*New Jersey Semi-Conductor Products, Inc.*

**REPETITIVE AVALANCHE AND dv/dt RATED**

## HEXFET®TRANSISTORS
### THRU-HOLE (TO-205AF)

## IRFF9110
### 100V, P-CHANNEL

**Product Summary**

| Part Number | BVDSS | RDS(on) | ID |
|-------------|-------|---------|-----|
| IRFF9110 | -100V | 1.2Ω | -2.5A |

The HEXFET transistors also feature all of the well established advantages of MOSFETs such as voltage control, very fast switching, ease of parelleling and temperature stability of the electrical parameters.

They are well suited for applications such as switching power supplies, motor controls, inverters, choppers, audio amplifiers and high energy pulse circuits.

**Features:**

- Repetitive Avalanche Ratings
- Dynamic dv/dt Rating
- Hermetically Sealed
- Simple Drive Requirements
- Ease of Paralleling

### Absolute Maximum Ratings

| | Parameter | | Units |
|---|-----------|---|-------|
| $I_D$ @ $V_{GS}$ = -10V, $T_C$ = 25°C | Continuous Drain Current | -2.5 | A |
| $I_D$ @ $V_{GS}$ = -10V, $T_C$ = 100°C | Continuous Drain Current | -1.6 | |
| $I_{DM}$ | Pulsed Drain Current ① | -10 | |
| $P_D$ @ $T_C$ = 25°C | Max. Power Dissipation | 15 | W |
| | Linear Derating Factor | 0.12 | W/°C |
| $V_{GS}$ | Gate-to-Source Voltage | ±20 | V |
| $E_{AS}$ | Single Pulse Avalanche Energy ② | 87 | mJ |
| $I_{AR}$ | Avalanche Current ① | — | A |
| $E_{AR}$ | Repetitive Avalanche Energy ① | — | mJ |
| dv/dt | Peak Diode Recovery dv/dt ③ | -5.5 | V/ns |
| $T_J$ | Operating Junction | -55 to 150 | °C |
| $T_{STG}$ | Storage Temperature Range | | |
| | Lead Temperature | 300 (0.063 in. (1.6mm) from case for 10s) | |
| | Weight | 0.98(typical) | g |

**Quality Semi-Conductors**

## IRFF9110

### Electrical Characteristics @ Tj = 25°C (Unless Otherwise Specified)

| | Parameter | Min | Typ | Max | Units | Test Conditions |
|---|---|---|---|---|---|---|
| BV$_{DSS}$ | Drain-to-Source Breakdown Voltage | -100 | — | — | V | V$_{GS}$ = 0V, I$_D$ = -1.0mA |
| ΔBV$_{DSS}$/ΔT$_J$ | Temperature Coefficient of Breakdown Voltage | — | -0.10 | — | V/°C | Reference to 25°C, I$_D$ = -1.0mA |
| R$_{DS(on)}$ | Static Drain-to-Source On-State | — | — | 1.2 | Ω | V$_{GS}$ = -10V, I$_D$ = -1.6A ④ |
| | Resistance | — | — | 1.38 | | V$_{GS}$ =-10V, I$_D$ = -2.5A ④ |
| V$_{GS(th)}$ | Gate Threshold Voltage | -2.0 | — | -4.0 | V | V$_{DS}$ = V$_{GS}$, I$_D$ = -250μA |
| gfs | Forward Transconductance | 0.8 | — | — | S (℧) | V$_{DS}$ > -15V, I$_{DS}$ = -1.6A ④ |
| I$_{DSS}$ | Zero Gate Voltage Drain Current | — | — | -25 | | V$_{DS}$= -80V, V$_{GS}$=0V |
| | | — | — | -250 | μA | V$_{DS}$ = -80V, V$_{GS}$ = 0V, T$_J$ = 125°C |
| I$_{GSS}$ | Gate-to-Source Leakage Forward | — | — | -100 | | V$_{GS}$ = -20V |
| I$_{GSS}$ | Gate-to-Source Leakage Reverse | — | — | 100 | nA | V$_{GS}$ = 20V |
| Q$_g$ | Total Gate Charge | 4.0 | — | 9.8 | | V$_{GS}$ =-10V, ID = -2.5A |
| Q$_{gs}$ | Gate-to-Source Charge | 0.8 | — | 1.8 | nC | V$_{DS}$= -50V |
| Q$_{gd}$ | Gate-to-Drain ('Miller') Charge | 1.9 | — | 4.3 | | |
| t$_{d(on)}$ | Turn-On Delay Time | — | — | 30 | | V$_{DD}$ = -50V, I$_D$ = -2.5A, R$_G$ =7.5Ω |
| t$_r$ | Rise Time | — | — | 60 | ns | |
| t$_{d(off)}$ | Turn-Off Delay Time | — | — | 40 | | |
| t$_f$ | Fall Time | — | — | 40 | | |
| L$_S$ + L$_D$ | Total Inductance | — | 7.0 | — | nH | Measured from drain lead (6mm/0.25in. from package) to source lead (6mm/0.25in. from package) |
| C$_{iss}$ | Input Capacitance | — | 200 | | | V$_{GS}$ = 0V, V$_{DS}$ = -25V f = 1.0MHz |
| C$_{oss}$ | Output Capacitance | — | 85 | — | pF | |
| C$_{rss}$ | Reverse Transfer Capacitance | — | 30 | — | | |

### Source-Drain Diode Ratings and Characteristics

| | Parameter | Min | Typ | Max | Units | Test Conditions |
|---|---|---|---|---|---|---|
| I$_S$ | Continuous Source Current (Body Diode) | — | — | -2.5 | A | |
| I$_{SM}$ | Pulse Source Current (Body Diode) ① | — | — | -10 | | |
| V$_{SD}$ | Diode Forward Voltage | — | — | -5.5 | V | T$_j$ = 25°C, I$_S$ =-2.5A, V$_{GS}$ = 0V ④ |
| t$_{rr}$ | Reverse Recovery Time | — | — | 200 | nS | T$_j$ = 25°C, I$_F$ = -2.5A, di/dt ≤ -100A/μs |
| Q$_{RR}$ | Reverse Recovery Charge | — | — | 4.0 | μC | V$_{DD}$ ≤ -50V ④ |
| t$_{on}$ | Forward Turn-On Time | Intrinsic turn-on time is negligible. Turn-on speed is substantially controlled by L$_S$ + L$_D$. | | | | |

### Thermal Resistance

| | Parameter | Min | Typ | Max | Units | Test Conditions |
|---|---|---|---|---|---|---|
| R$_{thJC}$ | Junction-to-Case | — | — | 8.3 | °C/W | |
| R$_{thJA}$ | Junction-to-Ambient | — | — | 175 | | Typical socket mount |