

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-247



1-Cathode
2-Anode

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		200	V
V_{RRM}	Maximum Repetitive Reverse Voltage			
$I_{F(AV)}$	Average Forward Current	$T_C = 125^\circ\text{C}$	100	A
$I_{F(RMS)}$	RMS Forward Current	$T_C = 125^\circ\text{C}$	150	
I_{FSM}	Non-Repetitive Surge Forward Current	$T_J = 45^\circ\text{C}, t = 10\text{ms}, 50\text{Hz}, \text{Sine}$	800	
P_D	Power Dissipation		520	W
T_J	Junction Temperature		-55 to +150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range		-55 to +150	$^\circ\text{C}$
Torque	Module-to-Sink	Recommended (M3)	1.1	N·m
$R_{th(J-C)}$	Junction-to-Case Thermal Resistance		0.24	$^\circ\text{C}/\text{W}$
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	$V_R = 200\text{V}$			10	μA
		$V_R = 200\text{V}, T_J = 125^\circ\text{C}$			5	mA
V_F	Forward Voltage	$I_F = 100\text{A}$		1.01	1.2	V
		$I_F = 100\text{A}, T_J = 125^\circ\text{C}$		0.95		
trr	Reverse Recovery Time ($I_F = 1\text{A}, di_F/dt = -200\text{A}/\mu\text{s}, V_R = 30\text{V}$)			35	40	ns
trr	Reverse Recovery Time	$I_F = 100\text{A}, V_R = 100\text{V}, di_F/dt = -200\text{A}/\mu\text{s}$		94		ns
I_{RRM}	Maximum Reverse Recovery Current			11.2		A
trr	Reverse Recovery Time	$I_F = 100\text{A}, V_R = 100\text{V}, di_F/dt = -200\text{A}/\mu\text{s}, T_J = 125^\circ\text{C}$		110		ns
I_{RRM}	Maximum Reverse Recovery Current			14.2		A

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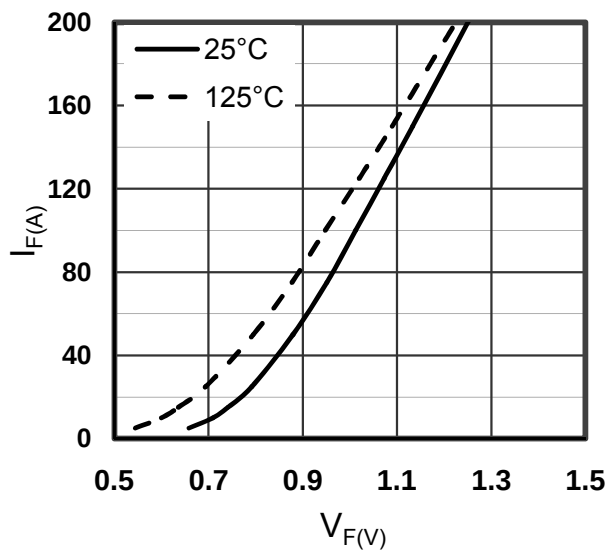


Figure1. Forward Voltage Drop vs Forward Current

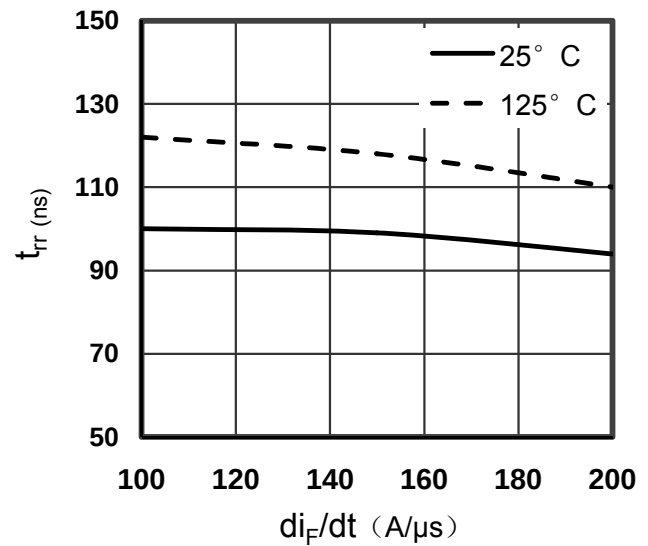


Figure2. Reverse Recovery Time vs di_F/dt

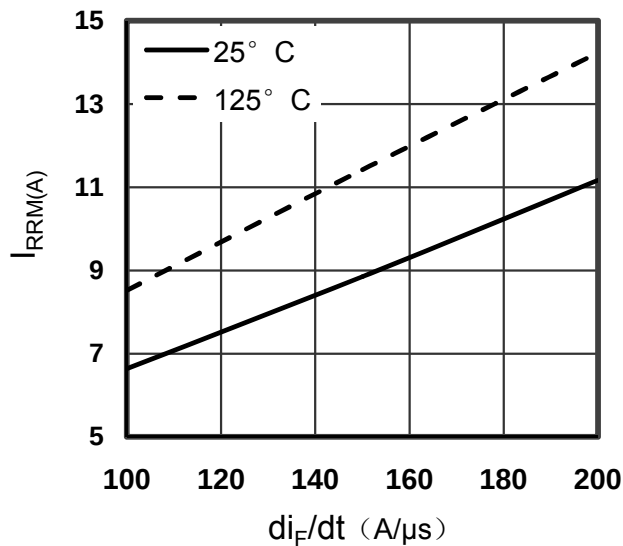


Figure3. Reverse Recovery Current vs di_F/dt

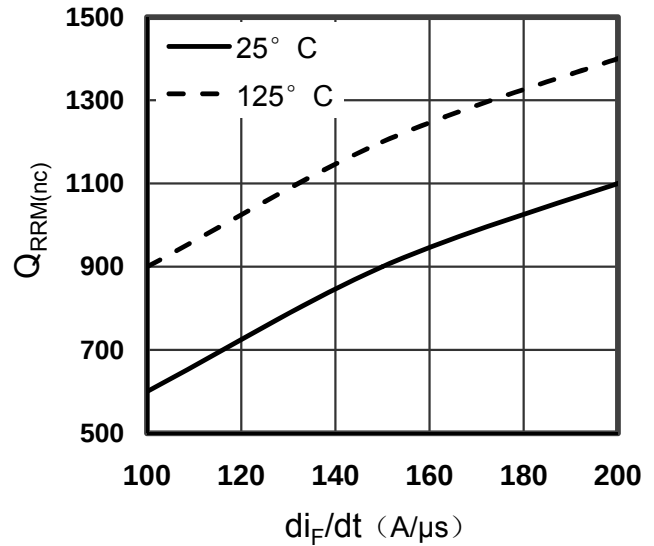


Figure4. Reverse Recovery Charge vs di_F/dt

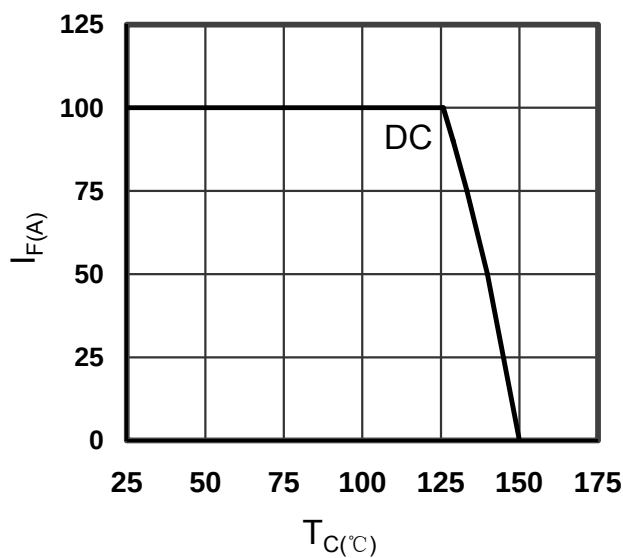


Figure5. Forward current vs. Case temperature

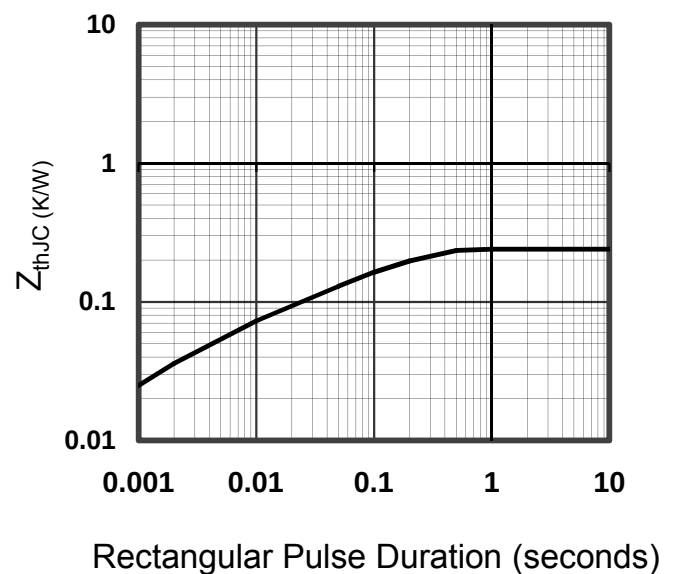


Figure6. Transient Thermal Impedance

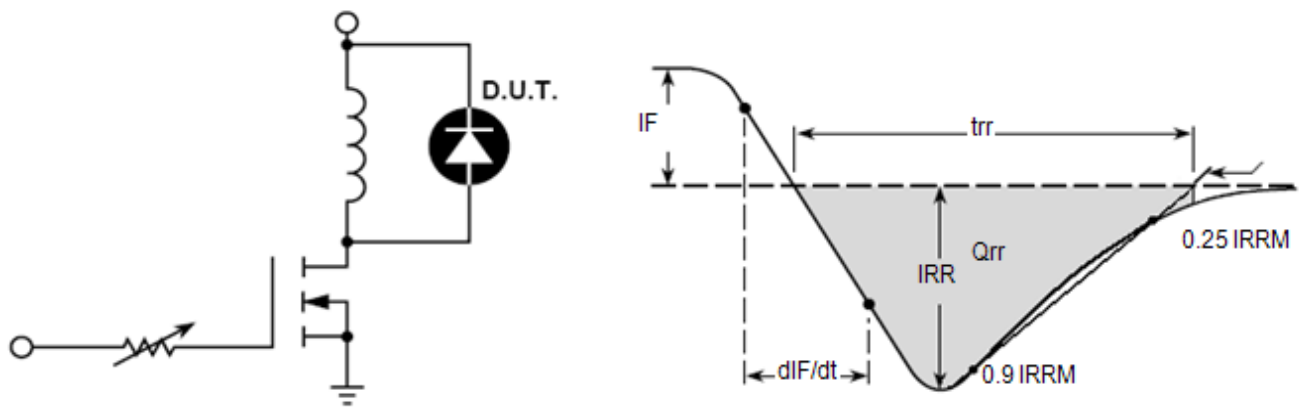
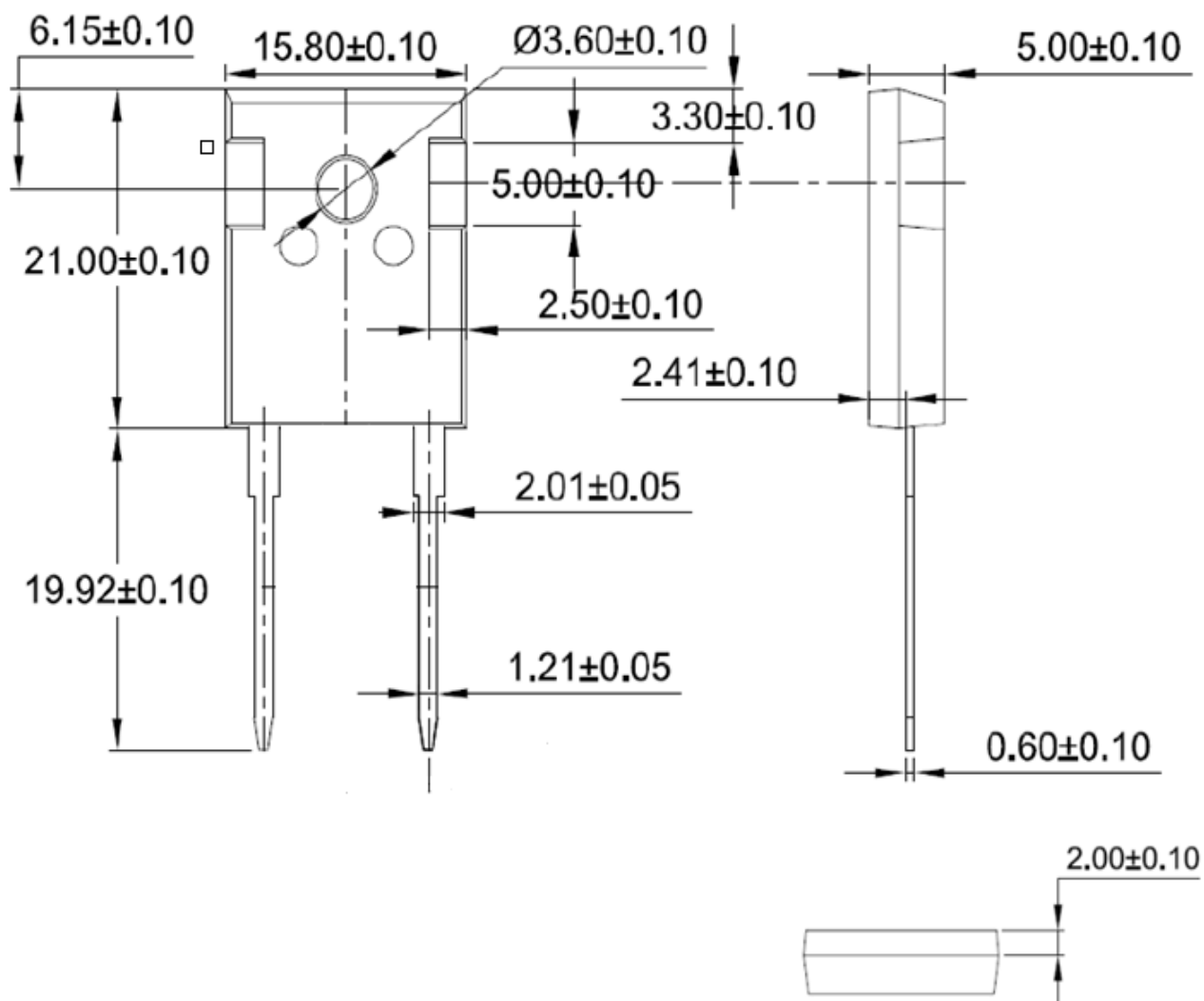


Figure7. Diode Reverse Recovery Test Circuit and Waveform



Dimensions in Millimeters
Figure8. Package Outline