# MM80FU040PC

**400V 80A FRED**

MACMIC

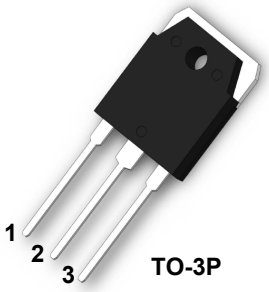
May 2015 Version 01 RoHS Compliant

## PRODUCT FEATURES

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

## APPLICATIONS

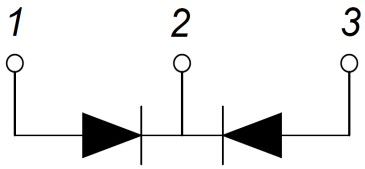
- Freewheeling, Snubber, Clamp
- Inversion Welder
- PFC
- Plating Power Supply
- Ultrasonic Cleaner and Welder
- Converter & Chopper
- UPS



TO-3P

## 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 | | 400 | V |
| $V_{RRM}$ | Maximum Repetitive Reverse Voltage | | | |
| $I_{F(AV)}$ | Average Forward Current | $T_C$=100℃, Per Diode | 40 | A |
| | | $T_C$=100℃, Per Package | 80 | |
| $I_{F(RMS)}$ | RMS Forward Current | $T_C$=100℃, Per Diode | 56 | |
| $I_{FSM}$ | Non Repetitive Surge Forward Current | $T_J$=25℃,t=10ms, 50Hz, Sine | 400 | |
| $P_D$ | Power Dissipation | | 156 | W |
| $T_J$ | Junction Temperature | | -55 to +150 | ℃ |
| $T_{STG}$ | Storage Temperature Range | | -55 to +125 | ℃ |
| Torque | To Heat Sink | Recommended（M3） | 1.1 | Nm |
| $R_{thJC}$ | Junction to Case Thermal Resistance( Per Diode ) | | 0.8 | ℃ /W |
| Weight | | | 6 | g |

## ELECTRICAL CHARACTERISTICS

*$T_C$=25°C unless otherwise specified*

| Symbol | Parameter/Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{RM}$ | Maximum Reverse Leakage Current | $V_R$ =400V | | | 10 | μA |
| | | $V_R$ =400V, $T_J$ = 125℃ | | | 1 | mA |
| $V_F$ | Forward Voltage | $I_F$=40A | | 1.3 | 1.5 | V |
| | | $I_F$=40A,$T_J$=125℃ | | 1.2 | | |
| trr | Reverse Recovery Time ($I_F$ = 1A, $dI_F/dt$ = -200A/μs, $V_R$ = 30V) | | | 20 | 25 | ns |
| trr | Reverse Recovery Time ($I_F$ = 0.5A, $I_R$=1A, $I_{RR}$ = 0.25A) | | | 30 | 40 | ns |
| trr | Reverse Recovery Time | $I_F$ =40A,$V_R$ =200V, | | 36 | | ns |
| $I_{RRM}$ | Maximum Reverse Recovery Current | $dI_F/dt$ = -200A/μs | | 3.2 | | A |
| trr | Reverse Recovery Time | $I_F$ = 40A,$V_R$ =200V, | | 96 | | ns |
| $I_{RRM}$ | Maximum Reverse Recovery Current | $dI_F/dt$ = -200A/μs ,$T_J$=125℃ | | 7.6 | | A |



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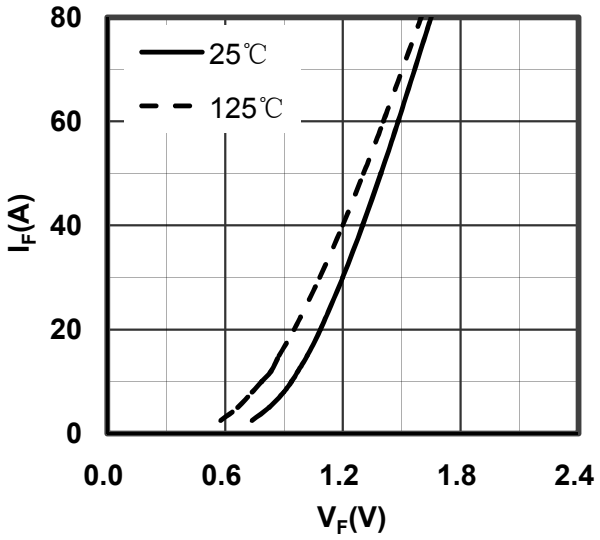



Figure 1. Forward Voltage Drop vs Forward Current

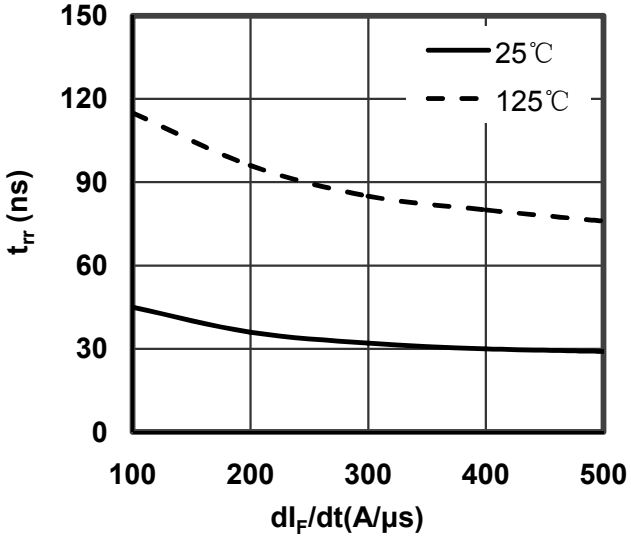



Figure 2. Reverse Recovery Time vs $dI_F/dt$

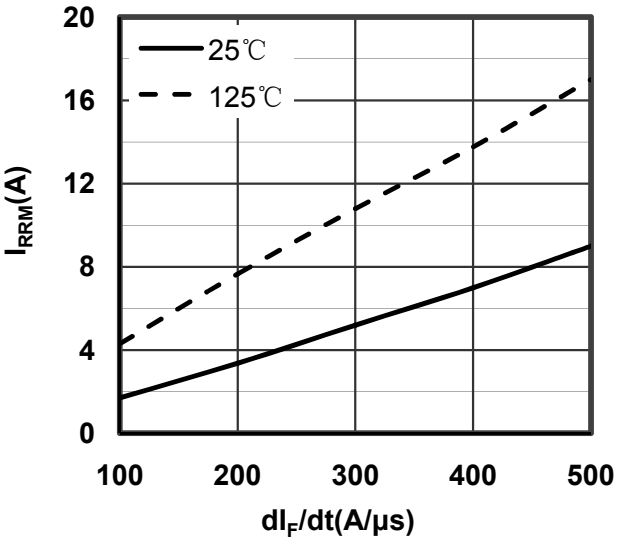



Figure 3. Reverse Recovery Current vs $dI_F/dt$

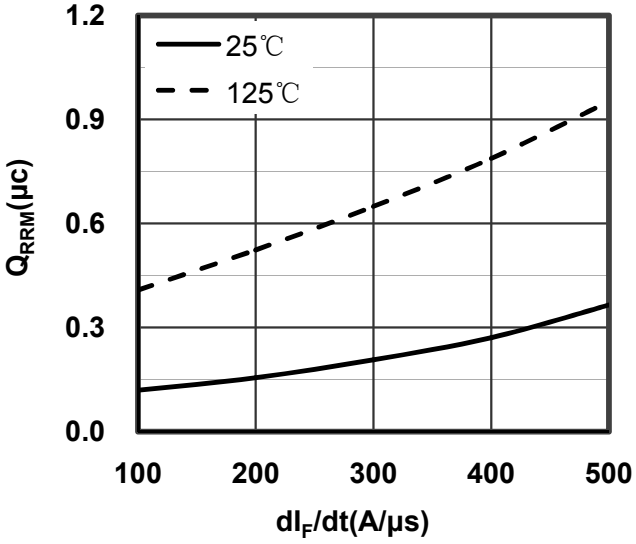



Figure 4. Reverse Recovery Charge vs $dI_F/dt$

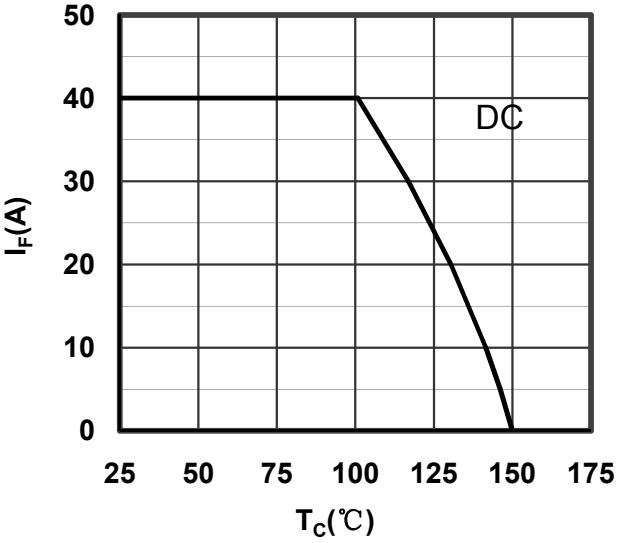



Figure 5.Forward current vs Case temperature

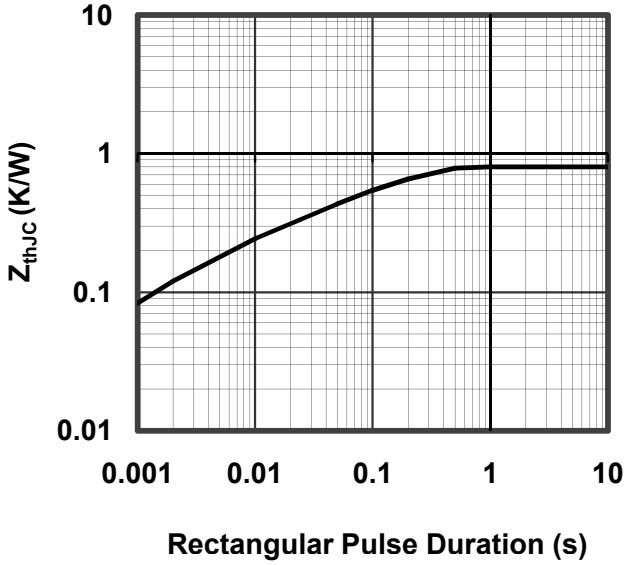



Figure 6.Transient Thermal Impedance

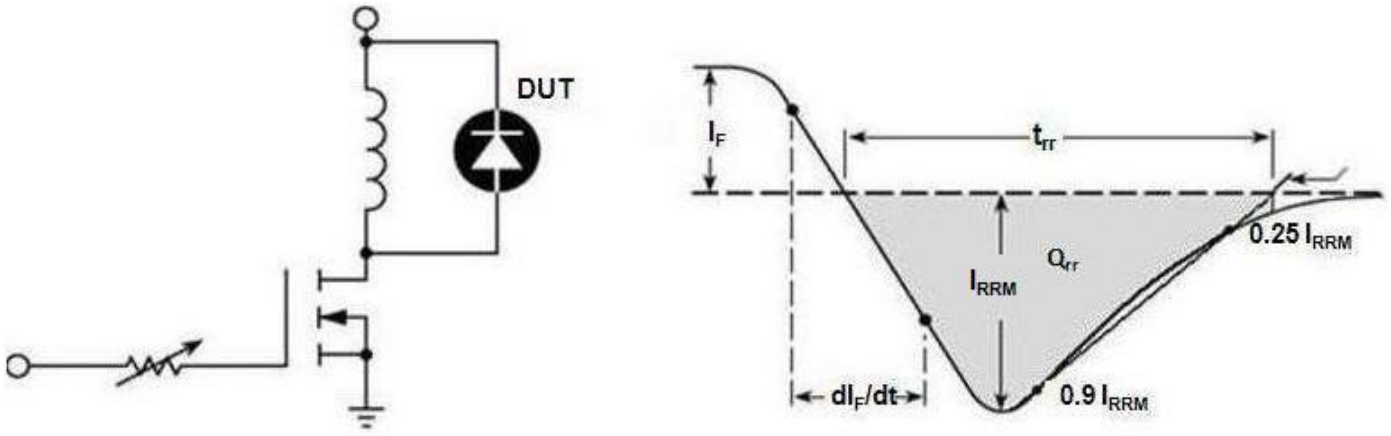
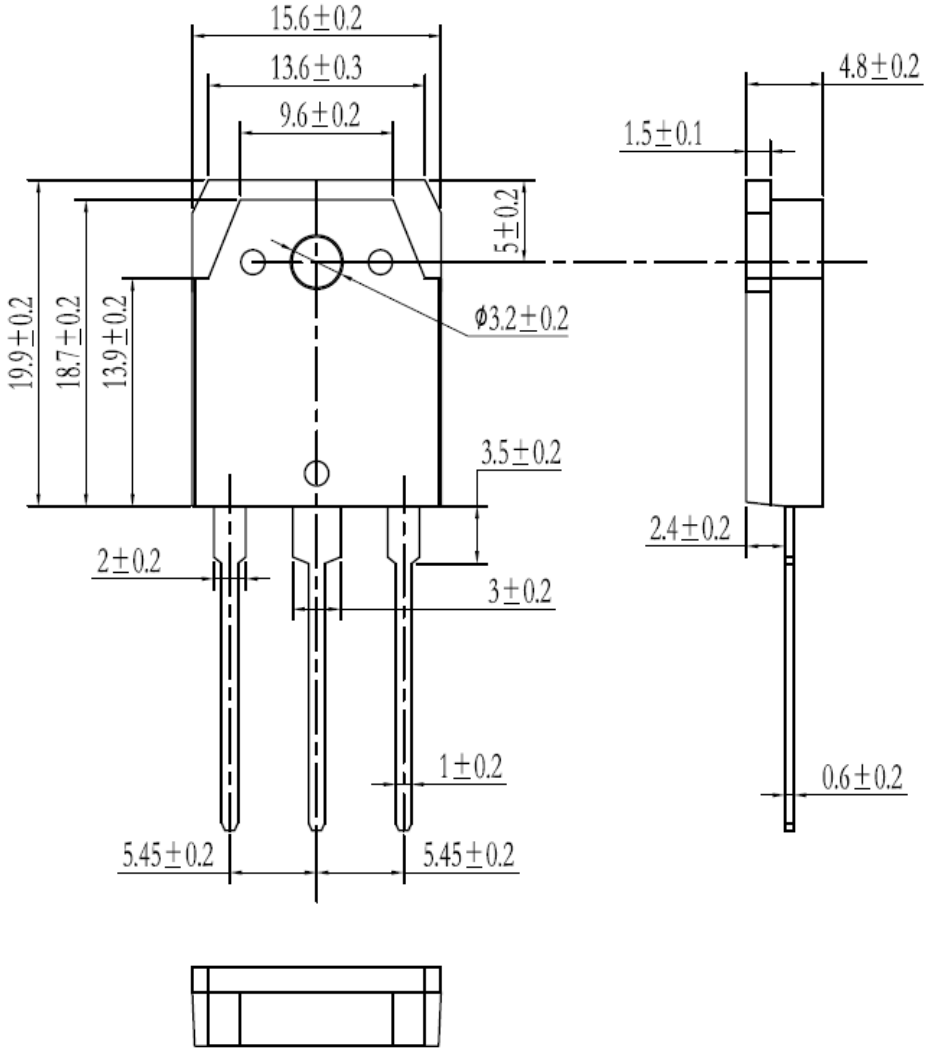



**Figure 7. Diode Reverse Recovery Test Circuit and Waveform**




**Dimensions in (mm)**

**Figure 8. Package Outline**