

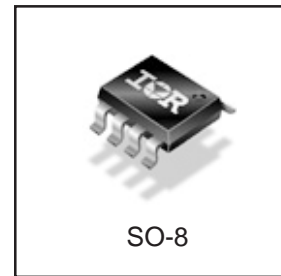
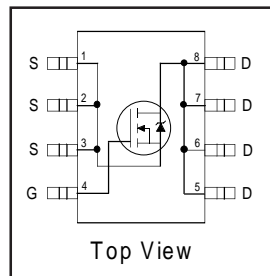
**Applications**

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

|                        |                                   |                      |
|------------------------|-----------------------------------|----------------------|
| <b>V<sub>DSS</sub></b> | <b>R<sub>DS(on)</sub> max(mΩ)</b> | <b>I<sub>D</sub></b> |
| <b>30V</b>             | <b>12.5@ V<sub>GS</sub> = 10V</b> | <b>11A</b>           |

**Benefits**

- Ultra-Low Gate Impedance
- Very Low R<sub>DS(on)</sub>
- Fully Characterized Avalanche Voltage and Current



**Absolute Maximum Ratings**

| Symbol                                 | Parameter                                       | Max.         | Units |
|--|---|--------------|-------|
| V <sub>DS</sub>                        | Drain-Source Voltage                            | 30           | V     |
| V <sub>GS</sub>                        | Gate-to-Source Voltage                          | ± 20         | V     |
| I <sub>D</sub> @ T <sub>A</sub> = 25°C | Continuous Drain Current, V <sub>GS</sub> @ 10V | 11           | A     |
| I <sub>D</sub> @ T <sub>A</sub> = 70°C | Continuous Drain Current, V <sub>GS</sub> @ 10V | 9.0          |       |
| I <sub>DM</sub>                        | Pulsed Drain Current <sup>①</sup>               | 90           |       |
| P <sub>D</sub> @ T <sub>A</sub> = 25°C | Maximum Power Dissipation <sup>③</sup>          | 2.5          | W     |
| P <sub>D</sub> @ T <sub>A</sub> = 70°C | Maximum Power Dissipation <sup>③</sup>          | 1.6          | W     |
|  | Linear Derating Factor                          | 0.02         | mW/°C |
| T <sub>J</sub> , T <sub>STG</sub>      | Junction and Storage Temperature Range          | -55 to + 150 | °C    |

**Thermal Resistance**

| Symbol           | Parameter                        | Typ. | Max. | Units |
|------------------|----------------------------------|------|------|-------|
| R <sub>θJL</sub> | Junction-to-Drain Lead           | —    | 20   | °C/W  |
| R <sub>θJA</sub> | Junction-to-Ambient <sup>④</sup> | —    | 50   |       |

Notes <sup>①</sup> through <sup>④</sup> are on page 8  
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# IRF7466

International  
**IR** Rectifier

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

|                                 | Parameter                            | Min. | Typ.  | Max. | Units      | Conditions  |
|---------------------------------|--------------------------------------|------|-------|------|------------|---|
| $V_{(BR)DSS}$                   | Drain-to-Source Breakdown Voltage    | 30   | —     | —    | V          | $V_{GS} = 0V, I_D = 250\mu A$   |
| $\Delta V_{(BR)DSS}/\Delta T_J$ | Breakdown Voltage Temp. Coefficient  | —    | 0.028 | —    | V/°C       | Reference to $25^\circ\text{C}, I_D = 1\text{mA}$                                   |
| $R_{DS(on)}$                    | Static Drain-to-Source On-Resistance | —    | 9.8   | 12.5 | m $\Omega$ | $V_{GS} = 10V, I_D = 11A$ ③<br>$V_{GS} = 4.5V, I_D = 8.8A$ ③                        |
| $V_{GS(th)}$                    | Gate Threshold Voltage               | 1.0  | —     | 3.0  | V          | $V_{DS} = V_{GS}, I_D = 250\mu A$   |
| $I_{DSS}$                       | Drain-to-Source Leakage Current      | —    | —     | 20   | $\mu A$    | $V_{DS} = 24V, V_{GS} = 0V$<br>$V_{DS} = 24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$ |
| $I_{GSS}$                       | Gate-to-Source Forward Leakage       | —    | —     | 200  | nA         | $V_{GS} = 16V$  |
|                                 | Gate-to-Source Reverse Leakage       | —    | —     | -200 | nA         | $V_{GS} = -16V$   |

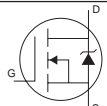
## Dynamic @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

| Symbol       | Parameter                       | Min. | Typ. | Max. | Units | Conditions   |
|--------------|---------------------------------|------|------|------|-------|--|
| $g_{fs}$     | Forward Transconductance        | 22   | —    | —    | S     | $V_{DS} = 15V, I_D = 8.8A$   |
| $Q_g$        | Total Gate Charge               | —    | 16   | 23   | nC    | $I_D = 8.8A$<br>$V_{DS} = 15V$<br>$V_{GS} = 4.5V$ ③                      |
| $Q_{gs}$     | Gate-to-Source Charge           | —    | 7.4  | 11   |       |  |
| $Q_{gd}$     | Gate-to-Drain ("Miller") Charge | —    | 5.3  | 8.0  |       |  |
| $Q_{oss}$    | Output Gate Charge              | —    | 19   | 29   |       |  |
| $t_{d(on)}$  | Turn-On Delay Time              | —    | 10   | —    | ns    | $V_{DD} = 15V$<br>$I_D = 8.8A$<br>$R_G = 1.8\Omega$<br>$V_{GS} = 4.5V$ ③ |
| $t_r$        | Rise Time                       | —    | 2.8  | —    |       |  |
| $t_{d(off)}$ | Turn-Off Delay Time             | —    | 13   | —    |       |  |
| $t_f$        | Fall Time                       | —    | 3.6  | —    |       |  |
| $C_{iss}$    | Input Capacitance               | —    | 2100 | —    | pF    | $V_{GS} = 0V$<br>$V_{DS} = 15V$<br>$f = 1.0\text{MHz}$                   |
| $C_{oss}$    | Output Capacitance              | —    | 710  | —    |       |  |
| $C_{riss}$   | Reverse Transfer Capacitance    | —    | 52   | —    |       |  |

## Avalanche Characteristics

| Symbol   | Parameter                      | Typ. | Max. | Units |
|----------|--------------------------------|------|------|-------|
| $E_{AS}$ | Single Pulse Avalanche Energy② | —    | 230  | mJ    |
| $I_{AR}$ | Avalanche Current①             | —    | 8.8  | 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   | —    | —    | 90   |       |  |
| $V_{SD}$ | Diode Forward Voltage                  | —    | 0.8  | 1.3  | V     | $T_J = 25^\circ\text{C}, I_S = 8.8A, V_{GS} = 0V$ ③<br>$T_J = 125^\circ\text{C}, I_S = 8.8A, V_{GS} = 0V$ ③  |
| $t_{rr}$ | Reverse Recovery Time                  | —    | 42   | 63   | ns    | $T_J = 25^\circ\text{C}, I_F = 8.8A, V_R = 15V$  |
| $Q_{rr}$ | Reverse Recovery Charge                | —    | 59   | 89   | nC    | $di/dt = 100A/\mu s$ ③   |
| $t_{rr}$ | Reverse Recovery Time                  | —    | 42   | 63   | ns    | $T_J = 125^\circ\text{C}, I_F = 8.8A, V_R = 15V$   |
| $Q_{rr}$ | Reverse Recovery Charge                | —    | 61   | 92   | nC    | $di/dt = 100A/\mu s$ ③   |

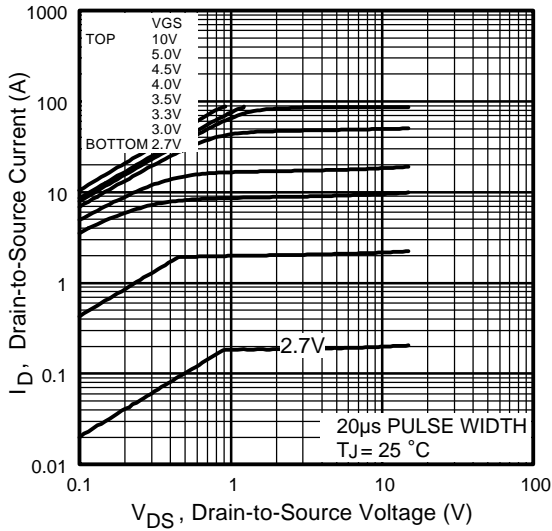


Fig 1. Typical Output Characteristics

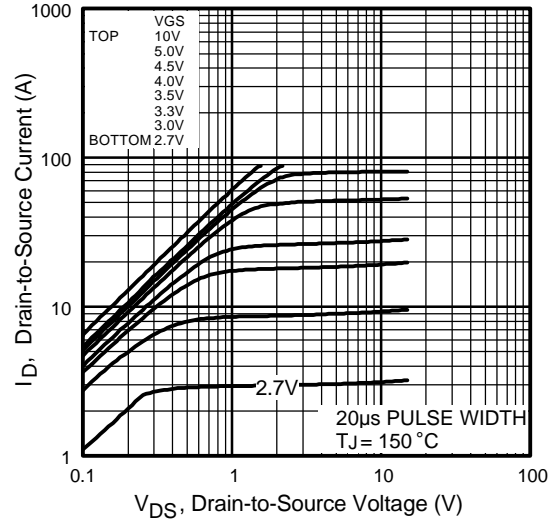


Fig 2. Typical Output Characteristics

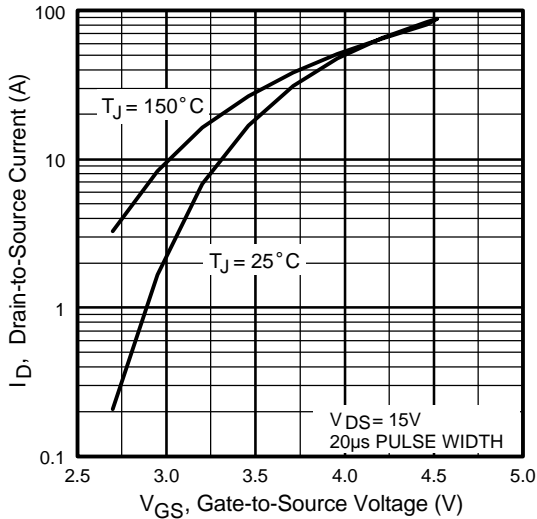


Fig 3. Typical Transfer Characteristics

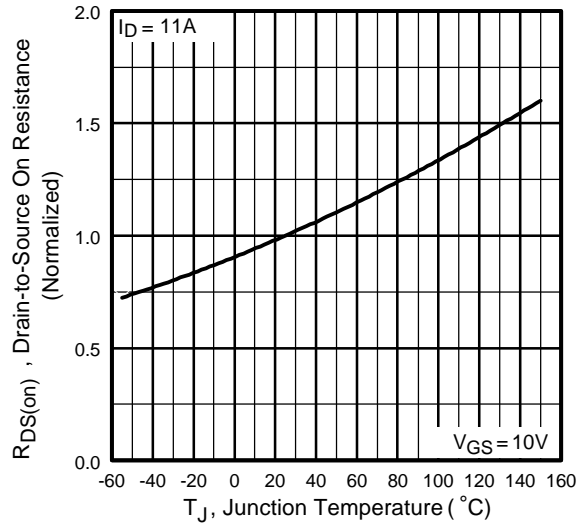
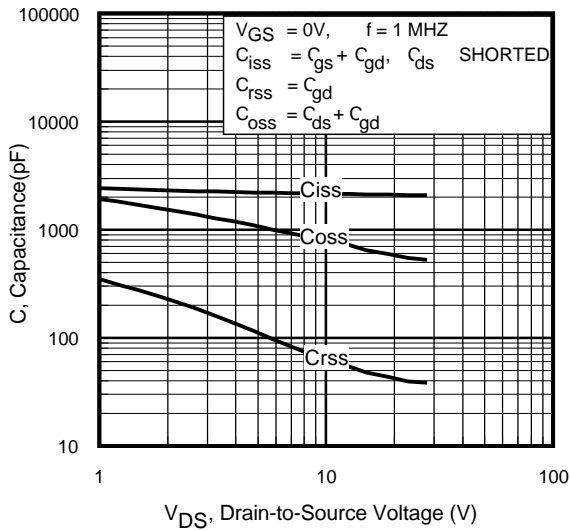
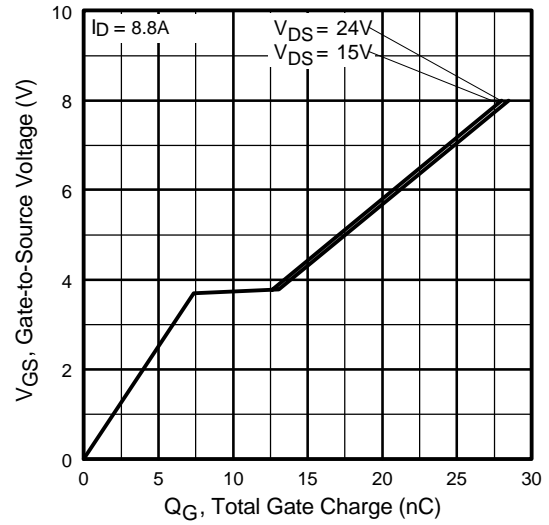


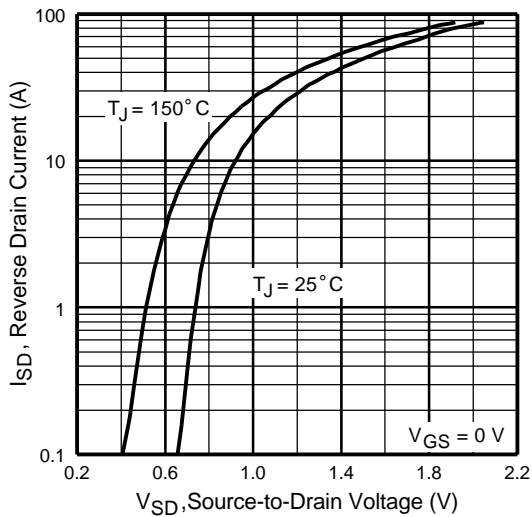
Fig 4. Normalized On-Resistance Vs. Temperature



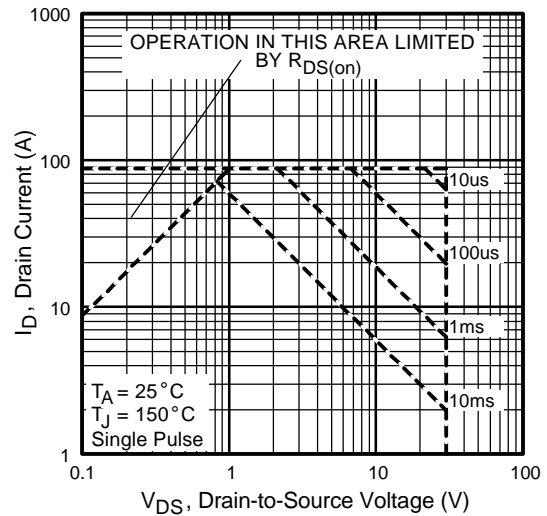
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



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

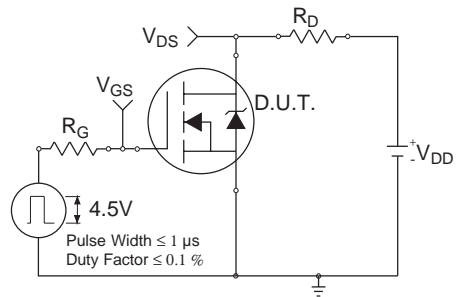
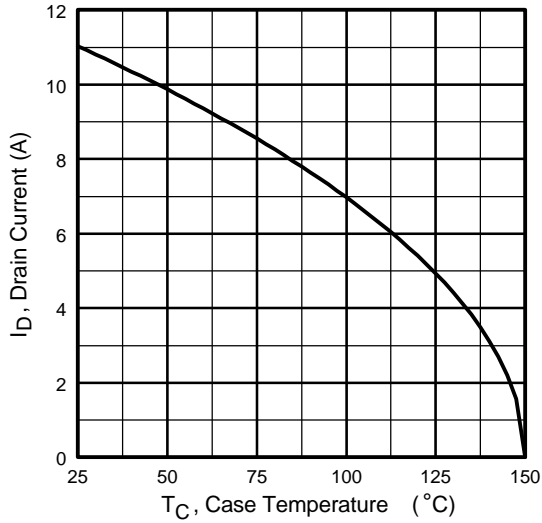


**Fig 7.** Typical Source-Drain Diode Forward Voltage

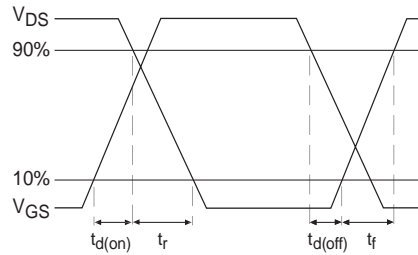


**Fig 8.** Maximum Safe Operating Area

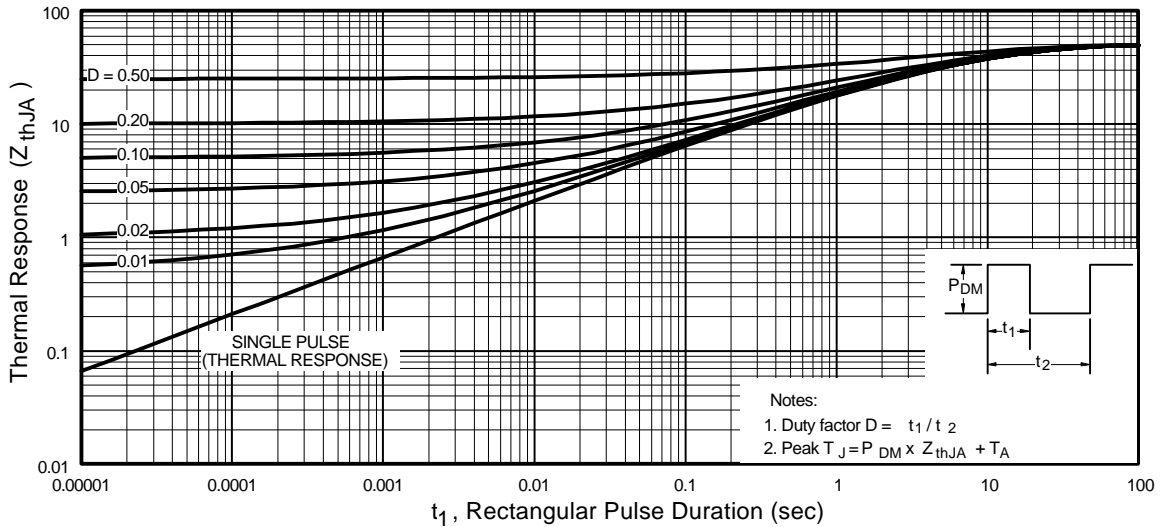
**Fig 6. On-Resistance Vs. Drain Current**



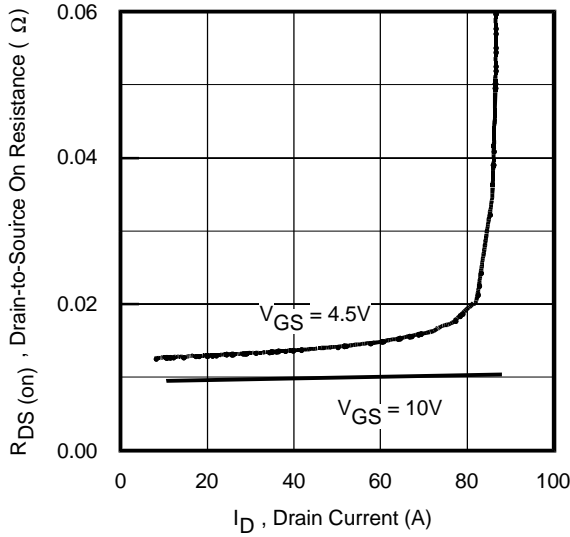
**Fig 10a. Switching Time Test Circuit**



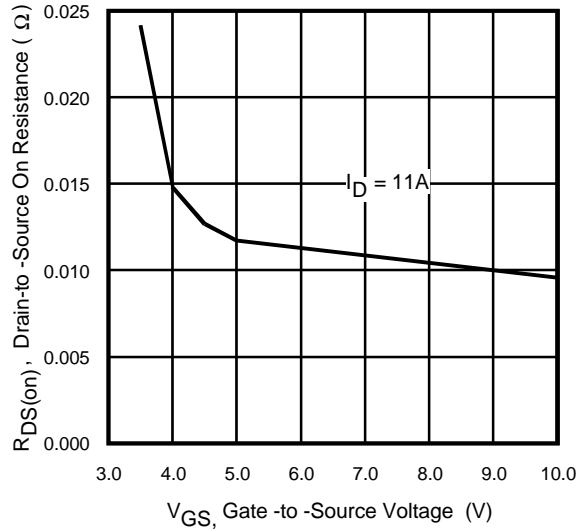
**Fig 10b. Switching Time Waveforms**



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



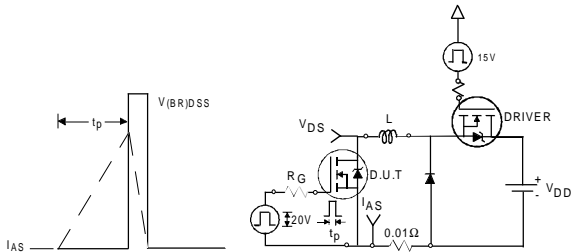
**Fig 12.** On-Resistance Vs. Drain Current



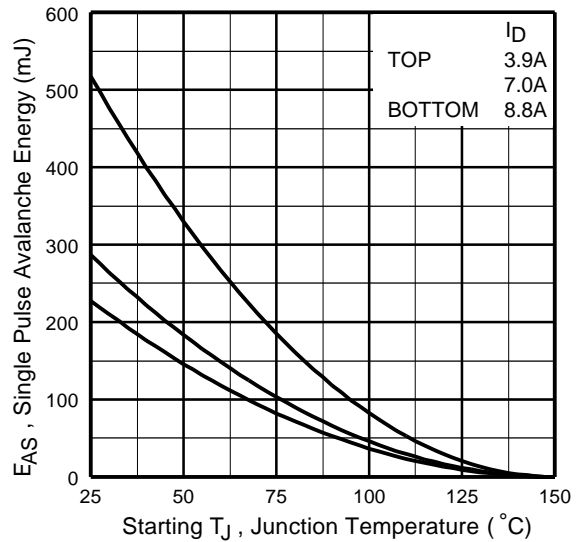
**Fig 13.** On-Resistance Vs. Gate Voltage



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

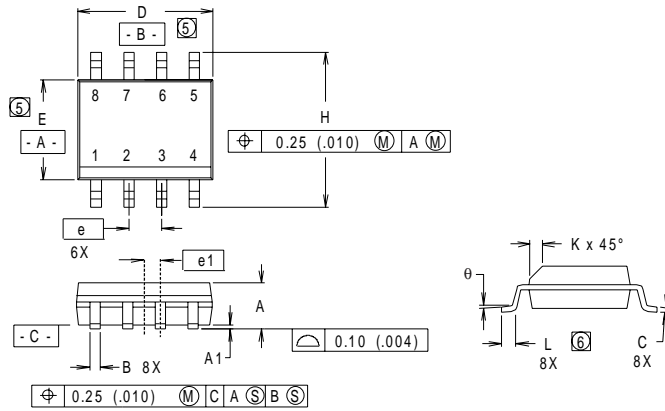


**Fig 14a&b.** Unclamped Inductive Test circuit and Waveforms



**Fig 14c.** Maximum Avalanche Energy Vs. Drain Current

## 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



# IRF7466

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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  $T_J = 25^\circ\text{C}$ ,  $L = 5.9\text{mH}$   
 $R_G = 25\Omega$ ,  $I_{AS} = 8.8\text{A}$ .
- ③ Pulse width  $\leq 400\mu\text{s}$ ; duty cycle  $\leq 2\%$ .
- ④ When mounted on 1 inch square copper board,  $t < 10$  sec

International  
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*Data and specifications subject to change without notice. 7/00*