

Common Cathode Fast Recovery Epitaxial Diode (FRED)

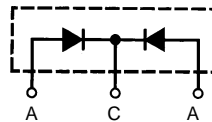
DSEK 30

$$I_{FAVM} = 2 \times 26 \text{ A}$$

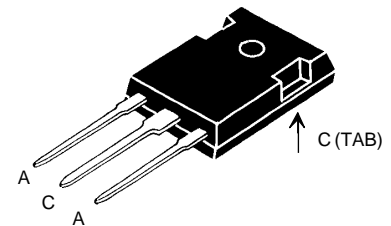
$$V_{RRM} = 1200 \text{ V}$$

$$t_{rr} = 40 \text{ ns}$$

| V_{RSM} | V_{RRM} | Type |
|-----------|-----------|-------------|
| V | V | |
| 1200 | 1200 | DSEK 30-12A |



TO-247 AD



A = Anode, C = Cathode, TAB = Cathode

| Symbol | Test Conditions | Maximum Ratings | |
|------------------|--|-----------------|------------------|
| I_{FRMS} | $T_{VJ} = T_{VJM}$ | 50 | A |
| $I_{FAVM} \star$ | $T_C = 85^\circ\text{C}$; rectangular, $d = 0.5$ | 26 | 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 |
| | $t = 8.3 \text{ ms}$ (60 Hz), sine | 210 | A |
| | $T_{VJ} = 150^\circ\text{C}$; $t = 10 \text{ ms}$ (50 Hz), sine | 185 | A |
| | $t = 8.3 \text{ ms}$ (60 Hz), sine | 195 | A |
| $\int i^2 dt$ | $T_{VJ} = 45^\circ\text{C}$; $t = 10 \text{ ms}$ (50 Hz), sine | 200 | A ² s |
| | $t = 8.3 \text{ ms}$ (60 Hz), sine | 180 | A ² s |
| | $T_{VJ} = 150^\circ\text{C}$; $t = 10 \text{ ms}$ (50 Hz), sine | 170 | A ² s |
| | $t = 8.3 \text{ ms}$ (60 Hz), sine | 160 | 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 with screw M3 | 0.45-0.55/4-5 | Nm/lb.in. |
| | Mounting torque with screw M3.5 | 0.45-0.55/4-5 | Nm/lb.in. |
| 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 behavior
- Epoxy meets UL 94V-0 flammability classification

Applications

- Rectifiers in switch mode power supplies (SMPS)
- 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 | $T_{VJ} = 25^\circ\text{C}$ $V_R = V_{RRM}$ | 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 | $I_F = 37 \text{ A}$; $T_{VJ} = 150^\circ\text{C}$ | 2.2 | V |
| | $T_{VJ} = 25^\circ\text{C}$ | 2.55 | V |
| V_{T0} | For power-loss calculations only | 1.65 | V |
| r_T | $T_{VJ} = T_{VJM}$ | 18.2 | m Ω |
| R_{thJC} | | 0.9 | K/W |
| R_{thCK} | | 0.5 | K/W |
| R_{thJA} | | 70 | 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} | $V_R = 540 \text{ V}$; $I_F = 30 \text{ A}$; $-di_F/dt = 240 \text{ A}/\mu\text{s}$ | 16 | 18 A |
| | $L \leq 0.05 \mu\text{H}$; $T_{VJ} = 100^\circ\text{C}$ | | |

$\star I_{FAVM}$ rating includes reverse blocking losses at T_{VJM} , $V_R = 0.8 V_{RRM}$ duty cycle $d = 0.5$
Data according to DIN/IEC 747 and refer to a single diode unless otherwise stated.
IXYS reserves the right to change limits, test conditions and dimensions

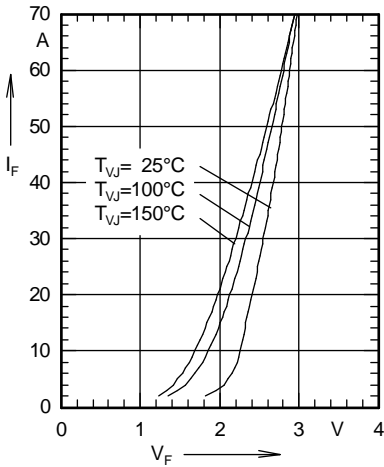


Fig. 1 Forward current versus voltage drop.

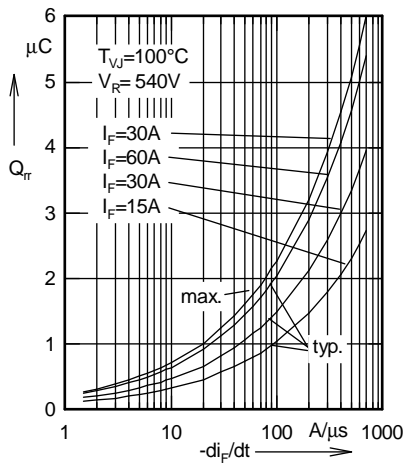


Fig. 2 Recovery charge versus $-di_F/dt$.

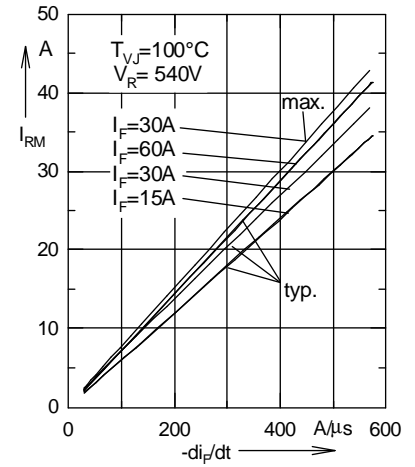


Fig. 3 Peak reverse current versus $-di_F/dt$.

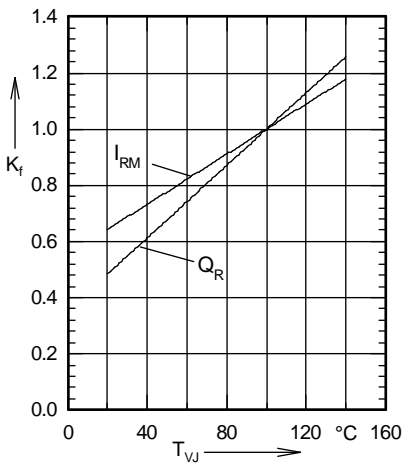


Fig. 4 Dynamic parameters versus junction temperature.

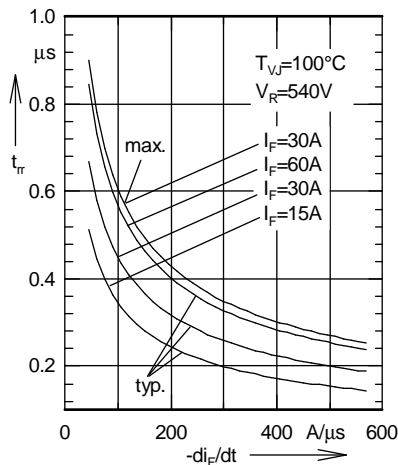


Fig. 5 Recovery time versus $-di_F/dt$.

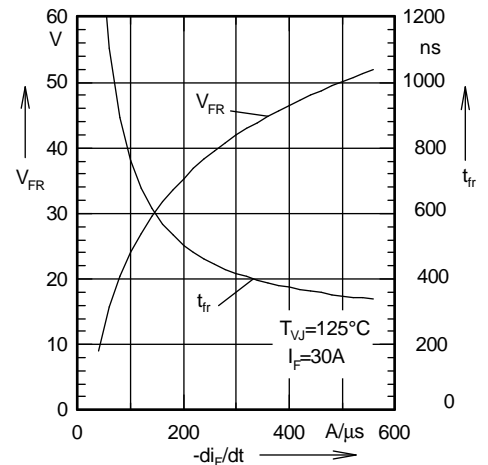


Fig. 6 Peak forward voltage versus $-di_F/dt$.

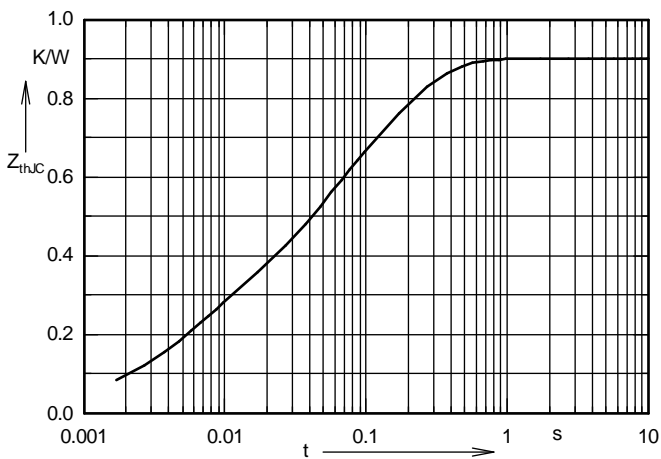
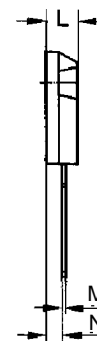
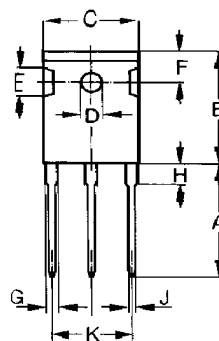


Fig. 7 Transient thermal impedance junction to case

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 | 1.5 | 2.49 | 0.087 | 0.102 |