# IXYS

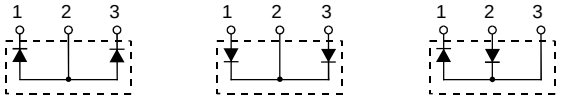
# Fast Recovery Epitaxial Diode (FRED) Module

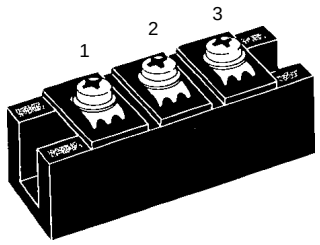
**MEA 250-12 DA**
**MEK 250-12 DA**
**MEE 250-12 DA**

$V_{RRM}$ = 1200 V
$I_{FAVM}$ = 260 A
$t_{rr}$ = 450 ns

Preliminary data

| $V_{RSM}$ V | $V_{RRM}$ V | Type |
|---|---|---|
| 1200 | 1200 | MEA 250-12DA |
| | | MEK 250-12DA |
| | | MEE 250-012DA |




| Symbol | Test Conditions | Maximum Ratings | |
|---|---|---|---|
| $I_{FRMS}$ | $T_C$ = 75°C | 367 | A |
| $I_{FAVM}$ ① | $T_C$ = 75°C; rectangular, d = 0.5 | 260 | A |
| $I_{FRM}$ | $t_P$ < 10 µs; rep. rating, pulse width limited by $T_{VJM}$ | 1480 | A |
| $I_{FSM}$ | $T_{VJ}$ = 45°C; t = 10 ms (50 Hz), sine | 2400 | A |
| | t = 8.3 ms (60 Hz), sine | 2640 | A |
| | $T_{VJ}$ = 150°C; t = 10 ms (50 Hz), sine | 2160 | A |
| | t = 8.3 ms (60 Hz), sine | 2380 | A |
| $I^2t$ | $T_{VJ}$ = 45°C; t = 10 ms (50 Hz), sine | 28800 | $A^2s$ |
| | t = 8.3 ms (60 Hz), sine | 29300 | $A^2s$ |
| | $T_{VJ}$ = 150°C; t = 10 ms (50 Hz), sine | 23300 | $A^2s$ |
| | t = 8.3 ms (60 Hz), sine | 23800 | $A^2s$ |
| $T_{VJ}$ | | -40...+150 | °C |
| $T_{stg}$ | | -40...+125 | °C |
| $T_{Smax}$ | | 110 | °C |
| $P_{tot}$ | $T_c$ = 25°C | 875 | W |
| $V_{ISOL}$ | 50/60 Hz, RMS t = 1 min | 3000 | V~ |
| | $I_{ISOL}$ ≤ 1 mA t = 1 s | 3600 | V~ |
| $M_d$ | Mounting torque (M6) | 2.25-2.75/20-25 | Nm/lb.in. |
| | Terminal connection torque (M6) | 4.50-5.50/40-48 | Nm/lb.in. |
| $d_S$ | Creeping distance on surface | 12.7 | mm |
| $d_A$ | Strike distance through air | 9.6 | mm |
| a | Maximum allowable acceleration | 50 | $m/s^2$ |
| Weight | | 150 | g |

| Symbol | Test Conditions | Characteristic Values (per diode) typ. | max. | |
|---|---|---|---|---|
| $I_R$ | $T_{VJ}$ = 25°C $V_R$ = $V_{RRM}$ | | 12 | mA |
| | $T_{VJ}$ = 25°C $V_R$ = 0.8 • $V_{RRM}$ | | 3 | mA |
| | $T_{VJ}$ = 125°C $V_R$ = 0.8 • $V_{RRM}$ | | 60 | mA |
| $V_F$ | $I_F$ = 150 A; $T_{VJ}$ = 125°C | | 1.38 | V |
| | $T_{VJ}$ = 25°C | | 1.69 | V |
| | $I_F$ = 260 A; $T_{VJ}$ = 125°C | | 1.54 | V |
| | $T_{VJ}$ = 25°C | | 1.80 | V |
| $V_{T0}$ | For power-loss calculations only | | 1.16 | V |
| $r_T$ | | | 1.46 | mΩ |
| $R_{thJH}$ | DC current | | 0.228 | K/W |
| $R_{thJC}$ | DC current | | 0.143 | K/W |
| $t_{rr}$ | $I_F$ = 300 A; $T_{VJ}$ = 100°C | 450 | 500 | ns |
| $I_{RM}$ | $V_R$ = 600 V; $T_{VJ}$ = 25°C | | 55 | A |
| | -di/dt = 400 A/µs; $T_{VJ}$ = 100°C | | 83 | A |

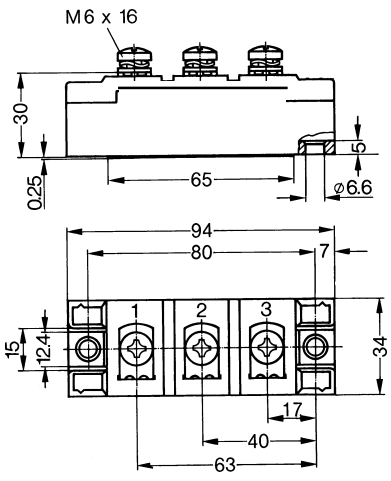
① $I_{FAVM}$ rating includes reverse blocking losses at $T_{VJM}$, $V_R$ = 0.6 $V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

### 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

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

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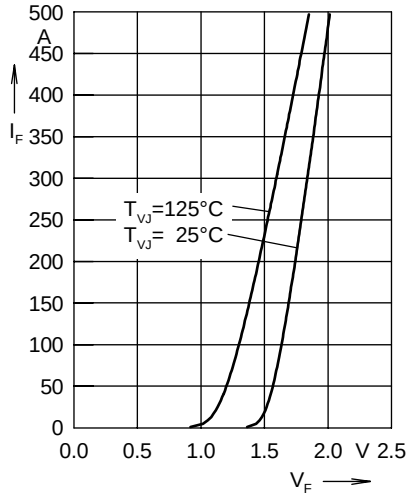


Fig. 1 Forward current $I_F$ versus voltage drop $V_F$ per leg

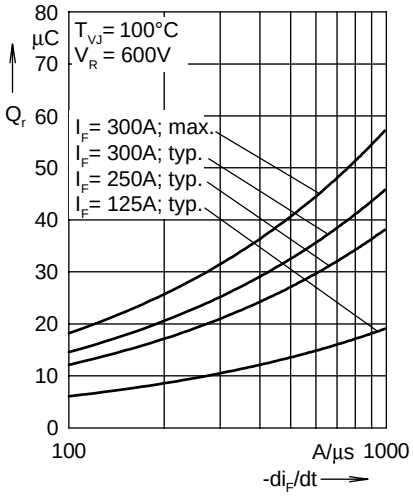


Fig. 2 Reverse recovery charge $Q_r$ versus $-di_F/dt$

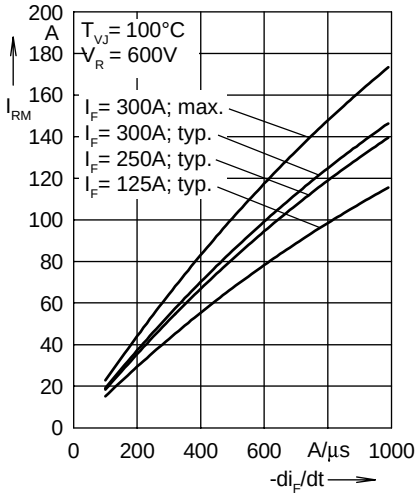


Fig. 3 Peak reverse current $I_{RM}$ versus $-di_F/dt$

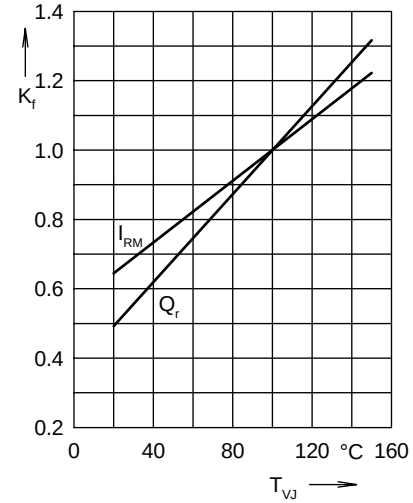


Fig. 4 Dynamic parameters $Q_r$, $I_{RM}$ versus junction temperature $T_{VJ}$

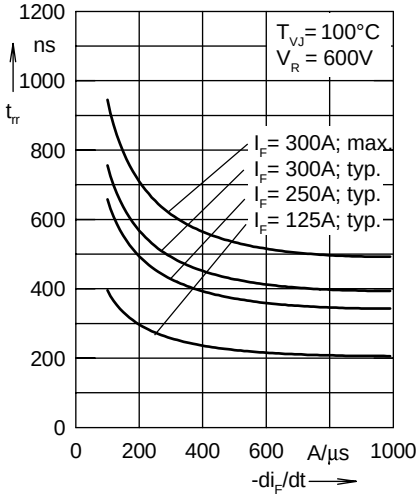


Fig. 5 Recovery time $t_{rr}$ versus $-di_F/dt$

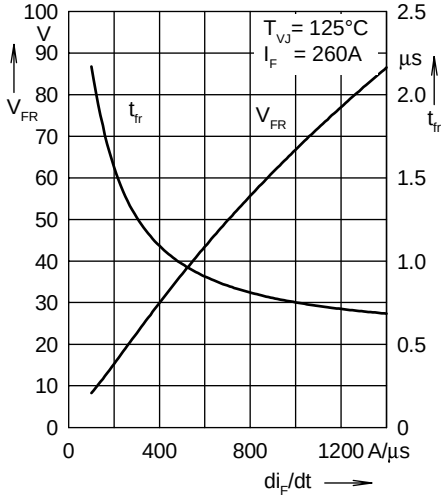


Fig. 6 Peak forward voltage $V_{FR}$ and $t_{fr}$ versus $di_F/dt$

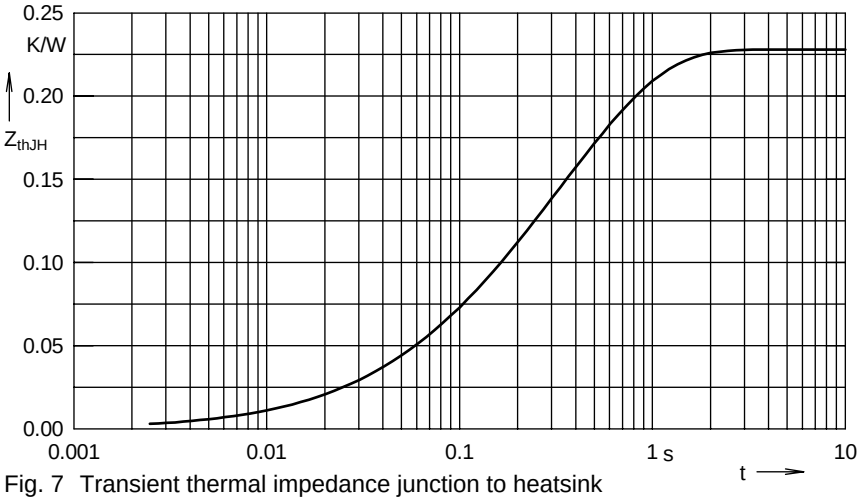


Fig. 7 Transient thermal impedance junction to heatsink

Constants for $Z_{thJS}$ calculation:

| i | $R_{thi}$ (K/W) | $t_i$ (s) |
|---|---|---|
| 1 | 0.002 | 0.08 |
| 2 | 0.008 | 0.024 |
| 3 | 0.054 | 0.112 |
| 4 | 0.164 | 0.464 |

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