              | 5    | μA    |
|                                                      | —                     | 0,10                   | 10                     | 10                                    | 10    | 300   | 300   | —     | 0.04              | 10   |       |
|                                                      | —                     | 0,15                   | 15                     | 20                                    | 20    | 600   | 600   | —     | 0.04              | 20   |       |
|                                                      | —                     | 0,20                   | 20                     | 100                                   | 100   | 3000  | 3000  | —     | 0.08              | 100  |       |
| Output Low (Sink) Current I <sub>OL</sub> Min.       | 0.4                   | 0,5                    | 5                      | 0.64                                  | 0.61  | 0.42  | 0.36  | 0.51  | 1                 | —    | mA    |
|                                                      | 0.5                   | 0,10                   | 10                     | 1.6                                   | 1.5   | 1.1   | 0.9   | 1.3   | 2.6               | —    |       |
|                                                      | 1.5                   | 0,15                   | 15                     | 4.2                                   | 4     | 2.8   | 2.4   | 3.4   | 6.8               | —    |       |
| Output High (Source) Current, I <sub>OH</sub> Min.   | 4.6                   | 0,5                    | 5                      | -0.64                                 | -0.61 | -0.42 | -0.36 | -0.51 | -1                | —    | mA    |
|                                                      | 2.5                   | 0,5                    | 5                      | -2                                    | -1.8  | -1.3  | -1.15 | -1.6  | -3.2              | —    |       |
|                                                      | 9.5                   | 0,10                   | 10                     | -1.6                                  | -1.5  | -1.1  | -0.9  | -1.3  | -2.6              | —    |       |
|                                                      | 13.5                  | 0,15                   | 15                     | -4.2                                  | -4    | -2.8  | -2.4  | -3.4  | -6.8              | —    |       |
| Output Voltage: Low-Level, V <sub>OL</sub> Max.      | —                     | 0,5                    | 5                      | 0.05                                  |       |       |       | —     | 0                 | 0.05 | V     |
|                                                      | —                     | 0,10                   | 10                     | 0.05                                  |       |       |       | —     | 0                 | 0.05 |       |
|                                                      | —                     | 0,15                   | 15                     | 0.05                                  |       |       |       | —     | 0                 | 0.05 |       |
| Output Voltage: High-Level, V <sub>OH</sub> Min.     | —                     | 0,5                    | 5                      | 4.95                                  |       |       |       | 4.95  | 5                 | —    | V     |
|                                                      | —                     | 0,10                   | 10                     | 9.95                                  |       |       |       | 9.95  | 10                | —    |       |
|                                                      | —                     | 0,15                   | 15                     | 14.95                                 |       |       |       | 14.95 | 15                | —    |       |
| Input Low Voltage V <sub>IL</sub> Max.               | 0.5,4.5               | —                      | 5                      | 1.5                                   |       |       |       | —     | —                 | 1.5  | V     |
|                                                      | 1,9                   | —                      | 10                     | 3                                     |       |       |       | —     | —                 | 3    |       |
|                                                      | 1.5,13.5              | —                      | 15                     | 4                                     |       |       |       | —     | —                 | 4    |       |
| Input High Voltage, V <sub>IH</sub> Min.             | 0.5,4.5               | —                      | 5                      | 3.5                                   |       |       |       | 3.5   | —                 | —    | V     |
|                                                      | 1,9                   | —                      | 10                     | 7                                     |       |       |       | 7     | —                 | —    |       |
|                                                      | 1.5,13.5              | —                      | 15                     | 11                                    |       |       |       | 11    | —                 | —    |       |
| Input Current I <sub>IN</sub> Max.                   | —                     | 0,18                   | 18                     | ±0.1                                  | ±0.1  | ±1    | ±1    | —     | ±10 <sup>-5</sup> | ±0.1 | μA    |
| 3-State Output Leakage Current I <sub>OUT</sub> Max. | 0,18                  | 0,18                   | 18                     | ±0.4                                  | ±0.4  | ±12   | ±12   | —     | ±10 <sup>-4</sup> | ±0.4 | μA    |

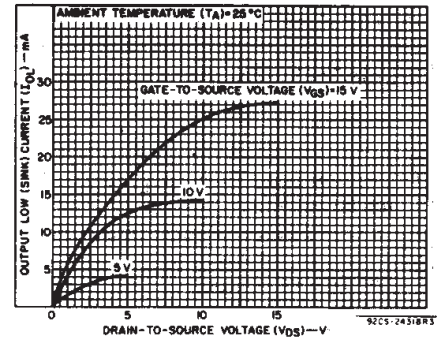


Fig. 3 - Typical output low (sink) current characteristics.

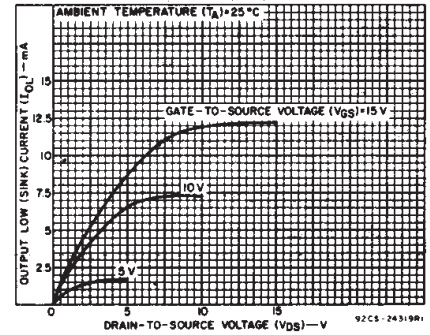


Fig. 4 - Minimum output low (sink) current characteristics.

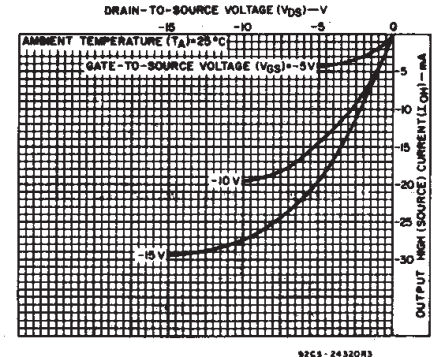


Fig. 5 - Typical output high (source) current characteristics.

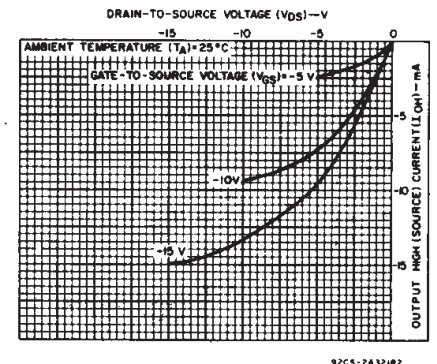


Fig. 6 - Minimum output high (source) current characteristics.

# CD4512B Types

DYNAMIC ELECTRICAL CHARACTERISTICS at  $T_A = 25^\circ\text{C}$ , Input  $t_r, t_f = 20\text{ ns}$ ,  $C_L = 50\text{ pF}$ ,  $R_L = 200\text{ k}\Omega$

| CHARACTERISTIC                                                               | TEST CONDITIONS<br>$V_{DD}$<br>(V) | LIMITS |      | UNITS |
|------------------------------------------------------------------------------|------------------------------------|--------|------|-------|
|                                                                              |                                    | Typ.   | Max. |       |
| Propagation Delay Time, $t_{PHL}$ , $t_{PLH}$<br>Inhibit to Output           | 5                                  | 140    | 280  | ns    |
|                                                                              | 10                                 | 70     | 140  |       |
|                                                                              | 15                                 | 50     | 100  |       |
| "A" Select to Output                                                         | 5                                  | 200    | 400  | ns    |
|                                                                              | 10                                 | 85     | 170  |       |
|                                                                              | 15                                 | 60     | 120  |       |
| Data to Output                                                               | 5                                  | 180    | 360  | ns    |
|                                                                              | 10                                 | 75     | 150  |       |
|                                                                              | 15                                 | 55     | 110  |       |
| 3-State Disable Delay Time:<br>$t_{PZL}$ , $t_{PLZ}$ , $t_{PHZ}$ , $t_{PZH}$ | 5                                  | 60     | 120  | ns    |
|                                                                              | 10                                 | 30     | 60   |       |
|                                                                              | 15                                 | 20     | 40   |       |
| Transition Time, $t_{THL}$ , $t_{TLH}$                                       | 5                                  | 100    | 200  | ns    |
|                                                                              | 10                                 | 50     | 100  |       |
|                                                                              | 15                                 | 40     | 80   |       |
| Input Capacitance, $C_{IN}$<br>(Any Input)                                   |                                    | 5      | 7.5  | pF    |

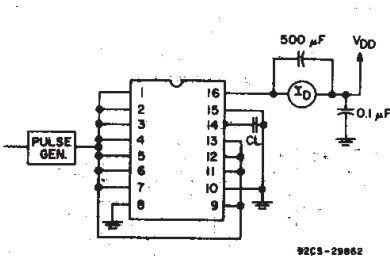


Fig. 9 - Dynamic power dissipation test circuit.

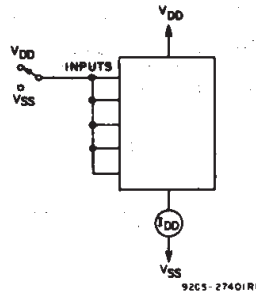


Fig. 10 - Quiescent device current test circuit.

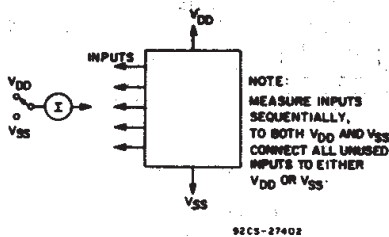


Fig. 11 - Input current test circuit.

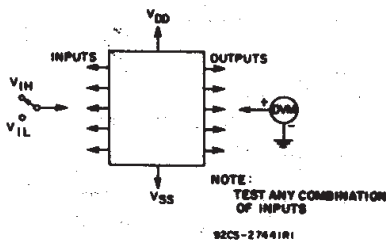


Fig. 12 - Input voltage test circuit.

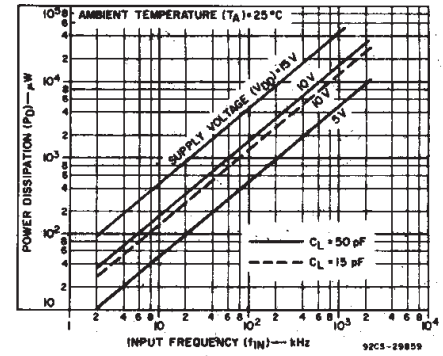


Fig. 7 - Typical dynamic power dissipation as a function of frequency.

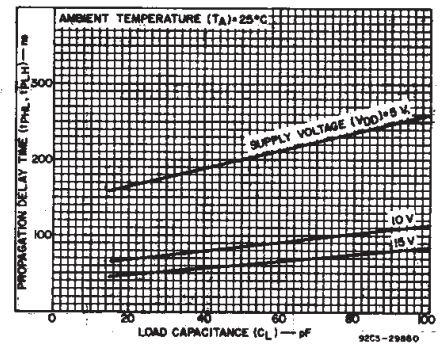
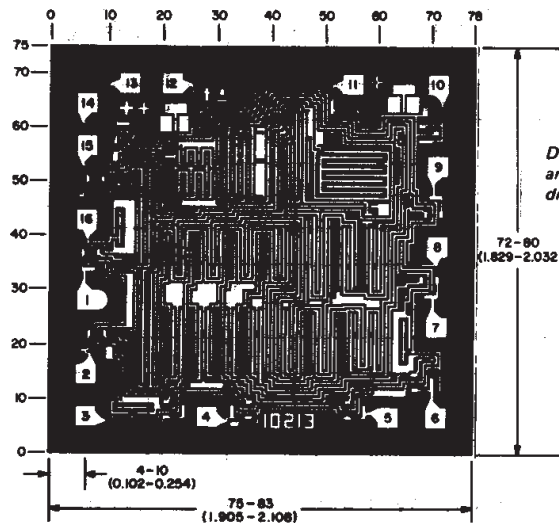


Fig. 8 - Typical propagation delay time as a function of load capacitance ("A" select to output).



Dimensions in parentheses are in millimeters and are derived from the basic inch dimensions as indicated. Grid graduations are in mils ( $10^{-3}$  inch).

Dimensions and pad layout for CD4512BH

**PACKAGING INFORMATION**

| Orderable Device | Status<br>(1) | Package Type | Package<br>Drawing | Pins | Package Qty | Eco Plan<br>(2)            | Lead/Ball Finish | MSL Peak Temp<br>(3) | Op Temp (°C) | Top-Side Markings<br>(4) | Samples                 |
|------------------|---------------|--------------|--------------------|------|-------------|----------------------------|------------------|----------------------|--------------|--------------------------|-------------------------|
| CD4512BE         | ACTIVE        | PDIP         | N                  | 16   | 25          | Pb-Free<br>(RoHS)          | CU NIPDAU        | N / A for Pkg Type   | -55 to 125   | CD4512BE                 | <a href="#">Samples</a> |
| CD4512BEE4       | ACTIVE        | PDIP         | N                  | 16   | 25          | Pb-Free<br>(RoHS)          | CU NIPDAU        | N / A for Pkg Type   | -55 to 125   | CD4512BE                 | <a href="#">Samples</a> |
| CD4512BF         | ACTIVE        | CDIP         | J                  | 16   | 1           | TBD                        | A42              | N / A for Pkg Type   | -55 to 125   | CD4512BF                 | <a href="#">Samples</a> |
| CD4512BF3A       | ACTIVE        | CDIP         | J                  | 16   | 1           | TBD                        | A42              | N / A for Pkg Type   | -55 to 125   | CD4512BF3A               | <a href="#">Samples</a> |
| CD4512BM         | ACTIVE        | SOIC         | D                  | 16   | 40          | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CD4512BM                 | <a href="#">Samples</a> |
| CD4512BM96       | ACTIVE        | SOIC         | D                  | 16   | 2500        | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CD4512BM                 | <a href="#">Samples</a> |
| CD4512BM96E4     | ACTIVE        | SOIC         | D                  | 16   | 2500        | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CD4512BM                 | <a href="#">Samples</a> |
| CD4512BM96G4     | ACTIVE        | SOIC         | D                  | 16   | 2500        | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CD4512BM                 | <a href="#">Samples</a> |
| CD4512BME4       | ACTIVE        | SOIC         | D                  | 16   | 40          | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CD4512BM                 | <a href="#">Samples</a> |
| CD4512BMG4       | ACTIVE        | SOIC         | D                  | 16   | 40          | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CD4512BM                 | <a href="#">Samples</a> |
| CD4512BMT        | ACTIVE        | SOIC         | D                  | 16   | 250         | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CD4512BM                 | <a href="#">Samples</a> |
| CD4512BMTE4      | ACTIVE        | SOIC         | D                  | 16   | 250         | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CD4512BM                 | <a href="#">Samples</a> |
| CD4512BMTG4      | ACTIVE        | SOIC         | D                  | 16   | 250         | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CD4512BM                 | <a href="#">Samples</a> |
| CD4512BNSR       | ACTIVE        | SO           | NS                 | 16   | 2000        | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CD4512B                  | <a href="#">Samples</a> |
| CD4512BNSRE4     | ACTIVE        | SO           | NS                 | 16   | 2000        | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CD4512B                  | <a href="#">Samples</a> |
| CD4512BNSRG4     | ACTIVE        | SO           | NS                 | 16   | 2000        | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CD4512B                  | <a href="#">Samples</a> |
| CD4512BPW        | ACTIVE        | TSSOP        | PW                 | 16   | 90          | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CM512B                   | <a href="#">Samples</a> |

| Orderable Device | Status<br>(1) | Package Type | Package<br>Drawing | Pins | Package Qty | Eco Plan<br>(2)            | Lead/Ball Finish | MSL Peak Temp<br>(3) | Op Temp (°C) | Top-Side Markings<br>(4) | Samples                 |
|------------------|---------------|--------------|--------------------|------|-------------|----------------------------|------------------|----------------------|--------------|--------------------------|-------------------------|
| CD4512BPWE4      | ACTIVE        | TSSOP        | PW                 | 16   | 90          | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CM512B                   | <a href="#">Samples</a> |
| CD4512BPWG4      | ACTIVE        | TSSOP        | PW                 | 16   | 90          | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CM512B                   | <a href="#">Samples</a> |
| CD4512BPWR       | ACTIVE        | TSSOP        | PW                 | 16   | 2000        | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CM512B                   | <a href="#">Samples</a> |
| CD4512BPWRE4     | ACTIVE        | TSSOP        | PW                 | 16   | 2000        | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CM512B                   | <a href="#">Samples</a> |
| CD4512BPWRG4     | ACTIVE        | TSSOP        | PW                 | 16   | 2000        | Green (RoHS<br>& no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM   | -55 to 125   | CM512B                   | <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.

(4) Only one of markings shown within the brackets will appear on the physical device.

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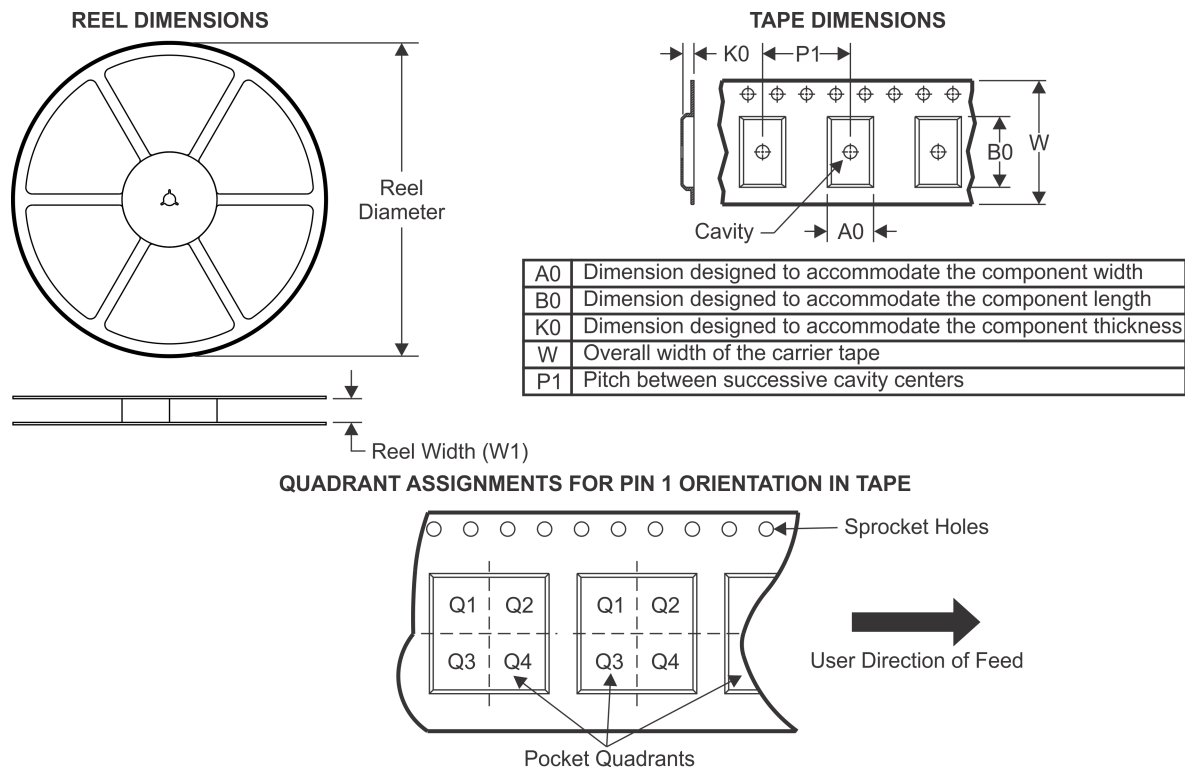
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

**OTHER QUALIFIED VERSIONS OF CD4512B, CD4512B-MIL :**

- Catalog: [CD4512B](#)
- Military: [CD4512B-MIL](#)

## NOTE: Qualified Version Definitions:

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

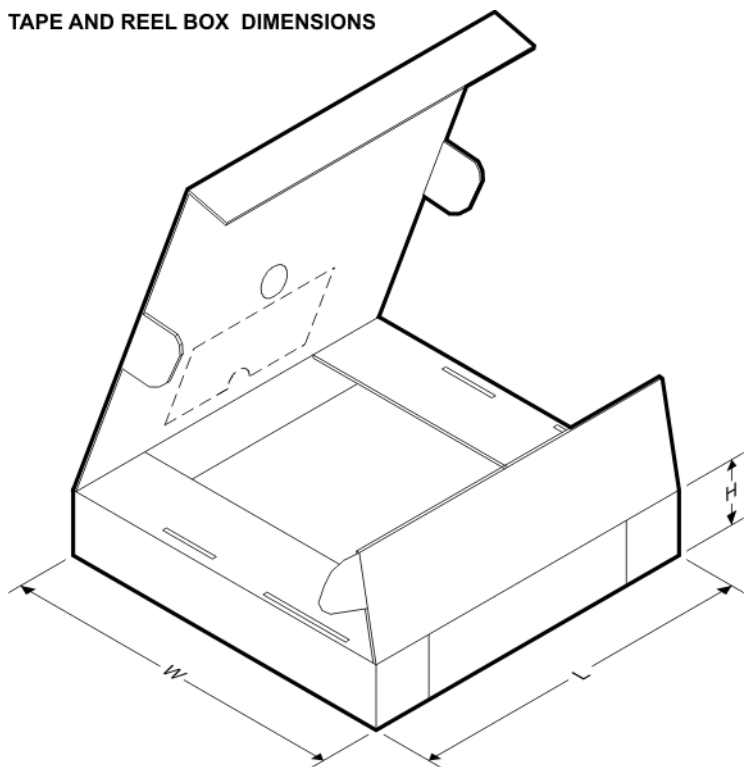
**TAPE AND REEL INFORMATION**


\*All dimensions are nominal

| Device     | Package Type | Package Drawing | Pins | SPQ  | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
|------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| CD4512BM96 | SOIC         | D               | 16   | 2500 | 330.0              | 16.4               | 6.5     | 10.3    | 2.1     | 8.0     | 16.0   | Q1            |
| CD4512BNSR | SO           | NS              | 16   | 2000 | 330.0              | 16.4               | 8.2     | 10.5    | 2.5     | 12.0    | 16.0   | Q1            |
| CD4512BPWR | TSSOP        | PW              | 16   | 2000 | 330.0              | 12.4               | 6.9     | 5.6     | 1.6     | 8.0     | 12.0   | Q1            |



## TAPE AND REEL BOX DIMENSIONS



\*All dimensions are nominal

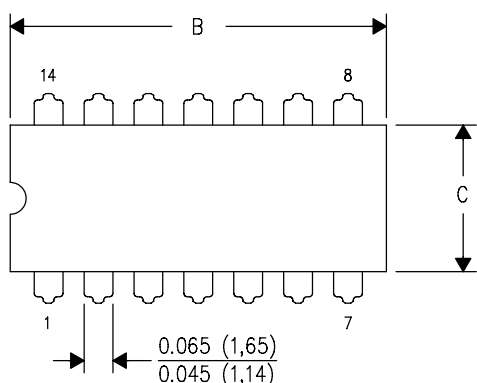
| Device     | Package Type | Package Drawing | Pins | SPQ  | Length (mm) | Width (mm) | Height (mm) |
|------------|--------------|-----------------|------|------|-------------|------------|-------------|
| CD4512BM96 | SOIC         | D               | 16   | 2500 | 333.2       | 345.9      | 28.6        |
| CD4512BNSR | SO           | NS              | 16   | 2000 | 367.0       | 367.0      | 38.0        |
| CD4512BPWR | TSSOP        | PW              | 16   | 2000 | 367.0       | 367.0      | 35.0        |



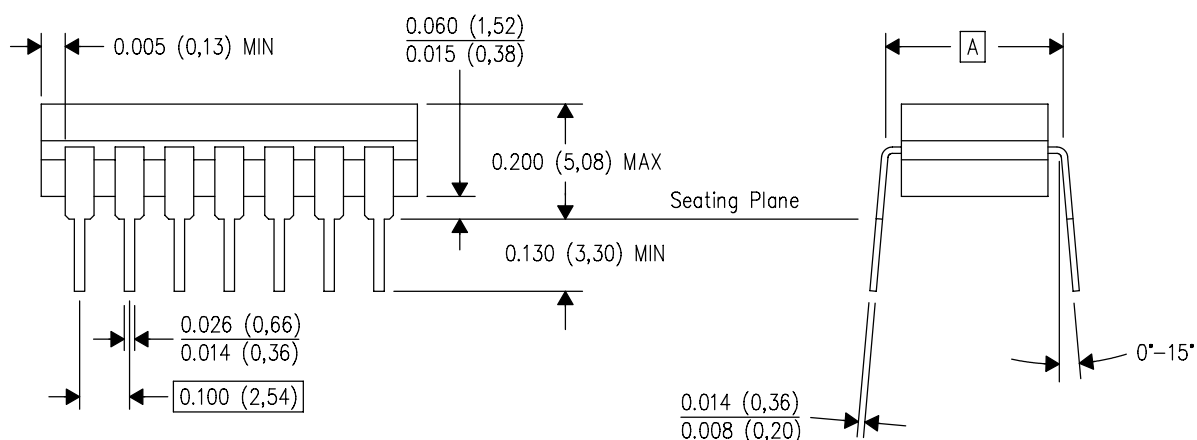
J (R-GDIP-T\*\*)

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)        |



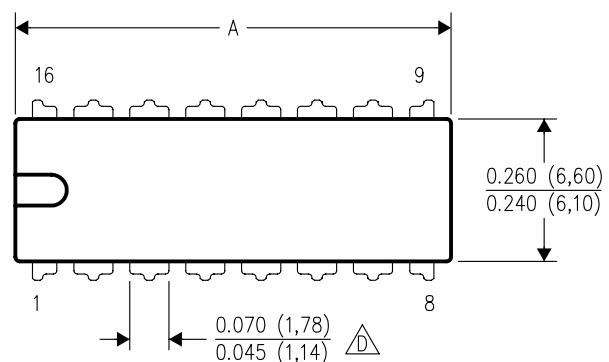
4040083/F 03/03

- 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.

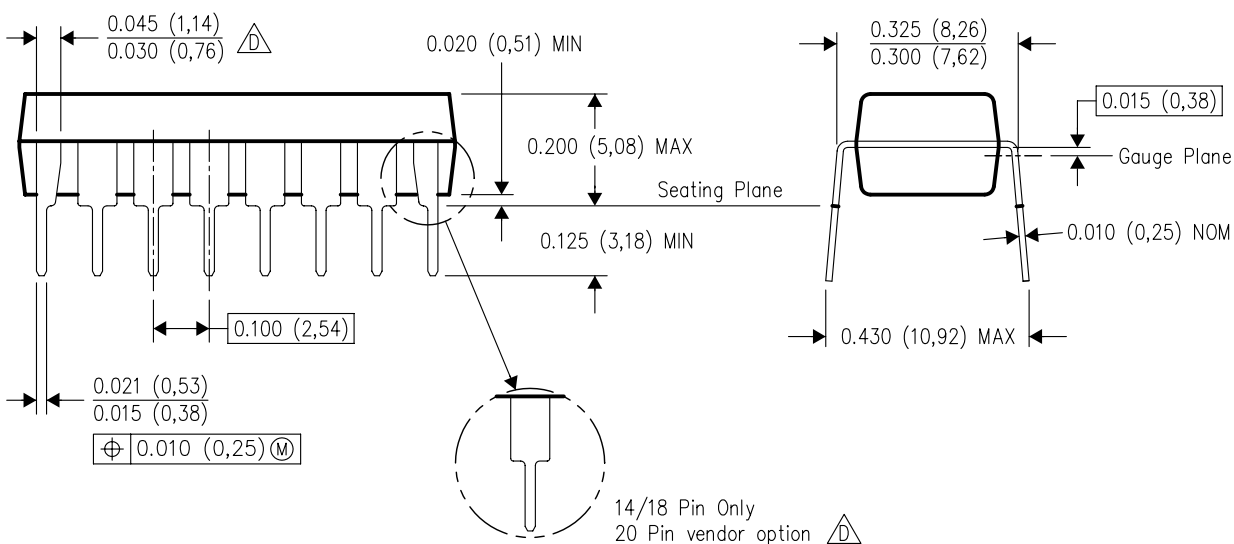
N (R-PDIP-T\*\*)

16 PINS SHOWN

## PLASTIC DUAL-IN-LINE PACKAGE



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



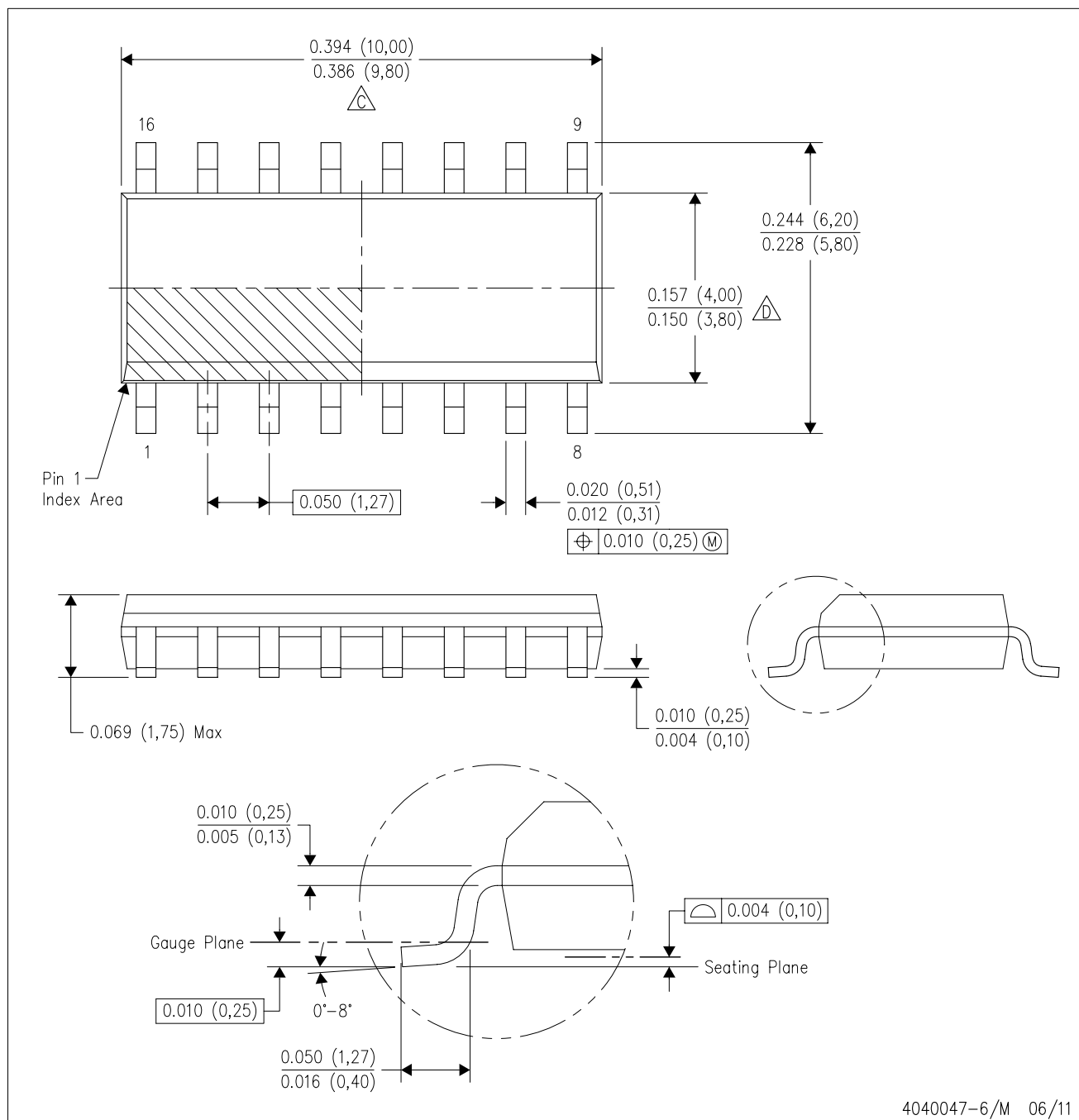
4040049/E 12/2002

NOTES:

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

## D (R-PDSO-G16)

# PLASTIC SMALL OUTLINE

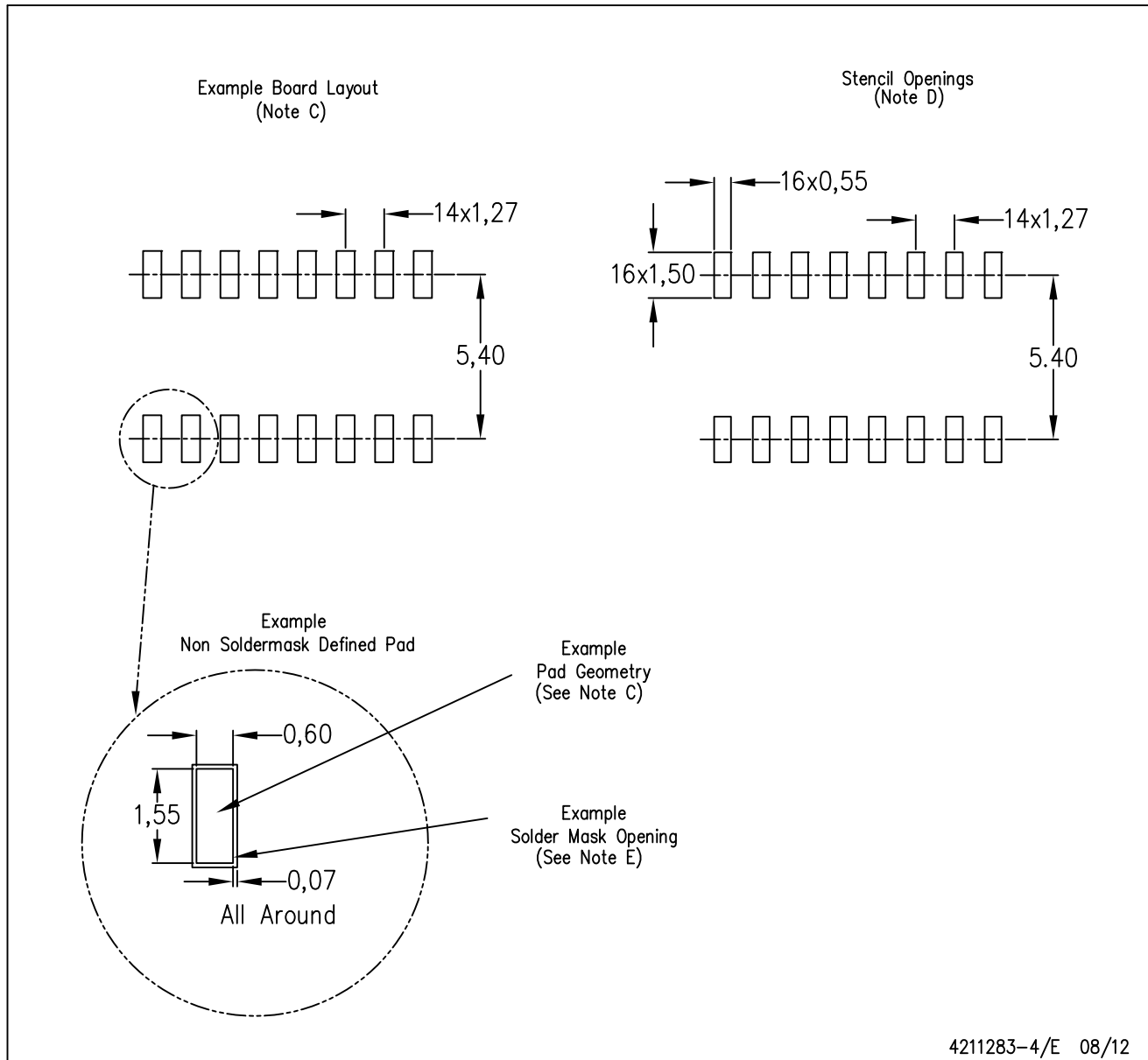


NOTES:

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

D (R-PDSO-G16)

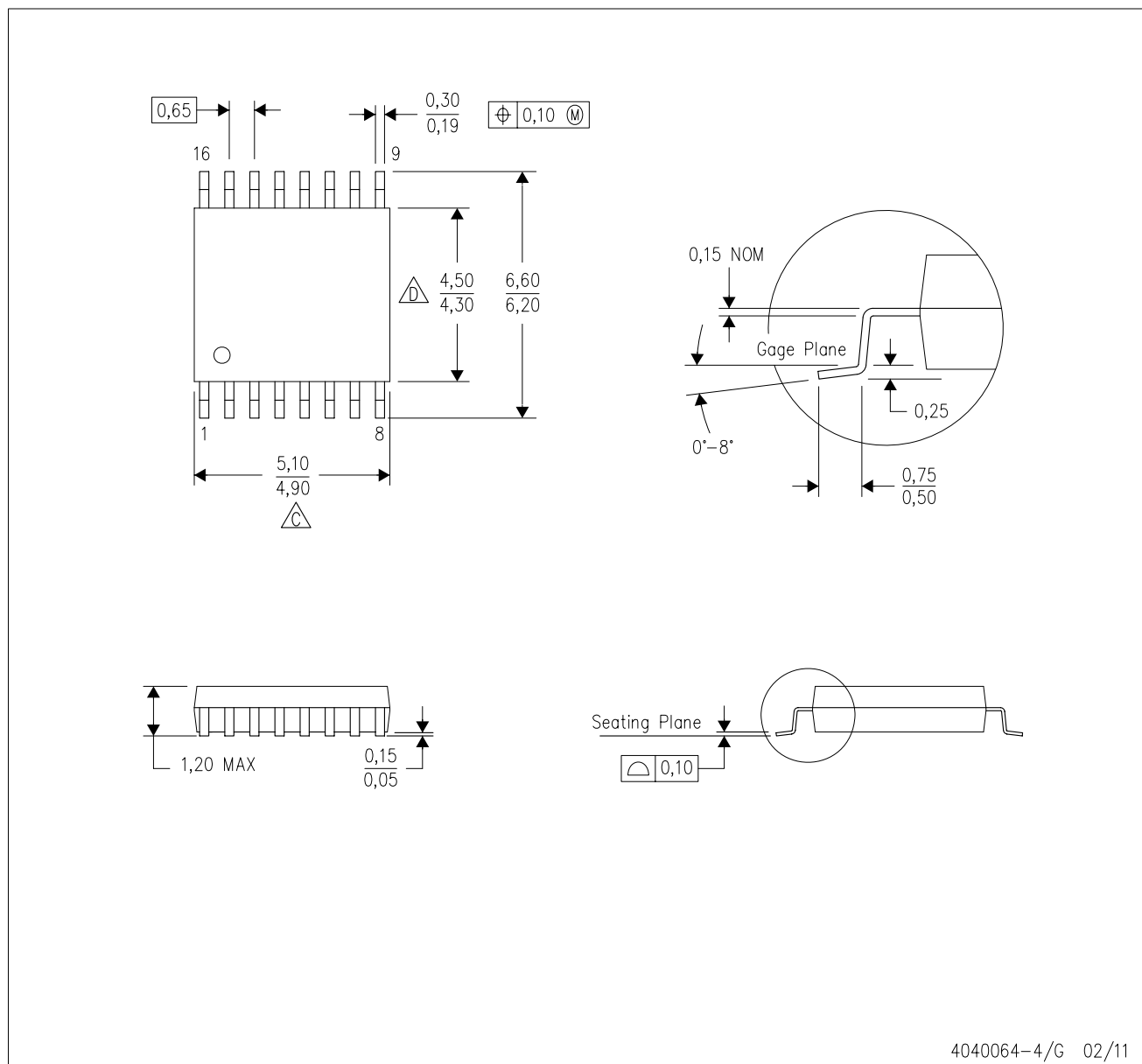
PLASTIC SMALL OUTLINE



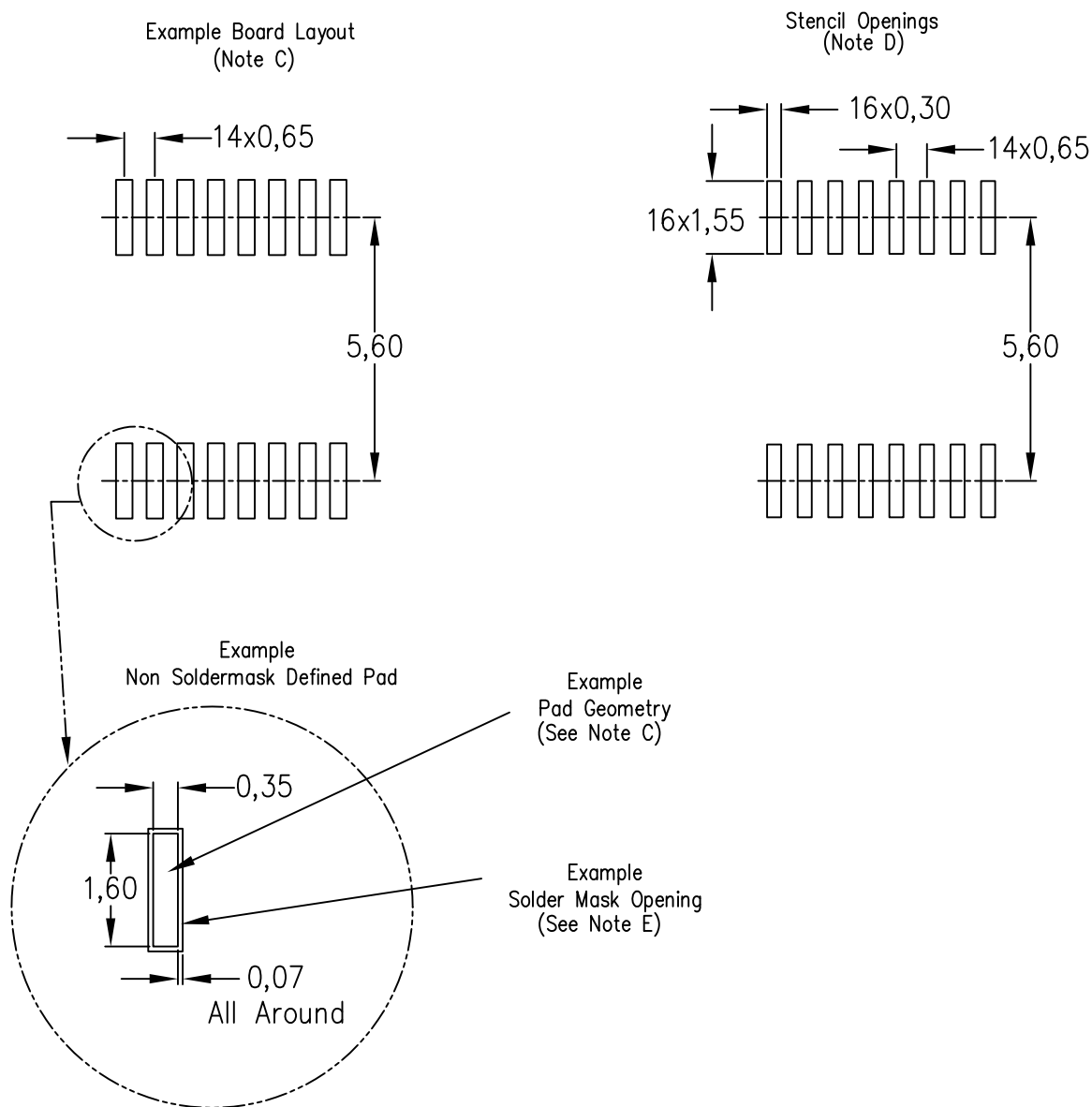
- NOTES:
- All linear dimensions are in millimeters.
  - This drawing is subject to change without notice.
  - Publication IPC-7351 is recommended for alternate designs.
  - Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact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

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.
  - 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.
  - D. Body width does not include interlead flash. Interlead flash shall not exceed 0,25 each side.
  - E. Falls within JEDEC MO-153



4211284-3/F 12/12

NOTES:

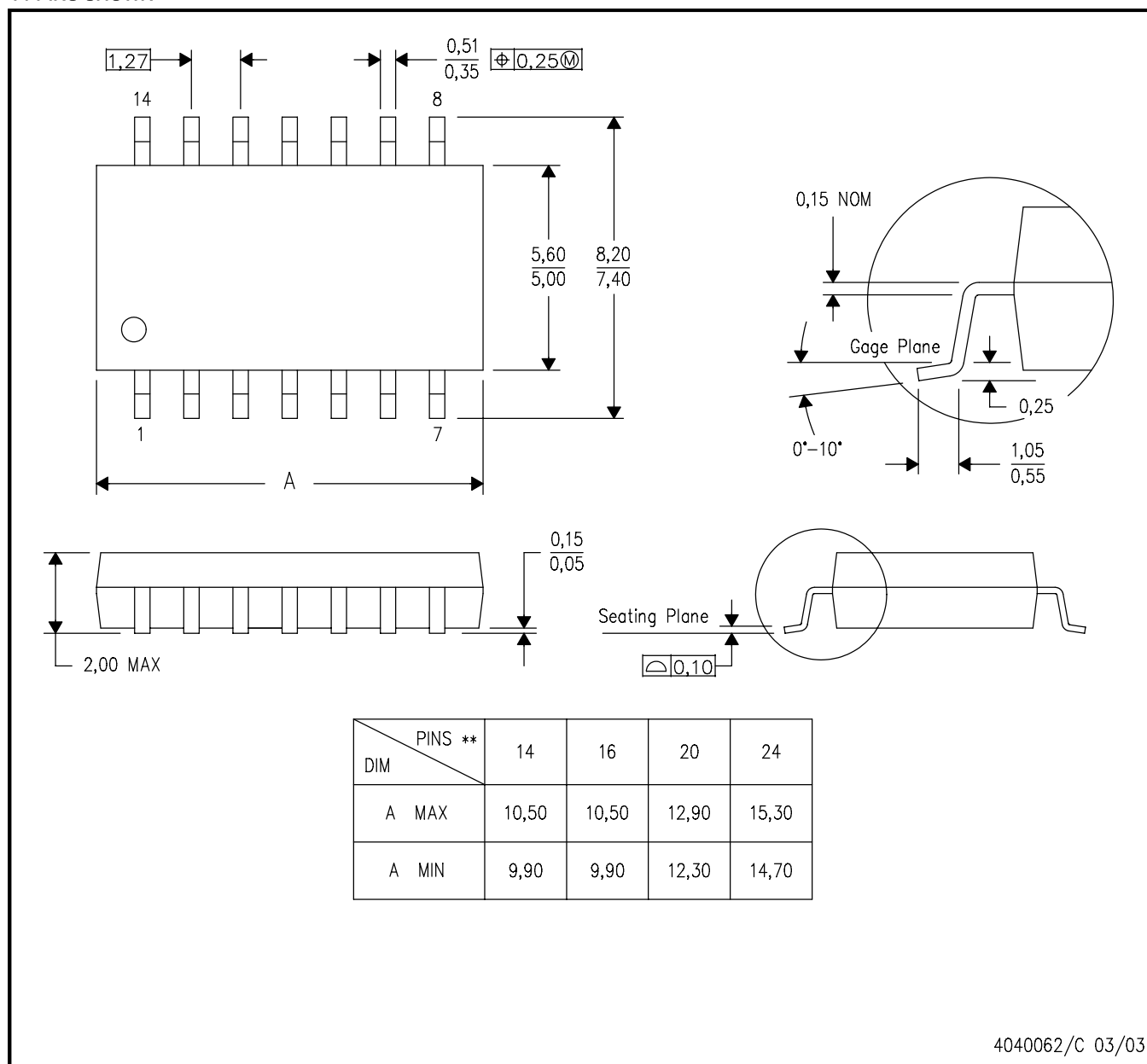
- A. All linear dimensions are in millimeters.
- B. This drawing is subject to change without notice.
- C. Publication IPC-7351 is recommended for alternate designs.
- D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact 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>                               |
| Logic                        | <a href="http://logic.ti.com">logic.ti.com</a>                                       |
| Power Mgmt                   | <a href="http://power.ti.com">power.ti.com</a>                                       |
| Microcontrollers             | <a href="http://microcontroller.ti.com">microcontroller.ti.com</a>                   |
| 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>                                 |
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|                               |                                                                                          |
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| 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>                             |
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- Подбор аналогов;
- Консультации по применению компонента;
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- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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