



## FRED Modules

**V<sub>RRM</sub>** 600V

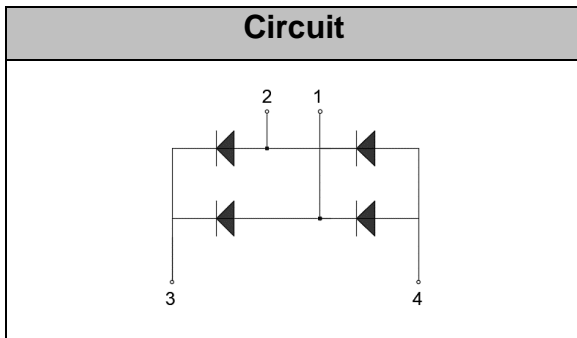
**I<sub>FAV</sub>** 60A

### Applications

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

### Features

- Soft Reverse Recovery Characteristics
- Ultrafast Reverse Recovery Time
- Low Reverse Recovery Loss
- Low Forward Voltage
- High Surge Current Capability
- Popular SOT-227 Package



## Maximum Ratings

Symbol	Conditions	Values	Units
V <sub>R</sub>		600	V
V <sub>RRM</sub>		600	V
I <sub>D</sub>	Single phase ,half wave 180°conduction T <sub>c</sub> =85°C	60	A
I <sub>FSM</sub>	1/2 Cycle , 50Hz, Sine	380	A
I <sup>2</sup> t	T <sub>J</sub> =45°C, t=10ms, 50Hz, Sine	720	A <sup>2</sup> s
P <sub>D</sub>	T <sub>c</sub> =25°C	152	W
T <sub>J</sub>		-40 to +150	°C
T <sub>STG</sub>		-40 to +125	°C
Visol	3000V AC 1min	1	mA
Torque	To Sink Recommended (M4)	0.7~1.1	N·m
Torque	To Terminal Recommended (M4)	0.7~1.1	N·m
Weight		26	g

## Thermal Characteristics

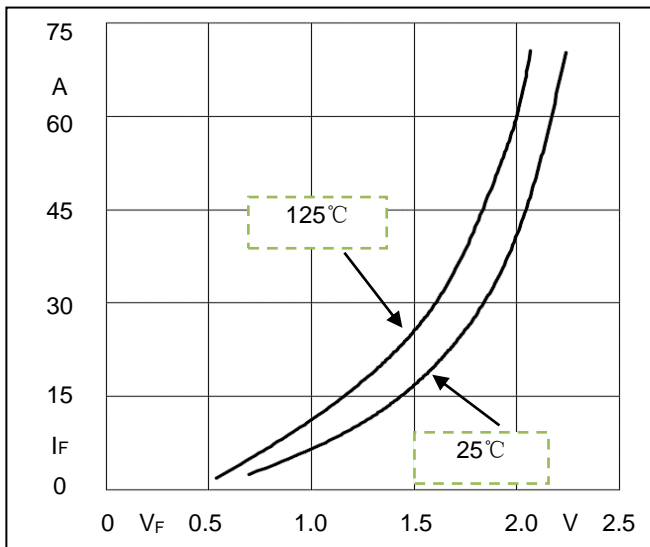
Symbol	Conditions	Values	Units
R <sub>th(j-c)</sub>	Per diode	1	°C/W
R <sub>th(j-c)</sub>	Per module	0.25	°C/W



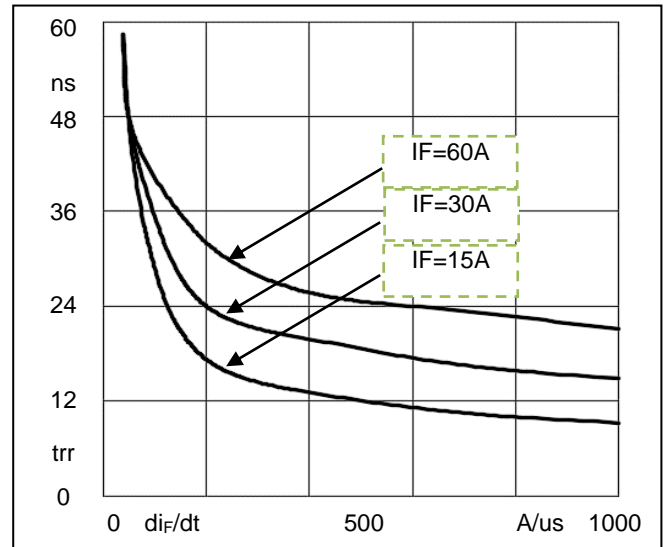
**Electrical Characteristics**

Symbol	Conditions	Values			Units
		Min.	Typ.	Max.	
$I_{RM}$	$V_R=600V$	--	--	0.1	mA
	$V_R=600V, T_J=125^{\circ}C$	--	--	2	mA
$V_F$	$I_F=30A$	--	1.65	1.8	V
	$I_F=30A, T_J=125^{\circ}C$	--		1.7	V
$t_{rr}$	$I_F=1A, V_R=30V, di_F/dt=-200A/\mu s$	--	24		ns

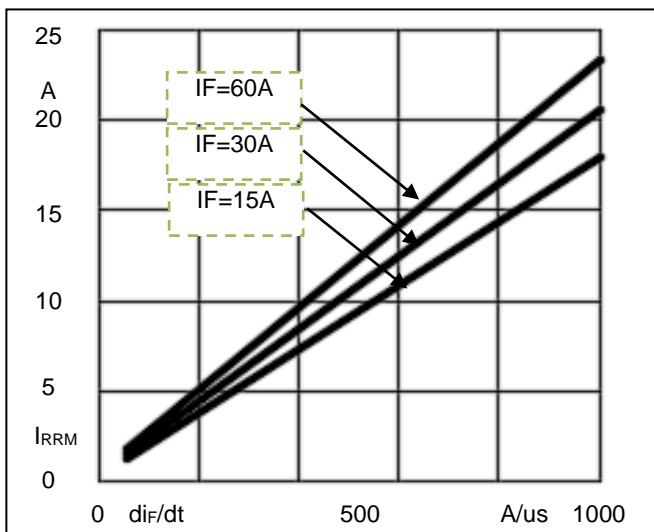
**Performance Curves**



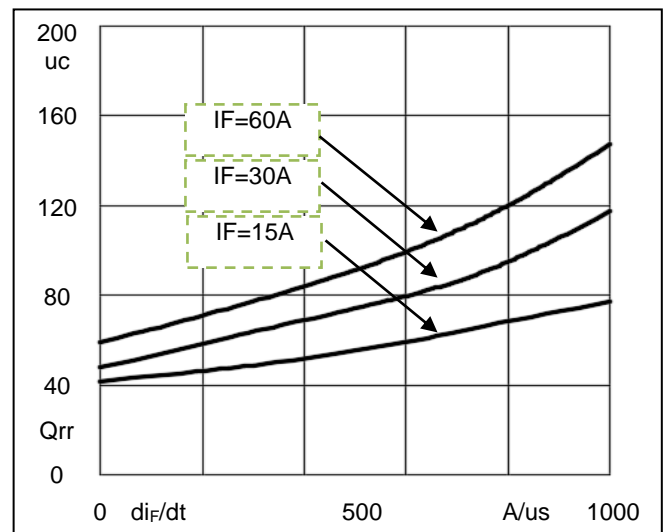
**Fig1. Forward Voltage Drop vs Forward Current**



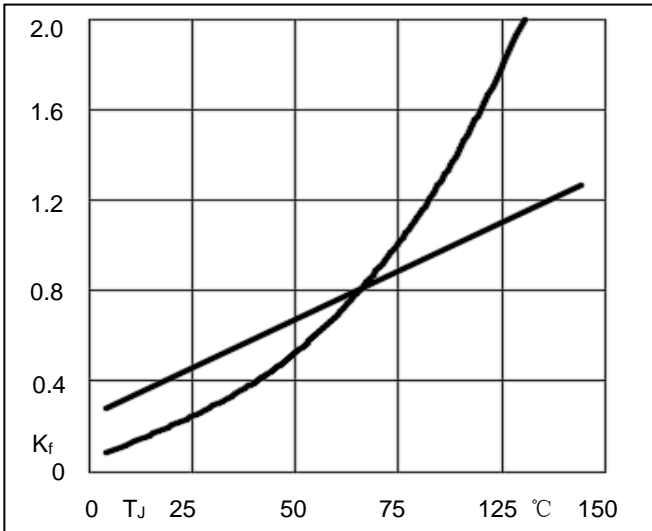
**Fig2. Reverse Recovery Time vs  $di_F/dt$**



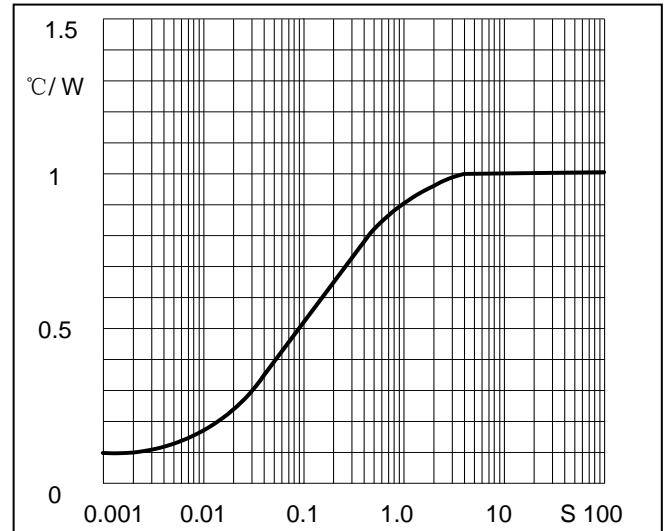
**Fig3. Reverse Recovery Current vs  $di_F/dt$**



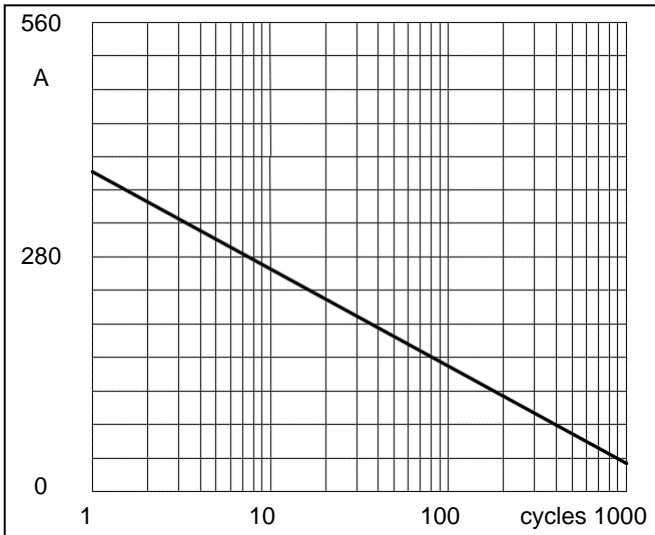
**Fig4. Reverse Recovery Charge vs  $di_F/dt$**



**Fig5. Dynamic Parameters vs Junction Temperature**



**Fig6. Transient Thermal Impedance**

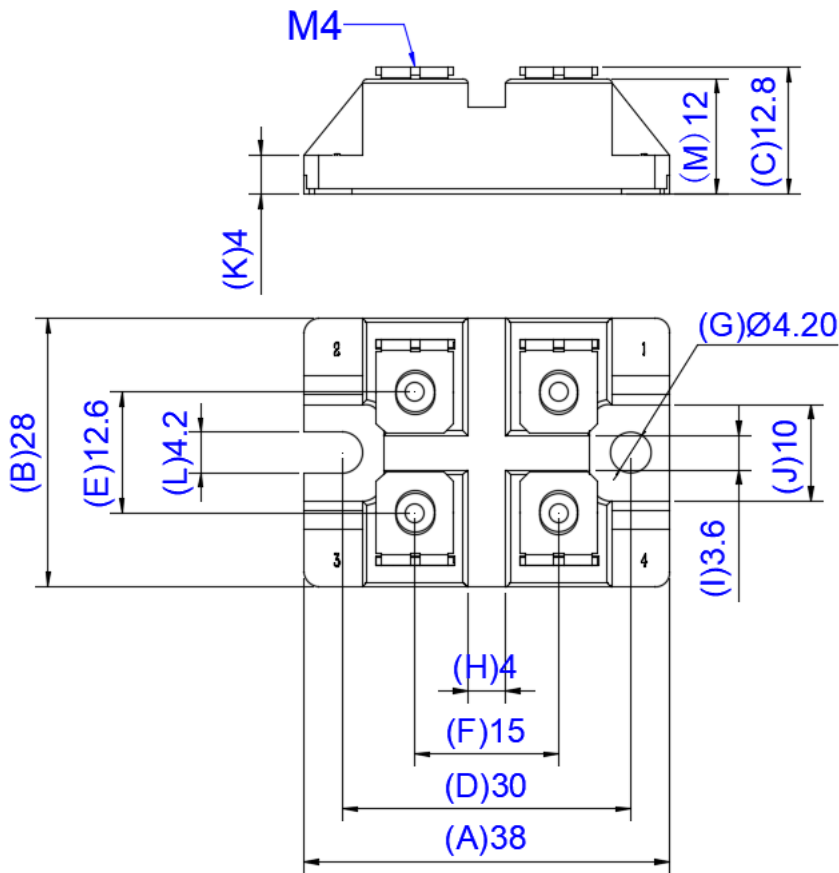


**Fig7. Max Non-Repetitive Forward Surge Current**

## Package Outline Information

CASE: FJ

Dimensions in mm



SMAF		
Dim	Min	Max
A	37.5	38.5
B	27.5	28.5
C	12.8	13.5
D	29.5	30.5
E	12.1	13.1
F	14.5	15.5
G	4	4.4
H	3.8	4.2
I	3.4	3.8
J	9.5	10.5
K	4	4.5
L	4	4.4
M	12	12.5