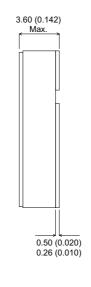


IRFN9140SMD

MECHANICAL DATA

Dimensions in mm (inches)

0.89 (0.035) 3.70 (0.146) min. 3.70 (0.146) 3.41 (0.134) 3.41 (0.134) 3 4.14 3.84 16.02 (0.631) 15.73 (0.619) 10.69 (0.421) 10.39 (0.409) 9.67 (0.381) 9.38 (0.369) 11.58 (0.456) 11.28 (0.444)



P-CHANNEL POWER MOSFET

V_{DSS} -100VI_{D(cont)} -14A R_{DS(on)} 0.020Ω

FEATURES

- HERMETICALLY SEALED SURFACE MOUNT PACKAGE
- SMALL FOOTPRINT EFFICIENT USE OF PCB SPACE.
- SIMPLE DRIVE REQUIREMENTS
- LIGHTWEIGHT
- HIGH PACKING DENSITIES

SMD₁

Pad 1 - Source Pad 2 - Drain Pad 3 - Gate

IRFxxxSM also available with Note: pins 1 and 3 reversed.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C unless otherwise stated)

| $\overline{V_{GS}}$ | Gate – Source Voltage | ±20V | | | |
|---------------------|--|--------------|--|--|--|
| I_{D} | Continuous Drain Current (V _{GS} = 0 , T _{case} = 25°C) | -14A | | | |
| I_{D} | Continuous Drain Current (V _{GS} = 0 , T _{case} = 100°C) | -9.0A | | | |
| I_{DM} | Pulsed Drain Current ¹ | –56A | | | |
| P_{D} | Power Dissipation @ T _{case} = 25°C | 75W | | | |
| | Linear Derating Factor | 0.6W/°C | | | |
| E _{AS} | Single Pulse Avalanche Energy ² | 500mJ | | | |
| dv/dt | Peak Diode Recovery ³ | -5.0V/ns | | | |
| T_J , T_stg | Operating and Storage Temperature Range | −55 to 150°C | | | |
| TL | Package Mounting Surface Temperature (for 5 sec) | 300°C | | | |
| $R_{	heta JC}$ | Thermal Resistance Junction to Case | 1.67°C/W | | | |
| $R_{\thetaJ-PCB}$ | Thermal Resistance Junction to PCB (Typical) | 4°C/W | | | |
| Mataa | <u>'</u> | | | | |

Notes

1) Pulse Test: Pulse Width \leq 300ms, $\delta \leq$ 2%

2) @ V_{DD} = -25V , L \geq 3.8mH , R_G = 25 Ω , Peak I_L = -14A , Starting T_J = 25°C

3) @ $I_{SD} \le -14A$, $di/dt \le -100A/\mu s$, $V_{DD} \le BV_{DSS}$, $T_J \le 150^{\circ}C$, SUGGESTED $R_G = 9.1\Omega$

Semelab plc. Telephone +44(0)1455 556565. Fax +44(0)1455 552612.

E-mail: sales@semelab.co.uk Website: http://www.semelab.co.uk



IRFN9140SMD

ELECTRICAL CHARACTERISTICS (T_{amb} = 25°C unless otherwise stated)

| | Parameter | Test Conditions | | Min. | Тур. | Max. | Unit | |
|---------------------|---|------------------------|--------------------------|------|------------|------|----------|--|
| | STATIC ELECTRICAL RATINGS | I | I. | | | | | |
| BV _{DSS} | Drain – Source Breakdown Voltage | $V_{GS} = 0$ | $I_D = -1mA$ | -100 | | | V | |
| ΔBV_{DSS} | Temperature Coefficient of | Reference to 25°C | | | -0.087 | | V/°C | |
| ΔT_{J} | Breakdown Voltage | $I_D = -1 \text{mA}$ | | | | | | |
| R _{DS(on)} | Static Drain – Source On–State | $V_{GS} = -10V$ | | | 0.20 | | | |
| | Resistance ¹ | $V_{GS} = -10V$ | I _D = -14A | | | 0.22 | .22 Ω | |
| V _{GS(th)} | Gate Threshold Voltage | $V_{DS} = V_{GS}$ | $I_D = -250 \mu A$ | -2 | | -4 | V | |
| 9 _{fs} | Forward Transconductance ¹ | V _{DS} ≥ -15V | I _{DS} = -9A | 6.2 | | | S(\O) | |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{GS} = 0 | $V_{DS} = 0.8BV_{DSS}$ | | | -25 | μΑ | |
| | | | T _J = 125°C | | | -250 | | |
| I _{GSS} | Forward Gate – Source Leakage | V _{GS} = -20V | • | | | -100 | . | |
| I _{GSS} | Reverse Gate – Source Leakage | V _{GS} = 20V | | | 100 | – nA | | |
| | DYNAMIC CHARACTERISTICS | 1 00 | | | | | | |
| C _{iss} | Input Capacitance | V _{GS} = 0 | | | 1400 | | | |
| C _{oss} | Output Capacitance | $V_{DS} = -25V$ | | 600 | | pF | | |
| C _{rss} | Reverse Transfer Capacitance | f = 1MHz | | 200 | | | | |
| Qg | Total Gate Charge ¹ | V _{GS} = -10V | I _D = -14A | | | | | |
| | | $V_{DS} = 0.5BV_{DSS}$ | | 31 | | 60 | nC | |
| Q _{gs} | Gate – Source Charge ¹ | $I_{D} = -14A$ | 3.7 | | 13 | | | |
| Q _{gd} | Gate – Drain ("Miller") Charge ¹ | $V_{DS} = 0.5BV_{DS}$ | 5 | | | 35.2 | nC | |
| t _{d(on)} | Turn-On Delay Time | | | | | 35 | | |
| t _r | Rise Time | $V_{DD} = -50V$ | | | | 85 | ns | |
| t _{d(off)} | Turn-Off Delay Time | $I_{D} = -14A$ | | | | 85 | | |
| t _f | Fall Time | $R_G = 9.1\Omega$ | | | | 65 | | |
| <u>'</u> | SOURCE – DRAIN DIODE CHARAC | TERISTICS | | | | | <u> </u> | |
| I _S | Continuous Source Current | | | | | -14 | A | |
| I _{SM} | Pulse Source Current ² | | | | | -56 | | |
| V _{SD} | Diode Forward Voltage | I _S = -14A | T _J = 25°C | | | -4.2 | V | |
| | | $V_{GS} = 0$ | | | | 7.2 | | |
| t _{rr} | Reverse Recovery Time | $I_{F} = -14A$ | $T_J = 25^{\circ}C$ | | | 280 | ns | |
| Q _{rr} | Reverse Recovery Charge | $d_i / d_t \le -100A/$ | us V _{DD} ≤-50V | | | 3.6 | μС | |
| t _{on} | Forward Turn-On Time | | | | negligible | | | |
| | PACKAGE CHARACTERISTICS | | | | | | | |
| L _D | Internal Drain Inductance (from centre of drain pad to die) | | | | 0.8 | | nH | |
| L _S | Internal Source Inductance (from centre | of source pad to end | | 2.8 | |] "F | | |

Notes

- 1) Pulse Test: Pulse Width \leq 300ms, $\delta \leq$ 2%
- 2) Repetitive Rating Pulse width limited by maximum junction temperature.

Semelab plc. Telephone +44(0)1455 556565. Fax +44(0)1455 552612.

E-mail: sales@semelab.co.uk Website: http://www.semelab.co.uk