

*G Denotes RoHS Compliant, Pb Free Terminal Finish.

ULTRAFAST SOFT RECOVERY RECTIFIER DIODE

PRODUCT APPLICATIONS

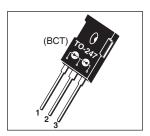
- Anti-Parallel Diode -Switchmode Power Supply -Inverters
- Free Wheeling Diode
 - -Motor Controllers
 - -Converters
 - -Inverters
- Snubber Diode
- PFC

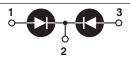
PRODUCT FEATURES

- Ultrafast Recovery Times
- Soft Recovery Characteristics
- Popular TO-247 Package
- · Low Forward Voltage
- · Low Leakage Current
- Avalanche Energy Rated

PRODUCT BENEFITS

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





- 1 Anode 1
- 2 Common Cathode Back of Case - Cathode
- 3 Anode 2

MAXIMUM RATINGS

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

Symbol	Characteristic / Test Conditions	APT60DQ60BCT(G)	UNIT
V _R	Maximum D.C. Reverse Voltage		
V _{RRM}	Maximum Peak Repetitive Reverse Voltage	600	Volts
V _{RWM}	Maximum Working Peak Reverse Voltage		
I _{F(AV)}	Maximum Average Forward Current (T _C = 110°C, Duty Cycle = 0.5)	60	
I _{F(RMS)}	RMS Forward Current (Square wave, 50% duty)	94	Amps
I _{FSM}	Non-Repetitive Forward Surge Current (T _J = 45°C, 8.3ms)	600	
E _{AVL}	Avalanche Energy (1A, 40mH)	20	mJ
T _J ,T _{STG}	Operating and StorageTemperature Range	-55 to 175	°C
T _L	Lead Temperature for 10 Sec.	300	°C

STATIC ELECTRICAL CHARACTERISTICS

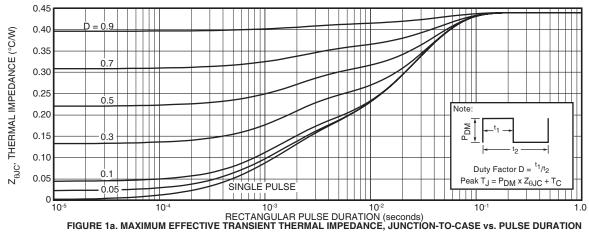
STATIC ELECTRICAL CHARACTERISTICS							
Symbol	Characteristic / Test Conditions		MIN	TYP	MAX	UNIT	
V _F	Forward Voltage	I _F = 60A		2.0	2.4	Volts	
		I _F = 120A		2.44			
		I _F = 60A, T _J = 125°C		1.7			
I _{RM}	Maximum Reverse Leakage Current	V _R = 600V			25	- μΑ	
		V _R = 600V, T _J = 125°C			500		
C _T	Junction Capacitance, V _R = 200V			75		pF	

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
t _{rr}	Reverse Recovery Time $I_F = 1A$, $di_F/dt =$	$-100A/\mu s$, $V_R = 30V$, $T_J = 25^{\circ}C$	-	26		20
t _{rr}	Reverse Recovery Time	$I_F = 60A$, $di_F/dt = -200A/\mu s$ $V_R = 400V$, $T_C = 25^{\circ}C$	-	35		ns
Q _{rr}	Reverse Recovery Charge		-	45		nC
I _{RRM}	Maximum Reverse Recovery Current		-	4	-	Amps
t _{rr}	Reverse Recovery Time	$I_F = 60A$, $di_F/dt = -200A/\mu s$ $V_R = 400V$, $T_C = 125°C$	-	175		ns
Q _{rr}	Reverse Recovery Charge		-	680		nC
I _{RRM}	Maximum Reverse Recovery Current		-	8	-	Amps
t _{rr}	Reverse Recovery Time	$I_F = 60A$, $di_F/dt = -1000A/\mu s$ $V_R = 400V$, $T_C = 125^{\circ}C$	-	100		ns
Q _{rr}	Reverse Recovery Charge		-	1380		nC
I _{RRM}	Maximum Reverse Recovery Current		-	26		Amps

THERMAL AND MECHANICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance			.44	°C/W
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.



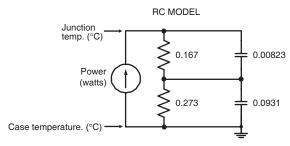
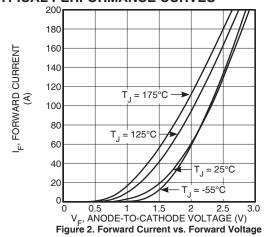


FIGURE 1b, TRANSIENT THERMAL IMPEDANCE MODEL

TYPICAL PERFORMANCE CURVES



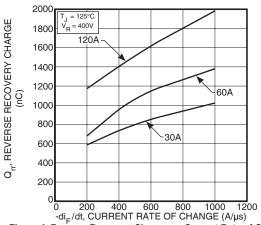
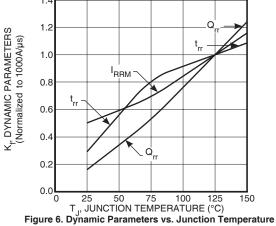
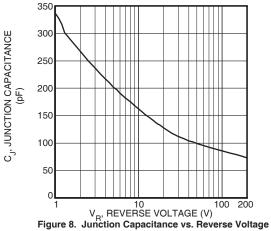


Figure 4. Reverse Recovery Charge vs. Current Rate of Change





APT60DQ60BCT(G)

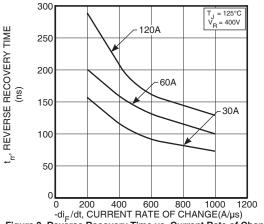


Figure 3. Reverse Recovery Time vs. Current Rate of Change

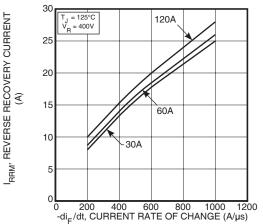


Figure 5. Reverse Recovery Current vs. Current Rate of Change

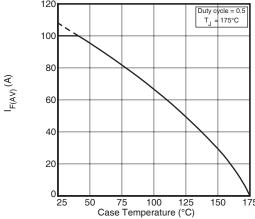


Figure 7. Maximum Average Forward Current vs. CaseTemperature

6

0.25 I_{RRM}

Slope = di_M/dt

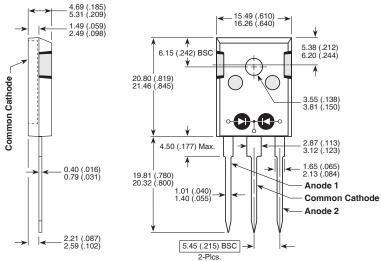
Figure 9. Diode Test Circuit

- 1 I_F Forward Conduction Current
- 2 di_F/dt Rate of Diode Current Change Through Zero Crossing.
- 3 I_{RRM} Maximum Reverse Recovery Current.
- 4 t_{rr} Reverse Recovery Time, measured from zero crossing where diode current goes from positive to negative, to the point at which the straight line through I_{RRM} and 0.25•I_{RRM} passes through zero.
- $\mathbf{5}$ \mathbf{Q}_{rr} Area Under the Curve Defined by \mathbf{I}_{RRM} and \mathbf{t}_{rr} .
- 6 di_M/dt Maximum Rate of Current Increase During the Trailing Portion of t_{rr.}

Figure 10, Diode Reverse Recovery Waveform and Definitions

TO-247 Package Outline

e1 SAC: Tin, Silver, Copper



Dimensions in Millimeters and (Inches)