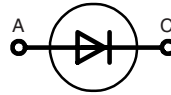


# HiPerFRED™ Epitaxial Diode

## with soft recovery

$I_{FAVM} = 6 \text{ A}$   
 $V_{RRM} = 600 \text{ V}$   
 $t_{rr} = 20 \text{ ns}$

| $V_{RSM}$<br>V | $V_{RRM}$<br>V | Type        | Marking<br>on product |
|----------------|----------------|-------------|-----------------------|
| 600            | 600            | DSEP 6-06AS | 6P060AS               |


**TO-252AA (DPAK)**


| Symbol         | Conditions   | Maximum Ratings |                  |
|----------------|--|-----------------|------------------|
| $I_{FRMS}$     | $T_{VJ} = T_{VJM}$   | 26              | A                |
| $I_{FAVM}$ ①   | $T_C = 152^\circ\text{C}$ ; rectangular, $d = 0.5$   | 6               | A                |
| $I_{FRM}$      | $t_p < 10 \mu\text{s}$ ; rep. rating, pulse width limited by $T_{VJM}$                           | 12              | A                |
| $I_{FSM}$<br>A | $T_{VJ} = 45^\circ\text{C}$ ; $t = 10 \text{ ms}$  | (50 Hz), sine   | 40               |
| $E_{AS}$       | $T_{VJ} = 25^\circ\text{C}$ ; non-repetitive<br>$I_{AS} = 0.8 \text{ A}$ ; $L = 180 \mu\text{H}$ | 0.1             | mJ               |
| $I_{AR}$       | $V_A = 1.5 \cdot V_R$ typ.; $f = 10 \text{ kHz}$ ; repetitive                                    | 0.1             | A                |
| $T_{VJ}$       |  | -40...+175      | $^\circ\text{C}$ |
| $T_{VJM}$      |  | 175             | $^\circ\text{C}$ |
| $T_{stg}$      |  | -40...+150      | $^\circ\text{C}$ |
| $P_{tot}$      | $T_C = 25^\circ\text{C}$   | 55              | W                |
| Weight         | typ.   | 0.3             | g                |

**Features**

- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low  $I_{RM}$ -values
- Soft recovery behaviour

**Applications**

- 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

**Dimensions see pages D4 - 85-86**

| Symbol     | Conditions  | Characteristic Values |               |
|------------|---|-----------------------|---------------|
|            |   | typ.                  | max.          |
| $I_R$      | $T_{VJ} = 25^\circ\text{C}$ $V_R = V_{RRM}$   | 50                    | $\mu\text{A}$ |
|            | $T_{VJ} = 150^\circ\text{C}$ $V_R = V_{RRM}$  | 0.2                   | mA            |
| $V_F$      | $I_F = 6 \text{ A}$ ; $T_{VJ} = 150^\circ\text{C}$<br>$T_{VJ} = 25^\circ\text{C}$                                     | 1.33                  | V             |
|            |   | 2.02                  | V             |
| $R_{thJC}$ |   | 2.8                   | K/W           |
| $t_{rr}$   | $I_F = 1 \text{ A}$ ; $-di/dt = 200 \text{ A}/\mu\text{s}$ ; $V_R = 30 \text{ V}$ ; $T_{VJ} = 25^\circ\text{C}$       | 20                    | tbd ns        |
| $I_{RM}$   | $V_R = 100 \text{ V}$ ; $I_F = 10 \text{ A}$ ; $-di_F/dt = 100 \text{ A}/\mu\text{s}$<br>$T_{VJ} = 100^\circ\text{C}$ | 3.5                   | 4.4 A         |
|            |   |                       |               |

①  $I_{FAVM}$  rating includes reverse blocking losses at  $T_{VJM}$ ,  $V_R = 0.6 V_{RRM}$ , duty cycle  $d = 0.5$

Data according to IEC 60747

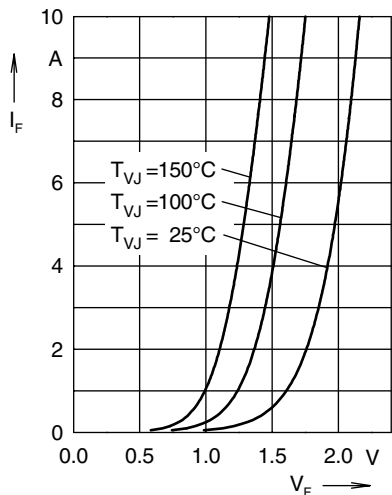


Fig. 1 Forward current  $I_F$  versus  $V_F$

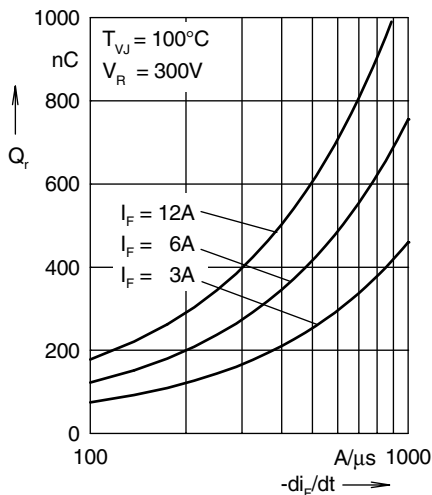


Fig. 2 Reverse recovery charge  $Q_r$  versus  $-di_F/dt$

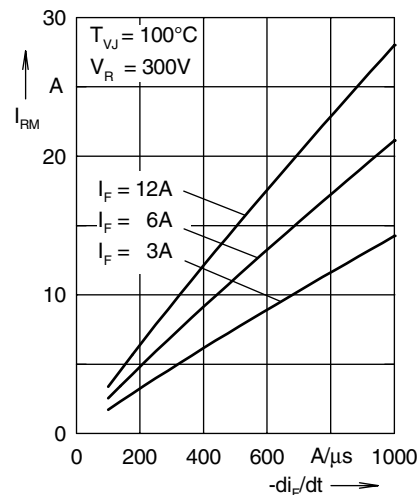


Fig. 3 Peak reverse current  $I_{RM}$  versus  $-di_F/dt$

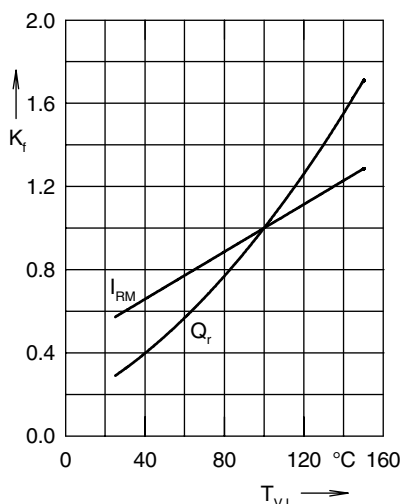


Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$

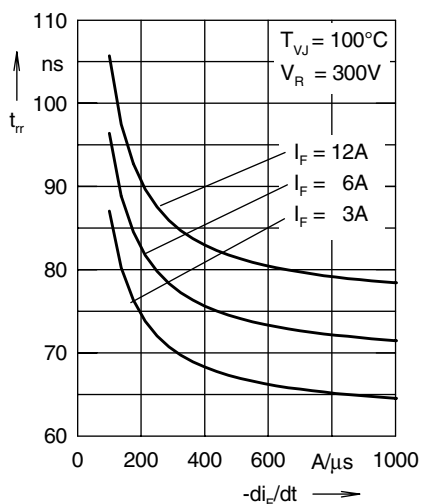


Fig. 5 Recovery time  $t_{rr}$  versus  $-di_F/dt$

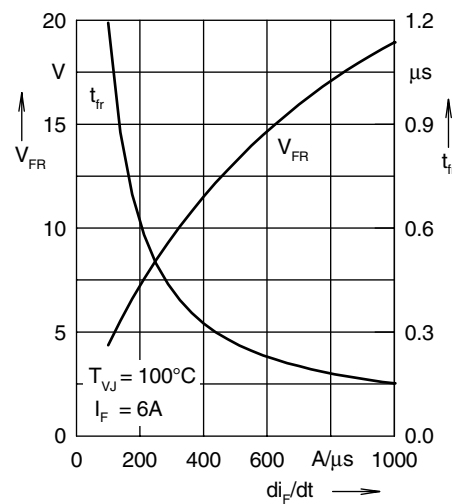


Fig. 6 Peak forward voltage  $V_{FR}$  and  $t_{fr}$  versus  $di_F/dt$

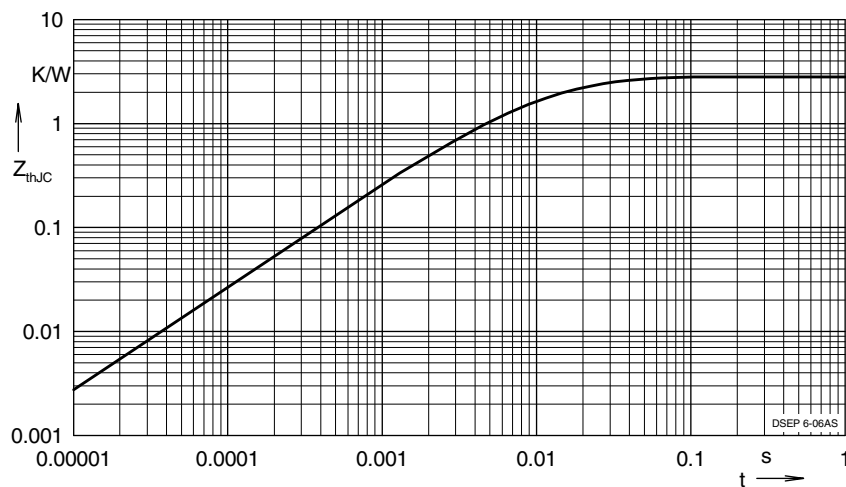


Fig. 7 Transient thermal resistance junction to case

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