

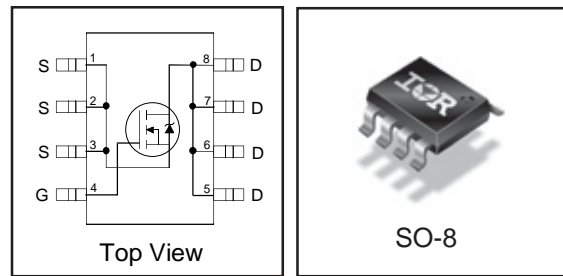
**Applications**

- High frequency DC-DC converters
- Lead-Free

<b>V<sub>DSS</sub></b>	<b>R<sub>DS(on)</sub> max</b>	<b>I<sub>D</sub></b>
<b>200V</b>	<b>0.73Ω</b>	<b>1.2A</b>

**Benefits**

- Low Gate to Drain Charge to Reduce Switching Losses
- Fully Characterized Capacitance Including Effective C<sub>OSS</sub> to Simplify Design, (See App. Note AN1001)
- Fully Characterized Avalanche Voltage and Current



**Absolute Maximum Ratings**

	Parameter	Max.	Units
I <sub>D</sub> @ T <sub>A</sub> = 25°C	Continuous Drain Current, V <sub>GS</sub> @ 10V	1.2	A
I <sub>D</sub> @ T <sub>A</sub> = 70°C	Continuous Drain Current, V <sub>GS</sub> @ 10V	1.0	
I <sub>DM</sub>	Pulsed Drain Current ①	10	
P <sub>D</sub> @ T <sub>A</sub> = 25°C	Power Dissipation	2.5	W
	Linear Derating Factor	0.02	W/°C
V <sub>GS</sub>	Gate-to-Source Voltage	± 30	V
dv/dt	Peak Diode Recovery dv/dt ③	6.8	V/ns
T <sub>J</sub>	Operating Junction and	-55 to + 150	°C
T <sub>STG</sub>	Storage Temperature Range		
	Soldering Temperature, for 10 seconds	300 (1.6mm from case )	

**Typical SMPS Topologies**

- Telecom 48V input Forward Converter

Notes ① through ⑥ are on page 8  
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# IRF7464PbF

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	200	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.23	—	V/°C	Reference to $25^\circ\text{C}, I_D = 1\text{mA}$ ⑥
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	0.73	$\Omega$	$V_{GS} = 10V, I_D = 0.72A$ ④
$V_{GS(th)}$	Gate Threshold Voltage	3.0	—	5.5	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
$I_{DSS}$	Drain-to-Source Leakage Current	—	—	25	$\mu A$	$V_{DS} = 200V, V_{GS} = 0V$
		—	—	250		$V_{DS} = 160V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
$I_{GSS}$	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = 30V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS} = -30V$

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$g_{fs}$	Forward Transconductance	1.1	—	—	S	$V_{DS} = 50V, I_D = 0.72A$
$Q_g$	Total Gate Charge	—	9.5	14	nC	$I_D = 0.72A$
$Q_{gs}$	Gate-to-Source Charge	—	2.5	3.8		$V_{DS} = 160V$
$Q_{gd}$	Gate-to-Drain ("Miller") Charge	—	4.6	6.9		$V_{GS} = 10V, \text{④}$
$t_{d(on)}$	Turn-On Delay Time	—	11	—	ns	$V_{DD} = 100V$
$t_r$	Rise Time	—	9.5	—		$I_D = 0.72A$
$t_{d(off)}$	Turn-Off Delay Time	—	18	—		$R_G = 24\Omega$
$t_f$	Fall Time	—	15	—		$V_{GS} = 10V, \text{④}$
$C_{iss}$	Input Capacitance	—	280	—	pF	$V_{GS} = 0V$
$C_{oss}$	Output Capacitance	—	52	—		$V_{DS} = 25V$
$C_{rSS}$	Reverse Transfer Capacitance	—	14	—		$f = 1.0\text{MHz}$
$C_{oss}$	Output Capacitance	—	330	—		$V_{GS} = 0V, V_{DS} = 1.0V, f = 1.0\text{MHz}$
$C_{oss}$	Output Capacitance	—	25	—		$V_{GS} = 0V, V_{DS} = 160V, f = 1.0\text{MHz}$
$C_{oss\ eff.}$	Effective Output Capacitance	—	48	—		$V_{GS} = 0V, V_{DS} = 0V \text{ to } 160V, \text{⑥}$

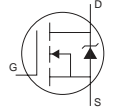
## Avalanche Characteristics

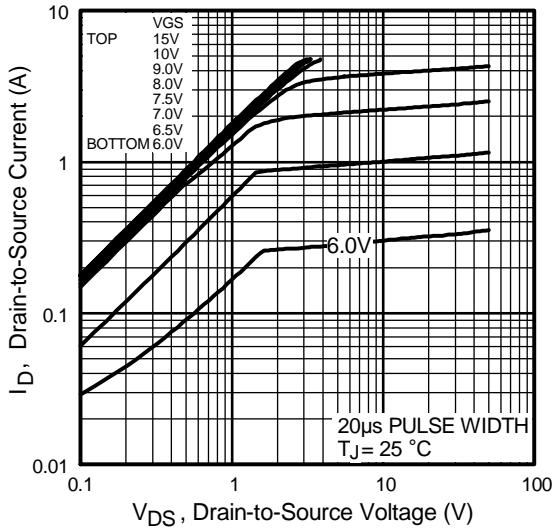
	Parameter	Typ.	Max.	Units
$E_{AS}$	Single Pulse Avalanche Energy②	—	68	mJ
$I_{AR}$	Avalanche Current①	—	1.2	A
$E_{AR}$	Repetitive Avalanche Energy①	—	0.25	mJ

## Thermal Resistance

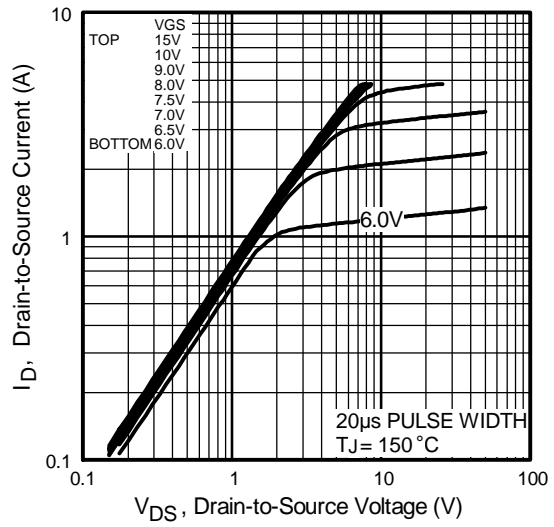
	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient⑥	—	50	°C/W

## Diode Characteristics

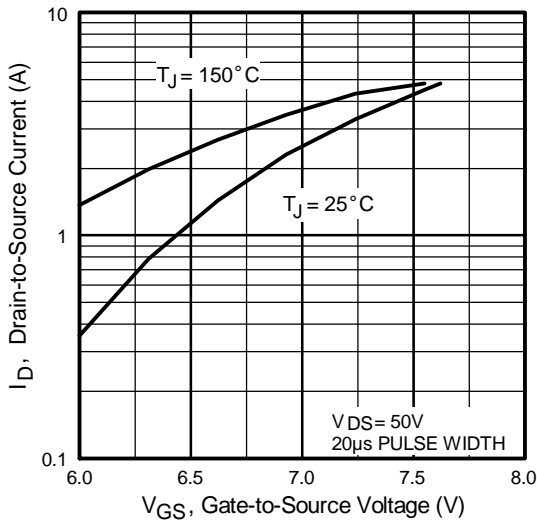
	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_S$	Continuous Source Current (Body Diode)	—	—	2.3	A	MOSFET symbol showing the integral reverse p-n junction diode. 
$I_{SM}$	Pulsed Source Current (Body Diode) ①	—	—	10		
$V_{SD}$	Diode Forward Voltage	—	—	1.3	V	$T_J = 25^\circ\text{C}, I_S = 0.72A, V_{GS} = 0V, \text{④}$
$t_{rr}$	Reverse Recovery Time	—	60	90	ns	$T_J = 25^\circ\text{C}, I_F = 0.72A$
$Q_{rr}$	Reverse Recovery Charge	—	130	200	nC	$di/dt = 100A/\mu s, \text{④}$



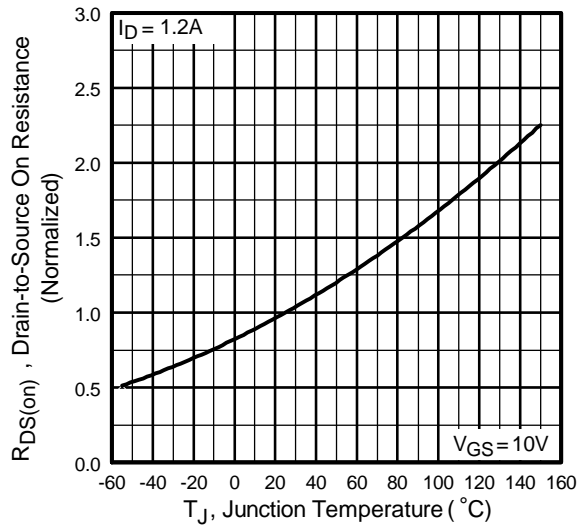
**Fig 1.** Typical Output Characteristics



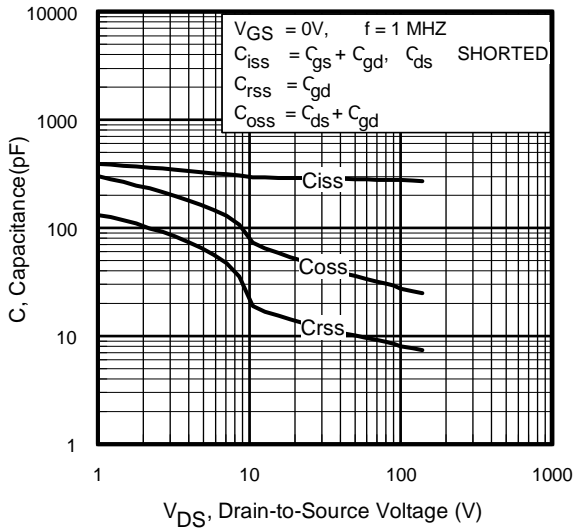
**Fig 2.** Typical Output Characteristics



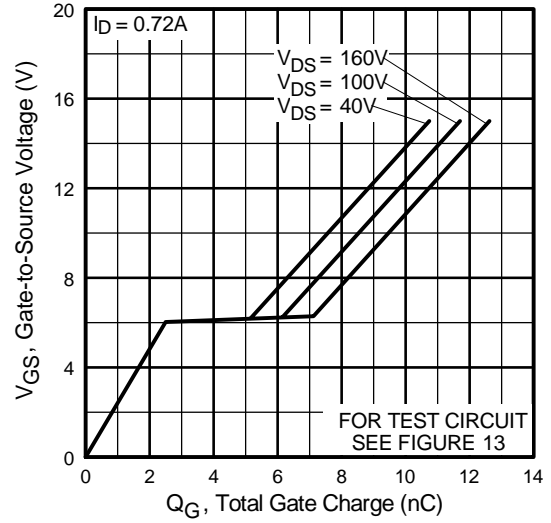
**Fig 3.** Typical Transfer Characteristics



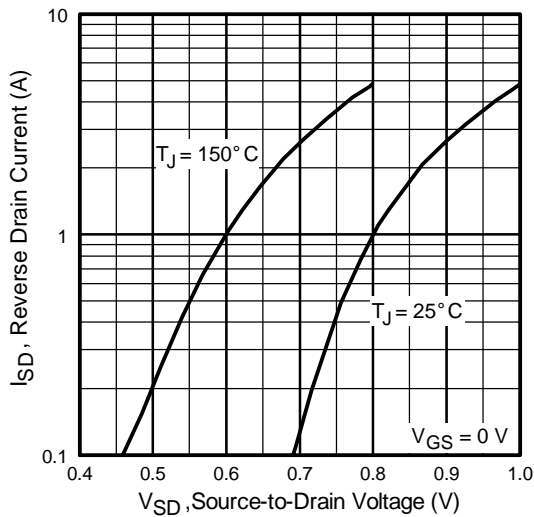
**Fig 4.** Normalized On-Resistance Vs. Temperature



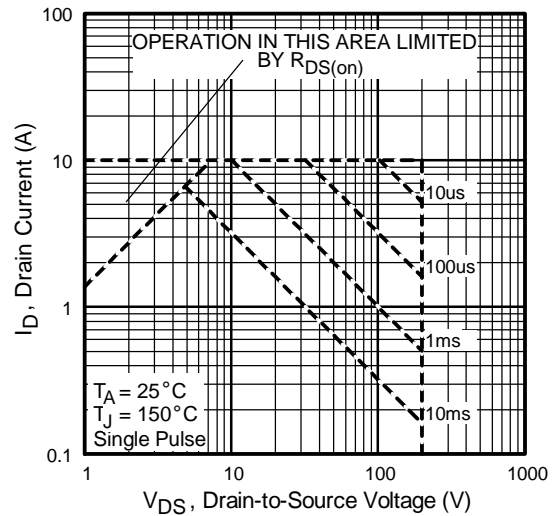
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



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



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

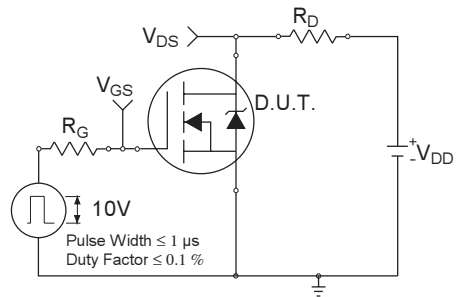
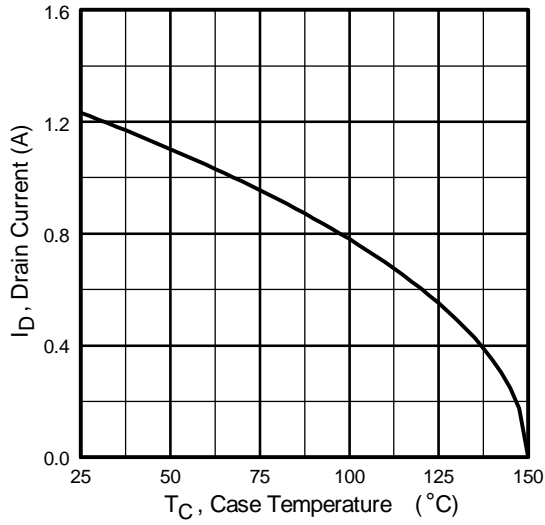


**Fig 8.** Maximum Safe Operating Area

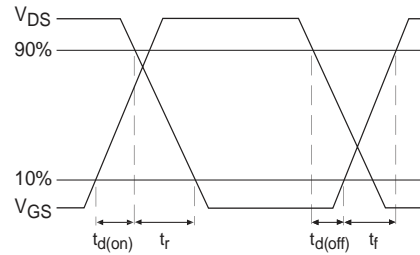
**Fig 6. On-Resistance Vs. Drain Current**

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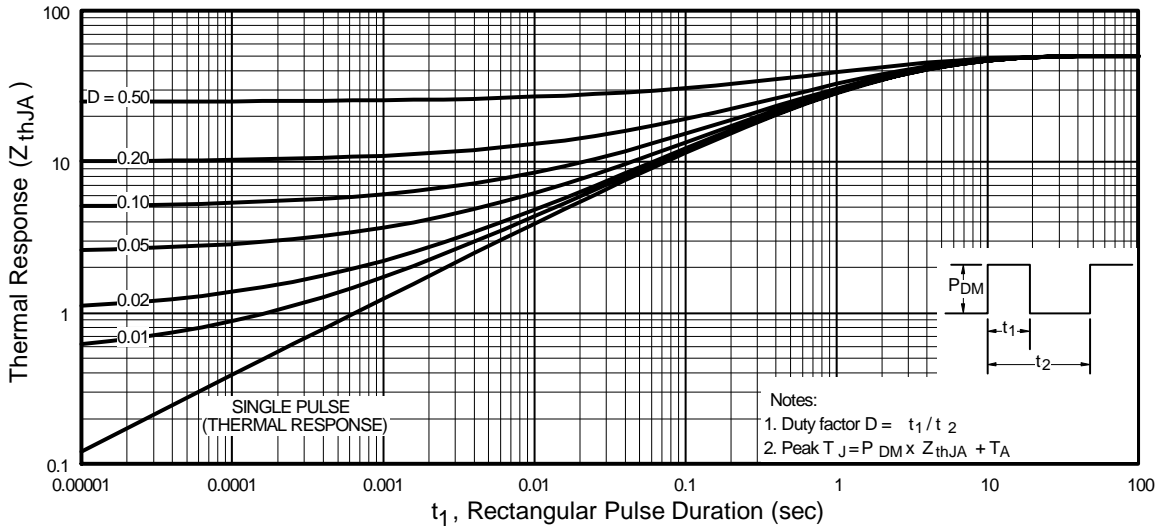
IRF7464PbF



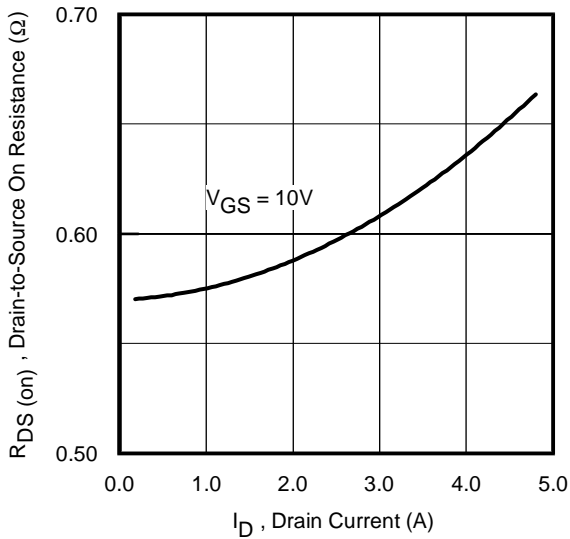
**Fig 10a. Switching Time Test Circuit**



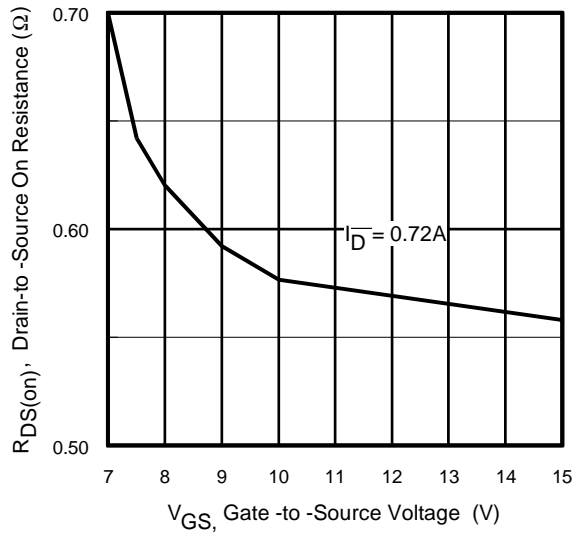
**Fig 10b. Switching Time Waveforms**



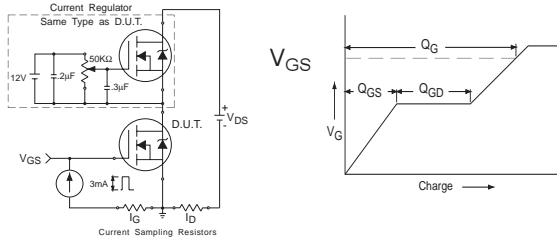
**Fig 10. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient**



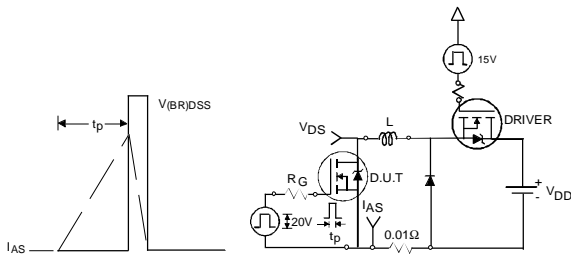
**Fig 12.** On-Resistance Vs. Drain Current



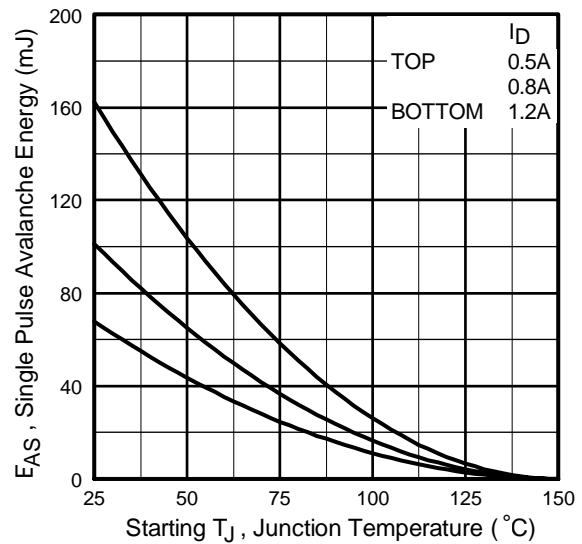
**Fig 13.** On-Resistance Vs. Gate Voltage



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

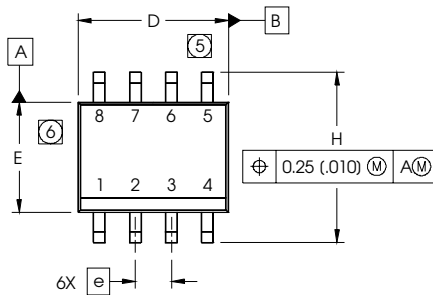


**Fig 14a&b.** Unclamped Inductive Test circuit and Waveforms

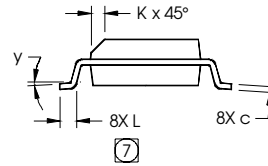
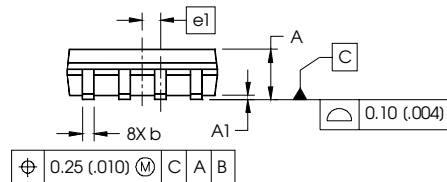


**Fig 14c.** Maximum Avalanche Energy Vs. Drain Current

## SO-8 Package Outline



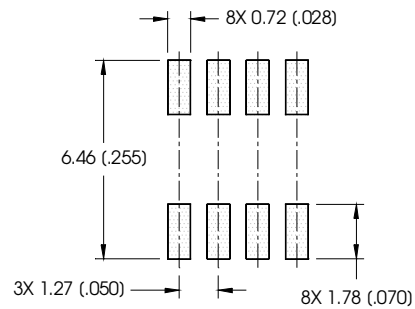
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40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



**NOTES:**

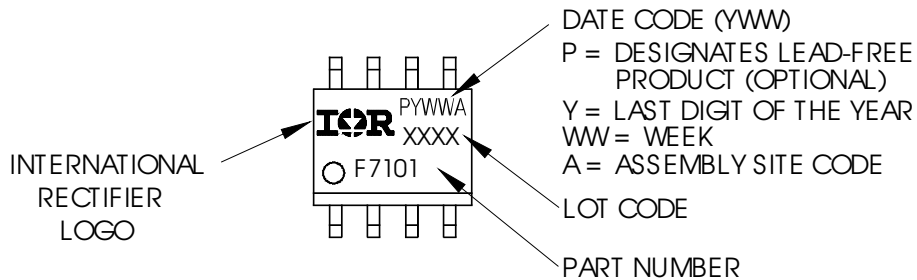
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 (.006).
6. DIMENSION DOES NOT INCLUDE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

**FOOT PRINT**



## SO-8 Part Marking

EXAMPLE: THIS IS AN IRF7101 (MOSFET)

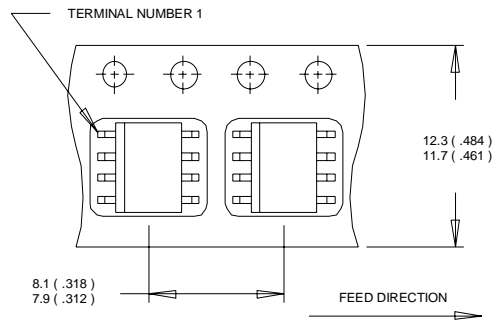


# IRF7464PbF

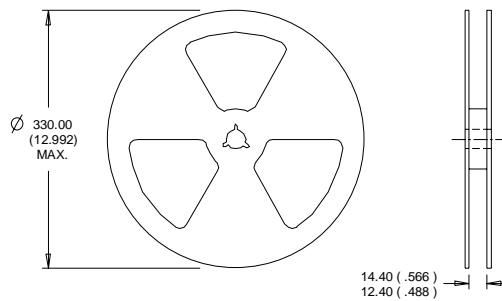
## SO-8 Tape and Reel

Dimensions are shown in millimeters (inches)

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- 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.

### Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting  $T_J = 25^\circ\text{C}$ ,  $L = 94\text{mH}$   
 $R_G = 25\Omega$ ,  $I_{AS} = 1.2\text{A}$ .
- ③  $I_{SD} \leq 0.72\text{A}$ ,  $di/dt \leq 130\text{A}/\mu\text{s}$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  
 $T_J \leq 150^\circ\text{C}$
- ④ Pulse width  $\leq 300\mu\text{s}$ ; duty cycle  $\leq 2\%$ .
- ⑤  $C_{OSS}$  eff. is a fixed capacitance that gives the same charging time as  $C_{OSS}$  while  $V_{DS}$  is rising from 0 to 80%  $V_{DSS}$
- ⑥ When mounted on 1 inch square copper board,  $t < 10$  sec

Data and specifications subject to change without notice.  
This product has been designed and qualified for the Consumer market.  
Qualifications Standards can be found on IR's Web site.

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IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105  
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