

SN74LV14A 六路施密特触发反相器

1 特性

- V_{CC} 工作电压范围为 2V 至 5.5V
- 5V 时 t_{pd} 最大值为 10ns
- $V_{CC} = 3.3V$ 、 $T_A = 25^\circ C$ 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
- 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 规范的要求

2 应用

- 网络交换机
- 可穿戴保健和健身设备
- PDA
- LCD 电视
- 电力基础设施

3 描述

这些六路施密特触发反相器需在 2V 至 5.5V V_{CC} 下运行。

SN74LV14A 器件包含六个独立的反相器。这些器件执行布尔函数 $Y = \bar{A}$ 。

封装信息

器件型号	封装 ⁽¹⁾	封装尺寸 (标称值)
SN74LV14A	TVSOP (14)	3.60mm × 4.40mm
	SOIC (14)	8.65mm × 3.91mm
	SSOP (14)	6.20mm × 5.30mm
	TSSOP (14)	5.00mm × 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。



图 3-1. 简化原理图



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4 Revision History

Changes from Revision K (September 2014) to Revision L (December 2022)	Page
• 通篇更新了表格、图和交叉参考的格式.....	1

Changes from Revision J (September 1997) to Revision K (September 2014)	Page
• 将文档更新为新的 TI 数据表格式.....	1
• 删除了“订购信息”表.....	1
• 添加了“应用”.....	1
• 添加了“器件信息”表.....	1
• Added Pin Functions table.....	3
• Changed MAX operating temperature to 125°C in Recommended Operating Conditions table.	4
• Added Thermal Information table.....	5
• Added Typical Characteristics.....	7
• Added Application and Implementation section.....	10
• Added Power Supply Recommendations and Layout sections.....	12

5 Pin Configuration and Functions

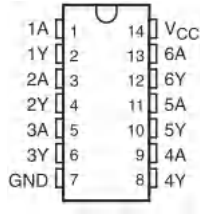


图 5-1. SN74LV14A D, DB, DGV, NS OR PW Package Top View

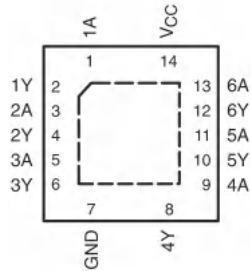


图 5-2. SN74LV14A RGY Package Top View

Pin Functions

NAME	PIN		TYPE ⁽¹⁾	DESCRIPTION
	SN74LV14A			
	D, DB, DGV, NS, PW	RGY		
1A	1	1	I	Input 1A
1Y	2	2	O	Output 1Y
2A	3	3	I	Input 2A
2Y	4	4	O	Output 2Y
3A	5	5	I	Input 3A
3Y	6	6	O	Output 3Y
4Y	8	8	O	Output 4Y
4A	9	9	I	Input 4A
5Y	10	10	O	Output 5Y
5A	11	11	I	Input 5A
6Y	12	12	O	Output 6Y
6A	13	13	I	Input 6A
GND	7	7	—	Ground Pin
NC	—	—	—	No Connection
V _{CC}	14	14	—	Power Pin

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

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
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}	±25	mA
	Continuous current through V _{CC} or GND		±50	mA
T _J	Junction temperature		150	°C
T _{stg}	Storage temperature range	- 65	150	°C

- (1) Stresses beyond those listed under # 6.1 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 # 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

		VALUE	UNIT
V _(ESD)	Electrostatic discharge	Human body model (HBM), per ANSI/ESDA/JEDEC JS-001, all pins ⁽¹⁾	±2000
		Charged device model (CDM), per JEDEC specification JESD22-C101, all pins ⁽²⁾	±1000
		Machine Model	±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.

6.3 Recommended Operating Conditions

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

		SN74LV14A		UNIT
		MIN	MAX	
V _{CC}	Supply voltage	2	5.5	V
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 V	- 50	μA
		V _{CC} = 2.3 V to 2.7 V	- 2	mA
		V _{CC} = 3 V to 3.6 V	- 6	
		V _{CC} = 4.5 V to 5.5 V	- 12	
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	6	
		V _{CC} = 4.5 V to 5.5 V	12	
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⁾		SN74LV14A						UNIT
		D	DB	DGV	NS	PW	RGY	
		14 PINS						
$R_{\theta JA}$	Junction-to-ambient thermal resistance	94.9	107.4	130.4	91.4	122.6	57.6	°C/W
$R_{\theta JC(top)}$	Junction-to-case (top) thermal resistance	56.3	59.9	53.4	49.0	51.3	70.4	
$R_{\theta JB}$	Junction-to-board thermal resistance	49.2	54.7	63.5	50.2	64.4	33.6	
ψ_{JT}	Junction-to-top characterization parameter	20.7	21.0	7.3	15.3	6.8	3.5	
ψ_{JB}	Junction-to-board characterization parameter	48.9	51.2	62.8	49.8	63.8	33.7	
$R_{\theta JC(bot)}$	Junction-to-case (bottom) thermal resistance	-	-	-	-	-	14.1	

(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}	SN74LV14A - 40°C to 85°C			SN74LV14A - 40°C to 125°C			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
V_{T+}	Positive-going threshold		2.5 V				1.75			V
			3.3 V				2.31			
			5 V				3.5			
V_{T-}	Negative-going threshold		2.5 V	0.75			0.75			V
			3.3 V	0.99			0.99			
			5 V	1.5			1.5			
$\Delta V_T (V_{T+} - V_{T-})$	Hysteresis		2.5 V	0.25			0.25			V
			3.3 V	0.33			0.33			
			5 V	0.5			0.5			
V_{OH}	High-level output voltage	$I_{OH} = -50 \mu A$	2 V to 5.5 V	$V_{CC} - 0.1$			$V_{CC} - 0.1$			V
		$I_{OH} = -2 mA$	2.3 V	2			2			
		$I_{OH} = -6 mA$	3 V	2.48			2.48			
		$I_{OH} = -12 mA$	4.5 V	3.8			3.8			
V_{OL}	Low-level output voltage	$I_{OL} = 50 \mu A$	2 V to 5.5 V	0.1			0.1			V
		$I_{OL} = 2 mA$	2.3 V	0.4			0.4			
		$I_{OL} = 6 mA$	3 V	0.44			0.44			
		$I_{OL} = 12 mA$	4.5 V	0.55			0.55			
I_I	Input leakage current	$V_I = V_{CC}$ or GND	0 to 5.5 V	± 1			± 1			μA
I_{CC}	Static supply current	$V_I = V_{CC}$ or GND, $I_O = 0$	5.5 V	20			20			μA
I_{off}	Input/Output Power-Off Leakage Current	V_I or $V_O = 0$ to 5.5 V	0	5			5			μA
C_i	Input capacitance	$V_I = V_{CC}$ or GND	3.3 V	2.3			2.3			pF
			5 V	2.3			2.3			

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

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	$T_A = 25^\circ\text{C}$			SN74LV14A - 40°C to 85°C		SN74LV14A - 40°C to 125°C		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A	Y	$C_L = 15\text{ pF}$	10.2 ⁽¹⁾	19.7 ⁽¹⁾	1	22	1	23	ns	
			$C_L = 50\text{ pF}$	13.3	24	1	27	1	28		

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

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

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	$T_A = 25^\circ\text{C}$			SN74LV14A - 40°C to 85°C		SN74LV14A - 40°C to 125°C		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A	Y	$C_L = 15\text{ pF}$	7.3 ⁽¹⁾	12.8 ⁽¹⁾	1	15	1	16	ns	
			$C_L = 50\text{ pF}$	9.6	16.3	1	18.5	1	19.5		

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

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

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	$T_A = 25^\circ\text{C}$			SN74LV14A - 40°C to 85°C		SN74LV14A - 40°C to 125°C		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A	Y	$C_L = 15\text{ pF}$	5.1 ⁽¹⁾	8.6 ⁽¹⁾	1	10	1	11	ns	
			$C_L = 50\text{ pF}$	6.7	10.6	1	12	1	13		

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

6.9 Noise Characteristics

$V_{CC} = 3.3\text{ V}$, $C_L = 50\text{ pF}$, $T_A = 25^\circ\text{C}$ ⁽¹⁾

		SN74LV14A			UNIT
		MIN	TYP	MAX	
$V_{OL(P)}$	Quiet output, maximum dynamic	0.2	0.8	V	
$V_{OL(V)}$	Quiet output, minimum dynamic	- 0.1	- 0.8	V	
$V_{OH(V)}$	Quiet output, minimum dynamic	3.1		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

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

PARAMETER		TEST CONDITIONS	V_{CC}	TYP	UNIT
C_{pd}	Power dissipation capacitance	$C_L = 50\text{ pF}$ $f = 10\text{ MHz}$	3.3 V	8.8	pF
			5 V	9.6	

6.11 Typical Characteristics

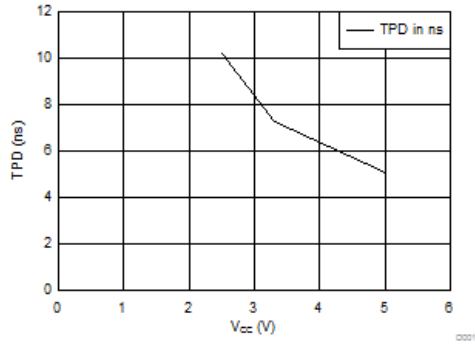


图 6-1. TPD vs V_{CC}

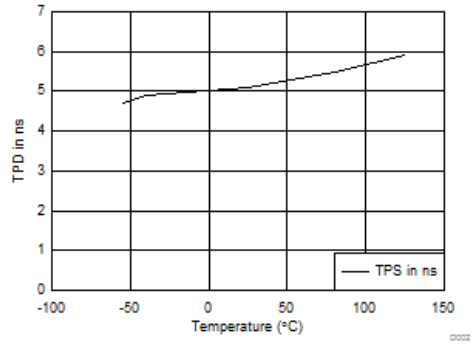
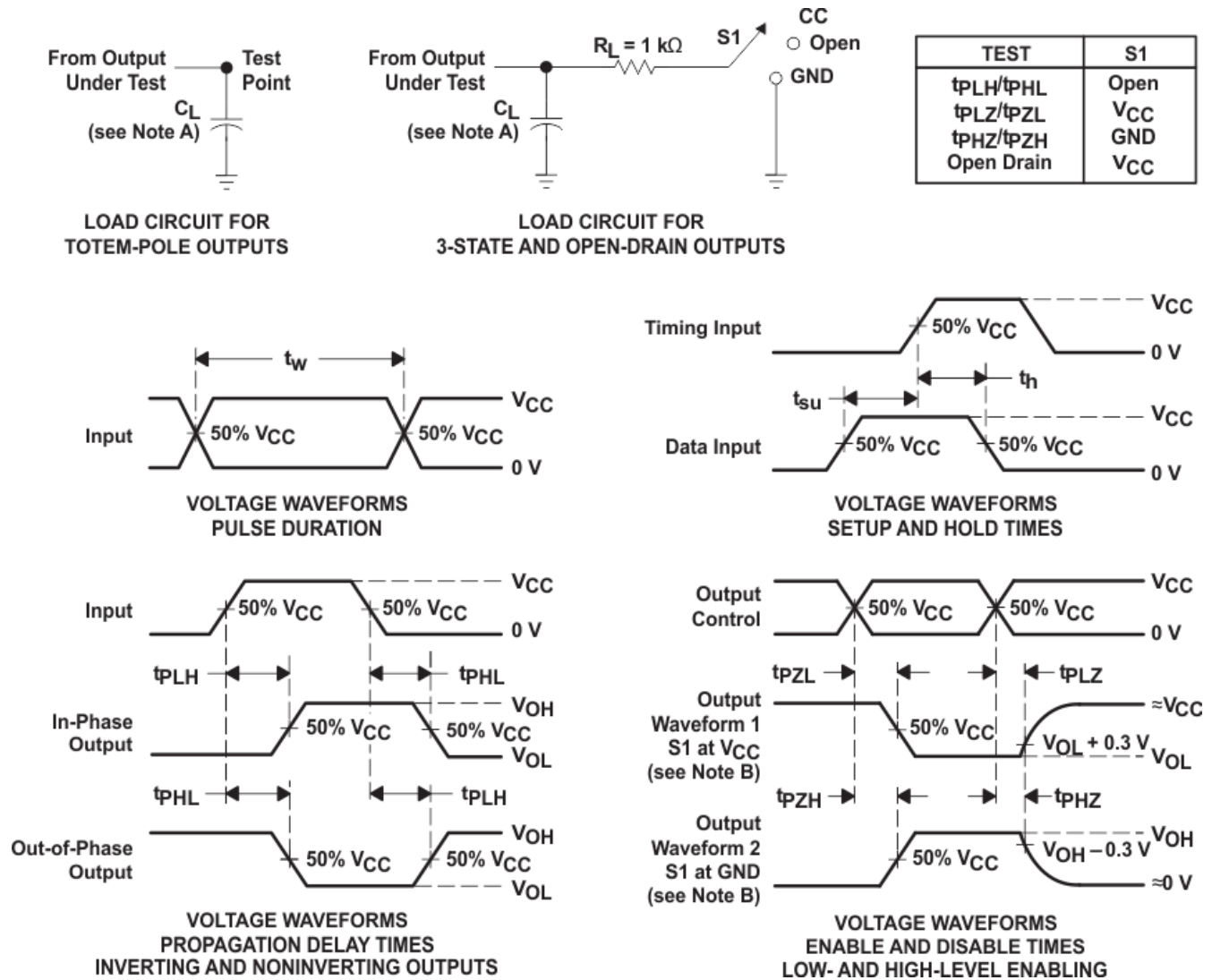


图 6-2. TPD vs Temperature

7 Parameter Measurement Information

7.1



- 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.

图 7-1. Load Circuit and Voltage Waveforms

8 Detailed Description

8.1 Overview

These hex Schmitt-trigger inverters are designed for 2 V to 5.5 V V_{CC} operation.

The SN74LV14A devices contain six independent inverters. These devices perform the Boolean function $Y = \bar{A}$.

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

8.2 Functional Block Diagram



图 8-1. Logic Diagram, Each Inverter (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
- Schmitt-trigger inputs allow for slow or noisy inputs

8.4 Device Functional Modes

表 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, X = Don' t Care

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

9 Application and Implementation

备注

以下应用部分中的信息不属于 TI 器件规格的范围，TI 不担保其准确性和完整性。TI 的客户应负责确定器件是否适用于其应用。客户应验证并测试其设计，以确保系统功能。

9.1 Application Information

Schmitt triggers should be used anytime you need to translate a sign wave into a square wave as shown in 图 9-1. They may also be used where a slow or noisy input needs to be sped up or cleaned up as shown in 图 9-2.

9.2 Typical Application

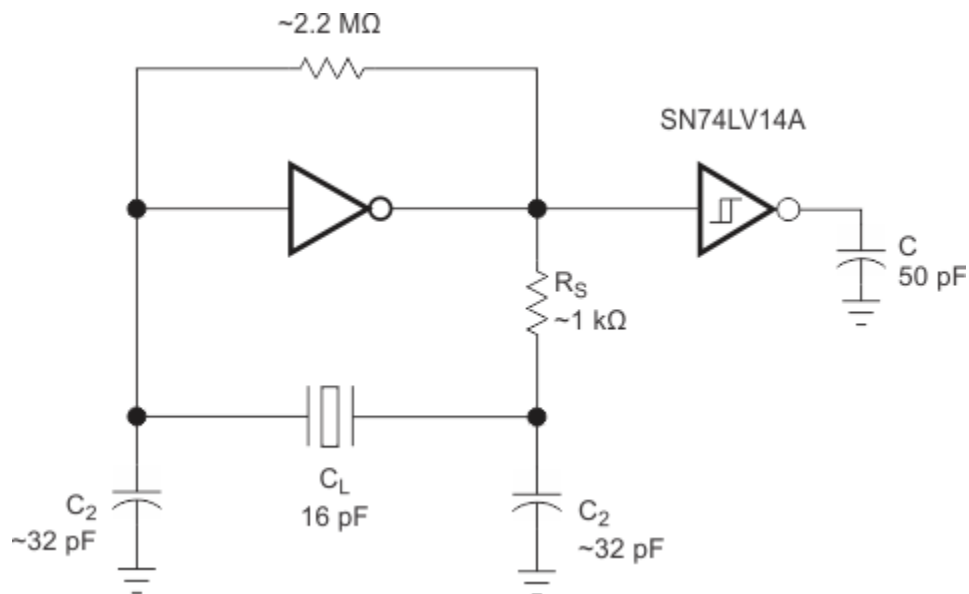


图 9-1. Oscillator Application Schematic

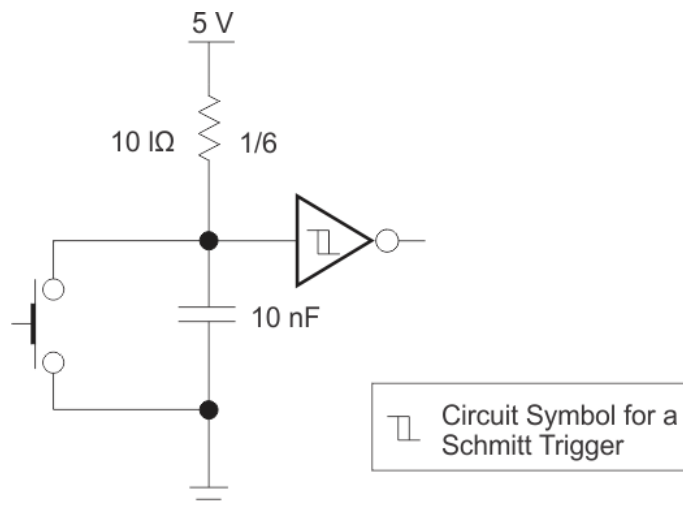


图 9-2. Switch De-bouncer Schematic

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 [§ 6.3](#) table.
- For specified high and low levels, see V_{IH} and V_{IL} in [§ 6.3](#) table.
- Inputs and outputs are overvoltage tolerant allowing them to go as high as 5.5 V at any valid V_{CC} .

2. Recommend Output Conditions:

- Load currents should not exceed 35 mA per output and 50 mA total for the part.

9.2.3 Application Curves

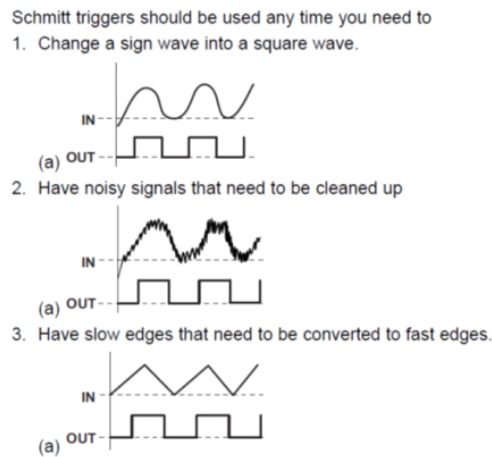


图 9-3. Schmitt Trigger Curves

10 Power Supply Recommendations

The power supply can be any voltage between the MIN and MAX supply voltage rating located in the [# 6.3](#) table.

Each V_{CC} terminal should have a good bypass capacitor to prevent power disturbance. For devices with a single supply, a $0.1 \mu\text{F}$ capacitor is recommended. If there are multiple V_{CC} terminals then $0.01 \mu\text{F}$ or $0.022 \mu\text{F}$ capacitors are recommended for each power terminal. It is ok to parallel multiple bypass capacitors to reject different frequencies of noise. $0.1 \mu\text{F}$ and $1.0 \mu\text{F}$ capacitors are commonly used in parallel. The bypass capacitor should be installed as close to the power terminal as possible for the best results.

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 the [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.

11.2 Layout Example

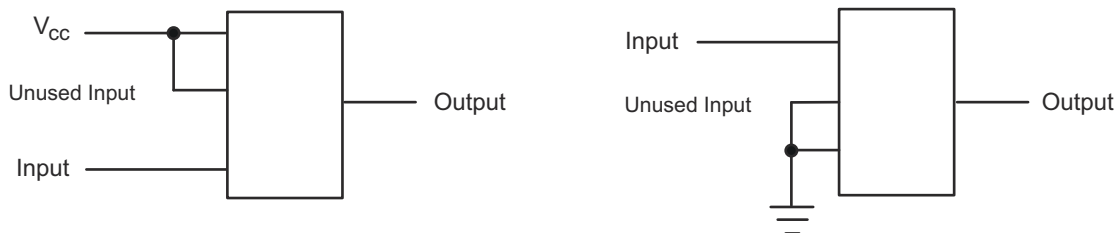


图 11-1. Layout Diagram

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
SN54LV14A	Click here	Click here	Click here	Click here	Click here
SN74LV14A	Click here	Click here	Click here	Click here	Click here

12.2 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。

12.3 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](#)》。

12.4 Trademarks

TI E2E™ is a trademark of Texas Instruments.

所有商标均为其各自所有者的财产。

12.5 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.

12.6 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。

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.

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)
SN74LV14AD	Obsolete	Production	SOIC (D) 14	-	-	Call TI	Call TI	-40 to 125	LV14A
SN74LV14ADBR	Active	Production	SSOP (DB) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV14A
SN74LV14ADBR.A	Active	Production	SSOP (DB) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV14A
SN74LV14ADGVR	Active	Production	TVSOP (DGV) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV14A
SN74LV14ADGVR.A	Active	Production	TVSOP (DGV) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV14A
SN74LV14ADR	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU SN	Level-1-260C-UNLIM	-40 to 125	LV14A
SN74LV14ADR.A	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV14A
SN74LV14ADRG4	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV14A
SN74LV14ADRG4.A	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV14A
SN74LV14ANSR	Active	Production	SOP (NS) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	74LV14A
SN74LV14ANSR.A	Active	Production	SOP (NS) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	74LV14A
SN74LV14APW	Obsolete	Production	TSSOP (PW) 14	-	-	Call TI	Call TI	-40 to 125	LV14A
SN74LV14APWR	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU SN	Level-1-260C-UNLIM	-40 to 125	LV14A
SN74LV14APWR.A	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV14A
SN74LV14APWRG3	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 125	LV14A
SN74LV14APWRG3.A	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 125	LV14A
SN74LV14APWRG4	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV14A
SN74LV14APWRG4.A	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV14A
SN74LV14ARGYR	Active	Production	VQFN (RGY) 14	3000 LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 125	LV14A
SN74LV14ARGYR.A	Active	Production	VQFN (RGY) 14	3000 LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 125	LV14A

(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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OTHER QUALIFIED VERSIONS OF SN74LV14A :

- Automotive : [SN74LV14A-Q1](#)
- Enhanced Product : [SN74LV14A-EP](#)

NOTE: Qualified Version Definitions:

- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects
- Enhanced Product - Supports Defense, Aerospace and Medical Applications

TAPE AND REEL INFORMATION

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
SN74LV14ADBR	SSOP	DB	14	2000	330.0	16.4	8.35	6.6	2.4	12.0	16.0	Q1
SN74LV14ADGVR	TVSOP	DGV	14	2000	330.0	12.4	6.8	4.0	1.6	8.0	12.0	Q1
SN74LV14ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV14ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV14ADRG4	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV14ADRG4	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV14ANSR	SOP	NS	14	2000	330.0	16.4	8.45	10.55	2.5	12.0	16.2	Q1
SN74LV14APWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LV14APWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LV14APWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.3	1.6	8.0	12.0	Q1
SN74LV14APWRG3	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LV14APWRG4	TSSOP	PW	14	2000	330.0	12.4	6.9	5.3	1.6	8.0	12.0	Q1
SN74LV14APWRG4	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LV14ARGYR	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)
SN74LV14ADBR	SSOP	DB	14	2000	353.0	353.0	32.0
SN74LV14ADGVR	TVSOP	DGV	14	2000	353.0	353.0	32.0
SN74LV14ADR	SOIC	D	14	2500	353.0	353.0	32.0
SN74LV14ADR	SOIC	D	14	2500	340.5	336.1	32.0
SN74LV14ADRG4	SOIC	D	14	2500	340.5	336.1	32.0
SN74LV14ADRG4	SOIC	D	14	2500	353.0	353.0	32.0
SN74LV14ANSR	SOP	NS	14	2000	353.0	353.0	32.0
SN74LV14APWR	TSSOP	PW	14	2000	356.0	356.0	35.0
SN74LV14APWR	TSSOP	PW	14	2000	353.0	353.0	32.0
SN74LV14APWR	TSSOP	PW	14	2000	367.0	367.0	35.0
SN74LV14APWRG3	TSSOP	PW	14	2000	364.0	364.0	27.0
SN74LV14APWRG4	TSSOP	PW	14	2000	367.0	367.0	35.0
SN74LV14APWRG4	TSSOP	PW	14	2000	353.0	353.0	32.0
SN74LV14ARGYR	VQFN	RGY	14	3000	360.0	360.0	36.0

GENERIC PACKAGE VIEW

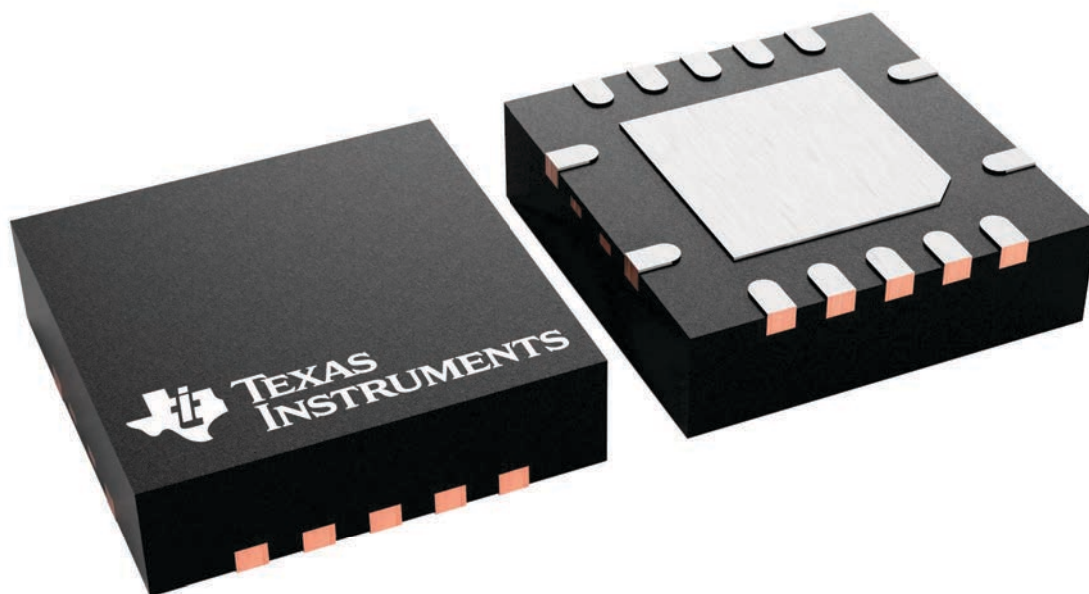
RGY 14

VQFN - 1 mm max height

3.5 x 3.5, 0.5 mm pitch

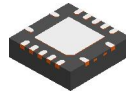
PLASTIC QUAD FLATPACK - NO LEAD

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



4231541/A

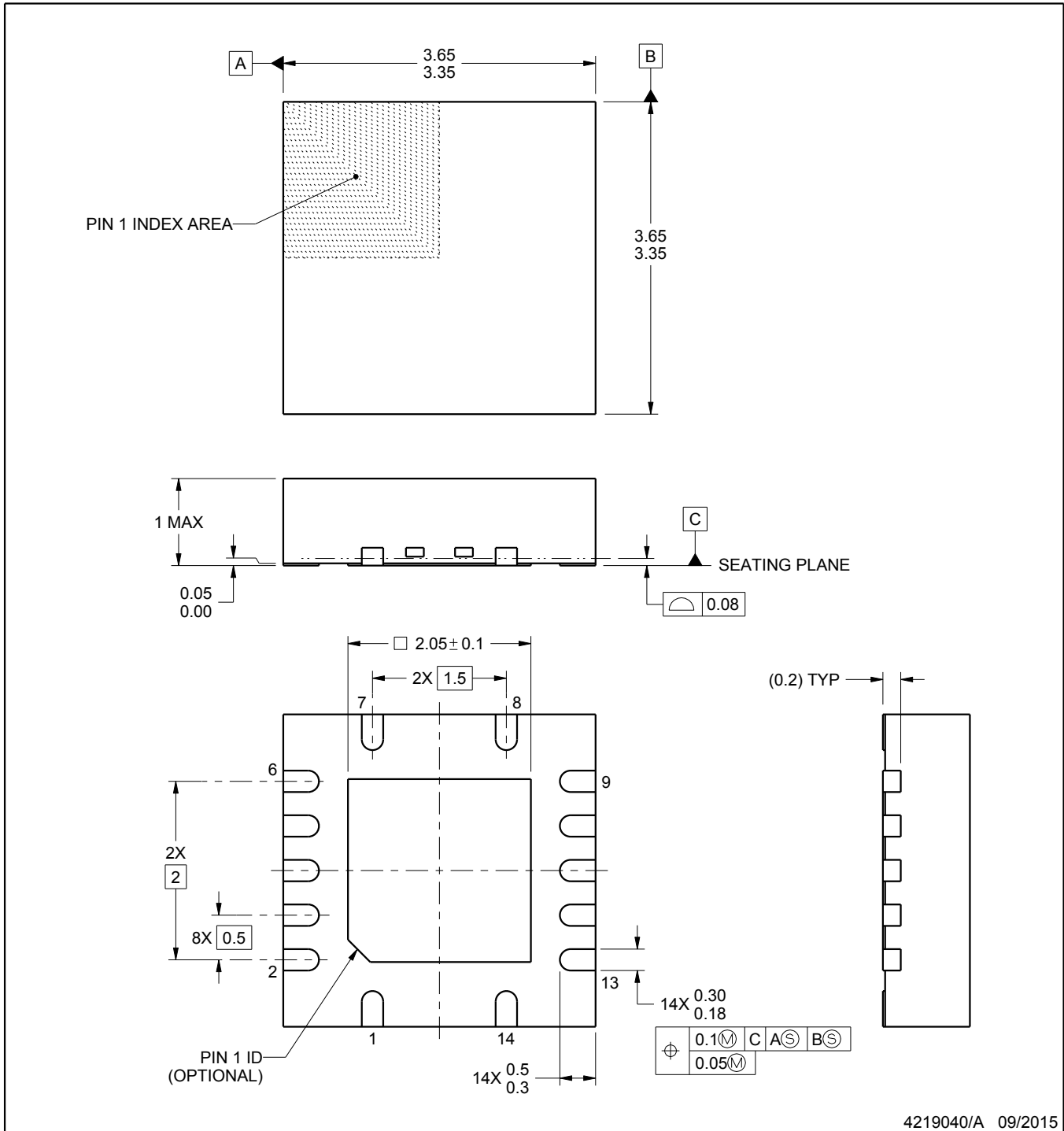
RGY0014A



PACKAGE OUTLINE

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



4219040/A 09/2015

NOTES:

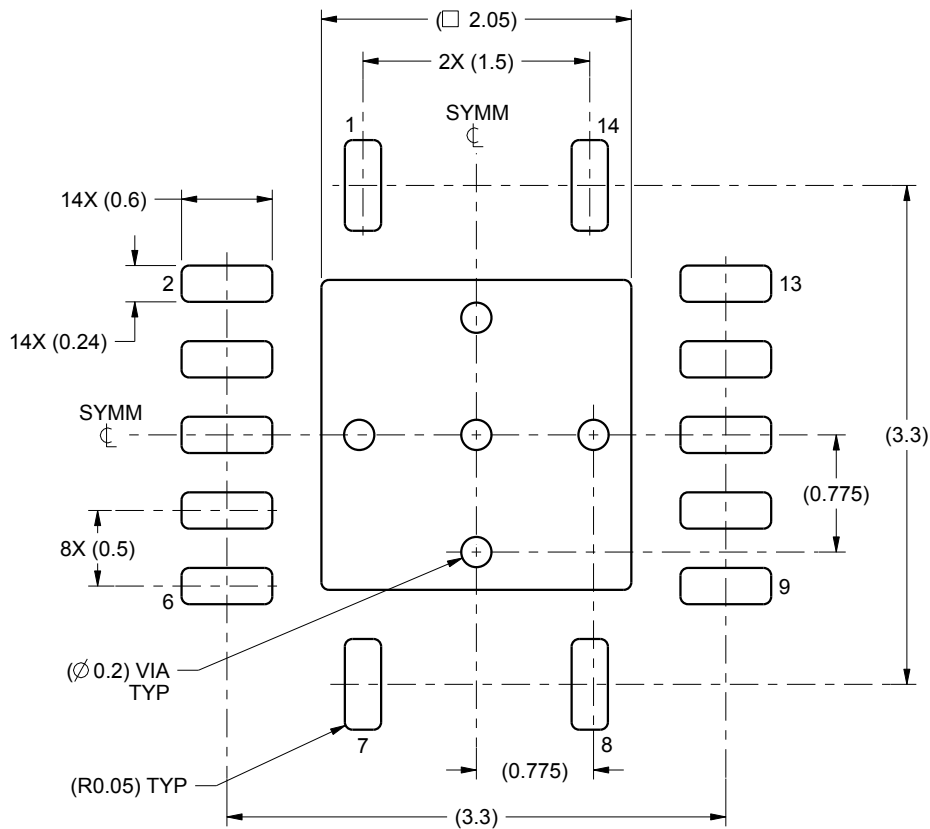
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.

EXAMPLE BOARD LAYOUT

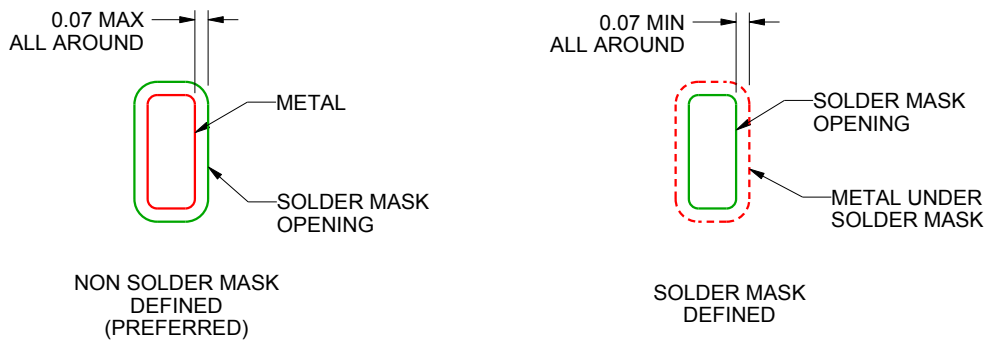
RGY0014A

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



LAND PATTERN EXAMPLE
SCALE:20X



SOLDER MASK DETAILS

4219040/A 09/2015

NOTES: (continued)

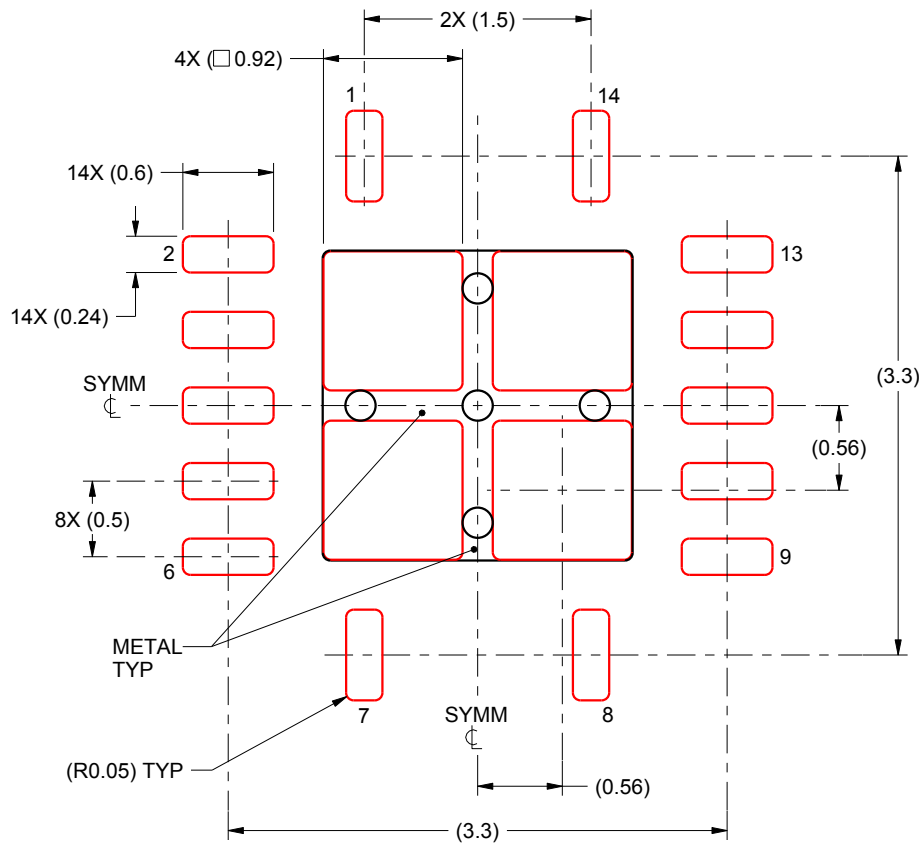
4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/sluea271).

EXAMPLE STENCIL DESIGN

RGY0014A

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL

EXPOSED PAD
80% PRINTED SOLDER COVERAGE BY AREA
SCALE:20X

4219040/A 09/2015

NOTES: (continued)

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

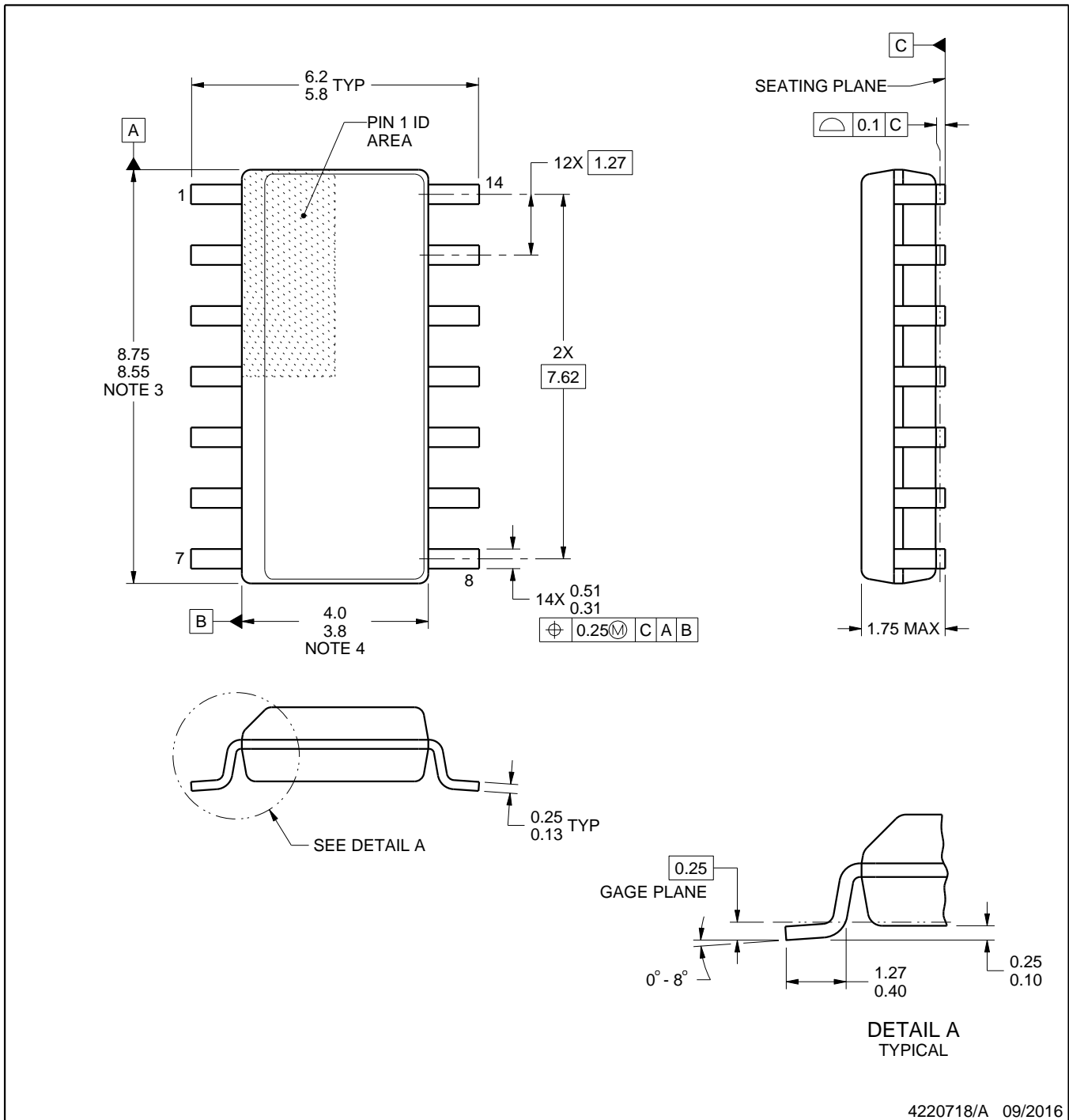
D0014A



PACKAGE OUTLINE

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



4220718/A 09/2016

NOTES:

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

EXAMPLE BOARD LAYOUT

D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



LAND PATTERN EXAMPLE
SCALE:8X



SOLDER MASK DETAILS

4220718/A 09/2016

NOTES: (continued)

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

EXAMPLE STENCIL DESIGN

D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



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

4220718/A 09/2016

NOTES: (continued)

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

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



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

DB0014A



PACKAGE OUTLINE

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



4220762/A 05/2024

NOTES:

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

EXAMPLE BOARD LAYOUT

DB0014A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



4220762/A 05/2024

NOTES: (continued)

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

EXAMPLE STENCIL DESIGN

DB0014A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE

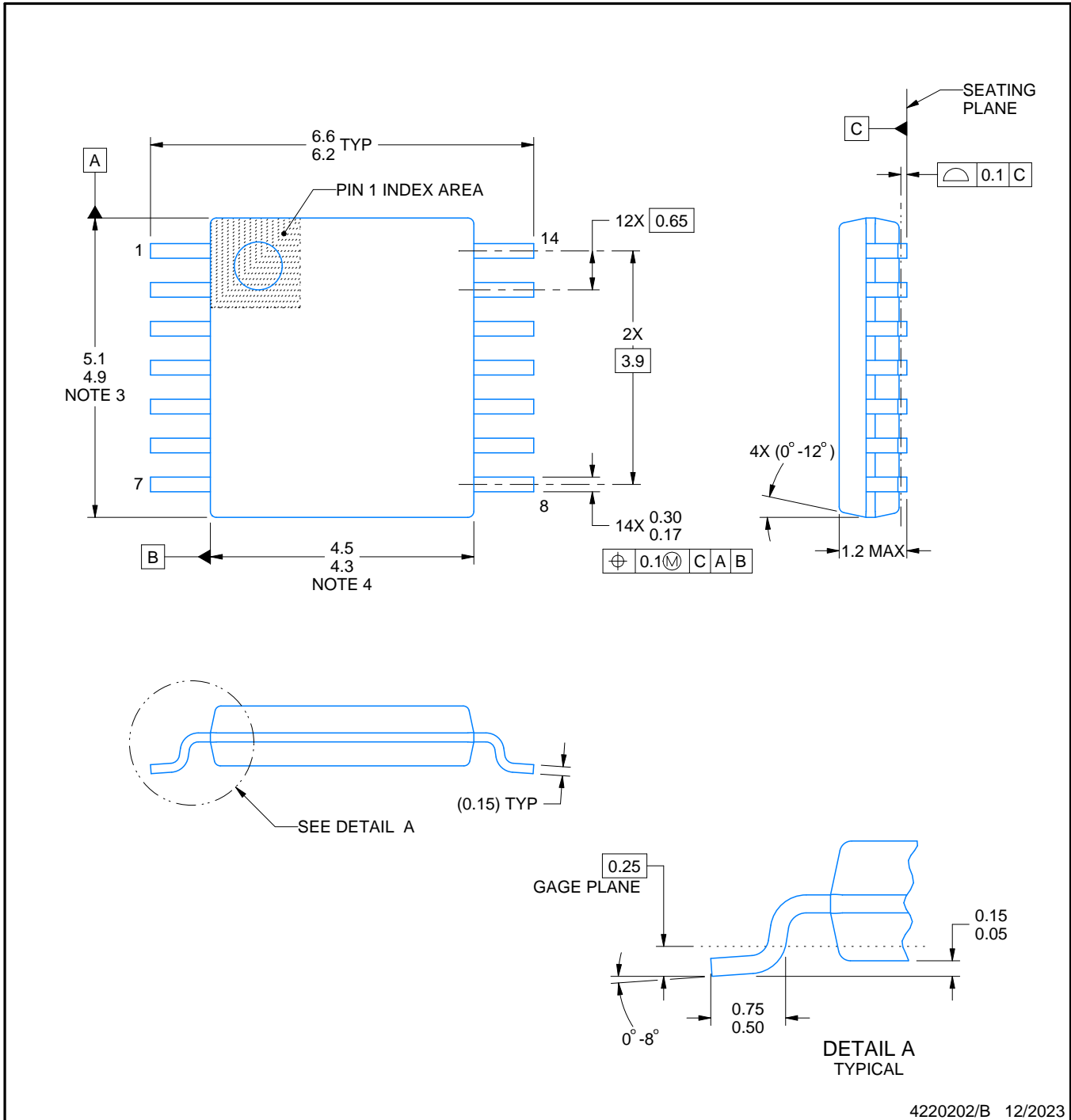


SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE: 10X

4220762/A 05/2024

NOTES: (continued)

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



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



4220202/B 12/2023

NOTES: (continued)

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

EXAMPLE STENCIL DESIGN

PW0014A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



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

4220202/B 12/2023

NOTES: (continued)

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

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最后更新日期：2025 年 10 月