IXYS

# Fast Recovery Epitaxial Diode

## DSEI 12

$I_{FAV}$ = 12 A
$V_{RRM}$ = 800-1000 V
$t_{rr}$ ≤ 50 ns

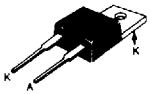
| $V_{RSM}$ V | $V_{RRM}$ V | Type |
|---|---|---|
| 800 | 800 | DSEI 12-08A |
| 1000 | 1000 | DSEI 12-10A |


| Symbol | Test conditions | Maximum ratings | |
|---|---|---|---|
| $I_{FRMS}$ | $T_{VJ}$ = $T_{VJM}$ | 25 | A |
| $I_{FAVM}$ 1) | $T_C$ = 100°C; rectangular, δ = 0.5 | 12 | A |
| $I_{FRM}$ | $t_P$ < 10 µs; rep. rating, pulse width limited by $T_{VJM}$ | 150 | A |
| $I_{FSM}$ | $T_{VJ}$ = 45°C; t = 10 ms (50 Hz), sine | 75 | A |
| | t = 8.3 ms (60 Hz), sine | 80 | A |
| | $T_{VJ}$ = 150°C; t = 10 ms (50 Hz), sine | 65 | A |
| | t = 8.3 ms (60 Hz), sine | 70 | A |
| $\int i^2dt$ | $T_{VJ}$ = 45°C t = 10 ms (50 Hz), sine | 28 | $A^2s$ |
| | t = 8.3 ms (60 Hz), sine | 27 | $A^2s$ |
| | $T_{VJ}$ = 150°C: t = 10 ms (50 Hz), sine | 21 | $A^2s$ |
| | t = 8.3 ms (60 Hz), sine | 20 | $A^2s$ |
| $T_{VJ}$ | | -40...+150 | °C |
| $T_{VJM}$ | | 150 | °C |
| $T_{stg}$ | | -40...+150 | °C |
| $P_{tot}$ | $T_C$ = 100°C | 31 | W |
| $M_d$ | Mounting torque | 45-55 | Ncm |
| Weight | | 2 | g |

| Symbol | Test conditions | Characteristics typ. | max. | |
|---|---|---|---|---|
| $I_R$ | $T_{VJ}$ = 25°C $V_R$ = $V_{RRM}$ | | 1 | mA |
| | $T_{VJ}$ = 25°C $V_R$ = 0.8 • $V_{RRM}$ | | 150 | µA |
| | $T_{VJ}$ = 125°C $V_R$ = 0.8 • $V_{RRM}$ | | 4 | mA |
| $V_F$ | $I_F$ = 12 A: $T_{VJ}$ = 150°C | | 2.1 | V |
| | $T_{VJ}$ = 25°C | | 2.7 | V |
| $V_{TO}$ | For power-loss calculations only | | 1.67 | V |
| $r_F$ | $T_{VJ}$ = $T_{VJM}$ | | 33.6 | mΩ |
| $R_{thJC}$ | | | 1.6 | K/W |
| $R_{thJA}$ | | | 60 | K/W |
| $t_{rr}$ | $I_F$ = 1 A; di/dt = -15 A/µs; $V_R$ = 30 V; $T_{VJ}$ = 25°C | | 50 | ns |
| $I_{RM}$ | $V_R$ = 540 V; $I_F$ = 12 A; $di_F/dt$ = -100 A/µs | 6.5 | 7.2 | A |
| | L ≤ 0.05 µH; $T_{VJ}$ = 100°C | | | |

1) $I_{FAVM}$ Rating includes reverse blocking losses at $T_{VJM}$, $V_R$ = 0.8 $V_{RRM}$, duty cycle δ = 0.5
Standards: DIN/IEC 747

**TO-220 AC**




**A = Anode** **K = Cathode**

**Features**
- International standard package
- Glass passivated chips
- Very short recovery time
- Extremely low losses at high switching frequencies
- Low $I_{RM}$-values
- Soft recovery behaviour

**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
- 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

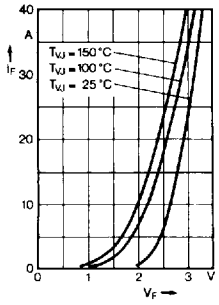



Fig. 1 Forward current versus voltage drop.

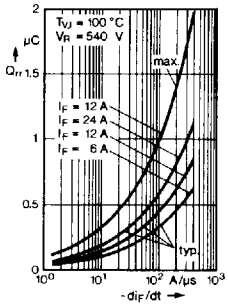



Fig. 2 Recovery charge versus $-di_F/dt$.

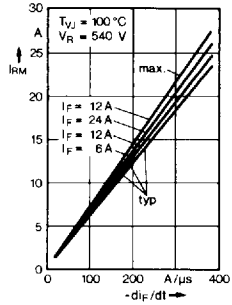



Fig. 3 Peak reverse current versus $-di_F/dt$.

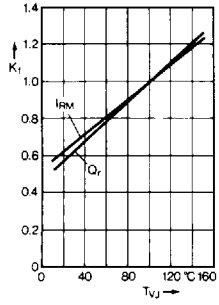



Fig. 4 Dynamic parameters versus junction temperature.

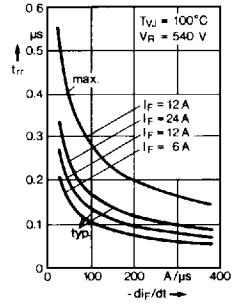



Fig. 5 Recovery time versus $-di_F/dt$.

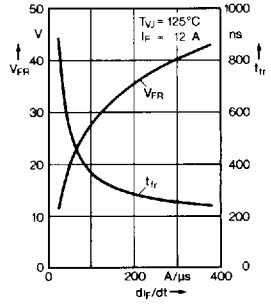



Fig. 6 Peak forward voltage versus $-di_F/dt$.

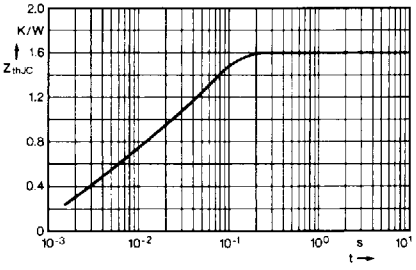
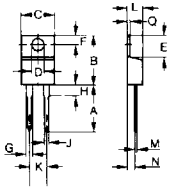



Fig. 7 Transient thermal impedance junction to case.

Dimensions




| Dim. | Millimeter Min. | Max. | Inches 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 | 2.300 | 0.270 |
| 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 | 0.51 | 0.76 | 0.020 | 0.030 |
| N | 2.04 | 2.49 | 0.080 | 0.115 |
| O | 0.64 | 1.39 | 0.025 | 0.055 |