

SNx4ACT74 Dual Positive-Edge-Triggered D-Type Flip-Flops

1 Features

- 4.5V to 5.5V V_{CC} operation
- Inputs accept voltages to 5.5V
- Max t_{pd} of 10.5ns at 5V
- Inputs are TTL-voltage compatible

2 Description

The 'ACT74 dual positive-edge-triggered devices are D-type flip-flops.

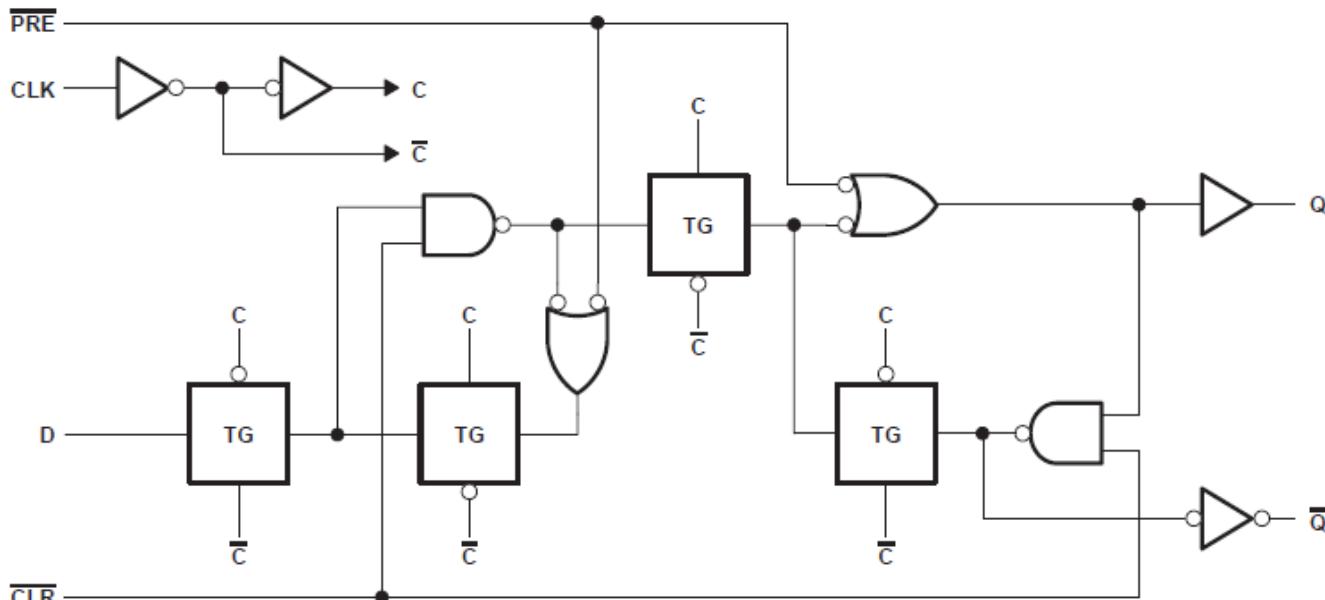
Device Information

PART NUMBER	PACKAGE ⁽¹⁾	PACKAGE SIZE ⁽²⁾	BODY SIZE ⁽³⁾
SNx4ACT74	PW (TSSOP, 14)	5mm × 6.4mm	5mm × 4.40mm
	D (SOIC, 14)	8.65mm × 6mm	8.65mm × 3.9mm
	DB (SSOP, 14)	6.2mm × 7.8mm	6.2mm × 5.3mm
	N (PDIP, 14)	19.3mm × 9.4mm	19.3mm × 6.35mm
	NS (SOP, 14)	10.2mm × 7.8mm	10.3mm × 5.3mm
	BQA (WQFN)	3mm × 2.5mm	3mm × 2.5mm

(1) For more information, see [Mechanical, Packaging, and Orderable Information](#).

(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)

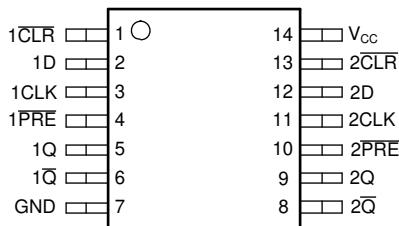


An IMPORTANT NOTICE at the end of this data sheet addresses availability, warranty, changes, use in safety-critical applications, intellectual property matters and other important disclaimers. PRODUCTION DATA.

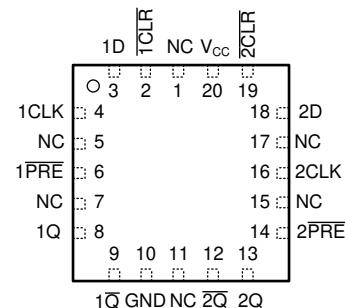
Table of Contents

1 Features	1	6.3 Device Functional Modes.....	8
2 Description	1	7 Application and Implementation	9
3 Pin Configuration and Functions	3	7.1 Power Supply Recommendations.....	9
4 Specifications	4	7.2 Layout.....	9
4.1 Absolute Maximum Ratings	4	8 Device and Documentation Support	10
4.2 Recommended Operating Conditions	4	8.1 Documentation Support (Analog).....	10
4.3 Thermal Information.....	4	8.2 Receiving Notification of Documentation Updates.....	10
4.4 Electrical Characteristics.....	5	8.3 Support Resources.....	10
4.5 Timing Requirements.....	5	8.4 Trademarks.....	10
4.6 Switching Characteristics.....	5	8.5 Electrostatic Discharge Caution.....	10
4.7 Operating Characteristics.....	6	8.6 Glossary.....	10
5 Parameter Measurement Information	7	9 Revision History	10
6 Detailed Description	8	10 Mechanical, Packaging, and Orderable Information	11
6.1 Overview.....	8		
6.2 Functional Block Diagram.....	8		

3 Pin Configuration and Functions



SN54ACT74 J or W Package; SN74ACT74 D, DB, N, NS, PW (Top View)



SN54ACT74 FK Package (Top View)

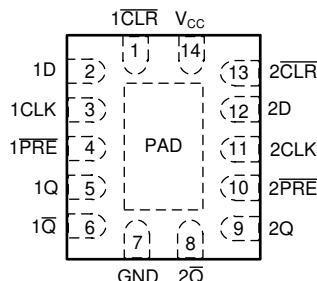


Figure 3-1. SN54ACT74 BQA Package (Top View)

PIN		TYPE ⁽¹⁾	DESCRIPTION
NAME	NO.		
1 CLR	1	Input	Channel 1, Clear Input, Active Low
1D	2	Input	Channel 1, Data Input
1CLK	3	Input	Channel 1, Positive edge triggered clock input
1 PRE	4	Input	Channel 1, Preset Input, Active Low
1Q	5	Output	Channel 1, Output
1 Q-bar	6	Output	Channel 1, Inverted Output
GND	7	—	Ground
2 Q-bar	8	Output	Channel 2, Inverted Output
2Q	9	Output	Channel 2, Output
2 PRE	10	Input	Channel 2, Preset Input, Active Low
2CLK	11	Input	Channel 2, Positive edge triggered clock input
2D	12	Input	Channel 2, Data Input
2 CLR	13	Input	Channel 2, Clear Input, Active Low
V _{cc}	14	—	Positive Supply

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

4 Specifications

4.1 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	Input voltage ⁽²⁾	-0.5	V _{CC} + 0.5	V
V _O	Voltage range applied to any output in the high-impedance or power-off state ⁽²⁾	-0.5	V _{CC} + 0.5	V
I _{IK}	Input clamp current (V _I < 0 or V _I > V _{CC})		±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})		±50	mA
	Continuous current through V _{CC} or GND		±200	mA
T _{stg}	Storage temperature range	-65	150	°C

4.2 Recommended Operating Conditions

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

		SN54ACT74		SN74ACT74		UNIT
		MIN	MAX	MIN	MAX	
V _{CC}	Supply voltage	4.5	5.5	4.5	5.5	V
V _{IH}	High-level input voltage	2		2		V
V _{IL}	Low-level input voltage		0.8		0.8	V
V _I	Input voltage	0	V _{CC}	0	V _{CC}	V
V _O	Output voltage	0	V _{CC}	0	V _{CC}	V
I _{OH}	High-level output current		-24		-24	mA
I _{OL}	Low-level output current		24		24	mA
Δt/Δv	Input transition rise and fall rate		8		8	ns/V
T _A	Operating free-air temperature	-55	125	-40	85	°C

4.3 Thermal Information

THERMAL METRIC ⁽¹⁾	SN74ACT74						
	BQA (WQFN)	D (SOIC)	DB (SSOP)	N (PDIP)	NS (SOP)	PW (TSSOP)	UNIT
	14 PINS						
R _{θJA}	Junction-to-ambient thermal resistance	91.3	119.9	96	80	76	145.7 °C/W
R _{θJC(top)}	Junction-to-case (top) thermal resistance	99.4	—	—	—	—	— °C/W
R _{θJB}	Junction-to-board thermal resistance	60.1	—	—	—	—	— °C/W
Ψ _{JT}	Junction-to-top characterization parameter	14.5	—	—	—	—	— °C/W
Ψ _{JB}	Junction-to-board characterization parameter	60.8	—	—	—	—	— °C/W
R _{θJC(bot)}	Junction-to-case (bottom) thermal resistance	37.0	—	—	—	—	— °C/W

(1) For more information about traditional and new thermal metrics, see the [Semiconductor and IC package thermal metrics](#) application report.

4.4 Electrical Characteristics

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

PARAMETER	TEST CONDITIONS	V _{CC}	T _A = 25°C			SN54ACT74		SN74ACT74		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
V _{OH}	I _{OH} = -50μA	4.5V	4.4	4.49		4.4		4.4		V
		5.5V	5.4	5.49		5.4		5.4		
	I _{OH} = -24mA	4.5V	3.86			3.7		3.76		
		5.5V	4.86			4.7		4.76		
	I _{OH} = -50mA† ⁽¹⁾	5.5V				3.86				
	I _{OH} = -75mA† ⁽¹⁾	5.5V						3.85		
V _{OL}	I _{OL} = 50μA	4.5V	0.001	0.1		0.1		0.1		V
		5.5V	0.001	0.1		0.1		0.1		
	I _{OL} = 24mA	4.5V		0.36		0.5		0.44		
		5.5V		0.36		0.5		0.44		
	I _{OL} = 50mA† ⁽¹⁾	5.5V				1.65				
	I _{OL} = 75mA† ⁽¹⁾	5.5V						1.65		
I _I	V _I = V _{CC} or GND	5.5V		±0.1		±1		±1	μA	
I _{CC}	V _I = V _{CC} or GND, I _O = 0	5.5V		2		40		20	μA	
ΔI _{CC‡} ⁽²⁾	One input at 3.4V, Other inputs at GND or V _{CC}	5.5V		0.6		1.6		1.5	mA	
C _i	V _I = V _{CC} or GND	5V		3					pF	

(1) Not more than one output should be tested at a time, and the duration of the test should not exceed 2ms.

(2) This is the increase in supply current for each input that is at one of the specified TTL voltage levels, rather than 0V or V_{CC}.

4.5 Timing Requirements

over recommended operating free-air temperature range (unless otherwise noted) (see [Load Circuit and Voltage Waveforms](#))

			T _A = 25°C		SN54ACT74		SN74ACT74		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	
f _{clock}	Clock frequency			145		85		125	MHz
t _w	Pulse duration	PRE or CLR low	5		7		6		ns
		CLK	5		7		6		
t _{su}	Setup time, data before CLK↑	Data	3		4		3.5		ns
			0		0.5		0		
t _h	Hold time, data after CLK↑	PRE or CLR inactive	1		1		1		ns

4.6 Switching Characteristics

over recommended operating free-air temperature range (unless otherwise noted) (see [Load Circuit and Voltage Waveforms](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	SN54ACT74			SN74ACT74			UNIT		
			T _A = 25°C			T _A = 25°C					
			MIN	TYP	MAX	MIN	TYP	MAX			
f _{max}			145	210		85	145	210	125	MHz	
t _{PLH}	PRE or CLR	Q or \bar{Q}	1	5.5	9.5	1	11.5	3	5.5	9.5	ns
			1	6	10	1	12.5	3	6	10	
t _{PHL}									3	11.5	

over recommended operating free-air temperature range (unless otherwise noted) (see [Load Circuit and Voltage Waveforms](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	SN54ACT74			SN74ACT74			UNIT			
			T _A = 25°C			T _A = 25°C						
			MIN	TYP	MAX	MIN	TYP	MAX				
t _{PLH}	CLK	Q or \bar{Q}	1	7.5	11	1	14	4	7.5	11	4	13
			1	6	10	1	12	3.5	6	10	3	11.5

4.7 Operating Characteristics

V_{CC} = 5V, T_A = 25°C

PARAMETER		TEST CONDITIONS				TYP	UNIT
C _{pd}	Power dissipation capacitance	C _L = 50pF, f = 1MHz				45	pF

5 Parameter Measurement Information

C_L includes probe and jig capacitance. All input pulses are supplied by generators having the following characteristics: $PRR \leq 1\text{MHz}$, $ZO = 50\Omega$, $tr \leq 2.5\text{ns}$, $tf \leq 2.5\text{ns}$. The outputs are measured one at a time with one input transition per measurement.

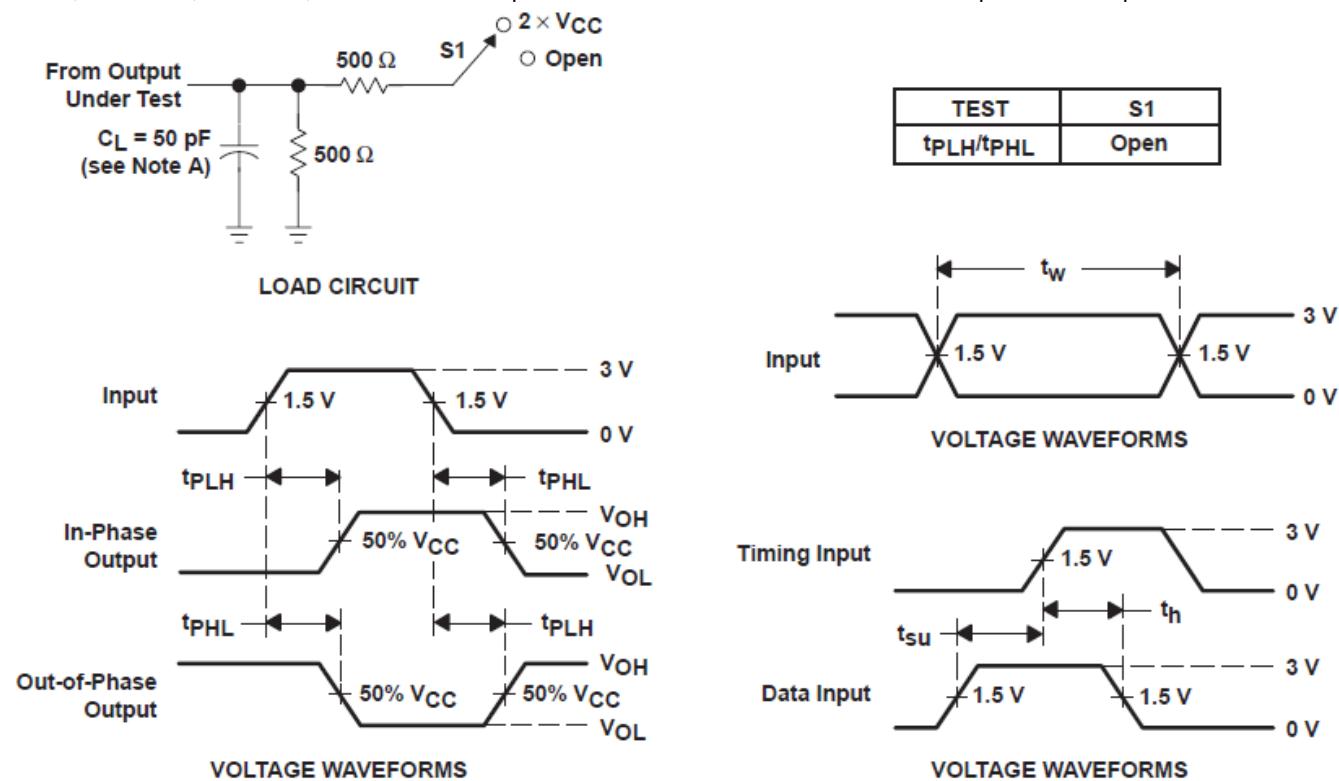


Figure 5-1. Load Circuit and Voltage Waveforms

Note

- A. C_L includes probe and jig capacitance.
- B. All input pulses are supplied by generators having the following characteristics: $PRR \leq 1\text{MHz}$, $ZO = 50\Omega$, $tr \leq 2.5\text{ns}$, $tf \leq 2.5\text{ns}$.
- C. The outputs are measured one at a time, with one input transition per measurement.

6 Detailed Description

6.1 Overview

A low level at the preset ($\overline{\text{PRE}}$) or clear ($\overline{\text{CLR}}$) input sets or resets the outputs, regardless of the levels of the other inputs. When $\overline{\text{PRE}}$ and $\overline{\text{CLR}}$ are inactive (high), data at the data (D) input meeting the setup-time requirements is transferred to the outputs on the positive-going edge of the clock pulse. Clock triggering occurs at a voltage level and is not directly related to the rise time of the clock pulse. Following the hold-time interval, changing data at D does not affect the levels at the outputs.

6.2 Functional Block Diagram

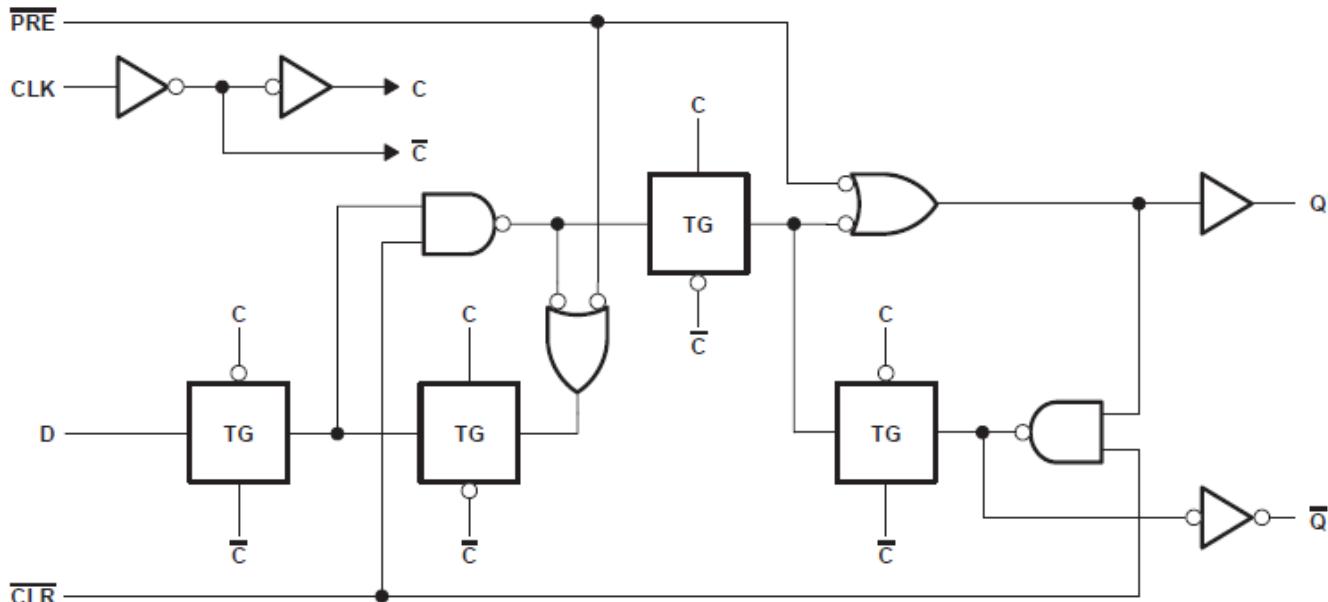


Figure 6-1. Logic Diagram (Positive Logic)

6.3 Device Functional Modes

Table 6-1. Function Table (each flip-flop)

INPUTS				OUTPUTS	
PRE	CLR	CLK	D	Q	\overline{Q}
L	H	X	X	H	L
H	L	X	X	L	H
L	L	X	X	H1	H1
H	H	↑	H	H	L
H	H	↑	L	L	H
H	H	L	X	Q_0	\overline{Q}_0

1. This configuration is nonstable; that is, it does not persist when either PRE or CLR returns to its inactive (high) level.

7 Application and Implementation

Note

Information in the following applications sections is not part of the TI component specification, and TI does not warrant its accuracy or completeness. TI's customers are responsible for determining suitability of components for their purposes, as well as validating and testing their design implementation to confirm system functionality.

7.1 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 $0.1\mu F$ capacitor is recommended for this device. Parallel multiple bypass capacitors to reject different frequencies of noise is acceptable. $0.1\mu F$ and $1\mu F$ 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 Figure 7-1.

7.2 Layout

7.2.1 Layout Guidelines

When using multiple bit logic devices inputs should not ever float.

In many cases, functions or parts of functions of digital logic devices are unused, for example, when only two inputs of a triple-input AND gate are used or only three of the four buffer gates are used. Such input pins should not be left unconnected because the undefined voltages at the outside connections result in undefined operational states. Specified below are the rules that must be observed under all circumstances. All unused inputs of digital logic devices must be connected to a high or low bias to prevent them from floating. The logic level that should be applied to any particular unused input depends on the function of the device. Generally they will be tied to GND or V_{CC} whichever make more sense or is more convenient. Floating outputs is generally acceptable, unless the part is a transceiver. If the transceiver has an output enable pin it will disable the outputs section of the part when asserted. This will not disable the input section of the I.O's so they also cannot float when disabled.

7.2.2 Layout Example

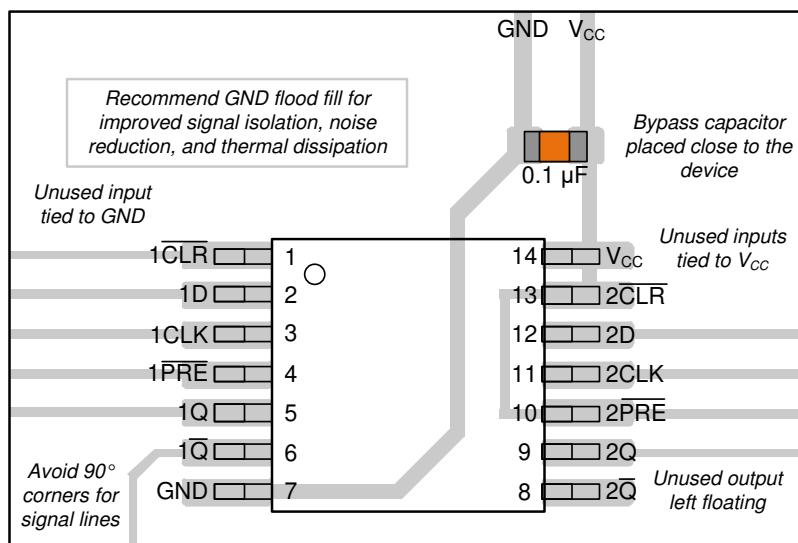


Figure 7-1. Example Layout for the in the SNx4ACT74 Package

8 Device and Documentation Support

TI offers an extensive line of development tools. Tools and software to evaluate the performance of the device, generate code, and develop solutions are listed below.

8.1 Documentation Support (Analog)

8.1.1 Related Documentation

The table below lists quick access links. Categories include technical documents, support and community resources, tools and software, and quick access to sample or buy.

Table 8-1. Related Links

PARTS	PRODUCT FOLDER	SAMPLE & BUY	TECHNICAL DOCUMENTS	TOOLS & SOFTWARE	SUPPORT & COMMUNITY
SN54ACT74	Click here				
SN74ACT74	Click here				

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 I (July 2024) to Revision J (April 2025)	Page
• Added BQA Package.....	3
• Added BQA thermal information.....	4

Changes from Revision H (October 2003) to Revision I (July 2024)	Page
• Added <i>Device Information</i> table, <i>Pin Functions</i> table, <i>Thermal Information</i> table, <i>Device Functional Modes, Application and Implementation</i> section, <i>Device and Documentation Support</i> section, and <i>Mechanical, Packaging, and Orderable Information</i> section	1
• Updated the numbering format for tables, figures, and cross-references throughout the document.....	1
• Updated R _{θJA} values: D = 86 to 119.9, PW = 113 to 145.7, all values in °C/W.....	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.

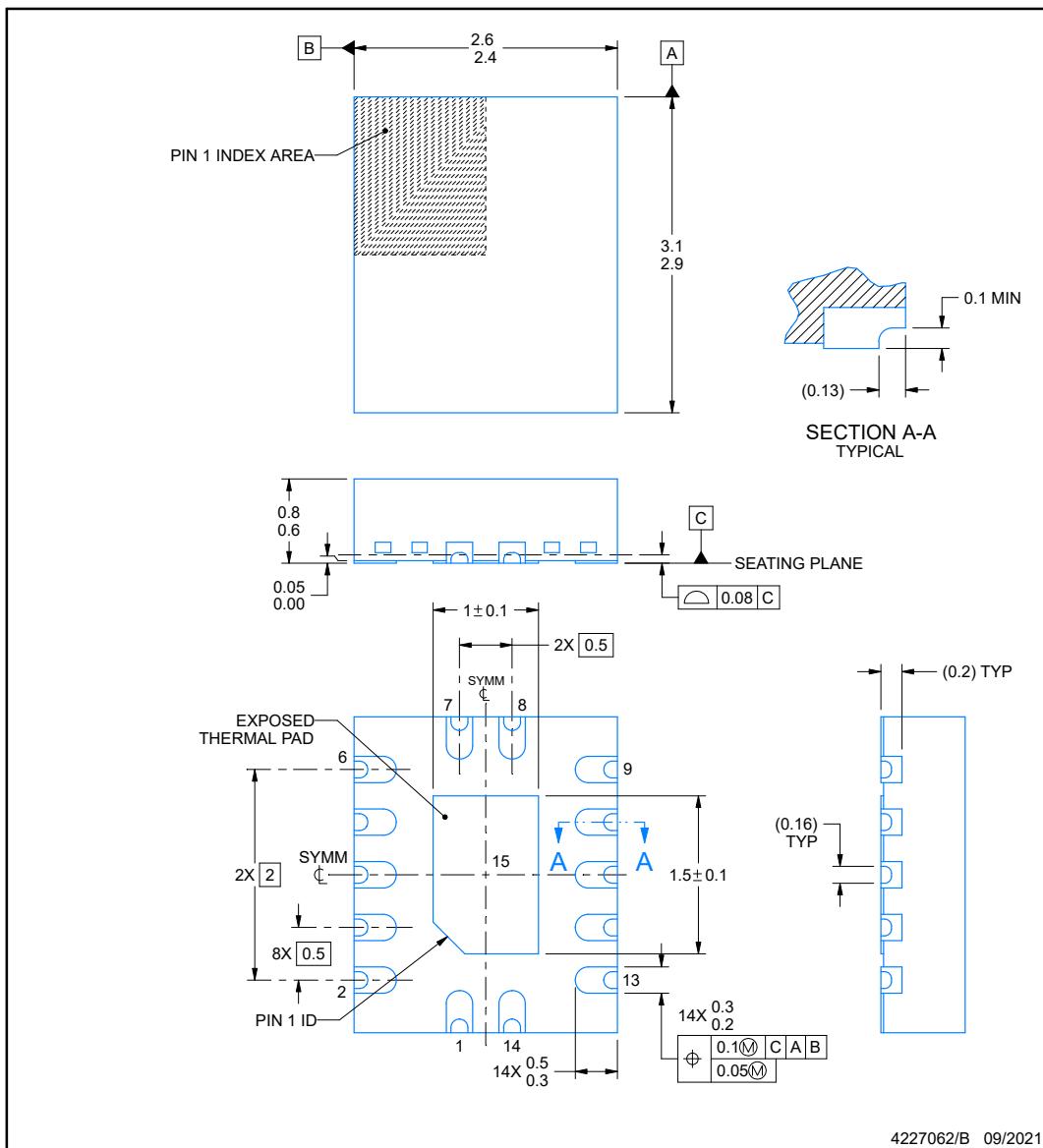
BQA0014B



PACKAGE OUTLINE

WQFN - 0.8 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.

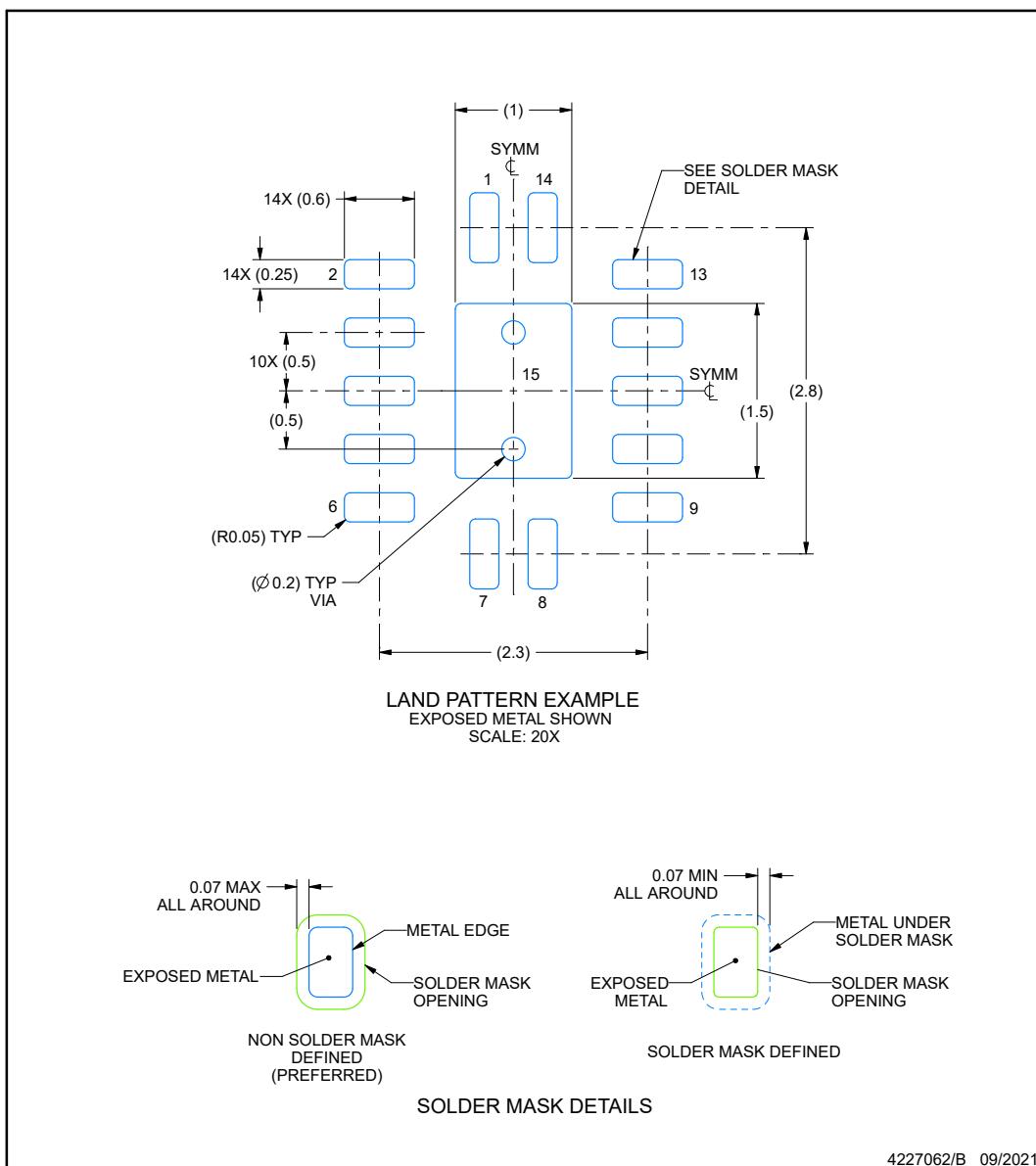


EXAMPLE BOARD LAYOUT

BQA0014B

WQFN - 0.8 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



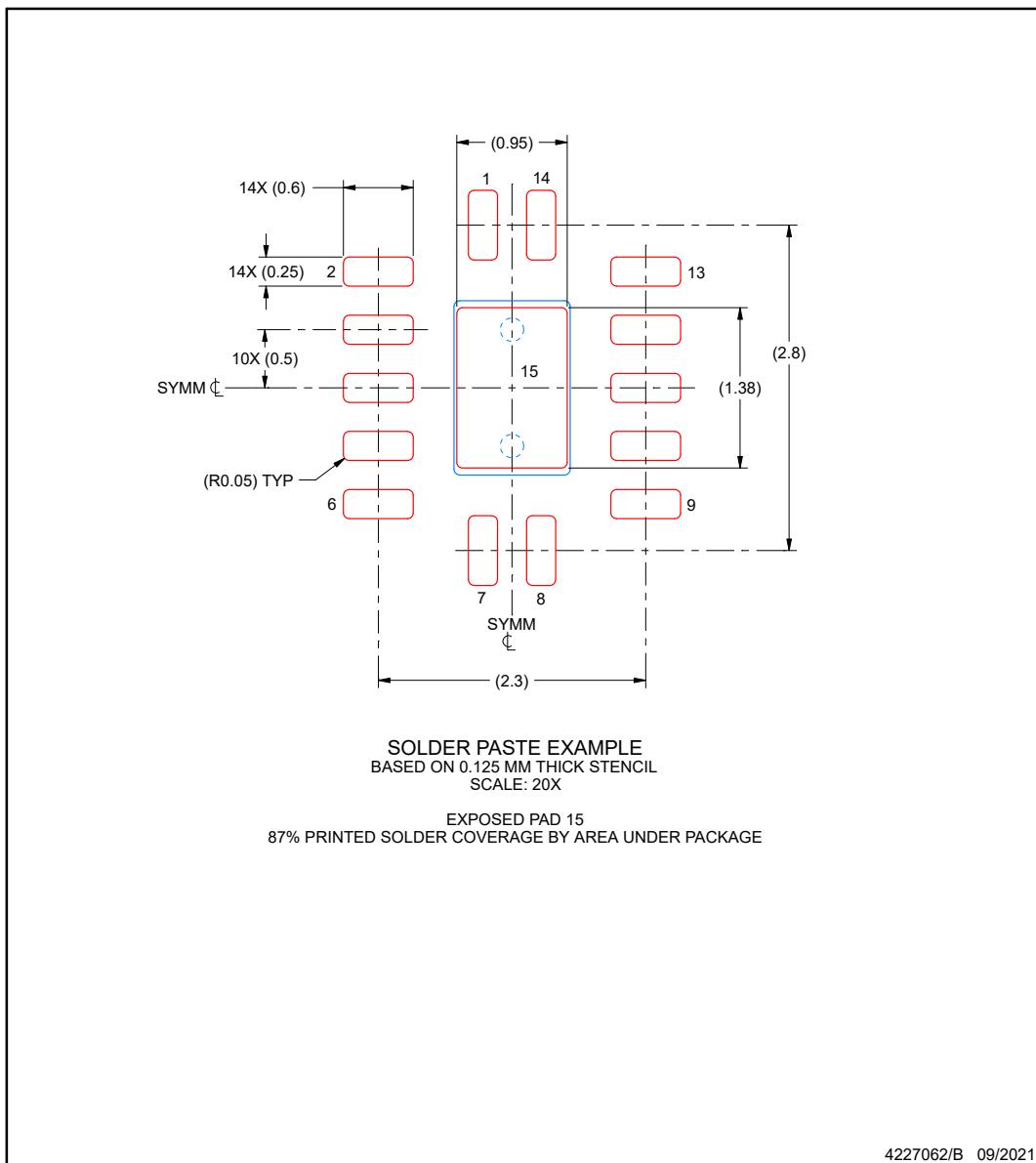
NOTES: (continued)

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).
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**BQA0014B****WQFN - 0.8 mm max height**

PLASTIC QUAD FLATPACK - NO LEAD



NOTES: (continued)

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

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)
5962-8752501M2A	Active	Production	LCCC (FK) 20	55 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8752501M2A SNJ54ACT74FK
5962-8752501MCA	Active	Production	CDIP (J) 14	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8752501MC A SNJ54ACT74J
5962-8752501MDA	Active	Production	CFP (W) 14	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8752501MD A SNJ54ACT74W
SN74ACT74BQAR	Active	Production	WQFN (BQA) 14	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AD74
SN74ACT74D	Obsolete	Production	SOIC (D) 14	-	-	Call TI	Call TI	-40 to 85	ACT74
SN74ACT74DBR	Active	Production	SSOP (DB) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AD74
SN74ACT74DBR.A	Active	Production	SSOP (DB) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AD74
SN74ACT74DR	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	ACT74
SN74ACT74DR.A	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	ACT74
SN74ACT74DR1G4	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	ACT74
SN74ACT74DR1G4.A	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	ACT74
SN74ACT74N	Active	Production	PDIP (N) 14	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 85	SN74ACT74N
SN74ACT74N.A	Active	Production	PDIP (N) 14	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 85	SN74ACT74N
SN74ACT74NE4	Active	Production	PDIP (N) 14	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 85	SN74ACT74N
SN74ACT74NSR	Active	Production	SOP (NS) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	ACT74
SN74ACT74NSR.A	Active	Production	SOP (NS) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	ACT74
SN74ACT74PW	Obsolete	Production	TSSOP (PW) 14	-	-	Call TI	Call TI	-40 to 85	AD74
SN74ACT74PWR	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU SN	Level-1-260C-UNLIM	-40 to 85	AD74
SN74ACT74PWR.A	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AD74
SN74ACT74PWRG4	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AD74
SN74ACT74PWRG4.A	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AD74
SNJ54ACT74FK	Active	Production	LCCC (FK) 20	55 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8752501M2A SNJ54ACT74FK

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)
SNJ54ACT74FK.A	Active	Production	LCCC (FK) 20	55 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 8752501M2A SNJ54ACT 74FK
SNJ54ACT74J	Active	Production	CDIP (J) 14	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8752501MC A SNJ54ACT74J
SNJ54ACT74J.A	Active	Production	CDIP (J) 14	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8752501MC A SNJ54ACT74J
SNJ54ACT74W	Active	Production	CFP (W) 14	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8752501MD A SNJ54ACT74W
SNJ54ACT74W.A	Active	Production	CFP (W) 14	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8752501MD A SNJ54ACT74W

⁽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 SN54ACT74, SN74ACT74 :

- Catalog : [SN74ACT74](#)
- Automotive : [SN74ACT74-Q1](#), [SN74ACT74-Q1](#)
- Enhanced Product : [SN74ACT74-EP](#), [SN74ACT74-EP](#)
- Military : [SN54ACT74](#)

NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product
- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects
- Enhanced Product - Supports Defense, Aerospace and Medical Applications
- 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
SN74ACT74BQAR	WQFN	BQA	14	3000	180.0	12.4	2.8	3.3	1.1	4.0	12.0	Q1
SN74ACT74DBR	SSOP	DB	14	2000	330.0	16.4	8.35	6.6	2.4	12.0	16.0	Q1
SN74ACT74NSR	SOP	NS	14	2000	330.0	16.4	8.1	10.4	2.5	12.0	16.0	Q1
SN74ACT74PWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74ACT74PWRG4	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)
SN74ACT74BQAR	WQFN	BQA	14	3000	210.0	185.0	35.0
SN74ACT74DBR	SSOP	DB	14	2000	353.0	353.0	32.0
SN74ACT74NSR	SOP	NS	14	2000	353.0	353.0	32.0
SN74ACT74PWR	TSSOP	PW	14	2000	353.0	353.0	32.0
SN74ACT74PWRG4	TSSOP	PW	14	2000	353.0	353.0	32.0

TUBE


*All dimensions are nominal

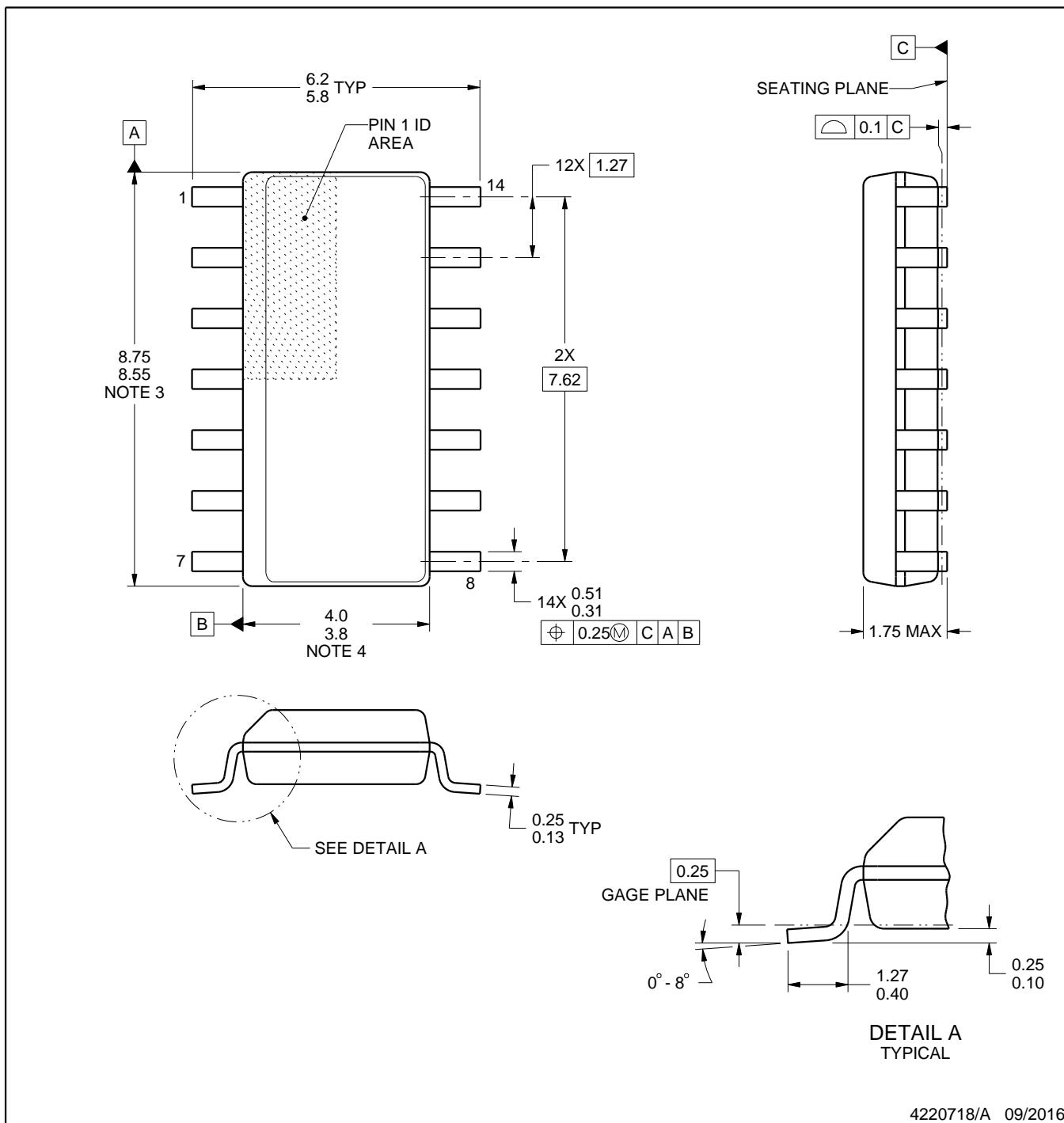
Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
5962-8752501M2A	FK	LCCC	20	55	506.98	12.06	2030	NA
5962-8752501MDA	W	CFP	14	25	506.98	26.16	6220	NA
SN74ACT74N	N	PDIP	14	25	506	13.97	11230	4.32
SN74ACT74N	N	PDIP	14	25	506	13.97	11230	4.32
SN74ACT74N.A	N	PDIP	14	25	506	13.97	11230	4.32
SN74ACT74N.A	N	PDIP	14	25	506	13.97	11230	4.32
SN74ACT74NE4	N	PDIP	14	25	506	13.97	11230	4.32
SN74ACT74NE4	N	PDIP	14	25	506	13.97	11230	4.32
SNJ54ACT74FK	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54ACT74FK.A	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54ACT74W	W	CFP	14	25	506.98	26.16	6220	NA
SNJ54ACT74W.A	W	CFP	14	25	506.98	26.16	6220	NA

PACKAGE OUTLINE

D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



4220718/A 09/2016

NOTES:

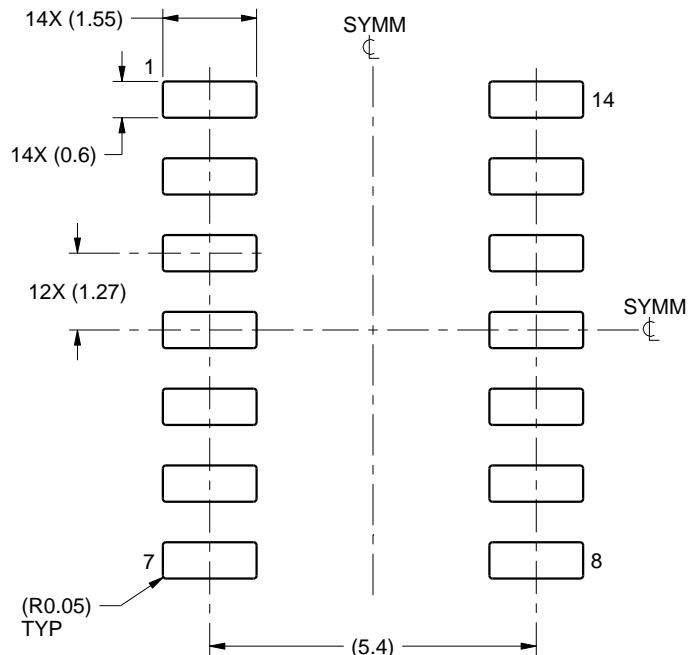
1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate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

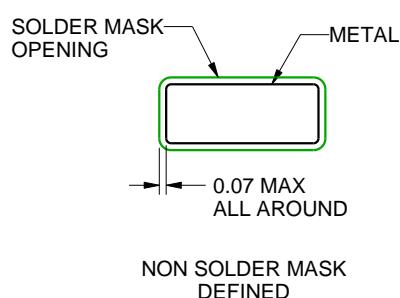
D0014A

SOIC - 1.75 mm max height

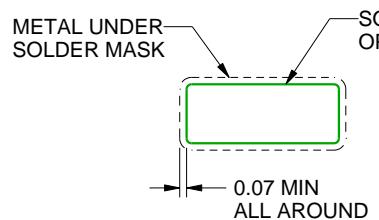
SMALL OUTLINE INTEGRATED CIRCUIT



LAND PATTERN EXAMPLE
SCALE:8X



NON SOLDER MASK
DEFINED



SOLDER MASK
DEFINED

SOLDER MASK DETAILS

4220718/A 09/2016

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

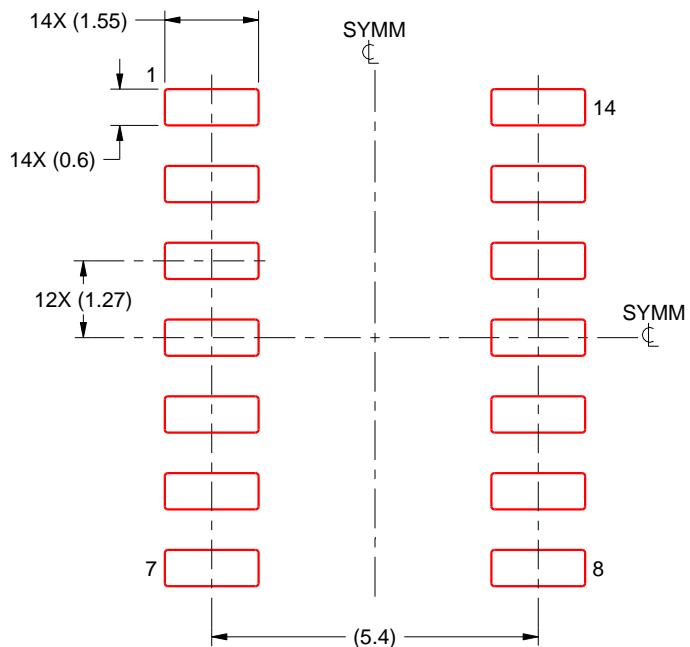
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

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

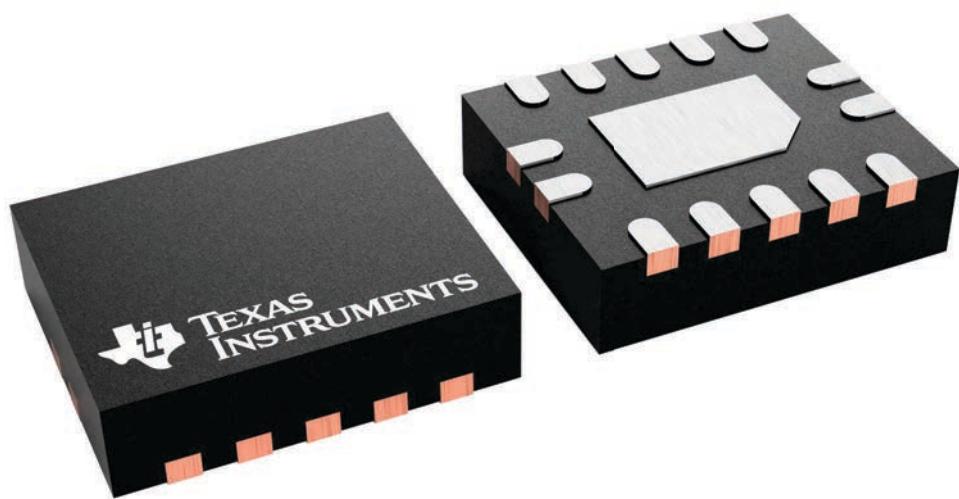
BQA 14

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.



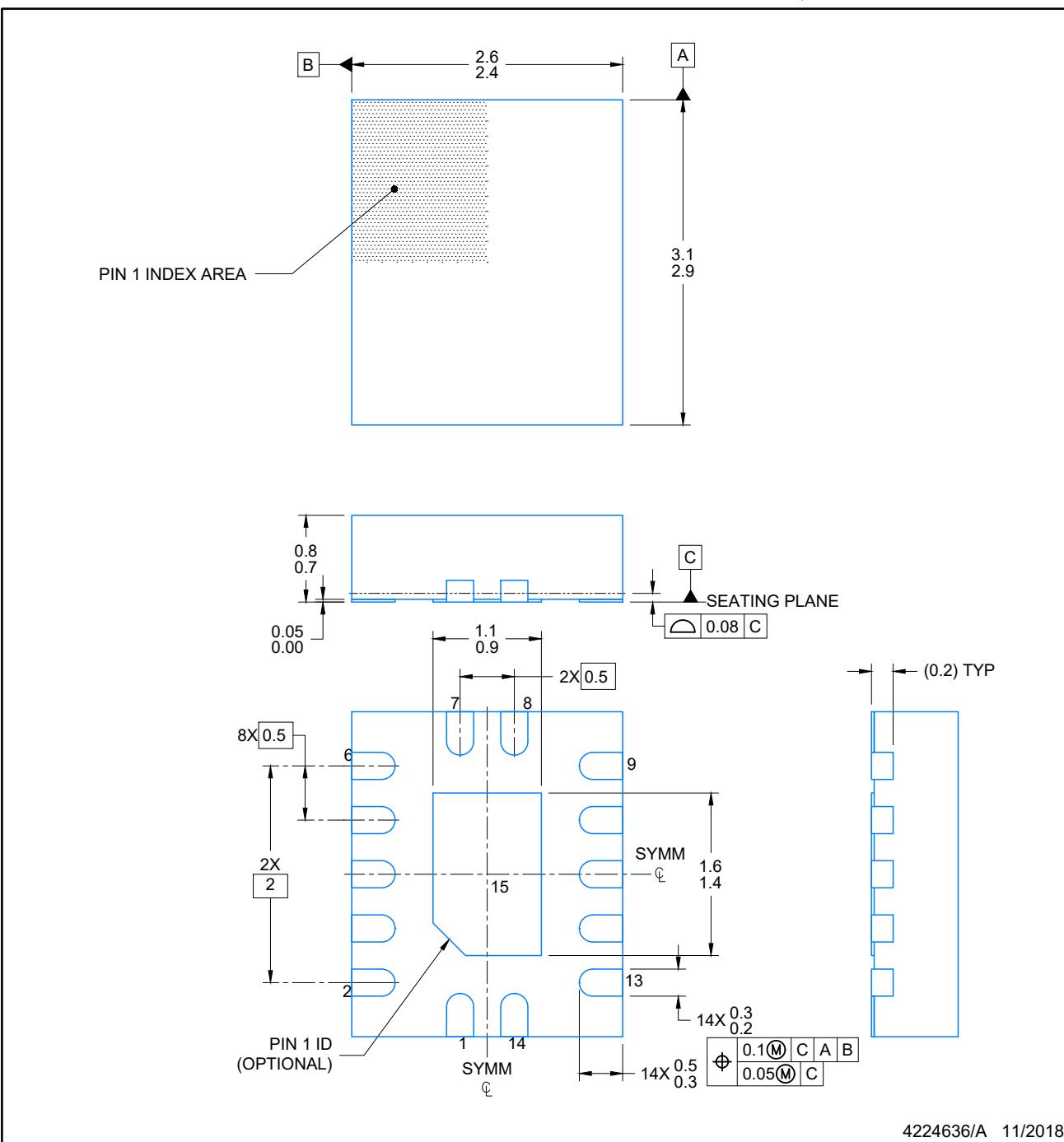
4227145/A

PACKAGE OUTLINE

WQFN - 0.8 mm max height

BQA0014A

PLASTIC QUAD FLAT PACK-NO LEAD



4224636/A 11/2018

NOTES:

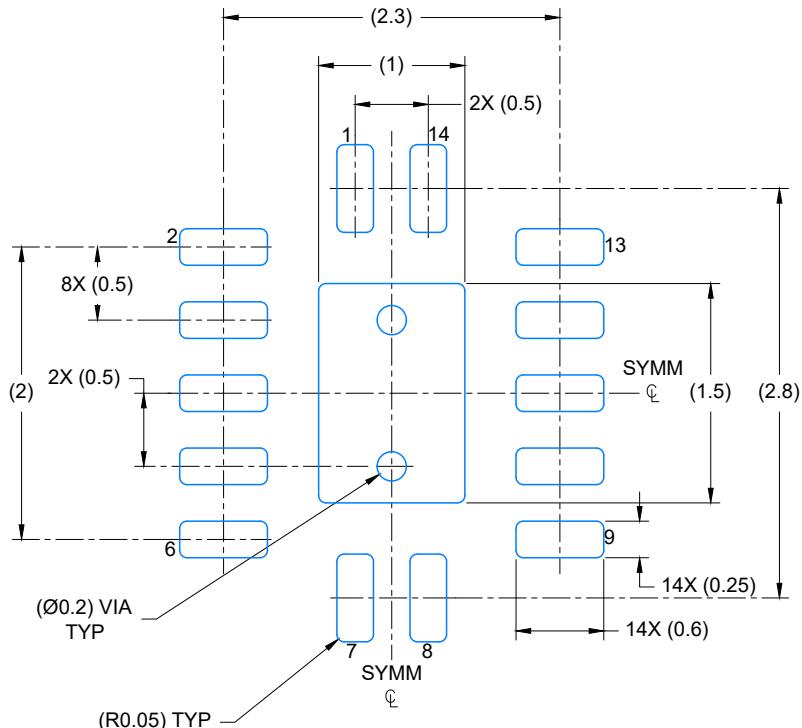
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. The package thermal pad must be soldered to the printed circuit board for optimal thermal and mechanical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

EXAMPLE BOARD LAYOUT

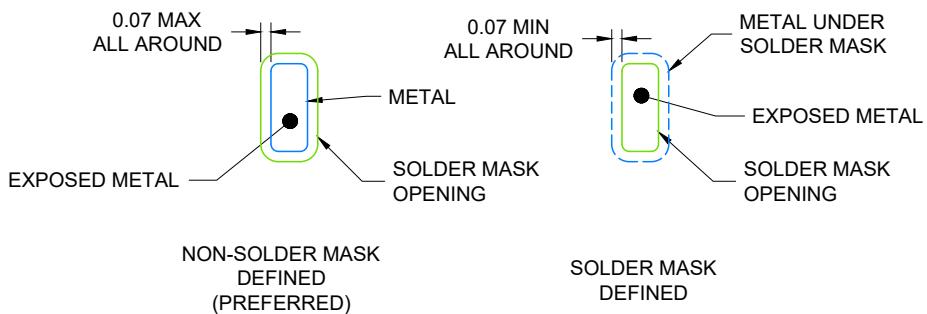
BQA0014A

WQFN - 0.8 mm max height

PLASTIC QUAD FLAT PACK-NO LEAD



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 20X



4224636/A 11/2018

NOTES: (continued)

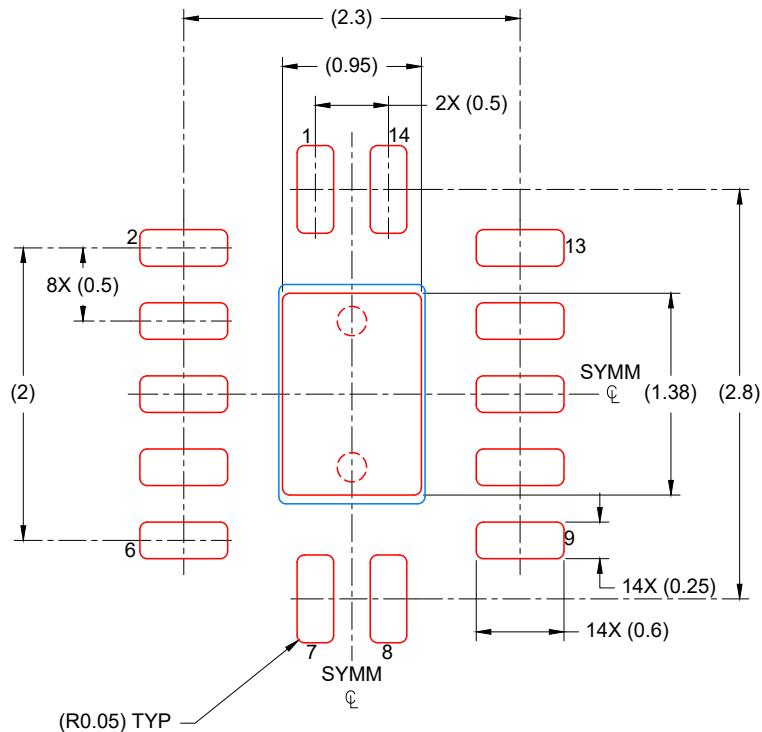
4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slua271).
5. Vias are optional depending on application, refer to device data sheet. If any vias are implemented, refer to their locations shown 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

4224636/A 11/2018

NOTES: (continued)

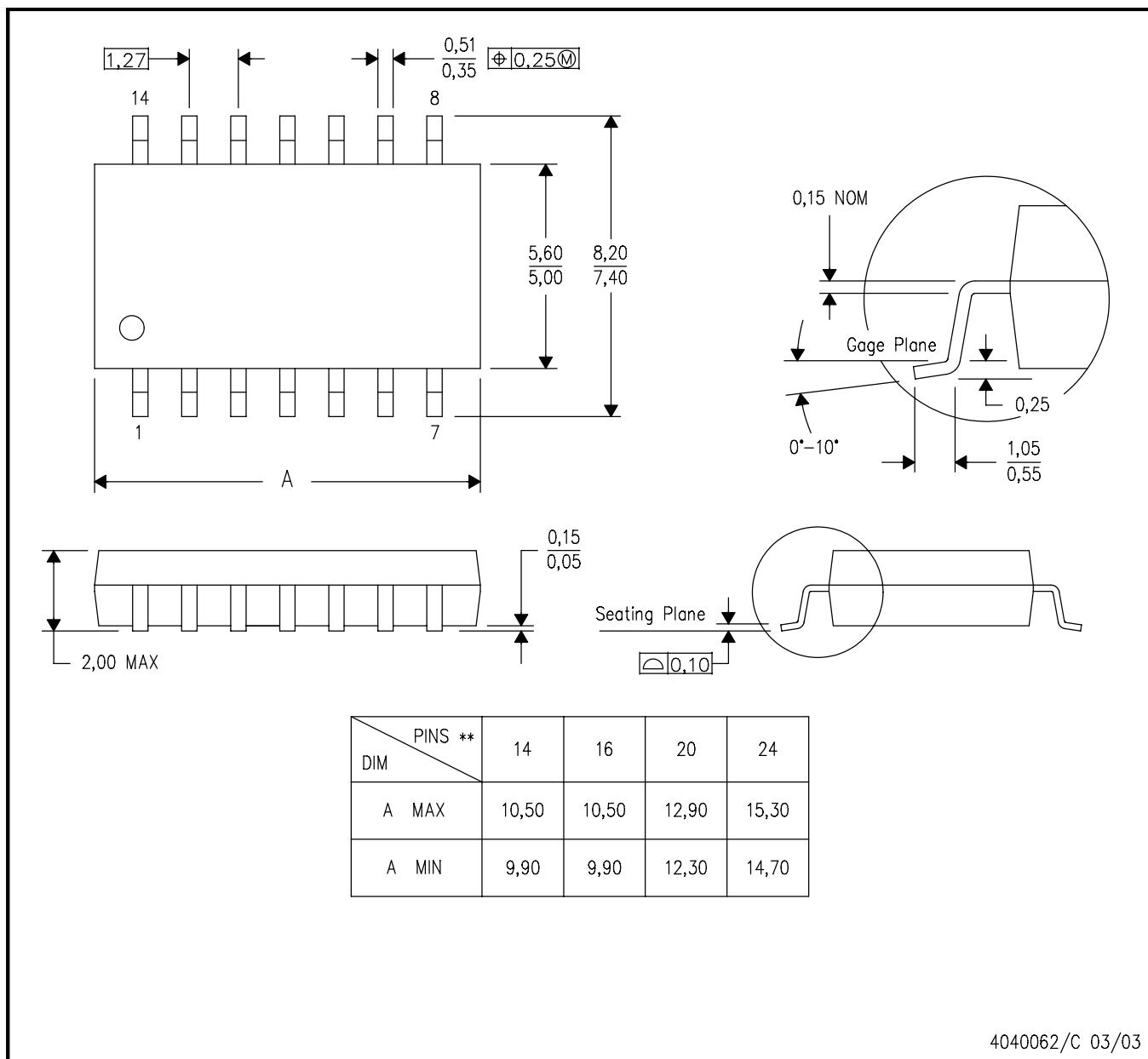
6. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.

MECHANICAL DATA

NS (R-PDSO-G**)

14-PINS SHOWN

PLASTIC SMALL-OUTLINE PACKAGE

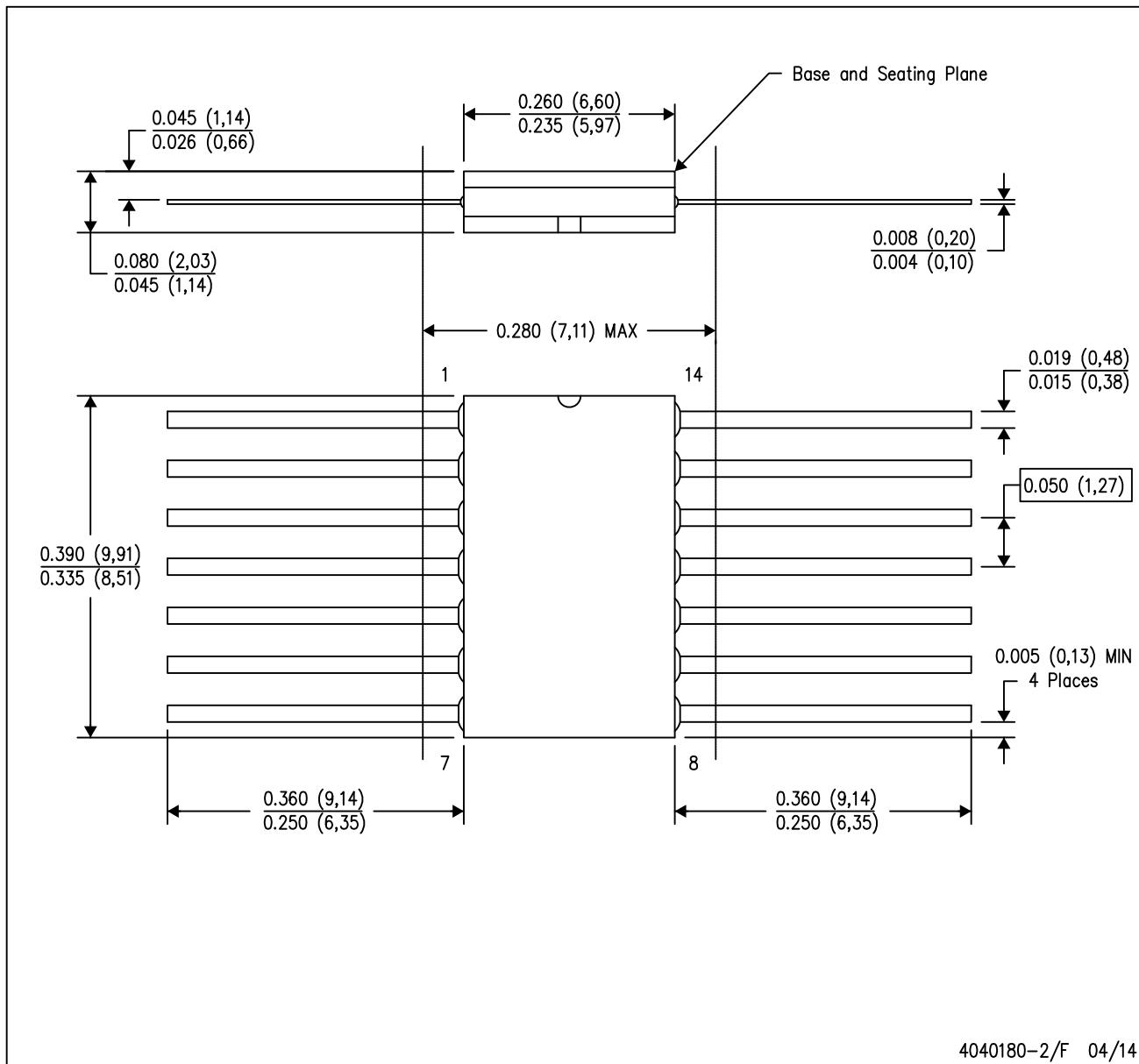


4040062/C 03/03

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.

W (R-GDFP-F14)

CERAMIC DUAL FLATPACK



4040180-2/F 04/14

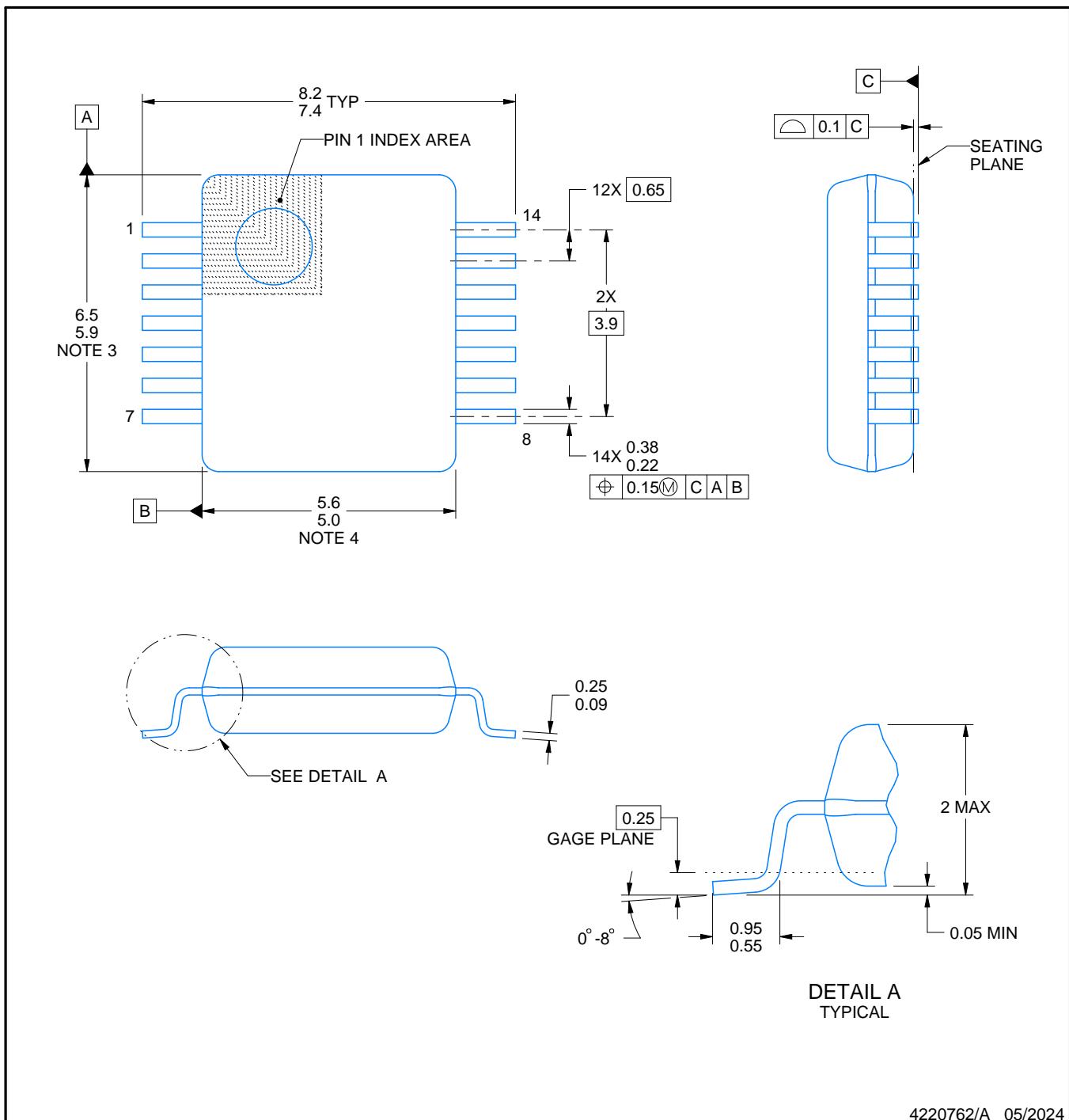
NOTES:

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

PACKAGE OUTLINE

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



NOTES:

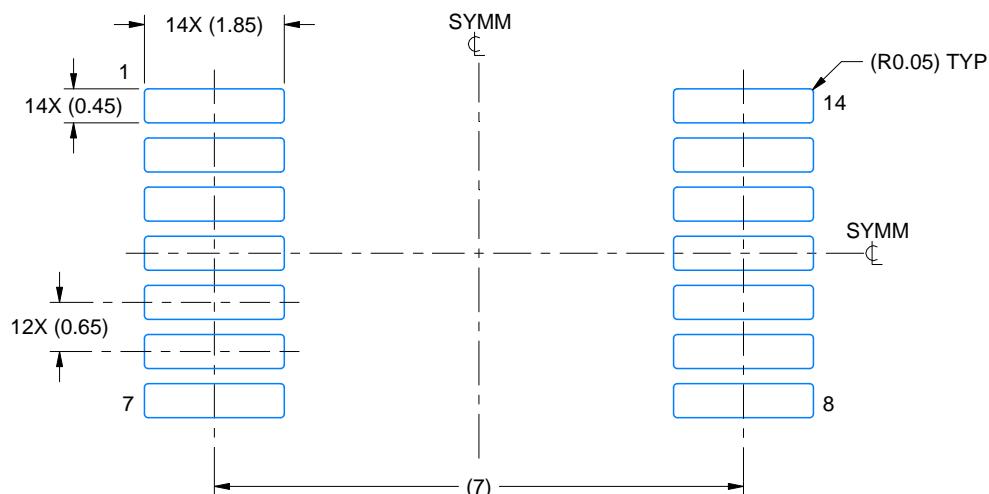
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or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

EXAMPLE BOARD LAYOUT

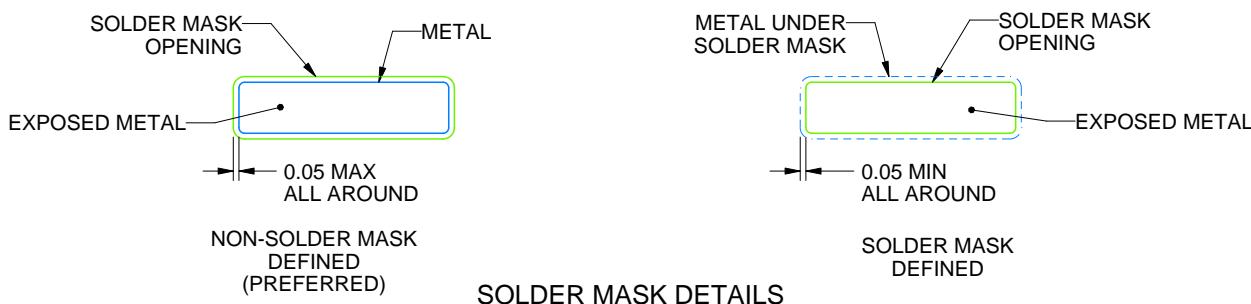
DB0014A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



4220762/A 05/2024

NOTES: (continued)

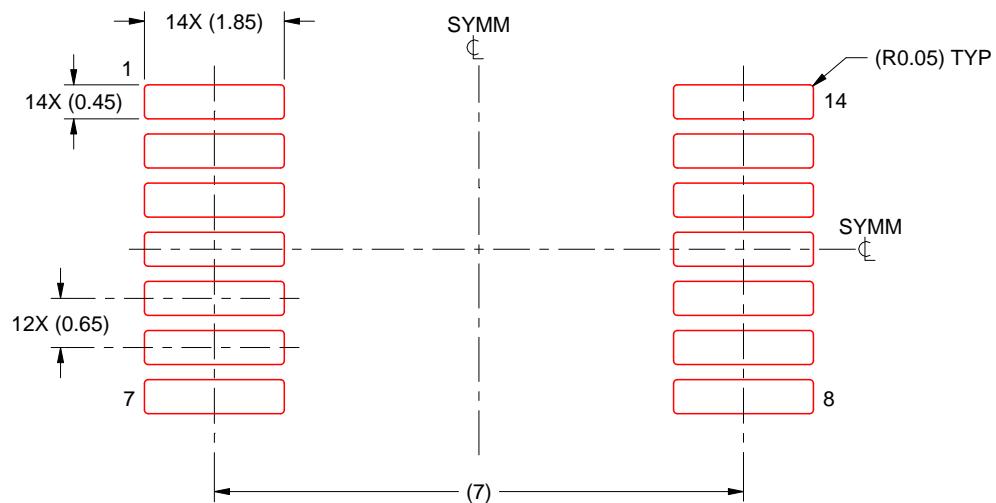
5. Publication IPC-7351 may have alternate designs.
6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

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

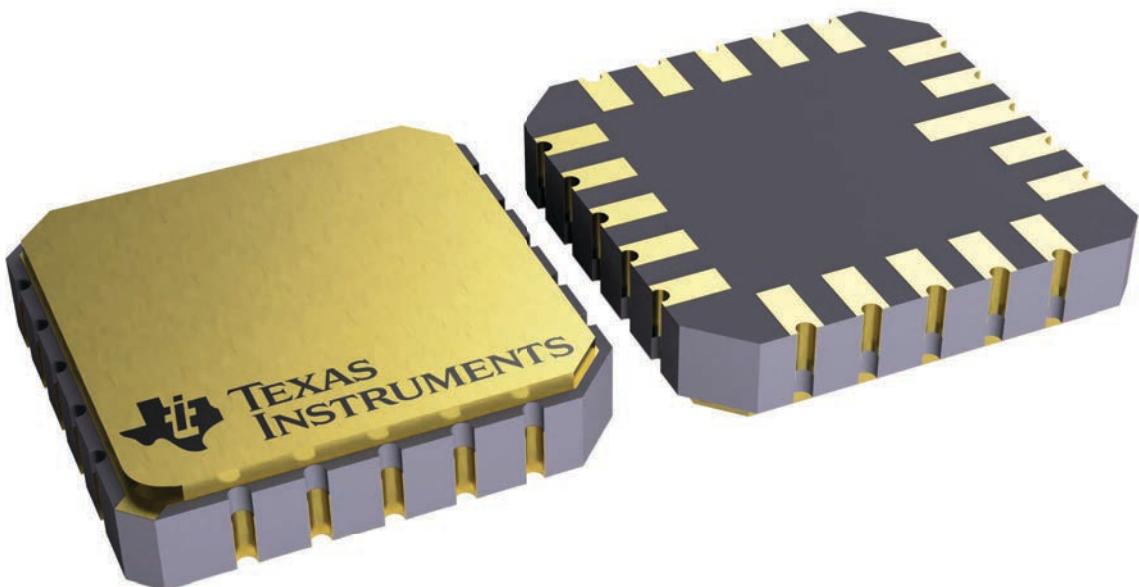
FK 20

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.



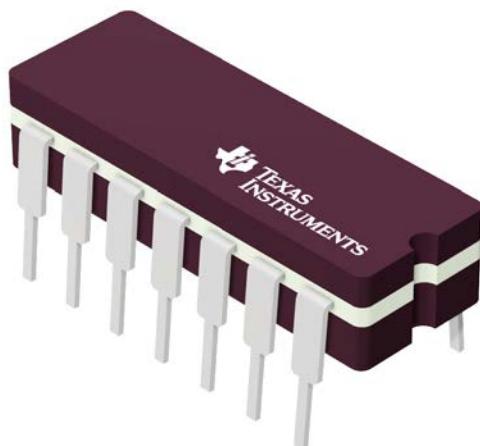
4229370VA\

GENERIC PACKAGE VIEW

J 14

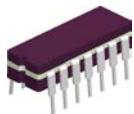
CDIP - 5.08 mm max height

CERAMIC DUAL IN LINE PACKAGE



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

4040083-5/G

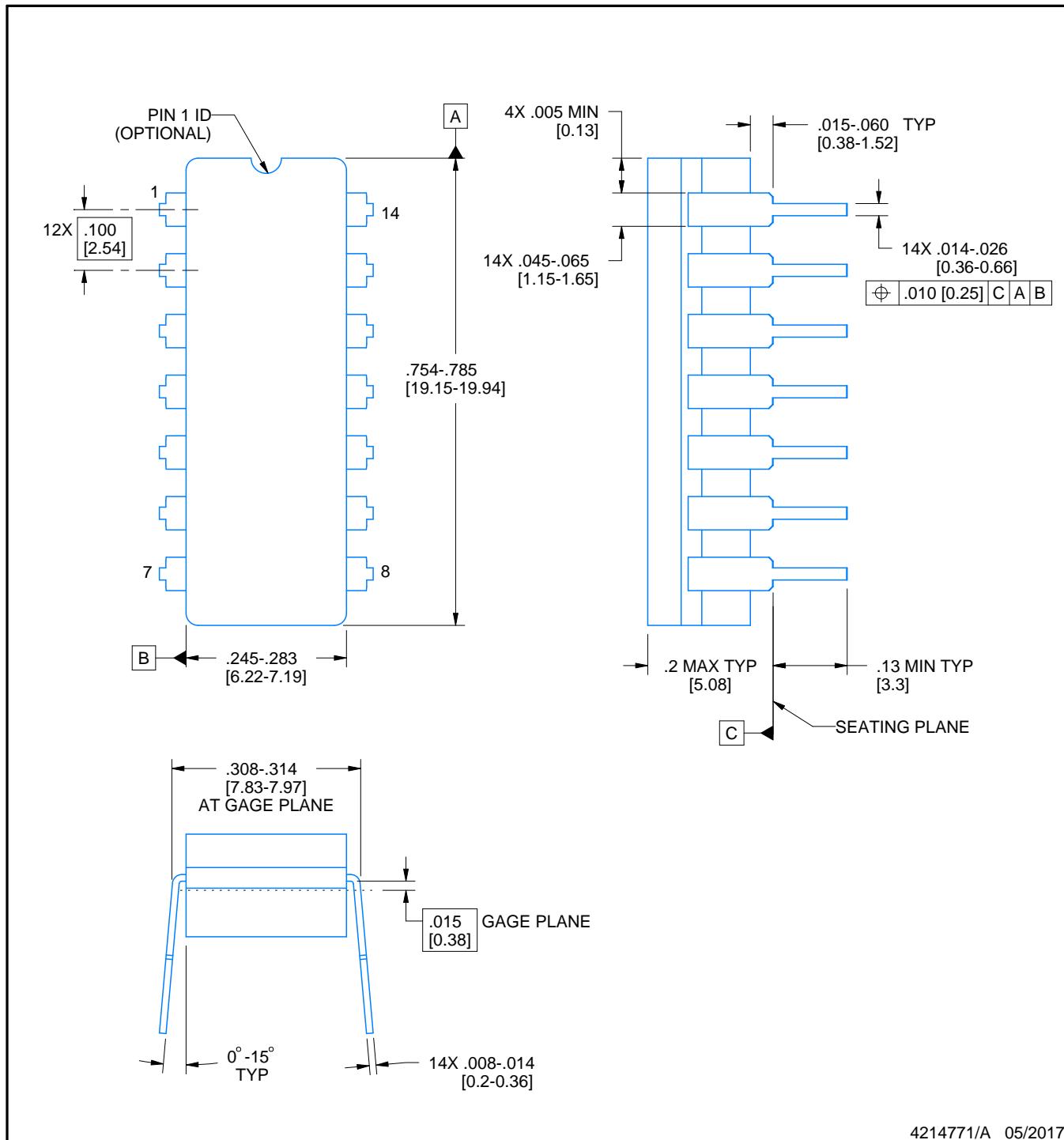


PACKAGE OUTLINE

J0014A

CDIP - 5.08 mm max height

CERAMIC DUAL IN LINE PACKAGE



4214771/A 05/2017

NOTES:

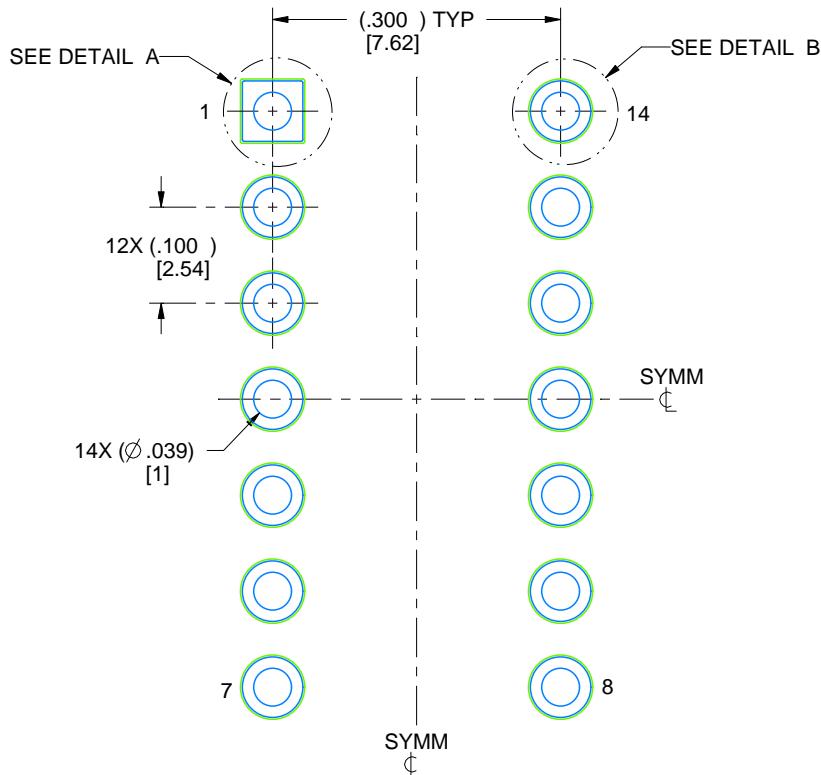
1. All controlling linear dimensions are in inches. Dimensions in brackets are in millimeters. Any dimension in brackets or parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This package is hermetically sealed with a ceramic lid using glass frit.
4. Index point is provided on cap for terminal identification only and on press ceramic glass frit seal only.
5. Falls within MIL-STD-1835 and GDIP1-T14.

EXAMPLE BOARD LAYOUT

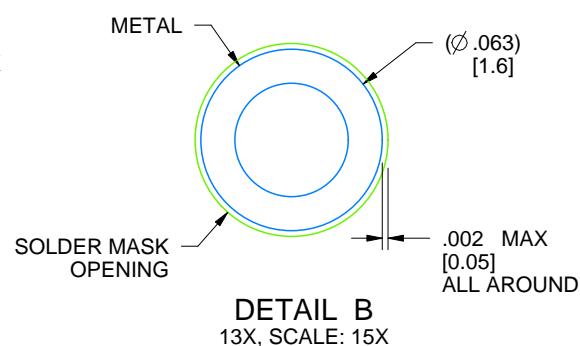
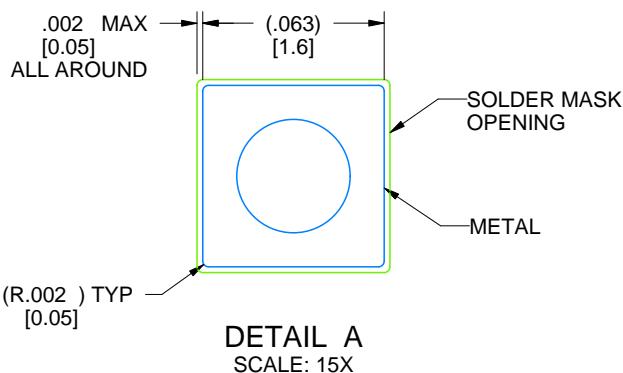
J0014A

CDIP - 5.08 mm max height

CERAMIC DUAL IN LINE PACKAGE



LAND PATTERN EXAMPLE
NON-SOLDER MASK DEFINED
SCALE: 5X

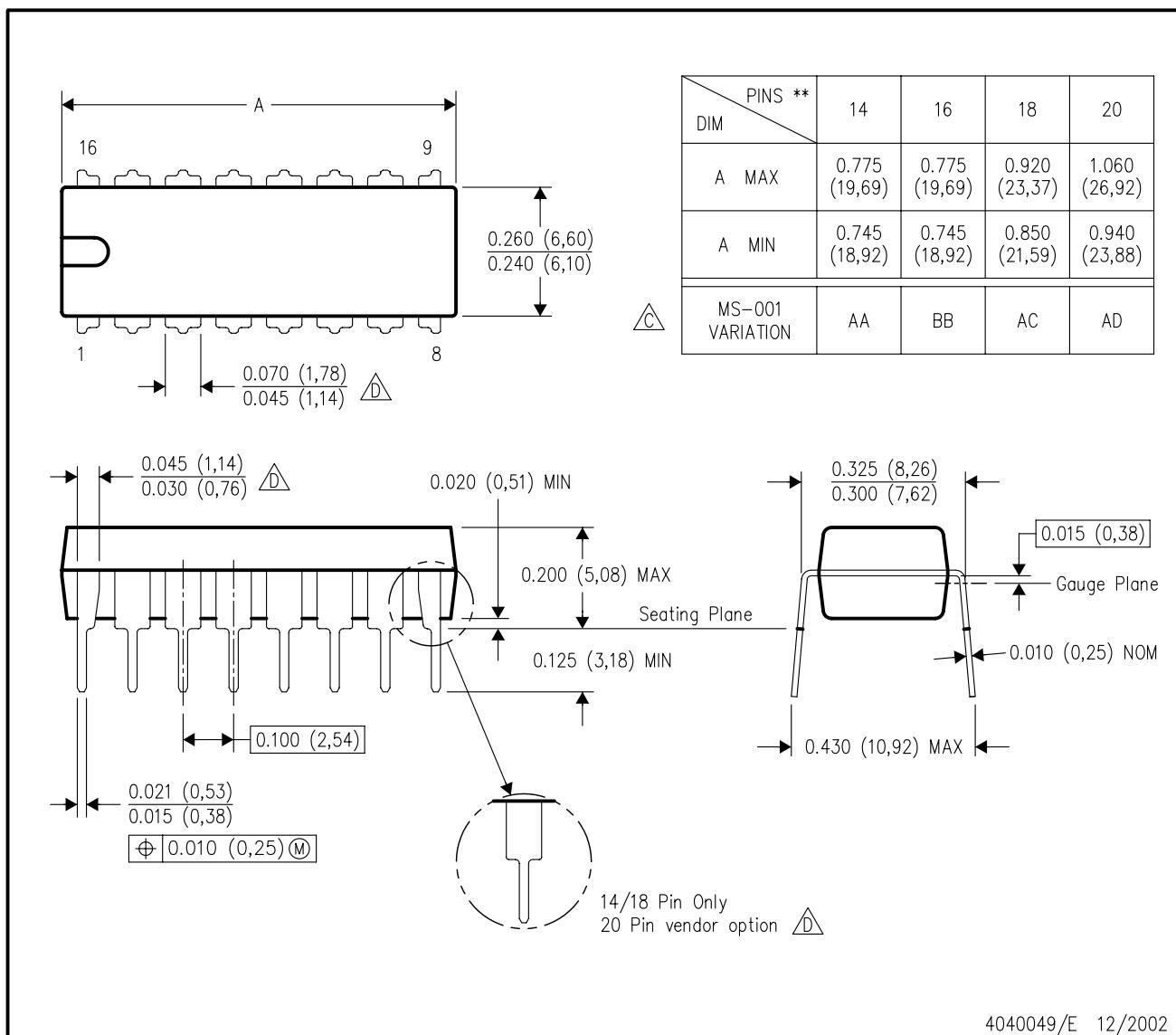


4214771/A 05/2017

N (R-PDIP-T**)

16 PINS SHOWN

PLASTIC DUAL-IN-LINE PACKAGE



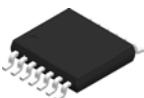
NOTES: A. All linear dimensions are in inches (millimeters).
 B. This drawing is subject to change without notice.

△ 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.

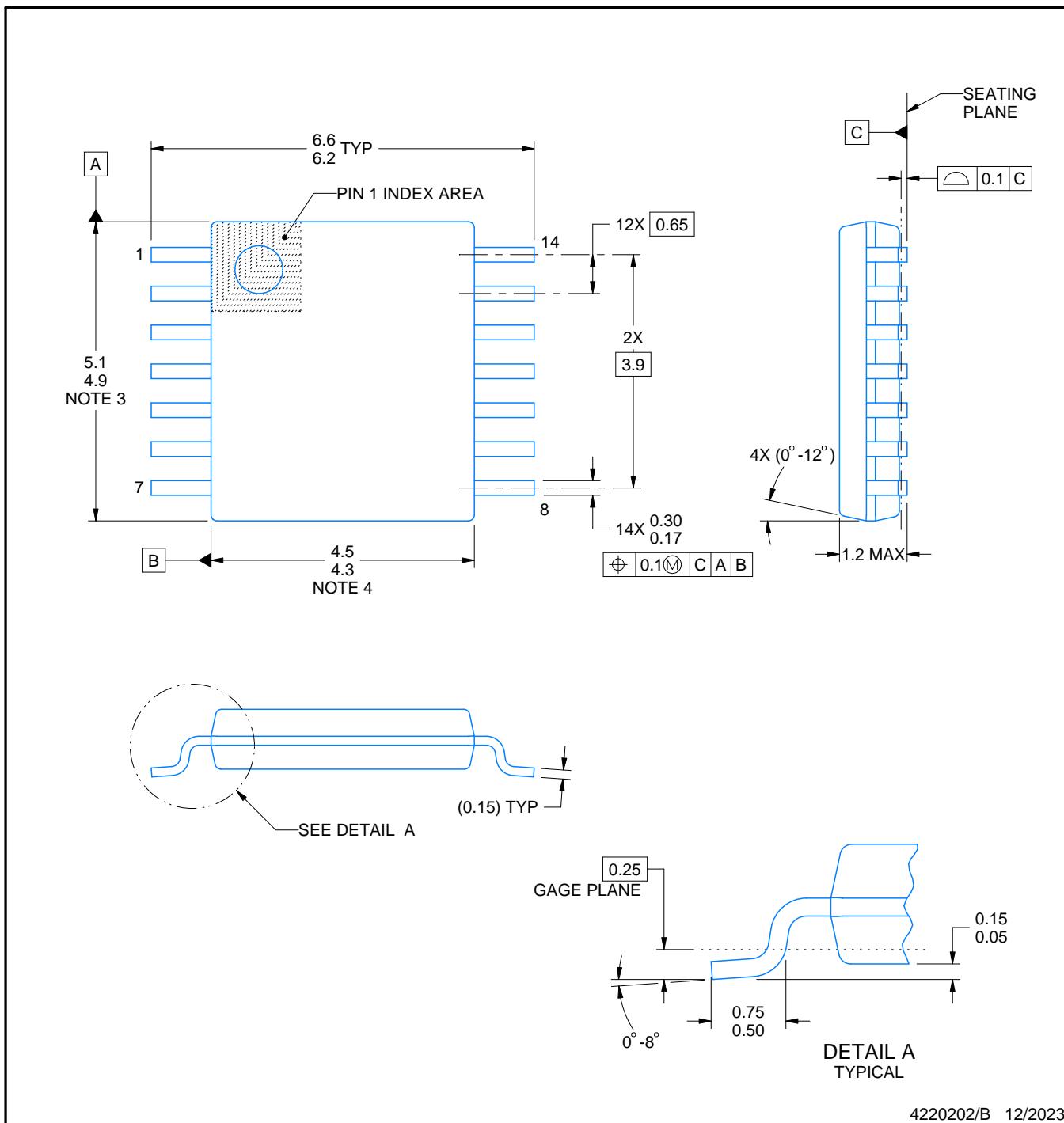
PACKAGE OUTLINE

PW0014A



TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



NOTES:

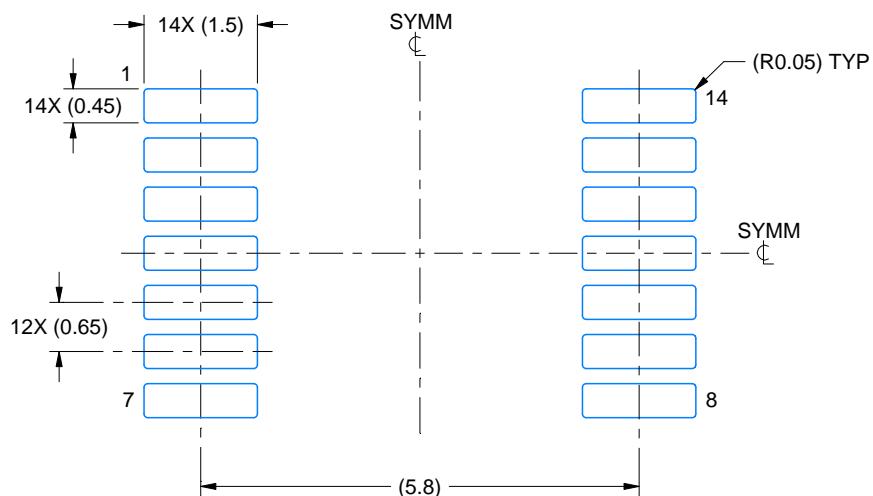
- All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
- This drawing is subject to change without notice.
- This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
- This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm per side.
- Reference JEDEC registration MO-153.

EXAMPLE BOARD LAYOUT

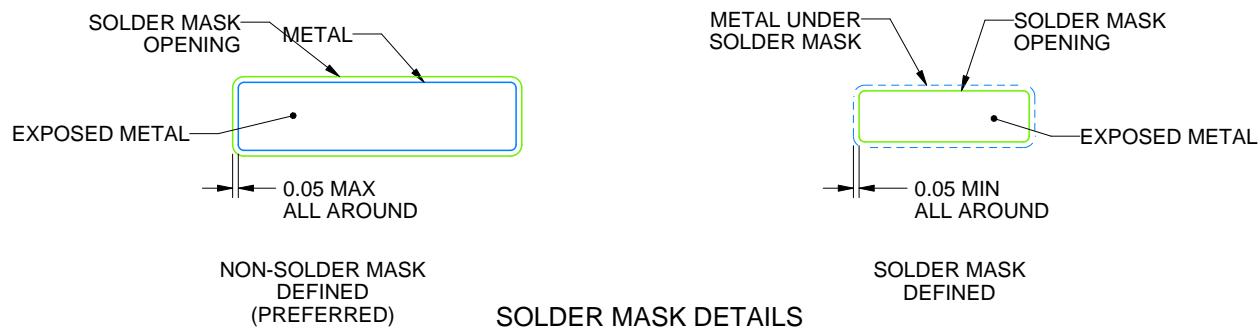
PW0014A

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.

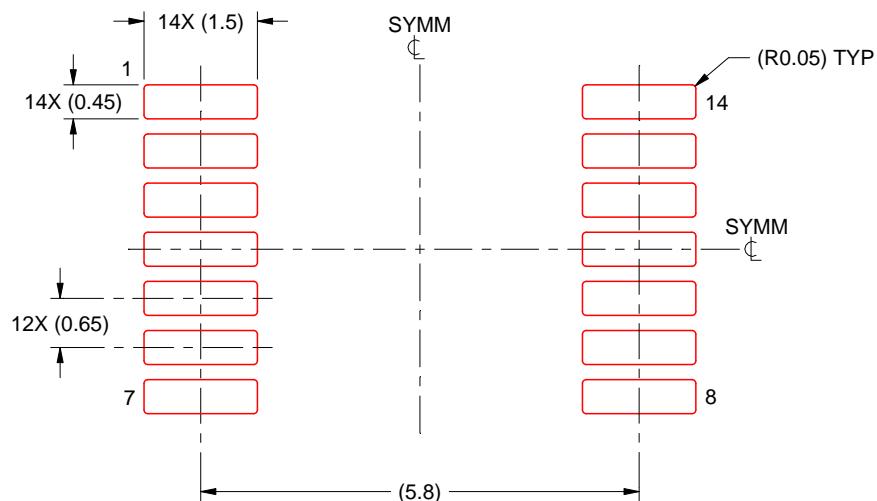
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

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.

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