

CSD19536KTT 100V N 通道 NexFET™ 功率 MOSFET

1 特性

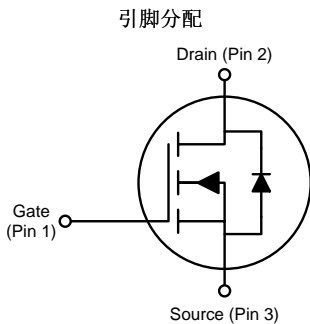
- 超低 Q_g 和 Q_{gd}
- 低热阻
- 雪崩级
- 无铅引脚镀层
- 符合 RoHS 环保标准
- 无卤素
- D²PAK 塑料封装

2 应用

- 次级侧同步整流器
- 热插拔
- 电机控制

3 说明

这款 100V、2mΩ、D²PAK (TO-263) NexFET™ 功率 MOSFET 旨在最大限度地降低功率转换应用中的损耗。



产品概要

$T_A = 25^\circ\text{C}$		典型值		单位
V_{DS}	漏源电压	100		V
Q_g	栅极电荷总量 (10V)	118		nC
Q_{gd}	栅极电荷 (栅极到漏极)	17		nC
$R_{DS(on)}$	漏源导通电阻	$V_{GS} = 6\text{V}$	2.2	mΩ
		$V_{GS} = 10\text{V}$	2	
$V_{GS(th)}$	阈值电压	2.5		V

器件信息(1)

器件	数量	包装介质	封装	运输
CSD19536KTT	500	13 英寸卷带	D ² PAK 塑料封装	卷带封装
CSD19536KTTT	50			

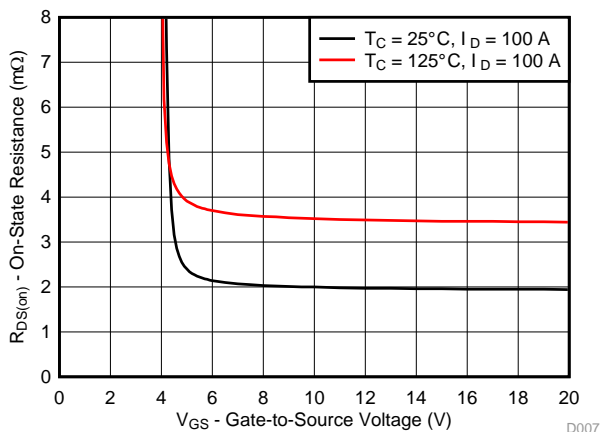
(1) 如需了解所有可用封装, 请参阅产品说明书末尾的可订购产品附录。

绝对最大额定值

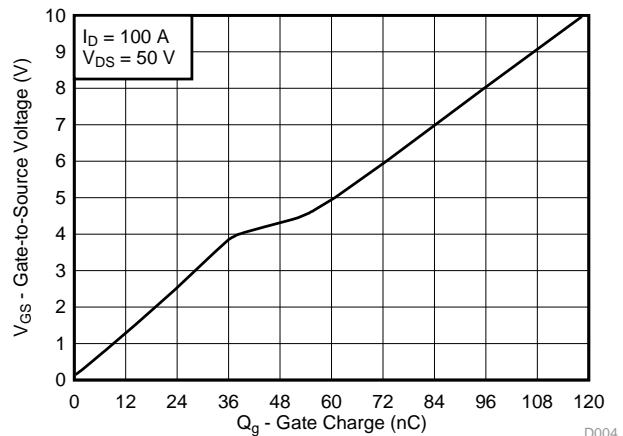
$T_A = 25^\circ\text{C}$		值	单位
V_{DS}	漏源电压	100	V
V_{GS}	栅源电压	±20	V
I_D	持续漏极电流 (受封装限制)	200	A
	持续漏极电流 (受芯片限制), $T_C = 25^\circ\text{C}$ 时测得	272	
	持续漏极电流 (受芯片限制), $T_C = 100^\circ\text{C}$ 时测得	192	
I_{DM}	脉冲漏极电流 ⁽¹⁾	400	A
P_D	功率耗散	375	W
T_J, T_{stg}	工作结温, 储存温度	-55 至 175	°C
E_{AS}	雪崩能量, 单脉冲 $I_D = 127\text{A}, L = 0.1\text{mH}, R_G = 25\Omega$	806	mJ

(1) 最大 $R_{\theta JC} = 0.4^\circ\text{C}/\text{W}$, 脉冲持续时间 $\leq 100\mu\text{s}$, 占比 $\leq 1\%$ 。

$R_{DS(on)}$ 与 V_{GS} 对比



栅极电荷



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4 修订历史记录

Changes from Revision A (May 2015) to Revision B	Page
• 已添加 接收文档更新通知 部分	7
• 更新了封装图	8
• 更新了 PCB 图	9
• 更新了模版图	10

Changes from Original (March 2015) to Revision A	Page
• 添加了 社区资源 部分	7
• 已添加 PCB 和模版布局图至 机械、封装和可订购信息	8

5 Specifications

5.1 Electrical Characteristics

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

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC CHARACTERISTICS						
V_{DSS}	Drain-to-source voltage	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	100			V
I_{DSS}	Drain-to-source leakage current	$V_{GS} = 0\text{ V}, V_{DS} = 80\text{ V}$			1	μA
I_{GSS}	Gate-to-source leakage current	$V_{DS} = 0\text{ V}, V_{GS} = 20\text{ V}$			100	nA
$V_{GS(th)}$	Gate-to-source threshold voltage	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	2.1	2.5	3.2	V
$R_{DS(on)}$	Drain-to-source on-resistance	$V_{GS} = 6\text{ V}, I_D = 100\text{ A}$		2.2	2.8	m Ω
		$V_{GS} = 10\text{ V}, I_D = 100\text{ A}$		2	2.4	
g_{fs}	Transconductance	$V_{DS} = 10\text{ V}, I_D = 100\text{ A}$		329		S
DYNAMIC CHARACTERISTICS						
C_{iss}	Input capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 50\text{ V}, f = 1\text{ MHz}$		9250	12000	pF
C_{oss}	Output capacitance			1820	2370	pF
C_{rss}	Reverse transfer capacitance			47	61	pF
R_G	Series gate resistance			1.4	2.8	Ω
Q_g	Gate charge total (10 V)	$V_{DS} = 50\text{ V}, I_D = 100\text{ A}$		118	153	nC
Q_{gd}	Gate charge gate-to-drain			17		nC
Q_{gs}	Gate charge gate-to-source			37		nC
$Q_{g(th)}$	Gate charge at V_{th}			24		nC
Q_{oss}	Output charge	$V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V}$		335		nC
$t_{d(on)}$	Turnon delay time	$V_{DS} = 50\text{ V}, V_{GS} = 10\text{ V}, I_{DS} = 100\text{ A}, R_G = 0\ \Omega$		13		ns
t_r	Rise time			8		ns
$t_{d(off)}$	Turnoff delay time			32		ns
t_f	Fall time			6		ns
DIODE CHARACTERISTICS						
V_{SD}	Diode forward voltage	$I_{SD} = 100\text{ A}, V_{GS} = 0\text{ V}$		0.9	1.1	V
Q_{rr}	Reverse recovery charge	$V_{DS} = 50\text{ V}, I_F = 100\text{ A}, di/dt = 300\text{ A}/\mu\text{s}$		548		nC
t_{rr}	Reverse recovery time			103		ns

5.2 Thermal Information

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

THERMAL METRIC		MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-case thermal resistance			0.4	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Junction-to-ambient thermal resistance			62	$^\circ\text{C}/\text{W}$

5.3 Typical MOSFET Characteristics

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

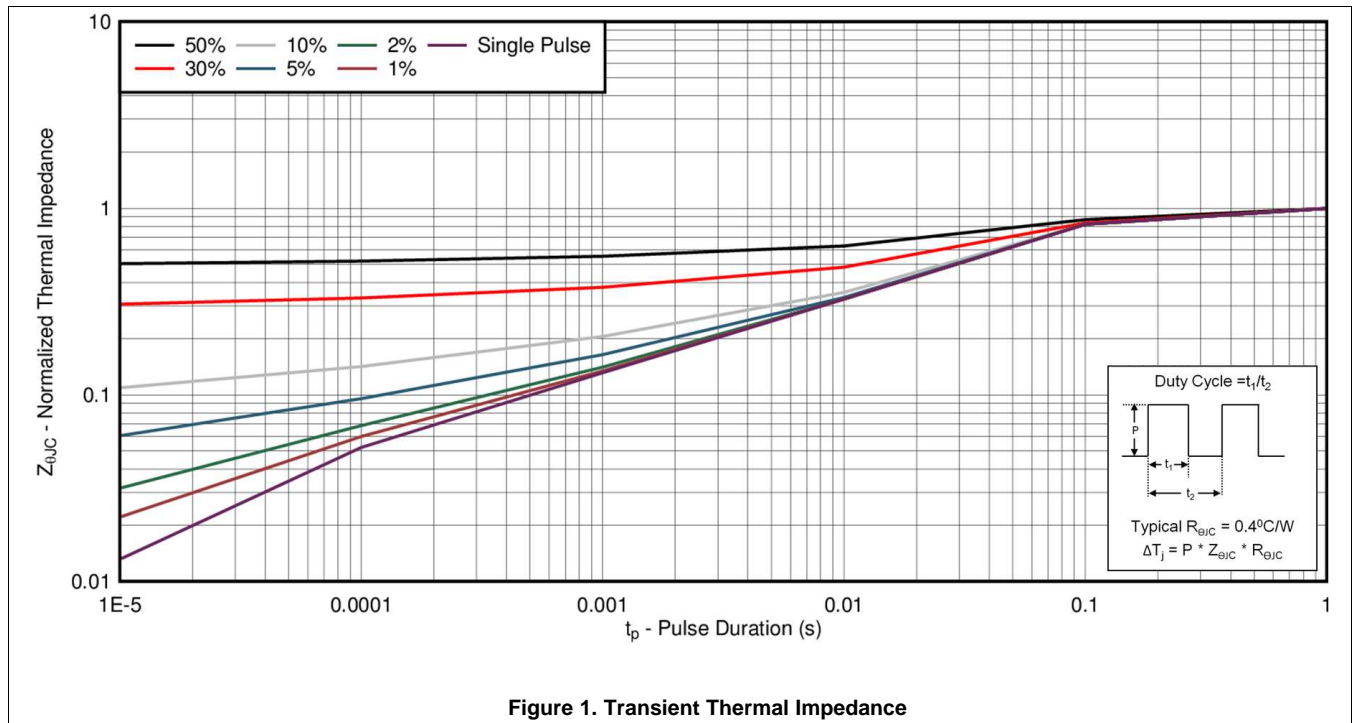


Figure 1. Transient Thermal Impedance

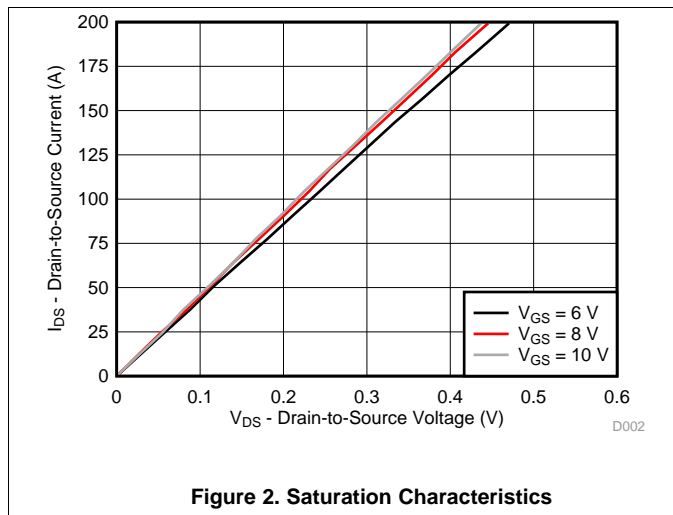


Figure 2. Saturation Characteristics

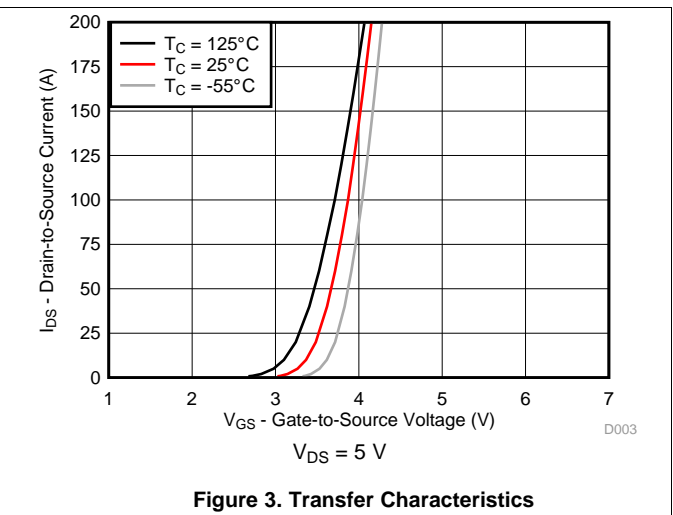
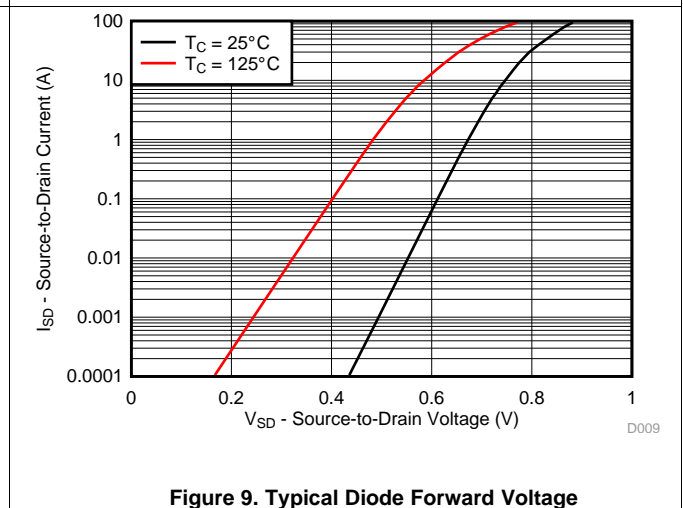
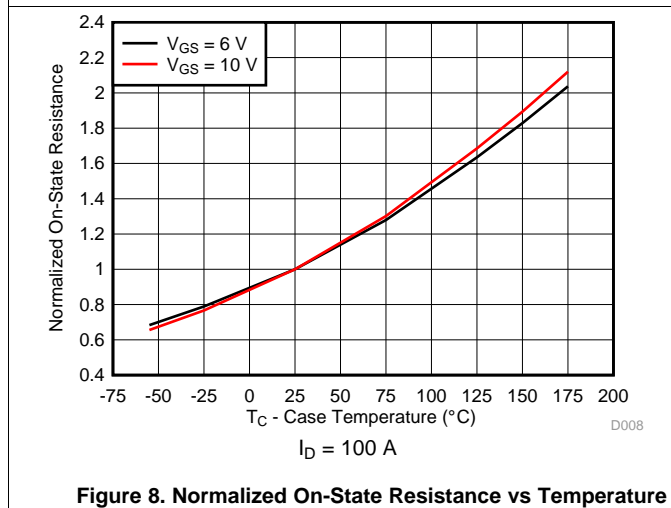
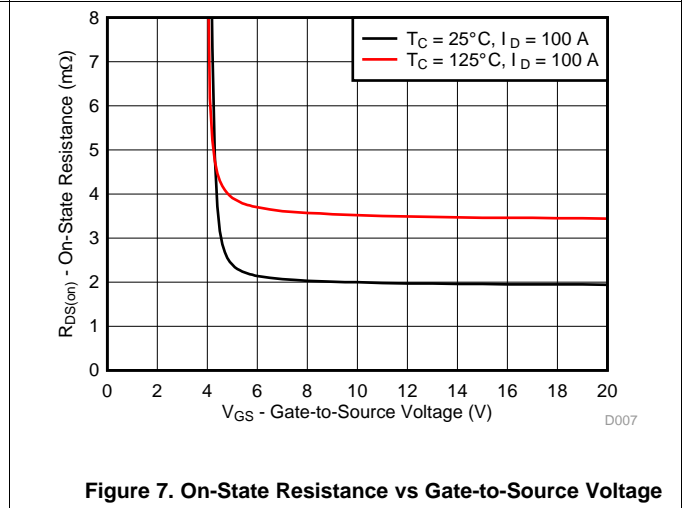
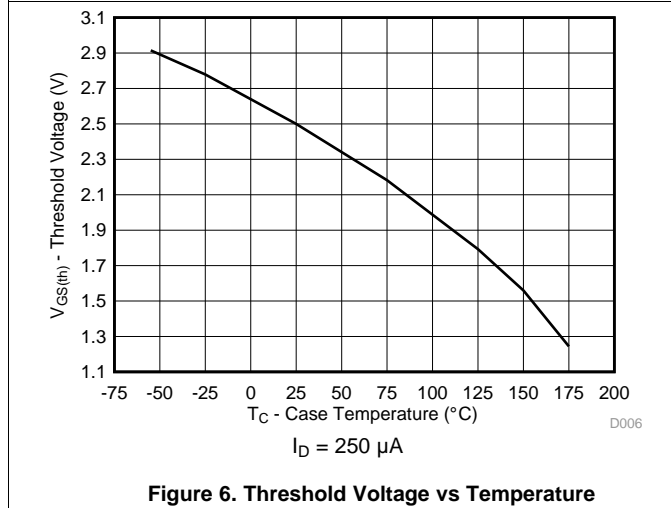
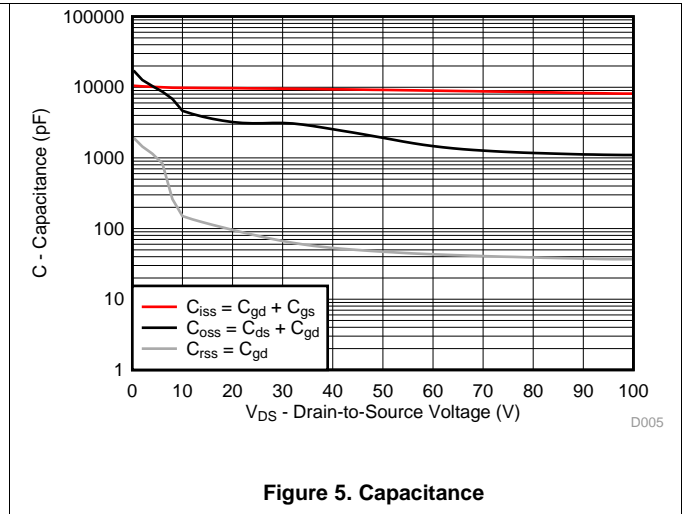
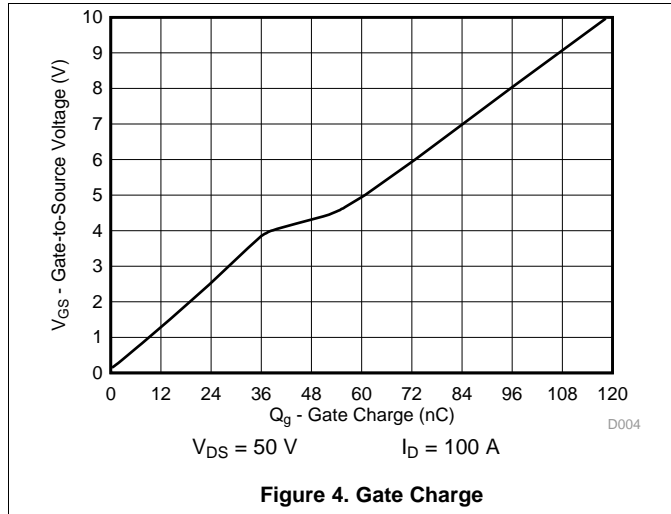


Figure 3. Transfer Characteristics

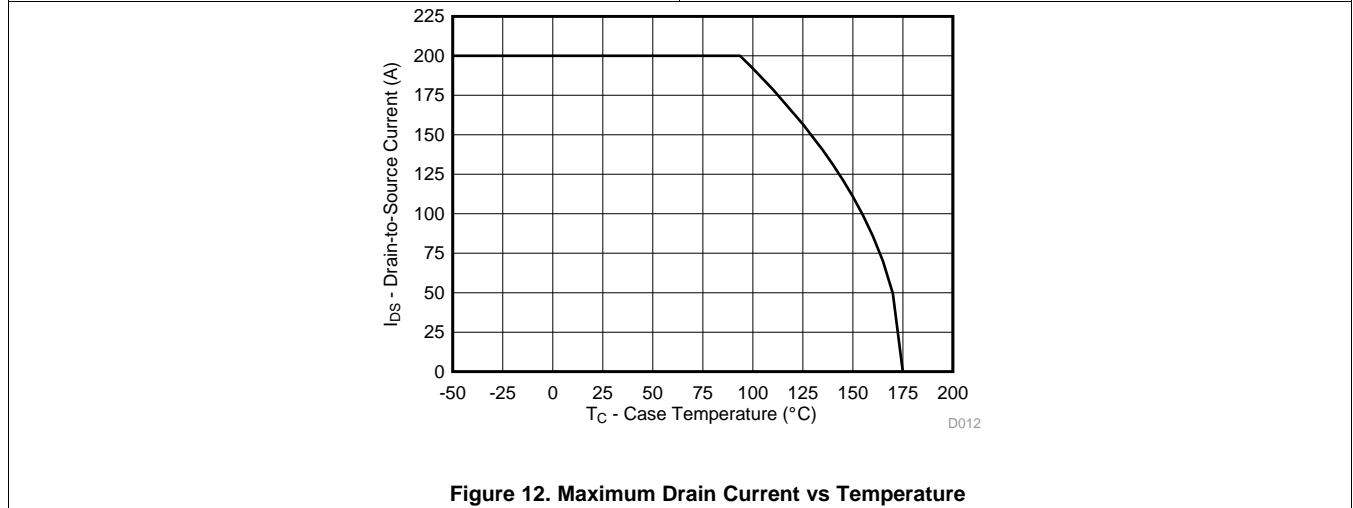
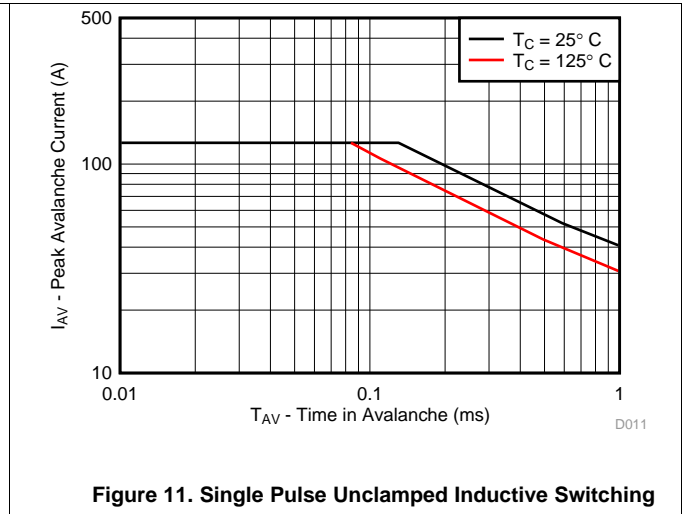
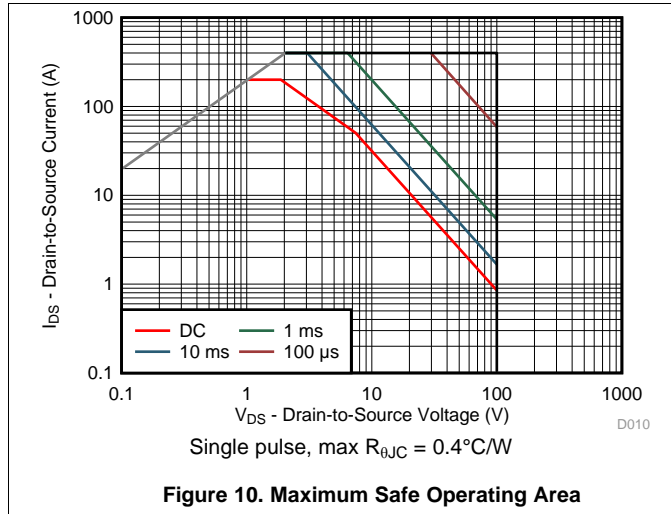
Typical MOSFET Characteristics (continued)

$T_A = 25^\circ\text{C}$ (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，请导航至德州仪器 TI.com.cn 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

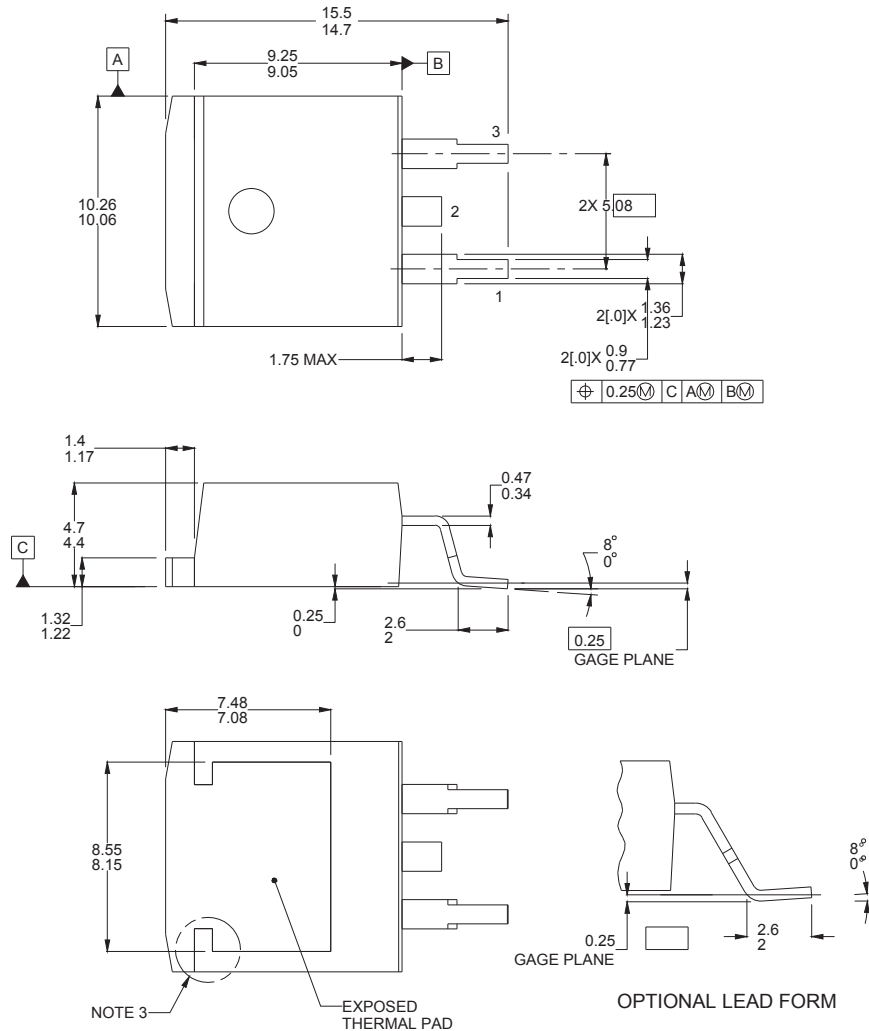
SLYZ022 — *TI Glossary*.

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，请参阅左侧的导航栏。

7.1 KTT 封装尺寸



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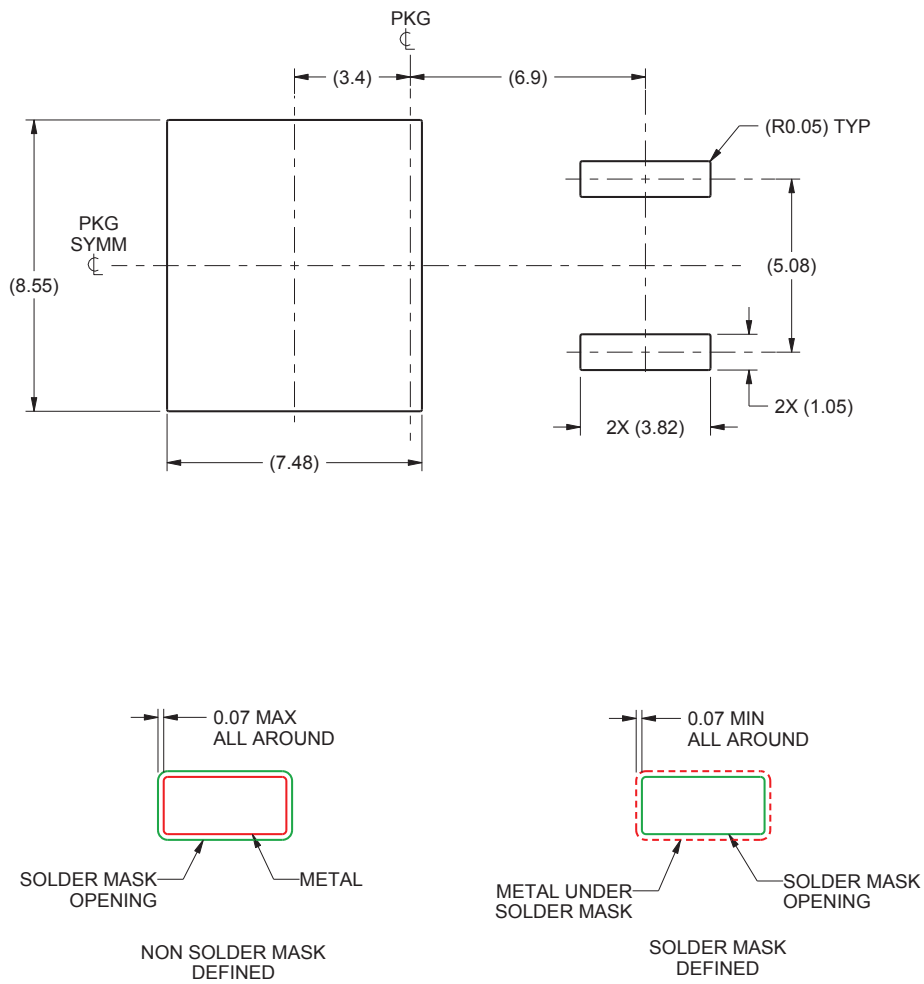
注:

1. 所有线性尺寸的单位均为毫米。括号中的任何尺寸仅供参考。尺寸和容限值遵循 ASME Y14.5M。
2. 本图纸如有变更，恕不通知。
3. 来自不同装配现场的产品可能不具备某些特性，形状也可能有所不同。

表 1. 引脚配置

位置	名称
引脚 1	栅极
引脚 2 / 标签	漏极
引脚 3	源极

7.2 推荐的 PCB 布局

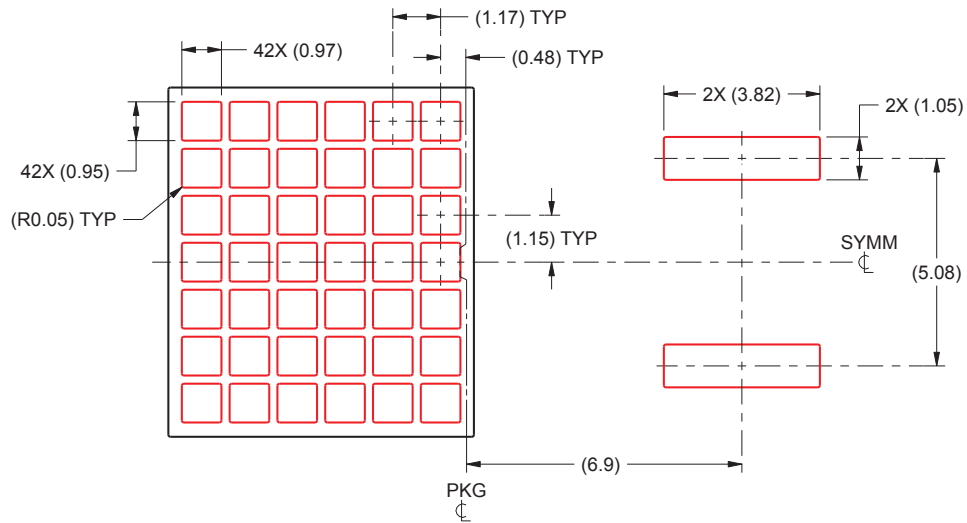


4222117/A 08/2015

注:

1. 此封装设计用于焊接到电路板的散热焊盘上。有关详细信息，请参阅德州仪器 (TI) 文献编号 SLMA002 (www.ti.com/cn/lit/slma002) 和 SLMA004 (www.ti.com/cn/lit/slma004)。

7.3 建议模版开孔



注:

1. 具有漏斗形壁和圆角的激光切割窗孔将提供最佳的焊锡膏脱离。IPC-7525 可能提供其他替代性设计建议。
2. 在电路板装配现场，对于模板设计可能有不同的建议。

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)
CSD19536KTT	Active	Production	DDPAK/ TO-263 (KTT) 2	500 LARGE T&R	ROHS Exempt	SN	Level-2-260C-1 YEAR	-55 to 175	CSD19536KTT
CSD19536KTT.Z	Active	Production	DDPAK/ TO-263 (KTT) 2	500 LARGE T&R	ROHS Exempt	SN	Level-2-260C-1 YEAR	-55 to 175	CSD19536KTT
CSD19536KTTT	Active	Production	DDPAK/ TO-263 (KTT) 2	50 SMALL T&R	ROHS Exempt	SN	Level-2-260C-1 YEAR	-55 to 175	CSD19536KTT
CSD19536KTTT.Z	Active	Production	DDPAK/ TO-263 (KTT) 2	50 SMALL T&R	ROHS Exempt	SN	Level-2-260C-1 YEAR	-55 to 175	CSD19536KTT

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

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

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

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

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

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

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

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TAPE AND REEL INFORMATION

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
CSD19536KTT	DDPAK/ TO-263	KTT	3	500	330.0	24.4	10.8	16.3	5.11	16.0	24.0	Q2
CSD19536KTTT	DDPAK/ TO-263	KTT	3	50	330.0	24.4	10.8	16.3	5.11	16.0	24.0	Q2

TAPE AND REEL BOX DIMENSIONS


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
CSD19536KTT	DDPAK/TO-263	KTT	3	500	340.0	340.0	38.0
CSD19536KTTT	DDPAK/TO-263	KTT	3	50	340.0	340.0	38.0

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