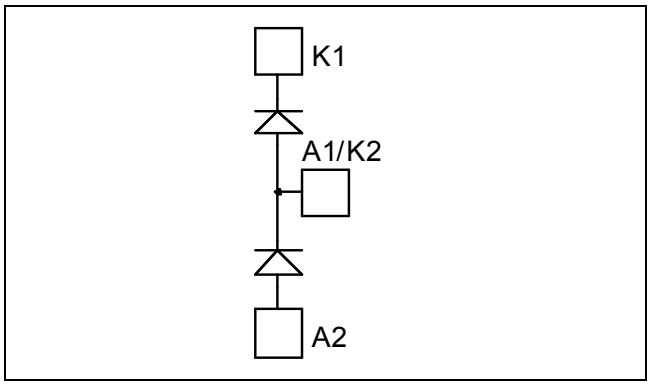
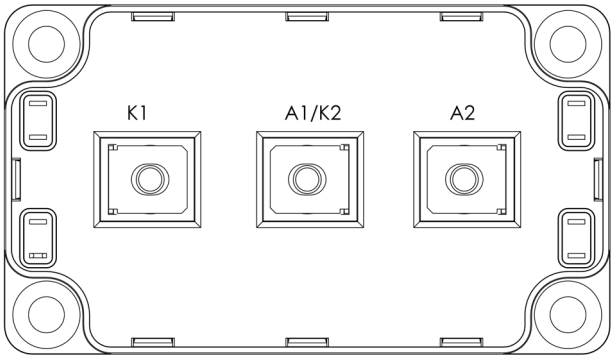
APTDF400AK20G

Diode Phase leg Power Module

V_{RRM} = 200V
I_F = 400A @ Tc = 80°C





Application

- Anti-Parallel diode
- 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

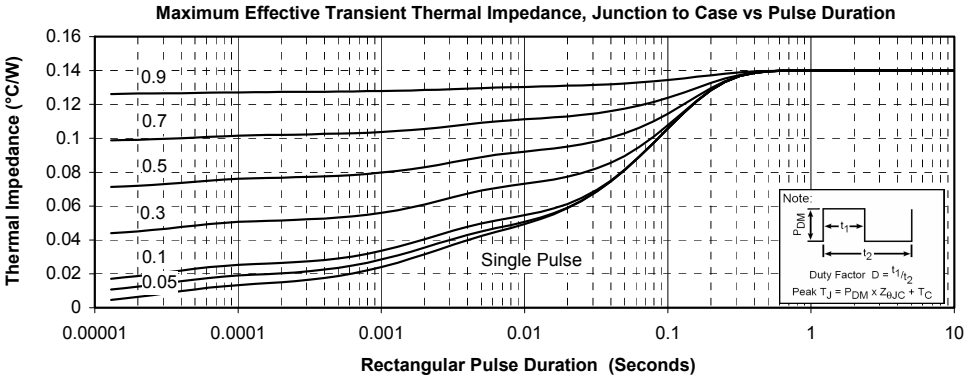
Dynamic Characteristics

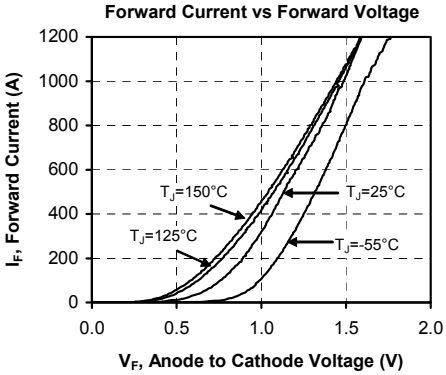
Symbol	*Characteristic*	*Test Conditions*		*Min*	*Typ*	*Max*	*Unit*
t_{rr}	Reverse Recovery Time	I_F=1A,V_R=30V di/dt = 400A/µs	T_j = 25°C		39		ns
t_{rr}	Reverse Recovery Time	I_F = 400A V_R = 133V di/dt = 800A/µs	T_j = 25°C		60		ns
			T_j = 125°C		110		
Q_{rr}	Reverse Recovery Charge		T_j = 25°C		800		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 V_R = 133V 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

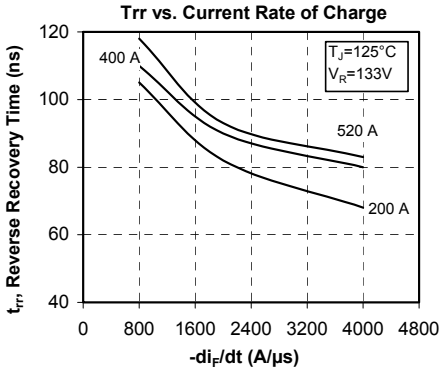
Thermal and package characteristics

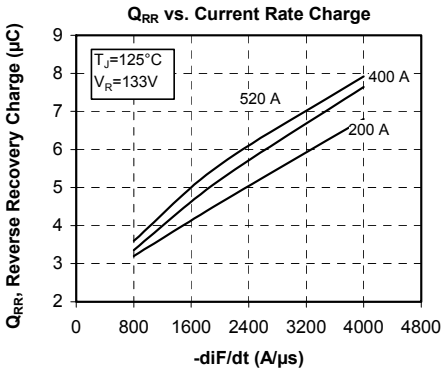
Symbol	*Characteristic*			*Min*	*Typ*	*Max*	*Unit*
R_{thJC}	Junction to Case Thermal Resistance					0.14	°C/W
V_{ISOL}	RMS Isolation Voltage, any terminal to case t =1 min, 50/60Hz			4000			V
T_J	Operating junction temperature range			-40		150	°C
T_{STG}	Storage Temperature Range			-40		125	
T_C	Operating 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

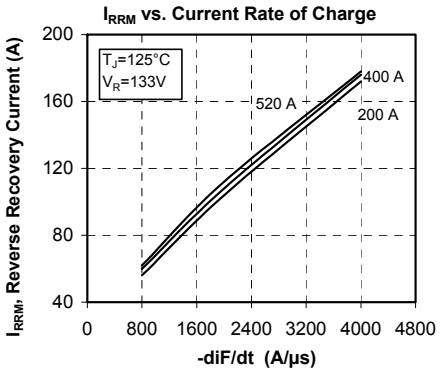
Typical Performance Curve

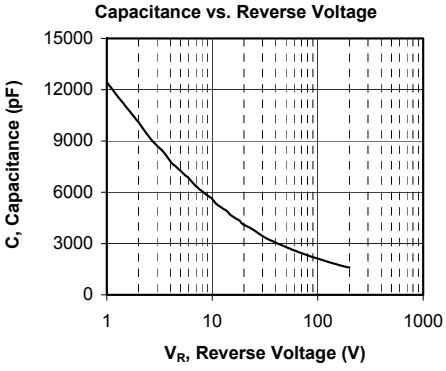


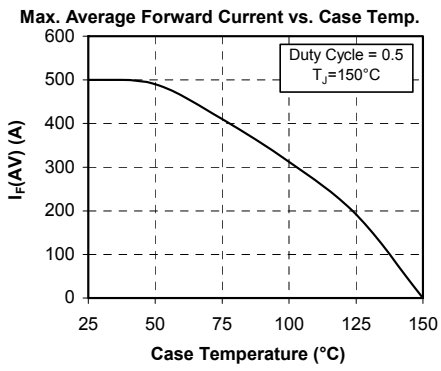




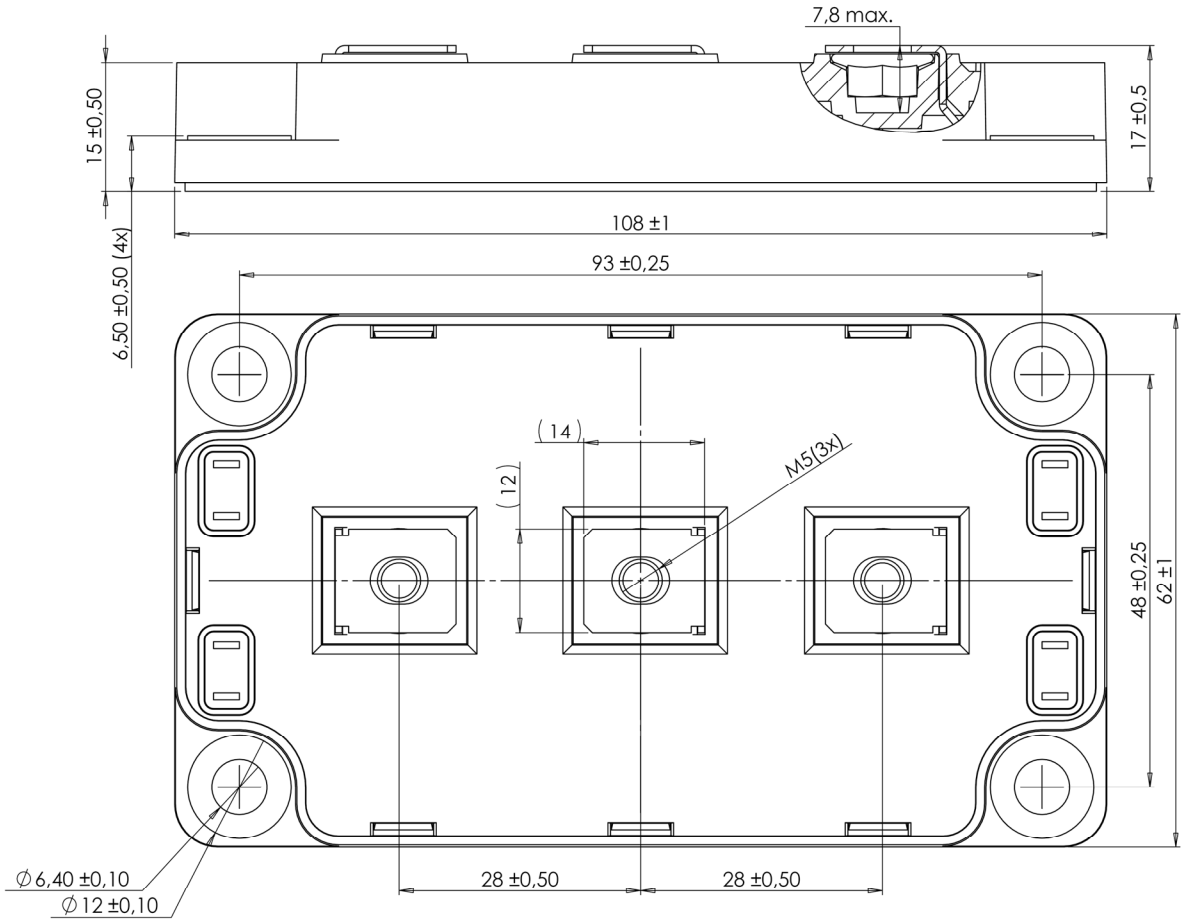








SP6 Package outline (dimensions in mm)



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