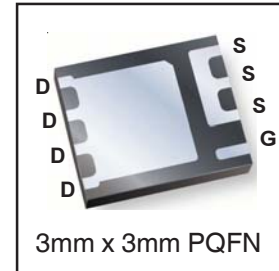
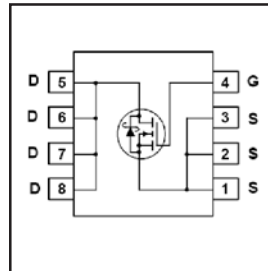


HEXFET® Power MOSFET

V_{DS}	30	V
$R_{DS(on) max}$ (@ $V_{GS} = 10V$)	12.4	mΩ
Q_g (typical)	5.4	nC
I_D (@ $T_A = 25^\circ C$)	12	A



Applications

- Synchronous Buck Converter for Computer Processor Power
- Isolated DC to DC Converters for Network and Telecom
- Buck Converters for Set-Top Boxes
- System/load switch

Features

Industry-standard pinout PQFN 3mm x 3mm Package
Compatible with Existing Surface Mount Techniques
RoHS Compliant, Halogen-Free
MSL1, Industrial qualification

⇒

Benefits

Multi-Vendor Compatibility
Easier Manufacturing
Environmentally Friendlier
Increased Reliability

Base Part Number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IRFH3707PbF-1	PQFN 3mm x 3mm	Tape and Reel	4000	IRFH3707TRPbF-1

Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain-to-Source Voltage	30	V
V_{GS}	Gate-to-Source Voltage	± 20	
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	12	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	9.4	
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	29	
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ (Package Limited)	18	
I_{DM}	Pulsed Drain Current ①	96	
$P_D @ T_A = 25^\circ C$	Power Dissipation ⑤	2.8	W
$P_D @ T_A = 70^\circ C$	Power Dissipation ⑤	1.8	
	Linear Derating Factor ⑤	0.02	W/°C
T_J	Operating Junction and	-55 to + 150	°C
T_{STG}	Storage Temperature Range		

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case ④	—	7.5	°C/W
$R_{\theta JA}$	Junction-to-Ambient ⑤⑥	—	45	
$R_{\theta JA}$	Junction-to-Ambient (t<10s) ⑥	—	31	

Notes ① through ⑥ are on page 10

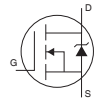
Static @ T_J = 25°C (unless otherwise specified)

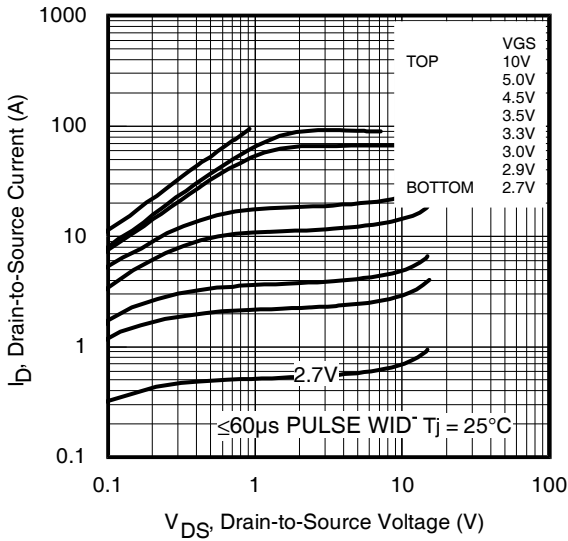
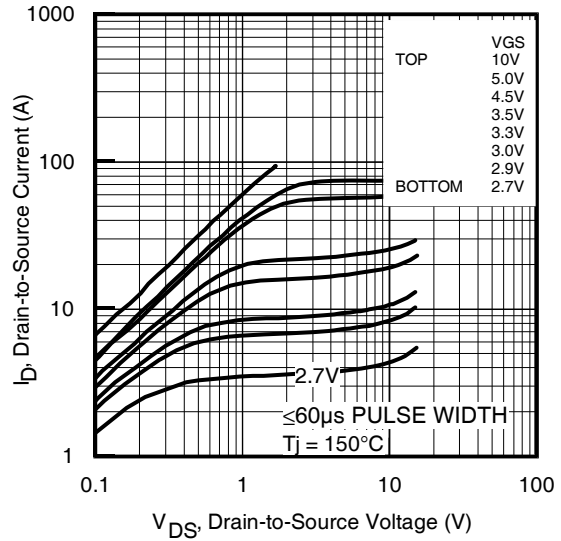
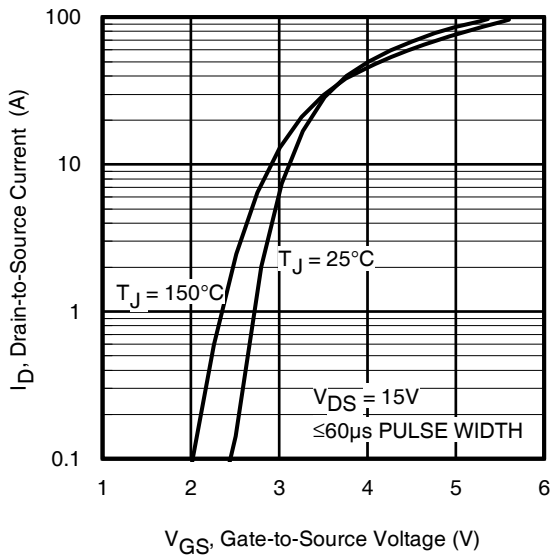
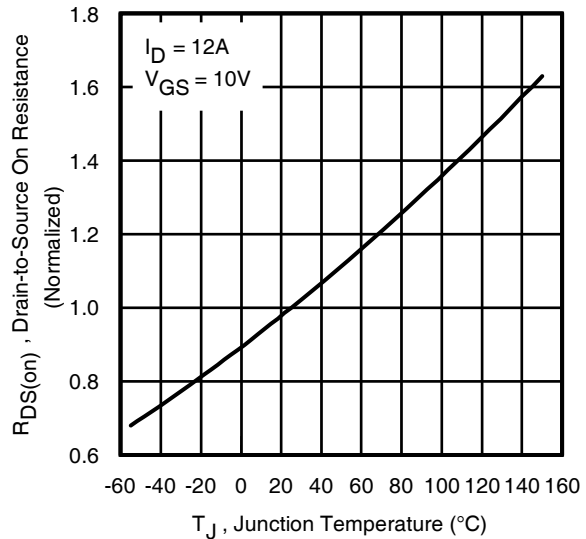
	Parameter	Min.	Typ.	Max.	Units	Conditions
BV _{DSS}	Drain-to-Source Breakdown Voltage	30	—	—	V	V _{GS} = 0V, I _D = 250μA
ΔBV _{DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient	—	0.02	—	V/°C	Reference to 25°C, I _D = 1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	9.4	12.4	mΩ	V _{GS} = 10V, I _D = 12A ③
		—	14.5	17.9		V _{GS} = 4.5V, I _D = 9.4A ③
V _{GS(th)}	Gate Threshold Voltage	1.35	1.8	2.35	V	V _{DS} = V _{GS} , I _D = 25μA
ΔV _{GS(th)}	Gate Threshold Voltage Coefficient	—	-6.2	—	mV/°C	
I _{DSS}	Drain-to-Source Leakage Current	—	—	1.0	μA	V _{DS} = 24V, V _{GS} = 0V
		—	—	150		V _{DS} = 24V, 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
g _{fs}	Forward Transconductance	17	—	—	S	V _{DS} = 15V, I _D = 9.4A
Q _g	Total Gate Charge	—	5.4	8.1	nC	V _{DS} = 15V V _{GS} = 4.5V I _D = 9.4A See Fig.17 & 18
Q _{gs1}	Pre-V _{th} Gate-to-Source Charge	—	1.1	—		
Q _{gs2}	Post-V _{th} Gate-to-Source Charge	—	0.7	—		
Q _{gd}	Gate-to-Drain Charge	—	2.2	—		
Q _{godr}	Gate Charge Overdrive	—	1.5	—		
Q _{sw}	Switch Charge (Q _{gs2} + Q _{gd})	—	2.9	—		
Q _{oss}	Output Charge	—	3.8	—	nC	V _{DS} = 16V, V _{GS} = 0V
R _G	Gate Resistance	—	2.0	—	Ω	
t _{d(on)}	Turn-On Delay Time	—	9.0	—	ns	V _{DD} = 15V, V _{GS} = 4.5V I _D = 9.4A R _G = 1.3Ω See Fig.15
t _r	Rise Time	—	11	—		
t _{d(off)}	Turn-Off Delay Time	—	9.9	—		
t _f	Fall Time	—	5.6	—		
C _{iss}	Input Capacitance	—	755	—	pF	V _{GS} = 0V V _{DS} = 15V f = 1.0MHz
C _{oss}	Output Capacitance	—	171	—		
C _{rss}	Reverse Transfer Capacitance	—	83	—		

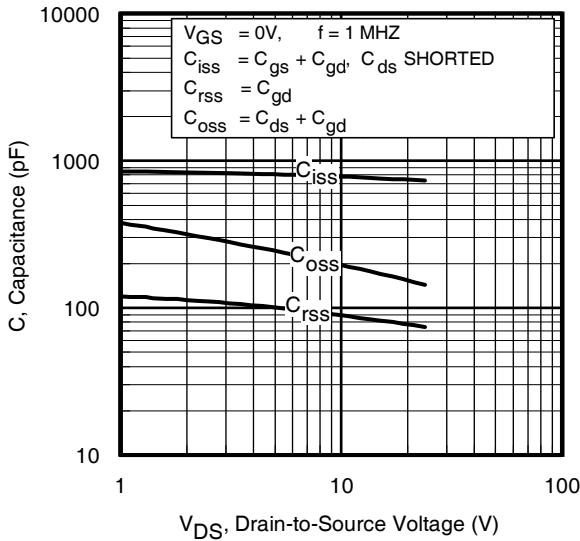
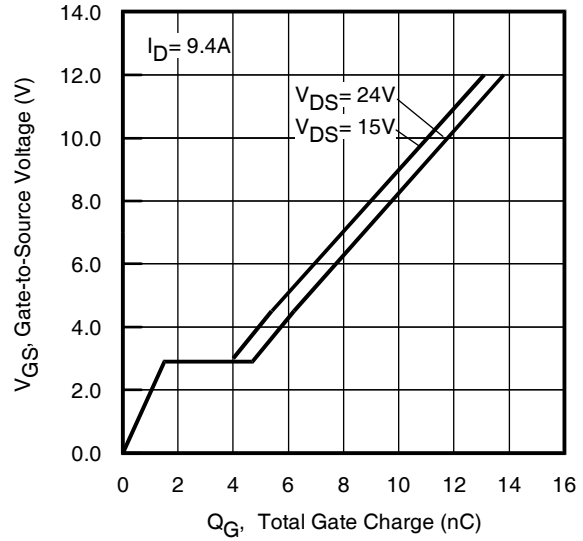
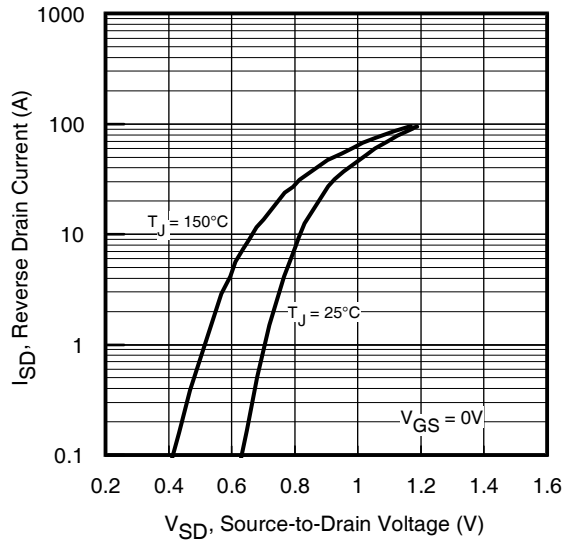
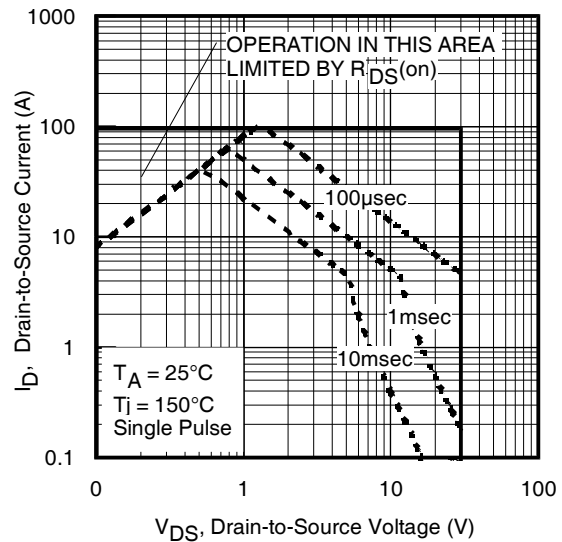
Avalanche Characteristics

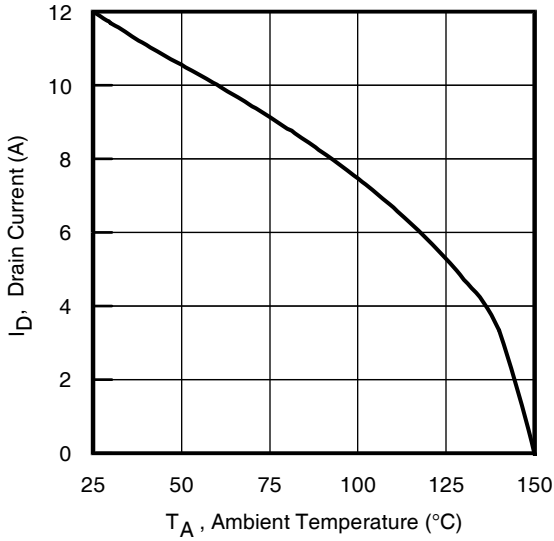
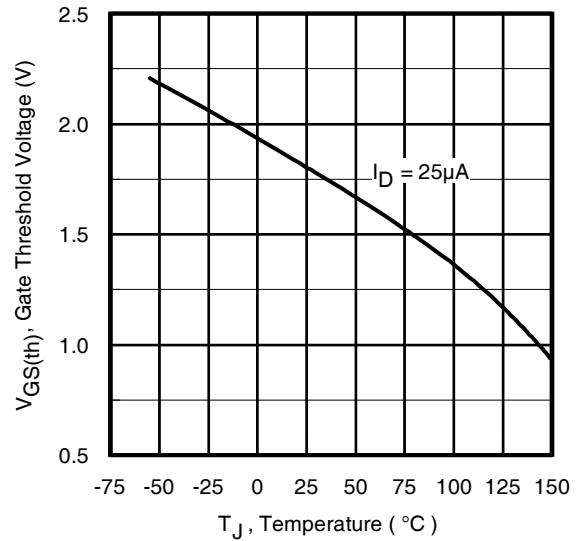
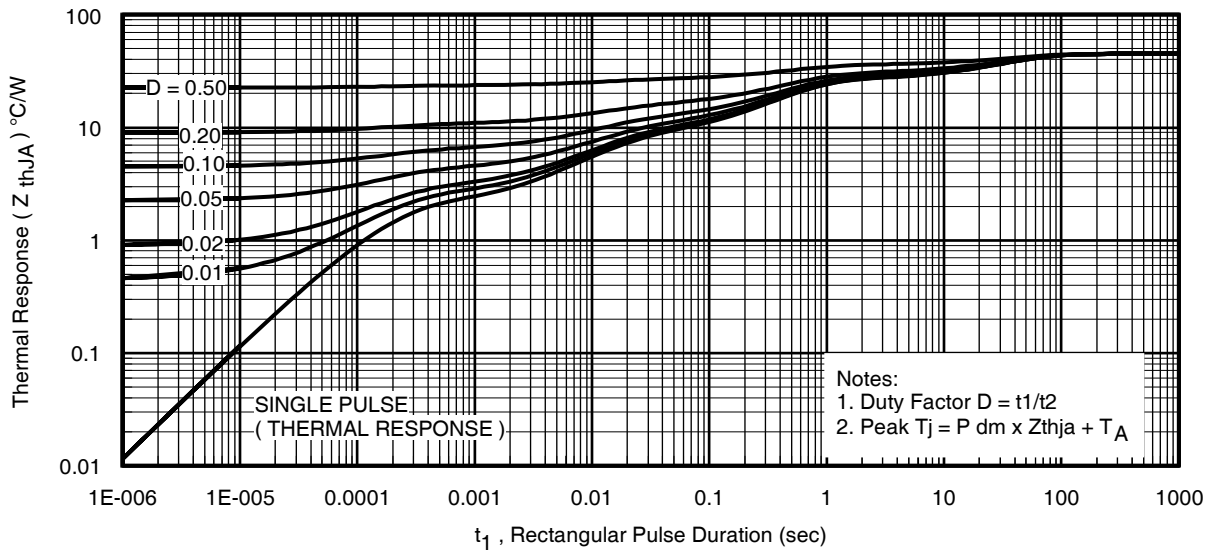
	Parameter	Typ.	Max.	Units
E _{AS}	Single Pulse Avalanche Energy ②	—	13	mJ
I _{AR}	Avalanche Current ①	—	9.4	A

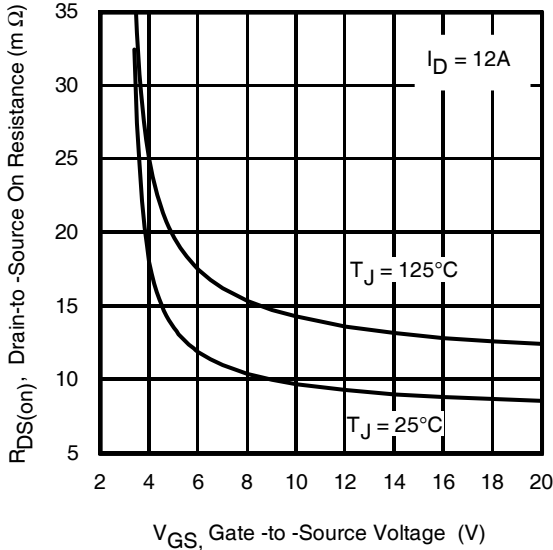
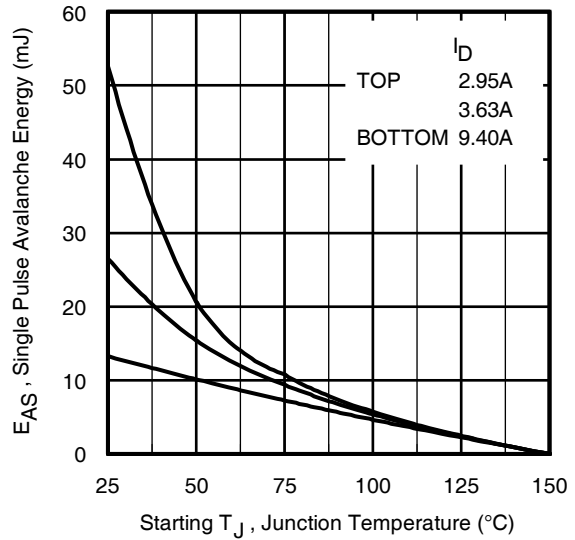
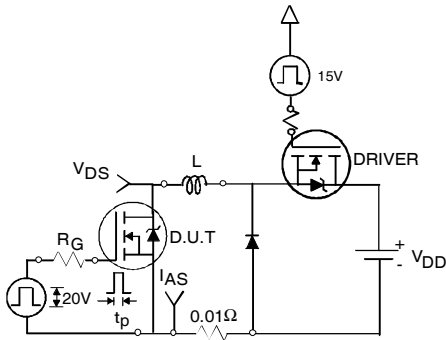
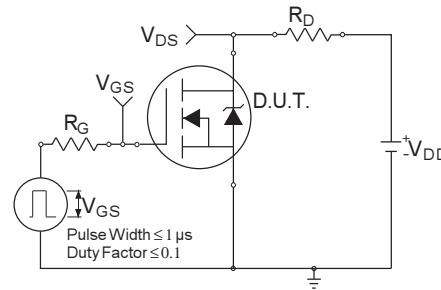
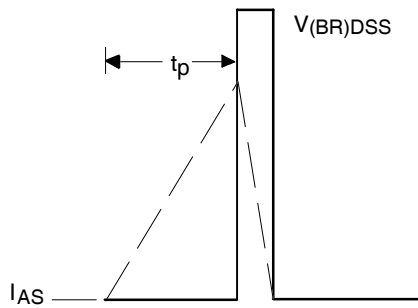
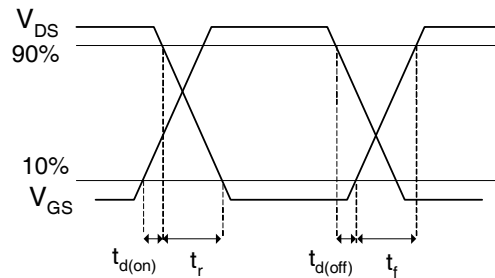
Diode Characteristics

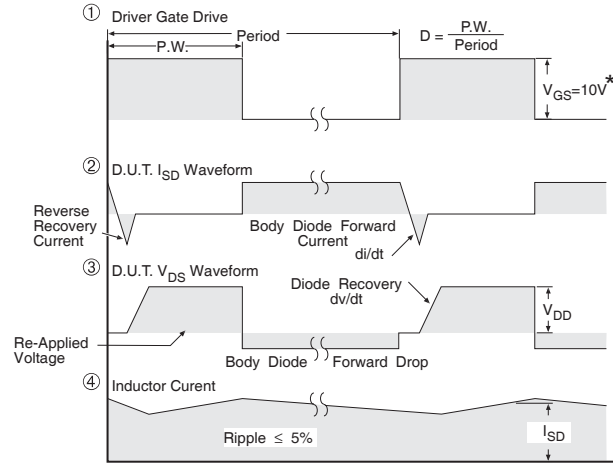
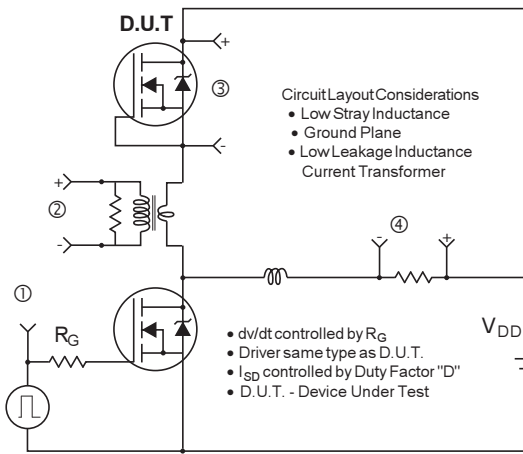
	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	3.5	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode) ①	—	—	96		
V _{SD}	Diode Forward Voltage	—	—	1.0	V	T _J = 25°C, I _S = 9.4A, V _{GS} = 0V ③
t _{rr}	Reverse Recovery Time	—	20	30	ns	T _J = 25°C, I _F = 9.4A, V _{DD} = 15V
Q _{rr}	Reverse Recovery Charge	—	27	41	nC	di/dt = 200A/μs ③
t _{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				


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-Drain Diode Forward Voltage

Fig 8. Maximum Safe Operating Area


Fig 9. Maximum Drain Current Vs. Ambient Temperature

Fig 10. Threshold Voltage Vs. Temperature

Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient


Fig 12. On-Resistance vs. Gate Voltage

Fig 13. Maximum Avalanche Energy vs. Drain Current

Fig 14a. Unclamped Inductive Test Circuit

Fig 15a. Switching Time Test Circuit

Fig 14b. Unclamped Inductive Waveforms

Fig 15b. Switching Time Waveforms



* $V_{GS} = 5V$ for Logic Level Devices

Fig 16. Peak Diode Recovery dv/dt Test Circuit for N-Channel HEXFET® Power MOSFETs

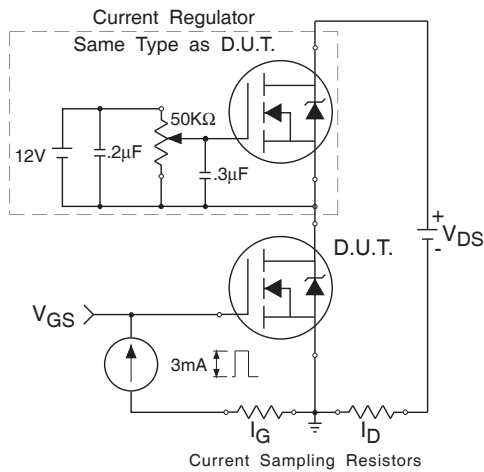


Fig 17. Gate Charge Test Circuit

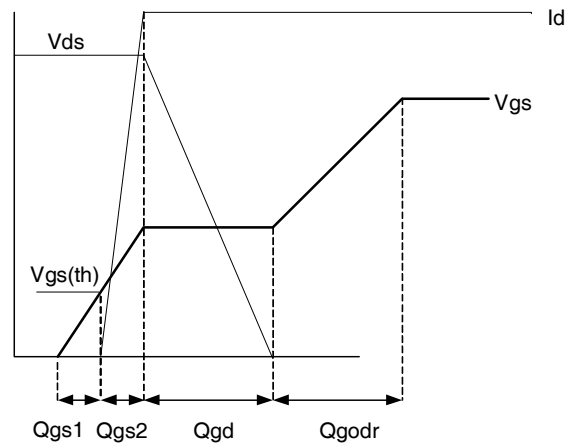
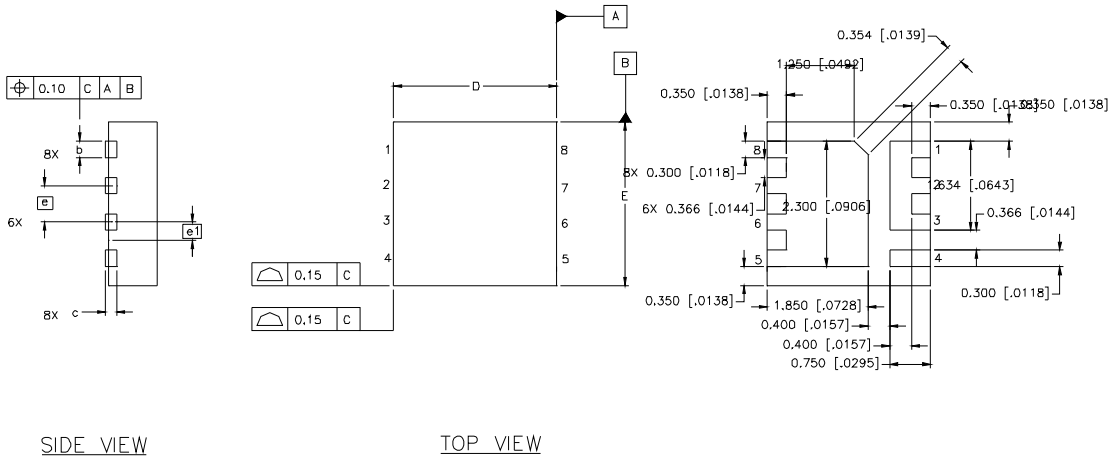


Fig 18. Gate Charge Waveform

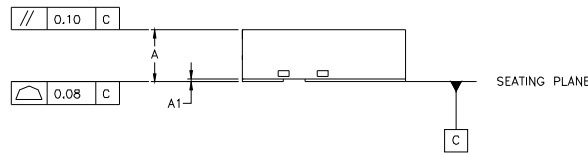
PQFN Package Details



SIDE VIEW

TOP VIEW

BOTTOM VIEW

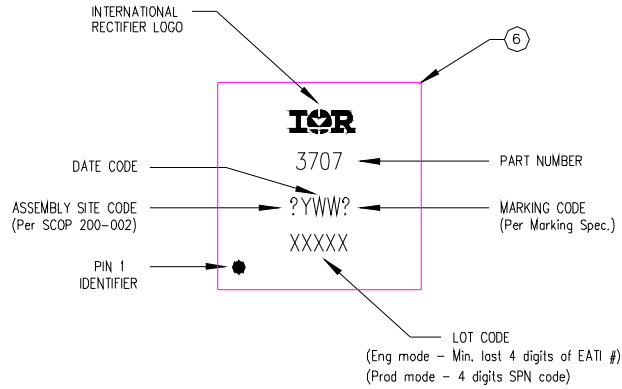


FRONT VIEW

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0315	.0394	0.800	1.000
A1	.0000	.0020	0.000	0.050
b	.0098	.0138	0.250	0.350
c	.0080 REF.		0.203 REF.	
D	.1181 BASIC		3.000 BASIC	
E	.1181 BASIC		3.000 BASIC	
e	.0262 BASIC		0.666 BASIC	
e1	.0131 BASIC		0.333 BASIC	

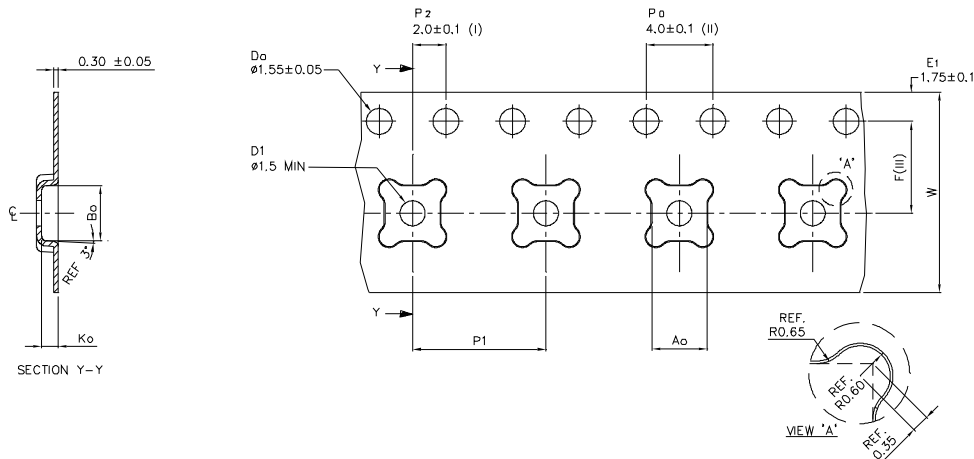
Note: For the most current drawing please refer to IR website at: <http://www.irf.com/package/>

PQFN Part Marking



TOP MARKING (LASER)

PQFN Tape and Reel



A _o	3.30	+/- 0.1
B _o	3.30	+/- 0.1
K _o	1.00	+/- 0.1
F	5.50	+/- 0.1
P ₁	8.00	+/- 0.1
W	12.00	+/- 0.3

- (I) Measured from centreline of sprocket hole to centreline of pocket.
- (II) Cumulative tolerance of 10 sprocket holes is ± 0.20 .
- (III) Measured from centreline of sprocket hole to centreline of pocket.
- (IV) Other material available.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.

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

Qualification information[†]

Qualification level	Industrial (per JEDEC JESD47F ^{††} guidelines)	
Moisture Sensitivity Level	PQFN 3mm x 3mm	MSL1 (per JEDEC J-STD-020D ^{††})
RoHS compliant	Yes	

[†] Qualification standards can be found at International Rectifier's web site: <http://www.irf.com/product-info/reliability>

^{††} Applicable version of JEDEC standard at the time of product release

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^\circ\text{C}$, $L = 0.297\text{mH}$, $R_G = 25\Omega$, $I_{AS} = 9.4\text{A}$.
- ③ Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.
- ④ R_{thjc} is guaranteed by design.
- ⑤ When mounted on 1 inch square 2 oz copper pad on 1.5x1.5 in. board of FR-4 material.
- ⑥ Refer to [application note #AN-994](#).

International
 Rectifier

IR WORLD HEADQUARTERS: 101 N. Sepulveda Blvd., El Segundo, California 90245, USA

To contact International Rectifier, please visit <http://www.irf.com/whoto-call/>

单击下面可查看定价，库存，交付和生命周期等信息

[>>Infineon Technologies\(英飞凌\)](#)