

# Fast Recovery Epitaxial Diode (FRED)

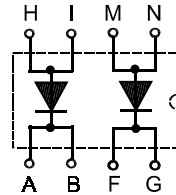
## DSEI 2x61

$I_{FAVM} = 2x60 \text{ A}$

$V_{RRM} = 1000 \text{ V}$

$t_{rr} = 35 \text{ ns}$

| $V_{RSM}$<br>V | $V_{RRM}$<br>V | Type           |
|----------------|----------------|----------------|
| 1000           | 1000           | DSEI 2x 61-10P |



| Symbol        | Conditions   | Maximum Ratings (per diode)                              |                  |
|---------------|--|--|------------------|
| $I_{FRMS}$    | $T_{VJ} = T_{VJM}$   | 100  | A                |
| $I_{FAVM}$ ①  | $T_C = 50^\circ\text{C}$ ; rectangular; $d = 0.5$                      | 60   | A                |
| $I_{FRM}$     | $t_p < 10 \mu\text{s}$ ; rep. rating; pulse width limited by $T_{VJM}$ | 800  | A                |
| $I_{FSM}$     | $T_{VJ} = 45^\circ\text{C}$ ; $t = 10 \text{ ms}$ (50 Hz), sine        | 500  | A                |
| $T_{VJ}$      |  | -40...+150   | $^\circ\text{C}$ |
| $T_{VJM}$     |  | 150  | $^\circ\text{C}$ |
| $T_{stg}$     |  | -40...+150   | $^\circ\text{C}$ |
| $P_{tot}$     | $T_C = 25^\circ\text{C}$   | 180  | W                |
| $V_{ISOL}$    | 50/60 Hz, RMS<br>$I_{ISOL} \leq 1 \text{ mA}$                          | $t = 1 \text{ min}$<br>2500<br>$t = 1 \text{ s}$<br>3000 | V~<br>V~         |
| $M_d$         | Mounting torque (M4)   | 1.5 - 2.0<br>14 - 18                                     | Nm<br>lb.in.     |
| <b>Weight</b> |  | 18   | g                |

### Features

- 2 independent FRED in 1 package
- Isolation voltage 3000 V~
- Planar passivated chips
- Leads suitable for PC board soldering
- Very short recovery time
- 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

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

| Symbol     | Conditions  | Characteristic Values (per diode) |                  |
|------------|---|-----------------------------------|------------------|
|            |   | typ.                              | max.             |
| $I_R$      | $T_{VJ} = 25^\circ\text{C}$ $V_R = V_{RRM}$   |                                   | 3 mA             |
|            | $T_{VJ} = 25^\circ\text{C}$ $V_R = 0.8 \cdot V_{RRM}$   |                                   | 0.5 mA           |
|            | $T_{VJ} = 125^\circ\text{C}$ $V_R = 0.8 \cdot V_{RRM}$  |                                   | 14 mA            |
| $V_F$      | $I_F = 60 \text{ A}$ ; $T_{VJ} = 150^\circ\text{C}$<br>$T_{VJ} = 25^\circ\text{C}$  |                                   | 1.8 V            |
|            |   |                                   | 2.3 V            |
| $V_{T0}$   | For power-loss calculations only  |                                   | 1.65 V           |
| $r_T$      | $T_{VJ} = T_{VJM}$  |                                   | 8.3 m $\Omega$   |
| $R_{thJC}$ |   | 0.7                               | K/W              |
| $R_{thCK}$ |   | 0.05                              | K/W              |
| $t_{rr}$   | $I_F = 1 \text{ A}$ ; $-di/dt = 200 \text{ A}/\mu\text{s}$<br>$V_R = 30 \text{ V}$ ; $T_{VJ} = 25^\circ\text{C}$                                  | 35                                | 50 ns            |
|            |   |                                   |                  |
| $I_{RM}$   | $V_R = 540 \text{ V}$ ; $I_F = 60 \text{ A}$ ; $-di_F/dt = 480 \text{ A}/\mu\text{s}$<br>$L \leq 0.05 \mu\text{H}$ ; $T_{VJ} = 100^\circ\text{C}$ | 32                                | 36 A             |
| $d_S$      | Creeping distance on surface  | min. 11.2                         | mm               |
| $d_A$      | Creeping distance in air  | min. 11.2                         | mm               |
| $a$        | Allowable acceleration  | max. 50                           | m/s <sup>2</sup> |

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

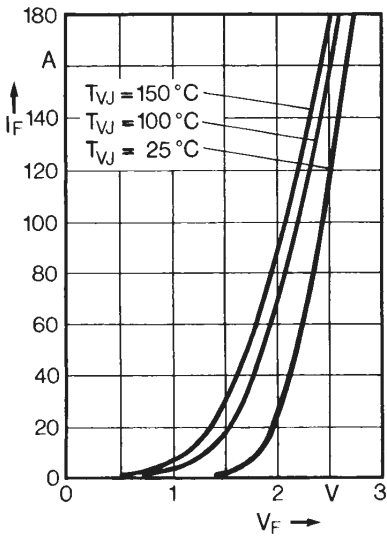


Fig. 1 Forward current versus voltage drop.

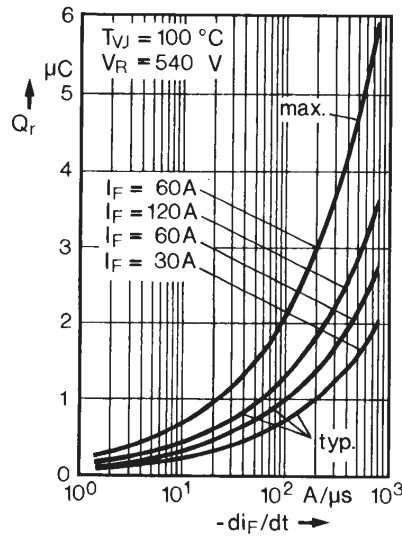


Fig. 2 Recovery charge versus  $-di_F/dt$ .

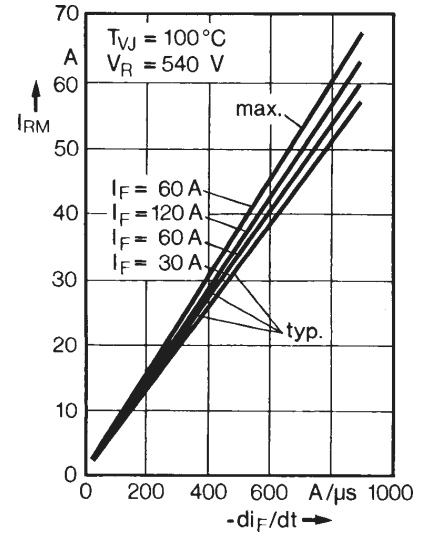


Fig. 3 Peak reverse current versus  $-di_F/dt$ .

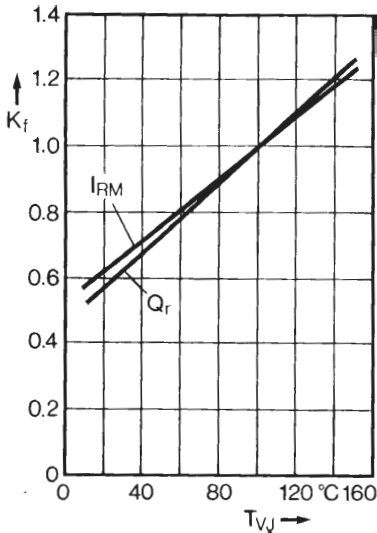


Fig. 4 Dynamic parameters versus junction temperature.

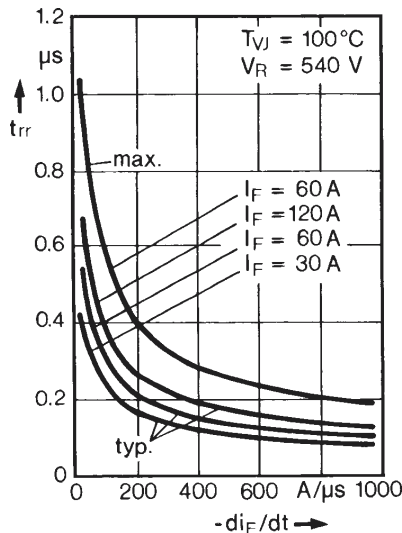


Fig. 5 Recovery time versus  $-di_F/dt$ .

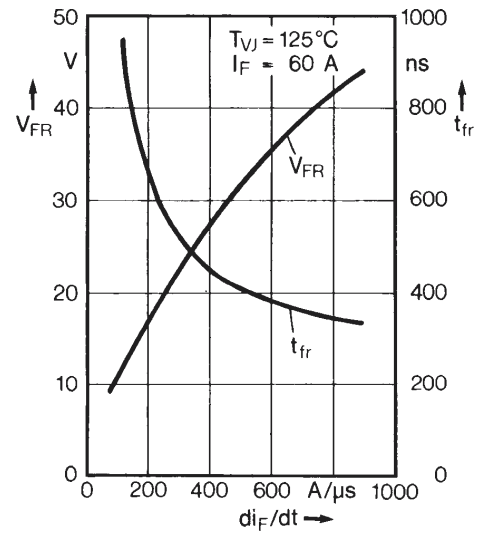


Fig. 6 Peak forward voltage versus  $di_F/dt$ .

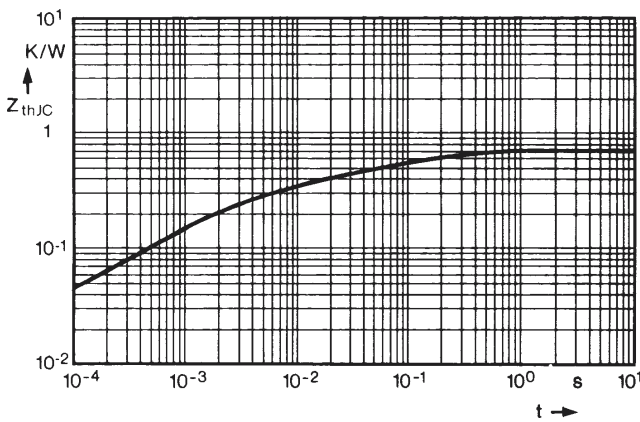


Fig. 7 Transient thermal impedance junction to case.

**Dimensions**

