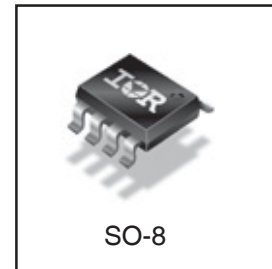
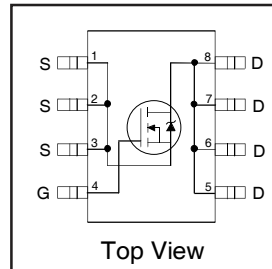


| | | |
|---|---------------|-----------|
| V_{DS} | 30 | V |
| $R_{DS(on) max}$ (@ $V_{GS} = 10V$) | 0.0075 | Ω |
| Q_g (typical) | 37 | nC |
| I_D (@ $T_A = 25^\circ C$) | 15 | A |

HEXFET® Power MOSFET



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 | |
| IRF7455PbF-1 | SO-8 | Tube/Bulk | 95 | IRF7455PbF-1 |
| | | Tape and Reel | 4000 | IRF7455TRPbF-1 |

Absolute Maximum Ratings

| Symbol | Parameter | Max. | Units |
|--------------------------|--|--------------|-------|
| V_{DS} | Drain-Source Voltage | 30 | V |
| V_{GS} | Gate-to-Source Voltage | ± 12 | V |
| $I_D @ T_A = 25^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V$ | 15 | A |
| $I_D @ T_A = 70^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V$ | 12 | |
| I_{DM} | Pulsed Drain Current ^① | 120 | |
| $P_D @ T_A = 25^\circ C$ | 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

| Symbol | Parameter | Typ. | Max. | Units |
|-----------------|----------------------------------|------|------|-------|
| $R_{\theta JA}$ | 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 | 30 | — | — | V | V _{GS} = 0V, I _b = 250μA |
| ΔV _{(BR)DSS} /ΔT _J | Breakdown Voltage Temp. Coefficient | — | 0.029 | — | V/°C | Reference to 25°C, I _b = 1.0mA |
| R _{DS(on)} | Static Drain-to-Source On-Resistance | — | 0.0060 | 0.0075 | Ω | V _{GS} = 10V, I _b = 15A ④ |
| | | — | 0.0069 | 0.009 | | V _{GS} = 4.5V, I _b = 12A ④ |
| | | — | 0.010 | 0.020 | | V _{GS} = 2.8V, I _b = 3.5A ④ |
| V _{GS(th)} | Gate Threshold Voltage | 0.6 | — | 2.0 | V | V _{DS} = V _{GS} , I _b = 250μA |
| I _{DSS} | Drain-to-Source Leakage Current | — | — | 20 | μA | V _{DS} = 24V, V _{GS} = 0V |
| | | — | — | 100 | | V _{DS} = 24V, V _{GS} = 0V, T _J = 125°C |
| I _{GSS} | Gate-to-Source Forward Leakage | — | — | 200 | nA | V _{GS} = 20V |
| | Gate-to-Source Reverse Leakage | — | — | -200 | | V _{GS} = -20V |

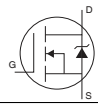
Dynamic @ T_J = 25°C (unless otherwise specified)

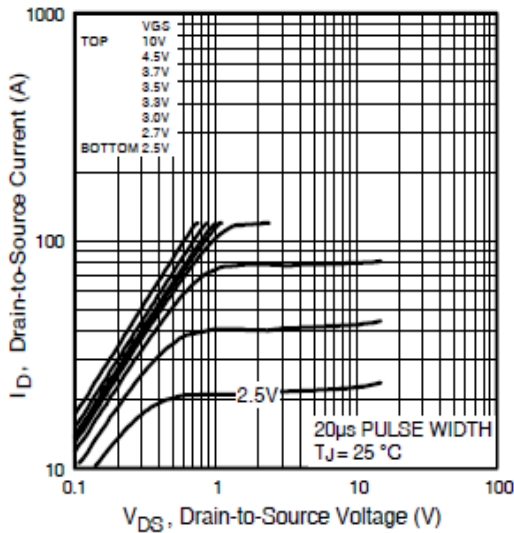
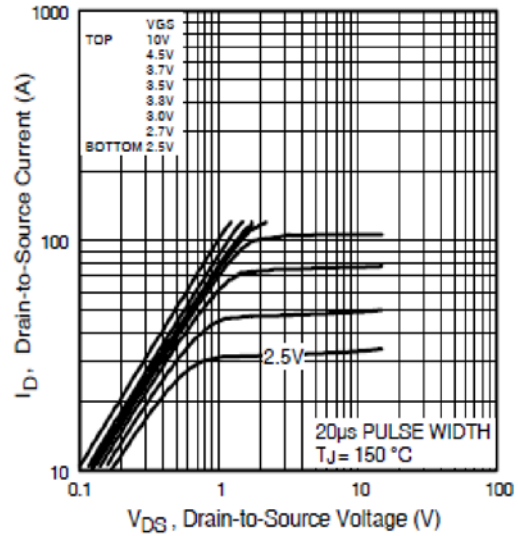
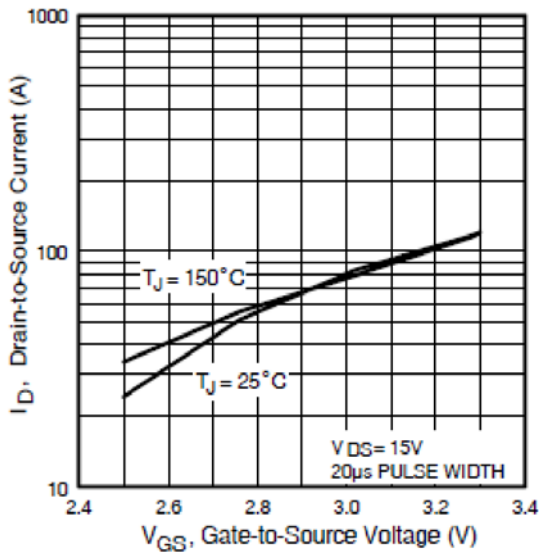
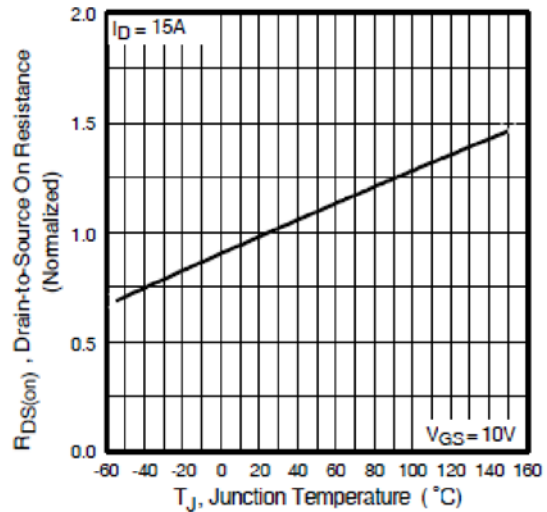
| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---------------------|--------------------------------|------|------|------|-------|---|
| g _{fs} | Forward Transconductance | 44 | — | — | S | V _{DS} = 10V, I _b = 15A |
| Q _g | Total Gate Charge | — | 37 | 56 | nC | I _b = 15A |
| Q _{gs} | Gate-to-Source Charge | — | 8.9 | 13 | | V _{DS} = 24V |
| Q _{gd} | Gate-to-Drain("Miller") Charge | — | 13 | 20 | | V _{GS} = 5.0V ③ |
| t _{d(on)} | Turn-On Delay Time | — | 17 | — | ns | V _{DD} = 15V |
| t _r | Rise Time | — | 18 | — | | I _b = 1.0A |
| t _{d(off)} | Turn-Off Delay Time | — | 51 | — | | R _G = 6.0Ω |
| t _f | Fall Time | — | 44 | — | | V _{GS} = 4.5V ③ |
| C _{iss} | Input Capacitance | — | 3480 | — | pF | V _{GS} = 0V |
| C _{oss} | Output Capacitance | — | 870 | — | | V _{DS} = 25V |
| C _{iss} | Reverse Transfer Capacitance | — | 100 | — | | f = 1.0MHz |

Avalanche Characteristics

| | Parameter | Typ. | Max. | Units |
|-----------------|---------------------------------|------|------|-------|
| E _{AS} | Single Pulse Avalanche Energy ② | — | 200 | mJ |
| I _{AR} | Avalanche Current ① | — | 15 | A |
| E _{AR} | Repetitive Avalanche Current ① | — | 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 | — | — | 120 | | |
| 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 | — | 64 | 96 | ns | T _J = 25°C, I _F = 2.5A |
| Q _{rr} | Reverse Recovery Charge | — | 99 | 150 | nC | di/dt = 100A/μs ③ |


Fig 1. Typical Output Characteristics

Fig 2. Typical Output Characteristics

Fig 3. Typical Transfer Characteristics

Fig 4. Normalized On-Resistance Vs. Temperature

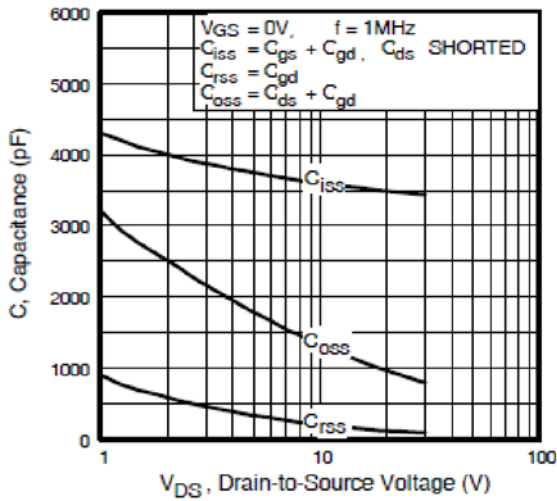


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

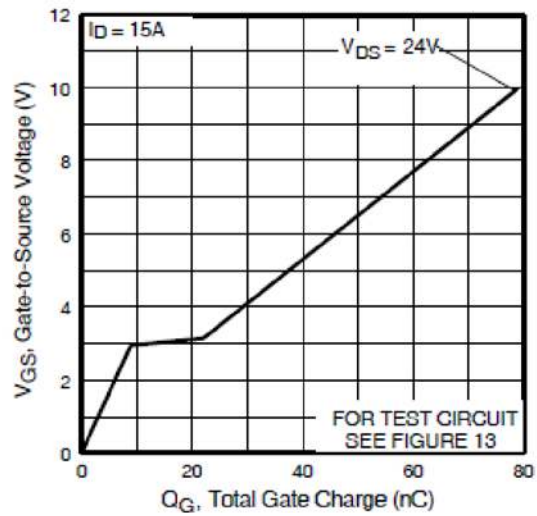


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

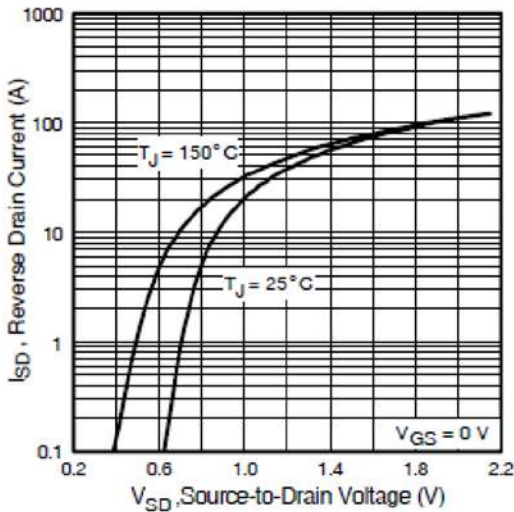


Fig 7. Typical Source-Drain Diode Forward Voltage

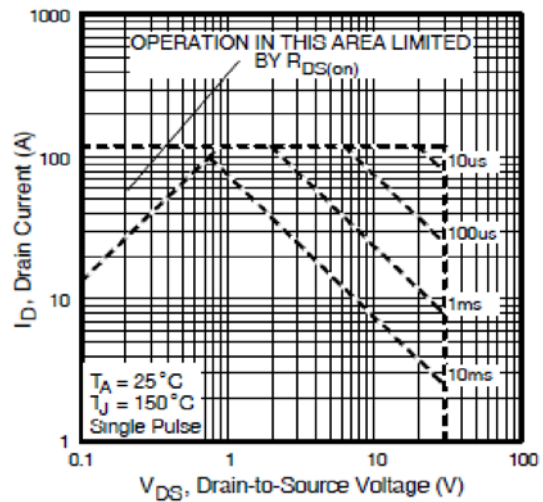


Fig 8. Maximum Safe Operating Area

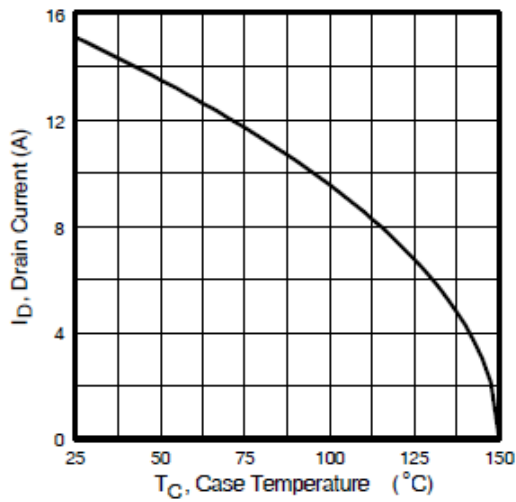


Fig 9. Maximum Drain Current Vs. Case Temperature

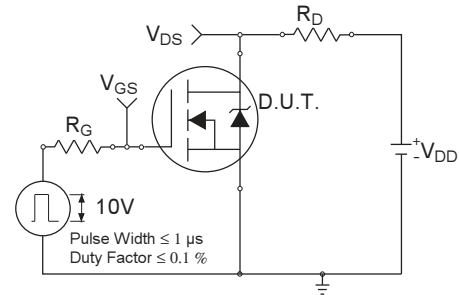


Fig 10a. Switching Time Test Circuit

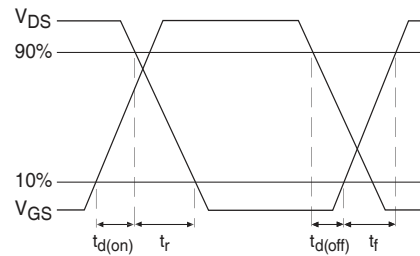


Fig 10b. Switching Time Waveforms

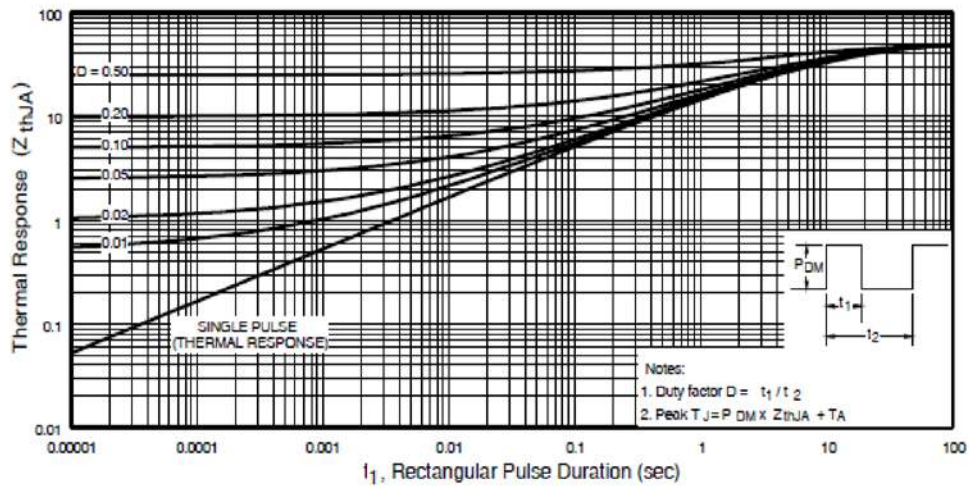
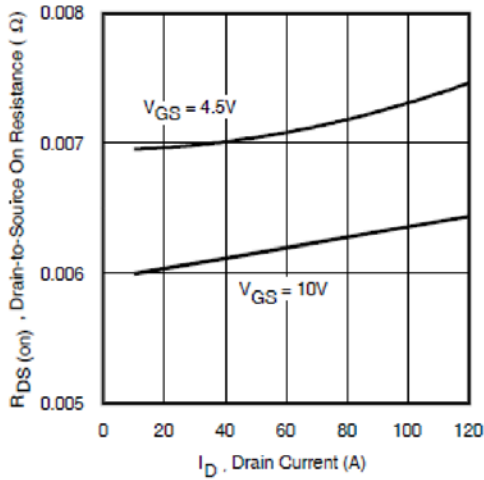
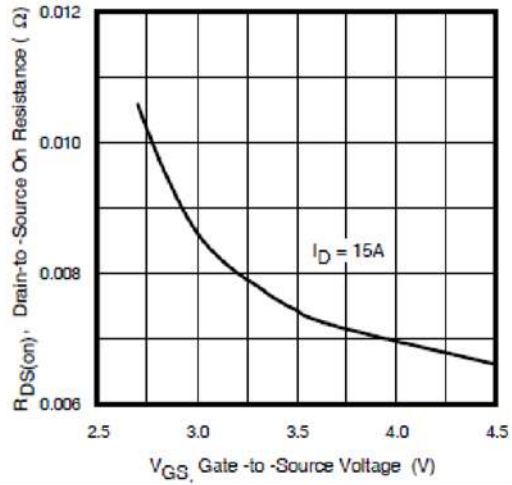
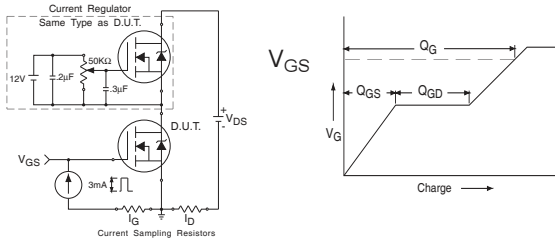
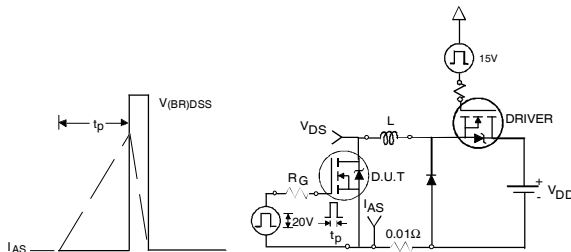
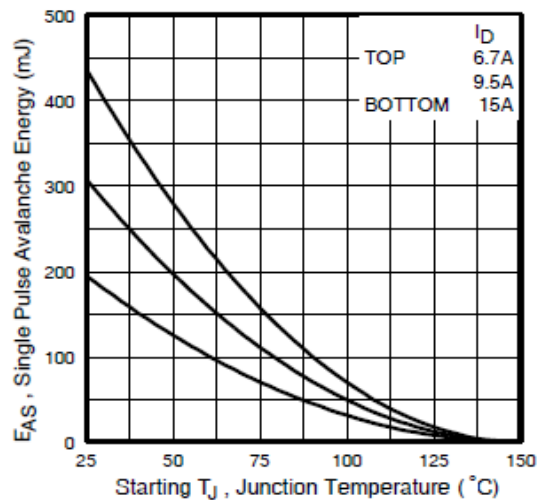
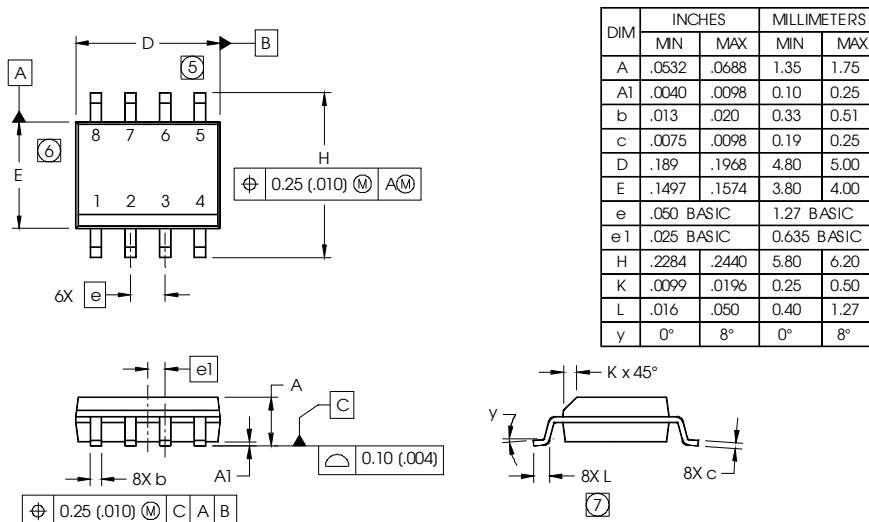


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient


Fig 12. 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

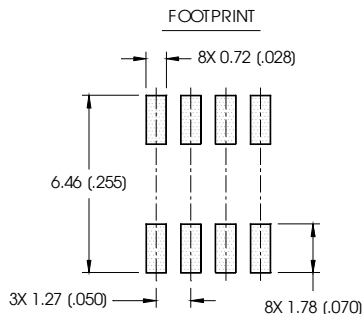
SO-8 Package Outline (MOSFET & Fetky)

Dimensions are shown in millimeters (inches)



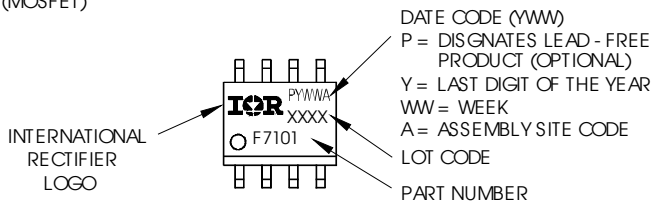
NOTES:

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.

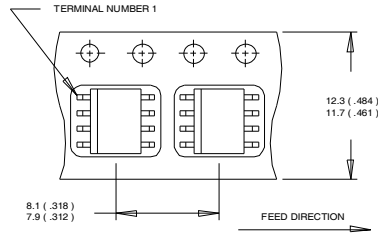


SO-8 Part Marking Information

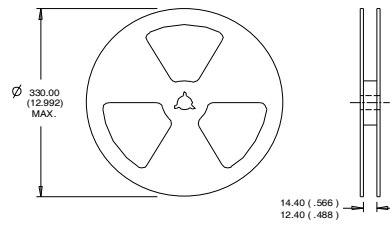
EXAMPLE: THIS IS AN IRF7101 (MOSFET)



Note: For the most current drawing please refer to IR website at: <http://www.irf.com/package/>

SO-8 Tape and Reel


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 | MSL1 (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 $T_J = 25^\circ\text{C}$, $L = 1.8\text{mH}$, $R_G = 25\Omega$, $I_{AS} = 15\text{A}$.
- ③ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.
- ④ When mounted on 1 inch square copper board, $t < 10\text{ sec}$