

## **TO-220AB Plastic-Encapsulate MOSFETS**

### **IRF630     N-Channel Power MOSFET**

#### **GENERAL DESCRIPTION**

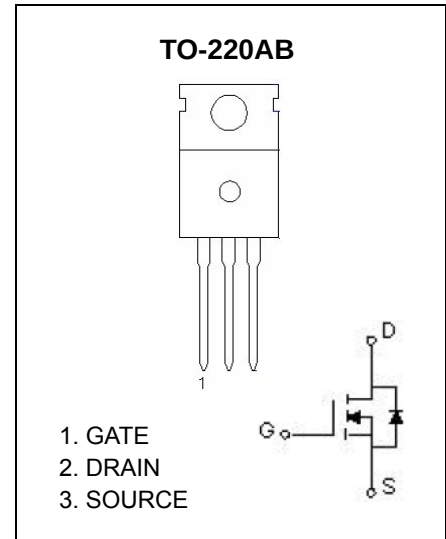
It uses advanced trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge .This device is suitable for high current load applications.

#### **FEATURE**

- High current rating
- Ultra lower  $R_{DS(on)}$
- Good stability and uniformity with high  $E_{AS}$
- Excellent package for good heat dissipation

#### **APPLICATION**

- Power switching application
- Load switching in high circuit application
- DC/DC converters



#### **Maximum ratings ( $T_a=25^{\circ}\text{C}$ unless otherwise noted)**

| Parameter                                                                      | Symbol          | Value     | Unit                        |
|--------------------------------------------------------------------------------|-----------------|-----------|-----------------------------|
| Drain-Source Voltage                                                           | $V_{DS}$        | 200       | V                           |
| Gate-Source Voltage                                                            | $V_{GS}$        | $\pm 20$  |                             |
| Continuous Drain Current                                                       | $I_D$           | 9.3       | A                           |
| Pulsed Drain Current                                                           | $I_{DM}$        | 37        |                             |
| Single Pulsed Avalanche Energy (note1)                                         | $E_{AS}$        | 250       | mJ                          |
| Thermal Resistance from Junction to Ambient                                    | $R_{\theta JA}$ | 62.5      | $^{\circ}\text{C}/\text{W}$ |
| Junction Temperature                                                           | $T_J$           | 150       | $^{\circ}\text{C}$          |
| Storage Temperature Range                                                      | $T_{STG}$       | -55 ~+150 |                             |
| Maximum lead temperure for soldering purposes ,<br>1/8"from case for 5 seconds | $T_L$           | 260       |                             |

**Electrical characteristics (T<sub>a</sub>=25°C unless otherwise noted)**

| Parameter                                            | Symbol               | Test Condition                                                                            | Min | Typ | Max   | Unit |
|------------------------------------------------------|----------------------|-------------------------------------------------------------------------------------------|-----|-----|-------|------|
| Off characteristics                                  |                      |                                                                                           |     |     |       |      |
| Drain-source breakdown voltage                       | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA                                               | 200 |     |       | V    |
| Zero gate voltage drain current                      | I <sub>DSS</sub>     | V <sub>DS</sub> =200V, V <sub>GS</sub> =0V                                                |     |     | 25    | μA   |
| Gate-body leakage current                            | I <sub>GSS</sub>     | V <sub>DS</sub> =0V, V <sub>GS</sub> =± 20V                                               |     |     | ± 100 | nA   |
| On characteristics (note2)                           |                      |                                                                                           |     |     |       |      |
| Gate-threshold voltage                               | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                  | 2   |     | 4     | V    |
| Static drain-source on-resistance                    | R <sub>DS(on)</sub>  | V <sub>GS</sub> =10V, I <sub>D</sub> =5.4A                                                |     |     | 400   | mΩ   |
| Forward transconductance                             | g <sub>fs</sub>      | V <sub>DS</sub> =50V, I <sub>D</sub> =5.4A                                                | 3.8 |     |       | S    |
| Dynamic characteristics (note 3)                     |                      |                                                                                           |     |     |       |      |
| Input capacitance                                    | C <sub>iss</sub>     | V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f =1MHz                                        |     | 800 |       | pF   |
| Output capacitance                                   | C <sub>OSS</sub>     |                                                                                           |     | 240 |       |      |
| Reverse transfer capacitance                         | C <sub>rss</sub>     |                                                                                           |     | 76  |       |      |
| Switching characteristics (note 3)                   |                      |                                                                                           |     |     |       |      |
| Turn-on delay time                                   | t <sub>d(on)</sub>   | V <sub>DD</sub> =100V, V <sub>GS</sub> =10V,<br>R <sub>G</sub> =12Ω, I <sub>D</sub> =5.9A |     | 9.4 |       | ns   |
| Turn-on rise time                                    | t <sub>r</sub>       |                                                                                           |     | 28  |       |      |
| Turn-off delay time                                  | t <sub>d(off)</sub>  |                                                                                           |     | 39  |       |      |
| Turn-off fall time                                   | t <sub>f</sub>       |                                                                                           |     | 20  |       |      |
| Drain-Source Diode Characteristics                   |                      |                                                                                           |     |     |       |      |
| Drain-source diode forward voltage(note2)            | V <sub>SD</sub>      | V <sub>GS</sub> = 0V, I <sub>S</sub> =9A                                                  |     |     | 2     | V    |
| Continuous drain-source diode forward current(note4) | I <sub>S</sub>       |                                                                                           |     |     | 9.3   | A    |
| Pulsed drain-source diode forward current            | I <sub>SM</sub>      |                                                                                           |     |     | 37    | A    |

**Notes :**

1. L=4.6mH, I<sub>L</sub>=9.9A, V<sub>DD</sub>=50V, R<sub>G</sub>=25Ω, Starting T<sub>J</sub>=25°C.
2. Pulse Test : Pulse width≤300μs, duty cycle ≤2%.
3. Guaranteed by design, not subject to production
4. Surface mounted on FR4 board, t≤10s