

# Fast Recovery Epitaxial Diode (FRED) Module

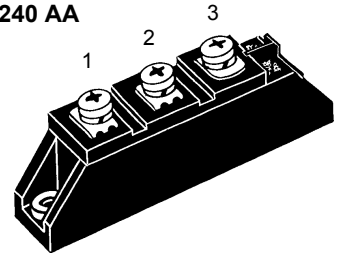
**MEA 75-12 DA**  
**MEK 75-12 DA**  
**MEE 75-12 DA**

**$V_{RRM} = 1200 V$**   
 **$I_{FAV} = 75 A$**   
 **$t_{rr} = 250 ns$**

Preliminary data

$V_{RSM}$ V	$V_{RRM}$ V	Type	MEK 75-12 DA	MEE 75-12 DA
1200	1200			

TO-240 AA



Symbol	Test Conditions	Maximum Ratings
$I_{FRMS}$	$T_{case} = 75^\circ C$	107 A
$I_{FAV}$	$T_{case} = 75^\circ C$ ; rectangular, $d = 0.5$	75 A
$I_{FRM}$	$t_p < 10 \mu s$ ; rep. rating, pulse width limited by $T_{VJM}$	TBD A
$I_{FSM}$	$T_{VJ} = 45^\circ C$ ; $t = 10 ms$ (50 Hz), sine	1200 A
	$t = 8.3 ms$ (60 Hz), sine	1300 A
	$T_{VJ} = 150^\circ C$ ; $t = 10 ms$ (50 Hz), sine	1080 A
	$t = 8.3 ms$ (60 Hz), sine	1170 A
$I^2t$	$T_{VJ} = 45^\circ C$ ; $t = 10 ms$ (50 Hz), sine	7200 A <sup>2</sup> s
	$t = 8.3 ms$ (60 Hz), sine	7100 A <sup>2</sup> s
	$T_{VJ} = 150^\circ C$ ; $t = 10 ms$ (50 Hz), sine	5800 A <sup>2</sup> s
	$t = 8.3 ms$ (60 Hz), sine	5700 A <sup>2</sup> s
$T_{VJ}$		-40...+150 °C
$T_{stg}$		-40...+125 °C
$T_{Hmax}$		110 °C
$P_{tot}$	$T_{case} = 25^\circ C$	280 W
$V_{ISOL}$	50/60 Hz, RMS $t = 1 min$	3000 V~
	$I_{ISOL} \leq 1 mA$ $t = 1 s$	3600 V~
$M_d$	Mounting torque (M5)	2.50-4/22-35 Nm/lb.in.
	Terminal connection torque (M5)	2.50-4/22-35 Nm/lb.in.
$d_s$	Creep distance on surface	12.7 mm
$d_A$	Strike distance through air	9.6 mm
$a$	Maximum allowable acceleration	50 m/s <sup>2</sup>
<b>Weight</b>		90 g

## Features

- International standard package with DCB ceramic base plate
- Planar passivated chips
- Short recovery time
- Low switching losses
- Soft recovery behaviour
- Isolation voltage 3600 V~
- UL registered E 72873

## Applications

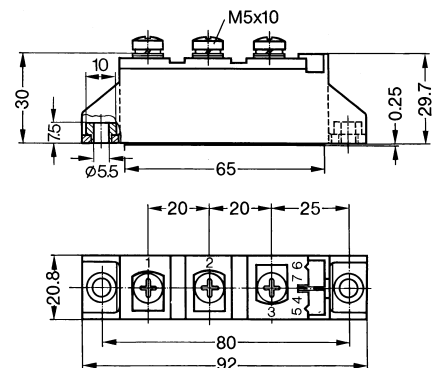
- Antiparallel diode for high frequency switching devices
- Free wheeling diode in converters and motor control circuits
- Inductive heating and melting
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

## Advantages

- High reliability circuit operation
- Low voltage peaks for reduced protection circuits
- Low noise switching
- Low losses

Symbol	Test Conditions	Characteristic Values (per diode)		
		typ.	max.	
$I_R$	$T_{VJ} = 25^\circ C$ $V_R = V_{RRM}$		2 mA	
	$T_{VJ} = 25^\circ C$ $V_R = 0.8 \cdot V_{RRM}$		0.5 mA	
	$T_{VJ} = 125^\circ C$ $V_R = 0.8 \cdot V_{RRM}$		34 mA	
$V_F$	$I_F = 100 A$ ; $T_{VJ} = 125^\circ C$		1.85 V	
	$T_{VJ} = 25^\circ C$		2.17 V	
	$I_F = 300 A$ ; $T_{VJ} = 125^\circ C$		2.58 V	
	$T_{VJ} = 25^\circ C$		2.64 V	
$V_{T0}$	For power-loss calculations only		1.48 V	
$r_T$			3.65 mΩ	
$R_{thJH}$	DC current		0.550 K/W	
$R_{thJC}$	DC current		0.450 K/W	
$t_{rr}$ $I_{RM}$	$I_F = 150 A$ $V_R = 600 V$ $-di/dt = 200 A/\mu s$	250	$T_{VJ} = 100^\circ C$	300 ns
			$T_{VJ} = 25^\circ C$	22 A
			$T_{VJ} = 100^\circ C$	33 A

## Dimensions in mm (1 mm = 0.0394")



Data according to IEC 60747

IXYS reserves the right to change limits, test conditions and dimensions

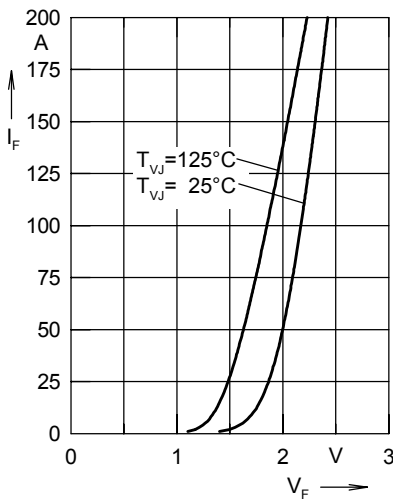


Fig. 1 Forward current  $I_F$  versus voltage drop  $V_F$  per leg

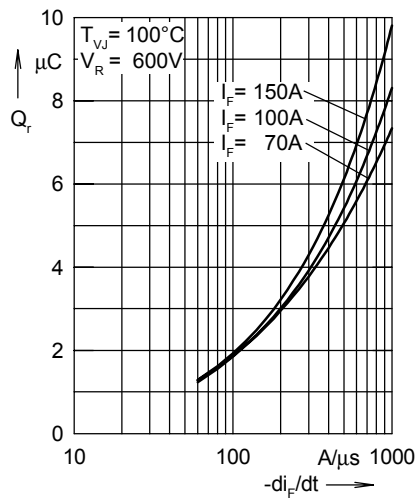


Fig. 2 Reverse recovery charge  $Q_r$  versus  $-di_F/dt$

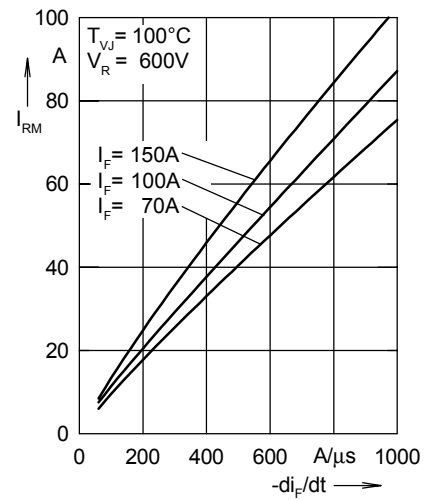


Fig. 3 Peak reverse current  $I_{RM}$  versus  $-di_F/dt$

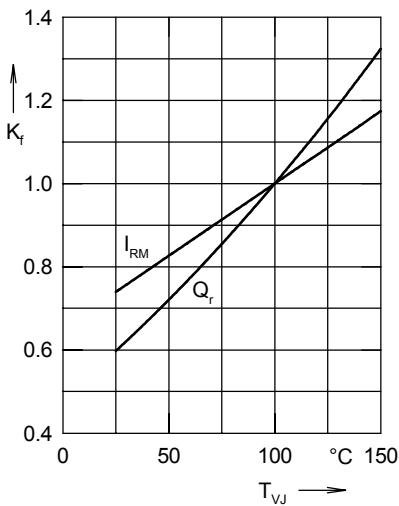


Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus junction temperature  $T_{VJ}$

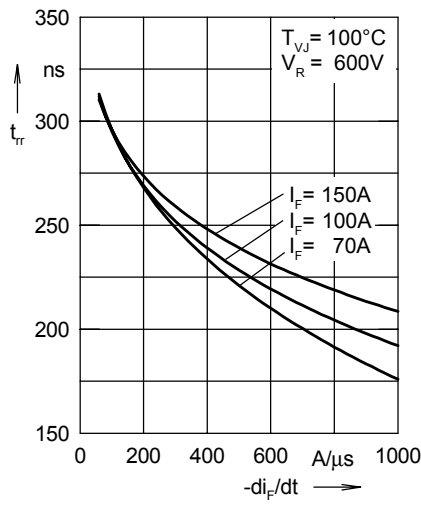


Fig. 5 Recovery time  $t_{tr}$  versus  $-di_F/dt$

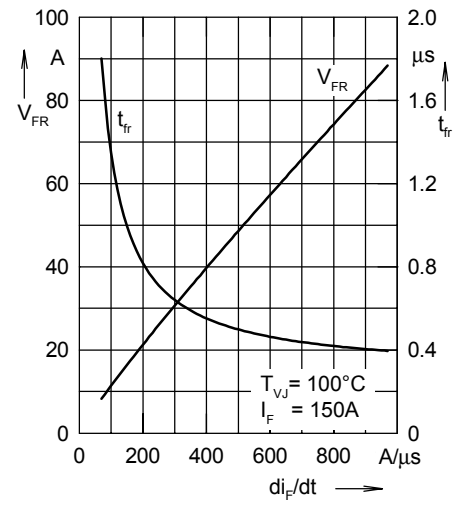


Fig. 6 Peak forward voltage  $V_{FR}$  and  $t_{tr}$  versus  $di_F/dt$

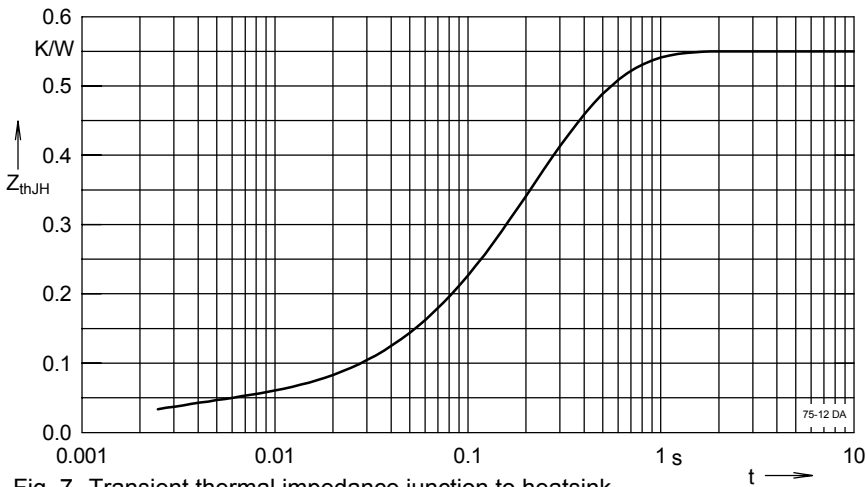


Fig. 7 Transient thermal impedance junction to heatsink

Constants for  $Z_{thJH}$  calculation:

i	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.037	0.002
2	0.138	0.134
3	0.093	0.25
4	0.282	0.274