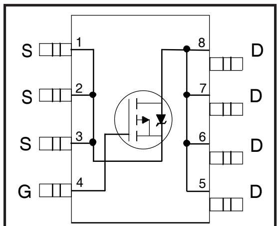
International
IOR Rectifier

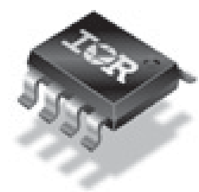
IRF6216PbF-1

HEXFET® Power MOSFET

V_{DS}	-150	V
$R_{DS(on)}$ max (@V_{GS} = -10V)	0.24	Ω
Q_g (typical)	33	nC
I_D (@T_A = 25°C)	-2.2	A



Top View


SO-8

Features	⇒	Benefits
Industry-standard pinout SO-8 Package		Multi-Vendor Compatibility
Compatible with Existing Surface Mount Techniques		Easier Manufacturing
RoHS Compliant, Halogen-Free		Environmentally Friendlier
MSL1, Industrial qualification		Increased Reliability

Base Part Number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IRF6216PbF-1	SO-8	Tube/Bulk	95	IRF6216PbF-1
		Tape and Reel	4000	IRF6216TRPbF-1

Absolute Maximum Ratings

	Parameter	Max.	Units
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	-2.2	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	-1.9	
I_{DM}	Pulsed Drain Current ①	-19	
P_D @T_A = 25°C	Power Dissipation④	2.5	W
	Linear Derating Factor	0.02	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
dv/dt	Peak Diode Recovery dv/dt	7.8	V/ns
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	

Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JL}$	Junction-to-Drain Lead	——	20	°C/W
$R_{\theta JA}$	Junction-to-Ambient ④	——	50	

Notes ① through ④ are on page 8

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-150	——	——	V	V_{GS} = 0V, I_D = -250μA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	——	-0.17	——	V/°C	Reference to 25°C, I_D = -1mA ③
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	——	——	0.240	Ω	V_{GS} = -10V, I_D = -1.3A ③
$V_{GS(th)}$	Gate Threshold Voltage	-3.0	——	-5.0	V	V_{DS} = V_{GS}, I_D = -250μA
I_{DSS}	Drain-to-Source Leakage Current	——	——	-25	μA	V_{DS} = -150V, V_{GS} = 0V
		——	——	-250		V_{DS} = -120V, 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

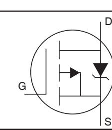
Dynamic @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
g_{fs}	Forward Transconductance	2.7	——	——	S	V_{DS} = -50V, I_D = -1.3A
Q_g	Total Gate Charge	——	33	49	nC	I_D = -1.3A
Q_{gs}	Gate-to-Source Charge	——	7.2	11		V_{DS} = -120V
Q_{gd}	Gate-to-Drain ("Miller") Charge	——	15	23		V_{GS} = -10V,
$t_{d(on)}$	Turn-On Delay Time	——	18	——	ns	V_{DD} = -75V
t_r	Rise Time	——	15	——		I_D = -1.3A
$t_{d(off)}$	Turn-Off Delay Time	——	33	——		R_G = 6.5Ω
t_f	Fall Time	——	26	——		V_{GS} = -10V ③
C_{iss}	Input Capacitance	——	1280	——	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	——	220	——		V_{DS} = -25V
C_{rss}	Reverse Transfer Capacitance	——	53	——		f = 1.0MHz
C_{oss}	Output Capacitance	——	1290	——		V_{GS} = 0V, V_{DS} = -1.0V, f = 1.0MHz
C_{oss}	Output Capacitance	——	99	——		V_{GS} = 0V, V_{DS} = -120V, f = 1.0MHz
C_{oss} eff.	Effective Output Capacitance	——	220	——		V_{GS} = 0V, V_{DS} = 0V to -120V

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy②	——	200	mJ
I_{AR}	Avalanche Current①	——	-4.0	A

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	——	——	-2.2	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	——	——	-19		
V_{SD}	Diode Forward Voltage	——	——	-1.6	V	T_J = 25°C, I_S = -1.3A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	——	80	120	nS	T_J = 25°C, I_F = -1.3A
Q_{rr}	Reverse RecoveryCharge	——	310	460	nC	di/dt = -100A/μs ③

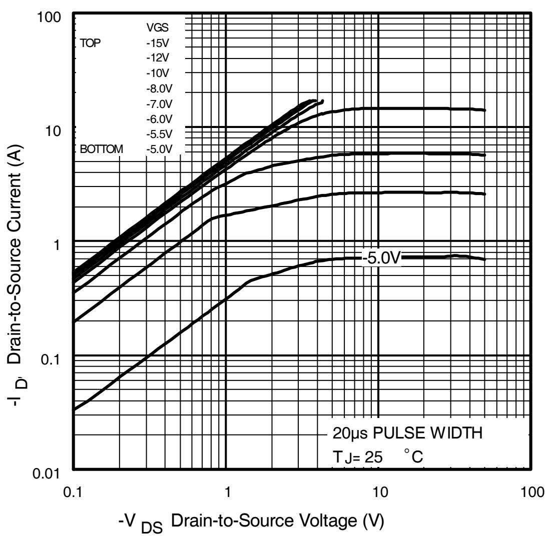


Fig 1. Typical Output Characteristics

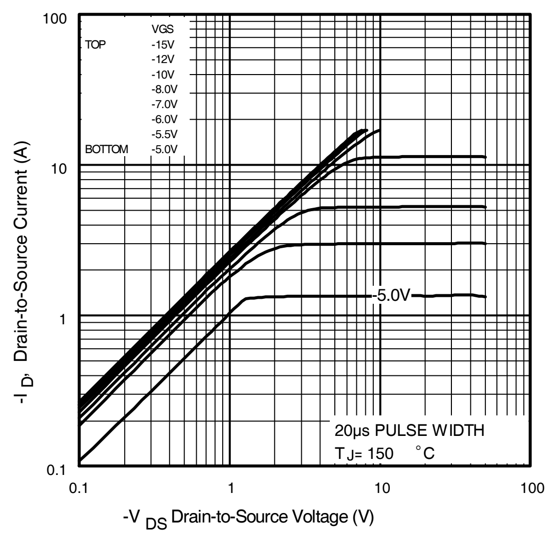


Fig 2. Typical Output Characteristics

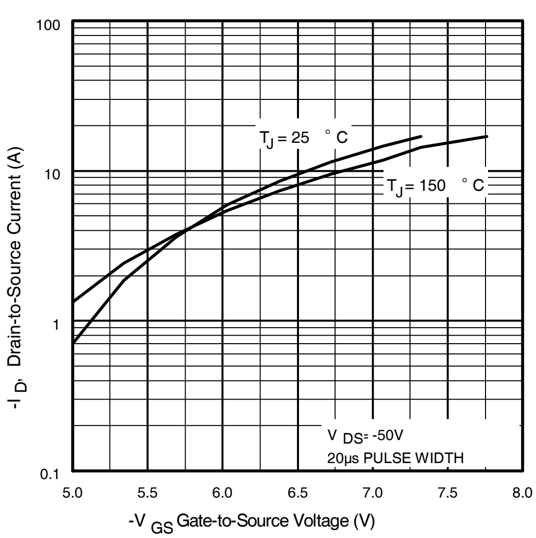


Fig 3. Typical Transfer Characteristics

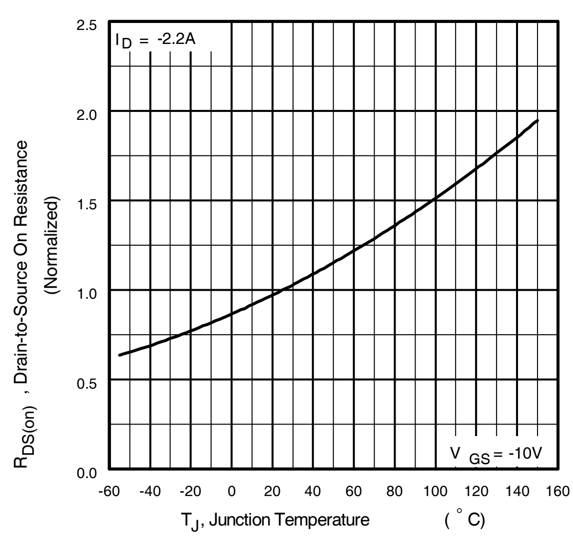


Fig 4. Normalized On-Resistance Vs. Temperature

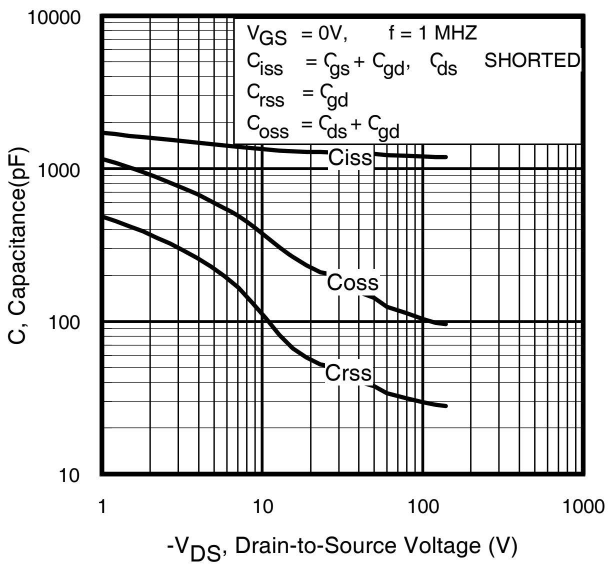


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

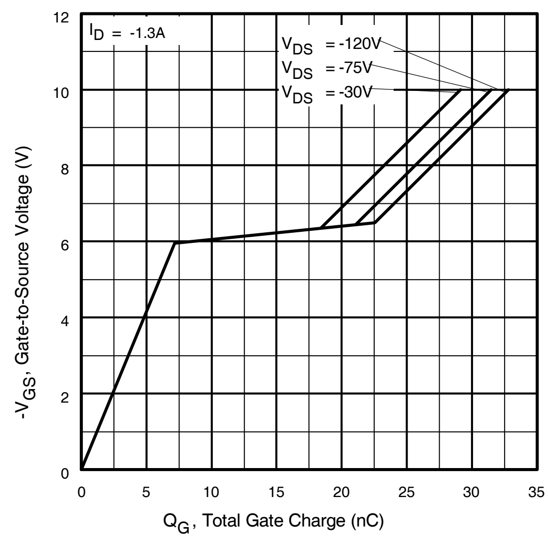


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

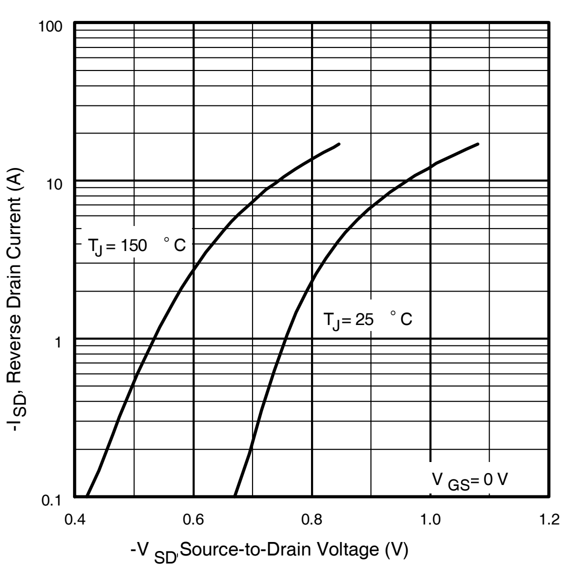


Fig 7. Typical Source-Drain Diode Forward Voltage

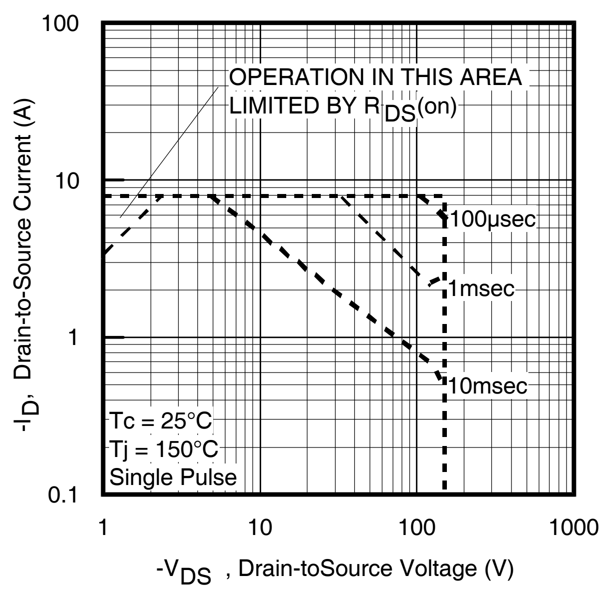


Fig 8. Maximum Safe Operating Area

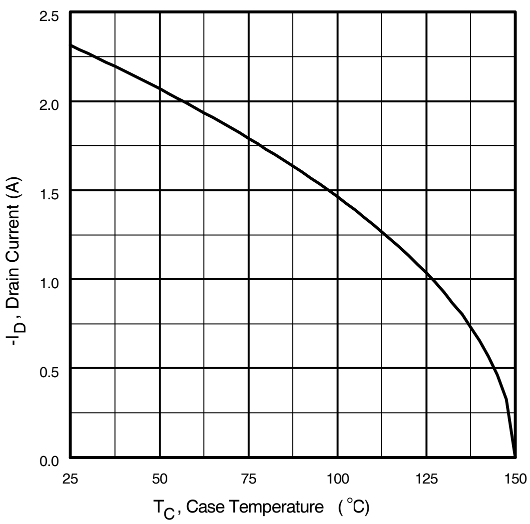


Fig 9. Maximum Drain Current Vs. Ambient Temperature

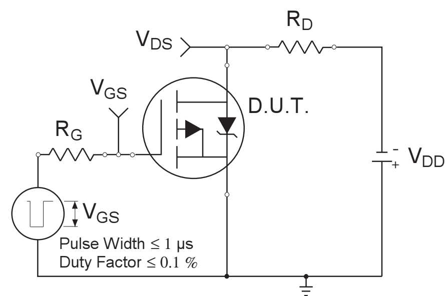


Fig 10a. Switching Time Test Circuit

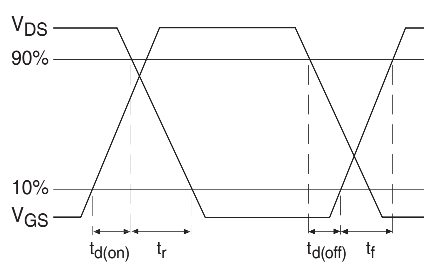


Fig 10b. Switching Time Waveforms

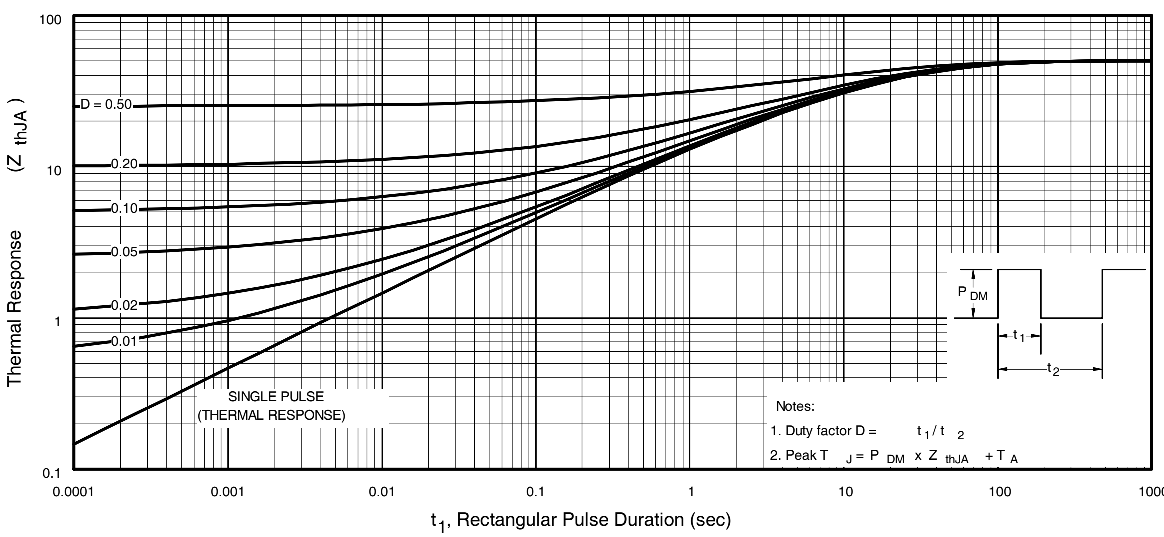


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

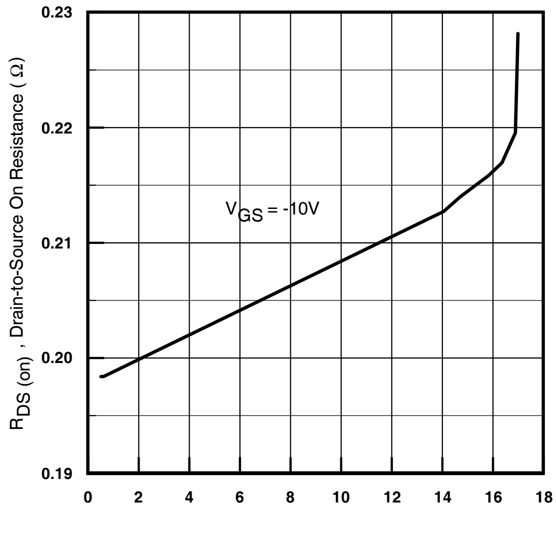


Fig 12. On-Resistance Vs. Drain Current

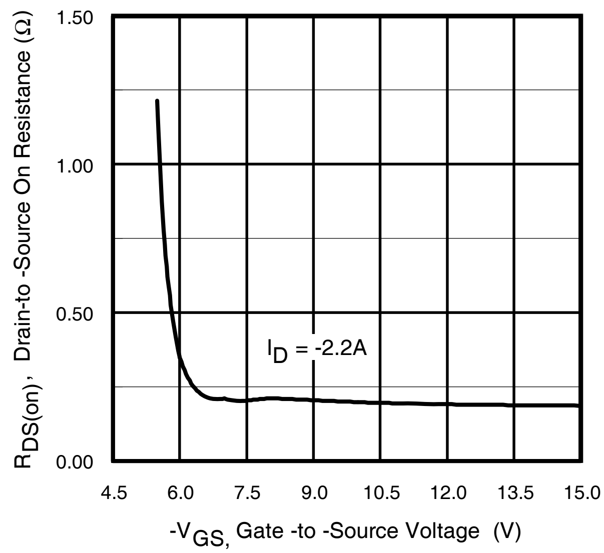


Fig 13. On-Resistance Vs. Gate Voltage

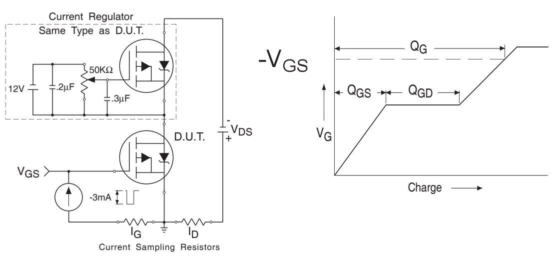
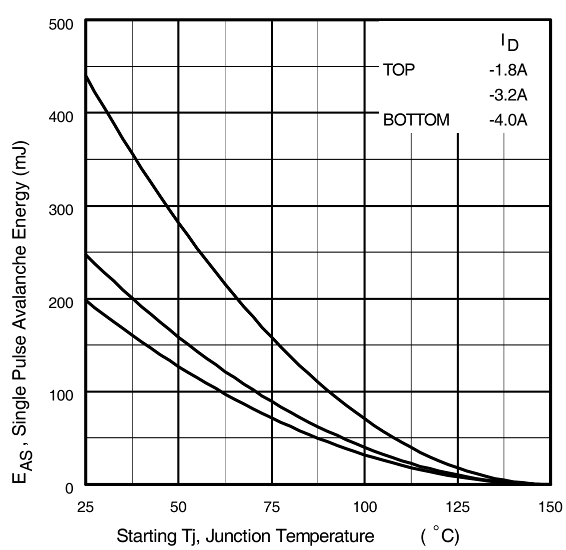


Fig 14a&b. Basic Gate Charge Test Circuit and Waveform



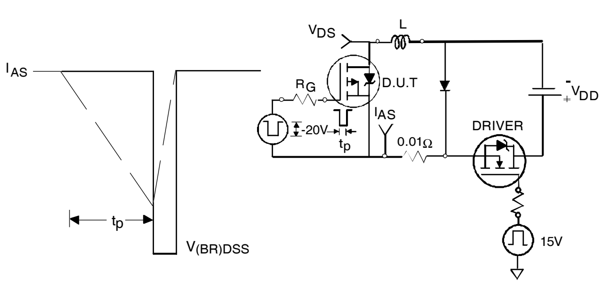
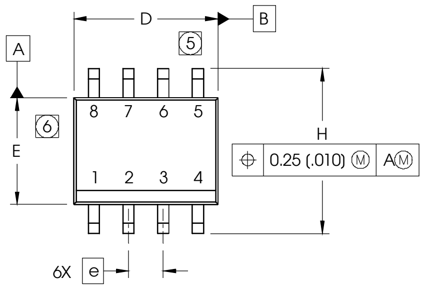


Fig 15a&b. Unclamped Inductive Test circuit and Waveforms

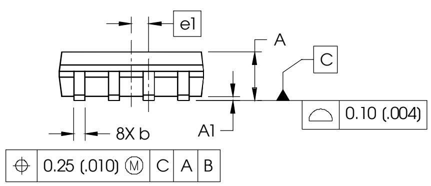
Fig 15c. Maximum Avalanche Energy Vs. Drain Current

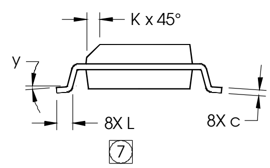
SO-8 Package Outline(Mosfet & Fetky)

Dimensions are shown in milimeters (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	
e 1	.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°





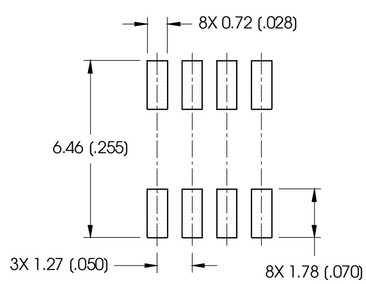
NOTES:
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.

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].

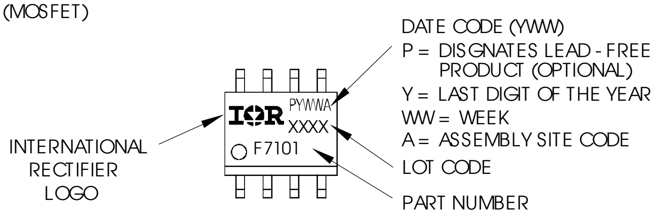
7 DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.

FOOTPRINT



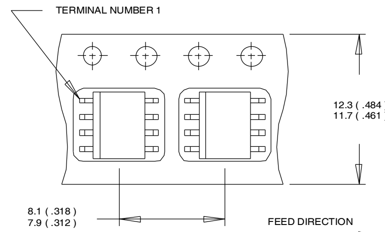
SO-8 Part Marking Information

EXAMPLE: THIS IS AN IRF7101 (MOSFET)

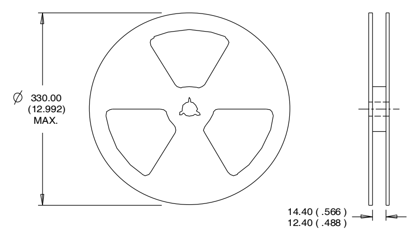


Note: For the most current drawing please refer to IR website at: http://www.irf.com/package/

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 $T_J = 25°C$, L = 25mH, $R_G = 25\Omega$, $I_{AS} = -4.0A$.
③ Pulse width ≤ 400µs; duty cycle ≤ 2%.
④ When mounted on 1 inch square copper board.

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/