

SN74LV21A 双路 4 输入正与门

1 特性

- 2V 至 5.5V V_{CC} 运行
- 电压为 5V 时, t_{pd} 最大值为 6ns
- $V_{CC} = 3.3V$ 、 $T_A = 25^\circ C$ 时, V_{OLP} (输出接地反弹) 典型值小于 0.8V
- $V_{CC} = 3.3V$ 、 $T_A = 25^\circ C$ 时, V_{OHV} (输出 V_{OH} 下冲) 典型值大于 2.3V
- I_{off} 支持局部关断模式运行
- 闩锁性能超过 100mA, 符合 JESD 78 II 类规范

2 说明

这些双路 4 输入正与门可在 2V 至 5.5V V_{CC} 电压下运行。

SN74LV21A 器件以正逻辑执行布尔函数 $Y = A \cdot B \cdot C \cdot D$ 。

这些器件专用于使用 I_{off} 的局部断电应用。 I_{off} 电路会禁用输出, 从而在器件断电时防止电流回流损坏器件。

封装信息

器件型号	封装 ¹	封装尺寸 ²
SN74LV21A	DGV (TVSOP, 14)	3.60 mm x 6.4 mm
	D (SOIC, 14)	8.65 mm x 6 mm
	NS (SO, 14)	10.20 mm x 7.8 mm
	DB (SSOP, 14)	6.20 mm x 7.8 mm
	PW (TSSOP, 14)	5.00 mm x 6.4 mm

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

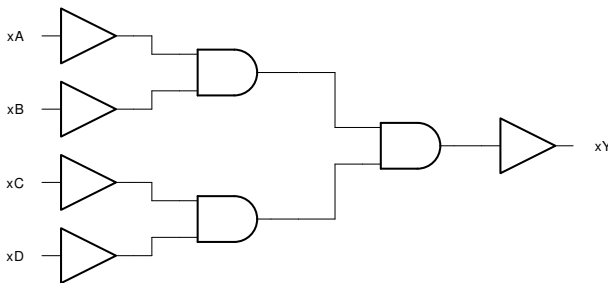


Table of Contents

1 特性	1	5.10 Operating Characteristics.....	6
2 说明	1	6 Parameter Measurement Information	7
3 Revision History	2	7 Detailed Description	8
4 Pin Configuration and Functions	3	7.1 Overview.....	8
5 Specifications	4	7.2 Functional Block Diagram.....	8
5.1 Absolute Maximum Ratings.....	4	7.3 Device Functional Modes.....	8
5.2 ESD Ratings.....	4	8 Device and Documentation Support	9
5.3 Recommended Operating Conditions	4	8.1 Documentation Support (Analog).....	9
5.4 Thermal Information.....	5	8.2 接收文档更新通知.....	9
5.5 Electrical Characteristics.....	5	8.3 支持资源.....	9
5.6 Switching Characteristics, $V_{CC} = 2.5\text{ V} \pm 0.2\text{ V}$	5	8.4 Trademarks.....	9
5.7 Switching Characteristics, $V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$	6	8.5 静电放电警告.....	9
5.8 Switching Characteristics, $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$	6	8.6 术语表.....	9
5.9 Noise Characteristics.....	6	9 Mechanical, Packaging, and Orderable Information	9

3 Revision History

注：以前版本的页码可能与当前版本的页码不同

Changes from Revision E (April 2005) to Revision F (July 2023)

Page

- 更新了整个文档中的编号、格式、表格、图和交叉参考，以反映当前数据表标准.....1

4 Pin Configuration and Functions

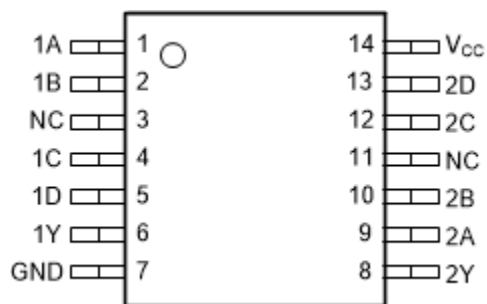


图 4-1. SN74LV21A D, DB, DGV, NS, or PW Package (Top View)

表 4-1. Pin Functions

PIN		TYPE ⁽¹⁾	DESCRIPTION
NAME	NO.		
1A	1	I	1A Input
1B	2	I	1B Input
NC	3	—	Not internally connected
1C	4	I	1C Input
1D	5	I	1D Input
1Y	6	O	1Y Output
2Y	8	O	2Y Output
2A	9	I	2A Input
2B	10	I	2B Input
NC	11	—	Not internally connected
2C	12	I	2C Input
2D	13	I	2D Input
GND	7	—	Ground Pin
V _{CC}	14	—	Power Pin

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

5 Specifications

5.1 Absolute Maximum Ratings

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

		MIN	MAX	UNIT
V_{CC}	Supply voltage range	- 0.5	7	V
V_I	Input voltage range ⁽²⁾	- 0.5	7	V
V_O	Output voltage range applied in high or low state ^{(2) (3)}	- 0.5	$V_{CC} + 0.5$	V
V_O	Output voltage range applied in 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	$(V_O = 0 \text{ to } V_{CC})$		± 25 mA
	Continuous current through V_{CC} or GND			± 50 mA
T_{stg}	Storage temperature	- 65	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 voltage ratings may be exceeded if the input and output current ratings are observed.
- (3) This value is limited to 5.5 V maximum.

5.2 ESD Ratings

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

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

		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
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	$V_{CC} \times 0.7$	
		$V_{CC} = 3 \text{ V to } 3.6 \text{ V}$	$V_{CC} \times 0.7$	
		$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$	$V_{CC} \times 0.7$	
V_{IL}	Low level input voltage	$V_{CC} = 2 \text{ V}$	0.5	V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	$V_{CC} \times 0.3$	
		$V_{CC} = 3 \text{ V to } 3.6 \text{ V}$	$V_{CC} \times 0.3$	
		$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$	$V_{CC} \times 0.3$	
V_I	Input voltage	0	5.5	V
V_O	Output voltage	0	V_{CC}	V
I_{OH}	High level output current	$V_{CC} = 2 \text{ V}$	- 50	μA
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	- 2	mA
		$V_{CC} = 3 \text{ V to } 3.6 \text{ V}$	- 6	
		$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$	- 12	

5.3 Recommended Operating Conditions (continued)

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

		MIN	MAX	UNIT
I_{OL} Low level output current	$V_{CC} = 2\text{ V}$		50	μA
	$V_{CC} = 2.3\text{ V to }2.7\text{ V}$		2	mA
	$V_{CC} = 3\text{ V to }3.6\text{ V}$		6	
	$V_{CC} = 4.5\text{ V to }5.5\text{ V}$		12	
$\Delta t / \Delta v$ Input transition rise and fall rate	$V_{CC} = 2.3\text{ V to }2.7\text{ V}$		200	ns/V
	$V_{CC} = 3\text{ V to }3.6\text{ V}$		100	
	$V_{CC} = 4.5\text{ V to }5.5\text{ V}$		20	
T_A Operating free-air temperature		- 40	85	$^{\circ}\text{C}$

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

5.4 Thermal Information

THERMAL METRIC ⁽¹⁾	SN74LV21A					UNIT
	D	DB	DGV	NS	PW	
	14 PINS	14 PINS	14 PINS	14 PINS	14 PINS	
$R_{\theta JA}$ Junction-to-ambient thermal resistance	86	96	127	76	113	$^{\circ}\text{C/W}$

(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_{CC}	MIN	TYP	MAX	UNIT
V_{OH} High-level output voltage	$I_{OH} = -50\text{ }\mu\text{A}$	2 V to 5.5 V	$V_{CC} - 0.1$			V
	$I_{OH} = -2\text{ mA}$	2.3 V	2			
	$I_{OH} = -6\text{ mA}$	3 V	2.48			
	$I_{OH} = -12\text{ mA}$	4.5 V	3.8			
V_{OL} Low-level output voltage	$I_{OL} = 50\text{ }\mu\text{A}$	2 V to 5.5 V			0.1	V
	$I_{OL} = 2\text{ mA}$	2.3 V			0.4	
	$I_{OL} = 6\text{ mA}$	3 V			0.44	
	$I_{OL} = 12\text{ mA}$	4.5 V			0.55	
I_I Input leakage current	$V_I = 5.5\text{ V or GND}$	0 to 5.5 V			± 1	μA
I_{CC} Supply current	$V_I = V_{CC}$ or GND, $I_O = 0$	5.5 V			20	μA
I_{off} Off-state leakage current	V_I or $V_O = 0$ to 5.5 V	0 V			5	μA
C_i Input capacitance	$V_I = V_{CC}$ or GND	3.3 V		1.9		pF

5.6 Switching Characteristics, $V_{CC} = 2.5\text{ V} \pm 0.2\text{ V}$

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	$T_A = 25^{\circ}\text{C}$			SN74LV21A		UNIT
				MIN	TYP	MAX	MIN	MAX	
t_{pd}	A, B, C or D	Y	$C_L = 15\text{ pF}$		7	12	1	14	ns
t_{pd}	A, B, C or D	Y	$C_L = 50\text{ pF}$		9.2	15.7	1	19	

5.7 Switching Characteristics, $V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	$T_A = 25^\circ\text{C}$			SN74LV21A		UNIT
				MIN	TYP	MAX	MIN	MAX	
t_{pd}	A, B, C, or D	Y	$C_L = 15\text{ pF}$		5.1	7	1	8.5	ns
t_{pd}	A, B, C, or D	Y	$C_L = 50\text{ pF}$		6.6	10.5	1	12	

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

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	$T_A = 25^\circ\text{C}$			SN74LV21A		UNIT
				MIN	TYP	MAX	MIN	MAX	
t_{pd}	A, B, C, or D	Y	$C_L = 15\text{ pF}$		3.8	5	1	6	ns
t_{pd}	A, B, C, or D	Y	$C_L = 50\text{ pF}$		4.9	7	1	8	

5.9 Noise Characteristics

$V_{CC} = 3.3\text{ V}$, $C_L = 50\text{ pF}$, $T_A = 25^\circ\text{C}$

PARAMETER ⁽¹⁾		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	-0.8	V
$V_{OH(V)}$	Quiet output, minimum dynamic V_{OH}		3.2		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.

5.10 Operating Characteristics

$T_A = 25^\circ\text{C}$

PARAMETER		TEST CONDITIONS		V_{CC}	TYP	UNIT
C_{pd}	Power dissipation capacitance	$C_L = 50\text{ pF}$, $f = 10\text{ MHz}$		3.3 V	17.4	pF
				5 V	20.2	

6 Parameter Measurement Information

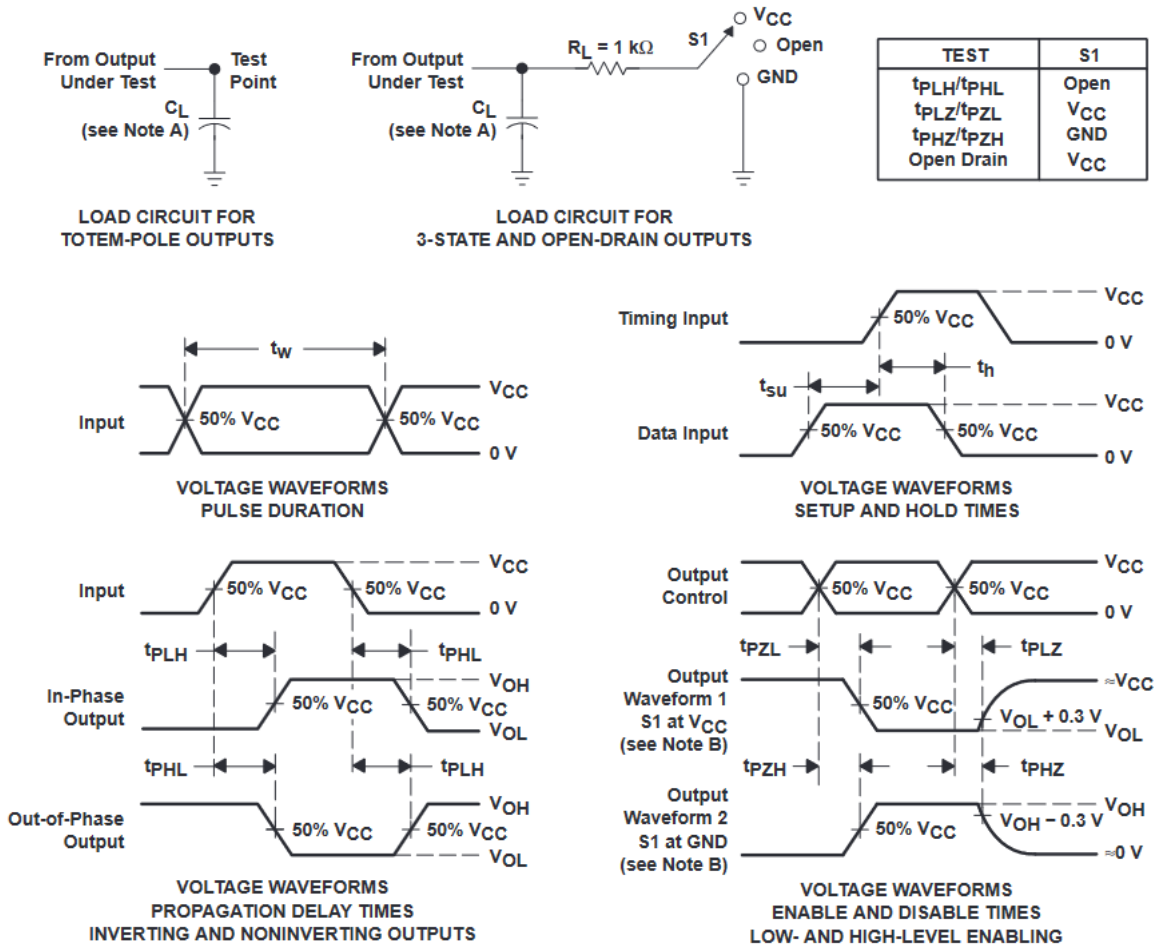


图 6-1. Load Circuit and Voltage Waveforms

- A. C_L includes probe and jig capacitance.
- B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
- C. All input pulses are supplied by generators having the following characteristics: $PRR \leq 1\text{ MHz}$, $Z_O = 50\ \Omega$, $t_r \leq 3\text{ ns}$, $t_f \leq 3\text{ ns}$.
- D. The outputs are measured one at a time, with one input transition per measurement.
- E. t_{PLZ} and t_{PHZ} are the same as t_{dis} .
- F. t_{PZL} and t_{PZH} are the same as t_{en} .
- G. t_{PHL} and t_{PLH} are the same as t_{pd} .
- H. All parameters and waveforms are not applicable to all devices.

7 Detailed Description

7.1 Overview

These devices are fully specified for partial-power-down applications using I_{off} . The I_{off} circuitry disables the outputs, preventing damaging current backflow through the devices when they are powered down. The SN74LV21A devices perform the Boolean function $Y = A \cdot B \cdot C \cdot D$ in positive logic. These dual 4-input positive-AND gates are designed for 2-V to 5.5-V V_{CC} operation.

7.2 Functional Block Diagram

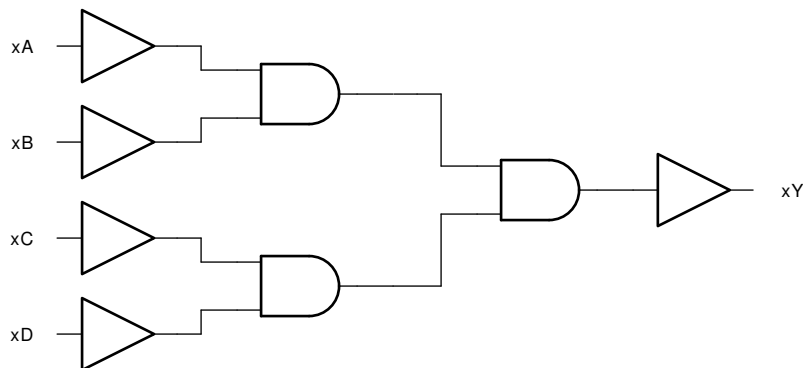


图 7-1. logic diagram (positive logic)

7.3 Device Functional Modes

Function Table
(each gate)

INPUTS ⁽¹⁾				OUTPUT ⁽²⁾ Y
A	B	C	D	
H	H	H	H	H
L	X	X	X	L
X	L	X	X	L
X	X	L	X	L
X	X	X	L	L

(1) H = High Voltage Level, L = Low Voltage Level, X = Do not Care, Z = High Impedance

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

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

PARTS	PRODUCT FOLDER	SAMPLE & BUY	TECHNICAL DOCUMENTS	TOOLS & SOFTWARE	SUPPORT & COMMUNITY
SN74LV21A	Click here	Click here	Click here	Click here	Click here

8.2 接收文档更新通知

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

8.3 支持资源

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

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

8.4 Trademarks

TI E2E™ is a trademark of Texas Instruments.

所有商标均为其各自所有者的财产。

8.5 静电放电警告



静电放电 (ESD) 会损坏这个集成电路。德州仪器 (TI) 建议通过适当的预防措施处理所有集成电路。如果不遵守正确的处理和安装程序，可能会损坏集成电路。

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

8.6 术语表

[TI 术语表](#) 本术语表列出并解释了术语、首字母缩略词和定义。

9 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)
SN74LV21AD	Obsolete	Production	SOIC (D) 14	-	-	Call TI	Call TI	-40 to 85	LV21A
SN74LV21ADBR	Active	Production	SSOP (DB) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LV21A
SN74LV21ADBR.A	Active	Production	SSOP (DB) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LV21A
SN74LV21ADGVR	NRND	Production	TVSOP (DGV) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LV21A
SN74LV21ADGVR.A	NRND	Production	TVSOP (DGV) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LV21A
SN74LV21ADR	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU SN	Level-1-260C-UNLIM	-40 to 85	LV21A
SN74LV21ADR.A	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LV21A
SN74LV21ANSR	NRND	Production	SOP (NS) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	74LV21A
SN74LV21ANSR.A	NRND	Production	SOP (NS) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	74LV21A
SN74LV21APW	Obsolete	Production	TSSOP (PW) 14	-	-	Call TI	Call TI	-40 to 85	LV21A
SN74LV21APWR	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU SN	Level-1-260C-UNLIM	-40 to 85	LV21A
SN74LV21APWR.A	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LV21A
SN74LV21APWRG4	Active	Production	TSSOP (PW) 14	2000 null	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LV21A
SN74LV21APWRG4	Active	Production	TSSOP (PW) 14	2000 null	No	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LV21A
SN74LV21APWRG4.A	Active	Production	TSSOP (PW) 14	2000 null	No	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LV21A
SN74LV21APWRG4.A	Active	Production	TSSOP (PW) 14	2000 null	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LV21A

⁽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.

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.

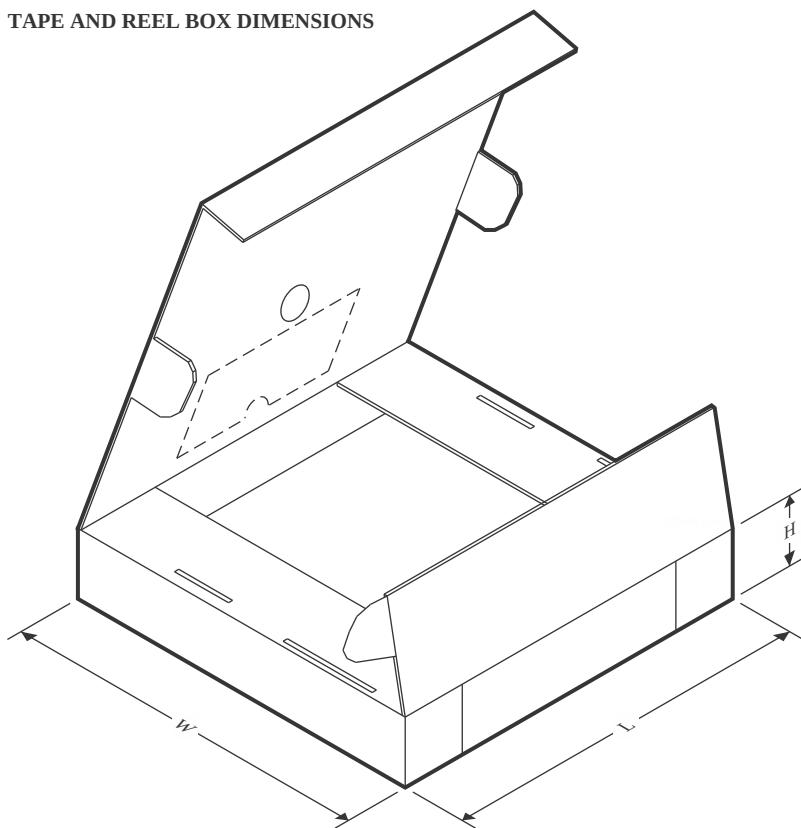
TAPE AND REEL INFORMATION



*All dimensions are nominal

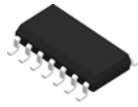
Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74LV21ADBR	SSOP	DB	14	2000	330.0	16.4	8.35	6.6	2.4	12.0	16.0	Q1
SN74LV21ADGVR	TVSOP	DGV	14	2000	330.0	12.4	6.8	4.0	1.6	8.0	12.0	Q1
SN74LV21ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV21ANSR	SOP	NS	14	2000	330.0	16.4	8.1	10.4	2.5	12.0	16.0	Q1
SN74LV21APWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1

TAPE AND REEL BOX DIMENSIONS

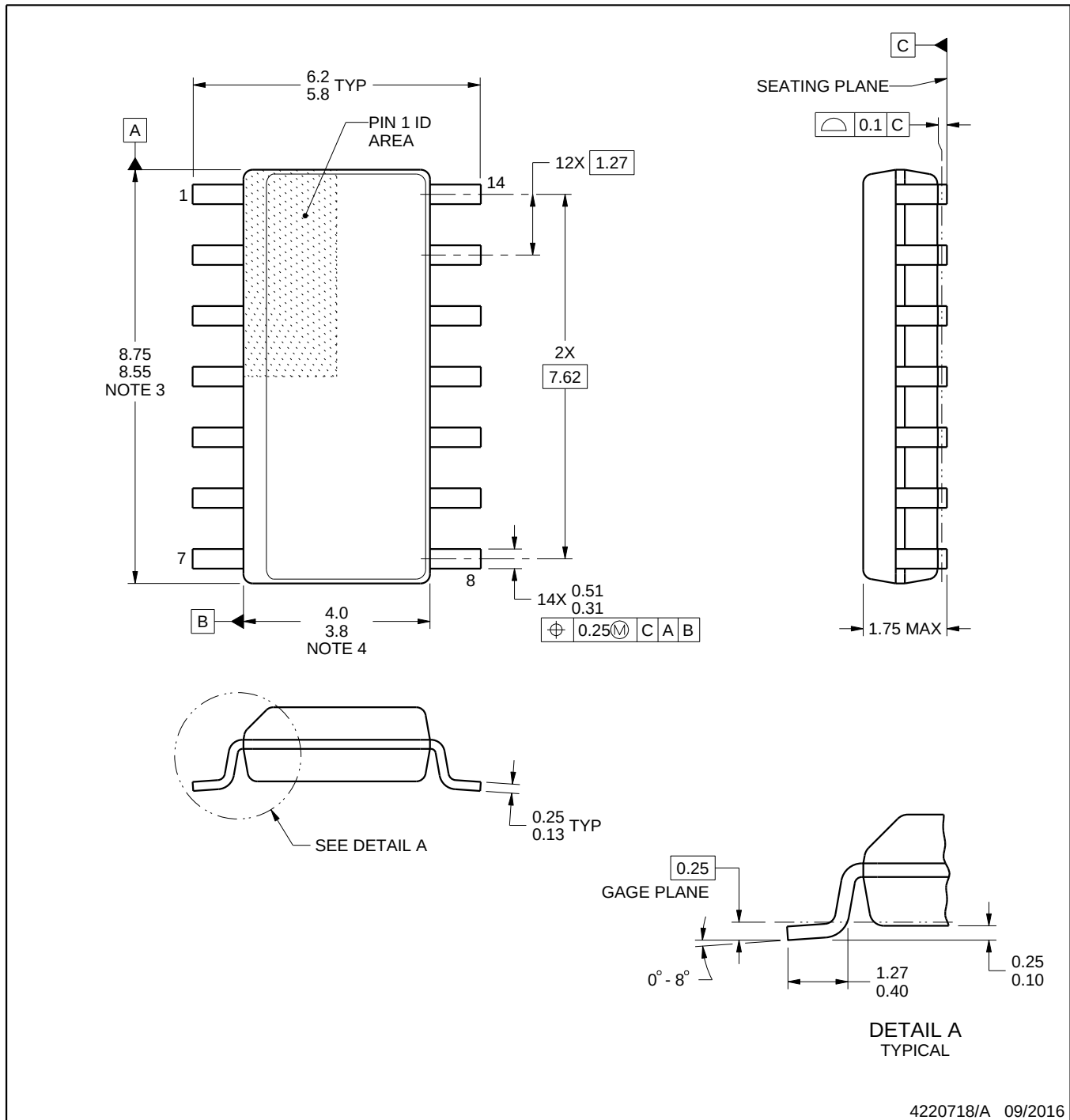


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LV21ADBR	SSOP	DB	14	2000	353.0	353.0	32.0
SN74LV21ADGVR	TVSOP	DGV	14	2000	353.0	353.0	32.0
SN74LV21ADR	SOIC	D	14	2500	353.0	353.0	32.0
SN74LV21ANSR	SOP	NS	14	2000	353.0	353.0	32.0
SN74LV21APWR	TSSOP	PW	14	2000	353.0	353.0	32.0

D0014A**PACKAGE OUTLINE****SOIC - 1.75 mm max height**

SMALL OUTLINE INTEGRATED CIRCUIT

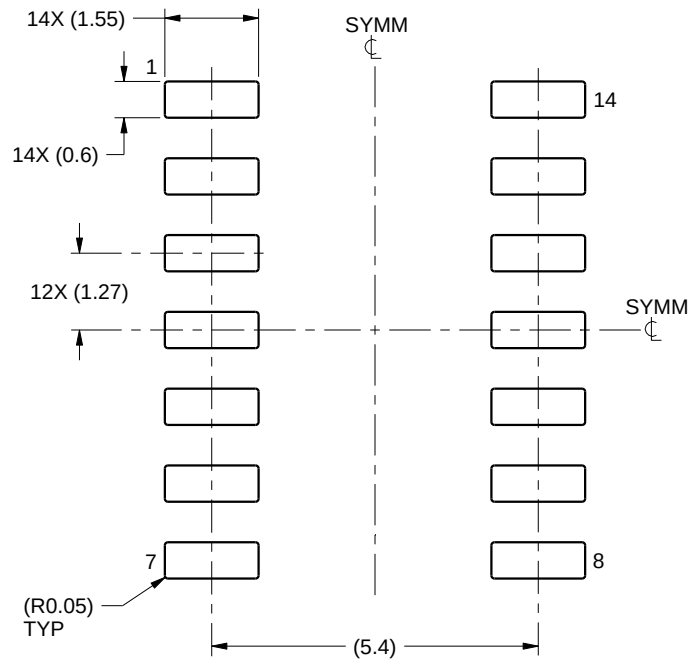


EXAMPLE BOARD LAYOUT

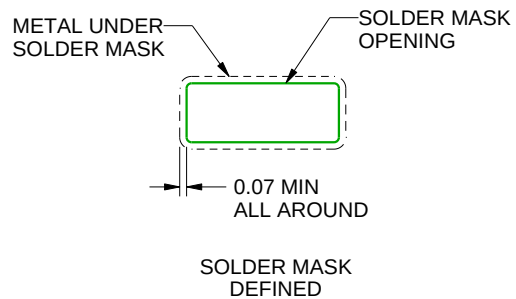
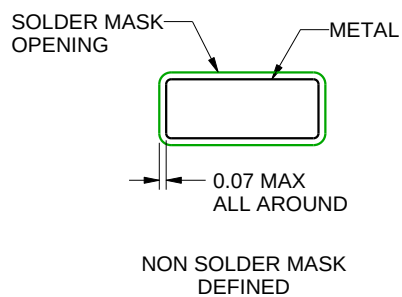
D0014A

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.

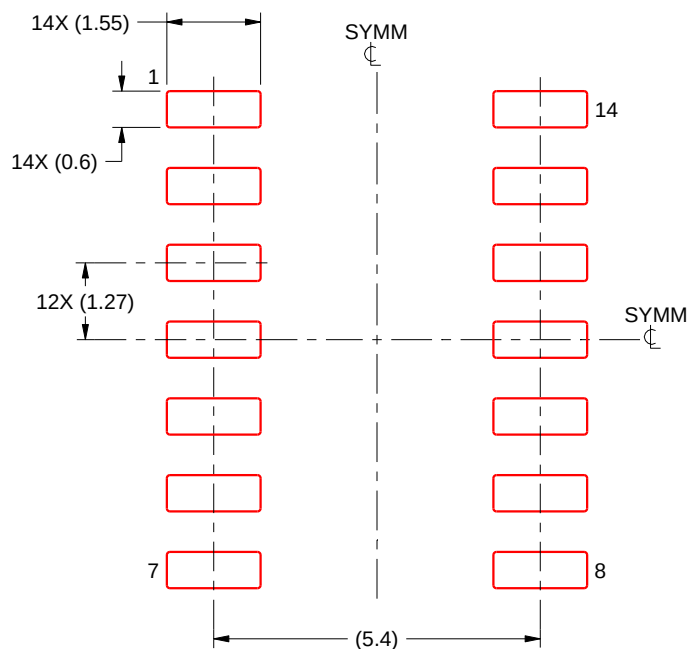
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

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)

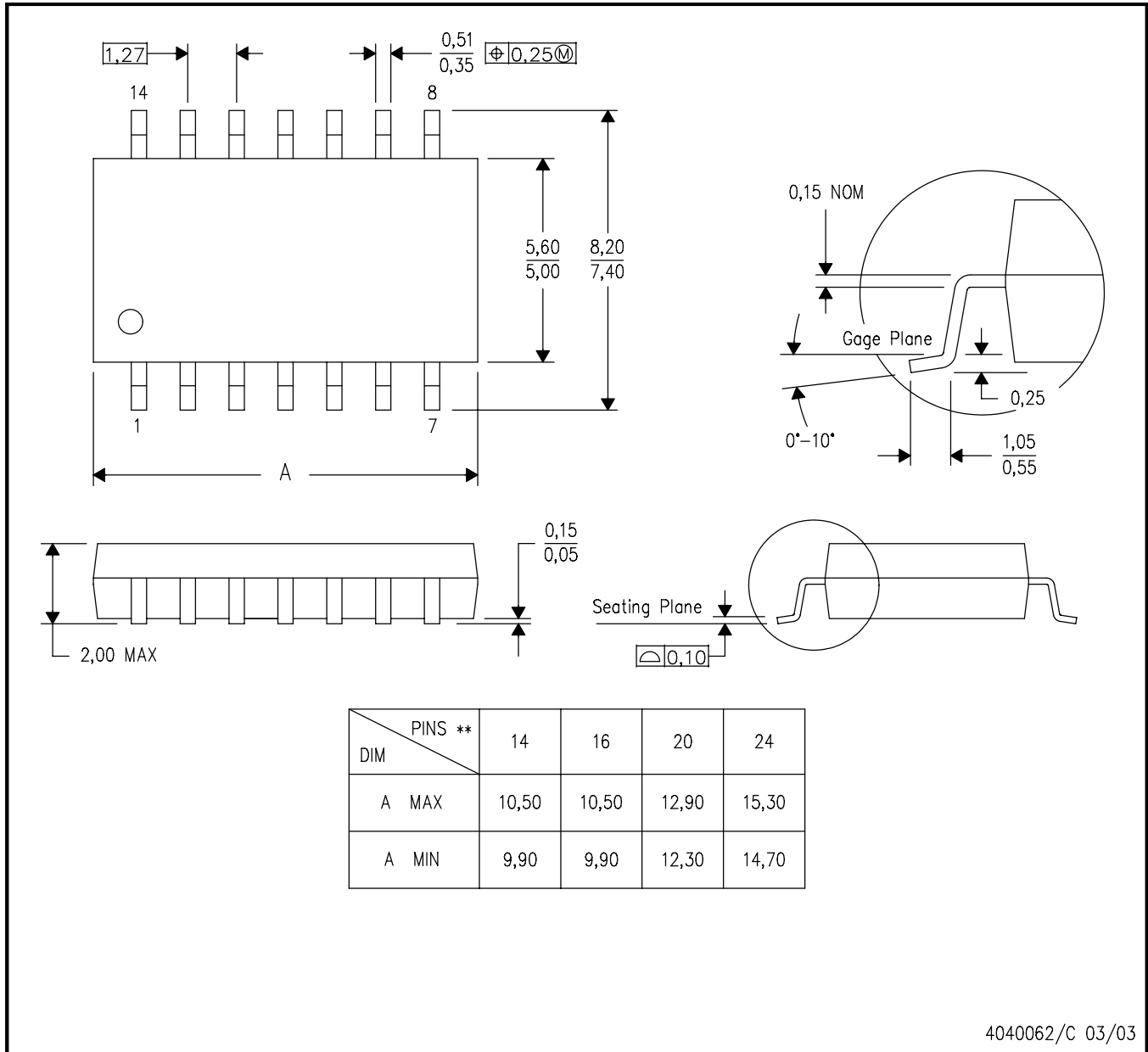
8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

MECHANICAL DATA

NS (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN

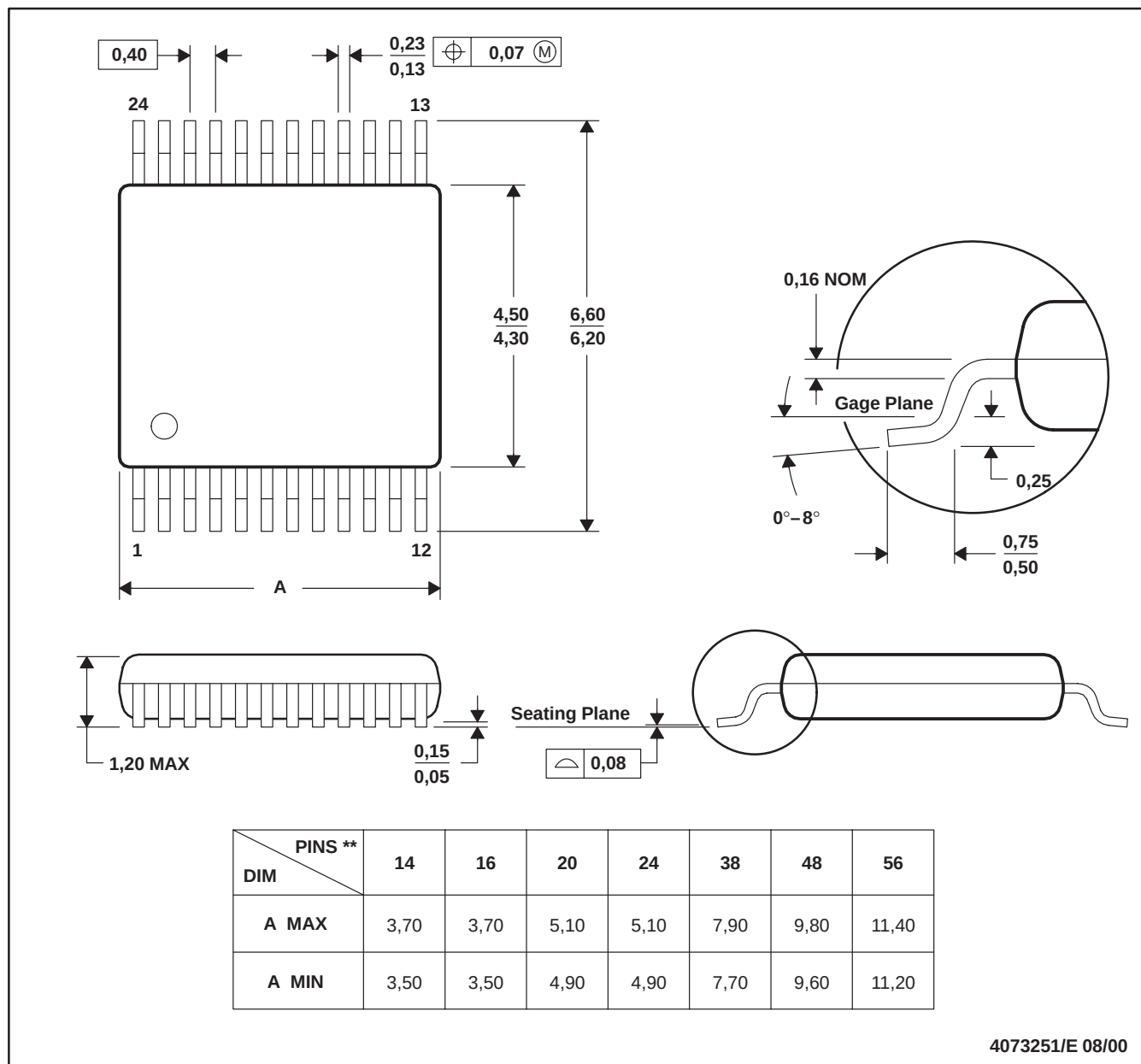


- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

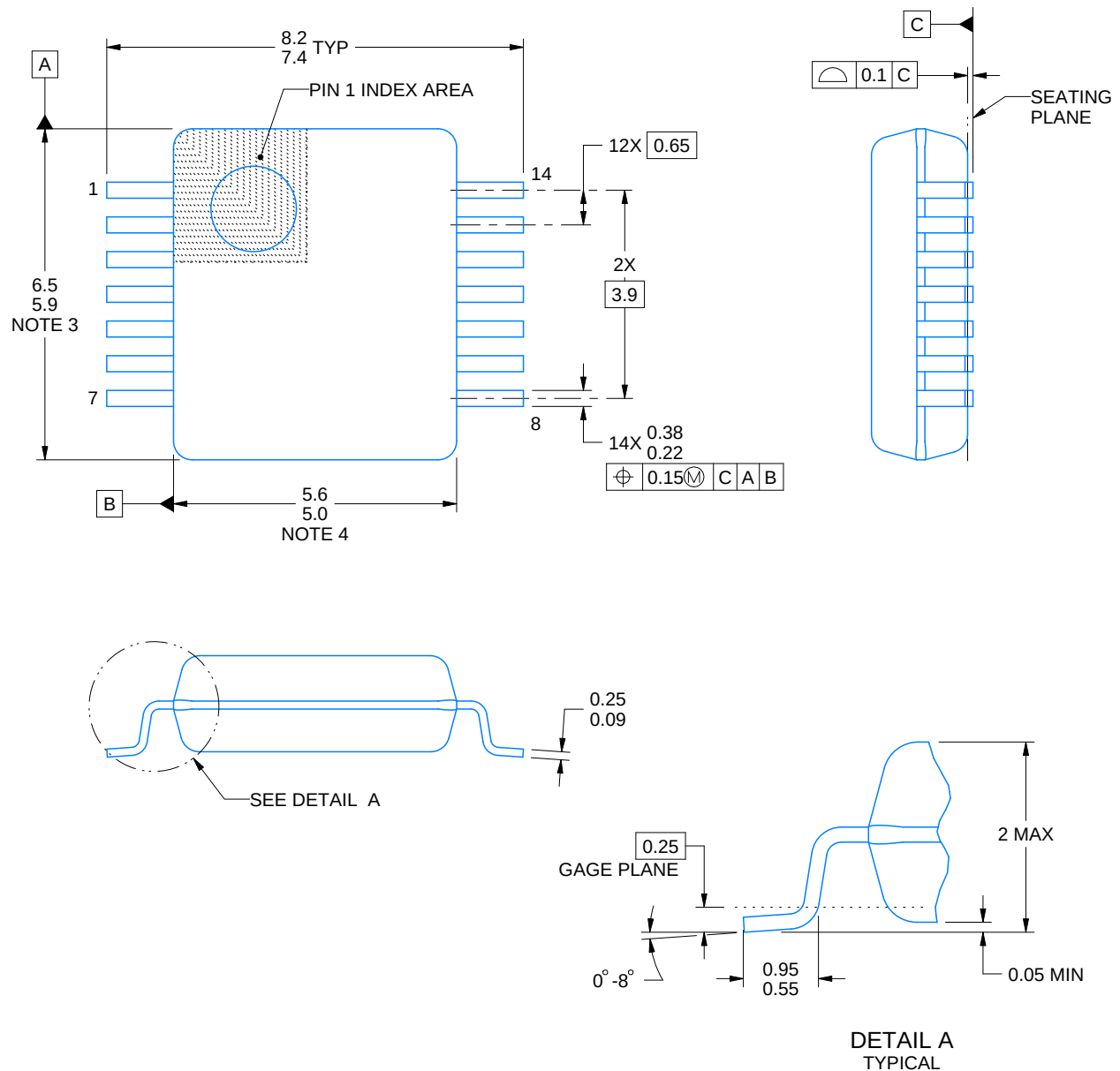
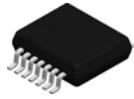
DGV (R-PDSO-G**)

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



4220762/A 05/2024

NOTES:

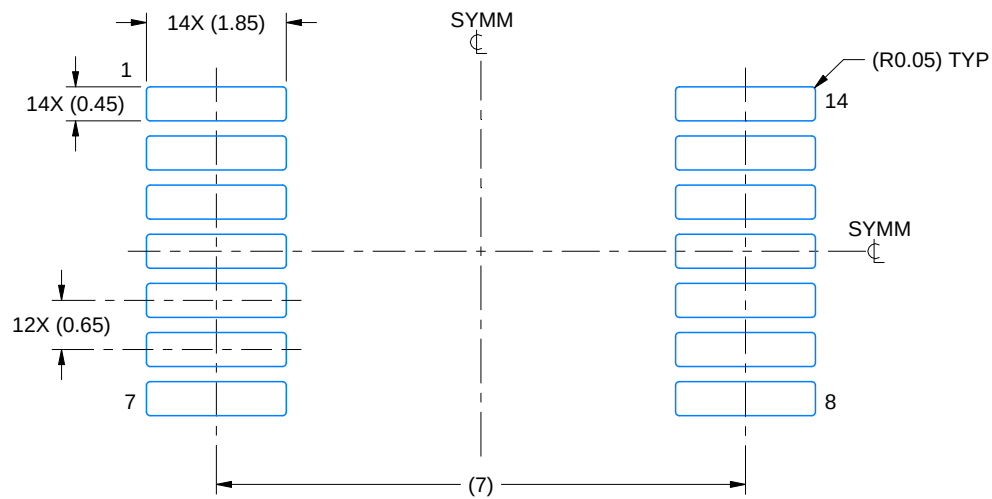
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or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

EXAMPLE BOARD LAYOUT

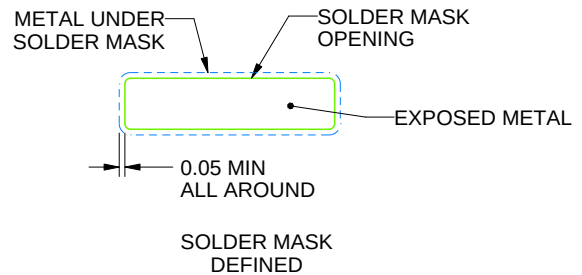
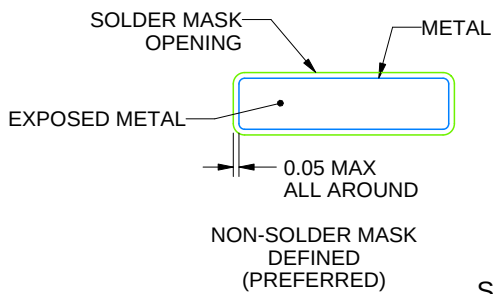
DB0014A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



SOLDER MASK DETAILS

4220762/A 05/2024

NOTES: (continued)

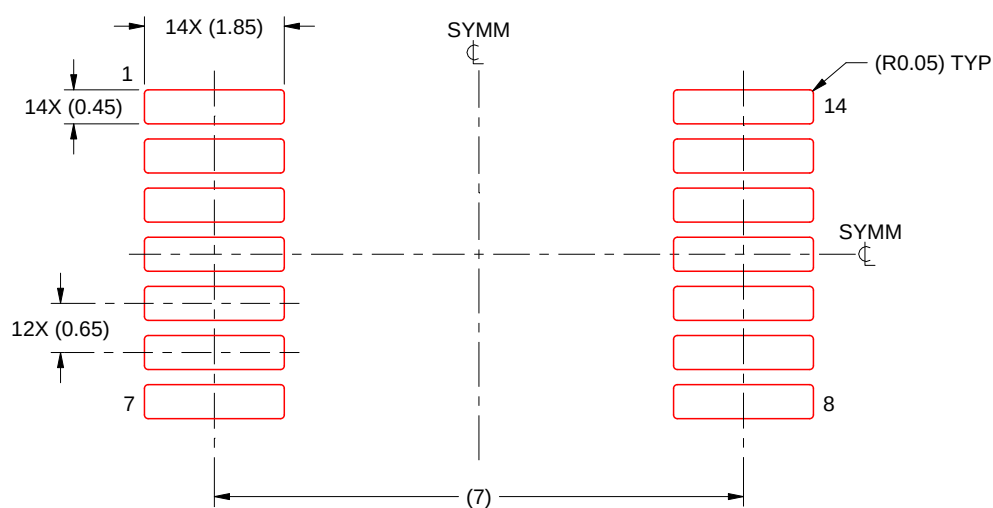
5. Publication IPC-7351 may have alternate designs.
6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

DB0014A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE

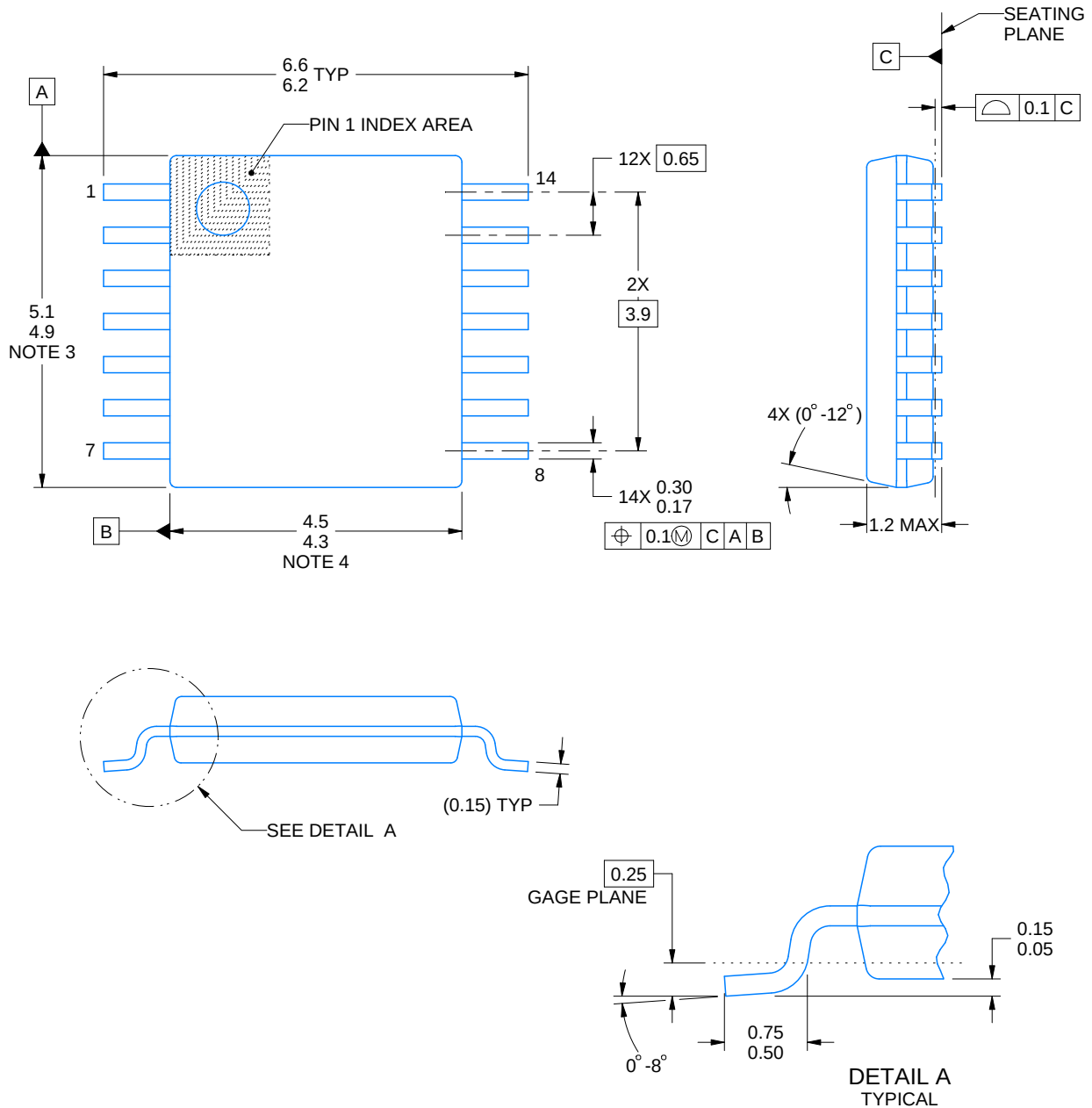
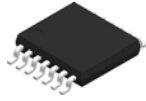


SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE: 10X

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.



4220202/B 12/2023

NOTES:

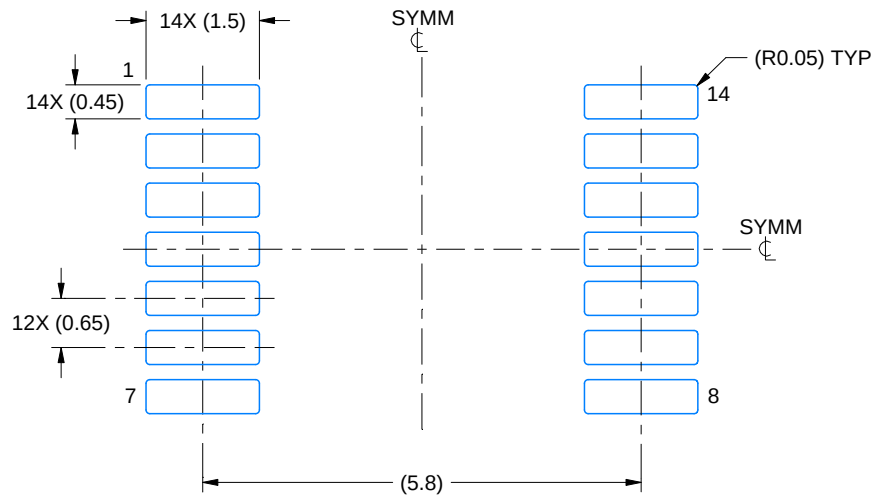
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or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

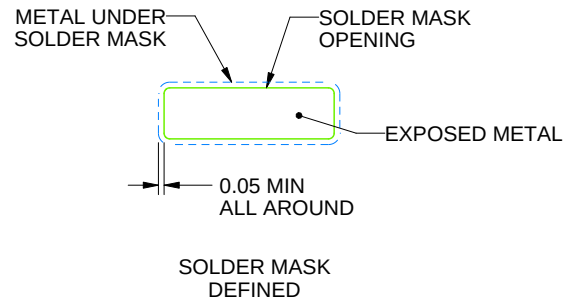
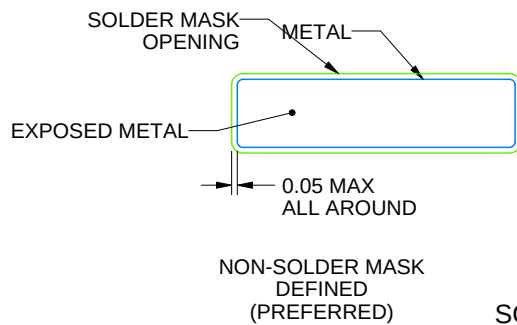
PW0014A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



SOLDER MASK DETAILS

4220202/B 12/2023

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

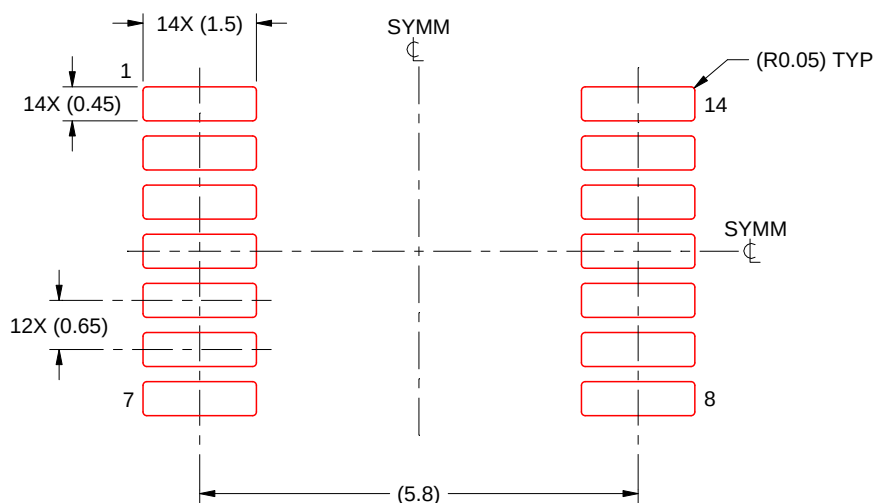
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

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.

重要通知和免责声明

TI“按原样”提供技术和可靠性数据（包括数据表）、设计资源（包括参考设计）、应用或其他设计建议、网络工具、安全信息和其他资源，不保证没有瑕疵且不做任何明示或暗示的担保，包括但不限于对适销性、与某特定用途的适用性或不侵犯任何第三方知识产权的暗示担保。

这些资源可供使用 TI 产品进行设计的熟练开发人员使用。您将自行承担以下全部责任：(1) 针对您的应用选择合适的 TI 产品，(2) 设计、验证并测试您的应用，(3) 确保您的应用满足相应标准以及任何其他安全、安保法规或其他要求。

这些资源如有变更，恕不另行通知。TI 授权您仅可将这些资源用于研发本资源所述的 TI 产品的相关应用。严禁以其他方式对这些资源进行复制或展示。您无权使用任何其他 TI 知识产权或任何第三方知识产权。对于因您对这些资源的使用而对 TI 及其代表造成的任何索赔、损害、成本、损失和债务，您将全额赔偿，TI 对此概不负责。

TI 提供的产品受 [TI 销售条款](#)、[TI 通用质量指南](#) 或 [ti.com](#) 上其他适用条款或 TI 产品随附的其他适用条款的约束。TI 提供这些资源并不会扩展或以其他方式更改 TI 针对 TI 产品发布的适用的担保或担保免责声明。除非德州仪器 (TI) 明确将某产品指定为定制产品或客户特定产品，否则其产品均为按确定价格收入目录的标准通用器件。

TI 反对并拒绝您可能提出的任何其他或不同的条款。

版权所有 © 2026，德州仪器 (TI) 公司

最后更新日期：2025 年 10 月