MM75F170B

1700V 75A FRED

December 2024 Version 01 RoHS Compliant

PRODUCT FEATURES

☐Ultrafast Recovery Time

☐Low Recovery Loss

☐Soft Reverse Recovery Characteristics

☐Low Leakage Current

☐Low Forward Voltage

☐High Surge Current Capability

APPLICATIONS

☐Freewheeling, Snubber, Clamp

☐Inversion Welder

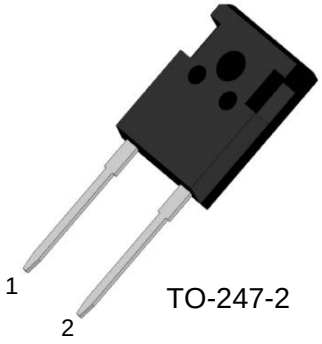
☐PFC

☐Plating Power Supply

☐Ultrasonic Cleaner and Welder

☐Converter & Chopper

☐UPS



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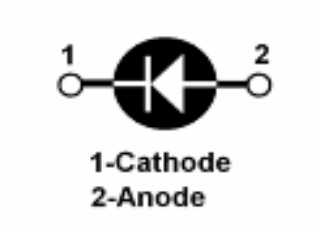
DESCRIPTION

FRED from MacMic utilizes advanced processing techniques to achieve ultrafast recovery times and higher forward current. Its soft recovery characteristics and high reliability suit for wide industrial applications.



ABSOLUTE MAXIMUM RATINGS (T_C=25°C unless otherwise specified)

Symbol	Parameter/Test Conditions		Values	Unit
V_R	Maximum D.C. Reverse Voltage		1700	V
V_{RRM}	Maximum Repetitive Reverse Voltage			
$I_{F(AV)}$	Average Forward Current	T_C=105℃	75	A
$I_{F(RMS)}$	RMS Forward Current	T_C=105℃	105	
I_{FSM}	Non Repetitive Surge Forward Current	T_J=25℃,t=10ms, 50Hz, Sine	700	
P_D	Power Dissipation		625	W
T_J	Junction Temperature		-55 to +150	℃
T_{op}	Operation Temperature		-55 to +150	℃
T_{STG}	Storage Temperature Range		-55 to +125	℃
Torque	To Heat Sink	Recommended（M3）	1.1	Nm
R_{thJC}	Junction to Case Thermal Resistance		0.24	℃ /W
Weight			6	g

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ELECTRICAL CHARACTERISTICS *(T_C=25°C unless otherwise specified)*

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
I_{RM}	Maximum Reverse Leakage Current	V_R =1700V			200	μA
		V_R =1700V, T_J = 150℃			2	mA
V_F	Forward Voltage	I_F=60A		1.85		V
		I_F=75A		2.00	2.40	
		I_F=150A		2.60		
		I_F=60A,T_J=125℃		1.95		
		I_F=75A,T_J=125℃		2.15	2.80	
		I_F=150A,T_J=125℃		2.95		
		I_F=60A,T_J=150℃		2.00		
		I_F=75A,T_J=150℃		2.20	2.80	
		I_F=150A,T_J=150℃		3.05		
C_J	Junction Capacitance	V_R=1200V,f=1MHz		40		pF
trr	Reverse Recovery Time	I_F =60A,V_R =1200V, dI_F/dt = -800A/μs		490		ns
I_{RRM}	Maximum Reverse Recovery Current			39		A
Q_{RR}	Reverse Recovery Charge			11.0		nC
trr	Reverse Recovery Time	I_F =60A,V_R =1200V, dI_F/dt = -800A/μs ,T_J=100℃		585		ns
I_{RRM}	Maximum Reverse Recovery Current			52		A
Q_{RR}	Reverse Recovery Charge			16.5		nC
trr	Reverse Recovery Time	I_F =60A,V_R =1200V, dI_F/dt = -800A/μs ,T_J=125℃		630		ns
I_{RRM}	Maximum Reverse Recovery Current			56		A
Q_{RR}	Reverse Recovery Charge			18.5		nC

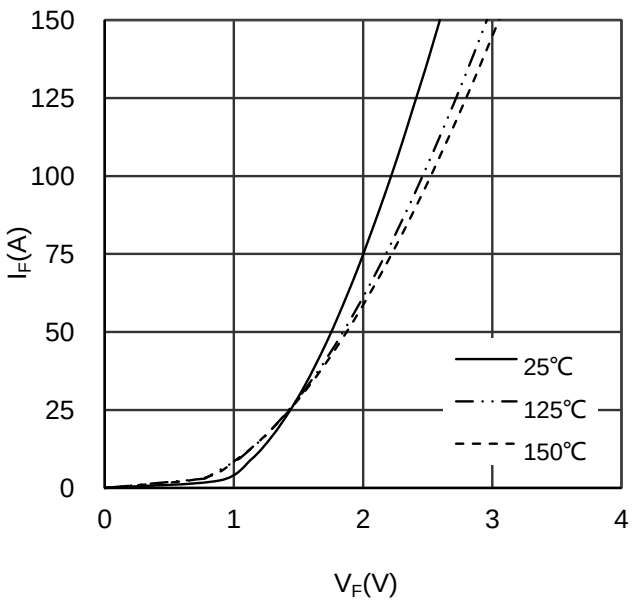


Figure 1. Forward Voltage Drop vs Forward Current

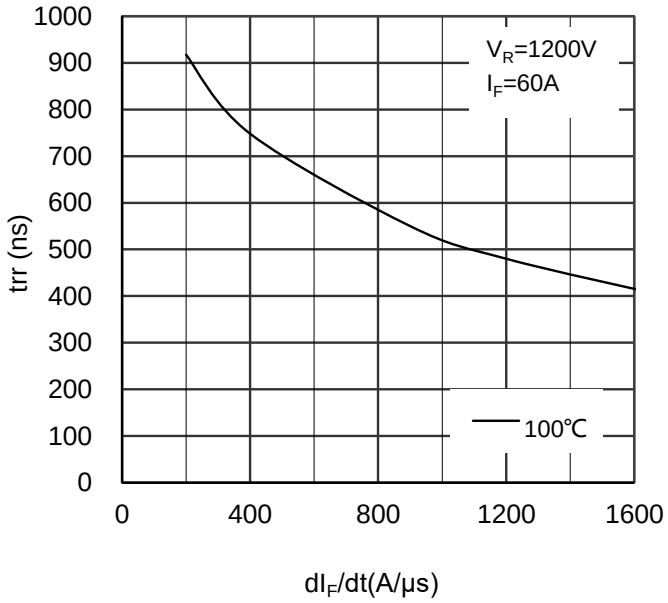


Figure 2. Reverse Recovery Time vs dI_F/dt

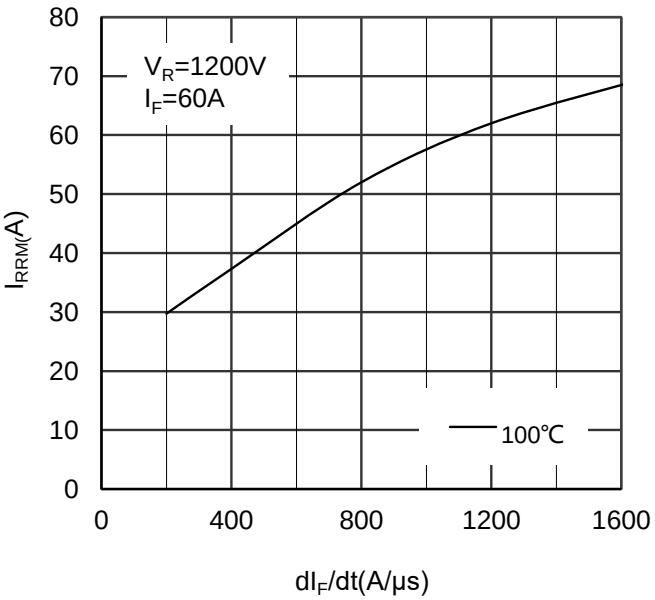


Figure 3. Reverse Recovery Current vs dI_F/dt

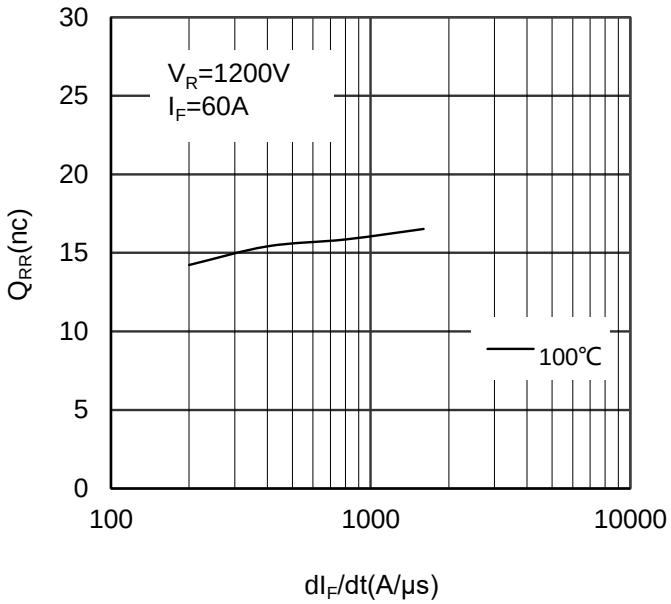


Figure 4. Reverse Recovery Charge vs dI_F/dt

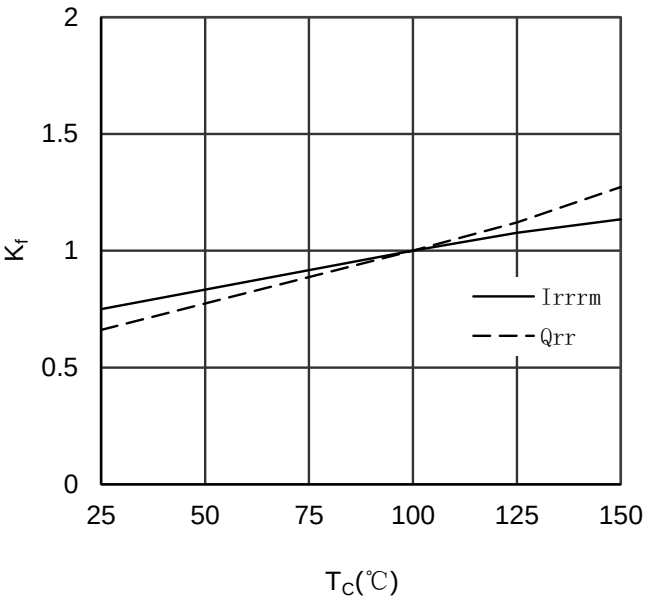


Figure 5.Forward current vs Case temperature

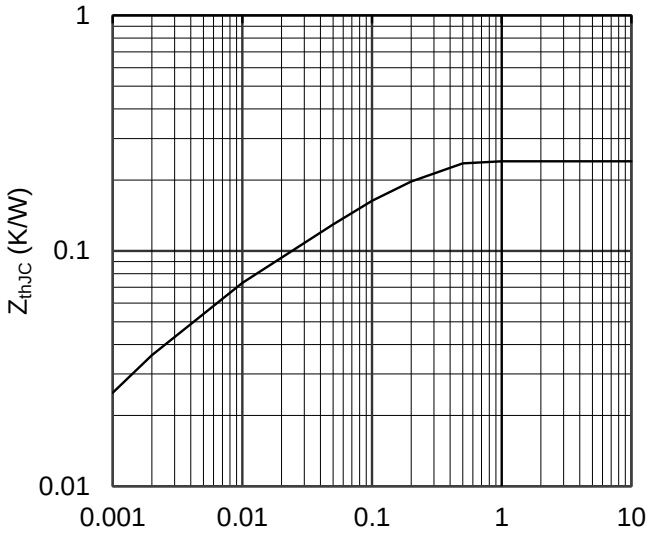


Figure 6.Transient Thermal Impedance

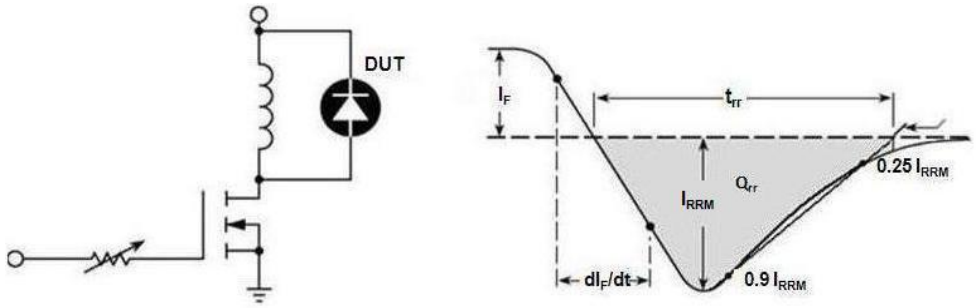
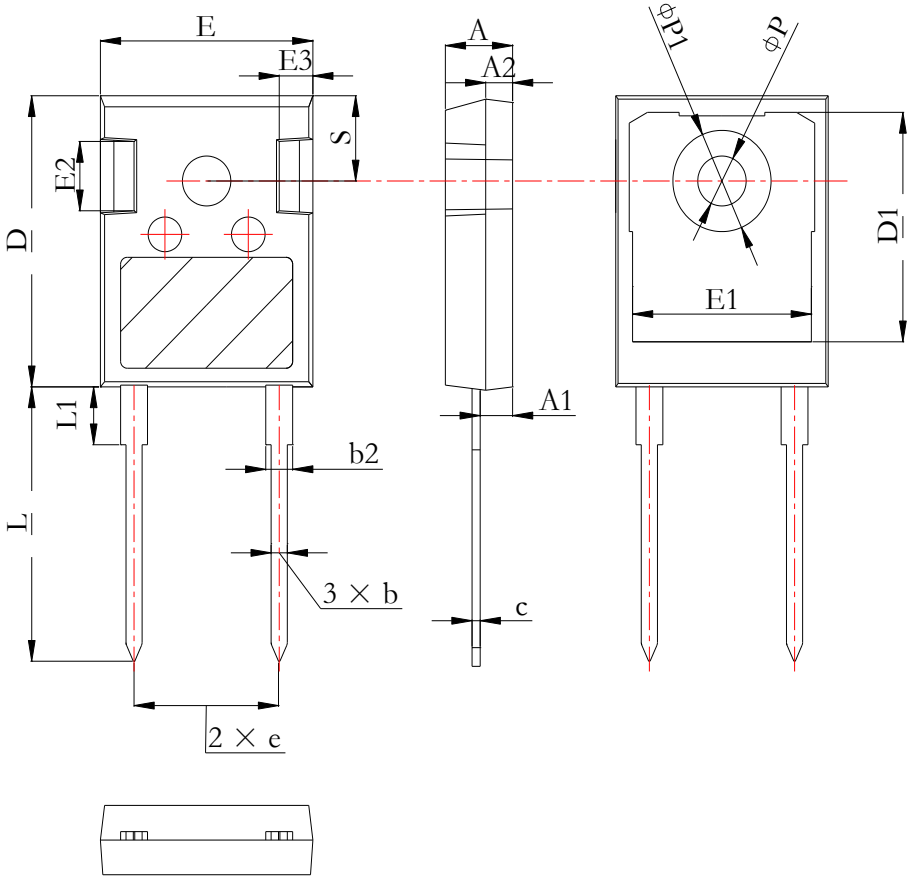


Figure 7. Diode Reverse Recovery Test Circuit and Waveform



Symbol	Min	Nom	Max
A	4.80	5.00	5.21
A1	2.21	2.41	2.61
A2	1.85	2.00	2.16
b	1.07	1.23	1.36
b2	1.90	2.05	2.41
c	0.50	0.60	0.75
e		5.44BSC	
E	15.50	15.80	16.13
E1	12.38	13.30	13.60
E2	3.68	-	5.20
E3	1.00	-	2.70
D	20.70	21.00	21.30
D1	16.25	-	17.65
L	19.60	19.91	20.32
L1	-	-	4.40
ΦP	3.40	3.60	3.80
ΦP1	-	-	7.30
S		6.15BSC	

Dimensions in (mm)

Figure 8. Package Outline