



## FRED Modules

**V<sub>RRM</sub>** 1200V

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

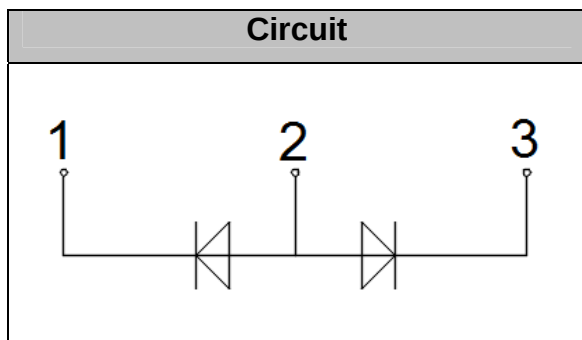
### Applications

- 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

**Circuit**



### Maximum Ratings

| Symbol       | Conditions                                               | Values      | Units                |
|--------------|----------------------------------------------------------|-------------|----------------------|
| $V_R$        |                                                          | 1200        | V                    |
| $V_{RRM}$    |                                                          | 1200        | V                    |
| $I_{F(AV)}$  | $T_C=110^{\circ}\text{C}$ , Per Diode                    | 200         | A                    |
| $I_{F(RMS)}$ | $T_C=110^{\circ}\text{C}$ , Per Diode                    | 280         | A                    |
| $I_{FSM}$    | 1/2 Cycle, 50Hz, Sine                                    | 1800        | A                    |
|              | 1/2 Cycle, 60Hz, Sine                                    | 1950        | A                    |
| $I^2t$       | $T_J=45^{\circ}\text{C}$ , $t=10\text{ms}$ , 50Hz, Sine  | 16200       | $\text{A}^2\text{s}$ |
|              | $T_J=45^{\circ}\text{C}$ , $t=8.3\text{ms}$ , 60Hz, Sine | 19000       | $\text{A}^2\text{s}$ |
| $P_D$        |                                                          | 568         | 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)                                         | 4.5         | N·m                  |
| Torque       | Recommended (M6)                                         | 4.5         | N·m                  |
| Weight       |                                                          | 100         | g                    |

### Thermal Characteristics

| Symbol        | Conditions       | Values | Units                |
|---------------|------------------|--------|----------------------|
| $R_{th(j-c)}$ | Junction-to-Case | 0.2    | $^{\circ}\text{C/W}$ |



## Electrical Characteristics

| Symbol    | Conditions                                                  | Values |      |      | Units |
|-----------|-------------------------------------------------------------|--------|------|------|-------|
|           |                                                             | Min.   | Typ. | Max. |       |
| $I_{RM}$  | $V_R=1200V$                                                 | --     | --   | 1    | mA    |
|           | $V_R=1200V, T_J=125^{\circ}C$                               | --     | --   | 5    | mA    |
| $V_F$     | $I_F=200A$                                                  | --     | 2.3  |      | V     |
|           | $I_F=200A, T_J=125^{\circ}C$                                | --     | 1.9  |      | V     |
| $t_{rr}$  | $I_F=1A, V_R=30V, di_F/dt=-200A/\mu s$                      | --     | 57   | --   | ns    |
| $t_{rr}$  | $V_R=600V, I_F=200A, di_F/dt=-200A/\mu s, T_J=25^{\circ}C$  | --     | 110  | --   | ns    |
| $I_{RRM}$ |                                                             | --     | 9    | --   | A     |
| $t_{rr}$  | $V_R=600V, I_F=200A, di_F/dt=-200A/\mu s, T_J=125^{\circ}C$ | --     | 500  | --   | ns    |
| $I_{RRM}$ |                                                             | --     | 21   | --   | A     |

## Performance Curves

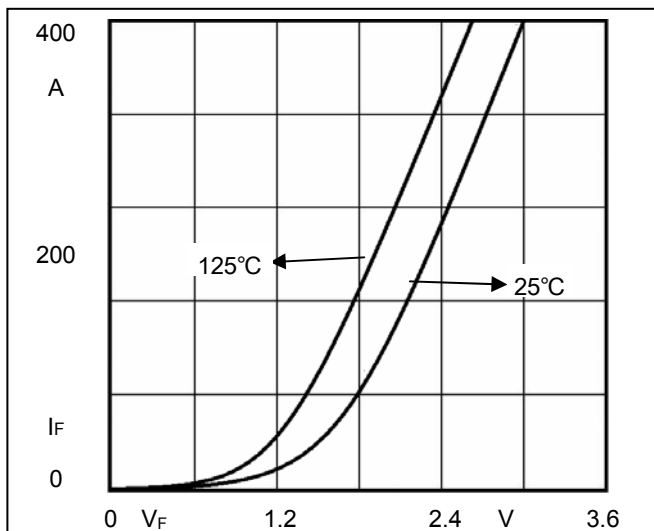


Fig1. Forward Voltage Drop vs Forward Current

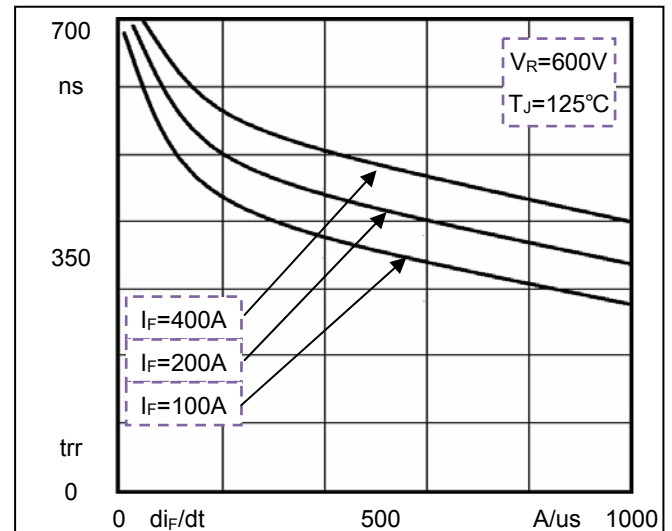


Fig2. Reverse Recovery Time vs  $di_F/dt$

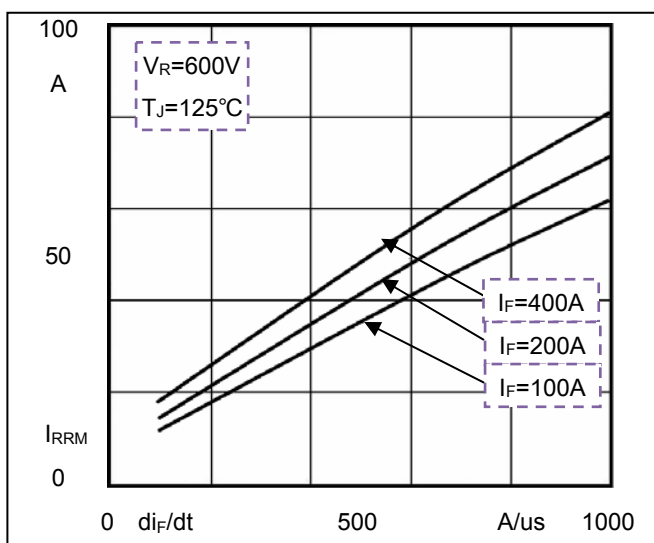


Fig3. Reverse Recovery Current vs  $di_F/dt$

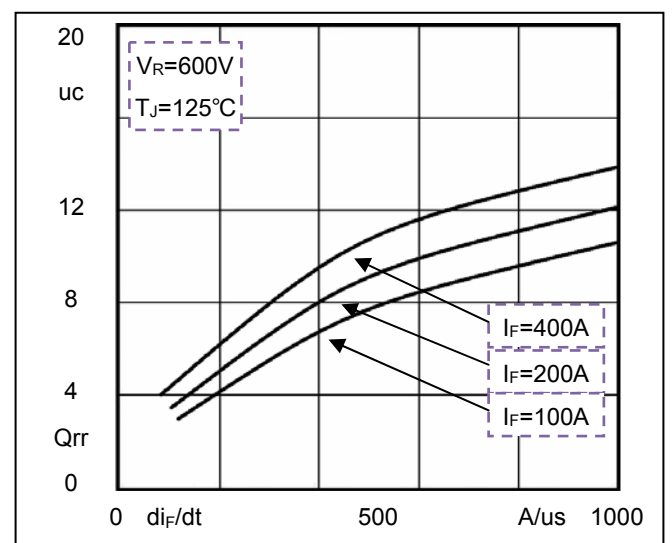
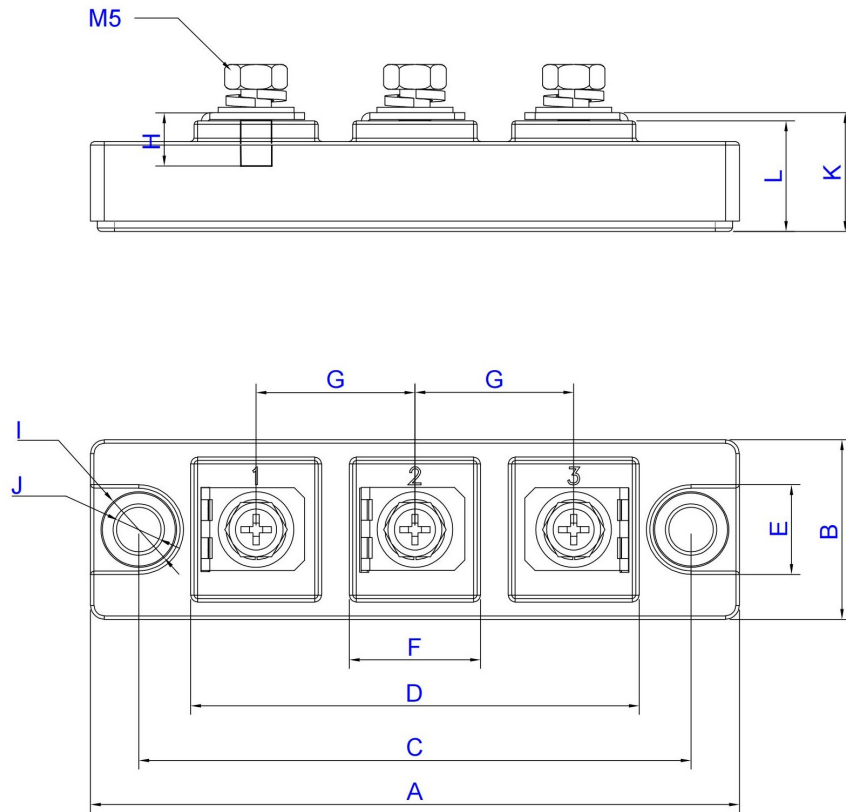


Fig4. Reverse Recovery Charge vs  $di_F/dt$

## Package Outline Information

### CASE: F5



| DIM | Min (mm) | Max (mm) | Note |
|-----|----------|----------|------|
| A   | 93.5     | 94.5     |      |
| B   | 25.5     | 26.5     |      |
| C   | 79.5     | 80.5     |      |
| D   | 64.5     | 65.5     |      |
| E   | 12.5     | 13.5     |      |
| F   | 18.5     | 19.5     |      |
| G   | 22.5     | 23.5     |      |
| H   | 6        | 7        |      |
| I   | 10.5     | 11.5     | Ø    |
| J   | 6        | 7        | Ø    |
| K   | 16.5     | 17.5     |      |
| L   | 15.5     | 16.5     |      |

## Packing Standard

| Item         | Length: A (mm) | Width: B (mm) | Height: C (mm) | Quantity (PCS) |
|--------------|----------------|---------------|----------------|----------------|
| Inner Box    | 276            | 258           | 40             | 10             |
| Outer Carton | 545            | 295           | 240            | 120            |



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