SN74LVC1G17 单路施密特触发缓冲器

1 特性

- 采用具有 0.5mm 间距的超小型 0.64mm^2 封装 (DPW)
- 支持 5V V_{CC} 运行
- 输入电压高达 5.5V
- 电压为 3.3V 时，t_{pd} 最大值为 4.6ns
- 低功耗，I_{CC} 最大值为 10 µA
- 电压为 3.3V 时，输出驱动为 ±24mA
- I_{off} 支持带电插入、局部关断模式以及后驱动保护
- 闩锁性能超出 JESD 78 II 类规范要求的 100mA
- 静电放电 (ESD) 保护性能超过 JESD 22 规范的要求
  - 2000V 人体放电模型 (A114-A)
  - 200V 机器模型 (A115-A)
  - 1000V 充电器件模型 (C101)

2 应用

- AV 接收器
- 音频接口盒：便携式
- 蓝光播放器与家庭影院
- MP3 播放器/录音机
- 个人数字助理 (PDA)
- 电源：电信/服务器交流/直流电源：单控制器：模拟和数字
- 固态硬盘 (SSD): 客户端和企业级
- 电视：LCD 电视/数字电视和高清电视 (HDTV)
- 平板电脑：企业
- 视频分析：服务器
- 无线耳机、键盘和鼠标

3 说明

这款单路施密特触发缓冲器专为 1.65V 至 5.5V V_{CC} 运行而设计。

SN74LVC1G17 器件包含一个缓冲器，并执行布尔函数 Y = A。

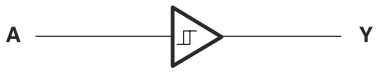
CMOS 器件具有高输出驱动，同时在宽 Vcc 工作范围内保持低静态功率耗散。

SN74LVC1G17 采用多种封装，包括外形尺寸为 0.8mm × 0.8mm 的超小型 DPW 封装。

器件信息

器件名称	封装(1)	封装尺寸
SN74LVC1G17	SOT-23 (5)	2.9mm × 1.6mm
	SC70 (5)	2.0mm × 1.25mm
	X2SON (4)	0.8mm × 0.8mm
	SON (6)	1.45mm × 1.0mm
	SON (6)	1.0mm × 1.0mm

(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。



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。

Table of Contents

1 特性 1
2 应用 1
3 说明 1
4 Revision History 2
5 Pin Configuration and Functions 3
6 Specifications 4
6.1 Absolute Maximum Ratings 4
6.2 Handling Ratings 4
6.3 Recommended Operating Conditions 5
6.4 Thermal Information 5
6.5 Electrical Characteristics—DC Limit Changes 6
6.6 Switching Characteristics, C_L = 15 pF 7
6.7 Switching Characteristics AC Limit, –40°C TO 85°C 7
6.8 Switching Characteristics AC Limit, –40°C TO 125°C 7
6.9 Operating Characteristics 7
6.10 Typical Characteristics 7
7 Parameter Measurement Information 8
8 Detailed Description 10
8.1 Overview 10
8.2 Functional Block Diagram 10
8.3 Feature Description 10
8.4 Device Functional Modes 10
9 Applications and Implementation 11
9.1 Application Information 11
9.2 Typical Application 11
10 Power Supply Recommendations 12
11 Layout 13
11.1 Layout Guidelines 13
11.2 Layout Example 13
12 Device and Documentation Support 14
12.1 Trademarks 14
12.2 Electrostatic Discharge Caution 14
12.3 Glossary 14
13 Mechanical, Packaging, and Orderable Information 14

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 V (April 2014) to Revision W (September 2020)	Page
• 更新了整个文档的表、图和交叉参考的编号格式	1
• Corrected part number from SN74LVC1G14 to SN74LVC1G17 in the *Application Information*section	11
• Corrected typical application schematic in *Typical Application* section	11

Changes from Revision U (February 2014) to Revision V (April 2014)	Page
• Added Pin Functions table.	3
• Added Handling Ratings table.	4
• Added Thermal Information table.	5
• Added Typical Characteristics.	7
• Added Application and Implementation section.	11
• Added Power Supply Recommendations section.	12
• Added Layout section.	13

Changes from Revision T (November 2012) to Revision U (February 2014)	Page
• 添加了“应用”	1
• Moved T_{stg} to Handling Ratings table	4
• Changed MAX operating free-air temperature from 85°C to 125°C	5
• Added –40°C to 125°C to Electrical Characteristics table	6
• Added Switching Characteristics table for –40°C to 125°C temperature range	7

Changes from Revision S (June 2011) to Revision T (November 2012)	Page
• Removed Ordering Information table	3

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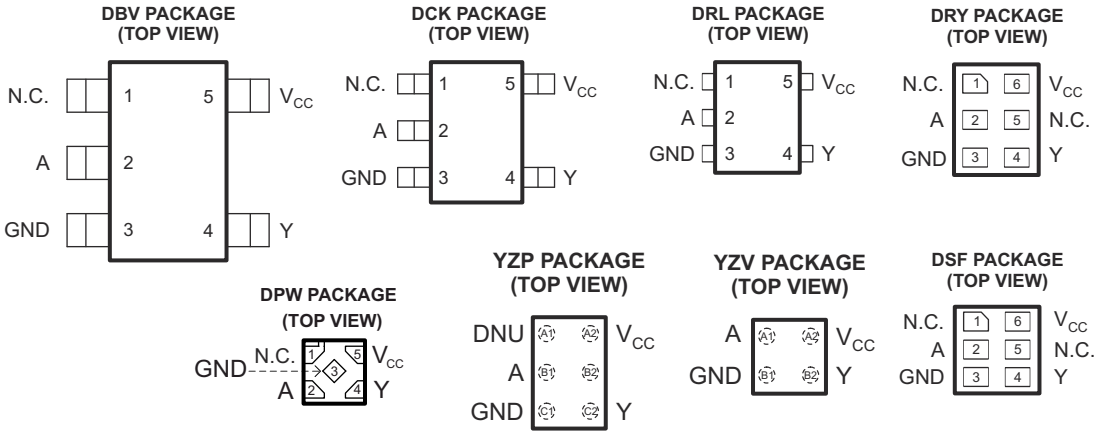
5 Pin Configuration and Functions



N.C. – No internal connection
See mechanical drawings for dimensions.
DNU – Do not use

Pin Functions

PIN					DESCRIPTION
NAME	DBV, DCK, DRL, DPW	DRY, DSF	YZP	YZV	
NC	1	1, 5	A1, B2	–	Not connected
A	2	2	B1	A1	Input
GND	3	3	C1	B1	Ground
Y	4	4	C2	B2	Output
V_{CC}	5	6	A2	A2	Power terminal

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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	6.5	V
V_I	Input voltage range(1)		– 0.5	6.5	V
V_O	Voltage range applied to any output in the high-impedance or power-off state(1)		– 0.5	6.5	V
V_O	Voltage range applied to any output in the high or low state(1) (2)		– 0.5	V_{CC} + 0.5	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			±50	mA
	Continuous current through V_{CC} or GND			±100	mA

(1) The input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.
(2) The value of V_{CC} is provided in the *Recommended Operating Conditions* table.

6.2 Handling Ratings

		MIN	MAX	UNIT
T_{stg}	Storage temperature range	– 65	150	°C
V_{ESD} (1)	Human-Body Model (HBM)(2)	0	2	kV
	Charged-Device Model (CDM)(3)	0	1	kV

(1) Electrostatic discharge (ESD) to measure device sensitivity and immunity to damage caused by assembly line electrostatic discharges in to the device.
(2) Level listed above is the passing level per ANSI, ESDA, and JEDEC JS-001. JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
(3) Level listed above is the passing level per EIA-JEDEC JESD22-C101. JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

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6.3 Recommended Operating Conditions

			MIN	MAX	UNIT
V_{CC}	Supply voltage	Operating	1.65	5.5	V
		Data retention only	1.5		
V_I	Input voltage		0	5.5	V
V_O	Output voltage		0	V_{CC}	V
I_{OH}	High-level output current	V_{CC} = 1.65 V		–4	mA
		V_{CC} = 2.3 V		–8	
		V_{CC} = 3 V		–16	
				–24	
		V_{CC} = 4.5 V		–32	
I_{OL}	Low-level output current	V_{CC} = 1.65 V		4	mA
		V_{CC} = 2.3 V		8	
		V_{CC} = 3 V		16	
				24	
		V_{CC} = 4.5 V		32	
T_A	Operating free-air temperature		–40	125	°C

6.4 Thermal Information

THERMAL METRIC[1]		SN74LVC1G17							UNIT
		DBV	DCK	DRL	DRY	YZP	DPW	YZV	
		5 PINS	5 PINS	5 PINS	6 PINS	5 PINS	4 PINS	4 PINS	
$R_{\theta JA}$	Junction-to-ambient thermal resistance	229	280	350	608	130	340	181	°C/W
$R_{\theta JC(top)}$	Junction-to-case (top) thermal resistance	164	66	121	432	54	215	1	
$R_{\theta JB}$	Junction-to-board thermal resistance	62	67	171	446	51	294	39	
ψ_{JT}	Junction-to-top characterization parameter	44	2	11	191	1	41	8	
ψ_{JB}	Junction-to-board characterization parameter	62	66	169	442	50	294	38	
$R_{\theta JC(bot)}$	Junction-to-case (bottom) thermal resistance	–	–	–	198	–	250	–	

(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—DC Limit Changes

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

PARAMETER	TEST CONDITIONS	V_{CC}	25°C			–40°C TO 85°C			–40°C TO 125°C			UNIT
			MIN	TYP(1)	MAX	MIN	TYP(1)	MAX	MIN	TYP	MAX	
V_{T+} (Positive-going input threshold voltage)		1.65 V				0.76		1.13	0.76		1.13	V
		2.3 V				1.08		1.56	1.08		1.56	
		3 V				1.48		1.92	1.48		1.92	
		4.5 V				2.19		2.74	2.19		2.74	
		5.5 V				2.65		3.33	2.65		3.33	
V_{T-} (Negative-going input threshold voltage)		1.65 V				0.35		0.59	0.35		0.59	V
		2.3 V				0.56		0.88	0.56		0.88	
		3 V				0.89		1.2	0.89		1.2	
		4.5 V				1.51		1.97	1.51		1.97	
		5.5 V				1.88		2.4	1.88		2.4	
ΔV_T Hysteresis ($V_{T+} - V_{T-}$)		1.65 V				0.36		0.64	0.36		0.64	V
		2.3 V				0.45		0.78	0.45		0.78	
		3 V				0.51		0.83	0.51		0.83	
		4.5 V				0.58		0.93	0.58		0.93	
		5.5 V				0.69		1.04	0.69		1.04	
V_{OH}	I_{OH} = –100 µA	1.65 V to 5.5 V				V_{CC} – 0.1			V_{CC} – 0.1			V
	I_{OH} = –4 mA	1.65 V				1.2			1.2			
	I_{OH} = –8 mA	2.3 V				1.9			1.9			
	I_{OH} = –16 mA	3 V				2.4			2.4			
	I_{OH} = –24 mA					2.3			2.3			
	I_{OH} = –32 mA	4.5 V				3.8			3.8			
V_{OL}	I_{OL} = 100 µA	1.65 V to 5.5 V						0.1			0.1	V
	I_{OL} = 4 mA	1.65 V						0.45			0.45	
	I_{OL} = 8 mA	2.3 V						0.3			0.3	
	I_{OL} = 16 mA	3 V						0.4			0.4	
	I_{OL} = 24 mA							0.55			0.55	
	I_{OL} = 32 mA	4.5 V						0.55			0.55	
I_I A input	V_I = 5.5 V or GND	0 to 5.5 V						±5			±5	µA
I_{off}	V_I or V_O = 5.5 V	0						±10			±10	µA
I_{CC}	V_I = 5.5 V or GND, I_O = 0	1.65 V to 5.5 V						10			10	µA
	V_I = 3.6 V or GND, I_O = 0	3 V to 3.6 V		0.5	1.5							
ΔI_{CC}	One input at V_{CC} – 0.6 V, Other inputs at V_{CC} or GND	3 V to 5.5 V						500			500	µA
C_I	V_I = V_{CC} or GND	3.3 V		4.5								pF

(1) All typical values are at V_{CC} = 3.3 V, T_A = 25°C.

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6.6 Switching Characteristics, C_L = 15 pF

over recommended operating free-air temperature range, C_L = 15 pF (unless otherwise noted) (see 图 7-1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	– 40°C TO 85°C								UNIT
			V_{CC} = 1.8 V ± 0.15 V		V_{CC} = 2.5 V ± 0.2 V		V_{CC} = 3.3 V ± 0.3 V		V_{CC} = 5 V ± 0.5 V		
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A	Y	2.8	9.9	1.6	5.5	1.5	4.6	0.9	4.4	ns

6.7 Switching Characteristics AC Limit, – 40°C TO 85°C

over recommended operating free-air temperature range, C_L = 30 pF or 50 pF (unless otherwise noted) (see 图 7-2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	– 40°C TO 85°C								UNIT
			V_{CC} = 1.8 V ± 0.15 V		V_{CC} = 2.5 V ± 0.2 V		V_{CC} = 3.3 V ± 0.3 V		V_{CC} = 5 V ± 0.5 V		
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A	Y	3.8	11	2	6.5	1.8	5.5	1.2	5	ns

6.8 Switching Characteristics AC Limit, – 40°C TO 125°C

over recommended operating free-air temperature range, C_L = 30 pF or 50 pF (unless otherwise noted) (see 图 7-2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	– 40°C TO 125°C								UNIT
			V_{CC} = 1.8 V ± 0.15 V		V_{CC} = 2.5 V ± 0.2 V		V_{CC} = 3.3 V ± 0.3 V		V_{CC} = 5 V ± 0.5 V		
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A	Y	3.8	13	2	8	1.8	6.5	1.2	6	ns

6.9 Operating Characteristics

T_A = 25°C

PARAMETER		TEST CONDITIONS	V_{CC} = 1.8 V	V_{CC} = 2.5 V	V_{CC} = 3.3 V	V_{CC} = 5 V	UNIT
			TYP	TYP	TYP	TYP	
C_{pd}	Power dissipation capacitance	f = 10 MHz	20	21	22	26	pF

6.10 Typical Characteristics

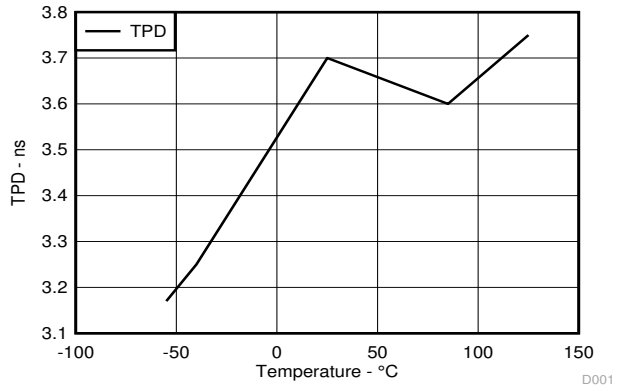


图 6-1. Across Temperature at 3.3V Vcc

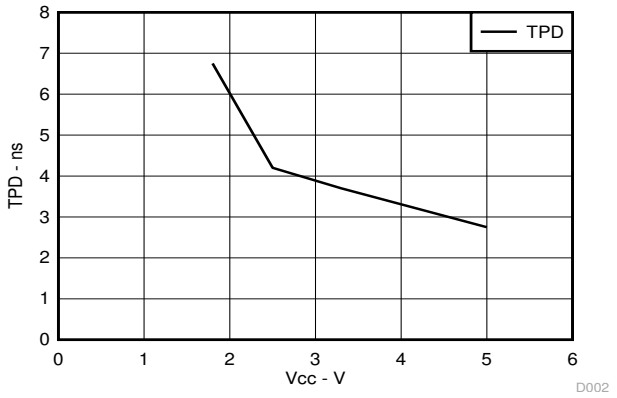
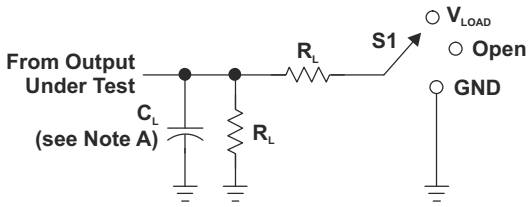


图 6-2. Across Vcc at 25°C

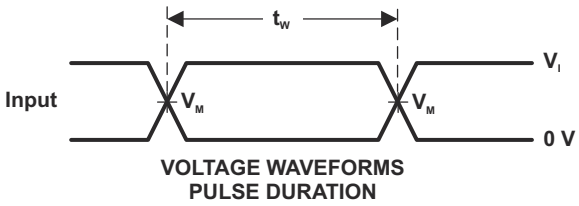
7 Parameter Measurement Information



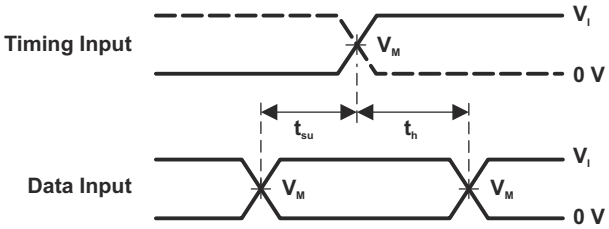
LOAD CIRCUIT

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

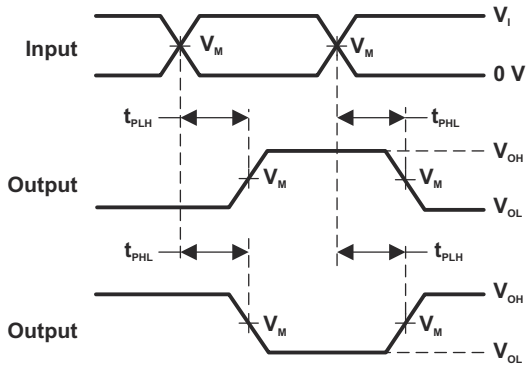
V_{CC}	INPUTS		V_M	V_{LOAD}	C_L	R_L	V_Δ
	V_I	t_r/t_f					
1.8 V ± 0.15 V	V_{CC}	≤2 ns	$V_{CC}/2$	2 × V_{CC}	15 pF	1 MΩ	0.15 V
2.5 V ± 0.2 V	V_{CC}	≤2 ns	$V_{CC}/2$	2 × V_{CC}	15 pF	1 MΩ	0.15 V
3.3 V ± 0.3 V	3 V	≤2.5 ns	1.5 V	6 V	15 pF	1 MΩ	0.3 V
5 V ± 0.5 V	V_{CC}	≤2.5 ns	$V_{CC}/2$	2 × V_{CC}	15 pF	1 MΩ	0.3 V



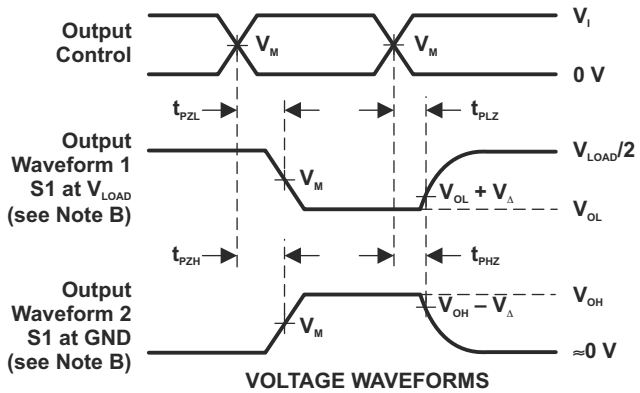
VOLTAGE WAVEFORMS
PULSE DURATION



VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES



VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES
INVERTING AND NONINVERTING OUTPUTS



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

NOTES: A. C_L includes probe and jig capacitance.
B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
C. All input pulses are supplied by generators having the following characteristics: PRR ≤ 10 MHz, Z_O = 50 Ω.
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. t_{PLH} and t_{PHL} are the same as t_{pd}.
H. All parameters and waveforms are not applicable to all devices.

图 7-1. Load Circuit and Voltage Waveforms

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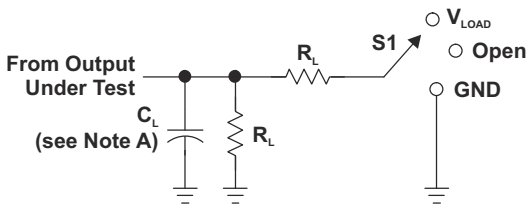
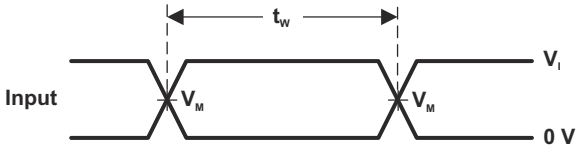


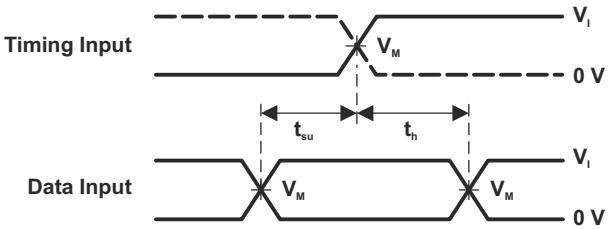
LOAD CIRCUIT

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

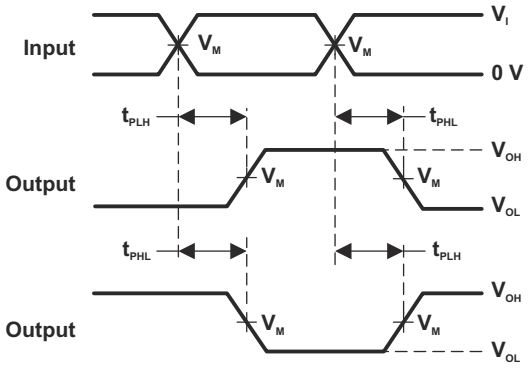
V_{CC}	INPUTS		V_M	V_{LOAD}	C_L	R_L	V_Δ
	V_I	t_r/t_f					
1.8 V ± 0.15 V	V_{CC}	≤2 ns	$V_{CC}/2$	2 × V_{CC}	30 pF	1 kΩ	0.15 V
2.5 V ± 0.2 V	V_{CC}	≤2 ns	$V_{CC}/2$	2 × V_{CC}	30 pF	500 Ω	0.15 V
3.3 V ± 0.3 V	3 V	≤2.5 ns	1.5 V	6 V	50 pF	500 Ω	0.3 V
5 V ± 0.5 V	V_{CC}	≤2.5 ns	$V_{CC}/2$	2 × V_{CC}	50 pF	500 Ω	0.3 V



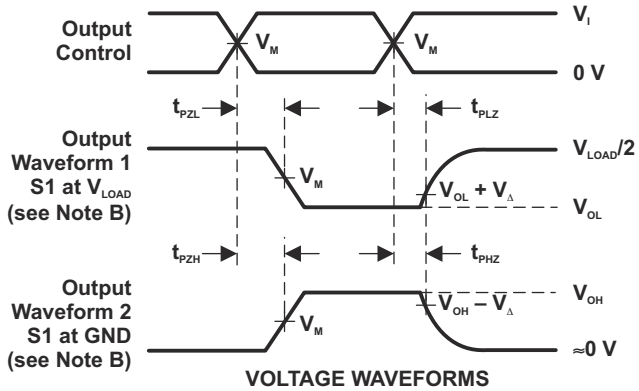
VOLTAGE WAVEFORMS
PULSE DURATION



VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES



VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES
INVERTING AND NONINVERTING OUTPUTS



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

NOTES: A. C_L includes probe and jig capacitance.
B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
C. All input pulses are supplied by generators having the following characteristics: PRR ≤ 10 MHz, Z_O = 50 Ω.
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E. t_{PLZ} and t_{PHZ} are the same as t_{dis}.
F. t_{PZL} and t_{PZH} are the same as t_{en}.
G. t_{PLH} and t_{PHL} are the same as t_{pd}.
H. 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

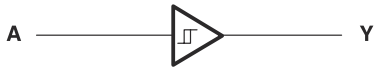
8.1 Overview

The SN74LVC1G17 device contains one Schmitt trigger buffer and performs the Boolean function Y = A. The device functions as an independent buffer, but because of Schmitt action, it will have different input threshold levels for a positive-going (VT+) and negative-going signals.

The DPW package technology is a major breakthrough in IC packaging. Its tiny 0.64 mm square footprint saves significant board space over other package options while still retaining the traditional manufacturing friendly lead pitch of 0.5 mm.

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.

8.2 Functional Block Diagram



8.3 Feature Description

- Wide operating voltage range.
  - Operates From 1.65 V to 5.5 V.
- Allows Down voltage translation.
- Inputs accept voltages to 5.5 V.
- I_{off} feature allows voltages on the inputs and outputs, when V_{CC} is 0 V.

8.4 Device Functional Modes

Table 8-1. Function Table

INPUT A	OUTPUT Y
H	H
L	L

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9 Applications and Implementation

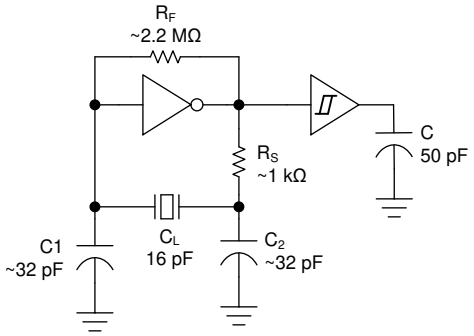
Note

Information in the following applications sections is not part of the TI component specification, and TI does not warrant its accuracy or completeness. TI's customers are responsible for determining suitability of components for their purposes. Customers should validate and test their design implementation to confirm system functionality.

9.1 Application Information

The SN74LVC1G17 is a high drive CMOS device that can be used for a multitude of buffer type functions where the input is slow or noisy. It can produce 24 mA of drive current at 3.3 V making it Ideal for driving multiple outputs and good for high speed applications up to 100 MHz. The inputs are 5.5 V tolerant allowing it to translate down to V_{CC}.

9.2 Typical Application



9.2.1 Design Requirements

This device uses CMOS technology and has balanced output drive. Care should be taken to avoid bus contention because it can drive currents that would exceed maximum limits. The high drive will also create fast edges into light loads so routing and load conditions should be considered to prevent ringing.

9.2.2 Detailed Design Procedure

1. Recommended Input Conditions
   - Rise time and fall time specs. See ($\Delta t/\Delta V$) in the Recommended Operating Conditions table.
   - Specified high and low levels. See (V_{IH} and V_{IL}) in the Recommended Operating Conditions table.
   - Inputs are overvoltage tolerant allowing them to go as high as (V_I max) in the Recommended Operating Conditions table at any valid V_{CC} .
2. Recommend Output Conditions
   - Load currents should not exceed (I_O max) per output and should not exceed (continuous current through V_{CC} or GND) total current for the part. These limits are located in the Absolute Max Ratings table.
   - Outputs should not be pulled above V_{CC}.

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9.2.3 Application Curves

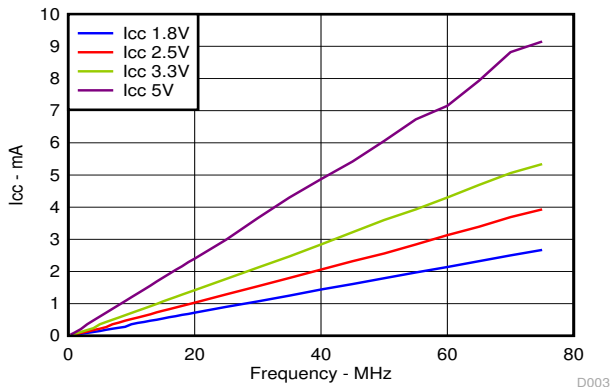

图 9-1. ICC vs Frequency

10 Power Supply Recommendations

The power supply can be any voltage between the min and max supply voltage rating located in the Recommended Operating Conditions table.

Each Vcc pin should have a good bypass capacitor to prevent power disturbance. For devices with a single supply a 0.1-μF capacitor is recommended and if there are multiple Vcc pins then a 0.01-μF or 0.022-μF capacitor is recommended for each power pin. It is ok to parallel multiple bypass caps to reject different frequencies of noise. 0.1-μF and 1-μF capacitors are commonly used in parallel. The bypass capacitor should be installed as close to the power pin as possible for best results.

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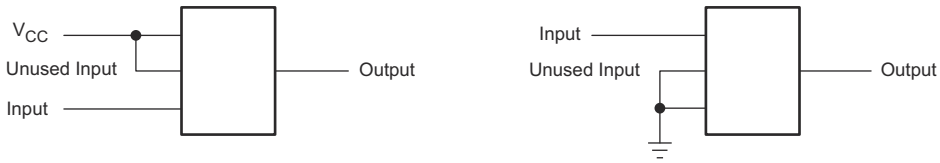
11 Layout

11.1 Layout Guidelines

When using multiple bit logic devices inputs should not 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 terminals 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 Vcc whichever make more sense or is more convenient.

11.2 Layout Example



12 Device and Documentation Support

12.1 Trademarks

所有商标均为其各自所有者的财产。

12.2 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.

12.3 Glossary

TI Glossary This glossary lists and explains terms, acronyms, and definitions.

13 Mechanical, Packaging, and Orderable Information

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

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PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
SN74LVC1G17DBVR	ACTIVE	SOT-23	DBV	5	3000	RoHS & Green	NIPDAU | SN	Level-1-260C-UNLIM	-40 to 125	(C175, C17F, C17J, C17K, C17R) (C17H, C17P, C17S)	Samples
SN74LVC1G17DBVRE4	ACTIVE	SOT-23	DBV	5	3000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C17F	Samples
SN74LVC1G17DBVRG4	ACTIVE	SOT-23	DBV	5	3000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C17F	Samples
SN74LVC1G17DBVT	ACTIVE	SOT-23	DBV	5	250	RoHS & Green	NIPDAU | SN	Level-1-260C-UNLIM	-40 to 125	(C175, C17F, C17J, C17K, C17R) (C17H, C17P, C17S)	Samples
SN74LVC1G17DBVTE4	ACTIVE	SOT-23	DBV	5	250	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C17F	Samples
SN74LVC1G17DBVTG4	ACTIVE	SOT-23	DBV	5	250	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C17F	Samples
SN74LVC1G17DCK3	ACTIVE	SC70	DCK	5	3000	RoHS & Non-Green	SNBI	Level-1-260C-UNLIM	-40 to 85	(C7F, C7Z)	Samples
SN74LVC1G17DCKR	ACTIVE	SC70	DCK	5	3000	RoHS & Green	NIPDAU | SN	Level-1-260C-UNLIM	-40 to 125	(C75, C7F, C7J, C7K, C7R, C7T) (C7H, C7P, C7S)	Samples
SN74LVC1G17DCKRE4	ACTIVE	SC70	DCK	5	3000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C75 C7S	Samples
SN74LVC1G17DCKRG4	ACTIVE	SC70	DCK	5	3000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C75 C7S	Samples
SN74LVC1G17DCKT	ACTIVE	SC70	DCK	5	250	RoHS & Green	NIPDAU | SN	Level-1-260C-UNLIM	-40 to 125	(C75, C7F, C7J, C7K, C7R, C7T) (C7H, C7P, C7S)	Samples
SN74LVC1G17DCKTE4	ACTIVE	SC70	DCK	5	250	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C75 C7S	Samples
SN74LVC1G17DCKTG4	ACTIVE	SC70	DCK	5	250	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C75 C7S	Samples
SN74LVC1G17DPWR	ACTIVE	X2SON	DPW	5	3000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	S4	Samples
SN74LVC1G17DRLR	ACTIVE	SOT-5X3	DRL	5	4000	RoHS & Green	NIPDAU | NIPDAUAG	Level-1-260C-UNLIM	-40 to 125	(C77, C7R)	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
SN74LVC1G17DRLRG4	ACTIVE	SOT-5X3	DRL	5	4000	RoHS & Green	NIPDAUAG	Level-1-260C-UNLIM	-40 to 125	(C77, C7R)	Samples
SN74LVC1G17DRYR	ACTIVE	SON	DRY	6	5000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	C7	Samples
SN74LVC1G17DSFR	ACTIVE	SON	DSF	6	5000	RoHS & Green	NIPDAU | NIPDAUAG	Level-1-260C-UNLIM	-40 to 125	C7	Samples
SN74LVC1G17YZPR	ACTIVE	DSBGA	YZP	5	3000	RoHS & Green	SNAGCU	Level-1-260C-UNLIM	-40 to 85	C7N	Samples
SN74LVC1G17YZVR	ACTIVE	DSBGA	YZV	4	3000	RoHS & Green	SNAGCU	Level-1-260C-UNLIM	-40 to 85	C7 (7, N)	Samples

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

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

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

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

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

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

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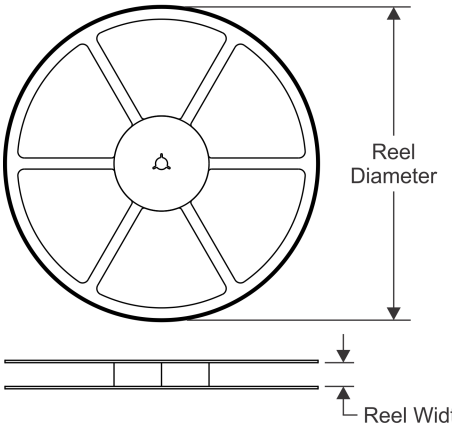
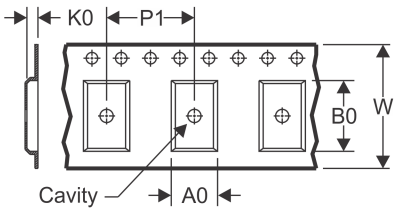
TAPE AND REEL INFORMATION

REEL DIMENSIONS

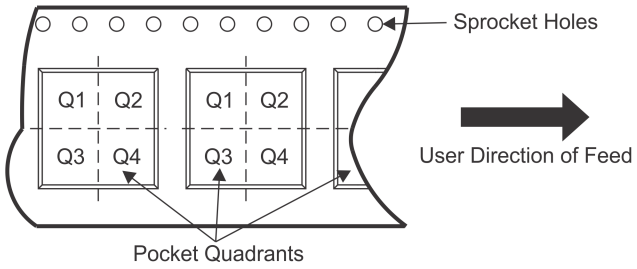


TAPE DIMENSIONS



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

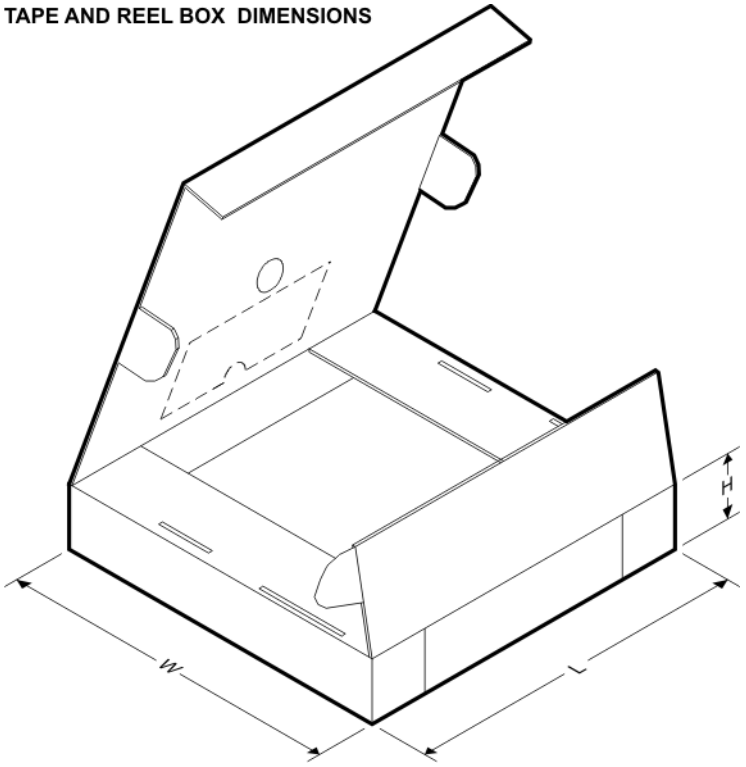


*All dimensions are nominal

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
SN74LVC1G17DBVR	SOT-23	DBV	5	3000	178.0	9.0	3.3	3.2	1.4	4.0	8.0	Q3
SN74LVC1G17DBVR	SOT-23	DBV	5	3000	178.0	9.2	3.3	3.23	1.55	4.0	8.0	Q3
SN74LVC1G17DBVR	SOT-23	DBV	5	3000	180.0	8.4	3.23	3.17	1.37	4.0	8.0	Q3
SN74LVC1G17DBVRG4	SOT-23	DBV	5	3000	178.0	9.0	3.23	3.17	1.37	4.0	8.0	Q3
SN74LVC1G17DBVT	SOT-23	DBV	5	250	178.0	9.0	3.23	3.17	1.37	4.0	8.0	Q3
SN74LVC1G17DBVT	SOT-23	DBV	5	250	178.0	9.0	3.3	3.2	1.4	4.0	8.0	Q3
SN74LVC1G17DBVT	SOT-23	DBV	5	250	180.0	8.4	3.23	3.17	1.37	4.0	8.0	Q3
SN74LVC1G17DBVT	SOT-23	DBV	5	250	178.0	9.2	3.3	3.23	1.55	4.0	8.0	Q3
SN74LVC1G17DBVTG4	SOT-23	DBV	5	250	178.0	9.0	3.23	3.17	1.37	4.0	8.0	Q3
SN74LVC1G17DCKR	SC70	DCK	5	3000	178.0	9.0	2.4	2.5	1.2	4.0	8.0	Q3
SN74LVC1G17DCKR	SC70	DCK	5	3000	180.0	8.4	2.47	2.3	1.25	4.0	8.0	Q3
SN74LVC1G17DCKR	SC70	DCK	5	3000	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74LVC1G17DCKRG4	SC70	DCK	5	3000	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74LVC1G17DCKT	SC70	DCK	5	250	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74LVC1G17DCKT	SC70	DCK	5	250	178.0	9.0	2.4	2.5	1.2	4.0	8.0	Q3
SN74LVC1G17DCKT	SC70	DCK	5	250	180.0	8.4	2.47	2.3	1.25	4.0	8.0	Q3
SN74LVC1G17DCKTG4	SC70	DCK	5	250	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74LVC1G17DPWR	X2SON	DPW	5	3000	178.0	8.4	0.91	0.91	0.5	2.0	8.0	Q3

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
SN74LVC1G17DRLR	SOT-5X3	DRL	5	4000	180.0	8.4	1.98	1.78	0.69	4.0	8.0	Q3
SN74LVC1G17DRLR	SOT-5X3	DRL	5	4000	180.0	9.5	1.78	1.78	0.69	4.0	8.0	Q3
SN74LVC1G17DRYR	SON	DRY	6	5000	180.0	9.5	1.15	1.6	0.75	4.0	8.0	Q1
SN74LVC1G17DSFR	SON	DSF	6	5000	180.0	9.5	1.16	1.16	0.5	4.0	8.0	Q2
SN74LVC1G17YZPR	DSBGA	YZP	5	3000	178.0	9.2	1.02	1.52	0.63	4.0	8.0	Q1
SN74LVC1G17YZVR	DSBGA	YZV	4	3000	178.0	9.2	1.0	1.0	0.63	4.0	8.0	Q1

TAPE AND REEL BOX DIMENSIONS

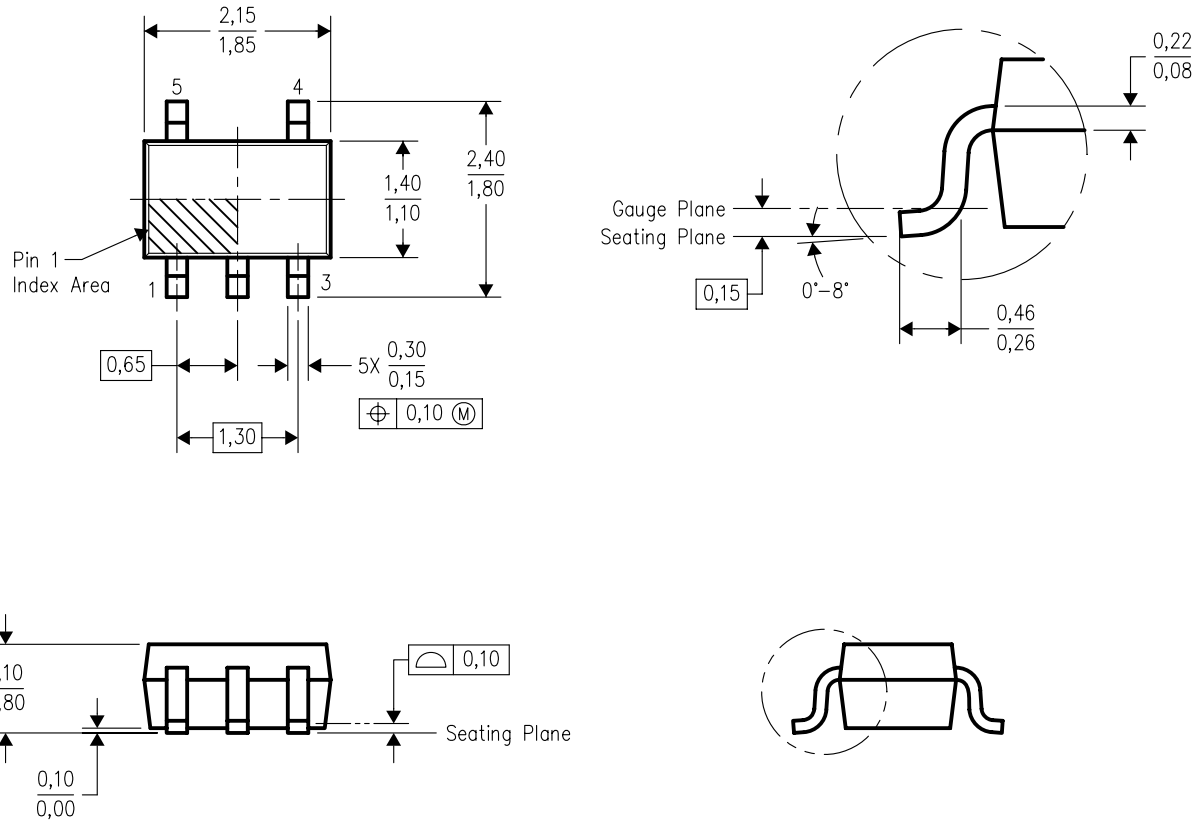


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LVC1G17DBVR	SOT-23	DBV	5	3000	180.0	180.0	18.0
SN74LVC1G17DBVR	SOT-23	DBV	5	3000	180.0	180.0	18.0
SN74LVC1G17DBVR	SOT-23	DBV	5	3000	202.0	201.0	28.0
SN74LVC1G17DBVRG4	SOT-23	DBV	5	3000	180.0	180.0	18.0
SN74LVC1G17DBVT	SOT-23	DBV	5	250	180.0	180.0	18.0
SN74LVC1G17DBVT	SOT-23	DBV	5	250	180.0	180.0	18.0
SN74LVC1G17DBVT	SOT-23	DBV	5	250	202.0	201.0	28.0
SN74LVC1G17DBVT	SOT-23	DBV	5	250	180.0	180.0	18.0
SN74LVC1G17DBVTG4	SOT-23	DBV	5	250	180.0	180.0	18.0
SN74LVC1G17DCKR	SC70	DCK	5	3000	180.0	180.0	18.0
SN74LVC1G17DCKR	SC70	DCK	5	3000	202.0	201.0	28.0

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LVC1G17DCKR	SC70	DCK	5	3000	180.0	180.0	18.0
SN74LVC1G17DCKRG4	SC70	DCK	5	3000	180.0	180.0	18.0
SN74LVC1G17DCKT	SC70	DCK	5	250	180.0	180.0	18.0
SN74LVC1G17DCKT	SC70	DCK	5	250	180.0	180.0	18.0
SN74LVC1G17DCKT	SC70	DCK	5	250	202.0	201.0	28.0
SN74LVC1G17DCKTG4	SC70	DCK	5	250	180.0	180.0	18.0
SN74LVC1G17DPWR	X2SON	DPW	5	3000	205.0	200.0	33.0
SN74LVC1G17DRLR	SOT-5X3	DRL	5	4000	202.0	201.0	28.0
SN74LVC1G17DRLR	SOT-5X3	DRL	5	4000	184.0	184.0	19.0
SN74LVC1G17DRYR	SON	DRY	6	5000	184.0	184.0	19.0
SN74LVC1G17DSFR	SON	DSF	6	5000	184.0	184.0	19.0
SN74LVC1G17YZPR	DSBGA	YZP	5	3000	220.0	220.0	35.0
SN74LVC1G17YZVR	DSBGA	YZV	4	3000	220.0	220.0	35.0

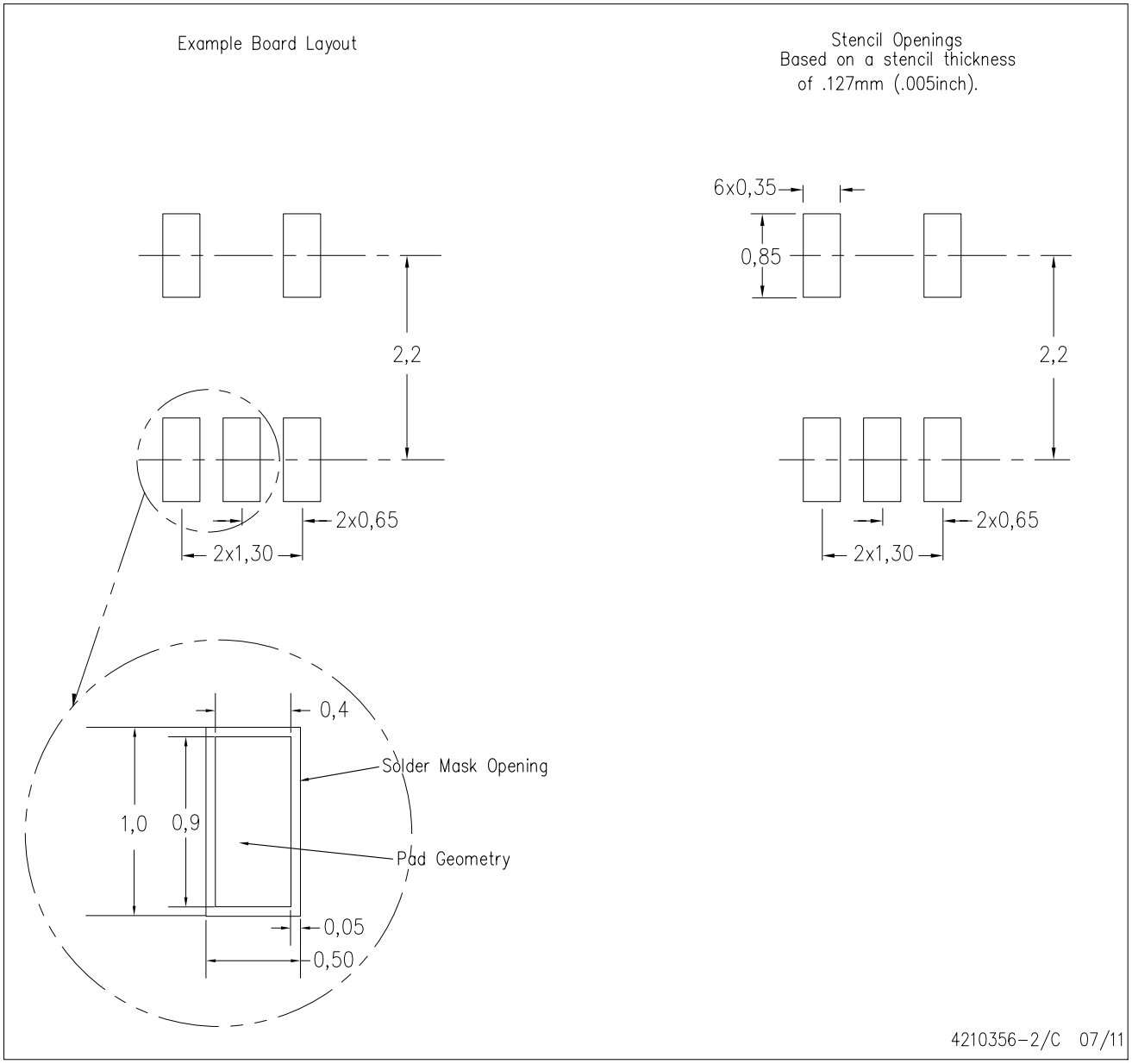
DCK (R–PDSO–G5) PLASTIC SMALL–OUTLINE PACKAGE



4093553–3/G 01/2007

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. Mold flash and protrusion shall not exceed 0.15 per side.
D. Falls within JEDEC MO–203 variation AA.

DCK (R–PDSO–G5) PLASTIC SMALL OUTLINE



NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Customers should place a note on the circuit board fabrication drawing not to alter the center solder mask defined pad.
D. Publication IPC–7351 is recommended for alternate designs.
E. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Example stencil design based on a 50% volumetric metal load solder paste. Refer to IPC–7525 for other stencil recommendations.

GENERIC PACKAGE VIEW

DRY 6 USON - 0.6 mm max height

PLASTIC SMALL OUTLINE - NO LEAD

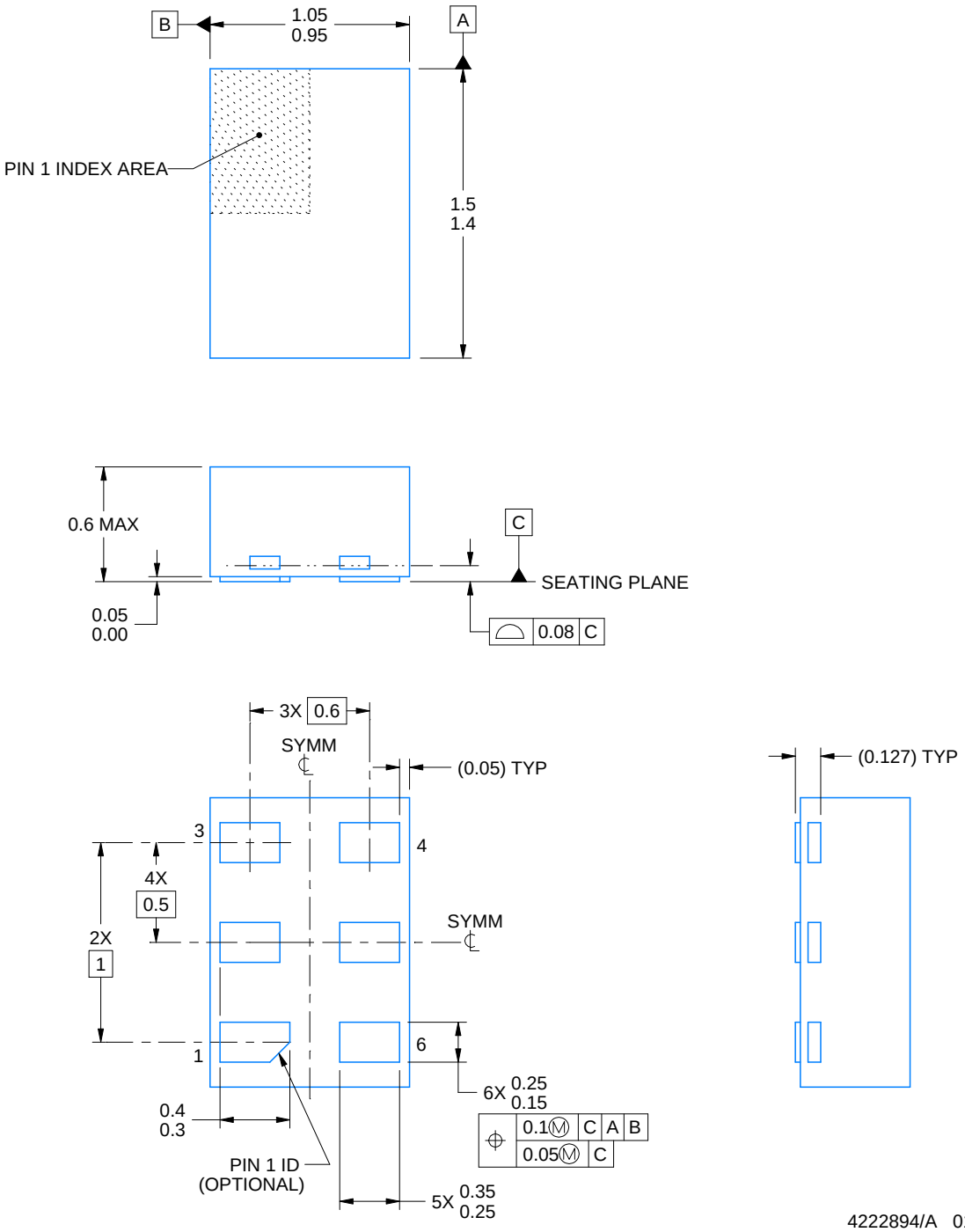
Images above are just a representation of the package family, actual package may vary.
Refer to the product data sheet for package details.

PACKAGE OUTLINE

DRY0006A

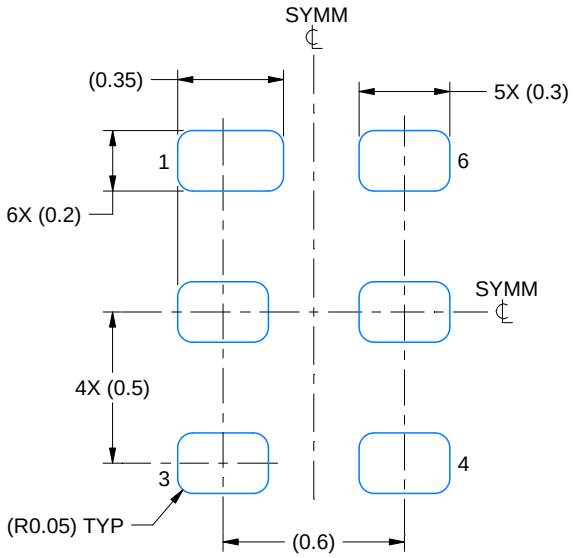
USON - 0.6 mm max height

PLASTIC SMALL OUTLINE - NO LEAD

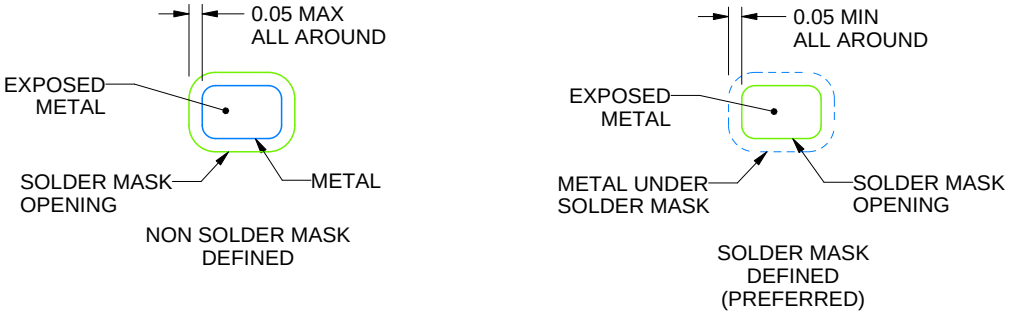


NOTES:

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)

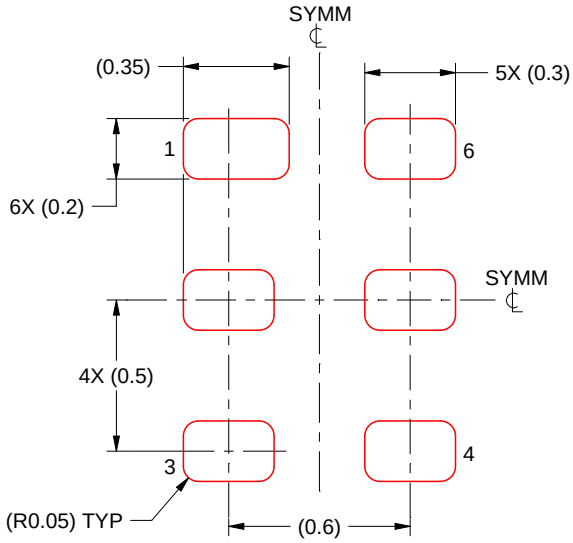
3. For more information, see QFN/SON PCB application report in literature No. SLUA271 (www.ti.com/lit/slua271).

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)

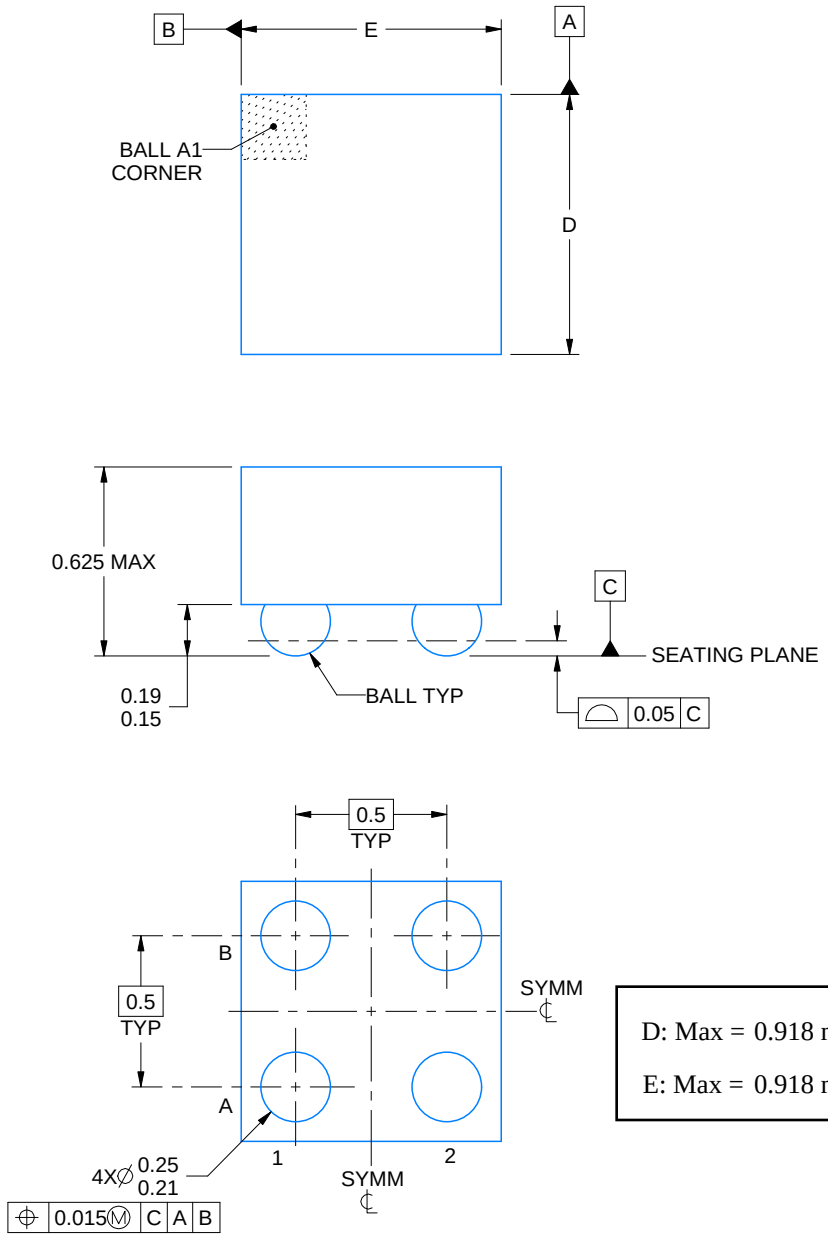
4. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.

PACKAGE OUTLINE

YZT0004

DSBGA - 0.625 mm max height

DIE SIZE BALL GRID ARRAY



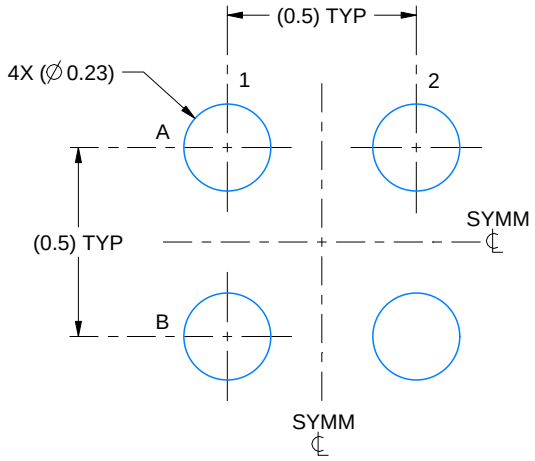
D: Max = 0.918 mm, Min =0.858 mm

E: Max = 0.918 mm, Min =0.858 mm

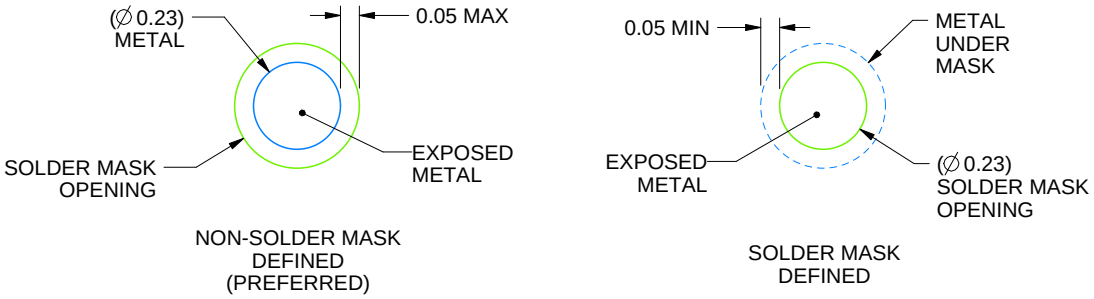
4219477/A 05/2017

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
EXPOSED METAL SHOWN
SCALE:50X



SOLDER MASK DETAILS
NOT TO SCALE

4219477/A 05/2017

NOTES: (continued)

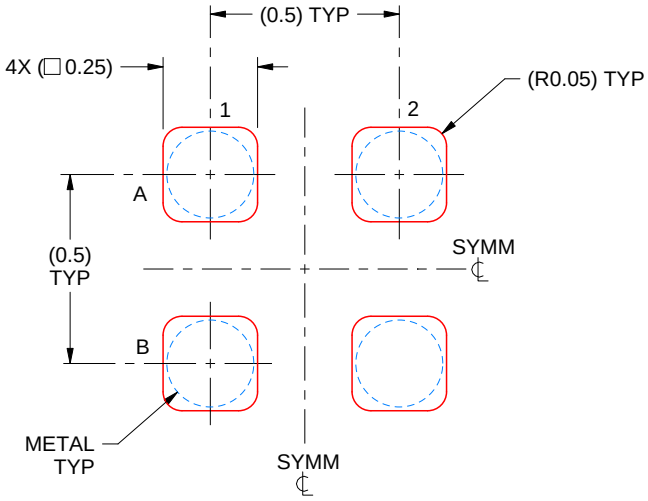
3. Final dimensions may vary due to manufacturing tolerance considerations and also routing constraints. Refer to Texas Instruments Literature No. SNVA009 (www.ti.com/lit/snva009).

EXAMPLE STENCIL DESIGN

YZT0004

DSBGA - 0.625 mm max height

DIE SIZE BALL GRID ARRAY



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

4219477/A 05/2017

NOTES: (continued)

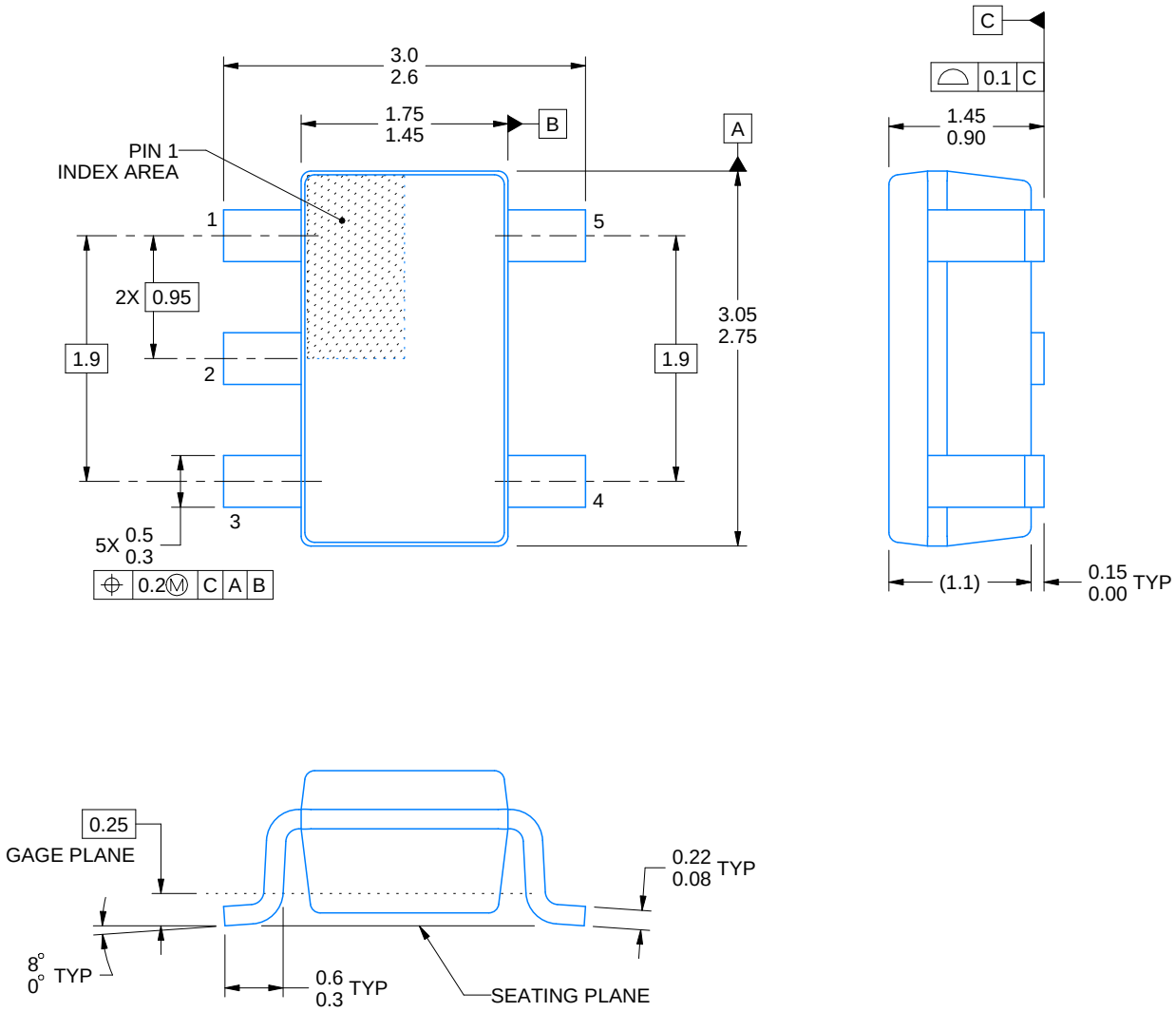
4. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release.

PACKAGE OUTLINE

DBV0005A

SOT-23 - 1.45 mm max height

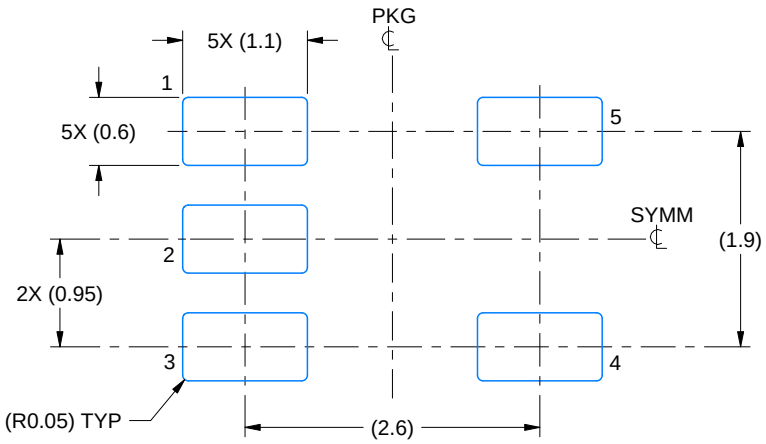
SMALL OUTLINE TRANSISTOR



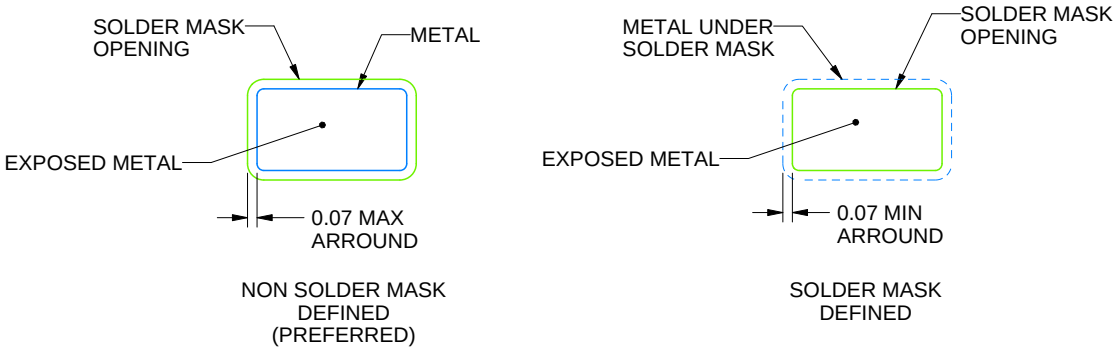
4214839/F 06/2021

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. Refernce JEDEC MO-178.
4. Body dimensions do not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.25 mm per side.



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE:15X

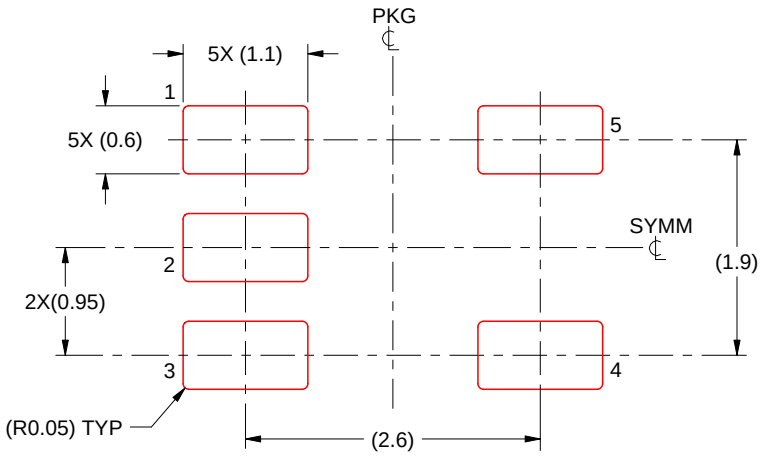


SOLDER MASK DETAILS

4214839/F 06/2021

NOTES: (continued)

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



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE:15X

4214839/F 06/2021

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

DPW 5 X2SON - 0.4 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.

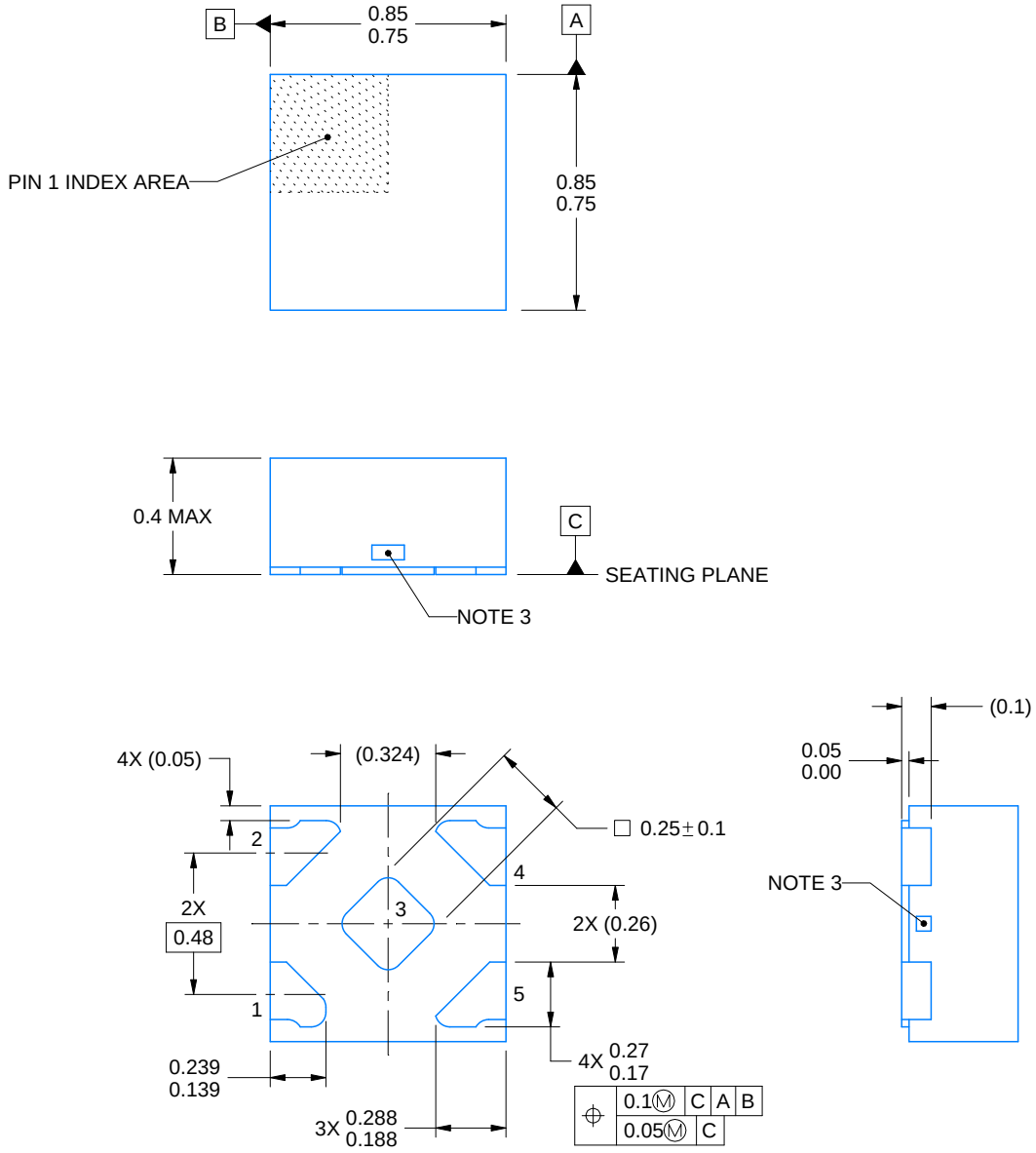
4211218-3/D

PACKAGE OUTLINE

DPW0005A

X2SON - 0.4 mm max height

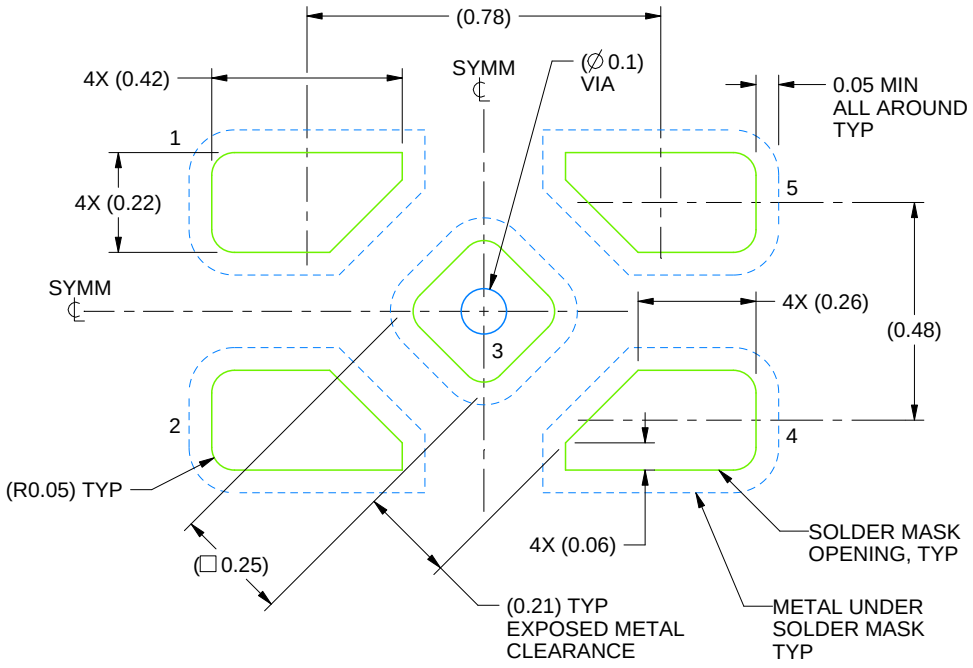
PLASTIC SMALL OUTLINE - NO LEAD



4223102/D 03/2022

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. The size and shape of this feature may vary.



LAND PATTERN EXAMPLE
SOLDER MASK DEFINED
SCALE:60X

4223102/D 03/2022

NOTES: (continued)

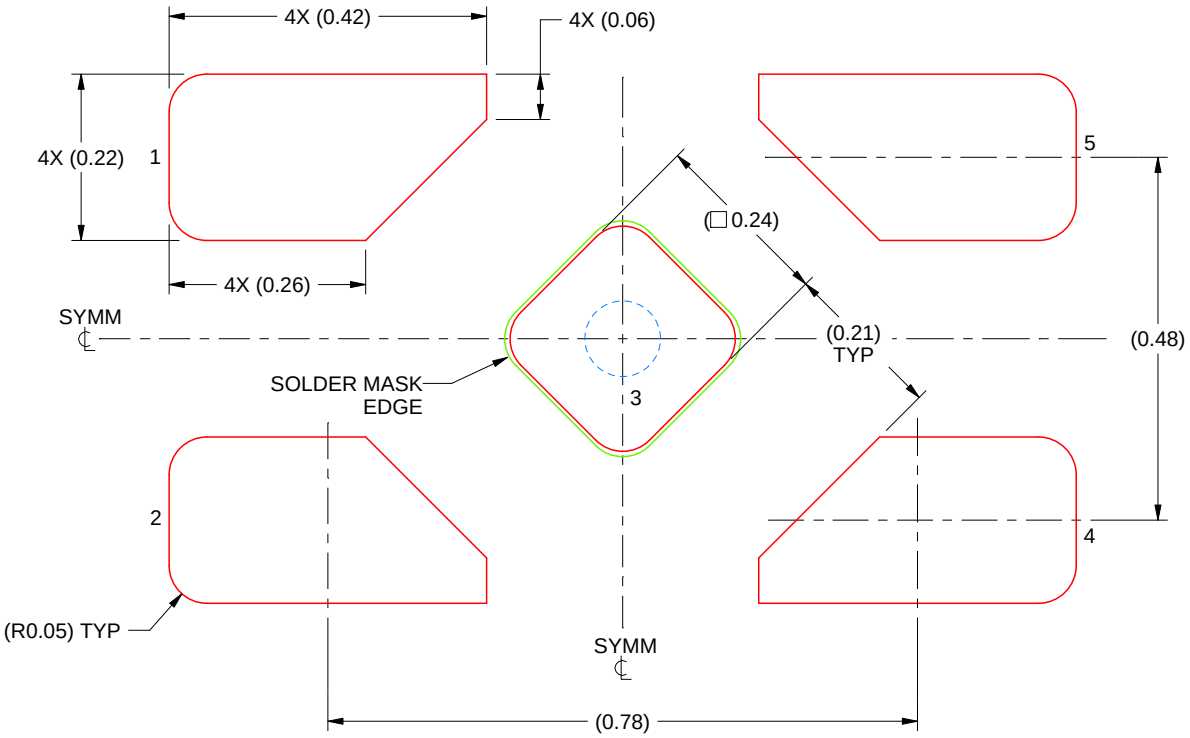
4. This package is designed to be soldered to a thermal pad on the board. For more information, refer to QFN/SON PCB application note in literature No. SLUA271 (www.ti.com/lit/slua271).

EXAMPLE STENCIL DESIGN

DPW0005A

X2SON - 0.4 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



SOLDER PASTE EXAMPLE
BASED ON 0.1 mm THICK STENCIL

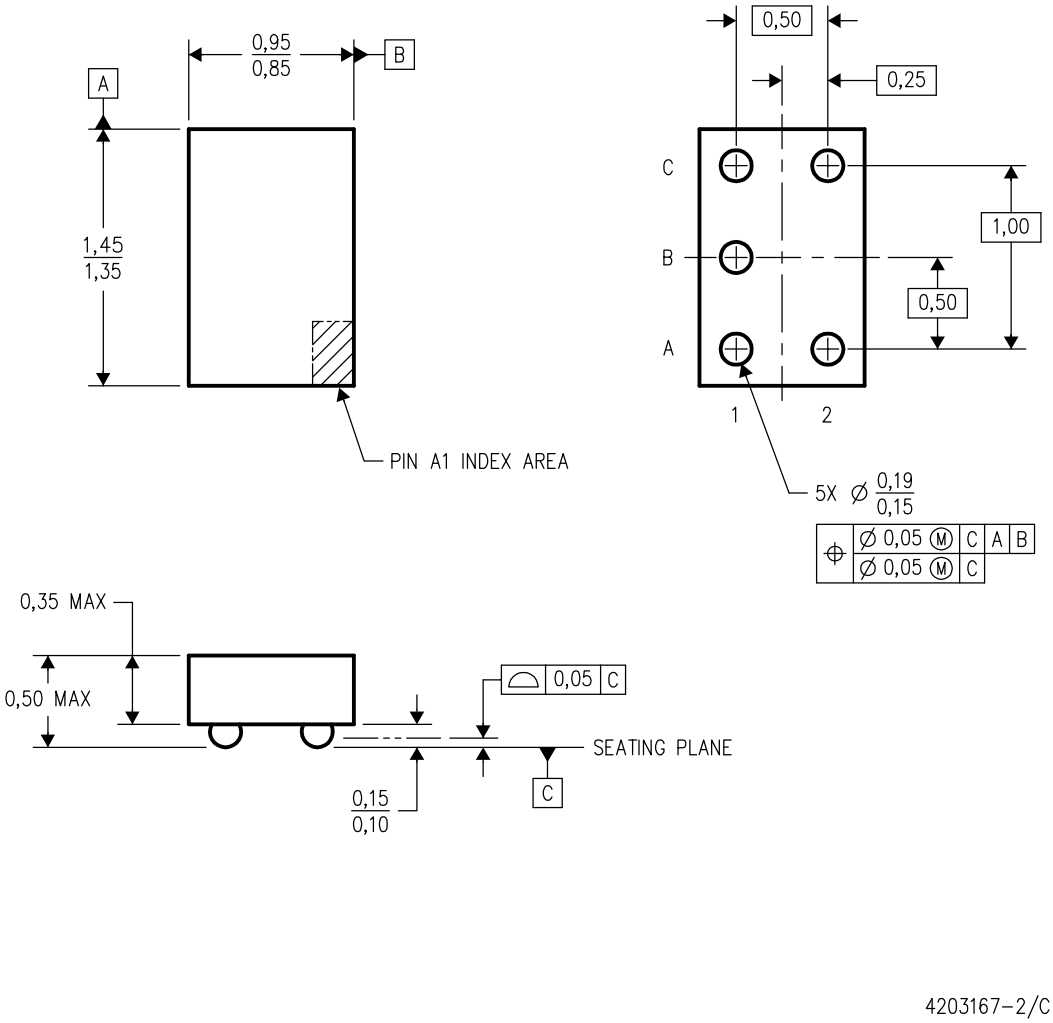
EXPOSED PAD 3
92% PRINTED SOLDER COVERAGE BY AREA UNDER PACKAGE
SCALE:100X

4223102/D 03/2022

NOTES: (continued)

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

YEA (R–XBGA–N5) DIE–SIZE BALL GRID ARRAY



NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. NanoStar™ package configuration.
D. Package complies to JEDEC MO–211 variation EA.
E. This package is tin–lead (SnPb). Refer to the 5 YZA package (drawing 4204151) for lead–free.

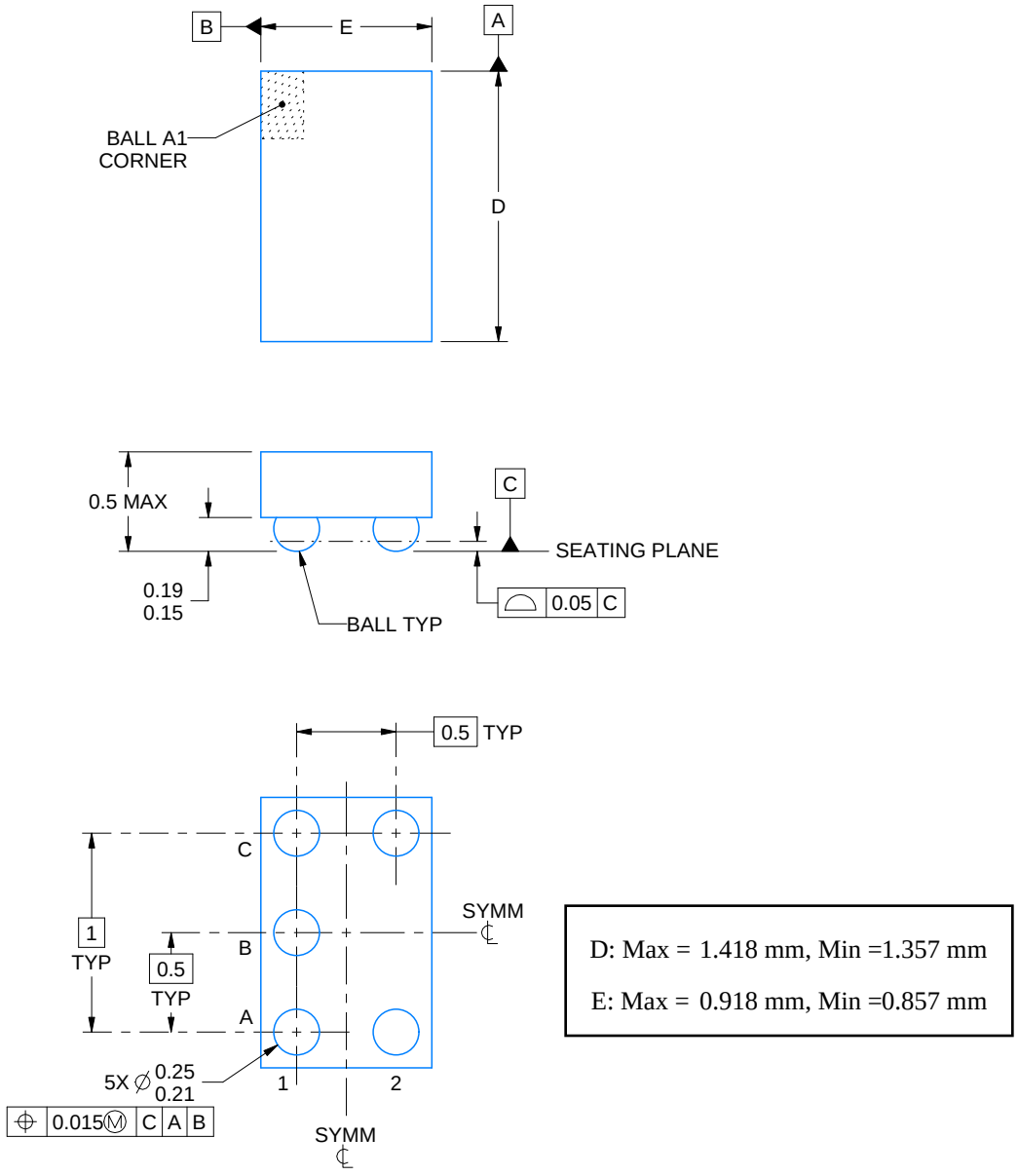
NanoStar is a trademark of Texas Instruments.

PACKAGE OUTLINE

YZP0005

DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



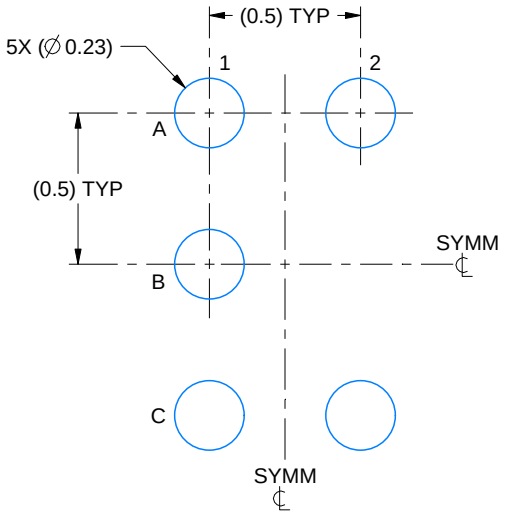
D: Max = 1.418 mm, Min =1.357 mm

E: Max = 0.918 mm, Min =0.857 mm

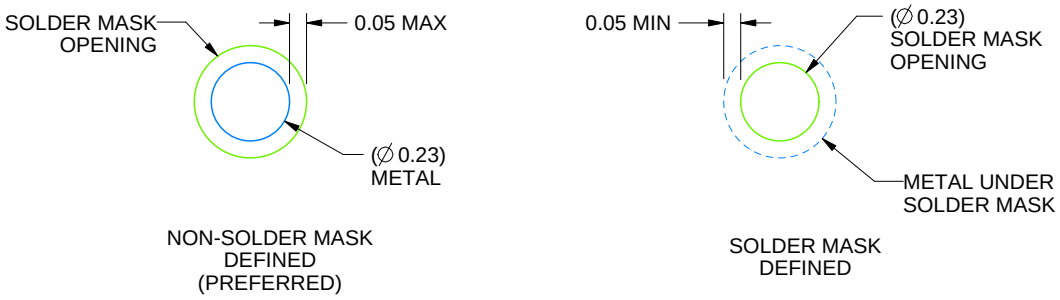
4219492/A 05/2017

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:40X

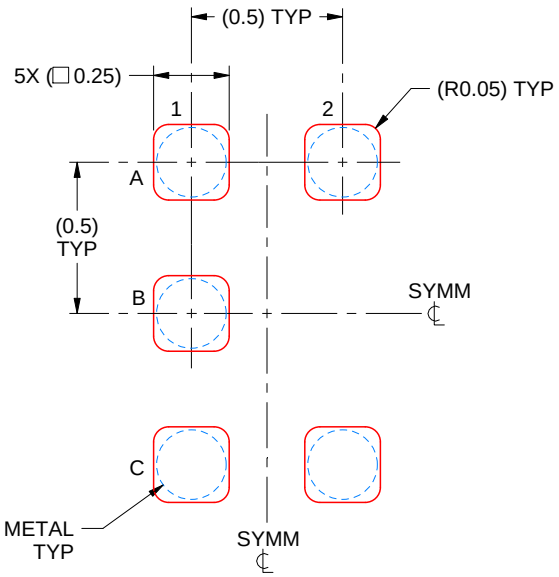


SOLDER MASK DETAILS
NOT TO SCALE

4219492/A 05/2017

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).



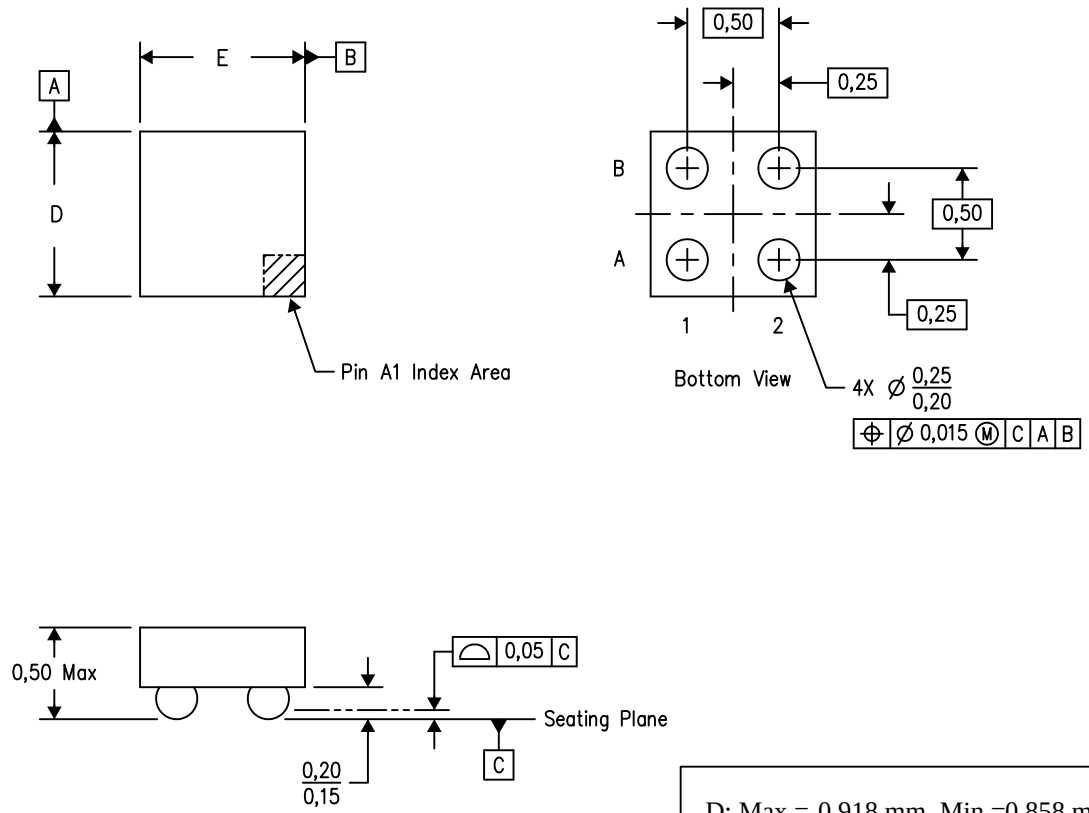
SOLDER PASTE EXAMPLE
BASED ON 0.1 mm THICK STENCIL
SCALE:40X

4219492/A 05/2017

NOTES: (continued)

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

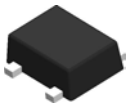
YZV (S–XBGA–N4) DIE–SIZE BALL GRID ARRAY



NOTES:
A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M–1994.
B. This drawing is subject to change without notice.
C. NanoFree™ package configuration.

NanoFree is a trademark of Texas Instruments.

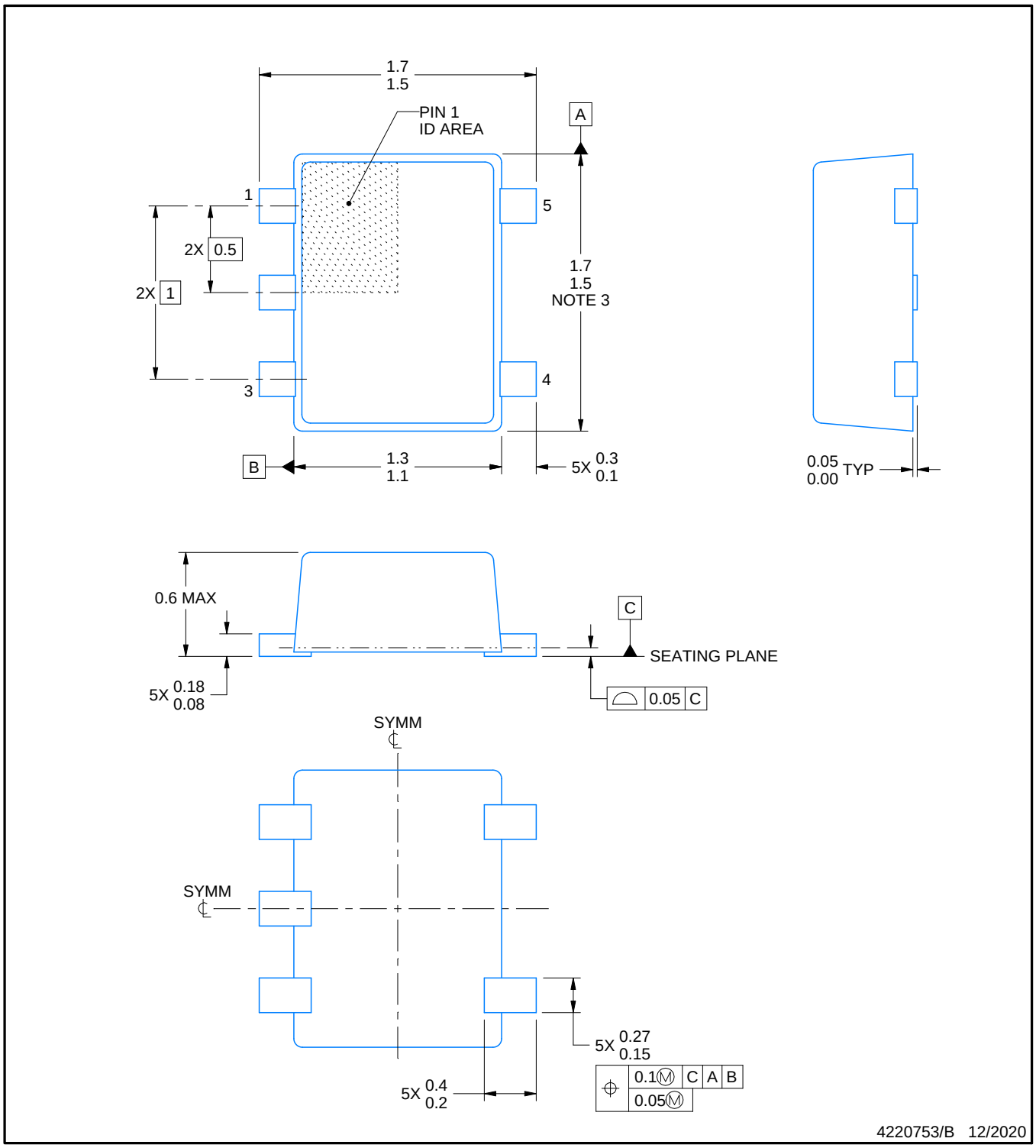
DRL0005A



PACKAGE OUTLINE

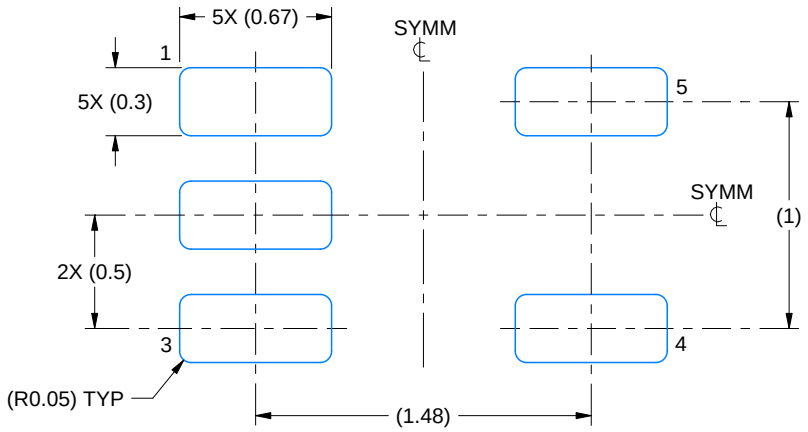
SOT - 0.6 mm max height

PLASTIC SMALL OUTLINE

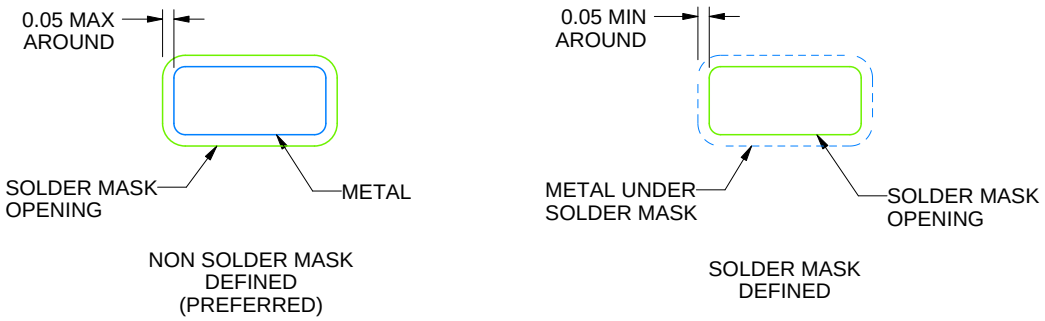


NOTES:

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-293 Variation UAAD-1



LAND PATTERN EXAMPLE
SCALE:30X

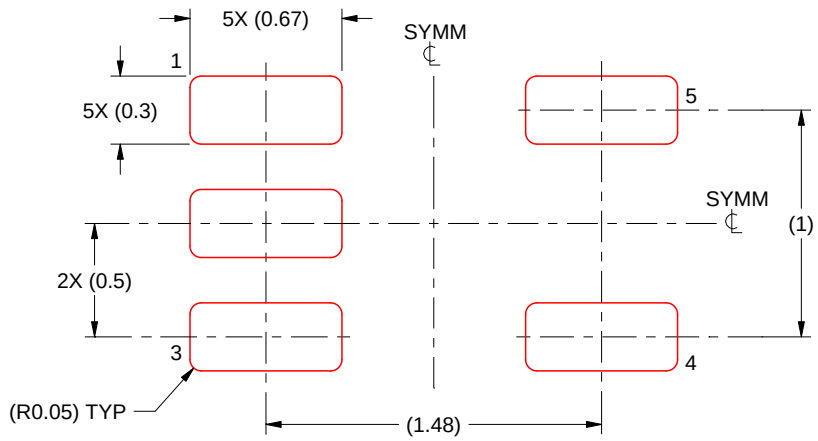


SOLDERMASK DETAILS

4220753/B 12/2020

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 0.1 mm THICK STENCIL
SCALE:30X

4220753/B 12/2020

NOTES: (continued)

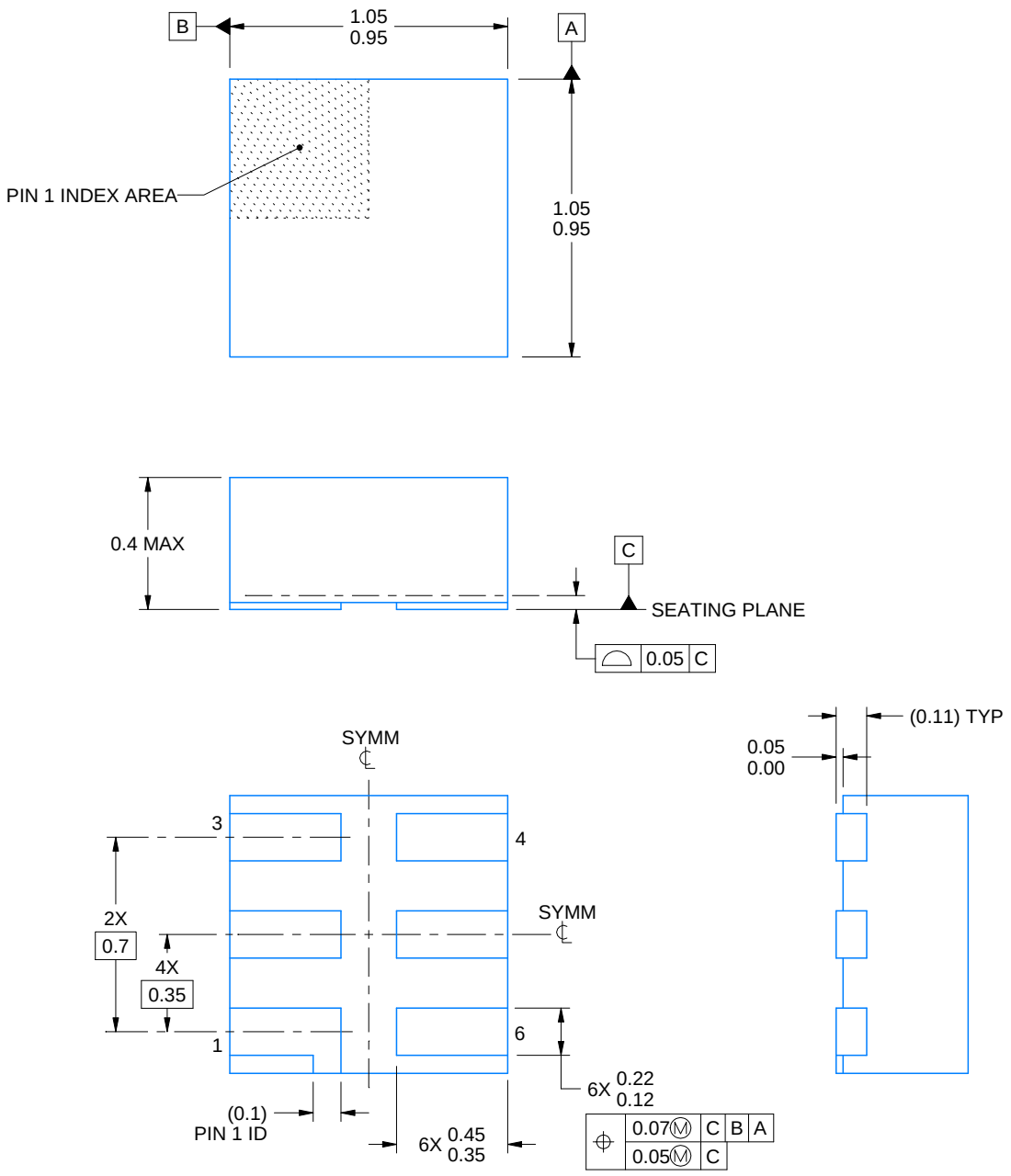
7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
8. Board assembly site may have different recommendations for stencil design.

PACKAGE OUTLINE

DSF0006A

X2SON - 0.4 mm max height

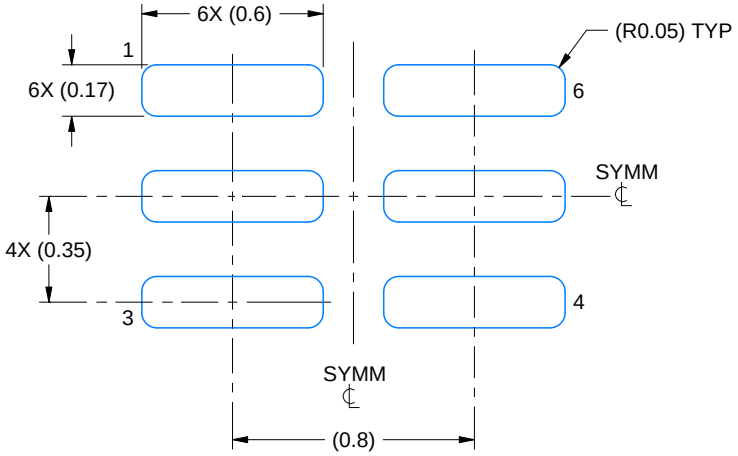
PLASTIC SMALL OUTLINE - NO LEAD



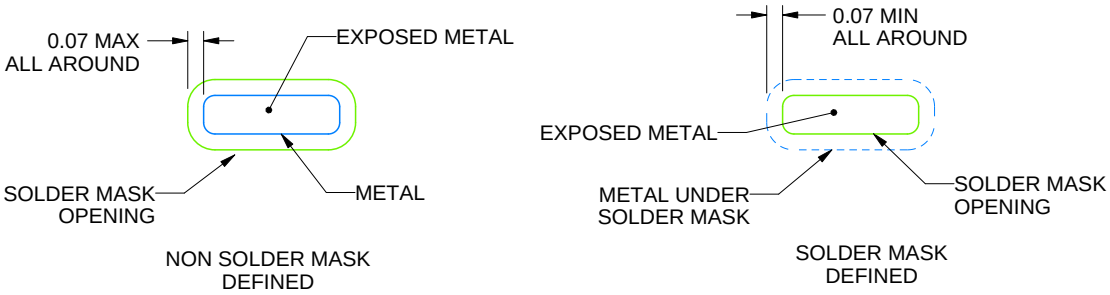
4220597/A 06/2017

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/A 06/2017

NOTES: (continued)

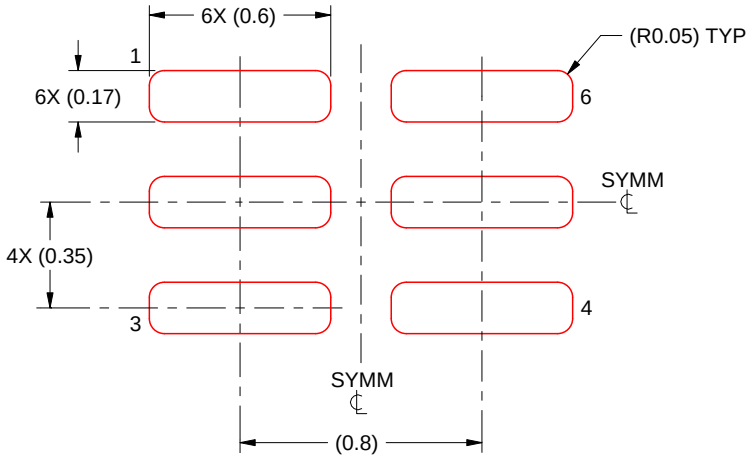
4. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slua271).

EXAMPLE STENCIL DESIGN

DSF0006A

X2SON - 0.4 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



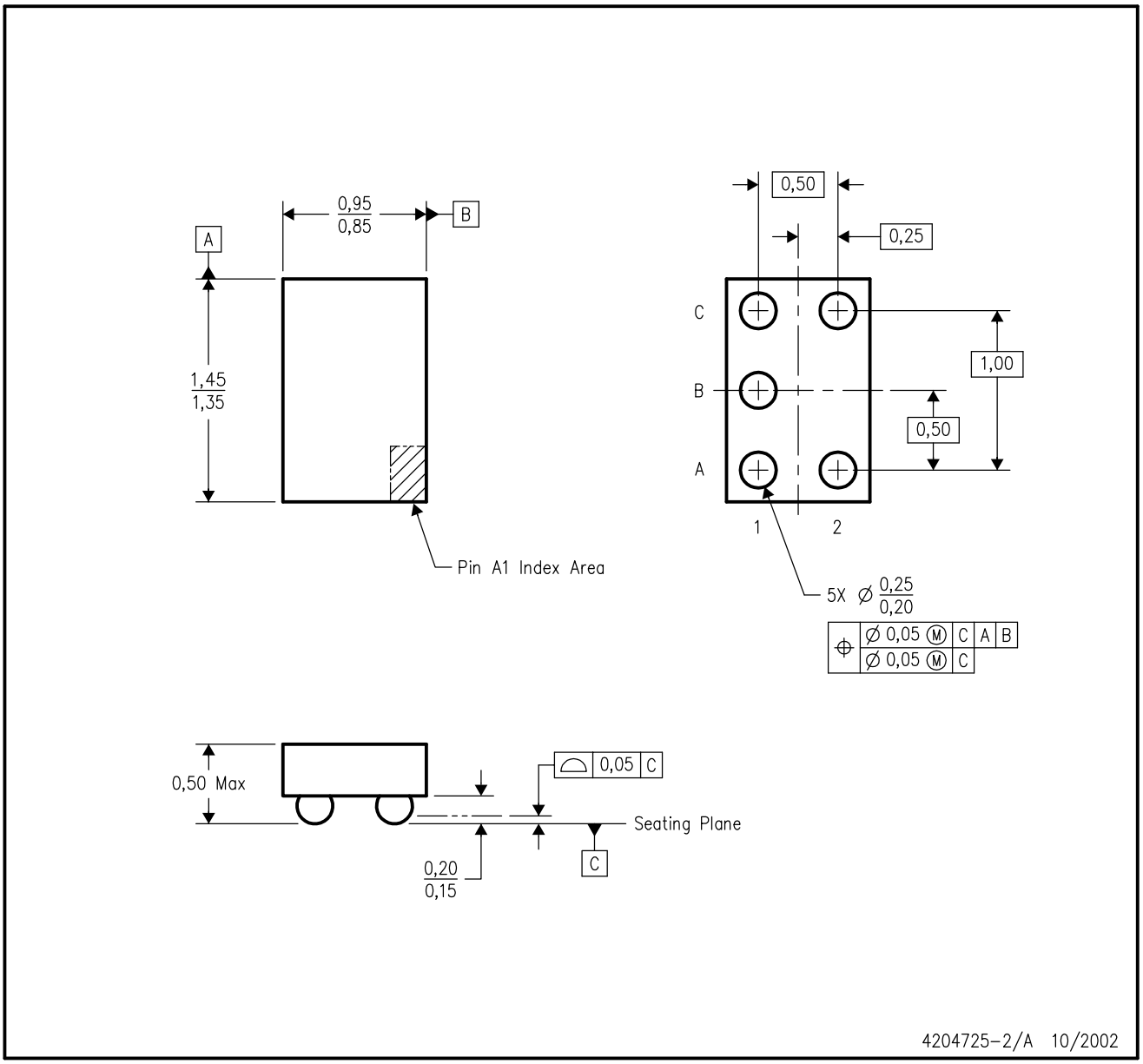
SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL

PRINTED SOLDER COVERAGE BY AREA UNDER PACKAGE
SCALE:40X

4220597/A 06/2017

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

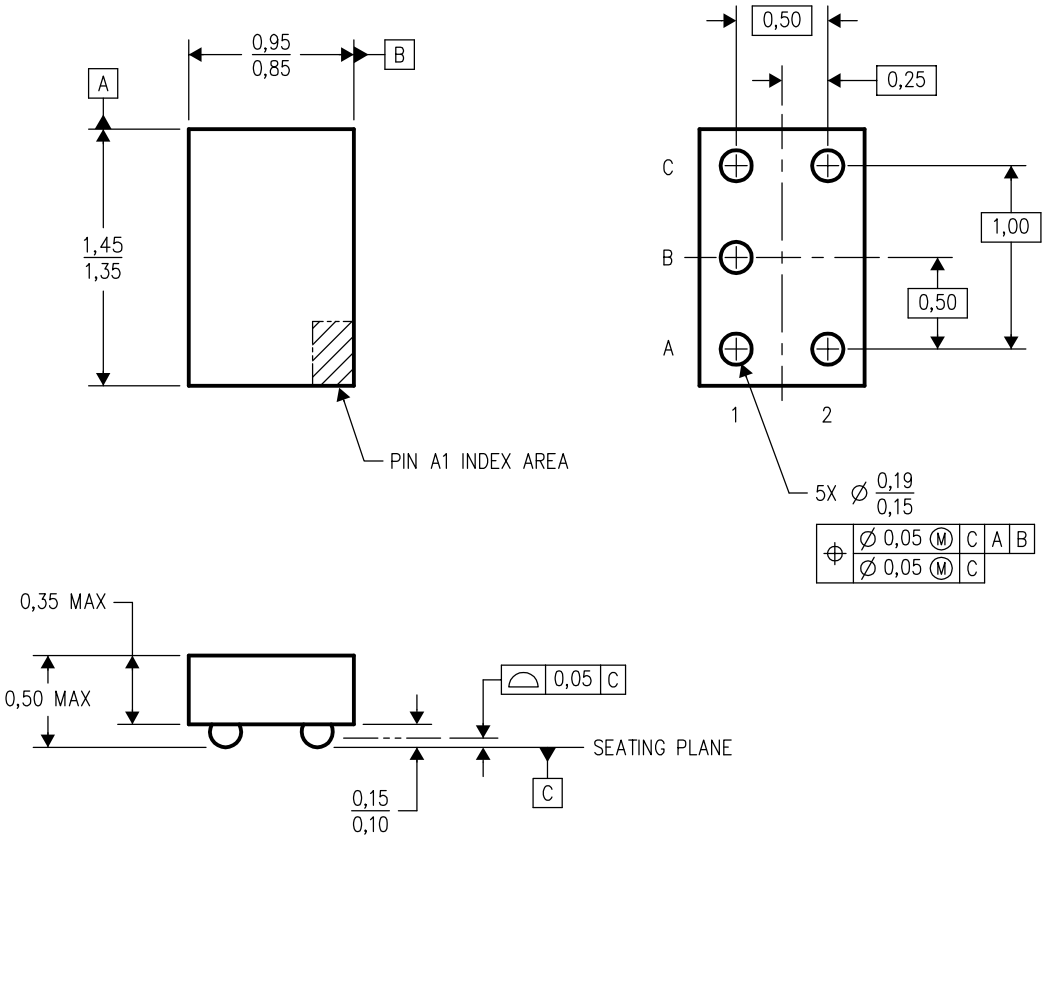
YEP (R–XBGA–N5) DIE–SIZE BALL GRID ARRAY



NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. NanoStar™ package configuration.
D. This package is tin–lead (SnPb). Refer to the 5 YZP package (drawing 4204741) for lead–free.

NanoStar is a trademark of Texas Instruments.

YZA (R–XBGA–N5) DIE–SIZE BALL GRID ARRAY



NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. NanoFree™ package configuration.
D. Package complies to JEDEC MO–211 variation EA.
E. This package is lead–free. Refer to the 5 YEA package (drawing 4203167) for tin–lead (SnPb).

NanoFree is a trademark of Texas Instruments.

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