

isc N-Channel MOSFET Transistor

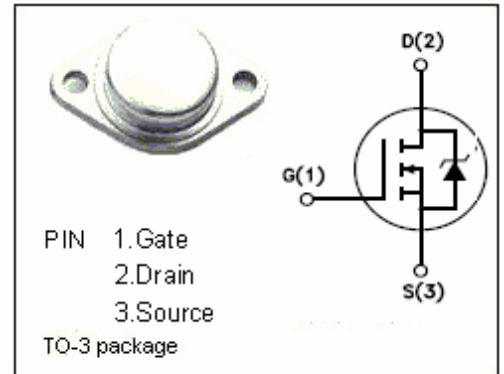
IRF451

DESCRIPTION

- 13A,450V
- Low  $R_{DS(on)}$  at high voltage
- Improved inductive ruggedness
- Low input Characteristics
- Fast switching times
- Extended safe operating area

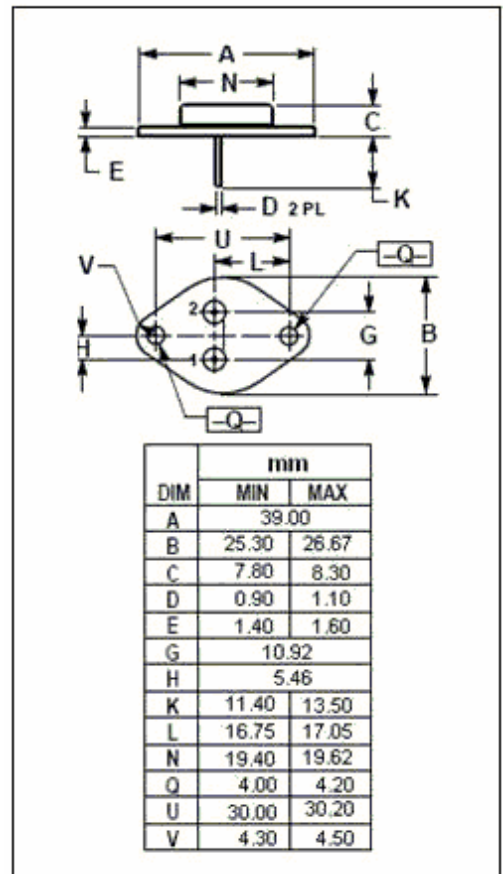
APPLICATIONS

- Designed for applications such as switching regulators, switching convertors ,motor drivers ,relay driver ,and drivers for high power bipolar switching transistors requiring high speed and low gate drive power.



ABSOLUTE MAXIMUM RATINGS( $T_a=25^{\circ}C$ )

| SYMBOL    | ARAMETER                                   | VALUE    | UNIT        |
|-----------|--|----------|-------------|
| $V_{DSS}$ | Drain-Source Voltage ( $V_{GS}=0$ )        | 450      | V           |
| $V_{GS}$  | Gate-Source Voltage                        | $\pm 20$ | V           |
| $I_D$     | Drain Current-continuous@ $TC=25^{\circ}C$ | 13       | A           |
| $P_{tot}$ | Total Dissipation@ $TC=25^{\circ}C$        | 125      | W           |
| $T_j$     | Max. Operating Junction Temperature        | -55~150  | $^{\circ}C$ |
| $T_{stg}$ | Storage Temperature Range                  | -55~150  | $^{\circ}C$ |



THERMAL CHARACTERISTICS

| SYMBOL       | PARAMETER                              | MAX  | UNIT          |
|--------------|--|------|---------------|
| $R_{th j-c}$ | Thermal Resistance,Junction to Case    | 0.83 | $^{\circ}C/W$ |
| $R_{th j-A}$ | Thermal Resistance,Junction to Ambient | 30   | $^{\circ}C/W$ |

## isc N-Channel Mosfet Transistor

## IRF451

• ELECTRICAL CHARACTERISTICS ( $T_C=25^\circ\text{C}$ )

| SYMBOL        | PARAMETER                        | CONDITIONS  | MIN | TYP  | MAX       | UNIT          |
|---------------|----------------------------------|---|-----|------|-----------|---------------|
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage   | $V_{GS}=0$ ; $I_D=0.25\text{mA}$                                | 450 |      |           | V             |
| $V_{GS(TH)}$  | Gate Threshold Voltage           | $V_{DS}=V_{GS}$ ; $I_D=0.25\text{mA}$                           | 2   |      | 4         | V             |
| $R_{DS(ON)}$  | Drain-Source On-stage Resistance | $V_{GS}=10\text{V}$ ; $I_D=7.2\text{A}$                         |     |      | 0.4       | $\Omega$      |
| $I_{GSS}$     | Gate Source Leakage Current      | $V_{GS}=\pm 20\text{V}$ ; $V_{DS}=0$                            |     |      | $\pm 100$ | nA            |
| $I_{DSS}$     | Zero Gate Voltage Drain Current  | $V_{DS}=450\text{V}$ ; $V_{GS}=0$                               |     |      | 250       | $\mu\text{A}$ |
| $V_{SD}$      | Diode Forward Voltage            | $I_F=13\text{A}$ ; $V_{GS}=0$                                   |     |      | 1.4       | V             |
| $C_{iss}$     | Input Capacitance                | $V_{DS}=25\text{V}$ , $V_{GS}=0\text{V}$ ,<br>$F=1.0\text{MHz}$ |     | 1800 |           | pF            |
| $C_{oss}$     | Output Capacitance               |   |     | 400  |           | pF            |
| $C_{rss}$     | Reverse Transfer Capacitance     |   |     | 100  |           | pF            |

• SWITCHING CHARACTERISTICS ( $T_C=25^\circ\text{C}$ )

| SYMBOL            | PARAMETER           | CONDITIONS   | MIN | TYP | MAX | UNIT |
|-------------------|---------------------|--|-----|-----|-----|------|
| $T_d(\text{on})$  | Turn-on Delay Time  | $V_{DD}=250\text{V}$ , $I_D=13\text{A}$<br>$R_G=6.2\Omega$ |     | 20  | 27  | ns   |
| $T_r$             | Rise Time           |  |     | 40  | 66  | ns   |
| $T_d(\text{off})$ | Turn-off Delay Time |  |     | 72  | 100 | ns   |
| $T_f$             | Fall Time           |  |     | 35  | 60  | ns   |