600V Isolation FRD Module

Description

The Fast Recovery Diode module devices are 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(typ.) = 1.55V @ I_F=160A
• Average Forward Current: $I_{F(AV)}$ = 160A @ T_C=100℃
• Reverse Recovery Time: t_{rr}(typ.) =250ns
• Extensive Characterization of Recovery Parameters
• Reduced EMI and RFI
• Isolation Type Package
• 150℃ Operating Junction Temperature
• Built-in Dual FRD Construction

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Internal Circuit
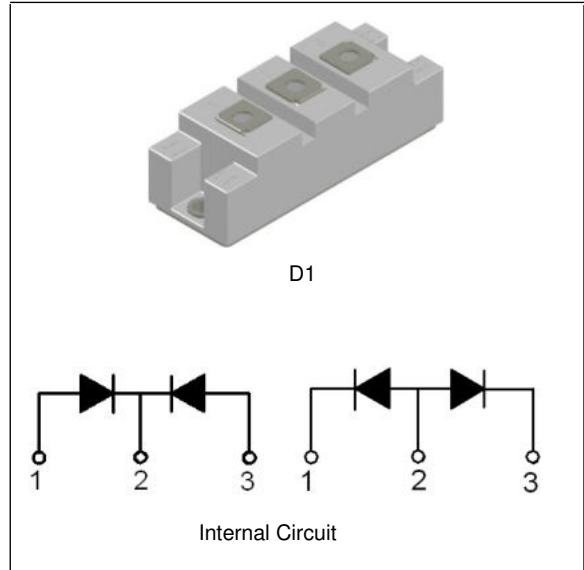
Applications

• High Speed & High Power converters, Inverter Welders
• Various Switching and Telecommunication Power Supply
• Cutting Machine

Absolute Maximum Ratings (T$_C$=25 ℃, 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℃		320	A
			T_C = 100℃		160	
		Per Package	T_C = 25℃		640	
			T_C = 100℃		320	
I_{FSM}	Non-repetitive Peak Surge Current (Per Diode) 60Hz Single Half-sine Wave				2750	A
I^2t	I^2t For Fusing 60Hz Sine Wave				31.4 * 10^3	A^{2}S
P_D	Maximum Power Dissipation				450	W
V_{iso}	Isolation Voltage @AC 1 Minutes				3300	V
T_J	Junction Temperature				-55 ~ +150	℃
T_{STG}	Storage Temperature Range				-55 ~ +150	℃
	Mounting Torque (M5)				4.0	N.m
	Terminal Torque (M5)				3.0	N.m
	Weight				145	g

Electrical Characteristics (Per Diode, T_C=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage Drop	I_F=160A	-	1.55	1.8	V
		I_F=160A, T_C=100℃	-	1.45	-	V
I_{RM}	Reverse Leakage Current	V_R=600V	-	-	0.5	mA
		V_R=600V, T_C=100℃	-	-	1	mA
t_{rr}	Reverse Recovery Time	I_F=1A, di/dt=-200A/us	-	35	-	ns
t_{rr}	Reverse Recovery Time	I_F=160A, di/dt=-200A/us	-	250	180	ns
I_{rr}	Reverse Recovery Current		-	20.4	-	A
t_{rr}	Reverse Recovery Time	I_F=160A, di/dt=-200A/us, T_C=100℃	-	450	-	ns
I_{rr}	Reverse Recovery Current		-	43.5	-	A

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{th(J-C)}$	Thermal Resistance, Junction to case	0.33	℃/W

Typical Performance Characteristics

Fig. 1. Typical Characteristics: V_F vs. I_F

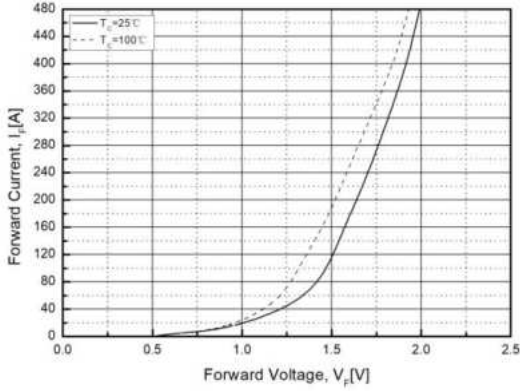

Fig. 2. Typical Reverse Recovery Time vs. di/dt

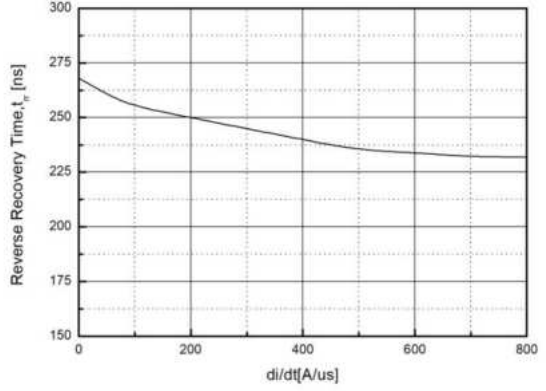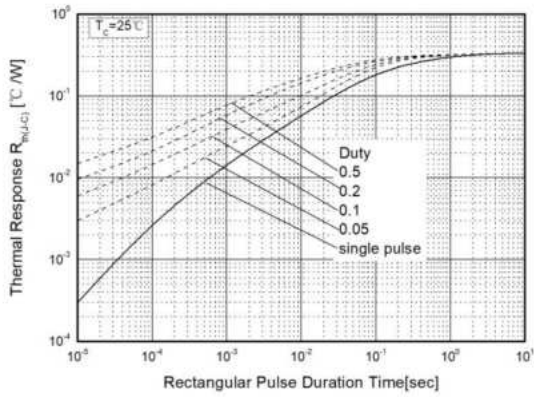Fig. 3. Transient Thermal Impedance
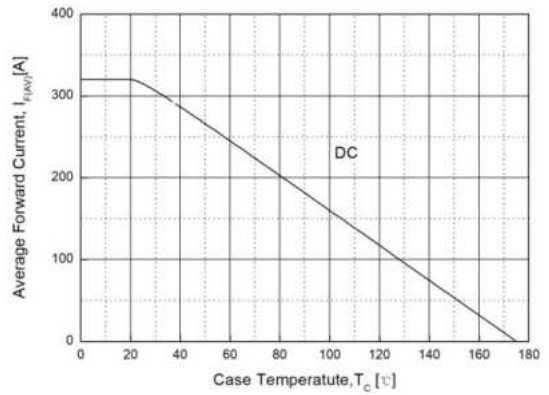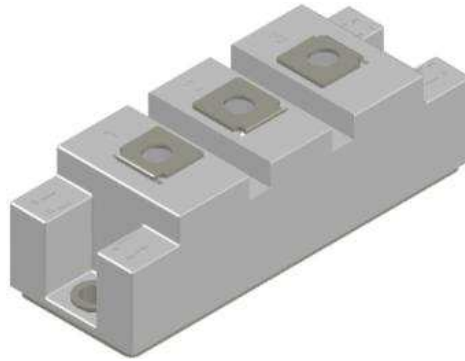Characteristics ($R_{th(J-C)}$)

Fig. 4. Forward Current Derating Curve

Package Dimensions

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(Dimensions in Millimeters)