

CSD25211W1015, P 通道 NexFET™ 功率金属氧化物半导体场效应晶体管 (MOSFET)

查询样片: [CSD25211W1015](#)

特性

- 超低导通电阻
- 超低 Q_g 和 Q_{gd}
- 小尺寸封装 **1.0mm x 1.5mm**
- 低高度 (高度为 **0.62mm**)
- 无铅
- 栅 - 源电压钳位
- 栅极静电放电 (ESD) 保护-3kV
- 符合 RoHS 环保标准
- 无卤素

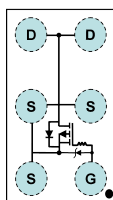
应用范围

- 电池管理
- 负载开关
- 电池保护

说明

此器件设计用于在超薄且具有出色散热特性的超小外形尺寸封装内产生尽可能低的导通电阻和栅极电荷。

顶视图



产品概述

除非额外注明, 否则 $T_A = 25^\circ\text{C}$		典型值	单位
V_{DS}	漏源极电压	-20	V
Q_g	栅极电荷总数 (-4.5V)	3.4	nC
Q_{gd}	栅漏栅极电荷	0.2	nC
$R_{DS(on)}$	漏源导通电阻	$V_{GS} = -2.5\text{V}$	36 mΩ
		$V_{GS} = -4.5\text{V}$	27 mΩ
$V_{GS(th)}$	电压阈值	-0.8	V

订购信息

器件	封装	介质	数量	出货
CSD25211W1015	1 x 1.5 晶圆级封装	7 英寸卷带	3000	卷带封装

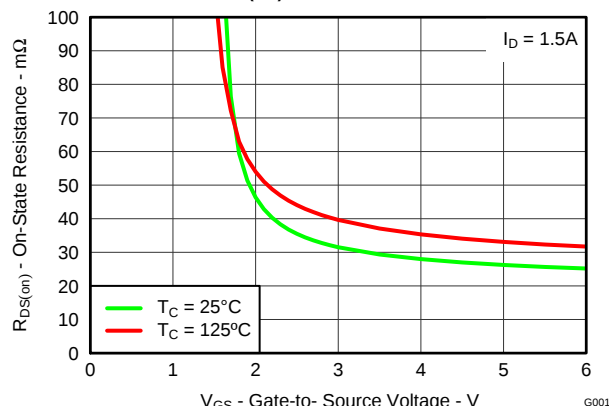
绝对最大额定值

$T_A = 25^\circ\text{C}$ 时测得, 除非另外注明		值	单位
V_{DS}	漏源极电压	-20	V
V_{GS}	栅源极电压	-6	V
I_D	持续漏极电流, $T_A = 25^\circ\text{C}^{(1)}$	-3.2	A
I_{DM}	脉冲漏极电流, $T_A = 25^\circ\text{C}^{(2)}$	-9.5	A
I_G	持续栅极电流, $T_A = 25^\circ\text{C}$	-0.5	A
	脉冲栅极电流	-7	A
P_D	功率耗散 ⁽¹⁾	1	W
T_{STG}	储存温度范围	-55 至 150	$^\circ\text{C}$
T_J	工作结温范围		

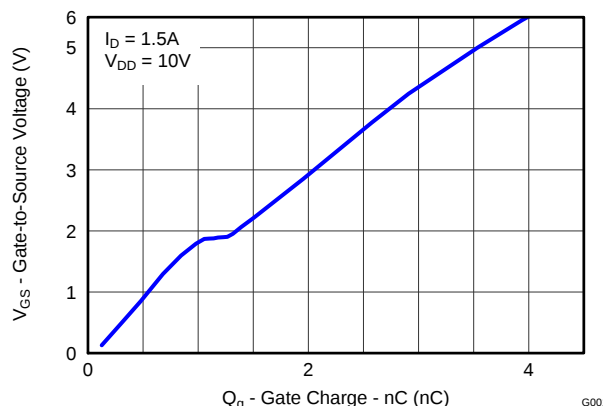
(1) $R_{\theta JA} = 119^\circ\text{C/W}$, 这是在厚度为 0.06 英寸的环氧板 (FR4) 印刷电路板 (PCB) 上的 1 英寸² 2 盎司铜过渡片上测得的典型值。

(2) 脉宽 $\leq 10\mu\text{s}$, 占空比 $\leq 2\%$

$R_{DS(on)}$ 与 V_{GS} 间的关系



栅极电荷



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PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of the Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.



These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

ELECTRICAL CHARACTERISTICS

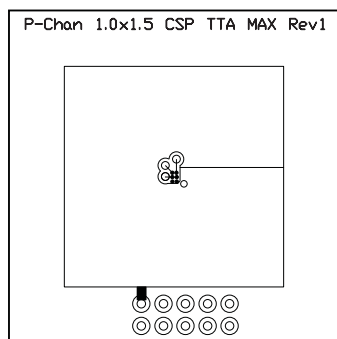
($T_A = 25^\circ\text{C}$ unless otherwise stated)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
Static Characteristics						
BV _{DSS}	Drain-to-Source Voltage	V _{GS} = 0 V, I _D = −250 μA	−20			V
BV _{GSS}	Gate-to-Source Voltage	V _{DS} = 0 V, I _G = −250 μA	−6.1		−7.2	V
I _{DSS}	Drain-to-Source Leakage Current	V _{GS} = 0 V, V _{DS} = −16 V			−1	μA
I _{GSS}	Gate-to-Source Leakage Current	V _{DS} = 0 V, V _{GS} = −6 V			−100	nA
V _{GS(th)}	Gate-to-Source Threshold Voltage	V _{DS} = V _{GS} , I _D = −250 μA	−0.5	−0.8	−1.1	V
R _{DS(on)}	Drain-to-Source On Resistance	V _{GS} = −2.5 V, I _D = −1.5 A		36	44	mΩ
		V _{GS} = −4.5 V, I _D = −1.5 A		27	33	mΩ
g _{fs}	Transconductance	V _{DS} = −10 V, I _D = −1.5 A		12		S
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V, V _{DS} = −10V, f = 1MHz		475	570	pF
C _{OSS}	Output Capacitance			234	281	pF
C _{RSS}	Reverse Transfer Capacitance			10.5	13.1	pF
Q _g	Gate Charge Total (−4.5 V)	V _{DS} = −10V, I _D = −1.5A		3.4	4.1	nC
Q _{gd}	Gate Charge Gate to Drain			0.2		nC
Q _{gs}	Gate Charge Gate to Source			1.1		nC
Q _{g(th)}	Gate Charge at V _{th}			0.6		nC
Q _{OSS}	Output Charge	V _{DS} = −10V, V _{GS} = 0V		3.8		nC
t _{d(on)}	Turn On Delay Time	V _{DS} = −10 V, V _{GS} = −4.5 V, I _D = −1.5 A R _G = 4 Ω		13.6		ns
t _r	Rise Time			8.8		ns
t _{d(off)}	Turn Off Delay Time			36.9		ns
t _f	Fall Time			14.2		ns
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _S = −1.5 A, V _{GS} = 0 V		−0.8	−1	V
Q _{rr}	Reverse Recovery Charge	V _{dd} = −10 V, I _F = −1.5 A, di/dt = 200 A/μs		6.9		nC
t _{rr}	Reverse Recovery Time			11.6		ns

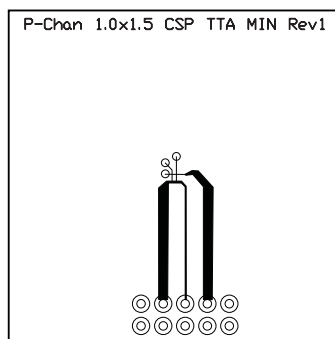
THERMAL CHARACTERISTICS

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

PARAMETER		MIN	TYP	MAX	UNIT
$R_{\theta JA}$	Thermal Resistance Junction to Ambient (Minimum Cu area)			230	$^\circ\text{C}/\text{W}$
	Thermal Resistance Junction to Ambient (1 in ² Cu area)			149	$^\circ\text{C}/\text{W}$



Max $R_{\theta JA} = 149^{\circ}\text{C/W}$
when mounted on 1
 inch^2 of 2 oz. Cu.



Max $R_{\theta JA} = 230^{\circ}\text{C/W}$
when mounted on
minimum pad area of
2 oz. Cu.

TYPICAL MOSFET CHARACTERISTICS

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

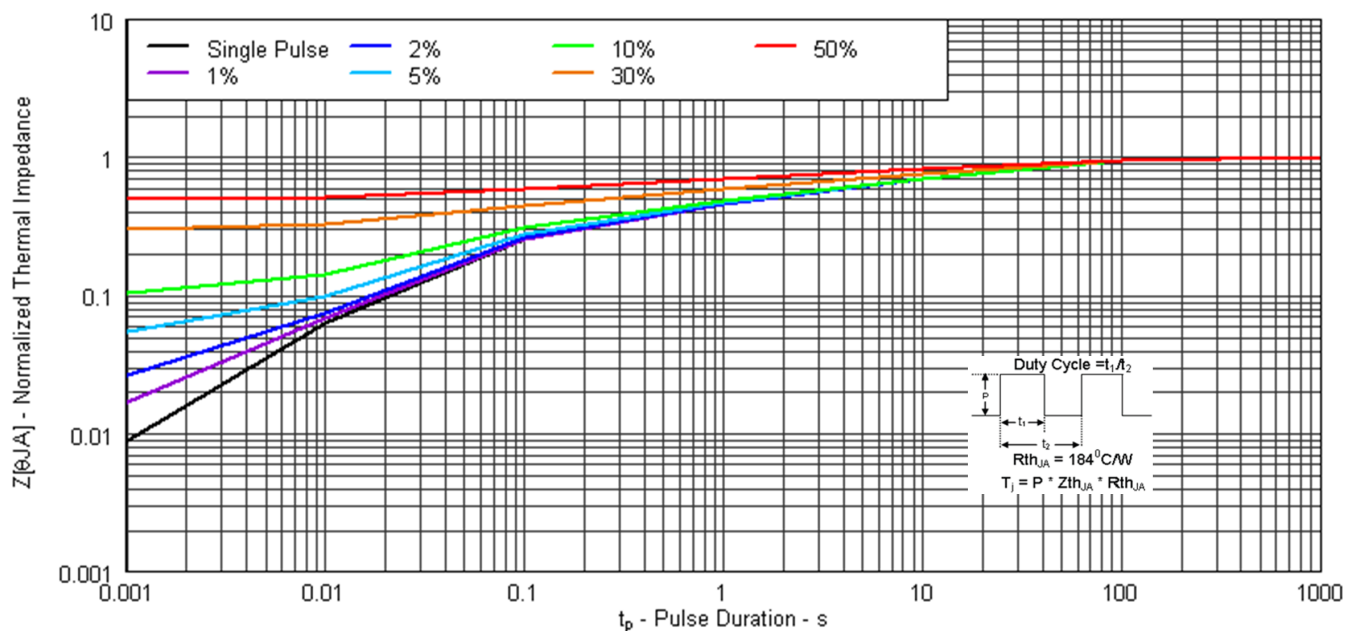
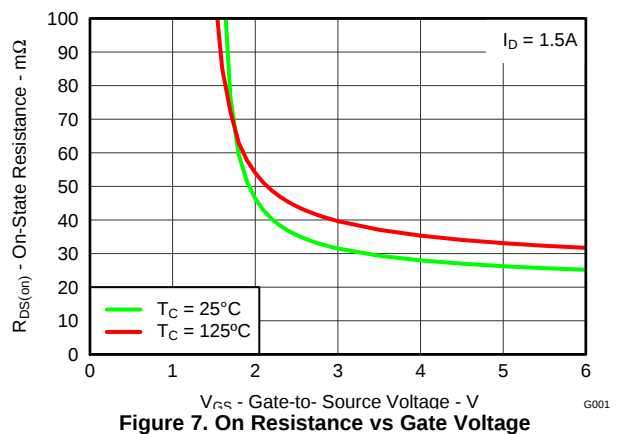
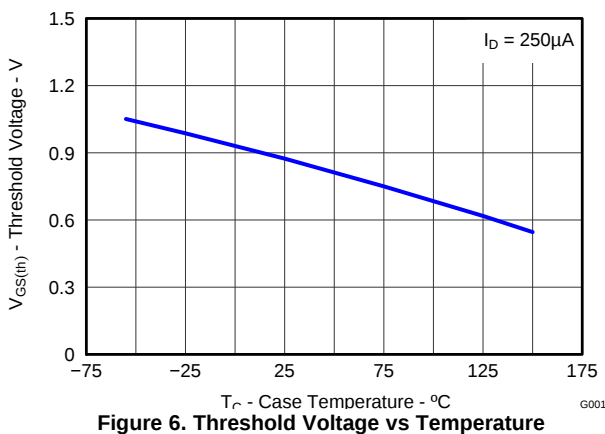
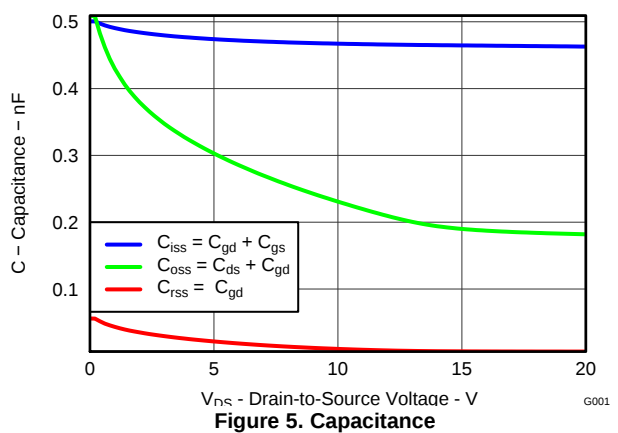
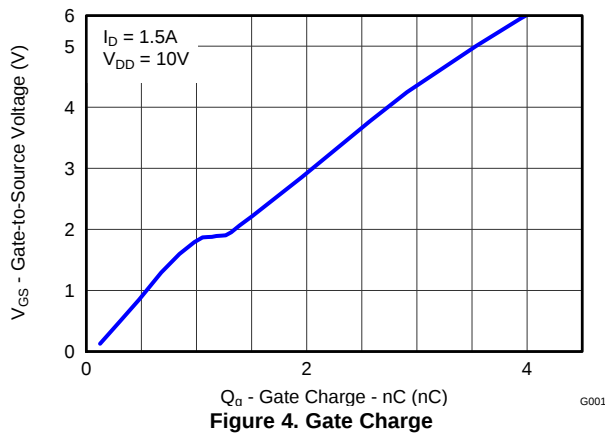
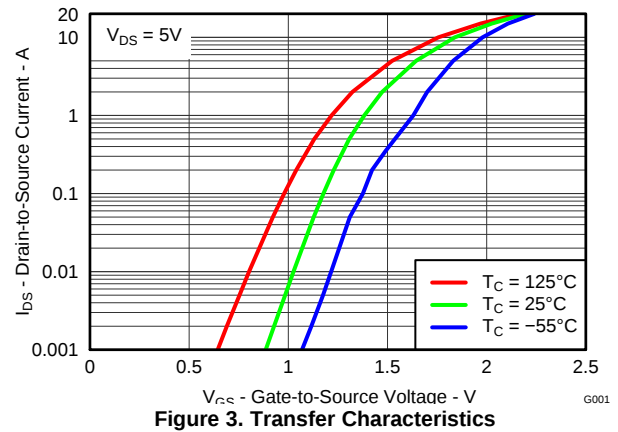
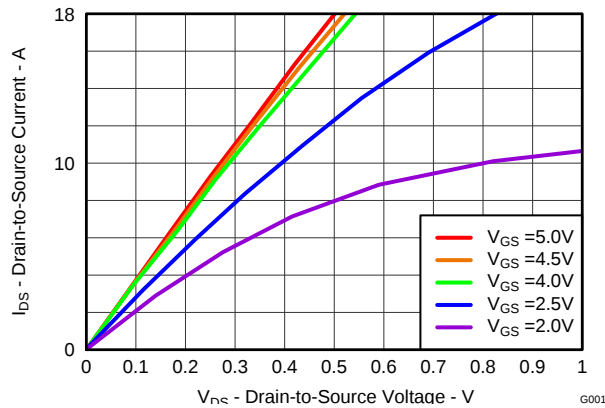


Figure 1. Transient Thermal Impedance

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)

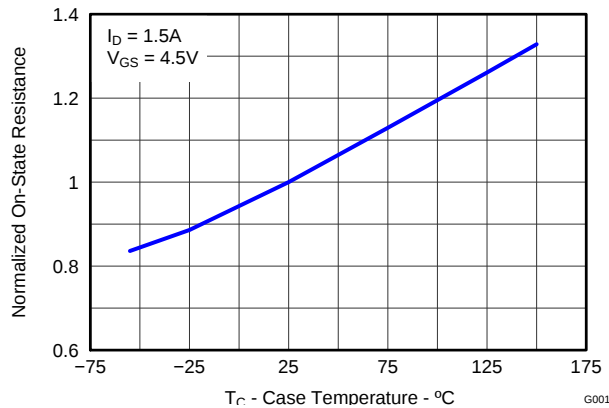


Figure 8. Normalized On Resistance vs Temperature

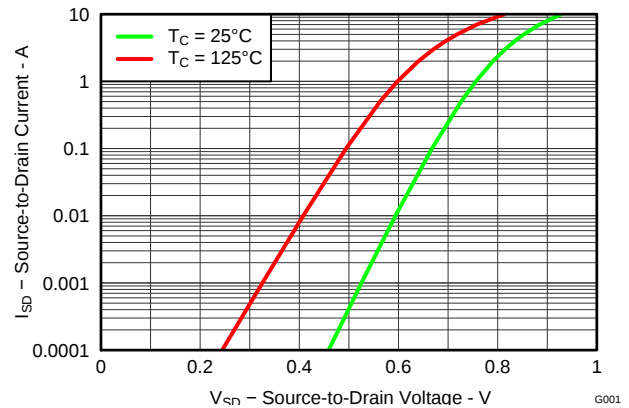


Figure 9. Typical Diode Forward Voltage

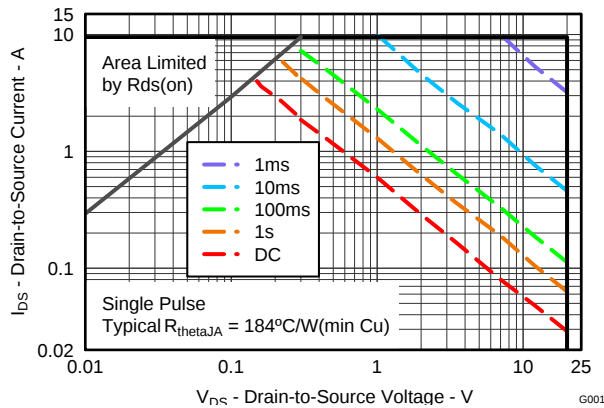


Figure 10. Maximum Safe Operating Area

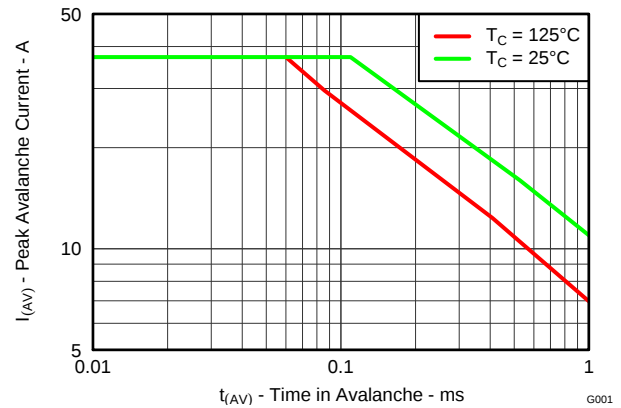


Figure 11. Single Pulse Unclamped Inductive Switching

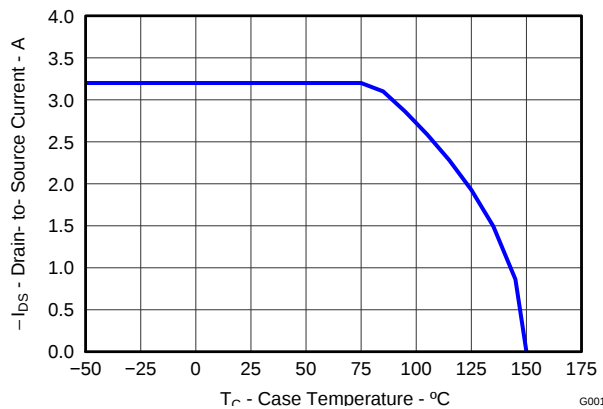
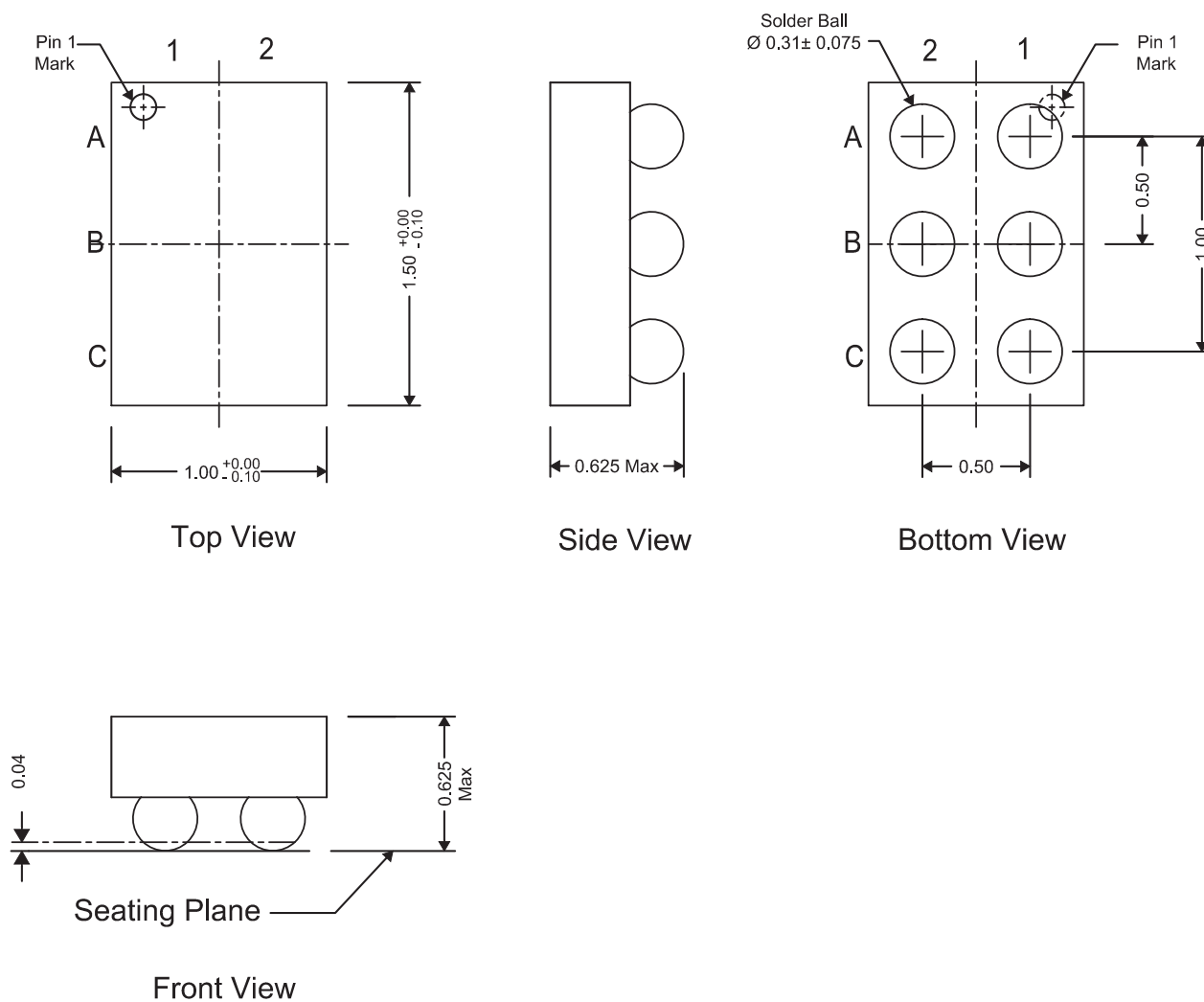


Figure 12. Maximum Drain Current vs Temperature

MECHANICAL DATA

CSD25211W1015 Package Dimensions

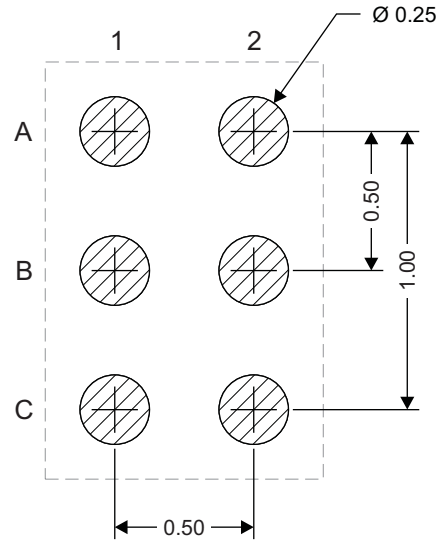


NOTE: All dimensions are in mm (unless otherwise specified)

Pinout

POSITION	DESIGNATION
C1, C2	Drain
A1	Gate
A2, B1, B2	Source

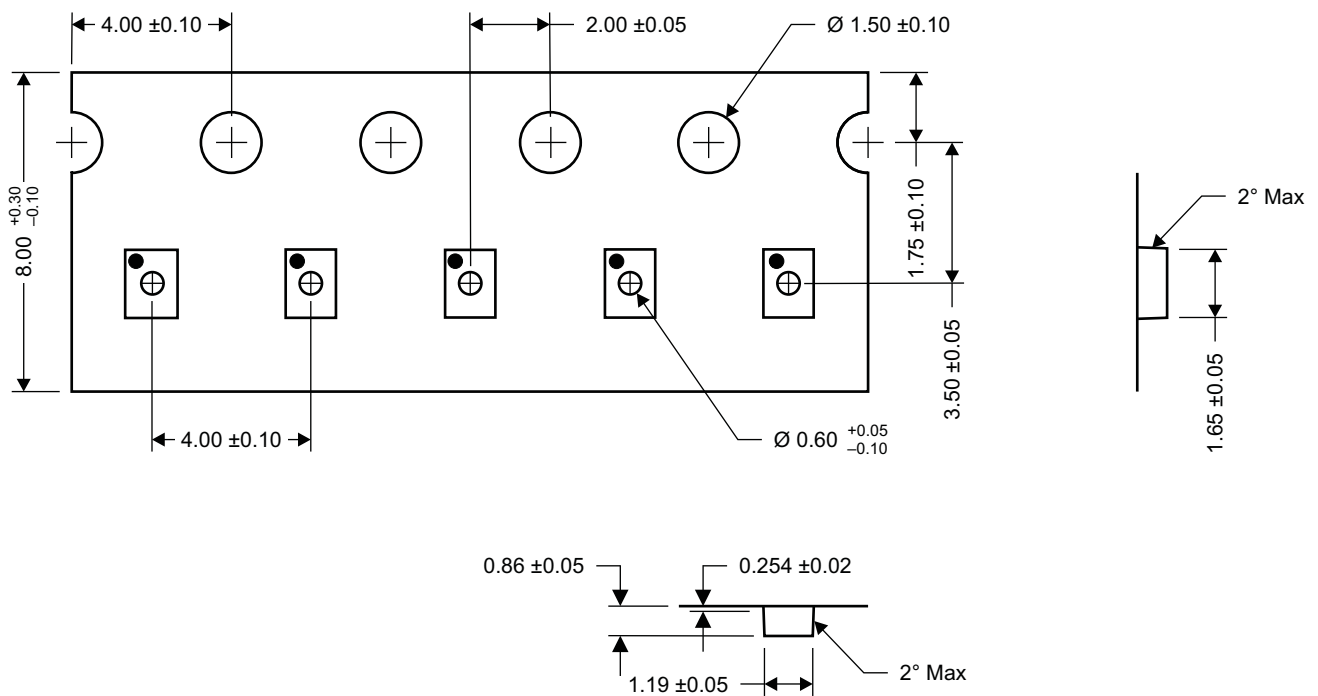
Land Pattern Recommendation



M0158-01

NOTE: All dimensions are in mm (unless otherwise specified)

Tape and Reel Information



M0159-01

NOTE: All dimensions are in mm (unless otherwise specified)

修订历史记录

Changes from Original (February 2012) to Revision A	Page
• 已包含器件型号	1
• Added more precision	6

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
CSD25211W1015	ACTIVE	DSBGA	YZC	6	3000	RoHS & Green	SNAGCU	Level-1-260C-UNLIM	-55 to 150	25211	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.

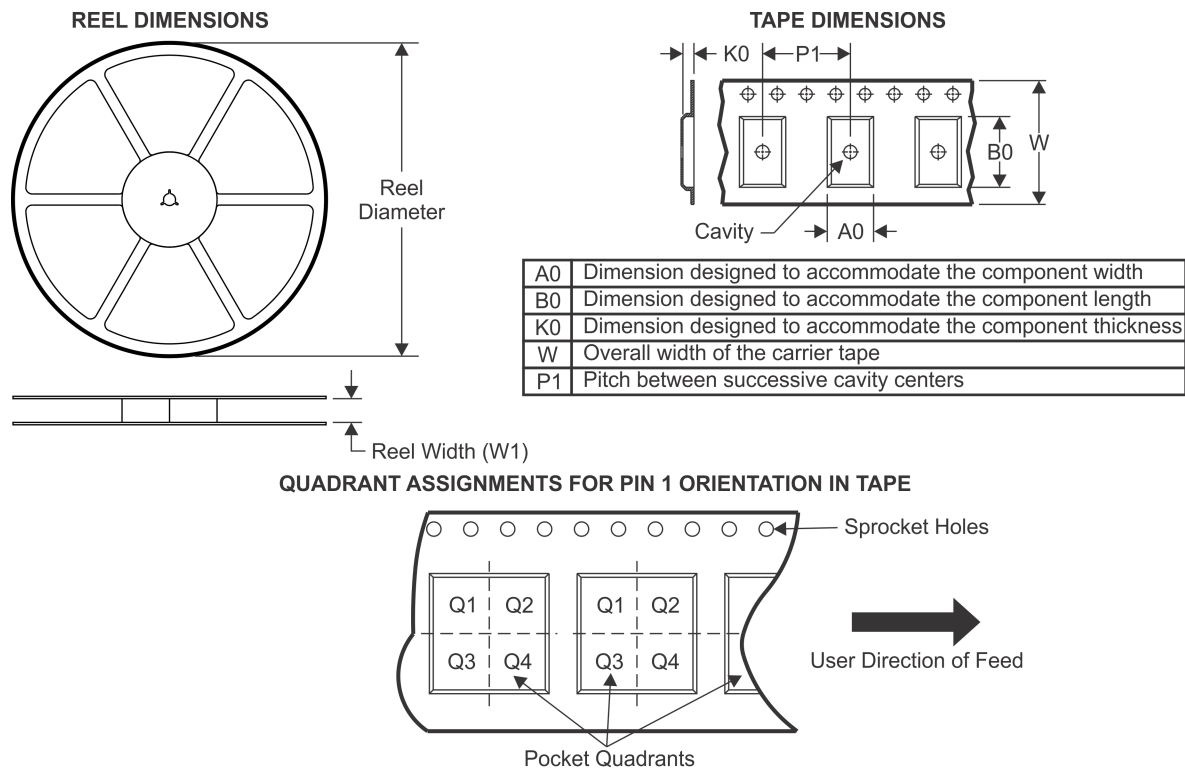
(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(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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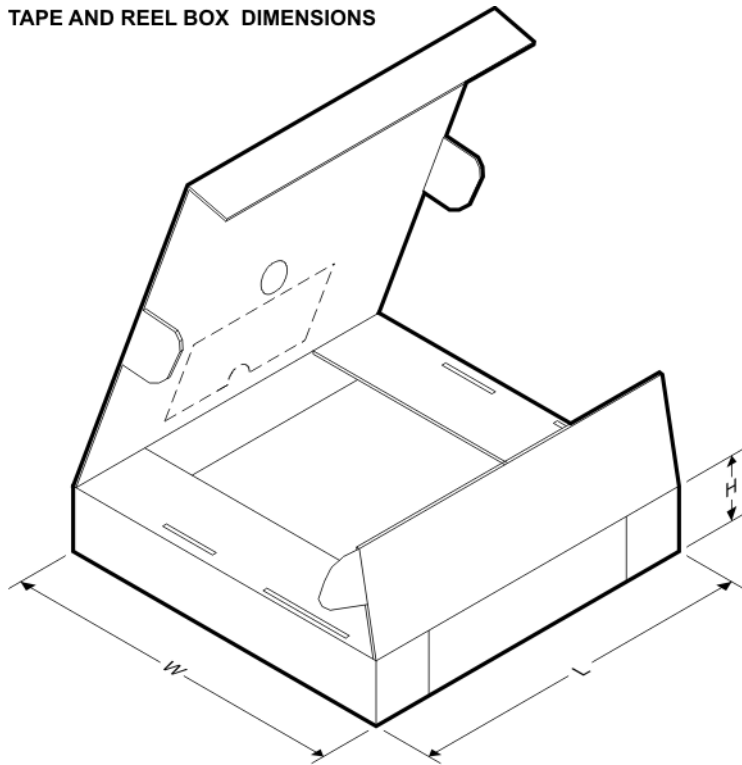
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TAPE AND REEL INFORMATION


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
CSD25211W1015	DSBGA	YZC	6	3000	180.0	8.4	1.09	1.56	0.65	2.0	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)
CSD25211W1015	DSBGA	YZC	6	3000	182.0	182.0	20.0

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