

ULTRAFAST SOFT RECOVERY RECTIFIER DIODE

PRODUCT APPLICATIONS

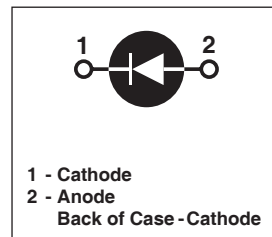
- Anti-Parallel Diode
 - Switchmode Power Supply
 - Inverters
- Free Wheeling Diode
 - Motor Controllers
 - Converters
 - Inverters
- Snubber Diode
- PFC

PRODUCT FEATURES

- Ultrafast Recovery Times
- Soft Recovery Characteristics
- Popular TO-247 Package or Surface Mount D³PAK Package
- Low Forward Voltage
- Low Leakage Current

PRODUCT BENEFITS

- Low Losses
- Low Noise Switching
- Cooler Operation
- Higher Reliability Systems
- Increased System Power Density



MAXIMUM RATINGS

All Ratings: $T_C = 25^\circ\text{C}$ unless otherwise specified.

Symbol	Characteristic / Test Conditions	APT60D30B(G)_S(G)	UNIT
V_R	Maximum D.C. Reverse Voltage	300	Volts
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		
V_{RWM}	Maximum Working Peak Reverse Voltage		
$I_{F(AV)}$	Maximum Average Forward Current ($T_C = 143^\circ\text{C}$, Duty Cycle = 0.5)	60	Amps
$I_{F(AV)}$	RMS Forward Current (Square wave, 50% duty)	142	
I_{FSM}	Non-Repetitive Forward Surge Current ($T_J = 45^\circ\text{C}$, 8.3ms)	600	
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to 175	$^\circ\text{C}$
T_L	Lead Temperature for 10 Sec.	300	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions		MIN	TYP	MAX	UNIT
V_F	Forward Voltage	$I_F = 60\text{A}$		1.2	1.4	Volts
		$I_F = 120\text{A}$		1.5		
		$I_F = 60\text{A}, T_J = 125^\circ\text{C}$		1.0		
I_{RM}	Maximum Reverse Leakage Current	$V_R = V_R \text{ Rated}$			250	μA
		$V_R = V_R \text{ Rated}, T_J = 125^\circ\text{C}$			500	
C_T	Junction Capacitance, $V_R = 200\text{V}$			150		pF

DYNAMIC CHARACTERISTICS

APT60D30B(G)_S(G)

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
t_{rr}	Reverse Recovery Time	$I_F = 1A$, $di_F/dt = -100A/\mu s$, $V_R = 30V$, $T_J = 25^\circ C$	-	29		ns
t_{rr}	Reverse Recovery Time	$I_F = 60A$, $di_F/dt = -200A/\mu s$ $V_R = 200V$, $T_C = 25^\circ C$	-	38		
Q_{rr}	Reverse Recovery Charge		-	75		nC
I_{RRM}	Maximum Reverse Recovery Current		-	4	-	Amps
t_{rr}	Reverse Recovery Time	$I_F = 60A$, $di_F/dt = -200A/\mu s$ $V_R = 200V$, $T_C = 125^\circ C$	-	80		ns
Q_{rr}	Reverse Recovery Charge		-	370		nC
I_{RRM}	Maximum Reverse Recovery Current		-	8	-	Amps
t_{rr}	Reverse Recovery Time	$I_F = 60A$, $di_F/dt = -800A/\mu s$ $V_R = 200V$, $T_C = 125^\circ C$	-	55		ns
Q_{rr}	Reverse Recovery Charge		-	740		nC
I_{RRM}	Maximum Reverse Recovery Current		-	23		Amps

THERMAL AND MECHANICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance			.34	$^\circ C/W$
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance			40	
W_T	Package Weight		0.22		oz
			5.9		g
Torque	Maximum Mounting Torque			10	lb•in
				1.1	N•m

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

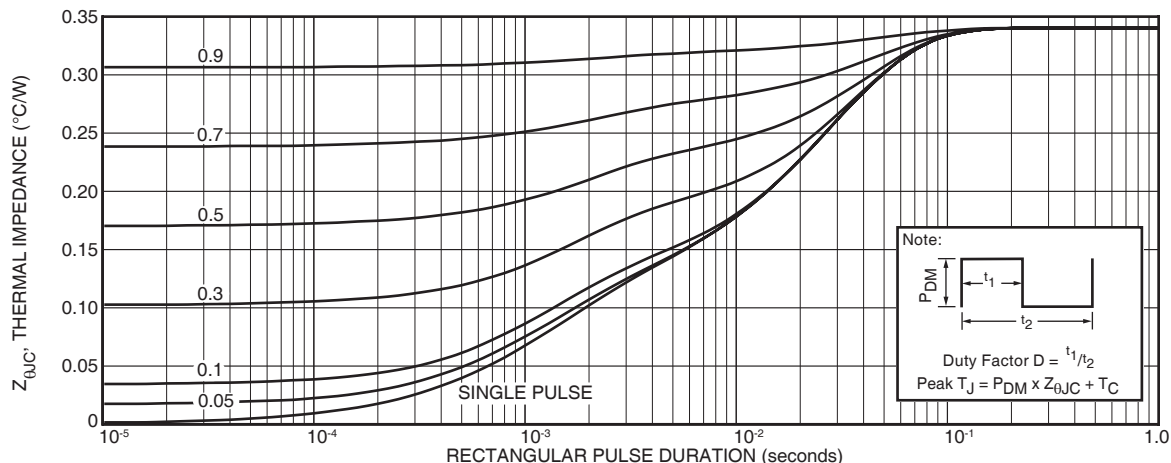


FIGURE 1a. MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs. PULSE DURATION

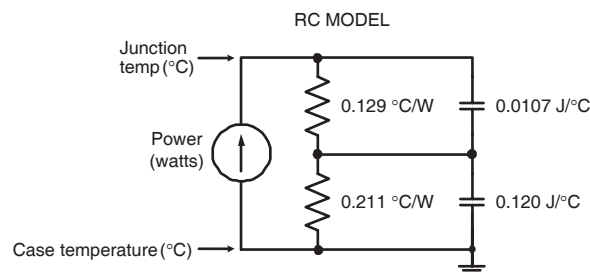


FIGURE 1b, TRANSIENT THERMAL IMPEDANCE MODEL

TYPICAL PERFORMANCE CURVES

APT60D30B(G)_S(G)

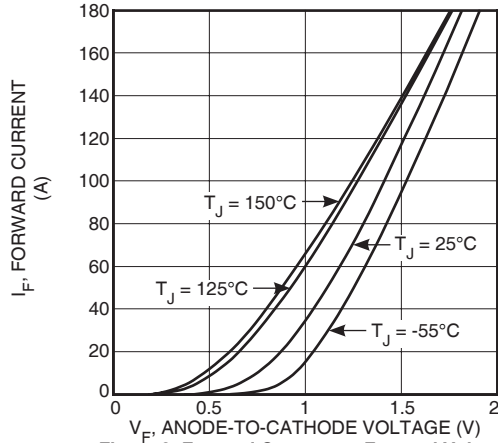


Figure 2. Forward Current vs. Forward Voltage

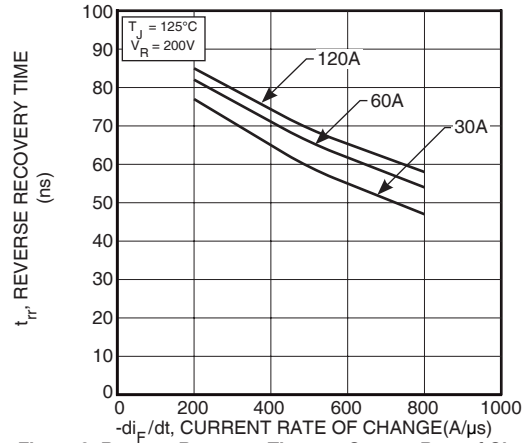


Figure 3. Reverse Recovery Time vs. Current Rate of Change

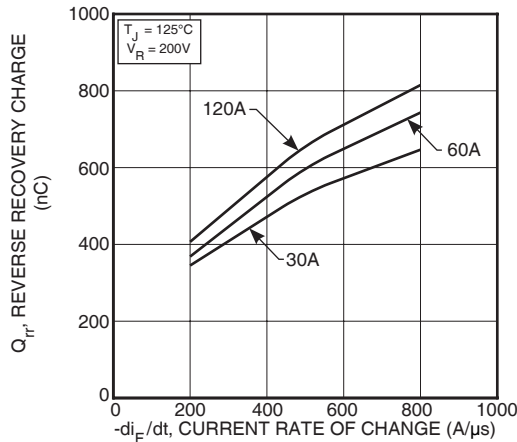


Figure 4. Reverse Recovery Charge vs. Current Rate of Change

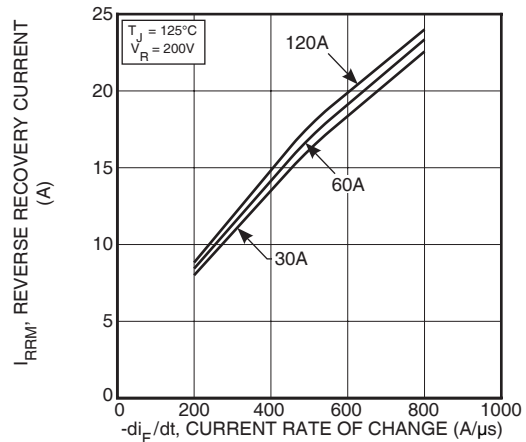


Figure 5. Reverse Recovery Current vs. Current Rate of Change

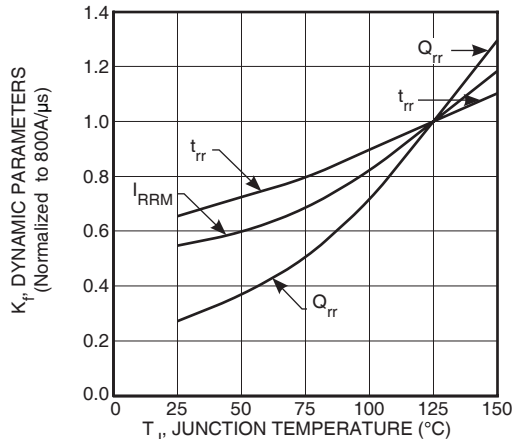


Figure 6. Dynamic Parameters vs. Junction Temperature

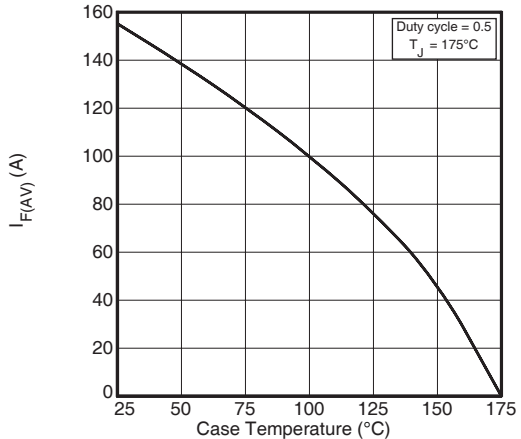


Figure 7. Maximum Average Forward Current vs. Case Temperature

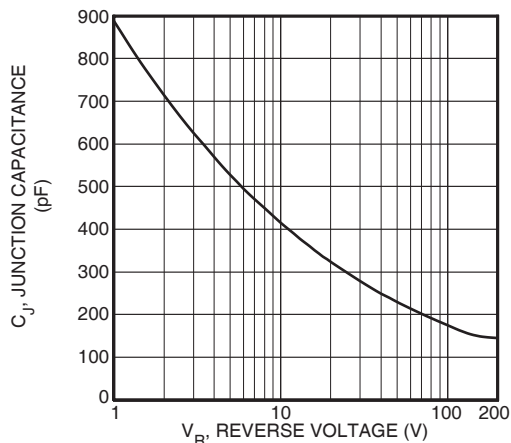


Figure 8. Junction Capacitance vs. Reverse Voltage



-

Figure 10, Diode Reverse Recovery Waveform and Definitions

① SAC: Tin, Silver, Copper



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

③ 100% Sn



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. US and Foreign patents pending. All Rights Reserved.