

勝特力材料 886-3-5753170  
 勝特力电子(上海) 86-21-34970699  
 勝特力电子(深圳) 86-755-83298787  
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# International **IR** Rectifier

PD-94037B

## IRF7473

HEXFET® Power MOSFET

### Applications

- Telecom and Data-Com 24 and 48V input DC-DC converters
- Motor Control
- Uninterruptible Power Supply

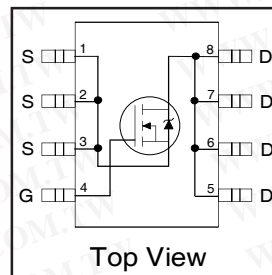
### Benefits

- Ultra Low On-Resistance
- High Speed Switching
- Low Gate Drive Current Due to Improved Gate Charge Characteristic
- Improved Avalanche Ruggedness and Dynamic dv/dt
- Fully Characterized Avalanche Voltage and Current

### Typical SMPS Topologies

- Full and Half Bridge 48V input Circuit
- Forward 24V input Circuit

$V_{DSS}$	$R_{DS(on) \max}$	$I_D$
100V	26mΩ @ $V_{GS} = 10V$	6.9A



### Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	6.9	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	5.5	
$I_{DM}$	Pulsed Drain Current ①	55	
$P_D @ T_A = 25^\circ C$	Power Dissipation	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 ②	5.8	V/ns
$T_J$	Operating Junction and	-55 to + 150	°C
$T_{STG}$	Storage Temperature Range		
	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 ⑥ are on page 8  
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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	100	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.11	—	V/°C	Reference to $25^\circ\text{C}, I_D = 1mA$ ③
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	22	26	mΩ	$V_{GS} = 10V, I_D = 4.1A$ ③
$V_{GS(th)}$	Gate Threshold Voltage	3.5	—	5.5	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
$I_{DSS}$	Drain-to-Source Leakage Current	—	—	1.0	μA	$V_{DS} = 95V, V_{GS} = 0V$
		—	—	250		$V_{DS} = 80V, V_{GS} = 0V, T_J = 150^\circ\text{C}$
$I_{GSS}$	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = 20V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS} = -20V$

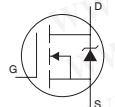
## Dynamic @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$g_{fs}$	Forward Transconductance	10	—	—	S	$V_{DS} = 50V, I_D = 4.1A$
$Q_g$	Total Gate Charge	—	61	—	nC	$I_D = 4.1A$
$Q_{gs}$	Gate-to-Source Charge	—	21	—		$V_{DS} = 50V$
$Q_{gd}$	Gate-to-Drain ("Miller") Charge	—	19	—		$V_{GS} = 10V,$
$t_{d(on)}$	Turn-On Delay Time	—	24	—	ns	$V_{DD} = 50V$
$t_r$	Rise Time	—	20	—		$I_D = 4.1A$
$t_{d(off)}$	Turn-Off Delay Time	—	29	—		$R_G = 6.0\Omega$
$t_f$	Fall Time	—	11	—		$V_{GS} = 10V$ ③
$C_{iss}$	Input Capacitance	—	3180	—		$V_{GS} = 0V$
$C_{oss}$	Output Capacitance	—	230	—	pF	$V_{DS} = 25V$
$C_{rss}$	Reverse Transfer Capacitance	—	120	—		$f = 1.0MHz$
$C_{oss}$	Output Capacitance	—	830	—		$V_{GS} = 0V, V_{DS} = 1.0V, f = 1.0MHz$
$C_{oss}$	Output Capacitance	—	150	—		$V_{GS} = 0V, V_{DS} = 80V, f = 1.0MHz$
$C_{oss\ eff.}$	Effective Output Capacitance	—	230	—		$V_{GS} = 0V, V_{DS} = 0V\ to\ 80V$ ⑤

## Avalanche Characteristics

	Parameter	Typ.	Max.	Units
$E_{AS}$	Single Pulse Avalanche Energy②	—	140	mJ
$I_{AR}$	Avalanche Current①	—	4.1	A

## 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	—	—	55		
$V_{SD}$	Diode Forward Voltage	—	—	1.3	V	$T_J = 25^\circ\text{C}, I_S = 4.1A, V_{GS} = 0V$ ③
$t_{rr}$	Reverse Recovery Time	—	55	—	ns	$T_J = 25^\circ\text{C}, I_F = 4.1A$
$Q_{rr}$	Reverse Recovery Charge	—	140	—	nC	$di/dt = 100A/\mu s$ ③

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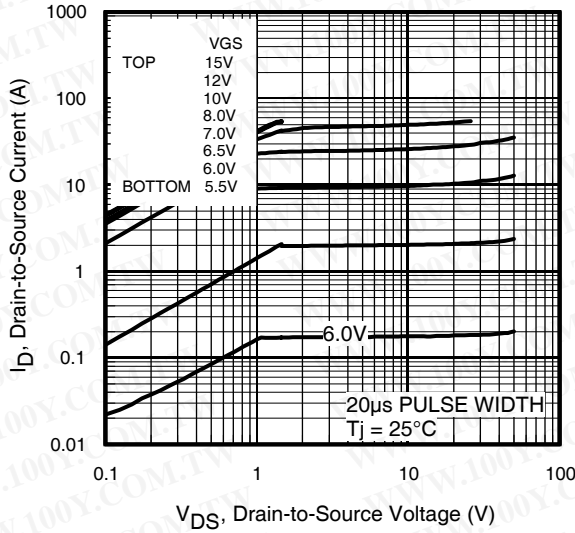


Fig 1. Typical Output Characteristics

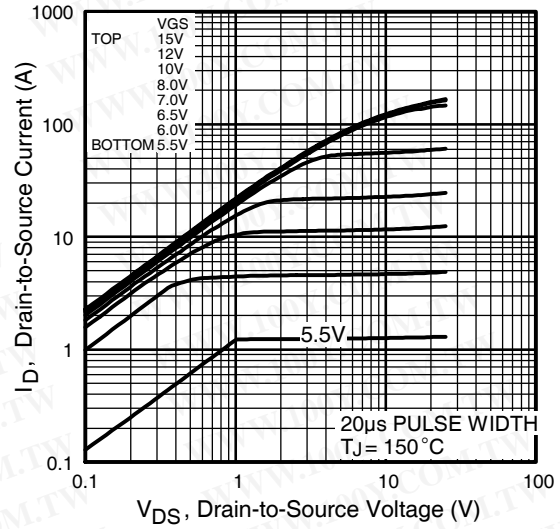


Fig 2. Typical Output Characteristics

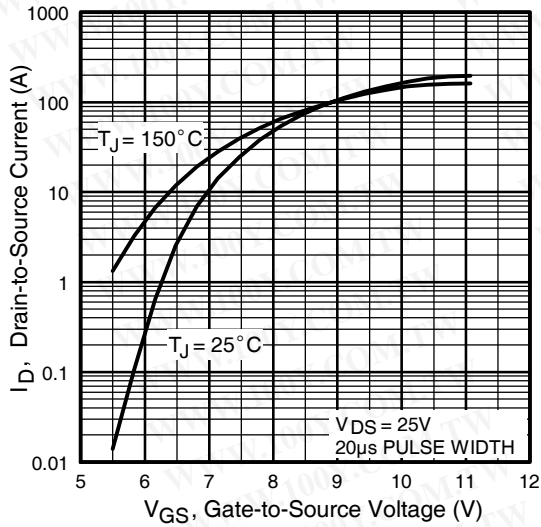


Fig 3. Typical Transfer Characteristics

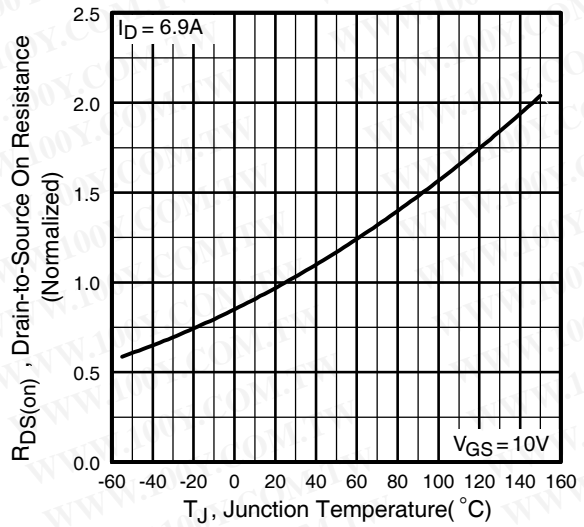
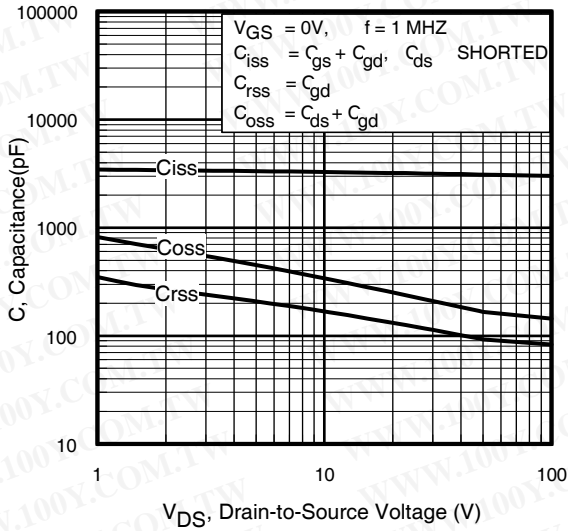


Fig 4. Normalized On-Resistance Vs. Temperature

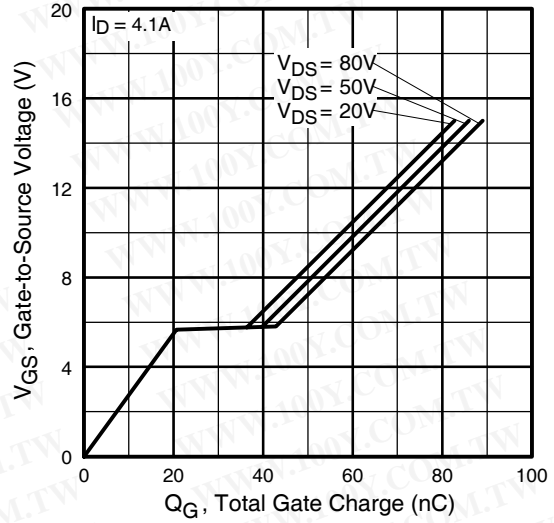
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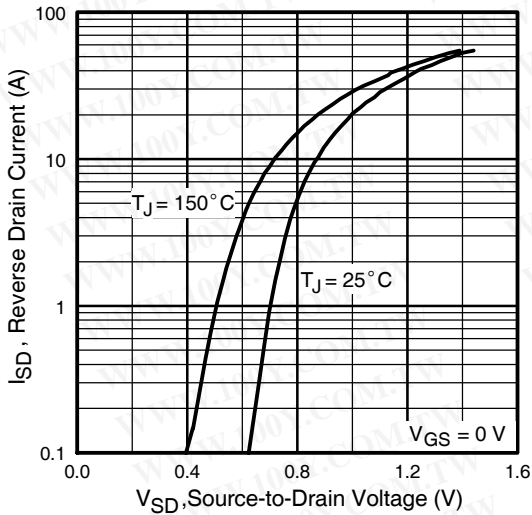
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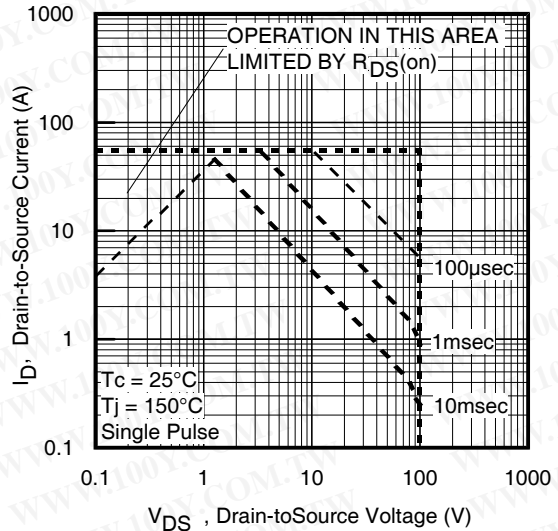
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



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



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

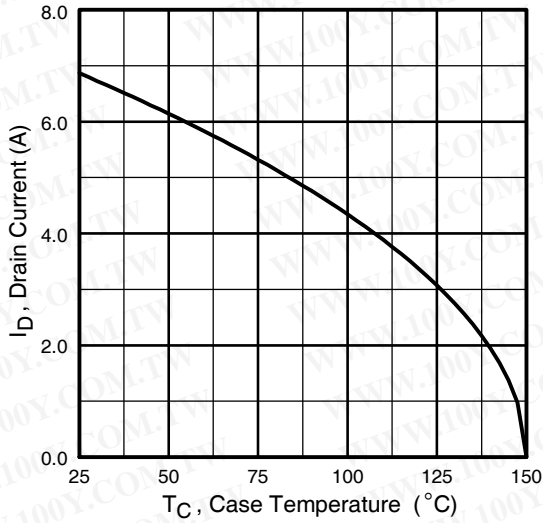


**Fig 8.** Maximum Safe Operating Area

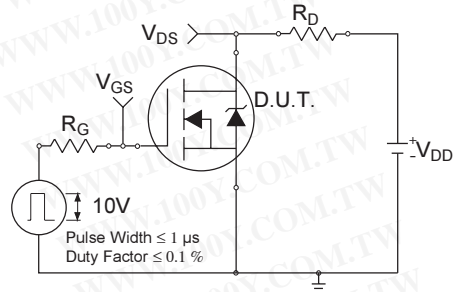
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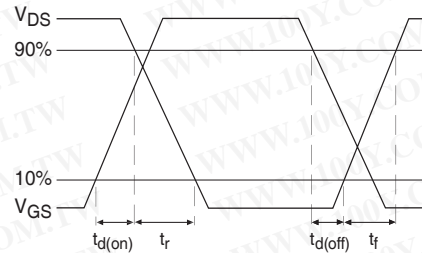
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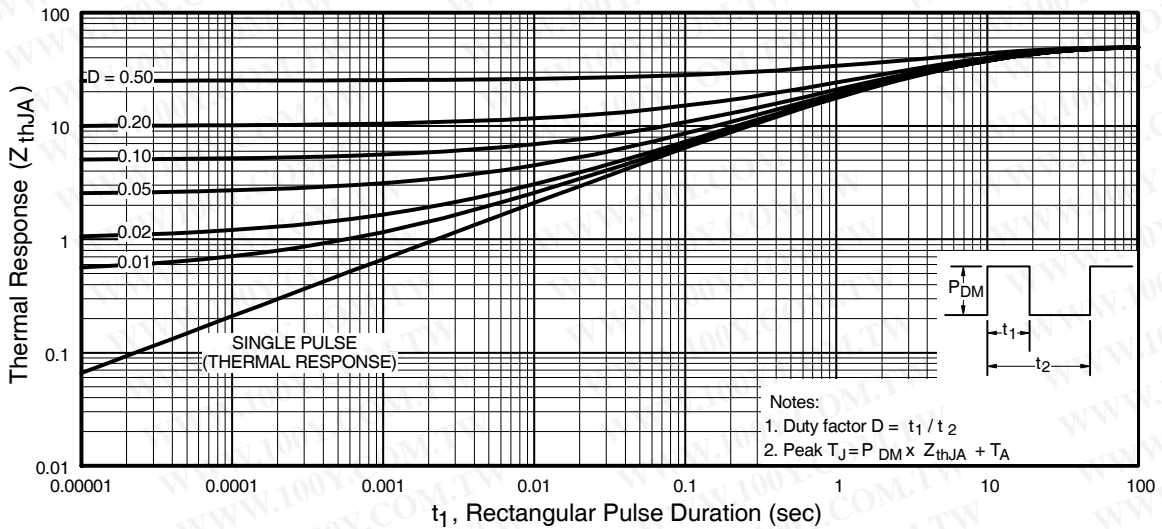
**Fig 9.** Maximum Drain Current Vs. Ambient Temperature



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



**Fig 10b.** Switching Time Waveforms

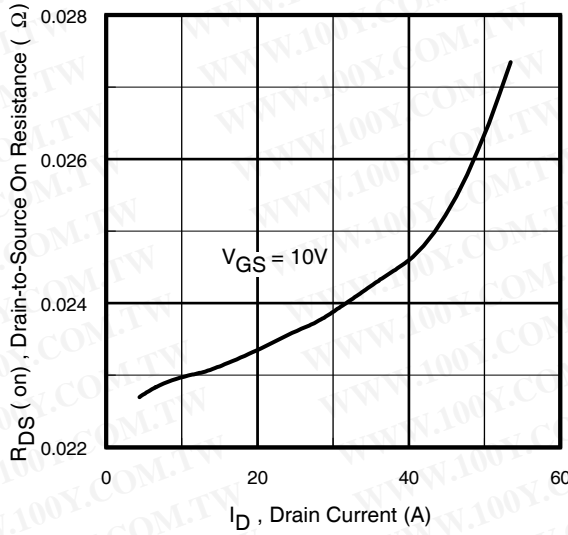


**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

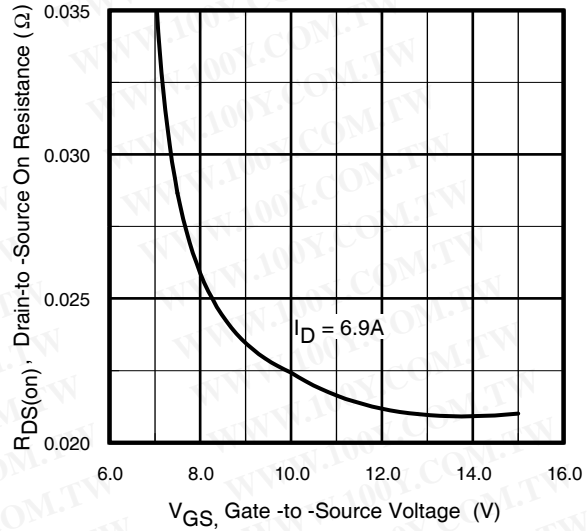
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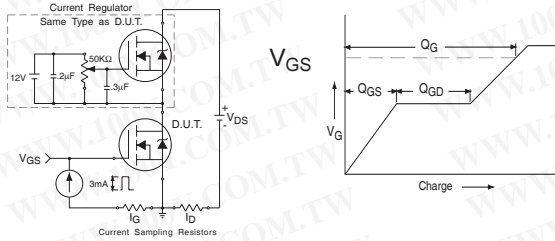
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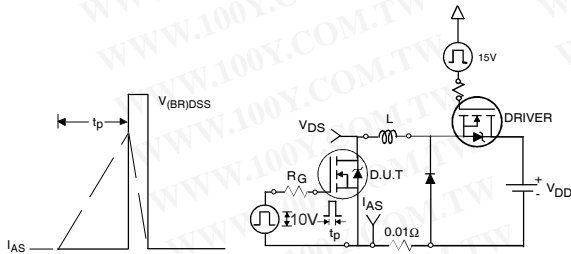
**Fig 12.** On-Resistance Vs. Drain Current



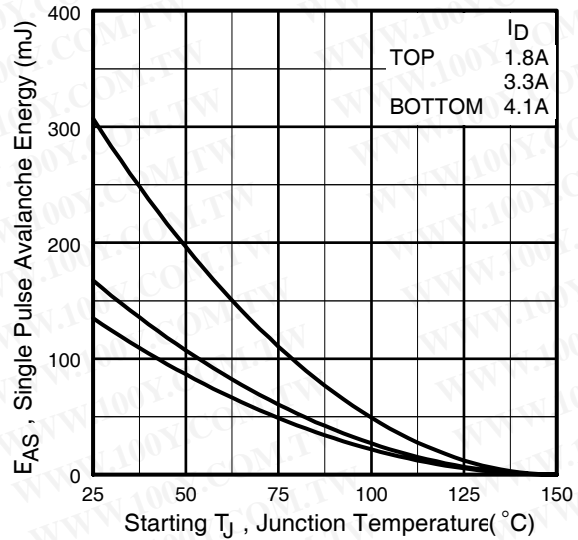
**Fig 13.** On-Resistance Vs. Gate Voltage



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



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



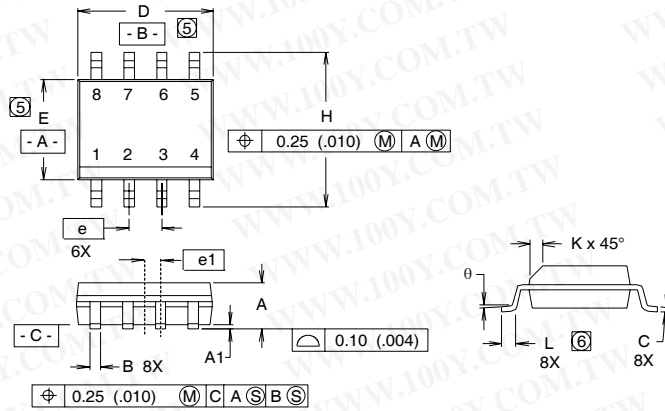
**Fig 15c.** Maximum Avalanche Energy Vs. Drain Current

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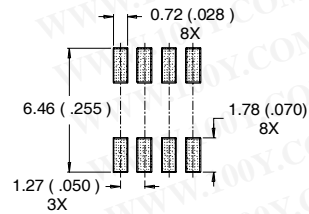
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**SO-8 Package Details**



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
B	.014	.018	0.36	0.46
C	.0075	.0098	0.19	0.25
D	.189	.196	4.80	4.98
E	.150	.157	3.81	3.99
e	.050 BASIC		1.27 BASIC	
e1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.011	.019	0.28	0.48
L	0.16	.050	0.41	1.27
θ	0°	8°	0°	8°

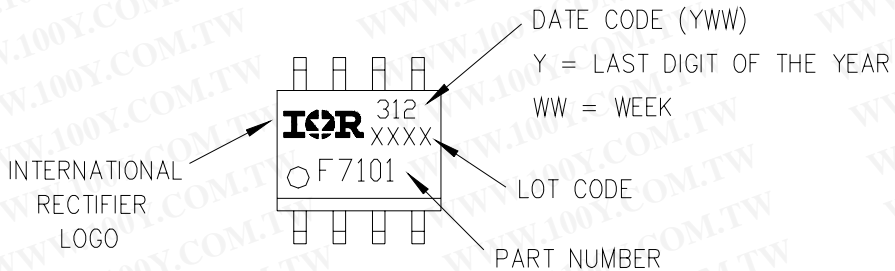
**RECOMMENDED FOOTPRINT**



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1982.
  2. CONTROLLING DIMENSION : INCH.
  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 0.25 (.006).
  - ⑥ DIMENSIONS IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE..

**SO-8 Part Marking**

EXAMPLE: THIS IS AN IRF7101

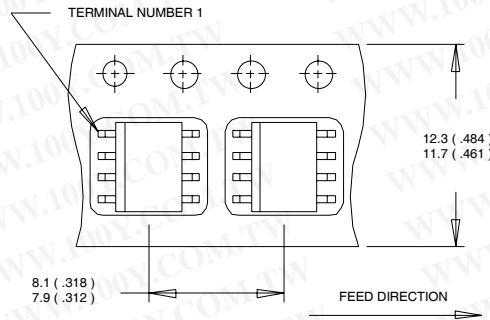


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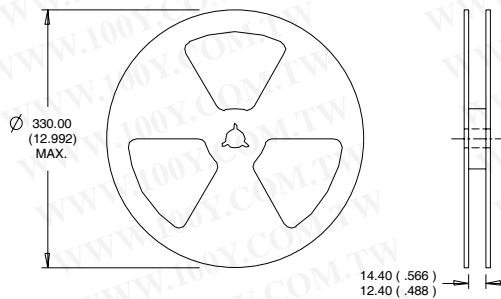
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## SO-8 Tape and Reel



- 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  $T_J = 25^\circ\text{C}$ ,  $L = 16\text{mH}$   
 $R_G = 25\Omega$ ,  $I_{AS} = 4.1\text{A}$ .
- ③ Pulse width  $\leq 400\mu\text{s}$ ; duty cycle  $\leq 2\%$ .
- ④ When mounted on 1 inch square copper board
- 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  $I_{SD} \leq 4.1\text{A}$ ,  $di/dt \leq 210\text{A}/\mu\text{s}$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  
 $T_J \leq 150^\circ\text{C}$

Data and specifications subject to change without notice.

This product has been designed and qualified for the Industrial market.

Qualification Standards can be found on IR's Web site.

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