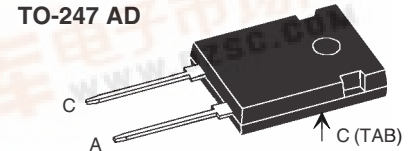
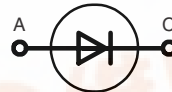


# HiPerFRED™ Epitaxial Diode with soft recovery

$I_{FAV} = 30\text{ A}$   
 $V_{RRM} = 300\text{ V}$   
 $t_{rr} = 30\text{ ns}$

| $V_{RSM}$<br>V | $V_{RRM}$<br>V | Type        |
|----------------|----------------|-------------|
| 300            | 300            | DSEP 30-03A |



A = Anode, C = Cathode, TAB = Cathode

| Symbol     | Conditions   | Maximum Ratings |                  |
|------------|--|-----------------|------------------|
| $I_{FRMS}$ | $T_C = 135^\circ\text{C}$ ; rectangular, $d = 0.5$   | 70              | A                |
| $I_{FAVM}$ |  | 30              | A                |
| $I_{FSM}$  | $T_{VJ} = 45^\circ\text{C}$ ; $t_p = 10\text{ ms}$ (50 Hz), sine                                     | 300             | A                |
| $E_{AS}$   | $T_{VJ} = 25^\circ\text{C}$ ; non-repetitive<br>$I_{AS} = 3\text{ A}$ ; $L = 180\text{ }\mu\text{H}$ | 1.2             | mJ               |
| $I_{AR}$   | $V_A = 1.5 \cdot V_R$ typ.; $f = 10\text{ kHz}$ ; repetitive   | 0.3             | A                |
| $T_{VJ}$   |  | -55...+175      | $^\circ\text{C}$ |
| $T_{VJM}$  |  | 175             | $^\circ\text{C}$ |
| $T_{stg}$  |  | -55...+150      | $^\circ\text{C}$ |
| $P_{tot}$  | $T_C = 25^\circ\text{C}$   | 165             | W                |
| $M_d$      | mounting torque  | 0.8...1.2       | Nm               |
| Weight     | typical  | 6               | g                |

### Features

- International standard package
- 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
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

### Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low  $I_{RM}$  reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

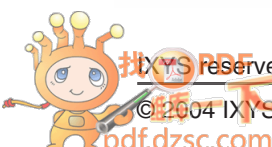
Dimensions see pages Outlines.pdf

| Symbol     | Conditions   | Characteristic Values |                   |
|------------|--|-----------------------|-------------------|
|            |  | typ.                  | max.              |
| $I_R$ ①    | $V_R = V_{RRM}$ ; $T_{VJ} = 25^\circ\text{C}$  |                       | 250 $\mu\text{A}$ |
|            | $V_R = V_{RRM}$ ; $T_{VJ} = 150^\circ\text{C}$   |                       | 1 mA              |
| $V_F$ ②    | $I_F = 30\text{ A}$ ; $T_{VJ} = 150^\circ\text{C}$   |                       | 1.14 V            |
|            | $T_{VJ} = 25^\circ\text{C}$  |                       | 1.55 V            |
| $R_{thJC}$ |  |                       | 0.9 K/W           |
| $R_{thCH}$ |  | 0.25                  | K/W               |
| $t_{rr}$   | $I_F = 1\text{ A}$ ; $-di/dt = 200\text{ A}/\mu\text{s}$ ;<br>$V_R = 30\text{ V}$ ; $T_{VJ} = 25^\circ\text{C}$    | 25                    | ns                |
| $I_{RM}$   | $V_R = 100\text{ V}$ ; $I_F = 50\text{ A}$ ; $-di_F/dt = 100\text{ A}/\mu\text{s}$<br>$T_{VJ} = 100^\circ\text{C}$ | 2.5                   | 3.5 A             |

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %

② Pulse Width = 300  $\mu\text{s}$ , Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified.



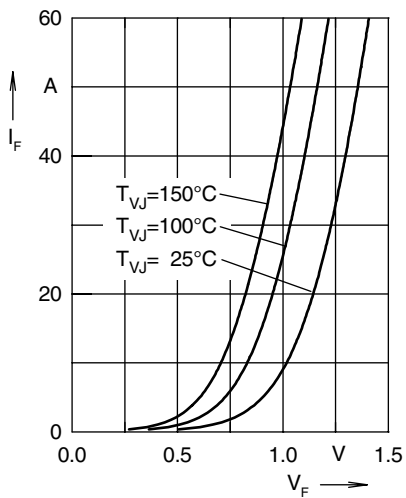


Fig. 1 Forward current  $I_F$  vs.  $V_F$

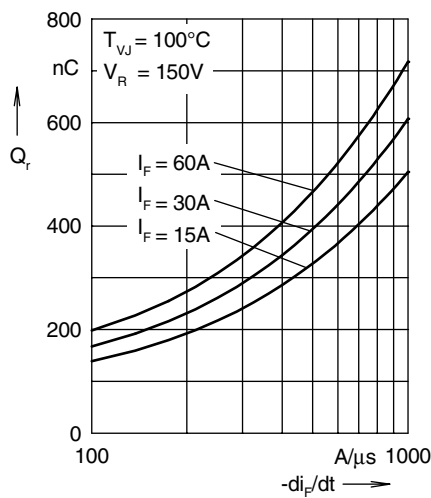


Fig. 2 Reverse recovery charge  $Q_r$  versus  $-di_F/dt$

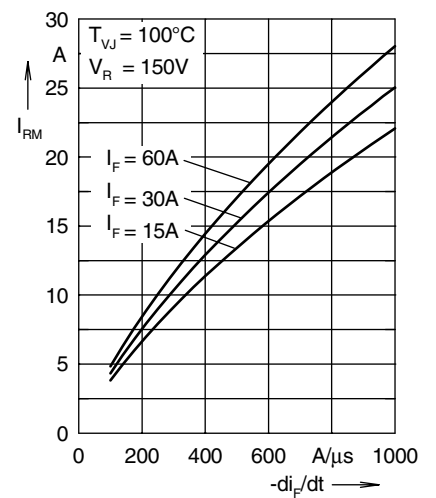


Fig. 3 Peak reverse current  $I_{RM}$  versus  $-di_F/dt$

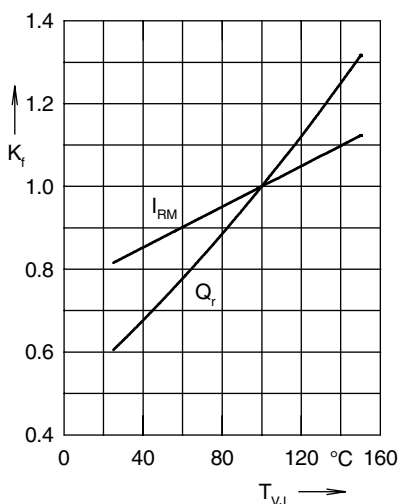


Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$

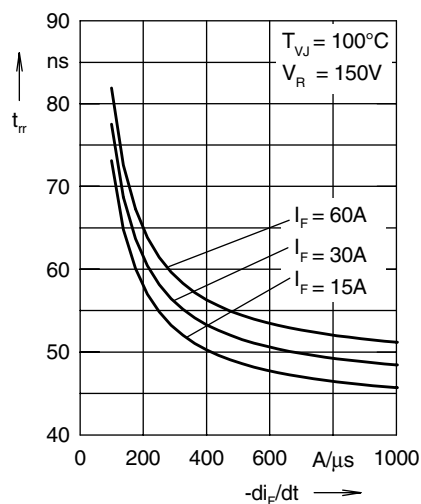


Fig. 5 Recovery time  $t_{rr}$  versus  $-di_F/dt$

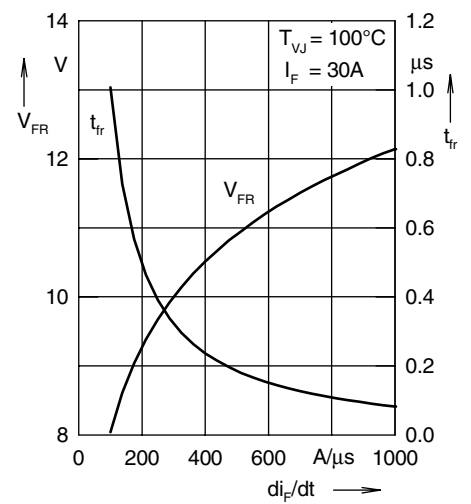


Fig. 6 Peak forward voltage  $V_{FR}$  and  $t_{fr}$  versus  $di_F/dt$

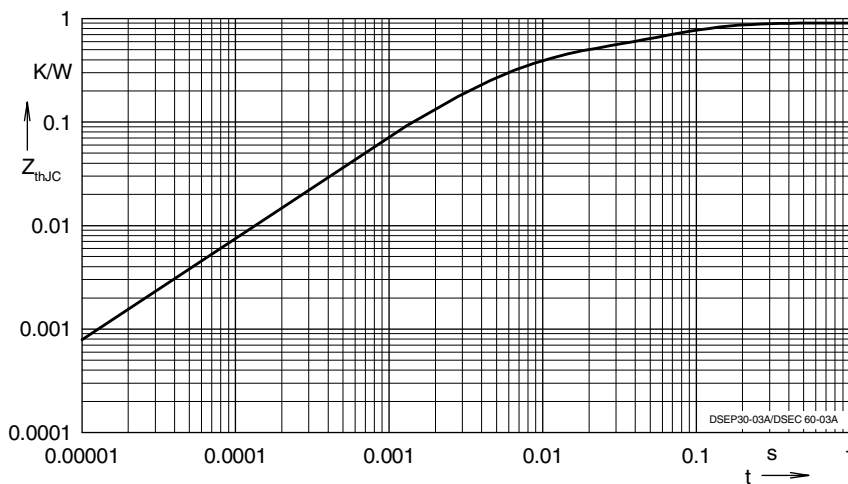


Fig. 7 Transient thermal resistance junction to case

Constants for  $Z_{thJC}$  calculation:

| i | $R_{thi}$ (K/W) | $t_i$ (s) |
|---|-----------------|-----------|
| 1 | 0.465           | 0.005     |
| 2 | 0.179           | 0.0003    |
| 3 | 0.256           | 0.04      |

NOTE: Fig. 2 to Fig. 6 shows typical values