



FRED Modules

V_{RRM} 1200V

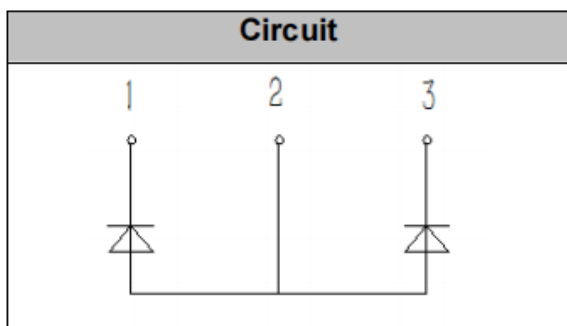
I_{FAV} 400 A

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		1200	V
V_{RRM}		1200	V
$I_{F(AV)}$	$T_C=90^{\circ}\text{C}$,	400	A
$I_{F(RMS)}$	$T_C=90^{\circ}\text{C}$,	560	A
I_{FSM}	1/2 Cycle , 50Hz, Sine	3200	A
	1/2 Cycle , 60Hz, Sine	3500	A
I^2t	$T_J=45^{\circ}\text{C}$, $t=10\text{ms}$, 50Hz, Sine	51200	A^2s
	$T_J=45^{\circ}\text{C}$, $t=8.3\text{ms}$, 60Hz, Sine		
P_D		1130	W
V_{ISOL}	a.c.50HZ;r.m.s.;1min	3000	V
T_J		-40 to +150	$^{\circ}\text{C}$
T_{STG}		-40 to +125	$^{\circ}\text{C}$
Torque	Module-to-Sink Recommended (M6)	4.5	N·m
Torque	Module Electrodes Recommended (M6)	4.5	N·m
Weight		160	g

Thermal Characteristics

Symbol	Conditions	Values	Units
$R_{th(j-c)}$	Per Diode	0.44	$^{\circ}\text{C/W}$
$R_{th(j-c)}$	Per Module	0.22	$^{\circ}\text{C/W}$
$R_{th(c-s)}$	Per Module	0.05	$^{\circ}\text{C/W}$



Electrical Characteristics

Symbol	Conditions	Values			Units
		Min.	Typ.	Max.	
I_{RM}	$V_R=1200V$	--	--	1	mA
	$V_R=1200V, T_J=125^{\circ}C$	--	--	5	mA
V_F	$I_F=400A$	--	1.8	2.0	V
	$I_F=400A, T_J=125^{\circ}C$	--	1.7	1.9	V
V_{FO}	$T_J=25^{\circ}C$	--	1.07	--	V
	$T_J=125^{\circ}C$	--	0.90	--	V
r_F	$T_J=25^{\circ}C$	--	1.83	--	m Ω
	$T_J=125^{\circ}C$	--	2.00	--	m Ω
t_{rr}	$V_R=600V, I_F=400A, di_F/dt=-200A/\mu s, T_J=25^{\circ}C$	--	190	--	ns
I_{RRM}		--	15	--	A
t_{rr}	$V_R=600V, I_F=400A, di_F/dt=-200A/\mu s, T_J=125^{\circ}C$	--	500	--	ns
I_{RRM}		--	35	--	A

Performance Curves

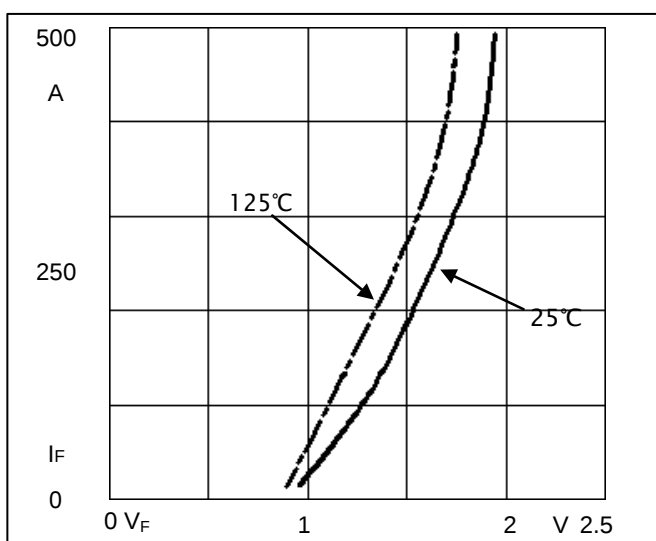


Fig1. Forward Voltage Drop vs Forward Current

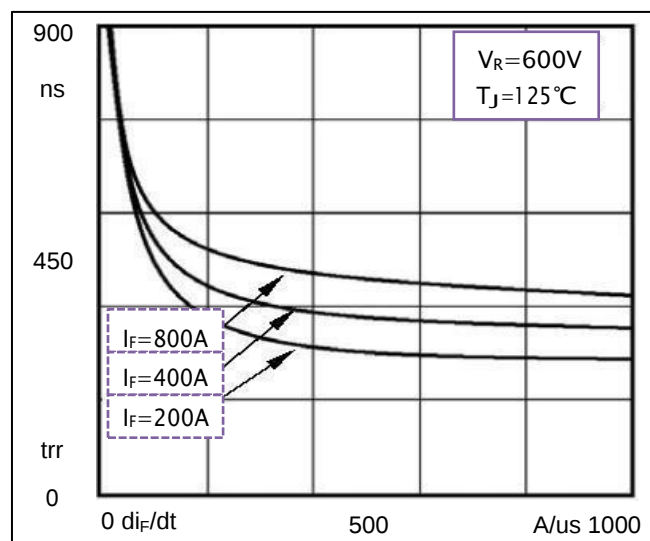


Fig2. Reverse Recovery Time vs di_F/dt

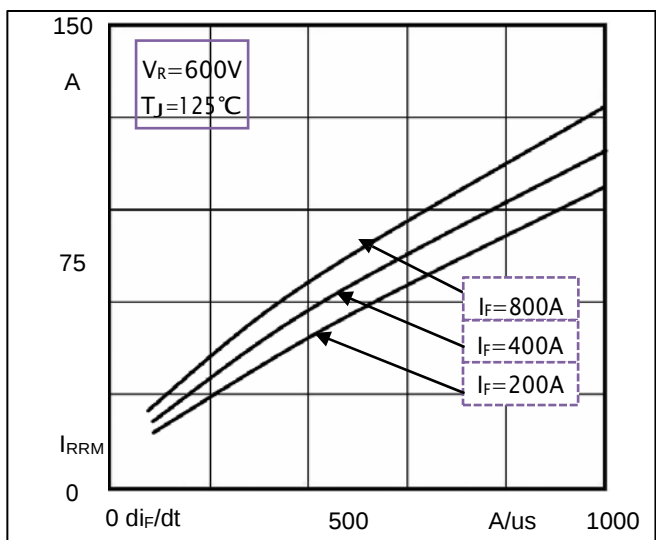


Fig3. Reverse Recovery Current vs di_F/dt

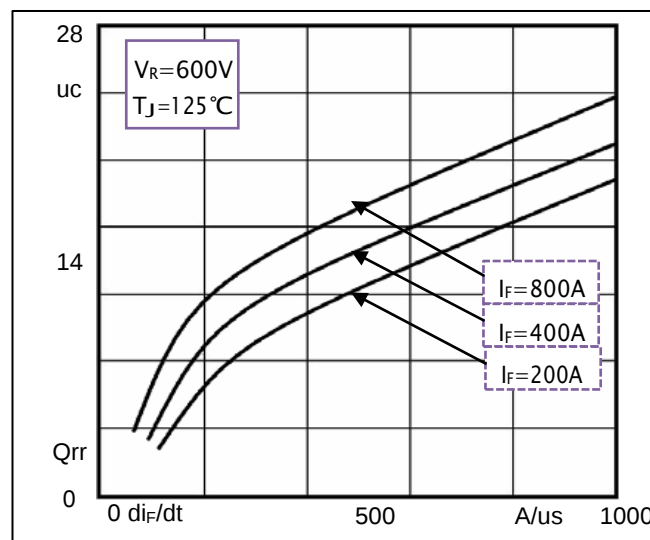
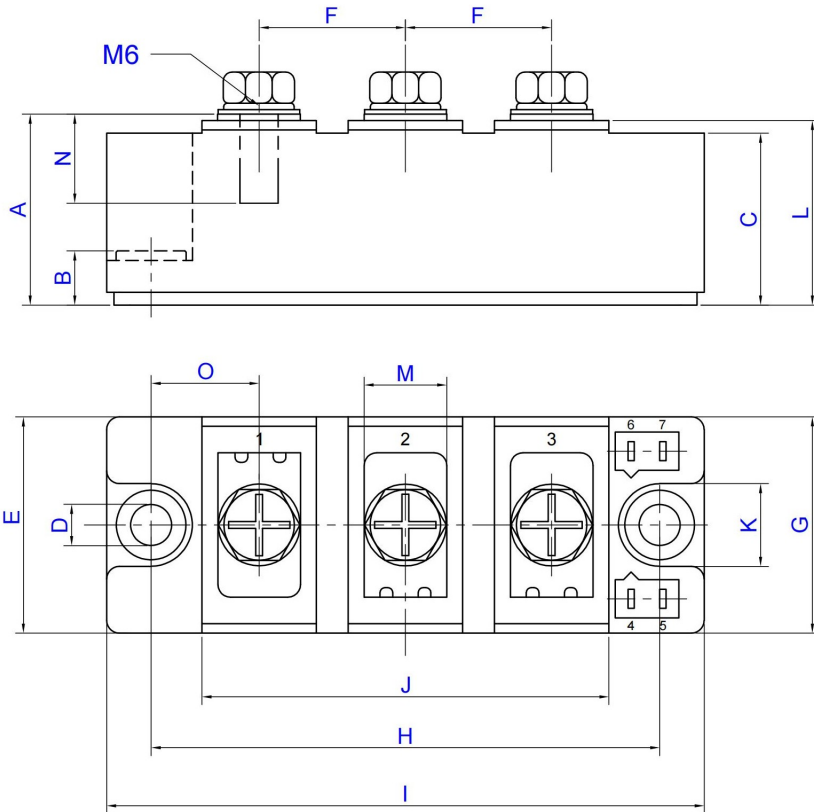


Fig4. Reverse Recovery Charge vs di_F/dt

Package Outline Information

CASE: F2



DIM	Min (mm)	Max (mm)	Note
A	29.5	30.5	
B	8.0	9.0	
C	26.5	27.5	
D	6.2	6.8	Ø
E	33.5	34.5	
F	22.5	23.5	
G	12.9	13.1	
H	79.5	80.5	
I	93.5	94.5	
J	63.5	64.5	
K	12.5	13.5	
L	28.5	29.5	
M	12.5	13.5	
N	13.5	14.5	
O	16.5	17.5	

Packing Standard

Item	Length: A (mm)	Width: B (mm)	Height: C (mm)	Quantity (PCS)
Inner Box	276	258	40	8
Outer Carton	545	295	240	80



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