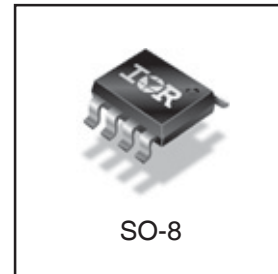
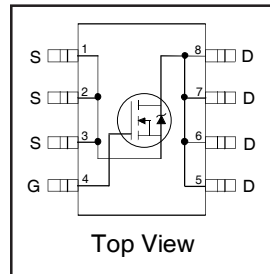


HEXFET® Power MOSFET

V_{DS}	30	V
$R_{DS(on) \text{ max}}$ (@ $V_{GS} = 10V$)	2.8	mΩ
$R_{DS(on) \text{ max}}$ (@ $V_{GS} = 4.5V$)	3.8	
Q_g (typical)	44	nC
I_D (@ $T_A = 25^\circ C$)	24	A



Features

Industry-standard pinout SO-8 Package
Compatible with Existing Surface Mount Techniques
RoHS Compliant, Halogen-Free
MSL1, Industrial qualification



Benefits

Multi-Vendor Compatibility
Easier Manufacturing
Environmentally Friendlier
Increased Reliability

Base Part Number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IRF8788PbF-1	SO-8	Tube/Bulk	95	IRF8788PbF-1
		Tape and Reel	4000	IRF8788TRPbF-1

Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain-to-Source Voltage	30	V
V_{GS}	Gate-to-Source Voltage	±20	
I_D @ $T_A = 25^\circ C$	Continuous Drain Current, V_{GS} @ 10V	24	A
I_D @ $T_A = 70^\circ C$	Continuous Drain Current, V_{GS} @ 10V	19	
I_{DM}	Pulsed Drain Current ①	190	
P_D @ $T_A = 25^\circ C$	Power Dissipation	2.5	W
P_D @ $T_A = 70^\circ C$	Power Dissipation	1.6	
	Linear Derating Factor	0.02	W/°C
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JL}$	Junction-to-Drain Lead ⑤	—	20	°C/W
$R_{\theta JA}$	Junction-to-Ambient ④⑤	—	50	

Notes ① through ⑤ are on page 9

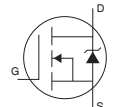
Static @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

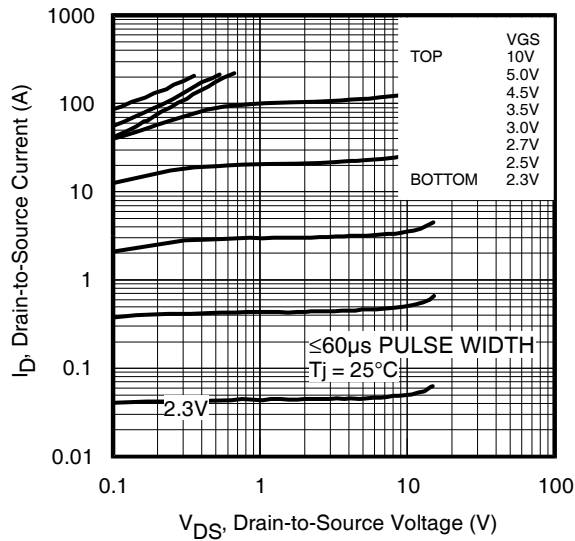
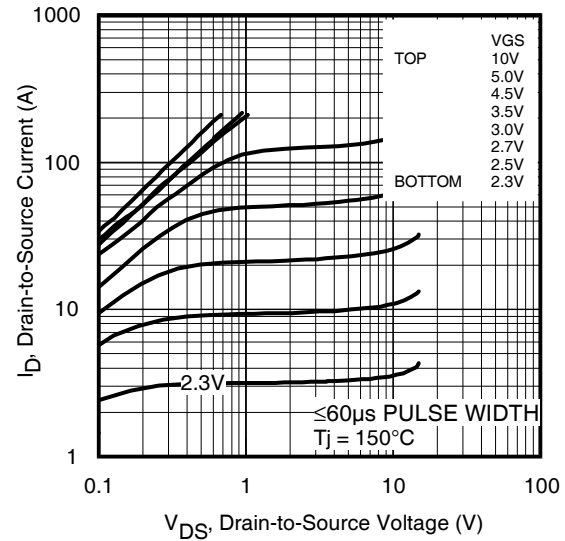
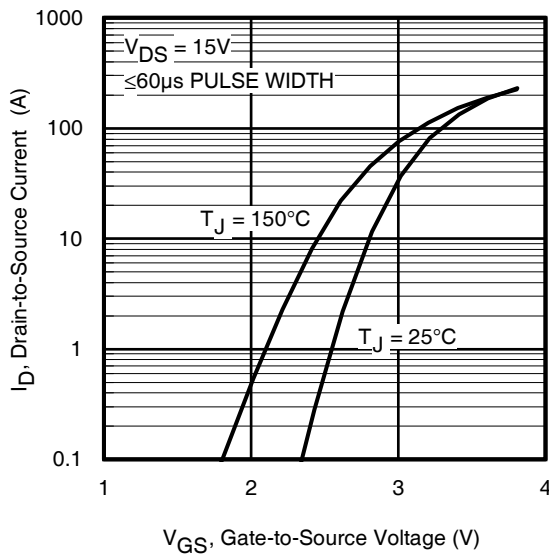
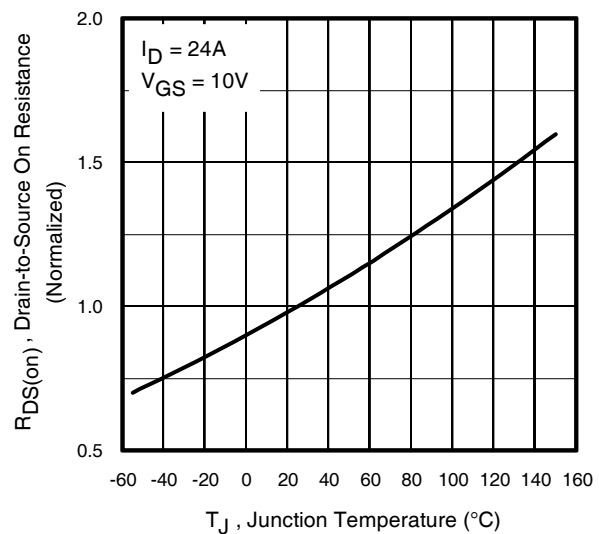
	Parameter	Min.	Typ.	Max.	Units	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.024	—	V/°C	Reference to $25^\circ\text{C}, I_D = 1mA$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	2.3	2.8	m Ω	$V_{GS} = 10V, I_D = 24A$ ③
		—	3.04	3.8		$V_{GS} = 4.5V, I_D = 19A$ ③
$V_{GS(th)}$	Gate Threshold Voltage	1.35	1.80	2.35	V	$V_{DS} = V_{GS}, I_D = 100\mu A$
$\Delta V_{GS(th)}$	Gate Threshold Voltage Coefficient	—	-6.59	—	mV/°C	
I_{DSS}	Drain-to-Source Leakage Current	—	—	1.0	μA	$V_{DS} = 24V, V_{GS} = 0V$
		—	—	150		$V_{DS} = 24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
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	95	—	—	S	$V_{DS} = 15V, I_D = 19A$
Q_g	Total Gate Charge	—	44	66	nC	$V_{DS} = 15V$ $V_{GS} = 4.5V$ $I_D = 19A$ See Figs. 17a & 17b
Q_{gs1}	Pre-Vth Gate-to-Source Charge	—	12	—		
Q_{gs2}	Post-Vth Gate-to-Source Charge	—	4.7	—		
Q_{gd}	Gate-to-Drain Charge	—	14	—		
Q_{godr}	Gate Charge Overdrive	—	13.3	—		
Q_{sw}	Switch Charge ($Q_{gs2} + Q_{gd}$)	—	18.7	—		
Q_{oss}	Output Charge	—	22	—	nC	$V_{DS} = 16V, V_{GS} = 0V$
R_g	Gate Resistance	—	0.54	1.09	Ω	
$t_{d(on)}$	Turn-On Delay Time	—	23	—	ns	$V_{DD} = 15V, V_{GS} = 4.5V$ $I_D = 19A$ $R_G = 1.8\Omega$ See Fig. 15a & 15b
t_r	Rise Time	—	24	—		
$t_{d(off)}$	Turn-Off Delay Time	—	23	—		
t_f	Fall Time	—	11	—		
C_{iss}	Input Capacitance	—	5720	—	pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance	—	980	—		$V_{DS} = 15V$
C_{rss}	Reverse Transfer Capacitance	—	450	—		$f = 1.0MHz$

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy ②	—	230	mJ
I_{AR}	Avalanche Current ①	—	19	A

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	3.1	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	190	A	
V_{SD}	Diode Forward Voltage	—	—	1.0	V	$T_J = 25^\circ\text{C}, I_S = 19A, V_{GS} = 0V$ ③
		—	—	0.75	V	$T_J = 25^\circ\text{C}, I_S = 2.2A, V_{GS} = 0V$ ③
t_{rr}	Reverse Recovery Time	—	24	36	ns	$T_J = 25^\circ\text{C}, I_F = 19A, V_{DD} = 15V$
Q_{rr}	Reverse Recovery Charge	—	33	50	nC	$di/dt = 230A/\mu s$ ③
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				


Fig 1. Typical Output Characteristics

Fig 2. Typical Output Characteristics

Fig 3. Typical Transfer Characteristics

Fig 4. Normalized On-Resistance vs. Temperature

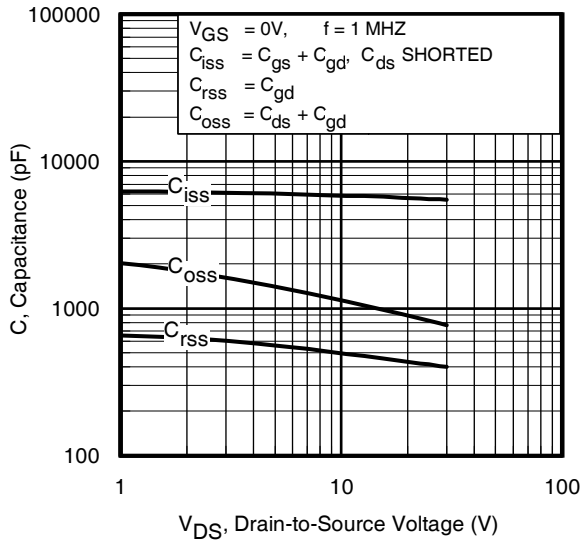


Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

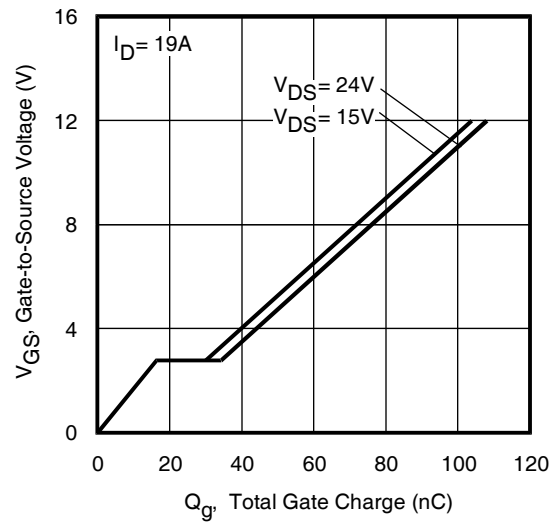


Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

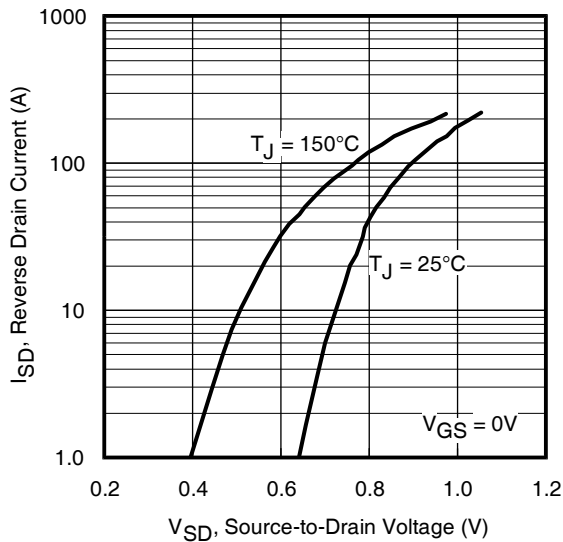


Fig 7. Typical Source-Drain Diode Forward Voltage

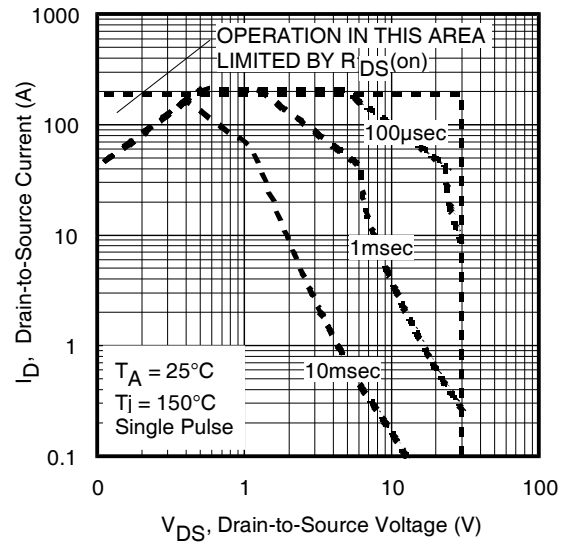


Fig 8. Maximum Safe Operating Area

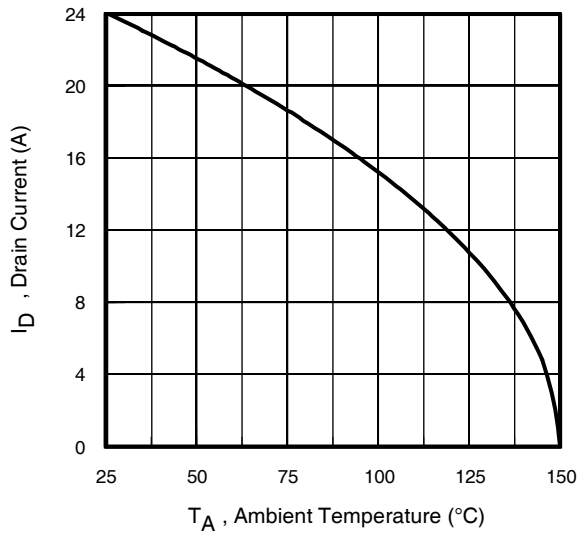


Fig 9. Maximum Drain Current vs. Ambient Temperature

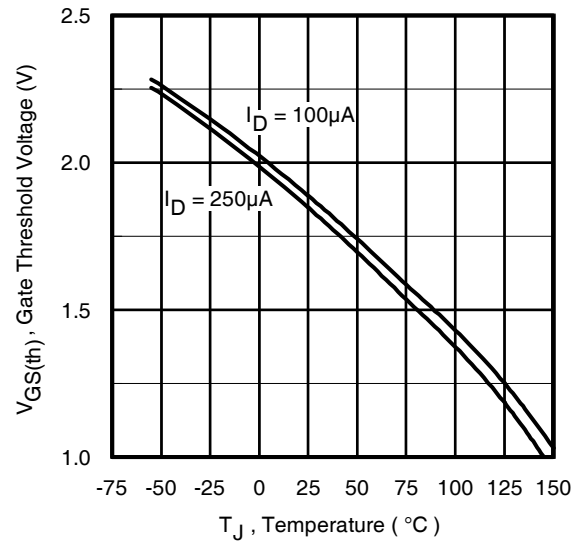


Fig 10. Threshold Voltage vs. Temperature

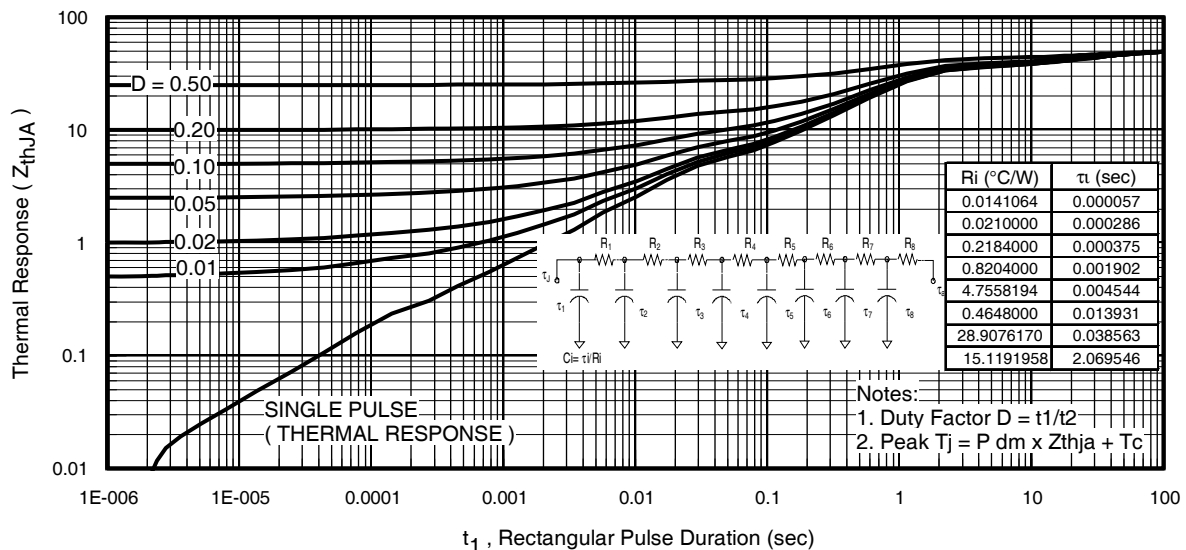
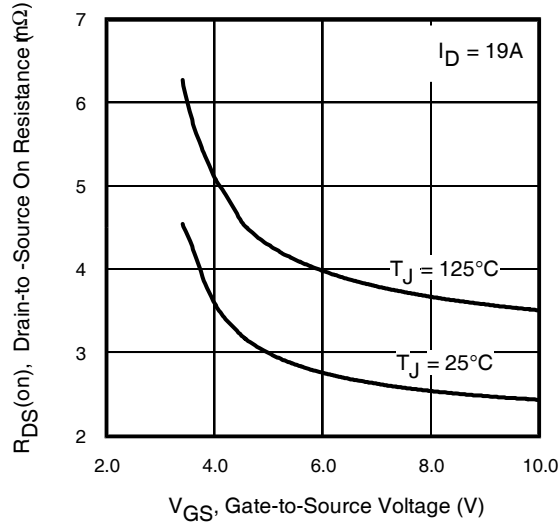
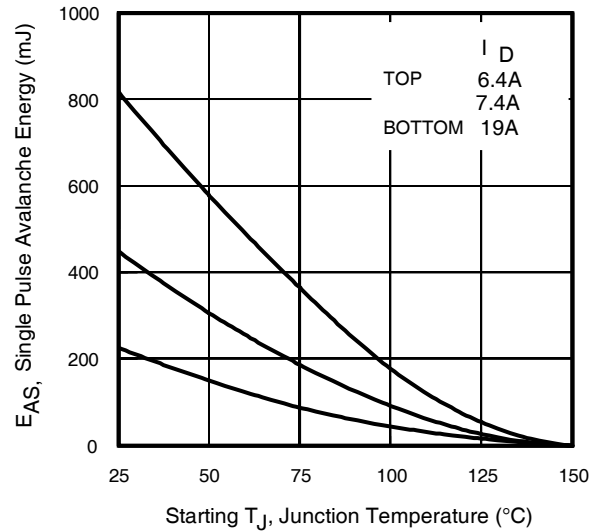
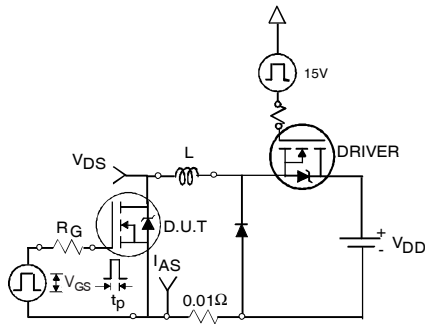
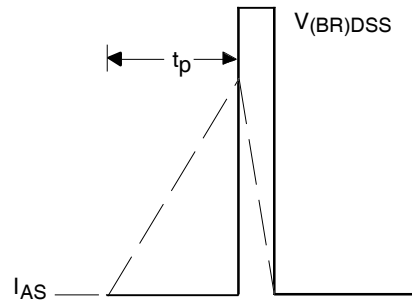
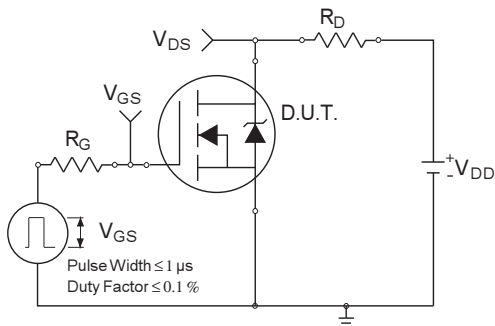
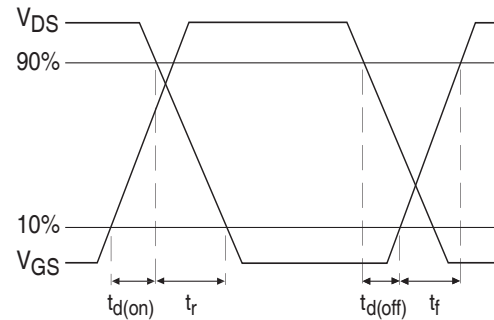


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient


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

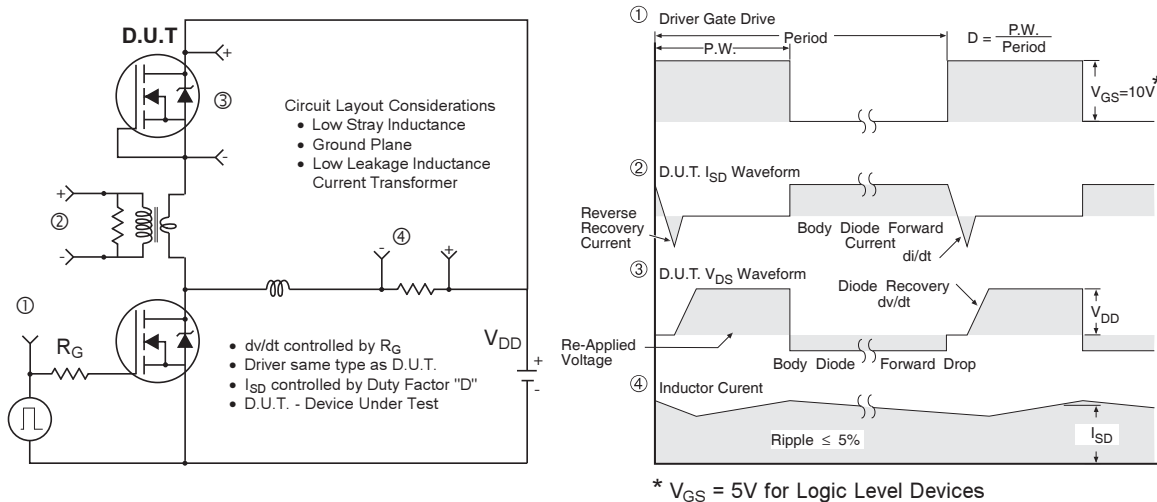


Fig 16. Peak Diode Recovery dv/dt Test Circuit for N-Channel HEXFET® Power MOSFETs

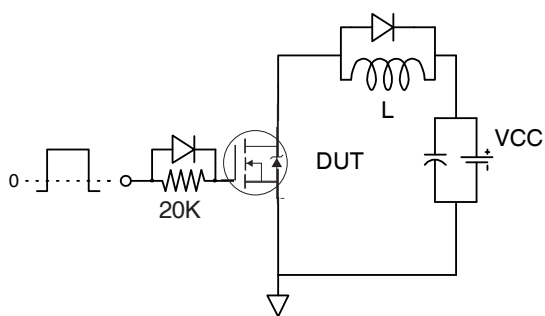


Fig 17a. Gate Charge Test Circuit

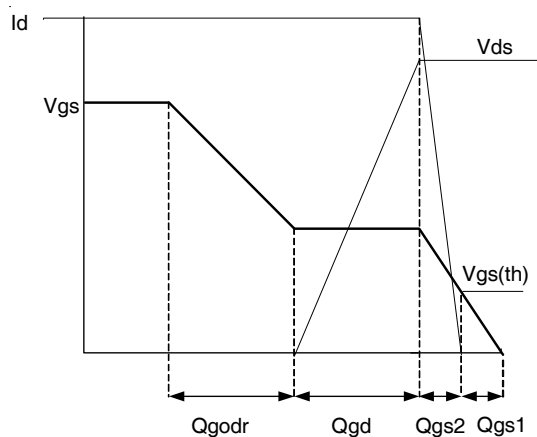
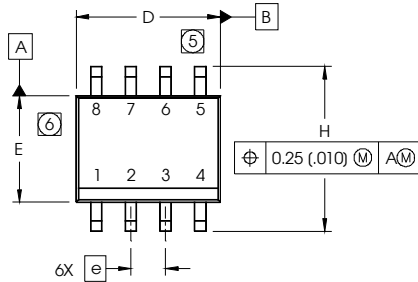


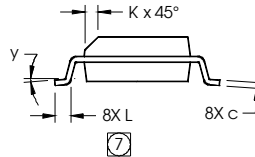
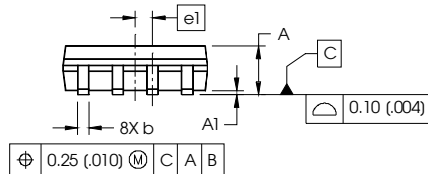
Fig 17b. Gate Charge Waveform

SO-8 Package Outline (Mosfet & Fetky)

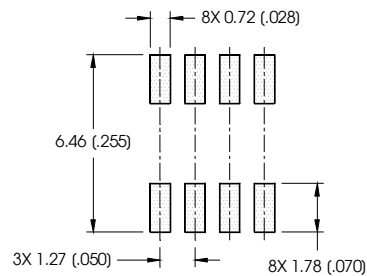
Dimensions are shown in millimeters (inches)



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050	BASIC	1.27	BASIC
e1	.025	BASIC	0.635	BASIC
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40	1.27
y	0°	8°	0°	8°



FOOTPRINT

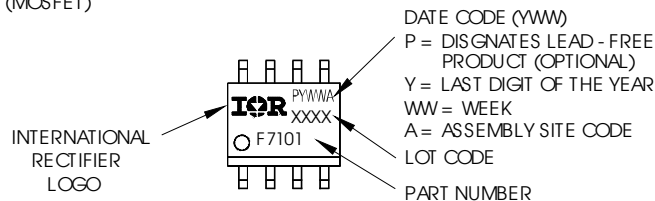


NOTES:

1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS.
MOLD PROTRUSIONS NOT TO EXCEED 0.15 (.006).
6. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS.
MOLD PROTRUSIONS NOT TO EXCEED 0.25 (.010).
7. DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.

SO-8 Part Marking Information

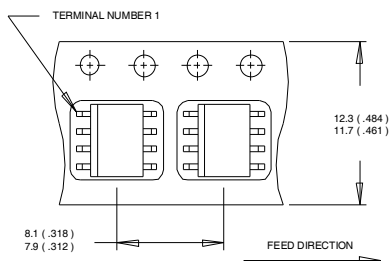
EXAMPLE: THIS IS AN IRF7101 (MOSFET)



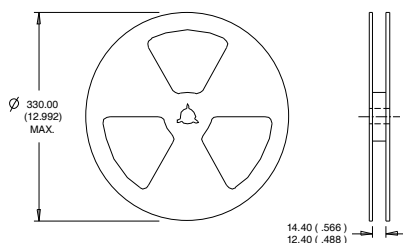
Note: For the most current drawing please refer to IR website at: <http://www.irf.com/package/>

SO-8 Tape and Reel

(Dimensions are shown in millimeters (inches))



NOTES:
 1. CONTROLLING DIMENSION: MILLIMETER.
 2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS(INCHES).
 3. OUTLINE CONFORMS TO EIA-481 & EIA-541.



NOTES:
 1. CONTROLLING DIMENSION: MILLIMETER.
 2. OUTLINE CONFORMS TO EIA-481 & EIA-541.

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

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^{\circ}\text{C}$, $L = 1.25\text{mH}$, $R_G = 25\Omega$, $I_{AS} = 19\text{A}$.
- ③ Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.
- ④ When mounted on 1 inch square copper board.
- ⑤ R_{θ} is measured at T_J of approximately 90°C .

Qualification information[†]

Qualification level	Industrial (per JEDEC JESD47F ^{††} guidelines)	
Moisture Sensitivity Level	SO-8	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

International
 Rectifier

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