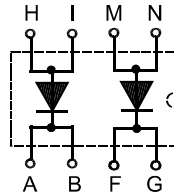


# Fast Recovery Epitaxial Diode (FRED)

$I_{FAVM} = 2x30 \text{ A}$   
 $V_{RRM} = 1000 \text{ V}$   
 $t_{rr} = 35 \text{ ns}$

| $V_{RSM}$ | $V_{RRM}$ | Type           |
|-----------|-----------|----------------|
| V         | V         |                |
| 1000      | 1000      | DSEI 2x 31-10P |



| Symbol        | Conditions   | Maximum Ratings (per diode) |                  |
|---------------|--|-----------------------------|------------------|
| $I_{FRMS}$    | $T_{VJ} = T_{VJM}$   | 70                          | A                |
| $I_{FAVM}$ ①  | $T_C = 50^\circ\text{C}$ ; rectangular; $d = 0.5$                      | 30                          | 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                |
| $T_{VJ}$      |  | -40...+150                  | $^\circ\text{C}$ |
| $T_{VJM}$     |  | 150                         | $^\circ\text{C}$ |
| $T_{stg}$     |  | -40...+150                  | $^\circ\text{C}$ |
| $P_{tot}$     | $T_C = 25^\circ\text{C}$   | 100                         | W                |
| $V_{ISOL}$    | 50/60 Hz, RMS  | 2500                        | V~               |
|               | $I_{ISOL} \leq 1 \text{ mA}$   | 3000                        | V~               |
| $M_d$         | Mounting torque (M4)   | 1.5 - 2.0                   | Nm               |
|               |  | 14 - 18                     | 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.                  |
| $I_R$      | $T_{VJ} = 25^\circ\text{C}$ $V_R = V_{RRM}$   |                                   | 750 $\mu\text{A}$     |
|            | $T_{VJ} = 25^\circ\text{C}$ $V_R = 0.8 \cdot V_{RRM}$   |                                   | 250 $\mu\text{A}$     |
|            | $T_{VJ} = 125^\circ\text{C}$ $V_R = 0.8 \cdot V_{RRM}$  |                                   | 7 mA                  |
| $V_F$      | $I_F = 30 \text{ A}$ ; $T_{VJ} = 150^\circ\text{C}$<br>$T_{VJ} = 25^\circ\text{C}$  |                                   | 2.0 V                 |
|            |   |                                   | 2.4 V                 |
| $V_{T0}$   | For power-loss calculations only  |                                   | 1.5 V                 |
| $r_T$      | $T_{VJ} = T_{VJM}$  |                                   | 12.5 $\text{m}\Omega$ |
| $R_{thJC}$ |   |                                   | 1.25 K/W              |
| $R_{thCK}$ | 0.05  |                                   | K/W                   |
| $t_{rr}$   | $I_F = 1 \text{ A}$ ; $-di/dt = 100 \text{ A}/\mu\text{s}$<br>$V_R = 30 \text{ V}$ ; $T_{VJ} = 25^\circ\text{C}$                                  | 35                                | 50 ns                 |
|            |   |                                   |                       |
| $I_{RM}$   | $V_R = 540 \text{ V}$ ; $I_F = 30 \text{ A}$ ; $-di_F/dt = 240 \text{ A}/\mu\text{s}$<br>$L \leq 0.05 \mu\text{H}$ ; $T_{VJ} = 100^\circ\text{C}$ | 16                                | 18 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                           | $\text{m}/\text{s}^2$ |

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

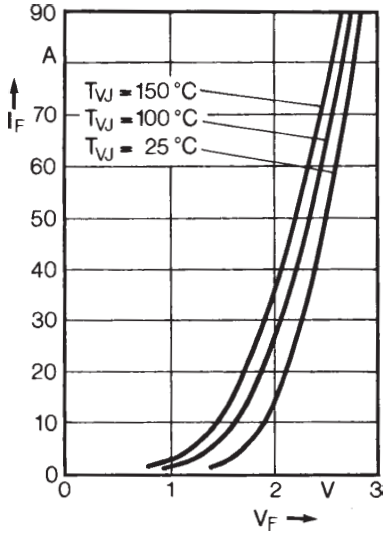


Fig. 1 Forward current versus voltage drop.

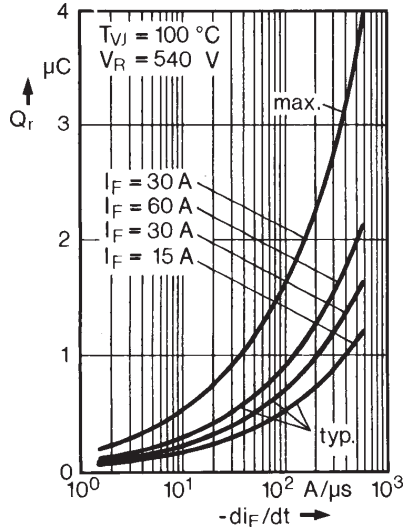


Fig. 2 Recovery charge versus  $-di_F/dt$ .

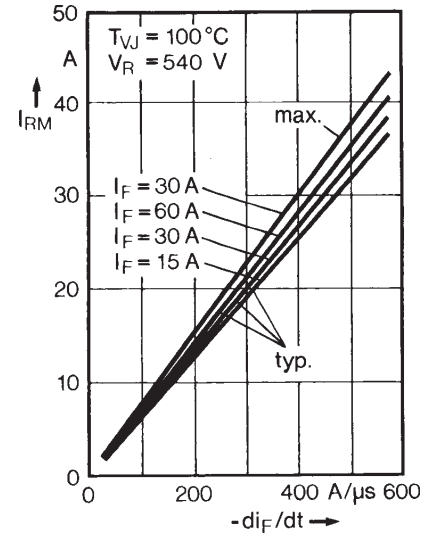


Fig. 3 Peak reverse current versus  $-di_F/dt$ .

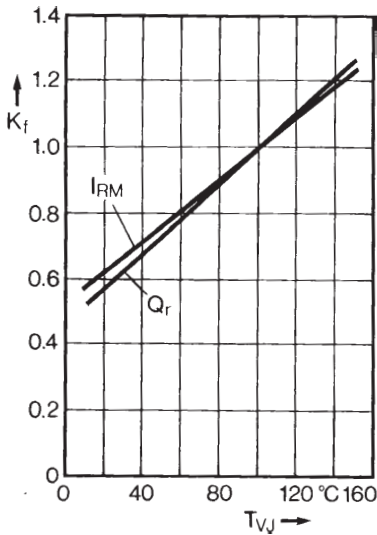


Fig. 4 Dynamic parameters versus junction temperature.

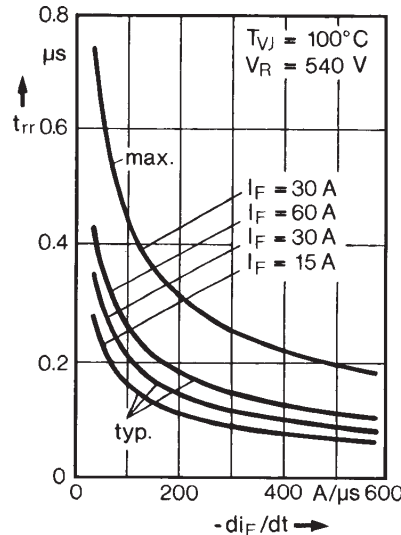


Fig. 5 Recovery time versus  $-di_F/dt$ .

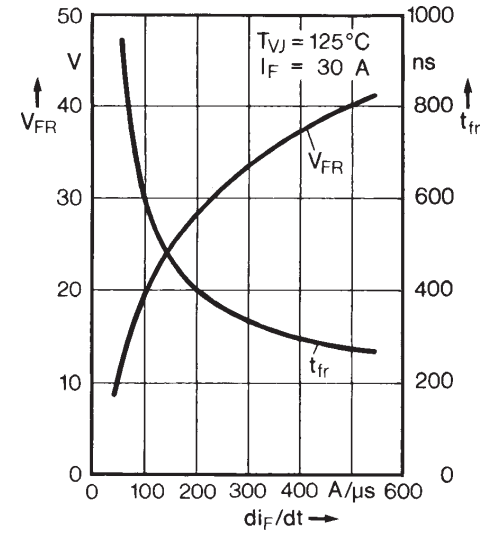


Fig. 6 Peak forward voltage versus  $di_F/dt$ .

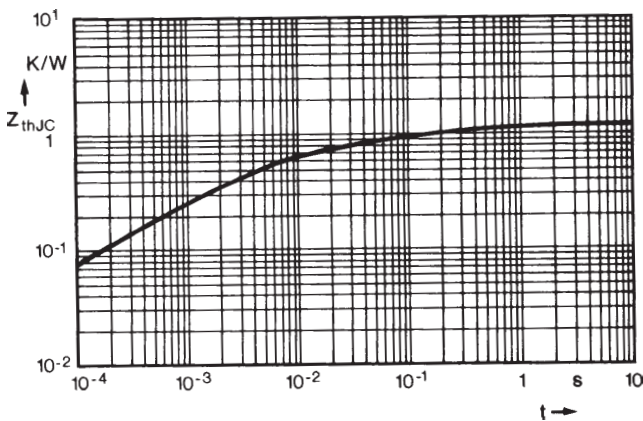


Fig. 7 Transient thermal impedance junction to case.

