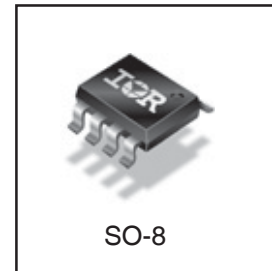
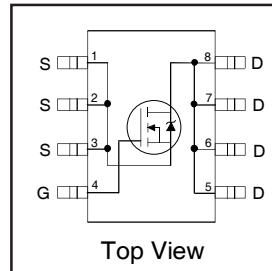


HEXFET® Power MOSFET

V_{DS}	20	V
$R_{DS(on) max}$ (@ $V_{GS} = 10V$)	0.0065	Ω
Q_g (typical)	41	nC
I_D (@ $T_A = 25^\circ C$)	16	A



Applications

- High Frequency DC-DC Converters with Synchronous Rectification

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	
IRF7456PbF-1	SO-8	Tube/Bulk	95	IRF7456PbF-1
		Tape and Reel	4000	IRF7456TRPbF-1

Absolute Maximum Ratings

Symbol	Parameter	Max.	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-to-Source Voltage	± 12	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	16	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	13	
I_{DM}	Pulsed Drain Current ^①	130	
$P_D @ T_A = 25^\circ C$	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	W/°C
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance

Parameter	Parameter	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient ^④	50	°C/W

Typical SMPS Topologies

- Telecom 48V Input Converters with Logic-Level Driven Synchronous Rectifiers

Notes ① through ④ are on page 8

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	—	0.024	—	V/°C	Reference to 25°C, I _D = 1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	0.0047	0.0065	Ω	V _{GS} = 10V, I _D = 16A ③
		—	0.0057	0.0075		V _{GS} = 4.5V, I _D = 13A ③
		—	0.011	0.020		V _{GS} = 2.8V, I _D = 3.5A ③
V _{GS(th)}	Gate Threshold Voltage	0.6	—	2.0	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} = 12V
	Gate-to-Source Reverse Leakage	—	—	-200		V _{GS} = -12V

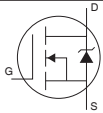
Dynamic @ T_J = 25°C (unless otherwise specified)

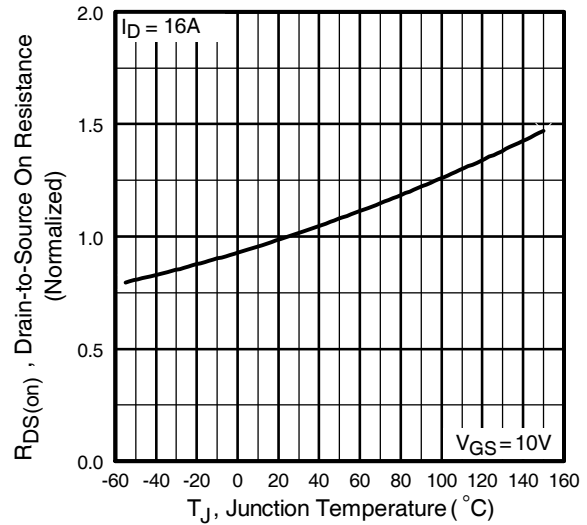
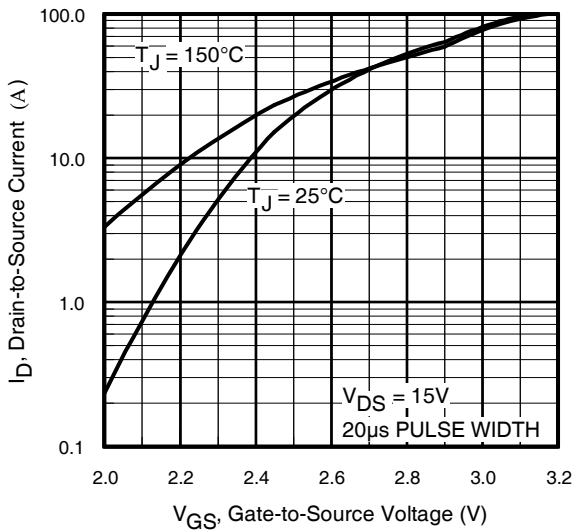
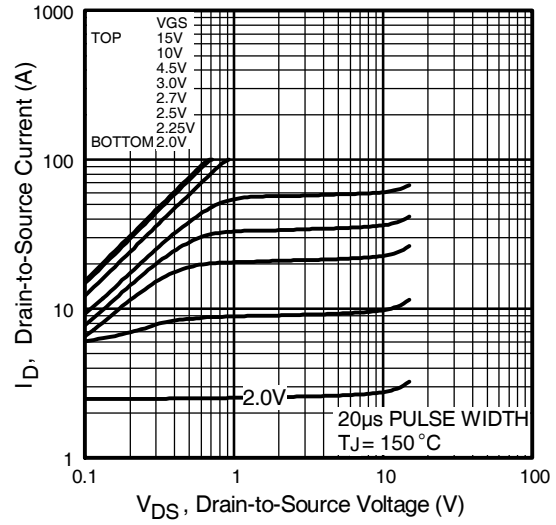
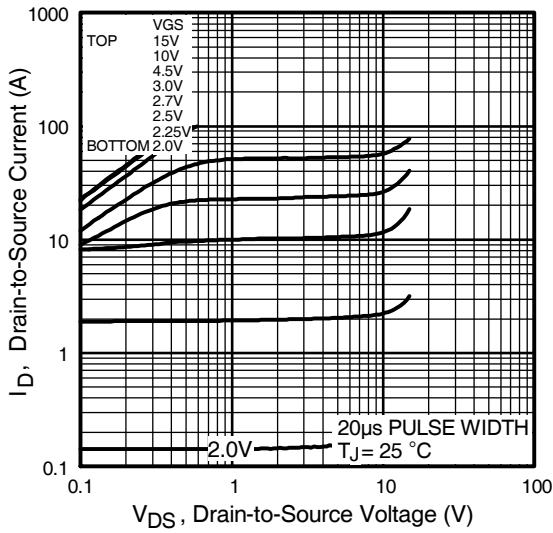
	Parameter	Min.	Typ.	Max.	Units	Conditions
g _{fs}	Forward Transconductance	44	—	—	S	V _{DS} = 10V, I _D = 16A
Q _g	Total Gate Charge	—	41	62	nC	I _D = 16A
Q _{gs}	Gate-to-Source Charge	—	9.7	15		V _{DS} = 16V
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	18	27		V _{GS} = 5.0V, ③
t _{d(on)}	Turn-On Delay Time	—	20	—		V _{DD} = 10V
t _r	Rise Time	—	25	—	ns	I _D = 1.0A
t _{d(off)}	Turn-Off Delay Time	—	50	—		R _G = 6.0Ω
t _f	Fall Time	—	52	—		V _{GS} = 4.5V ③
C _{iss}	Input Capacitance	—	3640	—	pF	V _{GS} = 0V
C _{oss}	Output Capacitance	—	1570	—		V _{DS} = 15V
C _{rss}	Reverse Transfer Capacitance	—	330	—		f = 1.0MHz

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E _{AS}	Single Pulse Avalanche Energy②	—	250	mJ
I _{AR}	Avalanche Current①	—	16	A
E _{AR}	Repetitive Avalanche Energy①	—	0.25	mJ

Diode 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	—	—	130		
V _{SD}	Diode Forward Voltage	—	—	1.2	V	T _J = 25°C, I _S = 2.5A, V _{GS} = 0V ③
t _{rr}	Reverse Recovery Time	—	48	72	ns	T _J = 25°C, I _F = 2.5A
Q _{rr}	Reverse Recovery Charge	—	74	110	nC	di/dt = 100A/μs ③



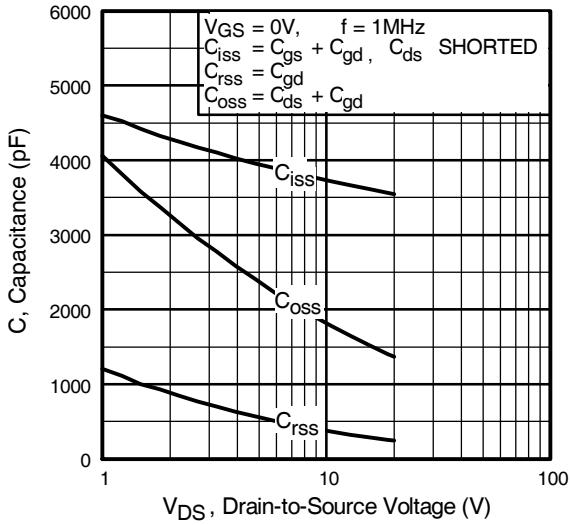


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

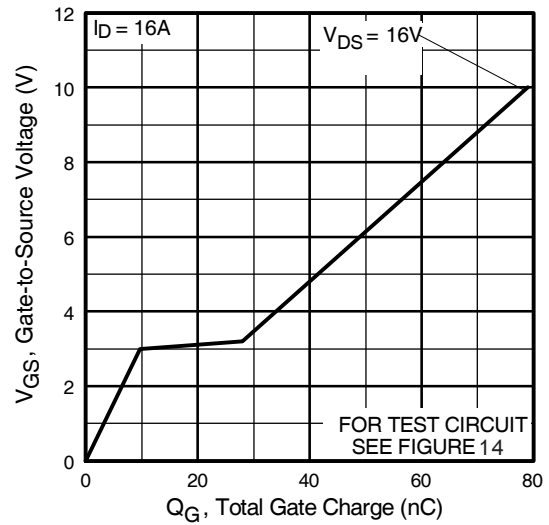


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

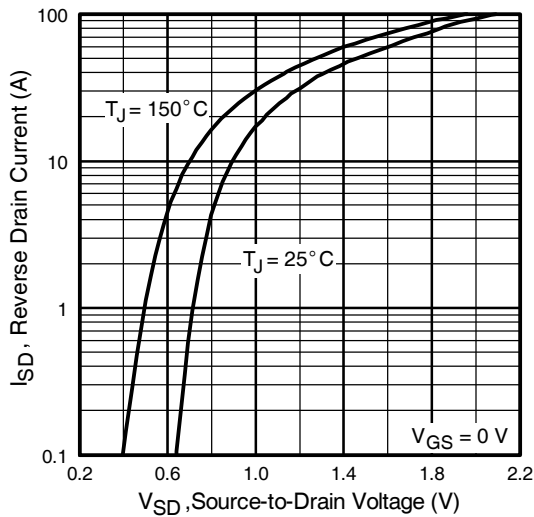


Fig 7. Typical Source-Drain Diode Forward Voltage

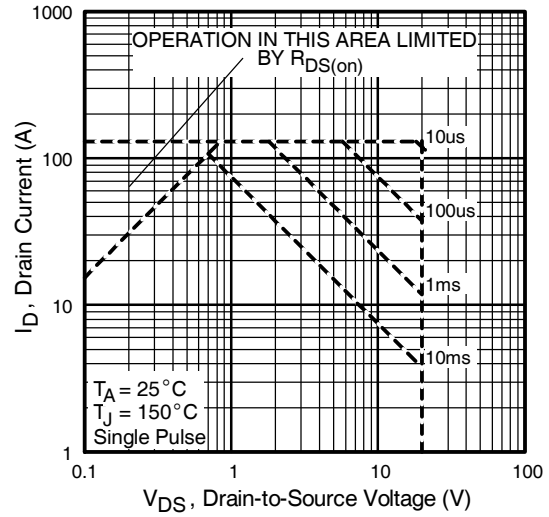


Fig 8. Maximum Safe Operating Area

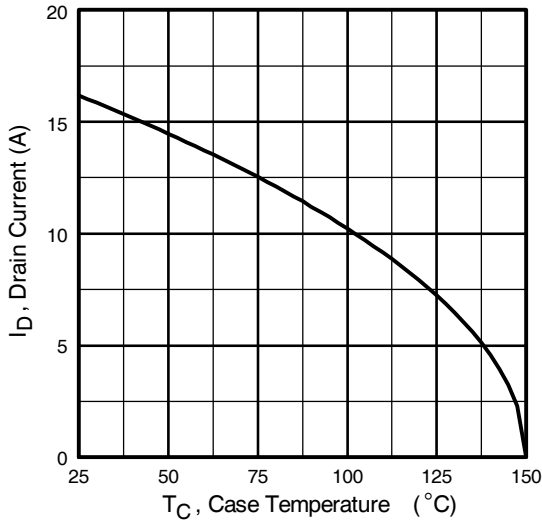


Fig 9. Maximum Drain Current Vs. Case Temperature

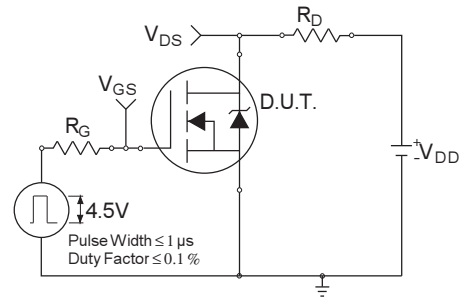


Fig 10a. Switching Time Test Circuit

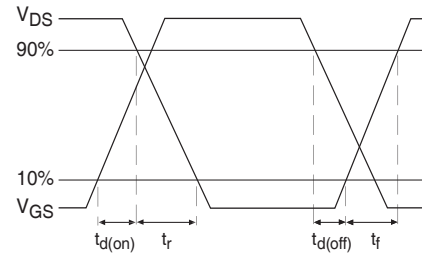


Fig 10b. Switching Time Waveforms

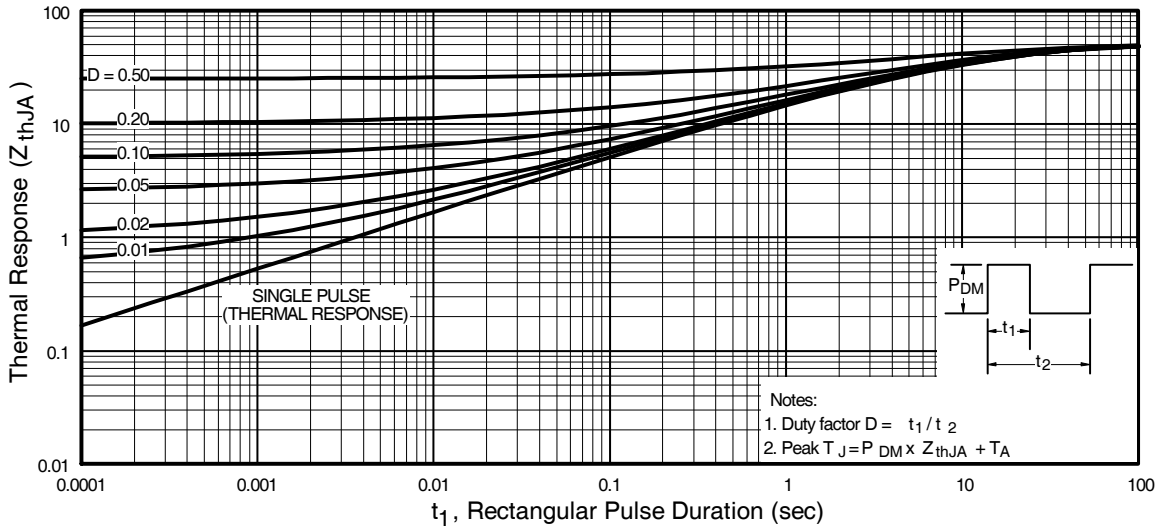
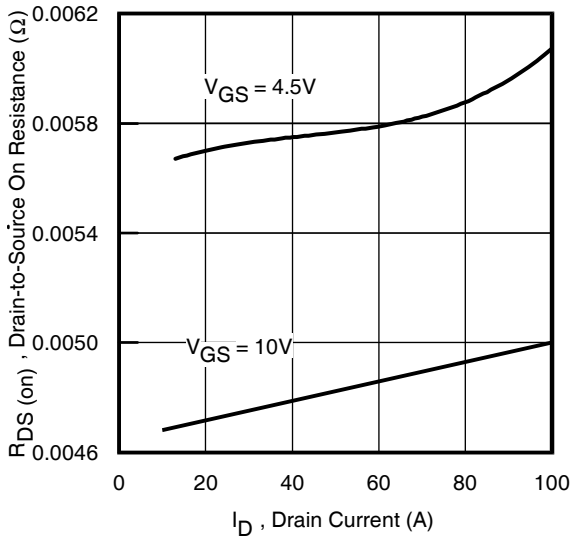
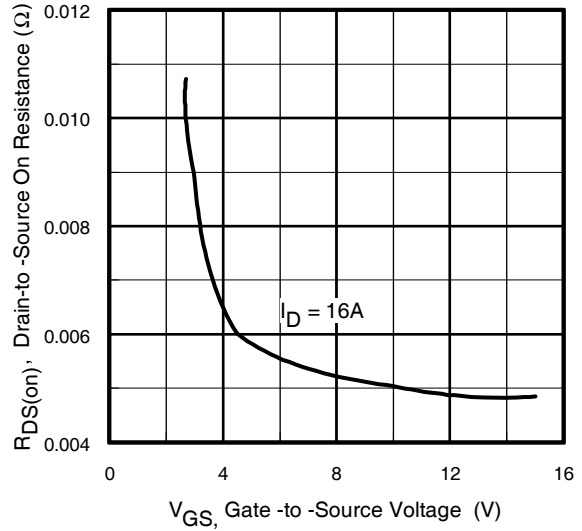
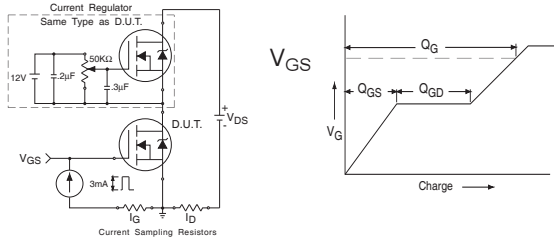
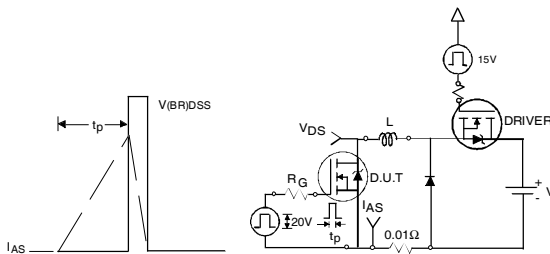
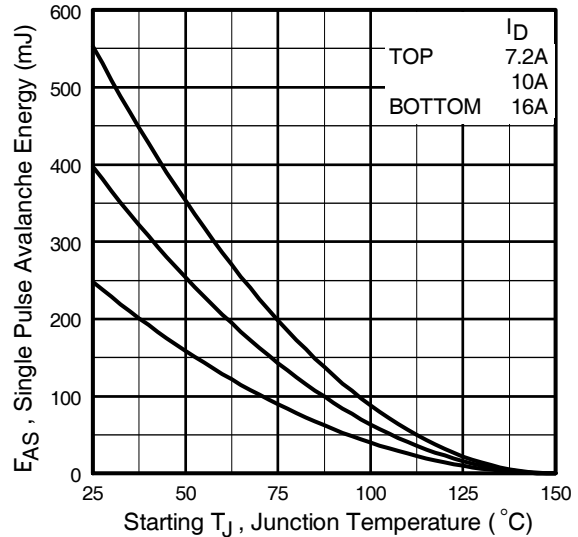
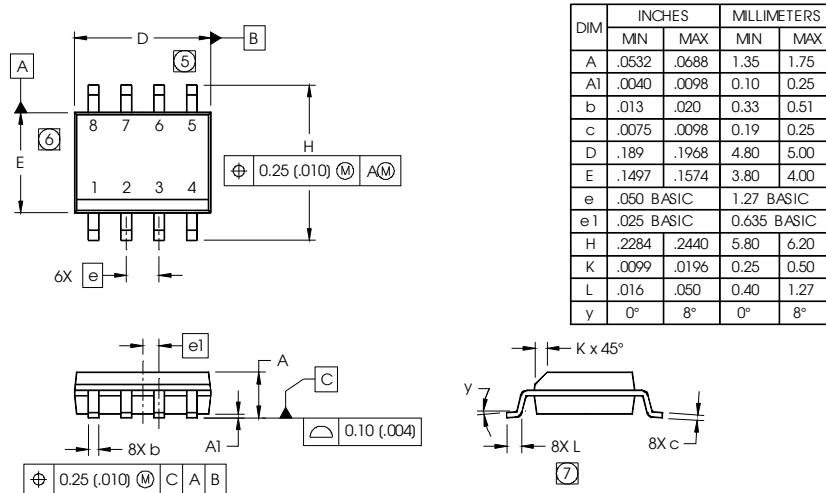


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case


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

SO-8 Package Outline (MOSFET & Fetky)

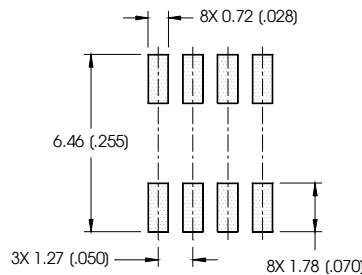
Dimensions are shown in millimeters (inches)



NOTES:

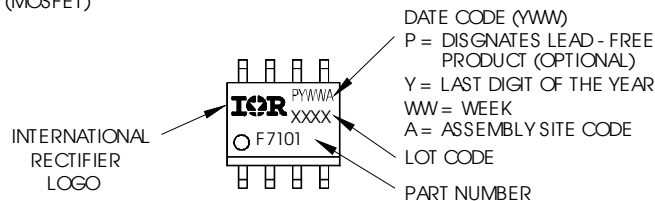
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
- ⑤ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 (.006).
- ⑥ DIMENSION DOES NOT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

FOOTPRINT

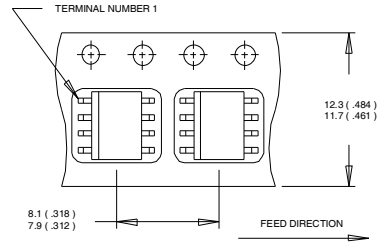


SO-8 Part Marking Information

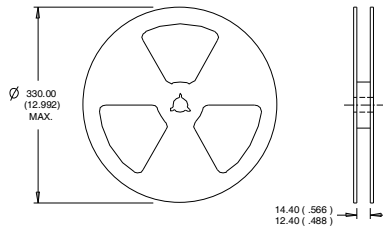
EXAMPLE: THIS IS AN IRF7101 (MOSFET)



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[†]

Qualification level	Industriid (per JEDEC JESD47F ^{††} guidelines)	
Moisture Sensitivity Level	SO-8	M5L1 (per JEDEC J-STD-020D ^{††})
RoHS compliant	Yes	

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

^{††} Applicable version of JEDEC standard at the time of product release

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^\circ\text{C}$, $L = 2.0\text{mH}$, $R_G = 25\Omega$, $I_{AS} = 16\text{A}$.
- ③ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.
- ④ When mounted on 1 inch square copper board, $t < 10\text{ sec}$