



## FRED Modules

**V<sub>RRM</sub>** 600V

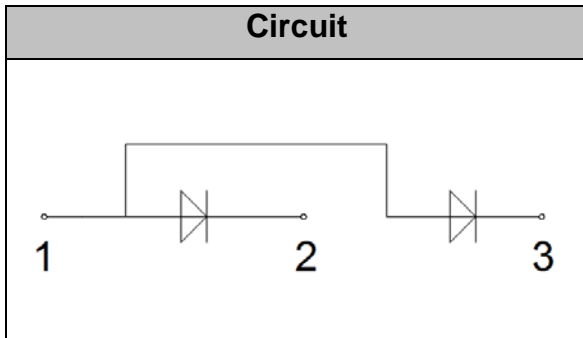
**I<sub>FAV</sub>** 150 A

### Applications

- Inversion Welder
- Uninterruptible Power Supply (UPS)
- Plating Power Supply
- Ultrasonic Cleaner and Welder
- Power Factor Correction (PFC) Circuit
- Converter & Chopper

### Features

- Soft Reverse Recovery Characteristics
- Ultrafast Reverse Recovery Time
- Low Reverse Recovery Loss
- Low Forward Voltage
- High Surge Current Capability
- Low Inductance Package



## Maximum Ratings

| Symbol       | Conditions   | Values      | Units                |
|--------------|--|-------------|----------------------|
| $V_R$        |  | 600         | V                    |
| $V_{RRM}$    |  | 600         | V                    |
| $I_{F(AV)}$  | $T_C=100^{\circ}\text{C}$ , Per Diode                    | 150         | A                    |
|              | $T_C=100^{\circ}\text{C}$ , Per Module                   | 300         | A                    |
| $I_{F(RMS)}$ | $T_C=100^{\circ}\text{C}$ , Per Diode                    | 220         | A                    |
| $I_{FSM}$    | 1/2 Cycle, 50Hz, Sine                                    | 1400        | A                    |
|              | 1/2 Cycle, 60Hz, Sine                                    | 1500        | A                    |
| $I^2t$       | $T_J=45^{\circ}\text{C}$ , $t=10\text{ms}$ , 50Hz, Sine  | 9800        | $\text{A}^2\text{s}$ |
|              | $T_J=45^{\circ}\text{C}$ , $t=8.3\text{ms}$ , 60Hz, Sine | 11200       | $\text{A}^2\text{s}$ |
| $P_D$        |  | 480         | W                    |
| Visol        | AC, $T_{on}=1\text{min}$                                 | 3000        | V                    |
| $T_J$        |  | -40 to +150 | $^{\circ}\text{C}$   |
| $T_{STG}$    |  | -40 to +125 | $^{\circ}\text{C}$   |
| Torque       | Recommended (M6)   | $5\pm 15\%$ | N·m                  |
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| Weight       |  | 160         | g                    |

## Thermal Characteristics

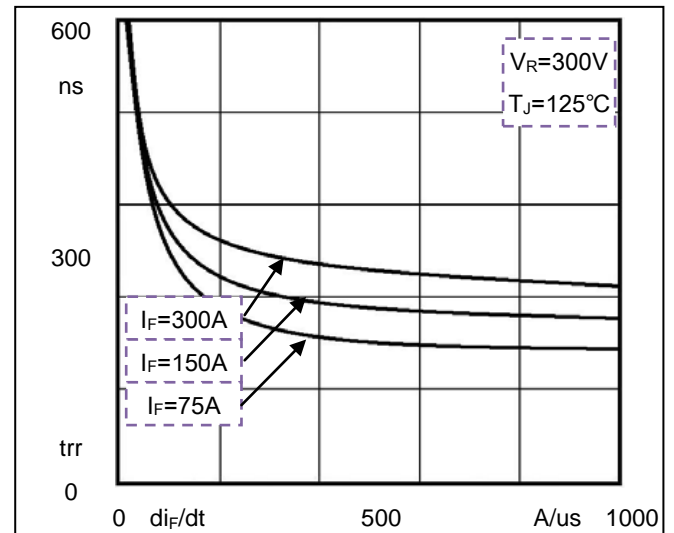
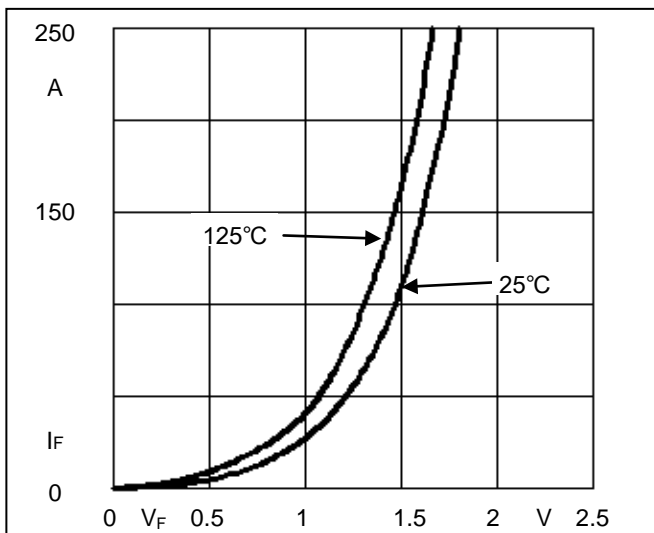
| Symbol        | Conditions | Values | Units                |
|---------------|------------|--------|----------------------|
| $R_{th(j-c)}$ | Per Module | 0.34   | $^{\circ}\text{C/W}$ |



**Electrical Characteristics**

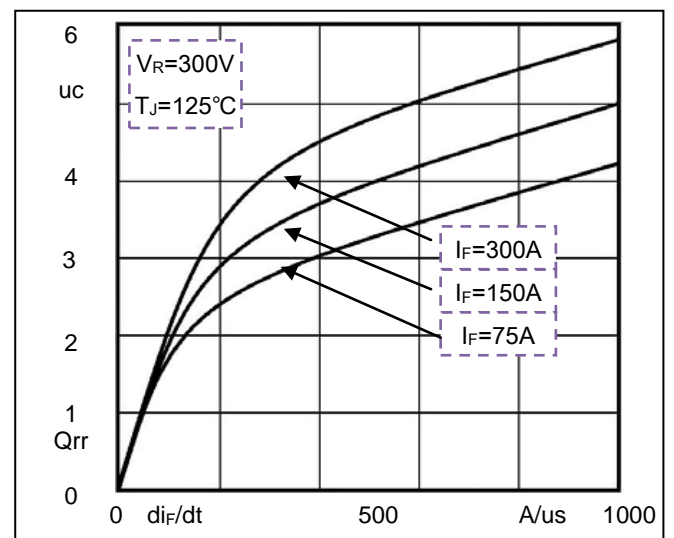
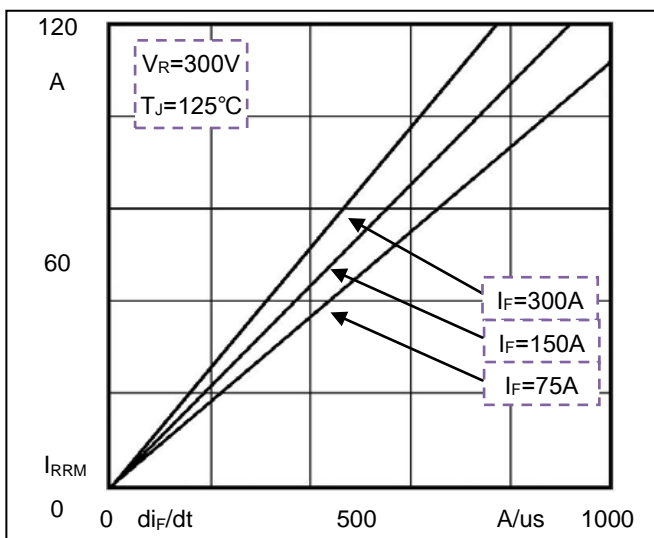
| Symbol    | Conditions   | Values |      |      | Units |
|-----------|--|--------|------|------|-------|
|           |  | Min.   | Typ. | Max. |       |
| $I_{RM}$  | $V_R=600V$   | --     | --   | 1    | mA    |
|           | $V_R=600V, T_J=125^\circ C$                                | --     | --   | 5    | mA    |
| $V_F$     | $I_F=150A$   | --     | 1.45 | 1.6  | V     |
|           | $I_F=150A, T_J=125^\circ C$                                | --     | --   | 1.45 | V     |
| $t_{rr}$  | $I_F=1A, V_R=30V, di_F/dt=-200A/\mu s$                     | --     | 50   | --   | ns    |
| $t_{rr}$  | $V_R=300V, I_F=150A, di_F/dt=-200A/\mu s, T_J=25^\circ C$  | --     | 130  | --   | ns    |
| $I_{RRM}$ |  | --     | 14   | --   | A     |
| $t_{rr}$  | $V_R=300V, I_F=150A, di_F/dt=-200A/\mu s, T_J=125^\circ C$ | --     | 220  | --   | ns    |
| $I_{RRM}$ |  | --     | 22   | --   | A     |

**Performance Curves**



**Fig1. Forward Voltage Drop vs Forward Current**

**Fig2. Reverse Recovery Time vs  $di_F/dt$**



**Fig3. Reverse Recovery Current vs  $di_F/dt$**

**Fig4. Reverse Recovery Charge vs  $di_F/dt$**

