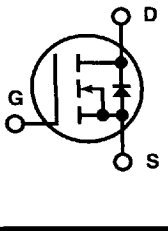

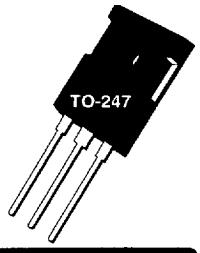

ADVANCED POWER TECHNOLOGY®

APT6060BNR 600V 13.0A 0.60Ω
APT6070BNR 600V 12.0A 0.70Ω

POWER MOS IV® **AVALANCHE RATED**

N-CHANNEL ENHANCEMENT MODE HIGH VOLTAGE POWER MOSFETS

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

Symbol	Parameter	APT6060BNR	APT6070BNR	UNIT
V_{DSS}	Drain-Source Voltage	600	600	Volts
I_D	Continuous Drain Current @ $T_C = 25°C$	13	12	Amps
I_{DM}	Pulsed Drain Current ①	52	48	
V_{GS}	Gate-Source Voltage Continuous	±20		Volts
V_{GSM}	Gate-Source Voltage Transient	±30		
P_D	Total Power Dissipation @ $T_C = 25°C$	240		Watts
	Linear Derating Factor	1.9		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		
I_{AR}	Avalanche Current ① (Repetitive and Non-Repetitive)	13		Amps
E_{AR}	Repetitive Avalanche Energy ①	20		mJ
E_{AS}	Single Pulse Avalanche Energy ④	800		

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions / Part Number		MIN	TYP	MAX	UNIT
BV_{DSS}	Drain-Source Breakdown Voltage ($V_{GS} = 0V$, $I_D = 250\ \mu A$)		600			Volts
$I_{D(ON)}$	On State Drain Current ②	APT6060BNR	13			Amps
	($V_{DS} > I_{D(ON)} \times R_{DS(ON)}$ Max, $V_{GS} = 10V$)	APT6070BNR	12			
$R_{DS(ON)}$	Drain-Source On-State Resistance ②	APT6060BNR			0.60	Ohms
	($V_{GS} = 10V$, 0.5 I_D [Cont.])	APT6070BNR			0.70	
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 ($V_{GS} = \pm 20V$, $V_{DS} = 0V$)				±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			0.51	°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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405 S.W. Columbia Street Bend, Oregon 97702-1035 Phone: (503) 382-8028 FAX: (503) 388-0364
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050-6051 Rev A

DYNAMIC CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	V_{GS} = 0V		1890		pF
C_{oss}	Output Capacitance	V_{DS} = 25V		286		
C_{rss}	Reverse Transfer Capacitance	f = 1 MHz		113		
Q_g	Total Gate Charge ③	V_{GS} = 10V		86		nC
Q_{gs}	Gate-Source Charge	V_{DD} = 0.5 V_{DSS}		9		
Q_{gd}	Gate-Drain ("Miller") Charge	I_D = I_D [Cont.] @ 25°C		49		
$t_d(on)$	Turn-on Delay Time	V_{GS} = 15V		15		ns
t_r	Rise Time	V_{DD} = 0.5 V_{DSS}		18		
$t_d(off)$	Turn-off Delay Time	I_D = I_D [Cont.] @ 25°C		71		
t_f	Fall Time	R_G = 1.8Ω		24		

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions / Part Number		MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)	APT6060BNR			13	Amps
		APT6070BNR			12	
I_{SM}	Pulsed Source Current ① (Body Diode)	APT6060BNR			52	
		APT6070BNR			48	
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)		240	480	960	ns
Q_{rr}	Reverse Recovery Charge (I_S = -I_D [Cont.], dI_S/dt = 100A/µs)		1.7	3.4	7	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.	240			Watts
SOA2	Safe Operating Area	I_{DS} = I_D [Cont.], V_{DS} = P_D / I_D [Cont.], t = 1 Sec.	240			
I_{LM}	Inductive Current Clamped	APT6060BNR	52			Amps
		APT6070BNR	48			

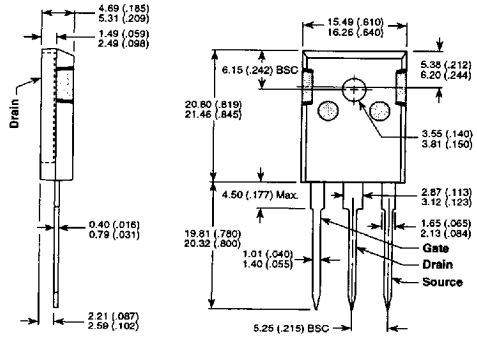
① Repetitive Rating: Pulse width limited by maximum junction temperature.

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

③ See MIL-STD-750 Method 3471

④ Starting T_j = +25°C, L = 9.47mH, R_G = 25Ω, Peak I_L = 13A

TO-247AD Package Outline



Dimensions in Millimeters and (Inches)