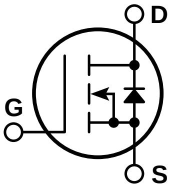

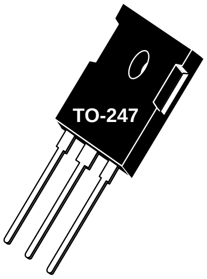

ADVANCED POWER TECHNOLOGY®

APT1001RBN 1000V 11.0A 1.00Ω

POWER MOS IV®

N-CHANNEL ENHANCEMENT MODE HIGH VOLTAGE POWER MOSFETS

MAXIMUM RATINGS

All Ratings: $T_C = 25°C$ unless otherwise specified.

Symbol	Parameter	APT 1001RBN		UNIT
V_{DSS}	Drain-Source Voltage	1000		Volts
I_D	Continuous Drain Current @ $T_C = 25°C$	11		Amps
I_{DM}	Pulsed Drain Current ①	44		
V_{GS}	Gate-Source Voltage	±30		Volts
P_D	Total Power Dissipation @ $T_C = 25°C$	310		Watts
	Linear Derating Factor	2.48		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 ($V_{GS} = 0V$, $I_D = 250\ \mu A$)	**APT1001RBN**	1000			Volts
$I_D(ON)$	On State Drain Current ② ($V_{DS} > I_D(ON) \times R_{DS}(ON)$ Max, $V_{GS} = 10V$)	**APT1001RBN**	11			Amps
$R_{DS}(ON)$	Drain-Source On-State Resistance ② ($V_{GS} = 10V$, $0.5\ I_D$ [Cont.])	**APT1001RBN**			1.00	Ohms
I_{DSS}	Zero Gate Voltage Drain Current ($V_{DS} = V_{DSS}$, $V_{GS} = 0V$)				250	µA
	Zero Gate Voltage Drain Current ($V_{DS} = 0.8\ V_{DSS}$, $V_{GS} = 0V$, $T_C = 125°C$)				1000	
I_{GSS}	Gate-Source Leakage Current ($V_{GS} = ±30V$, $V_{DS} = 0V$)				±100	nA
$V_{GS}(TH)$	Gate Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = 1.0mA$)		2		4	Volts

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.40	°C/W
$R_{\theta JA}$	Junction to Ambient			40	

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

USA
405 S.W. Columbia Street **Bend, Oregon 97702-1035** **Phone: (541) 382-8028** **FAX: (541) 388-0364**
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DYNAMIC CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1 MHz		2460	2950	pF
C_{oss}	Output Capacitance			360	500	
C_{rss}	Reverse Transfer Capacitance			105	160	
Q_g	Total Gate Charge ③	V_{GS} = 10V V_{DD} = 0.5 V_{DSS} I_D = I_D [Cont.] @ 25°C		90	130	nC
Q_{gs}	Gate-Source Charge			9.3	14	
Q_{gd}	Gate-Drain ("Miller") Charge			47	70	
t_d(on)	Turn-on Delay Time	V_{GS} = 15V V_{DD} = 0.5 V_{DSS} I_D = I_D [Cont.] @ 25°C R_G = 1.8Ω		15	30	ns
t_r	Rise Time			16	32	
t_d(off)	Turn-off Delay Time			64	95	
t_f	Fall Time			24	48	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions / Part Number		MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)	**APT1001RBN**			11	Amps
I_{SM}	Pulsed Source Current ① (Body Diode)	**APT1001RBN**			44	
V_{SD}	Diode Forward Voltage ② (V_{GS} = 0V, I_S = $-I_D$ [Cont.])				1.3	Volts
t_{rr}	Reverse Recovery Time (I_S = $-I_D$ [Cont.], dI_S/dt = 100A/µs)			636	1200	ns
Q_{rr}	Reverse Recovery Charge (I_S = $-I_D$ [Cont.], dI_S/dt = 100A/µs)			4.5	11	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 Sec.	310			Watts
SOA2	Safe Operating Area	I_{DS} = I_D [Cont.], V_{DS} = P_D / I_D [Cont.], t = 1 Sec.	310			
I_{LM}	Inductive Current Clamped	**APT1001RBN**	44			Amps

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

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

③See MIL-STD-750 Method 3471

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

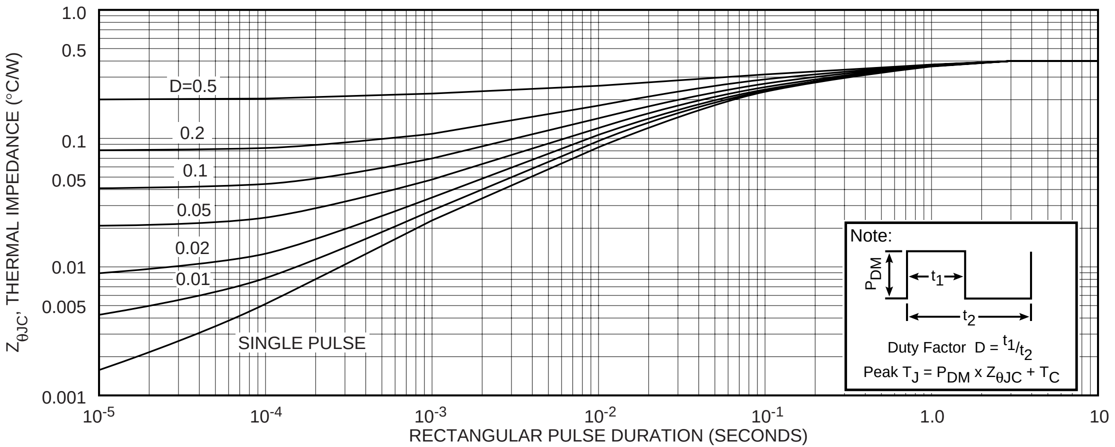


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

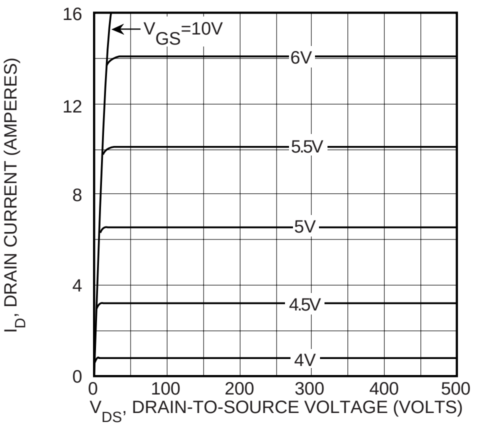


FIGURE 2, TYPICAL OUTPUT CHARACTERISTICS

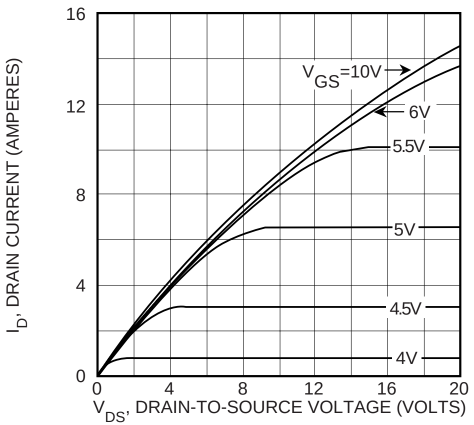


FIGURE 3, TYPICAL OUTPUT CHARACTERISTICS

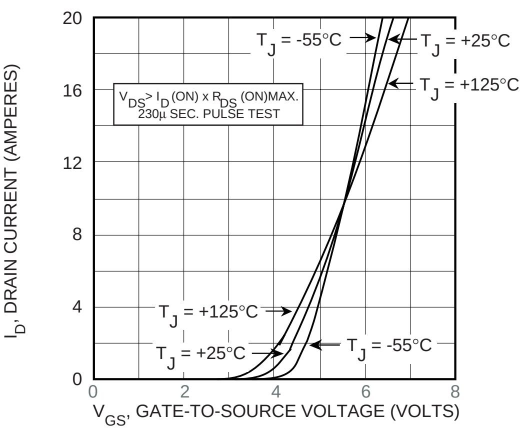


FIGURE 4, TYPICAL TRANSFER CHARACTERISTICS

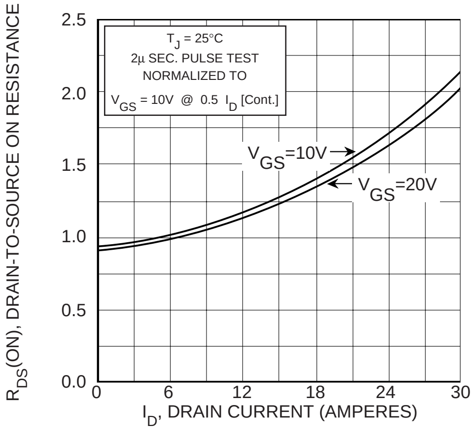


FIGURE 5, R_{DS}(ON) vs DRAIN CURRENT

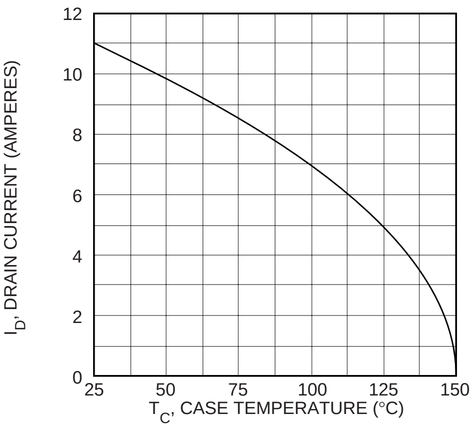


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

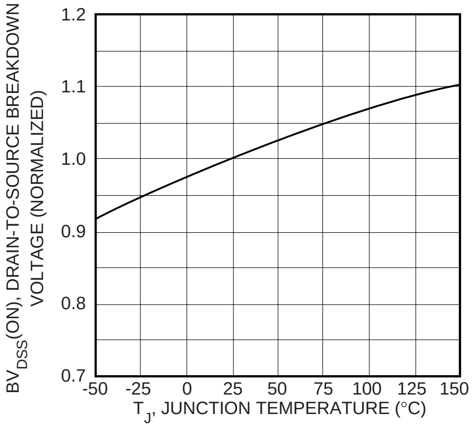


FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

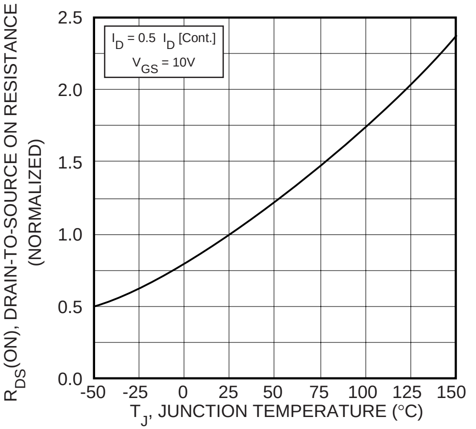


FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

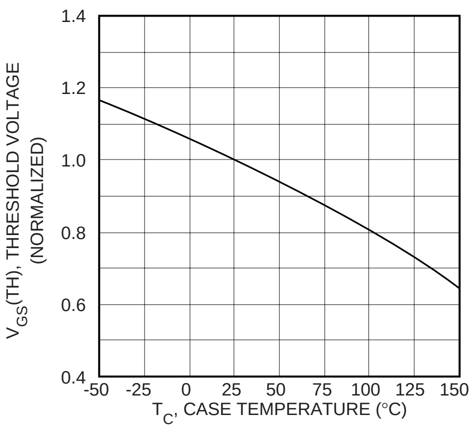


FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

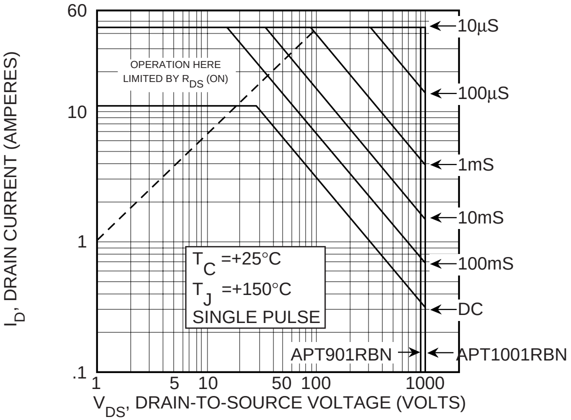


FIGURE 10, MAXIMUM SAFE OPERATING AREA

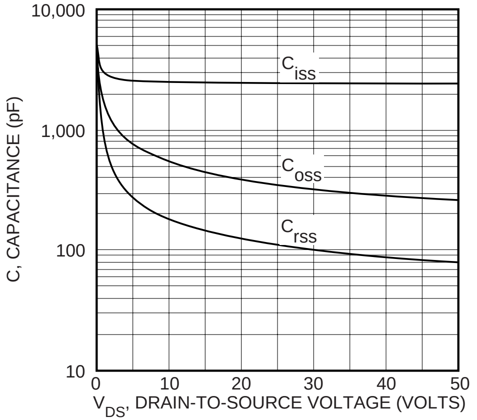


FIGURE 11, TYPICAL CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

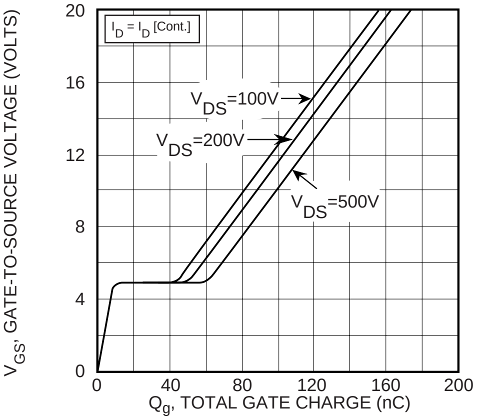


FIGURE 12, GATE CHARGES vs GATE-TO-SOURCE VOLTAGE

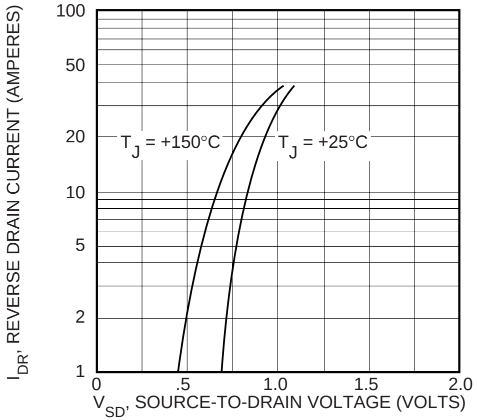
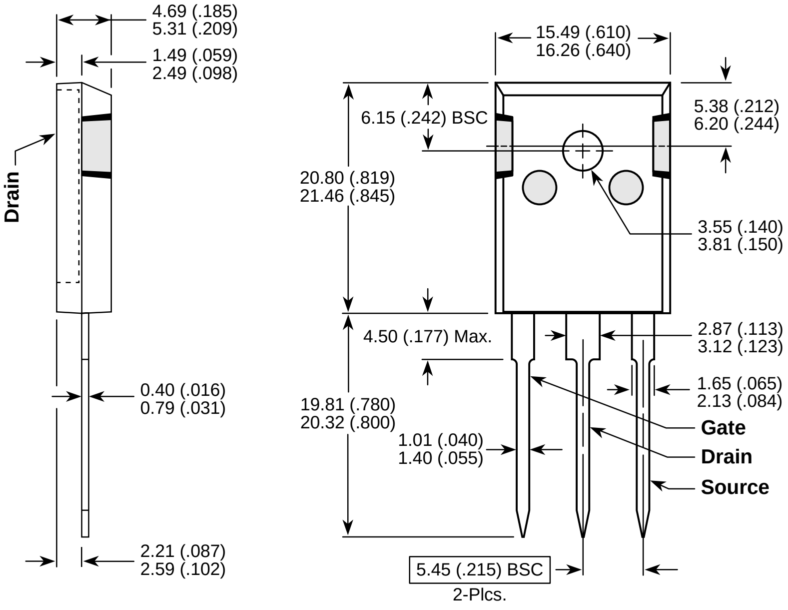


FIGURE 13, TYPICAL SOURCE-DRAIN DIODE FORWARD VOLTAGE

TO-247AD Package Outline



Dimensions in Millimeters and (Inches)