

CSD83325L 12V 双路 N 通道 NexFET™ 功率 MOSFET

1 特性

- 共漏极结构
- 低导通电阻
- 2.2mm x 1.15mm 小外形封装
- 无铅
- 符合 RoHS 环保标准
- 无卤素
- 栅极静电 (ESD) 保护

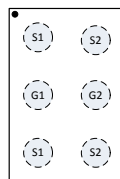
2 应用

- 电池管理
- 电池保护

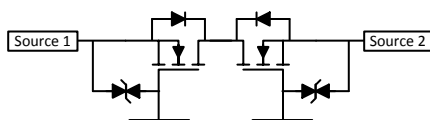
3 说明

此 12V、9.9mΩ、2.2mm x 1.15mm LGA 双路 NexFET™ 功率 MOSFET 旨在以小外形封装最大程度地降低电阻和栅极电荷。该器件的外形尺寸较小并采用共漏极配置，非常适合小型手持设备中由电池供电的应用。

俯视图



配置



产品概要

T _A = 25°C		典型值	单位
V _{S1S2}	源极电压	12	V
Q _g	栅极电荷总量 (4.5V)	8.4	nC
Q _{gd}	栅极电荷 (栅极到漏极)	1.9	nC

产品概要 (接下页)

T _A = 25°C		典型值	单位	
R _{S1S2(on)}	源极至源极导通电阻	V _{GS} = 2.5V	17.5	mΩ
		V _{GS} = 3.8V	10.9	mΩ
		V _{GS} = 4.5V	9.9	mΩ
V _{GS(th)}	阈值电压	0.95	V	

器件信息(1)

器件	数量	包装介质	封装	运输
CSD83325L	3000	7 英寸卷带	2.20mm x 1.15mm 接合栅格阵列 (LGA) 封装	卷带封装
CSD83325LT	250			

(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。

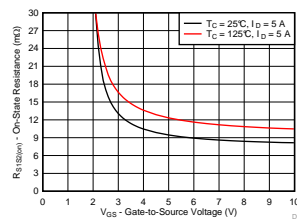
绝对最大额定值

T _A = 25°C		值	单位
V _{S1S2}	源极电压	12	V
V _{GS}	栅源电压	±10	V
I _S	持续源极电流 ⁽¹⁾	8	A
I _{SM}	脉冲源极电流 ⁽²⁾	52	A
P _D	功率耗散	2.3	W
V _(ESD)	人体模型 (HBM)	2000	V
T _J , T _{stg}	工作结温, 储存温度	-55 至 150	°C

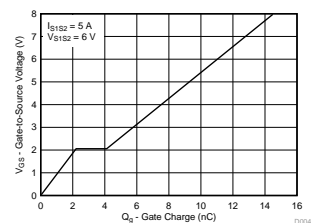
(1) 器件在 105°C 温度下运行。

(2) R_{θJA} = 150°C/W (覆铜面积最小时的典型值)，脉冲持续时间 ≤ 100μs，占空比 ≤ 1%。

R_{DS(on)} 与 V_{GS} 间的关系



栅极电荷



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4 修订历史记录

注：之前版本的页码可能与当前版本有所不同。

Changes from Revision A (January 2016) to Revision B	Page
• Added Diode Characteristics ($V_{F(S-S)}$) in the <i>Electrical Characteristics</i> table	3
• Added Figure 9 to <i>Typical MOSFET Characteristics</i> section	4
• 已添加 接收文档更新通知 部分改为 器件和文档支持 部分	7

Changes from Original (November 2014) to Revision A	Page
• Improved graph setup for readability	4
• 已添加 社区资源	7

5 Specifications

5.1 Electrical Characteristics

 $T_A = 25^\circ\text{C}$ (unless otherwise stated)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC CHARACTERISTICS						
BV_{S1S2}	Source-to-source voltage	$V_{GS} = 0\text{ V}, I_S = 250\ \mu\text{A}$	12			V
I_{S1S2}	Source-to-source leakage current	$V_{GS} = 0\text{ V}, V_{S1S2} = 9.6\text{ V}$			1	μA
I_{GSS}	Gate-to-source leakage current	$V_{S1S2} = 0\text{ V}, V_{GS} = 10\text{ V}$			10	μA
$V_{GS(th)}$	Gate-to-source threshold voltage	$V_{S1S2} = V_{GS}, I_S = 250\ \mu\text{A}$	0.75	0.95	1.25	V
$R_{S1S2(on)}$	Source-to-source on resistance	$V_{GS} = 2.5\text{ V}, I_S = 5\text{ A}$	14.0	17.5	23.0	$\text{m}\Omega$
		$V_{GS} = 3.8\text{ V}, I_S = 5\text{ A}$	8.8	10.9	13.0	$\text{m}\Omega$
		$V_{GS} = 4.5\text{ V}, I_S = 5\text{ A}$	7.9	9.9	11.9	$\text{m}\Omega$
g_{fs}	Transconductance	$V_{S1S2} = 1.2\text{ V}, I_S = 5\text{ A}$		36		S
DYNAMIC CHARACTERISTICS⁽¹⁾						
C_{iss}	Input capacitance	$V_{GS} = 0\text{ V}, V_{S1S2} = 6\text{ V}, f = 1\text{ MHz}$		902	1170	pF
C_{oss}	Output capacitance			187	243	pF
C_{rss}	Reverse transfer capacitance			111	144	pF
Q_g	Gate charge total (4.5 V)	$V_{S1S2} = 6\text{ V}, I_S = 5\text{ A}$		8.4	10.9	nC
Q_{gd}	Gate charge gate-to-drain			1.9		nC
Q_{gs}	Gate charge gate-to-source			2.2		nC
$Q_{g(th)}$	Gate charge at V_{th}			0.6		nC
Q_{oss}	Output charge	$V_{S1S2} = 6\text{ V}, V_{GS} = 0\text{ V}$		2.9		nC
$t_{d(on)}$	Turnon delay time	$V_{S1S2} = 6\text{ V}, V_{GS} = 4.5\text{ V}, I_{S1S2} = 5\text{ A}, R_G = 0\ \Omega$		205		ns
t_r	Rise time			353		ns
$t_{d(off)}$	Turnoff delay time			711		ns
t_f	Fall time			589		ns
DIODE CHARACTERISTICS						
$V_{F(S-S)}$	Source-to-source diode forward voltage	$I_{SS} = 5\text{ A}, V_{G1S1} = 0\text{ V}, V_{G2S2} = 4.5\text{ V}$		0.79	1.0	V

(1) Dynamic characteristics values specified are per single FET.

5.2 Thermal Information

 $T_A = 25^\circ\text{C}$ (unless otherwise stated)

THERMAL METRIC		MIN	TYP	MAX	UNIT
$R_{\theta JA}$	Junction-to-ambient thermal resistance ⁽¹⁾		150		$^\circ\text{C/W}$
	Junction-to-ambient thermal resistance ⁽²⁾		55		

(1) Device mounted on FR4 material with minimum Cu mounting area.

(2) Device mounted on FR4 material with 1-in² (6.45-cm²), 2-oz (0.071-mm) thick Cu.

5.3 Typical MOSFET Characteristics

T_A = 25°C (unless otherwise stated)

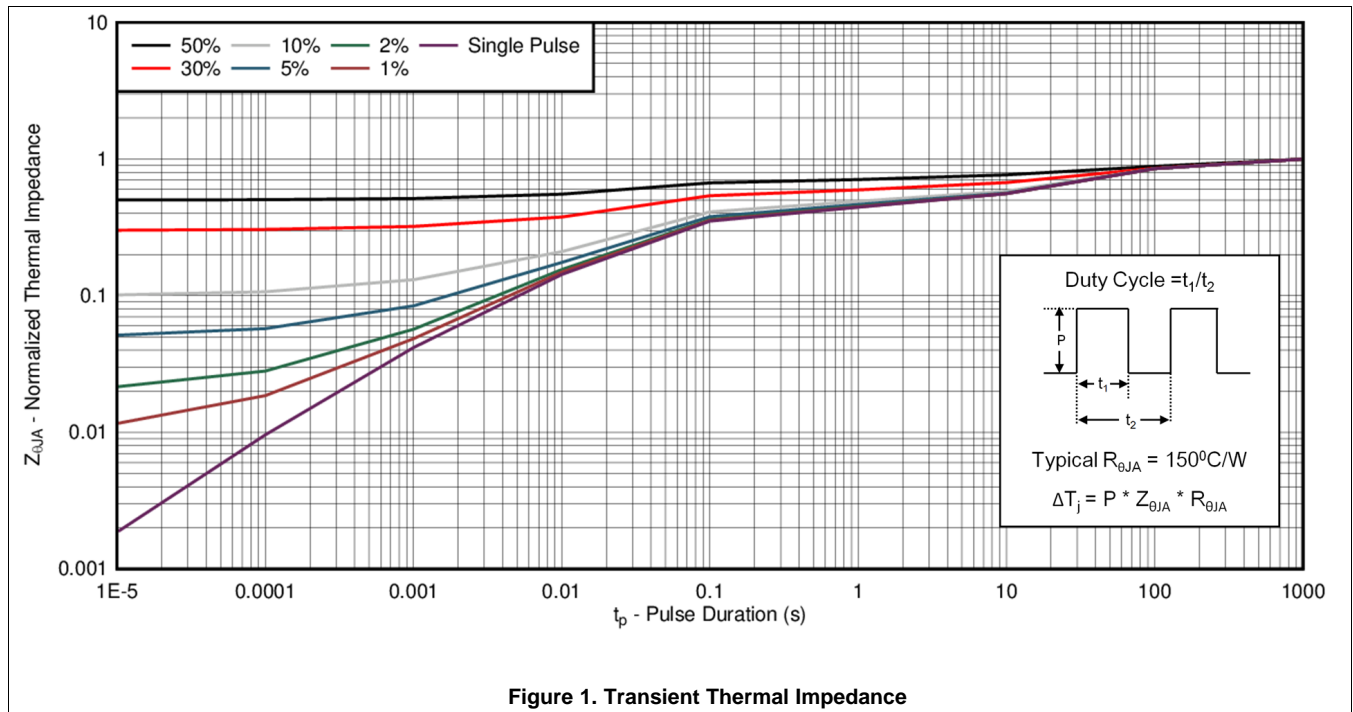


Figure 1. Transient Thermal Impedance

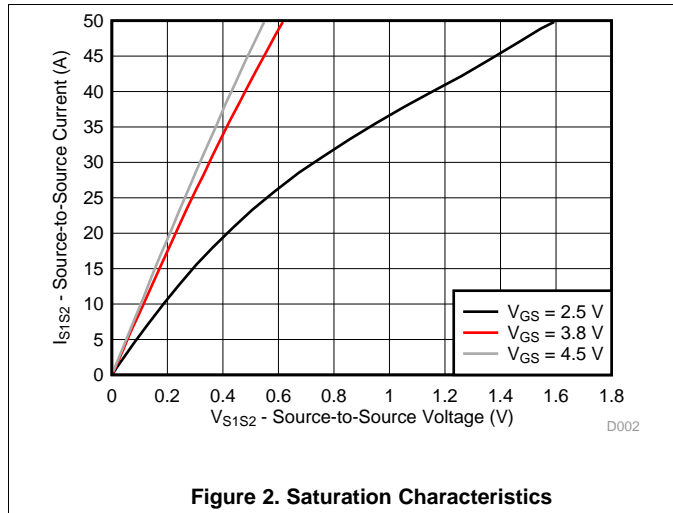


Figure 2. Saturation Characteristics

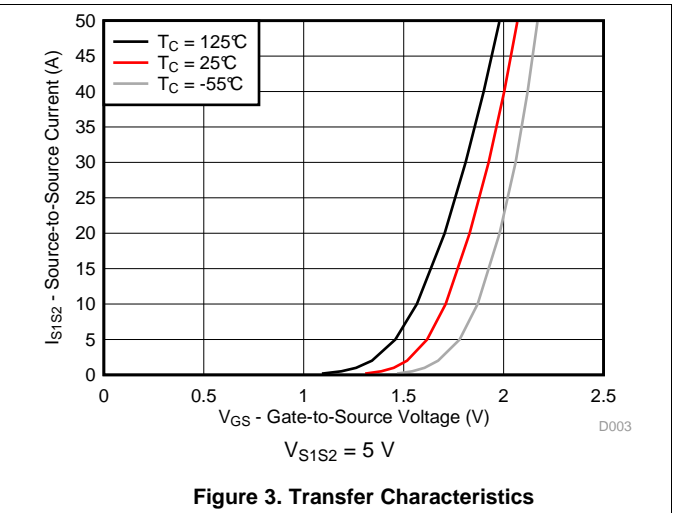
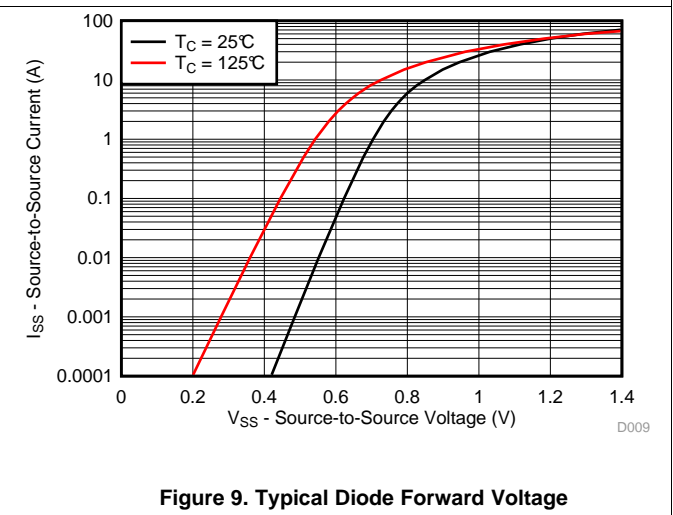
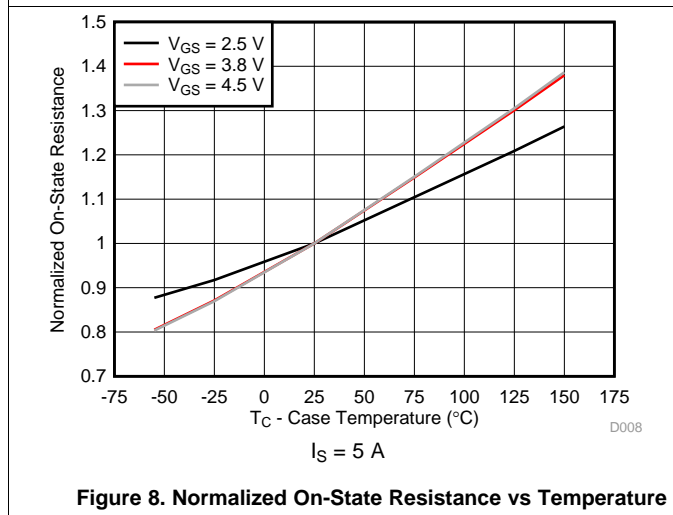
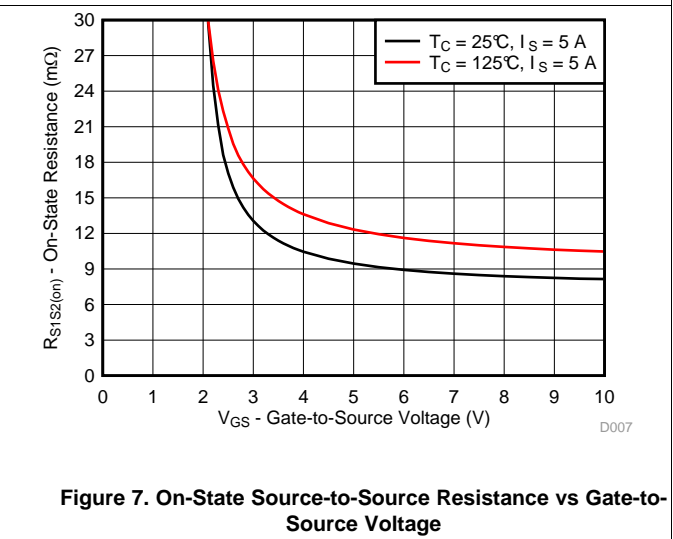
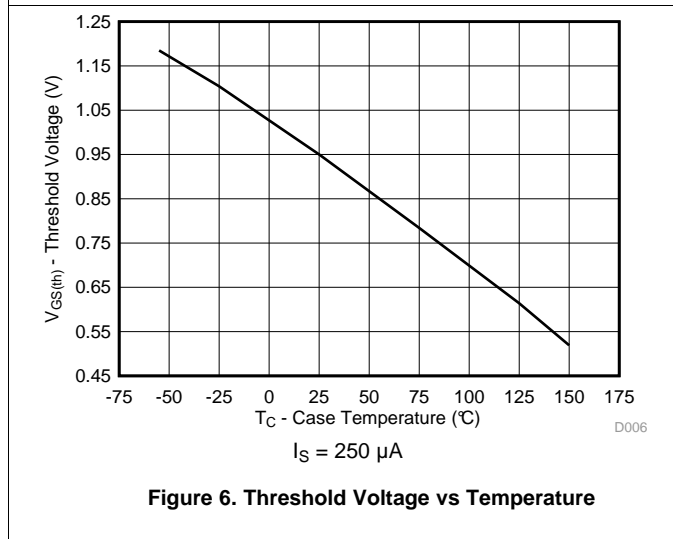
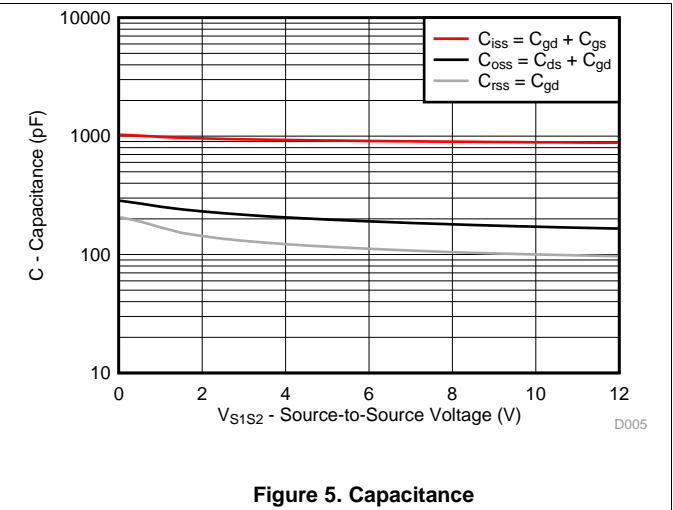
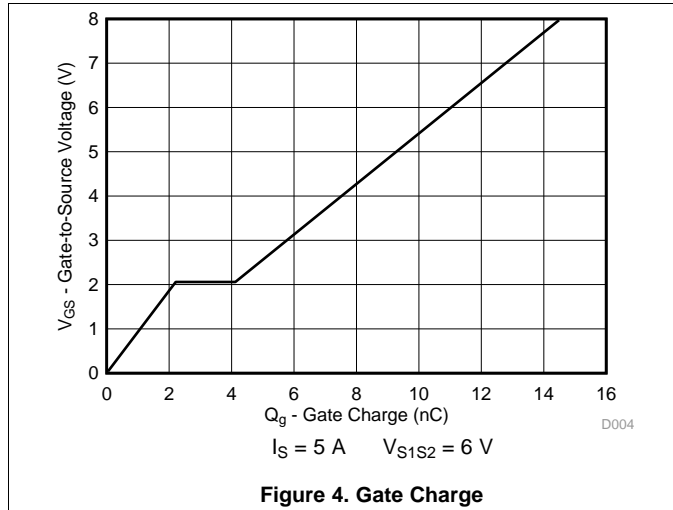


Figure 3. Transfer Characteristics

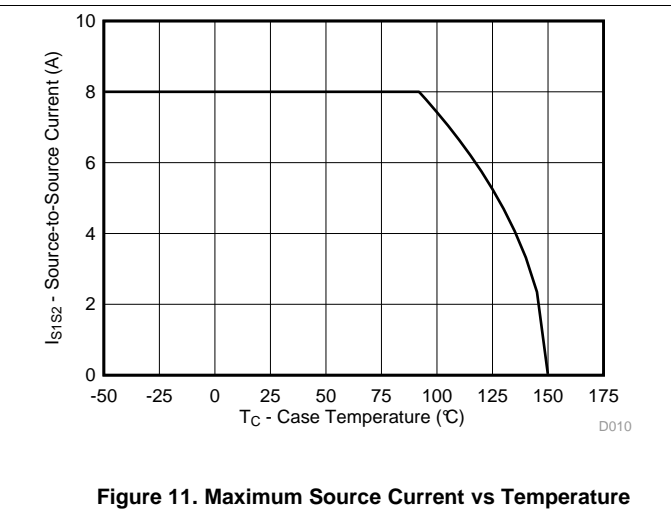
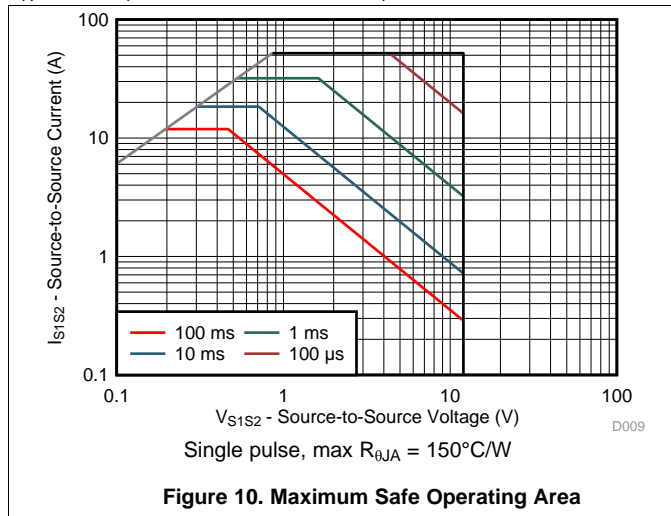
Typical MOSFET Characteristics (continued)

T_A = 25°C (unless otherwise stated)



Typical MOSFET Characteristics (continued)

$T_A = 25^\circ\text{C}$ (unless otherwise stated)



6 器件和文档支持

6.1 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。请单击右上角的 [通知我](#) 进行注册，即可收到任意产品信息更改每周摘要。有关更改的详细信息，请查看任意已修订文档中包含的修订历史记录。

6.2 社区资源

下列链接提供到 TI 社区资源的连接。链接的内容由各个分销商“按照原样”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》](#)。

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设计支持 [TI 参考设计支持](#) 可帮助您快速查找有帮助的 E2E 论坛、设计支持工具以及技术支持的联系信息。

6.3 商标

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6.4 静电放电警告



这些装置包含有限的内置 ESD 保护。存储或装卸时，应将导线一起截短或将装置放置于导电泡棉中，以防止 MOS 门极遭受静电损伤。

6.5 Glossary

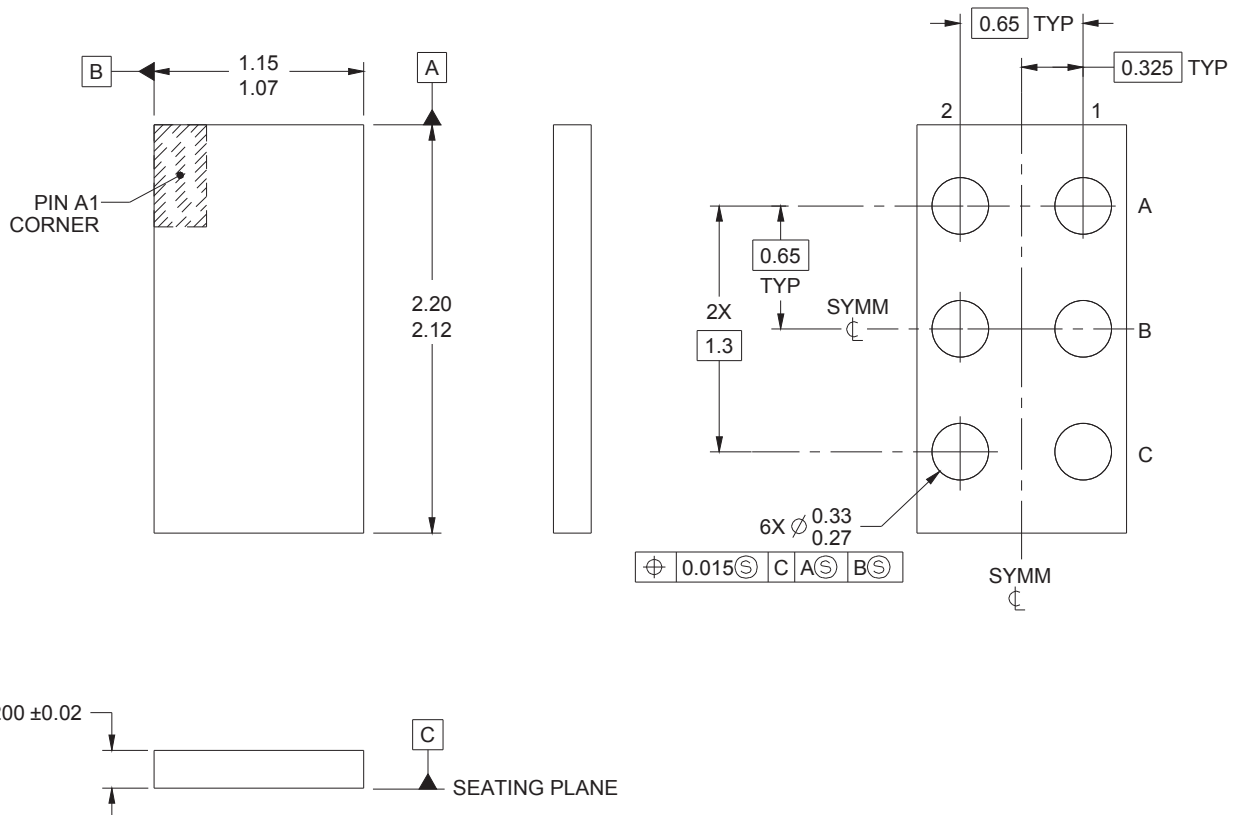
[SLYZ022](#) — *TI Glossary*.

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

7 机械、封装和可订购信息

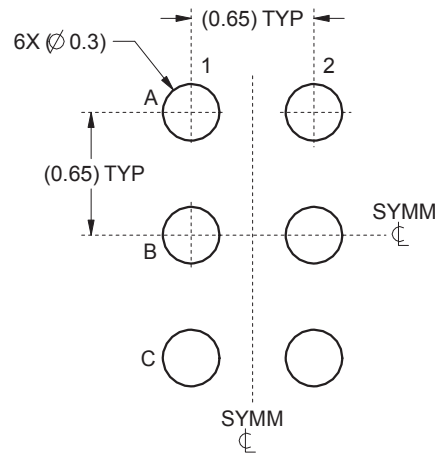
以下页面包括机械、封装和可订购信息。这些信息是指定器件的最新可用数据。这些数据发生变化时，我们可能不会另行通知或修订此文档。如欲获取此产品说明书的浏览器版本，请参见左侧的导航栏。

7.1 封装尺寸

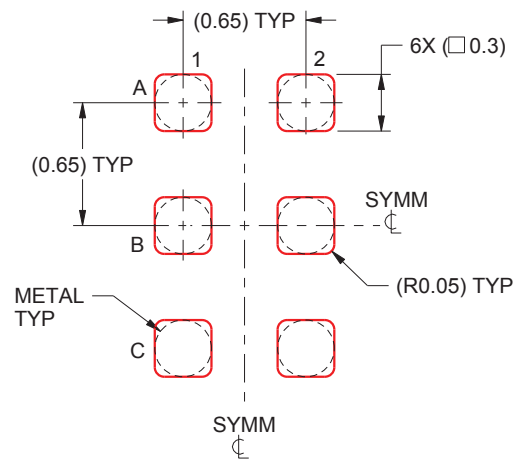


所有尺寸均以毫米为单位。

7.2 推荐的 PCB 布局



7.3 推荐的模板布局



所有尺寸的单位都是毫米。

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
CSD83325L	ACTIVE	PICOSTAR	YJE	6	3000	RoHS & Green	NIAU	Level-1-260C-UNLIM		83325L	Samples
CSD83325LT	ACTIVE	PICOSTAR	YJE	6	250	RoHS & Green	NIAU	Level-1-260C-UNLIM	-55 to 150	83325L	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



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
CSD83325L	PICOST AR	YJE	6	3000	178.0	8.4	1.25	2.34	0.32	4.0	8.0	Q1
CSD83325LT	PICOST AR	YJE	6	250	178.0	8.4	1.25	2.34	0.32	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)
CSD83325L	PICOSTAR	YJE	6	3000	220.0	220.0	35.0
CSD83325LT	PICOSTAR	YJE	6	250	220.0	220.0	35.0

重要声明和免责声明

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