

600V FRD Full Bridge Module

Description

The Fast Recovery Diode module devices used Full Bridge Structure, and optimized to reduce losses and EMI/RFI in high frequency power conditioning electrical systems.

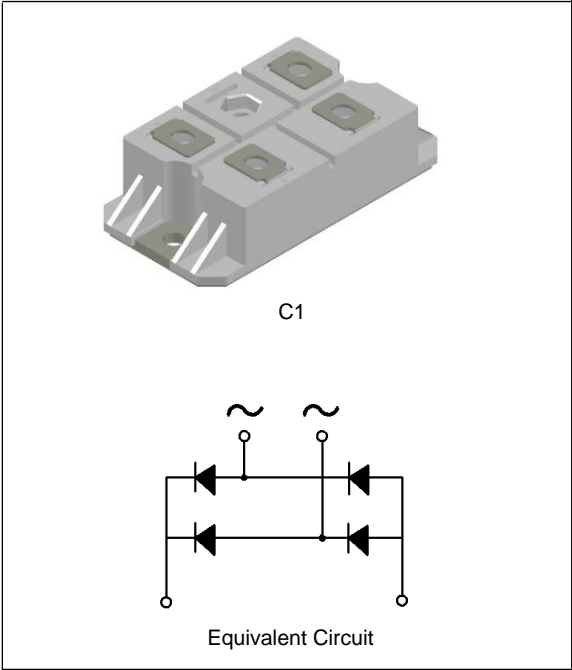
The Fast Recovery Diode module is ideally suited for power converters, inverter welders, motor drives and other applications where switching losses are significant portion of the total losses.

Features

- Repetitive Reverse Voltage: $V_{RRM} = 600V$
- Low Forward Voltage: $V_F(\text{typ.}) = 1.5V @ I_F=80A$
- Average Forward Current: $I_{F(AV)} = 80A @ T_C=100^\circ C$
- Reverse Recovery Time: $t_{rr}(\text{typ.}) = 85ns$
- Extensive Characterization of Recovery Parameters
- Reduced EMI and RFI
- Isolation Type Package
- $150^\circ C$ Operating Junction Temperature
- Built-in Full Bridge FRD Construction

Applications

- High Speed & High Power Converters, Inverter Welders
- Various Switching and Telecommunication Power Supply
- Cutting Machine



Absolute Maximum Ratings ($T_C=25^\circ C$, unless otherwise noted)

Symbol	Parameter			Ratings	Unit
V _{RRM}	Repetitive Peak Reverse Voltage			600	V
V _R	DC Blocking Voltage			480	V
I _{F(AV)}	Average Rectified Forward Current	Per Diode	T _C = 25℃	160	A
			T _C = 100℃	80	
		Per Package	T _C = 25℃	640	
			T _C = 100℃	320	
I _{FSM}	Non-repetitive Peak Surge Current (Per Diode) 60Hz Single Half-sine Wave			1750	A
I ² t	I ² t For Fusing 60Hz Sine Wave			12.7 * 10 ³	A ² S
P _D	Maximum Power Dissipation			270	W
V _{iso}	Isolation Voltage @AC 1 Minutes			2500	V
T _J	Junction Temperature			-55 ~ +150	℃
T _{STG}	Storage Temperature Range			-55 ~ +150	℃
	Mounting Torque (M5)			4.0	N.m
	Terminal Torque (M5)			2.0	N.m
	Weight			137	g

Electrical Characteristics (Per Diode, $T_C=25\text{ }^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage Drop	$I_F=80\text{A}$	-	1.5	1.8	V
		$I_F=80\text{A}$, $T_C=100^{\circ}\text{C}$	-	1.35	-	V
I_{RM}	Reverse Leakage Current	$V_R=600\text{V}$	-	-	0.5	mA
		$V_R=600\text{V}$, $T_C=100^{\circ}\text{C}$	-	-	1	mA
t_{rr}	Reverse Recovery Time	$I_F=1\text{A}$, $di/dt=-200\text{A/us}$	-	35	-	ns
t_{rr}	Reverse Recovery Time	$I_F=80\text{A}$, $di/dt=-200\text{A/us}$	-	85	110	ns
I_{rr}	Reverse Recovery Current		-	12.0	-	A
t_{rr}	Reverse Recovery Time	$I_F=80\text{A}$, $di/dt=-200\text{A/us}$, $T_C=100^{\circ}\text{C}$	-	200	-	ns
I_{rr}	Reverse Recovery Current		-	24.0	-	A

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{th(J-C)}$	Thermal Resistance, Junction to case	0.46	$^{\circ}\text{C/W}$

Typical Performance Characteristics

Fig. 1. Typical Characteristics: V_F vs. I_F

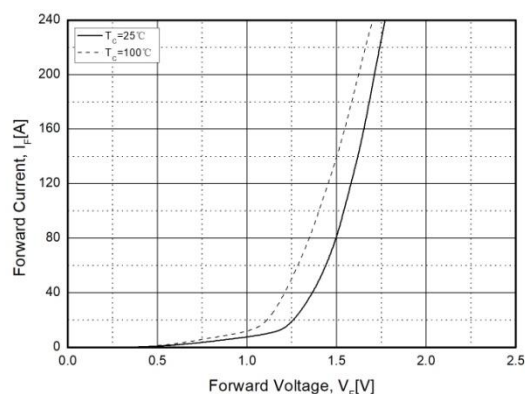


Fig. 2. Typical Reverse Recovery Time vs. di/dt

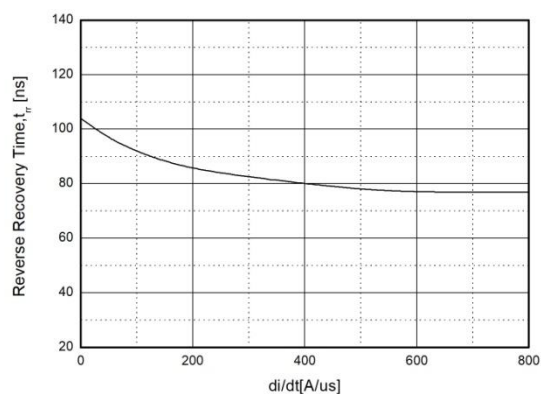


Fig. 3. Transient Thermal Impedance Characteristics ($R_{th(J-C)}$)

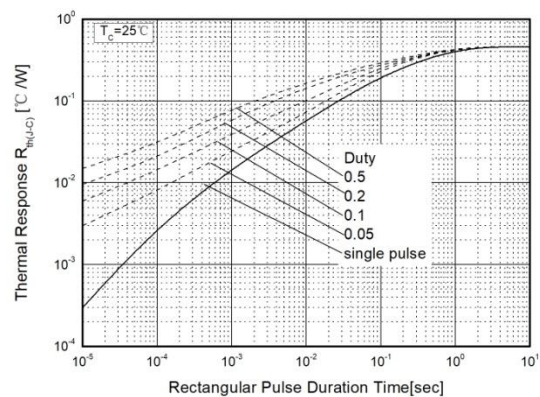
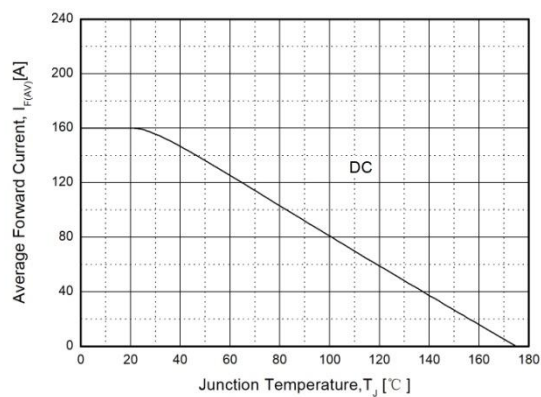
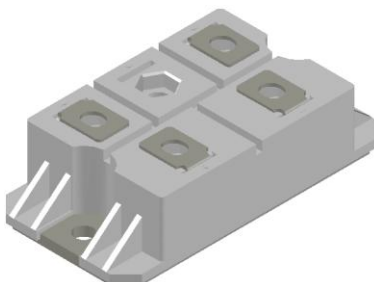


Fig. 4. Forward Current Derating Curve



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Technical drawing of a 4-pin DIN connector. The drawing includes three views: a top view, a side view, and a front view. Dimensions are given in millimeters (mm) with tolerances.

Top View Dimensions:

- Overall width: 82 ± 0.5
- Width of the central section: 66 ± 0.5
- Width of the side section: 60 ± 0.5
- Distance between the centers of the two outer pins: 20 ± 0.5
- Distance between the centers of the two inner pins: 20 ± 0.5
- Pin diameter: $\phi 5.5 \pm 0.2$
- Pin thread: M5
- Overall height: 42 ± 0.5
- Height of the side section: 20 ± 0.5
- Distance between the centers of the two bottom pins: 30 ± 0.5

Side View Dimensions:

- Overall width: 80 ± 0.5
- Height of the side section: 1 ± 0.2
- Height of the central section: 10 ± 0.2
- Maximum height: Max 23

Front View Dimensions:

- Distance between the centers of the two pins: 14.5 ± 0.2
- Overall width: 40 ± 0.2
- Height of the side section: 3 ± 0.2