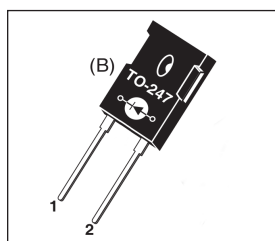


1 - Cathode
2 - Anode
Back of Case - Cathode



a MICROCHIP company

APT100D60BG 600V 100A

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 T-MAX™
- 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	APT100D60BG	UNIT
V_R	Maximum D.C. Reverse Voltage	600	Volts
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		
V_{RWM}	Maximum Working Peak Reverse Voltage		
$I_F(AV)$	Maximum Average Forward Current ($T_C = 80^\circ\text{C}$, Duty Cycle = 0.5) ①	100	Amps
$I_F(RMS)$	RMS Forward Current	180	
I_{FSM}	Non-Repetitive Forward Surge Current ($T_J = 45^\circ\text{C}$, 8.3ms)	1000	
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	$I_F = 100\text{A}$		2.0	Volts
		$I_F = 200\text{A}$		1.7	
		$I_F = 100\text{A}, T_J = 150^\circ\text{C}$		1.7	
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, $V_R = 200\text{V}$		165		pF
L_S	Series Inductance (Lead to Lead 5mm from Base)		20		nH

DYNAMIC CHARACTERISTICS

APT100D60BG

Symbol	Characteristic	MIN	TYP	MAX	UNIT
t_{rr1}	Reverse Recovery Time, $I_F = 1.0A$, $di_F/dt = -15A/\mu s$, $V_R = 30V$, $T_J = 25^\circ C$		60	75	ns
t_{rr2}	Reverse Recovery Time	$T_J = 25^\circ C$	60		
t_{rr3}	$I_F = 100A$, $di_F/dt = -800A/\mu s$, $V_R = 350V$	$T_J = 100^\circ C$	92		
t_{fr1}	Forward Recovery Time	$T_J = 25^\circ C$	185		
t_{fr2}	$I_F = 100A$, $di_F/dt = 800A/\mu s$, $V_R = 350V$	$T_J = 100^\circ C$	185		
I_{RRM1}	Reverse Recovery Current	$T_J = 25^\circ C$	27	38	Amps
I_{RRM2}	$I_F = 100A$, $di_F/dt = -800A/\mu s$, $V_R = 350V$	$T_J = 100^\circ C$	42	54	
Q_{rr1}	Recovery Charge	$T_J = 25^\circ C$	810		nC
Q_{rr2}	$I_F = 100A$, $di_F/dt = -800A/\mu s$, $V_R = 350V$	$T_J = 100^\circ C$	1930		
V_{fr1}	Forward Recovery Voltage	$T_J = 25^\circ C$	10.2		Volts
V_{fr2}	$I_F = 100A$, $di_F/dt = 800A/\mu s$, $V_R = 350V$	$T_J = 100^\circ C$	10.2		
diM/dt	Rate of Fall of Recovery Current	$T_J = 25^\circ C$	600		A/ μs
	$I_F = 100A$, $di_F/dt = -800A/\mu s$, $V_R = 350V$ (See Figure 10)	$T_J = 100^\circ C$	400		

THERMAL AND MECHANICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance			0.34	$^\circ C/W$
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance			40	
Wt	Package Weight		0.22		oz
			6.2		g

① Continuous current limited by lead temperature.

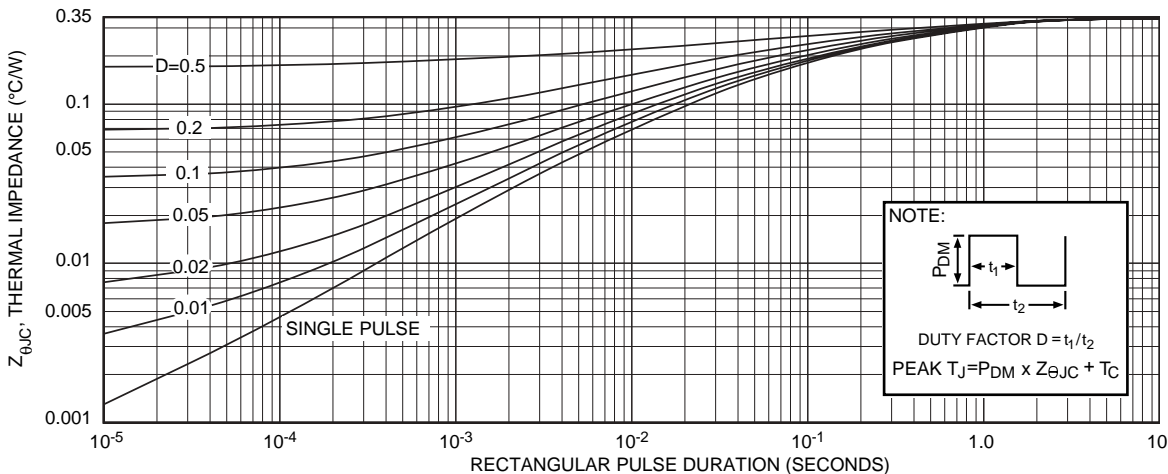


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

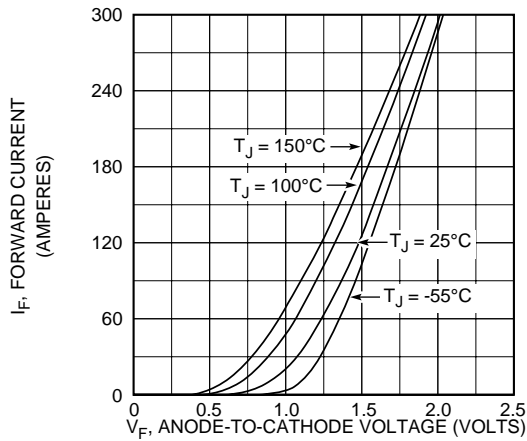


Figure 2, Forward Voltage Drop vs Forward Current

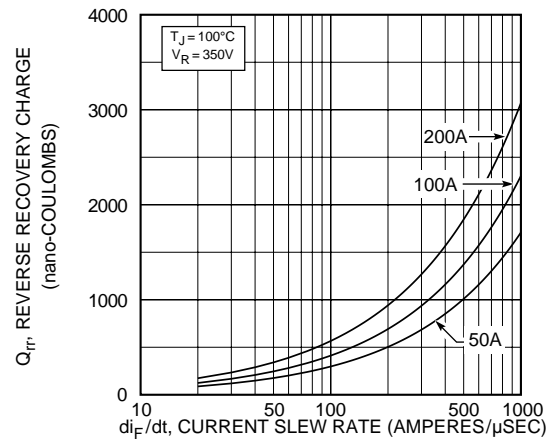


Figure 3, Reverse Recovery Charge vs Current Slew Rate

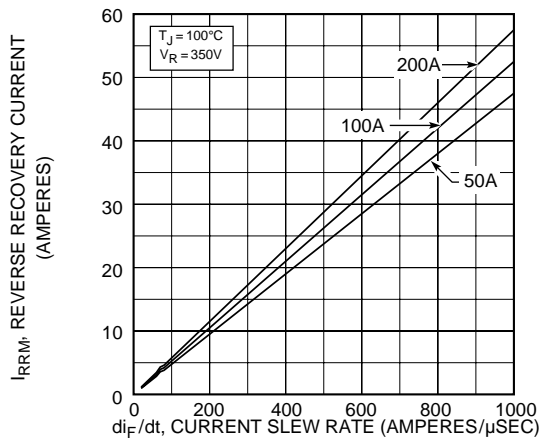


Figure 4, Reverse Recovery Current vs Current Slew Rate

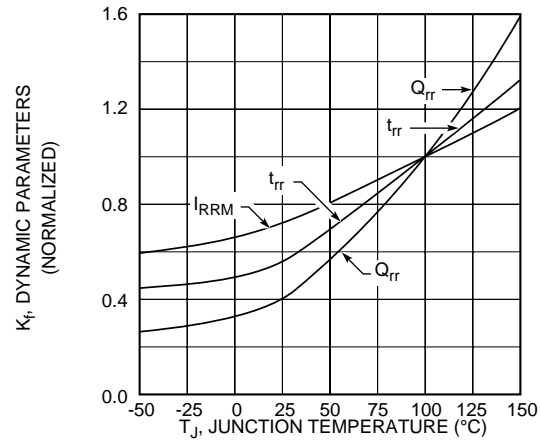


Figure 5, Dynamic Parameters vs Junction Temperature

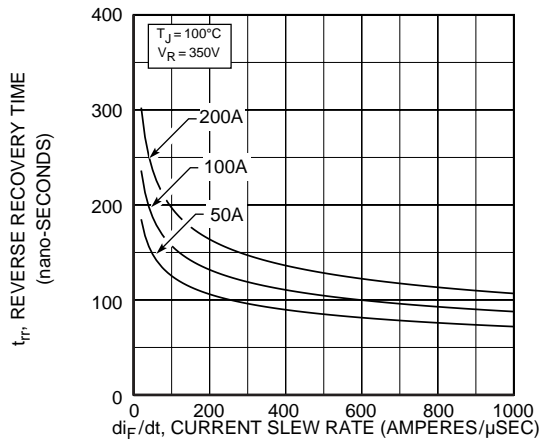


Figure 6, Reverse Recovery Time vs Current Slew Rate

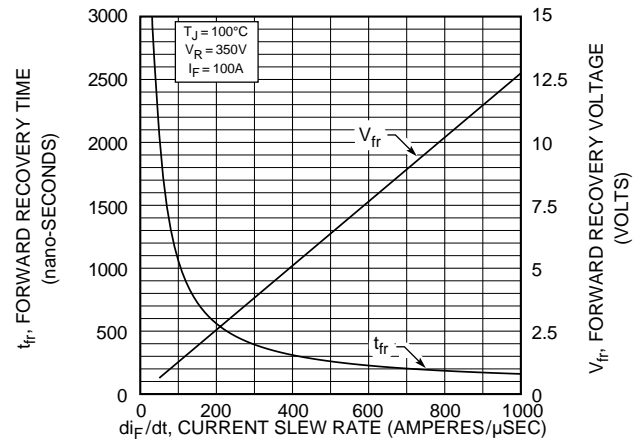


Figure 7, Forward Recovery Voltage/Time vs Current Slew Rate

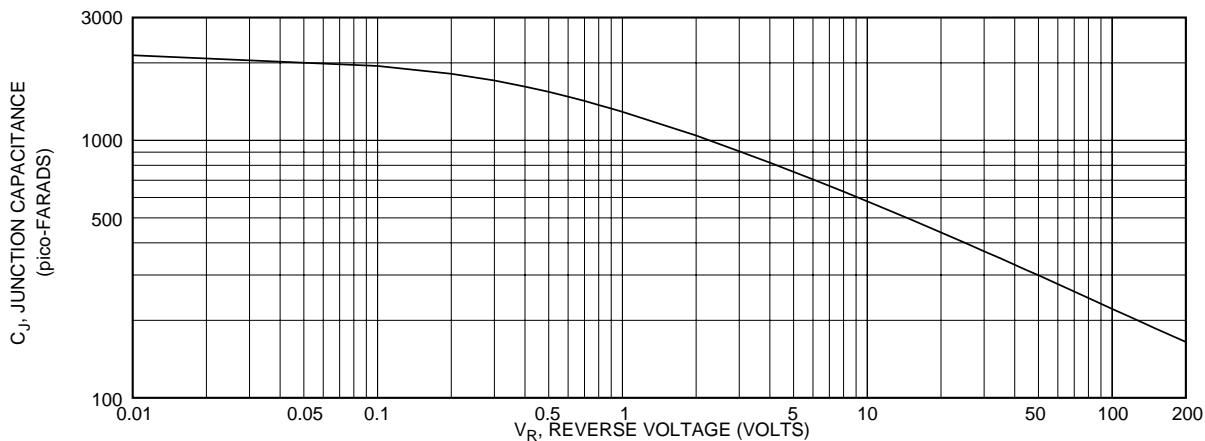


Figure 8, Junction Capacitance vs Reverse Voltage

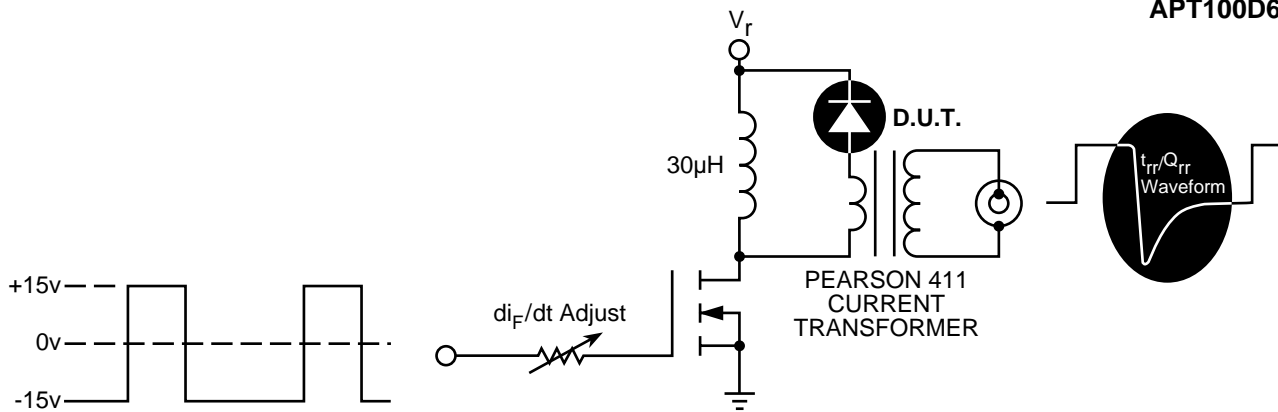


Figure 9, Diode Reverse Recovery Test Circuit and Waveforms

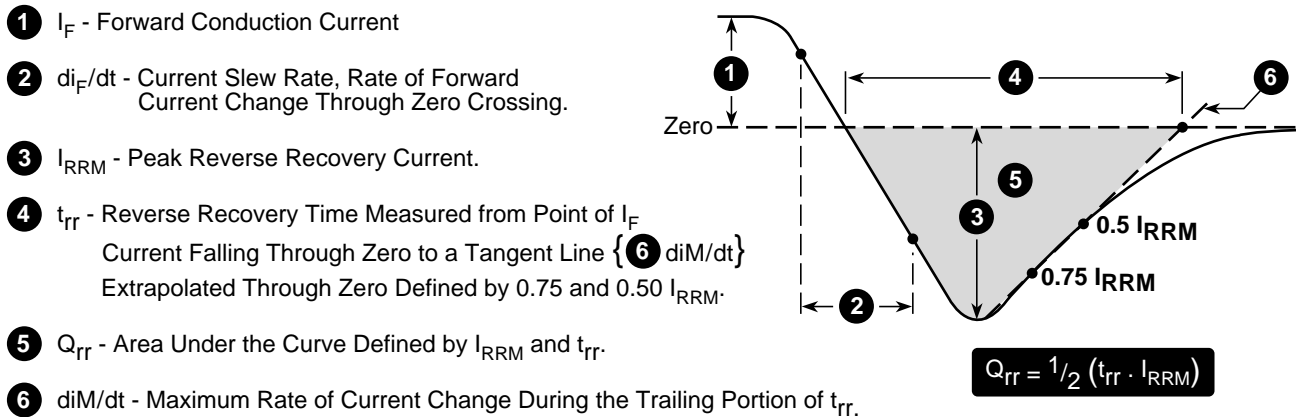
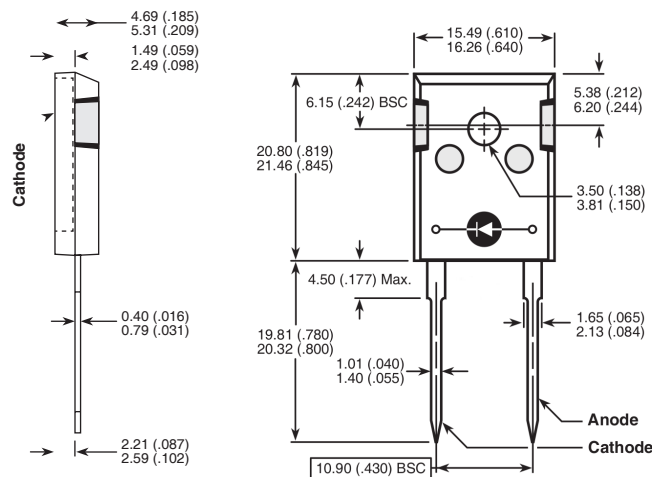


Figure 10, Diode Reverse Recovery Waveform and Definitions

TO-247 Package Outline



Dimensions in Millimeters and (Inches)



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