

μA741 General-Purpose Operational Amplifiers

1 Features

- Short-Circuit Protection
- Large Common-Mode and Differential Voltage Ranges
- No Frequency Compensation Required
- No Latch-Up

2 Applications

- DVD Recorders and Players
- Pro Audio Mixers

3 Description

The μA741 device is a general-purpose operational amplifier.

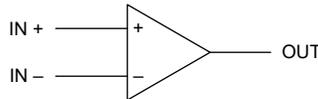
The high common-mode input voltage range and the absence of latch-up make the amplifier an excellent choice for voltage-follower applications. The device is short-circuit protected and the internal frequency compensation provides stability without external components.

The μA741C device is characterized for operation from 0°C to 70°C.

Package Information

| PART NUMBER | PACKAGE ⁽¹⁾ | BODY SIZE (NOM) |
|-------------|------------------------|-----------------|
| μA741CD | SOIC (8) | 4.90mm × 3.91mm |
| μA741CP | PDIP (8) | 9.81mm × 6.35mm |
| μA741CPS | SO (8) | 6.20mm × 5.30mm |

(1) For all available packages, see the orderable addendum at the end of the data sheet.



Functional Block Diagram



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4 Pin Configurations and Functions

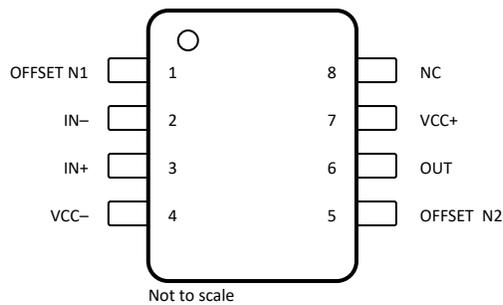


Figure 4-1. uA741C PS Package 8-Pin SO Top View

Table 4-1. Pin Functions

| PIN | | I/O | DESCRIPTION |
|-----------|-----|-----|--|
| NAME | NO. | | |
| IN+ | 3 | I | Noninverting input |
| IN- | 2 | I | Inverting input |
| NC | 8 | — | No internal connection |
| OFFSET N1 | 1 | I | External input offset voltage adjustment |
| OFFSET N2 | 5 | I | External input offset voltage adjustment |
| OUT | 6 | O | Output |
| VCC+ | 7 | — | Positive supply |
| VCC- | 4 | — | Negative supply |

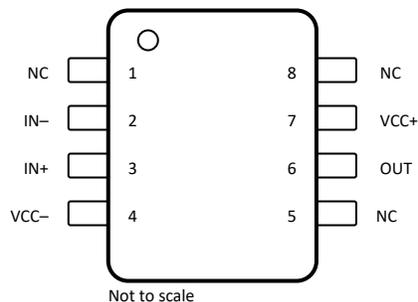


Figure 4-2. uA741C D or P Package 8-Pin SOIC, PDIP Top View

Table 4-2. Pin Functions

| PIN | | I/O | DESCRIPTION |
|------|-----|-----|------------------------|
| NAME | NO. | | |
| IN+ | 3 | I | Noninverting input |
| IN- | 2 | I | Inverting input |
| NC | 8 | — | No internal connection |
| NC | 1 | — | No internal connection |
| NC | 5 | — | No internal connection |
| OUT | 6 | O | Output |
| VCC+ | 7 | — | Positive supply |
| VCC- | 4 | — | Negative supply |

5 Specifications

5.1 Absolute Maximum Ratings

over virtual junction temperature range (unless otherwise noted)⁽¹⁾

| | | MIN | MAX | UNIT |
|--|---------------------|---------------------------------|-----|------|
| Supply voltage, V_{CC} ⁽²⁾ | μ A741C | -18 | 18 | V |
| Differential input voltage, V_{ID} ⁽³⁾ | μ A741C | -15 | 15 | V |
| Input voltage, V_i (any input) ^{(2) (4)} | μ A741C | -15 | 15 | V |
| Duration of output short circuit ⁽⁵⁾ | | Unlimited | | |
| Continuous total power dissipation | | See Section 5.3 | | |
| Case temperature for 60 seconds | μ A741C | N/A | N/A | °C |
| Lead temperature 1.6mm (1/16inch) from case for 60 seconds | μ A741C | N/A | N/A | °C |
| Lead temperature 1.6mm (1/16inch) from case for 10 seconds | D, P, or PS package | | 260 | °C |
| Operating junction temperature, T_J | | | 150 | °C |
| Storage temperature range, T_{stg} | μ A741C | -65 | 150 | °C |

- (1) 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.
- (2) All voltage values, unless otherwise noted, are with respect to the midpoint between V_{CC+} and V_{CC-} .
- (3) Differential voltages are at $IN+$ with respect to $IN-$.
- (4) The magnitude of the input voltage must never exceed the magnitude of the supply voltage or 15V, whichever is less.
- (5) The output may be shorted to ground or either power supply.

5.2 Recommended Operating Conditions

| | | MIN | MAX | UNIT | |
|-----------|--------------------------------|-------------|-----|------|----|
| V_{CC+} | Supply Voltage | 5 | 15 | V | |
| V_{CC-} | | -5 | -15 | | |
| T_A | Operating free-air temperature | μ A741C | 0 | 70 | °C |

5.3 Thermal Information

| THERMAL METRIC ⁽¹⁾ | | μ A741 | | | UNIT |
|-------------------------------|--|------------|----------|---------|------|
| | | D (SOIC) | P (PDIP) | PS (SO) | |
| | | 8 PINS | 8 PINS | 8 PINS | |
| $R_{\theta JA}$ | Junction-to-ambient thermal resistance | 138.7 | 87.4 | 119.7 | °C/W |
| $R_{\theta JC(top)}$ | Junction-to-case (top) thermal resistance | 78.7 | 89.3 | 66 | °C/W |
| $R_{\theta JB}$ | Junction-to-board thermal resistance | 82.2 | 64.4 | 70 | °C/W |
| ψ_{JT} | Junction-to-top characterization parameter | 27.8 | 49.8 | 27.2 | °C/W |
| ψ_{JB} | Junction-to-board characterization parameter | 81.4 | 64.1 | 69 | °C/W |

- (1) For more information about traditional and new thermal metrics, see the [Semiconductor and IC Package Thermal Metrics](#) application note.

5.4 Electrical Characteristics: μ A741C

at specified virtual junction temperature, $V_{CC\pm} = \pm 15V$ (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS ⁽¹⁾ | | MIN | TYP | MAX | UNIT |
|-----------|--|--------------------------------|------------|----------|-------------|-----------|------|
| V_{IO} | Input offset voltage | $V_O = 0$ | 25°C | 0.3 | 6 | mV | |
| | | | Full range | 7.5 | | | |
| I_{IO} | Input offset current | $V_O = 0$ | 25°C | 0.005 | 200 | nA | |
| | | | Full range | 300 | | | |
| I_{IB} | Input bias current | $V_O = 0$ | 25°C | 0.01 | 500 | nA | |
| | | | Full range | 800 | | | |
| V_{ICR} | Common-mode input voltage range | 25°C | ± 12 | ± 13 | V | | |
| | | Full range | ± 12 | | | | |
| V_{OM} | Maximum peak output voltage swing | $R_L = 10k\Omega$ | 25°C | ± 12 | ± 14.95 | V | |
| | | $R_L \geq 10k\Omega$ | Full range | ± 12 | | | |
| | | $R_L = 2k\Omega$ | 25°C | ± 10 | | | |
| | | $R_L \geq 2k\Omega$ | Full range | ± 10 | | | |
| A_{VD} | Large-signal differential voltage amplification | $R_L \geq 2k\Omega$ | 25°C | 20 | 200 | V/mV | |
| | | $V_O = \pm 10V$ | Full range | 15 | | | |
| r_i | Input resistance | 25°C | | 540 | $G\Omega$ | | |
| r_o | Output resistance | $f = 1MHz, I_O = 0A$ | 25°C | 575 | Ω | | |
| C_i | Input capacitance | 25°C | | 3 | pF | | |
| CMRR | Common-mode rejection ratio | $V_{IC} = V_{ICRmin}$ | 25°C | 70 | 90 | dB | |
| | | | Full range | 70 | | | |
| k_{SVS} | Supply voltage sensitivity ($\Delta V_{IO}/\Delta V_{CC}$) | $V_{CC} = \pm 9V$ to $\pm 15V$ | 25°C | 30 | 150 | $\mu V/V$ | |
| | | | Full range | 150 | | | |
| I_{OS} | Short-circuit output current | 25°C | | ± 80 | mA | | |
| I_{CC} | Supply current | $V_O = 0$; no load | 25°C | 0.13 | 2.8 | mA | |
| | | | Full range | 3.3 | | | |

- (1) All characteristics are measured under open-loop conditions with zero common-mode input voltage unless otherwise specified. Full range for the μ A741C is 0°C to 70°C.

5.5 Electrical Characteristics: μ A741Y

at specified virtual junction temperature, $V_{CC\pm} = \pm 15V$, $T_A = 25^\circ C$ (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS ⁽¹⁾ | MIN | TYP | MAX | UNIT |
|-----------|--|--------------------------------|----------|-------------|-----|------------|
| V_{IO} | Input offset voltage | $V_O = 0$ | | 0.3 | 5 | mV |
| I_{IO} | Input offset current | $V_O = 0$ | | 0.005 | 200 | nA |
| I_{IB} | Input bias current | $V_O = 0$ | | 0.01 | 500 | nA |
| V_{ICR} | Common-mode input voltage range | | ± 12 | ± 13 | | V |
| V_{OM} | Maximum peak output voltage swing | $R_L = 10k\Omega$ | ± 12 | ± 14.95 | | V |
| | | $R_L = 2k\Omega$ | ± 10 | ± 14.8 | | |
| A_{VD} | Large-signal differential voltage amplification | $R_L \geq 2k\Omega$ | 20 | 200 | | V/mV |
| r_i | Input resistance | | | 540 | | G Ω |
| r_o | Output resistance | $f = 1MHz, I_O = 0A$ | | 575 | | Ω |
| C_i | Input capacitance | | | 3 | | pF |
| CMRR | Common-mode rejection ratio | $V_{IC} = V_{ICRmin}$ | 70 | 90 | | dB |
| k_{SVS} | Supply voltage sensitivity ($\Delta V_{IO}/\Delta V_{CC}$) | $V_{CC} = \pm 9V$ to $\pm 15V$ | | 30 | 150 | $\mu V/V$ |
| I_{OS} | Short-circuit output current | | | ± 80 | | mA |
| I_{CC} | Supply current | $V_O = 0$; no load | | 0.13 | 2.8 | mA |

(1) All characteristics are measured under open-loop conditions with zero common-mode voltage unless otherwise specified.

5.6 Switching Characteristics: μ A741C

over operating free-air temperature range, $V_{CC\pm} = \pm 15V$, $T_A = 25^\circ C$ (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-----------|-------------------------|--|-----|-----|-----|------------|
| t_r | Rise time | $V_I = 20mV, R_L = 2k\Omega$ | | 0.3 | | μs |
| | Overshoot factor | $C_L = 100pF$ | | 5% | | |
| SR | Slew rate at unity gain | $V_I = 10V, R_L = 2k\Omega$ $C_L = 100pF$ | | 0.5 | | V/ μs |

5.7 Switching Characteristics: μ A741Y

over operating free-air temperature range, $V_{CC\pm} = \pm 15V$, $T_A = 25^\circ C$ (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-----------|-------------------------|--|-----|-----|-----|------------|
| t_r | Rise time | $V_I = 20mV, R_L = 2k\Omega$ | | 0.3 | | μs |
| | Overshoot factor | $C_L = 100pF$ | | 5% | | |
| SR | Slew rate at unity gain | $V_I = 10V, R_L = 2k\Omega$ $C_L = 100pF$ | | 0.5 | | V/ μs |

5.8 Typical Characteristics

Data at high and low temperatures are applicable only within the rated operating free-air temperature ranges of the various devices.

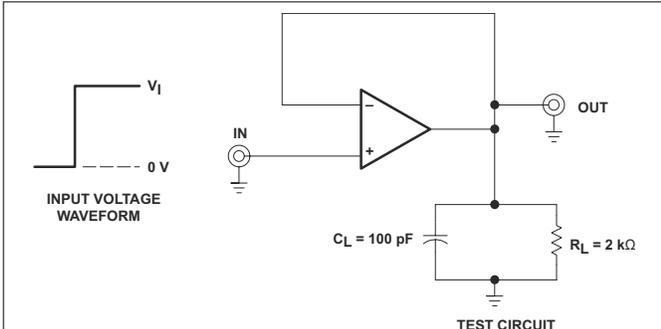


Figure 5-1. Rise Time, Overshoot, and Slew Rate

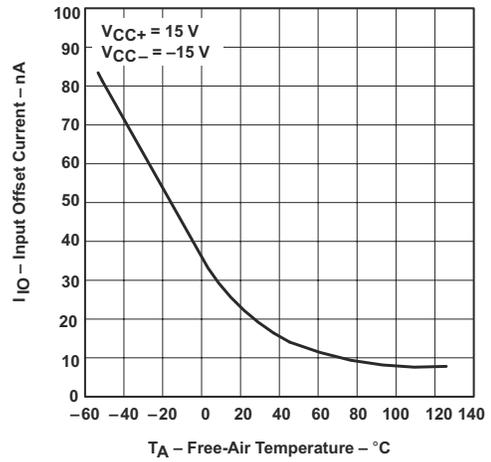


Figure 5-2. Input Offset Current vs Free-Air Temperature

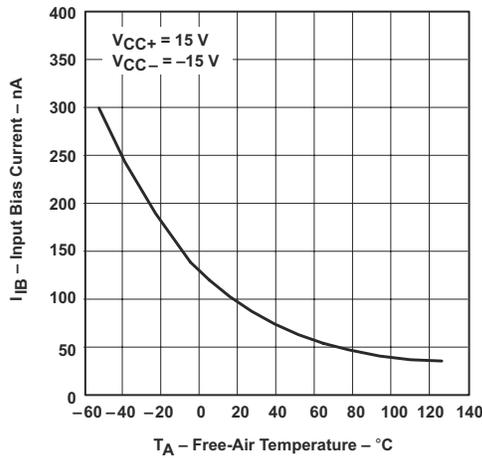


Figure 5-3. Input Bias Current vs Free-Air Temperature

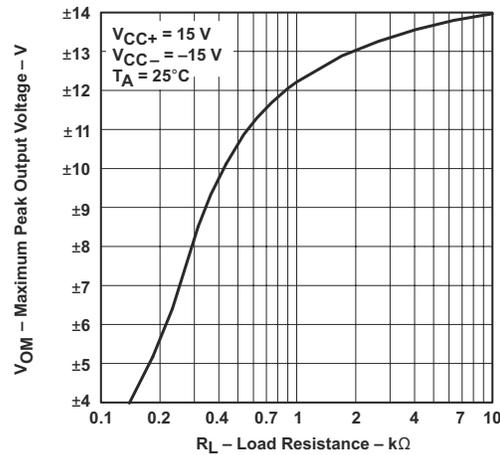


Figure 5-4. Maximum Output Voltage vs Load Resistance

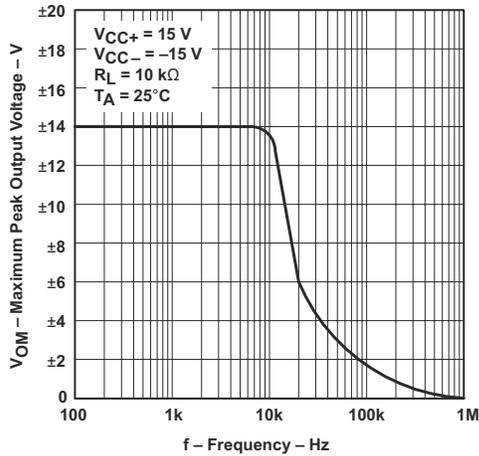


Figure 5-5. Maximum Peak Output Voltage vs Frequency

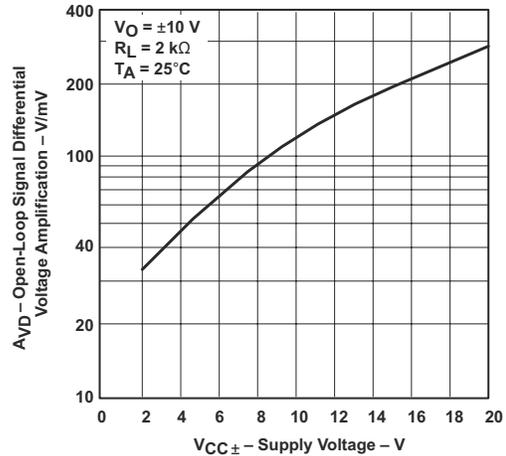


Figure 5-6. Open-Loop Signal Differential Voltage Amplification vs Supply Voltage

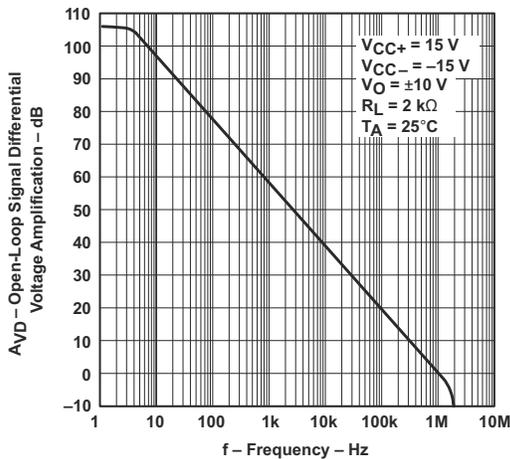


Figure 5-7. Open-Loop Large-Signal Differential Voltage Amplification vs Frequency

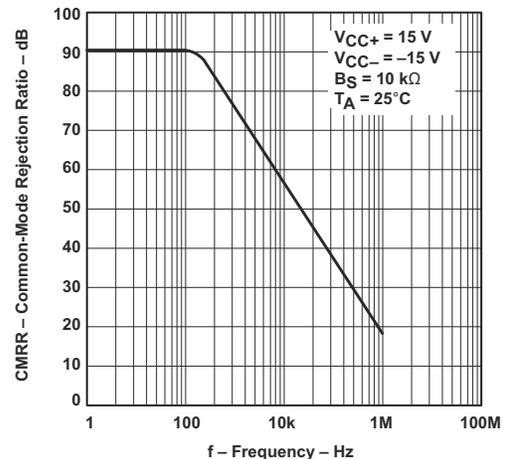


Figure 5-8. Common-Mode Rejection Ratio vs Frequency

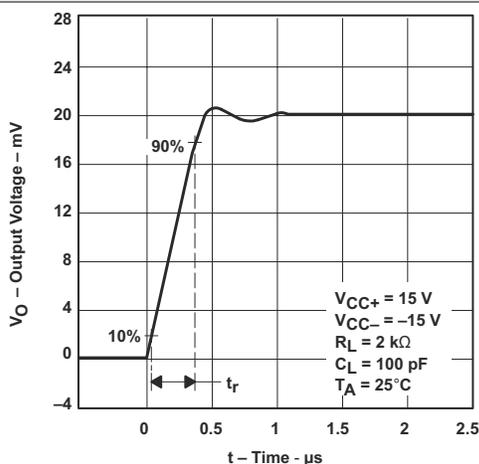


Figure 5-9. Output Voltage vs Elapsed Time

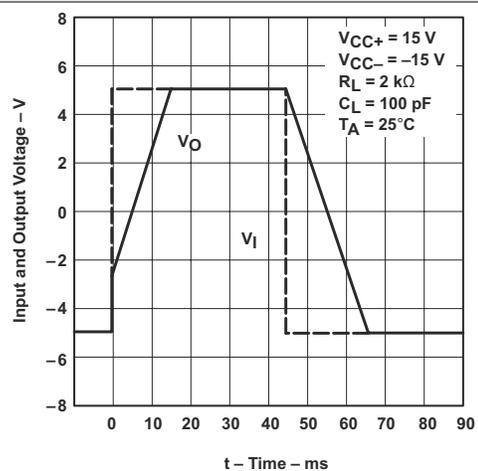


Figure 5-10. Voltage-Follower Large-Signal Pulse Response

6 Application and Implementation

Note

Information in the following applications sections is not part of the TI component specification, and TI does not warrant its accuracy or completeness. TI's customers are responsible for determining suitability of components for their purposes, as well as validating and testing their design implementation to confirm system functionality.

7 Power Supply Recommendations

The μ A741 device is specified for operation from ± 5 to ± 15 V; many specifications apply from 0°C to 70°C . [Section 5.8](#) presents parameters that can exhibit significant variance with regard to operating voltage or temperature.

Place 0.1- μF bypass capacitors close to the power-supply pins to reduce errors coupling in from noisy or high impedance power supplies. For more detailed information on bypass capacitor placement, see [Section 8.1](#).

CAUTION

Supply voltages larger than ± 18 V can permanently damage the device (see [Section 5.1](#)).

8 Layout

8.1 Layout Guidelines

For best operational performance of the device, use good PCB layout practices, including:

- Noise can propagate into analog circuitry through the power pins of the circuit as a whole and the operational amplifier. Bypass capacitors reduce the coupled noise by providing low impedance power sources local to the analog circuitry.
 - Connect low-ESR, 0.1- μF ceramic bypass capacitors between each supply pin and ground, placed as close as possible to the device. A single bypass capacitor from $V+$ to ground is applicable for single-supply applications.
- Separate grounding for analog and digital portions of circuitry is one of the simplest and most-effective methods of noise suppression. One or more layers on multilayer PCBs are usually devoted to ground planes. A ground plane helps distribute heat and reduces EMI noise pickup. Make sure to physically separate digital and analog grounds, paying attention to the flow of the ground current. For more detailed information, see [Circuit Board Layout Techniques](#).
- To reduce parasitic coupling, run the input traces as far away as possible from the supply or output traces. If it is not possible to keep them separate, it is much better to cross the sensitive trace perpendicular as opposed to in parallel with the noisy trace.
- Place the external components as close as possible to the device. Keeping R_F and R_G close to the inverting input minimizes parasitic capacitance, as shown in [Section 8.2](#).
- Keep the length of input traces as short as possible. Always remember that the input traces are the most sensitive part of the circuit.
- Consider a driven, low-impedance guard ring around the critical traces. A guard ring can significantly reduce leakage currents from nearby traces that are at different potentials.

8.2 Layout Example

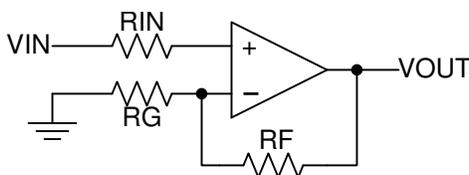


Figure 8-1. Operational Amplifier Schematic for Noninverting Configuration

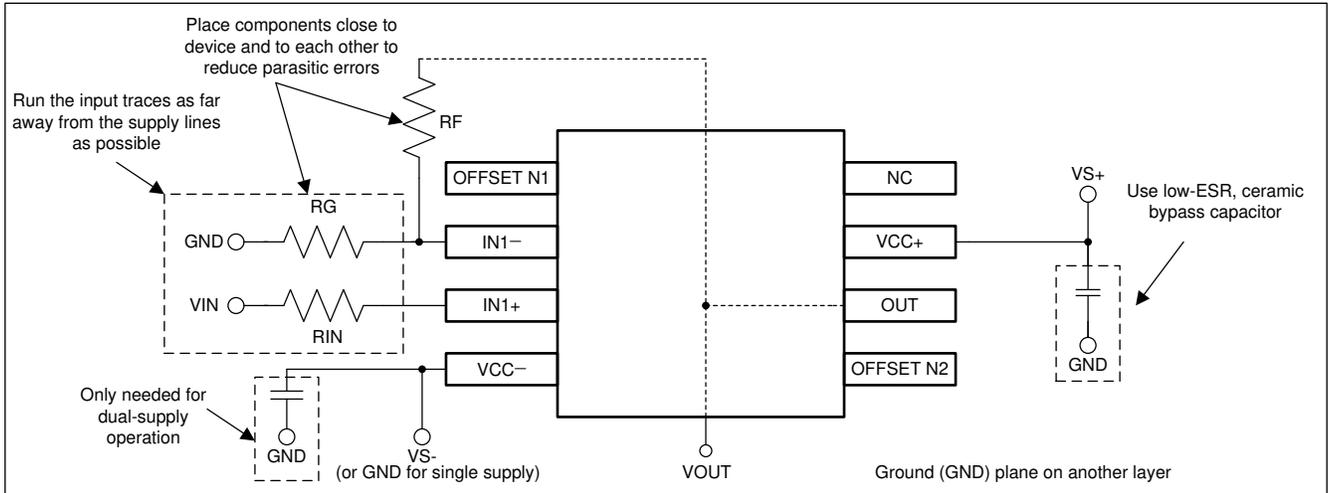


Figure 8-2. Operational Amplifier Board Layout for Noninverting Configuration

9 Device and Documentation Support

9.1 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. Click on *Notifications* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

9.2 Trademarks

All trademarks are the property of their respective owners.

9.3 Electrostatic Discharge Caution



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

9.4 Glossary

[TI Glossary](#)

This glossary lists and explains terms, acronyms, and definitions.

10 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

| Changes from Revision G (January 2018) to Revision H (January 2026) | Page |
|---|-------------|
| • Deleted Offset-Voltage Null Capability..... | 1 |
| • Deleted offset-voltage null capability | 1 |
| • Deleted Simplified schematic..... | 1 |
| • Updated Functional Block Diagram..... | 1 |
| • Changed Pin 1 and 5 of "uA741C D, P package" from "Offset N1 and Offset N2" to "No internal connection (NC)"..... | 3 |
| • Deleted Voltage between offset null (either OFFSET N1 or OFFSET N2) and V_{CC-} | 4 |
| • Changed Junction-to-ambient thermal resistance of D from 129.2°C/W to 138.7°C/W..... | 4 |
| • Changed Junction-to-case (top) thermal resistance of D from 73.6°C/W to 78.7°C/W..... | 4 |
| • Changed Junction-to-board thermal resistance of D from 72.4°C/W to 82.2°C/W..... | 4 |
| • Changed Junction-to-top characterization parameter of D from 25.9°C/W to 27.8°C/W..... | 4 |
| • Changed Junction-to-board characterization parameter of D from 71.7°C/W to 81.4°C/W..... | 4 |
| • Changed Input offset voltage in μ A741C at 15V typ value from 1mV to 0.3mV..... | 5 |
| • Changed Input offset current in μ A741C at 15V typ value from 20nA to 0.005nA..... | 5 |
| • Changed Input bias current in μ A741C at 15V typ value from 80nA to 0.01nA..... | 5 |
| • Changed Maximum peak output voltage swing in μ A741C at 15V typ value at $R_L = 10k\Omega$ from $\pm 14V$ to $\pm 14.95V$ | 5 |
| • Changed Input resistance in μ A741C at 15V typ value from 2M Ω to 540G Ω | 5 |
| • Changed Output resistance in μ A741C at 15V typ value from 75 Ω to 575 Ω | 5 |
| • Changed Input capacitance in μ A741C at 15V typ value from 1.4pF to 3pF..... | 5 |
| • Changed Short-circuit output current in μ A741C at 15V typ value from $\pm 25mA$ to $\pm 80mA$ | 5 |
| • Changed Supply current at 25°C in μ A741C at 15V typ value from 1.7mA to 0.13mA..... | 5 |
| • Deleted Total power dissipation section in μ A741C electrical characteristics..... | 5 |
| • Changed Input offset voltage in μ A741Y at 15V typ value from 1mV to 0.3mV..... | 6 |
| • Deleted offset voltage adjust range..... | 6 |
| • Changed Input offset current in μ A741Y at 15V typ value from 20nA to 0.005nA..... | 6 |
| • Changed Input bias current in μ A741Y at 15V typ value from 80nA to 0.01nA..... | 6 |
| • Changed Maximum peak output voltage swing in μ A741Y at 15V typ value at $R_L = 10k\Omega$ from $\pm 14V$ to $\pm 14.95V$ | 6 |
| • Changed Maximum peak output voltage swing in μ A741Y at 15V typ value at $R_L = 2k\Omega$ from $\pm 13V$ to $\pm 14.8V$ | 6 |
| • Changed Input resistance in μ A741Y at 15V typ value from 2M Ω to 540G Ω | 6 |
| • Changed Output resistance in μ A741Y at 15V typ value from 75 Ω to 575 Ω | 6 |
| • Changed Input capacitance in μ A741Y at 15V typ value from 1.4pF to 3pF..... | 6 |
| • Changed Short-circuit output current in μ A741Y at 15V typ value from $\pm 25mA$ to $\pm 80mA$ | 6 |
| • Changed Supply current at 25°C in μ A741Y at 15V typ value from 1.7mA to 0.13mA..... | 6 |
| • Deleted Total power dissipation section in μ A741Y electrical characteristics..... | 6 |

| Changes from Revision F (May 2017) to Revision G (January 2018) | Page |
|---|-------------|
| • Changed supply voltage unit from "°C" to "V" in <i>Absolute Maximum Ratings</i> table | 4 |

| Changes from Revision D (February 2014) to Revision E (January 2015) | Page |
|--|-------------|
| • Added <i>Applications</i> , <i>Device Information</i> table, <i>Pin Functions</i> table, <i>ESD Ratings</i> table, <i>Thermal Information</i> table, <i>Feature Description</i> section, <i>Device Functional Modes</i> , <i>Application and Implementation</i> section, <i>Power Supply Recommendations</i> section, <i>Layout</i> section, <i>Device and Documentation Support</i> section, and <i>Mechanical, Packaging, and Orderable Information</i> section..... | 1 |

- Moved *Typical Characteristics* into *Specifications* section. 7

Changes from Revision E (January 2015) to Revision F (May 2017) Page

- Updated data sheet text to the latest documentation and translation standards 1
- Deleted text regarding μ A741M device (obsolete package) from *Description* section..... 1
- Added μ A741CD, μ A741CP, and μ A741CPS devices to *Device Information* table 1
- Deleted μ A741x device from *Device Information* table 1
- Updated pinout diagrams and *Pin Functions* tables in the *Pin Configurations and Functions* section..... 3
- Deleted μ A741M pinout drawings information from *Pin Configurations and Functions* section 3
- Added operating junction temperature (T_J) and values to *Absolute Maximum Ratings* table 4
- Deleted text regarding μ A741M from *Absolute Maximum Ratings* table 4
- Deleted text regarding μ A741M device from *Recommended Operating Conditions* table 4
- Deleted *Dissipation Ratings* table 4
- Added *Thermal Information* table and values 4
- Deleted μ A741M in *Switching Characteristics* table 6
- Correct typo in [Figure 5-1](#) 7
- Changed pins 1 and 5 from "NC" to "Offset N1" and "Offset N2" in [Figure 8-2](#) 10

Changes from Revision C (January 2014) to Revision D (February 2014) Page

- Fixed *Typical Characteristics* graphs to remove extra lines. 7

Changes from Revision B (September 2000) to Revision C (January 2014) Page

- Updated document to new TI data sheet format - no specification changes..... 1
- Deleted *Ordering Information* table..... 1

11 Mechanical, Packaging, and Orderable Information

The following pages include mechanical packaging and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser based versions of this data sheet, refer to the left hand navigation.

PACKAGING INFORMATION

| Orderable part number | Status (1) | Material type (2) | Package Pins | Package qty Carrier | RoHS (3) | Lead finish/ Ball material (4) | MSL rating/ Peak reflow (5) | Op temp (°C) | Part marking (6) |
|---------------------------|---------------|----------------------|----------------|-----------------------|-------------|--------------------------------------|-----------------------------------|--------------|---------------------|
| UA741CD | Obsolete | Production | SOIC (D) 8 | - | - | Call TI | Call TI | 0 to 70 | UA741C |
| UA741CDR | Active | Production | SOIC (D) 8 | 2500 LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | UA741C |
| UA741CDR.A | Active | Production | SOIC (D) 8 | 2500 LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | UA741C |
| UA741CP | Active | Production | PDIP (P) 8 | 50 TUBE | Yes | NIPDAU | N/A for Pkg Type | 0 to 70 | UA741CP |
| UA741CP.A | Active | Production | PDIP (P) 8 | 50 TUBE | Yes | NIPDAU | N/A for Pkg Type | 0 to 70 | UA741CP |
| UA741CPE4 | Active | Production | PDIP (P) 8 | 50 TUBE | - | Call TI | Call TI | 0 to 70 | |
| UA741CPSR | Active | Production | SO (PS) 8 | 2000 LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | U741 |
| UA741CPSR.A | Active | Production | SO (PS) 8 | 2000 LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | U741 |
| UA741CPSRE4 | Active | Production | SO (PS) 8 | 2000 LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | U741 |

(1) **Status:** For more details on status, see our [product life cycle](#).

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

(4) **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

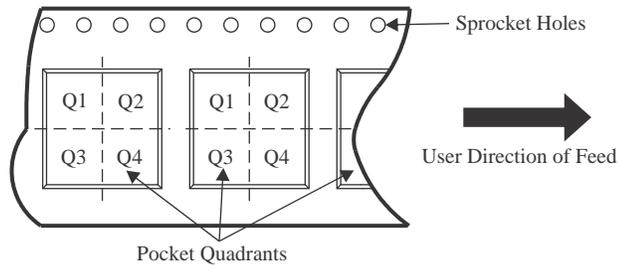
Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "-" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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TAPE AND REEL INFORMATION

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE


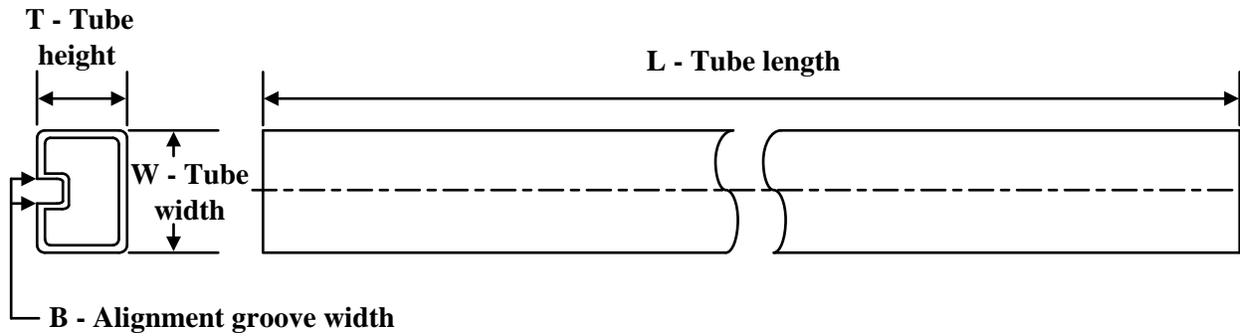
*All dimensions are nominal

| 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 |
|-----------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| UA741CDR | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.4 | 5.2 | 2.1 | 8.0 | 12.0 | Q1 |
| UA741CPSR | SO | PS | 8 | 2000 | 330.0 | 16.4 | 8.35 | 6.6 | 2.4 | 12.0 | 16.0 | Q1 |

TAPE AND REEL BOX DIMENSIONS


*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|-----------|--------------|-----------------|------|------|-------------|------------|-------------|
| UA741CDR | SOIC | D | 8 | 2500 | 353.0 | 353.0 | 32.0 |
| UA741CPSR | SO | PS | 8 | 2000 | 353.0 | 353.0 | 32.0 |

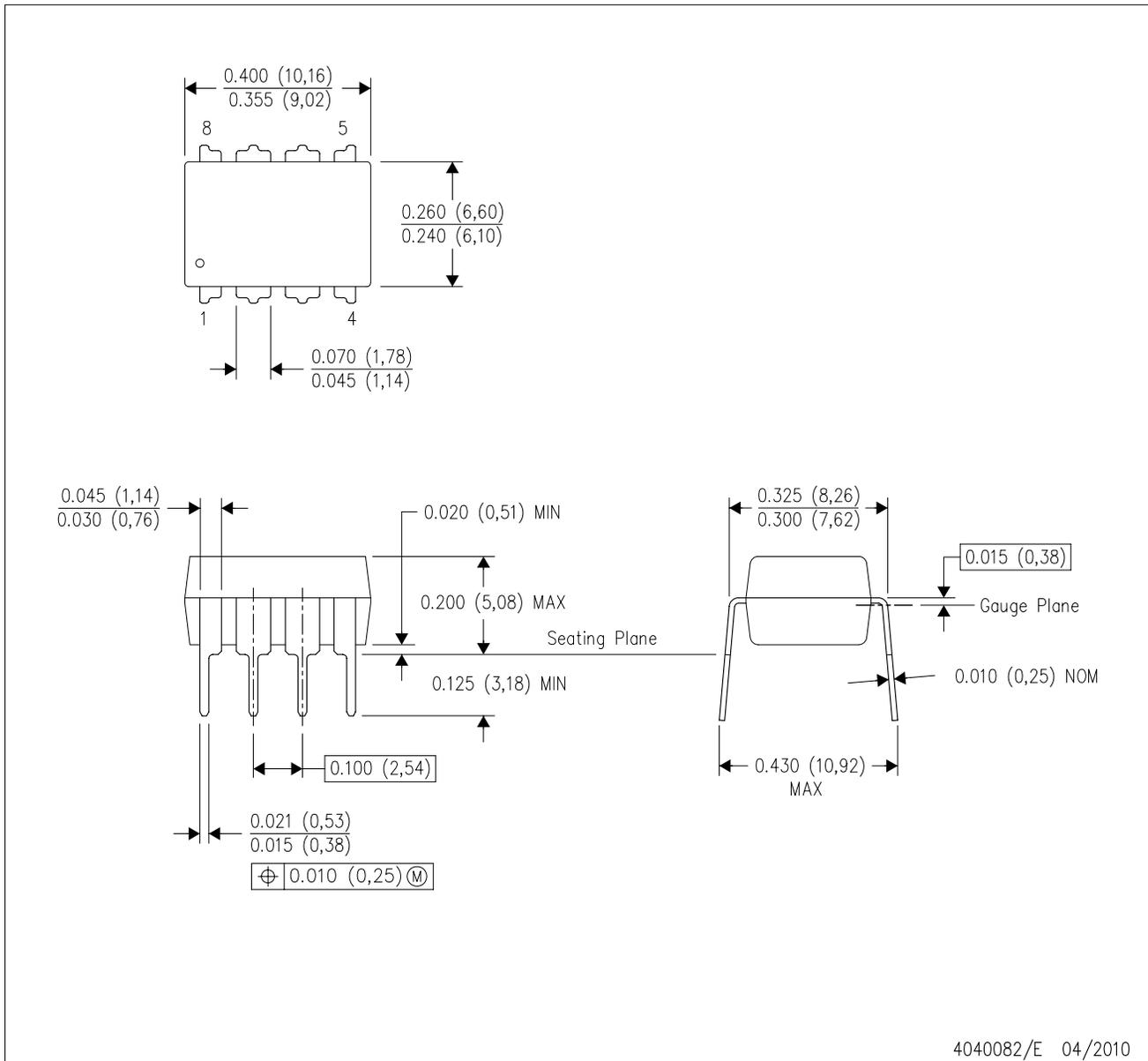
TUBE


*All dimensions are nominal

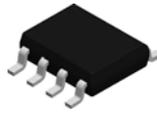
| Device | Package Name | Package Type | Pins | SPQ | L (mm) | W (mm) | T (μm) | B (mm) |
|-----------|--------------|--------------|------|-----|--------|--------|--------|--------|
| UA741CP | P | PDIP | 8 | 50 | 506 | 13.97 | 11230 | 4.32 |
| UA741CP.A | P | PDIP | 8 | 50 | 506 | 13.97 | 11230 | 4.32 |

P (R-PDIP-T8)

PLASTIC DUAL-IN-LINE PACKAGE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - C. Falls within JEDEC MS-001 variation BA.

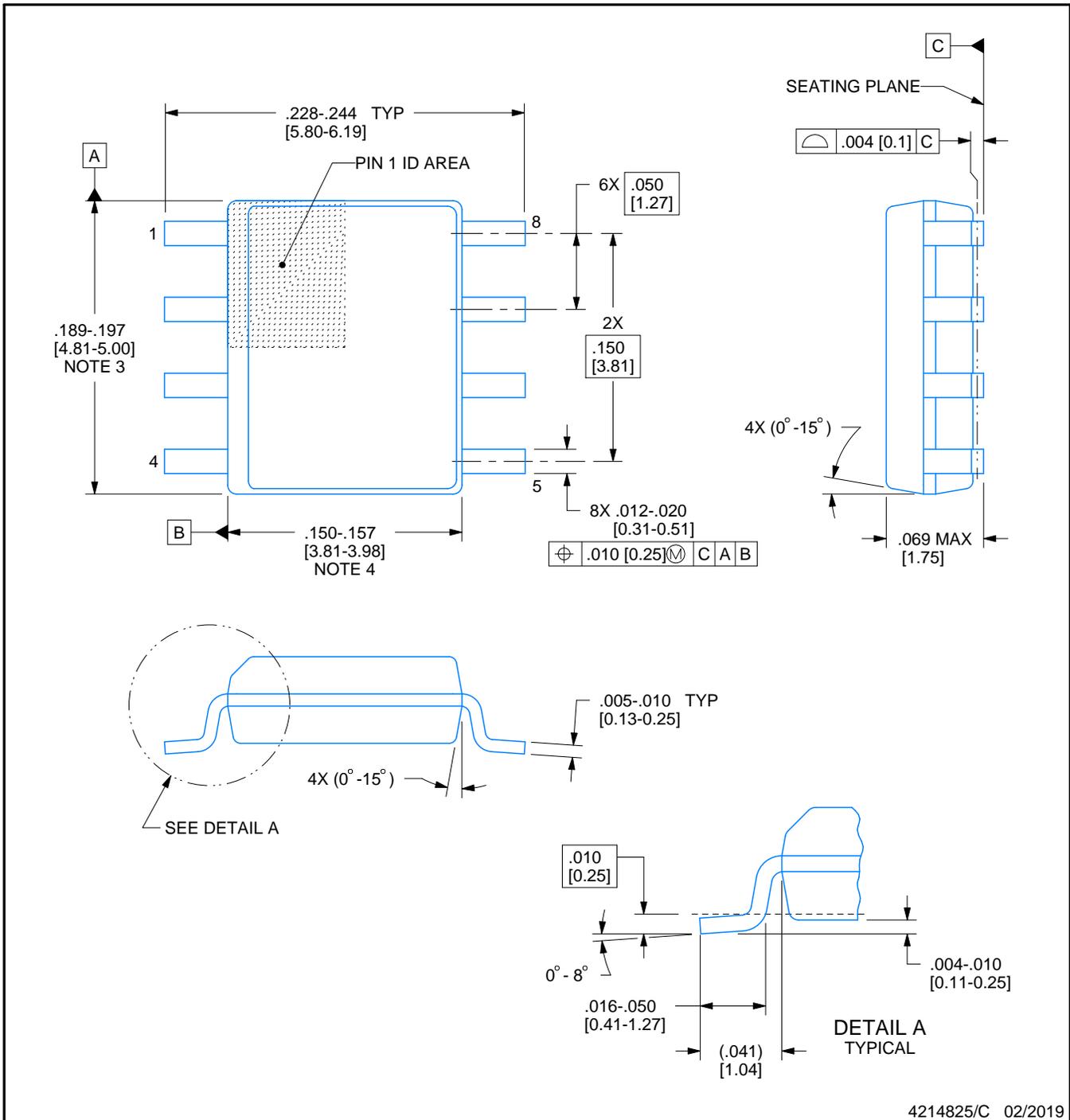


D0008A

PACKAGE OUTLINE

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



4214825/C 02/2019

NOTES:

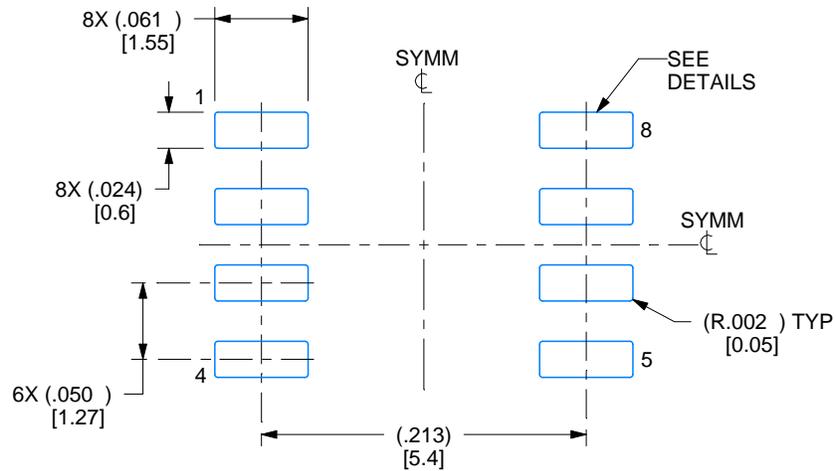
1. Linear dimensions are in inches [millimeters]. Dimensions in parenthesis are for reference only. Controlling dimensions are in inches. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed .006 [0.15] per side.
4. This dimension does not include interlead flash.
5. Reference JEDEC registration MS-012, variation AA.

EXAMPLE BOARD LAYOUT

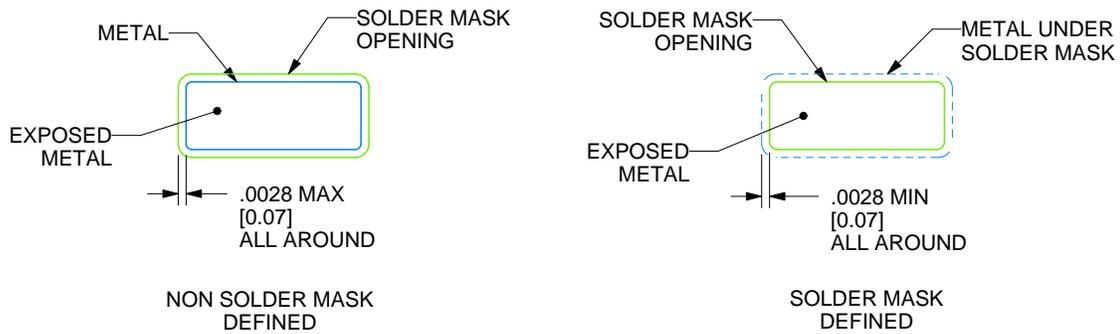
D0008A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE:8X



SOLDER MASK DETAILS

4214825/C 02/2019

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

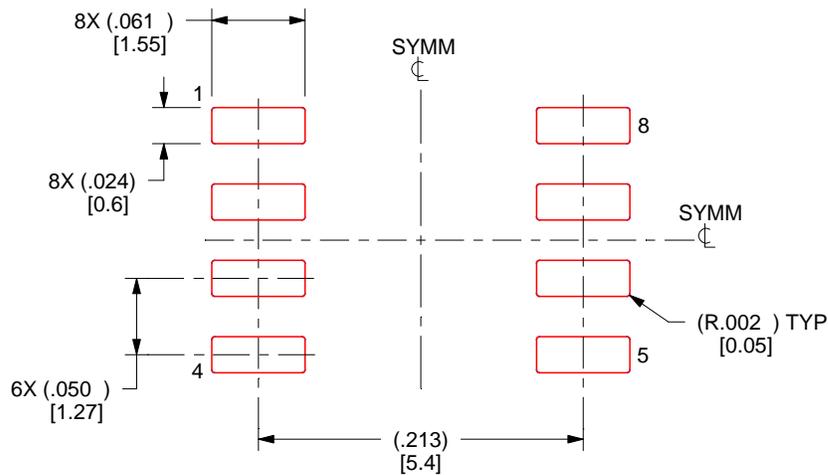
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

D0008A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



SOLDER PASTE EXAMPLE
BASED ON .005 INCH [0.125 MM] THICK STENCIL
SCALE:8X

4214825/C 02/2019

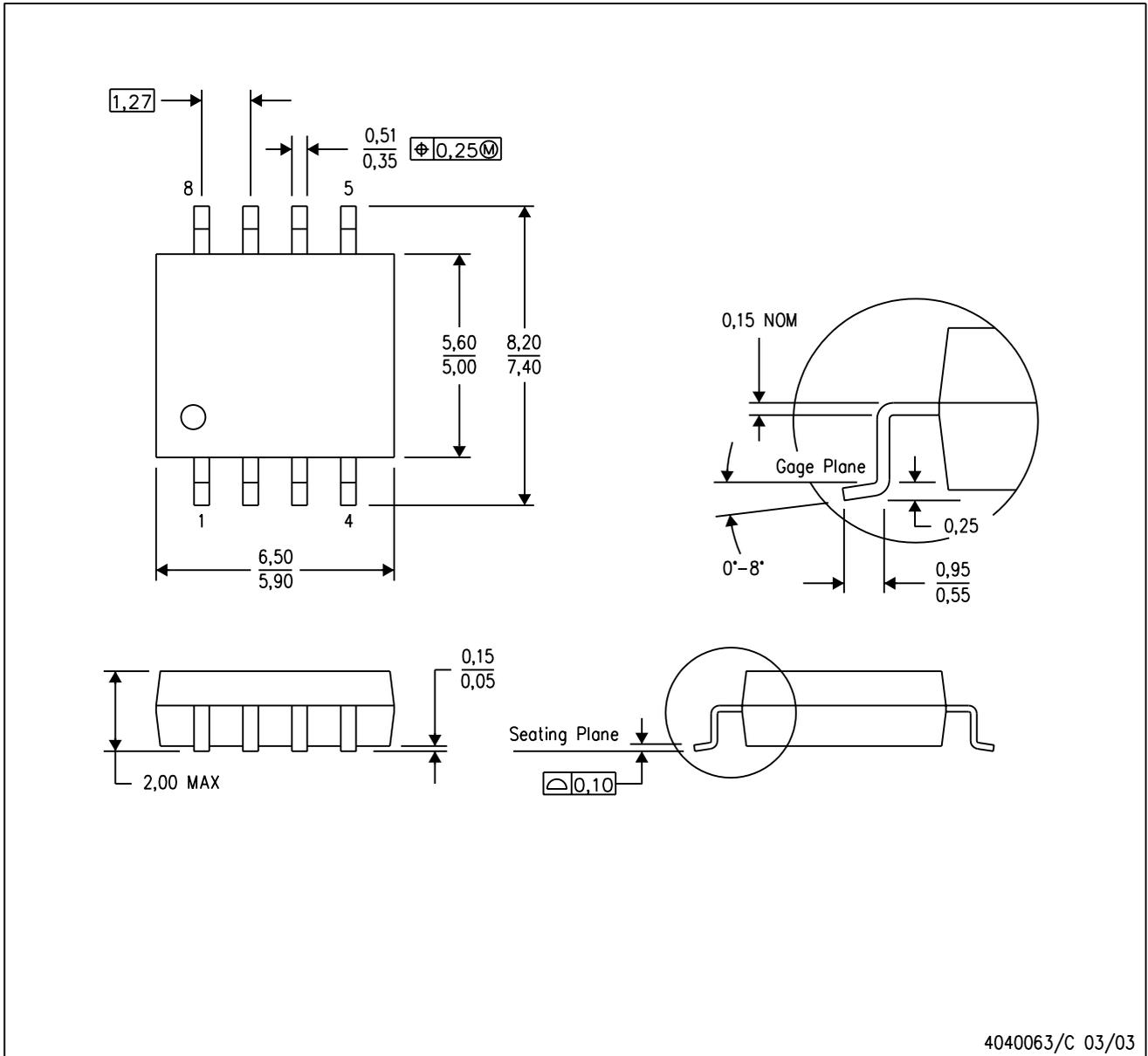
NOTES: (continued)

8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

MECHANICAL DATA

PS (R-PDSO-G8)

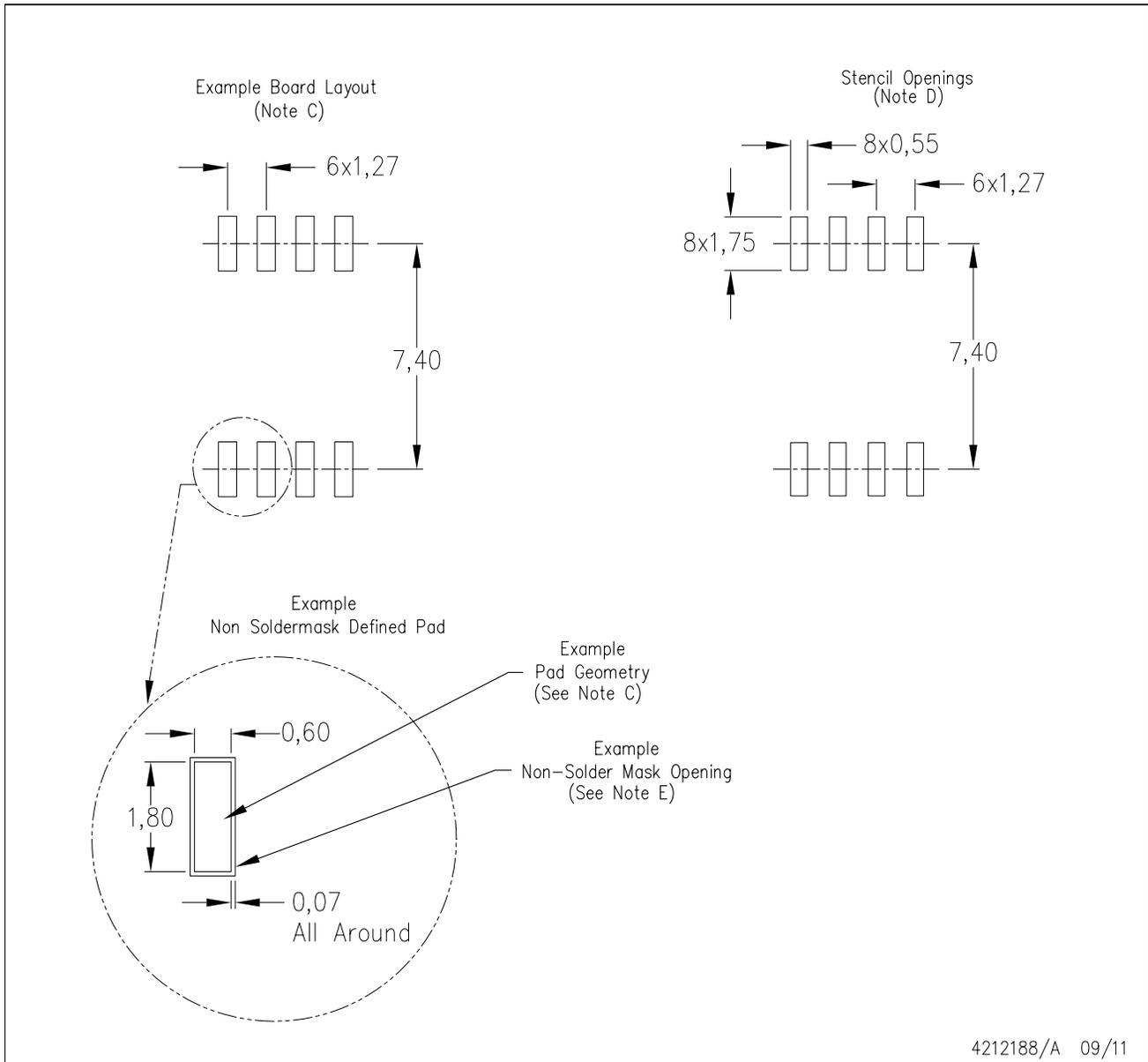
PLASTIC SMALL-OUTLINE PACKAGE



- 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.

PS (R-PDSO-G8)

PLASTIC SMALL OUTLINE



- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Publication IPC-7351 is recommended for alternate designs.
 - D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525 for other stencil recommendations.
 - E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.

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