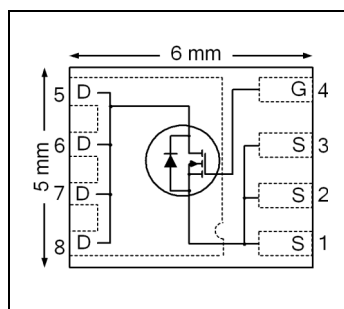


V_{DS}	30	V
$R_{DS(on)}$ max	1.10	mΩ
Q_g (typical)	58	nC
R_G (typical)	1.0	Ω
I_D (@ $T_{C(Bottom)} = 25^\circ\text{C}$)	290⑥	A



Applications

- Control MOSFET for synchronous buck converter

Features

Low $R_{DS(ON)}$ (≤ 1.10 mΩ)
Low Thermal Resistance to PCB ($<0.8^\circ\text{C/W}$)
100% R_g Tested
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 Reliability
Increased Power Density
Multi-Vendor Compatibility
Easier Manufacturing
Environmentally Friendlier
Increased Reliability

Base part number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IRFH8303PbF	PQFN 5 mm x 6 mm	Tape and Reel	4000	IRFH8303TRPbF

Absolute Maximum Ratings

	Parameter	Max.	Units
V_{GS}	Gate-to-Source Voltage	± 20	V
I_D @ $T_A = 25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	43	A
I_D @ $T_{C(Bottom)} = 25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	290⑥	
I_D @ $T_{C(Bottom)} = 100^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	183⑥	
I_{DM}	Pulsed Drain Current	1160	
P_D @ $T_A = 25^\circ\text{C}$	Power Dissipation	3.7	W
P_D @ $T_{C(Bottom)} = 25^\circ\text{C}$	Power Dissipation	156	
	Linear Derating Factor	0.029	W/°C
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C

Notes ① through ⑦ are on page 9

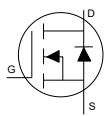
Static @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	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	—	21	—	mV/ $^\circ\text{C}$	Reference to $25^\circ\text{C}, I_D = 1.0\text{mA}$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	0.90	1.10	m Ω	$V_{GS} = 10V, I_D = 50A$ ②
		—	1.30	1.70		$V_{GS} = 4.5V, I_D = 50A$ ②
$V_{GS(th)}$	Gate Threshold Voltage	1.2	1.7	2.2	V	$V_{DS} = V_{GS}, I_D = 150\mu A$
$\Delta V_{GS(th)}$	Gate Threshold Voltage Coefficient	—	-5.7	—	mV/ $^\circ\text{C}$	
I_{DSS}	Drain-to-Source Leakage Current	—	—	1.0	μA	$V_{DS} = 24V, V_{GS} = 0V$
		—	—	150		$V_{DS} = 24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
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	158	—	—	S	$V_{DS} = 15V, I_D = 50A$
Q_g	Total Gate Charge	—	119	179	nC	$V_{GS} = 10V, V_{DS} = 15V, I_D = 50A$
Q_g	Total Gate Charge	—	58	87		
Q_{gs1}	Pre-V _{th} Gate-to-Source Charge	—	14	—		$V_{DS} = 15V$
Q_{gs2}	Post-V _{th} Gate-to-Source Charge	—	8	—		$V_{GS} = 4.5V$
Q_{gd}	Gate-to-Drain Charge	—	19	—		$I_D = 50A$
Q_{godr}	Gate Charge Overdrive	—	17	—		
Q_{sw}	Switch Charge ($Q_{gs2} + Q_{gd}$)	—	27	—	nC	
Q_{oss}	Output Charge	—	33	—		$V_{DS} = 16V, V_{GS} = 0V$
R_G	Gate Resistance	—	1.0	—	Ω	
$t_{d(on)}$	Turn-On Delay Time	—	21	—	ns	$V_{DD} = 30V, V_{GS} = 4.5V$
t_r	Rise Time	—	91	—		$I_D = 50A$
$t_{d(off)}$	Turn-Off Delay Time	—	48	—		$R_G = 1.8\Omega$
t_f	Fall Time	—	65	—		
C_{iss}	Input Capacitance	—	7736	—	pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance	—	1363	—		$V_{DS} = 24V$
C_{rss}	Reverse Transfer Capacitance	—	743	—		$f = 1.0\text{MHz}$

Avalanche Characteristics

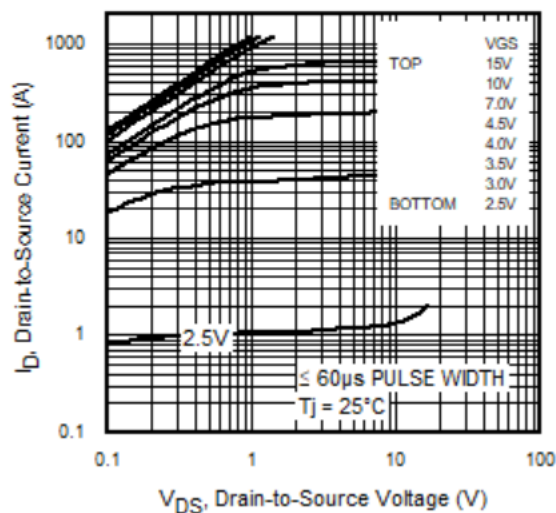
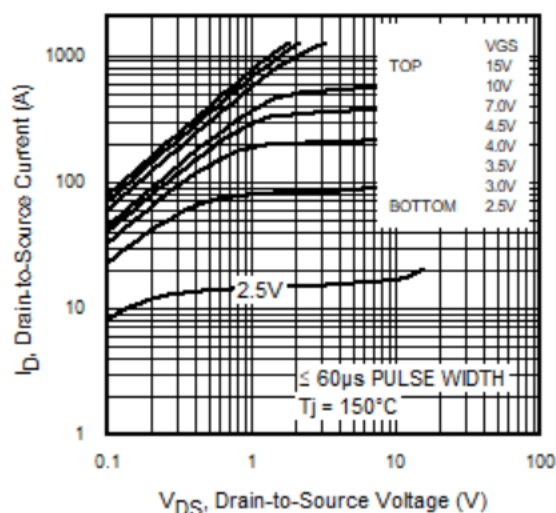
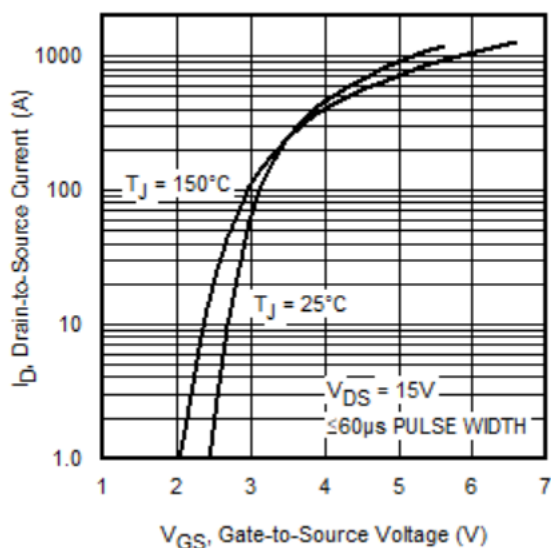
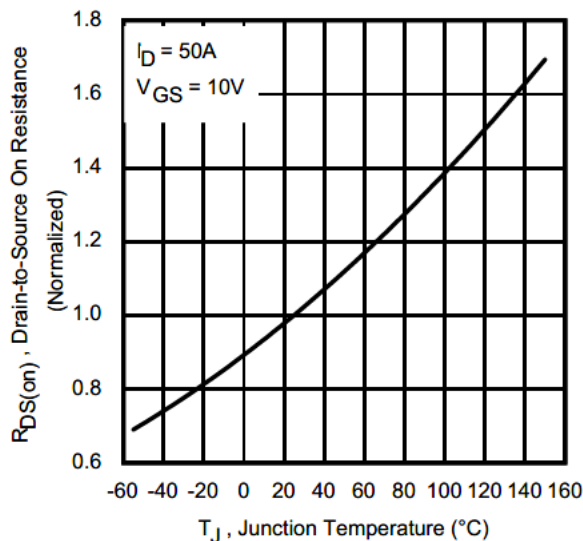
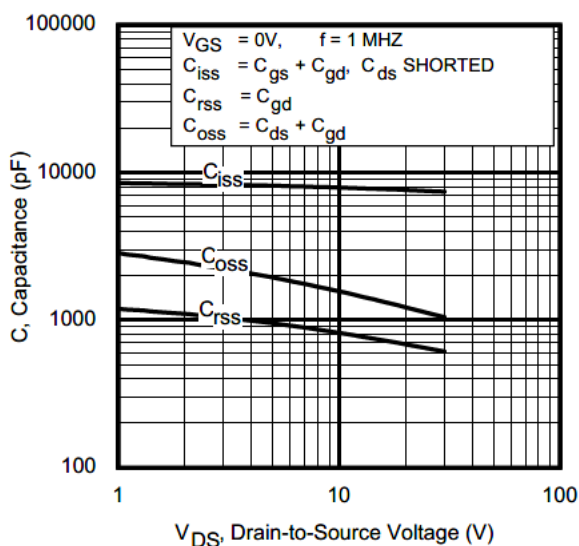
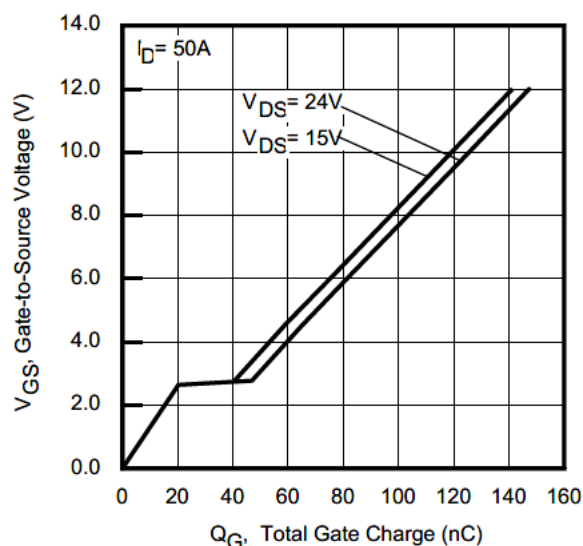
	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy ①	—	355	mJ

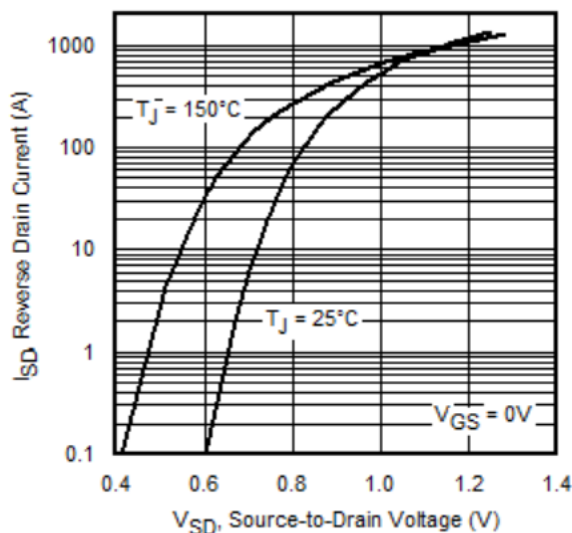
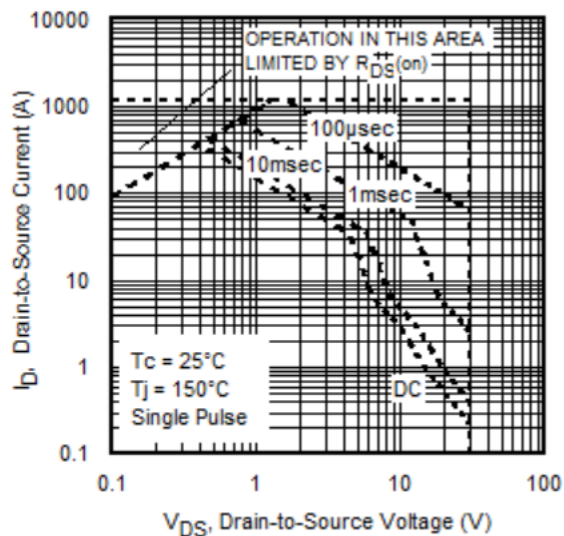
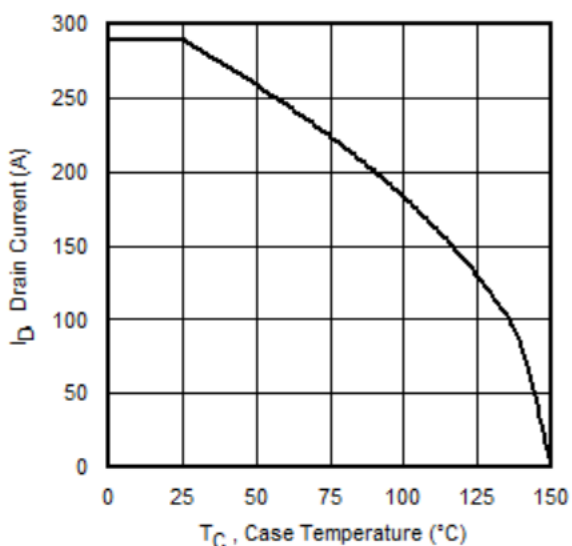
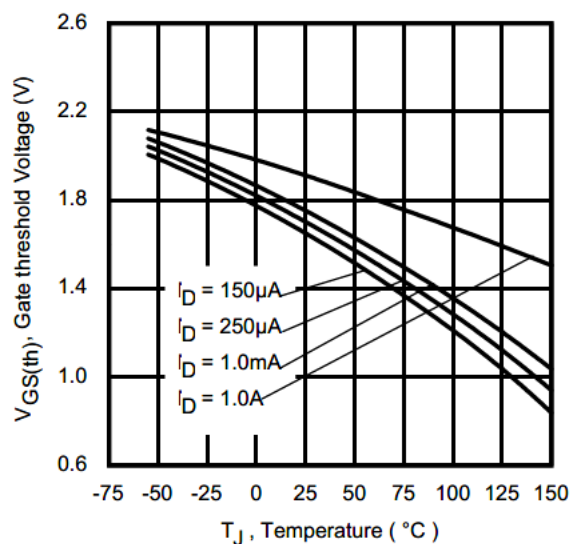
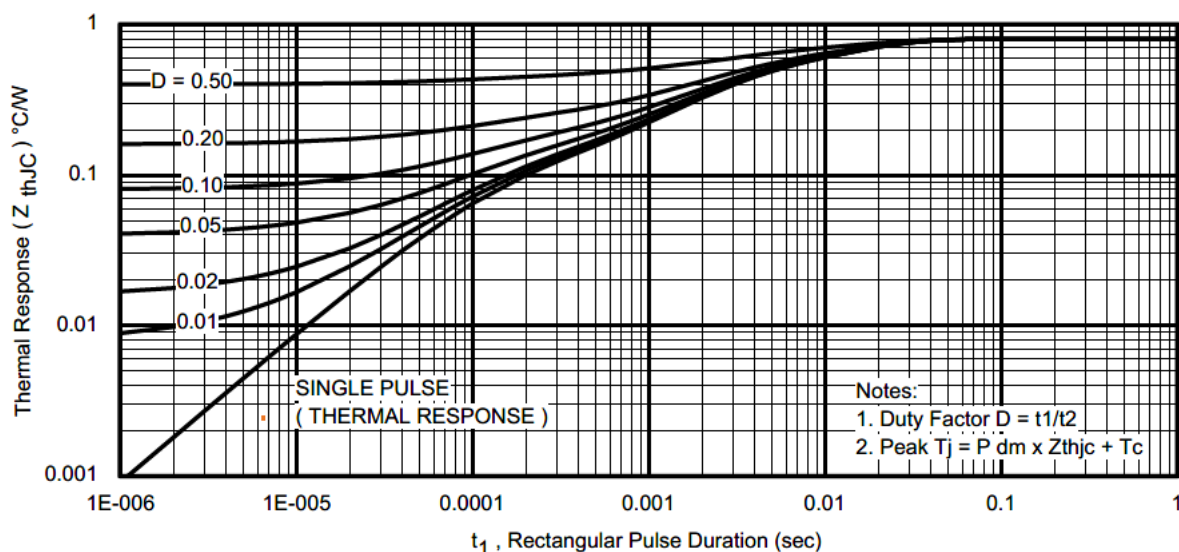
Diode Characteristics

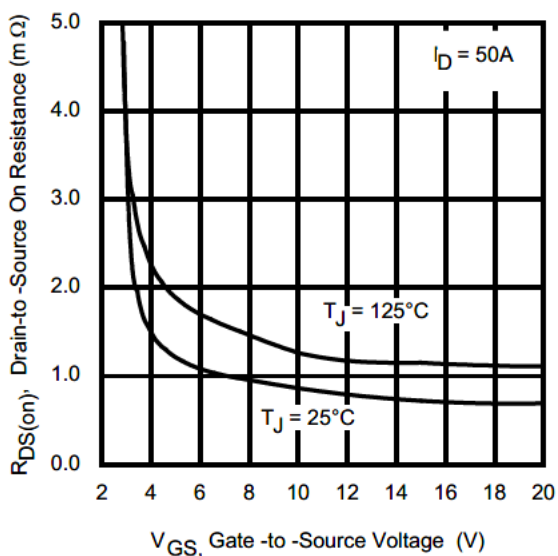
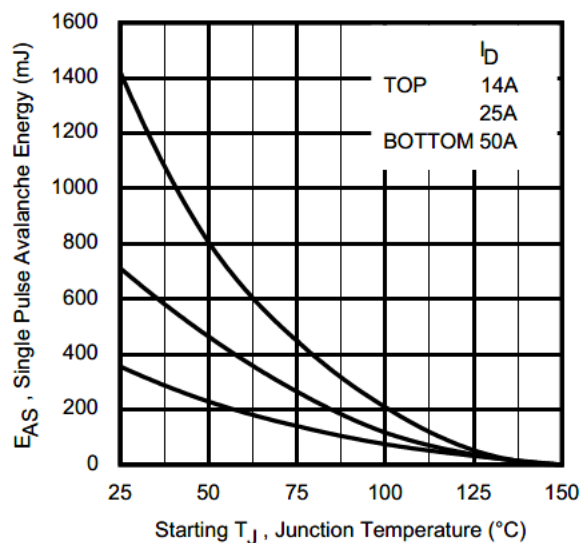
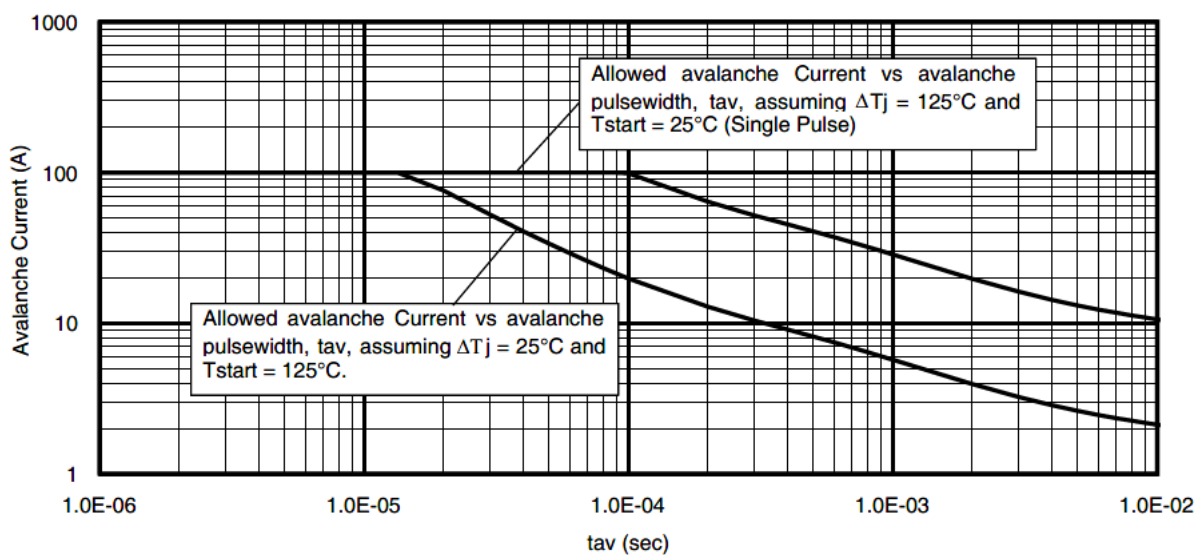
	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	156	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	1160		
V_{SD}	Diode Forward Voltage	—	—	1.0	V	$T_J = 25^\circ\text{C}, I_S = 50A, V_{GS} = 0V$ ②
t_{rr}	Reverse Recovery Time	—	33	50	ns	$T_J = 25^\circ\text{C}, I_F = 50A, V_{DD} = 15V$
Q_{rr}	Reverse Recovery Charge	—	51	77	nC	$di/dt = 200A/\mu s$ ②

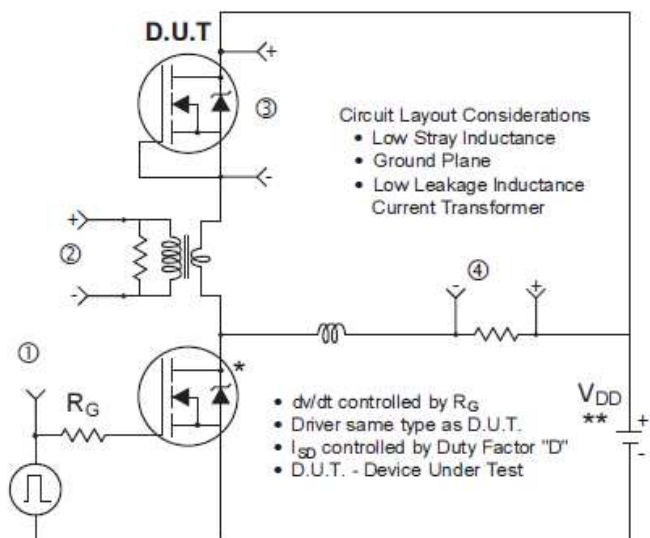
Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$ (Bottom)	Junction-to-Case ③	—	0.8	$^\circ\text{C/W}$
$R_{\theta JC}$ (Top)	Junction-to-Case ③	—	21	
$R_{\theta JA}$	Junction-to-Ambient ④	—	34	
$R_{\theta JA}$ (<10s)	Junction-to-Ambient ④	—	21	


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 Temperature

Fig 10. Drain-to-Source Breakdown Voltage

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. Single Avalanche Event: Pulse Current vs. Pulse Width



* Use P-Channel Driver for P-Channel Measurements

** Reverse Polarity for P-Channel

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

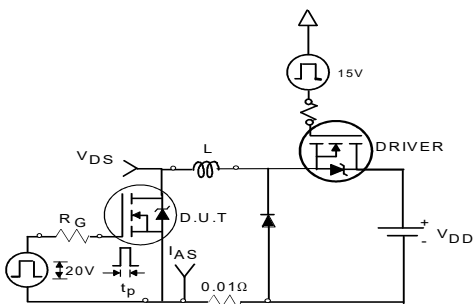
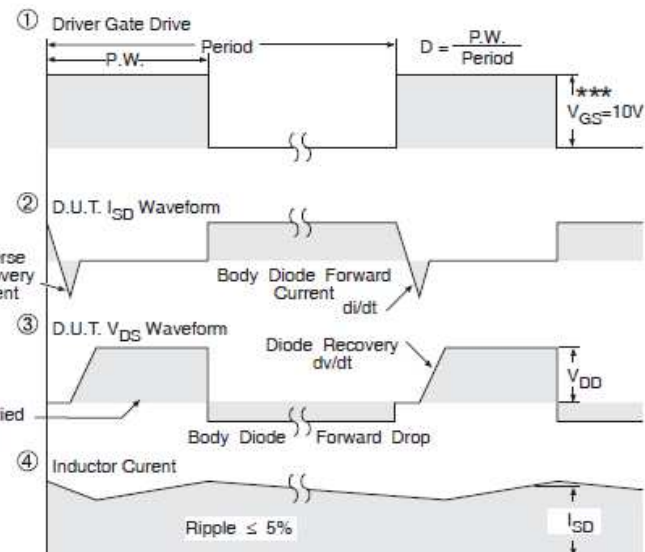


Fig 16a. Unclamped Inductive Test Circuit



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

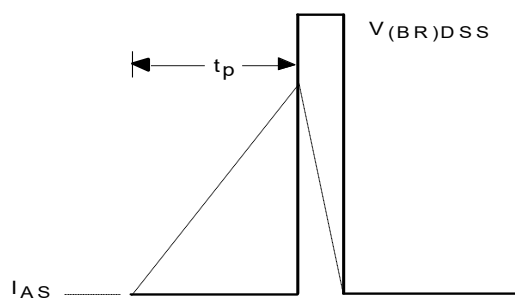


Fig 16b. Unclamped Inductive Waveforms

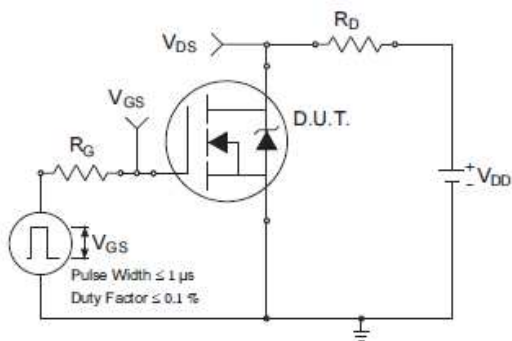


Fig 17a. Switching Time Test Circuit

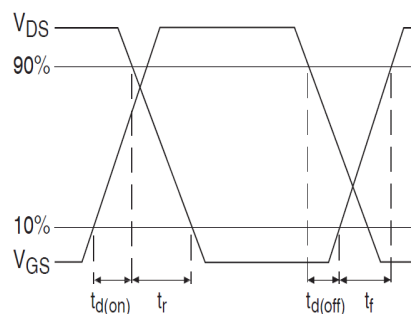


Fig 17b. Switching Time Waveforms

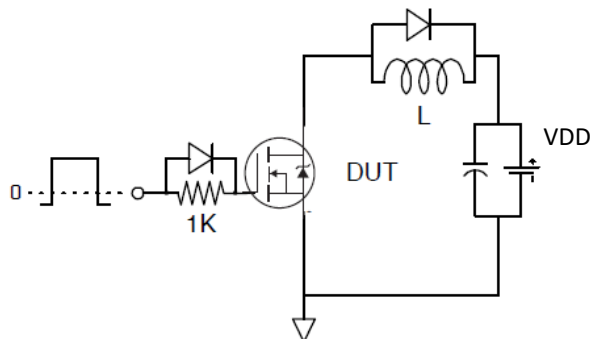


Fig 18. Gate Charge Test Circuit

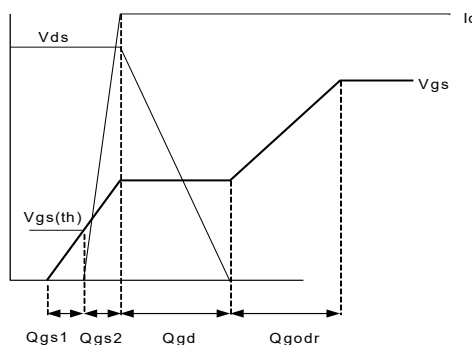
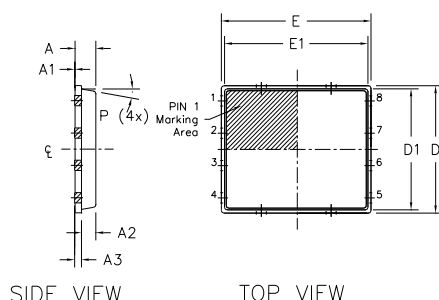
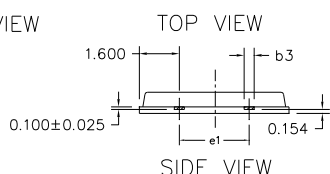


Fig 19. Gate Charge Waveform

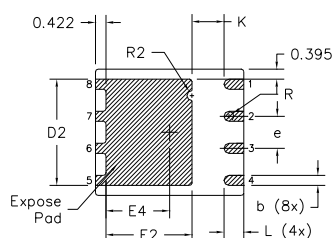
PQFN 5x6 Outline "B" Package Details



SIDE VIEW



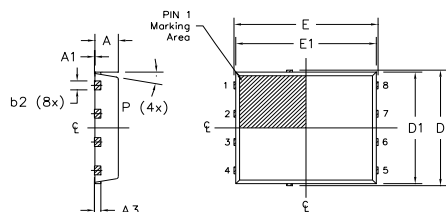
SIDE VIEW



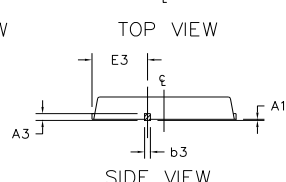
BOTTOM VIEW

DIM SYMBOL	MILLIMETERS		INCH	
	MIN	MAX	MIN	MAX
A	0.800	0.900	0.0315	0.0543
A1	0.000	0.050	0.0000	0.0020
A3	0.200	REF	0.0079	REF
b	0.350	0.470	0.0138	0.0185
b1	0.025	0.125	0.0010	0.0049
b2	0.210	0.410	0.0083	0.0161
b3	0.150	0.450	0.0059	0.0177
D	5.000	BSC	0.1969	BSC
D1	4.750	BSC	0.1870	BSC
D2	4.100	4.300	0.1614	0.1693
E	6.000	BSC	0.2362	BSC
E1	5.750	BSC	0.2264	BSC
E2	3.380	3.780	0.1331	0.1488
e	1.270	REF	0.0500	REF
e1	2.800	REF	0.1102	REF
K	1.200	1.420	0.0472	0.0559
L	0.710	0.900	0.0280	0.0354
P	0°	12°	0°	12°
R	0.200	REF	0.0079	REF
R2	0.150	0.200	0.0059	0.0079

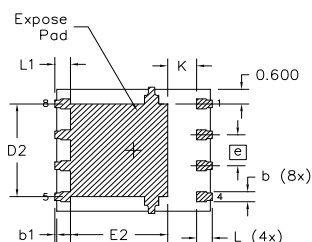
PQFN 5x6 Outline "G" Package Details



SIDE VIEW



SIDE VIEW



BOTTOM VIEW

DIM SYMBOL	MILLIMETERS		INCH	
	MIN.	MAX.	MIN.	MAX.
A	0.950	1.050	0.0374	0.0413
A1	0.000	0.050	0.0000	0.0020
A3	0.254	REF	0.0100	REF
b	0.310	0.510	0.0122	0.0201
b1	0.025	0.125	0.0010	0.0049
b2	0.210	0.410	0.0083	0.0161
b3	0.180	0.450	0.0071	0.0177
D	5.150	BSC	0.2028	BSC
D1	5.000	BSC	0.1969	BSC
D2	3.700	3.900	0.1457	0.1535
E	6.150	BSC	0.2421	BSC
E1	6.000	BSC	0.2362	BSC
E2	3.560	3.760	0.1402	0.1488
E3	2.270	2.470	0.0894	0.0972
e	1.27	REF	0.050	REF
K	0.830	1.400	0.0327	0.0551
L	0.510	0.710	0.0201	0.0280
L1	0.510	0.710	0.0201	0.0280
P	10 deg	12 deg	0 deg	12 deg

Note:

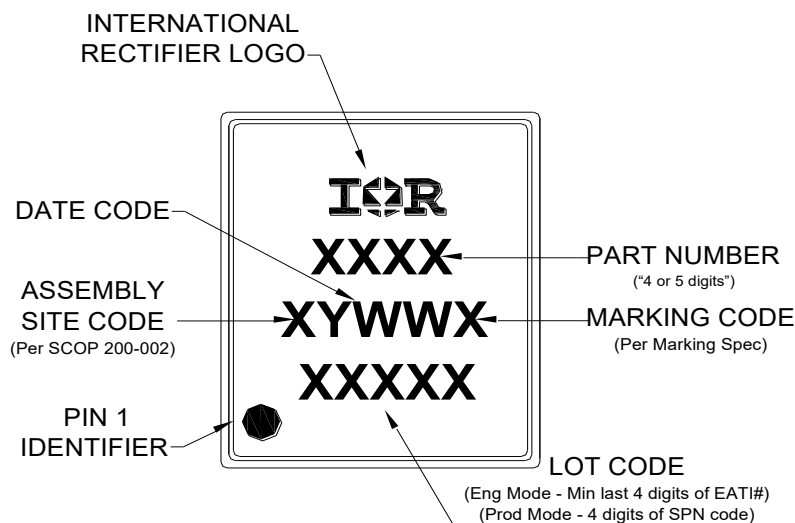
1. Dimensions and tolerancing confirm to ASME Y14.5M-1994
2. Dimension L represents terminal full back from package edge up to 0.1mm is acceptable
3. Coplanarity applies to the expose Heat Slug as well as the terminal
4. Radius on terminal is Optional

For more information on board mounting, including footprint and stencil recommendation, please refer to application note AN-1136: <http://www.infineon.com/technical-info/appnotes/an-1136.pdf>

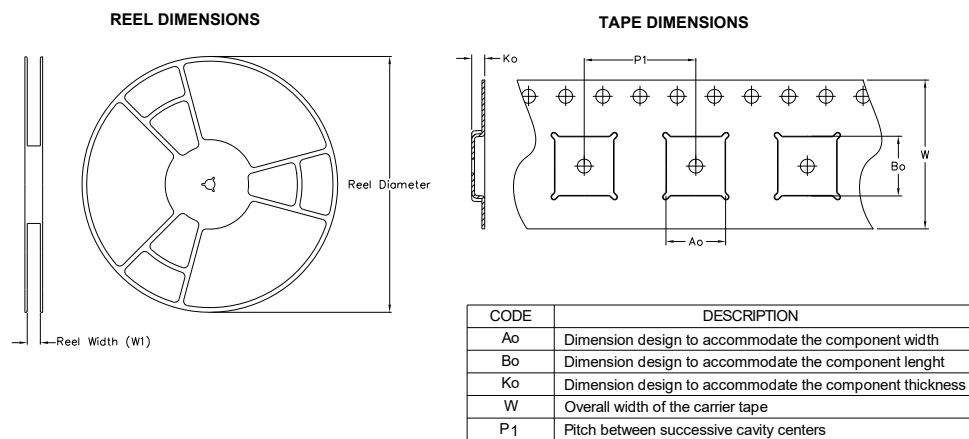
For more information on package inspection techniques, please refer to application note AN-1154: <http://www.infineon.com/technical-info/appnotes/an-1154.pdf>

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

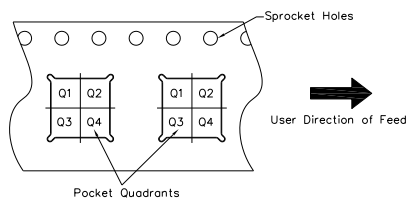
PQFN 5x6 Part Marking



PQFN 5x6 Tape and Reel



QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



Note: All dimension are nominal

Package Type	Reel Diameter (Inch)	QTY	Reel Width W1 (mm)	Ao (mm)	Bo (mm)	Ko (mm)	P1 (mm)	W (mm)	Pin 1 Quadrant
5 X 6 PQFN	13	4000	12.4	6.300	5.300	1.20	8.00	12	Q1

Note: For the most current drawing please refer to IR website at <http://www.infineon.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

Notes:

- ① Starting $T_J = 25^{\circ}\text{C}$, $L = 0.28\text{mH}$, $R_G = 50\Omega$, $I_{AS} = 50\text{A}$.
- ② Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.
- ③ R_{θ} is measured at T_J of approximately 90°C .
- ④ When mounted on 1 inch square PCB (FR-4). Please refer to AN-994 for more details:
<http://www.infineon.com/technical-info/appnotes/an-994.pdf>
- ⑤ Calculated continuous current based on maximum allowable junction temperature.
- ⑥ Rating refers to the product only with datasheet specified absolute maximum values, maintaining case temperature as specified. For other case temperatures please refer to Diagram 9. De-rating will be required based on the actual environmental conditions.

Revision History

Date	Rev.	Comments
10/22/2013	2.1	• Added the $R_{ds(on)}$ at $V_{GS} = 4.5\text{V}$ values, on page 2.
03/17/2015	2.2	• Updated package outline and tape and reel on pages 7 and 8.
01/24/2017	2.3	• Changed datasheet with Infineon logo - all pages • Added package outline for "option G" on page 7. • Added disclaimer on last page
02/27/2020	2.4	• Removed "HEXFET™ POWER MOSFET" -page1
08/17/2021	2.5	• Updated datasheet based on IFX template. • Updated Datasheet based on new current rating and application note :App-AN_1912_PL51_2001_180356

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