

## SN74AHC1G00 Single 2-Input Positive-NAND Gate

### 1 Features

- Operating Range: 2 V to 5.5 V
- Maximum  $t_{pd}$  of 6.5 ns at 5 V
- Low Power Consumption: Maximum  $I_{CC}$  of 10  $\mu$ A
- $\pm 8$ -mA Output Drive at 5 V
- Schmitt Trigger Action at All Inputs Makes the Circuit Tolerant for Slower Input Rise and Fall Time
- Latch-Up Performance Exceeds 250 mA Per JESD 17
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 1000-V Charged-Device Model (C101)

### 2 Applications

- IP Phones
- Notebook PCs
- Printers
- Access Control and Security
- Solar Inverters
- Personal Electronics

### 3 Description

The SN74AHC1G00 performs the Boolean function  $Y = \overline{A \cdot B}$  or  $Y = \overline{A} + \overline{B}$  in positive logic.

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

PART NUMBER	PACKAGE	BODY SIZE (NOM)
SN74AHC1G00DBV	SOT-23 (5)	2.90 mm x 1.60 mm
SN74AHC1G00DCK	SC70 (5)	2.00 mm x 1.25 mm
SN74AHC1G00DRL	SOT (5)	1.60 mm x 1.20 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

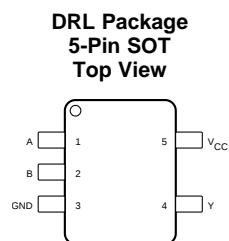
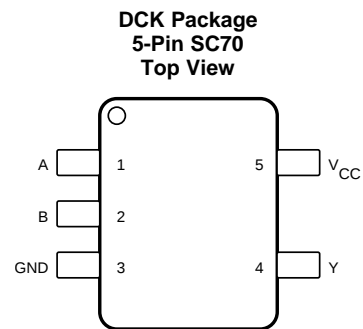
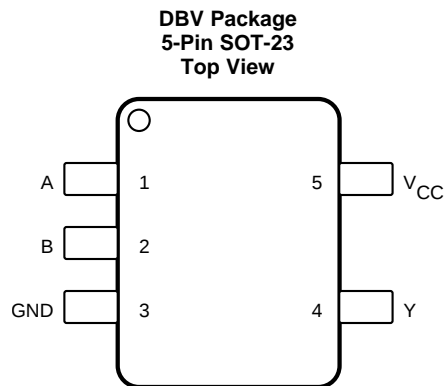
NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Revision N (May 2013) to Revision O	Page
<ul style="list-style-type: none"> <li>• Added <i>Device Information</i> table, <i>ESD Ratings</i> table, <i>Feature Description</i> section, <i>Device Functional Modes</i>, <i>Application and Implementation</i> section, <i>Power Supply Recommendations</i> section, <i>Layout</i> section, <i>Device and Documentation Support</i> section, and <i>Mechanical, Packaging, and Orderable Information</i> section. ....</li> </ul>	1

Changes from Original (March 1996) to Revision N	Page
<ul style="list-style-type: none"> <li>• Changed document format from Quicksilver to DocZone. ....</li> </ul>	1

## 5 Pin Configuration and Functions



### Pin Functions

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

## 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	7	V
V <sub>I</sub>	Input voltage <sup>(2)</sup>	-0.5	7	V
V <sub>O</sub>	Output voltage <sup>(2)</sup>	-0.5	V <sub>CC</sub> + 0.5	V
I <sub>IK</sub>	Input clamp current	V <sub>I</sub> < 0	-20	mA
I <sub>OK</sub>	Output clamp current	V <sub>O</sub> < 0 or V <sub>O</sub> > V <sub>CC</sub>	±20	mA
I <sub>O</sub>	Continuous output current	V <sub>O</sub> = 0 to V <sub>CC</sub>	±25	mA
Continuous current through V <sub>CC</sub> or GND			±50	mA
T <sub>J</sub>	Maximum junction temperature		150	°C
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, which do not imply functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions*. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

### 6.2 ESD Ratings

		VALUE	UNIT
V <sub>(ESD)</sub>	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

- (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

 See <sup>(1)</sup>

		MIN	MAX	UNIT
V <sub>CC</sub>	Supply voltage	2	5.5	V
V <sub>IH</sub>	High-level input voltage	V <sub>CC</sub> = 2 V	1.5	V
		V <sub>CC</sub> = 3 V	2.1	
		V <sub>CC</sub> = 5.5 V	3.85	
V <sub>IL</sub>	Low-level input voltage	V <sub>CC</sub> = 2 V	0.5	V
		V <sub>CC</sub> = 3 V	0.9	
		V <sub>CC</sub> = 5.5 V	1.65	
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> = 2 V	-50	μA
		V <sub>CC</sub> = 3.3 V ± 0.3 V	-4	mA
		V <sub>CC</sub> = 5 V ± 0.5 V	-8	
I <sub>OL</sub>	Low-level output current	V <sub>CC</sub> = 2 V	50	μA
		V <sub>CC</sub> = 3.3 V ± 0.3 V	4	mA
		V <sub>CC</sub> = 5 V ± 0.5 V	8	
Δt/Δv	Input transition rise or fall rate	V <sub>CC</sub> = 3.3 V ± 0.3 V	100	ns/V
		V <sub>CC</sub> = 5 V ± 0.5 V	20	
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. See the TI application report, *Implications of Slow or Floating CMOS Inputs*, SCBA004.

## 6.4 Thermal Information

THERMAL METRIC <sup>(1)</sup>		SN74AHC1G00			UNIT
		DBV (SOT-23)	DCK (SC70)	DRL (SOT)	
		5 PINS	5 PINS	5 PINS	
R <sub>θJA</sub>	Junction-to-ambient thermal resistance	240	276.53	256	°C/W
R <sub>θJC(top)</sub>	Junction-to-case (top) thermal resistance	174.5	118.5	130	°C/W
R <sub>θJB</sub>	Junction-to-board thermal resistance	73.7	62.8	152	°C/W
ψ <sub>JT</sub>	Junction-to-top characterization parameter	54.9	6.7	9.9	°C/W
ψ <sub>JB</sub>	Junction-to-board characterization parameter	72.9	62.1	152	°C/W

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

## 6.5 Electrical Characteristics

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

PARAMETER <sup>(1)</sup>	TEST CONDITIONS		V <sub>CC</sub>	MIN	TYP	MAX	UNIT		
V <sub>OH</sub>	I <sub>OH</sub> = -50 μA	T <sub>A</sub> = 25°C	2 V	1.9	2		V		
		T <sub>A</sub> = -40°C to +85°C		1.9					
		T <sub>A</sub> = -40°C to +125°C		1.9					
		T <sub>A</sub> = 25°C	3 V	2.9	3				
		T <sub>A</sub> = -40°C to +85°C		2.9					
		T <sub>A</sub> = -40°C to +125°C		2.9					
		T <sub>A</sub> = 25°C	4.5 V	4.4	4.5				
		T <sub>A</sub> = -40°C to +85°C		4.4					
		T <sub>A</sub> = -40°C to +125°C		4.4					
	I <sub>OH</sub> = -4 mA	T <sub>A</sub> = 25°C	3 V	2.58					
				T <sub>A</sub> = -40°C to +85°C	2.48				
				T <sub>A</sub> = -40°C to +125°C	2.48				
I <sub>OH</sub> = -8 mA		4.5 V	T <sub>A</sub> = 25°C	3.94					
			T <sub>A</sub> = -40°C to +85°C	3.8					
			T <sub>A</sub> = -40°C to +125°C	3.8					
V <sub>OL</sub>	I <sub>OL</sub> = 50 μA	T <sub>A</sub> = 25°C	2 V			0.1	V		
		T <sub>A</sub> = -40°C to +85°C				0.1			
		T <sub>A</sub> = -40°C to +125°C				0.1			
		T <sub>A</sub> = 25°C	3 V			0.1			
		T <sub>A</sub> = -40°C to +85°C				0.1			
		T <sub>A</sub> = -40°C to +125°C				0.1			
		T <sub>A</sub> = 25°C	4.5 V			0.1			
		T <sub>A</sub> = -40°C to +85°C				0.1			
		T <sub>A</sub> = -40°C to +125°C				0.1			
	I <sub>OL</sub> = 4 mA	T <sub>A</sub> = 25°C	3 V			0.36			
				T <sub>A</sub> = -40°C to +85°C				0.44	
				T <sub>A</sub> = -40°C to +125°C				0.44	
		I <sub>OL</sub> = 8 mA	4.5 V	T <sub>A</sub> = 25°C				0.36	
				T <sub>A</sub> = -40°C to +85°C				0.44	
				T <sub>A</sub> = -40°C to +125°C				0.44	
	I <sub>I</sub>	V <sub>I</sub> = 5.5 V or GND	T <sub>A</sub> = 25°C	0 V to 5.5 V				±0.1	μA
			T <sub>A</sub> = -40°C to +85°C					±1	
			T <sub>A</sub> = -40°C to +125°C					±1	

(1) Recommended T<sub>A</sub> = -40°C to +125°C

**Electrical Characteristics (continued)**

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

PARAMETER <sup>(1)</sup>	TEST CONDITIONS	V <sub>CC</sub>	MIN	TYP	MAX	UNIT
I <sub>CC</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0	5.5 V			1	μA
					T <sub>A</sub> = 25°C	
					T <sub>A</sub> = –40°C to +85°C	
C <sub>i</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND	5 V			2	pF
					T <sub>A</sub> = 25°C	
					T <sub>A</sub> = –40°C to +125°C	

**6.6 Switching Characteristics: V<sub>CC</sub> = 3.3 V ± 0.3 V**

 over recommended operating free-air temperature range, V<sub>CC</sub> = 3.3 V ± 0.3 V (unless otherwise noted) (see [Figure 2](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	OUTPUT CAPACITANCE	T <sub>A</sub> <sup>(1)</sup>	MIN	TYP	MAX	UNIT
t <sub>PLH</sub>	A or B	Y	C <sub>L</sub> = 15 pF	25°C		5.5	7.9	ns
				–40°C to +85°C	1		9.5	
				–40°C to +125°C	1		10.5	
t <sub>PHL</sub>	A or B	Y	C <sub>L</sub> = 15 pF	25°C		5.5	7.9	ns
				–40°C to +85°C	1		9.5	
				–40°C to +125°C	1		10.5	
t <sub>PLH</sub>	A or B	Y	C <sub>L</sub> = 50 pF	25°C		8	11.4	ns
				–40°C to +85°C	1		13	
				–40°C to +125°C	1		14	
t <sub>PHL</sub>	A or B	Y	C <sub>L</sub> = 50 pF	25°C		8	11.4	ns
				–40°C to +85°C	1		13	
				–40°C to +125°C	1		14	

 (1) Recommended T<sub>A</sub> = –40°C to +125°C

**6.7 Switching Characteristics: V<sub>CC</sub> = 5 V ± 0.5 V**

 over recommended operating free-air temperature range, V<sub>CC</sub> = 5 V ± 0.5 V (unless otherwise noted) (see [Figure 2](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	OUTPUT CAPACITANCE	T <sub>A</sub> <sup>(1)</sup>	MIN	TYP	MAX	UNIT
t <sub>PLH</sub>	A or B	Y	C <sub>L</sub> = 15 pF	25°C		3.7	5.5	ns
				–40°C to +85°C	1		6.5	
				–40°C to +125°C	1		7	
t <sub>PHL</sub>	A or B	Y	C <sub>L</sub> = 15 pF	25°C		3.7	5.5	ns
				–40°C to +85°C	1		6.5	
				–40°C to +125°C	1		7	
t <sub>PLH</sub>	A or B	Y	C <sub>L</sub> = 50 pF	25°C		5.2	7.5	ns
				–40°C to +85°C	1		6.5	
				–40°C to +125°C	1		9	
t <sub>PHL</sub>	A or B	Y	C <sub>L</sub> = 50 pF	25°C		5.2	7.5	ns
				–40°C to +85°C	1		6.5	
				–40°C to +125°C	1		9	

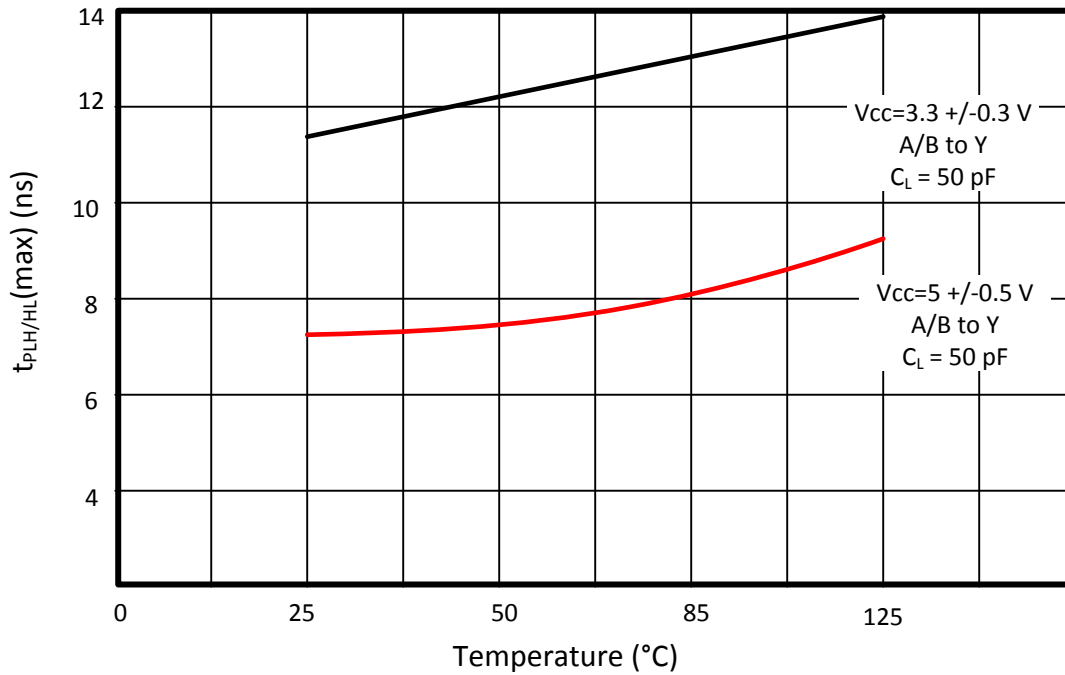
 (1) Recommended T<sub>A</sub> = –40°C to +125°C

### 6.8 Operating Characteristics

$V_{CC} = 5\text{ V}$ ,  $T_A = 25^\circ\text{C}$

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
$C_{pd}$ Power dissipation capacitance	No load, $f = 1\text{ MHz}$		9.5		pF

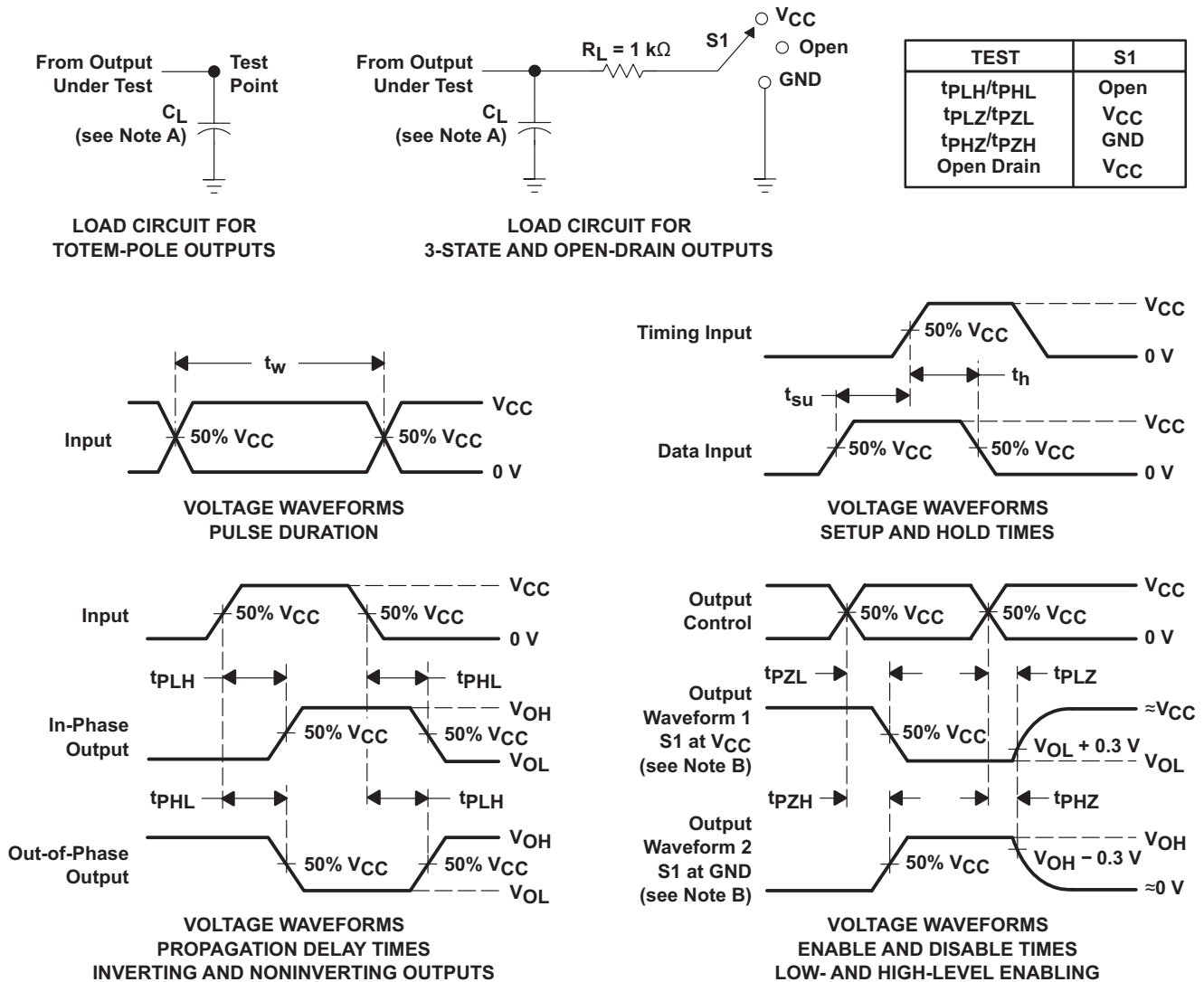
### 6.9 Typical Characteristics



$C_L = 50\text{ pF}$

**Figure 1. Propagation Delay vs Temperature**

## 7 Parameter Measurement information



- 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:  $PRR \leq 1\text{ MHz}$ ,  $Z_O = 50\ \Omega$ ,  $t_r \leq 3\text{ ns}$ ,  $t_f \leq 3\text{ ns}$ .
- D. The outputs are measured one at a time with one input transition per measurement.
- E. All parameters and waveforms are not applicable to all devices.

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



## 8 Detailed Description

### 8.1 Overview

The SN74AHC1G00 device performs the NAND Boolean function  $Y = \overline{A \times B}$  or  $Y = \overline{A} + \overline{B}$  in positive logic. The device has a wide operating range of  $V_{CC}$  from 2 V to 5 V.

### 8.2 Functional Block Diagram



Figure 3. Logic Diagram (Positive Logic)

### 8.3 Feature Description

The SN74AHC1G00 device has wide operating voltage range for logic system from 2 V to 5 V. The low propagation delay allows fast switching and higher speeds of operation. In addition, the low power consumption of 10- $\mu$ A (maximum) makes this device a good choice for portable and battery power-sensitive applications. The Schmitt trigger action on all inputs have noise rejection capabilities.

### 8.4 Device Functional Modes

Table 1 lists the functions of the SN74AHC1G00 device.

Table 1. Function Table

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

## 9 Application and Implementation

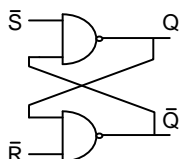
### NOTE

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.

### 9.1 Application Information

The SN74AHC1G00 device is a low-drive CMOS device with 8-mA output drive at 5 V. It can be used for a multitude of bus interface type applications where output ringing is a concern. The low drive and slow edge rates minimizes overshoot and undershoot on the outputs. The NAND gates are used to build simple SR flip flop. They could be used in removing noise from a switch debounce circuit

### 9.2 Typical Application



**Figure 4. Typical Application**

#### 9.2.1 Design Requirements

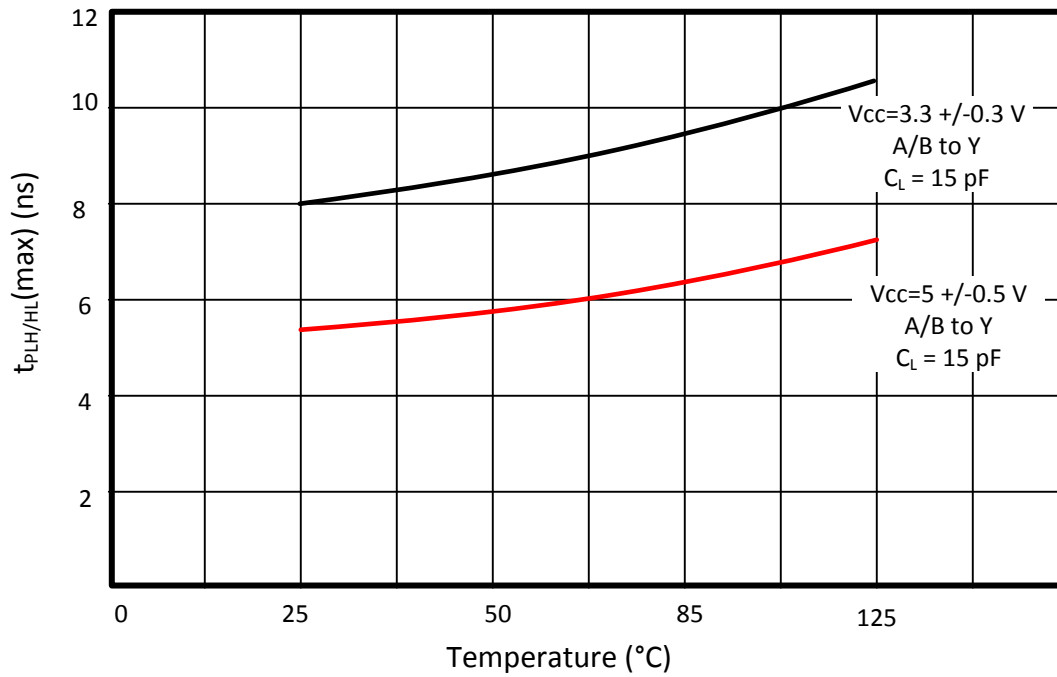
This SN74AHC1G00 device uses CMOS technology and has balanced output drive. Take care to avoid bus contention because it can drive currents that would exceed maximum limits. The high drive also creates fast edges into light loads. Routing and load conditions must be considered to prevent ringing.

#### 9.2.2 Detailed Design Procedure

- Recommended input conditions:
  - Specified high and low levels. See  $V_{IH}$  and  $V_{IL}$  in [Recommended Operating Conditions](#).
  - Inputs are overvoltage tolerant allowing them to go as high as 5.5 V at any valid  $V_{CC}$ .
- Recommended output conditions:
  - Load currents must not exceed 25 mA per output and 50 mA total for the part.
  - Outputs should not be pulled above  $V_{CC}$ .

Typical Application (continued)

9.2.3 Application Curve



C<sub>L</sub> = 15 pF

Figure 5. Propagation Delay vs Temperature

## 10 Power Supply Recommendations

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

Each  $V_{CC}$  terminal should have a good bypass capacitor to prevent power disturbance. For devices with a single supply, TI recommends a 0.1- $\mu\text{F}$  capacitor; if there are multiple  $V_{CC}$  terminals, then TI recommends a 0.01- $\mu\text{F}$  or 0.022- $\mu\text{F}$  capacitor for each power terminal. Multiple bypass capacitors can be paralleled to reject different frequencies of noise. Frequencies of 0.1  $\mu\text{F}$  and 1  $\mu\text{F}$  are commonly used in parallel. The bypass capacitor must be installed as close as possible to the power terminal for best results.

## 11 Layout

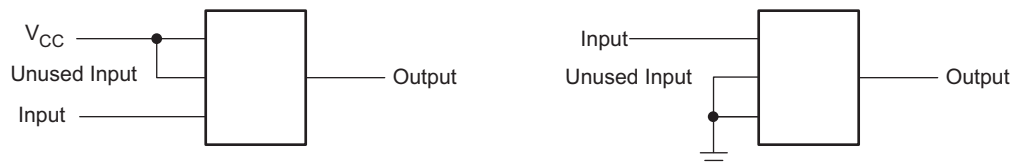
### 11.1 Layout Guidelines

When using multiple bit logic devices inputs must 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 three of the four buffer gates are used. Such input pins must not be left unconnected because the undefined voltages at the outside connections result in undefined operational states. The following are the rules 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 make more sense or is more convenient. Floating outputs is generally acceptable, unless the part is a transceiver. If the transceiver has an output enable pin, it disables the outputs section of the part when asserted. This does not disable the input section of the input and output, so they also cannot float when disabled.

### 11.2 Layout Example



**Figure 6. Layout Recommendation**

## 12 Device and Documentation Support

### 12.1 Documentation Support

#### 12.1.1 Related Documentation

For related documentation see the following:

- *Introduction to Logic*, [SLVA700](#)
- *Implications of Slow or Floating CMOS Inputs*, [SCBA004](#)

### 12.2 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.

### 12.3 Trademarks

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

### 12.4 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.

### 12.5 Glossary

[SLYZ022](#) — *TI Glossary*.

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

## 13 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/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
SN74AHC1G00DBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU   CU SN	Level-1-260C-UNLIM	-40 to 125	(A003, A00G, A00L, A00S, A04J)	<a href="#">Samples</a>
SN74AHC1G00DBVRG4	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	A00G	<a href="#">Samples</a>
SN74AHC1G00DBVT	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU   CU SN	Level-1-260C-UNLIM	-40 to 125	(A003, A00G, A00L, A00S, A04J)	<a href="#">Samples</a>
SN74AHC1G00DCK3	ACTIVE	SC70	DCK	5	3000	Pb-Free (RoHS)	CU SNBI	Level-1-260C-UNLIM	-40 to 125	AA Y	<a href="#">Samples</a>
SN74AHC1G00DCKR	ACTIVE	SC70	DCK	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU   CU SN	Level-1-260C-UNLIM	-40 to 125	(AA3, AAG, AAL, AA S)	<a href="#">Samples</a>
SN74AHC1G00DCKRE4	ACTIVE	SC70	DCK	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	AA3	<a href="#">Samples</a>
SN74AHC1G00DCKRG4	ACTIVE	SC70	DCK	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	AA3	<a href="#">Samples</a>
SN74AHC1G00DCKT	ACTIVE	SC70	DCK	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU   CU SN	Level-1-260C-UNLIM	-40 to 125	(AA3, AAG, AAL, AA S)	<a href="#">Samples</a>
SN74AHC1G00DCKTG4	ACTIVE	SC70	DCK	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	AA3	<a href="#">Samples</a>
SN74AHC1G00DRLR	ACTIVE	SOT-5X3	DRL	5	4000	Green (RoHS & no Sb/Br)	CU NIPDAU   CU NIPDAUAG	Level-1-260C-UNLIM	-40 to 125	(AAB, AAS)	<a href="#">Samples</a>

(1) 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.

(2) **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 (Cl) 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.

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

(4) 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.

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

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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 SN74AHC1G00 :**

- Automotive: [SN74AHC1G00-Q1](#)

NOTE: Qualified Version Definitions:

- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects

## TAPE AND REEL INFORMATION



### QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE

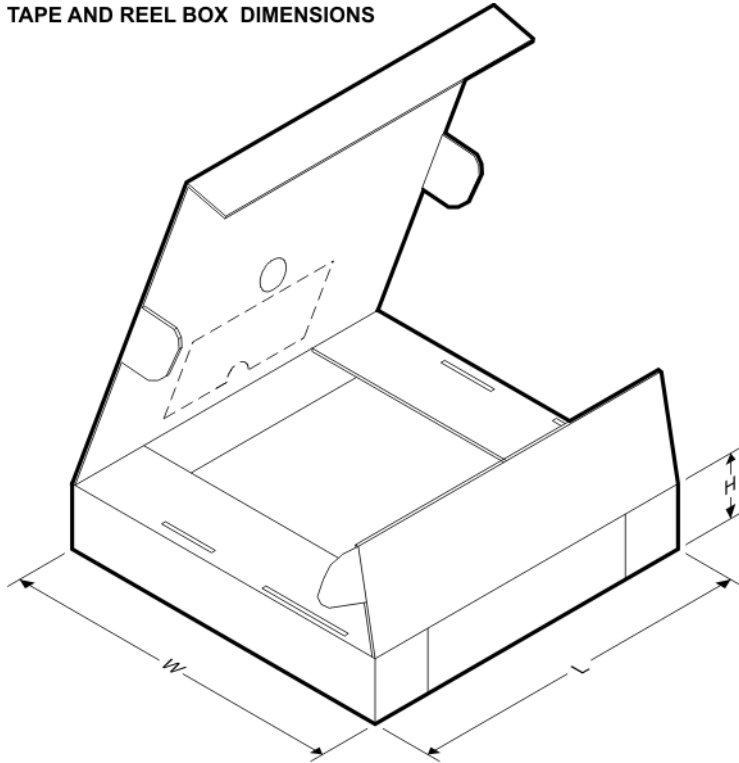


\*All dimensions are nominal

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
SN74AHC1G00DBVR	SOT-23	DBV	5	3000	178.0	9.0	3.3	3.2	1.4	4.0	8.0	Q3
SN74AHC1G00DBVR	SOT-23	DBV	5	3000	178.0	9.2	3.3	3.23	1.55	4.0	8.0	Q3
SN74AHC1G00DBVR	SOT-23	DBV	5	3000	180.0	8.4	3.23	3.17	1.37	4.0	8.0	Q3
SN74AHC1G00DBVR	SOT-23	DBV	5	3000	178.0	9.0	3.23	3.17	1.37	4.0	8.0	Q3
SN74AHC1G00DBVRG4	SOT-23	DBV	5	3000	178.0	9.0	3.23	3.17	1.37	4.0	8.0	Q3
SN74AHC1G00DBVT	SOT-23	DBV	5	250	178.0	9.0	3.23	3.17	1.37	4.0	8.0	Q3
SN74AHC1G00DBVT	SOT-23	DBV	5	250	178.0	9.0	3.3	3.2	1.4	4.0	8.0	Q3
SN74AHC1G00DBVT	SOT-23	DBV	5	250	178.0	9.2	3.3	3.23	1.55	4.0	8.0	Q3
SN74AHC1G00DCKR	SC70	DCK	5	3000	178.0	9.0	2.4	2.5	1.2	4.0	8.0	Q3
SN74AHC1G00DCKR	SC70	DCK	5	3000	180.0	8.4	2.47	2.3	1.25	4.0	8.0	Q3
SN74AHC1G00DCKR	SC70	DCK	5	3000	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74AHC1G00DCKR	SC70	DCK	5	3000	178.0	9.0	2.4	2.5	1.2	4.0	8.0	Q3
SN74AHC1G00DCKRG4	SC70	DCK	5	3000	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74AHC1G00DCKT	SC70	DCK	5	250	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74AHC1G00DCKT	SC70	DCK	5	250	180.0	9.2	2.3	2.55	1.2	4.0	8.0	Q3
SN74AHC1G00DCKT	SC70	DCK	5	250	178.0	9.0	2.4	2.5	1.2	4.0	8.0	Q3
SN74AHC1G00DCKT	SC70	DCK	5	250	178.0	9.0	2.4	2.5	1.2	4.0	8.0	Q3
SN74AHC1G00DCKTG4	SC70	DCK	5	250	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3



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
SN74AHC1G00DRLR	SOT-5X3	DRL	5	4000	180.0	8.4	1.98	1.78	0.69	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)
SN74AHC1G00DBVR	SOT-23	DBV	5	3000	180.0	180.0	18.0
SN74AHC1G00DBVR	SOT-23	DBV	5	3000	180.0	180.0	18.0
SN74AHC1G00DBVR	SOT-23	DBV	5	3000	202.0	201.0	28.0
SN74AHC1G00DBVR	SOT-23	DBV	5	3000	180.0	180.0	18.0
SN74AHC1G00DBVRG4	SOT-23	DBV	5	3000	180.0	180.0	18.0
SN74AHC1G00DBVT	SOT-23	DBV	5	250	180.0	180.0	18.0
SN74AHC1G00DBVT	SOT-23	DBV	5	250	180.0	180.0	18.0
SN74AHC1G00DBVT	SOT-23	DBV	5	250	180.0	180.0	18.0
SN74AHC1G00DCKR	SC70	DCK	5	3000	180.0	180.0	18.0
SN74AHC1G00DCKR	SC70	DCK	5	3000	202.0	201.0	28.0
SN74AHC1G00DCKR	SC70	DCK	5	3000	180.0	180.0	18.0
SN74AHC1G00DCKR	SC70	DCK	5	3000	180.0	180.0	18.0
SN74AHC1G00DCKRG4	SC70	DCK	5	3000	180.0	180.0	18.0
SN74AHC1G00DCKT	SC70	DCK	5	250	180.0	180.0	18.0
SN74AHC1G00DCKT	SC70	DCK	5	250	205.0	200.0	33.0
SN74AHC1G00DCKT	SC70	DCK	5	250	180.0	180.0	18.0

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Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74AHC1G00DCKT	SC70	DCK	5	250	180.0	180.0	18.0
SN74AHC1G00DCKTG4	SC70	DCK	5	250	180.0	180.0	18.0
SN74AHC1G00DRLR	SOT-5X3	DRL	5	4000	202.0	201.0	28.0

## GENERIC PACKAGE VIEW

DBV 5

SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



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

4073253/P

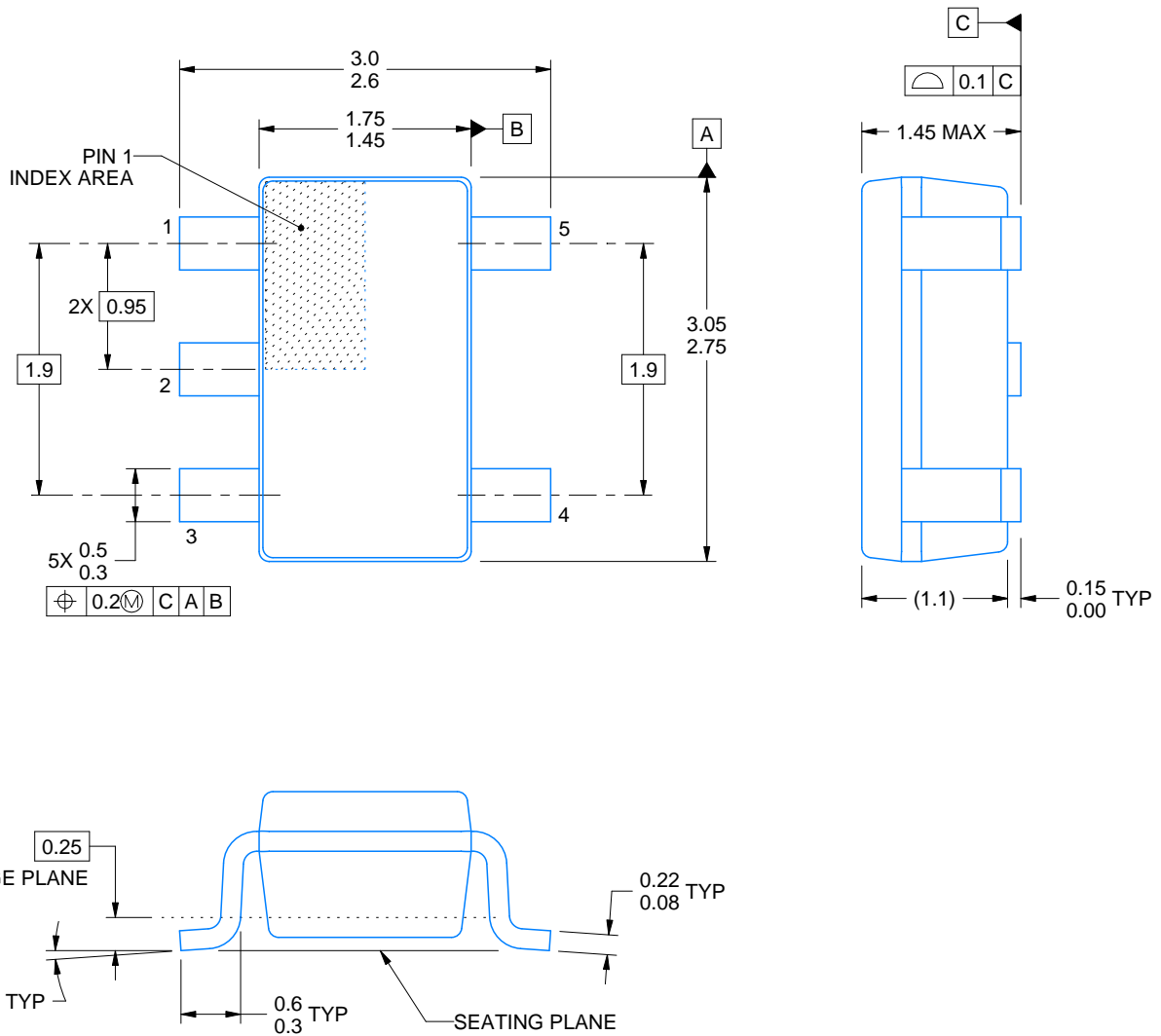
DBV0005A



# PACKAGE OUTLINE

SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



4214839/D 11/2018

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.
3. Reference JEDEC MO-178.
4. Body dimensions do not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.

# 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

4214839/D 11/2018

NOTES: (continued)

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

# EXAMPLE STENCIL DESIGN

DBV0005A

SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



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

4214839/D 11/2018

NOTES: (continued)

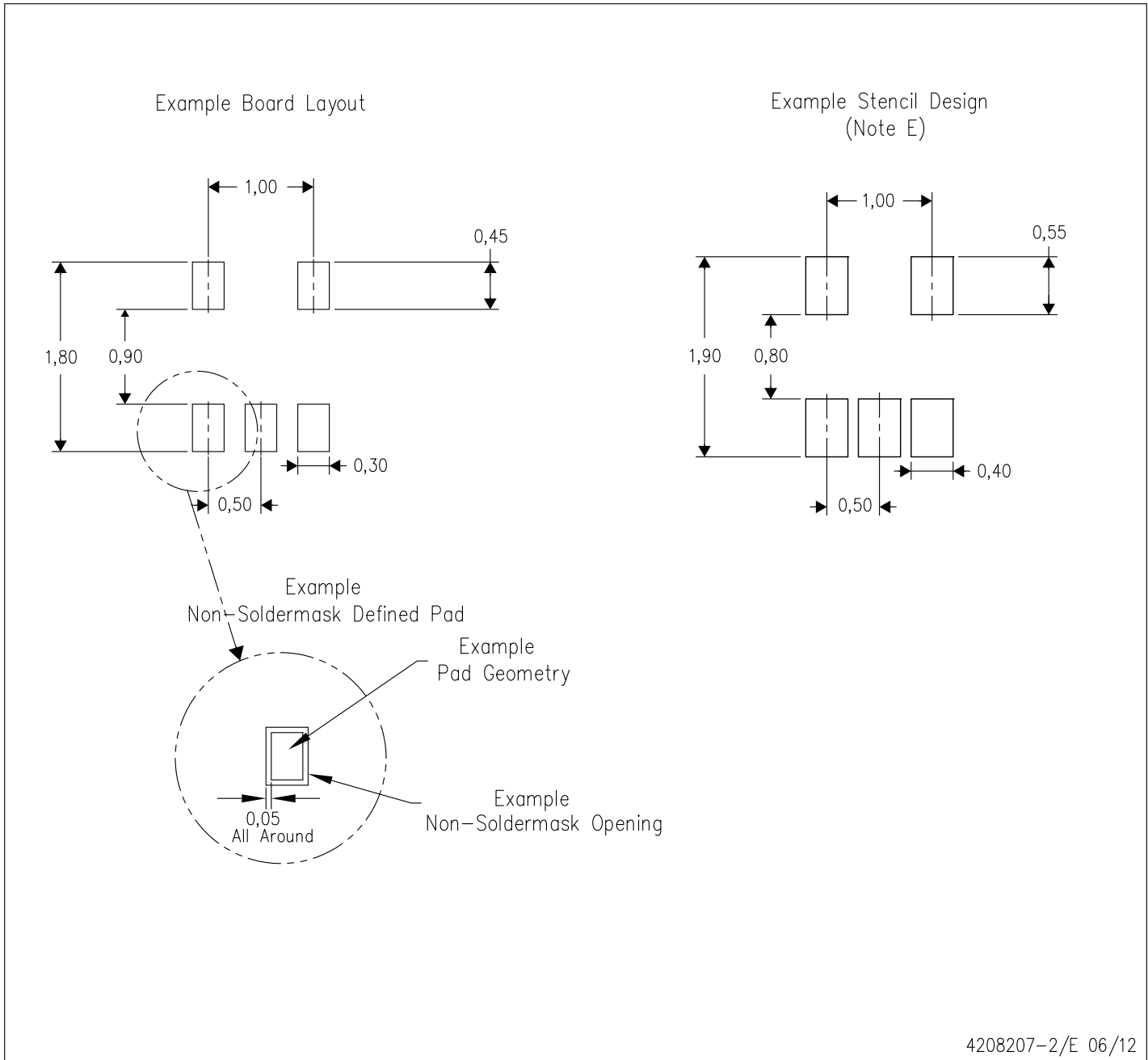
7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
8. Board assembly site may have different recommendations for stencil design.



- NOTES:
- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash, interlead flash, protrusions, or gate burrs. Mold flash, interlead flash, protrusions, or gate burrs shall not exceed 0,15 per end or side.
  - D. JEDEC package registration is pending.

DRL (R-PDSO-N5)

PLASTIC SMALL OUTLINE



- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Publication IPC-7351 is recommended for alternate designs.
  - D. Customers should contact their board fabrication site for minimum solder mask web tolerances between signal pads.
  - E. Maximum stencil thickness 0,127 mm (5 mils). All linear dimensions are in millimeters.
  - F. 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. Refer to IPC 7525 for stencil design considerations.
  - G. Side aperture dimensions over-print land for acceptable area ratio > 0.66. Customer may reduce side aperture dimensions if stencil manufacturing process allows for sufficient release at smaller opening.



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.

DCK (R-PDSO-G5)

PLASTIC SMALL OUTLINE



- NOTES:
- All linear dimensions are in millimeters.
  - This drawing is subject to change without notice.
  - Customers should place a note on the circuit board fabrication drawing not to alter the center solder mask defined pad.
  - Publication IPC-7351 is recommended for alternate designs.
  - 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.

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