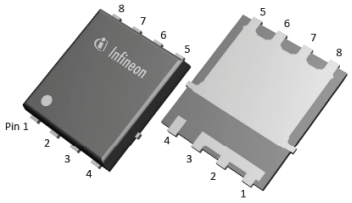
MOSFET

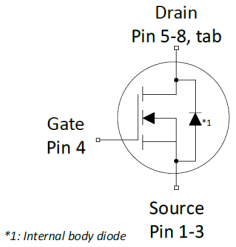
英飞凌OptiMOS™ 5 线性FET 2, 100 V

PG-TDSON-8



特性

- 非常适合热插拔、电池保护和电子保险丝应用
- 非常适合电流共享
- 极低的导通电阻 $R_{DS(on)}$
- 宽范围安全工作区（SOA）
- $V_{GS(th)}$ 分布范围窄（离散度小）
- 低跨导 gfs
- N沟道，标准电平
- 100% 雪崩测试
- 无铅镀层；符合 RoHS 标准
- 符合 IEC61249-2-21 标准的无卤素



产品验证

已通过 JEDEC 相关测试。

表 1　　主要性能参数

Parameter	Value	Unit
V_{DS}	100	V
$R_{DS(on),max}$	3.5	mΩ
I_D	164	A
$I(V_{DS}=50\ V, t_p=10\ ms)$	7.4	A

Part number	Package	Marking	Related links
ISC035N10NM5LF2	PG-TDSON-8	35N10LF2	-

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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	-	-	164	A	V_{GS}=10 V, T_C=25 °C
				116		V_{GS}=10 V, T_C=100 °C
				19		V_{GS}=10 V, T_A=25 °C, R_{thJA}=50 °C/W [2]
Pulsed drain current [3]	$I_{D,pulse}$	-	-	656	A	T_A=25 °C
Avalanche energy, single pulse [4]	E_{AS}	-	-	398	mJ	I_D=50 A, R_{GS}=25 Ω
Gate source voltage	V_{GS}	-20	-	20	V	-
Power dissipation	P_{tot}	-	-	217	W	T_C=25 °C
				3		T_A=25 °C, R_{thJA}=50 °C/W [2]
Operating and storage temperature	T_j, T_{stg}	-55	-	175	°C	-

1) 额定值指产品仅具有数据手册指定的绝对最大值，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) 器件置于40 mm × 40 mm × 1.5 mm 环氧树脂 PCB FR4 上，配有6 cm^2（单层，70 µm厚）铜层面积用于漏极连接。PCB在静止空气中垂直放置。

3) 详细信息请参见图 3和图 4

4) 详细信息请参见图 14

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	°C/W	-
Thermal resistance, junction - case, top	R_{thJC}			20		
Thermal resistance, junction - ambient, 6 cm^2 cooling area [5)]	R_{thJA}			50		

5) 器件置于40 mm × 40 mm × 1.5 mm 环氧树脂 PCB FR4 上，配有6 cm^2（单层，70 µm厚）铜层面积用于漏极连接。PCB在静止空气中垂直放置。

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	$V_{(BR)DSS}$	100	-	-	V	V_{GS}=0 V, I_D=1 mA
Gate threshold voltage	$V_{GS(th)}$	2.8	3.15	3.5	V	V_{DS}=V_{GS}, I_D=115 µA
Zero gate voltage drain current	I_{DSS}	-	0.1	1	µA	V_{DS}=100 V, V_{GS}=0 V, T_j=25 °C
			10	100		V_{DS}=100 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	$R_{DS(on)}$	-	3.0	3.5	mΩ	V_{GS}=10 V, I_D=50 A
Gate resistance	R_G	-	1.5	2.3	Ω	-
Transconductance [6)]	g_{fs}	26	52	-	S	$\|V_{DS}\|\geq 2\|I_D\|R_{DS(on)max}$, I_D=50 A

[6)] 由设计指定，未经过生产测试。

表 5　　动态特性

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Input capacitance [7)]	C_{iss}	-	5500	7200	pF	V_{GS}=0 V, V_{DS}=50 V, f=1 MHz
Output capacitance [7)]	C_{oss}		780	1000		
Reverse transfer capacitance [7)]	C_{rss}		19	33		
Turn-on delay time	$t_{d(on)}$	-	16	-	ns	V_{DD}=50 V, V_{GS}=10 V, I_D=50 A, $R_{G,ext}$=1.6 Ω
Rise time	t_r		11			
Turn-off delay time	$t_{d(off)}$		25			
Fall time	t_f		10			

[7)] 由设计指定，未经过生产测试。

表 6　　栅极电荷特性 [8)]

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Gate to source charge	Q_{gs}	-	35	-	nC	V_{DD}=50 V, I_D=50 A, V_{GS}=0 to 10 V
Gate charge at threshold	$Q_{g(th)}$		17	-	nC	
Gate to drain charge [9)]	Q_{gd}		12	18	nC	
Switching charge	Q_{sw}		30	-	nC	
Gate charge total [9)]	Q_g		70	88	nC	
Gate plateau voltage	$V_{plateau}$		6.4	-	V	
Output charge [9)]	Q_{oss}	-	90	115	nC	V_{DS}=50 V, V_{GS}=0 V

[8)] 参数定义请参见“栅极充电波形”。

[9)] 由设计指定，未经过生产测试。

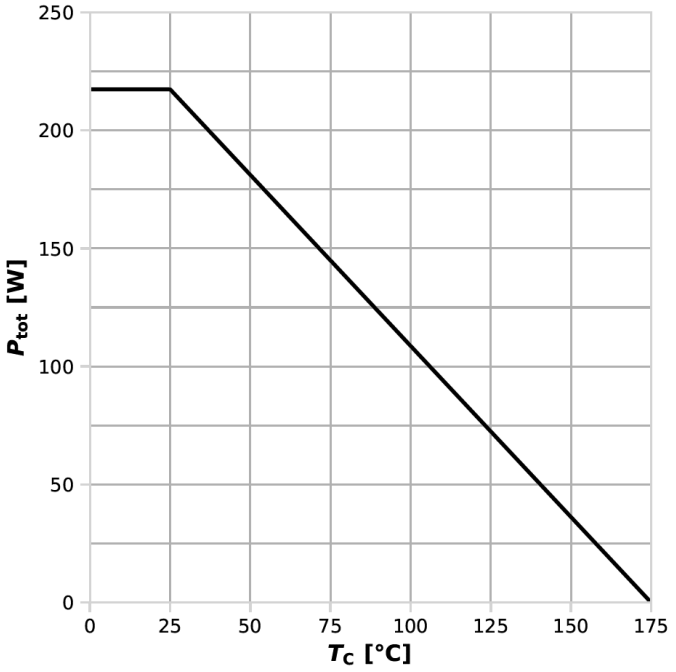
表 7　　反向二极管

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Diode continuous forward current	I_S	-	-	159	A	T_C=25 °C
Diode pulse current	$I_{S,pulse}$			656		
Diode forward voltage	V_{SD}	-	0.84	1.2	V	V_{GS}=0 V, I_F=50 A, T_j=25 °C
Reverse recovery time [10)]	t_{rr}	-	49	98	ns	V_R=50 V, I_F=50 A, di_F/dt=100 A/µs
Reverse recovery charge [10)]	Q_{rr}		72	144	nC	

[10)] 由设计指定，未经过生产测试。

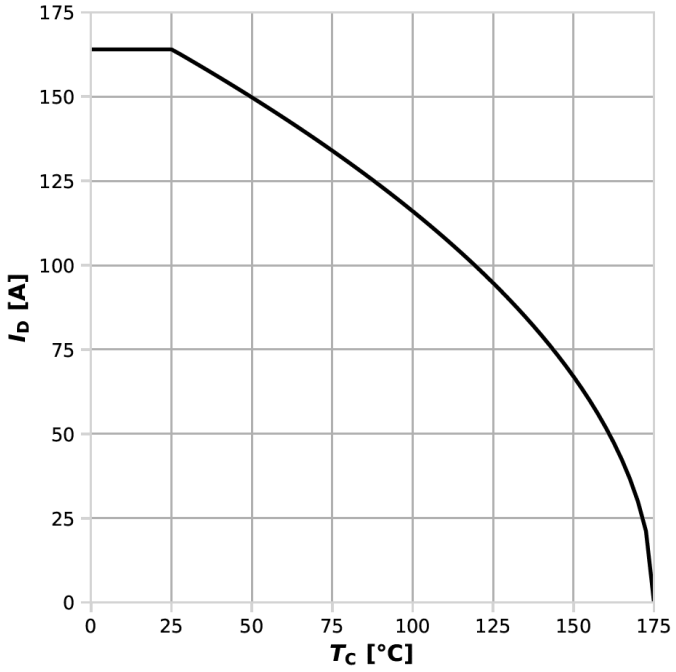
4 电气特性图

Diagram 1: Power dissipation



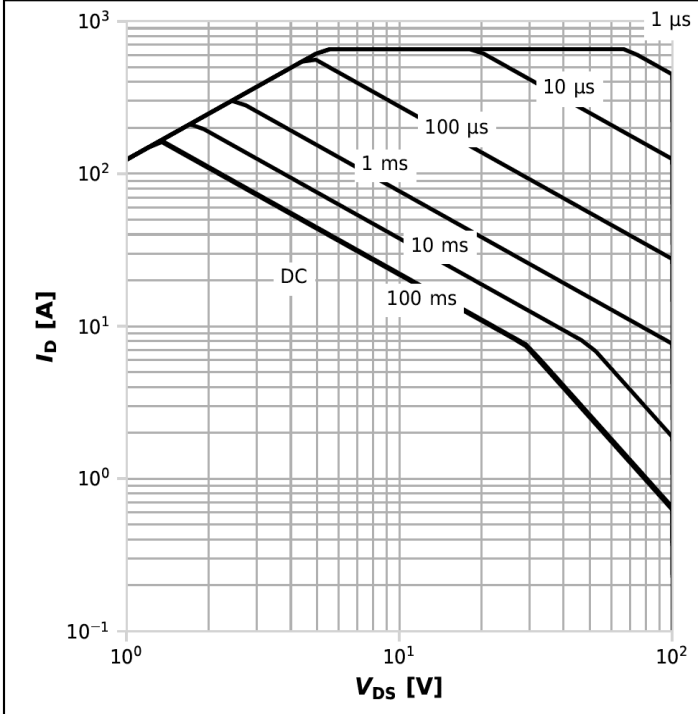
$P_{tot}=f(T_C)$

Diagram 2: Drain current



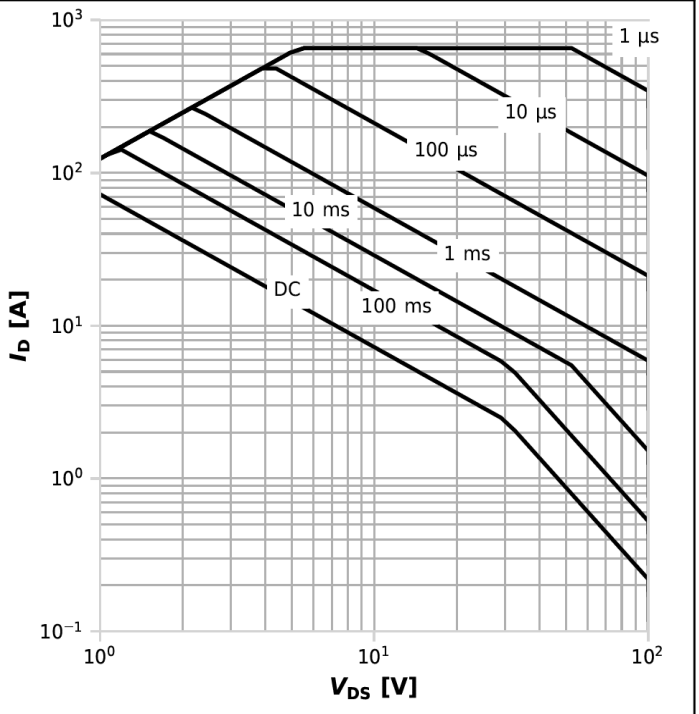
$I_D=f(T_C)$; $V_{GS}\geq 10$ V

Diagram 3: Safe operating area



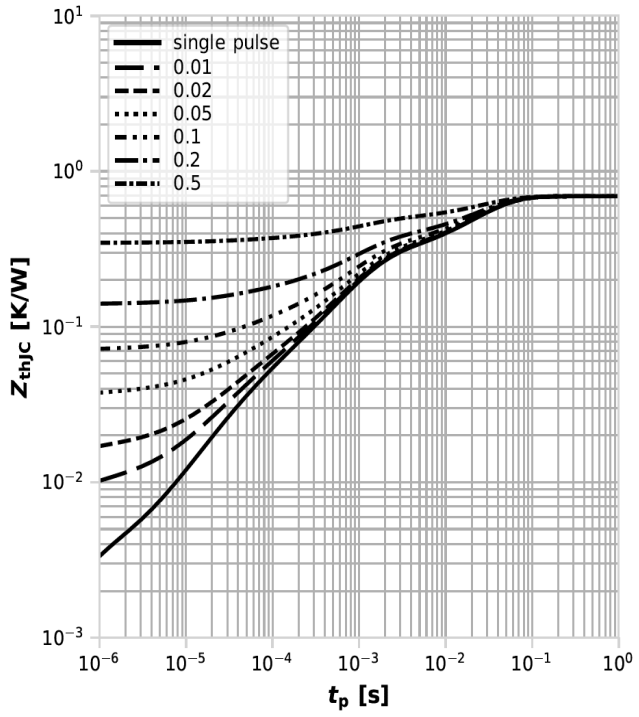
$I_D=f(V_{DS})$; $T_C=25$ °C; $D=0$; parameter: t_p

Diagram 4: Safe operating area



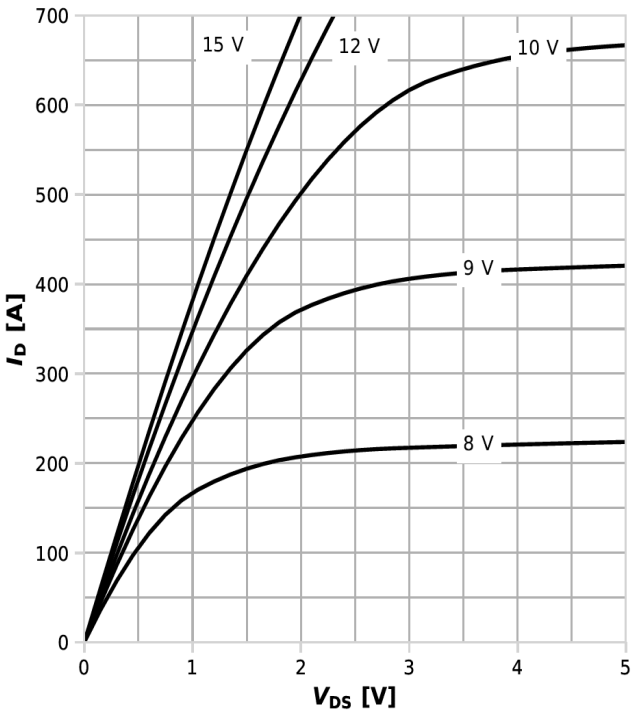
$I_D=f(V_{DS})$; $T_C=125$ °C; $D=0$; parameter: t_p

Diagram 5: Max. transient thermal impedance



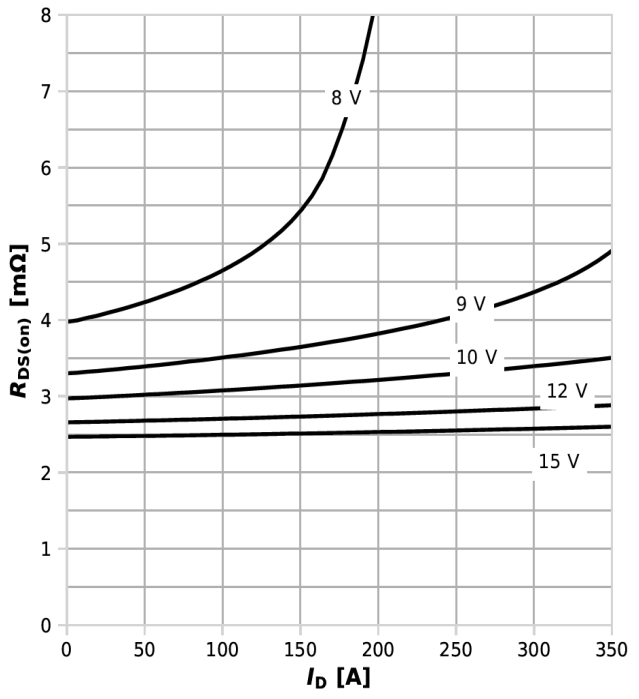
Z_{thJC}=f(t_p); parameter: D=t_p/T

Diagram 6: Typ. output characteristics



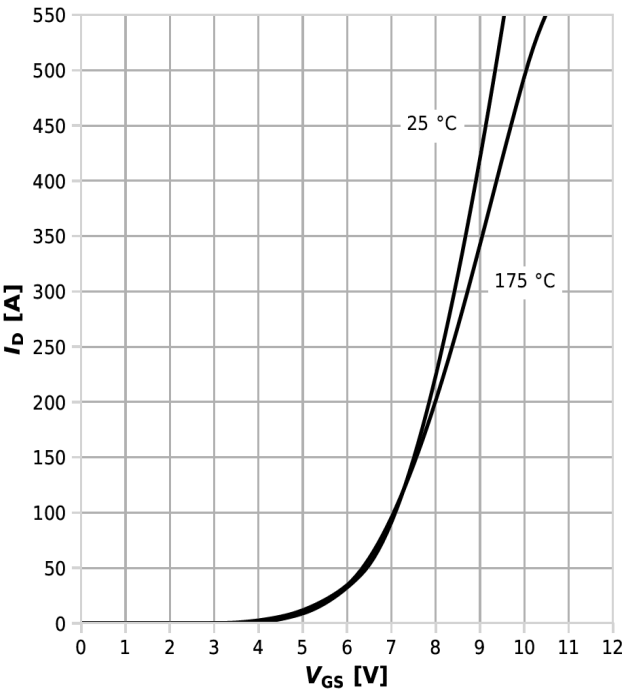
I_D=f(V_{DS}), T_j=25 °C; parameter: V_{GS}

Diagram 7: Typ. drain-source on resistance



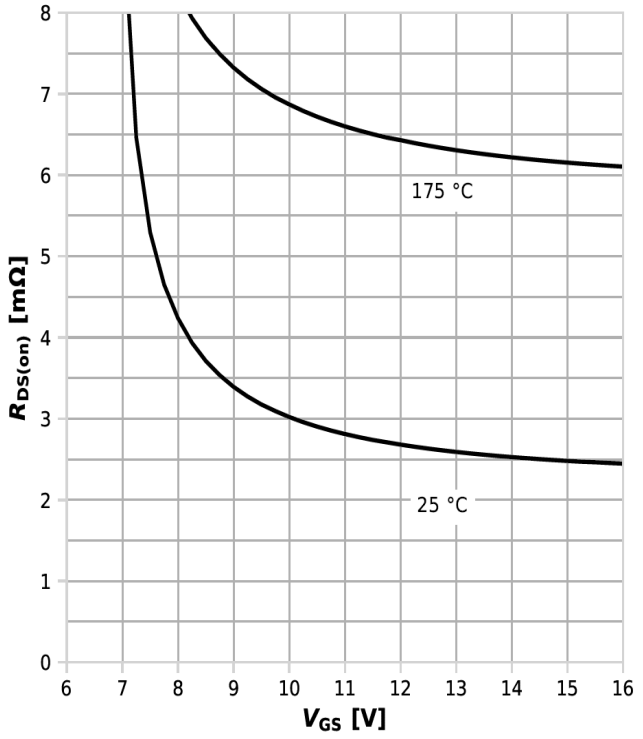
$R_{DS(on)}$=f(I_D), T_j=25 °C; parameter: V_{GS}

Diagram 8: Typ. transfer characteristics



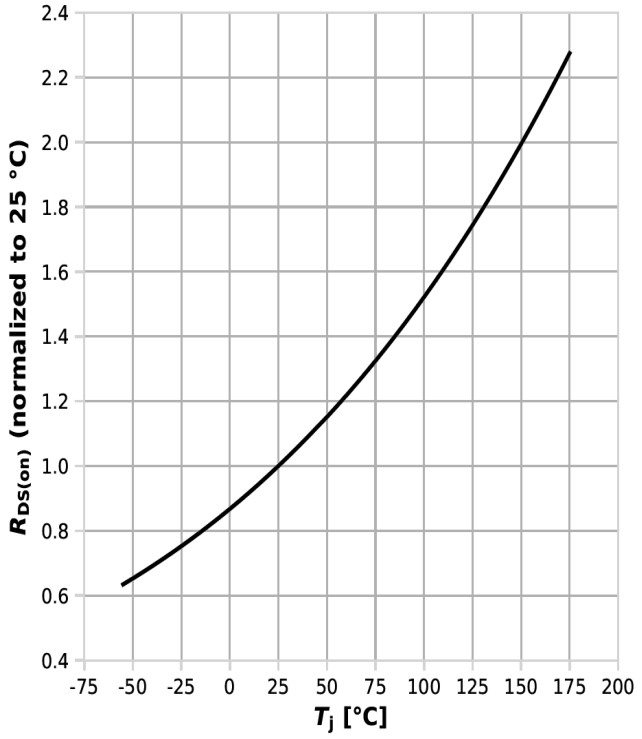
I_D=f(V_{GS}), $|V_{DS}|$>2$|I_D|R_{DS(on)max}$; parameter: T_j

Diagram 9: Typ. drain-source on resistance



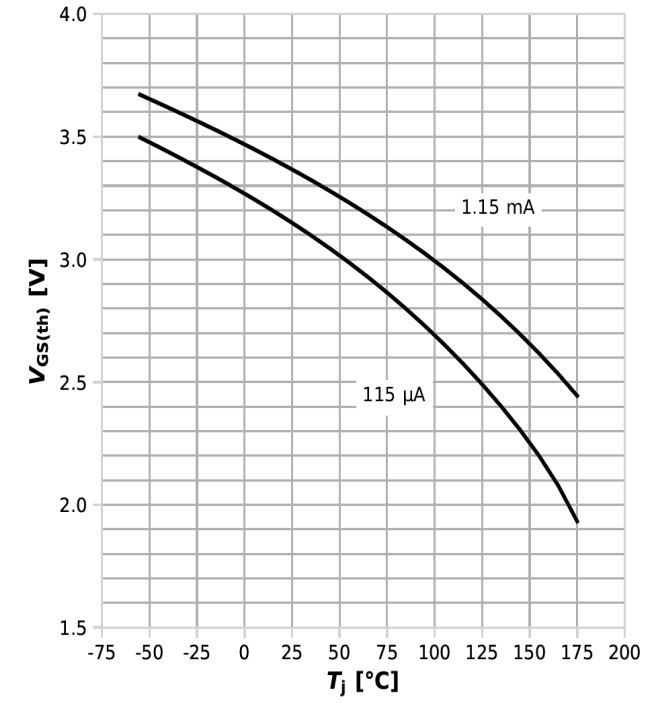
$R_{DS(on)}$=f(V_{GS}), I_D=50 A; parameter: T_j

Diagram 10: Normalized drain-source on resistance



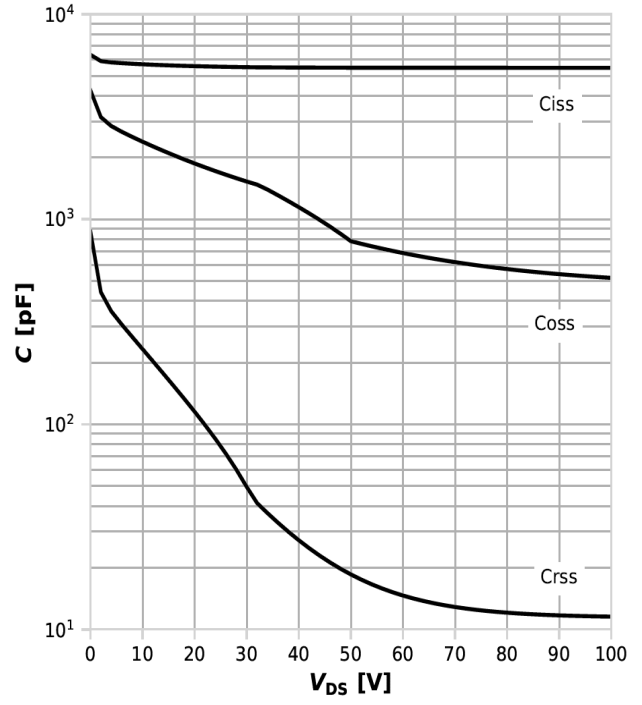
$R_{DS(on)}$=f(T_j), I_D=50 A, V_{GS}=10 V

Diagram 11: Typ. gate threshold voltage



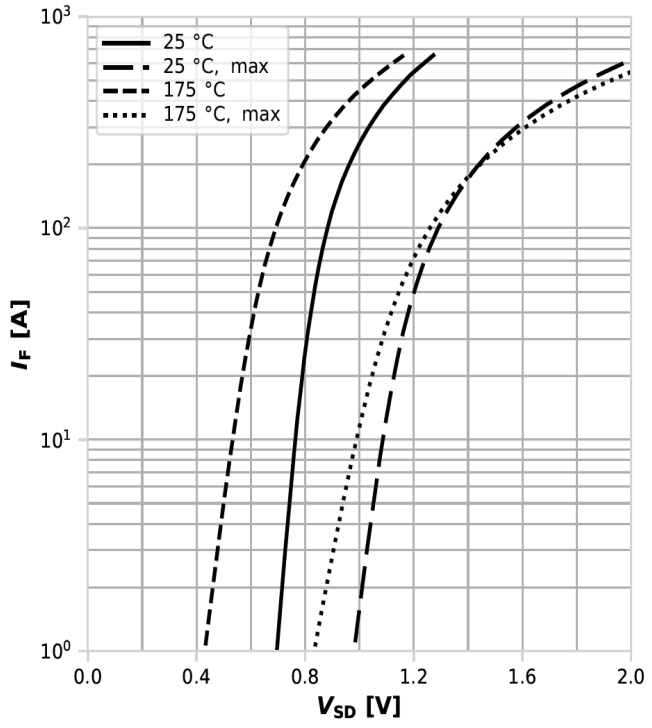
$V_{GS(th)}$=f(T_j), V_{GS}=V_{DS}; parameter: I_D

Diagram 12: Typ. capacitances



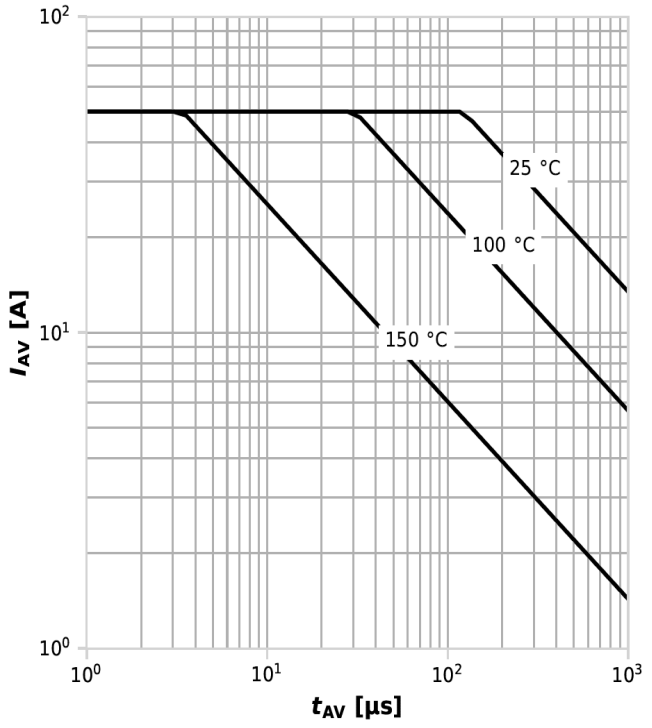
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz

Diagram 13: Forward characteristics of reverse diode



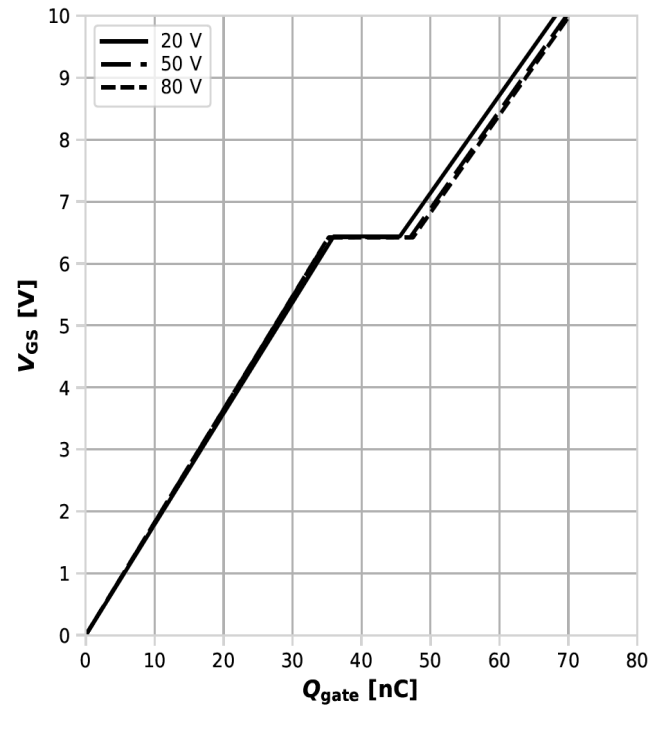
$I_F=f(V_{SD})$; parameter: T_j

Diagram 14: Avalanche characteristics



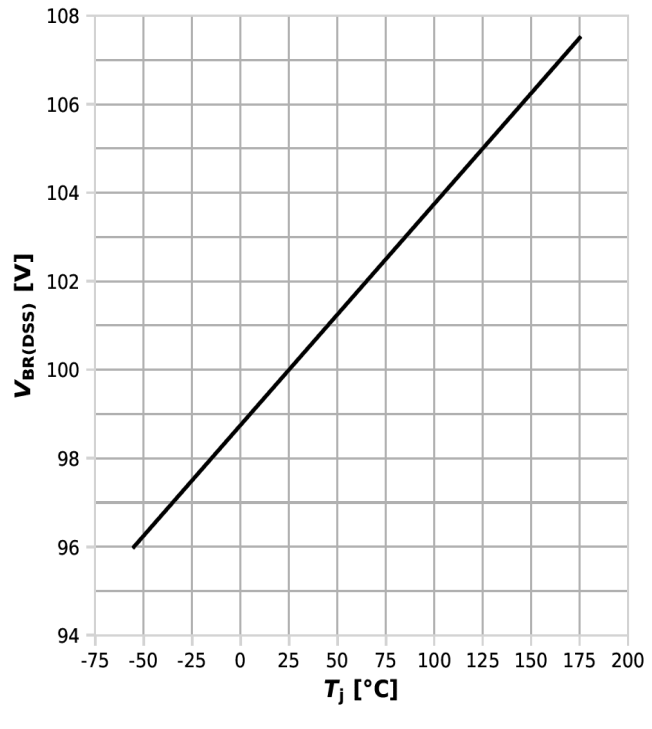
$I_{AS}=f(t_{AV})$; R_{GS}=25 Ω; parameter: $T_{j,start}$

Diagram 15: Typ. gate charge



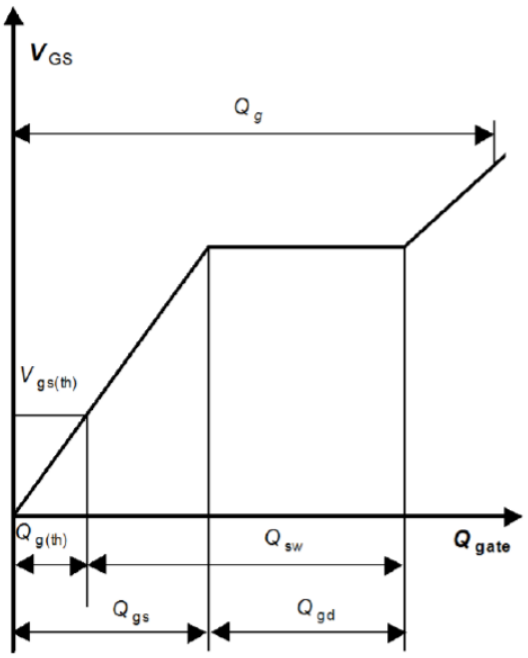
$V_{GS}=f(Q_{gate})$, I_D=50 A pulsed, T_j=25 °C; parameter: V_{DD}

Diagram 16: Drain-source breakdown voltage



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

Gate charge waveforms



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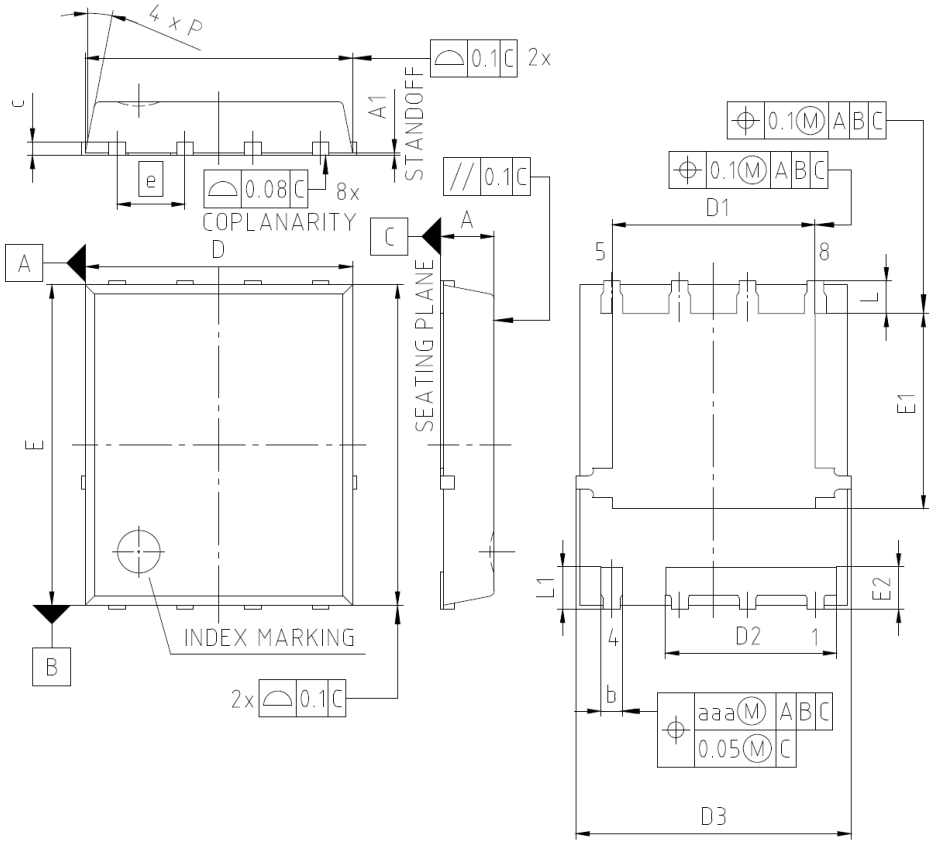
5 封装外形



PACKAGE - GROUP NUMBER:	PG-TDSON-8-U04	
DIMENSIONS	MILLIMETERS	
	MIN.	MAX.
A	0.90	1.20
A1	0	0.05
b	0.26	0.54
c	0.15	0.35
D	4.80	5.35
D1	3.70	4.40
D2	2.94	3.25
D3	4.80	5.61
E	5.70	6.10
E1	3.40	3.76
E2	0.69	0.90
e	1.27	
L	0.45	0.72
L1	0.69	0.90
aaa	0.10	0.25
P	8°	12°

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

图 1　　PG- TDSON- 8 封装外形，尺寸单位为毫米

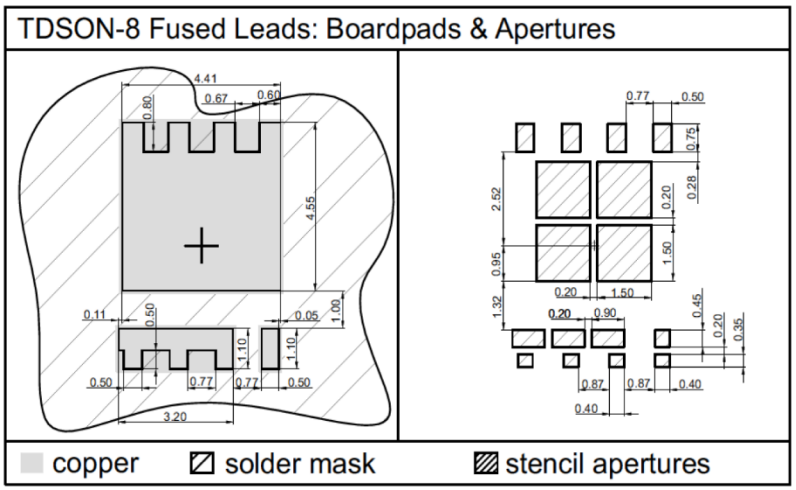


图 2 PG- TDSON- 8 封装图，尺寸单位为毫米

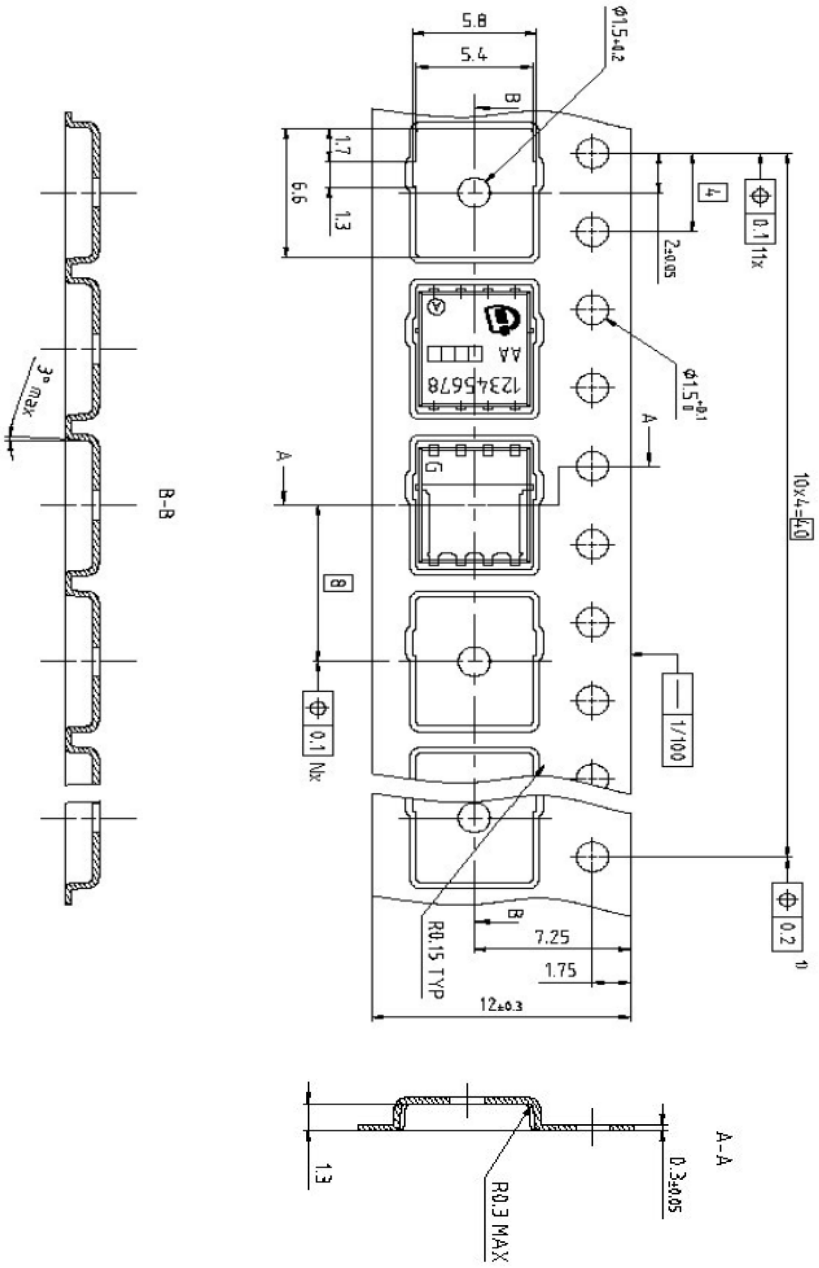


图 3 PG- TDSON- 8 封装变体，尺寸单位为毫米

修订记录

ISC035N10NM5LF2

Revision 2025 - 11 - 07 , Rev. 2 . 3

Previous revisions

Revision	Date	Subjects (major changes since last revision)
2.1	2023-11-08	Update sales name and marking
2.2	2024-10-22	Update SOA and transient thermal impedance diagrams
2.3	2025-11-07	Update Features and Gate threshold voltage

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