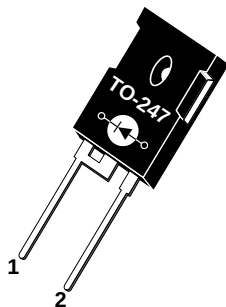


1 - Cathode
2 - Anode
Back of Case - Cathode



**ADVANCED
POWER
TECHNOLOGY®**
APT60D40B 400V 60A

ULTRAFAST SOFT RECOVERY RECTIFIER DIODE

PRODUCT APPLICATIONS

- Anti-Parallel Diode
 - Switchmode Power Supply
 - Inverters
- Free Wheeling Diode
 - Motor Controllers
 - Converters
- Snubber Diode
- Uninterruptible Power Supply (UPS)
- Induction Heating
- High Speed Rectifiers

PRODUCT FEATURES

- Ultrafast Recovery Times
- Soft Recovery Characteristics
- Popular TO-247 Package
- Low Forward Voltage
- High Blocking 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	APT60D40B	UNIT
V_R	Maximum D.C. Reverse Voltage	400	Volts
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		
V_{RWM}	Maximum Working Peak Reverse Voltage		
$I_F(AV)$	Maximum Average Forward Current ($T_C = 70^\circ\text{C}$, Duty Cycle = 0.5)	60	Amps
$I_F(RMS)$	RMS Forward Current	100	
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 150	$^\circ\text{C}$
T_L	Lead Temperature: 0.063" from Case for 10 Sec.	300	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
V_F	Maximum Forward Voltage	$I_F = 60\text{A}$		1.2	Volts
		$I_F = 120\text{A}$		1.5	
		$I_F = 60\text{A}, T_J = 150^\circ\text{C}$		1.05	
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, $V_R = 200\text{V}$		110		pF
L_S	Series Inductance (Lead to Lead 5mm from Base)		10		nH

USA

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EUROPE

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DYNAMIC CHARACTERISTICS

APT60D40B

Symbol	Characteristic	MIN	TYP	MAX	UNIT
t_{rr1}	Reverse Recovery Time, $I_F = 1.0A$, $di_F/dt = -15A/\mu s$, $V_R = 30V$, $T_J = 25^\circ C$		55	70	ns
t_{rr2}	Reverse Recovery Time		40		
t_{rr3}	$I_F = 60A$, $di_F/dt = -480A/\mu s$, $V_R = 240V$		65		
t_{fr1}	Forward Recovery Time		175		
t_{fr2}	$I_F = 60A$, $di_F/dt = 480A/\mu s$, $V_R = 240V$		175		
I_{RRM1}	Reverse Recovery Current		10	17	Amps
I_{RRM2}	$I_F = 60A$, $di_F/dt = -480A/\mu s$, $V_R = 240V$		20	30	
Q_{rr1}	Recovery Charge		275		nC
Q_{rr2}	$I_F = 60A$, $di_F/dt = -480A/\mu s$, $V_R = 240V$		800		
V_{fr1}	Forward Recovery Voltage		6.5		Volts
V_{fr2}	$I_F = 60A$, $di_F/dt = 480A/\mu s$, $V_R = 240V$		6.5		
diM/dt	Rate of Fall of Recovery Current		1250		A/ μs
	$I_F = 60A$, $di_F/dt = -480A/\mu s$, $V_R = 240V$ (See Figure 10)		2700		

THERMAL AND MECHANICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance			0.66	$^\circ C/W$
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance			40	
W_T	Package Weight		0.22		oz
			6.1		gm
Torque	Maximum Mounting Torque (Screw Type = 6-32 or 3mm Machine)			10	lb•in
				1.1	N•m

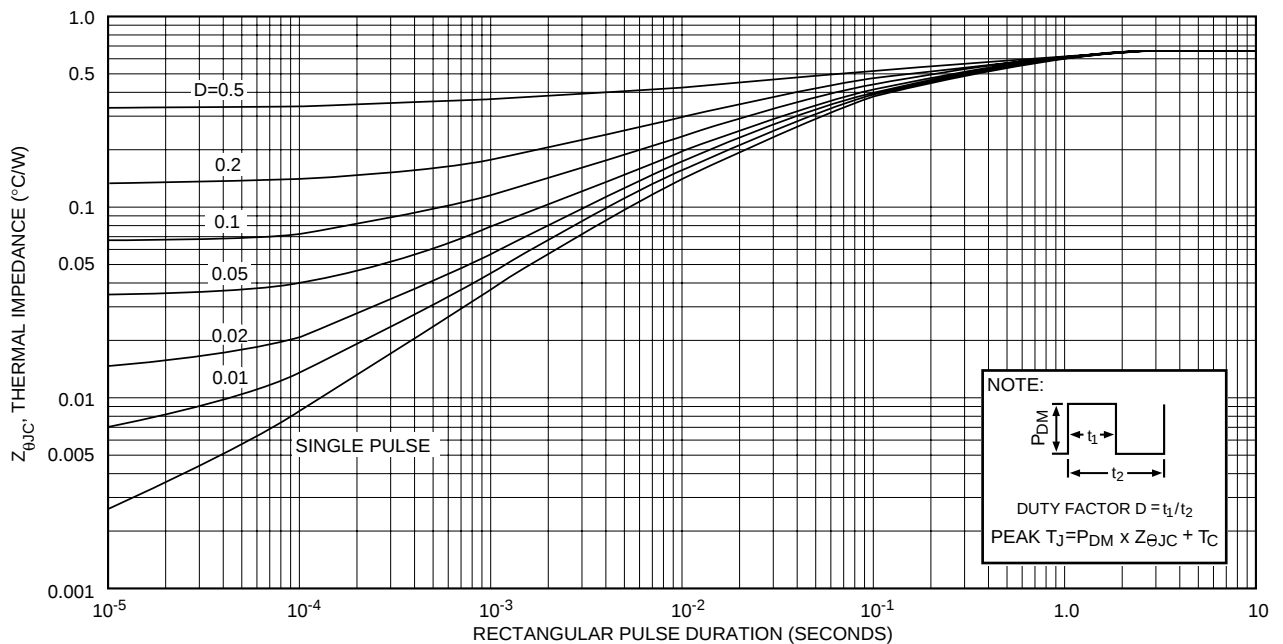


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

APT60D40B

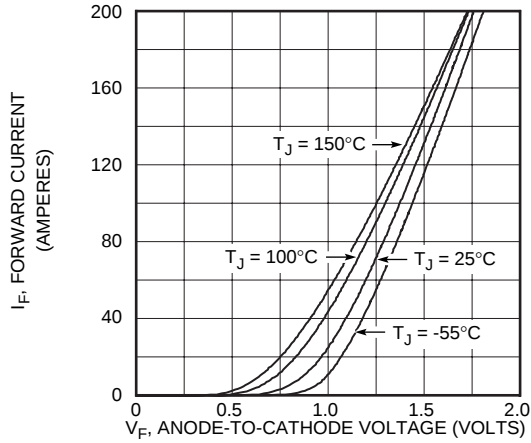


Figure 2, Forward Voltage Drop vs Forward Current

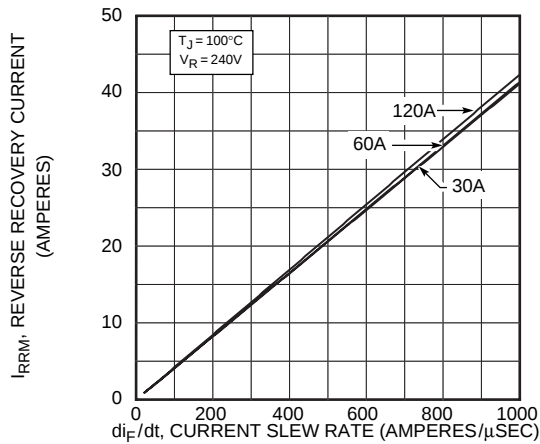


Figure 4, Reverse Recovery Current vs Current Slew Rate

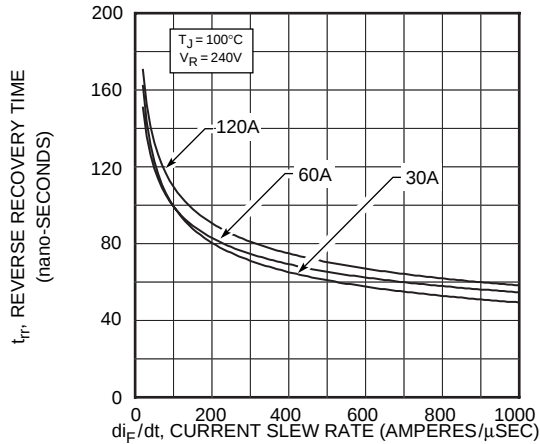


Figure 6, Reverse Recovery Time vs Current Slew Rate

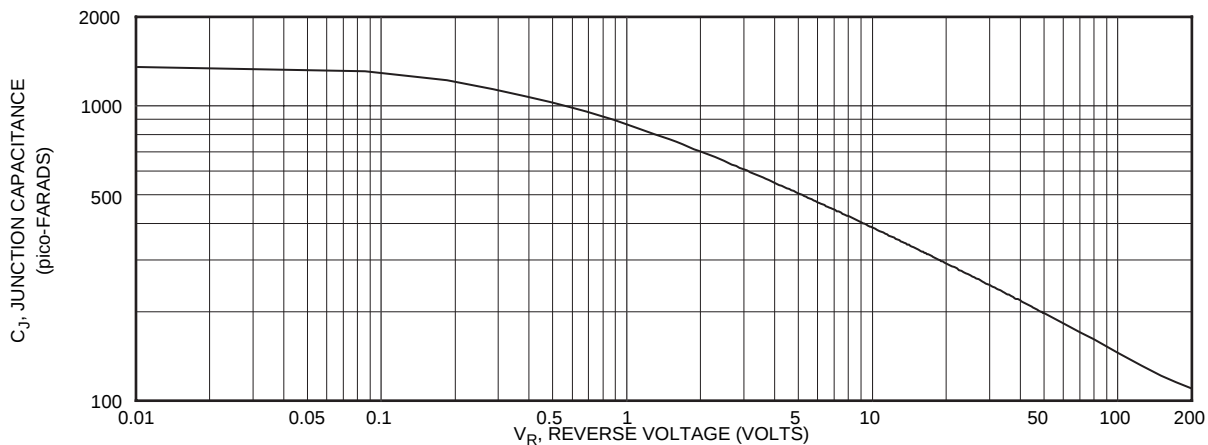


Figure 8, Junction Capacitance vs Reverse Voltage

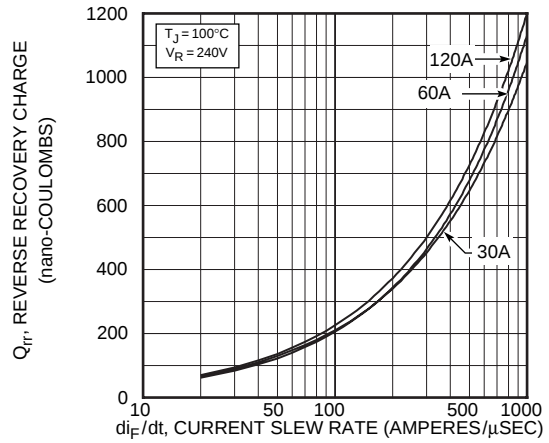


Figure 3, Reverse Recovery Charge vs Current Slew Rate

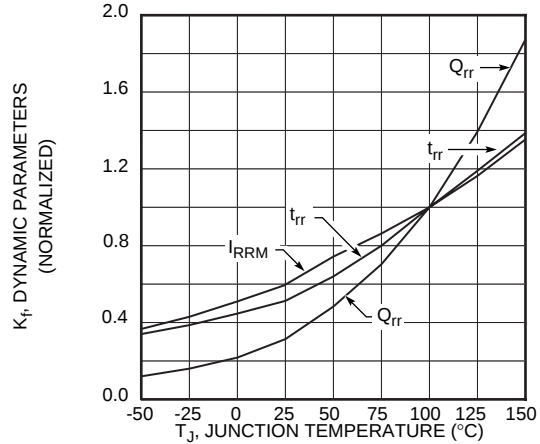


Figure 5, Dynamic Parameters vs Junction Temperature

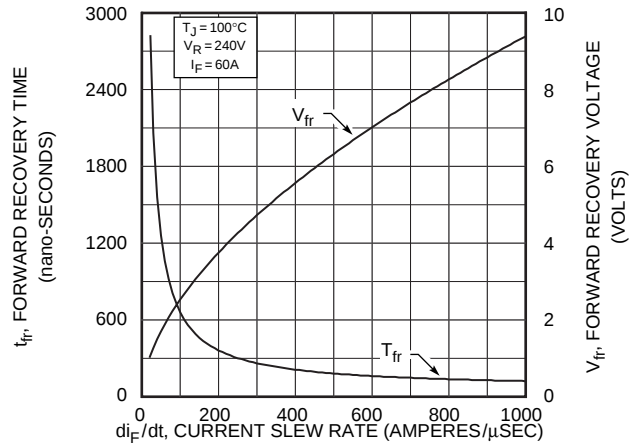


Figure 7, Forward Recovery Voltage/Time vs Current Slew Rate

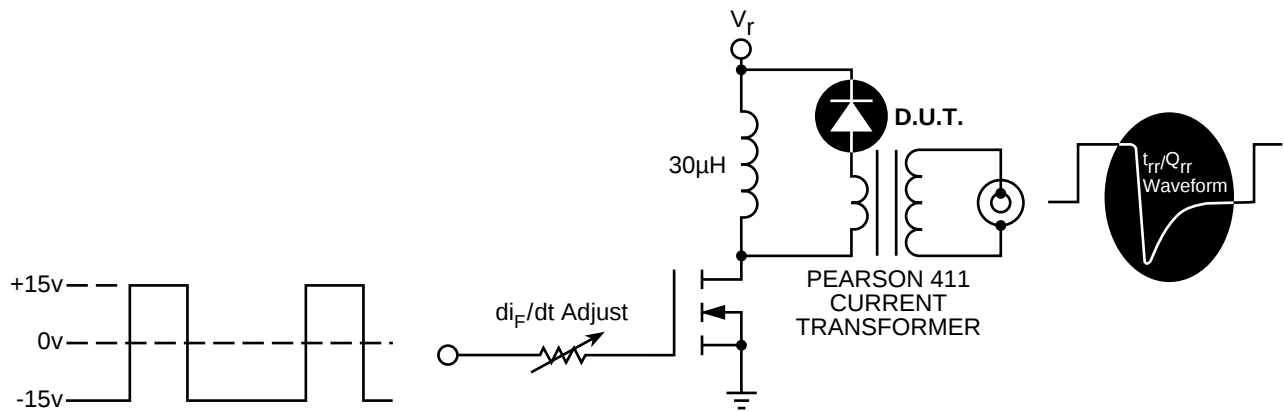


Figure 9, Diode Reverse Recovery Test Circuit and Waveforms

❶ I_F - Forward Conduction Current

❷ di_F/dt - Current Slew Rate, Rate of Forward Current Change Through Zero Crossing.

❸ I_{RRM} - Peak Reverse Recovery Current.

❹ t_{rr} - Reverse Recovery Time Measured from Point of I_F Current Falling Through Zero to a Tangent Line {❻ di_M/dt } Extrapolated Through Zero Defined by 0.75 and 0.50 I_{RRM} .

❺ Q_{rr} - Area Under the Curve Defined by I_{RRM} and t_{rr} .

❻ di_M/dt - Maximum Rate of Current Change During the Trailing Portion of t_{rr} .

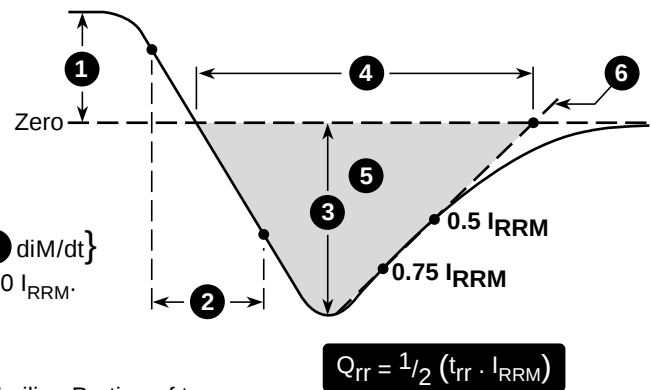
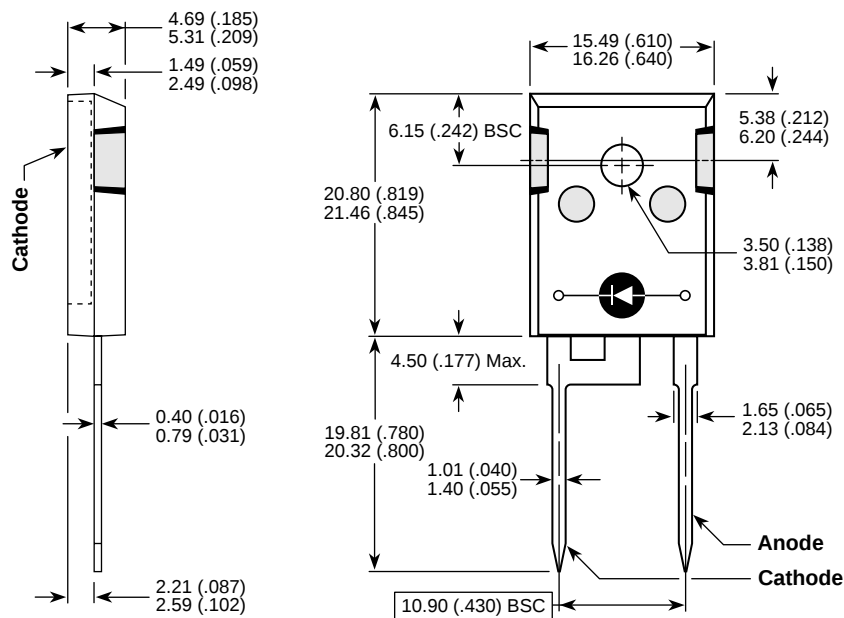


Figure 10, Diode Reverse Recovery Waveform and Definitions

TO-247 Package Outline



Dimensions in Millimeters and (Inches)