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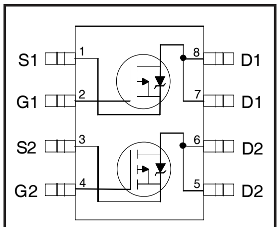
PD - 96105B

International
IOR Rectifier

IRF7306QPbF

HEXFET® Power MOSFET

- Advanced Process Technology
- Ultra Low On-Resistance
- Dual P Channel MOSFET
- Surface Mount
- Available in Tape & Reel
- 150°C Operating Temperature
- Lead-Free



Top View

V_{DSS} = -30V

$R_{DS(on)}$ = 0.10Ω

SO-8

Description

These HEXFET® Power MOSFET's in a Dual SO-8 package utilize the lastest processing techniques to achieve extremely low on-resistance per silicon area. Additional features of these HEXFET Power MOSFET's are a 150°C junction operating temperature, fast switching speed and improved repetitive avalanche rating. These benefits combine to make this design an extremely efficient and reliable device for use in a wide variety of applications.
The efficient SO-8 package provides enhanced thermal characteristics and dual MOSFET die capability making it ideal in a variety of power applications. This dual, surface mount SO-8 can dramatically reduce board space and is also available in Tape & Reel.

Base part number	Orderable part number	Package Type	Standard Pack		EOL Notice	Replacement Part Number
			Form	Quantity		
IRF7306QPbF	IRF7306QTRPbF	SO-8	Tape and Reel	4000	EOL 529	Please search the EOL part number on IR's website for guidance
	IRF7306QPbF	SO-8	Tube	95	EOL 527	

Absolute Maximum Ratings

	Parameter	Max.	Units
I_D @ T_A = 25°C	10 Sec. Pulsed Drain Current, V_{GS} @ -10V	-4.0	A
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ -10V	-3.6	
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ -10V	-2.9	
I_{DM}	Pulsed Drain Current ①	-14	
P_D @T_A = 25°C	Power Dissipation	2.0	W
	Linear Derating Factor	0.016	W/°C
V_{GS}	Gate-to-Source Voltage	±20	V
dv/dt	Peak Diode Recovery dv/dt ②	-5.0	V/ns
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance Ratings

	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient④	–––	62.5	°C/W

07/02/14

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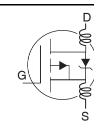
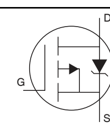
Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-30	–––	–––	V	V_{GS} = 0V, ID = -250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	–––	-0.037	–––	V/°C	Reference to 25°C, I_D = -1mA
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	–––	–––	0.10	Ω	V_{GS} = -10V, I_D = -1.8A ③
		–––	–––	0.16		V_{GS} = -4.5V, I_D = -1.5A ③
$V_{GS(th)}$	Gate Threshold Voltage	-1.0	–––	–––	V	V_{DS} = V_{GS}, I_D = -250µA
g_{fs}	Forward Transconductance	2.5	–––	–––	S	V_{DS} = -24V, I_D = -1.8A
I_{DSS}	Drain-to-Source Leakage Current	–––	–––	-1.0	µA	V_{DS} = -24V, V_{GS} = 0V
		–––	–––	-25		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
Q_g	Total Gate Charge	–––	–––	25	nC	I_D = -1.8A
Q_{gs}	Gate-to-Source Charge	–––	–––	2.9		V_{DS} = -24V
Q_{gd}	Gate-to-Drain ("Miller") Charge	–––	–––	9.0		V_{GS} = -10V, See Fig. 6 and 12 ③
$t_{d(on)}$	Turn-On Delay Time	–––	11	–––	ns	V_{DD} = -15V
t_r	Rise Time	–––	17	–––		I_D = -1.8A
$t_{d(off)}$	Turn-Off Delay Time	–––	25	–––		R_G = 6.0Ω
t_f	Fall Time	–––	18	–––		R_D = 8.2Ω, See Fig. 10 ③
L_D	Internal Drain Inductance	–––	4.0	–––	nH	Between lead tip and center of die contact 
L_S	Internal Source Inductance	–––	6.0	–––		
C_{iss}	Input Capacitance	–––	440	–––	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	–––	200	–––		V_{DS} = -25V
C_{rss}	Reverse Transfer Capacitance	–––	93	–––		ƒ = 1.0MHz, See Fig. 5

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	–––	–––	-2.5	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	–––	–––	-1.0	V	T_J = 25°C, I_S = -1.8A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	–––	53	80	ns	T_J = 25°C, I_F = -1.8A
Q_{rr}	Reverse RecoveryCharge	–––	66	99	nC	di/dt = 100A/µs ③
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				

Notes:

① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)

② $I_{SD} \leq$ -1.8A, di/dt ≤ 90A/µs, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq$150°C

③ Pulse width ≤ 300µs; duty cycle ≤ 2%.

④ Surface mounted on FR-4 board, t ≤ 10sec.

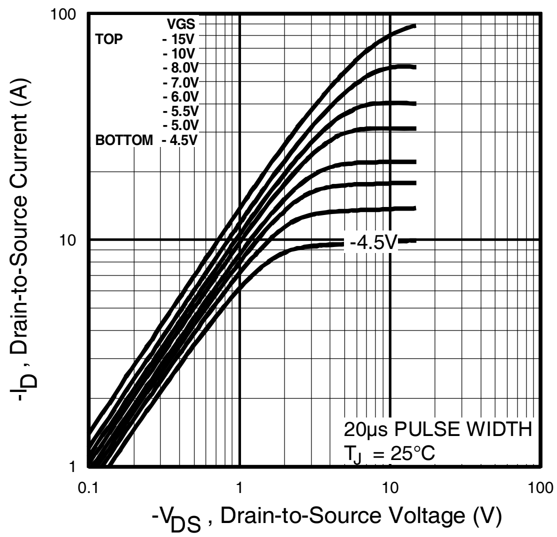


Fig 1. Typical Output Characteristics

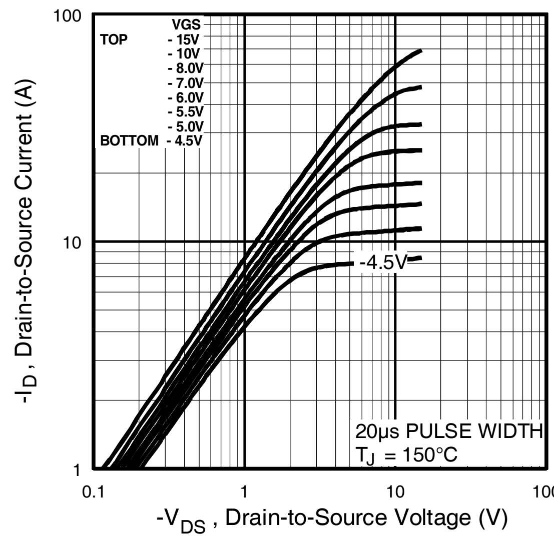


Fig 2. Typical Output Characteristics

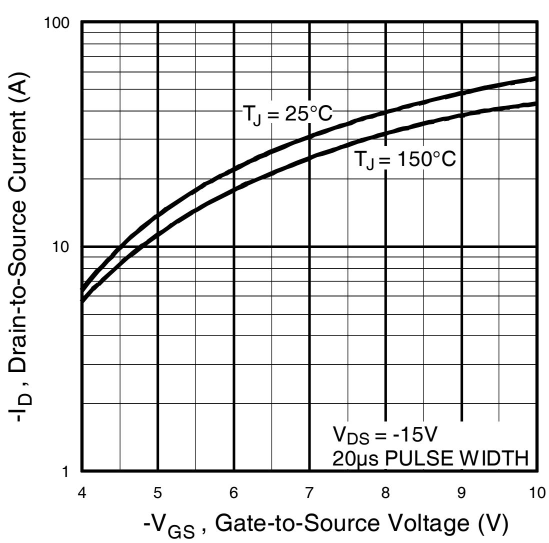


Fig 3. Typical Transfer Characteristics

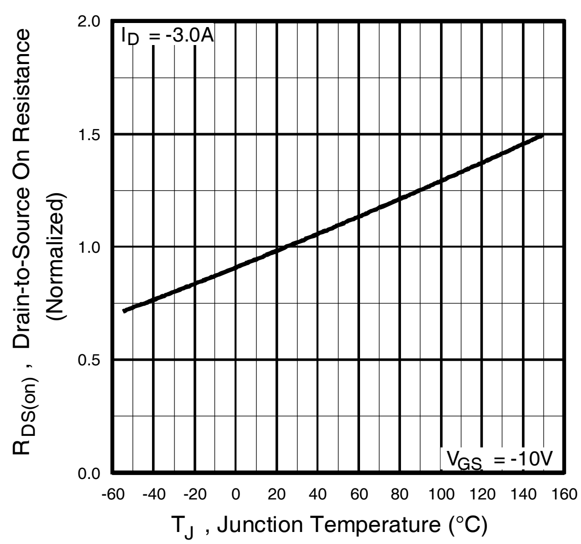


Fig 4. Normalized On-Resistance
Vs. Temperature

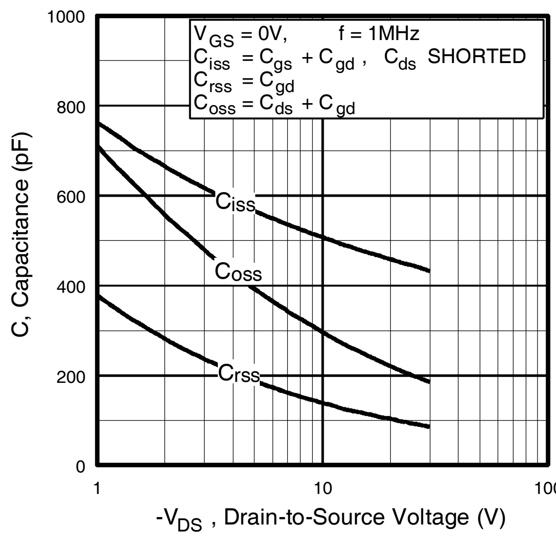


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

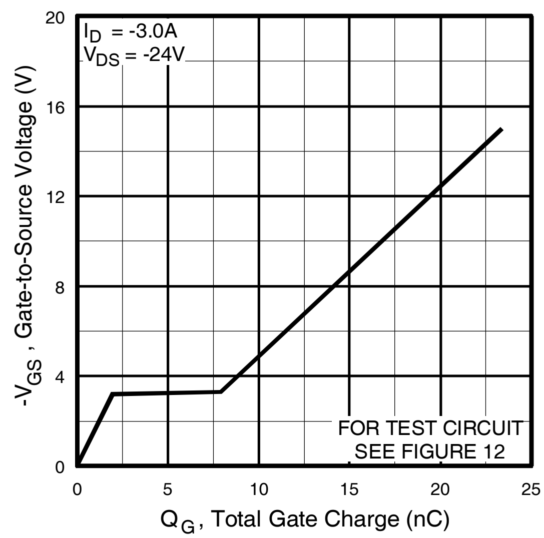


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

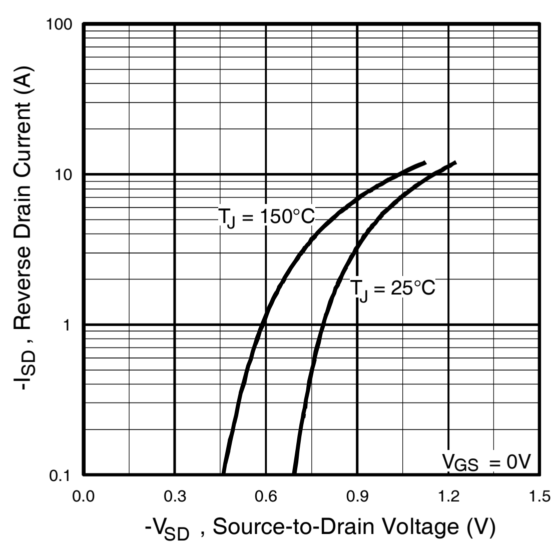


Fig 7. Typical Source-Drain Diode Forward Voltage

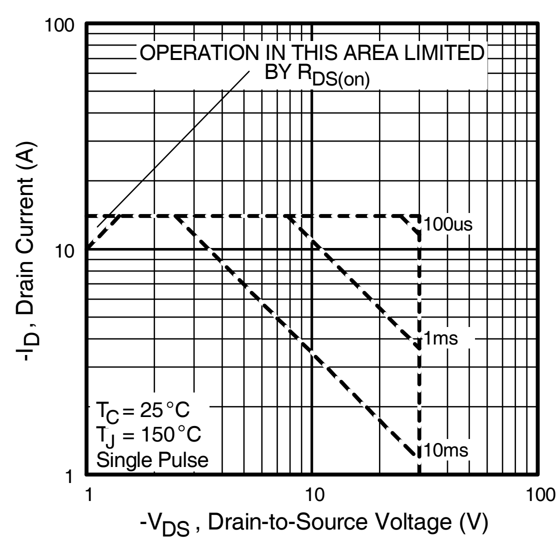


Fig 8. Maximum Safe Operating Area

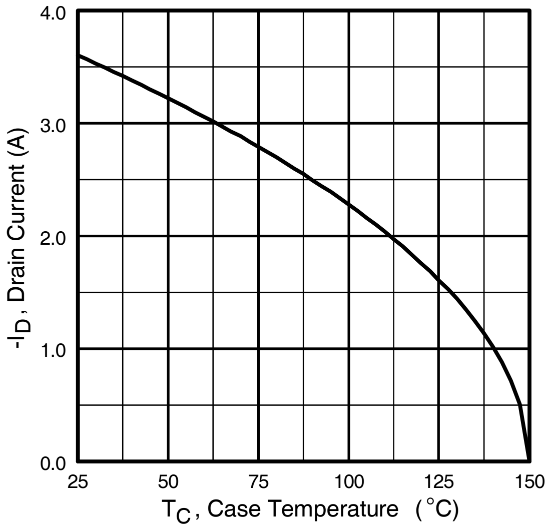


Fig 9. Maximum Drain Current Vs. Ambient Temperature

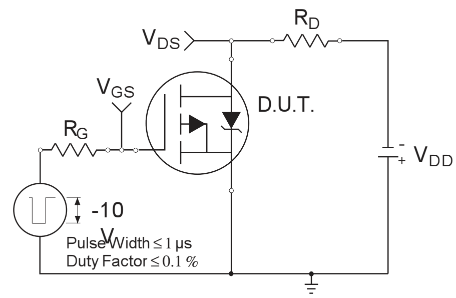


Fig 10a. Switching Time Test Circuit

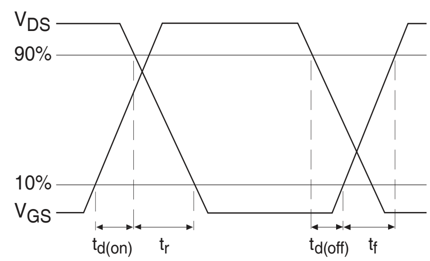


Fig 10b. Switching Time Waveforms

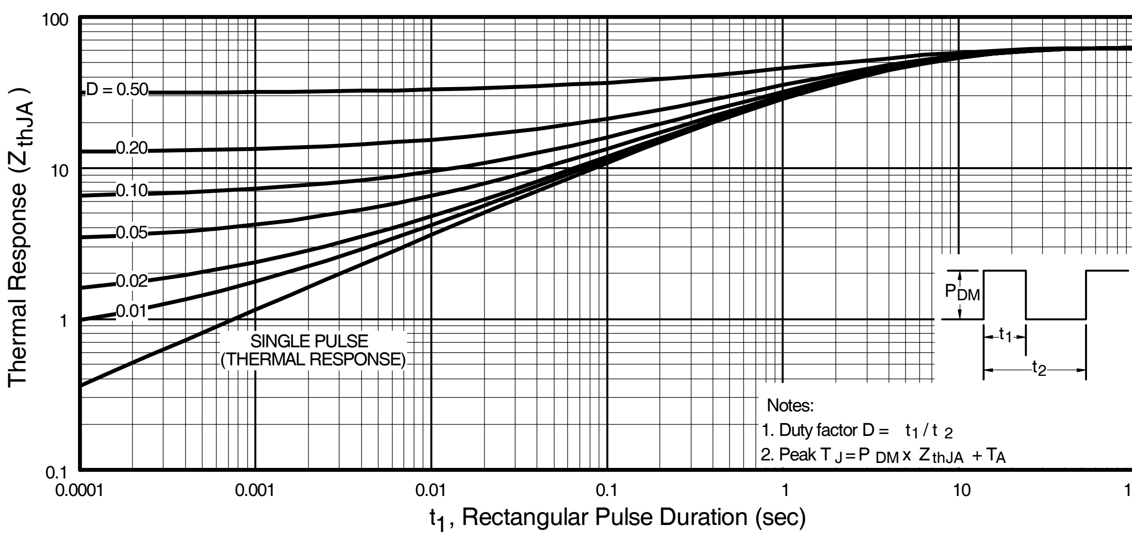


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

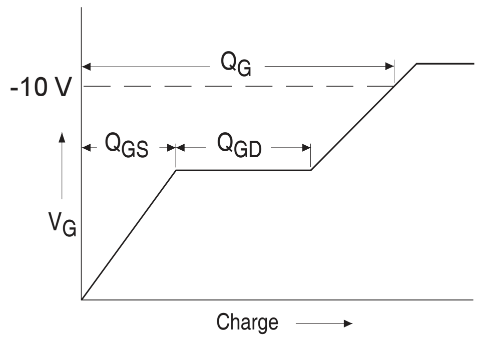


Fig 12a. Basic Gate Charge Waveform

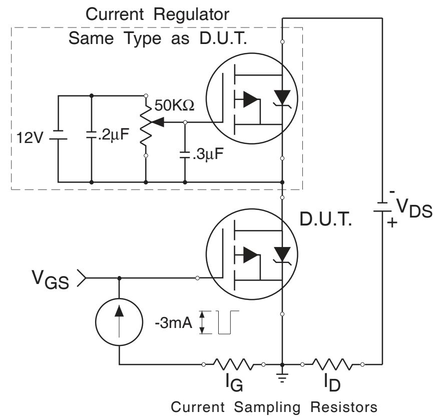


Fig 12b. Gate Charge Test Circuit

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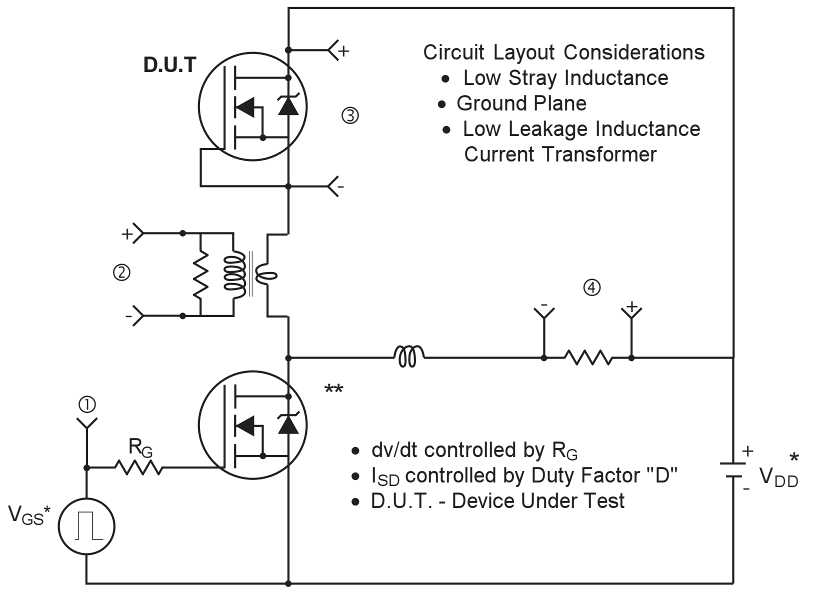
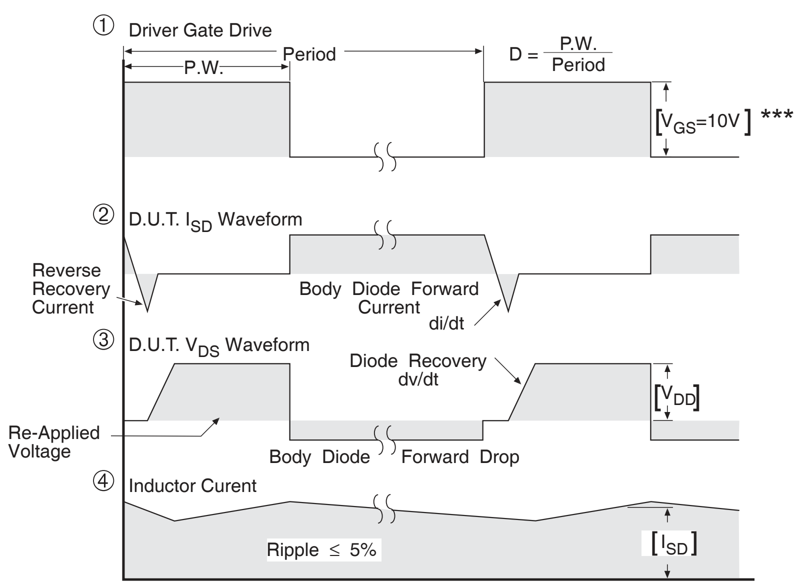
Peak Diode Recovery dv/dt Test Circuit



* Reverse Polarity for P-Channel

** Use P-Channel Driver for P-Channel Measurements

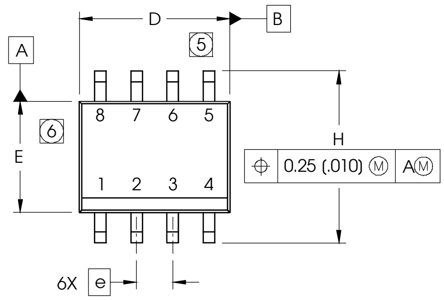


*** V_{GS} = 5.0V for Logic Level and 3V Drive Devices

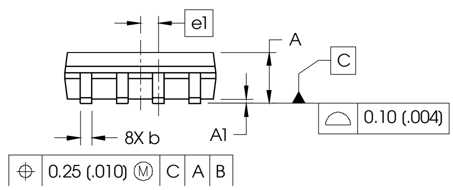
Fig 13. For P-Channel HEXFETS

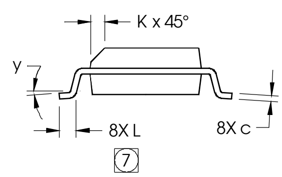
SO-8 Package Outline

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°

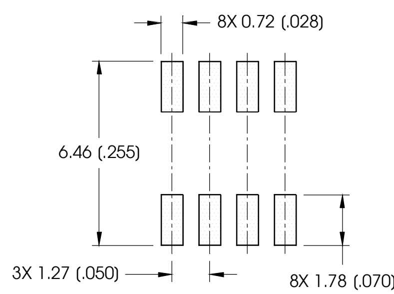




NOTES:

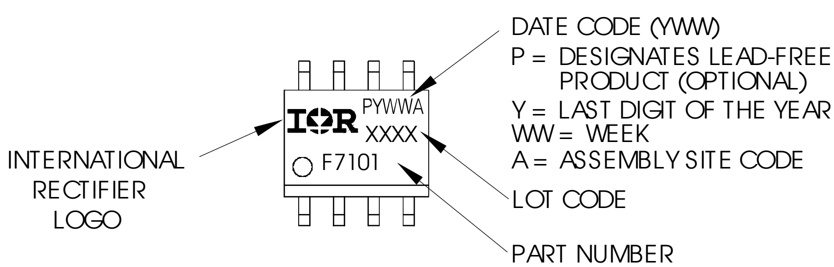
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [.006].
6. DIMENSION DOES NOT INCLUDE 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

EXAMPLE: THIS IS AN IRF7101 (MOSFET)



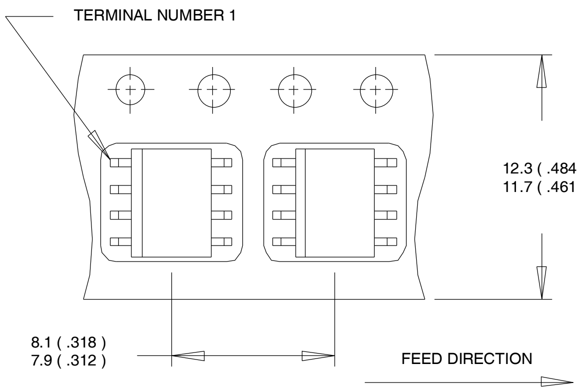
Notes:

1. For an Automotive Qualified version of this part please see http://www.irf.com/product-info/auto/

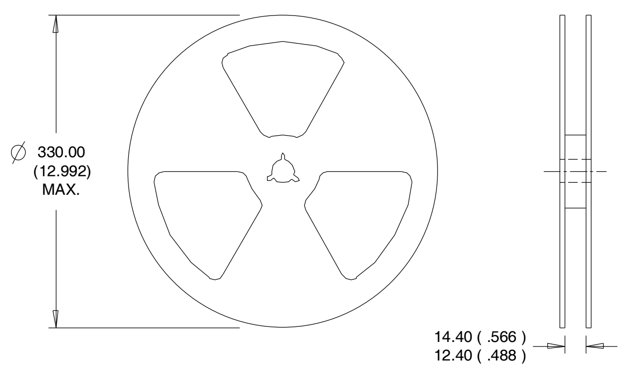
2. For the most current drawing please refer to IR website at http://www.irf.com/package/

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.

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	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.

Revision History

Date	Comments
7/2/2014	• Added ordering information to reflect the End-Of-life

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