

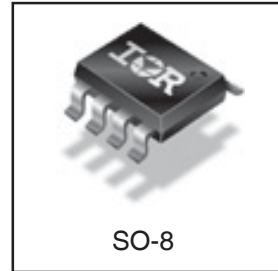
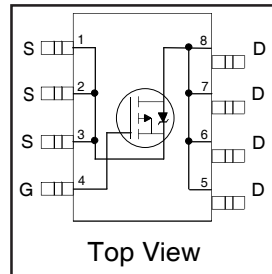


# THE DATASHEET OF IRF7425



HEXFET® Power MOSFET

$V_{DS}$	-20	V
$R_{DS(on) \max}$ (@ $V_{GS} = -4.5V$ )	8.2	mΩ
$R_{DS(on) \max}$ (@ $V_{GS} = -2.5V$ )	13	
$Q_g$ (typical)	87	nC
$I_D$ (@ $T_A = 25^\circ C$ )	-15	A



**Features**

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



**Benefits**

Multi-Vendor Compatibility
Easier Manufacturing
Environmentally Friendlier
Increased Reliability

Base Part Number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IRF7425PbF	SO-8	Tube/Bulk	95	IRF7425PbF
		Tape and Reel	4000	IRF7425TRPbF

**Absolute Maximum Ratings**

	Parameter	Max.	Units
$V_{DS}$	Drain- Source Voltage	-20	V
$I_D$ @ $T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V$	-15	A
$I_D$ @ $T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V$	-12	
$I_{DM}$	Pulsed Drain Current ①	-60	W
$P_D$ @ $T_A = 25^\circ C$	Power Dissipation ③	2.5	
$P_D$ @ $T_A = 70^\circ C$	Power Dissipation ③	1.6	
	Linear Derating Factor	20	mW/°C
$V_{GS}$	Gate-to-Source Voltage	± 12	V
$T_J, T_{STG}$	Junction and Storage Temperature Range	-55 to + 150	°C

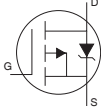
**Thermal Resistance**

	Parameter	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient ③	50	°C/W

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

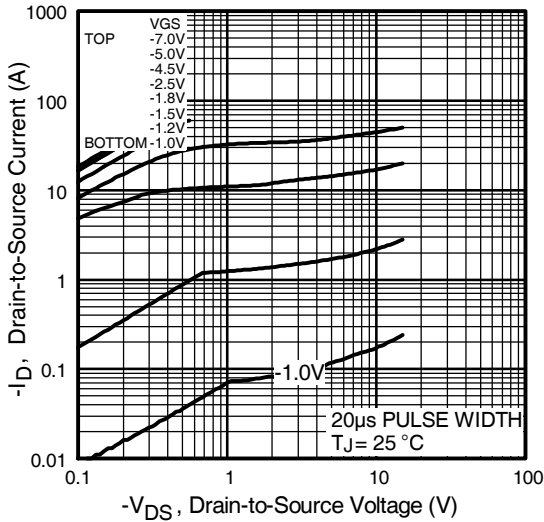
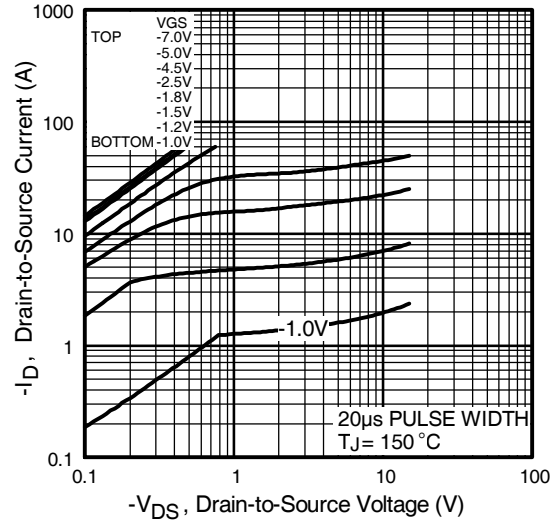
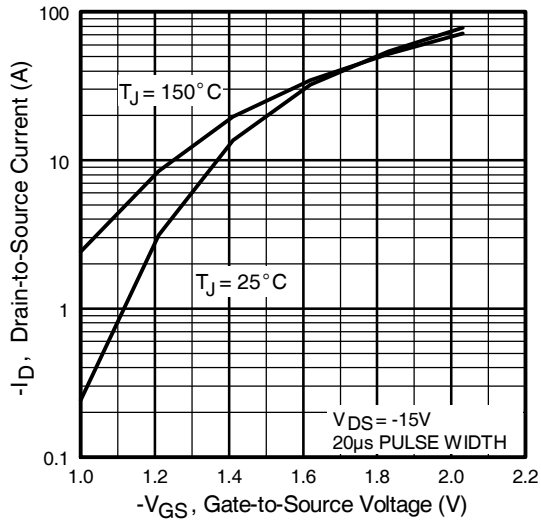
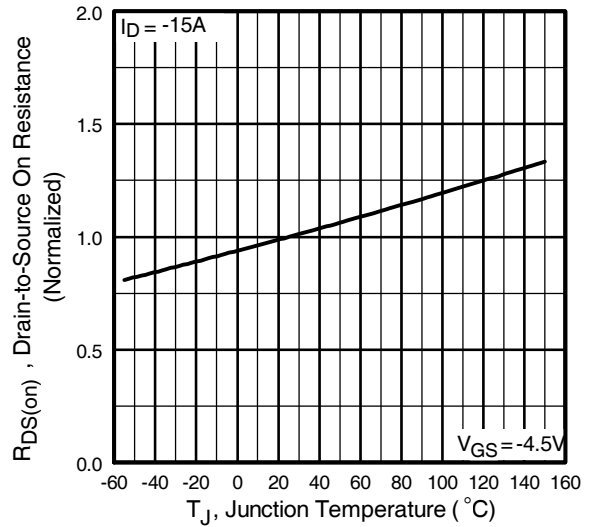
	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-20	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.010	—	V/ $^\circ\text{C}$	Reference to $25^\circ\text{C}$ , $I_D = -1mA$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	8.2	m $\Omega$	$V_{GS} = -4.5V, I_D = -15A$ ②
		—	—	13		$V_{GS} = -2.5V, I_D = -13A$ ②
$V_{GS(th)}$	Gate Threshold Voltage	-0.45	—	-1.2	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
$g_{fs}$	Forward Transconductance	44	—	—	S	$V_{DS} = -10V, I_D = -15A$
$I_{DSS}$	Drain-to-Source Leakage Current	—	—	-1.0	$\mu A$	$V_{DS} = -16V, V_{GS} = 0V$
		—	—	-25		$V_{DS} = -16V, V_{GS} = 0V, T_J = 70^\circ\text{C}$
$I_{GSS}$	Gate-to-Source Forward Leakage	—	—	-100	nA	$V_{GS} = -12V$
	Gate-to-Source Reverse Leakage	—	—	100		$V_{GS} = 12V$
$Q_g$	Total Gate Charge	—	87	130	nC	$I_D = -15A$
$Q_{gs}$	Gate-to-Source Charge	—	18	27		$V_{DS} = -10V$
$Q_{gd}$	Gate-to-Drain ("Miller") Charge	—	21	32		$V_{GS} = -4.5V$
$t_{d(on)}$	Turn-On Delay Time	—	13	—	ns	$V_{DD} = -10V$ ②
$t_r$	Rise Time	—	20	—		$I_D = -1.0A$
$t_{d(off)}$	Turn-Off Delay Time	—	230	—		$R_G = 6.0\Omega$
$t_f$	Fall Time	—	160	—		$V_{GS} = -4.5V$
$C_{iss}$	Input Capacitance	—	7980	—	pF	$V_{GS} = 0V$
$C_{oss}$	Output Capacitance	—	1480	—		$V_{DS} = -15V$
$C_{rss}$	Reverse Transfer Capacitance	—	980	—		$f = 1.0kHz$

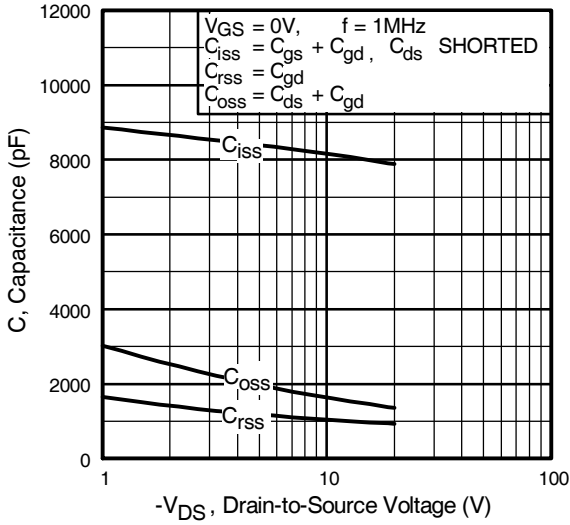
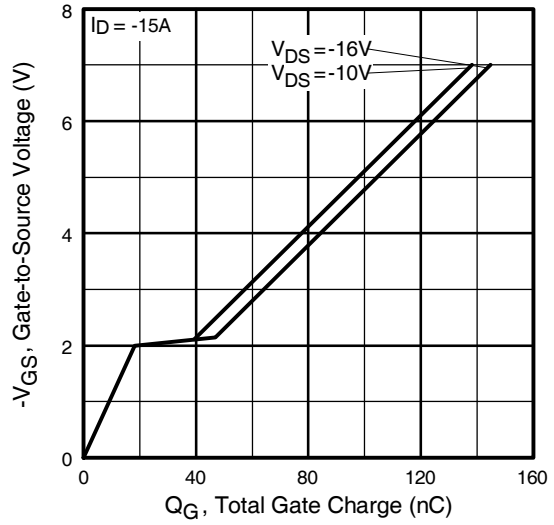
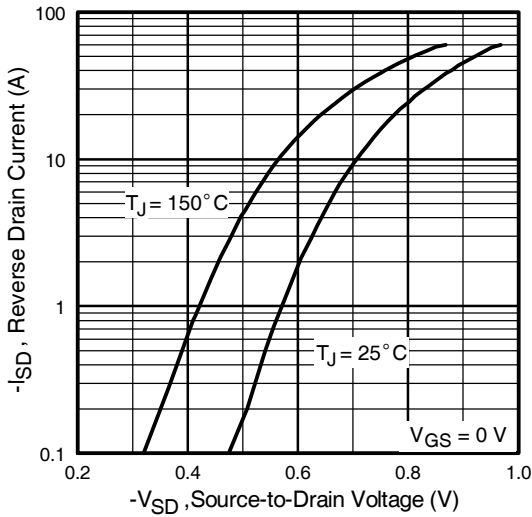
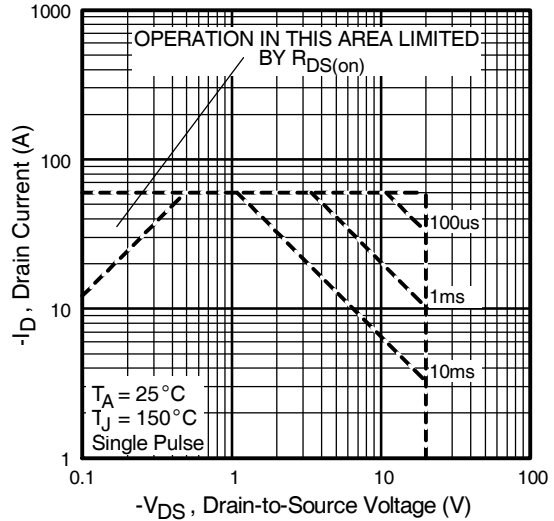
**Source-Drain Ratings and Characteristics**

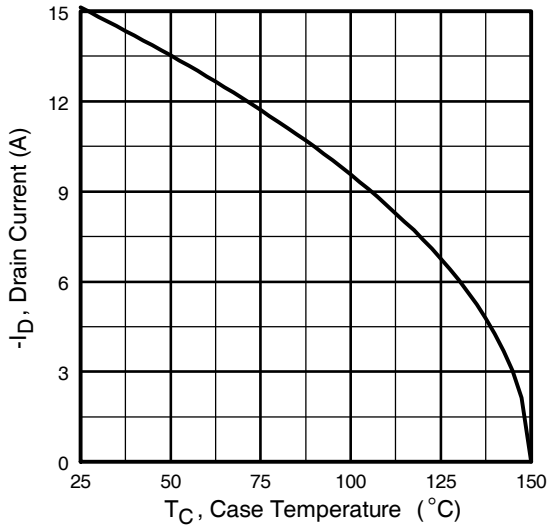
	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_S$	Continuous Source Current (Body Diode)	—	—	-2.5	A	MOSFET symbol showing the integral reverse p-n junction diode. 
$I_{SM}$	Pulsed Source Current (Body Diode) ①	—	—	-60		
$V_{SD}$	Diode Forward Voltage	—	—	-1.2	V	$T_J = 25^\circ\text{C}, I_S = -2.5A, V_{GS} = 0V$ ②
$t_{rr}$	Reverse Recovery Time	—	120	180	ns	$T_J = 25^\circ\text{C}, I_F = -2.5A$
$Q_{rr}$	Reverse Recovery Charge	—	160	240	nC	$di/dt = -100A/\mu s$ ②

**Notes:**

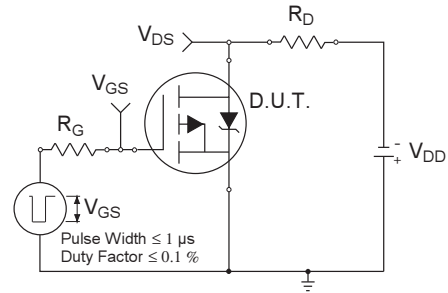
- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Pulse width  $\leq 400\mu s$ ; duty cycle  $\leq 2\%$ .
- ③ Surface mounted on 1 in square Cu board,  $t \leq 10sec$ .


**Fig 1.** Typical Output Characteristics

**Fig 2.** Typical Output Characteristics

**Fig 3.** Typical Transfer Characteristics

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

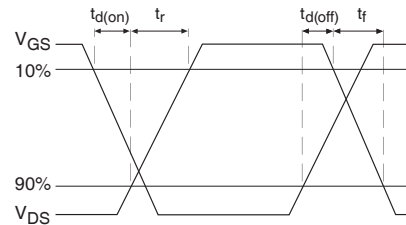

**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage

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

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

**Fig 8.** Maximum Safe Operating Area



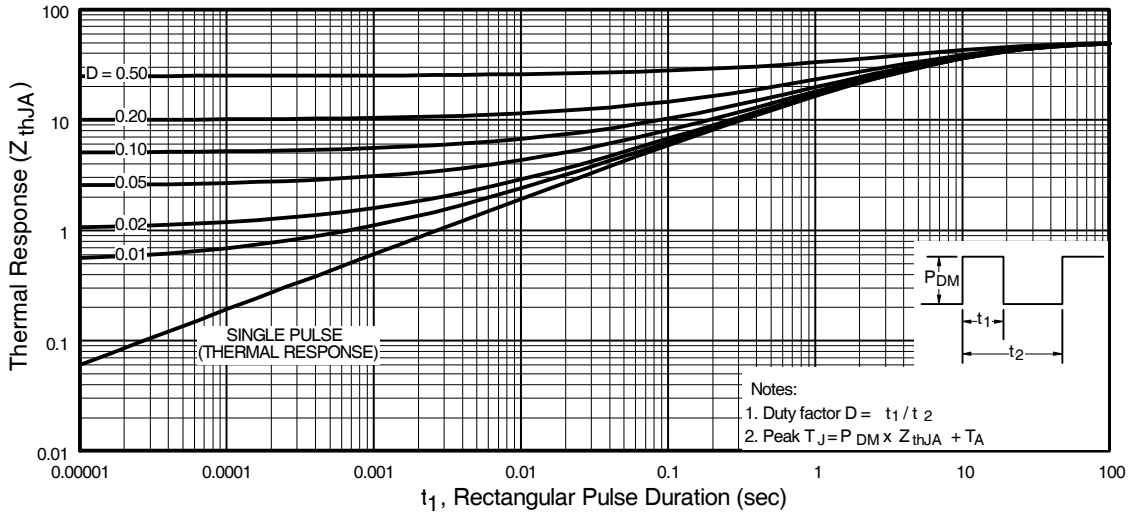
**Fig 9.** Maximum Drain Current Vs. Case Temperature



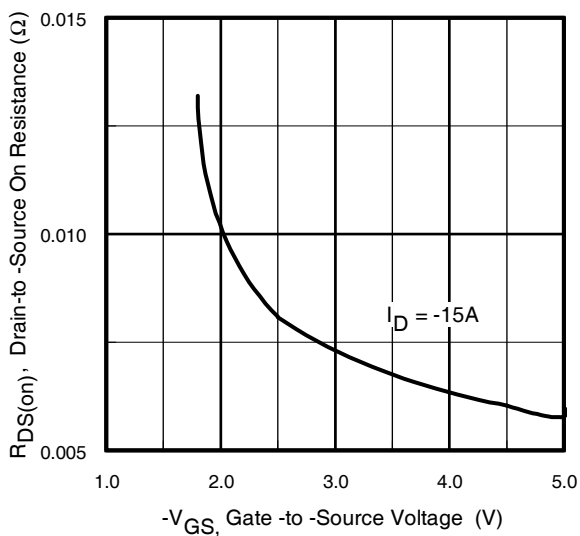
**Fig 10a.** Switching Time Test Circuit



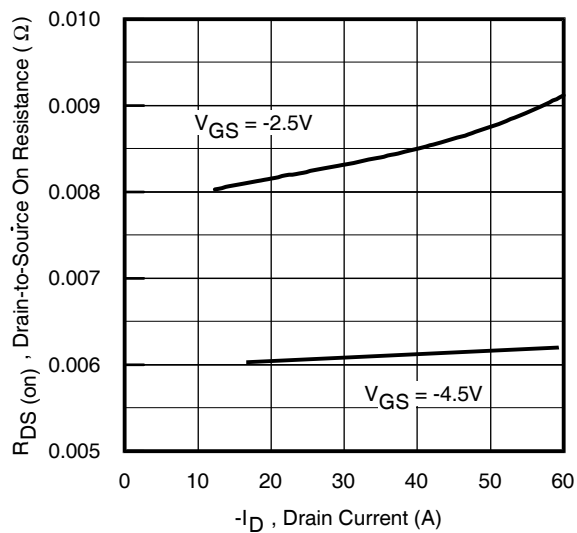
**Fig 10b.** Switching Time Waveforms



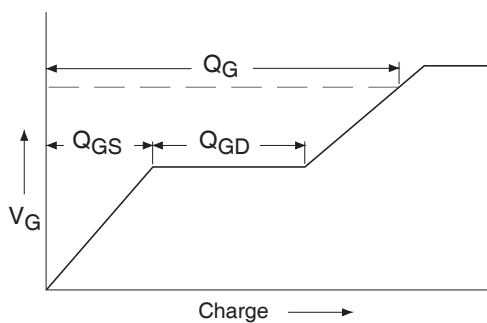
**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



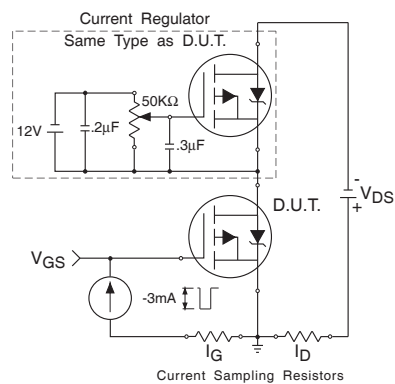
**Fig 12.** Typical On-Resistance Vs. Gate Voltage



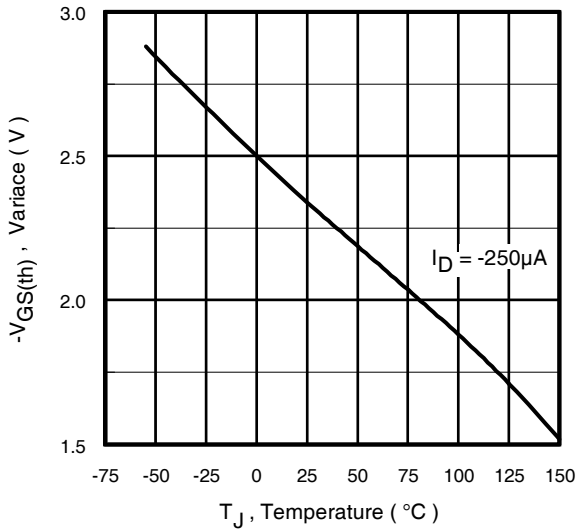
**Fig 13.** Typical On-Resistance Vs. Drain Current



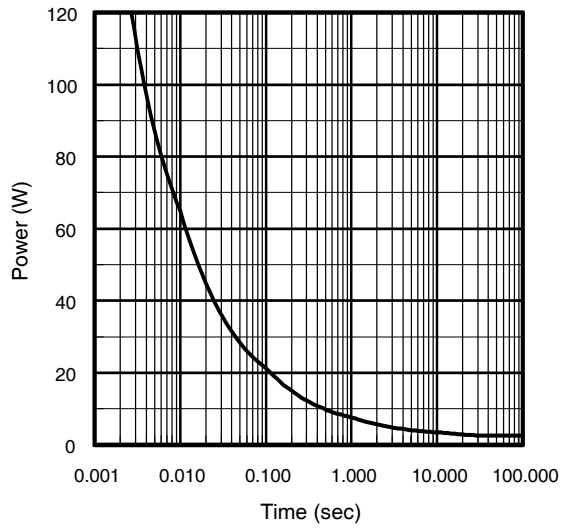
**Fig 14a.** Basic Gate Charge Waveform



**Fig 14b.** Gate Charge Test Circuit



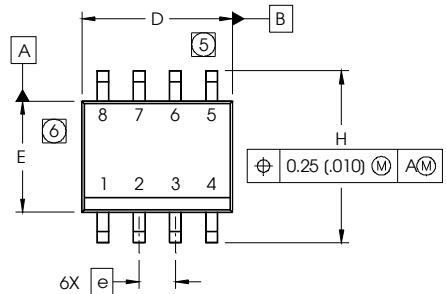
**Fig 15.** Typical V<sub>GS(th)</sub> Variance Vs. Junction Temperature



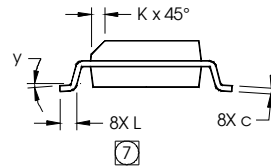
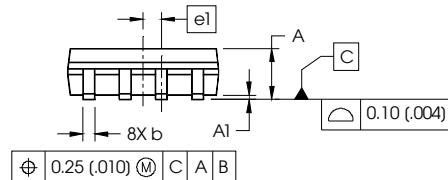
**Fig 16.** Typical Power Vs. Time

## SO-8 Package Outline

Dimensions are shown in millimeters (inches)



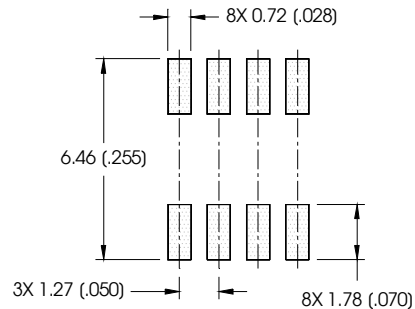
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40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



### NOTES:

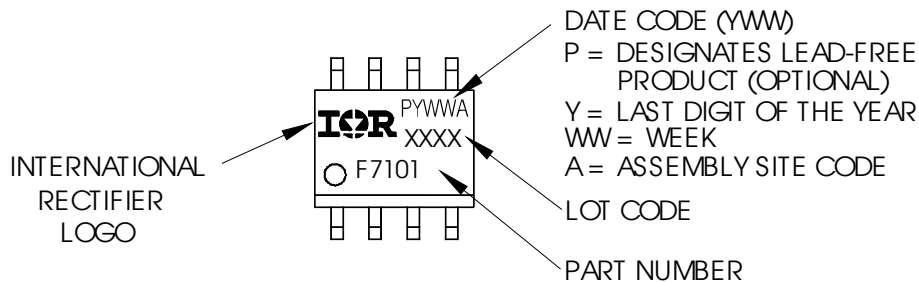
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
- ⑤ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 (.006).
- ⑥ DIMENSION DOES NOT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

### FOOTPRINT

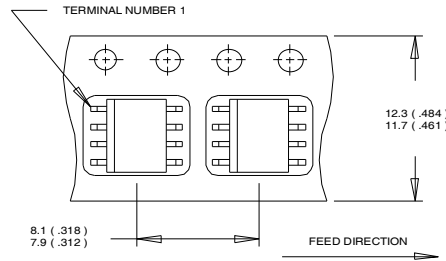


## SO-8 Part Marking

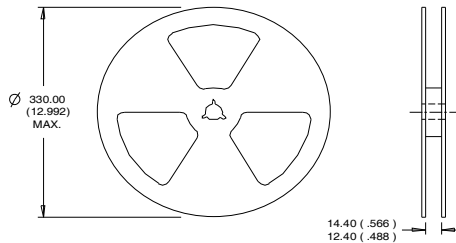
EXAMPLE: THIS IS AN IRF7101 (MOSFET)



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	Consumer (per JEDEC JESD47F <sup>††</sup> guidelines)	
Moisture Sensitivity Level	SO-8	M6L1 (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

**Revision History**

Date	Comments
10/29/2013	<ul style="list-style-type: none"> <li>• Added ordering information on page 1.</li> <li>• Updated datasheet with new IR corporate template.</li> </ul>

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