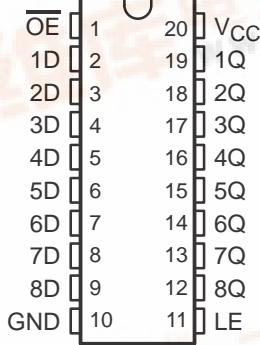


OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

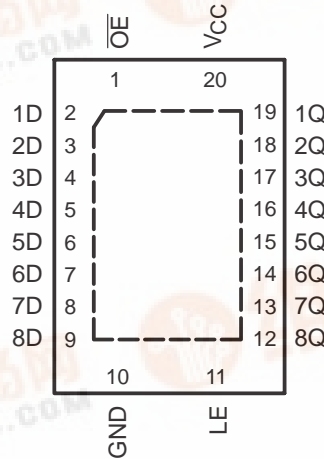
SCBS190F – JANUARY 1991 – REVISED SEPTEMBER 2003

- Typical V_{OLP} (Output Ground Bounce) <1 V at $V_{CC} = 5$ V, $T_A = 25^\circ\text{C}$
- High-Drive Outputs ($-32\text{-mA } I_{OH}$, $64\text{-mA } I_{OL}$)
- I_{off} Supports Partial-Power-Down Mode Operation
- Latch-Up Performance Exceeds 500 mA Per JEDEC Standard JESD 17
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 200-V Machine Model (A115-A)

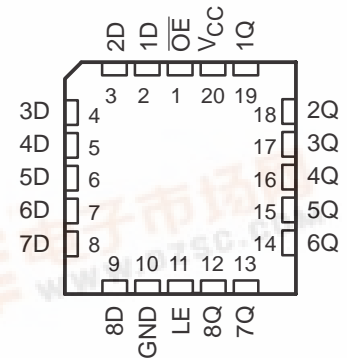
SN54ABT573 ... J OR W PACKAGE
SN74ABT573A ... DB, DW, N, NS,
OR PW PACKAGE
(TOP VIEW)



SN74ABT573A ... RGY PACKAGE
(TOP VIEW)



SN54ABT573 ... FK PACKAGE
(TOP VIEW)



description/ordering information

These 8-bit latches feature 3-state outputs designed specifically for driving highly capacitive or relatively low-impedance loads. They are particularly suitable for implementing buffer registers, I/O ports, bidirectional bus drivers, and working registers.

ORDERING INFORMATION

| T_A | PACKAGE† | | ORDERABLE PART NUMBER | TOP-SIDE MARKING |
|----------------|---------------|-----------------|-----------------------|------------------|
| -40°C to 85°C | PDIP – N | Tube | SN74ABT573AN | SN74ABT573AN |
| | QFN – RGY | Tape and reel | SN74ABT573ARGYR | AB573A |
| | SOIC – DW | Tube | SN74ABT573ADW | ABT573A |
| | | Tape and reel | SN74ABT573ADWR | |
| | SOP – NS | Tape and reel | SN74ABT573ANSR | ABT573A |
| | SSOP – DB | Tape and reel | SN74ABT573ADBR | AB573A |
| | TSSOP – PW | Tube | SN74ABT573APW | AB573A |
| | | Tape and reel | SN74ABT573APWR | |
| VFBGA – GQN | Tape and reel | SN74ABT573AGQNR | AB573A | |
| | | SN74ABT573AZQNR | | |
| -55°C to 125°C | CDIP – J | Tube | SNJ54ABT573J | SNJ54ABT573J |
| | CFP – W | Tube | SNJ54ABT573W | SNJ54ABT573W |
| | LCCC – FK | Tube | SNJ54ABT573FK | SNJ54ABT573FK |

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at 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.



SN54ABT573, SN74ABT573A OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

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description/ordering information (continued)

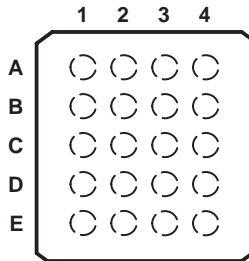
A buffered output-enable (\overline{OE}) input can be used to place the eight outputs in either a normal logic state (high or low logic levels) or the high-impedance state. In the high-impedance state, the outputs neither load nor drive the bus lines significantly. The high-impedance state and increased drive provide the capability to drive bus lines without need for interface or pullup components.

\overline{OE} does not affect the internal operations of the latches. Old data can be retained or new data can be entered while the outputs are in the high-impedance state.

To ensure the high-impedance state during power up or power down, \overline{OE} should be tied to V_{CC} through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

This device is fully specified for partial-power-down applications using I_{off} . The I_{off} circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.

SN74ABT573A . . . GQN OR ZQN PACKAGE
(TOP VIEW)



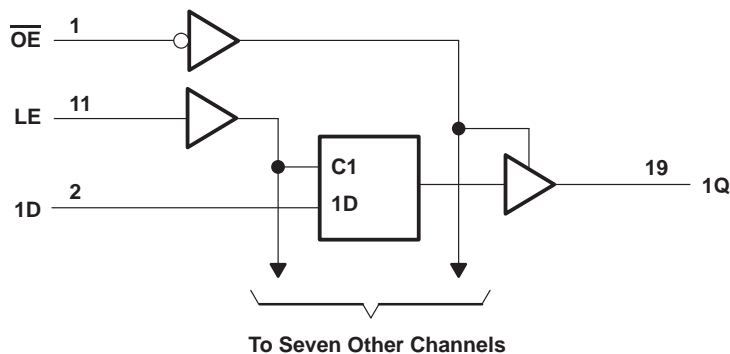
terminal assignments

| | 1 | 2 | 3 | 4 |
|---|-----|-----------------|----------|----|
| A | 1D | \overline{OE} | V_{CC} | 1Q |
| B | 3D | 3Q | 2D | 2Q |
| C | 5D | 4D | 5Q | 4Q |
| D | 7D | 7Q | 6D | 6Q |
| E | GND | 8D | LE | 8Q |

FUNCTION TABLE
(each latch)

| INPUTS | | | OUTPUT Q |
|-----------------|----|---|-------------|
| \overline{OE} | LE | D | |
| L | H | H | H |
| L | H | L | L |
| L | L | X | Q_0 |
| H | X | X | Z |

logic diagram (positive logic)



Pin numbers shown are for the DB, DW, FK, J, N, NS, PW, RGY, and W packages.

SN54ABT573, SN74ABT573A OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

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

| | |
|---|-----------------|
| Supply voltage range, V_{CC} | –0.5 V to 7 V |
| Input voltage range, V_I (see Note 1) | –0.5 V to 7 V |
| Voltage range applied to any output in the high or power-off state, V_O | –0.5 V to 5.5 V |
| Current into any output in the low state, I_{OL} : SN54ABT573 | 96 mA |
| SN74ABT573A | 128 mA |
| Input clamp current, I_{IK} ($V_I < 0$) | –18 mA |
| Output clamp current, I_{OK} ($V_O < 0$) | –50 mA |
| Package thermal impedance, θ_{JA} (see Note 2): DB package | 70°C/W |
| (see Note 2): DW package | 58°C/W |
| (see Note 2): GQN/ZQN package | 78°C/W |
| (see Note 2): N package | 69°C/W |
| (see Note 2): NS package | 60°C/W |
| (see Note 2): PW package | 83°C/W |
| (see Note 3): RGY package | 37°C/W |
| Storage temperature range, T_{stg} | –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.

- NOTES: 1. The input and output negative-voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
 2. The package thermal impedance is calculated in accordance with JESD 51-7.
 3. The package thermal impedance is calculated in accordance with JESD 51-5.

recommended operating conditions (see Note 4)

| | | SN54ABT573 | | SN74ABT573A | | UNIT |
|---------------------|------------------------------------|-----------------|----------|-------------|----------|------|
| | | MIN | MAX | MIN | MAX | |
| V_{CC} | Supply voltage | 4.5 | 5.5 | 4.5 | 5.5 | V |
| V_{IH} | High-level input voltage | 2 | | 2 | | V |
| V_{IL} | Low-level input voltage | | 0.8 | | 0.8 | V |
| V_I | Input voltage | 0 | V_{CC} | 0 | V_{CC} | V |
| I_{OH} | High-level output current | | –24 | | –32 | mA |
| I_{OL} | Low-level output current | | 48 | | 64 | mA |
| $\Delta t/\Delta v$ | Input transition rise or fall rate | Outputs enabled | | 5 | 5 | ns/V |
| T_A | Operating free-air temperature | –55 | 125 | –40 | 85 | °C |

NOTE 4: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

SN54ABT573, SN74ABT573A

OCTAL TRANSPARENT D-TYPE LATCHES

WITH 3-STATE OUTPUTS

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

| PARAMETER | TEST CONDITIONS | T _A = 25°C | | | SN54ABT573 | | SN74ABT573A | | UNIT |
|--------------------------|--|--------------------------|------|-------|------------|------|-------------|------|------|
| | | MIN | TYP† | MAX | MIN | MAX | MIN | MAX | |
| V _{IK} | V _{CC} = 4.5 V, I _I = -18 mA | | | -1.2 | | -1.2 | | -1.2 | V |
| V _{OH} | V _{CC} = 4.5 V, I _{OH} = -3 mA | 2.5 | | | 2.5 | | 2.5 | | V |
| | V _{CC} = 5 V, I _{OH} = -3 mA | 3 | | | 3 | | 3 | | |
| | V _{CC} = 4.5 V | I _{OH} = -24 mA | 2 | | | 2 | | | |
| I _{OH} = -32 mA | | 2* | | | | | 2 | | |
| V _{OL} | V _{CC} = 4.5 V | I _{OL} = 48 mA | | 0.55 | | 0.55 | | | V |
| | | I _{OL} = 64 mA | | 0.55* | | | 0.55 | | |
| V _{hys} | | | 100 | | | | | | mV |
| I _I | V _{CC} = 5.5 V, V _I = V _{CC} or GND | | | ±1 | | ±1 | | ±1 | µA |
| I _{OZH} | V _{CC} = 5.5 V, V _O = 2.7 V | | | 10‡ | | 10‡ | | 10‡ | µA |
| I _{OZL} | V _{CC} = 5.5 V, V _O = 0.5 V | | | -10‡ | | -10‡ | | -10‡ | µA |
| I _{off} | V _{CC} = 0, V _I or V _O ≤ 4.5 V | | | ±100 | | | | ±100 | µA |
| I _{CEX} | V _{CC} = 5.5 V, V _O = 5.5 V | Outputs high | | 50 | | 50 | | 50 | µA |
| I _{O§} | V _{CC} = 5.5 V, V _O = 2.5 V | -50 | -100 | -180 | -50 | -180 | -50 | -180 | mA |
| I _{CC} | V _{CC} = 5.5 V, I _O = 0, V _I = V _{CC} or GND | Outputs high | | 1 | 250 | 250 | | 250 | µA |
| | | Outputs low | | 24 | 30 | 30 | | 30 | mA |
| | | Outputs disabled | | 0.5 | 250 | 250 | | 250 | µA |
| ΔI _{CC¶} | V _{CC} = 5.5 V, One input at 3.4 V, Other inputs at V _{CC} or GND | | | 1.5 | | 1.5 | | 1.5 | mA |
| C _i | V _I = 2.5 V or 0.5 V | | | 3.5 | | | | | pF |
| C _o | V _O = 2.5 V or 0.5 V | | | 6.5 | | | | | pF |

* On products compliant to MIL-PRF-38535, this parameter does not apply.

† All typical values are at V_{CC} = 5 V.

‡ This data sheet limit may vary among suppliers.

§ Not more than one output should be tested at a time, and the duration of the test should not exceed one second.

¶ This is the increase in supply current for each input that is at the specified TTL voltage level, rather than V_{CC} or GND.

timing requirements over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 1)

| | | SN54ABT573 | | | | UNIT |
|-----------------|-----------------------------|--|-----|-----|-----|------|
| | | V _{CC} = 5 V, T _A = 25°C | | MIN | MAX | |
| | | MIN | MAX | | | |
| t _w | Pulse duration, LE high | 3.3 | | 3.3 | | ns |
| t _{su} | Setup time, data before LE↓ | High | 1.9 | | 2.5 | ns |
| | | Low | 1.5 | | 2.5 | |
| t _h | Hold time, data after LE↓ | 1 | | 2.5 | | ns |

SN54ABT573, SN74ABT573A OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

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timing requirements over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 1)

| | | SN74ABT573A | | | | UNIT | |
|-----------------|-----------------------------|---|-----|--|------|------|-----|
| | | V _{CC} = 5 V, T _A = 25°C | | | MIN | | MAX |
| | | MIN | MAX | | | | |
| t _w | Pulse duration, LE high | 3.3 | | | 3.3 | ns | |
| t _{su} | Setup time, data before LE↓ | High | 1.9 | | 1.9 | ns | |
| | | Low | 1.5 | | 1.5 | | |
| t _h | Hold time, data after LE↓ | 1.8† | | | 1.8† | ns | |

† This data-sheet limit may vary among suppliers.

switching characteristics over recommended ranges of supply voltage and operating free-air temperature, C_L = 50 pF (unless otherwise noted) (see Figure 1)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | SN54ABT573 | | | | UNIT | |
|------------------|-----------------|-------------|---|-----|-----|-----|------|-----|
| | | | V _{CC} = 5 V, T _A = 25°C | | | MIN | | MAX |
| | | | MIN | TYP | MAX | | | |
| t _{PLH} | D | Q | 1.9 | 3.2 | 5.4 | 1.4 | 6.4 | ns |
| t _{PHL} | | | 2.2 | 4.2 | 5.7 | 1.6 | 6.7 | |
| t _{PLH} | LE | Q | 2.2 | 4 | 6.1 | 2 | 7.1 | ns |
| t _{PHL} | | | 3.2 | 5.2 | 6.7 | 2.8 | 7.5 | |
| t _{PZH} | \overline{OE} | Q | 1.2 | 3.2 | 4.7 | 0.8 | 6.2 | ns |
| t _{PZL} | | | 2.7 | 4.7 | 6.2 | 2 | 7.2 | |
| t _{PHZ} | \overline{OE} | Q | 2.5 | 4.9 | 6.4 | 2.2 | 7.7 | ns |
| t _{PLZ} | | | 2 | 4.2 | 6 | 1.4 | 7 | |

switching characteristics over recommended ranges of supply voltage and operating free-air temperature, C_L = 50 pF (unless otherwise noted) (see Figure 1)

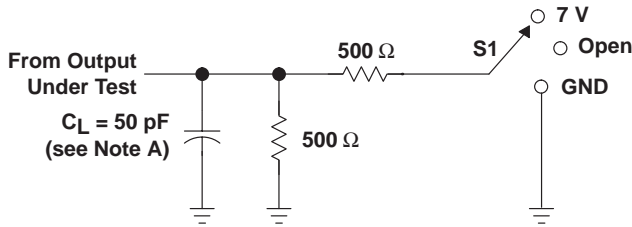
| PARAMETER | FROM (INPUT) | TO (OUTPUT) | SN74ABT573A | | | | UNIT | |
|------------------|-----------------|-------------|---|-----|-----|------|------|-----|
| | | | V _{CC} = 5 V, T _A = 25°C | | | MIN | | MAX |
| | | | MIN | TYP | MAX | | | |
| t _{PLH} | D | Q | 1.9 | 3.2 | 5.4 | 1.9 | 5.9 | ns |
| t _{PHL} | | | 2.2 | 4.2 | 5.7 | 2.2 | 6.2 | |
| t _{PLH} | LE | Q | 2.2 | 4 | 6.1 | 2.2 | 6.6 | ns |
| t _{PHL} | | | 3.2 | 5.2 | 6.7 | 3.2 | 7.2 | |
| t _{PZH} | \overline{OE} | Q | 1.2 | 3.2 | 4.7 | 1.2 | 5.2 | ns |
| t _{PZL} | | | 2.5† | 4.7 | 6.2 | 2.5† | 6.7 | |
| t _{PHZ} | \overline{OE} | Q | 2.5 | 4.9 | 6.4 | 2.5 | 7.1† | ns |
| t _{PLZ} | | | 2 | 4.2 | 6 | 2 | 6.5 | |

† This data-sheet limit may vary among suppliers.

SN54ABT573, SN74ABT573A OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

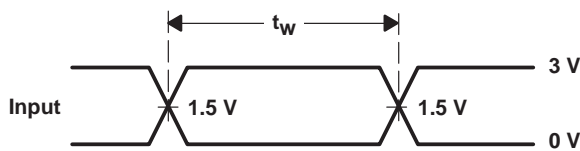
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PARAMETER MEASUREMENT INFORMATION

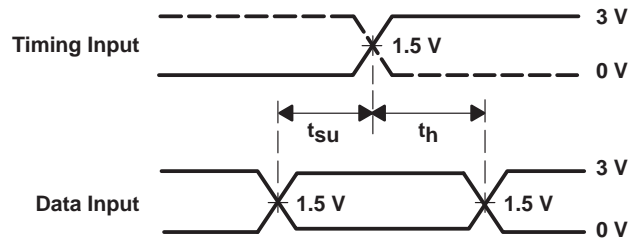


LOAD CIRCUIT

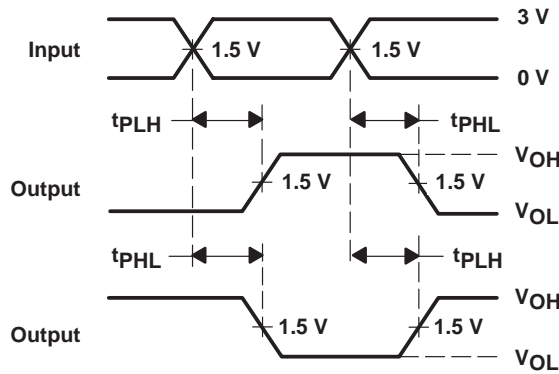
| TEST | S1 |
|-------------------|------|
| t_{PLH}/t_{PHL} | Open |
| t_{PLZ}/t_{PZL} | 7 V |
| t_{PHZ}/t_{PZH} | Open |



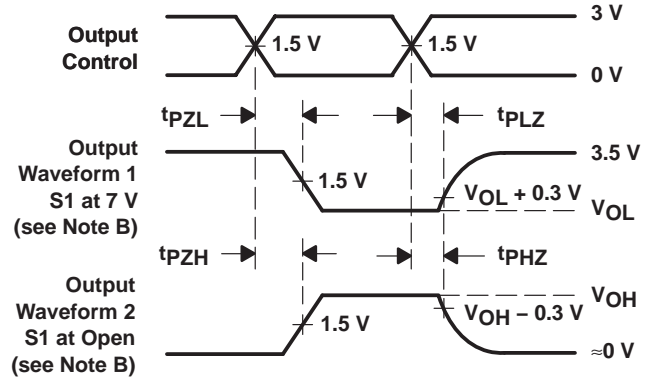
VOLTAGE WAVEFORMS
PULSE DURATION



VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES



VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES
INVERTING AND NONINVERTING OUTPUTS



VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES
LOW- AND HIGH-LEVEL ENABLING

- NOTES:
- C_L includes probe and jig capacitance.
 - 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.
 - All input pulses are supplied by generators having the following characteristics: $PRR \leq 10 \text{ MHz}$, $Z_O = 50 \Omega$, $t_r \leq 2.5 \text{ ns}$, $t_f \leq 2.5 \text{ ns}$.
 - The outputs are measured one at a time with one transition per measurement.
 - All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuit 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⁾ |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|--|
| 5962-9321901Q2A | ACTIVE | LCCC | FK | 20 | 1 | None | Call TI | Level-NC-NC-NC |
| 5962-9321901QRA | ACTIVE | CDIP | J | 20 | 1 | None | Call TI | Level-NC-NC-NC |
| 5962-9321901QSA | ACTIVE | CFP | W | 20 | 1 | None | Call TI | Level-NC-NC-NC |
| SN74ABT573ADBLE | OBSOLETE | SSOP | DB | 20 | | None | Call TI | Call TI |
| SN74ABT573ADBR | ACTIVE | SSOP | DB | 20 | 2000 | Pb-Free (RoHS) | CU NIPDAU | Level-2-260C-1 YEAR/ Level-1-235C-UNLIM |
| SN74ABT573ADW | ACTIVE | SOIC | DW | 20 | 25 | Pb-Free (RoHS) | CU NIPDAU | Level-2-250C-1 YEAR/ Level-1-235C-UNLIM |
| SN74ABT573ADWR | ACTIVE | SOIC | DW | 20 | 2000 | Pb-Free (RoHS) | CU NIPDAU | Level-2-250C-1 YEAR/ Level-1-235C-UNLIM |
| SN74ABT573AGQNR | ACTIVE | VFPGA | GQN | 20 | 1000 | None | SNPB | Level-1-240C-UNLIM |
| SN74ABT573AN | ACTIVE | PDIP | N | 20 | 20 | Pb-Free (RoHS) | CU NIPDAU | Level-NC-NC-NC |
| SN74ABT573ANSR | ACTIVE | SO | NS | 20 | 2000 | Pb-Free (RoHS) | CU NIPDAU | Level-2-260C-1 YEAR/ Level-1-235C-UNLIM |
| SN74ABT573APW | ACTIVE | TSSOP | PW | 20 | 70 | Pb-Free (RoHS) | CU NIPDAU | Level-1-250C-UNLIM |
| SN74ABT573APWLE | OBSOLETE | TSSOP | PW | 20 | | None | Call TI | Call TI |
| SN74ABT573APWR | ACTIVE | TSSOP | PW | 20 | 2000 | Pb-Free (RoHS) | CU NIPDAU | Level-1-250C-UNLIM |
| SN74ABT573ARGYR | ACTIVE | QFN | RGY | 20 | 1000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1YEAR |
| SN74ABT573AZQNR | ACTIVE | VFPGA | ZQN | 20 | 1000 | Pb-Free (RoHS) | SNAGCU | Level-1-260C-UNLIM |
| SNJ54ABT573FK | ACTIVE | LCCC | FK | 20 | 1 | None | Call TI | Level-NC-NC-NC |
| SNJ54ABT573J | ACTIVE | CDIP | J | 20 | 1 | None | Call TI | Level-NC-NC-NC |
| SNJ54ABT573W | ACTIVE | CFP | W | 20 | 1 | None | Call TI | Level-NC-NC-NC |

⁽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 - May not be currently available - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

None: Not yet available Lead (Pb-Free).

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" and in addition, uses package materials that do not contain halogens, including bromine (Br) or antimony (Sb) above 0.1% of total product weight.

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

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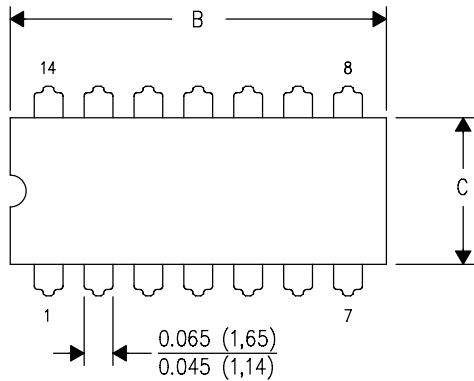
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In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

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) |



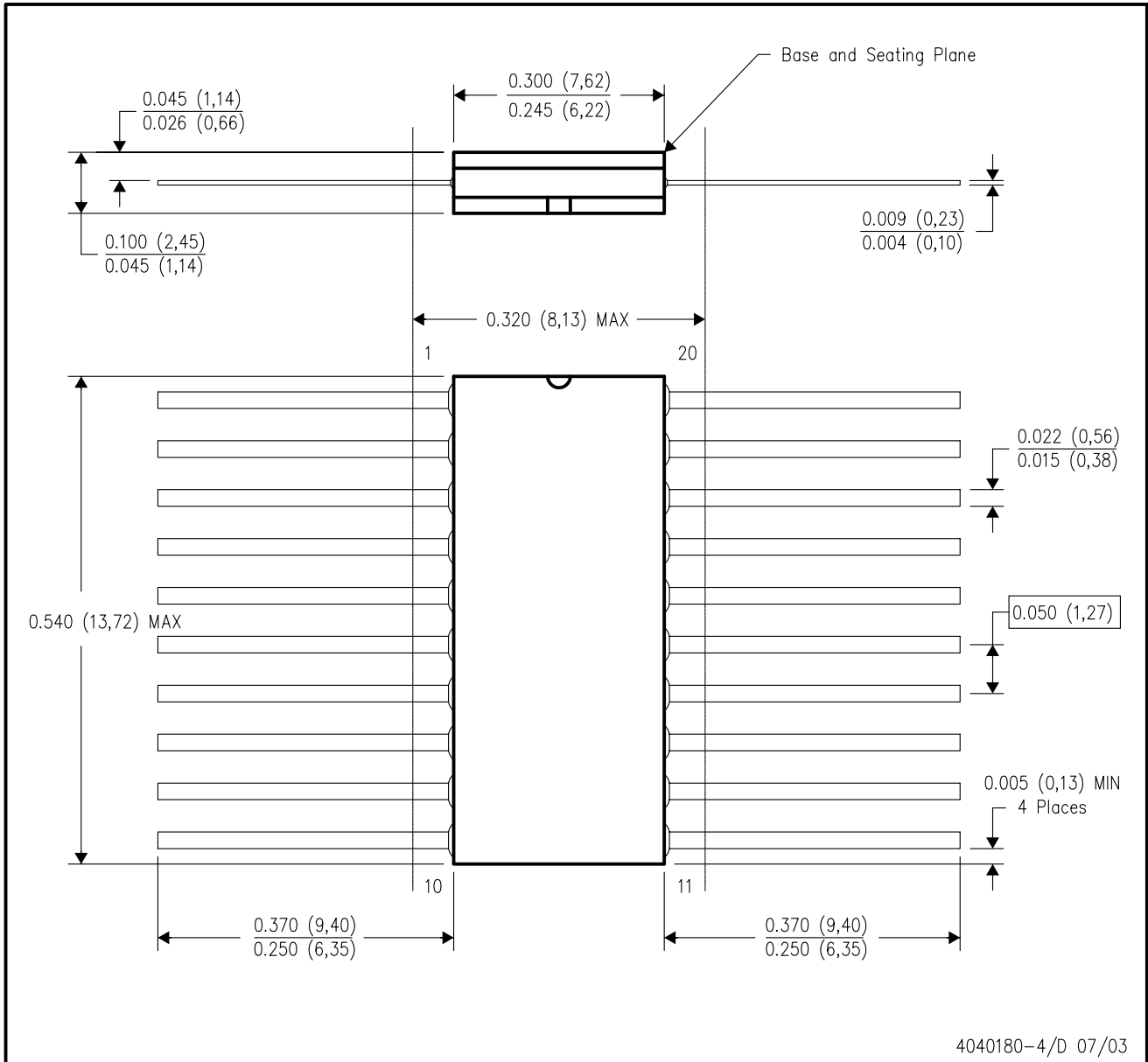
4040083/F 03/03

- 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

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

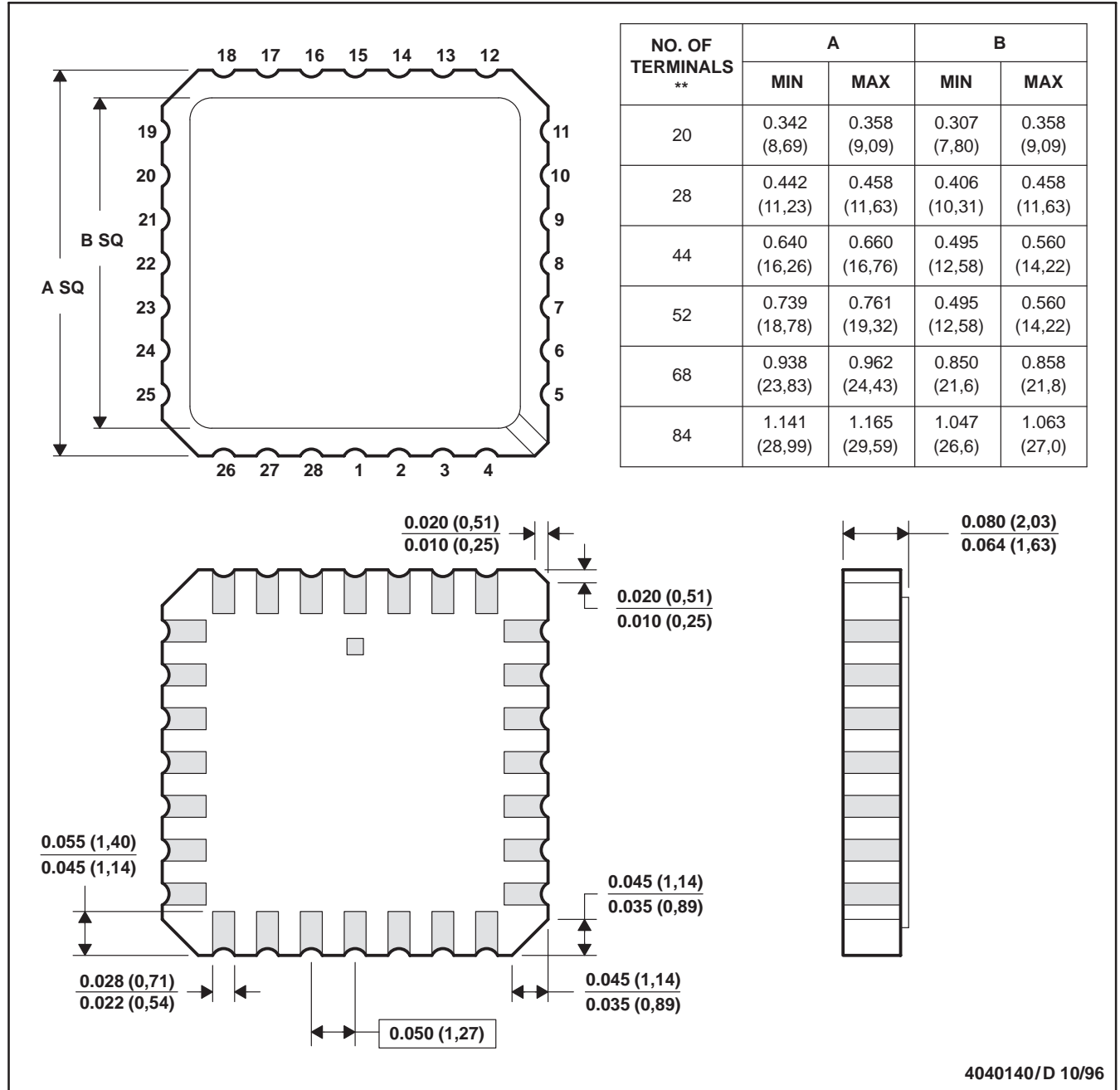
MECHANICAL DATA

MLCC006B – OCTOBER 1996

FK (S-CQCC-N**)

LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN

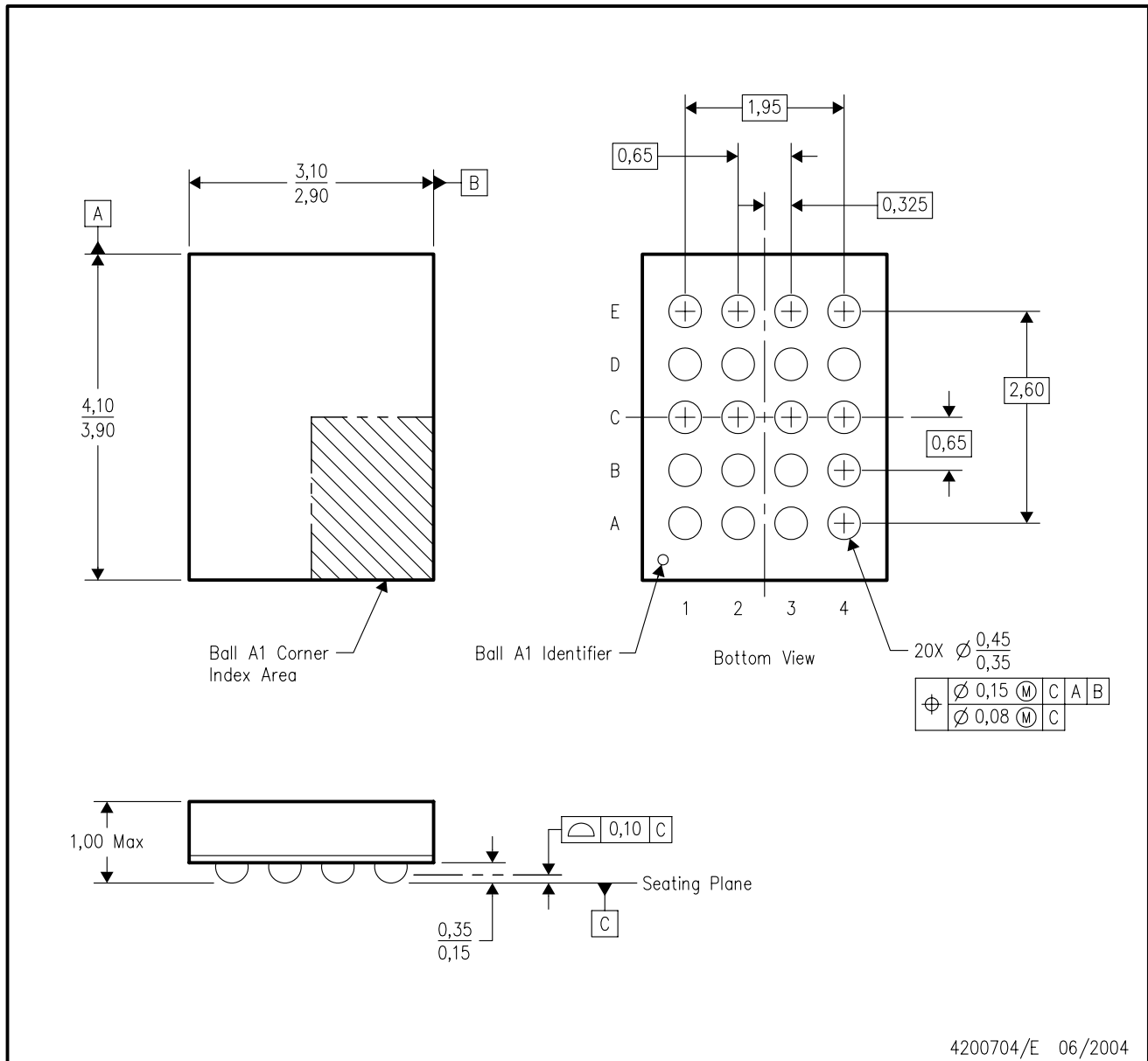


- NOTES:
- All linear dimensions are in inches (millimeters).
 - This drawing is subject to change without notice.
 - This package can be hermetically sealed with a metal lid.
 - The terminals are gold plated.
 - Falls within JEDEC MS-004

MECHANICAL DATA

GQN (R-PBGA-N20)

PLASTIC BALL GRID ARRAY

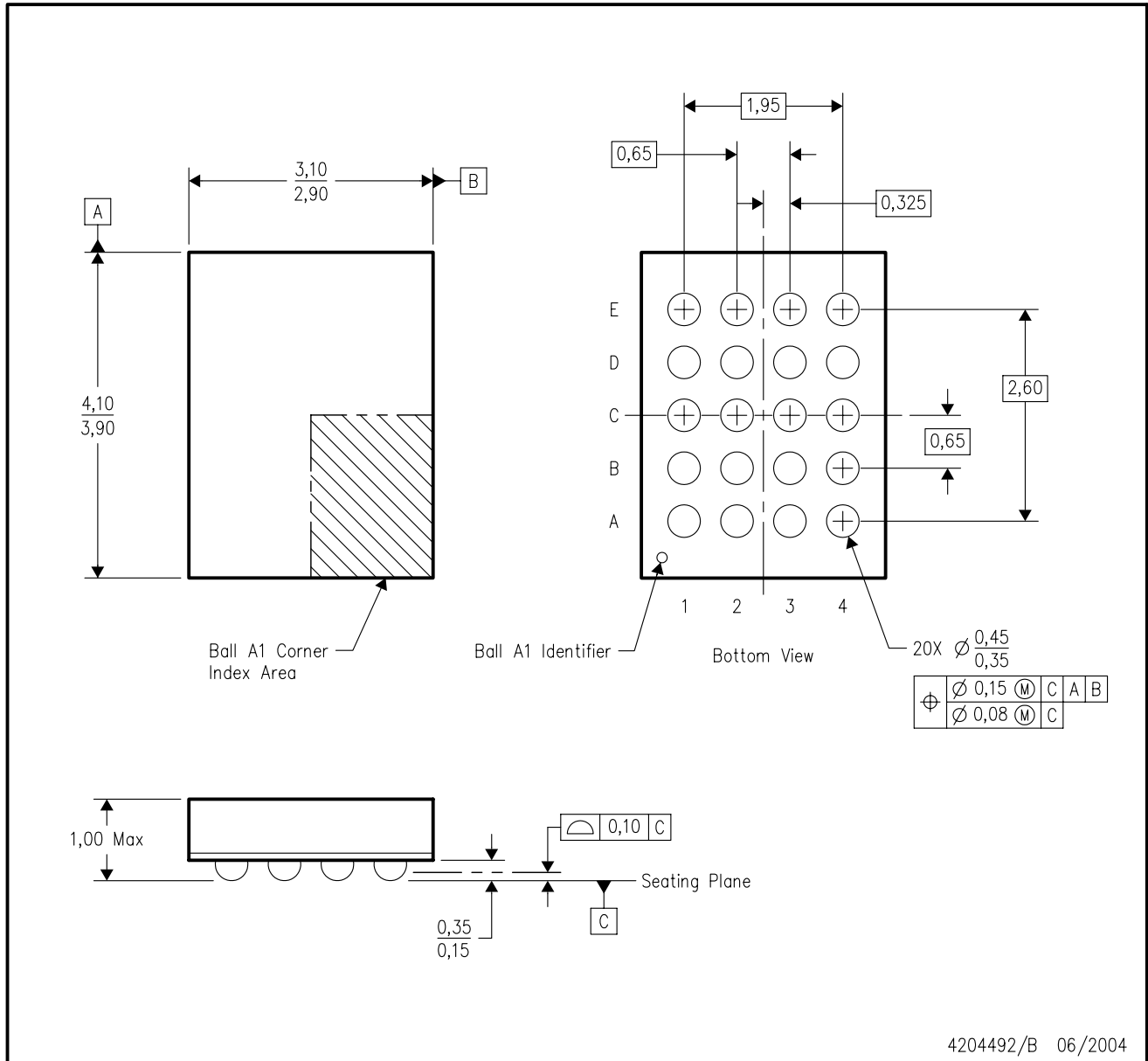


- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Falls within JEDEC MO-225 variation BC.
 - D. This package is tin-lead (SnPb). Refer to the 20 ZQN package (drawing 4204492) for lead-free.

MECHANICAL DATA

ZQN (R-PBGA-N20)

PLASTIC BALL GRID ARRAY



4204492/B 06/2004

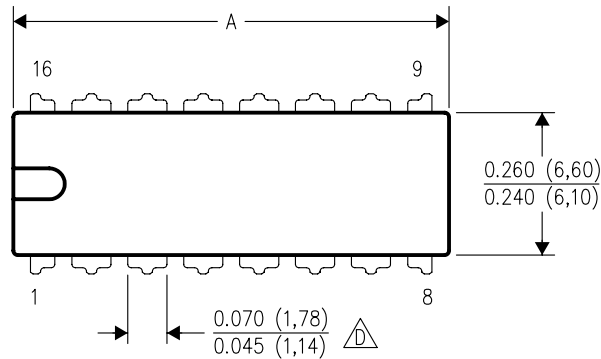
- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Falls within JEDEC MO-225 variation BC.
 - D. This package is lead-free. Refer to the 20 GQN package (drawing 4200704) for tin-lead (SnPb).

MECHANICAL DATA

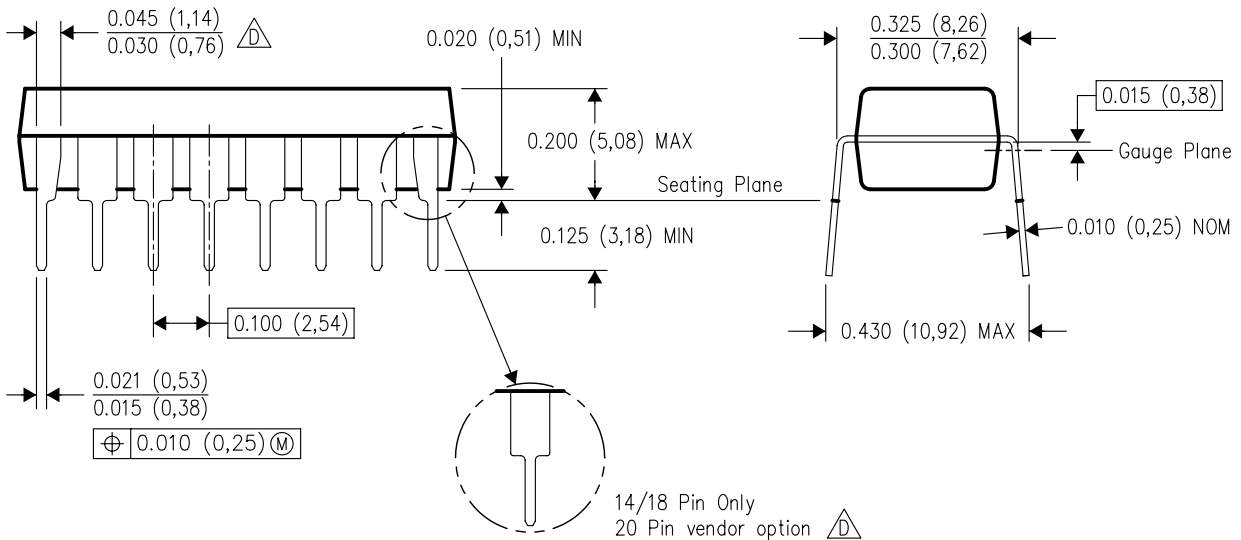
N (R-PDIP-T**)

16 PINS SHOWN

PLASTIC DUAL-IN-LINE PACKAGE



| PINS ** | 14 | 16 | 18 | 20 |
|------------------|------------------|------------------|------------------|------------------|
| DIM | | | | |
| 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 | AA | BB | AC | AD |



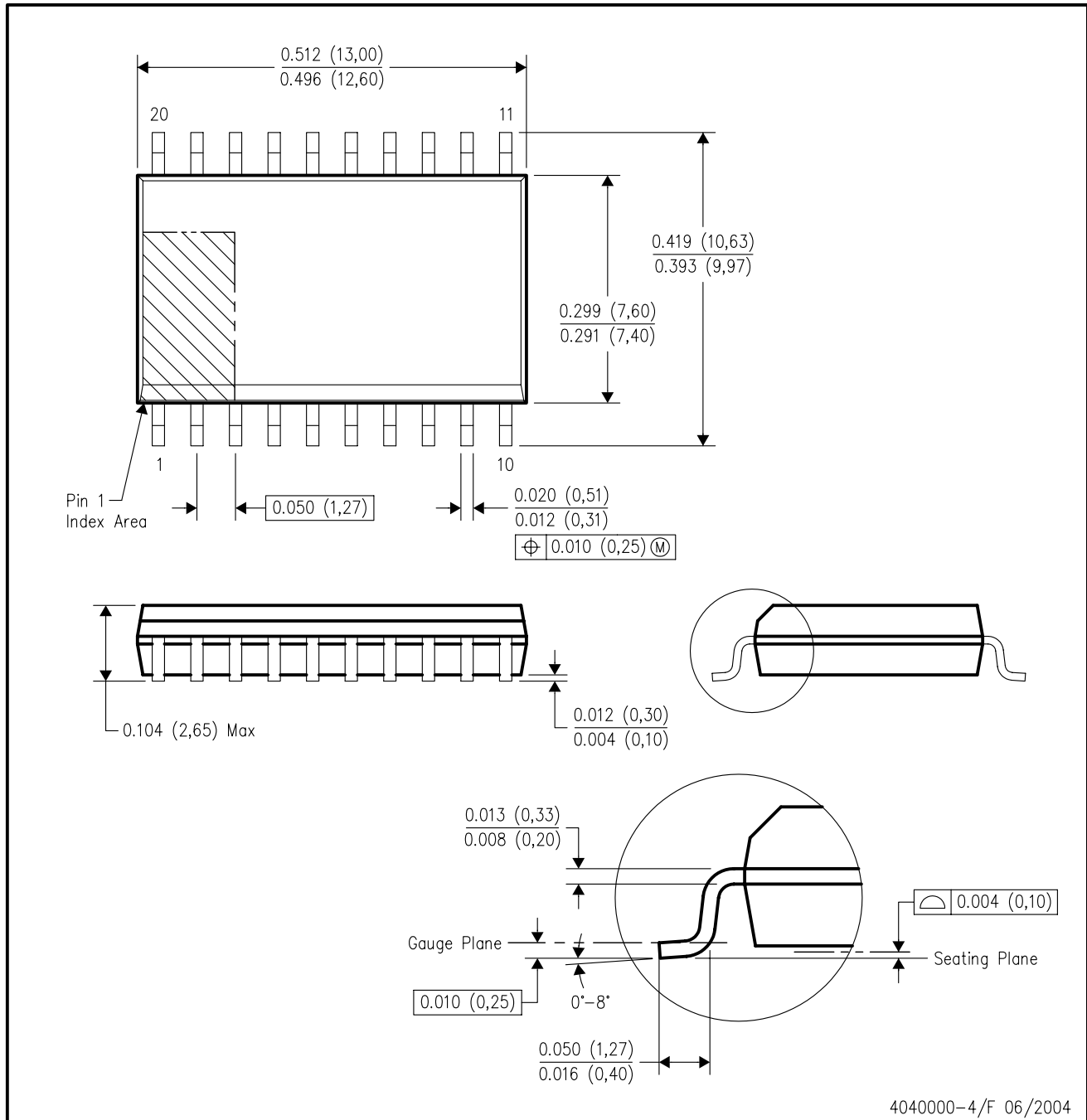
4040049/E 12/2002

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

MECHANICAL DATA

DW (R-PDSO-G20)

PLASTIC SMALL-OUTLINE PACKAGE

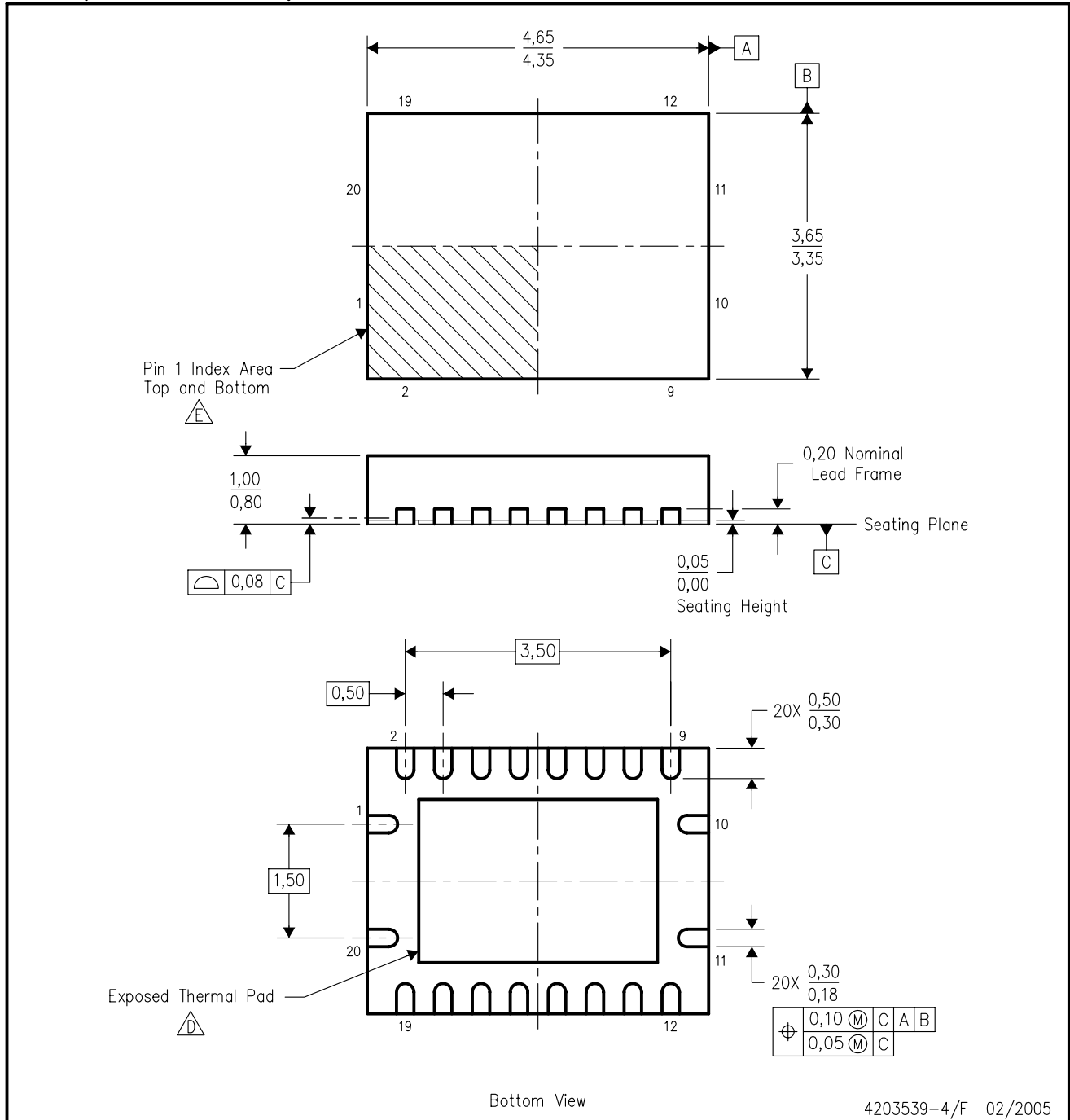


- NOTES:
- All linear dimensions are in inches (millimeters).
 - This drawing is subject to change without notice.
 - Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
 - Falls within JEDEC MS-013 variation AC.

MECHANICAL DATA

RGY (R-PQFP-N20)

PLASTIC QUAD FLATPACK



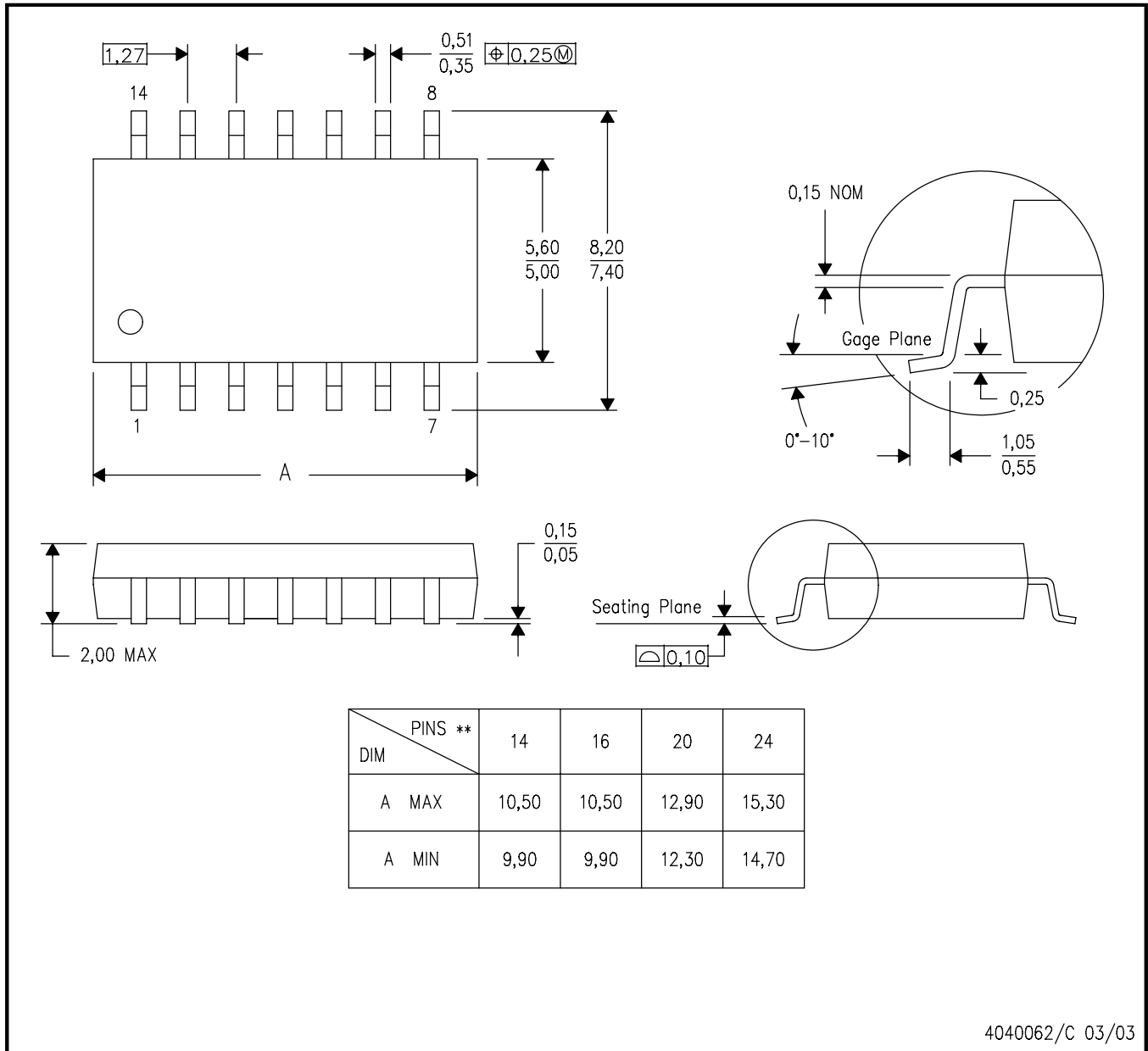
- NOTES:
- All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
 - This drawing is subject to change without notice.
 - QFN (Quad Flatpack No-Lead) package configuration.
 - The package thermal pad must be soldered to the board for thermal and mechanical performance. See the Product Data Sheet for details regarding the exposed thermal pad dimensions.
 - Pin 1 identifiers are located on both top and bottom of the package and within the zone indicated. The Pin 1 identifiers are either a molded, marked, or metal feature.
 - Package complies to JEDEC MO-241 variation BC.

MECHANICAL DATA

NS (R-PDSO-G)**

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN



4040062/C 03/03

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

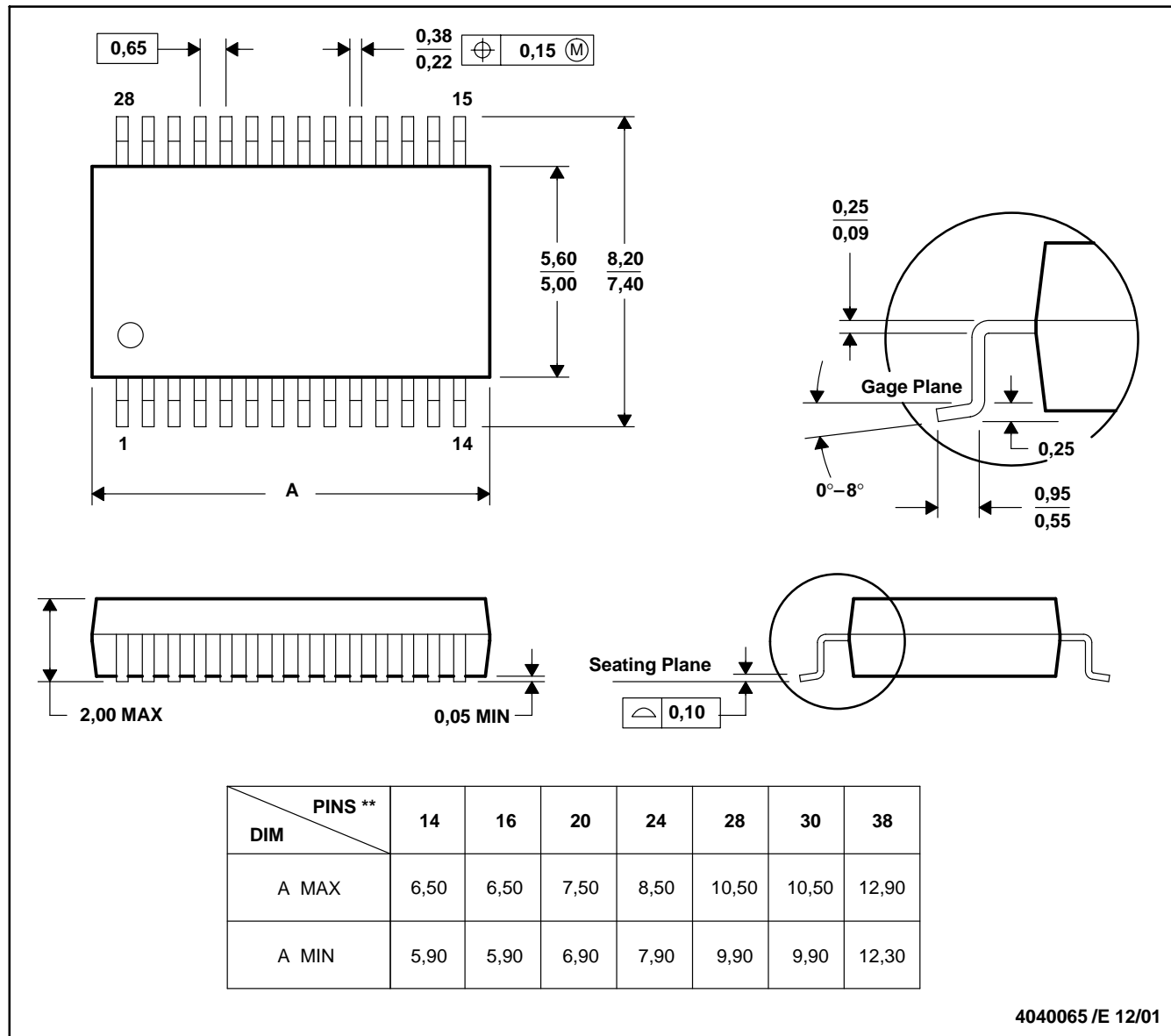
MECHANICAL DATA

MSS0002E – JANUARY 1995 – REVISED DECEMBER 2001

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

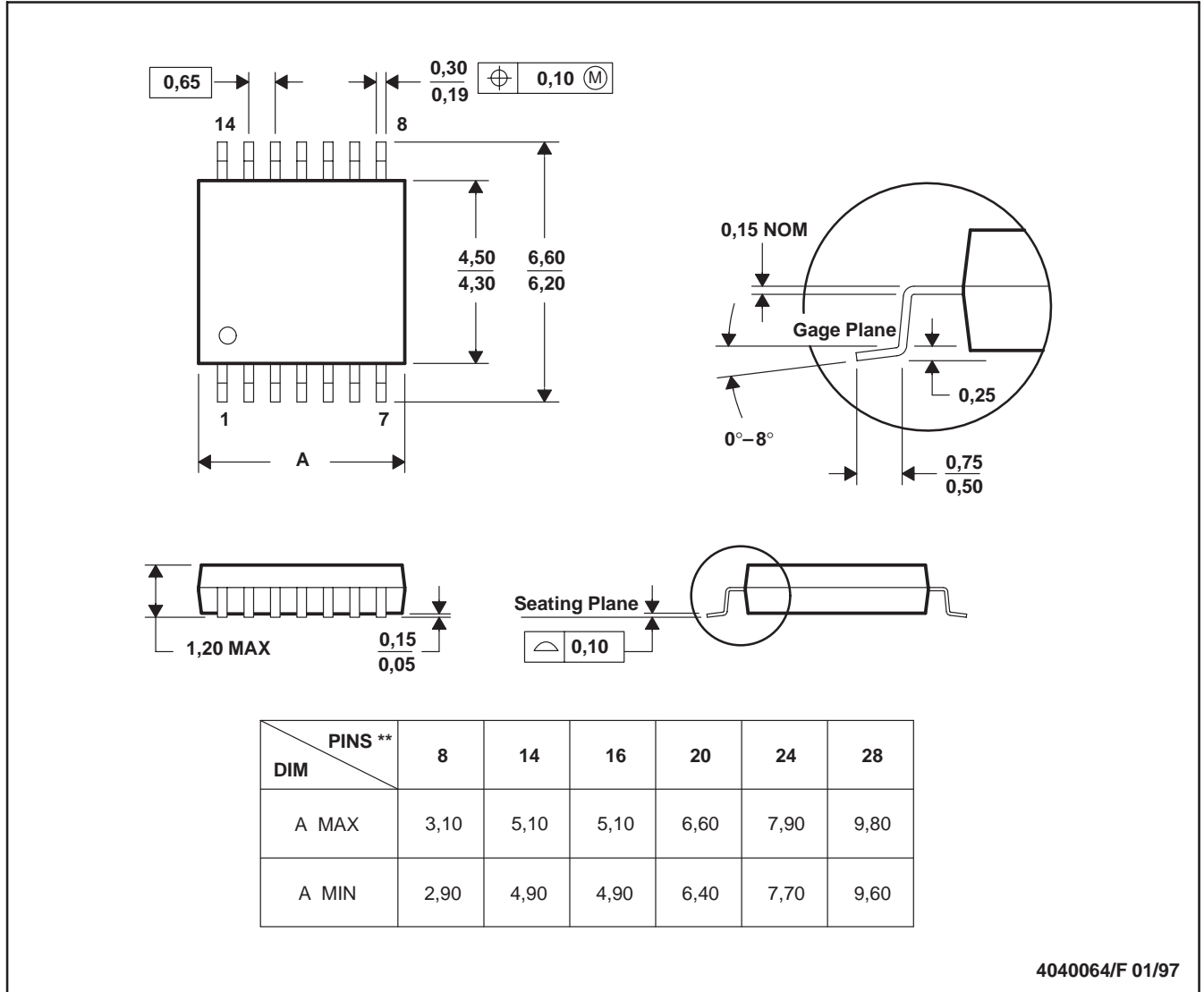
MECHANICAL DATA

MTSS001C – JANUARY 1995 – REVISED FEBRUARY 1999

PW (R-PDSO-G)**

PLASTIC SMALL-OUTLINE PACKAGE

14 PINS SHOWN



4040064/F 01/97

- 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-153

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