SN74LV125A 具有三态输出的四路总线缓冲门

1 特性

- 2V 至 5.5V V_{CC} 运行
- 电压为 5V 时，t_{pd} 最大值为 6ns
- V_{OLP}（输出接地反弹）典型值小于 0.8V（V_{CC} = 3.3V、T_A = 25°C 时）
- V_{CC} = 3.3V、T_A = 25°C 时，V_{OHV}（输出 V_{OH} 下冲）典型值大于 2.3 V
- 所有端口上均支持以混合模式电压运行
- I_{off} 支持局部断电模式运行
- 闩锁性能超过 250mA，符合 JESD 17 规范
- ESD 保护性能超过 JESD 22 规范要求
  - 4000V 人体放电模型
  - 200V 机器放电模型
  - 2000V 充电器件模型

2 应用

- 流量计
- 固态硬盘 (SSD)：企业
- 以太网供电 (PoE)
- 可编程逻辑控制器
- 电机驱动与控制
- 电子销售终端

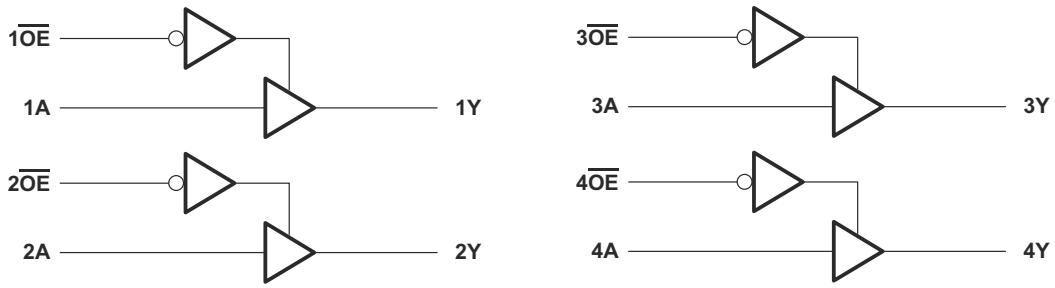
3 说明

SN74LV125A 四路总线缓冲门专为 2V 至 5.5V V_{CC} 运行而设计。

器件信息

器件型号(1)	封装	封装尺寸（标称值）
SN74LV125A	DGV (TVSOP, 14)	3.60mm x 4.40mm
	D (SOIC, 14)	8.65mm × 3.90mm
	NS (SO, 14)	10.20mm x 5.30mm
	DB (SSOP, 14)	6.20mm x 5.30mm
	PW (TSSOP, 14)	5.00mm x 4.40mm

(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。



Simplified Schematic

本文档旨在为方便起见，提供有关 TI 产品中文版本的信息，以确认产品的概要。有关适用的官方英文版本的最新信息，请访问 www.ti.com，其内容始终优先。TI 不保证翻译的准确性和有效性。在实际设计之前，请务必参考最新版本的英文版本。

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4 Revision History

Changes from Revision N (January 2015) to Revision O (May 2022)	Page
• Updated the numbering, formatting, tables, figures, and cross-references throughout the document to reflect modern data sheet standards	4

Changes from Revision M (December 2014) to Revision N (January 2015)	Page
• Added T_j spec to *Absolute Maximum Ratings* table	4
• Added text to *Overview* section	9

Changes from Revision L (April 2005) to Revision M (December 2014)	Page
• 添加了*应用*、*器件信息*表、*引脚功能*表、*ESD 等级*表、*热性能信息*表、*典型特性*、*特性说明*部分、*器件功能模式*、*应用和实施*部分、*电源相关建议*部分、*布局*部分、*器件和文档支持*部分以及*机械、封装和可订购信息*部分	1
• 删除了*订购信息*表	1
• Changed MAX operating temperature to 125°C in *Recommended Operating Conditions* table.	5

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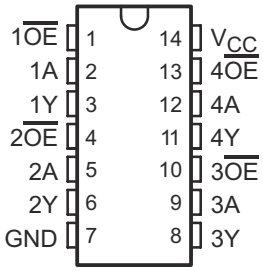
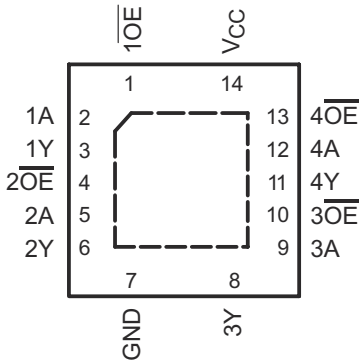
5 Pin Configuration and Functions

SN74LV125A . . . D, DB, DGV, N, NS, OR PW PACKAGE (TOP VIEW)



SN74LV125A . . . RGY PACKAGE (TOP VIEW)



Pin Functions

PIN		TYPE[1]	DESCRIPTION
NO.	NAME		
1	1$\overline{OE}$	I	Output Enable 1, Active Low
2	1A	I	1A Input
3	1Y	O	1Y Output
4	2$\overline{OE}$	I	Output Enable 2, Active Low
5	2A	I	2A Input
6	2Y	O	2Y Output
7	GND	—	Ground Pin
8	3Y	O	3Y Output
9	3A	I	3A Input
10	3$\overline{OE}$	I	Output Enable 3, Active Low
11	4Y	O	4Y Output
12	4A	I	4A Input
13	4$\overline{OE}$	I	Output Enable 4, Active Low
14	V_{CC}	—	Power Pin

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

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6 Specifications

6.1 Absolute Maximum Ratings

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

			MIN[1]	MAX	UNIT
V_{CC}	Supply voltage		– 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
V_O	Output voltage range[2] [3]		– 0.5	V_{CC} + 0.5	V
I_{IK}	Input clamp current	V_I < 0		– 20	mA
I_{OK}	Output clamp current	V_O < 0		– 50	mA
I_O	Continuous output current	V_O = 0 to V_{CC}		±35	mA
	Continuous current through V_{CC} or GND			±70	mA
T_j	Junction temperature			150	°C
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 节 6.3 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.
(3) This value is limited to 5.5-V maximum.

6.2 ESD Ratings

			MAX	UNIT
$V_{(ESD)}$	Electrostatic discharge	Human body model (HBM), per ANSI/ESDA/JEDEC JS-001, all pins[1]	±4000	V
		Charged device model (CDM), per JEDEC specification JESD22-C101, all pins[2]	±2000	
		Machine Model (MM)	±200	

(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.

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6.3 Recommended Operating Conditions

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

			SN74LV125A		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	High or low state	0	V_{CC}	V
		3-state	0	5.5	
I_{OH}	High-level output current	V_{CC} = 2 V		– 50	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	
I_{OL}	Low-level output current	V_{CC} = 2 V		50	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 or 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	
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)		SN74LV125A							UNIT
		D	DB	DGV	N	NS	PW	RGY	
		14 PINS							
$R_{\theta JA}$	Junction-to-ambient thermal resistance	92.7	105.0	127.6	89.2	89.6	119.8	55.0	°C/W
$R_{\theta JC(top)}$	Junction-to-case (top) thermal resistance	54.1	57.5	50.7	47.0	47.2	48.6	67.4	
$R_{\theta JB}$	Junction-to-board thermal resistance	47.0	52.3	60.5	47.9	48.4	61.5	31.0	
ψ_{JT}	Junction-to-top characterization parameter	18.9	19.1	6.1	14.1	14.0	5.7	2.6	
ψ_{JB}	Junction-to-board characterization parameter	46.7	51.8	59.8	47.5	48.1	61.0	31.1	
$R_{\theta JC(bot)}$	Junction-to-case (bottom) thermal resistance	N/A	N/A	N/A	N/A	N/A	N/A	11.6	

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

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6.5 Electrical Characteristics

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

PARAMETER	TEST CONDITIONS	V_{CC}	T_A = 25°C			– 40°C to 85°C		– 40°C to 125°C		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
V_{OH}	I_{OH} = – 50 µA	2 V to 5.5 V	V_{CC} – 0.1			V_{CC} – 0.1		V_{CC} – 0.1		V
	I_{OH} = – 2 mA	2.3 V	2			2		2		
	I_{OH} = – 8 mA	3 V	2.48			2.48		2.48		
	I_{OH} = – 16 mA	4.5 V	3.8			3.8		3.8		
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_{OZ}	V_O = V_{CC} or GND	5.5 V			±5		±5		±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						pF
		5 V		1.6						

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

over recommended operating free-air temperature range (unless otherwise noted) (see 图 7-1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T_A = 25°C			– 40°C to 85°C		– 40°C to 125°C		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A	Y	C_L = 15 pF		6.8(1)	13(1)	1	15.5	1	17	ns
t_{en}	$\overline{OE}$	Y			7(1)	13(1)	1	15.5	1	17	
t_{dis}	$\overline{OE}$	Y			5.1(1)	14.7(1)	1	17	1	18	
t_{pd}	A	Y	C_L = 50 pF		8.7	16.5	1	18.5	1	20	ns
t_{en}	$\overline{OE}$	Y			8.8	16.5	1	18.5	1	20	
t_{dis}	$\overline{OE}$	Y			7.3	18.2	1	20.5	1	21.5	
$t_{sk(o)}$						2		2		2	

(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 图 7-1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T_A = 25°C			– 40°C to 85°C		– 40°C to 125°C		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A	Y	C_L = 15 pF		4.8(1)	8(1)	1	9.5	1	11	ns
t_{en}	$\overline{OE}$	Y			4.8(1)	8(1)	1	9.5	1	10.5	
t_{dis}	$\overline{OE}$	Y			4.1(1)	9.7(1)	1	11.5	1	12.5	
t_{pd}	A	Y	C_L = 50 pF		6.1	11.5	1	13	1	14.5	ns
t_{en}	$\overline{OE}$	Y			6.2	11.5	1	13	1	14	
t_{dis}	$\overline{OE}$	Y			5.5	13.2	1	15	1	16	
$t_{sk(o)}$						1.5		1.5		1.5	

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

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

over recommended operating free-air temperature range (unless otherwise noted) (see 图 7-1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T_A = 25°C			−40°C to 85°C		−40°C to 125°C		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A	Y	C_L = 15 pF		3.4(1)	5.5(1)	1	6.5	1	7.5	ns
t_{en}	$\overline{OE}$	Y			3.4(1)	5.1(1)	1	6	1	7	
t_{dis}	$\overline{OE}$	Y			3.2(1)	6.8(1)	1	8	1	9	
t_{pd}	A	Y	C_L = 50 pF		4.3	7.5	1	8.5	1	9.5	ns
t_{en}	$\overline{OE}$	Y			4.4	7.1	1	8	1	9	
t_{dis}	$\overline{OE}$	Y			4	8.8	1	10	1	11	
$t_{sk(o)}$						1		1		1	

(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)		SN74LV125A			UNIT
		MIN	TYP	MAX	
$V_{OL(P)}$	Quiet output, maximum dynamic V_{OL}		0.4	0.8	V
$V_{OL(V)}$	Quiet output, minimum dynamic V_{OL}		−0.3	−0.8	V
$V_{OH(V)}$	Quiet output, minimum dynamic V_{OH}		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	Outputs enabled	C_L = 50 pF,	f = 10 MHz	3.3 V	15.5	pF
					5 V	17.6	

6.11 Typical Characteristics

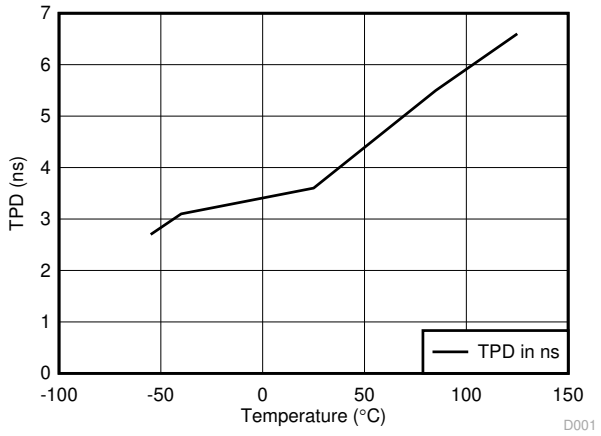


图 6-1. TPD vs Temperature

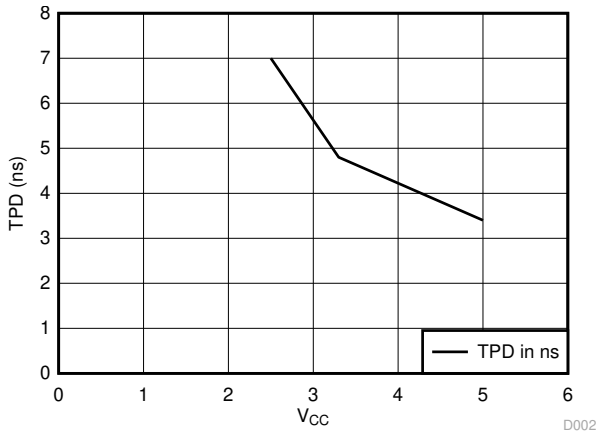
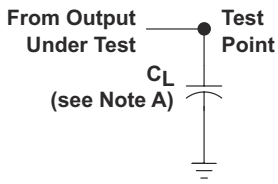


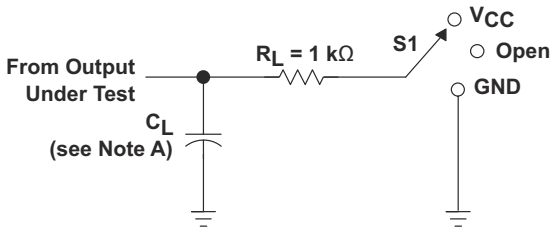
图 6-2. TPD vs V_{CC} at 25°C

7 Parameter Measurement Information

7.1

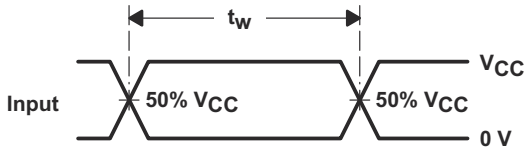


LOAD CIRCUIT FOR
TOTEM-POLE OUTPUTS

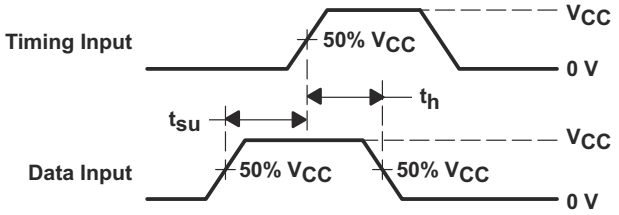


TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{CC}
t_{PHZ}/t_{PZH}	GND
Open Drain	V_{CC}

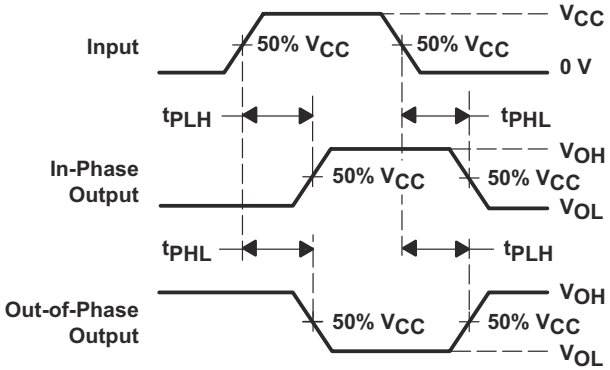
LOAD CIRCUIT FOR
3-STATE AND OPEN-DRAIN OUTPUTS



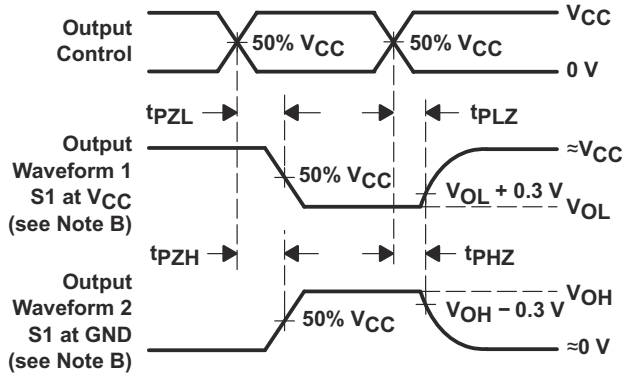
VOLTAGE WAVEFORMS
PULSE DURATION



VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES



VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES
INVERTING AND NONINVERTING OUTPUTS



VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES
LOW- AND HIGH-LEVEL ENABLING

NOTES: 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 ≤ 1 MHz, Z_O = 50 Ω, t_r ≤ 3 ns, t_f ≤ 3 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.

图 7-1. Load Circuit And Voltage Waveforms

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8 Detailed Description

8.1 Overview

The SN74LV125A quadruple bus buffer gate is designed for 2-V to 5.5-V V_{CC} operation.

These devices feature independent line drivers with 3-state outputs. Each output is disabled when the associated output-enable ($\overline{OE}$) input is high.

To ensure the high-impedance state during power up or power down, tie $\overline{OE}$ to V_{CC} through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

8.2 Functional Block Diagram

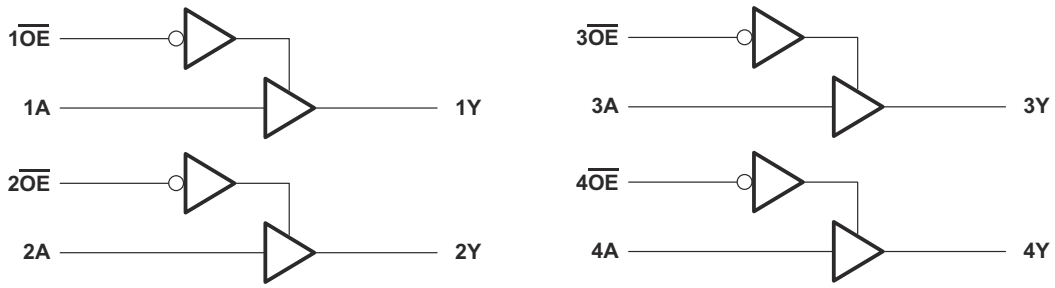

图 8-1. Logic Diagram (Positive Logic)

8.3 Feature Description

- Wide operating voltage range
  - Operates from 2 V to 5.5 V
- Allows down-voltage translation
  - Inputs accept voltages to 5.5 V
- I_{off} Feature
  - Supports Live Insertion, Partial Power-Down Mode, and Back-Drive Protection

8.4 Device Functional Modes

表 8-1. Function Table (Each Buffer)

INPUTS(1)		OUTPUT(2)
$\overline{OE}$	A	Y
L	H	H
L	L	L
H	X	Z

(1) H = High Voltage Level, L = Low Voltage Level, X = Don’t Care

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

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9 Application and Implementation

备注

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. Customers should validate and test their design implementation to confirm system functionality.

9.1 Application Information

The SN74LV125A is a low-drive CMOS device that can be used for a multitude of bus interface type applications where output ringing is a concern. The low drive and slow edge rates minimize overshoot and undershoot on the outputs. The inputs are 5.5-V tolerant at any valid V_{CC}, making it ideal for translating down to V_{CC}.

9.2 Typical Application

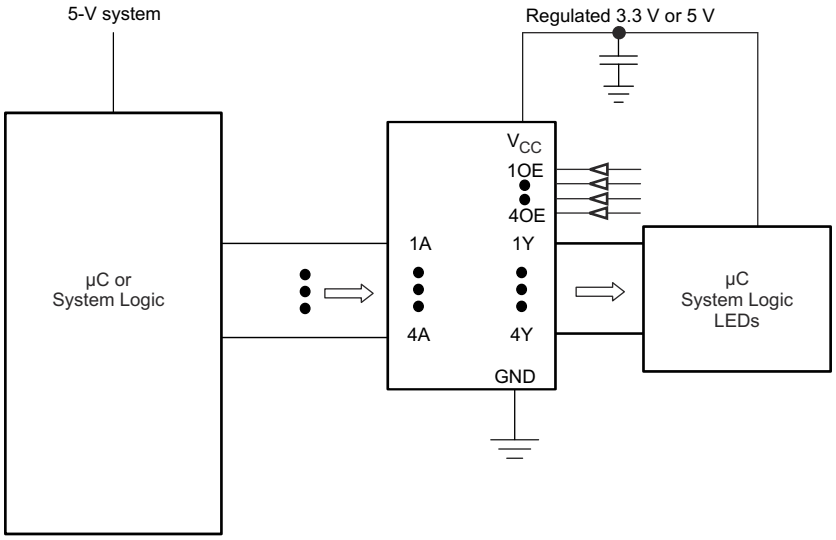

图 9-1. Typical Application Schematic

9.2.1 Design Requirements

This device uses CMOS technology and has balanced output drive. Care should be taken to avoid bus contention because it can drive currents that would exceed maximum limits. The high drive will also 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 $\Delta t/\Delta V$ in the *节 6.3* table.
   - For specified High and low levels, see V_{IH} and V_{IL} in the *节 6.3* table.
2. Recommend Output Conditions
   - Load currents should not exceed 35 mA per output and 70 mA total for the part.
   - Outputs should not be pulled above V_{CC}.

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9.2.3 Application Curves

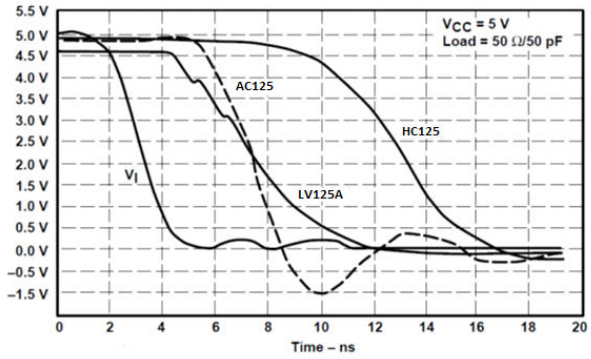

图 9-2. Switching Characteristics Comparison

10 Power Supply Recommendations

The power supply can be any voltage between the MIN and MAX supply voltage rating located in the *节 6.3* table.

Each V_{CC} pin should have a good bypass capacitor to prevent power disturbance. For devices with a single supply, 0.1 μF is recommended. If there are multiple V_{CC} pins, 0.01 μF or 0.022 μF is recommended for each power pin. It is acceptable to parallel multiple bypass caps to reject different frequencies of noise. A 0.1 μF and 1 μF are commonly used in parallel. The bypass capacitor should be installed as close to the power pin as possible for best results.

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11 Layout

11.1 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. Some examples are when only two inputs of a triple-input AND gate are used, or when 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 in 图 11-1 are 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 makes more sense or is more convenient. It is acceptable to float outputs 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/Os so they also cannot float when disabled.

11.2 Layout Example

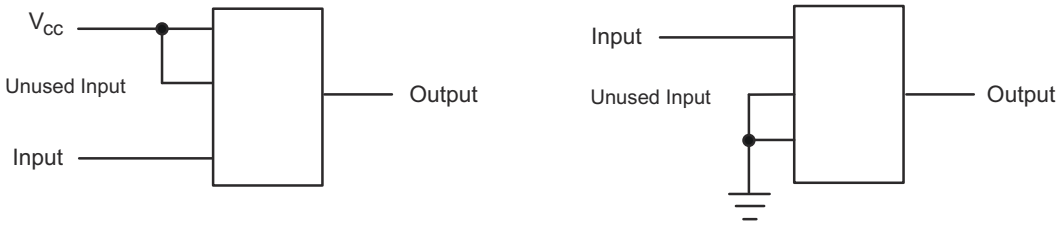

图 11-1. Layout Diagram

12 Device and Documentation Support

12.1 Related Links

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.

表 12-1. Related Links

PARTS	PRODUCT FOLDER	SAMPLE & BUY	TECHNICAL DOCUMENTS	TOOLS & SOFTWARE	SUPPORT & COMMUNITY
SN74LV125A	Click here	Click here	Click here	Click here	Click here

12.2 Trademarks

所有商标均为其各自所有者的财产。

12.3 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.

12.4 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。

13 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.

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PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
SN74LV125AD	OBSOLETE	SOIC	D	14		TBD	Call TI	Call TI	-40 to 125	LV125A	
SN74LV125ADBR	ACTIVE	SSOP	DB	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV125A	Samples
SN74LV125ADGVR	ACTIVE	TVSOP	DGV	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV125A	Samples
SN74LV125ADR	ACTIVE	SOIC	D	14	2500	RoHS & Green	NIPDAU | SN	Level-1-260C-UNLIM	-40 to 125	LV125A	Samples
SN74LV125AN	ACTIVE	PDIP	N	14	25	RoHS & Non-Green	NIPDAU	N / A for Pkg Type	-40 to 125	SN74LV125AN	Samples
SN74LV125ANSR	ACTIVE	SO	NS	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	74LV125A	Samples
SN74LV125APW	OBSOLETE	TSSOP	PW	14		TBD	Call TI	Call TI	-40 to 125	LV125A	
SN74LV125APWR	ACTIVE	TSSOP	PW	14	2000	RoHS & Green	NIPDAU | SN	Level-1-260C-UNLIM	-40 to 125	LV125A	Samples
SN74LV125APWRE4	ACTIVE	TSSOP	PW	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV125A	Samples
SN74LV125APWRG4	ACTIVE	TSSOP	PW	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV125A	Samples
SN74LV125APWT	OBSOLETE	TSSOP	PW	14		TBD	Call TI	Call TI	-40 to 125	LV125A	
SN74LV125ARGYR	ACTIVE	VQFN	RGY	14	3000	RoHS & Green	NIPDAU	Level-2-260C-1 YEAR	-40 to 125	LV125A	Samples
SN74LV125ARGYRG4	ACTIVE	VQFN	RGY	14	3000	RoHS & Green	NIPDAU	Level-2-260C-1 YEAR	-40 to 125	LV125A	Samples

(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

(2) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".
RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.
Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead finish/Ball material - Orderable Devices 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.

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

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

OTHER QUALIFIED VERSIONS OF SN74LV125A :

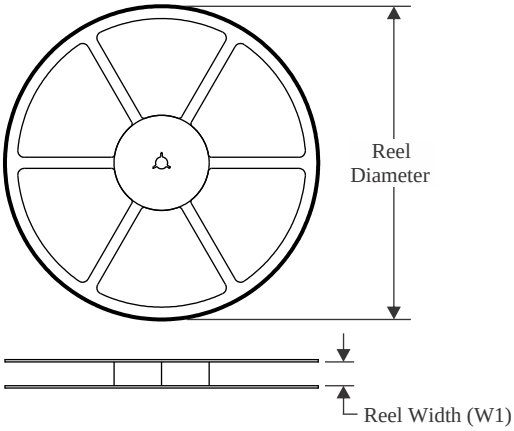
- Automotive : SN74LV125A-Q1

NOTE: Qualified Version Definitions:

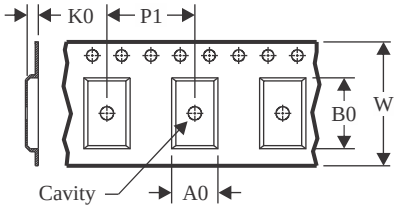
- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects

TAPE AND REEL INFORMATION

REEL DIMENSIONS

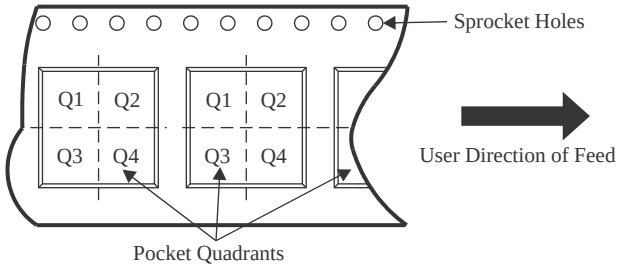


TAPE DIMENSIONS



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

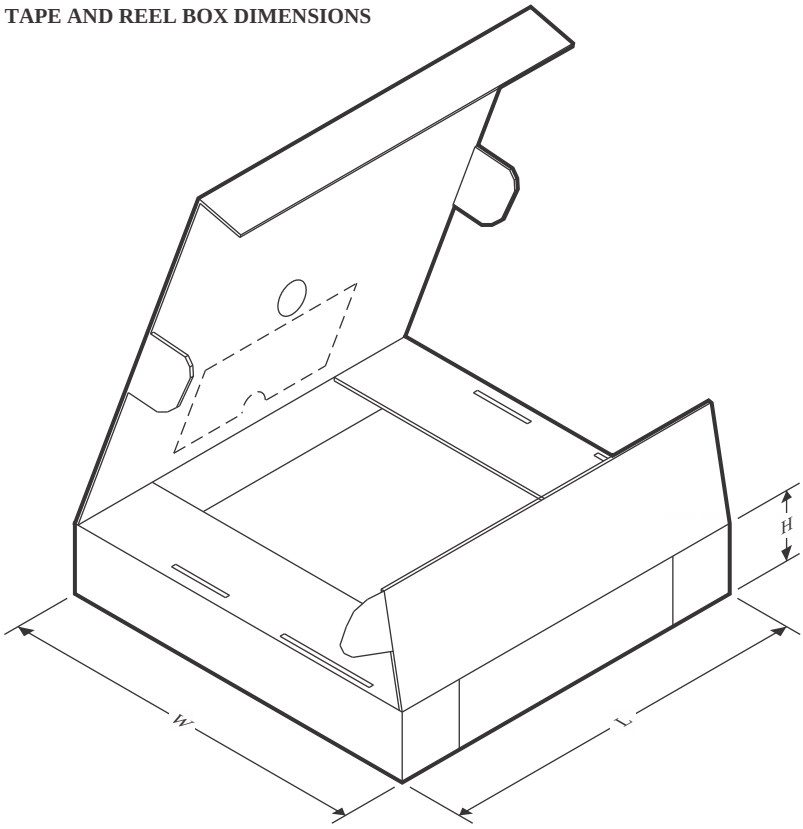
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*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
SN74LV125ADBR	SSOP	DB	14	2000	330.0	16.4	8.35	6.6	2.4	12.0	16.0	Q1
SN74LV125ADGVR	TVSOP	DGV	14	2000	330.0	12.4	6.8	4.0	1.6	8.0	12.0	Q1
SN74LV125ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV125ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV125ANSR	SO	NS	14	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1
SN74LV125APWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LV125APWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LV125ARGYR	VQFN	RGY	14	3000	330.0	12.4	3.75	3.75	1.15	8.0	12.0	Q1

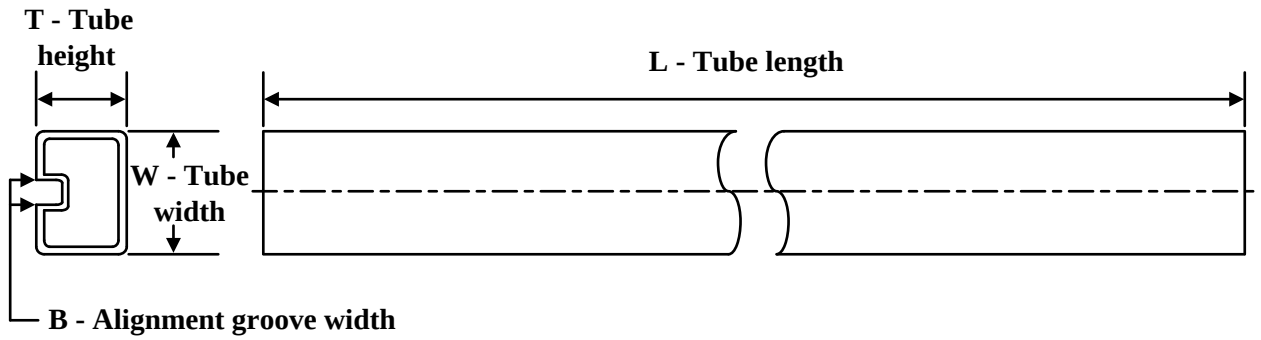
TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

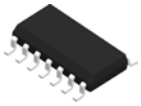
Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LV125ADBR	SSOP	DB	14	2000	356.0	356.0	35.0
SN74LV125ADGVR	TVSOP	DGV	14	2000	356.0	356.0	35.0
SN74LV125ADR	SOIC	D	14	2500	356.0	356.0	35.0
SN74LV125ADR	SOIC	D	14	2500	356.0	356.0	35.0
SN74LV125ANSR	SO	NS	14	2000	356.0	356.0	35.0
SN74LV125APWR	TSSOP	PW	14	2000	356.0	356.0	35.0
SN74LV125APWR	TSSOP	PW	14	2000	356.0	356.0	35.0
SN74LV125ARGYR	VQFN	RGY	14	3000	356.0	356.0	35.0

TUBE



*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (µm)	B (mm)
SN74LV125AN	N	PDIP	14	25	506	13.97	11230	4.32

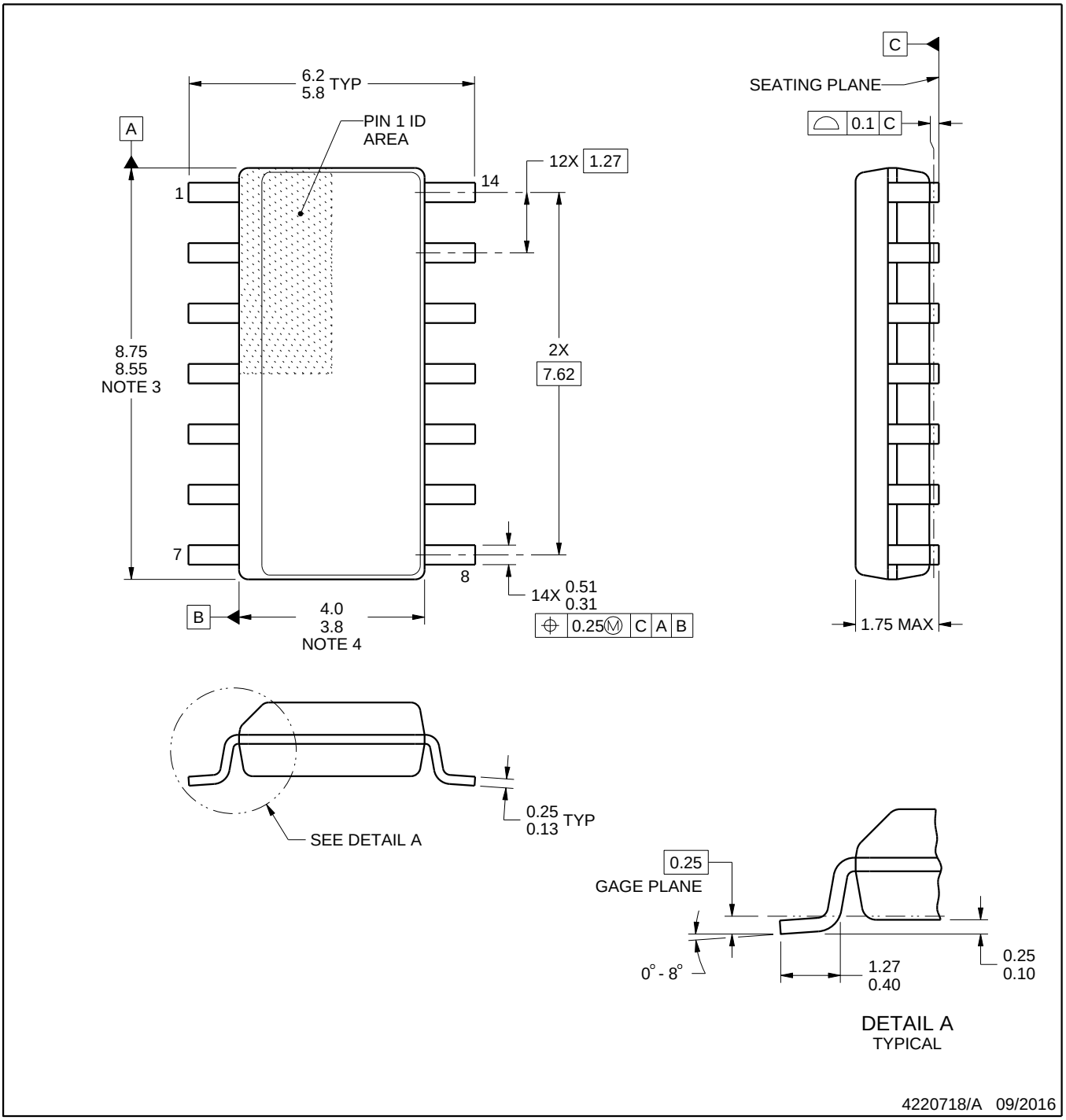


PACKAGE OUTLINE

D0014A

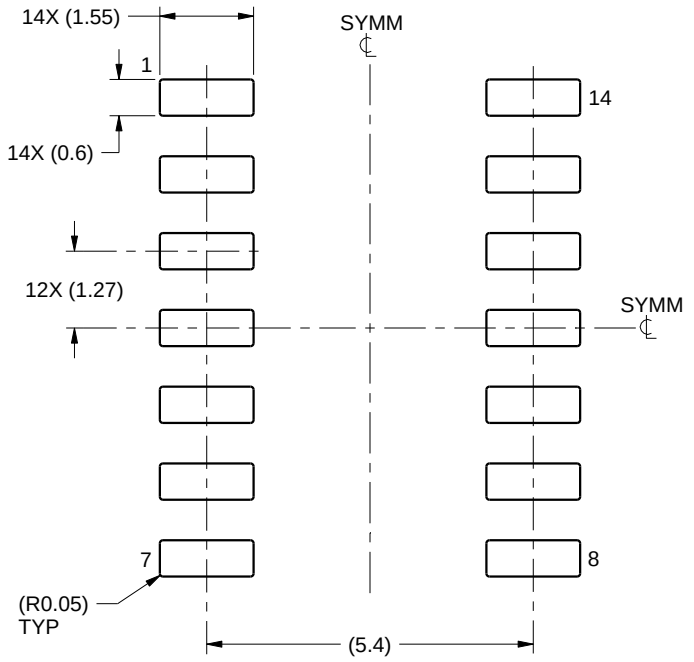
SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT

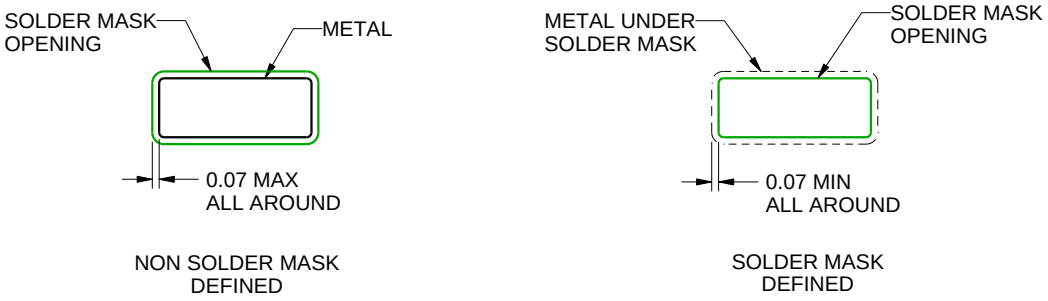


NOTES:

1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm, per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.43 mm, per side.
5. Reference JEDEC registration MS-012, variation AB.



LAND PATTERN EXAMPLE
SCALE:8X



SOLDER MASK DETAILS

4220718/A 09/2016

NOTES: (continued)

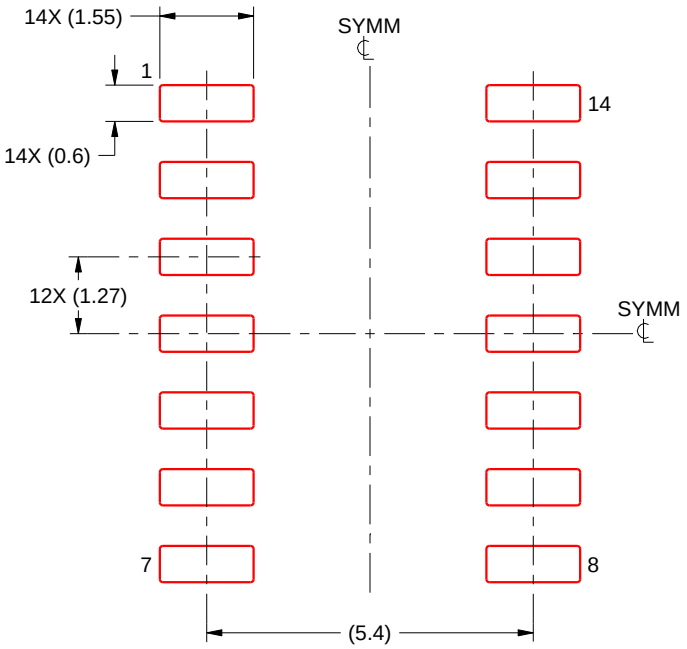
6. Publication IPC-7351 may have alternate designs.
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



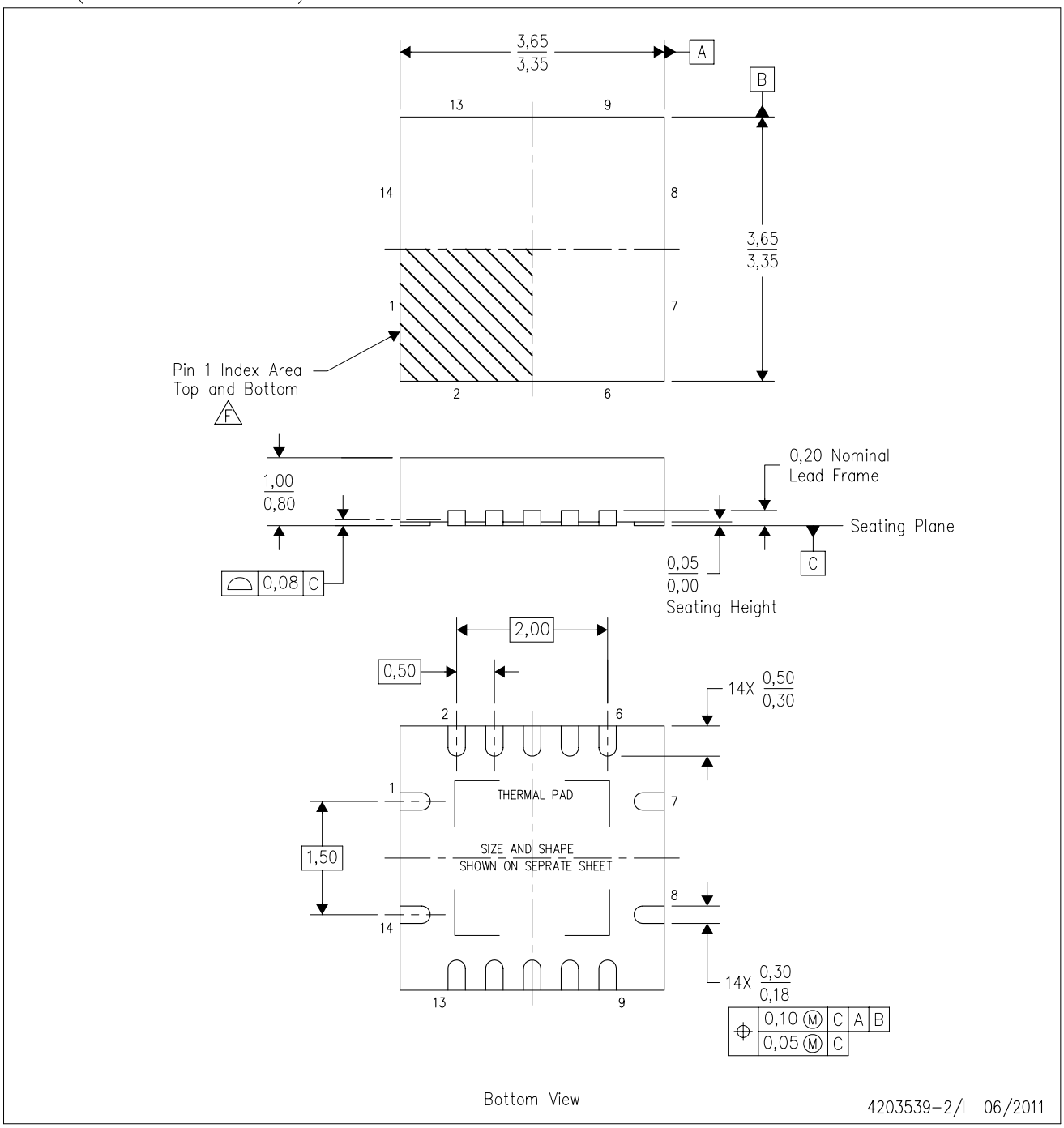
SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE:8X

4220718/A 09/2016

NOTES: (continued)

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

RGY (S–PVQFN–N14) PLASTIC QUAD FLATPACK NO–LEAD



NOTES:
A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M–1994.
B. This drawing is subject to change without notice.
C. QFN (Quad Flatpack No–Lead) package configuration.
D. The package thermal pad must be soldered to the board for thermal and mechanical performance.
E. See the additional figure in the Product Data Sheet for details regarding the exposed thermal pad features and dimensions.
F. Pin 1 identifiers are located on both top and bottom of the package and within the zone indicated. The Pin 1 identifiers are either a molded, marked, or metal feature.
G. Package complies to JEDEC MO–241 variation BA.

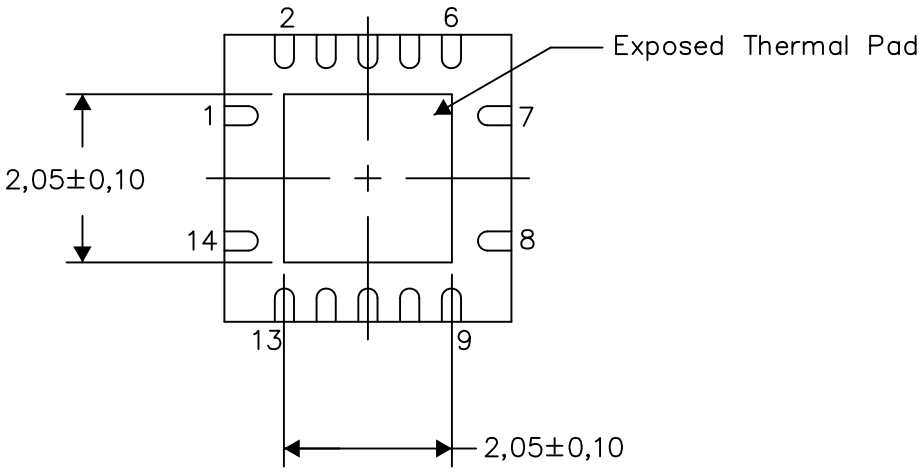
RGY (S–PVQFN–N14) PLASTIC QUAD FLATPACK NO–LEAD

THERMAL INFORMATION

This package incorporates an exposed thermal pad that is designed to be attached directly to an external heatsink. The thermal pad must be soldered directly to the printed circuit board (PCB). After soldering, the PCB can be used as a heatsink. In addition, through the use of thermal vias, the thermal pad can be attached directly to the appropriate copper plane shown in the electrical schematic for the device, or alternatively, can be attached to a special heatsink structure designed into the PCB. This design optimizes the heat transfer from the integrated circuit (IC).

For information on the Quad Flatpack No–Lead (QFN) package and its advantages, refer to Application Report, QFN/SON PCB Attachment, Texas Instruments Literature No. SLUA271. This document is available at www.ti.com.

The exposed thermal pad dimensions for this package are shown in the following illustration.



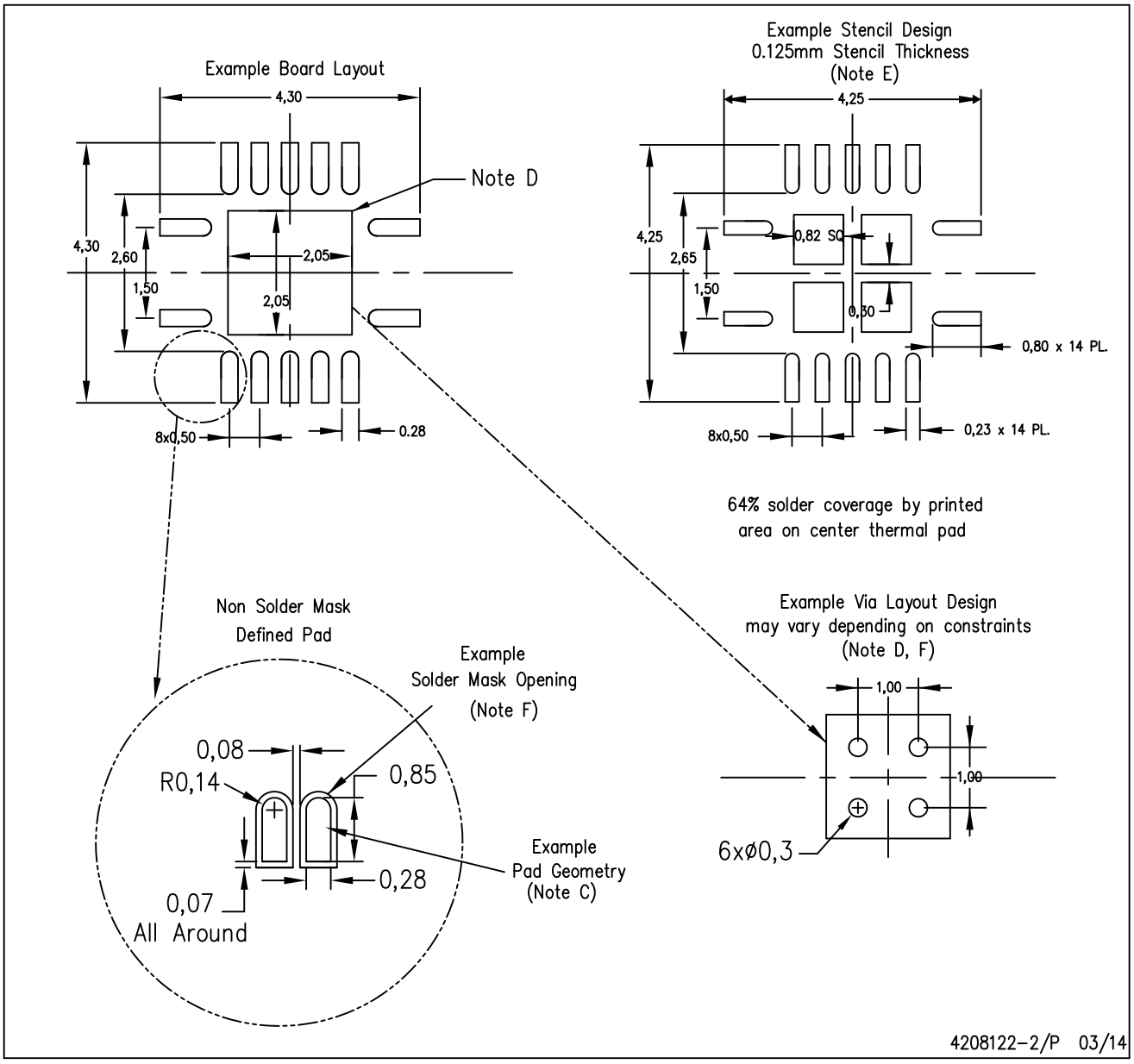
Bottom View

Exposed Thermal Pad Dimensions

4206353–2/P 03/14

NOTE: All linear dimensions are in millimeters

RGY (S–PVQFN–N14) PLASTIC QUAD FLATPACK NO–LEAD

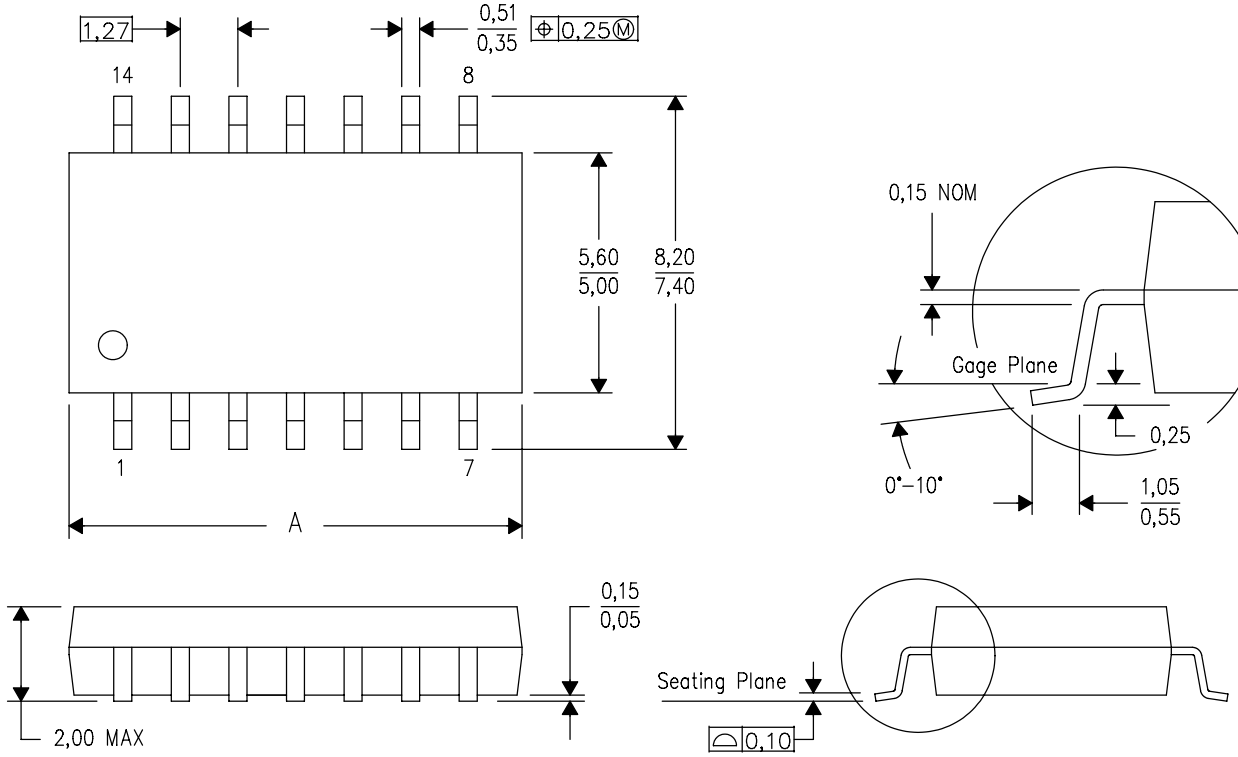


NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Publication IPC–7351 is recommended for alternate designs.
D. This package is designed to be soldered to a thermal pad on the board. Refer to Application Note, Quad Flat–Pack QFN/SON PCB Attachment, Texas Instruments Literature No. SLUA271, and also the Product Data Sheets for specific thermal information, via requirements, and recommended board layout. These documents are available at www.ti.com <http: //www.ti.com>.
E. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC 7525 for stencil design considerations.
F. Customers should contact their board fabrication site for minimum solder mask web tolerances between signal pads.

MECHANICAL DATA

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

14-PINS SHOWN



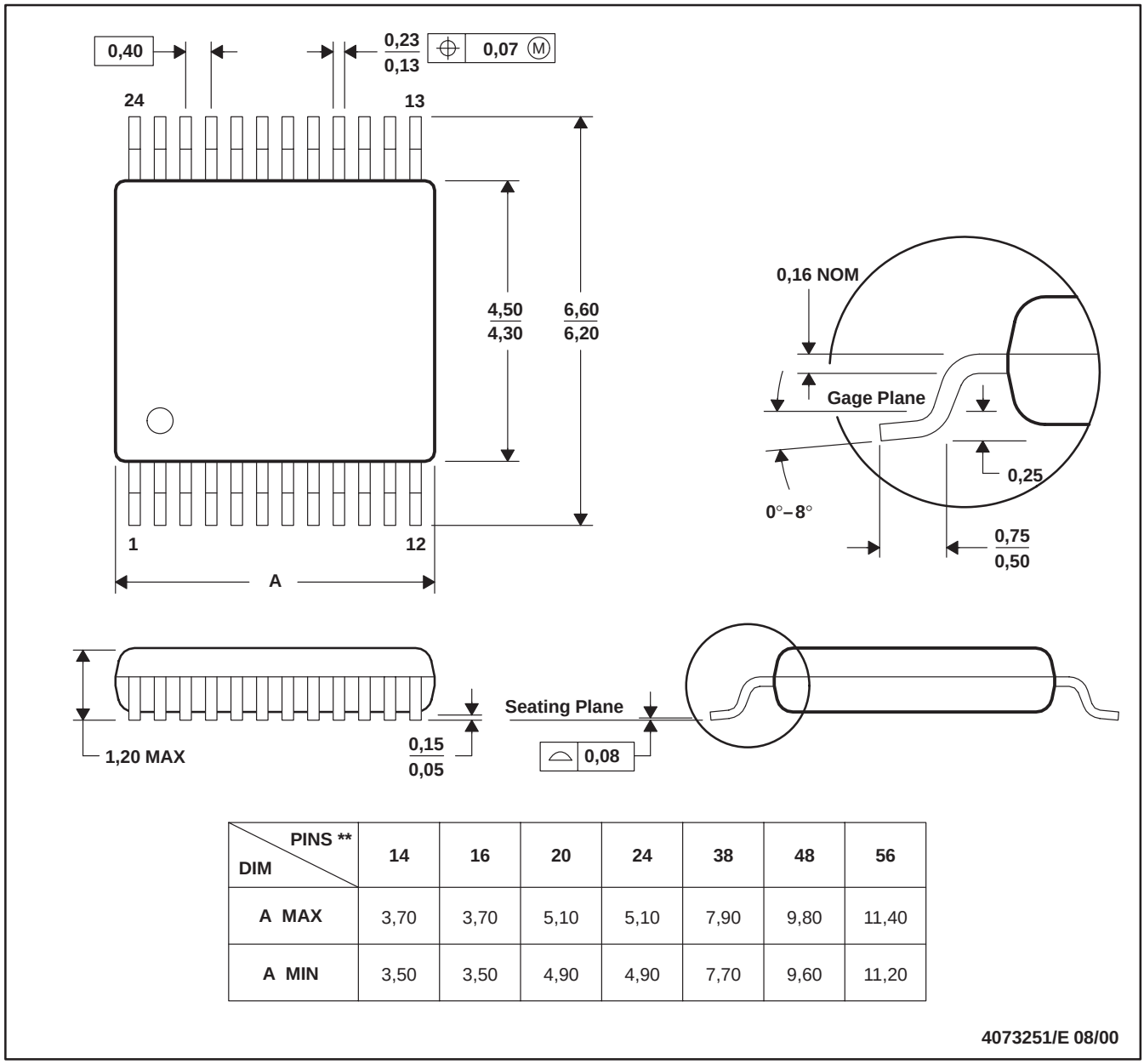
DIM \ PINS **	14	16	20	24
A MAX	10,50	10,50	12,90	15,30
A MIN	9,90	9,90	12,30	14,70

4040062/C 03/03

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

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

24 PINS SHOWN



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

4073251/E 08/00

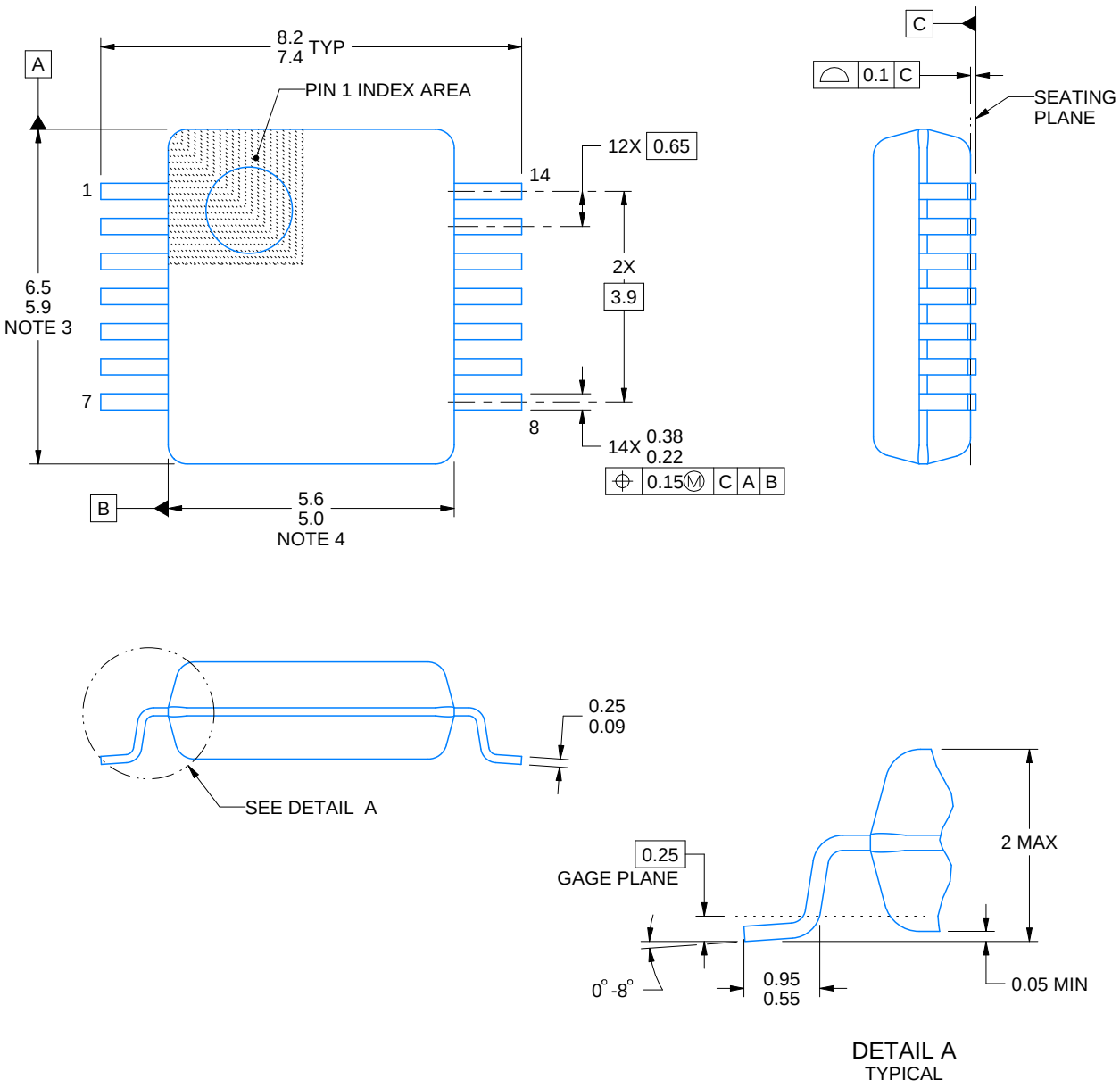
NOTES: A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15 per side.
D. Falls within JEDEC: 24/48 Pins – MO-153
14/16/20/56 Pins – MO-194

PACKAGE OUTLINE

DB0014A

SSOP - 2 mm max height

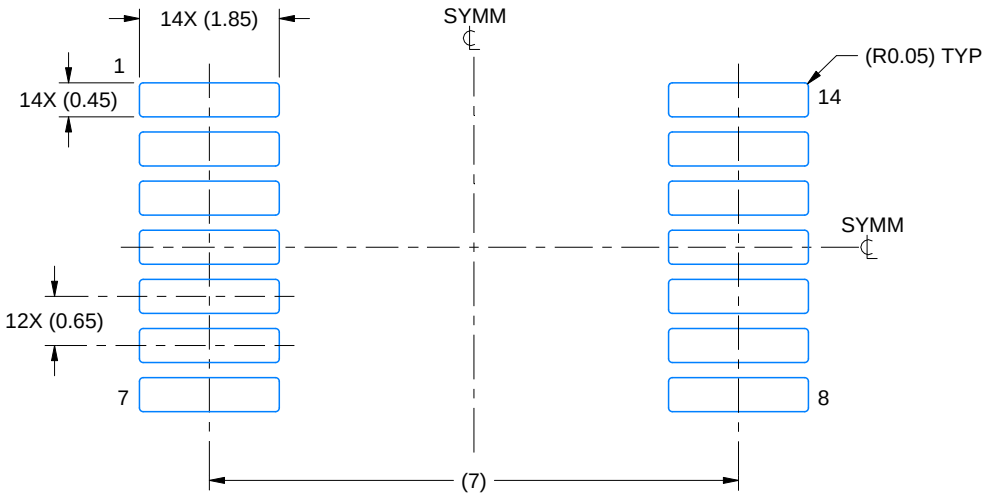
SMALL OUTLINE PACKAGE



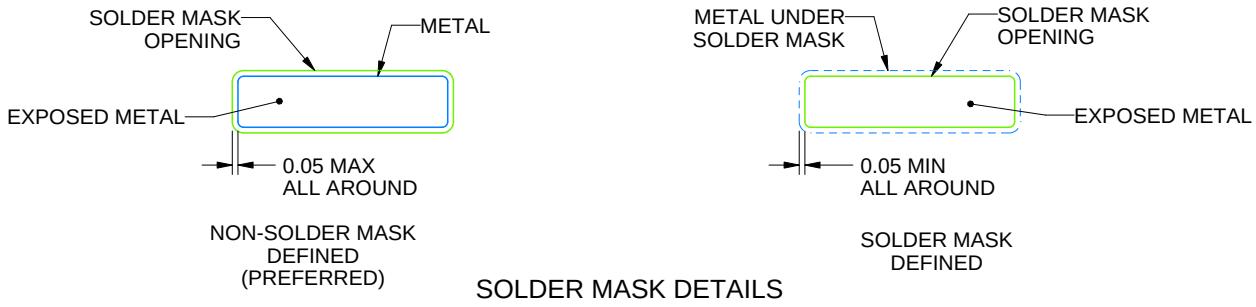
4220762/A 05/2024

NOTES:

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



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X

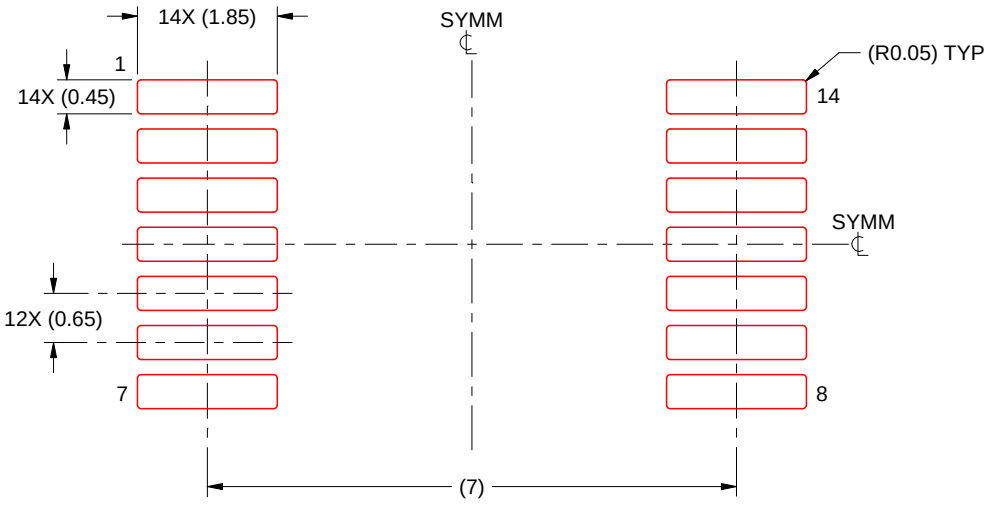


SOLDER MASK DETAILS

4220762/A 05/2024

NOTES: (continued)

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



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

4220762/A 05/2024

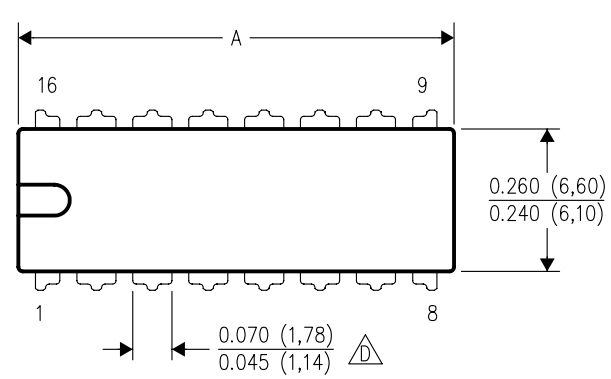
NOTES: (continued)

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

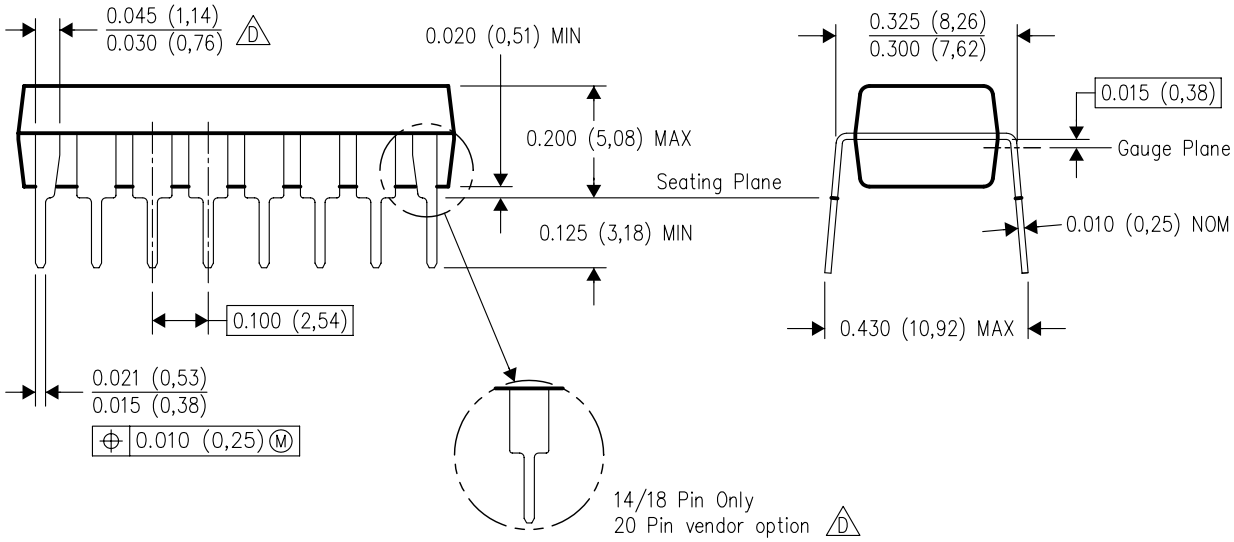
N (R–PDIP–T**)

PLASTIC DUAL–IN–LINE PACKAGE

16 PINS SHOWN



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



4040049/E 12/2002

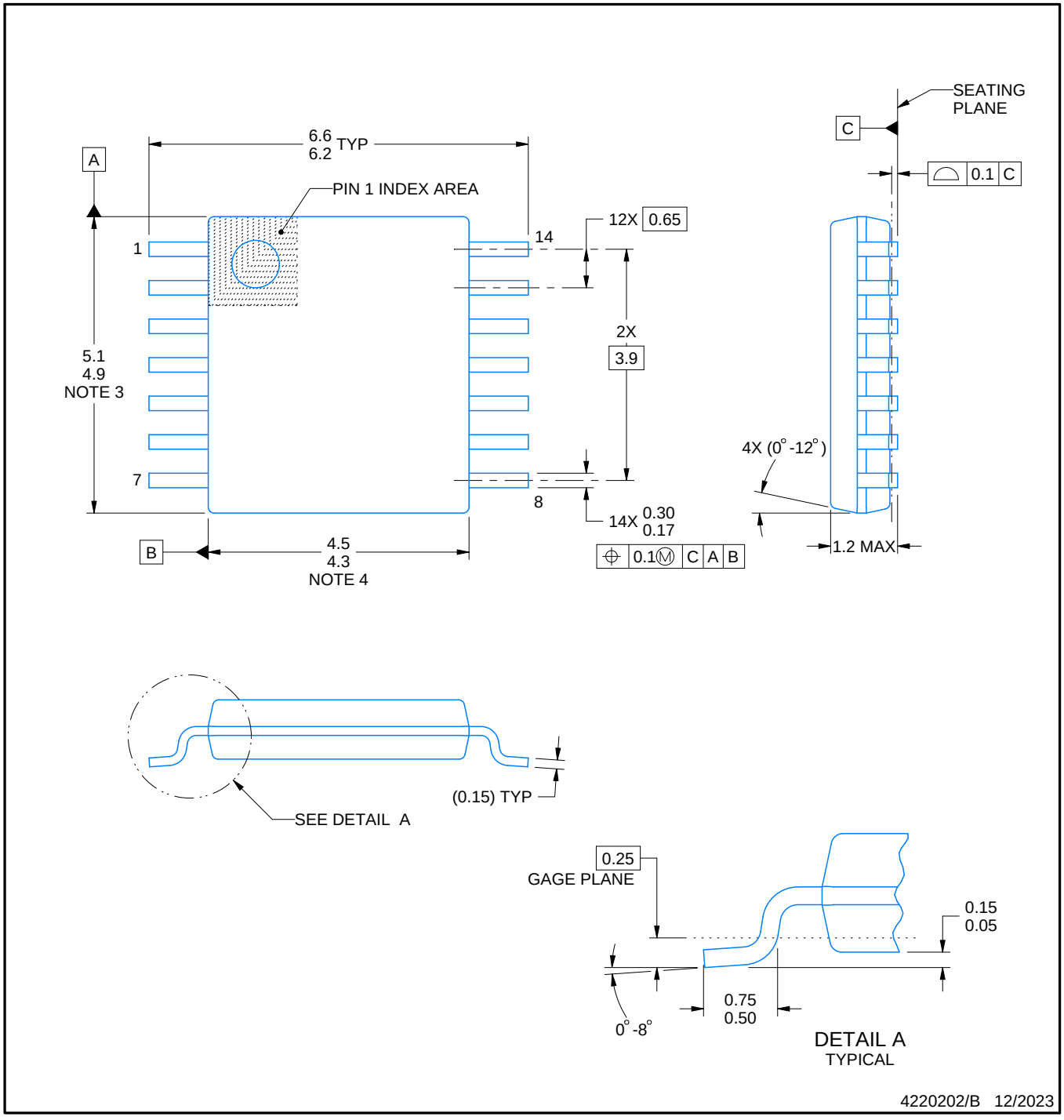
NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Falls within JEDEC MS–001, except 18 and 20 pin minimum body length (Dim A).
D. The 20 pin end lead shoulder width is a vendor option, either half or full width.

PACKAGE OUTLINE

PW0014A

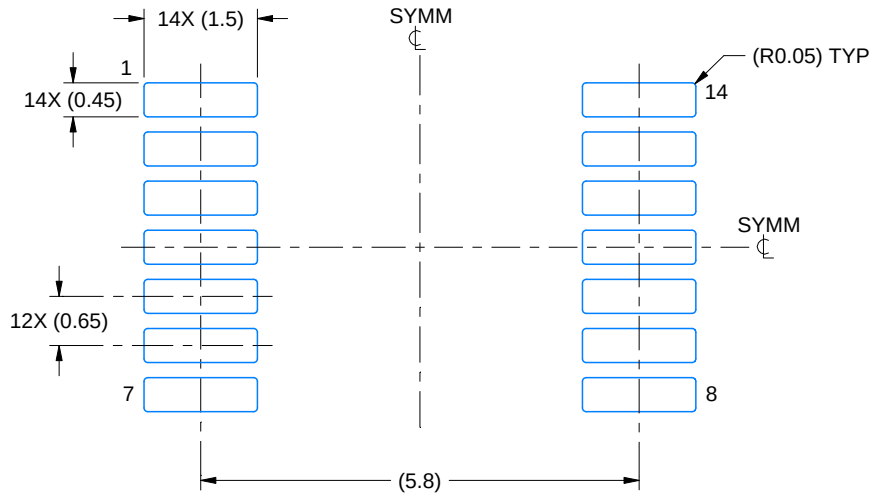
TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE

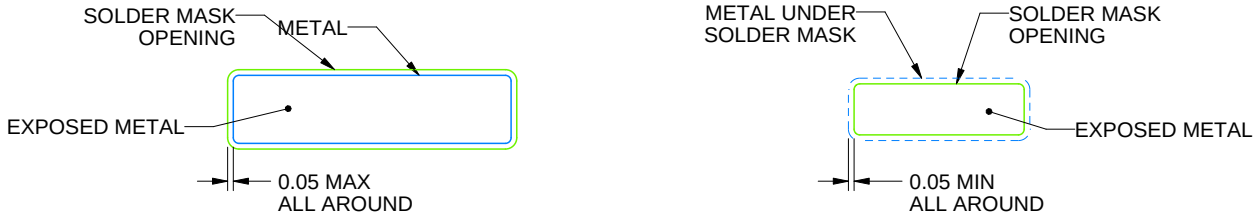


NOTES:

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



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



SOLDER MASK DETAILS

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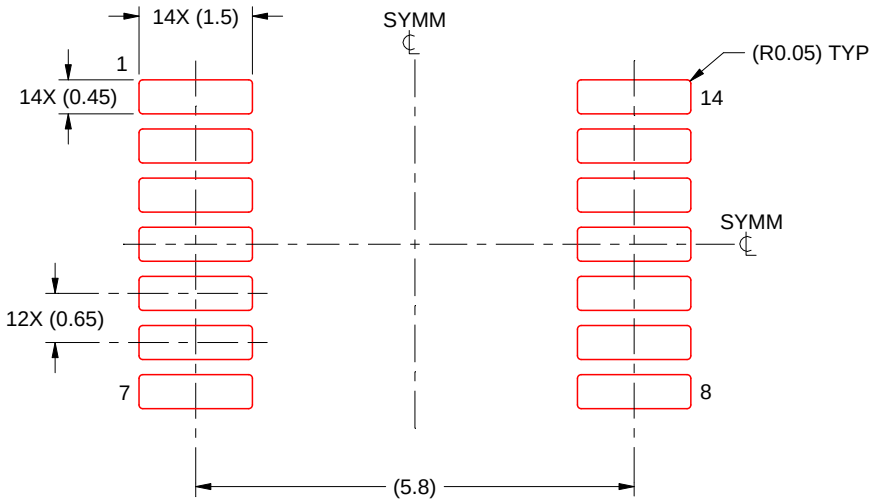
NOTES: (continued)

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

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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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