



## FRED Modules

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

**I<sub>FAV</sub>** 60A

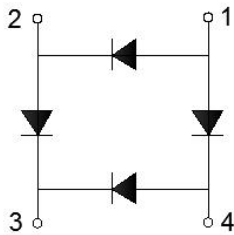
### Applications

- 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
- Popular SOT-227 Package

### Circuit



## Maximum Ratings

| Symbol           | Conditions                                                  | Values      | Units            |
|------------------|-------------------------------------------------------------|-------------|------------------|
| V <sub>R</sub>   |                                                             | 600         | V                |
| V <sub>RRM</sub> |                                                             | 600         | V                |
| I <sub>D</sub>   | Single phase ,half wave 180°conduction T <sub>c</sub> =85°C | 60          | A                |
| I <sub>FSM</sub> | 1/2 Cycle , 50Hz, Sine                                      | 380         | A                |
| I <sup>2</sup> t | T <sub>J</sub> =45°C, t=10ms, 50Hz, Sine                    | 720         | A <sup>2</sup> s |
| P <sub>D</sub>   | T <sub>c</sub> =25°C                                        | 125         | W                |
| T <sub>J</sub>   |                                                             | -40 to +150 | °C               |
| T <sub>STG</sub> |                                                             | -40 to +125 | °C               |
| Visol            | 3000V AC 1min                                               | 1           | mA               |
| Torque           | To Sink Recommended (M4)                                    | 0.7~1.1     | N·m              |
| Torque           | To Terminal Recommended (M4)                                | 0.7~1.1     | N·m              |
| Weight           |                                                             | 26          | g                |

## Thermal Characteristics

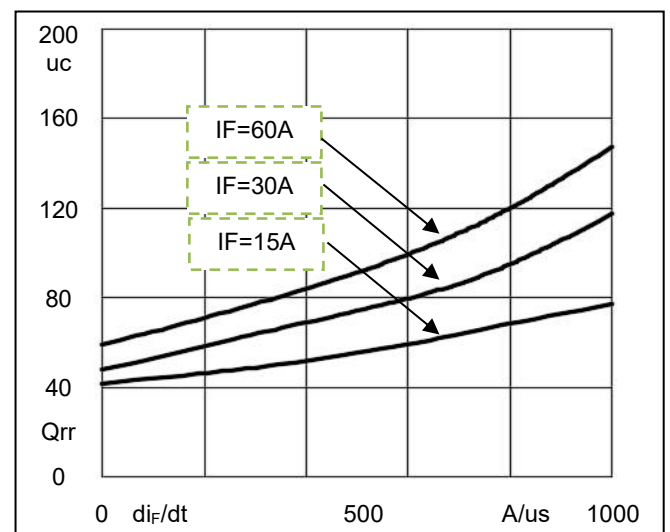
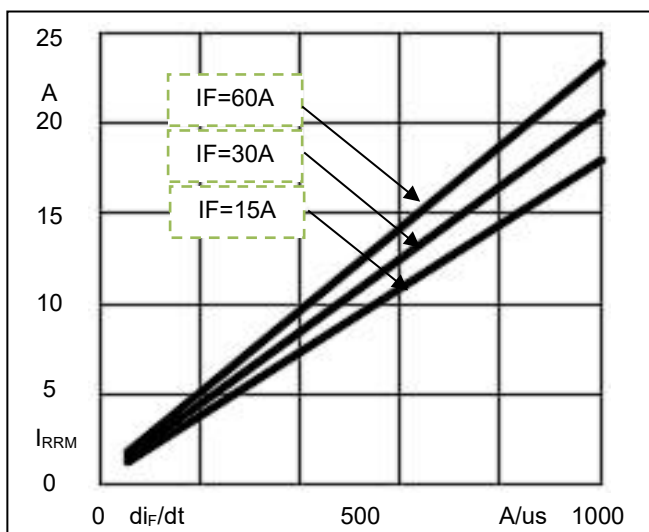
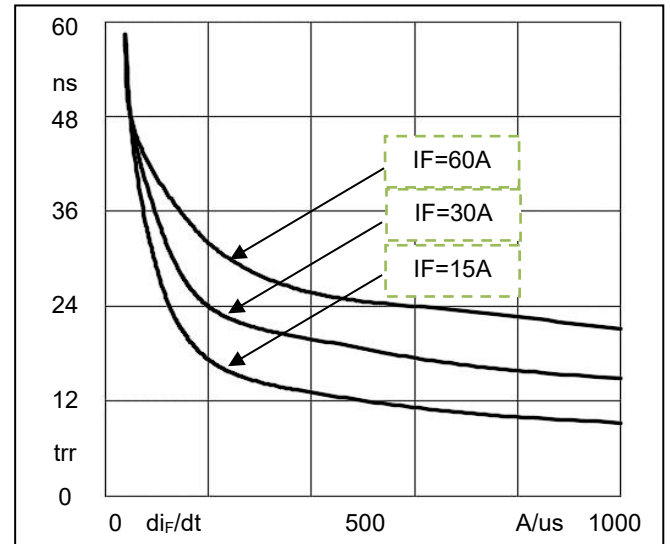
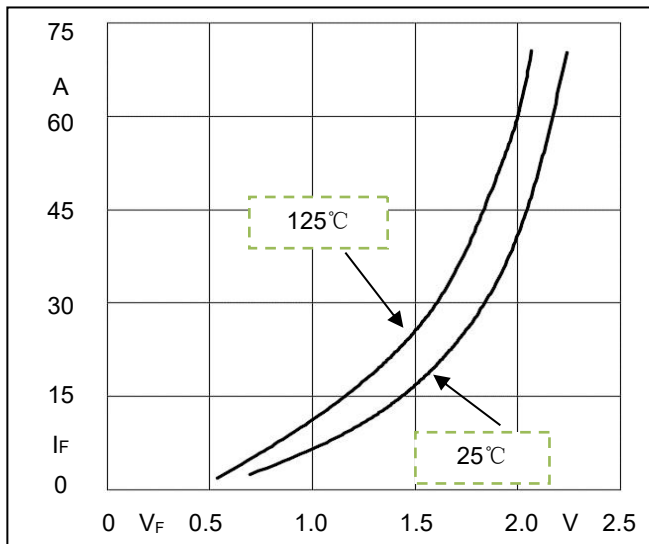
| Symbol               | Conditions | Values | Units |
|----------------------|------------|--------|-------|
| R <sub>th(j-c)</sub> | Per diode  | 1      | °C/W  |
| R <sub>th(j-c)</sub> | Per module | 0.25   | °C/W  |

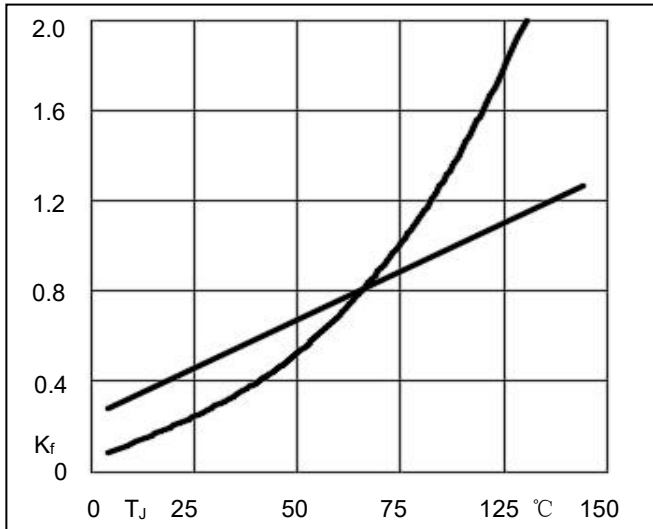


## Electrical Characteristics

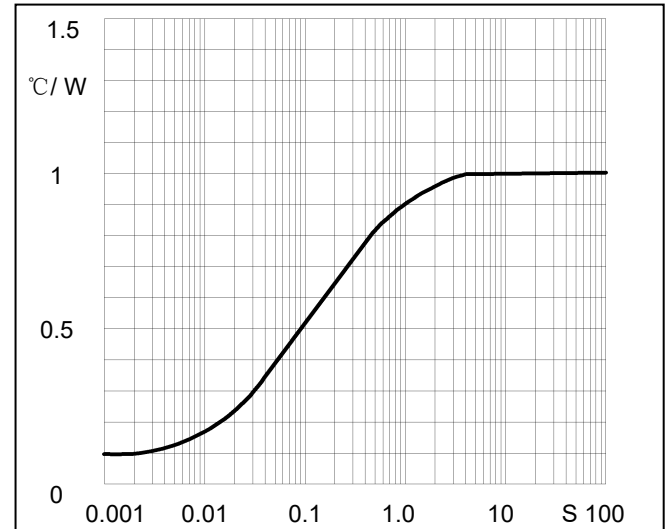
| Symbol   | Conditions                             | Values |      |      | Units |
|----------|----------------------------------------|--------|------|------|-------|
|          |                                        | Min.   | Typ. | Max. |       |
| $I_{RM}$ | $V_R=600V$                             | --     | --   | 0.1  | mA    |
|          | $V_R=600V, T_J=125^{\circ}C$           | --     | --   | 2    | mA    |
| $V_F$    | $I_F=30A$                              | --     | 1.65 | 1.8  | V     |
|          | $I_F=30A, T_J=125^{\circ}C$            | --     | --   | 1.7  | V     |
| $t_{rr}$ | $I_F=1A, V_R=30V, di_F/dt=-200A/\mu s$ | --     | 24   | --   | ns    |

## Performance Curves

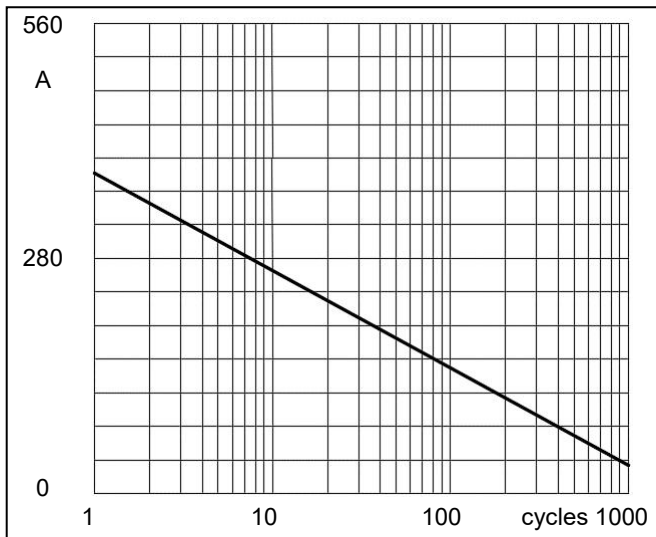




**Fig5. Dynamic Parameters vs Junction Temperature**



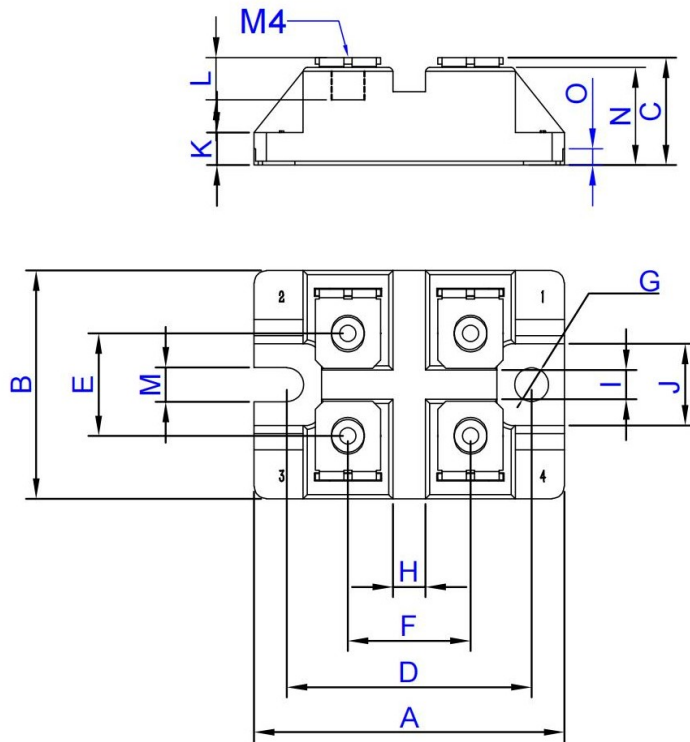
**Fig6. Transient Thermal Impedance**



**Fig7. Max Non-Repetitive Forward Surge Current**

## Package Outline Information

CASE: FJ



| DIM | Min (mm) | Max (mm) | Note |
|-----|----------|----------|------|
| A   | 37.5     | 38.5     |      |
| B   | 27.5     | 28.5     |      |
| C   | 12.8     | 13.5     |      |
| D   | 29.5     | 30.5     |      |
| E   | 12.1     | 13.1     |      |
| F   | 14.5     | 15.5     |      |
| G   | 4.0      | 4.4      | Ø    |
| H   | 3.7      | 4.3      |      |
| I   | 3.3      | 3.9      |      |
| J   | 9.5      | 10.5     |      |
| K   | 3.7      | 4.3      |      |
| L   | 5.0      | 5.5      |      |
| M   | 4.0      | 4.4      |      |
| N   | 11.7     | 12.3     |      |
| O   | 1.8      | 2.2      |      |

## Packing Standard

| Item         | Length: A (mm) | Width: B (mm) | Height: C (mm) | Quantity (PCS) |
|--------------|----------------|---------------|----------------|----------------|
| Inner EPE    | 252            | 246           | 25             | 25             |
| Inner Box    | 290            | 252           | 40             | 25             |
| Outer Carton | 300            | 270           | 280            | 150            |



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