



## FRED Modules

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

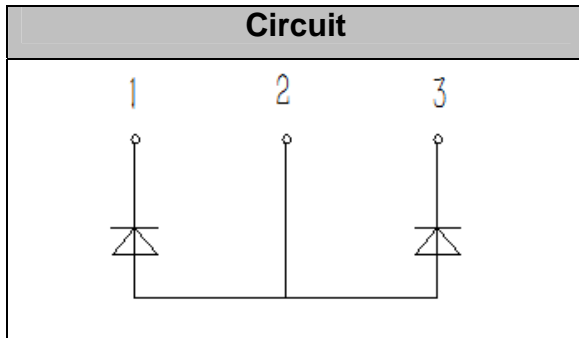
**I<sub>FAV</sub>** 300 A

### 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
- Low Inductance Package



## Maximum Ratings

Symbol	Conditions	Values	Units
$V_R$		600	V
$V_{RRM}$		600	V
$I_{F(AV)}$	$T_C=110^{\circ}\text{C}$ , Per Diode	300	A
$I_{F(RMS)}$	$T_C=110^{\circ}\text{C}$ , Per Diode	420	A
$I_{FSM}$	1/2 Cycle, 50Hz, Sine	3000	A
	1/2 Cycle, 60Hz, Sine	3200	A
$I^2t$	$T_J=45^{\circ}\text{C}$ , $t=10\text{ms}$ , 50Hz, Sine	45000	$\text{A}^2\text{s}$
	$T_J=45^{\circ}\text{C}$ , $t=8.3\text{ms}$ , 60Hz, Sine	51200	$\text{A}^2\text{s}$
$P_D$		890	W
Visol	AC, $T_{on}=1\text{min}$	3000	V
$T_J$		-40 to +150	$^{\circ}\text{C}$
$T_{STG}$		-40 to +125	$^{\circ}\text{C}$
Torque	Recommended (M6)	$4\pm 15\%$	N·m
Torque	Recommended (M6)	$4\pm 15\%$	N·m
Weight		160	g

## Thermal Characteristics

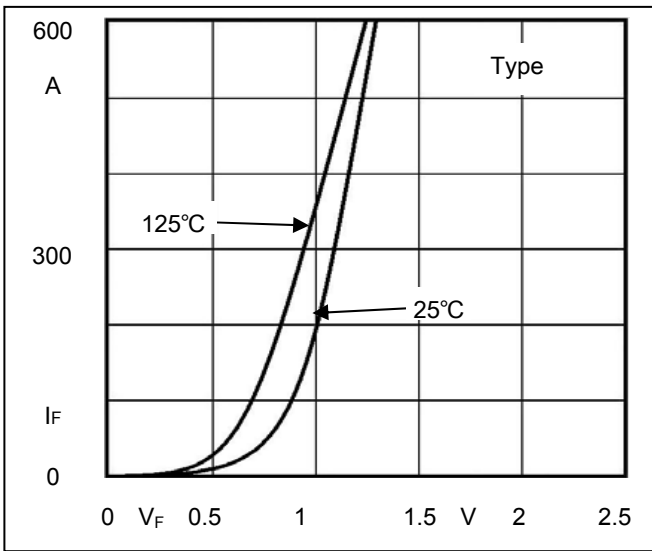
Symbol	Conditions	Values	Units
$R_{th(j-c)}$	Per Module	0.14	$^{\circ}\text{C}/\text{W}$



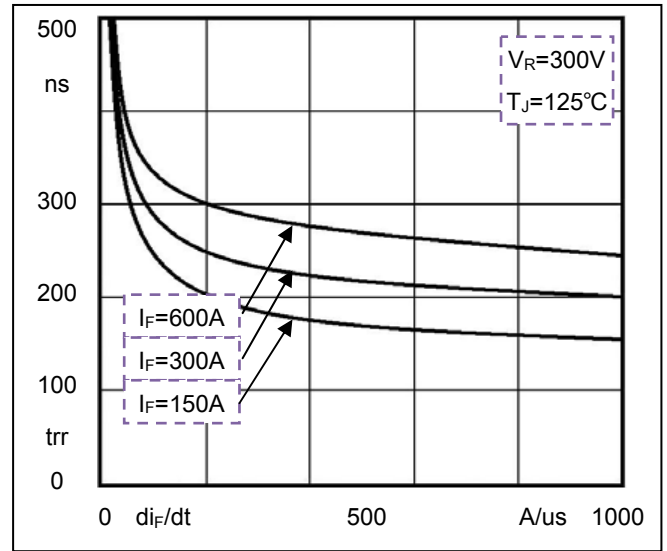
**Electrical Characteristics**

Symbol	Conditions	Values			Units
		Min.	Typ.	Max.	
$I_{RM}$	$V_R=600V$	--	--	0.5	mA
	$V_R=600V, T_J=125^\circ C$	--	--	5	mA
$V_F$	$I_F=300A$	--	1.15	1.65	V
	$I_F=300A, T_J=125^\circ C$	--	0.9	1.45	V
$t_{rr}$	$I_F=1A, V_R=30V, di_F/dt=-200A/\mu s$	--	55	--	ns
$t_{rr}$	$V_R=300V, I_F=300A, di_F/dt=-200A/\mu s, T_J=25^\circ C$	--	145	--	ns
$I_{RRM}$		--	17	--	A
$t_{rr}$	$V_R=300V, I_F=300A, di_F/dt=-200A/\mu s, T_J=125^\circ C$	--	240	--	ns
$I_{RRM}$		--	30	--	A

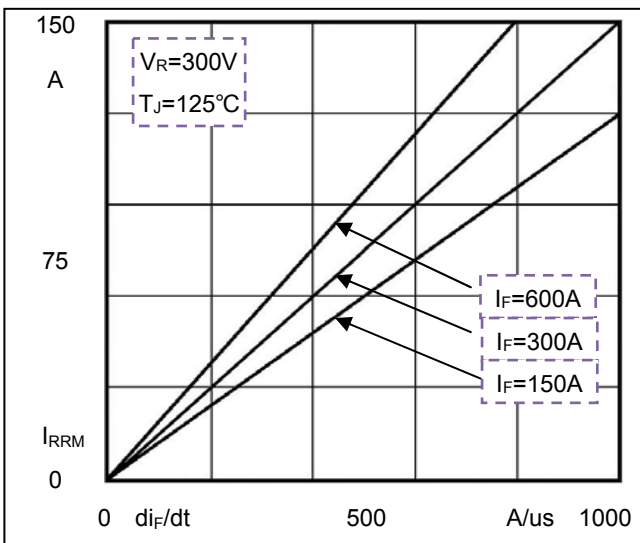
**Performance Curves**



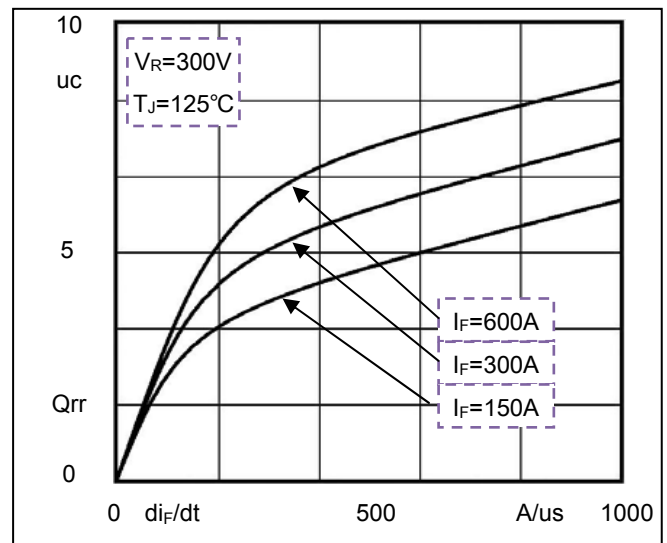
**Fig1. Forward Voltage Drop vs Forward Current**



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



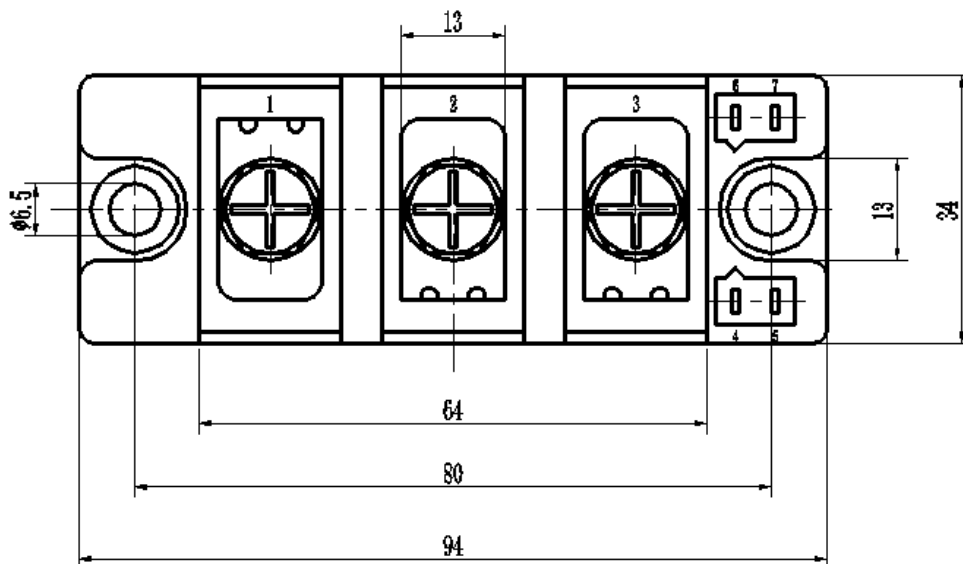
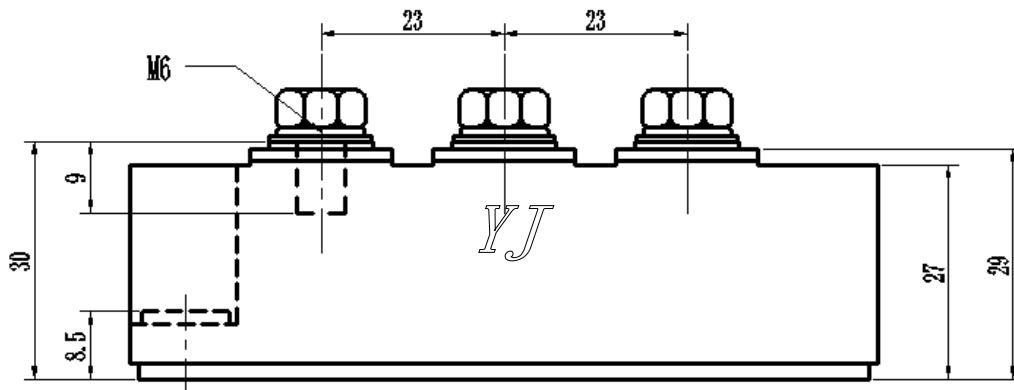
**Fig3. Reverse Recovery Current vs  $di_F/dt$**



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

## Package Outline Information

CASE: F2



Dimensions in mm

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