# SN74AHC4066 Quadruple Bilateral Analog Switch

## 1 Features

- 1V to 5.5V $V_{CC}$ operation
- Supports mixed-mode voltage operation on all ports
- High on-off output-voltage ratio
- Low crosstalk between switches
- Individual switch controls
- Extremely low input current
- ESD protection exceeds JESD 22:
  - 2000V Human-Body Model (A114-A)
  - 200V Machine Model (A115-A)
  - 1000V Charged-Device Model (C101)

## 2 Applications

- Analog signal switching or multiplexing:
  - Signal gating, modulator, squelch control, demodulator, chopper, commutating switch
- Digital signal switching and multiplexing
  - Audio and video signal routing
- Transmission-gate logic implementation
- Analog-to-digital and digital-to-analog conversion
- Digital control of frequency, impedance, phase, and analog-signal gain
- Motor speed control
- Battery chargers
- DC-DC converter

## 3 Description

This quadruple silicon-gate CMOS analog switch is designed for 1V to 5.5V VCC operation.

The switch is designed to handle both analog and digital signals. Each switch permits signals with amplitudes of up to 5.5V (peak) to be transmitted in either direction.

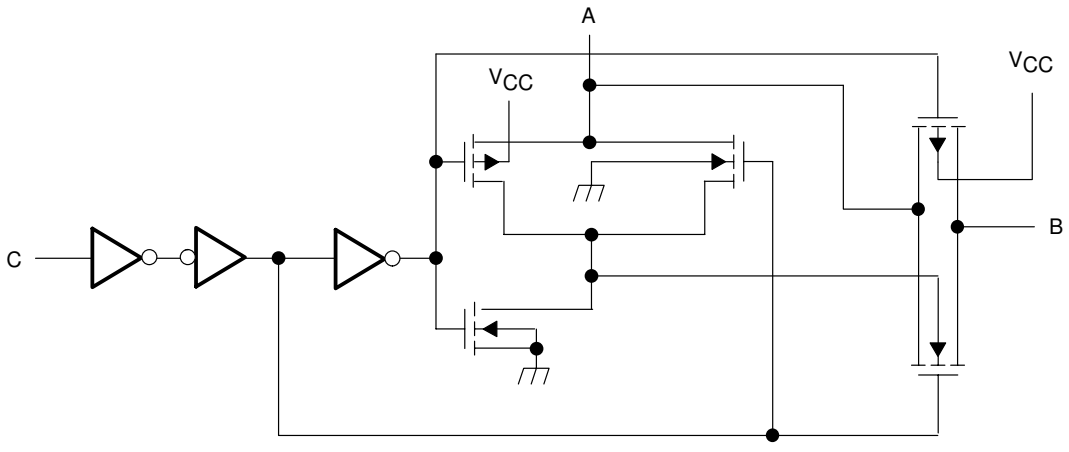
Each switch section has its own enable input control (C). A high-level voltage applied to C turns on the associated switch section.

Applications include signal gating, chopping, modulation or demodulation (modem), and signal multiplexing for analog-to-digital and digital-to-analog conversion systems.

**Package Information**

| PART NUMBER | PACKAGE(1) | PACKAGE SIZE(2) |
|---|---|---|
| SN74AHC4066 | D (SOIC, 14) | 8.65mm × 6mm |
| | PW (TSSOP, 14) | 5mm × 6.4mm |
| | RGY (VQFN, 14) | 3.5mm × 3.5mm |

(1) For more information, see Section 10.
(2) The package size (length × width) is a nominal value and includes pins, where applicable.






**Logic Diagram, Each Switch (Positive Logic)**

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## 4 Pin Configuration and Functions

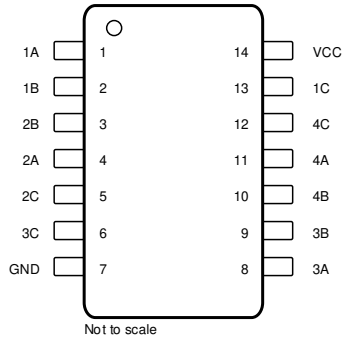



**Figure 4-1. D or PW Package, 14-Pin SOIC or TSSOP (Top View)**

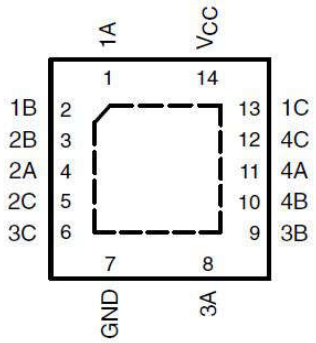



**Figure 4-2. RGY Package, 14-Pin QFN (Top View)**

**Table 4-1. Pin Functions**

| PIN | | TYPE(1) | DESCRIPTION |
|---|---|---|---|
| NAME | NO. | | |
| 1A | 1 | I/O | Switch 1 input/output |
| 1B | 2 | I/O | Switch 1 output/input |
| 2B | 3 | I/O | Switch 2 output/input |
| 2A | 4 | I/O | Switch 2 input/output |
| 2C | 5 | I | Switch 2 control |
| 3C | 6 | I | Switch 3 control |
| GND | 7 | — | Ground |
| 3A | 8 | I/O | Switch 3 input/output |
| 3B | 9 | I/O | Switch 3 output/input |
| 4B | 10 | I/O | Switch 4 output/input |
| 4A | 11 | I/O | Switch 4 input/output |
| 4C | 12 | I | Switch 4 control |
| 1C | 13 | I | Switch 1 control |
| $V_{CC}$ | 14 | — | Power |

(1) I = input, O = output

# 5 Specifications

## 5.1 Absolute Maximum Ratings

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

| | | | MIN | MAX | UNIT |
|---|---|---|---|---|---|
| $V_{CC}$ | Supply voltage(2) | | –0.5 | 7 | V |
| $V_I$ | Input voltage range | | –0.5 | 7 | V |
| $V_{IO}$ | Switch I/O voltage range | | –0.5 to $V_{CC}$ | +0.5 | V |
| $I_{IK}$ | Control-input clamp current | $V_I < 0$ | | -20 | mA |
| $I_I$ | I/O port diode current | $V_I < 0$ or $V_{I/O} > V_{CC}$ | | ±50 | mA |
| | On-state switch current | $V_{I/O}$ = 0 to $V_{CC}$ | | ±25 | mA |
| | Continuous current through $V_{CC}$ or GND | | | ±50 | mA |
| $T_{stg}$ | Storage temperature | | –60 | 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) All voltages are with respect to ground unless otherwise specified.

## 5.2 ESD Ratings

| | | | VALUE | UNIT |
|---|---|---|---|---|
| $V_{(ESD)}$ | Electrostatic discharge | Human-body model (HBM), per ANSI/ESDA/JEDEC JS-001(1) | ±2000 | V |
| | | Charged-device model (CDM), per JEDEC specification JESD22-C101(2) | ±1000 | |

(1) JEDEC document JEP155 states that 500V HBM allows safe manufacturing with a standard ESD control process.
(2) JEDEC document JEP157 states that 250V CDM allows safe manufacturing with a standard ESD control process. CDM value for N package only.

## 5.3 Thermal Information

| THERMAL METRIC(1) | | SN74AHC4066 | | | UNIT |
|---|---|---|---|---|---|
| | | D | PW | RGY | |
| | | 14 PINS | 14 PINS | 14 PINS | |
| $R_{\theta JA}$ | Junction-to-ambient thermal resistance | 127.7 | 150.6 | 91.9 | °C/W |
| $R_{\theta JC(top)}$ | Junction-to-case (top) thermal resistance | 81.8 | 78.2 | 91.8 | °C/W |
| $R_{\theta JC(bottom)}$ | Junction-to-case (bottom) thermal resistance | N/A | N/A | 50.0 | °C/W |
| $R_{\theta JB}$ | Junction-to-board thermal resistance | 84.2 | 93.7 | 66.5 | °C/W |
| $\psi_{JT}$ | Junction-to-top characterization parameter | 39.5 | 24.6 | 20.0 | °C/W |
| $\psi_{JB}$ | Junction-to-board characterization parameter | 83.7 | 93.1 | 66.3 | °C/W |

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

## 5.4 Recommended Operating Conditions

over operating free-air temperature range (unless otherwise noted)(2)

| | | | MIN | MAX | UNIT |
|---|---|---|---|---|---|
| $V_{CC}$ | Supply voltage | | 1 (1) | 5.5 | V |
| $V_{IH}$ | High-level input voltage, control inputs | $V_{CC}$ = 2V | 1.5 | | V |
| | | $V_{CC}$ = 2.3V to 2.7V | $V_{CC}$ × 0.7 | | |
| | | $V_{CC}$ = 3V to 3.6V | $V_{CC}$ × 0.7 | | |
| | | $V_{CC}$ = 4.5V to 5.5V | $V_{CC}$ × 0.7 | | |
| $V_{IL}$ | Low-level input voltage, control inputs | $V_{CC}$ = 2V | | 0.5 | V |
| | | $V_{CC}$ = 2.3V to 2.7V | | $V_{CC}$ × 0.3 | |
| | | $V_{CC}$ = 3V to 3.6V | | $V_{CC}$ × 0.3 | |
| | | $V_{CC}$ = 4.5V to 5.5V | | $V_{CC}$ × 0.3 | |
| $V_I$ | Control input voltage | | 0 | 5.5 | V |
| $V_{I/O}$ | Input/output voltage | | 0 | $V_{CC}$ | V |
| $\Delta t/\Delta v$ | Input transition rise and fall time | $V_{CC}$ = 2.3V to 2.7V | | 200 | ns/V |
| | | $V_{CC}$ = 3V to 3.6V | | 100 | |
| | | $V_{CC}$ = 4.5V to 5.5V | | 20 | |
| $T_A$ | Operating free-air temperature | | –40 | 85 | °C |

(1) With supply voltages at or below 2V, the analog switch on-state resistance becomes very nonlinear. Only digital signals should be transmitted at these low supply voltages.
(2) All unused inputs of the device must be held at $V_{CC}$ or GND for proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*.

## 5.5 Electrical Characteristics

$T_A$ = –40 to +85 °C unless otherwise specified.

| PARAMETER | | TEST CONDITIONS | $V_{CC}$ | $T_A$ = 25°C | | | MIN | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP | MAX | | | |
| $r_{on}$ | On-state switch resistance | $I_T$ = –1mA, $V_I$ = 0 to $V_{CC}$, $V_C$ = $V_{IH}$ (see Figure 6-1) | 2.3V | | 38 | 180 | | 225 | Ω |
| | | | 3V | | 29 | 150 | | 190 | |
| | | | 4.5V | | 21 | 75 | | 100 | |
| $r_{on(p)}$ | Peak on-state resistance | $I_T$ = –1mA, $V_I$ = $V_{CC}$ to GND, $V_C$ = $V_{IH}$ | 2.3V | | 143 | 500 | | 600 | Ω |
| | | | 3V | | 57 | 180 | | 225 | |
| | | | 4.5V | | 31 | 100 | | 125 | |
| $\Delta r_{on}$ | Difference in on-state resistance between switches | $I_T$ = –1mA, $V_I$ = $V_{CC}$ to GND, $V_C$ = $V_{IH}$ | 2.3V | | 6 | 30 | | 40 | Ω |
| | | | 3V | | 3 | 20 | | 30 | |
| | | | 4.5V | | 2 | 15 | | 20 | |
| $I_{IH}$ $I_{IL}$ | Control input current | $V_C$ = 0 or $V_{CC}$ | 5.5 | | | ±0.1 | | ±1 | µA |
| $I_{s(off)}$ | Off-state switch leakage current | $V_I$ = $V_{CC}$ and $V_O$ = GND, or $V_I$ = GND and $V_O$ = $V_{CC}$, $V_C$ = $V_{IL}$ (see Figure 6-2) | 5.5V | | | ±0.1 | | ±1 | µA |

## 5.5 Electrical Characteristics (continued)

$T_A$ = –40 to +85 °C unless otherwise specified.

| PARAMETER | | TEST CONDITIONS | $V_{CC}$ | $T_A$ = 25°C | | | MIN | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP | MAX | | | |
| $I_{s(on)}$ | On-state switch leakage current | $V_I$ = $V_{CC}$ or GND, $V_C$ = $V_{IH}$ (see Figure 6-3) | 5.5V | | | ±0.1 | | ±1 | µA |
| $I_{CC}$ | Supply current | $V_I$ = $V_{CC}$ or GND | 5.5V | | | | | 20 | µA |
| $C_{iC}$ | Control input capacitance | | | | 1.5 | | | | pF |
| $C_{iO}$ | Switch input/output capacitance | | | | 5.5 | | | | pF |
| $C_F$ | Feed-through capacitance | | | | 0.5 | | | | pF |

## 5.6 Switching Characteristics

over recommended operating free-air temperature range, $V_{CC}$ = 2.5V ± 0.2V (unless otherwise noted)

| PARAMETER | | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | $T_A$ = 25°C | | | MIN | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | MIN | TYP | MAX | | | |
| $t_{PLH}$, $t_{PHL}$ | Propagation delay time | A or B | B or A | $C_L$ = 50pF (see Figure 6-4) | | 1.2 | 10 | | 16 | ns |
| $t_{PZH}$, $t_{PZL}$ | Switch turn-on time | C | A or B | $C_L$ = 50pF $R_L$ = 1kΩ, (see Figure 6-5) | | 3.3 | 15 | | 20 | ns |
| $t_{PLZ}$, $t_{PHZ}$ | Switch turn-off time | C | A or B | $C_L$ = 50pF $R_L$ = 1kΩ, (see Figure 6-5) | | 6 | 15 | | 23 | ns |
| $t_{PLZ}$, $t_{PHZ}$ | Propagation delay time | A or B | B or A | $C_L$ = 50pF (see Figure 6-6) | | 2.6 | 12 | | 18 | ns |
| $t_{PLZ}$, $t_{PHZ}$ | Switch turn-on time | C | A or B | $C_L$ = 50pF $R_L$ = 1kΩ, (see Figure 6-8) | | 4.2 | 25 | | 32 | ns |
| $t_{PLZ}$, $t_{PHZ}$ | Switch turn-off time | C | A or B | $C_L$ = 50pF $R_L$ = 1kΩ, (see Figure 6-8) | | 9.6 | 25 | | 32 | ns |

## 5.7 Switching Characteristics

over recommended operating free-air temperature range, $V_{CC}$ = 3.3V ± 0.3V (unless otherwise noted)

| PARAMETER | | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | $T_A$ = 25°C | | | MIN | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | MIN | TYP | MAX | | | |
| $t_{PLH}$, $t_{PHL}$ | Propagation delay time | A or B | B or A | $C_L$ = 50pF (see Figure 6-4) | | 0.8 | 6 | | 10 | ns |
| $t_{PZH}$, $t_{PZL}$ | Switch turn-on time | C | A or B | $C_L$ = 50pF $R_L$ = 1kΩ, (see Figure 6-5) | | 2.3 | 11 | | 15 | ns |
| $t_{PLZ}$, $t_{PHZ}$ | Switch turn-off time | C | A or B | $C_L$ = 50pF $R_L$ = 1kΩ, (see Figure 6-5) | | 4.5 | 11 | | 15 | ns |
| $t_{PLZ}$, $t_{PHZ}$ | Propagation delay time | A or B | B or A | $C_L$ = 50pF (see Figure 6-6) | | 1.5 | 9 | | 12 | ns |
| $t_{PLZ}$, $t_{PHZ}$ | Switch turn-on time | C | A or B | $C_L$ = 50pF $R_L$ = 1kΩ, (see Figure 6-8) | | 3 | 18 | | 22 | ns |

## 5.7 Switching Characteristics (continued)

over recommended operating free-air temperature range, $V_{CC}$ = 3.3V ± 0.3V (unless otherwise noted)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | $T_A$ = 25°C | | | MIN | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP | MAX | | | |
| $t_{PLZ}$, $t_{PHZ}$ Switch turn-off time | C | A or B | $C_L$ = 50pF, $R_L$ = 1kΩ, (see Figure 6-8) | | 7.2 | 18 | | 22 | ns |

## 5.8 Switching Characteristics

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

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | $T_A$ = 25°C | | | MIN | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP | MAX | | | |
| $t_{PLH}$, $t_{PHL}$ Propagation delay time | A or B | B or A | $C_L$ = 50pF (see Figure 6-4) | | 0.3 | 4 | | 7 | ns |
| $t_{PZH}$, $t_{PZL}$ Switch turn-on time | C | A or B | $C_L$ = 50pF, $R_L$ = 1kΩ, (see Figure 6-5) | | 1.6 | 7 | | 10 | ns |
| $t_{PLZ}$, $t_{PHZ}$ Switch turn-off time | C | A or B | $C_L$ = 50pF, $R_L$ = 1kΩ, (see Figure 6-5) | | 3.2 | 7 | | 10 | ns |
| $t_{PLZ}$, $t_{PHZ}$ Propagation delay time | A or B | B or A | $C_L$ = 50pF (see Figure 6-6) | | 0.6 | 6 | | 8 | ns |
| $t_{PLZ}$, $t_{PHZ}$ Switch turn-on time | C | A or B | $C_L$ = 50pF, $R_L$ = 1kΩ, (see Figure 6-8) | | 2.1 | 12 | | 16 | ns |
| $t_{PLZ}$, $t_{PHZ}$ Switch turn-off time | C | A or B | $C_L$ = 50pF, $R_L$ = 1kΩ, (see Figure 6-8) | | 5.1 | 12 | | 16 | ns |

## 5.9 Analog Switching Characteristics

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

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | $V_{CC}$ | $T_A$ = 25°C | | | UNIT |
|---|---|---|---|---|---|---|---|---|
| | | | | | MIN | TYP | MAX | |
| Frequency response (switch on) | A or B | B or A | $C_L$ = 50pF, $R_L$ = 600Ω, $f_{in}$ = 1MHz (sine wave), $20\log_{10}(V_O/V_I)$ = -3 dB (see Figure 6-4) | 2.3V | | 60 | | MHz |
| | | | | 3V | | 75 | | |
| | | | | 4.5V | | 100 | | |
| Crosstalk (between any switches) | A or B | B or A | $C_L$ = 50pF, $R_L$ = 600Ω, $f_{in}$ = 1MHz (sine wave) (see Figure 6-4) | 2.3V | | -45 | | dB |
| | | | | 3V | | -45 | | |
| | | | | 4.5V | | -45 | | |
| Crosstalk (control input to signal output) | C | A or B | $C_L$ = 50pF, $R_L$ = 600Ω, $f_{in}$ = 1MHz (sine wave) (see Figure 6-4) | 2.3V | | 15 | | mV |
| | | | | 3V | | 20 | | |
| | | | | 4.5V | | 50 | | |
| Feed-through attenuation (switch off) | A or B | B or A | $C_L$ = 50pF, $R_L$ = 600Ω, $f_{in}$ = 1MHz (sine wave) (see Figure 6-4) | 2.3V | | -40 | | dB |
| | | | | 3V | | -40 | | |
| | | | | 4.5V | | -40 | | |

## 5.9 Analog Switching Characteristics (continued)

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

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | | $V_{CC}$ | $T_A$ = 25°C | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | MIN | TYP | MAX | |
| Sine-wave distortion | A or B | B or A | $C_L$ = 50pF, $R_L$ = 10kΩ, $f_{in}$ = 1kHz (sine wave) (see Figure 6-4) | $V_I$ = $2V_{p-p}$ | 2.3V | | 0.1 | | % |
| | | | | $V_I$ = $2.5V_{p-p}$ | 3V | | 0.1 | | |
| | | | | $V_I$ = $4V_{p-p}$ | 4.5V | | 0.1 | | |

## 5.10 Operating Characteristics

$T_A$ = 25°C

| PARAMETER | | TEST CONDITIONS | | TYP | UNIT |
|---|---|---|---|---|---|
| $C_{pd}$ | Power dissipation capacitance | $C_L$ = 50pF, | f = 10MHz | 4.5 | pF |

## 6 Parameter Measurement Information

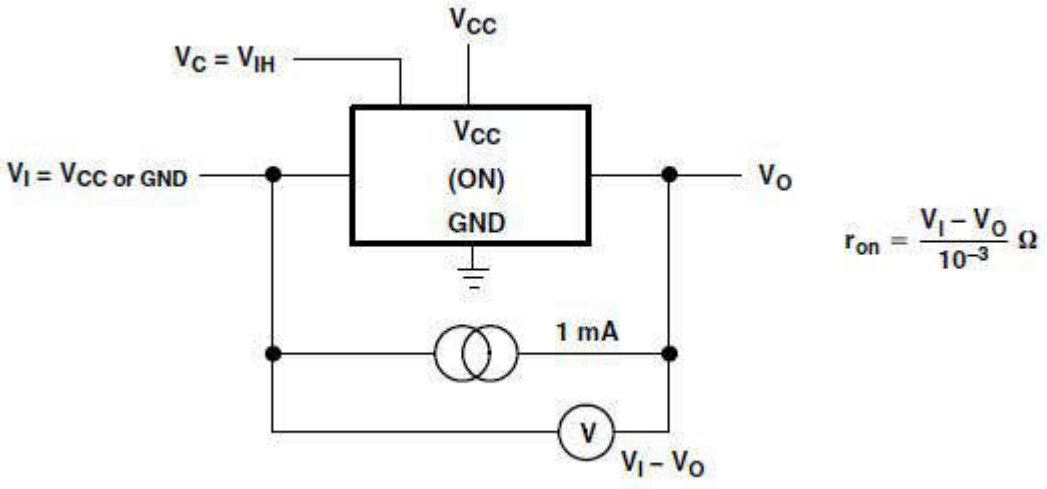



**Figure 6-1. ON-State Resistance Test Circuit**

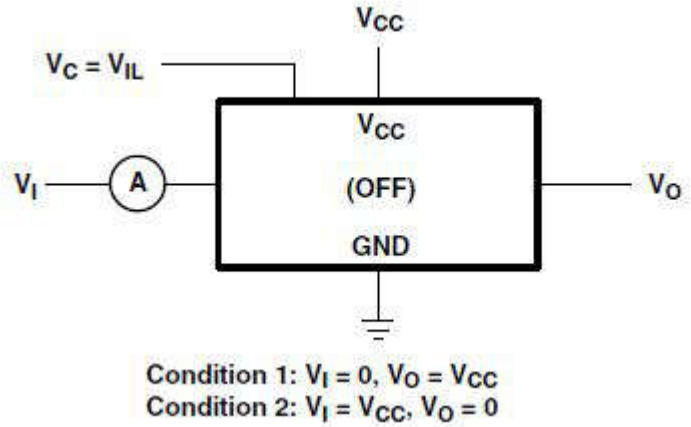



**Figure 6-2. OFF-State Switch Leakage-Current Test Circuit**

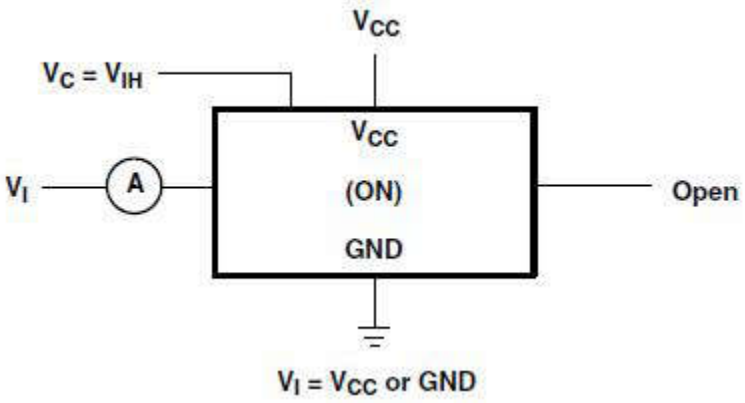



**Figure 6-3. ON-State Leakage-Current Test Circuit**

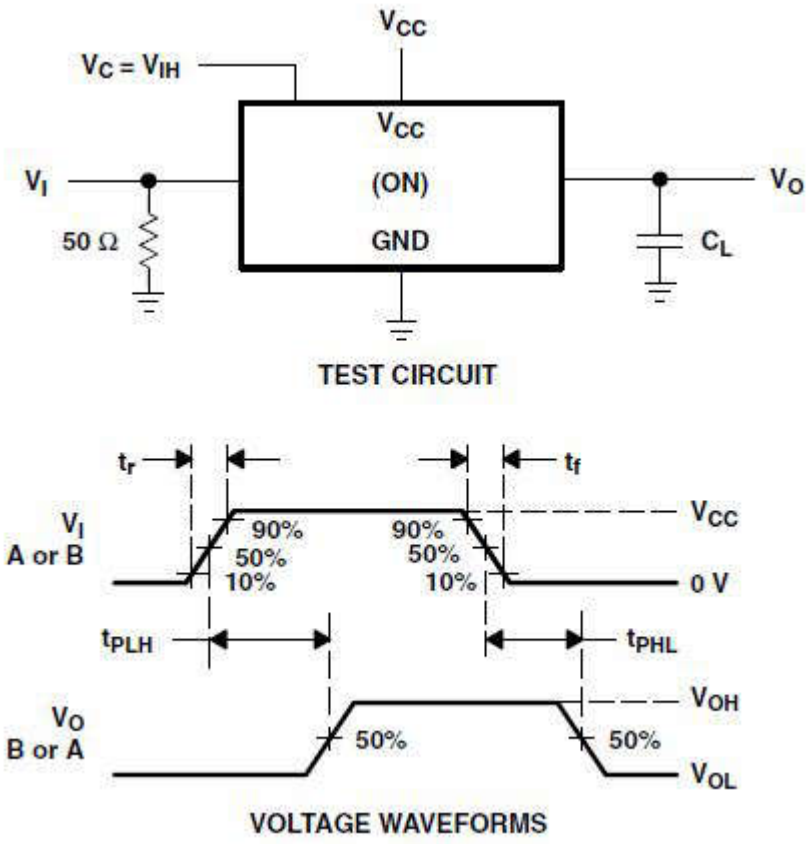
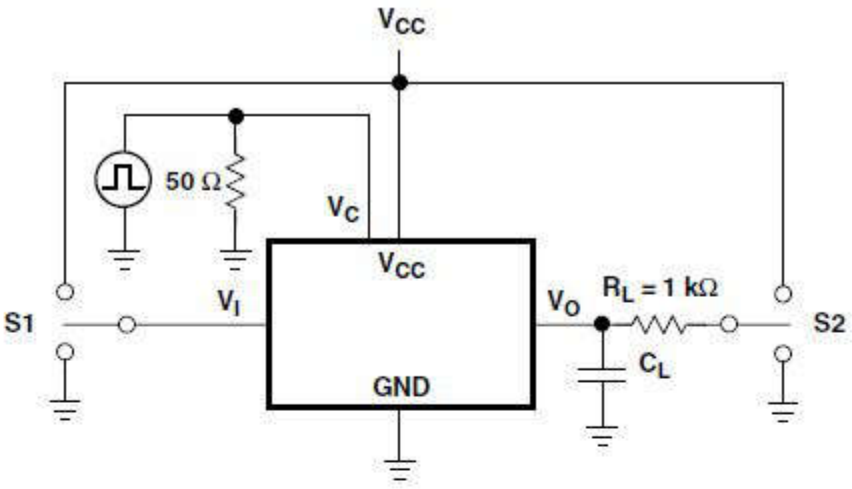
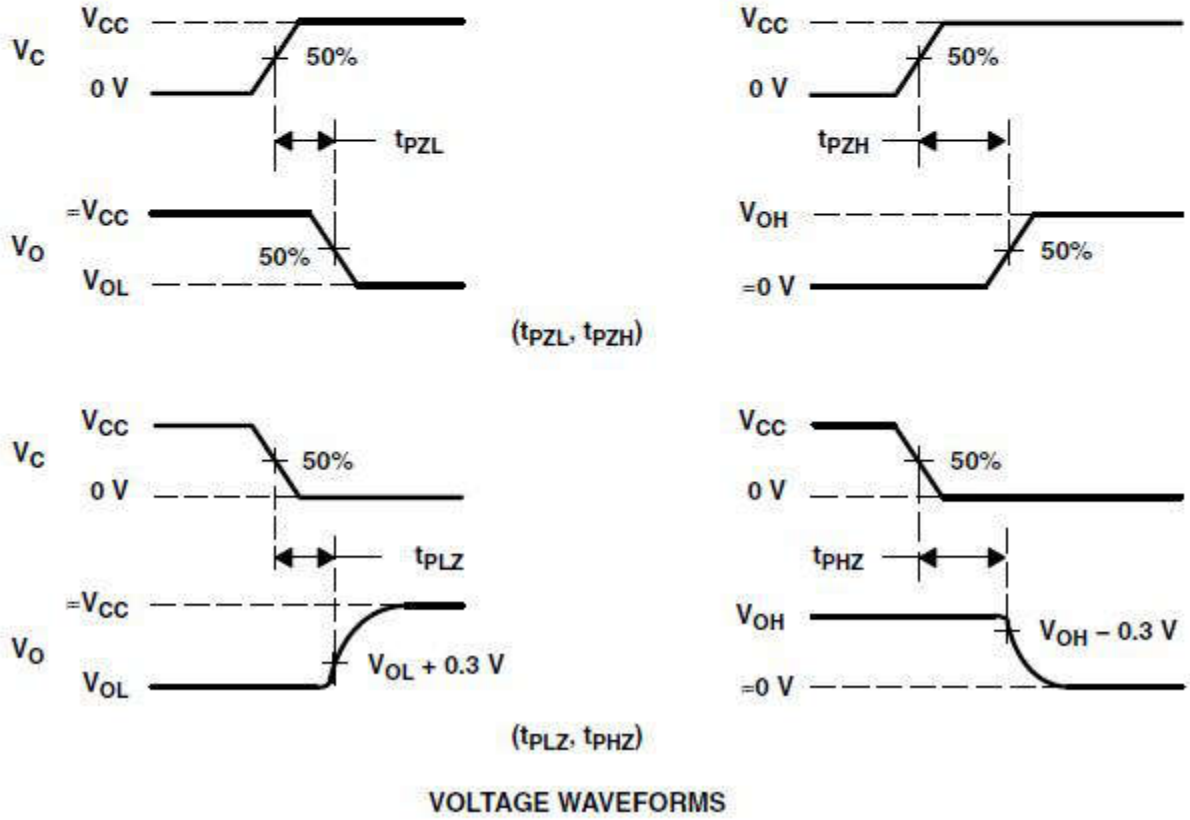



**Figure 6-4. Propagation Delay Time, Signal Input to Signal Output**




TEST CIRCUIT

| TEST | S1 | S2 |
|---|---|---|
| $t_{PZL}$ | GND | $V_{CC}$ |
| $t_{PZH}$ | $V_{CC}$ | GND |
| $t_{PLZ}$ | GND | $V_{CC}$ |
| $t_{PHZ}$ | $V_{CC}$ | GND |




VOLTAGE WAVEFORMS

**Figure 6-5. Switching Time ($t_{PZL}$, $t_{PLZ}$, $t_{PZH}$, $t_{PHZ}$), Control to Signal Output**

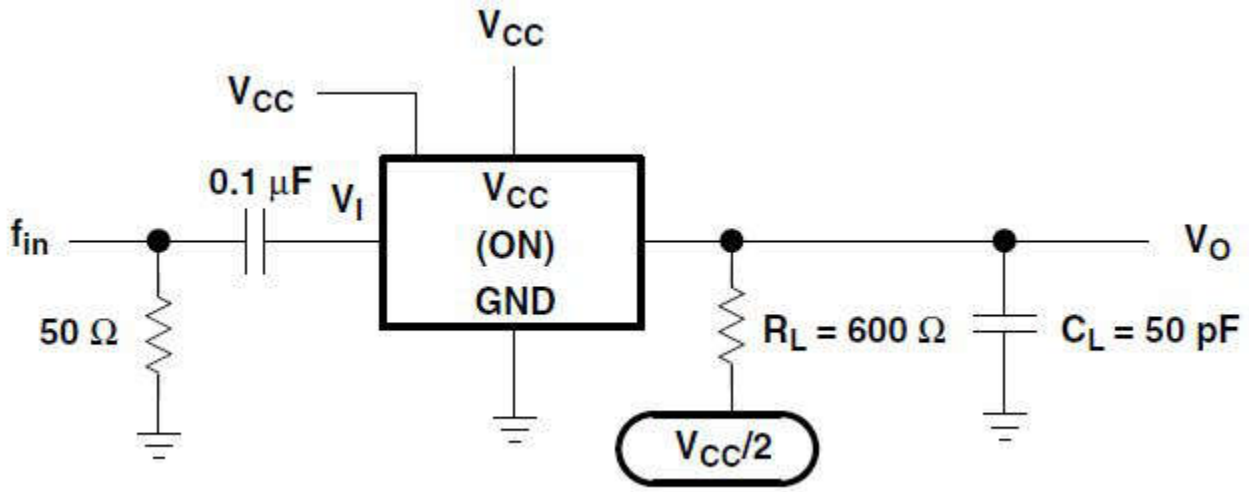



**Figure 6-6. Frequency Response (Switch On)**

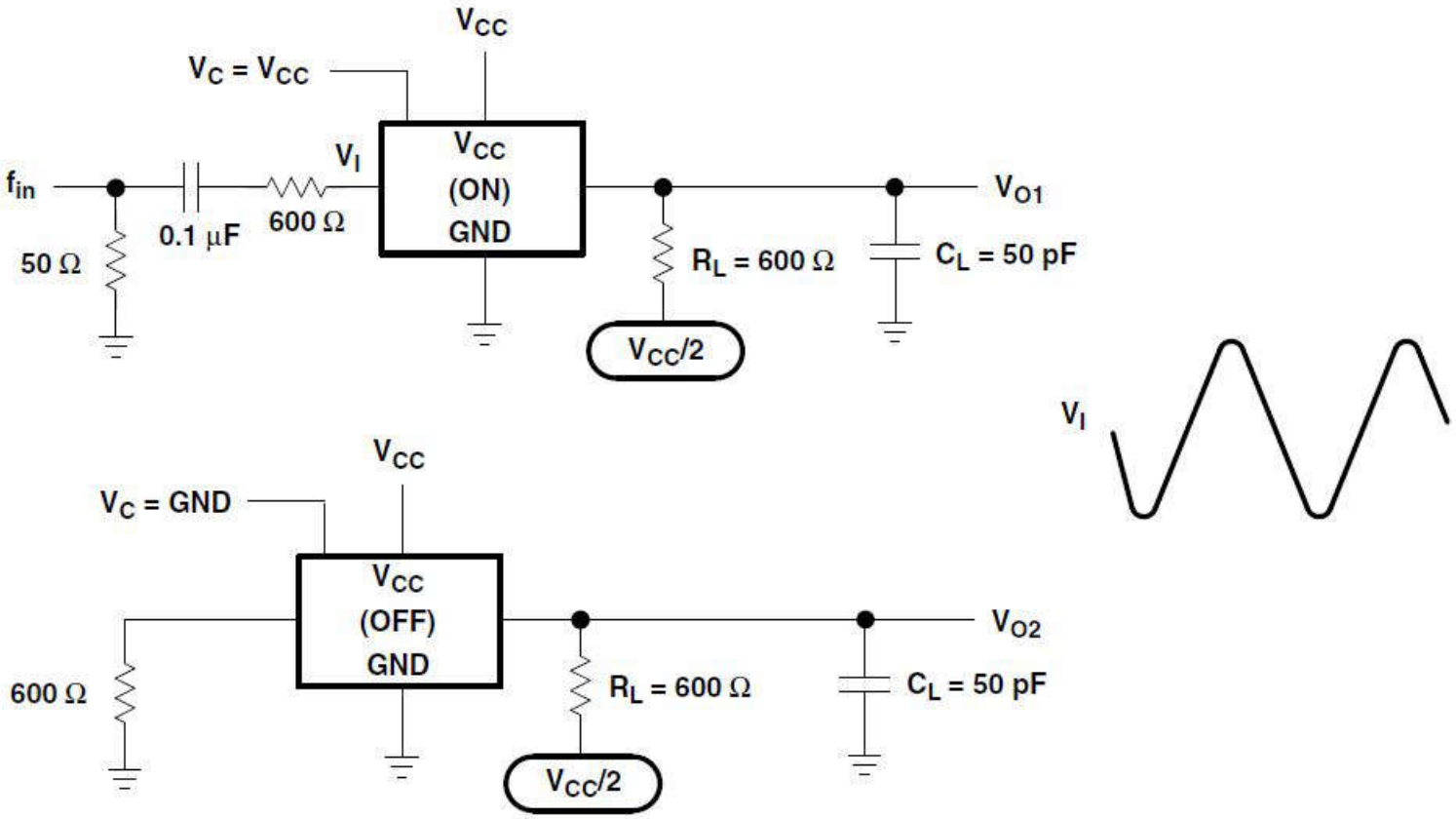



**Figure 6-7. Crosstalk Between Any Two Switches**

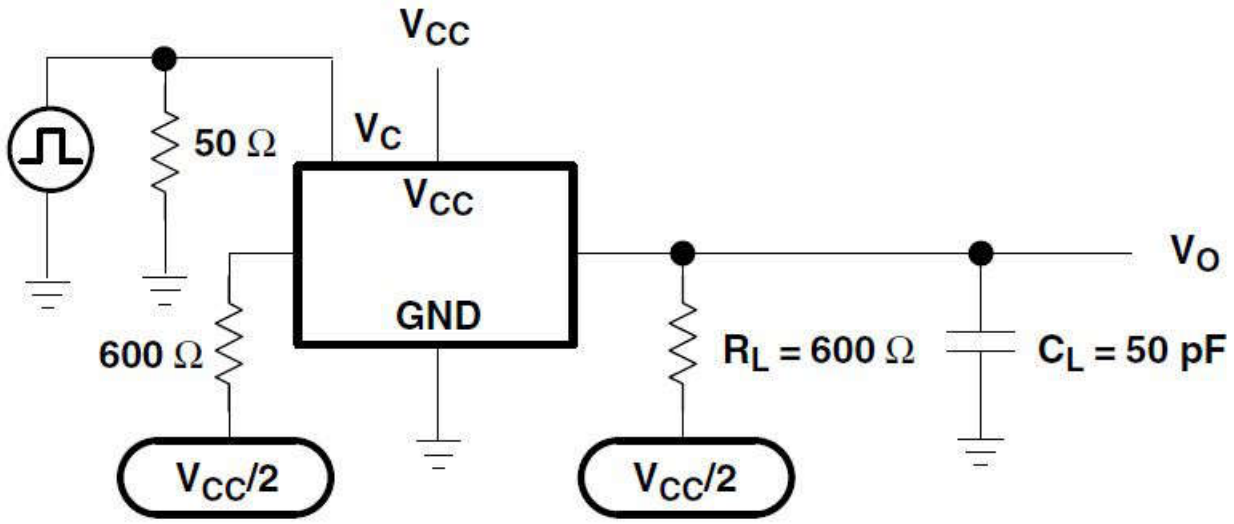



**Figure 6-8. Crosstalk (Control Input - Switch Output)**

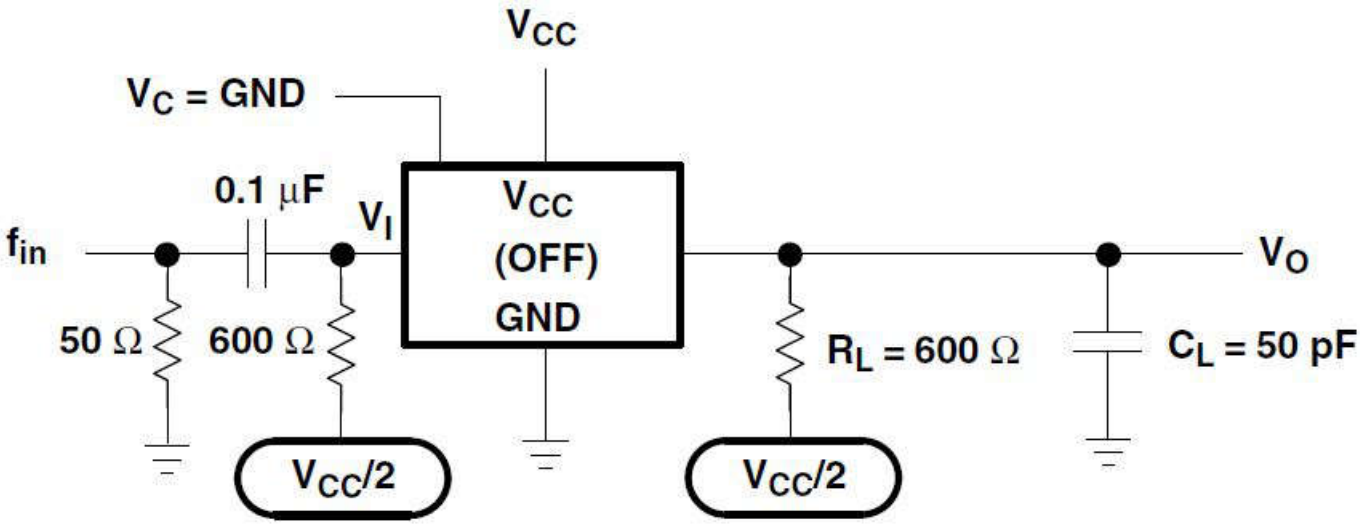



**Figure 6-9. Feed-Through Attenuation (Switch Off)**

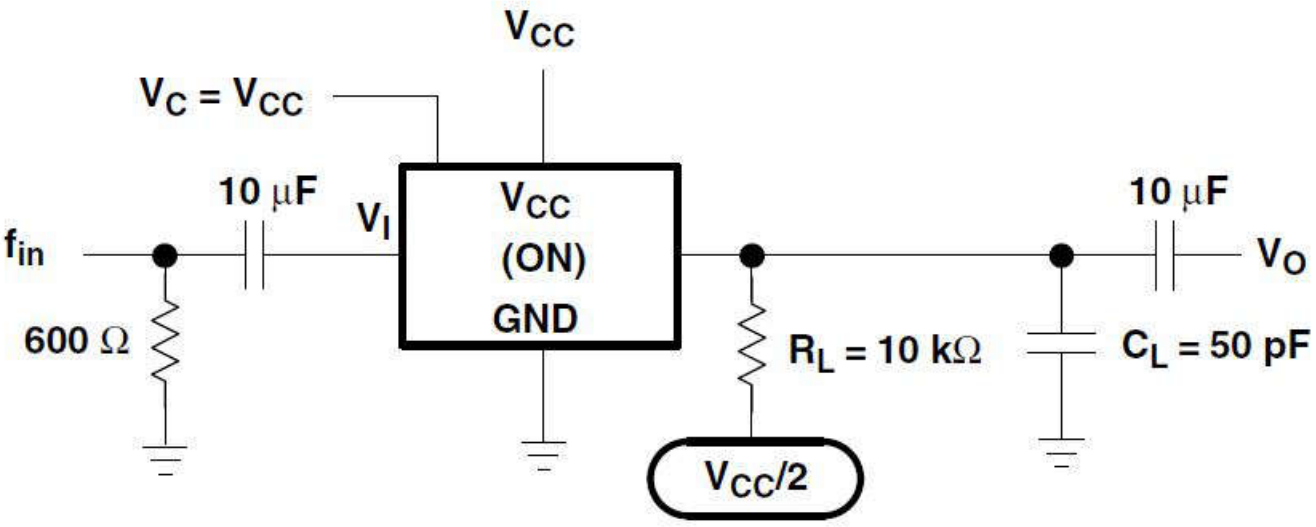



**Figure 6-10. Sine-Wave Distortion**

# 7 Detailed Description

## 7.1 Overview

The SN74AHC4066 device is a silicon-gate CMOS quadruple analog switch designed for 1V to 6V VCC operation. It is designed to handle both analog and digital signals. Each switch permits signals with amplitudes of up to 6V (peak) to be transmitted in either direction. A high-level voltage applied to the control pin C enables the respective switch to begin propagating signals across the device.

## 7.2 Functional Block Diagram

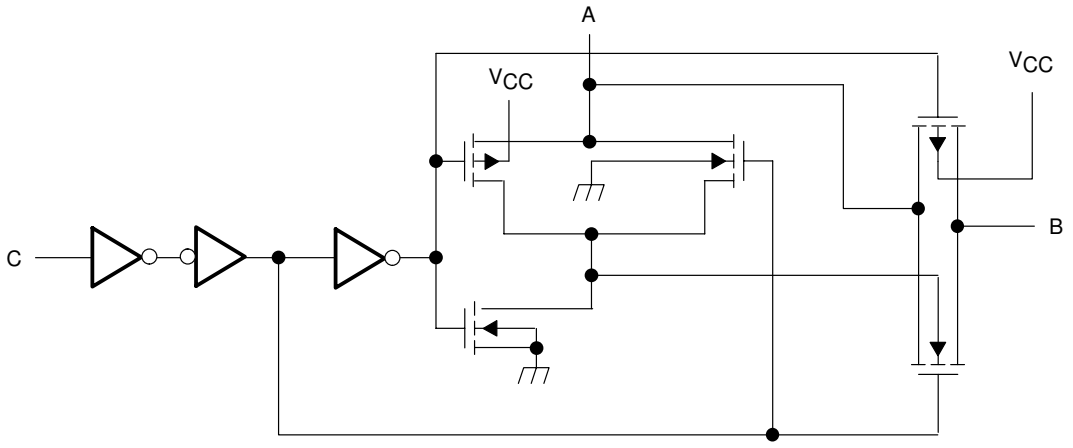





**Figure 7-1. Logic Diagram, Each Switch (Positive Logic)**

## 7.3 Device Functional Modes

Table 7-1 lists the functions for the SN74AHC4066 device.

**Table 7-1. Function Table (Each Switch)**

| INPUT CONTROL (C) | SWITCH |
|---|---|
| L | OFF |
| H | ON |

# 8 Device and Documentation Support

## 8.1 Documentation Support

### 8.1.1 Related Documentation

For related documentation, see the following:

- Texas Instruments, *Implications of Slow or Floating CMOS Inputs* application notes

## 8.2 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. Click on *Notifications* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

## 8.3 Support Resources

TI E2E™ support forums are an engineer's go-to source for fast, verified answers and design help — straight from the experts. Search existing answers or ask your own question to get the quick design help you need.

Linked content is 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.

## 8.4 Trademarks

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

## 8.5 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.

## 8.6 Glossary

| | |
|---|---|
| TI Glossary | This glossary lists and explains terms, acronyms, and definitions. |

# 9 Revision History

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

| Changes from Revision * (June 2003) to Revision A (February 2024) | Page |
|---|---|
| • Updated the data sheet to only include the *D*, *PW*, or *RGY* packages | 1 |
| • Updated the numbering format for tables, figures, and cross-references throughout the document | 1 |
| • Updated the *Thermal Information* | 3 |
| • Updated $V_{CC}$ operation from: 2V - 5.5V to: 1V - 5.5V | 4 |

# 10 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

## PACKAGING INFORMATION

| Orderable part number | Status (1) | Material type (2) | Package \| Pins | Package qty \| Carrier | RoHS (3) | Lead finish/ Ball material (4) | MSL rating/ Peak reflow (5) | Op temp (°C) | Part marking (6) |
|---|---|---|---|---|---|---|---|---|---|
| SN74AHC4066D | Obsolete | Production | SOIC (D) \| 14 | - | - | Call TI | Call TI | -40 to 85 | AHC4066 |
| SN74AHC4066DBR | NRND | Production | SSOP (DB) \| 14 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | HA4066 |
| SN74AHC4066DBR.A | NRND | Production | SSOP (DB) \| 14 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | HA4066 |
| SN74AHC4066DGVR | NRND | Production | TVSOP (DGV) \| 14 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | HA4066 |
| SN74AHC4066DGVR.A | NRND | Production | TVSOP (DGV) \| 14 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | HA4066 |
| SN74AHC4066DR | Active | Production | SOIC (D) \| 14 | 2500 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | AHC4066 |
| SN74AHC4066DR.A | Active | Production | SOIC (D) \| 14 | 2500 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | AHC4066 |
| SN74AHC4066N | NRND | Production | PDIP (N) \| 14 | 25 \| TUBE | Yes | NIPDAU | N/A for Pkg Type | -40 to 85 | SN74AHC4066N |
| SN74AHC4066N.A | NRND | Production | PDIP (N) \| 14 | 25 \| TUBE | Yes | NIPDAU | N/A for Pkg Type | -40 to 85 | SN74AHC4066N |
| SN74AHC4066NSR | NRND | Production | SOP (NS) \| 14 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | AHC4066 |
| SN74AHC4066NSR.A | NRND | Production | SOP (NS) \| 14 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | AHC4066 |
| SN74AHC4066PW | Obsolete | Production | TSSOP (PW) \| 14 | - | - | Call TI | Call TI | -40 to 85 | HA4066 |
| SN74AHC4066PWR | Active | Production | TSSOP (PW) \| 14 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | HA4066 |
| SN74AHC4066PWR.A | Active | Production | TSSOP (PW) \| 14 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | HA4066 |
| SN74AHC4066RGYR | Active | Production | VQFN (RGY) \| 14 | 3000 \| LARGE T&R | Yes | NIPDAU | Level-2-260C-1 YEAR | -40 to 85 | HA4066 |
| SN74AHC4066RGYR.A | Active | Production | VQFN (RGY) \| 14 | 3000 \| LARGE T&R | Yes | NIPDAU | Level-2-260C-1 YEAR | -40 to 85 | HA4066 |

(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.

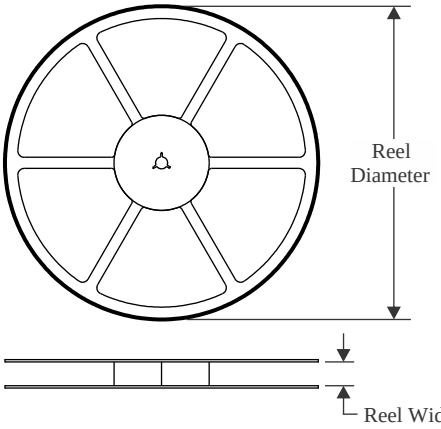
(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will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

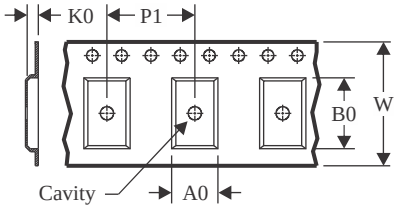
Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

## TAPE AND REEL INFORMATION

**REEL DIMENSIONS**

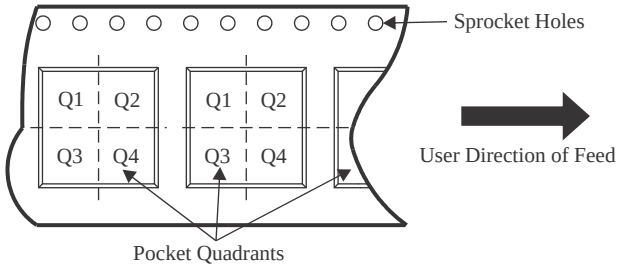



**TAPE DIMENSIONS**




| | |
|---|---|
| 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 |

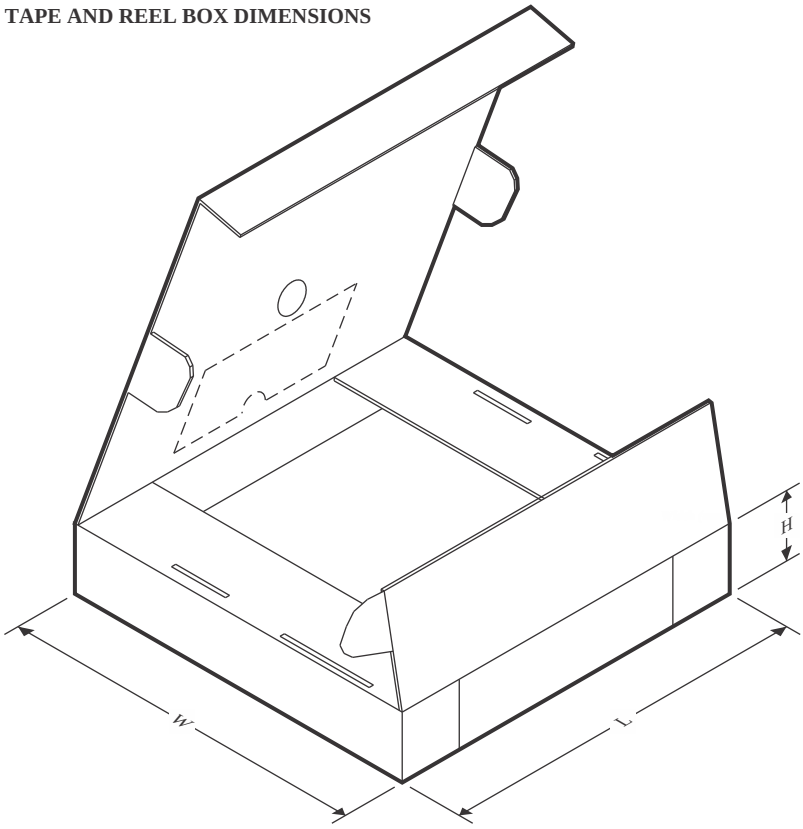
**QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE**




*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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SN74AHC4066DBR | SSOP | DB | 14 | 2000 | 330.0 | 16.4 | 8.35 | 6.6 | 2.4 | 12.0 | 16.0 | Q1 |
| SN74AHC4066DGVR | TVSOP | DGV | 14 | 2000 | 330.0 | 12.4 | 6.8 | 4.0 | 1.6 | 8.0 | 12.0 | Q1 |
| SN74AHC4066DR | SOIC | D | 14 | 2500 | 330.0 | 16.4 | 6.5 | 9.0 | 2.1 | 8.0 | 16.0 | Q1 |
| SN74AHC4066NSR | SOP | NS | 14 | 2000 | 330.0 | 16.4 | 8.1 | 10.4 | 2.5 | 12.0 | 16.0 | Q1 |
| SN74AHC4066PWR | TSSOP | PW | 14 | 2000 | 330.0 | 12.4 | 6.9 | 5.6 | 1.6 | 8.0 | 12.0 | Q1 |
| SN74AHC4066RGYR | VQFN | RGY | 14 | 3000 | 330.0 | 12.4 | 3.75 | 3.75 | 1.15 | 8.0 | 12.0 | Q1 |

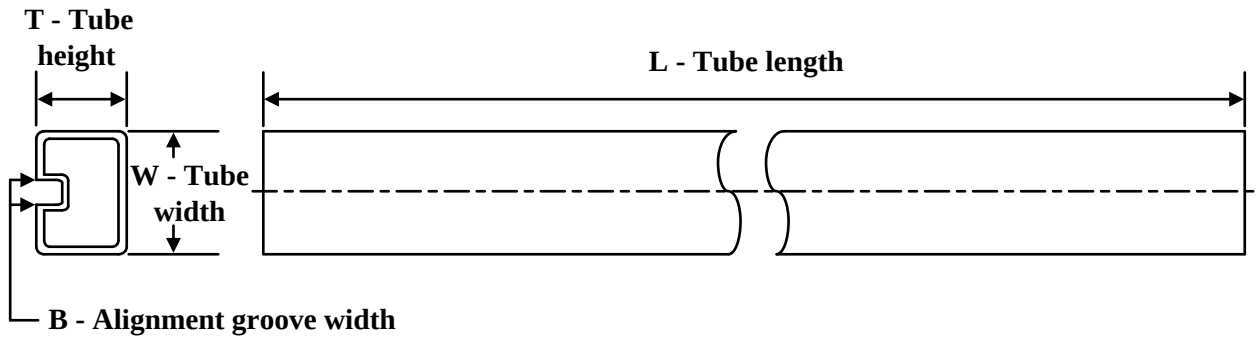
TAPE AND REEL BOX DIMENSIONS




*All dimensions are nominal

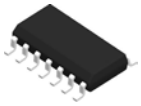
| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|---|---|---|---|---|---|---|---|
| SN74AHC4066DBR | SSOP | DB | 14 | 2000 | 353.0 | 353.0 | 32.0 |
| SN74AHC4066DGVR | TVSOP | DGV | 14 | 2000 | 353.0 | 353.0 | 32.0 |
| SN74AHC4066DR | SOIC | D | 14 | 2500 | 353.0 | 353.0 | 32.0 |
| SN74AHC4066NSR | SOP | NS | 14 | 2000 | 353.0 | 353.0 | 32.0 |
| SN74AHC4066PWR | TSSOP | PW | 14 | 2000 | 353.0 | 353.0 | 32.0 |
| SN74AHC4066RGYR | VQFN | RGY | 14 | 3000 | 367.0 | 367.0 | 35.0 |

## TUBE




*All dimensions are nominal

| Device | Package Name | Package Type | Pins | SPQ | L (mm) | W (mm) | T (µm) | B (mm) |
|---|---|---|---|---|---|---|---|---|
| SN74AHC4066N | N | PDIP | 14 | 25 | 506 | 13.97 | 11230 | 4.32 |
| SN74AHC4066N.A | N | PDIP | 14 | 25 | 506 | 13.97 | 11230 | 4.32 |

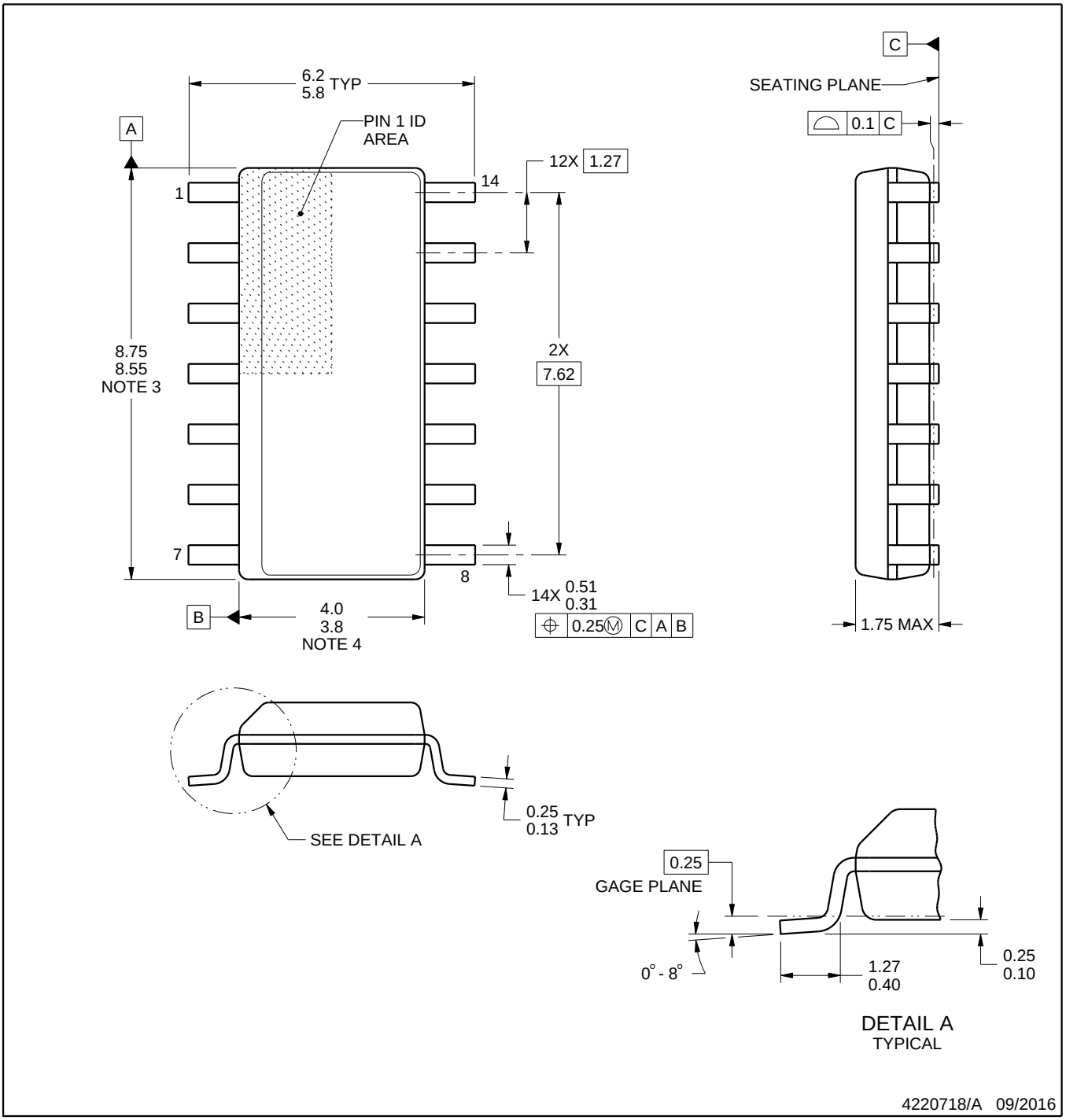


# PACKAGE OUTLINE

## D0014A

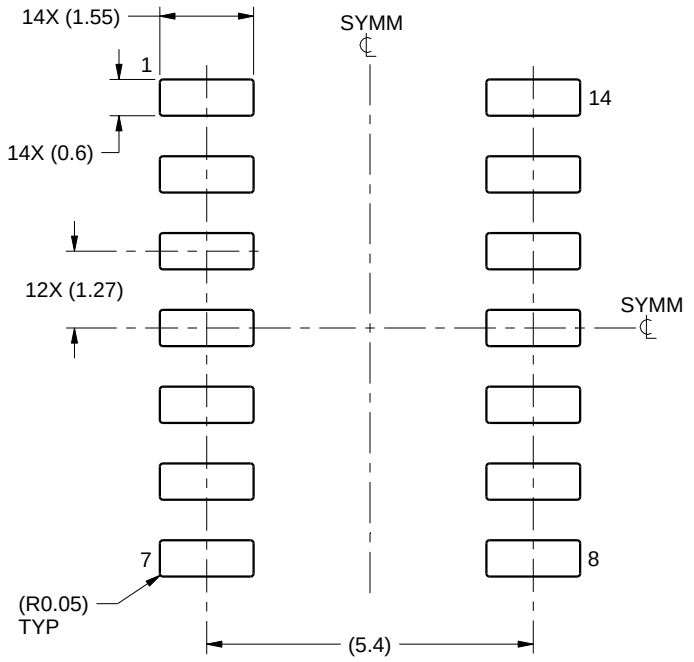
## SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT

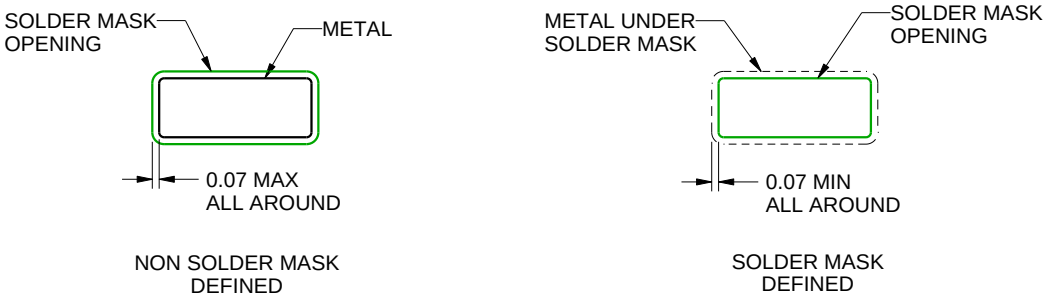



NOTES:

1. All linear dimensions are in millimeters. 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. This dimension does not include interlead flash. Interlead flash shall not exceed 0.43 mm, per side.
5. Reference JEDEC registration MS-012, variation AB.




LAND PATTERN EXAMPLE
SCALE:8X




SOLDER MASK DETAILS

4220718/A 09/2016

NOTES: (continued)

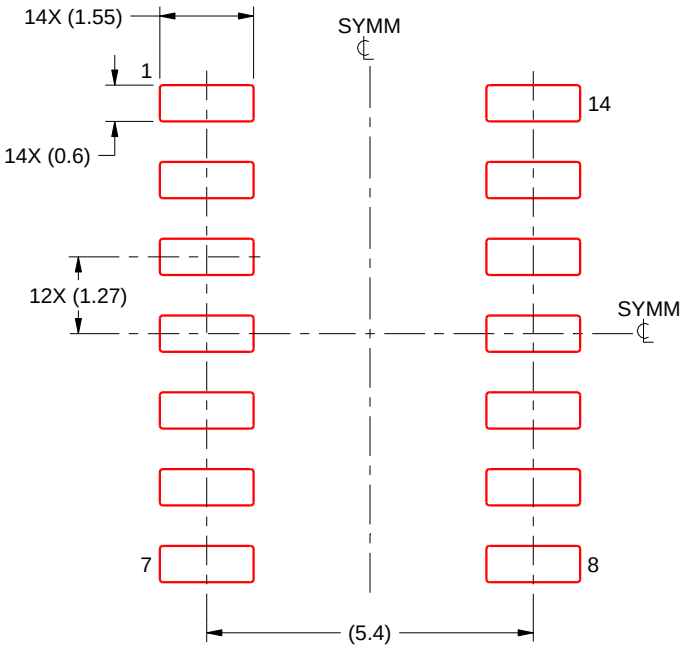
6. Publication IPC-7351 may have alternate designs.
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# EXAMPLE STENCIL DESIGN

## D0014A

## SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT




SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE:8X

4220718/A 09/2016

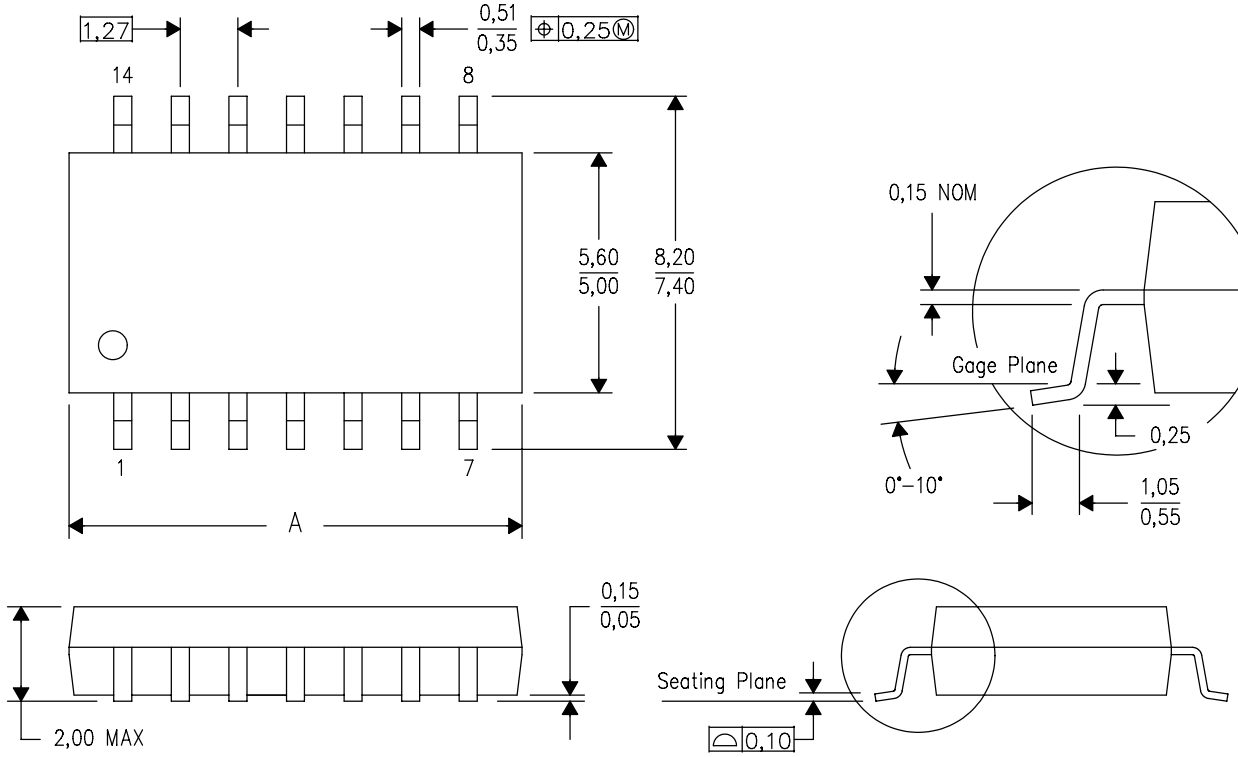
NOTES: (continued)

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.

## MECHANICAL DATA

**NS (R-PDSO-G**)** **PLASTIC SMALL-OUTLINE PACKAGE**

**14-PINS SHOWN**



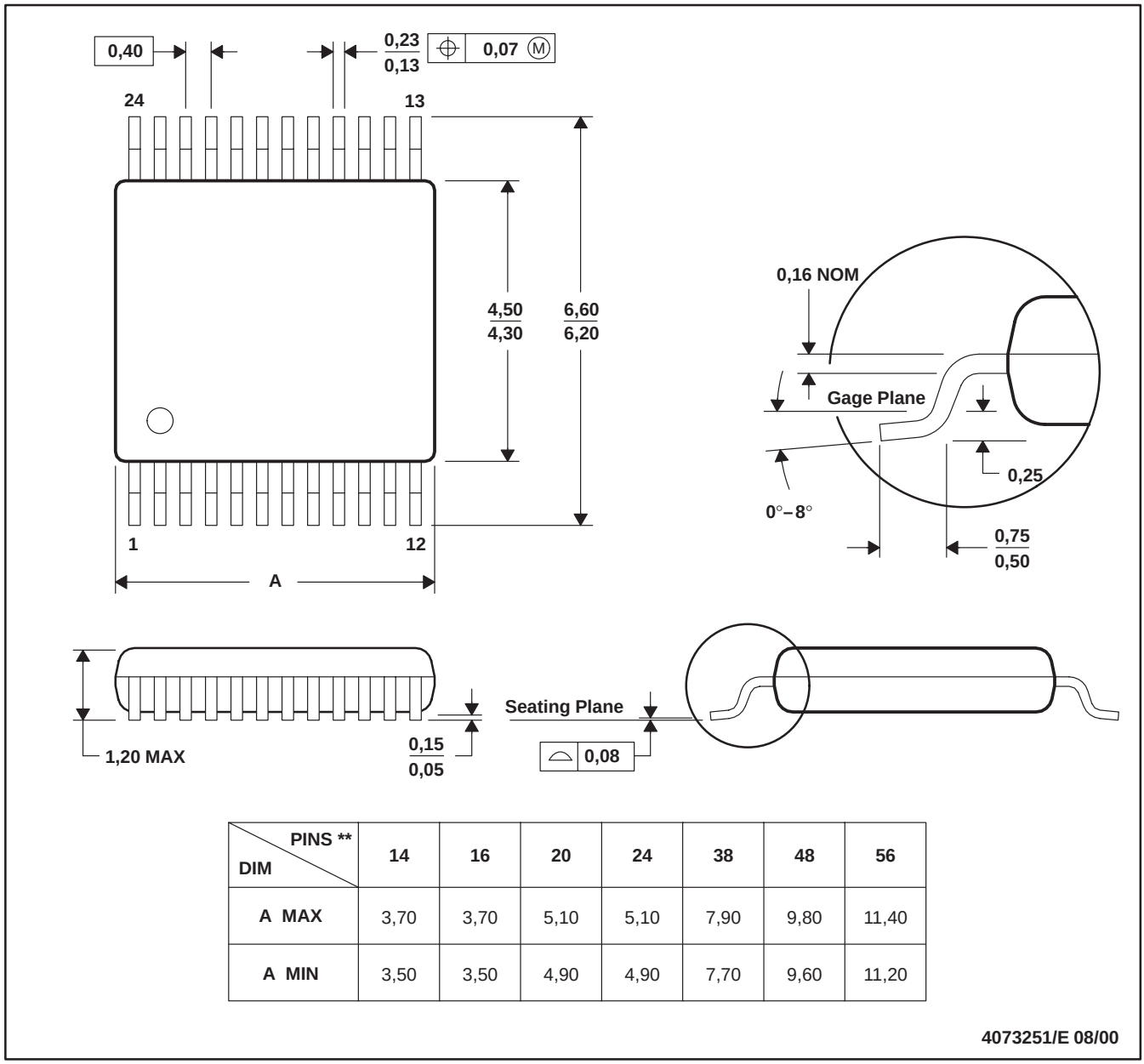

| DIM \ PINS ** | 14 | 16 | 20 | 24 |
|---|---|---|---|---|
| A MAX | 10,50 | 10,50 | 12,90 | 15,30 |
| A MIN | 9,90 | 9,90 | 12,30 | 14,70 |

4040062/C 03/03

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, not to exceed 0,15.

**DGV (R-PDSO-G**)** **PLASTIC SMALL-OUTLINE**

**24 PINS SHOWN**




| DIM \ PINS ** | 14 | 16 | 20 | 24 | 38 | 48 | 56 |
|---|---|---|---|---|---|---|---|
| A MAX | 3,70 | 3,70 | 5,10 | 5,10 | 7,90 | 9,80 | 11,40 |
| A MIN | 3,50 | 3,50 | 4,90 | 4,90 | 7,70 | 9,60 | 11,20 |

**4073251/E 08/00**

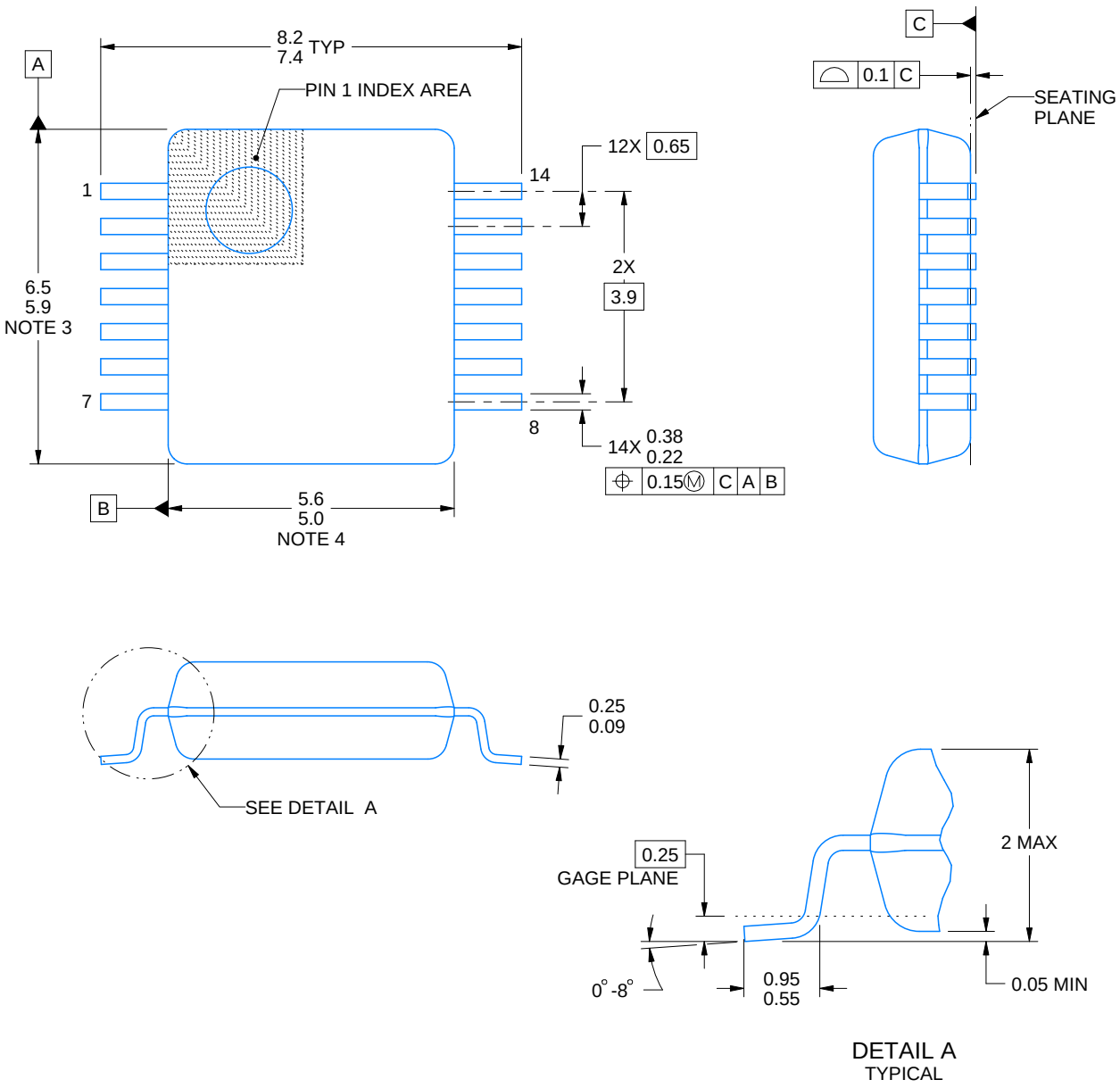
NOTES: A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15 per side.
D. Falls within JEDEC: 24/48 Pins – MO-153
14/16/20/56 Pins – MO-194

# PACKAGE OUTLINE

## DB0014A

## SSOP - 2 mm max height

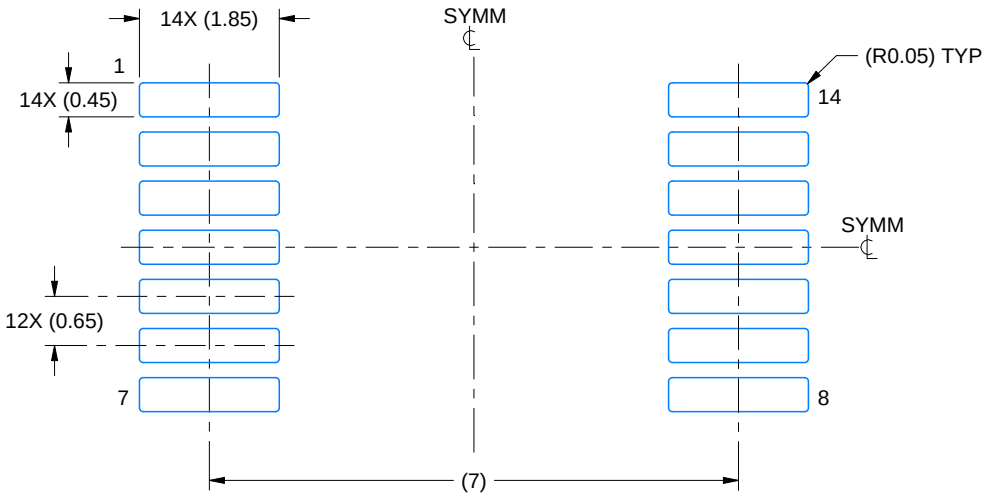
SMALL OUTLINE PACKAGE



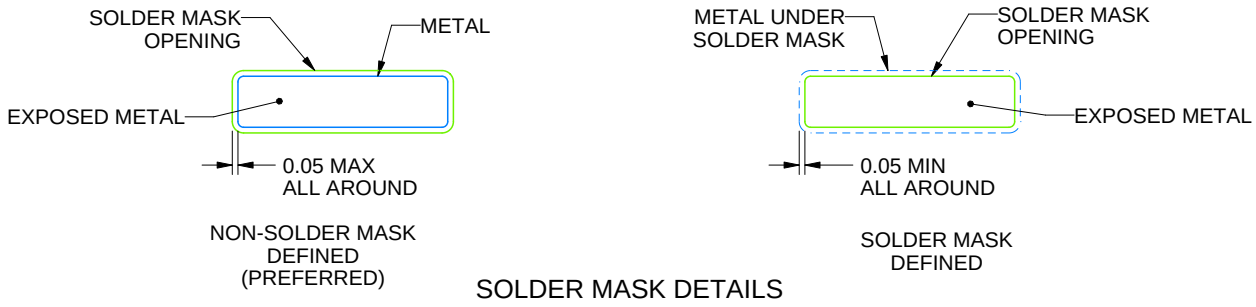

4220762/A 05/2024

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. 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-150.




LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X

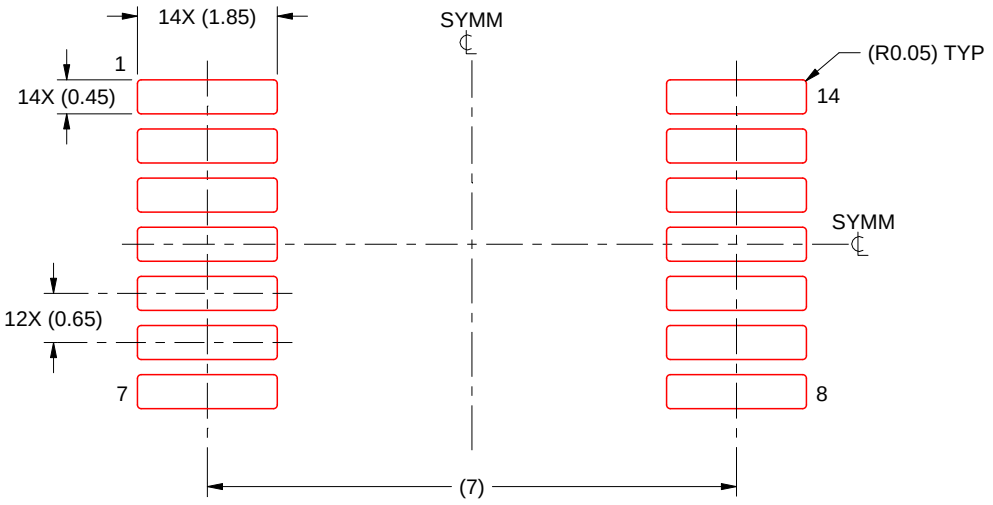



SOLDER MASK DETAILS

4220762/A 05/2024

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.




SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE: 10X

4220762/A 05/2024

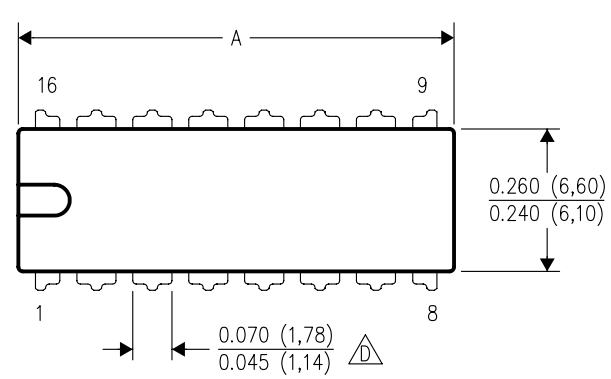
NOTES: (continued)

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.

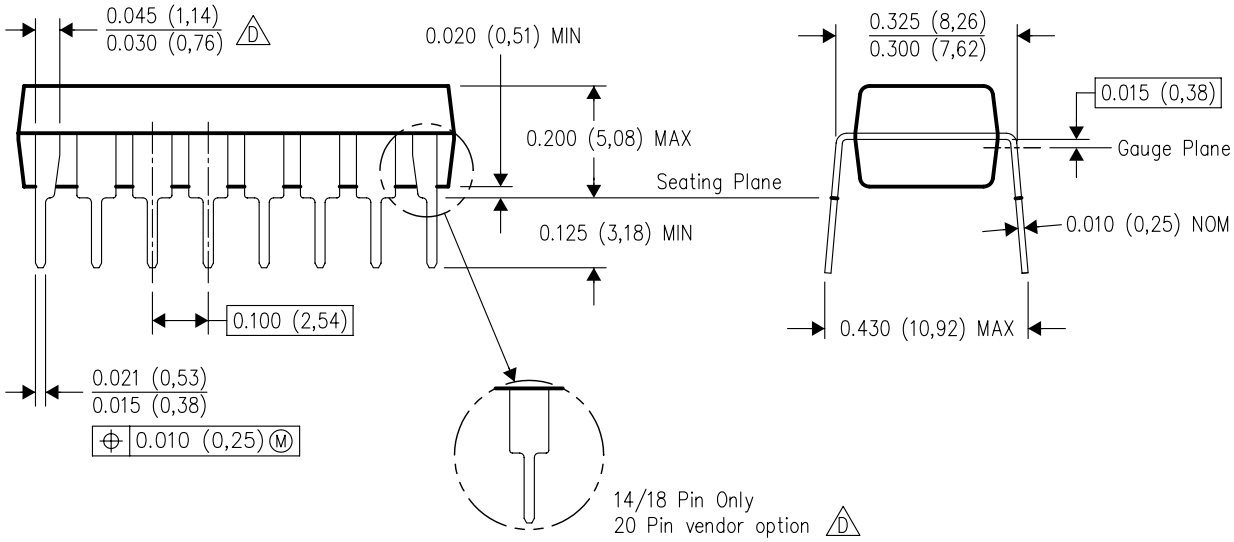
## N (R–PDIP–T**)

## PLASTIC DUAL–IN–LINE PACKAGE

16 PINS SHOWN




| DIM \ PINS ** | 14 | 16 | 18 | 20 |
|---|---|---|---|---|
| A MAX | 0.775 (19,69) | 0.775 (19,69) | 0.920 (23,37) | 1.060 (26,92) |
| A MIN | 0.745 (18,92) | 0.745 (18,92) | 0.850 (21,59) | 0.940 (23,88) |
| MS–001 VARIATION (C) | AA | BB | AC | AD |




4040049/E 12/2002

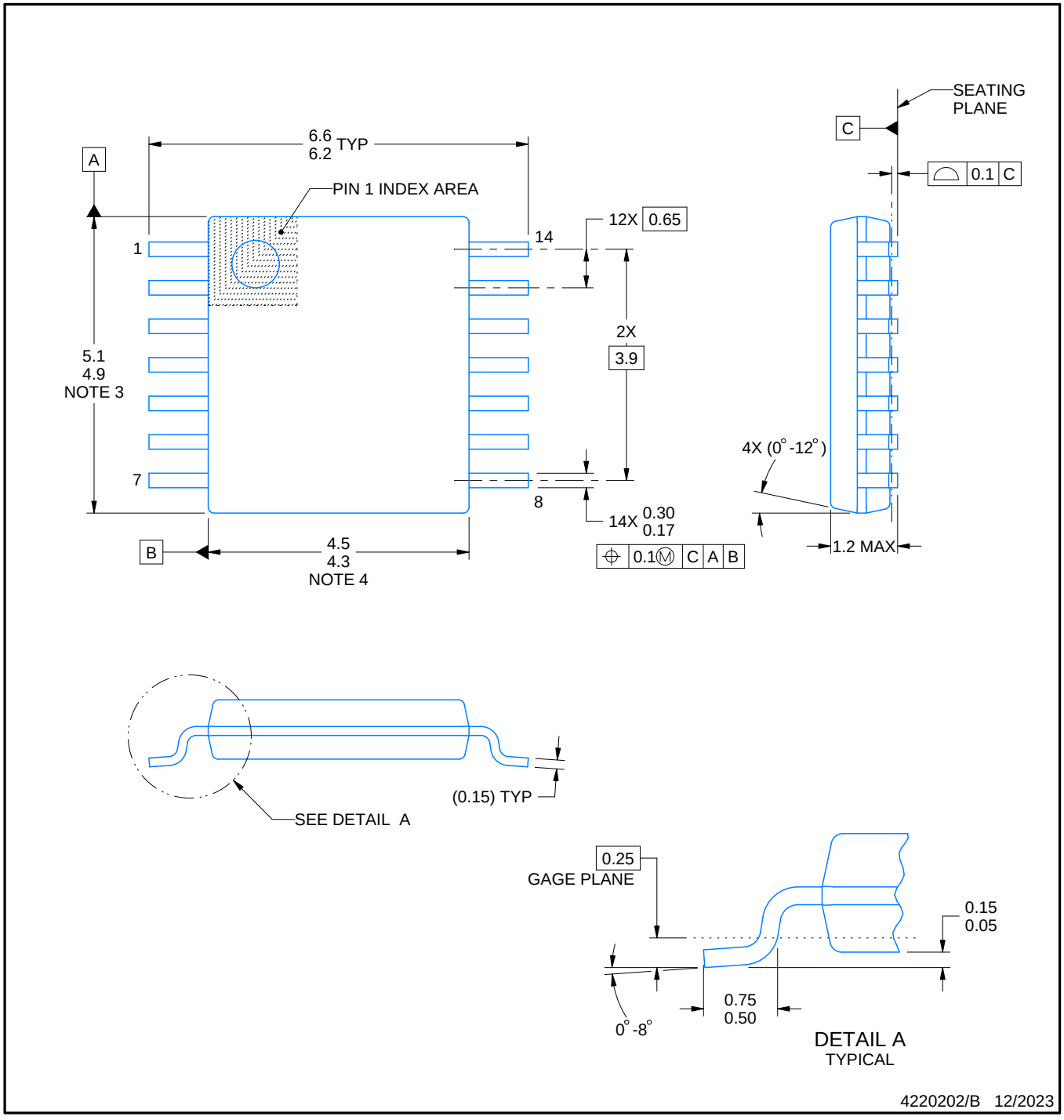
NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Falls within JEDEC MS–001, except 18 and 20 pin minimum body length (Dim A).
D. The 20 pin end lead shoulder width is a vendor option, either half or full width.

# PACKAGE OUTLINE

## PW0014A

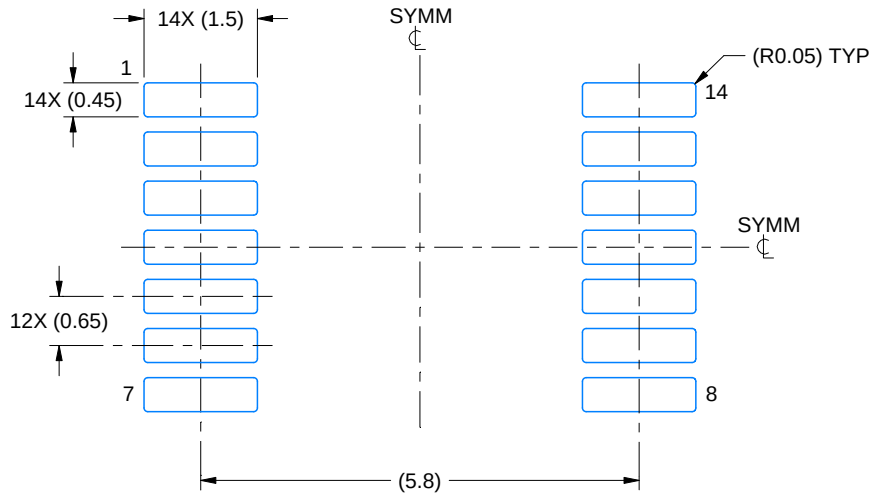
## TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE

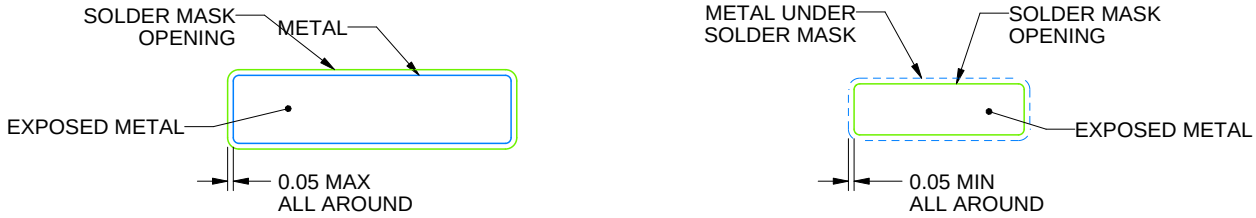



NOTES:

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. This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm per side.
5. Reference JEDEC registration MO-153.




LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X

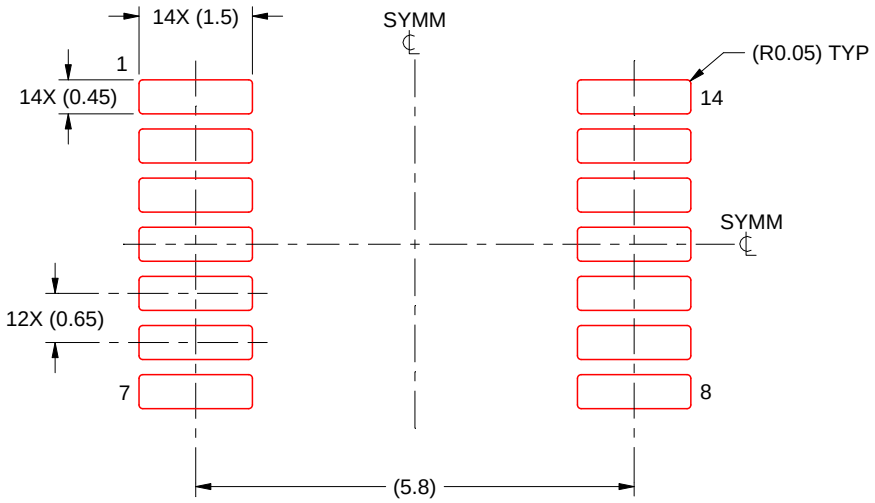



SOLDER MASK DETAILS

4220202/B 12/2023

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: 10X

4220202/B 12/2023

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.

# GENERIC PACKAGE VIEW

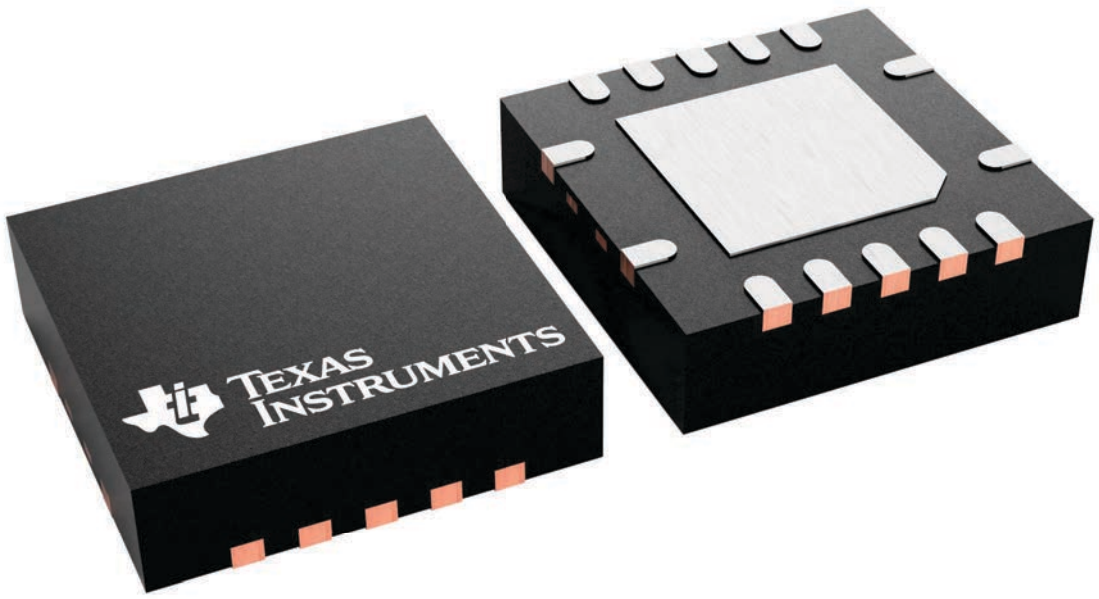
## RGY 14

## VQFN - 1 mm max height

**3.5 x 3.5, 0.5 mm pitch**

PLASTIC QUAD FLATPACK - NO LEAD

This image is a representation of the package family, actual package may vary.
Refer to the product data sheet for package details.



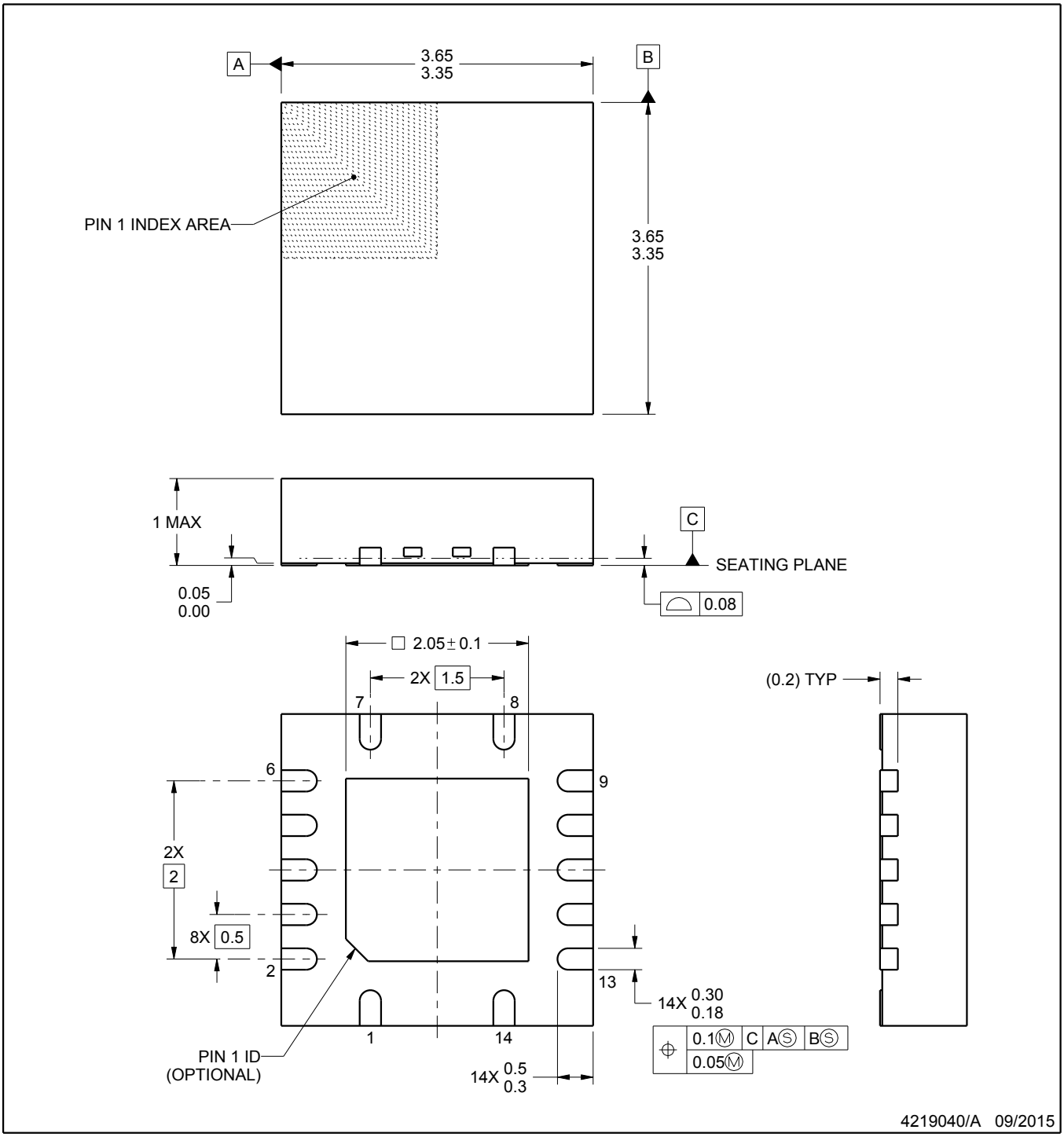

4231541/A

# PACKAGE OUTLINE

## RGY0014A

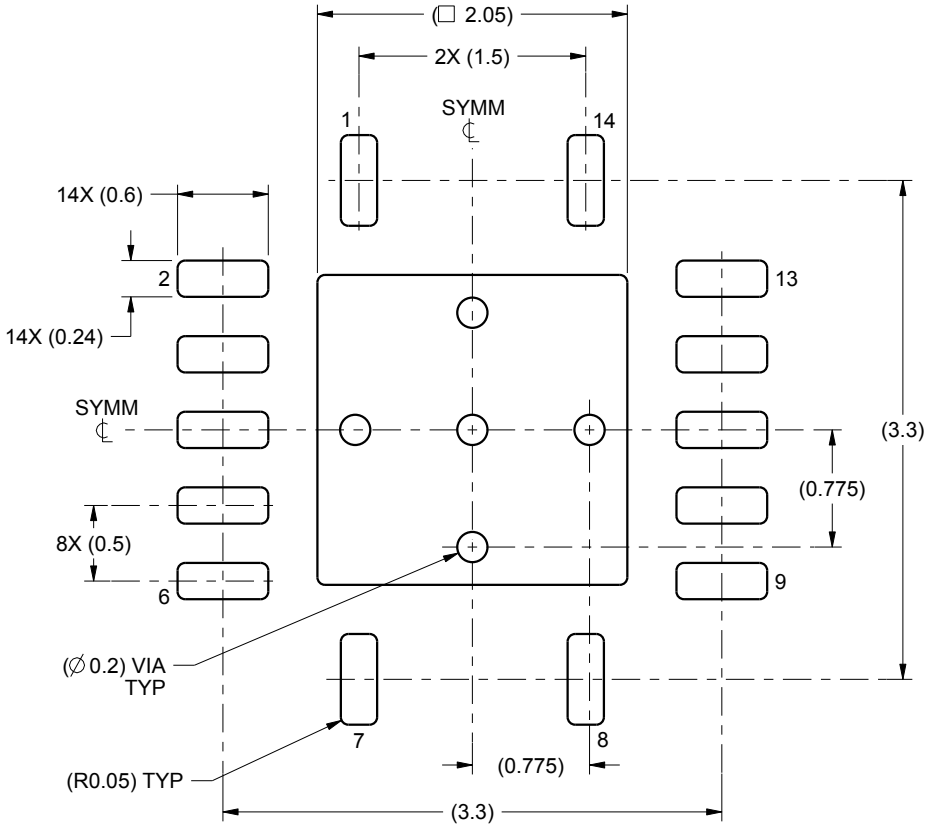
## VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD

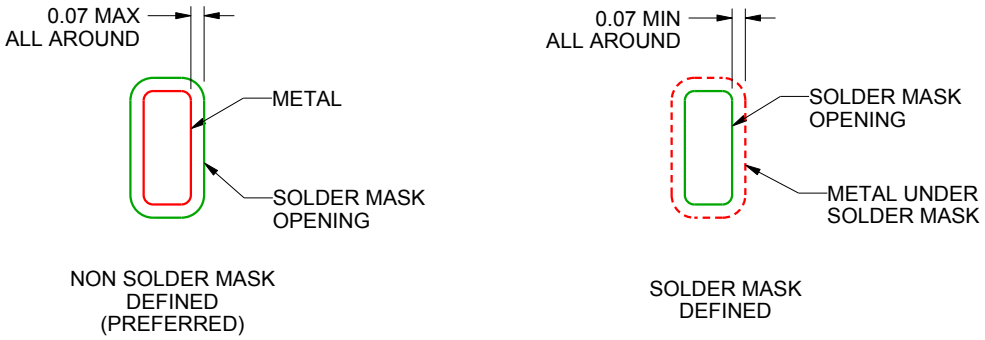



NOTES:

1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.




LAND PATTERN EXAMPLE
SCALE:20X




SOLDER MASK DETAILS

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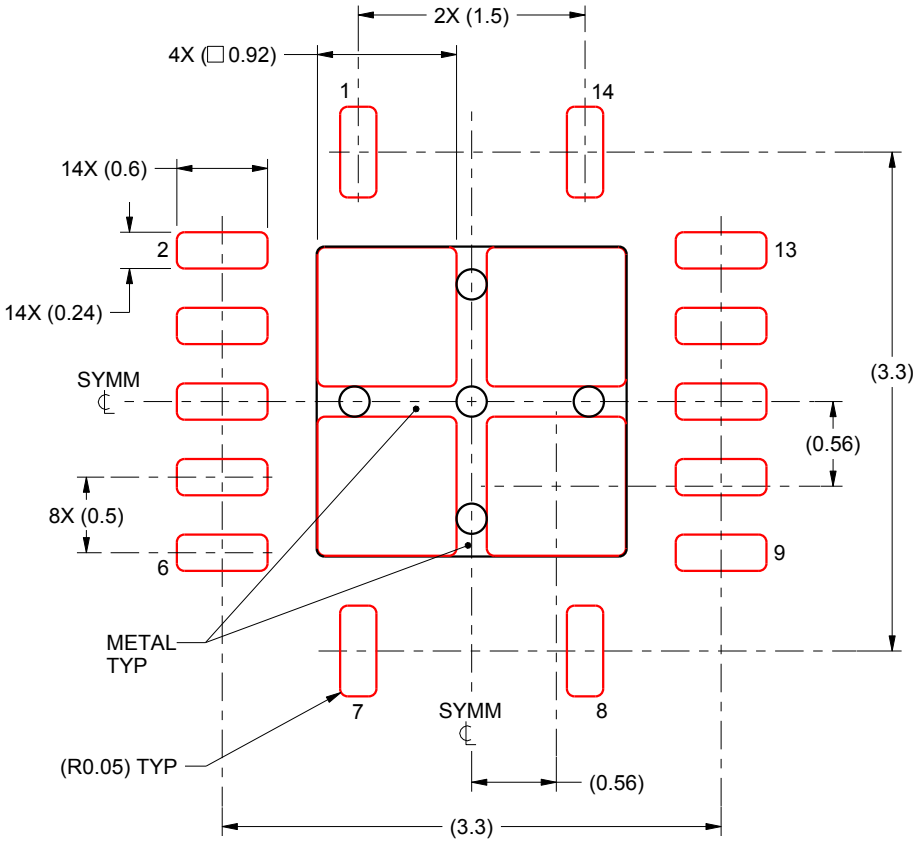
NOTES: (continued)

4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slua271).




SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL

EXPOSED PAD
80% PRINTED SOLDER COVERAGE BY AREA
SCALE:20X

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NOTES: (continued)

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

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