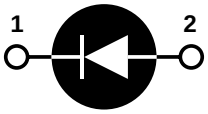
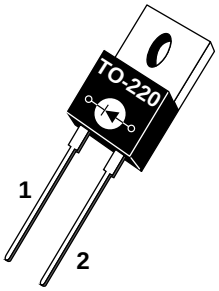


1 - Cathode
2 - Anode
Back of Case - Cathode



ADVANCED POWER TECHNOLOGY®

APT15D100K 1000V 15A

ULTRAFAST SOFT RECOVERY RECTIFIER DIODE

PRODUCT APPLICATIONS

- Anti-Parallel Diode
  - -Switchmode Power Supply
  - -Inverters
- Free Wheeling Diode
  - -Motor Controllers
  - -Converters
- Snubber Diode
- Uninterruptible Power Supply (UPS)
- Induction Heating
- High Speed Rectifiers

PRODUCT FEATURES

- Ultrafast Recovery Times
- Soft Recovery Characteristics
- Popular TO-220 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	APT15D100K	UNIT
V_R	Maximum D.C. Reverse Voltage	1000	Volts
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		
V_{RWM}	Maximum Working Peak Reverse Voltage		
I_F(AV)	Maximum Average Forward Current (T_C = 90°C, Duty Cycle = 0.5)	15	Amps
I_F(RMS)	RMS Forward Current	25	
I_{FSM}	Non-Repetitive Forward Surge Current (T_J = 45°C, 8.3ms)	80	
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 = 15A			2.3	Volts
		I_F = 30A		2.4		
		I_F = 15A, T_J = 150°C			1.9	
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			12		pF
L_S	Series Inductance (Lead to Lead 5mm from Base)			10		nH

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

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405 S.W. Columbia Street Bend, Oregon 97702-1035 Phone: (541) 382-8028 FAX: (541) 388-0364
EUROPE
Avenue J.F. Kennedy Bât B4 Parc Cadéra Nord F-33700 Merignac - France Phone: (33) 5 57 92 15 15 FAX: (33) 5 56 47 97 61

053-0010 Rev C

DYNAMIC CHARACTERISTICS

Symbol	Characteristic		MIN	TYP	MAX	UNIT
t_{rr1}	Reverse Recovery Time, I_F = 1.0A, di_F/dt = -15A/µs, V_R = 30V, T_J = 25°C			60	75	ns
t_{rr2}	Reverse Recovery Time	T_J = 25°C		60		ns
t_{rr3}	I_F = 15A, di_F/dt = -100A/µs, V_R = 540V	T_J = 100°C		120		ns
t_{fr1}	Forward Recovery Time	T_J = 25°C		180		ns
t_{fr2}	I_F = 15A, di_F/dt = 100A/µs, V_R = 540V	T_J = 100°C		180		ns
I_{RRM1}	Reverse Recovery Current	T_J = 25°C		3.8	7	Amps
I_{RRM2}	I_F = 15A, di_F/dt = -100A/µs, V_R = 540V	T_J = 100°C		4.5	9	Amps
Q_{rr1}	Recovery Charge	T_J = 25°C		114		nC
Q_{rr2}	I_F = 15A, di_F/dt = -100A/µs, V_R = 540V	T_J = 100°C		270		nC
V_{fr1}	Forward Recovery Voltage	T_J = 25°C		5.8		Volts
V_{fr2}	I_F = 15A, di_F/dt = 100A/µs, V_R = 540V	T_J = 100°C		5.8		Volts
diM/dt	Rate of Fall of Recovery Current	T_J = 25°C		100		A/µs
	I_F = 15A, di_F/dt = -100A/µs, V_R =540V (See Figure 10)	T_J = 100°C		50		A/µs

THERMAL AND MECHANICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance			1.7	°C/W
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance			80	°C/W
W_T	Package Weight		0.07		oz
			1.9		gm
Torque	Maximum Mounting Torque (Screw Type = 6-32 or 3.5mm Machine)			6.4	lb•in
				0.7	N•m

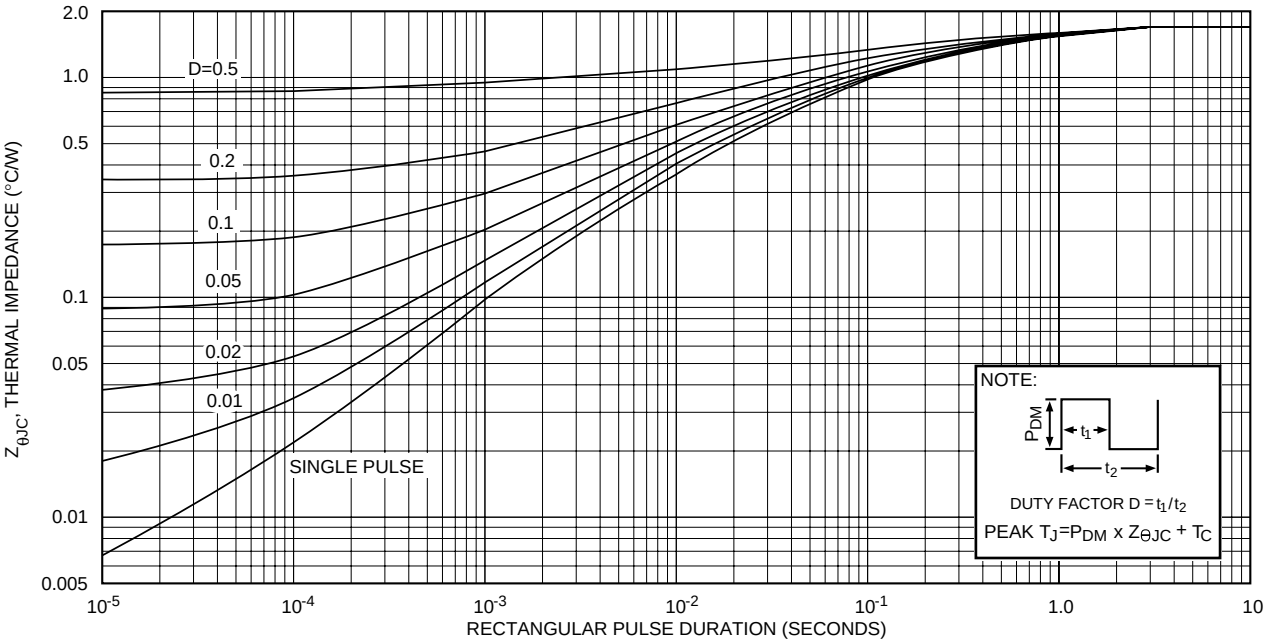


Figure 1, Maximum Effective Transient Thermal Impedance, Junction-To-Case vs Pulse Duration

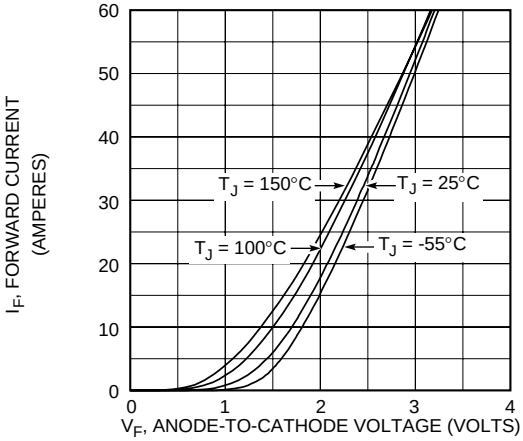


Figure 2, Forward Voltage Drop vs Forward Current

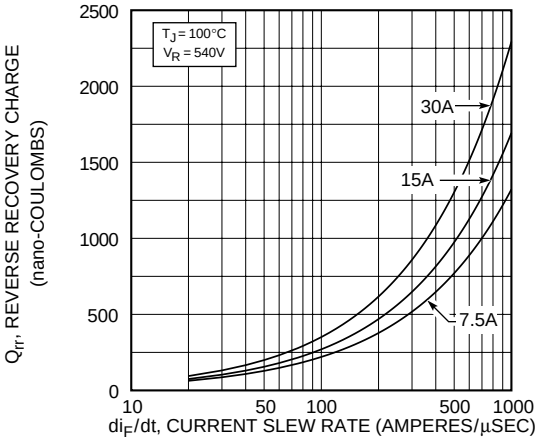


Figure 3, Reverse Recovery Charge vs Current Slew Rate

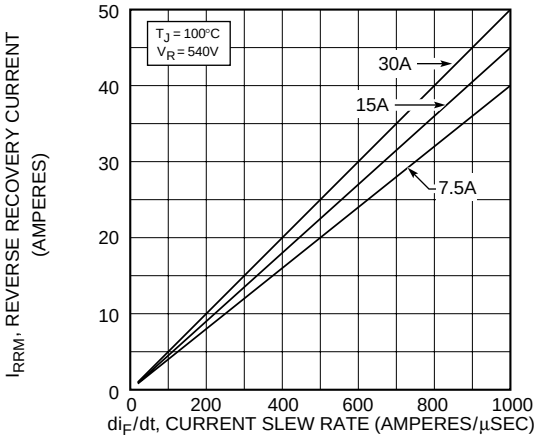


Figure 4, Reverse Recovery Current vs Current Slew Rate

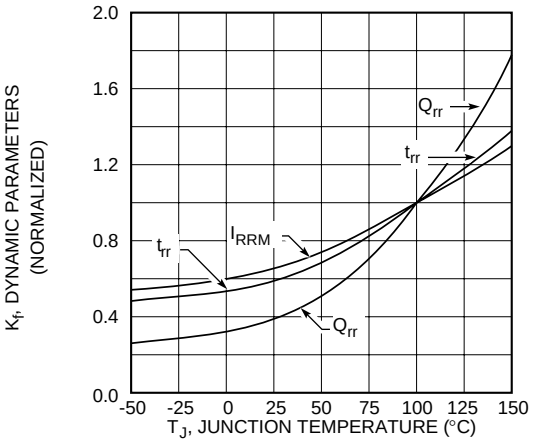


Figure 5, Dynamic Parameters vs Junction Temperature

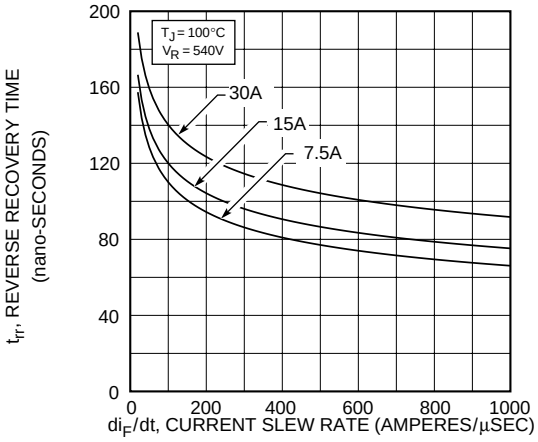


Figure 6, Reverse Recovery Time vs Current Slew Rate

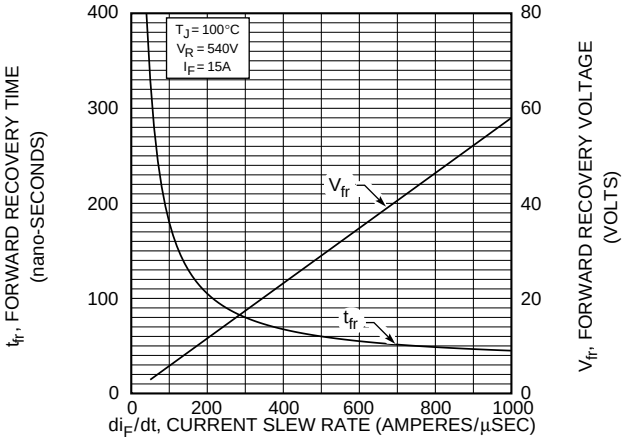


Figure 7, Forward Recovery Voltage/Time vs Current Slew Rate

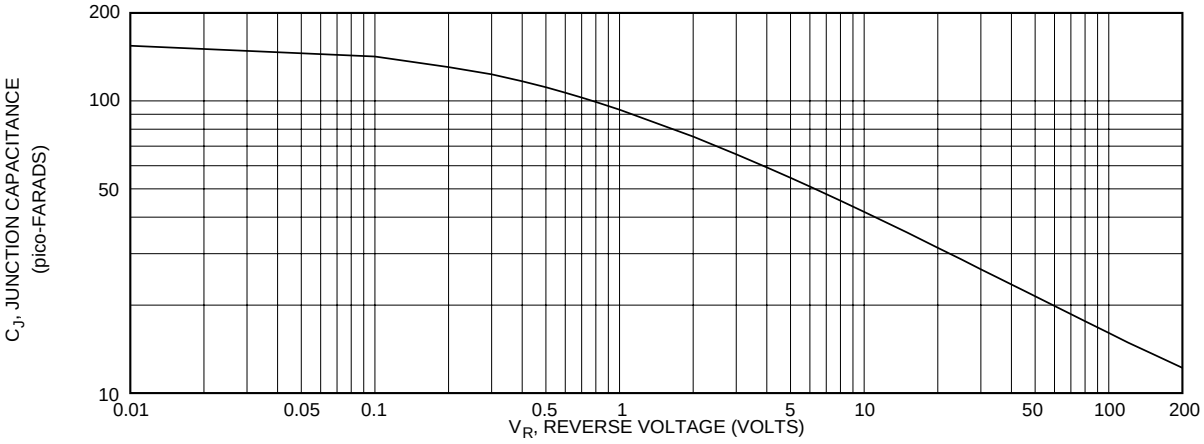


Figure 8, Junction Capacitance vs Reverse Voltage

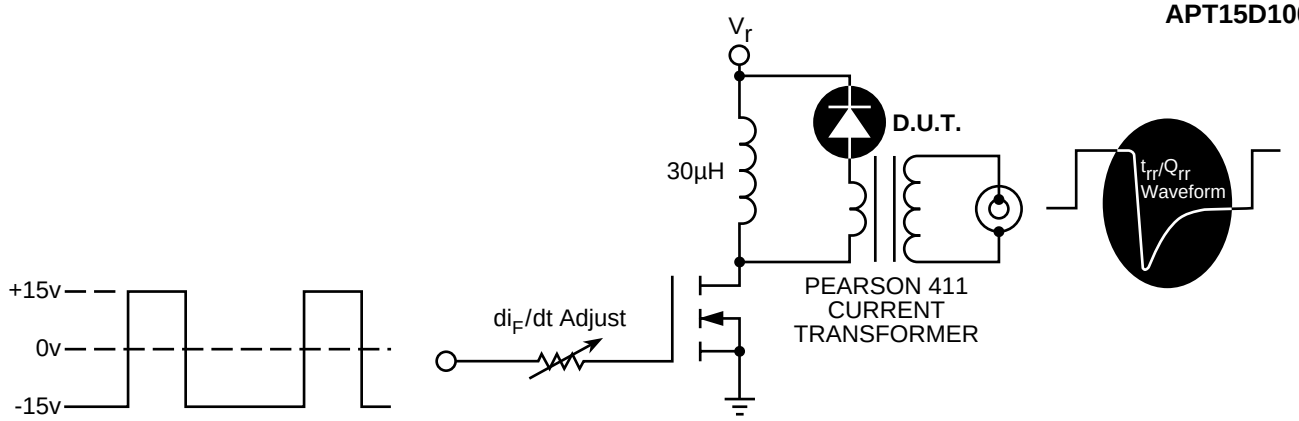


Figure 9, Diode Reverse Recovery Test Circuit and Waveforms

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}.

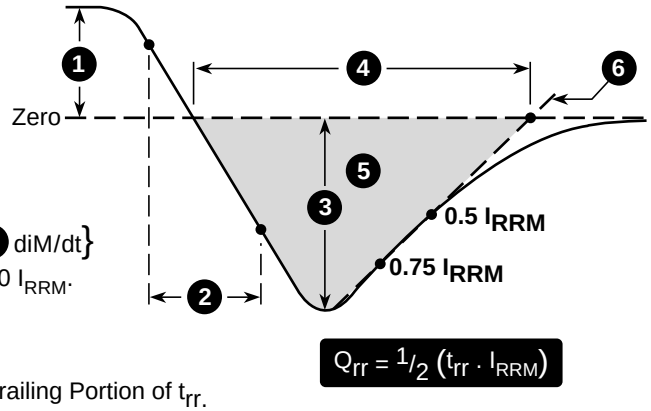
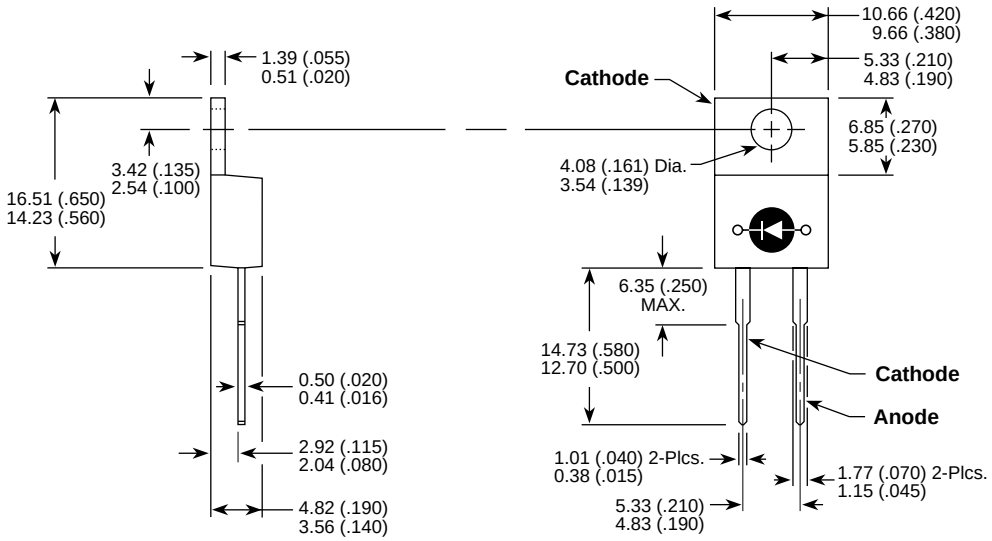


Figure 10, Diode Reverse Recovery Waveform and Definitions

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

TO-220AB Package Outline



Dimensions in Millimeters and (Inches)

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