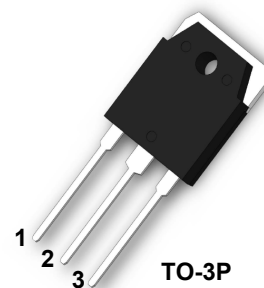


PRODUCT FEATURES

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

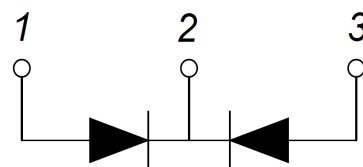
APPLICATIONS

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



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

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

ELECTRICAL CHARACTERISTICS

$T_C = 25^\circ\text{C}$ unless otherwise specified

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

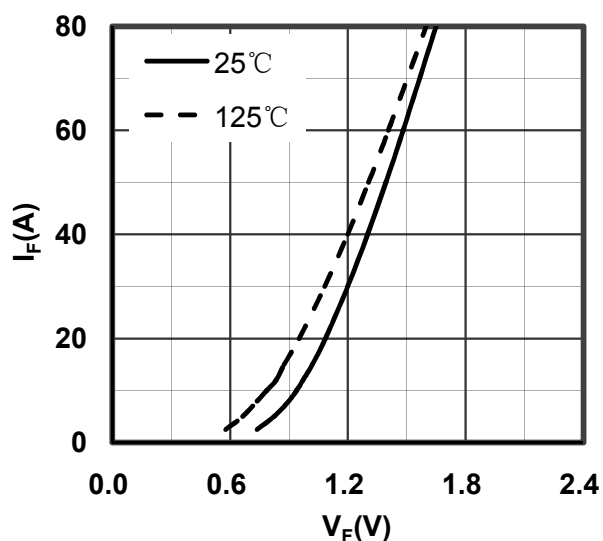


Figure 1. Forward Voltage Drop vs Forward Current

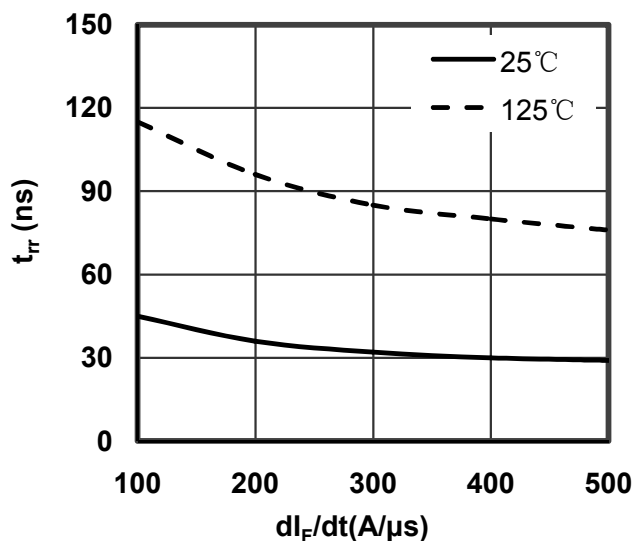
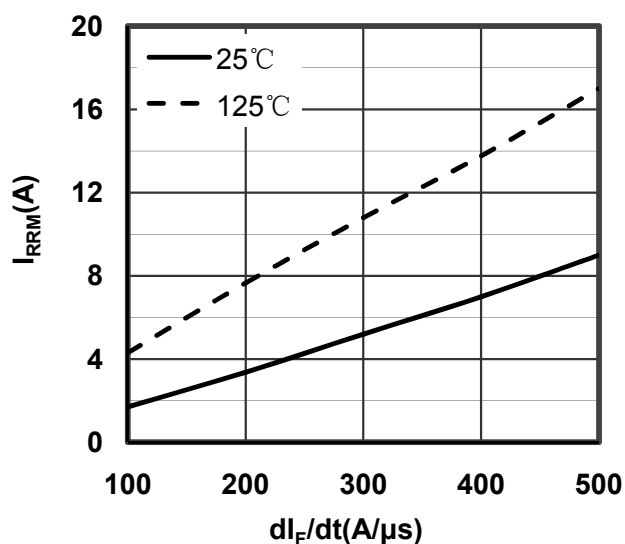
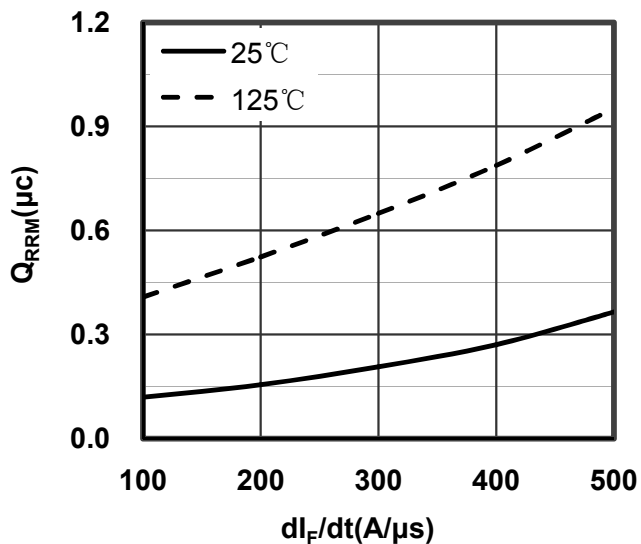
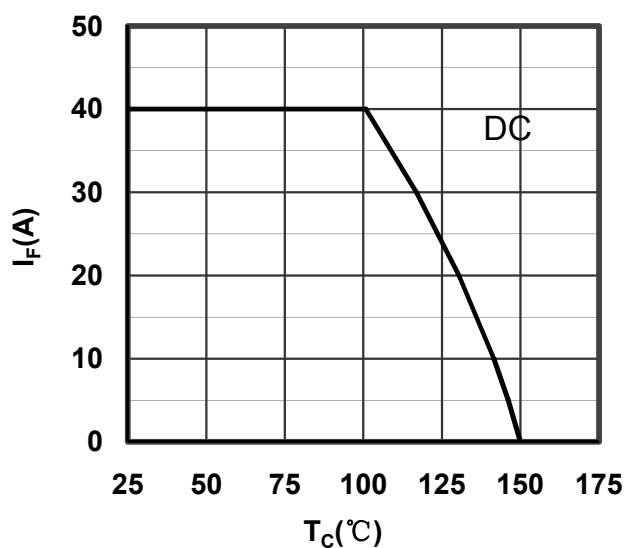
Figure 2. Reverse Recovery Time vs di_F/dt Figure 3. Reverse Recovery Current vs di_F/dt Figure 4. Reverse Recovery Charge vs di_F/dt 

Figure 5. Forward current vs Case temperature

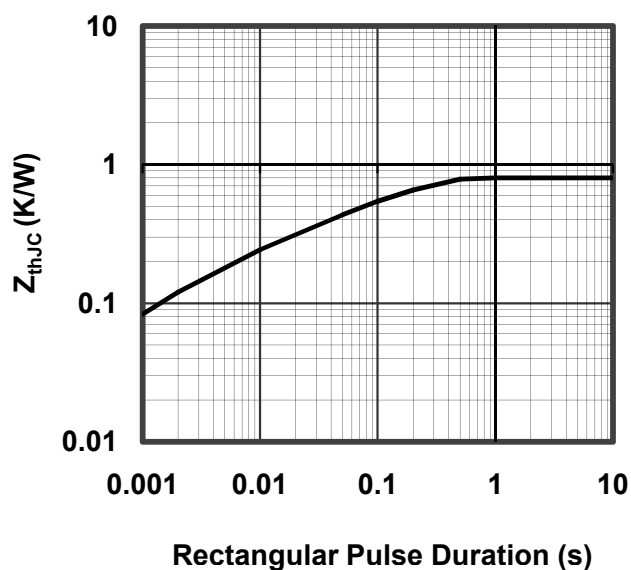


Figure 6. Transient Thermal Impedance

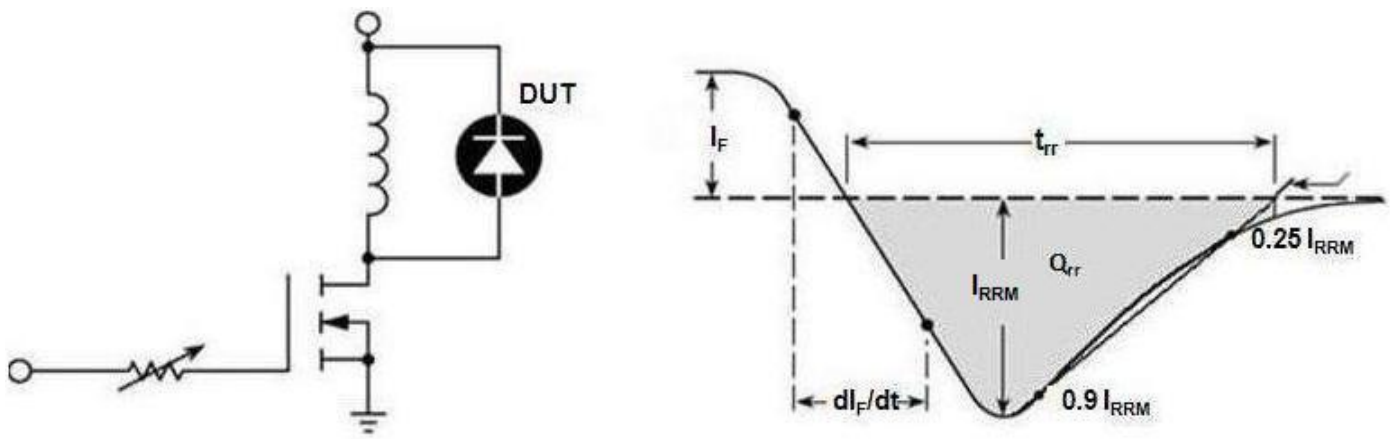
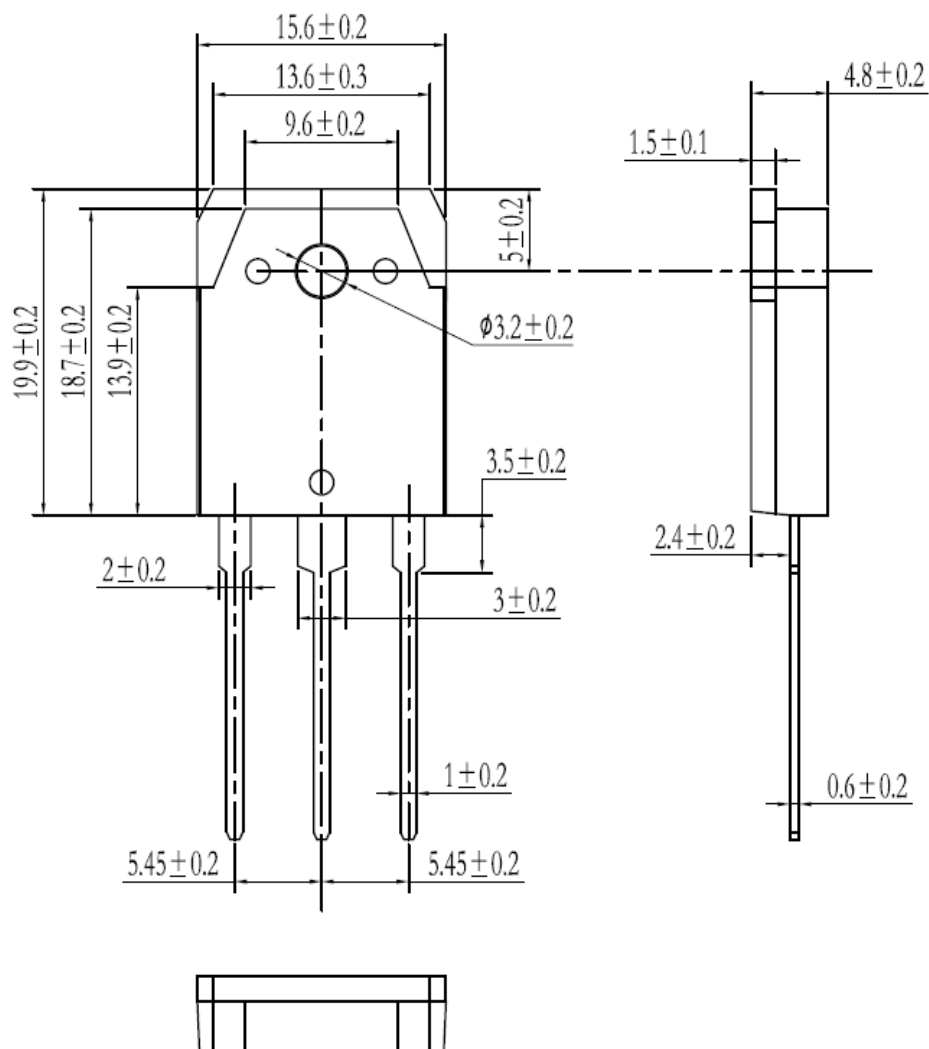


Figure 7. Diode Reverse Recovery Test Circuit and Waveform



Dimensions in (mm)
Figure 8. Package Outline