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	400	Volts
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		
V_{RWM}	Maximum Working Peak Reverse Voltage		
$I_{F(AV)}$	Maximum Average Forward Current ($T_C = 115°C$, Duty Cycle = 0.5)	60	Amps
$I_{F(AV)}$	RMS Forward Current (Square wave, 50% duty)	99	
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

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Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
t_{rr}	Reverse Recovery Time	I_F = 1A, di_F/dt = -100A/μs, V_R = 30V, T_J = 25°C	-	30		ns
t_{rr}	Reverse Recovery Time	I_F = 60A, di_F/dt = -200A/μs V_R = 266V, T_C = 25°C	-	37		ns
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/μs 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/μs 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	°C/W
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
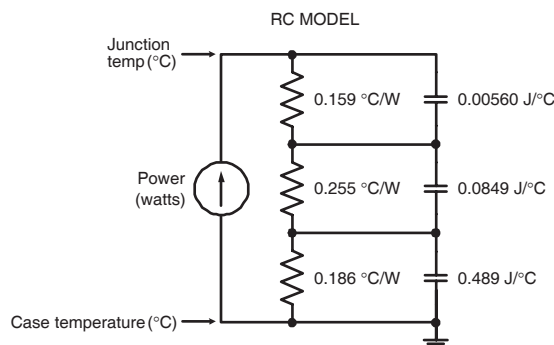
Note:

Duty Factor D = t_1/t_2
Peak T_J = P_{DM} x $Z_{\theta JC}$ + T_C

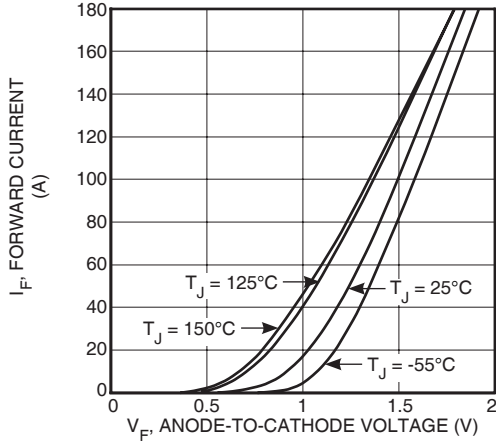RC MODEL

FIGURE 1b, TRANSIENT THERMAL IMPEDANCE MODEL

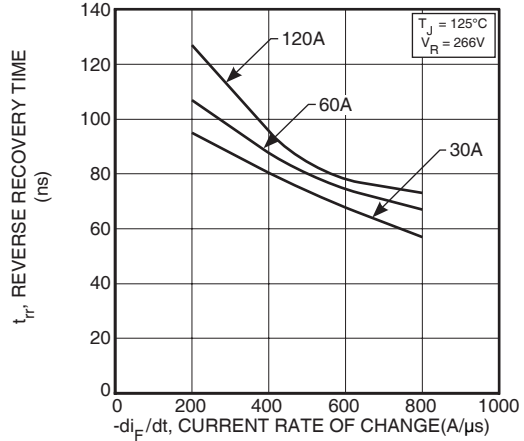**Figure 2. Forward Current vs. Forward Voltage**

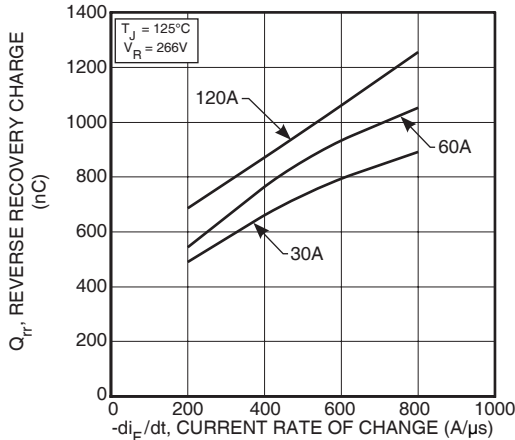**Figure 3. Reverse Recovery Time vs. Current Rate of Change**

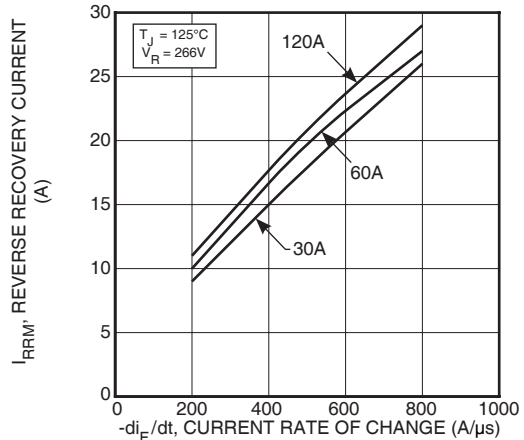**Figure 4. Reverse Recovery Charge vs. Current Rate of Change**

Figure 5. Reverse Recovery Current vs. Current Rate of Change
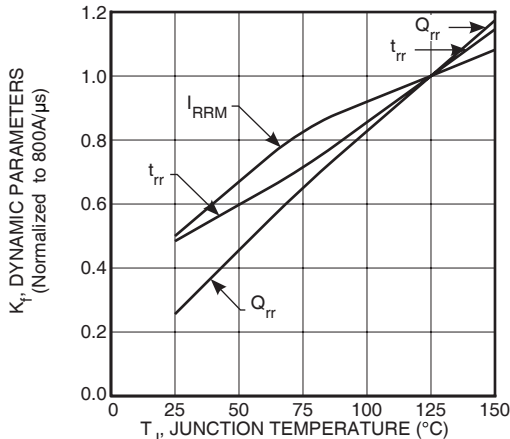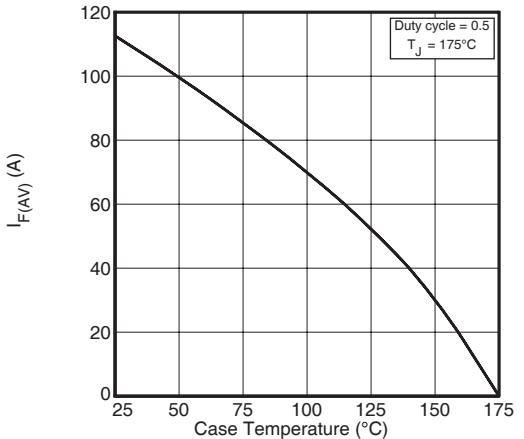
Figure 6. Dynamic Parameters vs. Junction Temperature

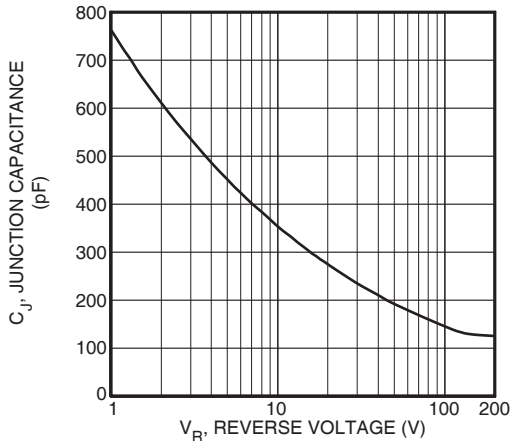**Figure 7. Maximum Average Forward Current vs. CaseTemperature**

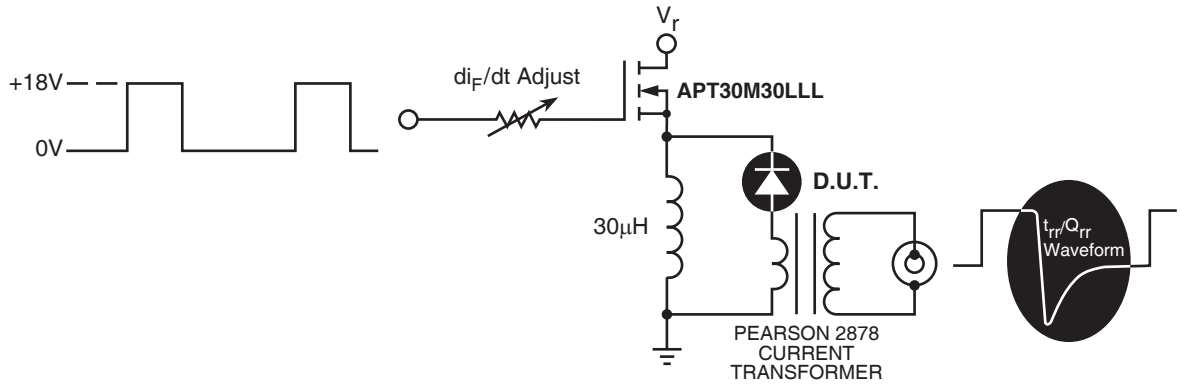**Figure 8. Junction Capacitance vs. Reverse Voltage**

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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.

5 Q$_{rr}$ - Area Under the Curve Defined by I$_{RRM}$ and t$_{rr}$.
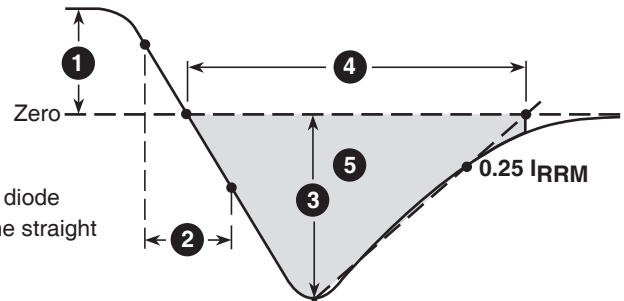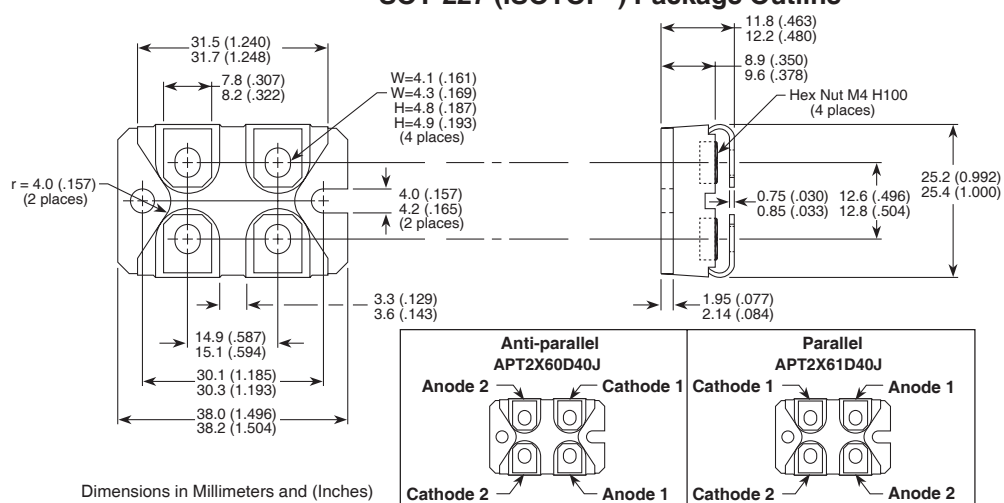

Figure 10, Diode Reverse Recovery Waveform and Definitions

SOT-227 (ISOTOP®) Package Outline

Dimensions in Millimeters and (Inches)

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