

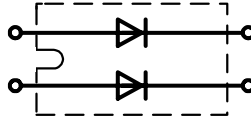
# HiPerDynFRED™ Epitaxial Diode with soft recovery

$$I_{FAV} = 2x25 \text{ A}$$

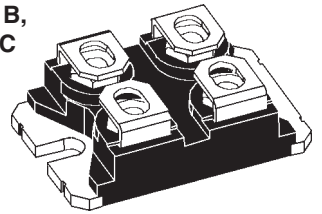
$$V_{RRM} = 1200 \text{ V}$$

$$t_{rr} = 30 \text{ ns}$$

| $V_{RSM}$<br>V | $V_{RRM}$<br>V | Type           |
|----------------|----------------|----------------|
| 1200           | 1200           | DSEP 2x 25-12C |



SOT-227 B,  
miniBLOC



| Symbol     | Test Conditions                                                                                  | Maximum Ratings |                  |
|------------|--------------------------------------------------------------------------------------------------|-----------------|------------------|
| $I_{FRMS}$ |                                                                                                  | 100             | A                |
| $I_{FAVM}$ | $T_C = 90^\circ\text{C}$ ; rectangular, $d = 0.5$                                                | 25              | A                |
| $I_{FSM}$  | $T_{VJ} = 45^\circ\text{C}$ ; $t_p = 10 \text{ ms}$ (50 Hz), sine                                | 250             | A                |
| $E_{AS}$   | $T_{VJ} = 25^\circ\text{C}$ ; non-repetitive<br>$I_{AS} = 1.3 \text{ A}$ ; $L = 180 \mu\text{H}$ | 0.2             | mJ               |
| $I_{AR}$   | $V_A = 1.5 \cdot V_R$ typ.; $f = 10 \text{ kHz}$ ; repetitive                                    | 0.1             | A                |
| $T_{VJ}$   |                                                                                                  | -40...+150      | $^\circ\text{C}$ |
| $T_{VJM}$  |                                                                                                  | 150             | $^\circ\text{C}$ |
| $T_{stg}$  |                                                                                                  | -40...+150      | $^\circ\text{C}$ |
| $P_{tot}$  | $T_C = 25^\circ\text{C}$                                                                         | 210             | W                |
| $V_{ISOL}$ | 50/60 Hz, RMS, $I_{ISOL} \leq 1 \text{ mA}$                                                      | 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

Dimensions see Outlines.pdf

| Symbol                   | Test Conditions                                                                                                         | Characteristic Values |                   |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------|
|                          |                                                                                                                         | typ.                  | max.              |
| $I_R$ ①                  | $V_R = V_{RRM}$ ; $T_{VJ} = 25^\circ\text{C}$<br>$T_{VJ} = 150^\circ\text{C}$                                           | 0.25<br>2.0           | mA<br>mA          |
| $V_F$ ②                  | $I_F = 25 \text{ A}$ ; $T_{VJ} = 125^\circ\text{C}$<br>$T_{VJ} = 25^\circ\text{C}$                                      | 3.0<br>4.7            | V<br>V            |
| $R_{thJC}$<br>$R_{thCH}$ | with heatsink compound                                                                                                  | 0.1                   | 0.6<br>K/W<br>K/W |
| $t_{rr}$                 | $I_F = 1 \text{ A}$ ; $-di/dt = 200 \text{ A}/\mu\text{s}$ ;<br>$V_R = 30 \text{ V}$ ; $T_{VJ} = 25^\circ\text{C}$      | 30                    | ns                |
| $I_{RM}$                 | $V_R = 100 \text{ V}$ ; $I_F = 50 \text{ A}$ ;<br>$-di_F/dt = 100 \text{ A}/\mu\text{s}$ ; $T_{VJ} = 100^\circ\text{C}$ | 3.0                   | 4.0<br>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.

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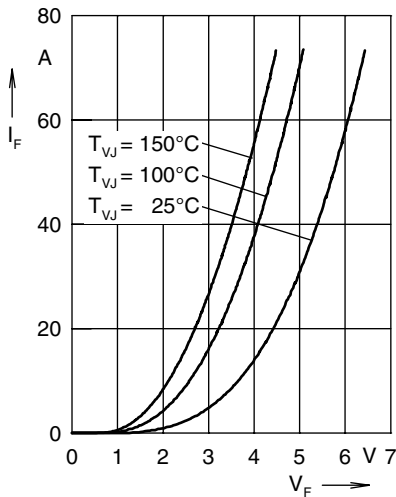


Fig. 1 Forward current  $I_F$  versus  $V_F$

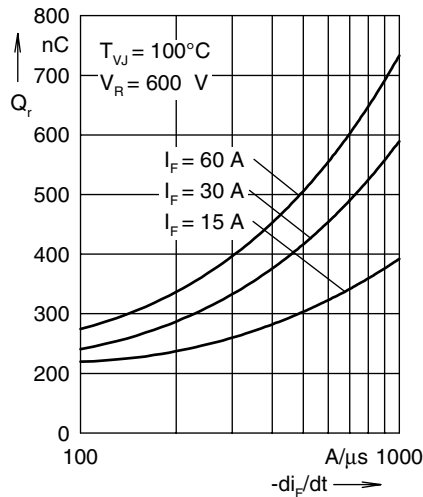


Fig. 2 Reverse recovery charge  $Q_r$  versus  $-di_F/dt$

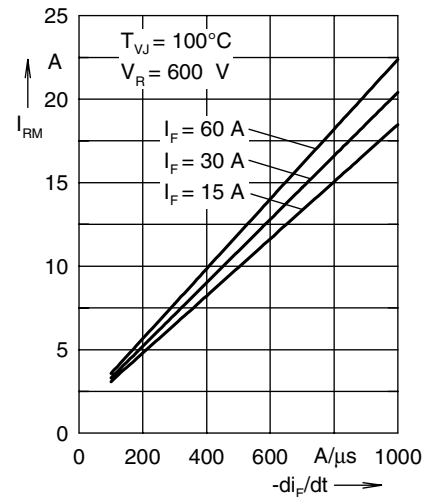


Fig. 3 Peak reverse current  $I_{RM}$  versus  $-di_F/dt$

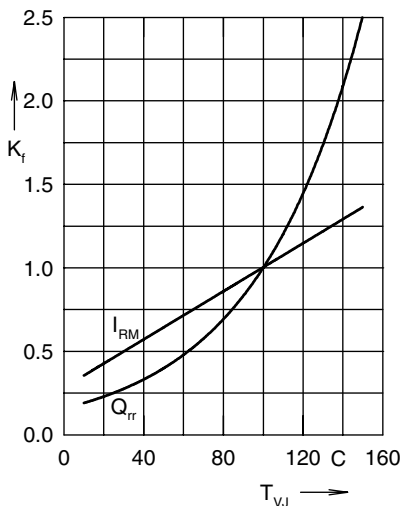


Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$

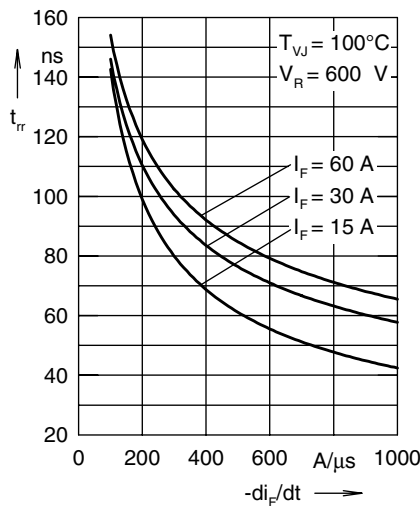


Fig. 5 Recovery time  $t_{tr}$  versus  $-di_F/dt$

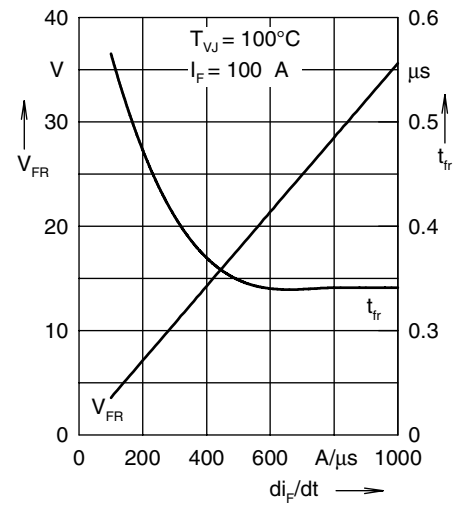


Fig. 6 Peak forward voltage  $V_{FR}$ ,  $t_{tr}$  versus  $di_F/dt$

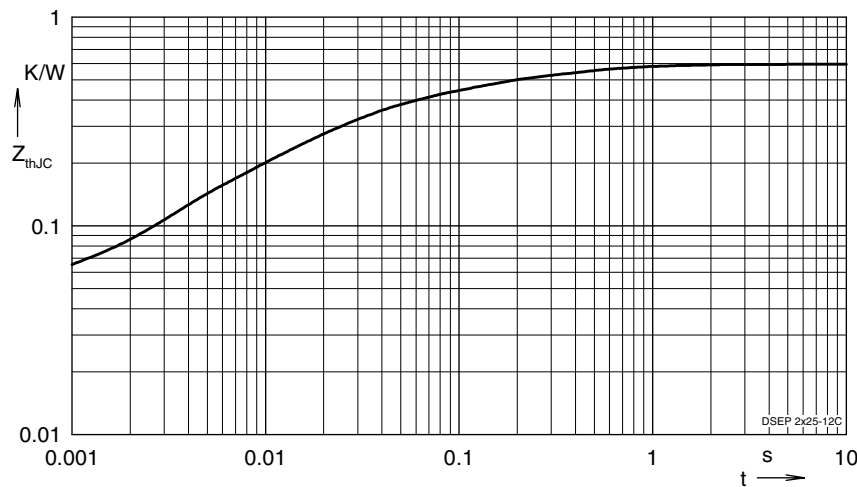


Fig. 7 Transient thermal resistance junction to case

Constants for  $Z_{thJC}$  calculation:

| i | $R_{thi}$ (K/W) | $t_i$ (s) |
|---|-----------------|-----------|
| 1 | 0.037           | 0.00024   |
| 2 | 0.07            | 0.0036    |
| 3 | 0.246           | 0.0235    |
| 4 | 0.176           | 0.142     |
| 5 | 0.07            | 0.7       |