

SNx4AHC04 六路反相器

1 特性

- 工作电压范围为 2 V 至 5.5V
- 闩锁性能超过 250mA，符合 JESD 17 规范

2 说明

'AHC04 器件包含六个独立的反相器。这些器件执行布尔函数 $Y = \bar{A}$ 。

器件信息

器件型号	封装 ¹	封装尺寸 ²
SN54AHC04	J (CDIP , 14)	19.56mm x 6.67mm
	W (CFP , 14)	13.1 mm x 6.92 mm
	FK (LCCC , 20)	8.9 mm x 8.9 mm
SN74AHC04	N (PDIP , 14)	19.3mm x 6.35mm
	D (SOIC , 14)	8.65mm x 3.91mm
	DB (SSOP , 14)	6.20mm x 5.30mm
	NS (SOP , 14)	12.60mm x 5.30mm
	PW (TSSOP , 14)	5.00mm x 4.40mm
	DGV (TVSOP , 14)	3.6mm x 4.4mm
	RGY (VQFN , 14)	3.50mm x 3.50mm
	BQA (WQFN , 14)	3mm x 2.5mm

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 × 宽）为标称值，并包括引脚（如适用）。

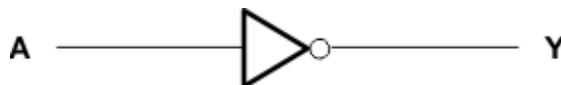


图 2-1. 逻辑图，每个逻辑门（正逻辑）



Table of Contents

1 特性	1	5.9 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 Functional Block Diagram.....	8
5 Specifications	4	7.2 Device Functional Modes.....	8
5.1 Absolute Maximum Ratings.....	4	8 Device and Documentation Support	9
5.2 ESD Ratings.....	4	8.1 Documentation Support (Analog).....	9
5.3 Recommended Operating Conditions	4	8.2 接收文档更新通知.....	9
5.4 Thermal Information.....	5	8.3 支持资源.....	9
5.5 Electrical Characteristics.....	5	8.4 Trademarks.....	9
5.6 Switching Characteristics.....	5	8.5 静电放电警告.....	9
5.7 Switching Characteristics, $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$	6	8.6 术语表.....	9
5.8 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 O (May 2023) to Revision P (June 2023)	Page
• 向 <i>器件信息</i> 表中添加了 BQA 封装.....	1
• 添加了 <i>器件和文档支持</i> 部分以及 <i>机械、封装和可订购信息</i> 部分.....	1
• Updated thermal values for R ^θ JA: D = 86 to 124.5, PW = 113 to 147.7, all values in °C/W	5
• Added thermal value for R ^θ JA: BQA = 88.3, all values in °C/W.....	5

Changes from Revision N (May 2013) to Revision O (May 2023)	Page
• 添加了 <i>封装信息表</i> 、 <i>引脚功能表</i> 和 <i>热性能信息表</i>	1

4 Pin Configuration and Functions

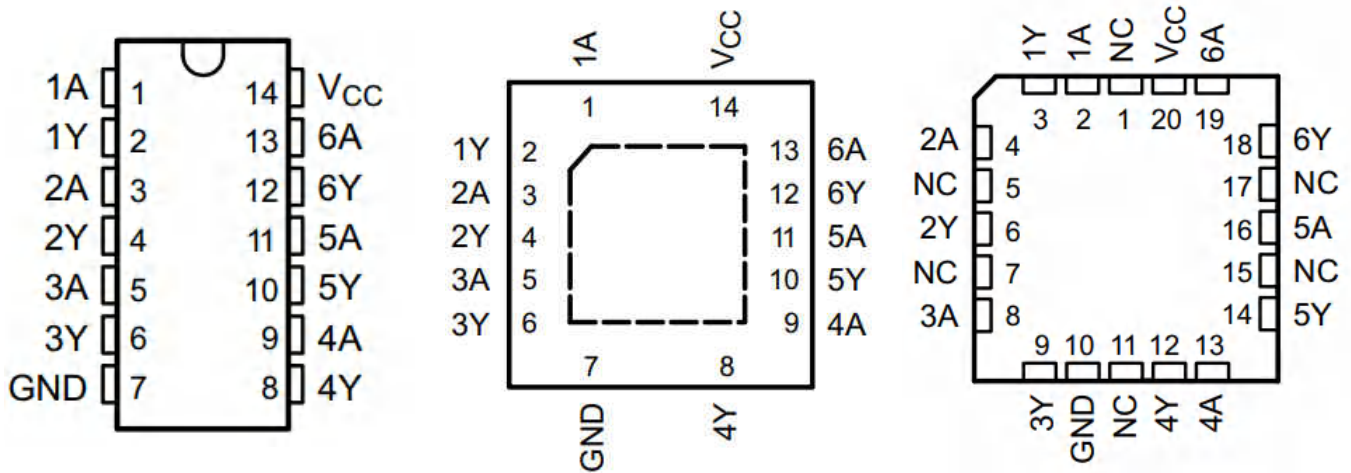


图 4-1. SN54AHC04 J or W Package SN74AHC04 D, DB, DGV, N, NS, or PW Package (Top View)

图 4-2. SN74AHC04 RGY or BQA Package (Top View)

图 4-3. SN54AHC04 FK Package (Top View)

表 4-1. Pin Functions

NAME	PIN				I/O	DESCRIPTION
	SN74AHC04		SN54AHC04			
	D, DB, DGV, N, NS, PW	RGY, BQA	J, W	FK		
1A	1	1	1	2	I	1A Input
1Y	2	2	2	3	O	1Y Output
2A	3	3	3	4	I	2A Input
2Y	4	4	4	6	O	2Y Output
3A	5	5	5	8	I	3A Input
3Y	6	6	6	9	O	3Y Output
4A	9	9	9	13	I	4A Input
4Y	8	8	8	12	O	4Y Output
5A	11	11	11	16	I	5A Input
5Y	10	10	10	14	I	5Y Output
6A	13	13	13	19	I	6A Input
6Y	12	12	12	18	O	6Y Output
GND	7	7	7	10	—	Ground Pin
NC	—	—	—	1	—	No Connection
				5		
				7		
				11		
				15		
V _{CC}	14	14	14	20	—	Power Pin

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 ⁽²⁾	Input voltage range	- 0.5	7	V
V _O ⁽²⁾	Output voltage range	- 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 or V _O > V _{CC})	±20	mA
I _{OK}	Continuous output current	(V _O = 0 to V _{CC})	±25	mA
	Continuous current through V _{CC} or GND		±50	mA
T _{stg}	Storage temperature range	- 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.

5.2 ESD Ratings

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

		SN54AHC04		SN74AHC04		UNIT
		MIN	MAX	MIN	MAX	
V _{CC}	Supply voltage	2	5.5	2	5.5	V
V _{IH}	High-level input voltage	V _{CC} = 2 V	1.5	1.5		V
		V _{CC} = 3 V	2.1	2.1		
		V _{CC} = 5.5 V	3.85	3.85		
V _{IL}	Low-level Input voltage	V _{CC} = 2 V		0.5	0.5	V
		V _{CC} = 3 V		0.9	0.9	
		V _{CC} = 5.5 V		1.65	1.65	
V _I	Input voltage	0	5.5	0	5.5	V
V _O	Output voltage	0	V _{CC}	0	V _{CC}	V
I _{OH}	High-level output current	V _{CC} = 2 V		- 50	- 50	mA
		V _{CC} = 3.3 V ± 0.3 V		- 4	- 4	
		V _{CC} = 5 V ± 0.5 V		- 8	- 8	
I _{OL}	Low-level output current	V _{CC} = 2 V		50	50	mA
		V _{CC} = 3.3 V ± 0.3 V		4	4	
		V _{CC} = 5 V ± 0.5 V		8	8	
Δt / Δv	Input Transition rise or fall rate	V _{CC} = 3.3 V ± 0.3 V		100	100	ns/V
		V _{CC} = 5 V ± 0.5 V		20	20	
T _A	Operating free-air temperature	- 55	125	- 40	125	°C

5.4 Thermal Information

THERMAL METRIC ¹		SNx4AHC04								UNIT
		D	DB	DGV	N	NS	PW	RGY	BQA	
		14 PINS								
R _{θJA}	Junction-to-ambient thermal resistance	124.5	96	127	80	76	147.7	47	88.3	°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 operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS	V _{CC}	T _A = 25°C			T _A = -55°C TO 125°C		T _A = -40°C TO 85°C		T _A = -40°C TO 125°C		UNIT
						SN54AHC04		SN74AHC04		Recommended SN74AHC04		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
V _{OH}	I _{OH} = -50 μA	2 V	1.9	2	1.9		1.9		1.9		V	
		3 V	2.9	3	2.9		2.9		2.9			
		4.5 V	4.4	4.5	4.4		4.4		4.4			
	I _{OH} = -4 mA	3 V	2.58		2.48		2.48		2.48			
		4.5 V	3.94		3.8		3.8		3.8			
V _{OL}	I _{OL} = 50 μA	2 V			0.1		0.1		0.1		V	
		3 V			0.1		0.1		0.1			
		4.5 V			0.1		0.1		0.1			
	I _{OH} = 4 mA	3 V			0.36		0.5		0.44			
		4.5 V			0.36		0.5		0.44			
I _I	V _I = 5.5 V or GND	0 V to 5.5 V			±0.1		±1 ⁽¹⁾		±1		μA	
I _{CC}	V _I = V _{CC} or GND, I _O = 0	5.5 V			2		20		20		μA	
C _i	V _I = V _{CC} or GND	5 V		2	10				10		pF	

(1) On products compliant to MIL-PRF-38535, this parameter is not production tested at V_{CC} = 0 V.

5.6 Switching Characteristics

over recommended operating free-air temperature range, V_{CC} = 3.3 V ± 0.3 V (unless otherwise noted) (see [Load Circuit and Voltage Waveforms](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T _A = 25°C		T _A = -55°C TO 125°C		T _A = -40°C TO 85°C		T _A = -40°C TO 125°C		UNIT
						SN54AHC04		SN74AHC04		Recommended SN74AHC04		
				TYP	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	A	Y	C _L = 15 pF	5 ⁽¹⁾	8.9 ⁽¹⁾	1 ⁽¹⁾	10.5 ⁽¹⁾	1	10.5	1	10.5	ns
t _{PHL}				5 ⁽¹⁾	8.9 ⁽¹⁾	1 ⁽¹⁾	10.5 ⁽¹⁾	1	10.5	1	10.5	
t _{PLH}	A	Y	C _L = 50 pF	7.5	11.4	1	13	1	13	1	13	ns
t _{PHL}				7.5	11.4	1	13	1	13	1	13	

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

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

over recommended operating free-air temperature range, $V_{CC} = 5 V \pm 0.5 V$ (unless otherwise noted) (see [Load Circuit and Voltage Waveforms](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	$T_A = 25^\circ C$		$T_A = -55^\circ C$ TO $125^\circ C$		$T_A = -40^\circ C$ TO $85^\circ C$		$T_A = -40^\circ C$ TO $125^\circ C$		UNIT
				TYP	MAX	SN54AHC04		SN74AHC04		Recommended		
						MIN	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A	Y	$C_L = 15 \text{ pF}$	3.8 ¹	5.5 ¹	1 ¹	6.5 ¹	1	6.5	1	6.5	ns
t_{PHL}				3.8 ¹	5.5 ¹	1 ¹	6.5 ¹	1	6.5	1	6.5	
t_{PLH}	A	Y	$C_L = 50 \text{ pF}$	5.3	7.5	1	8.5	1	8.5	1	8.5	ns
t_{PHL}				5.3	7.5	1	8.5	1	8.5	1	8.5	

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

5.8 Noise Characteristics

$V_{CC} = 5 V$, $C_L = 50 \text{ pF}$, $T_A = 25^\circ C$ ⁽¹⁾

PARAMETER		SN74AHC04			UNIT
		MIN	TYP	MAX	
$V_{OL(P)}$	Quiet output, maximum dynamic V_{OL}		0.4		V
$V_{OL(V)}$	Quiet output, minimum dynamic V_{OL}		-0.4		V
$V_{OH(V)}$	Quiet output, minimum dynamic V_{OH}		4.8		V
$V_{IH(D)}$	High-level dynamic input voltage		3.5		V
$V_{IL(D)}$	Low-level dynamic input voltage			1.5	V

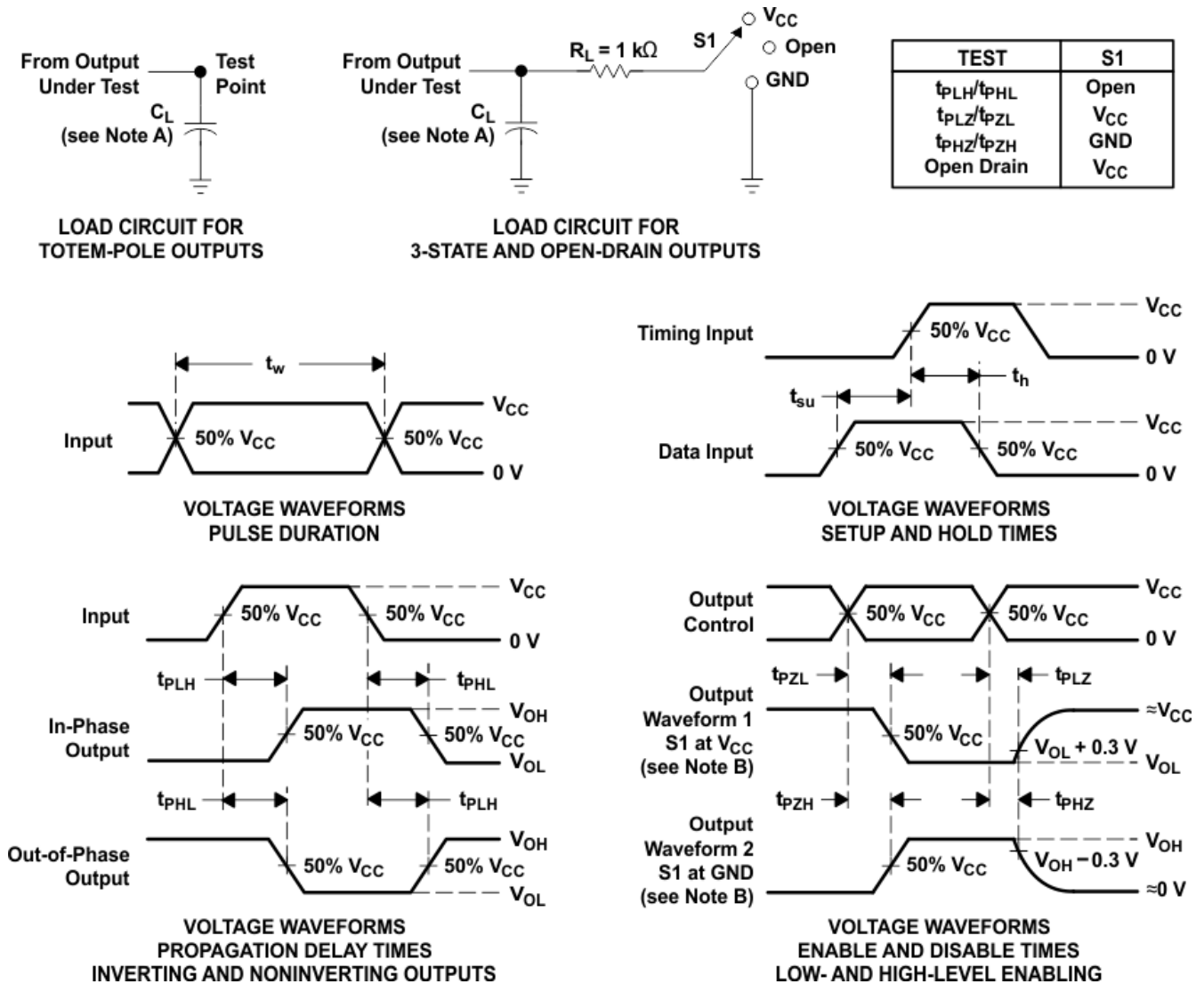
(1) Characteristics are for surface-mount packages only.

5.9 Operating Characteristics

$V_{CC} = 5 V$, $T_A = 25^\circ C$

PARAMETER		TEST CONDITIONS	TYP	UNIT
C_{pd}	Power dissipation capacitance	No load, $f = 1 \text{ MHz}$	12	pF

6 Parameter Measurement Information



- C_L includes probe and jig capacitance.
- 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.
- All input pulses are supplied by generators having the following characteristics: $PRR \leq 1$ MHz, $Z_O = 50 \Omega$, $t_r \leq 3$ ns, $t_f \leq 3$ ns.
- The outputs are measured one at a time with one input transition per measurement.
- All parameters and waveforms are not applicable to all devices.

图 6-1. Load Circuit and Voltage Waveforms

7 Detailed Description

7.1 Functional Block Diagram



7.2 Device Functional Modes

表 7-1. Function Table
(Each Inverter)

INPUT A	OUTPUT Y
H	L
L	H

8 Device and Documentation Support

8.1 Documentation Support (Analog)

8.1.1 Related Documentation

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

表 8-1. Related Links

PARTS	PRODUCT FOLDER	SAMPLE & BUY	TECHNICAL DOCUMENTS	TOOLS & SOFTWARE	SUPPORT & COMMUNITY
SN54AHC04	Click here	Click here	Click here	Click here	Click here
SN74AHC04	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)
5962-9680501Q2A	NRND	Production	LCCC (FK) 20	55 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 9680501Q2A SNJ54AHC 04FK
5962-9680501QCA	Active	Production	CDIP (J) 14	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9680501QC A SNJ54AHC04J
5962-9680501QDA	Active	Production	CFP (W) 14	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9680501QD A SNJ54AHC04W
SN74AHC04BQAR	Active	Production	WQFN (BQA) 14	3000 LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 125	AHC04
SN74AHC04BQAR.A	Active	Production	WQFN (BQA) 14	3000 LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 125	AHC04
SN74AHC04D	Obsolete	Production	SOIC (D) 14	-	-	Call TI	Call TI	-40 to 125	AHC04
SN74AHC04DBR	Active	Production	SSOP (DB) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA04
SN74AHC04DBR.A	Active	Production	SSOP (DB) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA04
SN74AHC04DGVR	NRND	Production	TVSOP (DGV) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA04
SN74AHC04DGVR.A	NRND	Production	TVSOP (DGV) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA04
SN74AHC04DR	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHC04
SN74AHC04DR.A	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHC04
SN74AHC04N	Active	Production	PDIP (N) 14	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 125	SN74AHC04N
SN74AHC04N.A	Active	Production	PDIP (N) 14	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 125	SN74AHC04N
SN74AHC04NSR	Active	Production	SOP (NS) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHC04
SN74AHC04NSR.A	Active	Production	SOP (NS) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHC04
SN74AHC04PW	Obsolete	Production	TSSOP (PW) 14	-	-	Call TI	Call TI	-40 to 125	HA04
SN74AHC04PWR	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU SN	Level-1-260C-UNLIM	-40 to 125	HA04
SN74AHC04PWR.A	Active	Production	TSSOP (PW) 14	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA04
SN74AHC04RGYR	Active	Production	VQFN (RGY) 14	3000 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 125	HA04
SN74AHC04RGYR.A	Active	Production	VQFN (RGY) 14	3000 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 125	HA04
SNJ54AHC04FK	NRND	Production	LCCC (FK) 20	55 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 9680501Q2A SNJ54AHC 04FK

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)
SNJ54AHC04FK.A	NRND	Production	LCCC (FK) 20	55 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 9680501Q2A SNJ54AHC 04FK
SNJ54AHC04J	Active	Production	CDIP (J) 14	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9680501QC A SNJ54AHC04J
SNJ54AHC04J.A	Active	Production	CDIP (J) 14	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9680501QC A SNJ54AHC04J
SNJ54AHC04W	Active	Production	CFP (W) 14	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9680501QD A SNJ54AHC04W
SNJ54AHC04W.A	Active	Production	CFP (W) 14	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9680501QD A SNJ54AHC04W

(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.

OTHER QUALIFIED VERSIONS OF SN54AHC04, SN74AHC04 :

- Catalog : [SN74AHC04](#)

- Automotive : [SN74AHC04-Q1](#), [SN74AHC04-Q1](#)

- Enhanced Product : [SN74AHC04-EP](#), [SN74AHC04-EP](#)

- Military : [SN54AHC04](#)

NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product

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

- Enhanced Product - Supports Defense, Aerospace and Medical Applications

- Military - QML certified for Military and Defense Applications

TAPE AND REEL INFORMATION

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE


*All dimensions are nominal

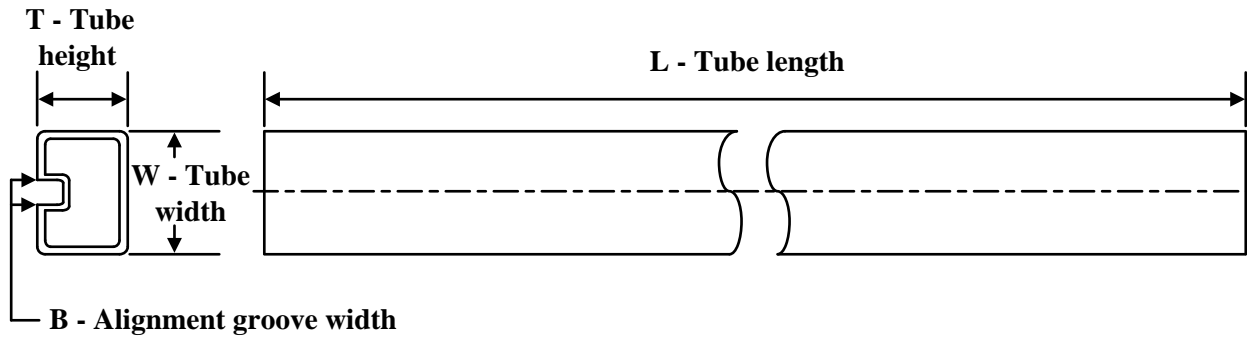
Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74AHC04BQAR	WQFN	BQA	14	3000	180.0	12.4	2.8	3.3	1.1	4.0	12.0	Q1
SN74AHC04DBR	SSOP	DB	14	2000	330.0	16.4	8.35	6.6	2.4	12.0	16.0	Q1
SN74AHC04DGVR	TVSOP	DGV	14	2000	330.0	12.4	6.8	4.0	1.6	8.0	12.0	Q1
SN74AHC04DR	SOIC	D	14	2500	330.0	12.4	3.75	3.75	1.15	8.0	12.0	Q1
SN74AHC04NSR	SOP	NS	14	2000	330.0	16.4	8.1	10.4	2.5	12.0	16.0	Q1
SN74AHC04PWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74AHC04RGYR	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)
SN74AHC04BQAR	WQFN	BQA	14	3000	210.0	185.0	35.0
SN74AHC04DBR	SSOP	DB	14	2000	353.0	353.0	32.0
SN74AHC04DGVR	TVSOP	DGV	14	2000	353.0	353.0	32.0
SN74AHC04DR	SOIC	D	14	2500	340.5	336.1	32.0
SN74AHC04NSR	SOP	NS	14	2000	353.0	353.0	32.0
SN74AHC04PWR	TSSOP	PW	14	2000	353.0	353.0	32.0
SN74AHC04RGYR	VQFN	RGY	14	3000	353.0	353.0	32.0

TUBE


*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
5962-9680501Q2A	FK	LCCC	20	55	506.98	12.06	2030	NA
5962-9680501QDA	W	CFP	14	25	506.98	26.16	6220	NA
SN74AHC04N	N	PDIP	14	25	506	13.97	11230	4.32
SN74AHC04N	N	PDIP	14	25	506	13.97	11230	4.32
SN74AHC04N.A	N	PDIP	14	25	506	13.97	11230	4.32
SN74AHC04N.A	N	PDIP	14	25	506	13.97	11230	4.32
SNJ54AHC04FK	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54AHC04FK.A	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54AHC04W	W	CFP	14	25	506.98	26.16	6220	NA
SNJ54AHC04W.A	W	CFP	14	25	506.98	26.16	6220	NA

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.

GENERIC PACKAGE VIEW

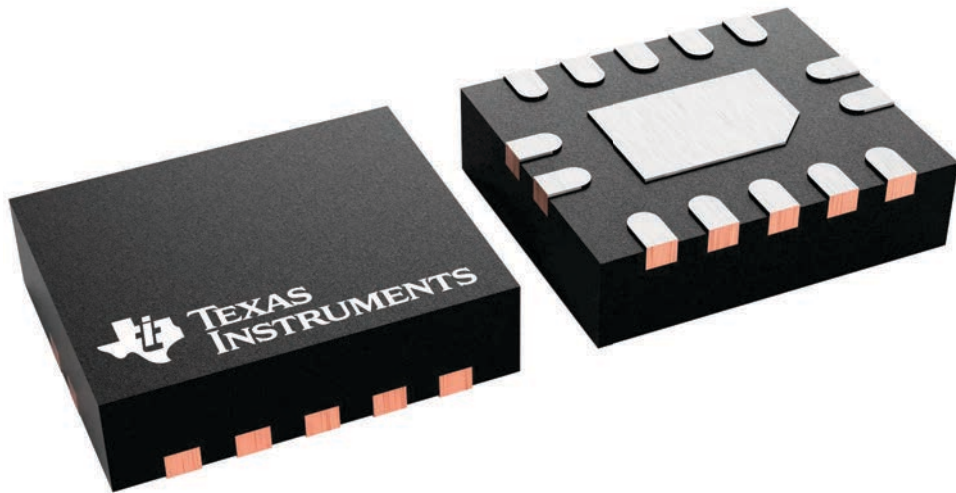
BQA 14

WQFN - 0.8 mm max height

2.5 x 3, 0.5 mm pitch

PLASTIC QUAD FLATPACK - NO LEAD

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



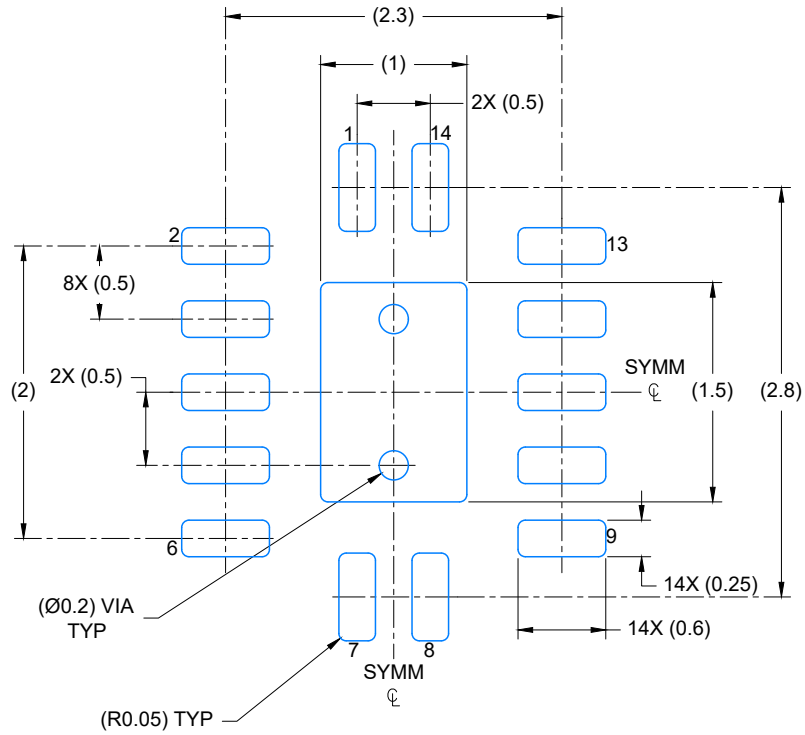
4227145/A

EXAMPLE BOARD LAYOUT

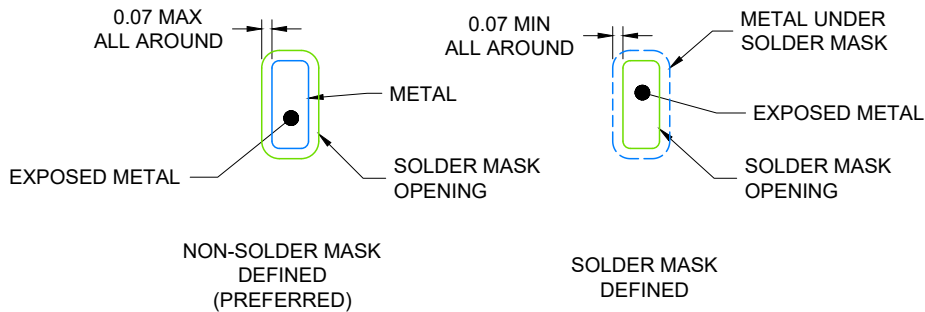
WQFN - 0.8 mm max height

BQA0014A

PLASTIC QUAD FLAT PACK-NO LEAD



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 20X



4224636/A 11/2018

NOTES: (continued)

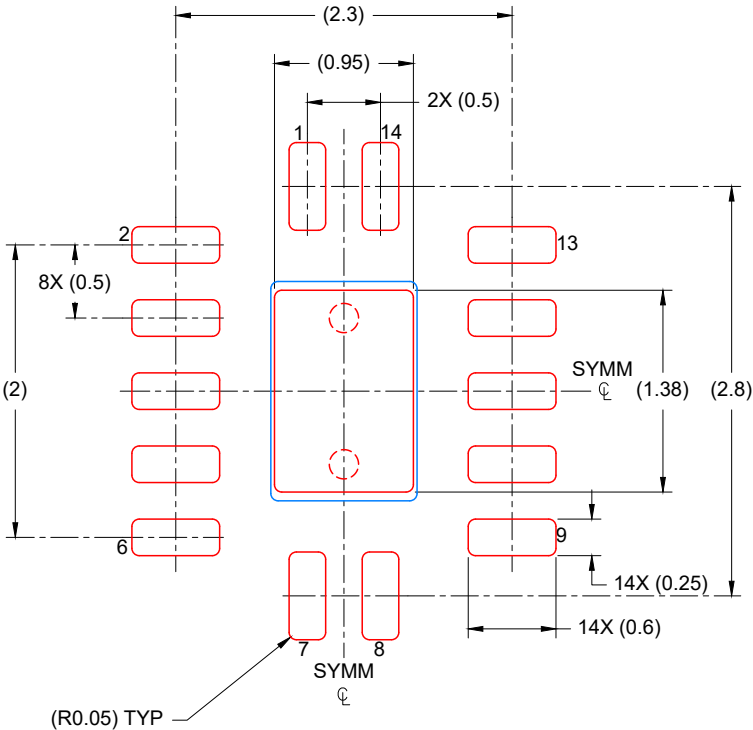
4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slua271).
5. Vias are optional depending on application, refer to device data sheet. If any vias are implemented, refer to their locations shown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

EXAMPLE STENCIL DESIGN

BQA0014A

WQFN - 0.8 mm max height

PLASTIC QUAD FLAT PACK-NO LEAD



SOLDER PASTE EXAMPLE
 BASED ON 0.125 mm THICK STENCIL

EXPOSED PAD
 88% PRINTED COVERAGE BY AREA
 SCALE: 20X

4224636/A 11/2018

NOTES: (continued)

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

MECHANICAL DATA

NS (R-PDSO-G**)

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.

W (R-GDFP-F14)

CERAMIC DUAL FLATPACK



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

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

DB0014A



PACKAGE OUTLINE

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



NOTES:

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

EXAMPLE BOARD LAYOUT

DB0014A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



4220762/A 05/2024

NOTES: (continued)

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

EXAMPLE STENCIL DESIGN

DB0014A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



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

4220762/A 05/2024

NOTES: (continued)

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

GENERIC PACKAGE VIEW

FK 20

LCCC - 2.03 mm max height

8.89 x 8.89, 1.27 mm pitch

LEADLESS CERAMIC CHIP CARRIER

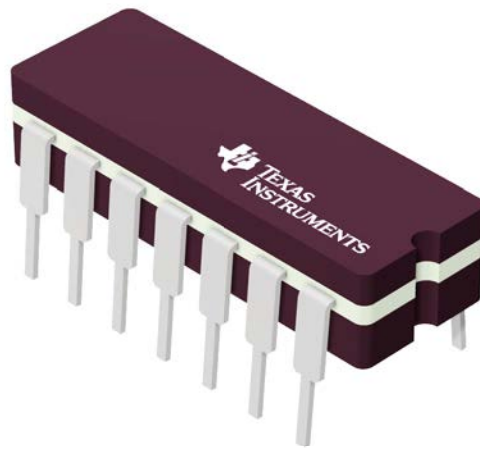
This image is a representation of the package family, actual package may vary.
Refer to the product data sheet for package details.



4229370VA\

J 14

GENERIC PACKAGE VIEW
CDIP - 5.08 mm max height
CERAMIC DUAL IN LINE PACKAGE



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

4040083-5/G

J0014A



PACKAGE OUTLINE

CDIP - 5.08 mm max height

CERAMIC DUAL IN LINE PACKAGE



4214771/A 05/2017

NOTES:

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

EXAMPLE BOARD LAYOUT

J0014A

CDIP - 5.08 mm max height

CERAMIC DUAL IN LINE PACKAGE



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



4214771/A 05/2017

N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



4040049/E 12/2002

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

PW0014A



PACKAGE OUTLINE
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.

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.

GENERIC PACKAGE VIEW

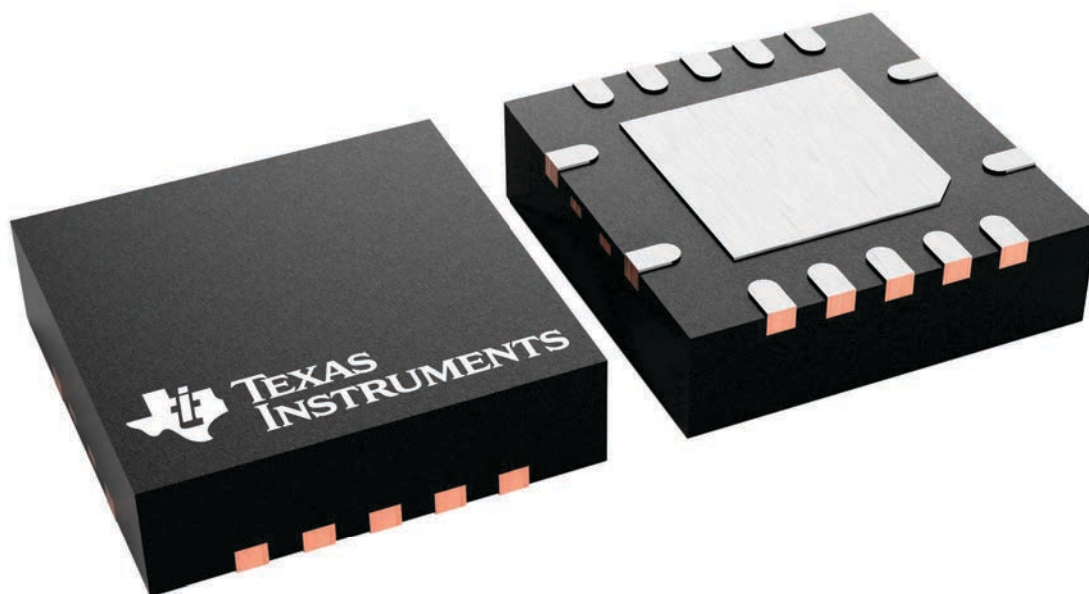
RGY 14

VQFN - 1 mm max height

3.5 x 3.5, 0.5 mm pitch

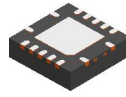
PLASTIC QUAD FLATPACK - NO LEAD

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



4231541/A

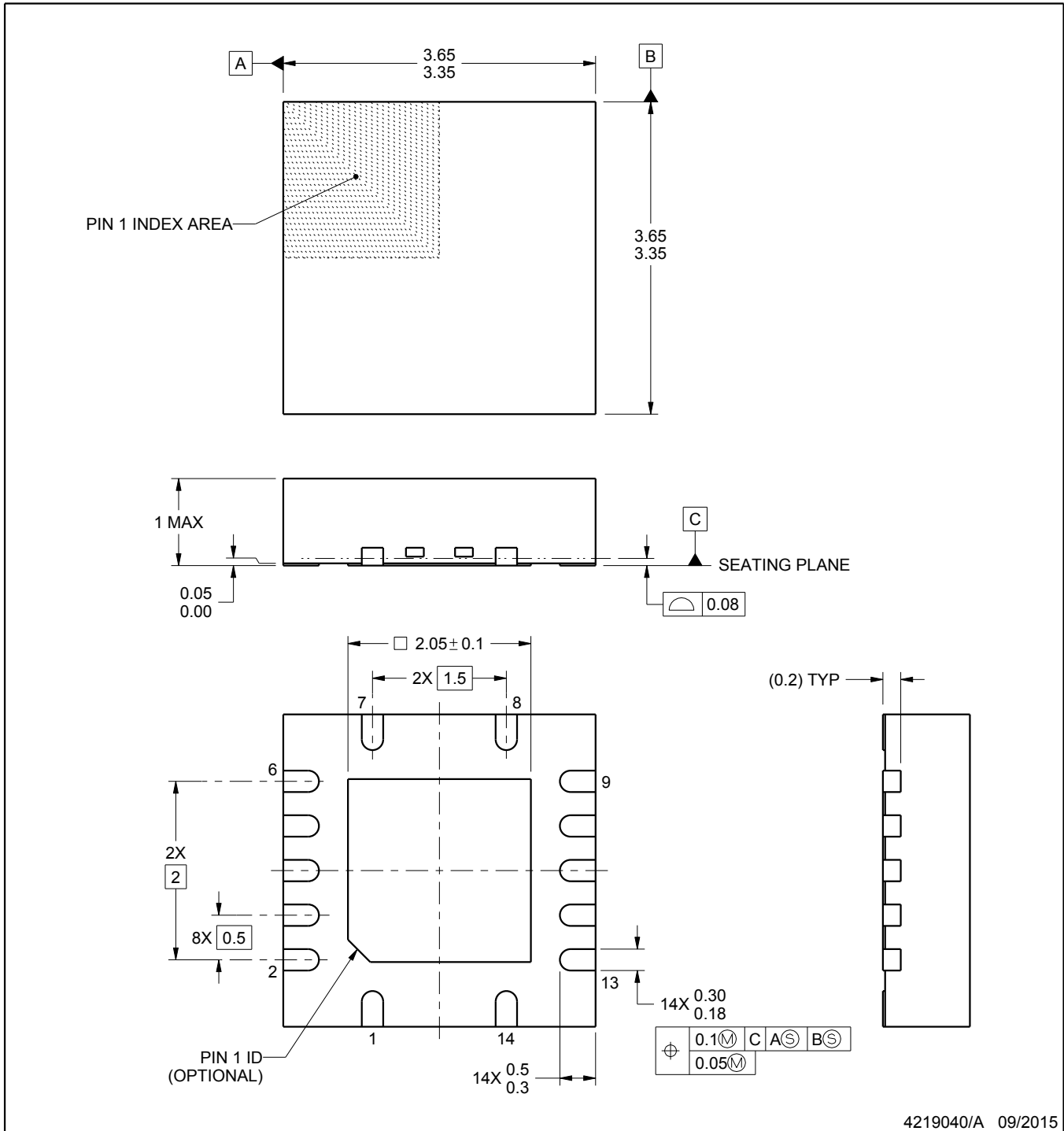
RGY0014A



PACKAGE OUTLINE

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



4219040/A 09/2015

NOTES:

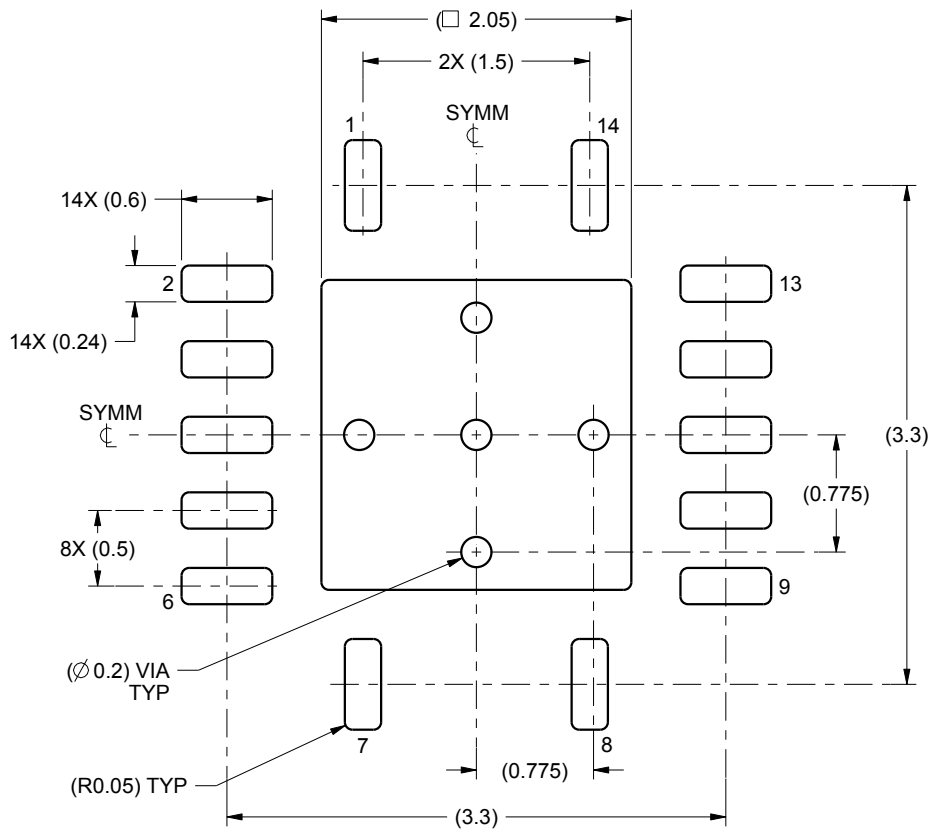
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.

EXAMPLE BOARD LAYOUT

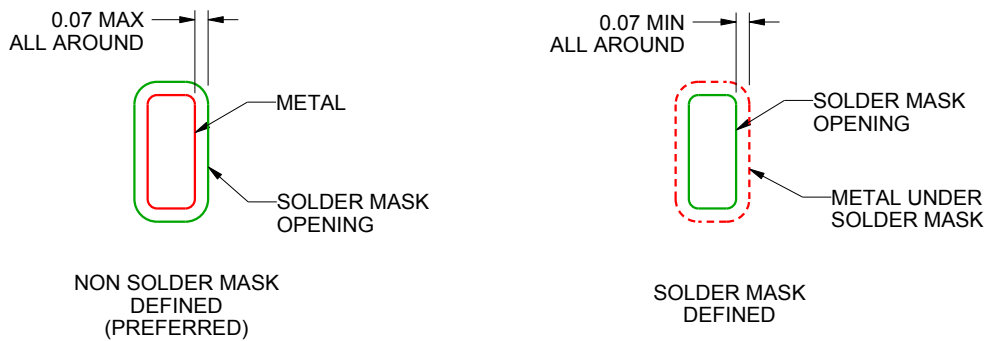
RGY0014A

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



LAND PATTERN EXAMPLE
SCALE:20X



SOLDER MASK DETAILS

4219040/A 09/2015

NOTES: (continued)

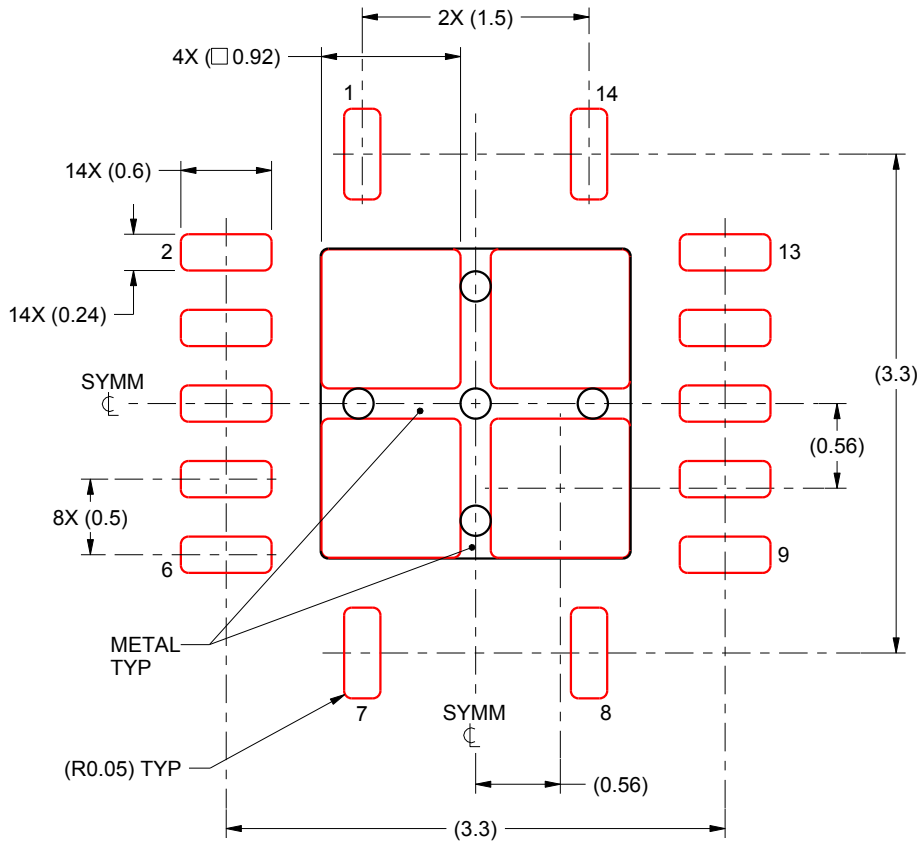
4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/sluea271).

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.

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最后更新日期：2025 年 10 月