

Ultrasoft Recovery Rectifier Diode

PRODUCT APPLICATIONS

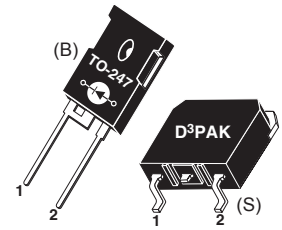
- Anti-Parallel Diode
 - Switchmode Power Supply
 - Inverters
- Applications
 - Induction Heating
- Resonant Mode Circuits
 - ZVS and ZCS Topologies
 - Phase Shifted Bridge

PRODUCT FEATURES

- Ultrasoft Recovery Times (t_{rr})
- Popular TO-247 Package or Surface Mount D³PAK Package
- Ultra Low Forward Voltage
- Low Leakage Current

PRODUCT BENEFITS

- Soft Switching - High Q_{rr}
- Low Noise Switching
 - Reduced Ringing
- Higher Reliability Systems
- Minimizes or eliminates snubber



1 - Cathode
 2 - Anode
 Back of Case - Cathode

MAXIMUM RATINGS

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

Symbol	Characteristic / Test Conditions	Ratings	Unit
V_R	Maximum D.C. Reverse Voltage	600	Volts
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		
V_{RWM}	Maximum Working Peak Reverse Voltage		
$I_{F(AV)}$	Maximum Average Forward current ($T_C = 115^\circ\text{C}$, Duty Cycle = 0.5)	75	Amps
$I_{F(RMS)}$	RMS Forward Current (Square wave, 50% duty)	225	
I_{FSM}	Non-Repetitive Forward Surge Current ($T_J = 45^\circ\text{C}$, 8.3 ms)	600	
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to 175	
T_L	Lead Temperature for 10 Seconds	300	$^\circ\text{C}$

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	Min	Typ	Max	Unit	
V_F	Forward Voltage		$I_F = 75\text{A}$	1.25	1.6	Volts
			$I_F = 150\text{A}$	2.0		
			$I_F = 75\text{A}, T_J = 125^\circ\text{C}$	1.25		
I_{RM}	Maximum Reverse Leakage Current		$V_R = 600\text{V}$		25	μA
			$V_R = 600\text{V}, T_J = 125^\circ\text{C}$		250	
C_T	Junction Capacitance, $V_R = 200\text{V}$		69		pF	

DYNAMIC CHARACTERISTICS

APT75DL60B_S(G)

Symbol	Characteristic / Test Conditions	Min	Typ	Max	Unit
t_{rr}	Reverse Recovery Time $I_F = 1A, di_F/dt = -100A/\mu s, V_R = 30V, T_J = 25^\circ C$		56		ns
t_{rr}	Reverse Recovery Time		460		
Q_{rr}	Reverse Recovery Charge		2174		nC
I_{RRM}	Maximum Reverse Recovery Current		11		
t_{rr}	Reverse Recovery Time		597		ns
Q_{rr}	Reverse Recovery Charge		4326		
I_{RRM}	Maximum Reverse Recovery Current		15		Amps
t_{rr}	Reverse Recovery Time		355		
Q_{rr}	Reverse Recovery Charge		7215		nC
I_{RRM}	Maximum Reverse Recovery Current		42		

THERMAL AND MECHANICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	Min	Typ	Max	Unit
$R_{\theta JC}$	Junction-to-Case Thermal Resistance			0.48	$^\circ C/W$
W_T	Package Weight		0.22		oz
			5.9		g
Torque	Maximum Mounting Torque			10	lb-in
				1.1	N-m

Microsemi reserves the right to change, without notice, the specifications and information contained herein.

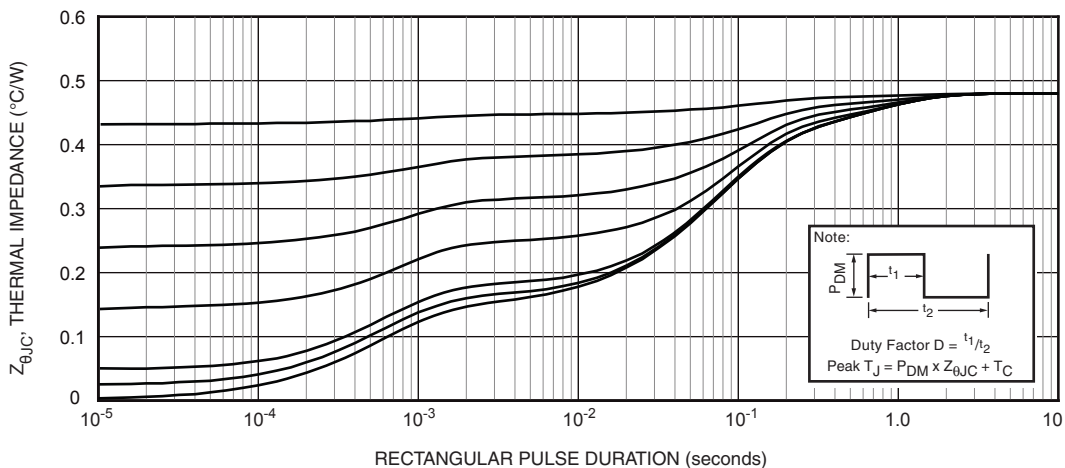


FIGURE 1a. MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs. PULSE DURATION

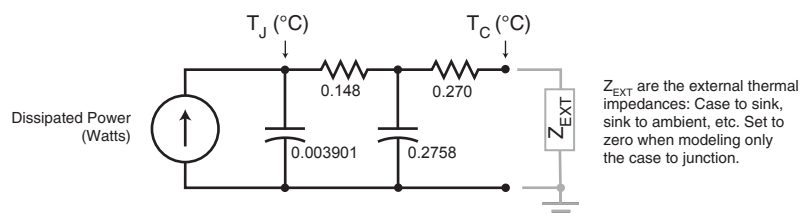


FIGURE 1b, TRANSIENT THERMAL IMPEDANCE MODEL

TYPICAL PERFORMANCE CURVES

APT75DL60B_S(G)

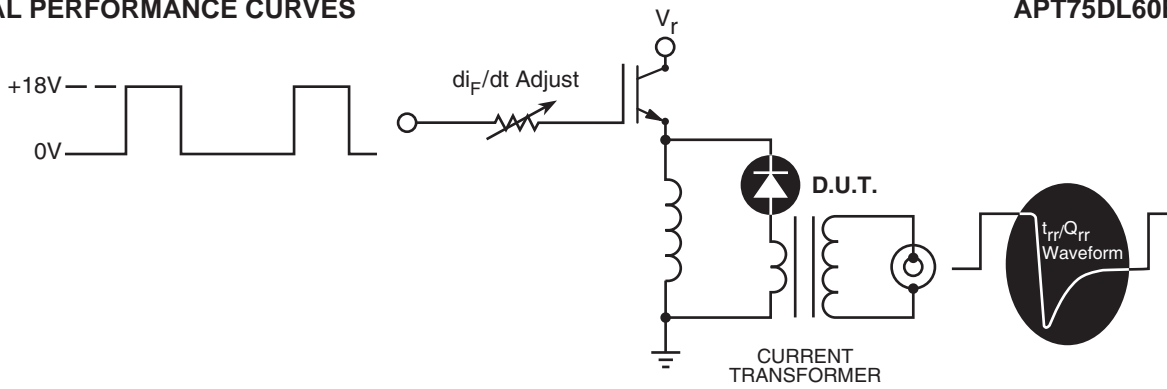


Figure 9. Diode Test Circuit

- 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} .
- 6 di_M/dt - Maximum Rate of Current Increase During the Trailing Portion of t_{rr} .

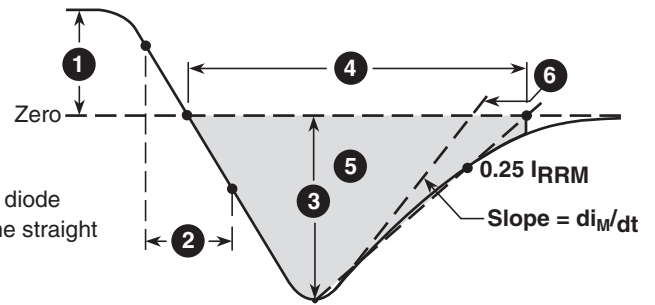
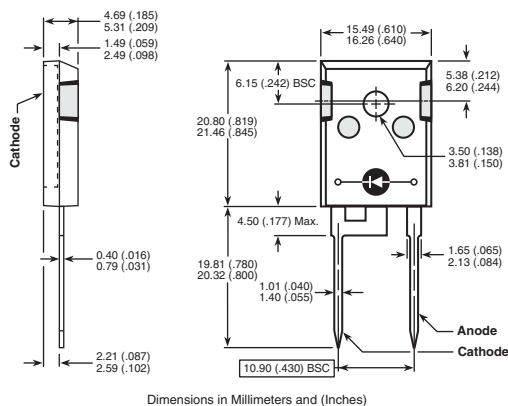


Figure 10, Diode Reverse Recovery Waveform and Definitions

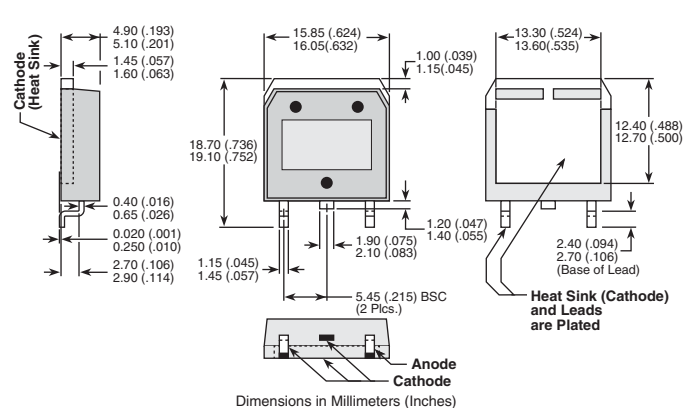
TO-247 Package Outline

e1 SAC: Tin, Silver, Copper



D³PAK Package Outline

e1 100% Sn



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