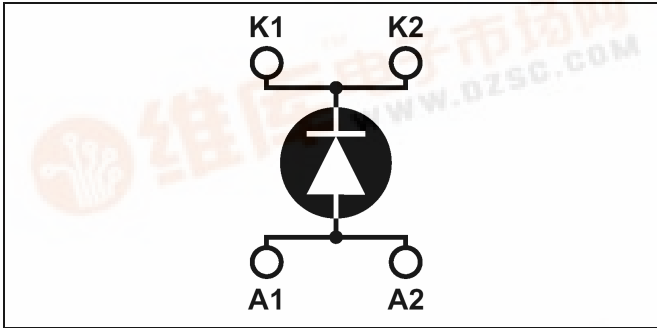


APTDF500U40

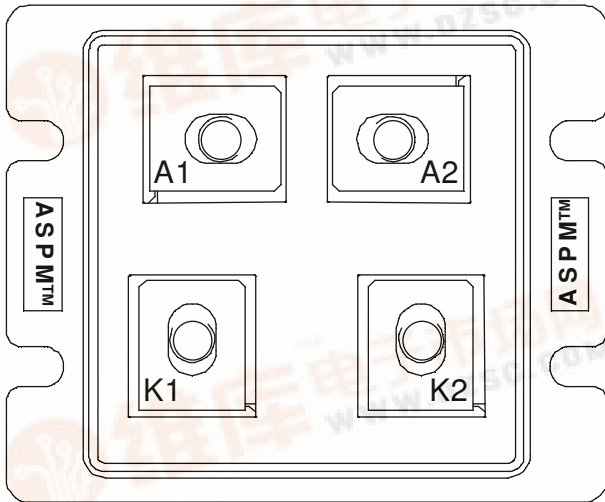
Single diode Power Module

$V_{CES} = 400V$
 $I_C = 500A @ T_c = 80^\circ C$



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

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%	A
		$T_c = 25^\circ C$	
		$T_c = 80^\circ C$	500
$I_{F(RMS)}$	RMS Forward Current	850	
I_{FSM}	Non-Repetitive Forward Surge Current	$T_j = 25^\circ C$	5000

Electrical Characteristics

All ratings @ $T_j = 25^\circ\text{C}$ unless otherwise specified

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

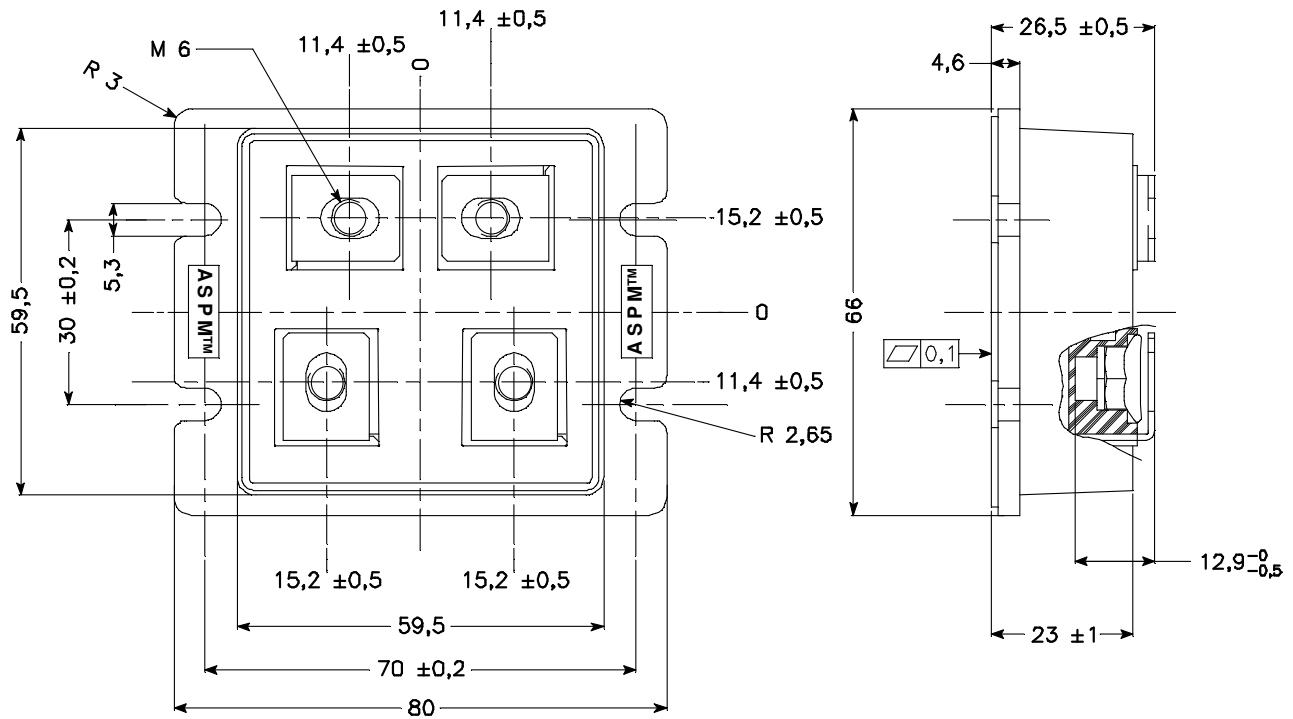
Dynamic Characteristics

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

Thermal and package characteristics

Symbol	Characteristic	Min	Typ	Max	Unit	
R_{thJC}	Junction to Case			0.08	$^\circ\text{C}/\text{W}$	
V_{ISOL}	RMS Isolation Voltage, any terminal to case $t = 1\text{ min}, I_{isol} < 1\text{mA}, 50/60\text{Hz}$	2500			V	
T_j	Operating junction temperature range	-40		150	$^\circ\text{C}$	
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	

Package outline



APT reserves the right to change, without notice, the specifications and information contained herein

APT's products are covered by one or more of U.S. patents 4,895,810 5,045,903 5,089,434 5,182,234 5,019,522 5,262,336 6,503,786 5,256,583 4,748,103 5,283,202 5,231,474 5,434,095 5,528,058 and foreign patents. U.S and Foreign patents pending. All Rights Reserved.