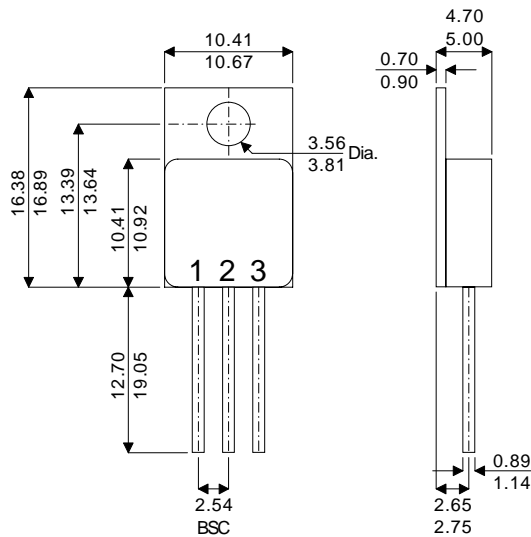


MECHANICAL DATA

Dimensions in mm (inches)



TO-220M – Metal Package

Pad 1 – Gate Pad 2 – Drain Pad 3 – Source

**N-CHANNEL
POWER MOSFET
FOR HI-REL
APPLICATIONS**

V_{DSS} **200V**
 $I_{D(cont)}$ **12A**
 $R_{DS(on)}$ **0.19Ω**

FEATURES

- HERMETICALLY SEALED TO-220 METAL PACKAGE
- SIMPLE DRIVE REQUIREMENTS
- LIGHTWEIGHT
- SCREENING OPTIONS AVAILABLE
- ALL LEADS ISOLATED FROM CASE

ABSOLUTE MAXIMUM RATINGS ($T_{case} = 25^{\circ}C$ unless otherwise stated)

| | | |
|-----------------|--|--------------|
| V_{GS} | Gate – Source Voltage | ±20V |
| I_D | Continuous Drain Current @ $T_{case} = 25^{\circ}C$ | 12A |
| I_D | Continuous Drain Current @ $T_{case} = 100^{\circ}C$ | 7.8A |
| I_{DM} | Pulsed Drain Current | 48A |
| P_D | Power Dissipation @ $T_{case} = 25^{\circ}C$ | 60W |
| | Linear Derating Factor | 0.48W/°C |
| T_J, T_{stg} | Operating and Storage Temperature Range | -55 to 150°C |
| $R_{\theta JC}$ | Thermal Resistance Junction to Case | 2.1°C/W max. |
| $R_{\theta JA}$ | Thermal Resistance Junction to Ambient | 80°C/W max. |

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise stated)

| Parameter | Test Conditions | Min. | Typ. | Max. | Unit | |
|---|--|--|---------------------------|--------------------------|---------------------------|---------------------|
| STATIC ELECTRICAL RATINGS | | | | | | |
| BV_{DSS} | Drain – Source Breakdown Voltage | $V_{GS} = 0$ | $I_D = 1\text{mA}$ | 200 | V | |
| $\frac{\Delta BV_{DSS}}{\Delta T_J}$ | Temperature Coefficient of Breakdown Voltage | Reference to 25°C $I_D = 1\text{mA}$ | | 0.29 | $\text{V}/^\circ\text{C}$ | |
| $R_{DS(on)}$ | Static Drain – Source On–State Resistance | $V_{GS} = 10\text{V}$ | $I_D = 7.8\text{A}$ | | 0.19 | Ω |
| | | $V_{GS} = 10\text{V}$ | $I_D = 12\text{A}$ | | 0.22 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS} = V_{GS}$ | $I_D = 250\mu\text{A}$ | 2 | 4 | V |
| g_{fs} | Forward Transconductance | $V_{DS} \geq 15\text{V}$ | $I_{DS} = 7.8\text{A}$ | 6.1 | | $\text{S}(\bar{v})$ |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{GS} = 0$ | $V_{DS} = 0.8BV_{DSS}$ | | 25 | μA |
| | | | $T_J = 125^\circ\text{C}$ | | 250 | |
| I_{GSS} | Forward Gate – Source Leakage | $V_{GS} = 20\text{V}$ | | | 100 | nA |
| I_{GSS} | Reverse Gate – Source Leakage | $V_{GS} = -20\text{V}$ | | | -100 | |
| DYNAMIC CHARACTERISTICS | | | | | | |
| C_{iss} | Input Capacitance | $V_{GS} = 0$ | | | 1300 | pF |
| C_{oss} | Output Capacitance | $V_{DS} = 25\text{V}$ | | | 400 | |
| C_{rss} | Reverse Transfer Capacitance | $f = 1\text{MHz}$ | | | 130 | |
| Q_g | Total Gate Charge | $V_{GS} = 10\text{V}$ | $I_D = 12\text{A}$ | 32 | 60 | nC |
| Q_{gs} | Gate – Source Charge | $I_D = 12\text{A}$ | | 2.2 | 10.6 | nC |
| Q_{gd} | Gate – Drain (“Miller”) Charge | $V_{DS} = 0.5BV_{DSS}$ | | 14.2 | 37.6 | |
| $t_{d(on)}$ | Turn–On Delay Time | $V_{DD} = 100\text{V}$ | | | 20 | ns |
| t_r | Rise Time | $I_D = 12\text{A}$ | | | 152 | |
| $t_{d(off)}$ | Turn–Off Delay Time | $R_G = 9.1\Omega$ | | | 58 | |
| t_f | Fall Time | | | | 67 | |
| SOURCE – DRAIN DIODE CHARACTERISTICS | | | | | | |
| I_S | Continuous Source Current | | | | 12 | A |
| I_{SM} | Pulse Source Current | | | | 49 | |
| V_{SD} | Diode Forward Voltage | $I_S = 12\text{A}$ | $T_J = 25^\circ\text{C}$ | | 1.5 | V |
| t_{rr} | Reverse Recovery Time | $I_S = 12\text{A}$ | $T_J = 25^\circ\text{C}$ | | 500 | ns |
| Q_{rr} | Reverse Recovery Charge | $d_i / d_t \leq 100\text{A}/\mu\text{s}$ | | $V_{DD} \leq 50\text{V}$ | 5.3 | μC |
| PACKAGE CHARACTERISTICS | | | | | | |
| L_D | Internal Drain Inductance | (from 6mm down drain lead pad to centre of die) | | 8.7 | | nH |
| L_S | Internal Source Inductance | (from 6mm down source lead to centre of source bond pad) | | 8.7 | | |



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