

## Dual 2-Input NAND Gate With Schmitt-Trigger Inputs

Check for Samples: [SN74LVC2G132](#)

### FEATURES

- Available in Texas Instruments NanoFree™ Package
- Supports 5-V  $V_{CC}$  Operation
- Inputs Accept Voltages to 5.5 V
- Max  $t_{pd}$  of 5.3 ns at 3.3 V
- Low Power Consumption, 10- $\mu$ A Max  $I_{CC}$
- $\pm 24$ -mA Output Drive at 3.3 V
- Typical  $V_{OLP}$  (Output Ground Bounce)  $< 0.8$  V at  $V_{CC} = 3.3$  V,  $T_A = 25^\circ\text{C}$
- Typical  $V_{OHV}$  (Output  $V_{OH}$  Undershoot)  $> 2$  V at  $V_{CC} = 3.3$  V,  $T_A = 25^\circ\text{C}$
- $I_{off}$  Supports Live Insertion, Partial Power Down Mode, and Back Drive Protection
- Support Translation Down (5V to 3.3V and 3.3V to 1.8V)
- 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)

### DESCRIPTION

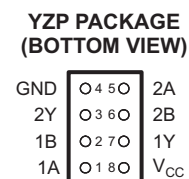
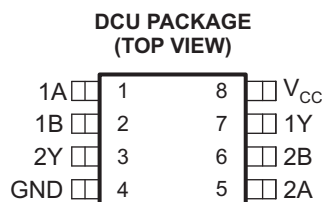
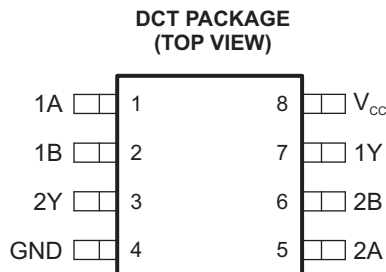
This dual 2-input NAND gate with Schmitt-trigger inputs is designed for 1.65-V to 5.5-V  $V_{CC}$  operation.

The SN74LVC2G132 contains two inverters and performs the Boolean function  $Y = \overline{A \cdot B}$  or  $Y = \overline{A} + \overline{B}$  in positive logic. The device functions as two independent inverters, but because of Schmitt action, it has different input threshold levels for positive-going ( $V_{T+}$ ) and negative-going ( $V_{T-}$ ) signals.

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

This device can be triggered from the slowest of input ramps and still give clean jitter-free output signals.

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.



See mechanical drawings for dimensions.



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PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of the Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

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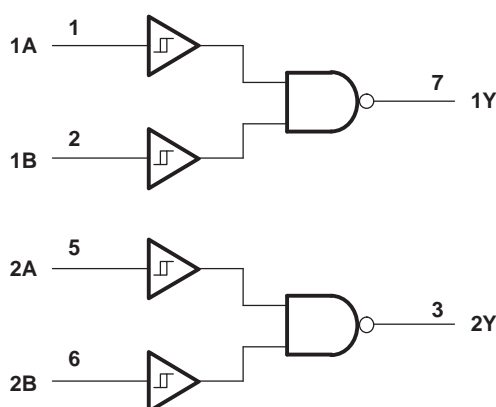


These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

**Function Table  
(Each Gate)**

INPUTS		OUTPUT Y
A	B	
L	L	H
L	H	H
H	L	H
H	H	L

**Logic Diagram (Positive Logic)**



### Absolute Maximum Ratings<sup>(1)</sup>

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

Over operating free air temperature range (unless otherwise noted)			MIN	MAX	UNIT
V <sub>CC</sub>	Supply voltage range		−0.5	6.5	V
V <sub>I</sub>	Input voltage range <sup>(2)</sup>		−0.5	6.5	V
V <sub>O</sub>	Voltage range applied to any output in the high-impedance or power-off state <sup>(2)</sup>		−0.5	6.5	V
V <sub>O</sub>	Voltage range applied to any output in the high or low state <sup>(2) (3)</sup>		−0.5	V <sub>CC</sub> + 0.5	V
I <sub>IK</sub>	Input clamp current	V <sub>I</sub> < 0		−50	mA
I <sub>OK</sub>	Output clamp current	V <sub>O</sub> < 0		−50	mA
I <sub>O</sub>	Continuous output current			±50	mA
	Continuous current through V <sub>CC</sub> or GND			±100	mA
θ <sub>JA</sub>	Package thermal impedance <sup>(4)</sup>	DCT package		220	°C/W
		DCU package		227	
		YZP package		102	
T <sub>stg</sub>	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 and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.
- (3) The value of  $V_{CC}$  is provided in the recommended operating conditions table.
- (4) The package thermal impedance is calculated in accordance with JESD 51-7

**Recommended Operating Conditions<sup>(1)</sup>**

			MIN	MAX	UNIT
$V_{CC}$	Supply voltage	Operating	1.65	5.5	V
		Data retention only	1.5		
$V_I$	Input voltage		0	5.5	V
$V_O$	Output voltage		0	$V_{CC}$	V
$I_{OH}$	High-level output current	$V_{CC} = 1.65\text{ V}$		–4	mA
		$V_{CC} = 2.3\text{ V}$		–8	
		$V_{CC} = 3\text{ V}$		–16	
				–24	
		$V_{CC} = 4.5\text{ V}$		–32	
$I_{OL}$	Low-level output current	$V_{CC} = 1.65\text{ V}$		4	mA
		$V_{CC} = 2.3\text{ V}$		8	
		$V_{CC} = 3\text{ V}$		16	
				24	
		$V_{CC} = 4.5\text{ V}$		32	
$T_A$	Operating free-air temperature		–40	125	°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 <sub>CC</sub>	–40°C to 85°C			–40°C to 125°C			UNI T
				MIN	TYP <sup>(1)</sup>	MAX	MIN	TYP <sup>(1)</sup>	MAX	
V <sub>T+</sub> Positive-going input threshold voltage			1.65 V	0.79		1.16	0.79		1.16	V
			2.3 V	1.11		1.56	1.11		1.56	
			3 V	1.5		1.87	1.5		1.87	
			4.5 V	2.16		2.74	2.16		2.74	
			5.5 V	2.61		3.33	2.61		3.33	
V <sub>T–</sub> Negative-going input threshold voltage			1.65 V	0.39		0.62	0.39		0.62	V
			2.3 V	0.58		0.87	0.58		0.87	
			3 V	0.84		1.14	0.84		1.14	
			4.5 V	1.41		1.79	1.41		1.79	
			5.5 V	1.87		2.29	1.87		2.29	
ΔV <sub>T</sub> Hysteresis (V <sub>T+</sub> – V <sub>T–</sub> )			1.65 V	0.37		0.62	0.37		0.62	V
			2.3 V	0.48		0.77	0.48		0.77	
			3 V	0.56		0.87	0.56		0.87	
			4.5 V	0.71		1.04	0.71		1.04	
			5.5 V	0.71		1.11	0.71		1.11	
V <sub>OH</sub>		I <sub>OH</sub> = –100 μA	1.65 V to 5.5 V	V <sub>CC</sub> – 0.1			V <sub>CC</sub> – 0.1			V
		I <sub>OH</sub> = –4 mA	1.65 V	1.2			1.2			
		I <sub>OH</sub> = –8 mA	2.3 V	1.9			1.9			
		I <sub>OH</sub> = –16 mA	3 V	2.4			2.4			
		I <sub>OH</sub> = –24 mA		2.3			2.3			
		I <sub>OH</sub> = –32 mA	4.5 V	3.8			3.8			
V <sub>OL</sub>		I <sub>OL</sub> = 100 μA	1.65 V to 5.5 V	0.1			0.1			V
		I <sub>OL</sub> = 4 mA	1.65 V	0.45			0.45			
		I <sub>OL</sub> = 8 mA	2.3 V	0.3			0.3			
		I <sub>OL</sub> = 16 mA	3 V	0.4			0.4			
		I <sub>OL</sub> = 24 mA		0.55			0.65			
		I <sub>OL</sub> = 32 mA	4.5 V	0.55			0.65			
I <sub>I</sub>	A or B inputs	V <sub>I</sub> = 5.5 V or GND	1.65 V to 5.5 V	±1			±1			μA
I <sub>off</sub>		V <sub>I</sub> or V <sub>O</sub> = 5.5 V	0	±10			±10			μA
I <sub>CC</sub>		V <sub>I</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0	1.65 V to 5.5 V	10			10			μA
ΔI <sub>CC</sub>		One input at V <sub>CC</sub> – 0.6 V, Other inputs at V <sub>CC</sub> or GND	3 V to 5.5 V	500			500			μA
C <sub>I</sub>		V <sub>I</sub> = V <sub>CC</sub> or GND	3.3 V	3.5						pF

(1) All typical values are at V<sub>CC</sub> = 3.3 V, T<sub>A</sub> = 25°C.

## Switching Characteristics

over recommended operating free-air temperature range,  $C_L = 15$  pF (unless otherwise noted) (see [Figure 1](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	SN74LVC2G132 –40°C to 85°C								UNIT
			V <sub>CC</sub> = 1.8 V ± 0.15 V		V <sub>CC</sub> = 2.5 V ± 0.2 V		V <sub>CC</sub> = 3.3 V ± 0.3 V		V <sub>CC</sub> = 5 V ± 0.5 V		
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t <sub>pd</sub>	A or B	Y	4	16	2.5	7	2	5.3	1.5	4.4	ns

## Switching Characteristics

over recommended operating free-air temperature range,  $C_L = 30$  pF or 50 pF (unless otherwise noted) (see [Figure 2](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	SN74LVC2G132 –40°C to 85°C				UNIT				
			V <sub>CC</sub> = 1.8 V ± 0.15 V		V <sub>CC</sub> = 2.5 V ± 0.2 V			V <sub>CC</sub> = 3.3 V ± 0.3 V		V <sub>CC</sub> = 5 V ± 0.5 V	
			MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
t <sub>pd</sub>	A or B	Y	4	16	3	7.5	2	6	2	5	ns

## Switching Characteristics

over recommended operating free-air temperature range,  $C_L = 30$  pF or 50 pF (unless otherwise noted) (see [Figure 2](#))

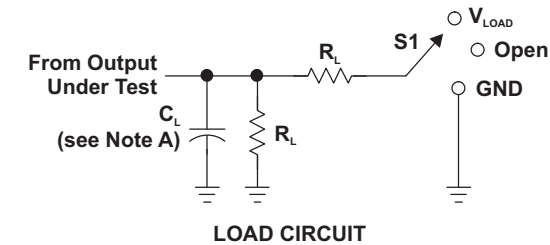
PARAMETER	FROM (INPUT)	TO (OUTPUT)	SN74LVC2G132 –40°C to 125°C						UNIT		
			V <sub>CC</sub> = 1.8 V ± 0.15 V		V <sub>CC</sub> = 2.5 V ± 0.2 V		V <sub>CC</sub> = 3.3 V ± 0.3 V			V <sub>CC</sub> = 5 V ± 0.5 V	
			MIN	MAX	MIN	MAX	MIN	MAX		MIN	MAX
t <sub>pd</sub>	A or B	Y	4	17	3	8.5	2	7	2	6	ns

## Operating Characteristics

$T_A = 25^\circ\text{C}$

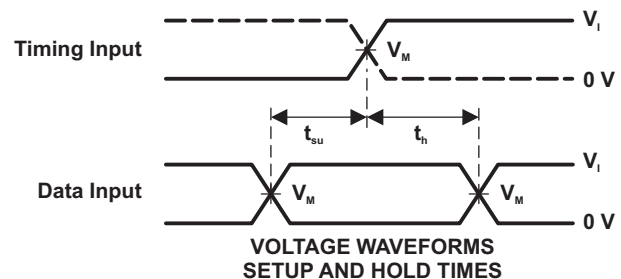
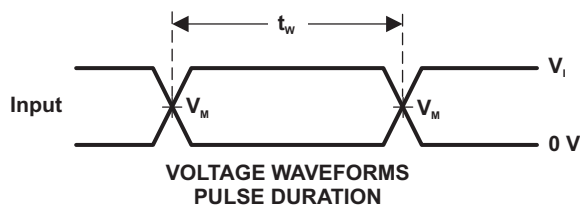
PARAMETER		TEST CONDITIONS	$V_{CC} = 1.8\text{ V}$	$V_{CC} = 2.5\text{ V}$	$V_{CC} = 3.3\text{ V}$	$V_{CC} = 5\text{ V}$	UNIT
			TYP	TYP	TYP	TYP	
$C_{pd}$	Power dissipation capacitance	$f = 10\text{ MHz}$	17	18	18	20	pF

## Parameter Measurement Information



TEST	S1
$t_{PLH}/t_{PHL}$	Open
$t_{PLZ}/t_{PZL}$	$V_{LOAD}$
$t_{PHZ}/t_{PZH}$	GND

$V_{CC}$	INPUTS		$V_M$	$V_{LOAD}$	$C_L$	$R_L$	$V_{\Delta}$
	$V_I$	$t_r/t_f$					
$1.8\text{ V} \pm 0.15\text{ V}$	$V_{CC}$	$\leq 2\text{ ns}$	$V_{CC}/2$	$2 \times V_{CC}$	15 pF	1 M $\Omega$	0.15 V
$2.5\text{ V} \pm 0.2\text{ V}$	$V_{CC}$	$\leq 2\text{ ns}$	$V_{CC}/2$	$2 \times V_{CC}$	15 pF	1 M $\Omega$	0.15 V
$3.3\text{ V} \pm 0.3\text{ V}$	3 V	$\leq 2.5\text{ ns}$	1.5 V	6 V	15 pF	1 M $\Omega$	0.3 V
$5\text{ V} \pm 0.5\text{ V}$	$V_{CC}$	$\leq 2.5\text{ ns}$	$V_{CC}/2$	$2 \times V_{CC}$	15 pF	1 M $\Omega$	0.3 V



- NOTES:
- $C_L$  includes probe and jig capacitance.
  - Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
  - All input pulses are supplied by generators having the following characteristics: PRR  $\leq 10\text{ MHz}$ ,  $Z_o = 50\ \Omega$ .
  - The outputs are measured one at a time, with one transition per measurement.
  - $t_{PLZ}$  and  $t_{PHZ}$  are the same as  $t_{dis}$ .
  - $t_{PZL}$  and  $t_{PZH}$  are the same as  $t_{en}$ .
  - $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{pd}$ .
  - All parameters and waveforms are not applicable to all devices.

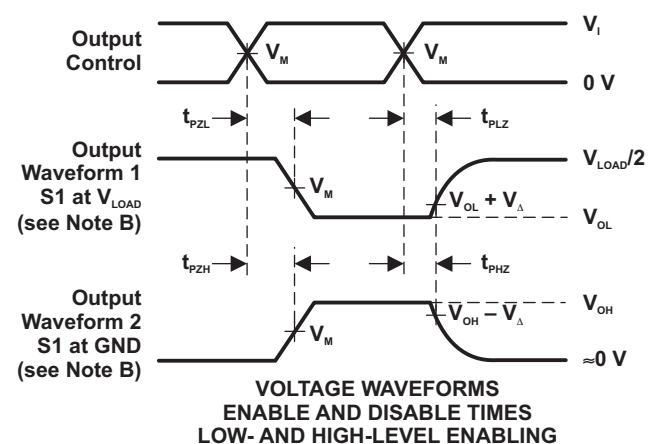
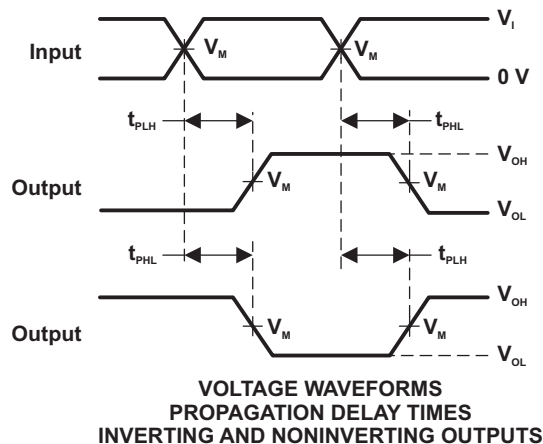
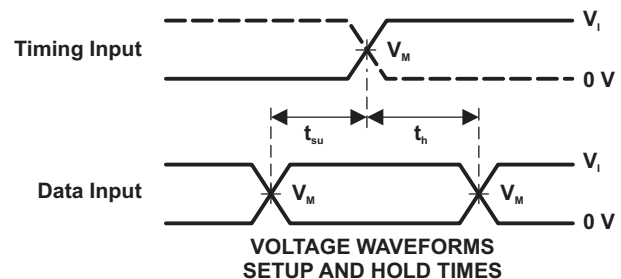
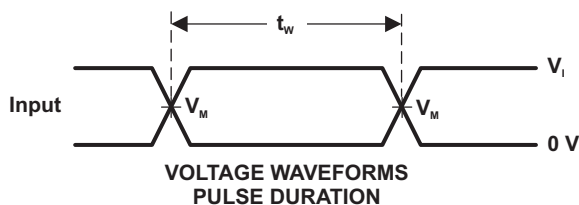
**Figure 1. Load Circuit and Voltage Waveforms**

## Parameter Measurement Information



TEST	S1
$t_{PLH}/t_{PHL}$	Open
$t_{PLZ}/t_{PZL}$	$V_{LOAD}$
$t_{PHZ}/t_{PZH}$	GND

$V_{CC}$	INPUTS		$V_M$	$V_{LOAD}$	$C_L$	$R_L$	$V_{\Delta}$
	$V_I$	$t_f/t_r$					
$1.8\text{ V} \pm 0.15\text{ V}$	$V_{CC}$	$\leq 2\text{ ns}$	$V_{CC}/2$	$2 \times V_{CC}$	30 pF	1 k $\Omega$	0.15 V
$2.5\text{ V} \pm 0.2\text{ V}$	$V_{CC}$	$\leq 2\text{ ns}$	$V_{CC}/2$	$2 \times V_{CC}$	30 pF	500 $\Omega$	0.15 V
$3.3\text{ V} \pm 0.3\text{ V}$	3 V	$\leq 2.5\text{ ns}$	1.5 V	6 V	50 pF	500 $\Omega$	0.3 V
$5\text{ V} \pm 0.5\text{ V}$	$V_{CC}$	$\leq 2.5\text{ ns}$	$V_{CC}/2$	$2 \times V_{CC}$	50 pF	500 $\Omega$	0.3 V



- NOTES:
- $C_L$  includes probe and jig capacitance.
  - Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
  - All input pulses are supplied by generators having the following characteristics: PRR  $\leq 10\text{ MHz}$ ,  $Z_o = 50\ \Omega$ .
  - The outputs are measured one at a time, with one transition per measurement.
  - $t_{PLZ}$  and  $t_{PHZ}$  are the same as  $t_{dis}$ .
  - $t_{PZL}$  and  $t_{PZH}$  are the same as  $t_{en}$ .
  - $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{pd}$ .
  - All parameters and waveforms are not applicable to all devices.

Figure 2. Load Circuit and Voltage Waveforms

## REVISION HISTORY

Changes from Revision C (January 2007) to Revision D	Page
• Updated document to new TI data sheet format. ....	1
• Removed Ordering Information table. ....	1
• Added ESD warning. ....	2
• Updated operating temperature range. ....	3



## 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)
<a href="#">74LVC2G132DCTRG4</a>	Active	Production	SSOP (DCT)   8	3000   LARGE T&R	Yes	NIPDAU   NIPDAU	Level-1-260C-UNLIM	-40 to 125	C3B (R, Z)
74LVC2G132DCTRG4.Z	Active	Production	SSOP (DCT)   8	3000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C3B (R, Z)
<a href="#">74LVC2G132DCURG4</a>	Active	Production	VSSOP (DCU)   8	3000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C3BR
74LVC2G132DCURG4.Z	Active	Production	VSSOP (DCU)   8	3000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C3BR
<a href="#">74LVC2G132DCUTG4</a>	Active	Production	VSSOP (DCU)   8	250   SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-	C3BR
74LVC2G132DCUTG4.Z	Active	Production	VSSOP (DCU)   8	250   SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C3BR
<a href="#">SN74LVC2G132DCTR</a>	Active	Production	SSOP (DCT)   8	3000   LARGE T&R	Yes	NIPDAU   SN   NIPDAU	Level-1-260C-UNLIM	-40 to 125	(2WM5, C3B) (R, Z)
SN74LVC2G132DCTR.Z	Active	Production	SSOP (DCT)   8	3000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	(2WM5, C3B) (R, Z)
<a href="#">SN74LVC2G132DCUR</a>	Active	Production	VSSOP (DCU)   8	3000   LARGE T&R	Yes	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	(3B, C3BJ, C3BR) CZ
SN74LVC2G132DCUR.Z	Active	Production	VSSOP (DCU)   8	3000   LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 125	(3B, C3BJ, C3BR) CZ
<a href="#">SN74LVC2G132DCUT</a>	Active	Production	VSSOP (DCU)   8	250   SMALL T&R	Yes	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	(C3BJ, C3BR)
SN74LVC2G132DCUT.Z	Active	Production	VSSOP (DCU)   8	250   SMALL T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 125	(C3BJ, C3BR)
SN74LVC2G132DCUTG4.Z	Active	Production	VSSOP (DCU)   8	250   SMALL T&R	-	Call TI	Call TI	-40 to 125	
<a href="#">SN74LVC2G132YZPR</a>	Active	Production	DSBGA (YZP)   8	3000   LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 85	(D57, D5N)
SN74LVC2G132YZPR.Z	Active	Production	DSBGA (YZP)   8	3000   LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 125	(D57, D5N)

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

<sup>(2)</sup> **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.

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

<sup>(4)</sup> **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.

<sup>(5)</sup> **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.

<sup>(6)</sup> **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
74LVC2G132DCTRG4	SSOP	DCT	8	3000	177.8	12.4	3.45	4.4	1.45	4.0	12.0	Q3
74LVC2G132DCURG4	VSSOP	DCU	8	3000	180.0	8.4	2.25	3.35	1.05	4.0	8.0	Q3
74LVC2G132DCUTG4	VSSOP	DCU	8	250	180.0	8.4	2.25	3.35	1.05	4.0	8.0	Q3
SN74LVC2G132DCTR	SSOP	DCT	8	3000	180.0	12.4	3.15	4.35	1.55	4.0	12.0	Q3
SN74LVC2G132DCUR	VSSOP	DCU	8	3000	178.0	9.0	2.25	3.35	1.05	4.0	8.0	Q3
SN74LVC2G132DCUT	VSSOP	DCU	8	250	178.0	9.0	2.25	3.35	1.05	4.0	8.0	Q3
SN74LVC2G132YZPR	DSBGA	YZP	8	3000	178.0	9.2	1.02	2.02	0.63	4.0	8.0	Q1

## TAPE AND REEL BOX DIMENSIONS



\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
74LVC2G132DCTRG4	SSOP	DCT	8	3000	183.0	183.0	20.0
74LVC2G132DCURG4	VSSOP	DCU	8	3000	202.0	201.0	28.0
74LVC2G132DCUTG4	VSSOP	DCU	8	250	202.0	201.0	28.0
SN74LVC2G132DCTR	SSOP	DCT	8	3000	190.0	190.0	30.0
SN74LVC2G132DCUR	VSSOP	DCU	8	3000	180.0	180.0	18.0
SN74LVC2G132DCUT	VSSOP	DCU	8	250	180.0	180.0	18.0
SN74LVC2G132YZPR	DSBGA	YZP	8	3000	220.0	220.0	35.0

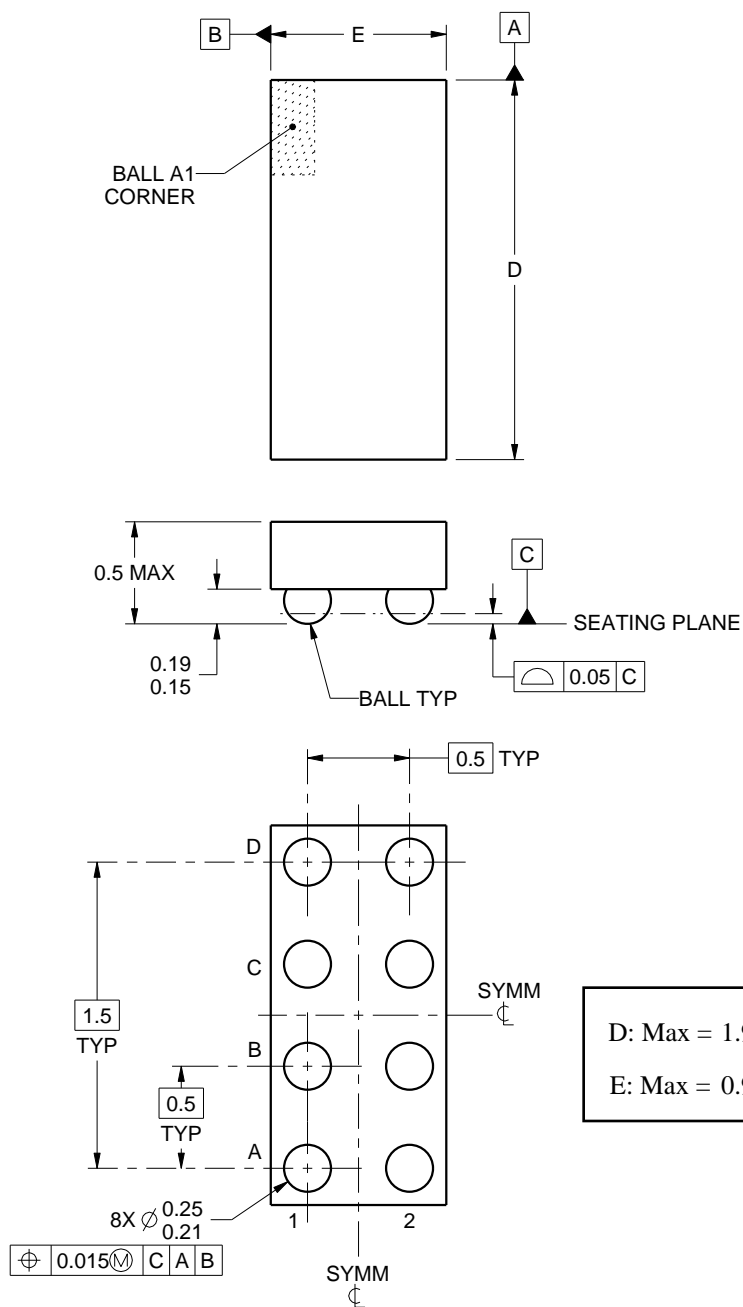
YZP0008



## PACKAGE OUTLINE

DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



4223082/A 07/2016

### NOTES:

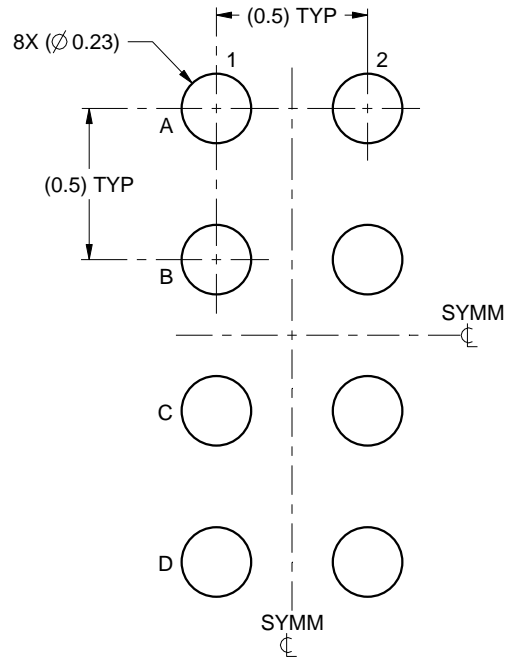
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.

# EXAMPLE BOARD LAYOUT

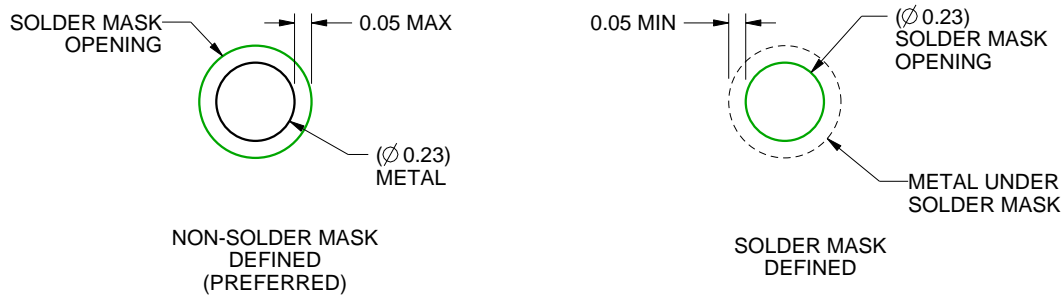
YZP0008

DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



LAND PATTERN EXAMPLE  
SCALE:40X



SOLDER MASK DETAILS  
NOT TO SCALE

4223082/A 07/2016

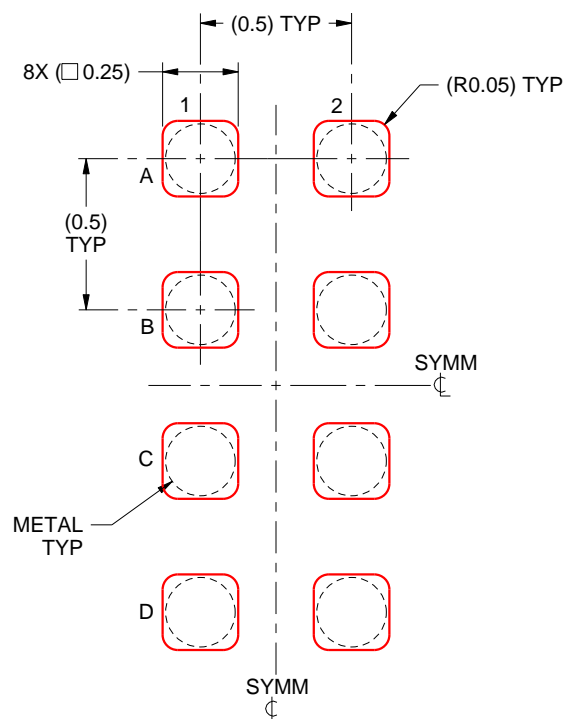
NOTES: (continued)

- 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](http://www.ti.com/lit/snva009)).

**YZP0008**

## DSBGA - 0.5 mm max height

## DIE SIZE BALL GRID ARRAY



SOLDER PASTE EXAMPLE  
BASED ON 0.1 mm THICK STENCIL  
SCALE:40X

4223082/A 07/2016

NOTES: (continued)

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



4225266/A 09/2014

## 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. Reference JEDEC registration MO-187 variation CA.



# EXAMPLE BOARD LAYOUT

DCU0008A

VSSOP - 0.9 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 25X



4225266/A 09/2014

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.

## EXAMPLE STENCIL DESIGN

DCU0008A

VSSOP - 0.9 mm max height

SMALL OUTLINE PACKAGE

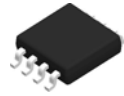


SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE: 25X

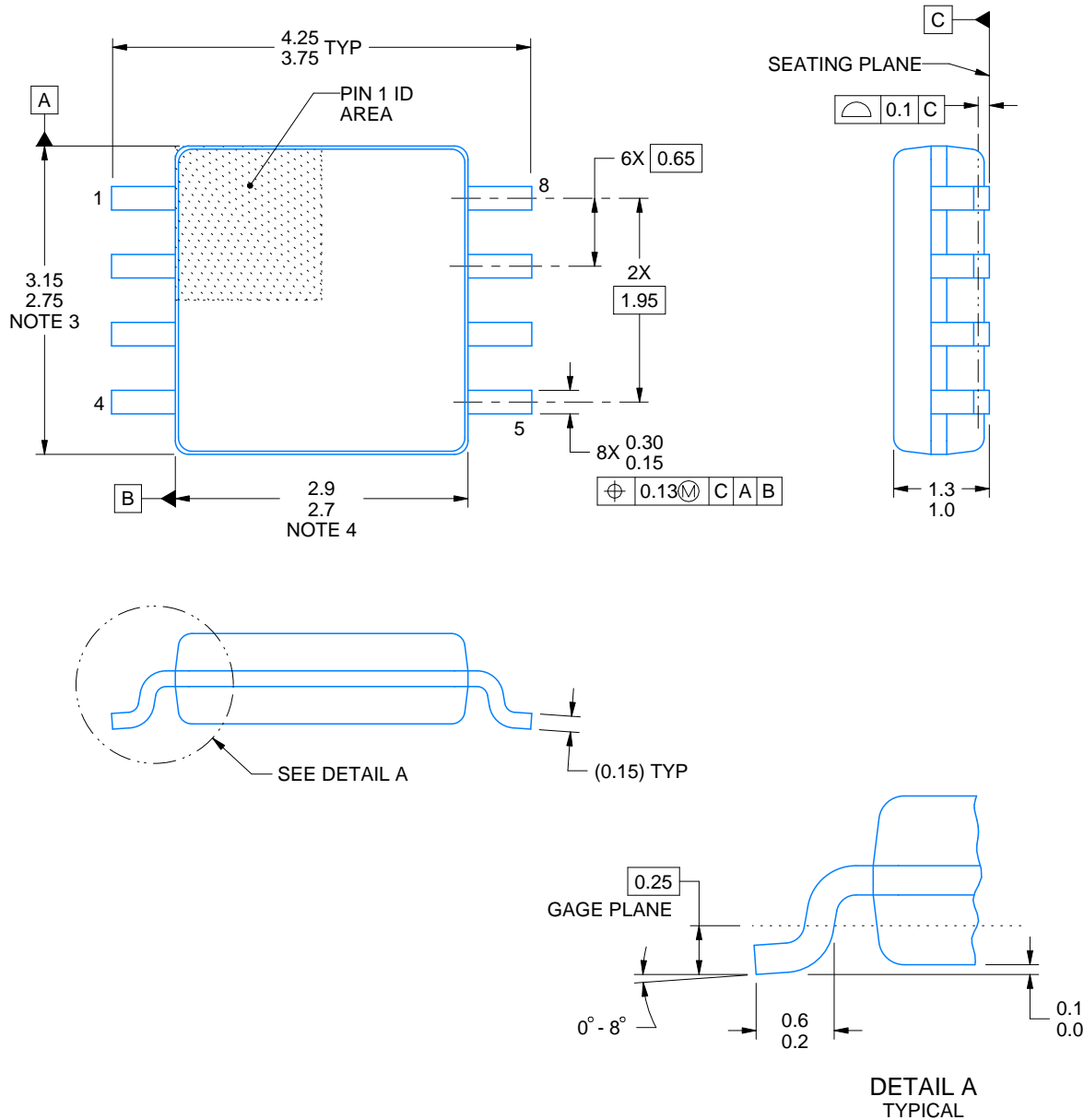
4225266/A 09/2014

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.

**DCT0008A****PACKAGE OUTLINE****SSOP - 1.3 mm max height**

SMALL OUTLINE PACKAGE



4220784/C 06/2021

**NOTES:**

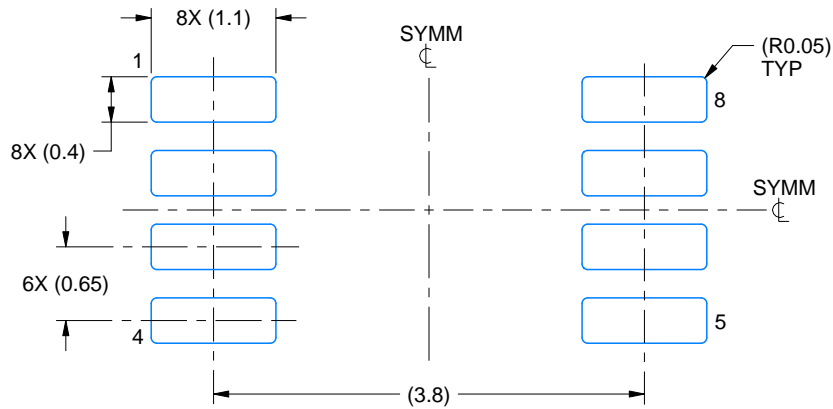
1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate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

# EXAMPLE BOARD LAYOUT

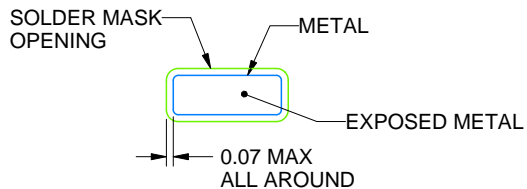
DCT0008A

SSOP - 1.3 mm max height

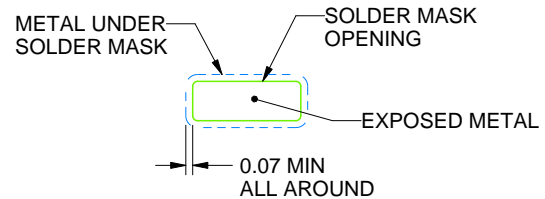
SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE:15X



NON SOLDER MASK  
DEFINED



SOLDER MASK  
DEFINED

SOLDER MASK DETAILS

4220784/C 06/2021

NOTES: (continued)

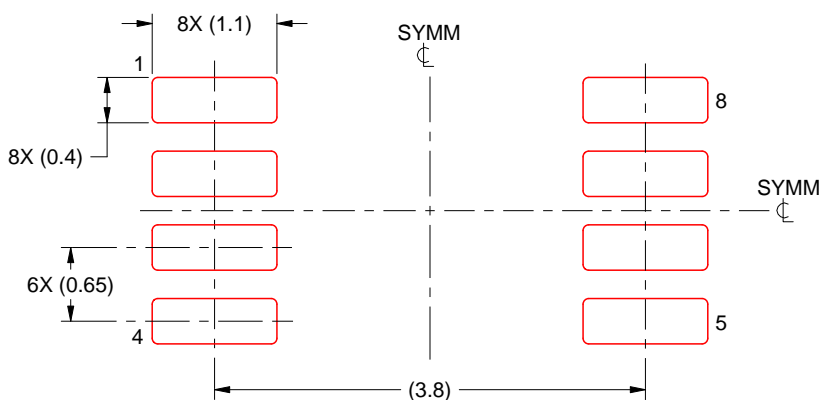
5. Publication IPC-7351 may have alternate designs.
6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

## EXAMPLE STENCIL DESIGN

DCT0008A

SSOP - 1.3 mm max height

SMALL OUTLINE PACKAGE



SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE:15X

4220784/C 06/2021

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.

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