



英飞凌汽车级40V 175°C N沟道增强型

OptiMOS™ 6 功率晶体管



特点

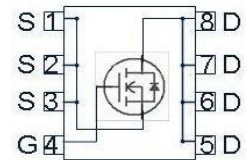
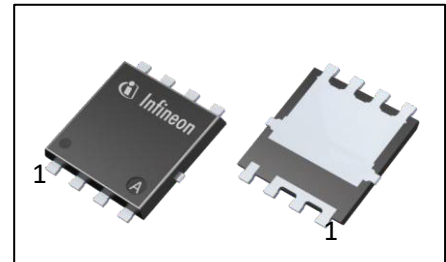
- 适用于汽车应用的功率MOSFET
- N 沟道 - 增强型 - 标准电平
- 通过 AEC-Q101 认证
- MSL1 回流焊峰值温度高达 260°C
- 工作温度 175°C
- 绿色产品：符合 RoHS 标准
- 100% 雪崩测试

Type	Package	Marking
IAUC120N04S6N006	PG-TDSON-8-53	6N04N006

产品概述

V_{DS}	40	V
$R_{DS(on),max}$	0.6	mΩ
I_D	120	A

PG-TDSON-8-53



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)}	405	A
		$V_{GS}=10\text{V}$, DC current ³⁾	120	
		$T_a=85^\circ\text{C}$, $V_{GS}=10\text{V}$, R_{thJA} on 2s2p ^{4,5)}	55	
Pulsed drain current ⁵⁾	$I_{D,pulse}$	$T_c=25^\circ\text{C}$, $t_p=100\mu\text{s}$	1500	
Avalanche energy, single pulse ²⁾	E_{AS}	$I_D=60\text{A}$, $R_G=25\Omega$	750	mJ
Avalanche current, single pulse	I_{AS}	$R_G=25\Omega$	120	A
Gate source voltage	V_{GS}	-	± 20	V
Power dissipation	P_{tot}	$T_c=25^\circ\text{C}$	187	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⁵⁾

Thermal resistance, junction - case	R_{thJC}	-	-	-	0.8	K/W
Thermal resistance, junction - ambient ⁴⁾	R_{thJA}	-	-	26	-	

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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=1mA$	40	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=130\mu A$	2.2	2.6	3.0	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=40V, V_{GS}=0V, T_j=25^{\circ}\text{C}$	-	-	1	μA
		$V_{DS}=40V, V_{GS}=0V, T_j=125^{\circ}\text{C}^{2)}$	-	-	33	
Gate-source leakage current	I_{GSS}	$V_{GS}=20V, V_{DS}=0V$	-	-	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=7V, I_D=60A$	-	0.54	0.85	m Ω
		$V_{GS}=10V, I_D=60A$	-	0.46	0.60	

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

动态参数特性²⁾

Input capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=25V,$ $f=1MHz$	-	7607	10117	pF
Output capacitance	C_{oss}		-	2249	2991	
Reverse transfer capacitance	C_{rss}		-	100	150	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=20V, V_{GS}=10V,$ $I_D=120A, R_G=3.5\Omega$	-	13	-	ns
Rise time	t_r		-	8	-	
Turn-off delay time	$t_{d(off)}$		-	33	-	
Fall time	t_f		-	16	-	

栅极电荷特性²⁾

Gate to source charge	Q_{gs}	$V_{DD}=32V, I_D=120A,$ $V_{GS}=0 \text{ to } 10V$	-	31	40	nC
Gate to drain charge	Q_{gd}		-	22	32	
Gate charge total	Q_g		-	116	151	
Gate plateau voltage	$V_{plateau}$		-	4.0	-	V

反向二极管

Diode continuous forward current ⁵⁾	I_S	$T_C=25^\circ C$	-	-	256	A
Diode pulse current ⁵⁾	$I_{S,pulse}$		-	-	1780	
Diode forward voltage	V_{SD}	$V_{GS}=0V, I_F=60A,$ $T_J=25^\circ C$	-	0.8	1.1	V
Reverse recovery time ²⁾	t_{rr}	$V_R=20V, I_F=50A,$ $di_F/dt=100A/\mu s$	-	66	-	ns
Reverse recovery charge ²⁾	Q_{rr}		-	83	-	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，但经过特性验证。

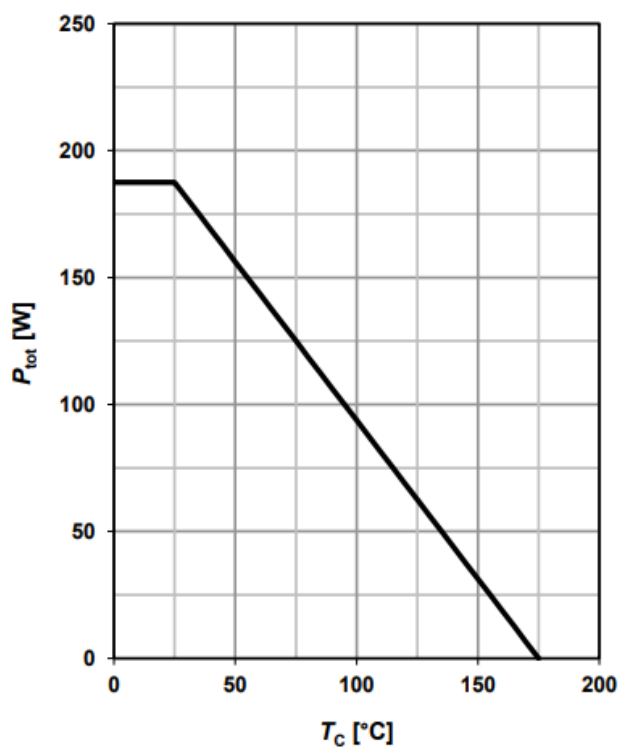
³⁾ 根据最佳实践，产品可在指定电流下运行，以最大程度地减少焊点处的电迁移。对于罕见事件和浪涌电流，可能会超过该值。

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。

⁵⁾ 该参数无需经过生产测试-通过设计验证。

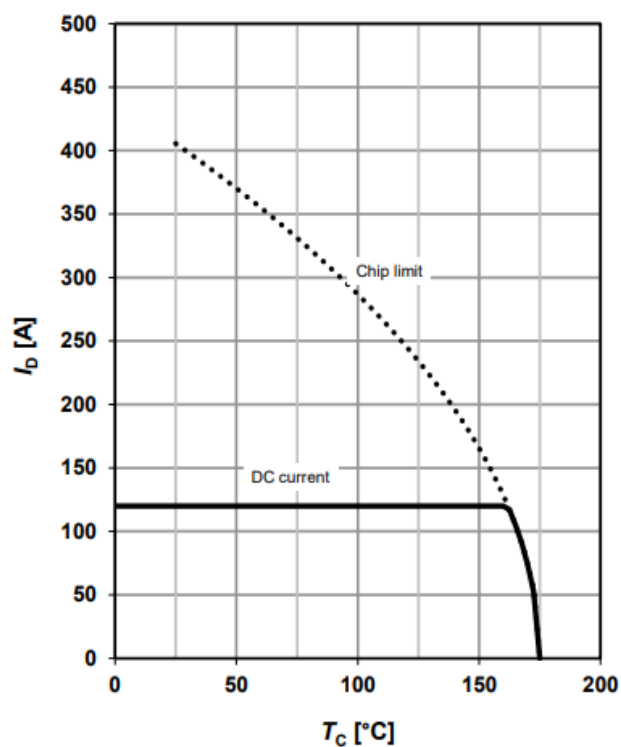
1 功率耗散

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



2 漏极电流

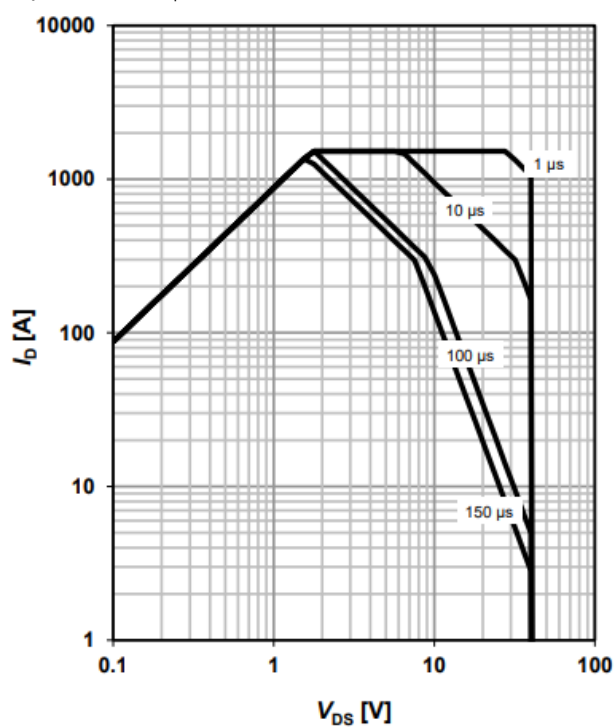
$$I_D = f(T_c); V_{\text{GS}} = 10 \text{ V}$$



3 安全工作区

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

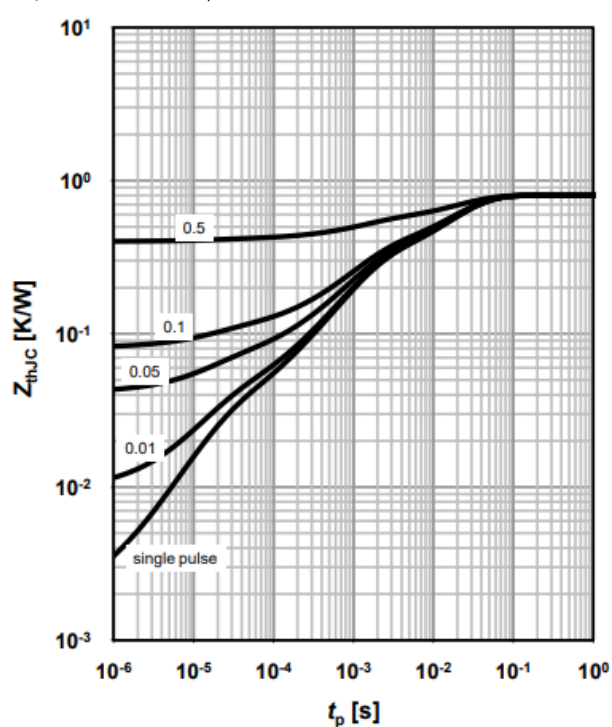
parameter: t_p



4 最大瞬态热阻抗

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

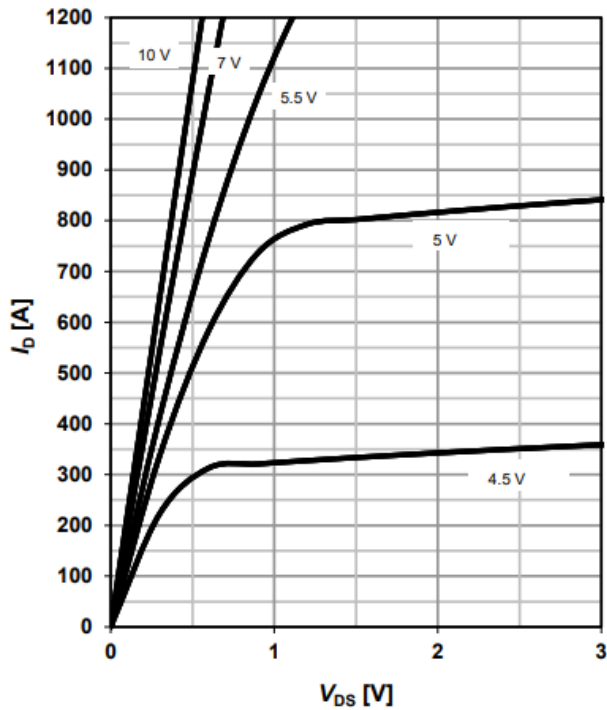
parameter: $D = t_p/T$



5 典型输出特性

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

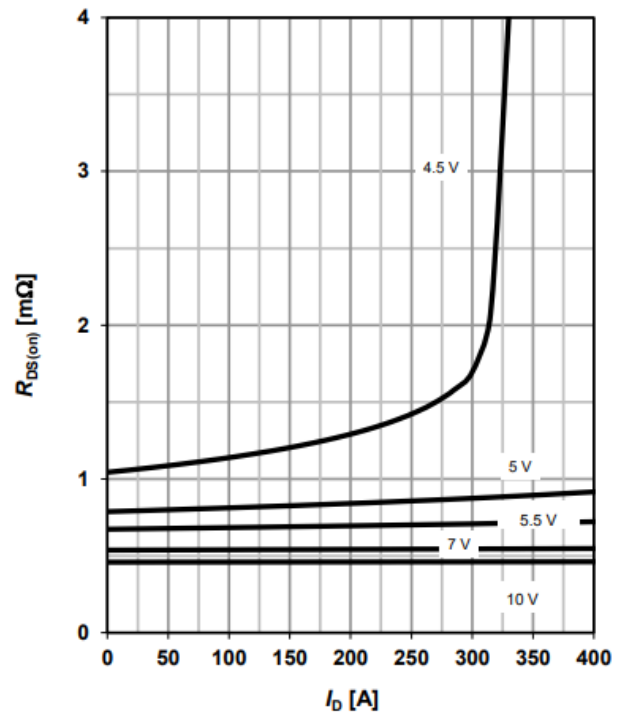
parameter: V_{GS}



6 典型漏源导通电阻

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

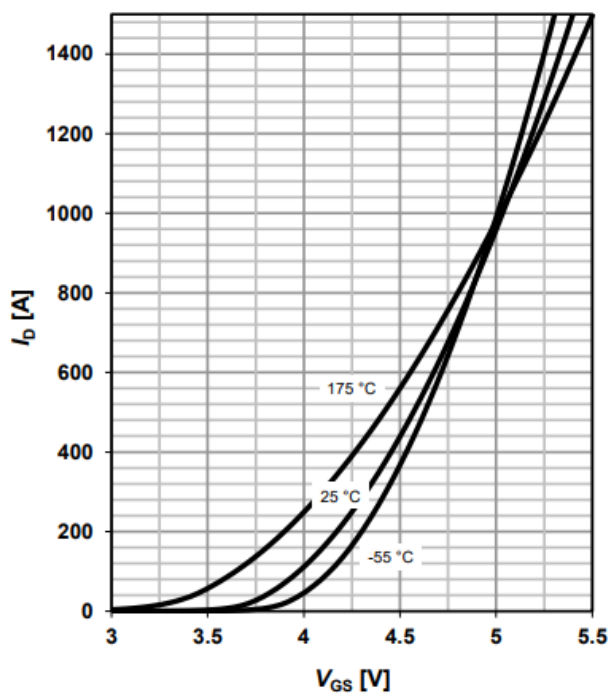
parameter: V_{GS}



7 典型转移特性

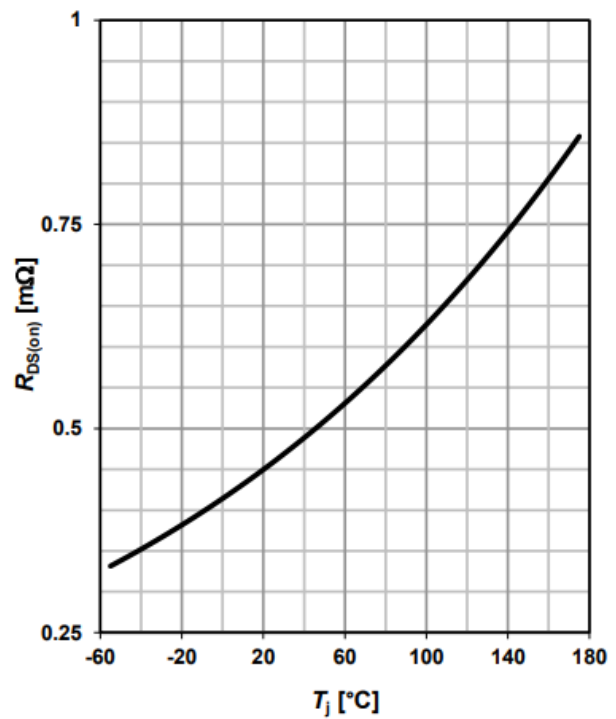
$$I_D = f(V_{GS}); V_{DS} = 6\text{ V}$$

parameter: T_j



8 典型漏源导通电阻

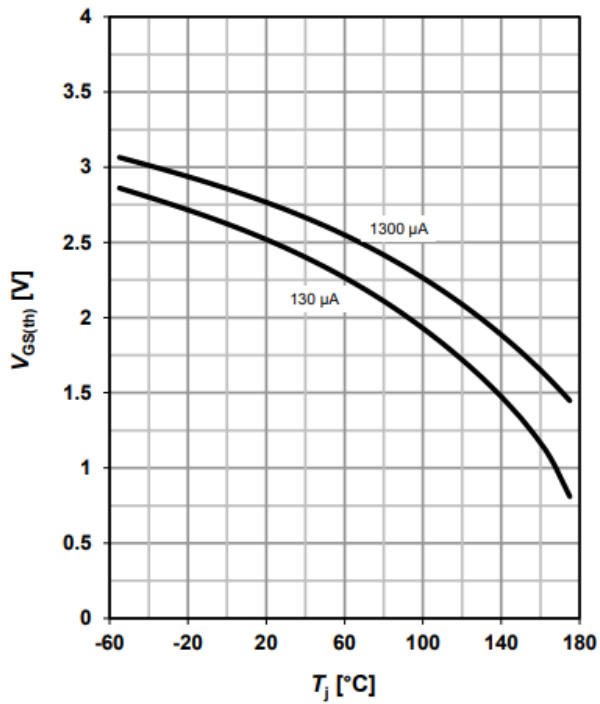
$$R_{DS(on)} = f(T_j); I_D = 60\text{ A}; V_{GS} = 10\text{ V}$$



9 典型栅极阈值电压

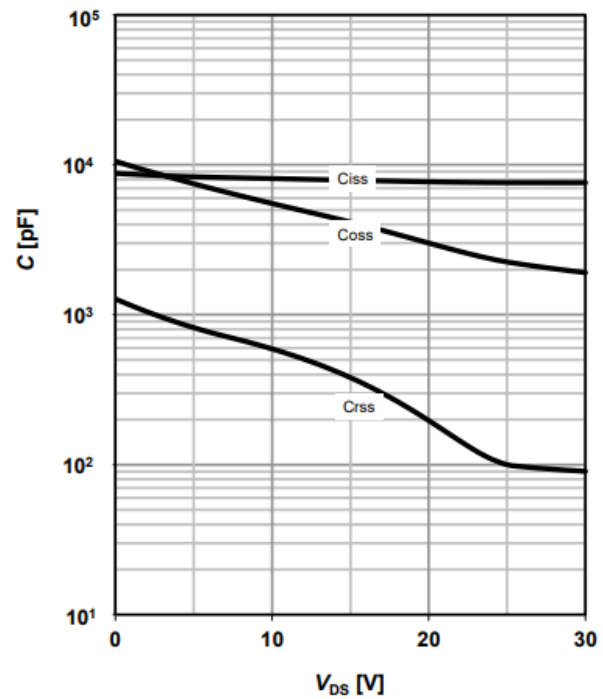
$$V_{GS(th)} = f(T_j); V_{GS} = V_{DS}$$

parameter: I_D



10 典型电容值

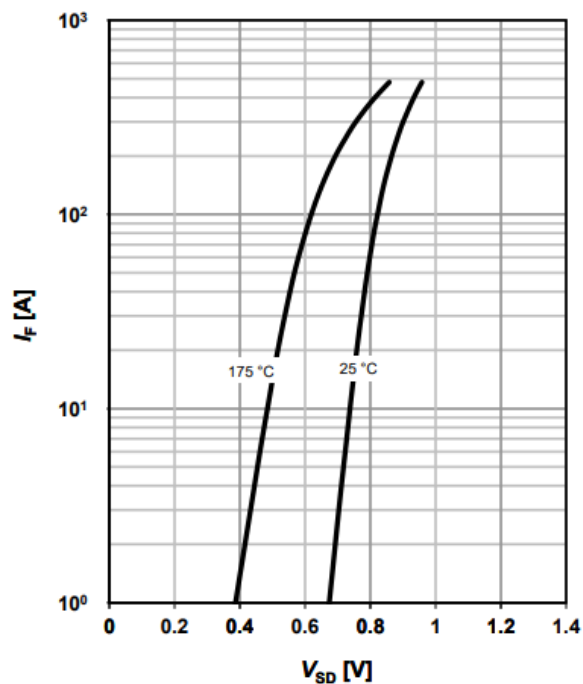
$$C = f(V_{DS}); V_{GS} = 0 \text{ V}; f = 1 \text{ MHz}$$



11 典型二极管正向导通特性

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

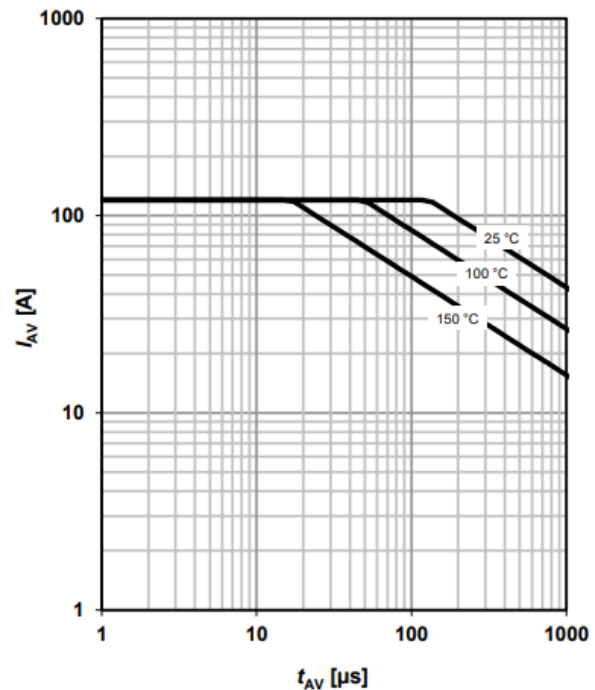
parameter: T_j



12 典型雪崩特性

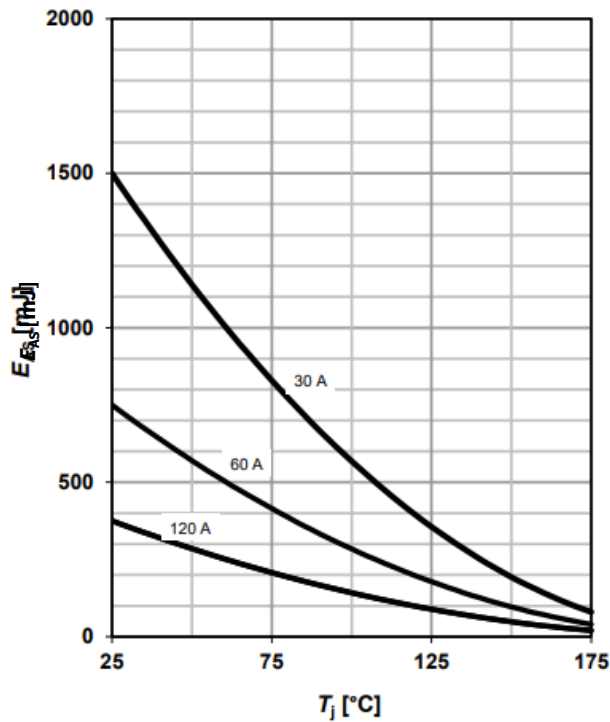
$$I_{AS} = f(t_{AV})$$

parameter: $T_{j(start)} > 25^\circ\text{C}$



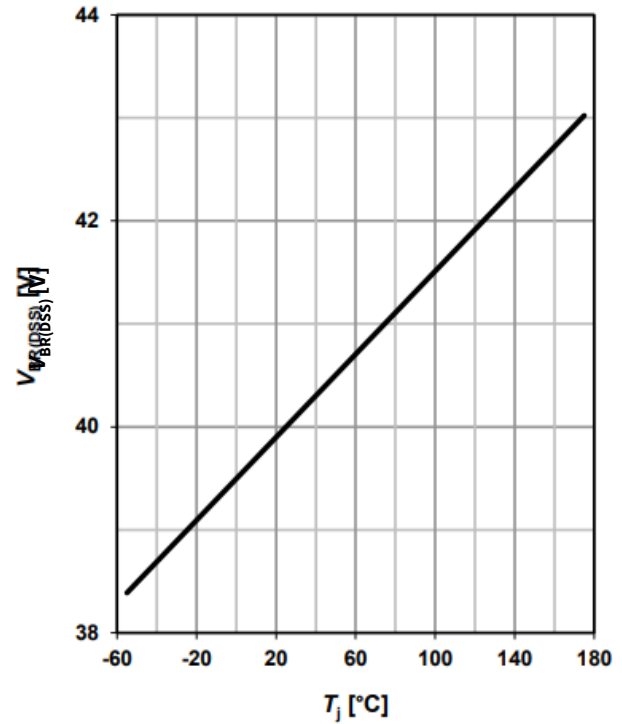
13 典型雪崩能量

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



14 漏源击穿电压

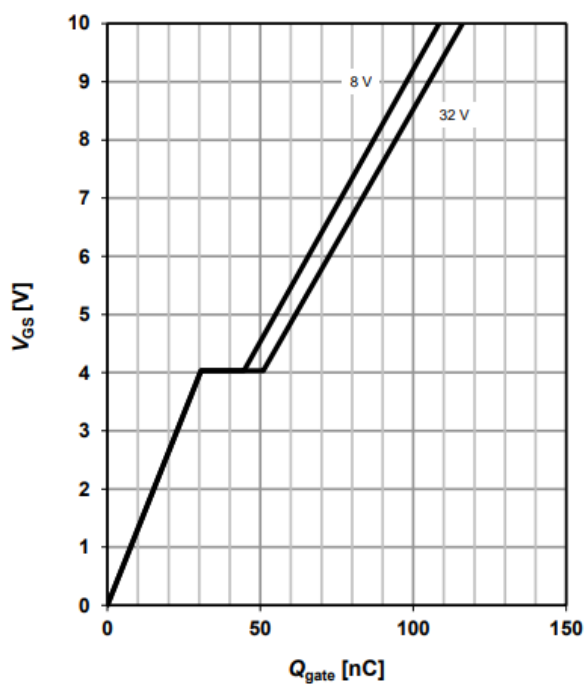
$$V_{BR(DSS)} = f(T_j); I_D = 1 \text{ mA}$$



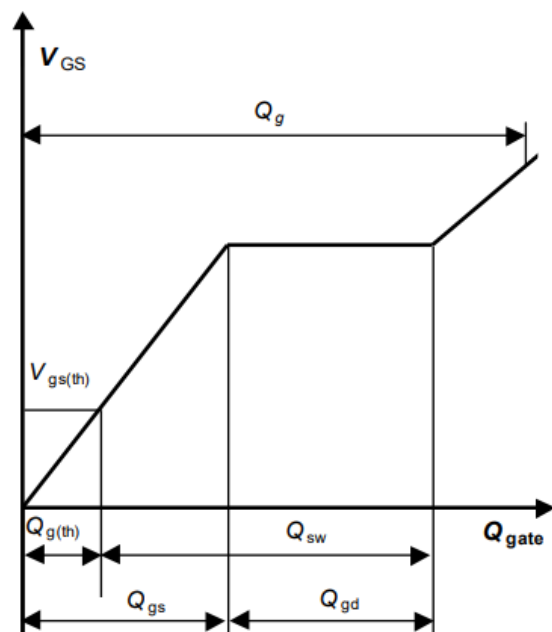
15 典型栅极电荷

$$V_{GS} = f(Q_{gate}); I_D = 120 \text{ A pulsed}$$

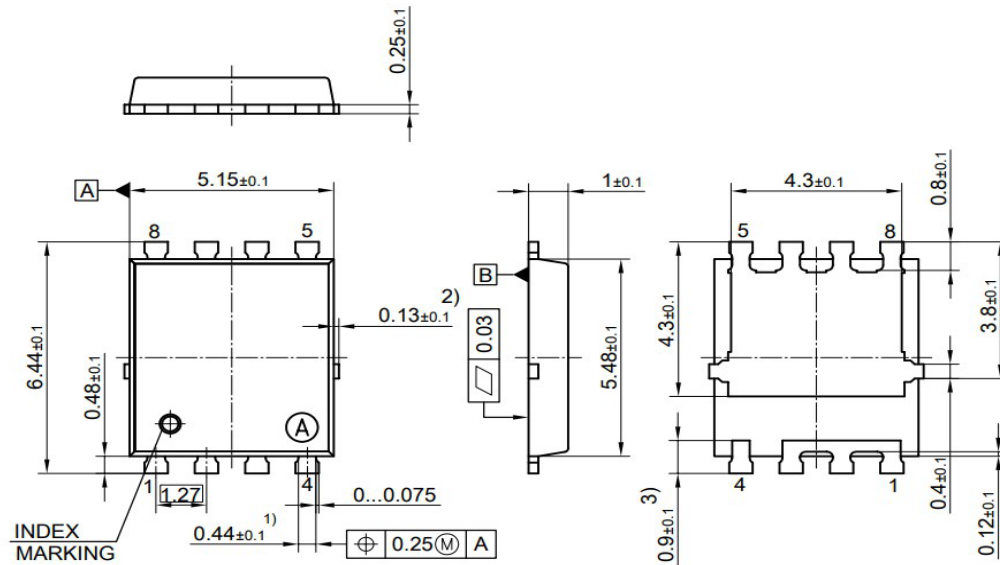
parameter: V_{DD}



16 栅极充电波形

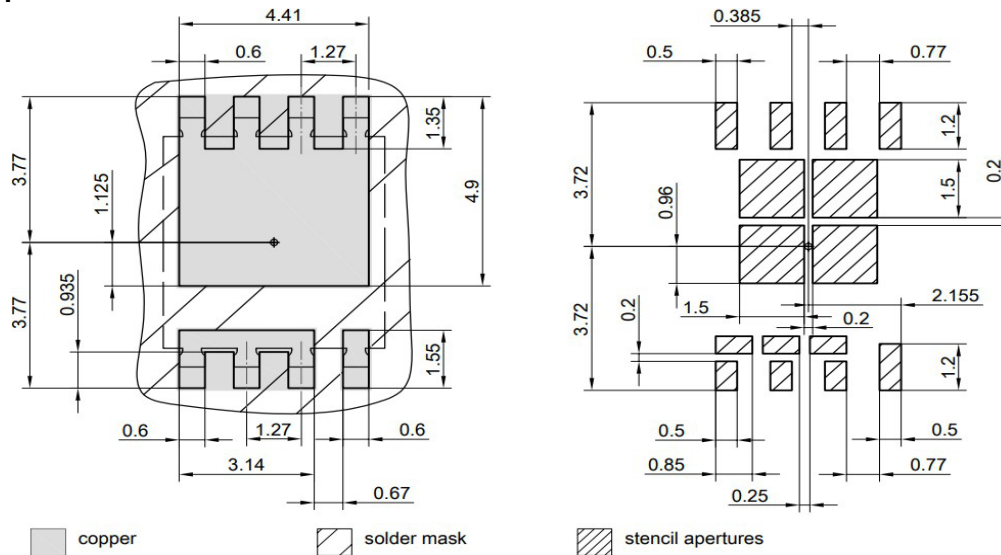


PG-TDSON-8: 封装外形

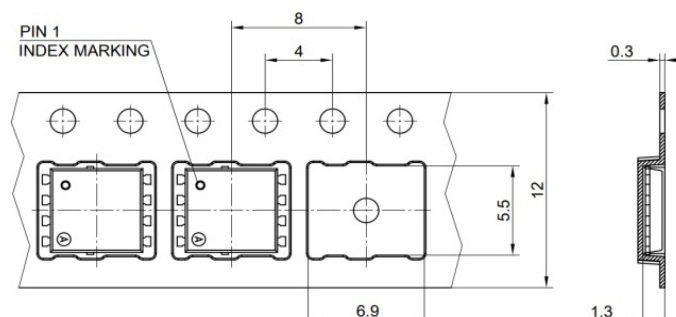


- 1) EXCLUDE MOLD FLASH
 - 2) REMOVAL ON MOLD GATE, INTRUSION 0.1MM AND PROTRUSION 0.1MM
 - 3) LEAD LENGTH UP TO ANTI FLASH LINE
 - 4) ALL METAL SURFACE ARE PLATED, EXCEPT AREA OF CUT
- ALL DIMENSIONS ARE IN UNITS MM
THE DRAWING IS IN COMPLIANCE WITH ISO 128 & PROJECTION METHOD 1 []

Footprint



包装信息



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修订记录

Version	Date	Changes
Revision 1.0	05.06.2020	Final Data Sheet



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