

英飞凌汽车级60V 175°C N沟道

增强型OptiMOS™ 5 功率晶体管



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

Type	Package	Marking
IAUC41N06S5L100	PG-TDSON-8-33	5N06L100

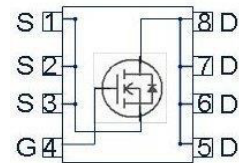
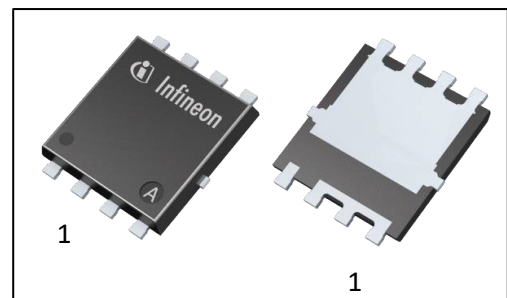
除非另有规定，否则均为 $T_j=25^\circ\text{C}$ 的最大额定值。

Parameter	Symbol	Conditions	Value	Unit
Drain current	I_D	$V_{GS}=10\text{ V}$, Chip limitation ^{1,2)}	41	A
		$V_{GS}=10\text{ V}$, DC current	41	
		$T_a=85^\circ\text{C}$, $V_{GS}=10\text{ V}$, R_{thJA} on 2s2p ^{2,3)}	12	
Pulsed drain current ²⁾	$I_{D,pulse}$	$T_c=25^\circ\text{C}$, $t_p=100\text{ }\mu\text{s}$	115	
Avalanche energy, single pulse ²⁾	E_{AS}	$I_D=20\text{ A}$	37	mJ
Avalanche current, single pulse	I_{AS}	-	41	A
Gate source voltage	V_{GS}	-	± 16	V
Power dissipation	P_{tot}	$T_c=25^\circ\text{C}$	42	W
Operating and storage temperature	T_j, T_{stg}	-	-55 ... +175	°C

产品概述

V_{DS}	60	V
$R_{DS(on),max}$	10	mΩ
I_D	41	A

[PG-TDSON-8-33](#)



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Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

热特性²⁾

Thermal resistance, junction - case	R_{thJC}	-	-	-	3.6	K/W
Thermal resistance, junction - ambient ³⁾	R_{thJA}	-	-	25.5	-	

除非另有规定，否则均为 $T_j=25^\circ\text{C}$ 的**电气特性**。

静态参数特性

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=1mA$	60	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=13\mu A$	1.2	1.7	2.2	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V,$ $T_j=25^\circ\text{C}$	-	-	1	μA
		$V_{DS}=60V, V_{GS}=0V,$ $T_j=125^\circ\text{C}^{1)}$	-	-	100	
Gate-source leakage current	I_{GSS}	$V_{GS}=16V, V_{DS}=0V$	-	-	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=20A$	-	11.6	13.9	m Ω
		$V_{GS}=10V, I_D=20A$	-	7.9	10	
Gate resistance ²⁾	R_G	-	-	1.1	-	Ω

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

动态参数特性²⁾

Input capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=30V,$ $f=1MHz$	-	927	1205	pF
Output capacitance	C_{oss}		-	183	238	
Reverse transfer capacitance	C_{rss}		-	12	18	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=30V, V_{GS}=10V,$ $I_D=20A, R_{G,ext}=3.5\Omega$	-	2.4	-	ns
Turn-off delay time	$t_{d(off)}$		-	6.7	-	
Rise time	t_r		-	1.0	-	
Fall time	t_f		-	2.2	-	

栅极电荷特性²⁾

Gate to source charge	Q_{gs}	$V_{DD}=30V, I_D=20A,$ $V_{GS}=0 \text{ to } 10V$	-	3.0	4.0	nC
Gate to drain charge	Q_{gd}		-	2.1	3.1	
Gate charge total	Q_g		-	12.7	16.4	
Gate plateau voltage	$V_{plateau}$		-	3.3	-	V

反向二极管

Diode continuous forward current ²⁾	I_s	$T_C=25^\circ C$	-	-	41	A
Diode pulse current ²⁾	$I_{S,pulse}$	$T_C=25^\circ C, t_p=100\mu s$	-	-	115	
Diode forward voltage	V_{SD}	$V_{GS}=0V, I_F=20A,$ $T_j=25^\circ C$	-	0.8	1.1	V
Reverse recovery time ²⁾	t_{rr}	$V_R=30V, I_F=41A,$ $di_F/dt=100A/\mu s$	-	26	-	ns
Reverse recovery charge ²⁾	Q_{rr}		-	16	-	nC

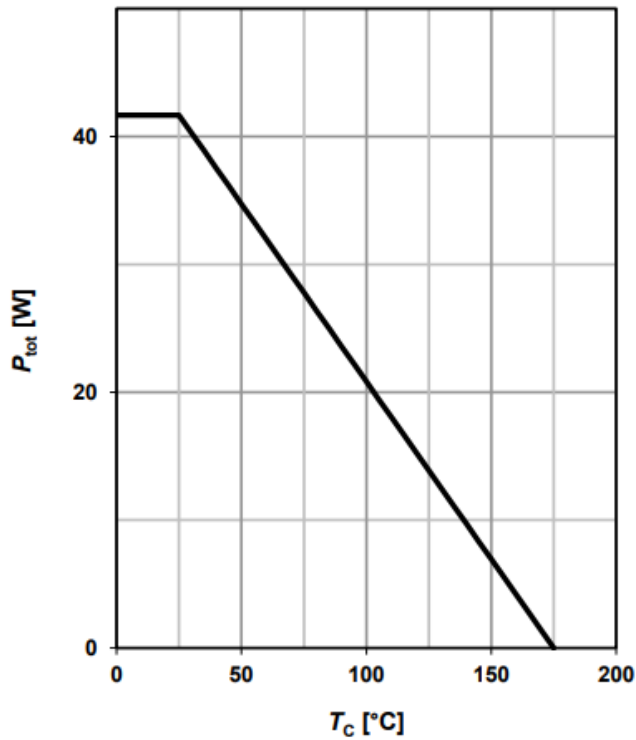
¹⁾ 实际上，电流能力受到包括客户特定的印刷电路板在内的整体系统设计的限制。

²⁾ 这些参数不经过生产测试，但经过设计和/或特性验证。

³⁾ 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。

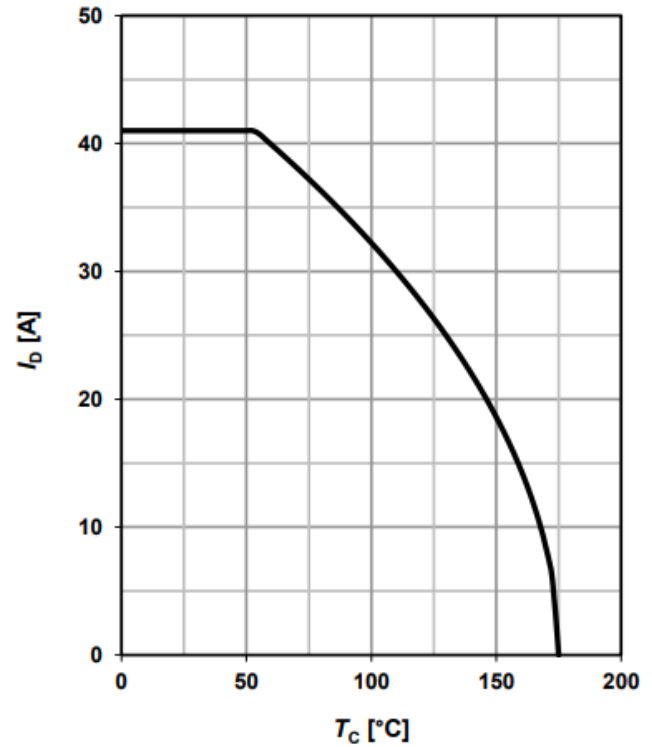
1 功率耗散

$$P_{\text{tot}} = f(T_c); V_{\text{GS}} = 10 \text{ V}$$



2 漏极电流

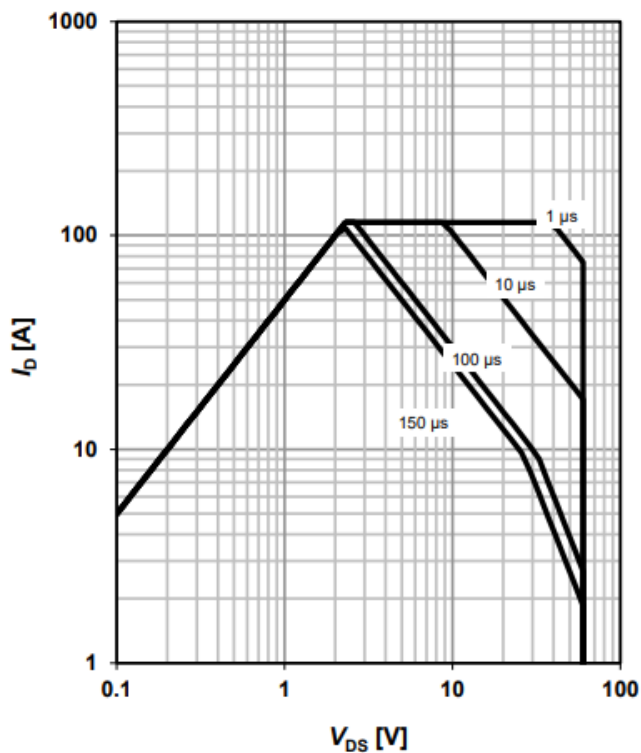
$$I_D = f(T_c); V_{\text{GS}} = 10 \text{ V}$$



3 安全工作区

$$I_D = f(V_{\text{DS}}); T_c = 25^\circ\text{C}; D = 0$$

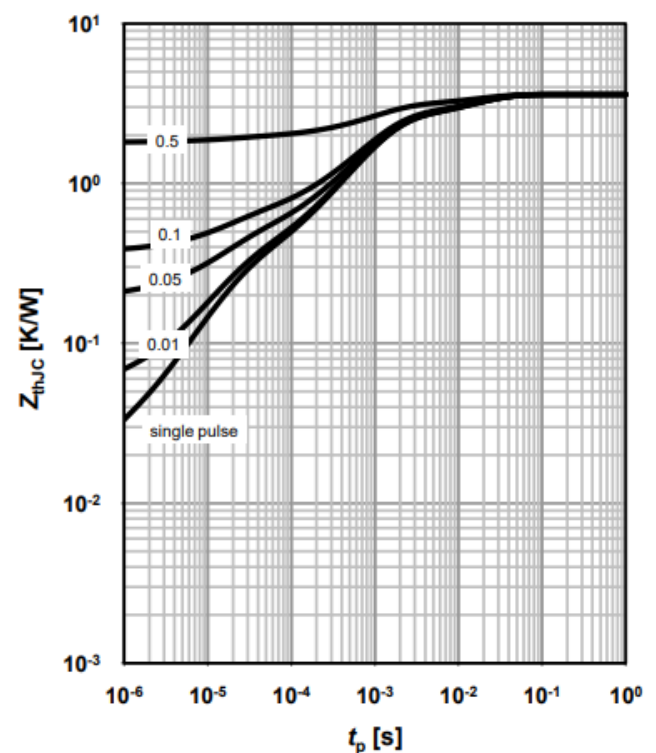
parameter: t_p



4 最大瞬态热阻抗

$$Z_{\text{thJC}} = f(t_p)$$

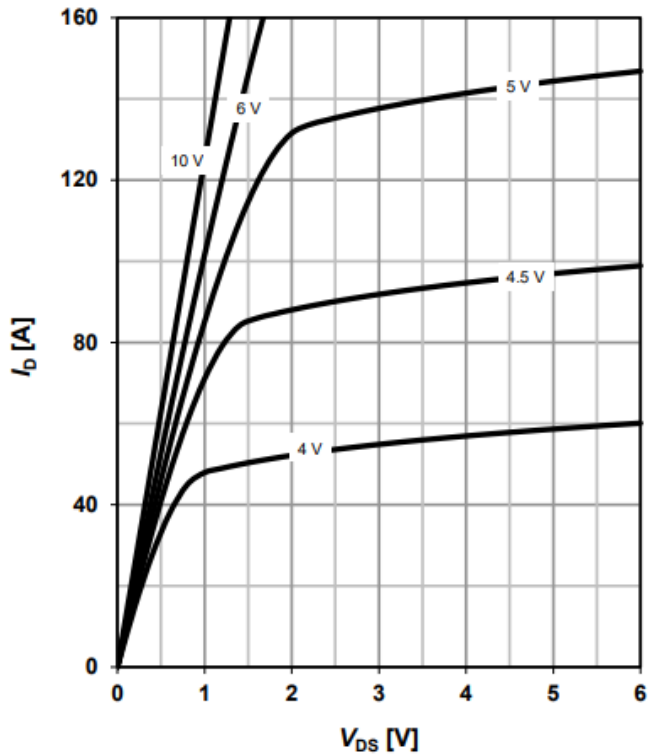
parameter: $D = t_p/T$



5 典型输出特性

$$I_D = f(V_{DS}); T_j = 25^\circ\text{C}$$

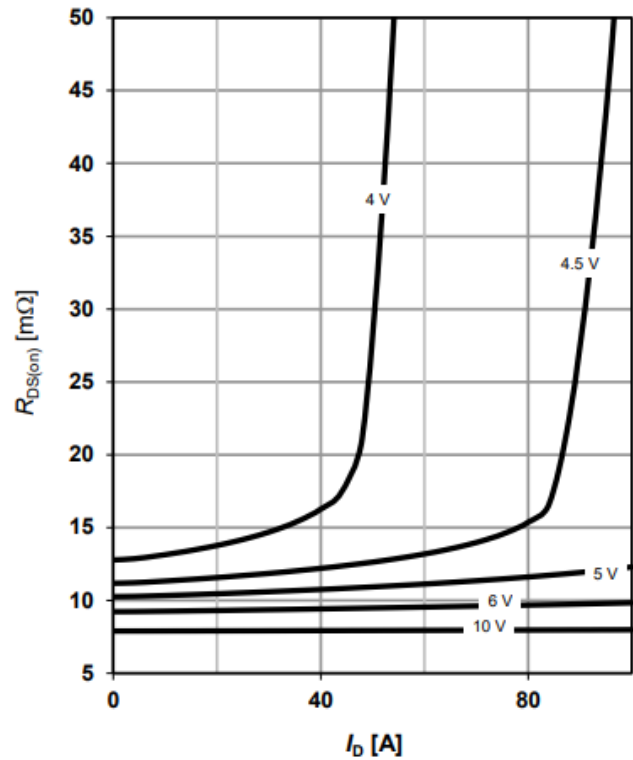
parameter: V_{GS}



6 典型漏源导通电阻

$$R_{DS(on)} = f(I_D); T_j = 25^\circ\text{C}$$

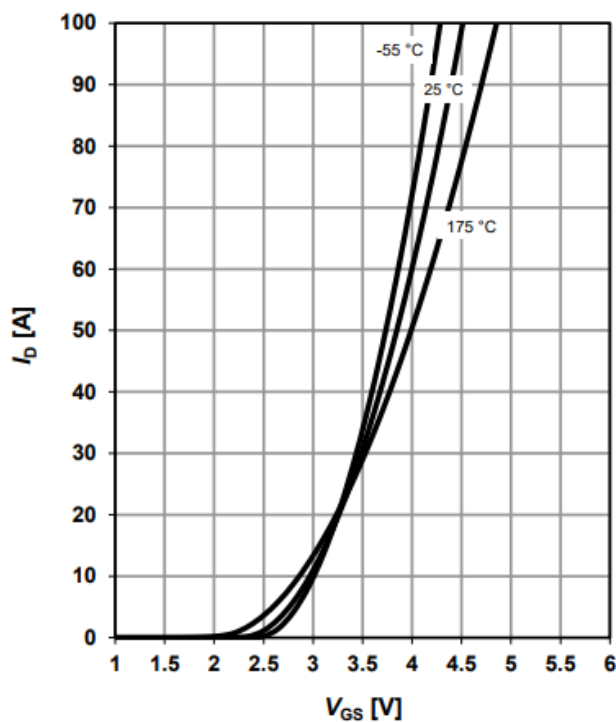
parameter: V_{GS}



7 典型转移特性

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

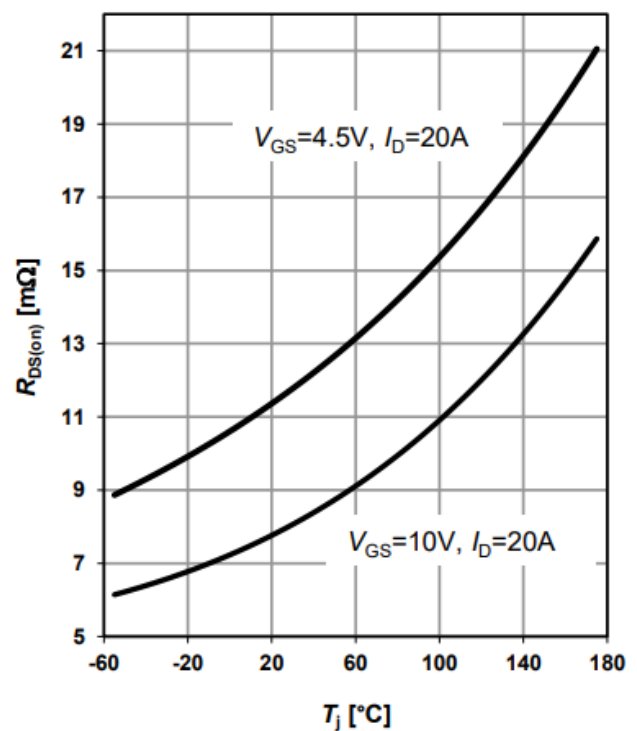
parameter: T_j



8 典型漏源导通电阻

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

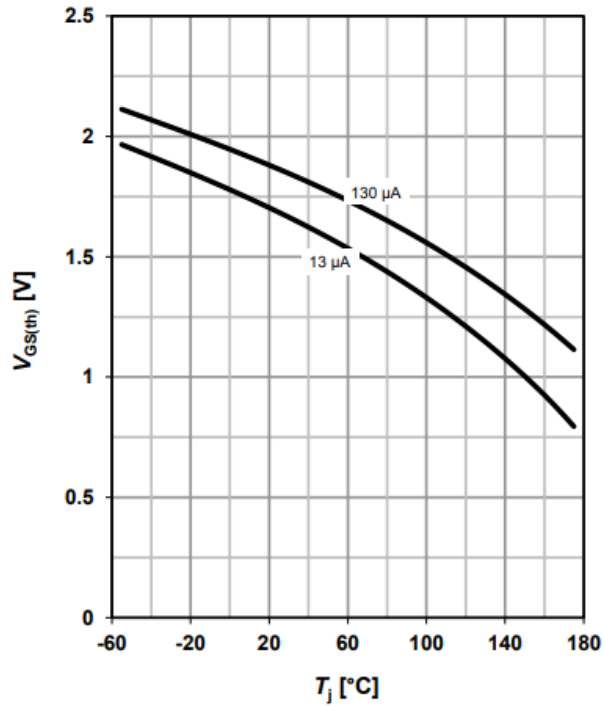
parameter: I_D, V_{GS}



9 典型栅极阈值电压

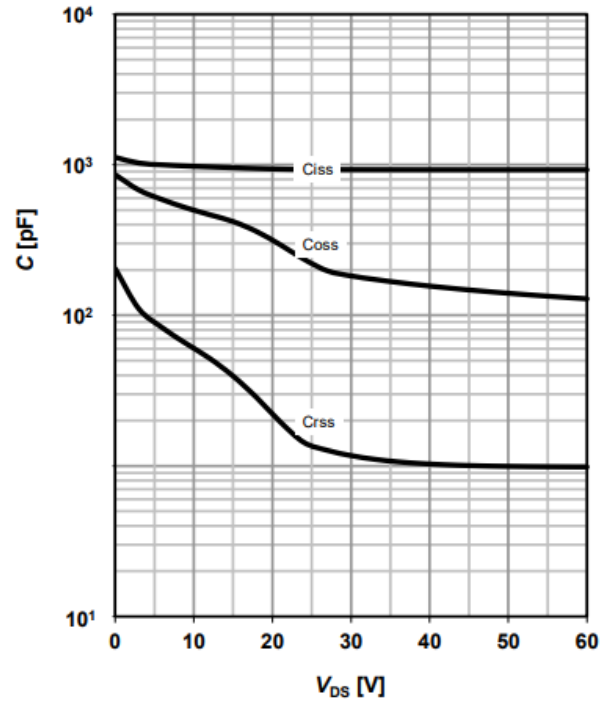
$$V_{GS(th)} = f(T_j); V_{GS} = V_{DS}$$

parameter: I_D



10 典型电容值

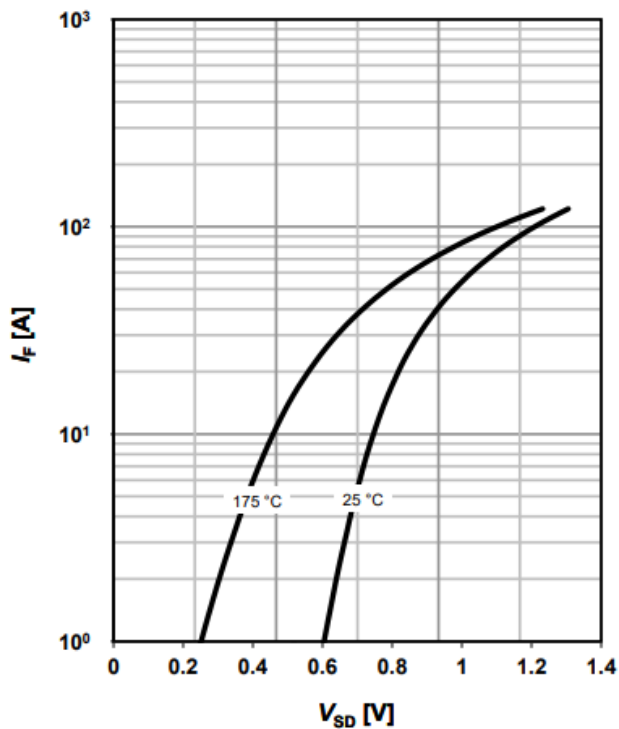
$$C = f(V_{DS}); V_{GS} = 0 \text{ V}; f = 1 \text{ MHz}$$



11 典型二极管正向导通特性

$$I_F = f(V_{SD})$$

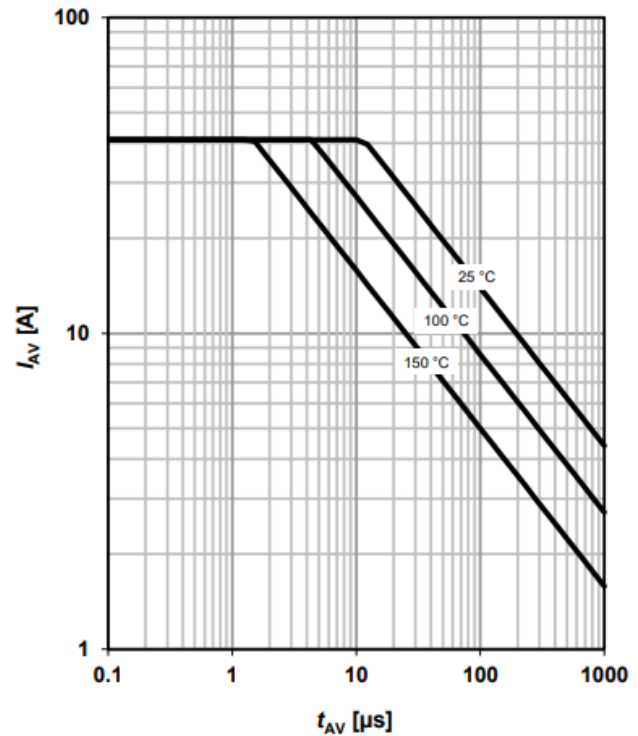
parameter: T_j



12 典型雪崩特性

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

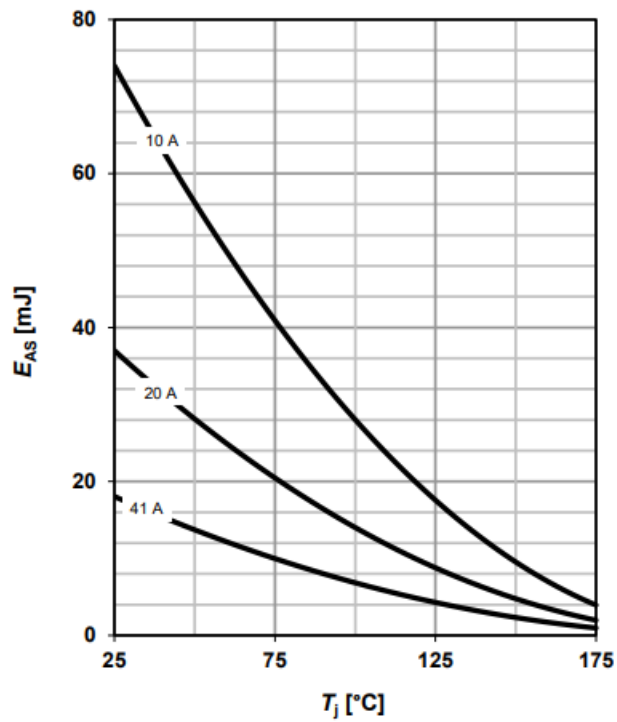
parameter: $T_{j(start)}$



13 典型雪崩能量

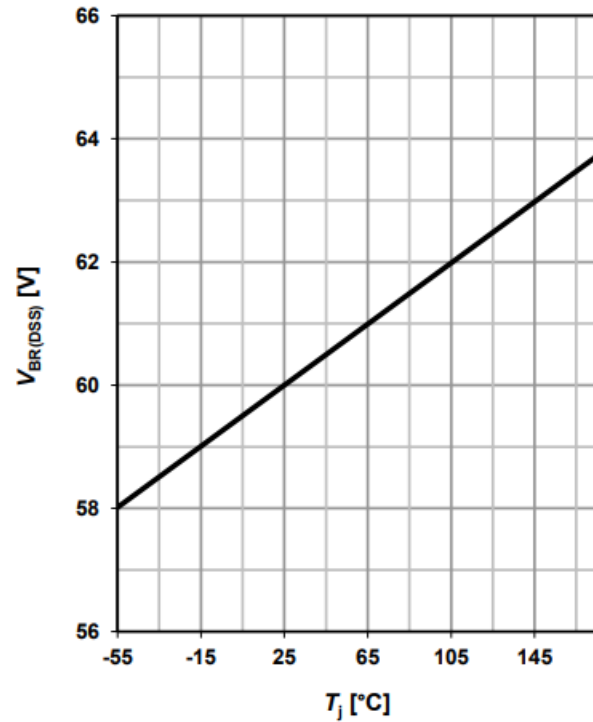
$$E_{AS} = f(T_j)$$

parameter: I_D



14 漏源击穿电压

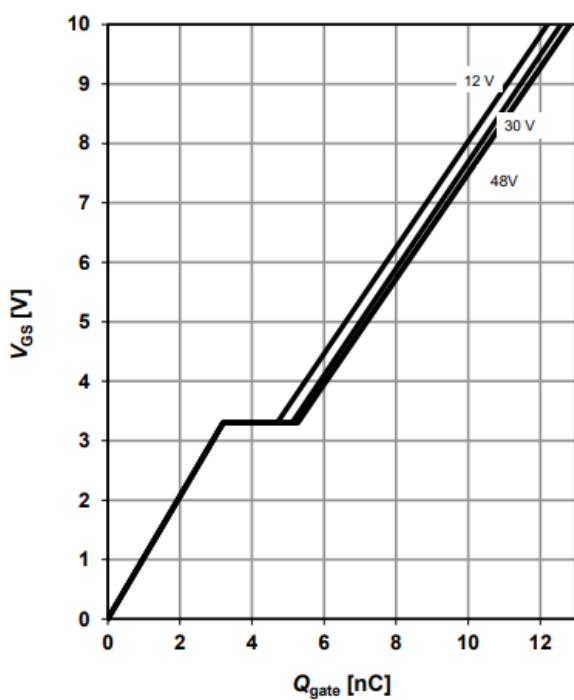
$$V_{BR(DSS)} = f(T_j); I_D = 1\text{ mA}$$



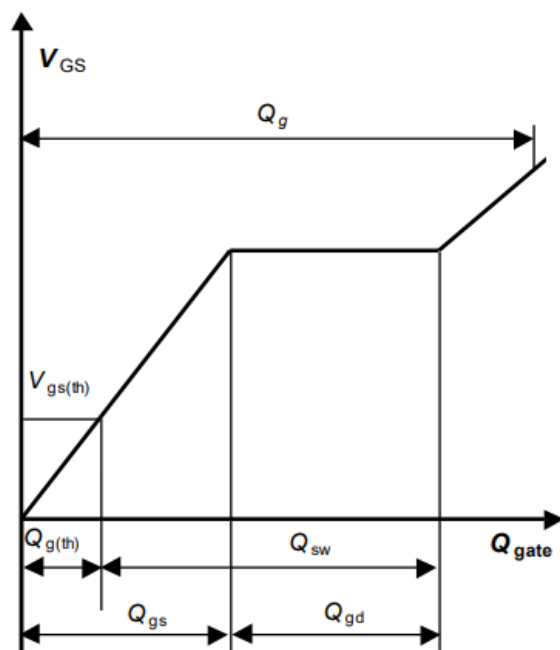
15 典型栅极电荷

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

parameter: V_{DD}



16 栅极充电波形



[illegible]

- ## Footprint



Technical drawing of the 1000 Series PCB. The top view shows a rectangular board with a width of 12 and a length of 6.9. There are six circular mounting holes along the top edge, with a center-to-center distance of 8 between the first two and 4 between the next two. A label 'PIN 1 INDEX MARKING' points to a small circle on the second component footprint. The side view shows a thickness of 0.3 and a mounting hole diameter of 1.3.

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修订记录

Version	Date	Changes
Revision 1.0	05.05.2020	Final Data Sheet



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