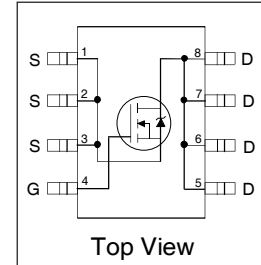


DEVICE CHARACTERISTICS<sup>⑤</sup>

	<b>IRF7809AV</b>
$R_{DS(on)}$	7.0m $\Omega$
$Q_G$	41nC
$Q_{sw}$	14nC
$Q_{oss}$	30nC

HEXFET<sup>®</sup> Power MOSFET



**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	
IRF7809AVPbF-1	SO-8	Tube/Bulk	95	IRF7809AVPbF-1
		Tape and Reel	4000	IRF7809AVTRPbF-1

**Absolute Maximum Ratings**

Parameter	Symbol	IRF7809A V	Units
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	
Continuous Drain or Source Current ( $V_{GS} \geq 4.5V$ )	$T_A = 25^\circ C$	13.3	A
	$T_L = 90^\circ C$	14.6	
Pulsed Drain Current <sup>①</sup>	$I_{DM}$	100	
Power Dissipation	$T_A = 25^\circ C$	2.5	W
	$T_L = 90^\circ C$	3.0	
Junction & Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ C$
Continuous Source Current (Body Diode)	$I_S$	2.5	A
Pulsed Source Current <sup>①</sup>	$I_{SM}$	50	

**Thermal Resistance**

Parameter		Max.	Units
Maximum Junction-to-Ambient <sup>③</sup>	$R_{\theta JA}$	50	$^\circ C/W$
Maximum Junction-to-Lead	$R_{\theta JL}$	20	$^\circ C/W$

**Electrical Characteristics**

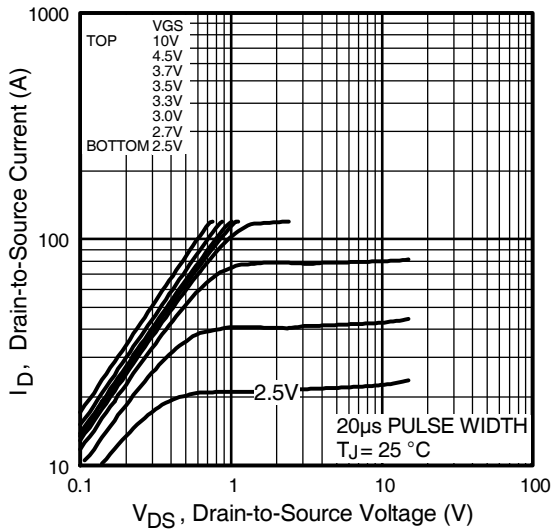
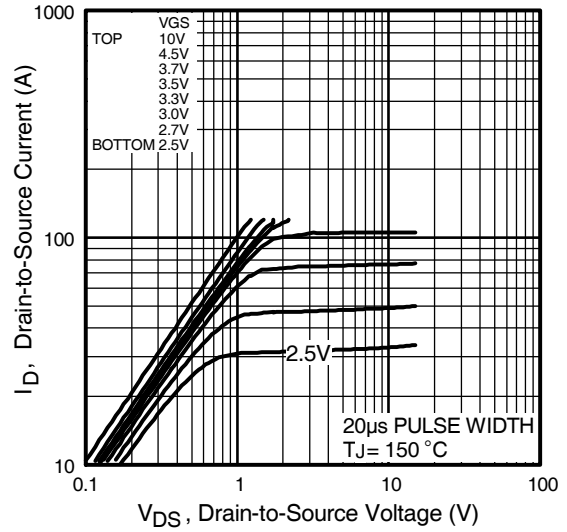
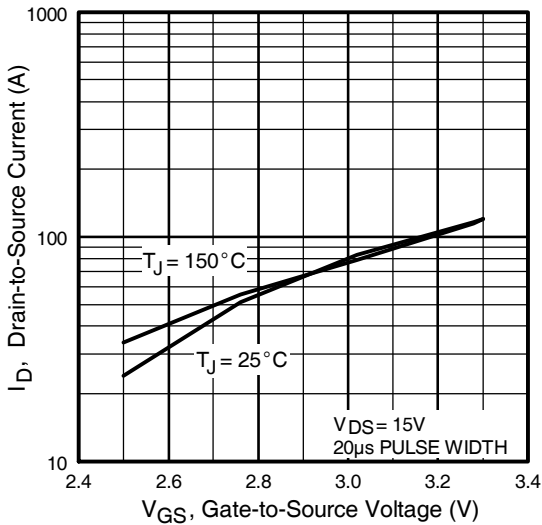
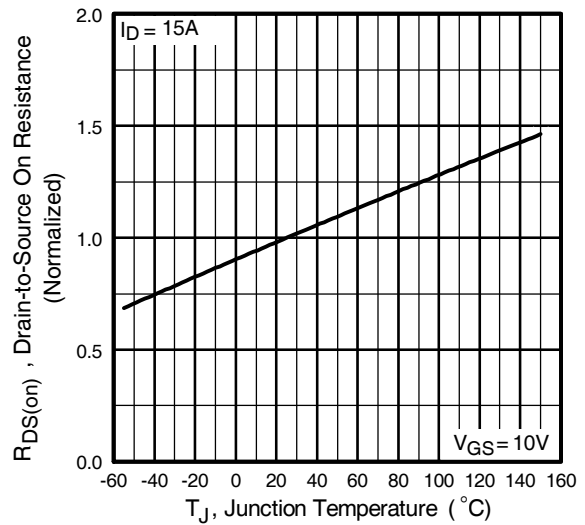
Parameter		Min	Typ	Max	Units	Conditions
Drain-to-Source Breakdown Voltage	$BV_{DSS}$	30	–	–	V	$V_{GS} = 0V, I_D = 250\mu A$
Static Drain-Source on Resistance	$R_{DS(on)}$		7.0	9.0	m $\Omega$	$V_{GS} = 4.5V, I_D = 15A$ ②
Gate Threshold Voltage	$V_{GS(th)}$	1.0			V	$V_{DS} = V_{GS}, I_D = 250\mu A$
Drain-Source Leakage Current	$I_{DSS}$			30	$\mu A$	$V_{DS} = 24V, V_{GS} = 0$
				150		$V_{DS} = 24V, V_{GS} = 0,$ $T_j = 100^\circ C$
Gate-Source Leakage Current*	$I_{GSS}$			$\pm 100$	nA	$V_{GS} = \pm 12V$
Total Gate Chg Cont FET	$Q_G$		41	62	nC	$V_{GS} = 5V, I_D = 15A, V_{DS} = 20V$
Total Gate Chg Sync FET	$Q_G$		36	54		$V_{GS} = 5V, V_{DS} < 100mV$
Pre-Vth Gate-Source Charge	$Q_{GS1}$		7.0			$V_{DS} = 20V, I_D = 15A$
Post-Vth Gate-Source Charge	$Q_{GS2}$		2.3			
Gate to Drain Charge	$Q_{GD}$		12			$I_D = 15A, V_{DS} = 16V$
Switch Chg( $Q_{GS2} + Q_{GD}$ )	$Q_{sw}$		14	21		
Output Charge*	$Q_{oss}$		30	45		$V_{DS} = 16V, V_{GS} = 0$
Gate Resistance	$R_G$		1.5	3.0		$\Omega$
Turn-on Delay Time	$t_{d(on)}$		14		ns	$V_{DD} = 16V, I_D = 15A$ $V_{GS} = 5V$ Clamped Inductive Load
Rise Time	$t_r$		36			
Turn-off Delay Time	$t_{d(off)}$		96			
Fall Time	$t_f$		10			
Input Capacitance	$C_{iss}$	–	3780	–	pF	$V_{DS} = 16V, V_{GS} = 0$
Output Capacitance	$C_{oss}$	–	1060	–		
Reverse Transfer Capacitance	$C_{rss}$	–	130	–		

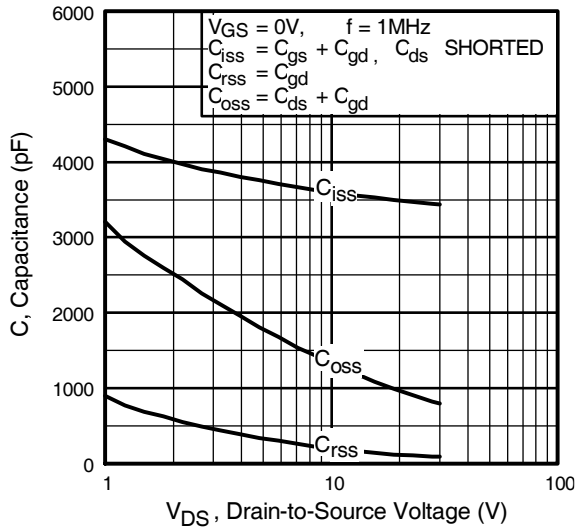
**Source-Drain Rating & Characteristics**

Parameter		Min	Typ	Max	Units	Conditions
Diode Forward Voltage*	$V_{SD}$			1.3	V	$I_S = 15A$ ②, $V_{GS} = 0V$
Reverse Recovery Charge④	$Q_{rr}$		120		nC	$di/dt \sim 700A/\mu s$ $V_{DS} = 16V, V_{GS} = 0V, I_S = 15A$
Reverse Recovery Charge (with Parallel Schottky)④	$Q_{rr(s)}$		150		nC	$di/dt = 700A/\mu s$ (with 10BQ040) $V_{DS} = 16V, V_{GS} = 0V, I_S = 15A$

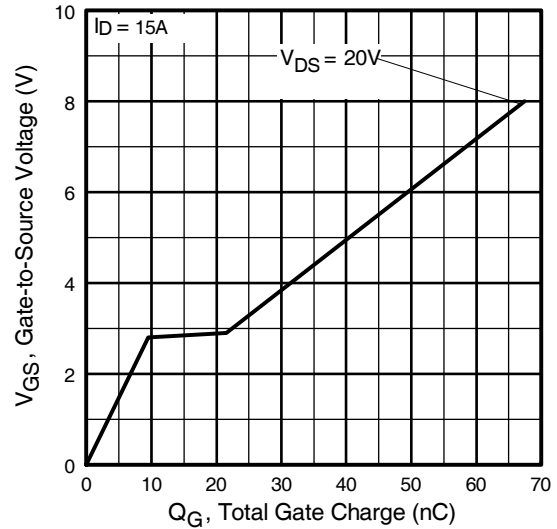
**Notes:**

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Pulse width  $\leq 400 \mu s$ ; duty cycle  $\leq 2\%$ .
- ③ When mounted on 1 inch square copper board,  $t < 10$  sec.
- ④ Typ = measured -  $Q_{oss}$
- ⑤ Typical values measured at  $V_{GS} = 4.5V, I_F = 15A$ .

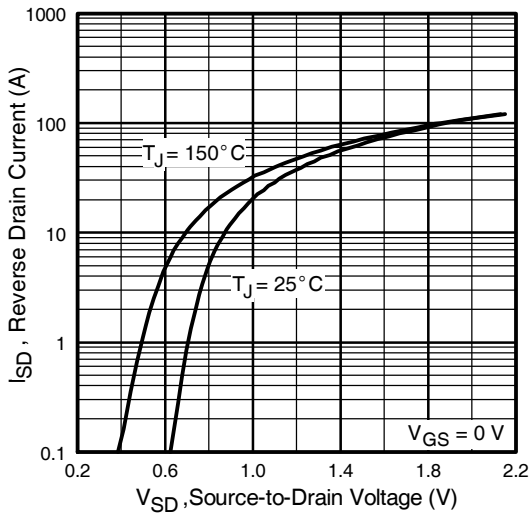

**Fig 1.** Typical Output Characteristics

**Fig 2.** Typical Output Characteristics

**Fig 3.** Typical Transfer Characteristics

**Fig 4.** Normalized On-Resistance Vs. Temperature



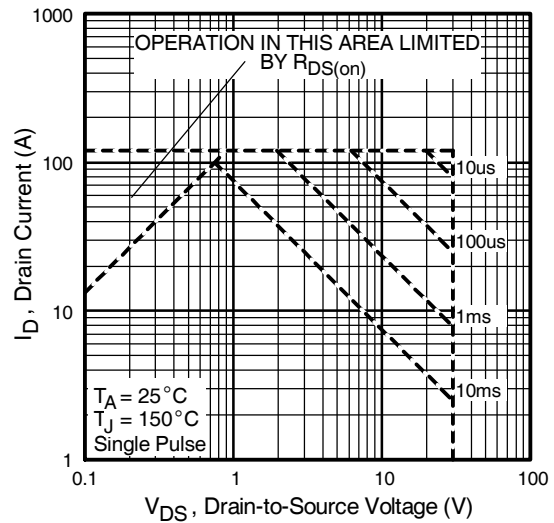
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



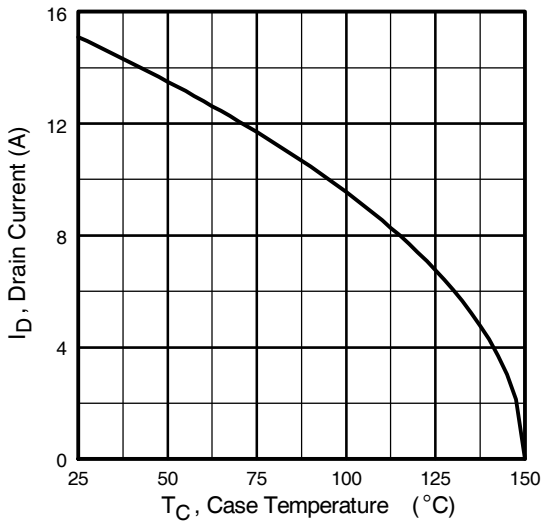
**Fig 6.** Typical Gate Charge Vs. Gate-to-Source Voltage



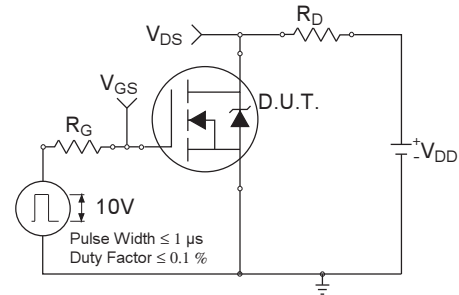
**Fig 7.** Typical Source-Drain Diode Forward Voltage



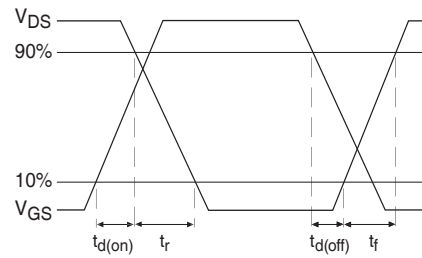
**Fig 8.** Maximum Safe Operating Area



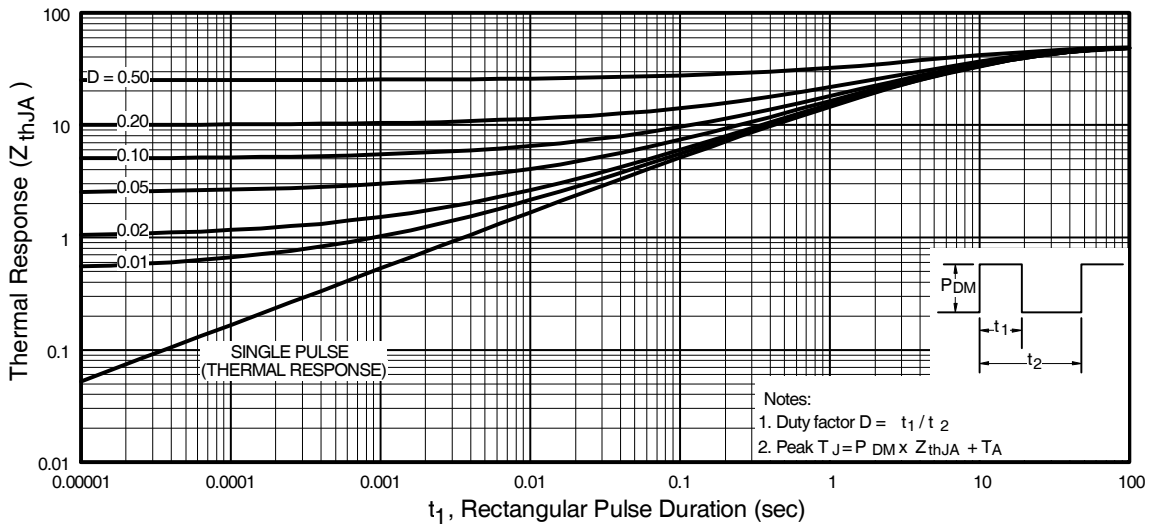
**Fig 9.** Maximum Drain Current Vs. Case Temperature



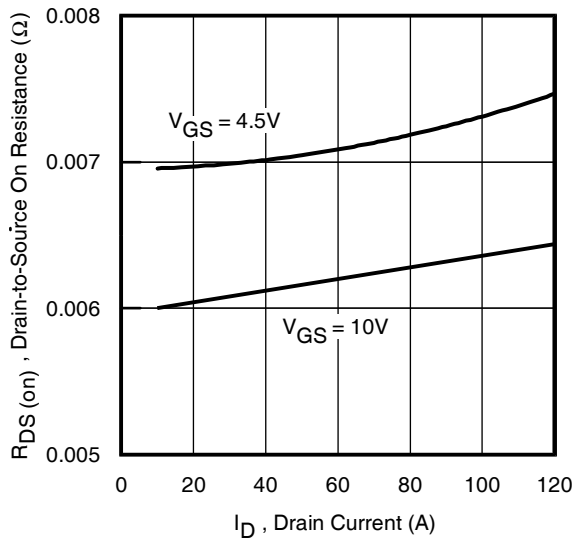
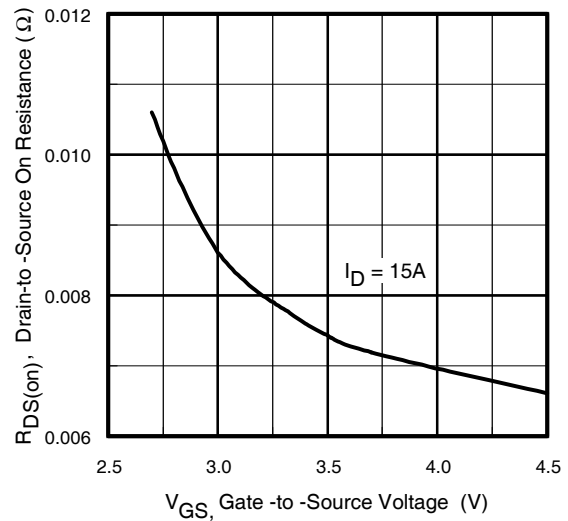
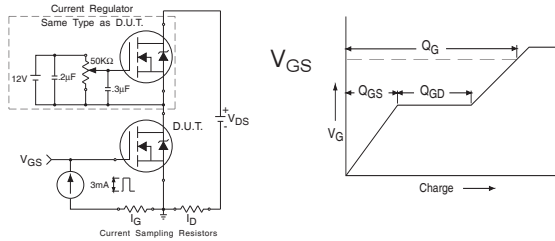
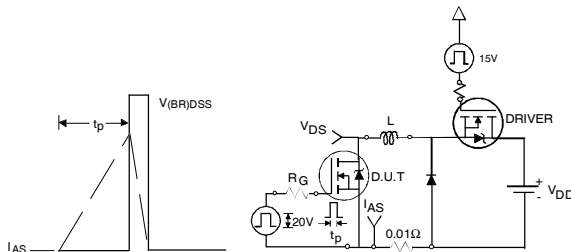
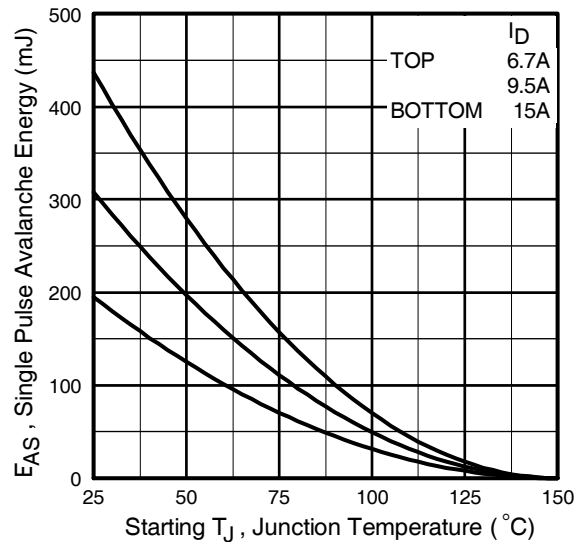
**Fig 10a.** Switching Time Test Circuit



**Fig 10b.** Switching Time Waveforms

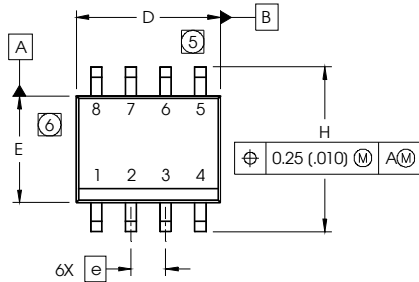


**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

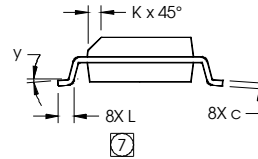
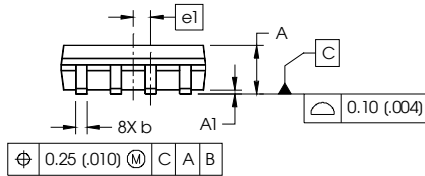

**Fig 12. On-Resistance Vs. Drain Current**

**Fig 13. On-Resistance Vs. Gate Voltage**

**Fig 13a&b. Basic Gate Charge Test Circuit and Waveform**

**Fig 14a&b. Unclamped Inductive Test circuit and Waveforms**

**Fig 14c. Maximum Avalanche Energy Vs. Drain Current**

## SO-8 Package Outline (MOSFET & Fetky)

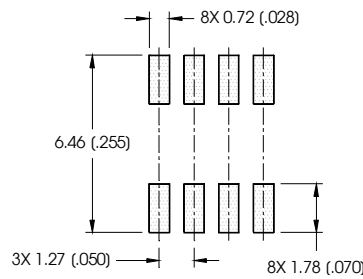
Dimensions are shown in millimeters (inches)



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

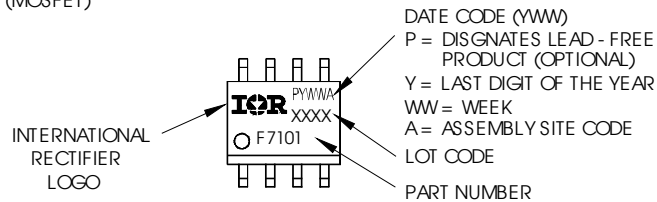


### NOTES:

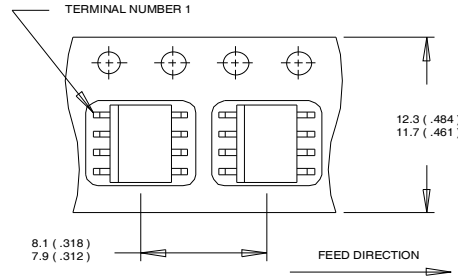
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
- ⑤ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 (.006).
- ⑥ DIMENSION DOES NOT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

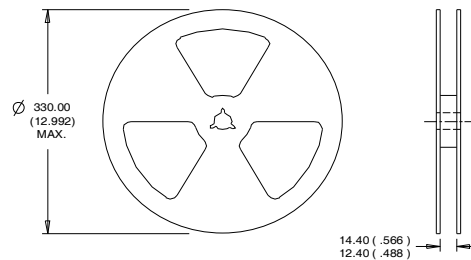
EXAMPLE: THIS IS AN IRF7101 (MOSFET)



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/>

**Qualification information<sup>†</sup>**

Qualification level	Industrial (per JEDEC JESD47F <sup>††</sup> guidelines)	
Moisture Sensitivity Level	SO-8	MSL1 (per JEDEC J-STD-020D <sup>††</sup> )
RoHS compliant	Yes	

<sup>†</sup> Qualification standards can be found at International Rectifier's web site: <http://www.irf.com/product-info/reliability>

<sup>††</sup> Applicable version of JEDEC standard at the time of product release