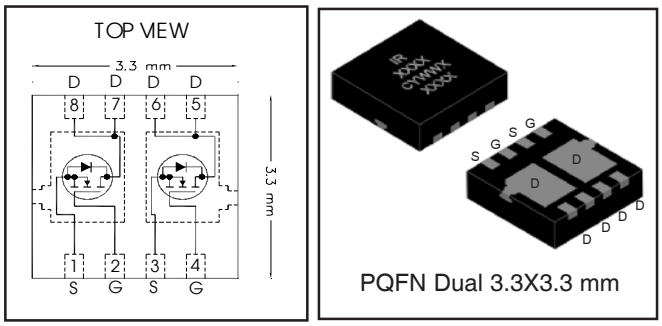
International
IOR Rectifier

IRFHM792PbF

HEXFET® Power MOSFET

V_{DS}	100	V
$V_{gs\ max}$	± 20	V
$R_{DS(on)\ max}$ (@V_{GS} = 10V)	195	mΩ
$Q_{g\ typ}$	4.2	nC
I_D (@$T_{c(Bottom)}$ = 25°C)	3.4⑥	A



Applications

- DC-DC Primary Switch
- 48V Battery Monitoring

Features and Benefits

Features		Benefits
Low RDSon (<195mΩ)		Lower Conduction Losses
Low Thermal Resistance to PCB (< 12°C/W)		Enable better thermal dissipation
Low Profile (<1.2mm)	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	
IRFHM792TRPBF	PQFN Dual 3.3mm x 3.3mm	Tape and Reel	4000	
~~IRFHM792TR2PBF~~	~~PQFN Dual 3.3mm x 3.3mm~~	~~Tape and Reel~~	~~400~~	EOL notice # 259

Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain-to-Source Voltage	100	V
V_{GS}	Gate-to-Source Voltage	± 20	
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	2.3	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	1.8	
I_D @ $T_{C(Bottom)}$ = 25°C	Continuous Drain Current, V_{GS} @ 10V	4.8 ⑥	
I_D @ $T_{C(Bottom)}$ = 100°C	Continuous Drain Current, V_{GS} @ 10V	3.1	
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V (Wirebond Limited)	3.4⑥	
I_{DM}	Pulsed Drain Current ①	14	
P_D @T_A = 25°C	Power Dissipation ⑤	2.3	W
P_D @$T_{C(Bottom)}$ = 25°C	Power Dissipation ⑤	10.4	
	Linear Derating Factor ⑤	0.018	W/°C
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C

Notes ① through ⑥ are on page 9

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	100	—	—	V	V_{GS} = 0V, I_D = 250µA
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.11	—	V/°C	Reference to 25°C, I_D = 1.0mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	164	195	mΩ	V_{GS} = 10V, I_D = 2.9A ③
$V_{GS(th)}$	Gate Threshold Voltage	2.0	3.0	4.0	V	V_{DS} = V_{GS}, I_D = 10µA
$\Delta V_{GS(th)}$	Gate Threshold Voltage Coefficient	—	-8.2	—	mV/°C	
I_{DSS}	Drain-to-Source Leakage Current	—	—	20	µA	V_{DS} = 100V, V_{GS} = 0V
		—	—	250	mA	V_{DS} = 100V, 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	3.5	—	—	S	V_{DS} = 50V, I_D = 2.9A
Q_g	Total Gate Charge	—	4.2	6.3	nC	V_{DS} = 50V V_{GS} = 10V I_D = 2.9A
Q_{gs1}	Pre-Vth Gate-to-Source Charge	—	0.7	—		
Q_{gs2}	Post-Vth Gate-to-Source Charge	—	0.3	—		
Q_{gd}	Gate-to-Drain Charge	—	1.3	—		
Q_{godr}	Gate Charge Overdrive	—	1.9	—		
Q_{sw}	Switch Charge (Q_{gs2} + Q_{gd})	—	1.6	—		
Q_{oss}	Output Charge	—	6.7	—	nC	V_{DS} = 16V, V_{GS} = 0V
R_G	Gate Resistance	—	1.6	—	Ω	
$t_{d(on)}$	Turn-On Delay Time	—	3.4	—	ns	V_{DD} = 50V, V_{GS} = 10V I_D = 2.9A R_G=1.8Ω
t_r	Rise Time	—	4.7	—		
$t_{d(off)}$	Turn-Off Delay Time	—	5.2	—		
t_f	Fall Time	—	2.6	—		
C_{iss}	Input Capacitance	—	251	—	pF	V_{GS} = 0V V_{DS} = 25V f = 1.0MHz
C_{oss}	Output Capacitance	—	31	—		
C_{rss}	Reverse Transfer Capacitance	—	13	—		

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy ②	—	10.2	mJ
I_{AR}	Avalanche Current ①	—	2.9	A

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	3.4⑥	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	14		
V_{SD}	Diode Forward Voltage	—	—	1.3	V	T_J = 25°C, I_S = 2.9A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	—	15	23	ns	T_J = 25°C, I_F = 2.9A, V_{DD} = 50V
Q_{rr}	Reverse Recovery Charge	—	45	68	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	—	12	°C/W
$R_{\theta JC}$ (Top)	Junction-to-Case ④	—	85	
$R_{\theta JA}$	Junction-to-Ambient ⑤	—	55	
$R_{\theta JA}$ (<10s)	Junction-to-Ambient ⑤	—	38	

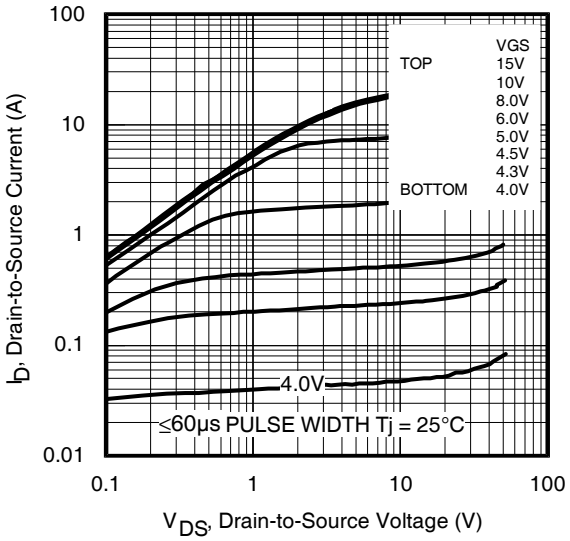


Fig 1. Typical Output Characteristics

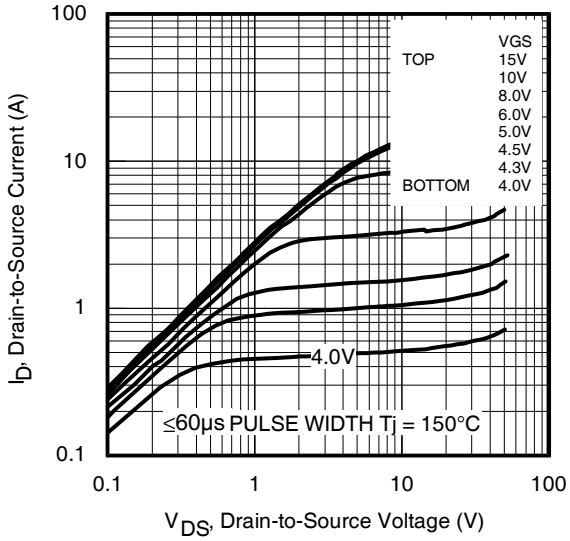


Fig 2. Typical Output Characteristics

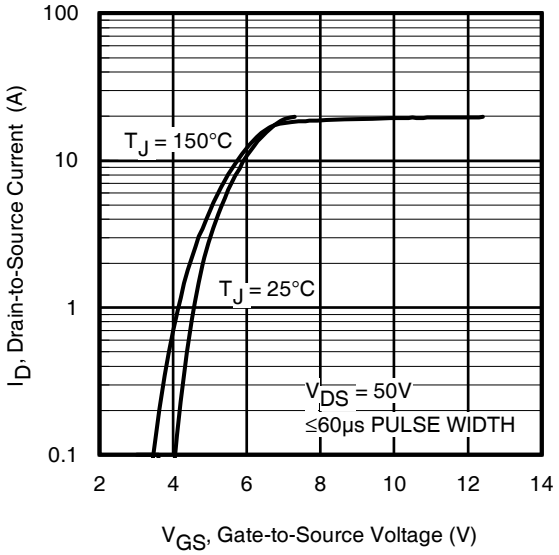


Fig 3. Typical Transfer Characteristics

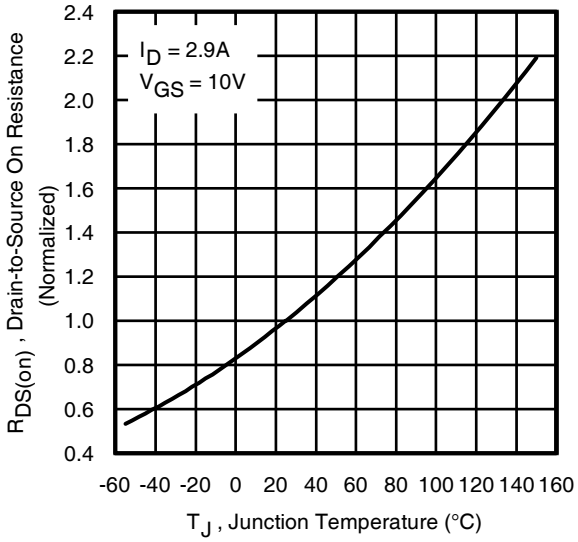


Fig 4. Normalized On-Resistance vs. Temperature

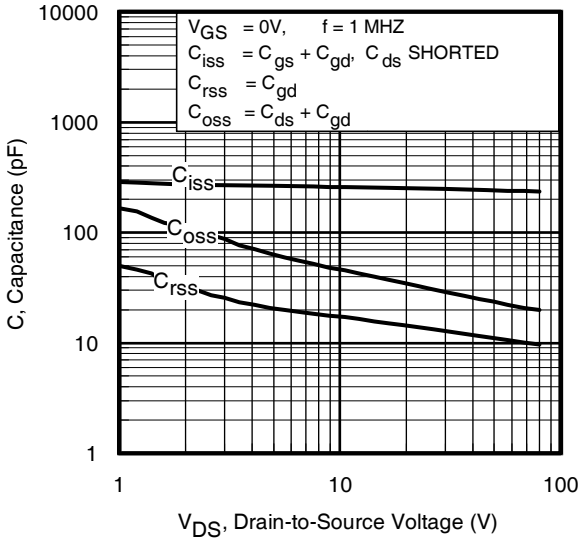


Fig 5. Typical Capacitance vs.Drain-to-Source Voltage

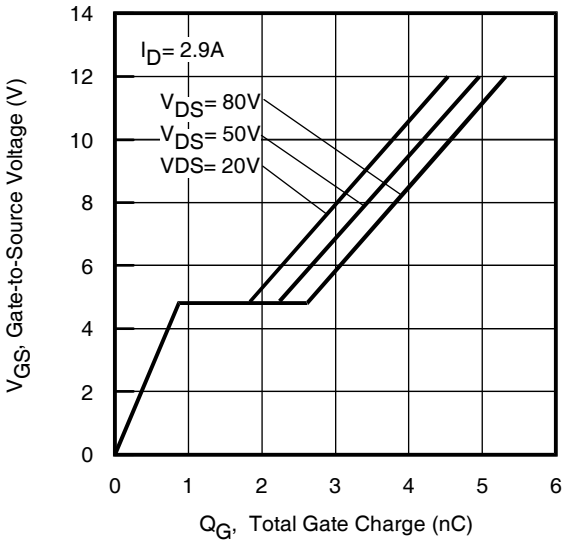


Fig 6. Typical Gate Charge vs.Gate-to-Source Voltage

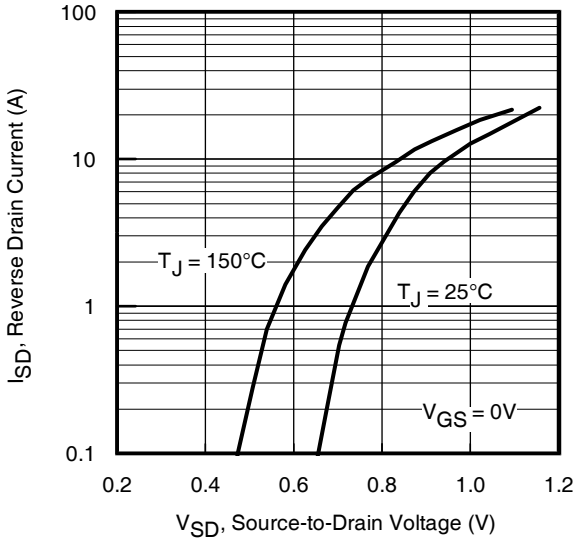


Fig 7. Typical Source-Drain Diode Forward Voltage

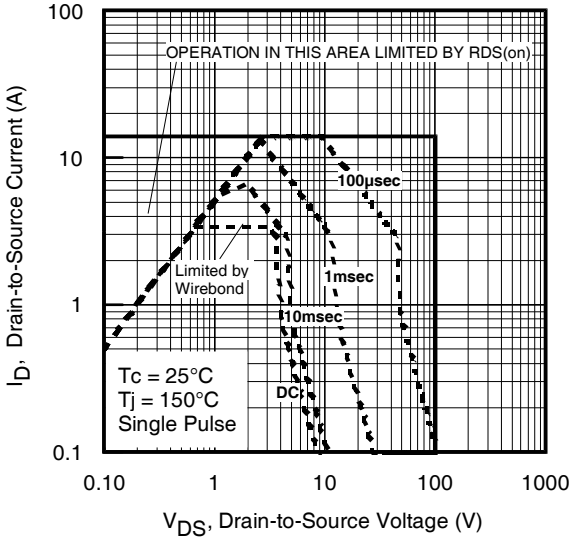


Fig 8. Maximum Safe Operating Area

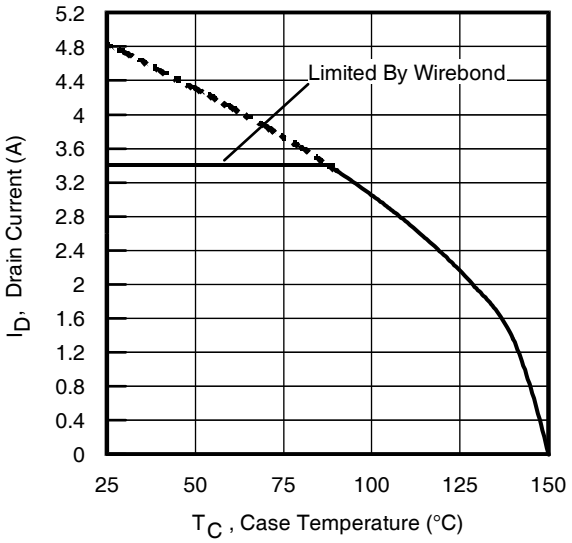


Fig 9. Maximum Drain Current vs. Case (Bottom) Temperature

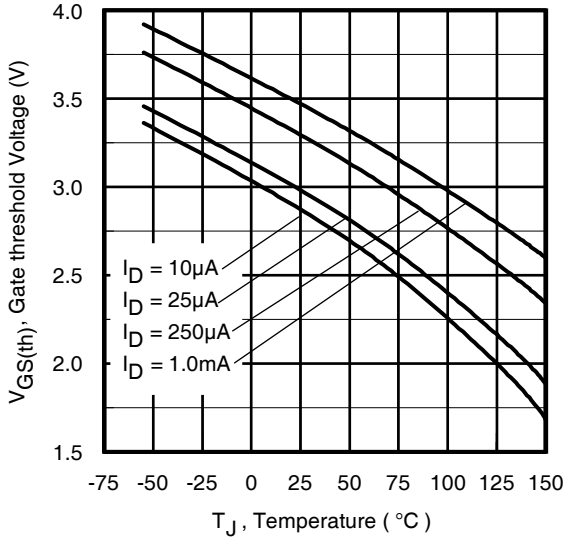


Fig 10. Threshold Voltage vs. Temperature

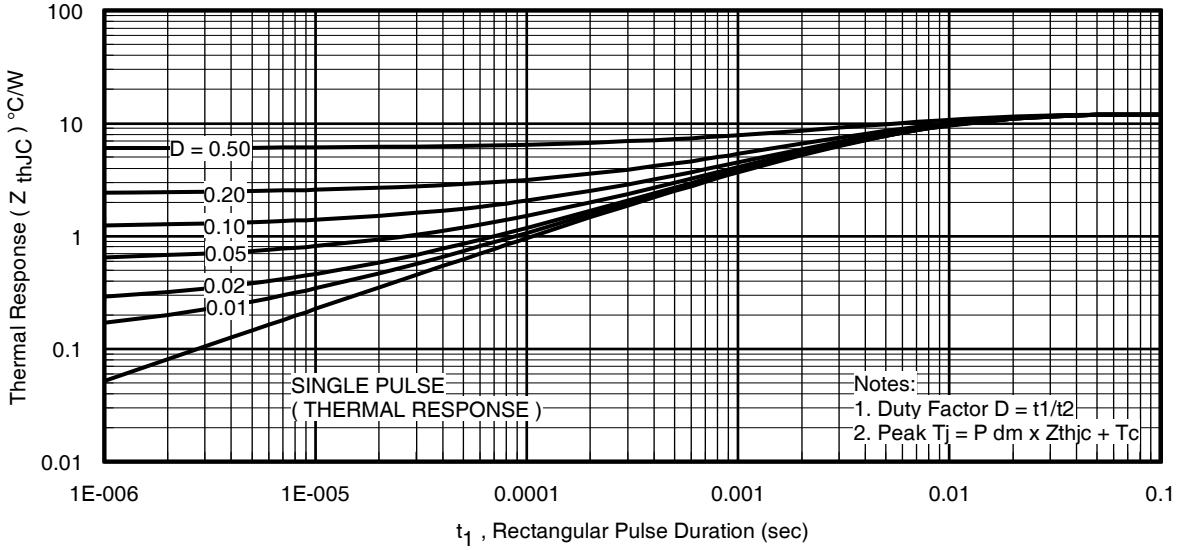


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case (Bottom)

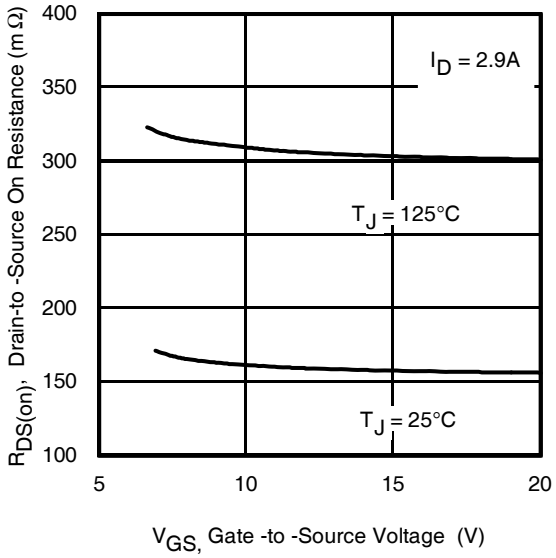


Fig 12. On-Resistance vs. Gate Voltage

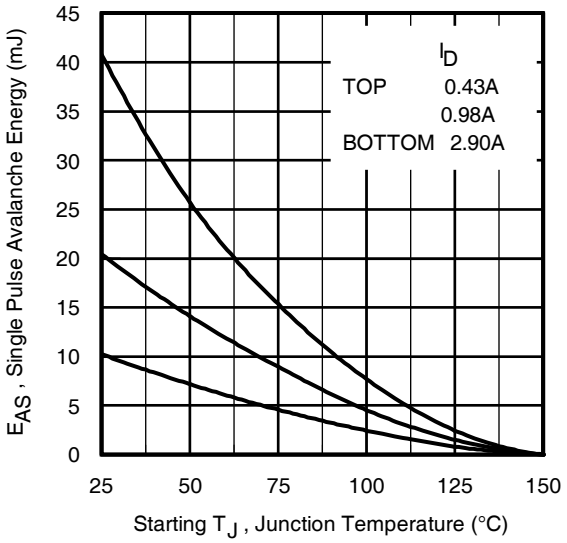


Fig 13. Maximum Avalanche Energy vs. Drain Current

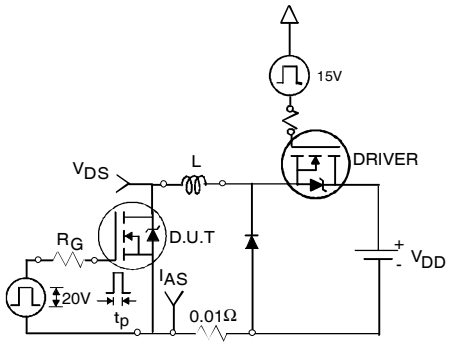


Fig 14a. Unclamped Inductive Test Circuit

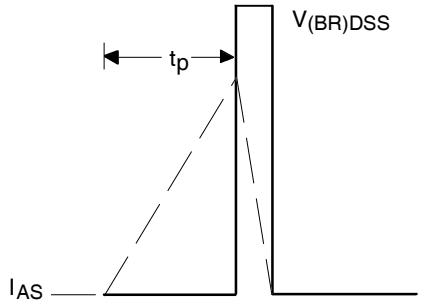


Fig 14b. Unclamped Inductive Waveforms

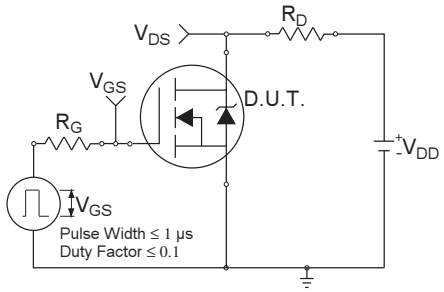


Fig 15a. Switching Time Test Circuit

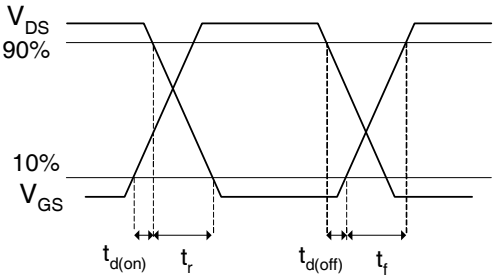


Fig 15b. Switching Time Waveforms

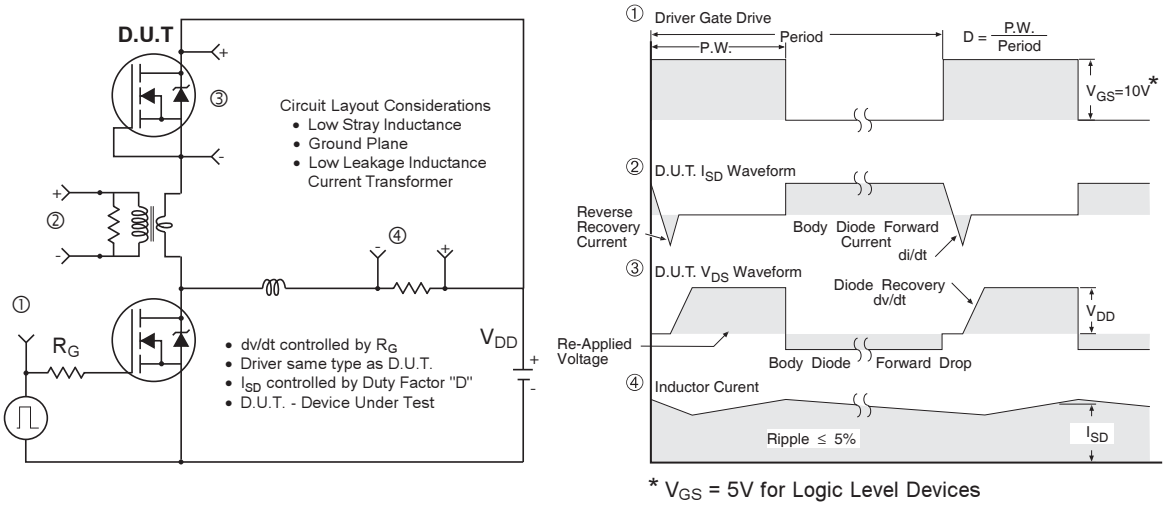


Fig 16. Peak Diode Recovery dv/dt Test Circuit for N-Channel HEXFET® Power MOSFETs

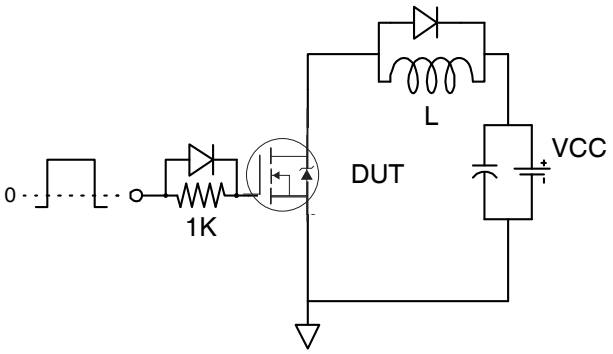


Fig 17. Gate Charge Test Circuit

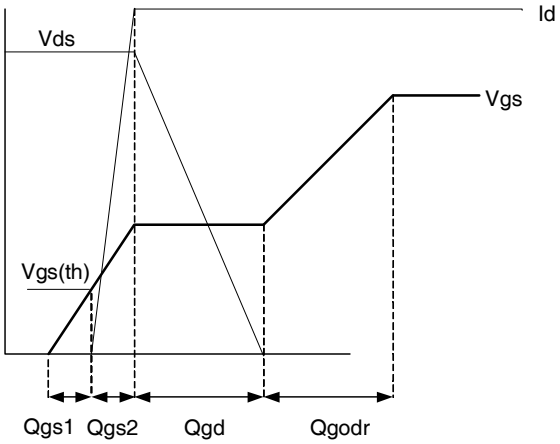
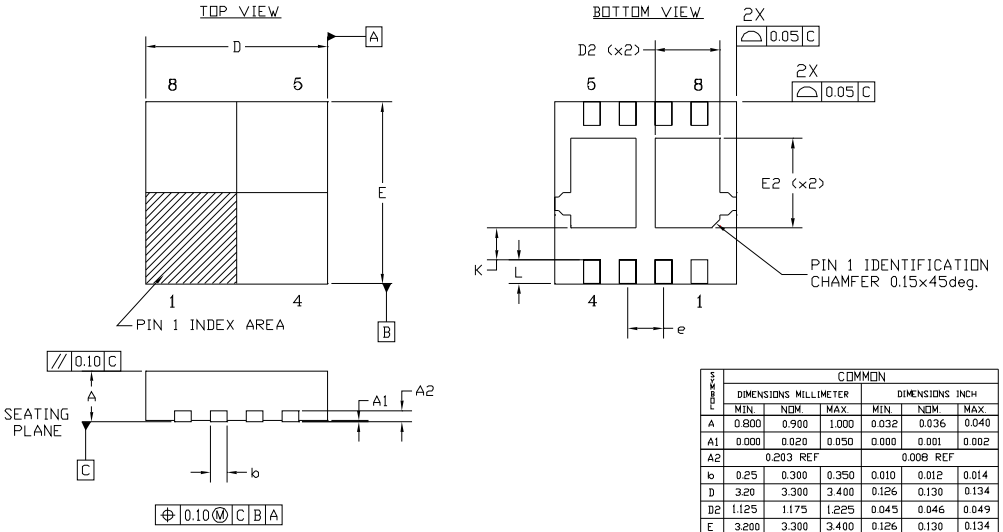


Fig 18. Gate Charge Waveform

PQFN Dual 3.3x3.3 Package Details



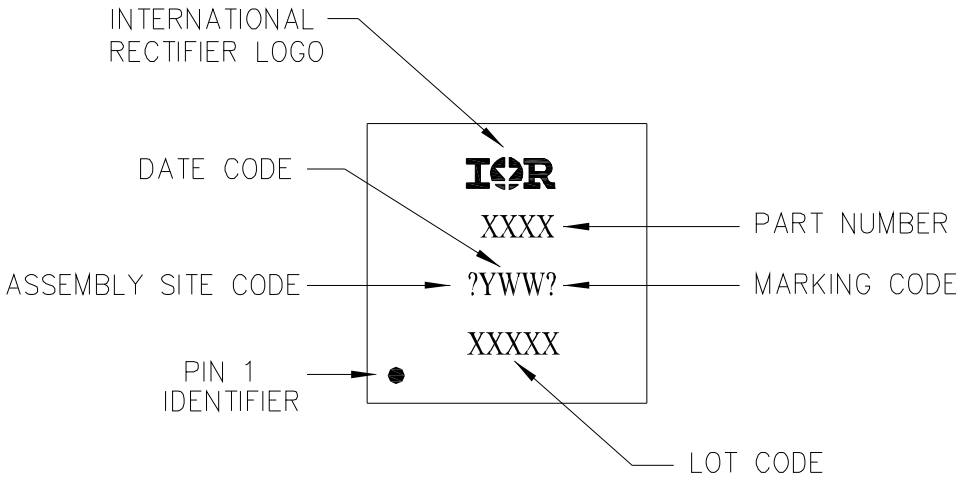
SYMBOL	COMMON					
	DIMENSIONS MILLIMETER			DIMENSIONS INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.800	0.900	1.000	0.032	0.036	0.040
A1	0.000	0.020	0.050	0.000	0.001	0.002
A2	0.203 REF			0.008 REF		
b	0.25	0.300	0.350	0.010	0.012	0.014
D	3.20	3.300	3.400	0.126	0.130	0.134
D2	1.125	1.175	1.225	0.045	0.046	0.049
E	3.200	3.300	3.400	0.126	0.130	0.134
E2	1.571	1.621	1.671	0.062	0.064	0.066
e	0.65 BSC			0.026 BSC		
L	0.380	0.430	0.48	0.015	0.017	0.019
K	0.583	-	-	0.023	-	-

NOTES :

1. DIMENSION AND TOLERANCING CONFORM TO ASME Y14.5M-1994.
2. CONTROLLING DIMENSIONS : MILLIMETER. CONVERTED INCH DIMENSION ARE NOT NECESSARILY EXACT.
3. DIMENSION b APPLIES TO METALLIZED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 mm. FROM TERMINAL TIP.

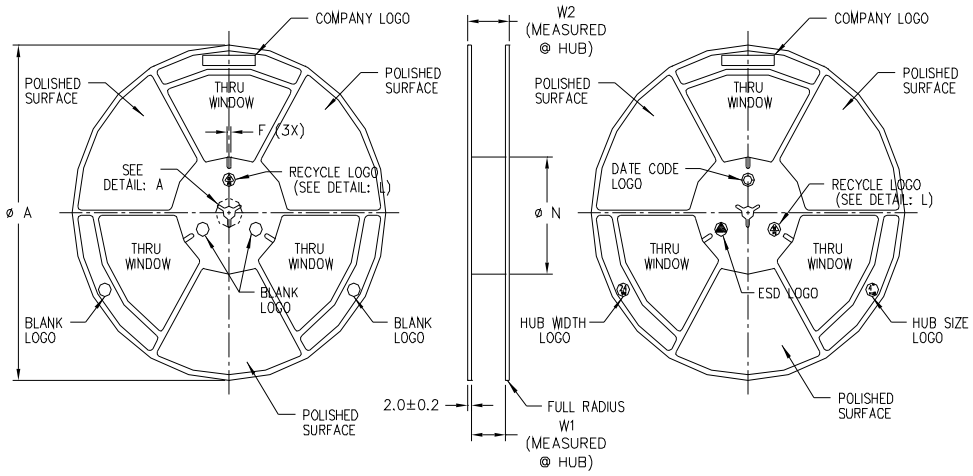
For footprint and stencil design recommendations, please refer to application note AN-1154 at
http://www.irf.com/technical-info/appnotes/an-1154.pdf

PQFN Dual 3.3x3.3 Part Marking



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

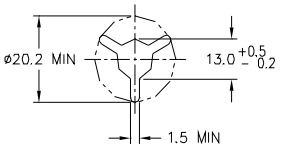
PQFN Dual 3.3x3.3 Tape and Reel



NOTES:

1. GENERIC PRODUCT.
2. FOR PRODUCT DRAWING ONLY.
3. SUNBLAST ALL SURFACE UNLESS OTHERWISE STATED.
4. MOLD 2

SURFACE RESISTIVITY			
LEGEND	SR RANGE	TYPE	COLOUR
A	BELOW 10^{12}	ANTISTATIC	ALL TYPES
B	10^{6} TO 10^{11}	STATIC DISSIPATIVE	BLACK ONLY
C	10^{5} & BELOW 10^{5}	CONDUCTIVE (GENERIC)	BLACK ONLY
D	10^{5} TO 10^{9}	CONDUCTIVE (CUSTOM)	BLACK ONLY
E	BELOW 10^{12}	COATED ANTISTATIC	ALL COLOR

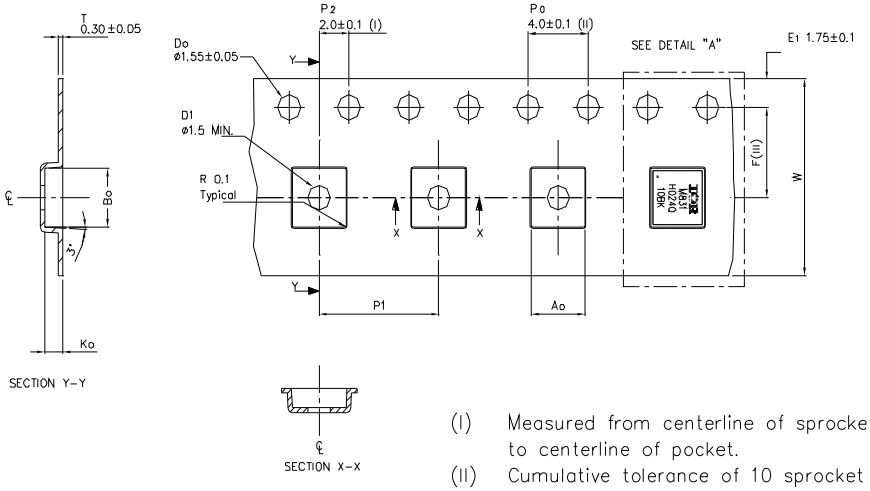


ARBOR HOLE
DETAIL: A

DETAIL: L

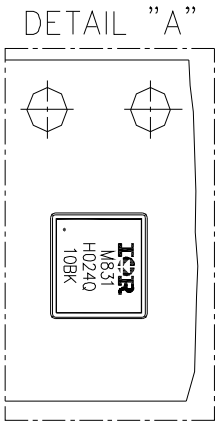
ANTISTATIC (ALL COLORS) STATIC DISSIPATIVE (BLACK) CONDUCTIVE (BLACK)

PRODUCT SPECIFICATION					
TAPE WIDTH	ø A ± 2.0	ø N ± 2.0	W1	W2 (MAX)	E (MIN)
08MM	330	100	8.4 +1.5 −0.0	14.4	2.5
12MM	330	100	12.4 +2.0 −0.0	18.4	2.5
16MM	330	100	16.4 +2.0 −0.0	22.4	2.5
24MM	330	100	24.4 +2.0 −0.0	30.4	2.5
32MM	330	100	32.4 +2.0 −0.0	38.4	2.5



Ao	3.60 +/− 0.1
Bo	3.60 +/− 0.1
Ko	1.20 +/− 0.1
F	5.50 +/− 0.1
P_1	8.00 +/− 0.1
W	12.00 +/− 0.3

(I) Measured from centerline of sprocket hole to centerline of pocket.
(II) Cumulative tolerance of 10 sprocket holes is ± 0.20 .
(III) Measured from centerline of sprocket hole to centerline of pocket.
(IV) Other material available.
(V) Typical SR of form tape Max 10^{9} OHM/SQ



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 Dual 3.3mm x 3.3mm	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

†† 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 = 2.43mH, R_G = 50Ω, I_{AS} = 2.9A.

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.

⑥ Calculated continuous current based on maximum allowable junction temperature. Package is limited to 3.4A by wirebond capability.

Revision History

Date	Comments
12/16/2013	• Updated ordering information to reflect the End-Of-life (EOL) of the mini-reel option (EOL notice #259) • Updated data sheet with new IR corporate template

International IOR Rectifier

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

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