SN74LV06A Hex Inverter Buffers/Drivers With Open-Drain Outputs

1 Features

- V_{CC} operation of 2 V to 5.5 V
- Max t_{pd} of 6.5 ns at 5 V
- Typical V_{OLP} (Output Ground Bounce) < 0.8 V at V_{CC} = 3.3 V, T_A = 25°C
- Typical V_{OHV} (Output V_{OH} Undershoot) > 2.3 V at V_{CC} = 3.3 V, T_A = 25°C
- Outputs are disabled during power up and power down with inputs tied to V_{CC}
- Support mixed-mode voltage operation on all ports
- I_{off} supports live insertion, partial power down mode, and back drive protection
- Latch-up performance exceeds 100 mA per JESD 78, Class II

2 Applications

- Servers
- Telecom Infrastructures
- TV Set-Top Boxes
- UPS
- Printers
- Elevators, and Escalators
- EPOS, ECR, and Cash Drawers
- Vending, Payment, Cash Machines

3 Description

These hex inverter buffers/drivers are designed for 2 V to 5.5 V V_{CC} operation.

The SN74LV06A device performs the Boolean function $Y = \overline{A}$ in positive logic.

The open-drain output require pull-up resistors to perform correctly and can be connected to other open-drain outputs to implement active-low wired-OR or active-high wired-AND functions.

Package Information

PART NUMBER(1)	PACKAGE	BODY SIZE (NOM)
SN74LV06A	DGV (TVSOP, 14)	3.60 mm x 4.40 mm
	D (SOIC, 14)	8.65 mm × 3.90 mm
	NS (SO, 14)	10.20 mm x 5.30 mm
	DB (SSOP, 14)	6.20 mm x 5.30 mm
	PW (TSSOP, 14)	5.00 mm x 4.40 mm

(1) For all available packages, see the orderable addendum at the end of the data sheet.

Simplified Schematic

Table of Contents

4 Revision History

Changes from Revision J (January 2016) to Revision K (March 2023) **Page**

- Updated structural layout of document and format of tables.... 1

Changes from Revision I (February 2015) to Revision J (January 2016) **Page**

- Added T_J Junction temperature to the *Section 6.1* table 4
- Changed Figure 9-2 11

5 Pin Configurations and Functions

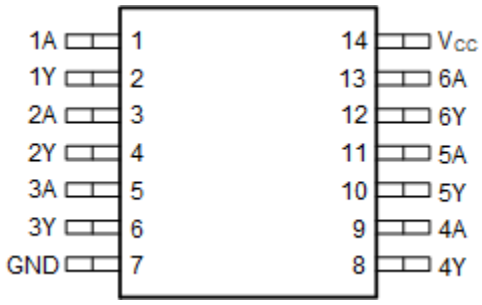


Figure 5-1. SN74LV06A D, DB, DGV, NS, or PW Package (Top View)

Table 5-1. Pin Functions

PIN		TYPE(1)	DESCRIPTION
NO.	NAME		
1	1A	I	Input 1
2	1Y	O	Output 1
3	2A	I	Input 2
4	2Y	O	Output 2
5	3A	I	Input 3
6	3Y	O	Output 3
8	4Y	O	Output 4
9	4A	I	Input 4
10	5Y	O	Output 5
11	5A	I	Input 5
12	6Y	O	Output 6
13	6A	I	Input 6
7	GND	GND	Ground Pin
14	V_{CC}	—	Power Pin

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

6 Specifications

6.1 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 range(2)		–0.5	7	V
V_O	Voltage range applied to any output in the high-impedance or power-off state(2)		–0.5	7	V
I_{IK}	Input clamp current	$V_I < 0$		–20	mA
I_{OK}	Output clamp current	$V_O < 0$		–50	mA
I_O	Continuous output current	V_O = 0 to V_{CC}		–35	mA
	Continuous current through V_{CC} or GND			±50	mA
T_{stg}	Storage temperature range		–65	150	°C
T_J	Junction Temperature			150	°C

(1) Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
(2) The input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.

6.2 ESD Ratings

			VALUE	UNIT
$V_{(ESD)}$	Electrostatic discharge	Human-body model (HBM), per ANSI/ESDA/JEDEC JS-001(1)	±2500	V
		Machine Model (MM), per JEDEC specification	±200	
		Charged-device model (CDM), per JEDEC specification JESD22-C101(2)	±2000	

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process. Manufacturing with less than 500-V HBM is possible with the necessary precautions.
(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process. Manufacturing with less than 250-V CDM is possible with the necessary precautions.

6.3 Recommended Operating Conditions

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

			SN74LV06A		UNIT
			MIN	MAX	
V_{CC}	Supply voltage		2	5.5	V
V_{IH}	High level input voltage	V_{CC} = 2 V	1.5		V
		V_{CC} = 2.3 V to 2.7 V	V_{CC} × 0.7		
		V_{CC} = 3 V to 3.6 V	V_{CC} × 0.7		
		V_{CC} = 4.5 V to 5.5 V	V_{CC} × 0.7		
V_{IL}	Low level input voltage	V_{CC} = 2 V		0.5	V
		V_{CC} = 2.3 V to 2.7 V		V_{CC} × 0.3	
		V_{CC} = 3 V to 3.6 V		V_{CC} × 0.3	
		V_{CC} = 4.5 V to 5.5 V		V_{CC} × 0.3	
V_I	Input voltage		0	5.5	V
V_O	Output voltage		0	5.5	V
I_{OL}	Low level output current	V_{CC} = 2 V		20	μA
		V_{CC} = 2.3 V to 2.7 V		2	mA
		V_{CC} = 3 V to 3.6 V		8	
		V_{CC} = 4.5 V to 5.5 V		16	
Δt/Δv	Input transition rise and fall rate	V_{CC} = 2.3 V to 2.7 V		200	ns/V
		V_{CC} = 3 V to 3.6 V		100	
		V_{CC} = 4.5 V to 5.5 V		20	

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

		SN74LV06A		UNIT
		MIN	MAX	
T_A	Operating free-air temperature	–40	125	°C

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

6.4 Thermal Information

THERMAL METRIC(1)		SN74LV06A					UNIT
		D	DB	DGV	NS	PW	
		14 PINS	14 PINS	14 PINS	14 PINS	14 PINS	
$R_{\theta JA}$	Junction-to-ambient thermal resistance	100.6	112.5	135.2	95.4	128.7	°C/W
$R_{\theta JC(top)}$	Junction-to-case (top) thermal resistance	51.8	65.0	57.9	52.9	57.2	
$R_{\theta JB}$	Junction-to-board thermal resistance	54.9	59.9	68.3	51.2	70.7	
ψ_{JT}	Junction-to-top characterization parameter	25.0	25.0	9.2	17.9	9.3	
ψ_{JB}	Junction-to-board characterization parameter	54.7	59.3	67.6	53.8	70.0	

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

6.5 Electrical Characteristics

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

PARAMETER	TEST CONDITIONS	V_{CC}	SN74LV06A			–40°C to 85°C SN74LV06A			–40°C to 125°C SN74LV06A		UNIT
			MIN	TYP	MAX	MIN	TYP	MAX			
V_{OL}	I_{OL} = 50 µA	2 V to 5.5 V			0.1			0.1		0.1	V
	I_{OL} = 2 mA	2.3 V			0.4			0.4		0.4	
	I_{OL} = 8 mA	3 V			0.44			0.44		0.44	
	I_{OL} = 16 mA	4.5 V			0.55			0.55		0.55	
I_I	V_I = 5.5 V or GND	0 to 5.5 V			±1			±1		±1	µA
I_{OH}	$V_I = V_{IL}$, $V_{OH} = V_{CC}$	5.5 V			±2.5			±2.5		±2.5	µA
I_{CC}	$V_I = V_{CC}$ or GND, I_O = 0	5.5 V			20			20		20	µA
I_{off}	V_I or V_O = 0 to 5.5 V	0			5			5		5	µA
C_i	$V_I = V_{CC}$ or GND	3.3 V		1.6			1.6			1.6	pF

6.6 Switching Characteristics, V_{CC} = 2.5 V ± 0.2 V

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T_A = 25°C			–40°C to 85°C SN74LV06A		–40°C to 125°C SN74LV06A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A	Y	C_L = 15 pF		5.4(1)	10.4(1)	1(1)	13(1)	1	14	ns
t_{PHL}					7.2(1)	10.4(1)	1(1)	13(1)	1	14	
t_{PLH}	A	Y	C_L = 50 pF		9.7	15.2	1	18	1	19	ns
t_{PHL}	A	Y			9.3	15.2	1	18	1	19	

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

6.7 Switching Characteristics, V_{CC} = 3.3 V ± 0.3 V

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T_A = 25°C			–40°C to 85°C SN74LV06A		–40°C to 125°C SN74LV06A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A	Y	C_L = 15 pF		4.1(1)	7.1(1)	1(1)	8.5(1)	1	9.5	ns
t_{PHL}	A	Y			4.9(1)	7.1(1)	1(1)	8.5(1)	1	9.5	

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T_A = 25°C			–40°C to 85°C SN74LV06A		–40°C to 125°C SN74LV06A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A	Y	C_L = 50 pF		7.1	10.6	1	12	1	13	ns
t_{PHL}	A	Y			6.4	10.6	1	12	1	13	

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

6.8 Switching Characteristics, V_{CC} = 5 V ± 0.5 V

operating free-air temperature range (unless otherwise noted) (see Load Circuit and Voltage Waveforms)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T_A = 25°C			–40°C to 85°C SN74LV06A		–40°C to 125°C SN74LV06A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A	Y	C_L = 15 pF		3[1]	5.5[1]	1[1]	6.5[1]	1	7	ns
t_{PHL}	A	Y			3.3[1]	5.5[1]	1[1]	6.5[1]	1	7	
t_{PLH}	A	Y	C_L = 50 pF		4.8	7.5	1	8.5	1	9	ns
t_{PHL}	A	Y			4.4	7.5	1	8.5	1	9	

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

6.9 Noise Characteristics

V_{CC} = 3.3 V, C_L = 50 pF, T_A = 25°C

PARAMETER[1]		MIN	TYP	MAX	UNIT
$V_{OL(P)}$	Quiet output, maximum dynamic V_{OL}		0.5	0.8	V
$V_{OL(V)}$	Quiet output, minimum dynamic V_{OL}		–0.1	–0.8	V
$V_{OH(V)}$	Quiet output, minimum dynamic V_{OH}		3.3		V
$V_{IH(D)}$	High-level dynamic input voltage	2.31			V
$V_{IL(D)}$	Low-level dynamic input voltage			0.99	V

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

6.10 Operating Characteristics

T_A = 25°C

PARAMETER		TEST CONDITIONS		V_{CC}	TYP	UNIT
C_{pd}	Power dissipation capacitance	C_L = 50 pF	f = 10 MHz	3.3 V	2.6	pF
				5 V	4.7	

6.11 Typical Characteristics

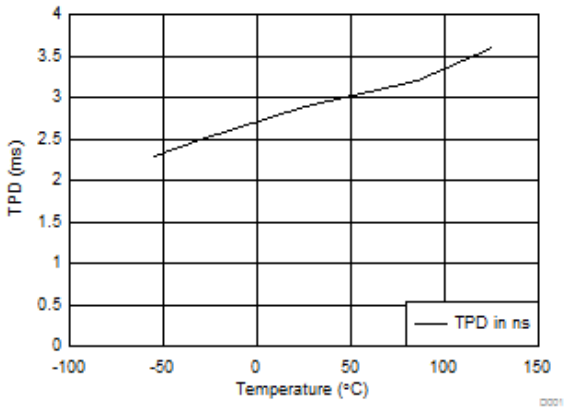


Figure 6-1. TPD vs Temperature at 5 V

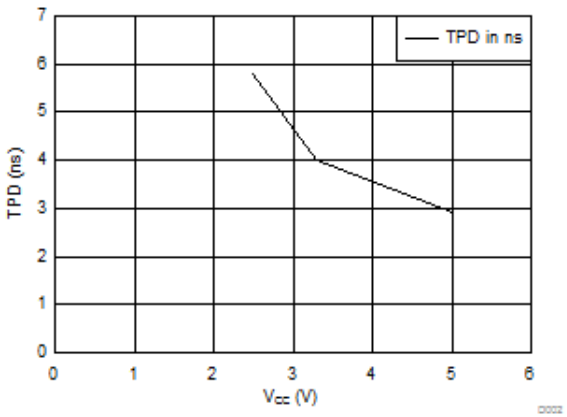
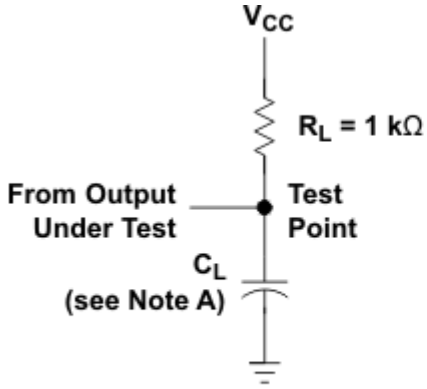
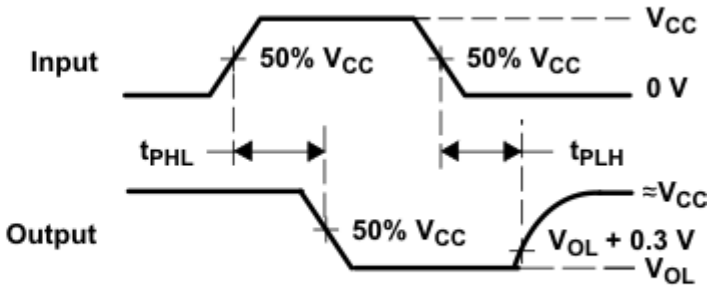


Figure 6-2. TPD vs V_{CC} at 25°C

7 Parameter Measurement Information



LOAD CIRCUIT FOR
OPEN-DRAIN OUTPUTS



VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES

A. C_L includes probe and jig capacitance.
B. All input pulses are supplied by generators having the following characteristics: PRR ≤ 1 MHz, Z_O = 50 Ω, t_r ≤ 3 ns, t_f ≤ 3 ns.
C. The outputs are measured one at a time, with one input transition per measurement.

Figure 7-1. Load Circuit and Voltage Waveforms

8 Detailed Description

8.1 Overview

These hex inverter buffers/drivers are designed for 2-V to 5.5-V V_{CC} operation.

The SN74LV06A device performs the Boolean function $Y = \overline{A}$ in positive logic.

The open-drain output require pull-up resistors to perform correctly and can be connected to other open-drain outputs to implement active-low wired-OR or active-high wired-AND functions.

These devices are fully specified for partial-power-down applications using I_{off}. The I_{off} circuitry disables the outputs, preventing damaging current back-flow through the devices when they are powered down.

8.2 Functional Block Diagram

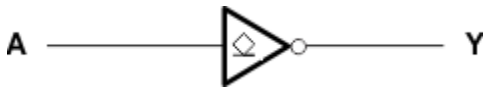


Figure 8-1. Logic Diagram (Positive Logic)

8.3 Feature Description

- Wide operating voltage range
  - Operates from 2 V to 5.5 V
- Allows up or down voltage translation
  - Inputs and outputs accept voltages to 5.5 V
- I_{off} feature
  - Allows voltages on the inputs and outputs when V_{CC} is 0 V

8.4 Device Functional Modes

Table 8-1. Function Table (Each Inverter)

INPUT(1) A	OUTPUT(2) Y
H	L
L	H

(1) H = High Voltage Level, L = Low Voltage Level
(2) H = Driving High, L = Driving Low

9 Application and Implementation

Note

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

9.1 Application Information

The SN74LV06A is a low drive Open drain CMOS device that can be used for a multitude of buffer type functions. The inputs are 5.5 V tolerant and the outputs open drain and 5.5 V tolerant allowing it to translate up to 5.5 V or down to any other voltage between GND and 5.5 V.

9.2 Typical Application

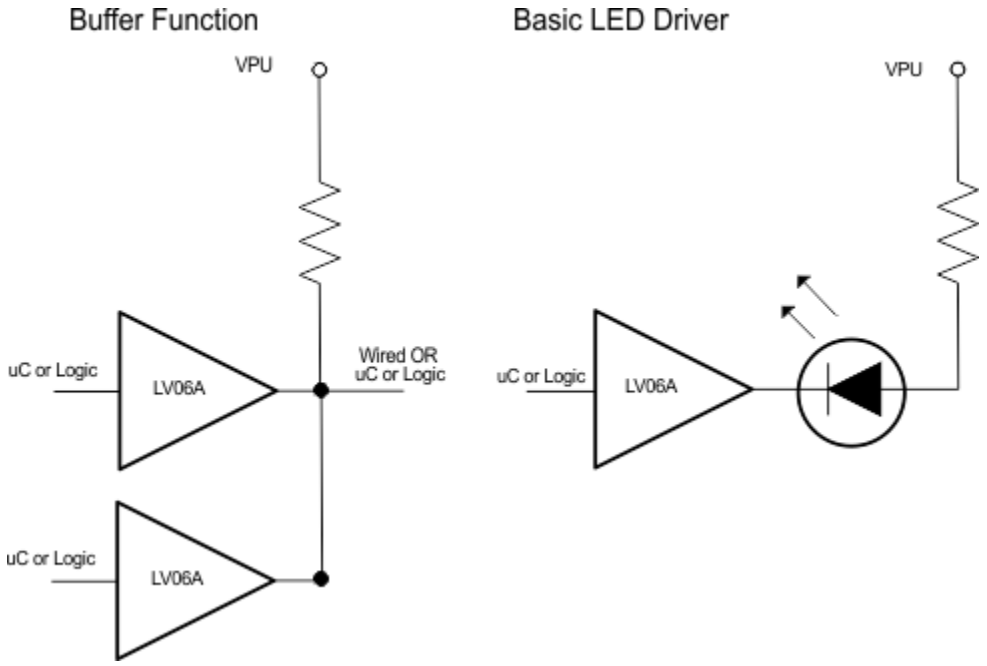


Figure 9-1. Typical Application Schematic

9.2.1 Design Requirements

This device uses CMOS technology and is open drain so it has low output drive only. Care should be taken to avoid bus contention because it can drive currents that would exceed maximum limits. The parallel output drive can create fast edges into light loads so routing and load conditions should be considered to prevent ringing.

9.2.2 Detailed Design Procedure

1. Recommended Input Conditions:
   - For rise time and fall time specifications, see Δt/ΔV in the Section 6.3 table.
   - For specified high and low levels, see V_{IH} and V_{IL} in the *Section 6.3* table.
   - Inputs are overvoltage tolerant allowing them to go as high as 5.5 V at any valid V_{CC}.
2. Recommended Output Conditions:
   - Load currents should not exceed 35 mA per output and 50 mA total for the part.

9.2.3 Application Curves

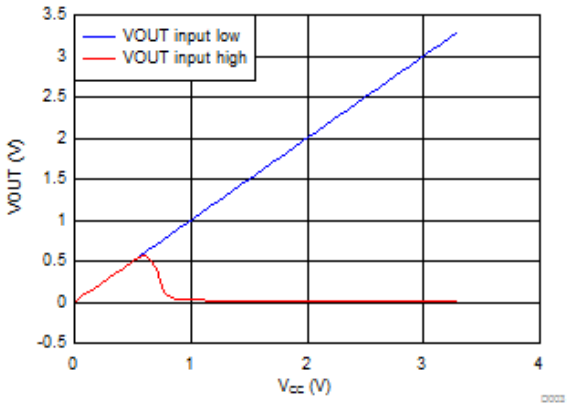


Figure 9-2. Output During Power Up with 4 k Pull-up at 3.3 V

9.3 Power Supply Recommendations

The power supply can be any voltage between the MIN and MAX supply voltage rating located in the *Section 6.3*. Each V_{CC} terminal should have a good bypass capacitor to prevent power disturbance. For devices with a single supply, a 0.1 µF capacitor is recommended. If there are multiple V_{CC} terminals then 0.01 µF or 0.022 µF capacitor is recommended for each power terminal. It is acceptable to parallel multiple bypass capacitors to reject different frequencies of noise. 0.1 µF and 1 µF capacitors are commonly used in parallel. The bypass capacitor should be installed as close to the power terminal as possible for best results.

9.4 Layout

9.4.1 Layout Guidelines

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

In many cases, functions or parts of functions of digital logic devices are unused, for example, when only two inputs of a triple-input AND gate are used or only 3 of the 4 buffer gates are used. Such input pins 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. It is generally OK to float outputs unless the part is a transceiver.

9.4.2 Layout Example

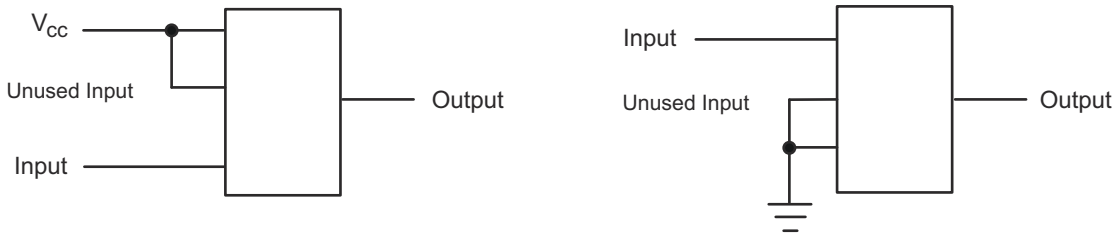


Figure 9-3. Layout Diagram

10 Device and Documentation Support

10.1 Documentation Support

10.1.1 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 10-1. Related Links

PARTS	PRODUCT FOLDER	SAMPLE & BUY	TECHNICAL DOCUMENTS	TOOLS & SOFTWARE	SUPPORT & COMMUNITY
SN74LV06A	Click here	Click here	Click here	Click here	Click here

10.2 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. Click on *Subscribe to updates* 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.

10.3 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.

10.4 Trademarks

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

10.5 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.

10.6 Glossary

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

11 Mechanical, Packaging, and Orderable Information

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

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)
SN74LV06AD	Obsolete	Production	SOIC (D) | 14	-	-	Call TI	Call TI	-40 to 125	LV06A
SN74LV06ADBR	Active	Production	SSOP (DB) | 14	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV06A
SN74LV06ADBR.A	Active	Production	SSOP (DB) | 14	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV06A
SN74LV06ADBR.B	Active	Production	SSOP (DB) | 14	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV06A
SN74LV06ADGVR	Active	Production	TVSOP (DGV) | 14	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV06A
SN74LV06ADGVR.A	Active	Production	TVSOP (DGV) | 14	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV06A
SN74LV06ADR	Active	Production	SOIC (D) | 14	2500 | LARGE T&R	Yes	NIPDAU | SN	Level-1-260C-UNLIM	-40 to 125	LV06A
SN74LV06ADR.A	Active	Production	SOIC (D) | 14	2500 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV06A
SN74LV06ADRE4	Active	Production	SOIC (D) | 14	2500 | LARGE T&R	No	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV06A
SN74LV06ADRE4	Active	Production	SOIC (D) | 14	2500 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV06A
SN74LV06ADRE4.A	Active	Production	SOIC (D) | 14	2500 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV06A
SN74LV06ADRE4.A	Active	Production	SOIC (D) | 14	2500 | LARGE T&R	No	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV06A
SN74LV06ANSR	Active	Production	SOP (NS) | 14	2000 | LARGE T&R	Yes	NIPDAU | NIPDAU	Level-1-260C-UNLIM	-40 to 125	74LV06A
SN74LV06ANSR.A	Active	Production	SOP (NS) | 14	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	74LV06A
SN74LV06APW	Obsolete	Production	TSSOP (PW) | 14	-	-	Call TI	Call TI	-40 to 125	LV06A
SN74LV06APWR	Active	Production	TSSOP (PW) | 14	2000 | LARGE T&R	Yes	NIPDAU | SN	Level-1-260C-UNLIM	-40 to 125	LV06A
SN74LV06APWR.A	Active	Production	TSSOP (PW) | 14	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV06A
SN74LV06APWR.B	Active	Production	TSSOP (PW) | 14	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV06A
SN74LV06APWT	Obsolete	Production	TSSOP (PW) | 14	-	-	Call TI	Call TI	-40 to 125	LV06A

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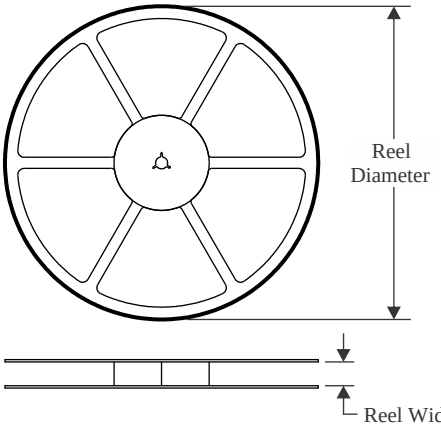
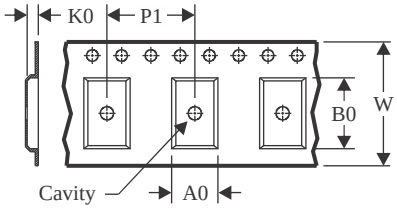
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

TAPE AND REEL INFORMATION

REEL DIMENSIONS

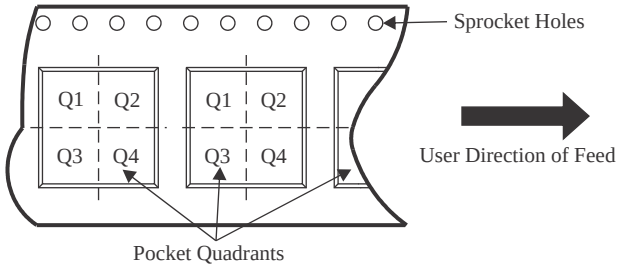


TAPE DIMENSIONS



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

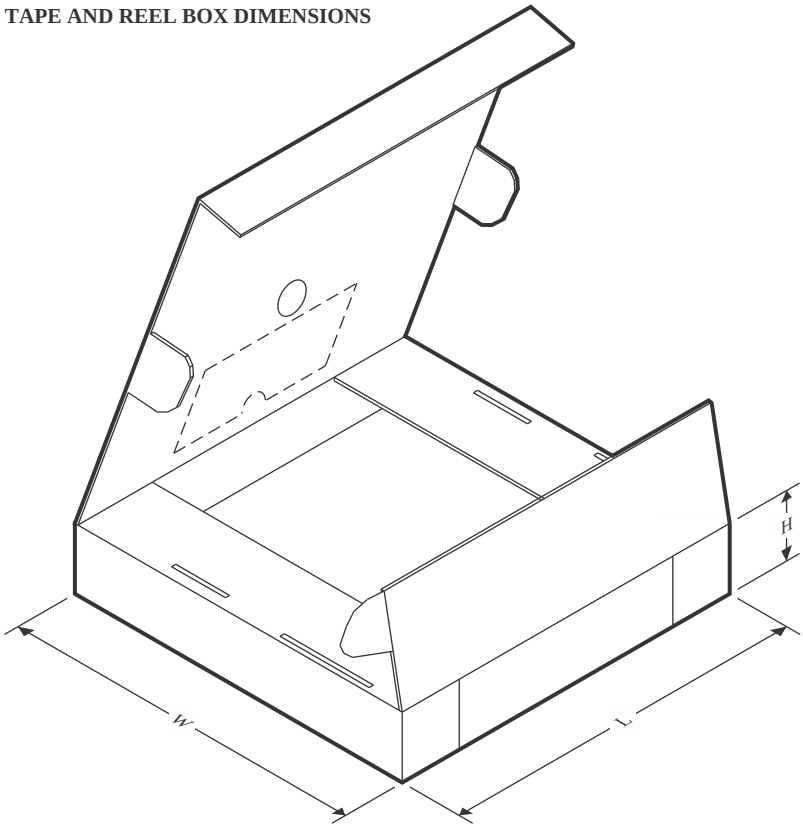
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

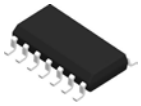
Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74LV06ADBR	SSOP	DB	14	2000	330.0	16.4	8.35	6.6	2.4	12.0	16.0	Q1
SN74LV06ADGVR	TVSOP	DGV	14	2000	330.0	12.4	6.8	4.0	1.6	8.0	12.0	Q1
SN74LV06ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV06ADRE4	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV06ANSR	SOP	NS	14	2000	330.0	16.4	8.1	10.4	2.5	12.0	16.0	Q1
SN74LV06ANSR	SOP	NS	14	2000	330.0	16.4	8.45	10.55	2.5	12.0	16.2	Q1
SN74LV06APWR	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)
SN74LV06ADBR	SSOP	DB	14	2000	353.0	353.0	32.0
SN74LV06ADGVR	TVSOP	DGV	14	2000	353.0	353.0	32.0
SN74LV06ADR	SOIC	D	14	2500	353.0	353.0	32.0
SN74LV06ADRE4	SOIC	D	14	2500	353.0	353.0	32.0
SN74LV06ANSR	SOP	NS	14	2000	353.0	353.0	32.0
SN74LV06ANSR	SOP	NS	14	2000	353.0	353.0	32.0
SN74LV06APWR	TSSOP	PW	14	2000	353.0	353.0	32.0

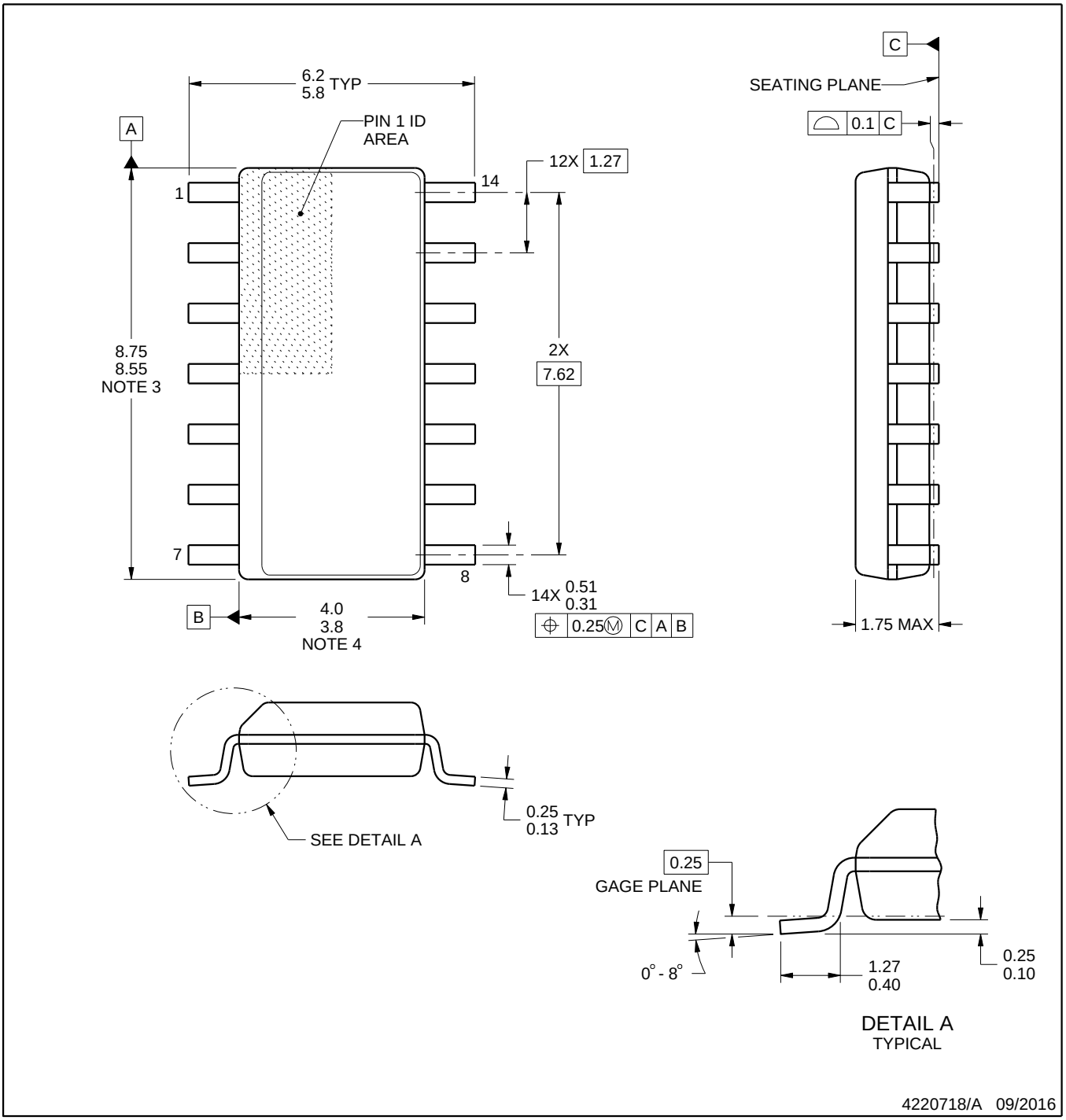


PACKAGE OUTLINE

D0014A

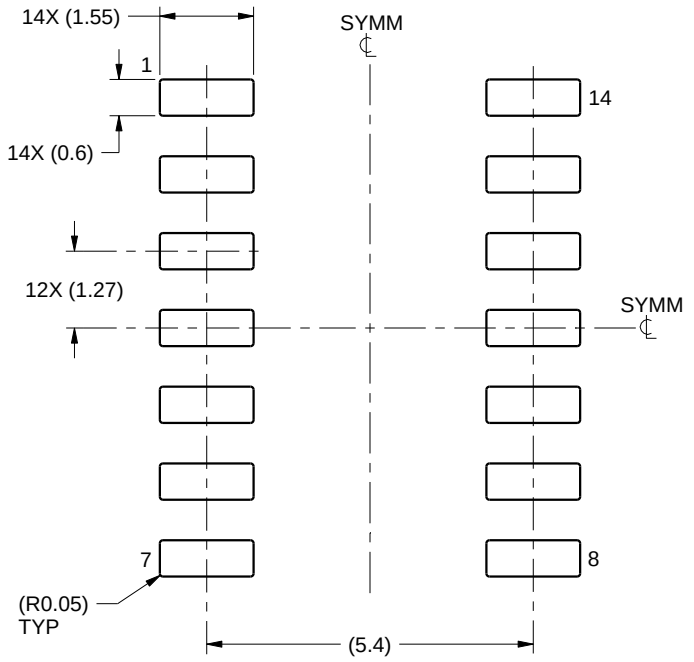
SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT

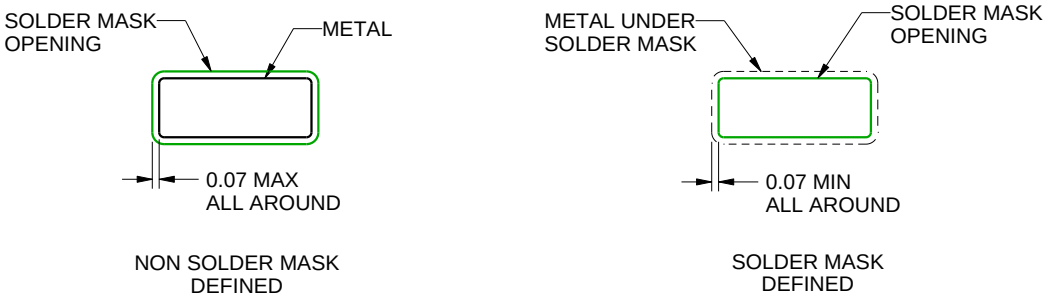


NOTES:

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)

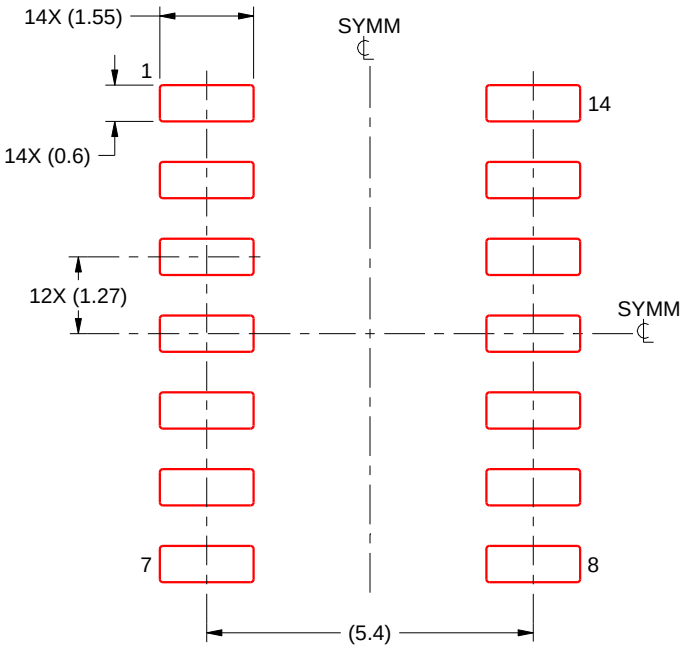
6. Publication IPC-7351 may have alternate designs.
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

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

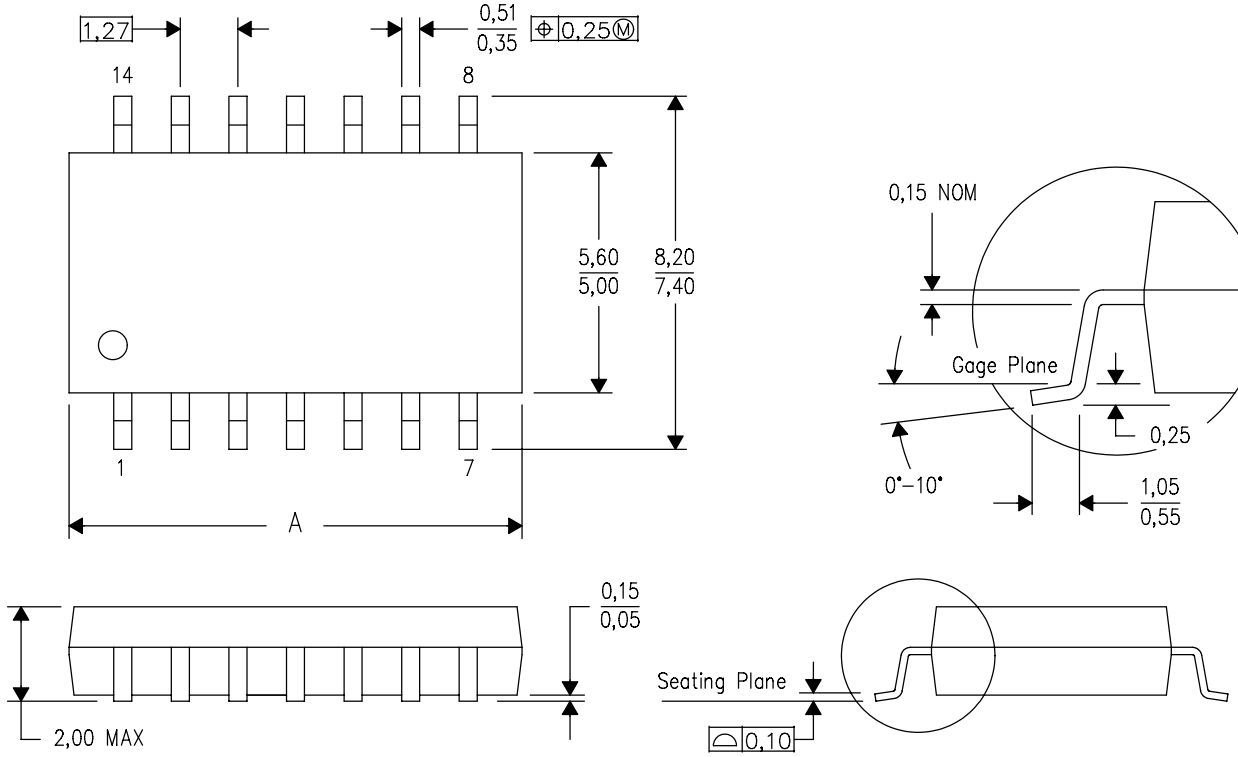
NOTES: (continued)

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



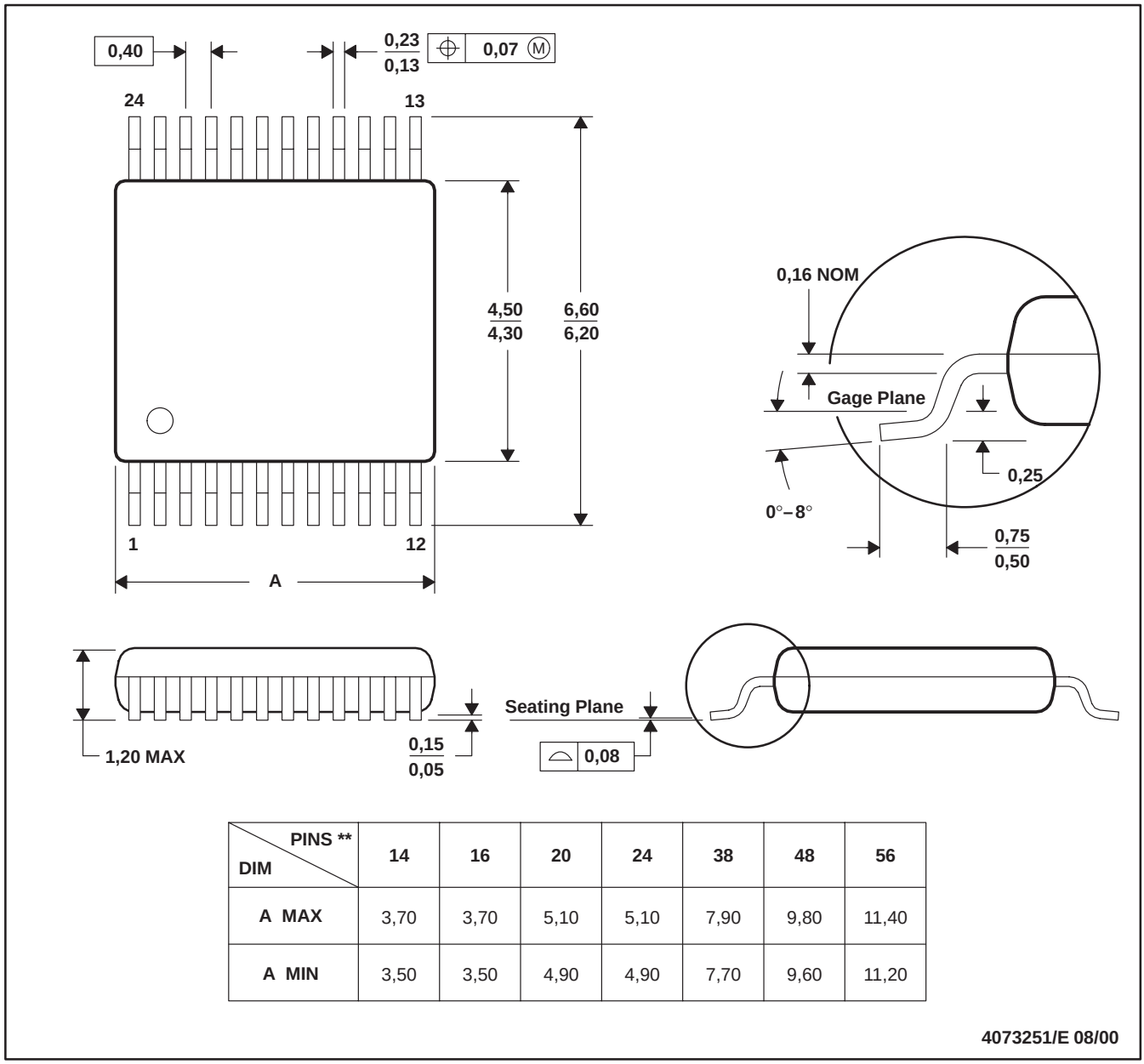
DIM \ PINS **	14	16	20	24
A MAX	10,50	10,50	12,90	15,30
A MIN	9,90	9,90	12,30	14,70

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

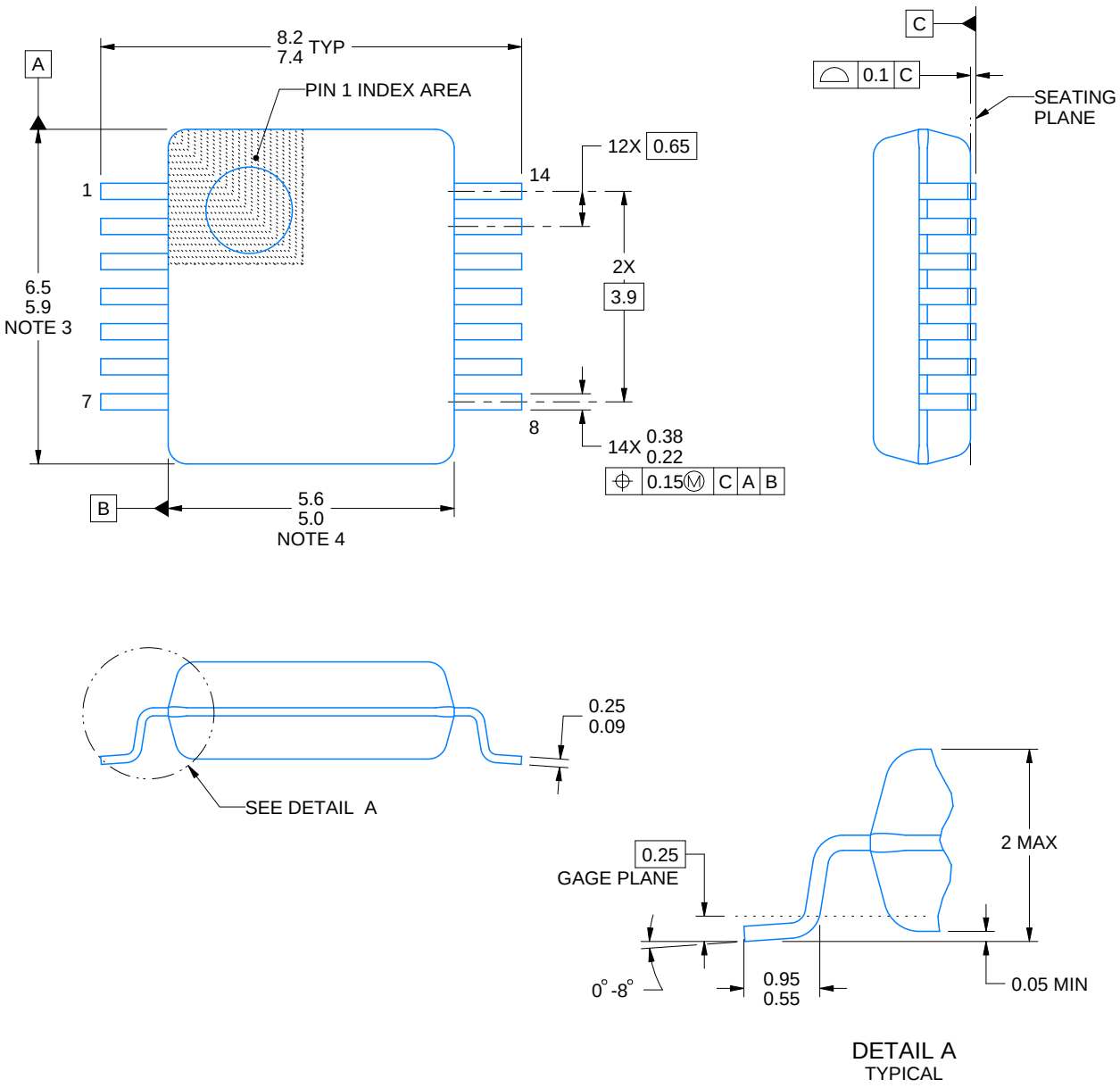
NOTES: A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15 per side.
D. Falls within JEDEC: 24/48 Pins – MO-153
14/16/20/56 Pins – MO-194

PACKAGE OUTLINE

DB0014A

SSOP - 2 mm max height

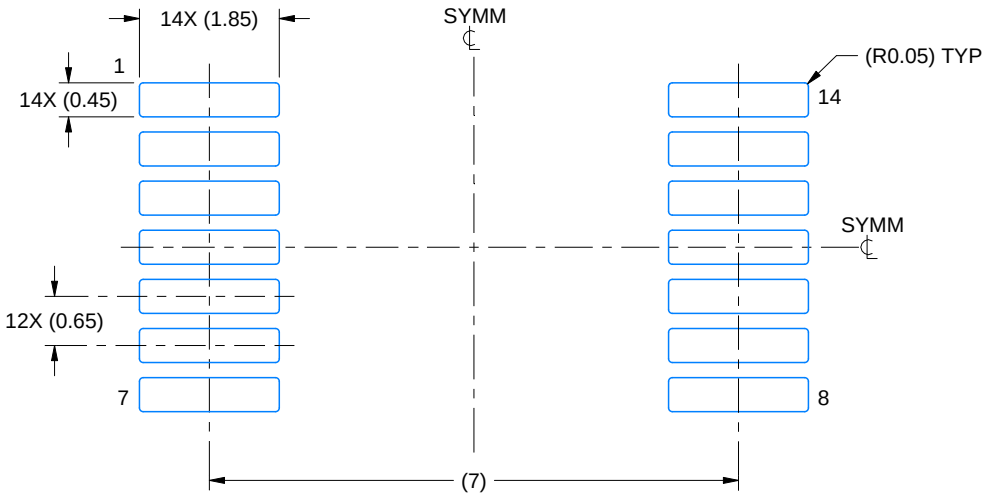
SMALL OUTLINE PACKAGE



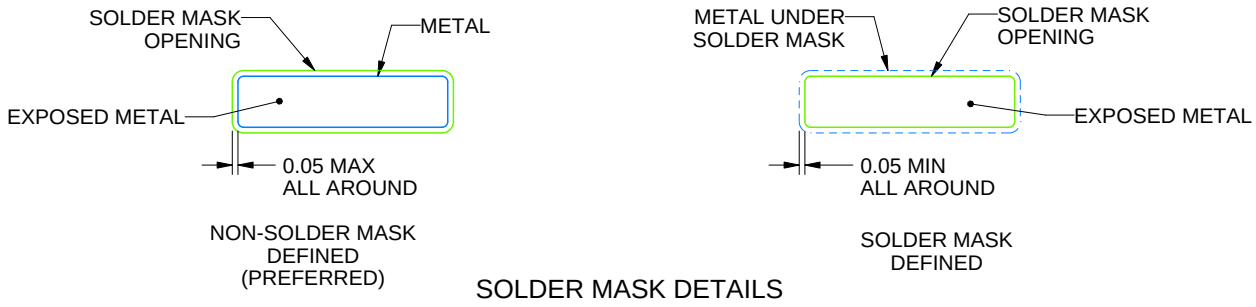
4220762/A 05/2024

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

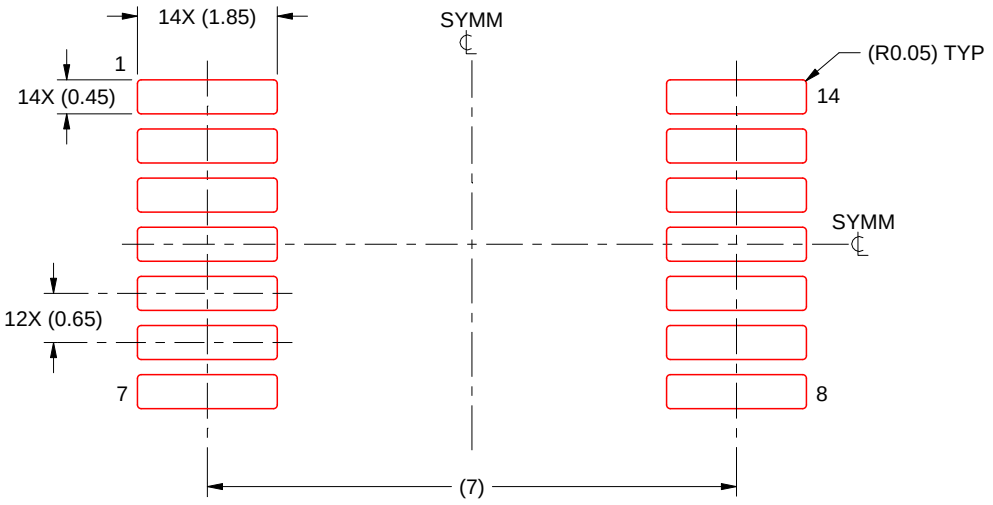


SOLDER MASK DETAILS

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)

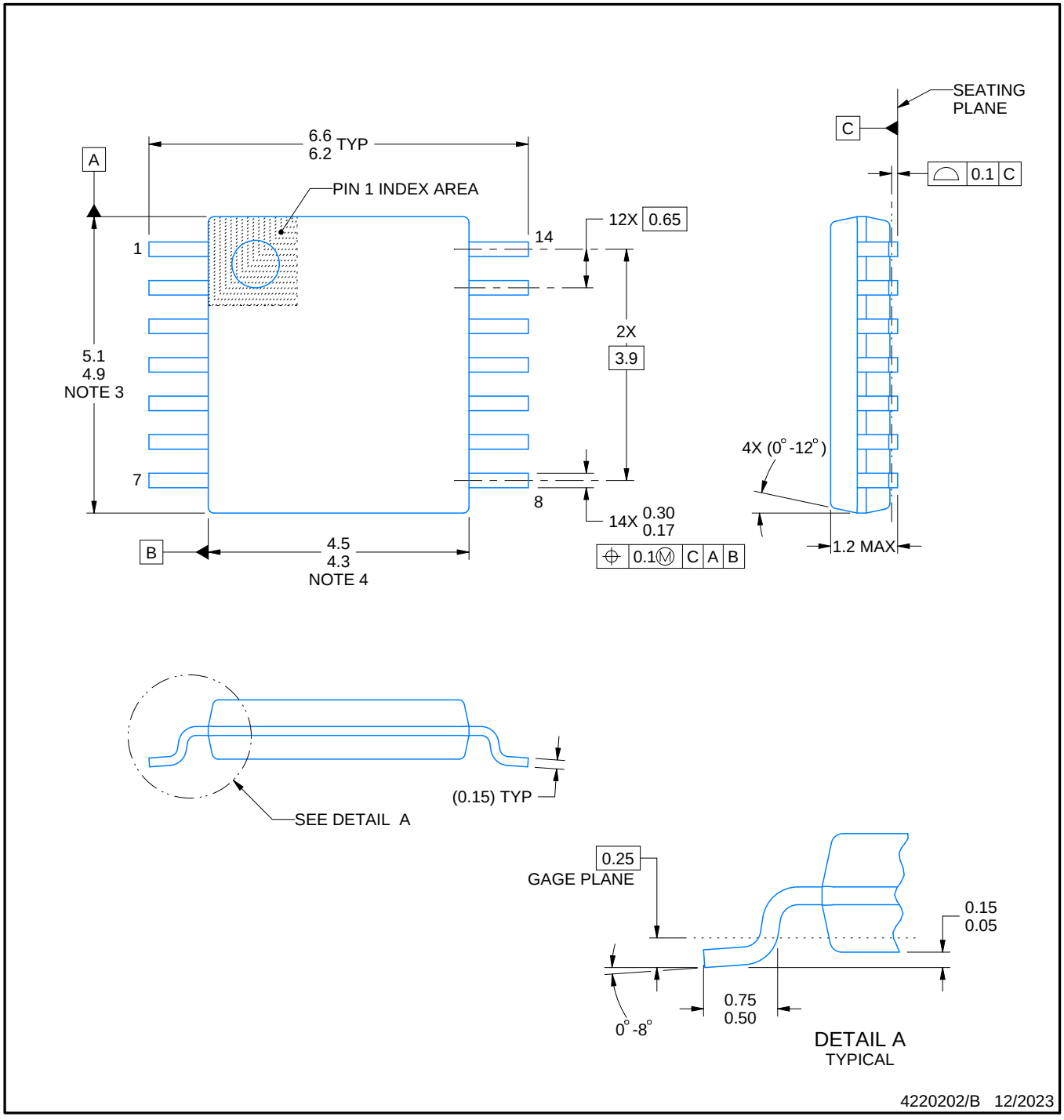
7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
8. Board assembly site may have different recommendations for stencil design.

PACKAGE OUTLINE

PW0014A

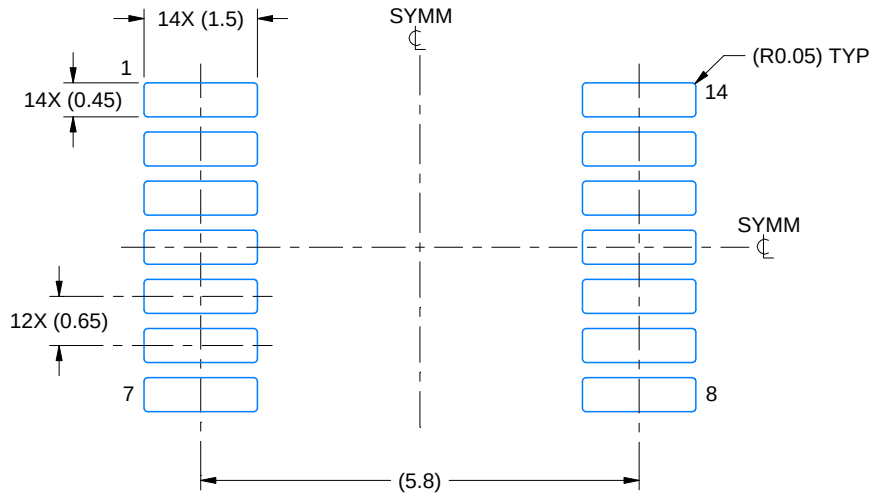
TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE

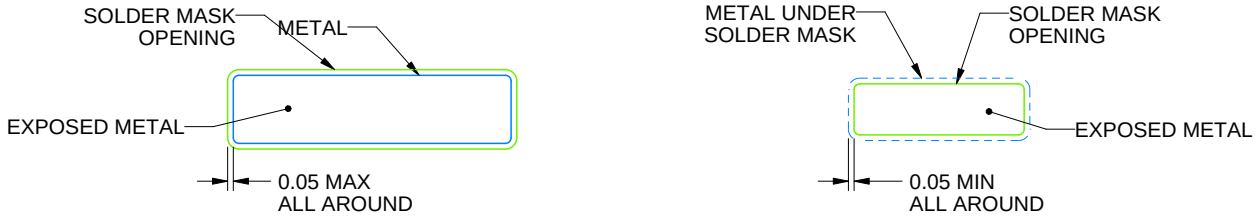


NOTES:

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

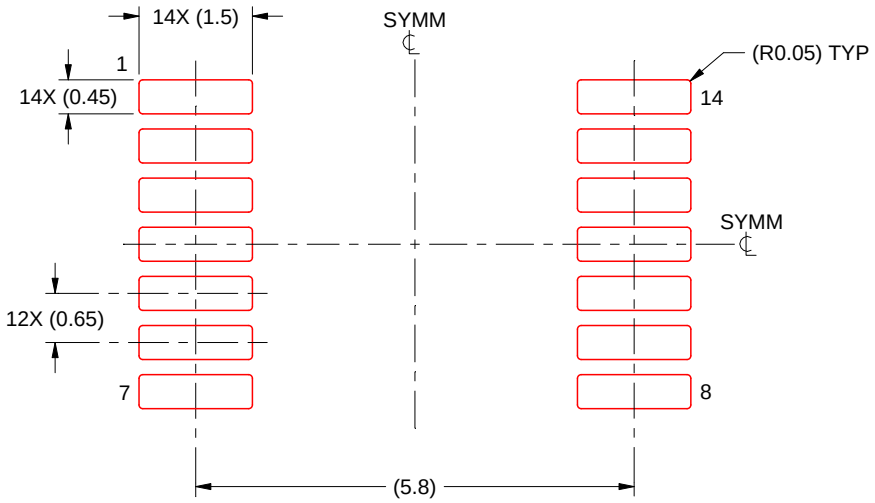


SOLDER MASK DETAILS

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.

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