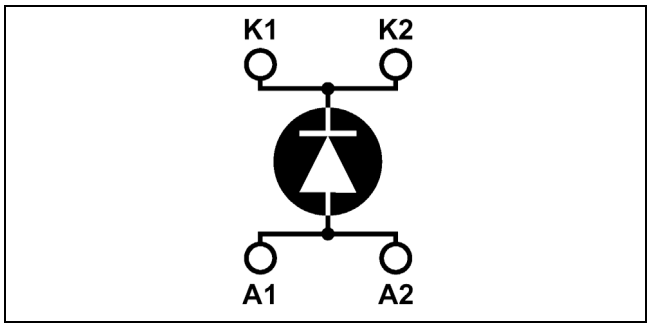
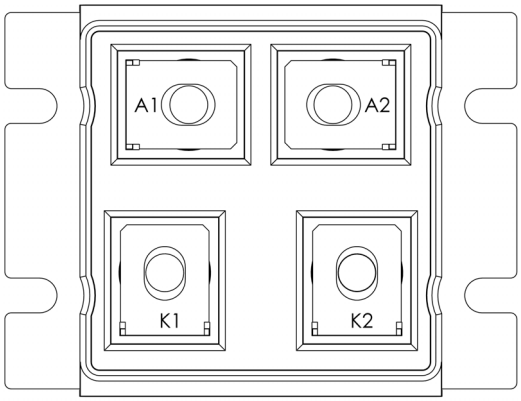
APTDF450U60G

Single diode Power Module

V_{CES} = 600V
I_C = 450A @ 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			600	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	450	
$I_{F(RMS)}$	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 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 = 500A			1.4	1.8	V
		I_F = 1000A			1.7		
		I_F = 500A	T_j = 150°C			1.5	
I_{RM}	Maximum Reverse Leakage Current	V_R = 600V	T_j = 25°C			2500	µA
			T_j = 150°C			5000	
C_T	Junction Capacitance	V_R = 200V			825		pF

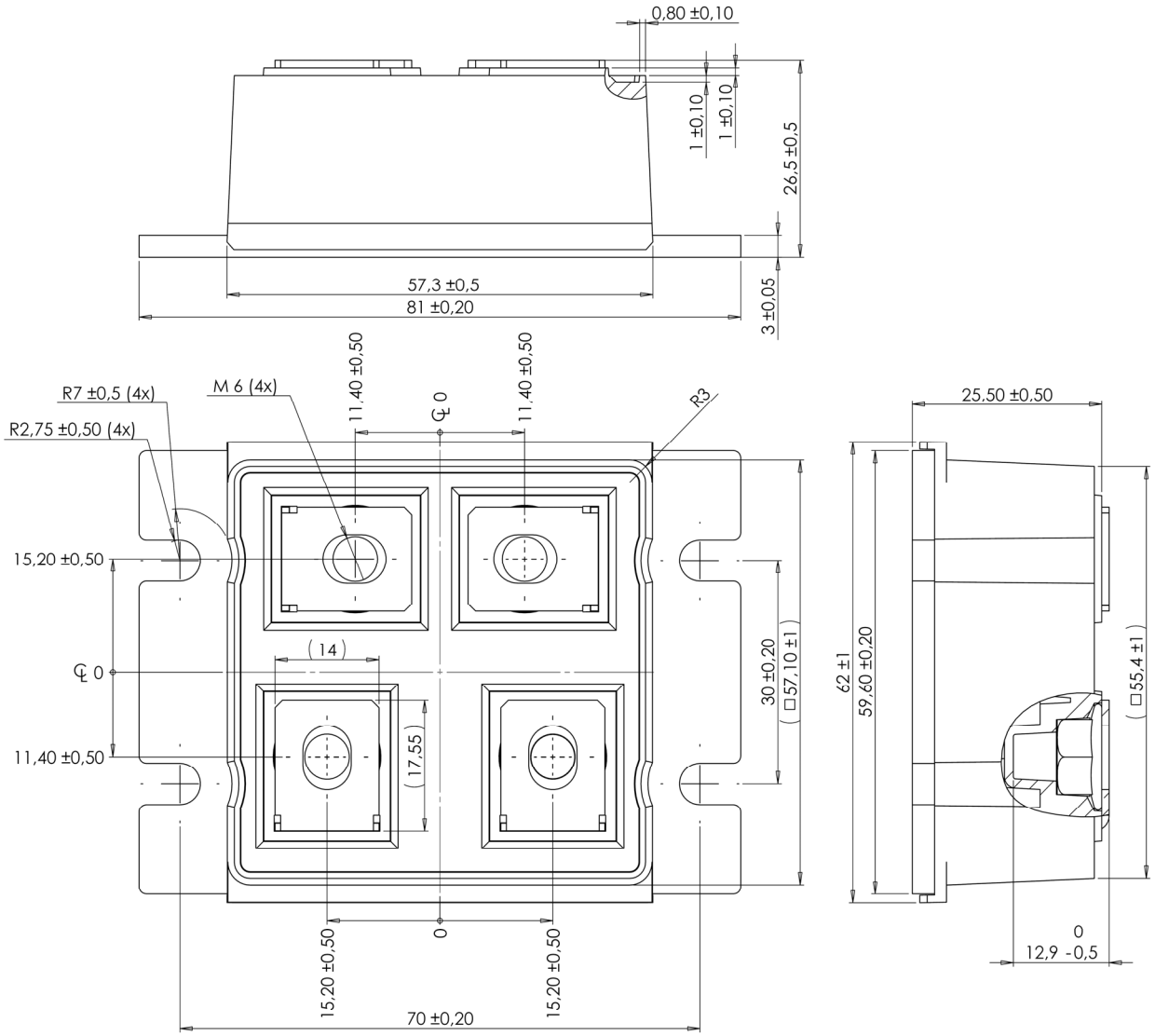
Dynamic Characteristics

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		60	75	ns
t_{rr2}		I_F = 500A V_R = 350V di/dt=1000A/µs	T_j = 25°C		90	115	
t_{rr3}			T_j = 100°C		135	255	
t_{fr1}	Forward Recovery Time	I_F = 500A V_R = 350V di/dt=1000A/µs	T_j = 25°C		135		ns
t_{fr2}			T_j = 100°C		135		
I_{RRM1}	Reverse Recovery Current		T_j = 25°C		35	50	A
I_{RRM2}			T_j = 100°C		55	70	
Q_{rr1}	Reverse Recovery Charge		T_j = 25°C		1575	2875	nC
Q_{rr2}			T_j = 100°C		3715	8925	
V_{fr1}	Forward Recovery Voltage		T_j = 25°C		23		V
V_{fr2}			T_j = 100°C		23		
$d_{IM/dt}$	Rate of Fall of Recovery Current		T_j = 25°C		600		A/µs
			T_j = 100°C		400		

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, 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	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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