英飞凌汽车级100V 175°C N沟道

增强型OptiMOS™ 5 功率晶体管

AEC Qualified RoHS

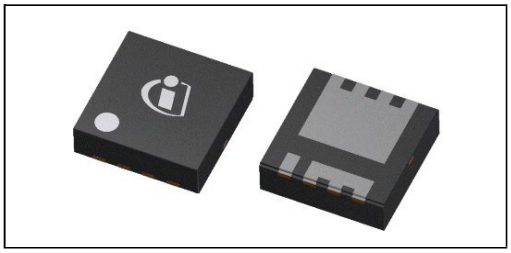
特点

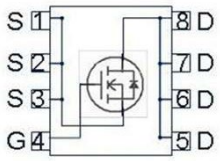
- 适用于汽车应用的功率MOSFET
- N 沟道 - 增强型 - 逻辑电平
- MSL1 回流焊峰值温度高达 260°C
- 工作温度 175°C
- 绿色产品：符合 RoHS 标准
- 100% 雪崩测试

产品概述

V_{DS}	100	V
$R_{DS(on),max}$	12	mΩ
I_D	40	A

PG-TSDSON-8-33





Type	Package	Marking
IAUZ40N10S5L120	PG-TSDSON-8-33	5N1L120

除非另有规定，否则均为T_j=25 °C 的**最大额定值。**

Parameter	Symbol	Conditions	Value	Unit
Drain current	I_D	V_{GS}=10 V, Chip limitation[1,2)]	46	A
		V_{GS}=10V, DC current[3)]	40	
		T_a=85 °C, V_{GS}=10 V, R_{thJA} on 2s2p [2,4)]	9	
Pulsed drain current[2)]	$I_{D,pulse}$	T_C=25 °C	160	
Avalanche energy, single pulse[2)]	E_{AS}	I_D=20 A	33	mJ
Avalanche current, single pulse	I_{AS}	-	22	A
Gate source voltage	V_{GS}	-	±20	V
Power dissipation	P_{tot}	T_C=25 °C	62	W
Operating and storage temperature	T_j, T_{stg}	-	-55 ... +175	°C

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Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
热特性[2]						
Thermal resistance, junction - case	R_{thJC}	-	-	-	2.4	K/W
Thermal resistance, junction - ambient[4]	R_{thJA}	-	-	35.5	-	
除非另有规定，否则均为T_j=25 °C 的**电气特性。**						
静态参数特性						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=1mA	100	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=27 µA	1.2	1.7	2.2	
Zero gate voltage drain current	I_{DSS}	V_{DS}=100V, V_{GS}=0V, T_j=25°C	-	0.1	1	µA
		V_{DS}=100V, V_{GS}=0V, T_j=125°C[2]	-	10	100	
Gate-source leakage current	I_{GSS}	V_{GS}=20V, V_{DS}=0V	-	-	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=4.5V, I_D=20A	-	13.6	18.5	mΩ
		V_{GS}=10V, I_D=20A	-	10.3	12	
Gate resistance[2]	R_G	-	-	1.3	-	Ω

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
动态参数特性[2)]						
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=50V, f=1MHz	-	1222	1589	pF
Output capacitance	C_{oss}		-	213	277	
Reverse transfer capacitance	C_{rss}		-	12	18	
Turn-on delay time	$t_{d(on)}$	V_{DD}=50V, V_{GS}=10V, I_D=20A, $R_{G,ext}$=3.5 Ω	-	3	-	ns
Turn-off delay time	$t_{d(off)}$		-	11	-	
Rise time	t_r		-	1	-	
Fall time	t_f		-	6	-	
栅极电荷特性[2)]						
Gate to source charge	Q_{gs}	V_{DD}=50V, I_D=20A, V_{GS}=0 to 10V	-	3.8	4.9	nC
Gate to drain charge	Q_{gd}		-	3.3	5.0	
Gate charge total	Q_g		-	17.4	22.6	
Gate plateau voltage	$V_{plateau}$		-	3.1	-	V
反向二极管						
Diode continous forward current[2)]	I_S	T_C=25°C	-	-	40	A
Diode pulse current[2)]	$I_{S,pulse}$	T_C=25 °C	-	-	160	
Diode forward voltage	V_{SD}	V_{GS}=0V, I_F=20 A, T_j=25°C	-	0.9	1.1	V
Reverse recovery time[2)]	t_{rr}	V_R=50V, I_F=40A, di_F/dt=100A/µs	-	38	-	ns
Reverse recovery charge[2)]	Q_{rr}		-	34	-	nC

[1)] 实际上，电流能力受到包括客户特定的印刷电路板在内的整体系统设计的限制。

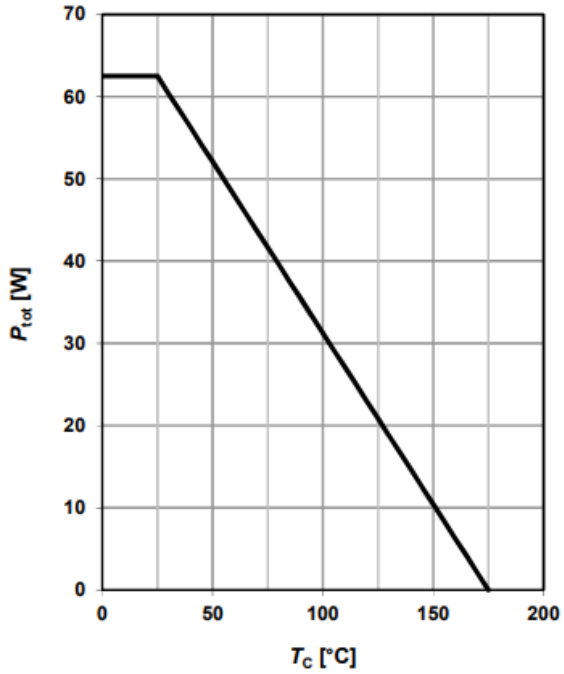
[2)]这些参数不经过生产测试，但经过设计和/或特性验证。

[3)]本产品可根据最佳实践在指定电流下运行，以尽量减少焊点处的电迁移。对于罕见事件和浪涌电流，可能会超过该值。

[4)]器件放置于根据JEDEC标准 (JESD51-5, -7) 定义的 2s2p FR4 印刷电路板上。印刷电路板垂直放置在静止空气中。

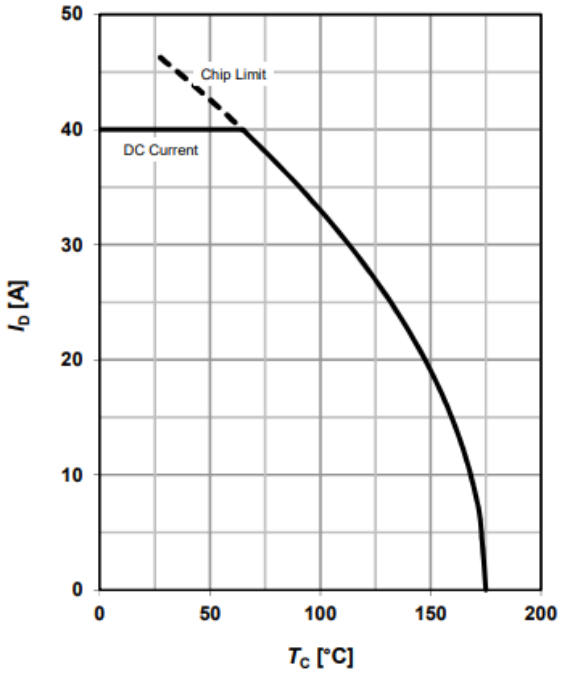
1 功率耗散

$P_{tot} = f(T_C)$; $V_{GS} = 10$ V



2 漏极电流

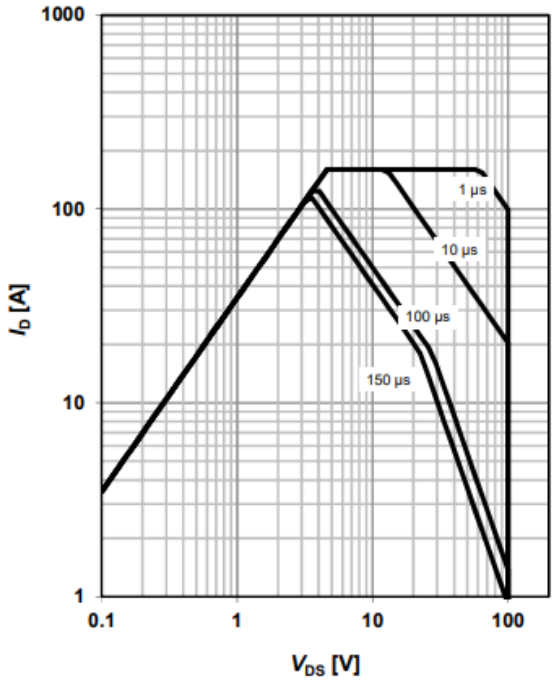
$I_D = f(T_C)$; $V_{GS} = 10$ V



3 安全工作区

$I_D = f(V_{DS})$; $T_C = 25$ °C; $D = 0$

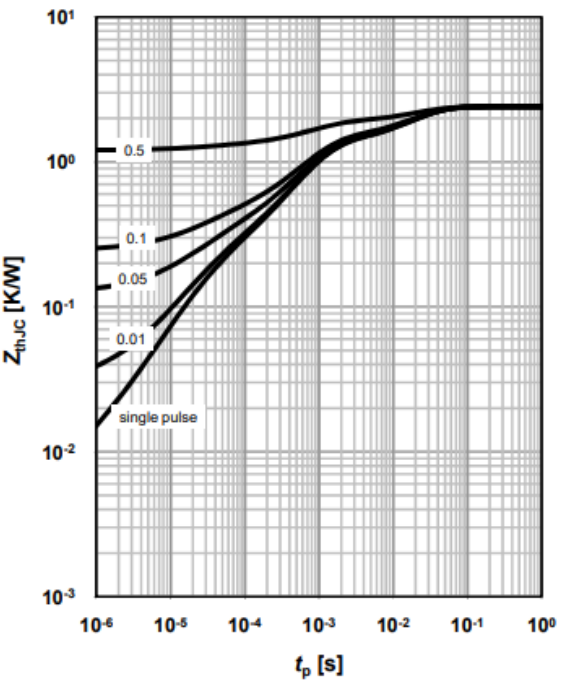
parameter: t_p



4 最大瞬态热阻抗

$Z_{thJC} = f(t_p)$

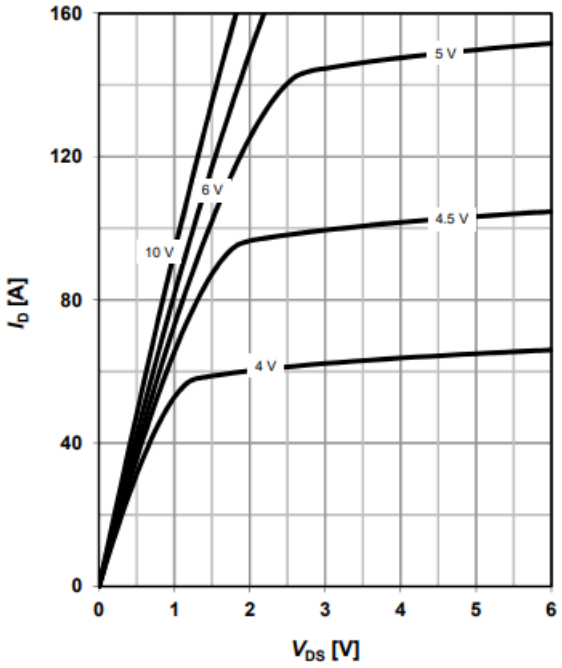
parameter: $D = t_p/T$



5 典型输出特性

$I_D = f(V_{DS})$; $T_j = 25$ °C

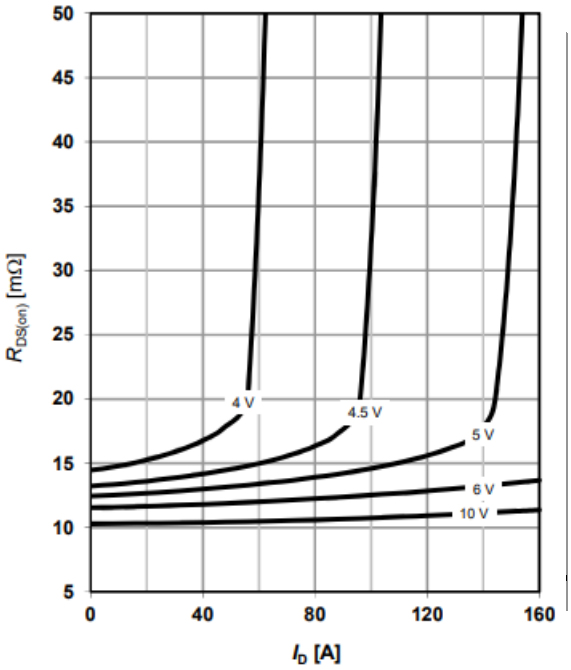
parameter: V_{GS}



6 典型漏源导通电阻

$R_{DS(on)} = f(I_D)$; $T_j = 25$ °C

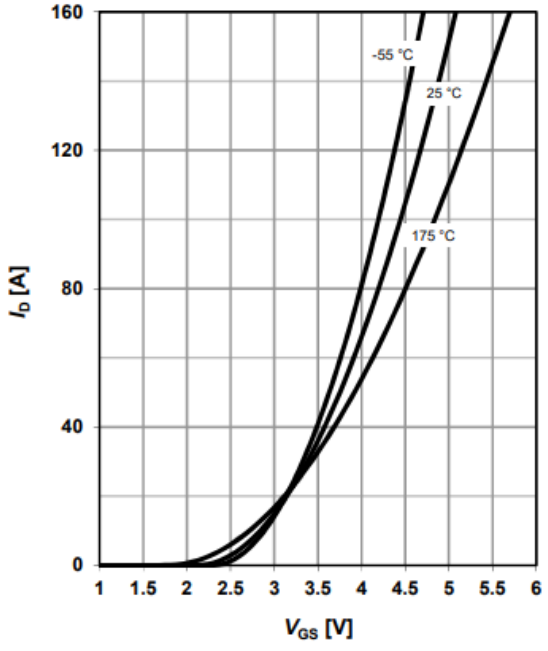
parameter: V_{GS}



7 典型转移特性

$I_D = f(V_{GS})$; $V_{DS} = 6$V

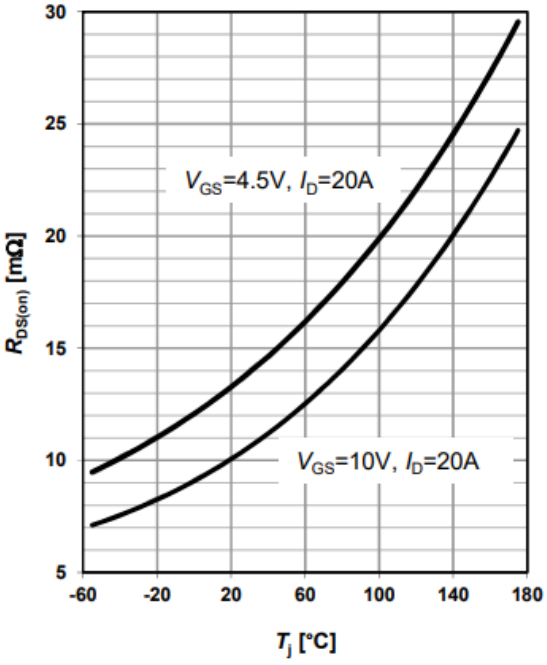
parameter: T_j



8 典型漏源导通电阻

$R_{DS(on)} = f(T_j)$;

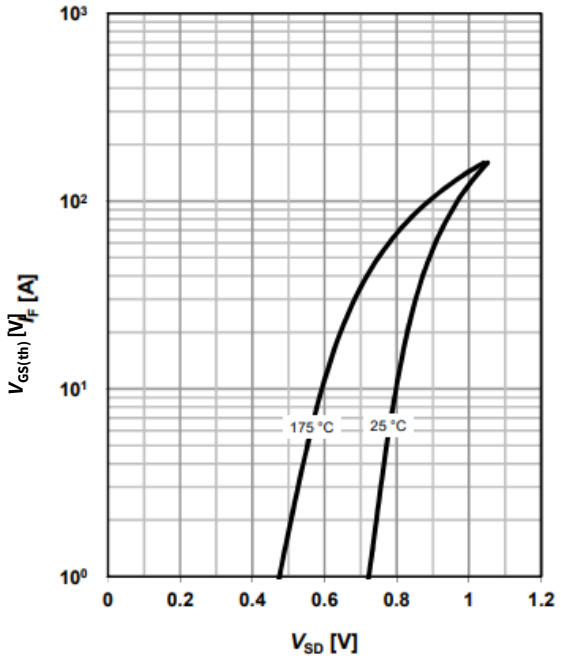
parameter: I_D, V_{GS}



9 典型栅极阈值电压

$I_F = f(V_{SD})$

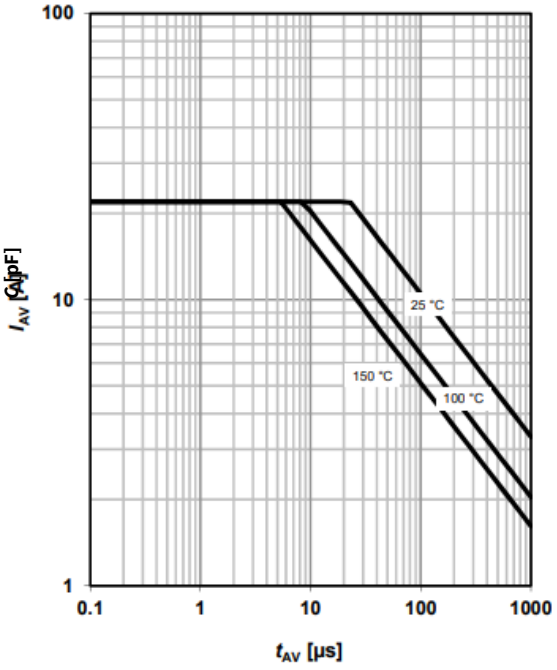
parameter: T_j



10 典型电容值

$I_{AS} = f(t_{AV})$

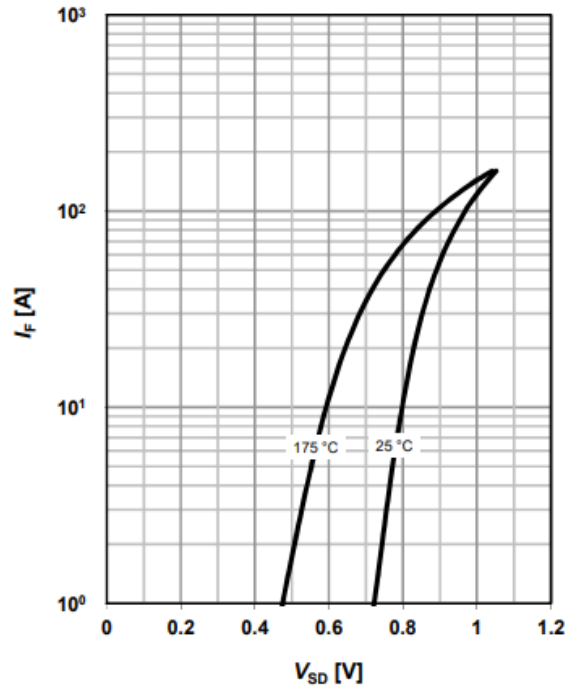
parameter: $T_{j(start)}$



11 典型二极管正向导通特性

$I_F = f(V_{SD})$

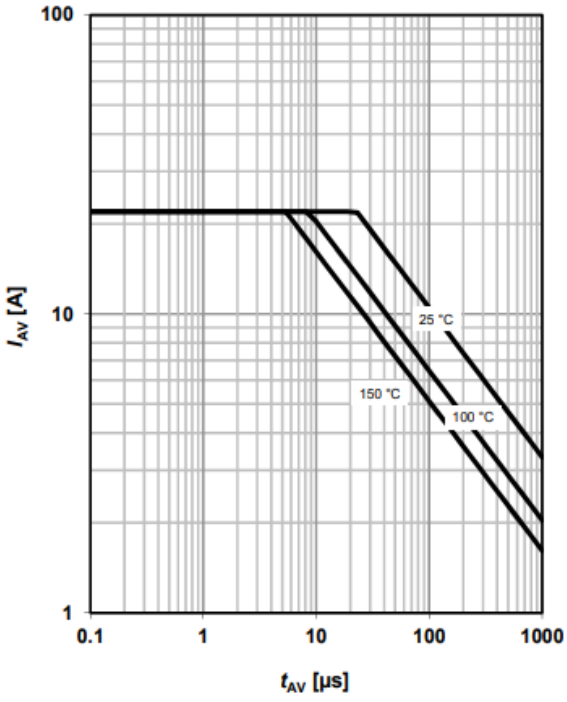
parameter: T_j



12 典型雪崩特性

$I_{AS} = f(t_{AV})$

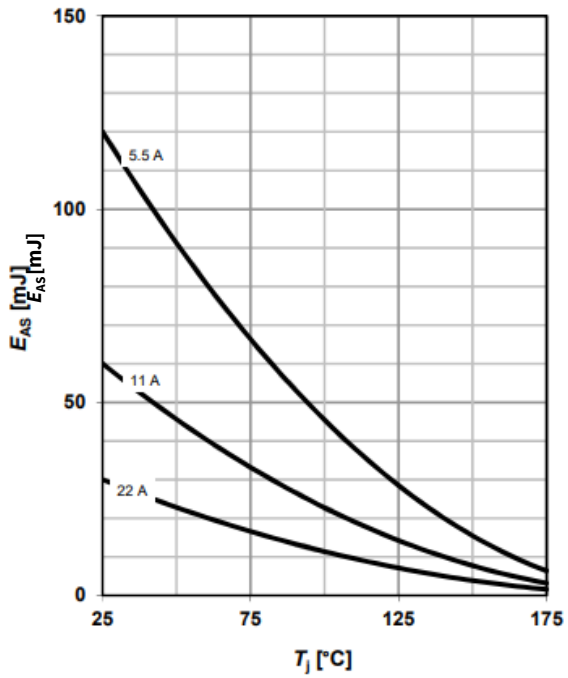
parameter: $T_{j(start)}$



13 典型雪崩能量

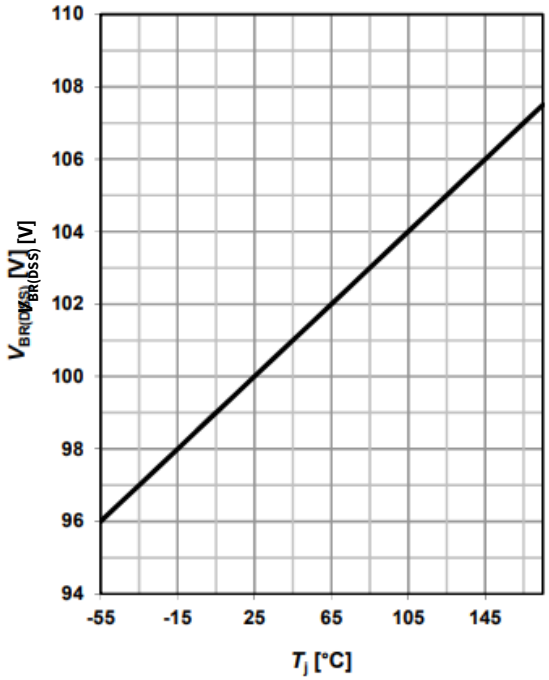
$E_{AS} = f(T_j)$

parameter: I_D



14 漏源击穿电压

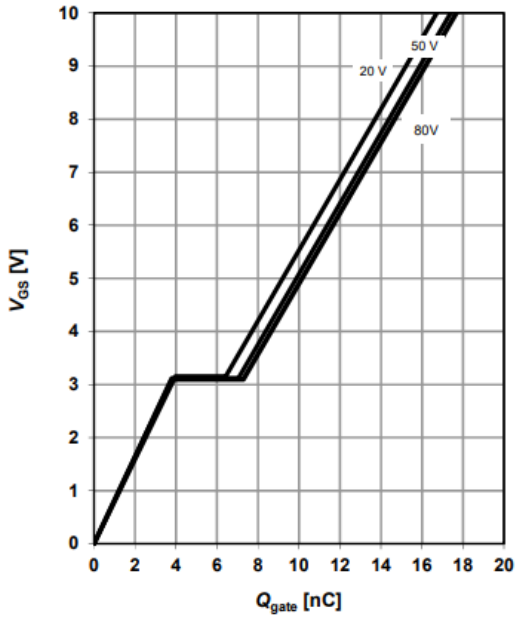
$V_{BR(DSS)} = f(T_j)$; $I_D = 1$ mA



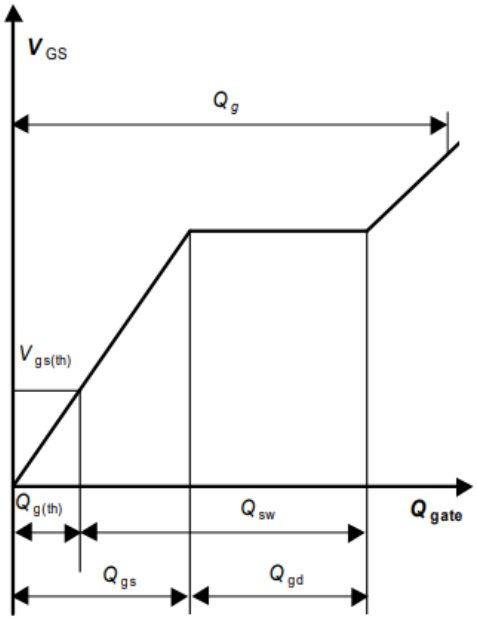
15 典型栅极电荷

$V_{GS} = f(Q_{gate})$; $I_D = 20$ A pulsed

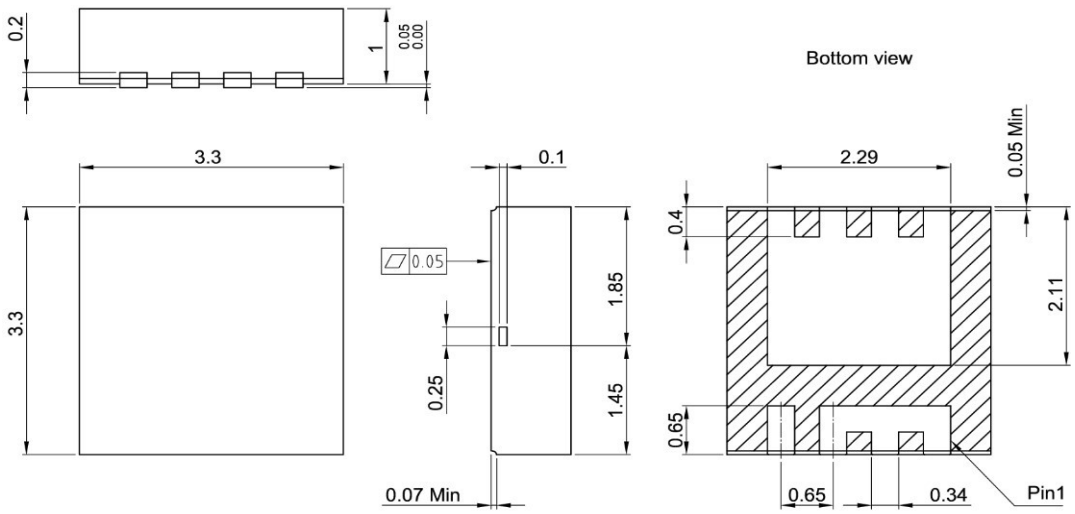
parameter: V_{DD}



16 栅极充电波形

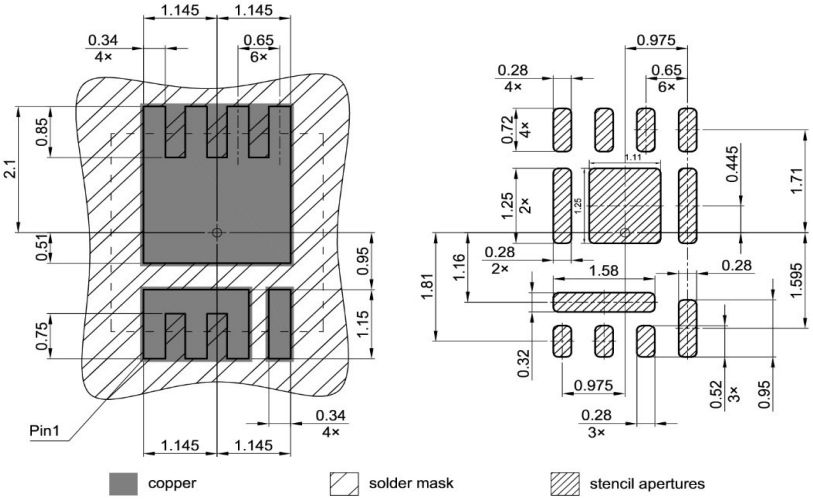


封装外形尺寸



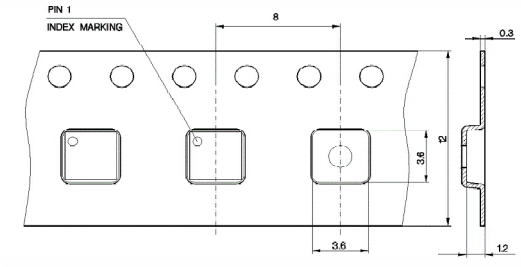
All dimensions are in units mm
The drawing is in compliance with ISO 128-30, Projection Method 1 [⊲⊕]

Footprint



All undimensioned radii is 0.075
Based on stencil thickness 0.13 mm
All dimensions are in units mm

包装信息



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修订记录

Version	Date	Changes
Revision 1.0	2021-05-14	Final Data Sheet
Revision 1.1	2021-06-18	Datasheet file name updated

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