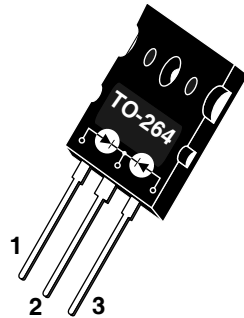


- 1 - Anode 1
- 2 - Common Cathode
- Back of Case - Cathode
- 3 - Anode 2



## APT100S20LCT(G) 200V 120A

\*G Denotes RoHS Compliant, Pb Free Terminal Finish.

# HIGH VOLTAGE SCHOTTKY DIODE

PRODUCT APPLICATIONS	PRODUCT FEATURES	PRODUCT BENEFITS
<ul style="list-style-type: none"> <li>• Parallel Diode               <ul style="list-style-type: none"> <li>-Switchmode Power Supply</li> <li>-Inverters</li> </ul> </li> <li>• Free Wheeling Diode               <ul style="list-style-type: none"> <li>-Motor Controllers</li> <li>-Converters</li> </ul> </li> <li>• Snubber Diode</li> <li>• Uninterruptible Power Supply (UPS)</li> <li>• 48 Volt Output Rectifiers</li> <li>• High Speed Rectifiers</li> </ul>	<ul style="list-style-type: none"> <li>• Ultrafast Recovery Times</li> <li>• Soft Recovery Characteristics</li> <li>• Popular TO-264 Package</li> <li>• Rugged - Avalanche Energy Rated</li> <li>• Low Forward Voltage</li> <li>• High Blocking Voltage</li> <li>• Low Leakage Current</li> </ul>	<ul style="list-style-type: none"> <li>• Low Losses</li> <li>• Low Noise Switching</li> <li>• Cooler Operation</li> <li>• Higher Reliability Systems</li> <li>• Increased System Power Density</li> </ul>

### MAXIMUM RATINGS

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

Symbol	Characteristic / Test Conditions	APT100S20LCT(G)	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 <sup>①</sup> ( $T_C = 125^\circ\text{C}$ , Duty Cycle = 0.5)	120	Amps
$I_F(RMS)$	RMS Forward Current (Square wave, 50% duty) <sup>①</sup>	318	
$I_{FSM}$	Non-Repetitive Forward Surge Current ( $T_J = 45^\circ\text{C}$ , 8.3ms)	1000	
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$T_L$	Lead Temperature for 10 Sec.	300	
$E_{VAL}$	Avalanche Energy (2A, 50mH)	100	

### STATIC ELECTRICAL CHARACTERISTICS

Symbol		MIN	TYP	MAX	UNIT	
$V_F$	Forward Voltage		$I_F = 100\text{A}$	.89	.95	Volts
			$I_F = 200\text{A}$	1.06		
			$I_F = 100\text{A}, T_J = 125^\circ\text{C}$	.76		
$I_{RM}$	Maximum Reverse Leakage Current		$V_R = V_R \text{ Rated}$		2	mA
			$V_R = V_R \text{ Rated}, T_J = 125^\circ\text{C}$		40	
$C_T$	Junction Capacitance, $V_R = 200\text{V}$		470		pF	

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
$t_{rr}$	Reverse Recovery Time	$I_F = 100A, di_F/dt = -200A/\mu s$ $V_R = 133V, T_C = 25^\circ C$	-	70		ns
$Q_{rr}$	Reverse Recovery Charge		-	230		nC
$I_{RRM}$	Maximum Reverse Recovery Current		-	6	-	Amps
$t_{rr}$	Reverse Recovery Time	$I_F = 100A, di_F/dt = -200A/\mu s$ $V_R = 133V, T_C = 125^\circ C$	-	110		ns
$Q_{rr}$	Reverse Recovery Charge		-	690		nC
$I_{RRM}$	Maximum Reverse Recovery Current		-	11	-	Amps
$t_{rr}$	Reverse Recovery Time	$I_F = 100A, di_F/dt = -700A/\mu s$ $V_R = 133V, T_C = 125^\circ C$	-	95		ns
$Q_{rr}$	Reverse Recovery Charge		-	1750		nC
$I_{RRM}$	Maximum Reverse Recovery Current		-	32		Amps

THERMAL AND MECHANICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance			.18	$^\circ C/W$
$W_T$	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.

① Continuous current limited by package lead temperature.

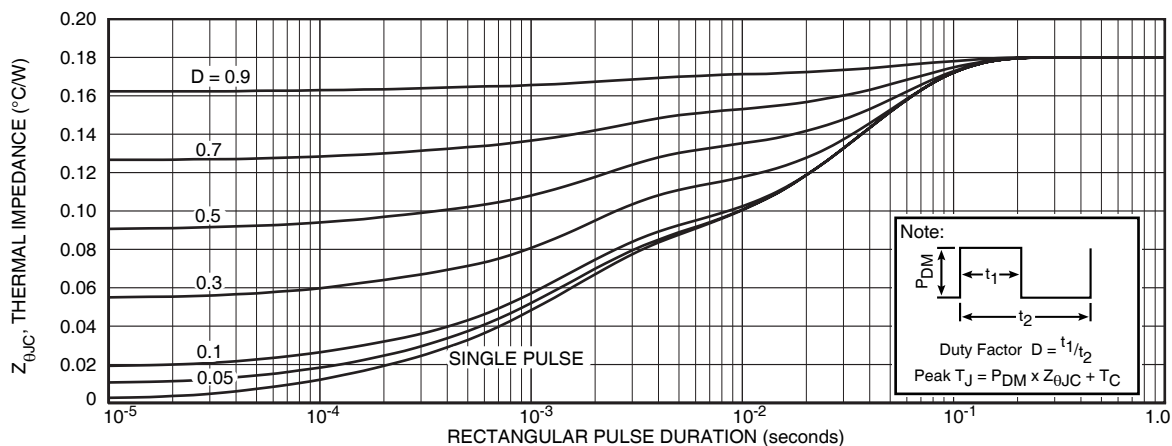
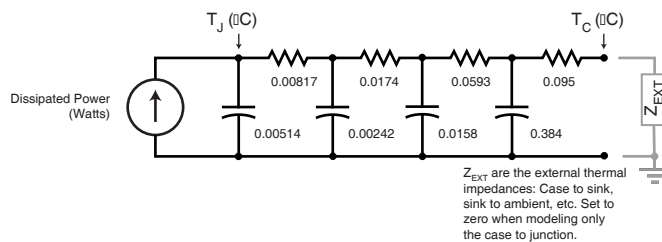


FIGURE 1a. MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs. PULSE DURATION

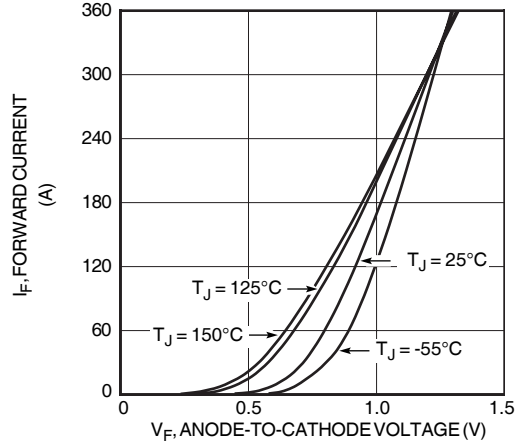


$Z_{EXT}$  are the external thermal impedances: Case to sink, sink to ambient, etc. Set to zero when modeling only the case to junction.

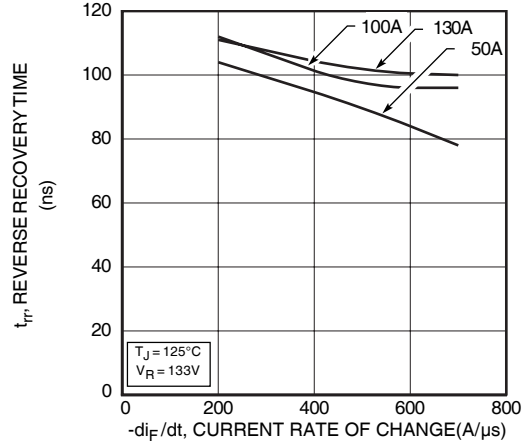
FIGURE 1b. TRANSIENT THERMAL IMPEDANCE MODEL

**TYPICAL PERFORMANCE CURVES**

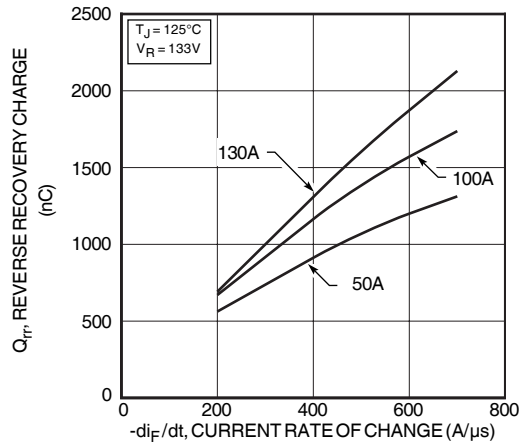
**APT100S20LCT(G)**



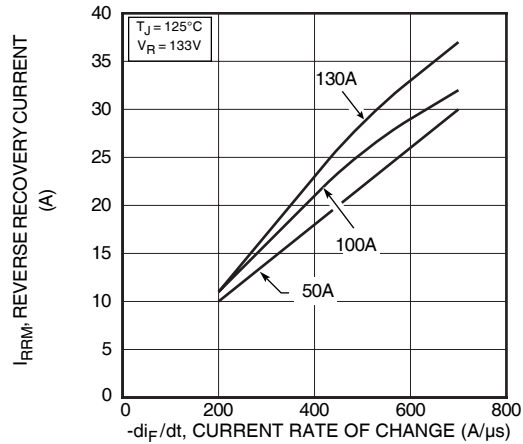
**Figure 2. Forward Current vs. Forward Voltage**



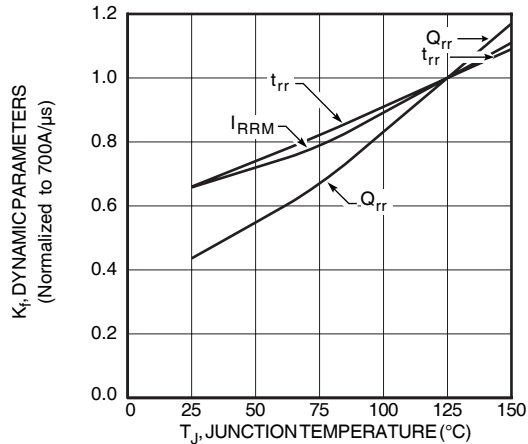
**Figure 3. Reverse Recovery Time vs. Current Rate of Change**



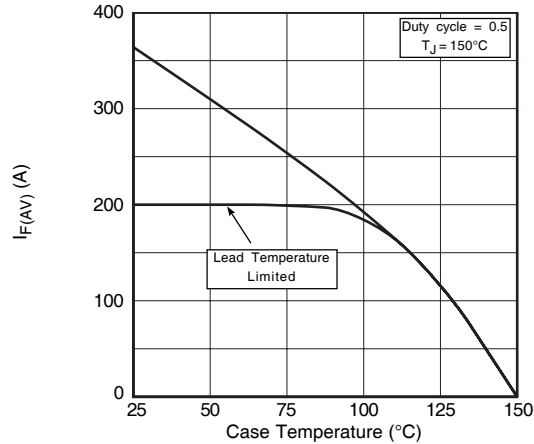
**Figure 4. Reverse Recovery Charge vs. Current Rate of Change**



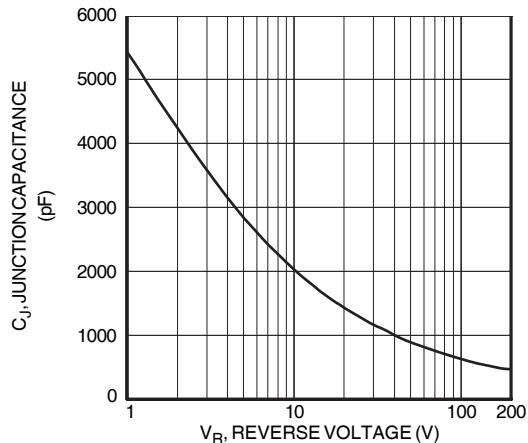
**Figure 5. Reverse Recovery Current vs. Current Rate of Change**



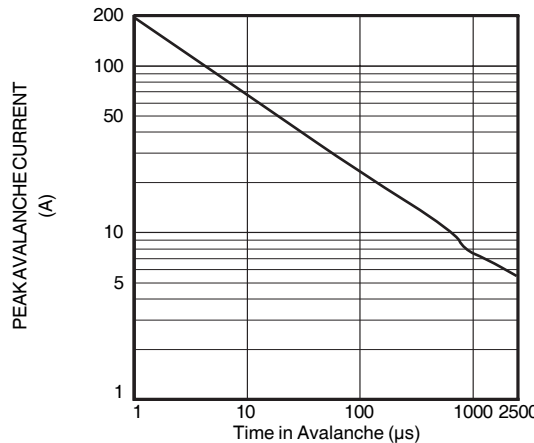
**Figure 6. Dynamic Parameters vs. Junction Temperature**



**Figure 7. Maximum Average Forward Current vs. Case Temperature**



**Figure 8. Junction Capacitance vs. Reverse Voltage**



**Figure 9. Single Pulse UIS SOA**

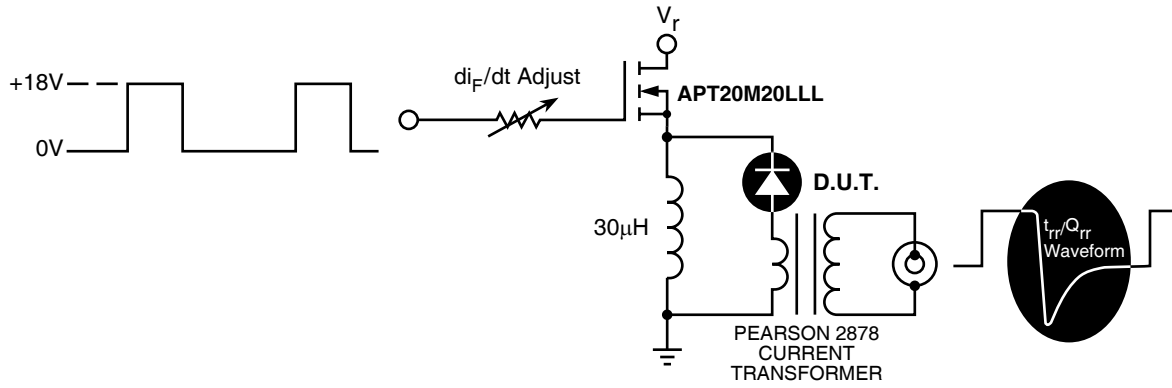


Figure 9. Diode Test Circuit

- 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  $t_{rr}$ .

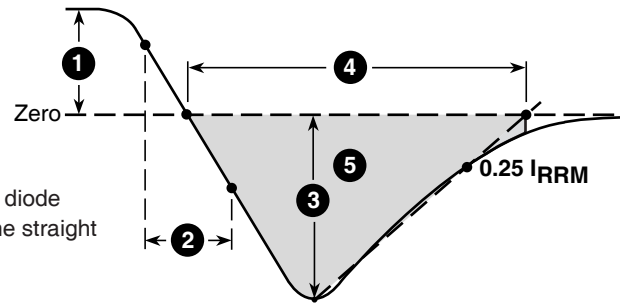


Figure 10, Diode Reverse Recovery Waveform and Definitions

### TO-264 Package Outline

