PD - 97173A

International
IOR Rectifier

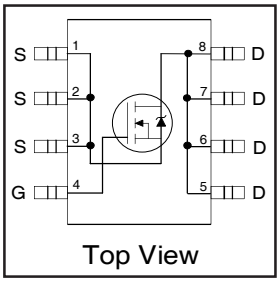
# IRF7855PbF

HEXFET® Power MOSFET

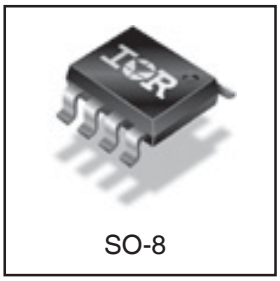
| $V_{DSS}$ | $R_{DS(on)}$ max | $I_D$ |
|---|---|---|
| 60V | 9.4mΩ@VGS = 10V | 12A |

### Applications

- Primary Side Switch in Bridge Topology in Isolated DC-DC Converters
- Primary Side Switch in Push-Pull Topology for 18-36Vin Isolated DC-DC Converters
- Secondary Side Synchronous Rectification Switch for 15Vout
- Suitable for 48V Non-Isolated Synchronous Buck DC-DC Applications



Top View


SO-8

### Benefits

- Low Gate to Drain Charge to Reduce Switching Losses
- Fully Characterized Capacitance Including Effective $C_{OSS}$ to Simplify Design, (See App. Note AN1001)
- Fully Characterized Avalanche Voltage and Current

### Absolute Maximum Ratings

| | Parameter | Max. | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-to-Source Voltage | 60 | V |
| $V_{GS}$ | Gate-to-Source Voltage | ± 20 | |
| $I_D$ @ $T_A$ = 25°C | Continuous Drain Current, $V_{GS}$ @ 10V | 12 | A |
| $I_D$ @ $T_A$ = 70°C | Continuous Drain Current, $V_{GS}$ @ 10V | 8.7 | |
| $I_{DM}$ | Pulsed Drain Current ① | 97 | |
| $P_D$ @$T_A$ = 25°C | Maximum Power Dissipation ③ | 2.5 | W |
| | Linear Derating Factor | 0.02 | W/°C |
| dv/dt | Peak Diode Recovery dv/dt ⑥ | 9.9 | V/ns |
| $T_J$<br>$T_{STG}$ | Operating Junction and<br>Storage Temperature Range | -55 to + 150 | °C |

### Thermal Resistance

| | Parameter | Typ. | Max. | Units |
|---|---|---|---|---|
| $R_{\theta JL}$ | Junction-to-Drain Lead | — | 20 | °C/W |
| $R_{\theta JA}$ | Junction-to-Ambient (PCB Mount) ③⑦ | — | 50 | |

Notes ① through ⑦ 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 | 60 | — | — | V | $V_{GS}$ = 0V, $I_D$ = 250µA |
| $\Delta V_{(BR)DSS}/\Delta T_J$ | Breakdown Voltage Temp. Coefficient | — | 72 | — | mV/°C | Reference to 25°C, $I_D$ = 1mA |
| $R_{DS(on)}$ | Static Drain-to-Source On-Resistance | — | 7.4 | 9.4 | mΩ | $V_{GS}$ = 10V, $I_D$ = 12A ④ |
| $V_{GS(th)}$ | Gate Threshold Voltage | 3.0 | — | 4.9 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = 100µA |
| $I_{DSS}$ | Drain-to-Source Leakage Current | — | — | 20 | µA | $V_{DS}$ = 60V, $V_{GS}$ = 0V |
| | | — | — | 250 | | $V_{DS}$ = 60V, $V_{GS}$ = 0V, $T_J$ = 125°C |
| $I_{GSS}$ | Gate-to-Source Forward Leakage | — | — | 100 | nA | $V_{GS}$ = 20V |
| | Gate-to-Source Reverse Leakage | — | — | -100 | | $V_{GS}$ = -20V |

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

| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---|---|---|---|---|---|---|
| gfs | Forward Transconductance | 14 | — | — | S | $V_{DS}$ = 25V, $I_D$ = 7.2A |
| $Q_g$ | Total Gate Charge | — | 26 | 39 | | $I_D$ = 7.2A |
| $Q_{gs}$ | Gate-to-Source Charge | — | 6.8 | — | nC | $V_{DS}$ = 30V |
| $Q_{gd}$ | Gate-to-Drain ("Miller") Charge | — | 9.6 | — | | $V_{GS}$ = 10V ④ |
| $t_{d(on)}$ | Turn-On Delay Time | — | 8.7 | — | | $V_{DD}$ = 30V |
| $t_r$ | Rise Time | — | 13 | — | | $I_D$ = 7.2A |
| $t_{d(off)}$ | Turn-Off Delay Time | — | 16 | — | ns | $R_G$ = 6.2Ω |
| $t_f$ | Fall Time | — | 12 | — | | $V_{GS}$ = 10V ④ |
| $C_{iss}$ | Input Capacitance | — | 1560 | — | | $V_{GS}$ = 0V |
| $C_{oss}$ | Output Capacitance | — | 440 | — | | $V_{DS}$ = 25V |
| $C_{rss}$ | Reverse Transfer Capacitance | — | 120 | — | pF | $f$ = 1.0MHz |
| $C_{oss}$ | Output Capacitance | — | 1910 | — | | $V_{GS}$ = 0V, $V_{DS}$ = 1.0V, $f$ = 1.0MHz |
| $C_{oss}$ | Output Capacitance | — | 320 | — | | $V_{GS}$ = 0V, $V_{DS}$ = 48V, $f$ = 1.0MHz |
| $C_{oss}$ eff. | Effective Output Capacitance | — | 520 | — | | $V_{GS}$ = 0V, $V_{DS}$ = 0V to 48V ⑤ |

## Avalanche Characteristics

| | Parameter | Typ. | Max. | Units |
|---|---|---|---|---|
| $E_{AS}$ | Single Pulse Avalanche Energy② | — | 540 | mJ |
| $I_{AR}$ | Avalanche Current ① | — | 7.2 | A |

## Diode Characteristics

| | 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 | — | — | 97 | | |
| $V_{SD}$ | Diode Forward Voltage | — | — | 1.3 | V | $T_J$ = 25°C, $I_S$ = 7.2A, $V_{GS}$ = 0V ④ |
| $t_{rr}$ | Reverse Recovery Time | — | 33 | 50 | ns | $T_J$ = 25°C, $I_F$ = 7.2A, $V_{DD}$ = 25V |
| $Q_{rr}$ | Reverse Recovery Charge | — | 38 | 57 | nC | di/dt = 100A/µs ④ |
| $t_{on}$ | Forward Turn-On Time | Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD) | | | | |

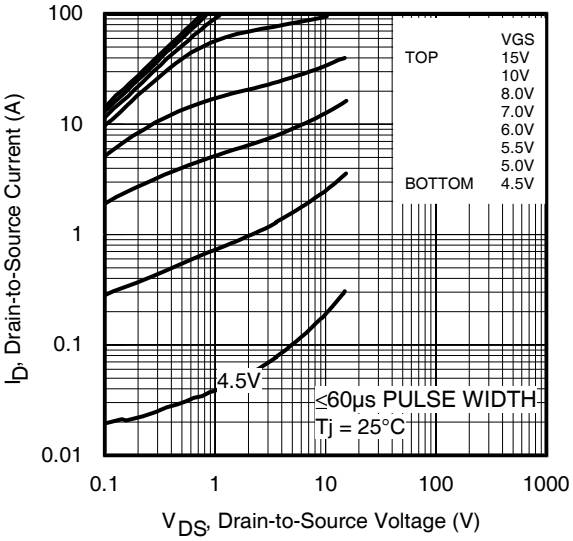



**Fig 1.** Typical Output Characteristics

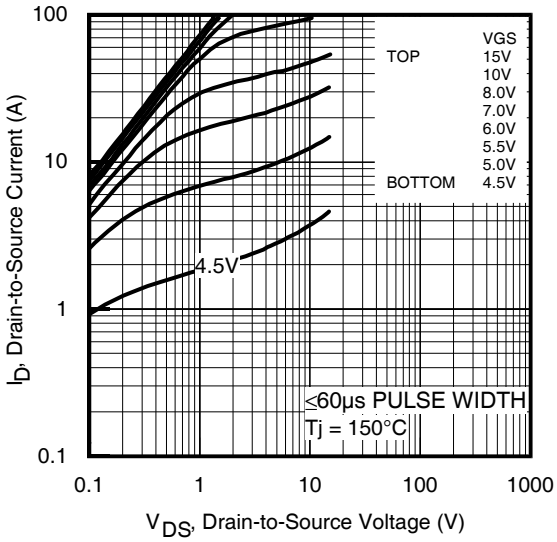



**Fig 2.** Typical Output Characteristics

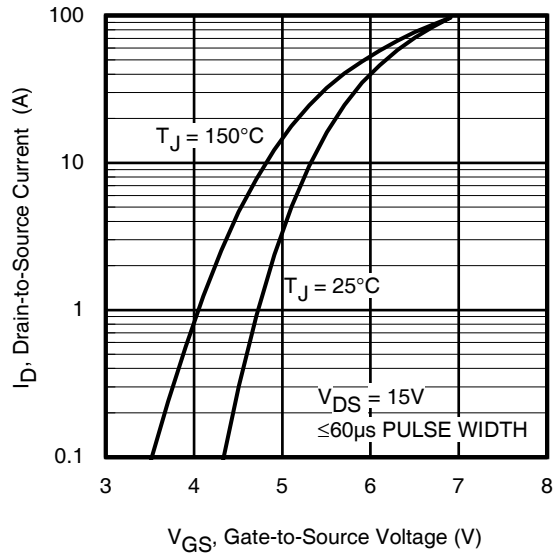



**Fig 3.** Typical Transfer Characteristics

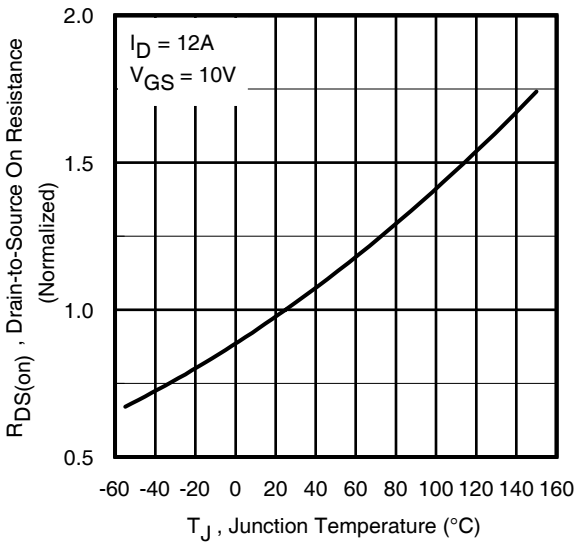



**Fig 4.** Normalized On-Resistance vs. Temperature

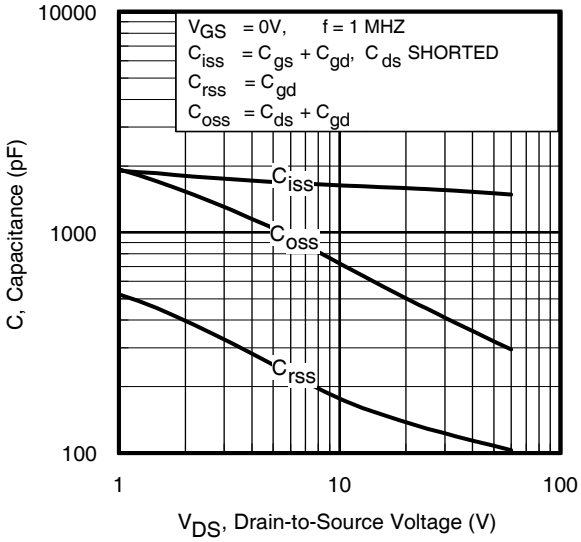



**Fig 5.** Typical Capacitance vs. Drain-to-Source Voltage

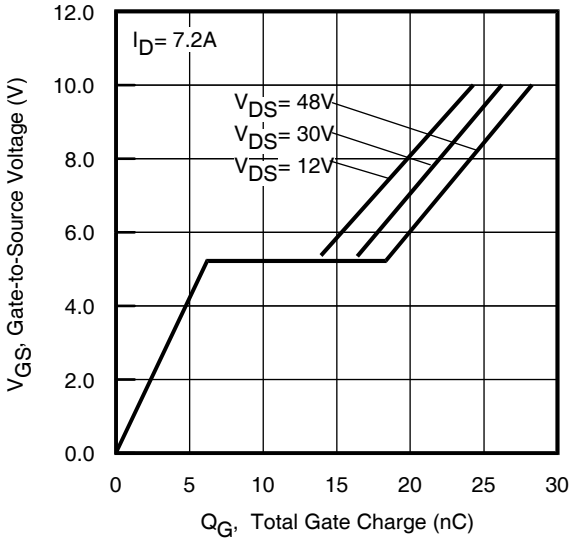



**Fig 6.** Typical Gate Charge vs. Gate-to-Source Voltage

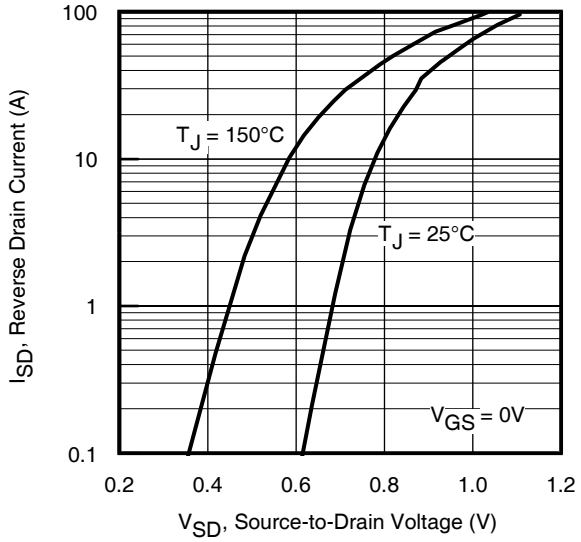



**Fig 7.** Typical Source-Drain Diode Forward Voltage

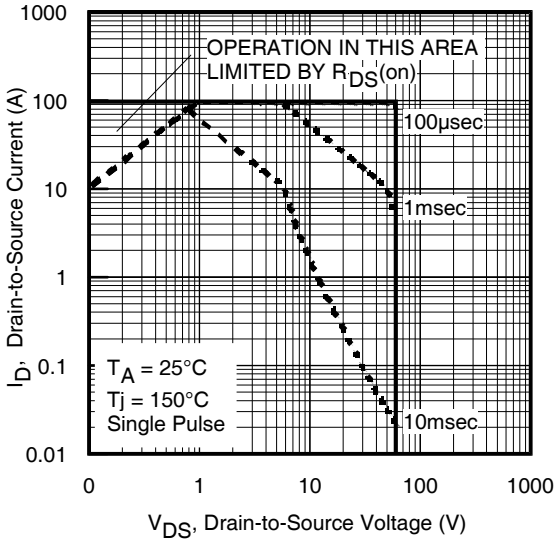



**Fig 8.** Maximum Safe Operating Area

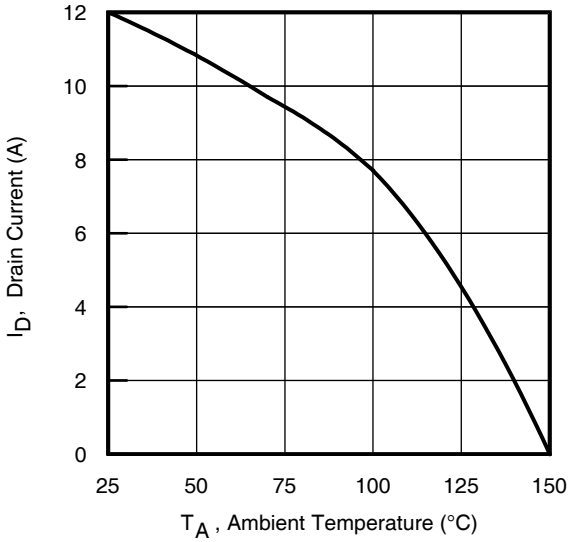



**Fig 9.** Maximum Drain Current vs. Ambient Temperature

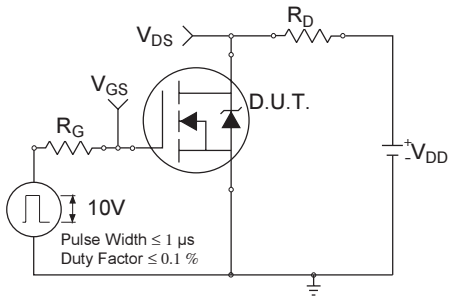



**Fig 10a.** Switching Time Test Circuit

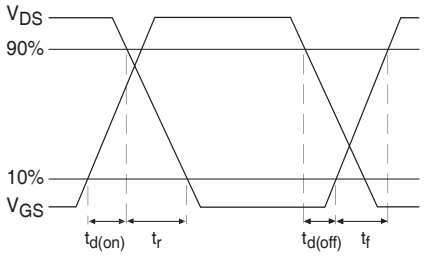



**Fig 10b.** Switching Time Waveforms

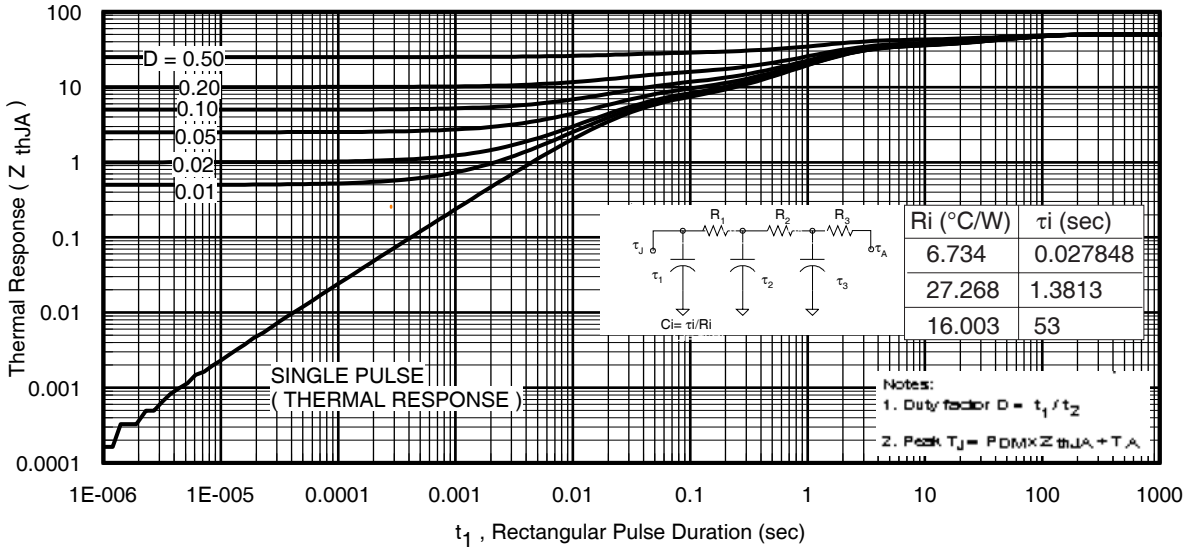



**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

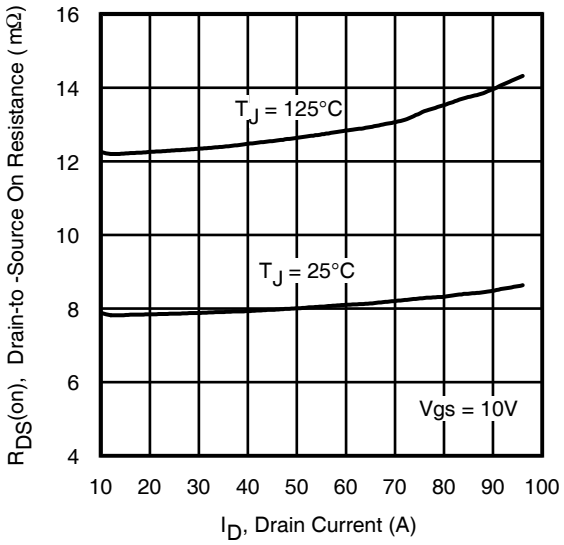



**Fig 12.** On-Resistance vs. Drain Current

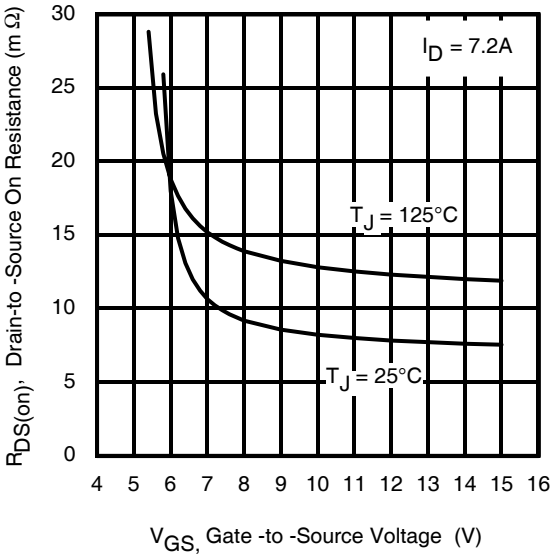



**Fig 13.** On-Resistance vs. Gate Voltage

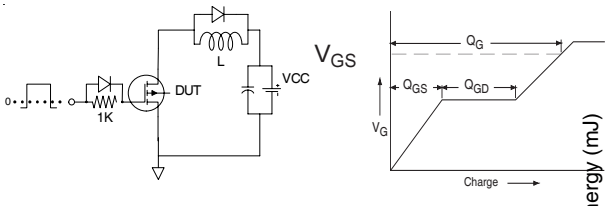



**Fig 14a&b.** Basic Gate Charge Test Circuit and Waveform

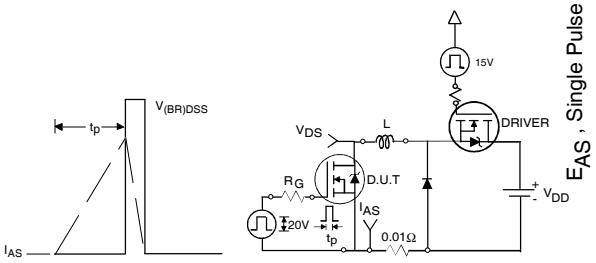



**Fig 15a&b.** Unclamped Inductive Test circuit and Waveforms

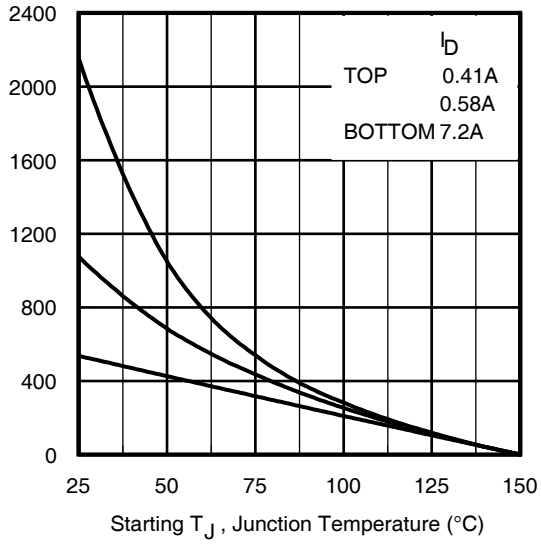
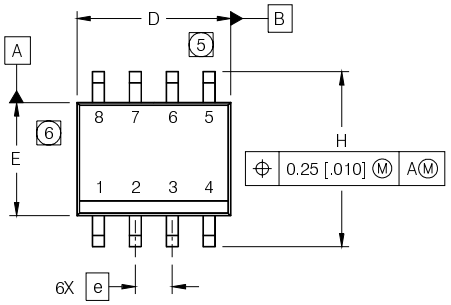
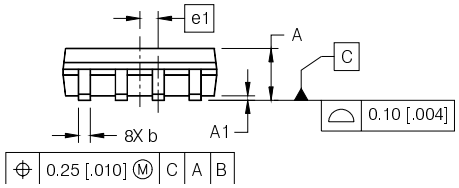


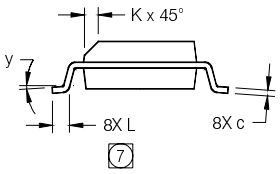

**Fig 15c.** Maximum Avalanche Energy vs. Drain Current

## SO-8 Package Details



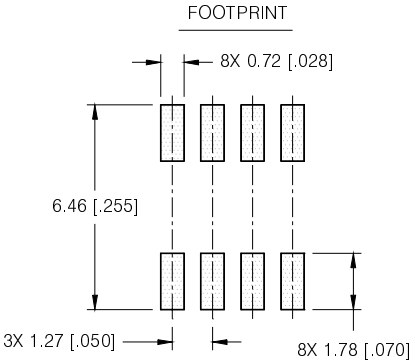

| DIM | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | .0532 | .0688 | 1.35 | 1.75 |
| A1 | .0040 | .0098 | 0.10 | 0.25 |
| b | .013 | .020 | 0.33 | 0.51 |
| c | .0075 | .0098 | 0.19 | 0.25 |
| D | .189 | .1968 | 4.80 | 5.00 |
| E | .1497 | .1574 | 3.80 | 4.00 |
| e | .050 BASIC | | 1.27 BASIC | |
| e 1 | .025 BASIC | | 0.635 BASIC | |
| H | .2284 | .2440 | 5.80 | 6.20 |
| K | .0099 | .0196 | 0.25 | 0.50 |
| L | .016 | .050 | 0.40 | 1.27 |
| y | 0° | 8° | 0° | 8° |



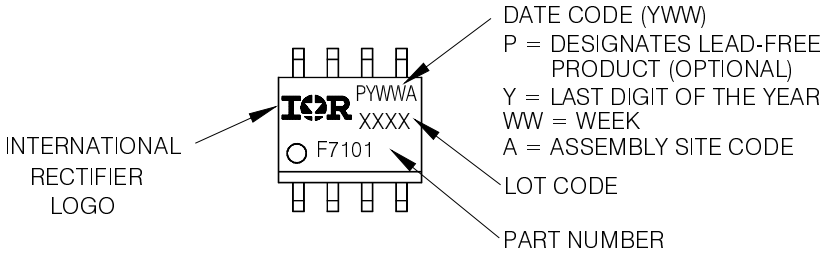

NOTES:

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.

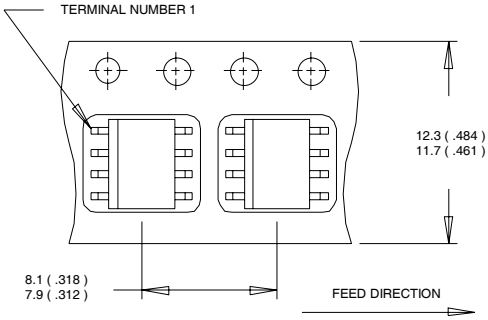



## SO-8 Part Marking

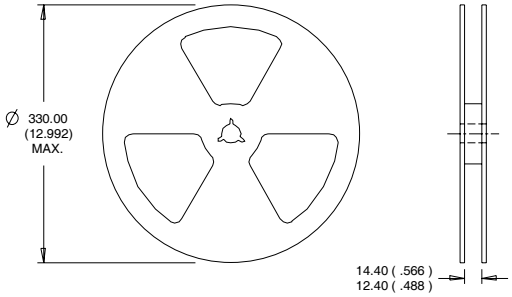
EXAMPLE: THIS IS AN IRF7101 (MOSFET)



## 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°C, L = 21mH, $R_G$ = 25Ω, $I_{AS}$ = 7.2A.

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

④ Pulse width ≤ 400µs; duty cycle ≤ 2%.

⑤ $C_{oss}$ eff. is a fixed capacitance that gives the same charging time as $C_{oss}$ while $V_{DS}$ is rising from 0 to 80% $V_{DSS}$.

⑥ $I_{SD}$ ≤ 7.2A, di/dt ≤ 650A/µs, $V_{DD}$ ≤ $V_{(BR)DSS}$, $T_J$ ≤ 150°C.

⑦ $R_\theta$ is measured at $T_J$ of approximately 90°C.

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.

International
IOR Rectifier

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Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

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**Kategorilere göz atın**

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**Üreticileri görün**

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**Teklif isteyin**

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