



## FRED Modules

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

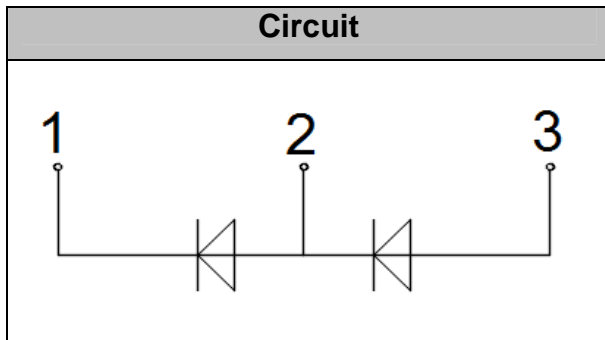
**I<sub>FAV</sub>** 150 A

### 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
- Insulation Encapsulation



### 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                    | 212         | A                    |
| $I_{FSM}$    | 1/2 Cycle, 50Hz, Sine                                  | 1400        | A                    |
|              | 1/2 Cycle, 60Hz, Sine                                  | 1536        | 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 |             | $\text{A}^2\text{s}$ |
| $P_D$        |  | 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)                                       | $3\pm 15\%$ | N·m                  |
| Torque       | Recommended (M6)                                       | $3\pm 15\%$ | N·m                  |
| Weight       |  | 160         | g                    |

### Thermal Characteristics

| Symbol        | Conditions                   | Values | Units              |
|---------------|------------------------------|--------|--------------------|
| $R_{th(j-c)}$ | Junction-to-Case, Per Diode  | 0.32   | $^\circ\text{C/W}$ |
| $R_{th(j-c)}$ | Junction-to-Case, Per Module | 0.16   | $^\circ\text{C/W}$ |



## 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    |
| $V_F$     | $I_F=150A$   | --     | 1.28 | 1.5  | V     |
|           | $I_F=150A, T_J=125^\circ C$                                | --     | --   | 1.4  | V     |
| trr       | $I_F=1A, V_R=30V, di_F/dt=-200A/\mu s$                     | --     | 50   | --   | ns    |
| trr       | $V_R=300V, I_F=150A, di_F/dt=-200A/\mu s, T_J=25^\circ C$  | --     | 130  | --   | ns    |
| $I_{RRM}$ |  | --     | 14   | --   | A     |
| trr       | $V_R=300V, I_F=150A, di_F/dt=-200A/\mu s, T_J=125^\circ C$ | --     | 220  | --   | ns    |
| $I_{RRM}$ |  | --     | 22   | --   | A     |

## Performance Curves

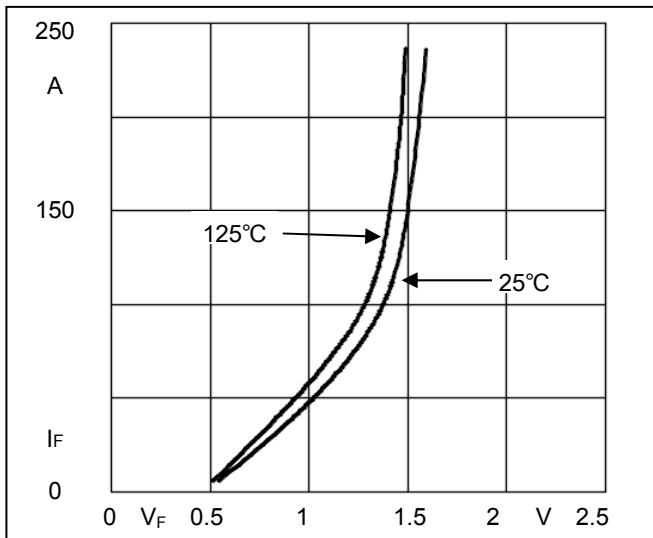


Fig1. Forward Voltage Drop vs Forward Current

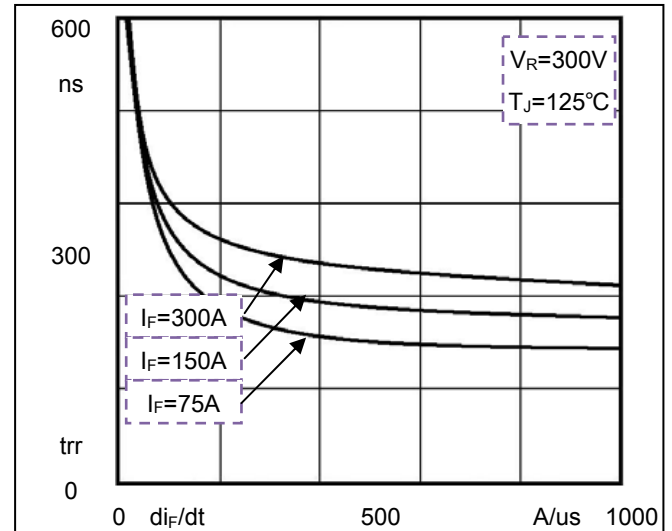


Fig2. Reverse Recovery Time vs  $di_F/dt$

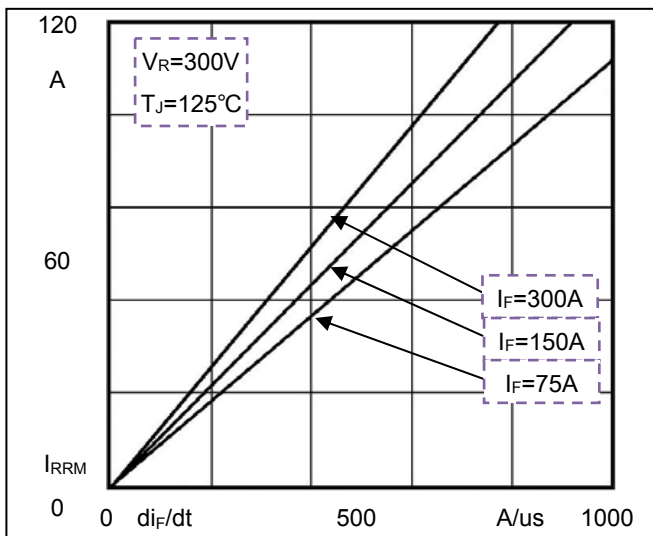


Fig3. Reverse Recovery Current vs  $di_F/dt$

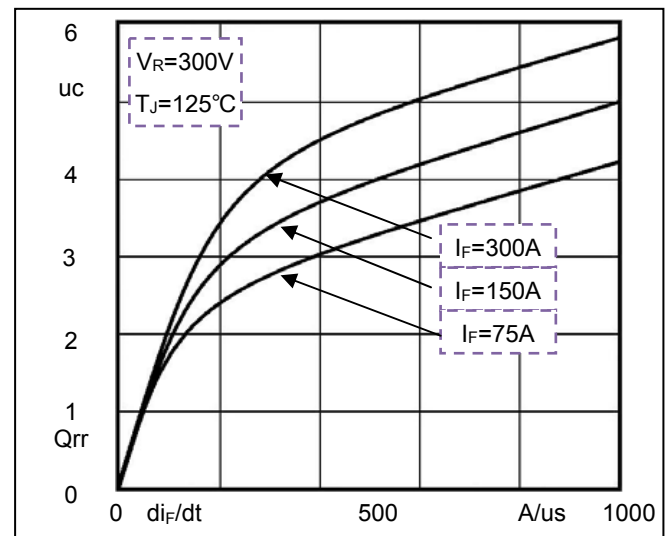
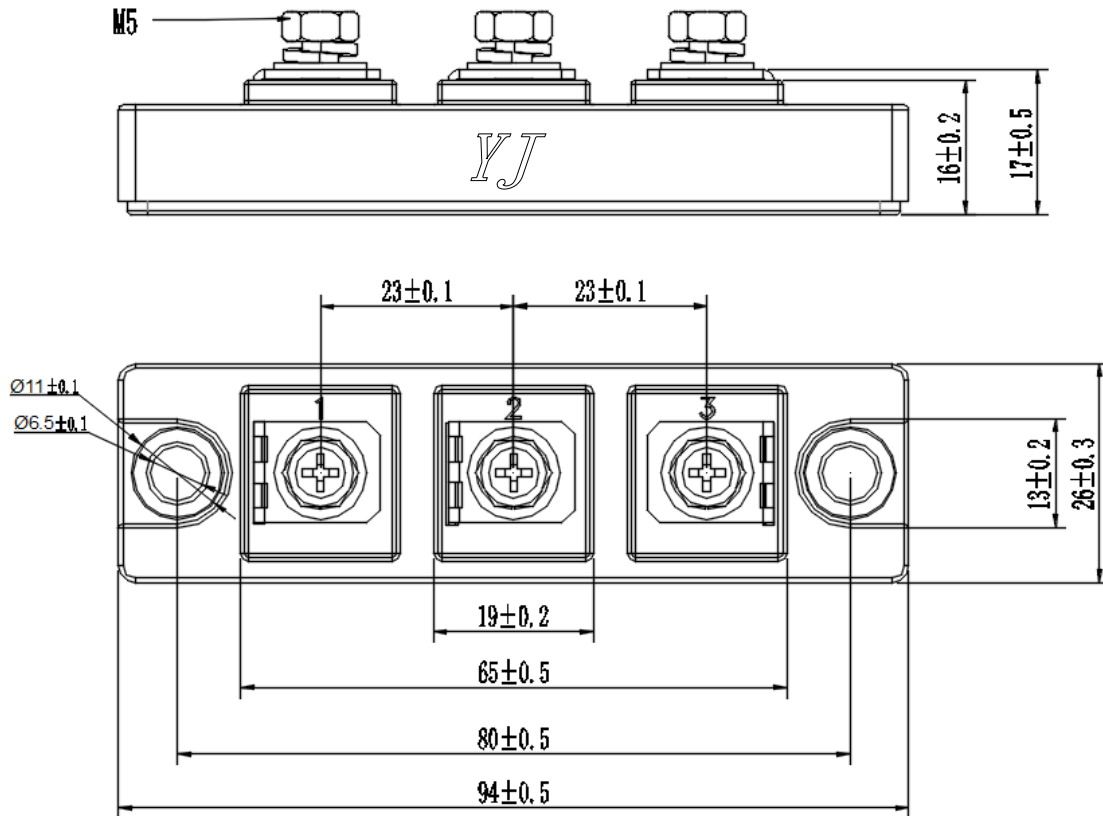


Fig4. Reverse Recovery Charge vs  $di_F/dt$

## Package Outline Information

CASE: F5



Dimensions in mm

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