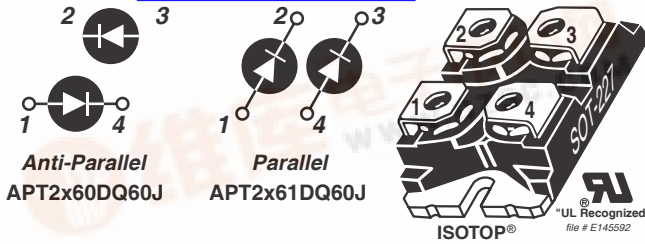


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APT2x61DQ60J 600V 60A  
APT2x60DQ60J 600V 60A

## DUAL DIE ISOTOP® PACKAGE ULTRAFAST SOFT RECOVERY RECTIFIER DIODE

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> <li>• Avalanche Energy Rated</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	APT2x61_60DQ60J	UNIT
$V_R$	Maximum D.C. Reverse Voltage		
$V_{RRM}$	Maximum Peak Repetitive Reverse Voltage	600	Volts
$V_{RWM}$	Maximum Working Peak Reverse Voltage		
$I_{F(AV)}$	Maximum Average Forward Current ( $T_C = 92^\circ\text{C}$ , Duty Cycle = 0.5)	60	
$I_{F(RMS)}$	RMS Forward Current (Square wave, 50% duty)	79	Amps
$I_{FSM}$	Non-Repetitive Forward Surge Current ( $T_J = 45^\circ\text{C}$ , 8.3ms)	600	
$E_{AVL}$	Avalanche Energy (1A, 40mH)	20	mJ
$T_J, T_{STG}$	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		$I_F = 60\text{A}$	1.7	2.3	Volts
			$I_F = 120\text{A}$	2.0		
			$I_F = 60\text{A}, T_J = 125^\circ\text{C}$	1.4		
$I_{RM}$	Maximum Reverse Leakage Current		$V_R = 600\text{V}$		25	μA
			$V_R = 600\text{V}, T_J = 125^\circ\text{C}$		500	
	Junction Capacitance, $V_R = 200\text{V}$			145	pF	

### DYNAMIC CHARACTERISTICS

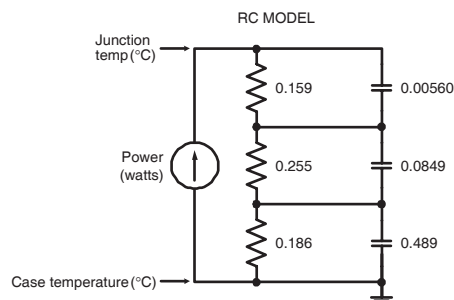
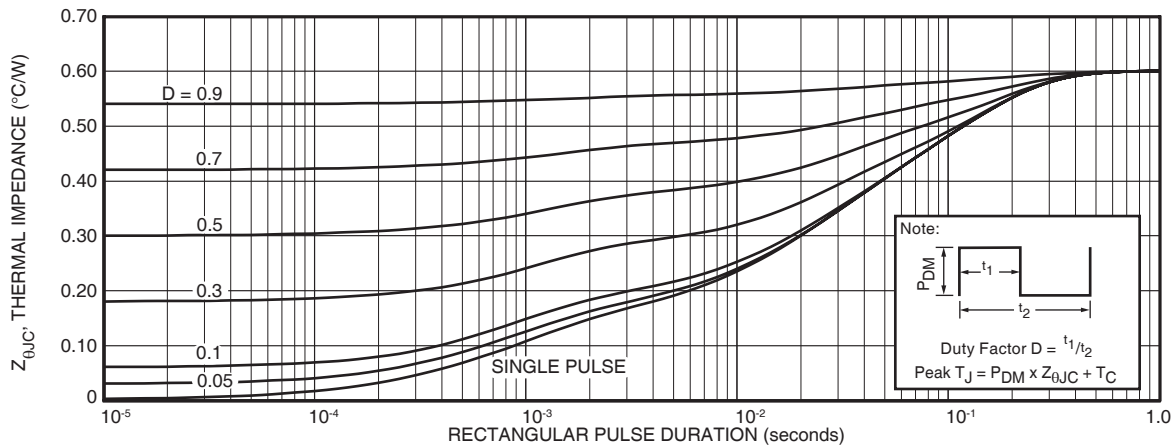
APT2x61\_60DQ60J

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
$t_{rr}$	Reverse Recovery Time	$I_F = 1A, di_F/dt = -100A/\mu s, V_R = 30V, T_J = 25^\circ C$	-	160		ns
$t_{rr}$	Reverse Recovery Time	$I_F = 60A, di_F/dt = -200A/\mu s, V_R = 400V, T_C = 25^\circ C$	-	70		
$Q_{rr}$	Reverse Recovery Charge		-	100		nC
$I_{RRM}$	Maximum Reverse Recovery Current		-	4	-	Amps
$t_{rr}$	Reverse Recovery Time	$I_F = 60A, di_F/dt = -200A/\mu s, V_R = 400V, T_C = 125^\circ C$	-	140		ns
$Q_{rr}$	Reverse Recovery Charge		-	690		nC
$I_{RRM}$	Maximum Reverse Recovery Current		-	9	-	Amps
$t_{rr}$	Reverse Recovery Time	$I_F = 60A, di_F/dt = -1000A/\mu s, V_R = 400V, T_C = 125^\circ C$	-	80		ns
$Q_{rr}$	Reverse Recovery Charge		-	1540		nC
$I_{RRM}$	Maximum Reverse Recovery Current		-	31		Amps

### THERMAL AND MECHANICAL CHARACTERISTICS

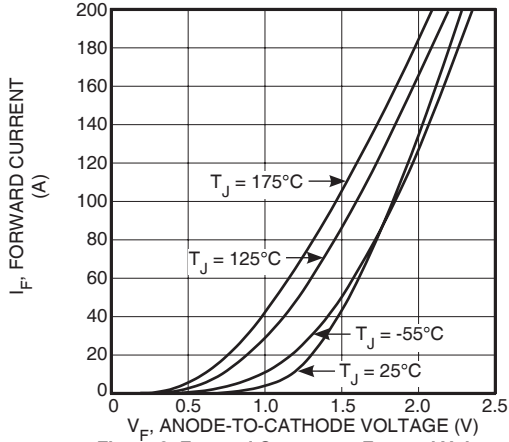
Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance			.60	$^\circ C/W$
$V_{Isolation}$	RMS Voltage (50-60Hz Sinusoidal Waveform From Terminals to Mounting Base for 1 Min.)	2500			Volts
$W_T$	Package Weight		1.03		oz
			29.2		g
Torque	Maximum Mounting Torque			10	lb•in
				1.1	N•m

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

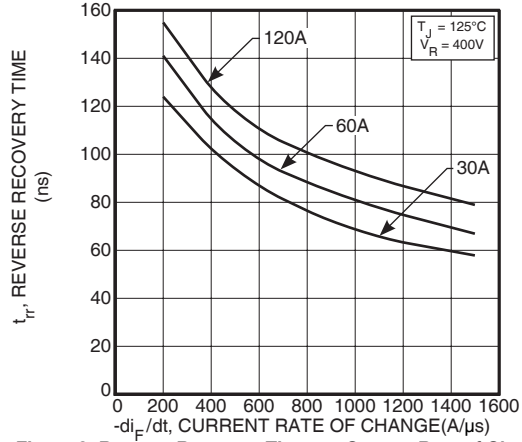


**TYPICAL PERFORMANCE CURVES**

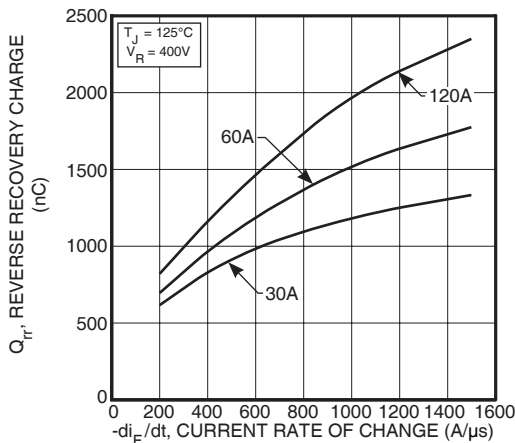
**APT2x61\_60DQ60J**



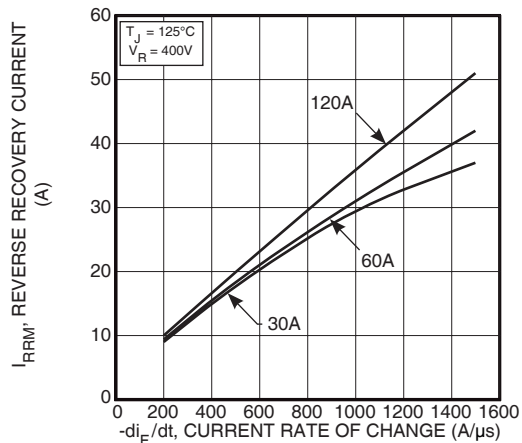
**Figure 2. Forward Current vs. Forward Voltage**



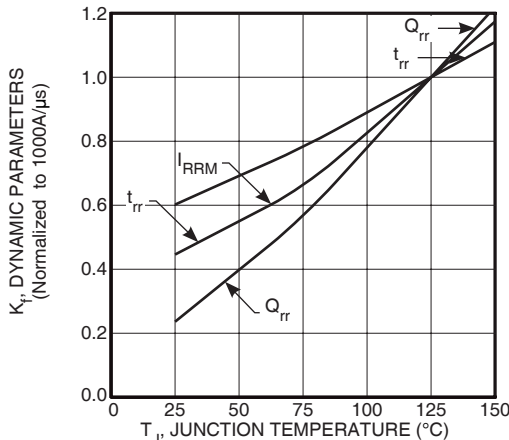
**Figure 3. Reverse Recovery Time vs. Current Rate of Change**



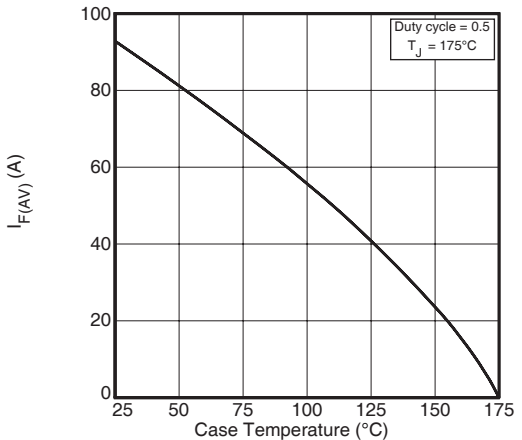
**Figure 4. Reverse Recovery Charge vs. Current Rate of Change**



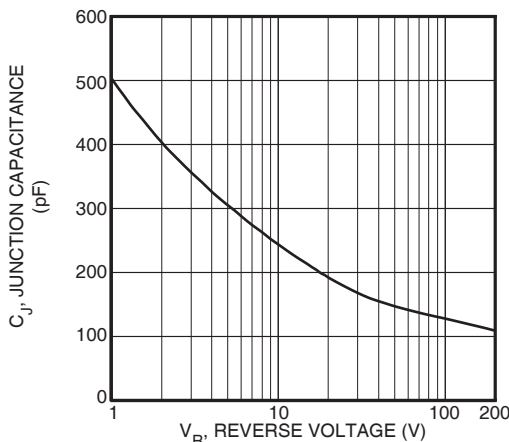
**Figure 5. Reverse Recovery Current vs. Current Rate of Change**



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



**Figure 7. Maximum Average Forward Current vs. Case Temperature**



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

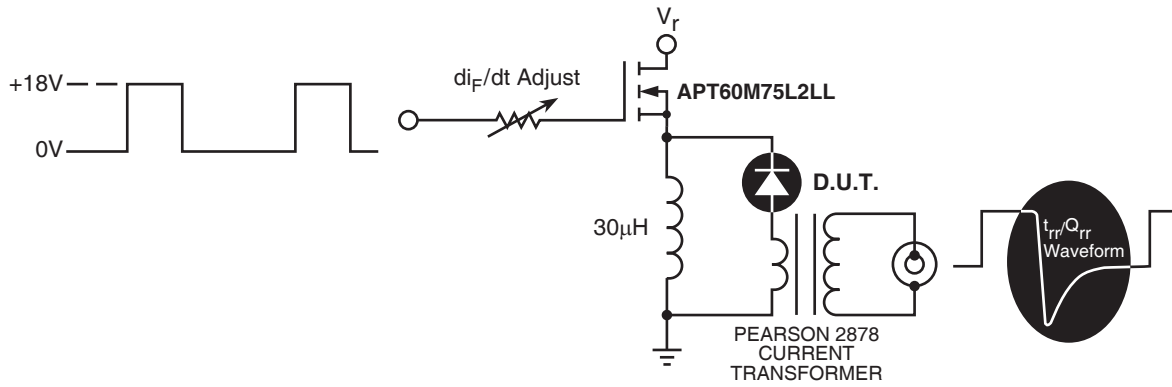


Figure 9. Diode Test Circuit

- 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  $t_{rr}$ .

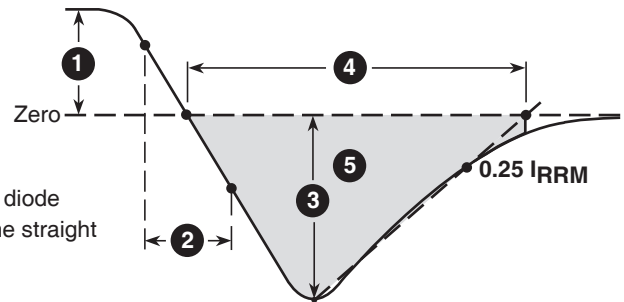
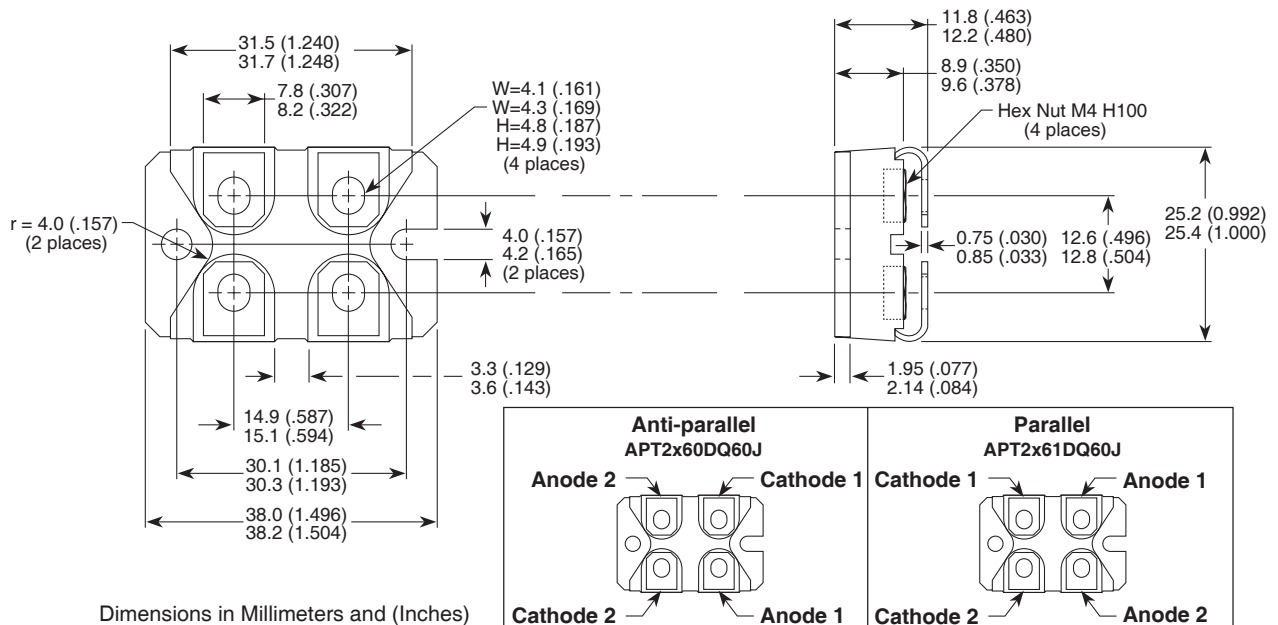


Figure 10, Diode Reverse Recovery Waveform and Definitions

### SOT-227 (ISOTOP®) Package Outline



Dimensions in Millimeters and (Inches)