

# IRF8734PbF

HEXFET® Power MOSFET

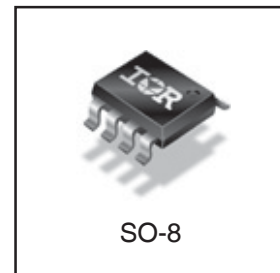
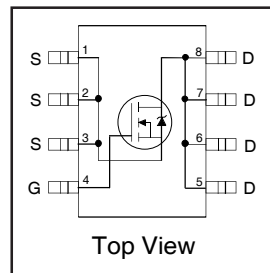
## Applications

- Synchronous MOSFET for Notebook Processor Power
- Synchronous Rectifier MOSFET for Isolated DC-DC Converters in Networking Systems

## Benefits

- Very Low  $R_{DS(on)}$  at 4.5V  $V_{GS}$
- Low Gate Charge
- Fully Characterized Avalanche Voltage and Current
- 100% Tested for  $R_G$
- Lead-Free

| $V_{DSS}$ | $R_{DS(on)}$ max            | Qg (typ.) |
|-----------|-----------------------------|-----------|
| 30V       | $3.5m\Omega @ V_{GS} = 10V$ | 20nC      |



## Absolute Maximum Ratings

|                          | Parameter                                           | Max.        | Units         |
|--------------------------|-----------------------------------------------------|-------------|---------------|
| $V_{DS}$                 | Drain-to-Source Voltage                             | 30          | V             |
| $V_{GS}$                 | Gate-to-Source Voltage                              | $\pm 20$    |               |
| $I_D @ T_A = 25^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V$            | 21          | A             |
| $I_D @ T_A = 70^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V$            | 17          |               |
| $I_{DM}$                 | Pulsed Drain Current ①                              | 168         | W             |
| $P_D @ T_A = 25^\circ C$ | Power Dissipation ④                                 | 2.5         |               |
| $P_D @ T_A = 70^\circ C$ | Power Dissipation ④                                 | 1.6         |               |
|                          | Linear Derating Factor                              | 0.02        | W/ $^\circ C$ |
| $T_J$<br>$T_{STG}$       | Operating Junction and<br>Storage Temperature Range | -55 to +150 | $^\circ C$    |

## Thermal Resistance

|                 | Parameter                | Typ. | Max. | Units        |
|-----------------|--------------------------|------|------|--------------|
| $R_{\theta JL}$ | Junction-to-Drain Lead ⑤ | —    | 20   | $^\circ C/W$ |
| $R_{\theta JA}$ | Junction-to-Ambient ④    | —    | 50   |              |

Notes ① through ⑤ are on page 10

## ORDERING INFORMATION:

See detailed ordering and shipping information on the last page of this data sheet.

# IRF8734PbF

International  
IR Rectifier

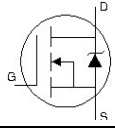
**Static @  $T_J = 25^\circ\text{C}$  (unless otherwise specified)**

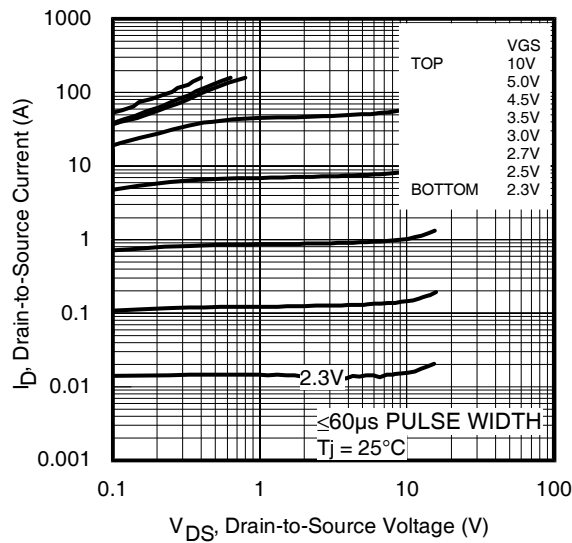
|                              | Parameter                                  | Min. | Typ.  | Max. | Units               | Conditions                                                                                 |
|------------------------------|--------------------------------------------|------|-------|------|---------------------|--------------------------------------------------------------------------------------------|
| $BV_{DSS}$                   | Drain-to-Source Breakdown Voltage          | 30   | —     | —    | V                   | $V_{GS} = 0V, I_D = 250\mu A$                                                              |
| $\Delta BV_{DSS}/\Delta T_J$ | Breakdown Voltage Temp. Coefficient        | —    | 0.023 | —    | V/ $^\circ\text{C}$ | Reference to $25^\circ\text{C}, I_D = 1mA$                                                 |
| $R_{DS(on)}$                 | Static Drain-to-Source On-Resistance       | —    | 2.9   | 3.5  | $m\Omega$           | $V_{GS} = 10V, I_D = 21A$ ③                                                                |
|                              |                                            | —    | 4.2   | 5.1  |                     | $V_{GS} = 4.5V, I_D = 17A$ ③                                                               |
| $V_{GS(th)}$                 | Gate Threshold Voltage                     | 1.35 | 1.80  | 2.35 | V                   | $V_{DS} = V_{GS}, I_D = 50\mu A$                                                           |
| $\Delta V_{GS(th)}$          | Gate Threshold Voltage Coefficient         | —    | -6.5  | —    | $mV/^\circ\text{C}$ |                                                                                            |
| $I_{DSS}$                    | Drain-to-Source Leakage Current            | —    | —     | 1.0  | $\mu A$             | $V_{DS} = 24V, V_{GS} = 0V$                                                                |
|                              |                                            | —    | —     | 150  |                     | $V_{DS} = 24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$                                       |
| $I_{GSS}$                    | Gate-to-Source Forward Leakage             | —    | —     | 100  | nA                  | $V_{GS} = 20V$                                                                             |
|                              | Gate-to-Source Reverse Leakage             | —    | —     | -100 |                     | $V_{GS} = -20V$                                                                            |
| $g_{fs}$                     | Forward Transconductance                   | 85   | —     | —    | S                   | $V_{DS} = 15V, I_D = 17A$                                                                  |
| $Q_g$                        | Total Gate Charge                          | —    | 20    | 30   | nC                  | $V_{DS} = 15V$<br>$V_{GS} = 4.5V$<br>$I_D = 17A$<br>See Figs. 16a & 16b                    |
| $Q_{gs1}$                    | Pre-V <sub>th</sub> Gate-to-Source Charge  | —    | 5.2   | —    |                     |                                                                                            |
| $Q_{gs2}$                    | Post-V <sub>th</sub> Gate-to-Source Charge | —    | 2.3   | —    |                     |                                                                                            |
| $Q_{gd}$                     | Gate-to-Drain Charge                       | —    | 6.9   | —    |                     |                                                                                            |
| $Q_{godr}$                   | Gate Charge Overdrive                      | —    | 5.4   | —    |                     |                                                                                            |
| $Q_{sw}$                     | Switch Charge ( $Q_{gs2} + Q_{gd}$ )       | —    | 9.2   | —    |                     |                                                                                            |
| $Q_{oss}$                    | Output Charge                              | —    | 15    | —    | nC                  | $V_{DS} = 16V, V_{GS} = 0V$                                                                |
| $R_G$                        | Gate Resistance                            | —    | 1.7   | 3.1  | $\Omega$            |                                                                                            |
| $t_{d(on)}$                  | Turn-On Delay Time                         | —    | 13    | —    | ns                  | $V_{DD} = 15V, V_{GS} = 4.5V$ ③<br>$I_D = 17A$<br>$R_G = 1.8\Omega$<br>See Figs. 15a & 15b |
| $t_r$                        | Rise Time                                  | —    | 16    | —    |                     |                                                                                            |
| $t_{d(off)}$                 | Turn-Off Delay Time                        | —    | 15    | —    |                     |                                                                                            |
| $t_f$                        | Fall Time                                  | —    | 8.0   | —    |                     |                                                                                            |
| $C_{iss}$                    | Input Capacitance                          | —    | 3175  | —    | pF                  | $V_{GS} = 0V$                                                                              |
| $C_{oss}$                    | Output Capacitance                         | —    | 627   | —    |                     | $V_{DS} = 15V$                                                                             |
| $C_{rss}$                    | Reverse Transfer Capacitance               | —    | 241   | —    |                     | $f = 1.0MHz$                                                                               |

## Avalanche Characteristics

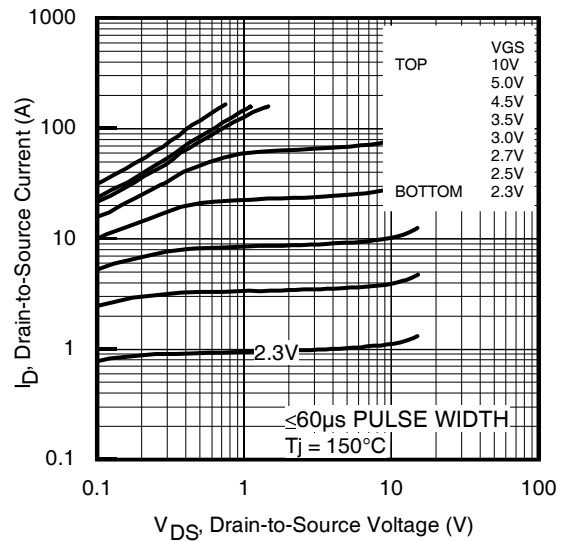
|          | Parameter                       | Typ. | Max. | Units |
|----------|---------------------------------|------|------|-------|
| $E_{AS}$ | Single Pulse Avalanche Energy ② | —    | 216  | mJ    |
| $I_{AR}$ | Avalanche Current ①             | —    | 17   | A     |

## Diode Characteristics

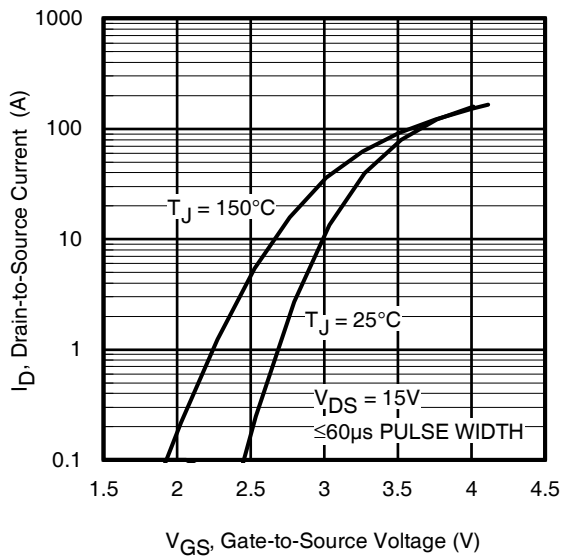
|          | Parameter                                 | Min. | Typ. | Max. | Units | Conditions                                                                                                                                                       |
|----------|-------------------------------------------|------|------|------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $I_S$    | Continuous Source Current<br>(Body Diode) | —    | —    | 3.1  | A     | MOSFET symbol<br>showing the<br>integral reverse<br>p-n junction diode.<br> |
| $I_{SM}$ | Pulsed Source Current<br>(Body Diode) ①   | —    | —    | 168  |       |                                                                                                                                                                  |
| $V_{SD}$ | Diode Forward Voltage                     | —    | —    | 1.0  | V     | $T_J = 25^\circ\text{C}, I_S = 17A, V_{GS} = 0V$ ③                                                                                                               |
| $t_{rr}$ | Reverse Recovery Time                     | —    | 20   | 30   | ns    | $T_J = 25^\circ\text{C}, I_F = 17A, V_{DD} = 15V$                                                                                                                |
| $Q_{rr}$ | Reverse Recovery Charge                   | —    | 25   | 38   | nC    | $di/dt = 345A/\mu s$ ③                                                                                                                                           |



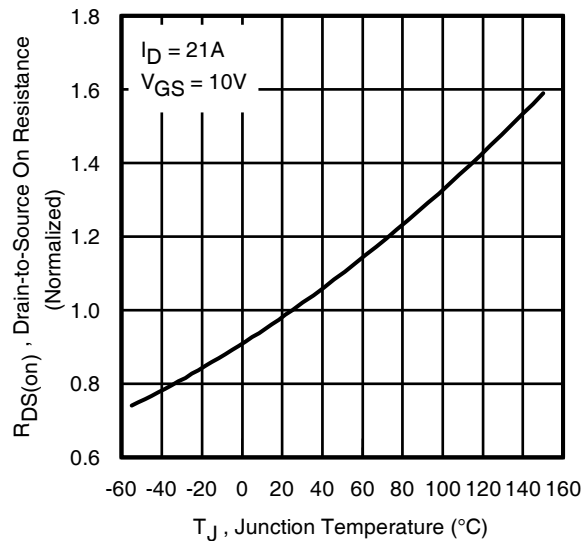
**Fig 1.** Typical Output Characteristics



**Fig 2.** Typical Output Characteristics



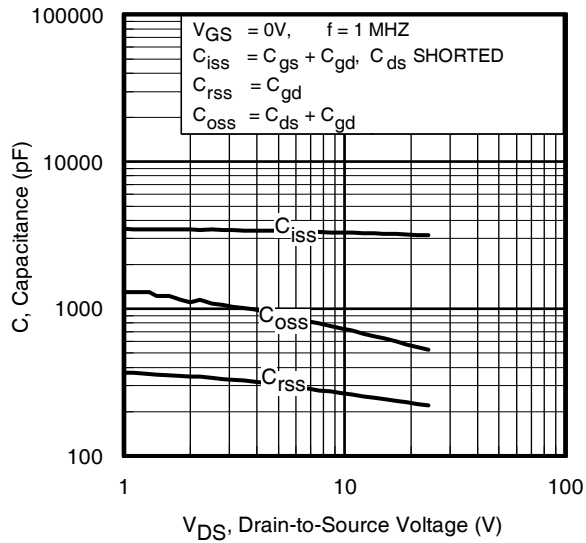
**Fig 3.** Typical Transfer Characteristics



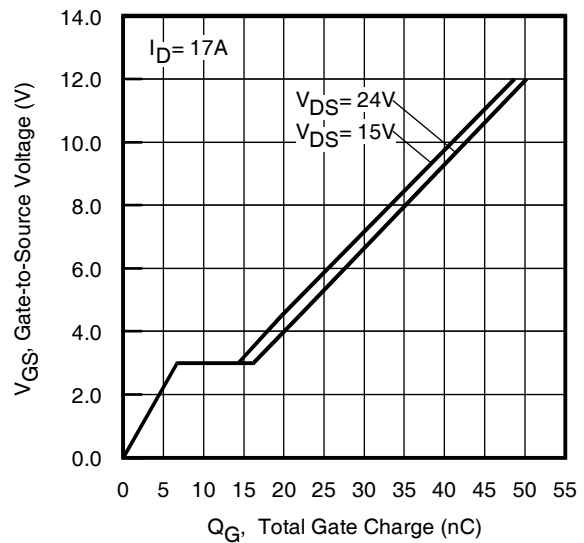
**Fig 4.** Normalized On-Resistance Vs. Temperature

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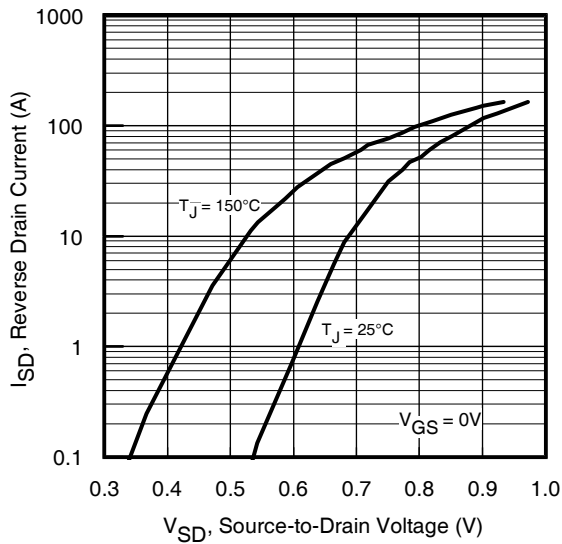
International  
**IR** Rectifier



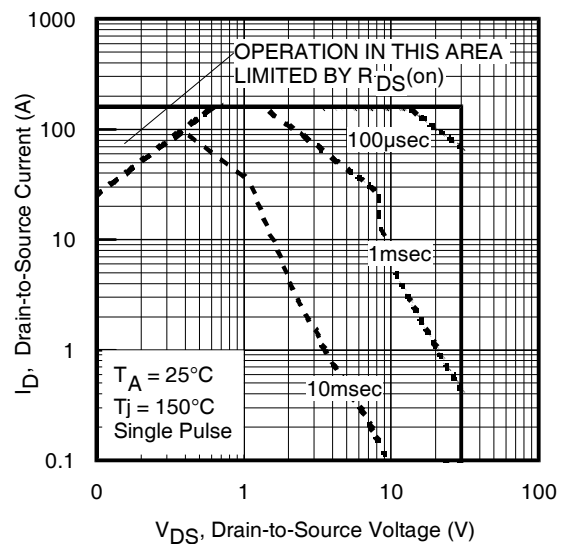
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



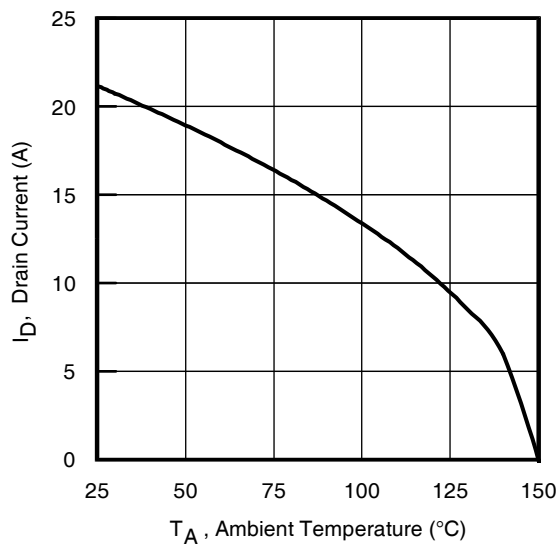
**Fig 6.** Typical Gate Charge Vs. Gate-to-Source Voltage



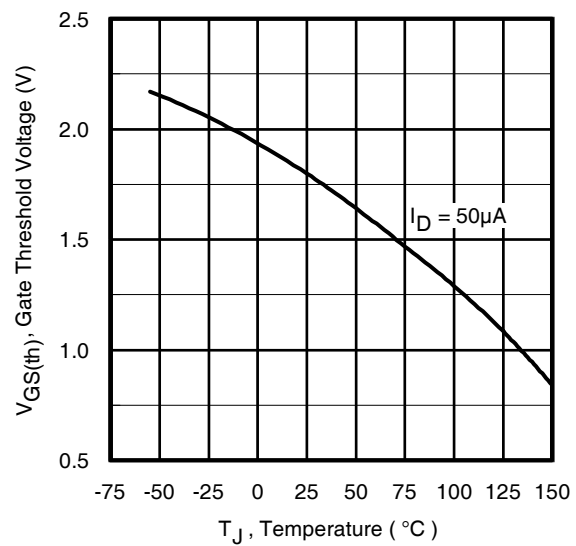
**Fig 7.** Typical Source-Drain Diode Forward Voltage



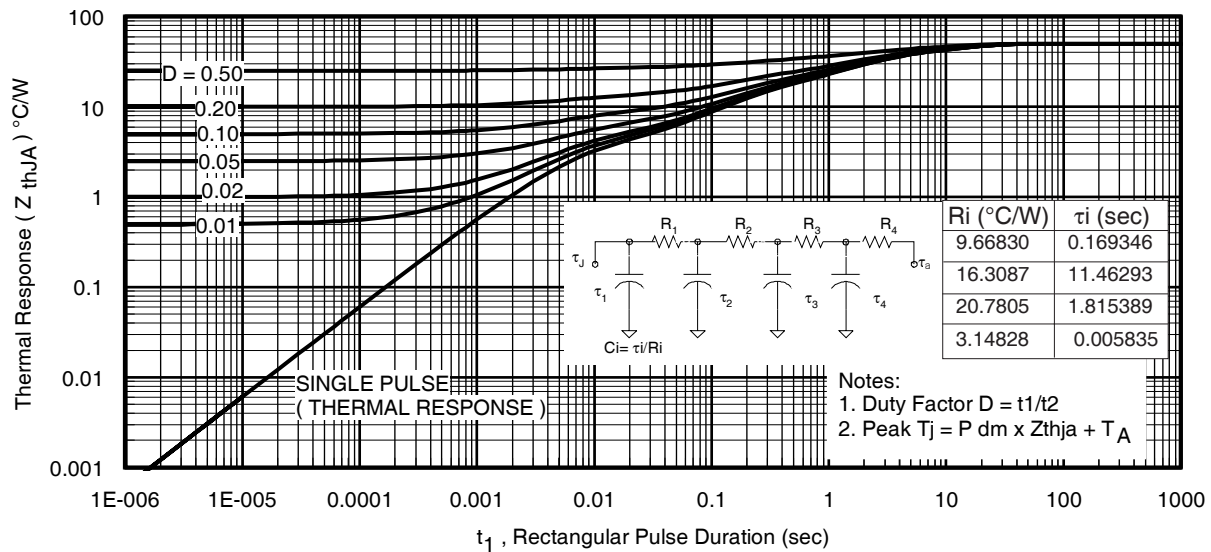
**Fig 8.** Maximum Safe Operating Area



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



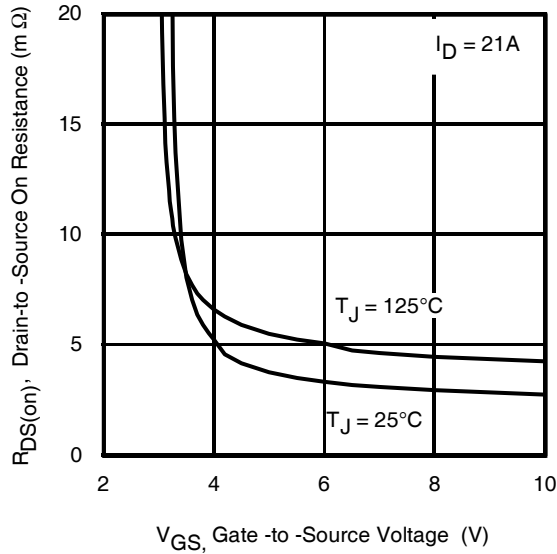
**Fig 10.** Threshold Voltage Vs. Temperature



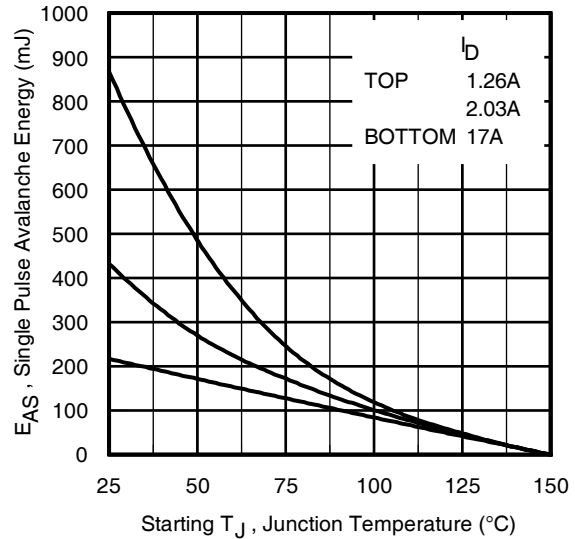
**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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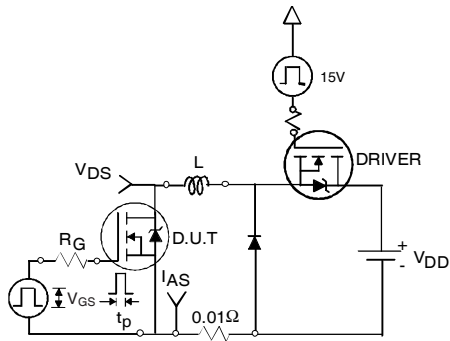
International  
**IR** Rectifier



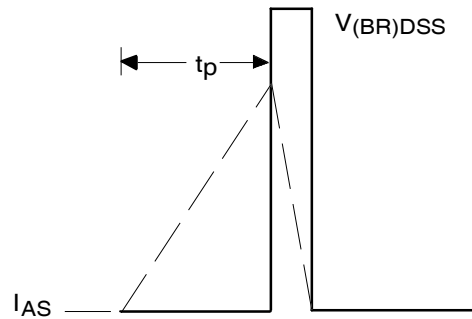
**Fig 12.** On-Resistance Vs. Gate Voltage



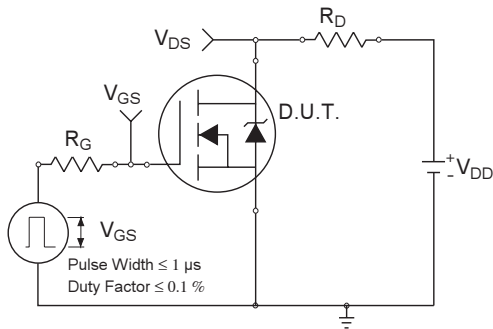
**Fig 13c.** Maximum Avalanche Energy Vs. Drain Current



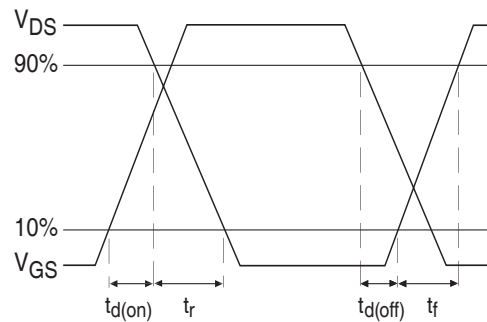
**Fig 14a.** Unclamped Inductive Test Circuit



**Fig 14b.** Unclamped Inductive Waveforms

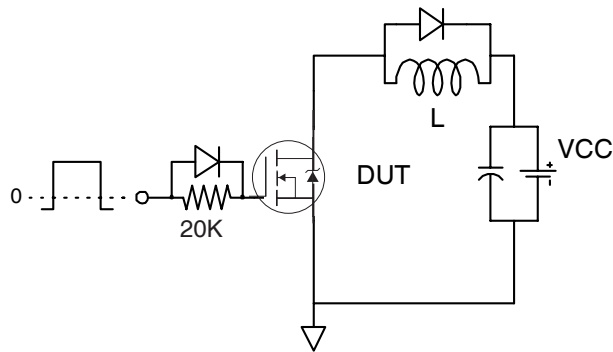


**Fig 15a.** Switching Time Test Circuit

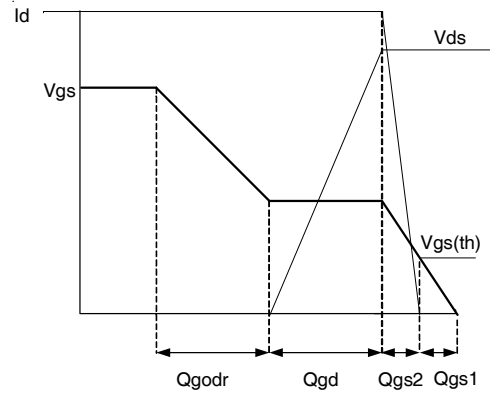


**Fig 15b.** Switching Time Waveforms

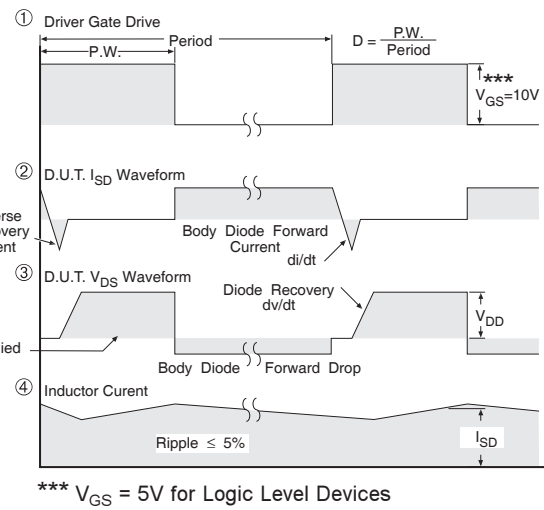
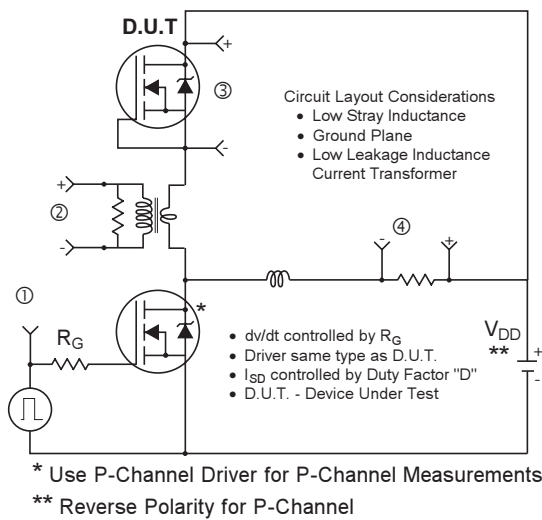
[www.irf.com](http://www.irf.com)



**Fig 16a.** Gate Charge Test Circuit



**Fig 16b.** Gate Charge Waveform



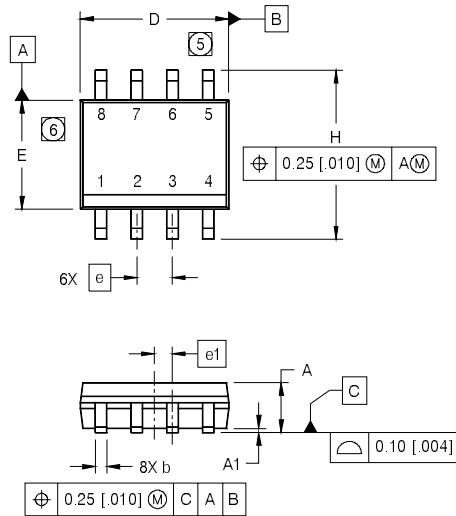
**Fig 17.** Diode Reverse Recovery Test Circuit for HEXFET® Power MOSFETs

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## SO-8 Package Outline (Mosfet & Fetky)

Dimensions are shown in millimeters (inches)

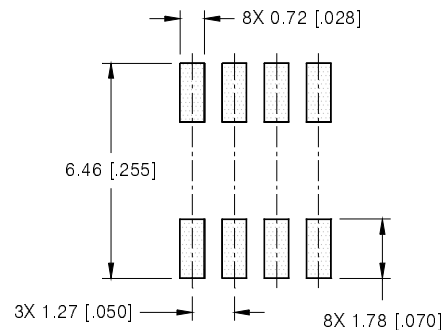


| DIM | INCHES     |       | MILLIMETERS |      |
|-----|------------|-------|-------------|------|
|     | MIN        | MAX   | MIN         | MAX  |
| A   | .0532      | .0688 | 1.35        | 1.75 |
| A1  | .0040      | .0098 | 0.10        | 0.25 |
| b   | .013       | .020  | 0.33        | 0.51 |
| 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  |      |
| e1  | .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:

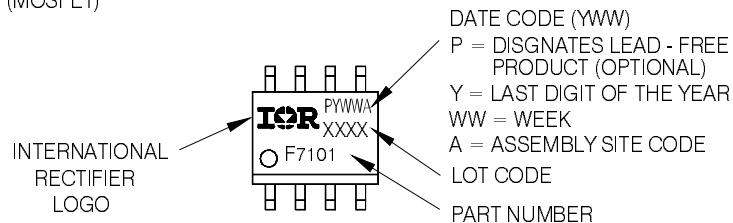
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [0.006].
6. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 [0.010].
7. DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.

### FOOTPRINT



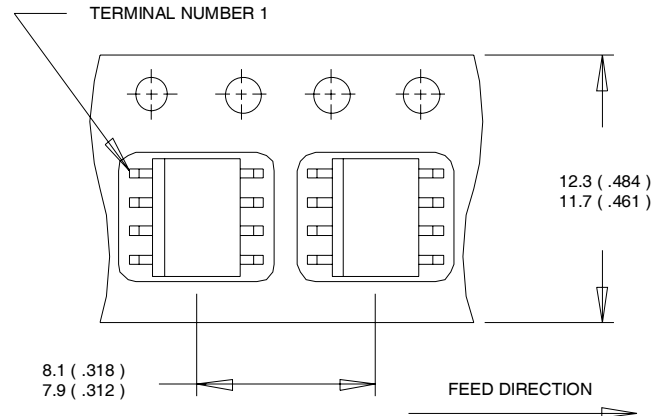
## SO-8 Part Marking Information

EXAMPLE: THIS IS AN IRF7101 (MOSFET)



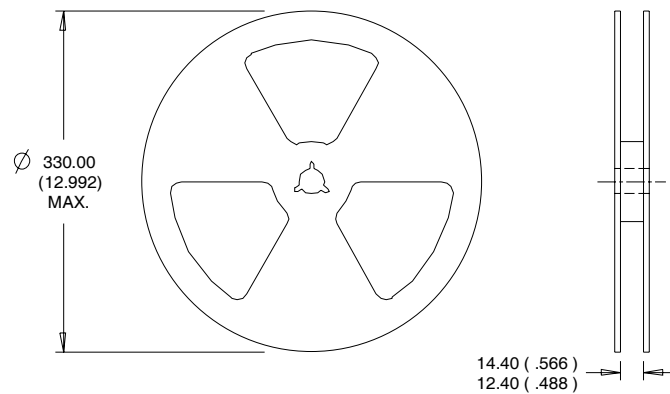
Note: For the most current drawing please refer to IR website at <http://www.irf.com/package/>

## 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/>

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| Orderable part number | Package Type | Standard Pack |          | Note |
|-----------------------|--------------|---------------|----------|------|
|                       |              | Form          | Quantity |      |
| IRF8734PbF            | SO-8         | Tube/Bulk     | 95       |      |
| IRF8734TRPbF          | SO-8         | Tape and Reel | 4000     |      |

## Qualification Information<sup>†</sup>

|                            |                                               |                                                |
|----------------------------|-----------------------------------------------|------------------------------------------------|
| Qualification level        | Consumer <sup>††</sup>                        |                                                |
|                            | (per JEDEC JESD47F <sup>†††</sup> guidelines) |                                                |
| Moisture Sensitivity Level | SO-8                                          | MSL1<br>(per JEDEC J-STD-020D <sup>†††</sup> ) |
| RoHS Compliant             | Yes                                           |                                                |

† Qualification standards can be found at International Rectifier's web site

<http://www.irf.com/product-info/reliability>

†† Higher qualification ratings may be available should the user have such requirements.  
Please contact your International Rectifier sales representative for further information:

<http://www.irf.com/whoto-call/salesrep/>

††† Applicable version of JEDEC standard at the time of product release.

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

### Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting  $T_J = 25^{\circ}\text{C}$ ,  $L = 1.69\text{mH}$   
 $R_G = 25\Omega$ ,  $I_{AS} = 16\text{A}$ .
- ③ Pulse width  $\leq 400\mu\text{s}$ ; duty cycle  $\leq 2\%$ .
- ④ When mounted on 1 inch square copper board
- ⑤  $R_{\theta}$  is measured at  $T_J$  of approximately  $90^{\circ}\text{C}$ .

Data and specifications subject to change without notice

International  
**IR** Rectifier

**IR WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105  
TAC Fax: (310) 252-7903

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