



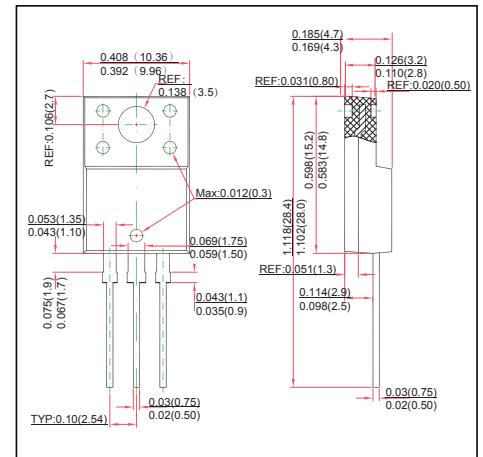
## TO-220F Plastic-Encapsulate MOSFETS

### FEATURE

- High Current Rating
- Lower  $R_{DS(on)}$
- Lower Capacitance
- Lower Total Gate Charge
- Tighter VSD Specifications
- Avalanche Energy Specified
- 600V N-Channel Power MOSFET

### MECHANICAL DATA

- Case style: TO-220F moldeplastic
- Mounting position: any



### MAXIMUM RATINGS AND CHARACTERISTICS

@ 25°C Ambient Temperature (unless otherwise noted)

| Parameter   | Symbol          | Value      | Unit |
|---|-----------------|------------|------|
| Drain-Source Voltage  | $V_{DS}$        | 600        | V    |
| Gate-Source Voltage   | $V_{GS}$        | $\pm 30$   |      |
| Continuous Drain Current  | $I_D$           | 4.0        | A    |
| Continuous Drain-Source Diode Forward Current                                 | $I_S$           | 4.0        |      |
| Single Pulsed Avalanche Energy (note1)  | $E_{AS}$        | 260        | mJ   |
| Thermal Resistance from Junction to Ambient                                   | $R_{\theta JA}$ | 62.5       | °C/W |
| Operating and Storage Temperature Range                                       | $T_J, T_{STG}$  | -55 ~ +150 | °C   |
| Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds | $T_L$           | 260        |      |

### MOSFET ELECTRICAL CHARACTERISTICS $T_A=25^\circ\text{C}$ unless otherwise specified

| Parameter                                  | Symbol        | Test Condition   | Min | Typ | Max  | Unit     |
|--|---------------|--|-----|-----|------|----------|
| <b>Off characteristics</b>                 |               |  |     |     |      |          |
| Drain-source breakdown voltage             | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$                              | 600 |     |      | V        |
| Drain-source diode forward voltage (note2) | $V_{SD}$      | $V_{GS} = 0V, I_S = 4.0A$                                  |     |     | 1.5  |          |
| Zero gate voltage drain current            | $I_{DSS}$     | $V_{DS} = 600V, V_{GS} = 0V$                               |     |     | 25   | $\mu A$  |
| Gate-body leakage current, forward (note2) | $I_{GSSF}$    | $V_{DS} = 0V, V_{GS} = 30V$                                |     |     | 100  | nA       |
| Gate-body leakage current, reverse (note2) | $I_{GSSR}$    | $V_{DS} = 0V, V_{GS} = -30V$                               |     |     | -100 |          |
| <b>On characteristics (note2)</b>          |               |  |     |     |      |          |
| Gate-threshold voltage                     | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = 250\mu A$                          | 2.0 | 3.7 | 4.0  | V        |
| Static drain-source on-resistance          | $R_{DS(on)}$  | $V_{GS} = 10V, I_D = 2.0A$                                 |     | 2.0 | 3.0  | $\Omega$ |
| Forward transconductance                   | $g_{fs}$      | $V_{DS} = 50V, I_D = 2A$                                   | 2.0 | 2.6 |      | S        |
| <b>Dynamic characteristics (note3)</b>     |               |  |     |     |      |          |
| Input capacitance                          | $C_{iss}$     | $V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$                      |     | 540 | 760  | pF       |
| Output capacitance                         | $C_{oss}$     |  |     | 125 | 180  |          |
| Reverse transfer capacitance               | $C_{rss}$     |  |     | 8.0 | 20   |          |
| <b>Switching characteristics</b>           |               |  |     |     |      |          |
| Total gate charge                          | $Q_g$         | $V_{DS} = 480V, V_{GS} = 10V, I_D = 4.0A$                  |     | 5.0 | 10   | nC       |
| Gate-source charge                         | $Q_{gs}$      |  |     | 2.7 |      |          |
| Gate-drain charge                          | $Q_{gd}$      |  |     | 2.0 |      |          |
| Turn-on delay time (note3)                 | $t_{d(on)}$   | $V_{DD} = 300V, V_{GS} = 10V, R_G = 9.1\Omega, I_D = 4.0A$ |     | 12  | 20   | ns       |
| Turn-on rise time (note3)                  | $t_r$         |  |     | 7.0 | 10   |          |
| Turn-off delay time (note3)                | $t_{d(off)}$  |  |     | 19  | 40   |          |
| Turn-off fall time (note3)                 | $t_f$         |  |     | 10  | 20   |          |

#### Notes :

1.  $L = 30mH, I_L = 4A, V_{DD} = 100V, V_{GS} = 10V, R_G = 25\Omega, \text{Starting } T_J = 25^\circ\text{C}.$
2. Pulse Test : Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
3. These parameters have no way to verify.

## RATINGS AND CHARACTERISTIC CURVES

