

IXYS

# Fast Recovery Epitaxial Diode

**DSEI 30**  $I_{FAV} = 30\text{ A}$   
 $V_{RRM} = 800\text{--}1000\text{ V}$   
 $t_{rr} \leq 50\text{ ns}$

| $V_{RSM}$<br>V | $V_{RRM}$<br>V | Type        |
|----------------|----------------|-------------|
| 800            | 800            | DSEI 30-08A |
| 1000           | 1000           | DSEI 30-10A |



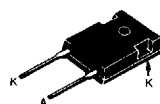
## Symbol Test conditions

|            |                                                                                                      |
|------------|------------------------------------------------------------------------------------------------------|
| $I_{FRMS}$ | $T_{VJ} = T_{VM}$                                                                                    |
| $I_{FAV}$  | 1) $T_C = 85^\circ\text{C}$ ; rectangular, $\delta = 0.5$                                            |
| $I_{FRM}$  | $I_p < 10\text{ }\mu\text{s}$ ; rep. rating, pulse width limited by $T_{VM}$                         |
| $I_{FSM}$  | $T_{VJ} = 45^\circ\text{C}$ ; $t = 10\text{ ms}$ (50 Hz), sine<br>$t = 8.3\text{ ms}$ (60 Hz), sine  |
|            | $T_{VJ} = 150^\circ\text{C}$ ; $t = 10\text{ ms}$ (50 Hz), sine<br>$t = 8.3\text{ ms}$ (60 Hz), sine |
| $ P_{dt} $ | $T_{VJ} = 45^\circ\text{C}$ ; $t = 10\text{ ms}$ (50 Hz), sine<br>$t = 8.3\text{ ms}$ (60 Hz), sine  |
|            | $T_{VJ} = 150^\circ\text{C}$ ; $t = 10\text{ ms}$ (50 Hz), sine<br>$t = 8.3\text{ ms}$ (60 Hz), sine |
| $T_{VJ}$   | -40...+150 $^\circ\text{C}$                                                                          |
| $T_{VM}$   | 150 $^\circ\text{C}$                                                                                 |
| $T_{stg}$  | -40...+150 $^\circ\text{C}$                                                                          |
| $P_{tot}$  | $T_C = 85^\circ\text{C}$ 72 W                                                                        |
| $M_s$      | Mounting torque 45-55 Ncm                                                                            |
| Weight     | 6 g                                                                                                  |

## Maximum ratings

|            |                  |
|------------|------------------|
| 70         | A                |
| 30         | A                |
| 375        | A                |
| 200        | A                |
| 210        | A                |
| 185        | A                |
| 195        | A                |
| 200        | A's              |
| 180        | A's              |
| 170        | A's              |
| 160        | A's              |
| -40...+150 | $^\circ\text{C}$ |
| 150        | $^\circ\text{C}$ |
| -40...+150 | $^\circ\text{C}$ |
| 72         | W                |
| 45-55      | Ncm              |
| 6          | g                |

## TO-247 AD



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

## Symbol Test conditions

|            |                                                                                                                                                     |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| $I_R$      | $T_{VJ} = 25^\circ\text{C}$ $V_R = V_{RRM}$                                                                                                         |
|            | $T_{VJ} = 25^\circ\text{C}$ $V_R = 0.8 \cdot V_{RRM}$                                                                                               |
|            | $T_{VJ} = 125^\circ\text{C}$ $V_R = 0.8 \cdot V_{RRM}$                                                                                              |
| $V_F$      | $I_F = 36\text{ A}$ ; $T_{VJ} = 150^\circ\text{C}$<br>$T_{VJ} = 25^\circ\text{C}$                                                                   |
| $V_{TO}$   | For power-loss calculations only                                                                                                                    |
| $r_f$      | $T_{VJ} = T_{VM}$                                                                                                                                   |
| $R_{thJC}$ | 0.9 K/W                                                                                                                                             |
| $R_{thJA}$ | 35 K/W                                                                                                                                              |
| $t_{rr}$   | $I_F = 1\text{ A}$ ; $di/dt = -15\text{ A}/\mu\text{s}$ ; $V_R = 30\text{ V}$ ; $T_{VJ} = 25^\circ\text{C}$                                         |
| $I_{RM}$   | $V_R = 540\text{ V}$ ; $I_F = 30\text{ A}$ ; $di/dt = -240\text{ A}/\mu\text{s}$<br>$L \leq 0.05\text{ }\mu\text{H}$ ; $T_{VJ} = 100^\circ\text{C}$ |

typ.

Characteristics  
max.

|      |               |
|------|---------------|
| 1.5  | mA            |
| 250  | $\mu\text{A}$ |
| 7    | mA            |
| 2    | V             |
| 2.4  | V             |
| 1.5  | V             |
| 12.5 | m $\Omega$    |
| 0.9  | K/W           |
| 35   | K/W           |
| 50   | ns            |
| 18   | A             |

1)  $I_{FRMS}$  Rating includes reverse blocking losses at  $T_{VM}$ ;  $V_R = 0.8 V_{RRM}$ ; duty cycle  $\delta = 0.5$   
Standards: DIN/IEC 747

# DSEI 30, 800-1000 V

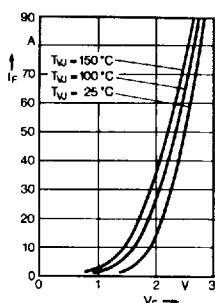


Fig. 1 Forward current versus voltage drop.

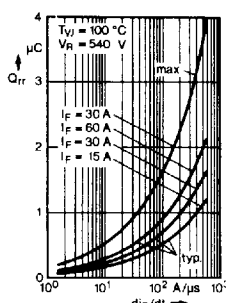


Fig. 2 Recovery charge versus  $-di_F/dt$ .

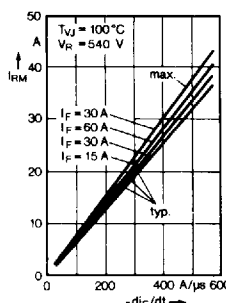


Fig. 3 Peak reverse current versus  $-di_F/dt$ .

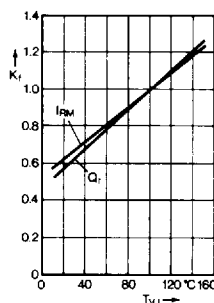


Fig. 4 Dynamic parameters versus junction temperature.

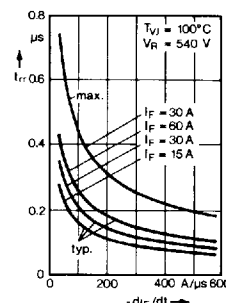


Fig. 5 Recovery time versus  $-di_F/dt$ .

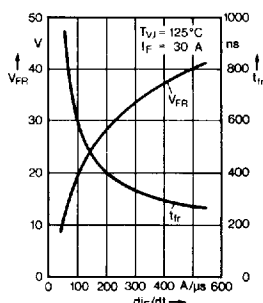


Fig. 6 Peak forward voltage versus  $di_F/dt$ .

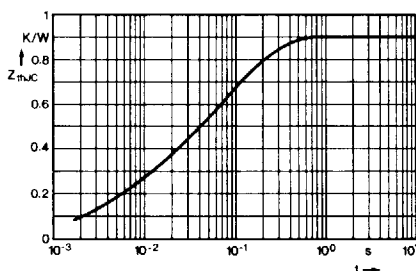
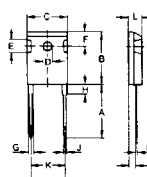


Fig. 7 Transient thermal impedance junction to case.

## Dimensions



| Dim. | Millimeter  | Inches      |
|------|-------------|-------------|
|      | Min. Max.   | Min. Max.   |
| A    | 19.81 20.32 | 0.780 0.800 |
| B    | 20.80 21.48 | 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     | 0.015 0.031 |
| N    | 1.5 2.49    | 0.067 0.102 |