



# MM30FU060P

600V 30A FRED

RoHS Compliant

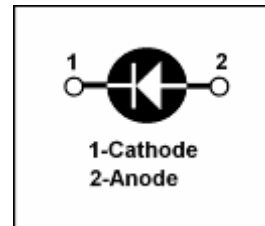
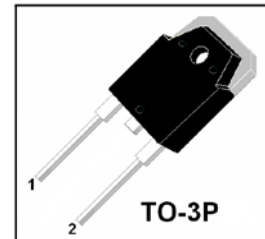
July 2010

## 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



## 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		600	V
$V_{RRM}$	Maximum Repetitive Reverse Voltage		600	V
$I_{F(AV)}$	Average Forward Current	$T_C=110^\circ\text{C}$	30	A
$I_{F(RMS)}$	RMS Forward Current	$T_C=110^\circ\text{C}$	42	A
$I_{FSM}$	Non-Repetitive Surge Forward Current	$T_J=45^\circ\text{C}$ , $t=10\text{ms}$ , 50Hz, Sine	300	A
$P_D$	Power Dissipation		156	W
$T_J$	Junction Temperature		-40 to +150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range		-40 to +150	$^\circ\text{C}$
Torque	Module-to-Sink	Recommended (M3)	1.1	N·m
$R_{\theta JC}$	Thermal Resistance	Junction-to-Case	0.8	$^\circ\text{C}/\text{W}$
Weight			6.0	g

## ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{RM}$	Reverse Leakage Current	$V_R=600\text{V}$	--	--	15	$\mu\text{A}$
		$V_R=600\text{V}$ , $T_J=125^\circ\text{C}$	--	--	250	$\mu\text{A}$
$V_F$	Forward Voltage	$I_F=30\text{A}$	--	1.6	2.1	V
		$I_F=30\text{A}$ , $T_J=125^\circ\text{C}$	--	1.4		V
$t_{rr}$	Reverse Recovery Time	$I_F=1\text{A}$ , $V_R=30\text{V}$ , $di_F/dt=-200\text{A}/\mu\text{s}$	--	25	--	ns
$t_{rr}$	Reverse Recovery Time	$V_R=300\text{V}$ , $I_F=30\text{A}$ $di_F/dt=-200\text{A}/\mu\text{s}$ , $T_J=25^\circ\text{C}$	--	35	--	ns
$I_{RRM}$	Max. Reverse Recovery Current		--	2.9	--	A
$t_{rr}$	Reverse Recovery Time	$V_R=300\text{V}$ , $I_F=30\text{A}$ $di_F/dt=-200\text{A}/\mu\text{s}$ , $T_J=125^\circ\text{C}$	--	105	--	ns
$I_{RRM}$	Max. Reverse Recovery Current		--	6	--	A

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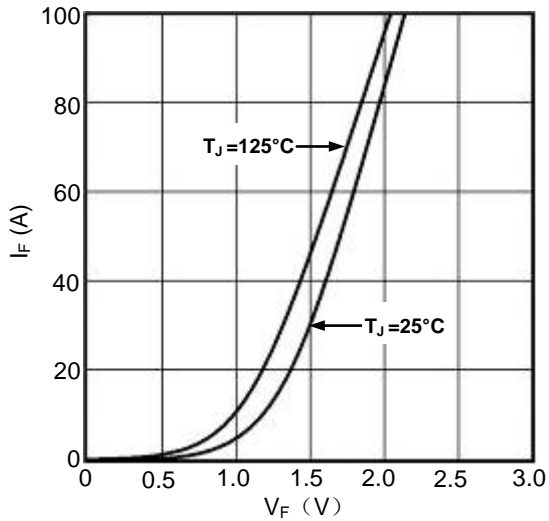


Fig1. Forward Voltage Drop vs Forward Current

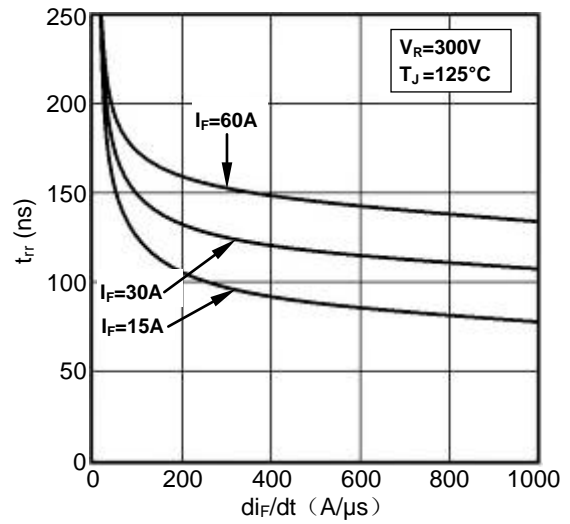


Fig2. Reverse Recovery Time vs  $di_F/dt$

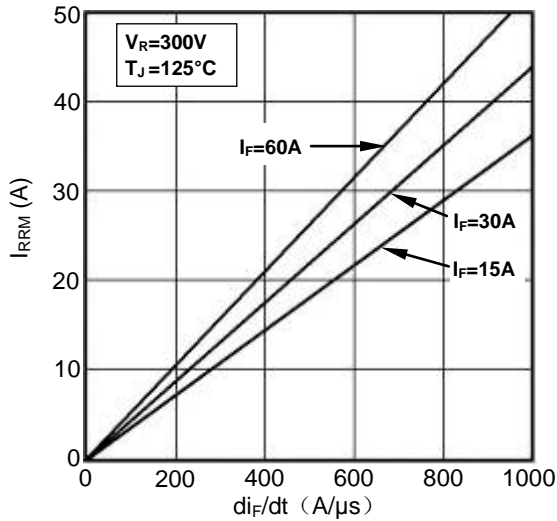


Fig3. Reverse Recovery Current vs  $di_F/dt$

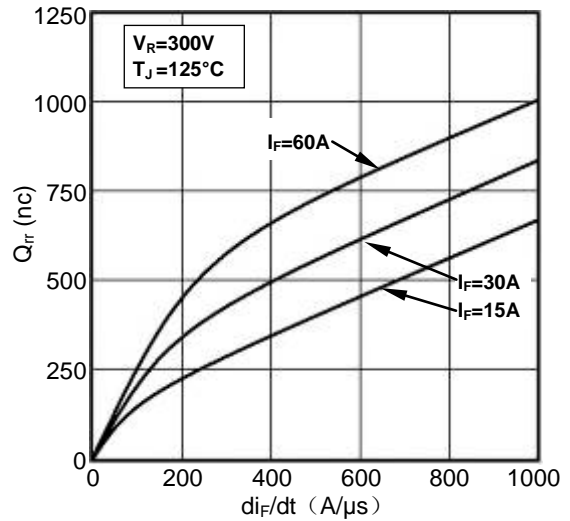


Fig4. Reverse Recovery Charge vs  $di_F/dt$

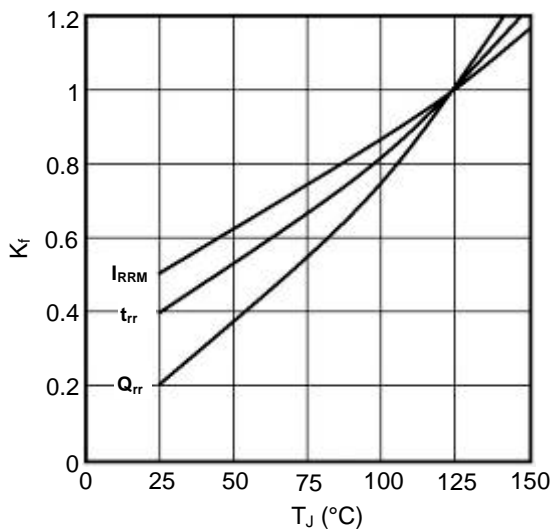


Fig5. Dynamic Parameters vs Junction Temperature

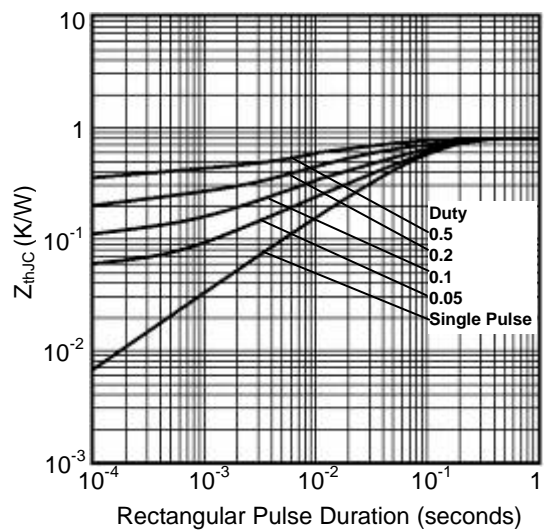


Fig6. Transient Thermal Impedance

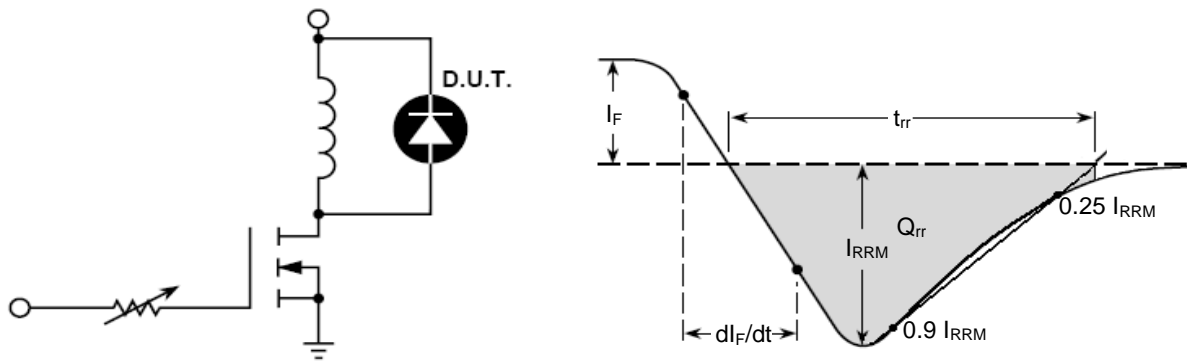
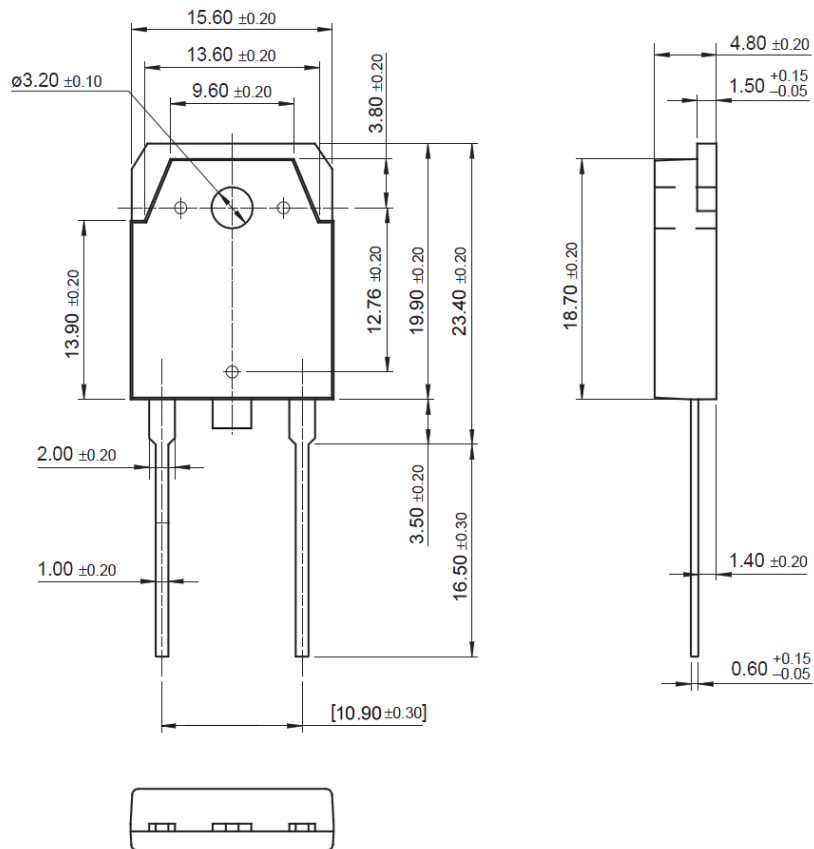


Fig7. Diode Reverse Recovery Test Circuit and Waveform



Dimensions in Millimeters and (Inchs)  
Fig8. Package Outline