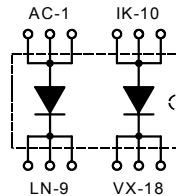


# Fast Recovery Epitaxial Diode (FRED)

**DSEI 2x101**

**$I_{FAVM} = 2 \times 96 \text{ A}$**   
 **$V_{RRM} = 600 \text{ V}$**   
 **$t_{rr} = 35 \text{ ns}$**

| $V_{RSM}$<br>V | $V_{RRM}$<br>V | Type            |
|----------------|----------------|-----------------|
| 600            | 600            | DSEI 2x 101-06P |



| Symbol       | Conditions                                                                          | Maximum Ratings (per diode) |                  |
|--------------|-------------------------------------------------------------------------------------|-----------------------------|------------------|
| $I_{FRMS}$   | $T_{VJ} = T_{VJM}$                                                                  | 150                         | A                |
| $I_{FAVM}$ ① | $T_C = 70^\circ\text{C}$ ; rectangular; $d = 0.5$                                   | 96                          | 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                     | 1200                        | A                |
| $T_{VJ}$     |                                                                                     | -40...+150                  | $^\circ\text{C}$ |
| $T_{VJM}$    |                                                                                     | 150                         | $^\circ\text{C}$ |
| $T_{stg}$    |                                                                                     | -40...+150                  | $^\circ\text{C}$ |
| $P_{tot}$    | $T_C = 25^\circ\text{C}$                                                            | 250                         | W                |
| $V_{ISOL}$   | 50/60 Hz, RMS $t = 1 \text{ min}$<br>$I_{ISOL} \leq 1 \text{ mA}$ $t = 1 \text{ s}$ | 2500<br>3000                | V~<br>V~         |
| $M_d$        | Mounting torque (M4)                                                                | 1.5 - 2.0<br>14 - 18        | Nm<br>lb.in.     |
| Weight       |                                                                                     | 24                          | 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>$T_{VJ} = 125^\circ\text{C}$ $V_R = 0.8 \cdot V_{RRM}$ |                                   | 3 mA<br>1 mA<br>20 mA |
| $V_F$                    | $I_F = 100 \text{ A}$ ; $T_{VJ} = 150^\circ\text{C}$<br>$T_{VJ} = 25^\circ\text{C}$                                                                            |                                   | 1.17 V<br>1.25 V      |
| $V_{T0}$                 | For power-loss calculations only                                                                                                                               |                                   | 0.7 V                 |
| $r_T$                    | $T_{VJ} = T_{VJM}$                                                                                                                                             |                                   | 4.7 m $\Omega$        |
| $R_{thJC}$<br>$R_{thCK}$ |                                                                                                                                                                | 0.05                              | 0.5 K/W<br>K/W        |
| $t_{rr}$                 | $I_F = 1 \text{ A}$ ; $-di/dt = 400 \text{ A}/\mu\text{s}$<br>$V_R = 30 \text{ V}$ ; $T_{VJ} = 25^\circ\text{C}$                                               | 40                                | 60 ns                 |
| $I_{RM}$                 | $V_R = 100 \text{ V}$ ; $I_F = 80 \text{ A}$ ; $-di_F/dt = 200 \text{ A}/\mu\text{s}$<br>$L \leq 0.05 \mu\text{H}$ ; $T_{VJ} = 100^\circ\text{C}$              | 19                                | 24 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

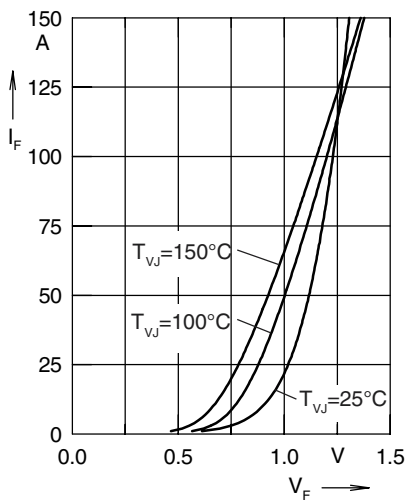


Fig. 1 Forward current  $I_F$  versus  $V_F$

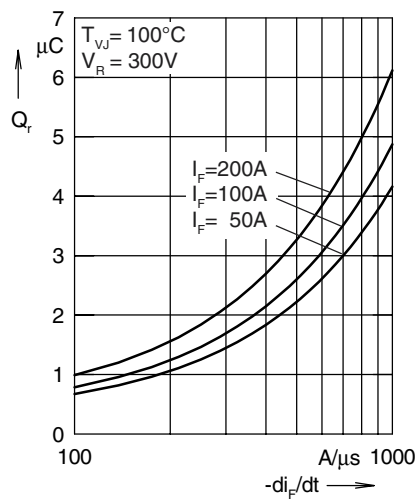


Fig. 2 Reverse recovery charge  $Q_r$  versus  $-di_F/dt$

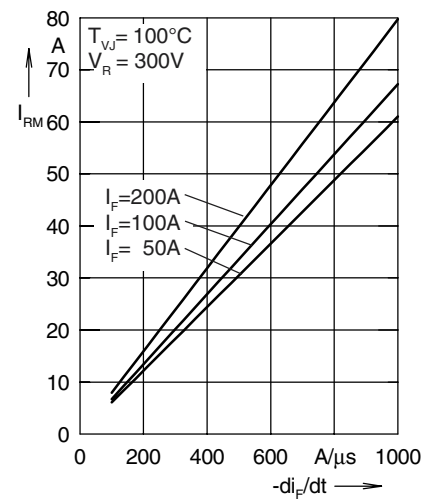


Fig. 3 Peak reverse current  $I_{RM}$  versus  $-di_F/dt$

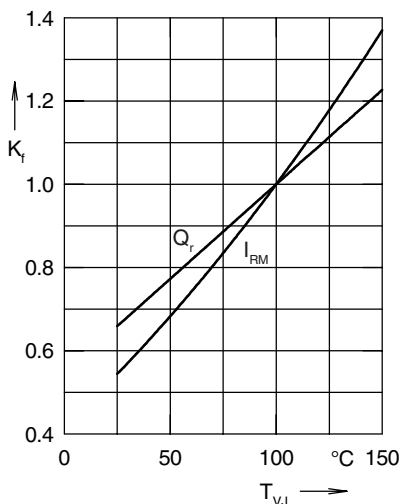


Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$

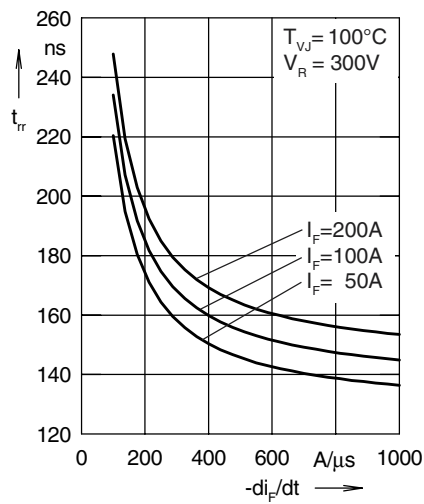


Fig. 5 Recovery time  $t_{rr}$  versus  $-di_F/dt$

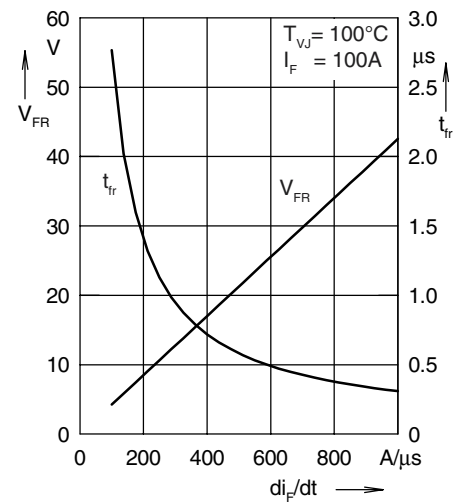


Fig. 6 Peak forward voltage  $V_{FR}$  and  $t_{rr}$  versus  $di_F/dt$

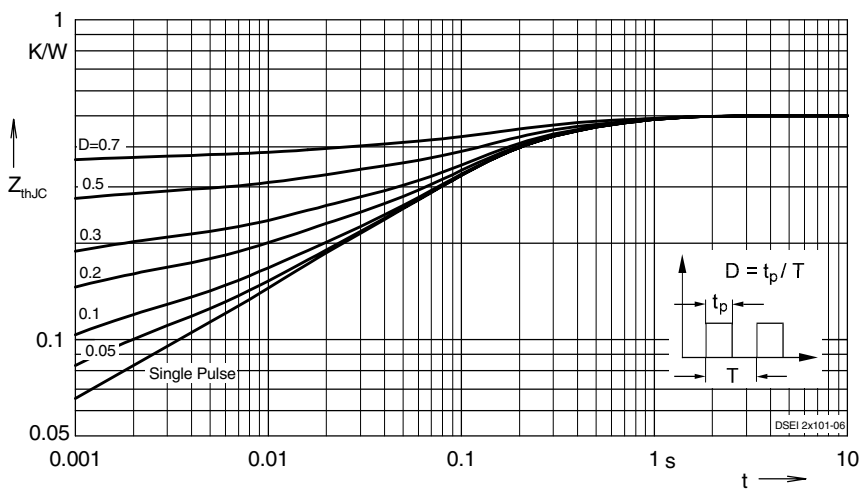


Fig. 7 Transient thermal impedance junction to case at various duty cycles

Dimensions in mm (1mm = 0.0394")

