

## SiC Diode Power Module



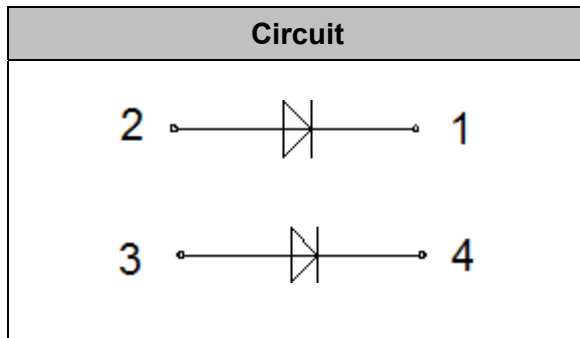
|             |       |
|-------------|-------|
| $V_{DC}$    | 1200V |
| $I_F$       | 2×40A |
| $T_{J,max}$ | 175°C |

### Applications

- Welding equipment
- Uninterruptible power supply (UPS)
- High frequency power supply
- Induction heating
- High speed rectifiers

### Features

- SiC Schottky Diode
  - Zero reverse recovery
  - Zero forward recovery
  - Temperature independent switching behavior
  - Positive temperature coefficient on  $V_F$
- Very low stray inductance
- Low forward voltage
- Isolated package (SOT-227)
- Low noise switching
- RoHS compliant



### ■ Absolute Maximum Ratings ( $T_J=25^\circ\text{C}$ unless otherwise specified)

| PARAMETER                                 | SYMBOL        | TEST CONDITIONS                                                | VALUE     | UNIT                 |
|-------------------------------------------|---------------|----------------------------------------------------------------|-----------|----------------------|
| Peak Repetitive Reverse Voltage           | $V_{RRM}$     | $T_J=25^\circ\text{C}$                                         | 1200      | V                    |
| DC Blocking Voltage                       | $V_{DC}$      | $T_J=25^\circ\text{C}$                                         | 1200      | V                    |
| Continuous Forward Current                | $I_F$         | $T_C=25^\circ\text{C}, T_J=175^\circ\text{C}$                  | 80        | A                    |
|                                           |               | $T_C=125^\circ\text{C}, T_J=175^\circ\text{C}$                 | 40        |                      |
|                                           |               | $T_C=135^\circ\text{C}, T_J=175^\circ\text{C}$                 | 35        |                      |
| Non-Repetitive Peak Forward Surge Current | $I_{FSM}$     | $T_C=25^\circ\text{C}, T_P=10\text{ms}, \text{Half Sine Wave}$ | 285       | A                    |
| $I^2t$ Value                              | $\int I^2 dt$ | $T_C=25^\circ\text{C}, T_P=10\text{ms}$                        | 405       | $\text{A}^2\text{s}$ |
| Power Dissipation                         | $P_{Tot}$     | $T_C=25^\circ\text{C}$                                         | 225       | W                    |
| Operating Junction Temperature            | $T_{J,op}$    |                                                                | -40...175 | $^\circ\text{C}$     |
| Storage Temperature                       | $T_{STG}$     |                                                                | -40...125 | $^\circ\text{C}$     |



## MB80DU12FJ

### ■ Electrical Characteristics ( $T_J=25^{\circ}\text{C}$ unless otherwise specified)

| PARAMETER                 | SYMBOL | TEST CONDITIONS                                | VALUE |      |      | UNIT          |
|---------------------------|--------|------------------------------------------------|-------|------|------|---------------|
|                           |        |                                                | Min.  | Typ. | Max. |               |
| Reverse Current           | $I_R$  | $V_R=1200\text{V}$ , $T_J=25^{\circ}\text{C}$  | --    | 3.0  | 100  | $\mu\text{A}$ |
|                           |        | $V_R=1200\text{V}$ , $T_J=175^{\circ}\text{C}$ | --    | 7.8  | --   |               |
| Forward Voltage           | $V_F$  | $I_F=40\text{A}$ , $T_J=25^{\circ}\text{C}$    | --    | 1.40 | 1.7  | V             |
|                           |        | $I_F=40\text{A}$ , $T_J=175^{\circ}\text{C}$   | --    | 1.81 | --   |               |
| Total Capacitance         | C      | $V_R=1\text{V}$ , $f=1\text{MHz}$              | --    | 2276 | --   | $\text{pF}$   |
|                           |        | $V_R=400\text{V}$ , $f=1\text{MHz}$            | --    | 206  | --   |               |
|                           |        | $V_R=800\text{V}$ , $f=1\text{MHz}$            | --    | 159  | --   |               |
| Total Capacitive Charge   | $Q_C$  | $V_R=800\text{V}$                              | --    | 220  | --   | nC            |
| Capacitance Stored Energy | $E_C$  | $V_R=800\text{V}$                              | --    | 57   | --   | $\mu\text{J}$ |

### ■ Thermal and Package Characteristics ( $T_J=25^{\circ}\text{C}$ unless otherwise specified)

| PARAMETER                            | SYMBOL     | TEST CONDITIONS                 | VALUE |      |      | UNIT                 |
|--------------------------------------|------------|---------------------------------|-------|------|------|----------------------|
|                                      |            |                                 | Min.  | Typ. | Max. |                      |
| Thermal Resistance, Junction to Case | $R_{thJC}$ | Per leg                         |       | 0.66 |      | $^{\circ}\text{C/W}$ |
| Isolation Breakdown Voltage          | $V_{isol}$ | AC, 50Hz (R.M.S), $t=3\text{s}$ | 3600  |      |      | V                    |
| Mounting Torque                      | M          | Recommended (M4 screw)          | 1     |      | 1.5  | Nm                   |
| Terminal Connection Torque           |            | Recommended (M4 screw)          | 1     |      | 1.5  |                      |
| Weight                               | W          |                                 |       | 32   |      | g                    |



## ■ Typical Performance Per Leg

Fig1. Forward Characteristics

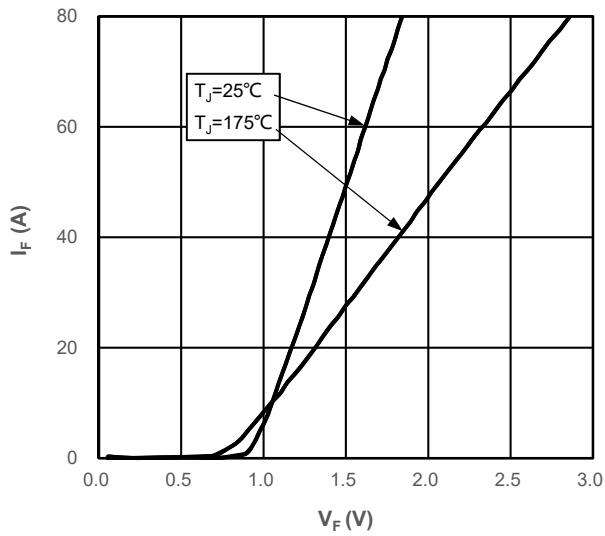


Fig2. Reverse Characteristics

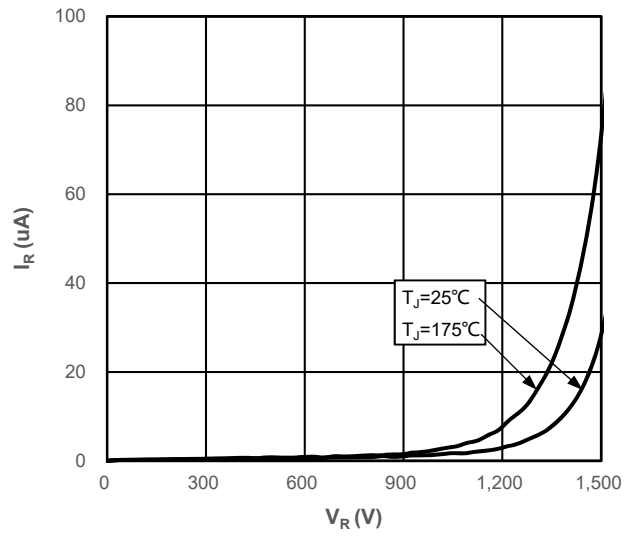


Fig3. Current Derating

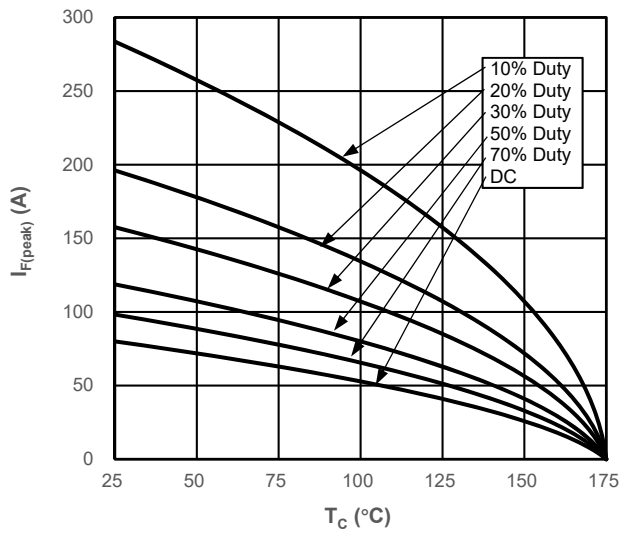


Fig4. Power Derating

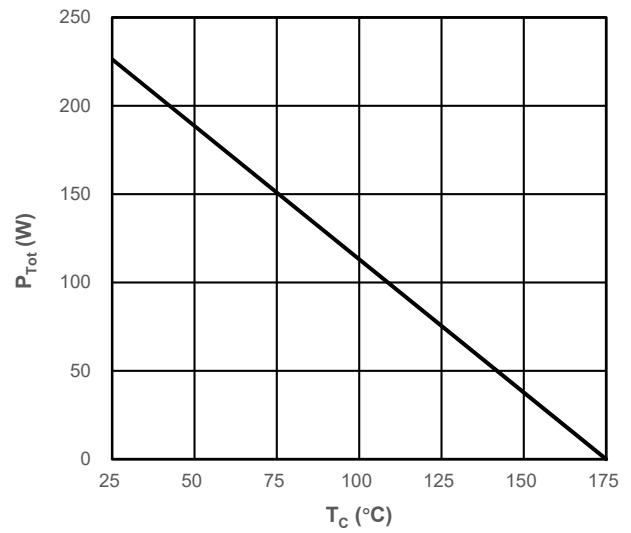


Fig5. Recovery Charge vs. Reverse Voltage

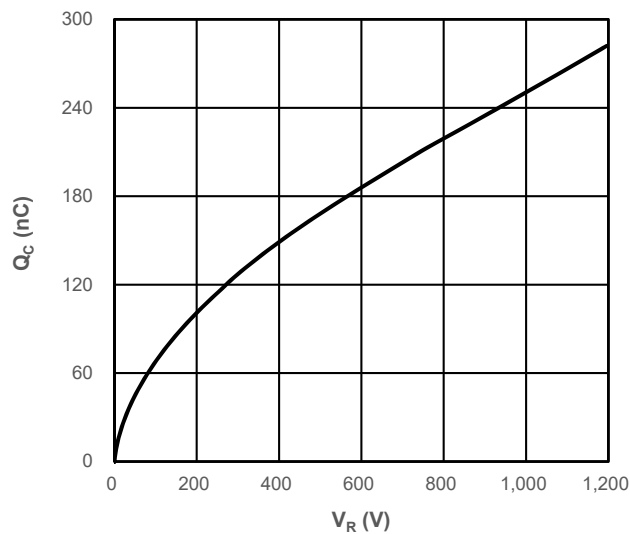
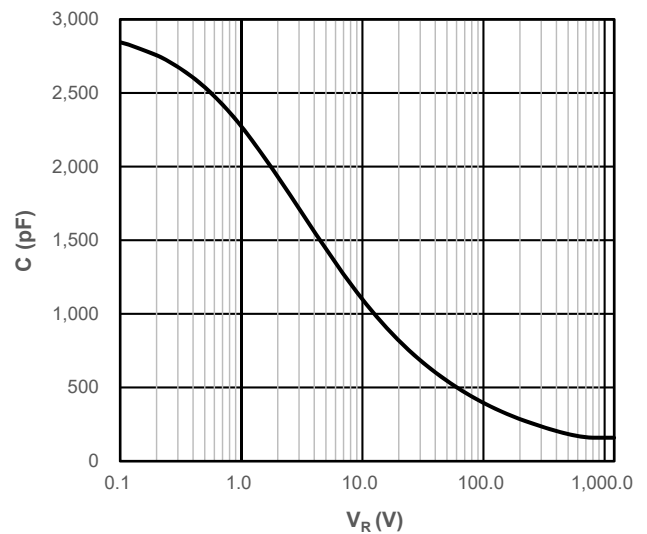


Fig6. Capacitance vs. Reverse Voltage





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Fig7. Typical Capacitance Stored Energy

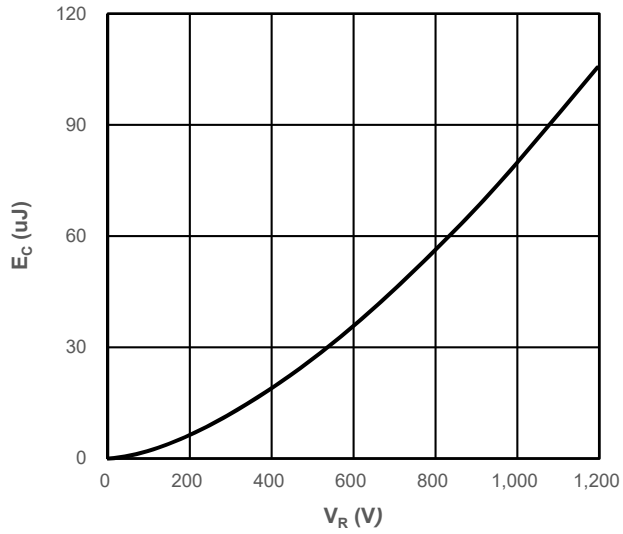
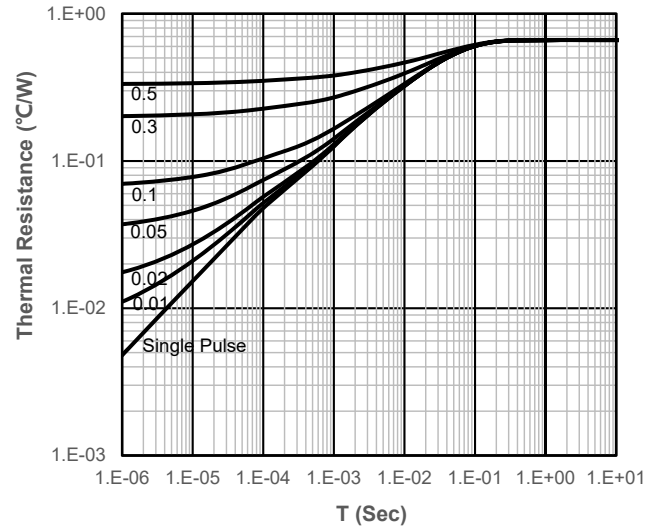


Fig8. Transient Thermal Impedance

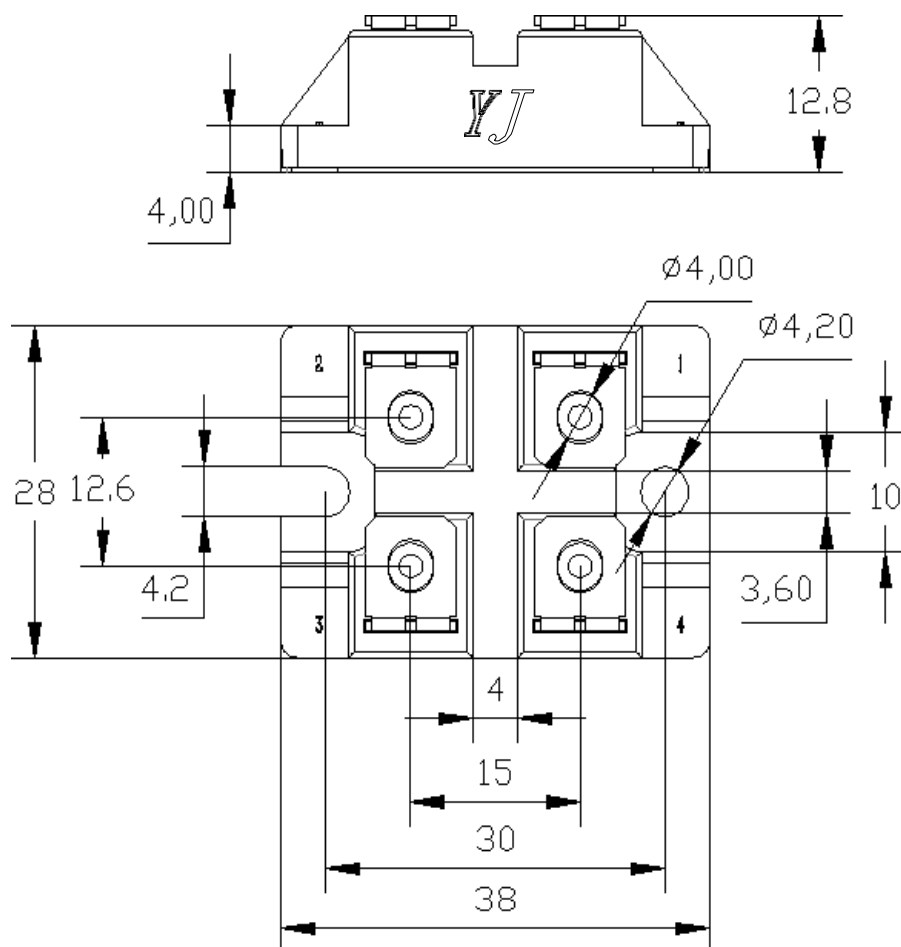




## MB80DU12FJ

### ■ Package Outline Information

CASE: FJ



Dimensions in mm



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