

英飞凌汽车级100V 175°C N沟道

增强型OptiMOS™ 5 功率晶体管



特点

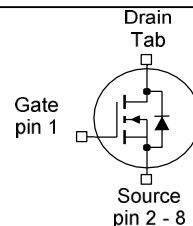
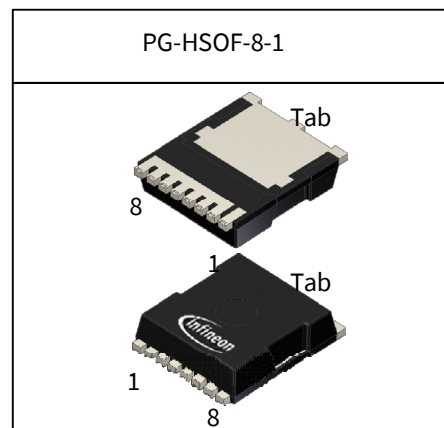
- N沟道-增强模式
- 通过 AEC-Q101 认证
- MSL1 回流焊峰值温度高达 260°C
- 工作温度 175°C
- 绿色产品：符合 RoHS 标准
- 超低 $R_{DS(on)}$
- 100% 雪崩测试

Type	Package	Marking
IAUT150N10S5N035	PG-HSOF-8-1	5N10035

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

产品概述

V_{DS}	100	V
$R_{DS(on)}$	3.5	mΩ
I_D	150	A



Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	$T_c=25^\circ\text{C}, V_{GS}=10\text{V}$	150	A
		$T_c=100^\circ\text{C}, V_{GS}=10\text{V}^{(1)}$	95	
Pulsed drain current ¹⁾	$I_{D,pulse}$	$T_c=25^\circ\text{C}$	600	
Avalanche energy, single pulse ¹⁾	E_{AS}	$I_D=75\text{ A}$	210	mJ
Avalanche current, single pulse	I_{AS}	-	120	A
Gate source voltage	V_{GS}	-	±20	V
Power dissipation	P_{tot}	$T_c=25^\circ\text{C}$	166	W
Operating and storage temperature	T_j, T_{stg}	-	-55 ... +175	°C
IEC climatic category; DIN IEC 68-1	-	-	55/175/56	

本数据手册的原文使用英文撰写。为方便起见，英飞凌提供了译文；由于翻译过程中可能使用了自动化工具，英飞凌不保证译文的准确性。为确认准确性，请务必访问 infineon.com 参考最新的英文版本（控制文档）。

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

热特性¹⁾

Thermal resistance, junction - case	R_{thJC}	-	-	-	0.9	K/W
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除非另有规定，否则均为 $T_j=25\text{ °C}$ 的电气特性。

静态参数特性

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}$, $I_D=1\text{ mA}$	100	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=110\text{ }\mu\text{A}$	2.2	3.0	3.8	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=100\text{ V}$, $V_{GS}=0\text{ V}$, $T_j=25\text{ °C}$	-	0.1	1	μA
		$V_{DS}=50\text{ V}$, $V_{GS}=0\text{ V}$, $T_j=85\text{ °C}^{2)}$	-	1	20	
Gate-source leakage current	I_{GSS}	$V_{GS}=20\text{ V}$, $V_{DS}=0\text{ V}$	-	-	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=6\text{ V}$, $I_D=40\text{ A}$	-	3.7	5.0	m Ω
		$V_{GS}=10\text{ V}$, $I_D=75\text{ A}$	-	3.0	3.5	

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

动态参数特性¹⁾

Input capacitance	C_{iss}	$V_{GS}=0\text{ V}, V_{DS}=50\text{ V},$ $f=1\text{ MHz}$	-	4700	6110	pF
Output capacitance	C_{oss}		-	780	1014	
Reverse transfer capacitance	C_{rss}		-	34	52	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=50\text{ V}, V_{GS}=10\text{ V},$ $I_D=50\text{ A}, R_{G,ext}=3.5\Omega$	-	12	-	ns
Rise time	t_r		-	7	-	
Turn-off delay time	$t_{d(off)}$		-	23	-	
Fall time	t_f		-	26	-	

门极电荷特性¹⁾

Gate to source charge	Q_{gs}	$V_{DD}=50\text{ V}, I_D=100\text{ A},$ $V_{GS}=0\text{ to }10\text{ V}$	-	23	30	nC
Gate to drain charge	Q_{gd}		-	15	23	
Gate charge total	Q_g		-	67	87	
Gate plateau voltage	$V_{plateau}$		-	5.2	-	V

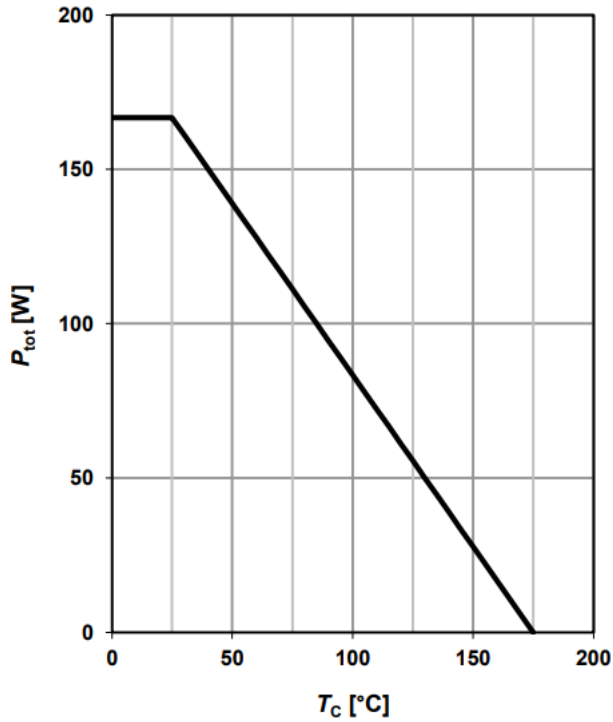
反向二极管

Diode continuous forward current ¹⁾	I_S	$T_C=25\text{ °C}$	-	-	150	A
Diode pulse current ¹⁾	$I_{S,pulse}$		-	-	600	
Diode forward voltage	V_{SD}	$V_{GS}=0\text{ V}, I_F=75\text{ A},$ $T_j=25\text{ °C}$	-	0.9	1.3	V
Reverse recovery time ¹⁾	t_{rr}	$V_R=50\text{ V}, I_F=50\text{ A},$ $di_F/dt=100\text{ A}/\mu\text{s}$	-	63	-	ns
Reverse recovery charge ¹⁾	Q_{rr}		-	120	-	nC

¹⁾由设计标定，不受制于生产测试。

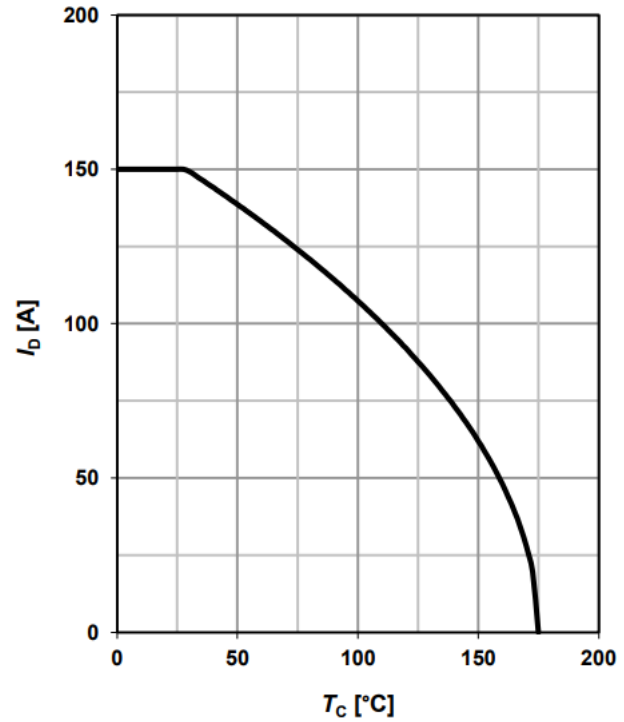
1 功率耗散

$$P_{\text{tot}} = f(T_C); V_{\text{GS}} \geq 6 \text{ V}$$



2 漏极电流

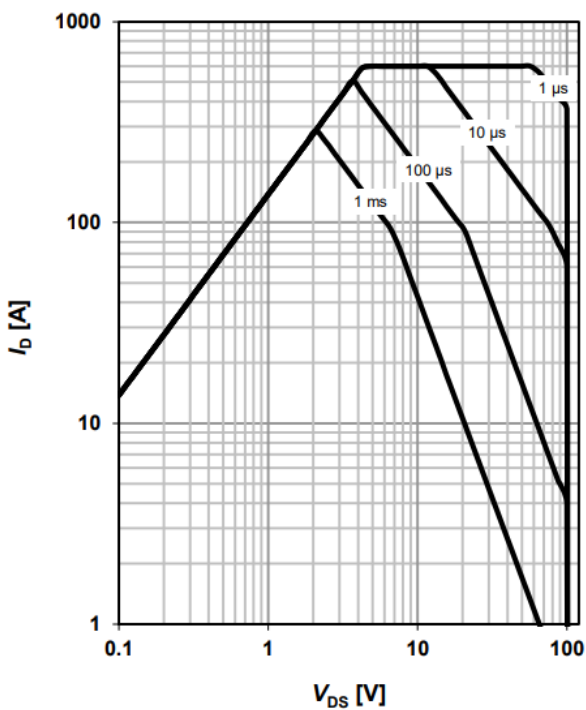
$$I_D = f(T_C); V_{\text{GS}} \geq 6 \text{ V}$$



3 安全工作区

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

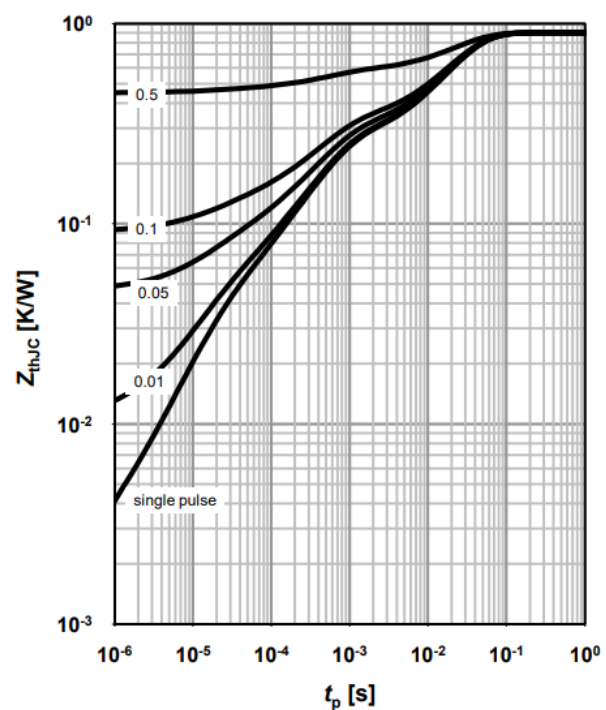
parameter: t_p



4 最大瞬态热阻抗

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

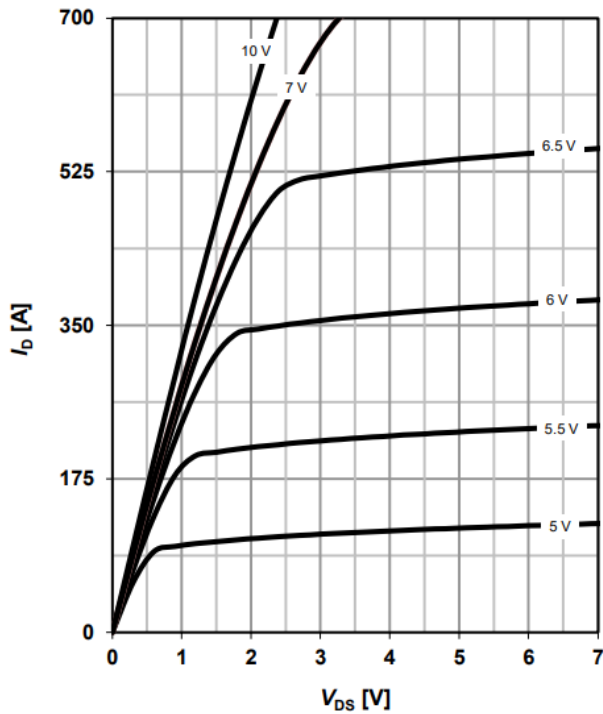
parameter: $D = t_p/T$



5 典型输出特性

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

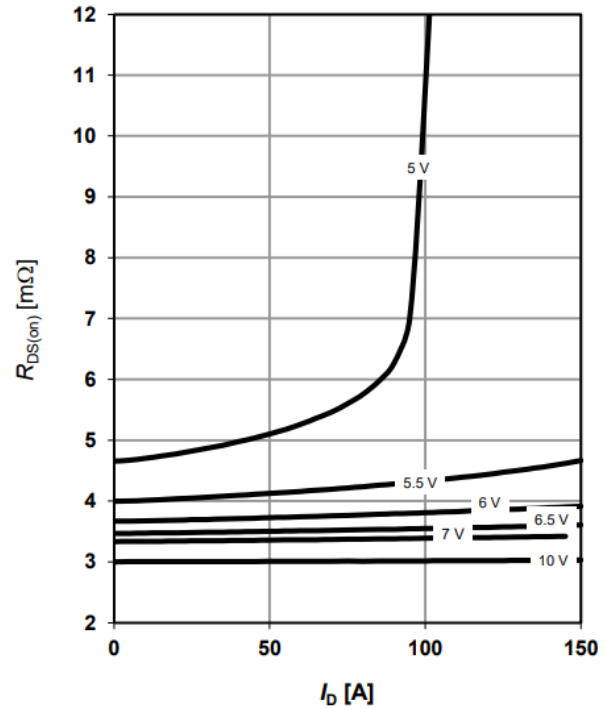
parameter: V_{GS}



6 典型漏源导通电阻

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

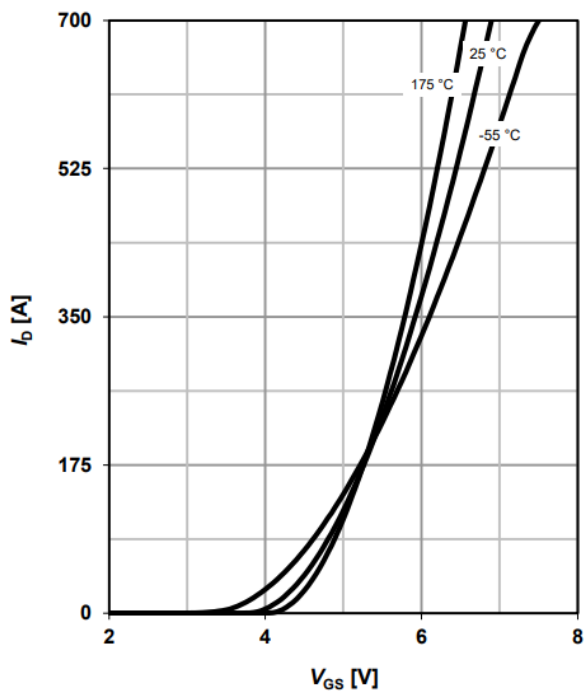
parameter: V_{GS}



7 典型转移特性

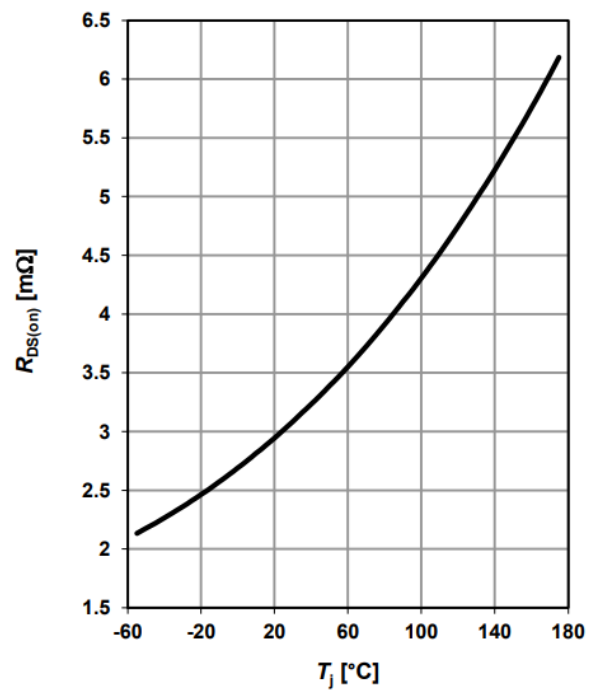
$$I_D = f(V_{GS}); V_{DS} = 6\text{ V}$$

parameter: T_j



8 典型漏源导通电阻

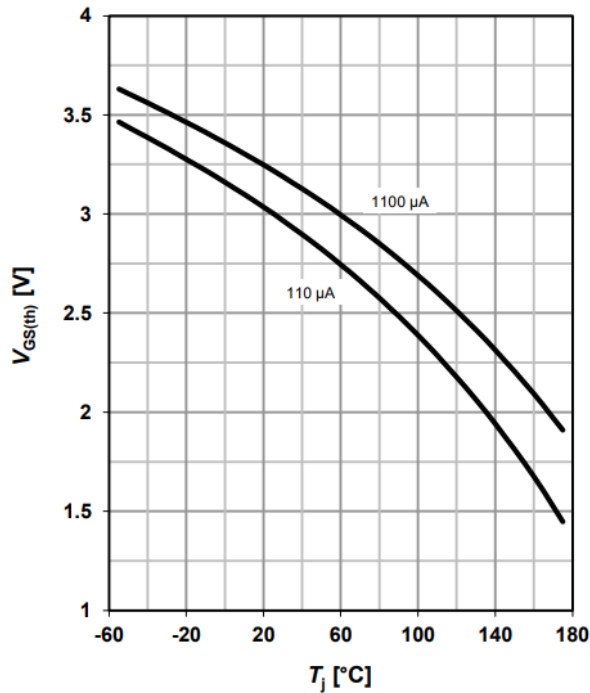
$$R_{DS(on)} = f(T_j); I_D = 75\text{ A}; V_{GS} = 10\text{ V}$$



9 典型栅极阈值电压

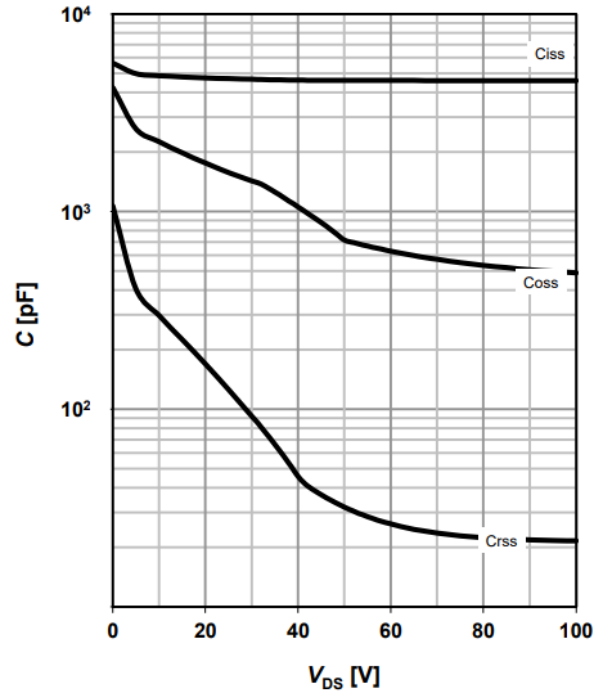
$$V_{GS(th)} = f(T_j); V_{GS} = V_{DS}$$

parameter: I_D



10 典型电容值

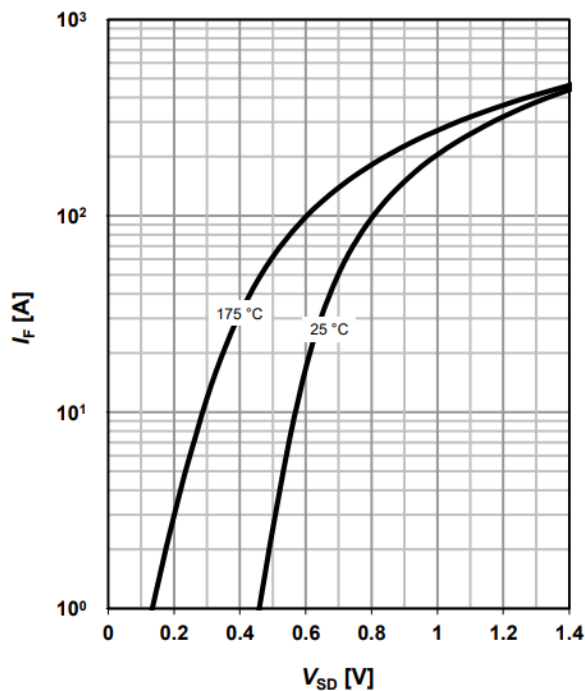
$$C = f(V_{DS}); V_{GS} = 0 \text{ V}; f = 1 \text{ MHz}$$



11 典型二极管正向导通特性

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

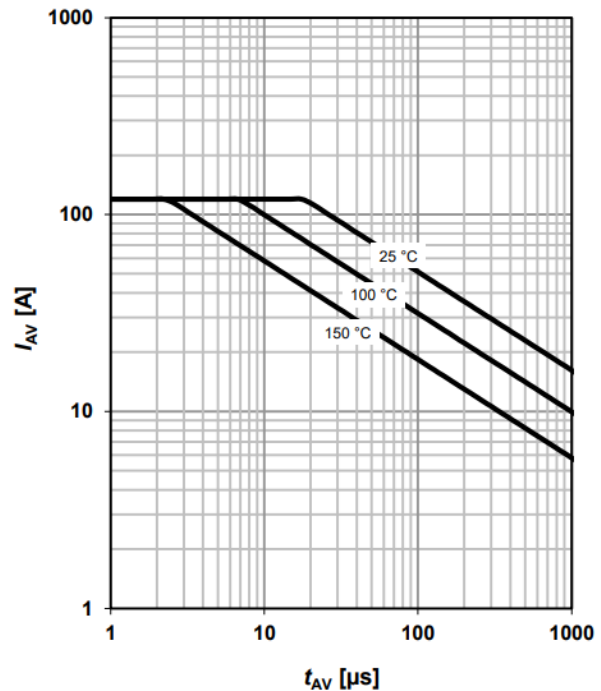
parameter: T_j



12 典型雪崩特性

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

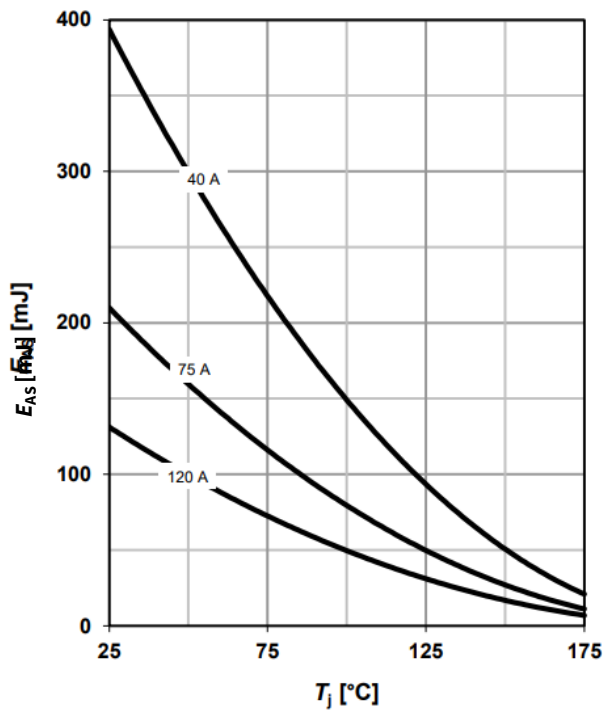
parameter: $T_{j(start)}$



13 典型雪崩能量

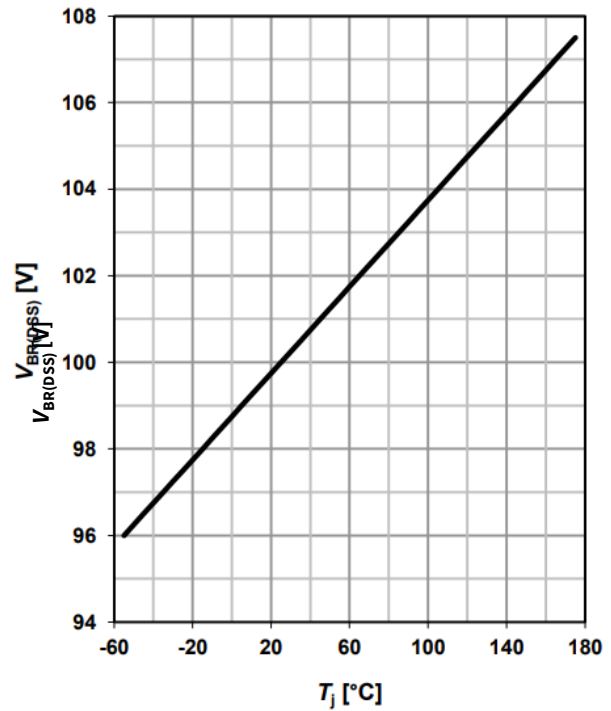
$$E_{AS} = f(T_j)$$

parameter: I_D



14 漏源击穿电压

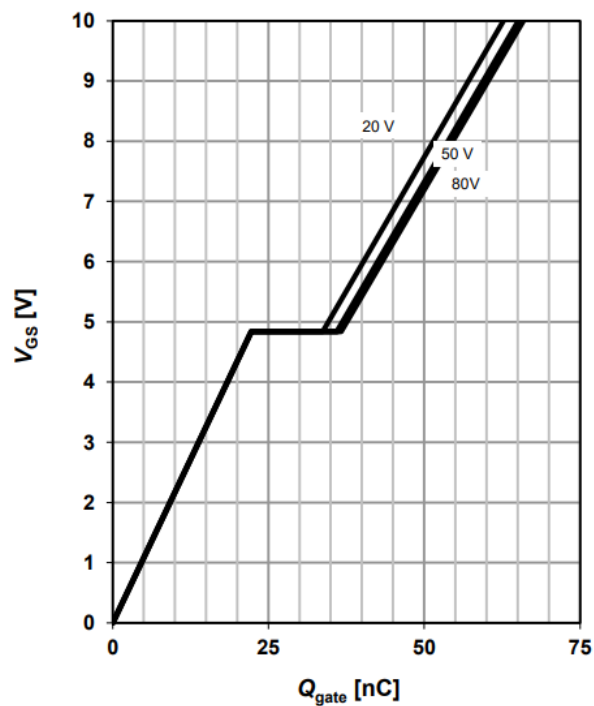
$$V_{BR(DSS)} = f(T_j); I_{D_typ} = 1 \text{ mA}$$



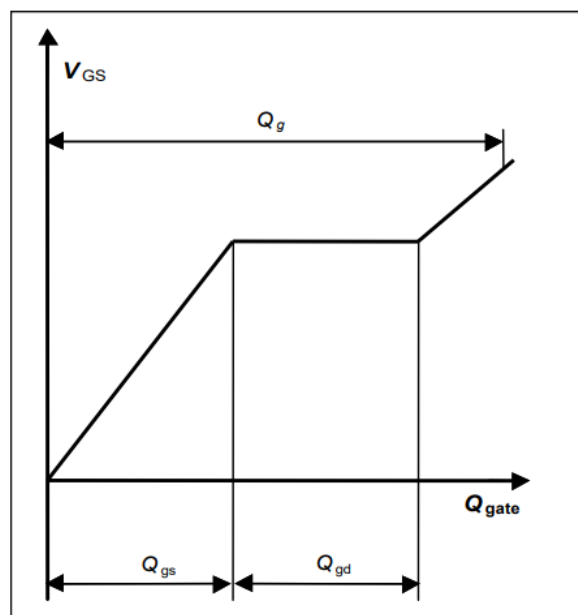
15 典型栅极电荷

$$V_{GS} = f(Q_{gate}); I_D = 100 \text{ A pulsed}$$

parameter: V_{DD}



16 栅极充电波形



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修订记录

Version	Date	Changes
Version 1.0	02.10.2017	Final Data Sheet
Version 2.0	14.03.2019	Updated avalanche parameters
Version 2.1	21.09.2023	package name on page 1



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