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**MF300U12F2**

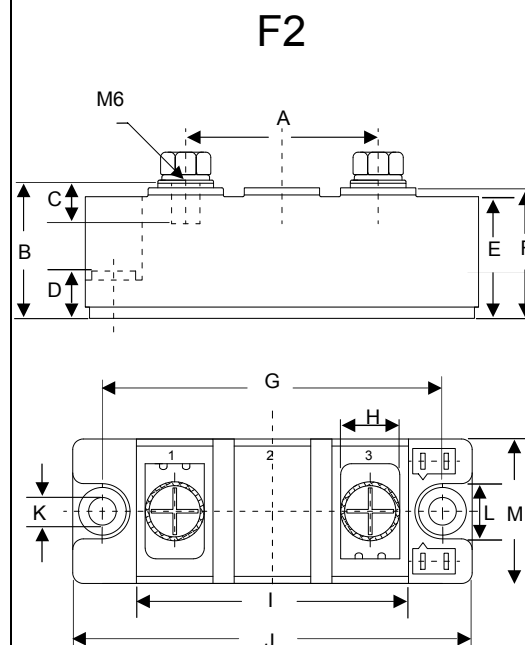
**300 Amp  
FRED Modules  
1200 Volts**

## Features

- Lead Free Finish/RoHS Compliant (NOTE 1) ("P" Suffix designates RoHS Compliant. See ordering information)
- Soft Reverse Recovery Characteristics
- Ultrafast Reverse Recovery Time
- Low Reverse Recovery Loss
- Low Forward Voltage
- High Surge Current Capability
- Low Inductance Package

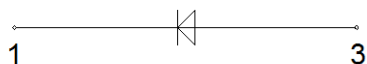
## Applications

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



| DIMENSIONS |        |       |       |       |      |
|------------|--------|-------|-------|-------|------|
| DIM        | INCHES |       | MM    |       | NOTE |
|            | MIN    | MAX   | MIN   | MAX   |      |
| A          | 1.799  | 1.823 | 45.70 | 46.30 |      |
| B          | 1.169  | 1.193 | 29.70 | 30.30 |      |
| C          | .343   | .366  | 8.70  | 9.30  |      |
| D          | .323   | .343  | 8.20  | 8.70  |      |
| E          | 1.051  | 1.075 | 26.70 | 27.30 |      |
| F          | 1.130  | 1.154 | 28.70 | 29.30 |      |
| G          | .120   | .130  | 79.70 | 80.30 |      |
| H          | .500   | .524  | 12.70 | 13.30 |      |
| I          | 2.501  | 2.531 | 63.70 | 64.30 |      |
| J          | 3.689  | 3.713 | 93.70 | 94.30 |      |
| K          |        | .256  |       | 6.50  | Ø    |
| L          | .500   | .524  | 12.70 | 13.30 |      |
| M          | 1.327  | 1.350 | 33.70 | 34.30 |      |

**Circuit**



## Maximum Ratings

| Symbol       | Conditions                                               | Values      | Units                |
|--------------|----------------------------------------------------------|-------------|----------------------|
| $V_R$        |                                                          | 1200        | V                    |
| $V_{RRM}$    |                                                          | 1200        | V                    |
| $I_{F(AV)}$  | $T_C=100^{\circ}\text{C}$                                | 300         | A                    |
|              | $T_C=110^{\circ}\text{C}$ , 20KHz                        | 210         | A                    |
| $I_{F(RMS)}$ | $T_C=110^{\circ}\text{C}$                                | 420         | A                    |
| $I_{FSM}$    | $T_J=45^{\circ}\text{C}$ , 1/2 Cycle, 50Hz, Sine         | 2500        | A                    |
|              | $T_J=45^{\circ}\text{C}$ , 1/2 Cycle, 60Hz, Sine         | 2800        | A                    |
| $I^2t$       | $T_J=45^{\circ}\text{C}$ , $t=10\text{ms}$ , 50Hz, Sine  | 312500      | $\text{A}^2\text{s}$ |
|              | $T_J=45^{\circ}\text{C}$ , $t=8.3\text{ms}$ , 60Hz, Sine | 325000      | $\text{A}^2\text{s}$ |
| $P_D$        |                                                          | 890         | 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                    |

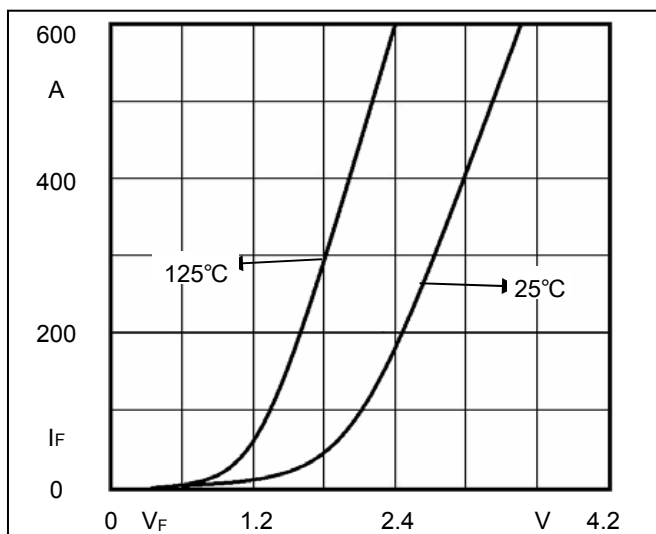
## Thermal Characteristics

| Symbol        | Conditions           | Values | Units                |
|---------------|----------------------|--------|----------------------|
| $R_{th(j-c)}$ | Junction - to - Case | 0.14   | $^{\circ}\text{C/W}$ |

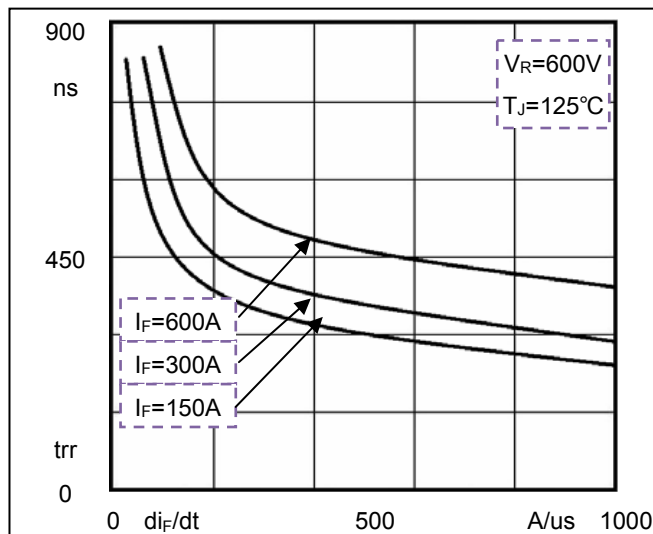
## Electrical Characteristics

| Symbol    | Conditions                                                                                             | Values |      |      | Units |
|-----------|--------------------------------------------------------------------------------------------------------|--------|------|------|-------|
|           |                                                                                                        | Min.   | Typ. | Max. |       |
| $I_{RM}$  | $V_R=1200\text{V}$                                                                                     | --     | --   | 5    | mA    |
|           | $V_R=1200\text{V}$ , $T_J=125^{\circ}\text{C}$                                                         | --     | --   | 10   | mA    |
| $V_F$     | $I_F=300\text{A}$                                                                                      | --     | 2.7  |      | V     |
|           | $I_F=300\text{A}$ , $T_J=125^{\circ}\text{C}$                                                          | --     | 1.8  |      | V     |
| $t_{rr}$  | $I_F=1\text{A}$ , $V_R=30\text{V}$ , $di_F/dt=-200\text{A}/\mu\text{s}$                                | --     | 75   | --   | ns    |
| $t_{rr}$  | $V_R=600\text{V}$ , $I_F=300\text{A}$ , $di_F/dt=-200\text{A}/\mu\text{s}$ , $T_J=25^{\circ}\text{C}$  | --     | 150  | --   | ns    |
| $I_{RRM}$ |                                                                                                        | --     | 12   | --   | A     |
| $t_{rr}$  | $V_R=600\text{V}$ , $I_F=300\text{A}$ , $di_F/dt=-200\text{A}/\mu\text{s}$ , $T_J=125^{\circ}\text{C}$ | --     | 450  | --   | ns    |
| $I_{RRM}$ |                                                                                                        | --     | 27   | --   | A     |

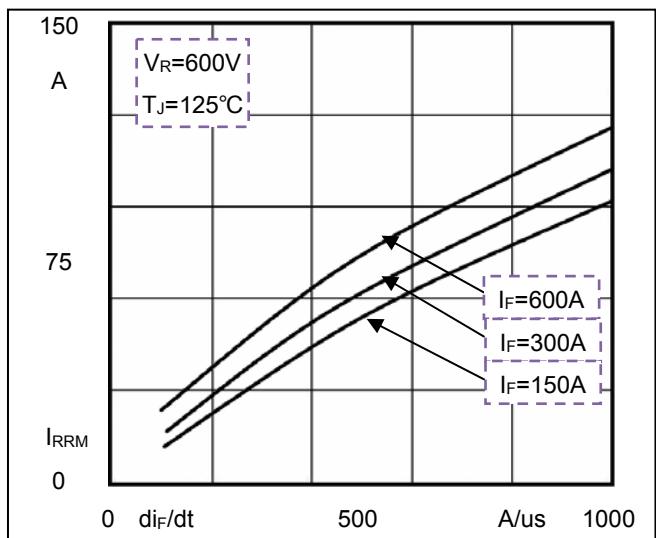
## Performance Curves



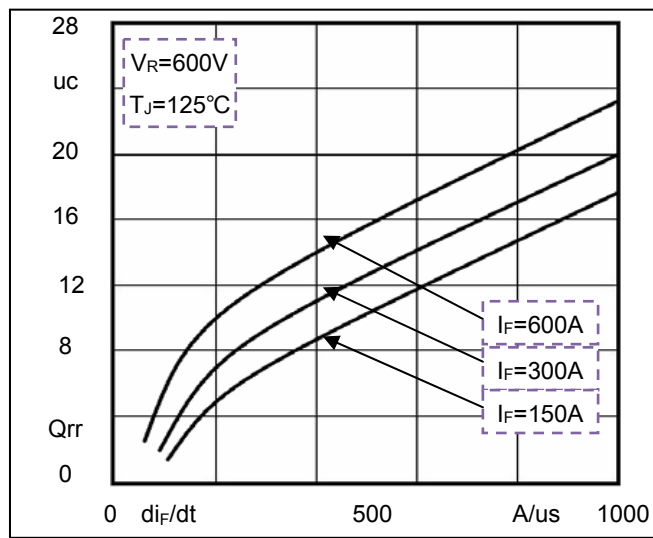
**Fig1. Forward Voltage Drop vs Forward Current**



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



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



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

## Ordering Information :

| Device         | Packing                   |
|----------------|---------------------------|
| Part Number-BP | Bulk: 8PCS/BOX ;80PCS/CTN |

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