MOSFET

英飞凌高耐热75V OptiMOS™3 功率晶体管

特性

- 针对同步整流进行了优化
- 非常适合高频开关和 DC/DC 转换器
- 出色的栅极电荷 x $R_{DS(on)}$产品 (FOM)
- 卓越的耐热性
- N沟道，标准电平
- 100% 雪崩测试
- 无铅镀层；符合RoHS标准
- 符合 JEDEC [1]工业应用标准
- 符合 IEC61249-2-21 标准的无卤素

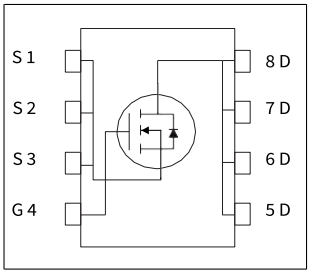

表 1　　主要性能参数

Parameter	Value	Unit
V_{DS}	75	V
$R_{DS(on),max}$	3.6	mΩ
I_D	159	A

Type / Ordering Code	Package	Marking	Related Links
BSC036NE7NS3 G	PG-TDSON-8	036NE7NS	-

[1] J-STD20 和 JESD22

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）。

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1 最大额定值

除非另有规定， T_A = 25 °C

表 2 最大额定值

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Continuous drain current[1]	I_D	- - -	- - -	159 101 20	A	V_{GS}=10 V, T_C=25 °C V_{GS}=10 V, T_C=100 °C V_{GS}=10 V, T_A=25 °C, R_{thJA}=50 K/W[2]
Pulsed drain current[3]	$I_{D,pulse}$	-	-	636	A	T_C=25 °C
Avalanche energy, single pulse	E_{AS}	-	-	260	mJ	I_D=50 A, R_{GS}=25 Ω
Gate source voltage	V_{GS}	-20	-	20	V	-
Power dissipation	P_{tot}	- -	- -	156 2.5	-	T_C=25 °C T_A=25 °C, R_{thJA}=50 K/W[2]
Operating and storage temperature	T_j, T_{stg}	-55	-	150	°C	IEC climatic category; DIN IEC 68-1: 55/150/56

2 热特性

表3 热特性

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case, bottom	R_{thJC}	-	-	0.8	K/W	-
Thermal resistance, junction - case, top	R_{thJC}	-	-	18	K/W	-
Device on PCB, minimal footprint	R_{thJA}	-	-	62	K/W	-
Device on PCB, 6 cm^2 cooling area[2]	R_{thJA}	-	-	50	K/W	-

[1]额定值指产品仅具有数据表指定的绝对最大值，保持外壳温度符合规定要求。其他外壳温度请参见图 2。需要根据实际环境条件降低额定值。

[2]器件位于 40 mm x 40 mm x 1.5 mm 环氧 PCB FR4 上，具有 6 cm2（一层，70 µm 厚）铜面积用于漏极连接。PCB 在静止空气中垂直放置。

[3]详细信息请参见图 3

3 电气特性

除非另有规定， T_j = 25 °C

表4 静态特性

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Drain-source breakdown voltage	$V_{(BR)DSS}$	75	-	-	V	V_{GS}=0 V, I_D=1 mA
Gate threshold voltage	$V_{GS(th)}$	2.3	3.1	3.8	V	V_{DS}=V_{GS}, I_D=110 µA
Zero gate voltage drain current	I_{DSS}	- -	0.1 10	1 100	µA	V_{DS}=75 V, V_{GS}=0 V, T_j=25 °C V_{DS}=75 V, V_{GS}=0 V, T_j=125 °C
Gate-source leakage current	I_{GSS}	-	10	100	nA	V_{GS}=20 V, V_{DS}=0 V
Drain-source on-state resistance	$R_{DS(on)}$	-	2.9	3.6	mΩ	V_{GS}=10 V, I_D=50 A
Gate resistance	R_G	-	2.7	-	Ω	-
Transconductance	g_{fs}	50	100	-	S	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=50 A

表 5 动态特性

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Input capacitance	C_{iss}	-	4400	-	pF	V_{GS}=0 V, V_{DS}=37.5 V, f=1 MHz
Output capacitance	C_{oss}	-	990	-	pF	V_{GS}=0 V, V_{DS}=37.5 V, f=1 MHz
Reverse transfer capacitance	C_{rss}	-	48	-	pF	V_{GS}=0 V, V_{DS}=37.5 V, f=1 MHz
Turn-on delay time	$t_{d(on)}$	-	14	-	ns	V_{DD}=37.5 V, V_{GS}=10 V, I_D=25 A, R_G=1.6 Ω
Rise time	t_r	-	18	-	ns	V_{DD}=37.5 V, V_{GS}=10 V, I_D=25 A, R_G=1.6 Ω
Turn-off delay time	$t_{d(off)}$	-	38	-	ns	V_{DD}=37.5 V, V_{GS}=10 V, I_D=25 A, R_G=1.6 Ω
Fall time	t_f	-	10	-	ns	V_{DD}=37.5 V, V_{GS}=10 V, I_D=25 A, R_G=1.6 Ω

表6 栅极电荷特性[1)]

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Gate to source charge	Q_{gs}	-	22.1	-	nC	V_{DD}=37.5 V, I_D=50 A, V_{GS}=0 to 10 V
Gate to drain charge	Q_{gd}	-	12.6	-	nC	V_{DD}=37.5 V, I_D=50 A, V_{GS}=0 to 10 V
Switching charge	Q_{sw}	-	21.0	-	nC	V_{DD}=37.5 V, I_D=50 A, V_{GS}=0 to 10 V
Gate charge total	Q_g	-	63.4	-	nC	V_{DD}=37.5 V, I_D=50 A, V_{GS}=0 to 10 V
Gate plateau voltage	$V_{plateau}$	-	5.0	-	V	V_{DD}=37.5 V, I_D=50 A, V_{GS}=0 to 10 V
Output charge	Q_{oss}	-	65	-	-	V_{DD}=37.5 V, V_{GS}=0 V

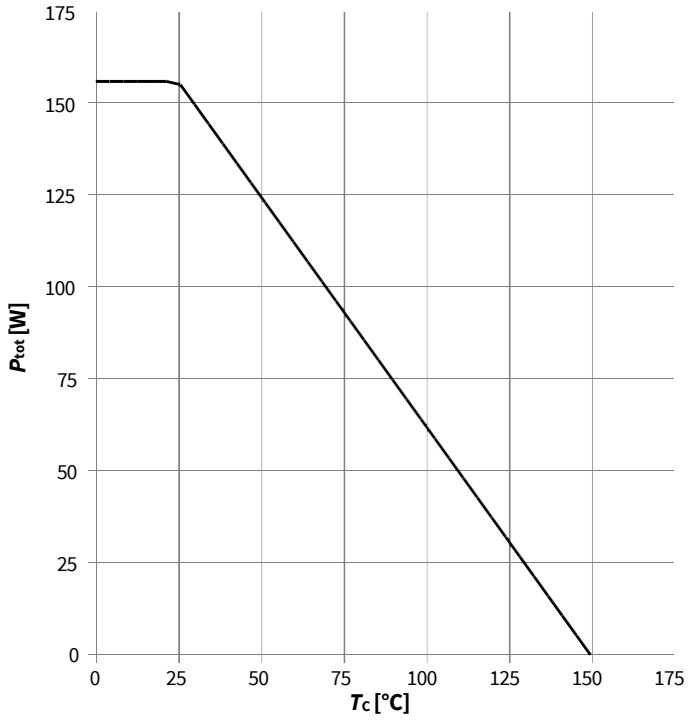
[1)]参数定义请参见"栅极充电波形"

表 7　　反向二极管

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Diode continuous forward current	I_S	-	-	130	A	T_C=25 °C
Diode pulse current	$I_{S,pulse}$	-	-	636	A	T_C=25 °C
Diode forward voltage	V_{SD}	-	0.9	1.2	V	V_{GS}=0 V, I_F=50 A, T_j=25 °C
Reverse recovery time	t_{rr}	-	44	-	ns	V_R=37.5 V, I_F=25A, di_F/dt=100 A/µs
Reverse recovery charge	Q_{rr}	-	64	-	nC	V_R=37.5 V, I_F=25A, di_F/dt=100 A/µs

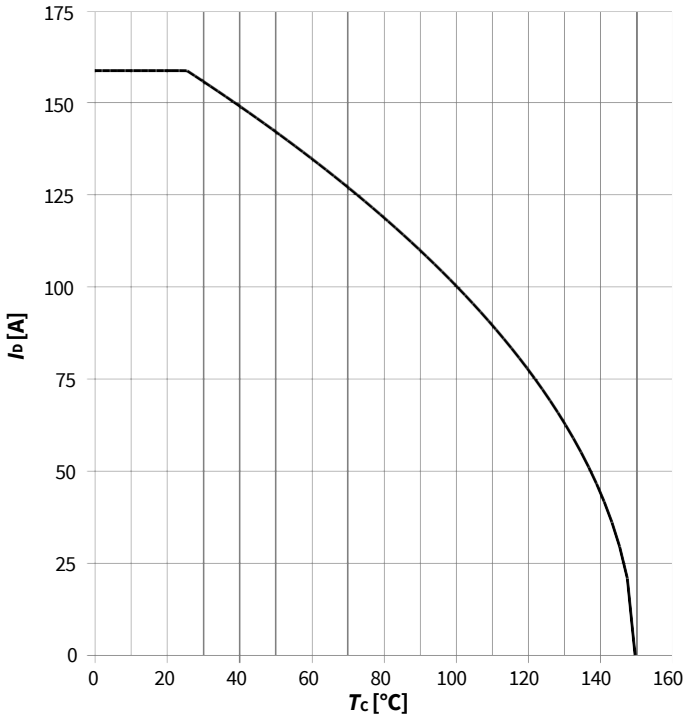
4 电气特性图

图1：功率耗散



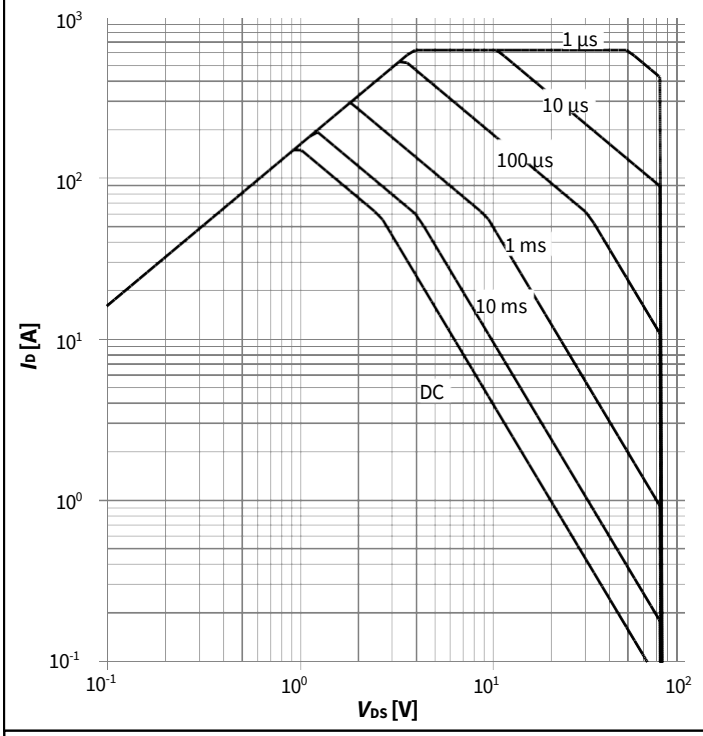
$P_{tot}=f(T_C)$

图2：漏极电流



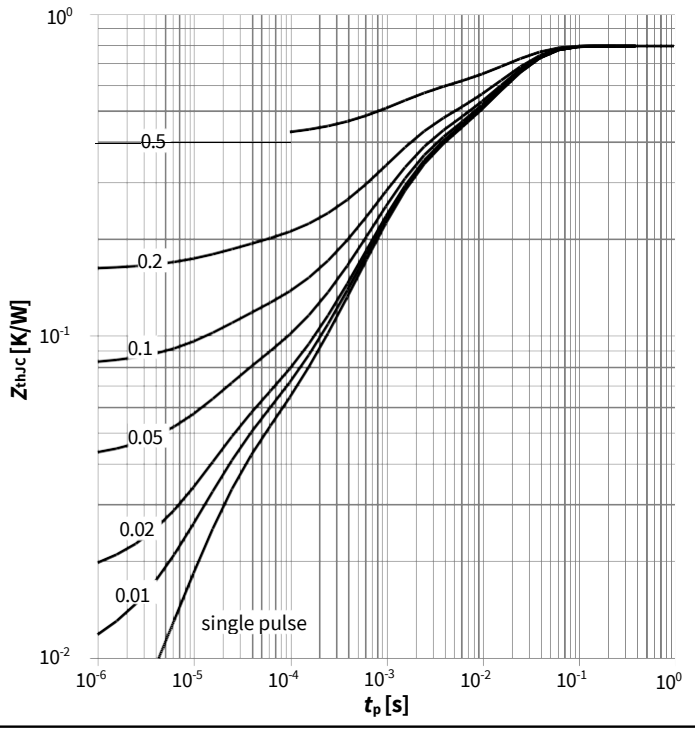
$I_D=f(T_C)$; $V_{GS}\geq 10$ V

图3：安全操作区



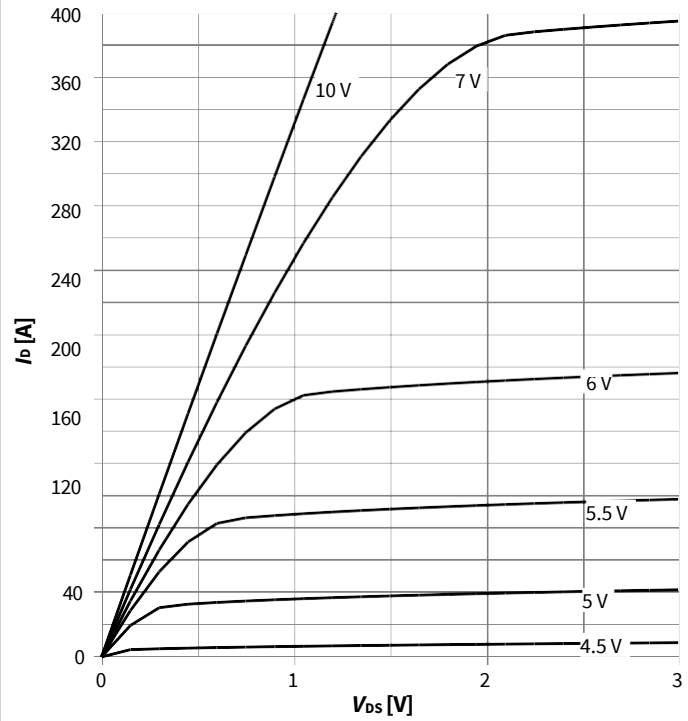
$I_D=f(V_{DS})$; T_C=25 °C; D=0; parameter: t_p

图4；最大瞬态热阻抗



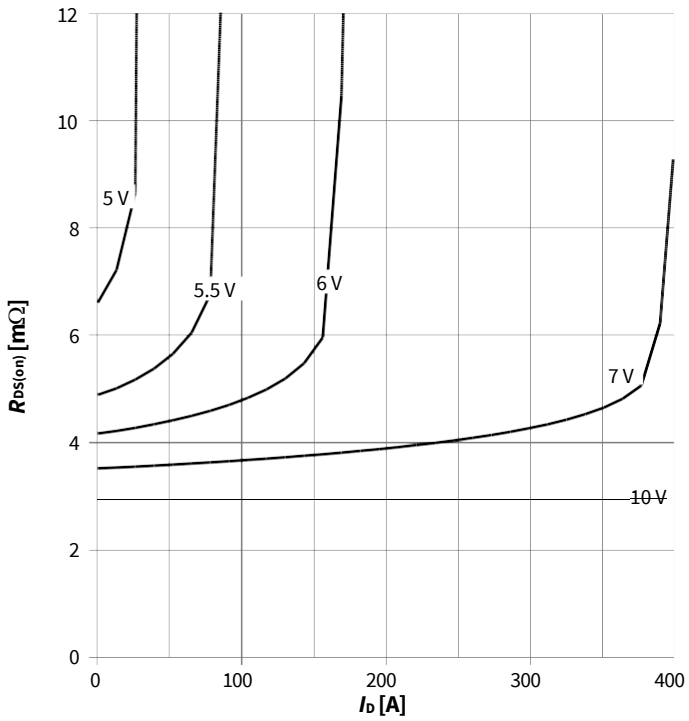
$Z_{thJC}=f(t_p)$; parameter: $D=t_p/T$

图5：典型输出特性



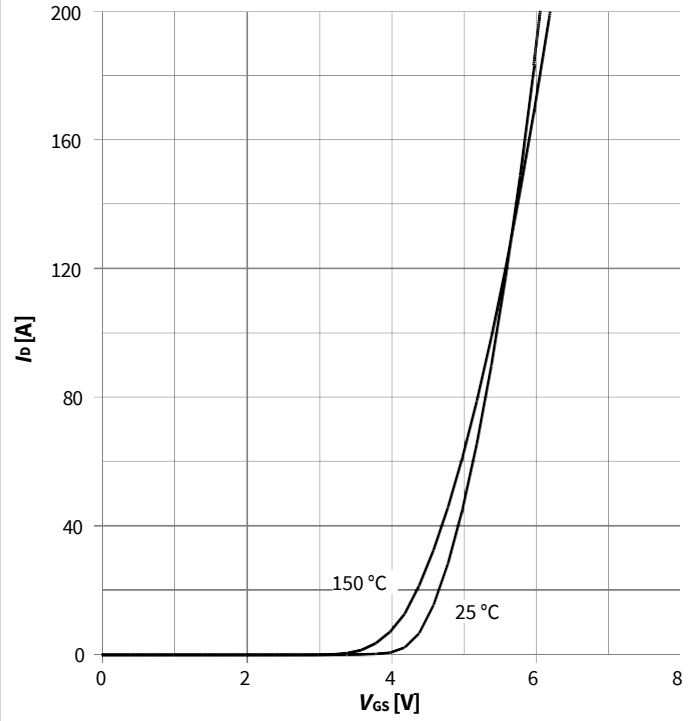
$I_D=f(V_{DS})$; $T_j=25$ °C; parameter: V_{GS}

图6：漏源导通电阻



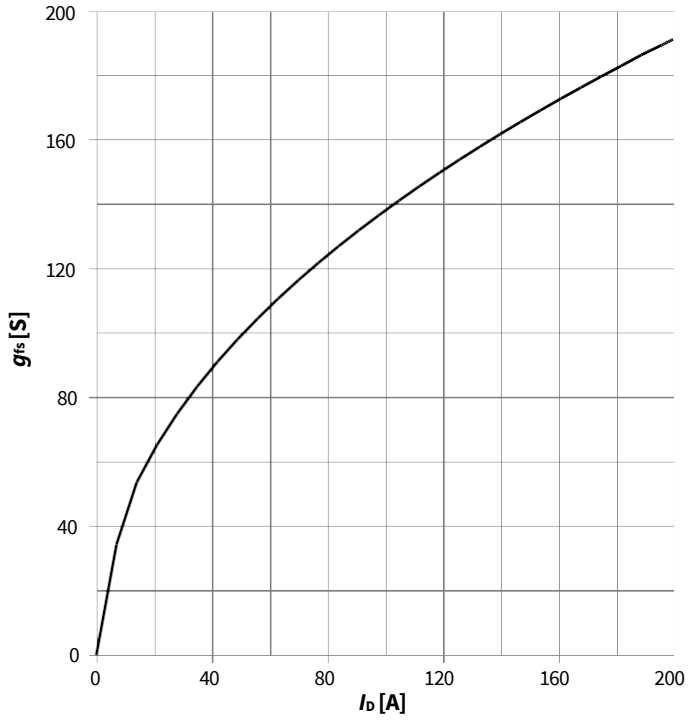
$R_{DS(on)}=f(I_D)$; $T_j=25$ °C; parameter: V_{GS}

图7：典型转移特性



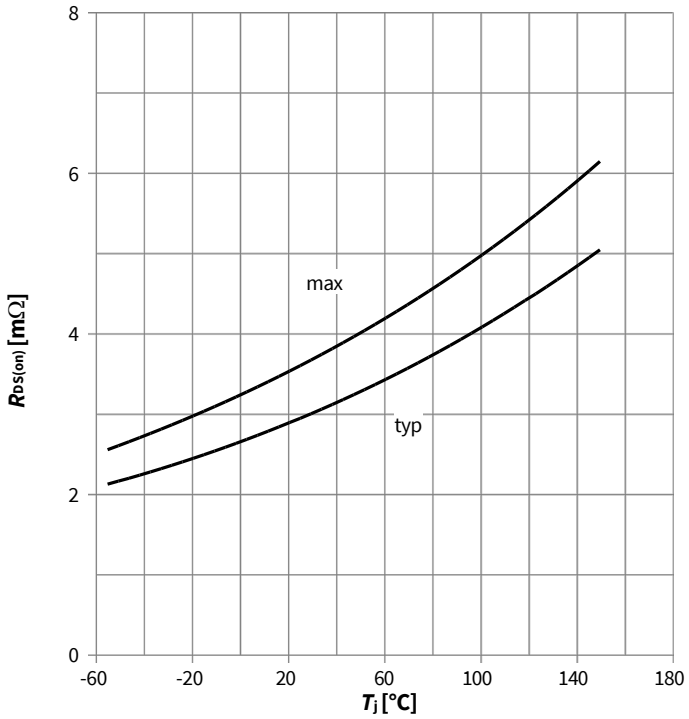
$I_D=f(V_{GS})$; $|V_{DS}|>2|I_D|R_{DS(on)max}$; parameter: T_j

图8: 典型正向跨导



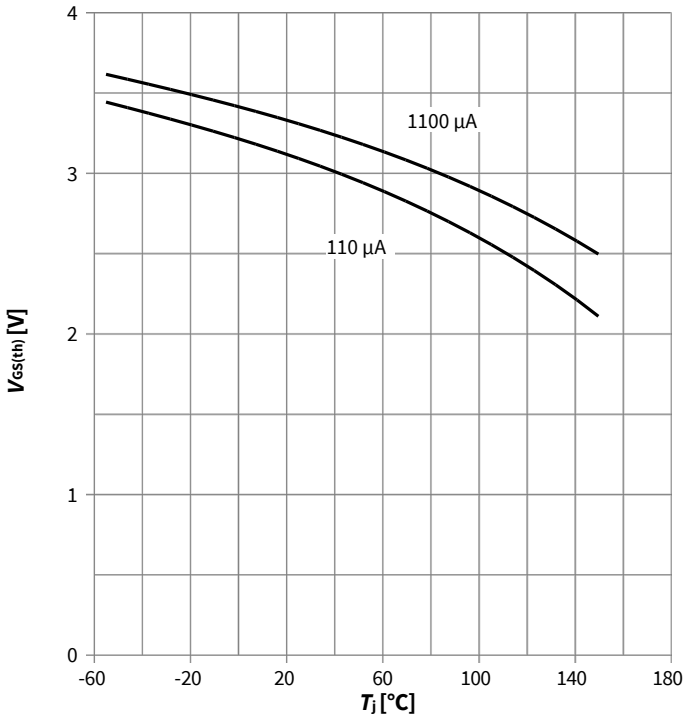
$g_{fs}=f(I_D)$; $T_j=25$ °C

图9：典型漏源导通电阻



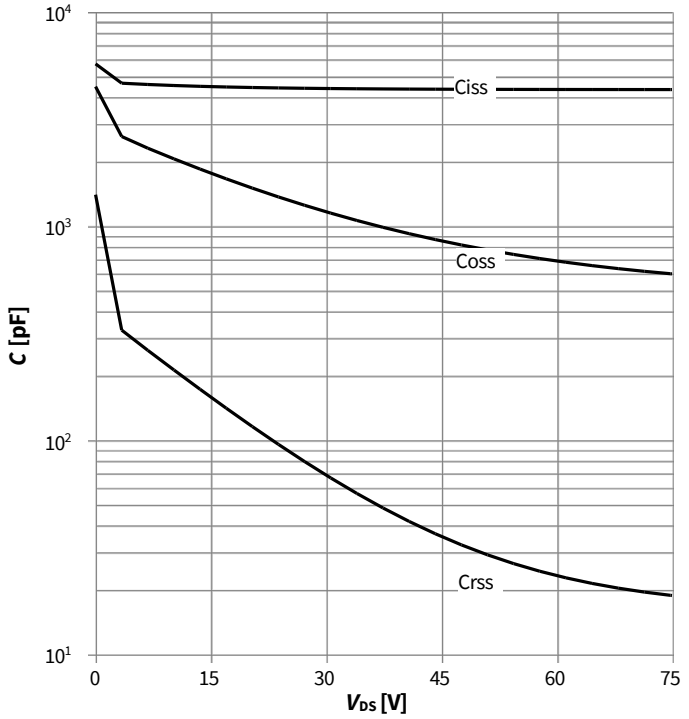
$R_{DS(on)}=f(T_j)$; $I_D=50$ A; $V_{GS}=10$ V

图10：典型栅极阈值电压



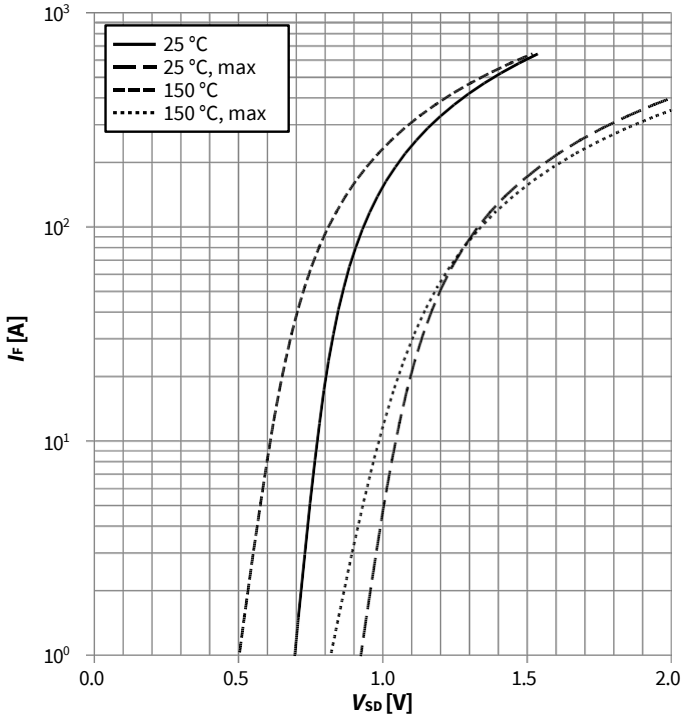
$V_{GS(th)}=f(T_j)$; $V_{GS}=V_{DS}$

图11：典型电容值



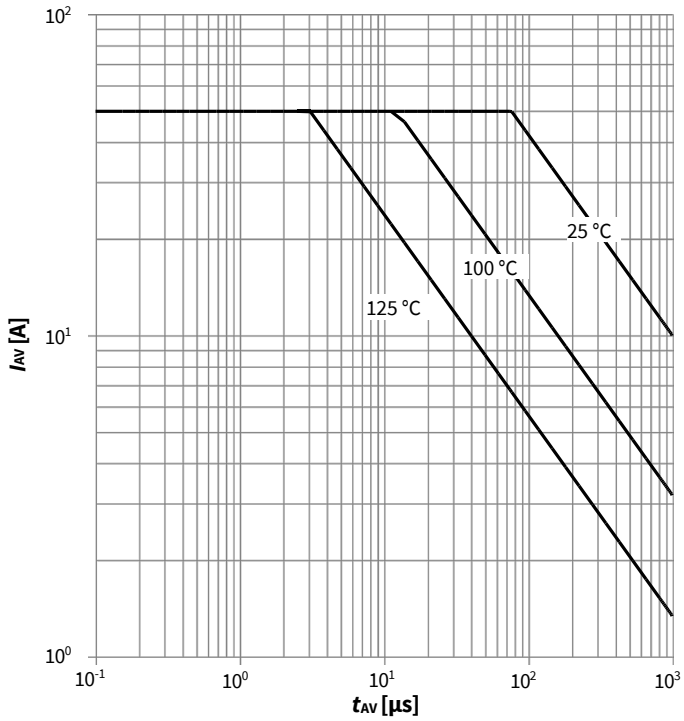
$C=f(V_{DS})$; $V_{GS}=0$ V; $f=1$ MHz

图12：反向二极管的正向特性



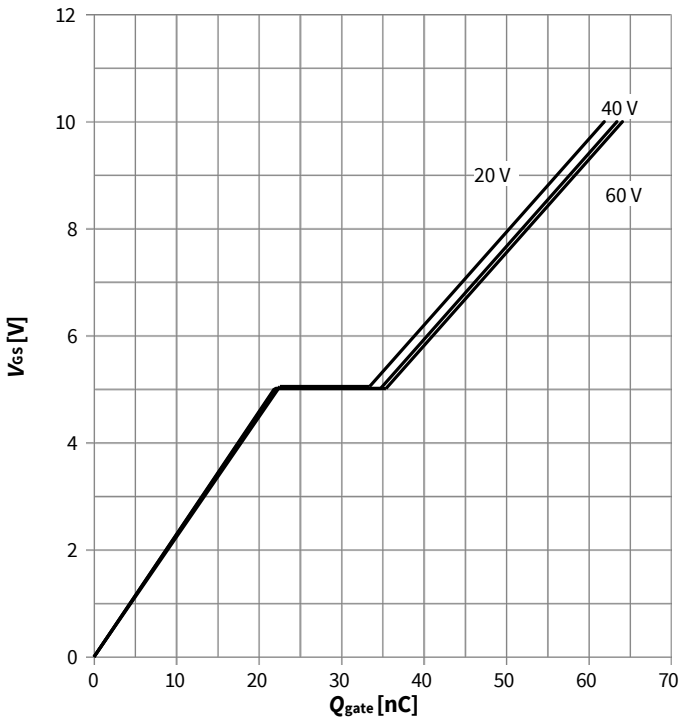
$I_F=f(V_{SD})$; parameter: T_j

图13：雪崩特性



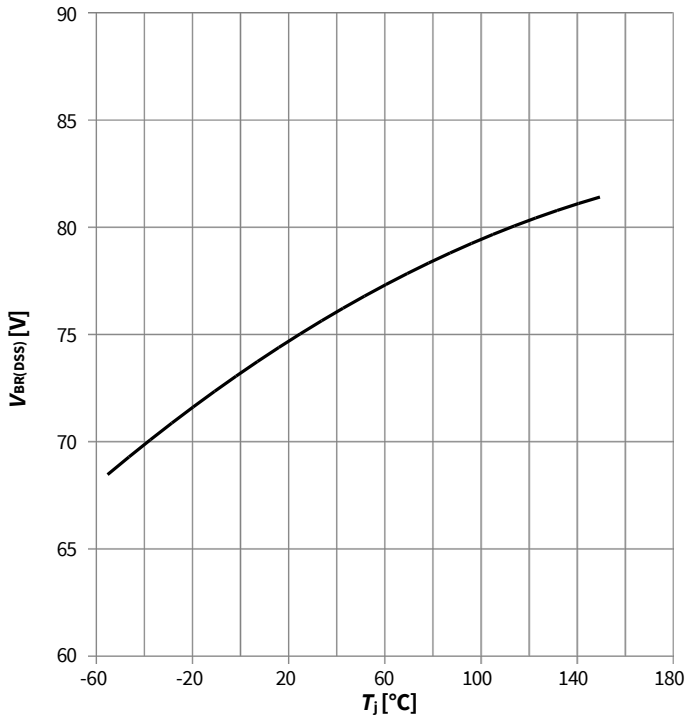
I_{AS}=f(t_{AV}); R_{GS}=25 Ω; parameter: $T_{j(start)}$

图14：典型栅极电荷



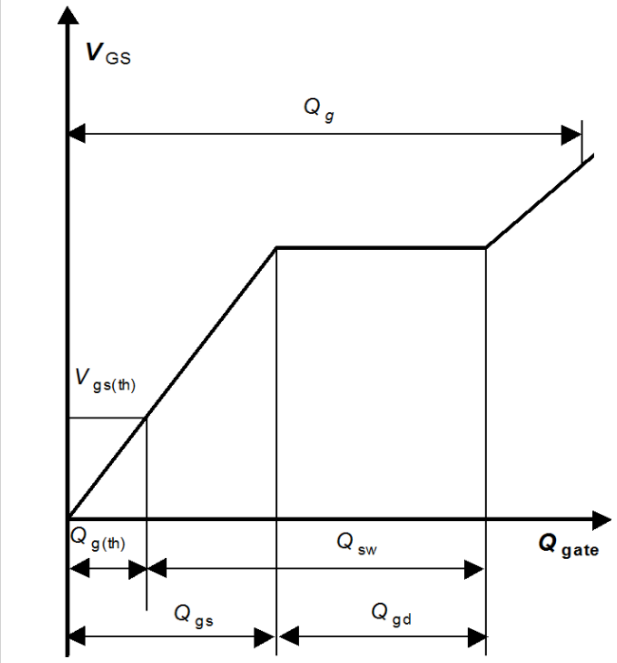
V_{GS}=f(Q_{gate}); I_D=50 A pulsed; parameter: V_{DD}

图15：漏源击穿电压

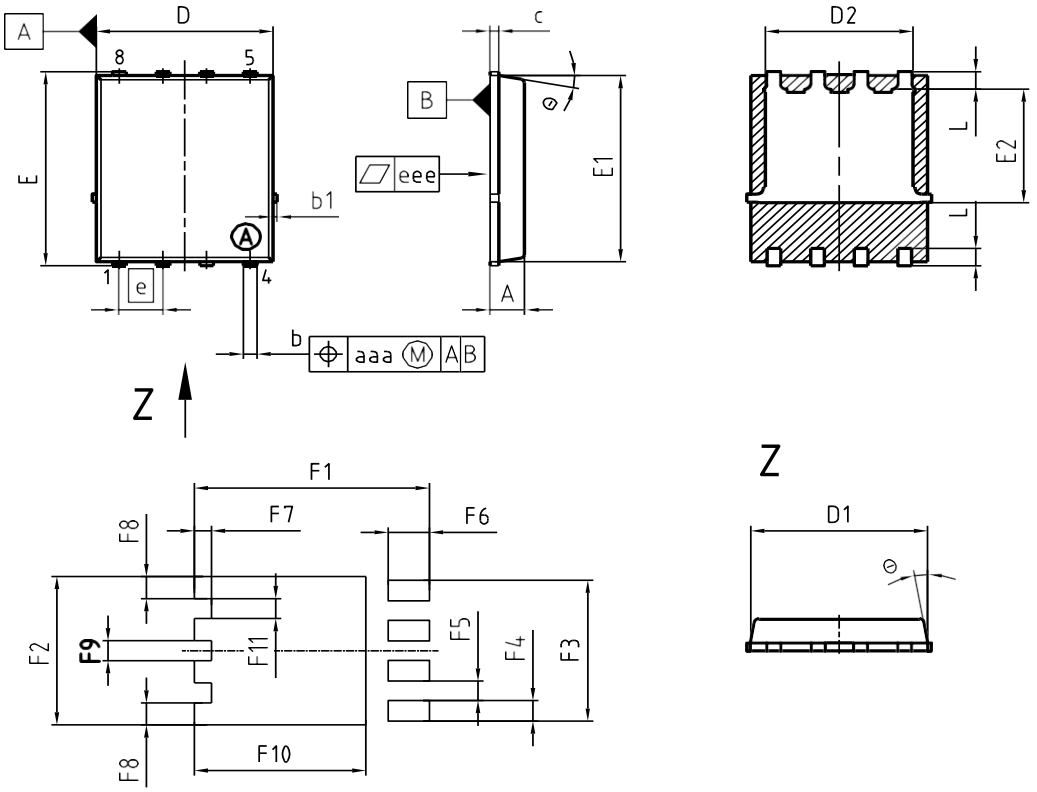


$V_{BR(DSS)}$=f(T_j); I_D=1 mA

图 栅极充电波形



5 封装外形



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.90	1.10	0.035	0.043
b	0.34	0.54	0.013	0.021
b1	0.02	0.22	0.001	0.008
c	0.15	0.35	0.006	0.014
D=D1	4 95	5 35	0.195	0 211
D2	4.20	4.40	0.165	0.173
E	5.95	6.35	0.234	0.250
E1	5.70	6.10	0.224	0.240
E2	3.40	3.80	0.134	0.150
e	1.27		0.050	
N	8		8	
L	0.45	0.65	0.018	0.026
⊖	8.5°	11.5°	8.5°	11.5°
aaa	0.25		0.010	
eee	0.05		0.002	
F1	6.75	6.95	0.266	0.274
F2	4.60	4.80	0.181	0.189
F3	4.36	4.56	0.172	0.180
F4	0.55	0.75	0.022	0.030
F5	0.52	0.72	0.020	0.028
F6	1.10	1.30	0.043	0.051
F7	0.40	0.60	0.016	0.024
F8	0.60	0.80	0.024	0.031
F9	0.53	0.73	0.021	0.029
F10	4.90	5.10	0.193	0.201
F11	0.53	0.73	0.021	0.029

DOCUMENT NO.
Z8B00003332

SCALE
0
2.5
0 2.5
5mm

EUROPEAN PROJECTION

ISSUE DATE
08-03-2007

REVISION
03

图 1 PG-TDSON-8 外形图，尺寸单位为毫米

修订记录

BSC036NE7NS3 G

Revision: 2020-07-29, Rev. 2.1

历史修订版本

Revision	Date	Subjects (major changes since last revision)
2.1	2020-07-29	Update current rating

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