- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers and Flat Packages, and Plastic and Ceramic DIPs
- Dependable Texas Instruments Quality and Reliability

## description

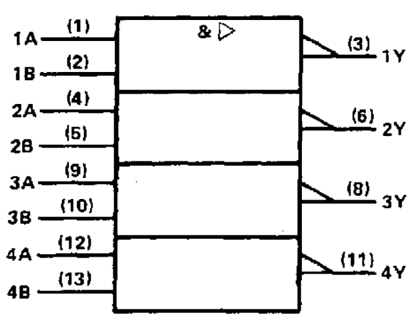
These devices contain four independent 2-input NAND buffer gates.

The SN5437, SN54LS37 and SN54S37 are characterized for operation over the full military range of −55°C to 125°C. The SN7437, SN74LS37 and SN74S37 are characterized for operation from 0°C to 70°C.

**FUNCTION TABLE (each gate)**

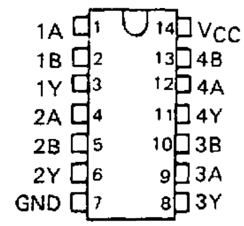
| INPUTS | | OUTPUT |
|---|---|---|
| A | B | Y |
| H | H | L |
| L | X | H |
| X | L | H |

## logic symbol†

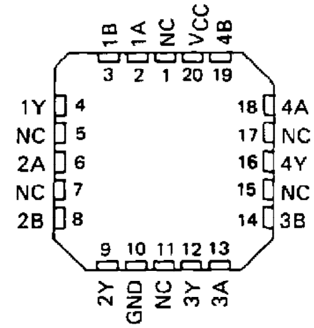



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for D, J, N, and W packages.

SN5437, SN54LS37, SN54S37 . . . J OR W PACKAGE
SN7437 . . . N PACKAGE
SN74LS37, SN74S37 . . . D OR N PACKAGE
(TOP VIEW)

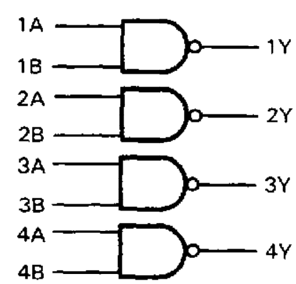



SN54LS37, SN54S37 . . . FK PACKAGE
(TOP VIEW)




NC – No internal connection

## logic diagram

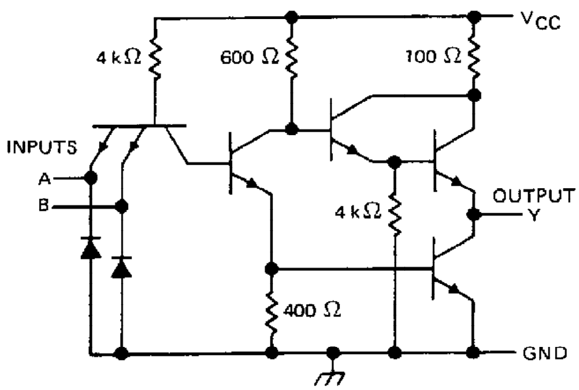



## positive logic

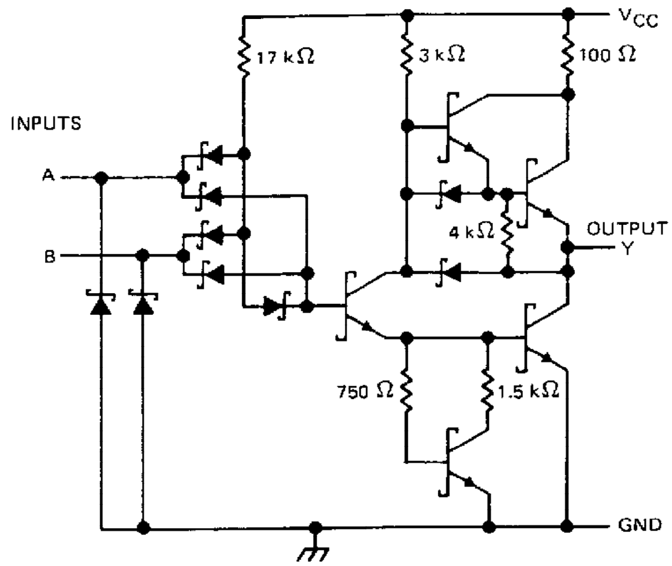
$Y = \overline{A \cdot B}$ or $Y = \overline{A} + \overline{B}$

**schematics (each gate)**

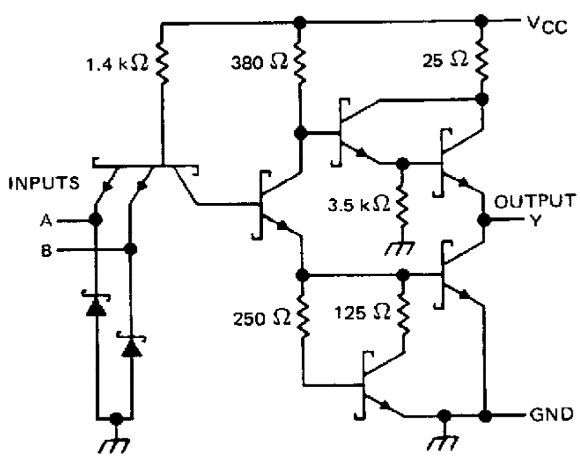
'37




'LS37




'S37




Resistor values shown are nominal.

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

| | |
|---|---|
| Supply voltage, $V_{CC}$ (see Note 1) | 7 V |
| Input voltage: '37, 'S37 | 5.5 V |
| 'LS37 | 7 V |
| Operating free-air temperature: SN54' | −55°C to 125°C |
| SN74' | 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

| | | SN5437 | | | SN7437 | | | 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 | | | 0.8 | | | 0.8 | V |
| $I_{OH}$ | High-level output current | | | − 1.2 | | | − 1.2 | mA |
| $I_{OL}$ | Low-level output current | | | 48 | | | 48 | 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 † | | | SN5437 | | | SN7437 | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| $V_{IK}$ | $V_{CC}$ = MIN, | $I_I$ = − 12 mA | | | | − 1.5 | | | − 1.5 | V |
| $V_{OH}$ | $V_{CC}$ = MIN, | $V_{IL}$ = 0.8 V, | $I_{OH}$ = − 1.2 mA | 2.4 | 3.3 | | 2.4 | 3.3 | | V |
| $V_{OL}$ | $V_{CC}$ = MIN, | $V_{IH}$ = 2 V, | $I_{OL}$ = 48 mA | | 0.2 | 0.4 | | 0.2 | 0.4 | V |
| $I_I$ | $V_{CC}$ = MAX, | $V_I$ = 5.5 V | | | | 1 | | | 1 | mA |
| $I_{IH}$ | $V_{CC}$ = MAX, | $V_I$ = 2.4 V | | | | 40 | | | 40 | μA |
| $I_{IL}$ | $V_{CC}$ = MAX, | $V_I$ = 0.4 V | | | | − 1.6 | | | − 1.6 | mA |
| $I_{OS}$§ | $V_{CC}$ = MAX | | | − 20 | | − 70 | − 18 | | − 70 | mA |
| $I_{CCH}$ | $V_{CC}$ = MAX, | $V_I$ = 0 V | | | 9 | 15.5 | | 9 | 15.5 | mA |
| $I_{CCL}$ | $V_{CC}$ = MAX, | $V_I$ = 4.5 V | | | 34 | 54 | | 34 | 54 | mA |

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

### switching characteristics, $V_{CC}$ = 5 V, $T_A$ = 25°C (see note 2)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|
| $t_{PLH}$ | A or B | Y | $R_L$ = 133 Ω, | $C_L$ = 45 pF | | 13 | 22 | ns |
| $t_{PHL}$ | | | | | | 8 | 15 | ns |

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

## recommended operating conditions

| | | SN54LS37 | | | SN74LS37 | | | 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 | | | −1.2 | mA |
| $I_{OL}$ | Low-level output current | | | 12 | | | 24 | 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 † | SN54LS37 | | | SN74LS37 | | | 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, $V_{IL}$ = MAX, $I_{OH}$ = −1.2 mA | 2.5 | 3.4 | | 2.7 | 3.4 | | V |
| $V_{OL}$ | $V_{CC}$ = MIN, $V_{IH}$ = 2 V, $I_{OL}$ = 12 mA | | 0.25 | 0.4 | | 0.25 | 0.4 | V |
| | $V_{CC}$ = MIN, $V_{IH}$ = 2 V, $I_{OL}$ = 24 mA | | | | | 0.35 | 0.5 | |
| $I_I$ | $V_{CC}$ = MAX, $V_I$ = 7 V | | | 0.1 | | | 0.1 | mA |
| $I_{IH}$ | $V_{CC}$ = MAX, $V_I$ = 2.7 V | | | 20 | | | 20 | μA |
| $I_{IL}$ | $V_{CC}$ = MAX, $V_I$ = 0.4 V | | | −0.4 | | | −0.4 | mA |
| $I_{OS}$§ | $V_{CC}$ = MAX | −30 | | −130 | −30 | | −130 | mA |
| $I_{CCH}$ | $V_{CC}$ = MAX, $V_I$ = 0 V | | 0.9 | 2 | | 0.9 | 2 | mA |
| $I_{CCL}$ | $V_{CC}$ = MAX, $V_I$ = 4.5 V | | 6 | 12 | | 6 | 12 | mA |

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

## switching characteristics, $V_{CC}$ = 5 V, $T_A$ = 25°C (see note 2)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| $t_{PLH}$ | A or B | Y | $R_L$ = 667 Ω, $C_L$ = 45 pF | | 12 | 24 | ns |
| $t_{PHL}$ | | | | | 12 | 24 | ns |

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

## recommended operating conditions

| | | SN54S37 | | | SN74S37 | | | 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 | | | 0.8 | | | 0.8 | V |
| $I_{OH}$ | High-level output current | | | −3 | | | −3 | mA |
| $I_{OL}$ | Low-level output current | | | 60 | | | 60 | 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 † | SN54S37 | | | SN74S37 | | | UNIT |
|---|---|---|---|---|---|---|---|---|
| | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| $V_{IK}$ | $V_{CC}$ = MIN, $I_I$ = −18 mA | | | −1.2 | | | −1.2 | V |
| $V_{OH}$ | $V_{CC}$ = MIN, $V_{IL}$ = 0.8 V, $I_{OH}$ = −3 mA | 2.5 | 3.4 | | 2.7 | 3.4 | | V |
| $V_{OL}$ | $V_{CC}$ = MIN, $V_{IH}$ = 2 V, $I_{OL}$ = 60 mA | | | 0.5 | | | 0.5 | V |
| $I_I$ | $V_{CC}$ = MAX, $V_I$ = 5.5 V | | | 1 | | | 1 | mA |
| $I_{IH}$ | $V_{CC}$ = MAX, $V_I$ = 2.7 V | | | 0.1 | | | 0.1 | mA |
| $I_{IL}$ | $V_{CC}$ = MAX, $V_I$ = 0.5 V | | | −4 | | | −4 | mA |
| $I_{OS}$§ | $V_{CC}$ = MAX | −50 | | −225 | −50 | | −225 | mA |
| $I_{CCH}$ | $V_{CC}$ = MAX, $V_I$ = 0 V | | 20 | 36 | | 20 | 36 | mA |
| $I_{CCL}$ | $V_{CC}$ = MAX, $V_I$ = 4.5 | | 46 | 80 | | 46 | 80 | mA |

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
‡ All typical values are at $V_{CC}$ = 5 V, $T_A$ = 25°C.
§ Not more than one output should be shorted at a time, and the duration of the short circuit should not exceed 100 milliseconds.

## switching characteristics, $V_{CC}$ = 5 V, $T_A$ = 25°C (see note 2)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| $t_{PLH}$ | A or B | Y | $R_L$ = 93 Ω, $C_L$ = 50 pF | | 4 | 6.5 | ns |
| $t_{PHL}$ | | | | | 4 | 6.5 | ns |
| $t_{PLH}$ | | | $R_L$ = 93 Ω, $C_L$ = 150 pF | | 6 | | ns |
| $t_{PHL}$ | | | | | 6 | | ns |

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

## PACKAGING INFORMATION

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) |
|---|---|---|---|---|---|---|---|---|
| 5962-9754101Q2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type |
| 5962-9754101QCA | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| 5962-9754101QCA | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| 5962-9754101QDA | ACTIVE | CFP | W | 14 | 1 | TBD | A42 | N / A for Pkg Type |
| 5962-9754101QDA | ACTIVE | CFP | W | 14 | 1 | TBD | A42 | N / A for Pkg Type |
| SN5437J | OBSOLETE | CDIP | J | 14 | | TBD | Call TI | Call TI |
| SN5437J | OBSOLETE | CDIP | J | 14 | | TBD | Call TI | Call TI |
| SN54LS37J | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SN54LS37J | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SN54S37J | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SN54S37J | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SN7437N | OBSOLETE | PDIP | N | 14 | | TBD | Call TI | Call TI |
| SN7437N | OBSOLETE | PDIP | N | 14 | | TBD | Call TI | Call TI |
| SN7437N3 | OBSOLETE | PDIP | N | 14 | | TBD | Call TI | Call TI |
| SN7437N3 | OBSOLETE | PDIP | N | 14 | | TBD | Call TI | Call TI |
| SN74LS37D | OBSOLETE | SOIC | D | 14 | | TBD | Call TI | Call TI |
| SN74LS37D | OBSOLETE | SOIC | D | 14 | | TBD | Call TI | Call TI |
| SN74LS37N | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN74LS37N | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN74LS37N3 | OBSOLETE | PDIP | N | 14 | | TBD | Call TI | Call TI |
| SN74LS37N3 | OBSOLETE | PDIP | N | 14 | | TBD | Call TI | Call TI |
| SN74LS37NE4 | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN74LS37NE4 | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN74LS37NSR | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74LS37NSR | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74LS37NSRE4 | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74LS37NSRE4 | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S37D | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S37D | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S37DE4 | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S37DE4 | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S37DR | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S37DR | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & | CU NIPDAU | Level-1-260C-UNLIM |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) |
|---|---|---|---|---|---|---|---|---|
| | | | | | | no Sb/Br) | | |
| SN74S37DRE4 | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S37DRE4 | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S37N | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN74S37N | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN74S37N3 | OBSOLETE | PDIP | N | 14 | | TBD | Call TI | Call TI |
| SN74S37N3 | OBSOLETE | PDIP | N | 14 | | TBD | Call TI | Call TI |
| SN74S37NE4 | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN74S37NE4 | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN74S37NSR | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S37NSR | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S37NSRE4 | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S37NSRE4 | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SNJ5437J | OBSOLETE | CDIP | J | 14 | | TBD | Call TI | Call TI |
| SNJ5437J | OBSOLETE | CDIP | J | 14 | | TBD | Call TI | Call TI |
| SNJ5437W | OBSOLETE | CFP | W | 14 | | TBD | Call TI | Call TI |
| SNJ5437W | OBSOLETE | CFP | W | 14 | | TBD | Call TI | Call TI |
| SNJ54LS37FK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type |
| SNJ54LS37FK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type |
| SNJ54LS37J | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SNJ54LS37J | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SNJ54LS37W | ACTIVE | CFP | W | 14 | 1 | TBD | A42 | N / A for Pkg Type |
| SNJ54LS37W | ACTIVE | CFP | W | 14 | 1 | TBD | A42 | N / A for Pkg Type |
| SNJ54S37FK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type |
| SNJ54S37FK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type |
| SNJ54S37J | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SNJ54S37J | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SNJ54S37W | ACTIVE | CFP | W | 14 | 1 | TBD | A42 | N / A for Pkg Type |
| SNJ54S37W | ACTIVE | CFP | W | 14 | 1 | TBD | A42 | N / A for Pkg Type |

(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.

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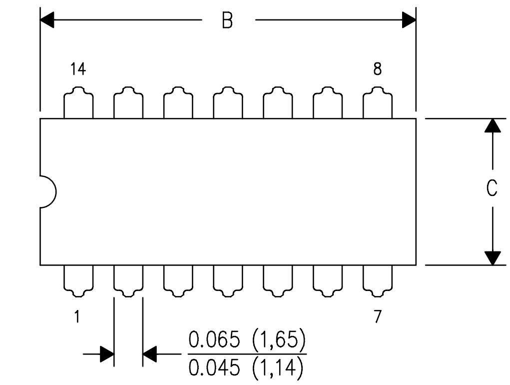
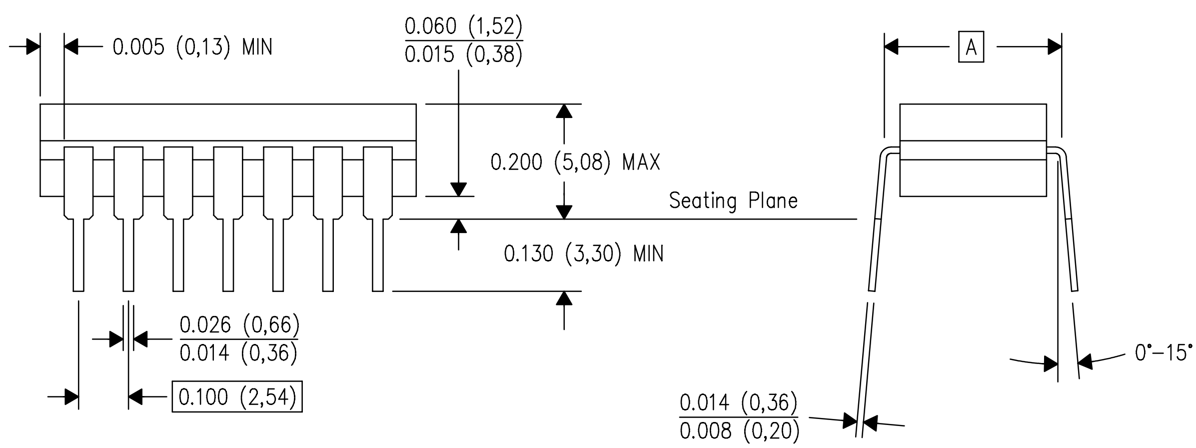
# J (R–GDIP–T**) CERAMIC DUAL IN–LINE PACKAGE

14 LEADS SHOWN



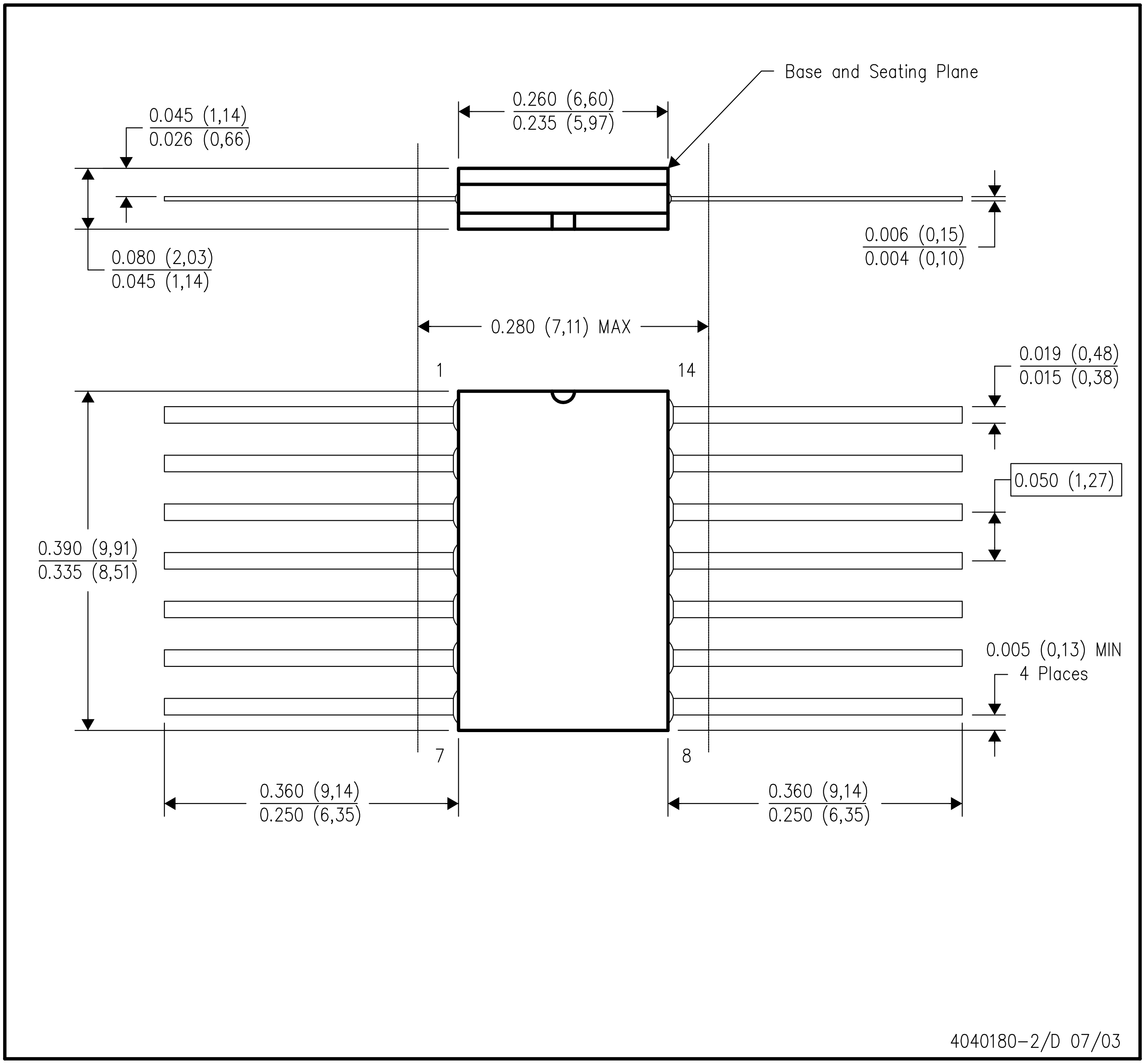

| PINS ** / DIM | 14 | 16 | 18 | 20 |
|---|---|---|---|---|
| A | 0.300 (7,62) BSC | 0.300 (7,62) BSC | 0.300 (7,62) BSC | 0.300 (7,62) BSC |
| B MAX | 0.785 (19,94) | .840 (21,34) | 0.960 (24,38) | 1.060 (26,92) |
| B MIN | — | — | — | — |
| C MAX | 0.300 (7,62) | 0.300 (7,62) | 0.310 (7,87) | 0.300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

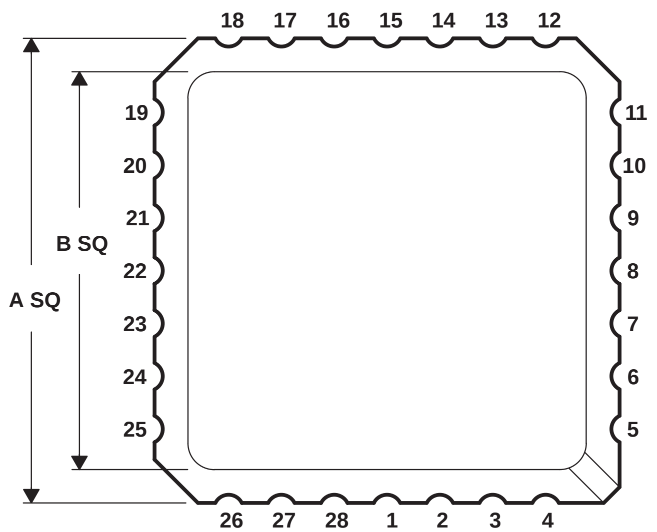
# W (R–GDFP–F14) CERAMIC DUAL FLATPACK



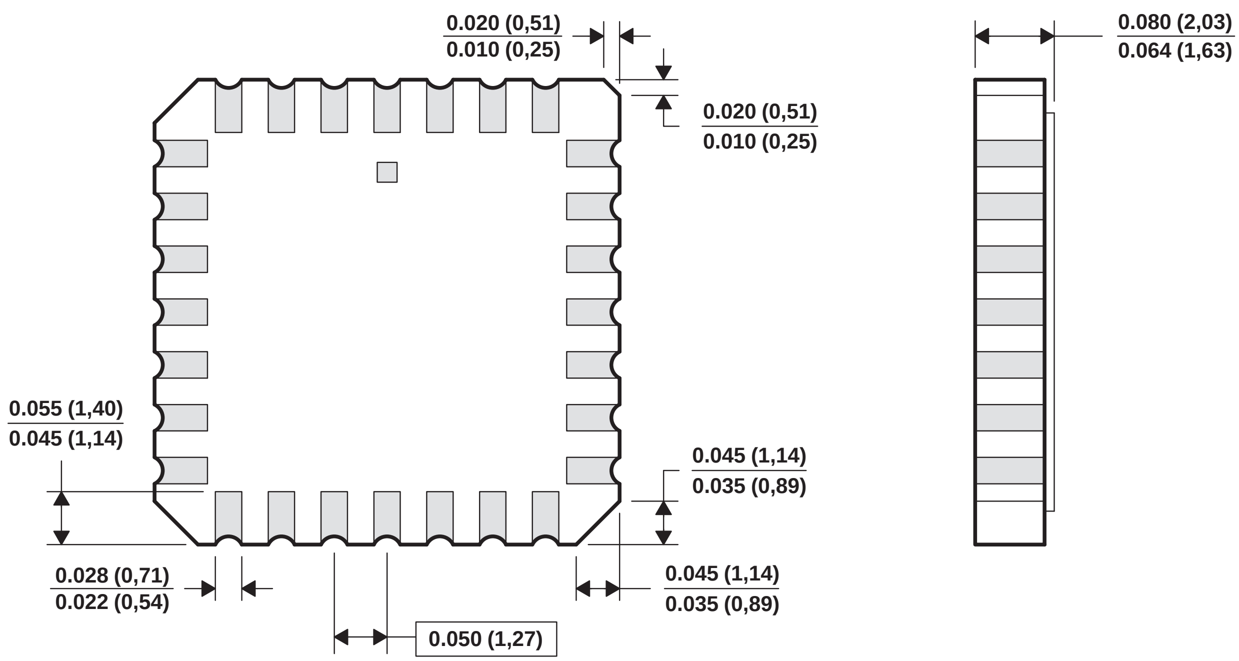

NOTES:
- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package can be hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification only.
- E. Falls within MIL STD 1835 GDFP1–F14 and JEDEC MO–092AB

**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 | 0.739 (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) |

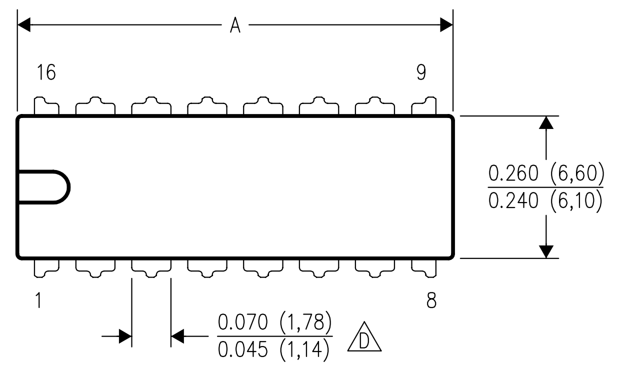



4040140 / D 10/96

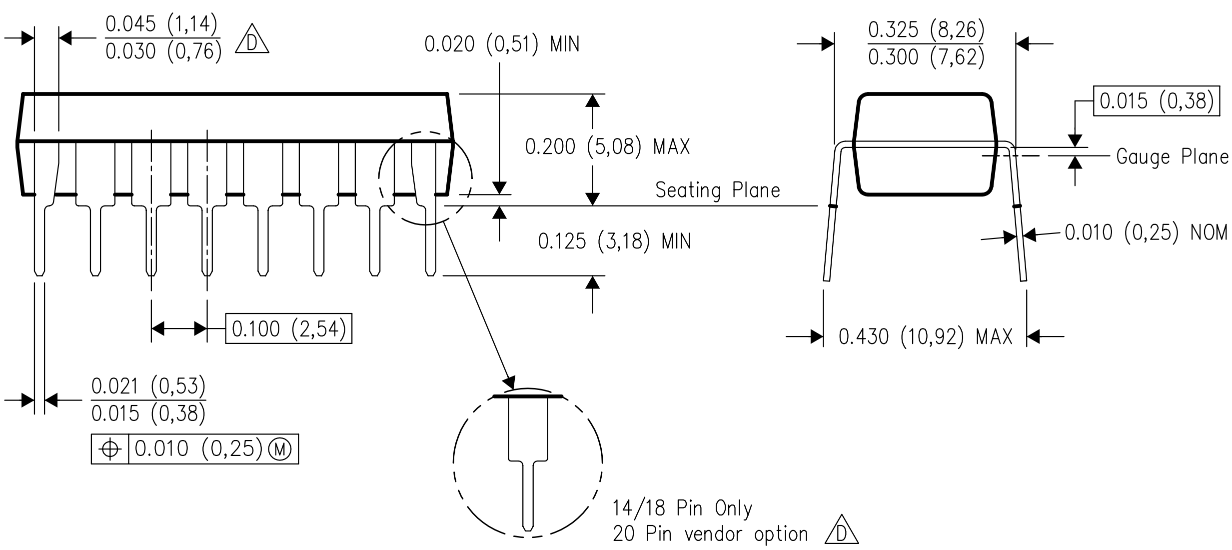
NOTES: A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. This package can be hermetically sealed with a metal lid.
D. The terminals are gold plated.
E. Falls within JEDEC MS-004

# N (R–PDIP–T**) PLASTIC DUAL–IN–LINE PACKAGE

16 PINS SHOWN



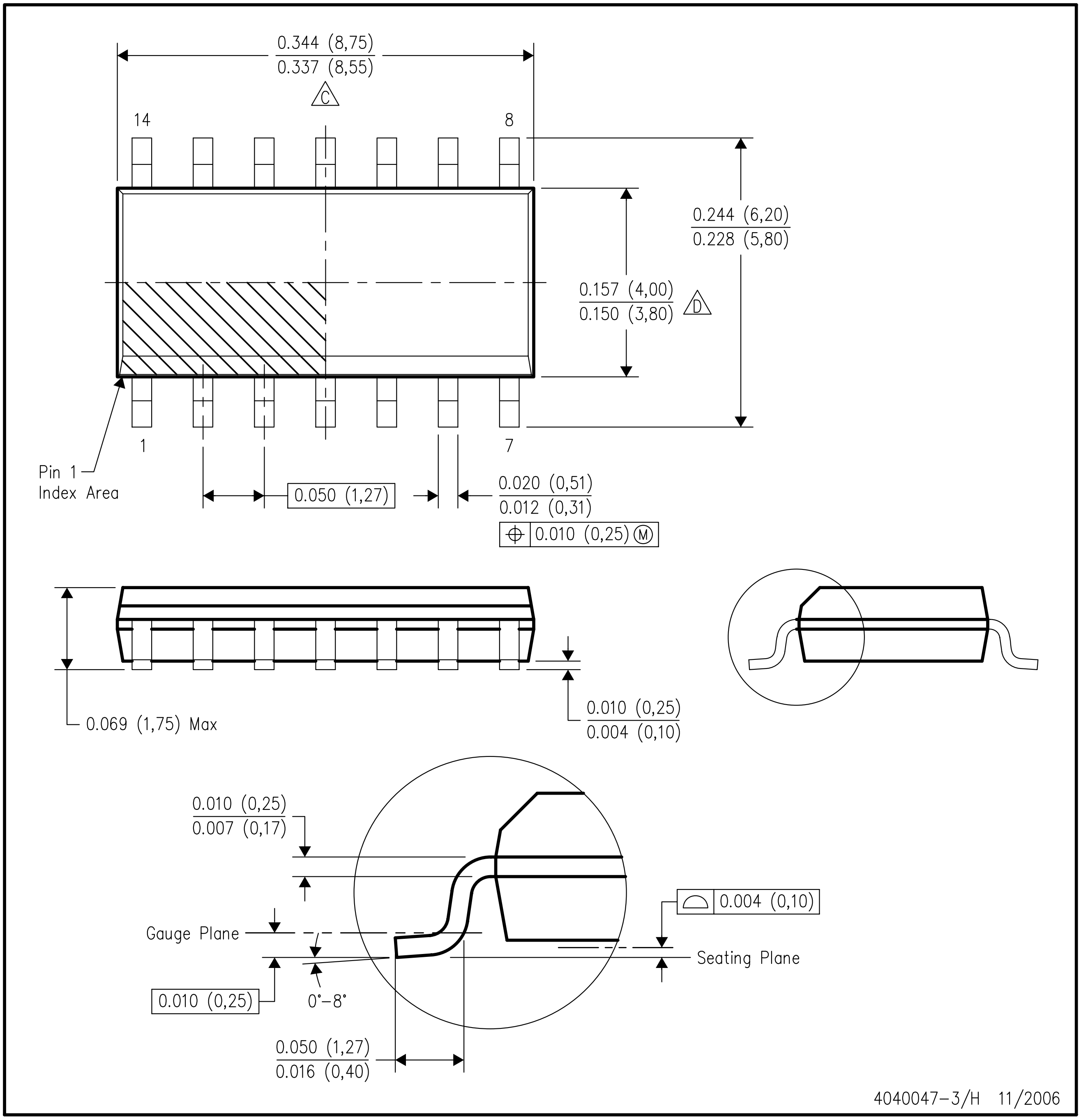

| PINS ** / DIM | 14 | 16 | 18 | 20 |
|---|---|---|---|---|
| A MAX | 0.775 (19,69) | 0.775 (19,69) | 0.920 (23,37) | 1.060 (26,92) |
| A MIN | 0.745 (18,92) | 0.745 (18,92) | 0.850 (21,59) | 0.940 (23,88) |
| MS–001 VARIATION (C) | AA | BB | AC | AD |




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.

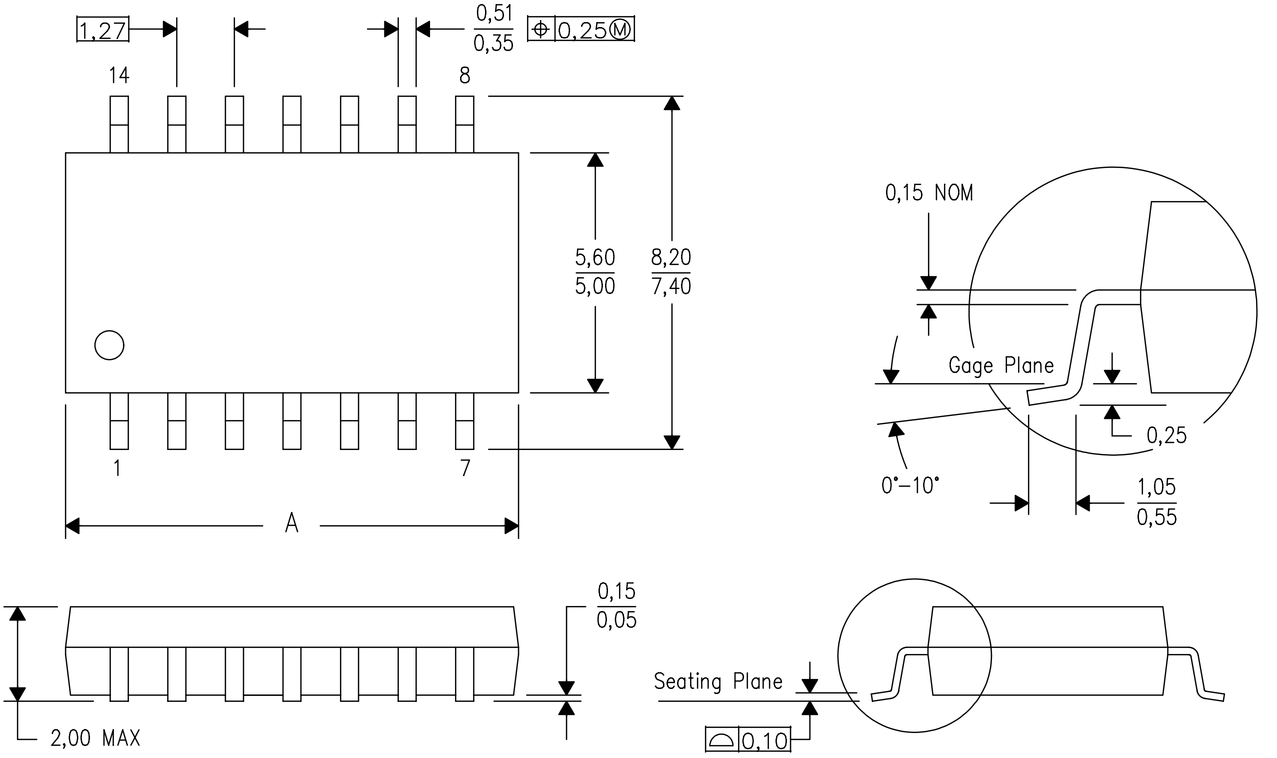
D (R–PDSO–G14) PLASTIC SMALL–OUTLINE PACKAGE




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 .006 (0,15) per end.
D. Body width does not include interlead flash. Interlead flash shall not exceed .017 (0,43) per side.
E. Reference JEDEC MS-012 variation AB.

**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.