# SN74AHCT1G14 单路施密特触发反相器门

## 1 特性

- 工作电压范围为 4.5V 至 5.5V
- 电压为 5V 时，$t_{pd}$ 最大值为 8ns
- 低功耗，$I_{CC}$ 最大值为 1 µ A
- 5V 时，输出驱动为 ±8mA
- 输入兼容 TTL 电压
- 闩锁性能超过 250mA，符合 JESD 17 规范

## 2 应用

- 启用或禁用数字信号
- 控制指示灯 LED
- 通信模块和系统控制器之间的转换

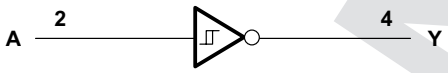
## 3 说明

SN74AHCT1G14 包含一个单路反相器门。该器件执行布尔函数 $Y = \overline{A}$。

**封装信息**

| 器件型号 | 封装(1) | 封装尺寸(2) | 封装尺寸(3) |
|---|---|---|---|
| SN74AHCT1G14 | DBV（SOT-23，5） | 2.9mm x 2.8mm | 2.9mm × 1.6mm |
| | DCK（SC-70，5） | 2.00mm × 1.25mm | 2.00mm × 1.25mm |

(1) 如需了解所有可用封装，请参阅数据表末尾的可订购产品附录。
(2) 封装尺寸（长 x 宽）为标称值，并包括引脚（如适用）。
(3) 封装尺寸（长 × 宽）为标称值，不包括引脚。




逻辑图（正逻辑）

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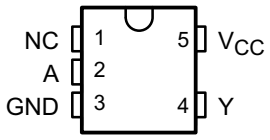
# 4 Pin Configuration and Functions




NC – No internal connection

See 节 11 for dimensions.

**图 4-1. DBV or DCK Package 5-Pin SOT-23 or SC70 (Top View)**

**表 4-1. Pin Functions**

| PIN | | TYPE(1) | DESCRIPTION |
|---|---|---|---|
| NO. | NAME | | |
| 1 | NC | — | No connect |
| 2 | A | I | Data Input |
| 3 | GND | — | Ground |
| 4 | Y | O | Data Output |
| 5 | $V_{CC}$ | — | Power |

(1) Signal Types: I = Input, O = Output, I/O = Input or Output

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# 5 Specifications

## 5.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted)(1)

| | | | MIN | MAX | UNIT |
|---|---|---|---|---|---|
| $V_{CC}$ | Supply voltage range | | –0.5 | 7 | V |
| $V_I$ (2) | Input voltage range | | –0.5 | 7 | V |
| $V_O$ (2) | Output voltage range | | –0.5 | $V_{CC}$ + 0.5 | V |
| $I_{IK}$ | Input clamp current | ($V_I$ < 0) | | –20 | mA |
| $I_{OK}$ | Output clamp current | ($V_O$ < 0 or $V_O$ > $V_{CC}$) | | ±20 | mA |
| $I_O$ | Continuous output current | ($V_O$ = 0 to $V_{CC}$) | | ±25 | mA |
| | Continuous current through $V_{CC}$ or GND | | | ±50 | mA |
| $T_{stg}$ | Storage temperature range | | –65 | 150 | °C |

(1) Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only, 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.

## 5.2 Recommended Operating Conditions

over operating free-air temperature range (unless otherwise noted)(1)

| | | MIN | MAX | UNIT |
|---|---|---|---|---|
| $V_{CC}$ | Supply voltage | 4.5 | 5.5 | V |
| $V_I$ | Input voltage | 0 | 5.5 | V |
| $V_O$ | Output voltage | 0 | $V_{CC}$ | V |
| $I_{OH}$ | High-level output current | | –8 | mA |
| $I_{OL}$ | Low-level output current | | 8 | mA |
| $T_A$ | Operating free-air temperature | –40 | 125 | °C |

(1) All unused inputs of the device must be held at $V_{CC}$ or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

## 5.3 Thermal Information

| THERMAL METRIC(1) | | SN74AHCT1G14 | | UNIT |
|---|---|---|---|---|
| | | DBV (SOT-23) | DCK (SC70) | |
| | | 5 PINS | 5 PINS | |
| $R_{\theta JA}$ | Junction-to-ambient thermal resistance | 278 | 289.2 | °C/W |

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

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## 5.4 Electrical Characteristics

over operating free-air temperature range (unless otherwise noted) (1)

| PARAMETER | | TEST CONDITIONS | | $V_{CC}$ | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|
| $V_{T+}$ | Positive-going input threshold voltage | | $T_A$ = 25°C | 4.5 V | 0.9 | | 2 | V |
| | | | $T_A$ = –40°C to 85°C | | 0.9 | | | |
| | | | $T_A$ = –40°C to 125°C | | 0.9 | | 2 | |
| | | | $T_A$ = 25°C | 5.5 V | 1.1 | | 2 | |
| | | | $T_A$ = –40°C to 85°C | | 1.1 | | | |
| | | | $T_A$ = –40°C to 125°C | | 1.1 | | 2 | |
| $V_{T-}$ | Negative-going input threshold voltage | | $T_A$ = 25°C | 4.5 V | 0.5 | | 1.6 | V |
| | | | $T_A$ = –40°C to 85°C | | 0.5 | | | |
| | | | $T_A$ = –40°C to 125°C | | 0.5 | | 1.6 | |
| | | | $T_A$ = 25°C | 5.5 V | 0.6 | | 1.5 | |
| | | | $T_A$ = –40°C to 85°C | | 0.6 | | | |
| | | | $T_A$ = –40°C to 125°C | | 0.6 | | 1.5 | |
| $\Delta V_T$ | Hysteresis (VT+ – VT-) | | $T_A$ = 25°C | 4.5 V | 0.4 | | 1.4 | V |
| | | | $T_A$ = –40°C to 85°C | | 0.4 | | | |
| | | | $T_A$ = –40°C to 125°C | | 0.4 | | 1.4 | |
| | | | $T_A$ = 25°C | 5.5 V | 0.5 | | 1.6 | |
| | | | $T_A$ = –40°C to 85°C | | 0.4 | | | |
| | | | $T_A$ = –40°C to 125°C | | 0.5 | | 1.6 | |
| $V_{OH}$ | High level output voltage | $I_{OH}$ = –50 mA | $T_A$ = 25°C | 4.5 V | 4.4 | 4.5 | | V |
| | | | $T_A$ = –40°C to 85°C | | 4.4 | | | |
| | | | $T_A$ = –40°C to 125°C | | 4.4 | | | |
| | | $I_{OH}$ = –8 mA | $T_A$ = 25°C | | 3.94 | | | |
| | | | $T_A$ = –40°C to 85°C | | 3.88 | | | |
| | | | $T_A$ = –40°C to 125°C | | 3.7 | | | |

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over operating free-air temperature range (unless otherwise noted) (1)

| PARAMETER | | TEST CONDITIONS | | $V_{CC}$ | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|
| $V_{OL}$ | Low level output voltage | $I_{OL}$ = 50 mA | $T_A$ = 25°C | 4.5 V | | | 0.1 | V |
| | | | $T_A$ = –40°C to 85°C | | | | 0.1 | |
| | | | $T_A$ = –40°C to 125°C | | | | 0.1 | |
| | | $I_{OL}$ = 8 mA | $T_A$ = 25°C | | | | 0.36 | |
| | | | $T_A$ = –40°C to 85°C | | | | 0.44 | |
| | | | $T_A$ = –40°C to 125°C | | | | 0.55 | |
| $I_I$ | Input leakage current | $V_I$ = 5.5 V or GND | $T_A$ = 25°C | 0 V to 5.5 V | | | ±0.1 | µA |
| | | | $T_A$ = –40°C to 85°C | | | | ±1 | |
| | | | $T_A$ = –40°C to 125°C | | | | ±1 | |
| $I_{CC}$ | Supply current | $V_I$ = $V_{CC}$ or GND, $I_O$ = 0 | $T_A$ = 25°C | 5.5 V | | | 1 | µA |
| | | | $T_A$ = –40°C to 85°C | | | | 10 | |
| | | | $T_A$ = –40°C to 125°C | | | | 10 | |
| $C_i$ | Input Capacitance | $V_I$ = $V_{CC}$ or GND | $T_A$ = 25°C | 5 V | | 2 | 10 | pF |
| | | | $T_A$ = –40°C to 85°C | | | | 10 | |
| | | | $T_A$ = –40°C to 125°C | | | | 10 | |

(1) Recommended $T_A$ = –40°C to 125°C

## 5.5 Switching Characteristics

over recommended operating free-air temperature range, $V_{CC}$ = 5 V ± 0.5 V (unless otherwise noted) (see Load Circuit and Voltage Waveforms)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | OUTPUT CAPACITANCE | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|
| $t_{PLH}$ | A | Y | $C_L$ = 15 pF | $T_A$ = 25°C | | 4 | 7 | ns |
| | | | | $T_A$ = –40°C to 85°C | 1 | | 8 | |
| | | | | $T_A$ = –40°C to 125°C | 1 | | 9 | |
| $t_{PHL}$ | | | | $T_A$ = 25°C | | 4 | 7 | |
| | | | | $T_A$ = –40°C to 85°C | 1 | | 8 | |
| | | | | $T_A$ = –40°C to 125°C | 1 | | 9 | |
| $t_{PLH}$ | A | Y | $C_L$ = 50 pF | $T_A$ = 25°C | | 5.5 | 8 | ns |
| | | | | $T_A$ = –40°C to 85°C | 1 | | 9 | |
| | | | | $T_A$ = –40°C to 125°C | 1 | | 10 | |
| $t_{PHL}$ | | | | $T_A$ = 25°C | | 5.5 | 8 | |
| | | | | $T_A$ = –40°C to 85°C | 1 | | 9 | |
| | | | | $T_A$ = –40°C to 125°C | 1 | | 10 | |

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## 5.6 Operating Characteristics

$V_{CC}$ = 5 V, $T_A$ = 25°C

| PARAMETER | | TEST CONDITIONS | TYP | UNIT |
|---|---|---|---|---|
| $C_{pd}$ | Power dissipation capacitance | No load, f = 1 MHz | 12 | pF |

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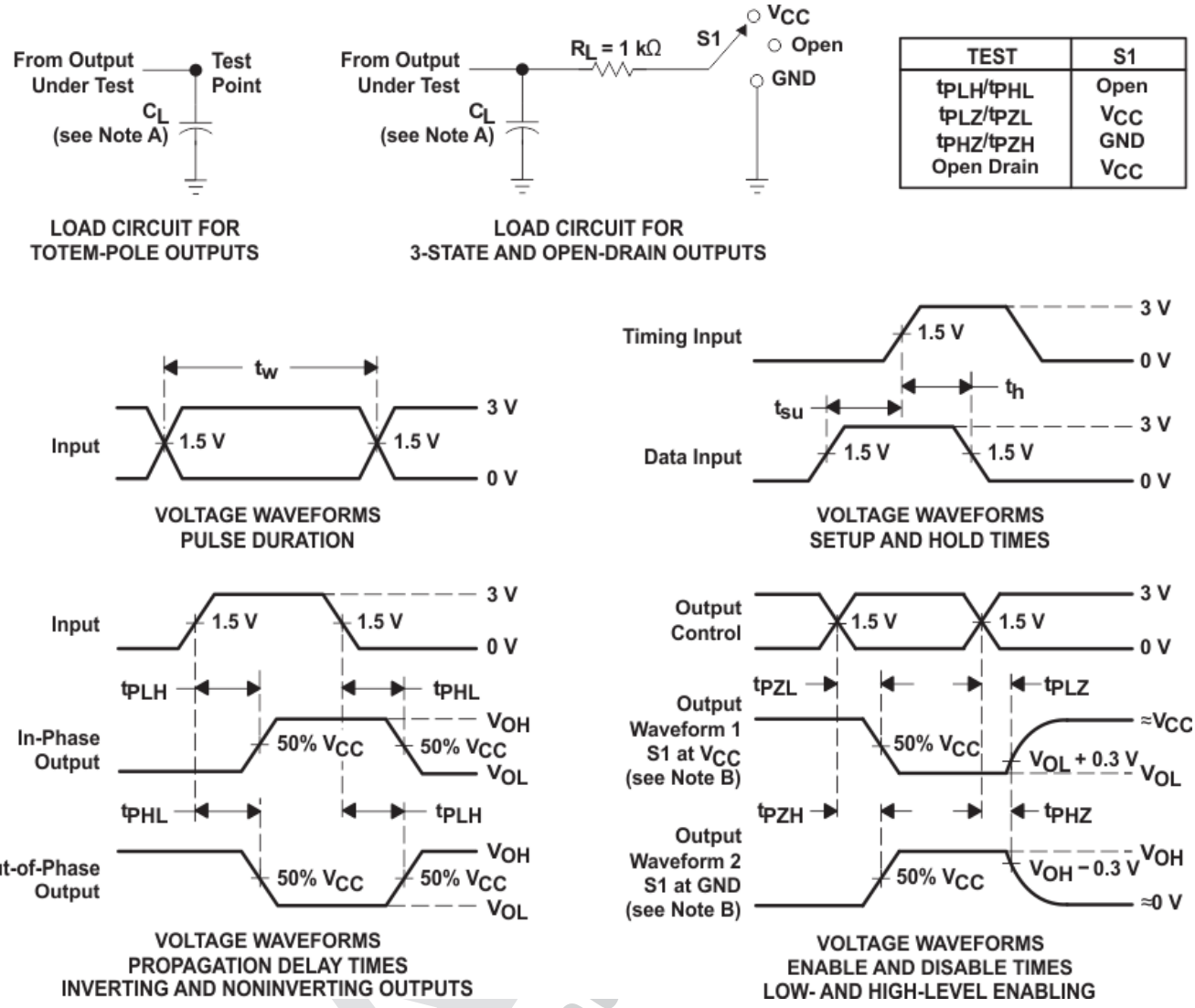
## 6 Parameter Measurement Information




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 ⩽ 1 MHz, $Z_O$ = 50 Ω, $t_r$ ⩽ 3 ns, $t_f$ ⩽ 3 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.

**图 6-1. Load Circuit and Voltage Waveforms**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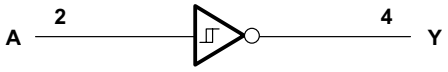
# 7 Detailed Description

## 7.1 Overview

The SN74AHCT1G14 contains a single inverter gate. The device performs the Boolean function $Y = \overline{A}$.

The device functions as an independent inverter gate, but because of the Schmitt action, gates may have different input threshold levels for positive- ($V_{T+}$) and negative-going ($V_{T-}$) signals.

## 7.2 Functional Block Diagram




## 7.3 Device Functional Modes

| INPUTS(1) | OUTPUT(2) |
|---|---|
| A | Y |
| H | L |
| L | H |

(1) H = High Voltage Level, L = Low Voltage Level, X = Don’t Care

(2) H = Driving High, L = Driving Low, Z = High Impedance State

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# 8 Application and Implementation

**备注**

以下应用部分中的信息不属于 TI 器件规格的范围，TI 不担保其准确性和完整性。TI 的客 户应负责确定器件是否适用于其应用。客户应验证并测试其设计，以确保系统功能。

## 8.1 Application Information

In this application, three 2-input AND gates are combined to produce a 4-input AND gate function as shown in Typical Application Block Diagram. The fourth gate can be used for another application in the system, or the inputs can be grounded and the channel left unused.

The SN74AHCT1G14 is used to directly control the $\overline{\text{RESET}}$ pin of a motor controller. The controller requires four input signals to all be HIGH before being enabled, and should be disabled in the event that any one signal goes LOW. The 4-input AND gate function combines the four individual reset signals into a single active-low reset signal.

## 8.2 Typical Application

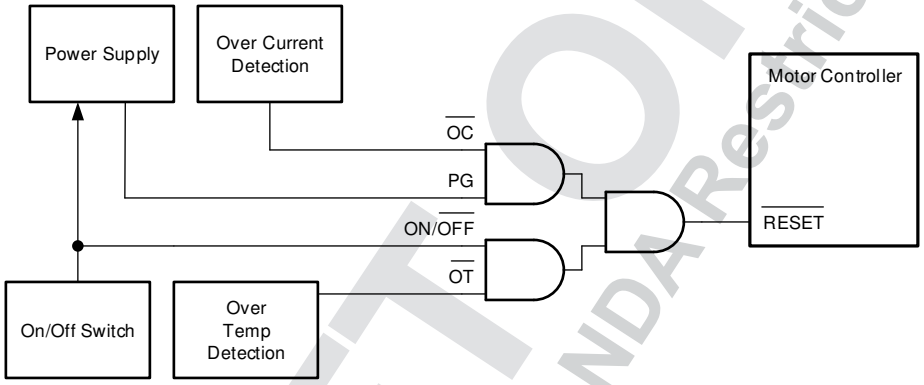


**图 8-1. Typical Application Block Diagram**

### 8.2.1 Design Requirements

#### *8.2.1.1 Power Considerations*

Ensure the desired supply voltage is within the range specified in the *Recommended Operating Conditions*. The supply voltage sets the electrical characteristics of the device as described in the *Electrical Characteristics* section.

The positive voltage supply must be capable of sourcing current equal to the maximum static supply current, $I_{CC}$, listed in the *Electrical Characteristics*, and any transient current required for switching.

The ground must be capable of sinking current equal to the total current to be sunk by all outputs of the SN74AHCT1G14 plus the maximum supply current, $I_{CC}$, listed in the *Electrical Characteristics*, and any transient current required for switching. The logic device can only sink as much current that can be sunk into its ground connection. Be sure to not exceed the maximum total current through GND listed in the *Absolute Maximum Ratings*.

The SN74AHCT1G14 can drive a load with a total capacitance less than or equal to 50 pF while still meeting all of the data sheet specifications. Larger capacitive loads can be applied; however, it is not recommended to exceed 50 pF.

The SN74AHCT1G14 can drive a load with total resistance described by $R_L \geqslant V_O / I_O$, with the output voltage and current defined in the *Electrical Characteristics* table with $V_{OL}$. When outputting in the HIGH state, the output

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voltage in the equation is defined as the difference between the measured output voltage and the supply voltage at the $V_{CC}$ pin.

Total power consumption can be calculated using the information provided in the *CMOS Power Consumption and Cpd Calculation* application note.

Thermal increase can be calculated using the information provided in the *Thermal Characteristics of Standard Linear and Logic (SLL) Packages and Devices* application note.

小心

The maximum junction temperature, $T_{J(max)}$ listed in the *Absolute Maximum Ratings*, is an additional limitation to prevent damage to the device. Do not violate any values listed in the *Absolute Maximum Ratings*. These limits are provided to prevent damage to the device.

#### 8.2.1.2 Input Considerations

Input signals must cross to be considered a logic LOW, and to be considered a logic HIGH. Do not exceed the maximum input voltage range found in the *Absolute Maximum Ratings*.

Unused inputs must be terminated to either $V_{CC}$ or ground. The unused inputs can be directly terminated if the input is completely unused, or they can be connected with a pull-up or pull-down resistor if the input will be used sometimes, but not always. A pull-up resistor is used for a default state of HIGH, and a pull-down resistor is used for a default state of LOW. The drive current of the controller, leakage current into the SN74AHCT1G14 (as specified in the *Electrical Characteristics*), and the desired input transition rate limits the resistor size. A 10-kΩ resistor value is often used due to these factors.

Refer to the *Feature Description* section for additional information regarding the inputs for this device.

#### 8.2.1.3 Output Considerations

The ground voltage is used to produce the output LOW voltage. Sinking current into the output will increase the output voltage as specified by the $V_{OL}$ specification in the *Electrical Characteristics*.

Unused outputs can be left floating. Do not connect outputs directly to $V_{CC}$ or ground.

Refer to the *Feature Description* section for additional information regarding the outputs for this device.

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### 8.2.2 Detailed Design Procedure

1. Add a decoupling capacitor from $V_{CC}$ to GND. The capacitor needs to be placed physically close to the device and electrically close to both the $V_{CC}$ and GND pins. An example layout is shown in the *Layout* section.
2. Ensure the capacitive load at the output is ⩽ 50 pF. This is not a hard limit; it will, however, ensure optimal performance. This can be accomplished by providing short, appropriately sized traces from the SN74AHCT1G14 to one or more of the receiving devices.
3. Ensure the resistive load at the output is larger than ($V_{CC}$ / $I_{O(max)}$) Ω, so that the maximum output current from the *Absolute Maximum Ratings* is not violated. Most CMOS inputs have a resistive load measured in MΩ; much larger than the minimum calculated previously.
4. Thermal issues are rarely a concern for logic gates; the power consumption and thermal increase, however, can be calculated using the steps provided in the application report, *CMOS Power Consumption and Cpd Calculation*.

### 8.2.3 Application Curves

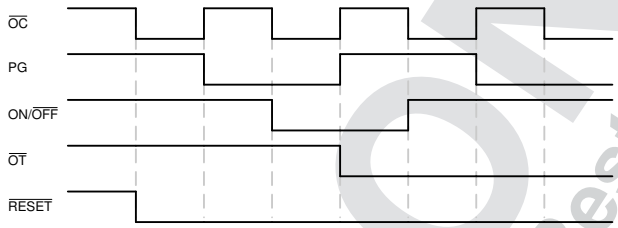


**图 8-2. Application Timing Diagram**

## 8.3 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. A 0.1-μF capacitor is recommended for this device. It is acceptable to parallel multiple bypass capacitors to reject different frequencies of noise. The 0.1-μF and 1-μF capacitors are commonly used in parallel. The bypass capacitor should be installed as close to the power terminal as possible for best results, as shown in the following layout example.

## 8.4 Layout

### 8.4.1 Layout Guidelines

When using multiple-input and multiple-channel logic devices, inputs must never be left floating. 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 unused input pins must not be left unconnected because the undefined voltages at the outside connections result in undefined operational states. All unused inputs of digital logic devices must be connected to a logic high or logic low voltage, as defined by the input voltage specifications, 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, the inputs are tied to GND or $V_{CC}$, whichever makes more sense for the logic function or is more convenient.

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### 8.4.2 Layout Example

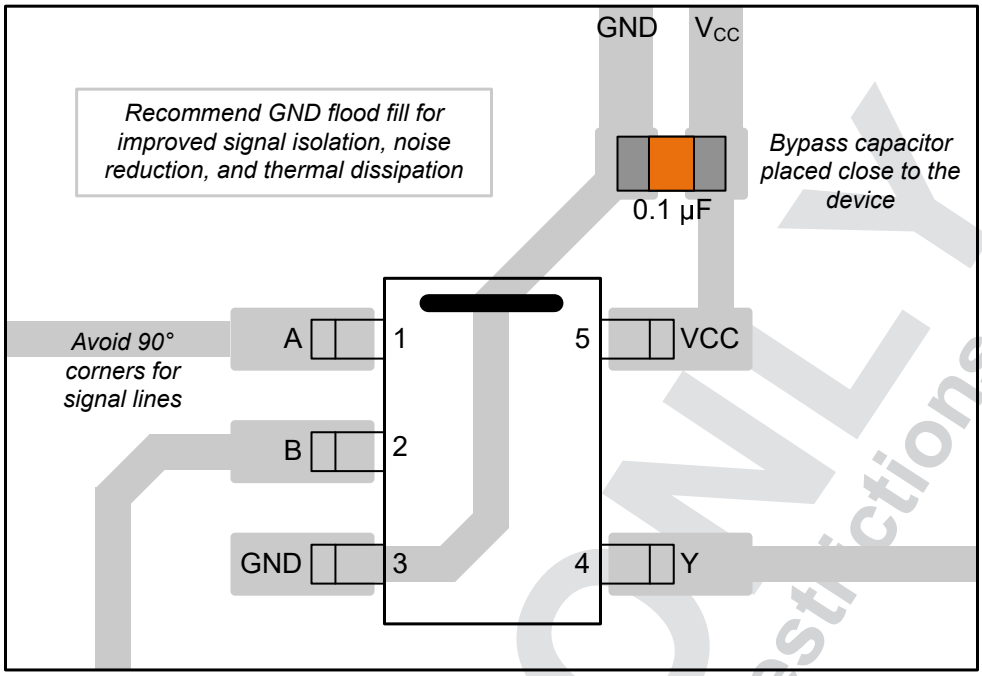


**图 8-3. Example Layout for the SN74AHCT1G14**

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# 9 Device and Documentation Support

## 9.1 Documentation Support (Analog)

### 9.1.1 Related Documentation

For related documentation, see the following:

- Texas Instruments, *CMOS Power Consumption and Cpd Calculation* application note
- Texas Instruments, *Designing With Logic* application note
- Texas Instruments, *Thermal Characteristics of Standard Linear and Logic (SLL) Packages and Devices* application note
- Texas Instruments, *Implications of Slow or Floating CMOS Inputs* application note

## 9.2 接收文档更新通知

要接收文档更新通知，请导航至 ti.com 上的器件产品文件夹。点击 *订阅更新* 进行注册，即可每周接收产品信息更改摘要。有关更改的详细信息，请查看任何已修订文档中包含的修订历史记录。

## 9.3 支持资源

TI E2E™ 支持论坛是工程师的重要参考资料，可直接从专家获得快速、经过验证的解答和设计帮助。搜索现有解答或提出自己的问题可获得所需的快速设计帮助。

链接的内容由各个贡献者“按原样”提供。这些内容并不构成 TI 技术规范，并且不一定反映 TI 的观点；请参阅 TI 的《使用条款》。

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ESD 的损坏小至导致微小的性能降级，大至整个器件故障。精密的集成电路可能更容易受到损坏，这是因为非常细微的参数更改都可能会导致器件与其发布的规格不相符。

## 9.6 术语表

| | |
|---|---|
| TI 术语表 | 本术语表列出并解释了术语、首字母缩略词和定义。 |

# 10 Revision History

注：以前版本的页码可能与当前版本的页码不同

| Changes from Revision Q (October 2023) to Revision R (February 2024) | Page |
|---|---|
| • 向*封装信息* 表中添加了封装尺寸 | 1 |
| • Updated R θ JA values: DBV = 206 to 278, all values in °C/W | 4 |

| Changes from Revision P (June 2013) to Revision Q (October 2023) | Page |
|---|---|
| • 添加了*应用*、*封装信息* 表、*引脚功能* 表、*热信息* 表、*器件功能模式*、*器件和文档支持* 部分、*应用和实现* 部分以及*机械、封装和可订购信息* 部分 | 1 |
| • Updated thermal values for DCK package from R θ JA = 252 to 289.2, all values in °C/W | 4 |

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## 11 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.

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## PACKAGING INFORMATION

| Orderable part number | Status (1) | Material type (2) | Package \| Pins | Package qty \| Carrier | RoHS (3) | Lead finish/ Ball material (4) | MSL rating/ Peak reflow (5) | Op temp (°C) | Part marking (6) |
|---|---|---|---|---|---|---|---|---|---|
| 74AHCT1G14DBVRE4 | Active | Production | SOT-23 (DBV) \| 5 | 3000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | (B143, B14G, B14L, B14S) |
| 74AHCT1G14DBVRE4.A | Active | Production | SOT-23 (DBV) \| 5 | 3000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | (B143, B14G, B14L, B14S) |
| 74AHCT1G14DBVRG4 | Active | Production | SOT-23 (DBV) \| 5 | 3000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | B14G |
| 74AHCT1G14DBVRG4.A | Active | Production | SOT-23 (DBV) \| 5 | 3000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | B14G |
| 74AHCT1G14DBVTE4 | Active | Production | SOT-23 (DBV) \| 5 | 250 \| SMALL T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | B14G |
| 74AHCT1G14DBVTG4.A | Active | Production | SOT-23 (DBV) \| 5 | 250 \| SMALL T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | B14G |
| 74AHCT1G14DCKTE4 | Active | Production | SC70 (DCK) \| 5 | 250 \| SMALL T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | BF3 |
| 74AHCT1G14DCKTG4 | Active | Production | SC70 (DCK) \| 5 | 250 \| SMALL T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | BF3 |
| 74AHCT1G14DCKTG4.A | Active | Production | SC70 (DCK) \| 5 | 250 \| SMALL T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | BF3 |
| SN74AHCT1G14DBVR | Active | Production | SOT-23 (DBV) \| 5 | 3000 \| LARGE T&R | Yes | SN | Level-1-260C-UNLIM | -40 to 125 | (36DH, 3CAF, B143, B14G, B14J, B 14L, B14S) |
| SN74AHCT1G14DBVR.A | Active | Production | SOT-23 (DBV) \| 5 | 3000 \| LARGE T&R | Yes | SN | Level-1-260C-UNLIM | -40 to 125 | (36DH, 3CAF, B143, B14G, B14J, B 14L, B14S) |
| SN74AHCT1G14DBVT | Obsolete | Production | SOT-23 (DBV) \| 5 | - | - | Call TI | Call TI | -40 to 125 | (B143, B14G, B14J, B14S) |
| SN74AHCT1G14DCK3 | Obsolete | Production | SC70 (DCK) \| 5 | - | - | Call TI | Call TI | -40 to 125 | BFY |
| SN74AHCT1G14DCKR | Active | Production | SC70 (DCK) \| 5 | 3000 \| LARGE T&R | Yes | SN | Level-1-260C-UNLIM | -40 to 125 | (1QN, BF3, BFG, BF J, BFL, BFS) |
| SN74AHCT1G14DCKR.A | Active | Production | SC70 (DCK) \| 5 | 3000 \| LARGE T&R | Yes | SN | Level-1-260C-UNLIM | -40 to 125 | (1QN, BF3, BFG, BF J, BFL, BFS) |
| SN74AHCT1G14DCKRG4.A | Active | Production | SC70 (DCK) \| 5 | 3000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | BF3 |
| SN74AHCT1G14DCKT | Obsolete | Production | SC70 (DCK) \| 5 | - | - | Call TI | Call TI | -40 to 125 | (BF3, BFG, BFJ, BF S) |

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

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

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

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

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

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

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

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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 SN74AHCT1G14 :**

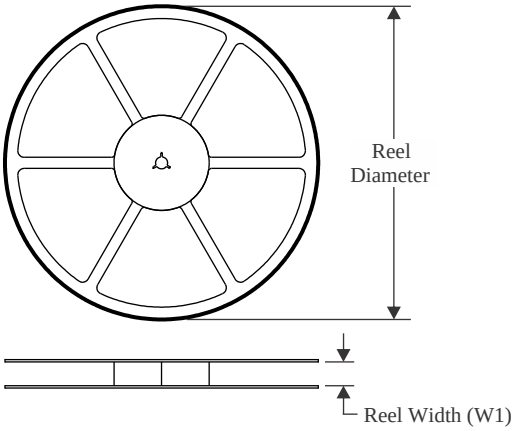
- Automotive : SN74AHCT1G14-Q1

NOTE: Qualified Version Definitions:

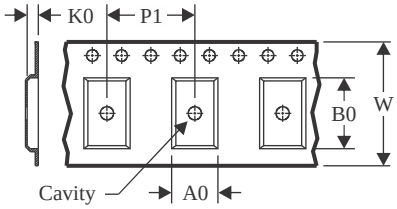
- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects

## TAPE AND REEL INFORMATION

**REEL DIMENSIONS**

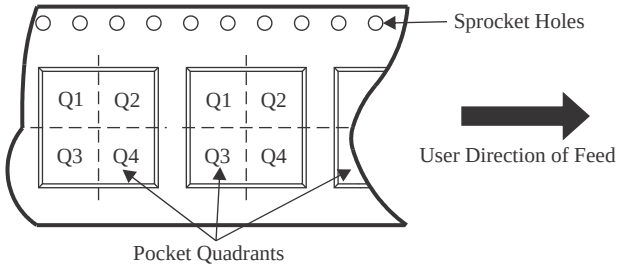



**TAPE DIMENSIONS**




| | |
|---|---|
| A0 | Dimension designed to accommodate the component width |
| B0 | Dimension designed to accommodate the component length |
| K0 | Dimension designed to accommodate the component thickness |
| W | Overall width of the carrier tape |
| P1 | Pitch between successive cavity centers |

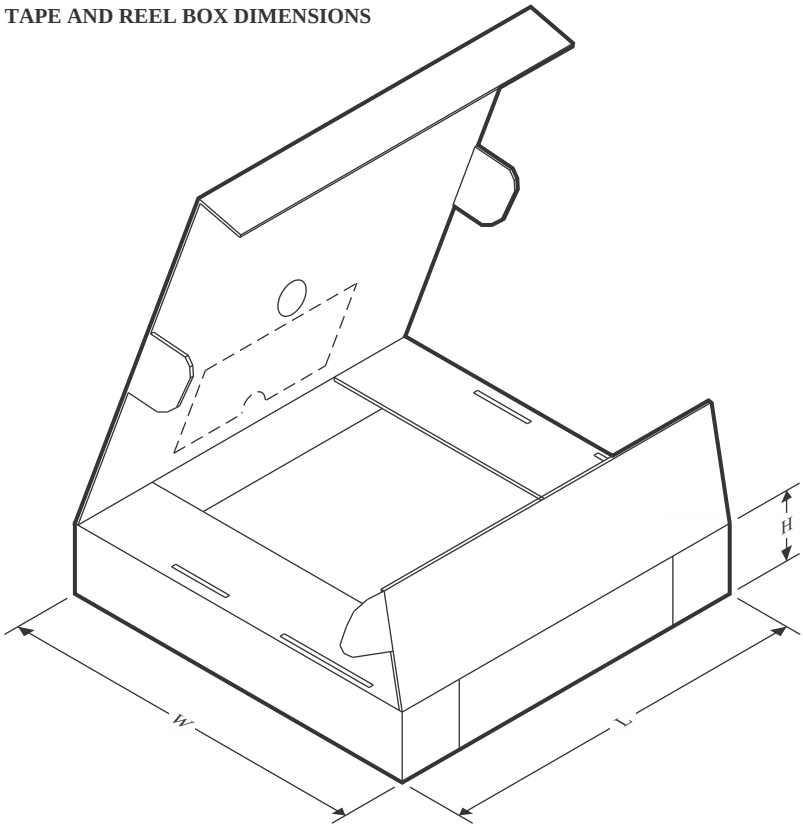
**QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE**




*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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 74AHCT1G14DBVRE4 | SOT-23 | DBV | 5 | 3000 | 178.0 | 9.0 | 3.23 | 3.17 | 1.37 | 4.0 | 8.0 | Q3 |
| 74AHCT1G14DBVRE4 | SOT-23 | DBV | 5 | 3000 | 180.0 | 8.4 | 3.23 | 3.17 | 1.37 | 4.0 | 8.0 | Q3 |
| 74AHCT1G14DBVRG4 | SOT-23 | DBV | 5 | 3000 | 178.0 | 9.0 | 3.23 | 3.17 | 1.37 | 4.0 | 8.0 | Q3 |
| 74AHCT1G14DCKTG4 | SC70 | DCK | 5 | 250 | 178.0 | 9.2 | 2.4 | 2.4 | 1.22 | 4.0 | 8.0 | Q3 |
| SN74AHCT1G14DBVR | SOT-23 | DBV | 5 | 3000 | 178.0 | 8.4 | 3.2 | 3.2 | 1.4 | 4.0 | 8.0 | Q3 |
| SN74AHCT1G14DCKR | SC70 | DCK | 5 | 3000 | 180.0 | 8.4 | 2.3 | 2.5 | 1.2 | 4.0 | 8.0 | Q3 |

TAPE AND REEL BOX DIMENSIONS




*All dimensions are nominal

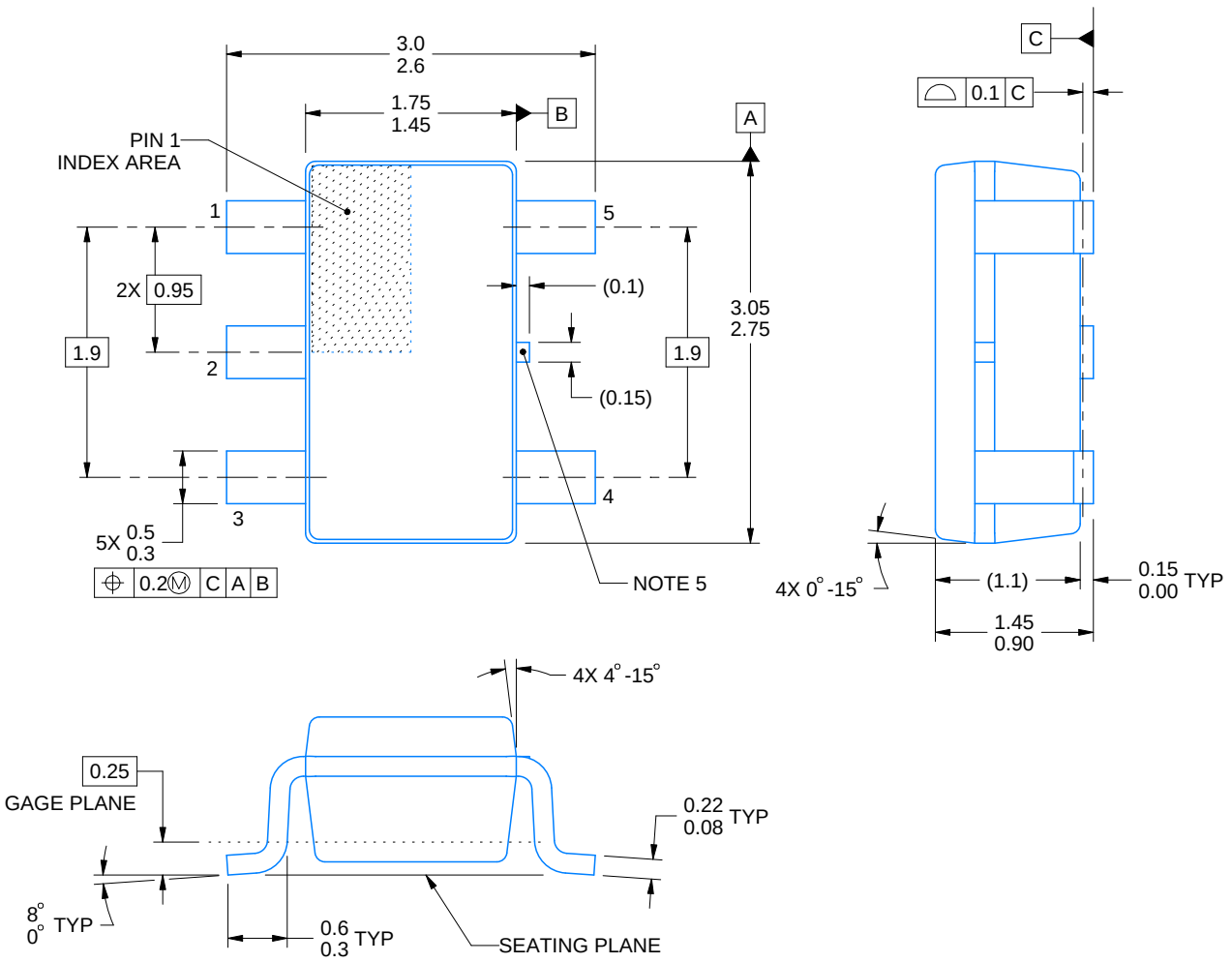
| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|---|---|---|---|---|---|---|---|
| 74AHCT1G14DBVRE4 | SOT-23 | DBV | 5 | 3000 | 180.0 | 180.0 | 18.0 |
| 74AHCT1G14DBVRE4 | SOT-23 | DBV | 5 | 3000 | 202.0 | 201.0 | 28.0 |
| 74AHCT1G14DBVRG4 | SOT-23 | DBV | 5 | 3000 | 180.0 | 180.0 | 18.0 |
| 74AHCT1G14DCKTG4 | SC70 | DCK | 5 | 250 | 180.0 | 180.0 | 18.0 |
| SN74AHCT1G14DBVR | SOT-23 | DBV | 5 | 3000 | 208.0 | 191.0 | 35.0 |
| SN74AHCT1G14DCKR | SC70 | DCK | 5 | 3000 | 210.0 | 185.0 | 35.0 |

# PACKAGE OUTLINE

## DBV0005A

## SOT-23 - 1.45 mm max height

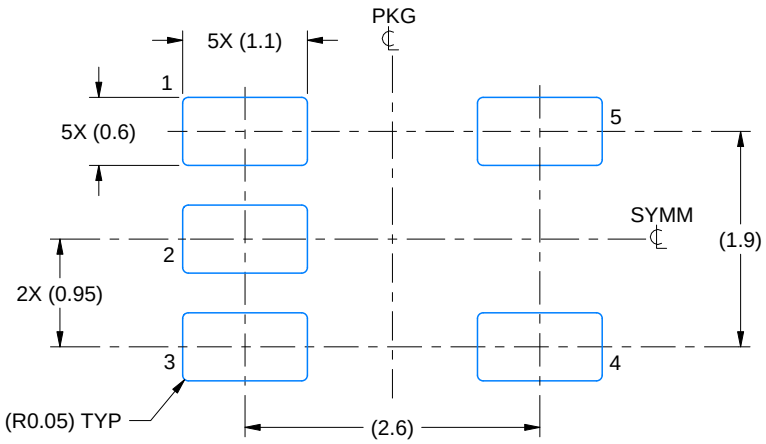
SMALL OUTLINE TRANSISTOR



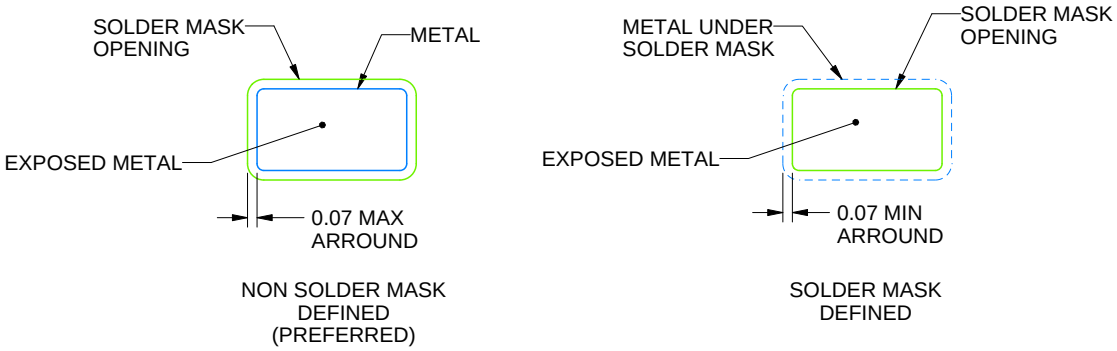

4214839/K 08/2024

NOTES:

1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. 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.
5. Support pin may differ or may not be present.




LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE:15X

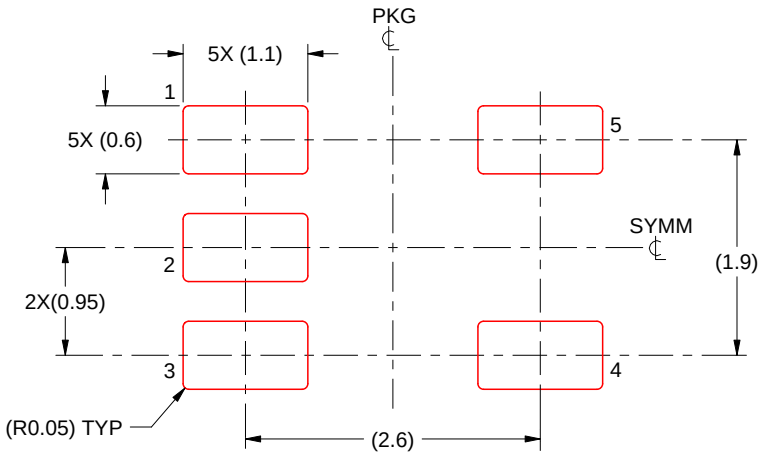



SOLDER MASK DETAILS

4214839/K 08/2024

NOTES: (continued)

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




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

4214839/K 08/2024

NOTES: (continued)

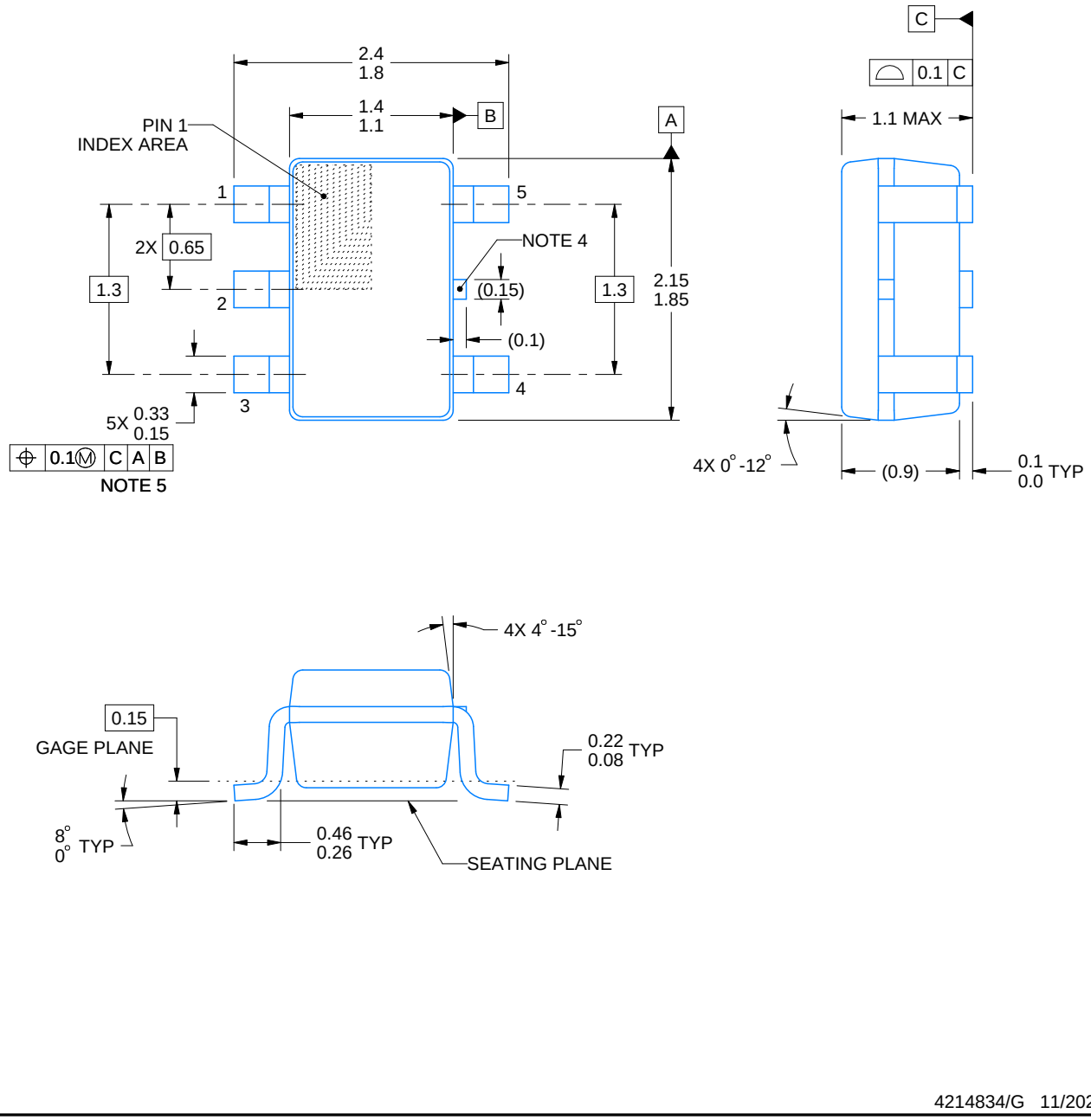
8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

# PACKAGE OUTLINE

## DCK0005A

## SOT - 1.1 max height

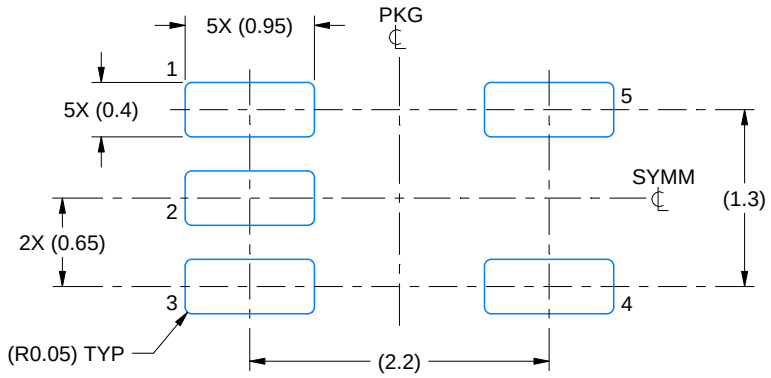
SMALL OUTLINE TRANSISTOR



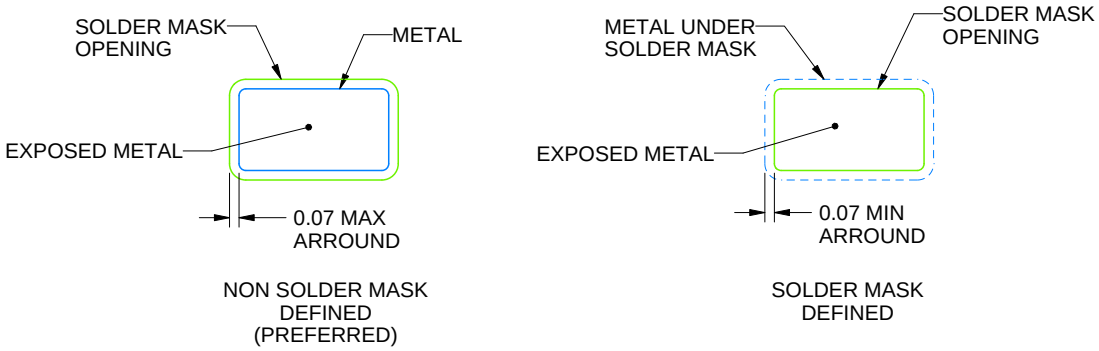

4214834/G 11/2024

NOTES:

1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. Refernce JEDEC MO-203.
4. Support pin may differ or may not be present.
5. Lead width does not comply with JEDEC.
6. Body dimensions do not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.25mm per side




LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE:18X

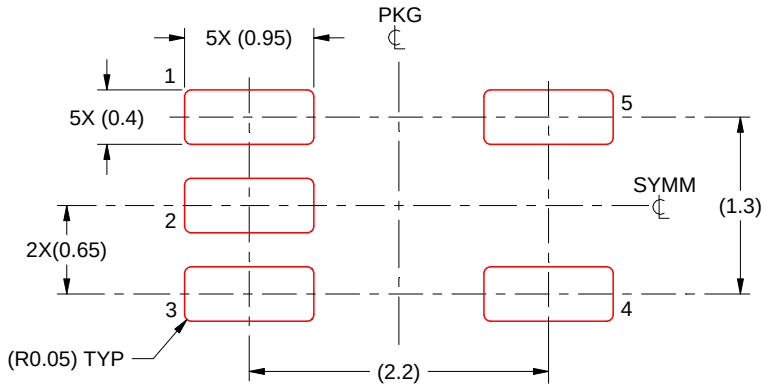



SOLDER MASK DETAILS

4214834/G 11/2024

NOTES: (continued)

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




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

4214834/G 11/2024

NOTES: (continued)

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

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最后更新日期：2025 年 10 月