具有漏极开路输出的 SN74AUP2G07 低功耗双路缓冲器/驱动器

1 特性

- 低静态功耗
  （I_{CC} = 0.9μA，最大值）
- 低动态功耗
  （C_{pd} = 1pF，3.3V 时的典型值）
- 低输入电容（C_i=1.5pF，典型值）
- 低噪声 – 过冲和下冲
  低于 V_{CC} 的 10%
- I_{off} 支持带电插入、局部关断模式和后驱动保护
- 输入迟滞在 V_{hys} = 250mV（3.3V 时的典型值）输入下
  可实现缓慢的输入转换和更好的开关抗噪性
- 宽工作 V_{CC} 范围为 0.8V 至 3.6V
- 针对 3.3V 运行进行了优化
- 3.6V 耐压 I/O 支持混合模式的信号操作
- 3.3V 时，t_{pd} = 3.3ns（最大值）
- 适用于点到点应用
- 闩锁性能超过 100mA，
  符合 JESD 78 II 类规范的要求
- ESD 性能测试符合 JESD 22 标准
  - 4500V 人体放电模型
  - 1500V 充电器件模型

2 应用

- 主动噪声消除 (ANC)
- 条形码扫描仪
- 血压监护仪
- CPAP 呼吸机
- 线缆解决方案
- DLP 3D 机器视觉、高光谱成像、光纤网络和光谱分析
- 电子书和智能手机
- 嵌入式计算机
- 现场变送器：温度或湿度传感器
- 指纹生物识别
- HVAC：暖通空调
- 网络附加存储 (NAS)
- 服务器主板和 PSU
- 软件定义无线电 (SDR)
- 电视：高清电视 (HDTV)、LCD 电视和数字电视
- 视频通信系统
- 无线数据存取卡、耳机、键盘、鼠标和局域网 (LAN) 卡
- X 射线：行李扫描仪、医疗和牙科

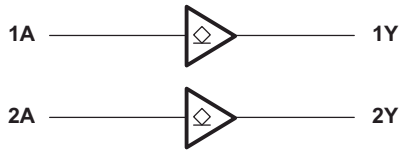
3 说明

SN74AUP2G07 器件是一个具有漏极开路输出的双路缓冲门，可在 0.8V 至 3.6V 电压范围内运行。

器件信息

器件型号	封装 (1)	封装尺寸（标称值）
SN74AUP2G07	SC70 (6)	3.00 mm x 1.25 mm
	SON (6)	1.45mm × 1.00mm
	SON (6)	1.00mm × 1.00mm
	DSBGA (6)	1.16 mm x 0.76 mm

(1) 如需了解所有可用封装，请参阅数据表末尾的可订购产品附录。



简化版方框图

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

注：以前版本的页码可能与当前版本的页码不同

Changes from Revision D (February 2016) to Revision E (October 2021) **Page**

- Changed pinout images style and formatting, removed overlapping letters in YZP package drawing, corrected BGA pin numbers in the *Pin Functions* table, changed V_{CC} and GND pin TYPE From: "—" To: "P" in the *Pin Functions* table and added footnote to the *Pin Functions* table to define pin types 3
- Changed maximum output voltage in the low state in the *节 6.1* table to 4.6 V 4
- Changed the V_O Output voltage in the *节 6.3* table from 'V_{CC}' to '3.6' 5
- Updated $R_{\theta JA}$ values to more accurately reflect device characteristics: YFP 132 to 125.4, DCK 252 to 302.4, DRY 234 to 338, DSF 300 to 372.5, added standard thermal characteristics for all packages ($R_{\theta JC(top)}$, $R_{\theta JB}$, Ψ_{JT}, Ψ_{JB}, $R_{\theta JC(bot)}$) 5

Changes from Revision C (November 2014) to Revision D (February 2016) **Page**

- Changed the V_{CC} pin TYPE From: "I" To: "—" in the *Pin Functions* table 3
- Added "Junction temperature" to the *节 6.1* table 4
- Deleted the I_{OH} High-level output current from the *节 6.3* table 5
- Deleted V_{OH} PARAMETER from the *节 6.5* table, these specifications do not pertain to open drain devices 6

Changes from Revision B (September 2009) to Revision C (November 2014) **Page**

- 删除了 *订购信息* 表 1
- 添加了 *应用*、*器件信息* 表、*引脚功能* 表、*处理等级* 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
- 更新了 *特性* 中的 I_{off} 1

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5 Pin Configuration and Functions

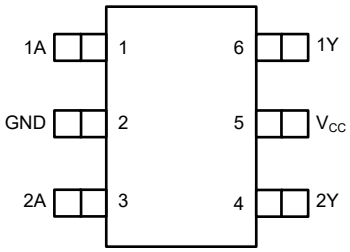


图 5-1. DCK Package 6-Pin SC70 Top View

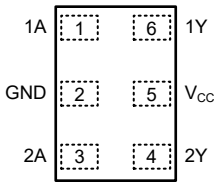


图 5-2. DRY Package 6-Pin SON Transparent Top View

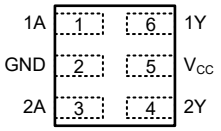


图 5-3. DSF Package 6-Pin SON Transparent Top View

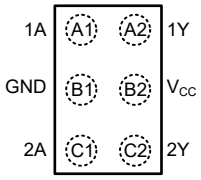


图 5-4. YFP Package 6-Pin DSBGA Transparent Top View

See the mechanical drawings for dimensions.

表 5-1. Pin Functions

PIN			TYPE (1)	DESCRIPTION
NAME	DCK, DSF, DRY, YFP	(BGA) YFP		
1A	1	A1	I	Input 1
1Y	6	A2	O	Output 1
2A	3	C1	I	Input 2
2Y	4	C2	O	Output 2
GND	2	B1	P	Ground
V_{CC}	5	B2	P	Power Pin

(1) I = Input, O = Output, P = Power

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6 Specifications

6.1 Absolute Maximum Ratings

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

			MIN	MAX	UNIT
V_{CC}	Supply voltage range		– 0.5	4.6	V
V_I	Input voltage range(1)		– 0.5	4.6	V
V_O	Voltage range applied to any output in the high-impedance or power-off state(1)		– 0.5	4.6	V
V_O	Output voltage range in the low state(1)		– 0.5	4.6	V
I_{IK}	Input clamp current	V_I < 0		– 50	mA
I_{OK}	Output clamp current	V_O < 0		– 50	mA
I_O	Continuous output current			±20	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) The input negative-voltage and output voltage ratings may be exceeded if the input and output current ratings are observed.

6.2 ESD Ratings

			VALUE	UNIT
$V_{(ESD)}$	Electrostatic discharge	Human-body model (HBM), per ANSI/ESDA/JEDEC JS-001(1)	±4500	V
		Charged-device model (CDM), per JEDEC specification JESD22-C101(2)	±1500	

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process. Manufacturing with less than 500-V HBM is possible with the necessary precautions.
(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process. Manufacturing with less than 250-V CDM is possible with the necessary precautions.

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6.3 Recommended Operating Conditions

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

			MIN	MAX	UNIT
V_{CC}	Supply voltage		0.8	3.6	V
V_{IH}	High-level input voltage	V_{CC} = 0.8 V	V_{CC}		V
		V_{CC} = 1.1 V to 1.95 V	0.65 × V_{CC}		
		V_{CC} = 2.3 V to 2.7 V	1.6		
		V_{CC} = 3 V to 3.6 V	2		
V_{IL}	Low-level input voltage	V_{CC} = 0.8 V		0	V
		V_{CC} = 1.1 V to 1.95 V		0.35 × V_{CC}	
		V_{CC} = 2.3 V to 2.7 V		0.7	
		V_{CC} = 3 V to 3.6 V		0.9	
V_I	Input voltage		0	3.6	V
V_O	Output voltage		0	3.6	V
I_{OL}	Low-level output current	V_{CC} = 0.8 V		20	μA
		V_{CC} = 1.1 V		1.1	mA
		V_{CC} = 1.4 V		1.7	
		V_{CC} = 1.65 V		1.9	
		V_{CC} = 2.3 V		3.1	
		V_{CC} = 3 V		4	
$\Delta t/\Delta v$	Input transition rise or fall rate	V_{CC} = 0.8 V to 3.6 V		200	ns/V
T_A	Operating free-air temperature		−40	85	°C

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

6.4 Thermal Information

THERMAL METRIC(1)		YFP	DCK	DRY	DSF	UNIT
		6 PINS	6 PINS	6 PINS	6 PINS	
$R_{\theta JA}$	Junction-to-ambient thermal resistance	125.4	302.4	338.0	372.5	°C/W
$R_{\theta JC(top)}$	Junction-to-case (top) thermal resistance	1.9	219.5	228.9	179.9	°C/W
$R_{\theta JB}$	Junction-to-board thermal resistance	37.2	106.7	203.5	231.2	°C/W
Ψ_{JT}	Junction-to-top characterization parameter	0.5	84.2	62.4	28.6	°C/W
Ψ_{JB}	Junction-to-board characterization parameter	37.5	106.0	203.6	230.9	°C/W
$R_{\theta JC(bot)}$	Junction-to-case (bottom) thermal resistance	N/A	N/A	N/A	N/A	°C/W

(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			T_A = – 40°C to 85°C		UNIT
				MIN	TYP	MAX	MIN	MAX	
V_{OL}		I_{OL} = 20 μA	0.8 V to 3.6 V			0.1		0.1	V
		I_{OL} = 1.1 mA	1.1 V			0.3 × V_{CC}		0.3 × V_{CC}	
		I_{OL} = 1.7 mA	1.4 V			0.31		0.37	
		I_{OL} = 1.9 mA	1.65 V			0.31		0.35	
		I_{OL} = 2.3 mA	2.3 V			0.31		0.33	
		I_{OL} = 3.1 mA				0.44		0.45	
		I_{OL} = 2.7 mA	3 V			0.31		0.33	
		I_{OL} = 4 mA				0.44		0.45	
I_I	A or B input	V_I = GND to 3.6 V	0 V to 3.6 V			0.1		0.5	μA
I_{off}		V_I or V_O = 0 V to 3.6 V	0 V			0.2		0.6	μA
ΔI_{off}		V_I or V_O = 0 V to 3.6 V	0 V to 0.2 V			0.2		0.6	μA
I_{CC}		V_I = GND or (V_{CC} to 3.6 V), I_O = 0	0.8 V to 3.6 V			0.5		0.9	μA
ΔI_{CC}		V_I = V_{CC} – 0.6 V(1), I_O = 0	3.3 V			40		50	μA
C_i		V_I = V_{CC} or GND	0 V		1.5				pF
			3.6 V		1.5				
C_o		V_O = GND	0 V		3				pF

(1) One input at V_{CC} – 0.6 V, other input at V_{CC} or GND.

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6.6 Switching Characteristics, C_L = 5 pF

over recommended operating free-air temperature range (unless otherwise noted) (see 图 7-1 and 图 7-2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC}	T_A = 25°C			T_A = –40°C to 85°C		UNIT
				MIN	TYP	MAX	MIN	MAX	
t_{pd}	A	Y	0.8 V		12.2				ns
			1.2 V ± 0.1 V	3.4	5.1	7.5	1.5	14.7	
			1.5 V ± 0.1 V	2.3	3.6	5.1	1.3	8.3	
			1.8 V ± 0.15 V	2.4	3.1	4	1	6.3	
			2.5 V ± 0.2 V	1.5	2.1	2.9	0.9	4.1	
			3.3 V ± 0.3 V	1.8	2.2	2.8	1.1	3.3	

6.7 Switching Characteristics, C_L = 10 pF

over recommended operating free-air temperature range (unless otherwise noted) (see 图 7-1 and 图 7-2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC}	T_A = 25°C			T_A = –40°C to 85°C		UNIT
				MIN	TYP	MAX	MIN	MAX	
t_{pd}	A	Y	0.8 V		15				ns
			1.2 V ± 0.1 V	4	6.2	9	2.4	16.2	
			1.5 V ± 0.1 V	3.1	4.4	6.1	2	9.4	
			1.8 V ± 0.15 V	3.3	3.9	4.8	1.6	7.1	
			2.5 V ± 0.2 V	2.1	2.8	3.5	1.3	4.8	
			3.3 V ± 0.3 V	2.3	3	4	1.4	4.5	

6.8 Switching Characteristics, C_L = 15 pF

over recommended operating free-air temperature range (unless otherwise noted) (see 图 7-1 and 图 7-2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC}	T_A = 25°C			T_A = –40°C to 85°C		UNIT
				MIN	TYP	MAX	MIN	MAX	
t_{pd}	A	Y	0.8 V		18.2				ns
			1.2 V ± 0.1 V	4.9	7.3	10.4	3.2	17.6	
			1.5 V ± 0.1 V	3.8	5.2	6.8	2.6	10.2	
			1.8 V ± 0.15 V	3.4	4.8	6.7	2.2	7.9	
			2.5 V ± 0.2 V	2.4	3.4	4.5	1.9	5.3	
			3.3 V ± 0.3 V	2.2	3.7	5.4	1.8	6.1	

6.9 Switching Characteristics, C_L = 30 pF

over recommended operating free-air temperature range (unless otherwise noted) (see 图 7-1 and 图 7-2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC}	T_A = 25°C			T_A = –40°C to 85°C		UNIT
				MIN	TYP	MAX	MIN	MAX	
t_{pd}	A	Y	0.8 V		26.5				ns
			1.2 V ± 0.1 V	8.1	10.7	14.4	4.5	21.9	
			1.5 V ± 0.1 V	6.5	7.7	9.4	3.8	13	
			1.8 V ± 0.15 V	5.8	7.5	9.7	3.2	11	
			2.5 V ± 0.2 V	4.5	5.4	6.7	3	7.1	
			3.3 V ± 0.3 V	3.9	6.3	9.7	2.8	10.4	

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6.10 Operating Characteristics

T_A = 25°C

PARAMETER		TEST CONDITIONS	V_{CC}	TYP	UNIT
C_{pd}	Power dissipation capacitance	f = 10 MHz	0.8 V	4	pF
			1.2 V ± 0.1 V	4	
			1.5 V ± 0.1 V	4	
			1.8 V ± 0.15 V	4	
			2.5 V ± 0.2 V	4.1	
			3.3 V ± 0.3 V	4.3	

6.11 Typical Characteristics

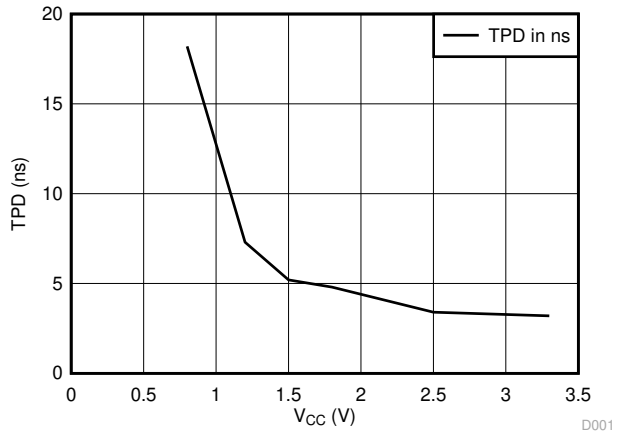


图 6-1. TPD vs V_{CC}

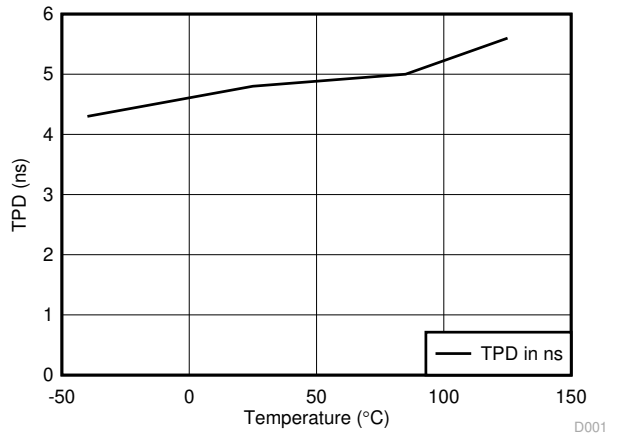
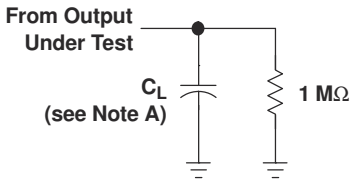


图 6-2. TPD vs Temperature

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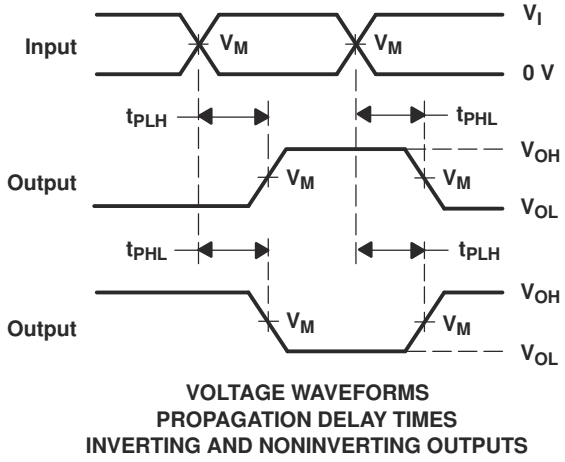
7 Parameter Measurement Information

7.1 Propagation Delays, Setup and Hold Times, and Pulse Duration

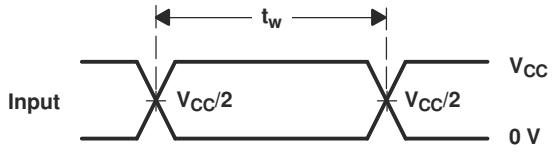


LOAD CIRCUIT

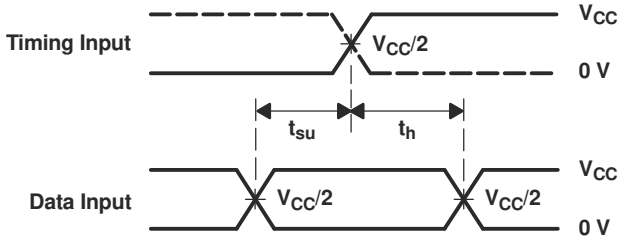
	V_{CC} = 0.8 V	V_{CC} = 1.2 V ± 0.1 V	V_{CC} = 1.5 V ± 0.1 V	V_{CC} = 1.8 V ± 0.15 V	V_{CC} = 2.5 V ± 0.2 V	V_{CC} = 3.3 V ± 0.3 V
C_L	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF
V_M	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$
V_I	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}



VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES
INVERTING AND NONINVERTING OUTPUTS



VOLTAGE WAVEFORMS
PULSE DURATION



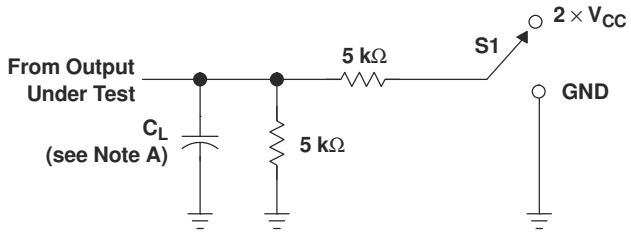
VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES

NOTES: A. C_L includes probe and jig capacitance.
B. All input pulses are supplied by generators having the following characteristics: PRR ≤ 10 MHz, Z_O = 50 Ω, t_r/t_f = 3 ns.
C. The outputs are measured one at a time, with one transition per measurement.
D. t_{PLH} and t_{PHL} are the same as t_{pd}.
E. All parameters and waveforms are not applicable to all devices.

图 7-1. Load Circuit and Voltage Waveforms

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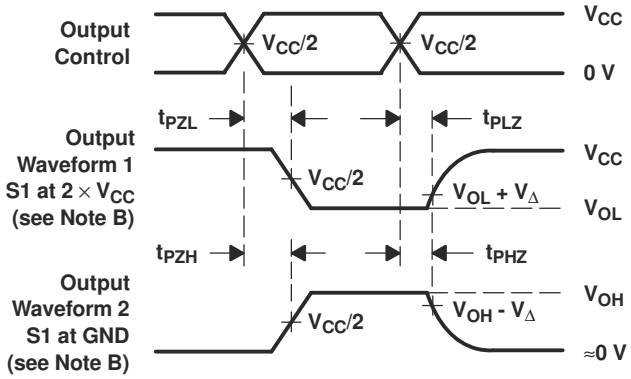
7.2 Enable and Disable Times



TEST	S1
t_{PLZ}/t_{PZL} t_{PHZ}/t_{PZH}	2 × V_{CC} GND

LOAD CIRCUIT

	V_{CC} = 0.8 V	V_{CC} = 1.2 V ± 0.1 V	V_{CC} = 1.5 V ± 0.1 V	V_{CC} = 1.8 V ± 0.15 V	V_{CC} = 2.5 V ± 0.2 V	V_{CC} = 3.3 V ± 0.3 V
C_L	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF
V_M	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$
V_I	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}
V_Δ	0.1 V	0.1 V	0.1 V	0.15 V	0.15 V	0.3 V



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 ≤ 10 MHz, Z_O = 50 Ω, t_r/t_f = 3 ns.
D. The outputs are measured one at a time, with one 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. All parameters and waveforms are not applicable to all devices.

图 7-2. Load Circuit and Voltage Waveforms

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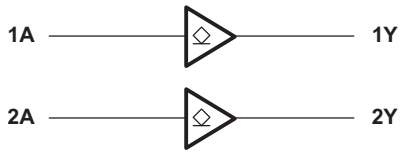
8 Detailed Description

8.1 Overview

The SN74AUP2G07 device is a dual buffer gate with open-drain outputs that operate from 0.8 V to 3.6 V. The output of this dual buffer/driver is open-drain, and can be connected to other open-drain outputs to implement active-low wired-OR or active-high wired-AND functions.

This device is fully specified for partial-power-down applications using I_{off}. The I_{off} circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.The I_{off} feature also allows for live insertion.

8.2 Functional Block Diagram



8.3 Feature Description

- Wide operating V_{CC} range of 0.8 V to 3.6 V
- 3.6-V I/O tolerant to support down translation
- Input hysteresis allows slow input transition and better switching noise immunity at the input
- I_{off} feature allows voltages on the inputs and outputs when V_{CC} is 0 V
- Low noise due to slower edge rates

8.4 Device Functional Modes

表 8-1 is the function table for SN74AUP2G07.

表 8-1. Function Table

INPUT(1) A	OUTPUT(2) Y
H	Z
L	L

(1) L = Input low, H = Input high
(2) L = Output low, Z = High impedance

9 Application and Implementation

Note

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

The AUP family is TI's premier solution to the industry’ s low-power needs in battery-powered portable applications. This family ensures very low static and dynamic power consumption across the entire V_{CC} range of 0.8 V to 3.6 V, resulting in increased battery life. This product also maintains excellent signal integrity. It has a small amount of hysteresis built in, allowing for slower or noisy input signals. The lowered drive produces slower edges and prevents overshoot and undershoot on the outputs.

9.2 Typical Application

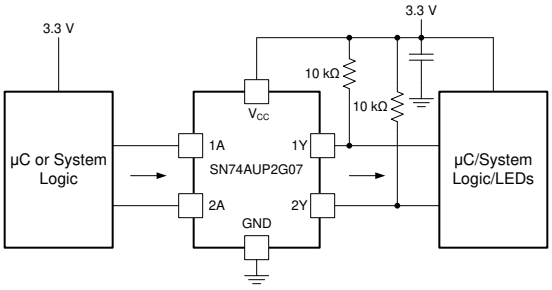


图 9-1. Typical Application Schematic

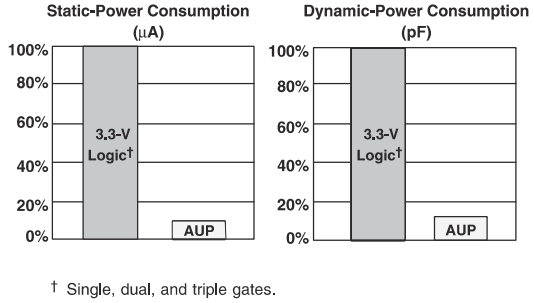
9.2.1 Design Requirements

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.

9.2.2 Detailed Design Procedure

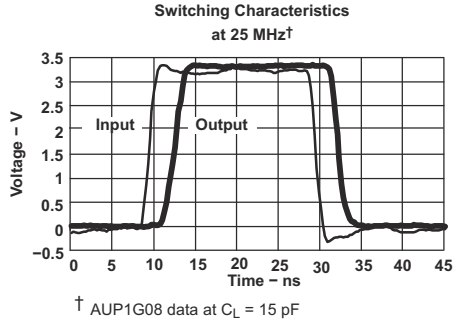
1. Recommended Input Conditions:
   - For rise time and fall time specifications, see Δt/ΔV in the 节 6.3 table.
   - For specified high and low levels. See V_{IH} and V_{IL} in the 节 6.3 table.
   - Inputs are overvoltage tolerant allowing them to go as high as 3.6 V at any valid V_{CC}.
2. Recommend Output Conditions:
   - Load currents should not exceed 20 mA on the output and 50 mA total for the part.

9.2.3 Application Curves



† Single, dual, and triple gates.

图 9-2. AUP – The Lowest-Power Family



† AUP1G08 data at C_L = 15 pF

图 9-3. Excellent Signal Integrity

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The AUP family of single gate logic makes excellent translators for the new lower voltage microprocessors that typically are powered from 0.8 V to 1.2 V. They can drop the voltage of peripheral drivers and accessories that are still powered by 3.3 V to the new uC power levels.

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, then 0.01 μF or 0.022 μF is recommended for each power pin. It is acceptable to parallel multiple bypass capacitors to reject different frequencies of noise. A 0.1 μF and a 1 μF are commonly used in parallel. The bypass capacitor should be installed as close to the power pin as possible for best results.

11 Layout

11.1 Layout Guidelines

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 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. 图 11-1 specifies 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 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 output section of the part when asserted. This will not disable the input section of the I/Os, so they cannot float when disabled.

11.2 Layout Example

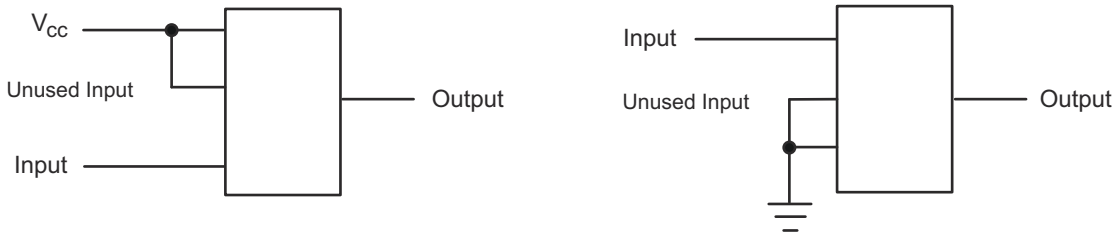


图 11-1. Layout Diagram

12 Device and Documentation Support

12.1 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。

12.2 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》。

12.3 Trademarks

TI E2E™ is a trademark of Texas Instruments.
所有商标均为其各自所有者的财产。

12.4 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.

12.5 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 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)
SN74AUP2G07DCKR	Active	Production	SC70 (DCK) | 6	3000 | LARGE T&R	Yes	NIPDAU | SN	Level-1-260C-UNLIM	-40 to 85	(H55, H5F)
SN74AUP2G07DCKR.B	Active	Production	SC70 (DCK) | 6	3000 | LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-40 to 85	(H55, H5F)
SN74AUP2G07DRYR	Active	Production	SON (DRY) | 6	5000 | LARGE T&R	Yes	NIPDAU | NIPDAUAG	Level-1-260C-UNLIM	-40 to 85	H5
SN74AUP2G07DRYR.B	Active	Production	SON (DRY) | 6	5000 | LARGE T&R	Yes	NIPDAUAG	Level-1-260C-UNLIM	-40 to 85	H5
SN74AUP2G07DSFR	Active	Production	SON (DSF) | 6	5000 | LARGE T&R	Yes	NIPDAU | NIPDAUAG	Level-1-260C-UNLIM	-40 to 85	H5
SN74AUP2G07DSFR.B	Active	Production	SON (DSF) | 6	5000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	H5
SN74AUP2G07DSFRG4	Active	Production	SON (DSF) | 6	5000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	H5
SN74AUP2G07DSFRG4.B	Active	Production	SON (DSF) | 6	5000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	H5
SN74AUP2G07YFPR	Active	Production	DSBGA (YFP) | 6	3000 | LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 85	HVN
SN74AUP2G07YFPR.B	Active	Production	DSBGA (YFP) | 6	3000 | LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 85	HVN

(1) **Status:** For more details on status, see our product life cycle.

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

(4) **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

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

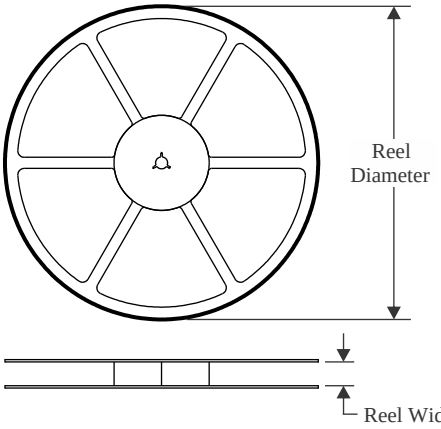
Important Information and Disclaimer: The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative

and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

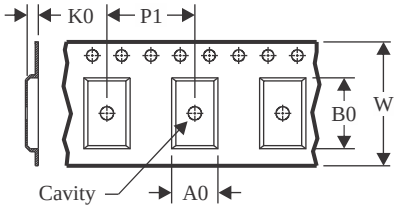
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

TAPE AND REEL INFORMATION

REEL DIMENSIONS

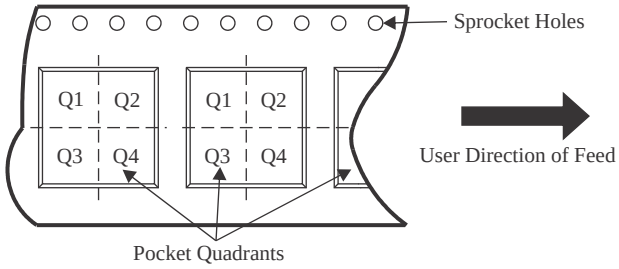


TAPE DIMENSIONS



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

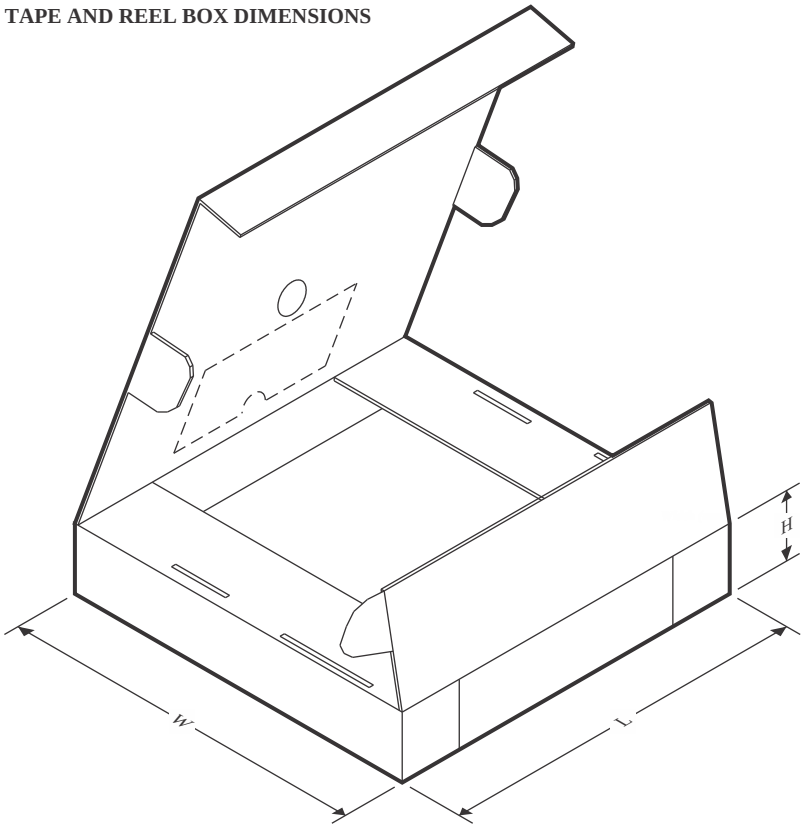
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*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
SN74AUP2G07DCKR	SC70	DCK	6	3000	178.0	8.4	2.25	2.45	1.2	4.0	8.0	Q3
SN74AUP2G07DCKR	SC70	DCK	6	3000	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74AUP2G07DCKR	SC70	DCK	6	3000	180.0	8.4	2.3	2.55	1.2	4.0	8.0	Q3
SN74AUP2G07DCKR	SC70	DCK	6	3000	178.0	9.0	2.4	2.5	1.2	4.0	8.0	Q3
SN74AUP2G07DRYR	SON	DRY	6	5000	180.0	8.4	1.25	1.6	0.7	4.0	8.0	Q1
SN74AUP2G07DRYR	SON	DRY	6	5000	180.0	9.5	1.15	1.6	0.75	4.0	8.0	Q1
SN74AUP2G07DSFR	SON	DSF	6	5000	180.0	8.4	1.16	1.16	0.5	4.0	8.0	Q2
SN74AUP2G07DSFR	SON	DSF	6	5000	180.0	8.4	1.16	1.16	0.63	4.0	8.0	Q2
SN74AUP2G07DSFR	SON	DSF	6	5000	180.0	9.5	1.16	1.16	0.5	4.0	8.0	Q2
SN74AUP2G07DSFRG4	SON	DSF	6	5000	180.0	9.5	1.16	1.16	0.5	4.0	8.0	Q2
SN74AUP2G07YFPR	DSBGA	YFP	6	3000	178.0	9.2	0.89	1.29	0.62	4.0	8.0	Q1

TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

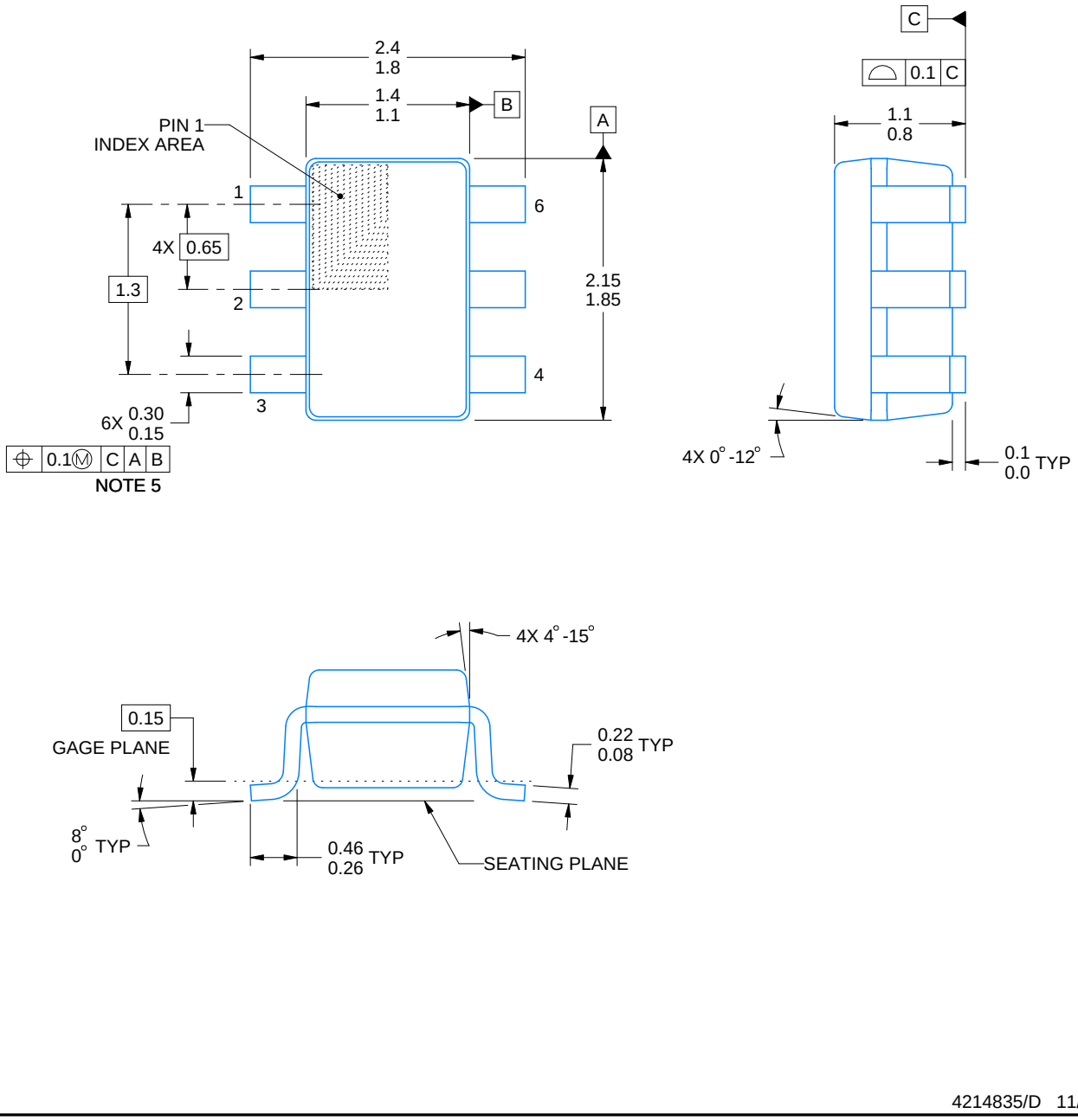
Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74AUP2G07DCKR	SC70	DCK	6	3000	208.0	191.0	35.0
SN74AUP2G07DCKR	SC70	DCK	6	3000	180.0	180.0	18.0
SN74AUP2G07DCKR	SC70	DCK	6	3000	210.0	185.0	35.0
SN74AUP2G07DCKR	SC70	DCK	6	3000	180.0	180.0	18.0
SN74AUP2G07DRYR	SON	DRY	6	5000	202.0	201.0	28.0
SN74AUP2G07DRYR	SON	DRY	6	5000	184.0	184.0	19.0
SN74AUP2G07DSFR	SON	DSF	6	5000	210.0	185.0	35.0
SN74AUP2G07DSFR	SON	DSF	6	5000	202.0	201.0	28.0
SN74AUP2G07DSFR	SON	DSF	6	5000	184.0	184.0	19.0
SN74AUP2G07DSFRG4	SON	DSF	6	5000	184.0	184.0	19.0
SN74AUP2G07YFPR	DSBGA	YFP	6	3000	220.0	220.0	35.0

PACKAGE OUTLINE

DCK0006A

SOT - 1.1 max height

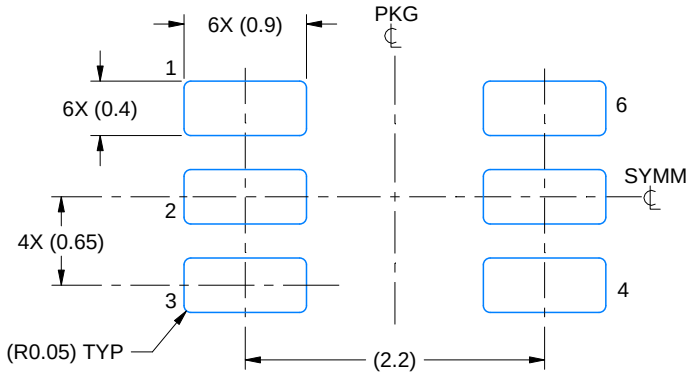
SMALL OUTLINE TRANSISTOR



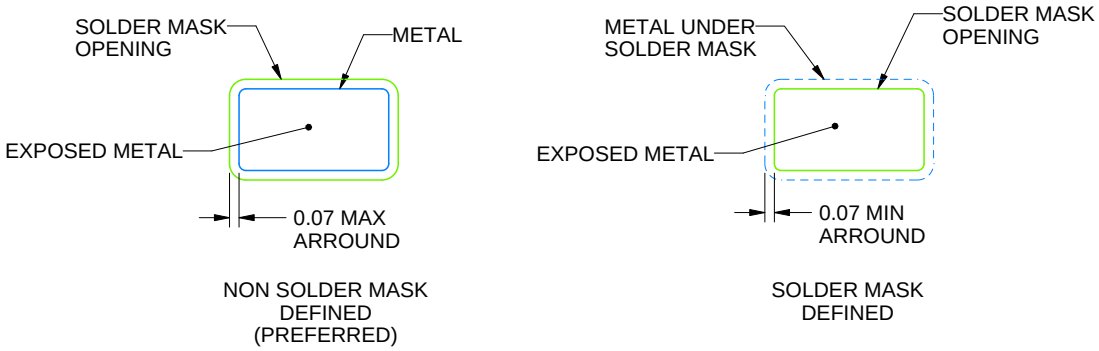
4214835/D 11/2024

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. Body dimensions do not include mold flash or protrusion. Mold flash and protrusion shall not exceed 0.15 per side.
4. Falls within JEDEC MO-203 variation AB.



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE:18X

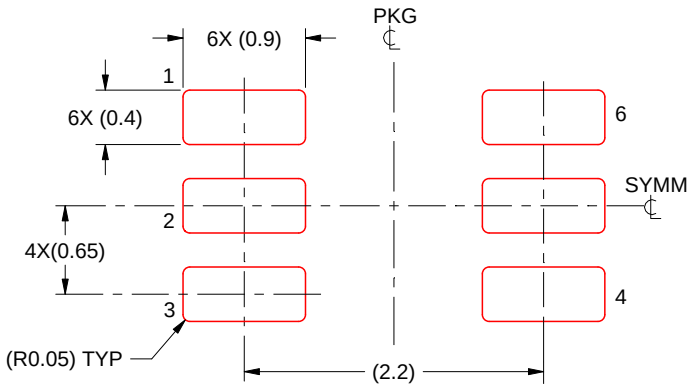


SOLDER MASK DETAILS

4214835/D 11/2024

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 THICK STENCIL
SCALE:18X

4214835/D 11/2024

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.

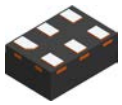
DRY 6 USON - 0.6 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



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

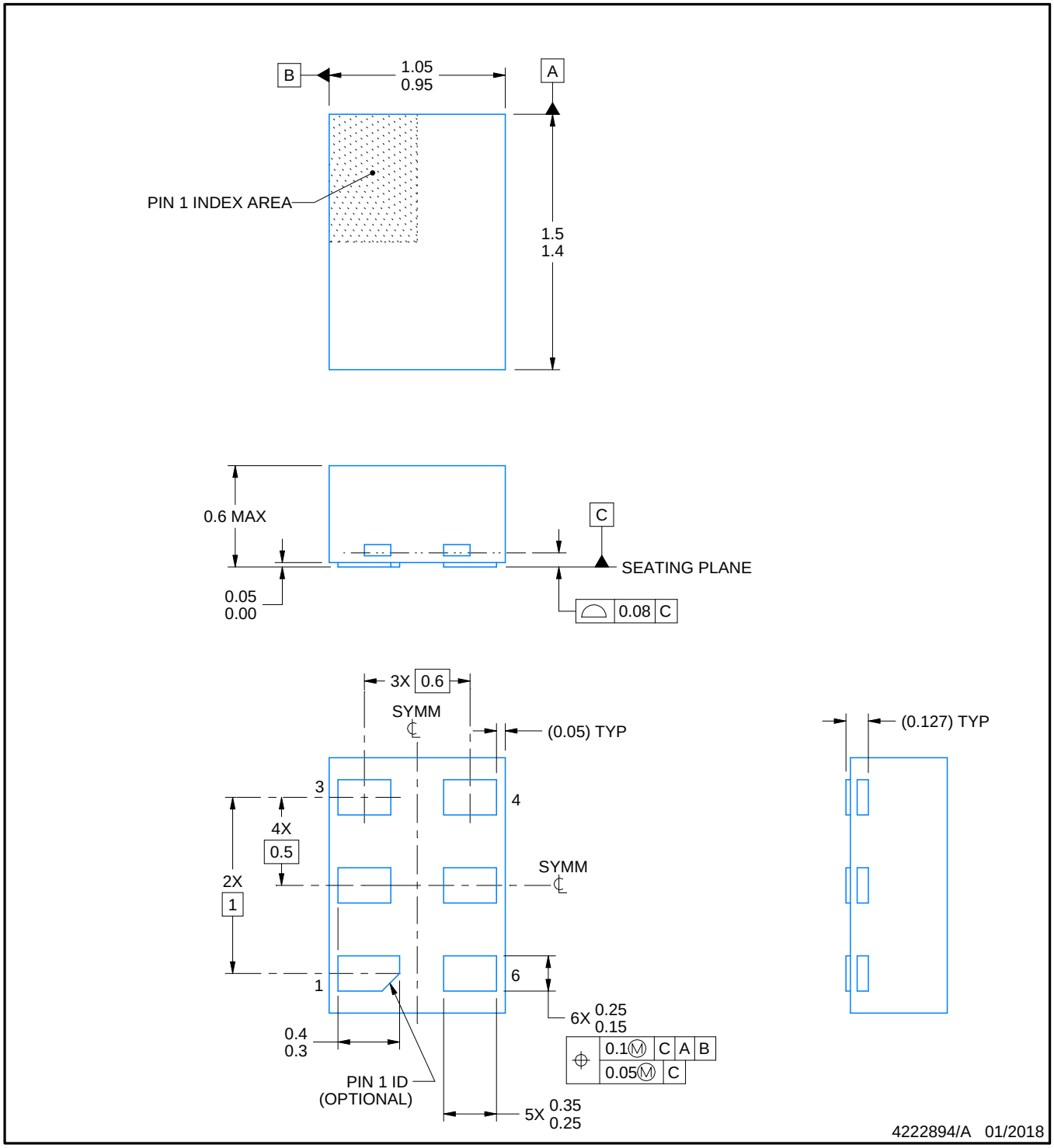
DRY0006A



PACKAGE OUTLINE

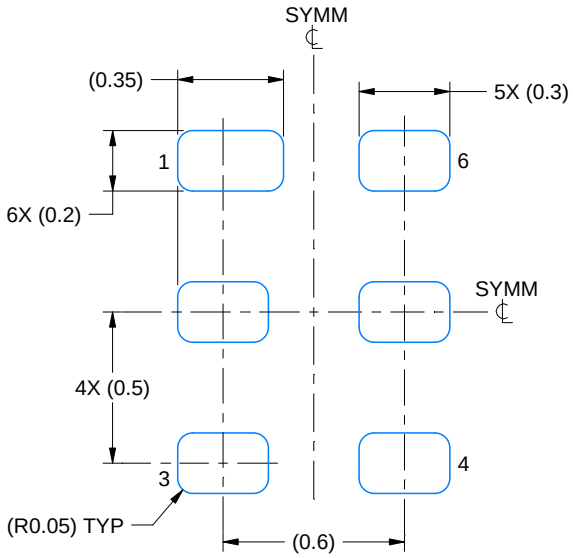
USON - 0.6 mm max height

PLASTIC SMALL OUTLINE - NO LEAD

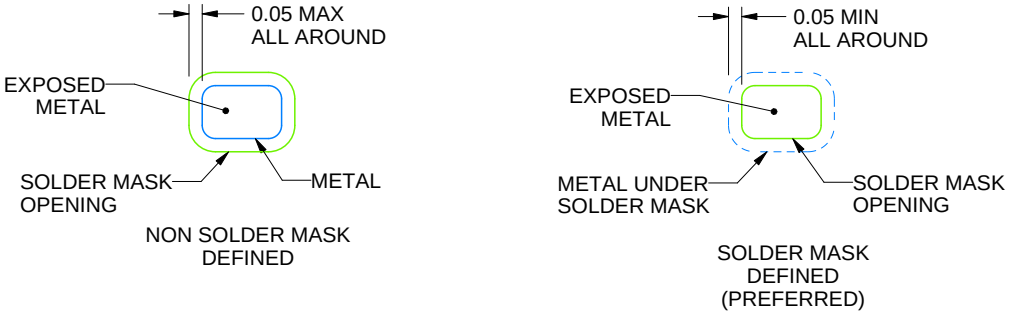


NOTES:

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.



LAND PATTERN EXAMPLE
1:1 RATIO WITH PKG SOLDER PADS
EXPOSED METAL SHOWN
SCALE:40X



SOLDER MASK DETAILS

4222894/A 01/2018

NOTES: (continued)

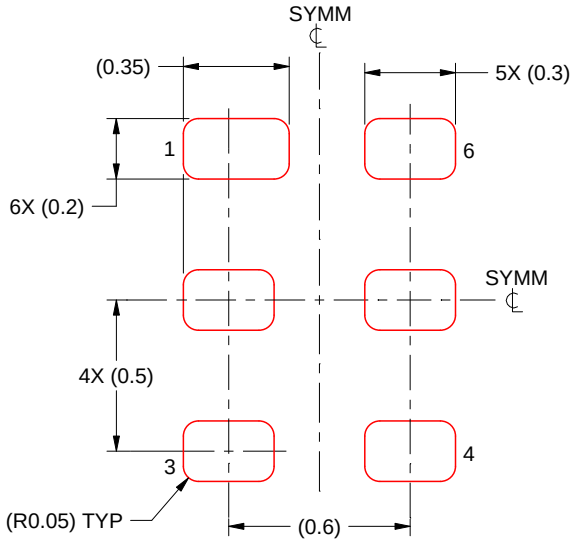
3. For more information, see QFN/SON PCB application report in literature No. SLUA271 (www.ti.com/lit/slua271).

EXAMPLE STENCIL DESIGN

DRY0006A

USON - 0.6 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



SOLDER PASTE EXAMPLE
BASED ON 0.075 - 0.1 mm THICK STENCIL
SCALE:40X

4222894/A 01/2018

NOTES: (continued)

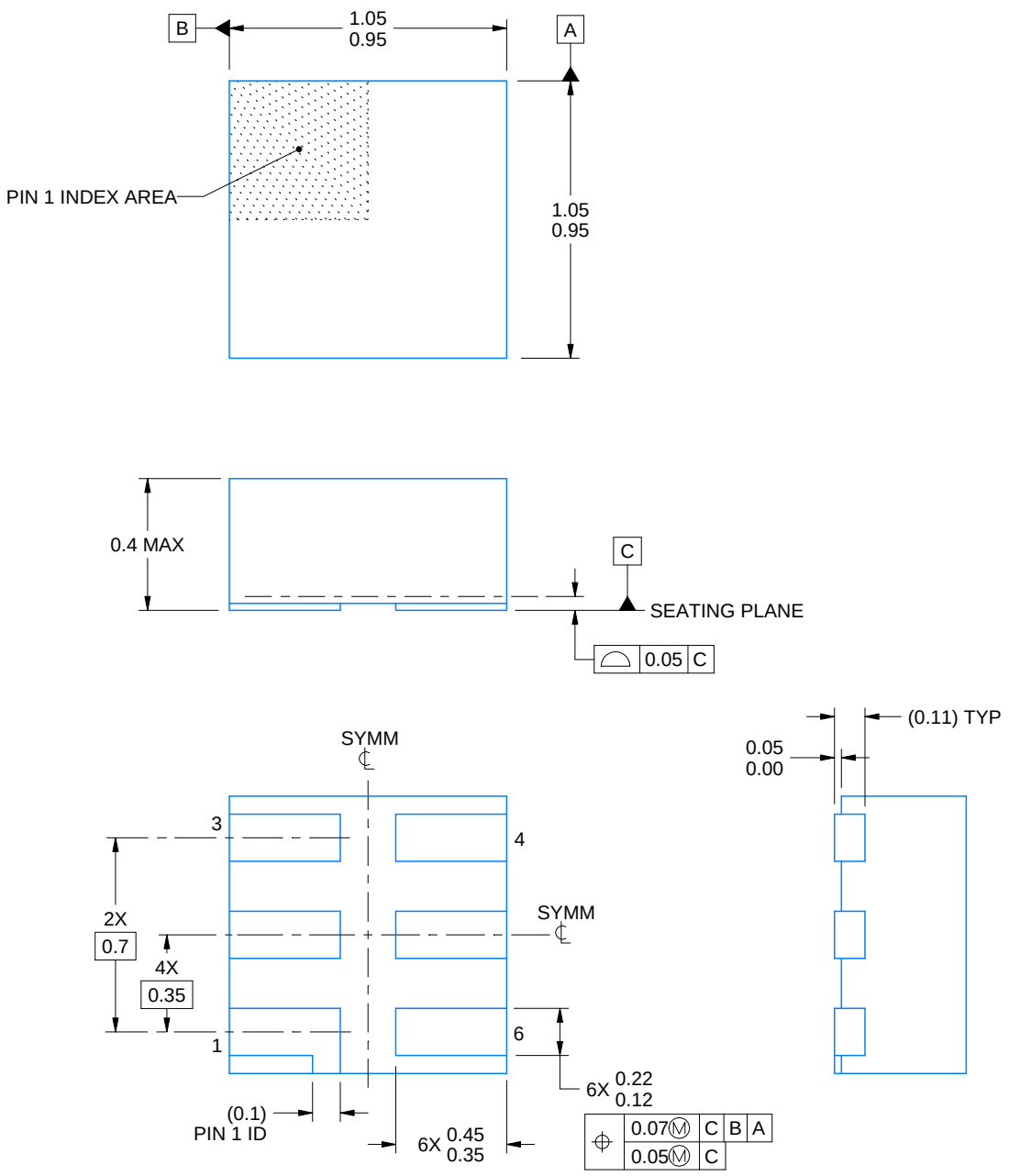
4. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.

PACKAGE OUTLINE

DSF0006A

X2SON - 0.4 mm max height

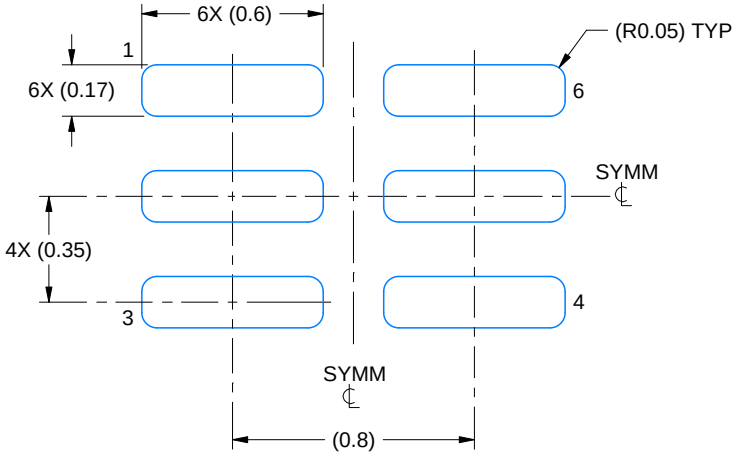
PLASTIC SMALL OUTLINE - NO LEAD



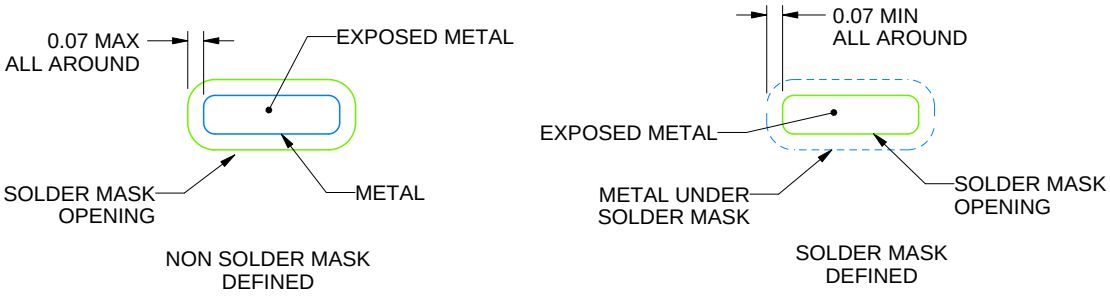
4220597/B 06/2022

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. Reference JEDEC registration MO-287, variation X2AAF.



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE:40X



SOLDER MASK DETAILS

4220597/B 06/2022

NOTES: (continued)

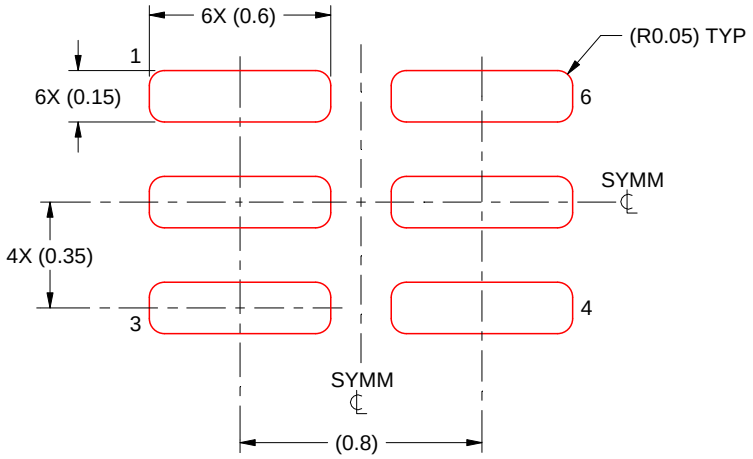
4. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slua271).

EXAMPLE STENCIL DESIGN

DSF0006A

X2SON - 0.4 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



SOLDER PASTE EXAMPLE
BASED ON 0.09 mm THICK STENCIL

PRINTED SOLDER COVERAGE BY AREA UNDER PACKAGE
SCALE:40X

4220597/B 06/2022

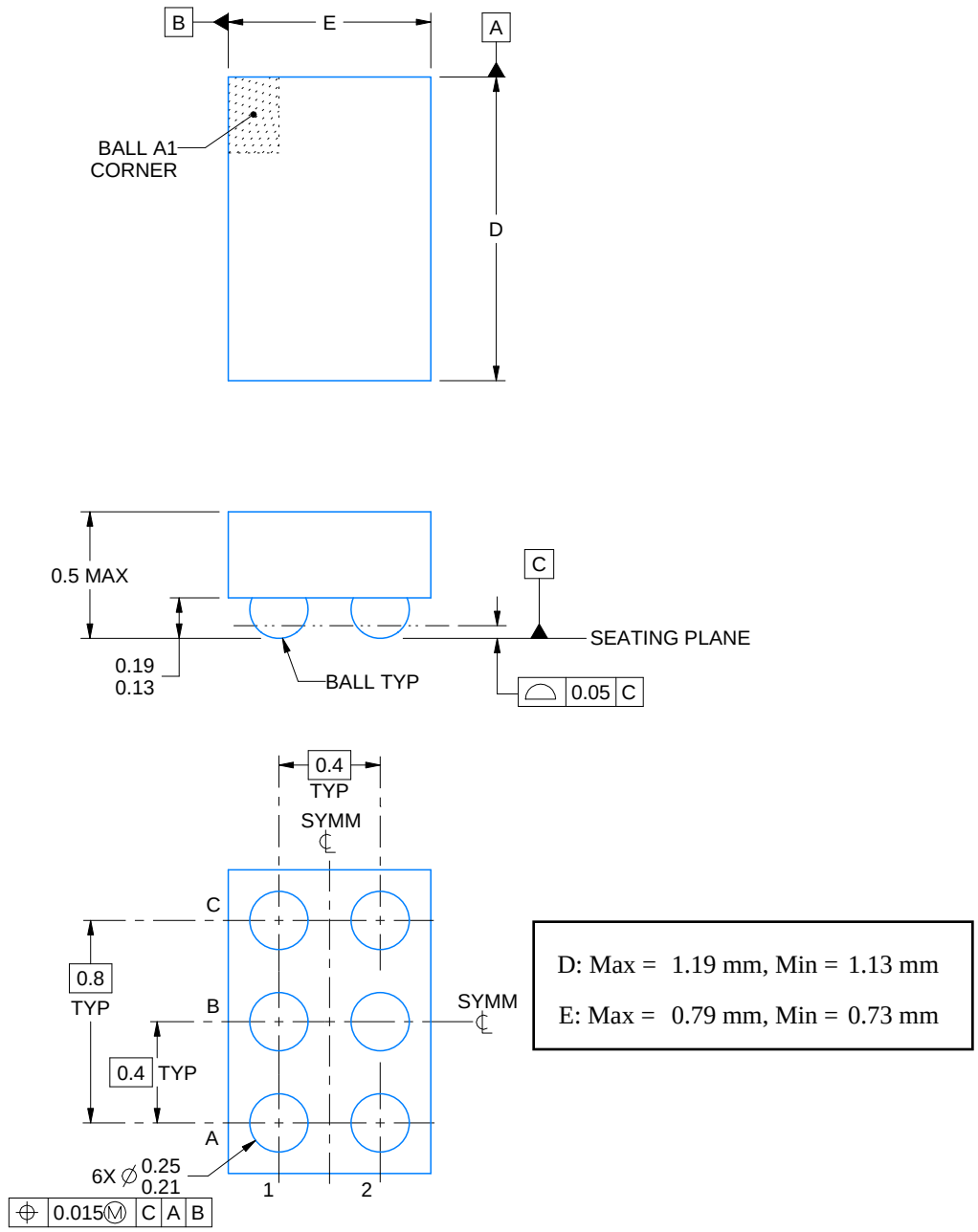
4. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.

PACKAGE OUTLINE

YFP0006

DSBGA - 0.5 mm max height

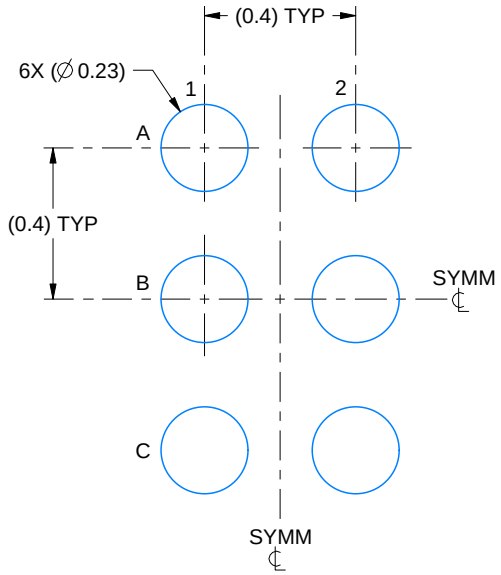
DIE SIZE BALL GRID ARRAY



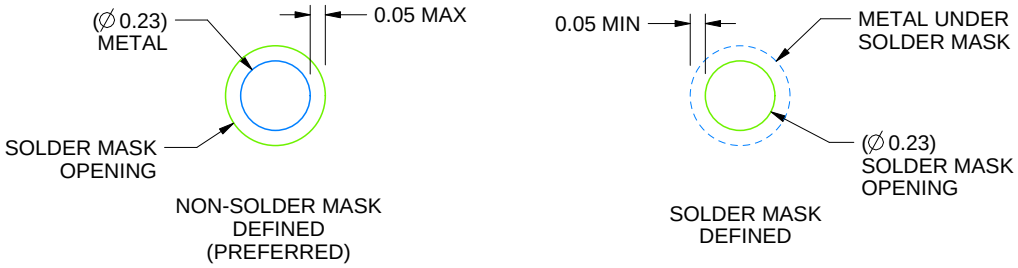
4223410/A 11/2016

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.



LAND PATTERN EXAMPLE
SCALE:50X

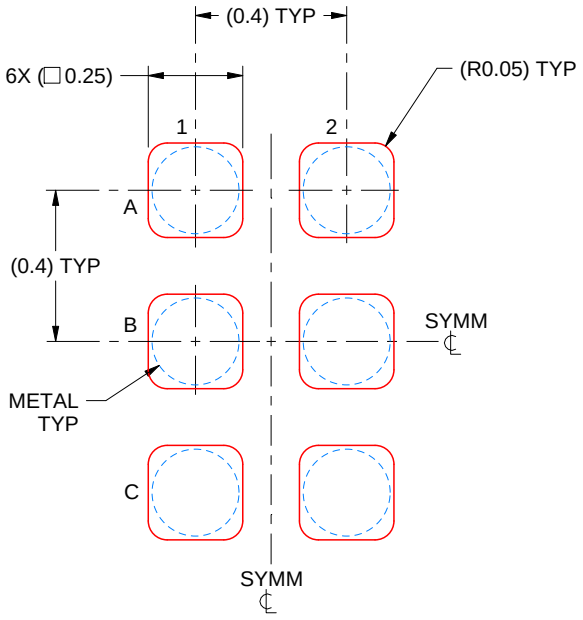


SOLDER MASK DETAILS
NOT TO SCALE

4223410/A 11/2016

NOTES: (continued)

3. Final dimensions may vary due to manufacturing tolerance considerations and also routing constraints.
   For more information, see Texas Instruments literature number SNVA009 (www.ti.com/lit/snva009).



SOLDER PASTE EXAMPLE
BASED ON 0.1 mm THICK STENCIL
SCALE:50X

4223410/A 11/2016

NOTES: (continued)

4. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release.

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