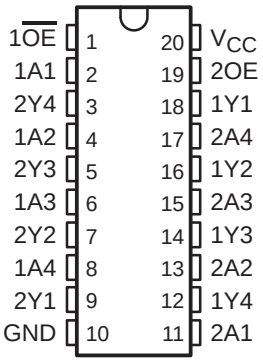
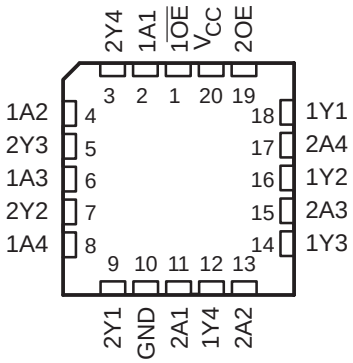
- **3-State Outputs Drive Bus Lines or Buffer Memory Address Registers**
- **pnp Inputs Reduce dc Loading**
- **Package Options Include Plastic Small-Outline (DW) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) 300-mil DIPs**

**SN54ALS241C, SN54AS241A . . . J PACKAGE**
**SN74ALS241C, SN74AS241A . . . DW OR N PACKAGE**
**(TOP VIEW)**




**SN54ALS241C, SN54AS241A . . . FK PACKAGE**
**(TOP VIEW)**




## description

These octal buffers/drivers are designed specifically to improve the performance and density of 3-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters. The designer has a choice of selected combinations of inverting and noninverting outputs, symmetrical active-low output-enable ($\overline{OE}$) inputs, and complementary OE and $\overline{OE}$ inputs. These devices feature high fan-out and improved fan-in.

The -1 version of SN74ALS241C is identical to the standard version, except that the recommended maximum $I_{OL}$ of the -1 version is 48 mA. There is no -1 version of the SN54ALS241C.

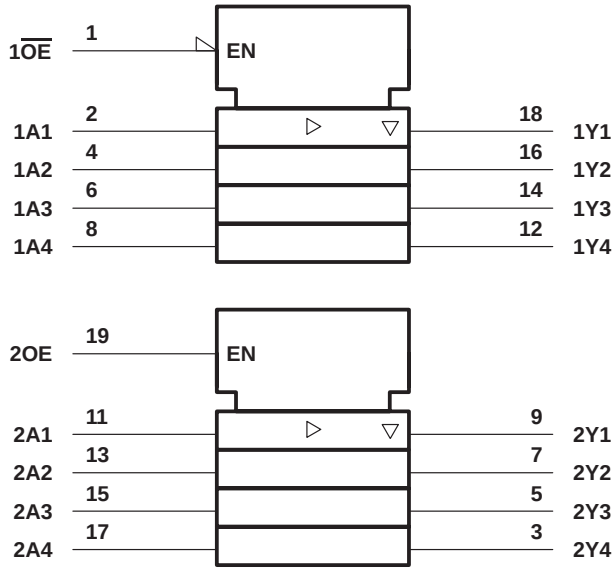
The SN54ALS241C and SN54AS241A are characterized for operation over the full military temperature range of –55°C to 125°C. The SN74ALS241C and SN74AS241A are characterized for operation from 0°C to 70°C.

**FUNCTION TABLES**

| INPUTS | | OUTPUT |
|---|---|---|
| $\overline{1OE}$ | 1A | 1Y |
| L | H | H |
| L | L | L |
| H | X | Z |

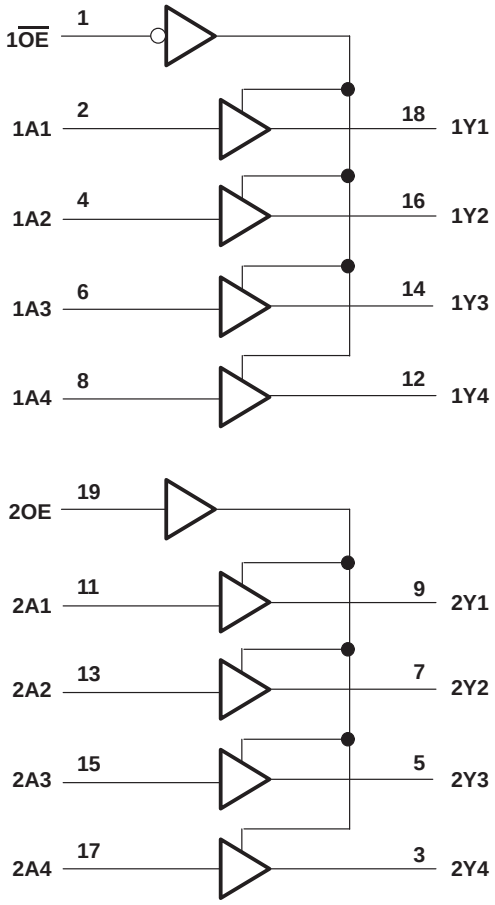
| INPUTS | | OUTPUT |
|---|---|---|
| 2OE | 2A | 2Y |
| H | H | H |
| H | L | L |
| L | X | Z |

## logic symbol†




† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

## logic diagram (positive logic)




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

Supply voltage, $V_{CC}$ . . . . . 7 V
Input voltage, $V_I$ . . . . . 7 V
Voltage applied to a disabled 3-state output . . . . . 5.5 V
Operating free-air temperature range, $T_A$: SN54ALS241C . . . . . –55°C to 125°C
SN74ALS241C . . . . . 0°C to 70°C
Storage temperature range . . . . . –65°C to 150°C

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

## recommended operating conditions

| | | SN54ALS241C | | | SN74ALS241C | | | UNIT |
|---|---|---|---|---|---|---|---|---|
| | | MIN | NOM | MAX | MIN | NOM | MAX | |
| $V_{CC}$ | Supply voltage | 4.5 | 5 | 5.5 | 4.5 | 5 | 5.5 | 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 | | | –12 | | | –15 | mA |
| $I_{OL}$ | Low-level output current | | | 12 | | | 24 | mA |
| | | | | | | | 48† | |
| $T_A$ | Operating free-air temperature | –55 | | 125 | 0 | | 70 | °C |

† Applies only to the -1 version and only if $V_{CC}$ is between 4.75 V and 5.25 V

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

| PARAMETER | TEST CONDITIONS | | SN54ALS241C | | | SN74ALS241C | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| $V_{IK}$ | $V_{CC}$ = 4.5 V, | $I_I$ = –18 mA | | | –1.2 | | | –1.2 | V |
| $V_{OH}$ | $V_{CC}$ = 4.5 V to 5.5 V, | $I_{OH}$ = –0.4 mA | $V_{CC}$ –2 | | | $V_{CC}$ –2 | | | V |
| | $V_{CC}$ = 4.5 V | $I_{OH}$ = –3 mA | 2.4 | 3.2 | | 2.4 | 3.2 | | |
| | | $I_{OH}$ = –12 mA | 2 | | | | | | |
| | | $I_{OH}$ = –15 mA | | | | 2 | | | |
| $V_{OL}$ | $V_{CC}$ = 4.5 V | $I_{OL}$ = 12 mA | | 0.25 | 0.4 | | 0.25 | 0.4 | V |
| | | $I_{OL}$ = 24 mA | | | | | 0.35 | 0.5 | |
| | | $I_{OL}$ = 48 mA (-1 version) | | | | | 0.35 | 0.5 | |
| $I_{OZH}$ | $V_{CC}$ = 5.5 V, | $V_O$ = 2.7 V | | | 20 | | | 20 | µA |
| $I_{OZL}$ | $V_{CC}$ = 5.5 V, | $V_O$ = 0.4 V | | | –20 | | | –20 | µA |
| $I_I$ | $V_{CC}$ = 5.5 V, | $V_I$ = 7 V | | | 0.1 | | | 0.1 | mA |
| $I_{IH}$ | $V_{CC}$ = 5.5 V, | $V_I$ = 2.7 V | | | 20 | | | 20 | µA |
| $I_{IL}$ | $V_{CC}$ = 5.5 V, | $V_I$ = 0.4 V | | | –0.1 | | | –0.1 | mA |
| $I_O$§ | $V_{CC}$ = 5.5 V, | $V_O$ = 2.25 V | –20 | | –112 | –30 | | –112 | mA |
| $I_{CC}$ | $V_{CC}$ = 5.5 V | Outputs high | | 9 | 17 | | 9 | 18 | mA |
| | | Outputs low | | 15 | 28 | | 15 | 26 | |
| | | Outputs disabled | | 17 | 32 | | 17 | 30 | |

‡ All typical values are at $V_{CC}$ = 5 V, $T_A$ = 25°C.
§ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, $I_{OS}$.

## switching characteristics (see Figure 1)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | $V_{CC}$ = 4.5 V to 5.5 V, $C_L$ = 50 pF, R1 = 500 Ω, R2 = 500 Ω, $T_A$ = MIN to MAX† | | | | UNIT |
|---|---|---|---|---|---|---|---|
| | | | SN54ALS241C | | SN74ALS241C | | |
| | | | MIN | MAX | MIN | MAX | |
| $t_{PLH}$ | A | Y | 3 | 31 | 2 | 11 | ns |
| $t_{PHL}$ | | | 1 | 17 | 3 | 10 | |
| $t_{PZH}$ | $1\overline{OE}$ | Y | 3 | 33 | 3 | 21 | ns |
| $t_{PZL}$ | | | 3 | 27 | 4 | 21 | |
| $t_{PHZ}$ | $1\overline{OE}$ | Y | 2 | 17 | 1 | 10 | ns |
| $t_{PLZ}$ | | | 2 | 32 | 2 | 15 | |
| $t_{PZH}$ | 2OE | Y | 3 | 38 | 4 | 21 | ns |
| $t_{PZL}$ | | | 3 | 30 | 5 | 21 | |
| $t_{PHZ}$ | 2OE | Y | 2 | 17 | 2 | 10 | ns |
| $t_{PLZ}$ | | | 3 | 35 | 3 | 15 | |

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

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

Supply voltage, $V_{CC}$ . . . . . 7 V
Input voltage, $V_I$ . . . . . 7 V
Voltage applied to a disabled 3-state output . . . . . 5.5 V
Operating free-air temperature range, $T_A$: SN54AS241A . . . . . –55°C to 125°C
SN74AS241A . . . . . 0°C to 70°C
Storage temperature range . . . . . –65°C to 150°C

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

## recommended operating conditions

| | | SN54AS241A | | | SN74AS241A | | | UNIT |
|---|---|---|---|---|---|---|---|---|
| | | MIN | NOM | MAX | MIN | NOM | MAX | |
| $V_{CC}$ | Supply voltage | 4.5 | 5 | 5.5 | 4.5 | 5 | 5.5 | 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 | | | –12 | | | –15 | mA |
| $I_{OL}$ | Low-level output current | | | 48 | | | 64 | 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 | | SN54AS241A | | | SN74AS241A | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | MIN | TYP† | MAX | MIN | TYP† | MAX | |
| $V_{IK}$ | $V_{CC}$ = 4.5 V, | $I_I$ = –18 mA | | | –1.2 | | | –1.2 | V |
| $V_{OH}$ | $V_{CC}$ = 4.5 V to 5.5 V, | $I_{OH}$ = –2 mA | $V_{CC}$ –2 | | | $V_{CC}$ –2 | | | V |
| | $V_{CC}$ = 4.5 V | $I_{OH}$ = –3 mA | 2.4 | 3.4 | | 2.4 | 3.4 | | |
| | | $I_{OH}$ = –12 mA | 2.4 | | | | | | |
| | | $I_{OH}$ = –15 mA | | | | 2.4 | | | |
| $V_{OL}$ | $V_{CC}$ = 4.5 V | $I_{OL}$ = 48 mA | | 0.27 | 0.55 | | | | V |
| | | $I_{OL}$ = 64 mA | | | | | 0.31 | 0.55 | |
| $I_{OZH}$ | $V_{CC}$ = 5.5 V, | $V_O$ = 2.7 V | | | 50 | | | 50 | µA |
| $I_{OZL}$ | $V_{CC}$ = 5.5 V, | $V_O$ = 0.4 V | | | –50 | | | –50 | µA |
| $I_I$ | $V_{CC}$ = 5.5 V, | $V_I$ = 7 V | | | 0.1 | | | 0.1 | mA |
| $I_{IH}$ | $V_{CC}$ = 5.5 V, | $V_I$ = 2.7 V | | | 20 | | | 20 | µA |
| $I_{IL}$ | $V_{CC}$ = 5.5 V, | $V_I$ = 0.4 V | | | –1 | | | –1 | mA |
| $I_O$‡ | $V_{CC}$ = 5.5 V, | $V_O$ = 2.25 V | –50 | | –150 | –50 | | –150 | mA |
| $I_{CC}$ | $V_{CC}$ = 5.5 V | Outputs high | | 22 | 35 | | 22 | 35 | mA |
| | | Outputs low | | 61 | 90 | | 61 | 90 | |
| | | Outputs disabled | | 35 | 56 | | 35 | 56 | |

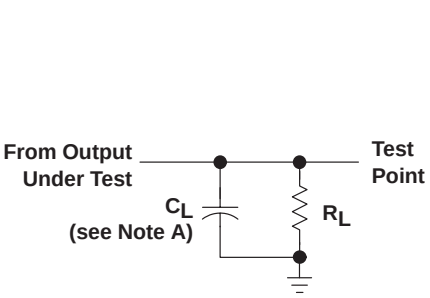
† All typical values are at $V_{CC}$ = 5 V, $T_A$ = 25°C.
‡ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, $I_{OS}$.

## switching characteristics (see Figure 1)

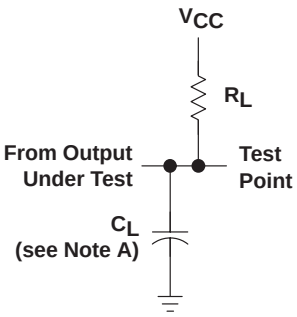
| PARAMETER | FROM (INPUT) | TO (OUTPUT) | $V_{CC}$ = 4.5 V to 5.5 V, $C_L$ = 50 pF, R1 = 500 Ω, R2 = 500 Ω, $T_A$ = MIN to MAX§ | | | | UNIT |
|---|---|---|---|---|---|---|---|
| | | | SN54AS241A | | SN74AS241A | | |
| | | | MIN | MAX | MIN | MAX | |
| $t_{PLH}$ | A | Y | 2 | 9 | 2 | 6.2 | ns |
| $t_{PHL}$ | | | 1 | 7 | 1 | 6.2 | |
| $t_{PZH}$ | $1\overline{OE}$ | Y | 1 | 10 | 1 | 9 | ns |
| $t_{PZL}$ | | | 2 | 8 | 2 | 7.5 | |
| $t_{PHZ}$ | $1\overline{OE}$ | Y | 1 | 6.5 | 1 | 6 | ns |
| $t_{PLZ}$ | | | 1 | 10.5 | 1 | 9 | |
| $t_{PZH}$ | 2OE | Y | 2 | 11 | 2 | 10.5 | ns |
| $t_{PZL}$ | | | 3 | 9.5 | 3 | 8.5 | |
| $t_{PHZ}$ | 2OE | Y | 1 | 7 | 1 | 7 | ns |
| $t_{PLZ}$ | | | 2 | 12 | 2 | 12 | |

§ For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

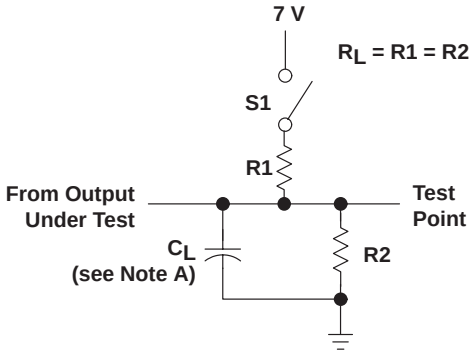
## PARAMETER MEASUREMENT INFORMATION
## SERIES 54ALS/74ALS AND 54AS/74AS DEVICES



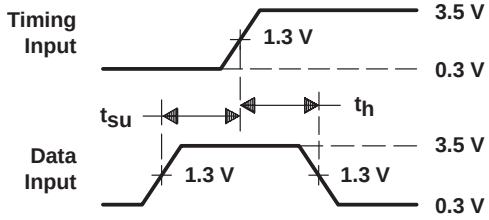

LOAD CIRCUIT FOR
BI-STATE
TOTEM-POLE OUTPUTS



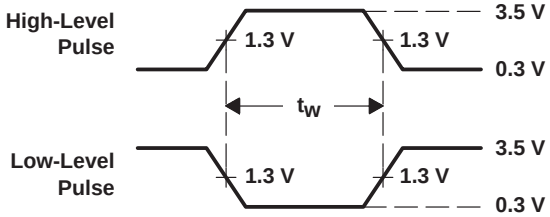

LOAD CIRCUIT
FOR OPEN-COLLECTOR OUTPUTS



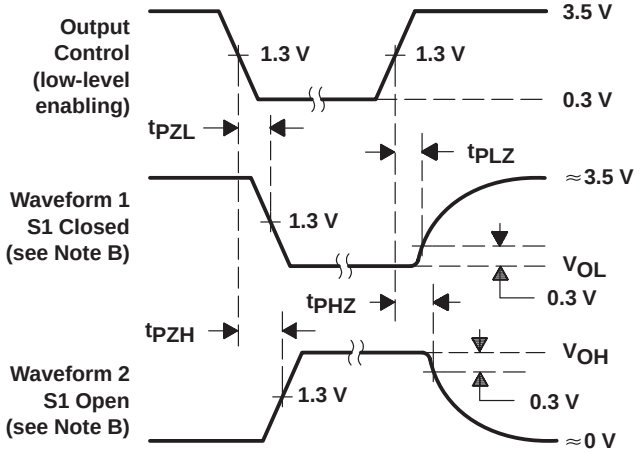

LOAD CIRCUIT
FOR 3-STATE OUTPUTS



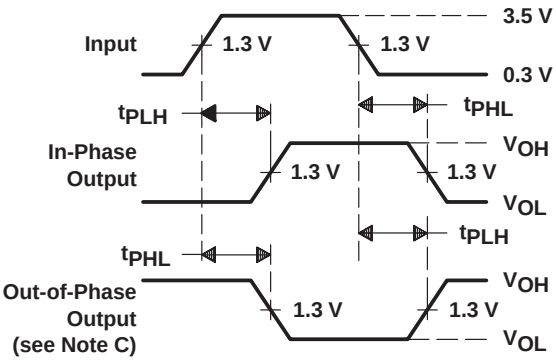

VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES




VOLTAGE WAVEFORMS
PULSE DURATIONS




VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES, 3-STATE OUTPUTS




VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES

NOTES: A. $C_L$ includes probe and jig capacitance.
B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
C. When measuring propagation delay items of 3-state outputs, switch S1 is open.
D. All input pulses have the following characteristics: PRR ≤ 1 MHz, $t_r = t_f$ = 2 ns, duty cycle = 50%.
E. The outputs are measured one at a time with one transition per measurement.

**Figure 1. Load Circuits and Voltage Waveforms**

## PACKAGING INFORMATION

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) |
|---|---|---|---|---|---|---|---|---|
| 5962-8859602SA | ACTIVE | CFP | W | 20 | 1 | TBD | A42 | N / A for Pkg Type |
| JM38510/38302B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type |
| JM38510/38302BRA | ACTIVE | CDIP | J | 20 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SN54ALS241CJ | ACTIVE | CDIP | J | 20 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SN54AS241AJ | ACTIVE | CDIP | J | 20 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SN74ALS241C-1DW | OBSOLETE | SOIC | DW | 20 | | TBD | Call TI | Call TI |
| SN74ALS241C-1DWR | OBSOLETE | SOIC | DW | 20 | | TBD | Call TI | Call TI |
| SN74ALS241C-1N | OBSOLETE | PDIP | N | 20 | | TBD | Call TI | Call TI |
| SN74ALS241CDW | ACTIVE | SOIC | DW | 20 | 25 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74ALS241CDWE4 | ACTIVE | SOIC | DW | 20 | 25 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74ALS241CDWG4 | ACTIVE | SOIC | DW | 20 | 25 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74ALS241CDWR | ACTIVE | SOIC | DW | 20 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74ALS241CDWRE4 | ACTIVE | SOIC | DW | 20 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74ALS241CDWRG4 | ACTIVE | SOIC | DW | 20 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74ALS241CN | ACTIVE | PDIP | N | 20 | 20 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN74ALS241CNE4 | ACTIVE | PDIP | N | 20 | 20 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN74ALS241CNSR | ACTIVE | SO | NS | 20 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74ALS241CNSRE4 | ACTIVE | SO | NS | 20 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74ALS241CNSRG4 | ACTIVE | SO | NS | 20 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AS241ADW | ACTIVE | SOIC | DW | 20 | 25 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AS241ADWE4 | ACTIVE | SOIC | DW | 20 | 25 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AS241ADWG4 | ACTIVE | SOIC | DW | 20 | 25 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AS241ADWR | ACTIVE | SOIC | DW | 20 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AS241ADWRE4 | ACTIVE | SOIC | DW | 20 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AS241ADWRG4 | ACTIVE | SOIC | DW | 20 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AS241AN | ACTIVE | PDIP | N | 20 | 20 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN74AS241ANE4 | ACTIVE | PDIP | N | 20 | 20 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN74AS241ANSR | ACTIVE | SO | NS | 20 | 2000 | Green (RoHS & no Sb/Br) | 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] |
|---|---|---|---|---|---|---|---|---|
| SN74AS241ANSRE4 | ACTIVE | SO | NS | 20 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AS241ANSRG4 | ACTIVE | SO | NS | 20 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SNJ54ALS241CFK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type |
| SNJ54ALS241CJ | ACTIVE | CDIP | J | 20 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SNJ54ALS241CW | ACTIVE | CFP | W | 20 | 1 | TBD | A42 | N / A for Pkg Type |
| SNJ54AS241AFK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type |
| SNJ54AS241AJ | ACTIVE | CDIP | J | 20 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SNJ54AS241AW | ACTIVE | CFP | W | 20 | 1 | TBD | A42 | N / A for Pkg Type |

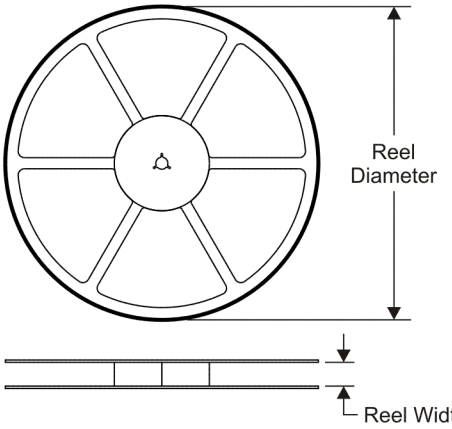
[1] The marketing status values are defined as follows:
**ACTIVE:** Product device recommended for new designs.
**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
**NRND:** Not recommended for new designs. Device is in production to support existing 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)

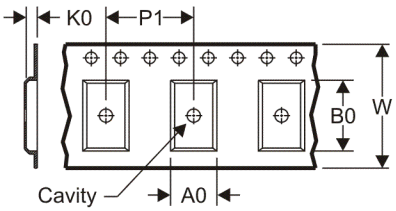
[3] MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

## TAPE AND REEL INFORMATION

**REEL DIMENSIONS**

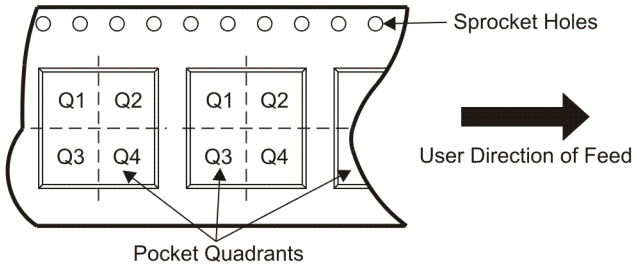



**TAPE DIMENSIONS**




| | |
|---|---|
| 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 |

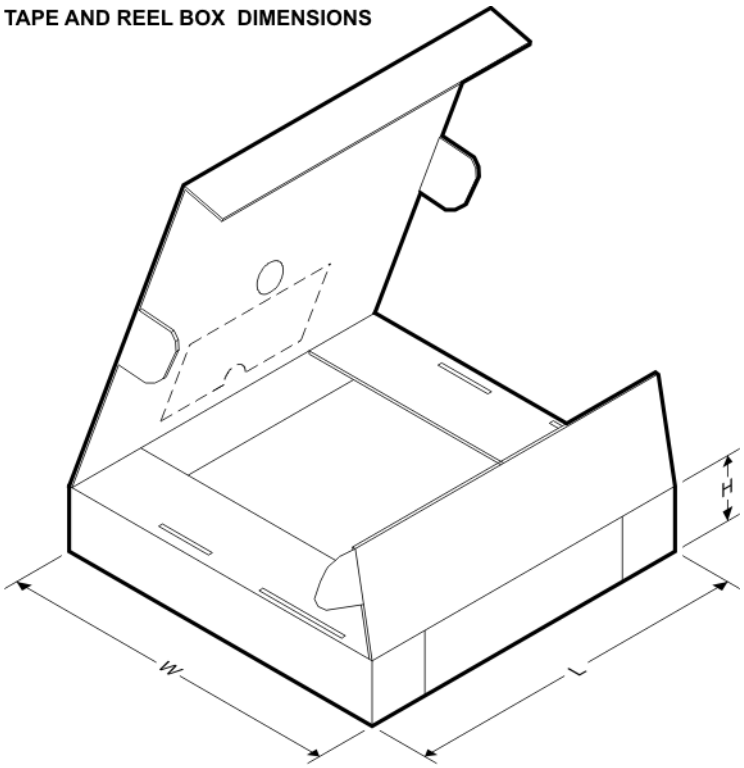
**QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE**




*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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SN74ALS241CDWR | SOIC | DW | 20 | 2000 | 330.0 | 24.4 | 10.8 | 13.0 | 2.7 | 12.0 | 24.0 | Q1 |
| SN74AS241ADWR | SOIC | DW | 20 | 2000 | 330.0 | 24.4 | 10.8 | 13.0 | 2.7 | 12.0 | 24.0 | Q1 |

**TAPE AND REEL BOX DIMENSIONS**

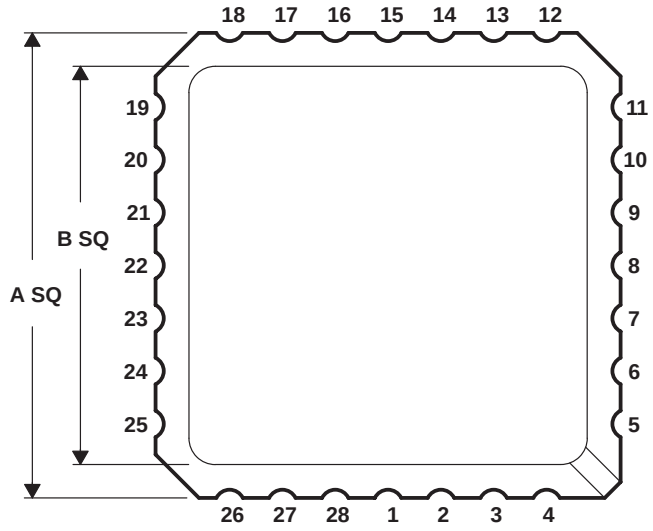



*All dimensions are nominal

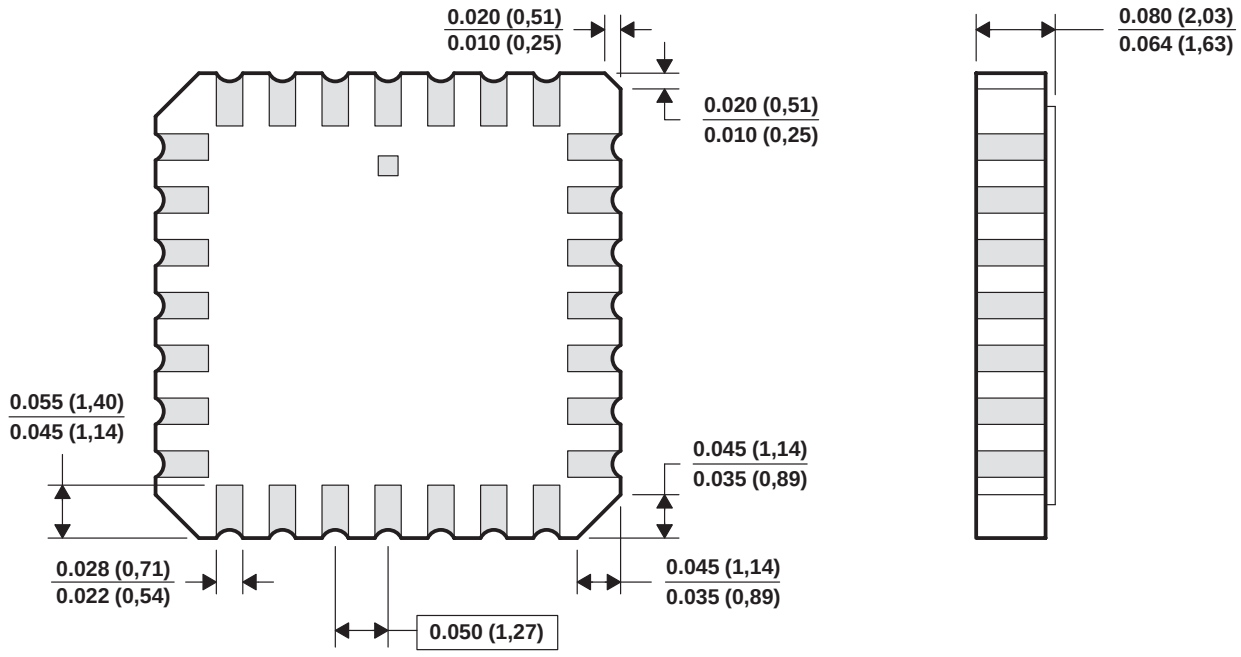
| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|---|---|---|---|---|---|---|---|
| SN74ALS241CDWR | SOIC | DW | 20 | 2000 | 346.0 | 346.0 | 41.0 |
| SN74AS241ADWR | SOIC | DW | 20 | 2000 | 346.0 | 346.0 | 41.0 |

**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) |



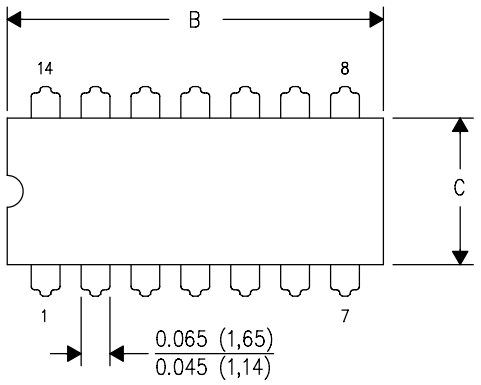

**4040140/D 10/96**

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

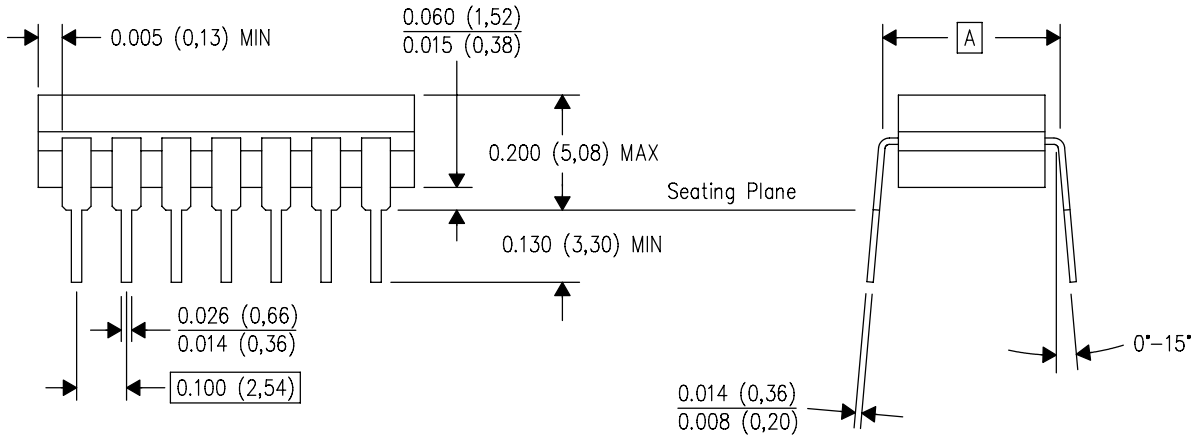
J (R–GDIP–T**)

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) |



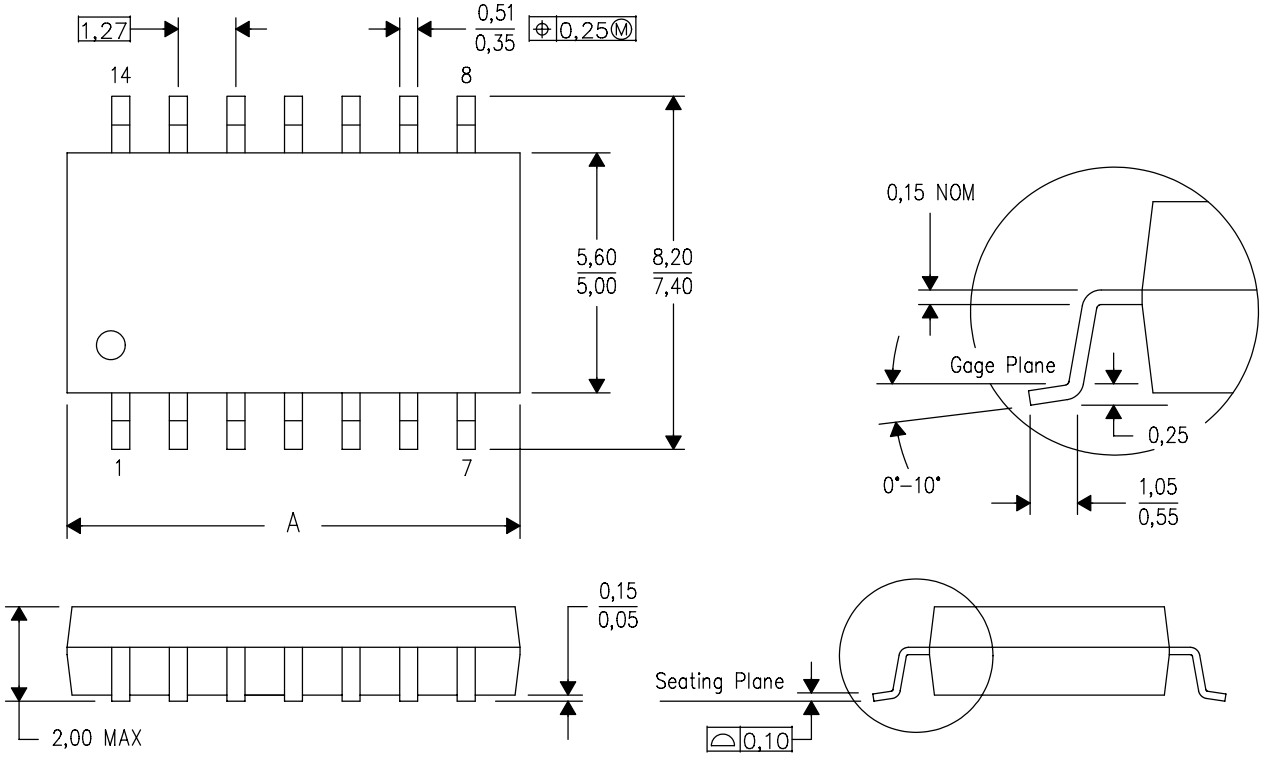

4040083/F 03/03

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.

## MECHANICAL DATA

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

**14-PINS SHOWN**

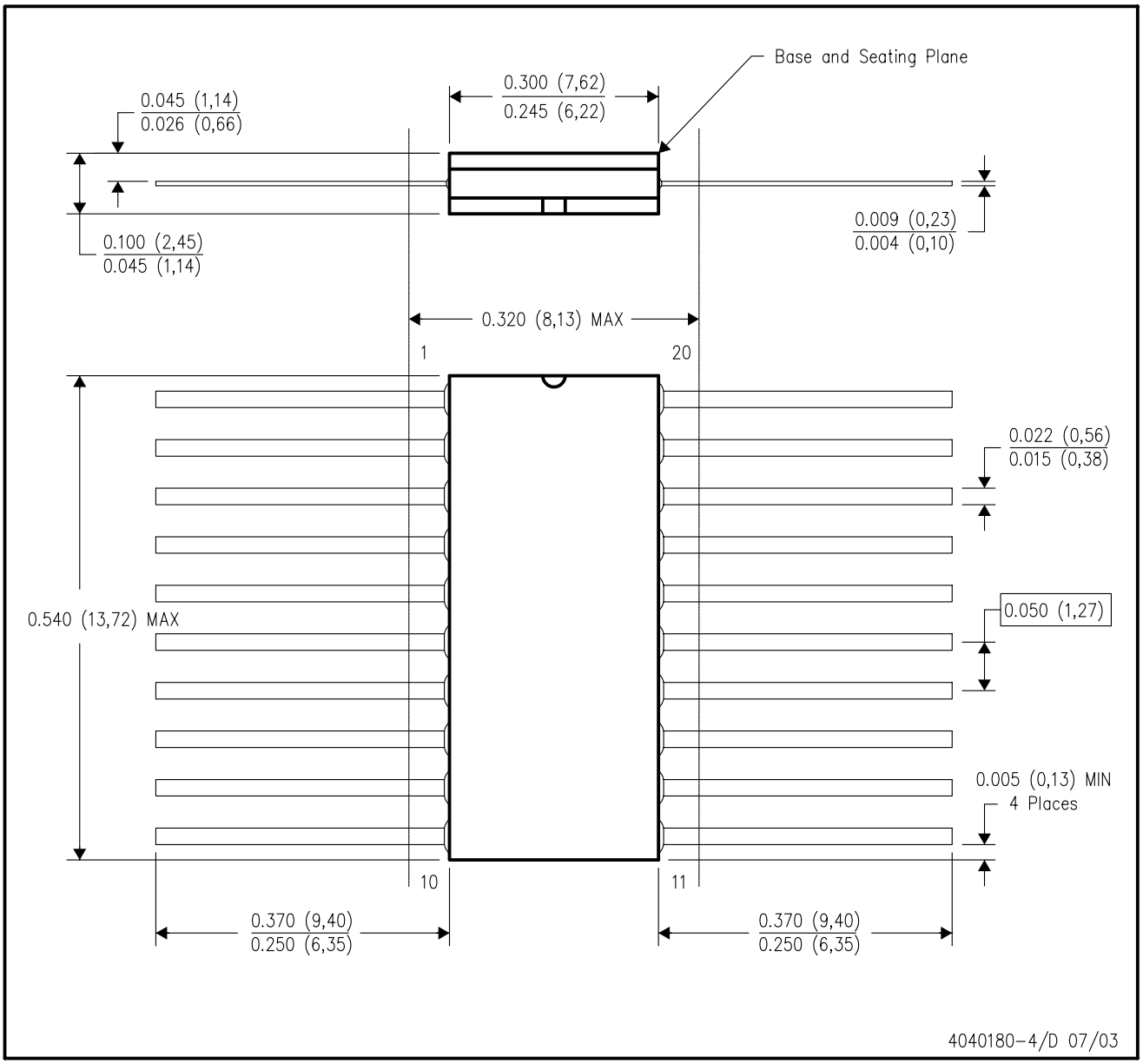



| DIM \ PINS ** | 14 | 16 | 20 | 24 |
|---|---|---|---|---|
| A MAX | 10,50 | 10,50 | 12,90 | 15,30 |
| A MIN | 9,90 | 9,90 | 12,30 | 14,70 |

4040062/C 03/03

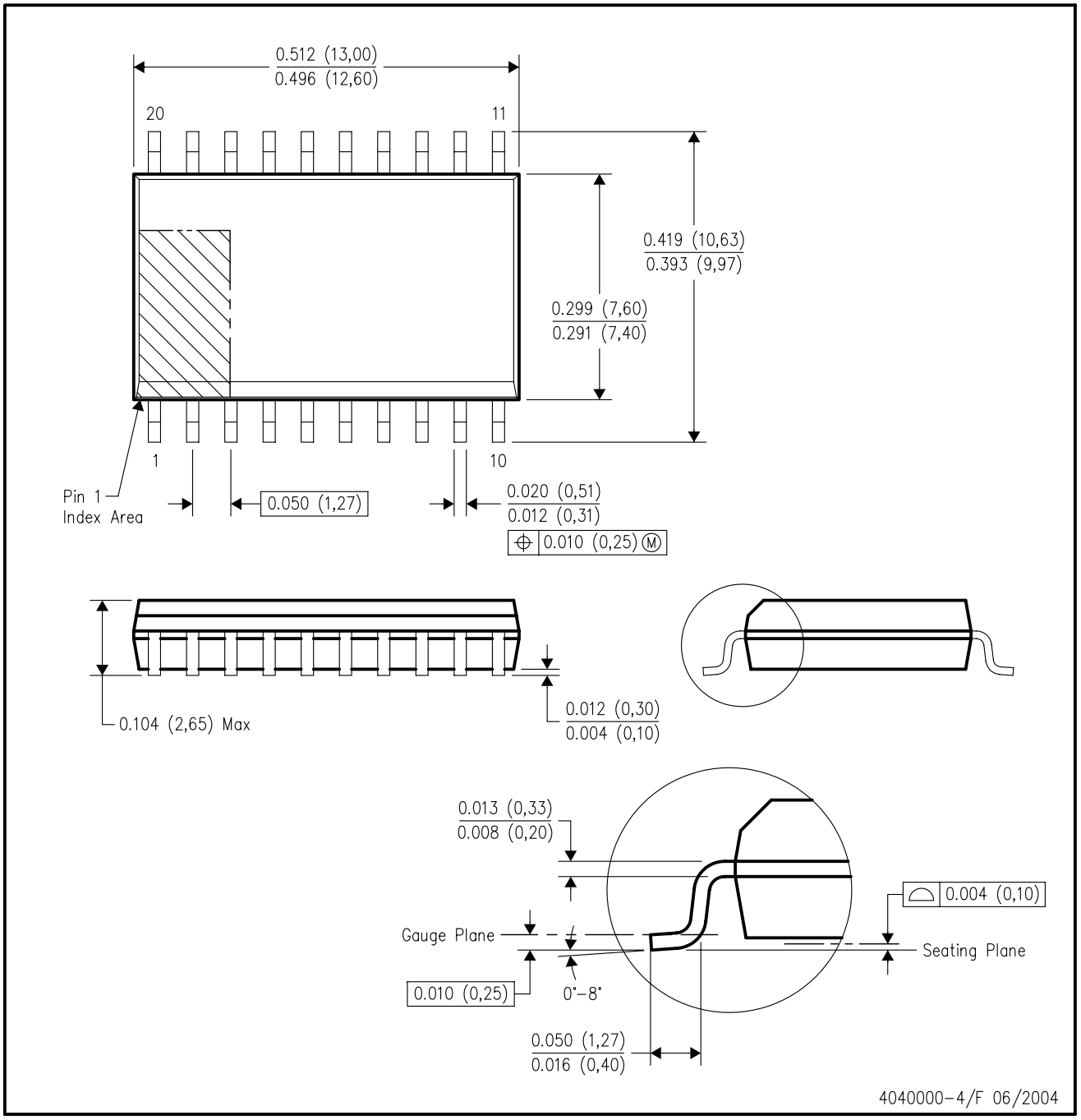
NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

## W (R–GDFP–F20) 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 GDFP2–F20

## DW (R–PDSO–G20) PLASTIC SMALL–OUTLINE PACKAGE

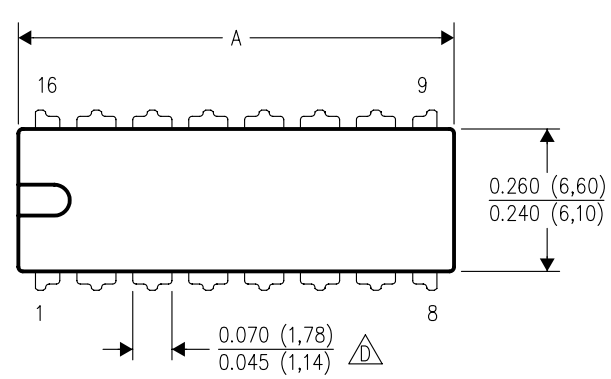



NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
D. Falls within JEDEC MS–013 variation AC.

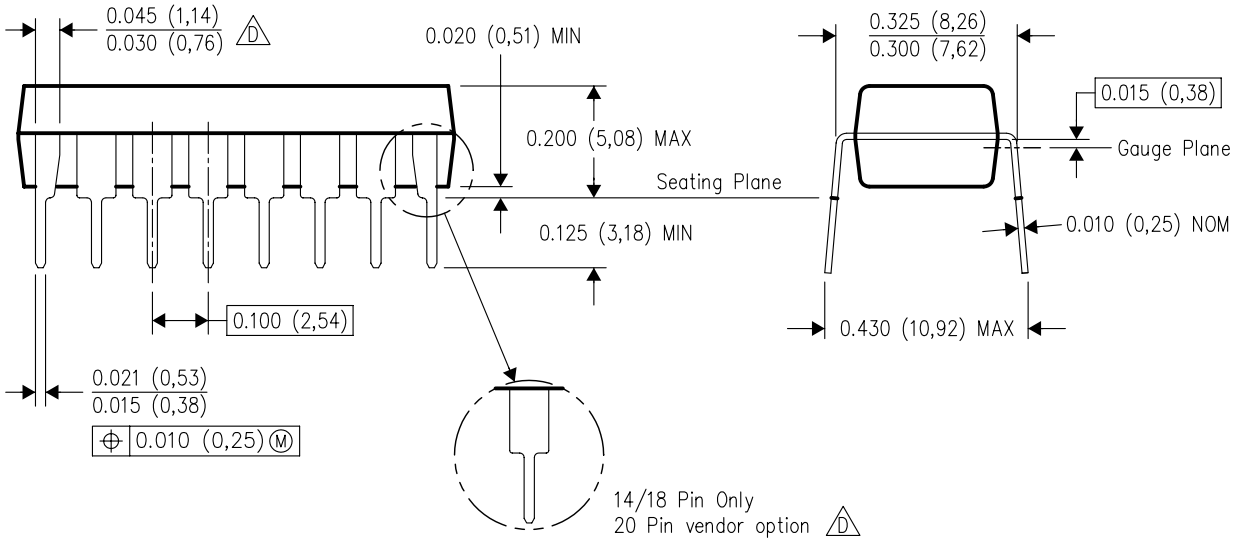
## N (R–PDIP–T**)

## 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.

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