



Sample &

Buv







SN74LVC1G34

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# SN74LVC1G34 Single Buffer Gate

#### 1 Features

- Available in the Ultra Small 0.64-mm<sup>2</sup> Package (DPW) with 0.5-mm Pitch
- Supports 5-V V<sub>CC</sub> Operation
- Inputs Accept Voltages to 5.5 V
- Provides Down Translation to V<sub>CC</sub>
- Max t<sub>pd</sub> of 3.5 ns at 3.3 V
- Low Power Consumption, 1-µA Max I<sub>CC</sub>
- ±24-mA Output Drive at 3.3 V
- I<sub>off</sub> Supports Live Insertion, Partial Power Down Mode, 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 (A114-A)
  - 200-V Machine Model (A115-A)
  - 1000-V Charged-Device Model (C101)

#### 2 Applications

- AV Receiver
- Audio Dock: Portable
- Blu-ray Player and Home Theater
- DVD Recorder and Player
- 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

### 4 Simplified Schematic

#### 3 Description

This single buffer gate is designed for 1.65-V to 5.5-V  $V_{\text{CC}}$  operation.

The SN74LVC1G34 device performs the Boolean function Y = A in positive logic.

The CMOS device has high output drive while maintaining low static power dissipation over a broad  $V_{CC}$  Operating range.

The SN74LVC1G34 is available in a variety of packages, including the ultra-small DPW package with a body size of  $0.8 \text{ mm} \times 0.8 \text{ mm}$ .

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

		-
DEVICE NAME	PACKAGE (PINS)	BODY SIZE
SN74LVC1G34YFP	DSBGA (4)	0.76 mm × 0.76 mm
SN74LVC1G34YZP	DSBGA (5)	1.38 mm × 0.88 mm
SN74LVC1G34YZV	DSBGA (4)	0.88 mm × 0.88 mm
SN74LVC1G34DPW	X2SON (5)	0.80 mm × 0.80 mm
SN74LVC1G34DBV	SOT-23 (5)	2.90 mm × 2.80 mm
SN74LVC1G34DCK	SC70 (5)	2.00 mm × 2.10 mm
SN74LVC1G34DRL	SOT (5)	1.60 mm × 1.60 mm
SN74LVC1G34DRY	SON (6)	1.45 mm ×1.00 mm
SN74LVC1G34DSF	SON(6)	1.00 mm × 1.00 mm

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



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### 5 Revision History

### Changes from Revision L (April 2014) to Revision M Changed X2SON from 4 pin to 5 pin on *Device Information* table ......1 Added package temperature specification for DSBGA package ......6

#### Changes from Revision K (March 2014) to Revision L

•	Added Device Information table.	. 1
•	Added Pin Functions table.	. 4
•	Updated Handling Ratings table.	. 5
•	Updated operating temperature range.	. 6
•	Added Thermal Information table.	. 6
•	Added Typical Characteristics.	. 8
•	Added Detailed Description section.	11
•	Added Application and Implementation section.	12

#### Changes from Revision J (December 2013) to Revision K

•	Added Applications.	1
•	DPW Package.	4
•	Moved T <sub>stg</sub> to Handling Ratings table	5

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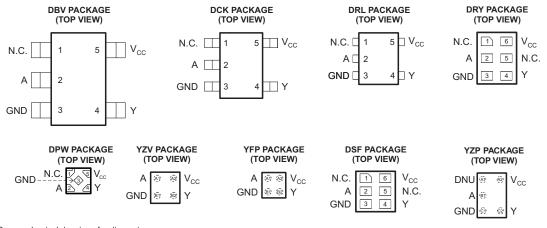
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<b>Changes from Revision</b>	I (June2011	) to Revision J
------------------------------	-------------	-----------------

		-
•	Updated document to new TI data sheet format	1
•	Removed Ordering Information table.	1

### 6 Pin Configuration and Functions



See mechanical drawings for dimensions. N.C. – No internal connection DNU – Do not use

**Pin Functions** PIN DESCRIPTION DRL NAME DPW DRY, DSF YZP YFP, YZV DCK, DBV 1, 5 NC 1 A1 Not connected 1 \_ А 2 2 2 Β1 A1 Input GND 3 C1 B1 3 3 Ground Υ 4 4 4 C2 B2 Output  $V_{\text{CC}}$ 5 5 6 A2 A2 Power pin

### 7 Specifications

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

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

			MIN	MAX	UNIT
V <sub>CC</sub>	Supply voltage range	-0.5	6.5	V	
VI	Input voltage range		-0.5	6.5	V
Vo	Voltage range applied to any output in the high-impeda	nce or power-off state <sup>(2)</sup>	-0.5	6.5	V
Vo	Voltage range applied to any output in the high or low state <sup>(2)(3)</sup>			V <sub>CC</sub> + 0.5	V
I <sub>IK</sub>	Input clamp current	V <sub>1</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 range		-65	150	°C
TJ	Max Junction temperature			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.

### 7.2 ESD Ratings

			MIN	MAX	UNIT	
V	Electrostatio discharge	Human body model (HBM), per ANSI/ESDA/JEDEC JS-001, all $pins^{(1)}$		±2	kV	
V(ESD)	Electrostatic discharge	Charged device model (CDM), per JEDEC specification JESD22-C101, all pins <sup>(2)</sup>		±1	κV	

(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.

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### 7.3 Recommended Operating Conditions<sup>(1)</sup>

			MIN	MAX	UNIT
v	Supply voltage	Operating	1.65	5.5	V
VCC	Supply voltage	Data retention only	1.5		V
		$V_{CC} = 1.65 \text{ V} \text{ to } 1.95 \text{ V}$	0.65 × V <sub>CC</sub>		
V <sub>IH</sub> V <sub>IL</sub> V <sub>O</sub>		$V_{CC}$ = 2.3 V to 2.7 V	1.7		V
VIН	High-level input voltage	$V_{CC} = 3 V \text{ to } 3.6 V$	2		V
		$V_{CC}$ = 4.5 V to 5.5 V	0.7 × V <sub>CC</sub>		
V <sub>IH</sub> Hi V <sub>IL</sub> Lc V <sub>I</sub> In V <sub>O</sub> O I <sub>OH</sub> Hi I <sub>OL</sub> Lc		$V_{CC} = 1.65 \text{ V} \text{ to } 1.95 \text{ V}$		$0.35 \times V_{CC}$	
		$V_{CC}$ = 2.3 V to 2.7 V		0.7	V
۷IL	Low-level input voltage	$V_{CC} = 3 V \text{ to } 3.6 V$		0.8	V
			$0.3 \times V_{CC}$		
VI	Input voltage		0	5.5	V
Vo	Output voltage		0	V <sub>CC</sub>	V
		V <sub>CC</sub> = 1.65 V		-4	
	High-level output current	$V_{CC} = 2.3 V$		-8	
I <sub>OH</sub>		$V_{CC} = 3 V$		-16	mA
		$v_{CC} = 3 v$		-24	
		$V_{CC} = 4.5 V$		-32	
		V <sub>CC</sub> = 1.65 V		4	
		$V_{CC} = 2.3 V$		8	
l <sub>OL</sub>	Low-level output current	N 2 M		16	mA
		$V_{CC} = 3 V$		24	
		$V_{CC} = 4.5 V$		32	
		$V_{CC} = 1.8 \text{ V} \pm 0.15 \text{ V}, 2.5 \text{ V} \pm 0.2 \text{ V}$		20	
Δt/Δv	Input transition rise or fall rate	$V_{CC} = 3.3 \text{ V} \pm 0.3 \text{ V}$		10	ns/V
		$V_{CC} = 5 V \pm 0.5 V$		10	
T <sub>A</sub>	Operating free-air temperature	DSBGA package	-40	85	°C
		All other packages	-40	125	°C

 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

			SN74LVC1G34						
	THERMAL METRIC <sup>(1)</sup>	DBV	DCK	DRL	DRY	YZP	DPW	UNIT	
		5 PINS	5 PINS	5 PINS	6 PINS	5 PINS	4 PINS		
R <sub>θJA</sub>	Junction-to-ambient thermal resistance	229	278	243	439	130	340		
R <sub>0JC(top)</sub>	Junction-to-case (top) thermal resistance	164	93	78	277	54	215		
$R_{\theta J B}$	Junction-to-board thermal resistance	62	65	78	271	51	294	°C/W	
$\Psi_{JT}$	Junction-to-top characterization parameter	44	2	10	84	1	41	°C/w	
Ψјв	Junction-to-board characterization parameter	62	64	77	271	50	294		
R <sub>0JC(bot)</sub>	Junction-to-case (bottom) thermal resistance	-	-	-	-	-	250		

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



#### 7.5 Electrical Characteristics

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

			-40°0	-40°C to 85°C -40°C to 125°C		-40°C to 125°C		
PARAMETER	TEST CONDITIONS	V <sub>cc</sub>	MIN	TYP <sup>(1)</sup> MAX	MIN	TYP <sup>(1)</sup>	MAX	UNIT
	I <sub>OH</sub> = -100 μA	1.65 V to 5.5 V	$V_{CC} - 0.1$		V <sub>CC</sub> - 0.1			
	I <sub>OH</sub> = -4 mA	1.65 V	1.2		1.2			
N/	I <sub>OH</sub> = -8 mA	2.3 V	1.9		1.9			V
V <sub>OH</sub>	I <sub>OH</sub> = -16 mA	2.14	2.4		2.4			v
	I <sub>OH</sub> = -24 mA	3 V	2.3		2.3			
	I <sub>OH</sub> = -32 mA	4.5 V	3.8		3.8			
	I <sub>OL</sub> = 100 μA	1.65 V to 5.5 V		0.1			0.1	
	I <sub>OL</sub> = 4 mA	1.65 V		0.45			0.45	
N/	I <sub>OL</sub> = 8 mA	2.3 V		0.3			0.3	V
V <sub>OL</sub>	I <sub>OL</sub> = 16 mA	2.14		0.4			0.4	v
	I <sub>OL</sub> = 24 mA	3 V		0.55			0.55	
	I <sub>OL</sub> = 32 mA	4.5 V		0.55			0.55	
I <sub>I</sub>	$V_{I} = 5.5 V \text{ or GND}$	0 to 5.5 V		±1			±2	μA
I <sub>off</sub>	$V_{\rm I}$ or $V_{\rm O}$ = 5.5 V	0		±10			±10	μA
I <sub>CC</sub>	$V_{\rm I} = 5.5 \text{ V or GND}, \qquad I_{\rm O} = 0$	1.65 V to 5.5 V		1			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
Ci	$V_{I} = V_{CC}$ 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.

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#### 7.6 Switching Characteristics, $C_L = 15 \text{ pF}$

over recommended operating free-air temperature range,  $C_L = 15 \text{ pF}$  (unless otherwise noted) (see Figure 3)

						–40°C	to 85°C				
PARAMETER	FROM (INPUT)	TO (OUTPUT)	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		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t <sub>pd</sub>	А	Y	2	9.9	1.5	6	1	3.5	1	2.9	ns

#### 7.7 Switching Characteristics, -40°C to 85°C

over recommended operating free-air temperature range, C<sub>L</sub> = 30 pF or 50 pF (unless otherwise noted) (see Figure 4)

						–40°C	to 85°C				UNIT
PARAMETER	FROM (INPUT)	TO (OUTPUT)	V <sub>CC</sub> = ± 0.1		V <sub>cc</sub> = ± 0.2		V <sub>CC</sub> = 3.3 V ± 0.3 V		V <sub>CC</sub> = 5 V ± 0.5 V		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t <sub>pd</sub>	А	Y	3.2	8.6	1.5	4.4	1.5	4.1	1	3.2	ns

### 7.8 Switching Characteristics, -40°C to 125°C

over recommended operating free-air temperature range, C<sub>L</sub> = 30 pF or 50 pF (unless otherwise noted) (see Figure 4)

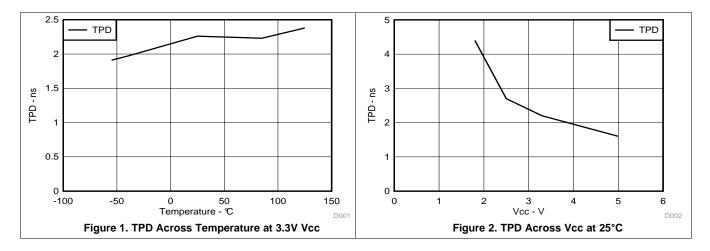
						<b>-40°C</b>	to 125°C				UNIT
PARAMETER	FROM (INPUT)	TO (OUTPUT)	V <sub>CC</sub> = 1.8 V ± 0.15 V		V <sub>CC</sub> = 2.5 V ± 0.2 V		V <sub>CC</sub> = 3.3 V ± 0.3 V		V <sub>CC</sub> = 5 V ± 0.5 V		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t <sub>pd</sub>	А	Y	3.2	9.5	1.5	5.1	1.5	4.7	1	3.9	ns

#### 7.9 Operating Characteristics

 $T_A = 25^{\circ}C$ 

	PARAMETER	TEST CONDITIONS	V <sub>CC</sub> = 1.8 V TYP	V <sub>CC</sub> = 2.5 V TYP	V <sub>CC</sub> = 3.3 V TYP	V <sub>CC</sub> = 5 V TYP	UNIT
$C_{pd}$	Power dissipation capacitance	f = 10 MHz	16	16	16	18	pF

### 7.10 Typical Characteristics





V

0 V

٧ı

0 V

Vı

0 V

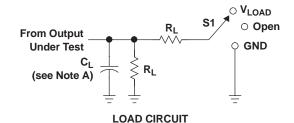
V<sub>LOAD</sub>/2

VoL

VOH

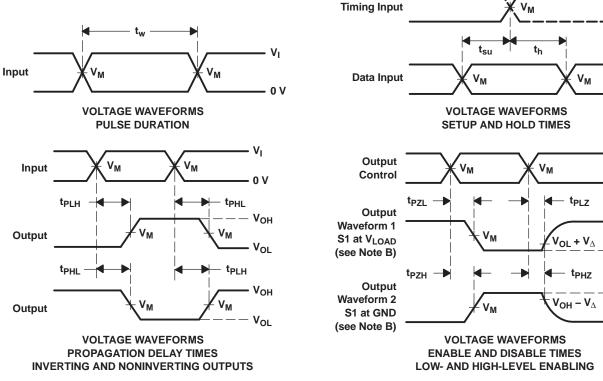
≈0 V

#### Parameter Measurement Information 8



TEST	S1
t <sub>PLH</sub> /t <sub>PHL</sub>	Open
t <sub>PLZ</sub> /t <sub>PZL</sub>	V <sub>LOAD</sub>
t <sub>PHZ</sub> /t <sub>PZH</sub>	GND

	INI	INPUTS			_	-	
V <sub>CC</sub>	VI	t <sub>r</sub> /t <sub>f</sub>	VM	V <sub>LOAD</sub>	CL	RL	$V_{\Delta}$
$1.8~V\pm0.15~V$	V <sub>CC</sub>	≤2 ns	V <sub>CC</sub> /2	$2 \times V_{CC}$	15 pF	<b>1 Μ</b> Ω	0.15 V
$\textbf{2.5 V} \pm \textbf{0.2 V}$	V <sub>CC</sub>	≤2 ns	V <sub>CC</sub> /2	$2 \times V_{CC}$	15 pF	<b>1 Μ</b> Ω	0.15 V
3.3 V $\pm$ 0.3 V	3 V	≤2.5 ns	1.5 V	6 V	15 pF	<b>1 Μ</b> Ω	0.3 V
5 V $\pm$ 0.5 V	V <sub>CC</sub>	≤2.5 ns	V <sub>CC</sub> /2	$2 \times V_{CC}$	15 pF	<b>1 Μ</b> Ω	0.3 V



NOTES: A. CL 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<sub>O</sub> = 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<sub>PZL</sub> and t<sub>PZH</sub> are the same as t<sub>en</sub>.
- G. t<sub>PLH</sub> and t<sub>PHL</sub> are the same as t<sub>pd</sub>.
- H. All parameters and waveforms are not applicable to all devices.

#### Figure 3. Load Circuit and Voltage Waveforms

RL

From Output

**Under Test** 

(see Note A)

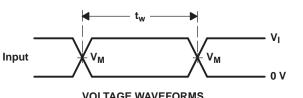
C

#### **S**1 RĻ O Open TEST O GND t<sub>PLH</sub>/t<sub>PHL</sub> Open

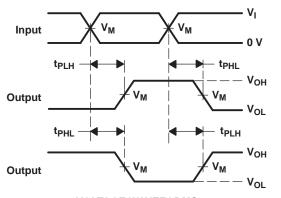
Parameter Measurement Information (continued)

DAD CIRCUIT							
	IN	PUTS			_	_	
V <sub>CC</sub>	VI	t <sub>r</sub> /t <sub>f</sub>	VM	V <sub>LOAD</sub>	CL	RL	$V_{\Delta}$
.8 V $\pm$ 0.15 V	Vcc	≤2 ns	V <sub>CC</sub> /2	$2 \times V_{CC}$	30 pF	<b>1 k</b> Ω	0.15 V
2.5 V $\pm$ 0.2 V	V <sub>CC</sub>	≤2 ns	V <sub>CC</sub> /2	$2 \times V_{CC}$	30 pF	<b>500</b> Ω	0.15 V
3.3 V $\pm$ 0.3 V	3 V	≤2.5 ns	1.5 V	6 V	50 pF	<b>500</b> Ω	0.3 V
5 V $\pm$ 0.5 V	V <sub>CC</sub>	≤2.5 ns	V <sub>CC</sub> /2	$2 \times V_{CC}$	50 pF	<b>500</b> Ω	0.3 V

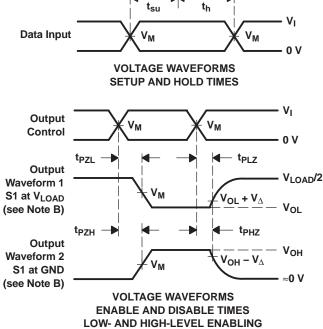
**Timing Input** 



**VOLTAGE WAVEFORMS** PULSE DURATION



#### VOLTAGE WAVEFORMS **PROPAGATION DELAY TIMES** INVERTING AND NONINVERTING OUTPUTS



NOTES: A. CL 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<sub>O</sub> = 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 4. Load Circuit and Voltage Waveforms

STRUMENTS

V

0 V

XAS

**S**1

VLOAD

GND

VM

t<sub>PLZ</sub>/t<sub>PZL</sub>

tPHZ/tPZH



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#### 9 Detailed Description

#### 9.1 Overview

The SN74LVC1G34 device contains one buffer gate device and performs the Boolean function Y = A. 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.

The DPW package technology is a major breakthrough in IC packaging. Its tiny 0.64 mm square footprint saves significant board space over other package options while still retaining the traditional manufacturing friendly lead pitch of 0.5 mm.

#### 9.2 Functional Block Diagram



#### 9.3 Feature Description

- Wide operating voltage range.
  - Operates from 1.65 V to 5.5 V.
- Allows down voltage translation.
- Inputs accept voltages to 5.5 V.
- I<sub>off</sub> feature allows voltages on the inputs and outputs when V<sub>CC</sub> is 0 V.

#### 9.4 Device Functional Modes

Functio	n Table
INPUT A	OUTPUT Y
Н	Н
L	L

TEXAS INSTRUMENTS

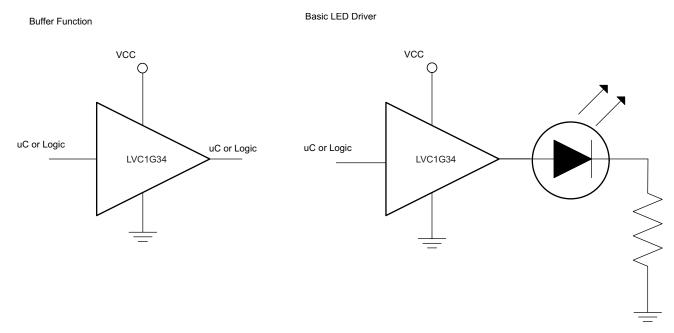
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### **10** Application and Implementation

#### **10.1** Application Information

The SN74LVC1G34 is a high drive CMOS device that can be used as a buffer with a high output drive, such as an LED application. It can produce 24 mA of drive current at 3.3 V making it ideal for driving multiple outputs and good for high speed applications up to 100 MHz. The inputs are 5.5 V tolerant allowing it to translate down to  $V_{CC}$ .

### **10.2 Typical Application**



#### 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. The high drive will also create fast edges into light loads so routing and load conditions should be considered to prevent ringing.

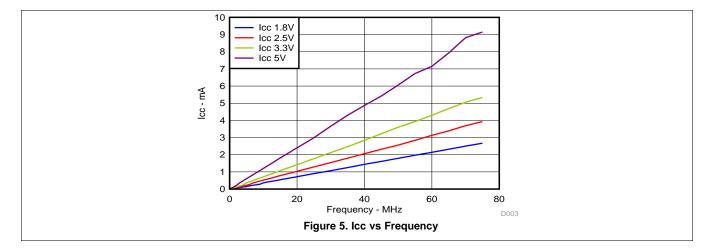
#### 10.2.2 Detailed Design Procedure

- 1. Recommended Input Conditions
  - Rise time and fall time specs. See ( $\Delta t/\Delta V$ ) in the *Recommended Operating Conditions* table.
  - Specified high and low levels. See (V<sub>IH</sub> and V<sub>IL</sub>) in the *Recommended Operating Conditions* table.
  - Inputs are overvoltage tolerant allowing them to go as high as (VI max) in the *Recommended Operating Conditions* table at any valid V<sub>CC</sub>.
- 2. Recommend Output Conditions
  - Load currents should not exceed (I<sub>O</sub> max) per output and should not exceed (Continuous current through V<sub>CC</sub> or GND) total current for the part. These limits are located in the *Absolute Max Ratings* table.
  - Outputs should not be pulled above  $V_{CC}$ .



#### **Typical Application (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 Vcc pin should have a good bypass capacitor to prevent power disturbance. For devices with a single supply a  $0.1-\mu$ F capacitor is recommended and if there are multiple Vcc pins then a  $0.01-\mu$ F or  $0.022-\mu$ F capacitor is recommended for each power pin. It is ok to parallel multiple bypass caps to reject different frequencies of noise.  $0.1-\mu$ F and  $1-\mu$ F capacitors are commonly used in parallel. The bypass capacitor should be installed as close to the power pin as possible for best results.

#### 12 Layout

#### 12.1 Layout Guidelines

When using multiple bit logic devices inputs should not ever float. In many cases, functions or parts of functions of digital logic devices are unused; for example, when only two inputs of a triple-input AND gate are used or 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 below are the 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 Vcc whichever make more sense or is more convenient.

#### 12.2 Layout Example





### **13** Device and Documentation Support

#### 13.1 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<sup>™</sup> 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.

#### 13.2 Trademarks

E2E is a trademark of Texas Instruments. All other trademarks are the property of their respective owners.

#### **13.3 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.

#### 13.4 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 Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
SN74LVC1G34DBVR	ACTIVE	SOT-23	DBV	5	3000	RoHS & Green	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	(C345, C34F, C34J, C34K, C34R) (C34H, C34P, C34S)	Samples
SN74LVC1G34DBVRE4	ACTIVE	SOT-23	DBV	5	3000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C345 C34S	Samples
SN74LVC1G34DBVRG4	ACTIVE	SOT-23	DBV	5	3000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C345 C34S	Samples
SN74LVC1G34DBVT	ACTIVE	SOT-23	DBV	5	250	RoHS & Green	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	(C345, C34J, C34K, C34R) (C34H, C34S)	Samples
SN74LVC1G34DBVTE4	ACTIVE	SOT-23	DBV	5	250	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C345 C34S	Samples
SN74LVC1G34DBVTG4	ACTIVE	SOT-23	DBV	5	250	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C345 C34S	Samples
SN74LVC1G34DCKR	ACTIVE	SC70	DCK	5	3000	RoHS & Green	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	(C95, C9F, C9J, C9 K, C9R) (C9H, C9P, C9S)	Samples
SN74LVC1G34DCKRE4	ACTIVE	SC70	DCK	5	3000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C95 C9S	Samples
SN74LVC1G34DCKRG4	ACTIVE	SC70	DCK	5	3000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C95 C9S	Samples
SN74LVC1G34DCKT	ACTIVE	SC70	DCK	5	250	RoHS & Green	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 125	(C95, C9J, C9K, C9 R) (C9H, C9S)	Samples
SN74LVC1G34DCKTG4	ACTIVE	SC70	DCK	5	250	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C95 C9S	Samples
SN74LVC1G34DPWR	ACTIVE	X2SON	DPW	5	3000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	P4	Samples
SN74LVC1G34DRLR	ACTIVE	SOT-5X3	DRL	5	4000	RoHS & Green	NIPDAUAG	Level-1-260C-UNLIM	-40 to 125	(C97, C9R)	Samples
SN74LVC1G34DRYR	ACTIVE	SON	DRY	6	5000	RoHS & Green	NIPDAU   NIPDAUAG	Level-1-260C-UNLIM	-40 to 125	C9	Samples
SN74LVC1G34DSFR	ACTIVE	SON	DSF	6	5000	RoHS & Green	NIPDAU   NIPDAUAG	Level-1-260C-UNLIM	-40 to 125	C9	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
SN74LVC1G34YFPR	ACTIVE	DSBGA	YFP	4	3000	RoHS & Green	SNAGCU	Level-1-260C-UNLIM	-40 to 85	C9 N	Samples
SN74LVC1G34YZPR	ACTIVE	DSBGA	YZP	5	3000	RoHS & Green	SNAGCU	Level-1-260C-UNLIM	-40 to 85	C9N	Samples
SN74LVC1G34YZVR	ACTIVE	DSBGA	YZV	4	3000	RoHS & Green	SNAGCU	Level-1-260C-UNLIM	-40 to 85	C9 N	Samples

<sup>(1)</sup> The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

**PREVIEW:** Device has been announced but is not in production. Samples may or may not be available.

**OBSOLETE:** TI has discontinued the production of the device.

<sup>(2)</sup> RoHS: TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

**RoHS Exempt:** TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

Green: TI defines "Green" to mean the content of Chlorine (CI) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

<sup>(3)</sup> MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

<sup>(4)</sup> There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

<sup>(6)</sup> Lead finish/Ball material - Orderable Devices 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.

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

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

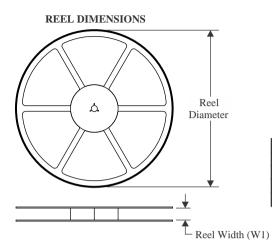


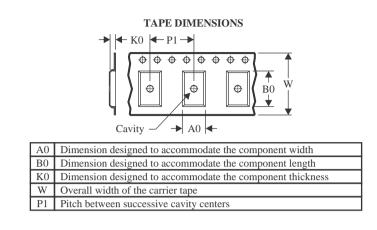
### PACKAGE OPTION ADDENDUM

Texas

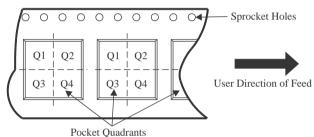
STRUMENTS

#### TAPE AND REEL INFORMATION





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



Device	-	Package Drawing	Pins	SPQ	Reel Diameter	Reel Width	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
	Туре	Drawing			(mm)	W1 (mm)	· · /	(11111)	(11111)	(1111)	(1111)	Quadrant
SN74LVC1G34DBVR	SOT-23	DBV	5	3000	178.0	9.0	3.3	3.2	1.4	4.0	8.0	Q3
SN74LVC1G34DBVR	SOT-23	DBV	5	3000	178.0	9.2	3.3	3.23	1.55	4.0	8.0	Q3
SN74LVC1G34DBVR	SOT-23	DBV	5	3000	180.0	8.4	3.23	3.17	1.37	4.0	8.0	Q3
SN74LVC1G34DBVRG4	SOT-23	DBV	5	3000	178.0	9.2	3.3	3.23	1.55	4.0	8.0	Q3
SN74LVC1G34DBVT	SOT-23	DBV	5	250	178.0	9.2	3.3	3.23	1.55	4.0	8.0	Q3
SN74LVC1G34DBVT	SOT-23	DBV	5	250	178.0	9.0	3.3	3.2	1.4	4.0	8.0	Q3
SN74LVC1G34DBVT	SOT-23	DBV	5	250	180.0	8.4	3.23	3.17	1.37	4.0	8.0	Q3
SN74LVC1G34DBVTG4	SOT-23	DBV	5	250	178.0	9.2	3.3	3.23	1.55	4.0	8.0	Q3
SN74LVC1G34DCKR	SC70	DCK	5	3000	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74LVC1G34DCKR	SC70	DCK	5	3000	180.0	8.4	2.47	2.3	1.25	4.0	8.0	Q3
SN74LVC1G34DCKR	SC70	DCK	5	3000	178.0	9.0	2.4	2.5	1.2	4.0	8.0	Q3
SN74LVC1G34DCKRG4	SC70	DCK	5	3000	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74LVC1G34DCKT	SC70	DCK	5	250	180.0	8.4	2.47	2.3	1.25	4.0	8.0	Q3
SN74LVC1G34DCKT	SC70	DCK	5	250	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74LVC1G34DCKT	SC70	DCK	5	250	178.0	9.0	2.4	2.5	1.2	4.0	8.0	Q3
SN74LVC1G34DCKTG4	SC70	DCK	5	250	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3

# PACKAGE MATERIALS INFORMATION



www.ti.com

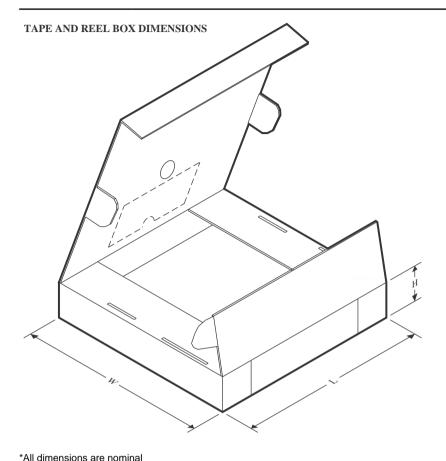
8-Jun-2022

Device	Package Type	Package Drawing		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74LVC1G34DPWR	X2SON	DPW	5	3000	178.0	8.4	0.91	0.91	0.5	2.0	8.0	Q3
SN74LVC1G34DRLR	SOT-5X3	DRL	5	4000	180.0	8.4	1.98	1.78	0.69	4.0	8.0	Q3
SN74LVC1G34DRYR	SON	DRY	6	5000	180.0	9.5	1.15	1.6	0.75	4.0	8.0	Q1
SN74LVC1G34DSFR	SON	DSF	6	5000	180.0	9.5	1.16	1.16	0.5	4.0	8.0	Q2
SN74LVC1G34YFPR	DSBGA	YFP	4	3000	178.0	9.2	0.89	0.89	0.58	4.0	8.0	Q1
SN74LVC1G34YZPR	DSBGA	YZP	5	3000	178.0	9.2	1.02	1.52	0.63	4.0	8.0	Q1
SN74LVC1G34YZVR	DSBGA	YZV	4	3000	178.0	9.2	1.0	1.0	0.63	4.0	8.0	Q1



# PACKAGE MATERIALS INFORMATION

8-Jun-2022



Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LVC1G34DBVR	SOT-23	DBV	5	3000	180.0	180.0	18.0
SN74LVC1G34DBVR	SOT-23	DBV	5	3000	180.0	180.0	18.0
SN74LVC1G34DBVR	SOT-23	DBV	5	3000	202.0	201.0	28.0
SN74LVC1G34DBVRG4	SOT-23	DBV	5	3000	180.0	180.0	18.0
SN74LVC1G34DBVT	SOT-23	DBV	5	250	180.0	180.0	18.0
SN74LVC1G34DBVT	SOT-23	DBV	5	250	180.0	180.0	18.0
SN74LVC1G34DBVT	SOT-23	DBV	5	250	202.0	201.0	28.0
SN74LVC1G34DBVTG4	SOT-23	DBV	5	250	180.0	180.0	18.0
SN74LVC1G34DCKR	SC70	DCK	5	3000	180.0	180.0	18.0
SN74LVC1G34DCKR	SC70	DCK	5	3000	202.0	201.0	28.0
SN74LVC1G34DCKR	SC70	DCK	5	3000	180.0	180.0	18.0
SN74LVC1G34DCKRG4	SC70	DCK	5	3000	180.0	180.0	18.0
SN74LVC1G34DCKT	SC70	DCK	5	250	202.0	201.0	28.0
SN74LVC1G34DCKT	SC70	DCK	5	250	180.0	180.0	18.0
SN74LVC1G34DCKT	SC70	DCK	5	250	180.0	180.0	18.0
SN74LVC1G34DCKTG4	SC70	DCK	5	250	180.0	180.0	18.0
SN74LVC1G34DPWR	X2SON	DPW	5	3000	205.0	200.0	33.0
SN74LVC1G34DRLR	SOT-5X3	DRL	5	4000	202.0	201.0	28.0





8-Jun-2022

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LVC1G34DRYR	SON	DRY	6	5000	184.0	184.0	19.0
SN74LVC1G34DSFR	SON	DSF	6	5000	184.0	184.0	19.0
SN74LVC1G34YFPR	DSBGA	YFP	4	3000	220.0	220.0	35.0
SN74LVC1G34YZPR	DSBGA	YZP	5	3000	220.0	220.0	35.0
SN74LVC1G34YZVR	DSBGA	YZV	4	3000	220.0	220.0	35.0

### **GENERIC PACKAGE VIEW**

# X2SON - 0.4 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.



4211218-3/D

# **DPW0005A**



# **PACKAGE OUTLINE**

### X2SON - 0.4 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



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. The size and shape of this feature may vary.



# **DPW0005A**

# **EXAMPLE BOARD LAYOUT**

### X2SON - 0.4 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



NOTES: (continued)

4. This package is designed to be soldered to a thermal pad on the board. For more information, refer to QFN/SON PCB application note in literature No. SLUA271 (www.ti.com/lit/slua271).



# DPW0005A

# **EXAMPLE STENCIL DESIGN**

### X2SON - 0.4 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



NOTES: (continued)

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



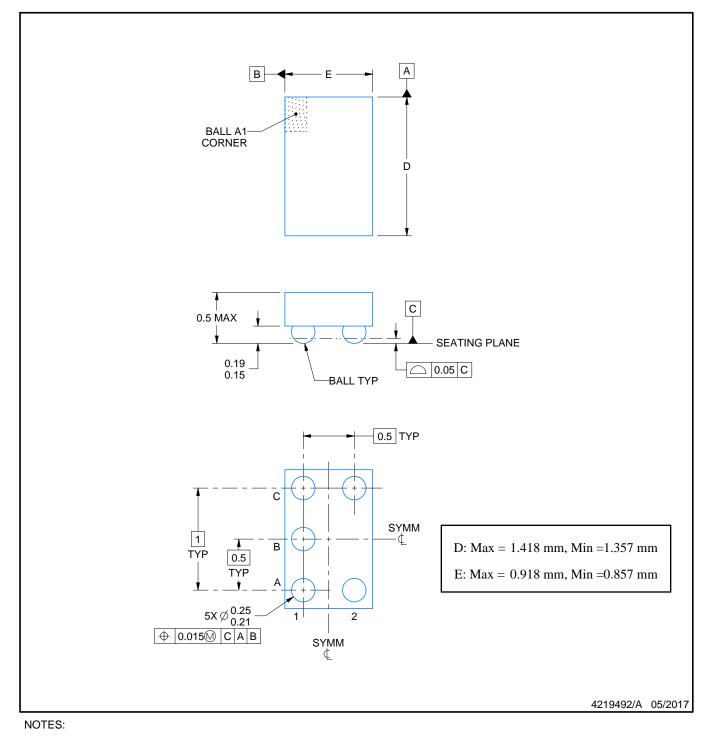
# YZP0005



# **PACKAGE OUTLINE**

### DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



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



# YZP0005

# **EXAMPLE BOARD LAYOUT**

### DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



NOTES: (continued)

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



# YZP0005

# **EXAMPLE STENCIL DESIGN**

### DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



NOTES: (continued)

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





- B. This drawing is subject to change without notice.
- C. NanoFree™ package configuration.

NanoFree is a trademark of Texas Instruments.



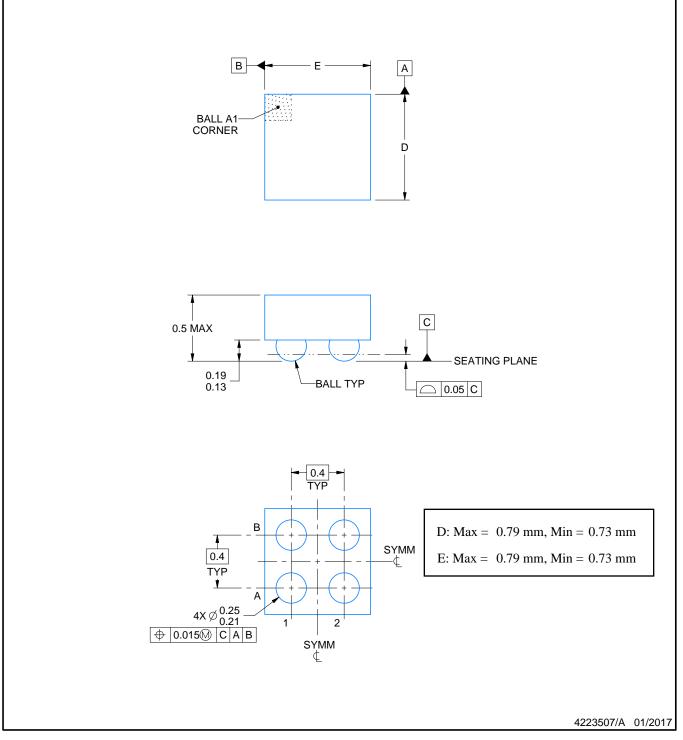
# **YFP0004**



# **PACKAGE OUTLINE**

### DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



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.

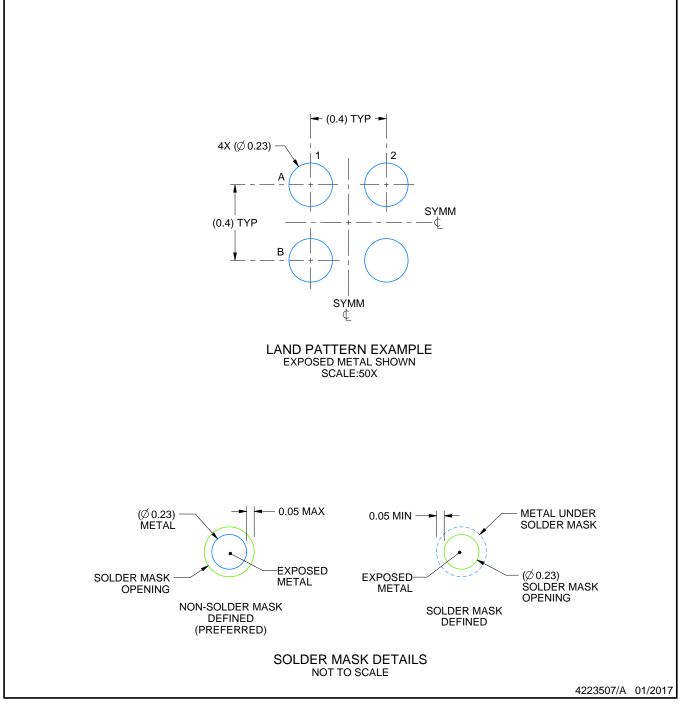


# YFP0004

# **EXAMPLE BOARD LAYOUT**

### DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



NOTES: (continued)

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

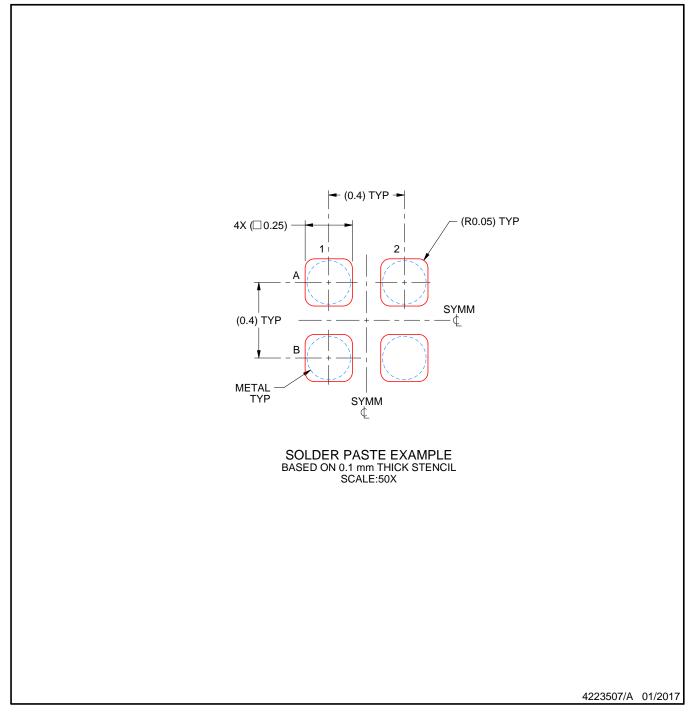


# YFP0004

# **EXAMPLE STENCIL DESIGN**

### DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



NOTES: (continued)

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



# **DRL0005A**



# **PACKAGE OUTLINE**

### SOT - 0.6 mm max height

PLASTIC SMALL OUTLINE



- 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-293 Variation UAAD-1



# DRL0005A

# **EXAMPLE BOARD LAYOUT**

### SOT - 0.6 mm max height

PLASTIC SMALL OUTLINE



NOTES: (continued)

5. Publication IPC-7351 may have alternate designs.

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



# **DRL0005A**

# **EXAMPLE STENCIL DESIGN**

### SOT - 0.6 mm max height

PLASTIC SMALL OUTLINE



NOTES: (continued)

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

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



DCK (R-PDSO-G5)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES: A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash or protrusion. Mold flash and protrusion shall not exceed 0.15 per side.
  - D. Falls within JEDEC MO-203 variation AA.



### LAND PATTERN DATA



- A. All linear dimensions are in millimeters.B. This drawing is subject to change without notice.
- C. Customers should place a note on the circuit board fabrication drawing not to alter the center solder mask defined pad.
- D. Publication IPC-7351 is recommended for alternate designs.
- E. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Example stencil design based on a 50% volumetric metal load solder paste. Refer to IPC-7525 for other stencil recommendations.



### **GENERIC PACKAGE VIEW**

# 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

### **DRY0006A**



### **PACKAGE OUTLINE**

#### USON - 0.6 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



- 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.



### DRY0006A

### **EXAMPLE BOARD LAYOUT**

#### USON - 0.6 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



NOTES: (continued)

3. For more information, see QFN/SON PCB application report in literature No. SLUA271 (www.ti.com/lit/slua271).



### DRY0006A

### **EXAMPLE STENCIL DESIGN**

#### USON - 0.6 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



NOTES: (continued)

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



### **DSF0006A**



### **PACKAGE OUTLINE**

#### X2SON - 0.4 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



- 1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing Per ASME Y14.5M.
  This drawing is subject to change without notice.
  Reference JEDEC registration MO-287, variation X2AAF.



### **DSF0006A**

### **EXAMPLE BOARD LAYOUT**

#### X2SON - 0.4 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



NOTES: (continued)

4. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slua271).



### **DSF0006A**

### **EXAMPLE STENCIL DESIGN**

#### X2SON - 0.4 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



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



### **DBV0005A**



### **PACKAGE OUTLINE**

#### SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



- 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. Refernce JEDEC MO-178.

- 4. Body dimensions do not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.25 mm per side.



### DBV0005A

### **EXAMPLE BOARD LAYOUT**

#### SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



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.



### DBV0005A

### **EXAMPLE STENCIL DESIGN**

#### SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



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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