# MM15F060K

**600V 15A FRED**

**RoHS Compliant**

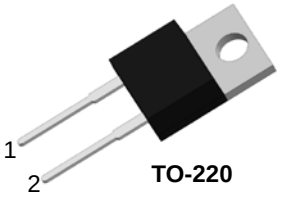
**December 2008** **PRELIMINARY**

## PRODUCT FEATURES

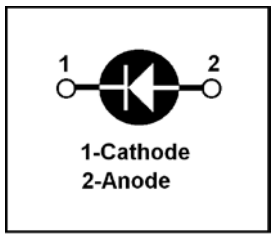
- Ultrafast Recovery Time
- Soft Recovery Characteristics
- Low Recovery Loss
- Low Forward Voltage
- High Surge Current Capability
- Low Leakage Current

## APPLICATIONS

- Freewheeling, Snubber, Clamp
- Inversion Welder
- PFC
- Plating Power Supply
- Ultrasonic Cleaner and Welder
- Converter & Chopper
- UPS




**TO-220**




## DESCRIPTION

FRED from MacMic utilizes advanced processing techniques to achieve ultrafast recovery times and higher forward current. Its soft recovery characteristics and high reliability suit for wide industrial applications.

## ABSOLUTE MAXIMUM RATINGS

$T_C$=25°C unless otherwise specified

| Symbol | Parameter | Test Conditions | Values | Unit |
|---|---|---|---|---|
| $V_R$ | Maximum D.C. Reverse Voltage | | 600 | V |
| $V_{RRM}$ | Maximum Repetitive Reverse Voltage | | 600 | V |
| $I_{F(AV)}$ | Average Forward Current | $T_C$=110°C | 15 | A |
| $I_{F(RMS)}$ | RMS Forward Current | $T_C$=110°C | 21 | A |
| $I_{FSM}$ | Non-Repetitive Surge Forward Current | $T_J$=45°C, t=10ms, 50Hz, Sine | 150 | A |
| $P_D$ | Power Dissipation | | 83 | W |
| $T_J$ | Junction Temperature | | -40 to +150 | °C |
| $T_{STG}$ | Storage Temperature Range | | -40 to +150 | °C |
| Torque | Module-to-Sink | Recommended（M3） | 1.1 | N·m |
| $R_{\theta JC}$ | Thermal Resistance | Junction-to-Case | 1.5 | °C /W |
| Weight | | | 2.1 | g |

## ELECTRICAL CHARACTERISTICS

$T_C$=25°C unless otherwise specified

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{RM}$ | Reverse Leakage Current | $V_R$=600V | -- | -- | 10 | μA |
| | | $V_R$=600V, $T_J$=125°C | -- | -- | 250 | μA |
| $V_F$ | Forward Voltage | $I_F$=15A | -- | 1.3 | 1.7 | V |
| | | $I_F$=15A, $T_J$=125°C | -- | 1.1 | | V |
| $t_{rr}$ | Reverse Recovery Time | $I_F$=1A, $V_R$=30V, $di_F/dt$=-200A/μs | -- | 30 | -- | ns |
| $t_{rr}$ | Reverse Recovery Time | $V_R$=300V, $I_F$=15A | -- | 50 | -- | ns |
| $I_{RRM}$ | Max. Reverse Recovery Current | $di_F/dt$=-200A/μs, $T_J$=25°C | -- | 4 | -- | A |
| $t_{rr}$ | Reverse Recovery Time | $V_R$=300V, $I_F$=15A | -- | 125 | -- | ns |
| $I_{RRM}$ | Max. Reverse Recovery Current | $di_F/dt$=-200A/μs, $T_J$=125°C | -- | 8 | -- | A |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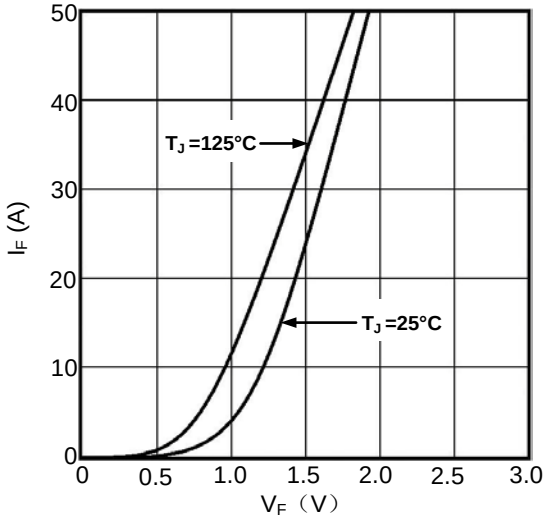



Fig1. Forward Voltage Drop vs Forward Current

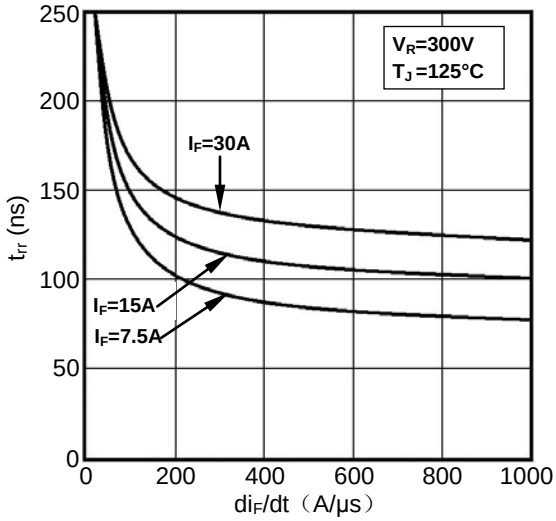



Fig2. Reverse Recovery Time vs $di_F/dt$

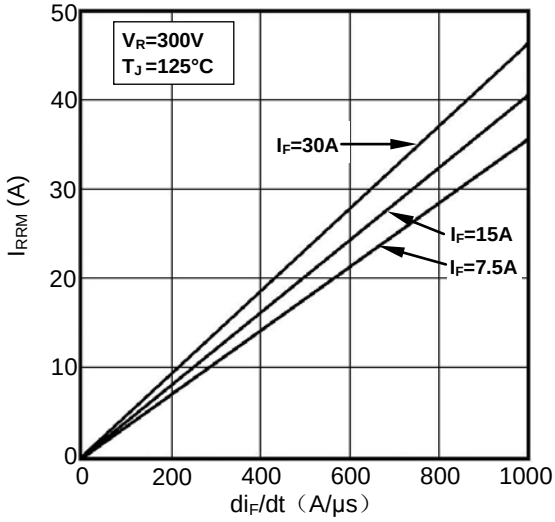



Fig3. Reverse Recovery Current vs $di_F/dt$

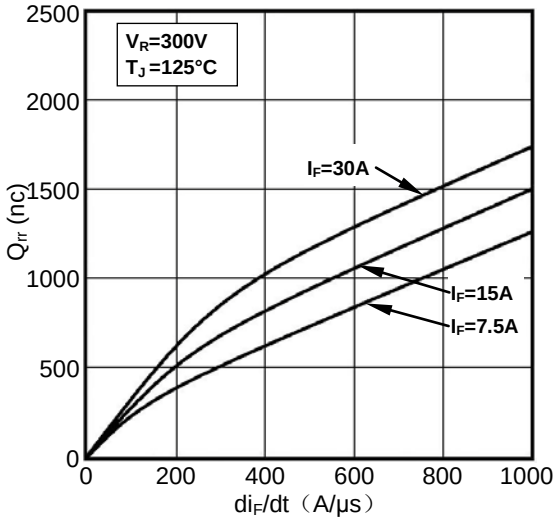



Fig4. Reverse Recovery Charge vs $di_F/dt$

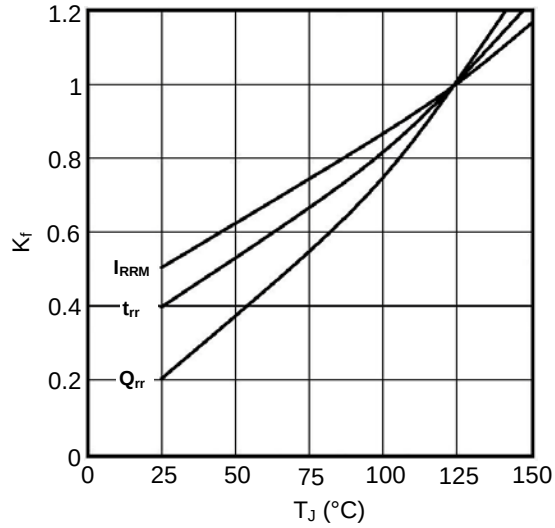



Fig5. Dynamic Parameters vs Junction Temperature

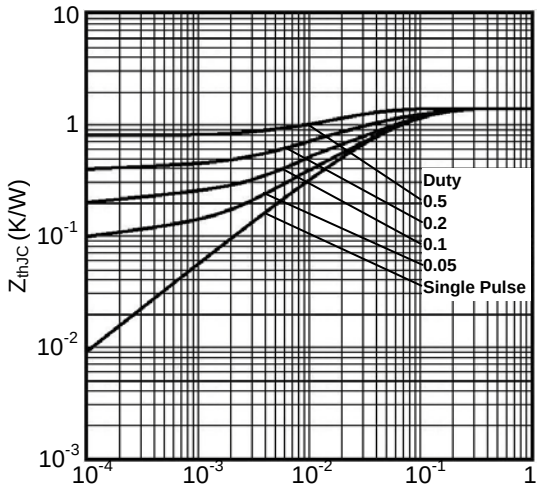



Fig6. Transient Thermal Impedance

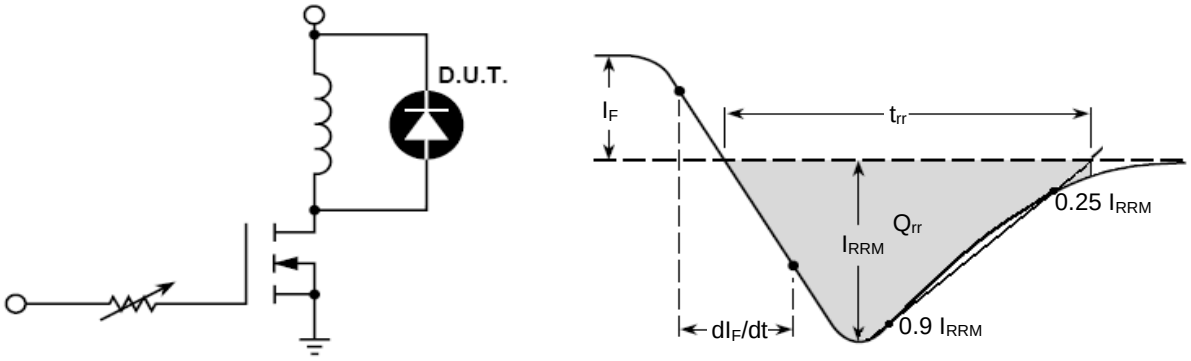
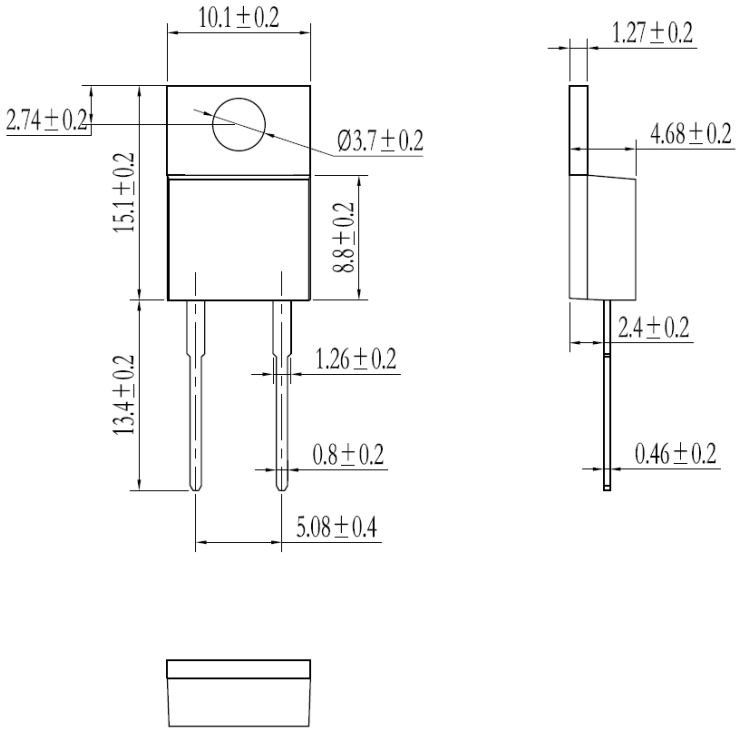



Fig7. Diode Reverse Recovery Test Circuit and Waveform




Dimensions in Millimeters
Fig8. Package Outline