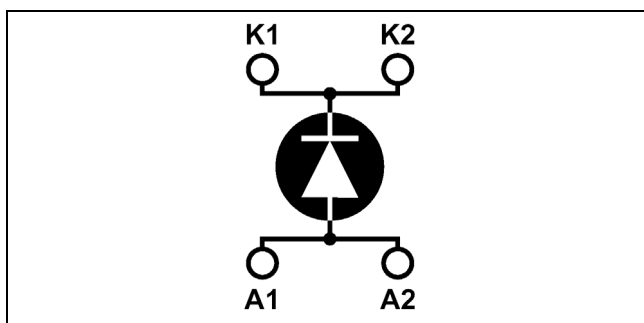


## Single diode Power Module

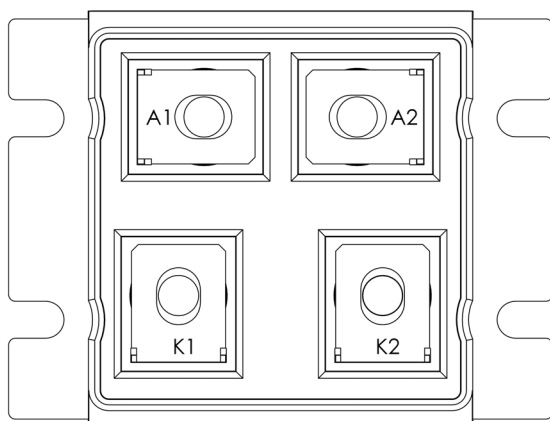
$$V_{CES} = 1200V$$

$$I_C = 400A @ T_c = 80^{\circ}C$$



### Application

- Anti-Parallel diode
  - Switchmode Power Supply
  - Inverters
- Snubber diode
- Uninterruptible Power Supply (UPS)
- Induction heating
- Welding equipment
- High speed rectifiers
- Electric vehicles



### Features

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

### Benefits

- Low losses
- Low noise switching
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- RoHS Compliant

### Absolute maximum ratings

| <i>Symbol</i>       | <i>Parameter</i>                        |                  |                       | <i>Max ratings</i> | <i>Unit</i> |  |
|---------------------|-----------------------------------------|------------------|-----------------------|--------------------|-------------|--|
| V <sub>R</sub>      | Maximum DC reverse Voltage              |                  |                       | 1200               | V           |  |
| V <sub>RRM</sub>    | Maximum Peak Repetitive Reverse Voltage |                  |                       |                    |             |  |
| I <sub>F(AV)</sub>  | Maximum Average Forward Current         | Duty cycle = 50% | T <sub>c</sub> = 25°C | 450                | A           |  |
|                     |                                         |                  | T <sub>c</sub> = 80°C | 400                |             |  |
| I <sub>F(RMS)</sub> | RMS Forward Current                     |                  |                       | 750                |             |  |
| I <sub>FSM</sub>    | Non-Repetitive Forward Surge Current    |                  | T <sub>j</sub> = 25°C | 5000               |             |  |

**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 @  $T_j = 25^{\circ}C$  unless otherwise specified**

**Electrical Characteristics**

| Symbol   | Characteristic                  | Test Conditions |                      | Min | Typ | Max  | Unit    |
|----------|---------------------------------|-----------------|----------------------|-----|-----|------|---------|
| $V_F$    | Diode Forward Voltage           | $I_F = 500A$    |                      |     |     | 2.5  | V       |
|          |                                 | $I_F = 1000A$   |                      |     | 2.5 |      |         |
|          |                                 | $I_F = 500A$    | $T_j = 150^{\circ}C$ |     |     | 2.0  |         |
| $I_{RM}$ | Maximum Reverse Leakage Current | $V_R = 1200V$   | $T_j = 25^{\circ}C$  |     |     | 2500 | $\mu A$ |
|          |                                 |                 | $T_j = 125^{\circ}C$ |     |     | 5000 |         |
| $C_T$    | Junction Capacitance            | $V_R = 200V$    |                      |     | 600 |      | pF      |

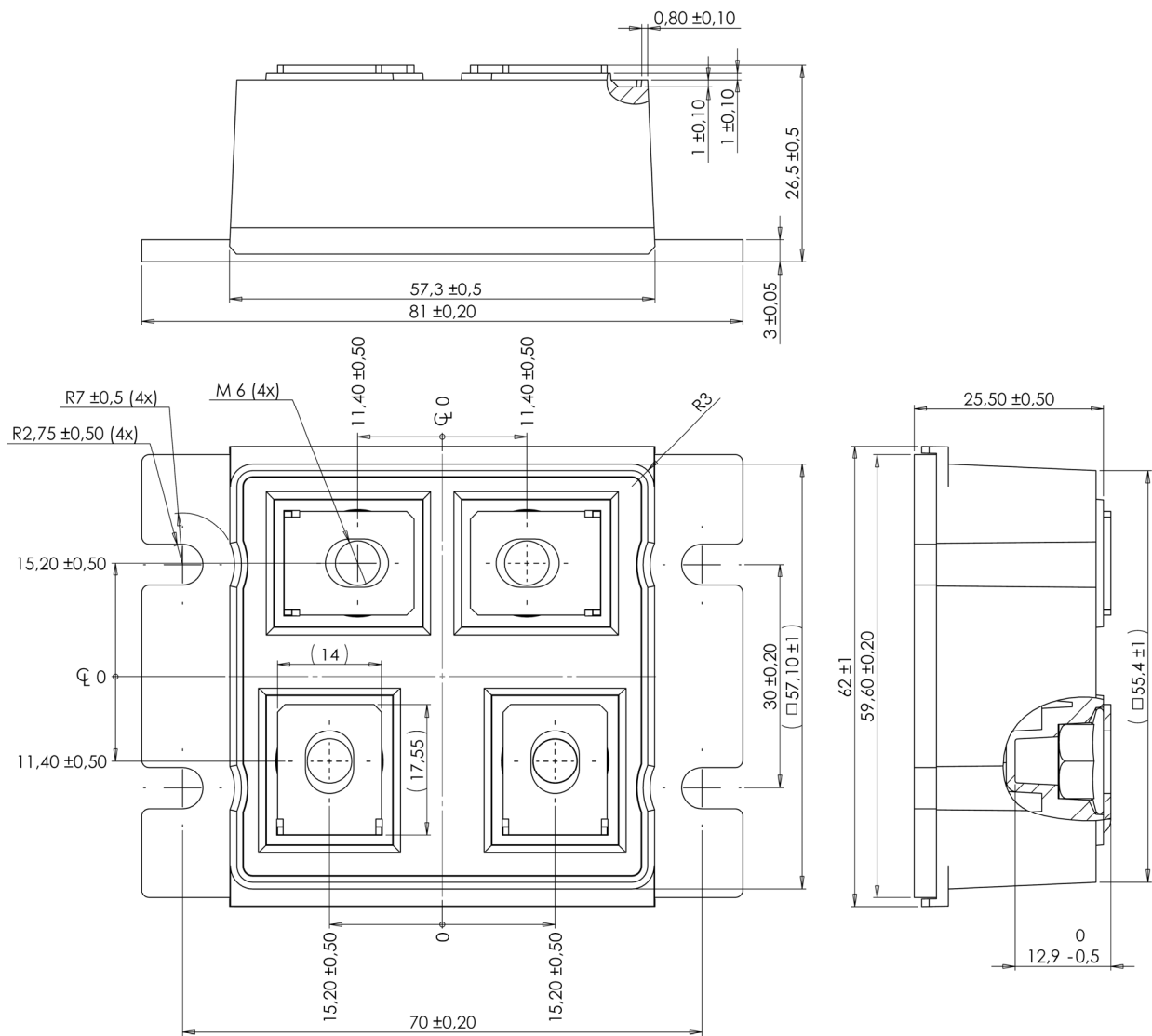
**Dynamic Characteristics**

| Symbol              | Characteristic                   | Test Conditions                                                  |                        | Min | Typ  | Max | Unit |
|---------------------|----------------------------------|------------------------------------------------------------------|------------------------|-----|------|-----|------|
| t <sub>rr1</sub>    | Reverse Recovery Time            | I <sub>F</sub> =1A,V <sub>R</sub> =30V<br>di/dt = 15A/μs         | T <sub>j</sub> = 25°C  |     | 90   |     | ns   |
| t <sub>rr2</sub>    |                                  | I <sub>F</sub> = 500A<br>V <sub>R</sub> = 650V<br>di/dt=1000A/μs | T <sub>j</sub> = 25°C  |     | 110  |     |      |
| t <sub>rr3</sub>    |                                  |                                                                  | T <sub>j</sub> = 100°C |     | 175  |     |      |
| t <sub>fr1</sub>    | Forward Recovery Time            | I <sub>F</sub> = 500A<br>V <sub>R</sub> = 650V<br>di/dt=1000A/μs | T <sub>j</sub> = 25°C  |     | 220  |     | ns   |
| t <sub>fr2</sub>    |                                  |                                                                  | T <sub>j</sub> = 100°C |     | 220  |     |      |
| I <sub>RRM1</sub>   | Reverse Recovery Current         |                                                                  | T <sub>j</sub> = 25°C  |     | 70   |     | A    |
| I <sub>RRM2</sub>   |                                  |                                                                  | T <sub>j</sub> = 100°C |     | 120  |     |      |
| Q <sub>rr1</sub>    | Reverse Recovery Charge          |                                                                  | T <sub>j</sub> = 25°C  |     | 10   |     | μC   |
| Q <sub>rr2</sub>    |                                  |                                                                  | T <sub>j</sub> = 100°C |     | 30   |     |      |
| V <sub>fr1</sub>    | Forward Recovery Voltage         |                                                                  | T <sub>j</sub> = 25°C  |     | 26   |     | V    |
| V <sub>fr2</sub>    |                                  |                                                                  | T <sub>j</sub> = 100°C |     | 26   |     |      |
| d <sub>IM</sub> /dt | Rate of Fall of Recovery Current |                                                                  | T <sub>j</sub> = 25°C  |     | 1200 |     | A/μs |
|                     |                                  |                                                                  | T <sub>j</sub> = 100°C |     | 800  |     |      |

**Thermal and package characteristics**

| Symbol     | Characteristic                                                   |               |    | Min  | Typ | Max  | Unit          |
|------------|------------------------------------------------------------------|---------------|----|------|-----|------|---------------|
| $R_{thJC}$ | Junction to Case Thermal Resistance                              |               |    |      |     | 0.08 | $^{\circ}C/W$ |
| $V_{ISOL}$ | RMS Isolation Voltage, any terminal to case $t = 1$ min, 50/60Hz |               |    | 4000 |     |      | V             |
| $T_J$      | Operating junction temperature range                             |               |    | -40  |     | 150  | $^{\circ}C$   |
| $T_{STG}$  | Storage Temperature Range                                        |               |    | -40  |     | 125  |               |
| $T_C$      | Operating Case Temperature                                       |               |    | -40  |     | 100  |               |
| Torque     | Mounting torque                                                  | To heatsink   | M5 | 2.5  |     | 3.5  | N.m           |
|            |                                                                  | For terminals | M6 | 3    |     | 4    |               |
| Wt         | Package Weight                                                   |               |    |      |     | 250  | g             |

### LP4 Package outline (dimensions in mm)



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