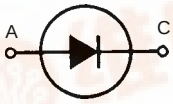
IXYS

# Fast Recovery Epitaxial Diode (FRED)

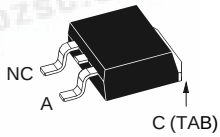
## DSEI 8

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

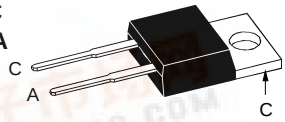
| $V_{RSM}$ V | $V_{RRM}$ V | Type |
|---|---|---|
| 640 | 600 | DSEI 8-06A |
| 640 | 600 | DSEI 8-06AS |




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




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




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

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

| Symbol | Test Conditions | | Characteristic Values typ. | max. | |
|---|---|---|---|---|---|
| $I_R$ | $T_{VJ}$ = 25°C | $V_R = V_{RRM}$ | | 20 | µA |
| | $T_{VJ}$ = 25°C | $V_R = 0.8 \cdot V_{RRM}$ | | 10 | µA |
| | $T_{VJ}$ = 125°C | $V_R = 0.8 \cdot V_{RRM}$ | | 1.5 | mA |
| $V_F$ | $I_F$ = 8 A; | $T_{VJ}$ = 150°C | | 1.3 | V |
| | | $T_{VJ}$ = 25°C | | 1.5 | V |
| $V_{T0}$ | For power-loss calculations only | | | 0.98 | V |
| $r_T$ | $T_{VJ} = T_{VJM}$ | | | 28.7 | mΩ |
| $R_{thJC}$ | | | | 2.5 | K/W |
| $R_{thCK}$ | | | 0.5 | | K/W |
| $R_{thJA}$ | | | | 60 | K/W |
| $t_{rr}$ | $I_F$ = 1 A; -di/dt = 50 A/µs; $V_R$ = 30 V; $T_{VJ}$ = 25°C | | 35 | 50 | ns |
| $I_{RM}$ | $V_R$ = 350 V; $I_F$ = 8 A; $-di_F/dt$ = 64 A/µs<br>L ≤ 0.05 µH; $T_{VJ}$ = 100°C | | 2.5 | 2.8 | A |

### 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

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

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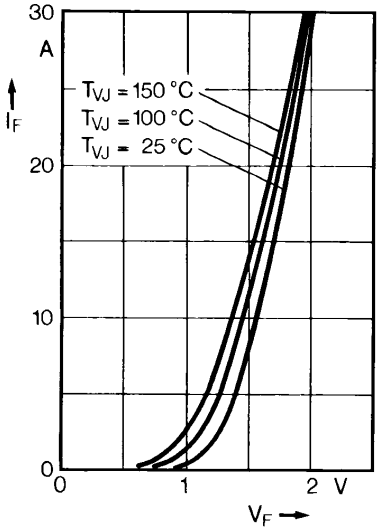



Fig. 1 Forward current versus voltage drop.

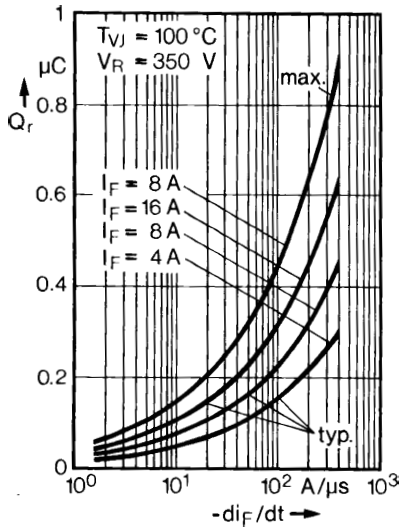



Fig. 2 Recovery charge versus $-di_F/dt$.

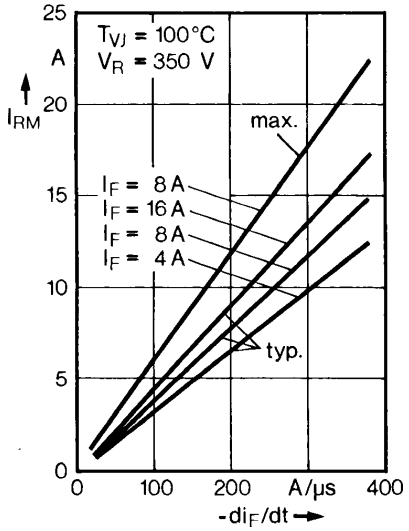



Fig. 3 Peak reverse current versus $-di_F/dt$.

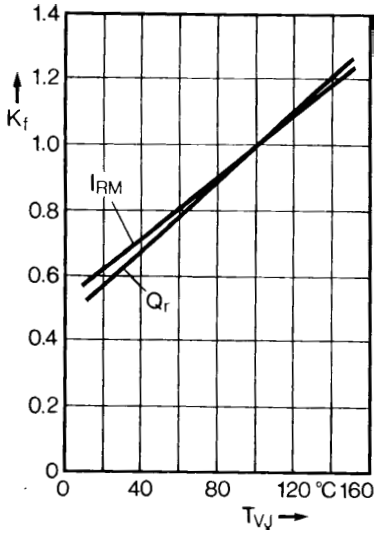



Fig. 4 Dynamic parameters versus junction temperature.

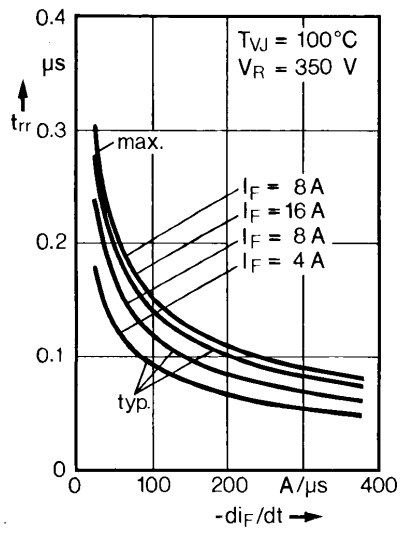



Fig. 5 Recovery time versus $-di_F/dt$.

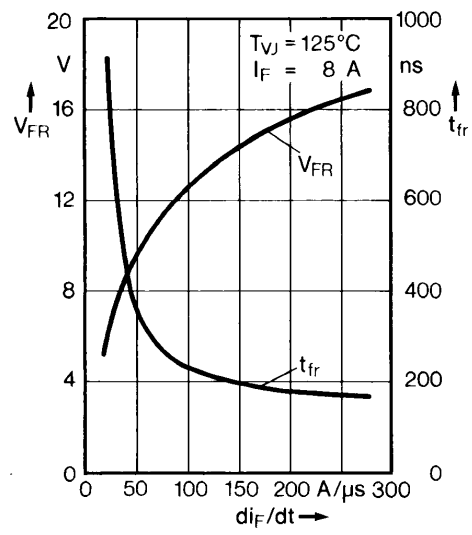



Fig. 6 Peak forward voltage versus $di_F/dt$.

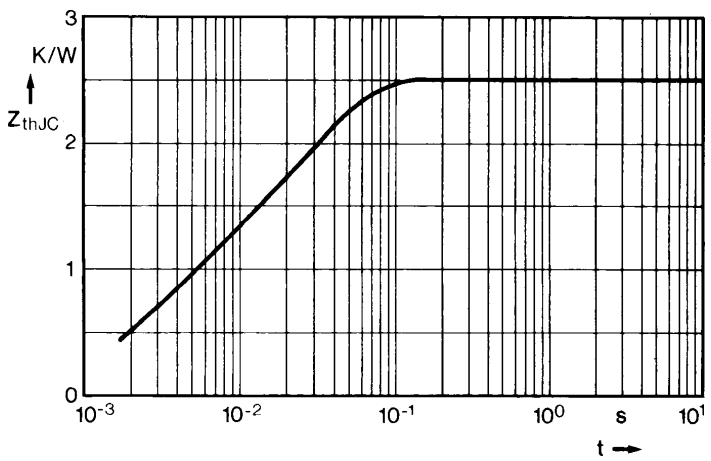
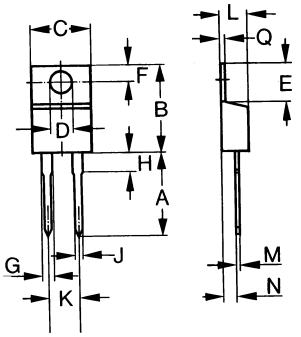



Fig. 7 Transient thermal impedance junction to case.

## Dimensions TO-220 AC




| Dim. | Millimeter Min. | Millimeter Max. | Inches Min. | Inches 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**

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