

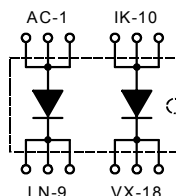
## Fast Recovery Epitaxial Diode (FRED)

## PSEI 2x101

$$\begin{aligned} I_{FAVM} &= 2 \times 91 \text{ A} \\ V_{RRM} &= 1200 \text{ V} \\ t_{rr} &= 40 \text{ ns} \end{aligned}$$

Preliminary Data Sheet

| $V_{RSM}$<br>(V) | $V_{RRM}$<br>(V) | Type          |
|------------------|------------------|---------------|
| 1200             | 1200             | PSEI 2x101/12 |



| Symbol        | Test Conditions                                                       | Maximum Ratings       |
|---------------|-----------------------------------------------------------------------|-----------------------|
| $I_{FRMS}$    | $T_{VJ} = T_{VJM}$                                                    | 130 A                 |
| $I_{FAVM}^*$  | $T_C = 50^\circ\text{C}$ , rectangular, $d=0.5$                       | 91 A                  |
| $I_{FRM}$     | $t_p < 10\mu\text{s}$ ; rep. rating, pulse width limited by $T_{VJM}$ | TBD A                 |
| $I_{FSM}$     | $T_{VJ} = 45^\circ\text{C}$ $t = 10 \text{ ms}$ (50 Hz), sine         | 900 A                 |
|               | $V_R = 0$ $t = 8.3 \text{ ms}$ (60 Hz), sine                          | 970 A                 |
|               | $T_{VJ} = 125^\circ\text{C}$ $t = 10 \text{ ms}$ (50 Hz), sine        | 810 A                 |
|               | $V_R = 0$ $t = 8.3 \text{ ms}$ (60 Hz), sine                          | 870 A                 |
| $\int i^2 dt$ | $T_{VJ} = 45^\circ\text{C}$ $t = 10 \text{ ms}$ (50 Hz), sine         | 4100 A <sup>2</sup> s |
|               | $V_R = 0$ $t = 8.3 \text{ ms}$ (60 Hz), sine                          | 4000 A <sup>2</sup> s |
|               | $T_{VJ} = 125^\circ\text{C}$ $t = 10 \text{ ms}$ (50 Hz), sine        | 3300 A <sup>2</sup> s |
|               | $V_R = 0$ $t = 8.3 \text{ ms}$ (60 Hz), sine                          | 3200 A <sup>2</sup> s |
| $T_{VJ}$      |                                                                       | -40... + 150 °C       |
| $T_{VJM}$     |                                                                       | 150 °C                |
| $T_{stg}$     |                                                                       | -40... + 150 °C       |
| $V_{ISOL}$    | 50/60 Hz, RMS $t = 1 \text{ min}$                                     | 2500 V~               |
|               | $I_{ISOL} \leq 1 \text{ mA}$ $t = 1 \text{ s}$                        | 3000 V~               |
| $M_d$         | Mounting torque (M4)                                                  | 1.5 - 2.0 Nm          |
|               |                                                                       | 14 - 18 lb.in.        |
| Weight        | typ.                                                                  | 24 g                  |

| Symbol     | Test Conditions                                                                                                                                  | Characteristic Value |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| $I_R$      | $T_{VJ} = 25^\circ\text{C}$ , $V_R = V_{RRM}$                                                                                                    | max. 3 mA            |
|            | $T_{VJ} = 25^\circ\text{C}$ , $V_R = 0.8 \cdot V_{RRM}$                                                                                          | max. 1.5 mA          |
|            | $T_{VJ} = 125^\circ\text{C}$ , $V_R = 0.8 \cdot V_{RRM}$                                                                                         | max. 15 mA           |
| $V_F$      | $I_F = 100 \text{ A}$ , $T_{VJ} = 25^\circ\text{C}$                                                                                              | max. 1.87 V          |
| $V_{TO}$   | For power-loss calculations only                                                                                                                 | 1.01 V               |
| $r_T$      |                                                                                                                                                  | 6.1 mΩ               |
| $R_{thJC}$ | per diode; max.                                                                                                                                  | 0.5 K/W              |
| $R_{thCH}$ | per diode; typ.                                                                                                                                  | 0.05 K/W             |
| $I_{RM}$   | $I_F = 75 \text{ A}$ ; $-di_F/dt = 200 \text{ A}/\mu\text{s}$ ; $V_R = 100 \text{ V}$<br>$L \leq 0.05 \text{ mH}$ ; $T_{VJ} = 100^\circ\text{C}$ | typ. 24 A            |
| $t_{rr}$   | $I_F = 1 \text{ A}$ ; $-di_F/dt = 400 \text{ A}/\mu\text{s}$ ; $V_R = 30 \text{ V}$ ;<br>$T_{VJ} = 25^\circ\text{C}$                             | typ. 40 ns           |
| $d_s$      | Creeping distance on surface                                                                                                                     | 11.2 mm              |
| $d_A$      | Creeping distance in air                                                                                                                         | 11.2 mm              |
| $a$        | Max. allowable acceleration                                                                                                                      | 50 m/s <sup>2</sup>  |

### Features

- 2 independent FRED in 1 package
- Isolation voltage 3000 V~
- Planar glass passivated chips
- Low forward voltage drop
- Leads suitable for PC board soldering
- Very short recovery time
- Soft recovery behaviour
- UL registered, E 148688

### 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

- Easy to mount with two screws
- Space and weight savings
- Improved temperature and power cycling capability
- Low noise switching
- Small and light weight

Data according to IEC 60747 refer to a single diode unless otherwise stated

\* $I_{FAVM}$  rating includes blocking losses at  $T_{VJM}$ ;  
 $V_R = 0.8 V_{RRM}$ ; duty cycle  $d=0.5$

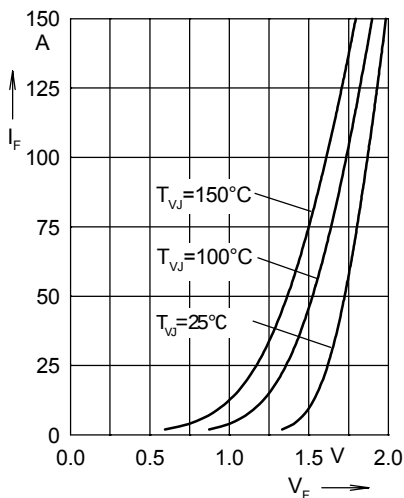


Fig. 1 Forward current  $I_F$  versus  $V_F$

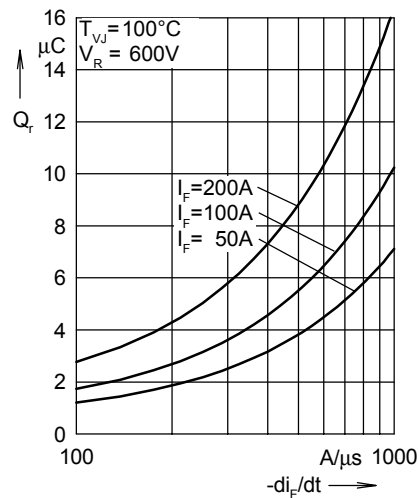


Fig. 2 Reverse recovery charge  $Q_r$  versus  $-di_F/dt$

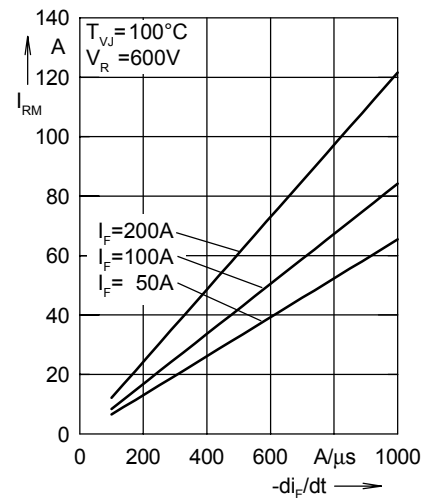


Fig. 3 Peak reverse current  $I_{RM}$  versus  $-di_F/dt$

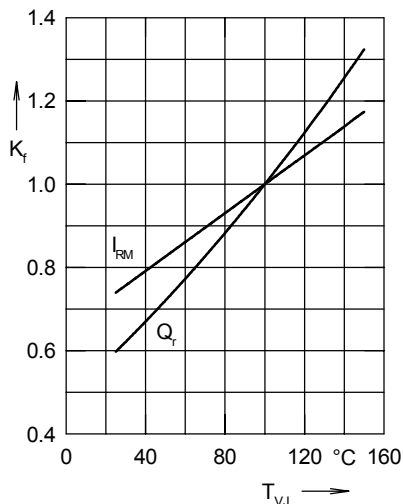


Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$

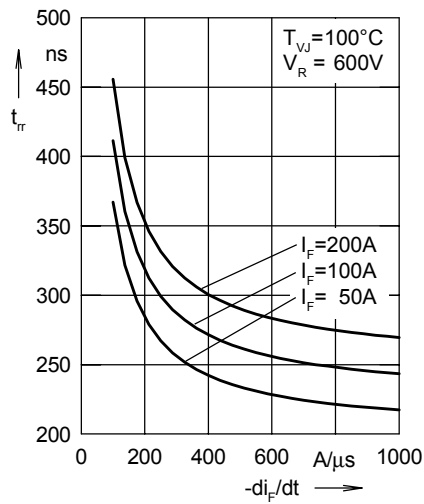


Fig. 5 Recovery time  $t_{rr}$  versus  $-di_F/dt$

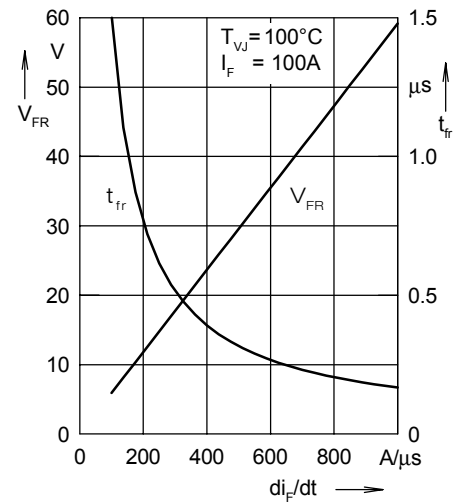


Fig. 6 Peak forward voltage  $V_{FR}$  and  $t_{rr}$  versus  $di_F/dt$

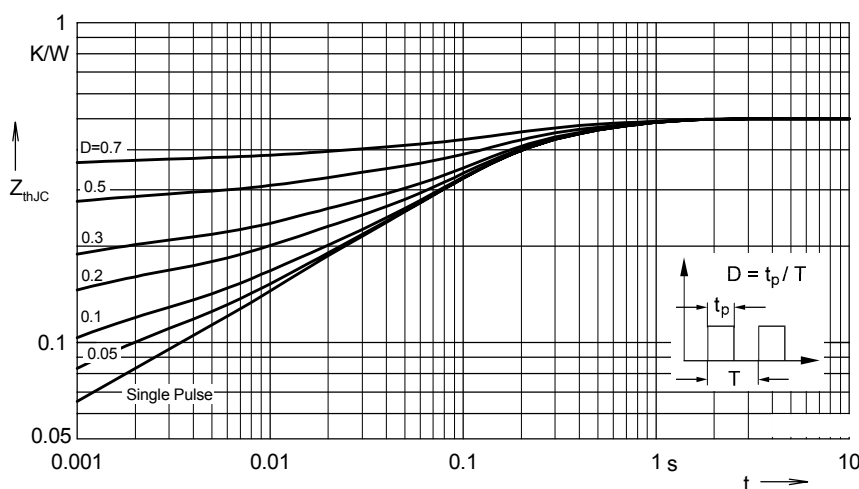


Fig. 7 Transient thermal impedance junction to case at various duty cycles

### Package style and outline

Dimensions in mm (1mm = 0.0394")

