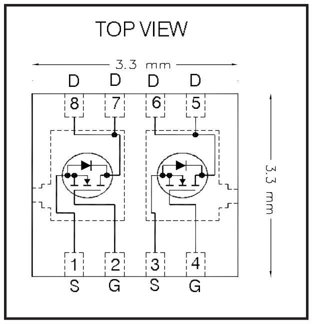
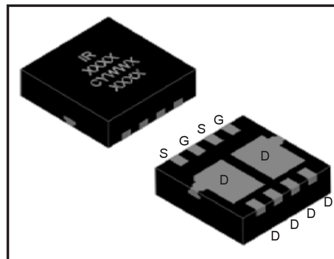
International
IOR Rectifier

IRFHM8363PbF

HEXFET® Power MOSFET

V_{DS}	30	V
$V_{gs\ max}$	± 20	V
$R_{DS(on)\ max}$ (@V_{GS} = 10V)	14.9	mΩ
(@V_{GS} = 4.5V)	20.4	
$Q_{g\ typ}$	6.7	nC
I_D (@$T_{c(Bottom)}$ = 25°C)	10⑦	A





PQFN Dual 3.3X3.3 mm

Applications

- Power Stage for high frequency buck converters
- Battery Protection charge and discharge switches

Features and Benefits

Features		Benefits
Low Thermal Resistance to PCB (< 6.7°C/W)		Enable better thermal dissipation
Low Profile (<1.0mm)	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, Consumer Qualification		Increased Reliability

Orderable part number	Package Type	Standard Pack		Note
		Form	Quantity	
IRFHM8363TRPBF	PQFN Dual 3.3mm x 3.3mm	Tape and Reel	4000	
IRFHM8363TR2PBF	PQFN Dual 3.3mm x 3.3mm	Tape and Reel	400	

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°C	Continuous Drain Current, V_{GS} @ 10V	11	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	8.6	
I_D @ $T_{C(Bottom)}$ = 25°C	Continuous Drain Current, V_{GS} @ 10V	29⑥⑦	
I_D @ $T_{C(Bottom)}$ = 100°C	Continuous Drain Current, V_{GS} @ 10V	18⑥⑦	
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V (Package Limited)	10⑦	
I_{DM}	Pulsed Drain Current ①	116	
P_D @T_A = 25°C	Power Dissipation ⑤	2.7	W
P_D @$T_{C(Bottom)}$ = 25°C	Power Dissipation	19	
	Linear Derating Factor	0.02	W/°C
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C

Notes ① through ⑦ are on page 9

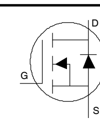
Static @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	30	–––	–––	V	V_{GS} = 0V, I_D = 250μA
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	–––	0.022	–––	V/°C	Reference to 25°C, I_D = 1.0mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	–––	12.2	14.9	mΩ	V_{GS} = 10V, I_D = 10A ③
		–––	16.3	20.4		V_{GS} = 4.5V, I_D = 8.0A ③
$V_{GS(th)}$	Gate Threshold Voltage	1.35	1.8	2.35	V	V_{DS} = V_{GS}, I_D = 25μA
$\Delta V_{GS(th)}$	Gate Threshold Voltage Coefficient	–––	-6.3	–––	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
gfs	Forward Transconductance	20	–––	–––	S	V_{DS} = 10V, I_D = 10A
Q_g	Total Gate Charge	–––	15	–––	nC	V_{GS} = 10V, V_{DS} = 15V, I_D = 10A
Q_g	Total Gate Charge	–––	6.7	–––	nC	V_{DS} = 15V
Q_{gs1}	Pre-Vth Gate-to-Source Charge	–––	2.1	–––		V_{GS} = 4.5V
Q_{gs2}	Post-Vth Gate-to-Source Charge	–––	1.0	–––		I_D = 10A
Q_{gd}	Gate-to-Drain Charge	–––	2.0	–––		
Q_{godr}	Gate Charge Overdrive	–––	1.6	–––		
Q_{sw}	Switch Charge (Q_{gs2} + Q_{gd})	–––	3.0	–––		
Q_{oss}	Output Charge	–––	7.6	–––	nC	V_{DS} = 24V, V_{GS} = 0V
R_G	Gate Resistance	–––	1.6	–––	Ω	
$t_{d(on)}$	Turn-On Delay Time	–––	14	–––	ns	V_{DD} = 15V, V_{GS} = 4.5V
t_r	Rise Time	–––	94	–––		I_D = 10A
$t_{d(off)}$	Turn-Off Delay Time	–––	12	–––		R_G=1.8Ω
t_f	Fall Time	–––	33	–––		
C_{iss}	Input Capacitance	–––	1165	–––	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	–––	260	–––		V_{DS} = 10V
C_{rss}	Reverse Transfer Capacitance	–––	100	–––		f = 1.0MHz

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy ②	–––	29	mJ
I_{AR}	Avalanche Current ①	–––	10	A

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	–––	–––	10⑦	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	–––	–––	116		
V_{SD}	Diode Forward Voltage	–––	–––	1.3	V	T_J = 25°C, I_S = 10A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	–––	17	26	ns	T_J = 25°C, I_F = 10A, V_{DD} = 15V
Q_{rr}	Reverse Recovery Charge	–––	24	36	nC	di/dt = 280A/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	–––	6.7	°C/W
$R_{\theta JC}$ (Top)	Junction-to-Case ④	–––	72	
$R_{\theta JA}$	Junction-to-Ambient ⑤	–––	47	
$R_{\theta JA}$ (<10s)	Junction-to-Ambient ⑤	–––	32	

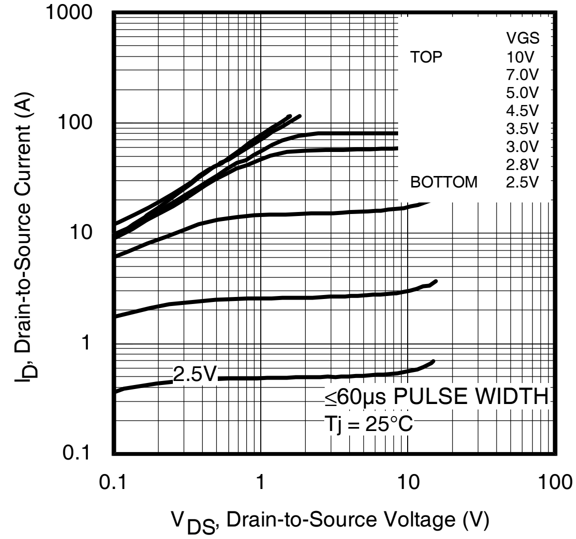


Fig 1. Typical Output Characteristics

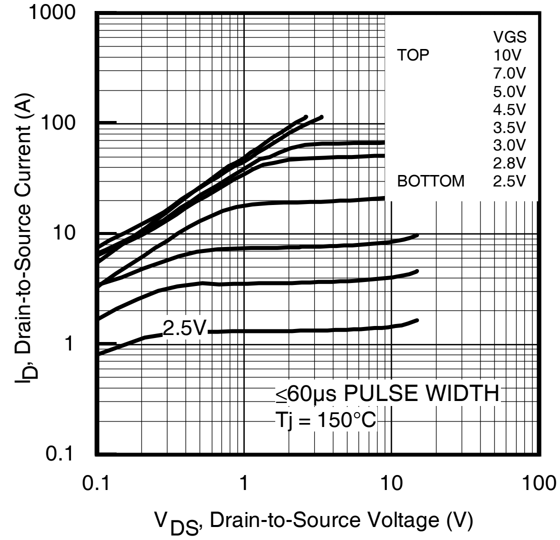


Fig 2. Typical Output Characteristics

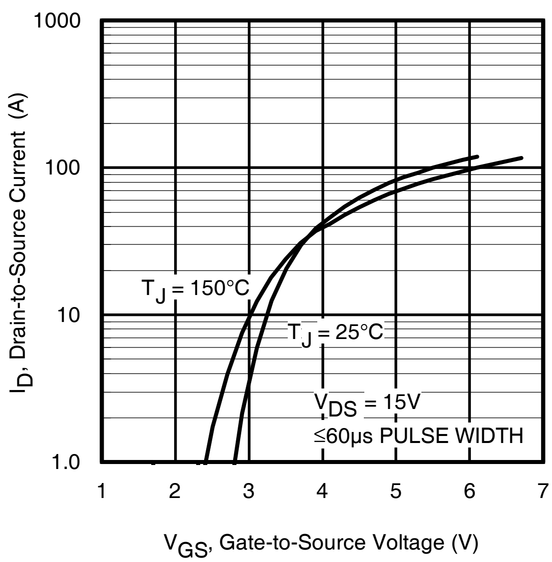


Fig 3. Typical Transfer Characteristics

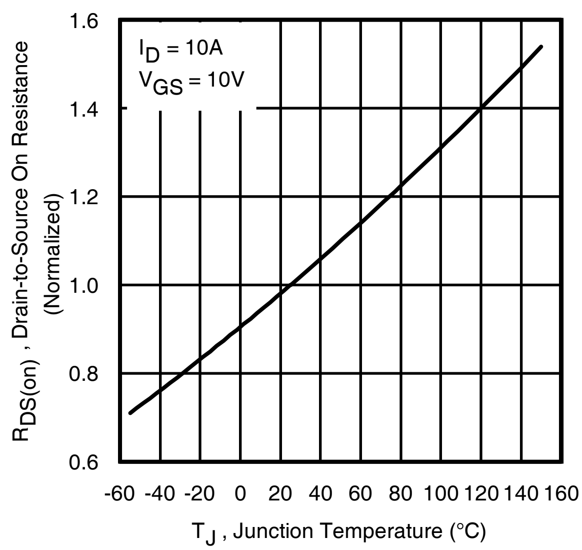


Fig 4. Normalized On-Resistance vs. Temperature

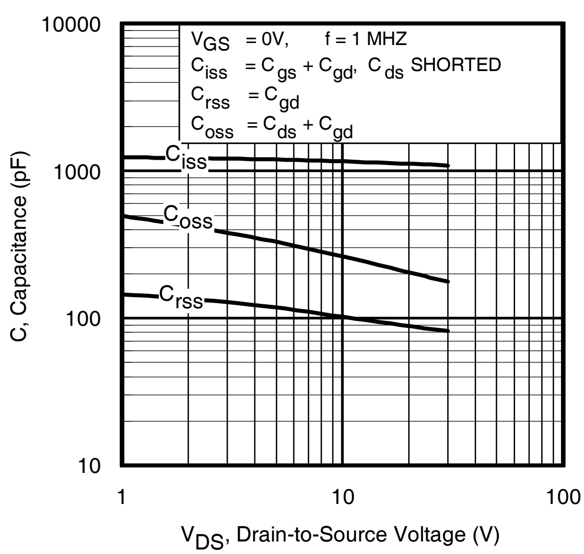


Fig 5. Typical Capacitance vs.Drain-to-Source Voltage

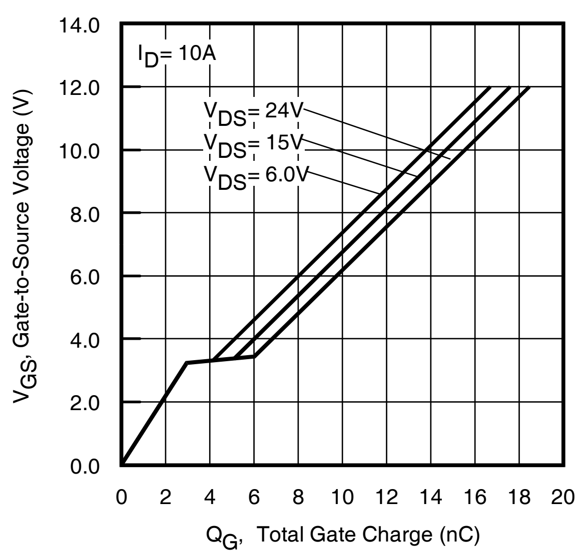


Fig 6. Typical Gate Charge vs.Gate-to-Source Voltage

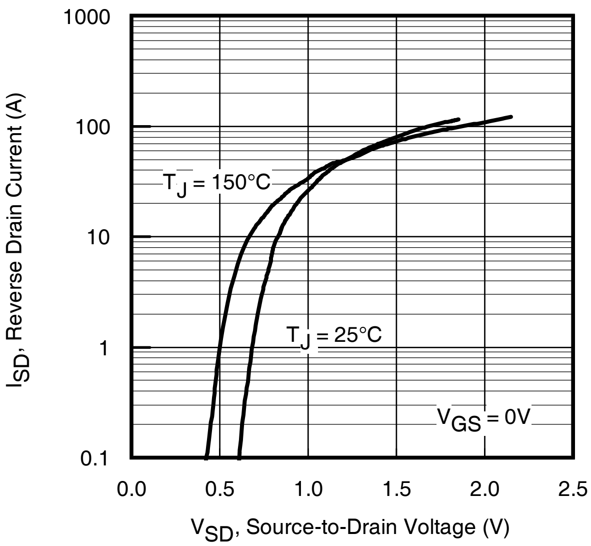


Fig 7. Typical Source-Drain Diode Forward Voltage

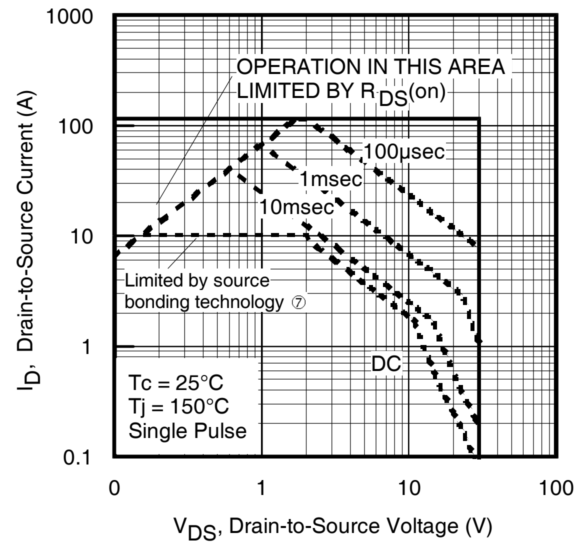


Fig 8. Maximum Safe Operating Area

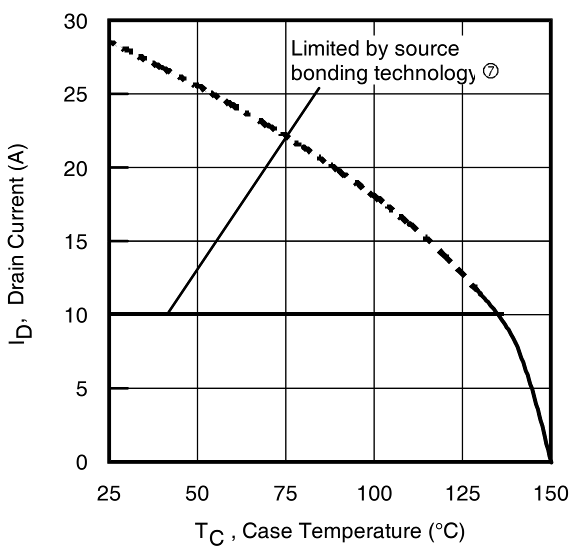


Fig 9. Maximum Drain Current vs. Case (Bottom) Temperature

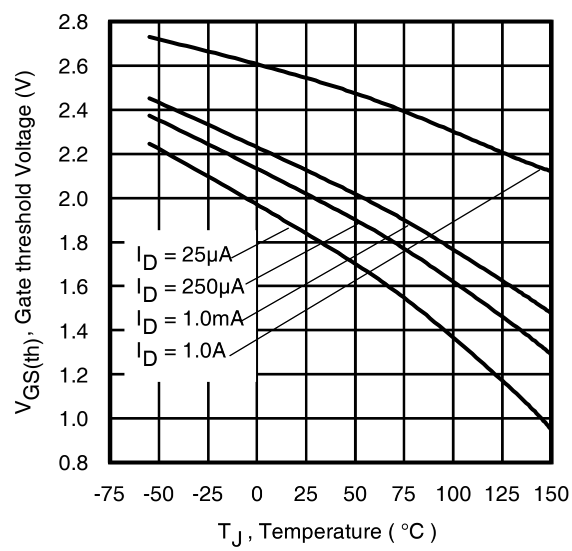


Fig 10. Threshold Voltage vs. Temperature

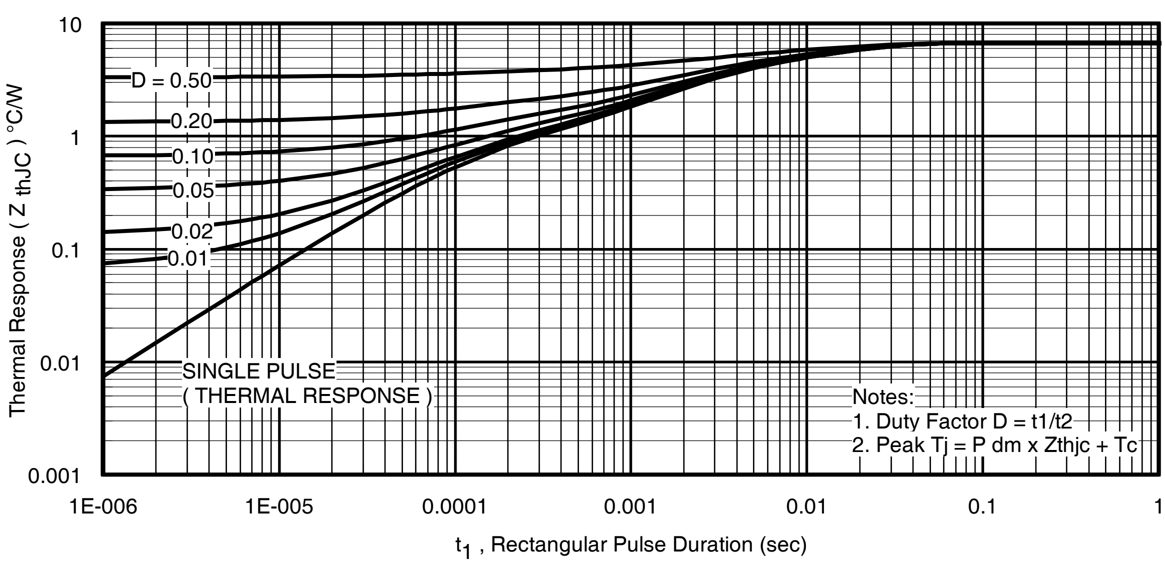


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case (Bottom)

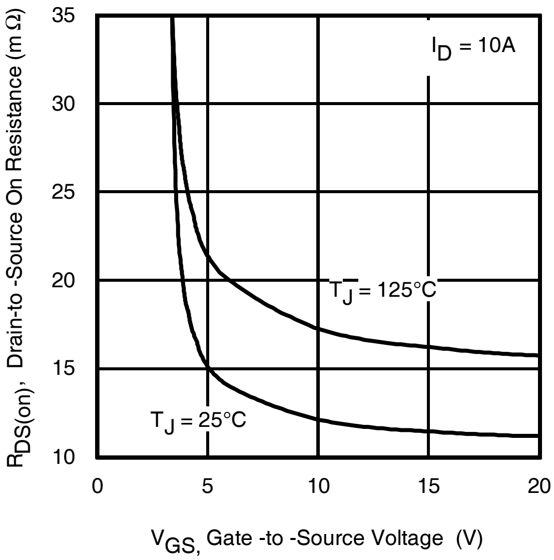


Fig 12. On-Resistance vs. Gate Voltage

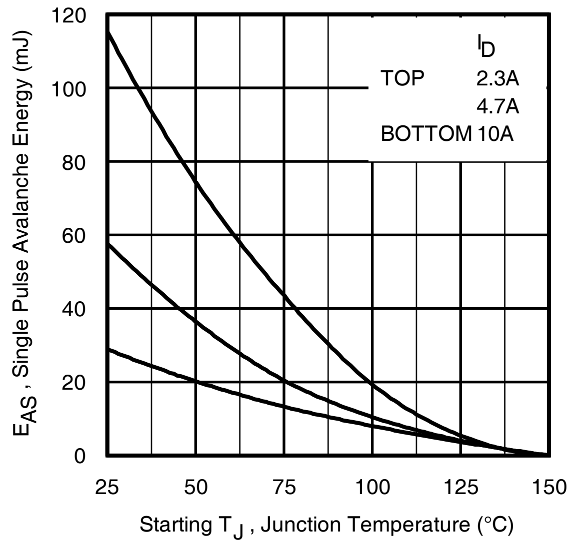


Fig 13. Maximum Avalanche Energy vs. Drain Current

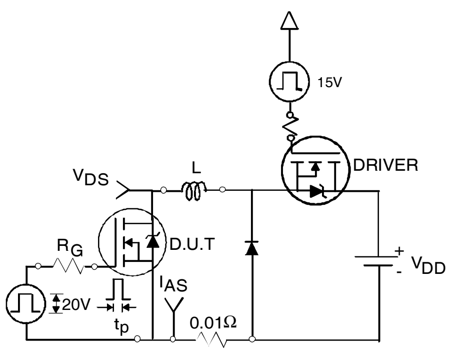


Fig 14a. Unclamped Inductive Test Circuit

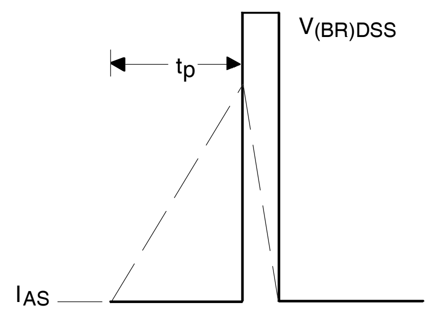


Fig 14b. Unclamped Inductive Waveforms

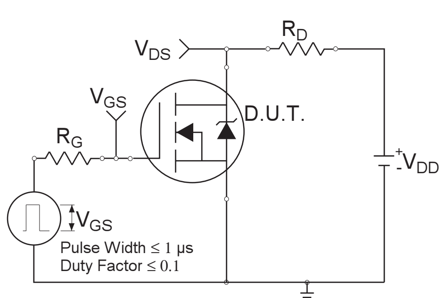


Fig 15a. Switching Time Test Circuit

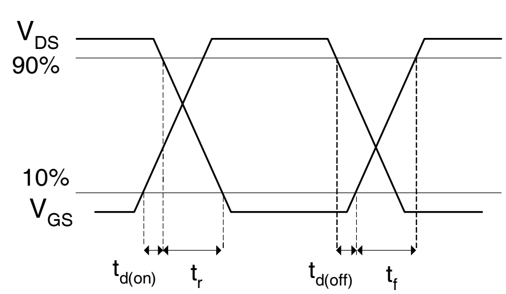


Fig 15b. Switching Time Waveforms

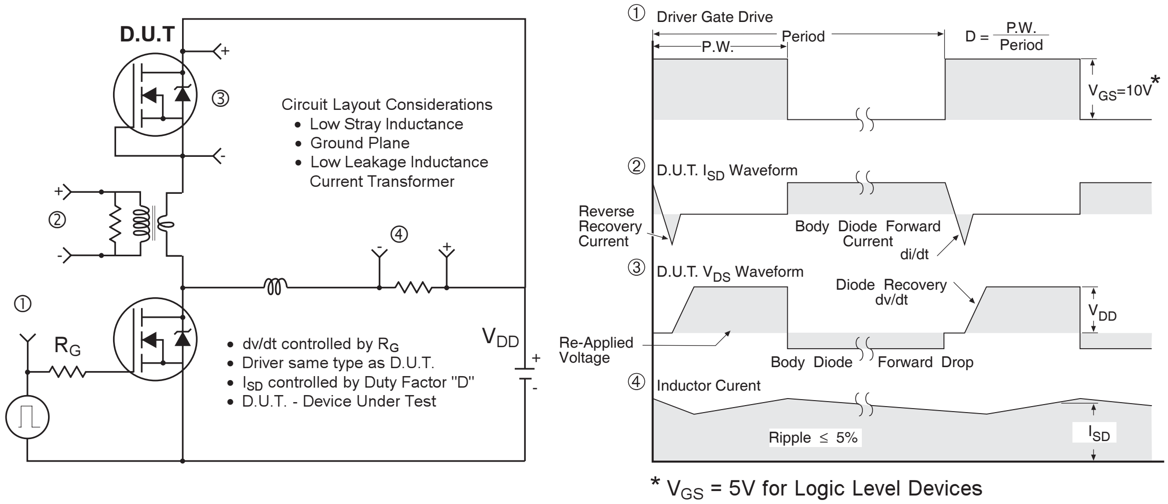


Fig 16. Peak Diode Recovery dv/dt Test Circuit for N-Channel HEXFET® Power MOSFETs

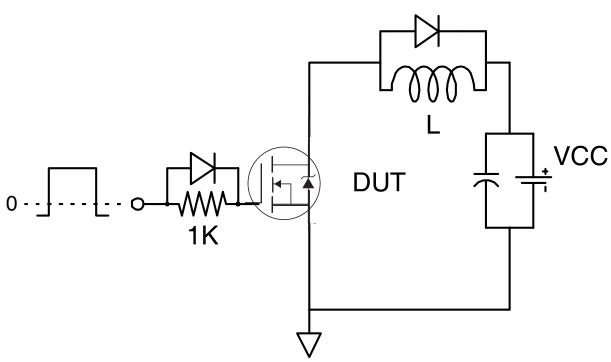


Fig 17. Gate Charge Test Circuit

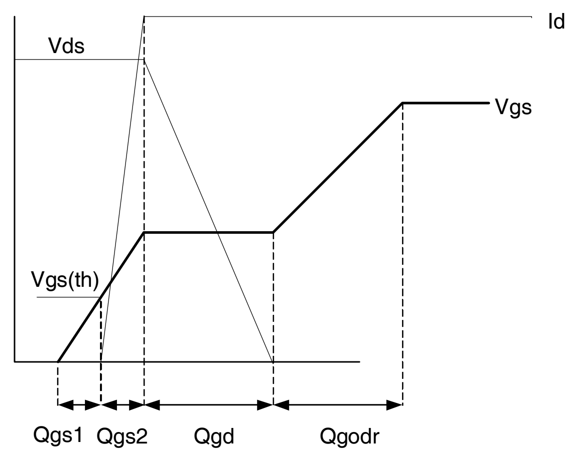
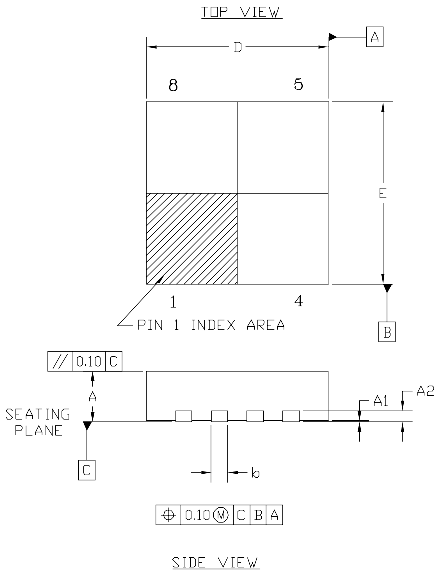
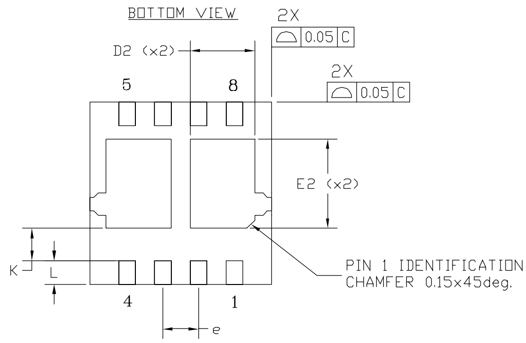


Fig 18. Gate Charge Waveform

PQFN Dual 3.3 x 3.3 Package Details





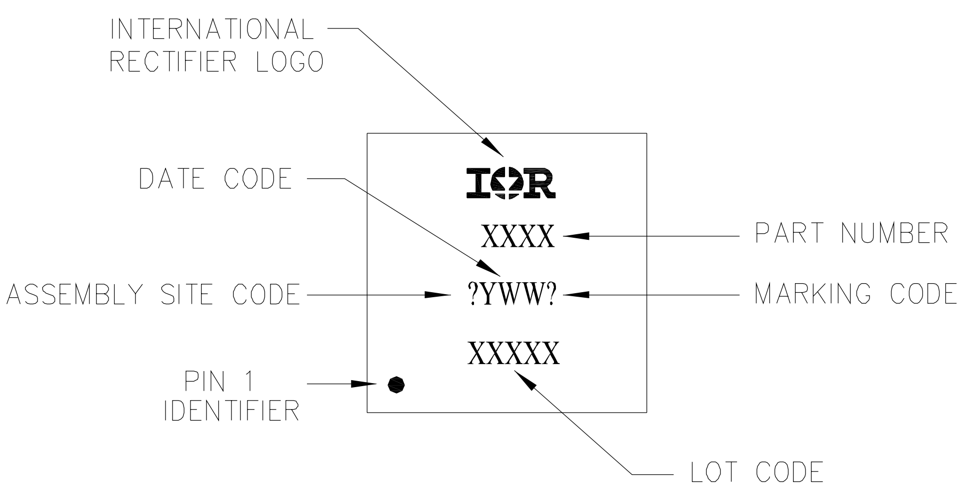
SYMBOL	COMMON					
	DIMENSIONS MILLIMETER			DIMENSIONS INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.800	0.900	1.000	0.032	0.036	0.040
A1	0.000	0.020	0.050	0.000	0.001	0.002
A2	0.203 REF			0.008 REF		
b	0.25	0.300	0.350	0.010	0.012	0.014
D	3.20	3.300	3.400	0.126	0.130	0.134
D2	1.125	1.175	1.225	0.045	0.046	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.

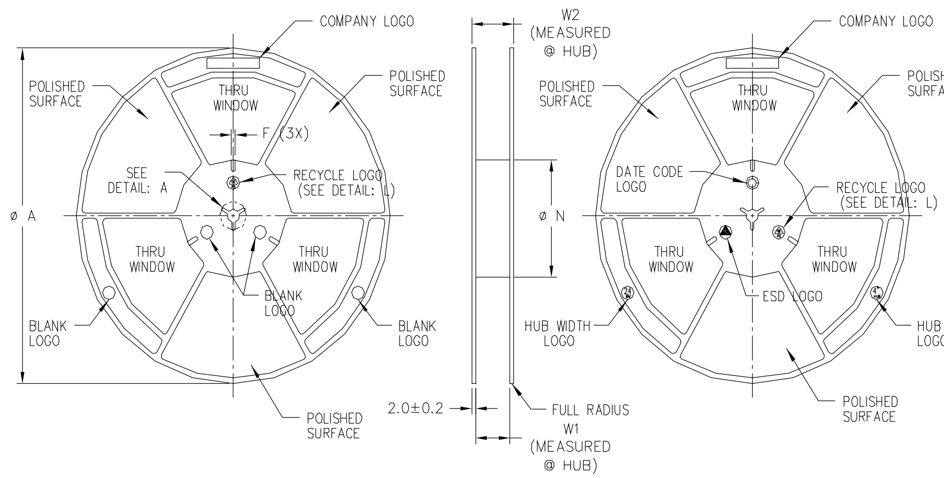
For more information on board mounting, including footprint and stencil recommendation, please refer to application note AN-1136: http://www.irf.com/technical-info/appnotes/an-1136.pdf
For more information on package inspection techniques, please refer to application note AN-1154: http://www.irf.com/technical-info/appnotes/an-1154.pdf

PQFN Dual 3.3 x 3.3 Part Marking



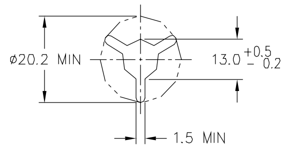
Note: For the most current drawing please refer to IR website at: http://www.irf.com/package/

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



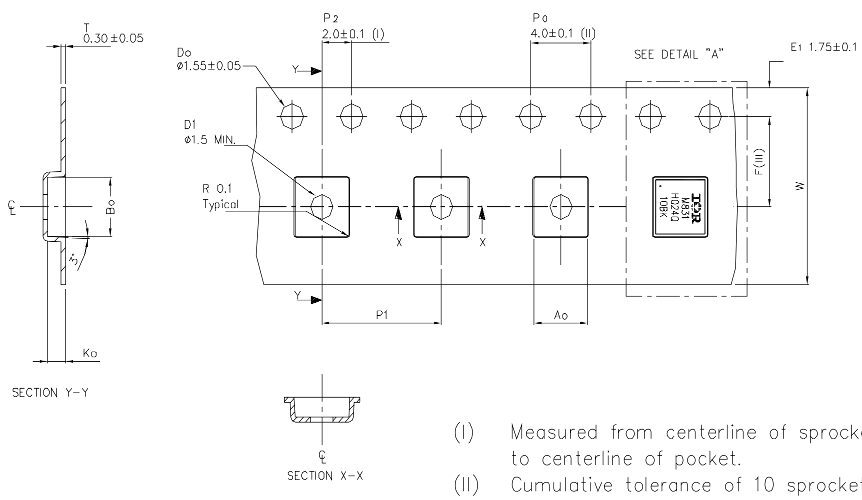
ARBOR HOLE
DETAIL: A

DETAIL: L

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

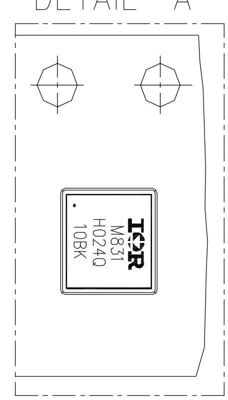
SURFACE RESISTIVITY			
LEGEND	SR RANGE	TYPE	COLOUR
A	BELOW 10^{12}	ANTISTATIC	ALL TYPES
B	10^{6} TO 10^{11}	STATIC DISSIPATIVE	BLACK ONLY
C	10^{5} & BELOW 10^{5}	CONDUCTIVE (GENERIC)	BLACK ONLY
D	10^{5} TO 10^{9}	CONDUCTIVE (CUSTOM)	BLACK ONLY
E	BELOW 10^{12}	COATED ANTISTATIC	ALL COLOR

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



(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

DETAIL "A"



Ao	3.60 +/− 0.1
Bo	3.60 +/− 0.1
Ko	1.20 +/− 0.1
F	5.50 +/− 0.1
P1	8.00 +/− 0.1
W	12.00 +/− 0.3

Qualification information†

Qualification level	Consumer†† (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 = 0.58mH, R_G = 50Ω, I_{AS} = 10A.
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 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.
⑦ Current is limited to 10A by source bonding technology.

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/

