

## Fast Recovery Epitaxial Diode (FRED)

PSEI 2x30  
PSEI 2x31

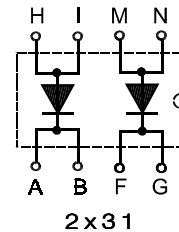
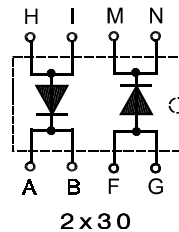
$$I_{FAVM} = 2 \times 28 \text{ A}$$

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

$$t_{rr} = 40 \text{ ns}$$

Preliminary Data Sheet

| $V_{RSM}$<br>(V) | $V_{RRM}$<br>(V) | Type                      |
|------------------|------------------|---------------------------|
| 1200             | 1200             | PSEI 2x30/12 PSEI 2x31/12 |



| Symbol        | Test Conditions                                                       | Maximum Ratings      |
|---------------|-----------------------------------------------------------------------|----------------------|
| $I_{FRMS}$    | $T_{VJ} = T_{VJM}$                                                    | 70 A                 |
| $I_{FAVM}^*$  | $T_C = 50^\circ\text{C}$ , rectangular, $d=0.5$                       | 28 A                 |
| $I_{FRM}$     | $t_p < 10\mu\text{s}$ ; rep. rating, pulse width limited by $T_{VJM}$ | 375 A                |
| $I_{FSM}$     | $T_{VJ} = 45^\circ\text{C}$ $t = 10 \text{ ms}$ (50 Hz), sine         | 200 A                |
|               | $V_R = 0$ $t = 8.3 \text{ ms}$ (60 Hz), sine                          | 210 A                |
|               | $T_{VJ} = 125^\circ\text{C}$ $t = 10 \text{ ms}$ (50 Hz), sine        | 185 A                |
|               | $V_R = 0$ $t = 8.3 \text{ ms}$ (60 Hz), sine                          | 195 A                |
| $\int i^2 dt$ | $T_{VJ} = 45^\circ\text{C}$ $t = 10 \text{ ms}$ (50 Hz), sine         | 200 A <sup>2</sup> s |
|               | $V_R = 0$ $t = 8.3 \text{ ms}$ (60 Hz), sine                          | 180 A <sup>2</sup> s |
|               | $T_{VJ} = 125^\circ\text{C}$ $t = 10 \text{ ms}$ (50 Hz), sine        | 170 A <sup>2</sup> s |
|               | $V_R = 0$ $t = 8.3 \text{ ms}$ (60 Hz), sine                          | 160 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~              |
|               | $I_{ISOL} \leq 1 \text{ mA}$ $t = 1 \text{ s}$                        | 3600 V~              |
| $M_d$         | Mounting torque (M4)                                                  | 1.5 - 1.8 Nm         |
|               |                                                                       | 14 - 16 lb.in.       |
| <b>Weight</b> | typ.                                                                  | 16 g                 |

| Symbol     | Test Conditions                                                                                                                            | Characteristic Value   |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| $I_R$      | $T_{VJ} = 25^\circ\text{C}$ , $V_R = V_{RRM}$                                                                                              | max. 750 $\mu\text{A}$ |
|            | $T_{VJ} = 25^\circ\text{C}$ , $V_R = 0.8 \cdot V_{RRM}$                                                                                    | max. 250 $\mu\text{A}$ |
|            | $T_{VJ} = 125^\circ\text{C}$ , $V_R = 0.8 \cdot V_{RRM}$                                                                                   | max. 7 mA              |
| $V_F$      | $I_F = 30 \text{ A}$ , $T_{VJ} = 150^\circ\text{C}$                                                                                        | max. 2.20 V            |
|            | $T_{VJ} = 25^\circ\text{C}$                                                                                                                | max. 2.55 V            |
| $V_{TO}$   | For power-loss calculations only                                                                                                           | 1.65 V                 |
| $r_T$      |                                                                                                                                            | 18.2 m $\Omega$        |
| $R_{thJC}$ | per diode; max.                                                                                                                            | 1.25 K/W               |
| $R_{thCH}$ | per diode; typ.                                                                                                                            | 0.05 K/W               |
| $I_{RM}$   | $I_F = 30\text{A}$ ; $-di_F/dt = 240\text{A}/\mu\text{s}$ ; $V_R = 540\text{V}$<br>$L \leq 0.05 \text{ mH}$ ; $T_{VJ} = 100^\circ\text{C}$ | typ. 16 A              |
| $t_{rr}$   | $I_F = 1\text{A}$ ; $-di_F/dt = 100\text{A}/\mu\text{s}$ ; $V_R = 30\text{V}$ ;<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 3600 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  $d=0.5$

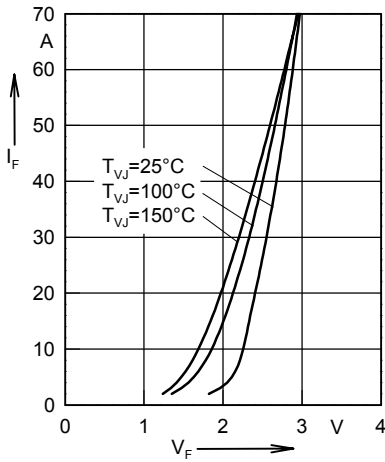


Fig. 1 Forward current versus voltage drop.

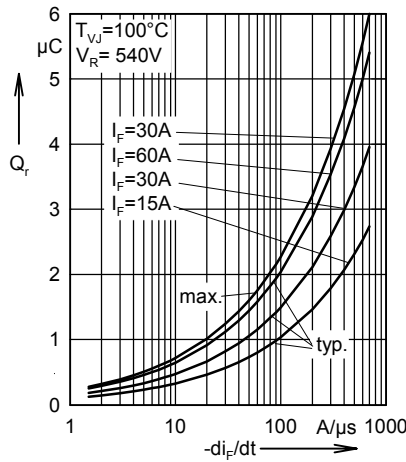


Fig. 2 Recovery charge versus  $-di_F/dt$ .

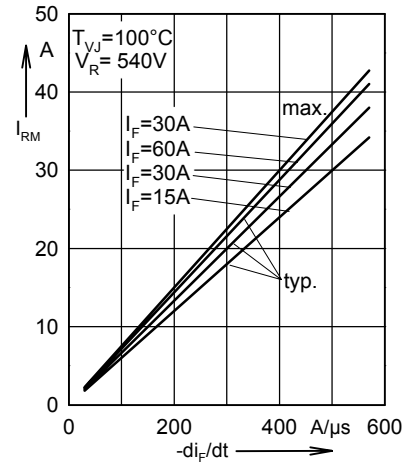


Fig. 3 Peak reverse current versus  $-di_F/dt$ .

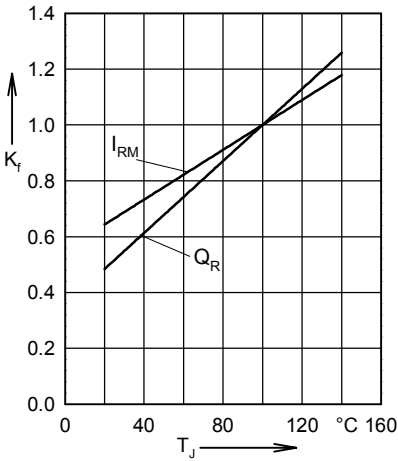


Fig. 4 Dynamic parameters versus junction temperature.

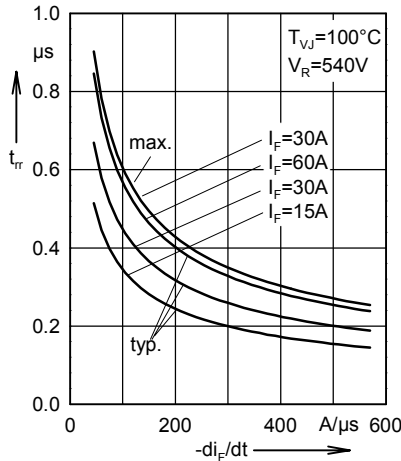


Fig. 5 Recovery time versus  $-di_F/dt$ .

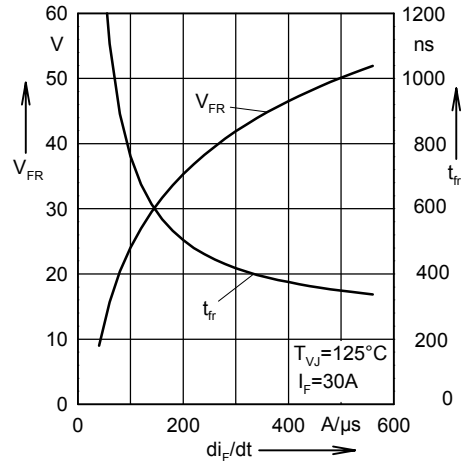


Fig. 6 Peak forward voltage versus  $di_F/dt$ .

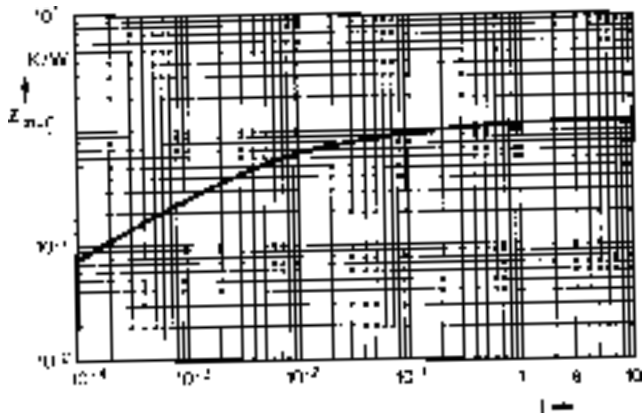


Fig. 7 Transient thermal impedance junction to case.

### Package style and outline

Dimensions in mm (1mm = 0.0394")

