



## SN74LVC2G17 Dual Schmitt-Trigger Buffer

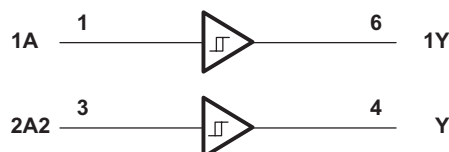
### 1 Features

- Schmitt-Trigger inputs provide hysteresis
- Available in the Texas Instruments NanoFree™ Package
- Supports 5-V  $V_{CC}$  Operation
- Inputs Accept Voltages to 5.5 V
- Max  $t_{pd}$  of 5.4 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 Operation and Back-Drive Protection
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model
  - 1000-V Charged-Device Model

### 2 Applications

- AV Receivers
- Audio Docks: Portable
- Blu-ray Players and Home Theater
- MP3 Players/Recorders
- Personal Digital Assistants (PDAs)
- Power: Telecom/Server AC/DC Supply: Single Controller: Analog and Digital
- Solid State Drives (SSDs): Client and Enterprise
- TVs: LCD/Digital and High-Definition (HDTVs)
- Tablets: Enterprise
- Video Analytics: Server
- Wireless Headsets, Keyboards, and Mice

### 4 Simplified Schematic



### 3 Description

This dual Schmitt-Trigger buffer is designed for 1.65-V to 5.5-V  $V_{CC}$  operation.

The SN74LVC2G17 device contains two buffers and performs the Boolean function  $Y = A$ . The device functions as two independent buffers, but because of Schmitt action, it may have 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 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.

#### Device Information<sup>(1)</sup>

PART NUMBER	PACKAGE (PIN)	BODY SIZE
SN74LVC2G17	SOT-23 (6)	2.90 mm × 1.60 mm
	SC70 (6)	2.00 mm × 1.25 mm
	SON (6)	1.45 mm × 1.00 mm
	SON (6)	1.00 mm × 1.00 mm
	DSBGA (6)	1.41 mm × 0.91 mm

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



## Table of Contents

<b>1 Features</b> .....	<b>1</b>	<b>9 Detailed Description</b> .....	<b>8</b>
<b>2 Applications</b> .....	<b>1</b>	9.1 Overview .....	8
<b>3 Description</b> .....	<b>1</b>	9.2 Functional Block Diagram .....	8
<b>4 Simplified Schematic</b> .....	<b>1</b>	9.3 Feature Description .....	8
<b>5 Revision History</b> .....	<b>2</b>	9.4 Device Functional Modes .....	8
<b>6 Pin Configuration and Functions</b> .....	<b>3</b>	<b>10 Application and Implementation</b> .....	<b>9</b>
<b>7 Specifications</b> .....	<b>4</b>	10.1 Application Information .....	9
7.1 Absolute Maximum Ratings .....	4	10.2 Typical Power Button Circuit .....	9
7.2 ESD Ratings .....	4	<b>11 Power Supply Recommendations</b> .....	<b>10</b>
7.3 Recommended Operating Conditions .....	4	<b>12 Layout</b> .....	<b>10</b>
7.4 Thermal Information .....	5	12.1 Layout Guidelines .....	10
7.5 Electrical Characteristics .....	5	12.2 Layout Example .....	11
7.6 Switching Characteristics, –40°C to 85°C .....	6	<b>13 Device and Documentation Support</b> .....	<b>12</b>
7.7 Switching Characteristics, –40°C to 125°C .....	6	13.1 Trademarks .....	12
7.8 Operating Characteristics .....	6	13.2 Electrostatic Discharge Caution .....	12
7.9 Typical Characteristics .....	6	13.3 Glossary .....	12
<b>8 Parameter Measurement Information</b> .....	<b>7</b>	<b>14 Mechanical, Packaging, and Orderable Information</b> .....	<b>12</b>

## 5 Revision History

### Changes from Revision M (November 2013) to Revision N Page

- Added *Applications*, *Device Information* table, *Pin Functions* table, *ESD Ratings* table, *Thermal Information* table, *Typical Characteristics*, *Feature Description* section, *Device Functional Modes*, *Application and Implementation* section, *Power Supply Recommendations* section, *Layout* section, *Device and Documentation Support* section, and *Mechanical, Packaging, and Orderable Information* section. .... 1

### Changes from Revision L (September 2013) to Revision M Page

- Updated document formatting. .... 1
- Changed MAX operating temperature to 125°C in *Recommended Operating Conditions* table. .... 4

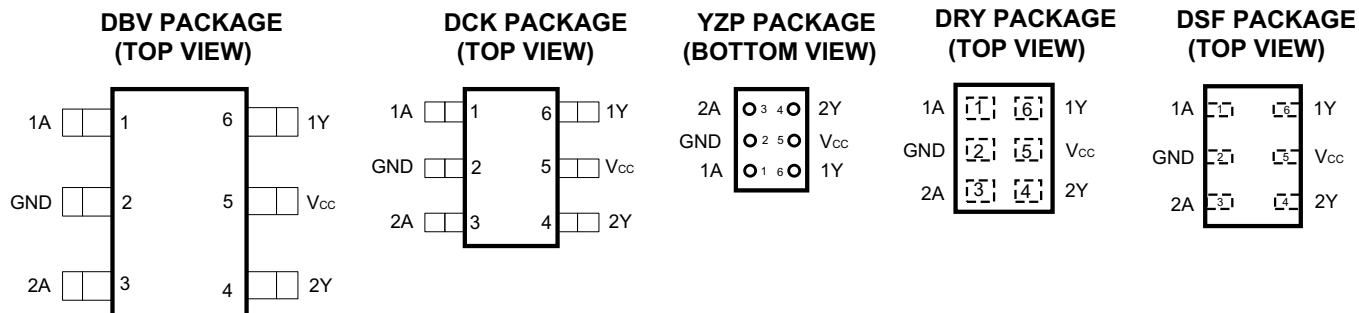
### Changes from Revision K (July 2012) to Revision L Page

- Updated document to new TI data sheet format. .... 1
- Added ESD warning. .... 12

### Changes from Revision J (June 2012) to Revision K Page

- Updated pin out graphic. .... 3

## 6 Pin Configuration and Functions



### Pin Functions

PIN		TYPE	DESCRIPTION
NAME	NO.		
1A	1	I	Input 1
1Y	6	O	Output 1
2A	3	I	Input 2
2Y	4	O	Output 2
GND	2	—	Ground
V <sub>CC</sub>	5	—	Power Pin

## 7 Specifications

### 7.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted)<sup>(1)</sup>

		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
T <sub>J</sub>	Junction temperature under bias		150	°C
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 negative-voltage and output voltage ratings may be exceeded if the input and output current ratings are observed.
- (3) The value of V<sub>CC</sub> is provided in the *Recommended Operating Conditions* table.

### 7.2 ESD Ratings

		VALUE	UNIT
V <sub>ESD</sub> <sup>(1)</sup>	Human-Body Model (HBM), per ANSI/ESDA/JEDEC JS-001, all pins <sup>(2)</sup>	2000	V
	Charged-Device Model (CDM), per JEDEC specification JESD22-C101, all pins <sup>(3)</sup>	1000	V

- (1) Electrostatic discharge (ESD) to measure device sensitivity and immunity to damage caused by assembly line electrostatic discharges in to the device.
- (2) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
- (3) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

### 7.3 Recommended Operating Conditions

over operating free-air temperature range (unless otherwise noted)<sup>(1)</sup>

			MIN	MAX	UNIT
V <sub>CC</sub>	Supply voltage	Operating	1.65	5.5	V
V <sub>I</sub>	Input voltage		0	5.5	V
V <sub>O</sub>	Output voltage		0	V <sub>CC</sub>	V
I <sub>OH</sub>	High-level output current	V <sub>CC</sub> = 1.65 V		–4	mA
		V <sub>CC</sub> = 2.3 V		–8	
		V <sub>CC</sub> = 3 V		–16	
				–24	
		V <sub>CC</sub> = 4.5 V		–32	
I <sub>OL</sub>	Low-level output current	V <sub>CC</sub> = 1.65 V		4	mA
		V <sub>CC</sub> = 2.3 V		8	
		V <sub>CC</sub> = 3 V		16	
				24	
		V <sub>CC</sub> = 4.5 V		32	
T <sub>A</sub>	Operating free-air temperature		–40	125	°C

- (1) All unused inputs of the device must be held at V<sub>CC</sub> or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number [SCBA004](#).

## 7.4 Thermal Information

THERMAL METRIC <sup>(1)</sup>		SN74LVC2G17					UNIT
		DBV	DCK	YZP	DRY	DSF	
		6 PINS					
R <sub>θJA</sub>	Junction-to-ambient thermal resistance <sup>(2)</sup>	165	259	123	234	300	°C/W

(1) For more information about traditional and new thermal metrics, see the *IC Package Thermal Metrics* application report, [SPRA953](#).

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

## 7.5 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		UNIT		
				MIN	TYP <sup>(1)</sup>	MAX	MIN		TYP <sup>(1)</sup>	MAX
V <sub>T+</sub> Positive-going input threshold voltage			1.65 V	0.7		1.4	0.7		1.4	V
			2.3 V	1.0		1.7	1.0		1.7	
			3 V	1.3		2.0	1.3		2.0	
			4.5 V	1.9		3.1	1.9		3.1	
			5.5 V	2.2		3.7	2.2		3.7	
V <sub>T–</sub> Negative-going input threshold voltage			1.65 V	0.3		0.7	0.3		0.7	V
			2.3 V	0.4		1	0.4		1.0	
			3 V	0.8		1.3	0.8		1.3	
			4.5 V	1.1		2	1.1		2.0	
			5.5 V	1.4		2.5	1.4		2.5	
ΔV <sub>T</sub> Hysteresis (V <sub>T+</sub> – V <sub>T–</sub> )			1.65 V	0.3		0.8	0.3		0.8	V
			2.3 V	0.4		0.9	0.35		0.9	
			3 V	0.4		1.1	0.4		1.1	
			4.5 V	0.6		1.3	0.6		1.3	
			5.5 V	0.7		1.4	0.7		1.4	
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		0.55				
		I <sub>OL</sub> = 32 mA	4.5 V	0.55		0.55				
I <sub>I</sub>	A input	V <sub>I</sub> = 5.5 V or GND	0 to 5.5 V	±5		±5			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> = 5.5 V 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	4		4			pF	

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

## 7.6 Switching Characteristics, –40°C to 85°C

over recommended operating free-air temperature range (unless otherwise noted) (see [Figure 3](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	–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	Y	3.9	9.3	1.9	5.7	2.2	5.4	1.5	4.3	ns

## 7.7 Switching Characteristics, –40°C to 125°C

over recommended operating free-air temperature range (unless otherwise noted) (see [Figure 3](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	–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	Y	3.9	9.8	1.9	6.2	2.2	5.9	1.5	4.8	ns

## 7.8 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	19	21	pF

## 7.9 Typical Characteristics

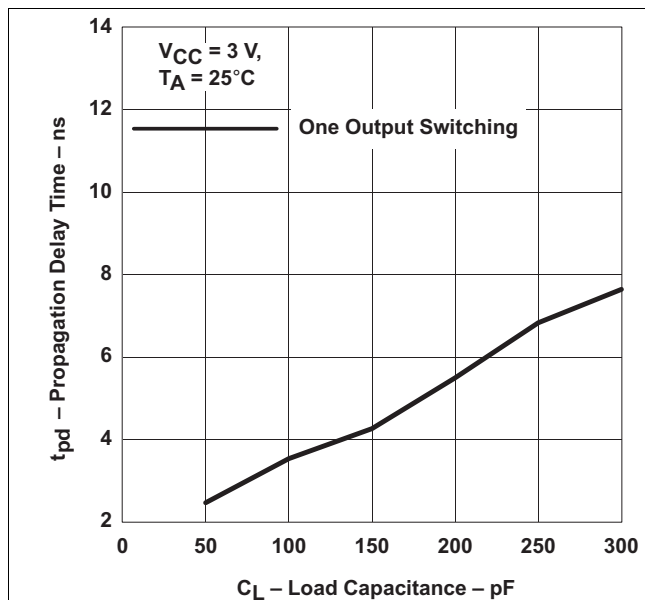


Figure 1. Propagation Delay (Low to High Transition) vs Load Capacitance

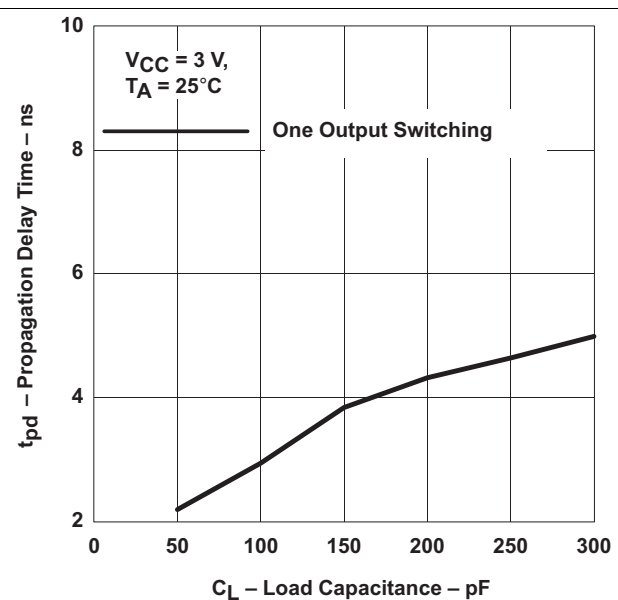
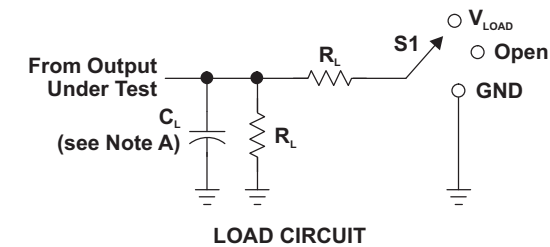


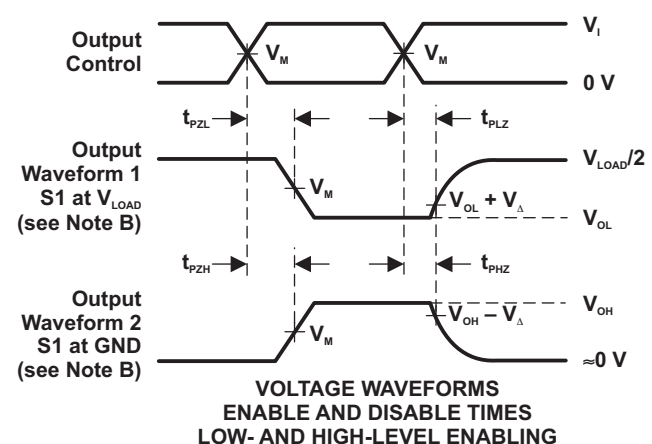
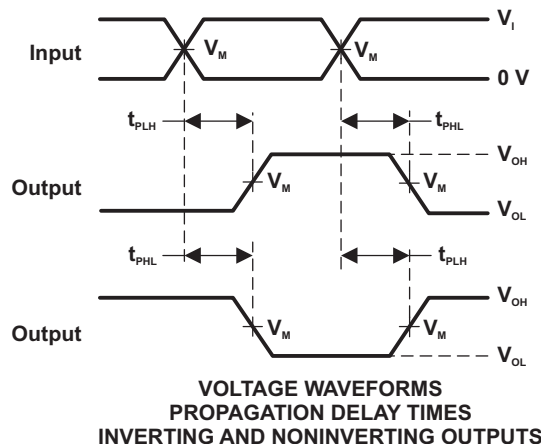
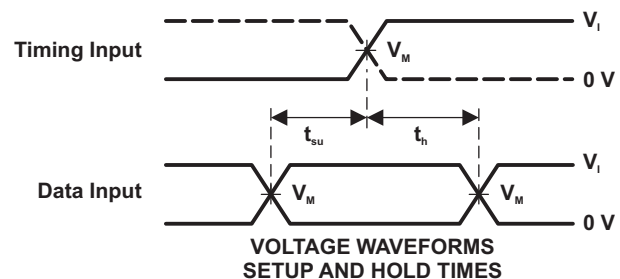
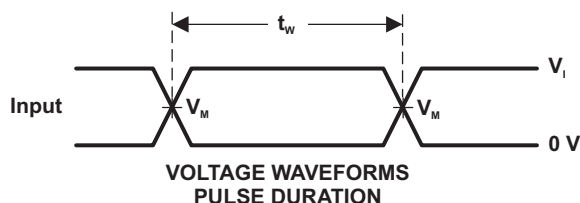
Figure 2. Propagation Delay (High to Low Transition) vs Load Capacitance

## 8 Parameter Measurement Information



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

$V_{CC}$	INPUTS		$V_M$	$V_{LOAD}$	$C_L$	$R_L$	$V_{\Delta}$
	$V_I$	$t_i/t_f$					
$1.8\text{ V} \pm 0.15\text{ V}$	$V_{CC}$	$\leq 2\text{ ns}$	$V_{CC}/2$	$2 \times V_{CC}$	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:  $PRR \leq 10\text{ MHz}$ ,  $Z_o = 50\text{ }\Omega$ .
  - 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 3. Load Circuit and Voltage Waveforms

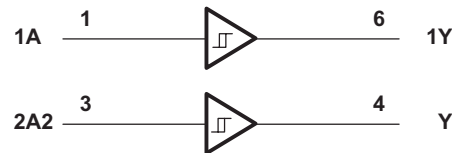
## 9 Detailed Description

### 9.1 Overview

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.

### 9.2 Functional Block Diagram



### 9.3 Feature Description

- 1.65 V to 5.5 V operating voltage range
- Allows down voltage translation
  - 5 V to 3.3 V
  - 5 V or 3.3 V to 1.8 V
- Inputs accept voltages to 5.5 V
  - 5-V tolerance on input pin
- $I_{off}$  feature
  - Allows voltage on the inputs and outputs when  $V_{CC}$  is 0 V
  - Able to reduce leakage when  $V_{CC}$  is 0 V
- Schmitt-Trigger Input can improve the noise immunity capability

### 9.4 Device Functional Modes

INPUT A	OUTPUT Y
H	H
L	L



## 10 Application and Implementation

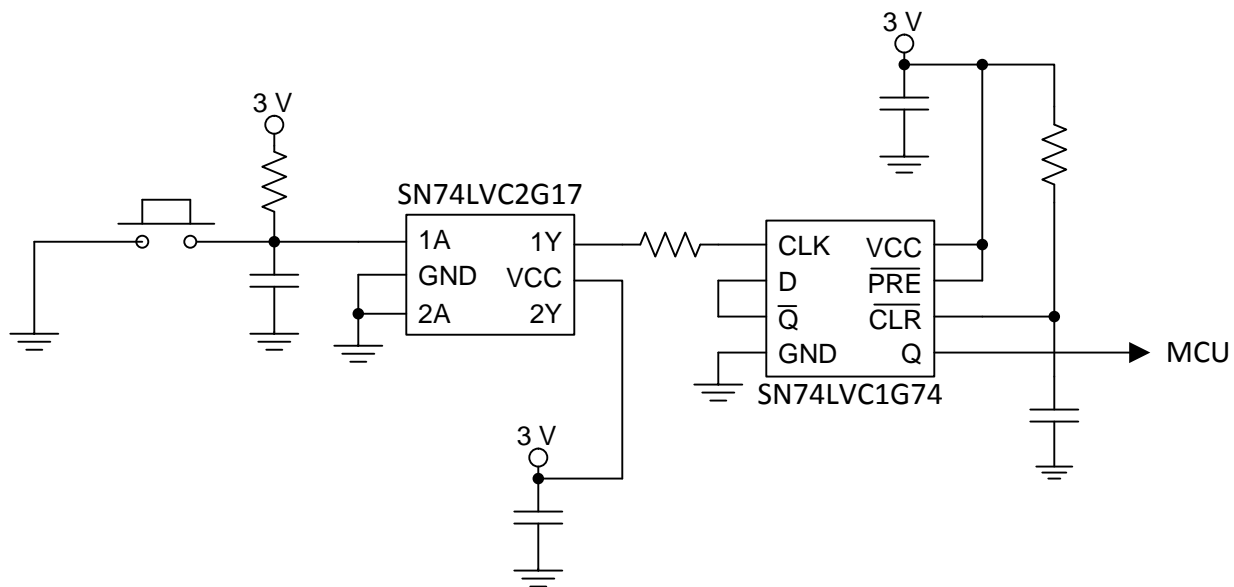
### NOTE

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

### 10.1 Application Information

The SN74LVC2G17 device contains two buffers and performs the Boolean function  $Y = A$ . The device functions as two independent buffers, but because of Schmitt action, it may have different input threshold levels for positive-going ( $V_{T+}$ ) and negative-going ( $V_{T-}$ ) signals.

### 10.2 Typical Power Button Circuit



**Figure 4. Device Power Button Circuit**

#### 10.2.1 Design Requirements

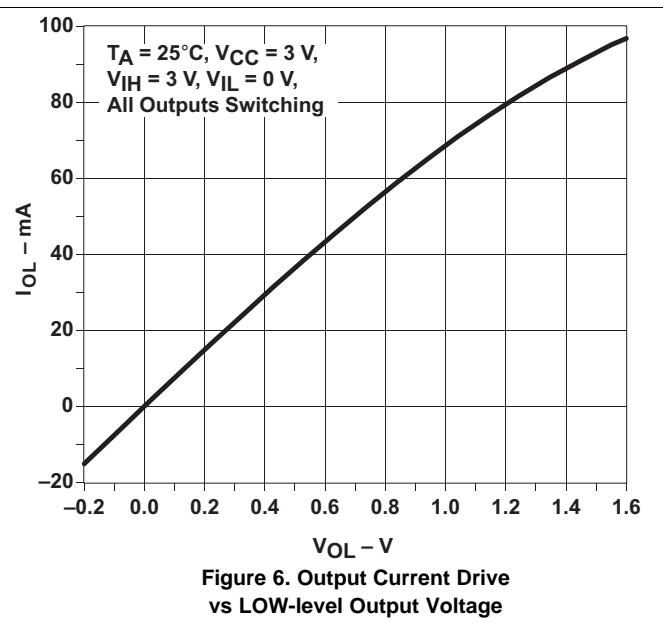
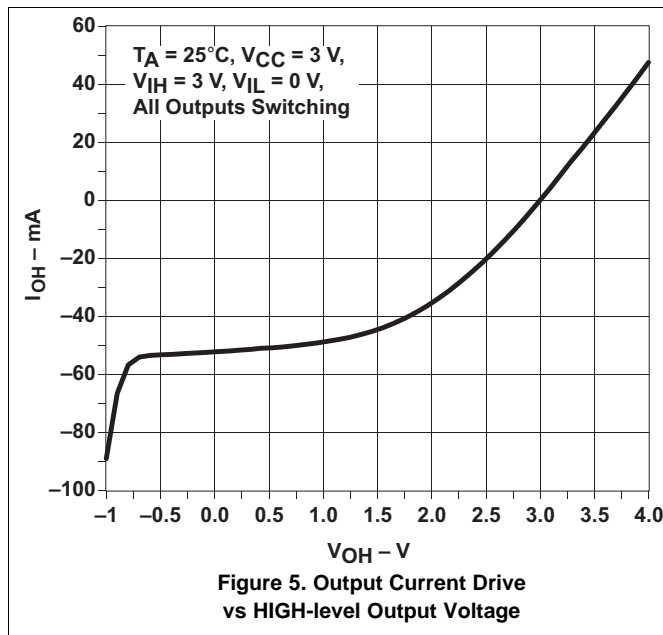
This device uses CMOS technology and has balanced output drive. Care should be taken to avoid bus contention because it can drive currents that would exceed maximum limits. Outputs can be combined to produce higher drive but the high drive will also create faster edges into light loads so routing and load conditions should be considered to prevent ringing.

#### 10.2.2 Detailed Design Procedure

1. Recommended Input Conditions:
  - For rise time and fall time specifications, see ( $\Delta t/\Delta V$ ) in [Recommended Operating Conditions](#) table.
  - For specified high and low levels, see ( $V_{IH}$  and  $V_{IL}$ ) in [Recommended Operating Conditions](#) table.
  - Inputs are overvoltage tolerant allowing them to go as high as 5.5 V at any valid  $V_{CC}$ .
2. Recommend Output Conditions:
  - Load currents should not exceed 50 mA per output and 100 mA total for the part.
  - Series resistors on the output may be used if the user desires to slow the output edge signal or limit the output current.

## Typical Power Button Circuit (continued)

### 10.2.3 Application Curves



## 11 Power Supply Recommendations

The power supply can be any voltage between the MIN and MAX supply voltage rating located in the [Recommended Operating Conditions](#) table.

Each  $V_{CC}$  terminal should have a good bypass capacitor to prevent power disturbance. For devices with a single supply, a 0.1  $\mu\text{F}$  capacitor is recommended. If there are multiple  $V_{CC}$  terminals then 0.01  $\mu\text{F}$  or 0.022  $\mu\text{F}$  capacitors are recommended for each power terminal. It is ok to parallel multiple bypass capacitors to reject different frequencies of noise. Multiple bypass capacitors may be paralleled to reject different frequencies of noise. The bypass capacitor should be installed as close to the power terminal as possible for the best results.

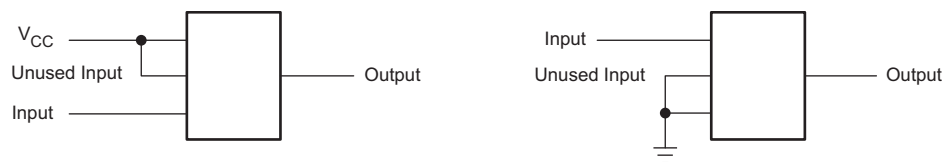
## 12 Layout

### 12.1 Layout Guidelines

When using multiple bit logic devices, inputs should not float. In many cases, functions or parts of functions of digital logic devices are unused. Some examples are when only two inputs of a triple-input AND gate are used, or when only 3 of the 4-buffer gates are used. Such input pins should not be left unconnected because the undefined voltages at the outside connections result in undefined operational states.

Specified in [Figure 7](#) are rules that must be observed under all circumstances. All unused inputs of digital logic devices must be connected to a high or low bias to prevent them from floating. The logic level that should be applied to any particular unused input depends on the function of the device. Generally they will be tied to GND or  $V_{CC}$ , whichever makes more sense or is more convenient.

## 12.2 Layout Example



**Figure 7. Layout Diagram**

## 13 Device and Documentation Support

### 13.1 Trademarks

NanoFree is a trademark of Texas Instruments.  
All other trademarks are the property of their respective owners.

### 13.2 Electrostatic Discharge Caution



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.

### 13.3 Glossary

[SLYZ022](#) — *TI Glossary*.

This glossary lists and explains terms, acronyms and definitions.

## 14 Mechanical, Packaging, and Orderable Information

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

## PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package   Pins	Package qty   Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
<a href="#">SN74LVC2G17DBVR</a>	Active	Production	SOT-23 (DBV)   6	3000   LARGE T&R	Yes	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	(C175, C17F, C17K, C17R)
SN74LVC2G17DBVR.B	Active	Production	SOT-23 (DBV)   6	3000   LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 125	(C175, C17F, C17K, C17R)
SN74LVC2G17DBVRG4.B	Active	Production	SOT-23 (DBV)   6	3000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	(C17F, C17R)
<a href="#">SN74LVC2G17DBVT</a>	Active	Production	SOT-23 (DBV)   6	250   SMALL T&R	Yes	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	(C175, C17F, C17K, C17R)
SN74LVC2G17DBVT.B	Active	Production	SOT-23 (DBV)   6	250   SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	(C175, C17F, C17K, C17R)
<a href="#">SN74LVC2G17DBVTG4</a>	Active	Production	SOT-23 (DBV)   6	250   SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	(C17F, C17R)
SN74LVC2G17DBVTG4.B	Active	Production	SOT-23 (DBV)   6	250   SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	(C17F, C17R)
<a href="#">SN74LVC2G17DCK3</a>	Last Time Buy	Production	SC70 (DCK)   6	3000   LARGE T&R	Yes	SNBI	Level-1-260C-UNLIM	-40 to 85	(C7F, C7Z)
SN74LVC2G17DCK3.B	Last Time Buy	Production	SC70 (DCK)   6	3000   LARGE T&R	Yes	SNBI	Level-1-260C-UNLIM	-40 to 85	(C7F, C7Z)
<a href="#">SN74LVC2G17DCKR</a>	Active	Production	SC70 (DCK)   6	3000   LARGE T&R	Yes	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	(C75, C7F, C7J, C7K, C7R)
SN74LVC2G17DCKR.B	Active	Production	SC70 (DCK)   6	3000   LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 125	(C75, C7F, C7J, C7K, C7R)
SN74LVC2G17DCKRE4	Active	Production	SC70 (DCK)   6	3000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C75
<a href="#">SN74LVC2G17DCKRG4</a>	Active	Production	SC70 (DCK)   6	3000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C75
SN74LVC2G17DCKRG4.B	Active	Production	SC70 (DCK)   6	3000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C75
<a href="#">SN74LVC2G17DCKT</a>	Active	Production	SC70 (DCK)   6	250   SMALL T&R	Yes	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	(C75, C7F, C7J, C7K, C7R)
SN74LVC2G17DCKT.B	Active	Production	SC70 (DCK)   6	250   SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	(C75, C7F, C7J, C7K, C7R)
SN74LVC2G17DCKTE4	Active	Production	SC70 (DCK)   6	250   SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C75
<a href="#">SN74LVC2G17DCKTG4</a>	Active	Production	SC70 (DCK)   6	250   SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C75
SN74LVC2G17DCKTG4.B	Active	Production	SC70 (DCK)   6	250   SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C75
<a href="#">SN74LVC2G17DRYR</a>	Active	Production	SON (DRY)   6	5000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C7
SN74LVC2G17DRYR.B	Active	Production	SON (DRY)   6	5000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C7
SN74LVC2G17DRYRG4	Active	Production	SON (DRY)   6	5000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C7

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)
SN74LVC2G17DRYRG4.B	Active	Production	SON (DRY)   6	5000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C7
<a href="#">SN74LVC2G17DSF2</a>	Active	Production	SON (DSF)   6	5000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C7
SN74LVC2G17DSF2.B	Active	Production	SON (DSF)   6	5000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C7
SN74LVC2G17DSF2G4	Active	Production	SON (DSF)   6	5000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C7
SN74LVC2G17DSF2G4.B	Active	Production	SON (DSF)   6	5000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C7
<a href="#">SN74LVC2G17DSFR</a>	Active	Production	SON (DSF)   6	5000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C7
SN74LVC2G17DSFR.B	Active	Production	SON (DSF)   6	5000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C7
<a href="#">SN74LVC2G17YZPR</a>	Active	Production	DSBGA (YZP)   6	3000   LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 85	(C77, C7N)
SN74LVC2G17YZPR.B	Active	Production	DSBGA (YZP)   6	3000   LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 85	(C77, C7N)

<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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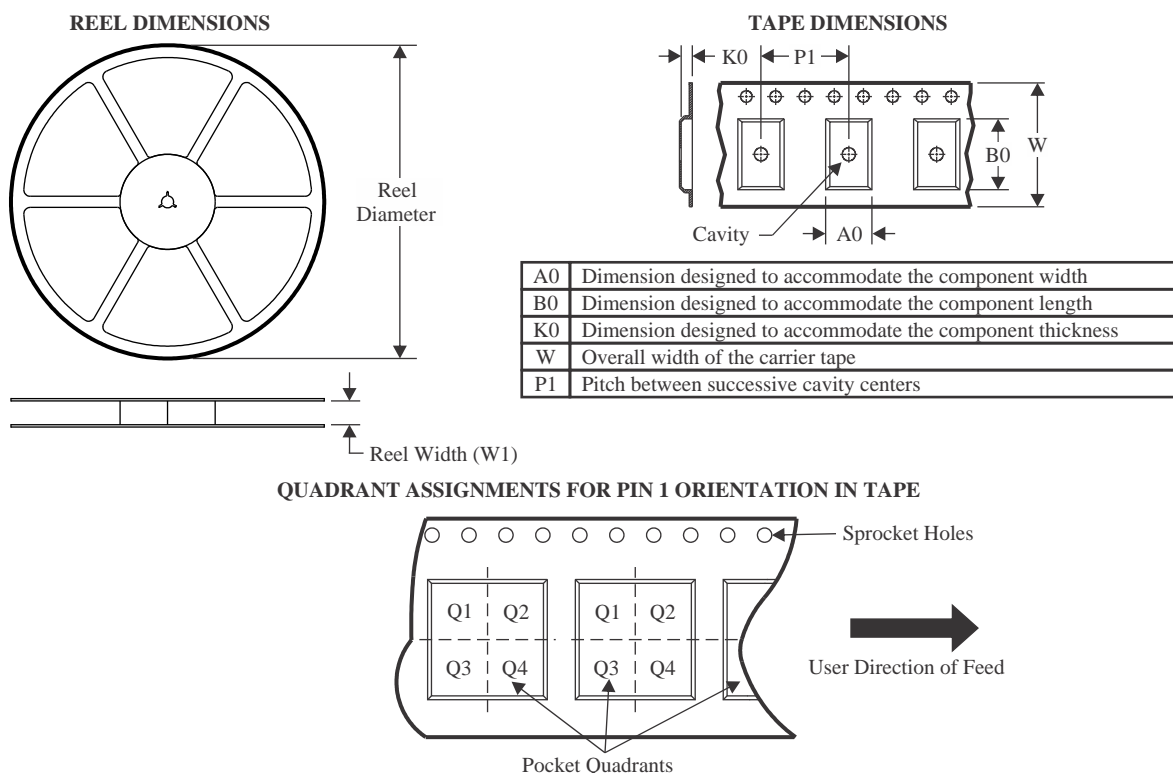
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

**OTHER QUALIFIED VERSIONS OF SN74LVC2G17 :**

- Automotive : [SN74LVC2G17-Q1](#)
- Enhanced Product : [SN74LVC2G17-EP](#)

**NOTE: Qualified Version Definitions:**

- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects
- Enhanced Product - Supports Defense, Aerospace and Medical Applications

**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
SN74LVC2G17DBVR	SOT-23	DBV	6	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
SN74LVC2G17DBVT	SOT-23	DBV	6	250	180.0	8.4	3.23	3.17	1.37	4.0	8.0	Q3
SN74LVC2G17DBVTG4	SOT-23	DBV	6	250	178.0	9.0	3.23	3.17	1.37	4.0	8.0	Q3
SN74LVC2G17DCKR	SC70	DCK	6	3000	180.0	8.4	2.3	2.5	1.2	4.0	8.0	Q3
SN74LVC2G17DCKRG4	SC70	DCK	6	3000	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74LVC2G17DCKT	SC70	DCK	6	250	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74LVC2G17DCKT	SC70	DCK	6	250	178.0	9.0	2.4	2.5	1.2	4.0	8.0	Q3
SN74LVC2G17DCKT	SC70	DCK	6	250	180.0	8.4	2.41	2.41	1.2	4.0	8.0	Q3
SN74LVC2G17DCKTG4	SC70	DCK	6	250	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74LVC2G17DRYR	SON	DRY	6	5000	180.0	9.5	1.15	1.6	0.75	4.0	8.0	Q1
SN74LVC2G17DRYRG4	SON	DRY	6	5000	180.0	9.5	1.15	1.6	0.75	4.0	8.0	Q1
SN74LVC2G17DSF2	SON	DSF	6	5000	180.0	9.5	1.16	1.16	0.5	4.0	8.0	Q3
SN74LVC2G17DSF2G4	SON	DSF	6	5000	180.0	9.5	1.16	1.16	0.5	4.0	8.0	Q3
SN74LVC2G17DSFR	SON	DSF	6	5000	180.0	9.5	1.16	1.16	0.5	4.0	8.0	Q2
SN74LVC2G17YZPR	DSBGA	YZP	6	3000	178.0	9.2	1.02	1.52	0.63	4.0	8.0	Q1



## TAPE AND REEL BOX DIMENSIONS

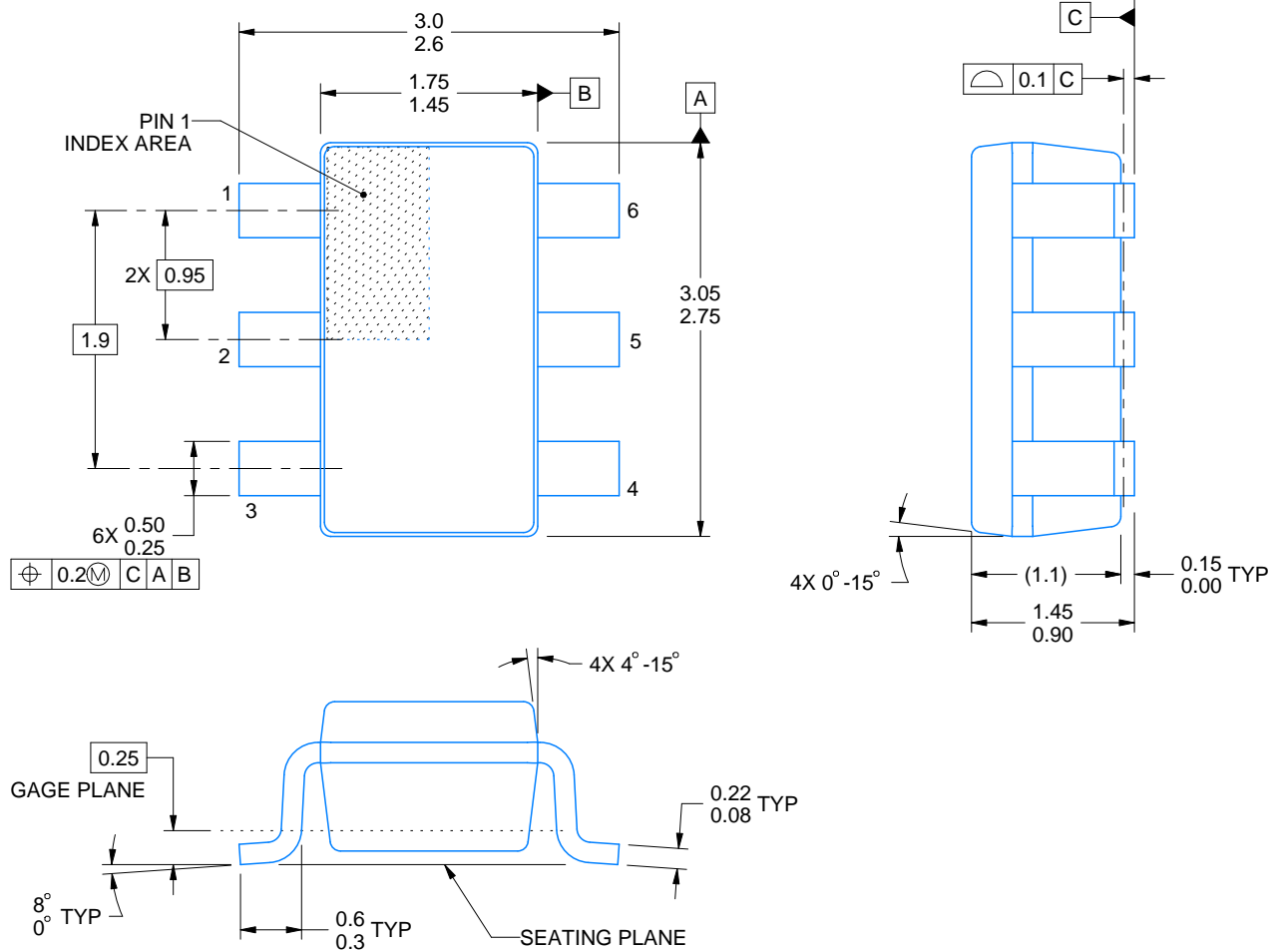


\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LVC2G17DBVR	SOT-23	DBV	6	3000	208.0	191.0	35.0
SN74LVC2G17DBVT	SOT-23	DBV	6	250	202.0	201.0	28.0
SN74LVC2G17DBVTG4	SOT-23	DBV	6	250	180.0	180.0	18.0
SN74LVC2G17DCKR	SC70	DCK	6	3000	210.0	185.0	35.0
SN74LVC2G17DCKRG4	SC70	DCK	6	3000	180.0	180.0	18.0
SN74LVC2G17DCKT	SC70	DCK	6	250	180.0	180.0	18.0
SN74LVC2G17DCKT	SC70	DCK	6	250	180.0	180.0	18.0
SN74LVC2G17DCKT	SC70	DCK	6	250	202.0	201.0	28.0
SN74LVC2G17DCKTG4	SC70	DCK	6	250	180.0	180.0	18.0
SN74LVC2G17DRYR	SON	DRY	6	5000	184.0	184.0	19.0
SN74LVC2G17DRYRG4	SON	DRY	6	5000	184.0	184.0	19.0
SN74LVC2G17DSF2	SON	DSF	6	5000	184.0	184.0	19.0
SN74LVC2G17DSF2G4	SON	DSF	6	5000	184.0	184.0	19.0
SN74LVC2G17DSFR	SON	DSF	6	5000	184.0	184.0	19.0
SN74LVC2G17YZPR	DSBGA	YZP	6	3000	220.0	220.0	35.0

**DBV0006A****PACKAGE OUTLINE****SOT-23 - 1.45 mm max height**

SMALL OUTLINE TRANSISTOR



4214840/G 08/2024

**NOTES:**

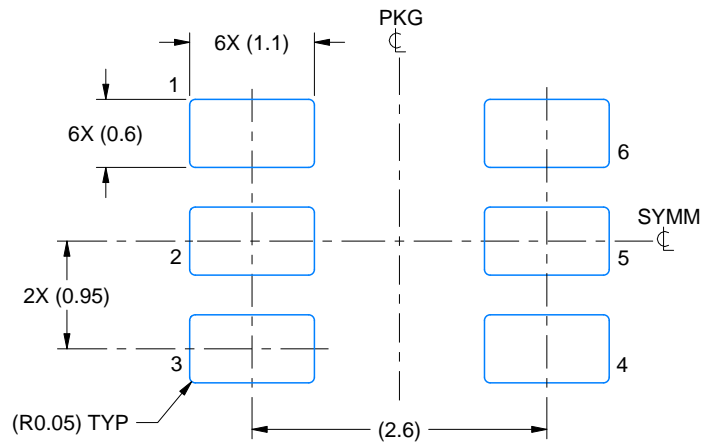
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. Body dimensions do not include mold flash or protrusion. Mold flash and protrusion shall not exceed 0.25 per side.
4. Leads 1,2,3 may be wider than leads 4,5,6 for package orientation.
5. Reference JEDEC MO-178.

# EXAMPLE BOARD LAYOUT

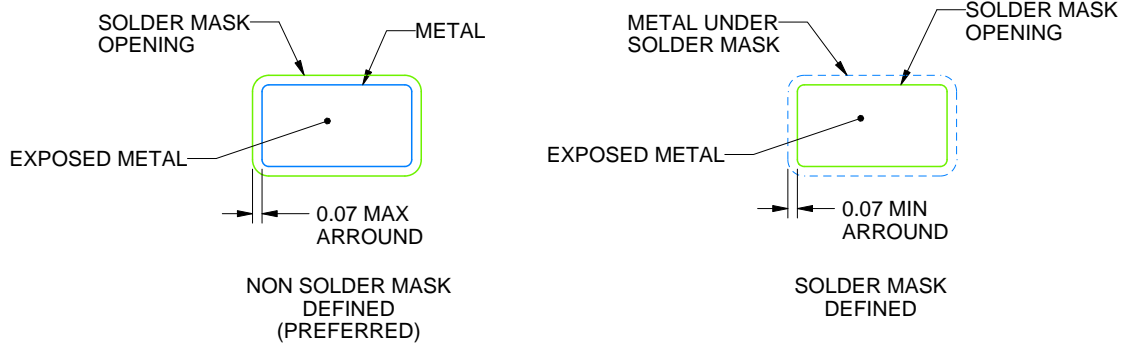
DBV0006A

SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE:15X



SOLDER MASK DETAILS

4214840/G 08/2024

NOTES: (continued)

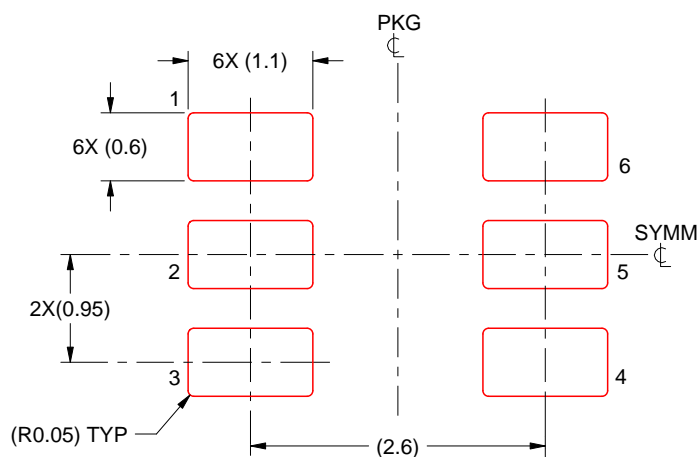
6. Publication IPC-7351 may have alternate designs.
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

## EXAMPLE STENCIL DESIGN

DBV0006A

SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



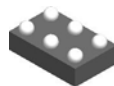
SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE:15X

4214840/G 08/2024

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.

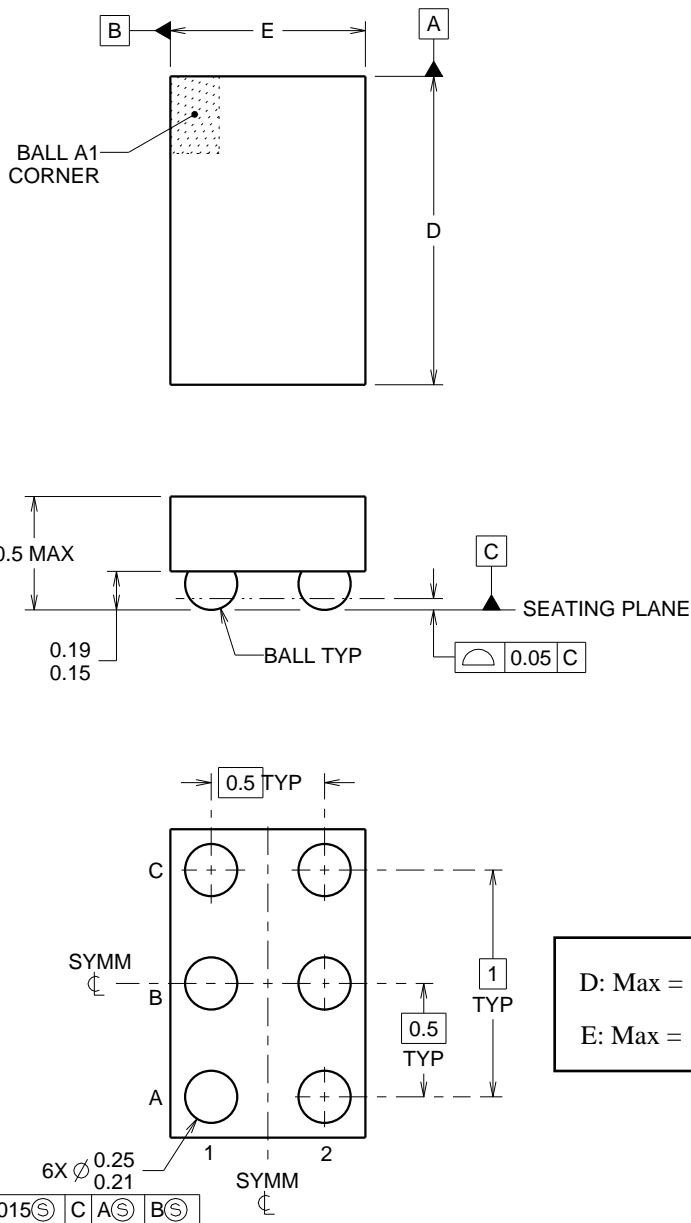
YZP0006



# PACKAGE OUTLINE

DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



4219524/A 06/2014

## NOTES:

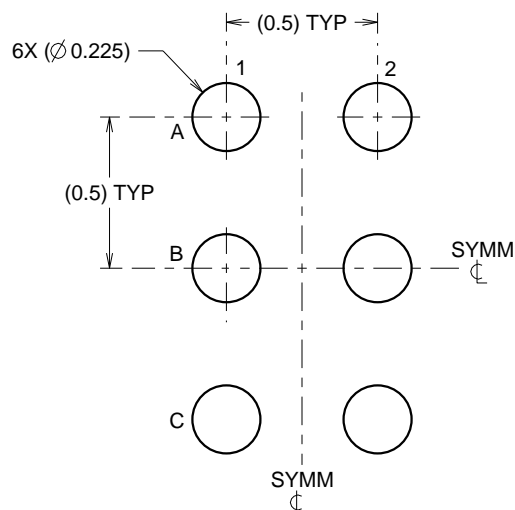
NanoFree Is a trademark of Texas Instruments.

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. NanoFree™ package configuration.

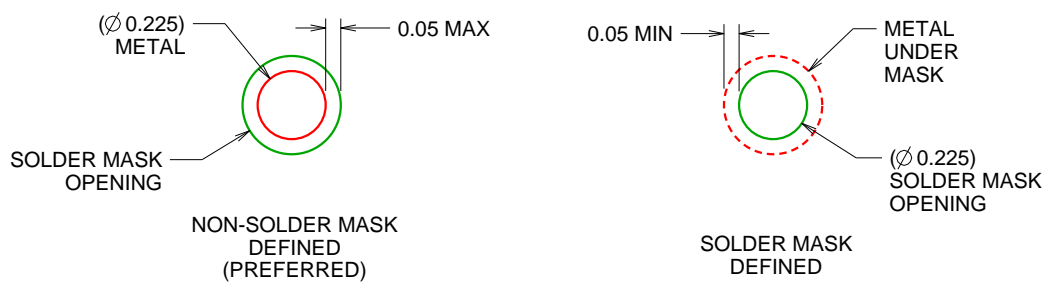
**YZP0006**

## DSBGA - 0.5 mm max height

## DIE SIZE BALL GRID ARRAY



LAND PATTERN EXAMPLE  
SCALE:40X



SOLDER MASK DETAILS  
NOT TO SCALE

4219524/A 06/2014

NOTES: (continued)

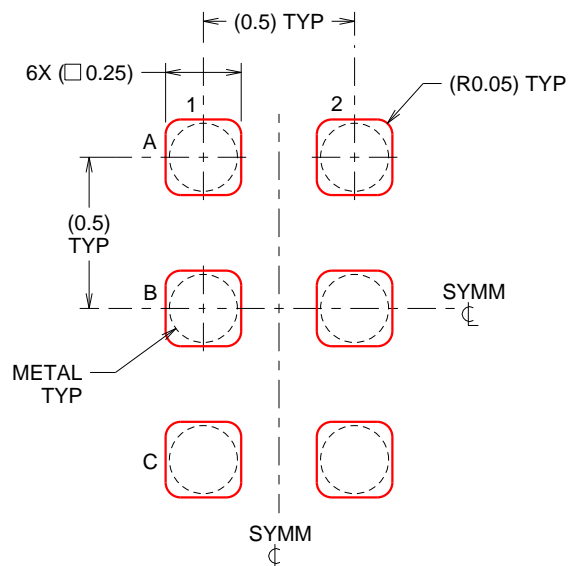
4. Final dimensions may vary due to manufacturing tolerance considerations and also routing constraints. For more information, see Texas Instruments literature number SBVA017 ([www.ti.com/lit/sbva017](http://www.ti.com/lit/sbva017)).

## EXAMPLE STENCIL DESIGN

YZP0006

DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



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

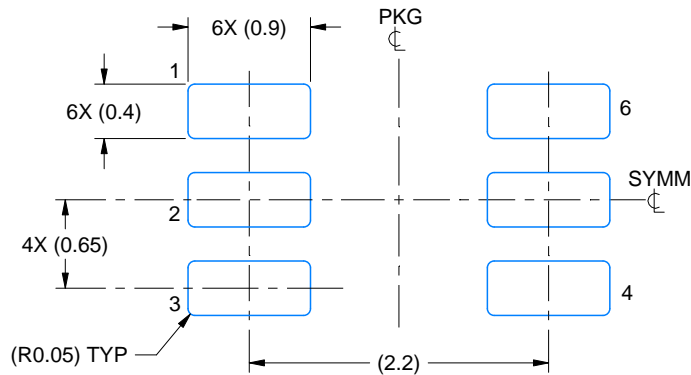
4219524/A 06/2014

NOTES: (continued)

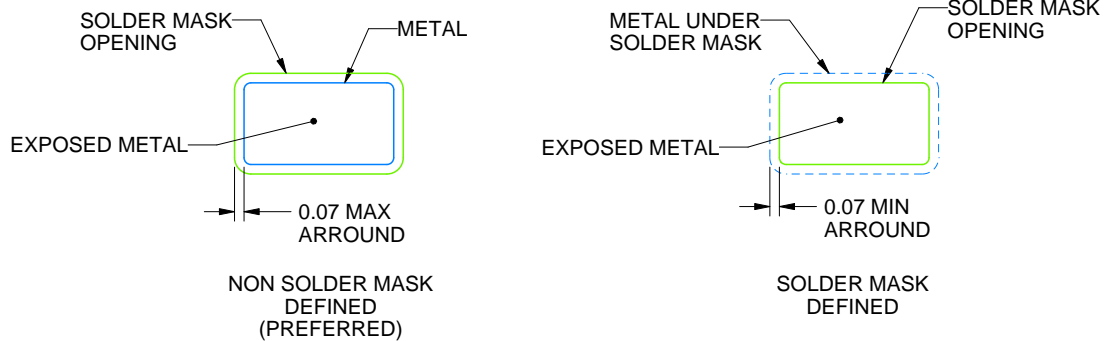
5. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release.







LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE:18X

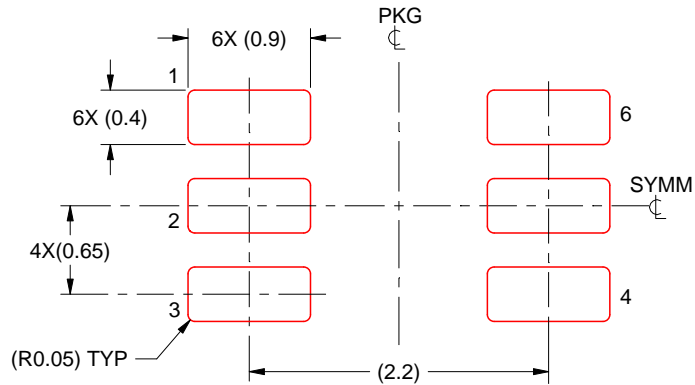


SOLDER MASK DETAILS

4214835/D 11/2024

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.



SOLDER PASTE EXAMPLE  
 BASED ON 0.125 THICK STENCIL  
 SCALE:18X

4214835/D 11/2024

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.

## GENERIC PACKAGE VIEW

**DRY 6**

**USON - 0.6 mm max height**

PLASTIC SMALL OUTLINE - NO LEAD



Images above are just a representation of the package family, actual package may vary.  
Refer to the product data sheet for package details.

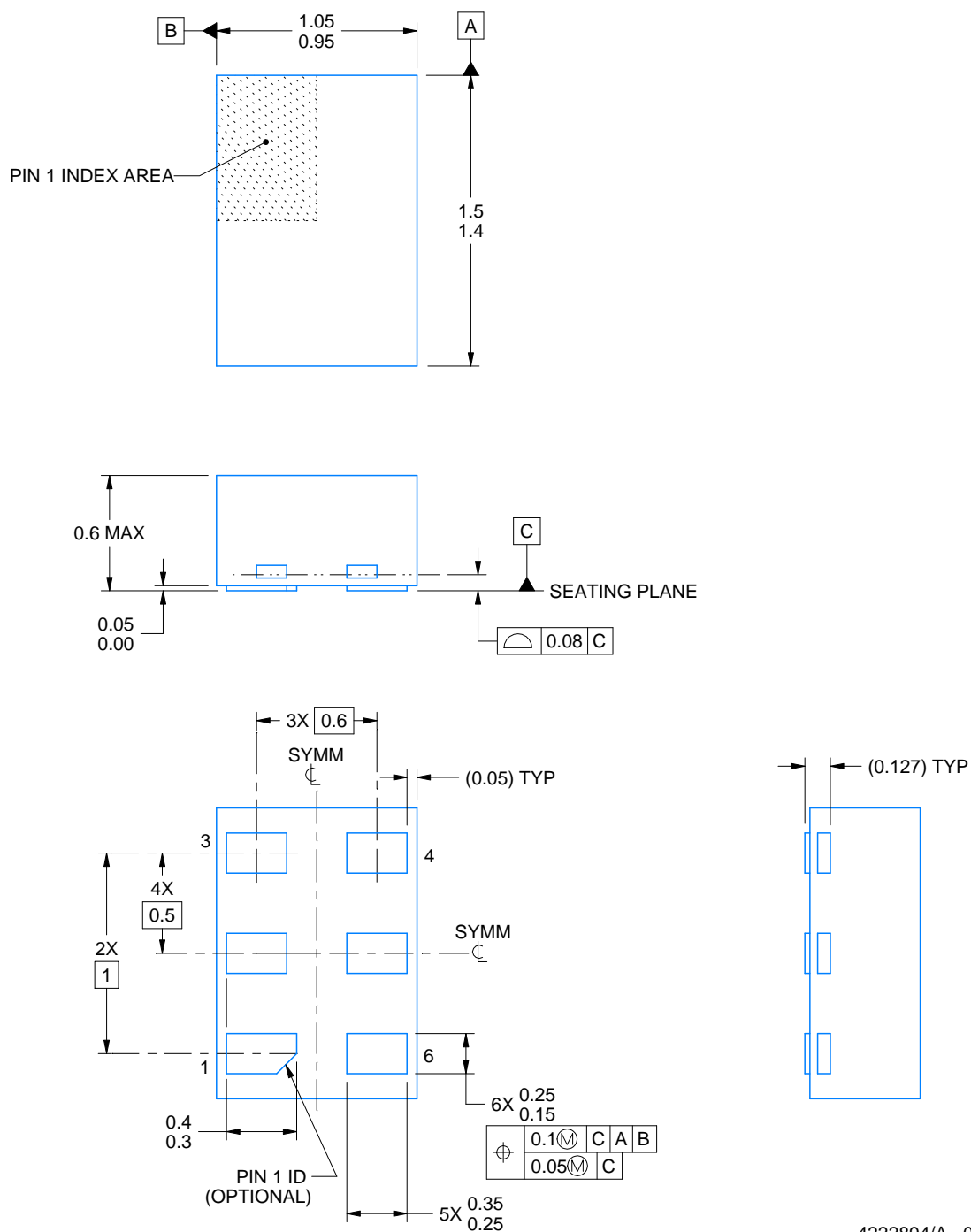
4207181/G



## PACKAGE OUTLINE

### USON - 0.6 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



4222894/A 01/2018

NOTES:

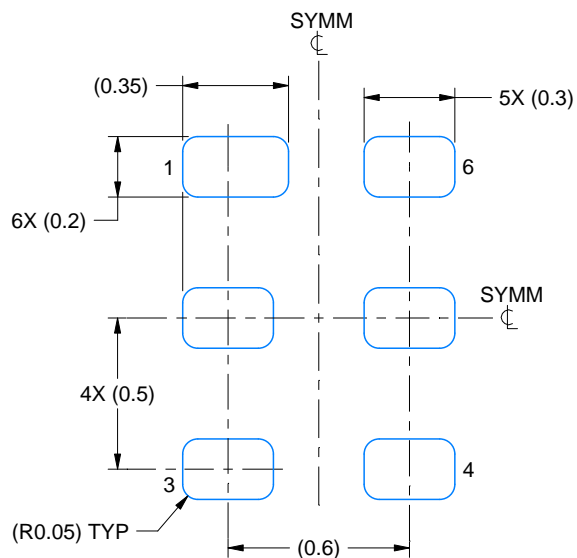
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.

# EXAMPLE BOARD LAYOUT

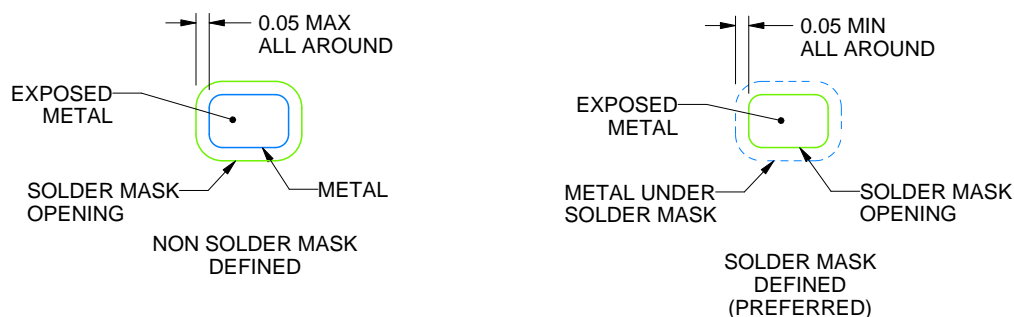
DRY0006A

USON - 0.6 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



**LAND PATTERN EXAMPLE**  
1:1 RATIO WITH PKG SOLDER PADS  
EXPOSED METAL SHOWN  
SCALE:40X



**SOLDER MASK DETAILS**

4222894/A 01/2018

NOTES: (continued)

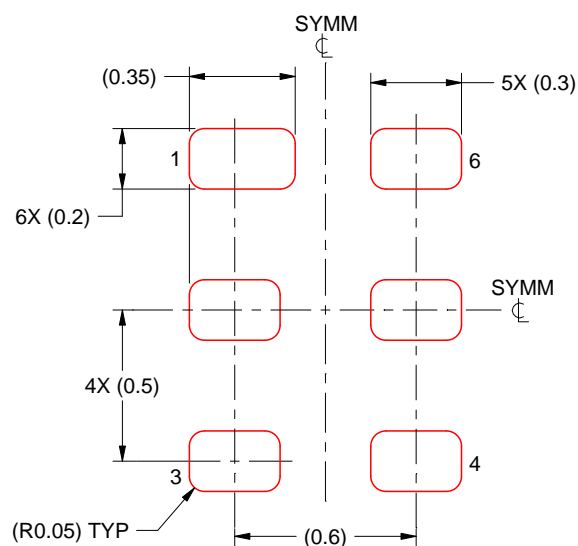
3. For more information, see QFN/SON PCB application report in literature No. SLUA271 ([www.ti.com/lit/slue271](http://www.ti.com/lit/slue271)).

## EXAMPLE STENCIL DESIGN

DRY0006A

USON - 0.6 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



SOLDER PASTE EXAMPLE  
BASED ON 0.075 - 0.1 mm THICK STENCIL  
SCALE:40X

4222894/A 01/2018

NOTES: (continued)

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

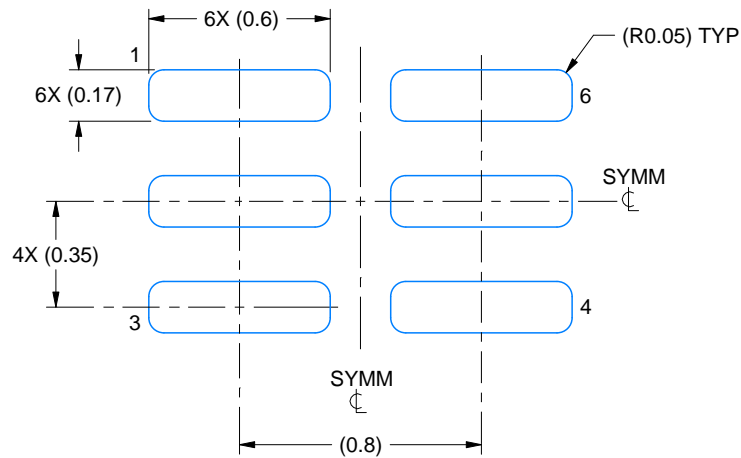


# EXAMPLE BOARD LAYOUT

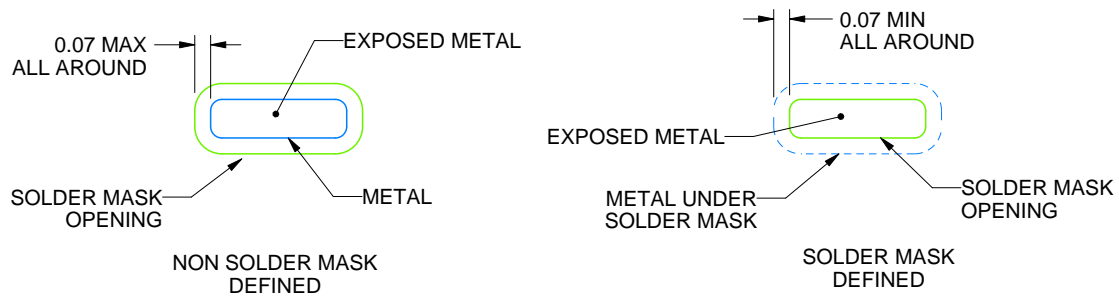
DSF0006A

X2SON - 0.4 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE:40X



SOLDER MASK DETAILS

4220597/B 06/2022

NOTES: (continued)

4. For more information, see Texas Instruments literature number SLUA271 ([www.ti.com/lit/slue271](http://www.ti.com/lit/slue271)).

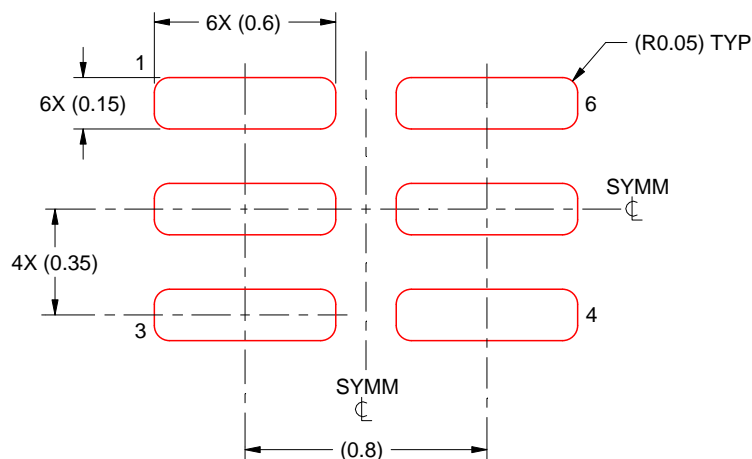


# EXAMPLE STENCIL DESIGN

DSF0006A

X2SON - 0.4 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



SOLDER PASTE EXAMPLE  
BASED ON 0.09 mm THICK STENCIL

PRINTED SOLDER COVERAGE BY AREA UNDER PACKAGE  
SCALE:40X

4220597/B 06/2022

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

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