

# SNx4AHC126 Quadruple Bus Buffer Gates with 3-State Outputs

## 1 Features

- Operating range 2V to 5.5V  $V_{CC}$
- Low delay, 3.8 ns (typical with 5-V supply)
- Latch-up performance exceeds 250mA per JESD 17

## 2 Applications

- Drive indicator LEDs
- Drive transmission lines with logic
- Enable or disable a digital signal

## 3 Description

The SNx4AHC126 devices are quadruple bus buffer gates featuring independent line drivers with 3-state outputs.

For the high-impedance state during power up or power down, OE can be tied to GND through a pull-down resistor; the minimum value of the resistor is determined by the current-sourcing capability of the drive.

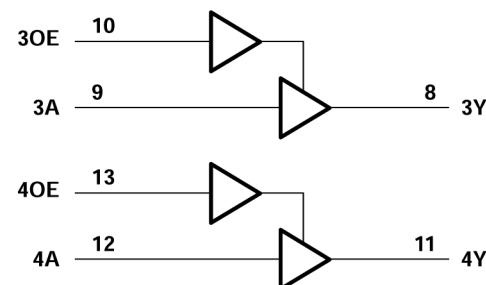
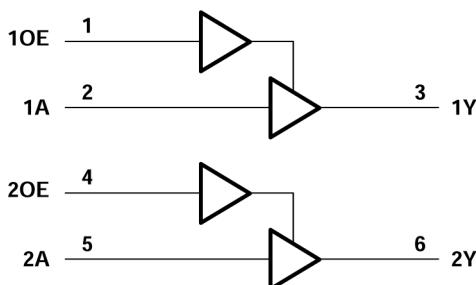
### Package Information

PART NUMBER	PACKAGE <sup>(1)</sup>	PACKAGE SIZE <sup>(2)</sup>	BODY SIZE <sup>(3)</sup>
SNx4AHC126	BQA (WQFN, 14)	3mm × 2.5mm	3mm × 2.5mm
	PW (TSSOP, 14)	5mm × 6.4mm	5mm × 4.4mm

(1) For more information, see [Section 10](#).

(2) The package size (length × width) is a nominal value and includes pins, where applicable.

(3) The body size (length × width) is a nominal value and does not include pins.



Logic Diagram (Positive Logic)



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## 4 Pin Configuration and Functions

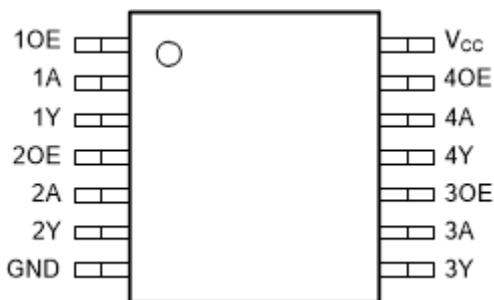


Figure 4-1. PW Package, 14-Pin (Top View)

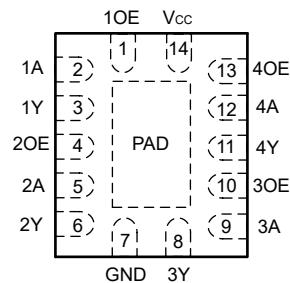


Figure 4-2. BQA Package, WQFN 14-Pin  
(Transparent Top View)

Table 4-1. Pin Functions

PIN		TYPE <sup>(1)</sup>	DESCRIPTION
NAME	NO.		
1OE	1	I	Channel 1, output enable
1A	2	I	Channel 1, A input
1Y	3	O	Channel 1, Y output
2OE	4	I	Channel 2, output enable
2A	5	I	Channel 2, A input
2Y	6	O	Channel 2, Y output
GND	7	G	Ground
3Y	8	O	Channel 3, Y output
3A	9	I	Channel 3, A input
3OE	10	I	Channel 3, OE input
4Y	11	O	Channel 4, Y output
4A	12	I	Channel 4, A input
4OE	13	I	Channel 4, OE input
V <sub>cc</sub>	14	P	Positive supply
Thermal Pad <sup>(2)</sup>	—	—	Thermal pad; connect to GND or leave floating

(1) I = input, O = output, P = power, G = ground

(2) BQA package only

## 5 Specifications

### 5.1 Absolute Maximum Ratings

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

		MIN	MAX	UNIT
$V_{CC}$	Supply voltage range	-0.5	7	V
$V_I$ <sup>(2)</sup>	Input voltage range	-0.5	7	V
$V_O$ <sup>(2)</sup>	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 $V_O > V_{CC}$ )		$\pm 20$	mA
$I_O$	Continuous output current ( $V_O = 0$ to $V_{CC}$ )		$\pm 25$	mA
	Continuous current through $V_{CC}$ or GND		$\pm 50$	mA
$T_{stg}$	Storage temperature range	-65	150	°C

(1) Operation outside the *Absolute Maximum Rating* may cause permanent device damage. *Absolute Maximum Rating* do not imply functional operation of the device at these or any other conditions beyond those listed under *Recommended Operating Condition*. If used outside the *Recommended Operating Condition* but within the *Absolute Maximum Rating*, the device may not be fully functional, and this may affect device reliability, functionality, performance, and shorten the device lifetime.

(2) The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

### 5.2 ESD Ratings

		VALUE	UNIT
$V_{(ESD)}$	Electrostatic discharge	Human-body model (HBM), per ANSI/ESDA/JEDEC JS-001 <sup>(1)</sup>	$\pm 2000$
		Charged-device model (CDM), per ANSI/ESDA/JEDEC JS-002 <sup>(2)</sup>	$\pm 1000$

(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.

### 5.3 Recommended Operating Conditions

		MIN	MAX	UNIT	
$V_{CC}$	Supply voltage	2	5.5	V	
$V_{IH}$	High-level input voltage	$V_{CC} = 2\text{ V}$	1.5	V	
		$V_{CC} = 3\text{ V}$	2.1		
		$V_{CC} = 5.5\text{ V}$	3.85		
$V_{IL}$	Low-level input voltage	$V_{CC} = 2\text{ V}$	0.5	V	
		$V_{CC} = 3\text{ V}$	0.9		
		$V_{CC} = 5.5\text{ V}$	1.65		
$V_I$ <sup>(1)</sup>	Input voltage	0	5.5	V	
$V_O$	Output voltage	0	$V_{CC}$	V	
$I_{OH}$ <sup>(2)</sup>	High-level output current	$V_{CC} = 2\text{ V}$	-50	$\mu\text{A}$	
		$V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$	-4		
		$V_{CC} = 5\text{ V} \pm 0.5\text{ V}$	-8		
$I_{OL}$ <sup>(2)</sup>	Low-level output current	$V_{CC} = 2\text{ V}$	50	$\mu\text{A}$	
		$V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$	4		
		$V_{CC} = 5\text{ V} \pm 0.5\text{ V}$	8		
$\Delta t/\Delta V$	Input transition rise or fall rate	$V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$	100	ns/V	
		$V_{CC} = 5\text{ V} \pm 0.5\text{ V}$	20		
$T_A$	Operating free-air temperature	SN74AHC126	-40	85	$^{\circ}\text{C}$
		SN54AHC126	-55	125	$^{\circ}\text{C}$

(1) 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*, literature number SCBA004.

(2) Recommended current values provided to maintain appropriate output state as per the relevant output voltage specification ( $V_{OL}$  for  $I_{OL}$ ,  $V_{OH}$  for  $I_{OH}$ ). See *Electrical Characteristics* table for details.

### 5.4 Thermal Information

THERMAL METRIC <sup>(1)</sup>	SN74AHC126						UNIT
	D	DB	DGV	N	NS	PW	
	14 PINS						
$R_{\theta JA}$	Junction-to-ambient thermal resistance	124.6					147.7
$R_{\theta JC(\text{top})}$	Junction-to-case (top) thermal resistance	79.7					77.4
$R_{\theta JB}$	Junction-to-board thermal resistance	81.2					90.9
$\Psi_{JT}$	Junction-to-top characterization parameter	39.3					27.2
$\Psi_{JB}$	Junction-to-board characterization parameter	80.8					90.2
$R_{\theta JC(\text{bot})}$	Junction-to-case (bottom) thermal resistance	N/A	N/A	N/A	N/A	N/A	N/A

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

## 5.5 Electrical Characteristics

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

PARAMETER	TEST CONDITIONS	V <sub>CC</sub>	T <sub>A</sub> = 25 °C			-40 to +85 °C		-55 to +125 °C		UNIT	
			MIN	TYP	MAX	MIN	MAX	MIN	MAX		
V <sub>OH</sub>	I <sub>OH</sub> = -50 µA	2 V	1.9	2		1.9		1.9		V	
		3 V	2.9	3		2.9		2.9			
		4.5 V	4.4	4.5		4.4		4.4			
	I <sub>OH</sub> = -4 mA	3 V	2.58			2.48		2.48		V	
		4.5 V	3.94			3.8		3.8			
	I <sub>OL</sub> = 50 µA	2 V	0.1			0.1		0.1		V	
V <sub>OL</sub>		3 V	0.1			0.1		0.1			
		4.5 V	0.1			0.1		0.1			
I <sub>OL</sub> = 4 mA	3 V	0.36			0.44		0.5		V		
	4.5 V	0.36			0.44		0.5				
I <sub>I</sub>	V <sub>I</sub> = 5.5 V or GND	0 V to 5.5 V	±0.1			±1		±1 <sup>(1)</sup>		µA	
I <sub>OZ</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND	5.5 V	±0.25					±2.5		µA	
I <sub>CC</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0	5.5 V	4					40		µA	
C <sub>i</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND	5 V	4	10		10				pF	

(1) On products compliant to MIL-PRF-38535, this parameter is not production tested at V<sub>CC</sub> = 0 V.

## 5.6 Switching Characteristics, V<sub>CC</sub> = 3.3 V ± 0.3 V

over recommended operating free-air temperature range, V<sub>CC</sub> = 3.3 V ± 0.3 V (unless otherwise noted) (see [Section 6](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T <sub>A</sub> = 25°C			-40 to +85 °C		-55 to +125 °C		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	A	Y	C <sub>L</sub> = 15 pF	5.6 <sup>(1)</sup>	8 <sup>(1)</sup>		1	9.5	1 <sup>(1)</sup>	9.5 <sup>(1)</sup>	ns
t <sub>PHL</sub>				5.6 <sup>(1)</sup>	8 <sup>(1)</sup>		1	9.5	1 <sup>(1)</sup>	9.5 <sup>(1)</sup>	
t <sub>PZH</sub>	OE	Y	C <sub>L</sub> = 15 pF	5.4 <sup>(1)</sup>	8 <sup>(1)</sup>		1	9.5	1 <sup>(1)</sup>	9.5 <sup>(1)</sup>	ns
t <sub>PZL</sub>				5.4 <sup>(1)</sup>	8 <sup>(1)</sup>		1	9.5	1 <sup>(1)</sup>	9.5 <sup>(1)</sup>	
t <sub>PHZ</sub>	OE	Y	C <sub>L</sub> = 15 pF	7 <sup>(1)</sup>	9.7 <sup>(1)</sup>		1	11.5	1 <sup>(1)</sup>	11.5 <sup>(1)</sup>	ns
t <sub>PLZ</sub>				7 <sup>(1)</sup>	9.7 <sup>(1)</sup>		1	11.5	1 <sup>(1)</sup>	11.5 <sup>(1)</sup>	
t <sub>PLH</sub>	A	Y	C <sub>L</sub> = 50 pF	8.1	11.5		1	13	1	13	ns
t <sub>PHL</sub>				8.1	11.5		1	13	1	13	
t <sub>PZH</sub>	OE	Y	C <sub>L</sub> = 50 pF	7.9	11.5		1	13	1	13	ns
t <sub>PZL</sub>				7.9	11.5		1	13	1	13	
t <sub>PHZ</sub>	OE	Y	C <sub>L</sub> = 50 pF	9.5	13.2		1	15	1	15	ns
t <sub>PLZ</sub>				9.5	13.2		1	15	1	15	
t <sub>sk(o)</sub>			C <sub>L</sub> = 50 pF	1.5 <sup>(2)</sup>			1.5				ns

(1) (2)

## 5.7 Switching Characteristics, $V_{CC} = 5 \text{ V} \pm 0.5 \text{ V}$

over recommended operating free-air temperature range,  $V_{CC} = 5 \text{ V} \pm 0.5 \text{ V}$  (unless otherwise noted) (see [Section 6](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	TA = 25°C			-40 to +85 °C		-55 to +125 °C		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	A	Y	C <sub>L</sub> = 15 pF	3.8 <sup>(1)</sup>	5.5 <sup>(1)</sup>		1	6.5	1 <sup>(1)</sup>	6.5 <sup>(1)</sup>	ns
t <sub>PHL</sub>				3.8 <sup>(1)</sup>	5.5 <sup>(1)</sup>		1	6.5	1 <sup>(1)</sup>	6.5 <sup>(1)</sup>	
t <sub>PZH</sub>	OE	Y	C <sub>L</sub> = 15 pF	3.6 <sup>(1)</sup>	5.1 <sup>(1)</sup>		1	6	1 <sup>(1)</sup>	6 <sup>(1)</sup>	ns
t <sub>PZL</sub>				3.6 <sup>(1)</sup>	5.1 <sup>(1)</sup>		1	6	1 <sup>(1)</sup>	6 <sup>(1)</sup>	
t <sub>PHZ</sub>	OE	Y	C <sub>L</sub> = 15 pF	4.6 <sup>(1)</sup>	6.8 <sup>(1)</sup>		1	8	1 <sup>(1)</sup>	8 <sup>(1)</sup>	ns
t <sub>PLZ</sub>				4.6 <sup>(1)</sup>	6.8 <sup>(1)</sup>		1	8	1 <sup>(1)</sup>	8 <sup>(1)</sup>	
t <sub>PLH</sub>	A	Y	C <sub>L</sub> = 50 pF	5.3	7.5		1	8.5	1	8.5	ns
t <sub>PHL</sub>				5.3	7.5		1	8.5	1	8.5	
t <sub>PZH</sub>	OE	Y	C <sub>L</sub> = 50 pF	5.1	7.1		1	8	1	8	ns
t <sub>PZL</sub>				5.1	7.1		1	8	1	8	
t <sub>PHZ</sub>	OE	Y	C <sub>L</sub> = 50 pF	6.1	8.8		1	10	1	10	ns
t <sub>PLZ</sub>				6.1	8.8		1	10	1	10	
t <sub>sk(o)</sub>			C <sub>L</sub> = 50 pF		1 <sup>(2)</sup>			1			ns

(1) On products compliant to MIL-PRF-38535, this parameter is not production tested.

(2) On products compliant to MIL-PRF-38535, this parameter does not apply.

## 5.8 Noise Characteristics

$V_{CC} = 5 \text{ V}$ ,  $C_L = 50 \text{ pF}$ ,  $T_A = 25^\circ\text{C}$ <sup>(1)</sup>

PARAMETER		MIN	TYP	MAX	UNIT
$V_{OL(P)}$	Quiet output, maximum dynamic $V_{OL}$		0.2	0.8	V
$V_{OL(V)}$	Quiet output, minimum dynamic $V_{OL}$	-0.9	-0.2		V
$V_{OH(V)}$	Quiet output, minimum dynamic $V_{OH}$	4.4	4.7		V
$V_{IH(D)}$	High-level dynamic input voltage	3.5			V
$V_{IL(D)}$	Low-level dynamic input voltage			1.5	V

(1) Characteristics are for surface-mount packages only.

## 5.9 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, $f = 1 \text{ MHz}$	14	pF

## 5.10 Typical Characteristics

$T_A = 25^\circ\text{C}$  (unless otherwise noted)

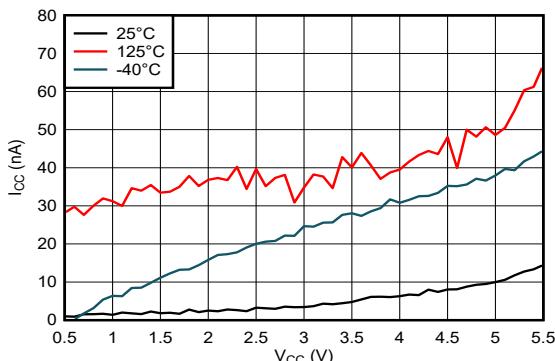


Figure 5-1. Supply Current Across Supply Voltage

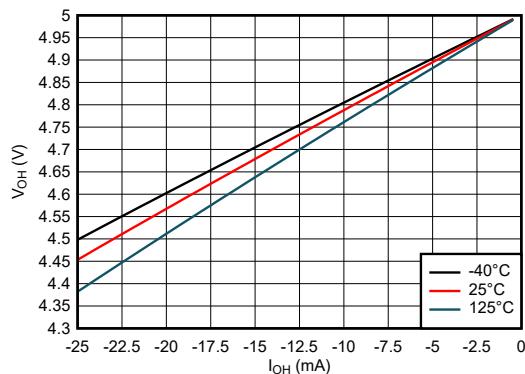


Figure 5-2. Output Voltage vs Current in HIGH State; 5-V Supply

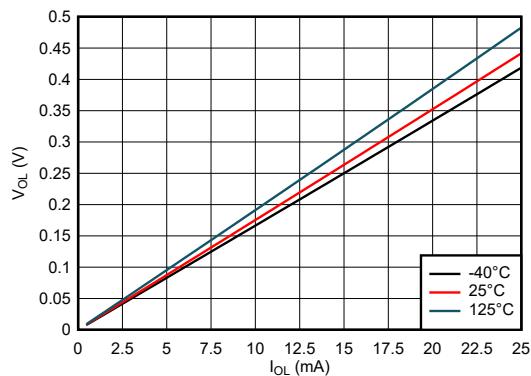


Figure 5-3. Output Voltage vs Current in LOW State; 5-V Supply

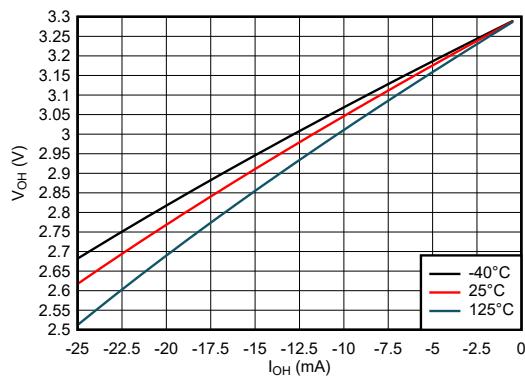


Figure 5-4. Output Voltage vs Current in HIGH State; 3.3-V Supply

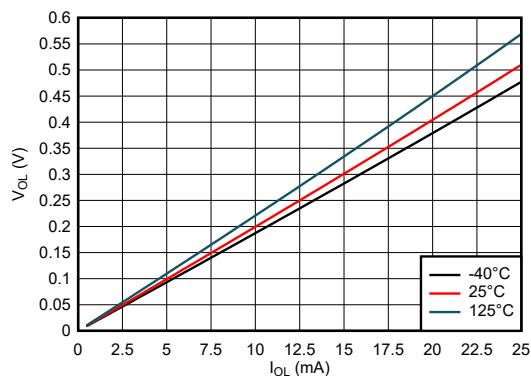


Figure 5-5. Output Voltage vs Current in LOW State; 3.3-V Supply

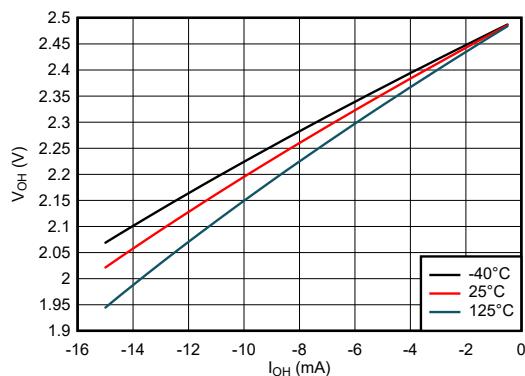


Figure 5-6. Output Voltage vs Current in HIGH State; 2.5-V Supply

## 5.10 Typical Characteristics (continued)

$T_A = 25^\circ\text{C}$  (unless otherwise noted)

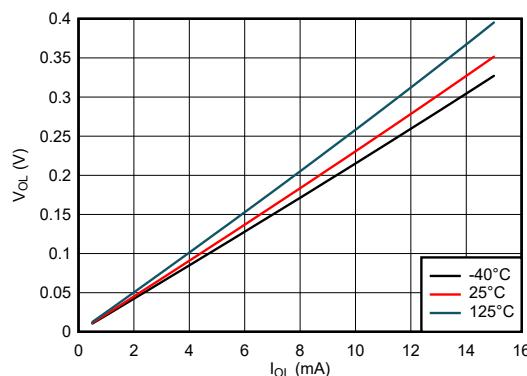


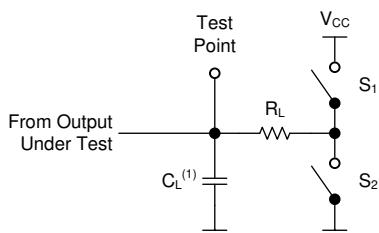
Figure 5-7. Output Voltage vs Current in LOW State; 2.5-V Supply

## 6 Parameter Measurement Information

Phase relationships between waveforms were chosen arbitrarily for the examples listed in the following table. All input pulses are supplied by generators having the following characteristics: PRR  $\leq$  1MHz,  $Z_0 = 50\Omega$ ,  $t_t < 2.5$  ns.

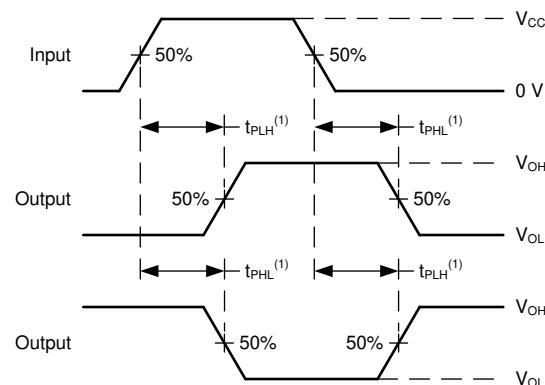
The outputs are measured individually with one input transition per measurement.

TEST	S1	S2	$R_L$	$C_L$	$\Delta V$	$V_{cc}$
$t_{PLH}, t_{PHL}$	OPEN	OPEN	—	15pF, 50pF	—	ALL
$t_{PLZ}, t_{PZL}$	CLOSED	OPEN	1 k $\Omega$	15pF, 50pF	0.15V	$\leq 2.5$ V
$t_{PHZ}, t_{PZH}$	OPEN	CLOSED	1 k $\Omega$	15pF, 50pF	0.15V	$\leq 2.5$ V
$t_{PLZ}, t_{PZL}$	CLOSED	OPEN	1 k $\Omega$	15pF, 50pF	0.3V	$> 2.5$ V
$t_{PHZ}, t_{PZH}$	OPEN	CLOSED	1 k $\Omega$	15pF, 50pF	0.3V	$> 2.5$ V



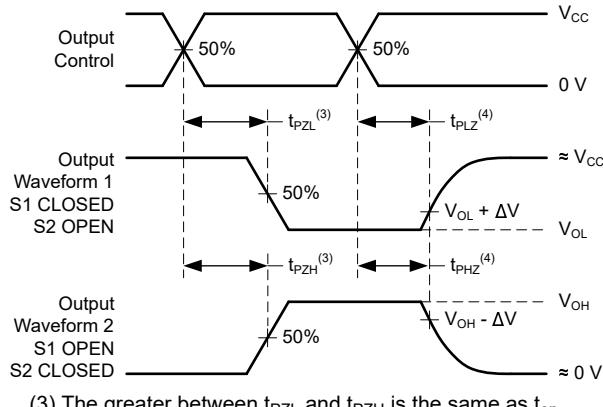
(1)  $C_L$  includes probe and test-fixture capacitance.

**Figure 6-1. Load Circuit for 3-State Outputs**



(1) The greater between  $t_{PLH}$  and  $t_{PHL}$  is the same as  $t_{pd}$ .

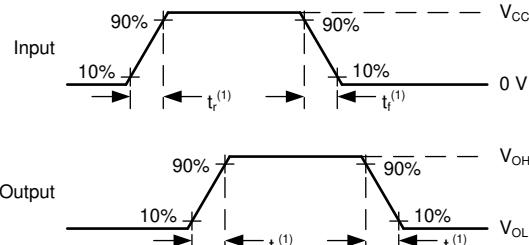
**Figure 6-2. Voltage Waveforms Propagation Delays**



(3) The greater between  $t_{PZL}$  and  $t_{PZH}$  is the same as  $t_{en}$ .

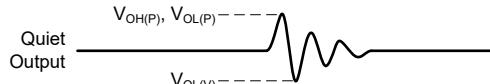
(4) The greater between  $t_{PLZ}$  and  $t_{PHZ}$  is the same as  $t_{dis}$ .

**Figure 6-3. Voltage Waveforms Propagation Delays**



(1) The greater between  $t_r$  and  $t_f$  is the same as  $t_t$ .

**Figure 6-4. Voltage Waveforms, Input and Output Transition Times**



Noise values measured with all other outputs simultaneously switching.

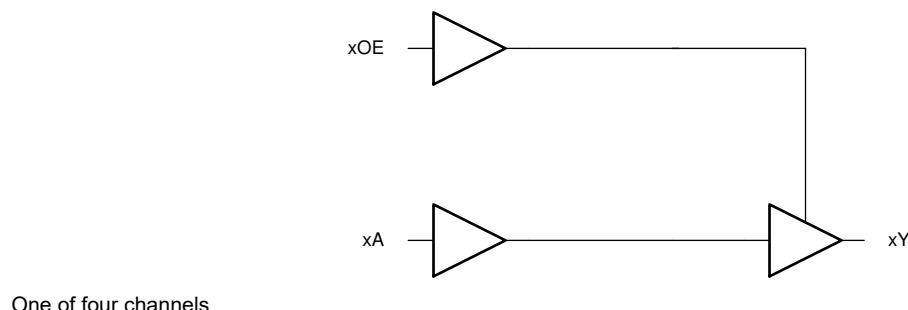
**Figure 6-5. Voltage Waveforms, Noise**

## 7 Detailed Description

### 7.1 Overview

This device contains four independent buffers with 3-state outputs. Each gate performs the Boolean function  $Y = A$  in positive logic.

### 7.2 Functional Block Diagram



### 7.3 Feature Description

#### 7.3.1 Balanced CMOS 3-State Outputs

This device includes balanced CMOS 3-state outputs. Driving high, driving low, and high impedance are the three states that these outputs can be in. The term *balanced* indicates that the device can sink and source similar currents. The drive capability of this device may create fast edges into light loads, so routing and load conditions should be considered to prevent ringing. Additionally, the outputs of this device can drive larger currents than the device can sustain without being damaged. It is important for the output power of the device to be limited to avoid damage due to overcurrent. The electrical and thermal limits defined in the *Absolute Maximum Ratings* must be followed at all times.

When placed into the high-impedance state, the output will neither source nor sink current, with the exception of minor leakage current as defined in the *Electrical Characteristics* table. In the high-impedance state, the output voltage is not controlled by the device and is dependent on external factors. If no other drivers are connected to the node, then this is known as a floating node and the voltage is unknown. A pull-up or pull-down resistor can be connected to the output to provide a known voltage at the output while it is in the high-impedance state. The value of the resistor will depend on multiple factors, including parasitic capacitance and power consumption limitations. Typically, a 10-k $\Omega$  resistor can be used to meet these requirements.

Unused 3-state CMOS outputs should be left disconnected.

#### 7.3.2 Standard CMOS Inputs

This device includes standard CMOS inputs. Standard CMOS inputs are high impedance and are typically modeled as a resistor in parallel with the input capacitance given in the *Electrical Characteristics*. The worst case resistance is calculated with the maximum input voltage, given in the *Absolute Maximum Ratings*, and the maximum input leakage current, given in the *Electrical Characteristics*, using Ohm's law ( $R = V \div I$ ).

Standard CMOS inputs require that input signals transition between valid logic states quickly, as defined by the input transition time or rate in the *Recommended Operating Conditions* table. Failing to meet this specification will result in excessive power consumption and could cause oscillations. More details can be found in [Implications of Slow or Floating CMOS Inputs](#).

Do not leave standard CMOS inputs floating at any time during operation. Unused inputs must be terminated at V<sub>CC</sub> or GND. If a system will not be actively driving an input at all times, then a pull-up or pull-down resistor can be added to provide a valid input voltage during these times. The resistor value will depend on multiple factors; a 10-k $\Omega$  resistor, however, is recommended and will typically meet all requirements.

### 7.3.3 Clamp Diode Structure

As Figure 7-1 shows, the outputs to this device have both positive and negative clamping diodes, and the inputs to this device have negative clamping diodes only.

#### CAUTION

Voltages beyond the values specified in the *Absolute Maximum Ratings* table can cause damage to the device. The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.

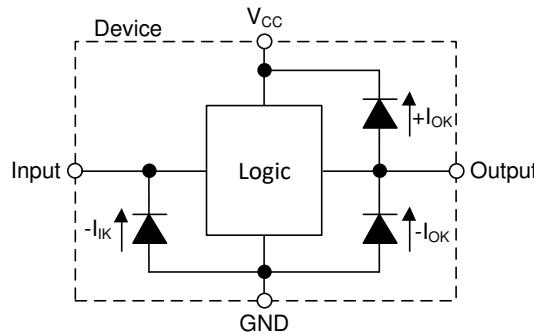


Figure 7-1. Electrical Placement of Clamping Diodes for Each Input and Output

### 7.4 Device Functional Modes

Table 7-1. Function Table

INPUTS		OUTPUT
OE	A	Y
L	X	Z
H	L	L
H	H	H

## 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*

### 8.2 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on [ti.com](http://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.

<b>Changes from Revision M (August 2023) to Revision N (February 2024)</b>	<b>Page</b>
• Added thermal values for D package: $R_{\theta JA} = 124.6$ , $R_{\theta JC(\text{top})} = 79.7$ , $R_{\theta JB} = 81.2$ , $\Psi_{JT} = 39.3$ , $\Psi_{JB} = 80.8$ , $R_{\theta JC(\text{bot})} = \text{N/A}$ , all values in $^{\circ}\text{C/W}$ .....	5

<b>Changes from Revision L (July 2003) to Revision M (August 2023)</b>	<b>Page</b>
• Changed the numbering format for tables, figures, and cross-references throughout the document.....	1
• Added the <i>BQA</i> package to the data sheet.....	1
• Deleted the <i>J</i> , <i>W</i> , <i>D</i> , <i>DB</i> , <i>DGV</i> , <i>N</i> , <i>NS</i> , and <i>FK</i> packages from the data sheet.....	1

## 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)
5962-9686201Q2A	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 9686201Q2A SNJ54AHC 126FK
5962-9686201QDA	Active	Production	CFP (W)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9686201QD A SNJ54AHC126W
SN74AHC126BQAR	Active	Production	WQFN (BQA)   14	3000   LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 125	AHC126
SN74AHC126BQAR.A	Active	Production	WQFN (BQA)   14	3000   LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 125	AHC126
SN74AHC126D	Obsolete	Production	SOIC (D)   14	-	-	Call TI	Call TI	-40 to 85	AHC126
SN74AHC126DBR	Active	Production	SSOP (DB)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA126
SN74AHC126DBR.A	Active	Production	SSOP (DB)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA126
SN74AHC126DGVR	Active	Production	TVSOP (DGV)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA126
SN74AHC126DGVR.A	Active	Production	TVSOP (DGV)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA126
SN74AHC126DR	Active	Production	SOIC (D)   14	2500   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AHC126
SN74AHC126DR.A	Active	Production	SOIC (D)   14	2500   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AHC126
SN74AHC126N	Active	Production	PDIP (N)   14	25   TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 85	SN74AHC126N
SN74AHC126N.A	Active	Production	PDIP (N)   14	25   TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 85	SN74AHC126N
SN74AHC126NSR	Active	Production	SOP (NS)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AHC126
SN74AHC126NSR.A	Active	Production	SOP (NS)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AHC126
SN74AHC126PW	Obsolete	Production	TSSOP (PW)   14	-	-	Call TI	Call TI	-40 to 85	HA126
SN74AHC126PWR	Active	Production	TSSOP (PW)   14	2000   LARGE T&R	Yes	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 85	HA126
SN74AHC126PWR.A	Active	Production	TSSOP (PW)   14	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA126
SN74AHC126PWRG4	Active	Production	TSSOP (PW)   14	2000   null	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA126
SN74AHC126PWRG4	Active	Production	TSSOP (PW)   14	2000   null	No	NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA126
SN74AHC126PWRG4.A	Active	Production	TSSOP (PW)   14	2000   null	No	NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA126
SN74AHC126PWRG4.A	Active	Production	TSSOP (PW)   14	2000   null	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	HA126
SNJ54AHC126FK	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 9686201Q2A SNJ54AHC 126FK

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)
SNJ54AHC126FK.A	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 9686201Q2A SNJ54AHC 126FK
SNJ54AHC126W	Active	Production	CFP (W)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9686201QD A SNJ54AHC126W
SNJ54AHC126W.A	Active	Production	CFP (W)   14	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9686201QD A SNJ54AHC126W

<sup>(1)</sup> **Status:** For more details on status, see our [product life cycle](#).

<sup>(2)</sup> **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.

<sup>(3)</sup> **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

<sup>(4)</sup> **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.

<sup>(5)</sup> **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.

<sup>(6)</sup> **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.

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

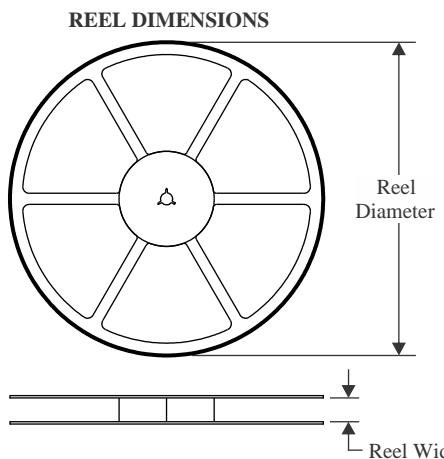
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

**OTHER QUALIFIED VERSIONS OF SN54AHC126, SN74AHC126 :**

- Catalog : [SN74AHC126](#)
- Automotive : [SN74AHC126-Q1](#), [SN74AHC126-Q1](#)
- Military : [SN54AHC126](#)

NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product
- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects
- Military - QML certified for Military and Defense Applications

**TAPE AND REEL INFORMATION**


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
SN74AHC126BQAR	WQFN	BQA	14	3000	180.0	12.4	2.8	3.3	1.1	4.0	12.0	Q1
SN74AHC126DBR	SSOP	DB	14	2000	330.0	16.4	8.35	6.6	2.4	12.0	16.0	Q1
SN74AHC126DGVR	TVSOP	DGV	14	2000	330.0	12.4	6.8	4.0	1.6	8.0	12.0	Q1
SN74AHC126NSR	SOP	NS	14	2000	330.0	16.4	8.1	10.4	2.5	12.0	16.0	Q1
SN74AHC126PWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	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)
SN74AHC126BQAR	WQFN	BQA	14	3000	210.0	185.0	35.0
SN74AHC126DBR	SSOP	DB	14	2000	353.0	353.0	32.0
SN74AHC126DGVR	TVSOP	DGV	14	2000	353.0	353.0	32.0
SN74AHC126NSR	SOP	NS	14	2000	353.0	353.0	32.0
SN74AHC126PWR	TSSOP	PW	14	2000	353.0	353.0	32.0

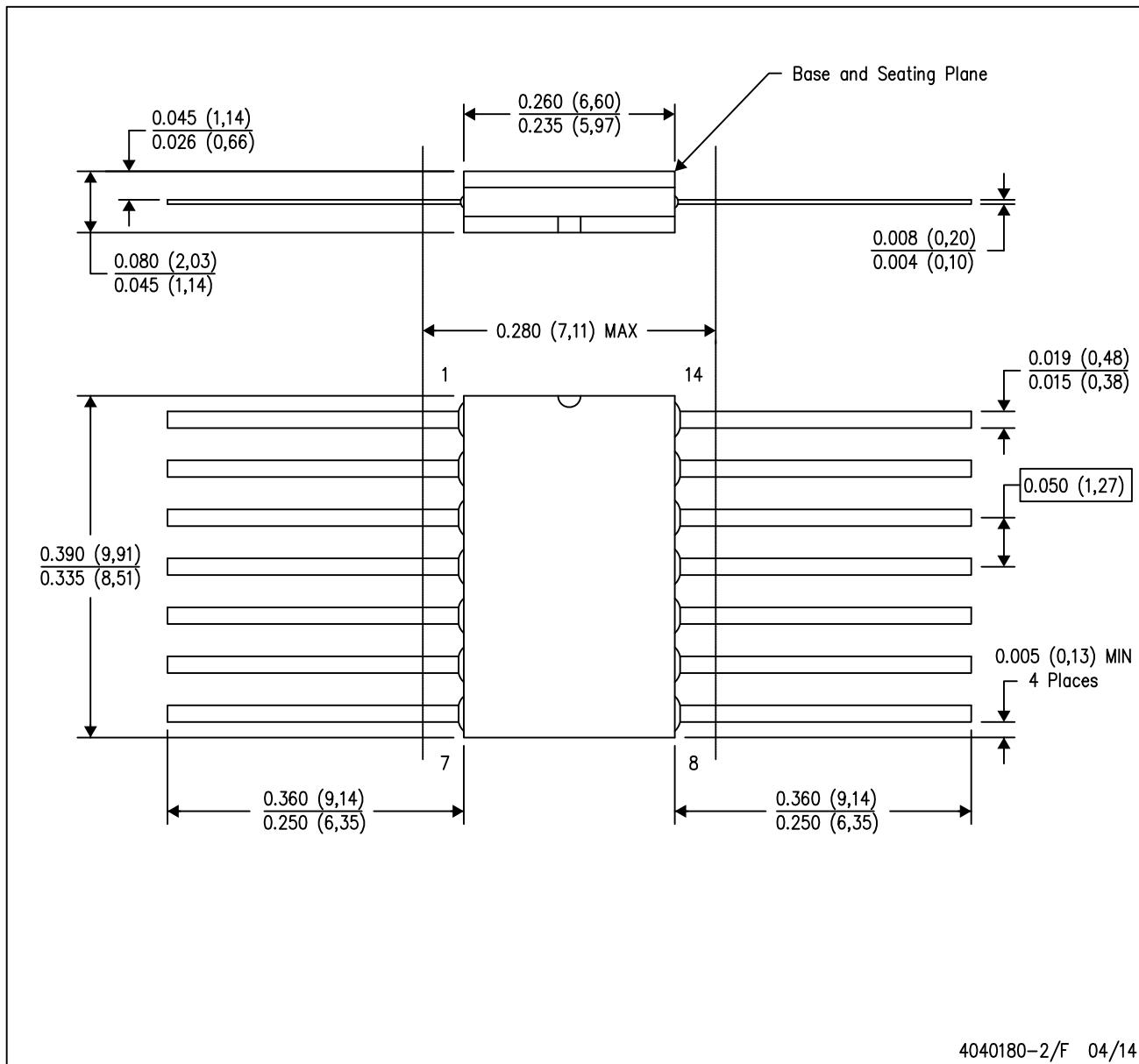
**TUBE**


\*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T ( $\mu$ m)	B (mm)
5962-9686201Q2A	FK	LCCC	20	55	506.98	12.06	2030	NA
5962-9686201QDA	W	CFP	14	25	506.98	26.16	6220	NA
SN74AHC126N	N	PDIP	14	25	506	13.97	11230	4.32
SN74AHC126N	N	PDIP	14	25	506	13.97	11230	4.32
SN74AHC126N.A	N	PDIP	14	25	506	13.97	11230	4.32
SN74AHC126N.A	N	PDIP	14	25	506	13.97	11230	4.32
SNJ54AHC126FK	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54AHC126FK.A	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54AHC126W	W	CFP	14	25	506.98	26.16	6220	NA
SNJ54AHC126W.A	W	CFP	14	25	506.98	26.16	6220	NA

W (R-GDFP-F14)

CERAMIC DUAL FLATPACK



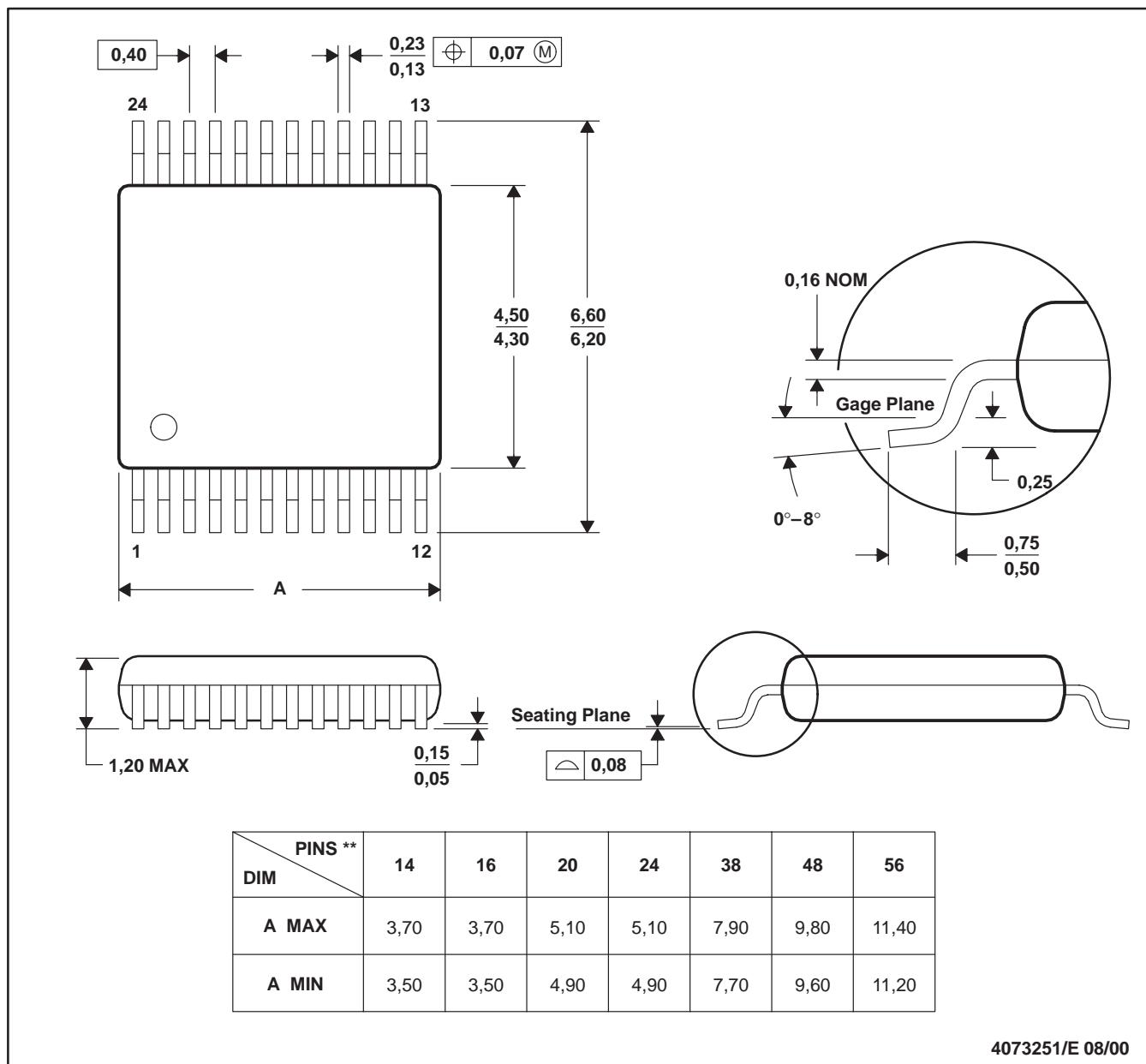
NOTES:

- All linear dimensions are in inches (millimeters).
- This drawing is subject to change without notice.
- This package can be hermetically sealed with a ceramic lid using glass frit.
- Index point is provided on cap for terminal identification only.
- Falls within MIL-STD 1835 GDFP1-F14

## DGV (R-PDSO-G\*\*)

## PLASTIC SMALL-OUTLINE

24 PINS SHOWN

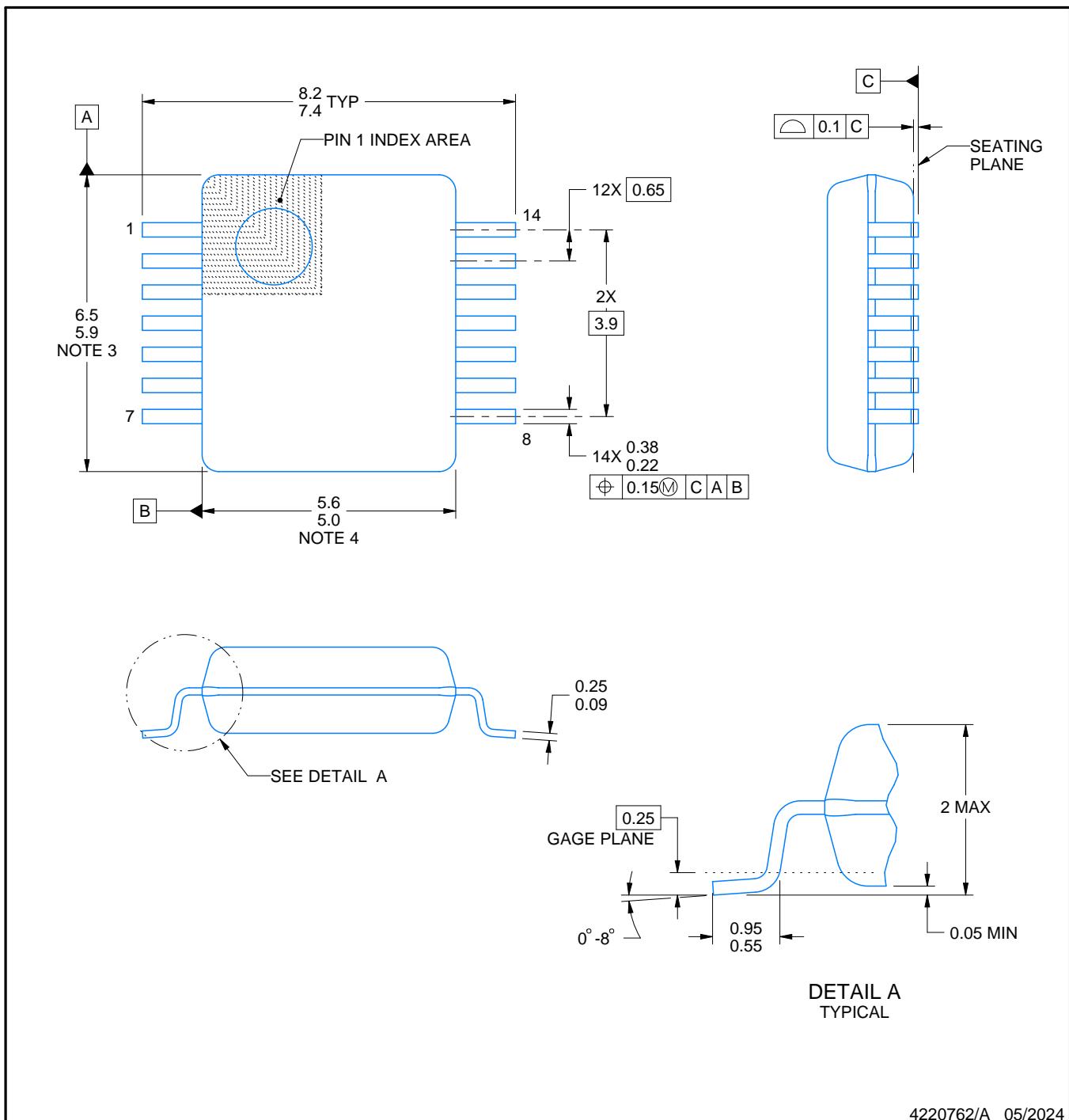


NOTES: A. All linear dimensions are in millimeters.  
 B. This drawing is subject to change without notice.  
 C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15 per side.  
 D. Falls within JEDEC: 24/48 Pins – MO-153  
 14/16/20/56 Pins – MO-194

# PACKAGE OUTLINE

## SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



### NOTES:

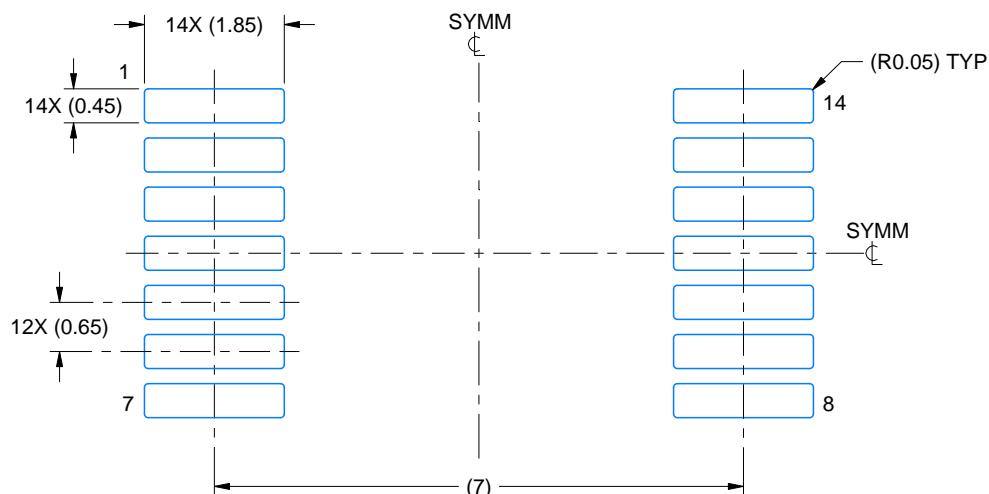
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. Reference JEDEC registration MO-150.

# EXAMPLE BOARD LAYOUT

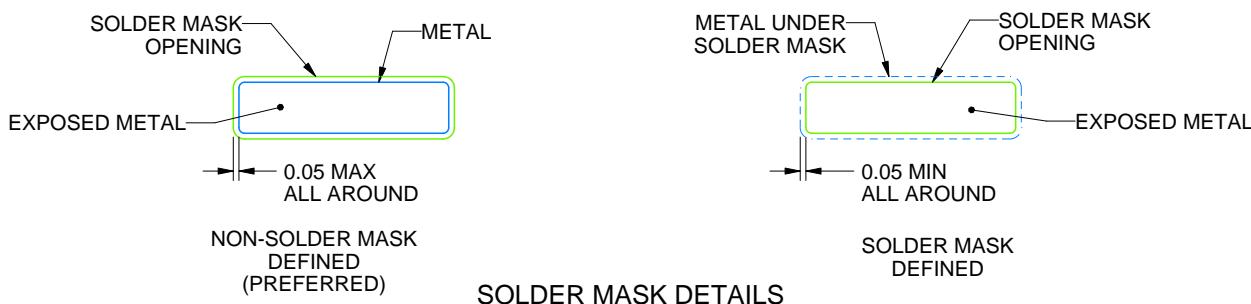
DB0014A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 10X



4220762/A 05/2024

NOTES: (continued)

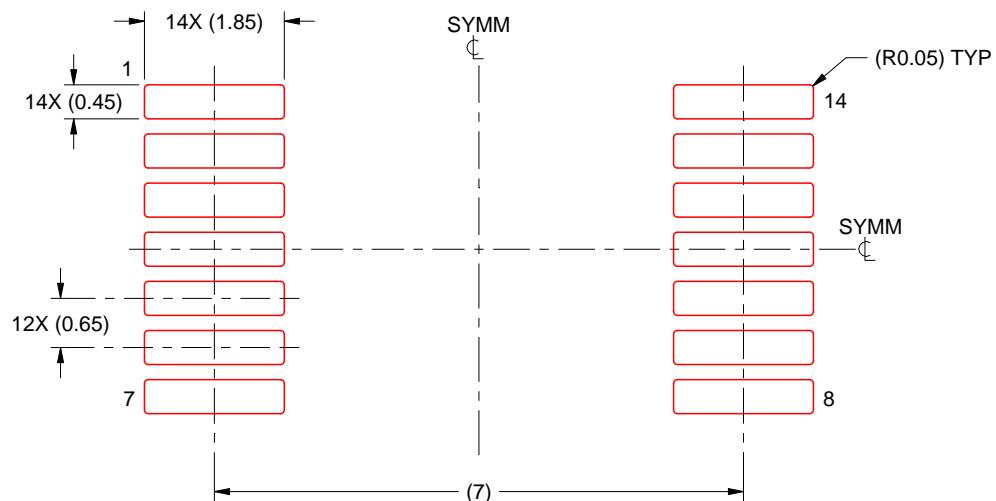
5. Publication IPC-7351 may have alternate designs.
6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# EXAMPLE STENCIL DESIGN

DB0014A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



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.

# GENERIC PACKAGE VIEW

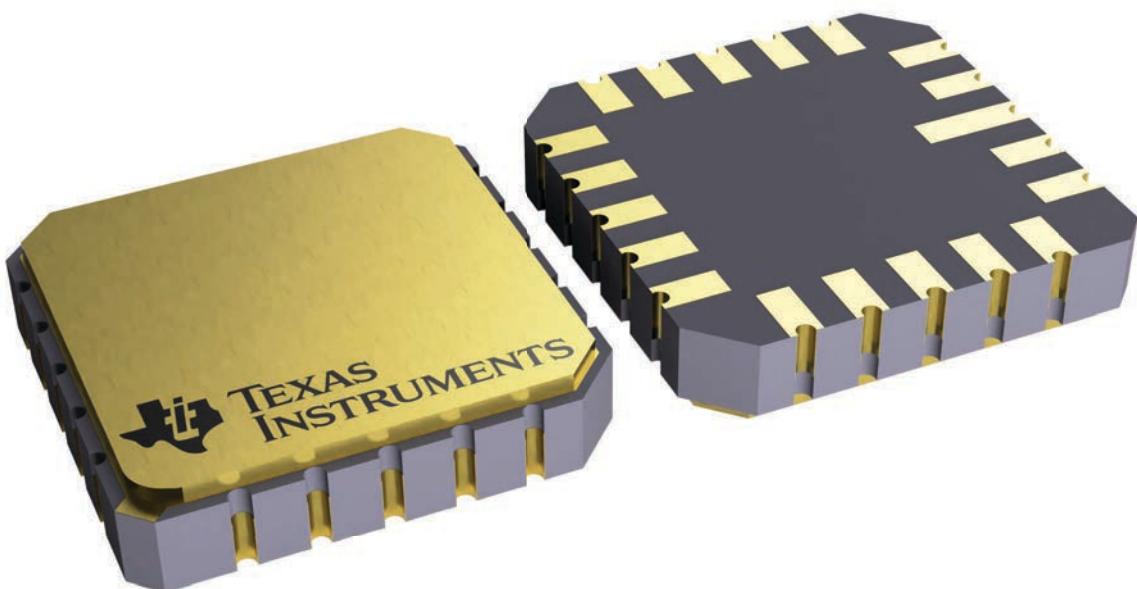
**FK 20**

**LCCC - 2.03 mm max height**

**8.89 x 8.89, 1.27 mm pitch**

**LEADLESS CERAMIC CHIP CARRIER**

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

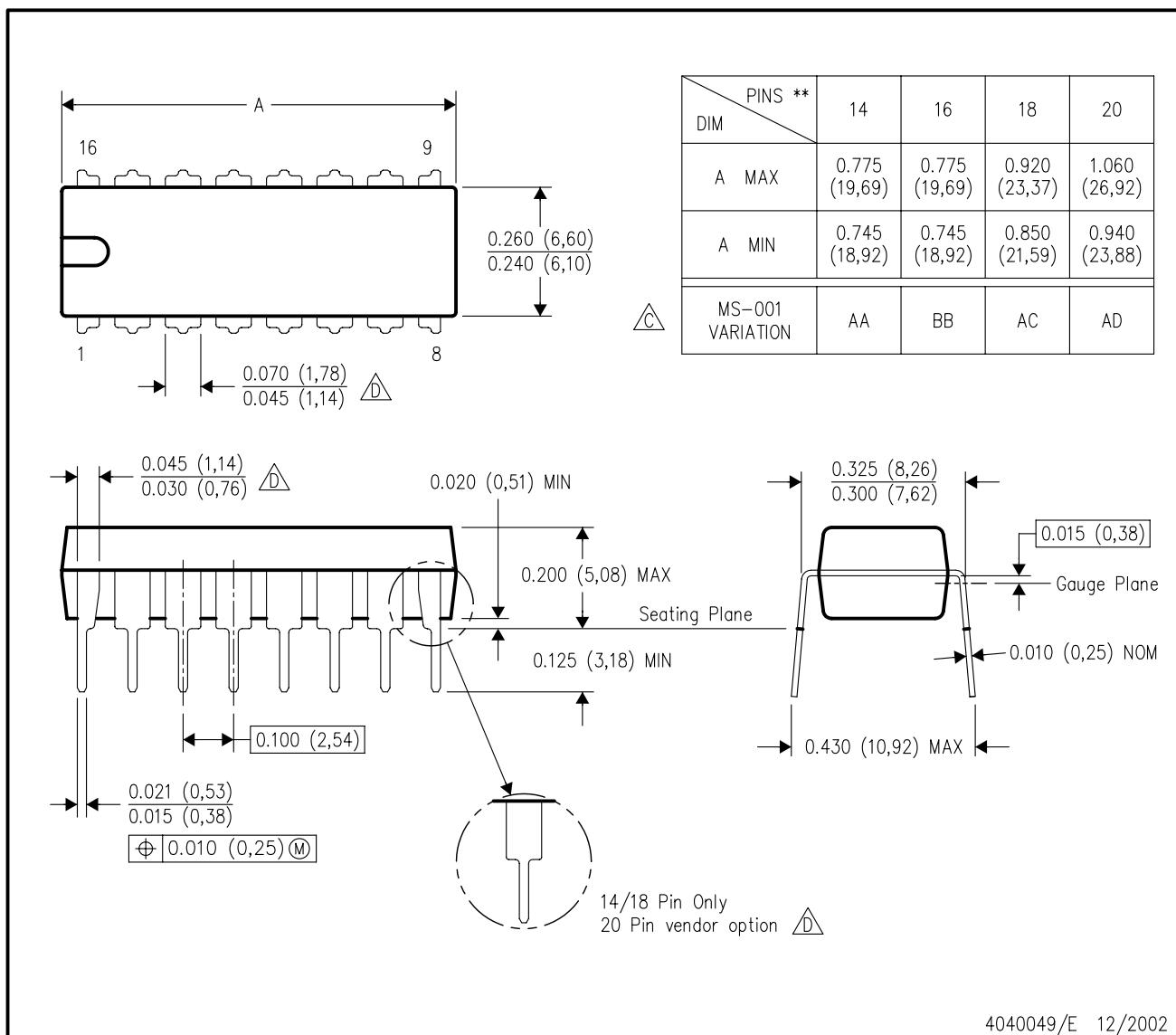


4229370VA\

## N (R-PDIP-T\*\*)

16 PINS SHOWN

## PLASTIC DUAL-IN-LINE PACKAGE



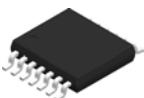
NOTES: A. All linear dimensions are in inches (millimeters).  
 B. This drawing is subject to change without notice.

△ Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).

△ The 20 pin end lead shoulder width is a vendor option, either half or full width.

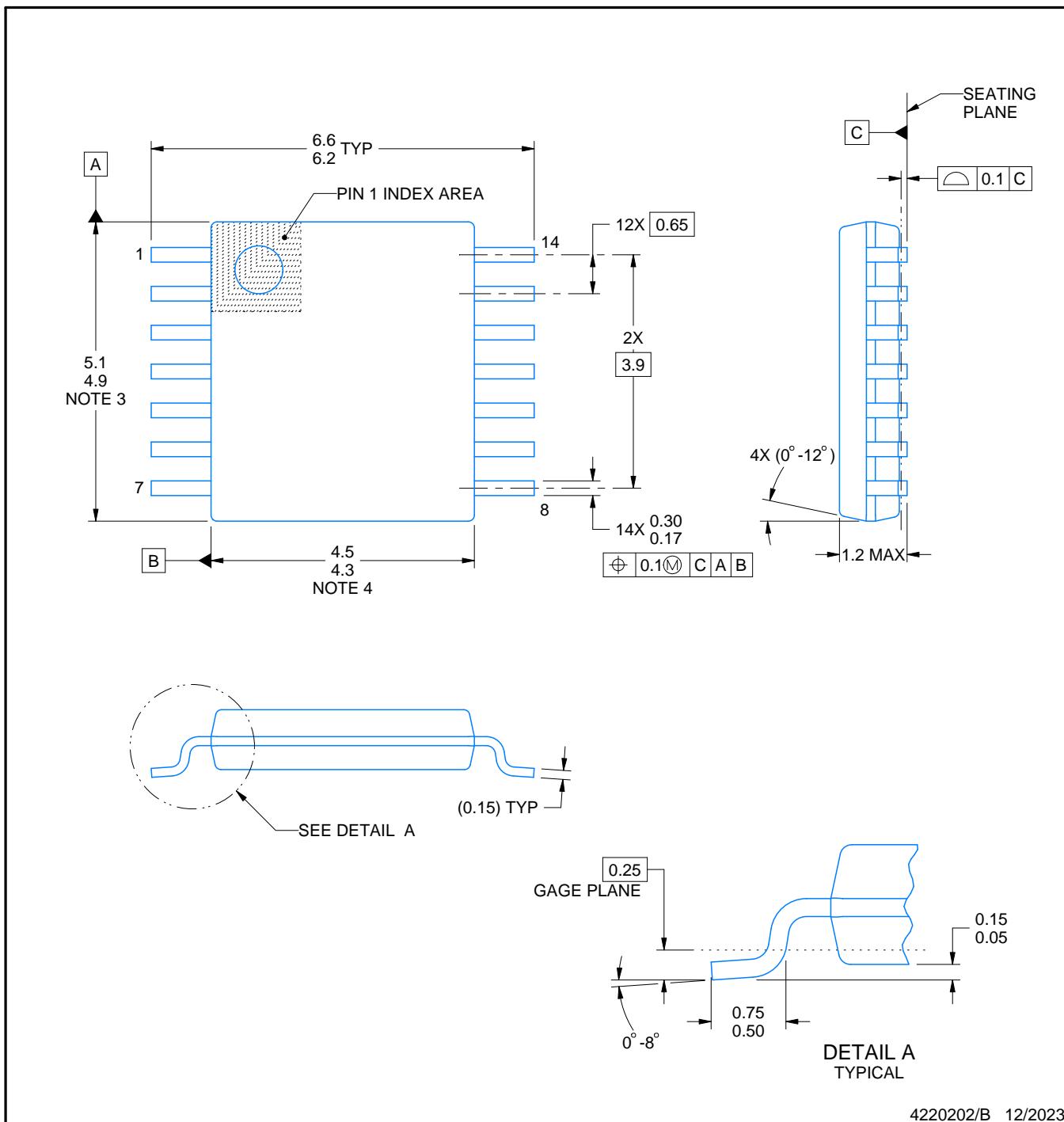
# PACKAGE OUTLINE

PW0014A



TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



## NOTES:

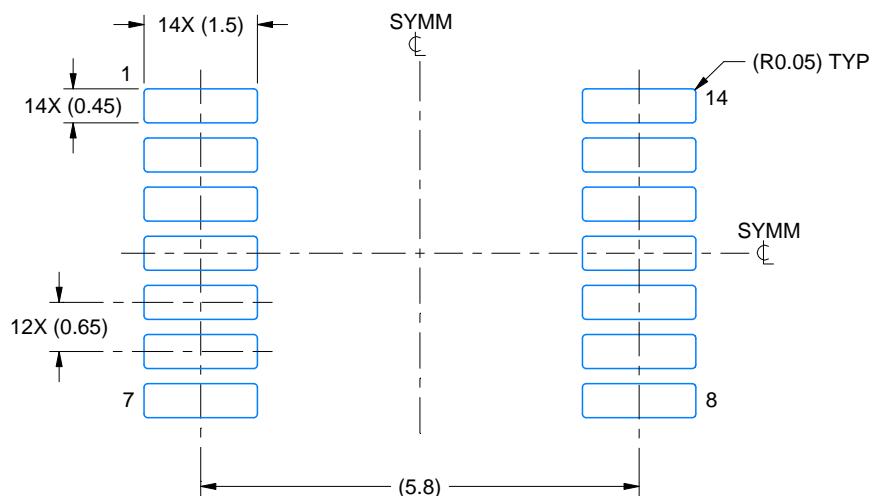
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or 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.

# EXAMPLE BOARD LAYOUT

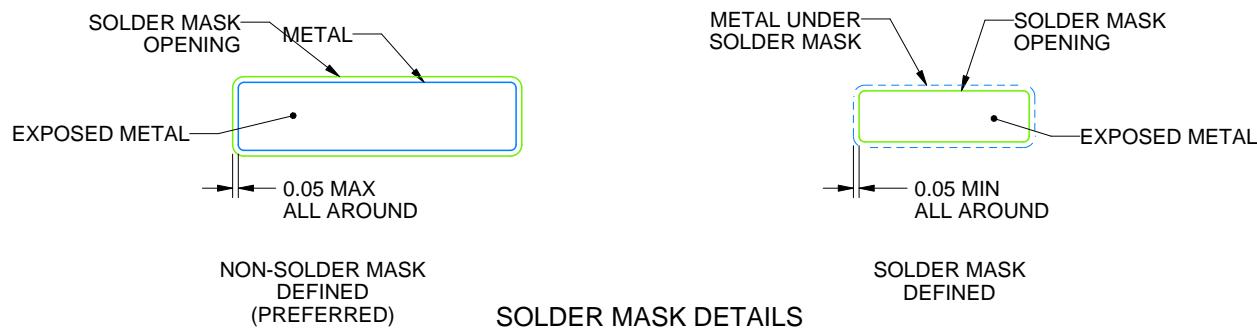
PW0014A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 10X



4220202/B 12/2023

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

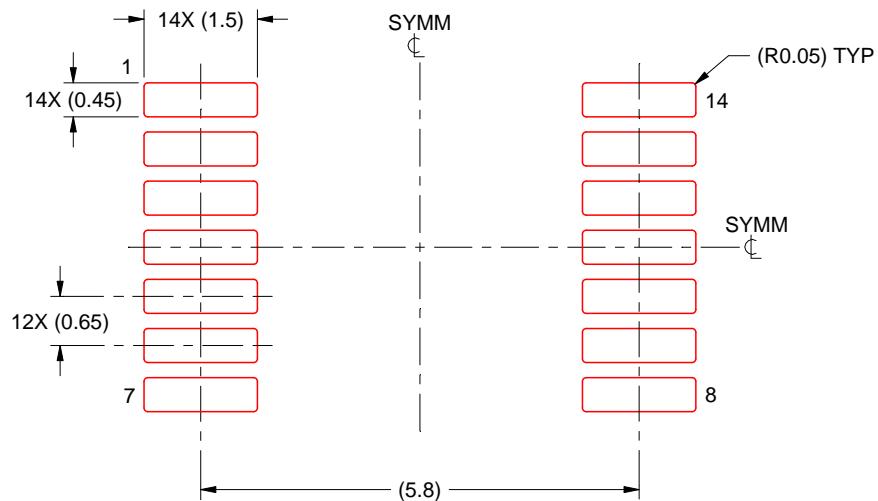
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

## EXAMPLE STENCIL DESIGN

**PW0014A**

## **TSSOP - 1.2 mm max height**

## SMALL OUTLINE PACKAGE



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

4220202/B 12/2023

#### NOTES: (continued)

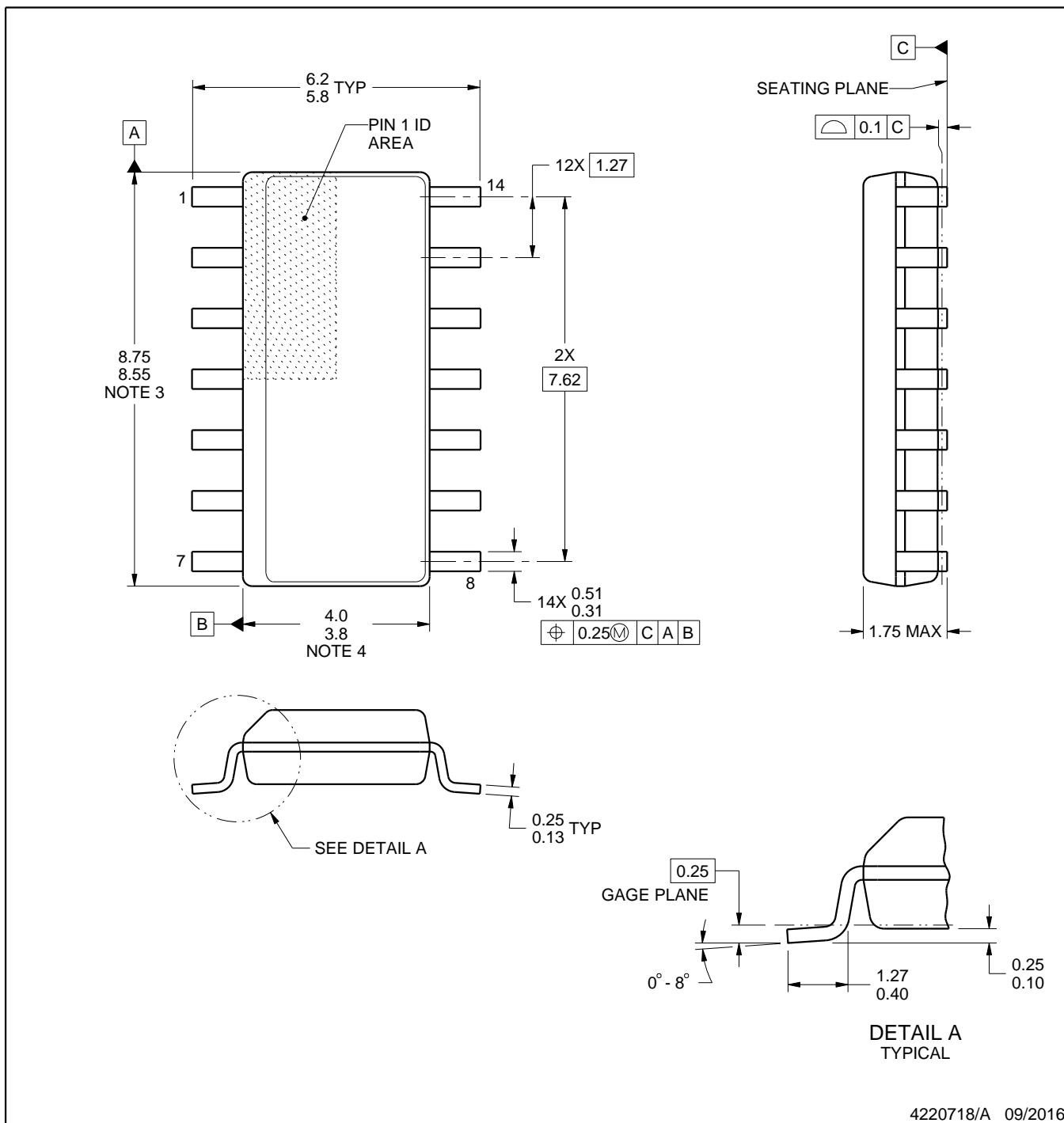
8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

# PACKAGE OUTLINE

D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



4220718/A 09/2016

## NOTES:

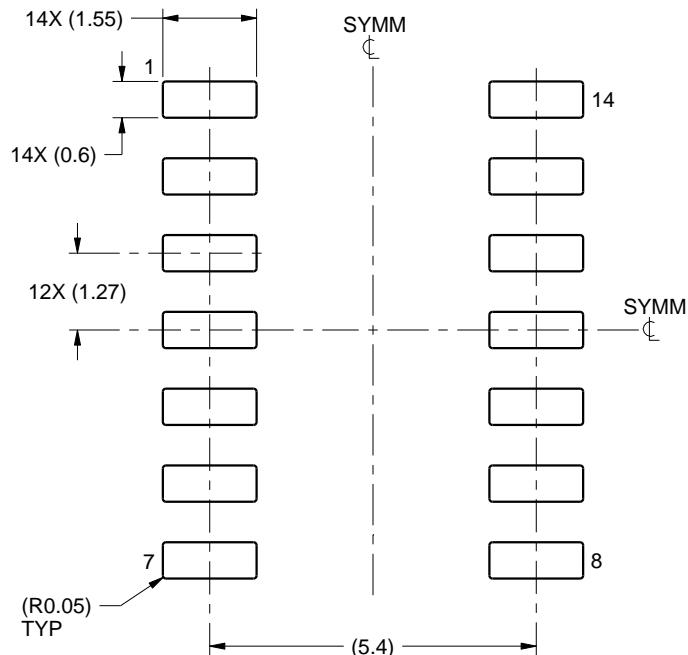
1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate 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.

# EXAMPLE BOARD LAYOUT

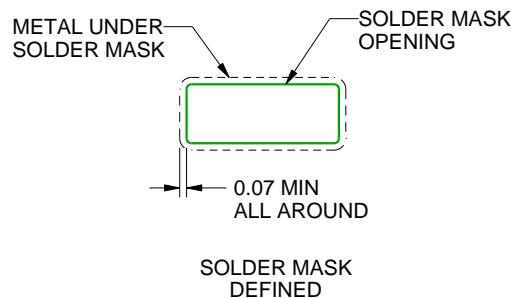
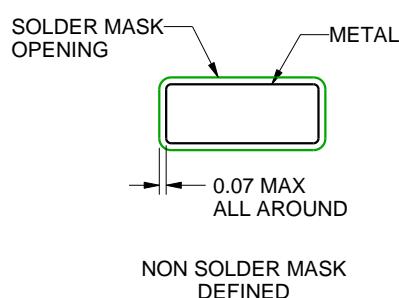
D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



LAND PATTERN EXAMPLE  
SCALE:8X



SOLDER MASK DETAILS

4220718/A 09/2016

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

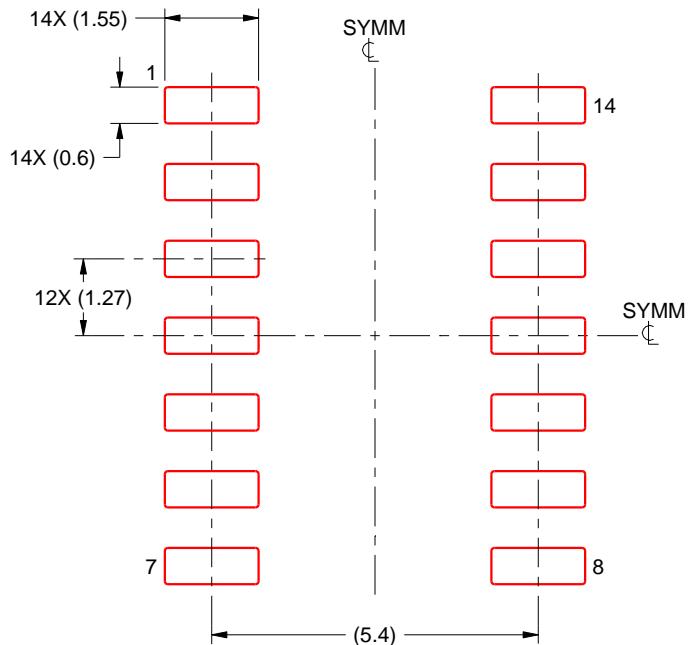
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# 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.

## GENERIC PACKAGE VIEW

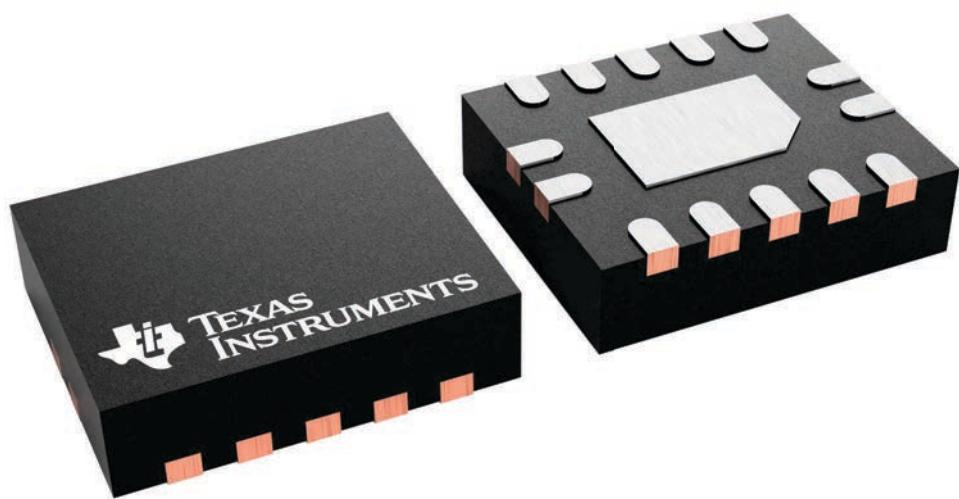
**BQA 14**

**WQFN - 0.8 mm max height**

**2.5 x 3, 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.



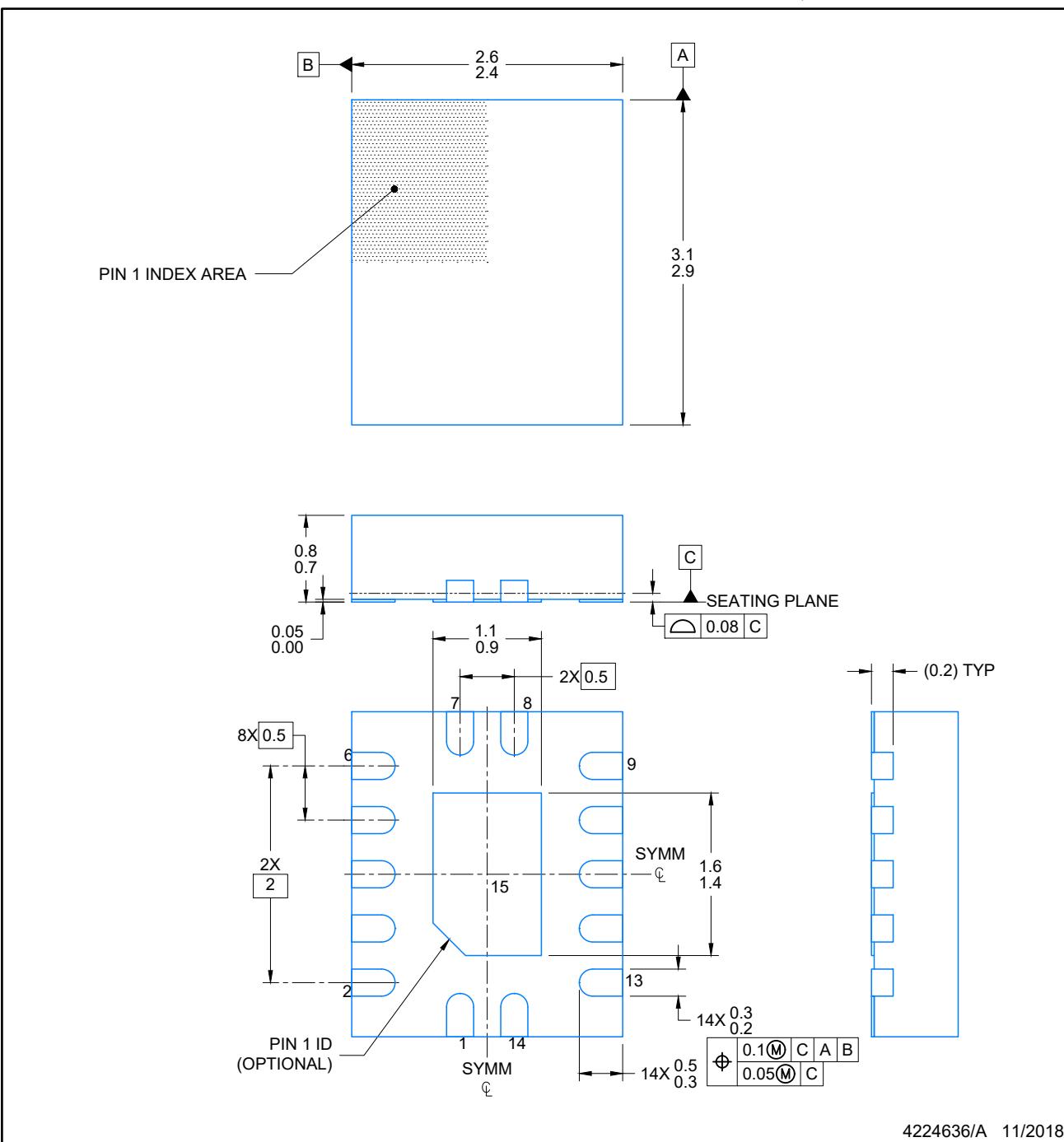
4227145/A

# PACKAGE OUTLINE

## WQFN - 0.8 mm max height

BQA0014A

PLASTIC QUAD FLAT PACK-NO LEAD



4224636/A 11/2018

### NOTES:

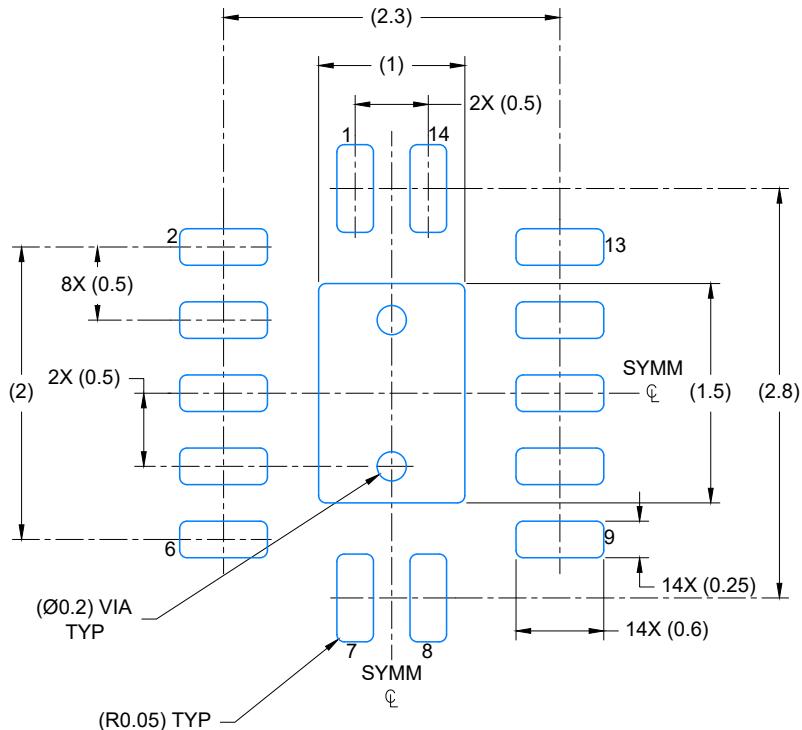
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. The package thermal pad must be soldered to the printed circuit board for optimal thermal and mechanical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

## EXAMPLE BOARD LAYOUT

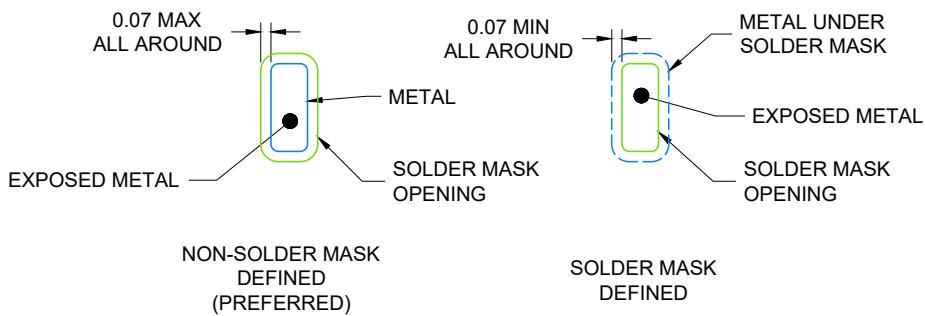
**BQA0014A**

## **WQFN - 0.8 mm max height**

**PLASTIC QUAD FLAT PACK-NO LEAD**



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 20X



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#### NOTES: (continued)

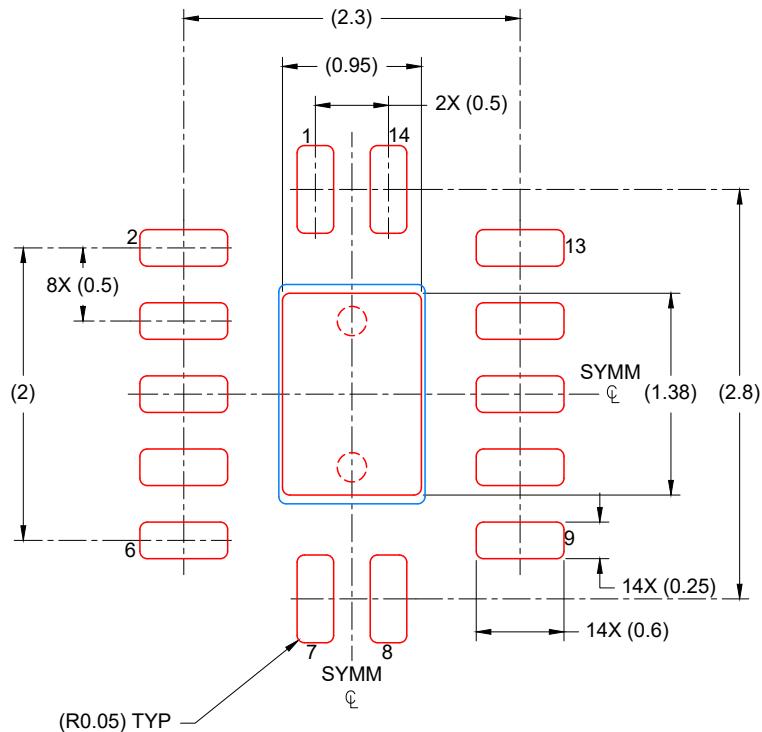
4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 ([www.ti.com/lit/slua271](http://www.ti.com/lit/slua271)).
5. Vias are optional depending on application, refer to device data sheet. If any vias are implemented, refer to their locations shown on this view. It is recommended that vias under paste be filled, plugged or tented.

# EXAMPLE STENCIL DESIGN

BQA0014A

WQFN - 0.8 mm max height

PLASTIC QUAD FLAT PACK-NO LEAD



SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL

EXPOSED PAD  
88% PRINTED COVERAGE BY AREA  
SCALE: 20X

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NOTES: (continued)

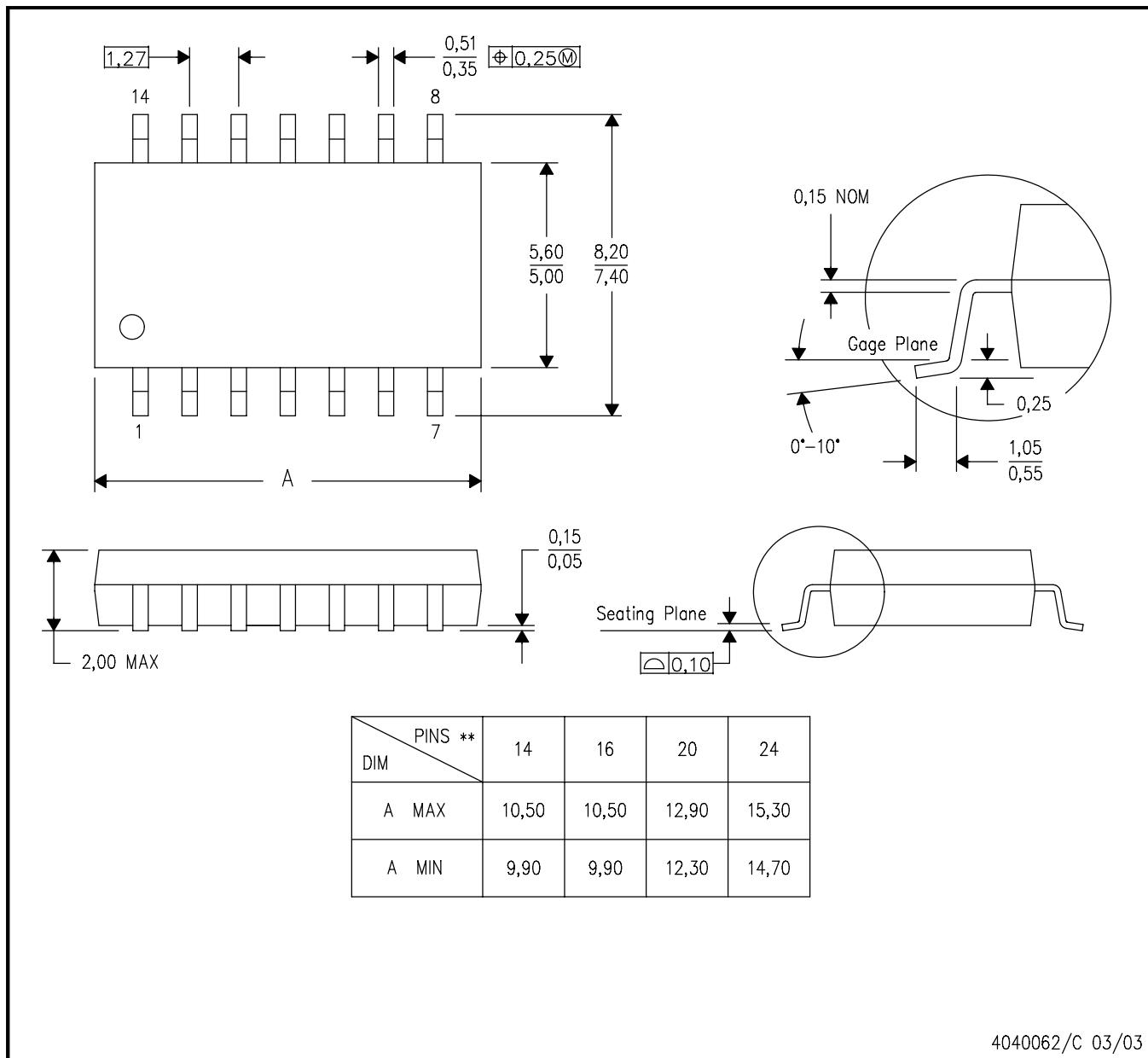
6. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.

## MECHANICAL DATA

**NS (R-PDSO-G\*\*)**

## PLASTIC SMALL-OUTLINE PACKAGE

**14-PINS SHOWN**



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.

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