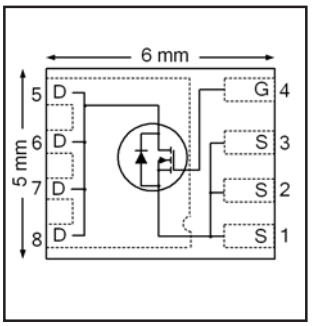
HEXFET® Power MOSFET

V_{DS}	75	V
$R_{DS(on)\ max}$ ($@V_{GS}$ = 10V)	8.5	mΩ
$Q_{g\ (typical)}$	48	nC
$R_{G\ (typical)}$	0.6	Ω
I_D ($@T_{c(Bottom)}$ = 25°C)	75	A





PQFN 5X6 mm

Applications

- Secondary Side Synchronous Rectification
- Inverters for DC Motors
- DC-DC Brick Applications
- Boost Converters

Features and Benefits

Features		Benefits
Low RDSon (< 8.5mΩ)		Lower Conduction Losses
Low Thermal Resistance to PCB (< 1.2°C/W)		Enables better thermal dissipation
Low Profile (<0.9 mm)	results in	Increased Power Density
Industry-Standard Pinout	⇒	Multi-Vendor Compatibility
Compatible with Existing Surface Mount Techniques		Easier Manufacturing
RoHS Compliant Containing no Lead, no Bromide and no Halogen		Environmentally Friendlier
MSL1, Industrial Qualification		Increased Reliability

Orderable part number	Package Type	Standard Pack		Note
		Form	Quantity	
IRFH7107TRPBF	PQFN 5mm x 6mm	Tape and Reel	4000	
~~IRFH7107TR2PBF~~	~~PQFN 5mm x 6mm~~	~~Tape and Reel~~	~~400~~	EOL notice #259

Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain-to-Source Voltage	75	V
V_{GS}	Gate-to-Source Voltage	± 20	
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	11	
I_D @ $T_{C(Bottom)}$ = 25°C	Continuous Drain Current, V_{GS} @ 10V	75	
I_D @ $T_{C(Bottom)}$ = 100°C	Continuous Drain Current, V_{GS} @ 10V	47	
I_{DM}	Pulsed Drain Current ①	300	
P_D @T_A = 25°C	Power Dissipation ⑤	3.6	W
P_D @ $T_{C(Bottom)}$ = 25°C	Power Dissipation ⑤	104	
	Linear Derating Factor ⑤	0.029	W/°C
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C

Notes ① through ⑤ are on page 9

 © 2014 International Rectifier

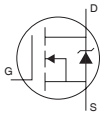
Static @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	75	—	—	V	V_{GS} = 0V, I_D = 250uA
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.09	—	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
$\Delta V_{GS(th)}$	Gate Threshold Voltage Coefficient	—	-8.7	—	mV/°C	
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
gfs	Forward Transconductance	68	—	—	S	V_{DS} = 25V, I_D = 45A
Q_g	Total Gate Charge	—	48	72	nC	V_{DS} = 38V V_{GS} = 10V I_D = 45A
Q_{gs1}	Pre-Vth Gate-to-Source Charge	—	10	—		
Q_{gs2}	Post-Vth Gate-to-Source Charge	—	4.0	—		
Q_{gd}	Gate-to-Drain Charge	—	15	—		
Q_{godr}	Gate Charge Overdrive	—	19	—		
Q_{sw}	Switch Charge (Q_{gs2} + Q_{gd})	—	19	—		
Q_{oss}	Output Charge	—	19	—	nC	V_{DS} = 16V, V_{GS} = 0V
R_G	Gate Resistance	—	0.6	—	Ω	
$t_{d(on)}$	Turn-On Delay Time	—	9.1	—	ns	V_{DD} = 38V, V_{GS} = 10V I_D = 45A R_G=1.8Ω
t_r	Rise Time	—	12	—		
$t_{d(off)}$	Turn-Off Delay Time	—	20	—		
t_f	Fall Time	—	6.5	—		
C_{iss}	Input Capacitance	—	3110	—	pF	V_{GS} = 0V V_{DS} = 25V f = 1.0MHz
C_{oss}	Output Capacitance	—	365	—		
C_{rss}	Reverse Transfer Capacitance	—	165	—		

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy ②	—	106	mJ
I_{AR}	Avalanche Current ①	—	45	A

Diode Characteristics

	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		
V_{SD}	Diode Forward Voltage	—	—	1.3	V	T_J = 25°C, I_S = 45A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	—	28	42	ns	T_J = 25°C, I_F = 45A, V_{DD} = 38V
Q_{rr}	Reverse Recovery Charge	—	160	240	nC	di/dt = 500A/µs ③
t_{on}	Forward Turn-On Time	Time is dominated by parasitic Inductance				

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$ (Bottom)	Junction-to-Case ④	—	1.2	°C/W
$R_{\theta JC}$ (Top)	Junction-to-Case ④	—	30	
$R_{\theta JA}$	Junction-to-Ambient ⑤	—	35	
$R_{\theta JA}$ (<10s)	Junction-to-Ambient ⑤	—	22	

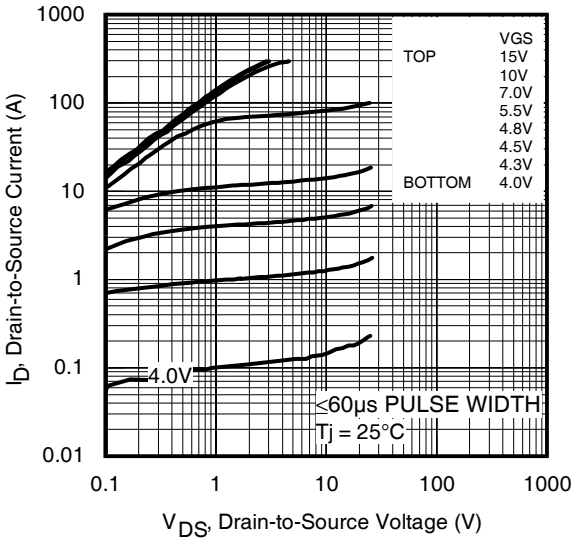


Fig 1. Typical Output Characteristics

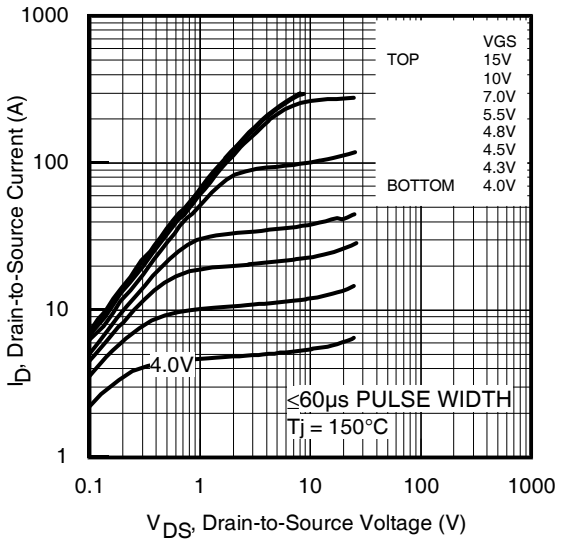


Fig 2. Typical Output Characteristics

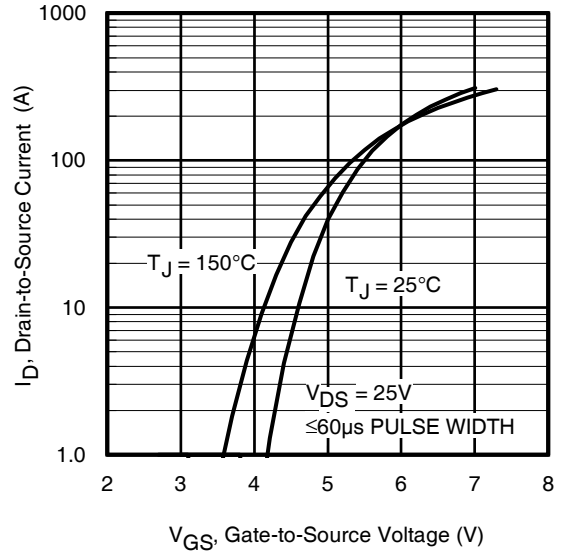


Fig 3. Typical Transfer Characteristics

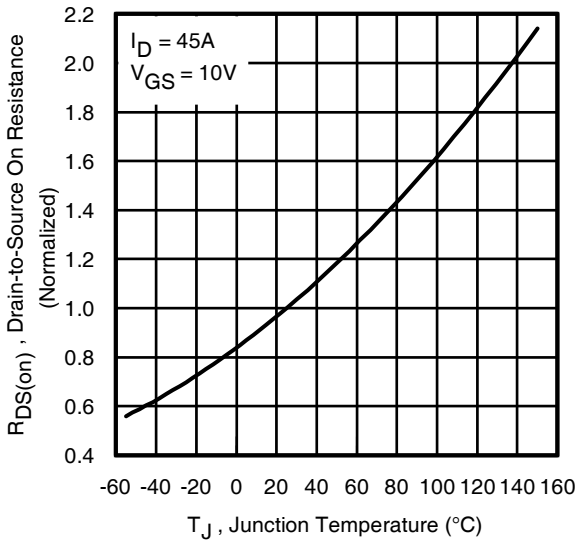


Fig 4. Normalized On-Resistance vs. Temperature

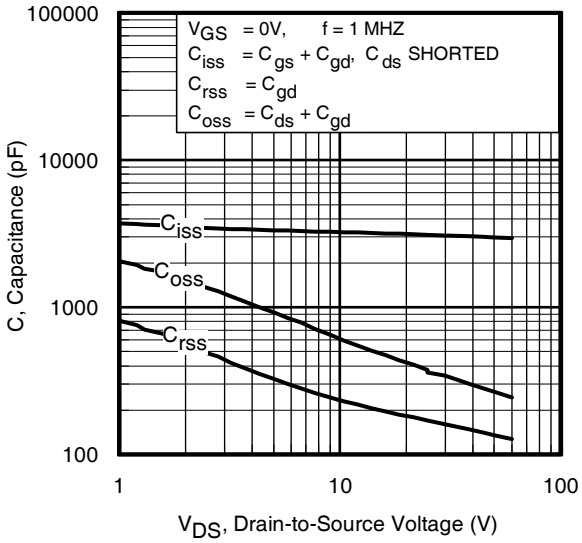


Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

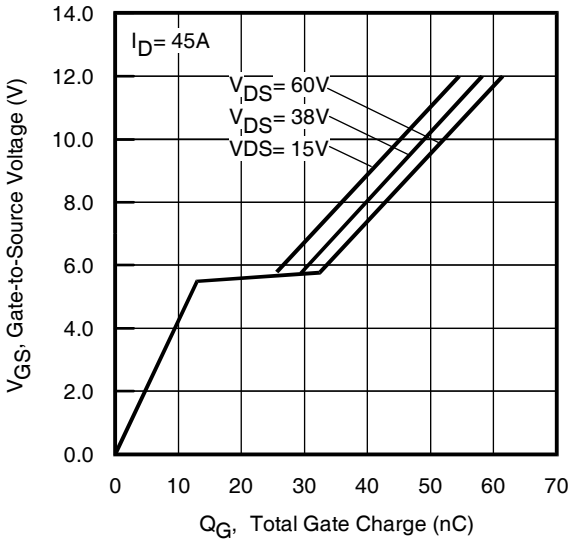


Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

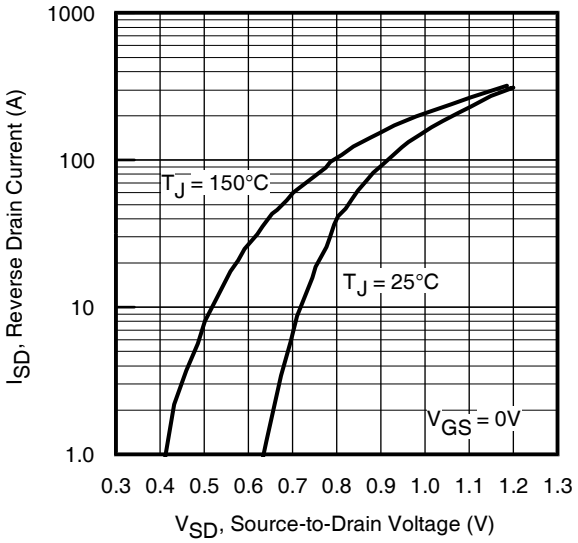


Fig 7. Typical Source-Drain Diode Forward Voltage

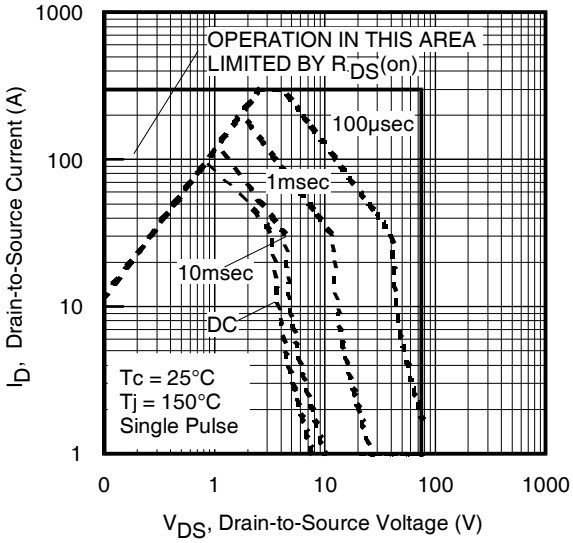


Fig 8. Maximum Safe Operating Area

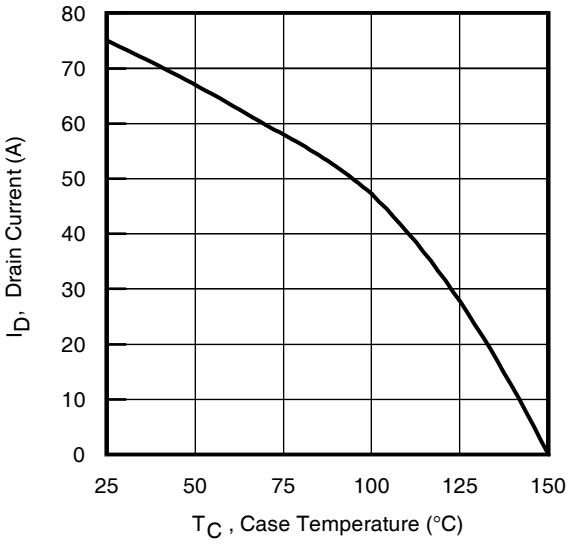


Fig 9. Maximum Drain Current vs. Case (Bottom) Temperature

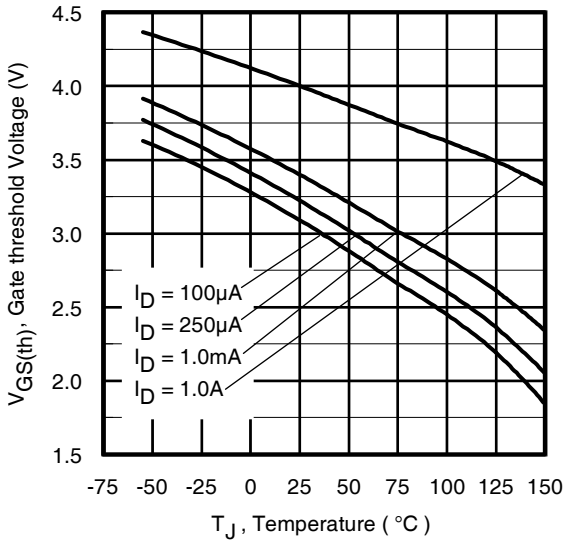


Fig 10. Threshold Voltage vs. Temperature

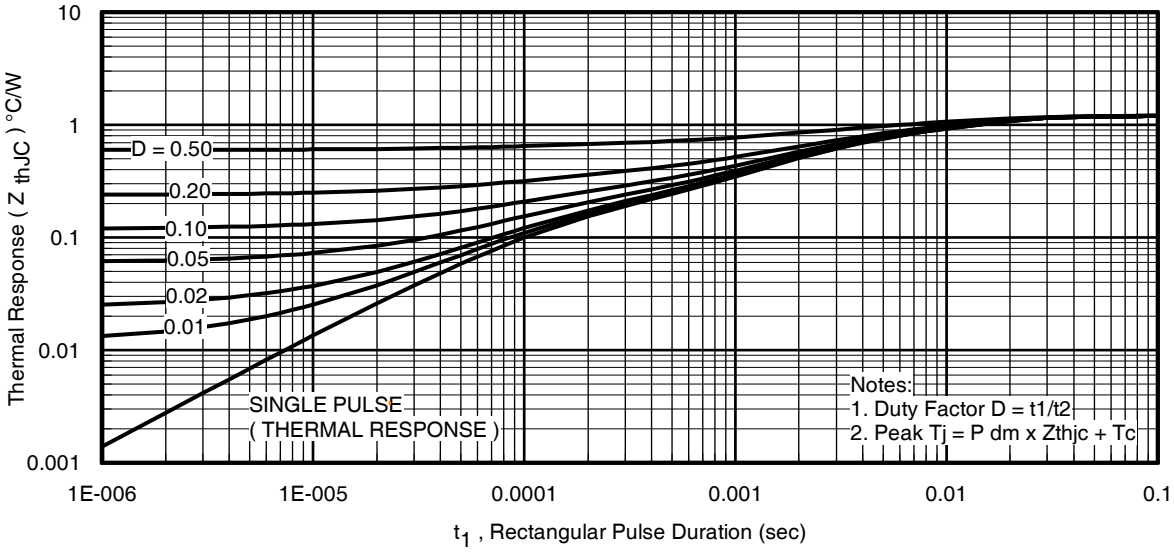


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case (Bottom)

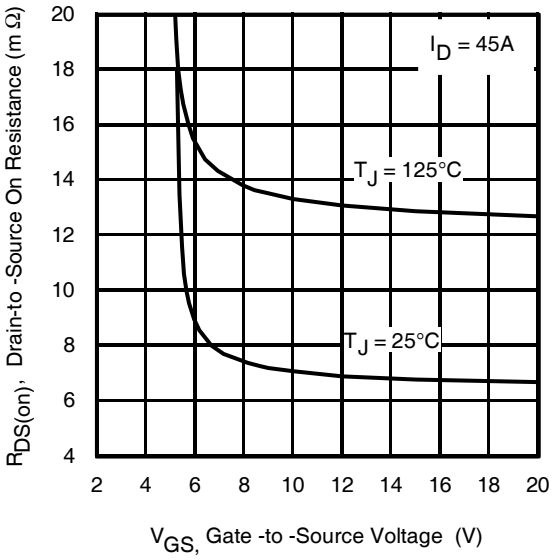


Fig 12. On-Resistance vs. Gate Voltage

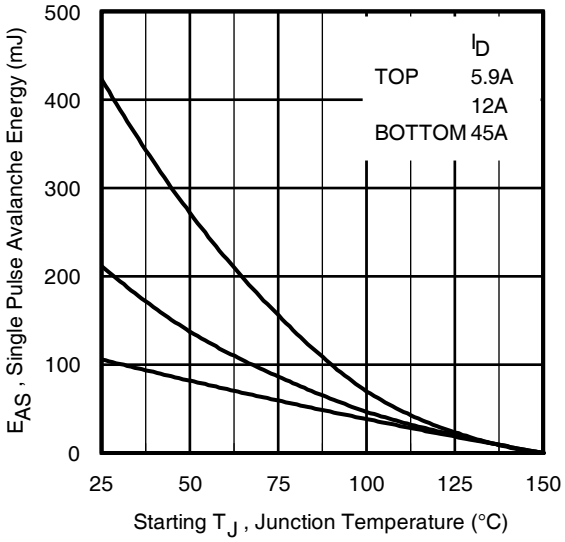


Fig 13. Maximum Avalanche Energy vs. Drain Current

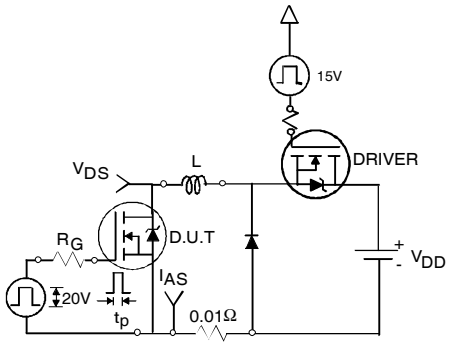


Fig 14a. Unclamped Inductive Test Circuit

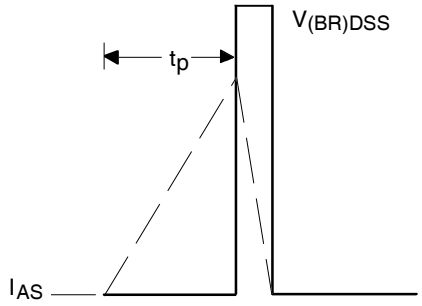


Fig 14b. Unclamped Inductive Waveforms

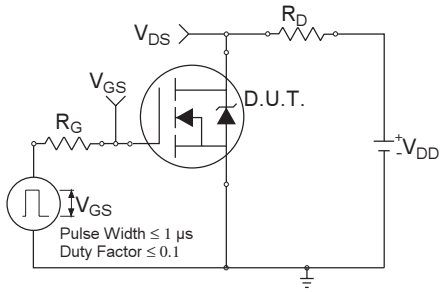


Fig 15a. Switching Time Test Circuit

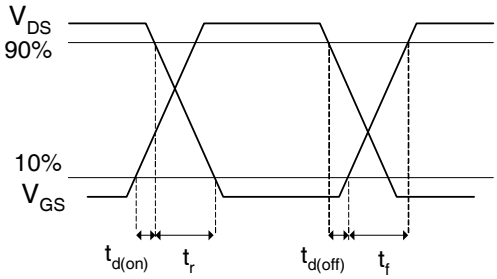


Fig 15b. Switching Time Waveforms

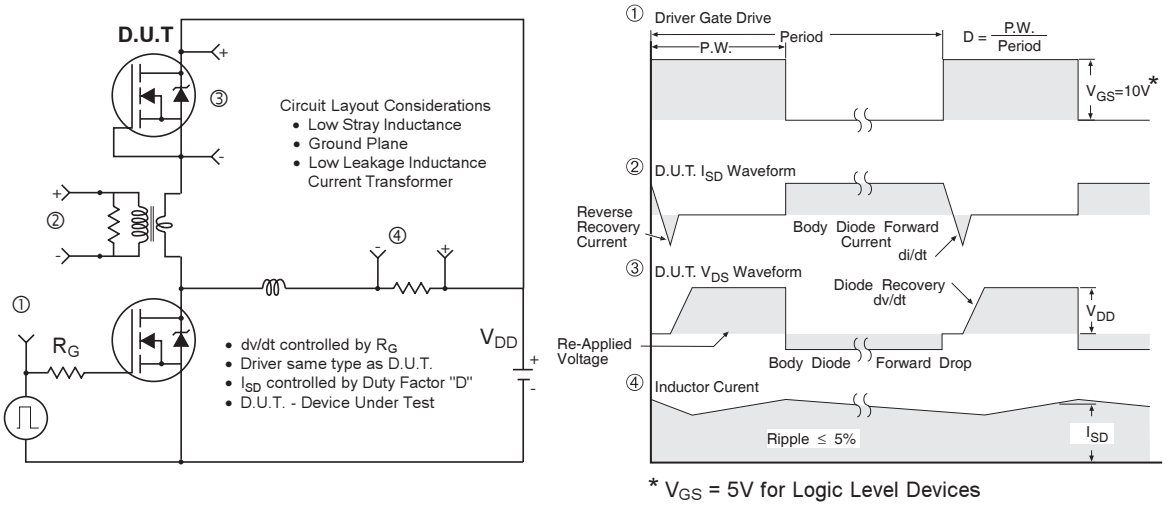


Fig 16. Peak Diode Recovery dv/dt Test Circuit for N-Channel HEXFET® Power MOSFETs

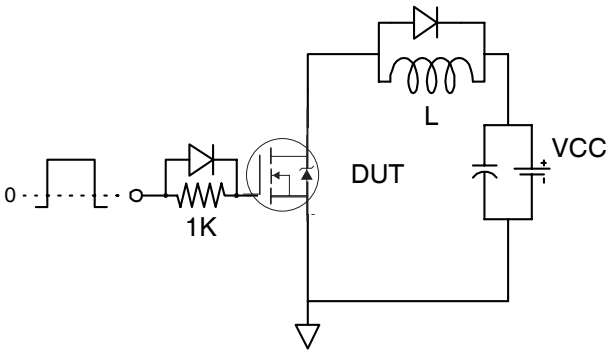


Fig 17. Gate Charge Test Circuit

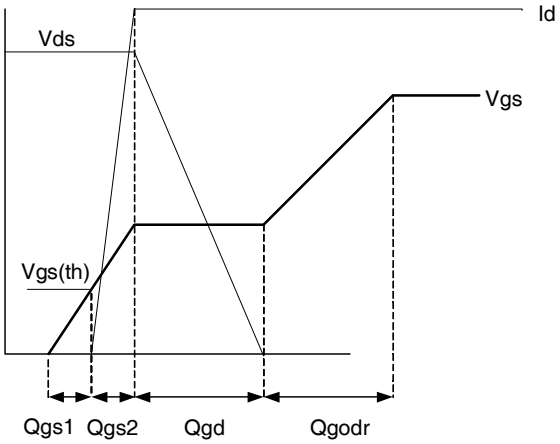
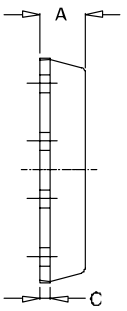
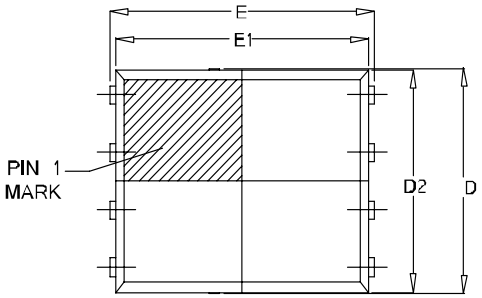


Fig 18. Gate Charge Waveform

PQFN 5x6 Outline "E" Package Details

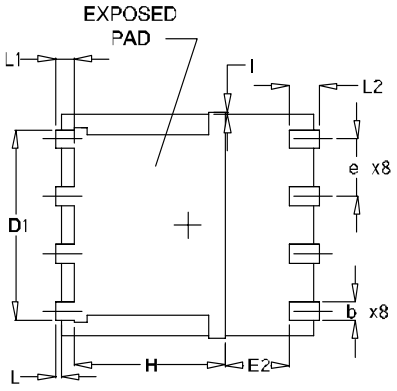


SIDEVIEW



TOP VIEW

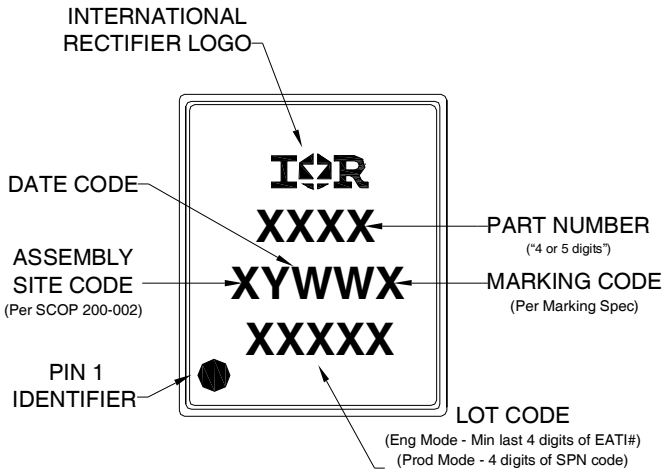
SYMBOL	OUTLINE PQFN 5X6E		
	MIN.	NOM	MAX.
A	0.90	1.03	1.17
b	0.33	0.41	0.48
C	0.20	0.25	0.35
D	4.80	4.98	5.15
D1	3.91	4.11	4.31
D2	4.80	4.90	5.00
E	5.90	6.02	6.15
E1	5.65	5.75	5.85
E2	1.10	—	—
e	1.27 BSC		
L	0.05	0.15	0.25
L1	0.38	0.44	0.50
L2	0.51	0.68	0.86
H	3.32	3.45	3.58
I	—	—	0.18



BOTTOM VIEW

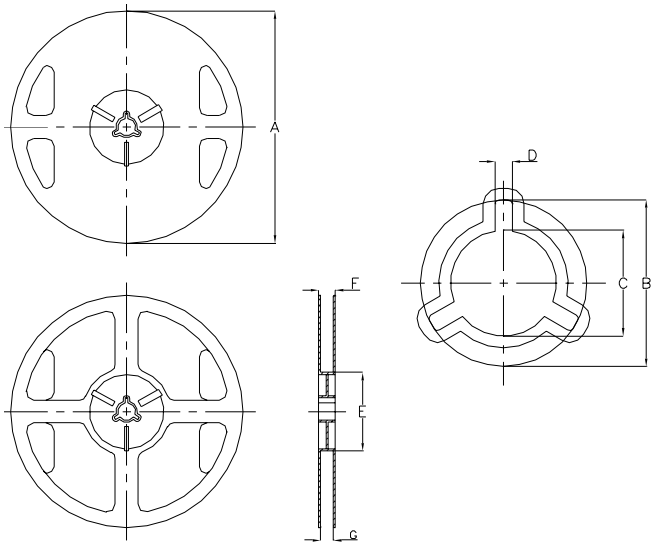
For more information on board mounting, including footprint and stencil recommendation, please refer to application note AN-1136:
http://www.irf.com/technical-info/appnotes/an-1136.pdf
For more information on package inspection techniques, please refer to application note AN-1154:
http://www.irf.com/technical-info/appnotes/an-1154.pdf

PQFN 5x6 Outline "E" Part Marking



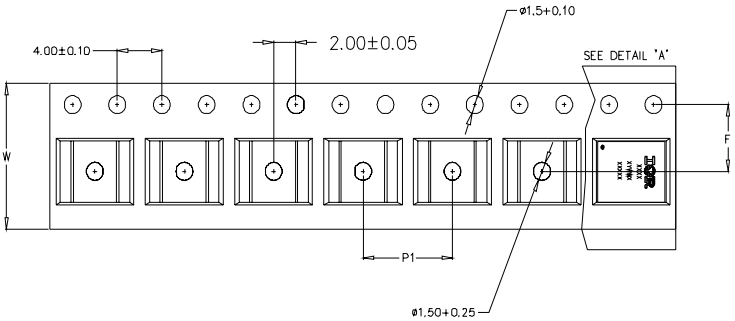
Note: For the most current drawing please refer to IR website at: http://www.irf.com/package/

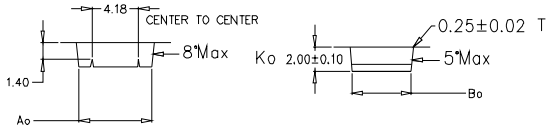
PQFN 5x6 Outline "E" Tape and Reel



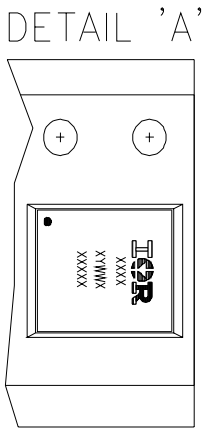
NOTE: Controlling dimensions in mm Std reel quantity is 4000 parts.

REEL DIMENSIONS								
STANDARD OPTION (QTY 4000)					TR1 OPTION (QTY 400)			
	METRIC		IMPERIAL		METRIC		IMPERIAL	
CODE	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
A	329.5	330.5	12.972	13.011	177.5	178.5	6.988	7.028
B	20.9	21.5	0.823	0.846	20.9	21.5	0.823	0.846
C	12.8	13.5	0.504	0.532	13.2	13.8	0.520	0.543
D	1.7	2.3	0.067	0.091	1.9	2.3	0.075	0.091
E	97	99	3.819	3.898	65	66	2.350	2.598
F	Ref	17.4			Ref	12		
G	13	14.5	0.512	0.571	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 −0.10



Qualification information†

Qualification level	Industrial†† (per JEDEC JESD47F ††† guidelines)	
Moisture Sensitivity Level	PQFN 5mm x 6mm	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

†† Higher qualification ratings may be available should the user have such requirements.
Please contact your International Rectifier sales representative for further information:
http://www.irf.com/whoto-call/salesrep/

††† 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°C, L = 0.11mH, R_G = 50Ω, I_{AS} = 45A.

③ Pulse width ≤ 400µs; duty cycle ≤ 2%.

④ R_θ is measured at T_J of approximately 90°C.

⑤ When mounted on 1 inch square 2 oz copper pad on 1.5x1.5 in. board of FR-4 material.

Revision History

Date	Comment
1/20/2014	• Updated ordering information to reflect the End-Of-Life (EOL) of the mini-reel option (EOL notice #259). • Updated data sheet with the new IR corporate template.

International
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IR WORLD HEADQUARTERS: 101 N. Sepulveda Blvd., El Segundo, California 90245, USA
To contact International Rectifier, please visit http://www.irf.com/whoto-call/