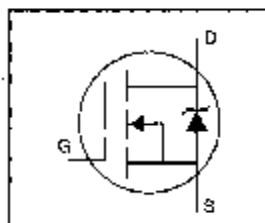


HEXFET® Power MOSFET

- Isolated Package
- High Voltage Isolation= 2.5KV RMS @
- Sink to Lead Creepage Dist.= 4.8mm
- 175°C Operating Temperature
- Dynamic dv/dt Rating
- Low Thermal Resistance



$$V_{DSS} = 100V$$

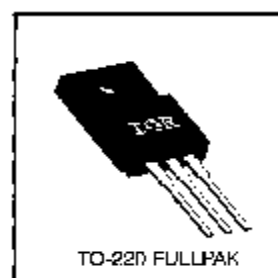
$$R_{DS(on)} = 0.16\Omega$$

$$I_D = 9.7A$$

Description

Third Generation HEXFETs from International Rectifier provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

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.



DATA
SHEETS

Absolute Maximum Ratings

| | Parameter | Max. | Units |
|-----------------------------|---|-----------------------|-------|
| I_D @ $T_C = 25^\circ C$ | Continuous Drain Current, $V_{GS} \geq 10V$ | 9.7 | A |
| I_D @ $T_C = 100^\circ C$ | Continuous Drain Current, $V_{GS} \geq 10V$ | 6.9 | |
| I_{DM} | Pulsed Drain Current (10) | 39 | |
| P_D @ $T_C = 25^\circ C$ | Power Dissipation | 42 | W |
| | Linear Derating Factor | 0.28 | W/°C |
| V_{GS} | Gate-to-Source Voltage | ± 20 | V |
| E_{AS} | Single Pulse Avalanche Energy (1) | 100 | mJ |
| I_{AK} | Avalanche Current (1) | 9.7 | A |
| E_{AK} | Repetitive Avalanche Energy (1) | 4.2 | mJ |
| dv/dt | Peak Diode Recovery dv/dt (3) | 5.5 | V/ns |
| T_J | Operating Junction and | -55 to 175 | °C |
| T_{stg} | Storage Temperature Range | | |
| | Soldering Temperature, for 10 seconds | 300 (1.8mm from case) | |
| | Mounting Torque, 6-32 or M3 screw | 10 lbf-in (1.1 N-m) | |


Thermal Resistance

| | Parameter | Min. | Typ. | Max. | Units |
|----------|---------------------|------|------|------|-------|
| R_{JC} | Junction-to-Case | — | — | 3.2 | °C/W |
| R_{JA} | Junction-to-Ambient | | | 65 | |

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

| | Parameter | Min. | Typ. | Max. | Units | Test Conditions |
|--------------------------------|--------------------------------------|------|------|------|----------|---|
| $V_{(BR)SS}$ | Drain-to-Source Breakdown Voltage | 100 | — | — | V | $V_{GS}=0V$, $I_D=250\mu A$ |
| $\Delta V_{(BR)SS}/\Delta T_J$ | Breakdown Voltage Temp. Coefficient | — | 0.12 | — | V/°C | Reference to 25°C , $I_D=1mA$ |
| $R_{DS(on)}$ | Static Drain-to-Source On-Resistance | — | — | 0.15 | Ω | $V_{GS}=10V$, $I_D=6.8A$ ① |
| $V_{GS(th)}$ | Gate Threshold Voltage | 2.0 | — | 4.0 | V | $V_{DS}=V_{GS}$, $I_D=250\mu A$ |
| g_{fs} | Forward Transconductance | 4.0 | — | — | S | $V_{DS}=50V$, $I_D=5.8A$ ② |
| I_{DSS} | Drain-to-Source Leakage Current | — | — | 25 | μA | $V_{DS}=100V$, $V_{GS}=0V$ |
| | | — | — | 250 | | $V_{DS}=80V$, $V_{GS}=0V$, $T_J=150^\circ\text{C}$ |
| I_{GSS} | Gate-to-Source Forward Leakage | — | — | 100 | nA | $V_{GS}=20V$ |
| | Gate-to-Source Reverse Leakage | — | — | -100 | | $V_{GS}=-20V$ |
| Q_g | Total Gate Charge | — | — | 33 | nC | $I_D=9.7A$ |
| Q_{gs} | Gate-to-Source Charge | — | — | 5.4 | | $V_{DS}=80V$ |
| Q_{gd} | Gate-to-Drain ("Miller") Charge | — | — | 15 | | $V_{GS}=10V$ See Fig. 8 and 13 ③ |
| $t_{(on)}$ | Turn-On Delay Time | — | 8.5 | — | ns | $V_{DD}=50V$ |
| t_r | Rise Time | — | 28 | — | | $I_D=9.7A$ |
| $t_{(off)}$ | Turn-Off Delay Time | — | 34 | — | | $R_G=12\Omega$ |
| t_f | Fall Time | — | 25 | — | | $R_D=5.1\Omega$ See Figure 10 ④ |
| L_D | Internal Drain Inductance | — | 4.5 | — | nH | Between lead, 8 mm (0.25in.) from package and center of die contact |
| L_S | Internal Source Inductance | — | 7.5 | — | | |
| C_{iss} | Input Capacitance | — | 570 | — | pF | $V_{DS}=0V$ |
| C_{oss} | Output Capacitance | — | 250 | — | | $V_{DS}=25V$ |
| C_{rss} | Reverse Transfer Capacitance | — | 60 | — | | $f=1.0MHz$ See Figure 5 |
| C_i | Drain to Sink Capacitance | — | 12 | — | pF | $f=1.0MHz$ |

Source-Drain Ratings and Characteristics

| | Parameter | Min. | Typ. | Max. | Units | Test Conditions |
|----------|--|---|------|------|---------|--|
| I_H | Continuous Source Current (Body Diode) | — | — | 9.7 | A | MOSFET symbol showing the integral reverse p-n junction diode.  |
| I_{SM} | Pulsed Source Current (Body Diode) ① | — | — | 39 | | |
| V_{SD} | Diode Forward Voltage | — | — | 2.5 | V | $T_J=25^\circ\text{C}$, $I_S=9.7A$, $V_{GS}=0V$ ② |
| t_{rr} | Reverse Recovery Time | — | 150 | 280 | ns | $T_J=25^\circ\text{C}$, $I_S=9.7A$ |
| Q_{rr} | Reverse Recovery Charge | — | 0.85 | 1.7 | μC | $dI/dt=100A/\mu s$ ③ |
| t_{on} | Forward Turn-On Time | Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D) | | | | |

Notes:

① Repetitive rating; pulse width limited by max. junction temperature (See Figure 11)

② $I_{SD}\leq 9.7A$, $dI/dt\leq 140A/\mu s$, $V_{SD}\leq V_{(BR)DSS}$, $T_J\leq 175^\circ\text{C}$

③ $t=60s$, $f=60Hz$

④ $V_{DD}=25V$, starting $T_J=25^\circ\text{C}$, $L=1.6mH$, $R_G=25\Omega$, $I_{AS}=9.7A$ (See Figure 12)

⑤ Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.