

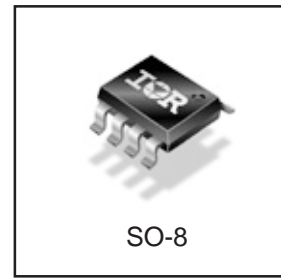
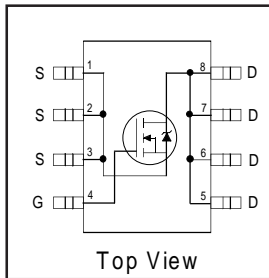
Applications

- High Frequency Isolated DC-DC Converters with Synchronous Rectification for Telecom and Industrial Use
- High Frequency Buck Converters for Computer Processor Power

V_{DSS}	$R_{DS(on) \max}(m\Omega)$	I_D
20V	10@$V_{GS} = 10V$	12A

Benefits

- Ultra-Low Gate Impedance
- Very Low $R_{DS(on)}$
- Fully Characterized Avalanche Voltage and Current



Absolute Maximum Ratings

Symbol	Parameter	Max.	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-to-Source Voltage	± 20	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	12	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	10	
I_{DM}	Pulsed Drain Current ^①	100	
$P_D @ T_A = 25^\circ C$	Maximum Power Dissipation ^③	2.5	W
$P_D @ T_A = 70^\circ C$	Maximum Power Dissipation ^③	1.6	W
	Linear Derating Factor	0.02	mW/ $^\circ C$
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	$^\circ C$

Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JL}$	Junction-to-Drain Lead	—	20	$^\circ C/W$
$R_{\theta JA}$	Junction-to-Ambient ^⑤	—	50	

Notes ① through ⑤ are on page 8

IRF7460

International
IR Rectifier

Static @ T_J = 25°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 = 250μA
ΔV _{(BR)DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient	—	0.089	—	V/°C	Reference to 25°C, I _D = 1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	7.2	10	mΩ	V _{GS} = 10V, I _D = 12A ④
		—	10.5	14		V _{GS} = 4.5V, I _D = 9.6A ④
V _{GS(th)}	Gate Threshold Voltage	1.0	—	3.0	V	V _{DS} = V _{GS} , I _D = 250μA
I _{DSS}	Drain-to-Source Leakage Current	—	—	20	μA	V _{DS} = 16V, V _{GS} = 0V
		—	—	100		V _{DS} = 16V, V _{GS} = 0V, T _J = 125°C
I _{GSS}	Gate-to-Source Forward Leakage	—	—	200	nA	V _{GS} = 16V
	Gate-to-Source Reverse Leakage	—	—	-200		V _{GS} = -16V

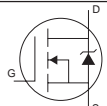
Dynamic @ T_J = 25°C (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
g _{fs}	Forward Transconductance	26	—	—	S	V _{DS} = 16V, I _D = 9.6A
Q _g	Total Gate Charge	—	19	—	nC	I _D = 9.6A
Q _{gs}	Gate-to-Source Charge	—	6.9	—		V _{DS} = 10V
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	6.0	—		V _{GS} = 4.5V, ④
Q _{oss}	Output Gate Charge	—	17	26		V _{GS} = 0V, V _{DS} = 10V
t _{d(on)}	Turn-On Delay Time	—	11	—	ns	V _{DD} = 10V
t _r	Rise Time	—	6.9	—		I _D = 9.6A
t _{d(off)}	Turn-Off Delay Time	—	12	—		R _G = 1.8Ω
t _f	Fall Time	—	4.3	—		V _{GS} = 4.5V ④
C _{iss}	Input Capacitance	—	2050	—		pF
C _{oss}	Output Capacitance	—	1060	—	V _{DS} = 10V	
C _{riss}	Reverse Transfer Capacitance	—	150	—	f = 1.0MHz	

Avalanche Characteristics

Symbol	Parameter	Typ.	Max.	Units
E _{AS}	Single Pulse Avalanche Energy②	—	240	mJ
I _{AR}	Avalanche Current①	—	9.6	A

Diode Characteristics

Symbol	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	—	—	100		
V _{SD}	Diode Forward Voltage	—	0.8	1.3	V	T _J = 25°C, I _S = 9.6A, V _{GS} = 0V ④
		—	0.66	—		T _J = 125°C, I _S = 9.6A, V _{GS} = 0V ④
t _{rr}	Reverse Recovery Time	—	44	66	ns	T _J = 25°C, I _F = 9.6A, V _R = 10V
Q _{rr}	Reverse Recovery Charge	—	60	90	nC	di/dt = 100A/μs ④
t _{rr}	Reverse Recovery Time	—	44	66	ns	T _J = 125°C, I _F = 9.6A, V _R = 10V
Q _{rr}	Reverse Recovery Charge	—	64	96	nC	di/dt = 100A/μs ④

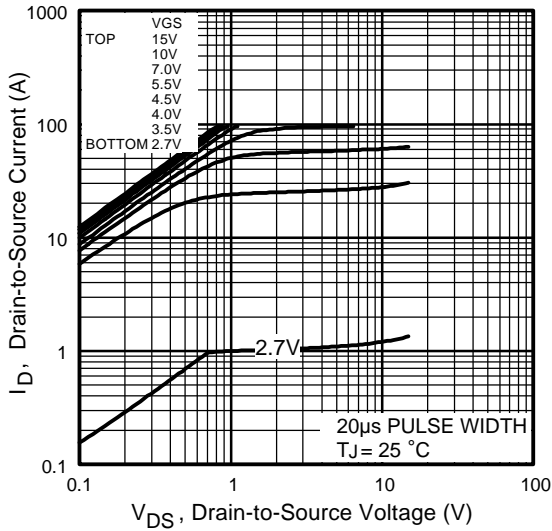


Fig 1. Typical Output Characteristics

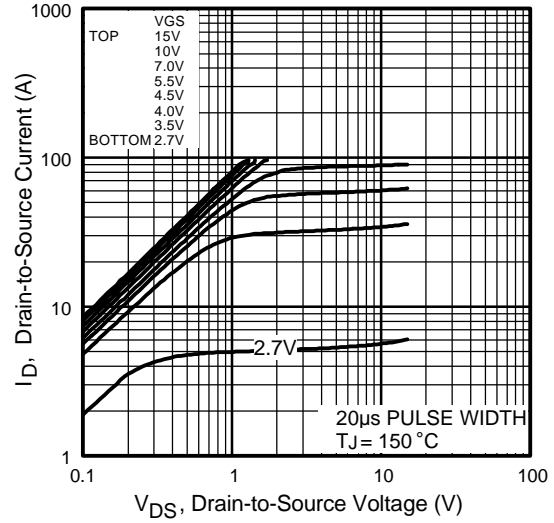


Fig 2. Typical Output Characteristics

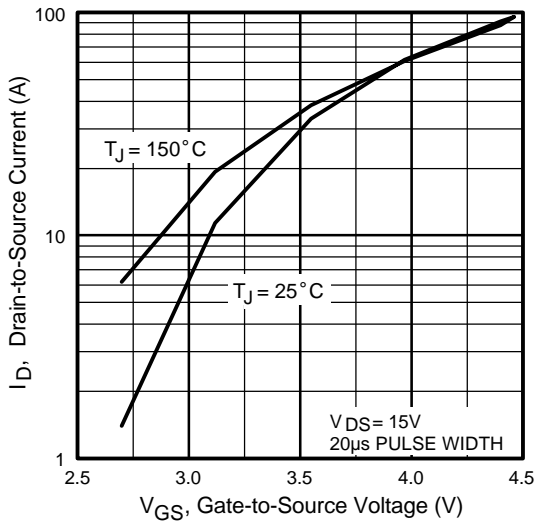


Fig 3. Typical Transfer Characteristics

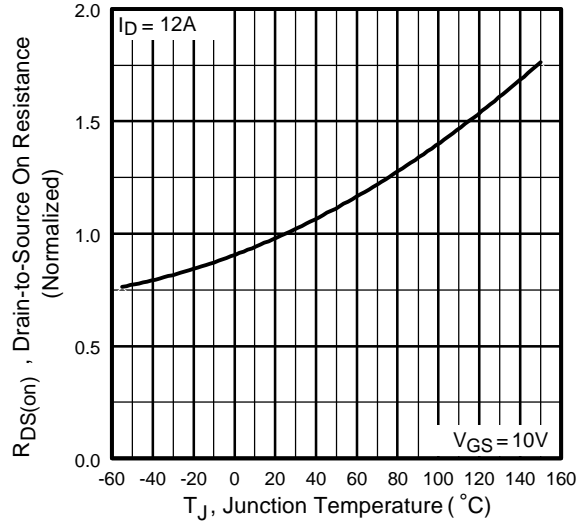


Fig 4. Normalized On-Resistance Vs. Temperature

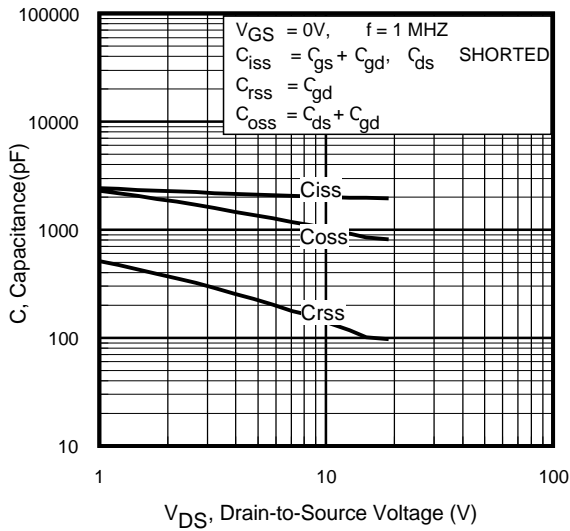


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

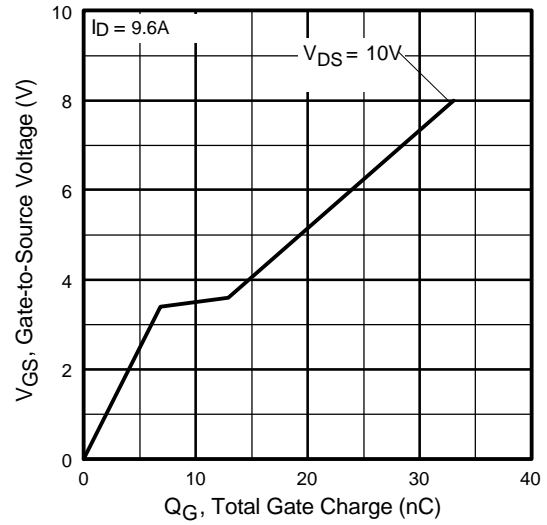


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

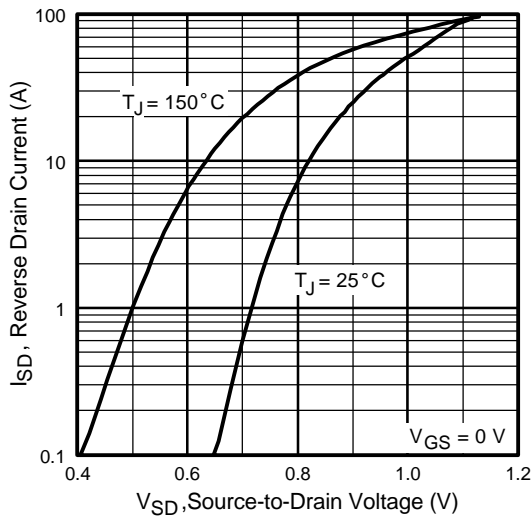


Fig 7. Typical Source-Drain Diode Forward Voltage

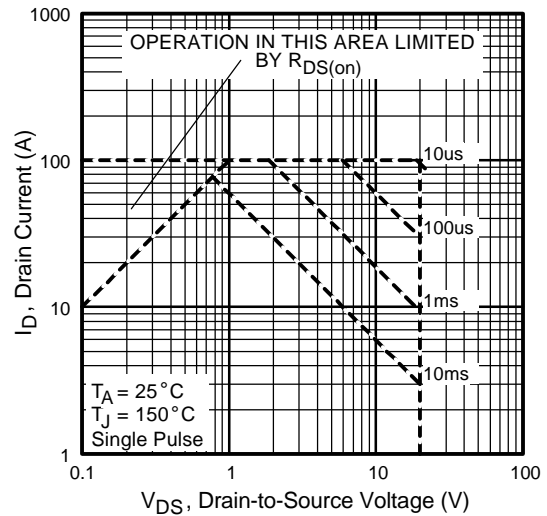


Fig 8. Maximum Safe Operating Area

Fig 6. On-Resistance Vs. Drain Current

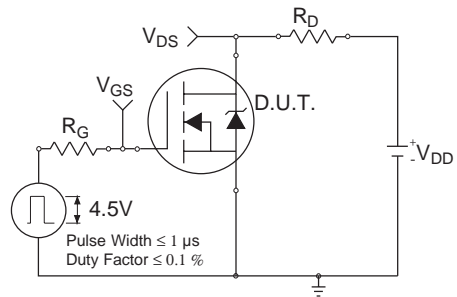
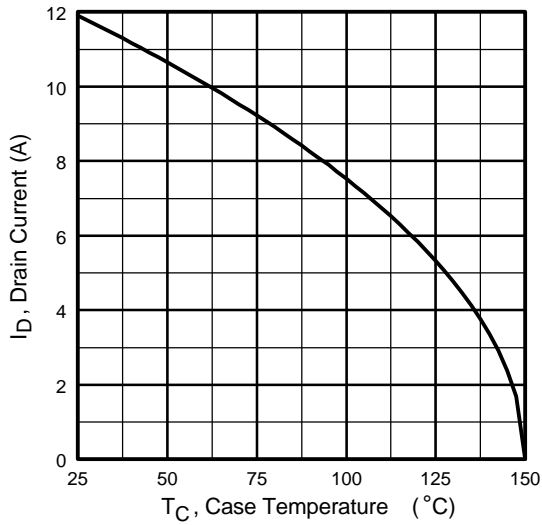


Fig 10a. Switching Time Test Circuit

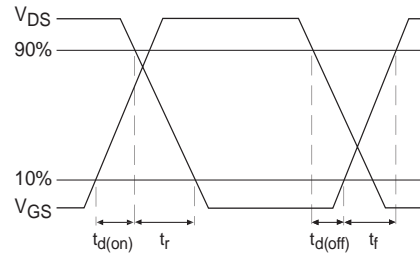


Fig 10b. Switching Time Waveforms

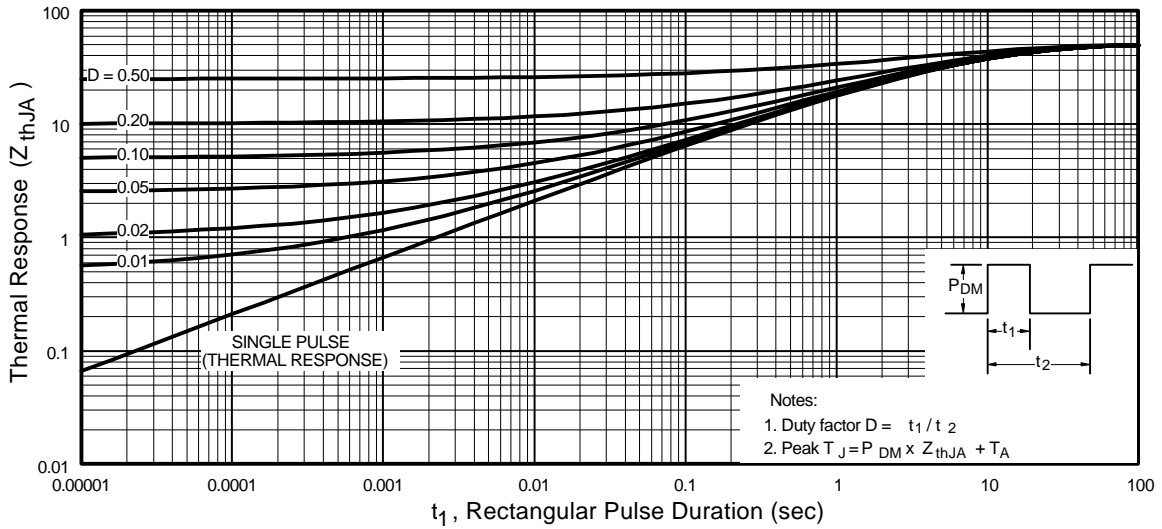


Fig 10. Maximum Effective Transient Thermal Impedance, Junction-to-Case

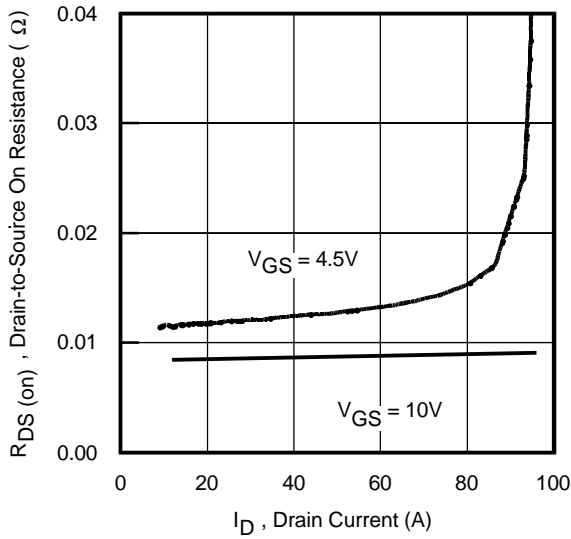


Fig 12. On-Resistance Vs. Drain Current

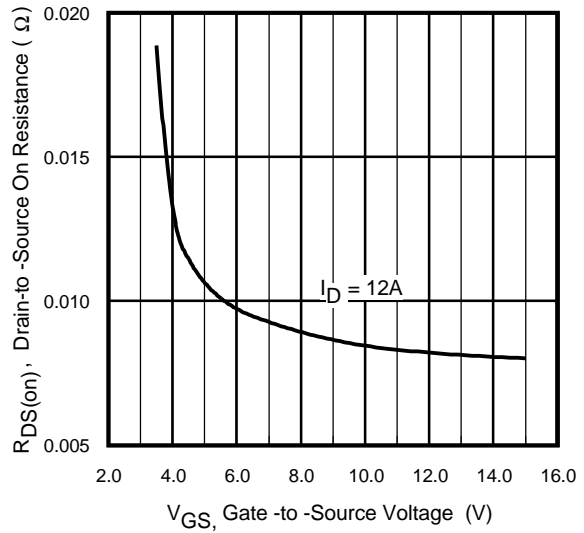


Fig 13. On-Resistance Vs. Gate Voltage

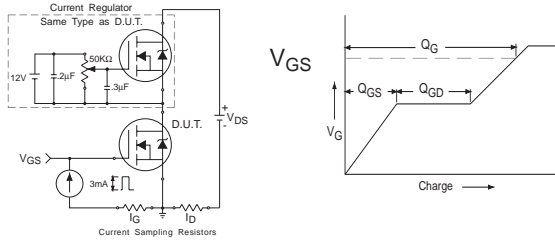


Fig 13a&b. Basic Gate Charge Test Circuit and Waveform

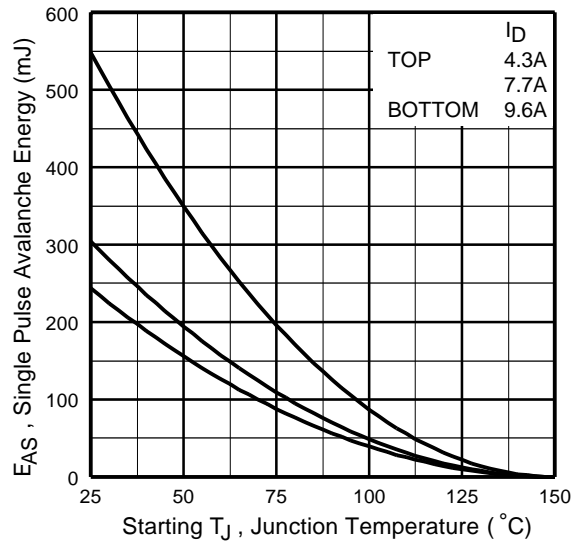


Fig 14c. Maximum Avalanche Energy Vs. Drain Current

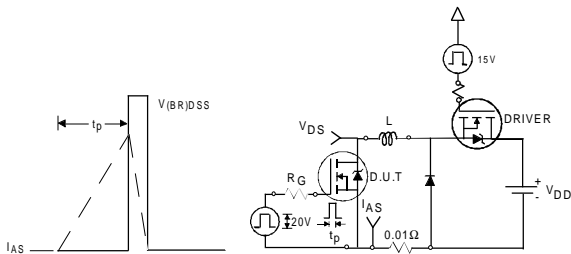
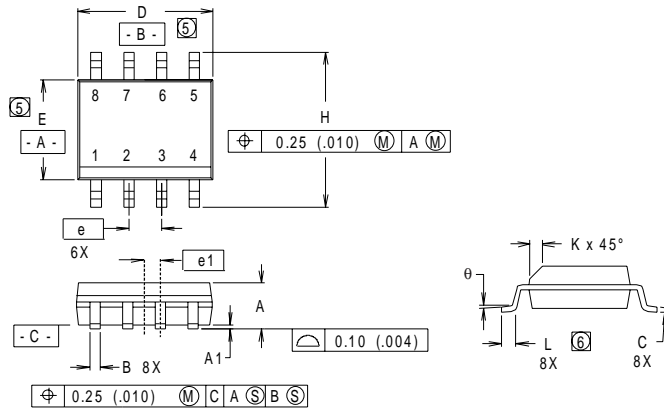


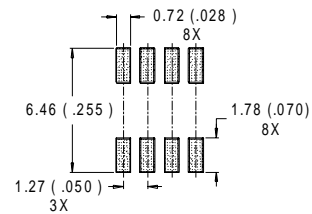
Fig 14a&b. Unclamped Inductive Test circuit and Waveforms

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

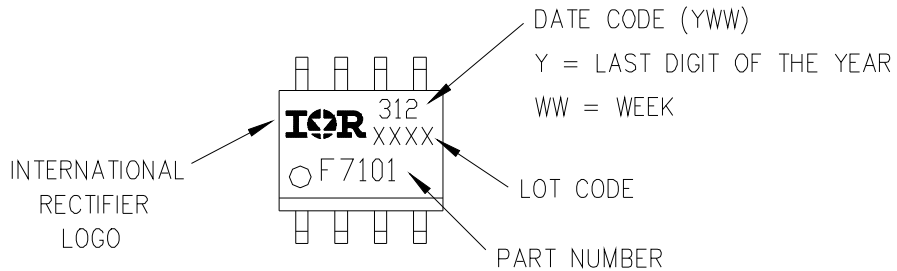


NOTES:

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

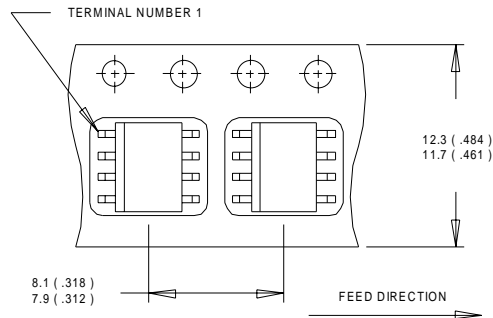
EXAMPLE: THIS IS AN IRF7101



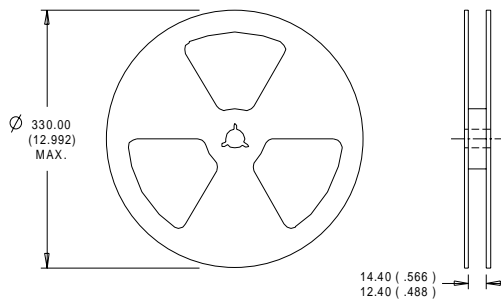
IRF7460

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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 $T_J = 25^\circ\text{C}$, $L = 5.2\text{mH}$
 $R_G = 25\Omega$, $I_{AS} = 9.6\text{A}$.
- ③ Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.
- ④ 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 Industrial market.
Qualification Standards can be found on IR's Web site.

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IR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7903

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