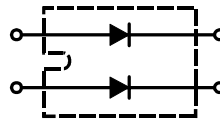


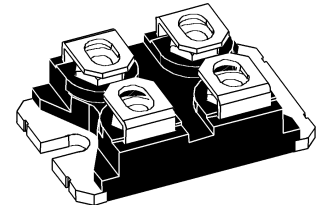
# HiPerFRED™ Epitaxial Diode with soft recovery

$I_{FAV} = 2 \times 60 \text{ A}$   
 $V_{RRM} = 300 \text{ V}$   
 $t_{rr} = 30 \text{ ns}$

| $V_{RSM}$<br>V | $V_{RRM}$<br>V | Type           |
|----------------|----------------|----------------|
| 300            | 300            | DSEP 2x 61-03A |



miniBLOC, SOT-227 B



| Symbol     | Conditions   | Maximum Ratings |                  |
|------------|--|-----------------|------------------|
| $I_{FRMS}$ |  | 100             | A                |
| $I_{FAVM}$ | $T_C = 75^\circ\text{C}$ ; rectangular, $d = 0.5$  | 60              | A                |
| $I_{FSM}$  | $T_{VJ} = 45^\circ\text{C}$ ; $t_p = 10 \text{ ms}$ (50 Hz), sine                              | 600             | A                |
| $E_{AS}$   | $T_{VJ} = 25^\circ\text{C}$ ; non-repetitive<br>$I_{AS} = 4 \text{ A}$ ; $L = 180 \mu\text{H}$ | 1.6             | mJ               |
| $I_{AR}$   | $V_A = 1.5 \cdot V_R$ typ.; $f = 10 \text{ kHz}$ ; repetitive                                  | 0.4             | A                |
| $T_{VJ}$   |  | -40...+150      | $^\circ\text{C}$ |
| $T_{VJM}$  |  | 150             | $^\circ\text{C}$ |
| $T_{stg}$  |  | -40...+150      | $^\circ\text{C}$ |
| $P_{tot}$  | $T_C = 25^\circ\text{C}$   | 140             | W                |
| $V_{ISOL}$ | 50/60 Hz, RMS<br>$I_{ISOL} \leq 1 \text{ mA}$  | 2500            | V~               |
| $M_d$      | mounting torque (M4)   | 1.1-1.5/9-13    | Nm/lb.in.        |
|            | terminal connection torque (M4)  | 1.1-1.5/9-13    | Nm/lb.in.        |
| Weight     | typical  | 30              | g                |

## Features

- International standard package miniBLOC
- Isolation voltage 2500 V~
- UL registered E 72873
- 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
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

## Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low  $I_{RM}$  reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

| Symbol     | Conditions   | Characteristic Values |      |
|------------|--|-----------------------|------|
|            |  | typ.                  | max. |
| $I_R$ ①    | $T_{VJ} = 25^\circ\text{C}$ $V_R = V_{RRM}$<br>$T_{VJ} = 150^\circ\text{C}$ $V_R = V_{RRM}$                            | 0.65                  | 2.5  |
|            |  |                       | mA   |
| $V_F$ ②    | $I_F = 60 \text{ A}$ ; $T_{VJ} = 125^\circ\text{C}$<br>$T_{VJ} = 25^\circ\text{C}$                                     | 1.26                  | 1.68 |
|            |  |                       | V    |
| $R_{thJC}$ |  | 0.85                  |      |
| $R_{thCH}$ | 0.1  |                       | K/W  |
| $t_{rr}$   | $I_F = 1 \text{ A}$ ; $-di/dt = 300 \text{ A}/\mu\text{s}$ ;<br>$V_R = 30 \text{ V}$ ; $T_{VJ} = 25^\circ\text{C}$     | 30                    |      |
|            |  |                       | ns   |
| $I_{RM}$   | $V_R = 100 \text{ V}$ ; $I_F = 130 \text{ A}$ ; $-di_F/dt = 100 \text{ A}/\mu\text{s}$<br>$T_{VJ} = 100^\circ\text{C}$ | 4.8                   |      |
|            |  |                       | A    |

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %  
② Pulse Width = 300  $\mu\text{s}$ , Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

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

Dimensions see outlines.pdf

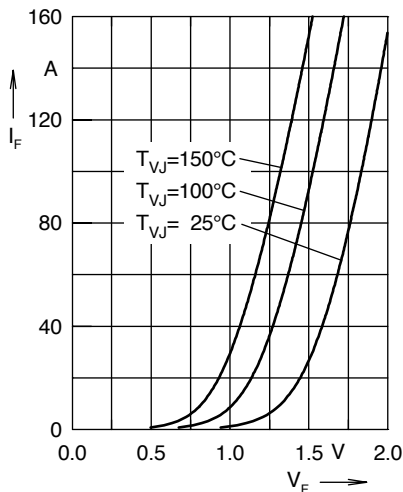


Fig. 1 Forward current  $I_F$  versus  $V_F$

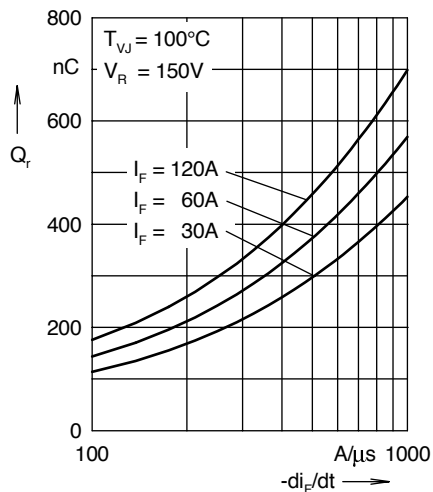


Fig. 2 Reverse recovery charge  $Q_r$  versus  $-di_F/dt$

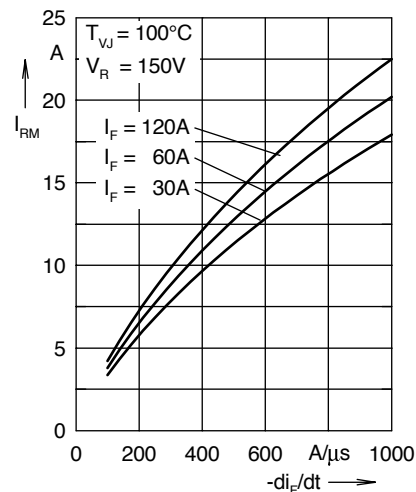


Fig. 3 Peak reverse current  $I_{RM}$  versus  $-di_F/dt$

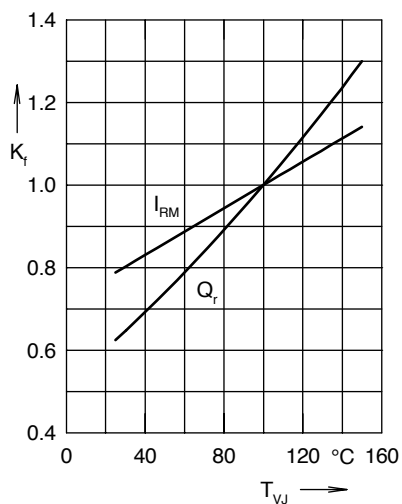


Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$

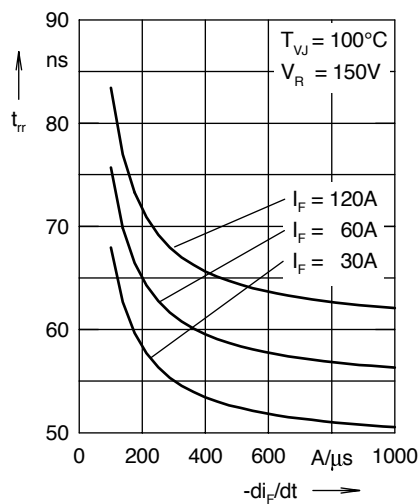


Fig. 5 Recovery time  $t_{rr}$  versus  $-di_F/dt$

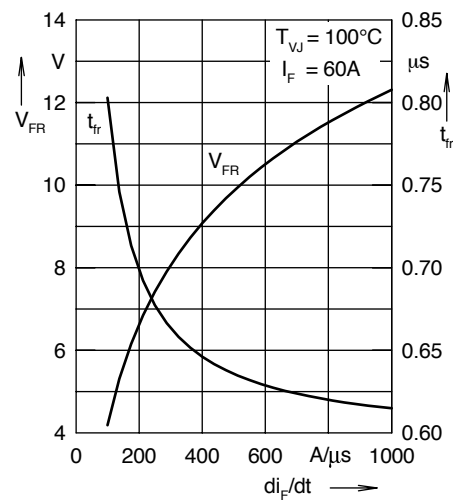


Fig. 6 Peak forward voltage  $V_{FR}$  and  $t_{fr}$  versus  $di_F/dt$

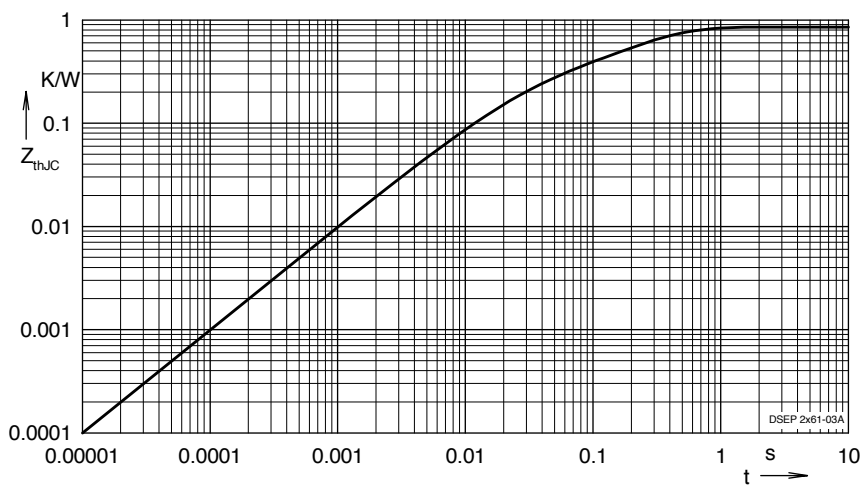


Fig. 7 Transient thermal resistance junction to case

Constants for  $Z_{thJC}$  calculation:

| i | $R_{thi}$ (K/W) | $t_i$ (s) |
|---|-----------------|-----------|
| 1 | 0.307           | 0.0055    |
| 2 | 0.353           | 0.009     |
| 3 | 0.089           | 0.0007    |
| 4 | 0.101           | 0.04      |

NOTE: Fig. 2 to Fig. 6 shows typical values

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