

μA741 汎用オペアンプ

1 特長

- 短絡保護
- オフセット電圧のNull機能
- 広い同相および差動電圧範囲
- 周波数補償が不要
- ラッチアップなし

2 アプリケーション

- DVDレコーダーおよびプレーヤー
- プロ用オーディオ・ミキサー

3 概要

μA741デバイスは汎用オペアンプで、オフセット電圧のNull機能が搭載されています。

同相入力電圧範囲が広く、ラッチアップがないため、このアンプは電圧フォロワー・アプリケーションに最適です。このデバイスは短絡保護されており、内部の周波数補償により、外部部品なしに安定が保証されます。

図12に示すように、値の低いポテンショメータをオフセットNull入力の間に接続して、オフセット電圧を打ち消すことができます。

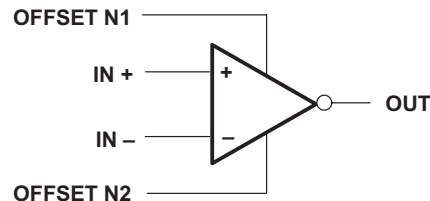
μA741Cデバイスは、0°C～70°Cでの動作が規定されています。

製品情報⁽¹⁾

型番	パッケージ	本体サイズ(公称)
μA741CD	SOIC (8)	4.90mm×3.91mm
μA741CP	PDIP (8)	9.81mm×6.35mm
μA741CPS	SO (8)	6.20mm×5.30mm

(1) 利用可能なすべてのパッケージについては、このデータシートの末尾にある注文情報を参照してください。

概略回路図



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4 改訂履歴

Revision F (May 2017) から Revision G に変更

Page

•	Changed supply voltage unit from "°C" to "V" in <i>Absolute Maximum Ratings</i> table	5
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Revision E (January 2015) から Revision F に変更

Page

•	最新のドキュメントおよび翻訳標準に合わせて、データシートのテキストを更新	1
•	「概要」セクションからμA741M (製造終了パッケージ)に関するテキストを削除	1
•	「製品情報」表にμA741CD、μA741CP、μA741CPSデバイスを追加	1
•	「製品情報」表からμA741xデバイスを削除	1
•	Updated pinout diagrams and <i>Pin Functions</i> tables in the <i>Pin Configurations and Functions</i> section	4
•	Deleted μA741M pinout drawings information from <i>Pin Configurations and Functions</i> section	4
•	Deleted Electrical Characteristics: μA741M table from <i>Specifications</i> section	5
•	Added operating junction temperature (T _j) and values to <i>Absolute Maximum Ratings</i> table	5
•	Deleted text regarding μA741M from <i>Absolute Maximum Ratings</i> table	5
•	Deleted text regarding μA741M device from <i>Recommended Operating Conditions</i> table	5
•	Deleted <i>Dissipation Ratings</i> table	5
•	Added <i>Thermal Information</i> table and values	5
•	Deleted μA741M in <i>Switching Characteristics</i> table	7
•	Correct typo in 図 1	8
•	削除 text regarding μA741M device from <i>Detailed Description</i> section	10
•	Updated text in <i>Overview</i> section	10
•	追加 2017 copyright to <i>Functional Block Diagram</i>	10
•	追加 caption to 図 11 in <i>Device Functional Modes</i> section	11
•	変更 pins 1 and 5 from "NC" to "Offset N1" and "Offset N2" in 図 18	15

Revision D (February 2014) から Revision E に変更
Page

- 「アプリケーション」セクション、「製品情報」表、「ピン機能」表、「ESD定格」表、「熱に関する情報」表、「機能説明」セクション、「デバイスの機能モード」セクション、「アプリケーションと実装」セクション、「電源に関する推奨事項」セクション、「レイアウト」セクション、「デバイスおよびドキュメントのサポート」セクション、「メカニカル、パッケージ、および注文情報」セクションを追加 **1**
- Moved *Typical Characteristics* into *Specifications* section. **8**

Revision C (January 2014) から Revision D に変更
Page

- Fixed *Typical Characteristics* graphs to remove extra lines. **8**

Revision B (September 2000) から Revision C に変更
Page

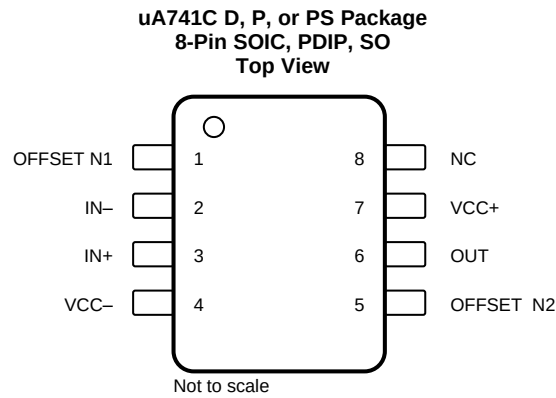
- 新しいTIデータシート・フォーマットにドキュメントを更新 - 仕様変更なし..... **1**
- 「注文情報」表を 削除 **1**

uA741

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5 Pin Configurations and Functions



NC- no internal connection

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

6 Specifications

6.1 Absolute Maximum Ratings

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

		MIN	MAX	UNIT
Supply voltage, V_{CC} ⁽²⁾	μA741C	–18	18	V
Differential input voltage, V_{ID} ⁽³⁾	μA741C	–15	15	V
Input voltage, V_I (any input) ⁽²⁾⁽⁴⁾	μA741C	–15	15	V
Voltage between offset null (either OFFSET N1 or OFFSET N2) and V_{CC-}	μA741C	–15	15	V
Duration of output short circuit ⁽⁵⁾		Unlimited		
Continuous total power dissipation		See Thermal Information		
Case temperature for 60 seconds	μA741C	N/A	N/A	°C
Lead temperature 1.6 mm (1/16 inch) from case for 60 seconds	μA741C	N/A	N/A	°C
Lead temperature 1.6 mm (1/16 inch) from case for 10 seconds	D, P, or PS package		260	°C
Operating junction temperature, T_J			150	°C
Storage temperature range, T_{stg}	μA741C	–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 15 V, whichever is less.
- (5) The output may be shorted to ground or either power supply.

6.2 Recommended Operating Conditions

		MIN	MAX	UNIT
V_{CC+} — Supply voltage		5	15	V
V_{CC-}		–5	–15	V
T_A — Operating free-air temperature	μA741C	0	70	°C

6.3 Thermal Information

THERMAL METRIC ⁽¹⁾		μA741			UNIT
		D (SOIC)	P (PDIP)	PS (SO)	
		8 PINS	8 PINS	8 PINS	
$R_{\theta JA}$	Junction-to-ambient thermal resistance	129.2	87.4	119.7	°C/W
$R_{\theta JC(top)}$	Junction-to-case (top) thermal resistance	73.6	89.3	66	°C/W
$R_{\theta JB}$	Junction-to-board thermal resistance	72.4	64.4	70	°C/W
ψ_{JT}	Junction-to-top characterization parameter	25.9	49.8	27.2	°C/W
ψ_{JB}	Junction-to-board characterization parameter	71.7	64.1	69	°C/W

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

6.4 Electrical Characteristics: μ A741C

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

PARAMETER		TEST CONDITIONS ⁽¹⁾		MIN	TYP	MAX	UNIT
V_{IO}	Input offset voltage	$V_O = 0$	25°C		1	6	mV
			Full range			7.5	
$\Delta V_{IO(adj)}$	Offset voltage adjust range	$V_O = 0$	25°C		± 15		mV
I_{IO}	Input offset current	$V_O = 0$	25°C		20	200	nA
			Full range			300	
I_{IB}	Input bias current	$V_O = 0$	25°C		80	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	$R_L = 10\text{ k}\Omega$	25°C	± 12	± 14		V
		$R_L \geq 10\text{ k}\Omega$	Full range	± 12			
		$R_L = 2\text{ k}\Omega$	25°C	± 10			
		$R_L \geq 2\text{ k}\Omega$	Full range	± 10			
A_{VD}	Large-signal differential voltage amplification	$R_L \geq 2\text{ k}\Omega$	25°C	20	200		V/mV
		$V_O = \pm 10\text{ V}$	Full range	15			
r_i	Input resistance	25°C		0.3	2		M Ω
r_o	Output resistance	$V_O = 0$; see ⁽²⁾	25°C		75		Ω
C_i	Input capacitance	25°C			1.4		pF
CMRR	Common-mode rejection ratio	$V_{IC} = V_{ICRmin}$	25°C	70	90		dB
			Full range	70			
k_{SVS}	Supply voltage sensitivity ($\Delta V_{IO}/\Delta V_{CC}$)	$V_{CC} = \pm 9\text{ V to } \pm 15\text{ V}$	25°C		30	150	$\mu\text{V/V}$
			Full range			150	
I_{OS}	Short-circuit output current	25°C			± 25	± 40	mA
I_{CC}	Supply current	$V_O = 0$; no load	25°C		1.7	2.8	mA
			Full range			3.3	
P_D	Total power dissipation	$V_O = 0$; no load	25°C		50	85	mW
			Full range			100	

(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.

(2) This typical value applies only at frequencies above a few hundred hertz because of the effects of drift and thermal feedback.

6.5 Electrical Characteristics: μ A741Y

at specified virtual junction temperature, $V_{CC\pm} = \pm 15$ V, $T_A = 25^\circ\text{C}$ (unless otherwise noted)⁽¹⁾

PARAMETER		TEST CONDITIONS ⁽²⁾	MIN	TYP	MAX	UNIT
V_{IO}	Input offset voltage	$V_O = 0$		1	5	mV
$\Delta V_{IO(\text{adj})}$	Offset voltage adjust range	$V_O = 0$		± 15		mV
I_{IO}	Input offset current	$V_O = 0$		20	200	nA
I_{IB}	Input bias current	$V_O = 0$		80	500	nA
V_{ICR}	Common-mode input voltage range		± 12	± 13		V
V_{OM}	Maximum peak output voltage swing	$R_L = 10\text{ k}\Omega$	± 12	± 14		V
		$R_L = 2\text{ k}\Omega$	± 10	± 13		
A_{VD}	Large-signal differential voltage amplification	$R_L \geq 2\text{ k}\Omega$	20	200		V/mV
r_i	Input resistance		0.3	2		M Ω
r_o	Output resistance	$V_O = 0$; see ⁽¹⁾		75		Ω
C_i	Input capacitance			1.4		pF
CMRR	Common-mode rejection ratio	$V_{IC} = V_{ICR\text{min}}$	70	90		dB
k_{SVS}	Supply voltage sensitivity ($\Delta V_{IO}/\Delta V_{CC}$)	$V_{CC} = \pm 9$ V to ± 15 V		30	150	$\mu\text{V/V}$
I_{OS}	Short-circuit output current			± 25	± 40	mA
I_{CC}	Supply current	$V_O = 0$; no load		1.7	2.8	mA
P_D	Total power dissipation	$V_O = 0$; no load		50	85	mW

(1) This typical value applies only at frequencies above a few hundred hertz because of the effects of drift and thermal feedback.

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

6.6 Switching Characteristics: μ A741C

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

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_r	Rise time	$V_I = 20\text{ mV}$, $R_L = 2\text{ k}\Omega$		0.3		μs
	Overshoot factor	$C_L = 100\text{ pF}$; see 1		5%		
SR	Slew rate at unity gain	$V_I = 10\text{ V}$, $R_L = 2\text{ k}\Omega$ $C_L = 100\text{ pF}$; see 1		0.5		V/ μs

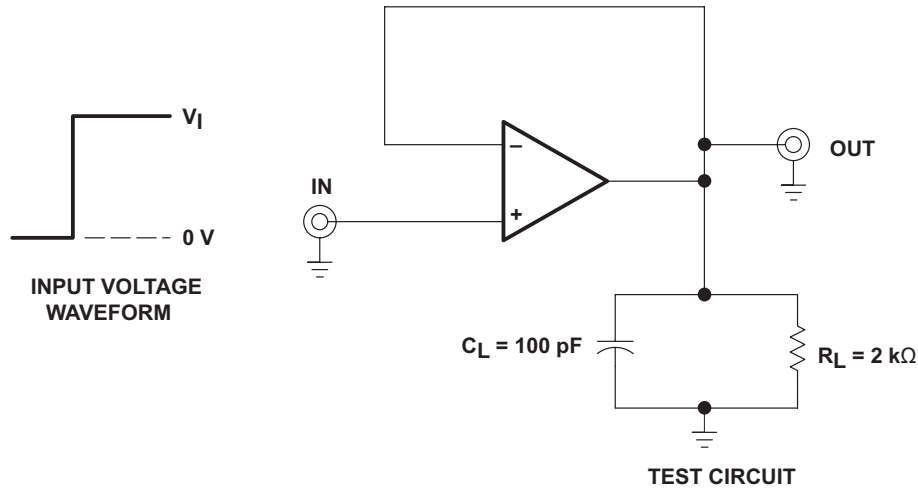
6.7 Switching Characteristics: μ A741Y

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

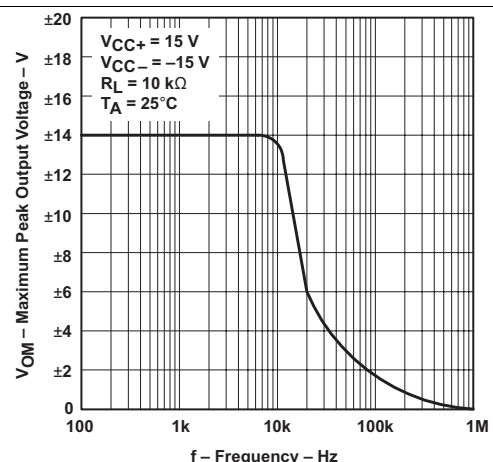
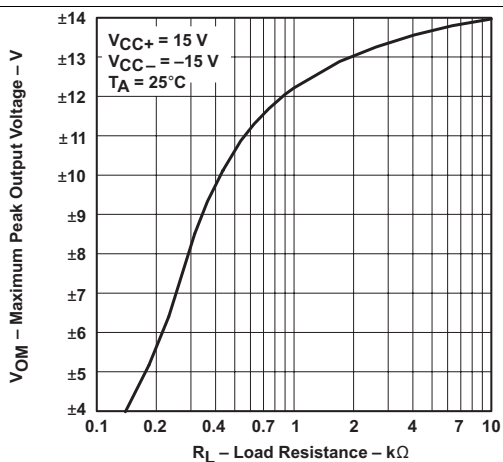
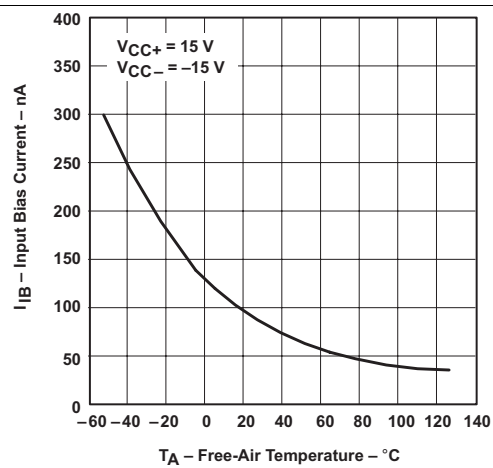
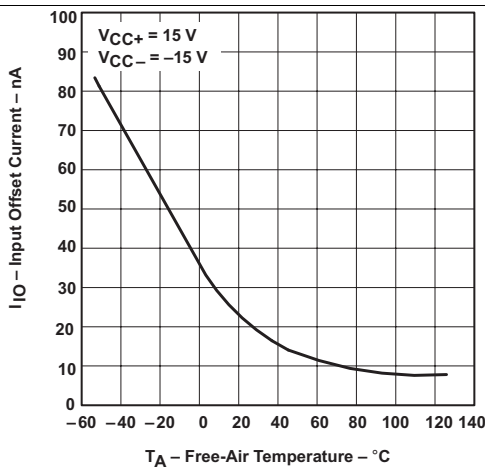
PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_r	Rise time	$V_I = 20\text{ mV}$, $R_L = 2\text{ k}\Omega$		0.3		μs
	Overshoot factor	$C_L = 100\text{ pF}$; see 1		5%		
SR	Slew rate at unity gain	$V_I = 10\text{ V}$, $R_L = 2\text{ k}\Omega$ $C_L = 100\text{ pF}$; see 1		0.5		V/ μs

6.8 Typical Characteristics

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



1. Rise Time, Overshoot, and Slew Rate



Typical Characteristics (continued)

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

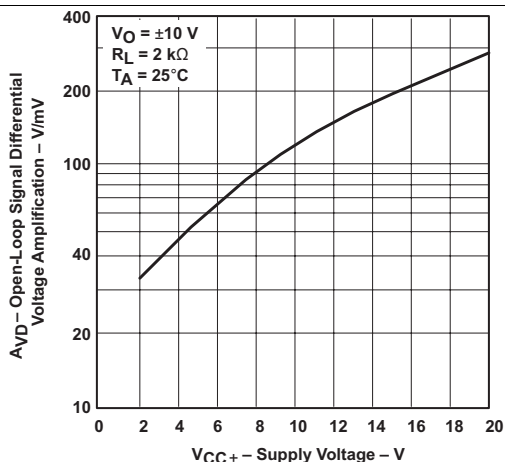


FIG. 6. Open-Loop Signal Differential Voltage Amplification vs Supply Voltage

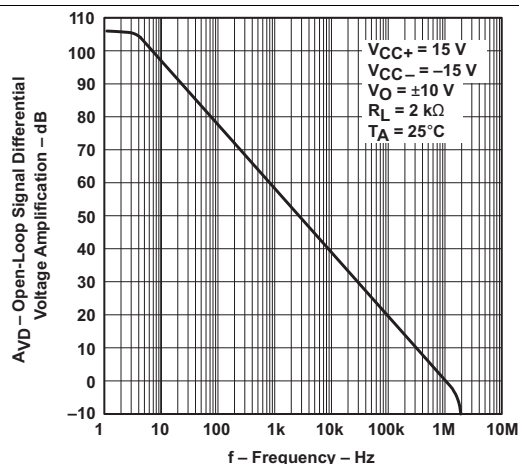


FIG. 7. Open-Loop Large-Signal Differential Voltage Amplification vs Frequency

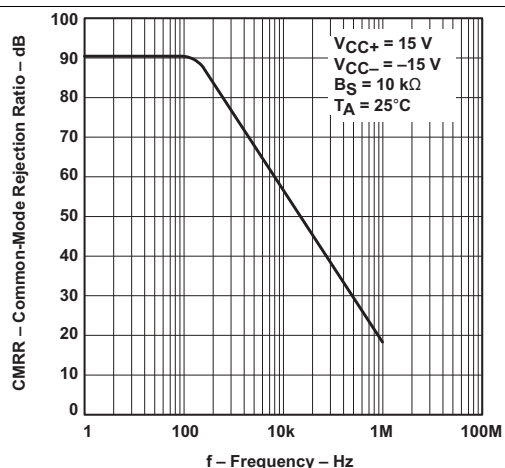


FIG. 8. Common-Mode Rejection Ratio vs Frequency

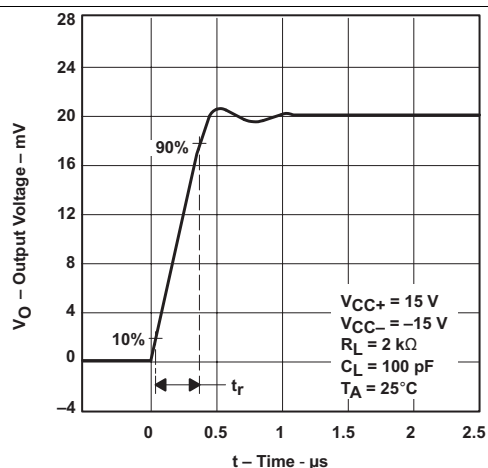


FIG. 9. Output Voltage vs Elapsed Time

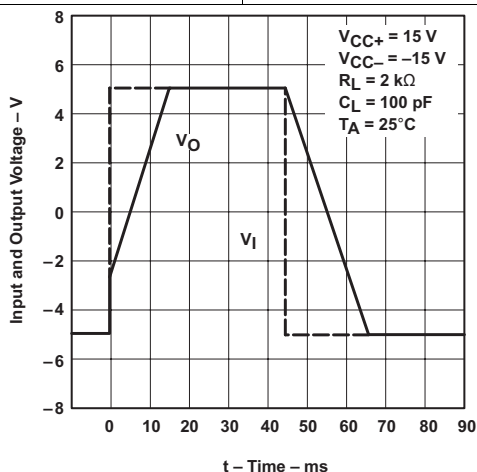


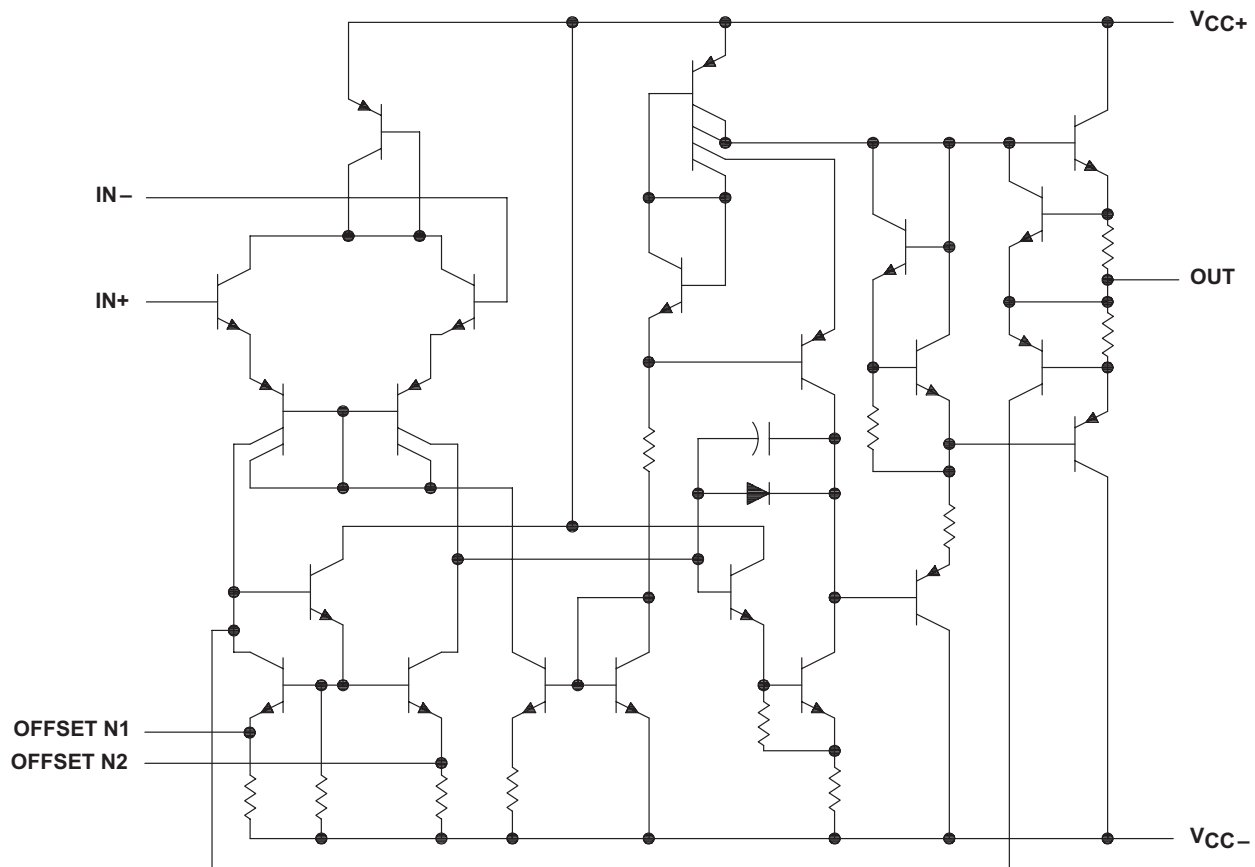
FIG. 10. Voltage-Follower Large-Signal Pulse Response

7 Detailed Description

7.1 Overview

The μ A741 has been a popular operational amplifier for over four decades. Typical open loop gain is 106 dB while driving a 2000- Ω load. Short circuit tolerance, offset voltage trimming, and unity-gain stability makes the μ A741 useful for many applications.

7.2 Functional Block Diagram



Component Count

Transistors	22
Resistors	11
Diode	1
Capacitor	1

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7.3 Feature Description

7.3.1 Offset-Voltage Null Capability

The input offset voltage of operational amplifiers (op amps) arises from unavoidable mismatches in the differential input stage of the op-amp circuit caused by mismatched transistor pairs, collector currents, current-gain betas (β), collector or emitter resistors and so forth. The input offset pins allow the designer to adjust for mismatches caused by external circuitry. See [Application and Implementation](#) for more details on design techniques.

Feature Description (continued)

7.3.2 Slew Rate

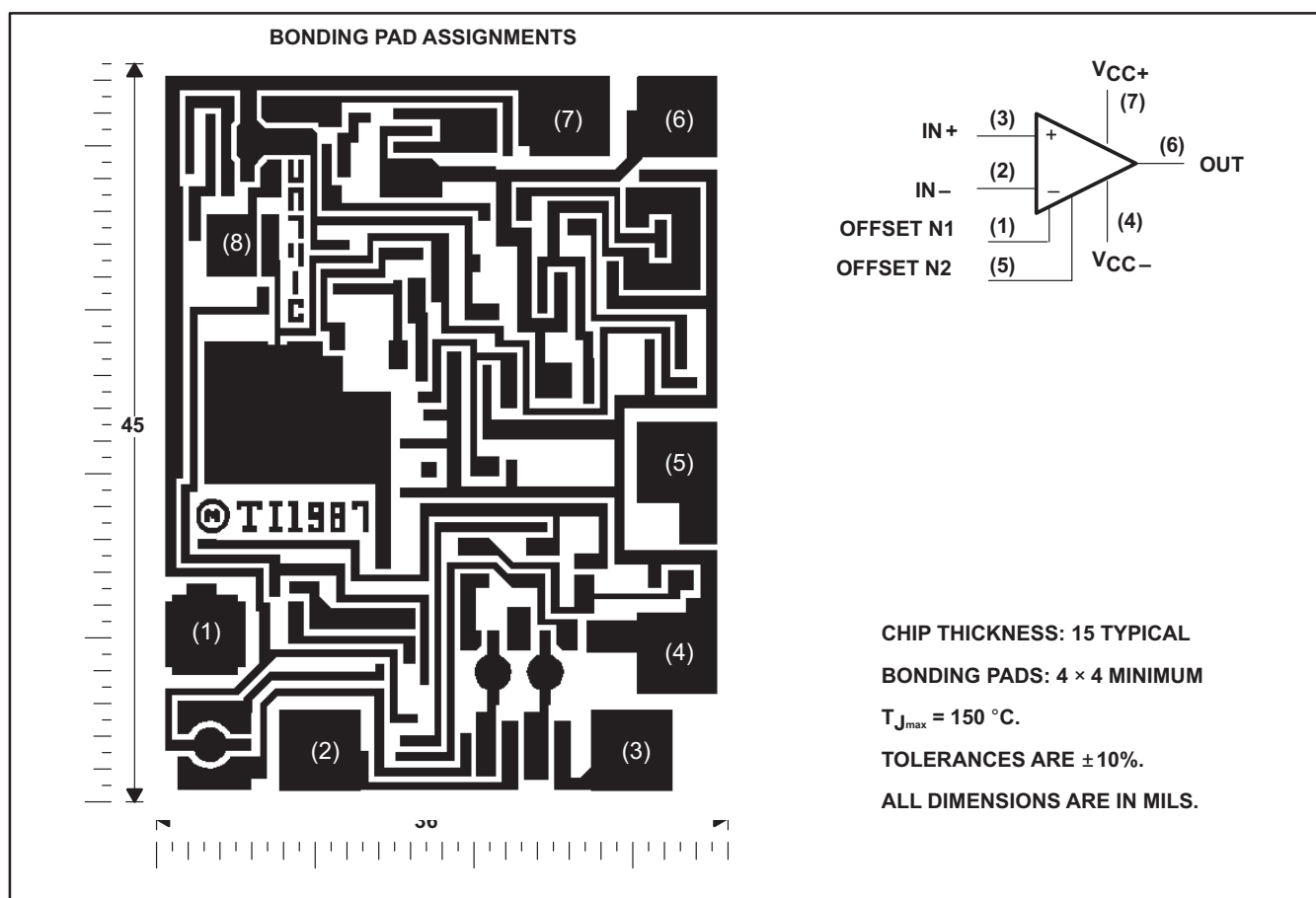
The slew rate is the rate at which an operational amplifier can change an output when there is a change on the input. The μ A741 device has a $0.5\text{-V}/\mu\text{s}$ slew rate. Parameters that vary significantly with operating voltages or temperature are shown in [Typical Characteristics](#).

7.4 Device Functional Modes

The μ A741 device is powered on when the power supply is connected. The device can operate as a single-supply or dual-supply operational amplifier depending on the application.

7.5 μ A741Y Chip Information

When properly assembled, this chip displays characteristics similar to the μ A741C device. Thermal compression or ultrasonic bonding may be used on the doped-aluminum bonding pads. Chips can be mounted with conductive epoxy or a gold-silicon preform.



✎ 11. Bonding Pad Assignments

8 Application and Implementation

注

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. Customers should validate and test their design implementation to confirm system functionality.

8.1 Application Information

The input offset voltage of operational amplifiers (op amps) arises from unavoidable mismatches in the differential input stage of the op-amp circuit caused by mismatched transistor pairs, collector currents, current-gain betas (β), collector or emitter resistors and so forth. The input offset pins allow the designer to adjust for mismatches resulting from external circuitry. These input mismatches can be adjusted by placing resistors or a potentiometer between the inputs as shown in [Figure 12](#). A potentiometer can fine-tune the circuit during testing or for applications which require precision offset control. For more information about designing using the input-offset pins, see [Nulling Input Offset Voltage of Operational Amplifiers](#).

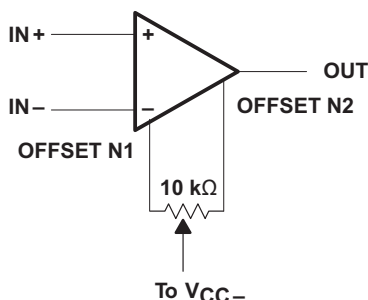


Figure 12. Input Offset Voltage Null Circuit

8.2 Typical Application

The voltage follower configuration of the operational amplifier is used for applications where a weak signal drives a relatively high current load. This circuit is also called a buffer amplifier or unity-gain amplifier. The inputs of an operational amplifier have a very high resistance which puts a negligible current load on the voltage source. The output resistance of the operational amplifier is almost negligible, so the resistance can provide as much current as necessary to the output load.

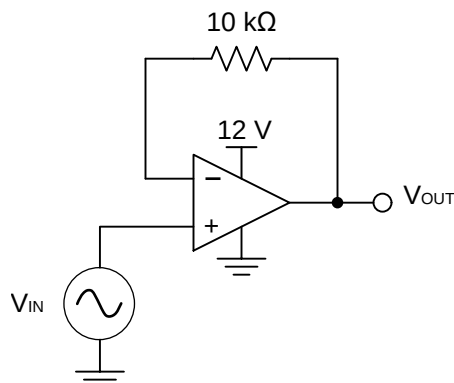


Figure 13. Voltage Follower Schematic

Typical Application (continued)

8.2.1 Design Requirements

- Output range from 2 V to 11.5 V
- Input range from 2 V to 11.5 V
- Resistive feedback to negative input

8.2.2 Detailed Design Procedure

8.2.2.1 Output Voltage Swing

The output voltage of an operational amplifier is limited by the internal circuitry to some level below the supply rails. For this amplifier, the output voltage swing is within ± 12 V, which accommodates the input and output voltage requirements.

8.2.2.2 Supply and Input Voltage

For correct operation of the amplifier, neither input must be higher than the recommended positive supply rail voltage or lower than the recommended negative supply rail voltage. The selected amplifier must be able to operate at the supply voltage that accommodates the inputs. Because the input for this application goes up to 11.5 V, the supply voltage must be 12 V. Using a negative voltage on the lower rail rather than ground allows the amplifier to maintain linearity for inputs below 2 V.

8.2.3 Application Curves for Output Characteristics

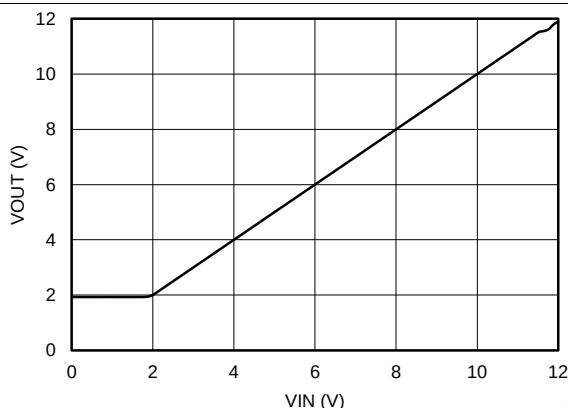


FIG 14. Output Voltage vs Input Voltage

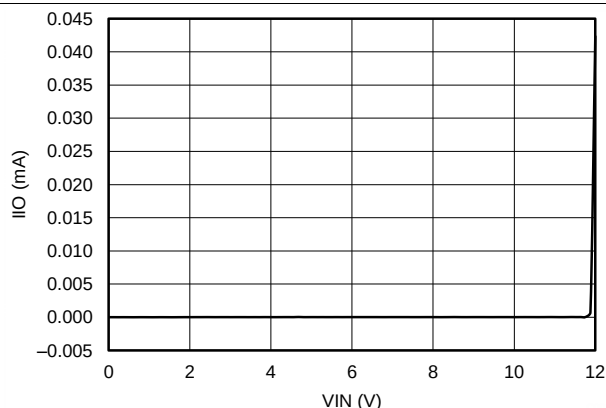


FIG 15. Current Drawn Input of Voltage Follower (I_{IO}) vs Input Voltage

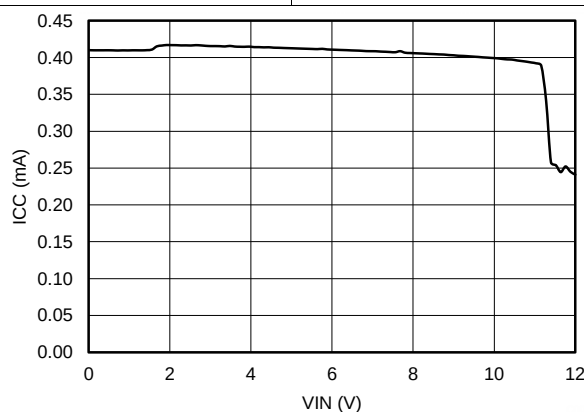


FIG 16. Current Drawn from Supply (I_{CC}) vs Input Voltage

9 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 . [Typical Characteristics](#) 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 [Layout Guidelines](#).

注意

Supply voltages larger than ± 18 V can permanently damage the device (see [Absolute Maximum Ratings](#)).

10 Layout

10.1 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 [Layout Example](#).
- 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.

10.2 Layout Example

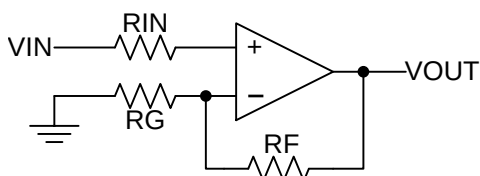


图 17. Operational Amplifier Schematic for Noninverting Configuration

Layout Example (continued)

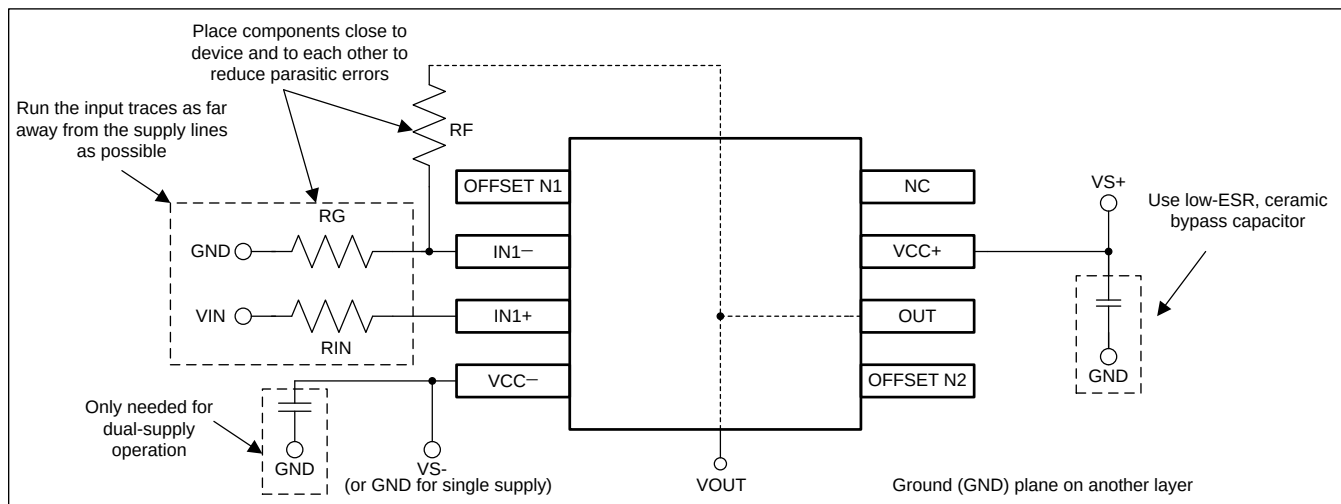


FIG 18. Operational Amplifier Board Layout for Noninverting Configuration

11 デバイスおよびドキュメントのサポート

11.1 ドキュメントの更新通知を受け取る方法

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11.3 静電気放電に関する注意事項



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11.4 Glossary

[SLYZ022](#) — *TI Glossary*.

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

12 メカニカル、パッケージ、および注文情報

以降のページには、メカニカル、パッケージ、および注文に関する情報が記載されています。これらの情報は、指定のデバイスに対して提供されている最新のデータです。このデータは予告なく変更されることがあり、ドキュメントが改訂される場合もあります。このデータシートのブラウザ対応版については、左側にあるナビゲーションを参照してください。

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.

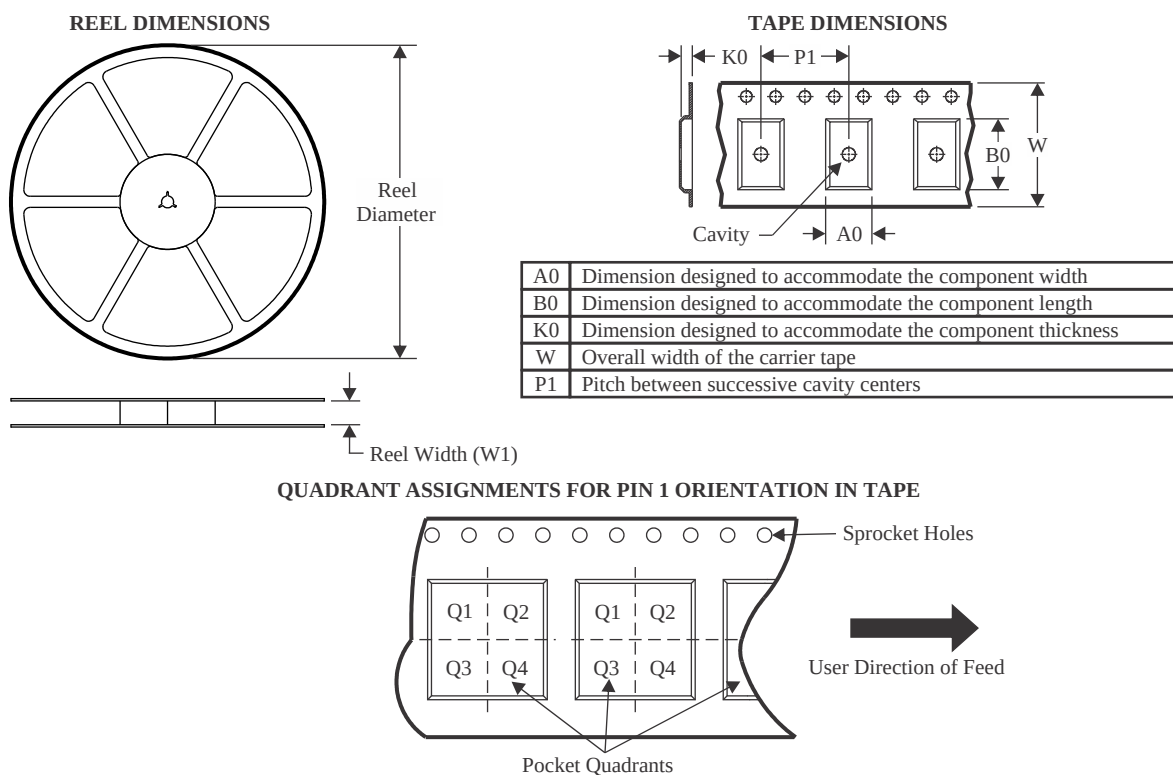
Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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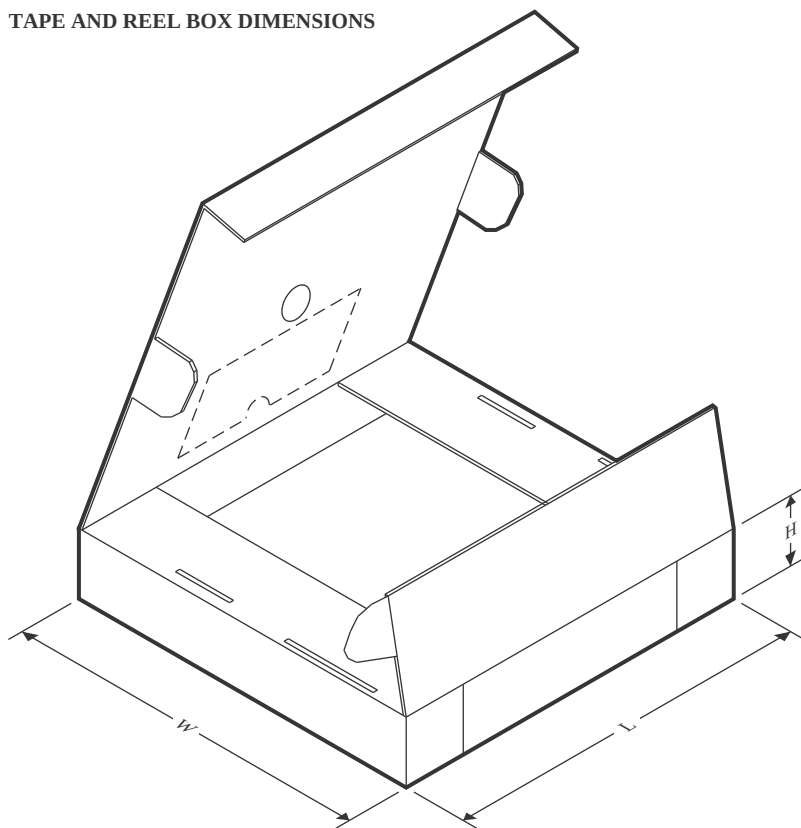
TAPE AND REEL INFORMATION



*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
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

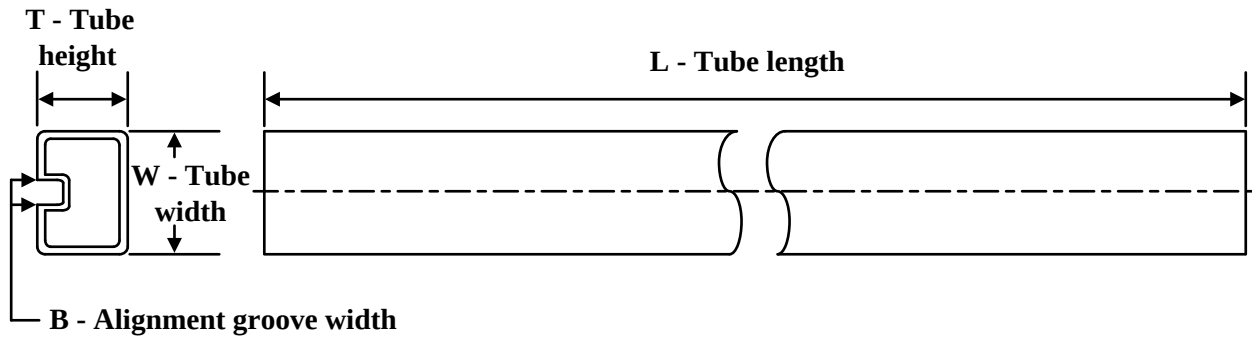
TAPE AND REEL BOX DIMENSIONS



*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
UA741CDR	SOIC	D	8	2500	353.0	353.0	32.0
UA741CPSR	SO	PS	8	2000	356.0	356.0	35.0

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



PACKAGE OUTLINE

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



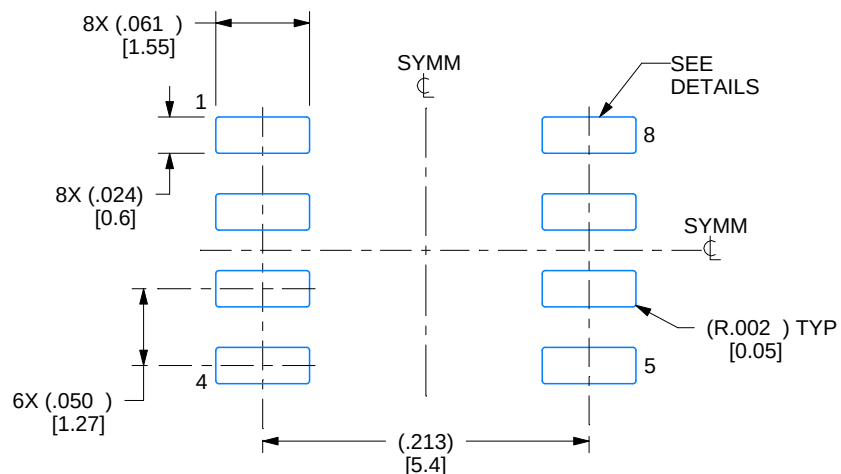
1. Linear dimensions are in inches [millimeters]. Dimensions in parenthesis are for reference only. Controlling dimensions are in inches. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate 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

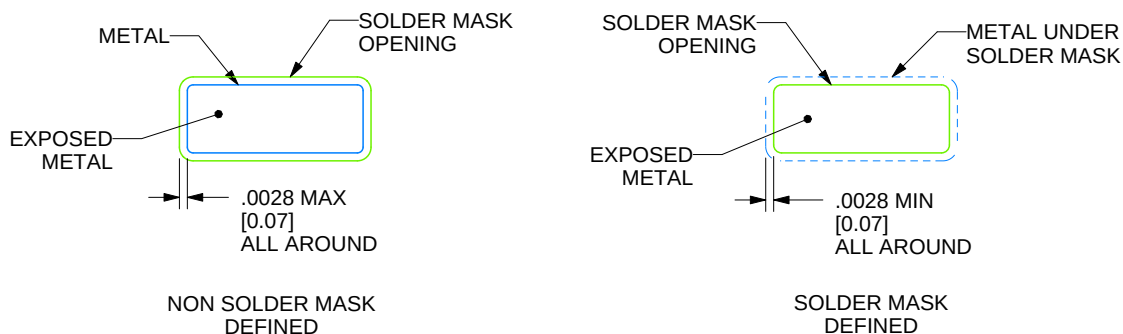
D0008A

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.

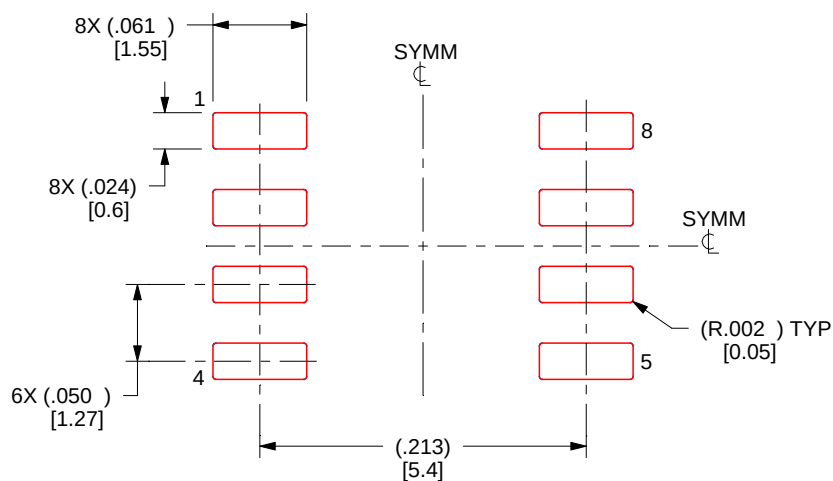
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

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

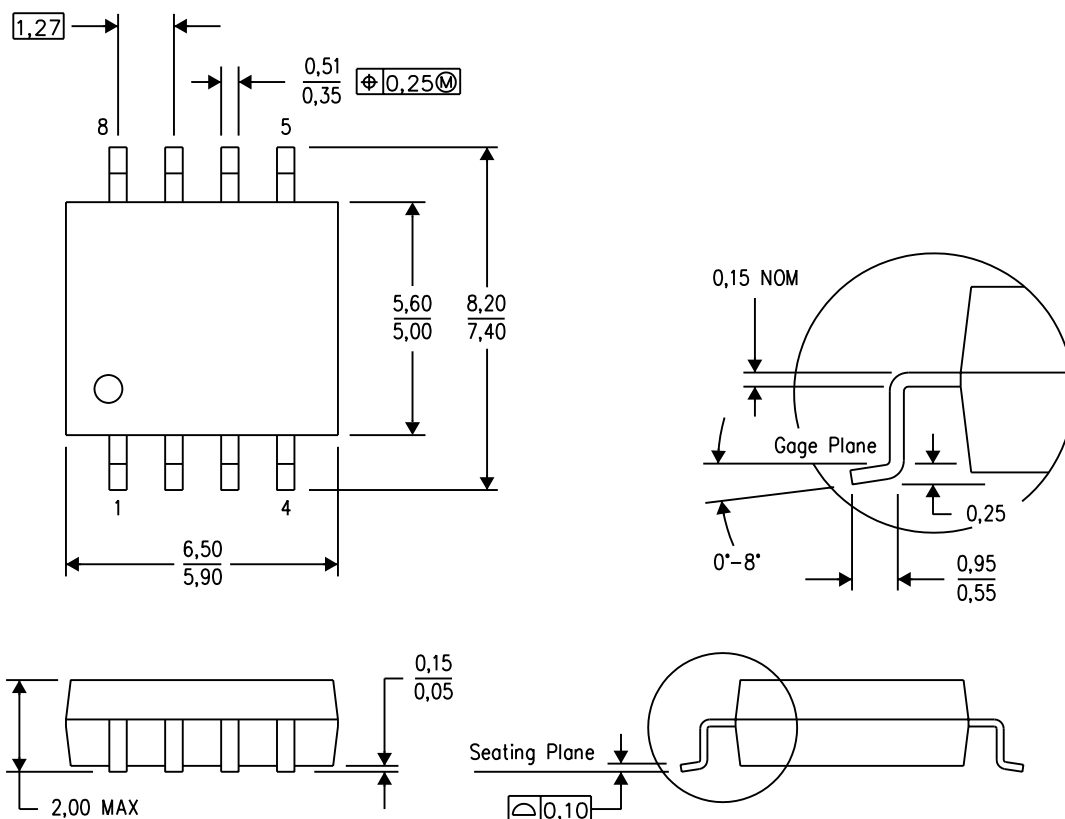
NOTES: (continued)

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

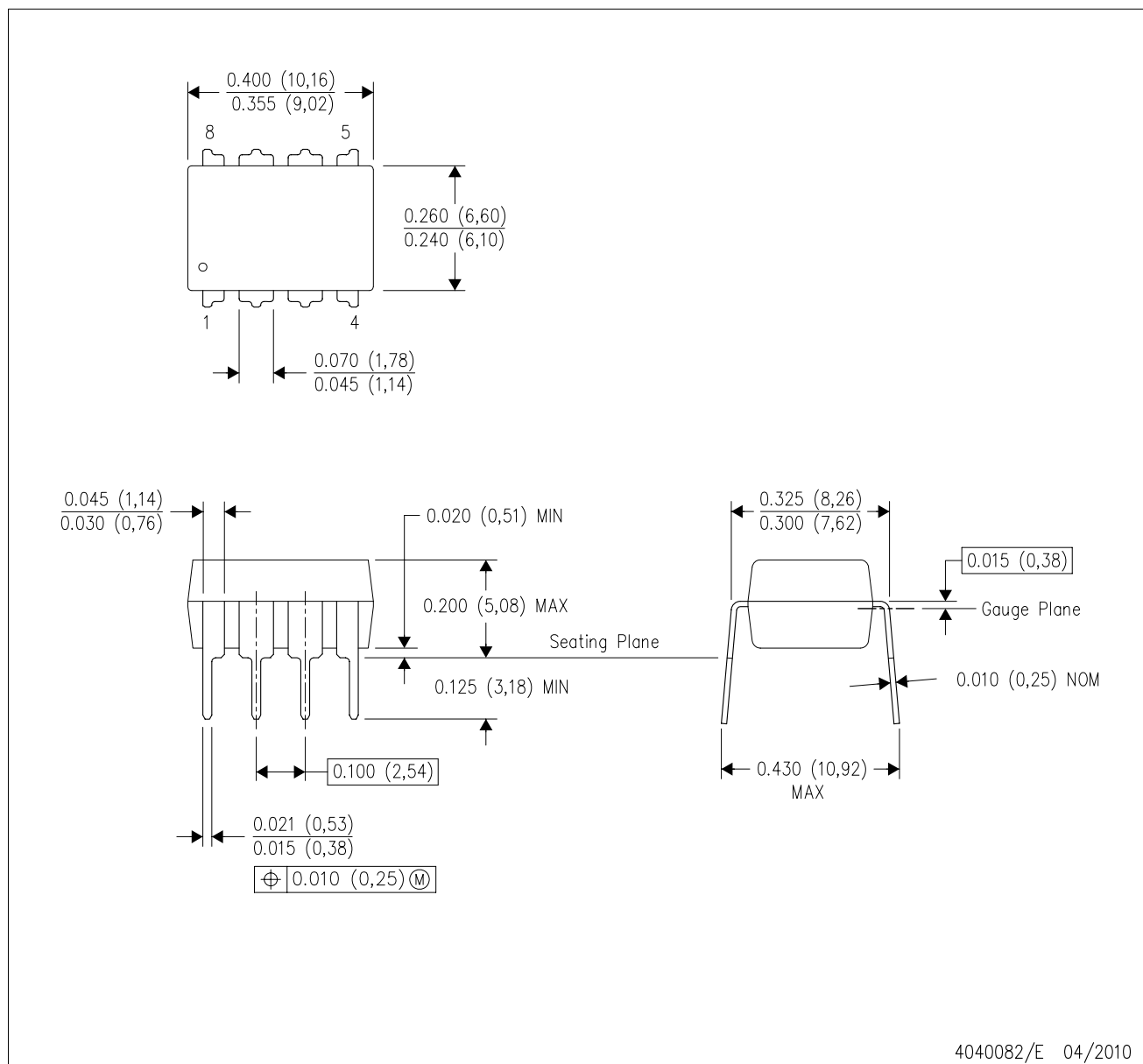


4040063/C 03/03

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

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.

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