



FRED Modules

Features

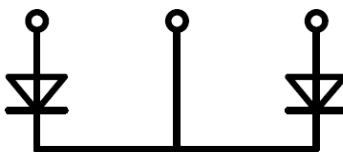
- Ultrafast reverse recovery time
- Low reverse recovery loss
- High surge current capability
- Soft reverse recovery characteristics
- Low forward voltage and leakage current

Product Summary

Parameter	Value	Unit
V_{RRM}	600	V
$I_{F(AV)}$	2X200	A
$I_{FSM}(@ t_p = 10ms)$	3500	A
$V_F(Max)$	1.5	V
$T_{rr}(Typ)$	56	ns

Applications

- Inversion welder
- Uninterruptible power supply and plating power supply
- Ultrasonic cleaner and welder
- Converter and chopper
- PFC



Absolute Maximum Ratings (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Conditions	Symbol	Values	Unit
Repetitive peak reverse voltage	$T_{vj} = 25^\circ\text{C}$	V_{RRM}	600	V
Average on-state current	$T_C = 110^\circ\text{C}$, per diode	$I_{F(AV)}$	200	A
	$T_C = 110^\circ\text{C}$, per module		400	
Forward surge current	Sine wave, $t_p=10\text{ms}$, $T_J=45^\circ\text{C}$, per diode	I_{FSM}	3500	A
I^2t Value for fusing		I^2t	61250	A^2s
Junction temperature range		T_J	-40 - 150	$^\circ\text{C}$
Storage temperature range		T_{stg}	-40 - 125	$^\circ\text{C}$

**Electrical Characteristics (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)**

Parameter	Conditions	Symbol	Values			Unit
			Min.	Typ.	Max.	
Forward voltage	$I_F = 200\text{A}$, $T_{vj} = 25^\circ\text{C}$	V_F		1.3	1.5	V
	$I_F = 200\text{A}$, $T_{vj} = 125^\circ\text{C}$			1.2		
Maximum reverse leakage current	$V_R = V_{RRM}$, $T_{vj} = 25^\circ\text{C}$	I_{RRM}			0.5	mA
	$V_R = V_{RRM}$, $T_{vj} = 125^\circ\text{C}$				10	
Maximum reverse recovery current	$I_F = 200\text{A}$, $V_R = 300\text{V}$, $di_F/dt = -200\text{A}/\mu\text{s}$, $T_{vj} = 25^\circ\text{C}$	I_{RM}		14		A
	$I_F = 200\text{A}$, $V_R = 300\text{V}$, $di_F/dt = -200\text{A}/\mu\text{s}$, $T_{vj} = 125^\circ\text{C}$	I_{RM}		22		
Reverse recovery time	$I_F = 1\text{A}$, $V_R = 30\text{V}$, $di_F/dt = -200\text{A}/\mu\text{s}$	t_{rr}		56		ns
	$I_F = 200\text{A}$, $V_R = 300\text{V}$, $di_F/dt = -200\text{A}/\mu\text{s}$, $T_{vj} = 25^\circ\text{C}$	t_{rr}		130		ns
	$I_F = 200\text{A}$, $V_R = 300\text{V}$, $di_F/dt = -200\text{A}/\mu\text{s}$, $T_{vj} = 125^\circ\text{C}$	t_{rr}		220		ns

Thermal Characteristics (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Conditions	Symbol	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance, junction to case	per diode	$R_{th(j-c)}$			0.06	$^\circ\text{C}/\text{W}$
Mounting torque	Base plate to heatsink screw M6	M	3.0		4.7	N·m
	Electrode to terminal screw M6		3.0		4.7	N·m

Ordering Information

Device	Marking	Package	Weight	Inner Box	Per Carton
JMF400MD06F3U	JMF400MD06F3U	F3	$92 \pm 5\text{g}/\text{PCS}$	18PCS	162PCS

Typical Electrical & Thermal Characteristics

FIG.1: Forward voltage drop vs forward current

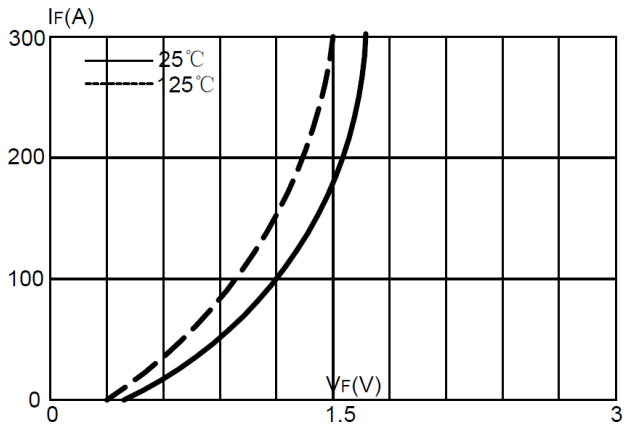


FIG.2: Reverse recovery time vs di_F/dt

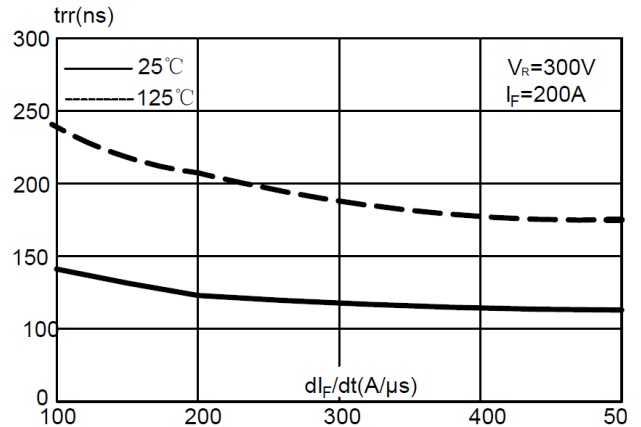


FIG.3: Reverse recovery current vs di_F/dt

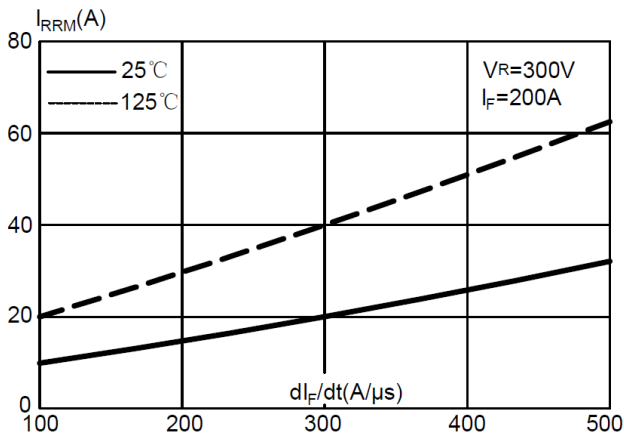


FIG.4: Forward current vs case temperature

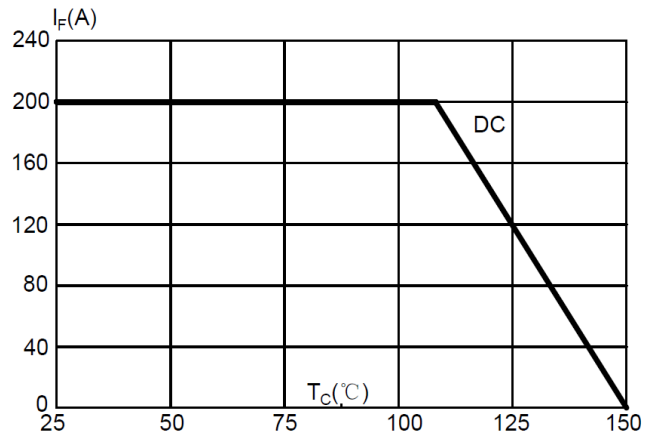
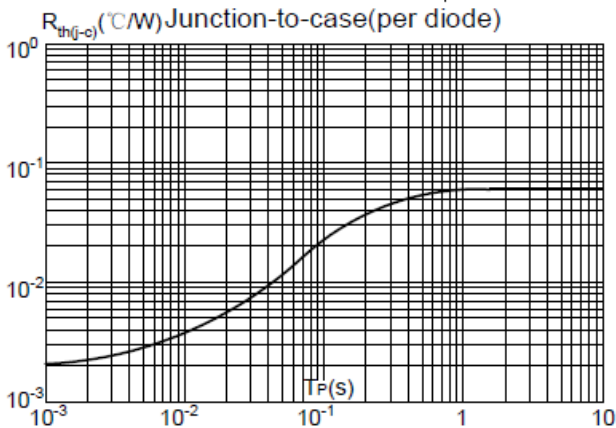
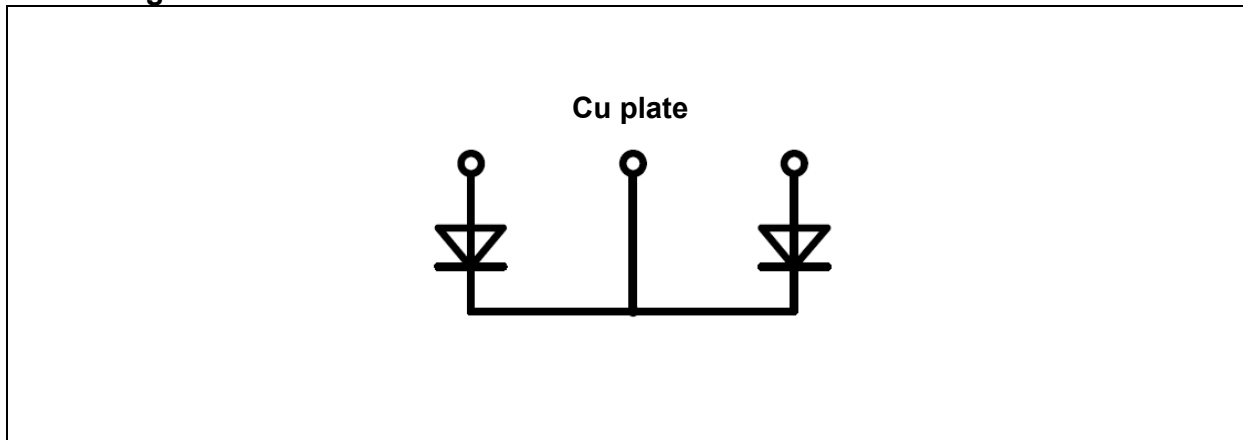
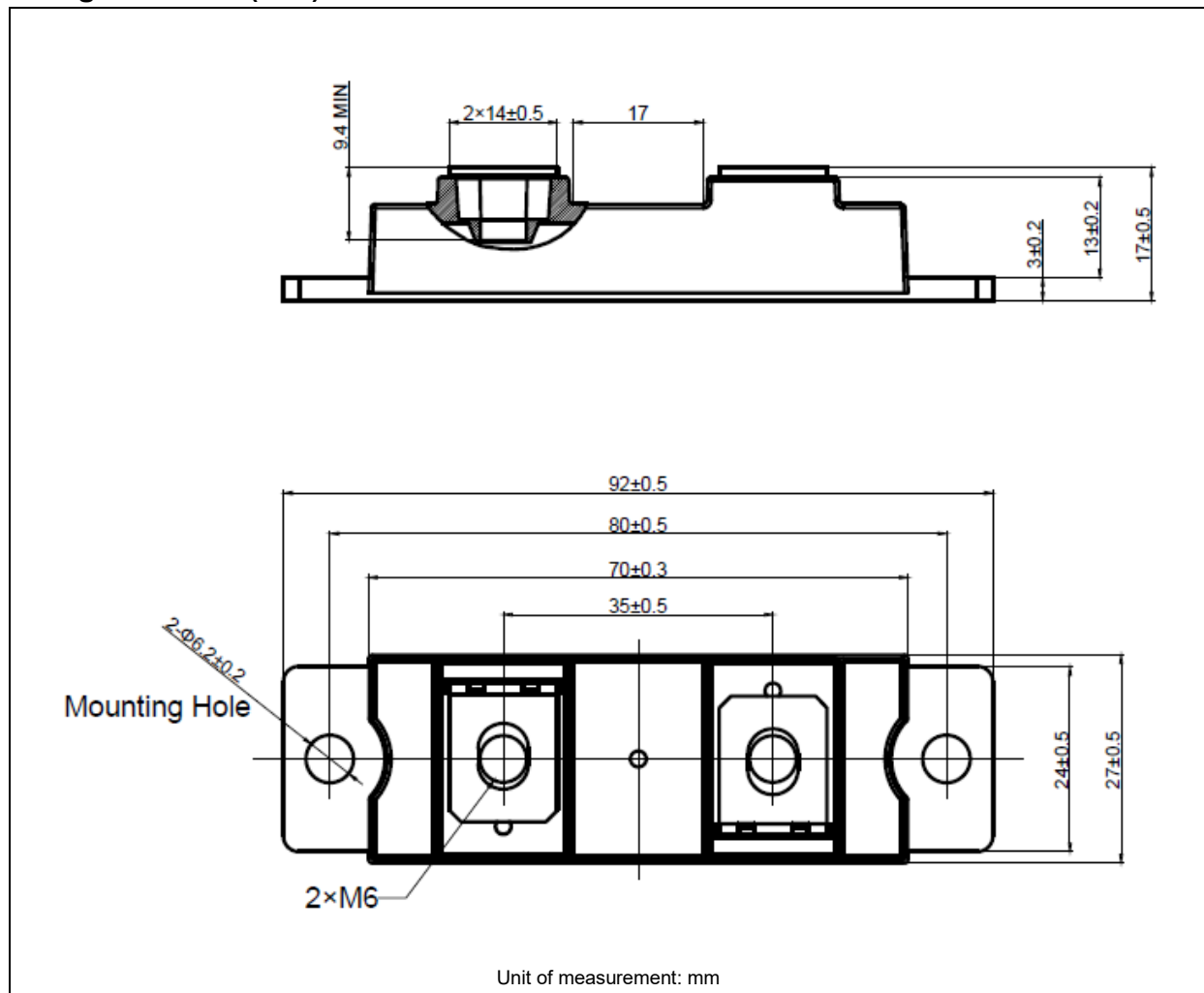


FIG.5: Maximum transient thermal impedance



Circuit Diagram

Package Outlines (mm)




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