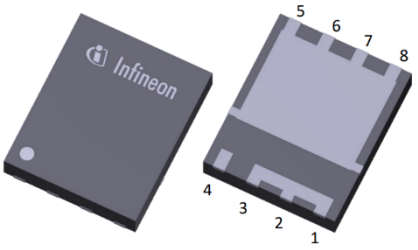
英飞凌 MOSFET

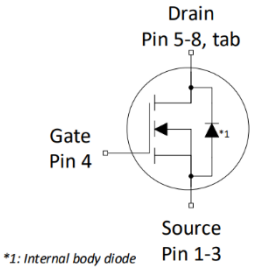
PG-TSON-8



OptiMOS™ 6 功率晶体管，60 V

特性

- 针对高性能 SMPS 进行了优化
- 针对同步整流进行了优化
- N沟道，逻辑电平
- 极低的导通电阻 $R_{DS(on)}$
- 卓越的热阻
- 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

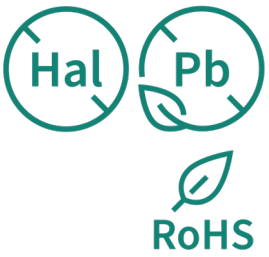


产品验证

完全符合 JEDEC 工业应用标准

表 1　　主要性能参数

Parameter	Value	Unit
V_{DS}	60	V
$R_{DS(on),max}$	0.7	mΩ
I_D	440	A
Q_{oss}	190	nC
Q_G	85	nC
Q_{rr} (1000A/µs)	361	nC



Part number	Package	Marking	Related links
ISC007N06LM6	PG-TSON-8	007N6L6	-

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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	-	-	440	A	V_{GS}=10 V, T_C=25 °C
				312		V_{GS}=10 V, T_C=100 °C
				278		V_{GS}=4.5 V, T_C=100 °C
				48		V_{GS}=10V,T_A=25°C,R_{thJA}=50°C/W [2]
Pulsed drain current [3]	$I_{D,pulse}$	-	-	1760	A	T_A=25 °C
Avalanche energy, single pulse [4]	E_{AS}	-	-	929	mJ	I_D=50 A, R_{GS}=25 Ω
Gate source voltage	V_{GS}	-20	-	20	V	-
Power dissipation	P_{tot}	-	-	259	W	T_C=25 °C
				3.0		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

4) 详细信息请参见图 13

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}	-	0.29	0.58	°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	$V_{(BR)DSS}$	60	-	-	V	V_{GS}=0 V, I_D=1 mA
Gate threshold voltage	$V_{GS(th)}$	1.1	1.7	2.3	V	V_{DS}=V_{GS}, I_D=149 µA
Zero gate voltage drain current	I_{DSS}	-	0.1	1.0	µA	V_{DS}=48 V, V_{GS}=0 V, T_j=25 °C
			10	100		V_{DS}=48 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	$R_{DS(on)}$	-	0.62	0.7	mΩ	V_{GS}=10 V, I_D=50 A
			0.76	0.88		V_{GS}=4.5 V, I_D=25 A
Gate resistance	R_G	-	0.9	-	Ω	-
Transconductance [6]	g_{fs}	170	340	-	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}	-	13000	17000	pF	V_{GS}=0 V, V_{DS}=30 V, f=1 MHz
Output capacitance [7]	C_{oss}		3300	4300		
Reverse transfer capacitance [7]	C_{rss}		60	100		
Turn-on delay time	$t_{d(on)}$	-	13.5	-	ns	V_{DD}=30 V, V_{GS}=10 V, I_D=50 A, $R_{G,ext}$=1.6 Ω
Rise time	t_r		6.0			
Turn-off delay time	$t_{d(off)}$		32.9			
Fall time	t_f		8.5			

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}	-	33	-	nC	V_{DD}=30 V, I_D=50 A, V_{GS}=0 to 4.5 V
Gate charge at threshold	$Q_{g(th)}$		21	-	nC	
Gate to drain charge [9)]	Q_{gd}		21	32	nC	
Switching charge	Q_{sw}		32	-	nC	
Gate charge total [9)]	Q_g		85	106	nC	
Gate plateau voltage	$V_{plateau}$		2.6	-	V	
Gate charge total [9)]	Q_g	-	177	235	nC	V_{DD}=30 V, I_D=50 A, V_{GS}=0 to 10 V
Output charge [9)]	Q_{oss}	-	190	253	nC	V_{DS}=30 V, V_{GS}=0 V

8)　参数定义请参数见“栅极电荷波形”。

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	-	-	231	A	T_C=25 °C
Diode pulse current	$I_{S,pulse}$			1760		
Diode forward voltage	V_{SD}	-	0.79	1.0	V	V_{GS}=0 V, I_F=50 A, T_j=25 °C
Reverse recovery time [10)]	t_{rr}	-	68	136	ns	V_R=30 V, I_F=50 A, di_F/dt=100 A/µs
Reverse recovery charge [10)]	Q_{rr}		110	220	nC	
Reverse recovery time [10)]	t_{rr}	-	33	66	ns	V_R=30 V, I_F=50 A, di_F/dt=1000 A/µs
Reverse recovery charge [10)]	Q_{rr}		361	722	nC	

10)　由设计指定。未经过生产测试。

4 电气特性图

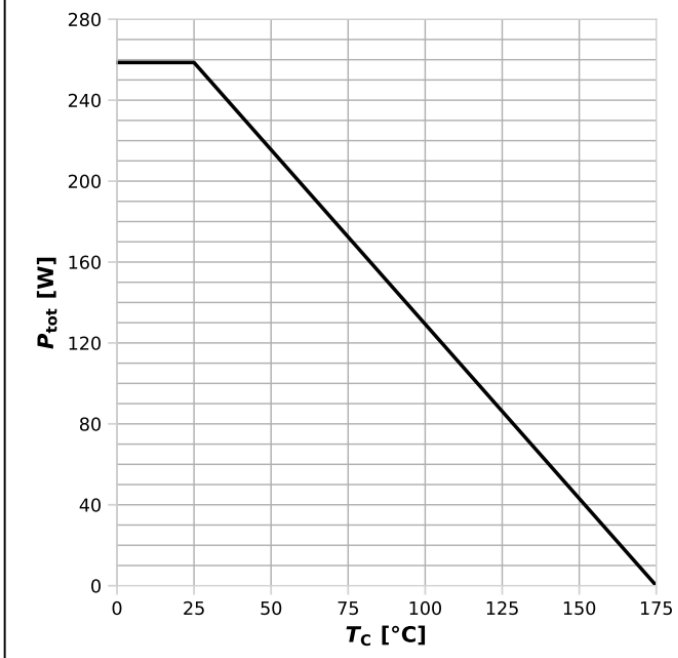
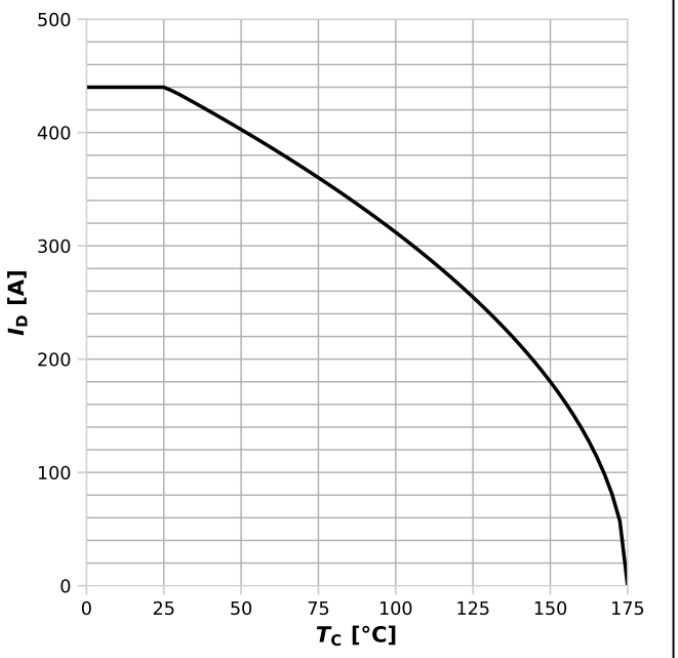
Diagram 1: Power dissipation	Diagram 2: Drain current
	
P_{tot}=f(T_C)	I_D=f(T_C); V_{GS}≥10 V

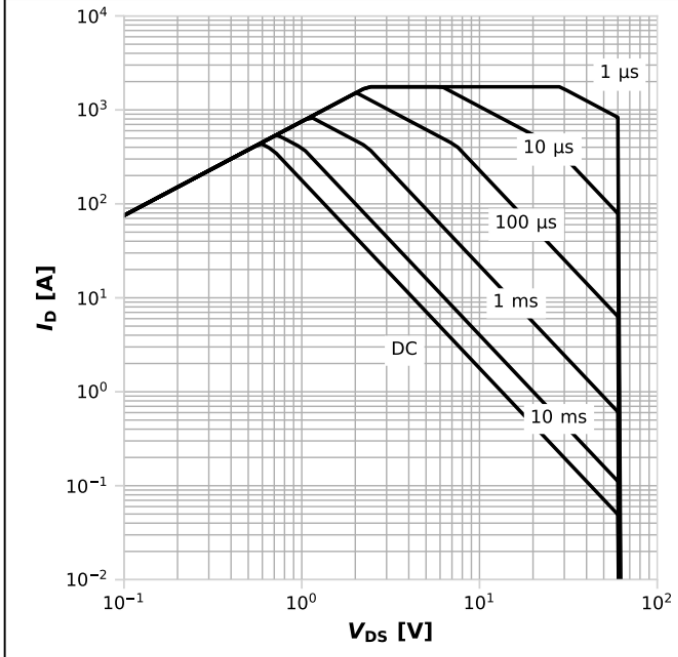
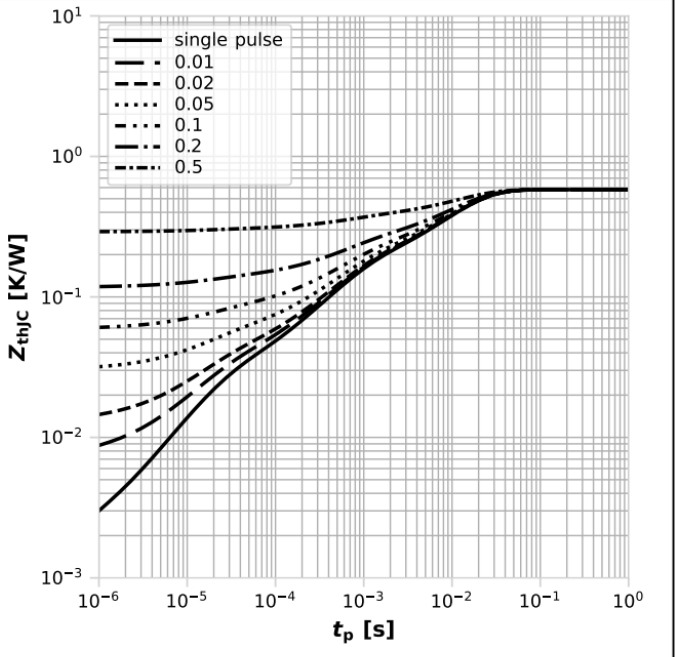
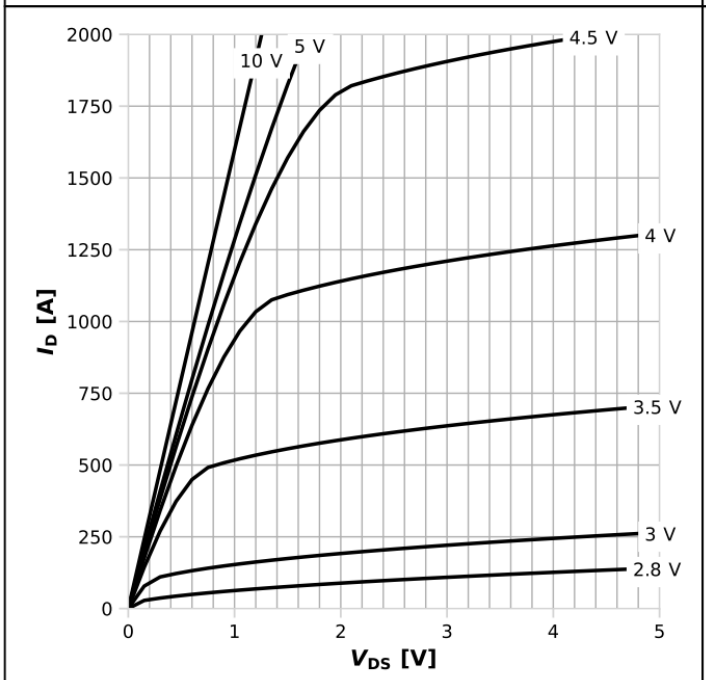
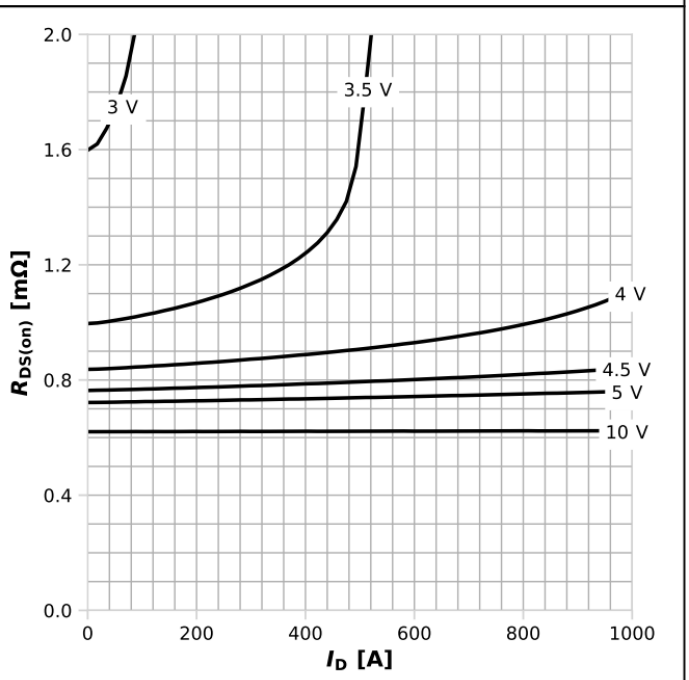
Diagram 3: Safe operating area	Diagram 4: Max. transient thermal impedance
	
I_D=f(V_{DS}); T_C=25 °C; D=0; parameter: t_p	Z_{thJC}=f(t_p); parameter: D=t_p/T

Diagram 5: Typ. output characteristics



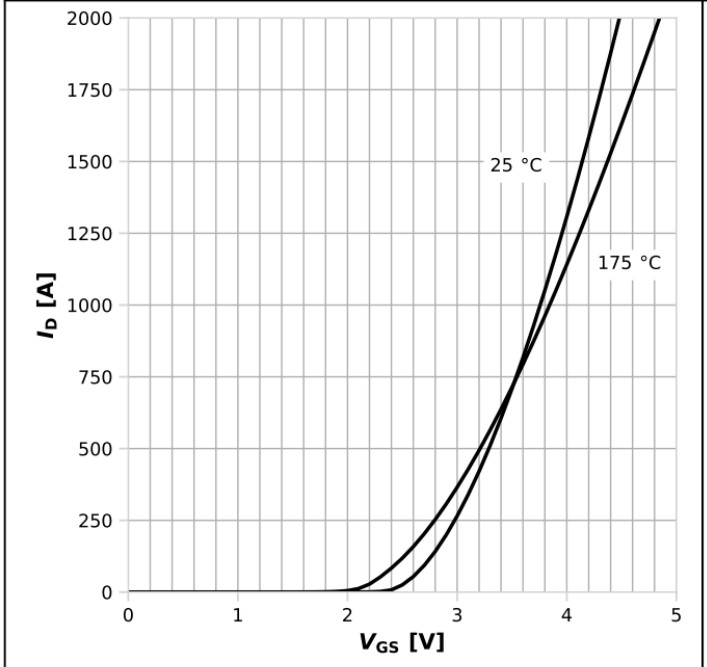
I_D=f(V_{DS}), T_j=25 °C; parameter: V_{GS}

Diagram 6: Typ. drain-source on resistance



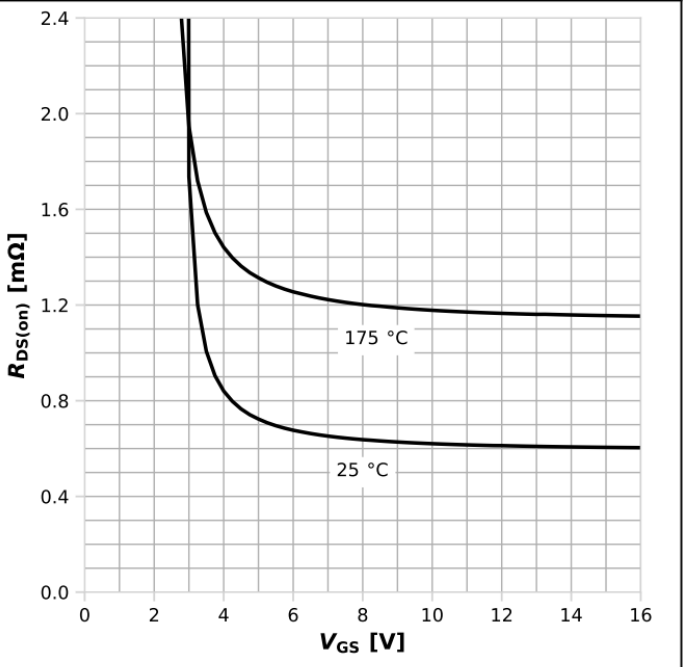
$R_{DS(on)}$=f(I_D), T_j=25 °C; parameter: V_{GS}

Diagram 7: Typ. transfer characteristics



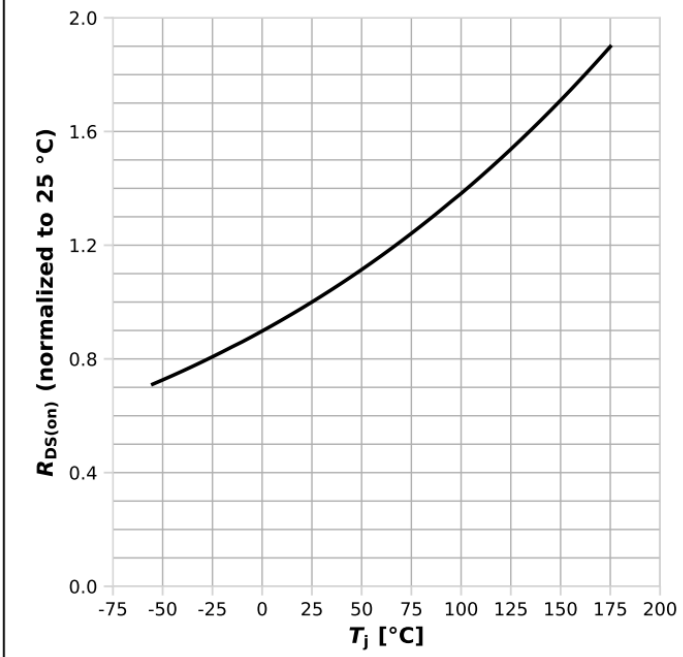
I_D=f(V_{GS}), $|V_{DS}|>2|I_D|R_{DS(on)max}$; parameter: T_j

Diagram 8: Typ. drain-source on resistance



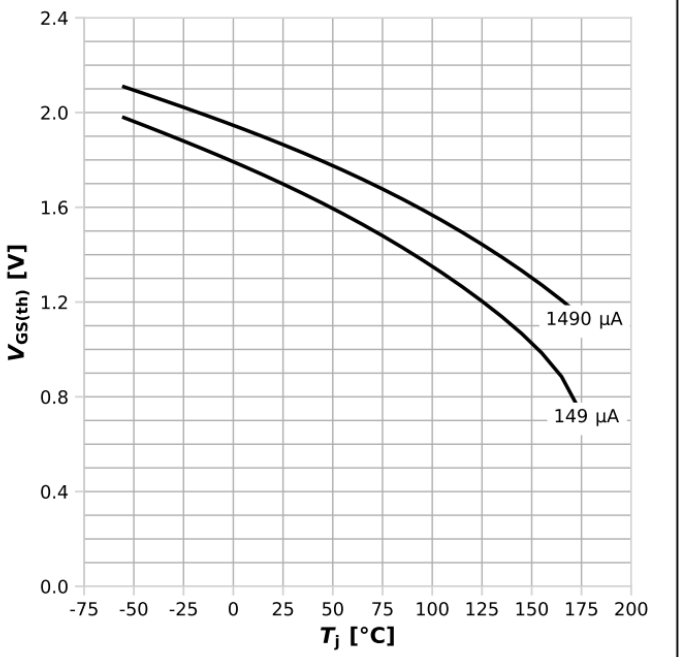
$R_{DS(on)}$=f(V_{GS}), I_D=50 A; parameter: T_j

Diagram 9: Normalized drain-source on resistance



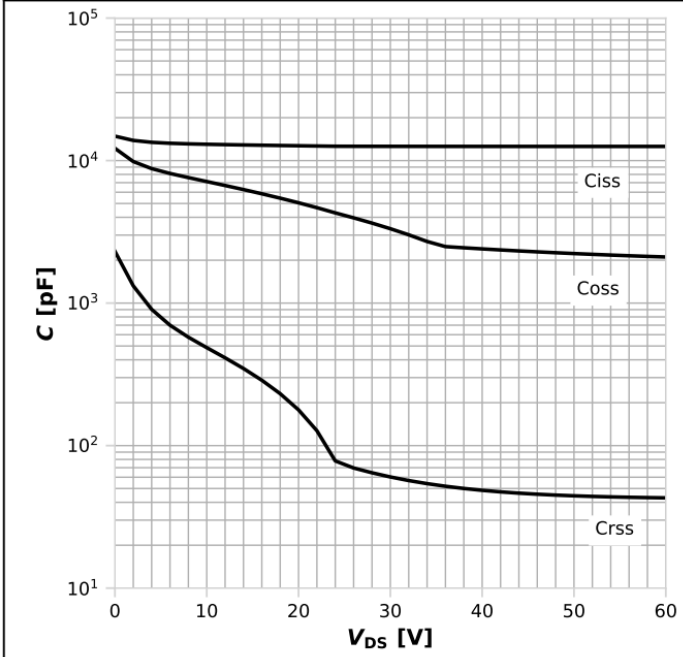
$R_{DS(on)}$=f(T_j), I_D=50 A, V_{GS}=10 V

Diagram 10: Typ. gate threshold voltage



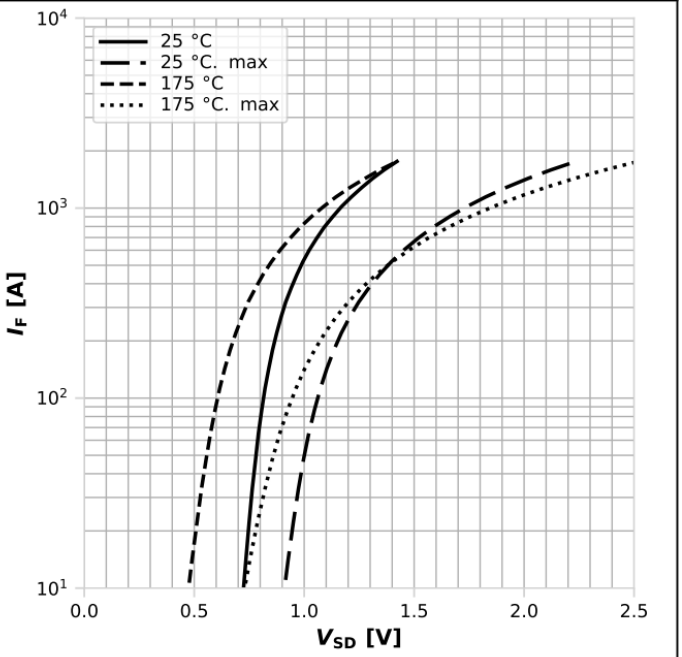
$V_{GS(th}$=f(T_j), V_{GS}=V_{DS}; parameter: I_D

Diagram 11: Typ. capacitances



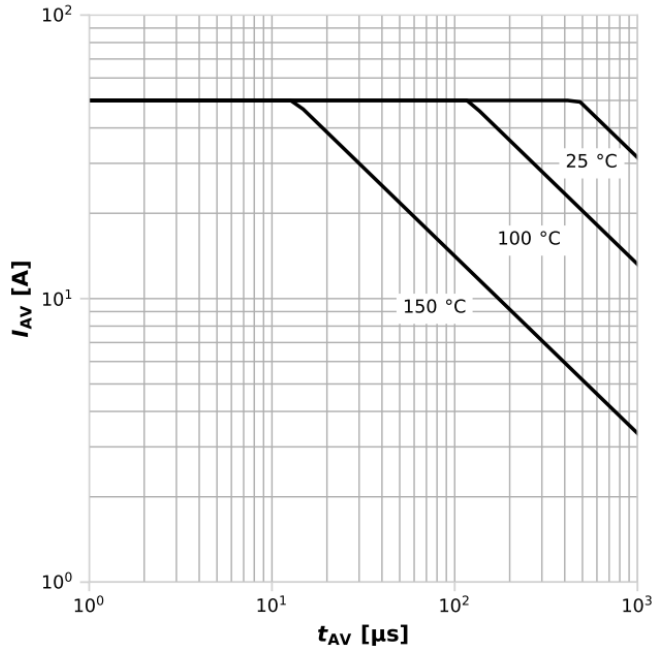
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz

Diagram 12: Forward characteristics of reverse diode



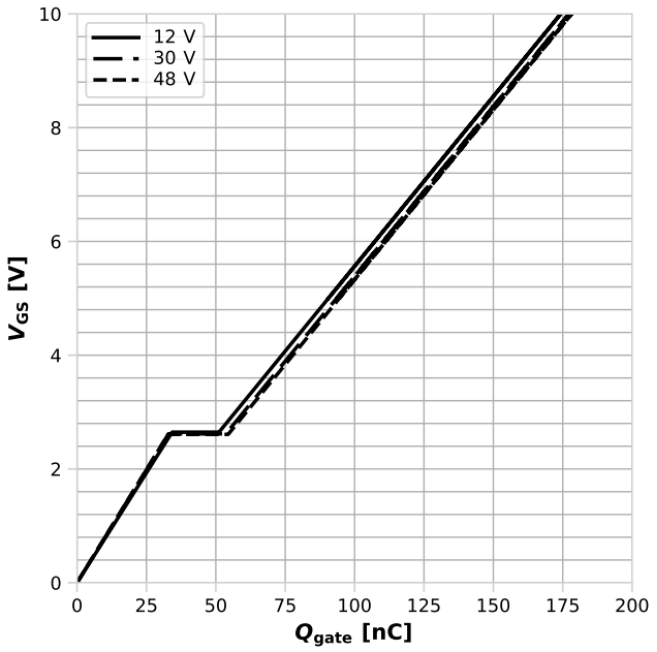
I_F=f(V_{SD}); parameter: T_j

Diagram 13: Avalanche characteristics



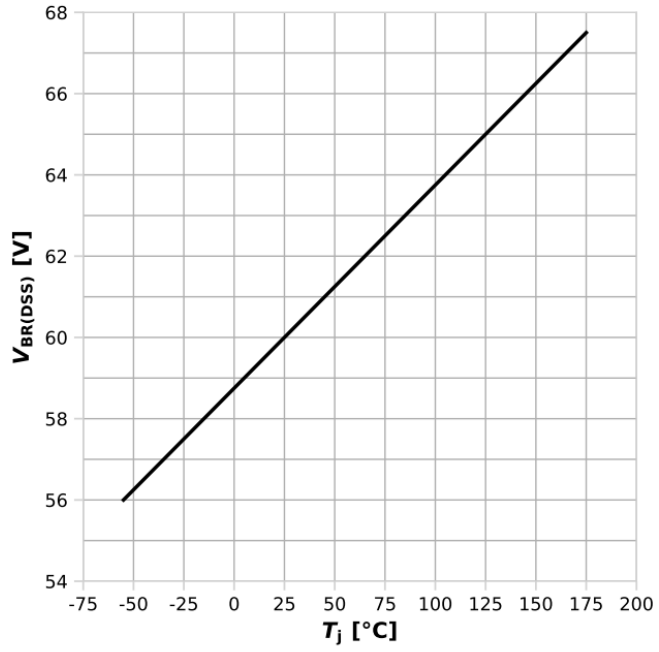
I_{AS}=f(t_{AV}); R_{GS}=25 Ω; parameter: $T_{j,start}$

Diagram 14: Typ. gate charge



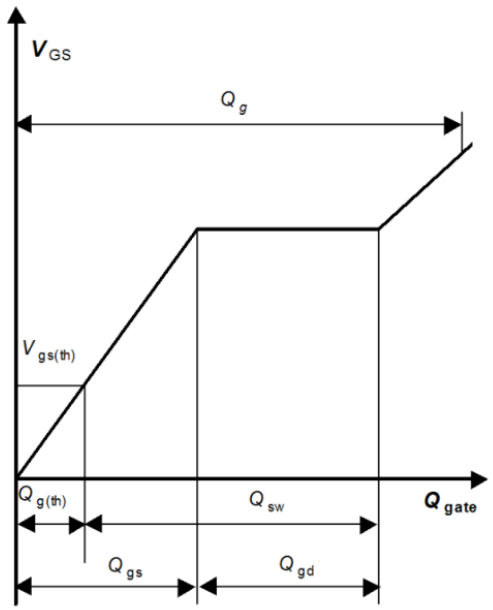
V_{GS}=f(Q_{gate}), I_D=50 A pulsed, T_j=25 °C; parameter: V_{DD}

Diagram 15: Min. drain-source breakdown voltage



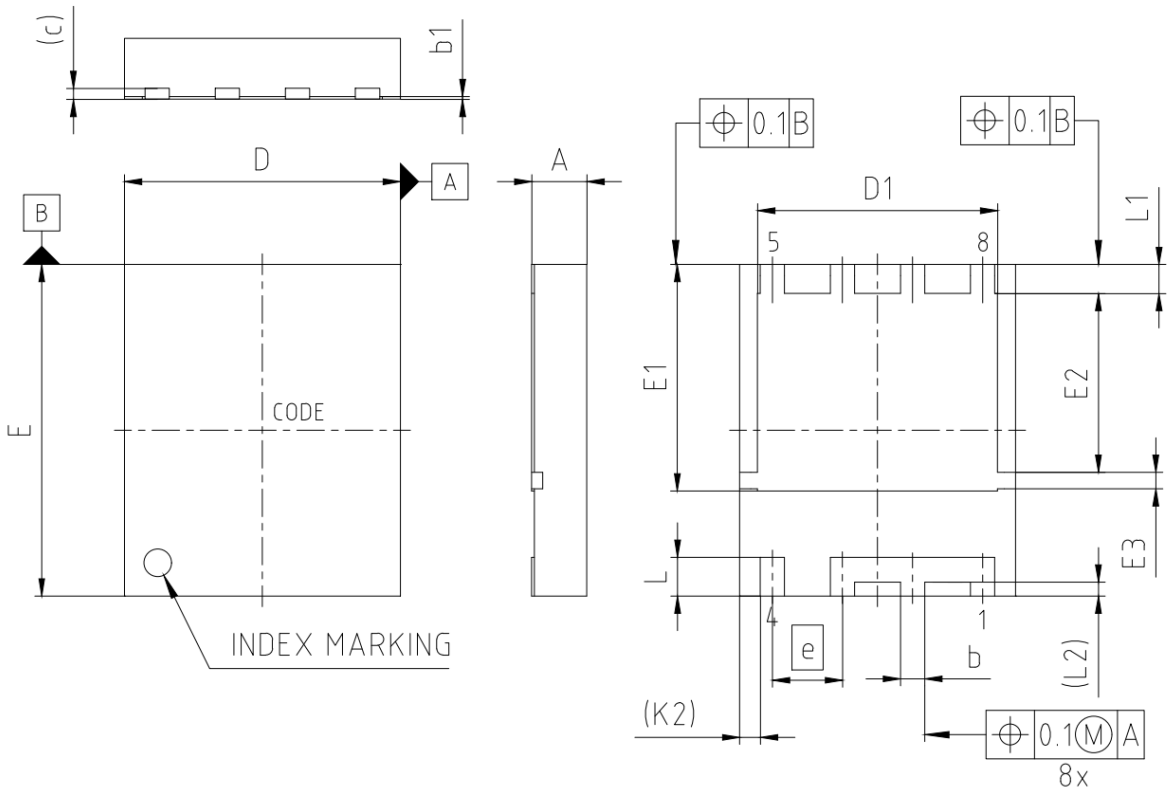
$V_{BR(DSS)}$=f(T_j); I_D=10 mA

Gate charge waveforms



-

5 封装外形



PACKAGE - GROUP NUMBER:	PG-TSON-8-U05	
DIMENSION	**MILLIMETERS**	
	MIN.	MAX.
A	**0.90**	**1.10**
b	**0.34**	**0.54**
b1	**0.00**	**0.05**
c	**0.20**	
D	**4.90**	**5.10**
D1	**4.25**	**4.45**
E	**5.90**	**6.10**
E1	**4.00**	**4.20**
E2	**3.14**	**3.34**
E3	**0.20**	**0.40**
e	**1.27**	
K2	**0.38**	
L	**0.60**	**0.80**
L1	**0.43**	**0.63**
L2	**0.25**	

NOTE: DIMENSIONS DO NOT INCLUDE MOLD FLASH, PROTRUSION OR GATE BURRS

图 1 PG-TSON-8 外形图，尺寸单位为毫米

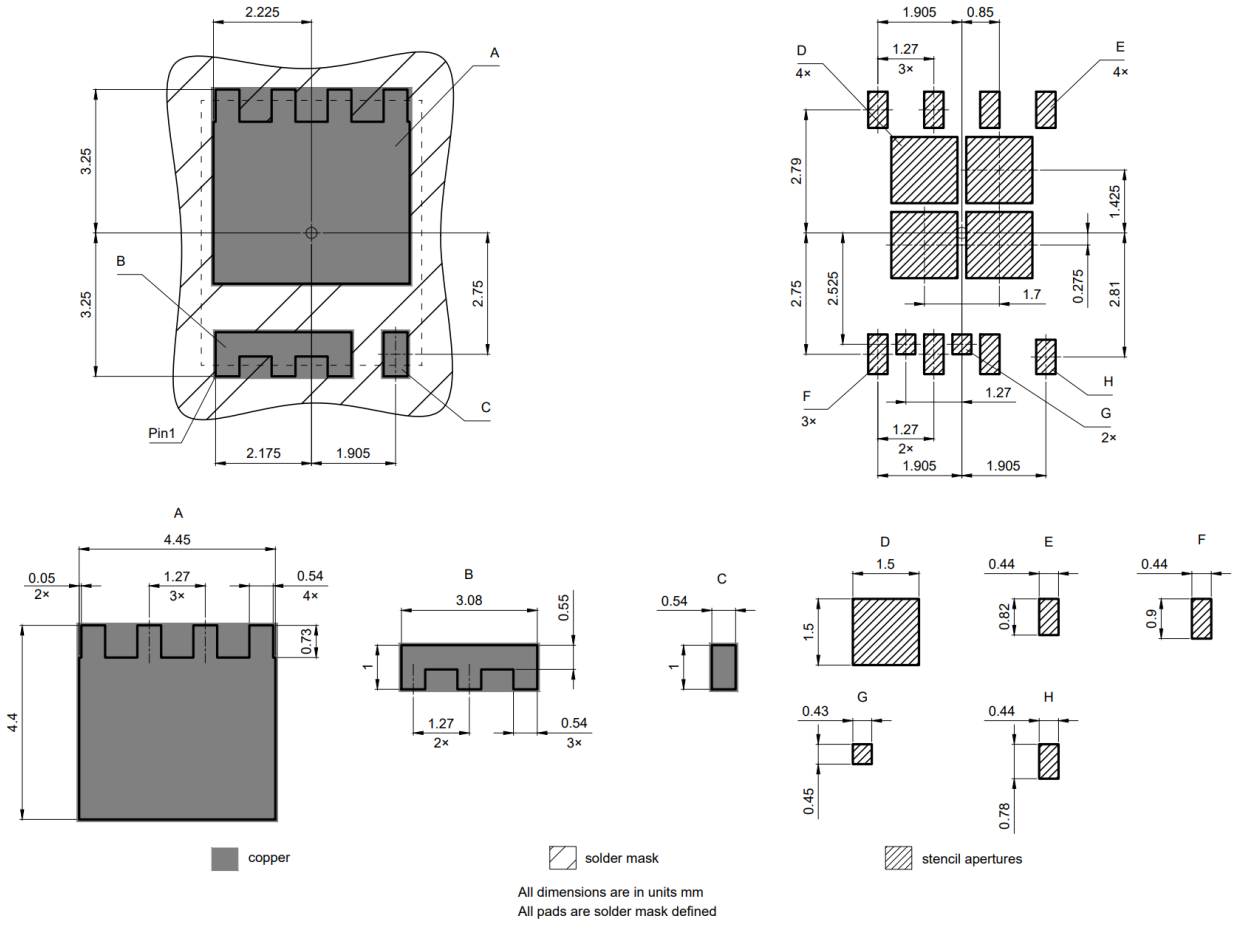


图 2 PG-TSON-8 焊盘图，尺寸单位为毫米

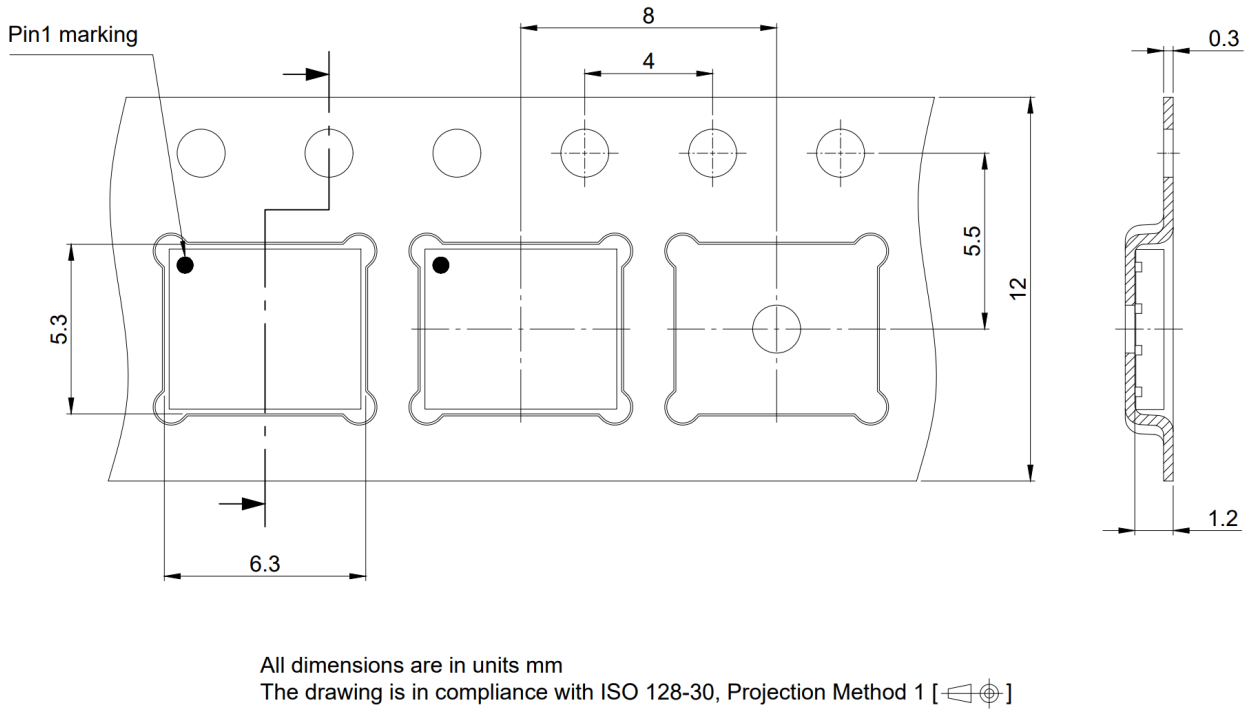


图 3 PG-TSON-8 封装变体，尺寸单位为毫米

修订记录

ISC007N06LM6

Revision 2025 - 03 - 24 , Rev. 2 . 1

历史修订版本

Revision	Date	Subjects (major changes since last revision)
2.0	2024-05-07	Release of final
2.1	2025-03-24	Updated POD index misalignment against outline

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