

CD74AC174 具有清零功能的六路 D 类触发器

1 特性

- 交流类型的工作电压范围为 1.5V 至 5.5V，并在电源电压的 30% 时具有平衡的抗噪性能
- 包含 6 个具有单轨输出的触发器
- 缓冲输入
- 双极 F、AS 和 S 的速度，同时功耗显著降低
- 平衡传播延迟
- $\pm 24\text{mA}$ 输出驱动电流
 - 扇出至 15 个 F 器件
- 防 SCR 闩锁 CMOS 工艺和电路设计

2 应用

- 缓冲器/存储寄存器
- 移位寄存器

3 说明

CD74AC174 是一款具有直接清零 ($\overline{\text{CLR}}$) 输入的正边沿触发式 D 类触发器，设计用于 1.5V 至 5.5V V_{CC} 工作电压范围。

封装信息

器件型号	封装 ⁽¹⁾	封装尺寸 ⁽²⁾	本体尺寸 ⁽³⁾
CD74AC174	BQB (WQFN , 16)	3.5mm × 2.5mm	3.5mm × 2.5mm
	D (SOIC , 16)	9.9mm × 6mm	9.9mm × 3.9mm
	N (PDIP , 16)	19.3mm × 9.4mm	19.3mm × 6.35mm
	PW (TSSOP , 16)	5mm × 6.4mm	5mm × 4.4mm

- (1) 如需了解更多信息，请参阅第 11 节。
(2) 封装尺寸 (长 × 宽) 为标称值，并包括引脚 (如适用)。
(3) 本体尺寸 (长 × 宽) 为标称值，不包括引脚。

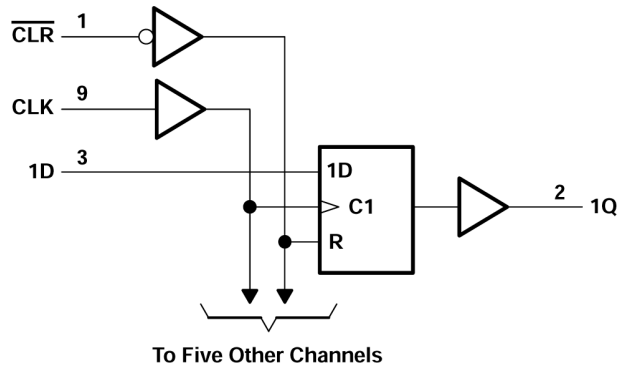


Table of Contents

1 特性	1	7 Detailed Description	10
2 应用	1	7.1 Overview.....	10
3 说明	1	7.2 Functional Block Diagram.....	10
4 Pin Configuration and Functions	3	7.3 Device Functional Modes.....	10
5 Specifications	4	8 Application and Implementation	11
5.1 Absolute Maximum Ratings.....	4	8.1 Power Supply Recommendations.....	11
5.2 ESD Ratings.....	4	8.2 Layout.....	11
5.3 Recommended Operating Conditions.....	4	9 Device and Documentation Support	12
5.4 Thermal Information.....	4	9.1 Documentation Support (Analog).....	12
5.5 Electrical Characteristics.....	5	9.2 接收文档更新通知.....	12
5.6 Timing Requirements, $V_{CC} = 1.5\text{ V}$	5	9.3 支持资源.....	12
5.7 Timing Requirements, $V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$	6	9.4 Trademarks.....	12
5.8 Timing Requirements, $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$	6	9.5 静电放电警告.....	12
5.9 Switching Characteristics, $V_{CC} = 1.5\text{ V}$	6	9.6 术语表.....	12
5.10 Switching Characteristics, $V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$	6	10 Revision History	12
5.11 Switching Characteristics, $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$	7	11 Mechanical, Packaging, and Orderable Information	12
5.12 Operating Characteristics.....	7		
6 Parameter Measurement Information	8		

4 Pin Configuration and Functions

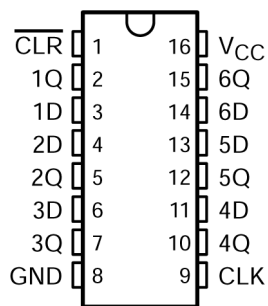


图 4-1. D, N, or PW Package; 16-Pin SOIC, PDIP, or TSSOP (Top View)

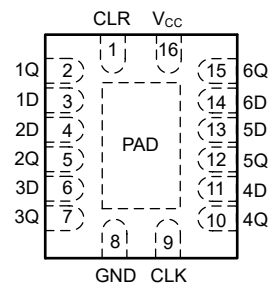


图 4-2. BQB Package, 16-Pin WQFN (Top View)

表 4-1. Pin Functions

PIN		TYPE	DESCRIPTION
NAME	NO.		
CLR	1	I	Clear Pin
1Q	2	O	1Q Output
1D	3	I	1D Input
2D	4	I	2D Input
2Q	5	O	2Q Output
3D	6	I	3D Input
3Q	7	O	3Q Output
GND	8	—	Ground Pin
CLK	9	I	Clock Pin
4Q	10	O	4Q Output
4D	11	I	4D Input
5Q	12	O	5Q Output
5D	13	I	5D Input
6D	14	I	6D Input
6Q	15	O	6Q Output
V _{CC}	16	P	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	6	V
I_{IK}	Input clamp current	$(V_I < 0\text{ V or } V_I > V_{CC})^{(2)}$		±20 mA
I_{OK}	Output clamp current	$(V_O < 0\text{ V or } V_O > V_{CC})^{(2)}$		±50 mA
I_O	Continuous output current	$(V_O > 0\text{ V or } V_O < V_{CC})$		±50 mA
	Continuous current through V_{CC} or GND			±150 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

- (1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.

5.3 Recommended Operating Conditions

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

			T _A = 25°C		– 55°C to 125°C		– 40°C to 85°C		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	
V _{CC}	Supply voltage		1.5	5.5	1.5	5.5	1.5	5.5	V
V _{IH}	High-level input voltage	V _{CC} = 1.5 V	1.2		1.2		1.2		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} = 1.5 V	0.3		0.3		0.3		V
		V _{CC} = 3 V	0.9		0.9				
		V _{CC} = 5.5 V	1.65		1.65				
V _I	Input voltage		0	V _{CC}	0	V _{CC}	0	V _{CC}	V
V _O	Output voltage		0	V _{CC}	0	V _{CC}	0	V _{CC}	V
I _{OH}	High-level output current	V _{CC} = 4.5 V to 5.5 V	– 24		– 24		– 24		mA
I _{OL}	Low-level output current	V _{CC} = 4.5 V to 5.5 V	24		24		24		mA
Δ t / Δ v	Input transition rise or fall rate	V _{CC} = 1.5 V to 3 V	50		50		50		ns/V
		V _{CC} = 1.6 V to 5.5 V	20		20		20		

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

5.4 Thermal Information

THERMAL METRIC ⁽¹⁾		CD74AC174				UNIT
		BQB (WQFN)	D (SOIC)	N (PDIP)	PW (TSSOP)	
		16 PINS	16 PINS	16 PINS	16 PINS	
R _{θJA}	Junction-to-ambient thermal resistance	91.2	106.6	67	126.2	°C/W

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

5.5 Electrical Characteristics

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

PARAMETER	TEST CONDITIONS		V _{CC}	T _A = 25 °C		- 55°C to 125°C		- 40°C to 85°C		UNIT
				MIN	MAX	MIN	MAX	MIN	MAX	
V _{OH}	V _I = V _{IH} or V _{IL}	I _{OH} = - 50 μ A	1.5 V	1.4		1.4		1.4		V
			3 V	2.9		2.9		2.9		
			4.5 V	4.4		4.4		4.4		
		I _{OH} = - 4 mA	3 V	2.58		2.4		2.48		
		I _{OH} = - 24 mA	4.5 V	3.94		3.7		3.8		
		I _{OH} = - 50 mA ⁽¹⁾	5.5 V			3.85				
		I _{OH} = - 75 mA ⁽¹⁾	5.5 V					3.85		
V _{OL}	V _I = V _{IH} or V _{IL}	I _{OL} = 50 μ A	1.5 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 _{OL} = 12 mA	3 V		0.36		0.5		0.44	
		I _{OL} = 24 mA	4.5 V		0.36		0.5		0.44	
		I _{OL} = 50 mA ⁽¹⁾	5.5 V				1.65			
		I _{OL} = 75 mA ⁽¹⁾	5.5 V						1.65	
I _I	V _I = V _{CC} or GND		5.5 V		±0.1		±1		±1	μ A
I _{CC}	V _I = V _{CC} or GND, I _O = 0		5.5 V		8		160		80	μ A
C _i					10		10		10	pF

(1) Test one output at a time, not exceeding 1-second duration. Measurement is made by forcing indicated current and measuring voltage to minimize power dissipation. Test verifies a minimum 50-Ω transmission-line drive capability at 85°C and 75-Ω transmission-line drive capability at 125°C.

5.6 Timing Requirements, V_{CC} = 1.5 V

over recommended operating free-air temperature range, V_{CC} = 1.5 V (unless otherwise noted)

			- 55°C to 125°C		- 40°C to 85°C		UNIT
			MIN	MAX	MIN	MAX	
f _{clock}	Clock frequency			8		9	MHz
t _w	Pulse duration	CLR low		50		44	ns
		CLK high or low		65		57	
T _{su}	Setup time before CLK ↑			2		2	ns
t _h	Hold time, data after CLK ↑			38		33	ns
t _{rec}	Recovery time, before CLK ↑			1.5		1.5	ns

5.7 Timing Requirements, $V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$

over recommended operating free-air temperature range, $V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$ (unless otherwise noted)

			– 55°C to 125°C		– 40°C to 85°C		UNIT
			MIN	MAX	MIN	MAX	
f_{clock}	Clock frequency			68		77	MHz
t_w	Pulse duration	$\overline{\text{CLR}}$ low	5.6		4.9		ns
		CLK high or low	7.3		6.4		
T_{su}	Setup time before CLK $\uparrow$	Data	2		2		ns
t_h	Hold time, data after CLK $\uparrow$		4.2		3.7		ns
t_{rec}	Recovery time, before CLK $\uparrow$	$\overline{\text{CLR}}$ $\uparrow$	1.5		1.5		ns

5.8 Timing Requirements, $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$

over recommended operating free-air temperature range, $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$ (unless otherwise noted)

			– 55°C to 125°C		– 40°C to 85°C		UNIT
			MIN	MAX	MIN	MAX	
f_{clock}	Clock frequency			95		108	MHz
t_w	Pulse duration	$\overline{\text{CLR}}$ low	4		3.5		ns
		CLK high or low	5.2		4.6		
t_{su}	Setup time before CLK $\uparrow$	Data	2		2		ns
t_h	Hold time, data after CLK $\uparrow$		3		2.6		ns
t_{rec}	Recovery time, before CLK $\uparrow$	$\overline{\text{CLR}}$ $\uparrow$	1.5		1.5		ns

5.9 Switching Characteristics, $V_{CC} = 1.5\text{ V}$

over recommended operating free-air temperature range, $V_{CC} = 1.5\text{ V}$, $C_L = 50\text{ pF}$ (unless otherwise noted) (see [Load Circuit and Voltage Waveforms](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	– 55°C to 125°C		– 40°C to 85°C		UNIT
			MIN	MAX	MIN	MAX	
f_{max}			8		9		MHz
t_{PLH}	CLK	Any Q		169		154	ns
t_{PHL}				169		154	
t_{PLH}	$\overline{\text{CLR}}$	Any Q		181		165	ns
t_{PHL}				181		165	

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

over recommended operating free-air temperature range, $V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$, $C_L = 50\text{ pF}$ (unless otherwise noted) (see [Load Circuit and Voltage Waveforms](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	– 55°C to 125°C		– 40°C to 85°C		UNIT
			MIN	MAX	MIN	MAX	
f_{max}			68		77		MHz
t_{PLH}	CLK	Any Q	4.7	18.9	4.9	17.2	ns
t_{PHL}			4.7	18.9	4.9	17.2	
t_{PLH}	$\overline{\text{CLR}}$	Any Q	5.1	20.3	5.2	18.5	ns
t_{PHL}			5.1	20.3	5.2	18.5	

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

over recommended operating free-air temperature range, $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$, $C_L = 50\text{ pF}$ (unless otherwise noted) (see [Load Circuit and Voltage Waveforms](#))

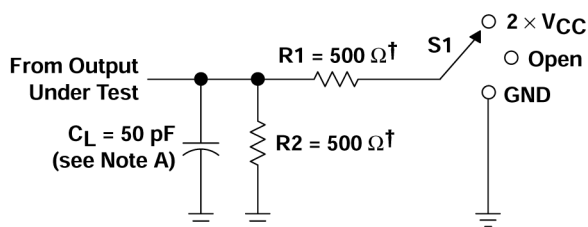
PARAMETER	FROM (INPUT)	TO (OUTPUT)	- 55°C to 125°C		- 40°C to 85°C		UNIT
			MIN	MAX	MIN	MAX	
$f_{\max}$			95		108		MHz
t_{PLH}	CLK	Any Q	3.4	13.5	3.5	12.3	ns
t_{PHL}			3.4	13.5	3.5	12.3	
t_{PLH}	$\overline{\text{CLR}}$	Any Q	3.6	14.5	3.7	13.2	ns
t_{PHL}			3.6	14.5	3.7	13.2	

5.12 Operating Characteristics

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

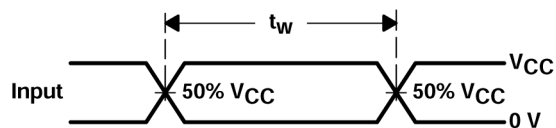
PARAMETER		TYP	UNIT
C_{pd}	Power dissipation capacitance	37	pF

6 Parameter Measurement Information

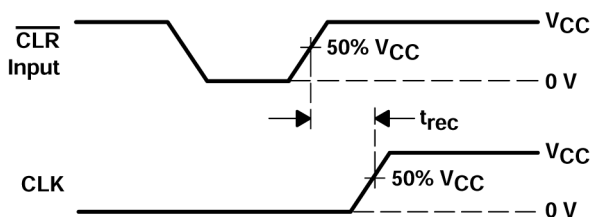


† When $V_{CC} = 1.5 \text{ V}$, $R1 = R2 = 1 \text{ k}\Omega$

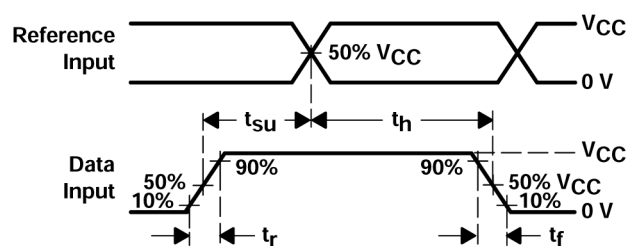
LOAD CIRCUIT



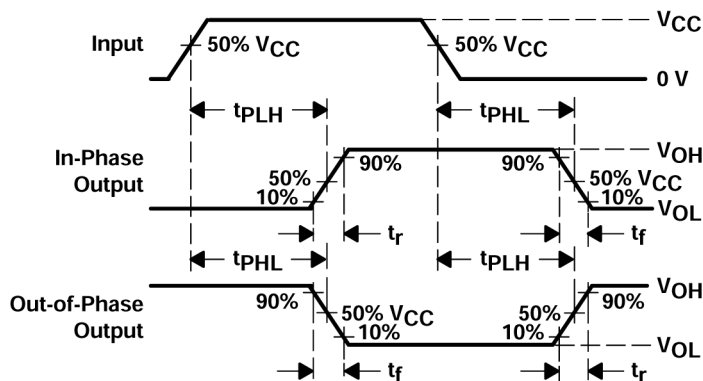
VOLTAGE WAVEFORMS
PULSE DURATION



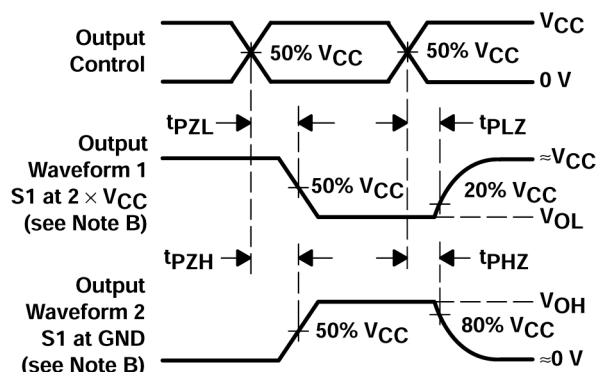
VOLTAGE WAVEFORMS
RECOVERY TIME



VOLTAGE WAVEFORMS
SETUP AND HOLD AND INPUT RISE AND FALL TIMES



VOLTAGE WAVEFORMS
PROPAGATION DELAY AND OUTPUT TRANSITION TIMES



VOLTAGE WAVEFORMS
OUTPUT ENABLE AND DISABLE TIMES

图 6-1. Load Circuit and Voltage Waveforms

- A. C_L includes probe and test-fixture 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: $PRR \leq 1 \text{ MHz}$, $Z_O = 50 \Omega$, $t_r = 3 \text{ ns}$, $t_f = 3 \text{ ns}$. Phase relationships between waveforms are arbitrary.
- D. For clock inputs, f_{max} is measured with the input duty cycle at 50%.
- E. The outputs are measured one at a time with one input transition per measurement.
- F. t_{PLH} and t_{PHL} are the same as t_{pd} .
- G. t_{PZL} and t_{PZH} are the same as t_{en} .
- H. t_{PLZ} and t_{PHZ} are the same as t_{dis} .
- I. All parameters and waveforms are not applicable to all devices.

TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	$2 \times V_{CC}$
t_{PHZ}/t_{PZH}	GND

7 Detailed Description

7.1 Overview

Information at the data (D) inputs that meets the setup time requirements is transferred to the outputs on the positive-going edge of the clock (CLK) pulse. Clock triggering occurs at a particular voltage level and is not directly related to the transition time of the positive-going edge of CLK. When CLK is at either the high or low level, the D input has no effect at the output.

7.2 Functional Block Diagram

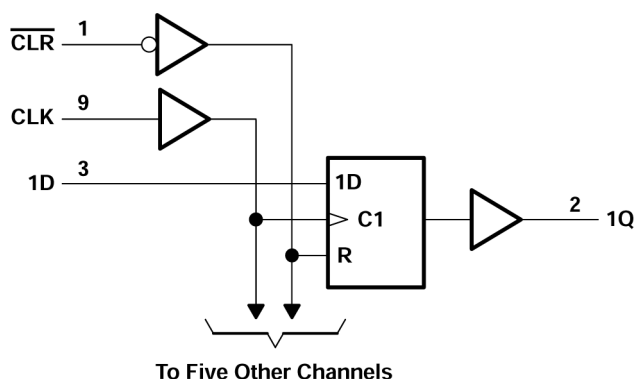


图 7-1. Logic Diagram (Positive Logic)

7.3 Device Functional Modes

表 7-1. Function Table (Each Flip-flop)

INPUTS			OUTPUT
CLR	CLK	D	Q
L	X	X	L
H	↑	H	H
H	↑	L	L
H	L	X	Q ₀

8 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。

8.1 Power Supply Recommendations

The power supply can be any voltage between the min and max supply voltage rating located in [节 5.3](#).

Each V_{CC} terminal should have a good bypass capacitor to prevent power disturbance. For devices with a single supply, TI recommends 0.1 μF and if there are multiple V_{CC} terminals, then TI recommends .01 μF or .022 μF for each power terminal. It is okay to parallel multiple bypass capacitors 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 terminal as possible for best results.

8.2 Layout

8.2.1 Layout Guidelines

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

In many cases, functions or parts of functions of digital logic devices are unused, for example, when only two inputs of a triple-input AND gate are used or only 3 of the 4 buffer gates are used. Such input pins should not be left unconnected because the undefined voltages at the outside connections result in undefined operational states. Specified below are the rules that must be observed under all circumstances. All unused inputs of digital logic devices must be connected to a high or low bias to prevent them from floating. The logic level that should be applied to any particular unused input depends on the function of the device. Generally they will be tied to GND or V_{CC} whichever make more sense or is more convenient. It is generally okay 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 does not disable the input section of the IOs so they cannot float when disabled.

9 Device and Documentation Support

9.1 Documentation Support (Analog)

9.1.1 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 9-1. Related Links

PARTS	PRODUCT FOLDER	SAMPLE & BUY	TECHNICAL DOCUMENTS	TOOLS & SOFTWARE	SUPPORT & COMMUNITY
CD74AC174	Click here	Click here	Click here	Click here	Click here

9.2 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 [通知](#) 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。

9.3 支持资源

[TI E2E™ 中文支持论坛](#) 是工程师的重要参考资料，可直接从专家处获得快速、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，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](#)。

9.4 Trademarks

TI E2E™ is a trademark of Texas Instruments.

所有商标均为其各自所有者的财产。

9.5 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。

9.6 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。

10 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 B (April 2024) to Revision C (October 2024)	Page
---	------

- | | |
|---|---|
| • 向封装信息表、引脚配置和功能部分以及热性能信息表中添加了 BQB 和 PW 封装..... | 1 |
|---|---|

Changes from Revision A (November 2023) to Revision B (April 2024)	Page
--	------

- | | |
|---|---|
| • Updated thermal values for D package from $R_{\theta JA} = 73$ to 106.6, all values in °C/W | 4 |
|---|---|

11 Mechanical, Packaging, and Orderable Information

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

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package Pins	Package qty Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
CD74AC174BQBR	Active	Production	WQFN (BQB) 16	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC174
CD74AC174BQBR.A	Active	Production	WQFN (BQB) 16	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC174
CD74AC174E	Active	Production	PDIP (N) 16	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74AC174E
CD74AC174E.A	Active	Production	PDIP (N) 16	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74AC174E
CD74AC174M	Obsolete	Production	SOIC (D) 16	-	-	Call TI	Call TI	-55 to 125	AC174M
CD74AC174M96	Active	Production	SOIC (D) 16	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC174M
CD74AC174M96.A	Active	Production	SOIC (D) 16	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC174M
CD74AC174PWR	Active	Production	TSSOP (PW) 16	3000 LARGE T&R	Yes	NIPDAU SN	Level-1-260C-UNLIM	-55 to 125	AC174
CD74AC174PWR.A	Active	Production	TSSOP (PW) 16	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	AC174

⁽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.

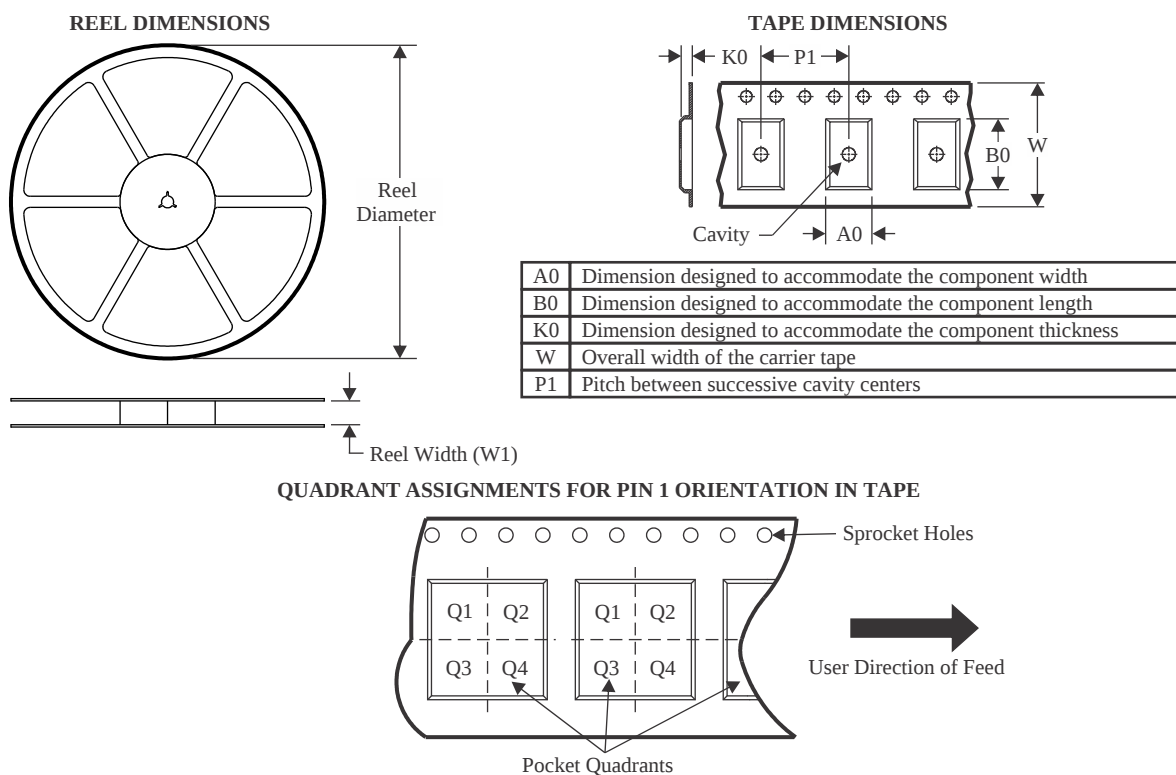
Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "-" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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TAPE AND REEL INFORMATION



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
CD74AC174BQBR	WQFN	BQB	16	3000	180.0	12.4	2.8	3.8	1.2	4.0	12.0	Q1
CD74AC174M96	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
CD74AC174M96	SOIC	D	16	2500	330.0	12.4	3.75	3.75	1.15	8.0	12.0	Q1
CD74AC174M96	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
CD74AC174PWR	TSSOP	PW	16	3000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
CD74AC174PWR	TSSOP	PW	16	3000	330.0	12.4	6.85	5.45	1.6	8.0	12.0	Q1

TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
CD74AC174BQBR	WQFN	BQB	16	3000	210.0	185.0	35.0
CD74AC174M96	SOIC	D	16	2500	353.0	353.0	32.0
CD74AC174M96	SOIC	D	16	2500	340.5	336.1	32.0
CD74AC174M96	SOIC	D	16	2500	353.0	353.0	32.0
CD74AC174PWR	TSSOP	PW	16	3000	353.0	353.0	32.0
CD74AC174PWR	TSSOP	PW	16	3000	366.0	364.0	50.0

TUBE


*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
CD74AC174E	N	PDIP	16	25	506	13.97	11230	4.32
CD74AC174E	N	PDIP	16	25	506	13.97	11230	4.32
CD74AC174E.A	N	PDIP	16	25	506	13.97	11230	4.32
CD74AC174E.A	N	PDIP	16	25	506	13.97	11230	4.32

D (R-PDSO-G16)

PLASTIC SMALL OUTLINE



NOTES:

- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- $\triangle C$ Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
- $\triangle D$ Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
- E. Reference JEDEC MS-012 variation AC.

GENERIC PACKAGE VIEW

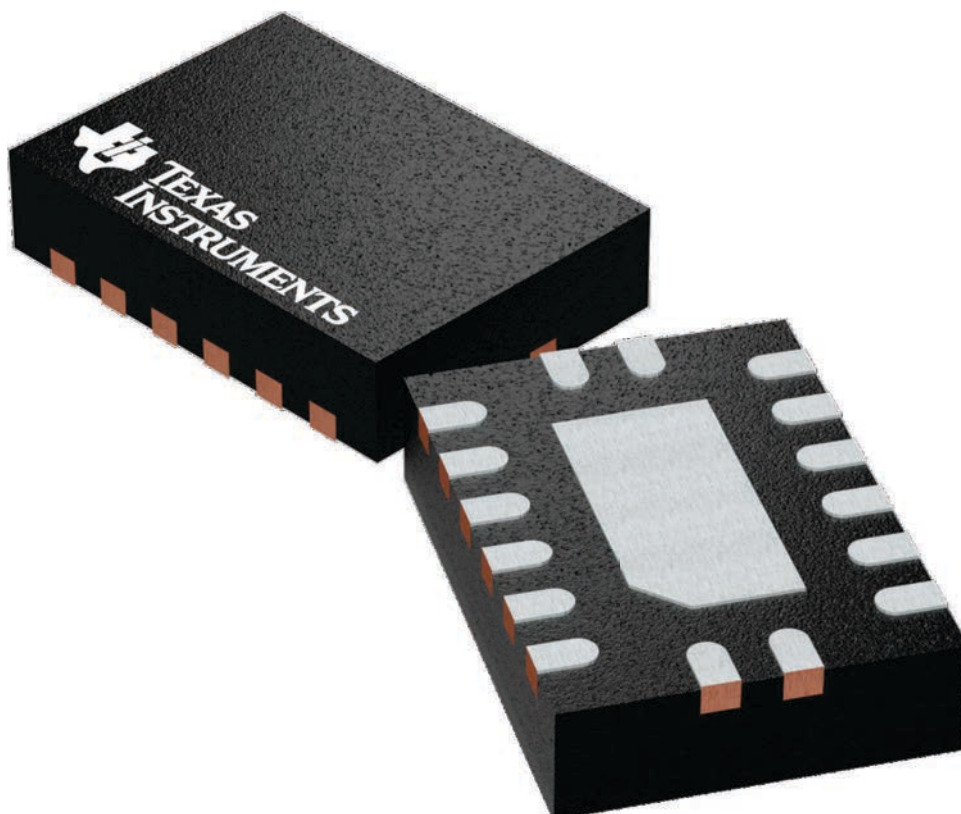
BQB 16

WQFN - 0.8 mm max height

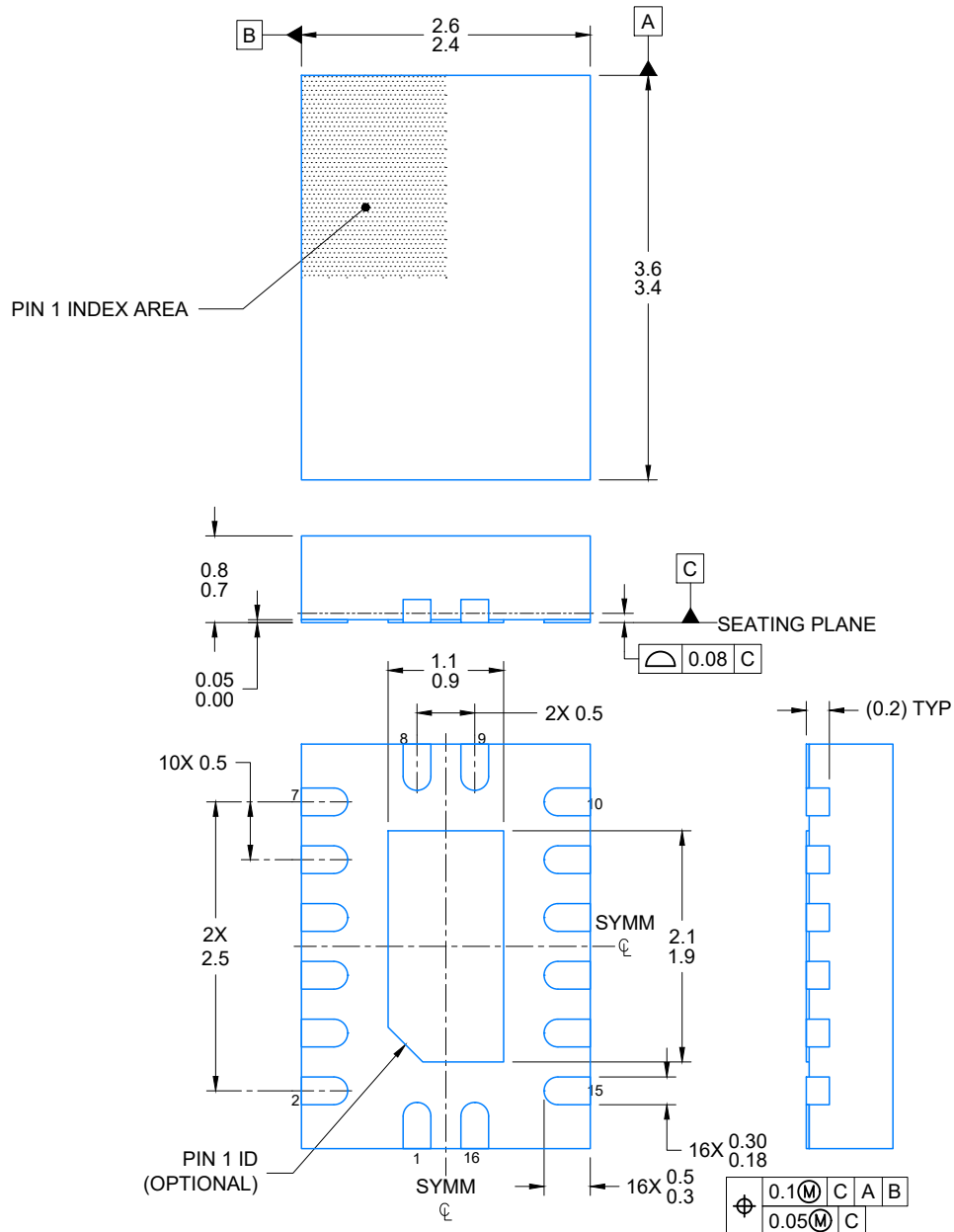
2.5 x 3.5, 0.5 mm pitch

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.



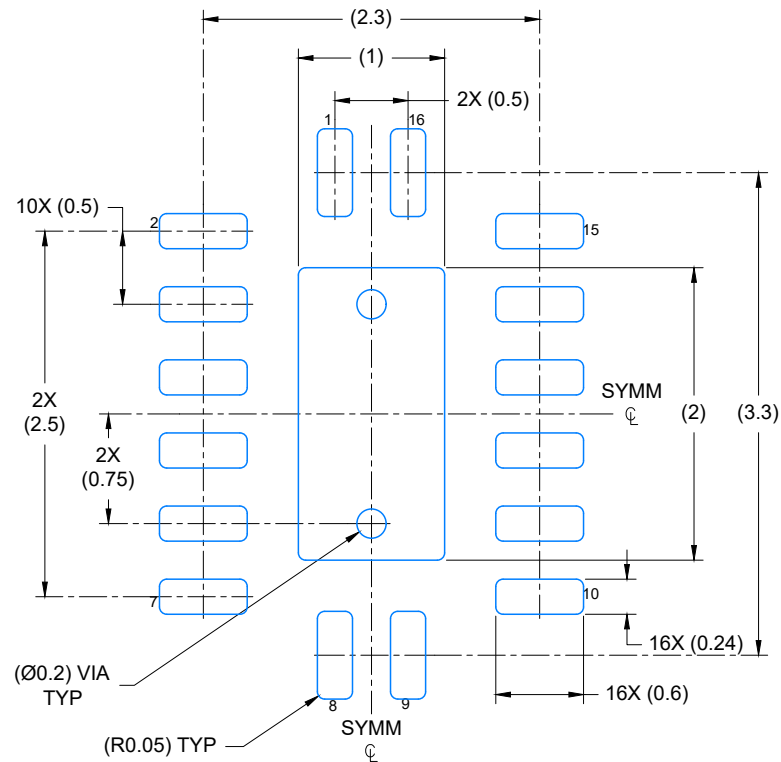
4226161/A



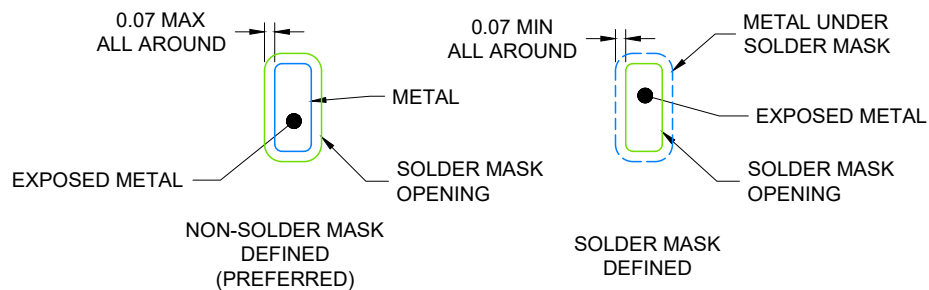
4224640/A 11/2018

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 optimal thermal and mechanical performance.



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 20X



4224640/A 11/2018

NOTES: (continued)

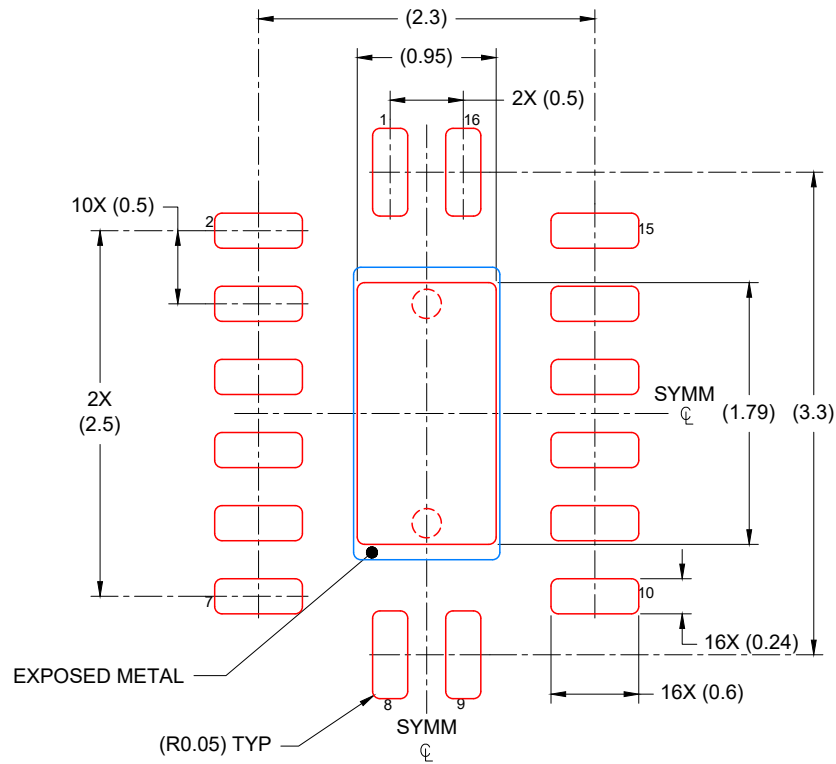
4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slue271).
5. Vias are optional depending on application, refer to device data sheet. If any vias are implemented, refer to their locations shown on this view. It is recommended that vias under paste be filled, plugged or tented.

EXAMPLE STENCIL DESIGN

BQB0016A

WQFN - 0.8 mm max height

PLASTIC QUAD FLAT PACK-NO LEAD



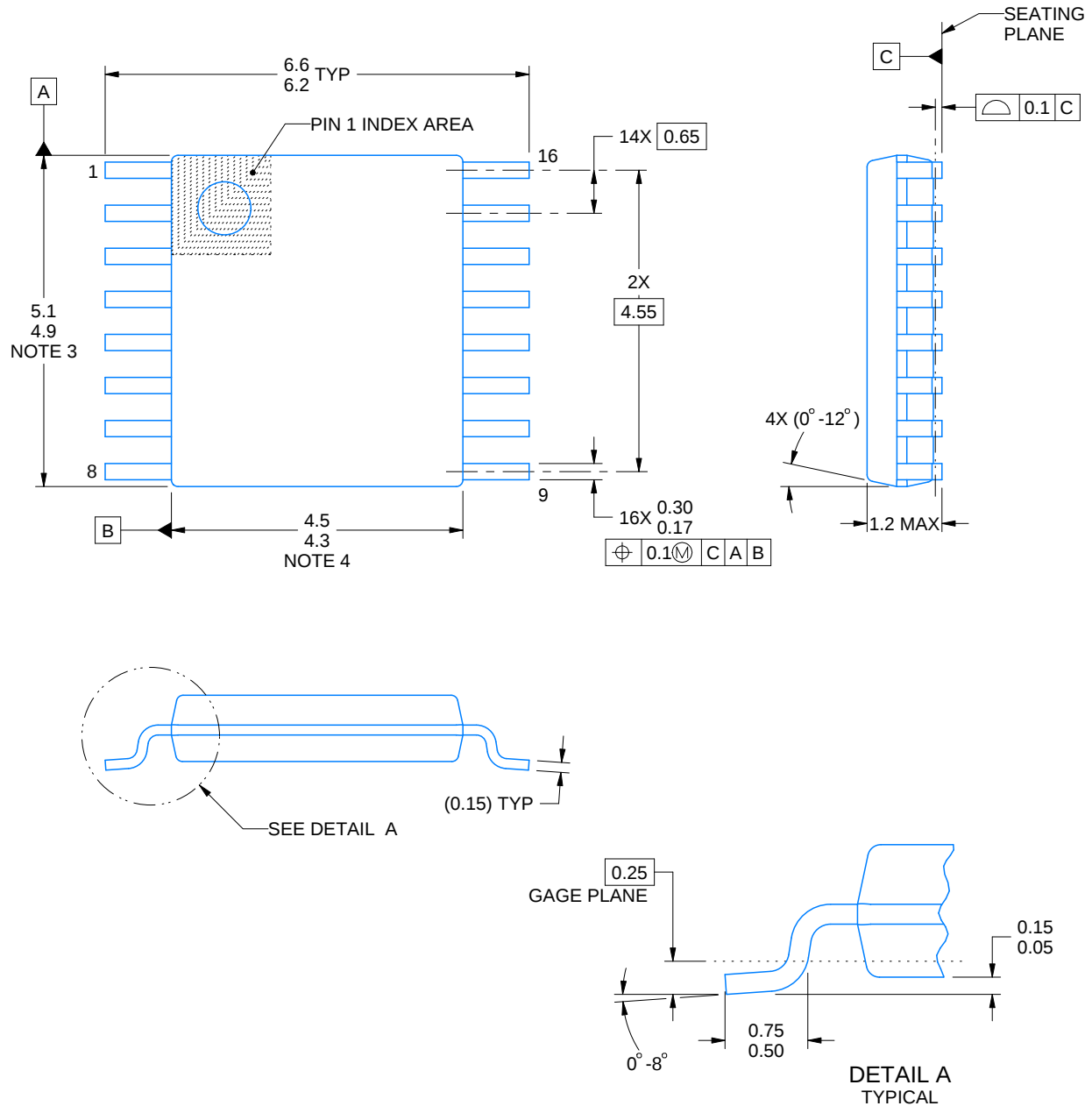
SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL

EXPOSED PAD
85% PRINTED COVERAGE BY AREA
SCALE: 20X

4224640/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.



4220204/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

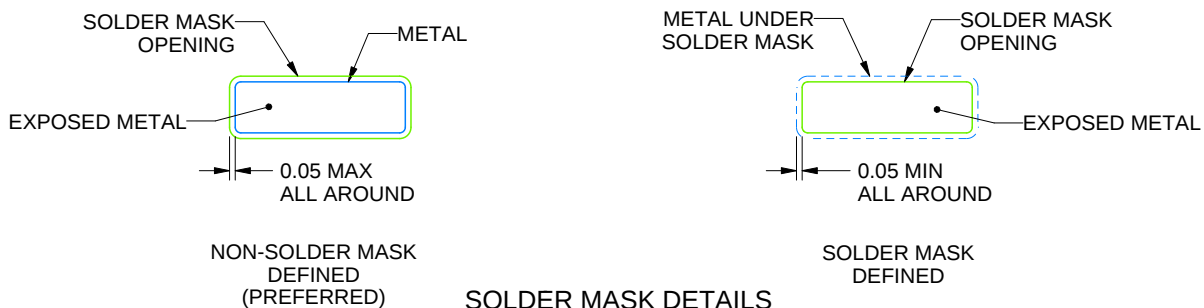
PW0016A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



4220204/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

PW0016A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



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

4220204/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.

N (R-PDIP-T**)

16 PINS SHOWN

PLASTIC DUAL-IN-LINE PACKAGE



PINS **	14	16	18	20
DIM				
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	AA	BB	AC	AD



14/18 Pin Only
20 Pin vendor option

4040049/E 12/2002

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

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