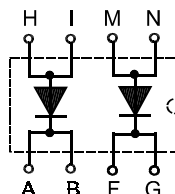


# Fast Recovery Epitaxial Diode (FRED)

**DSEI 2x61**

**$I_{FAVM} = 2 \times 52 \text{ A}$**   
 **$V_{RRM} = 1200 \text{ V}$**   
 **$t_{rr} = 40 \text{ ns}$**

| $V_{RSM}$<br>V | $V_{RRM}$<br>V | Type           |
|----------------|----------------|----------------|
| 1200           | 1200           | DSEI 2x 61-12P |



| Symbol       | Conditions                                                             | Maximum Ratings (per diode) |                  |
|--------------|------------------------------------------------------------------------|-----------------------------|------------------|
| $I_{FRMS}$   | $T_{VJ} = T_{VJM}$                                                     | 100                         | A                |
| $I_{FAVM}$ ① | $T_C = 50^\circ\text{C}$ ; rectangular; $d = 0.5$                      | 52                          | A                |
| $I_{FRM}$    | $t_p < 10 \mu\text{s}$ ; rep. rating; pulse width limited by $T_{VJM}$ | 700                         | A                |
| $I_{FSM}$    | $T_{VJ} = 45^\circ\text{C}$ ; $t = 10 \text{ ms}$ (50 Hz), sine        | 450                         | 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>$I_{ISOL} \leq 1 \text{ mA}$                          | 2500<br>3000                | V~<br>V~         |
| $M_d$        | Mounting torque (M4)                                                   | 1.5 - 2.0<br>14 - 18        | Nm<br>lb.in.     |
| Weight       |                                                                        | 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.                      |
| $I_R$      | $T_{VJ} = 25^\circ\text{C}$ $V_R = V_{RRM}$<br>$T_{VJ} = 25^\circ\text{C}$ $V_R = 0.8 \cdot V_{RRM}$<br>$T_{VJ} = 125^\circ\text{C}$ $V_R = 0.8 \cdot V_{RRM}$ |                                   | 2.2 mA<br>0.5 mA<br>14 mA |
| $V_F$      | $I_F = 60 \text{ A}$ ; $T_{VJ} = 150^\circ\text{C}$<br>$T_{VJ} = 25^\circ\text{C}$                                                                             |                                   | 2.15 V<br>2.50 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>$V_R = 30 \text{ V}$ ; $T_{VJ} = 25^\circ\text{C}$                                               | 40                                | 60 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

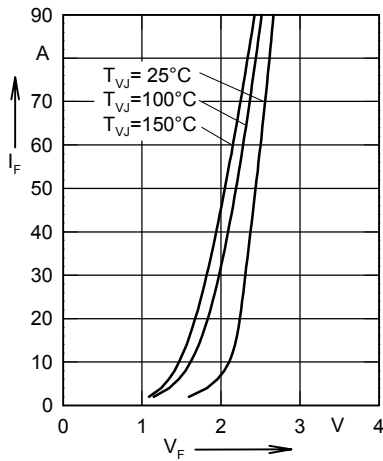


Fig. 1 Forward current versus voltage drop.

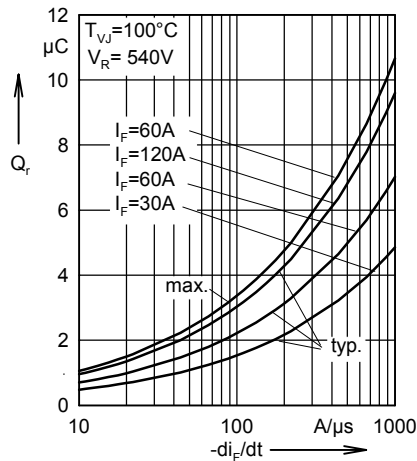


Fig. 2 Recovery charge versus  $-di_F/dt$ .

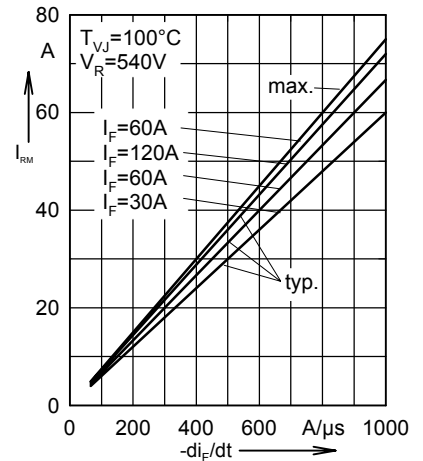


Fig. 3 Peak reverse current versus  $-di_F/dt$ .

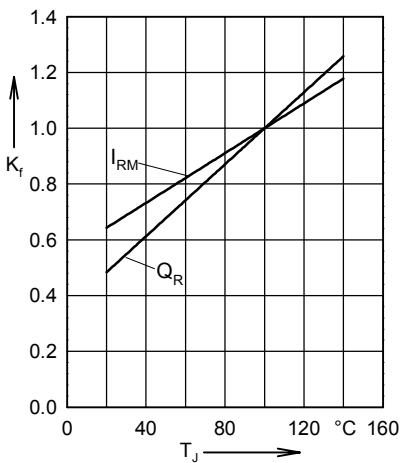


Fig. 4 Dynamic parameters versus junction temperature.

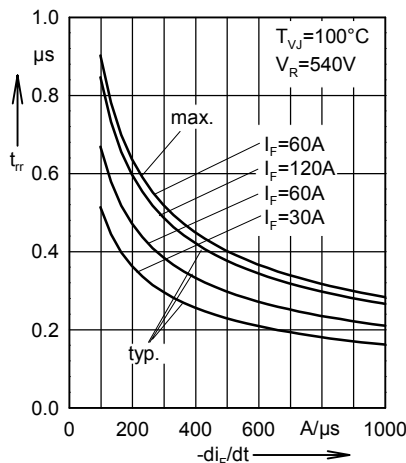


Fig. 5 Recovery time versus  $-di_F/dt$ .

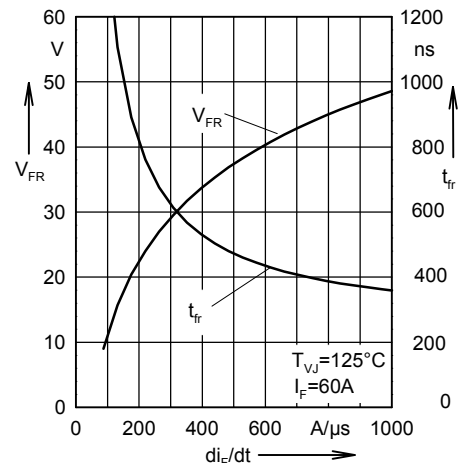


Fig. 6 Peak forward voltage versus  $di_F/dt$ .

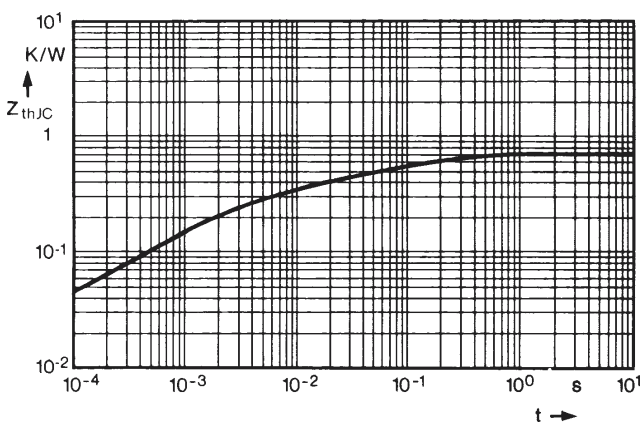


Fig. 7 Transient thermal impedance junction to case.

## Dimensions

