

APT2X30D100J 1000V 30A
APT2X30D90J 900V 30A
APT2X30D80J 800V 30A

DUAL DIE ISOTOP PACKAGE

ULTRAFAST SOFT RECOVERY DUAL RECTIFIER DIODES

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

MAXIMUM RATINGS

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

Symbol	Characteristic / Test Conditions	APT2X30D100J-90J-80J	UNIT
V_R	Maximum D.C. Reverse Voltage	1000-900-800	Volts
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		
V_{RWM}	Maximum Working Peak Reverse Voltage		
$I_F(AV)$	Maximum Average Forward Current ($T_C = 85^\circ\text{C}$, Duty Cycle = 0.5)	30	Amps
$I_F(RMS)$	RMS Forward Current	70	
I_{FSM}	Non-Repetitive Forward Surge Current ($T_J = 45^\circ\text{C}$, 8.3mS)	210	
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			2.3	Volts
				$I_F = 30\text{A}$	
				$I_F = 60\text{A}$	
I_{RM}	Maximum Reverse Leakage Current			1.9	μA
				$I_F = 30\text{A}, T_J = 150^\circ\text{C}$	
				$V_R = V_R \text{ Rated}$	
	$V_R = V_R \text{ Rated}, T_J = 125^\circ\text{C}$			500	
C_T	Junction Capacitance, $V_R = 200\text{V}$		30		pF
L_S	Series Inductance (Lead to Lead 5mm from Base)		10		nH

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DYNAMIC CHARACTERISTICS

APT2X30D100J-90J-80J

Symbol	Characteristic	MIN	TYP	MAX	UNIT
t_{rr1}	Reverse Recovery Time, $I_F = 1.0A$, $di_F/dt = -15A/\mu S$, $V_R = 30V$, $T_J = 25^\circ C$		60	75	nS
t_{rr2}	Reverse Recovery Time	$T_J = 25^\circ C$	60	75	
t_{rr3}	$I_F = 30A$, $di_F/dt = -240A/\mu S$, $V_R = 540V$	$T_J = 100^\circ C$	120	200	
t_{fr1}	Forward Recovery Time	$T_J = 25^\circ C$	200		
t_{fr2}	$I_F = 30A$, $di_F/dt = 240A/\mu S$, $V_R = 540V$	$T_J = 100^\circ C$	200		
I_{RRM1}	Reverse Recovery Current	$T_J = 25^\circ C$	6	13	Amps
I_{RRM2}	$I_F = 30A$, $di_F/dt = -240A/\mu S$, $V_R = 540V$	$T_J = 100^\circ C$	10	18	
Q_{rr1}	Recovery Charge	$T_J = 25^\circ C$	180	490	nC
Q_{rr2}	$I_F = 30A$, $di_F/dt = -240A/\mu S$, $V_R = 540V$	$T_J = 100^\circ C$	600	1800	
V_{fr1}	Forward Recovery Voltage	$T_J = 25^\circ C$	9		Volts
V_{fr2}	$I_F = 30A$, $di_F/dt = 240A/\mu S$, $V_R = 540V$	$T_J = 100^\circ C$	9		
diM/dt	Rate of Fall of Recovery Current	$T_J = 25^\circ C$	450		A/ μS
	$I_F = 30A$, $di_F/dt = -240A/\mu S$, $V_R = 540V$ (See Figure 10)	$T_J = 100^\circ C$	250		

THERMAL AND MECHANICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance			0.90	$^\circ C/W$
$R_{\theta JA}$	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

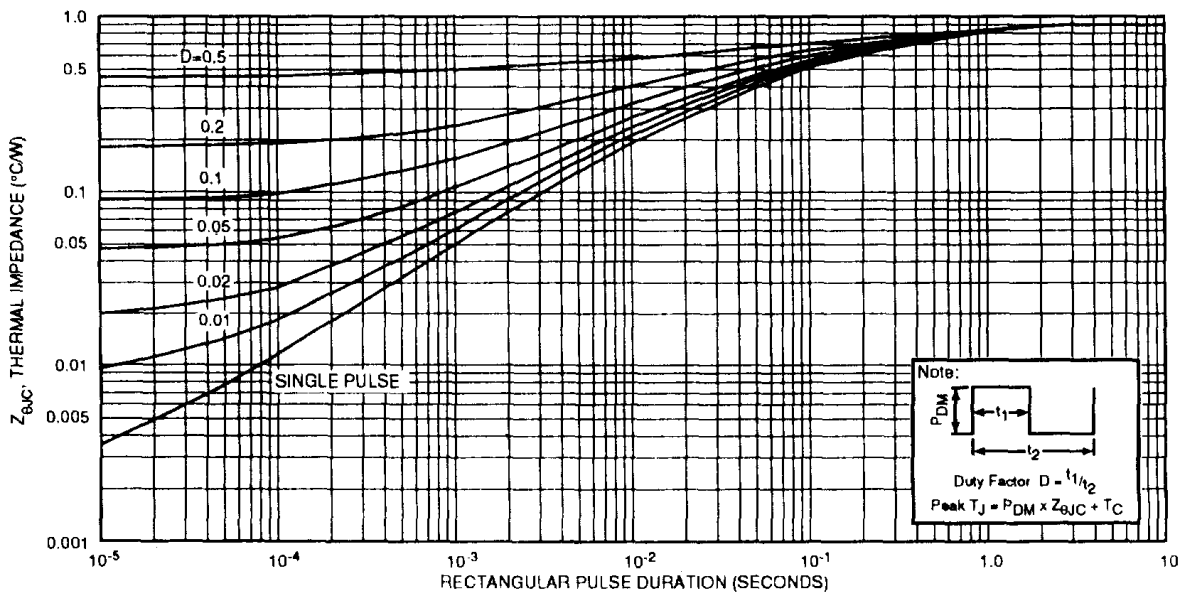
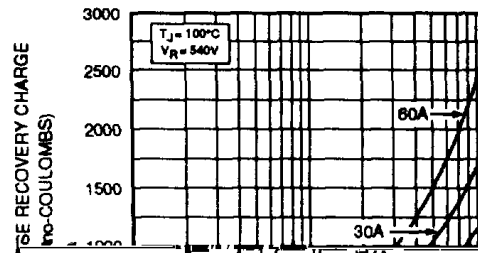
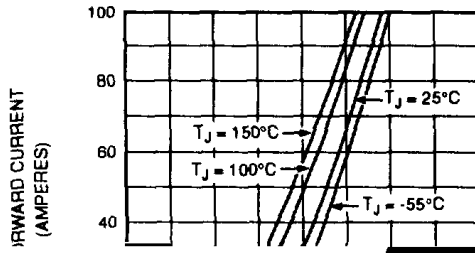


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

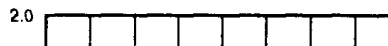
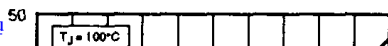
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V_F , ANODE-TO-CATHODE VOLTAGE (VOLTS)
Figure 2, Forward Voltage Drop vs Forward Current

di_F/dt , CURRENT SLEW RATE (AMPERES/ μSEC)
Figure 3, Reverse Recovery Charge vs Current Slew Rate



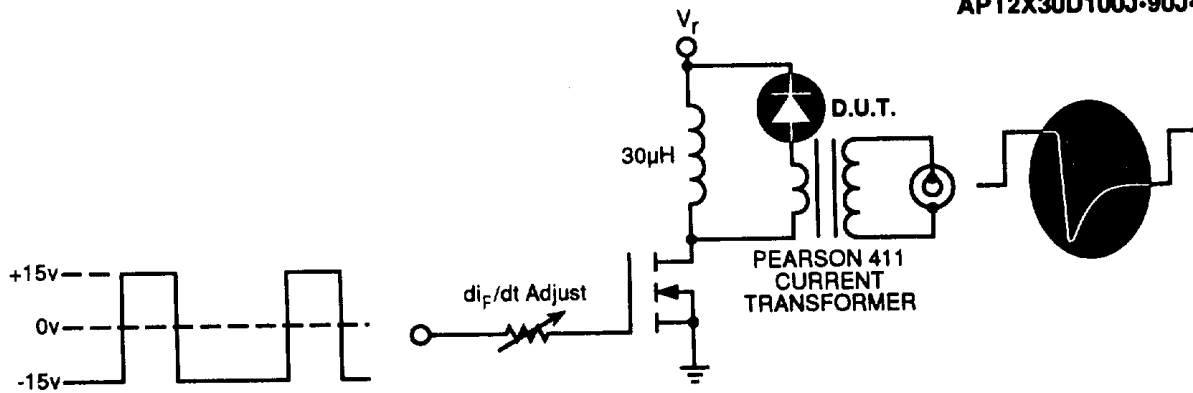


Figure 9, Diode Reverse Recovery Test Circuit and Waveforms

- 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} .

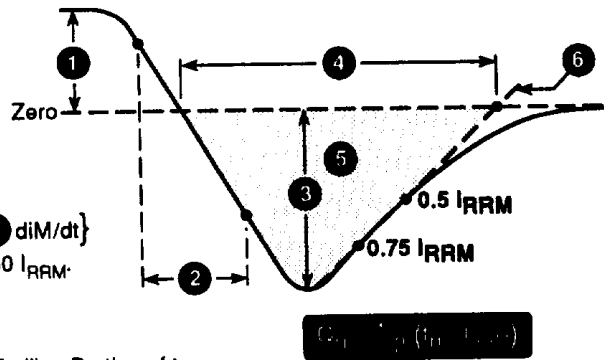
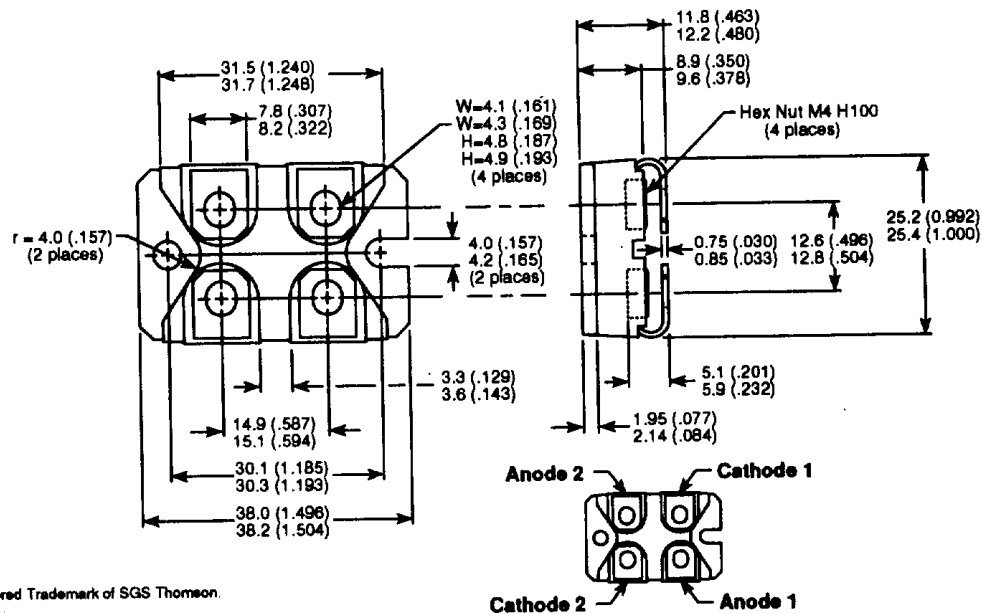


Figure 10, Diode Reverse Recovery Waveform and Definitions

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)