

**APT2X60D60J 600V 60A**  
**APT2X60D50J 500V 60A**

**DUAL DIE ISOTOP PACKAGE**

**ULTRAFAST SOFT RECOVERY DUAL RECTIFIER DIODES**

PRODUCT APPLICATIONS	PRODUCT FEATURES	PRODUCT BENEFITS
<ul style="list-style-type: none"> <li>• Anti-Parallel Diode -Switchmode Power Supply -Inverters</li> <li>• Free Wheeling Diode -Motor Controllers -Converters</li> <li>• Snubber Diode</li> <li>• Uninterruptible Power Supply (UPS)</li> <li>• Induction Heating</li> <li>• High Speed Rectifiers</li> </ul>	<ul style="list-style-type: none"> <li>• Ultrafast Recovery Times</li> <li>• Soft Recovery Characteristics</li> <li>• Popular SOT-227 Package</li> <li>• Low Forward Voltage</li> <li>• High Blocking Voltage</li> <li>• Low Leakage Current</li> </ul>	<ul style="list-style-type: none"> <li>• Low Losses</li> <li>• Low Noise Switching</li> <li>• Cooler Operation</li> <li>• Higher Reliability Systems</li> <li>• Increased System Power Density</li> </ul>

**MAXIMUM RATINGS**

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

Symbol	Characteristic / Test Conditions	APT2X60D60J-50J	UNIT
$V_R$	Maximum D.C. Reverse Voltage	600-500	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			$I_F = 60\text{A}$	1.8
				$I_F = 120\text{A}$	1.75
				$I_F = 60\text{A}, T_J = 150^\circ\text{C}$	1.5
$I_{RM}$	Maximum Reverse Leakage Current			$V_R = V_R \text{ Rated}$	250
				$V_R = V_R \text{ Rated}, T_J = 125^\circ\text{C}$	500
$C_T$	Junction Capacitance, $V_R = 200\text{V}$		85		pF
$L_S$	Series Inductance (Lead to Lead 5mm from Base)		10		nH

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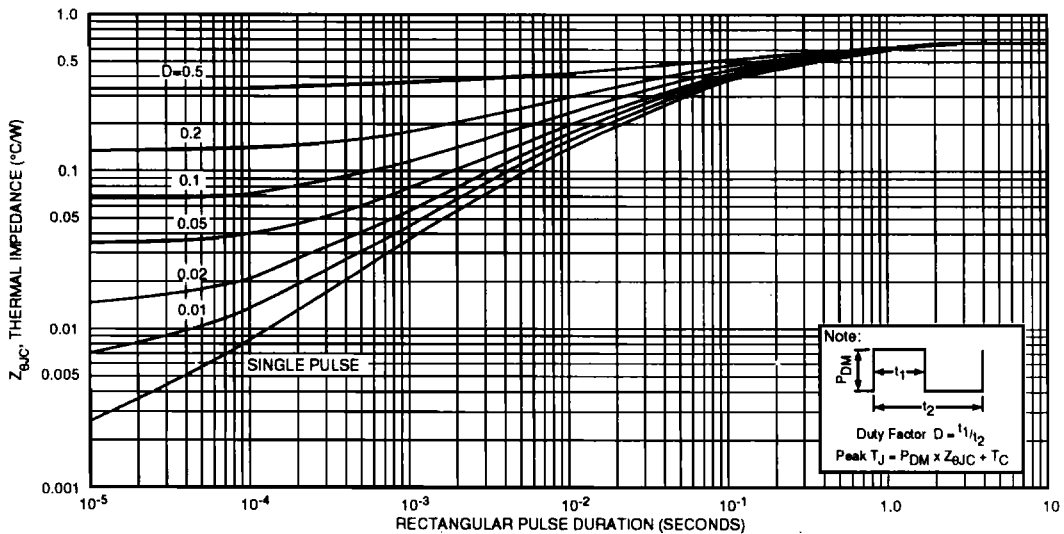
**DYNAMIC CHARACTERISTICS**

**APT2X60D60J-50J**

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		70	85	
$t_{rr3}$	$I_F = 60A$ , $di_F/dt = -480A/\mu s$ , $V_R = 350V$		90	180	
$t_{fr1}$	Forward Recovery Time		200		
$t_{fr2}$	$I_F = 60A$ , $di_F/dt = 480A/\mu s$ , $V_R = 350V$		200		
$I_{RRM1}$	Reverse Recovery Current		10	17	Amps
$I_{RRM2}$	$I_F = 60A$ , $di_F/dt = -480A/\mu s$ , $V_R = 350V$		20	30	
$Q_{rr1}$	Recovery Charge		350	725	nC
$Q_{rr2}$	$I_F = 60A$ , $di_F/dt = -480A/\mu s$ , $V_R = 350V$		900	2700	
$V_{fr1}$	Forward Recovery Voltage		7		Volts
$V_{fr2}$	$I_F = 60A$ , $di_F/dt = 480A/\mu s$ , $V_R = 350V$		7		
$diI/dt$	Rate of Fall of Recovery Current		800		A/ $\mu s$
	$I_F = 60A$ , $di_F/dt = -480A/\mu s$ , $V_R = 350V$ (See Figure 10)		500		

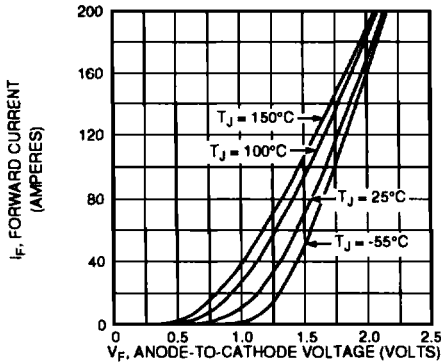
**THERMAL AND MECHANICAL CHARACTERISTICS**

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			20	
$V_{isolation}$	RMS Voltage (50-60 Hz Sinusoidal Waveform from Terminals to Mounting Base for 1 Min.)	2500			Volts
$W_T$	Package Weight		1.03		oz
			29.2		gm
Torque	Maximum Torque (Mounting = 8-32 or 4mm Machine and Terminals = 4mm Machine)			13.6	lb·in
				1.5	N·m

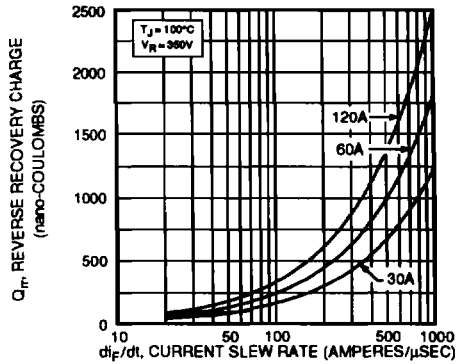


**FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION**

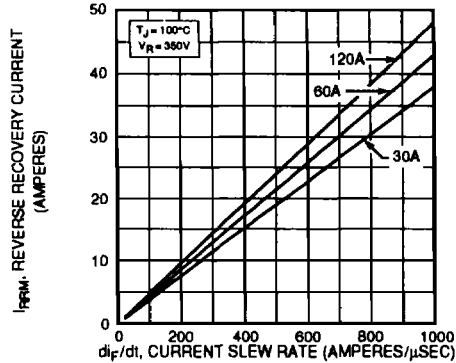
**APT2X60D60J-50J**



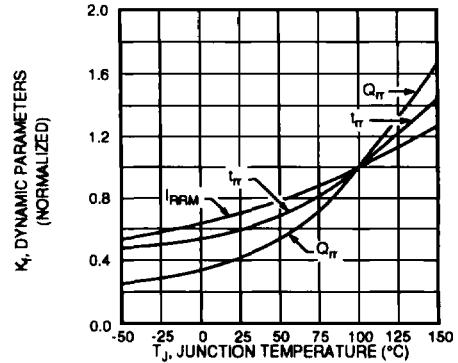
**Figure 2, Forward Voltage Drop vs Forward Current**



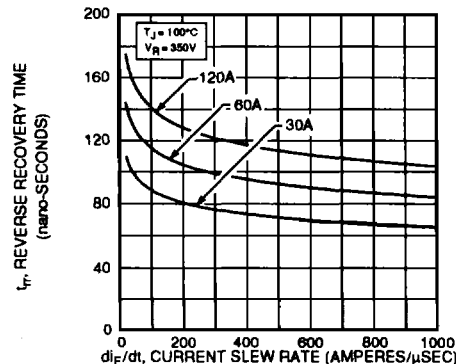
**Figure 3, Reverse Recovery Charge vs Current Slew Rate**



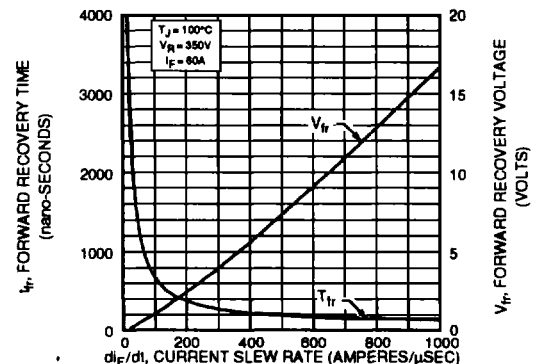
**Figure 4, Reverse Recovery Current vs Current Slew Rate**



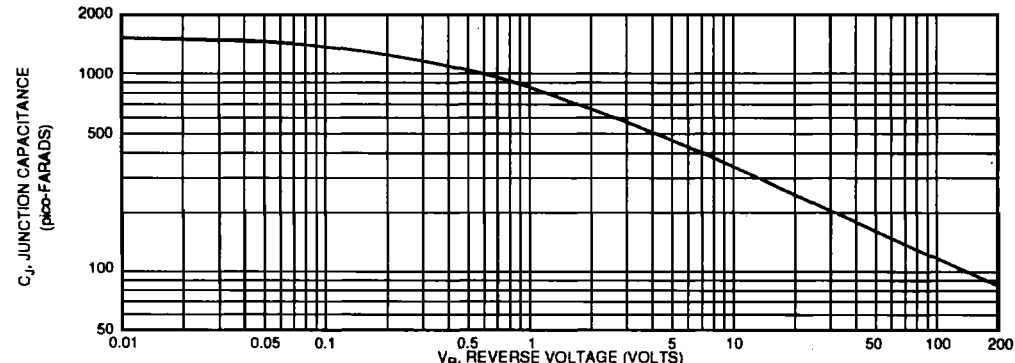
**Figure 5, Dynamic Parameters vs Junction Temperature**



**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**

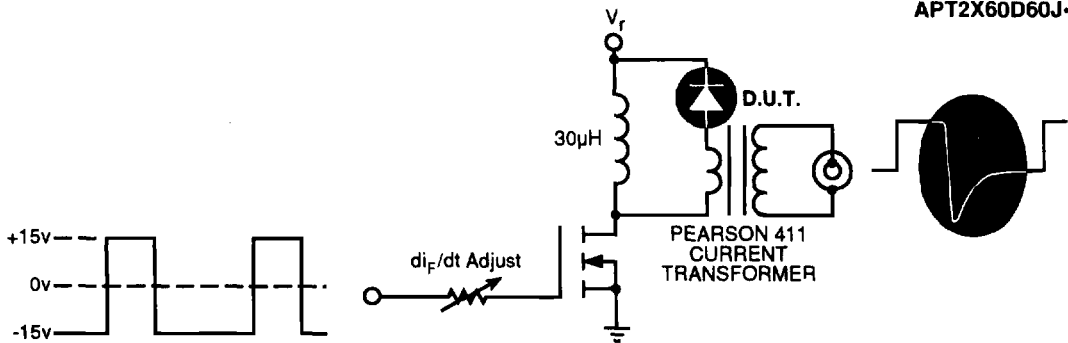


Figure 9, Diode Reverse Recovery Test Circuit and Waveforms

1  $I_F$  - Forward Conduction Current

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

3  $I_{RRM}$  - Peak Reverse Recovery Current.

4  $t_{rr}$  - Reverse Recovery Time Measured from Point of  $I_F$  Current Falling Through Zero to a Tangent Line { 6  $diM/dt$  } Extrapolated Through Zero Defined by 0.75 and 0.50  $I_{RRM}$ .

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

6  $diM/dt$  - Maximum Rate of Current Change During the Trailing Portion of  $t_{rr}$ .

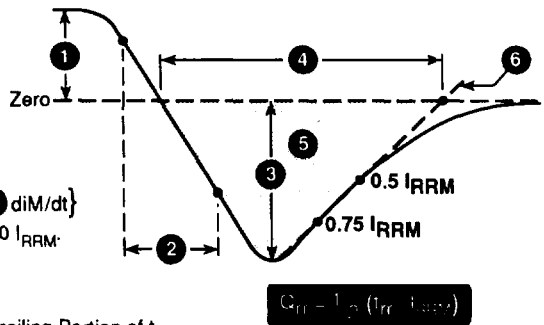
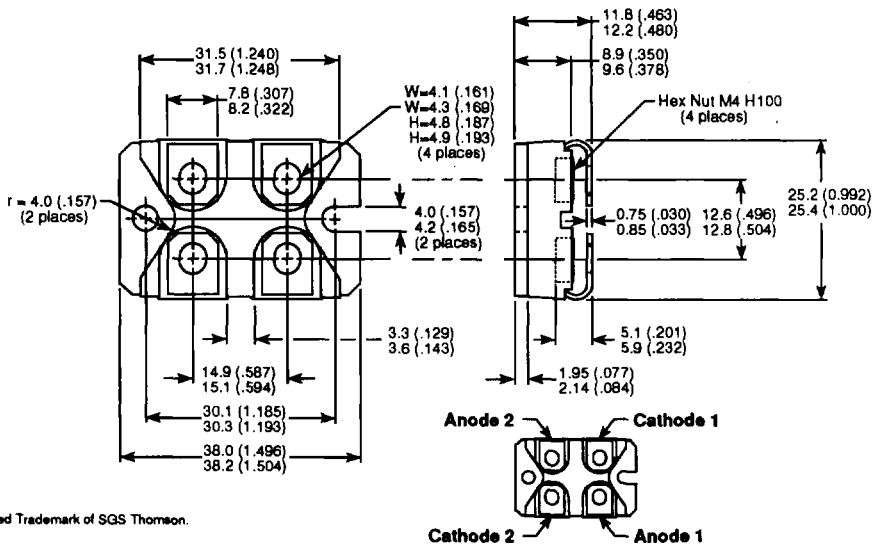


Figure 10, Diode Reverse Recovery Waveform and Definitions

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

SOT-227 (Anti-Parallel Diode) Package Outline



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Dimensions in Millimeters and (Inches)