英飞凌汽车级100V 175°C N沟道

增强型OptiMOS™ 5 功率晶体管

AEC Qualified | Infineon Automotive Quality | RoHS

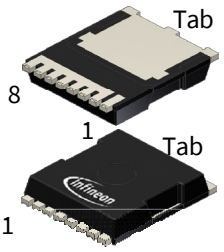
产品概述

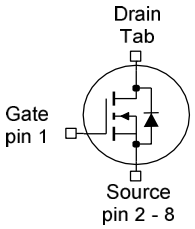
V_{DS}	100	V
$R_{DS(on)}$	1.4	mΩ
I_D	300	A

特点

- 适用于汽车应用的功率MOSFET
- N 沟道 – 增强型 – 标准电平
- 严苛于AEC-Q101 的扩展认证
- 加强电气测试
- 坚固的设计
- 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

PG-HSOF-8-1





Type	Package	Marking
IAUT300N10S5N014	PG-HSOF-8-1	5N10014

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	V_{GS}=10 V, Chip limitation[1,2)]	360	A
		V_{GS}=10V, DC current[3)]	300	
		T_a=85 °C, V_{GS}=10 V, R_{thJA} on 2s2p[2,4)]	46	
Pulsed drain current[2)]	$I_{D,pulse}$	T_C=25 °C, t_p= 100 µs	1315	
Avalanche energy, single pulse[2)]	E_{AS}	I_D=150 A	652	mJ
Avalanche current, single pulse	I_{AS}	-	300	A
Gate source voltage	V_{GS}	-	±20	V
Power dissipation	P_{tot}	T_C=25 °C	375	W
Operating and storage temperature	T_j, T_{stg}	-	-55 ... +175	°C
IEC climatic category; DIN IEC 68-1	-	-	55/175/56	

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Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

热特性[2)]

Thermal resistance, junction - case	R_{thJC}	-	-	-	0.4	K/W
Thermal resistance, junction - ambient[4)]	R_{thJA}	-	-	14.8	-	

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}=0 V, I_D=1 mA	100	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=275 µA	2.2	3.0	3.8	
Zero gate voltage drain current	I_{DSS}	V_{DS}=100 V, V_{GS}=0 V, T_j=25 °C	-	0.1	1	µA
		V_{DS}=50 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	2.0	mΩ
		V_{GS}=10 V, I_D=100 A	-	1.3	1.4	
Gate resistance[2)]	R_G	-	-	1.5	-	Ω

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}=50 V, f=1 MHz	-	12316	16011	pF
Output capacitance	C_{oss}		-	1920	2496	
Reverse transfer capacitance	C_{rss}		-	84	126	
Turn-on delay time	$t_{d(on)}$	V_{DD}=50 V, V_{GS}=10 V, I_D=100 A, R_G=3.5 Ω	-	29	-	ns
Rise time	t_r		-	15	-	
Turn-off delay time	$t_{d(off)}$		-	70	-	
Fall time	t_f		-	48	-	
栅极电荷特性[2)]						
Gate to source charge	Q_{gs}	V_{DD}=50 V, I_D=100 A, V_{GS}=0 to 10 V	-	52	68	nC
Gate to drain charge	Q_{gd}		-	33	50	
Gate charge total	Q_g		-	166	216	
Gate plateau voltage	$V_{plateau}$		-	4.4	-	V
反向二极管						
Diode continous forward current[2)]	I_S	T_C=25 °C	-	-	300	A
Diode pulse current[2)]	$I_{S,pulse}$	T_C=25 °C	-	-	1315	
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=100 A, T_j=25 °C	-	0.9	1.3	V
Reverse recovery time[2)]	t_{rr}	V_R=50 V, I_F=50A, di_F/dt =100 A/µs	-	90	-	ns
Reverse recovery charge[2)]	Q_{rr}		-	220	-	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。

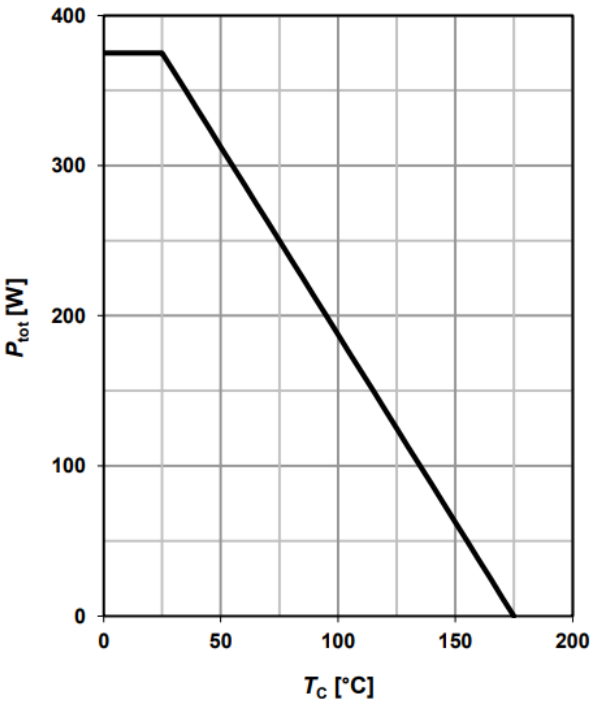
[2)]该参数不受制于生产测试 – 由设计标定。

[3)]电流受到接合线的限制。

[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。

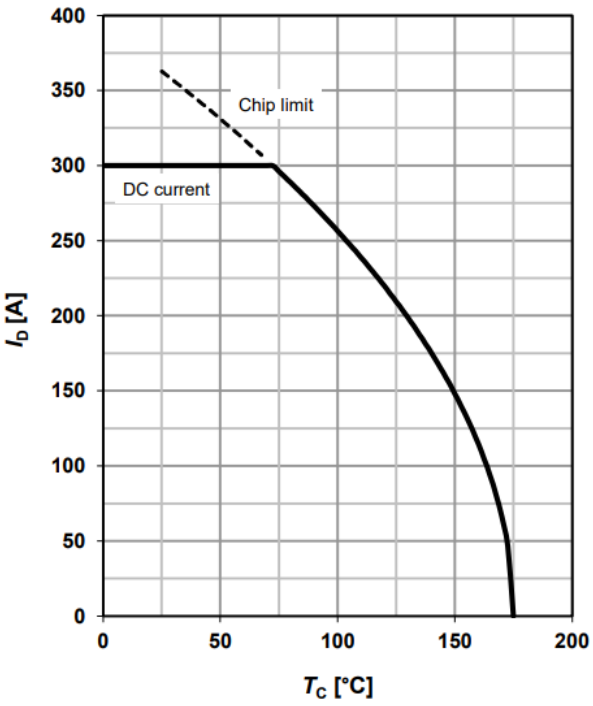
1 功率耗散

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



2 漏极电流

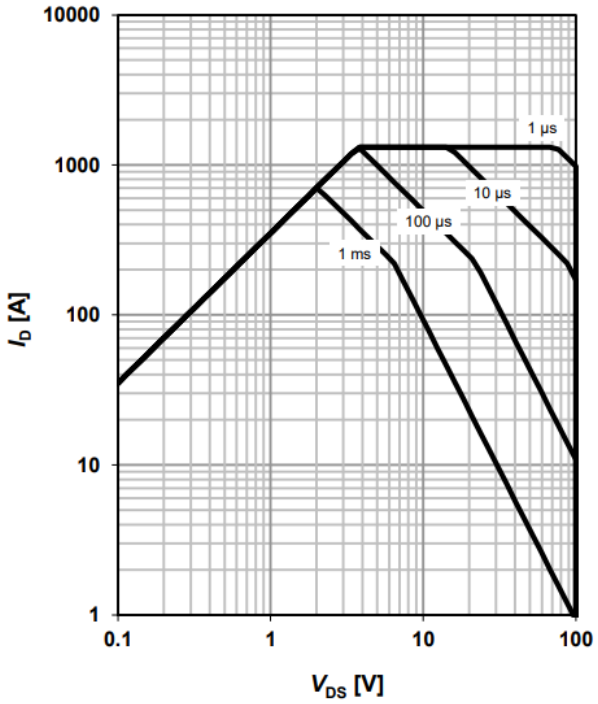
$I_D = f(T_C); V_{GS} \geq 6\ V$



3 安全工作区

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

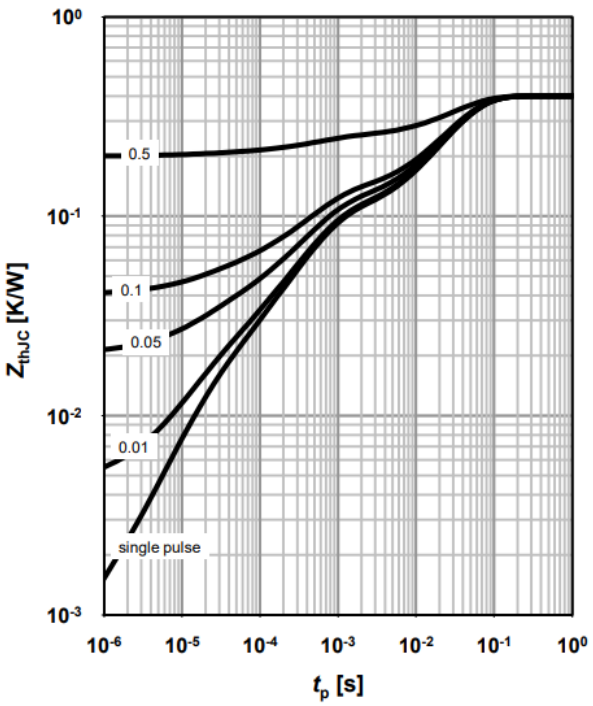
parameter: t_p



4 最大瞬态热阻抗

$Z_{thJC} = f(t_p)$

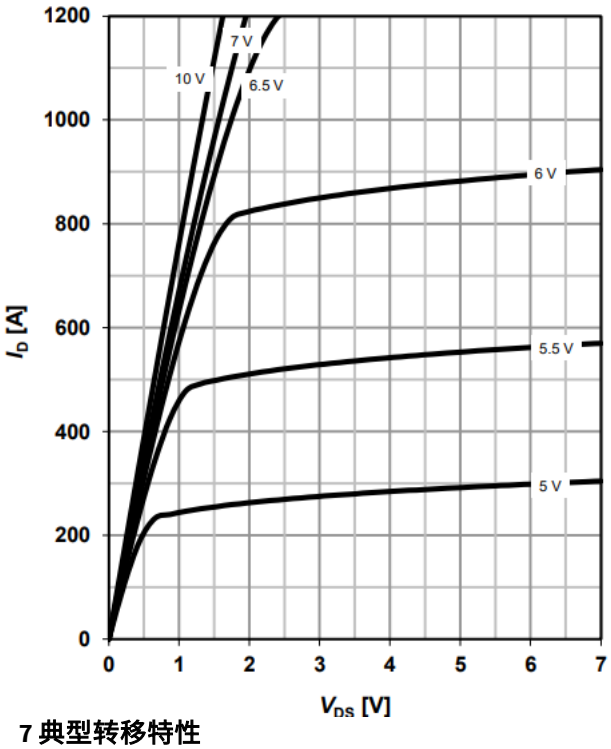
parameter: $D = t_p/T$



5 典型输出特性

$I_D = f(V_{DS})$; $T_j = 25\ °C$

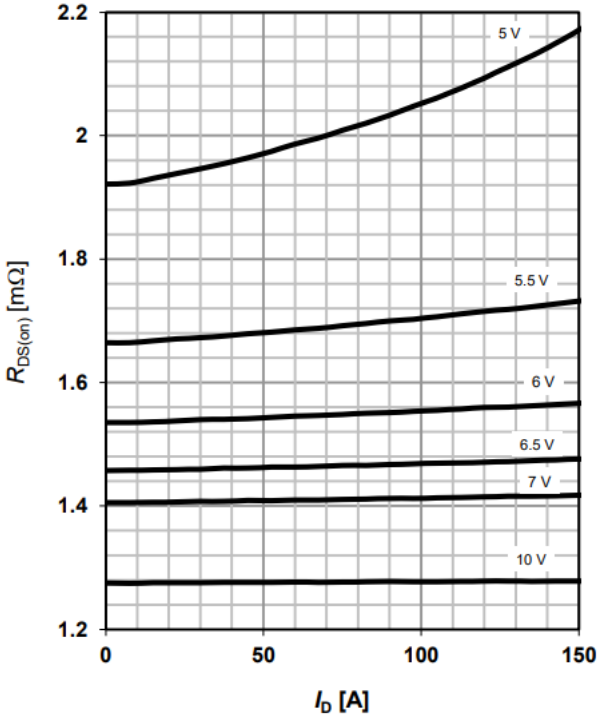
parameter: V_{GS}



6 典型漏源导通电阻

$R_{DS(on)} = f(I_D)$; $T_j = 25\ °C$

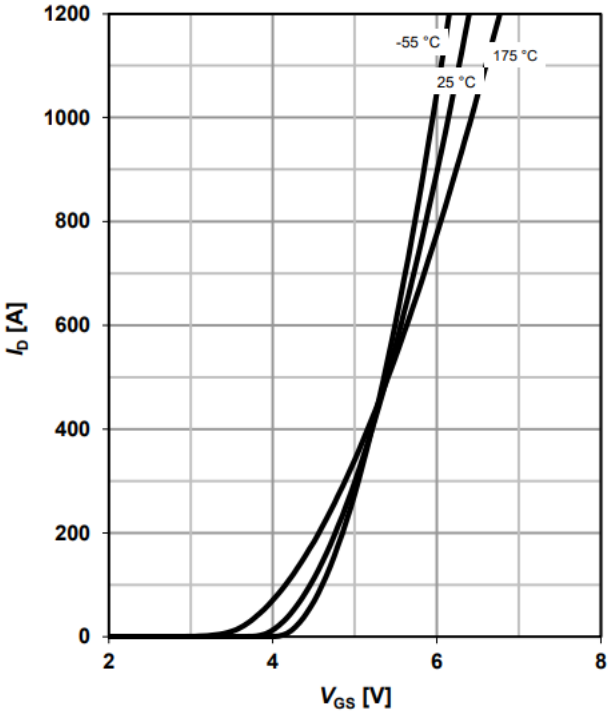
parameter: V_{GS}



7 典型转移特性

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

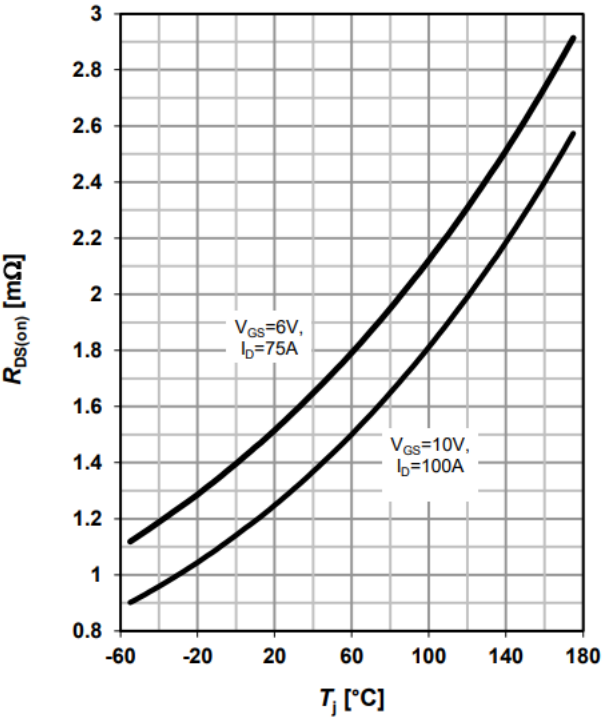
parameter: T_j



8 典型漏源导通电阻

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

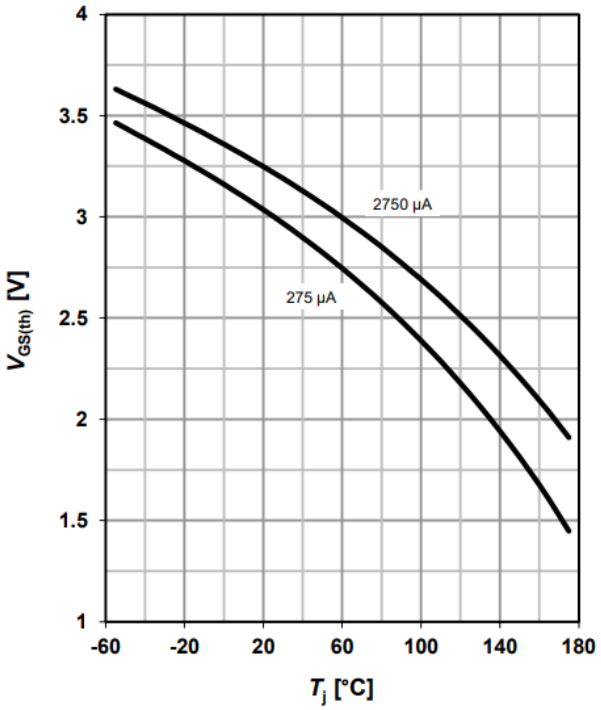
parameter: I_D, V_{GS}



9 典型栅极阈值电压

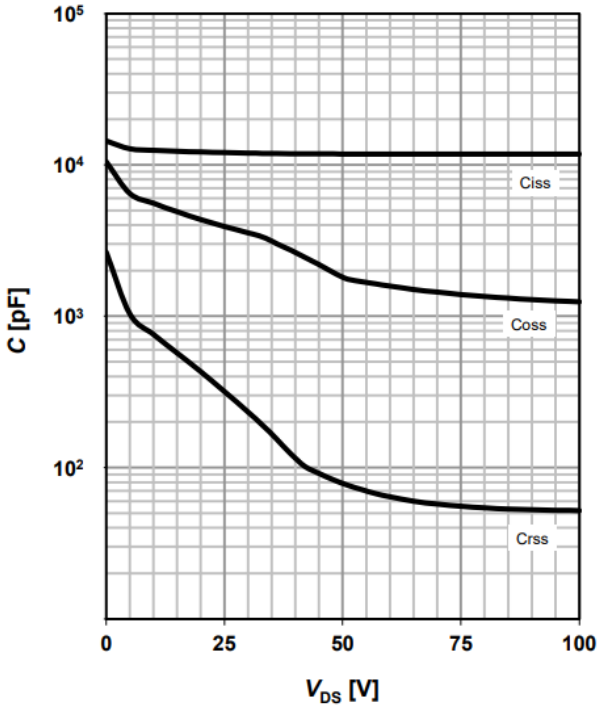
$V_{GS(th)} = f(T_j)$; $V_{GS} = V_{DS}$

parameter: I_D



10 典型电容值

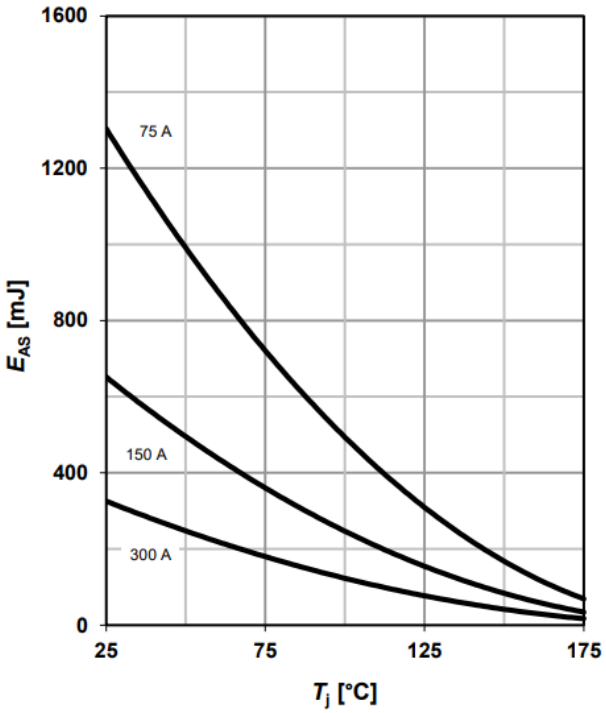
$C = f(V_{DS})$; $V_{GS} = 0$ V; $f = 1$ MHz



11 典型二极管正向导通特性

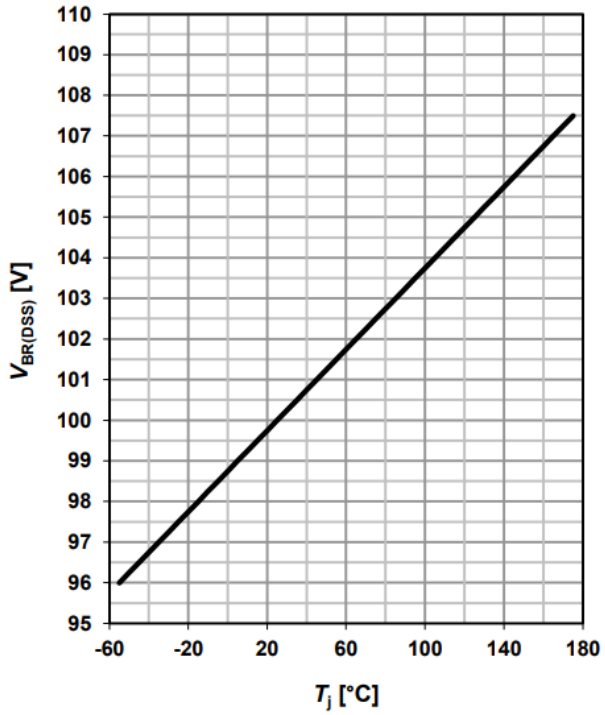
$E_{AS} = f(T_j)$

parameter: I_D



12 典型雪崩特性

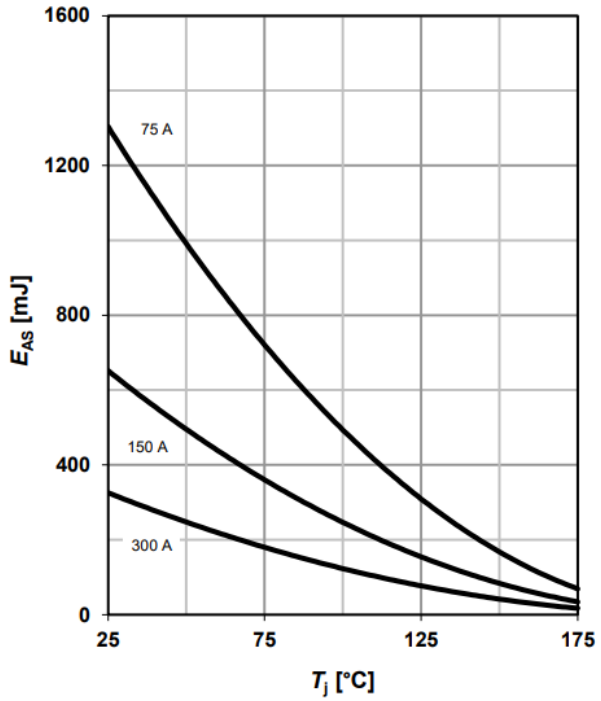
$V_{BR(DSS)} = f(T_j)$; $I_{D_typ} = 1$ mA



13 典型雪崩能量

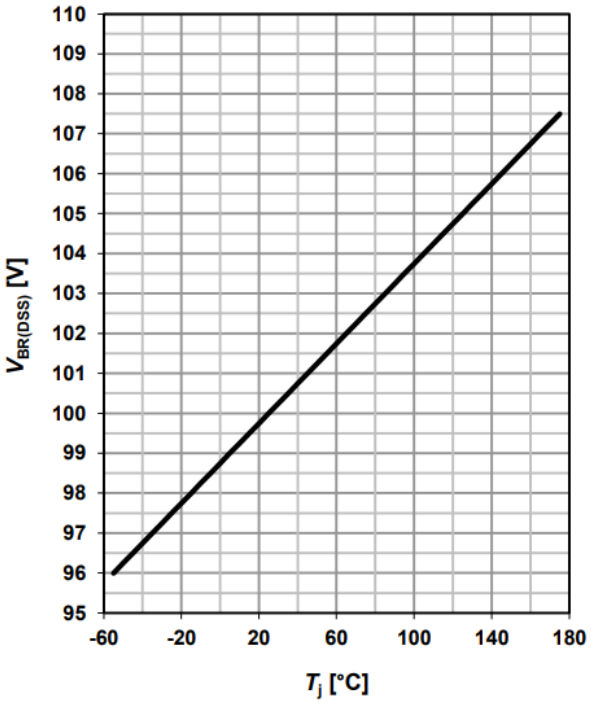
$E_{AS} = f(T_j)$

parameter: I_D



14 漏源击穿电压

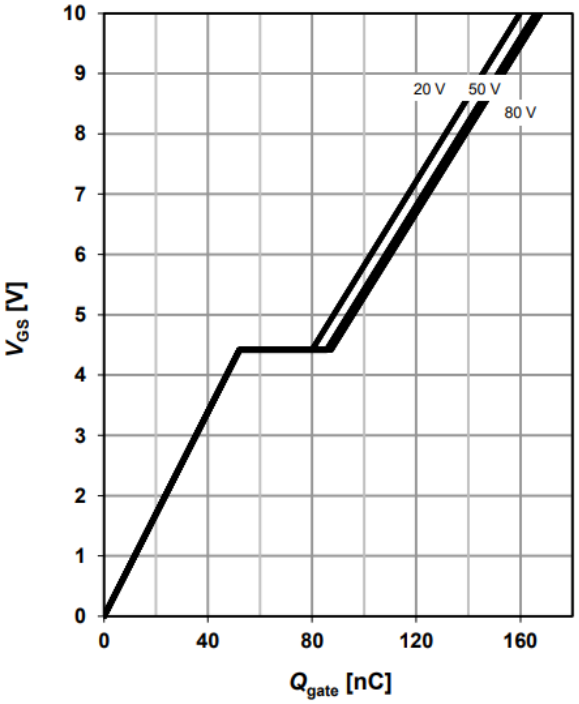
$V_{BR(DSS)} = f(T_j)$; I_{D_typ} = 1 mA



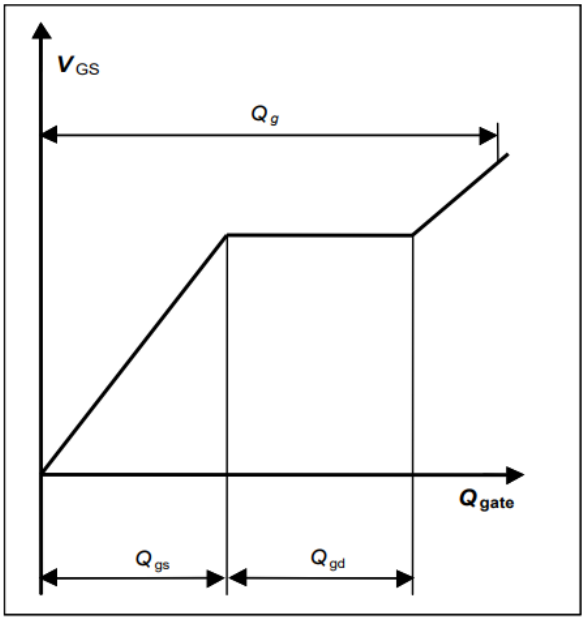
15 典型栅极电荷

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

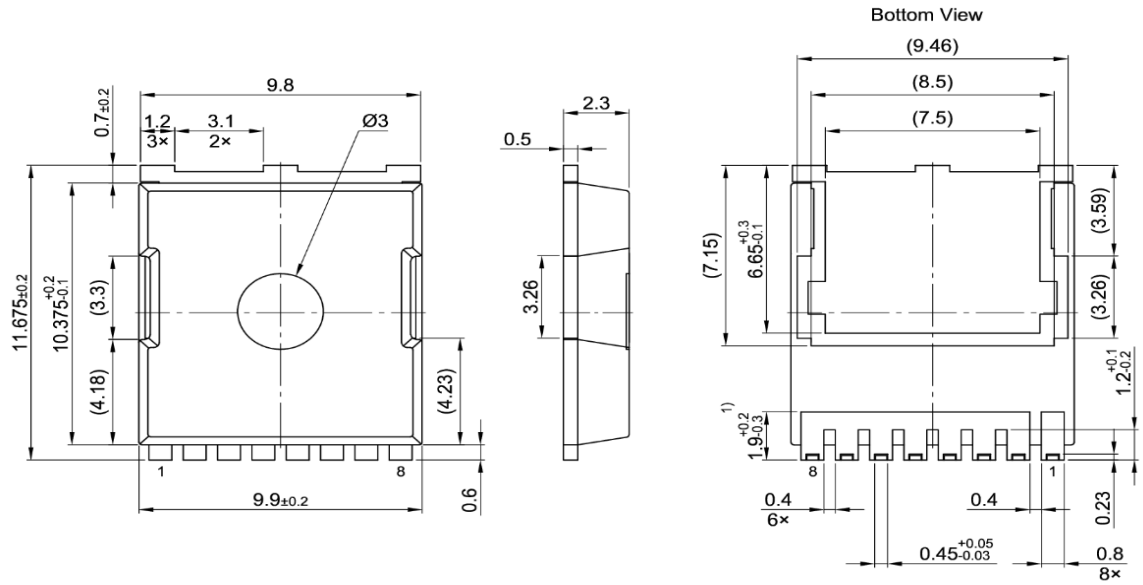
parameter: V_{DD}



16 栅极充电波形

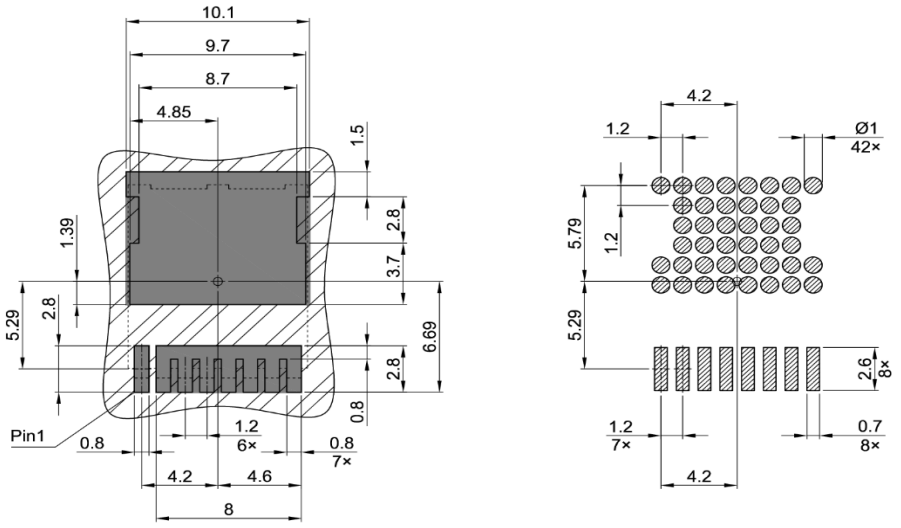


封装外形尺寸



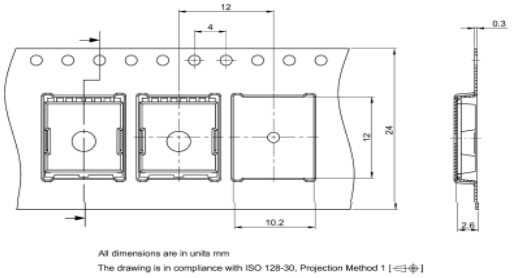
1) Lead length up to anti flash profile; mold flashes excluded
All dimensions are in units mm
The drawing is in compliance with ISO 128-30, Projection Method 1 [⇥⊕]
Drawing according to ISO 8015, general tolerances ±0,1; ±1°30'

Footprint



All pads are solder mask defined
All dimensions are in units mm

包装信息



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修订记录

Version	Date	Changes
Version 1.0	2021-01-19	Final Datasheet
Version 1.1	2023-02-07	package outline corrected, footprint updated

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