



## FRED Modules

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

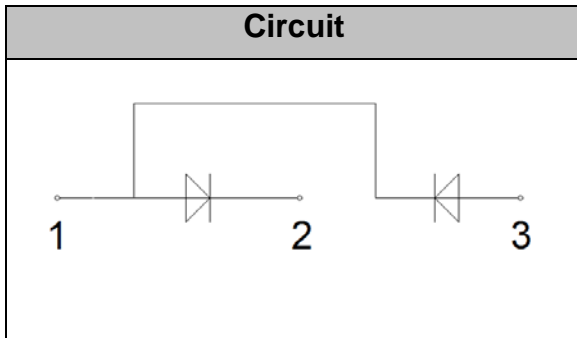
**I<sub>FAV</sub>** 200 A

### 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 <sub>R</sub>      |   | 600         | V                |
| V <sub>RRM</sub>    |   | 600         | V                |
| I <sub>F(AV)</sub>  | T <sub>C</sub> =110°C, Per Diode          | 200         | A                |
|                     | T <sub>C</sub> =120°C, 20KHz, Per Module  | 300         | A                |
| I <sub>F(RMS)</sub> | T <sub>C</sub> =110°C, Per Diode          | 280         | A                |
| I <sub>FSM</sub>    | 1/2 Cycle, 50Hz, Sine                     | 2000        | A                |
|                     | 1/2 Cycle, 60Hz, Sine                     | 2200        | A                |
| I <sup>2</sup> t    | T <sub>J</sub> =45°C, t=10ms, 50Hz, Sine  | 20000       | A <sup>2</sup> s |
|                     | T <sub>J</sub> =45°C, t=8.3ms, 60Hz, Sine | 24200       | A <sup>2</sup> s |
| P <sub>D</sub>      |   | 690         | W                |
| Visol               | AC, Ton=1min                              | 3000        | V                |
| T <sub>J</sub>      |   | -40 to +150 | °C               |
| T <sub>STG</sub>    |   | -40 to +125 | °C               |
| Torque              | Recommended (M6)                          | 5±15%       | N·m              |
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| Weight              |   | 160         | g                |

## Thermal Characteristics

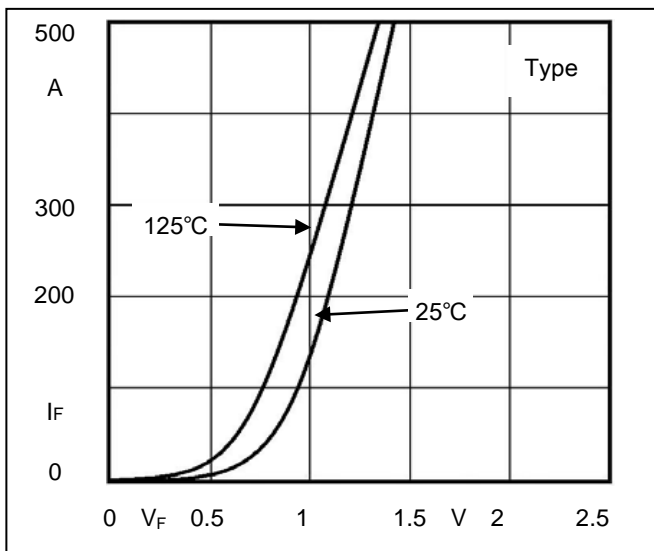
| Symbol               | Conditions | Values | Units |
|----------------------|------------|--------|-------|
| R <sub>th(j-c)</sub> | Per Module | 0.18   | °C/W  |



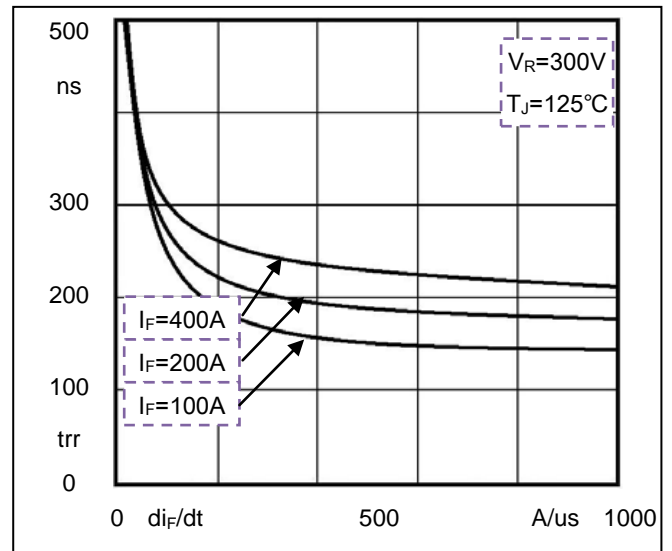
**Electrical Characteristics**

| Symbol    | Conditions   | Values |      |      | Units |
|-----------|--|--------|------|------|-------|
|           |  | Min.   | Typ. | Max. |       |
| $I_{RM}$  | $V_R=600V$   | --     | --   | 0.5  | mA    |
|           | $V_R=600V, T_J=125^\circ C$                                | --     | --   | 3    | mA    |
| $V_F$     | $I_F=200A$   | --     | 1.15 | 1.6  | V     |
|           | $I_F=200A, T_J=125^\circ C$                                | --     | 0.9  | 1.25 | V     |
| $t_{rr}$  | $I_F=1A, V_R=30V, di_F/dt=-200A/\mu s$                     | --     | 50   | --   | ns    |
| $t_{rr}$  | $V_R=300V, I_F=200A, di_F/dt=-200A/\mu s, T_J=25^\circ C$  | --     | 140  | --   | ns    |
| $I_{RRM}$ |  | --     | 15   | --   | A     |
| $t_{rr}$  | $V_R=300V, I_F=200A, di_F/dt=-200A/\mu s, T_J=125^\circ C$ | --     | 230  | --   | ns    |
| $I_{RRM}$ |  | --     | 25   | --   | A     |

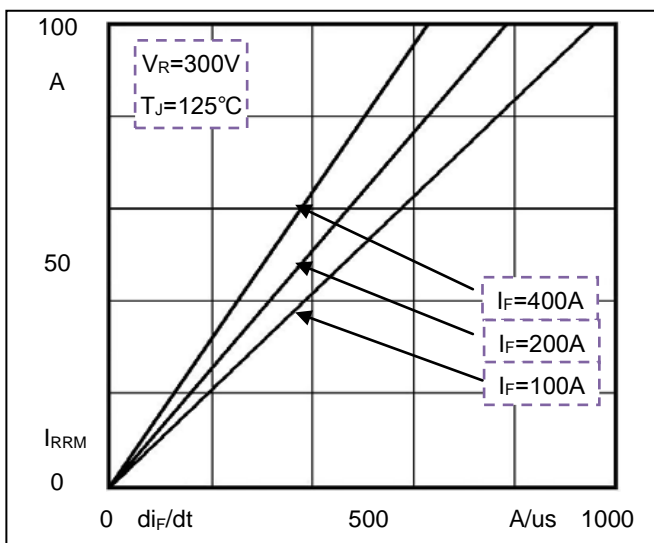
**Performance Curves**



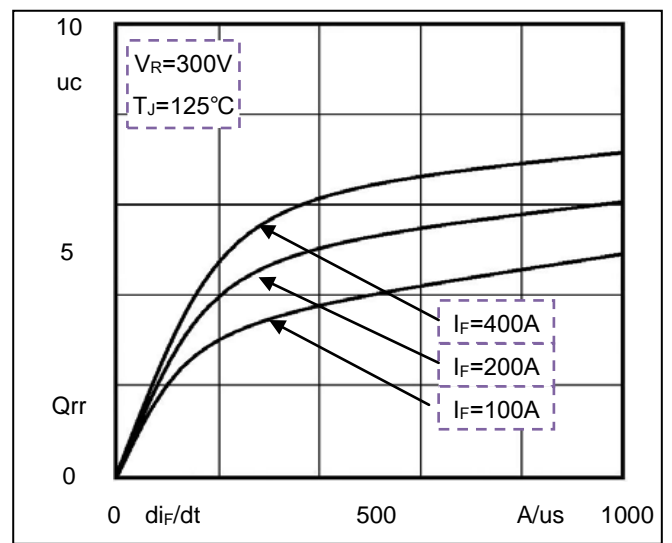
**Fig1. Forward Voltage Drop vs Forward Current**



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



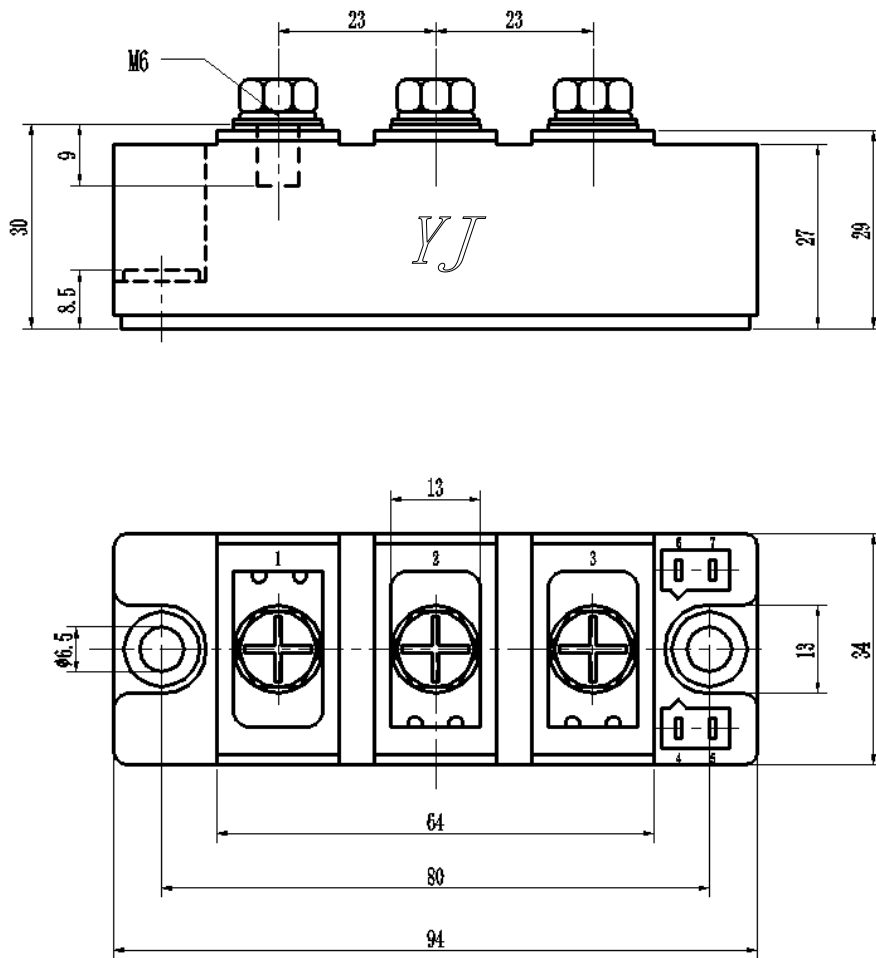
**Fig3. Reverse Recovery Current vs  $di_F/dt$**



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

### Package Outline Information

CASE: F2



Dimensions in mm