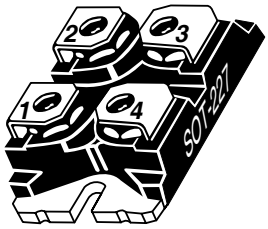


Parallel

APT2X31S20J



ADVANCED POWER TECHNOLOGY®

APT2X31S20J 200V 45A

DUAL DIE ISOTOP® PACKAGE
HIGH VOLTAGE SCHOTTKY DIODES

PRODUCT APPLICATIONS

- **Parallel Diode**
  - **-Switchmode Power Supply**
  - **-Inverters**
- **Free Wheeling Diode**
  - **-Motor Controllers**
  - **-Converters**
- **Snubber Diode**
- **Uninterruptible Power Supply (UPS)**
- **48 Volt Output Rectifiers**
- **High Speed Rectifiers**

PRODUCT FEATURES

- **Ultrafast Recovery Times**
- **Soft Recovery Characteristics**
- **Popular SOT-227 Package**
- **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°C unless otherwise specified.

Symbol	Characteristic / Test Conditions	APT2X31S20J	UNIT
V_R	Maximum D.C. Reverse Voltage	200	Volts
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		
V_{RWM}	Maximum Working Peak Reverse Voltage		
$I_F(AV)$	Maximum Average Forward Current (T_C = 105°C, Duty Cycle = 0.5)	45	Amps
$I_F(RMS)$	RMS Forward Current (Square wave, 50% duty)	81	
I_{FSM}	Non-Repetitive Forward Surge Current (T_J = 45°C, 8.3ms)	320	
T_J,T_{STG}	Operating and StorageTemperature Range	-55 to 150	°C
E_{AVL}	Avalanche Energy (2A, 15mH)	30	mJ

STATIC ELECTRICAL CHARACTERISTICS

Symbol			MIN	TYP	MAX	UNIT
V_F	Forward Voltage	I_F = 30A		.80	.85	Volts
		I_F = 60A		.91		
		I_F = 30A, T_J = 125°C		.67		
I_{RM}	Maximum Reverse Leakage Current	V_R = V_R Rated			0.5	mA
		V_R = V_R Rated, T_J = 125°C			15	
C_T	Junction Capacitance, V_R = 200V			150		pF

APT Website - http://www.advancedpower.com

053-6033 Rev C 9-2004

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DYNAMIC CHARACTERISTICS

APT2X31S20J

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
t_{rr}	Reverse Recovery Time	I_F = 30A, di_F/dt = -200A/µs V_R = 133V, T_C = 25°C	-	55		ns
Q_{rr}	Reverse Recovery Charge		-	190		nC
I_{RRM}	Maximum Reverse Recovery Current		-	6	-	Amps
t_{rr}	Reverse Recovery Time	I_F = 30A, di_F/dt = -200A/µs V_R = 133V, T_C = 125°C	-	100		ns
Q_{rr}	Reverse Recovery Charge		-	450		nC
I_{RRM}	Maximum Reverse Recovery Current		-	9	-	Amps
t_{rr}	Reverse Recovery Time	I_F = 30A, di_F/dt = -700A/µs V_R = 133V, T_C = 125°C	-	70		ns
Q_{rr}	Reverse Recovery Charge		-	960		nC
I_{RRM}	Maximum Reverse Recovery Current		-	24		Amps

THERMAL AND MECHANICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance			1.04	°C/W
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance			20	
W_T	Package Weight		1.03		oz
			29.2		g
Torque	Maximum Terminal & Mounting Torque			10	lb•in
				1.1	N•m

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

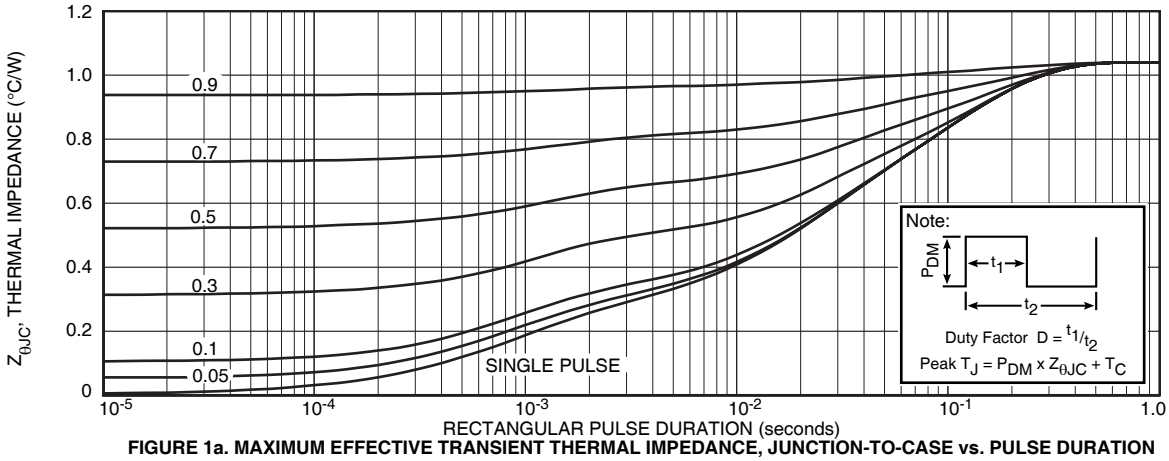


FIGURE 1a. MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs. PULSE DURATION

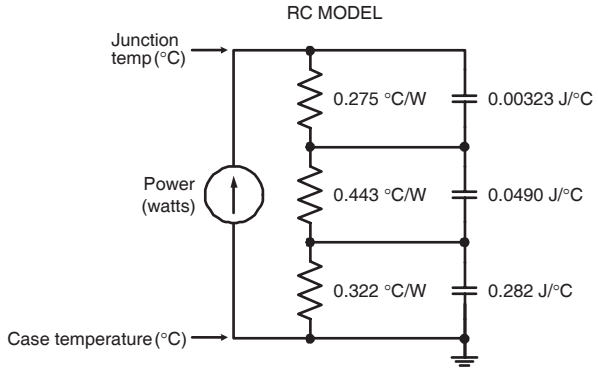


FIGURE 1b, TRANSIENT THERMAL IMPEDANCE MODEL

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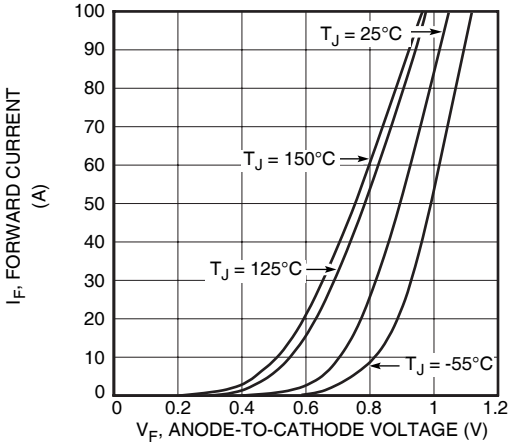


Figure 2. Forward Current *vs.* Forward Voltage

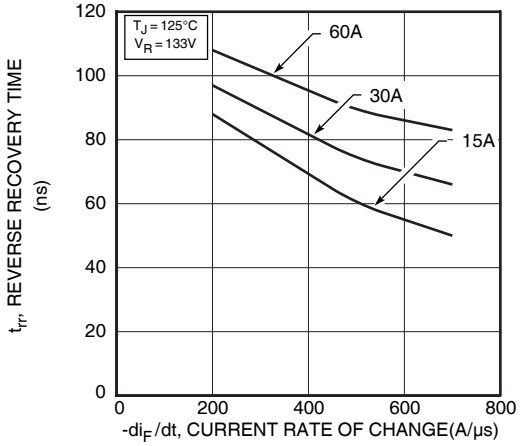


Figure 3. Reverse Recovery Time *vs.* Current Rate of Change

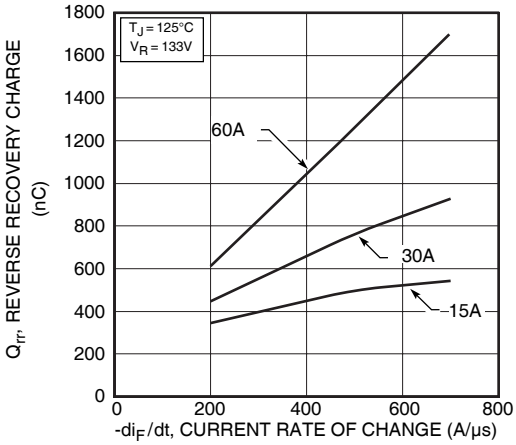


Figure 4. Reverse Recovery Charge *vs.* Current Rate of Change

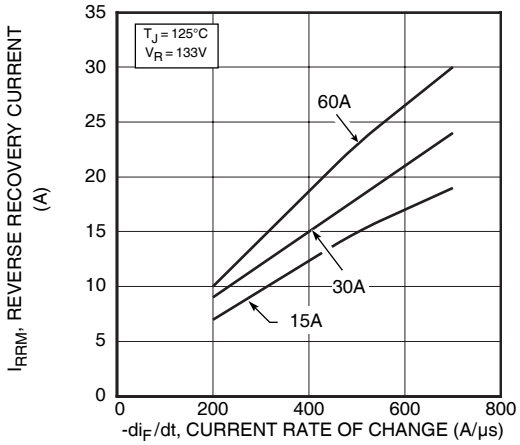


Figure 5. Reverse Recovery Current *vs.* Current Rate of Change

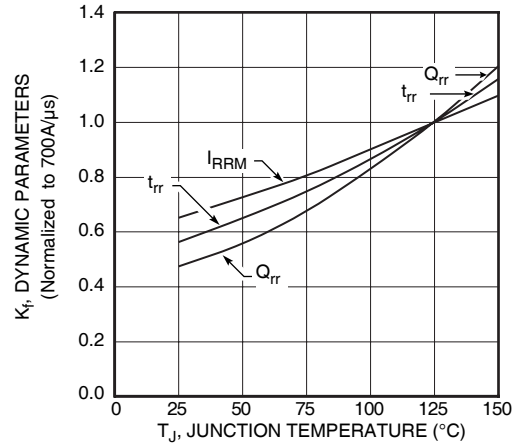


Figure 6. Dynamic Parameters *vs.* Junction Temperature

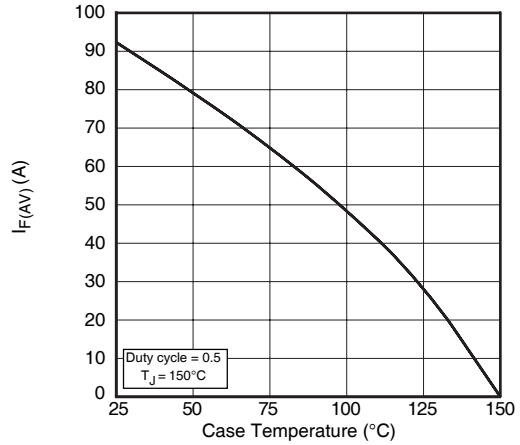


Figure 7. Maximum Average Forward Current *vs.* CaseTemperature

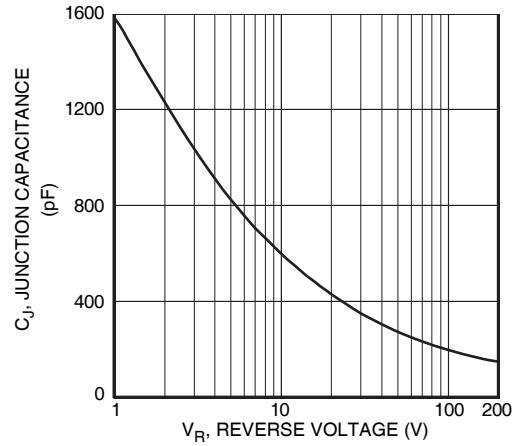


Figure 8. Junction Capacitance *vs.* Reverse Voltage

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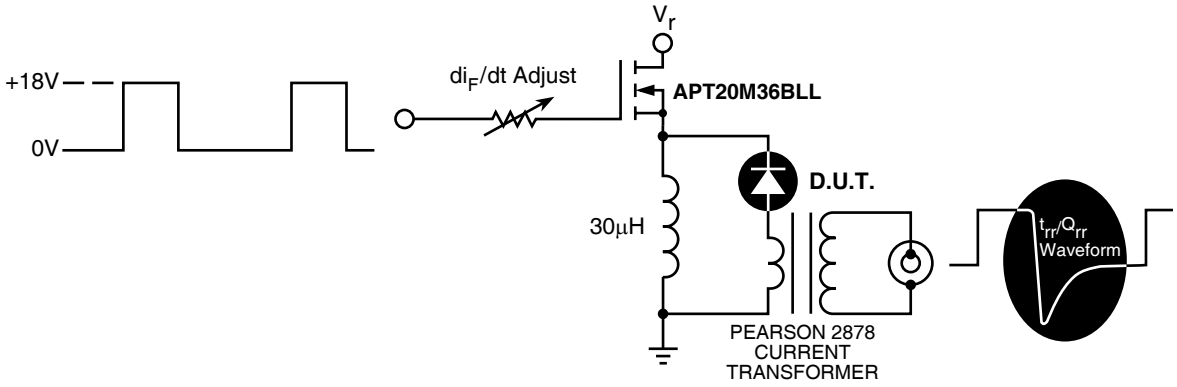
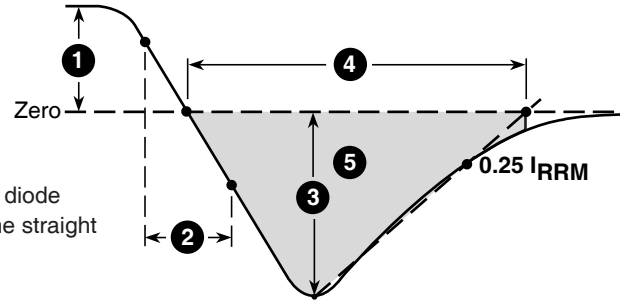


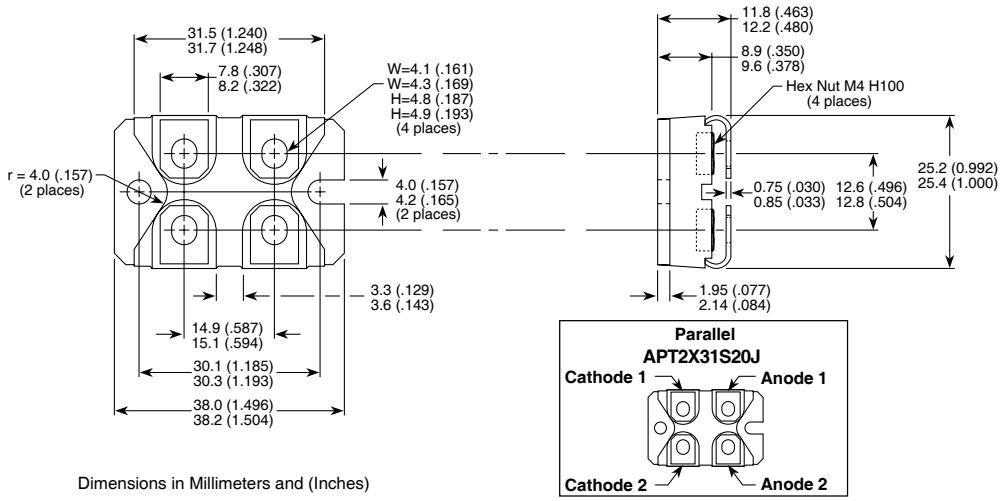
Figure 9. Diode Test Circuit



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 $0.25 \bullet I_{RRM}$ 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 Package Outline



Dimensions in Millimeters and (Inches)

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