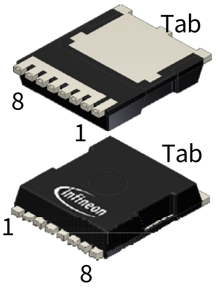
英飞凌汽车级80V 175°C N沟道增强型OptiMOS™ 5 功率晶体管

产品概述

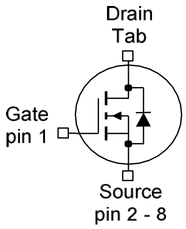
V_{DS}	80	V
$R_{DS(on)}$	1.4	mΩ
I_D	300	A

PG-HSOF-8-1



特点

- N沟道-增强模式
- 符合 AEC-Q100
- 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 Rds(on)
- 100% 雪崩测试



Type	Package	Marking
IAUT300N08S5N014	**PG-HSOF-8-1**	5N08014

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
Continuous drain current	I_D	T_C=25°C, V_{GS}=10V 1)	300	A
		T_C=100 °C, V_{GS}=10 V 2)	230	
Pulsed drain current 2)	$I_{D,pulse}$	T_C=25 °C	1200	
Avalanche energy, single pulse 2)	E_{AS}	I_D=150 A	600	mJ
Avalanche current, single pulse	I_{AS}	-	300	A
Gate source voltage	V_{GS}	-	±20	V
Power dissipation	P_{tot}	T_C=25 °C	300	W
Operating and storage temperature	T_j, T_{stg}	-	-55 ... +175	°C
IEC climatic category; DIN IEC 68-1	-	-	55/175/56	

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
热特性[2]						
Thermal resistance, junction - case	R_{thJC}	-	-	-	0.5	K/W
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[2]	$V_{(BR)DSS}$	V_{GS}=0 V, I_D=1 mA	80	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=230 µA	2.2	3	3.8	
Zero gate voltage drain current[2]	I_{DSS}	V_{DS}=80 V, V_{GS}=0 V, T_j=25 °C	-	0.1	1	µA
		V_{DS}=40 V, V_{GS}=0 V, T_j=85 °C[2]	-	1	20	
Gate-source leakage current	I_{GSS}	V_{GS}=20 V, V_{DS}=0 V	-	-	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=6 V, I_D=75 A	-	1.6	2.1	mΩ
		V_{GS}=10 V, I_D=100 A	-	1.1	1.4	

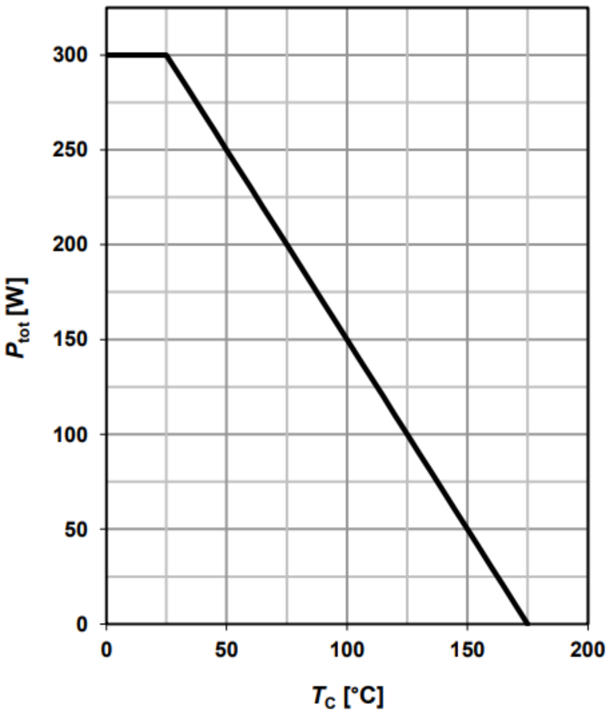
Parameter	**Symbol**	**Conditions**	**Values**			**Unit**
			min.	**typ.**	**max.**	
动态参数特性[2]						
Input capacitance	C_{iss}	V_{GS}=0 V, V_{DS}=40 V, f=1 MHz	-	10137	13178	pF
Output capacitance	C_{oss}		-	1626	2114	
Reverse transfer capacitance	C_{rss}		-	71	106	
Turn-on delay time	$t_{d(on)}$	V_{DD}=40 V, V_{GS}=10 V, I_D=100 A, R_G=3.5 Ω	-	25	-	ns
Rise time	t_r		-	15	-	
Turn-off delay time	$t_{d(off)}$		-	52	-	
Fall time	t_f		-	46	-	
栅极电荷特性[2]						
Gate to source charge	Q_{gs}	V_{DD}=40 V, I_D=100 A, V_{GS}=0 to 10 V	-	46	60	nC
Gate to drain charge	Q_{gd}		-	30	47	
Gate charge total	Q_g		-	144	187	
Gate plateau voltage	$V_{plateau}$		-	4.5	-	V
反向二极管						
Diode continous forward current[2]	I_S	T_C=25 °C	-	-	300	A
Diode pulse current[2]	$I_{S,pulse}$		-	-	1200	
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=100 A, T_j=25 °C	-	0.9	1.2	V
Reverse recovery time[2]	t_{rr}	V_R=40 V, I_F=50A, di_F/dt=100 A/µs	-	83	-	ns
Reverse recovery charge[2]	Q_{rr}		-	156	-	nC

[1] 电流受封装限制；当R_{thJC}= 0.5 K/W时，该芯片在25°C时能够承载327 A。

[2] 由设计标定，不受制于生产测试。

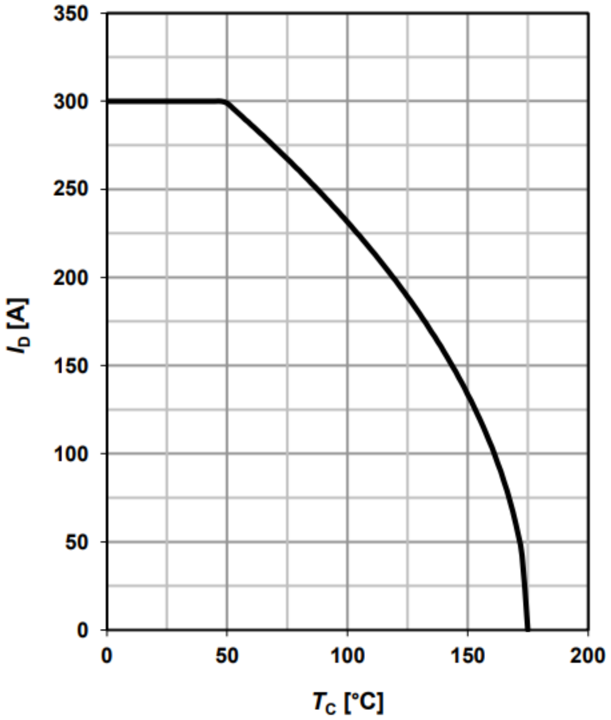
1 功率耗散

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



2 漏极电流

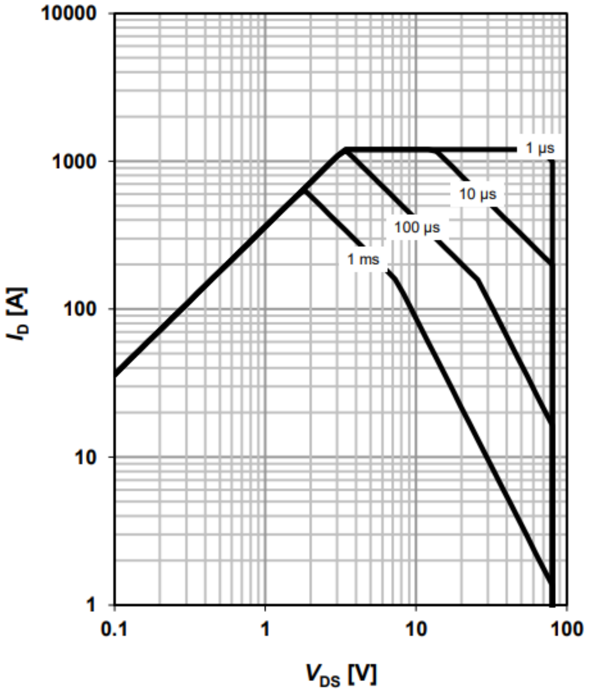
$I_{\text{D}} = \mathrm{f}(T_{\text{C}})$; $V_{\text{GS}} \geq 6\ \text{V}$



3 安全工作区

$I_{\text{D}} = \mathrm{f}(V_{\text{DS}})$; $T_{\text{C}} = 25\ \text{°C}$; $D = 0$

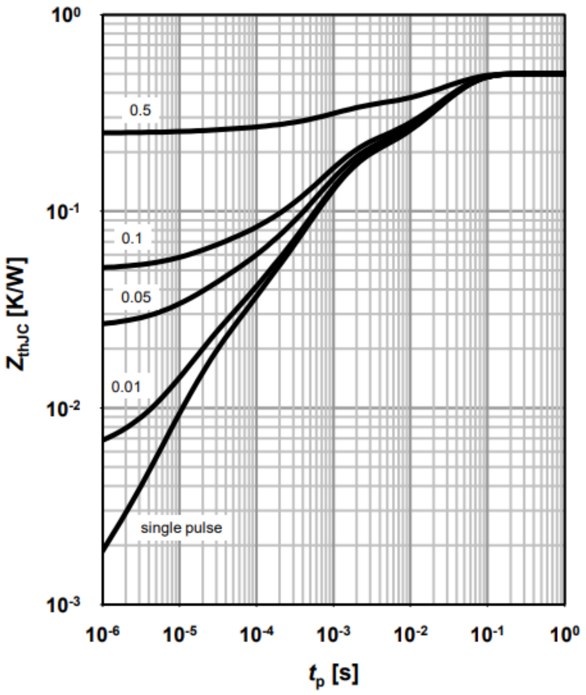
parameter: t_{p}



4 最大瞬态热阻抗

$Z_{\text{thJC}} = \mathrm{f}(t_{\text{p}})$

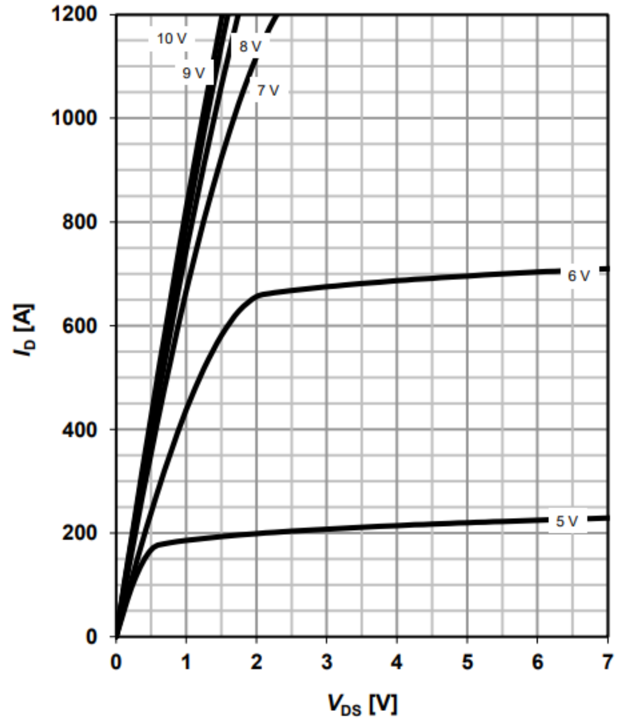
parameter: $D = t_{\text{p}}/T$



5 典型输出特性

$I_D = f(V_{DS})$; $T_j = 25$ °C

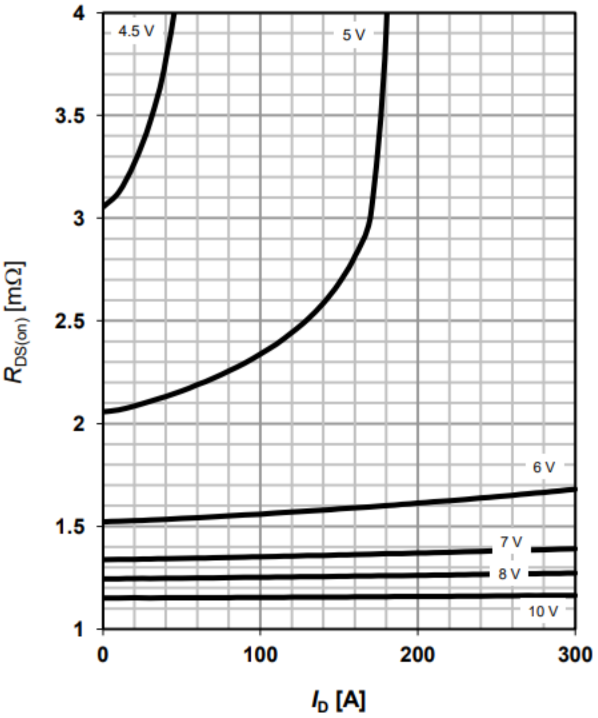
parameter: V_{GS}



6 典型漏源导通电阻

$R_{DS(on)} = f(I_D)$; $T_j = 25$ °C

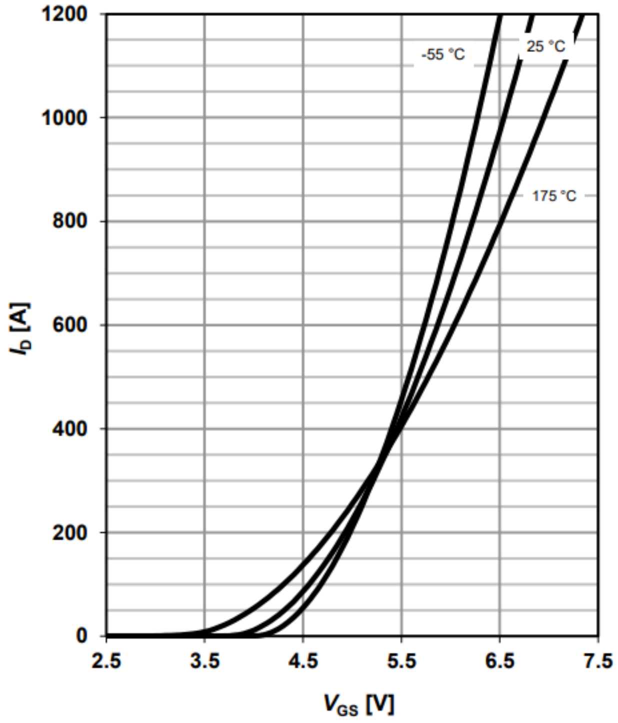
parameter: V_{GS}



7 典型转移特性

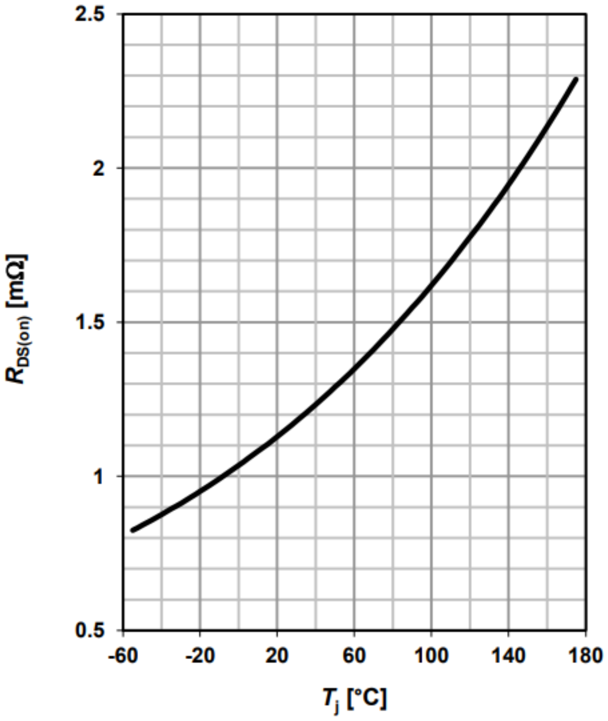
$I_D = f(V_{GS})$; $V_{DS} = 6$V

parameter: T_j



8 典型漏源导通电阻

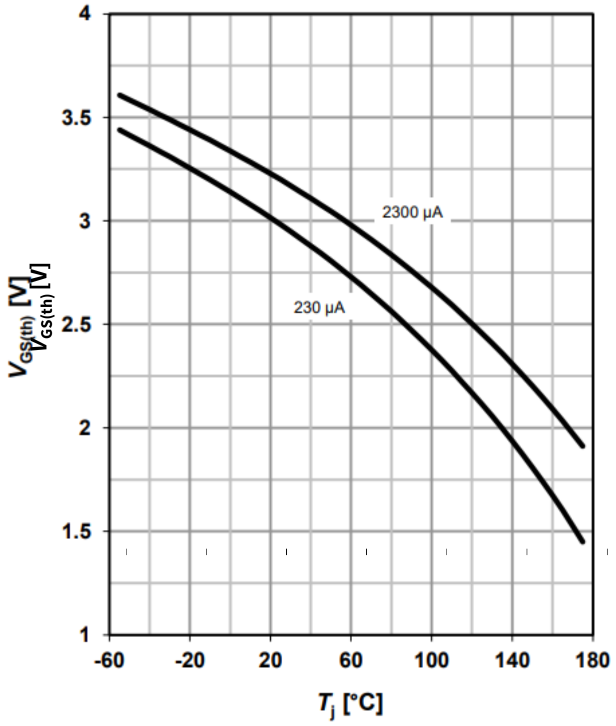
$R_{DS(on)} = f(T_j)$; $I_D = 100$ A; $V_{GS} = 10$ V



9 典型栅极阈值电压

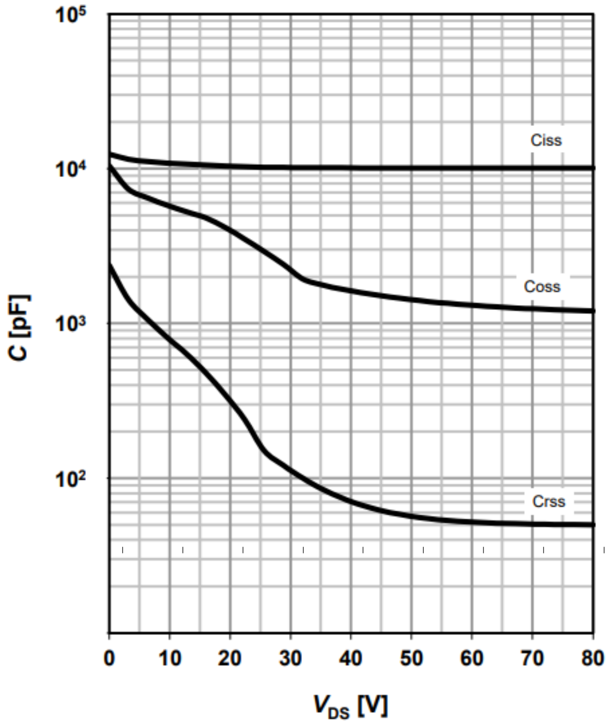
$V_{GS(th)} = f(T_j)$; $V_{GS} = V_{DS}$

parameter: I_D



10 典型电容值

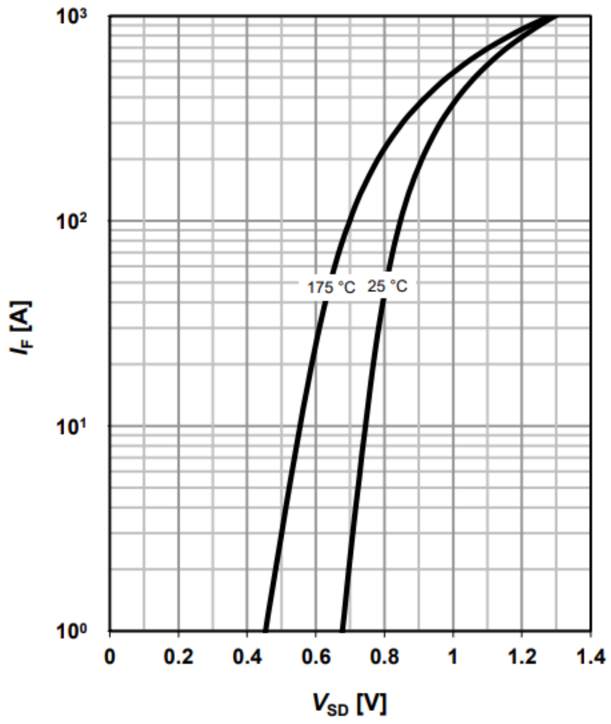
$C = f(V_{DS})$; $V_{GS} = 0$ V; $f = 1$ MHz



11 典型二极管正向导通特性

$IF = f(V_{SD})$

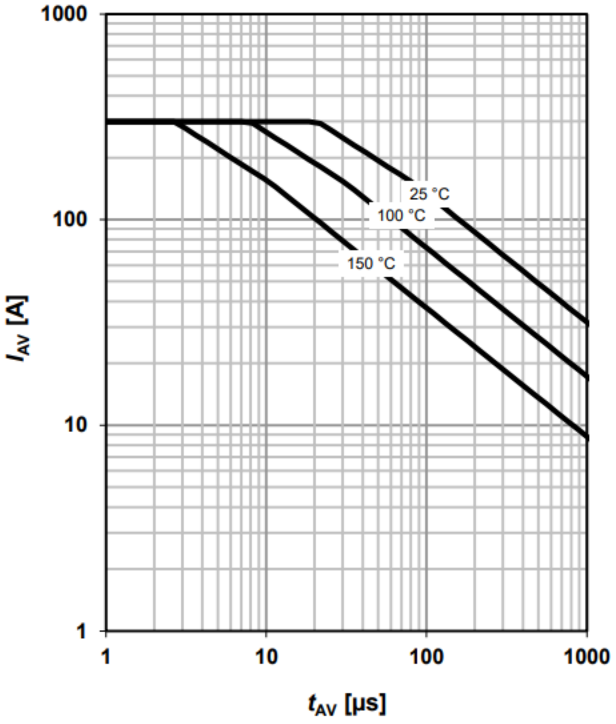
parameter: T_j



12 典型雪崩特性

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

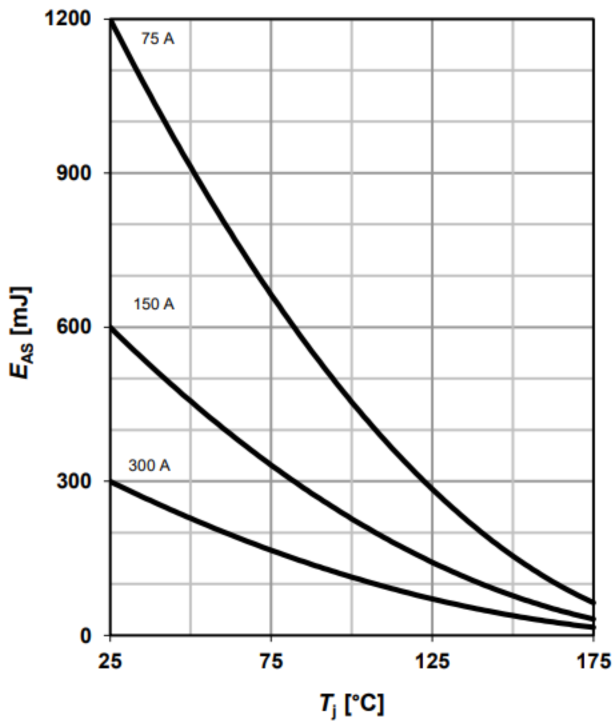
parameter: $T_{j(start)}$



13 典型雪崩能量

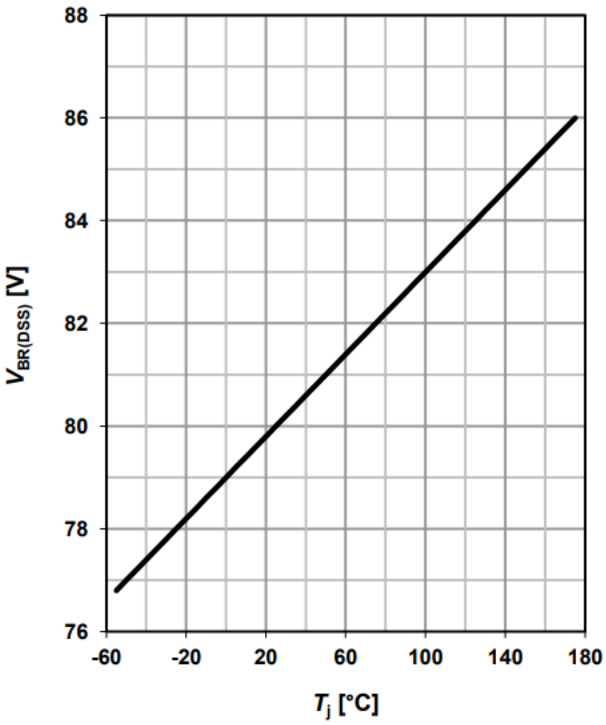
$E_{AS} = f(T_j)$

parameter: I_D



14 漏源击穿电压

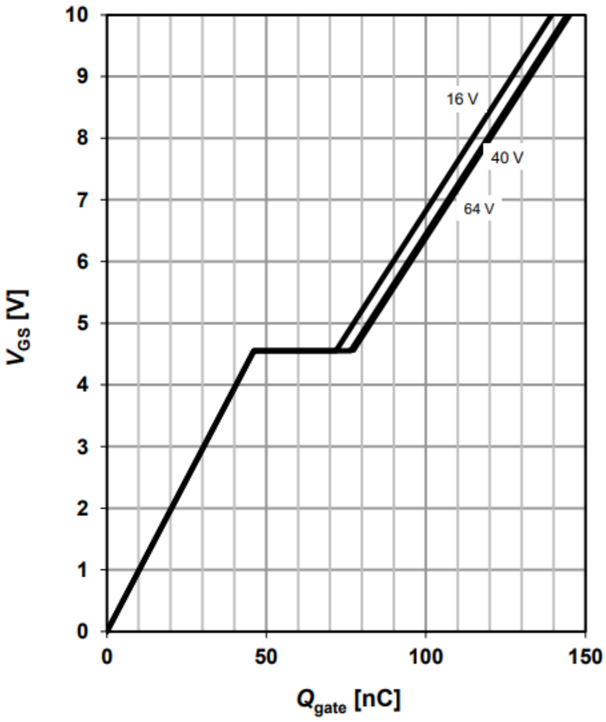
$V_{BR(DSS)} = f(T_j)$; $I_{D\_typ} = 1$ mA



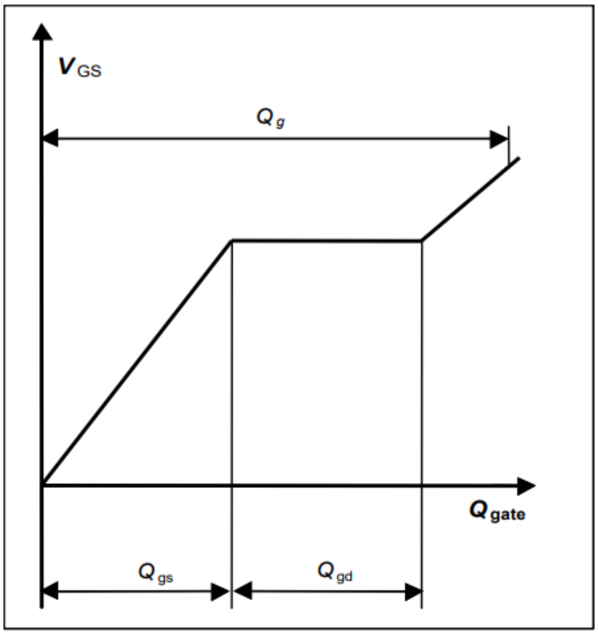
15 典型栅极电荷

$V_{GS} = f(Q_{gate})$; $I_D = 100$ 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	15.12.2017	Final Data Sheet
Version 1.1	17.01.2024	package name (page 1)

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