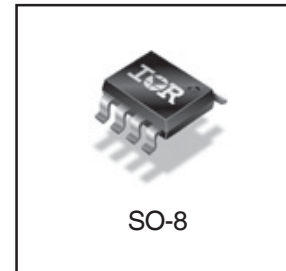
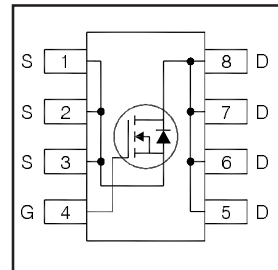


# IRF6201PbF

HEXFET® Power MOSFET

|                                                             |             |           |
|-------------------------------------------------------------|-------------|-----------|
| <b>V<sub>DS</sub></b>                                       | <b>20</b>   | <b>V</b>  |
| <b>R<sub>DS(on)</sub> max</b><br>(@ V <sub>GS</sub> = 4.5V) | <b>2.45</b> | <b>mΩ</b> |
| <b>R<sub>DS(on)</sub> max</b><br>(@ V <sub>GS</sub> = 2.5V) | <b>2.75</b> | <b>mΩ</b> |
| <b>Q<sub>g</sub> (typical)</b>                              | <b>130</b>  | <b>nC</b> |
| <b>I<sub>D</sub></b><br>(@ T <sub>A</sub> = 25°C)           | <b>27</b>   | <b>A</b>  |



## Applications

- OR-ing or hot-swap MOSFET
- Battery operated DC motor inverter MOSFET
- System/Load switch

## Features and Benefits

### Features

|                                                              |
|--------------------------------------------------------------|
| Low R <sub>DS(on)</sub> (≤ 2.45mΩ @ V <sub>gs</sub> = 4.5V)  |
| Industry-standard SO-8 package                               |
| RoHS compliant containing no lead, no bromide and no halogen |

results in  
⇒

### Benefits

|                            |
|----------------------------|
| Lower conduction losses    |
| Multi-vendor compatibility |
| Environmentally Friendly   |

| Orderable part number | Package Type | Standard Pack |          | Note |
|-----------------------|--------------|---------------|----------|------|
|                       |              | Form          | Quantity |      |
| IRF6201PbF            | SO8          | Tube/Bulk     | 95       |      |
| IRF6201TRPbF          | SO8          | Tape and Reel | 4000     |      |

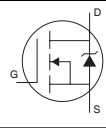
## Absolute Maximum Ratings

|                                        | Parameter                                           | Max.         | Units |
|----------------------------------------|-----------------------------------------------------|--------------|-------|
| V <sub>DS</sub>                        | Drain-to-Source Voltage                             | 20           | V     |
| V <sub>GS</sub>                        | Gate-to-Source Voltage                              | ±12          |       |
| I <sub>D</sub> @ T <sub>A</sub> = 25°C | Continuous Drain Current, V <sub>GS</sub> @ 4.5V    | 27           | A     |
| I <sub>D</sub> @ T <sub>A</sub> = 70°C | Continuous Drain Current, V <sub>GS</sub> @ 4.5V    | 22           |       |
| I <sub>DM</sub>                        | Pulsed Drain Current ①                              | 110          |       |
| P <sub>D</sub> @ T <sub>A</sub> = 25°C | Power Dissipation ③                                 | 2.5          | W     |
| P <sub>D</sub> @ T <sub>A</sub> = 70°C | Power Dissipation ③                                 | 1.6          |       |
|                                        | Linear Derating Factor                              | 0.02         | W/°C  |
| T <sub>J</sub><br>T <sub>STG</sub>     | Operating Junction and<br>Storage Temperature Range | -55 to + 150 | °C    |

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

|                              | Parameter                            | Min. | Typ. | Max. | Units                | Conditions                                           |
|------------------------------|--------------------------------------|------|------|------|----------------------|------------------------------------------------------|
| $BV_{DSS}$                   | Drain-to-Source Breakdown Voltage    | 20   | —    | —    | V                    | $V_{GS} = 0V, I_D = 250\mu A$                        |
| $\Delta BV_{DSS}/\Delta T_J$ | Breakdown Voltage Temp. Coefficient  | —    | 4.6  | —    | mV/ $^\circ\text{C}$ | Reference to $25^\circ\text{C}$ , $I_D = 1\text{mA}$ |
| $R_{DS(on)}$                 | Static Drain-to-Source On-Resistance | —    | 1.90 | 2.45 | m $\Omega$           | $V_{GS} = 4.5V, I_D = 27A$ ②                         |
|                              |                                      | —    | 2.10 | 2.75 |                      | $V_{GS} = 2.5V, I_D = 22A$ ②                         |
| $V_{GS(th)}$                 | Gate Threshold Voltage               | 0.5  | —    | 1.1  | V                    | $V_{DS} = V_{GS}, I_D = 100\mu A$                    |
| $I_{DSS}$                    | Drain-to-Source Leakage Current      | —    | —    | 1.0  | $\mu A$              | $V_{DS} = 16V, V_{GS} = 0V$                          |
|                              |                                      | —    | —    | 150  |                      | $V_{DS} = 16V, V_{GS} = 0V, T_J = 125^\circ\text{C}$ |
| $I_{GSS}$                    | Gate-to-Source Forward Leakage       | —    | —    | 100  | nA                   | $V_{GS} = 12V$                                       |
|                              | Gate-to-Source Reverse Leakage       | —    | —    | -100 |                      | $V_{GS} = -12V$                                      |
| $Q_g$                        | Total Gate Charge                    | —    | 130  | 195  | nC                   | $V_{GS} = 4.5V$                                      |
| $Q_{gs}$                     | Gate-to-Source Charge                | —    | 16   | —    |                      | $V_{DS} = 10V$                                       |
| $Q_{gd}$                     | Gate-to-Drain Charge                 | —    | 60   | —    |                      | $I_D = 22A$                                          |
| $t_{d(on)}$                  | Turn-On Delay Time                   | —    | 29   | —    | ns                   | $V_{DD} = 20V, V_{GS} = 4.5V$                        |
| $t_r$                        | Rise Time                            | —    | 100  | —    |                      | $I_D = 1.0A$                                         |
| $t_{d(off)}$                 | Turn-Off Delay Time                  | —    | 320  | —    |                      | $R_G = 6.8\Omega$                                    |
| $t_f$                        | Fall Time                            | —    | 265  | —    |                      | See Figs. 10a & 10b                                  |
| $C_{iss}$                    | Input Capacitance                    | —    | 8555 | —    | pF                   | $V_{GS} = 0V$                                        |
| $C_{oss}$                    | Output Capacitance                   | —    | 1735 | —    |                      | $V_{DS} = 16V$                                       |
| $C_{rss}$                    | Reverse Transfer Capacitance         | —    | 1290 | —    |                      | $f = 1.0\text{MHz}$                                  |

## Diode Characteristics

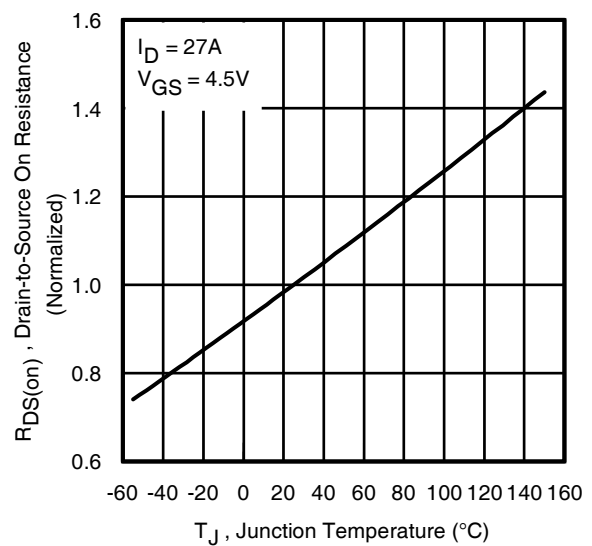
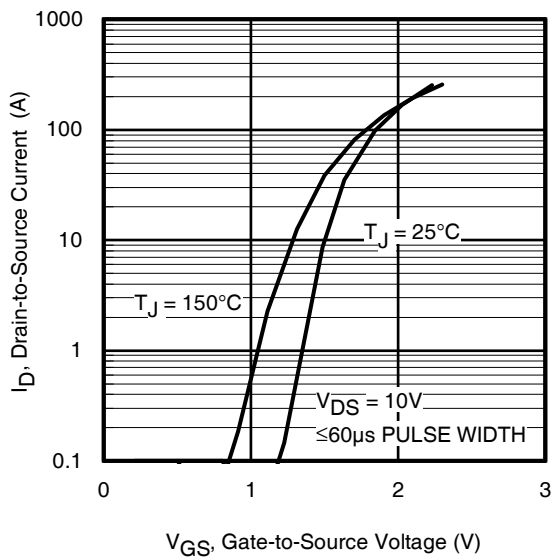
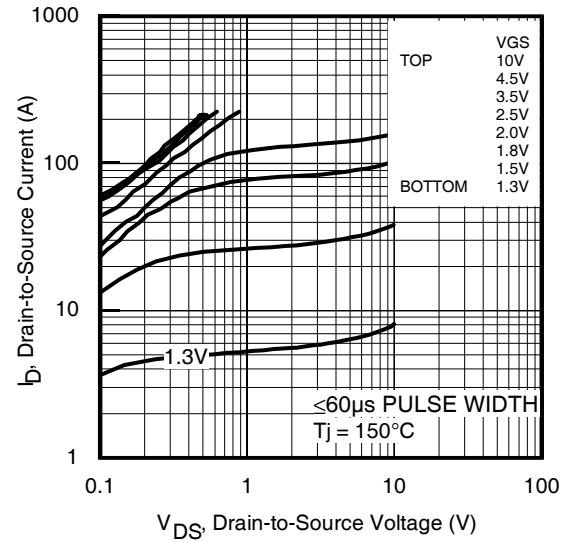
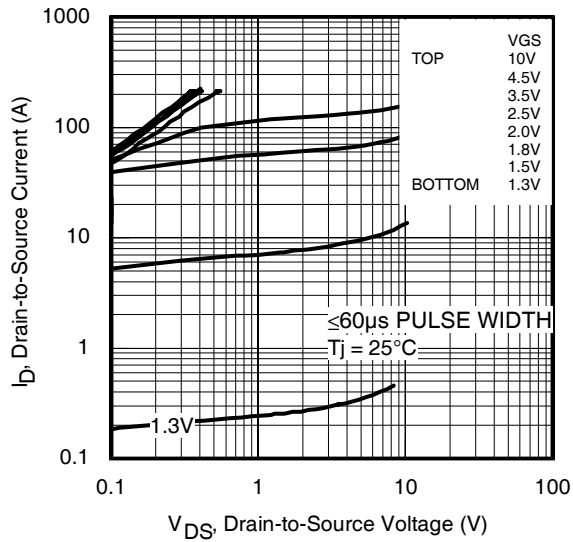
|          | Parameter                                 | Min. | Typ. | Max. | Units | Conditions                                                                                                                                           |
|----------|-------------------------------------------|------|------|------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| $I_S$    | Continuous Source Current<br>(Body Diode) | —    | —    | 2.5  | A     | MOSFET symbol showing the integral reverse p-n junction diode.  |
| $I_{SM}$ | Pulsed Source Current<br>(Body Diode) ①   | —    | —    | 110  |       |                                                                                                                                                      |
| $V_{SD}$ | Diode Forward Voltage                     | —    | —    | 1.2  | V     | $T_J = 25^\circ\text{C}, I_S = 2.5A, V_{GS} = 0V$ ②                                                                                                  |
| $t_{rr}$ | Reverse Recovery Time                     | —    | 82   | 120  | ns    | $T_J = 25^\circ\text{C}, I_F = 2.5A, V_{DD} = 16V$                                                                                                   |
| $Q_{rr}$ | Reverse Recovery Charge                   | —    | 180  | 270  | nC    | $di/dt = 100/\mu s$ ②                                                                                                                                |

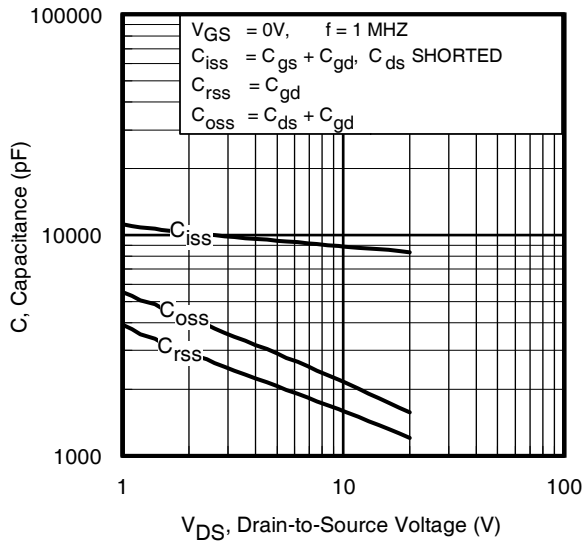
## Thermal Resistance

|                 | Parameter                | Typ. | Max. | Units              |
|-----------------|--------------------------|------|------|--------------------|
| $R_{\theta JL}$ | Junction-to-Drain Lead ④ | —    | 20   | $^\circ\text{C/W}$ |
| $R_{\theta JA}$ | Junction-to-Ambient ③    | —    | 50   |                    |

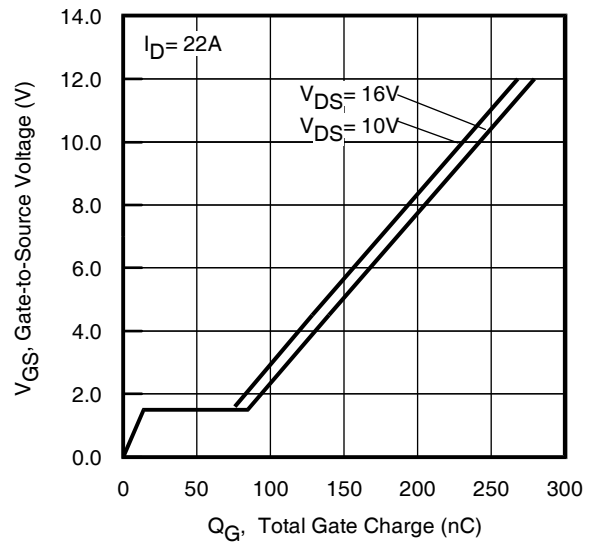
### Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Pulse width  $\leq 400\mu s$ ; duty cycle  $\leq 2\%$ .
- ③ When mounted on 1 inch square copper board.
- ④  $R_\theta$  is measured at  $T_J$  approximately  $90^\circ\text{C}$ .

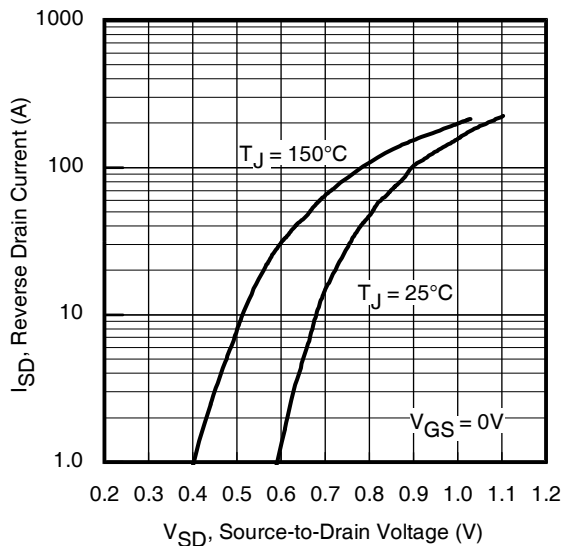




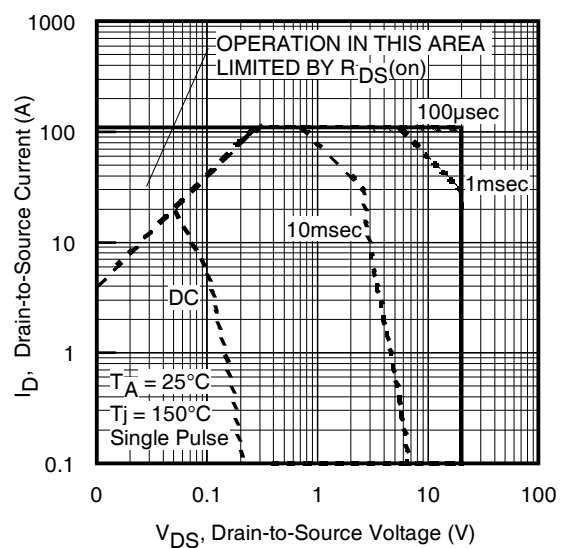
**Fig 5.** Typical Capacitance vs. Drain-to-Source Voltage



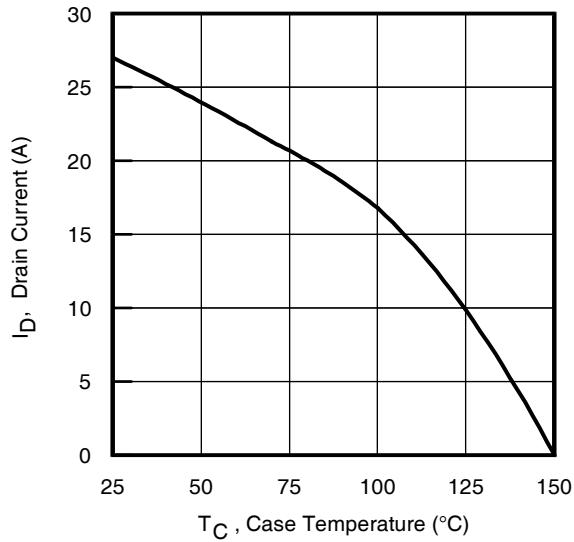
**Fig 6.** Typical Gate Charge vs. Gate-to-Source Voltage



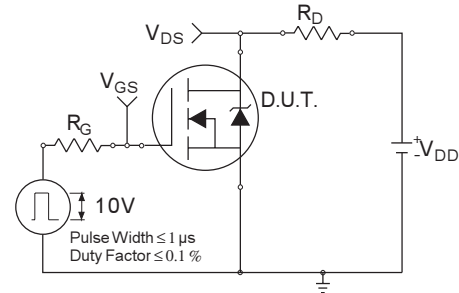
**Fig 7.** Typical Source-Drain Diode Forward Voltage



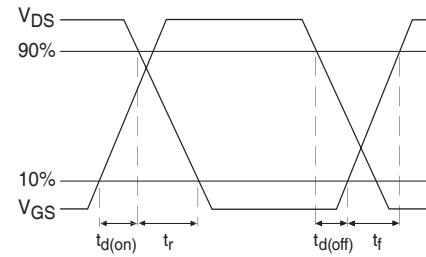
**Fig 8.** Maximum Safe Operating Area



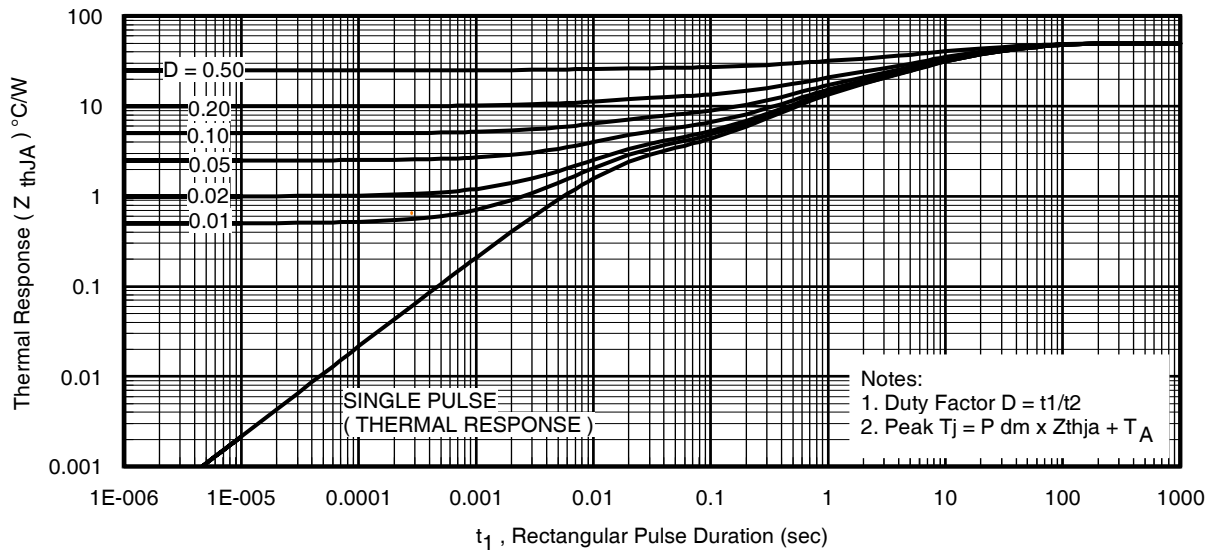
**Fig 9.** Maximum Drain Current vs. Case Temperature



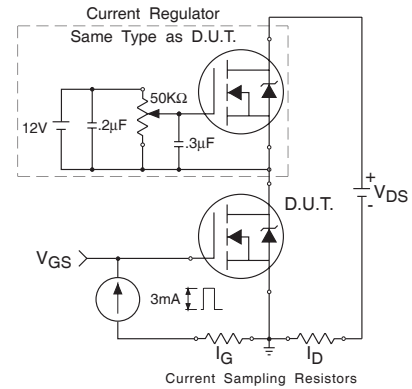
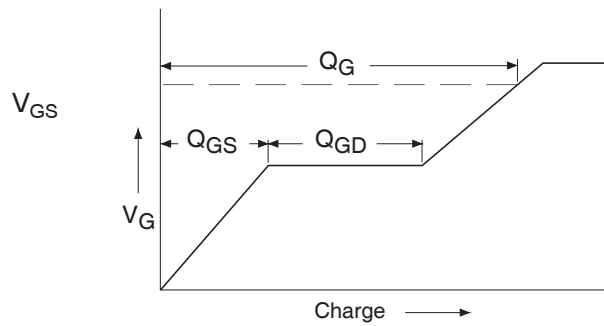
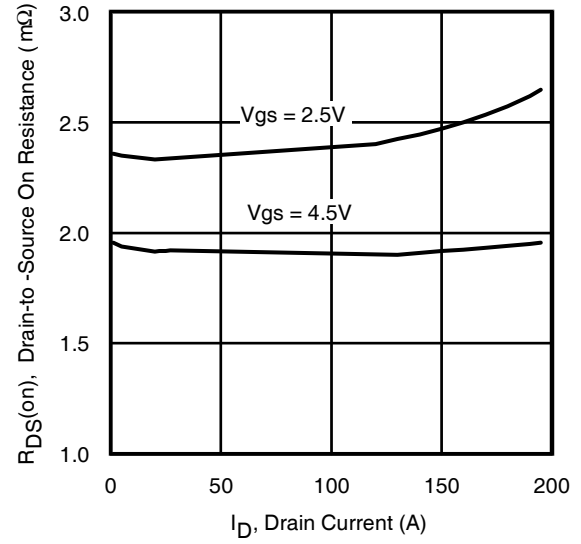
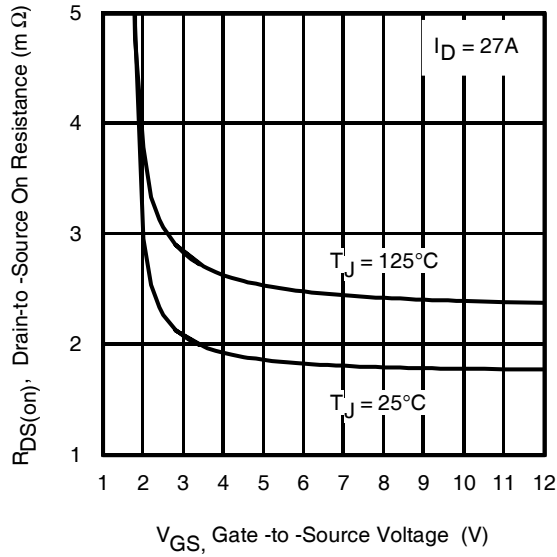
**Fig 10a.** Switching Time Test Circuit

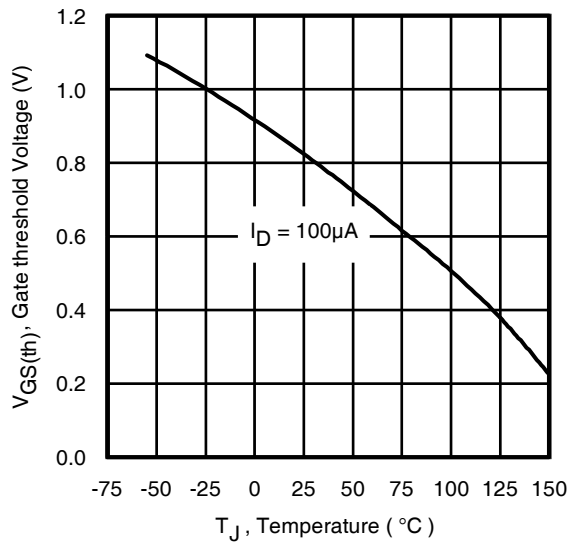


**Fig 10b.** Switching Time Waveforms

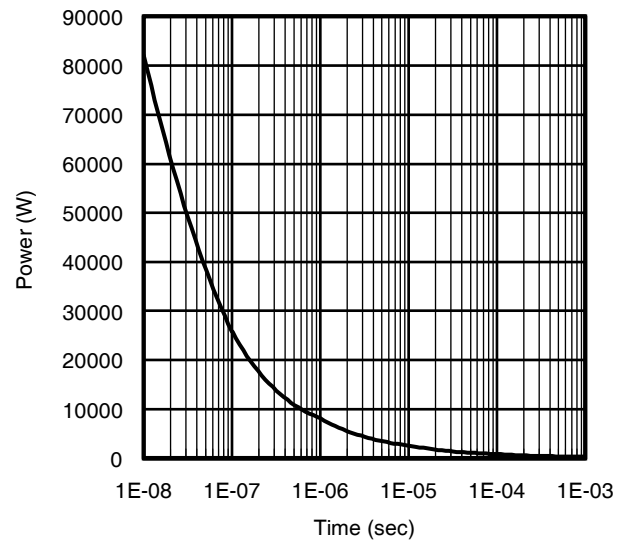


**Fig 11.** Typical Effective Transient Thermal Impedance, Junction-to-Ambient





**Fig 15.** Typical Threshold Voltage vs. Junction Temperature



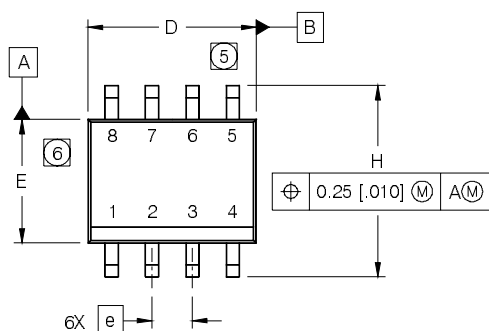
**Fig 16.** Typical Power vs. Time

# IRF6201PbF

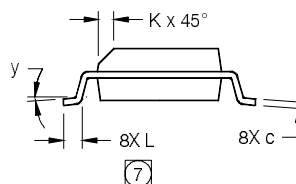
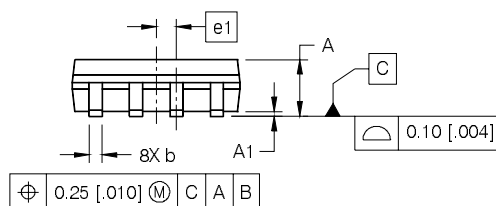
International  
**IR** Rectifier

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

Dimensions are shown in millimeters (inches)



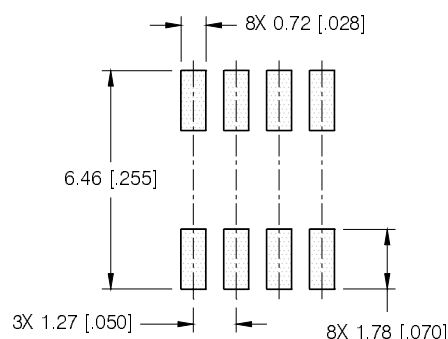
| DIM | INCHES     |       | MILLIMETERS |      |
|-----|------------|-------|-------------|------|
|     | MIN        | MAX   | MIN         | MAX  |
| A   | .0532      | .0688 | 1.35        | 1.75 |
| A1  | .0040      | .0098 | 0.10        | 0.25 |
| b   | .013       | .020  | 0.33        | 0.51 |
|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

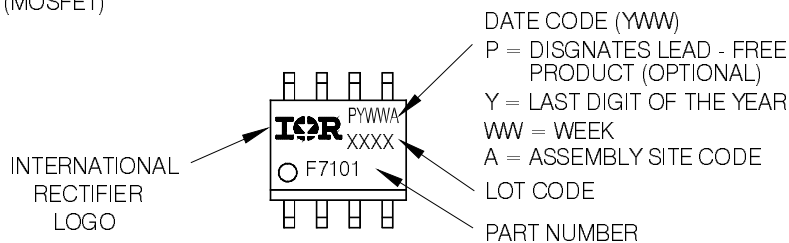
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [0.006].
6. DIMENSION DOES NOT INCLUDE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

### FOOTPRINT



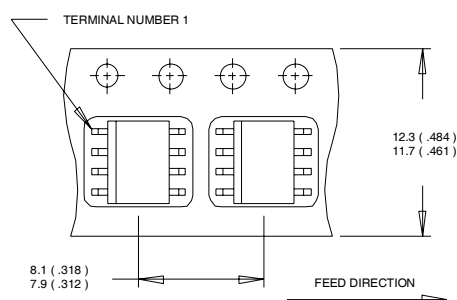
## SO-8 Part Marking Information

EXAMPLE: THIS IS AN IRF7101 (MOSFET)

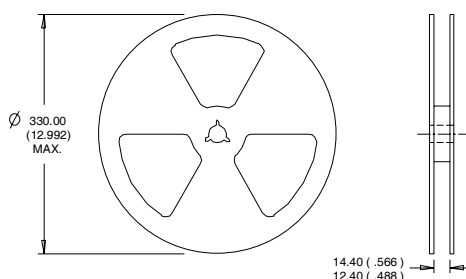


Note: For the most current drawing please refer to IR website at <http://www.irf.com/package/>

## SO-8 Tape and Reel



- 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.

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

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

<sup>†</sup> Qualification standards can be found at International Rectifier's web site

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

<sup>††</sup> 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/>

<sup>†††</sup> Applicable version of JEDEC standard at the time of product release.

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

Visit us at [www.irf.com](http://www.irf.com) for sales contact information. 11/10

## IMPORTANT NOTICE

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics ("Beschaffenhheitsgarantie").

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

In addition, any information given in this document is subject to customer's compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer's products and any use of the product of Infineon Technologies in customer's applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

For further information on the product, technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies office ([www.infineon.com](http://www.infineon.com)).

## WARNINGS

Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies' products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Infineon:](#)

[IRF6201TRPBF](#) [IRF6201PBF](#)