- Three-State Versions of '151, 'LS151, 'S151
- Three-State Outputs Interface Directly with System Bus
- Perform Parallel-to-Serial Conversion
- Permit Multiplexing from N-lines to One Line
- Complementary Outputs Provide True and Inverted Data
- Fully Compatible with Most TTL Circuits

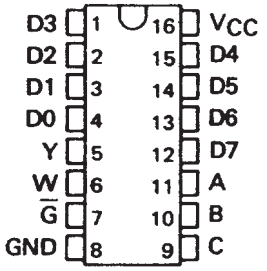
| TYPE | MAX NO. OF COMMON OUTPUTS | TYPICAL AVG PROP DELAY TIME (D TO Y) | TYPICAL POWER DISSIPATION |
|---|---|---|---|
| SN54251 | 49 | 17 ns | 250 mW |
| SN74251 | 129 | 17 ns | 250 mW |
| SN54LS251 | 49 | 17 ns | 35 mW |
| SN74LS251 | 129 | 17 ns | 35 mW |
| SN54S251 | 39 | 8 ns | 275 mW |
| SN74S251 | 129 | 8 ns | 275 mW |

## description

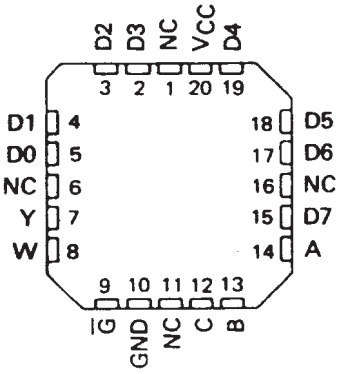
These monolithic data selectors/multiplexers contain full on-chip binary decoding to select one-of-eight data sources and feature a strobe-controlled three-state output. The strobe must be at a low logic level to enable these devices. The three-state outputs permit a number of outputs to be connected to a common bus. When the strobe input is high, both outputs are in a high-impedance state in which both the upper and lower transistors of each totem-pole output are off, and the output neither drives nor loads the bus significantly. When the strobe is low, the outputs are activated and operate as standard TTL totem-pole outputs.

To minimize the possibility that two outputs will attempt to take a common bus to opposite logic levels, the output control circuitry is designed so that the average output disable time is shorter than the average output enable time. The SN54251 and SN74251 have output clamp diodes to attenuate reflections on the bus line.

**SN54251, SN54LS251, SN54S251 . . . J OR W PACKAGE**
**SN74251 . . . N PACKAGE**
**SN74LS251, SN74S251 . . . D OR N PACKAGE**
**(TOP VIEW)**




**SN54LS251, SN54S251 . . . FK PACKAGE**
**(TOP VIEW)**




NC – No internal connection

**FUNCTION TABLE**

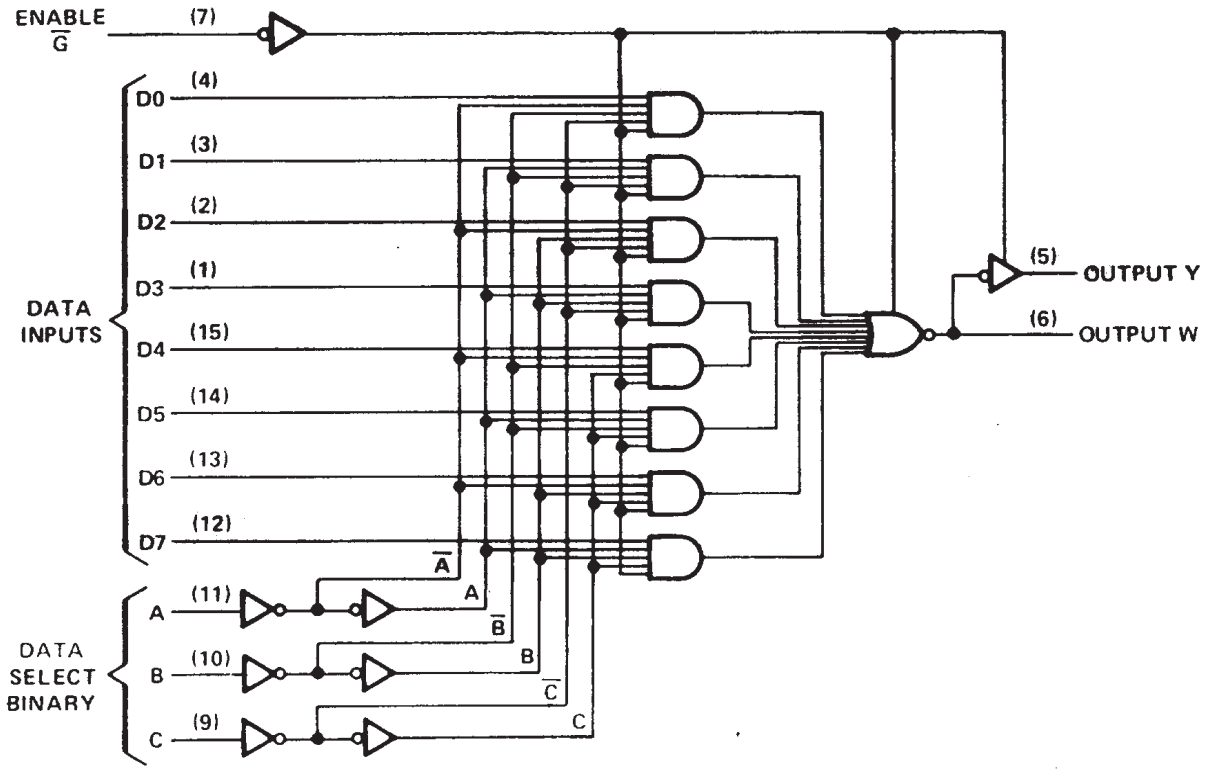
| INPUTS | | | | OUTPUTS | |
|---|---|---|---|---|---|
| SELECT | | | ENABLE | | |
| C | B | A | $\overline{G}$ | Y | W |
| X | X | X | H | Z | Z |
| L | L | L | L | D0 | $\overline{D0}$ |
| L | L | H | L | D1 | $\overline{D1}$ |
| L | H | L | L | D2 | $\overline{D2}$ |
| L | H | H | L | D3 | $\overline{D3}$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

H = high logic level, L = low logic level
X = irrelevant, Z = high impedance (off)
D0, D1 . . . D7 = the level of the respective D input

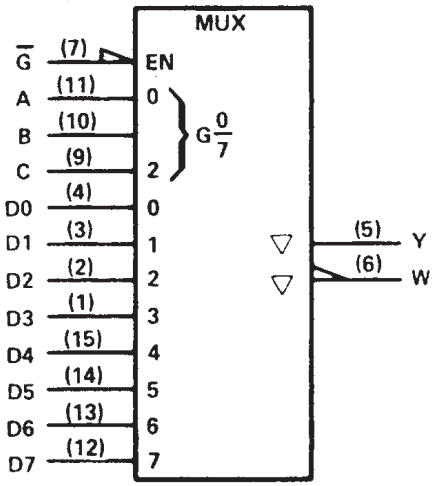
PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

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## logic diagram (positive logic)




## logic symbol†




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

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

Supply voltage, $V_{CC}$ (see Note 1) . . . . . 7 V
Input voltage . . . . . 5.5 V
Off-state output voltage . . . . . 5.5 V
Operating free-air temperature range: SN54251 . . . . . −55°C to 125°C
SN74251 . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

NOTE 1: Voltage values are with respect to network ground terminal.

### recommended operating conditions

| | SN54251 | | | SN74251 | | | UNIT |
|---|---|---|---|---|---|---|---|
| | MIN | NOM | MAX | MIN | NOM | MAX | |
| Supply voltage, $V_{CC}$ | 4.5 | 5 | 5.5 | 4.75 | 5 | 5.25 | V |
| High-level output current, $I_{OH}$ | | | −2 | | | −5.2 | mA |
| Low-level output current, $I_{OL}$ | | | 16 | | | 16 | mA |
| Operating free-air temperature, $T_A$ | −55 | | 125 | 0 | | 70 | °C |

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

| PARAMETER | | TEST CONDITIONS† | | MIN | TYP‡ | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| $V_{IH}$ | High-level input voltage | | | 2 | | | V |
| $V_{IL}$ | Low-level input voltage | | | | | 0.8 | V |
| $V_{IK}$ | Input clamp voltage | $V_{CC}$ = MIN, $I_I$ = −12 mA | | | | −1.5 | V |
| $V_{OH}$ | High-level output voltage | $V_{CC}$ = MIN, $V_{IH}$ = 2 V, $V_{IL}$ = 0.8 V, $I_{OH}$ = MAX | | 2.4 | 3.2 | | V |
| $V_{OL}$ | Low-level output voltage | $V_{CC}$ = MIN, $V_{IH}$ = 2 V, $V_{IL}$ = 0.8 V, $I_{OL}$ = 16 mA | | | 0.2 | 0.4 | V |
| $I_{OZ}$ | Off-state (high-impedance-state) output current | $V_{CC}$ = MAX, $V_{IH}$ = 2 V | $V_O$ = 2.4 V | | | 40 | μA |
| | | | $V_O$ = 0.4 V | | | −40 | |
| $V_O$ | Output clamp voltage | $V_{CC}$ = MAX, $V_{IH}$ = 4.5 V | $I_O$ = −12 mA | | | −1.5 | V |
| | | | $I_O$ = 12 mA | | | $V_{CC}$+1.5 | |
| $I_I$ | Input current at maximum input voltage | $V_{CC}$ = MAX, $V_I$ = 5.5 V | | | | 1 | mA |
| $I_{IH}$ | High-level input current | $V_{CC}$ = MAX, $V_I$ = 2.4 V | | | | 40 | μA |
| $I_{IL}$ | Low-level input current | $V_{CC}$ = MAX, $V_I$ = 0.4 V | | | | −1.6 | mA |
| $I_{OS}$ | Short-circuit output current§ | $V_{CC}$ = MAX | | −18 | | −55 | mA |
| $I_{CC}$ | Supply current | $V_{CC}$ = MAX, All outputs open | All inputs at 4.5 V, | | 38 | 62 | mA |

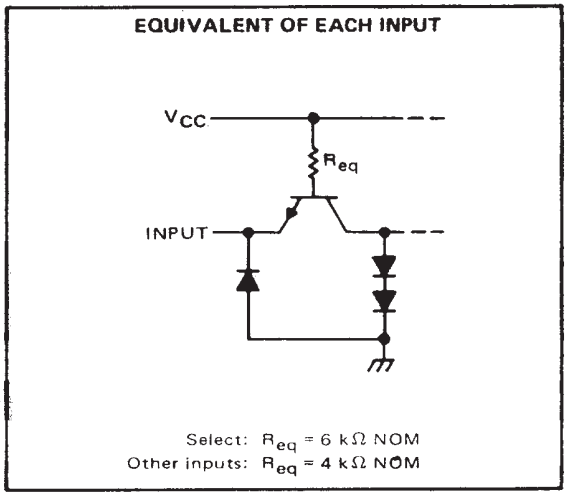
†For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
‡All typical values are at $V_{CC}$ = 5 V, $T_A$ = 25°C.
§Not more than one output should be shorted at a time.

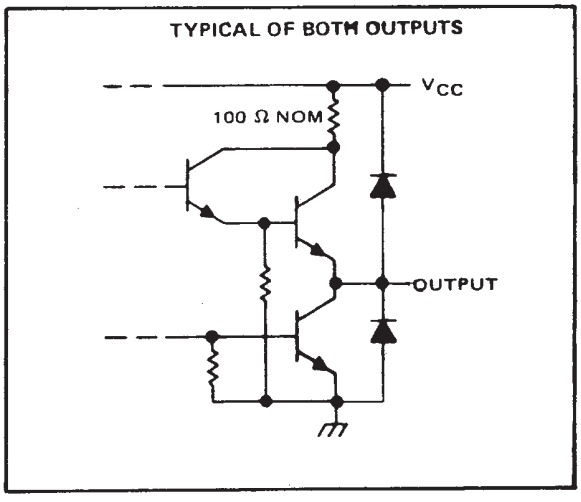
## switching characteristics, $V_{CC}$ = 5 V, $T_A$ = 25°C

| PARAMETER† | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| $t_{PLH}$ | A, B, or C (4 levels) | Y | $C_L$ = 50 pF, $R_L$ = 400 Ω, See Note 2 | | 29 | 45 | ns |
| $t_{PHL}$ | | | | | 28 | 45 | |
| $t_{PLH}$ | A, B, or C (3 levels) | W | | | 20 | 33 | ns |
| $t_{PHL}$ | | | | | 21 | 33 | |
| $t_{PLH}$ | Any D | Y | | | 17 | 28 | ns |
| $t_{PHL}$ | | | | | 18 | 28 | |
| $t_{PLH}$ | Any D | W | | | 10 | 15 | ns |
| $t_{PHL}$ | | | | | 9 | 15 | |
| $t_{PZH}$ | $\overline{G}$ | Y | | | 17 | 27 | ns |
| $t_{PZL}$ | | | | | 26 | 40 | |
| $t_{PZH}$ | $\overline{G}$ | W | | | 17 | 27 | ns |
| $t_{PZL}$ | | | | | 24 | 40 | |
| $t_{PHZ}$ | $\overline{G}$ | Y | $C_L$ = 5 pF, $R_L$ = 400 Ω, See Note 2 | | 5 | 8 | ns |
| $t_{PLZ}$ | | | | | 15 | 23 | |
| $t_{PHZ}$ | $\overline{G}$ | W | | | 5 | 8 | ns |
| $t_{PLZ}$ | | | | | 15 | 23 | |

†$t_{PLH}$ = Propagation delay time, low-to-high-level output
$t_{PHL}$ = Propagation delay time, high-to-low-level output
$t_{PZH}$ = Output enable time to high level
$t_{PZL}$ = Output enable time to low level
$t_{PHZ}$ = Output disable time from high level
$t_{PLZ}$ = Output disable time from low level
NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

## schematics of inputs and outputs



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

Supply voltage, $V_{CC}$ (see Note 1) . . . . . 7 V
Input voltage . . . . . 7 V
Off-state output voltage . . . . . 5.5 V
Operating free-air temperature range: SN54LS251 . . . . . 55°C to 125°C
SN74LS251 . . . . . 0°C to 70°C
Storage temperature range . . . . . –65°C to 150°C

NOTE 1: Voltage values are with respect to network ground terminal.

### recommended operating conditions

| | | SN54LS251 | | | SN74LS251 | | | UNIT |
|---|---|---|---|---|---|---|---|---|
| | | MIN | NOM | MAX | MIN | NOM | MAX | |
| $V_{CC}$ | Supply voltage | 4.5 | 5 | 5.5 | 4.75 | 5 | 5.25 | V |
| $V_{IH}$ | High-level input voltage | 2 | | | 2 | | | V |
| $V_{IL}$ | Low-level input voltage | | | 0.7 | | | 0.8 | V |
| $I_{OH}$ | High-level output current | | | – 1 | | | – 2.6 | mA |
| $I_{OL}$ | Low-level output current | | | 4 | | | 8 | mA |
| $T_A$ | Operating free-air temperature | – 55 | | 125 | 0 | | 70 | °C |

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

| PARAMETER | | TEST CONDITIONS† | | SN54LS251 | | | SN74LS251 | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| $V_{IK}$ | | $V_{CC}$ = MIN, $I_I$ = – 18 mA | | | | – 1.5 | | | – 1.5 | V |
| $V_{OH}$ | | $V_{CC}$ = MIN, $V_{IH}$ = 2 V, $V_{IL}$ = MAX, $I_{OH}$ = MAX | | 2.4 | 3.4 | | 2.4 | 3.1 | | V |
| $V_{OL}$ | | $V_{CC}$ = MIN, $V_{IH}$ = 2 V, $V_{IL}$ = MAX | $I_{OL}$ = 4 mA | | 0.25 | 0.4 | | 0.25 | 0.4 | V |
| | | | $I_{OL}$ = 8 mA | | | | | 0.35 | 0.5 | |
| $I_{OZ}$ | | $V_{CC}$ = MAX, $V_{IH}$ = 2 V | $V_O$ = 2.7 V | | | 20 | | | 20 | μA |
| | | | $V_O$ = 0.4 V | | | –20 | | | – 20 | |
| $I_I$ | | $V_{CC}$ = MAX, $V_I$ = 7 V | | | | 0.1 | | | 0.1 | mA |
| $I_{IH}$ | | $V_{CC}$ = MAX, $V_I$ = 2.7 V | | | | 20 | | | 20 | μA |
| $I_{IL}$ | Enable $\overline{G}$ | $V_{CC}$ = MAX, $V_I$ = 0.4 | | | | – 0.2 | | | – 0.2 | mA |
| | All other | | | | | – 0.4 | | | – 0.4 | |
| $I_{OS}$§ | | $V_{CC}$ = MAX | | – 30 | | – 130 | – 30 | | – 130 | mA |
| $I_{CC}$ | | $V_{CC}$ = MAX, See Note 3 | Condition A | | 6.1 | 10 | | 6.1 | 10 | mA |
| | | | Condition B | | 7.1 | 12 | | 7.1 | 12 | |

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
‡ All typical values are at $V_{CC}$ = 5 V, $T_A$ = 25°C.
§ Not more than one output should be shorted at a time, and duration of the short-circuit should not exceed one second.
NOTE 3: $I_{CC}$ is measured with the outputs open and all data and select inputs at 4.5 V under the following conditions:
A. Enable grounded.
B. Strobe at 4.5 V.

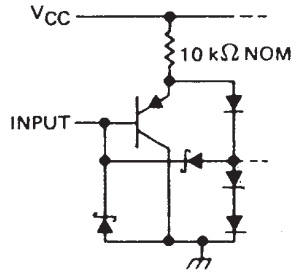
## switching characteristics, $V_{CC}$ = 5 V, $T_A$ = 25°C

| PARAMETER† | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| $t_{PLH}$ | A, B, or C (4 levels) | Y | $C_L$ = 15 pF, $R_L$ = 2 kΩ, See Note 2 | | 29 | 45 | ns |
| $t_{PHL}$ | | | | | 28 | 45 | |
| $t_{PLH}$ | A, B, or C (3 levels) | W | | | 20 | 33 | ns |
| $t_{PHL}$ | | | | | 21 | 33 | |
| $t_{PLH}$ | Any D | Y | | | 17 | 28 | ns |
| $t_{PHL}$ | | | | | 18 | 28 | |
| $t_{PLH}$ | Any D | W | | | 10 | 15 | ns |
| $t_{PHL}$ | | | | | 9 | 15 | |
| $t_{PZH}$ | $\overline{G}$ | Y | | | 30 | 45 | ns |
| $t_{PZL}$ | | | | | 26 | 40 | |
| $t_{PZH}$ | $\overline{G}$ | W | | | 17 | 27 | ns |
| $t_{PZL}$ | | | | | 24 | 40 | |
| $t_{PHZ}$ | $\overline{G}$ | Y | $C_L$ = 5 pF, $R_L$ = 2 kΩ, See Note 2 | | 30 | 45 | ns |
| $t_{PLZ}$ | | | | | 15 | 25 | |
| $t_{PHZ}$ | $\overline{G}$ | W | | | 37 | 55 | ns |
| $t_{PLZ}$ | | | | | 15 | 25 | |

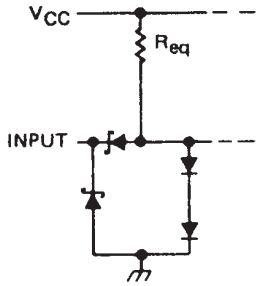
†$t_{PLH}$ = Propagation delay time, low-to-high-level output
$t_{PHL}$ = Propagation delay time, high-to-low-level output
$t_{PZH}$ = Output enable time to high level
$t_{PZL}$ = Output enable time to low level
$t_{PHZ}$ = Output disable time from high level
$t_{PLZ}$ = Output disable time from low level
NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

## schematics of inputs and outputs

EQUIVALENT OF $\overline{G}$ INPUT

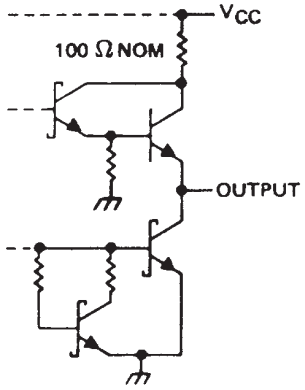



EQUIVALENT OF ALL OTHER INPUTS




A, B, C: $R_{eq}$ = 20 kΩ NOM
D0 thru D7: $R_{eq}$ = 17 kΩ NOM

TYPICAL OF BOTH OUTPUTS



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

Supply voltage, $V_{CC}$ (see Note 1) . . . . . 7 V
Input voltage . . . . . 5.5 V
Off-state output voltage . . . . . 5.5 V
Operating free-air temperature range: SN54S251 . . . . . −55°C to 125°C
SN74S251 . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

NOTE 1: Voltage values are with respect to network ground terminal.

### recommended operating conditions

| | SN54S251 | | | SN74S251 | | | UNIT |
|---|---|---|---|---|---|---|---|
| | MIN | NOM | MAX | MIN | NOM | MAX | |
| Supply voltage, $V_{CC}$ | 4.5 | 5 | 5.5 | 4.75 | 5 | 5.25 | V |
| High-level output current, $I_{OH}$ | | | −2 | | | −6.5 | mA |
| Low-level output current, $I_{OL}$ | | | 20 | | | 20 | mA |
| Operating free-air temperature, $T_A$ | −55 | | 125 | 0 | | 70 | °C |

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

| PARAMETER | | TEST CONDITIONS† | | | MIN | TYP‡ | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|
| $V_{IH}$ | High-level input voltage | | | | 2 | | | V |
| $V_{IL}$ | Low-level input voltage | | | | | | 0.8 | V |
| $V_{IK}$ | Input clamp voltage | $V_{CC}$ = MIN, | $I_I$ = −18 mA | | | | −1.2 | V |
| $V_{OH}$ | High-level output voltage | $V_{CC}$ = MIN, $V_{IH}$ = 2 V, | | SN54S' | 2.4 | 3.4 | | V |
| | | $V_{IL}$ = 0.8 V, | $I_{OH}$ = MAX | SN74S' | 2.4 | 3.2 | | |
| $V_{OL}$ | Low-level output voltage | $V_{CC}$ = MIN, $V_{IH}$ = 2 V, | | | | | 0.5 | V |
| | | $V_{IL}$ = 0.8 V, | $I_{OL}$ = 20 mA | | | | | |
| $I_{OZ}$ | Off-state (high-impedance-state) output current | $V_{CC}$ = MAX, | $V_O$ = 2.4 V | | | | 50 | μA |
| | | $V_{IH}$ = 2 V | $V_O$ = 0.5 V | | | | −50 | |
| $I_I$ | Input current at maximum input voltage | $V_{CC}$ = MAX, | $V_I$ = 5.5 V | | | | 1 | mA |
| $I_{IH}$ | High-level input current | $V_{CC}$ = MAX, | $V_I$ = 2.7 V | | | | 50 | μA |
| $I_{IL}$ | Low-level input current | $V_{CC}$ = MAX, | $V_I$ = 0.5 V | | | | −2 | mA |
| $I_{OS}$ | Short-circuit output current§ | $V_{CC}$ = MAX | | | −40 | | −100 | mA |
| $I_{CC}$ | Supply current | $V_{CC}$ = MAX, All inputs at 4.5 V, All outputs open | | | | 55 | 85 | mA |

†For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
‡All typical values are at $V_{CC}$ = 5 V, $T_A$ = 25°C.
§Not more than one output should be shorted at a time, and duration of the short-circuit should not exceed one second.

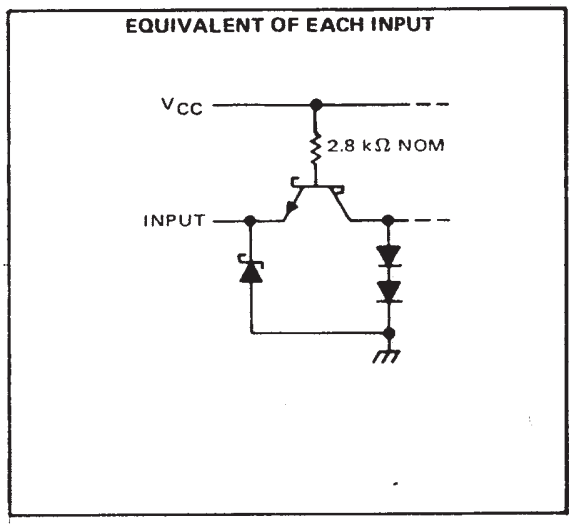
## switching characteristics, $V_{CC}$ = 5 V, $T_A$ = 25°C

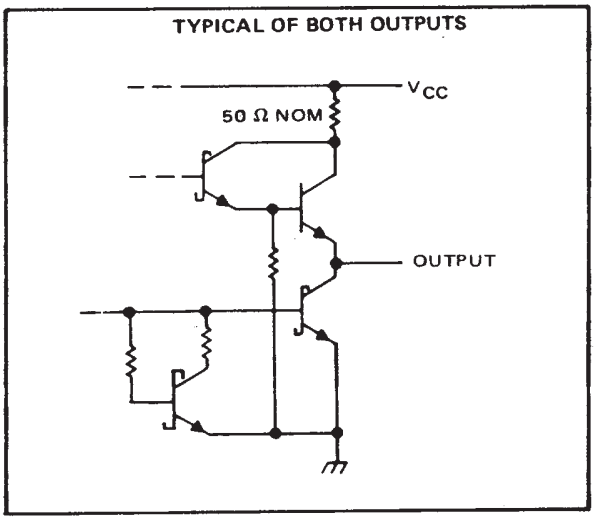
| PARAMETER† | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| $t_{PLH}$ | A, B, or C (4 levels) | Y | $C_L$ = 15 pF, $R_L$ = 280 Ω, See Note 2 | | 12 | 18 | ns |
| $t_{PHL}$ | | | | | 13 | 19.5 | |
| $t_{PLH}$ | A, B, or C (3 levels) | W | | | 10 | 15 | ns |
| $t_{PHL}$ | | | | | 9 | 13.5 | |
| $t_{PLH}$ | Any D | Y | | | 8 | 12 | ns |
| $t_{PHL}$ | | | | | 8 | 12 | |
| $t_{PLH}$ | Any D | W | | | 4.5 | 7 | ns |
| $t_{PHL}$ | | | | | 4.5 | 7 | |
| $t_{PZH}$ | $\overline{G}$ | Y | $C_L$ = 50 pF, $R_L$ = 280 Ω, See Note 2 | | 13 | 19.5 | ns |
| $t_{PZL}$ | | | | | 14 | 21 | |
| $t_{PZH}$ | $\overline{G}$ | W | | | 13 | 19.5 | ns |
| $t_{PZL}$ | | | | | 14 | 21 | |
| $t_{PHZ}$ | $\overline{G}$ | Y | $C_L$ = 5 pF, $R_L$ = 280 Ω, See Note 2 | | 5.5 | 8.5 | ns |
| $t_{PLZ}$ | | | | | 9 | 14 | |
| $t_{PHZ}$ | $\overline{G}$ | W | | | 5.5 | 8.5 | ns |
| $t_{PLZ}$ | | | | | 9 | 14 | |

† $t_{PLH}$ = Propagation delay time, low-to-high-level output
$t_{PHL}$ = Propagation delay time, high-to-low-level output
$t_{PZH}$ = Output enable time to high level
$t_{PZL}$ = Output enable time to low level
$t_{PHZ}$ = Output disable time from high level
$t_{PLZ}$ = Output disable time from low level

NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

## schematics of inputs and outputs



## PACKAGING INFORMATION

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7601601EA | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | 7601601EA SNJ54LS251J | Samples |
| 7601601FA | ACTIVE | CFP | W | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | 7601601FA SNJ54LS251W | Samples |
| 7601601FA | ACTIVE | CFP | W | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | 7601601FA SNJ54LS251W | Samples |
| 8002201EA | OBSOLETE | CDIP | J | 16 | | TBD | Call TI | Call TI | -55 to 125 | | |
| 8002201EA | OBSOLETE | CDIP | J | 16 | | TBD | Call TI | Call TI | -55 to 125 | | |
| 8002201FA | OBSOLETE | CFP | W | 16 | | TBD | Call TI | Call TI | -55 to 125 | | |
| 8002201FA | OBSOLETE | CFP | W | 16 | | TBD | Call TI | Call TI | -55 to 125 | | |
| JM38510/07905BEA | OBSOLETE | CDIP | J | 16 | | TBD | Call TI | Call TI | -55 to 125 | | |
| JM38510/07905BEA | OBSOLETE | CDIP | J | 16 | | TBD | Call TI | Call TI | -55 to 125 | | |
| JM38510/30905B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | JM38510/ 30905B2A | Samples |
| JM38510/30905B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | JM38510/ 30905B2A | Samples |
| JM38510/30905BEA | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 30905BEA | Samples |
| JM38510/30905BEA | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 30905BEA | Samples |
| JM38510/30905BFA | NRND | CFP | W | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 30905BFA | |
| JM38510/30905BFA | NRND | CFP | W | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 30905BFA | |
| M38510/30905B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | JM38510/ 30905B2A | Samples |
| M38510/30905B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | JM38510/ 30905B2A | Samples |
| M38510/30905BEA | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 30905BEA | Samples |
| M38510/30905BEA | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 30905BEA | Samples |
| M38510/30905BFA | NRND | CFP | W | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ | |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 30905BFA | |
| M38510/30905BFA | NRND | CFP | W | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 30905BFA | |
| SN54251J | OBSOLETE | CDIP | J | 16 | | TBD | Call TI | Call TI | -55 to 125 | | |
| SN54251J | OBSOLETE | CDIP | J | 16 | | TBD | Call TI | Call TI | -55 to 125 | | |
| SN54LS251J | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SN54LS251J | Samples |
| SN54LS251J | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SN54LS251J | Samples |
| SN54S251J | OBSOLETE | CDIP | J | 16 | | TBD | Call TI | Call TI | -55 to 125 | | |
| SN54S251J | OBSOLETE | CDIP | J | 16 | | TBD | Call TI | Call TI | -55 to 125 | | |
| SN74251N | OBSOLETE | PDIP | N | 16 | | TBD | Call TI | Call TI | 0 to 70 | | |
| SN74251N | OBSOLETE | PDIP | N | 16 | | TBD | Call TI | Call TI | 0 to 70 | | |
| SN74251N3 | OBSOLETE | PDIP | N | 16 | | TBD | Call TI | Call TI | 0 to 70 | | |
| SN74251N3 | OBSOLETE | PDIP | N | 16 | | TBD | Call TI | Call TI | 0 to 70 | | |
| SN74LS251D | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS251 | Samples |
| SN74LS251D | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS251 | Samples |
| SN74LS251DE4 | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS251 | Samples |
| SN74LS251DE4 | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS251 | Samples |
| SN74LS251DG4 | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS251 | Samples |
| SN74LS251DG4 | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS251 | Samples |
| SN74LS251DR | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS251 | Samples |
| SN74LS251DR | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS251 | Samples |
| SN74LS251DRE4 | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS251 | Samples |
| SN74LS251DRE4 | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS251 | Samples |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SN74LS251DRG4 | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS251 | Samples |
| SN74LS251DRG4 | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS251 | Samples |
| SN74LS251N | ACTIVE | PDIP | N | 16 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | 0 to 70 | SN74LS251N | Samples |
| SN74LS251N | ACTIVE | PDIP | N | 16 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | 0 to 70 | SN74LS251N | Samples |
| SN74LS251N3 | OBSOLETE | PDIP | N | 16 | | TBD | Call TI | Call TI | 0 to 70 | | |
| SN74LS251N3 | OBSOLETE | PDIP | N | 16 | | TBD | Call TI | Call TI | 0 to 70 | | |
| SN74LS251NE4 | ACTIVE | PDIP | N | 16 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | 0 to 70 | SN74LS251N | Samples |
| SN74LS251NE4 | ACTIVE | PDIP | N | 16 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | 0 to 70 | SN74LS251N | Samples |
| SN74LS251NSR | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS251 | Samples |
| SN74LS251NSR | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS251 | Samples |
| SN74LS251NSRE4 | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS251 | Samples |
| SN74LS251NSRE4 | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS251 | Samples |
| SN74LS251NSRG4 | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS251 | Samples |
| SN74LS251NSRG4 | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS251 | Samples |
| SN74S251D | OBSOLETE | SOIC | D | 16 | | TBD | Call TI | Call TI | 0 to 70 | | |
| SN74S251D | OBSOLETE | SOIC | D | 16 | | TBD | Call TI | Call TI | 0 to 70 | | |
| SN74S251N | OBSOLETE | PDIP | N | 16 | | TBD | Call TI | Call TI | 0 to 70 | | |
| SN74S251N | OBSOLETE | PDIP | N | 16 | | TBD | Call TI | Call TI | 0 to 70 | | |
| SN74S251N3 | OBSOLETE | PDIP | N | 16 | | TBD | Call TI | Call TI | 0 to 70 | | |
| SN74S251N3 | OBSOLETE | PDIP | N | 16 | | TBD | Call TI | Call TI | 0 to 70 | | |
| SNJ54251J | OBSOLETE | CDIP | J | 16 | | TBD | Call TI | Call TI | -55 to 125 | | |
| SNJ54251J | OBSOLETE | CDIP | J | 16 | | TBD | Call TI | Call TI | -55 to 125 | | |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SNJ54LS251FK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | SNJ54LS 251FK | Samples |
| SNJ54LS251FK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | SNJ54LS 251FK | Samples |
| SNJ54LS251J | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | 7601601EA SNJ54LS251J | Samples |
| SNJ54LS251J | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | 7601601EA SNJ54LS251J | Samples |
| SNJ54LS251W | ACTIVE | CFP | W | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | 7601601FA SNJ54LS251W | Samples |
| SNJ54LS251W | ACTIVE | CFP | W | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | 7601601FA SNJ54LS251W | Samples |
| SNJ54S251FK | OBSOLETE | LCCC | FK | 20 | | TBD | Call TI | Call TI | -55 to 125 | | |
| SNJ54S251FK | OBSOLETE | LCCC | FK | 20 | | TBD | Call TI | Call TI | -55 to 125 | | |
| SNJ54S251J | OBSOLETE | CDIP | J | 16 | | TBD | Call TI | Call TI | -55 to 125 | | |
| SNJ54S251J | OBSOLETE | CDIP | J | 16 | | TBD | Call TI | Call TI | -55 to 125 | | |
| SNJ54S251W | OBSOLETE | CFP | W | 16 | | TBD | Call TI | Call TI | -55 to 125 | | |
| SNJ54S251W | OBSOLETE | CFP | W | 16 | | TBD | Call TI | Call TI | -55 to 125 | | |

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

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

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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 SN54251, SN54LS251, SN54S251, SN74251, SN74LS251, SN74S251 :**

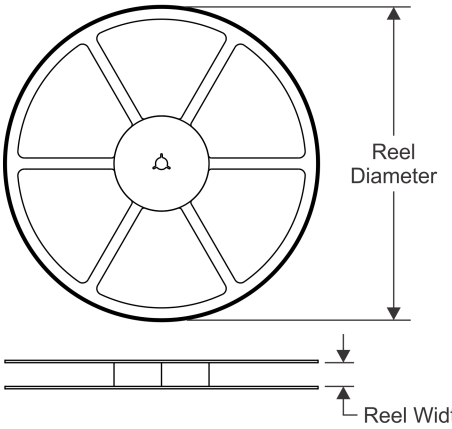
- Catalog: SN74251, SN74LS251, SN74S251
- Military: SN54251, SN54LS251, SN54S251

NOTE: Qualified Version Definitions:

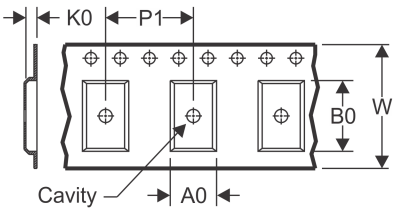
- Catalog - TI's standard catalog product
- Military - QML certified for Military and Defense Applications

## TAPE AND REEL INFORMATION

**REEL DIMENSIONS**

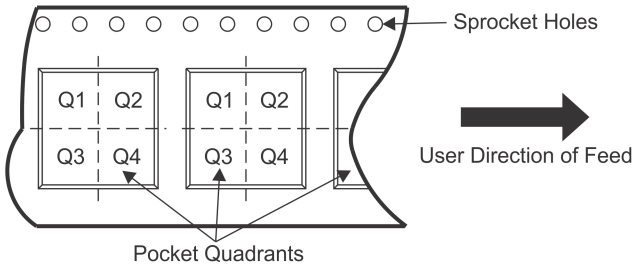



**TAPE DIMENSIONS**




| | |
|---|---|
| A0 | Dimension designed to accommodate the component width |
| B0 | Dimension designed to accommodate the component length |
| K0 | Dimension designed to accommodate the component thickness |
| W | Overall width of the carrier tape |
| P1 | Pitch between successive cavity centers |

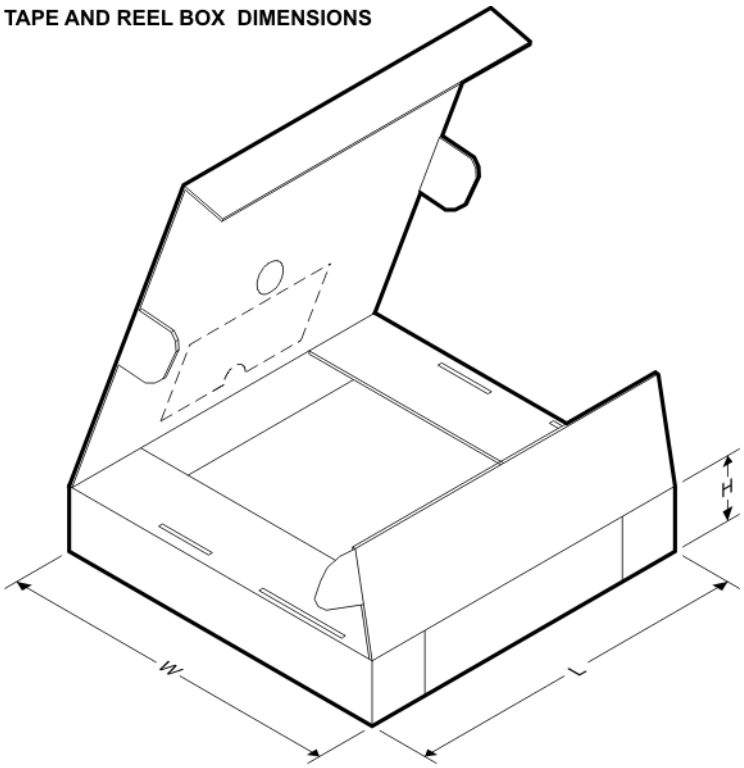
**QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE**




*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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SN74LS251DR | SOIC | D | 16 | 2500 | 330.0 | 16.4 | 6.5 | 10.3 | 2.1 | 8.0 | 16.0 | Q1 |

TAPE AND REEL BOX DIMENSIONS



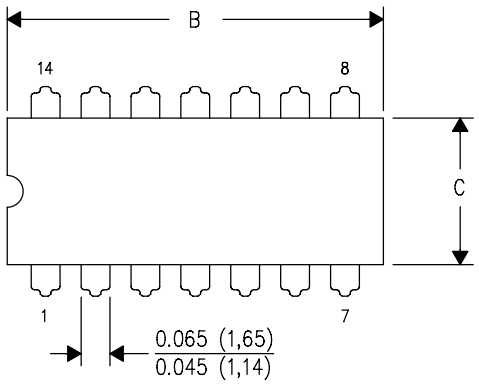

*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|---|---|---|---|---|---|---|---|
| SN74LS251DR | SOIC | D | 16 | 2500 | 333.2 | 345.9 | 28.6 |

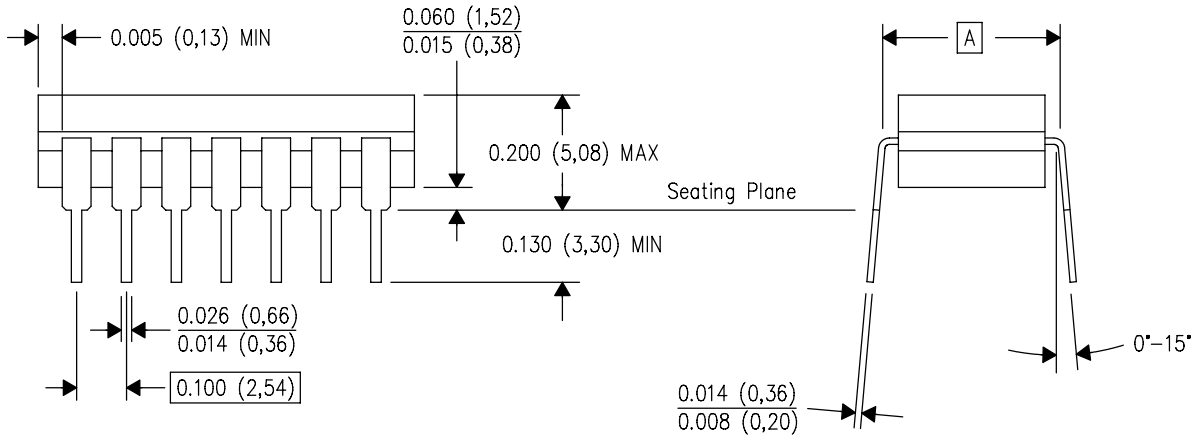
J (R–GDIP–T**)

14 LEADS SHOWN

# CERAMIC DUAL IN–LINE PACKAGE



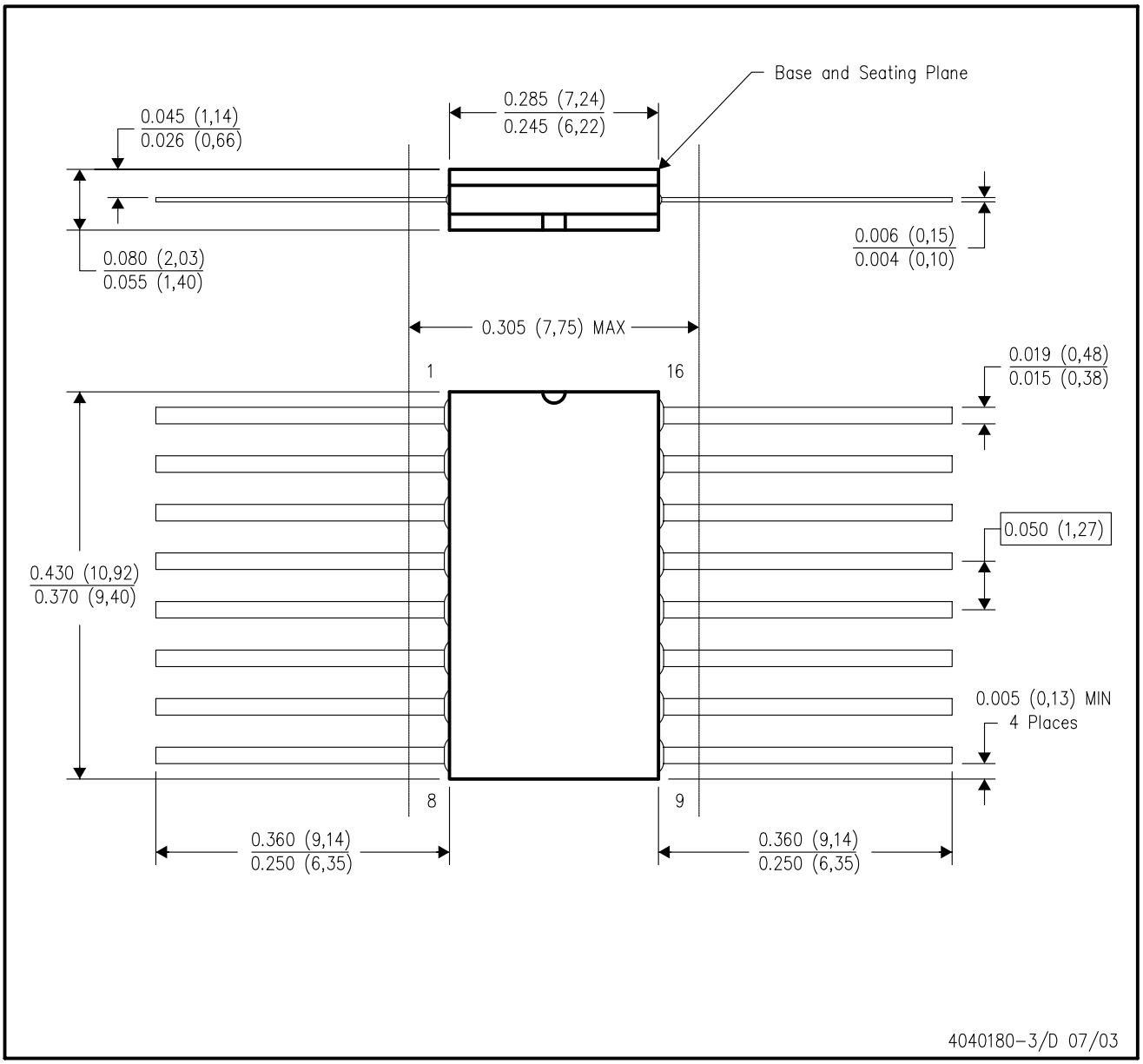

| DIM \ PINS ** | 14 | 16 | 18 | 20 |
|---|---|---|---|---|
| A | 0.300 (7,62) BSC | 0.300 (7,62) BSC | 0.300 (7,62) BSC | 0.300 (7,62) BSC |
| B MAX | 0.785 (19,94) | .840 (21,34) | 0.960 (24,38) | 1.060 (26,92) |
| B MIN | — | — | — | — |
| C MAX | 0.300 (7,62) | 0.300 (7,62) | 0.310 (7,87) | 0.300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

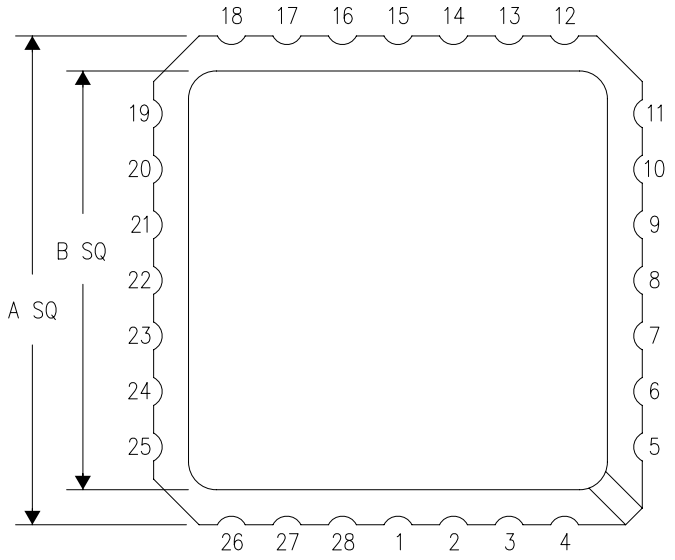
## W (R–GDFP–F16) CERAMIC DUAL FLATPACK



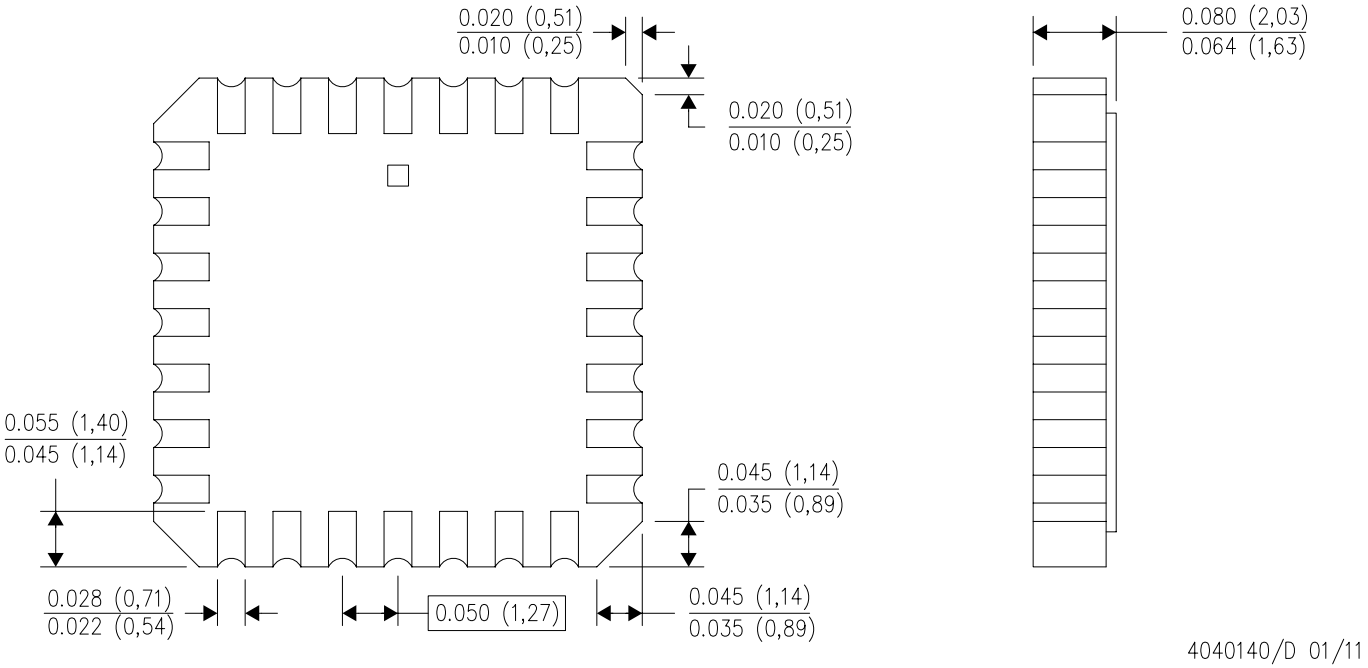

NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. This package can be hermetically sealed with a ceramic lid using glass frit.
D. Index point is provided on cap for terminal identification only.
E. Falls within MIL STD 1835 GDFP1–F16 and JEDEC MO–092AC

FK (S–CQCC–N**) LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN




| NO. OF TERMINALS ** | A | | B | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| 20 | 0.342 (8,69) | 0.358 (9,09) | 0.307 (7,80) | 0.358 (9,09) |
| 28 | 0.442 (11,23) | 0.458 (11,63) | 0.406 (10,31) | 0.458 (11,63) |
| 44 | 0.640 (16,26) | 0.660 (16,76) | 0.495 (12,58) | 0.560 (14,22) |
| 52 | 0.740 (18,78) | 0.761 (19,32) | 0.495 (12,58) | 0.560 (14,22) |
| 68 | 0.938 (23,83) | 0.962 (24,43) | 0.850 (21,6) | 0.858 (21,8) |
| 84 | 1.141 (28,99) | 1.165 (29,59) | 1.047 (26,6) | 1.063 (27,0) |



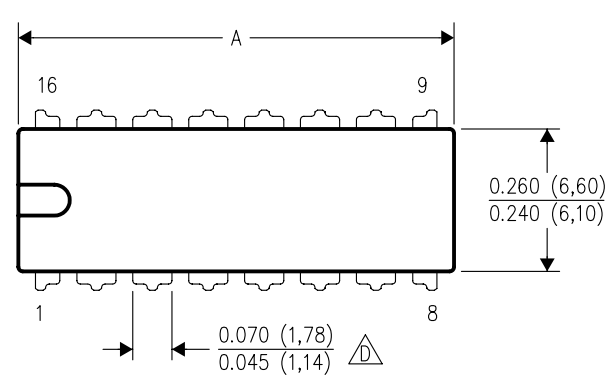

4040140/D 01/11

NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. This package can be hermetically sealed with a metal lid.
D. Falls within JEDEC MS–004

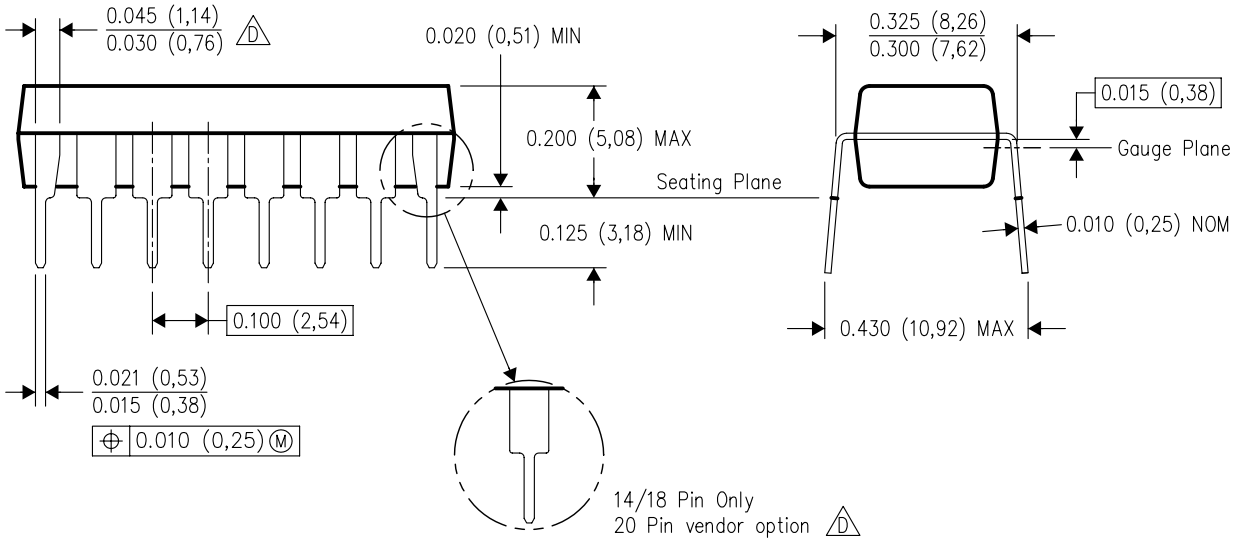
## N (R–PDIP–T**)

## PLASTIC DUAL–IN–LINE PACKAGE

16 PINS SHOWN



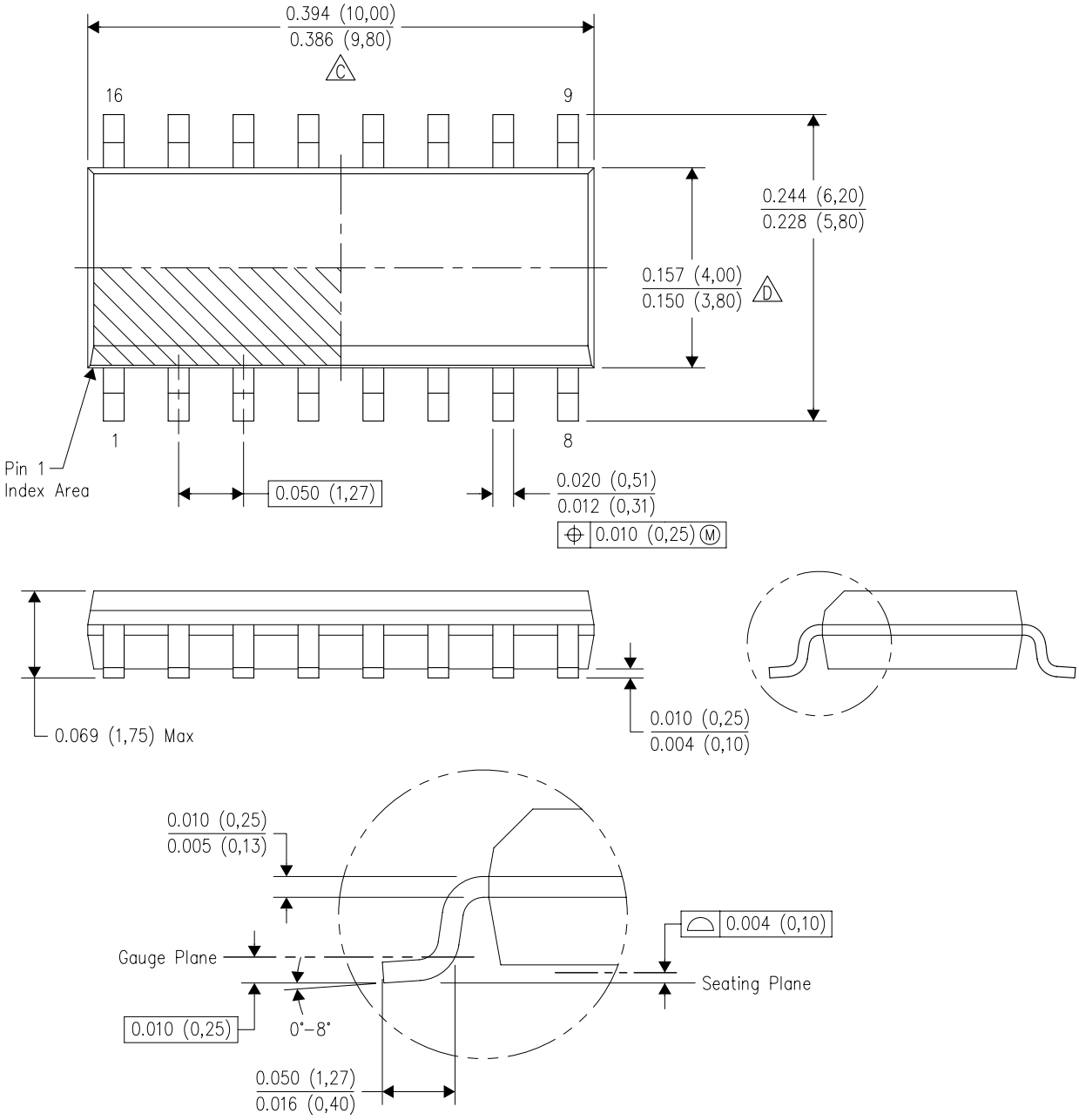

| DIM \ PINS ** | 14 | 16 | 18 | 20 |
|---|---|---|---|---|
| A MAX | 0.775 (19,69) | 0.775 (19,69) | 0.920 (23,37) | 1.060 (26,92) |
| A MIN | 0.745 (18,92) | 0.745 (18,92) | 0.850 (21,59) | 0.940 (23,88) |
| MS–001 VARIATION (C) | AA | BB | AC | AD |




4040049/E 12/2002

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

D (R–PDSO–G16) PLASTIC SMALL OUTLINE

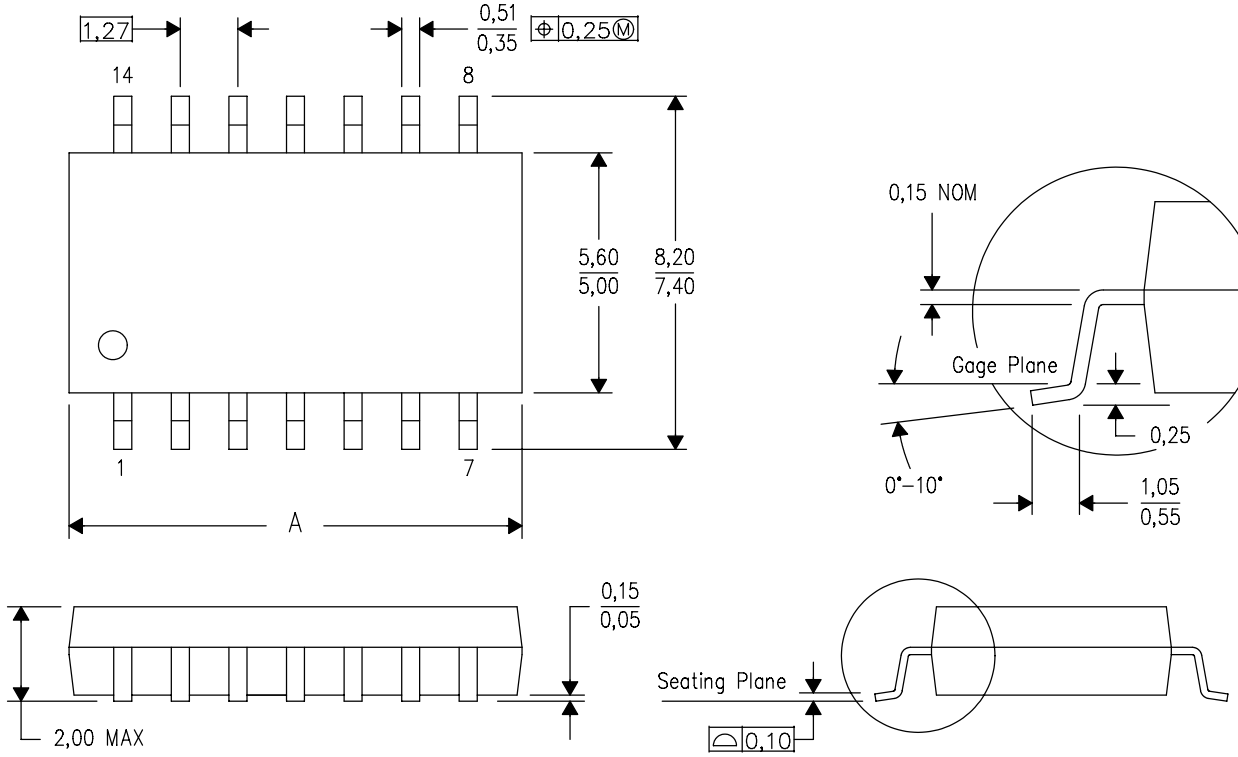



NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
D. Body width does not include interlead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

## MECHANICAL DATA

**NS (R-PDSO-G**)** **PLASTIC SMALL-OUTLINE PACKAGE**

**14-PINS SHOWN**




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

4040062/C 03/03

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

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