

isc N-Channel Mosfet Transistor

IRF646

• FEATURES

- 14A, 275V
- $R_{DS(ON)} = 0.280\Omega$
- Single Pulse Avalanche Energy Rated
- SOA is Power Dissipation Limited
- Nanosecond Switching Speeds
- High Input Impedance
- 275V DC Rating-120V AC Line System Operation

• DESCRIPTION

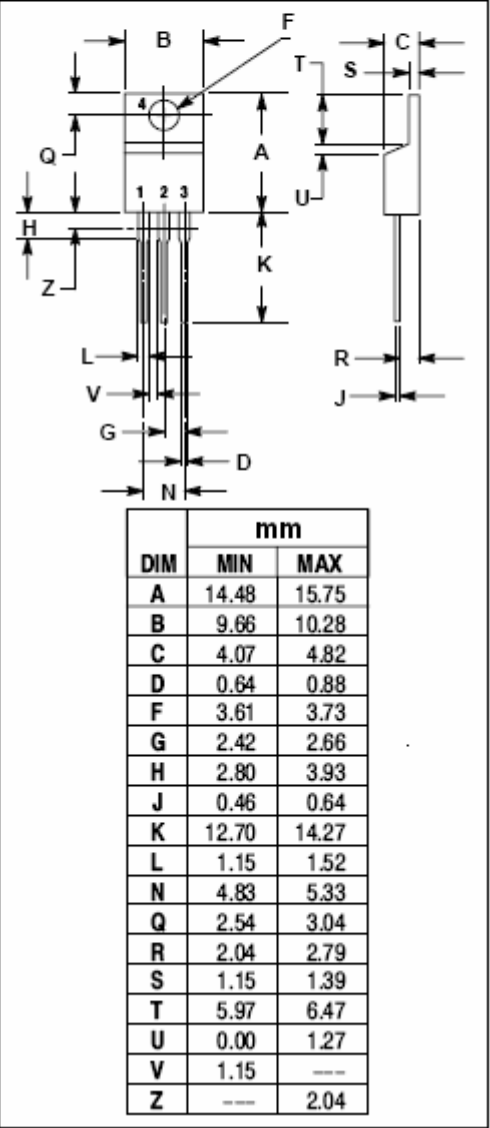
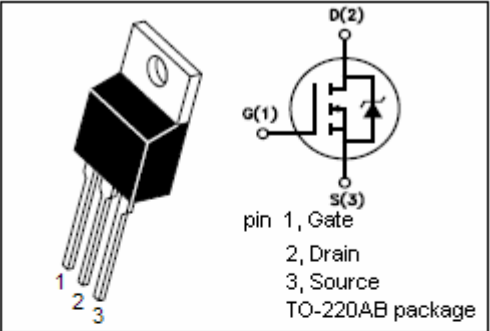
• designed for applications such as switching regulators, switching convertors, motor drivers,relay drivers, and drivers for high power bipolar switching transistors requiring high speed and low gate drive power. These types can be operated directly from integrated circuits.

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

| SYMBOL    | PARAMETER                             | VALUE    | UNIT        |
|-----------|---------------------------------------|----------|-------------|
| $V_{DSS}$ | Drain-Source Voltage                  | 275      | V           |
| $V_{GS}$  | Gate-Source Voltage-Continuous        | $\pm 20$ | V           |
| $I_D$     | Drain Current-Continuous              | 14       | A           |
| $I_{DM}$  | Drain Current-Single Plused           | 56       | A           |
| $P_D$     | Total Dissipation @ $T_C=25^{\circ}C$ | 125      | W           |
| $T_j$     | Max. Operating Junction Temperature   | -55~150  | $^{\circ}C$ |
| $T_{stg}$ | Storage Temperature                   | -55~150  | $^{\circ}C$ |

• THERMAL CHARACTERISTICS

| SYMBOL          | PARAMETER                           | MAX | UNIT          |
|-----------------|-------------------------------------|-----|---------------|
| $R_{th\ j-c}$   | Thermal Resistance,Junction to Case | 1.0 | $^{\circ}C/W$ |
| $R_{\theta JA}$ | Junction-to-Ambient                 | 80  | $^{\circ}C/W$ |



**isc N-Channel Mosfet Transistor****IRF646****ELECTRICAL CHARACTERISTICS** $T_C=25^{\circ}\text{C}$  unless otherwise specified

| SYMBOL        | PARAMETER                       | CONDITIONS                                                      | MIN | MAX       | UNIT          |
|---------------|---------------------------------|-----------------------------------------------------------------|-----|-----------|---------------|
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage  | $V_{GS}=0$ ; $I_D=0.25\text{mA}$                                | 275 |           | 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-Resistance      | $V_{GS}=10\text{V}$ ; $I_D=8\text{A}$                           |     | 0.28      | $\Omega$      |
| $I_{GSS}$     | Gate-Body Leakage Current       | $V_{GS}=\pm 20\text{V}$ ; $V_{DS}=0$                            |     | $\pm 100$ | nA            |
| $I_{DSS}$     | Zero Gate Voltage Drain Current | $V_{DS}=275\text{V}$ ; $V_{GS}=0$                               |     | 25        | $\mu\text{A}$ |
| $V_{SD}$      | Forward On-Voltage              | $I_S=14\text{A}$ ; $V_{GS}=0$                                   |     | 1.8       | V             |
| $C_{iss}$     | Input Capacitance               | $V_{DS}=25\text{V}$ , $V_{GS}=0\text{V}$ ,<br>$F=1.0\text{MHz}$ |     | 1300      | pF            |
| $C_{oss}$     | Output Capacitance              |                                                                 |     | 320       | pF            |
| $C_{rss}$     | Reverse Transfer Capacitance    |                                                                 |     | 69        | pF            |

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

| SYMBOL     | PARAMETER           | CONDITIONS                                                                       | MIN | TYP | MAX | UNIT |
|------------|---------------------|----------------------------------------------------------------------------------|-----|-----|-----|------|
| $T_d(on)$  | Turn-on Delay Time  | $V_{DD}=125\text{V}$ , $I_D=14\text{A}$<br>$R_{GS}=9.1\Omega$<br>$R_L=8.6\Omega$ |     | 16  | 24  | ns   |
| $T_r$      | Rise Time           |                                                                                  |     | 67  | 100 | ns   |
| $T_d(off)$ | Turn-off Delay Time |                                                                                  |     | 53  | 80  | ns   |
| $T_f$      | Fall Time           |                                                                                  |     | 49  | 74  | ns   |