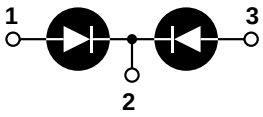
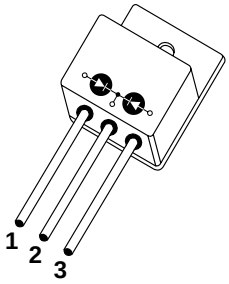


1 - Anode 1
2 - Common Cathode
3 - Anode 2



ADVANCED POWER TECHNOLOGY®

APT30D40HCT 400V 2x30A

ULTRAFAST SOFT RECOVERY RECTIFIER DIODES

PRODUCT APPLICATIONS	PRODUCT FEATURES	PRODUCT BENEFITS
• 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 • Hermetic TO-258 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 Are Per Leg: T_C = 25°C unless otherwise specified.

Symbol	Characteristic / Test Conditions	APT30D40HCT	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 = 85°C, Duty Cycle = 0.5)	30	Amps
$I_F(RMS)$	RMS Forward Current	70	
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
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	I_F = 30A			1.75	Volts
		I_F = 60A		1.85		
		I_F = 30A, T_J = 150°C			1.55	
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			52		pF
L_S	Series Inductance (Lead to Lead 5mm from Base)			TBD		nH

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

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053-4018 Rev A

DYNAMIC CHARACTERISTICS

Symbol	Characteristic		MIN	TYP	MAX	UNIT
t_{rr1}	Reverse Recovery Time, I_F = 30A, di_F/dt = -100A/µs, V_R = 50V, T_J = 25°C			40	60	ns
t_{rr2}	Reverse Recovery Time	T_J = 25°C		45		
t_{rr3}	I_F = 30A, di_F/dt = -240A/µs, V_R = 240V	T_J = 100°C		70		
t_{fr1}	Forward Recovery Time	T_J = 25°C		150		
t_{fr2}	I_F = 30A, di_F/dt = 240A/µs, V_R = 240V	T_J = 100°C		150		
I_{RRM1}	Reverse Recovery Current	T_J = 25°C		2.2	5	Amps
I_{RRM2}	I_F = 30A, di_F/dt = -100A/µs, V_R = 50V	T_J = 100°C		5		
Q_{rr1}	Recovery Charge	T_J = 25°C		135		nC
Q_{rr2}	I_F = 30A, di_F/dt = -240A/µs, V_R = 240V	T_J = 100°C		350		
V_{fr1}	Forward Recovery Voltage	T_J = 25°C		3.2		Volts
V_{fr2}	I_F = 30A, di_F/dt = 240A/µs, V_R = 240V	T_J = 100°C		3.2		
diM/dt	Rate of Fall of Recovery Current	T_J = 25°C		500		A/µs
	I_F = 30A, di_F/dt = -240A/µs, V_R = 240V (See Figure 10)	T_J = 100°C		500		

THERMAL AND MECHANICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance			1.2	°C/W
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance			40	

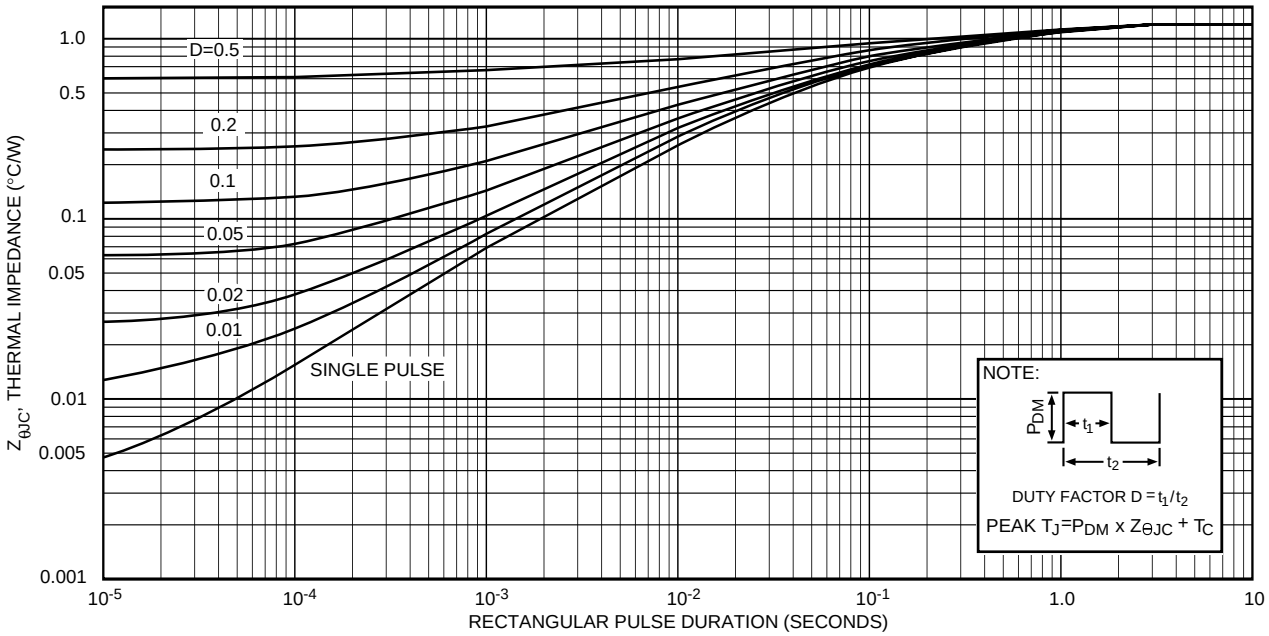


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

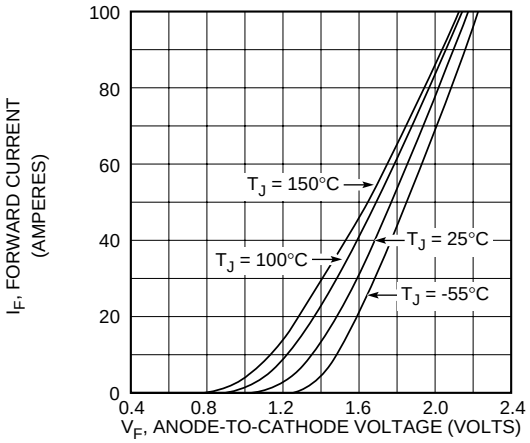


Figure 2, Forward Voltage Drop vs Forward Current

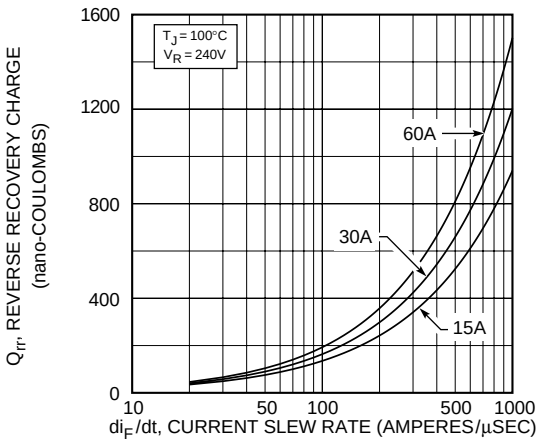


Figure 3, Reverse Recovery Charge vs Current Slew Rate

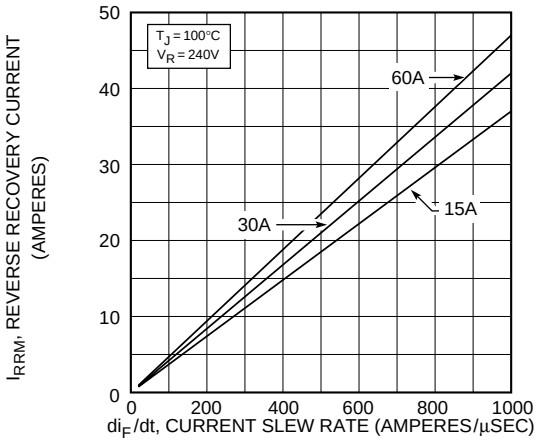


Figure 4, Reverse Recovery Current vs Current Slew Rate

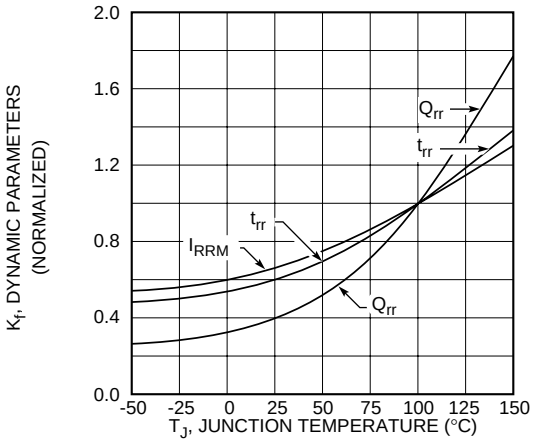


Figure 5, Dynamic Parameters vs Junction Temperature

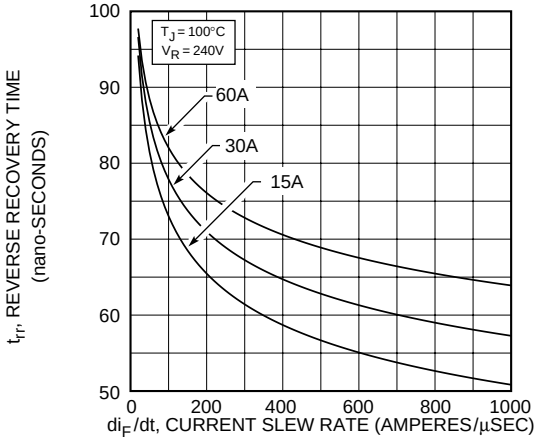


Figure 6, Reverse Recovery Time vs Current Slew Rate

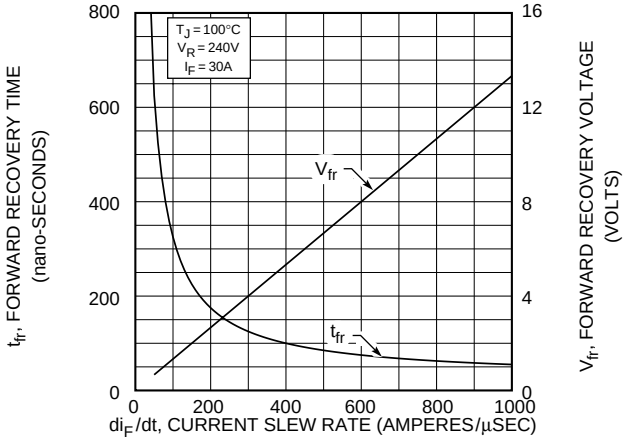


Figure 7, Forward Recovery Voltage/Time vs Current Slew Rate

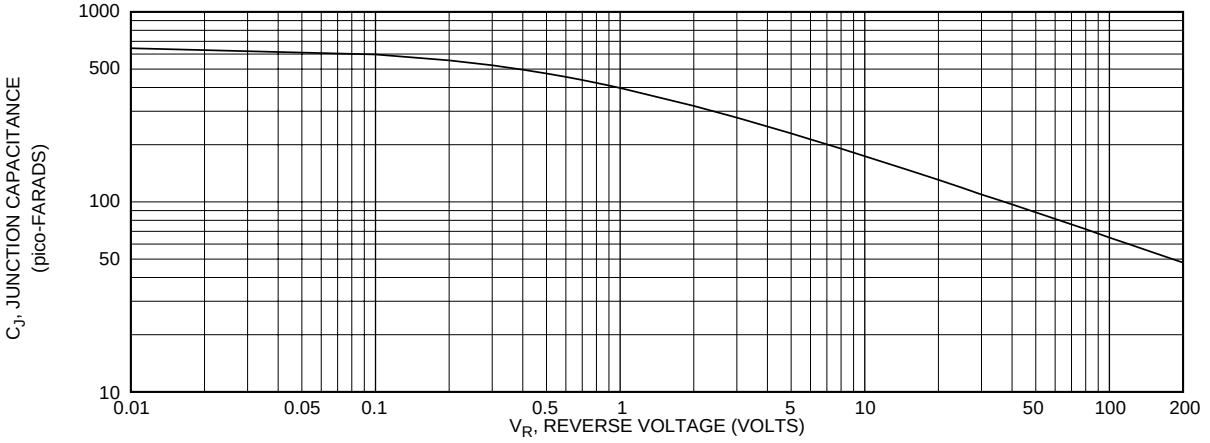


Figure 8, Junction Capacitance vs Reverse Voltage

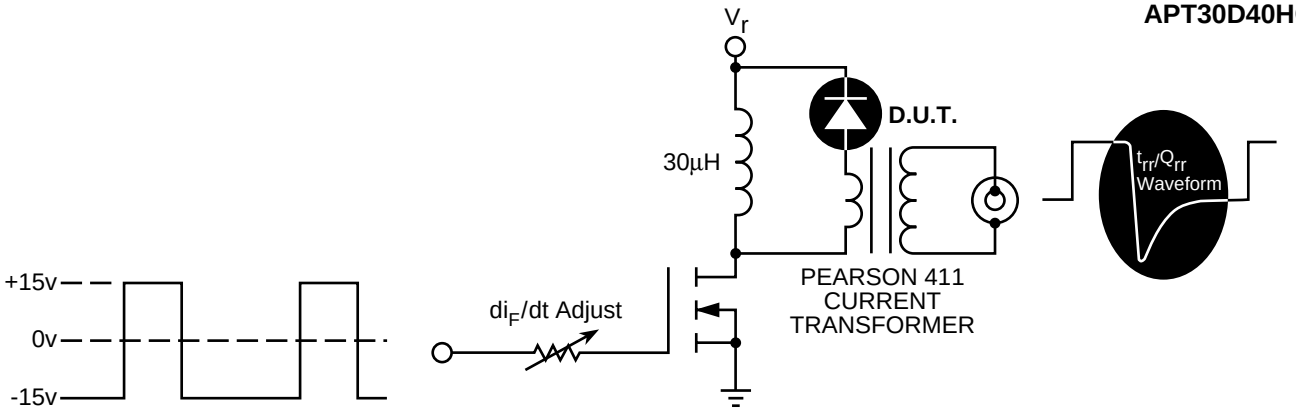


Figure 9, Diode Reverse Recovery Test Circuit and Waveforms

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}.

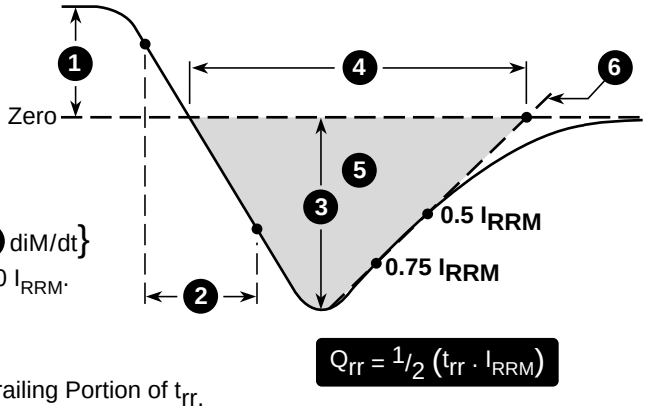
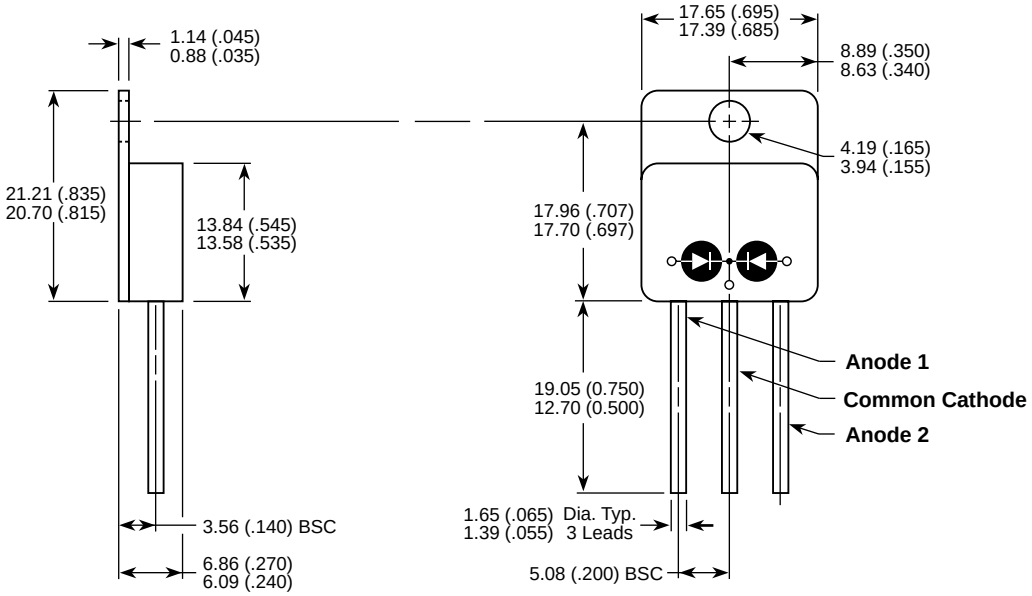


Figure 10, Diode Reverse Recovery Waveform and Definitions

TO-258AA Package Outline



Dimensions in Millimeters and (Inches)

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