

## SN74LVC1G132 Single 2-Input NAND Gate With Schmitt-Trigger Inputs

### 1 Features

- 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)
- Available in Texas Instruments NanoStar™ and NanoFree™ Packages
- 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 Maximum  $I_{CC}$
- $\pm 24$ -mA Output Drive at 3.3 V
- $I_{off}$  Supports Partial-Power-Down Mode Operation

### 2 Applications

- AV Receiver
- Audio Dock: Portable
- Blu-Ray Player and Home Theater
- Embedded PC
- MP3 Player/Recorder (Portable Audio)
- Personal Digital Assistant (PDA)
- Power: Telecom/Server AC/DC Supply: Single Controller: Analog and Digital
- Solid State Drive (SSD): Client and Enterprise
- TV: LCD/Digital and High-Definition (HDTV)
- Tablet: Enterprise
- Video Analytics: Server
- Wireless Headset, Keyboard, and Mouse

### 3 Description

The SN74LVC1G132 device contains one 2-input NAND gate with Schmitt-trigger inputs designed for 1.65-V to 5.5-V  $V_{CC}$  operation and performs the Boolean function  $Y = A \times B$  or  $Y = \overline{A + B}$  in positive logic.

Because of Schmitt action, this device has different input threshold levels for positive-going ( $V_{T+}$ ) and negative-going ( $V_{T-}$ ) signals.

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.

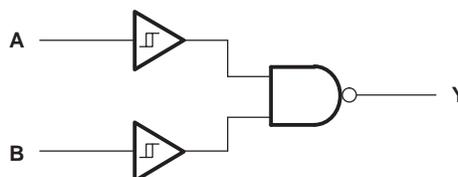
NanoStar™ and NanoFree™ package technology is a major breakthrough in IC packaging concepts, using the die as the package.

#### Device Information(1)

ORDER NUMBER	PACKAGE	BODY SIZE
SN74LVC1G132DBV	SOT-23 (5)	2.90 mm x 1.60 mm
SN74LVC1G132DCK	SC70 (5)	2.00 mm x 1.25 mm

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

#### Logic Diagram (Positive Logic)



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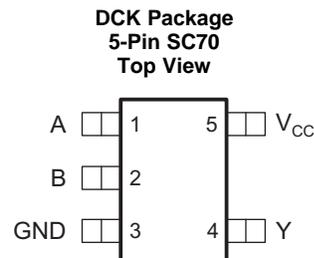
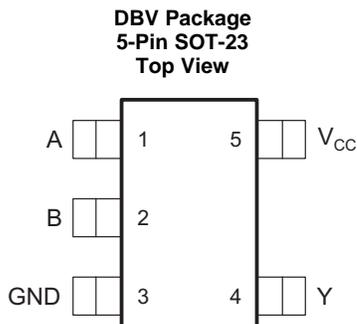
## 4 Revision History

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

<b>Changes from Revision C (December 2013) to Revision D</b>	<b>Page</b>
<ul style="list-style-type: none"> <li>• Added <i>Applications</i>, <i>Device Information</i> table, <i>Pin Configuration and Functions</i> section, <i>ESD Ratings</i> table, <i>Thermal Information</i> table, <i>Feature Description</i> section, <i>Device Functional Modes</i>, <i>Device and Documentation Support</i> section, and <i>Mechanical, Packaging, and Orderable Information</i> section..... 1</li> <li>• Deleted YEP, YZP packages throughout data sheet ..... 1</li> </ul>	  

<b>Changes from Revision B (September 2006) to Revision C</b>	<b>Page</b>
<ul style="list-style-type: none"> <li>• Updated document to new TI data sheet format ..... 1</li> <li>• Removed <i>Ordering Information</i> table ..... 1</li> <li>• Updated operating temperature range. .... 4</li> <li>• Added ESD warning. .... 10</li> </ul>	    

## 5 Pin Configuration and Functions



See mechanical drawings for dimensions.

### Pin Functions

PIN		I/O	DESCRIPTION
NAME	DBV, DCK		
A	1	I	A logic input
B	2	I	B logic input
GND	3	—	Ground
V <sub>CC</sub>	5	—	Positive supply
Y	4	O	Y NAND logic output

## 6 Specifications

### 6.1 Absolute Maximum Ratings

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

		MIN	MAX	UNIT	
V <sub>CC</sub>	Supply voltage	–0.5	6.5	V	
V <sub>I</sub>	Input voltage <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>stg</sub>	Storage temperature	–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<sub>CC</sub> is provided in the *Recommended Operating Conditions* table.

## 6.2 ESD Ratings

		VALUE	UNIT
$V_{(ESD)}$	Electrostatic discharge	Human-body model (HBM), per ANSI/ESDA/JEDEC JS-001 <sup>(1)</sup>	2000
		Charged-device model (CDM), per JEDEC specification JESD22-C101 <sup>(2)</sup>	1000
		Machine Model (A115-A)	200

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

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

## 6.3 Recommended Operating Conditions

		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. See [Implications of Slow or Floating CMOS Inputs](#), SCBA004.

## 6.4 Thermal Information

THERMAL METRIC <sup>(1)</sup>	SN74LVC1G132		UNIT	
	DBV (SOT-23)	DCK (SC70)		
	5 PINS	5 PINS		
$R_{\theta JA}$	Junction-to-ambient thermal resistance	206	252	°C/W

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

## 6.5 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	0.79		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		1.16	
		4.5 V	1.41		1.79	1.41		1.84	
		5.5 V	1.87		2.29	1.87		2.33	
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	0.54		0.87	
		4.5 V	0.71		1.04	0.66		1.04	
		5.5 V	0.71		1.11	0.67		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		0.55		
	I <sub>OL</sub> = 32 mA	4.5 V			0.55		0.55		
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.

## 6.6 Switching Characteristics: –40°C to +85°C, C<sub>L</sub> = 15 pF

over recommended operating free-air temperature range, C<sub>L</sub> = 15 pF (unless otherwise noted) (see Figure 1)

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 or B	Y	4	16	2.5	7	2	5.3	1.5	4.4	ns

### 6.7 Switching Characteristics: –40°C to +85°C

 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)	–40°C to +85°C								UNIT
			$V_{CC} = 1.8\text{ V} \pm 0.15\text{ V}$		$V_{CC} = 2.5\text{ V} \pm 0.2\text{ V}$		$V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$		$V_{CC} = 5\text{ V} \pm 0.5\text{ V}$		
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
$t_{pd}$	A or B	Y	4	16	3	7.5	2	6	2	5	ns

### 6.8 Switching Characteristics: –40°C to +125°C

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

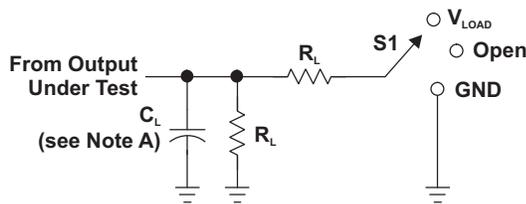
PARAMETER	FROM (INPUT)	TO (OUTPUT)	–40°C to +125°C								UNIT
			$V_{CC} = 1.8\text{ V} \pm 0.15\text{ V}$		$V_{CC} = 2.5\text{ V} \pm 0.2\text{ V}$		$V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$		$V_{CC} = 5\text{ V} \pm 0.5\text{ V}$		
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
$t_{pd}$	A or B	Y	4	16.5	3	8	2	6.5	2	5.5	ns

### 6.9 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

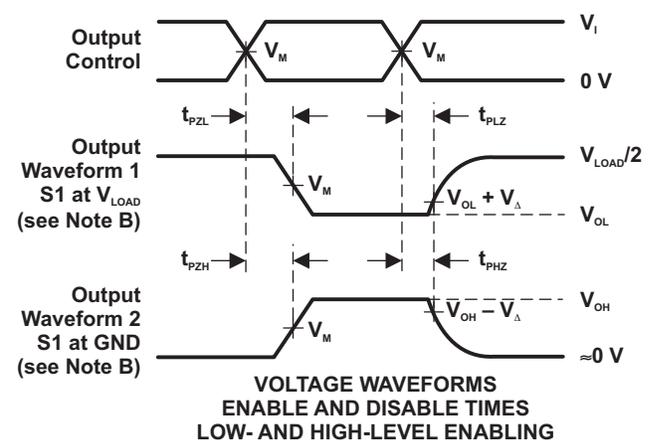
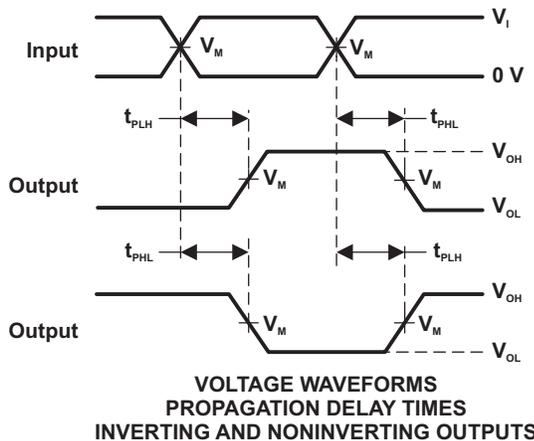
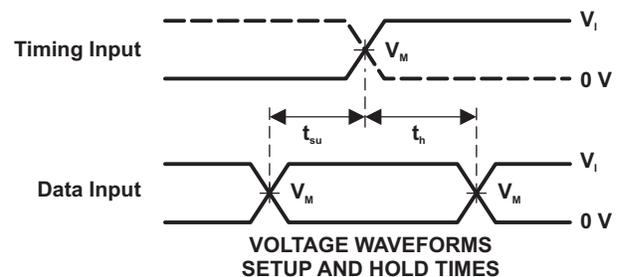
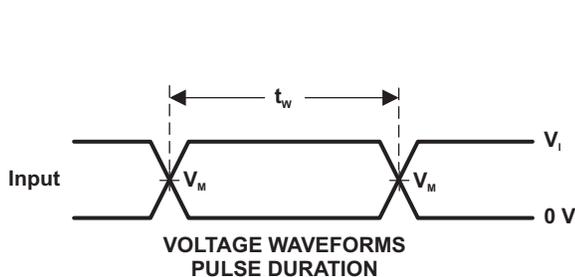
## 7 Parameter Measurement Information



LOAD CIRCUIT

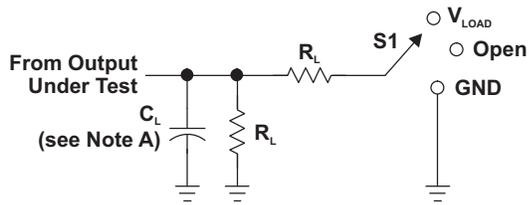
TEST	S1
$t_{PLH}/t_{PHL}$	Open
$t_{PLZ}/t_{PZL}$	$V_{LOAD}$
$t_{PHZ}/t_{PZH}$	GND

$V_{CC}$	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



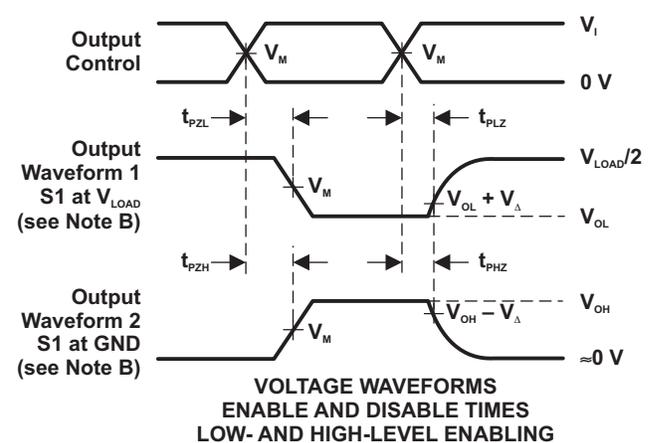
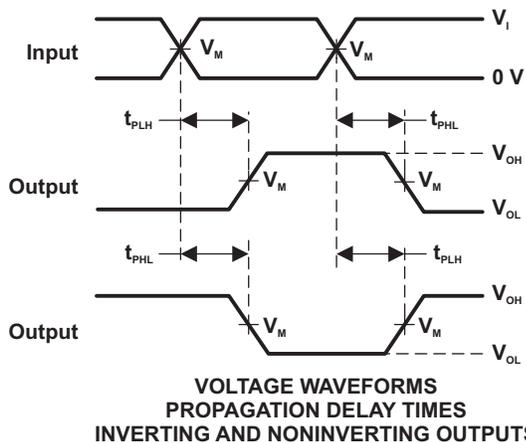
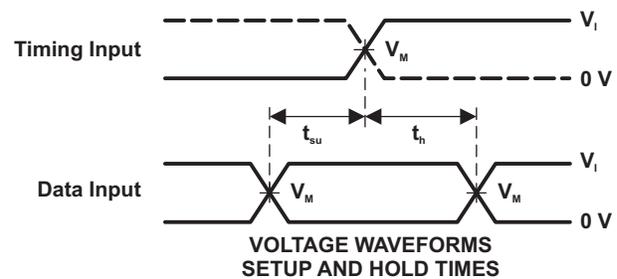
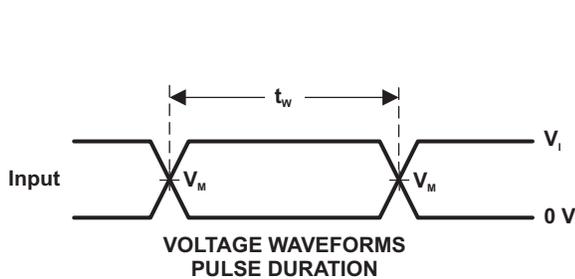
- NOTES:
- A.  $C_L$  includes probe and jig capacitance.
  - B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
  - C. All input pulses are supplied by generators having the following characteristics: PRR  $\leq$  10 MHz,  $Z_o = 50\ \Omega$ .
  - 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

**Parameter Measurement Information (continued)**

**LOAD CIRCUIT**

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

$V_{CC}$	INPUTS		$V_M$	$V_{LOAD}$	$C_L$	$R_L$	$V_{\Delta}$
	$V_I$	$t_r/t_f$					
$1.8\text{ V} \pm 0.15\text{ V}$	$V_{CC}$	$\leq 2\text{ ns}$	$V_{CC}/2$	$2 \times V_{CC}$	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:
- 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:  $PRR \leq 10\text{ MHz}$ ,  $Z_o = 50\ \Omega$ .
  - 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  $t_{on}$ .
  - G.  $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{pd}$ .
  - H. All parameters and waveforms are not applicable to all devices.

**Figure 2. Load Circuit and Voltage Waveforms**

## 8 Detailed Description

### 8.1 Functional Block Diagram

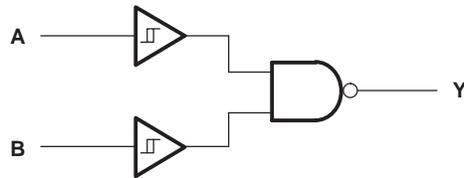


Figure 3. Logic Diagram (Positive Logic)

### 8.2 Device Functional Modes

Table 1 lists the functional modes of the SN74LVC1G132.

Table 1. Function Table

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

## 9 Device and Documentation Support

### 9.1 Documentation Support

#### 9.1.1 Related Documentation

For related documentation see the following:

[Implications of Slow or Floating CMOS Inputs](#), SCBA004

### 9.2 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. In the upper right corner, click on *Alert me* 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.

### 9.3 Community Resources

The following links connect to TI community resources. Linked contents are 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](#).

**TI E2E™ Online Community** *TI's Engineer-to-Engineer (E2E) Community*. Created to foster collaboration among engineers. At e2e.ti.com, you can ask questions, share knowledge, explore ideas and help solve problems with fellow engineers.

**Design Support** *TI's Design Support* Quickly find helpful E2E forums along with design support tools and contact information for technical support.

### 9.4 Trademarks

NanoStar, NanoFree, E2E are trademarks of Texas Instruments. All other trademarks are the property of their respective owners.

### 9.5 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.

### 9.6 Glossary

[SLYZ022](#) — *TI Glossary*.

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

## 10 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)
74LVC1G132DBVRG4.B	Active	Production	SOT-23 (DBV)   5	3000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C3BR
<a href="#">74LVC1G132DCKRG4</a>	Active	Production	SC70 (DCK)   5	3000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	D5R
74LVC1G132DCKRG4.B	Active	Production	SC70 (DCK)   5	3000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	D5R
<a href="#">74LVC1G132DCKTG4</a>	Active	Production	SC70 (DCK)   5	250   SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	D5R
74LVC1G132DCKTG4.B	Active	Production	SC70 (DCK)   5	250   SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	D5R
<a href="#">SN74LVC1G132DBVR</a>	Active	Production	SOT-23 (DBV)   5	3000   LARGE T&R	Yes	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	(C3BJ, C3BR)
SN74LVC1G132DBVR.A	Active	Production	SOT-23 (DBV)   5	3000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	(C3BJ, C3BR)
SN74LVC1G132DBVR.B	Active	Production	SOT-23 (DBV)   5	3000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	(C3BJ, C3BR)
<a href="#">SN74LVC1G132DBVT</a>	Active	Production	SOT-23 (DBV)   5	250   SMALL T&R	Yes	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	(C3BJ, C3BR)
SN74LVC1G132DBVT.B	Active	Production	SOT-23 (DBV)   5	250   SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	(C3BJ, C3BR)
SN74LVC1G132DBVTG4.B	Active	Production	SOT-23 (DBV)   5	250   SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C3BR
<a href="#">SN74LVC1G132DCKR</a>	Active	Production	SC70 (DCK)   5	3000   LARGE T&R	Yes	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	(D55, D5J, D5R)
SN74LVC1G132DCKR.A	Active	Production	SC70 (DCK)   5	3000   LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 125	(D55, D5J, D5R)
SN74LVC1G132DCKR.B	Active	Production	SC70 (DCK)   5	3000   LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 125	(D55, D5J, D5R)
SN74LVC1G132DCKRG4.A	Active	Production	SC70 (DCK)   5	3000   LARGE T&R	-	Call TI	Call TI	-40 to 125	
SN74LVC1G132DCKRG4.B	Active	Production	SC70 (DCK)   5	3000   LARGE T&R	-	Call TI	Call TI	-40 to 125	
<a href="#">SN74LVC1G132DCKT</a>	Active	Production	SC70 (DCK)   5	250   SMALL T&R	Yes	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	(D55, D5J, D5R)
SN74LVC1G132DCKT.B	Active	Production	SC70 (DCK)   5	250   SMALL T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 125	(D55, D5J, D5R)

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

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

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

(4) **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

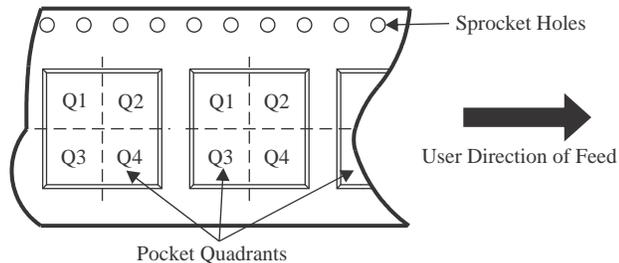
(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

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

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**TAPE AND REEL INFORMATION**

**QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE**


\*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
74LVC1G132DCKRG4	SC70	DCK	5	3000	180.0	8.4	2.47	2.3	1.25	4.0	8.0	Q3
74LVC1G132DCKTG4	SC70	DCK	5	250	180.0	8.4	2.47	2.3	1.25	4.0	8.0	Q3
SN74LVC1G132DBVR	SOT-23	DBV	5	3000	178.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
SN74LVC1G132DBVT	SOT-23	DBV	5	250	180.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
SN74LVC1G132DBVT	SOT-23	DBV	5	250	180.0	8.4	3.2	3.2	1.4	4.0	8.0	Q3
SN74LVC1G132DCKR	SC70	DCK	5	3000	178.0	8.4	2.25	2.45	1.2	4.0	8.0	Q3
SN74LVC1G132DCKT	SC70	DCK	5	250	178.0	9.0	2.4	2.5	1.2	4.0	8.0	Q3

**TAPE AND REEL BOX DIMENSIONS**


\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
74LVC1G132DCKRG4	SC70	DCK	5	3000	183.0	183.0	20.0
74LVC1G132DCKTG4	SC70	DCK	5	250	183.0	183.0	20.0
SN74LVC1G132DBVR	SOT-23	DBV	5	3000	208.0	191.0	35.0
SN74LVC1G132DBVT	SOT-23	DBV	5	250	210.0	185.0	35.0
SN74LVC1G132DBVT	SOT-23	DBV	5	250	210.0	185.0	35.0
SN74LVC1G132DCKR	SC70	DCK	5	3000	208.0	191.0	35.0
SN74LVC1G132DCKT	SC70	DCK	5	250	180.0	180.0	18.0

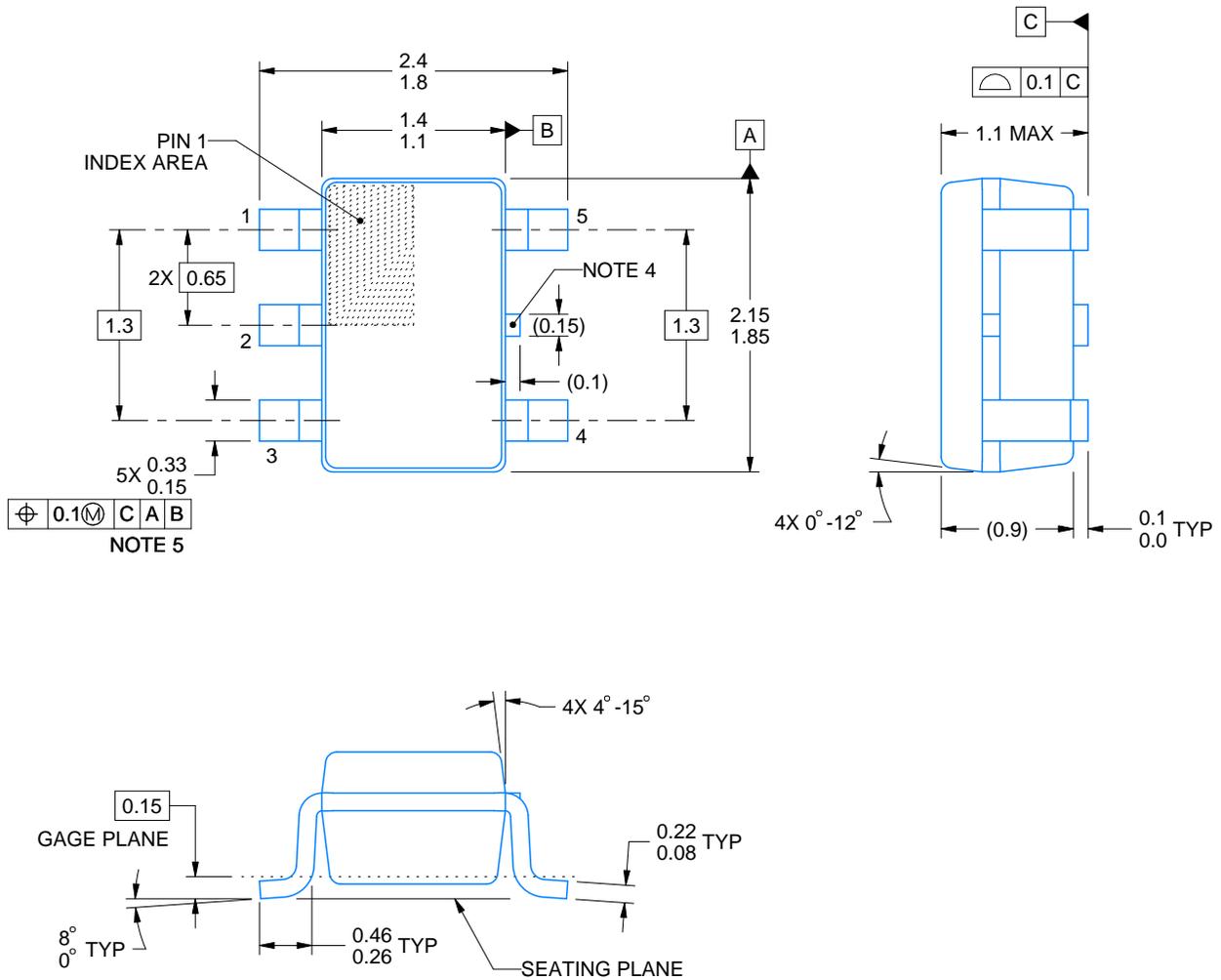
# DCK0005A



# PACKAGE OUTLINE

SOT - 1.1 max height

SMALL OUTLINE TRANSISTOR



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**NOTES:**

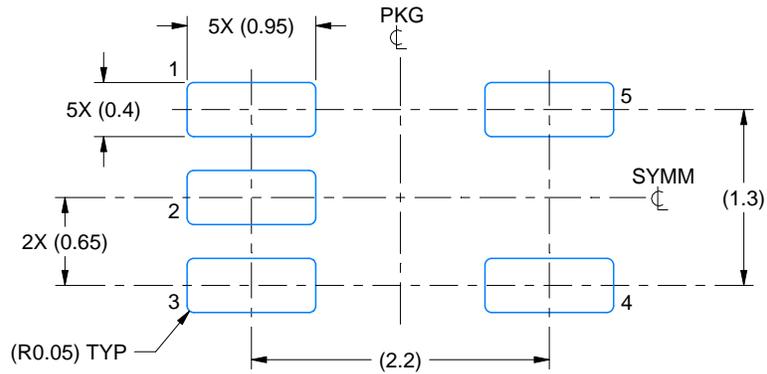
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. Reference JEDEC MO-203.
4. Support pin may differ or may not be present.
5. Lead width does not comply 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

# EXAMPLE BOARD LAYOUT

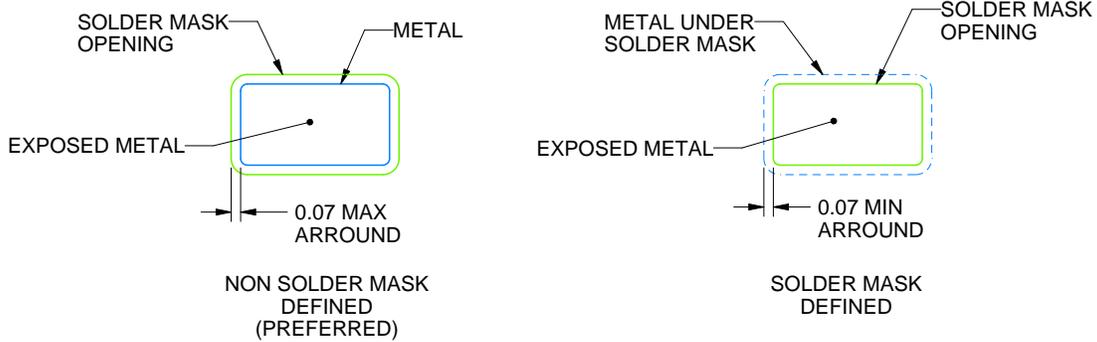
DCK0005A

SOT - 1.1 max height

SMALL OUTLINE TRANSISTOR



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE:18X



SOLDER MASK DETAILS

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NOTES: (continued)

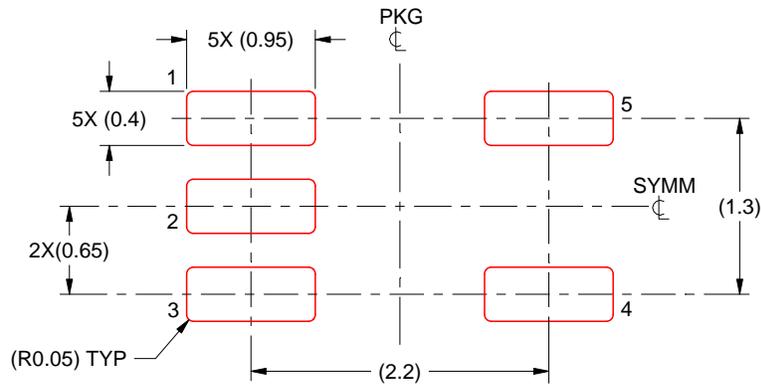
- 7. Publication IPC-7351 may have alternate designs.
- 8. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# EXAMPLE STENCIL DESIGN

DCK0005A

SOT - 1.1 max height

SMALL OUTLINE TRANSISTOR



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

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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.

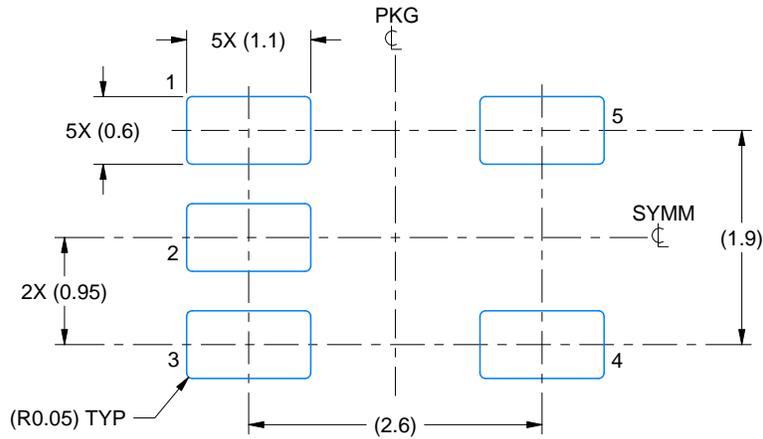


# EXAMPLE BOARD LAYOUT

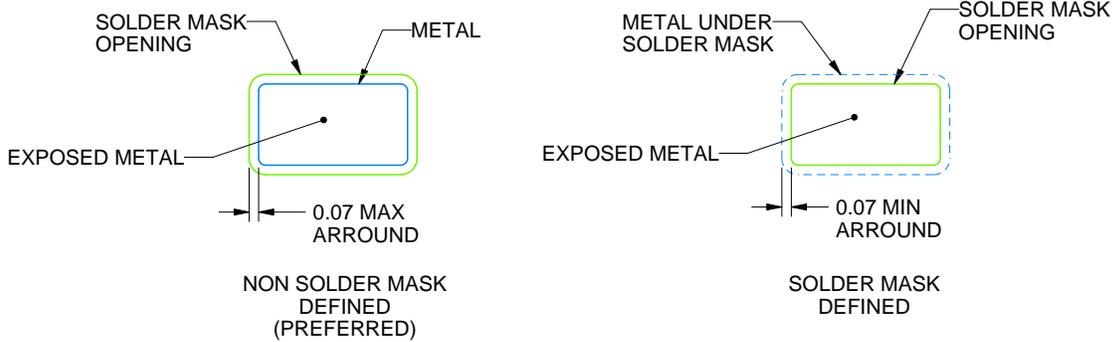
DBV0005A

SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE:15X



SOLDER MASK DETAILS

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NOTES: (continued)

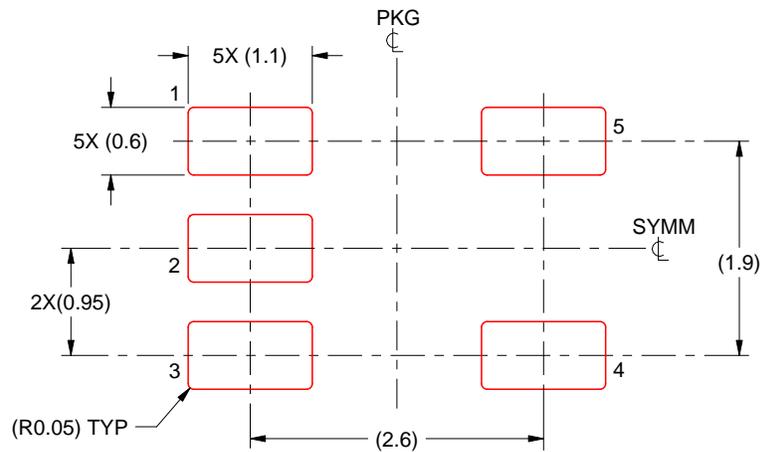
- 6. Publication IPC-7351 may have alternate designs.
- 7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# EXAMPLE STENCIL DESIGN

DBV0005A

SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



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

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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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