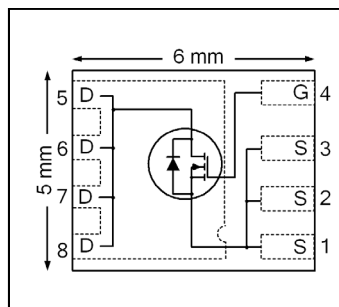


HEXFET® Power MOSFET

V_{DSS}	30	V
R_{DS(on)} max (@ V _{GS} = 10V)	1.3	mΩ
Q_g (typical)	50	nC
R_g (typical)	1.3	Ω
I_D (@T _{C (Bottom)} = 25°C)	100 Ⓢ	A



Applications

- OR-ing MOSFET for 12V (typical) Bus in-Rush Current
- Battery Operated DC Motor Inverters

Features

Low R _{DS(on)} (<1.3mΩ)
Low Thermal Resistance to PCB (<0.8°C/W)
Low Profile (<0.9 mm)
Industry-Standard Pinout
Compatible with Existing Surface Mount Techniques
RoHS Compliant, Halogen-Free
MSL1, Industrial Qualification

results in



Benefits

Lower Conduction Losses
Enable better thermal dissipation
Increased Power Density
Multi-Vendor Compatibility
Easier Manufacturing
Environmentally Friendlier
Increased Reliability

Base part number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IRFH8307PbF	PQFN 5mm x 6 mm	Tape and Reel	4000	IRFH8307TRPbF

Absolute Maximum Ratings

	Parameter	Max.	Units
V _{GS}	Gate-to-Source Voltage	± 20	V
I _D @ T _A = 25°C	Continuous Drain Current, V _{GS} @ 10V	42	A
I _D @ T _A = 70°C	Continuous Drain Current, V _{GS} @ 10V	33	
I _D @ T _{C (Bottom)} = 25°C	Continuous Drain Current, V _{GS} @ 10V	100Ⓢ	
I _D @ T _{C (Bottom)} = 100°C	Continuous Drain Current, V _{GS} @ 10V	100Ⓢ	
I _{DM}	Pulsed Drain Current ①	400	W
P _D @ T _A = 25°C	Power Dissipation ⑤	3.6	
P _D @ T _{C (Bottom)} = 25°C	Power Dissipation ⑤	156	W/°C
	Linear Derating Factor ⑤	0.029	
T _J T _{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C

Notes ① through ⑥ are on page 8

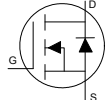
Static @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.02	—	$V/^\circ\text{C}$	Reference to $25^\circ\text{C}, I_D = 1\text{mA}$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	1.1	1.3	$m\Omega$	$V_{GS} = 10V, I_D = 50A$ ③
		—	1.7	2.1		$V_{GS} = 4.5V, I_D = 50A$ ③
$V_{GS(th)}$	Gate Threshold Voltage	1.35	1.80	2.35	V	$V_{DS} = V_{GS}, I_D = 150\mu A$
$\Delta V_{GS(th)}$	Gate Threshold Voltage Coefficient	—	-6.2	—	$mV/^\circ\text{C}$	
I_{DSS}	Drain-to-Source Leakage Current	—	—	5.0	μA	$V_{DS} = 24V, V_{GS} = 0V$
		—	—	150		$V_{DS} = 24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
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	190	—	—	S	$V_{DS} = 15V, I_D = 50A$
Q_g	Total Gate Charge	—	120	—	nC	$V_{GS} = 10V, V_{DS} = 15V, I_D = 50A$
Q_g	Total Gate Charge	—	50	75	nC	$V_{DS} = 15V$ $V_{GS} = 4.5V$ $I_D = 50A$ See Fig. 18
Q_{gs1}	Pre-Vth Gate-to-Source Charge	—	12	—		
Q_{gs2}	Post-Vth Gate-to-Source Charge	—	6.5	—		
Q_{gd}	Gate-to-Drain Charge	—	16	—		
Q_{godr}	Gate Charge Overdrive	—	16	—		
Q_{sw}	Switch Charge ($Q_{gs2} + Q_{gd}$)	—	23	—	nC	$V_{DS} = 16V, V_{GS} = 0V$
Q_{oss}	Output Charge	—	30	—		
R_G	Gate Resistance	—	1.3	2.6	Ω	
$t_{d(on)}$	Turn-On Delay Time	—	26	—	ns	$V_{DD} = 15V, V_{GS} = 4.5V$ $I_D = 50A$ $R_G = 1.8\Omega$ See Fig. 17
t_r	Rise Time	—	30	—		
$t_{d(off)}$	Turn-Off Delay Time	—	31	—		
t_f	Fall Time	—	13	—		
C_{iss}	Input Capacitance	—	7200	—	pF	$V_{GS} = 0V$ $V_{DS} = 15V$ $f = 1.0\text{MHz}$
C_{oss}	Output Capacitance	—	1360	—		
C_{rss}	Reverse Transfer Capacitance	—	590	—		

Avalanche Characteristics

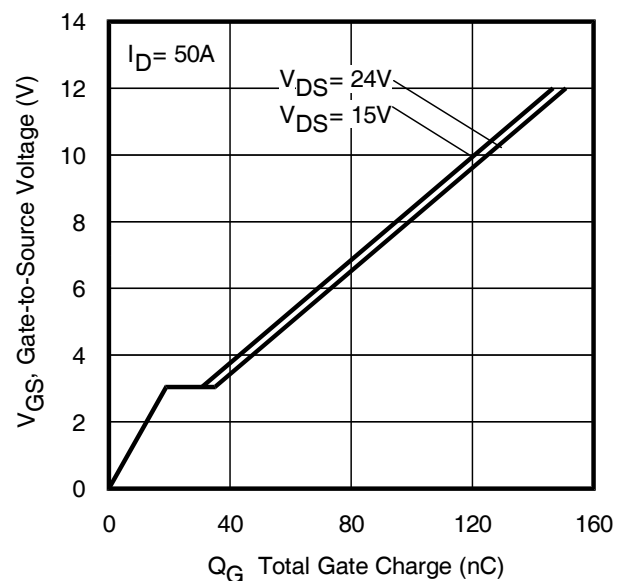
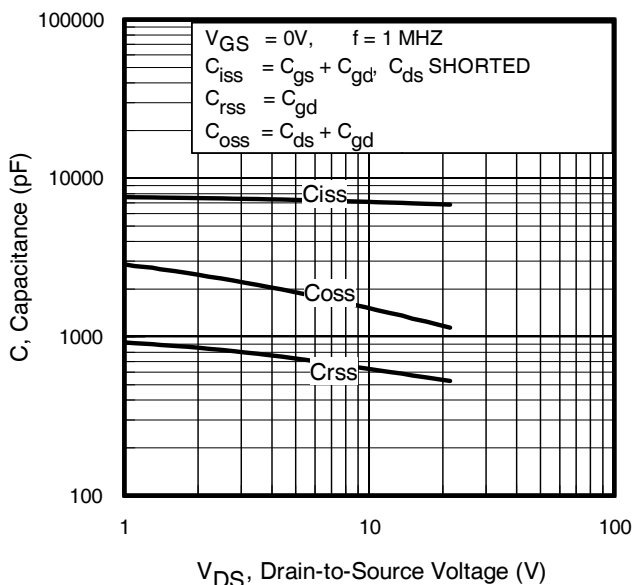
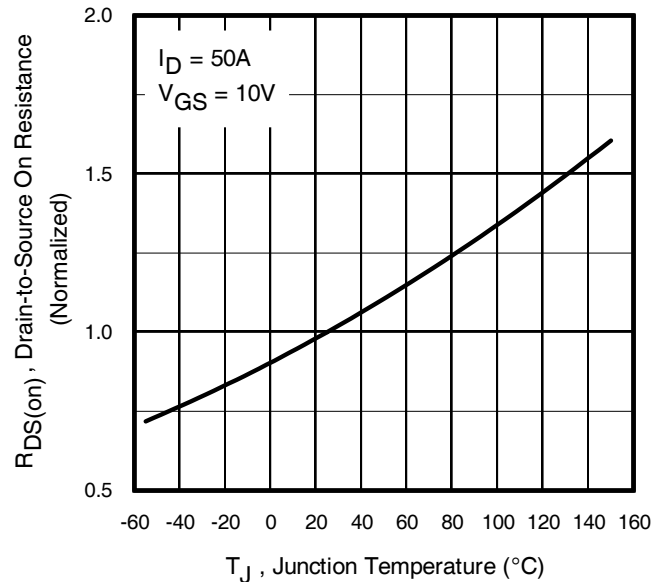
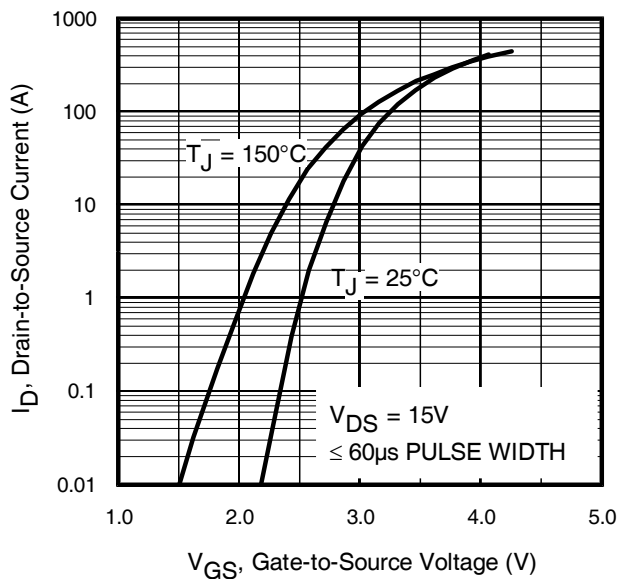
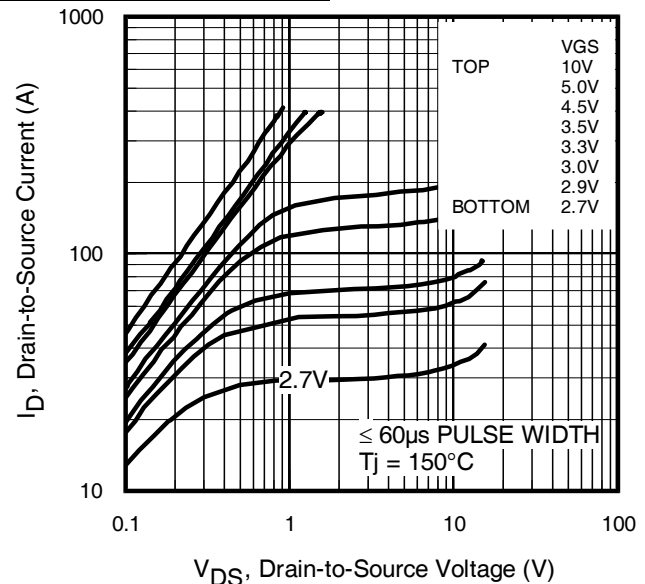
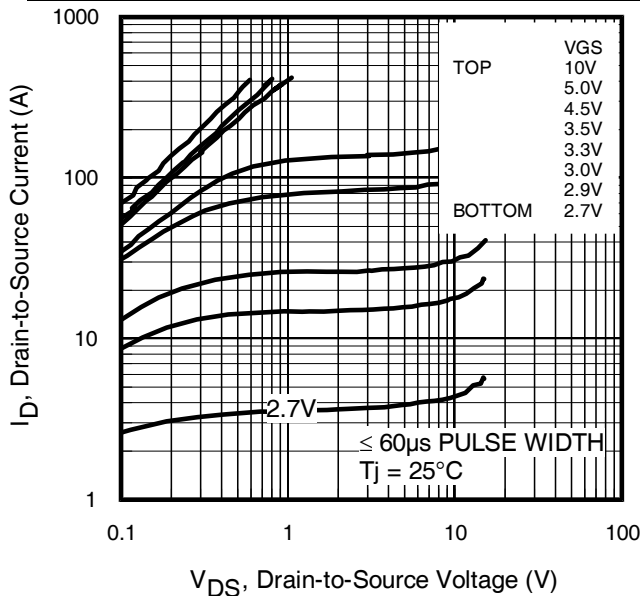
	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy ②	—	420	mJ
I_{AR}	Avalanche Current ①	—	50	A

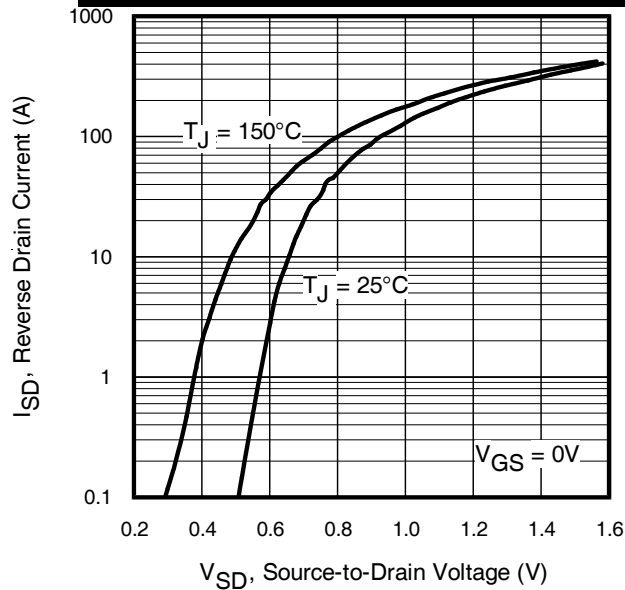
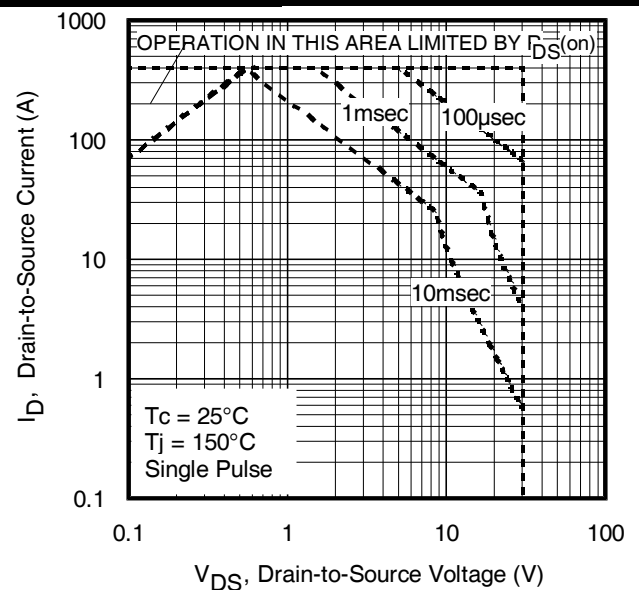
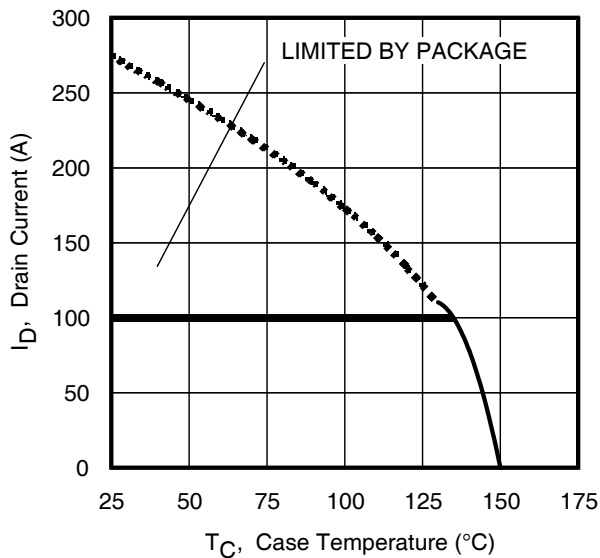
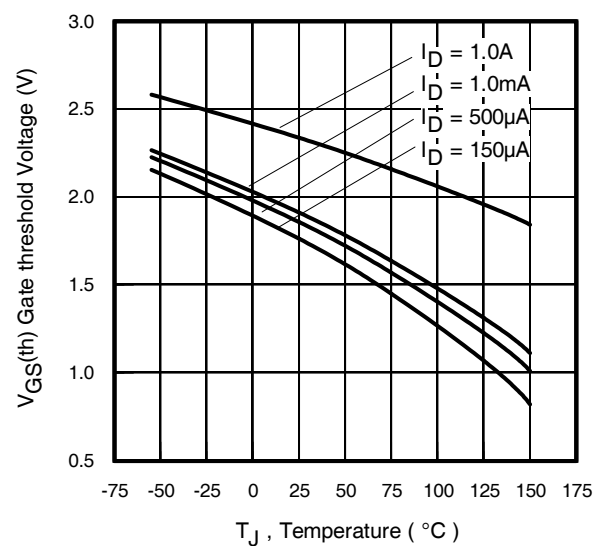
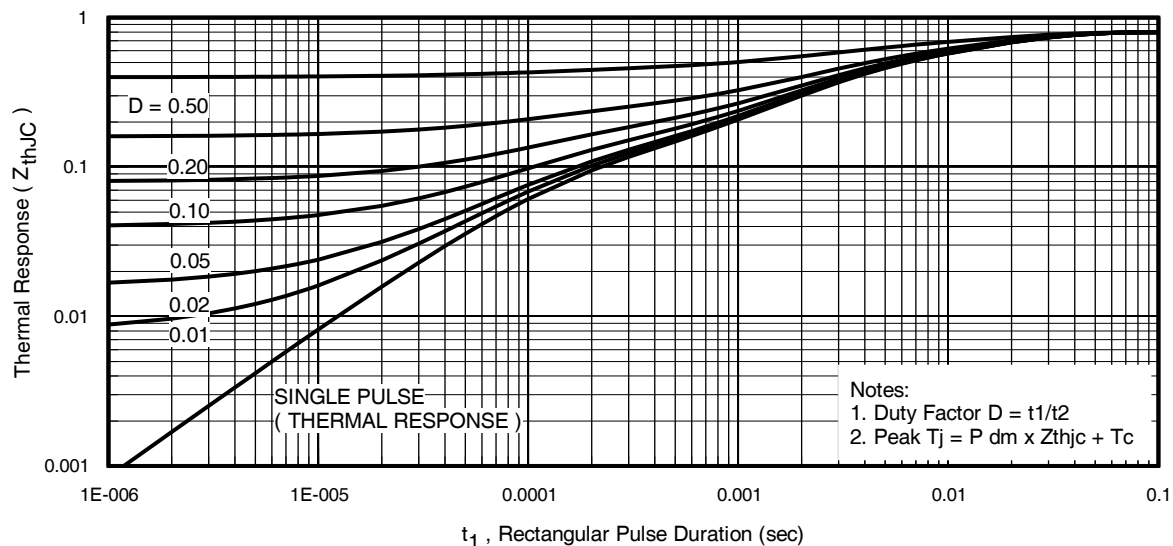
Diode Characteristics

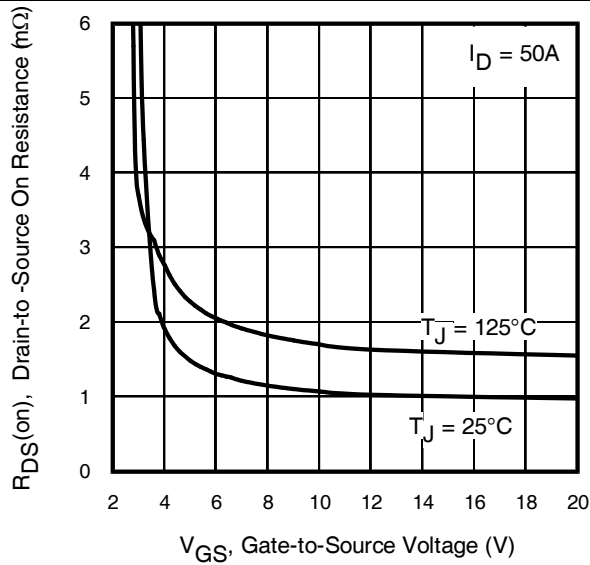
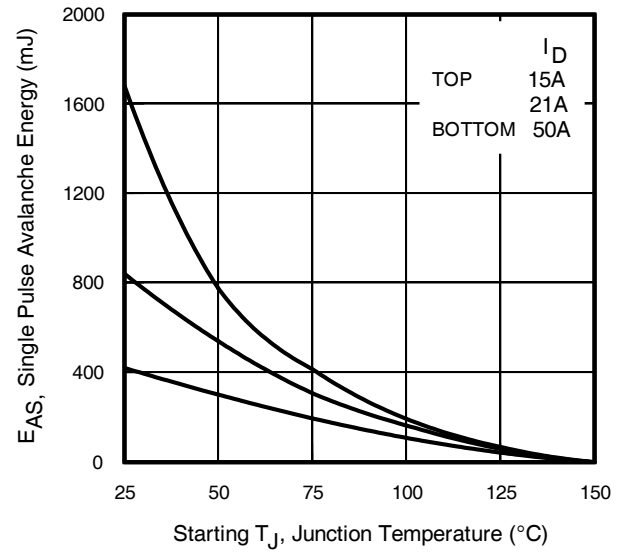
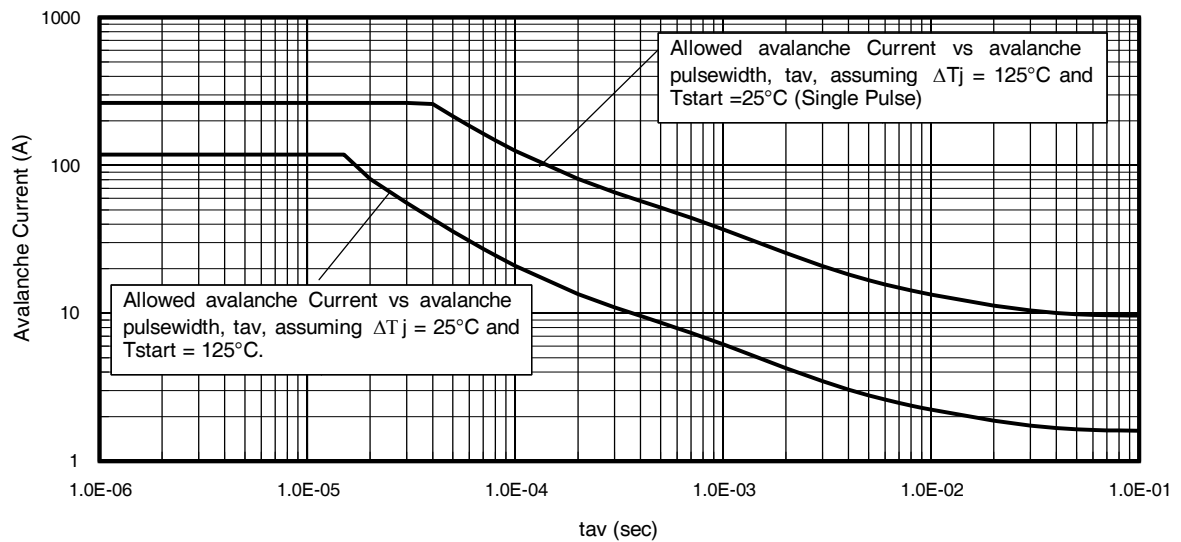
	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	100⑥	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	400		
V_{SD}	Diode Forward Voltage	—	—	1.0	V	$T_J = 25^\circ\text{C}, I_S = 50A, V_{GS} = 0V$ ③
t_{rr}	Reverse Recovery Time	—	34	51	ns	$T_J = 25^\circ\text{C}, I_F = 50A, V_{DD} = 15V$ $di/dt = 200A/\mu s$ ③
Q_{rr}	Reverse Recovery Charge	—	68	100	nC	

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$ (Bottom)	Junction-to-Case ④	0.5	0.8	$^\circ\text{C/W}$
$R_{\theta JC}$ (Top)	Junction-to-Case ④	—	15	
$R_{\theta JA}$	Junction-to-Ambient ⑤	—	35	
$R_{\theta JA} (<10s)$	Junction-to-Ambient ⑤	—	33	




Fig 7. Typical Source-Drain Diode Forward Voltage

Fig 8. Maximum Safe Operating Area

Fig 9. Maximum Drain Current vs. Case Temperature

Fig 10. Threshold Voltage Vs. Temperature

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


Fig 12. On-Resistance vs. Gate Voltage

Fig 13. Maximum Avalanche Energy vs. Drain Current

Fig 14. Typical Avalanche Current vs. Pulse width

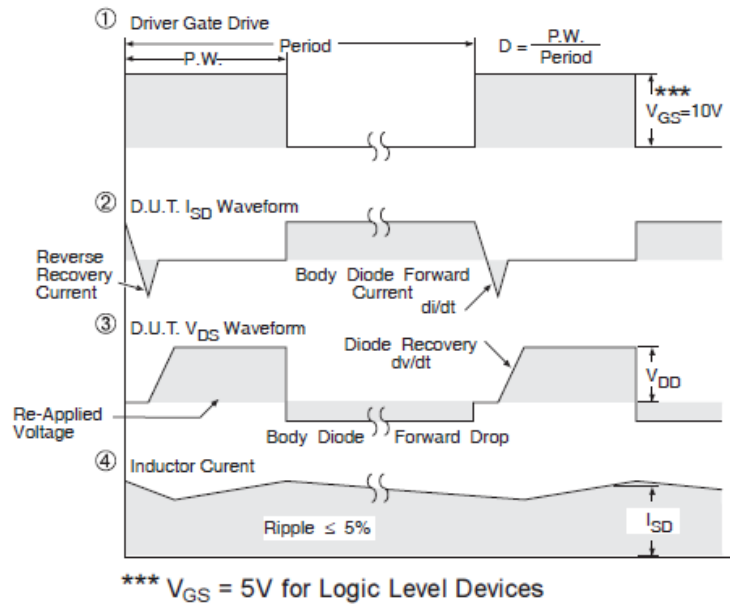
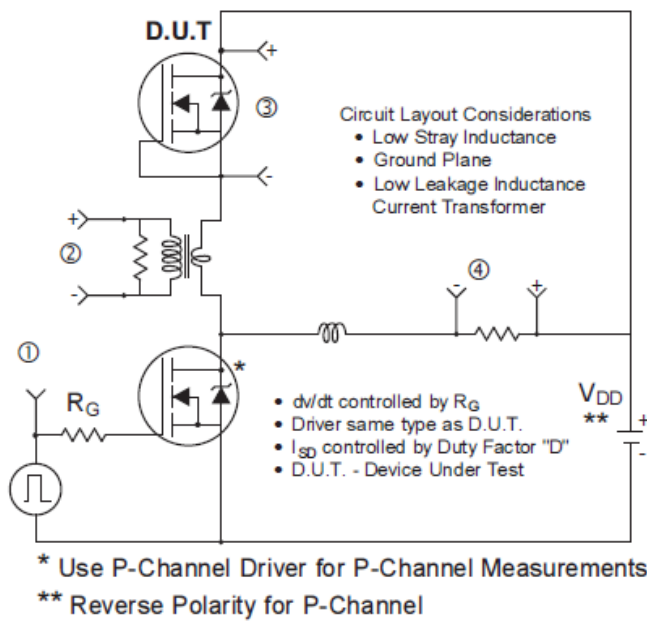


Fig 15. Peak Diode Recovery dv/dt Test Circuit for N-Channel HEXFET® Power MOSFETs

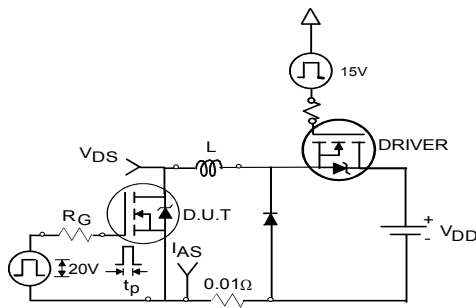


Fig 16a. Unclamped Inductive Test Circuit

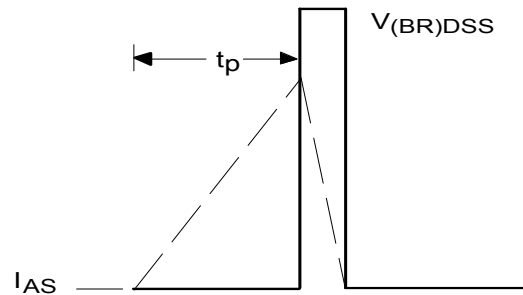


Fig 16b. Unclamped Inductive Waveforms

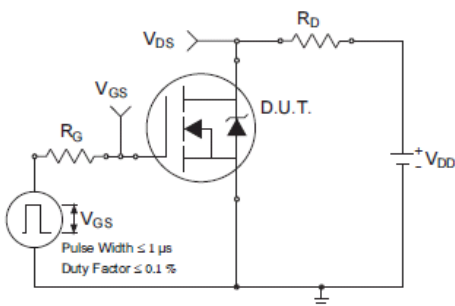


Fig 17a. Switching Time Test Circuit

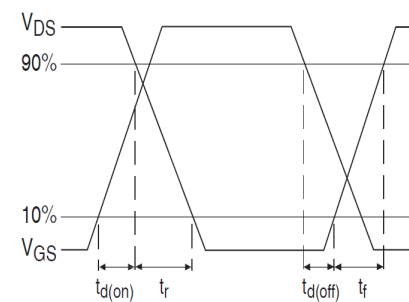


Fig 17b. Switching Time Waveforms

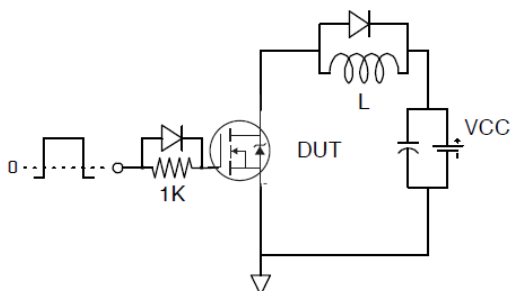


Fig 18a. Gate Charge Test Circuit

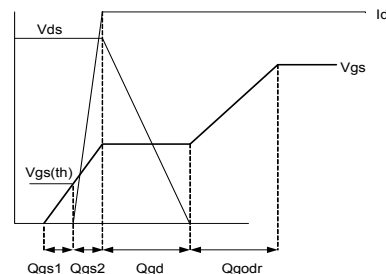
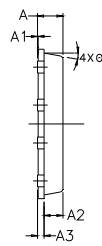
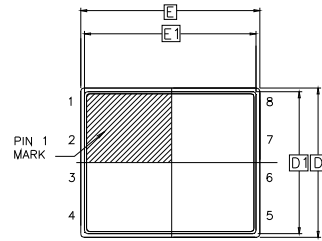


Fig 18b. Gate Charge Waveform

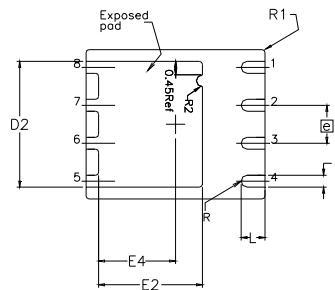
PQFN 5x6 Outline "B" Package Details


SIDE VIEW



TOP VIEW

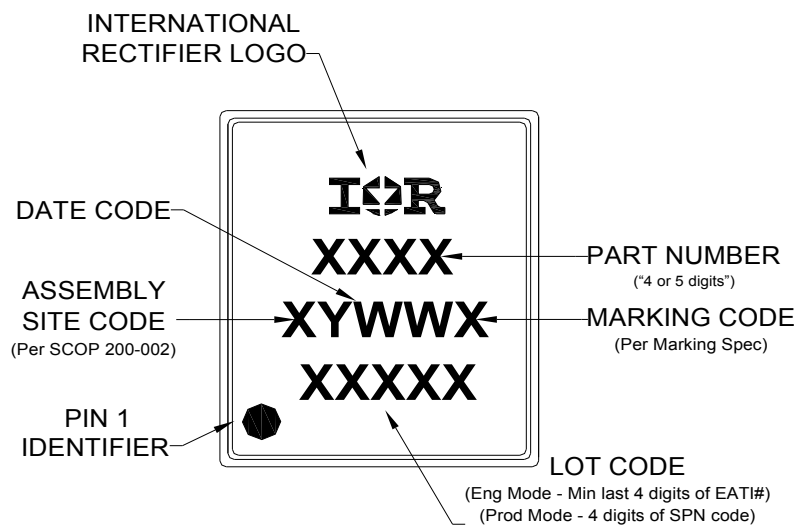
DIM SYMBOL	MIN	NOM	MAX
A	0.800	0.830	1.05
A1	0.000	0.020	0.050
A2	0.580	0.630	0.680
A3		0.254 REF	
Ø	0"	10"	12"
b	0.350	0.400	0.470
D	4.850	5.000	5.150
D1	4.675	4.750	5.000
D2	3.700	4.210	4.300
e		1.270 BSC	
E	5.850	6.000	6.150
E1	5.675	5.750	6.000
E2	3.380	3.480	3.760
E4	2.480	2.580	2.680
L	0.550	0.800	0.900
R		0.200 REF	
R1		0.100 REF	
R2	0.150	0.200	0.250



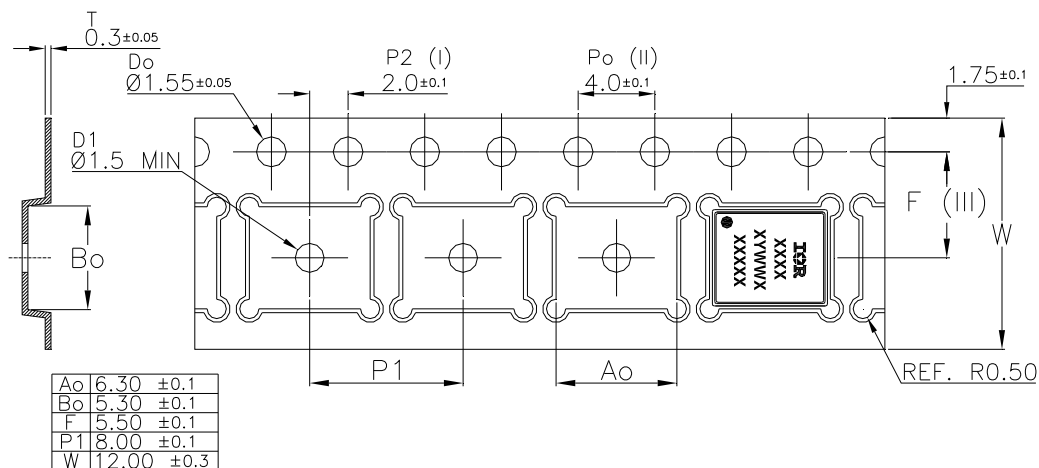
BOTTOM VIEW

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 "B" Part Marking


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

PQFN 5x6 Outline "B" Tape and Reel


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 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/>

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

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^\circ\text{C}$, $L = 0.337\text{mH}$, $R_G = 50\Omega$, $I_{AS} = 50\text{A}$.
- ③ Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.
- ④ R_θ is measured at T_J of approximately 90°C .
- ⑤ When mounted on 1 inch square PCB (FR-4). Please refer to AN-994 for more details:
<http://www.irf.com/technical-info/appnotes/an-994.pdf>
- ⑥ Calculated continuous current based on maximum allowable junction temperature. Package is limited to 100A by production test capability.

Revision History

Date	Comments
3/28/2013	Updated package outline, on page 7.
8/1/13	Added "StrongIRFET™" above part number on page1

International
 Rectifier

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