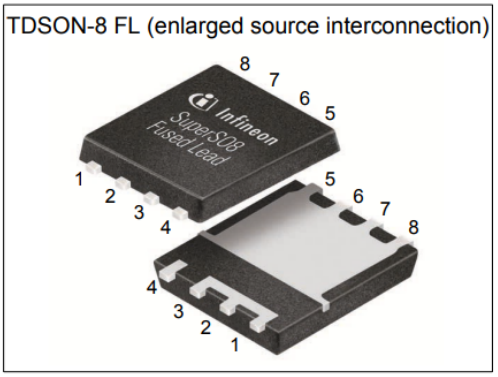
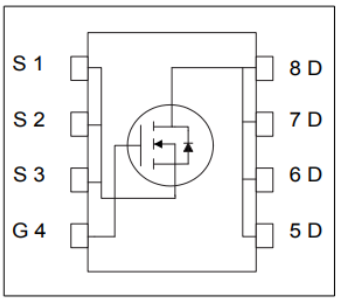
MOSFET

英飞凌高耐热60V OptiMOS™功率晶体管

TDSON-8 FL (enlarged source interconnection)





特性

- 针对同步整流进行了优化
- 额定温度为 175°C
- 100% 雪崩测试
- 卓越的耐热性
- N沟道
- 符合 JEDEC [1]工业应用标准
- 无铅镀层；符合RoHS标准
- 符合 IEC61249-2-21 标准的无卤素
- 源极互连尺寸增大，焊点可靠性更高

表 1　　主要性能参数

Parameter	Value	Unit
V_{DS}	60	V
$R_{DS(on),max}$	1.95	mΩ
I_D	192	A
Q_{OSS}	63	nC
Q_G(0V..10V)	58	nC

Type / Ordering Code	Package	Marking	Related Links
BSC019N06NS	PG-TDSON-8 FL	019N06NS	-

[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）。

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	- - -	- - -	192 136 28	A	V_{GS}=10 V, T_A=25 °C V_{GS}=10 V, T_A=100 °C V_{GS}=10 V, T_A=25 °C, R_{thJA}=50 K/W[2]
Pulsed drain current[3]	$I_{D,pulse}$	-	-	768	A	T_A=25 °C
Avalanche energy, single pulse[4]	E_{AS}	-	-	220	mJ	I_D=50 A, R_{GS}=25 Ω
Gate source voltage	V_{GS}	-20	-	20	V	-
Power dissipation	P_{tot}	- -	- -	136 3.0	W	T_A=25 °C T_A=25 °C, R_{thJA}=50 K/W
Operating and storage temperature	T_j, T_{stg}	-55	-	175	°C	-

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}	-	0.7	1.1	K/W	-
Thermal resistance, junction - case, top	R_{thJC}	-	-	20	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] 器件安装在 40 mm x 40 mm x 1.5 mm环氧树脂印刷电路板 FR4 上，漏极连接用铜面积为 6 cm² （一层，70 µm厚）。印刷电路板垂直放置在静止空气中。

[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	$V_{GS(th)}$	2.1	2.8	3.3	V	V_{DS}=V_{GS}, I_D=74 µA
Zero gate voltage drain current	I_{DSS}	- -	0.5 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	$R_{DS(on)}$	- -	1.7 2.4	1.95 3.2	mΩ	V_{GS}=10 V, I_D=50 A V_{GS}=6 V, I_D=12.5 A
Gate resistance[1)]	R_G	-	1.7	2.6	Ω	-
Transconductance	g_{fs}	60	120	-	S	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=50 A

表5 动态特性[1)]

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Input capacitance	C_{iss}	-	4200	5250	pF	V_{GS}=0 V, V_{DS}=30 V, f=1 MHz
Output capacitance	C_{oss}	-	960	1200	pF	V_{GS}=0 V, V_{DS}=30 V, f=1 MHz
Reverse transfer capacitance	C_{rss}	-	41	82	pF	V_{GS}=0 V, V_{DS}=30 V, f=1 MHz
Turn-on delay time	$t_{d(on)}$	-	12	-	ns	V_{DD}=30 V, V_{GS}=10 V, I_D=30 A, $R_{G,ext}$=1.6 Ω
Rise time	t_r	-	7	-	ns	V_{DD}=30 V, V_{GS}=10 V, I_D=30 A, $R_{G,ext}$=1.6 Ω
Turn-off delay time	$t_{d(off)}$	-	26	-	ns	V_{DD}=30 V, V_{GS}=10 V, I_D=30 A, $R_{G,ext}$=1.6 Ω
Fall time	t_f	-	8	-	ns	V_{DD}=30 V, V_{GS}=10 V, I_D=30 A, $R_{G,ext}$=1.6 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}	-	19	-	nC	V_{DD}=30 V, I_D=50 A, V_{GS}=0 to 10 V
Gate charge at threshold	$Q_{g(th)}$	-	12	-	nC	V_{DD}=30 V, I_D=50 A, V_{GS}=0 to 10 V
Gate to drain charge[1)]	Q_{gd}	-	11	16	nC	V_{DD}=30 V, I_D=50 A, V_{GS}=0 to 10 V
Switching charge	Q_{sw}	-	18	-	nC	V_{DD}=30 V, I_D=50 A, V_{GS}=0 to 10 V
Gate charge total[1)]	Q_g	-	58	77	nC	V_{DD}=30 V, I_D=50 A, V_{GS}=0 to 10 V
Gate plateau voltage	$V_{plateau}$	-	4.4	-	V	V_{DD}=30 V, I_D=50 A, V_{GS}=0 to 10 V
Gate charge total, sync. FET	$Q_{g(sync)}$	-	51	-	nC	V_{DS}=0.1 V, V_{GS}=0 to 10 V
Output charge[1)]	Q_{oss}	-	63	79	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"

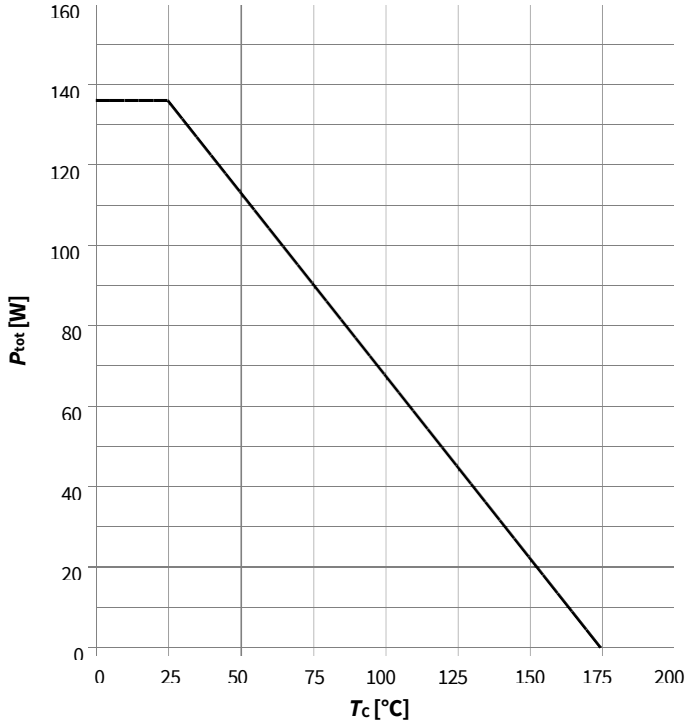
表 7　　反向二极管

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Diode continuous forward current	I_S	-	-	114	A	T_C=25 °C
Diode pulse current	$I_{S,pulse}$	-	-	768	A	T_C=25 °C
Diode forward voltage	V_{SD}	-	0.86	1.2	V	V_{GS}=0 V, I_F=50 A, T_j=25 °C
Reverse recovery time[1)]	t_{rr}	-	42	67	ns	V_R=30 V, I_F=50A, di_F/dt=100 A/µs
Reverse recovery charge	Q_{rr}	-	43	-	nC	V_R=30 V, I_F=50A, di_F/dt=100 A/µs

[1)]由设计标定，不受制于生产测试。

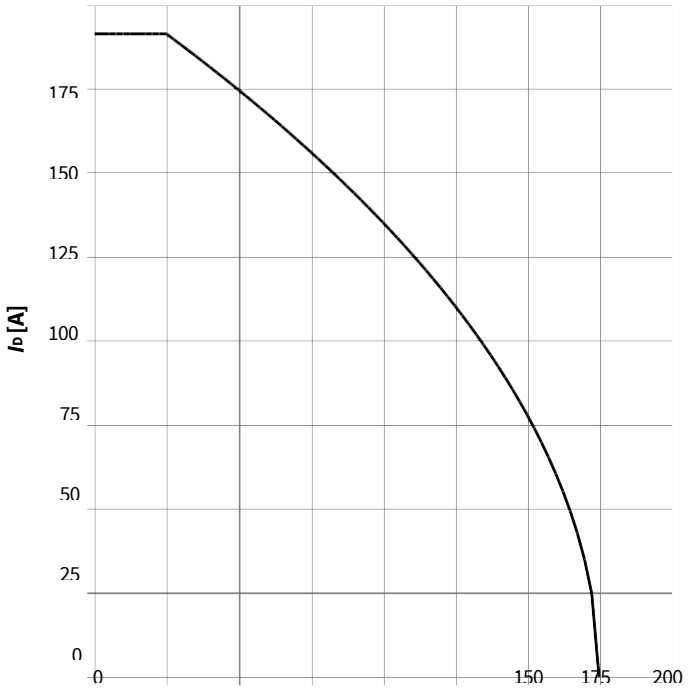
4 电气特性图

图1: 功率耗散



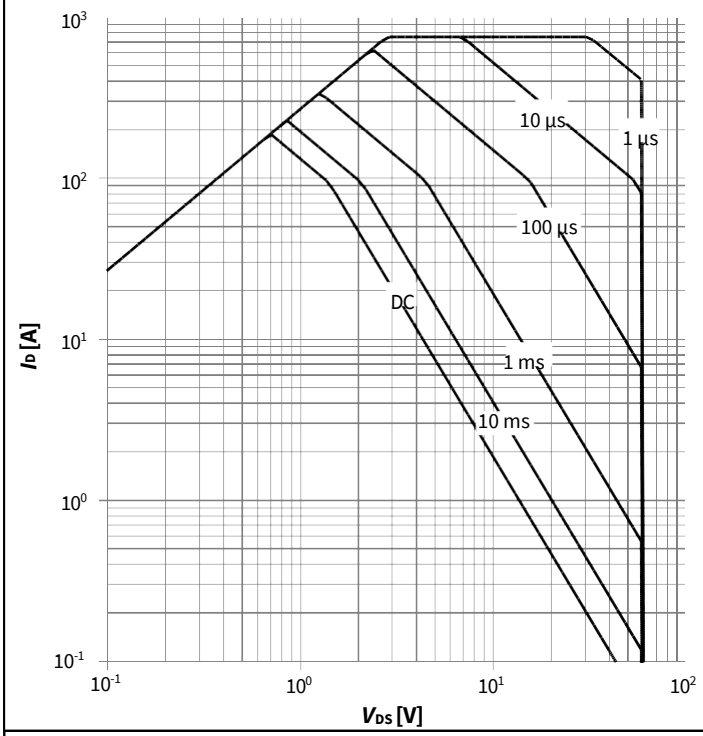
$P_{tot}=f(T_C)$

图 2: 漏极电流



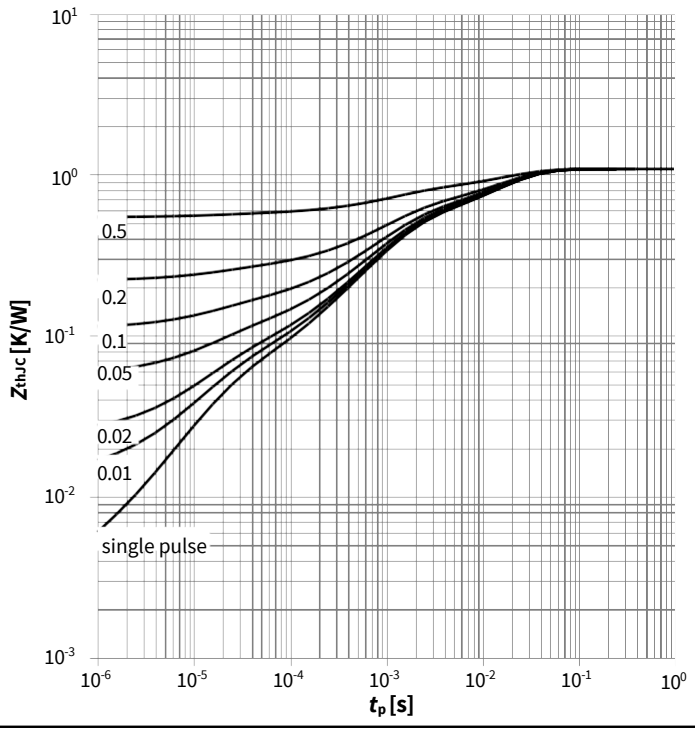
$I_D=f(T_C)$; $V_{GS}\geq 10$ V

图3: 安全操作区



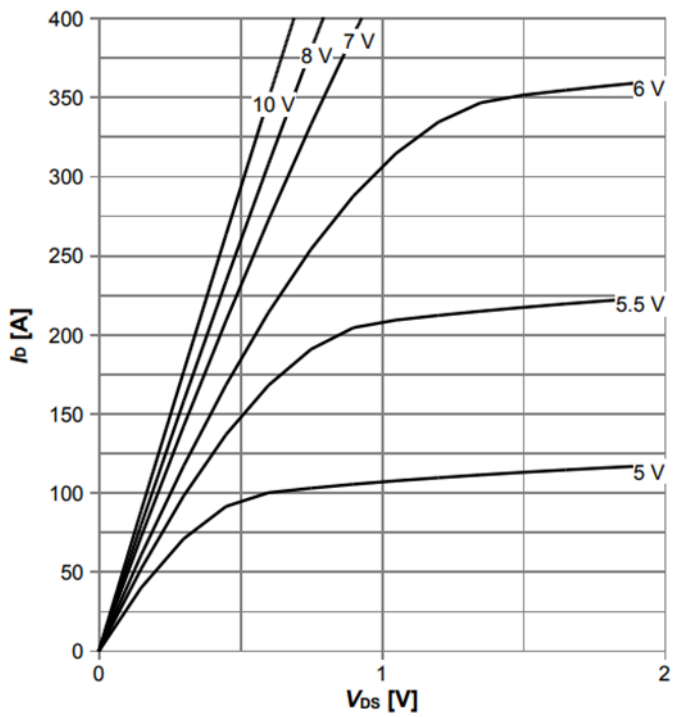
$I_D=f(V_{DS})$; T_C=25 °C; D=0; parameter: t_p

图 4: 最大瞬态热阻抗



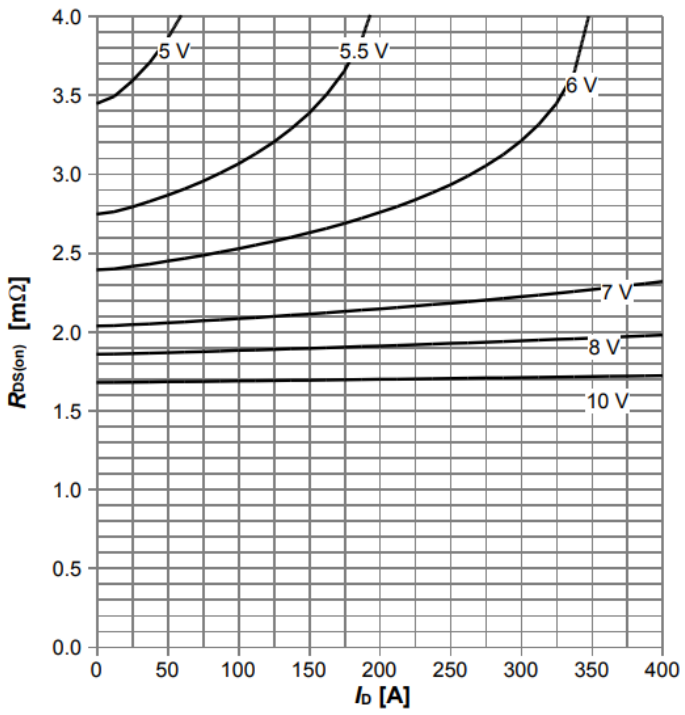
$Z_{thJC}=f(t_p)$; parameter: $D=t_p/T$

图 5：典型输出特性



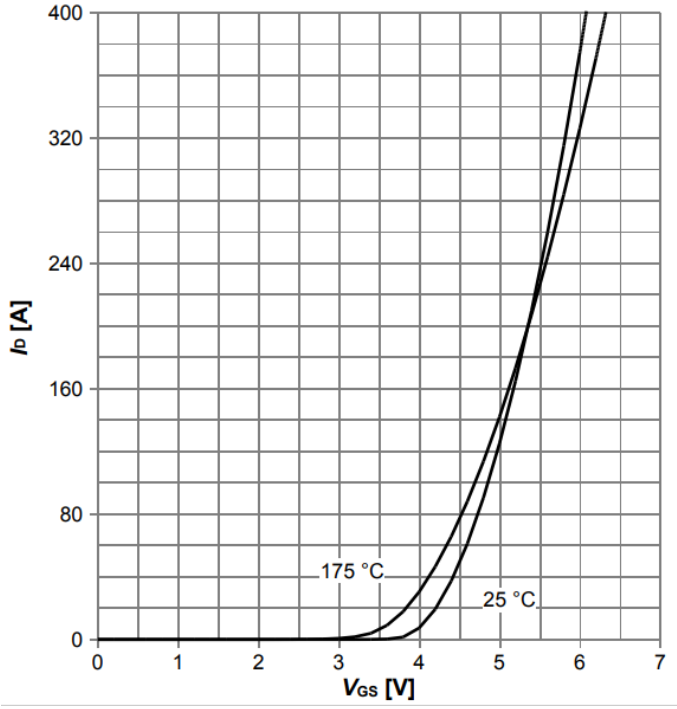
$I_D=f(V_{DS})$; T_j=25 °C; parameter: V_{GS}

图 6：典型漏源导通电阻



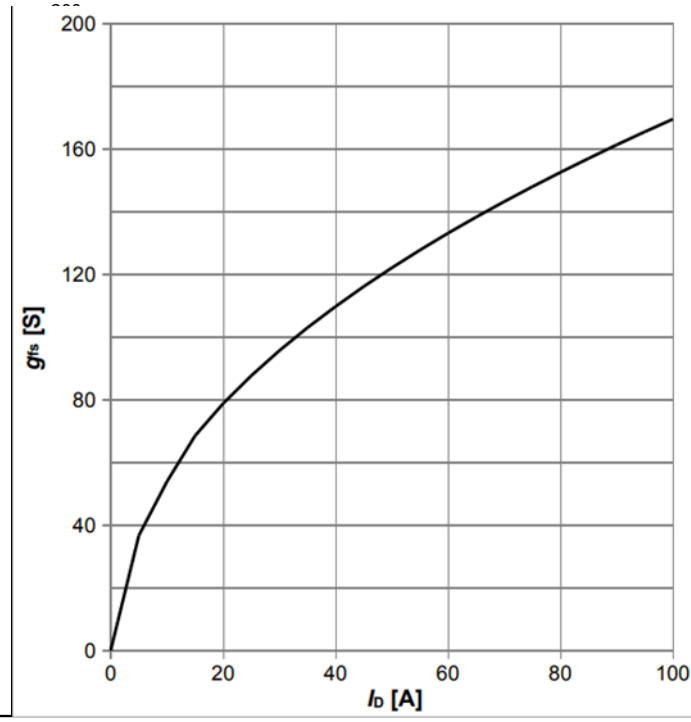
$R_{DS(on)}=f(I_D)$; T_j=25 °C; parameter: V_{GS}

图 7：典型转移特性



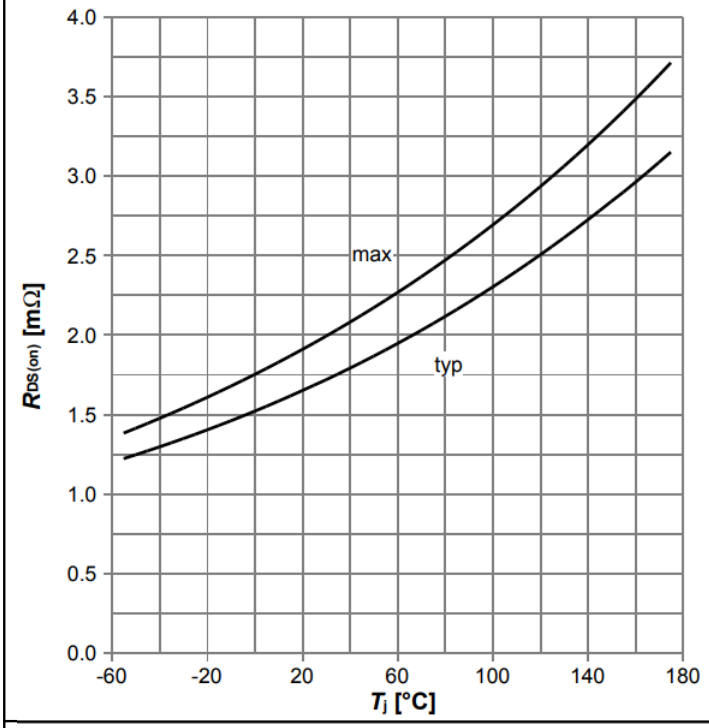
$I_D=f(V_{GS})$; $|V_{DS}|>2|I_D|R_{DS(on)max}$; parameter: T_j

图 8：典型正向跨导



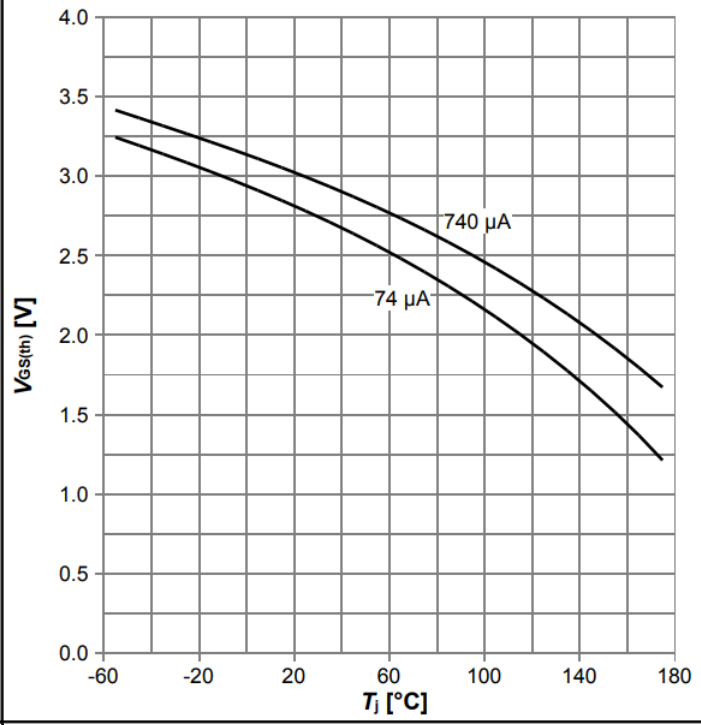
$g_{fs}=f(I_D)$; T_j=25 °C

图 9：漏源导通电阻



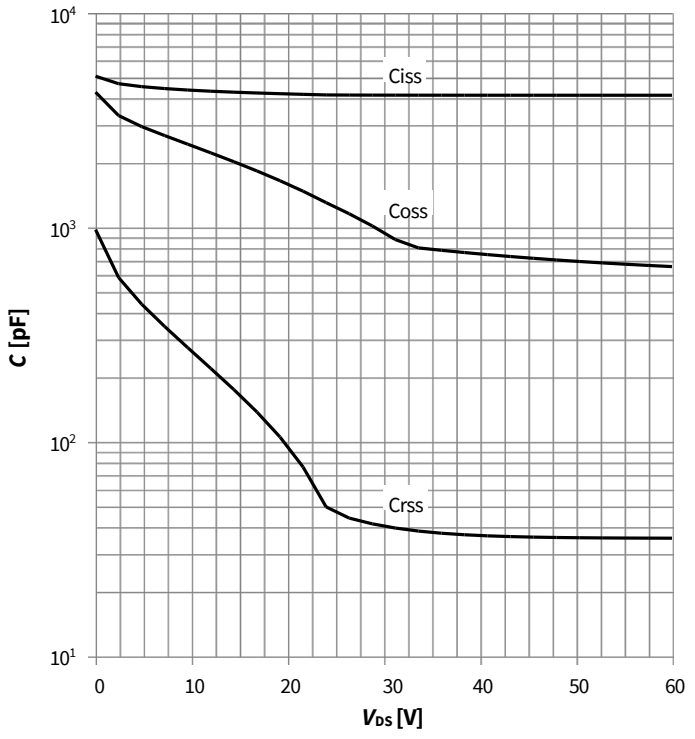
$R_{DS(on)}$=f(T_j); I_D=50 A; V_{GS}=10 V

图 10：典型栅极阈值电压



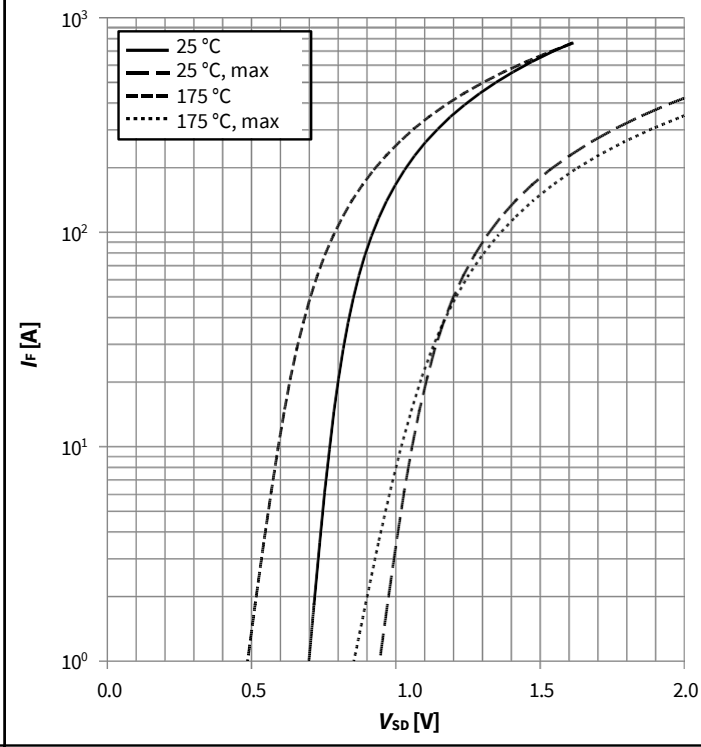
$V_{GS(th)}$=f(T_j); V_{GS}=V_{DS}

图 11：典型电容值



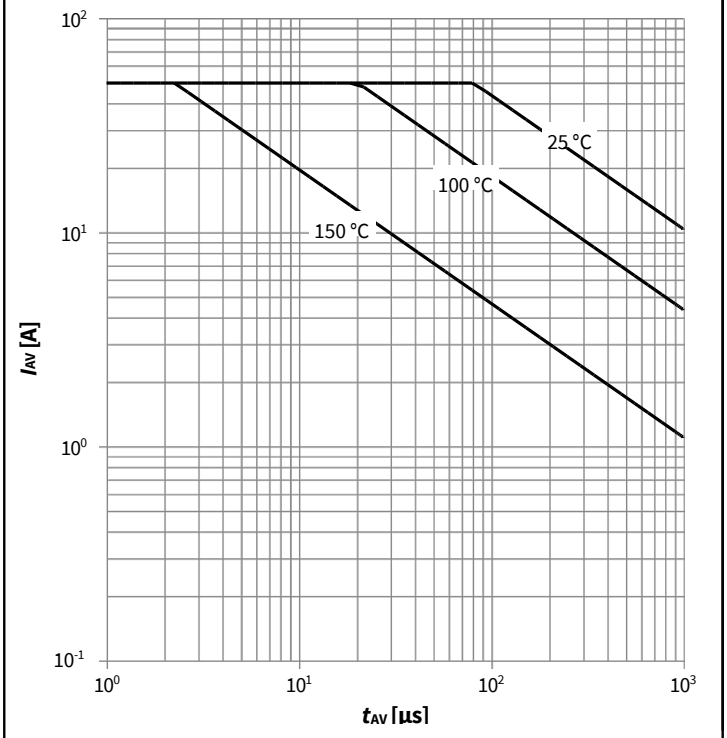
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz

图 12：反向二极管的正向特性



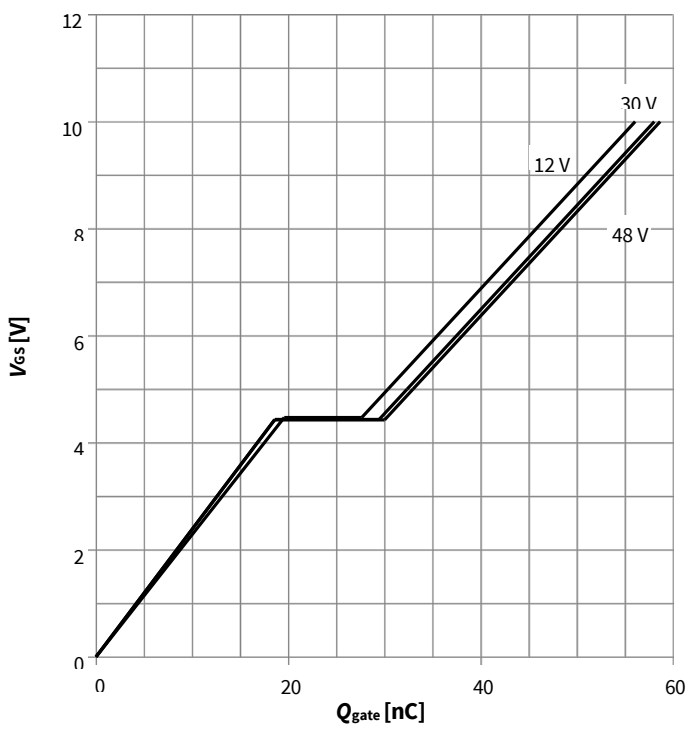
I_F=f(V_{SD}); parameter: T_j

图 13：雪崩特性



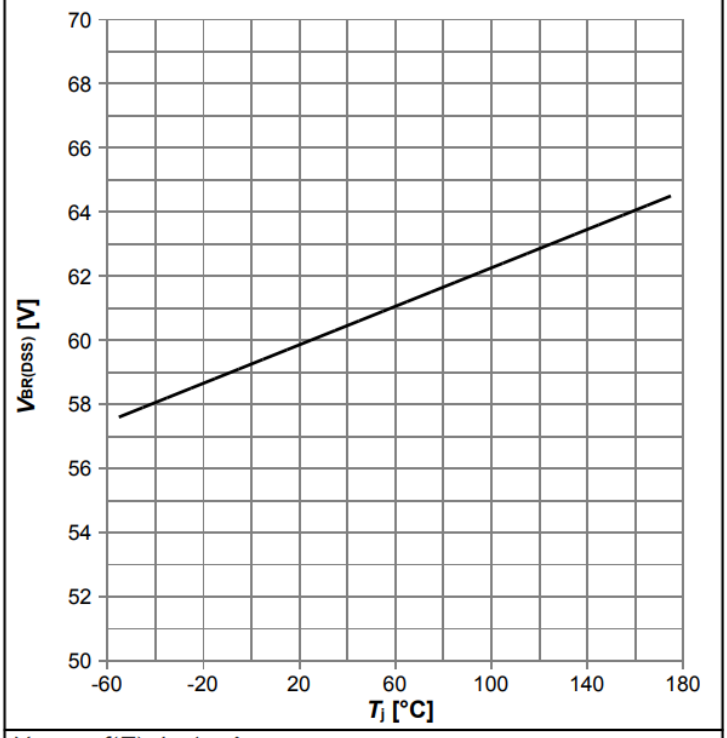
$I_{AS}=f(t_{AV})$; $R_{GS}=25\ \Omega$; parameter: $T_{j(start)}$

图 14：典型栅极电荷



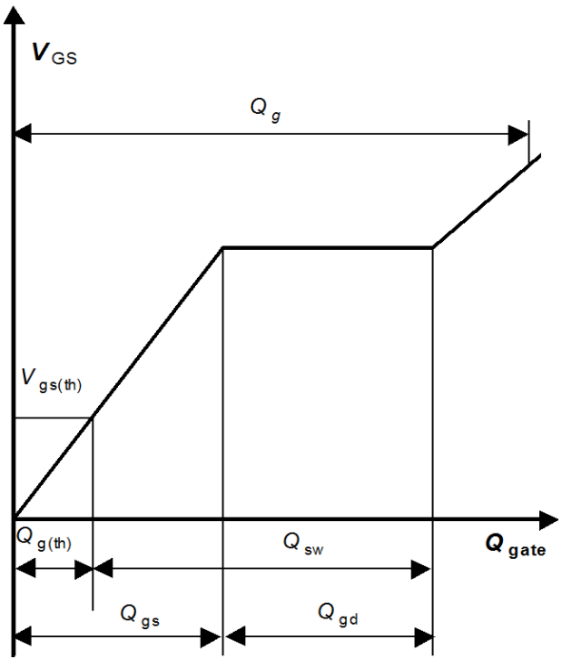
$V_{GS}=f(Q_{gate})$; $I_D=50$ A pulsed; parameter: V_{DD}

图 15：漏源击穿电压

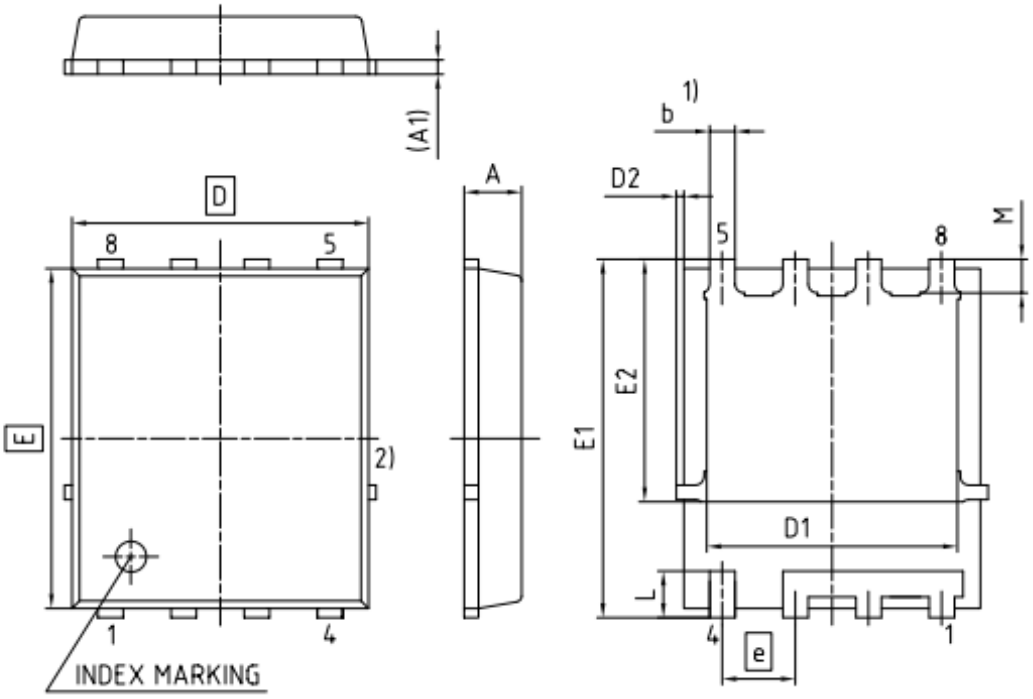


$V_{BR(DSS)}=f(T_j)$; $I_D=1$ mA

栅极充电波形



5 封装外形



1) EXCLUDING MOLD FLASH
2) REMOVAL ON MOLD GATE
INTRUSION 0.1 MM
PROTRUSION 0.1 MM
LEAD LENGTH UP TO ANTI FLASH LINE
ALL METAL SURFACES ARE PLATED, EXCEPT AREA OF CUT

DIMENSION	MILLIMETERS	
	MIN.	MAX.
A	0.90	1.20
A1	0.15	0.35
b	0.26	0.54
D	4.90	5.30
D1	3.70	4.50
D2	0.02	0.23
E	5.70	6.10
E1	5.90	6.42
E2	3.88	4.42
e	1.27	
L	0.69	0.90
M	0.45	0.69

DOCUMENT NO.
Z8B000193699
REVISION
03
SCALE 10:1
0 1 2 3mm
EUROPEAN PROJECTION
ISSUE DATE
19.06.2019

图 1　　PG-TDSON-8 FL 外形图，尺寸单位为毫米

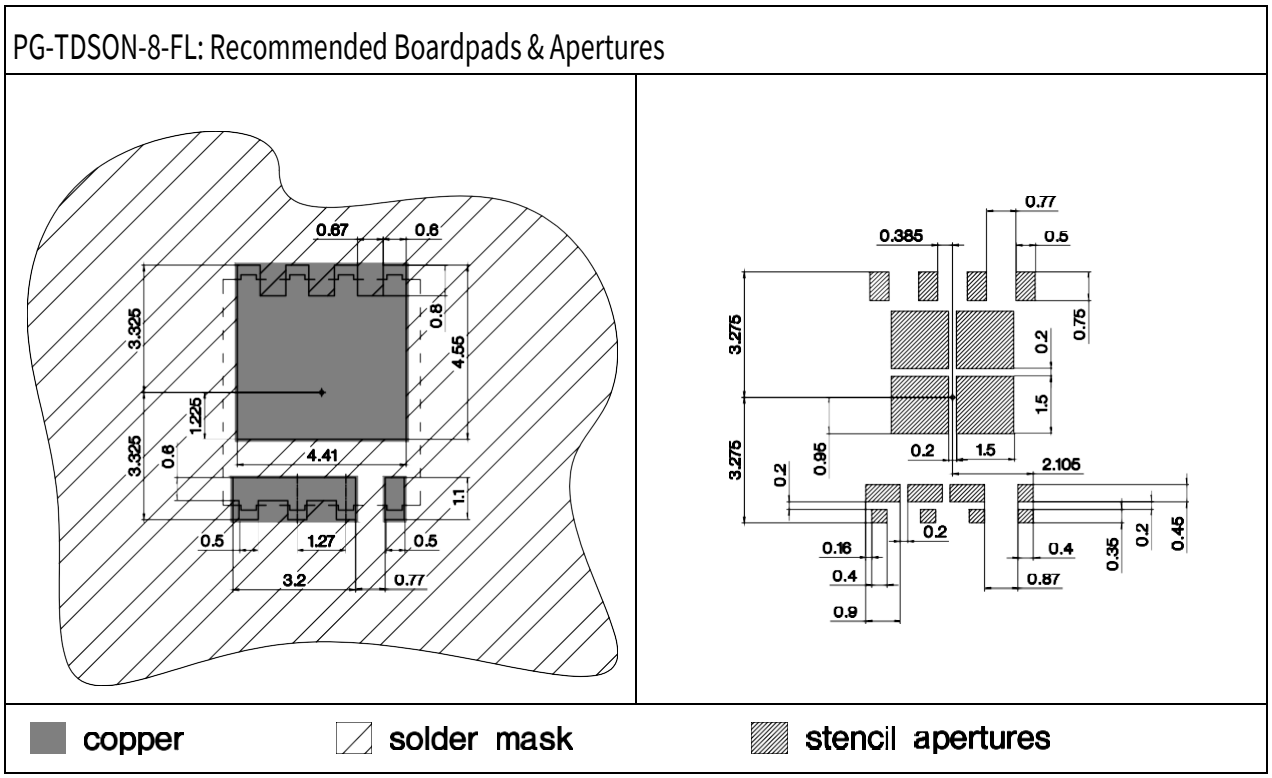


图 2　　外形板焊盘 (TDSON-8 FL)

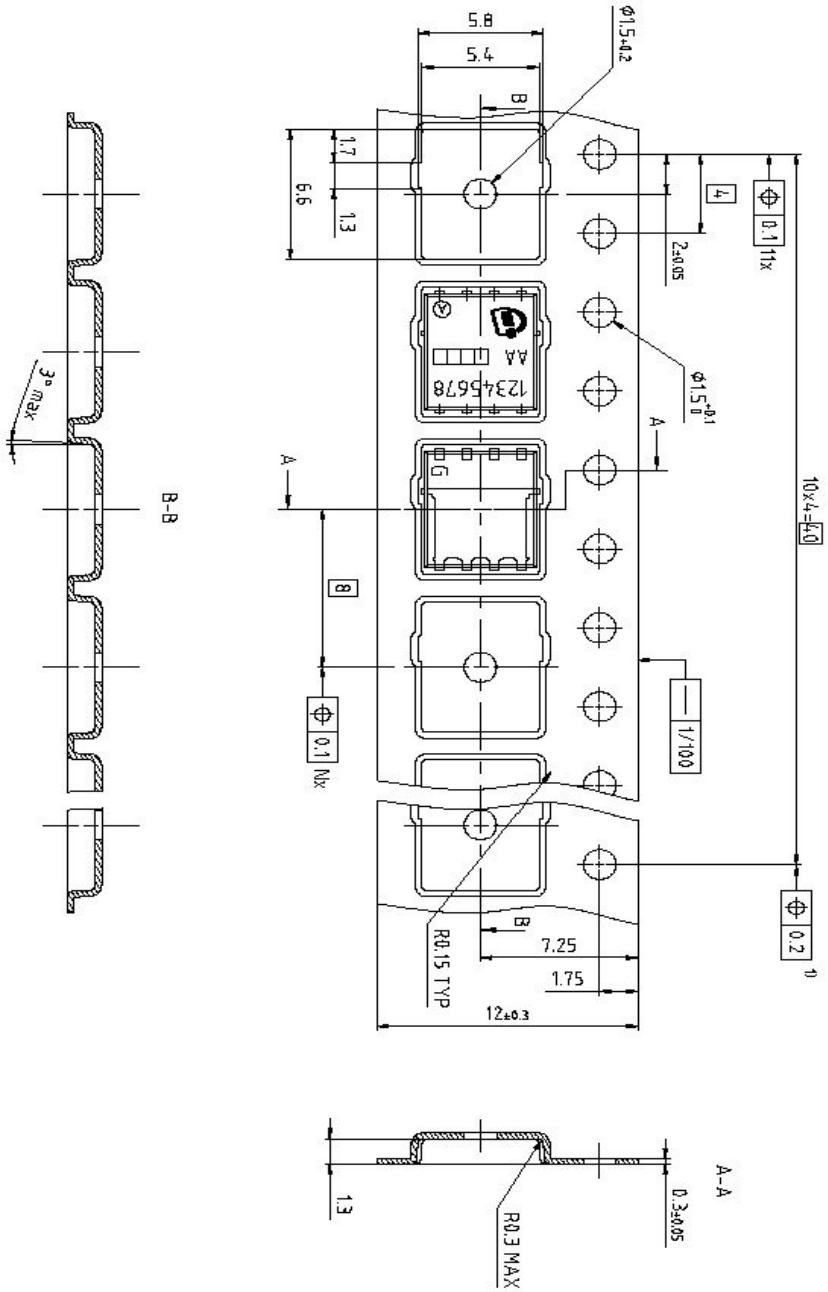


图 3　　封装外形胶带 (TDSON-8 FL)

修订记录

BSC019N06NS

Revision: 2020-10-23, Rev. 2.3

历史修订版本

Revision	Date	Subjects (major changes since last revision)
2.0	2016-01-11	Release of final version
2.1	2017-03-20	Rev. 2.0
2.2	2019-11-04	Update package drawings
2.3	2020-10-23	Update current rating and Vsd typ

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