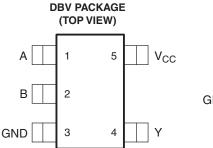
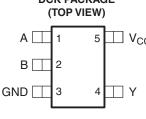


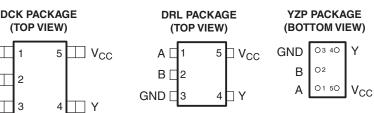
FEATURES

- Available in the Texas Instruments NanoFree[™] Package
- Optimized for 1.8-V Operation and Is 3.6-V I/O **Tolerant to Support Mixed-Mode Signal** Operation
- I_{off} Supports Partial-Power-Down Mode Operation
- Sub-1-V Operable
- Max t_{pd} of 2.4 ns at 1.8 V





- Low Power Consumption, 10-µA Max I_{cc}
- ±8-mA Output Drive at 1.8 V
- Latch-Up Performance Exceeds 100 mA Per JESD 78. Class II
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 200-V Machine Model (A115-A)
 - 1000-V Charged-Device Model (C101)



See mechanical drawings for dimensions.

DESCRIPTION/ORDERING INFORMATION

This single 2-input positive-NOR gate is operational at 0.8-V to 2.7-V V_{CC}, but is designed specifically for 1.65-V to 1.95-V V_{CC} operation.

The SN74AUC1G02 performs the Boolean function $Y = \overline{A + B}$ or $Y = \overline{A \cdot B}$ in positive logic.

NanoFree[™] package technology is a major breakthrough in IC packaging concepts, using the die as the package.

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

For more information about AUC Little Logic devices, please refer to the TI application report, Applications of Texas Instruments AUC Sub-1-V Little Logic Devices, literature number SCEA027.

T _A	PACKAGE ⁽¹⁾		ORDERABLE PART NUMBER	TOP-SIDE MARKING ⁽²⁾
	NanoFree™ – WCSP (DSBGA) 0.23-mm Large Bump – YZP (Pb-free)	Reel of 3000	SN74AUC1G02YZPR	UB_
–40°C to 85°C	SOT (SOT-23) – DBV	Reel of 3000	SN74AUC1G02DBVR	U02_
	SOT (SC-70) – DCK	Reel of 3000	SN74AUC1G02DCKR	UB_
	SOT (SOT-553) – DRL	Reel of 4000	SN74AUC1G02DRLR	UB_

ORDERING INFORMATION

(1) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI website at www.ti.com.

(2)DBV/DCK/DRL: The actual top-side marking has one additional character that designates the assembly/test site. YZP: The actual top-side marking has three preceding characters to denote year, month, and sequence code, and one following character to designate the assembly/test site. Pin 1 identifier indicates solder-bump composition (1 = SnPb, • = Pb-free).

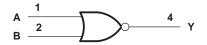


Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet. NanoFree is a trademark of Texas Instruments.

FUNCTION TABLE

INP	UTS	OUTPUT
Α	В	Y
Н	Х	L
Х	Н	L
L	L	н

LOGIC DIAGRAM (POSITIVE LOGIC)



Absolute Maximum Ratings⁽¹⁾

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

			MIN	MAX	UNIT
V _{CC}	Supply voltage range		-0.5	3.6	V
VI	Input voltage range ⁽²⁾		-0.5	3.6	V
N	Voltage range applied to any output in the h	igh-impedance or power-off state ⁽²⁾	- 0.5	3.6	V
Vo	Output voltage range ⁽²⁾		-0.5	V _{CC} + 0.5	V
I _{IK}	Input clamp current	V ₁ < 0		-50	mA
I _{OK}	Output clamp current	V _O < 0		-50	mA
I _O	Continuous output current	V ₀ < 0		±20	mA
	Continuous current through V_{CC} or GND			±100	mA
		DBV package		206	
0	Decline the strength interval (3)	DCK package		252	°C/W
θ_{JA}	Package thermal impedance ⁽³⁾	DRL package		142	-C/W
		YZP package		132	
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) The input negative-voltage and output voltage ratings may be exceeded if the input and output current ratings are observed.

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

Recommended Operating Conditions⁽¹⁾

			MIN	MAX	UNIT	
V_{CC}	Supply voltage		0.8	2.7	V	
		V _{CC} = 0.8 V	V _{CC}			
V _{IH}	High-level input voltage	$V_{CC} = 1.1 \text{ V to } 1.95 \text{ V}$	$0.65 imes V_{CC}$		V	
		V_{CC} = 2.3 V to 2.7 V	1.7			
		V _{CC} = 0.8 V		V _{CC}		
V _{IL}	Low-level input voltage	V _{CC} = 1.1 V to 1.95 V	0.	$35 \times V_{CC}$	V	
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		0.7		
VI	Input voltage		0	3.6	V	
Vo	Output voltage		0	V _{CC}	V	
		V _{CC} = 0.8 V		-0.7		
	High-level output current	V _{CC} = 1.1 V		-3		
I _{OH}		$V_{CC} = 1.4 V$		-5	mA	
		V _{CC} = 1.65 V				
		V _{CC} = 2.3 V		-9		
		V _{CC} = 0.8 V		0.7		
		V _{CC} = 1.1 V		3		
I _{OL}	Low-level output current	$V_{CC} = 1.4 V$		5	mA	
		V _{CC} = 1.65 V		8		
		V _{CC} = 2.3 V		9		
	lanut transition vise or fell rate	V _{CC} = 0.8 V to 1.95 V		20		
$\Delta t / \Delta v$	Input transition rise or fall rate	$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		10	ns/V	
T _A	Operating free-air temperature	·	-40	85	°C	

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

Electrical Characteristics

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

PARAMETER	TEST CONDITIONS	V _{cc}	MIN TYP ⁽¹⁾ MAX	UNIT		
	I _{OH} = -100 μA	0.8 V to 2.7 V	V _{CC} – 0.1			
	I _{OH} = -0.7 mA	0.8 V	0.55			
M	$I_{OH} = -3 \text{ mA}$	1.1 V	0.8	- v		
V _{OH}	$I_{OH} = -5 \text{ mA}$	1.4 V	1			
	$I_{OH} = -8 \text{ mA}$	1.65 V	1.2	1		
	$I_{OH} = -9 \text{ mA}$	2.3 V	1.8			
	I _{OL} = 100 μA	0.8 V to 2.7 V	0.2			
	I _{OL} = 0.7 mA	0.8 V	0.25			
N	I _{OL} = 3 mA	1.1 V	0.3	.3 V		
V _{OL}	I _{OL} = 5 mA	1.4 V	0.4	V		
	I _{OL} = 8 mA	1.65 V	0.45			
	I _{OL} = 9 mA	2.3 V	0.6			
I _I A input	V _I = V _{CC} or GND	0 to 2.7 V	±5	μA		
l _{off}	$V_{I} = V_{O} \text{ or } 2.7 \text{ V}$	0	±10	μA		
I _{CC}	$V_{I} = V_{CC} \text{ or GND}, \qquad I_{O} = 0$	0.8 V to 2.7 V	10	μA		
Ci	V _I = V _{CC} or GND	2.5 V	3	pF		

(1) All typical values are at $T_A = 25^{\circ}C$.

SN74AUC1G02 SINGLE 2-INPUT POSITIVE-NOR GATE

SCES369P-SEPTEMBER 2001-REVISED MARCH 2007

Switching Characteristics

over recommended operating free-air temperature range, $C_L = 15 \text{ pF}$ (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 0.8 V$ $V_{CC} = 1.2 V \\ \pm 0.1 V$		V_{CC} = 1.5 V ± 0.1 V		V _{CC} = 1.8 V ± 0.15 V		$\begin{array}{c} V_{CC} \texttt{= 2.5 V} \\ \pm \texttt{0.2 V} \end{array}$		UNIT		
			TYP	MIN	MAX	MIN	MAX	MIN	TYP	MAX	MIN	MAX	
t _{pd}	A or B	Y	4.6	0.9	3.2	0.5	2.2	0.4	1	1.9	0.2	1.7	ns

Switching Characteristics

over recommended operating free-air temperature range, $C_L = 30 \text{ pF}$ (unless otherwise noted) (see Figure 1)

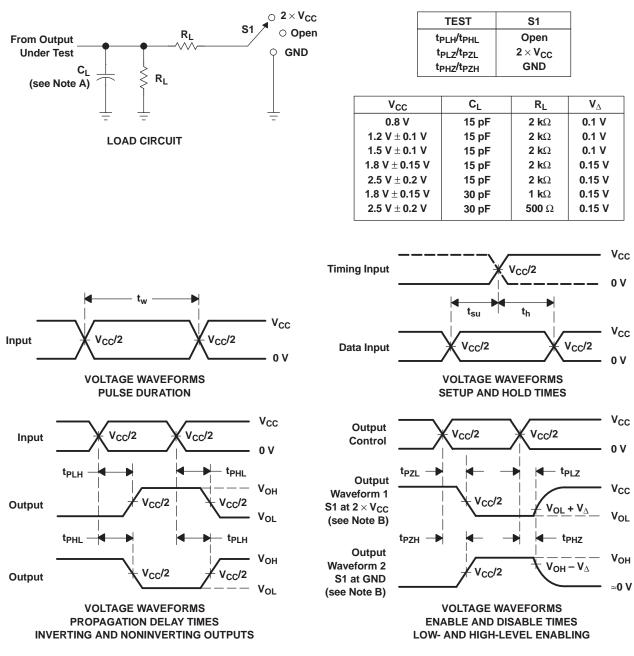
PARAMETER	FROM (INPUT)	TO (OUTPUT)		c = 1.8 \ 0.15 V	/	V_{CC} = 2.5 V ± 0.2 V		UNIT
	(INFOT)		MIN	TYP	MAX	MIN	MAX	
t _{pd}	A or B	Y	0.7	1.3	2.4	0.5	2.1	ns

Operating Characteristics

 $T_A = 25^{\circ}C$

	PARAMETER	TEST CONDITIONS	V _{CC} = 0.8 V TYP	V _{CC} = 1.2 V TYP	V _{CC} = 1.5 V TYP	V _{CC} = 1.8 V TYP	V _{CC} = 2.5 V TYP	UNIT
C _{pd}	Power dissipation capacitance	f = 10 MHz	15	15	15	15	19	pF

PARAMETER MEASUREMENT INFORMATION



NOTES: A. C_L includes probe and jig capacitance.

- B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
- C. All input pulses are supplied by generators having the following characteristics: PRR \leq 10 MHz, Z_O = 50 Ω , slew rate \geq 1 V/ns.
- D. The outputs are measured one at a time, with one transition per measurement.
- E. t_{PLZ} and t_{PHZ} are the same as t_{dis} .
- F. t_{PZL} and t_{PZH} are the same as t_{en} .
- G. t_{PLH} and t_{PHL} are the same as t_{pd} .
- H. All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuit and Voltage Waveforms



PACKAGING INFORMATION

Orderable part number	Status	Material type	Package Pins	Package qty Carrier	RoHS	Lead finish/	MSL rating/	Op temp (°C)	Part marking
	(1)	(2)			(3)	Ball material	Peak reflow		(6)
						(4)	(5)		
SN74AUC1G02DBVR	Active	Production	SOT-23 (DBV) 5	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	U02R
SN74AUC1G02DBVR.B	Active	Production	SOT-23 (DBV) 5	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	U02R
SN74AUC1G02DCKR	Active	Production	SC70 (DCK) 5	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	UBR
SN74AUC1G02DCKR.B	Active	Production	SC70 (DCK) 5	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	UBR
SN74AUC1G02DCKRG4	Active	Production	SC70 (DCK) 5	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	UBR
SN74AUC1G02DCKRG4.B	Active	Production	SC70 (DCK) 5	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	UBR
SN74AUC1G02DRLR	Active	Production	SOT-5X3 (DRL) 5	4000 LARGE T&R	Yes	NIPDAUAG	Level-1-260C-UNLIM	-40 to 85	(UB7, UBR)
SN74AUC1G02DRLR.B	Active	Production	SOT-5X3 (DRL) 5	4000 LARGE T&R	Yes	NIPDAUAG	Level-1-260C-UNLIM	-40 to 85	(UB7, UBR)
SN74AUC1G02YZPR	Active	Production	DSBGA (YZP) 5	3000 LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 85	UB
SN74AUC1G02YZPR.B	Active	Production	DSBGA (YZP) 5	3000 LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 85	UB

⁽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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PACKAGE OPTION ADDENDUM

17-Jun-2025

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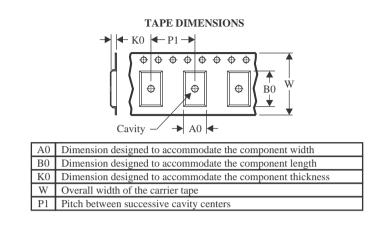


Texas

STRUMENTS

TAPE AND REEL INFORMATION





QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal												
Device	Package Type	Package Drawing		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74AUC1G02DBVR	SOT-23	DBV	5	3000	180.0	8.4	3.23	3.17	1.37	4.0	8.0	Q3
SN74AUC1G02DCKR	SC70	DCK	5	3000	180.0	8.4	2.47	2.3	1.25	4.0	8.0	Q3
SN74AUC1G02DCKRG4	SC70	DCK	5	3000	180.0	8.4	2.47	2.3	1.25	4.0	8.0	Q3
SN74AUC1G02DRLR	SOT-5X3	DRL	5	4000	180.0	8.4	1.98	1.78	0.69	4.0	8.0	Q3
SN74AUC1G02YZPR	DSBGA	YZP	5	3000	180.0	8.4	1.02	1.52	0.63	4.0	8.0	Q1



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PACKAGE MATERIALS INFORMATION

18-Jun-2025



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74AUC1G02DBVR	SOT-23	DBV	5	3000	202.0	201.0	28.0
SN74AUC1G02DCKR	SC70	DCK	5	3000	202.0	201.0	28.0
SN74AUC1G02DCKRG4	SC70	DCK	5	3000	202.0	201.0	28.0
SN74AUC1G02DRLR	SOT-5X3	DRL	5	4000	202.0	201.0	28.0
SN74AUC1G02YZPR	DSBGA	YZP	5	3000	182.0	182.0	20.0

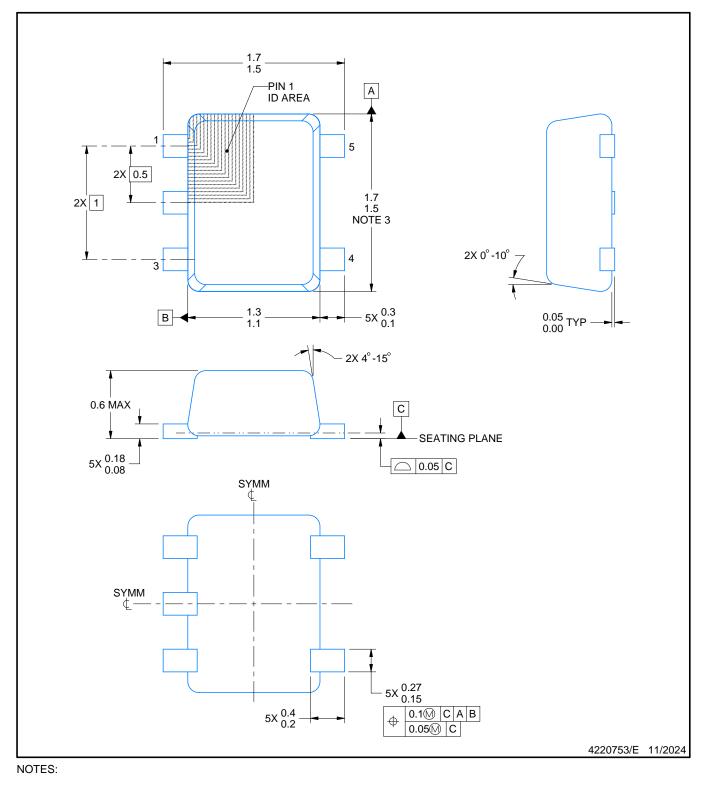
DRL0005A



PACKAGE OUTLINE

SOT - 0.6 mm max height

PLASTIC SMALL OUTLINE



- All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
 This drawing is subject to change without notice.
 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. Reference JEDEC registration MO-293 Variation UAAD-1

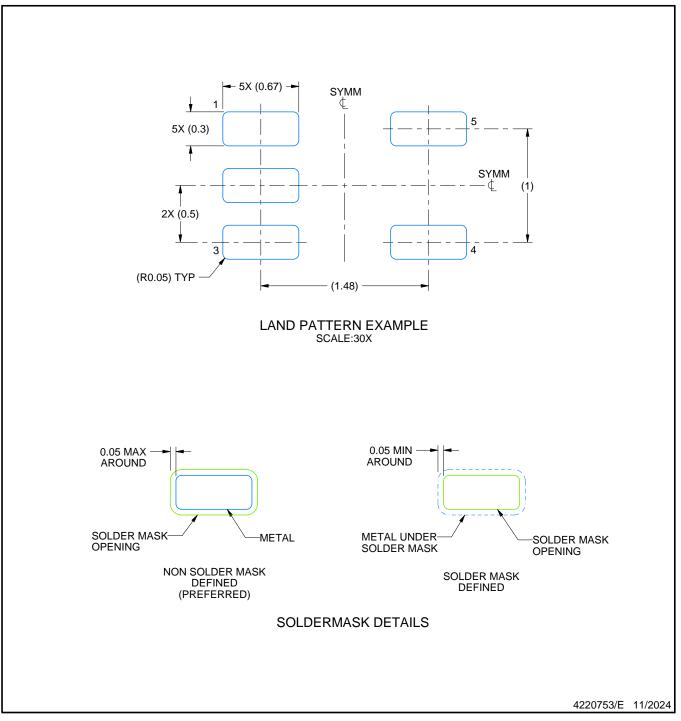


DRL0005A

EXAMPLE BOARD LAYOUT

SOT - 0.6 mm max height

PLASTIC SMALL OUTLINE



NOTES: (continued)

5. Publication IPC-7351 may have alternate designs.

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

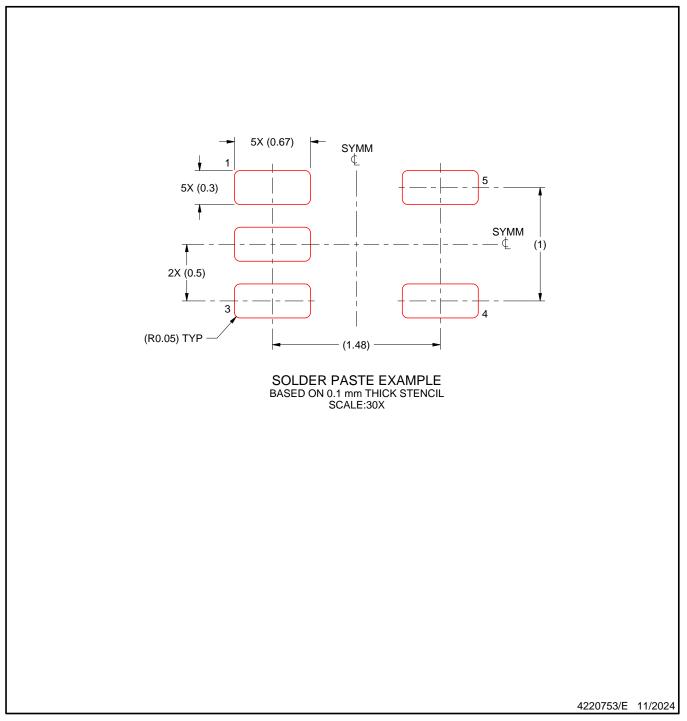


DRL0005A

EXAMPLE STENCIL DESIGN

SOT - 0.6 mm max height

PLASTIC SMALL OUTLINE



NOTES: (continued)

7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.

8. Board assembly site may have different recommendations for stencil design.



YZP0005



PACKAGE OUTLINE

DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



- 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.



YZP0005

EXAMPLE BOARD LAYOUT

DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



NOTES: (continued)

3. Final dimensions may vary due to manufacturing tolerance considerations and also routing constraints. For more information, see Texas Instruments literature number SNVA009 (www.ti.com/lit/snva009).

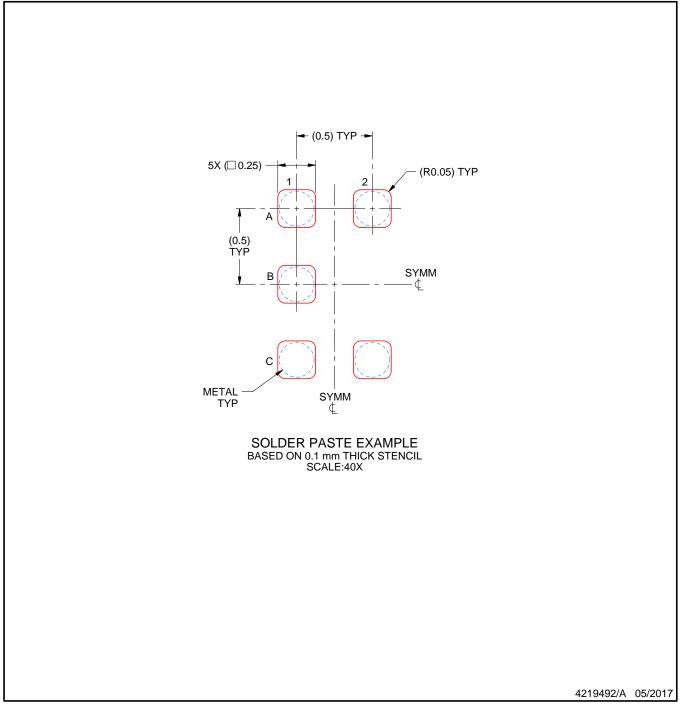


YZP0005

EXAMPLE STENCIL DESIGN

DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



NOTES: (continued)

4. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release.



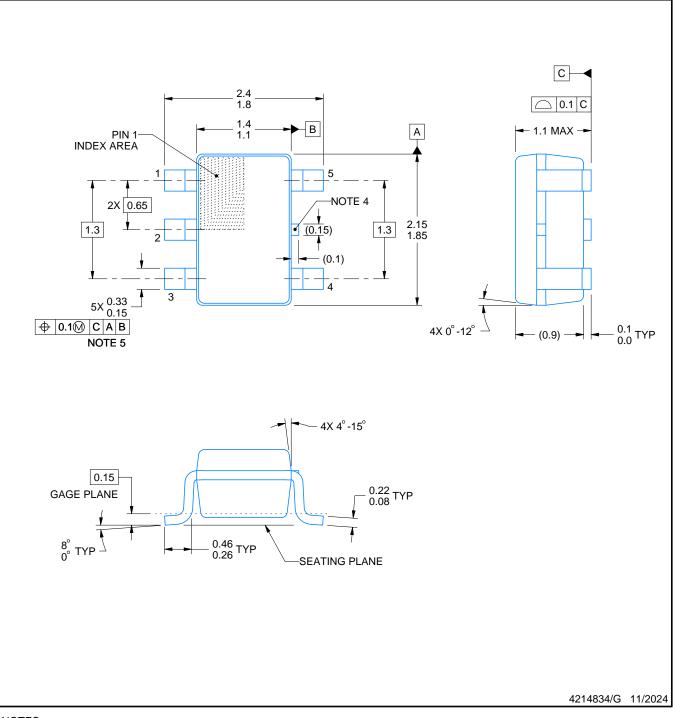
DCK0005A



PACKAGE OUTLINE

SOT - 1.1 max height

SMALL OUTLINE TRANSISTOR



NOTES:

- 1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
 This drawing is subject to change without notice.
 Reference JEDEC MO-203.

- 4. Support pin may differ or may not be present.5. Lead width does not comply with JEDEC.
- 6. Body dimensions do not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.25mm per side



DCK0005A

EXAMPLE BOARD LAYOUT

SOT - 1.1 max height

SMALL OUTLINE TRANSISTOR



NOTES: (continued)

Publication IPC-7351 may have alternate designs.
 Solder mask tolerances between and around signal pads can vary based on board fabrication site.



DCK0005A

EXAMPLE STENCIL DESIGN

SOT - 1.1 max height

SMALL OUTLINE TRANSISTOR



NOTES: (continued)

9. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.

10. Board assembly site may have different recommendations for stencil design.



DBV0005A



PACKAGE OUTLINE

SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



NOTES:

- 1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
 This drawing is subject to change without notice.
 Reference JEDEC MO-178.

- 4. Body dimensions do not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.25 mm per side.
- 5. Support pin may differ or may not be present.



DBV0005A

EXAMPLE BOARD LAYOUT

SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



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.



DBV0005A

EXAMPLE STENCIL DESIGN

SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



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.



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