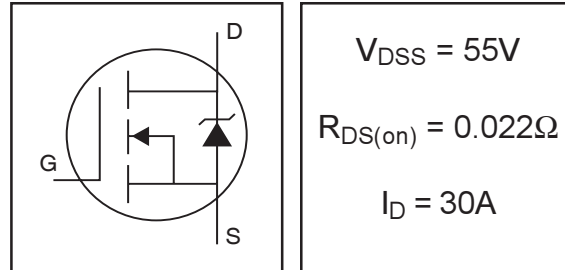


# IRLIZ44NPbF

HEXFET® Power MOSFET

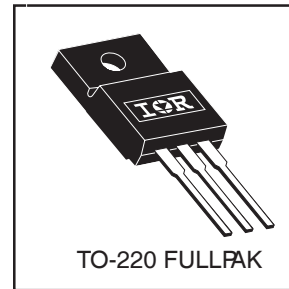
- Logic-Level Gate Drive
- Advanced Process Technology
- Isolated Package
- High Voltage Isolation = 2.5KV RMS ⑤
- Sink to Lead Creepage Dist. = 4.8mm
- Fully Avalanche Rated
- Lead-Free



## Description

Fifth Generation HEXFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design that HEXFET Power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

The TO-220 Fullpak eliminates the need for additional insulating hardware in commercial-industrial applications. The moulding compound used provides a high isolation capability and a low thermal resistance between the tab and external heatsink. This isolation is equivalent to using a 100 micron mica barrier with standard TO-220 product. The Fullpak is mounted to a heatsink using a single clip or by a single screw fixing.



## Absolute Maximum Ratings

|                                 | Parameter  | Max.               | Units |
|---------------------------------|--|--------------------|-------|
| $I_D @ T_C = 25^\circ\text{C}$  | Continuous Drain Current, $V_{GS} @ 10\text{V}$  | 30                 | A     |
| $I_D @ T_C = 100^\circ\text{C}$ | Continuous Drain Current, $V_{GS} @ 10\text{V}$  | 22                 |       |
| $I_{DM}$                        | Pulsed Drain Current ①⑥                          | 160                |       |
| $P_D @ T_C = 25^\circ\text{C}$  | Power Dissipation                                | 45                 | W     |
|                                 | Linear Derating Factor                           | 0.3                | W/°C  |
| $V_{GS}$                        | Gate-to-Source Voltage                           | $\pm 16$           | V     |
| $E_{AS}$                        | Single Pulse Avalanche Energy②⑥                  | 210                | mJ    |
| $I_{AR}$                        | Avalanche Current①⑥                              | 25                 | A     |
| $E_{AR}$                        | Repetitive Avalanche Energy①                     | 4.5                | mJ    |
| dv/dt                           | Peak Diode Recovery dv/dt ③④                     | 5.0                | V/ns  |
| $T_J$                           | Operating Junction and Storage Temperature Range | -55 to + 175       | °C    |
| $T_{STG}$                       |  |                    |       |
|                                 |  |                    |       |
|                                 | Mounting torque, 6-32 or M3 screw                | 10 lbf·in (1.1N·m) |       |

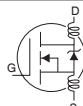
## Thermal Resistance

|                 | Parameter           | Typ. | Max. | Units |
|-----------------|---------------------|------|------|-------|
| $R_{\theta JC}$ | Junction-to-Case    | ---  | 3.3  | °C/W  |
| $R_{\theta JA}$ | Junction-to-Ambient | ---  | 65   |       |

# IRLIZ44NPbF

International  
**IR** Rectifier

## Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise specified)

|  | Parameter                            | Min. | Typ.  | Max.  | Units | Conditions  |
|--|--------------------------------------|------|-------|-------|-------|---|
| V <sub>(BR)DSS</sub>                   | Drain-to-Source Breakdown Voltage    | 55   | —     | —     | V     | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA  |
| ΔV <sub>(BR)DSS</sub> /ΔT <sub>J</sub> | Breakdown Voltage Temp. Coefficient  | —    | 0.070 | —     | V/°C  | Reference to 25°C, I <sub>D</sub> = 1mA <sup>⑥</sup>                                  |
| R <sub>DS(on)</sub>                    | Static Drain-to-Source On-Resistance | —    | —     | 0.022 | Ω     | V <sub>GS</sub> = 10V, I <sub>D</sub> = 17A <sup>④</sup>                              |
|  |                                      | —    | —     | 0.025 |       | V <sub>GS</sub> = 5.0V, I <sub>D</sub> = 17A <sup>④</sup>                             |
|  |                                      | —    | —     | 0.035 |       | V <sub>GS</sub> = 4.0V, I <sub>D</sub> = 14A <sup>④</sup>                             |
| V <sub>GS(th)</sub>                    | Gate Threshold Voltage               | 1.0  | —     | 2.0   | V     | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                            |
| g <sub>fs</sub>                        | Forward Transconductance             | 21   | —     | —     | S     | V <sub>DS</sub> = 25V, I <sub>D</sub> = 25A <sup>⑥</sup>                              |
| I <sub>DSS</sub>                       | Drain-to-Source Leakage Current      | —    | —     | 25    | μA    | V <sub>DS</sub> = 55V, V <sub>GS</sub> = 0V   |
|  |                                      | —    | —     | 250   |       | V <sub>DS</sub> = 44V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 150°C                   |
| I <sub>GSS</sub>                       | Gate-to-Source Forward Leakage       | —    | —     | 100   | nA    | V <sub>GS</sub> = 16V   |
|  | Gate-to-Source Reverse Leakage       | —    | —     | -100  |       | V <sub>GS</sub> = -16V  |
| Q <sub>g</sub>                         | Total Gate Charge                    | —    | —     | 48    | nC    | I <sub>D</sub> = 25A  |
| Q <sub>gs</sub>                        | Gate-to-Source Charge                | —    | —     | 8.6   |       | V <sub>DS</sub> = 44V   |
| Q <sub>gd</sub>                        | Gate-to-Drain ("Miller") Charge      | —    | —     | 25    |       | V <sub>GS</sub> = 5.0V, See Fig. 6 and 13 <sup>④⑥</sup>                               |
| t <sub>d(on)</sub>                     | Turn-On Delay Time                   | —    | 11    | —     | ns    | V <sub>DD</sub> = 28V   |
| t <sub>r</sub>                         | Rise Time                            | —    | 84    | —     |       | I <sub>D</sub> = 25A  |
| t <sub>d(off)</sub>                    | Turn-Off Delay Time                  | —    | 26    | —     |       | R <sub>G</sub> = 3.4Ω, V <sub>GS</sub> = 5.0V   |
| t <sub>f</sub>                         | Fall Time                            | —    | 15    | —     |       | R <sub>D</sub> = 1.1Ω, See Fig. 10 <sup>④⑥</sup>                                      |
| L <sub>D</sub>                         | Internal Drain Inductance            | —    | 4.5   | —     | nH    | Between lead,<br>6mm (0.25in.)<br>from package<br>and center of die contact           |
| L <sub>S</sub>                         | Internal Source Inductance           | —    | 7.5   | —     |       |  |
| C <sub>iss</sub>                       | Input Capacitance                    | —    | 1700  | —     | pF    | V <sub>GS</sub> = 0V  |
| C <sub>oss</sub>                       | Output Capacitance                   | —    | 400   | —     |       | V <sub>DS</sub> = 25V   |
| C <sub>rss</sub>                       | Reverse Transfer Capacitance         | —    | 150   | —     |       | f = 1.0MHz, See Fig. 5 <sup>⑥</sup>   |
| C                                      | Drain to Sink Capacitance            | —    | 12    | —     |       | f = 1.0MHz  |

## Source-Drain Ratings and Characteristics

|                 | Parameter   | Min.   | Typ. | Max. | Units | Conditions   |
|-----------------|---|--|------|------|-------|--|
| I <sub>S</sub>  | Continuous Source Current<br>(Body Diode)           | —  | —    | 30   | A     | MOSFET symbol<br>showing the<br>integral reverse<br>p-n junction diode.        |
| I <sub>SM</sub> | Pulsed Source Current<br>(Body Diode) <sup>①⑥</sup> | —  | —    | 160  |       |  |
| V <sub>SD</sub> | Diode Forward Voltage                               | —  | —    | 1.3  | V     | T <sub>J</sub> = 25°C, I <sub>S</sub> = 17A, V <sub>GS</sub> = 0V <sup>④</sup> |
| t <sub>rr</sub> | Reverse Recovery Time                               | —  | 80   | 120  | ns    | T <sub>J</sub> = 25°C, I <sub>F</sub> = 25A                                    |
| Q <sub>rr</sub> | Reverse Recovery Charge                             | —  | 210  | 320  | μC    | di/dt = 100A/μs <sup>④⑥</sup>  |
| t <sub>on</sub> | Forward Turn-On Time                                | Intrinsic turn-on time is negligible (turn-on is dominated by L <sub>S</sub> +L <sub>D</sub> ) |      |      |       |  |

### Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. ( See fig. 11 )
- ② V<sub>DD</sub> = 15V, starting T<sub>J</sub> = 25°C, L = 470μH  
R<sub>G</sub> = 25Ω, I<sub>AS</sub> = 25A. (See Figure 12)
- ③ I<sub>SD</sub> ≤ 25A, di/dt ≤ 270A/μs, V<sub>DD</sub> ≤ V<sub>(BR)DSS</sub>,  
T<sub>J</sub> ≤ 175°C

④ Pulse width ≤ 300μs; duty cycle ≤ 2%.

⑤ t = 60s, f = 60Hz

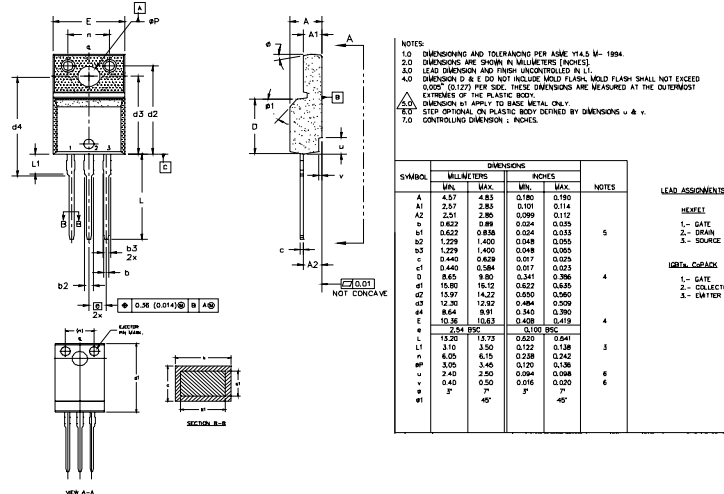
⑥ Uses IRLZ44N data and test conditions

# IRLIZ44NPbF

International  
**IOR** Rectifier

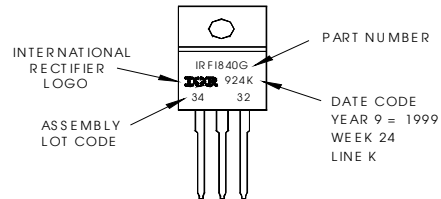
## TO-220 Full-Pak Package Outline

Dimensions are shown in millimeters (inches)



## TO-220 Full-Pak Part Marking Information

EXAMPLE: THIS IS AN IRF1840G  
 WITH ASSEMBLY  
 LOT CODE 3432  
 ASSEMBLED ON WW 24 1999  
 IN THE ASSEMBLY LINE "K"  
**Note:** "P" in assembly line  
 position indicates "Lead-Free"



Data and specifications subject to change without notice.

International  
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