



Fast Recovery Epitaxial Diode (FRED)

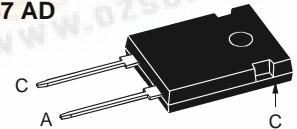
DSEI 30

$I_{FAVM} = 37\text{ A}$
 $V_{RRM} = 600\text{ V}$
 $t_{rr} = 35\text{ ns}$

| | | |
|-----------|-----------|-------------|
| V_{RSM} | V_{RRM} | Type |
| V | V | |
| 640 | 600 | DSEI 30-06A |



TO-247 AD



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, $d = 0.5$ | 37 | A |
| | $t_p < 10\ \mu\text{s}$; 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 | 300 | A |
| | $t = 8.3\text{ ms}$ (60 Hz), sine | 320 | A |
| | $T_{VJ} = 150^\circ\text{C}$; $t = 10\text{ ms}$ (50 Hz), sine | 260 | A |
| | $t = 8.3\text{ ms}$ (60 Hz), sine | 280 | A |
| I^2t | $T_{VJ} = 45^\circ\text{C}$; $t = 10\text{ ms}$ (50 Hz), sine | 450 | A ² s |
| | $t = 8.3\text{ ms}$ (60 Hz), sine | 420 | A ² s |
| | $T_{VJ} = 150^\circ\text{C}$; $t = 10\text{ ms}$ (50 Hz), sine | 340 | A ² s |
| | $t = 8.3\text{ ms}$ (60 Hz), sine | 320 | A ² s |
| T_{VJ} | | -40...+150 | °C |
| T_{VJM} | | 150 | °C |
| T_{stg} | | -40...+150 | °C |
| P_{tot} | $T_C = 25^\circ\text{C}$ | 125 | W |
| M_d | Mounting torque | 0.8...1.2 | Nm |
| Weight | | 6 | g |

Features

- International standard package JEDEC TO-247 AD
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- 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

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

| Symbol | Test Conditions | Characteristic Values | |
|--|---|-----------------------|---------------|
| | | typ. | max. |
| I_R | $T_{VJ} = 25^\circ\text{C}$ $V_R = V_{RRM}$ | 100 | μA |
| | $T_{VJ} = 25^\circ\text{C}$ $V_R = 0.8 \cdot V_{RRM}$ | 50 | μA |
| | $T_{VJ} = 125^\circ\text{C}$ $V_R = 0.8 \cdot V_{RRM}$ | 7 | mA |
| V_F | $I_F = 37\text{ A}$; $T_{VJ} = 150^\circ\text{C}$ | 1.4 | V |
| | $T_{VJ} = 25^\circ\text{C}$ | 1.6 | V |
| V_{T0} | For power-loss calculations only | 1.01 | V |
| r_T | $T_{VJ} = T_{VJM}$ | 7.1 | m Ω |
| R_{thJC} R_{thCK} R_{thJA} | 0.25 | 1 | K/W |
| | | | K/W |
| | | 35 | K/W |
| t_{rr} | $I_F = 1\text{ A}$; $-di/dt = 100\text{ A}/\mu\text{s}$; $V_R = 30\text{ V}$; $T_{VJ} = 25^\circ\text{C}$ | 35 | 50 ns |
| I_{RM} | $V_R = 350\text{ V}$; $I_F = 30\text{ A}$; $-di_F/dt = 240\text{ A}/\mu\text{s}$ $L \leq 0.05\ \mu\text{H}$; $T_{VJ} = 100^\circ\text{C}$ | 10 | 11 A |

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

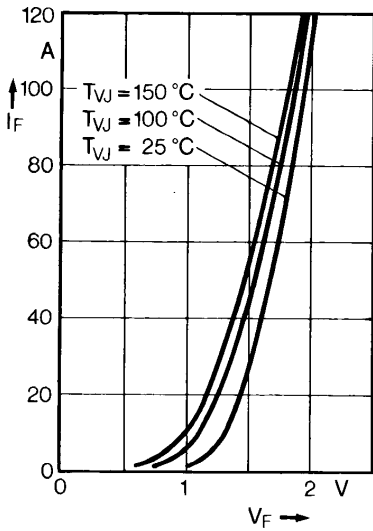


Fig. 1 Forward current versus voltage drop.

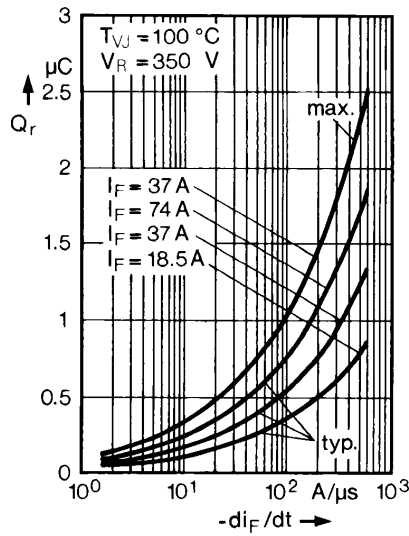


Fig. 2 Recovery charge versus $-di_F/dt$.

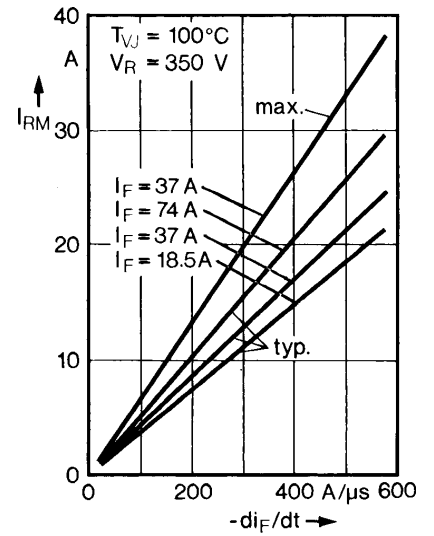


Fig. 3 Peak reverse current versus $-di_F/dt$.

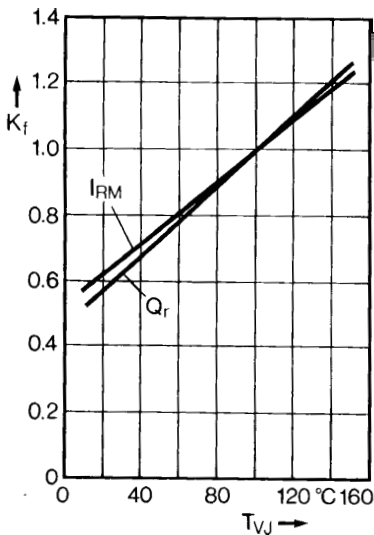


Fig. 4 Dynamic parameters versus junction temperature.

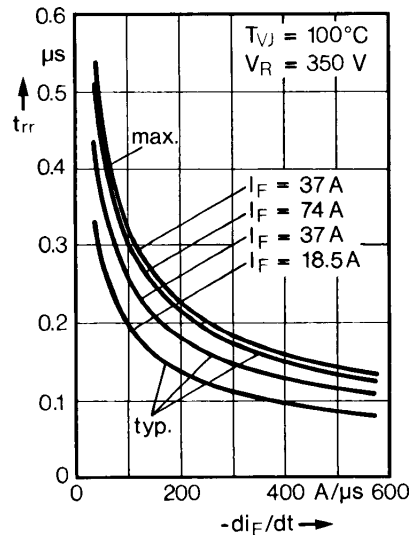


Fig. 5 Recovery time versus $-di_F/dt$.

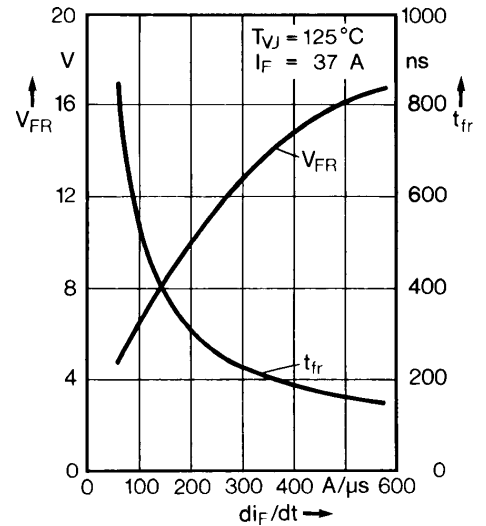


Fig. 6 Peak forward voltage versus di_F/dt .

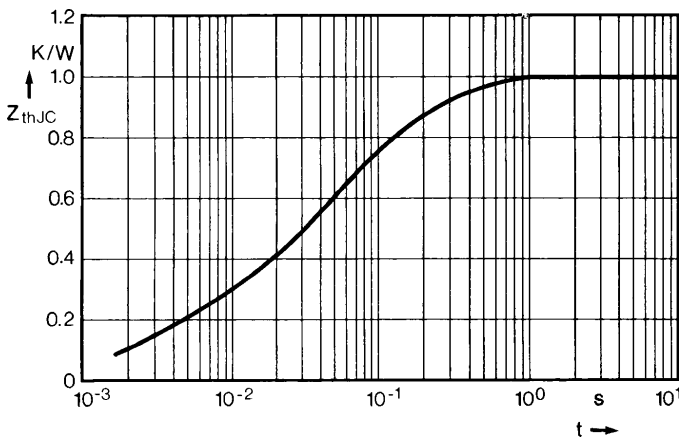
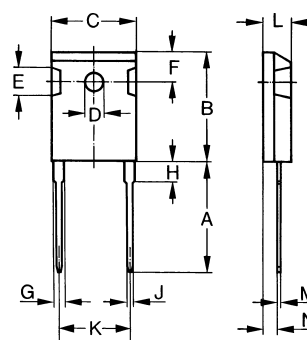


Fig. 7 Transient thermal impedance junction to case.

Dimensions



| Dim. | Millimeter | | Inches | |
|------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 19.81 | 20.32 | 0.780 | 0.800 |
| B | 20.80 | 21.46 | 0.819 | 0.845 |
| C | 15.75 | 16.26 | 0.610 | 0.640 |
| D | 3.55 | 3.65 | 0.140 | 0.144 |
| E | 4.32 | 5.49 | 0.170 | 0.216 |
| F | 5.4 | 6.2 | 0.212 | 0.244 |
| G | 1.65 | 2.13 | 0.065 | 0.084 |
| H | - | 4.5 | - | 0.177 |
| J | 1.0 | 1.4 | 0.040 | 0.055 |
| K | 10.8 | 11.0 | 0.426 | 0.433 |
| L | 4.7 | 5.3 | 0.185 | 0.209 |
| M | 0.4 | 0.8 | 0.016 | 0.031 |
| N | 2.2 | 2.54 | 0.087 | 0.102 |