

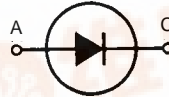


Fast Recovery Epitaxial Diode (FRED)

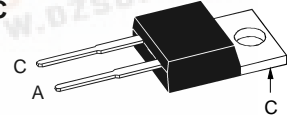
DSEI 20

$I_{FAVM} = 17\text{ A}$
 $V_{RRM} = 1200\text{ V}$
 $t_{rr} = 40\text{ ns}$

| V_{RSM} | V_{RRM} | Type |
|-----------|-----------|-------------|
| V | V | |
| 1200 | 1200 | DSEI 20-12A |



TO-220 AC



A = Anode, C = Cathode

| Symbol | Test Conditions | Maximum Ratings | |
|---|---|-----------------|------------------|
| I_{FRMS} I_{FAVM} ① I_{FRM} | $T_{VJ} = T_{VJM}$ | 70 | A |
| | $T_C = 85^\circ\text{C}$; rectangular, $d = 0.5$ | 17 | A |
| | $t_p < 10\ \mu\text{s}$; rep. rating, pulse width limited by T_{VJM} | 220 | A |
| I_{FSM} | $T_{VJ} = 45^\circ\text{C}$; $t = 10\text{ ms}$ (50 Hz), sine | 130 | A |
| | $t = 8.3\text{ ms}$ (60 Hz), sine | 140 | A |
| | $T_{VJ} = 150^\circ\text{C}$; $t = 10\text{ ms}$ (50 Hz), sine | 110 | A |
| | $t = 8.3\text{ ms}$ (60 Hz), sine | 120 | A |
| I^2t | $T_{VJ} = 45^\circ\text{C}$; $t = 10\text{ ms}$ (50 Hz), sine | 85 | A ² s |
| | $t = 8.3\text{ ms}$ (60 Hz), sine | 80 | A ² s |
| | $T_{VJ} = 150^\circ\text{C}$; $t = 10\text{ ms}$ (50 Hz), sine | 60 | A ² s |
| | $t = 8.3\text{ ms}$ (60 Hz), sine | 60 | A ² s |
| T_{VJ} | | -40...+150 | °C |
| T_{VJM} | | 150 | °C |
| T_{stg} | | -40...+150 | °C |
| P_{tot} | $T_C = 25^\circ\text{C}$ | 78 | W |
| M_d | Mounting torque | 0.4...0.6 | Nm |
| Weight | | 2 | g |

Features

- International standard package
- Glass passivated chips
- Very short recovery time
- Extremely low losses at high switching frequencies
- Low I_{RM} -values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

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

| Symbol | Test Conditions | Characteristic Values | |
|------------|---|-----------------------------|-------------------|
| | | typ. | max. |
| I_R | $T_{VJ} = 25^\circ\text{C}$ | $V_R = V_{RRM}$ | 750 μA |
| | $T_{VJ} = 25^\circ\text{C}$ | $V_R = 0.8 \cdot V_{RRM}$ | 250 μA |
| | $T_{VJ} = 125^\circ\text{C}$ | $V_R = 0.8 \cdot V_{RRM}$ | 7 mA |
| V_F | $I_F = 12\text{ A}$; $T_{VJ} = 150^\circ\text{C}$ | $T_{VJ} = 25^\circ\text{C}$ | 1.87 V |
| | | | 2.15 V |
| V_{To} | For power-loss calculations only | 1.65 | V |
| r_T | $T_{VJ} = T_{VJM}$ | 18.2 | m Ω |
| R_{thJC} | | 1.6 | K/W |
| R_{thJA} | | 60 | K/W |
| t_{rr} | $I_F = 1\text{ A}$; $-di/dt = 100\text{ A}/\mu\text{s}$; $V_R = 30\text{ V}$; $T_{VJ} = 25^\circ\text{C}$ | 40 | 60 ns |
| I_{RM} | $V_R = 540\text{ V}$; $I_F = 20\text{ A}$; $-di_F/dt = 100\text{ A}/\mu\text{s}$ $L \leq 0.05\ \mu\text{H}$; $T_{VJ} = 100^\circ\text{C}$ | 7 | A |

Advantages

- High reliability circuit operation
- Low voltage peaks for reduced protection circuits
- Low noise switching
- Low losses
- Operating at lower temperature or space saving by reduced cooling

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
 IXYS reserves the right to change limits, test conditions and dimensions

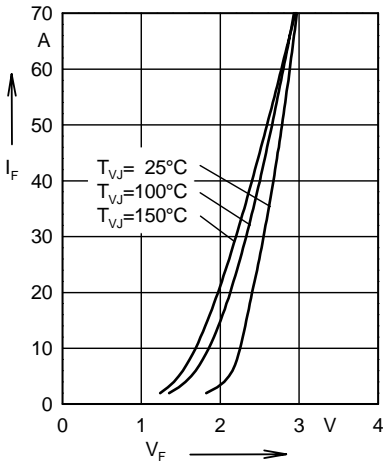


Fig. 1 Forward current versus voltage drop.

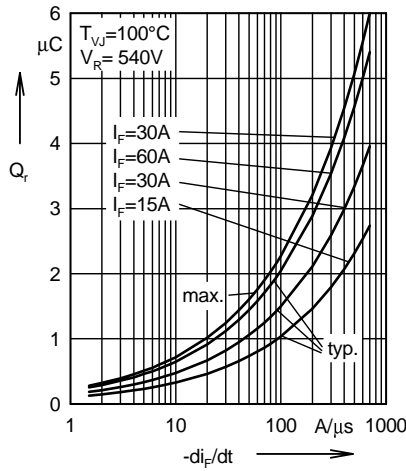


Fig. 2 Recovery charge versus $-di_F/dt$.

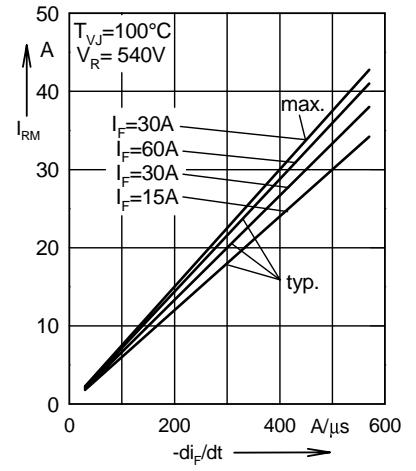


Fig. 3 Peak reverse current versus $-di_F/dt$.

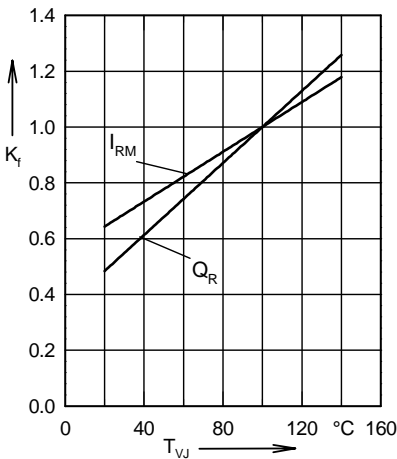


Fig. 4 Dynamic parameters versus junction temperature.

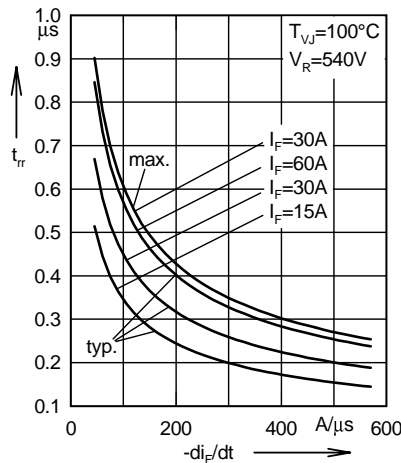


Fig. 5 Recovery time versus $-di_F/dt$.

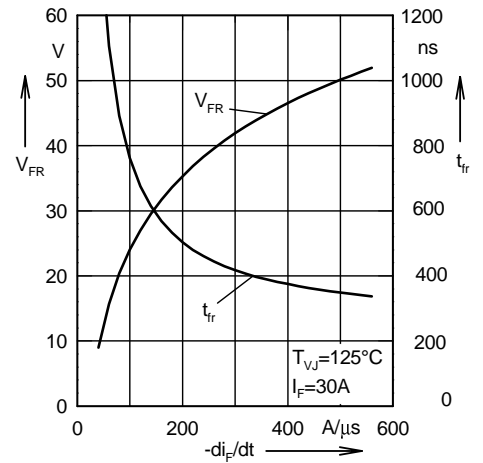


Fig. 6 Peak forward voltage versus di_F/dt .

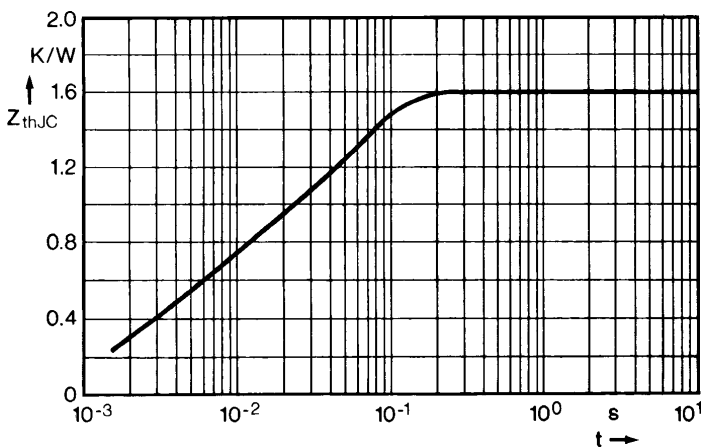
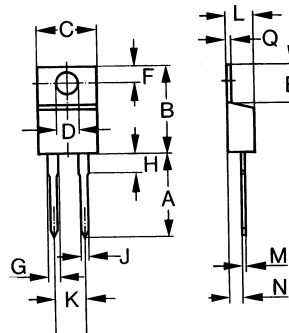


Fig. 7 Transient thermal impedance junction to case.

Dimensions



| Dim. | Millimeter | | Inches | |
|------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 12.70 | 14.73 | 0.500 | 0.580 |
| B | 14.23 | 16.51 | 0.560 | 0.650 |
| C | 9.66 | 10.66 | 0.380 | 0.420 |
| D | 3.54 | 4.08 | 0.139 | 0.161 |
| E | 5.85 | 6.85 | 0.230 | 0.420 |
| F | 2.54 | 3.42 | 0.100 | 0.135 |
| G | 1.15 | 1.77 | 0.045 | 0.070 |
| H | - | 6.35 | - | 0.250 |
| J | 0.64 | 0.89 | 0.025 | 0.035 |
| K | 4.83 | 5.33 | 0.190 | 0.210 |
| L | 3.56 | 4.82 | 0.140 | 0.190 |
| M | 0.38 | 0.56 | 0.015 | 0.022 |
| N | 2.04 | 2.49 | 0.080 | 0.115 |
| Q | 0.64 | 1.39 | 0.025 | 0.055 |