



## SN74AHCT1G08 Single 2-Input Positive-AND Gate

### 1 Features

- Operating Range: 4.5 V to 5.5 V
- Maximum  $t_{pd}$  of 7.1 ns at 5 V
- Low Power Consumption: Maximum  $I_{CC}$  of 10- $\mu$ A
- $\pm 8$ -mA Output Drive at 5 V
- Inputs Are TTL-Voltage Compatible
- Latch-Up Performance Exceeds 250 mA Per JESD 17

### 2 Applications

- TV, Set-Top Box, and Audio
- Wireless Infrastructure
- Factory Automation and Control
- PC and Notebooks
- Building Automation
- Grid Infrastructure
- Medical, Healthcare, and Fitness
- Printers
- Test and Measurement
- EPOS (Electronic Point of Sale)
- Telecom Infrastructure
- Projectors

### 3 Description

The SN74AHCT1G08 device is a single 2-input positive-AND gate. The device performs the Boolean function  $Y = A \cdot B$  or  $Y = A + B$  in positive logic. Low  $I_{CC}$  current allows this device to be used in power-sensitive or battery-powered applications.

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

| PART NUMBER      | PACKAGE    | BODY SIZE (NOM)   |
|------------------|------------|-------------------|
| SN74AHCT1G08DBVR | SOT-23 (5) | 2.90 mm x 1.60 mm |
| SN74AHCT1G08DCKR | SC70 (5)   | 2.00 mm x 1.25 mm |
| SN74AHCT1G08DRLR | 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



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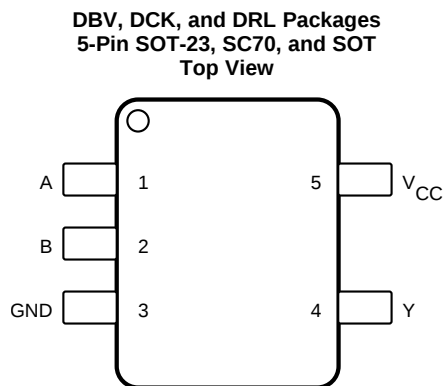
## 4 Revision History

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

| Changes from Revision P (May 2013) to Revision Q                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Page     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <ul style="list-style-type: none"> <li>Added <i>Applications</i> section, <i>Device Information</i> table, <i>Table of Contents</i>, <i>Pin Configuration and Functions</i> section, <i>Specifications</i> section, <i>ESD Ratings</i> table, <i>Thermal Information</i> table, <i>Typical Characteristics</i> section, <i>Detailed Description</i> section, <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> | <b>1</b> |

| Changes from Revision O (June 2005) to Revision P                                                     | Page     |
|-------------------------------------------------------------------------------------------------------|----------|
| <ul style="list-style-type: none"> <li>Extended operating temperature range to 125°C .....</li> </ul> | <b>4</b> |

## 5 Pin Configuration and Functions



**Pin Functions**

| PIN             |     | I/O | DESCRIPTION |
|-----------------|-----|-----|-------------|
| NAME            | NO. |     |             |
| A               | 1   | I   | Input A     |
| B               | 2   | I   | Input B     |
| GND             | 3   | —   | Ground Pin  |
| V <sub>CC</sub> | 5   | —   | Supply Pin  |
| Y               | 4   | O   | Output      |

## 6 Specifications

### 6.1 Absolute Maximum Ratings

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

|                                                   | MIN                                                    | MAX                   | UNIT |
|---------------------------------------------------|--------------------------------------------------------|-----------------------|------|
| Supply voltage                                    | −0.5                                                   | 7                     | V    |
| Input voltage <sup>(2)</sup>                      | −0.5                                                   | 7                     | V    |
| Output voltage <sup>(2)</sup>                     | −0.5                                                   | V <sub>CC</sub> + 0.5 | V    |
| Input clamp current                               | V <sub>I</sub> < 0                                     | −20                   | mA   |
| Output clamp current                              | V <sub>O</sub> < 0 or V <sub>O</sub> > V <sub>CC</sub> | ±20                   | mA   |
| 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   |
| Maximum junction temperature, T <sub>J</sub>      |                                                        | 150                   | °C   |
| Storage temperature, T <sub>stg</sub>             | −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>              | ±2500 |
|                                            | 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.

**SN74AHCT1G08**

SCLS315Q –MARCH 1996–REVISED APRIL 2016

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### 6.3 Recommended Operating Conditions

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

|                 |                                     | MIN | MAX             | UNIT |
|-----------------|-------------------------------------|-----|-----------------|------|
| V <sub>CC</sub> | Supply voltage                      | 4.5 | 5.5             | V    |
| V <sub>IH</sub> | High-level input voltage            | 2   |                 | V    |
| V <sub>IL</sub> | Low-level input voltage             |     | 0.8             | V    |
| V <sub>I</sub>  | Input voltage                       | 0   | 5.5             | V    |
| V <sub>O</sub>  | Output voltage                      | 0   | V <sub>CC</sub> | V    |
| I <sub>OH</sub> | High-level output current           |     | –8              | mA   |
| I <sub>OL</sub> | Low-level output current            |     | 8               | mA   |
| Δt/Δv           | Input transition rise and fall rate |     | 20              | ns/V |
| 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 TI application report, *Implications of Slow or Floating CMOS Inputs* (SCBA004).

### 6.4 Thermal Information

| THERMAL METRIC <sup>(1)</sup> |                                              | SN74AHCT1G08 |            |           | UNIT |
|-------------------------------|----------------------------------------------|--------------|------------|-----------|------|
|                               |                                              | DBV (SOT-23) | DCK (SC70) | DRL (SOT) |      |
|                               |                                              | 5 PINS       | 5 PINS     | 5 PINS    |      |
| R <sub>θJA</sub>              | Junction-to-ambient thermal resistance       | 226          | 277.5      | 242.9     | °C/W |
| R <sub>θJC(top)</sub>         | Junction-to-case (top) thermal resistance    | 165          | 92.9       | 77.5      | °C/W |
| R <sub>θJB</sub>              | Junction-to-board thermal resistance         | 59.1         | 64.2       | 77.5      | °C/W |
| Ψ <sub>JT</sub>               | Junction-to-top characterization parameter   | 45.5         | 1.9        | 9.6       | °C/W |
| Ψ <sub>JB</sub>               | Junction-to-board characterization parameter | 58.3         | 63.5       | 77.3      | °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                       | TEST CONDITIONS                                  |                                                                                      | MIN                             | TYP  | MAX  | UNIT |
|---------------------------------|--------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------|------|------|------|
| V <sub>OH</sub>                 | High-level output voltage                        | I <sub>OH</sub> = –50 μA, V <sub>CC</sub> = 4.5 V                                    | T <sub>A</sub> = 25°C           | 4.4  | 4.5  | V    |
|                                 |                                                  |                                                                                      | T <sub>A</sub> = –40°C to 125°C | 4.4  |      |      |
|                                 | I <sub>OH</sub> = –8 mA, V <sub>CC</sub> = 4.5 V |                                                                                      | T <sub>A</sub> = 25°C           | 3.94 |      |      |
|                                 |                                                  |                                                                                      | T <sub>A</sub> = –40°C to 125°C | 3.8  |      |      |
| V <sub>OL</sub>                 | Low-level output voltage                         | I <sub>OL</sub> = 50 μA, V <sub>CC</sub> = 4.5 V                                     |                                 |      | 0.1  | V    |
|                                 |                                                  | I <sub>OL</sub> = 8 mA, V <sub>CC</sub> = 4.5 V                                      | T <sub>A</sub> = 25°C           |      | 0.36 |      |
|                                 |                                                  |                                                                                      | T <sub>A</sub> = –40°C to 125°C |      | 0.44 |      |
| I <sub>I</sub>                  | Input current                                    | V <sub>I</sub> = 5.5 V or GND, V <sub>CC</sub> = 0 V to 5.5 V                        | T <sub>A</sub> = 25°C           |      | ±0.1 | μA   |
|                                 |                                                  |                                                                                      | T <sub>A</sub> = –40°C to 125°C |      | ±1   |      |
| I <sub>CC</sub>                 | Supply current                                   | V <sub>I</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0, V <sub>CC</sub> = 5.5 V | T <sub>A</sub> = 25°C           |      | 1    | μA   |
|                                 |                                                  |                                                                                      | T <sub>A</sub> = –40°C to 125°C |      | 10   |      |
| ΔI <sub>CC</sub> <sup>(1)</sup> | Change in supply current                         | One input at 3.4 V, Other Inputs at V <sub>CC</sub> or GND, V <sub>CC</sub> = 5.5 V  | T <sub>A</sub> = 25°C           |      | 1.35 | mA   |
|                                 |                                                  |                                                                                      | T <sub>A</sub> = –40°C to 125°C |      | 1.5  |      |
| C <sub>I</sub>                  | Input capacitance                                | V <sub>I</sub> = V <sub>CC</sub> or GND, V <sub>CC</sub> = 5 V                       |                                 | 4    | 10   | pF   |

(1) This is the increase in supply current for each input at one of the specified TTL voltage levels, rather than 0 V or V<sub>CC</sub>.

## 6.6 Switching Characteristics

over recommended operating free-air temperature range,  $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$  (unless otherwise noted) (see Figure 2)

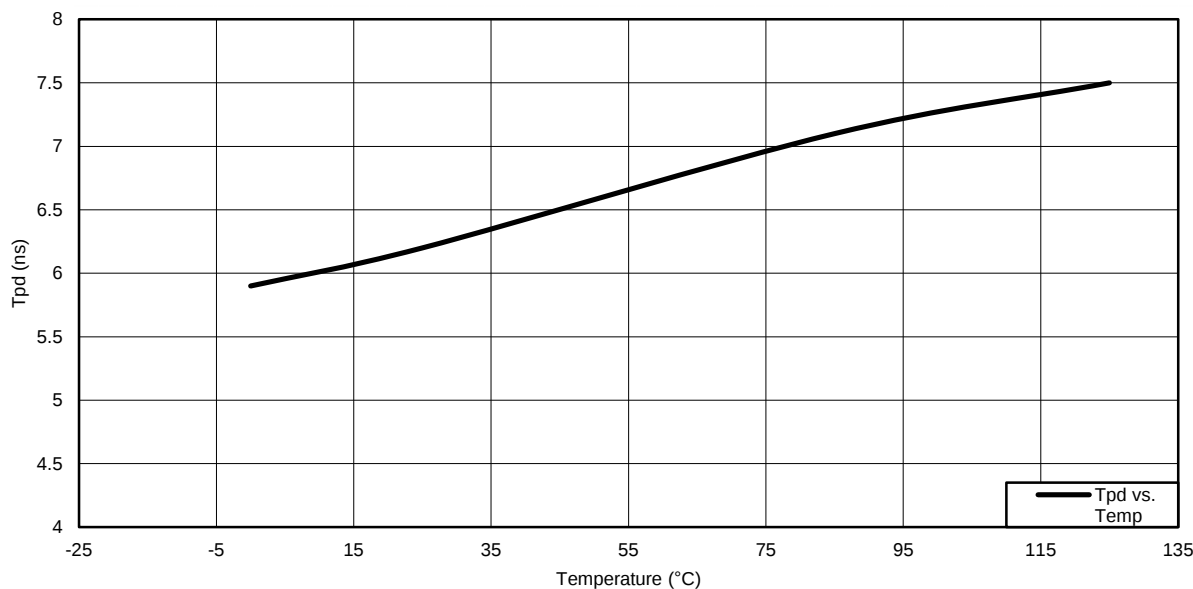
| PARAMETER                                           | FROM (INPUT) | TO (OUTPUT) | OUTPUT CAPACITANCE   | TEST CONDITIONS                                 | MIN | TYP | MAX | UNIT |
|-----------------------------------------------------|--------------|-------------|----------------------|-------------------------------------------------|-----|-----|-----|------|
| $t_{PLH}$ Propagation delay, low to high transition | A or B       | Y           | $C_L = 15\text{ pF}$ | $T_A = 25^\circ\text{C}$                        |     | 5   | 6.2 | ns   |
|                                                     |              |             |                      | $T_A = -40^\circ\text{C to } 85^\circ\text{C}$  | 1   |     | 7.1 |      |
|                                                     |              |             |                      | $T_A = -40^\circ\text{C to } 125^\circ\text{C}$ | 1   |     | 7.5 |      |
| $t_{PHL}$ Propagation delay, high to low transition | A or B       | Y           | $C_L = 15\text{ pF}$ | $T_A = 25^\circ\text{C}$                        |     | 5   | 6.2 | ns   |
|                                                     |              |             |                      | $T_A = -40^\circ\text{C to } 85^\circ\text{C}$  | 1   |     | 7.1 |      |
|                                                     |              |             |                      | $T_A = -40^\circ\text{C to } 125^\circ\text{C}$ | 1   |     | 7.5 |      |
| $t_{PLH}$ Propagation delay, low to high transition | A or B       | Y           | $C_L = 50\text{ pF}$ | $T_A = 25^\circ\text{C}$                        |     | 5.5 | 7.9 | ns   |
|                                                     |              |             |                      | Propagation delay, high to low transition       | 1   |     | 9   |      |
|                                                     |              |             |                      | $T_A = -40^\circ\text{C to } 125^\circ\text{C}$ | 1   |     | 10  |      |
| $t_{PHL}$ Propagation delay, high to low transition | A or B       | Y           | $C_L = 50\text{ pF}$ | $T_A = 25^\circ\text{C}$                        |     | 5.5 | 7.9 | ns   |
|                                                     |              |             |                      | $T_A = -40^\circ\text{C to } 85^\circ\text{C}$  | 1   |     | 9   |      |
|                                                     |              |             |                      | $T_A = -40^\circ\text{C to } 125^\circ\text{C}$ | 1   |     | 10  |      |

## 6.7 Operating Characteristics

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

| PARAMETER                              | TEST CONDITIONS             | TYP | UNIT |
|----------------------------------------|-----------------------------|-----|------|
| $C_{pd}$ Power dissipation capacitance | No load, $f = 1\text{ MHz}$ | 18  | pF   |

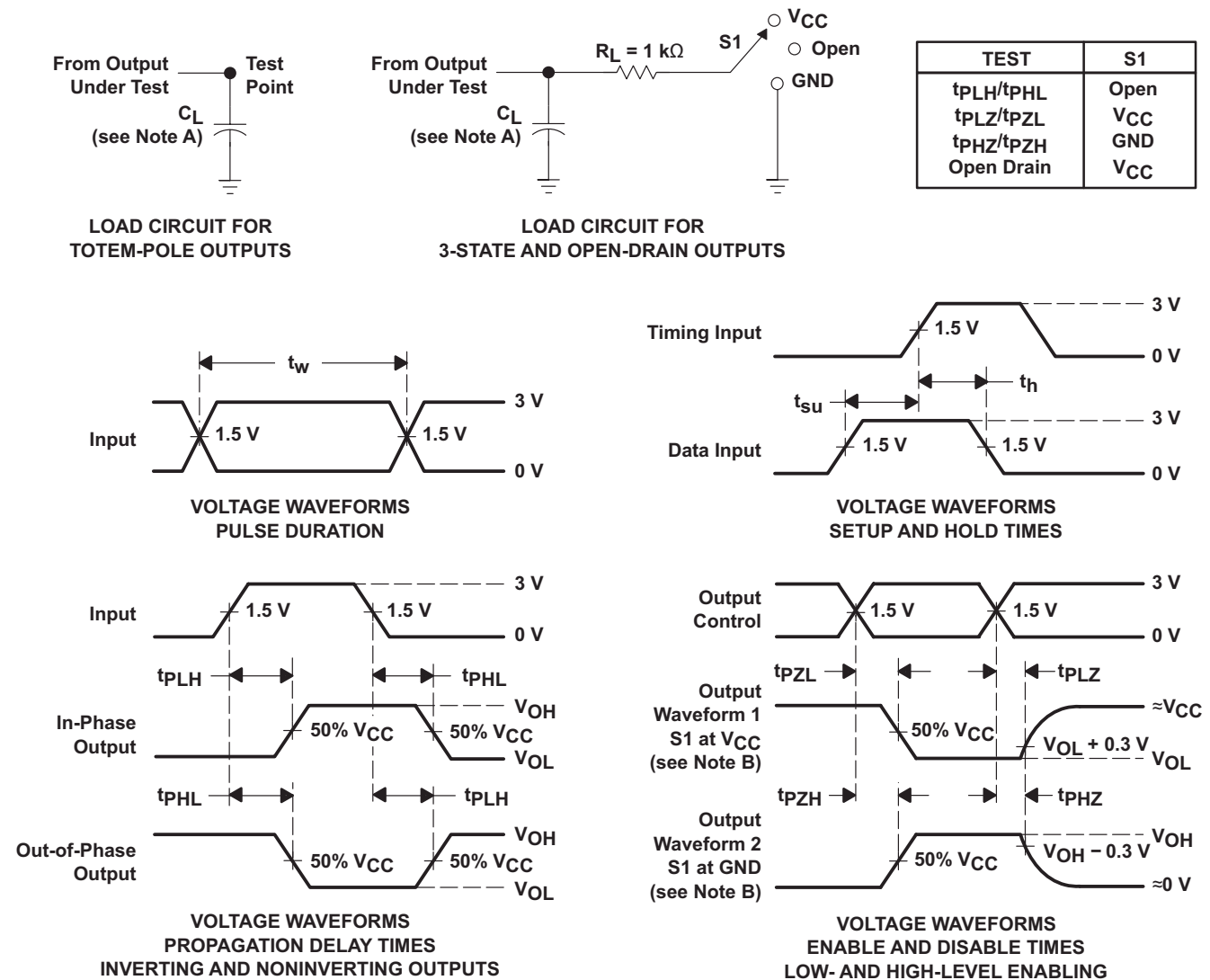
## 6.8 Typical Characteristics



$C_L = 15\text{ pF}$

**Figure 1.  $T_{pd}$  vs Temperature**

## 7 Parameter Measurement Information



$C_L$  includes probe and jig capacitance.

Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control.

Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.

All input pulses are supplied by generators having the following characteristics:  $PRR \leq 1\text{ MHz}$ ,  $Z_O = 50\ \Omega$ ,  $t_r \leq 3\text{ ns}$ ,  $t_f \leq 3\text{ ns}$ .

The outputs are measured one at a time with one input transition per measurement.

All parameters and waveforms are not applicable to all devices.

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

## 8 Detailed Description

### 8.1 Overview

The SN74AHCT1G08 device is a single 2-input positive-AND gate. The device performs the Boolean AND function ( $Y = A \cdot B$  or  $Y = A + B$ ) in positive logic. Low  $I_{CC}$  current allows this device to be used in power-sensitive or battery-powered applications. Robust inputs allow the device to up-translate with a propagation delay of 20 ns.

### 8.2 Functional Block Diagram



**Figure 3. Logic Diagram (Positive Logic)**

### 8.3 Feature Description

The  $V_{CC}$  for the device is optimized at 5 V.

Up voltage translation from 3.3 V to 5 V is allowed. The inputs accept  $V_{IH}$  levels of 2 V.

Output ringing is minimized by slow edge rates.

Inputs are TTL-Voltage compatible.

### 8.4 Device Functional Modes

[Table 1](#) lists the functional modes of the SN74AHCT1G08.

**Table 1. Function Table**

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

## 9 Application and Implementation

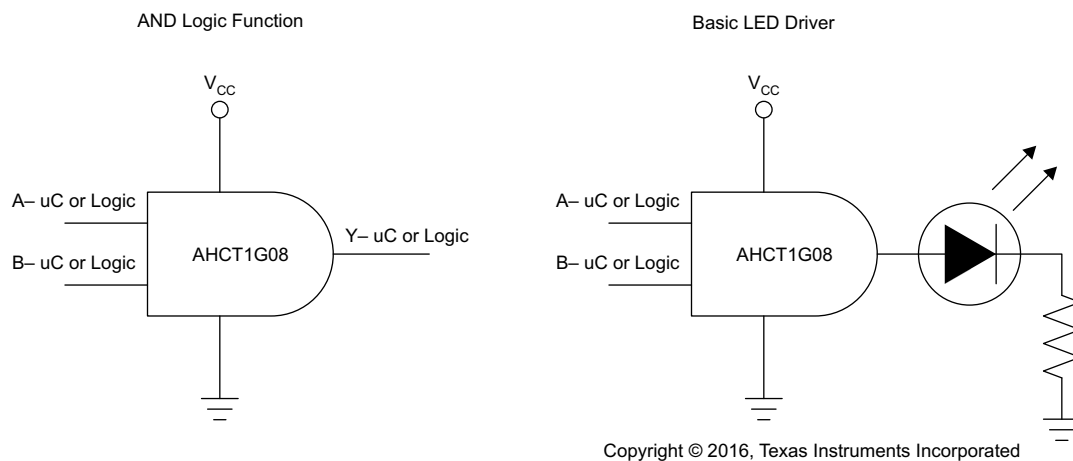
### NOTE

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 SN74AHCT1G08 device is a single AND gate, which is often used for many common functions like power sequencing or an *on* LED indicator. Because the device is configured to output LOW unless all inputs are HIGH, an LED tied to the output of the device will only turn HIGH when all systems connected are sending a HIGH, or *ready* signal.

### 9.2 Typical Application



**Figure 4. Typical Application Diagram**

#### 9.2.1 Design Requirements

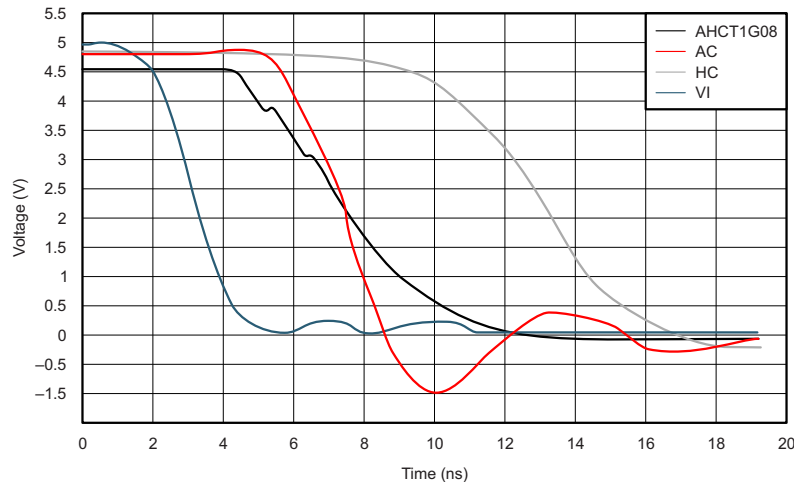
This device uses CMOS technology and has balanced output drive. Take care to avoid bus contention because it can drive currents that would exceed maximum limits. The high drive also creates fast edges into light loads, so routing and load conditions must be considered to prevent ringing.

#### 9.2.2 Detailed Design Procedure

1. Recommended Input Conditions
  - For rise time and fall time specifications, see  $\Delta t/\Delta V$  in [Recommended Operating Conditions](#).
  - For 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  $V_{CC}$ .
2. Recommended Output Conditions
  - Load currents must not exceed 25 mA per output and 50 mA total for the part.
  - Outputs must not be pulled above  $V_{CC}$ .

## Typical Application (continued)

### 9.2.3 Application Curve



$$V_{CC} = 5 \text{ V}$$

$$\text{Load} = 50 \, \Omega / 50 \text{ pF}$$

Figure 5. Typical Switching Characteristics

## 10 Power Supply Recommendations

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

Each  $V_{CC}$  pin must have a good bypass capacitor to prevent power disturbance. TI recommends a 0.1- $\mu\text{F}$  capacitor for devices with a single supply; and a 0.01- $\mu\text{F}$  or 0.022- $\mu\text{F}$  capacitor for each power pin if there are multiple  $V_{CC}$  pins. It is ok to parallel multiple bypass capacitors to reject different frequencies of noise. 0.1- $\mu\text{F}$  and 1- $\mu\text{F}$  capacitors are commonly used in parallel. The bypass capacitor must be installed as close to the power pin as possible 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 3 of the 4 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. Observe the following rules 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 must 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.

### 11.2 Layout Example

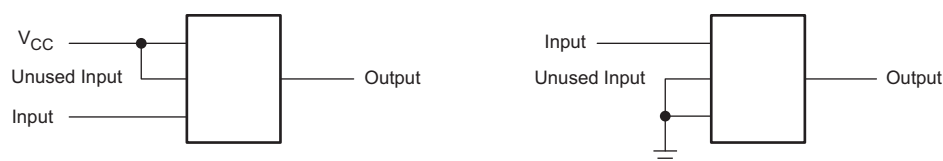


Figure 6. Layout Diagram

## 12 Device and Documentation Support

### 12.1 Documentation Support

#### 12.1.1 Related Documentation

For related documentation, see the following:

*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



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

### 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<br>(1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan<br>(2)  | Lead finish/<br>Ball material<br>(6) | MSL Peak Temp<br>(3) | Op Temp (°C) | Device Marking<br>(4/5)        | Samples                 |
|------------------|---------------|--------------|-----------------|------|-------------|------------------|--------------------------------------|----------------------|--------------|--------------------------------|-------------------------|
| 74AHCT1G08DBVRE4 | ACTIVE        | SOT-23       | DBV             | 5    | 3000        | RoHS & Green     | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 125   | B08G                           | <a href="#">Samples</a> |
| 74AHCT1G08DBVRG4 | ACTIVE        | SOT-23       | DBV             | 5    | 3000        | RoHS & Green     | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 125   | B08G                           | <a href="#">Samples</a> |
| 74AHCT1G08DCKRE4 | ACTIVE        | SC70         | DCK             | 5    | 3000        | RoHS & Green     | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 125   | (BE3, BEG, BEJ, BE L, BES)     | <a href="#">Samples</a> |
| 74AHCT1G08DCKRG4 | ACTIVE        | SC70         | DCK             | 5    | 3000        | RoHS & Green     | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 125   | (BE3, BEG, BEJ, BE L, BES)     | <a href="#">Samples</a> |
| 74AHCT1G08DCKTG4 | ACTIVE        | SC70         | DCK             | 5    | 250         | RoHS & Green     | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 125   | (BE3, BEG, BEL, BE S)          | <a href="#">Samples</a> |
| 74AHCT1G08DRLRG4 | ACTIVE        | SOT-5X3      | DRL             | 5    | 4000        | RoHS & Green     | NIPDAUAG                             | Level-1-260C-UNLIM   | -40 to 125   | (BEB, BES)                     | <a href="#">Samples</a> |
| SN74AHCT1G08DBV3 | ACTIVE        | SOT-23       | DBV             | 5    | 3000        | RoHS & Non-Green | SNBI                                 | Level-1-260C-UNLIM   | -40 to 125   | B08Y                           | <a href="#">Samples</a> |
| SN74AHCT1G08DBVR | ACTIVE        | SOT-23       | DBV             | 5    | 3000        | RoHS & Green     | NIPDAU   SN                          | Level-1-260C-UNLIM   | -40 to 125   | (B083, B08G, B08J, B08L, B08S) | <a href="#">Samples</a> |
| SN74AHCT1G08DBVT | ACTIVE        | SOT-23       | DBV             | 5    | 250         | RoHS & Green     | NIPDAU   SN                          | Level-1-260C-UNLIM   | -40 to 125   | (B083, B08G, B08J, B08L, B08S) | <a href="#">Samples</a> |
| SN74AHCT1G08DCK3 | ACTIVE        | SC70         | DCK             | 5    | 3000        | RoHS & Non-Green | SNBI                                 | Level-1-260C-UNLIM   | -40 to 125   | BEY                            | <a href="#">Samples</a> |
| SN74AHCT1G08DCKR | ACTIVE        | SC70         | DCK             | 5    | 3000        | RoHS & Green     | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 125   | (BE3, BEG, BEJ, BE L, BES)     | <a href="#">Samples</a> |
| SN74AHCT1G08DCKT | ACTIVE        | SC70         | DCK             | 5    | 250         | RoHS & Green     | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 125   | (BE3, BEG, BEL, BE S)          | <a href="#">Samples</a> |
| SN74AHCT1G08DRLR | ACTIVE        | SOT-5X3      | DRL             | 5    | 4000        | RoHS & Green     | NIPDAU   NIPDAUAG                    | Level-1-260C-UNLIM   | -40 to 125   | (BEB, BES)                     | <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.

<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 (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of  $\leq 1000$ ppm threshold. Antimony trioxide based flame retardants must also meet the  $\leq 1000$ ppm 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.

<sup>(5)</sup> 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.

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**TAPE AND REEL INFORMATION**


\*All dimensions are nominal

| Device           | Package Type | Package Drawing | Pins | SPQ  | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
|------------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| 74AHCT1G08DBVRG4 | SOT-23       | DBV             | 5    | 3000 | 178.0              | 9.0                | 3.23    | 3.17    | 1.37    | 4.0     | 8.0    | Q3            |
| SN74AHCT1G08DBVR | SOT-23       | DBV             | 5    | 3000 | 178.0              | 9.0                | 3.3     | 3.2     | 1.4     | 4.0     | 8.0    | Q3            |
| SN74AHCT1G08DBVR | SOT-23       | DBV             | 5    | 3000 | 178.0              | 9.2                | 3.3     | 3.23    | 1.55    | 4.0     | 8.0    | Q3            |
| SN74AHCT1G08DBVR | SOT-23       | DBV             | 5    | 3000 | 180.0              | 8.4                | 3.23    | 3.17    | 1.37    | 4.0     | 8.0    | Q3            |
| SN74AHCT1G08DBVR | SOT-23       | DBV             | 5    | 3000 | 178.0              | 9.0                | 3.23    | 3.17    | 1.37    | 4.0     | 8.0    | Q3            |
| SN74AHCT1G08DBVT | SOT-23       | DBV             | 5    | 250  | 178.0              | 9.0                | 3.23    | 3.17    | 1.37    | 4.0     | 8.0    | Q3            |
| SN74AHCT1G08DBVT | SOT-23       | DBV             | 5    | 250  | 178.0              | 9.0                | 3.3     | 3.2     | 1.4     | 4.0     | 8.0    | Q3            |
| SN74AHCT1G08DCKR | SC70         | DCK             | 5    | 3000 | 178.0              | 9.2                | 2.4     | 2.4     | 1.22    | 4.0     | 8.0    | Q3            |
| SN74AHCT1G08DCKR | SC70         | DCK             | 5    | 3000 | 178.0              | 9.0                | 2.4     | 2.5     | 1.2     | 4.0     | 8.0    | Q3            |
| SN74AHCT1G08DCKR | SC70         | DCK             | 5    | 3000 | 180.0              | 8.4                | 2.47    | 2.3     | 1.25    | 4.0     | 8.0    | Q3            |
| SN74AHCT1G08DCKT | SC70         | DCK             | 5    | 250  | 180.0              | 8.4                | 2.47    | 2.3     | 1.25    | 4.0     | 8.0    | Q3            |
| SN74AHCT1G08DCKT | SC70         | DCK             | 5    | 250  | 178.0              | 9.2                | 2.4     | 2.4     | 1.22    | 4.0     | 8.0    | Q3            |
| SN74AHCT1G08DCKT | SC70         | DCK             | 5    | 250  | 178.0              | 9.0                | 2.4     | 2.5     | 1.2     | 4.0     | 8.0    | Q3            |
| SN74AHCT1G08DRLR | 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) |
|------------------|--------------|-----------------|------|------|-------------|------------|-------------|
| 74AHCT1G08DBVRG4 | SOT-23       | DBV             | 5    | 3000 | 180.0       | 180.0      | 18.0        |
| SN74AHCT1G08DBVR | SOT-23       | DBV             | 5    | 3000 | 180.0       | 180.0      | 18.0        |
| SN74AHCT1G08DBVR | SOT-23       | DBV             | 5    | 3000 | 180.0       | 180.0      | 18.0        |
| SN74AHCT1G08DBVR | SOT-23       | DBV             | 5    | 3000 | 202.0       | 201.0      | 28.0        |
| SN74AHCT1G08DBVR | SOT-23       | DBV             | 5    | 3000 | 180.0       | 180.0      | 18.0        |
| SN74AHCT1G08DBVT | SOT-23       | DBV             | 5    | 250  | 180.0       | 180.0      | 18.0        |
| SN74AHCT1G08DBVT | SOT-23       | DBV             | 5    | 250  | 180.0       | 180.0      | 18.0        |
| SN74AHCT1G08DCKR | SC70         | DCK             | 5    | 3000 | 180.0       | 180.0      | 18.0        |
| SN74AHCT1G08DCKR | SC70         | DCK             | 5    | 3000 | 180.0       | 180.0      | 18.0        |
| SN74AHCT1G08DCKR | SC70         | DCK             | 5    | 3000 | 202.0       | 201.0      | 28.0        |
| SN74AHCT1G08DCKT | SC70         | DCK             | 5    | 250  | 202.0       | 201.0      | 28.0        |
| SN74AHCT1G08DCKT | SC70         | DCK             | 5    | 250  | 180.0       | 180.0      | 18.0        |
| SN74AHCT1G08DCKT | SC70         | DCK             | 5    | 250  | 180.0       | 180.0      | 18.0        |
| SN74AHCT1G08DRLR | SOT-5X3      | DRL             | 5    | 4000 | 202.0       | 201.0      | 28.0        |

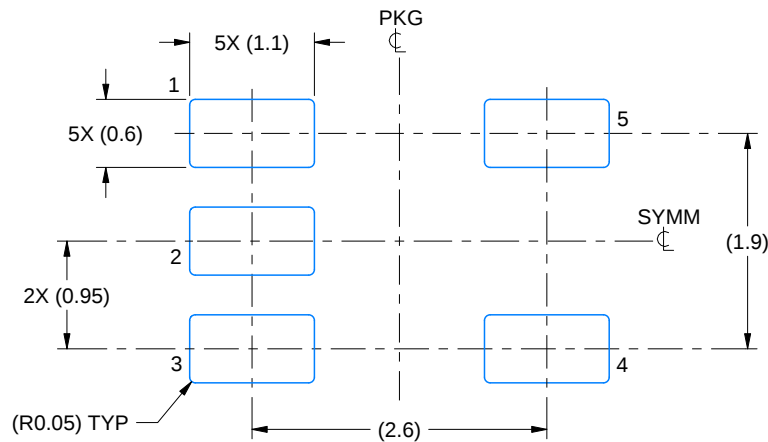


# EXAMPLE BOARD LAYOUT

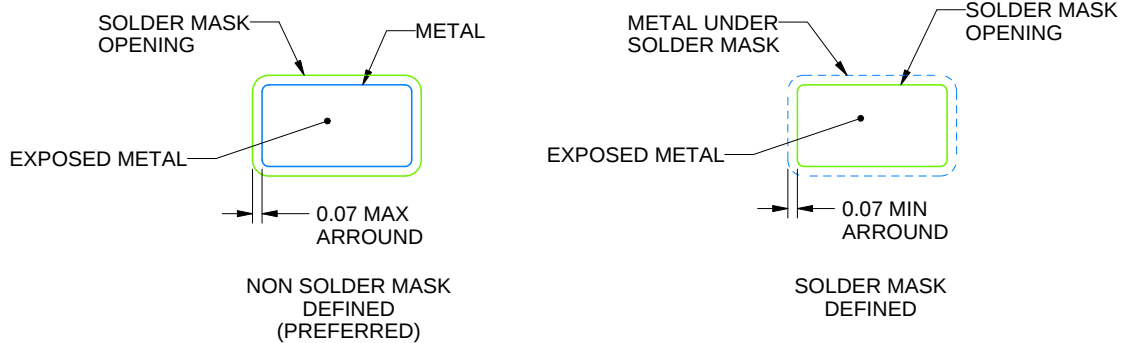
DBV0005A

SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE:15X



SOLDER MASK DETAILS

4214839/F 06/2021

NOTES: (continued)

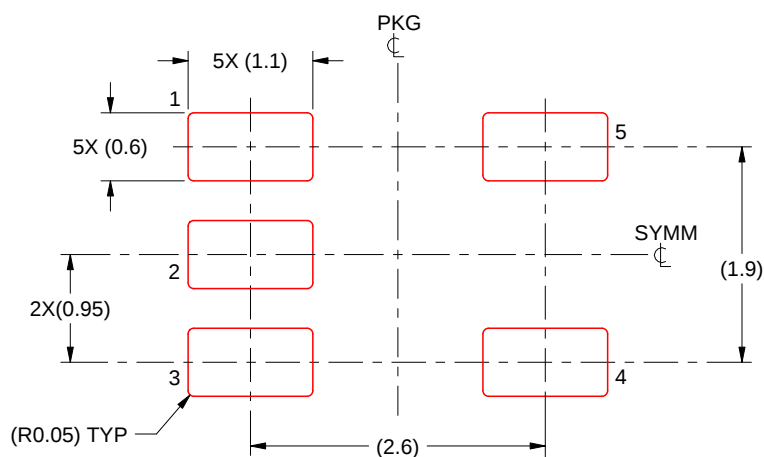
5. Publication IPC-7351 may have alternate designs.
6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

## EXAMPLE STENCIL DESIGN

DBV0005A

SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



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

4214839/F 06/2021

NOTES: (continued)

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

## DCK (R-PDSO-G5)

## PLASTIC SMALL-OUTLINE PACKAGE



4093553-3/G 01/2007

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

DCK (R-PDSO-G5)

PLASTIC SMALL OUTLINE



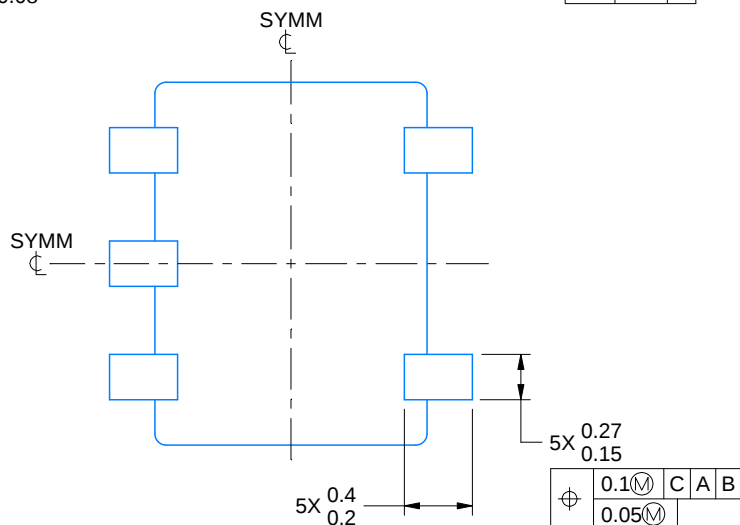
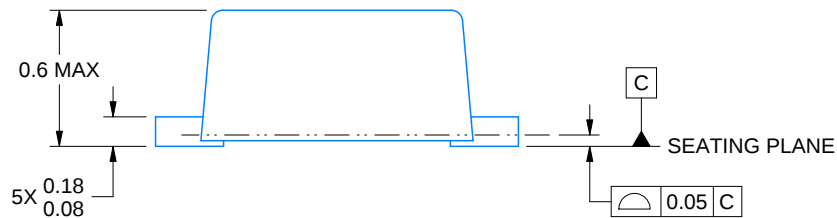
- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Customers should place a note on the circuit board fabrication drawing not to alter the center solder mask defined pad.
  - D. Publication IPC-7351 is recommended for alternate designs.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



**SOT - 0.6 mm max height**

The drawing shows a rectangular component with the following dimensions and features:

- Overall Dimensions:**
  - Width: 1.7 (top) and 1.5 (middle)
  - Height: 1.7 (right) and 1.5 (middle)
- Pin 1 ID Area:** A shaded rectangular area on the left side, with a label "PIN 1 ID AREA" pointing to it.
- Pin Dimensions:**
  - Pin 1: 0.5 (width) and 1 (height)
  - Pin 2: 0.5 (width) and 1 (height)
  - Pin 3: 0.5 (width) and 1 (height)
  - Pin 4: 0.5 (width) and 1 (height)
  - Pin 5: 0.5 (width) and 1 (height)
- Other Dimensions:**
  - Distance from left edge to Pin 1: 1.3
  - Distance from left edge to Pin 2: 1.1
  - Distance from left edge to Pin 3: 1.1
  - Distance from left edge to Pin 4: 1.1
  - Distance from left edge to Pin 5: 1.1
  - Distance from right edge to Pin 1: 0.05
  - Distance from right edge to Pin 2: 0.05
  - Distance from right edge to Pin 3: 0.05
  - Distance from right edge to Pin 4: 0.05
  - Distance from right edge to Pin 5: 0.05
- Notes:**
  - NOTE 3: 1.7, 1.5
- Side View:** A side view of the component showing the profile of the pins and the overall shape.



NOTES:

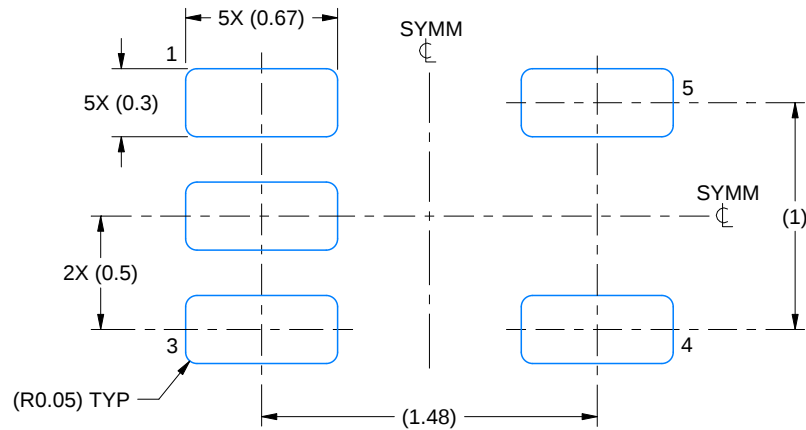
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. Reference JEDEC registration MO-293 Variation UAAD-1

# EXAMPLE BOARD LAYOUT

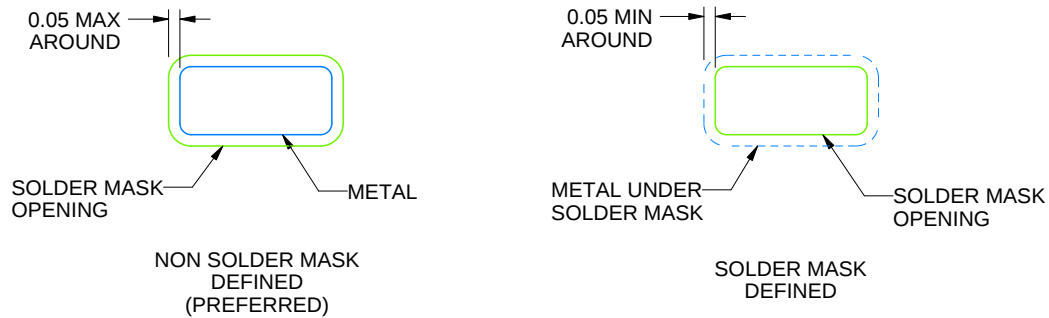
DRL0005A

SOT - 0.6 mm max height

PLASTIC SMALL OUTLINE



LAND PATTERN EXAMPLE  
SCALE:30X



SOLDERMASK DETAILS

4220753/B 12/2020

NOTES: (continued)

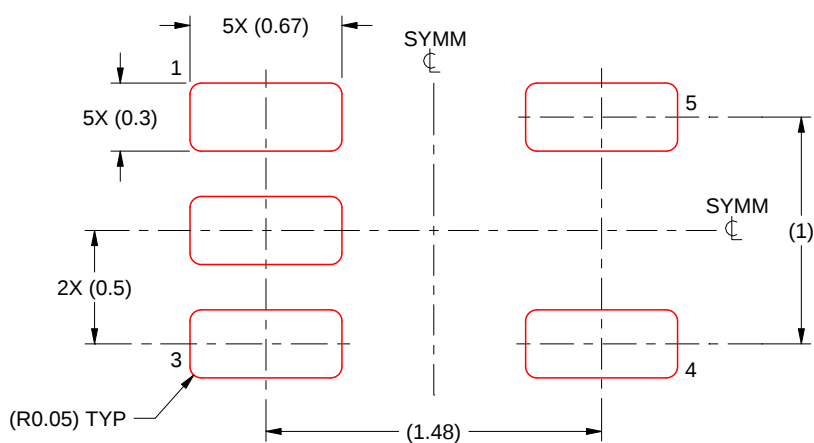
5. Publication IPC-7351 may have alternate designs.
6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

## EXAMPLE STENCIL DESIGN

DRL0005A

SOT - 0.6 mm max height

PLASTIC SMALL OUTLINE



SOLDER PASTE EXAMPLE  
BASED ON 0.1 mm THICK STENCIL  
SCALE:30X

4220753/B 12/2020

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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