

# SN54ALS240A, SN54AS240A, SN74ALS240A, SN74AS240A

## OCTAL BUFFERS/DRIVERS

### WITH 3-STATE OUTPUTS

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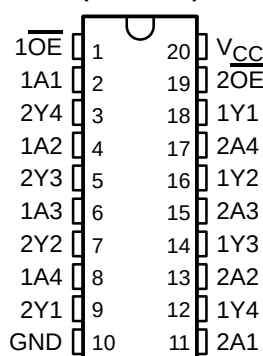
- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
- pnp Inputs Reduce dc Loading

#### description/ordering information

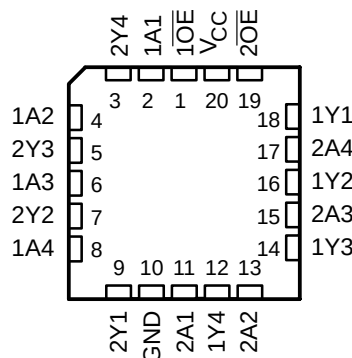
These octal buffers/drivers are designed specifically to improve both the performance and density of 3-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters. When these devices are used with the 'ALS241, 'AS241A, 'ALS244, and 'AS244A devices, the circuit designer has 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 SN74ALS240A is identical to the standard version, except that the recommended maximum  $I_{OL}$  for the -1 version is 48 mA. There is no -1 version of the SN54ALS240A.

SN54ALS240A, SN54AS240A . . . J OR W PACKAGE  
SN74ALS240A . . . DB, DW, N, OR NS PACKAGE  
SN74AS240A . . . DW OR N PACKAGE



SN54ALS240A, SN54AS240A . . . FK PACKAGE  
(TOP VIEW)



#### ORDERING INFORMATION

| $T_A$       | PACKAGE†  |               | ORDERABLE PART NUMBER | TOP-SIDE MARKING |
|-------------|-----------|---------------|-----------------------|------------------|
| 0°C to 70°C | PDIP – N  | Tube          | SN74ALS240AN          | SN74ALS240AN     |
|             |           |               | SN74ALS240A-1N        | SN74ALS240A-1N   |
|             |           |               | SN74AS240AN           | SN74AS240AN      |
|             | SOIC – DW | Tube          | SN74ALS240ADW         | ALS240A          |
|             |           | Tape and reel | SN74ALS240ADWR        |                  |
|             |           | Tube          | SN74ALS240A-1DW       | ALS240A-1        |
|             |           | Tape and reel | SN74ALS240A-1DWR      |                  |
|             |           | Tube          | SN74AS240ADW          | AS240A           |
|             |           | Tape and reel | SN74AS240ADWR         |                  |
|             | SOP – NS  | Tape and reel | SN74ALS240ANSR        | ALS240A          |
|             |           |               | SN74ALS240A-1NSR      | ALS240A-1        |
|             | SSOP – DB | Tape and reel | SN74ALS240ADBR        | G240A            |
|             |           |               | SN74ALS240A-1DBR      | G240A-1          |

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at [www.ti.com/sc/package](http://www.ti.com/sc/package).



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

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.

**TEXAS  
INSTRUMENTS**

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On products compliant to MIL-PRF-38535, all parameters are tested unless otherwise noted. On all other products, production processing does not necessarily include testing of all parameters.

# SN54ALS240A, SN54AS240A, SN74ALS240A, SN74AS240A

## OCTAL BUFFERS/DRIVERS

### WITH 3-STATE OUTPUTS

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#### description/ordering information (continued)

#### ORDERING INFORMATION

| T <sub>A</sub> | PACKAGE <sup>†</sup> |      | ORDERABLE<br>PART NUMBER | TOP-SIDE<br>MARKING |
|----------------|----------------------|------|--------------------------|---------------------|
| –55°C to 125°C | CDIP – J             | Tube | SNJ54ALS240AJ            | SNJ54ALS240AJ       |
|                |                      |      | SNJ54AS240AJ             | SNJ54AS240AJ        |
|                | CFP – W              | Tube | SNJ54ALS240AW            | SNJ54ALS240AW       |
|                |                      |      | SNJ54AS240AW             | SNJ54AS240AW        |
|                | LCCC – FK            | Tube | SNJ54ALS240AFK           | SNJ54ALS240AFK      |
|                |                      |      | SNJ54AS240AFK            | SNJ54AS240AFK       |

<sup>†</sup> Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at [www.ti.com/sc/package](http://www.ti.com/sc/package).

#### FUNCTION TABLE (each buffer)

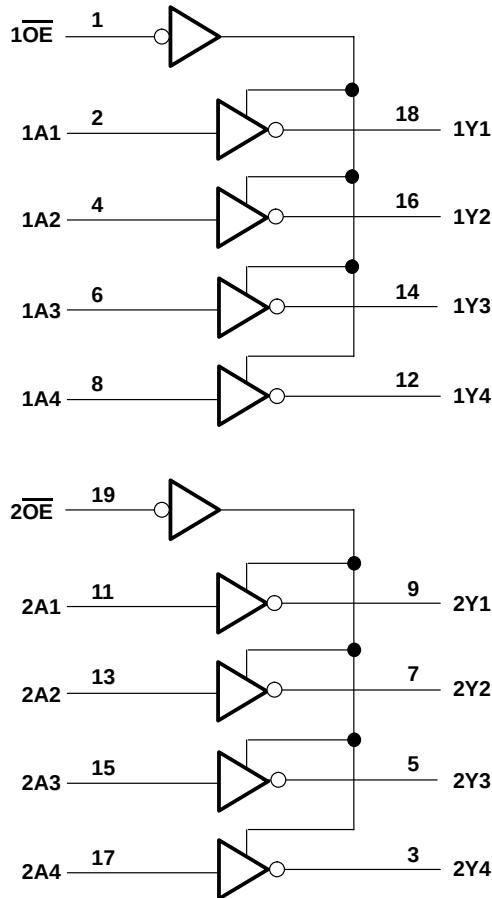
| INPUTS                 |   | OUTPUT<br>Y |
|------------------------|---|-------------|
| $\overline{\text{OE}}$ | A |             |
| L                      | H | L           |
| L                      | L | H           |
| H                      | X | Z           |

# SN54ALS240A, SN54AS240A, SN74ALS240A, SN74AS240A

## OCTAL BUFFERS/DRIVERS WITH 3-STATE OUTPUTS

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logic diagram (positive logic)



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)<sup>†</sup>

|                                                                   |                |
|-------------------------------------------------------------------|----------------|
| Supply voltage, $V_{CC}$                                          | 7 V            |
| Input voltage, $V_I$                                              | 7 V            |
| Voltage applied to a disabled 3-state output                      | 5.5 V          |
| Package thermal impedance, $\theta_{JA}$ (see Note 1): DB package | 70°C/W         |
| DW package                                                        | 58°C/W         |
| N package                                                         | 70°C/W         |
| NS package                                                        | 60°C/W         |
| Storage temperature range, $T_{stg}$                              | –65°C to 150°C |

<sup>†</sup> 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.

NOTE 1: The package thermal impedance is calculated in accordance with JESD 51-7.

# SN54ALS240A, SN54AS240A, SN74ALS240A, SN74AS240A

## OCTAL BUFFERS/DRIVERS

### WITH 3-STATE OUTPUTS

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#### recommended operating conditions

|                 |                                | MIN                     | NOM | MAX             | UNIT |
|-----------------|--------------------------------|-------------------------|-----|-----------------|------|
| V <sub>CC</sub> | Supply voltage                 | 4.5                     | 5   | 5.5             | V    |
| V <sub>IH</sub> | High-level input voltage       | 2                       |     |                 | V    |
| V <sub>IL</sub> | Low-level input voltage        | SN54ALS240A             |     | 0.7             | V    |
|                 |                                | SN74ALS240A, 'AS240A    |     | 0.8             |      |
| I <sub>OH</sub> | High-level output current      | SN54ALS240A, SN54AS240A |     | –12             | mA   |
|                 |                                | SN74ALS240A, SN74AS240A |     | –15             |      |
| I <sub>OL</sub> | Low-level output current       | SN54ALS240A             |     | 12              | mA   |
|                 |                                | SN74ALS240A             |     | 24              |      |
|                 |                                |                         |     | 48 <sup>†</sup> |      |
|                 |                                | SN54AS240A              |     | 48              |      |
| T <sub>A</sub>  | Operating free-air temperature | SN54ALS240A, SN54AS240A |     | –55             | °C   |
|                 |                                | SN74ALS240A, SN74AS240A |     | 0               |      |

<sup>†</sup> Applies only to the -1 version and only if V<sub>CC</sub> is between 4.75 V and 5.25 V

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

| PARAMETER                   | TEST CONDITIONS                                             |                                      | SN54ALS240A         |                  |     | SN74ALS240A         |                  |     | UNIT |
|-----------------------------|-------------------------------------------------------------|--------------------------------------|---------------------|------------------|-----|---------------------|------------------|-----|------|
|                             |                                                             |                                      | MIN                 | TYP <sup>‡</sup> | MAX | MIN                 | TYP <sup>‡</sup> | MAX |      |
| V <sub>IK</sub>             | V <sub>CC</sub> = 4.5 V, I <sub>I</sub> = −18 mA            |                                      | −1.2                |                  |     | −1.2                |                  |     | V    |
| V <sub>OH</sub>             | V <sub>CC</sub> = 4.5 V to 5.5 V, I <sub>OH</sub> = −0.4 mA |                                      | V <sub>CC</sub> − 2 |                  |     | V <sub>CC</sub> − 2 |                  |     | V    |
|                             | V <sub>CC</sub> = 4.5 V                                     | I <sub>OH</sub> = −3 mA              | 2.4                 | 3.2              |     | 2.4                 | 3.2              |     |      |
|                             |                                                             | I <sub>OH</sub> = −12 mA             | 2                   |                  |     |                     |                  |     |      |
|                             |                                                             | I <sub>OH</sub> = −15 mA             |                     |                  |     | 2                   |                  |     |      |
| V <sub>OL</sub>             | V <sub>CC</sub> = 4.5 V                                     | I <sub>OL</sub> = 12 mA              | 0.25 0.4            |                  |     | 0.25 0.4            |                  |     | V    |
|                             |                                                             | I <sub>OL</sub> = 24 mA              |                     |                  |     | 0.35 0.5            |                  |     |      |
|                             |                                                             | I <sub>OL</sub> = 48 mA <sup>†</sup> |                     |                  |     | 0.35 0.5            |                  |     |      |
| I <sub>OZH</sub>            | V <sub>CC</sub> = 5.5 V, V <sub>O</sub> = 2.7 V             |                                      | 20                  |                  |     | 20                  |                  |     | μA   |
| I <sub>OZL</sub>            | V <sub>CC</sub> = 5.5 V, V <sub>O</sub> = 0.4 V             |                                      | −20                 |                  |     | −20                 |                  |     | μA   |
| I <sub>I</sub>              | V <sub>CC</sub> = 5.5 V, V <sub>I</sub> = 7 V               |                                      | 0.1                 |                  |     | 0.1                 |                  |     | mA   |
| I <sub>IH</sub>             | V <sub>CC</sub> = 5.5 V, V <sub>I</sub> = 2.7 V             |                                      | 20                  |                  |     | 20                  |                  |     | μA   |
| I <sub>IL</sub>             | V <sub>CC</sub> = 5.5 V, V <sub>I</sub> = 0.4 V             |                                      | −0.1                |                  |     | −0.1                |                  |     | mA   |
| I <sub>O</sub> <sup>§</sup> | V <sub>CC</sub> = 5.5 V, V <sub>O</sub> = 2.25 V            |                                      | −20                 | −112             |     | −30                 | −112             |     | mA   |
| I <sub>CC</sub>             | V <sub>CC</sub> = 5.5 V                                     | Outputs high                         | 4                   | 11               |     | 4                   | 11               |     | mA   |
|                             |                                                             | Outputs low                          | 13                  | 23               |     | 13                  | 23               |     |      |
|                             |                                                             | Outputs disabled                     | 14                  | 25               |     | 14                  | 25               |     |      |

<sup>†</sup> Applies only to the -1 version and only if V<sub>CC</sub> is between 4.75 V and 5.25 V

<sup>‡</sup> All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.

<sup>§</sup> The output conditions have been chosen to produce a current that closely approximates one-half of the true short-circuit output current, I<sub>OS</sub>.



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# SN54ALS240A, SN54AS240A, SN74ALS240A, SN74AS240A

## OCTAL BUFFERS/DRIVERS WITH 3-STATE OUTPUTS

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

| PARAMETER                  | TEST CONDITIONS                  |                          | SN54AS240A          |                  |      | SN74AS240A          |                  |      | UNIT |
|----------------------------|----------------------------------|--------------------------|---------------------|------------------|------|---------------------|------------------|------|------|
|                            |                                  |                          | MIN                 | TYP <sup>†</sup> | MAX  | MIN                 | TYP <sup>†</sup> | MAX  |      |
| V <sub>IK</sub>            | V <sub>CC</sub> = 4.5 V,         | I <sub>I</sub> = –18 mA  |                     |                  | –1.2 |                     |                  | –1.2 | V    |
| V <sub>OH</sub>            | V <sub>CC</sub> = 4.5 V to 5.5 V | I <sub>OH</sub> = –2 mA  | V <sub>CC</sub> – 2 |                  |      | V <sub>CC</sub> – 2 |                  |      | V    |
|                            |                                  | I <sub>OH</sub> = –3 mA  | 2.4                 | 3.4              |      | 2.4                 | 3.4              |      |      |
|                            | V <sub>CC</sub> = 4.5 V          | I <sub>OH</sub> = –12 mA | 2.4                 |                  |      |                     |                  |      |      |
|                            |                                  | I <sub>OH</sub> = –15 mA |                     |                  |      | 2.4                 |                  |      |      |
| V <sub>OL</sub>            | V <sub>CC</sub> = 4.5 V          | I <sub>OL</sub> = 48 mA  | 0.27                | 0.55             |      |                     |                  |      | V    |
|                            |                                  | I <sub>OL</sub> = 64 mA  |                     |                  |      | 0.31                | 0.55             |      |      |
| I <sub>OZH</sub>           | V <sub>CC</sub> = 5.5 V,         | V <sub>O</sub> = 2.7 V   |                     |                  | 50   |                     |                  | 50   | μA   |
| I <sub>OZL</sub>           | V <sub>CC</sub> = 5.5 V,         | V <sub>O</sub> = 0.4 V   |                     |                  | –50  |                     |                  | –50  | μA   |
| I <sub>I</sub>             | V <sub>CC</sub> = 5.5 V,         | V <sub>I</sub> = 7 V     |                     |                  | 0.1  |                     |                  | 0.1  | mA   |
| I <sub>IH</sub>            | V <sub>CC</sub> = 5.5 V,         | V <sub>I</sub> = 2.7 V   |                     |                  | 20   |                     |                  | 20   | μA   |
| I <sub>IL</sub>            | A inputs                         | V <sub>CC</sub> = 5.5 V, |                     |                  | –1   |                     |                  | –1   | mA   |
|                            | OE inputs                        |                          |                     |                  |      |                     |                  |      |      |
|                            |                                  | V <sub>I</sub> = 0.4 V   |                     |                  | –0.5 |                     |                  | –0.5 |      |
| I <sub>O<sup>‡</sup></sub> | V <sub>CC</sub> = 5.5 V,         | V <sub>O</sub> = 2.25 V  | –50                 |                  | –150 | –50                 |                  | –150 | mA   |
| I <sub>CC</sub>            | V <sub>CC</sub> = 5.5 V          | Outputs high             | 11                  | 17               |      | 11                  | 17               |      | mA   |
|                            |                                  | Outputs low              | 51                  | 75               |      | 51                  | 75               |      |      |
|                            |                                  | Outputs disabled         | 24                  | 38               |      | 24                  | 38               |      |      |

<sup>†</sup> All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.

<sup>‡</sup> The output conditions have been chosen to produce a current that closely approximates one-half of the true short-circuit output current, I<sub>OS</sub>.

### switching characteristics (see Figure 1)

| PARAMETER        | FROM<br>(INPUT)        | TO<br>(OUTPUT) | V <sub>CC</sub> = 4.5 V to 5.5 V,<br>C <sub>L</sub> = 50 pF,<br>R <sub>1</sub> = 500 Ω,<br>R <sub>2</sub> = 500 Ω,<br>T <sub>A</sub> = MIN to MAX§ |     |             |     | UNIT |
|------------------|------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------------|-----|------|
|                  |                        |                | SN54ALS240A                                                                                                                                        |     | SN74ALS240A |     |      |
|                  |                        |                | MIN                                                                                                                                                | MAX | MIN         | MAX |      |
| t <sub>PLH</sub> | A                      | Y              | 2                                                                                                                                                  | 22  | 2           | 9   | ns   |
| t <sub>PHL</sub> |                        |                | 2                                                                                                                                                  | 11  | 2           | 9   |      |
| t <sub>PZH</sub> | $\overline{\text{OE}}$ | Y              | 4                                                                                                                                                  | 34  | 5           | 13  | ns   |
| t <sub>PZL</sub> |                        |                | 5                                                                                                                                                  | 26  | 5           | 18  |      |
| t <sub>PHZ</sub> | $\overline{\text{OE}}$ | Y              | 1                                                                                                                                                  | 15  | 2           | 10  | ns   |
| t <sub>PLZ</sub> |                        |                | 3                                                                                                                                                  | 24  | 3           | 12  |      |

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



# SN54ALS240A, SN54AS240A, SN74ALS240A, SN74AS240A

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#### switching characteristics (see Figure 1)

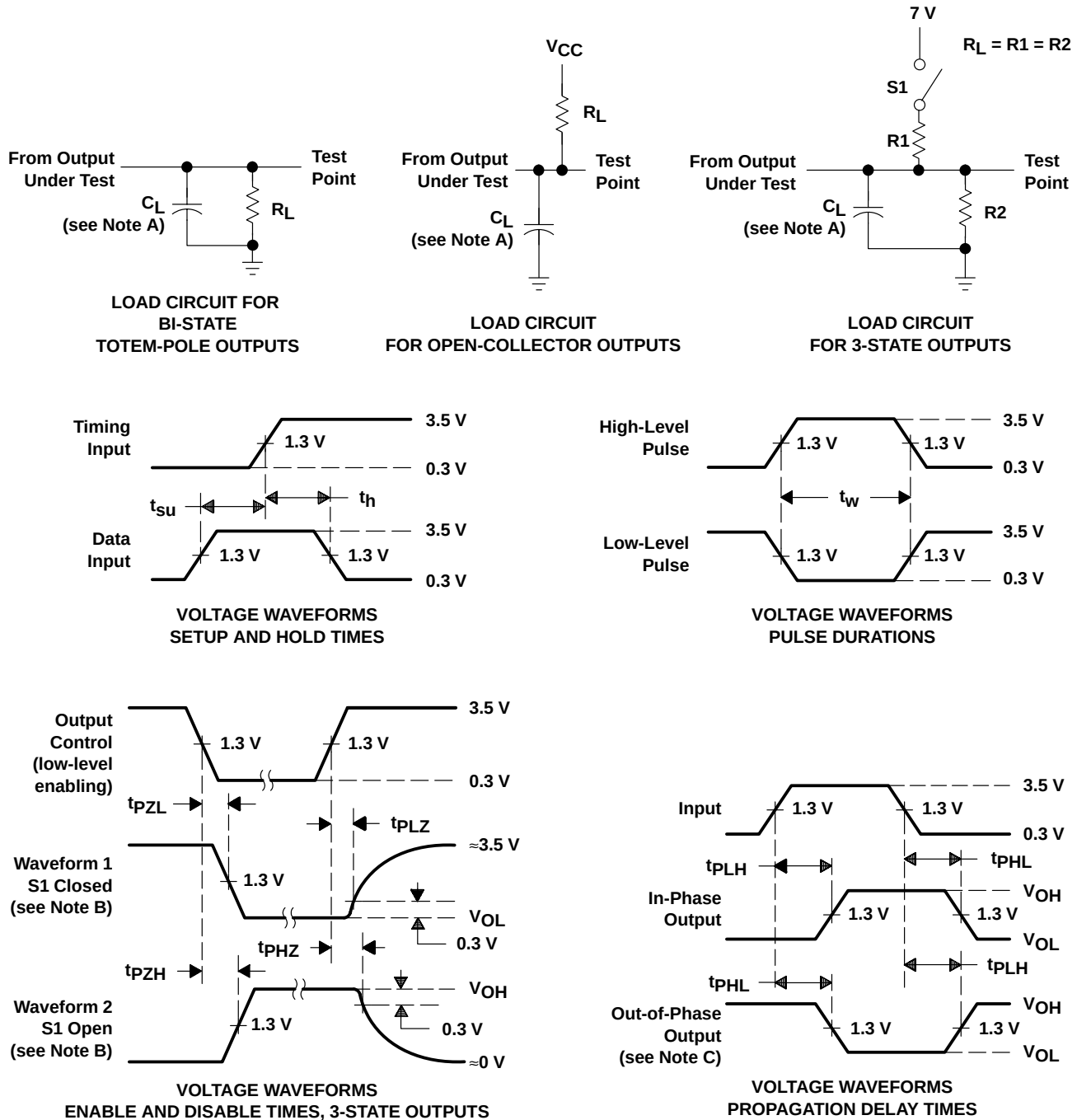
| PARAMETER        | FROM<br>(INPUT)        | TO<br>(OUTPUT) | V <sub>CC</sub> = 4.5 V to 5.5 V,<br>C <sub>L</sub> = 50 pF,<br>R1 = 500 Ω,<br>R2 = 500 Ω,<br>T <sub>A</sub> = MIN to MAX† |      |            |     | UNIT |
|------------------|------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------|------|------------|-----|------|
|                  |                        |                | SN54AS240A                                                                                                                 |      | SN74AS240A |     |      |
|                  |                        |                | MIN                                                                                                                        | MAX  | MIN        | MAX |      |
| t <sub>PLH</sub> | A                      | Y              | 1                                                                                                                          | 7    | 1          | 6.5 | ns   |
| t <sub>PHL</sub> |                        |                | 1.2                                                                                                                        | 6.5  | 1.2        | 6.5 |      |
| t <sub>PZH</sub> | $\overline{\text{OE}}$ | Y              | 1                                                                                                                          | 7    | 1          | 6.4 | ns   |
| t <sub>PZL</sub> |                        |                | 1.1                                                                                                                        | 9.5  | 1.1        | 9   |      |
| t <sub>PHZ</sub> | $\overline{\text{OE}}$ | Y              | 1.2                                                                                                                        | 5.5  | 1.2        | 5   | ns   |
| t <sub>PLZ</sub> |                        |                | 1.5                                                                                                                        | 12.5 | 1.5        | 9.5 |      |

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

# SN54ALS240A, SN54AS240A, SN74ALS240A, SN74AS240A OCTAL BUFFERS/DRIVERS WITH 3-STATE OUTPUTS

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



- 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:  $PRR \leq 1$  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 <sup>(1)</sup> | Package Type | Package Drawing | Pins | Package Qty | Eco Plan <sup>(2)</sup> | Lead/Ball Finish | MSL Peak Temp <sup>(3)</sup> |
|--------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|------------------------------|
| 5962-8859101SA     | ACTIVE                | CFP          | W               | 20   | 1           | TBD                     | Call TI          | Level-NC-NC-NC               |
| JM38510/38301B2A   | ACTIVE                | LCCC         | FK              | 20   | 1           | TBD                     | Call TI          | Level-NC-NC-NC               |
| JM38510/38301BRA   | ACTIVE                | CDIP         | J               | 20   | 1           | TBD                     | Call TI          | Level-NC-NC-NC               |
| SN54ALS240AJ       | ACTIVE                | CDIP         | J               | 20   | 1           | TBD                     | Call TI          | Level-NC-NC-NC               |
| SN54AS240AJ        | ACTIVE                | CDIP         | J               | 20   | 1           | TBD                     | Call TI          | Level-NC-NC-NC               |
| SN74ALS240A-1DBR   | ACTIVE                | SSOP         | DB              | 20   | 2000        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74ALS240A-1DBRE4 | ACTIVE                | SSOP         | DB              | 20   | 2000        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74ALS240A-1DW    | ACTIVE                | SOIC         | DW              | 20   | 25          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74ALS240A-1DWE4  | ACTIVE                | SOIC         | DW              | 20   | 25          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74ALS240A-1DWR   | ACTIVE                | SOIC         | DW              | 20   | 2000        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74ALS240A-1DWRE4 | ACTIVE                | SOIC         | DW              | 20   | 2000        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74ALS240A-1N     | ACTIVE                | PDIP         | N               | 20   | 20          | Pb-Free (RoHS)          | CU NIPDAU        | Level-NC-NC-NC               |
| SN74ALS240A-1NE4   | ACTIVE                | PDIP         | N               | 20   | 20          | Pb-Free (RoHS)          | CU NIPDAU        | Level-NC-NC-NC               |
| SN74ALS240A-1NSR   | ACTIVE                | SO           | NS              | 20   | 2000        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74ALS240A-1NSRE4 | ACTIVE                | SO           | NS              | 20   | 2000        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74ALS240ADW      | ACTIVE                | SOIC         | DW              | 20   | 25          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74ALS240ADWE4    | ACTIVE                | SOIC         | DW              | 20   | 25          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74ALS240ADWR     | ACTIVE                | SOIC         | DW              | 20   | 2000        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74ALS240ADWRE4   | ACTIVE                | SOIC         | DW              | 20   | 2000        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74ALS240AN       | ACTIVE                | PDIP         | N               | 20   | 20          | Pb-Free (RoHS)          | CU NIPDAU        | Level-NC-NC-NC               |
| SN74ALS240ANE4     | ACTIVE                | PDIP         | N               | 20   | 20          | Pb-Free (RoHS)          | CU NIPDAU        | Level-NC-NC-NC               |
| SN74ALS240ANSR     | ACTIVE                | SO           | NS              | 20   | 2000        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74ALS240ANSRE4   | ACTIVE                | SO           | NS              | 20   | 2000        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74AS240ADW       | ACTIVE                | SOIC         | DW              | 20   | 25          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74AS240ADWE4     | ACTIVE                | SOIC         | DW              | 20   | 25          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74AS240ADWR      | ACTIVE                | SOIC         | DW              | 20   | 2000        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74AS240ADWRE4    | ACTIVE                | SOIC         | DW              | 20   | 2000        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |



| Orderable Device | Status <sup>(1)</sup> | Package Type | Package Drawing | Pins | Package Qty | Eco Plan <sup>(2)</sup> | Lead/Ball Finish | MSL Peak Temp <sup>(3)</sup> |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|------------------------------|
| SN74AS240AN      | ACTIVE                | PDIP         | N               | 20   | 20          | Pb-Free (RoHS)          | CU NIPDAU        | Level-NC-NC-NC               |
| SN74AS240ANE4    | ACTIVE                | PDIP         | N               | 20   | 20          | Pb-Free (RoHS)          | CU NIPDAU        | Level-NC-NC-NC               |
| SN74AS240ANSR    | ACTIVE                | SO           | NS              | 20   | 2000        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SN74AS240ANSRE4  | ACTIVE                | SO           | NS              | 20   | 2000        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| SNJ54ALS240AFK   | ACTIVE                | LCCC         | FK              | 20   | 1           | TBD                     | Call TI          | Level-NC-NC-NC               |
| SNJ54ALS240AJ    | ACTIVE                | CDIP         | J               | 20   | 1           | TBD                     | Call TI          | Level-NC-NC-NC               |
| SNJ54ALS240AW    | ACTIVE                | CFP          | W               | 20   | 1           | TBD                     | Call TI          | Level-NC-NC-NC               |
| SNJ54AS240AFK    | ACTIVE                | LCCC         | FK              | 20   | 1           | TBD                     | Call TI          | Level-NC-NC-NC               |
| SNJ54AS240AJ     | ACTIVE                | CDIP         | J               | 20   | 1           | TBD                     | Call TI          | Level-NC-NC-NC               |
| SNJ54AS240AW     | ACTIVE                | CFP          | W               | 20   | 1           | TBD                     | Call TI          | Level-NC-NC-NC               |

<sup>(1)</sup> 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.

<sup>(2)</sup> Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS) 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.

**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)

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

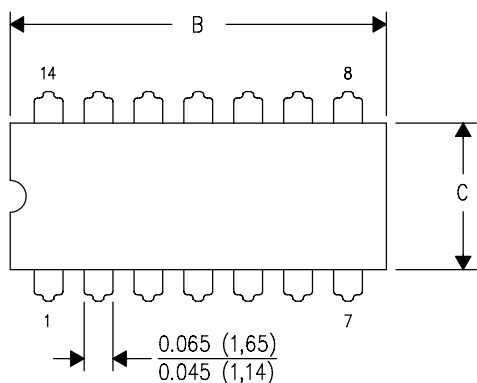
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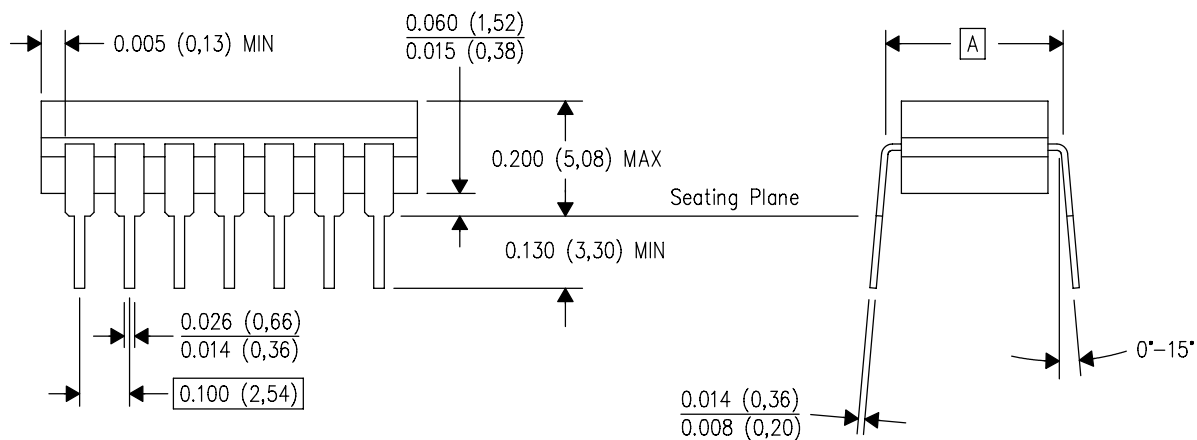
J (R-GDIP-T\*\*)

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)        |

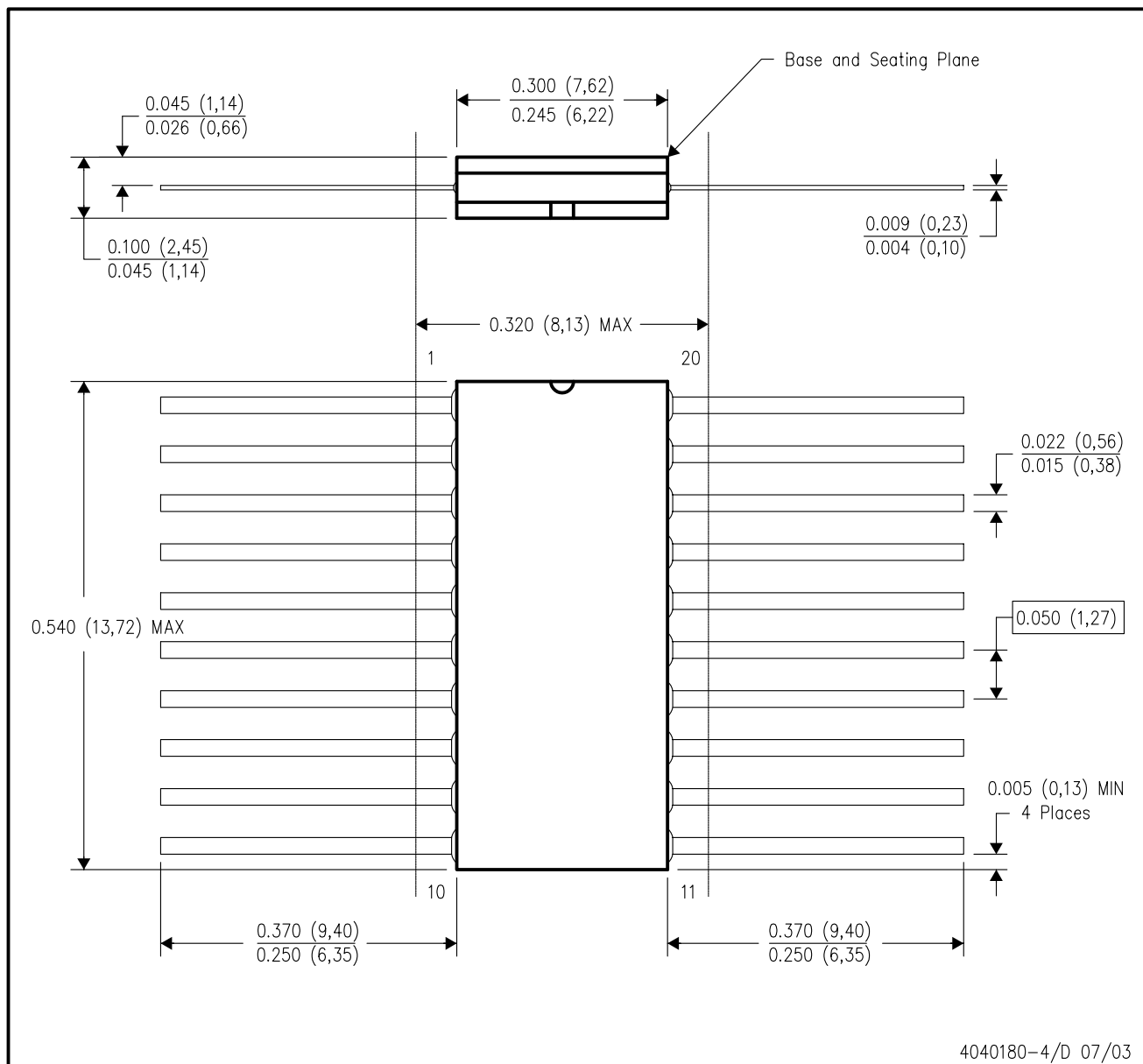


4040083/F 03/03

- 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.

W (R-GDFP-F20)

CERAMIC DUAL FLATPACK

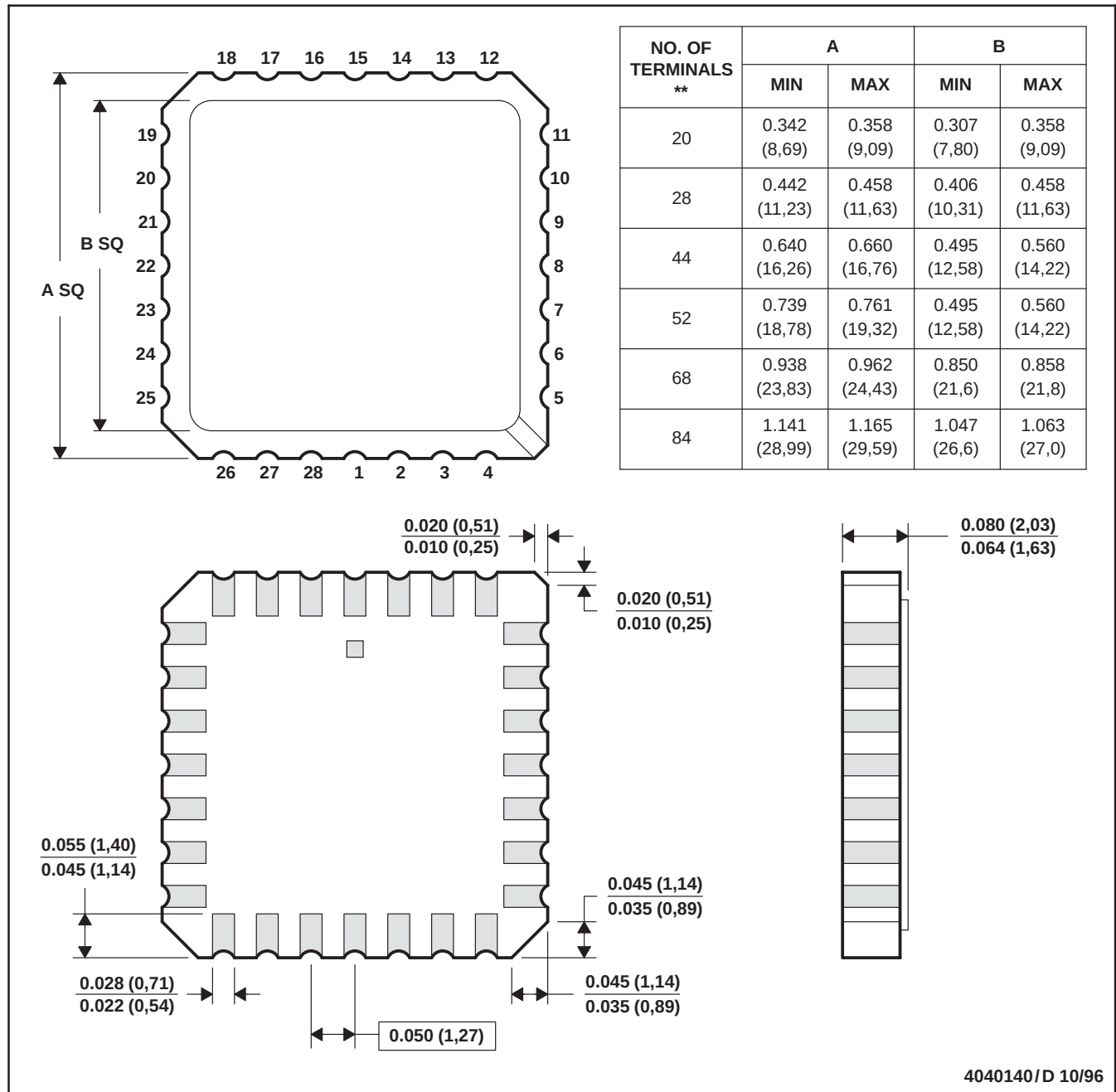


- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - This package can be hermetically sealed with a ceramic lid using glass frit.
  - Index point is provided on cap for terminal identification only.
  - Falls within Mil-Std 1835 GDFP2-F20

FK (S-CQCC-N\*\*)

LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN

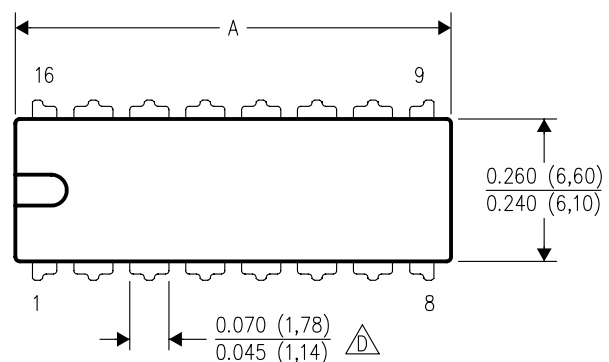


- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - This package can be hermetically sealed with a metal lid.
  - The terminals are gold plated.
  - Falls within JEDEC MS-004

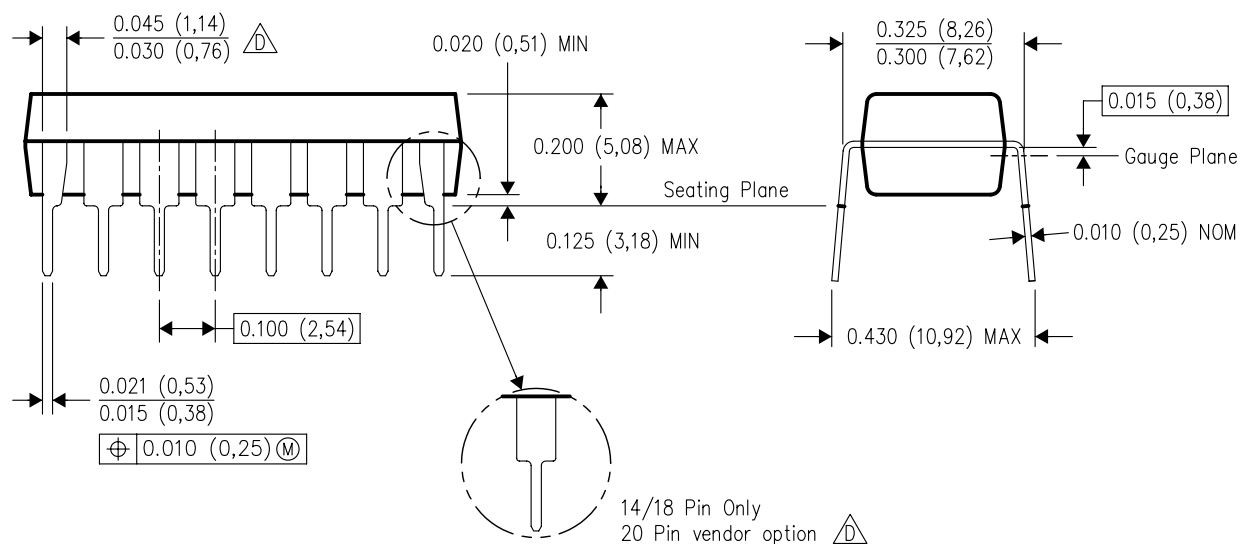
## N (R-PDIP-T\*\*)

16 PINS SHOWN

## PLASTIC DUAL-IN-LINE PACKAGE



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

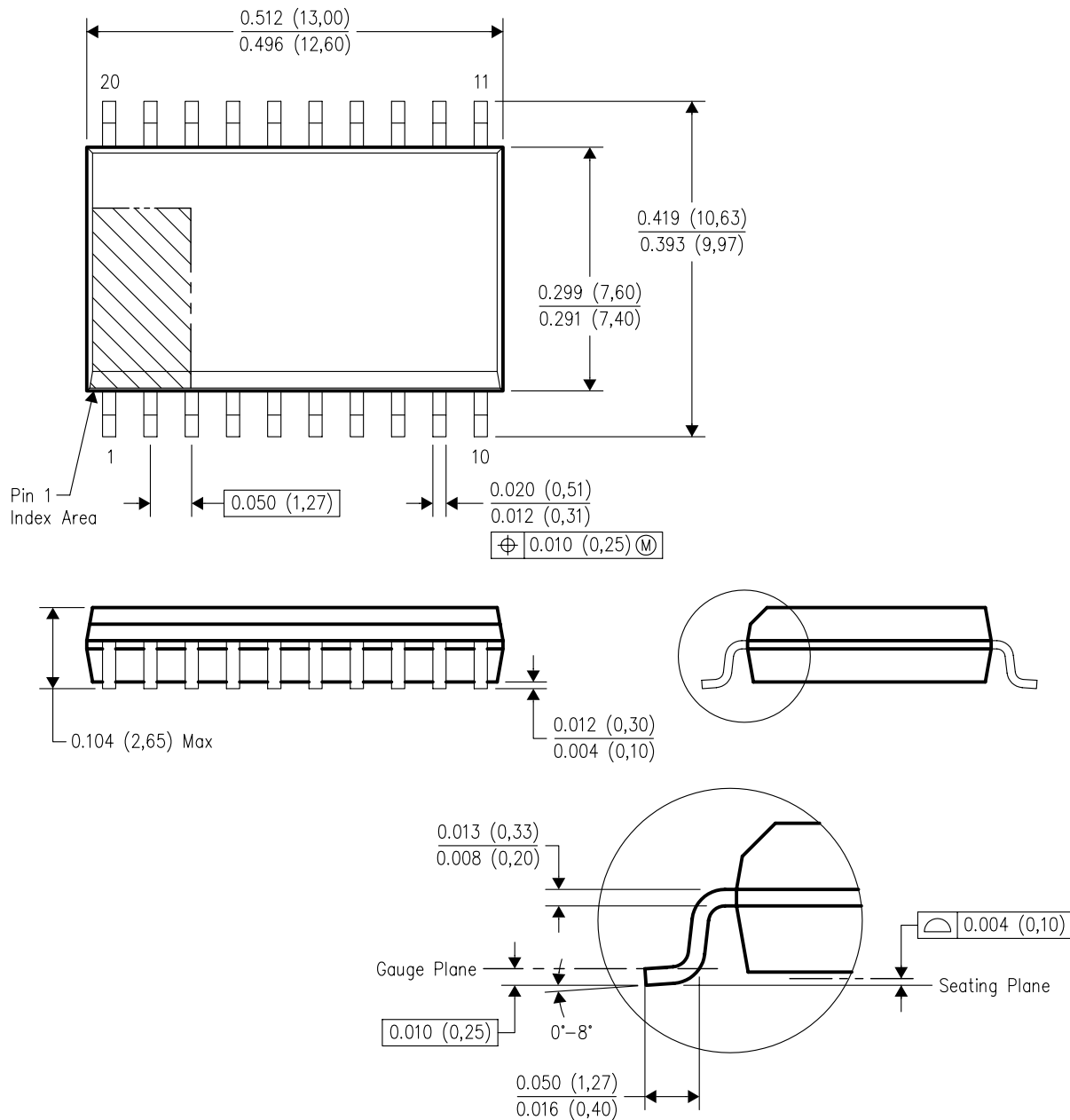


4040049/E 12/2002

- 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.

DW (R-PDSO-G20)

## PLASTIC SMALL-OUTLINE PACKAGE



4040000-4/F 06/2004

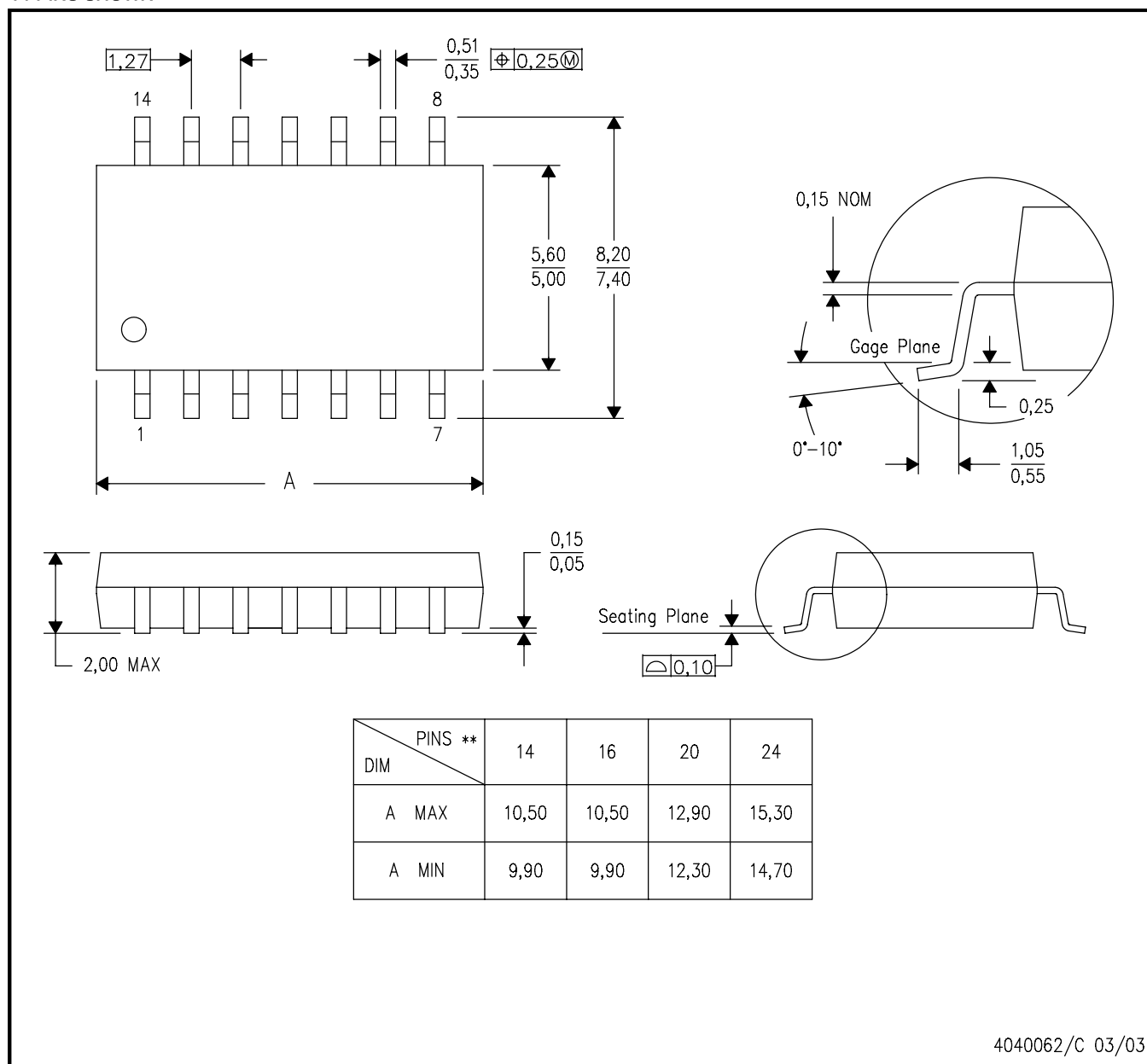
- NOTES: A. All linear dimensions are in inches (millimeters).  
B. This drawing is subject to change without notice.  
C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).  
D. Falls within JEDEC MS-013 variation AC.

# MECHANICAL DATA

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

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN

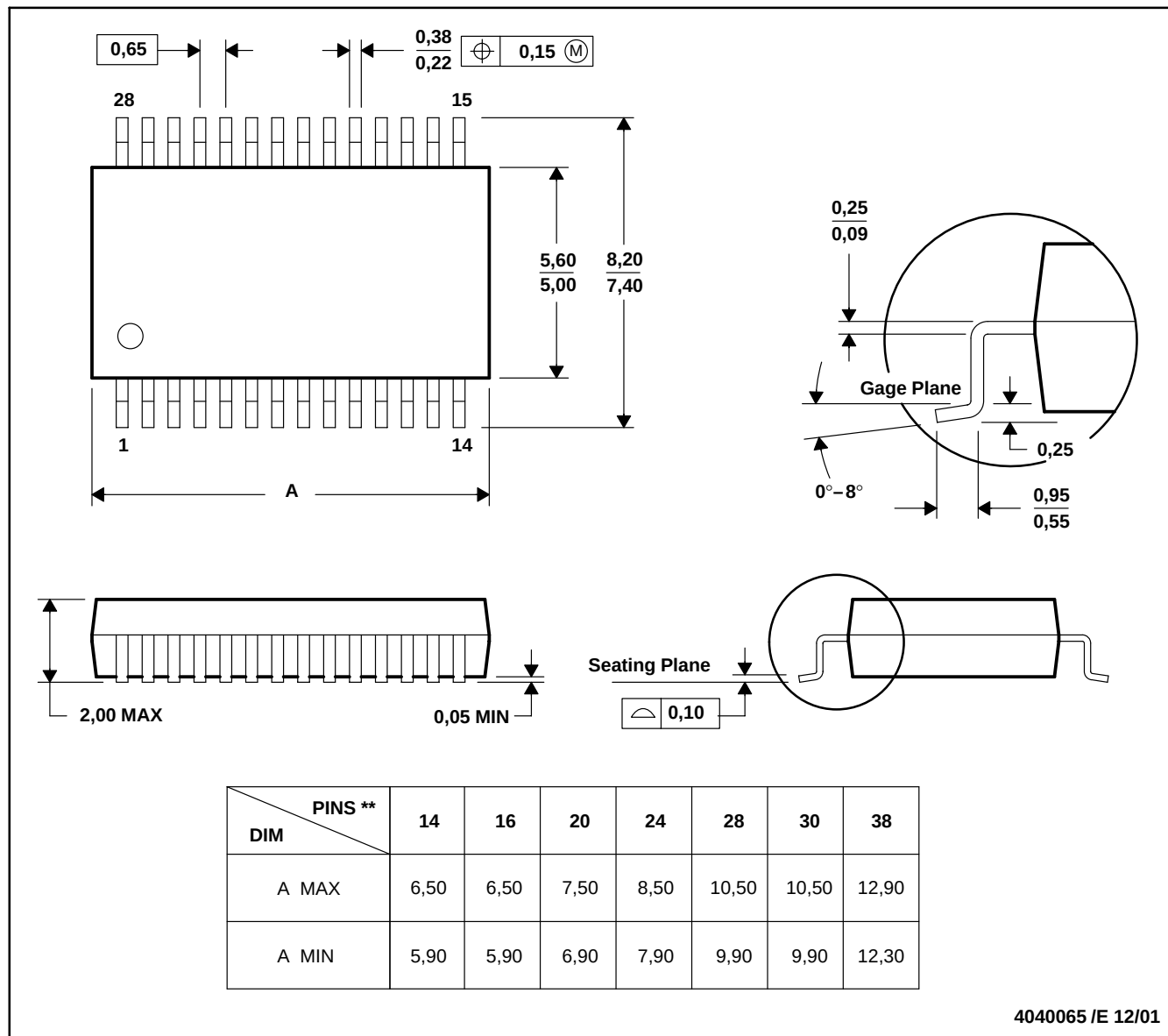


- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

## DB (R-PDSO-G\*\*)

## PLASTIC SMALL-OUTLINE

28 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.  
 D. Falls within JEDEC MO-150



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