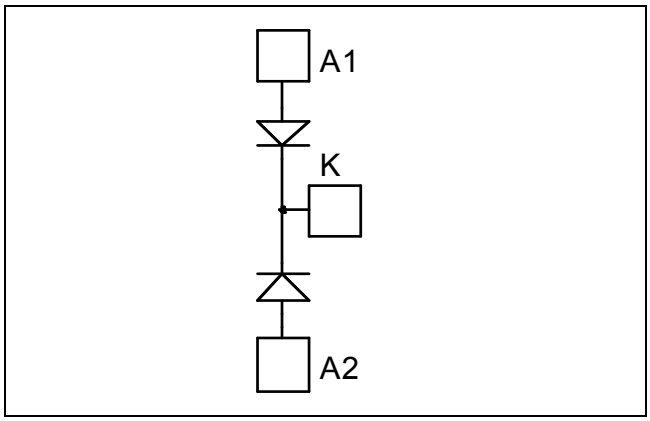
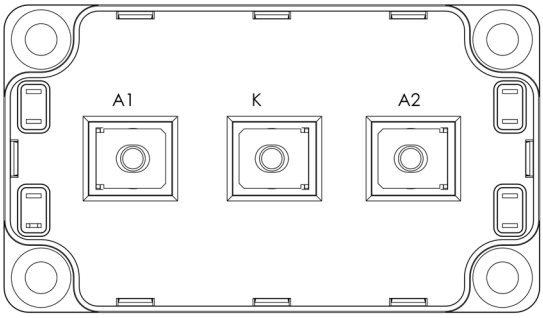
# APTDF400KK20G

## *Dual Common Cathode diodes Power Module*

**$V_{RRM}$ = 200V**
**$I_C$ = 400A @ Tc = 80°C**




### 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
  - Symmetrical design
  - M5 power connectors
- High level of integration

### Benefits

- Outstanding performance at high frequency operation
- 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 | | | 200 | 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 | 400 | |
| $I_{F(RMS)}$ | RMS Forward Current | Duty cycle = 50% | $T_C$ = 45°C | 500 | |
| $I_{FSM}$ | Non-Repetitive Forward Surge Current | 8.3ms | $T_C$ = 45°C | 3000 | |

**CAUTION:** These Devices are sensitive to Electrostatic Discharge. Proper Handling 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 | $I_F$ = 400A | | | 1.0 | 1.1 | V |
| | | $I_F$ = 800A | | | 1.4 | | |
| | | $I_F$ = 400A | $T_j$ = 125°C | | 0.9 | | |
| $I_{RM}$ | Maximum Reverse Leakage Current | $V_R$ = 200V | $T_j$ = 25°C | | | 750 | µA |
| | | | $T_j$ = 125°C | | | 1000 | |
| $C_T$ | Junction Capacitance | $V_R$ = 200V | | | 1600 | | pF |

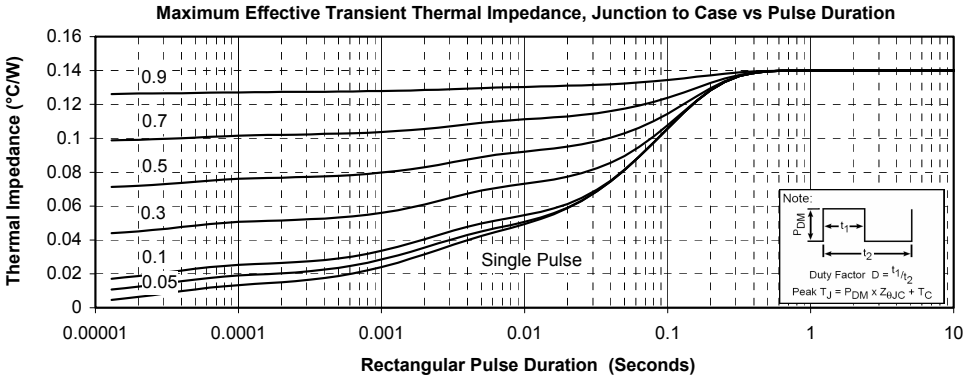
## Dynamic Characteristics

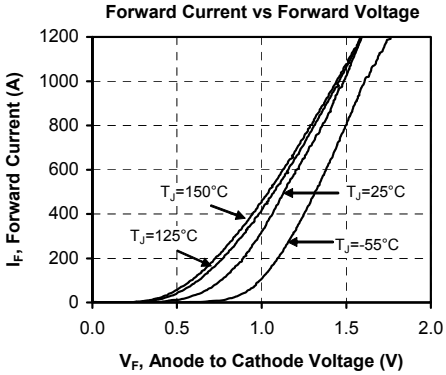
| *Symbol* | *Characteristic* | *Test Conditions* | | *Min* | *Typ* | *Max* | *Unit* |
|---|---|---|---|---|---|---|---|
| $t_{rr}$ | Reverse Recovery Time | $I_F$=1A,$V_R$=30V<br>di/dt = 400A/µs | $T_j$ = 25°C | | 39 | | ns |
| $t_{rr}$ | Reverse Recovery Time | $I_F$ = 400A<br>$V_R$ = 133V<br>di/dt = 800A/µs | $T_j$ = 25°C | | 60 | | ns |
| | | | $T_j$ = 125°C | | 110 | | |
| $Q_{rr}$ | Reverse Recovery Charge | | $T_j$ = 25°C | | 800 | | nC |
| | | | $T_j$ = 125°C | | 3360 | | |
| $I_{RRM}$ | Reverse Recovery Current | | $T_j$ = 25°C | | 24 | | A |
| | | | $T_j$ = 125°C | | 60 | | |
| $t_{rr}$ | Reverse Recovery Time | $I_F$ = 400A<br>$V_R$ = 133V<br>di/dt = 4000A/µs | $T_j$ = 125°C | | 80 | | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | | | 7.64 | | µC |
| $I_{RRM}$ | Reverse Recovery Current | | | | 176 | | A |

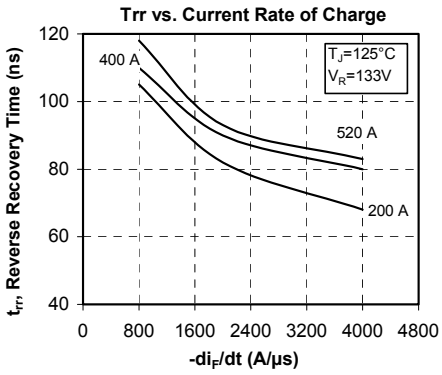
## Thermal and package characteristics

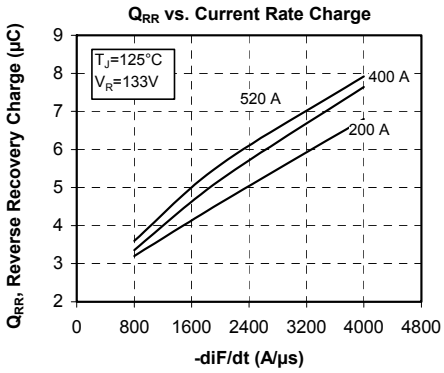
| *Symbol* | *Characteristic* | | | *Min* | *Typ* | *Max* | *Unit* |
|---|---|---|---|---|---|---|---|
| $R_{thJC}$ | Junction to Case Thermal Resistance | | | | | 0.14 | °C/W |
| $V_{ISOL}$ | RMS Isolation Voltage, any terminal to case t =1 min, 50/60Hz | | | 4000 | | | V |
| $T_J$ | Operating junction temperature range | | | -40 | | 150 | °C |
| $T_{STG}$ | Storage Temperature Range | | | -40 | | 125 | |
| $T_C$ | Operating Case Temperature | | | -40 | | 100 | |
| Torque | Mounting torque | To heatsink | M6 | 3 | | 5 | N.m |
| | | For terminals | M5 | 2 | | 3.5 | |
| Wt | Package Weight | | | | | 300 | g |

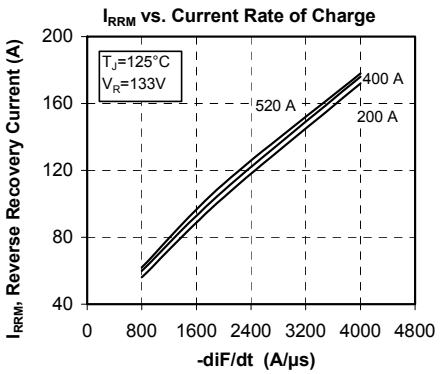
## Typical Performance Curve

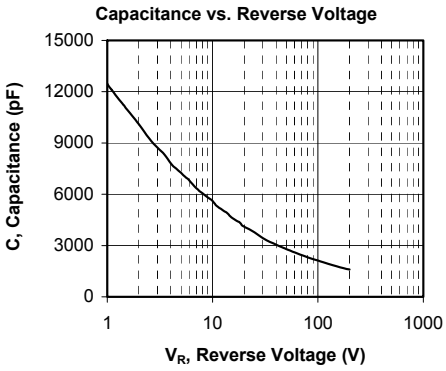


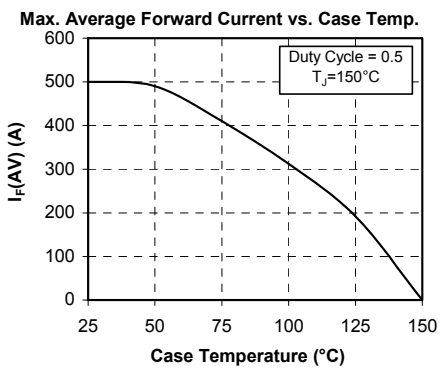



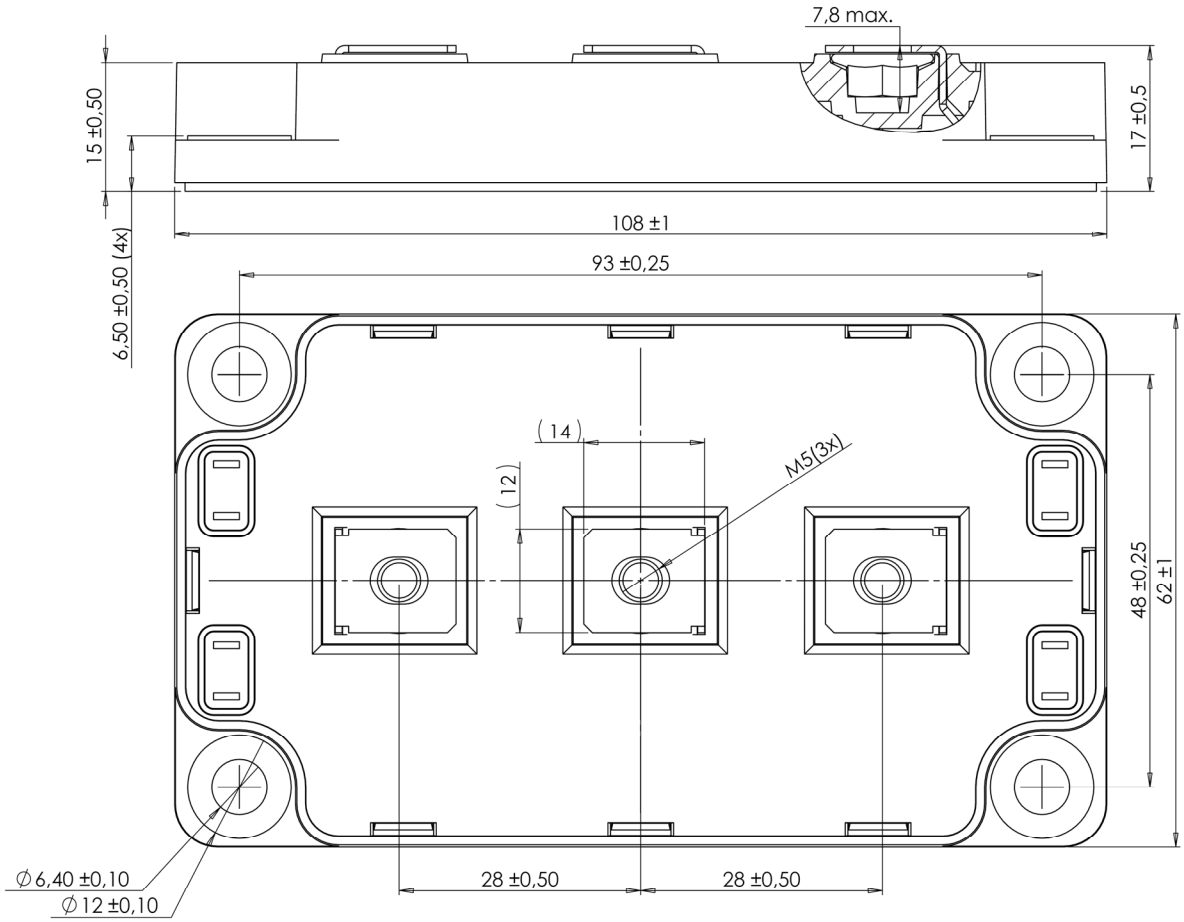



**SP6 Package outline** (dimensions in mm)



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