

APT1001R6BN 1000V 8.0A 1.60Ω
APT901R6BN 900V 8.0A 1.60Ω

POWER MOS iV®

N-CHANNEL ENHANCEMENT MODE HIGH VOLTAGE POWER MOSFETS

MAXIMUM RATINGS

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

Symbol	Parameter	APT901R6BN	APT1001R6BN	UNIT
V _{DSS}	Drain-Source Voltage	900	1000	Volts
I _D	Continuous Drain Current @ T _C = 25°C	8		Amps
I _{DM}	Pulsed Drain Current ①	32		
V _{GS}	Gate-Source Voltage	±30		Volts
P _D	Total Power Dissipation @ T _C = 25°C	240		Watts
	Linear Derating Factor	1.96		W/°C
T _J , T _{STG}	Operating and Storage Junction Temperature Range	-55 to 150		°C
T _L	Lead Temperature: 0.063" from Case for 10 Sec.	300		

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions / Part Number	MIN	TYP	MAX	UNIT
BV_{DSS}	Drain-Source Breakdown Voltage ($V_{GS} = 0V, I_D = 250 \mu\text{A}$)	APT1001R6BN 1000			Volts
		APT901R6BN 900			
$I_{D(ON)}$	On State Drain Current ② ($V_{DS} > I_{D(ON)} \times R_{DS(ON)}$ Max, $V_{GS} = 10V$)	8			Amps
$R_{DS(ON)}$	Drain-Source On-State Resistance ② ($V_{GS} = 10V, 0.5 I_D$ [Cont.])			1.60	Ohms
I_{DSS}	Zero Gate Voltage Drain Current ($V_{DS} = V_{DSS}, V_{GS} = 0V$)			250	μA
	Zero Gate Voltage Drain Current ($V_{DS} = 0.8 V_{DSS}, V_{GS} = 0V, T_C = 125^\circ\text{C}$)			1000	
I_{GSS}	Gate-Source Leakage Current ($V_{GS} = \pm 30V, V_{DS} = 0V$)			± 100	nA
$V_{GS(TH)}$	Gate Threshold Voltage ($V_{DS} = V_{GS}, I_D = 1.0\text{mA}$)	2		4	Volts

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.51	$^\circ\text{C/W}$
$R_{\theta JA}$	Junction to Ambient			40	



CAUTION: These Devices are Sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

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DYNAMIC CHARACTERISTICS

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Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1 \text{ MHz}$		1530	1800	pF
C_{oss}	Output Capacitance			230	325	
C_{rss}	Reverse Transfer Capacitance			80	120	
Q_g	Total Gate Charge ③	$V_{GS} = 10V$ $V_{DD} = 0.5 V_{DSS}$ $I_D = I_D [\text{Cont.}] @ 25^\circ\text{C}$		66	105	nC
Q_{gs}	Gate-Source Charge			6.5	10	
Q_{gd}	Gate-Drain ("Miller") Charge			36	54	
$t_d(\text{on})$	Turn-on Delay Time	$V_{GS} = 15V$ $V_{DD} = 0.5 V_{DSS}$ $I_D = I_D [\text{Cont.}] @ 25^\circ\text{C}$ $R_G = 1.8\Omega$		14	28	ns
t_r	Rise Time			13	26	
$t_d(\text{off})$	Turn-off Delay Time			55	82	
t_f	Fall Time			19	37	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions / Part Number	MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)			8	Amps
I_{SM}	Pulsed Source Current ① (Body Diode)			32	
V_{SD}	Diode Forward Voltage ② ($V_{GS} = 0V$, $I_S = -I_D [\text{Cont.}]$)			1.3	Volts
t_{rr}	Reverse Recovery Time ($I_S = -I_D [\text{Cont.}]$, $dI_S/dt = 100A/\mu s$)	225	450	910	ns
Q_{rr}	Reverse Recovery Charge ($I_S = -I_D [\text{Cont.}]$, $dI_S/dt = 100A/\mu s$)	1.2	2.5	5	μC

SAFE OPERATING AREA CHARACTERISTICS

Symbol	Characteristic	Test Conditions / Part Number	MIN	TYP	MAX	UNIT
SOA1	Safe Operating Area	$V_{DS} = 0.4 V_{DSS}$, $I_{DS} = P_D / 0.4 V_{DSS}$, $t = 1 \text{ Sec.}$	240			Watts
SOA2	Safe Operating Area	$I_{DS} = I_D [\text{Cont.}]$, $V_{DS} = P_D / I_D [\text{Cont.}]$, $t = 1 \text{ Sec.}$	240			
I_{LM}	Inductive Current Clamped		32			Amps

① Repetitive Rating: Pulse width limited by maximum junction temperature. See Transient Thermal Impedance Curve. (Fig.1)

② Pulse Test: Pulse width < 380 μs , Duty Cycle < 2%

③ See MIL-STD-750 Method 3471

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

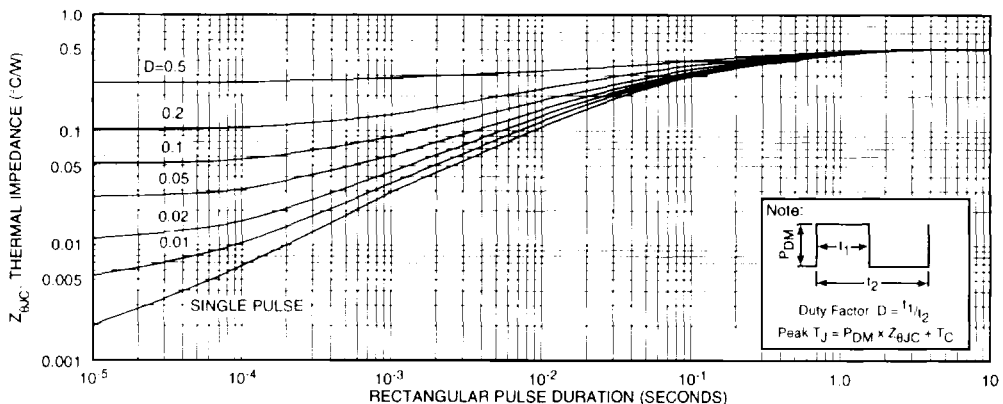


FIGURE 1. MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

APT1001R6/901R6BN

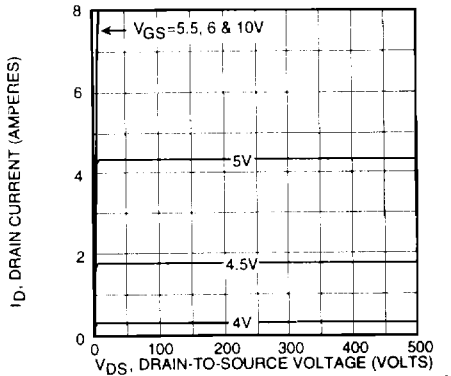


FIGURE 2. TYPICAL OUTPUT CHARACTERISTICS

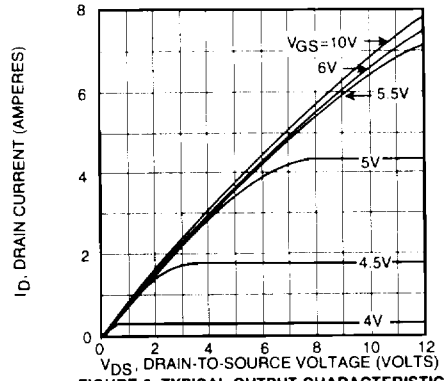


FIGURE 3. TYPICAL OUTPUT CHARACTERISTICS

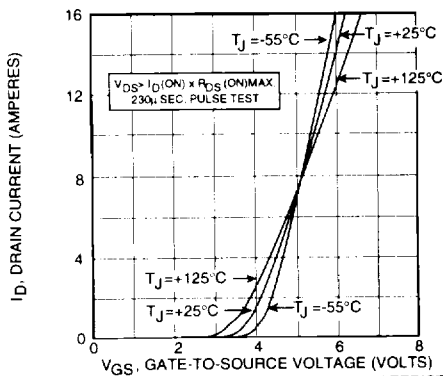


FIGURE 4. TYPICAL TRANSFER CHARACTERISTICS

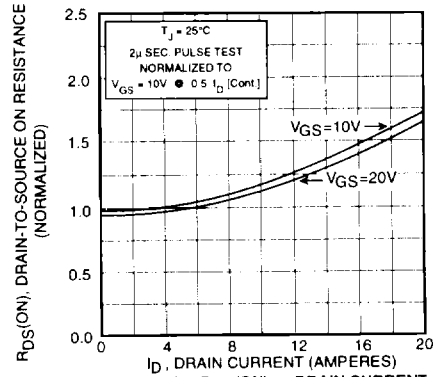


FIGURE 5. $R_{DS(ON)}$ vs DRAIN CURRENT

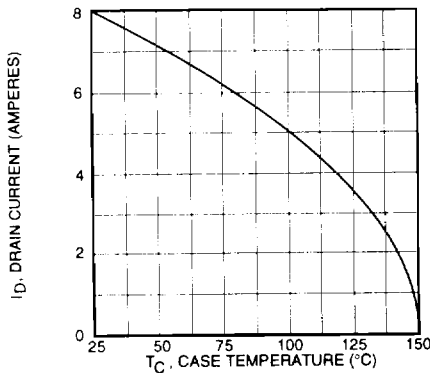


FIGURE 6. MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

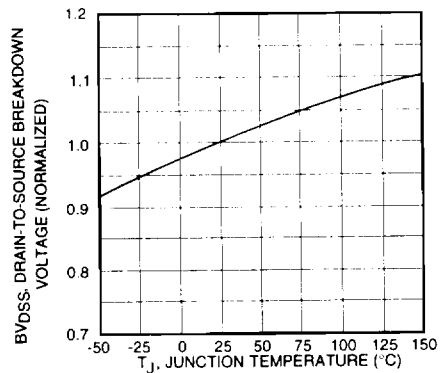


FIGURE 7. BREAKDOWN VOLTAGE vs TEMPERATURE

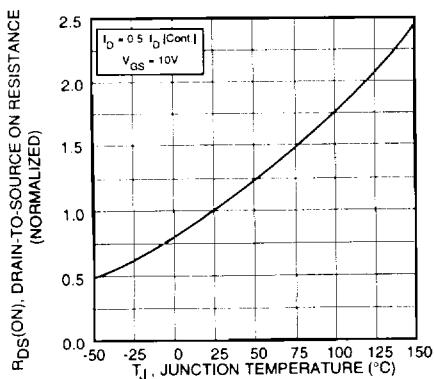


FIGURE 8. ON-RESISTANCE vs. TEMPERATURE

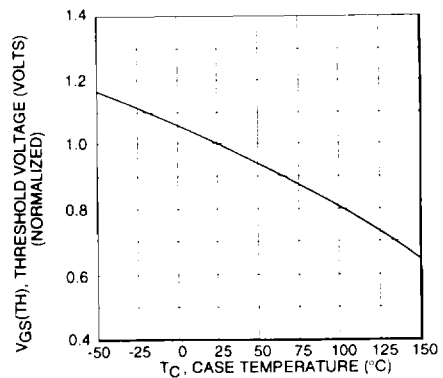


FIGURE 9. THRESHOLD VOLTAGE vs TEMPERATURE

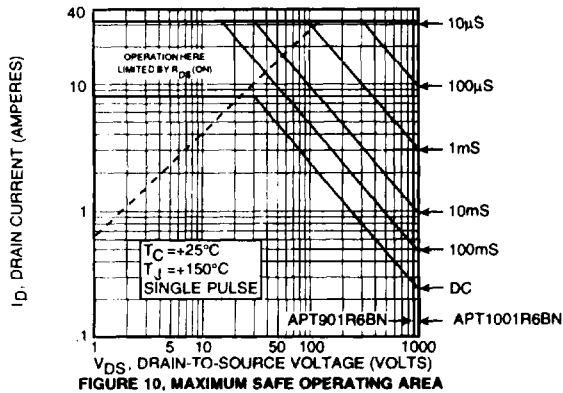


FIGURE 10. MAXIMUM SAFE OPERATING AREA

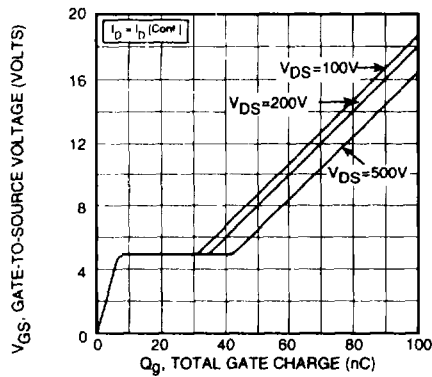


FIGURE 12. GATE CHARGES vs GATE-TO-SOURCE VOLTAGE

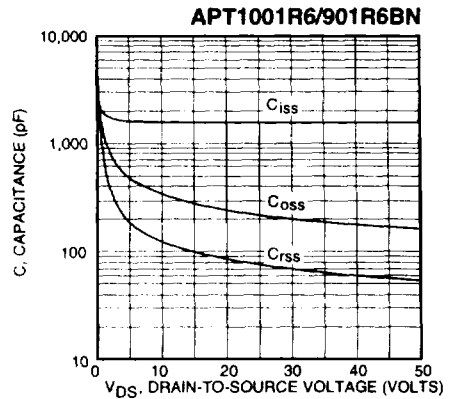


FIGURE 11. TYPICAL CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

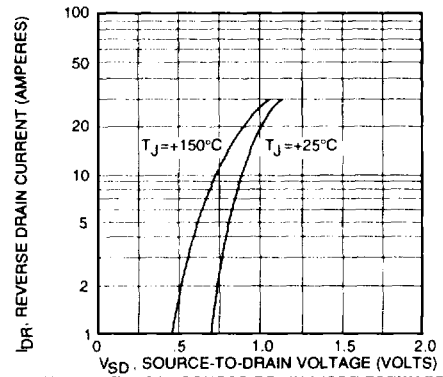


FIGURE 13. TYPICAL SOURCE-DRAIN DIODE FORWARD VOLTAGE

TO-247AD Package Outline

