特性

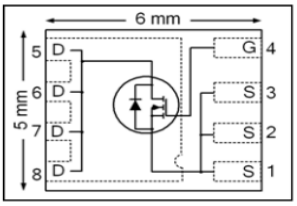
- 先进工艺技术
- 超低导通电阻
- 工作温度 175°C
- 快速开关
- 允许达到 Tjmax 的重复雪崩
- 无铅，符合RoHS要求
- 汽车认证 *

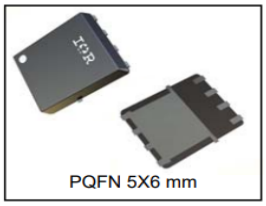
HEXFET ®功率MOSFET

V_{DSS}	75V
$R_{DS(on)}$ max (@V_{GS} = 10V)	8.5mΩ
$Q_{G\ (typical)}$	51nC
I_D (@$T_{C\ (Bottom)}$ = 25°C)	75A

描述

这款HEXFET® 功率MOSFET专为汽车应用而设计，采用最新的工艺技术实现单位硅面积极低的导通电阻。该设计的其他特点包括 175°C 工作结温、开关速度快和提高重复雪崩额定值。通过结合以上特点，使该设计成为一种极其高效和可靠的器件，可用于汽车应用和各种其他应用。





G	D	S
Gate	Drain	Source

应用

- 电流注入
- 高负载
- DC-DC变换器

Base Part Number	Package Type	Standard Pack		Complete Part Number
		Form	Quantity	
AUIRFN7107	PQFN 5mm x 6mm	Tape and Reel	4000	AUIRFN7107TR

绝对最大额定值

超过“绝对最大额定值”所列值的应力可能会对器件造成永久性损坏。这些仅仅是应力额定值，并不意味着器件在这些或任何其他超过该规范所示的条件下能够正常运行。延长暴露在绝对最大额定值条件的时间可能会影响器件的可靠性。热阻抗和功率耗散额定值是在装板和静止空气条件下测得的。环境温度（TA）为 25°C，除非另有规定。

	Parameter	Max.	Units
V_{DS}	Drain-to-Source Voltage	75	V
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	14	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	12	
I_D @ $T_{C(Bottom)}$ = 25°C	Continuous Drain Current, V_{GS} @ 10V	75⑥	
I_D @ $T_{C(Bottom)}$ = 100°C	Continuous Drain Current, V_{GS} @ 10V	53⑥	
I_{DM}	Pulsed Drain Current ①	300	
P_D @T_A = 25°C	Power Dissipation	4.4	W
P_D @$T_{C(Bottom)}$ = 25°C	Power Dissipation	125	
	Linear Derating Factor	0.029	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy ②	123	mJ
I_{AR}	Avalanche Current ①	45	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 175	°C

HEXFET® 是英飞凌的注册商标。

*认证标准可在 www.infineon.com 上找到

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）。

热阻抗

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$ (Bottom)	Junction-to-Case ④	---	1.2	°C/W
$R_{\theta JC}$ (Top)	Junction-to-Case ④	---	27	
$R_{\theta JA}$	Junction-to-Ambient ⑤	---	34	
$R_{\theta JA}$ (<10s)	Junction-to-Ambient ⑤	---	22	

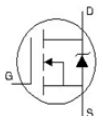
静态电气特性@T_J = 25°C（除非另有说明）

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	75	---	---	V	V_{GS} = 0V, I_D = 250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	---	0.074	---	V/°C	Reference to 25°C, I_D = 1.0mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	---	6.9	8.5	mΩ	V_{GS} = 10V, I_D = 45A ③
$V_{GS(th)}$	Gate Threshold Voltage	2.0	---	4.0	V	V_{DS} = V_{GS}, I_D = 100µA
R_G	Internal Gate Resistance	---	0.82	---	Ω	
gfs	Forward Transconductance	73	---	---	S	V_{DS} = 25V, I_D = 45A
I_{DSS}	Drain-to-Source Leakage Current	---	---	20	µA	V_{DS} = 75V, V_{GS} = 0V
		---	---	250		V_{DS} = 75V, V_{GS} = 0V, T_J = 125°C
I_{GSS}	Gate-to-Source Forward Leakage	---	---	100	nA	V_{GS} = 20V
	Gate-to-Source Reverse Leakage	---	---	-100		V_{GS} = -20V

动态电气特性在 T_J = 25°C时测得（除非另有规定）

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
Q_g	Total Gate Charge	---	51	77	nC	I_D = 45A V_{DS} = 38V V_{GS} = 10V
Q_{gs}	Gate-to-Source Charge	---	15	---		
Q_{gd}	Gate-to-Drain ("Miller") Charge	---	14	---		
Q_{sync}	Total Gate Charge Sync. (Q_g - Q_{gd})	---	37	---		I_D = 45A, V_{DS} =0V, V_{GS} = 10V
$t_{d(on)}$	Turn-On Delay Time	---	8.0	---	ns	V_{DD} = 75V I_D = 45A R_G = 1.8Ω V_{GS} = 10V ③
t_r	Rise Time	---	12	---		
$t_{d(off)}$	Turn-Off Delay Time	---	19	---		
t_f	Fall Time	---	7.0	---		
C_{iss}	Input Capacitance	---	3001	---	pF	V_{GS} = 0V V_{DS} = 25V f = 1.0 MHz
C_{oss}	Output Capacitance	---	371	---		
C_{rss}	Reverse Transfer Capacitance	---	151	---		

二极管特性

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	---	---	75	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	---	---	300	A	
V_{SD}	Diode Forward Voltage	---	0.85	1.3	V	T_J = 25°C, I_S = 45A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	---	28	---	ns	T_J = 25°C, I_F = 45A, V_{DD} = 38V di/dt = 500A/µs ③
Q_{rr}	Reverse Recovery Charge	---	145	---	nC	

注：

① 重复额定值；脉冲宽度受最高结温限制。

② 初始 T_J = 25°C、L =0.12mH、R_G =50 Ω 、I_{AS} = 45A。

③ 脉冲宽度≤ 400µs；占空比≤ 2%。

④ R_θ 在 TJ 约为 90°C 时测得。

⑤ 安装在 1 英寸见方的PCB上（FR-4 或 G-10 材料）。有关推荐的封装和焊接技术，请参阅应用注释 #AN-994：
http://www.irf.com/technical-info/appnotes/an-994.pdf

⑥ 根据最大允许结温计算连续电流。

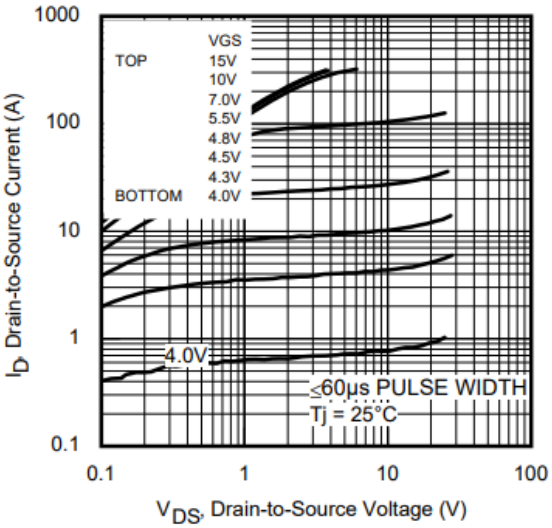


Fig. 1 Typical Output Characteristics

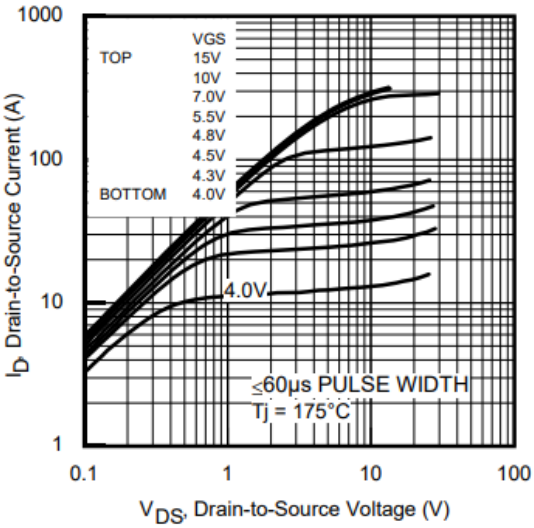


Fig. 2 Typical Output Characteristics

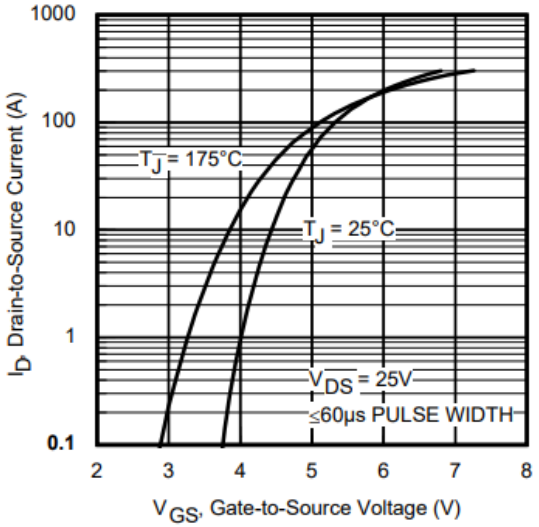


Fig. 3 Typical Transfer Characteristics

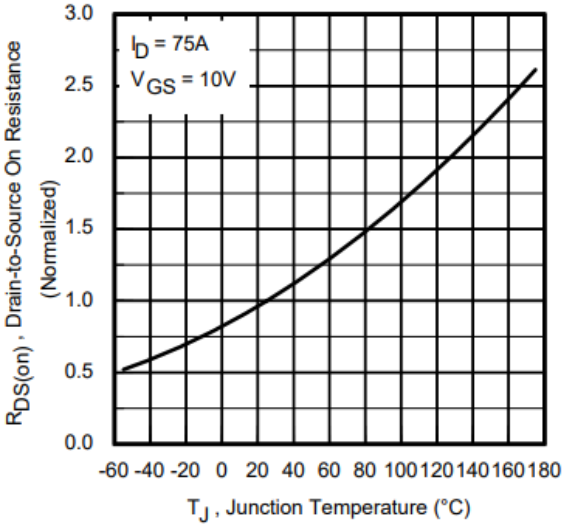


Fig. 4 Normalized On-Resistance vs. Temperature

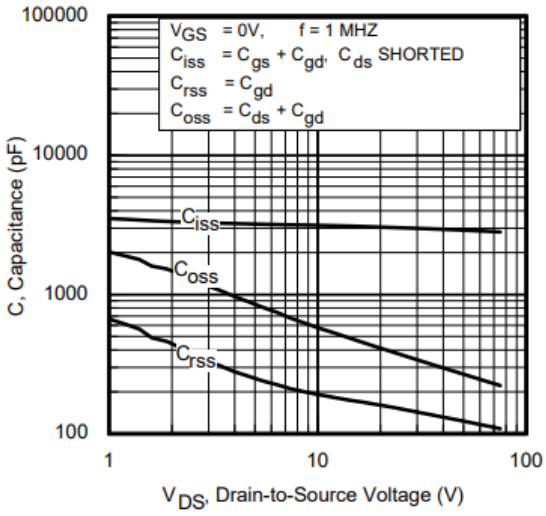


Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

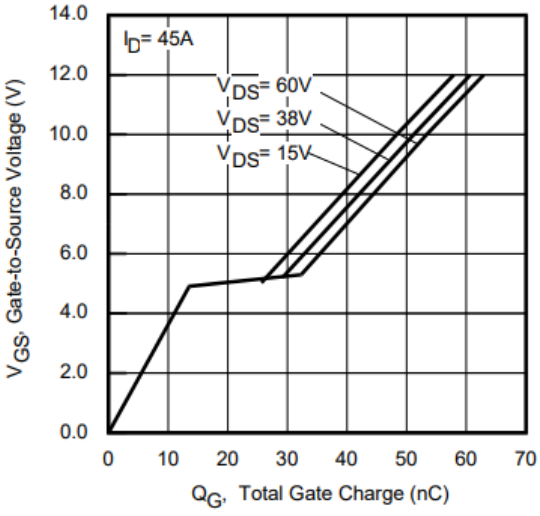


Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

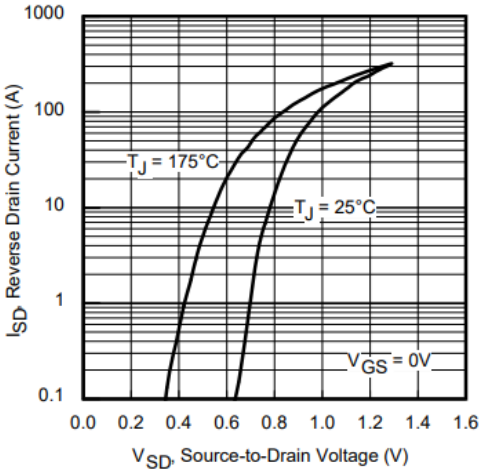


Fig. 7 Typical Source-to-Drain Diode Forward Voltage

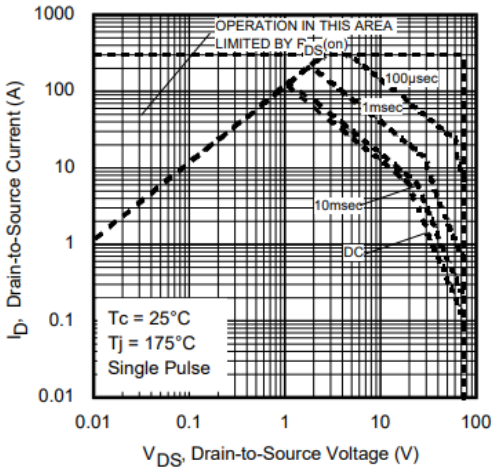


Fig 8. Maximum Safe Operating Area

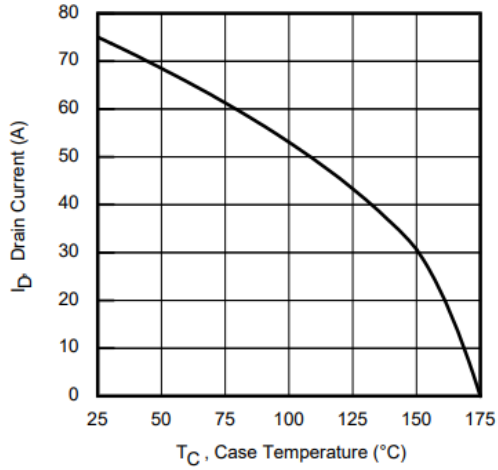


Fig 9. Maximum Drain Current vs. Case Temperature

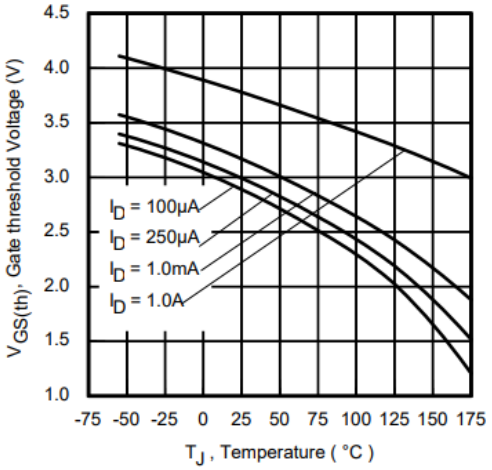
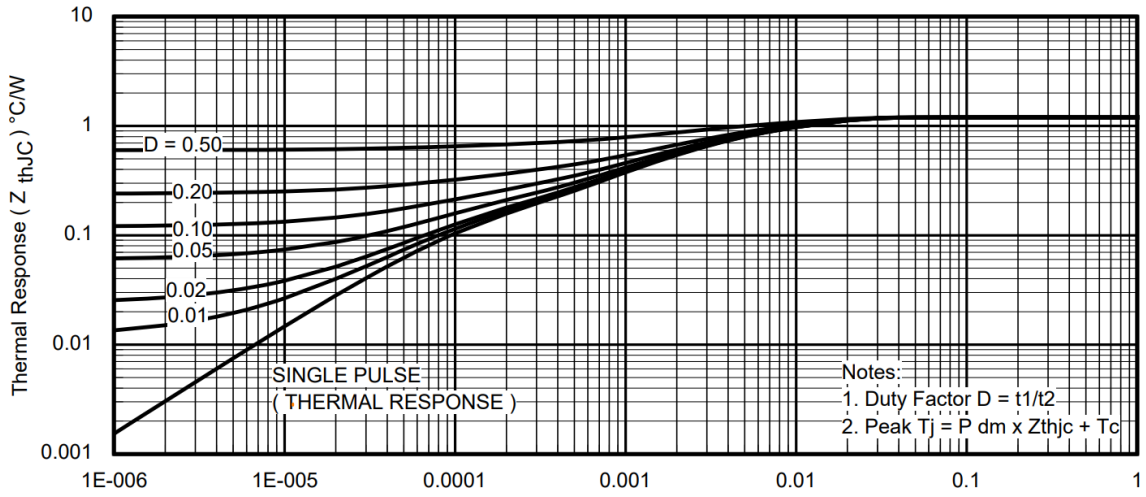


Fig 10. Threshold Voltage vs. Temperature



t1，矩形脉冲持续时间（秒）

图 11.最大有效瞬态热阻，结到壳

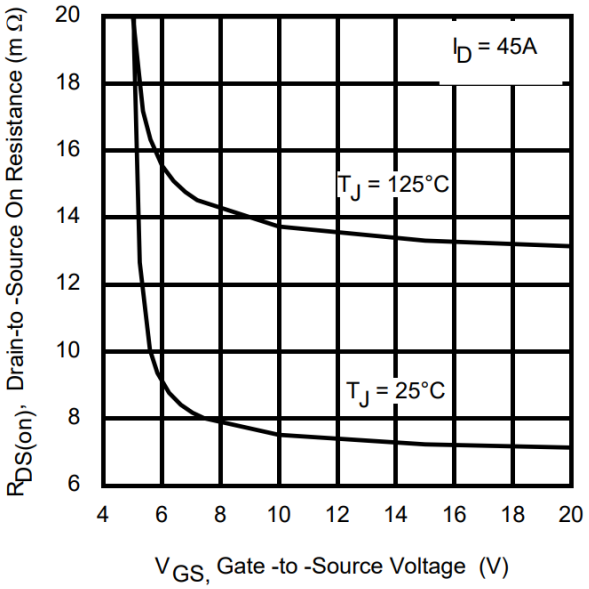


图 12.典型导通电阻与栅极电压的关系

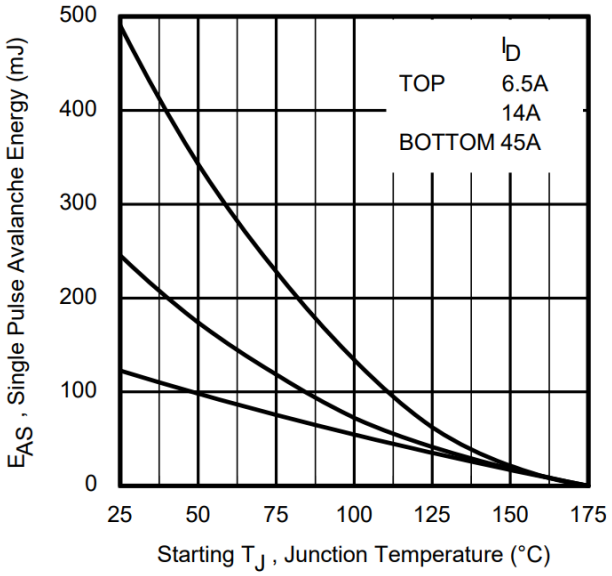


图 13.最大雪崩能量与漏极电流的关系

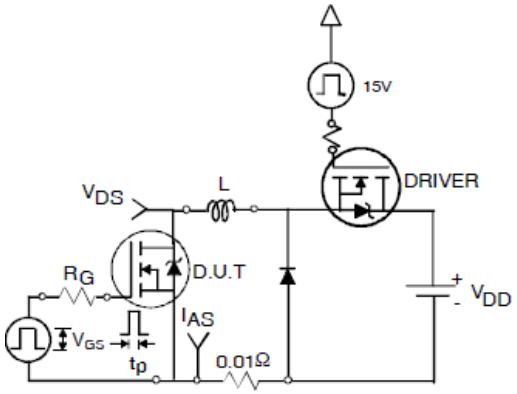


图 14a.未钳位电感测试电路

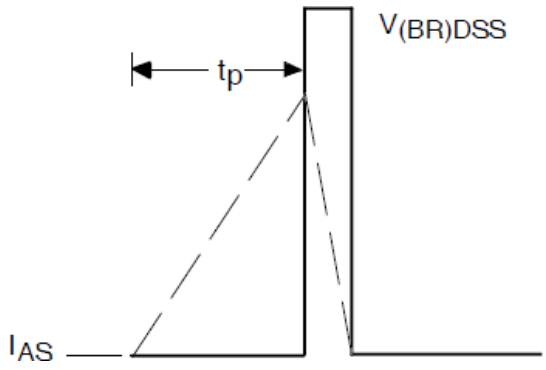


图 14b.未钳位电感波形

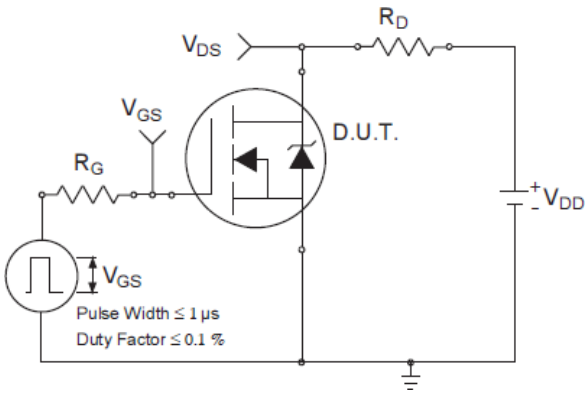


图 15a.开关时间测试电路

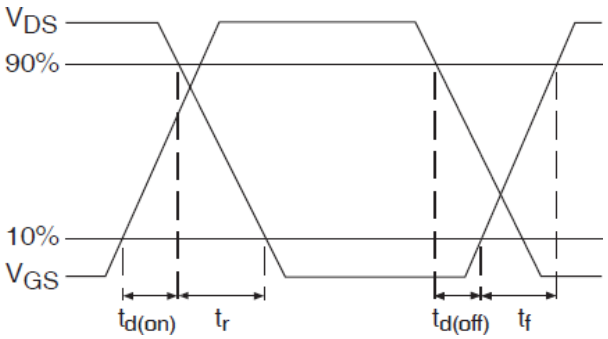


图 15b.开关时间波形

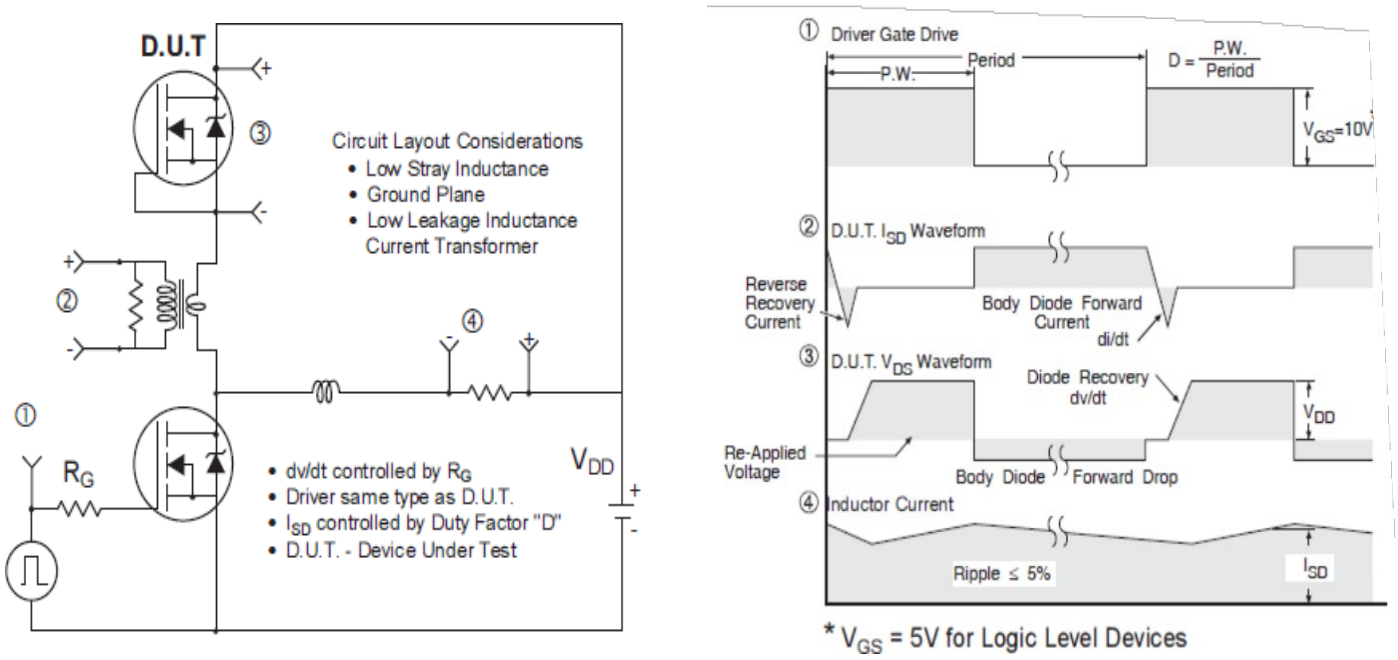


图 16. N 沟道 HEXFET® 功率 MOSFET 体内二极管峰值恢复 dv/dt 测试电路

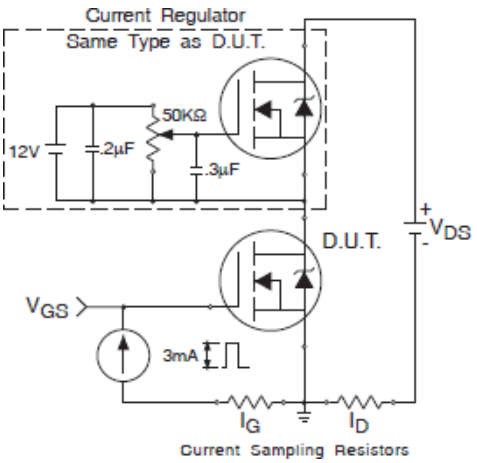


图 17a.阻抗充电波形

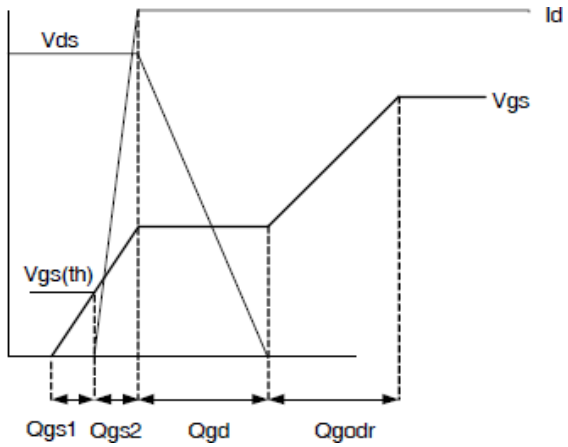
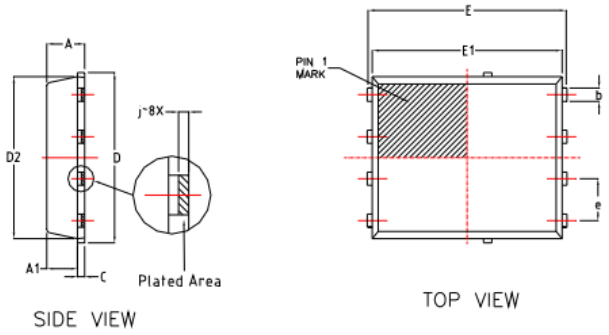
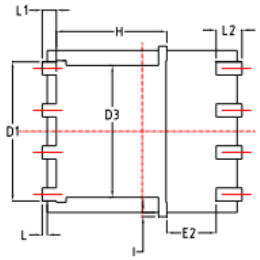


图 17b.阻抗充电波形

PQFN 5x6 封装形状“E”封装详细信息

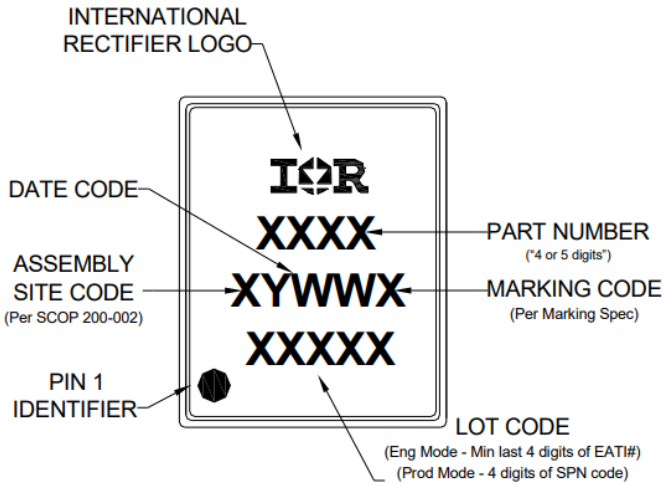


DIM	MM		
	MIN	NOM	MAX
A	0.90	1.10	1.17
A1	0.824	0.897	0.97
b	0.33	0.41	0.50
c	0.150	0.20	0.250
D	4.80	4.98	5.15
D1	3.91	4.22	4.36
D2	4.80	4.90	5.00
D3	3.85	4.00	4.15
E	5.90	6.05	6.15
E1	5.65	5.76	5.85
E2	1.10	/	/
e	1.27 BSC		
L	0.05	0.15	0.25
L1	0.38	0.425	0.50
L2	0.51	0.785	0.86
H	3.25	3.35	3.58
I	0	/	0.18
j	0.1015 BSC		



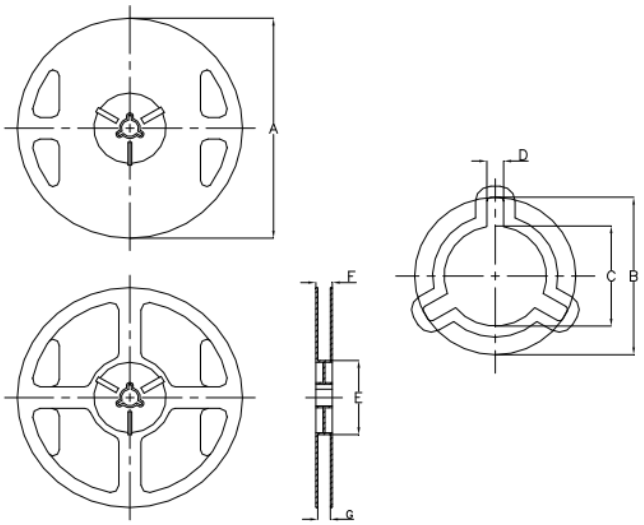
For more information on board mounting, including footprint and stencil recommendation, please refer to application note AN-1136: http://www.irf.com/technical-info/appnotes/an-1136.pdf
For more information on package inspection techniques, please refer to application note AN-1154: http://www.irf.com/technical-info/appnotes/an-1154.pdf

PQFN 5x6 封装形状“E”部分标识



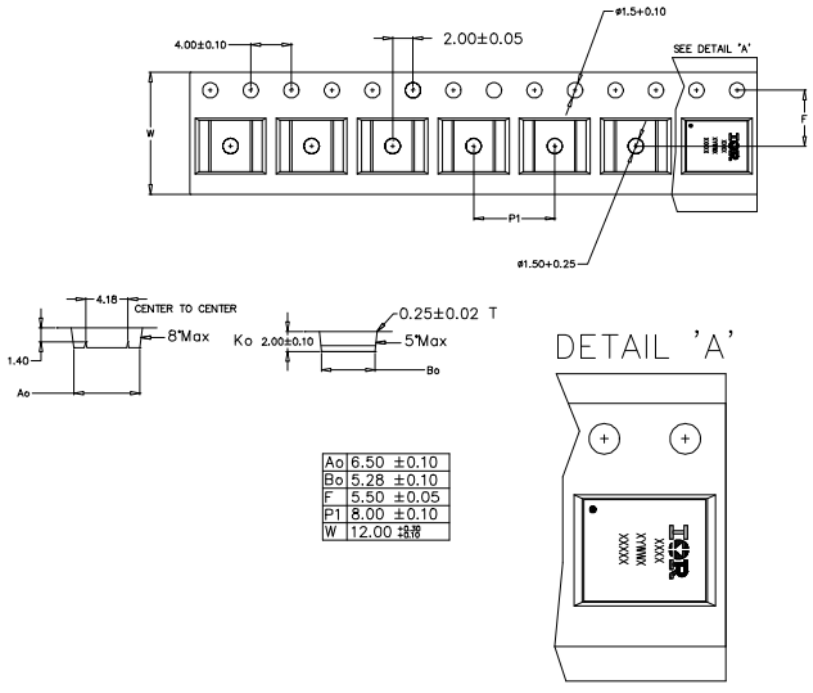
Note: For the most current drawing please refer to IR website at http://www.irf.com/package/

PQFN 5x6 封装形状 "E" 卷带封装



NOTE: Controlling dimensions in mm Std reel quantity is 4000 parts.

REEL DIMENSIONS				
STANDARD OPTION (QTY 4000) TR				
	METRIC		IMPERIAL	
CODE	MIN	MAX	MIN	MAX
A	329.5	330.5	12.972	13.011
B	20.9	21.5	0.823	0.846
C	12.8	13.5	0.504	0.532
D	1.7	2.3	0.067	0.091
E	97	99	3.819	3.898
F	Ref	17.4		
G	13	14.5	0.512	0.571



Ao	6.50 ±0.10
Bo	5.28 ±0.10
F	5.50 ±0.05
P1	8.00 ±0.10
W	12.00 ±0.30

Note: For the most current drawing please refer to IR website at http://www.irf.com/package/

Qualification Information

Qualification Level		Automotive (per AEC-Q101)	
		Comments: This part number(s) passed Automotive qualification. Infineon's Industrial and Consumer qualification level is granted by extension of the higher Automotive level.	
Moisture Sensitivity Level		PQFN 5x6	MSL1
ESD	Human Body Model	Class H1C (+/- 2000V)† AEC-Q101-001	
	Charged Device Model	Class C5 (+/- 2000V)† AEC-Q101-005	
RoHS Compliant		Yes	

† 最高通过电压。

修订记录

Date	Comments
10/12/2015	• Updated datasheet with corporate template

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