

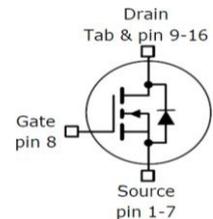
英飞凌汽车级100V 175°C N沟道
增强型OptiMOS™ 5 功率晶体管

特点

- 适用于汽车应用的功率MOSFET
- N 沟道 – 增强型 – 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

产品概述

V_{DS}	100	V
$R_{DS(on)}$	1.9	mΩ
I_D	260	A



Type	Package	Marking
IAUS260N10S5N019T	PG-HDSOP-16-2	5N10019

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
Continuous drain current	I_D	$V_{GS}=10\text{ V}$, Chip limitation ^{1,2)}	260	A
		$V_{GS}=10\text{V}$, DC current	260	
		$T_a=85^\circ\text{C}$, $V_{GS}=10\text{ V}$, R_{thJA} on 2s2p ^{2,3)}	91	
Pulsed drain current ²⁾	$I_{D,pulse}$	$T_c=25^\circ\text{C}$, $t_p=100\ \mu\text{s}$	995	
Avalanche energy, single pulse ²⁾	E_{AS}	$I_D=130\text{ A}$	400	mJ
Avalanche current, single pulse	I_{AS}	-	220	A
Gate source voltage	V_{GS}	-	± 20	V
Power dissipation	P_{tot}	$T_c=25^\circ\text{C}$	300	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}	Top	-	-	0.5	K/W
		Bottom (Pin 1-7)	-	9	-	
		Bottom (Pin 9-16)	-	3	-	
Thermal resistance, junction - ambient ⁴⁾	R_{thJA}	Top	-	2.8	-	
		Bottom (through PCB)	-	40	-	

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	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=210\text{ }\mu\text{A}$	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	$R_{DS(on)}$	$V_{GS}=6\text{ V}$, $I_D=65\text{ A}$	-	2.0	2.6	m Ω
		$V_{GS}=10\text{ V}$, $I_D=100\text{ A}$	-	1.6	1.9	
Gate resistance ²⁾	R_G	-	-	1.2	-	Ω

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

动态参数特性²⁾

Input capacitance	C_{iss}	$V_{GS}=0\text{ V}, V_{DS}=50\text{ V},$ $f=1\text{ MHz}$	-	9100	11830	pF
Output capacitance	C_{oss}		-	1386	1801	
Reverse transfer capacitance	C_{rss}		-	61	92	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=50\text{ V}, V_{GS}=10\text{ V},$ $I_D=100\text{ A}, R_G=3.5$	-	21	-	ns
Rise time	t_r		-	11	-	
Turn-off delay time	$t_{d(off)}$		-	49	-	
Fall time	t_f		-	38	-	

栅极电荷特性²⁾

Gate to source charge	Q_{gs}	$V_{DD}=50\text{ V}, I_D=100\text{ A},$ $V_{GS}=0\text{ to }10\text{ V}$	-	41	54	nC
Gate to drain charge	Q_{gd}		-	28	42	
Gate charge total	Q_g		-	128	166	
Gate plateau voltage	$V_{plateau}$		-	4.5	-	V

反向二极管

Diode continuous forward current ²⁾	I_S	$T_C=25\text{ }^\circ\text{C}$	-	-	260	A
Diode pulse current ²⁾	$I_{S,pulse}$	$T_C=25\text{ }^\circ\text{C}, t_p=100\text{ }\mu\text{s}$	-	-	2000	
Diode forward voltage	V_{SD}	$V_{GS}=0\text{ V}, I_F=100\text{ A},$ $T_J=25\text{ }^\circ\text{C}$	-	0.9	1.3	V
Reverse recovery time ²⁾	t_{rr}	$V_R=50\text{ V}, I_F=50\text{ A},$ $di_F/dt=100\text{ A}/\mu\text{s}$	-	79	-	ns
Reverse recovery charge ²⁾	Q_{rr}		-	177	-	nC

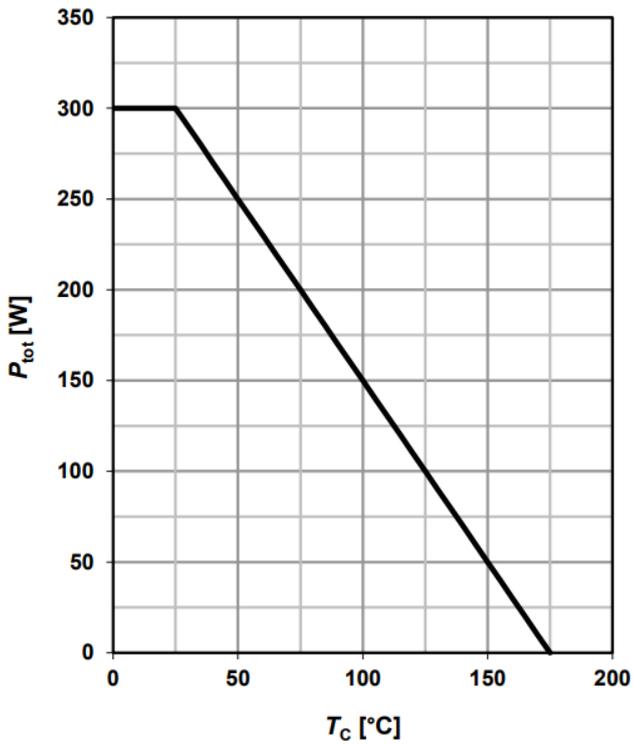
¹⁾ 实际上，电流能力受到包括客户特定的印刷电路板在内的整体系统设计的限制。

²⁾ 该参数不受制于生产测试 - 由设计标定。

³⁾ 四层 2s2p FR4 印刷电路板上的器件，具有顶部冷却功能。隔热材料厚度为 100 μm ，电导率为 0.7 W/mK。散热器的顶面固定在环境温度下。印刷电路板的底面处于自由对流状态。值可能会根据客户特定的设计而有所不同。

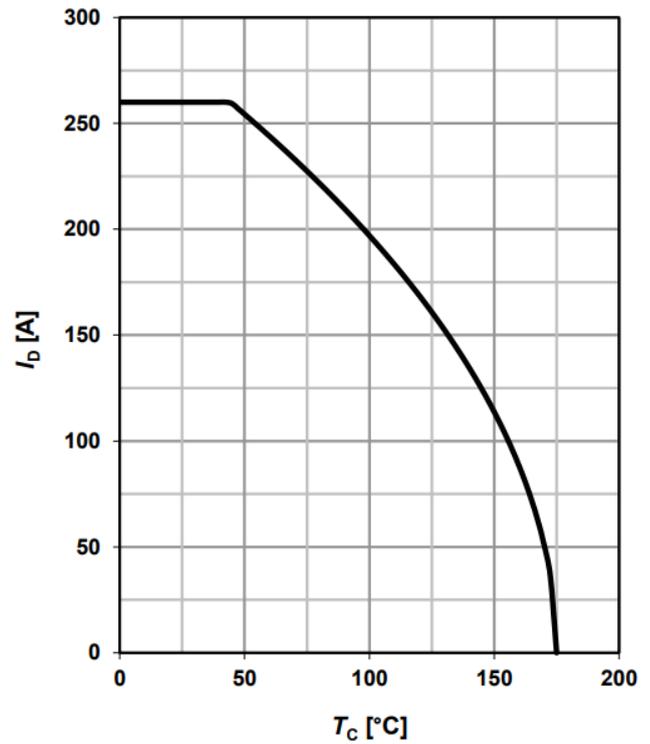
1 功率耗散

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



2 漏极电流

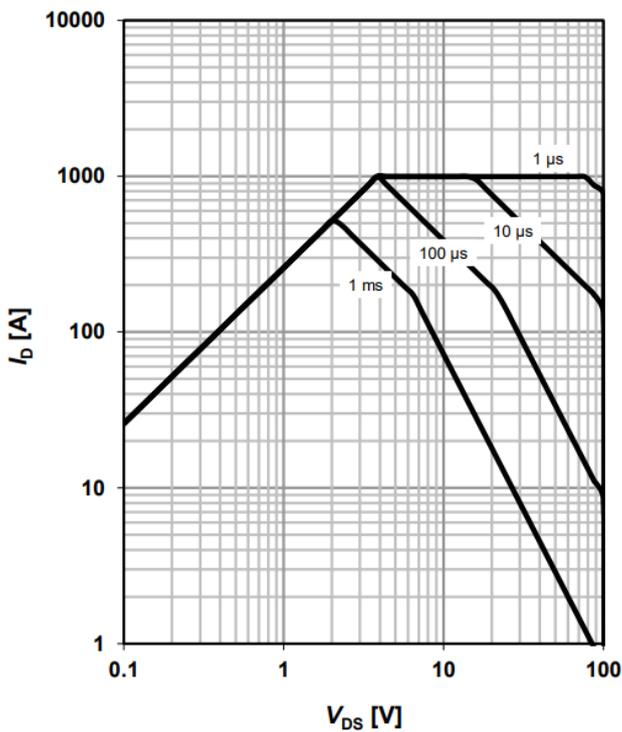
$$I_D = f(T_c); V_{\text{GS}} \geq 6 \text{ V}$$



3 安全工作区

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

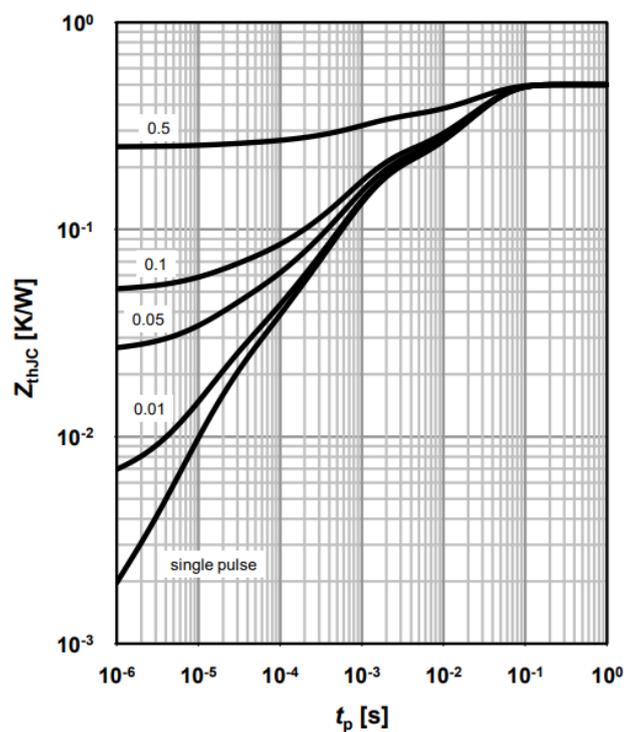
parameter: t_p



4 最大瞬态热阻抗

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

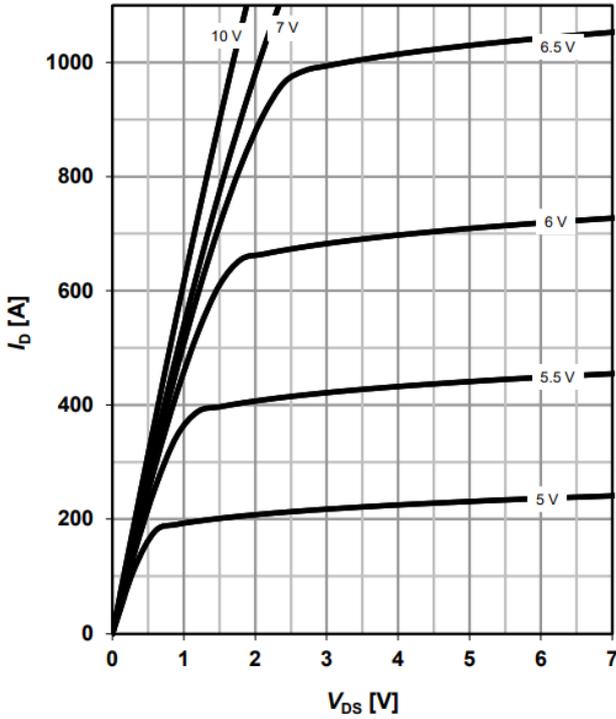
parameter: $D = t_p/T$



5 典型输出特性

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

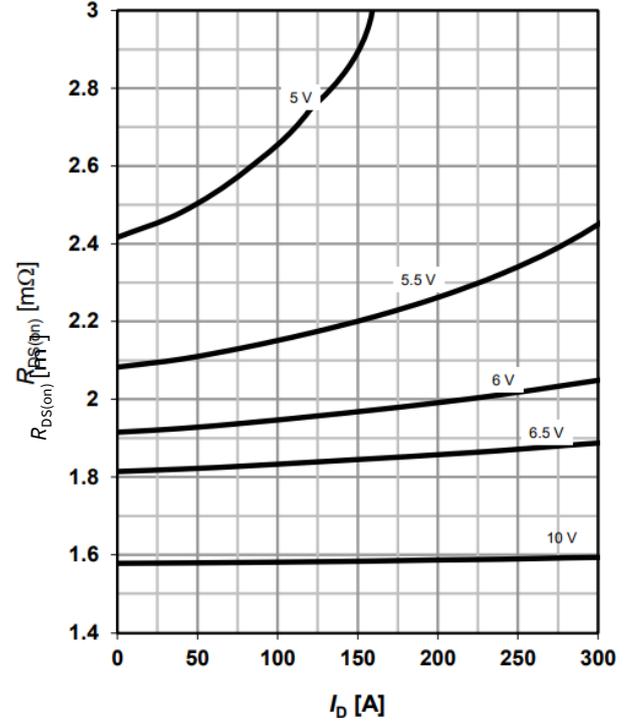
parameter: V_{GS}



6 典型漏源导通电阻

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

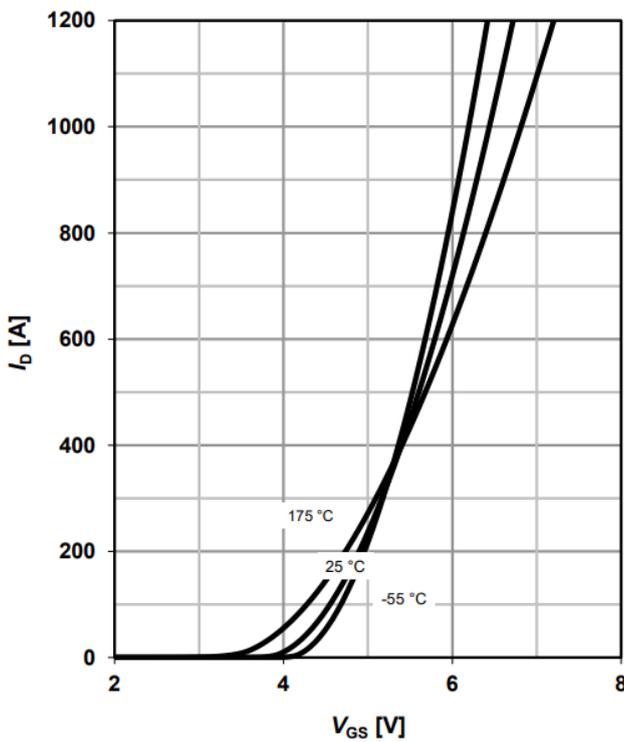
parameter: V_{GS}



7 典型转移特性

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

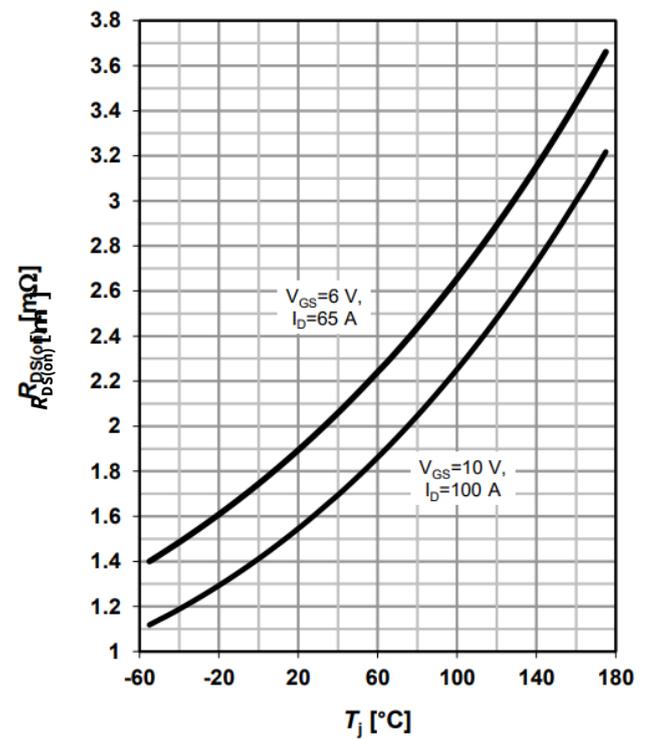
parameter: T_j



8 典型漏源导通电阻

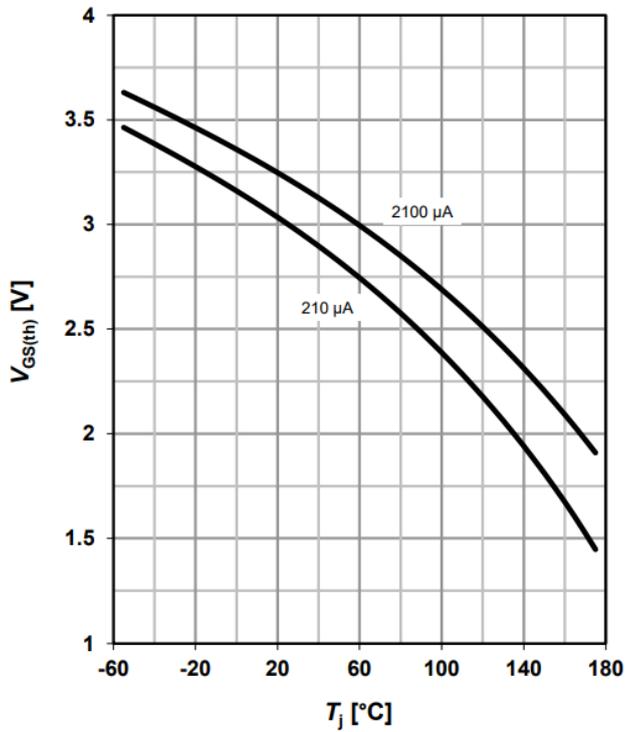
$$R_{DS(on)} = f(T_j)$$

parameter: I_D, V_{GS}

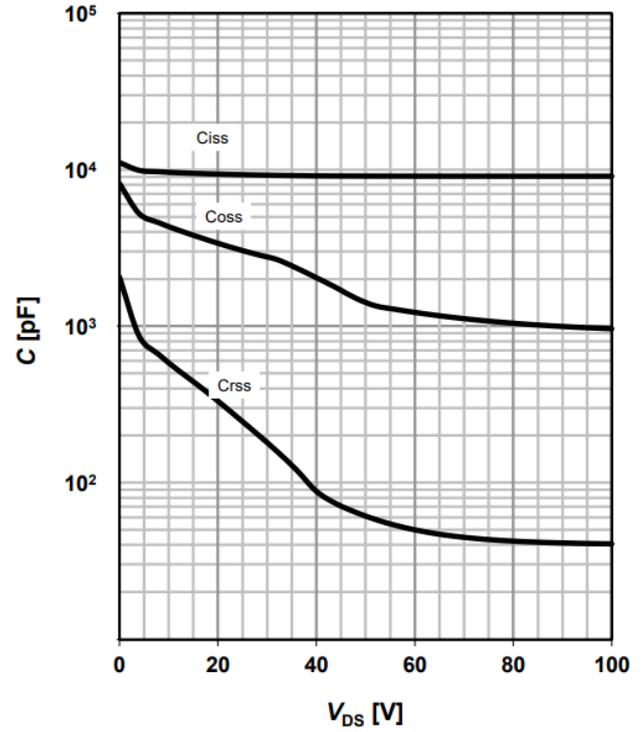


9 典型栅极阈值电压

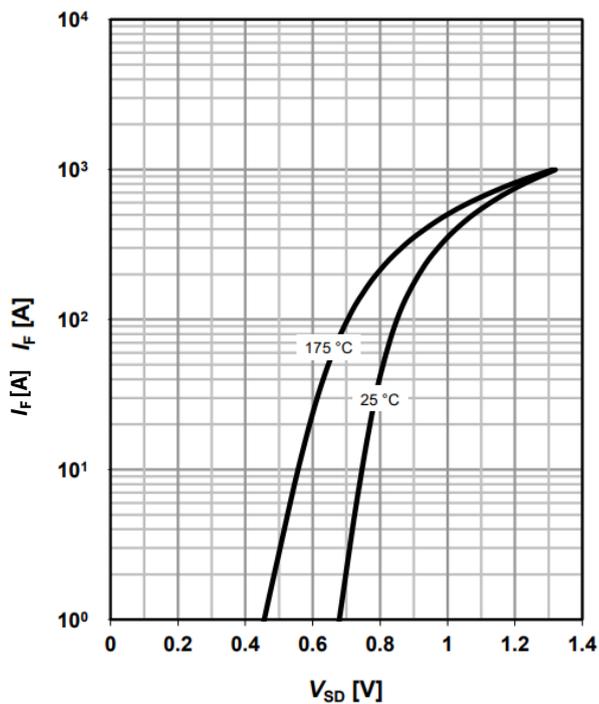
$$V_{GS(th)} = f(T_j); V_{GS} = V_{DS}$$

 parameter: I_D

10 典型电容值

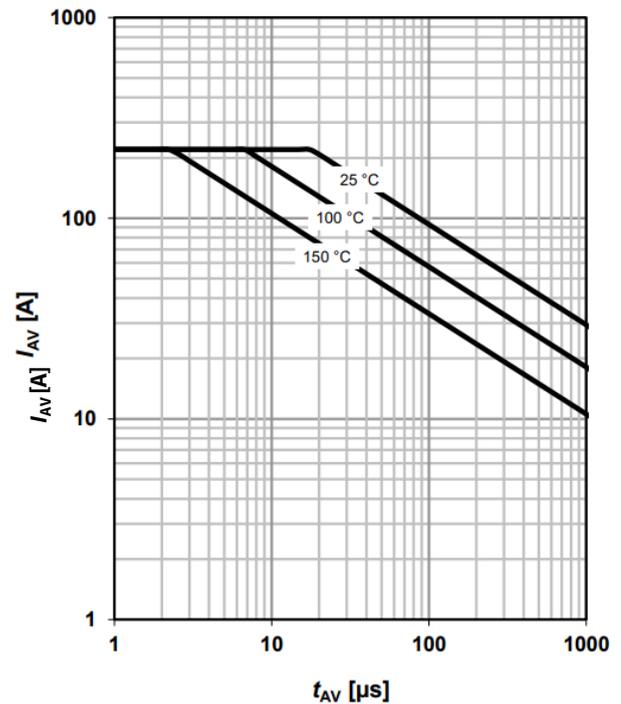
$$C = f(V_{DS}); V_{GS} = 0 V; f = 1 MHz$$


11 典型二极管正向导通特性

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

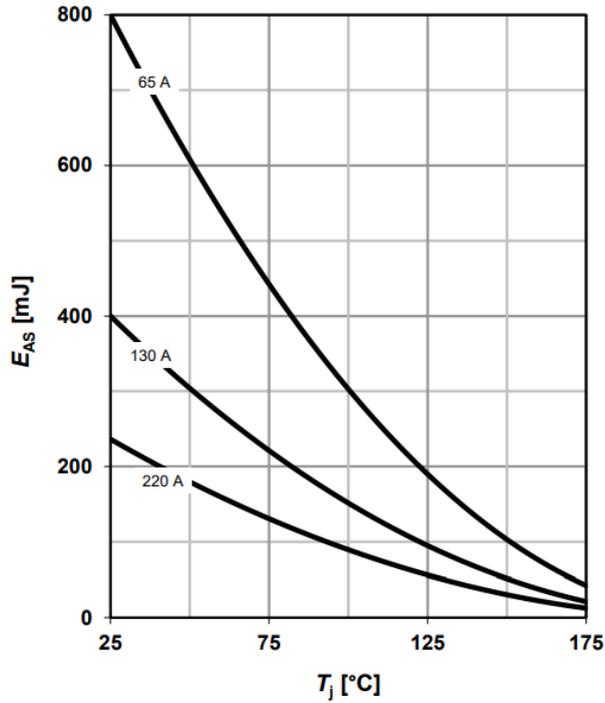
 parameter: T_j

12 典型雪崩特性

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

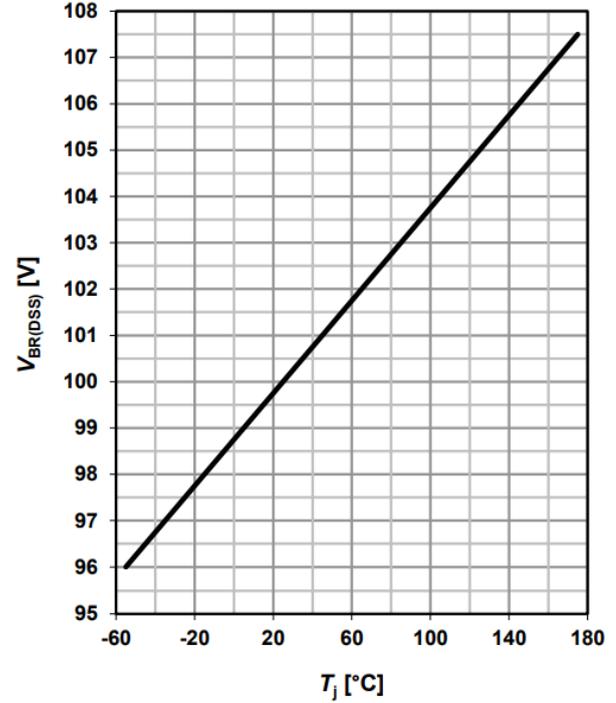
 parameter: $T_{j(start)}$


13 典型雪崩能量

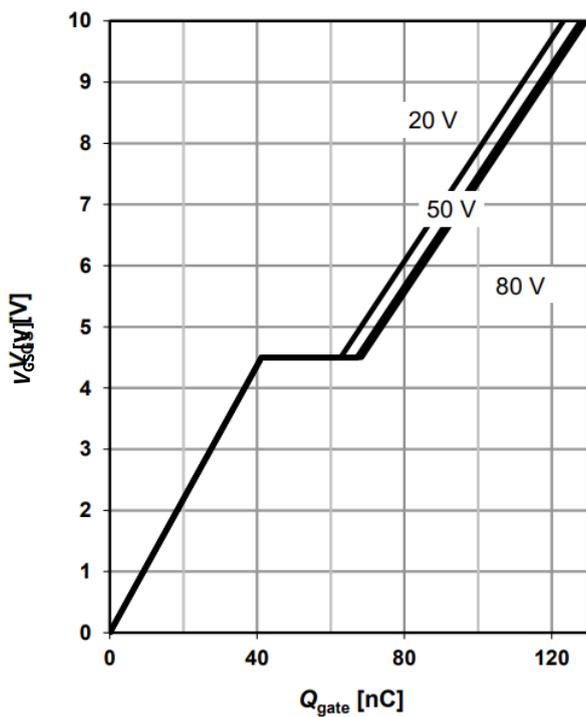
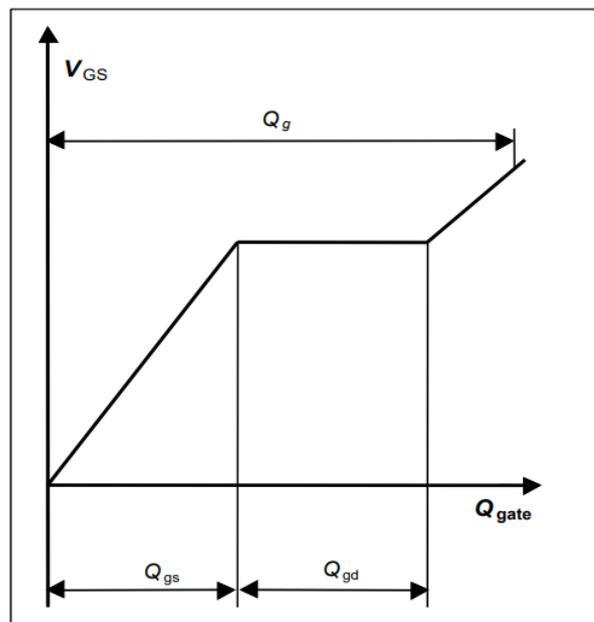
$$E_{AS} = f(T_j)$$

 parameter: I_D

14 漏源击穿电压

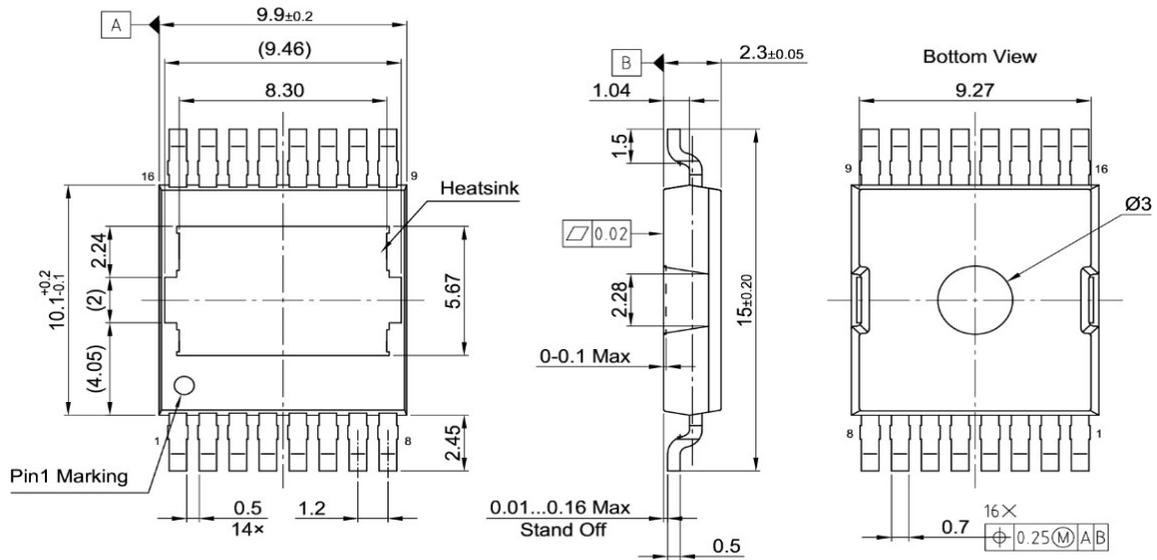
$$V_{BR(DSS)} = f(T_j); I_{D_typ} = 1 \text{ mA}$$


15 典型栅极电荷

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

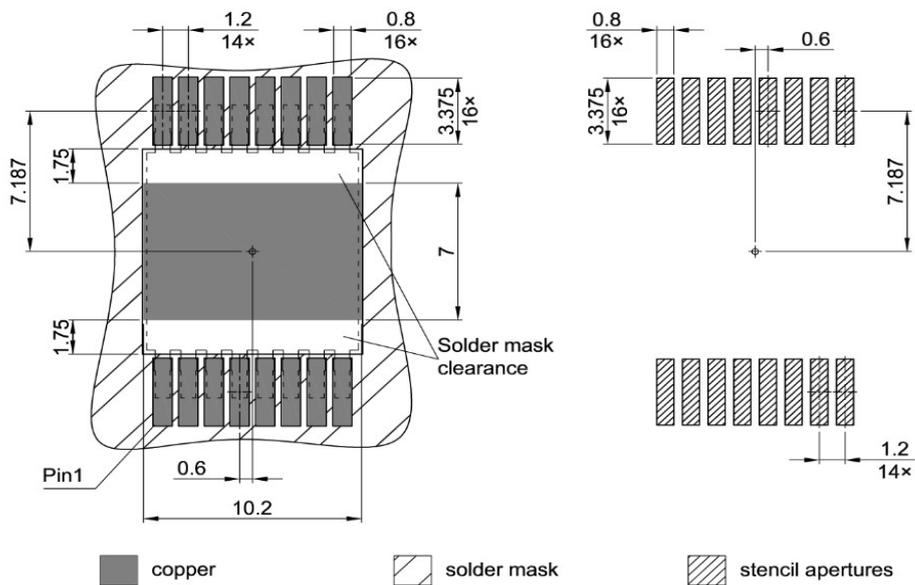
 parameter: V_{DD}

16 栅极充电波形


封装外形尺寸



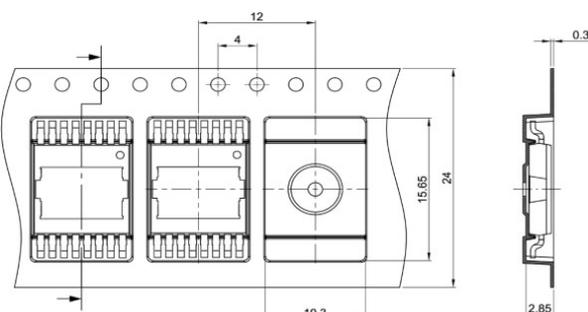
All metal surfaces tin plated except area of cut and heatsink
 All dimensions are in units mm
 The drawing is in compliance with ISO 128-30, Projection Method 1 []

Footprint



Based on stencil thickness 0.20 mm
 All dimensions are in units mm

包装信息



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Infineon Technologies AG
81726 Munich, Germany

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修订记录

Version	Date	Changes
Version 1.0	01.10.2020	Final Datasheet



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Edition 2025-04-17

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