英飞凌汽车级 MOSFET

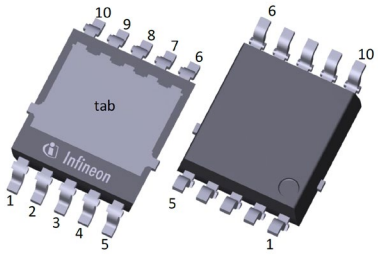
英飞凌OptiMOS™ 7 功率晶体管

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特性

- 适用于汽车应用的功率 MOSFET
- N 沟道 - 增强型 - 逻辑电平
- 严苛于 AEC-Q101 的扩展认证
- 加强电气测试
- 坚固的设计
- MSL1 回流焊峰值温度高达 260°C
- 工作温度 175°C
- 符合 RoHS 标准
- 100% 雪崩测试

PG-LHDSO-10

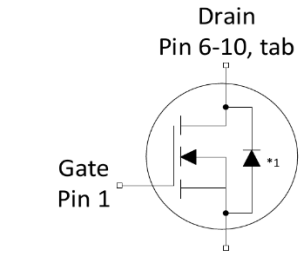


潜在应用

通用汽车应用

产品验证

符合汽车应用标准。根据 AEC-Q101 进行产品验证。



*1: Internal body diode

表 1　　主要性能参数

Parameter	Value	Unit
V_{DS}	100	V
$R_{DS(on)}$	28.6	mΩ
I_D(chip limited)	27	A

AEC Qualified

Extended quality

RoHS

Part number	Package	Marking	Related links
IAUCN10S7L290T	PG-LHDSO-10	7B1	see Appendix A

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_j = 25°C

表 2 最大额定值

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Continuous drain current	I_D	-	-	27	A	Chip limitation, V_{GS} = 10 V [1) 2)]
				27		DC current, V_{GS} = 10 V
				13		R_{thJH} on 2s2p, V_{GS} = 10 V, T_a = 100 °C [1) 3)]
Pulsed drain current [1)]	$I_{D,pulse}$	-	-	52	A	T_C = 25 °C, t_p = 100 µs
Avalanche energy, single pulse [1)]	E_{AS}	-	-	12	mJ	I_D = 9 A
Avalanche current, single pulse	I_{AS}	-	-	18	A	-
Gate source voltage	V_{GS}	-16		16	V	
Gate source voltage	V_{GS}	-	-	20	V	Limited to duty factor of 1%
Power dissipation	P_{tot}	-	-	45	W	T_C = 25 °C
Operating temperature	T_j	-55	-	175	°C	-

1) 此参数表不适用于生产测试，由设计定义。

2) 电流能力受到包括客户特定的印刷电路板在内的整体系统设计的限制。

3) 该器件采用2s2p FR4 PCB，其设计符合JEDEC标准（JESD51-5、-7）。PCB 在静止空气中垂直放置。

2 热特性

表 3 热特性

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case [4]	R_{thJC}	-	-	3.34	K/W	-
Thermal characterization parameter, source pin [4] [5]	Ψ_{source}		14.2	-		
Thermal characterization parameter, drain pin [4] [6]	Ψ_{drain}		11.4	-		
Thermal resistance, junction - heatsink [4] [7]	R_{thJH}		10.1	-		
Thermal resistance, junction - ambient [8] [4]	R_{thJA}		48.7	-		

[4] 此参数表不适用于生产测试，由设计定义。
[5] 热特性参数，计算公式为 $\Psi source = (T_{source} - T_{ambient})/Pdis$ （条件3）。用于确定PCB给定功率下源极引脚的温度。
[6] 热特性参数，计算公式为 $\Psi drain = (T_{drain} - T ambient)/Pdis$ （条件3）。用于确定PCB给定功率下漏极引脚的温度。
[7] 根据相关规定定义的2s2p FR4 PCB上的器件。符合 JEDEC 标准（JESD51-5、-7），无热过孔，散热器尺寸为 71×110×2 毫米通过导热界面材料（TIM）固定在顶部垫片上，其导热系数为 3.3 W/(m·K)，厚度为 400 µm。散热器固定在85°C的环境温度下。
[8] 该器件采用2s2p FR4 PCB，其设计符合JEDEC标准（JESD51-5、-7）。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	I_D = 1 mA, V_{GS} = 0 V
Gate threshold voltage	$V_{GS(th)}$	1.2	1.6	2	V	V_{DS}=V_{GS}, I_D = 10 µA
Zero gate voltage drain current	I_{DSS}	-	-	1	µA	V_{DS} = 100 V, T_j = 25 °C, V_{GS} = 0 V
				3		V_{DS} = 100 V, T_j = 100 °C, V_{GS} = 0 V [9]
Gate-source leakage current	I_{GSS}	-	-	100	nA	V_{DS} = 0 V, V_{GS} = 16 V
Drain-source on-state resistance	$R_{DS(on)}$	-	31.3	38.2	mΩ	I_D = 14 A, V_{GS} = 4.5 V
			25.5	28.6		I_D = 14 A, V_{GS} = 10 V
Gate resistance [9]	R_G	-	1.5	-	Ω	-

[4] 此参数表不适用于生产测试，由设计定义。

表 5　　动态特性

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Input capacitance [10]	C_{iss}	-	430	560	pF	V_{DS} = 50 V, V_{GS} = 0 V, f = 1 MHz
Output capacitance [10]	C_{oss}		180	240		
Reverse transfer capacitance [10]	C_{rss}		5	8		
Turn-on delay time [10]	$t_{d(on)}$	-	2	-	ns	I_D = 14 A, V_{GS} = 10 V, V_{DD} = 50 V, R_G = 3.5 Ω
Rise time [10]	t_r		2			
Turn-off delay time [10]	$t_{d(off)}$		8			
Fall time [10]	t_f		4			

[5] 此参数表不适用于生产测试，由设计定义。

表 6　　栅极电荷特性

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Gate to source charge [11]	Q_{gs}	-	1.4	1.8	nC	I_D = 14 A, V_{DS} = 50 V, V_{GS} = 0 V to 10 V
Gate to drain charge [11]	Q_{gd}		2	3	nC	
Gate charge total [11]	Q_g		9	11	nC	
Gate plateau voltage [11]	$V_{plateau}$		3.1	-	V	

[6] 此参数表不适用于生产测试，由设计定义。

表 7　　反向二极管

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Diode continuous forward current [12]	I_S	-	-	27	A	T_C = 25 °C
Diode pulse current [12]	$I_{S,pulse}$	-	-	52	A	T_C = 25 °C, t_p = 100 µs
Diode forward voltage	V_{SD}	-	0.9	1	V	T_j = 25 °C, V_{GS} = 0 V, I_F = 14 A
Reverse recovery time [12]	t_{rr}	-	21	32	ns	di_F/dt =100 A/µs, V_R = 50 V, I_F = 27 A
Reverse recovery charge [12]	Q_{rr}		8	15	nC	

[7] 此参数表不适用于生产测试，由设计定义。

4 电气特性图

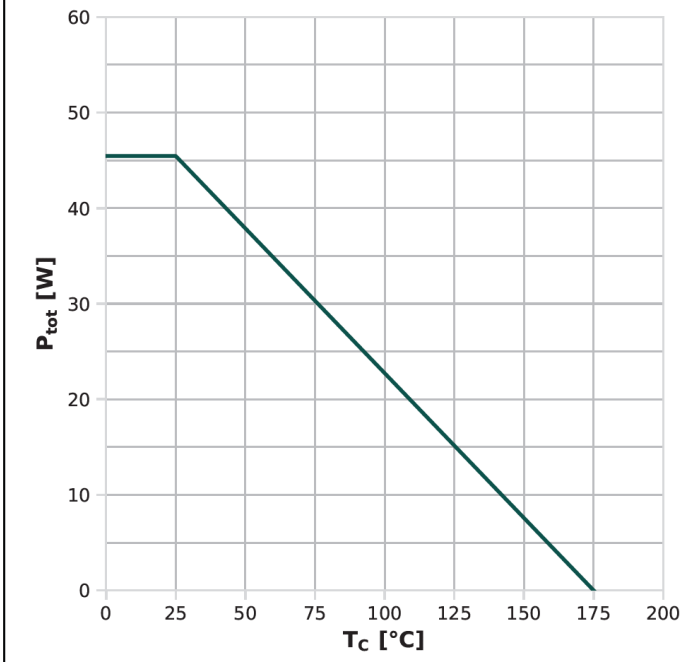
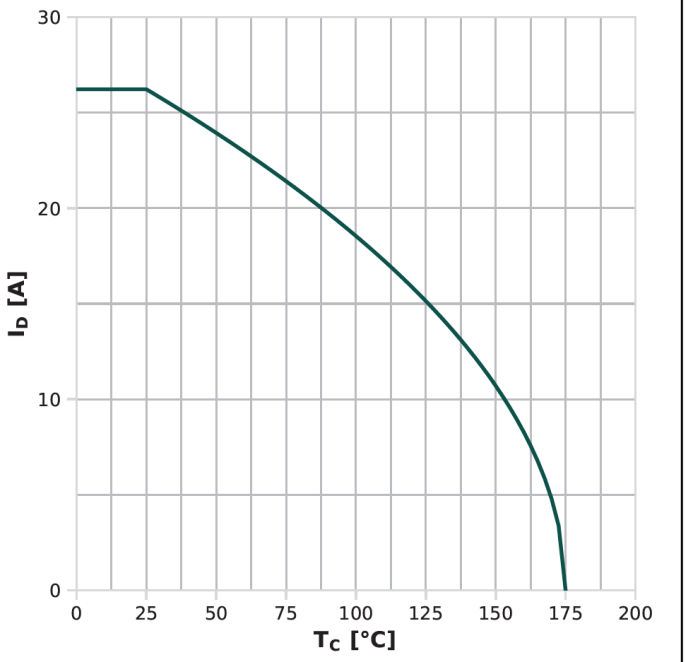
Diagram 1: Power dissipation	Diagram 2: Drain Current
	
$P_{tot}=f(T_C)$; $V_{GS} \geq 6$ V	$I_D=f(T_C)$; $V_{GS} \geq 6$V

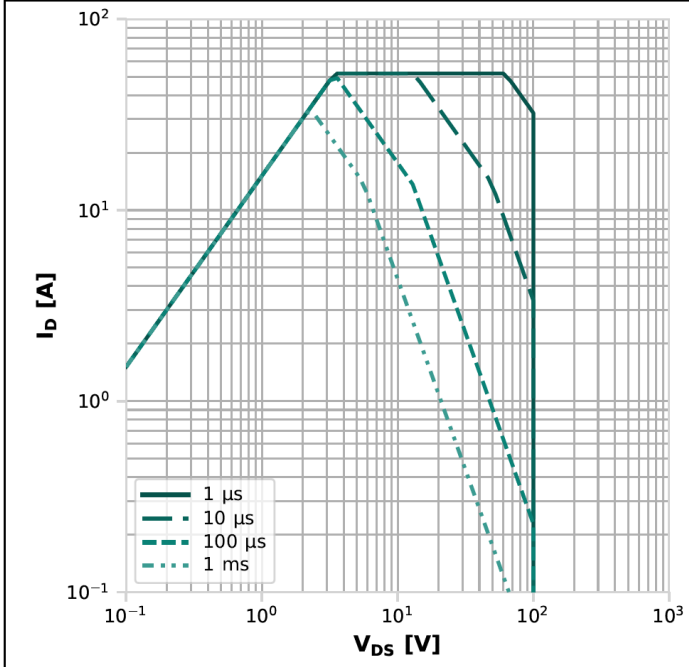
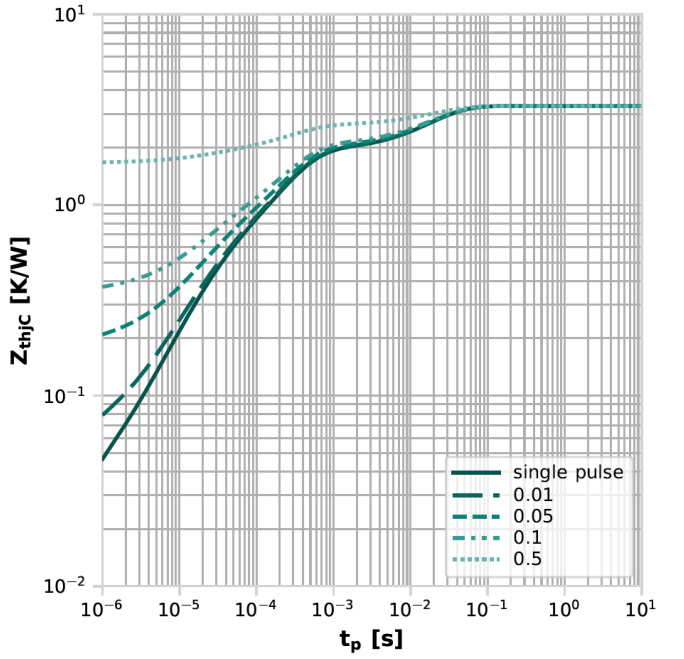
Diagram 3: Safe operating area	Diagram 4: Max. transient thermal impedance
	
$I_D=f(V_{DS})$; T_C= 25 °C; D=0; parameter: t_p	$Z_{thjC}=f(t_p)$; parameter: D=t_p/T

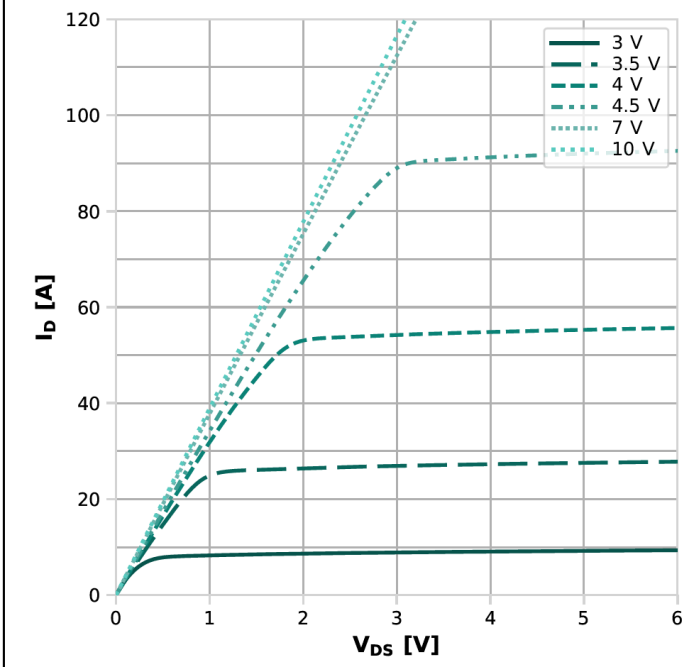
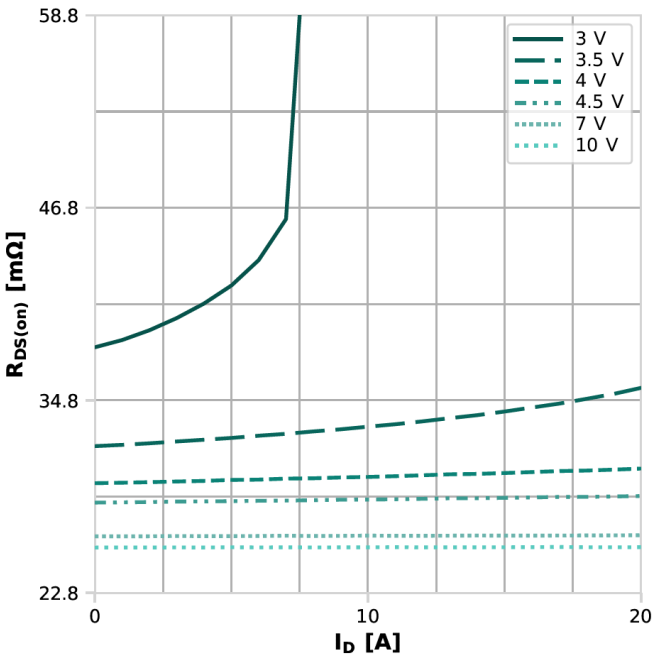
Diagram 5: Typ. output characteristics	Diagram 6: Typ. drain-source on-state resistance
	
$I_D=f(V_{DS})$; T_j= 25 °C, parameter: V_{GS}	$R_{DS(on)}=f(I_D)$; T_j= 25 °C; parameter: V_{GS}

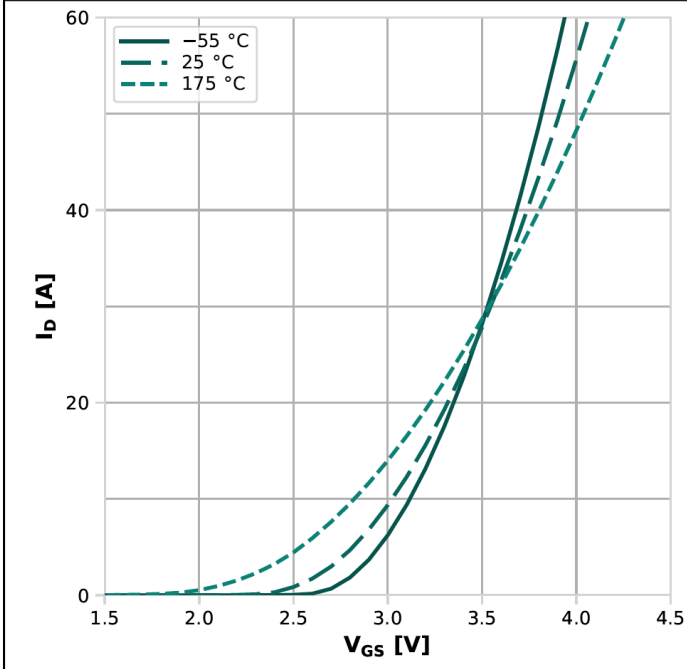
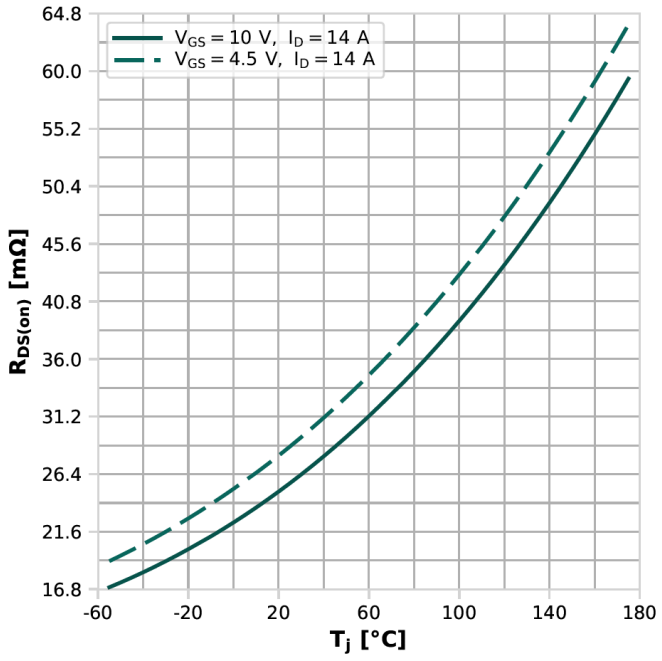
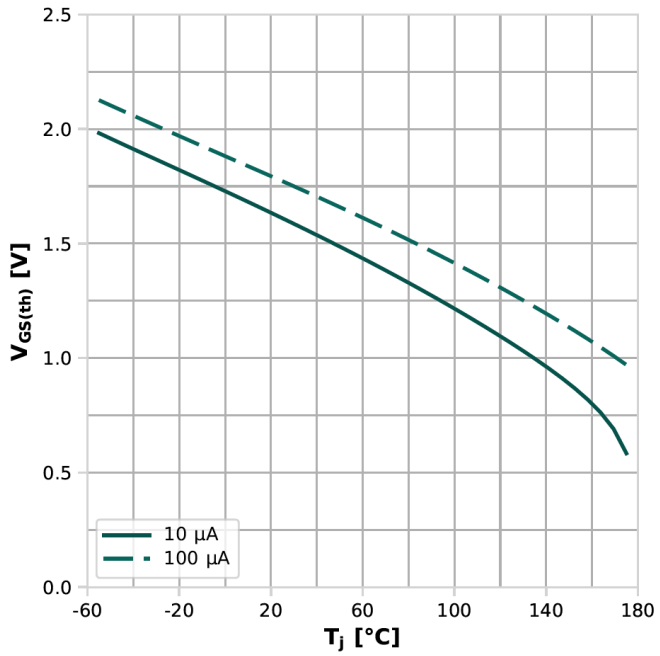
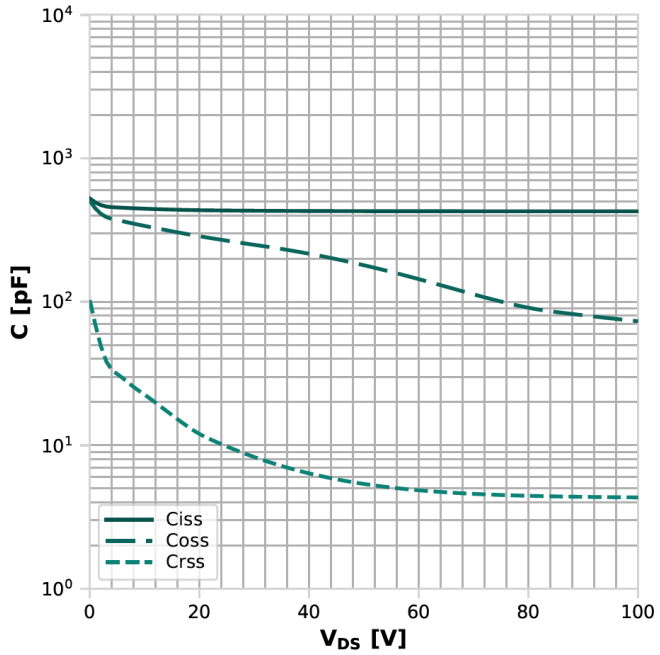
Diagram 7: Typ. transfer characteristics	Diagram 8: Typ. drain-source on-state resistance
	
$I_D=f(V_{GS})$; V_{DS}= 6 V; parameter: T_j	$R_{DS(on)}=f(T_j)$; parameter: I_D, V_{GS}

Diagram 9: Typ. gate threshold voltage



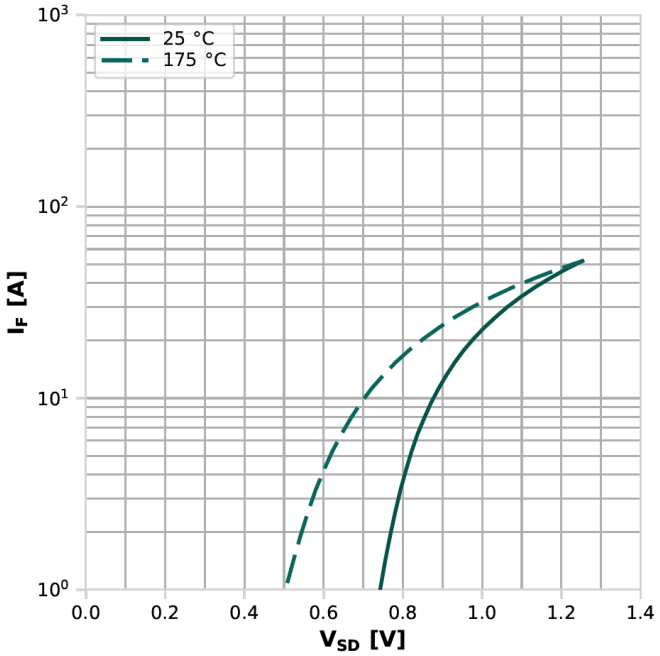
$V_{GS(th)}=f(T_j)$; $V_{GS}= V_{DS}$; parameter: I_D

Diagram 10: Typ. capacitances



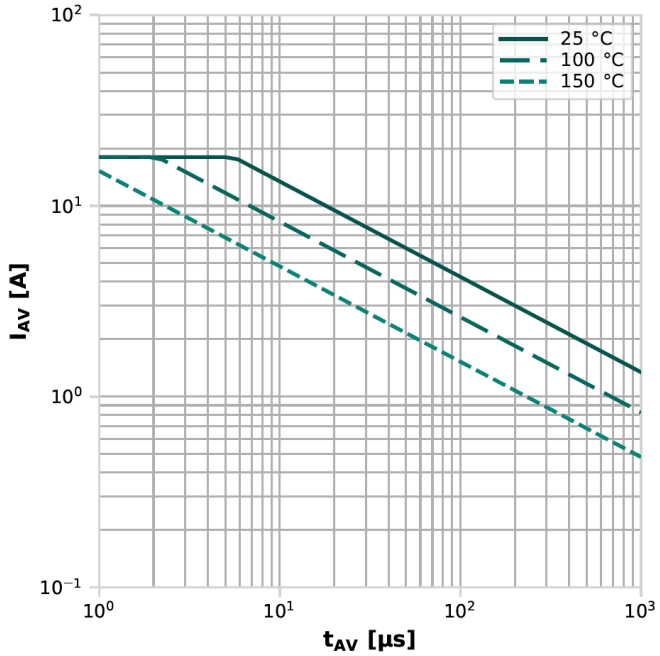
C=f(V_{DS}); V_{GS}= 0 V; f=1 MHz

Diagram 11: Typ. forward diode characteristics



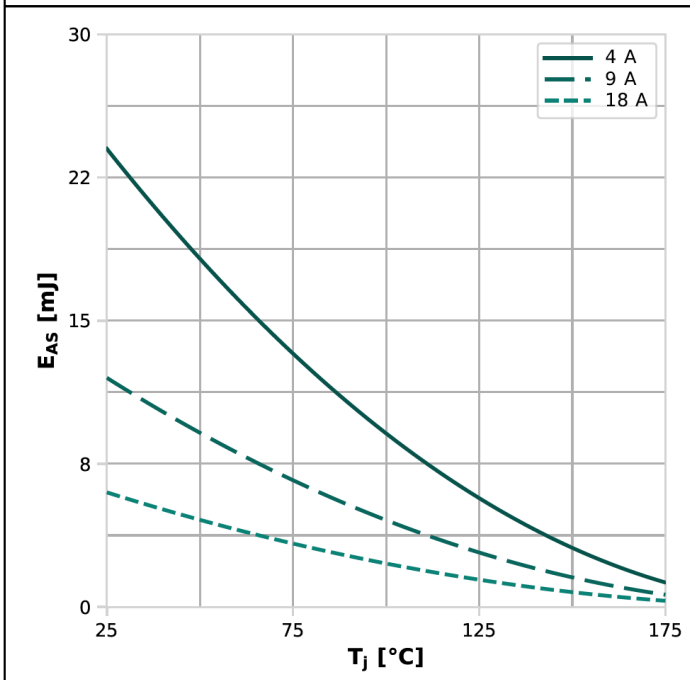
$I_F=f(V_{SD})$; parameter: T_j

Diagram 12: Typ. avalanche characteristics



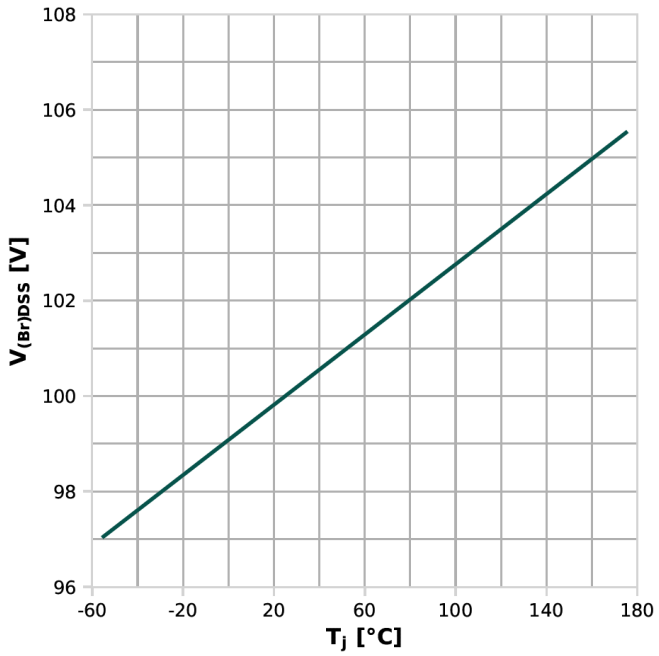
$I_{AS}=f(t_{AV})$; parameter: $T_{j(start)}$

Diagram 13: Typical avalanche Energy



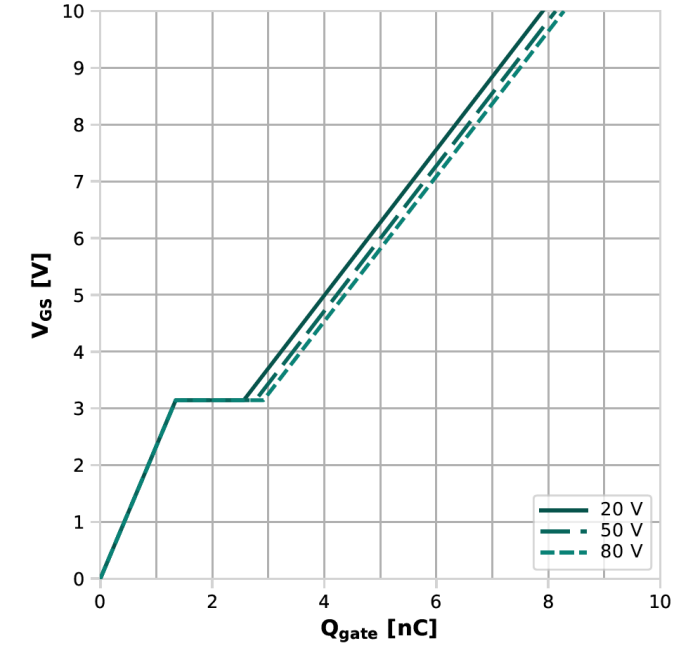
$E_{AS}=f(T_j)$; parameter: I_D

Diagram 14: Drain-source breakdown voltage



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

Diagram 15: Typ. gate charge



$V_{GS}=f(Q_{gate})$; I_D= 14 A pulsed; parameter: V_{DD}

5 测试电路

表 8 阻性负载的开关时间测试电路

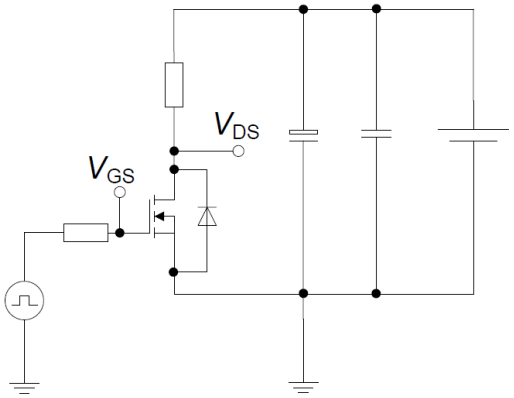
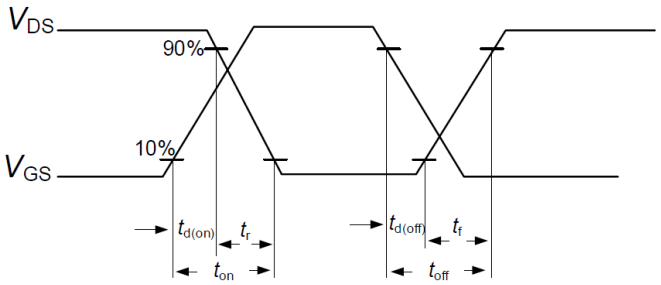
Switching times test circuit for resistive load	Switching times waveform
	

表 9 非钳位感性负载测试电路

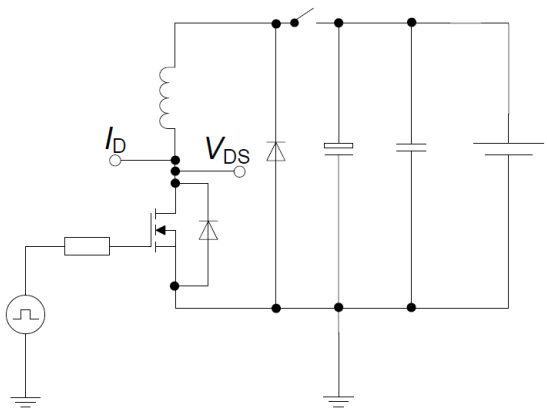
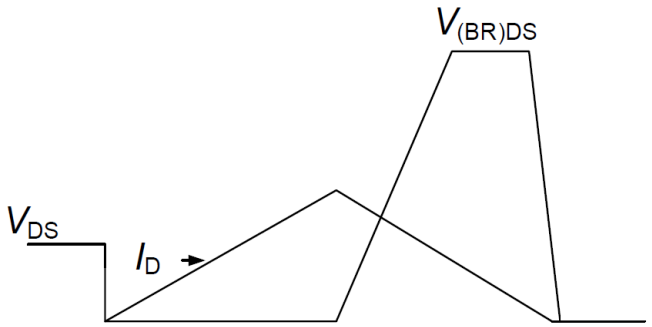
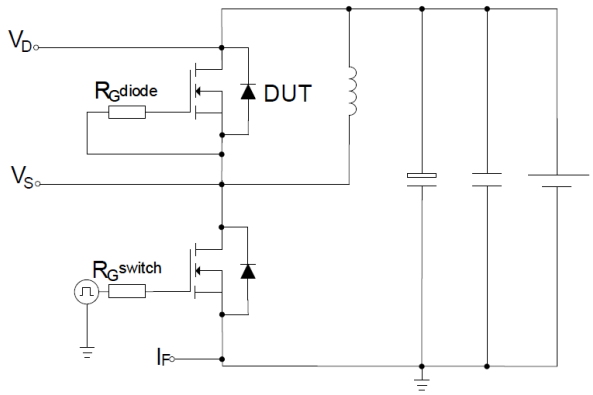
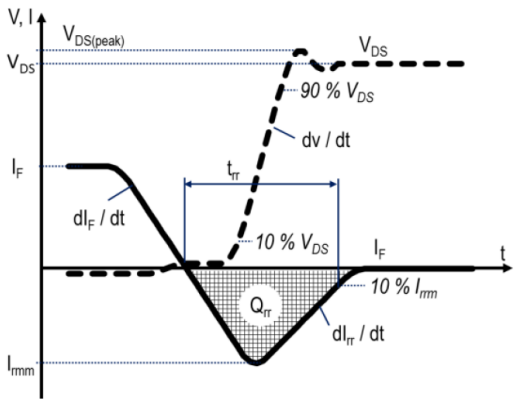
Unclamped inductive load test circuit	Unclamped inductive waveform
	

表10 二极管特性

Test circuit for diode characteristics	Diode recovery waveform
	

6 封装外形

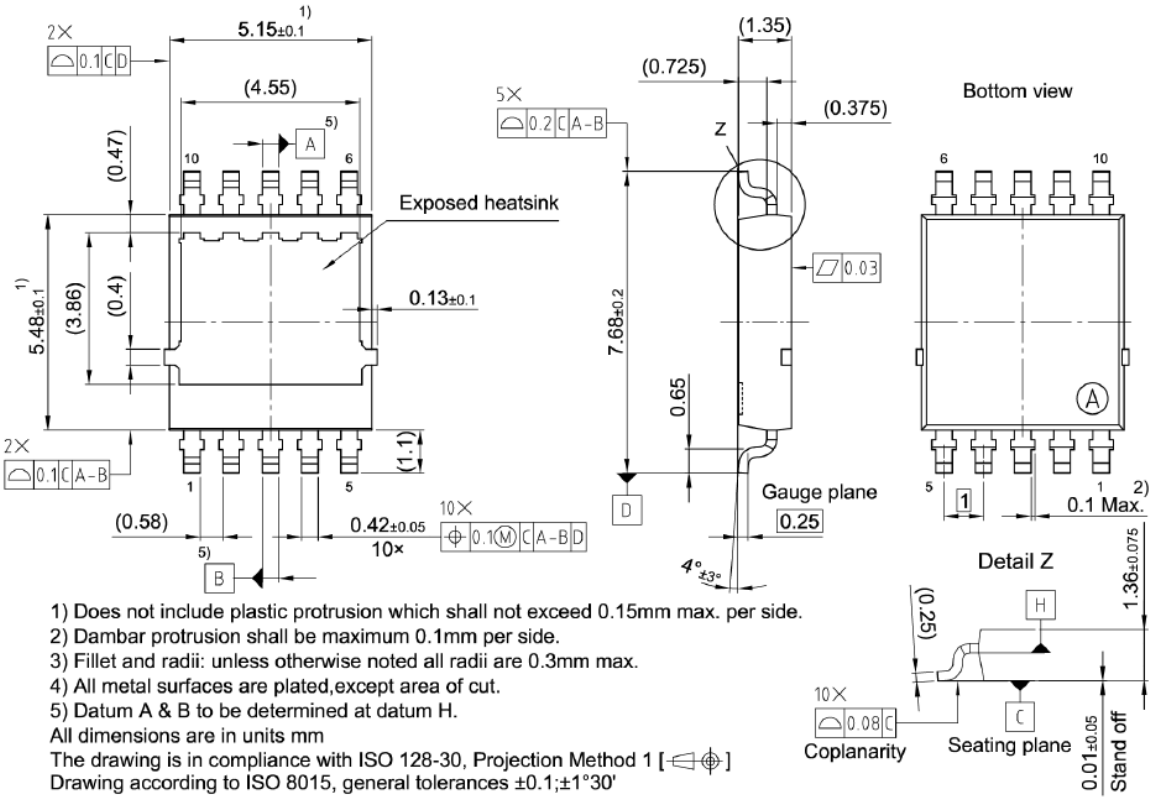


图 1　　PG-LHDSO-10 外形图，尺寸单位为毫米

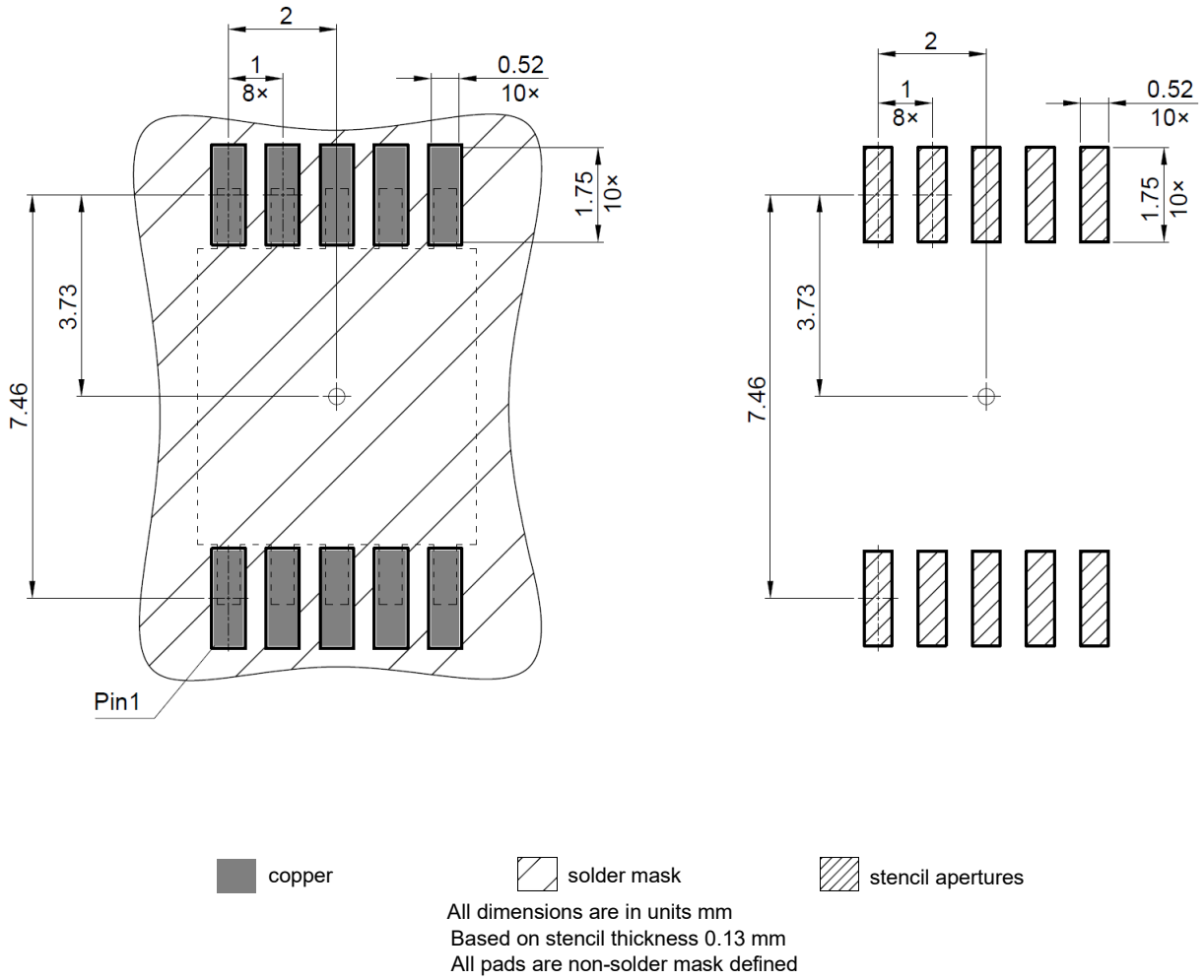


图 2　　PG-LHDSO- 10封装图，尺寸单位为毫米

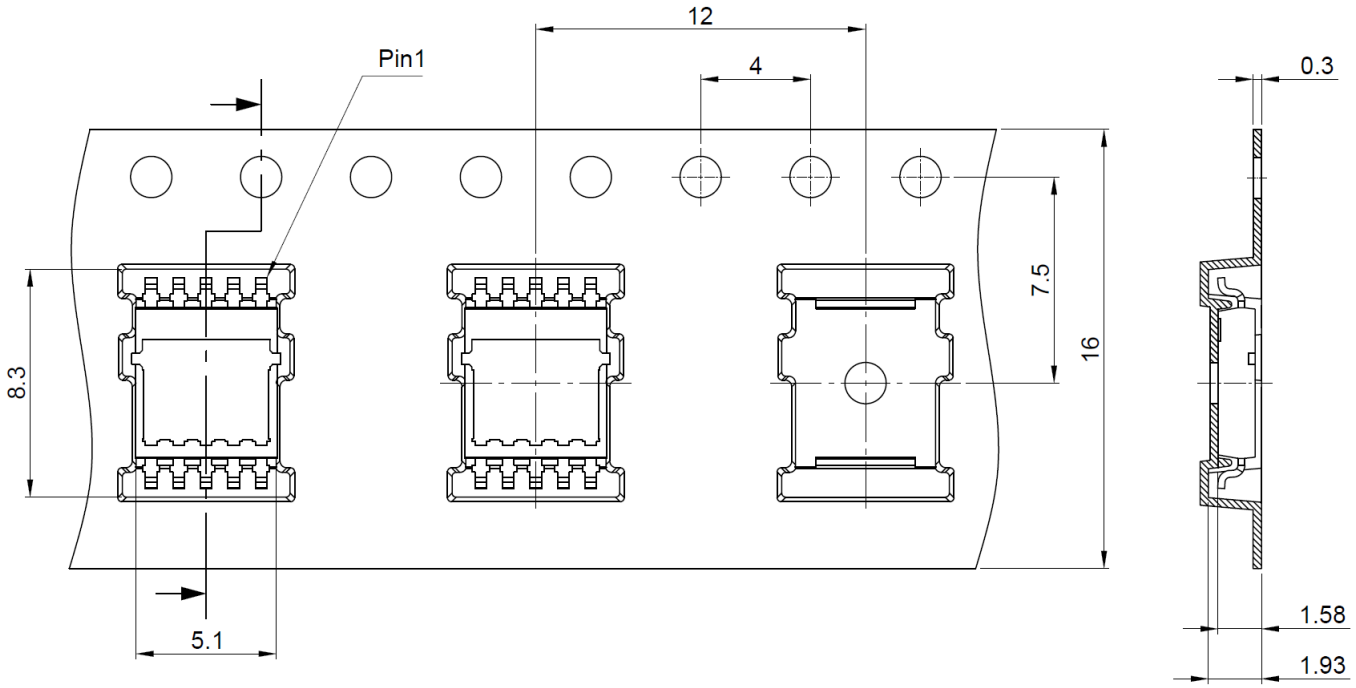


图 3　　PG-LHDSO- 10 封装变体，尺寸单位为毫米

7 附录A

表 11 相关链接

- IFX Optimos™ 功率晶体管网页

修订记录

IAUCN10S7L290T

Revision 2026 - 03 - 04, Rev. 1.1

Previous revisions

Revision	Date	Subjects (major changes since last revision)
1.0	2026-02-24	Final Data Sheet
1.1	2026-03-04	Corrected confidentiality level

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