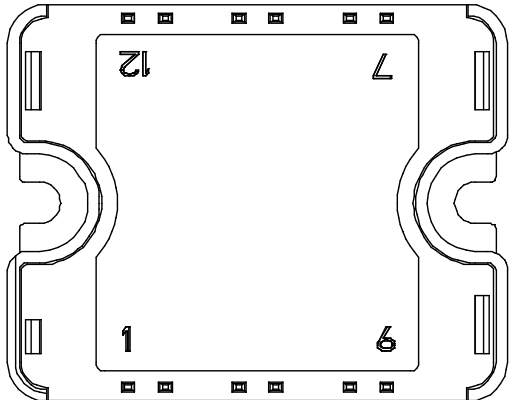
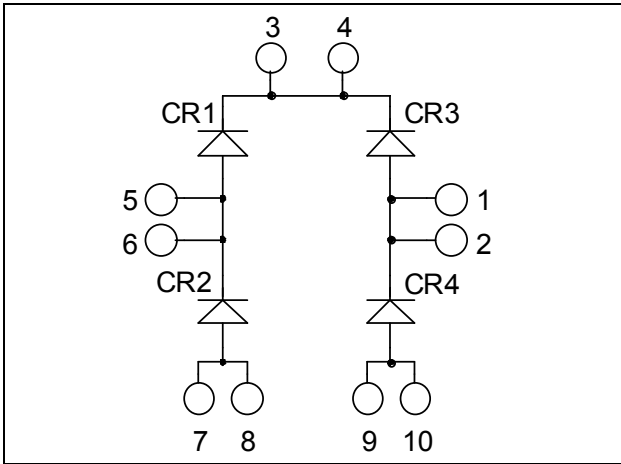


## Fast Diode Full Bridge Power Module

**$V_{RRM} = 1200V$**   
 **$I_C = 60A @ T_c = 80^\circ C$**



All multiple inputs and outputs must be shorted together  
 3/4 ; 5/6 ; 7/8 ; 1/2 ; 9/10

### Application

- Uninterruptible Power Supply (UPS)
- Induction heating
- Welding equipment
- High speed rectifiers

### Features

- Ultra fast recovery times
- Soft recovery characteristics
- High blocking voltage
- High current
- Low leakage current
- Very low stray inductance
- High level of integration

### Benefits

- Outstanding performance at high frequency operation
- Low losses
- Low noise switching
- Solderable terminals for easy PCB mounting
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- RoHS Compliant

### Absolute maximum ratings

| Symbol      | Parameter                               | Max ratings        | Unit |
|-------------|---|--------------------|------|
| $V_R$       | Maximum DC reverse Voltage              | 1200               | V    |
| $V_{RRM}$   | Maximum Peak Repetitive Reverse Voltage |                    |      |
| $I_{F(AV)}$ | Maximum Average Forward Current         | Duty cycle = 50%   | A    |
|             |   | $T_C = 25^\circ C$ |      |
|             |   | $T_C = 80^\circ C$ | 60   |
| $I_{FSM}$   | Non-Repetitive Forward Surge Current    | 8.3ms              | 500  |
|             |   | $T_J = 45^\circ C$ |      |

**CAUTION:** These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed. See application note APT0502 on [www.microsemi.com](http://www.microsemi.com)

All ratings @  $T_j = 25^\circ\text{C}$  unless otherwise specified

**Electrical Characteristics**

| Symbol   | Characteristic                  | Test Conditions      | Min                       | Typ | Max | Unit          |
|----------|---------------------------------|----------------------|---------------------------|-----|-----|---------------|
| $V_F$    | Diode Forward Voltage           | $I_F = 60\text{A}$   |                           | 2.5 | 3   | V             |
|          |                                 | $I_F = 120\text{A}$  |                           | 3   |     |               |
|          |                                 | $I_F = 60\text{A}$   | $T_j = 125^\circ\text{C}$ | 1.8 |     |               |
| $I_{RM}$ | Maximum Reverse Leakage Current | $V_R = 1200\text{V}$ | $T_j = 25^\circ\text{C}$  |     | 100 | $\mu\text{A}$ |
|          |                                 |                      | $T_j = 125^\circ\text{C}$ |     | 500 |               |
| $C_T$    | Junction Capacitance            | $V_R = 200\text{V}$  |                           | 70  |     | pF            |

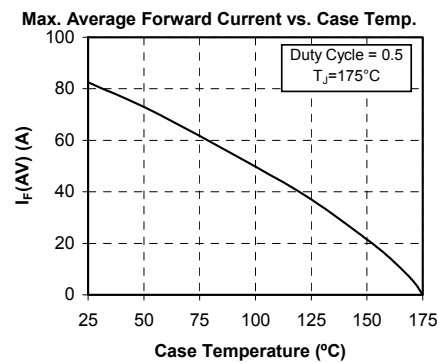
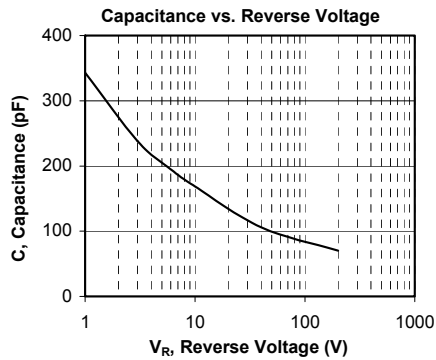
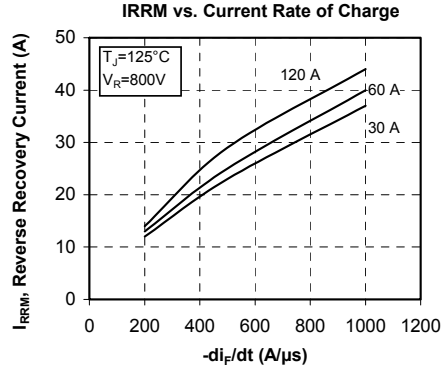
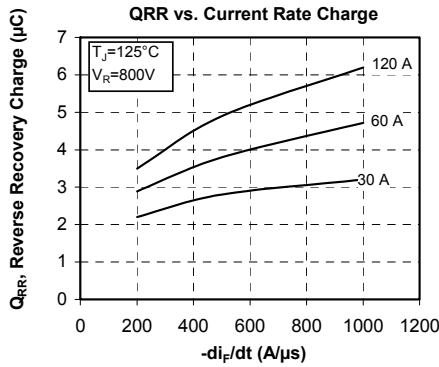
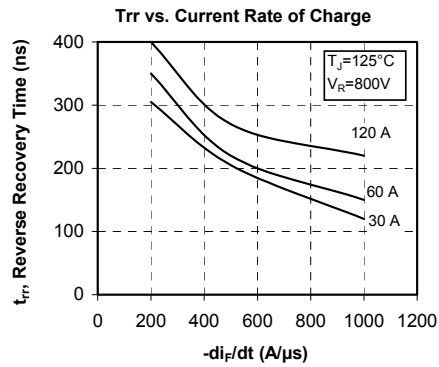
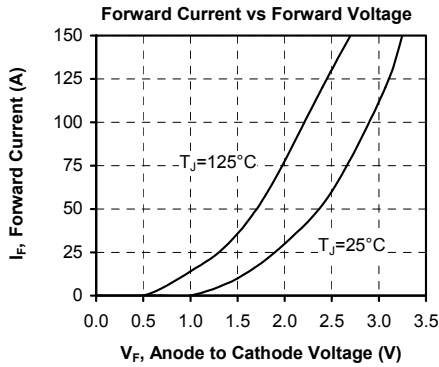
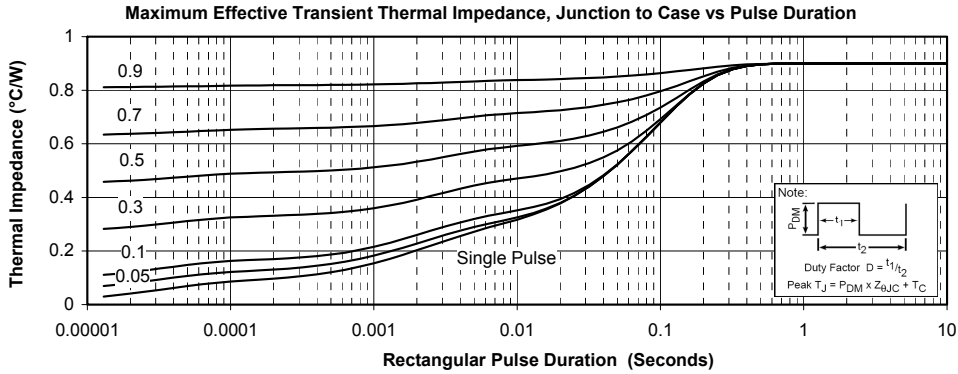
**Dynamic Characteristics**

| Symbol    | Characteristic           | Test Conditions   | Min                       | Typ | Max  | Unit |
|-----------|--------------------------|---|---------------------------|-----|------|------|
| $t_{rr}$  | Reverse Recovery Time    | $I_F = 60\text{A}$<br>$V_R = 800\text{V}$<br>$di/dt = 200\text{A}/\mu\text{s}$  | $T_j = 25^\circ\text{C}$  |     | 265  | ns   |
|           |                          |   | $T_j = 125^\circ\text{C}$ |     | 350  |      |
| $Q_{rr}$  | Reverse Recovery Charge  |   | $T_j = 25^\circ\text{C}$  |     | 560  | nC   |
|           |                          |   | $T_j = 125^\circ\text{C}$ |     | 2890 |      |
| $I_{RRM}$ | Reverse Recovery Current |   | $T_j = 25^\circ\text{C}$  |     | 5    | A    |
|           |                          |   | $T_j = 125^\circ\text{C}$ |     | 13   |      |
| $t_{rr}$  | Reverse Recovery Time    | $I_F = 60\text{A}$<br>$V_R = 800\text{V}$<br>$di/dt = 1000\text{A}/\mu\text{s}$ | $T_j = 125^\circ\text{C}$ |     | 150  | ns   |
| $Q_{rr}$  | Reverse Recovery Charge  |   |                           |     | 4700 | nC   |
| $I_{RRM}$ | Reverse Recovery Current |   |                           |     | 40   | A    |

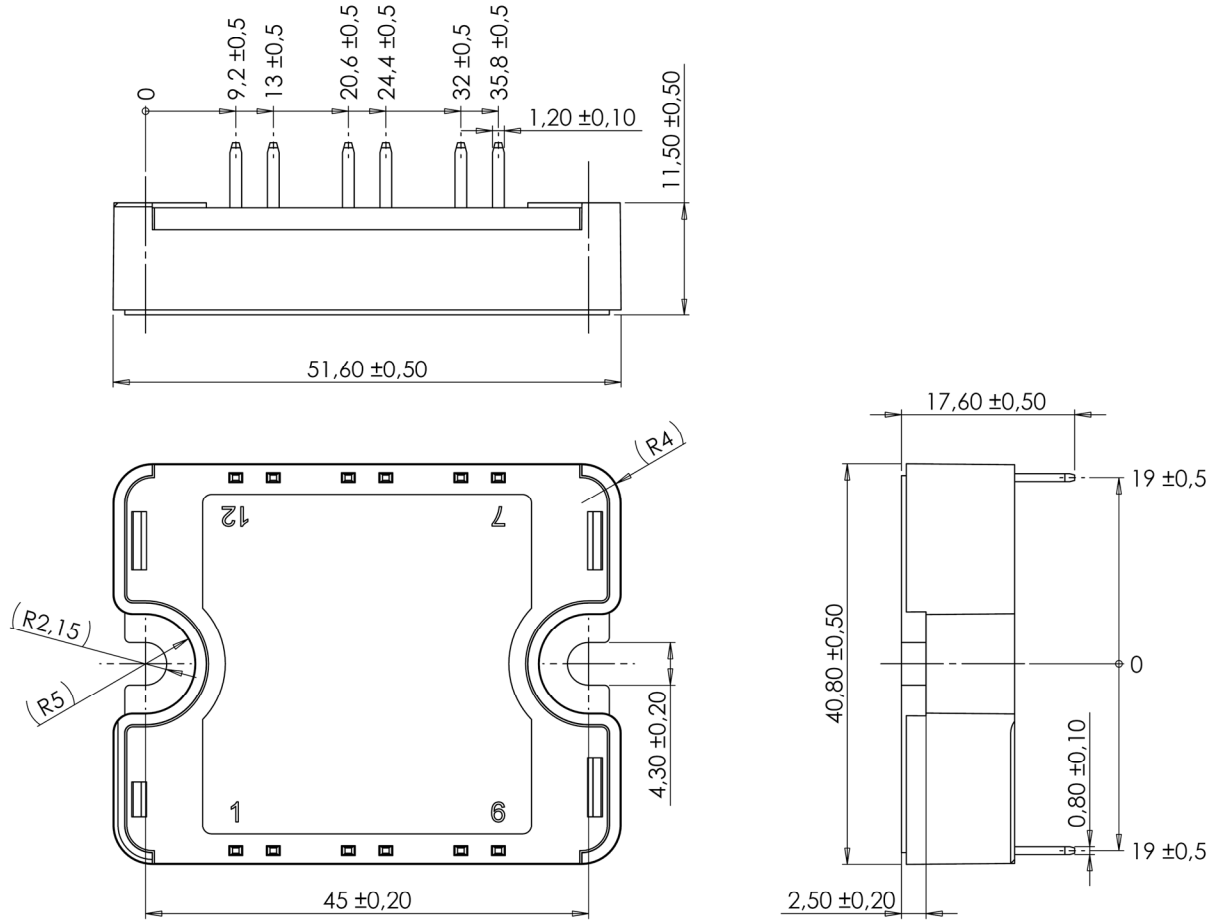
**Thermal and package characteristics**

| Symbol     | Characteristic   | Min         | Typ | Max | Unit                      |     |
|------------|--|-------------|-----|-----|---------------------------|-----|
| $R_{thJC}$ | Junction to Case Thermal Resistance                                      |             |     | 0.9 | $^\circ\text{C}/\text{W}$ |     |
| $V_{ISOL}$ | RMS Isolation Voltage, any terminal to case $t = 1\text{ min}$ , 50/60Hz | 4000        |     |     | V                         |     |
| $T_J$      | Operating junction temperature range                                     | -40         |     | 175 | $^\circ\text{C}$          |     |
| $T_{STG}$  | Storage Temperature Range  | -40         |     | 125 |                           |     |
| $T_C$      | Operating Case Temperature   | -40         |     | 100 |                           |     |
| Torque     | Mounting torque  | To heatsink | M4  | 2   | 3                         | N.m |
| Wt         | Package Weight   |             |     |     | 80                        | g   |

## Typical Performance Curve



**SP1 Package outline** (dimensions in mm)



See application note 1904 - Mounting Instructions for SP1 Power Modules on [www.microsemi.com](http://www.microsemi.com)

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