

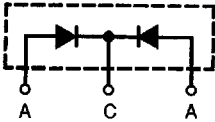
Common Cathode  
Fast Recovery  
Epitaxial Diode (FRED)

DSEK 30

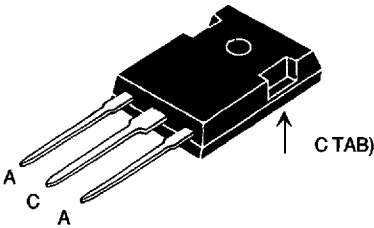
$V_{RRM} = 600\text{ V}$   
 $I_{FAVM} = 2 \times 30\text{ A}$   
 $t_{rr} = 35\text{ ns}$

Preliminary data

| $V_{RSM}$<br>V | $V_{RRM}$<br>V | Type        |
|----------------|----------------|-------------|
| 640            | 600            | DSEK 30-06A |



TO-247 AD



A = Anode, C = Cathode, TAB = Cathode

| Symbol                                | Test Conditions                                                                                                                                          | Maximum Ratings                 |                                                          |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------------------------|
| $I_{FRMS}$<br>$I_{FAVM}$<br>$I_{FRM}$ | $T_{VJ} = T_{VJM}$<br>$T_C = 85^\circ\text{C}$ ; rectangular, $d = 0.5$<br>$t_p < 10\text{ }\mu\text{s}$ ; rep. rating, pulse width limited by $T_{VJM}$ | 50<br>30<br>375                 | A<br>A<br>A                                              |
| $I_{FSM}$                             | $T_{VJ} = 45^\circ\text{C}$ ; $t = 10\text{ ms}$ (50 Hz), sine<br>$t = 8.3\text{ ms}$ (60 Hz), sine                                                      | 300<br>320                      | A<br>A                                                   |
|                                       | $T_{VJ} = 150^\circ\text{C}$ ; $t = 10\text{ ms}$ (50 Hz), sine<br>$t = 8.3\text{ ms}$ (60 Hz), sine                                                     | 260<br>280                      | A<br>A                                                   |
| $\int i^2 dt$                         | $T_{VJ} = 45^\circ\text{C}$ ; $t = 10\text{ ms}$ (50 Hz), sine<br>$t = 8.3\text{ ms}$ (60 Hz), sine                                                      | 450<br>420                      | $\text{A}^2\text{s}$<br>$\text{A}^2\text{s}$             |
|                                       | $T_{VJ} = 150^\circ\text{C}$ ; $t = 10\text{ ms}$ (50 Hz), sine<br>$t = 8.3\text{ ms}$ (60 Hz), sine                                                     | 340<br>320                      | $\text{A}^2\text{s}$<br>$\text{A}^2\text{s}$             |
| $T_{VJ}$<br>$T_{VJM}$<br>$T_{stg}$    |                                                                                                                                                          | -40...+150<br>150<br>-40...+150 | $^\circ\text{C}$<br>$^\circ\text{C}$<br>$^\circ\text{C}$ |
| $P_{tot}$                             | $T_C = 25^\circ\text{C}$                                                                                                                                 | 125                             | W                                                        |
| $M_d$                                 | Mounting torque with screw M3<br>Mounting torque with screw M3.5                                                                                         | 0.45-0.55/4-5<br>0.45-0.55/4-5  | Nm/lb.in.<br>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 meet 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.                                 |
| $I_R$                                  | $T_{VJ} = 25^\circ\text{C}$ $V_R = V_{RRM}$<br>$T_{VJ} = 25^\circ\text{C}$ $V_R = 0.8 \cdot V_{RRM}$<br>$T_{VJ} = 125^\circ\text{C}$ $V_R = 0.8 \cdot V_{RRM}$ | 100<br>50<br>7        | $\mu\text{A}$<br>$\mu\text{A}$<br>mA |
| $V_F$                                  | $I_F = 37\text{ A}$ ; $T_{VJ} = 150^\circ\text{C}$<br>$T_{VJ} = 25^\circ\text{C}$                                                                              | 1.4<br>1.6            | V<br>V                               |
| $V_{TO}$                               | For power-loss calculations only                                                                                                                               | 1.01                  | V                                    |
| $r_T$                                  | $T_{VJ} = T_{VJM}$                                                                                                                                             | 7.1                   | m $\Omega$                           |
| $R_{thJC}$<br>$R_{thCK}$<br>$R_{thJA}$ |                                                                                                                                                                | 1<br>0.5<br>70        | K/W<br>K/W<br>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                    | ns                                   |
| $I_{RM}$                               | $V_R = 350\text{ V}$ ; $I_F = 30\text{ A}$ ; $-di_F/dt = 240\text{ A}/\mu\text{s}$<br>$L \leq 0.05\text{ }\mu\text{H}$ ; $T_{VJ} = 100^\circ\text{C}$          | 10                    | 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 DIN/IEC 747 and refer to a single diode unless otherwise stated.  
IXYS reserves the right to change limits, test conditions and dimensions

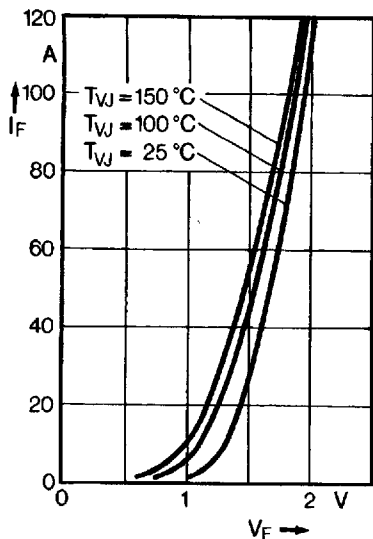


Fig. 1 Forward current versus voltage drop.

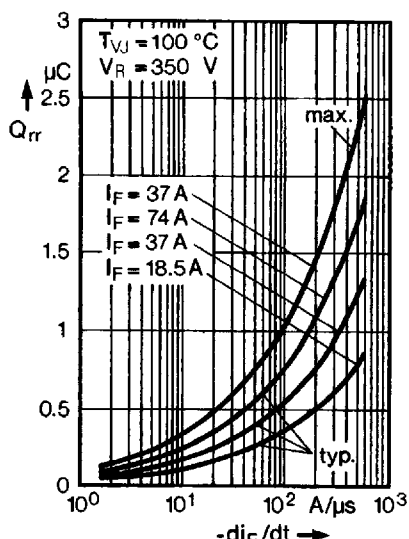


Fig. 2 Recovery charge versus  $-di_F/dt$ .

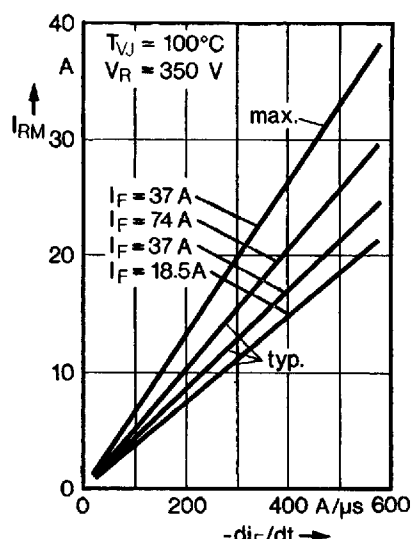


Fig. 3 Peak reverse current versus  $-di_F/dt$ .

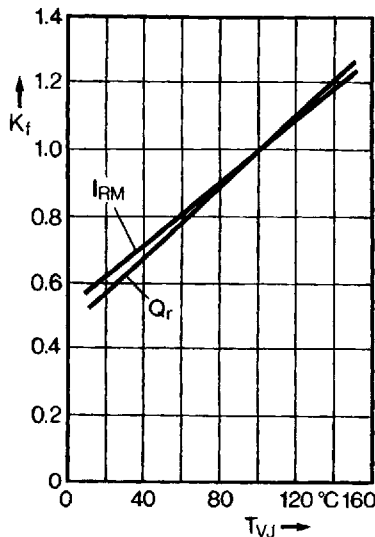


Fig. 4 Dynamic parameters versus junction temperature.

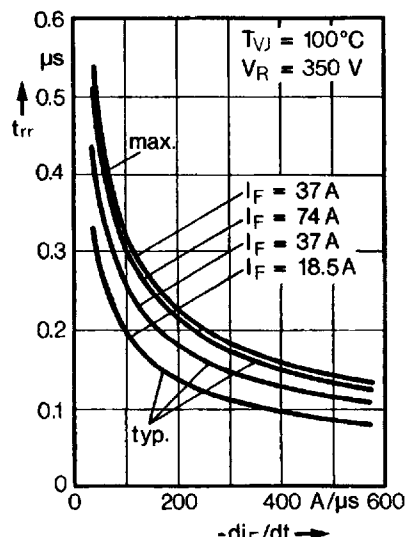


Fig. 5 Recovery time versus  $-di_F/dt$ .

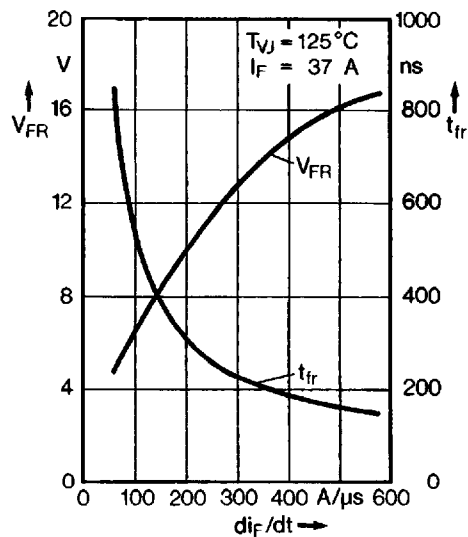


Fig. 6 Peak forward voltage versus  $-di_F/dt$ .

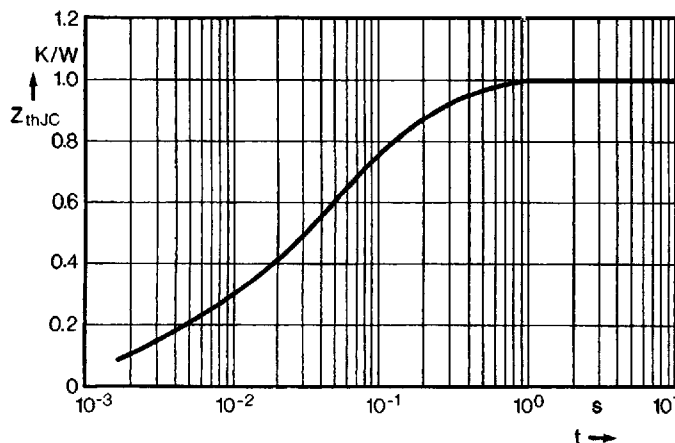
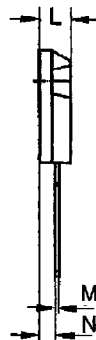
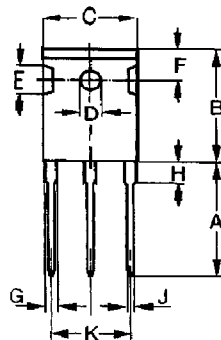


Fig. 7 Transient thermal impedance junction to case.

#### Dimensions



| Dim. | Millimeter<br>Min. Max. | Inches<br>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         |