



# MMF300YB050U

500V 300A FRED Module

RoHS Compliant

March 2010

PRELIMINARY

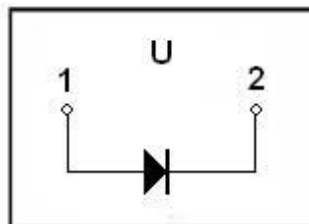
## PRODUCT FEATURES

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



## APPLICATIONS

- Inversion Welder
- Uninterruptible Power Supply (UPS)
- Plating Power Supply
- Ultrasonic Cleaner and Welder
- Converter & Chopper
- Power Factor Correction (PFC) Circuit



## ABSOLUTE MAXIMUM RATINGS

T<sub>C</sub>=25°C unless otherwise specified

Symbol	Parameter	Test Conditions	Values	Unit
V <sub>R</sub>	Maximum D.C. Reverse Voltage		500	V
V <sub>RRM</sub>	Maximum Repetitive Reverse Voltage		500	V
I <sub>F(AV)</sub>	Average Forward Current	T <sub>C</sub> =110°C	300	A
I <sub>F(RMS)</sub>	RMS Forward Current	T <sub>C</sub> =110°C	420	A
I <sub>FSM</sub>	Non-Repetitive Surge Forward Current	1/2 Cycle , 50Hz, Sine	5000	A
		1/2 Cycle , 60Hz, Sine	5500	A
I <sup>2</sup> t	I <sup>2</sup> t (For Fusing)	T <sub>J</sub> =45°C, t=10ms, 50Hz, Sine	125000	A <sup>2</sup> s
		T <sub>J</sub> =45°C, t=8.3ms, 60Hz, Sine	151250	A <sup>2</sup> s
P <sub>D</sub>	Power Dissipation		1136	W
T <sub>J</sub>	Junction Temperature		-40 to +150	°C
T <sub>STG</sub>	Storage Temperature Range		-40 to +125	°C
Torque	Module-to-Sink	Recommended (M6)	3~4.7	N·m
Torque	Module Electrodes	Recommended (M6)	3~4.7	N·m
R <sub>θJC</sub>	Thermal Resistance	Junction-to-Case	0.11	°C /W
Weight			133	g

MacMic Science & Technology Co., Ltd.

Add: #18, Hua Shan Zhong Lu, New District, Changzhou City, Jiangsu Province, P. R .of China

Tel.: +86-519-85163708 Fax: +86-519-85162291 Post Code: 213022 Website: [www.macmicst.com](http://www.macmicst.com)

ELECTRICAL CHARACTERISTICS

T<sub>C</sub>=25°C unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>RM</sub>	Reverse Leakage Current	V <sub>R</sub> =500V	--	--	0.5	mA
		V <sub>R</sub> =500V, T <sub>J</sub> =125°C	--	--	5	mA
V <sub>F</sub>	Forward Voltage	I <sub>F</sub> =300A	--	1.2	1.40	V
		I <sub>F</sub> =300A, T <sub>J</sub> =125°C	--	--	1.25	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> =1A, V <sub>R</sub> =30V, di <sub>F</sub> /dt=-200A/μs	--	68	--	ns
t <sub>rr</sub>	Reverse Recovery Time	V <sub>R</sub> =250V, I <sub>F</sub> =300A	--	160	--	ns
I <sub>RRM</sub>	Max. Reverse Recovery Current	di <sub>F</sub> /dt=-200A/μs, T <sub>J</sub> =25°C	--	15	--	A
t <sub>rr</sub>	Reverse Recovery Time	V <sub>R</sub> =250V, I <sub>F</sub> =300A	--	340	--	ns
I <sub>RRM</sub>	Max. Reverse Recovery Current	di <sub>F</sub> /dt=-200A/μs, T <sub>J</sub> =125°C	--	34	--	A

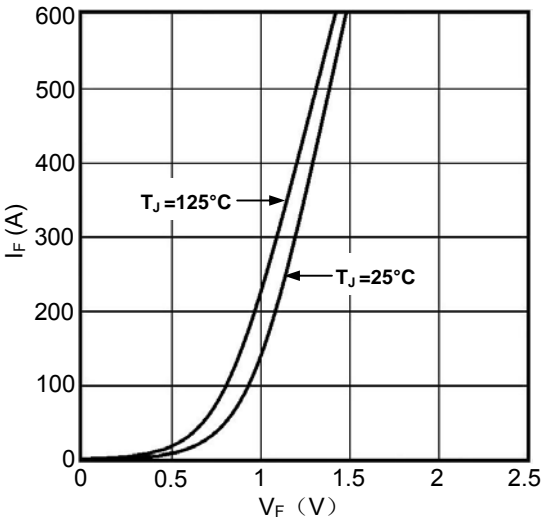


Figure1. Forward Voltage Drop vs Forward Current

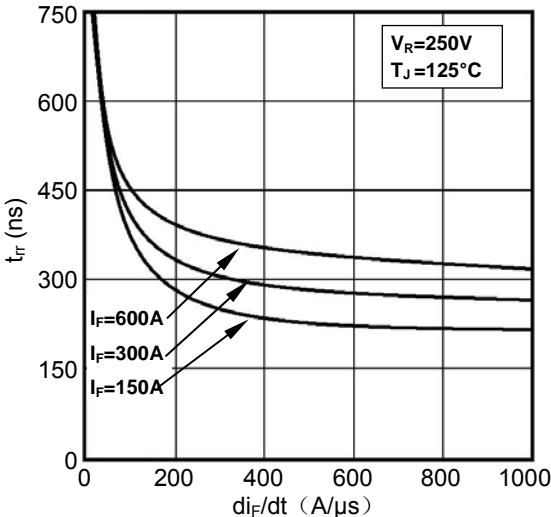


Figure2. Reverse Recovery Time vs di<sub>F</sub>/dt

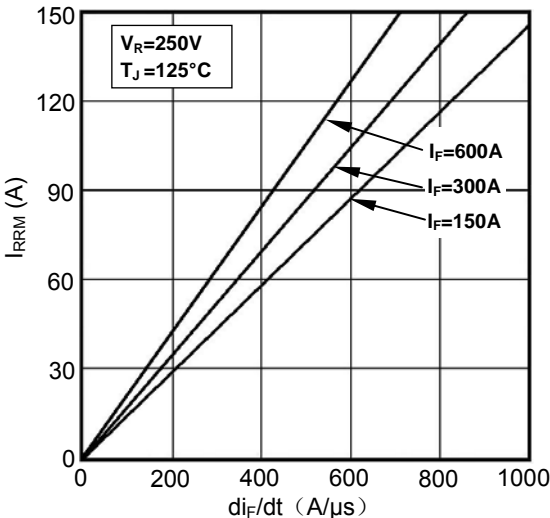


Figure3. Reverse Recovery Current vs di<sub>F</sub>/dt

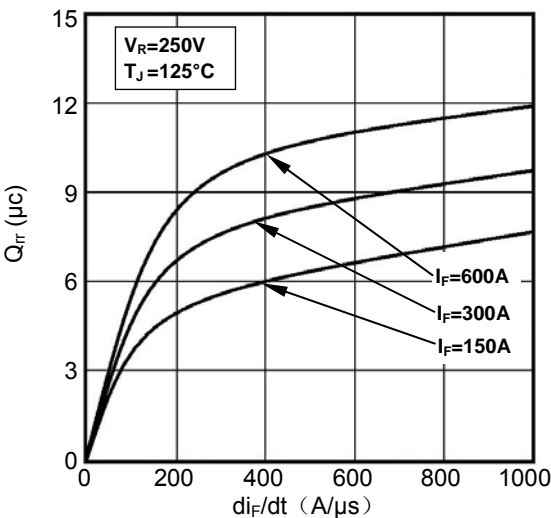


Figure4. Reverse Recovery Charge vs di<sub>F</sub>/dt

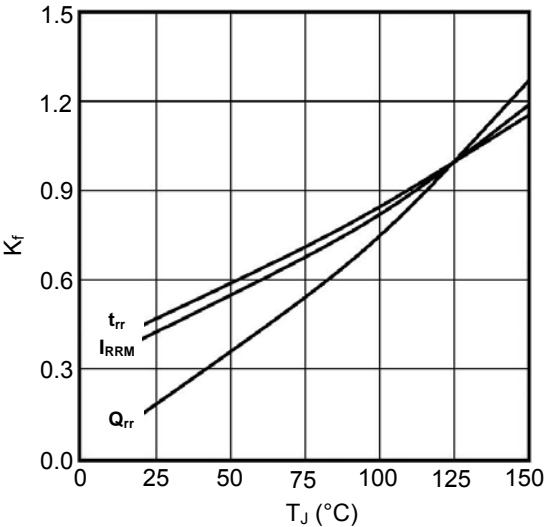


Figure5. Dynamic Parameters vs Junction Temperature

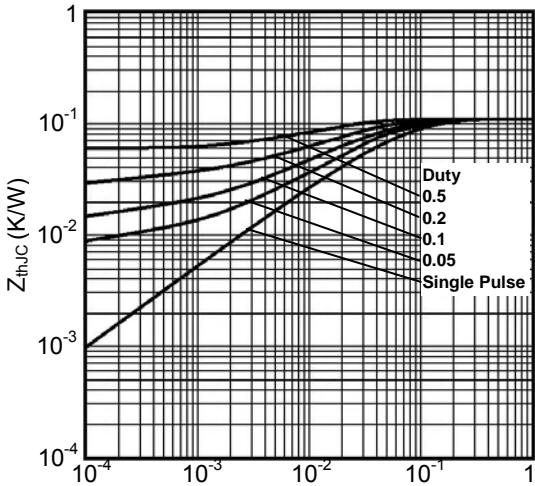
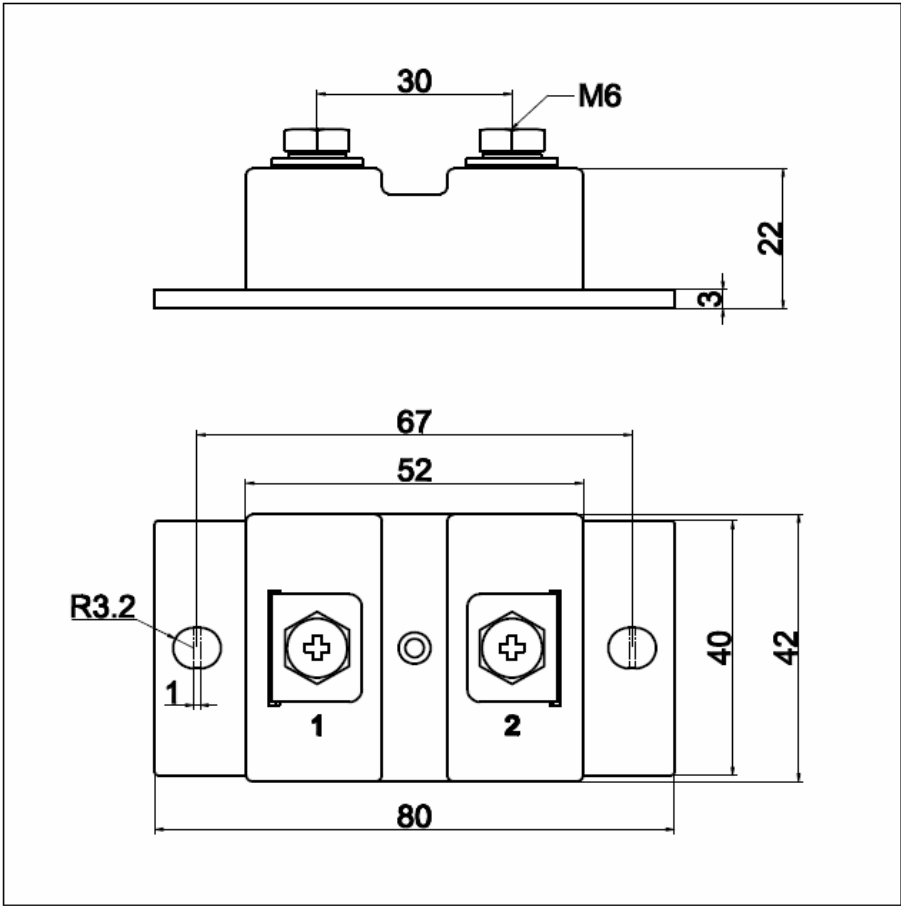


Figure6. Transient Thermal Impedance



Dimensions (mm)  
Figure7. Package Outline