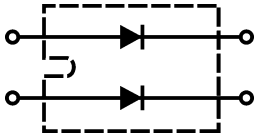
# IXYS

# Fast Recovery Epitaxial Diode (FRED)

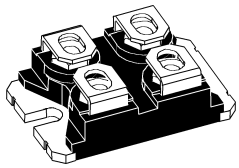
## DSEI 2x 61

$I_{FAVM}$ = 2x 52 A
$V_{RRM}$ = 1200 V
$t_{rr}$ = 40 ns

| $V_{RSM}$ V | $V_{RRM}$ V | Type |
|---|---|---|
| 1200 | 1200 | DSEI 2x 61-12B |



**miniBLOC, SOT-227 B**
E72873



| Symbol | Test Conditions | Maximum Ratings (per diode) | |
|---|---|---|---|
| $I_{FRMS}$ | $T_{VJ} = T_{VJM}$ | 100 | A |
| $I_{FAVM}$ ① | $T_C$ = 50°C; rectangular, d = 0.5 | 52 | A |
| $I_{FRM}$ | $t_P$ < 10 µs; rep. rating, pulse width limited by $T_{VJM}$ | 700 | A |
| $I_{FSM}$ | $T_{VJ}$ = 45°C; t = 10 ms (50 Hz), sine | 450 | A |
| | t = 8.3 ms (60 Hz), sine | 500 | A |
| | $T_{VJ}$ = 150°C; t = 10 ms (50 Hz), sine | 400 | A |
| | t = 8.3 ms (60 Hz), sine | 440 | A |
| $I^2t$ | $T_{VJ}$ = 45°C t = 10 ms (50 Hz), sine | 1000 | $A^2s$ |
| | t = 8.3 ms (60 Hz), sine | 1050 | $A^2s$ |
| | $T_{VJ}$ = 150°C; t = 10 ms (50 Hz), sine | 800 | $A^2s$ |
| | t = 8.3 ms (60 Hz), sine | 810 | $A^2s$ |
| $T_{VJ}$ | | -40...+150 | °C |
| $T_{VJM}$ | | 150 | °C |
| $T_{stg}$ | | -40...+150 | °C |
| $P_{tot}$ | $T_C$ = 25°C | 180 | W |
| $V_{ISOL}$ | 50/60 Hz, RMS | 2500 | V~ |
| | $I_{ISOL} \leq$ 1 mA | | |
| $M_d$ | Mounting torque | 1.5/13 | Nm/lb.in. |
| | Terminal connection torque (M4) | 1.5/13 | Nm/lb.in. |
| Weight | | 30 | g |

| Symbol | Test Conditions | Characteristic Values (per diode) typ. | max. | |
|---|---|---|---|---|
| $I_R$ | $T_{VJ}$ = 25°C $V_R = V_{RRM}$ | | 2.2 | mA |
| | $T_{VJ}$ = 25°C $V_R = 0.8 \cdot V_{RRM}$ | | 0.5 | mA |
| | $T_{VJ}$ = 125°C $V_R = 0.8 \cdot V_{RRM}$ | | 14 | mA |
| $V_F$ | $I_F$ = 60 A; $T_{VJ}$ = 150°C | | 2.15 | V |
| | $T_{VJ}$ = 25°C | | 2.50 | V |
| $V_{T0}$ | For power-loss calculations only | | 1.65 | V |
| $r_T$ | $T_{VJ} = T_{VJM}$ | | 8.3 | mΩ |
| $R_{thJC}$ | | 0.7 | | K/W |
| $R_{thCK}$ | | 0.05 | | K/W |
| $t_{rr}$ | $I_F$ = 1 A; -di/dt = 200 A/µs; $V_R$ = 30 V; $T_{VJ}$ = 25°C | 40 | 60 | ns |
| $I_{RM}$ | $V_R$ = 540 V; $I_F$ = 60 A; $-di_F/dt$ = 480 A/µs | 32 | 36 | A |
| | L ≤ 0.05 µH; $T_{VJ}$ = 100°C | | | |

### Features

- International standard package miniBLOC (ISOTOP compatible)
- Isolation voltage 2500 V~
- 2 independent FRED in 1 package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low $I_{RM}$-values
- Soft recovery behaviour

### Applications

- Antiparallel diode for high frequency switching devices
- Anti saturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- 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
- Operating at lower temperature or space saving by reduced cooling

① $I_{FAVM}$ rating includes reverse blocking losses at $T_{VJM}$, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

600

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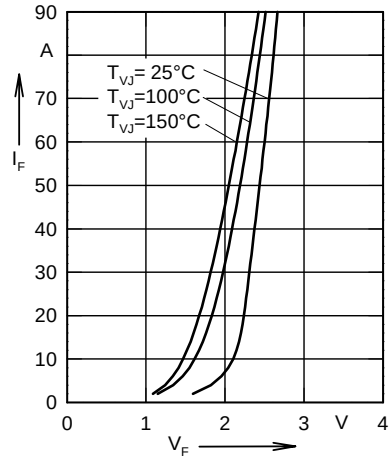



Fig. 1 Forward current versus voltage drop.

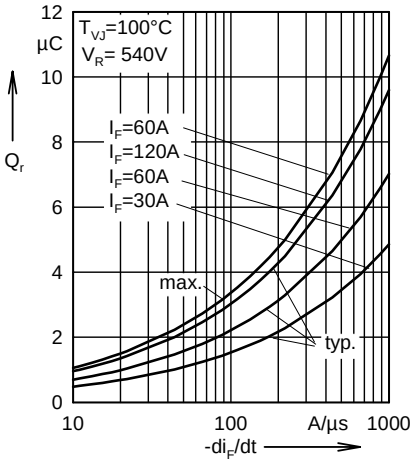



Fig. 2 Recovery charge versus $-di_F/dt$.

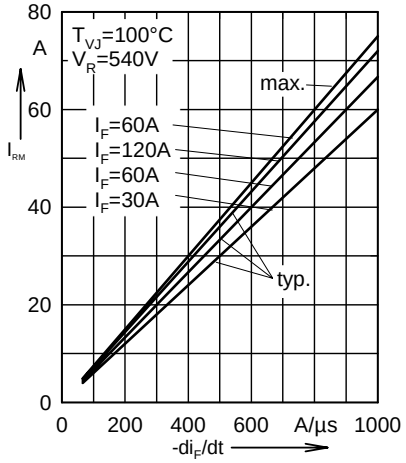



Fig. 3 Peak reverse current versus $-di_F/dt$.

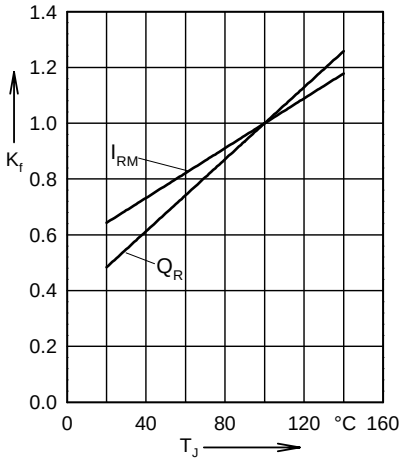



Fig. 4 Dynamic parameters versus junction temperature.

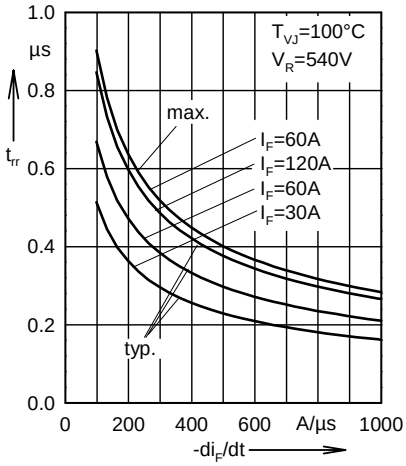



Fig. 5 Recovery time versus $-di_F/dt$.

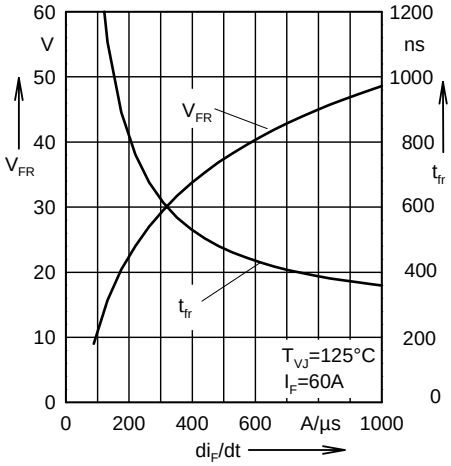



Fig. 6 Peak forward voltage versus $di_F/dt$.

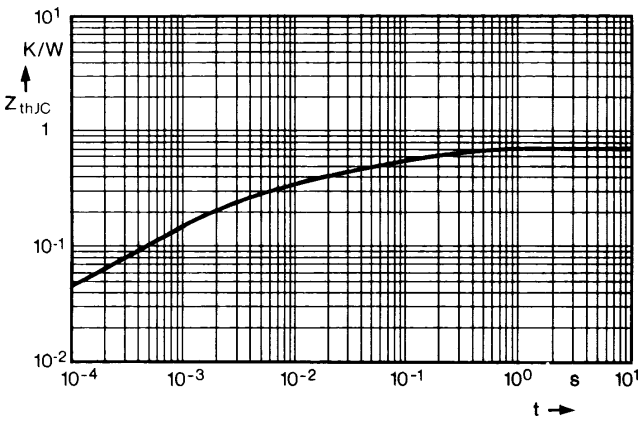
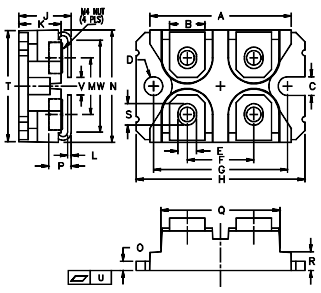



Fig. 7 Transient thermal impedance junction to case.

## Dimensions



miniBLOC SOT-227 B
M4 screws (4x) supplied

| Dim. | Millimeter | | Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 31.50 | 31.88 | 1.240 | 1.255 |
| B | 7.80 | 8.20 | 0.307 | 0.323 |
| C | 4.09 | 4.29 | 0.161 | 0.169 |
| D | 4.09 | 4.29 | 0.161 | 0.169 |
| E | 4.09 | 4.29 | 0.161 | 0.169 |
| F | 14.91 | 15.11 | 0.587 | 0.595 |
| G | 30.12 | 30.30 | 1.186 | 1.193 |
| H | 37.80 | 38.20 | 1.489 | 1.505 |
| J | 11.68 | 12.22 | 0.460 | 0.481 |
| K | 8.92 | 9.60 | 0.351 | 0.378 |
| L | 0.76 | 0.84 | 0.030 | 0.033 |
| M | 12.60 | 12.85 | 0.496 | 0.506 |
| N | 25.15 | 25.42 | 0.990 | 1.001 |
| O | 1.98 | 2.13 | 0.078 | 0.084 |
| P | 4.95 | 5.97 | 0.195 | 0.235 |
| Q | 26.54 | 26.90 | 1.045 | 1.059 |
| R | 3.94 | 4.42 | 0.155 | 0.174 |
| S | 4.72 | 4.85 | 0.186 | 0.191 |
| T | 24.59 | 25.07 | 0.968 | 0.987 |
| U | -0.05 | 0.1 | -0.002 | 0.004 |
| V | 3.30 | 4.57 | 0.130 | 0.180 |
| W | 0.780 | 0.830 | 19.81 | 21.08 |

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