

MC3x03 Quadruple Low-power Operational Amplifiers

1 Features

- Wide range of supply voltages, single supply: 3V to 36V or dual supplies
- Class AB output stage
- True differential input stage
- Low input bias current
- Internal frequency compensation
- Short-circuit protection
- Designed to be interchangeable with Motorola MC3303, MC3403

2 Applications

- Industrial control circuits
- Sensor signal conditioning (temperature, pressure, flow)
- Preamplifier stages for audio equipment
- Medical electronics
- Automotive systems

3 Description

The MC3303 and the MC3403 are quadruple operational amplifiers similar in performance to the μ A741, but with several distinct advantages. MC3303 and the MC3403 are designed to operate from a single supply over a range of voltages from 3V to

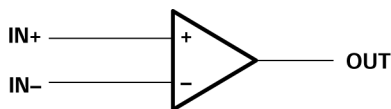
36V. Operation from split supplies also is possible, provided the difference between the two supplies is 3V to 36V. The common-mode input range includes the negative supply. Output range is from the negative supply to $V_{CC} - 1.5V$. Quiescent supply currents are less than one-half those of the μ A741.

The MC3303 is characterized for operation from -40°C to 85°C , and the MC3403 is characterized for operation from 0°C to 70°C .

Package Information

PART NUMBER	PACKAGE ⁽¹⁾	PACKAGE SIZE ⁽²⁾
MC3303	N (PDIP, 14)	19.3mm × 6.35mm
	D (SOIC, 14)	8.65mm × 3.9mm
	PW (TSSOP, 14)	5mm × 4.4mm
MC3403	N (PDIP, 14)	19.3mm × 6.35mm
	D (SOIC, 14)	8.65mm × 3.9mm
	PW (TSSOP, 14)	5mm × 4.4mm
	NS (SOP, 14)	10.3mm × 5.3mm

- (1) For all available packages, see the orderable addendum at the end of the datasheet.
- (2) The package size (length × width) is a nominal value and includes pins, where applicable.



Logic Diagram (Each Amplifier)



Table of Contents

1 Features	1	5.7 Typical Characteristics	8
2 Applications	1	5.8 Legacy Versus New Die Comparison.....	10
3 Description	1	6 Device and Documentation Support	11
4 Pin Configuration and Functions	3	6.1 Receiving Notification of Documentation Updates....	11
5 Specifications	4	6.2 Support Resources.....	11
5.1 Absolute Maximum Ratings.....	4	6.3 Trademarks.....	11
5.2 ESD Ratings.....	4	6.4 Electrostatic Discharge Caution.....	11
5.3 Recommended Operating Conditions.....	4	6.5 Glossary.....	11
5.4 Electrical Characteristics.....	5	7 Revision History	11
5.5 Electrical Characteristics.....	6	8 Mechanical, Packaging, and Orderable Information..	13
5.6 Operating Characteristics.....	7		

4 Pin Configuration and Functions

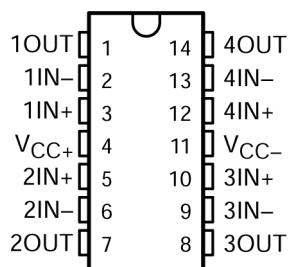


Figure 4-1. MC3303:D, N, or PW Package MC3403:D, N, NS, or PW Package (Top View)

Table 4-1. Pin Functions

PIN		TYPE	DESCRIPTION
NAME	NO.		
1OUT	1	Output	Output channel 1
1IN–	2	Input	Inverting input channel 1
1IN+	3	Input	Non Inverting input channel 1
V _{CC} +	4	—	Positive power supply
2IN+	5	Input	Non Inverting input channel 2
2IN–	6	Input	Inverting input channel 2
2OUT	7	Output	Output channel 2
3OUT	8	Output	Output channel 3
3IN–	9	Input	Inverting input channel 3
3IN+	10	Input	Non Inverting input channel 3
V _{CC} –	11	—	Ground or negative power supply
4IN+	12	Input	Non Inverting input channel 4
4IN–	13	Input	Inverting input channel 4
4OUT	14	Output	Output channel 4

5 Specifications

5.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted)⁽¹⁾

			MIN	MAX	UNIT
V_{CC+}	Supply voltage ⁽²⁾			18	V
V_{CC-}				-18	V
	Supply voltage, V_{CC+} with respect to V_{CC-}			36	V
	Differential input voltage ⁽³⁾			±36	V
	Input voltage ⁽²⁾⁽⁴⁾			±18	V
θ_{JA}	Package thermal impedance ⁽⁵⁾	D package		86	°C/W
		N package		80	°C/W
		NS package		76	°C/W
		PW package		113	°C/W
	Lead temperature 1.6mm (1/16 inch) from case for 10 seconds			260	°C
T_{stg}	Storage temperature range		-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) These voltage values are with respect to the midpoint between V_{CC+} and V_{CC-} .

(3) Differential voltages are at $IN+$ with respect to $IN-$.

(4) Neither input must ever be more positive than V_{CC+} or more negative than V_{CC-} .

(5) The package thermal impedance is calculated in accordance with JESD 51-7.

5.2 ESD Ratings

			VALUE	UNIT
MC3303, MC3403				
$V_{(ESD)}$	Electrostatic discharge	Human-body model (HBM), per ANSI/ESDA/JEDEC JS-001 ⁽¹⁾	±1000	V
		Charged-device model (CDM), per JEDEC specification JESD22-C101 ⁽²⁾	±1000	

(1) JEDEC document JEP155 states that 500V HBM allows safe manufacturing with a standard ESD control process.

(2) JEDEC document JEP157 states that 250V CDM allows safe manufacturing with a standard ESD control process.

5.3 Recommended Operating Conditions

			MIN	MAX	UNIT
V_{CC}	Supply voltage		5	30	V
	Dual-supply voltage	V_{CC+}	2.5	15	V
		V_{CC-}	-2.5	-15	V
T_a	Operating free-air temperature	MC3303	-40	85	°C
		MC3403	0	70	

5.4 Electrical Characteristics

at specified free-air temperature, $V_{CC+} = 14V$, $V_{CC-} = 0V$ for MC3303, $V = \pm 15V$ for MC3403 (unless otherwise noted)

PARAMETER		TEST CONDITIONS ⁽¹⁾		MC3303			MC3403			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
V_{IO}	Input offset voltage	$V_O = 2.5V$, $25^\circ C$		0.6	8		0.6	10		mV
		$V_O = 0V$ for MC3403 and $V_O = 7V$ for MC3303	Full range			10			12	mV
αV_{IO}	Temperature coefficient of input offset voltage	$V_O = 0V$ for MC3403 and $V_O = 7V$ for MC3303	Full range		7			7		$\mu V/^\circ C$
I_{IO}	Input offset current	$V_O = 2.5V$, $25^\circ C$		0.5	75		0.5	50		nA
			Full range			250			200	
αI_{IO}	Temperature coefficient of input offset current	$V_O = 0V$ for MC3403 and $V_O = 7V$ for MC3303	Full range		10			10		$pA/^\circ C$
I_{IB}	Input bias current	$V_O = 2.5V$, $25^\circ C$		-0.01	-0.5		-0.01	-0.5		μA
			Full range			-1			-0.8	
V_{ICR}	Common-mode input voltage range ⁽²⁾		$25^\circ C$	V_{CC-} to 12 to V_{CC-} to 12.5			V_{CC-} to 13 to V_{CC-} to 13.5			V
V_{OM}	Peak output voltage swing	$R_L = 10k\Omega$, $25^\circ C$		± 12	± 12.6		± 12	± 13.6		V
		$R_L = 2k\Omega$, $25^\circ C$		± 10	± 12.5		± 10	± 13.5		
		$R_L = 2k\Omega$, Full range		± 10			± 10			
A_{VD}	Large-signal differential voltage amplification	$V_O = 1.7V$ to $3.3V$, $R_L = 10k\Omega$, $25^\circ C$		20	100		20	100		V/mV
			Full range	15			15			
B_1	Unity-gain bandwidth	$V_O = 50mV$, $R_L = 10k\Omega$, $25^\circ C$			1			1		MHz
ϕ_m	Phase margin	$CL = 20pF$, $R_L = 10M\Omega$, $25^\circ C$			56°			56°		
r_i	Input resistance		$25^\circ C$	0.3	10		0.3	10		M Ω
R_O	Output resistance		$25^\circ C$		300			300		Ω
CMRR	Common mode rejection ratio	$V_{IC} = V_{ICRmin}$, $25^\circ C$		70	80		70	80		dB
k_{SVS}	Supply-voltage sensitivity ($\Delta V_{IO}/\Delta V_{CC\pm}$)	$V_{CC\pm} = \pm 2.5V$ to $\pm 15V$, 25°			10	562		10	562	$\mu V/V$
I_{OS}	Short-circuit output current ⁽³⁾		$25^\circ C$	± 10	± 40		± 10	± 40		mA
I_{CC}	Total supply current	$V_O = 2.5V$, No load ⁽⁴⁾ , $25^\circ C$		0.24	7		0.24	7		mA
V_{O1}/V_{O2}	Crosstalk attenuation	$f = 1kHz$ to $20kHz$			120			120		dB

(1) All characteristics are measured under open-loop conditions with zero common-mode voltage unless otherwise specified. Full range for T_A is $-40^\circ C$ to $85^\circ C$ for MC3303, and $0^\circ C$ to $70^\circ C$ for MC3403.

(2) The V_{ICR} limits are linked directly, volt-for-volt, to supply voltage; the positive limit is 2V less than V_{CC+} .

(3) Temperature and/or supply voltages must be limited to make sure that the dissipation rating is not exceeded.

(4) V_{IO} , I_{IO} , I_{IB} , and I_{CC} are defined at $V_O = 0$ for MC3403 and $V_O = 7V$ for MC3303.

5.5 Electrical Characteristics

$V_{CC+} = 5V$, $V_{CC-} = 0V$, $T_A = 25^\circ C$ (unless otherwise noted)

PARAMETER		TEST CONDITIONS ⁽¹⁾	MC3303			MC3403			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
V _{IO}	Input offset voltage	V _O =2.5V		0.6	10		0.6	10	mV
I _{IO}	Input offset current	V _O =2.5V		0.5	75		0.5	50	nA
I _{IB}	Input bias current			−0.01	−0.5		−0.01	−0.5	μA
V _{OM}	Peak output voltage swing ⁽²⁾	R _L = 10kΩ	3.3	3.65		3.3	3.65		V
		R _L = 10kΩ, V _{CC} + = 5V to 30V	V _{CC} ±1.7			V _{CC} ±1.7			
A _{VD}	Large-signal differential voltage amplification	V _O = 1.7V to 3.3V, R _L = 2kΩ		100		100			V/mV
k _{SVS}	Supply voltage sensitivity (ΔV _{IO} /ΔV _{CC})	V _{CC} ± = ±2.5 to ±15 V			562			562	μV/V
I _{CC}	Total supply current	V _O = 2.5V, No load		0.240	7		0.240	7	mA
VO1/VO2	Crosstalk attenuation	f = 1kHz to 20kHz		120		120			dB

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

(2) Output swings essentially to ground.

5.6 Operating Characteristics

$V_{CC+} = 14V$, $V_{CC-} = 0V$ for MC3303, $V_{CC\pm} = \pm 15V$ for MC3403, $T_A = 25^{\circ}C$, $A_{VD} = 1$ (unless otherwise noted)

PARAMETER		TEST CONDITIONS			TYP	UNIT
SR	Slew rate at unity gain	$V_I = \pm 10V$,	$C_L = 30pF$,	$R_L = 1M\Omega$	0.5	V/ μs
t_r	Rise time	$\Delta V_O = 50mV$,	$C_L = 30pF$,	$R_L = 1M\Omega$	0.35	μs
t_f	Fall time	$\Delta V_O = 50mV$,	$C_L = 30pF$,	$R_L = 1M\Omega$	0.35	μs
	Overshoot factor	$\Delta V_O = 50mV$,	$C_L = 30pF$,	$R_L = 1M\Omega$	12	%

5.7 Typical Characteristics

Operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied.

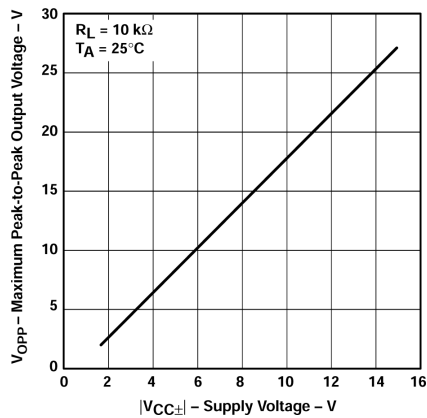


Figure 5-1. Maximum Peak-to-peak Output Voltage vs Supply Voltage (Legacy Die)

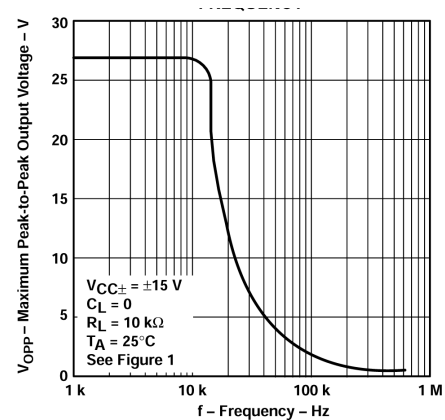


Figure 5-2. Maximum Peak-to-peak Output Voltage vs Frequency (Legacy Die)

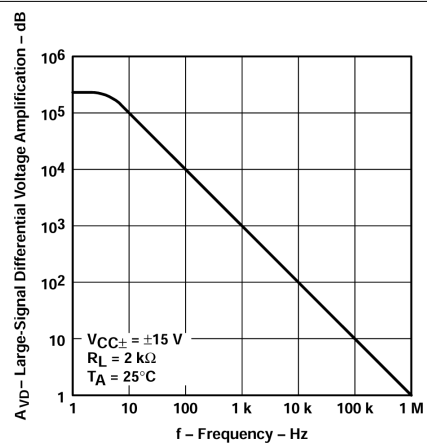


Figure 5-3. Large-Signal Differential Voltage Amplification vs Frequency (Legacy Die)

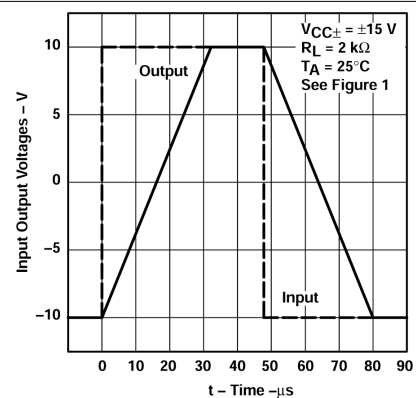


Figure 5-4. Voltage-Follower Large-Signal Pulse Response (Legacy Die)

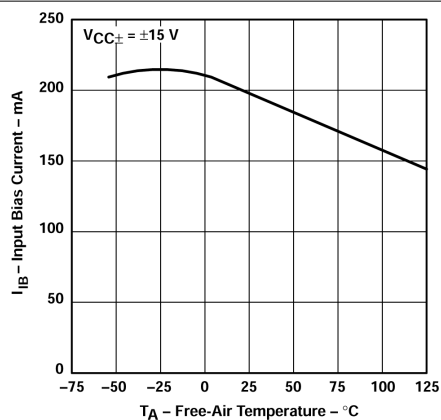


Figure 5-5. Input Bias Current vs Free-air Temperature (Legacy Die)

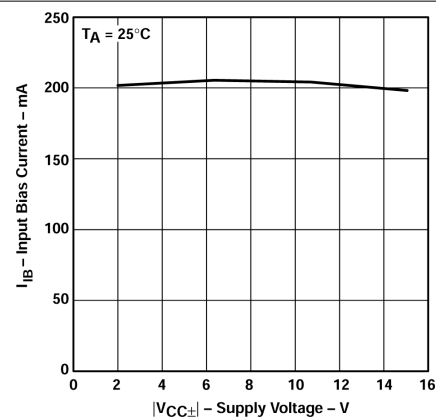


Figure 5-6. Input Bias Current vs Supply Voltage (Legacy Die)

5.7 Typical Characteristics (continued)

Operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied.

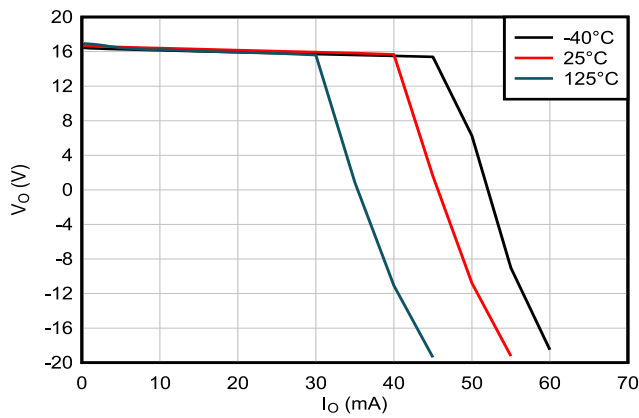


Figure 5-7. Output Voltage Swing vs Output Current (Sourcing) (New Die)

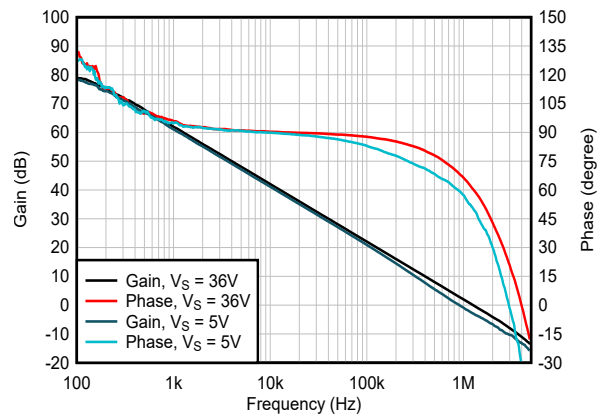


Figure 5-8. Open-Loop Gain and Phase vs Frequency (New Die)

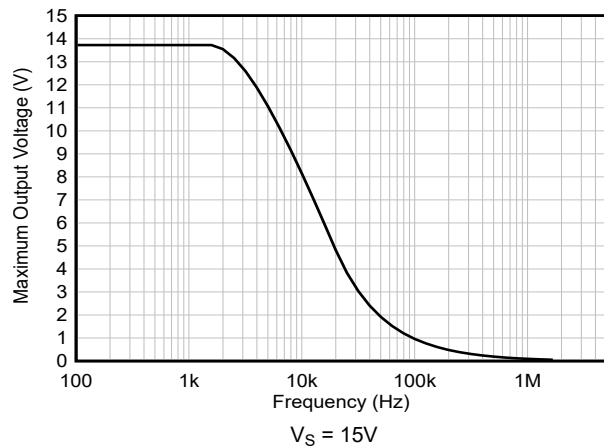


Figure 5-9. Maximum Output Voltage vs Frequency (New Die)

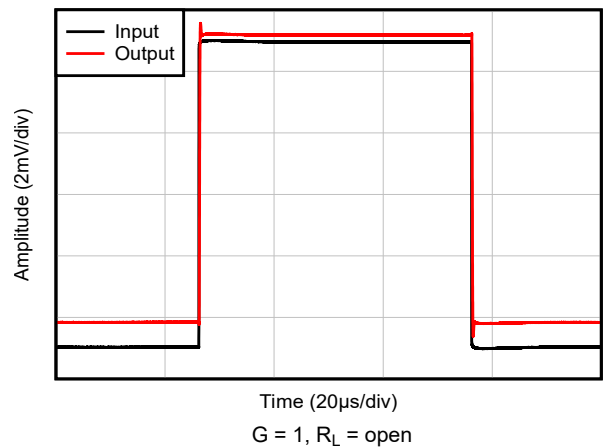


Figure 5-10. Small-Signal Step Response, G = 1 (New Die)

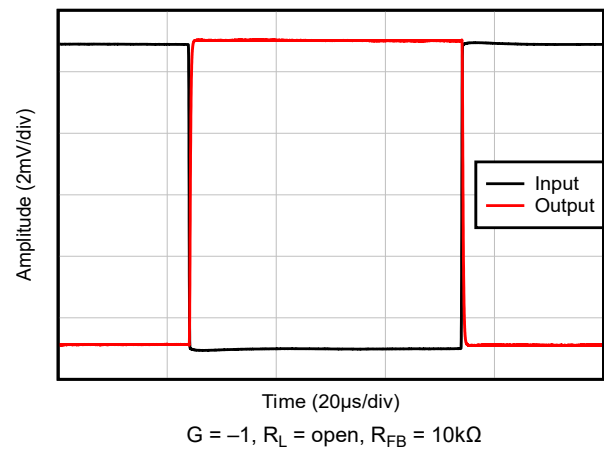


Figure 5-11. Small-Signal Step Response, G = -1 (New Die)

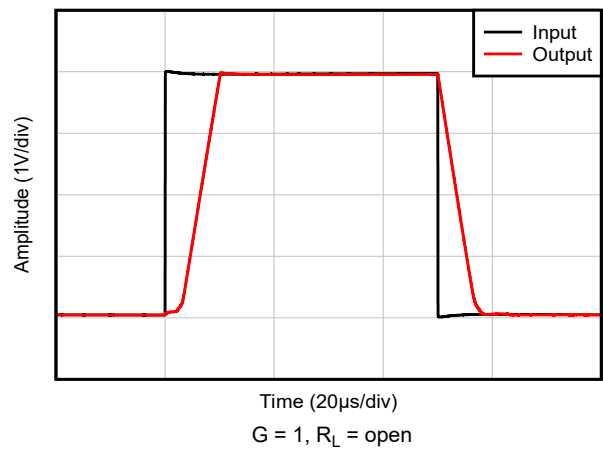


Figure 5-12. Large-Signal Step Response, G = 1 (New Die)

5.7 Typical Characteristics (continued)

Operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied.

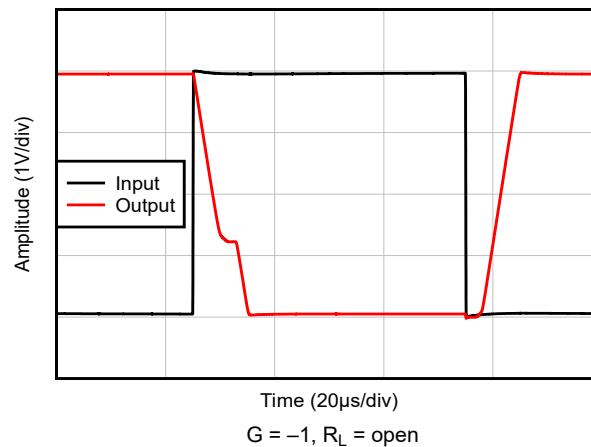


Figure 5-13. Large-Signal Step Response, $G = -1$ (New Die)

5.8 Legacy Versus New Die Comparison

As of the publication of revision D of this datasheet, Texas Instruments has moved manufacturing of the die for MC3303 and MC3403 to a modern fabrication site. The two different die are referred to in this document as “Legacy” (previous fabrication site) and “New” die. The die origin can be separated from the “Chip Source Origin” (CSO) parameter in the shipping information. The old die CSO is “SHE”, for the new die CSO is “RFB”. The old die information is maintained in this datasheet for comparison purposes, but all new manufacturing has moved to the new die.

6 Device and Documentation Support

TI offers an extensive line of development tools. Tools and software to evaluate the performance of the device, generate code, and develop solutions are listed below.

6.1 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.

6.2 Support Resources

[TI E2E™ support forums](#) are an engineer's go-to source for fast, verified answers and design help — straight from the experts. Search existing answers or ask your own question to get the quick design help you need.

Linked content is provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's [Terms of Use](#).

6.3 Trademarks

TI E2E™ is a trademark of Texas Instruments.

All trademarks are the property of their respective owners.

6.4 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.

6.5 Glossary

[TI Glossary](#) This glossary lists and explains terms, acronyms, and definitions.

7 Revision History

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

Changes from Revision C (February 2002) to Revision D (October 2026)	Page
• Updated the numbering format for tables, figures, and cross-references throughout the document.....	1
• Added <i>Applications</i> section.....	1
• Updated Package Information table in <i>Description</i> section.....	1
• Deleted DB package information from datasheet.....	1
• Deleted <i>Schematic</i> section.....	1
• Added <i>Pin Configuration and Functions</i> section and Pin Functions table.....	3
• Added <i>ESD Ratings</i> section.....	4
• Changed Input offset voltage for 25°C typical from 2mV to 0.6mV.....	5
• Changed Input offset current for 25°C typical from 30nA to 0.5nA.....	5
• Changed Temperature coefficient of input offset voltage typical from 10μV/°C to 7μV/°C.....	5
• Changed Temperature coefficient of input offset current typical from 50pA/°C to 10pA/°C.....	5
• Changed Input bias current for 25°C typical from –0.2μA to –0.01μA.....	5
• Changed Peak output voltage swing for $R_L = 10k\Omega$ typical from 12.5V to 12.6V for MC3303.....	5
• Changed Peak output voltage swing for $R_L = 10k\Omega$ typical from ±13.5V to ±13.6V for MC3403.....	5
• Changed Peak output voltage swing for $R_L = 2k\Omega$ typical from 12V to 12.5V for MC3303.....	5
• Changed Peak output voltage swing for $R_L = 2k\Omega$ typical from ±13V to ±13.5V for MC3403.....	5
• Changed Large-signal differential voltage amplification test condition from $R_L = 2k\Omega$ to 10kΩ and typical from 200V/mV to 100V/mV.....	5
• Deleted Maximum-output-swing bandwidth.....	5

• Changed Phase margin test conditions from $C_L = 200\text{pF}$ to 20pF and from $R_L = 2\text{k}\Omega$ to $10\text{M}\Omega$	5
• Changed Phase margin typical from 60° to 56°	5
• Deleted Input resistance test condition and changed typical from $1\text{M}\Omega$ to $10\text{M}\Omega$	5
• Deleted Output resistance test condition and changed typical from 75Ω to 300Ω	5
• Changed Common-mode rejection ratio typical from 90dB to 80dB	5
• Changed Supply voltage sensitivity typical from $30\mu\text{V/V}$ to $10\mu\text{V/V}$ and maximum from $150\mu\text{V/V}$ to $562\mu\text{V/V}$	5
• Changed Short-circuit output current typical from $\pm 30\text{mA}$ to $\pm 40\text{mA}$ and deleted maximum.....	5
• Changed Total supply current typical from 2.8mA to 0.24mA	5
• Added Crosstalk attenuation.....	5
• Changed Input offset voltage typical from 2mV to 0.6mV	6
• Changed Input offset current typical from 30nA to 0.5nA	6
• Changed Input bias current typical from $-0.2\mu\text{A}$ to $-0.01\mu\text{A}$	6
• Changed Peak output voltage swing, $R_L = 10\text{k}\Omega$ typical from 3.5V to 3.65V	6
• Deleted Large-signal differential voltage amplification minimum and changed typical from 200V/mV to 100V/mV	6
• Changed Supply-voltage sensitivity maximum from $150\mu\text{V/V}$ to $562\mu\text{V/V}$	6
• Changed Supply current typical from 2.5mA to 0.240mA	6
• Changed Slew rate at unity gain test conditions C_L from 100pF to 30pF and R_L from $2\text{k}\Omega$ to $1\text{M}\Omega$ and deleted See Figure 1 and changed typical from $0.6\text{V}/\mu\text{s}$ to $0.5\text{V}/\mu\text{s}$	7
• Changed Rise time test conditions C_L from 100pF to 30pF and R_L from $10\text{k}\Omega$ to $1\text{M}\Omega$ and deleted See Figure 1.....	7
• Changed Fall time test conditions C_L from 100pF to 30pF and R_L from $10\text{k}\Omega$ to $1\text{M}\Omega$ and deleted See Figure 1.....	7
• Changed Overshoot factor test conditions C_L from 100pF to 30pF and R_L from $10\text{k}\Omega$ to $1\text{M}\Omega$ and deleted See Figure 1 and typical from 20% to 12%	7
• Deleted Crossover distortion row.....	7
• Deleted <i>Parameter Measurement Information</i> section.....	7
• Added Legacy Die to existing figure titles and added new die figures in <i>Typical Characteristics</i> section.....	8
• Added <i>Legacy Versus New Die Comparison</i> section.....	10

8 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 datasheet, 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)
MC3303D	Obsolete	Production	SOIC (D) 14	-	-	Call TI	Call TI	-40 to 85	MC3303
MC3303DR	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	MC3303
MC3303DR.A	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	MC3303
MC3303N	Active	Production	PDIP (N) 14	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 85	MC3303N
MC3303N.A	Active	Production	PDIP (N) 14	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 85	MC3303N
MC3303PW	Obsolete	Production	TSSOP (PW) 14	-	-	Call TI	Call TI	-40 to 85	M3303
MC3303PWR	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	M3303
MC3303PWR.A	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	M3303
MC3403D	Obsolete	Production	SOIC (D) 14	-	-	Call TI	Call TI	0 to 70	MC3403
MC3403DR	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	MC3403
MC3403DR.A	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	MC3403
MC3403N	Active	Production	PDIP (N) 14	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	MC3403N
MC3403N.A	Active	Production	PDIP (N) 14	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	MC3403N
MC3403NSR	Active	Production	SOP (NS) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	MC3403
MC3403NSR.A	Active	Production	SOP (NS) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	MC3403
MC3403PWR	Obsolete	Production	TSSOP (PW) 14	-	-	Call TI	Call TI	0 to 70	M3403

⁽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.

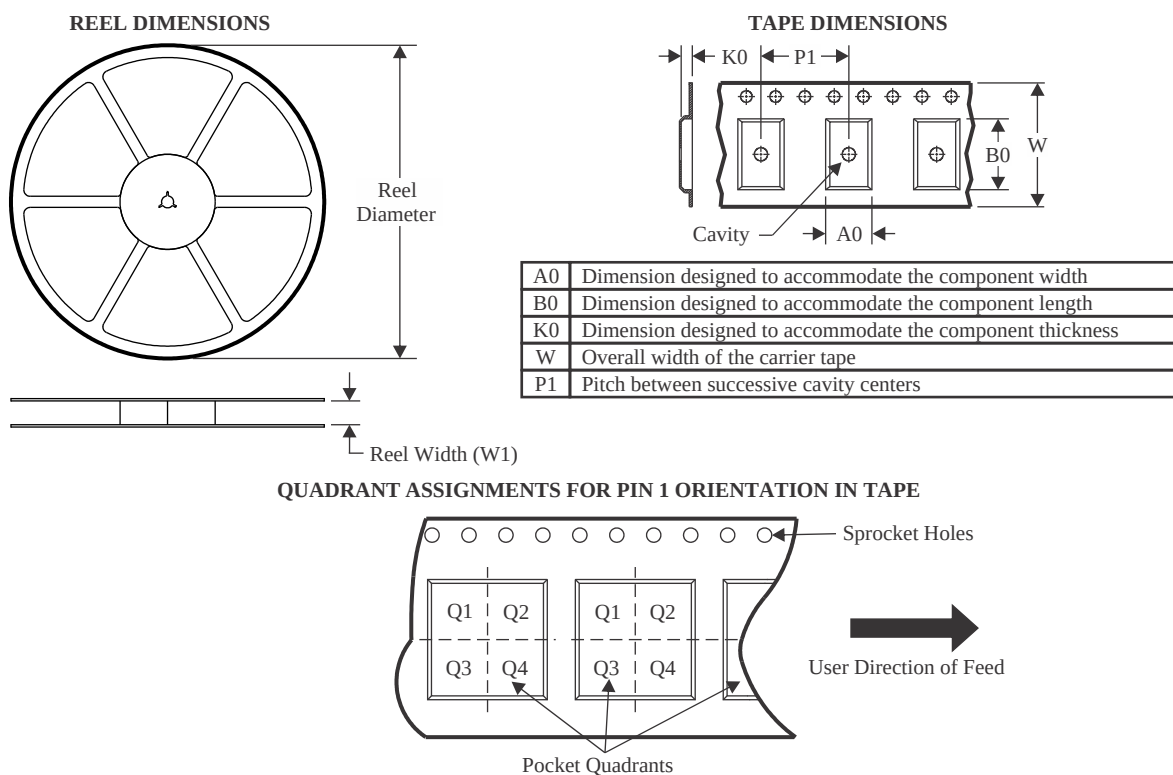
(6) Part marking: There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

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.

Important Information and Disclaimer: The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

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.

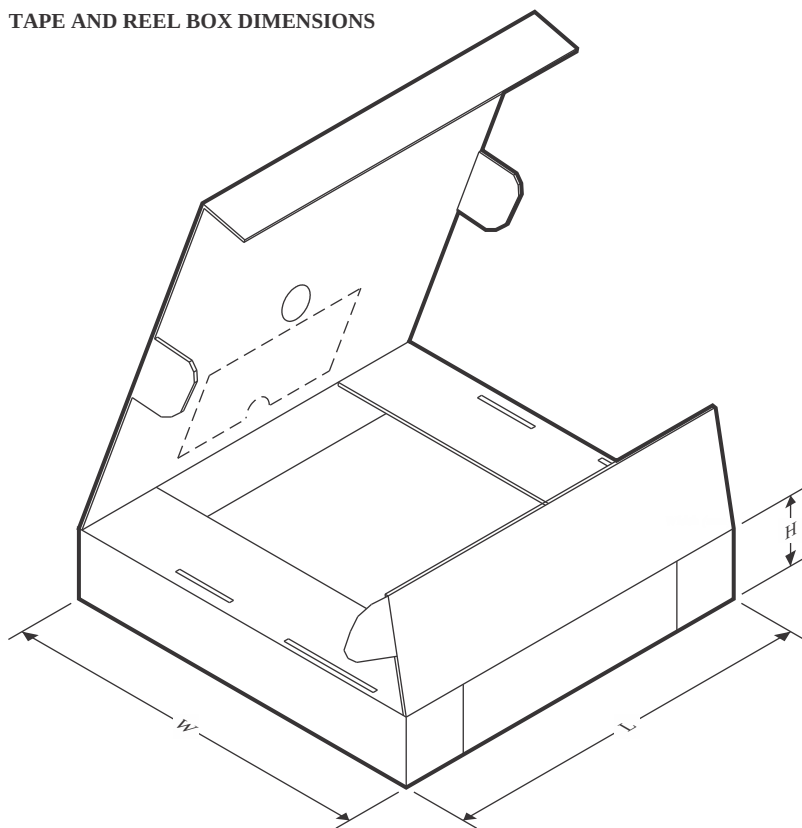
TAPE AND REEL INFORMATION



*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
MC3303DR	SOIC	D	14	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
MC3303PWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
MC3303PWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
MC3403DR	SOIC	D	14	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
MC3403DR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
MC3403NSR	SOP	NS	14	2000	330.0	16.4	8.1	10.4	2.5	12.0	16.0	Q1

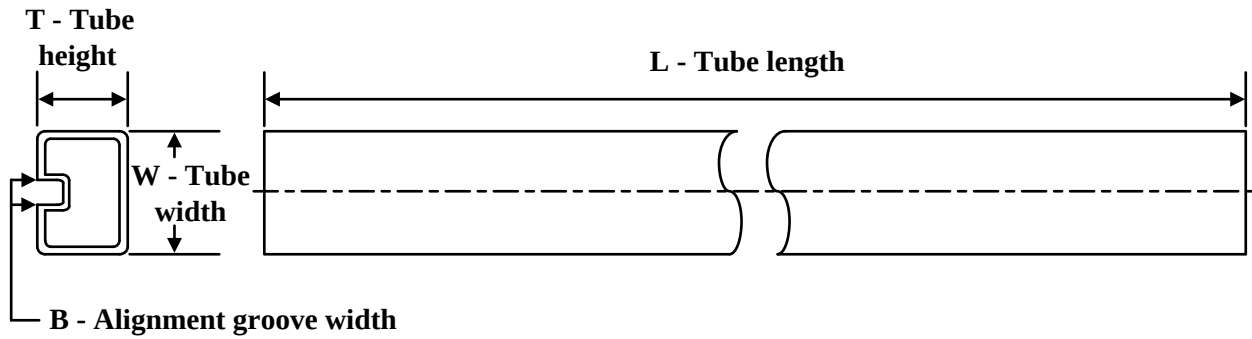
TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

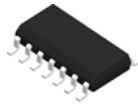
Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
MC3303DR	SOIC	D	14	2500	340.5	336.1	25.0
MC3303PWR	TSSOP	PW	14	2000	353.0	353.0	32.0
MC3303PWR	TSSOP	PW	14	2000	353.0	353.0	32.0
MC3403DR	SOIC	D	14	2500	340.5	336.1	25.0
MC3403DR	SOIC	D	14	2500	353.0	353.0	32.0
MC3403NSR	SOP	NS	14	2000	353.0	353.0	32.0

TUBE

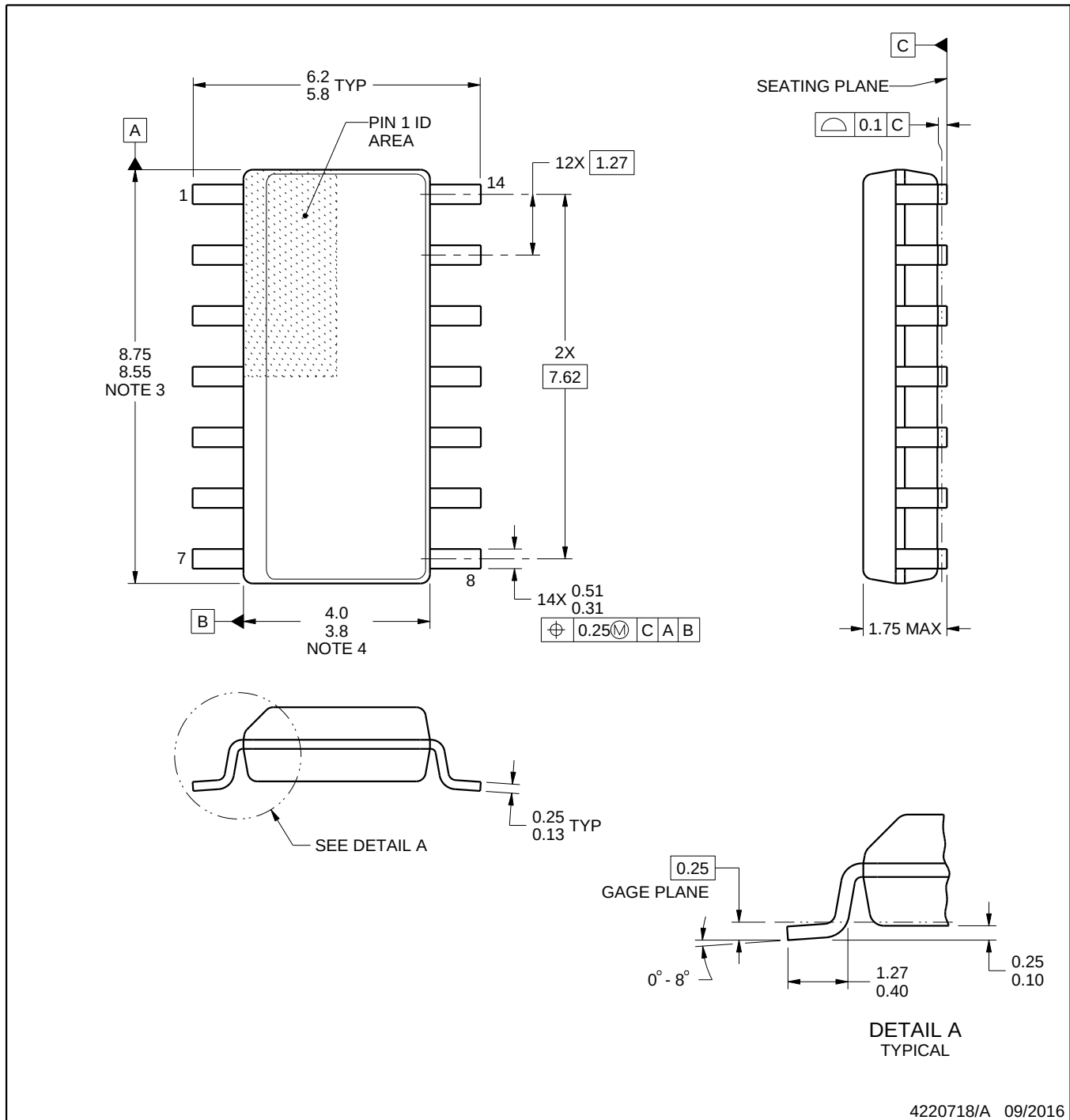


*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
MC3303N	N	PDIP	14	25	506	13.97	11230	4.32
MC3303N	N	PDIP	14	25	506	13.97	11230	4.32
MC3303N.A	N	PDIP	14	25	506	13.97	11230	4.32
MC3303N.A	N	PDIP	14	25	506	13.97	11230	4.32
MC3403N	N	PDIP	14	25	506	13.97	11230	4.32
MC3403N	N	PDIP	14	25	506	13.97	11230	4.32
MC3403N.A	N	PDIP	14	25	506	13.97	11230	4.32
MC3403N.A	N	PDIP	14	25	506	13.97	11230	4.32

D0014A**PACKAGE OUTLINE****SOIC - 1.75 mm max height**

SMALL OUTLINE INTEGRATED CIRCUIT

**NOTES:**

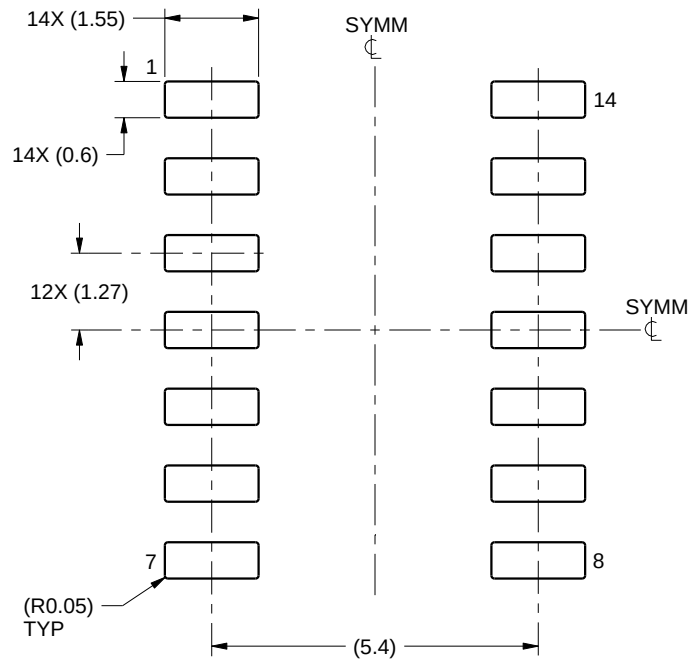
1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm, per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.43 mm, per side.
5. Reference JEDEC registration MS-012, variation AB.

EXAMPLE BOARD LAYOUT

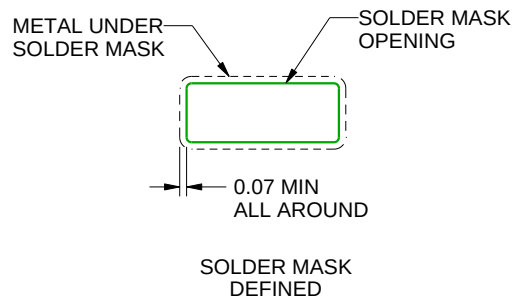
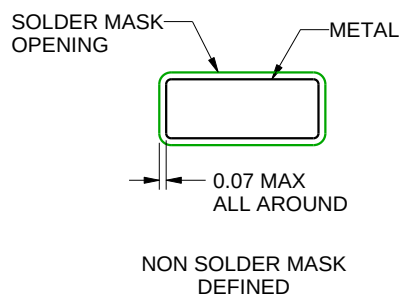
D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



LAND PATTERN EXAMPLE
SCALE:8X



SOLDER MASK DETAILS

4220718/A 09/2016

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

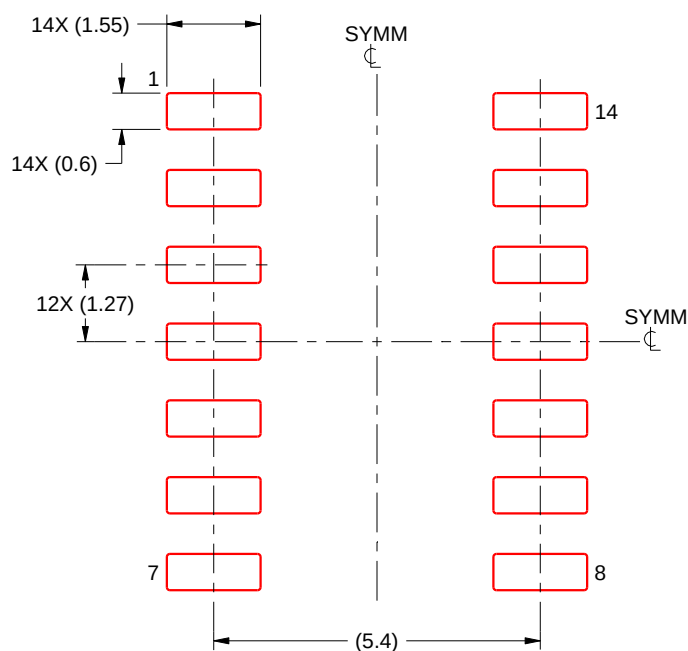
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE:8X

4220718/A 09/2016

NOTES: (continued)

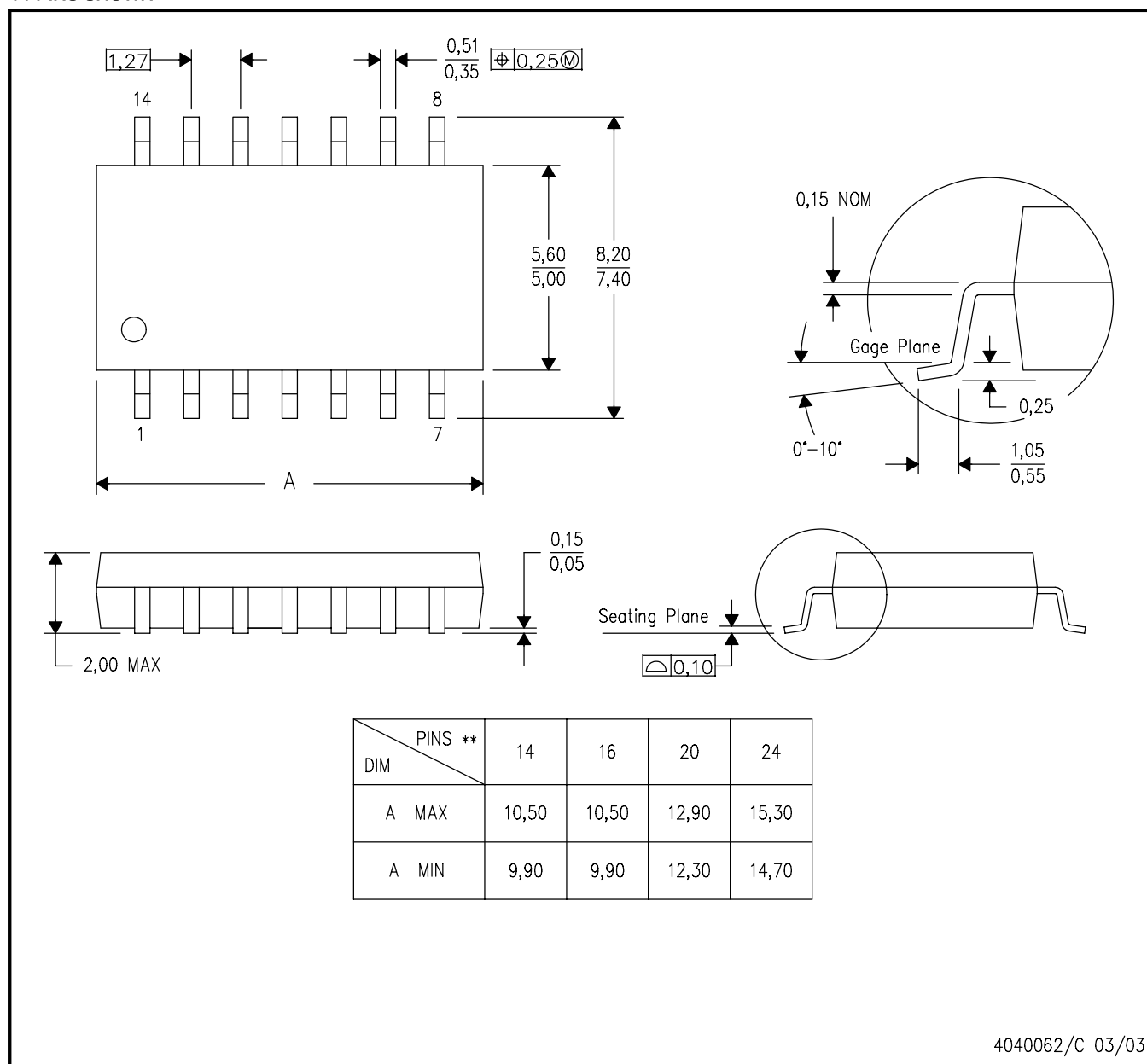
8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

MECHANICAL DATA

NS (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN

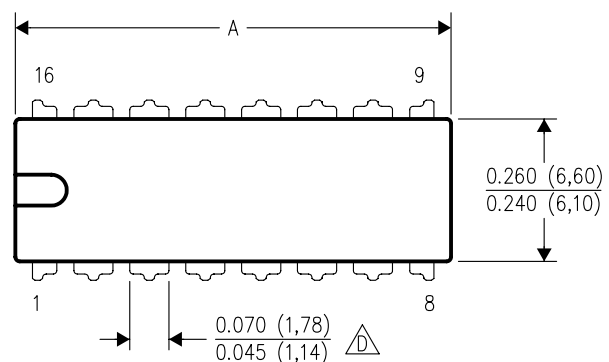


- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

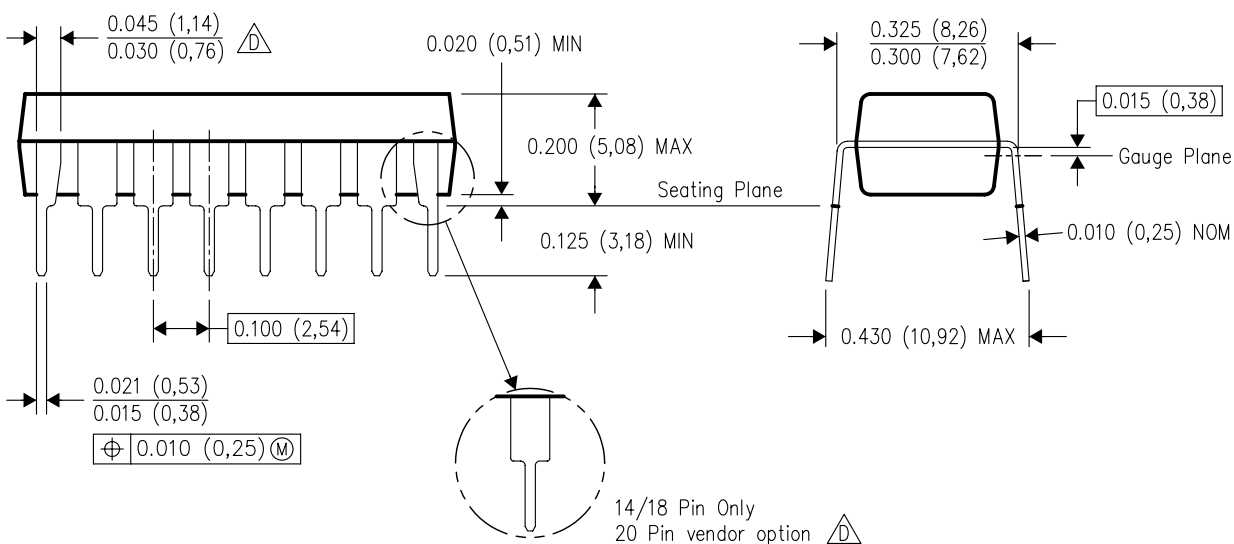
N (R-PDIP-T**)

16 PINS SHOWN

PLASTIC DUAL-IN-LINE PACKAGE



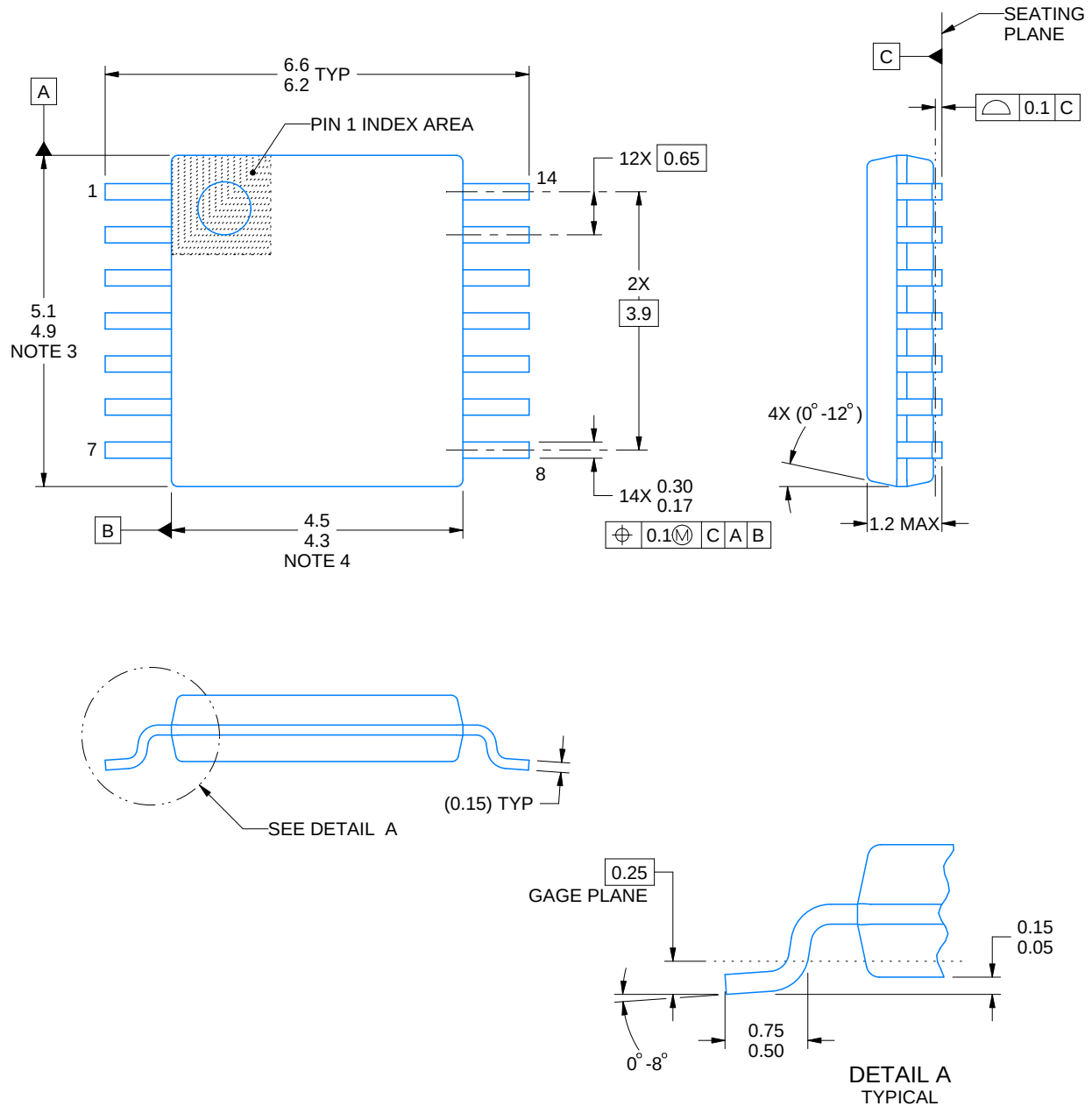
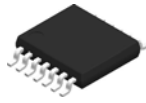
PINS ** DIM	14	16	18	20
A MAX	0.775 (19,69)	0.775 (19,69)	0.920 (23,37)	1.060 (26,92)
A MIN	0.745 (18,92)	0.745 (18,92)	0.850 (21,59)	0.940 (23,88)
MS-001 VARIATION	AA	BB	AC	AD



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.



4220202/B 12/2023

NOTES:

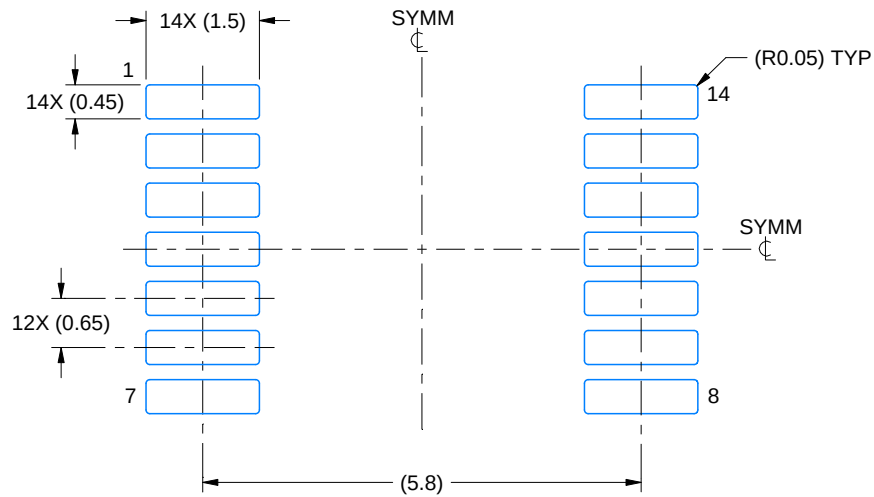
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm per side.
5. Reference JEDEC registration MO-153.

EXAMPLE BOARD LAYOUT

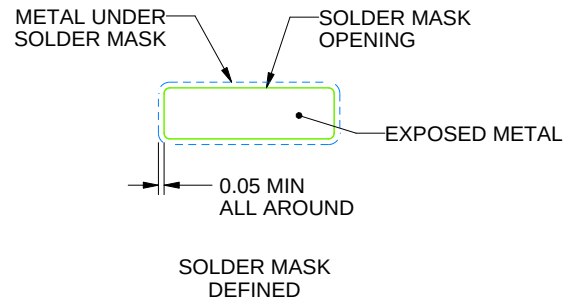
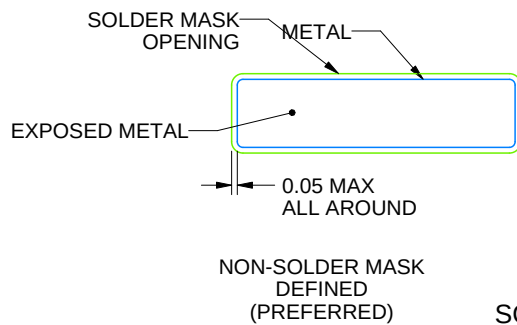
PW0014A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



SOLDER MASK DETAILS

4220202/B 12/2023

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

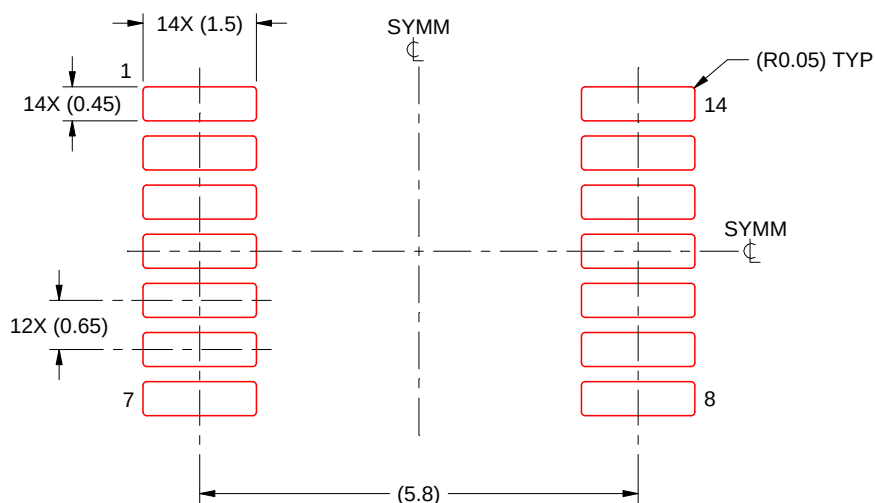
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

PW0014A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE: 10X

4220202/B 12/2023

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.

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you fully indemnify TI and its representatives against any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to [TI's Terms of Sale](#), [TI's General Quality Guidelines](#), or other applicable terms available either on [ti.com](#) or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products. Unless TI explicitly designates a product as custom or customer-specified, TI products are standard, catalog, general purpose devices.

TI objects to and rejects any additional or different terms you may propose.

Copyright © 2026, Texas Instruments Incorporated

Last updated 10/2025