Anti-Parallel
APT2X60D40J

Parallel
APT2X61D40J

ISOTOP®

"UL Recognized"

ADVANCED POWER TECHNOLOGY®

APT2X61D40J	**400V**	**60A**
APT2X60D40J	**400V**	**60A**

DUAL DIE ISOTOP® PACKAGE

ULTRAFAST SOFT RECOVERY RECTIFIER DIODE

PRODUCT APPLICATIONS	PRODUCT FEATURES	PRODUCT BENEFITS

• **Anti-Parallel Diode**
  -Switchmode Power Supply
  -Inverters
• **Free Wheeling Diode**
  -Motor Controllers
  -Converters
• **Snubber Diode**
• **Uninterruptible Power Supply (UPS)**
• **Induction Heating**
• **High Speed Rectifiers**
	• **Ultrafast Recovery Times**
	
	• **Soft Recovery Characteristics**
	
	• **Popular SOT-227 Package**
	
	• **Low Forward Voltage**
	
	• **High Blocking Voltage**
	
	• **Low Leakage Current**
		• **Low Losses**
		
		• **Low Noise Switching**
		
		• **Cooler Operation**
		
		• **Higher Reliability Systems**
		
		• **Increased System Power Density**

MAXIMUM RATINGS

All Ratings: T_C = 25°C unless otherwise specified.

Symbol	Characteristic / Test Conditions	APT2X61_60D40J	UNIT
V_R	Maximum D.C. Reverse Voltage		
V_{RRM}	Maximum Peak Repetitive Reverse Voltage	400	Volts
V_{RWM}	Maximum Working Peak Reverse Voltage		
$I_{F(AV)}$	Maximum Average Forward Current (T_C = 115°C, Duty Cycle = 0.5)	60	
$I_{F(AV)}$	RMS Forward Current (Square wave, 50% duty)	99	Amps
I_{FSM}	Non-Repetitive Forward Surge Current (T_J = 45°C, 8.3ms)	600	
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to 175	°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 = 60A		1.3	1.5	Volts
		I_F = 120A		1.6		
		I_F = 60A, T_J = 125°C		1.2		
I_{RM}	Maximum Reverse Leakage Current	V_R = V_R Rated			250	µA
		V_R = V_R Rated, T_J = 125°C			500	
C_T	Junction Capacitance, V_R = 200V			120		pF

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
t_{rr}	Reverse Recovery Time	$I_F = 1A$, $di_F/dt = -100A/\mu s$, $V_R = 30V$, $T_J = 25°C$	-	30		ns
t_{rr}	Reverse Recovery Time	$I_F = 60A$, $di_F/dt = -200A/\mu s$ $V_R = 266V$, $T_C = 25°C$	-	37		
Q_{rr}	Reverse Recovery Charge		-	80		nC
I_{RRM}	Maximum Reverse Recovery Current		-	4	-	Amps
t_{rr}	Reverse Recovery Time	$I_F = 60A$, $di_F/dt = -200A/\mu s$ $V_R = 266V$, $T_C = 125°C$	-	110		ns
Q_{rr}	Reverse Recovery Charge		-	540		nC
I_{RRM}	Maximum Reverse Recovery Current		-	10	-	Amps
t_{rr}	Reverse Recovery Time	$I_F = 60A$, $di_F/dt = -800A/\mu s$ $V_R = 266V$, $T_C = 125°C$	-	65		ns
Q_{rr}	Reverse Recovery Charge		-	1050		nC
I_{RRM}	Maximum Reverse Recovery Current		-	27		Amps

THERMAL AND MECHANICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance			.60	°C/W
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance			20	
W_T	Package Weight		1.03		oz
			29.2		g
Torque	Maximum Mounting Torque			10	lb•in
				1.1	N•m

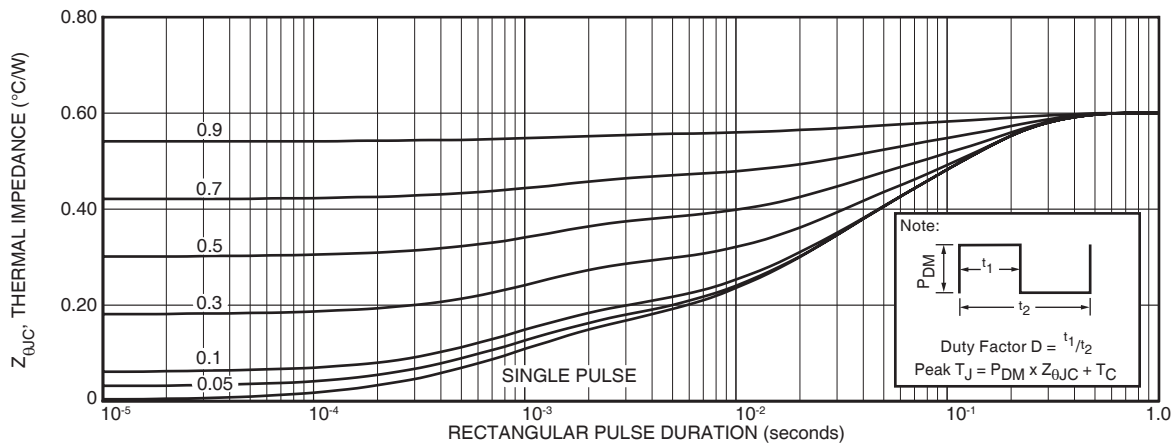**APT Reserves the right to change, without notice, the specifications and information contained herein.**

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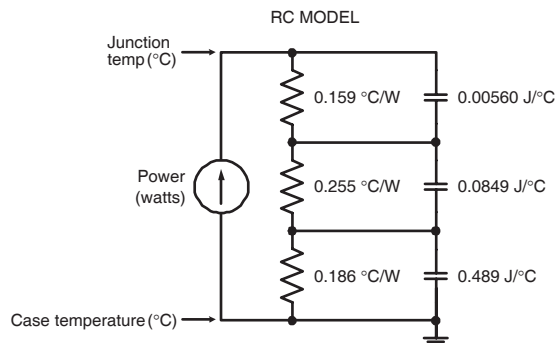

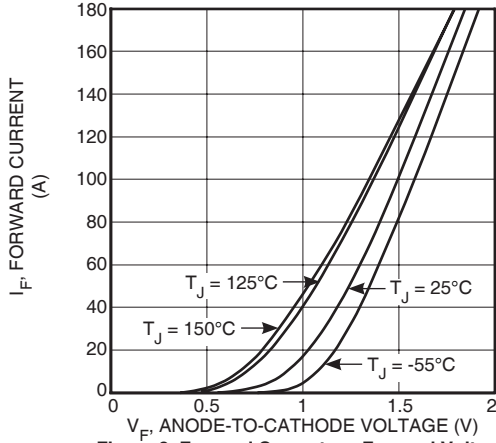FIGURE 1b, TRANSIENT THERMAL IMPEDANCE MODEL

Figure 2. Forward Current vs. Forward Voltage
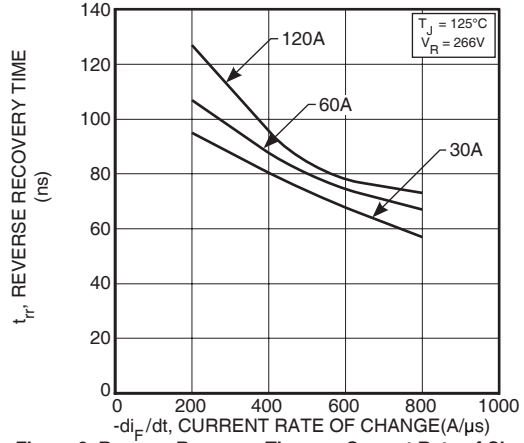

Figure 3. Reverse Recovery Time vs. Current Rate of Change
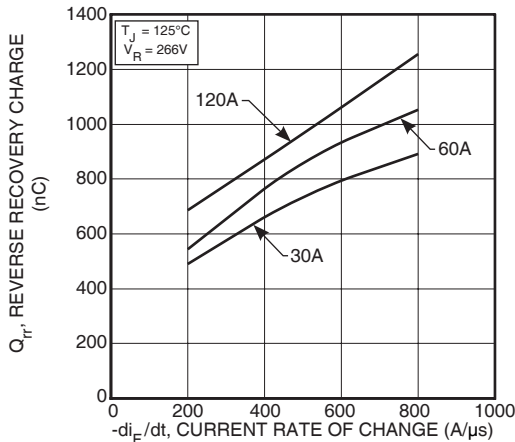

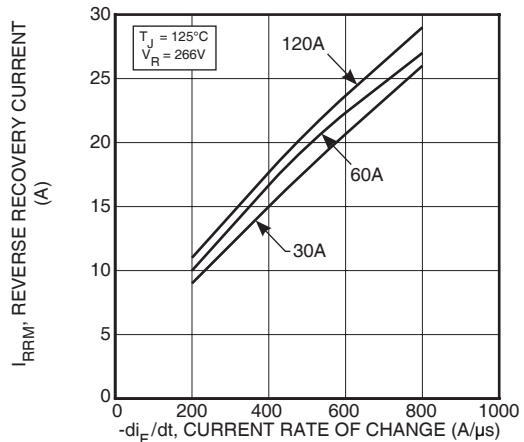**Figure 4. Reverse Recovery Charge vs. Current Rate of Change**

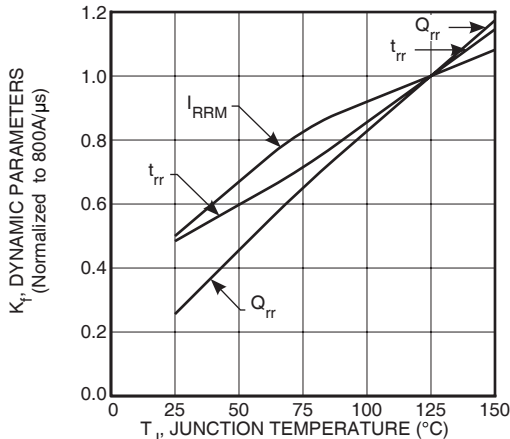**Figure 5. Reverse Recovery Current vs. Current Rate of Change**

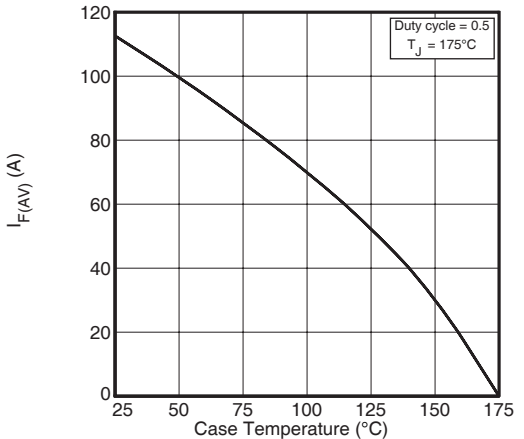**Figure 6. Dynamic Parameters vs. Junction Temperature**

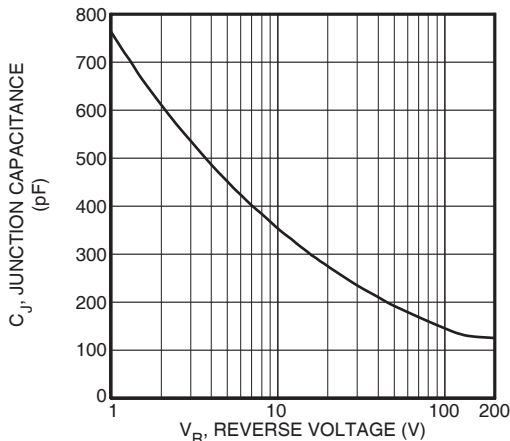**Figure 7. Maximum Average Forward Current vs. CaseTemperature**
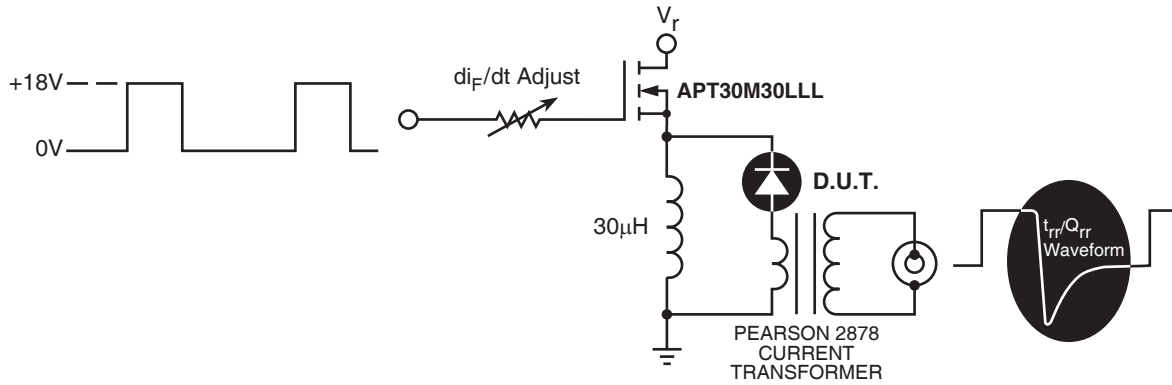

Figure 8. Junction Capacitance vs. Reverse Voltage

053-4005   Rev   F   2-2005

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 $0.25 \cdot I_{RRM}$ passes through zero.

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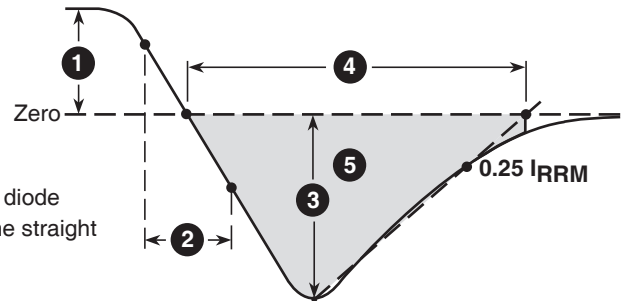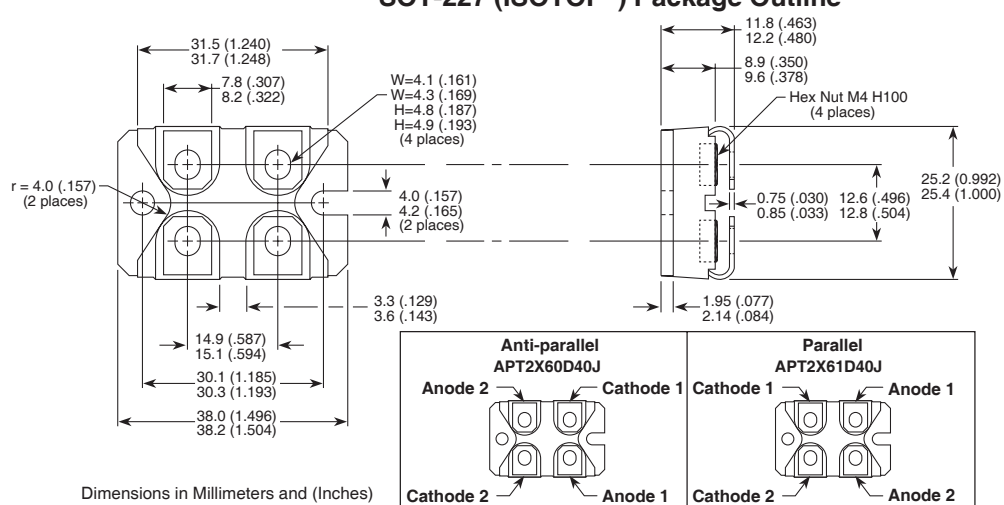

Figure 10, Diode Reverse Recovery Waveform and Definitions

SOT-227 (ISOTOP®) Package Outline

Dimensions in Millimeters and (Inches)