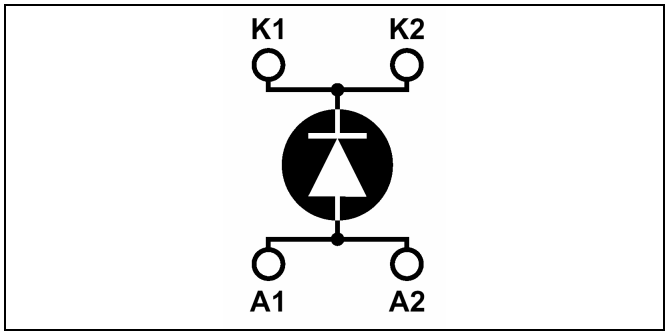
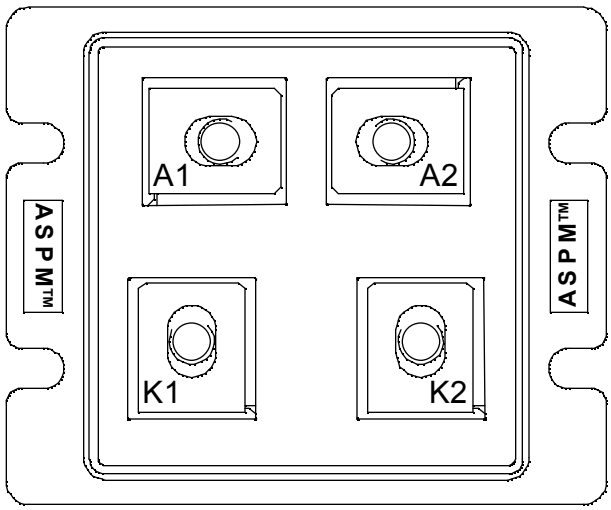
# *Single diode Power Module*

$V_{CES}$ = 400V
$I_C$ = 500A @ Tc = 80°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

| *Symbol* | *Parameter* | | | *Max ratings* | *Unit* |
|---|---|---|---|---|---|
| $V_R$ | Maximum DC reverse Voltage | | | 400 | V |
| $V_{RRM}$ | Maximum Peak Repetitive Reverse Voltage | | | | |
| $I_{F(AV)}$ | Maximum Average Forward Current | Duty cycle = 50% | $T_c$ = 25°C | 500 | A |
| | | | $T_c$ = 80°C | 500 | |
| $I_{F(RMS)}$ | RMS Forward Current | | | 850 | |
| $I_{FSM}$ | Non-Repetitive Forward Surge Current | | $T_j$ = 25°C | 5000 | |

**CAUTION:** These Devices are sensitive to Electrostatic Discharge. Proper Handing Procedures Should Be Followed. See application note APT0502 on www.microsemi.com

**All ratings @ $T_j$ = 25°C unless otherwise specified**

## Electrical Characteristics

| *Symbol* | *Characteristic* | *Test Conditions* | | *Min* | *Typ* | *Max* | *Unit* |
|---|---|---|---|---|---|---|---|
| $V_F$ | Diode Forward Voltage | $I_F$ = 500A | | | | 1.5 | V |
| | | $I_F$ = 1000A | | | 1.5 | | |
| | | $I_F$ = 500A | $T_j$ = 150°C | | | 1.3 | |
| $I_{RM}$ | Maximum Reverse Leakage Current | $V_R$ = 400V | $T_j$ = 25°C | | | 2500 | µA |
| | | | $T_j$ = 150°C | | | 5000 | |
| $C_T$ | Junction Capacitance | $V_R$ = 200V | | | 800 | | pF |

## Dynamic Characteristics

| *Symbol* | *Characteristic* | *Test Conditions* | | *Min* | *Typ* | *Max* | *Unit* |
|---|---|---|---|---|---|---|---|
| $t_{rr1}$ | Reverse Recovery Time | $I_F$=1A,$V_R$=30V di/dt = 15A/µs | $T_j$ = 25°C | | | 50 | ns |
| $t_{rr2}$ | | $I_F$ = 500A $V_R$ = 240V di/dt=1000A/µs | $T_j$ = 25°C | | | 120 | |
| $t_{rr3}$ | | | $T_j$ = 100°C | | | 260 | |
| $t_{fr1}$ | Forward Recovery Time | $I_F$ = 500A $V_R$ = 240V di/dt=1000A/µs | $T_j$ = 25°C | | 210 | | ns |
| $t_{fr2}$ | | | $T_j$ = 100°C | | 220 | | |
| $I_{RRM1}$ | Reverse Recovery Current | | $T_j$ = 25°C | | | 50 | A |
| $I_{RRM2}$ | | | $T_j$ = 100°C | | | 120 | |
| $Q_{rr1}$ | Reverse Recovery Charge | | $T_j$ = 25°C | | | 3 | µC |
| $Q_{rr2}$ | | | $T_j$ = 100°C | | | 15.6 | |
| $V_{fr1}$ | Forward Recovery Voltage | | $T_j$ = 25°C | | 19 | | V |
| $V_{fr2}$ | | | $T_j$ = 100°C | | 19 | | |
| $d_{IM/dt}$ | Rate of Fall of Recovery Current | | $T_j$ = 25°C | | 1200 | | A/µs |
| | | | $T_j$ = 100°C | | 1800 | | |

## Thermal and package characteristics

| *Symbol* | *Characteristic* | | | *Min* | *Typ* | *Max* | *Unit* |
|---|---|---|---|---|---|---|---|
| $R_{thJC}$ | Junction to Case Thermal Resistance | | | | | 0.08 | °C/W |
| $V_{ISOL}$ | RMS Isolation Voltage, any terminal to case t =1 min, I isol<1mA, 50/60Hz | | | 2500 | | | V |
| $T_J$ | Operating junction temperature range | | | -40 | | 150 | °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)