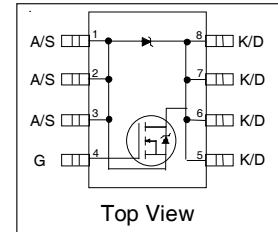
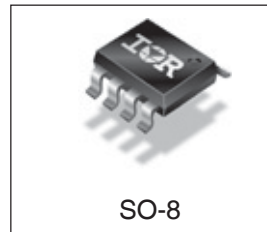


# IRF7807D1PbF

## FETKY™ MOSFET / SCHOTTKY DIODE

- Co-Pack N-channel HEXFET® Power MOSFET and Schottky Diode
- Ideal for Synchronous Rectifiers in DC-DC Converters Up to 5A Output
- Low Conduction Losses
- Low Switching Losses
- Low Vf Schottky Rectifier
- Lead-Free



### Description

The FETKY™ family of Co-Pack HEXFET® MOSFETs and Schottky diodes offers the designer an innovative, board space saving solution for switching regulator and power management applications. HEXFET power MOSFETs utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. Combining this technology with International Rectifier's low forward drop Schottky rectifiers results in an extremely efficient device suitable for use in a wide variety of portable electronics applications.

The SO-8 has been modified through a customized leadframe for enhanced thermal characteristics. The SO-8 package is designed for vapor phase, infrared or wave soldering techniques.

### Device Features (Max Values)

|              | IRF7807D1 |
|--------------|-----------|
| $V_{DS}$     | 30V       |
| $R_{DS(on)}$ | 25mΩ      |
| $Q_g$        | 14nC      |
| $Q_{sw}$     | 5.2nC     |
| $Q_{oss}$    | 18.4nC    |

### Absolute Maximum Ratings

| Parameter   | Symbol         | Max.       | Units |
|---|----------------|------------|-------|
| Drain-Source Voltage                                      | $V_{DS}$       | 30         | V     |
| Gate-Source Voltage                                       | $V_{GS}$       | ±12        |       |
| Continuous Drain or Source Current ( $V_{GS} \geq 4.5V$ ) | $I_D$          | 25°C       | A     |
|   |                | 70°C       |       |
| Pulsed Drain Current①                                     | $I_{DM}$       | 66         |       |
| Power Dissipation   | $P_D$          | 25°C       | W     |
|   |                | 70°C       |       |
| Schottky and Body Diode Average Forward Current④          | $I_F (AV)$     | 25°C       | A     |
|   |                | 70°C       |       |
| Junction & Storage Temperature Range                      | $T_J, T_{STG}$ | -55 to 150 | °C    |

### Thermal Resistance

| Parameter                    | Symbol          | Max. | Units |
|------------------------------|-----------------|------|-------|
| Maximum Junction-to-Ambient③ | $R_{\theta JA}$ | 50   | °C/W  |

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1

# IRF7807D1PbF

International  
**IR** Rectifier

## Electrical Characteristics

| Parameter                             |               | Min | Typ  | Max     | Units      | Conditions                                     |
|---------------------------------------|---------------|-----|------|---------|------------|--|
| Drain-to-Source Breakdown Voltage*    | $V_{(BR)DSS}$ | 30  |      |         | V          | $V_{GS} = 0V, I_D = 250\mu A$                  |
| Static Drain-Source on Resistance*    | $R_{DS(on)}$  |     | 17   | 25      | m $\Omega$ | $V_{GS} = 4.5V, I_D = 7A$ ②                    |
| Gate Threshold Voltage*               | $V_{GS(th)}$  | 1.0 |      |         | V          | $V_{DS} = V_{GS}, I_D = 250\mu A$              |
| Drain-Source Leakage Current*         | $I_{DSS}$     |     |      | 90      | $\mu A$    | $V_{DS} = 24V, V_{GS} = 0V$                    |
|                                       |               |     |      | 7.2     | mA         | $V_{DS} = 24V, V_{GS} = 0V, T_j = 125^\circ C$ |
| Gate-Source Leakage Current*          | $I_{GSS}$     |     |      | +/- 100 | nA         | $V_{GS} = +/-12V$                              |
| Total Gate Charge Synch FET*          | $Q_{gsync}$   |     | 10.5 | 14      | nC         | $V_{DS} < 100mV, V_{GS} = 5V, I_D = 7A$        |
| Total Gate Charge Control FET*        | $Q_{gcont}$   |     | 12   | 17      |            | $V_{DS} = 16V, V_{GS} = 5V, I_D = 7A$          |
| Pre-Vth Gate-Source Charge            | $Q_{gs1}$     |     | 2.1  |         |            | $V_{DS} = 16V, I_D = 7A$                       |
| Post-Vth Gate-Source Charge           | $Q_{gs2}$     |     | 0.76 |         |            |  |
| Gate to Drain Charge                  | $Q_{gd}$      |     | 2.9  |         |            |  |
| Switch Charge* ( $Q_{gs2} + Q_{gd}$ ) | $Q_{SW}$      |     | 3.66 | 5.2     |            |  |
| Output Charge*                        | $Q_{oss}$     |     | 15.3 | 18.4    |            | $V_{DS} = 16V, V_{GS} = 0$                     |
| Gate Resistance                       | $R_g$         |     | 1.2  |         | $\Omega$   |  |

## Schottky Diode & Body Diode Ratings and Characteristics

| Parameter               |          | Min   | Typ | Max  | Units | Conditions                                   |
|-------------------------|----------|---|-----|------|-------|--|
| Diode Forward Voltage   | $V_{SD}$ |   |     | 0.5  | V     | $T_j = 25^\circ C, I_s = 1A, V_{GS} = 0V$ ②  |
|                         |          |   |     | 0.39 |       | $T_j = 125^\circ C, I_s = 1A, V_{GS} = 0V$ ② |
| Reverse Recovery Time   | trr      |   | 51  |      | ns    | $T_j = 25^\circ C, I_s = 7.0A, V_{DS} = 16V$ |
| Reverse Recovery Charge | Qrr      |   | 48  |      | nC    | di/dt = 100A/ $\mu s$                        |
| Forward Turn-On Time    | $t_{on}$ | Intrinsic turn-on time is negligible (turn-on is dominated by $L_s + L_D$ ) |     |      |       |  |

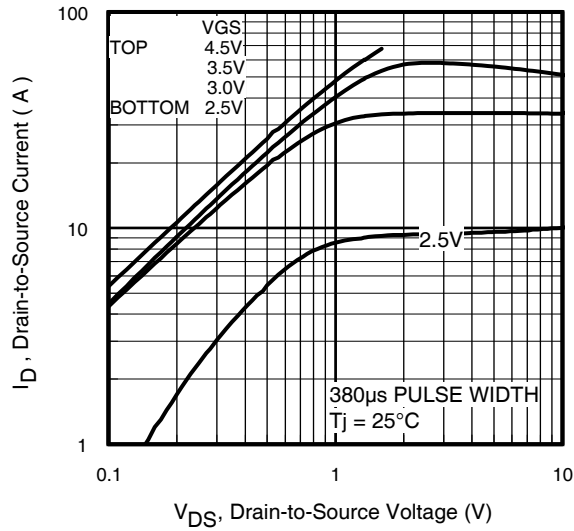
① Repetitive rating; pulse width limited by max. junction temperature.

② Pulse width  $\leq 300 \mu s$ ; duty cycle  $\leq 2\%$ .

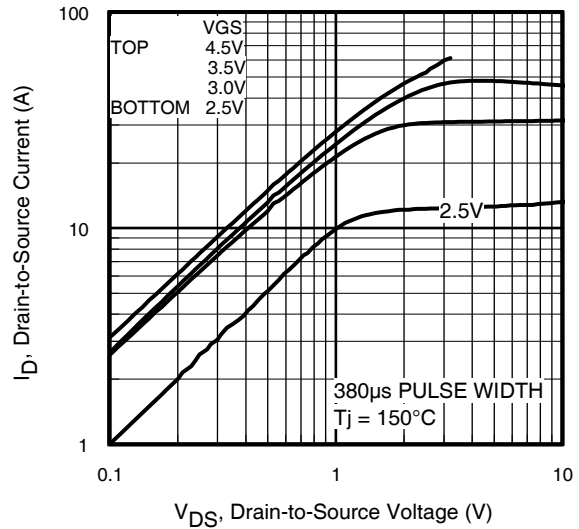
③ When mounted on 1 inch square copper board,  $t < 10$  sec.

④ 50% Duty Cycle, Rectangular

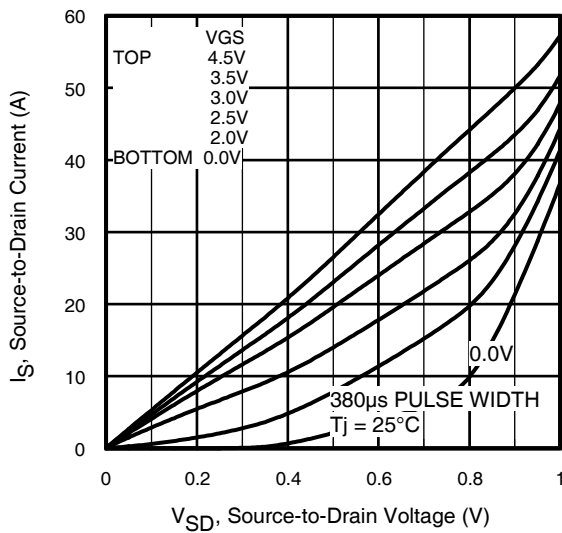
\* Devices are 100% tested to these parameters.



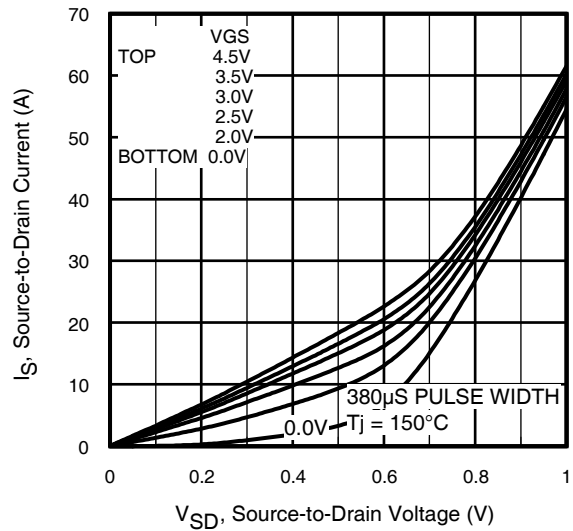
**Fig 1.** Typical Output Characteristics



**Fig 2.** Typical Output Characteristics

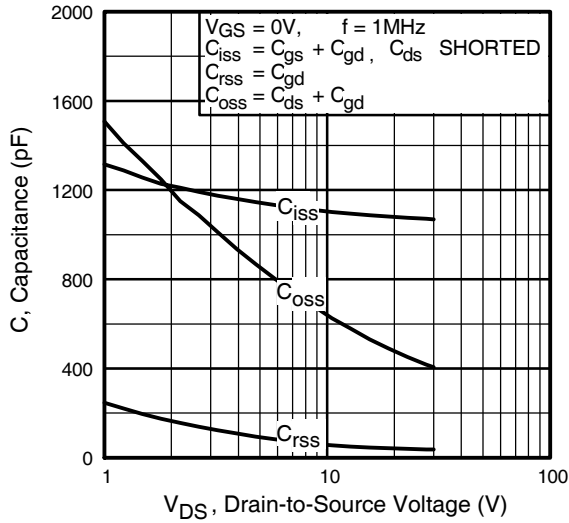


**Fig 3.** Typical Reverse Output Characteristics

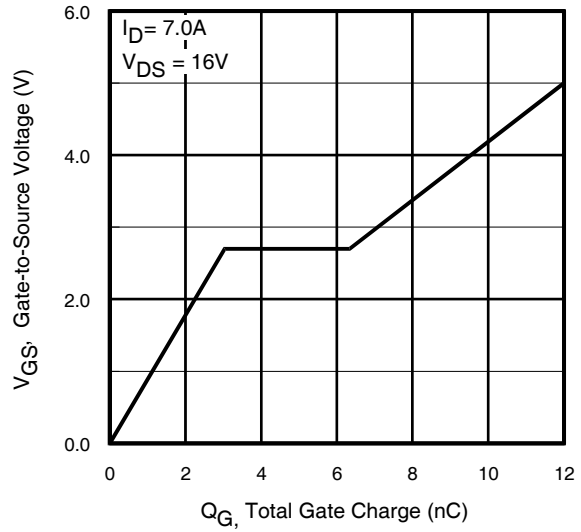


**Fig 4.** Typical Reverse Output Characteristics

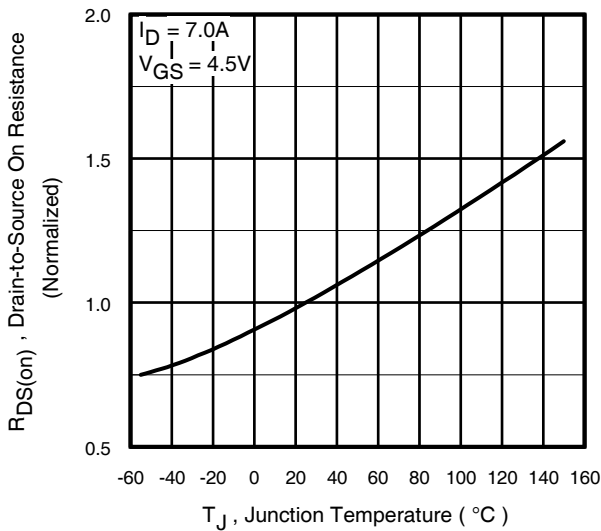
# IRF7807D1PbF



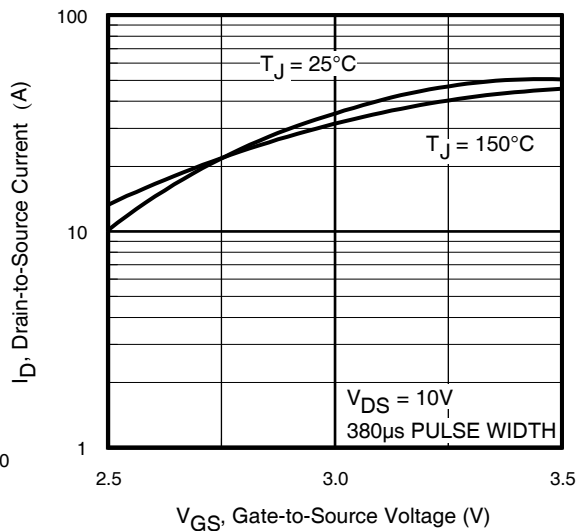
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



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



**Fig 7.** Normalized On-Resistance Vs. Temperature



**Fig 8.** Typical Transfer Characteristics

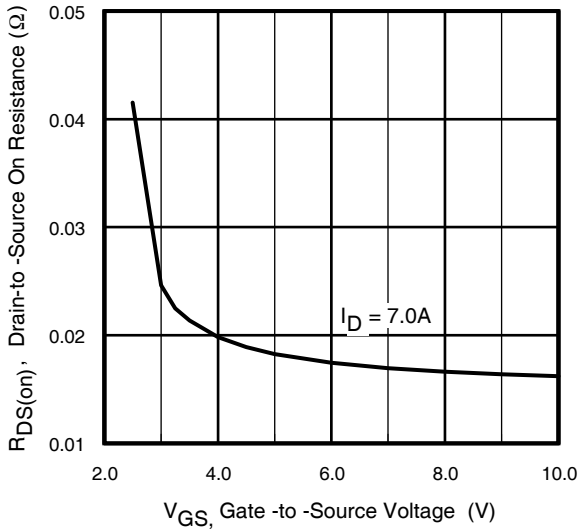


Fig 9. On-Resistance Vs. Gate Voltage

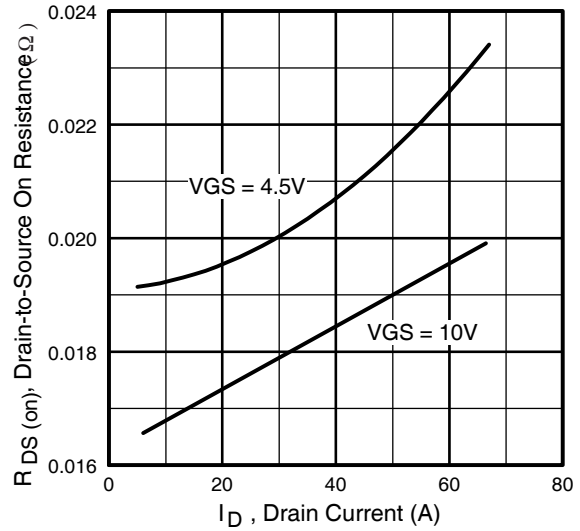


Fig 10. On-Resistance Vs. Drain Current

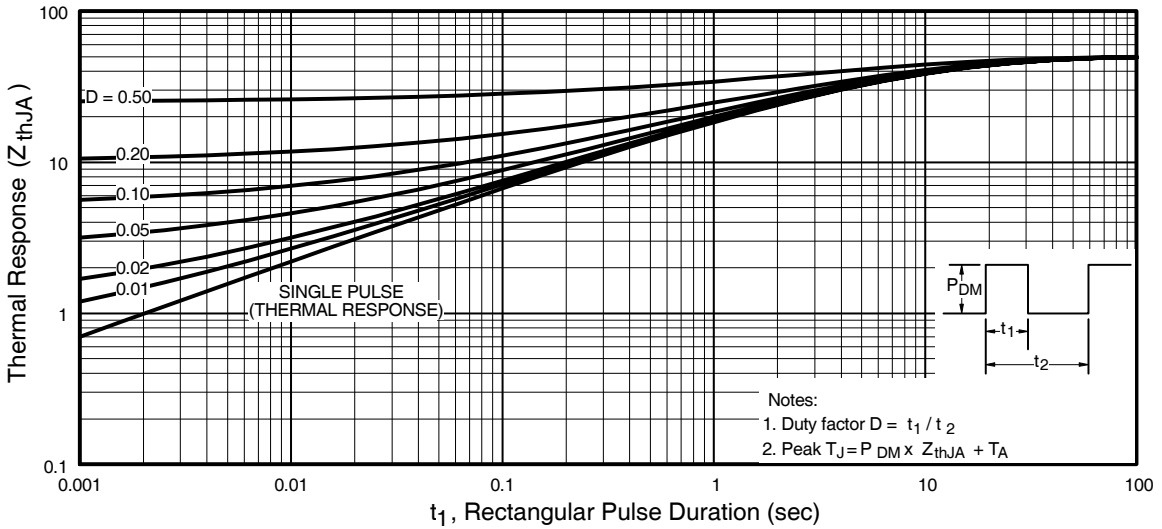
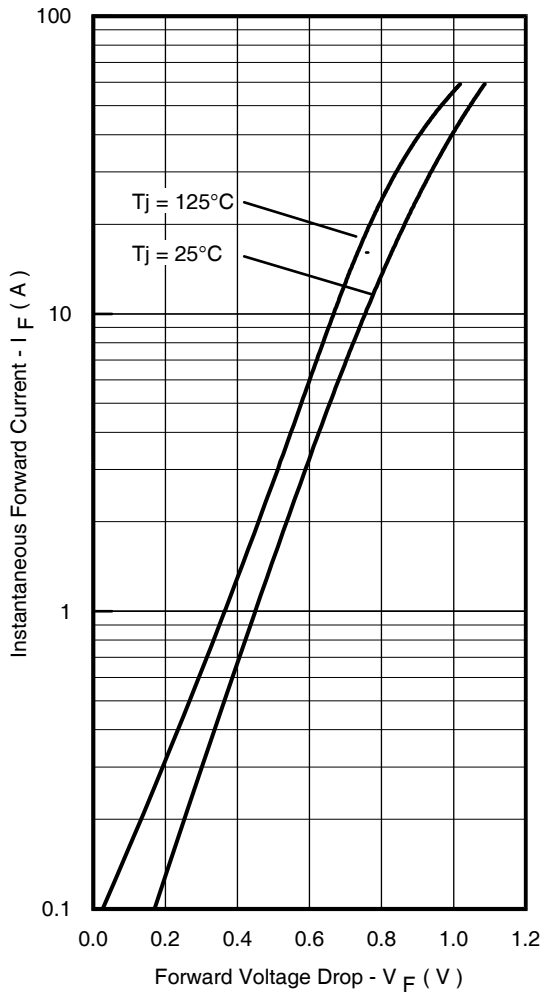
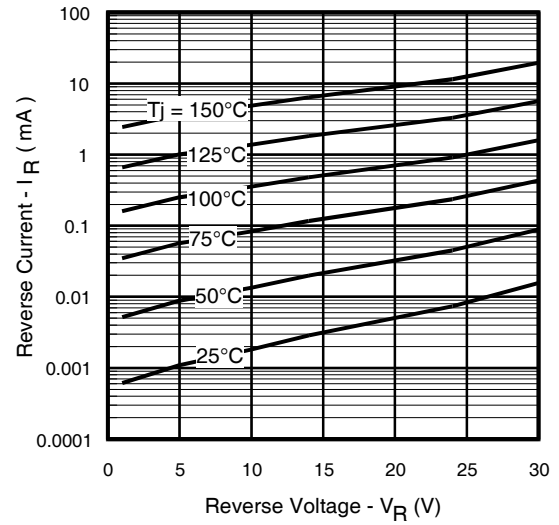


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient (HEXFET<sup>®</sup> MOSFET)

## MOSFET , Body Diode & Schottky Diode Characteristics



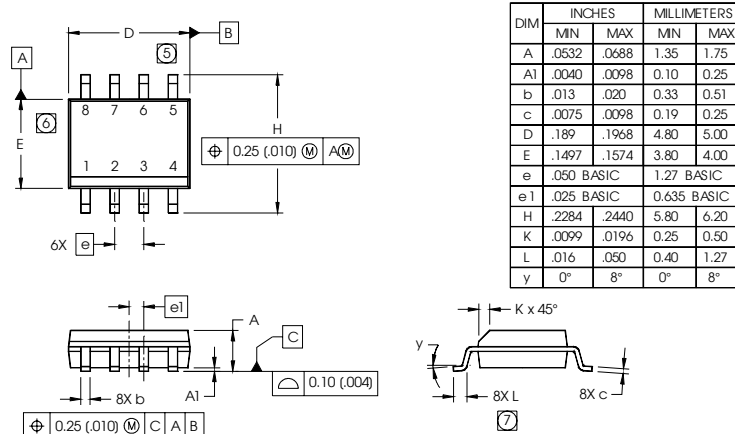
**Fig. 12** - Typical Forward Voltage Drop Characteristics



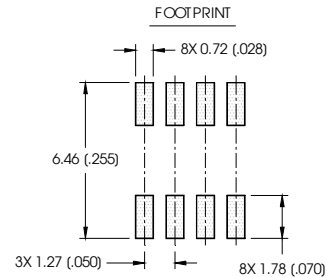
**Fig. 13** - Typical Values of Reverse Current Vs. Reverse Voltage

## SO-8 Package Outline

Dimensions are shown in millimeters (inches)

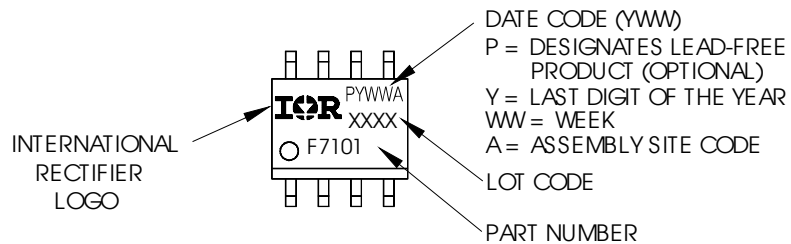


- NOTES:
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
  2. CONTROLLING DIMENSION: MILLIMETER
  3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
  4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
  5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 (.006).
  6. DIMENSION 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 (Lead-Free)

EXAMPLE: THIS IS AN IRF7101 (MOSFET)

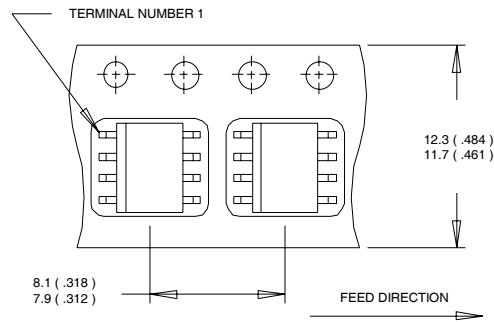


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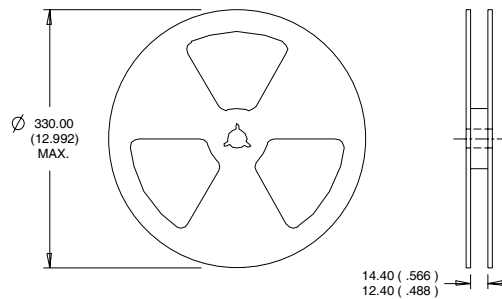
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## SO-8 Tape and Reel

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.

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.

International  
**IR** Rectifier

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