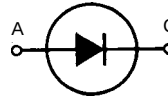


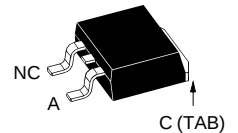
# Fast Recovery Epitaxial Diode (FRED)

**DSEI 8**  $I_{FAVM} = 8\text{ A}$   
 $V_{RRM} = 600\text{ V}$   
 $t_{rr} = 35\text{ ns}$

| $V_{RSM}$<br>V | $V_{RRM}$<br>V | Type        |
|----------------|----------------|-------------|
| 640            | 600            | DSEI 8-06A  |
| 640            | 600            | DSEI 8-06AS |

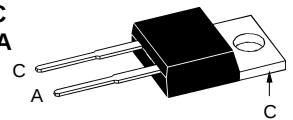


**TO-263 AA**  
**DSEI 8-06AS**



| Symbol       | Test Conditions                                                               | Maximum Ratings |                      |
|--------------|-------------------------------------------------------------------------------|-----------------|----------------------|
| $I_{FRMS}$   | $T_{VJ} = T_{VJM}$                                                            | 16              | A                    |
| $I_{FAVM}$ ① | $T_C = 115^\circ\text{C}$ ; rectangular, $d = 0.5$                            | 8               | A                    |
| $I_{FRM}$    | $t_p < 10\text{ }\mu\text{s}$ ; rep. rating, pulse width limited by $T_{VJM}$ | 130             | A                    |
| $I_{FSM}$    | $T_{VJ} = 45^\circ\text{C}$ ; $t = 10\text{ ms}$ (50 Hz), sine                | 100             | A                    |
|              | $t = 8.3\text{ ms}$ (60 Hz), sine                                             | 110             | A                    |
|              | $T_{VJ} = 150^\circ\text{C}$ ; $t = 10\text{ ms}$ (50 Hz), sine               | 85              | A                    |
|              | $t = 8.3\text{ ms}$ (60 Hz), sine                                             | 95              | A                    |
| $I^2t$       | $T_{VJ} = 45^\circ\text{C}$ ; $t = 10\text{ ms}$ (50 Hz), sine                | 50              | $\text{A}^2\text{s}$ |
|              | $t = 8.3\text{ ms}$ (60 Hz), sine                                             | 50              | $\text{A}^2\text{s}$ |
|              | $T_{VJ} = 150^\circ\text{C}$ ; $t = 10\text{ ms}$ (50 Hz), sine               | 36              | $\text{A}^2\text{s}$ |
|              | $t = 8.3\text{ ms}$ (60 Hz), sine                                             | 37              | $\text{A}^2\text{s}$ |
| $T_{VJ}$     |                                                                               | -40...+150      | $^\circ\text{C}$     |
| $T_{VJM}$    |                                                                               | 150             | $^\circ\text{C}$     |
| $T_{stg}$    |                                                                               | -40...+150      | $^\circ\text{C}$     |
| $P_{tot}$    | $T_C = 25^\circ\text{C}$                                                      | 50              | W                    |
| $M_d$        | Mounting torque                                                               | 0.4...0.6       | Nm                   |
| Weight       |                                                                               | 2               | g                    |

**TO-220 AC**  
**DSEI 8-06A**



A = Anode, C = Cathode, NC = No connection  
TAB = Cathode

## Features

- International standard package JEDEC TO-220 AC & TO-263 AB
- 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.             |
| $I_R$      | $T_{VJ} = 25^\circ\text{C}$                                                                                                                         |                       | 20 $\mu\text{A}$ |
|            | $T_{VJ} = 25^\circ\text{C}$                                                                                                                         |                       | 10 $\mu\text{A}$ |
|            | $T_{VJ} = 125^\circ\text{C}$                                                                                                                        |                       | 1.5 mA           |
| $V_F$      | $I_F = 8\text{ A}$ ; $T_{VJ} = 150^\circ\text{C}$                                                                                                   |                       | 1.3 V            |
|            | $T_{VJ} = 25^\circ\text{C}$                                                                                                                         |                       | 1.5 V            |
| $V_{T0}$   | For power-loss calculations only                                                                                                                    |                       | 0.98 V           |
| $r_T$      | $T_{VJ} = T_{VJM}$                                                                                                                                  |                       | 28.7 m $\Omega$  |
| $R_{thJC}$ | 0.5                                                                                                                                                 |                       | 2.5 K/W          |
| $R_{thCK}$ |                                                                                                                                                     |                       | 60 K/W           |
| $R_{thJA}$ |                                                                                                                                                     |                       | 60 K/W           |
| $t_{rr}$   | $I_F = 1\text{ A}$ ; $-di/dt = 50\text{ A}/\mu\text{s}$ ; $V_R = 30\text{ V}$ ; $T_{VJ} = 25^\circ\text{C}$                                         | 35                    | 50 ns            |
| $I_{RM}$   | $V_R = 350\text{ V}$ ; $I_F = 8\text{ A}$ ; $-di_F/dt = 64\text{ A}/\mu\text{s}$<br>$L \leq 0.05\text{ }\mu\text{H}$ ; $T_{VJ} = 100^\circ\text{C}$ | 2.5                   | 2.8 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

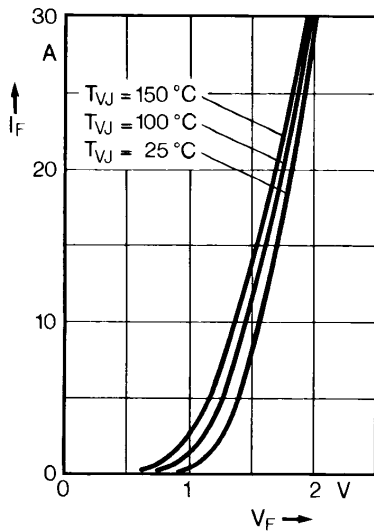


Fig. 1 Forward current versus voltage drop.

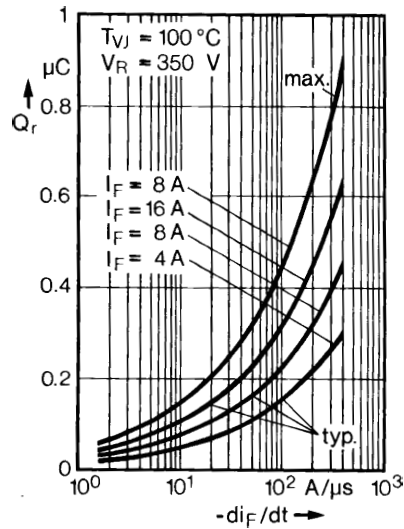


Fig. 2 Recovery charge versus  $-di_F/dt$ .

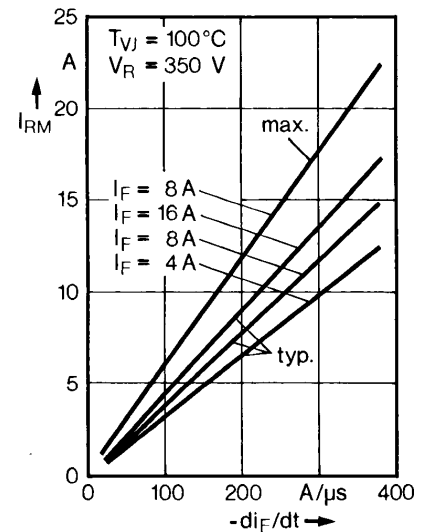


Fig. 3 Peak reverse current versus  $-di_F/dt$ .

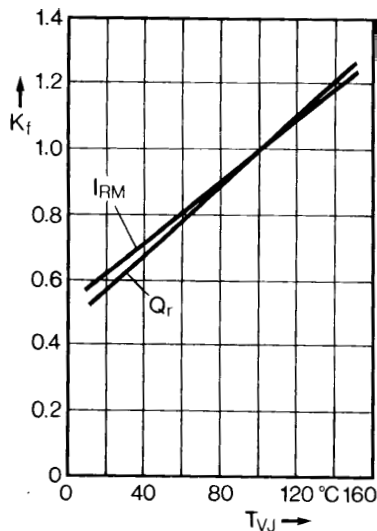


Fig. 4 Dynamic parameters versus junction temperature.

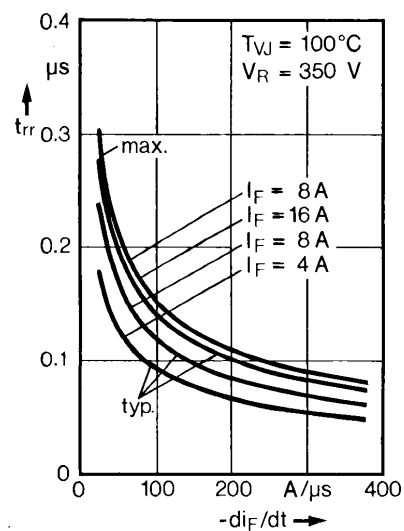


Fig. 5 Recovery time versus  $-di_F/dt$ .

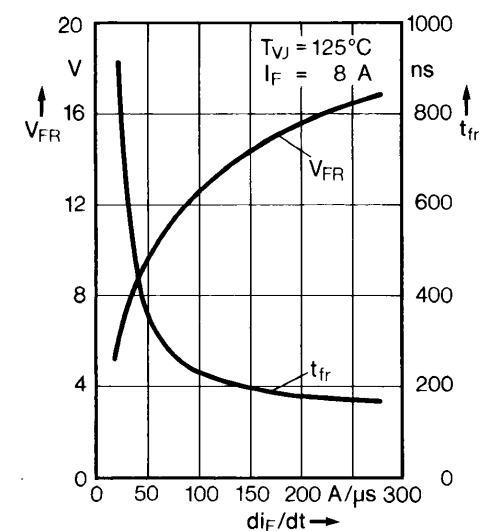


Fig. 6 Peak forward voltage versus  $di_F/dt$ .

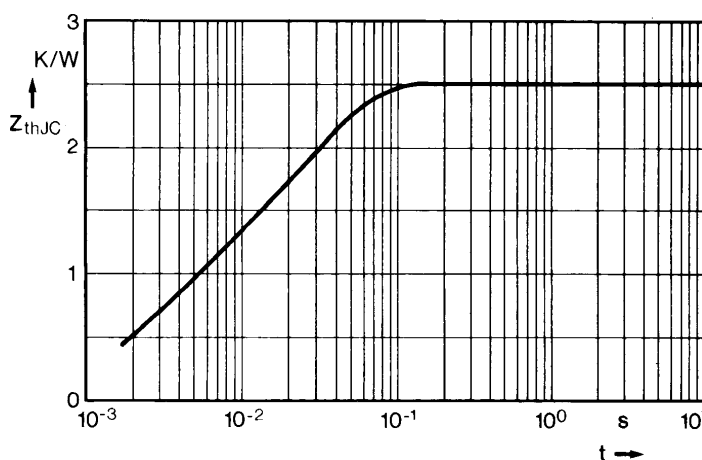
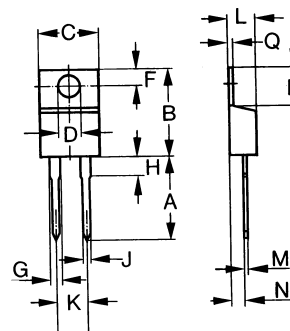


Fig. 7 Transient thermal impedance junction to case.

### Dimensions TO-220 AC



| 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 |

Dimension TO-263 AA see DSEI 19