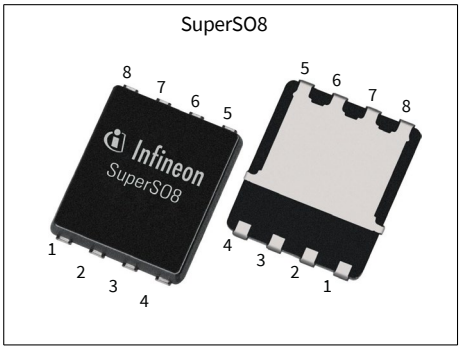
MOSFET

英飞凌高耐热60V OptiMOS™3 功率晶体管



特性

- 非常适合高频开关和同步整流
- 优化的DC/DC转换器技术
- 出色的栅极电荷 x $R_{DS(on)}$乘积 (FOM)
- 极低的导通电阻$R_{DS(on)}$
- 卓越的耐热性
- N沟道，逻辑电平
- 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

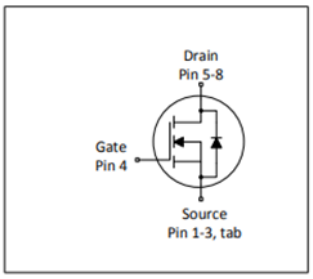


表 1　　主要性能参数

Parameter	Value	Unit
V_{DS}	60	V
$R_{DS(on),max}$	6.7	mΩ
I_D	79	A

Type / Ordering Code	Package	Marking	Related Links
BSC067N06LS3 G	PG-TDSON-8	067N06LS	-

[1] J-STD20 和 JESD22

目录

1 最大额定值

除非另有规定， T_j = 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	- - - - -	- - - - -	79 50 59 37 15	A	V_{GS}=10 V, T_C=25 °C V_{GS}=10 V, T_C=100 °C V_{GS}=4.5 V, T_C=25 °C V_{GS}=4.5 V, T_C=100 °C V_{GS}=10 V, T_A=25 °C, R_{thJA}=50K/W[2]
Pulsed drain current[3]	$I_{D,pulse}$	-	-	316	A	T_C=25 °C
Avalanche energy, single pulse[4]	E_{AS}	-	-	47	mJ	I_D=50 A, R_{GS}=25 Ω
Gate source voltage	V_{GS}	-20	-	20	V	-
Power dissipation	P_{tot}	- -	- -	69 2.5	W	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	R_{thJC}	-	-	1.8	K/W	-
Device on PCB, minimal footprint	R_{thJA}	-	-	62	K/W	-
Device on PCB, 6 cm² 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

[4]详细信息请参见图 13

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	$V_{(BR)DSS}$	60	-	-	V	V_{GS}=0 V, I_D=1 mA
Gate threshold voltage	$V_{GS(th)}$	1.2	1.7	2.2	V	V_{DS}=V_{GS}, I_D=35 µA
Zero gate voltage drain current	I_{DSS}	- -	0.1 10	1 100	µA	V_{DS}=60 V, V_{GS}=0 V, T_j=25 °C V_{DS}=60 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	$R_{DS(on)}$	- -	8.0 5.4	12.1 6.7	mΩ	V_{GS}=4.5 V, I_D=25 A V_{GS}=10 V, I_D=50 A
Gate resistance	R_G	-	1.3	-	Ω	-
Transconductance	g_{fs}	38	77	-	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[1)]	C_{iss}	-	3800	5100	pF	V_{GS}=0 V, V_{DS}=30 V, f=1 MHz
Output capacitance[1)]	C_{oss}	-	710	940	pF	V_{GS}=0 V, V_{DS}=30 V, f=1 MHz
Reverse transfer capacitance	C_{rss}	-	32	-	pF	V_{GS}=0 V, V_{DS}=30 V, f=1 MHz
Turn-on delay time	$t_{d(on)}$	-	15	-	ns	V_{DD}=30 V, V_{GS}=10 V, I_D=20 A, R_G=2 Ω
Rise time	t_r	-	26	-	ns	V_{DD}=30 V, V_{GS}=10 V, I_D=20 A, R_G=2 Ω
Turn-off delay time	$t_{d(off)}$	-	37	-	ns	V_{DD}=30 V, V_{GS}=10 V, I_D=20 A, R_G=2 Ω
Fall time	t_f	-	7	-	ns	V_{DD}=30 V, V_{GS}=10 V, I_D=20 A, R_G=2 Ω

表6 栅极电荷特性[2)]

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Gate to source charge	Q_{gs}	-	14	-	nC	V_{DD}=30 V, I_D=50 A, V_{GS}=0 to 4.5 V
Gate charge at threshold	$Q_{g(th)}$	-	7	-	nC	V_{DD}=30 V, I_D=50 A, V_{GS}=0 to 4.5 V
Gate to drain charge	Q_{gd}	-	5	-	nC	V_{DD}=30 V, I_D=50 A, V_{GS}=0 to 4.5 V
Switching charge	Q_{sw}	-	12	-	nC	V_{DD}=30 V, I_D=50 A, V_{GS}=0 to 4.5 V
Gate charge total[1)]	Q_g	-	23	30	nC	V_{DD}=30 V, I_D=50 A, V_{GS}=0 to 4.5 V
Gate plateau voltage	$V_{plateau}$	-	3.6	-	V	V_{DD}=30 V, I_D=50 A, V_{GS}=0 to 4.5 V
Gate charge total[1)]	Q_g	-	51	67	nC	V_{DD}=30 V, I_D=50 A, V_{GS}=0 to 10 V
Output charge[1)]	Q_{oss}	-	35	47	nC	V_{DD}=30 V, V_{GS}=0 V

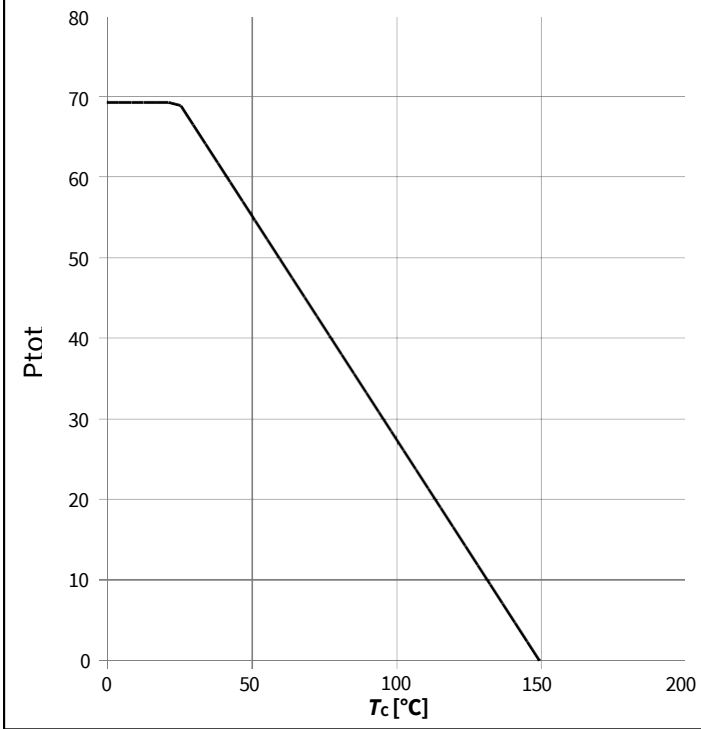
[1)]由设计标定，不受制于生产测试。
[2)] 参数定义请参见"栅极电荷波形"

表 7　　反向二极管

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Diode continuous forward current	I_S	-	-	58	A	T_C=25 °C
Diode pulse current	$I_{S,pulse}$	-	-	316	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}	-	40	-	ns	V_R=30 V, I_F=20A, di_F/dt=100 A/µs
Reverse recovery charge	Q_{rr}	-	39	-	nC	V_R=30 V, I_F=20A, di_F/dt=100 A/µs

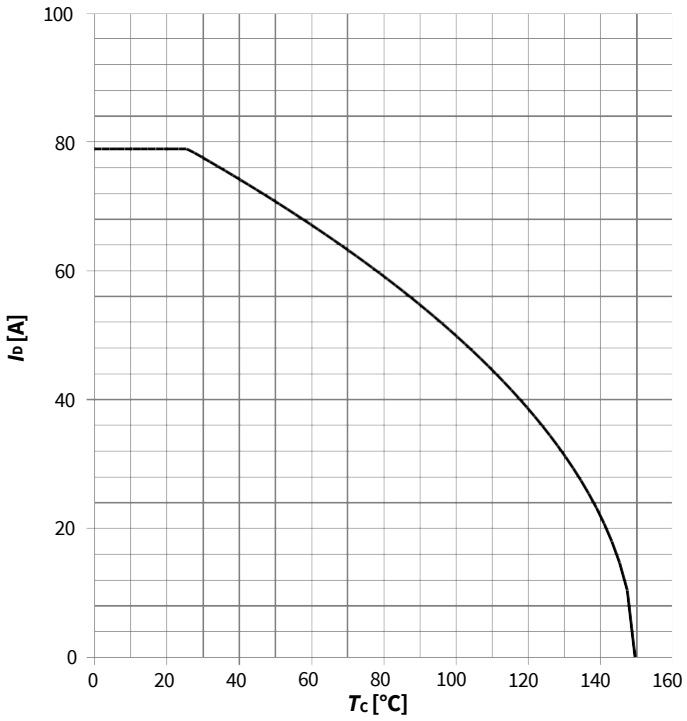
4 电气特性图

图 1：功率耗散



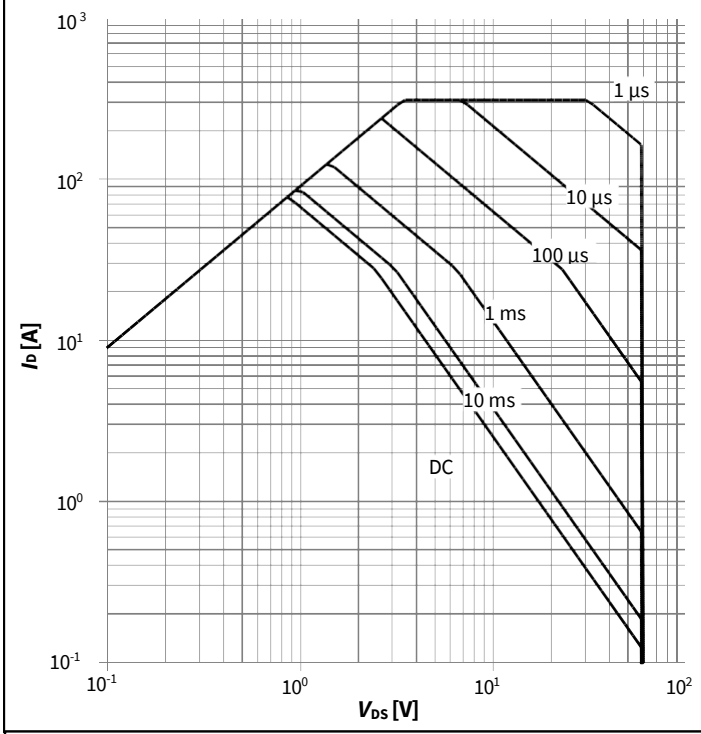
$P_{tot}=f(T_C)$

图 2：漏极电流



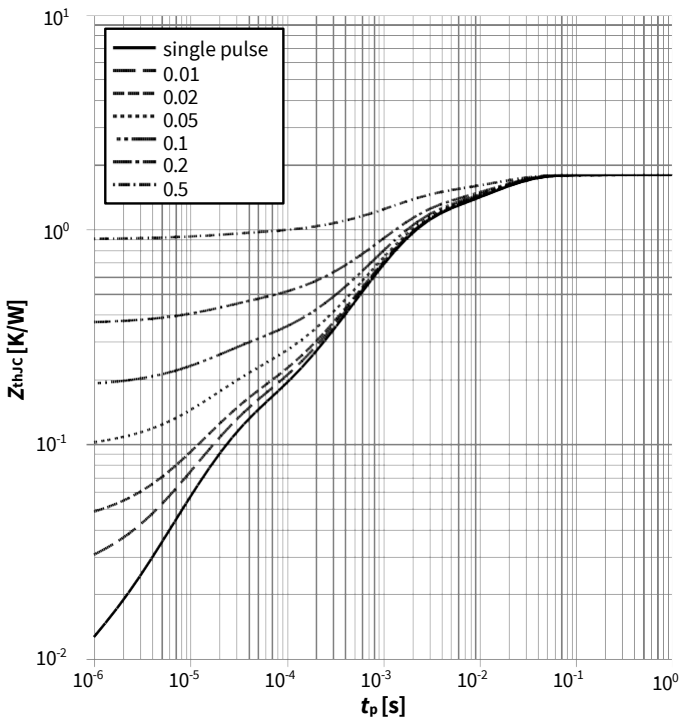
$I_D=f(T_C)$; $V_{GS}\geq 10$ V

图 3：安全操作区



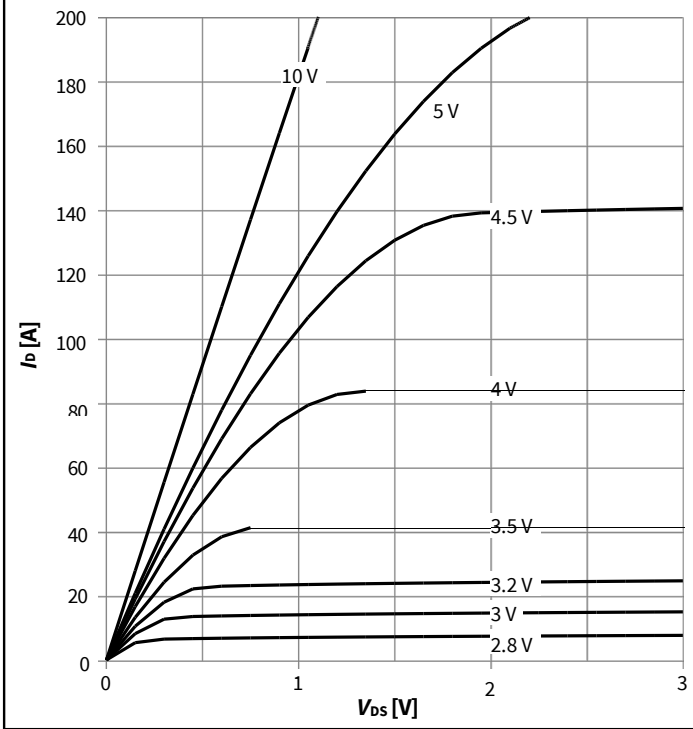
$I_D=f(V_{DS})$; T_C=25 °C; D=0; 参数：t_p

图 4：最大瞬态热阻抗



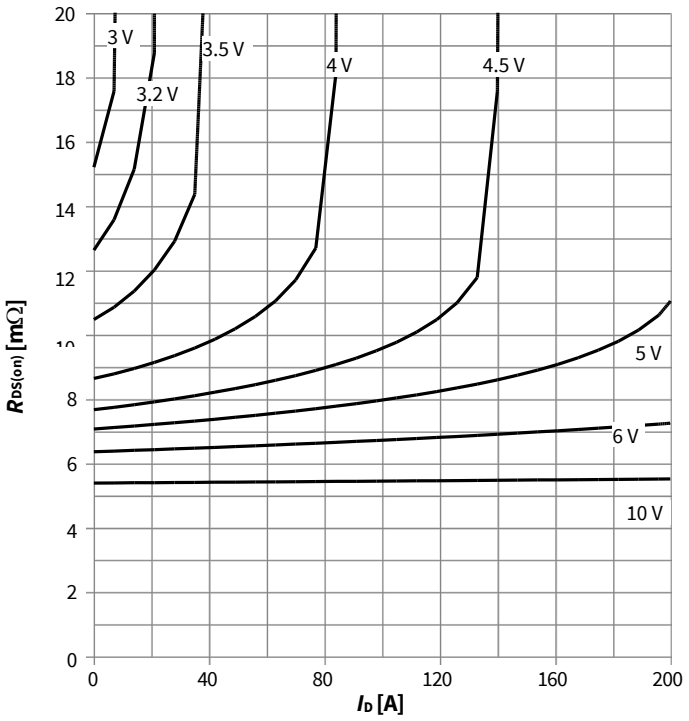
$Z_{thJC}=f(t_p)$; 参数：$D=t_p/T$

图 5：典型输出特性



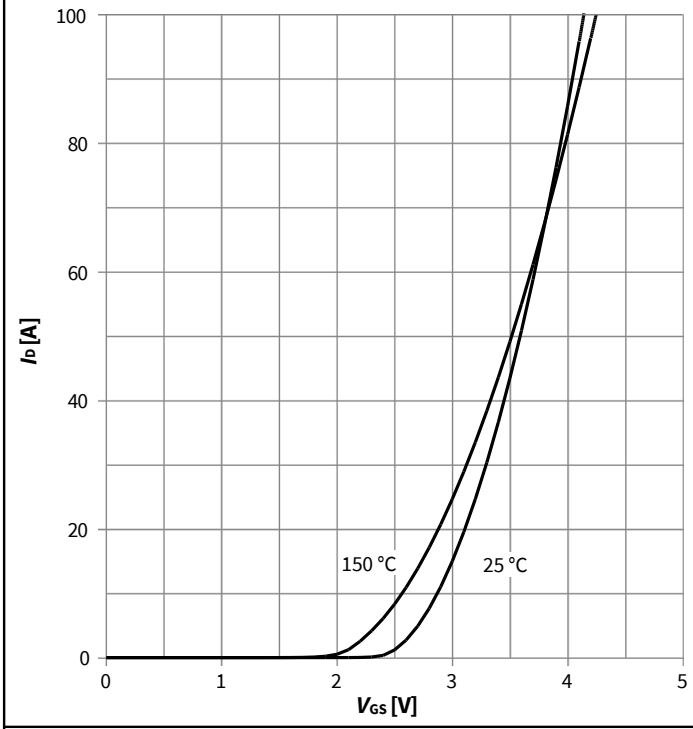
$I_D=f(V_{DS})$; T_j=25 °C; 参数: V_{GS}

图 6：典型漏源导通电阻



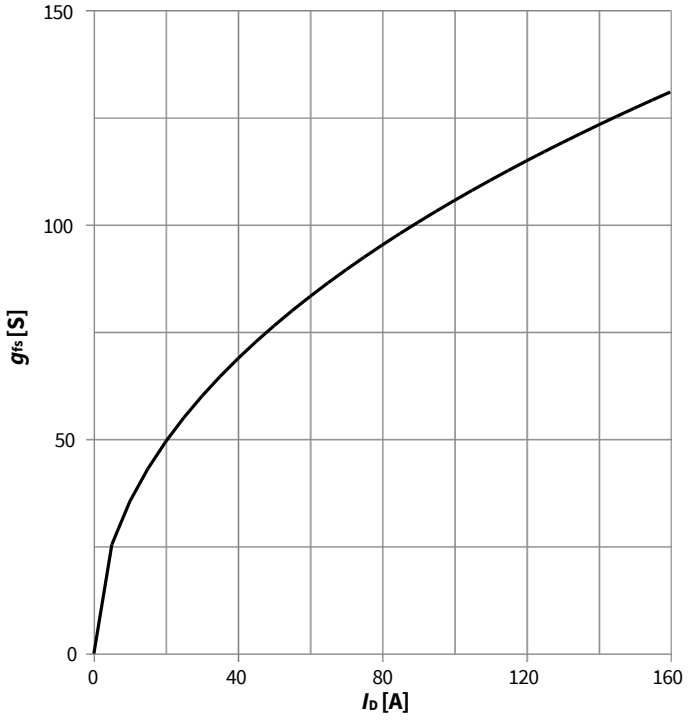
$R_{DS(on)}=f(I_D)$; T_j=25 °C; 参数: V_{GS}

图 7：典型转移特性



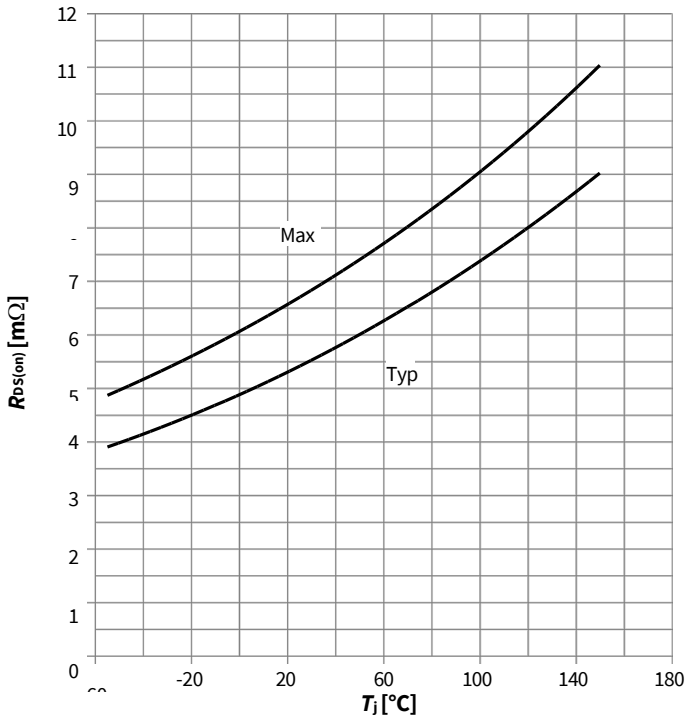
$I_D=f(V_{GS})$; $|V_{DS}|>2|I_D|R_{DS(on)max}$; 参数: T_j

图 8：典型正向跨导



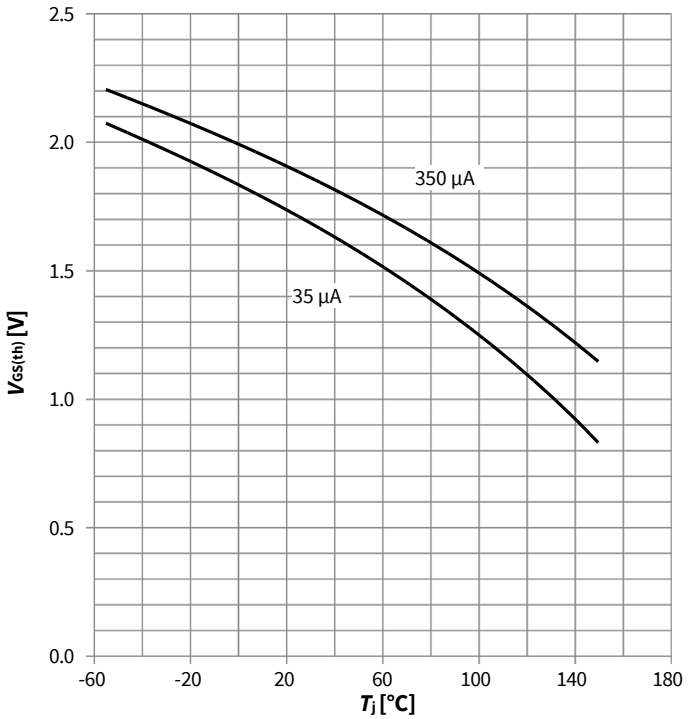
$g_{fs}=f(I_D)$; T_j=25 °C

图 9：漏源导通电阻



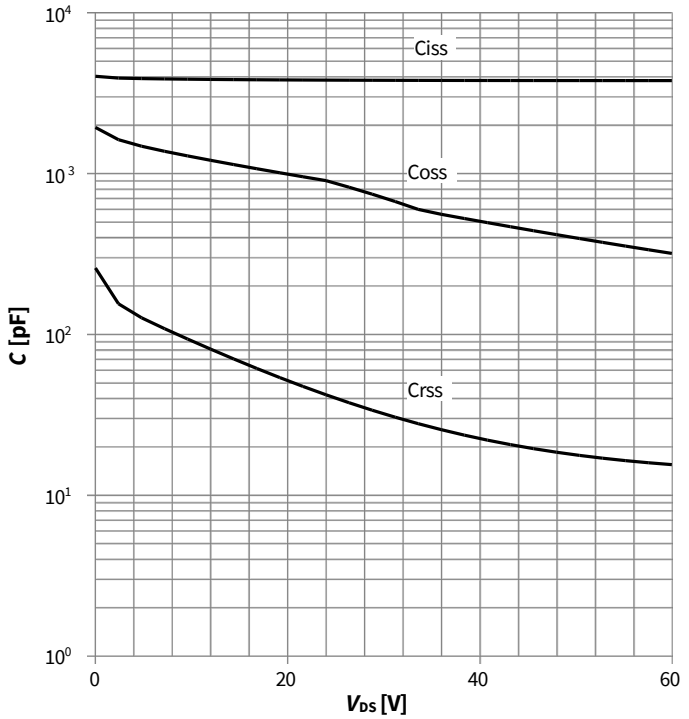
$R_{DS(on)}$=f(T_j); I_D=50 A; V_{GS}=10 V

图 10：典型栅极阈值电压



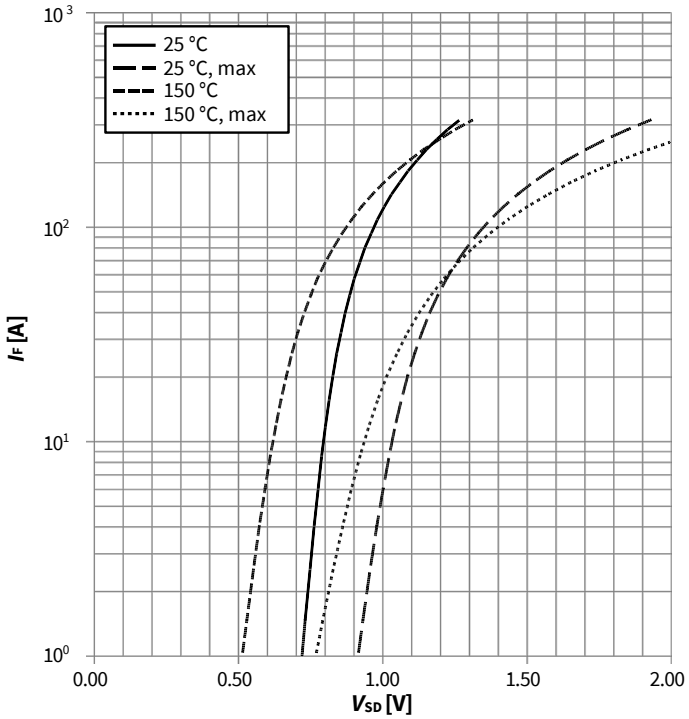
$V_{GS(th)}$=f(T_j); V_{GS}=V_{DS}; 参数: I_D

图 11：典型电容值



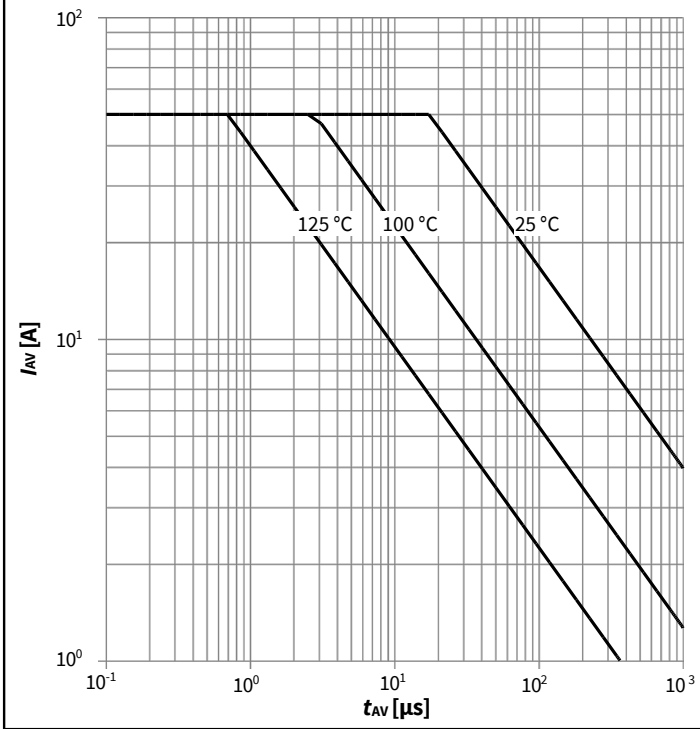
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz

图 12：反向二极管的正向特性



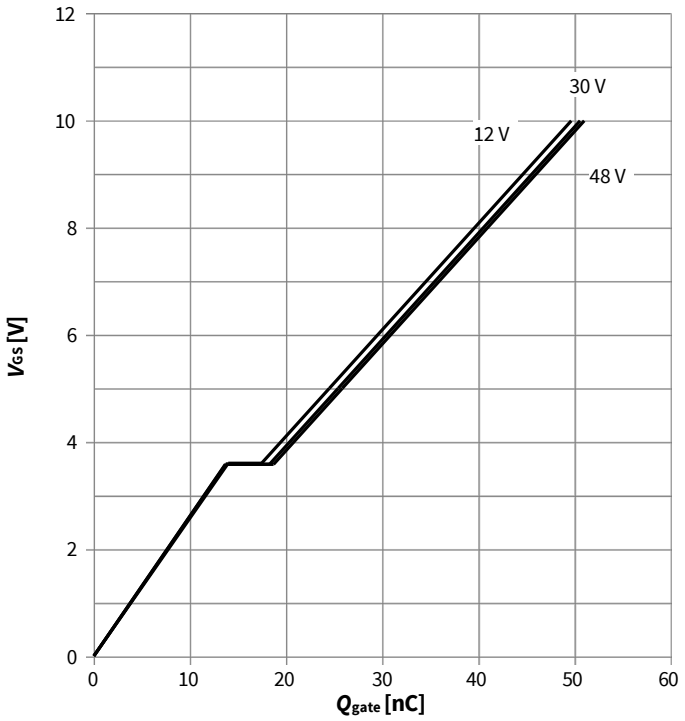
I_F=f(V_{SD}); 参数： T_j

图 13：雪崩特性



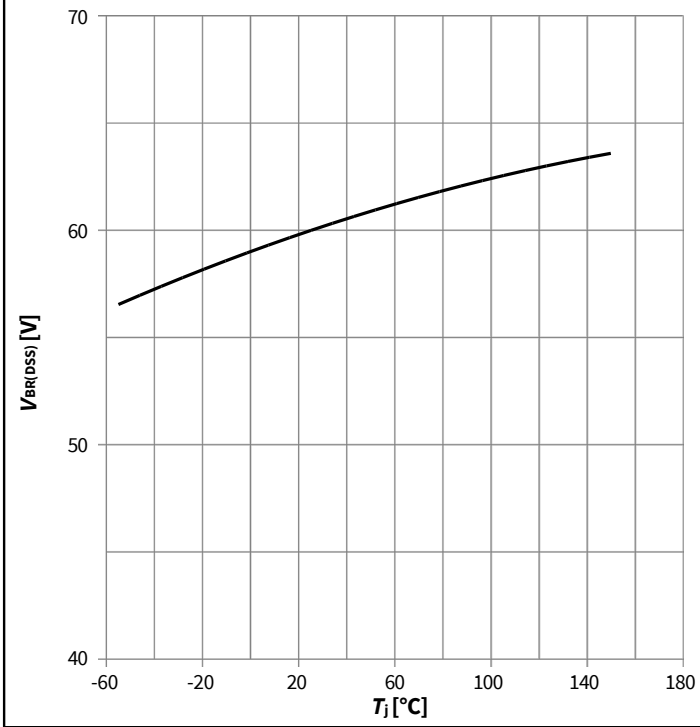
I_{AS}=f(t_{AV}); R_{GS}=25 Ω; 参数: $T_{j(start)}$

图 14：典型栅极电荷



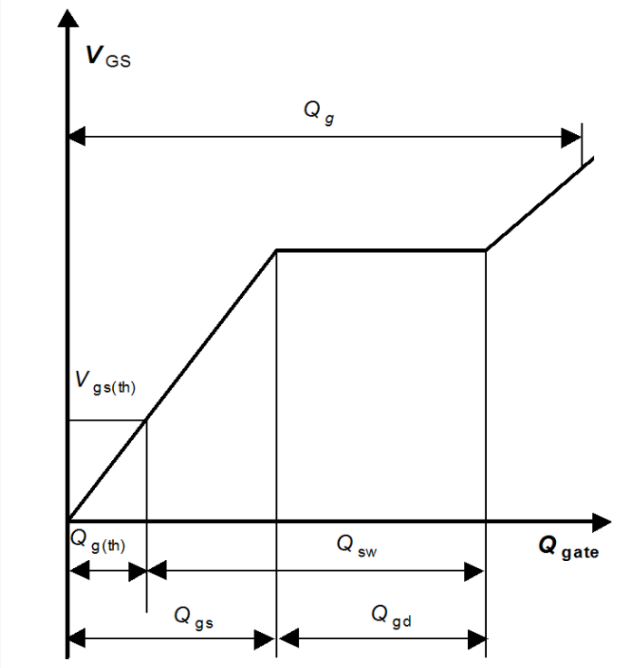
V_{GS}=f(Q_{gate}); I_D=50 A pulsed； 参数： V_{DD}

图 15：漏源击穿电压

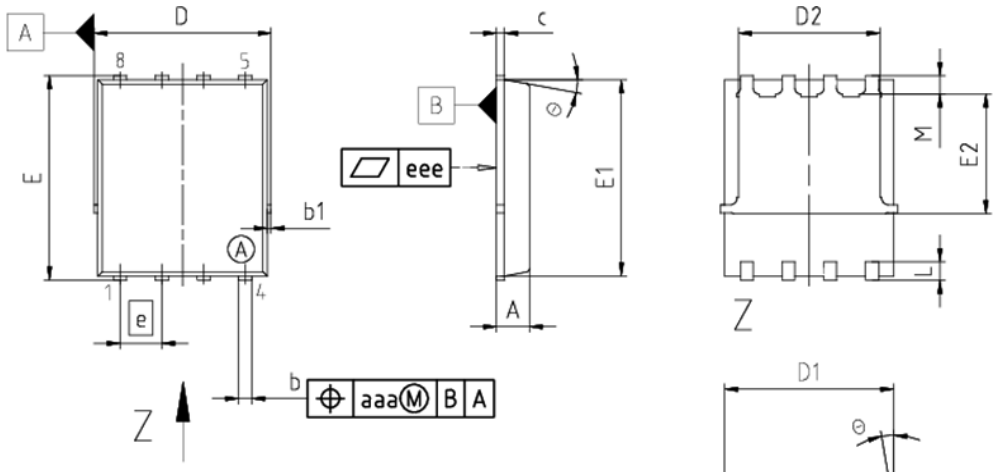


$V_{BR(DSS)}$ = f(T_j); I_D = 1 mA

栅极充电波形



5 封装外形



DIM	MILLIMETERS	
	MIN	MAX
A	0.90	1.10
b	0.31	0.54
b1	0.02	0.22
c	0.15	0.35
D	5.15	5.49
D1	4.95	5.35
D2	3.70	4.40
E	5.95	6.35
E1	5.70	6.10
E2	3.40	3.80
e	1.27	
N	8	
L	0.45	0.71
M	0.45	0.75
Θ	8.5°	12°
aaa	0.25	
eee	0.08	

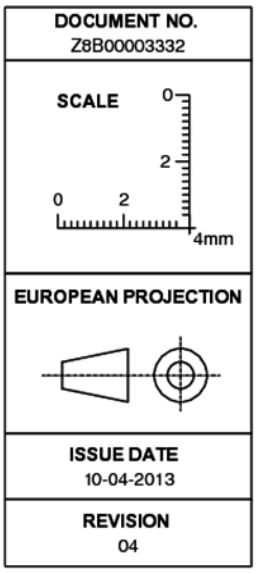


图 1 PG-TDSON-8 外形图，尺寸单位为毫米

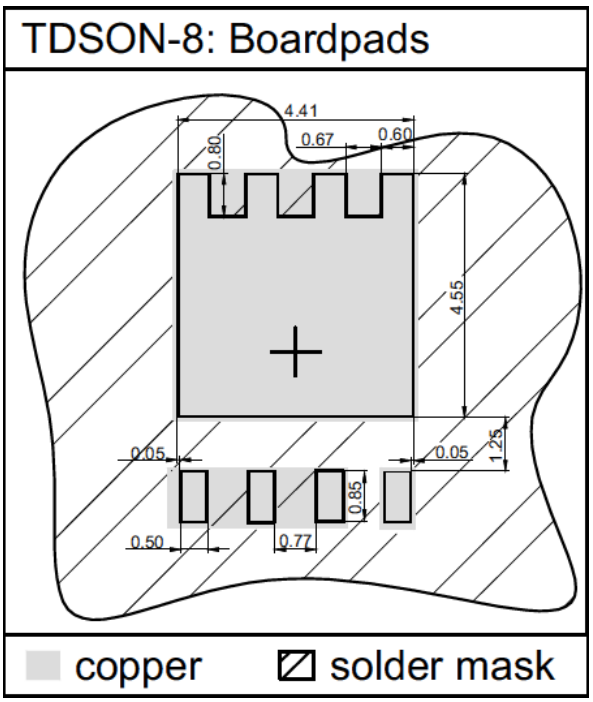


图 2　　外形封装（TDSON-8）

修订记录

BSC067N06LS3 G

Revision: 2021-09-15, Rev. 2.5

历史修订版本

Revision	Date	Subjects (major changes since last revision)
2.5	2021-09-15	Update current rating and footnotes

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