

APT8075BN	800V	13.0A	0.75Ω
APT7575BN	750V	13.0A	0.75Ω
APT8090BN	800V	12.0A	0.90Ω
APT7590BN	750V	12.0A	0.90Ω

POWER MOSFET®

N-CHANNEL ENHANCEMENT MODE HIGH VOLTAGE POWER MOSFETS

MAXIMUM RATINGS

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

Symbol	Parameter	APT				UNIT
		7575BN	8075BN	7590BN	8090BN	
V_{DSS}	Drain-Source Voltage	750	800	750	800	Volts
I_D	Continuous Drain Current	13.0		12.0		Amps
I_{DM}	Pulsed Drain Current ^①	52		48		Amps
V_{GS}	Gate-Source Voltage	±30				Volts
P_D	Total Power Dissipation @ $T_C = 25^\circ\text{C}$, Derate Above 25°C	310				Watts
T_J, T_{STG}	Operating and Storage Junction Temperature Range	- 55 to 150				$^\circ\text{C}$

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions / Part Number	MIN	TYP	MAX	UNIT
BV_{DSS}	Drain-Source Breakdown Voltage ($V_{GS} = 0V, I_D = 250 \mu\text{A}$)	APT8075BN / APT8090BN		800	Volts
		APT7575BN / APT7590BN		750	Volts
I_{DSS}	Zero Gate Voltage Drain Current ($V_{DS} = V_{DSS}, V_{GS} = 0V$) ($V_{DS} = 0.8 V_{DSS}, V_{GS} = 0V, T_C = 125^\circ\text{C}$)			250	μA
				1000	
I_{GSS}	Gate-Source Leakage Current ($V_{GS} = \pm 30V, V_{DS} = 0V$)			±100	nA
$I_D(ON)$	On State Drain Current ^② ($V_{DS} > I_D(ON) \times R_{DS}(ON)$ Max, $V_{GS} = 10V$)	APT8075BN / APT7575BN		13.0	Amps
		APT8090BN / APT7590BN		12.0	Amps
$V_{GS}(TH)$	Gate Threshold Voltage ($V_{DS} = V_{GS}, I_D = 1\text{mA}$)	2		4	Volts
$R_{DS}(ON)$	Static Drain-Source On-State Resistance ^② ($V_{GS} = 10V, I_D = 0.5 I_D(\text{Cont.})$)	APT8075BN / APT7575BN		0.75	Ohms
		APT8090BN / APT7590BN		0.90	Ohms

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.40	$^\circ\text{C/W}$
$R_{\theta JA}$	Junction to Ambient			40	$^\circ\text{C/W}$
T_L	Max. Lead Temp. for Soldering Conditions: 0.063" from Case for 10 Sec.			300	$^\circ\text{C}$

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

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DYNAMIC CHARACTERISTICS

APT8075/757, 8090/7590BN

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C _{iss}	Input Capacitance	V _{GS} = 0V V _{DS} = 25V f = 1 MHz		2410	2950	pF
C _{oss}	Output Capacitance			370	520	pF
C _{rss}	Reverse Transfer Capacitance			120	180	pF
Q _g	Total Gate Charge ^③	V _{GS} = 10V, I _D = I _D [Cont.] V _{DD} = 0.5 V _{DSS}		88	130	nC
Q _{gs}	Gate-Source Charge			8.9	13	nC
Q _{gd}	Gate-Drain ("Miller") Charge			44	67	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} = 0.5 V _{DSS} I _D = I _D [Cont.], V _{GS} = 15V R _G = 1.8Ω		13	27	ns
t _r	Rise Time			18	36	ns
t _{d(off)}	Turn-off Delay Time			62	94	ns
t _f	Fall Time			24	48	ns

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions / Part Number	MIN	TYP	MAX	UNIT
I _S	Continuous Source Current (Body Diode)	APT8075BN / APT7575BN		13.0	Amps
		APT8090BN / APT7590BN		12.0	Amps
I _{SM}	Pulsed Source Current ^① (Body Diode)	APT8075BN / APT7575BN		52	Amps
		APT8090BN / APT7590BN		48	Amps
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)	328	656	1300	ns
Q _{rr}	Reverse Recovery Charge	3.1	6.2	12	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			Watts
I _{LM}	Inductive Current Clamped	APT8075BN / APT7575BN	52			Amps
		APT8090BN / APT7590BN	48			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

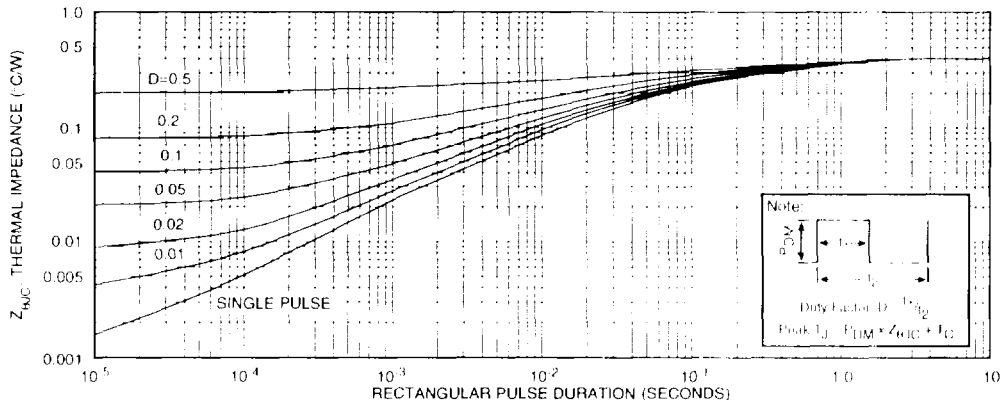


FIGURE 1. MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

APT8075/7575/8090/7590BN

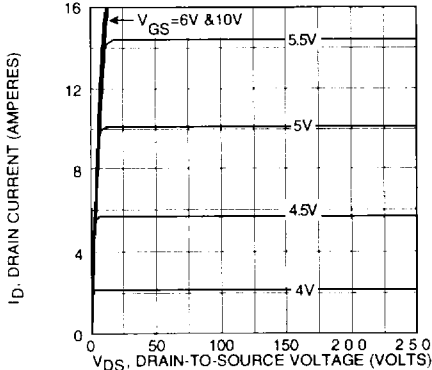


FIGURE 2, TYPICAL OUTPUT CHARACTERISTICS

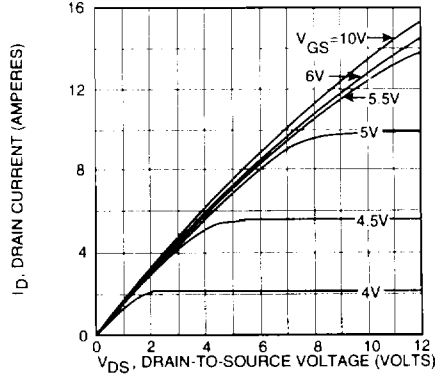


FIGURE 3, TYPICAL OUTPUT CHARACTERISTICS

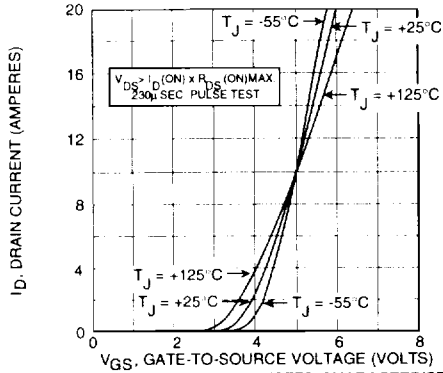


FIGURE 4, TYPICAL TRANSFER CHARACTERISTICS

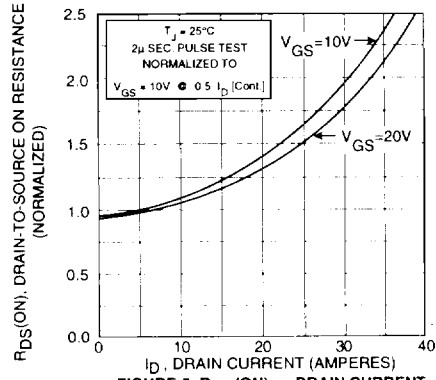


FIGURE 5, $R_{DS}(ON)$ vs DRAIN CURRENT

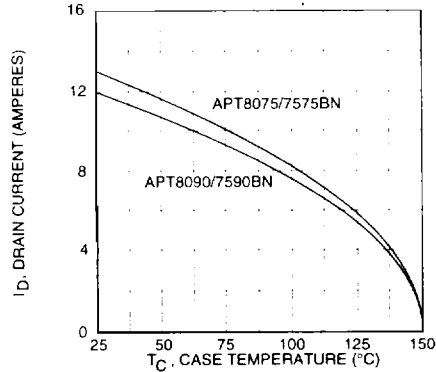


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

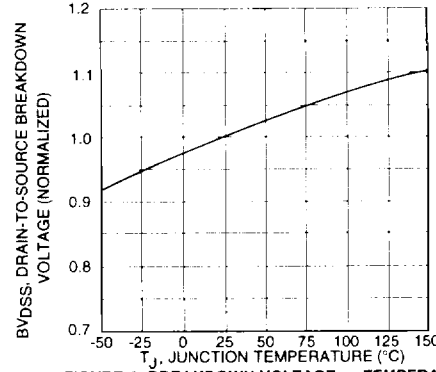


FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

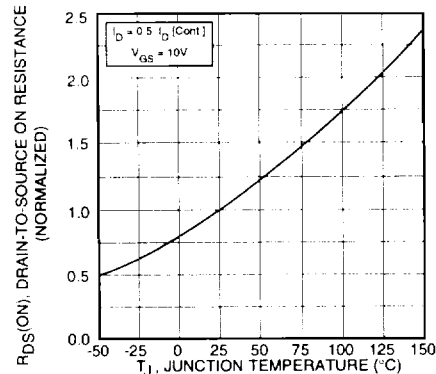


FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

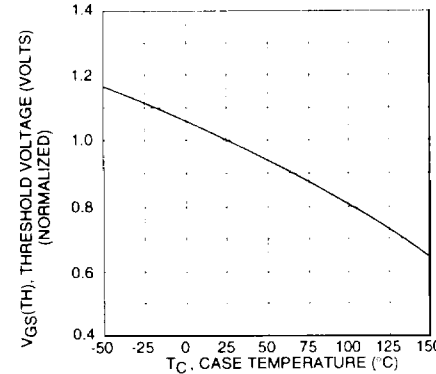


FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

APT8075/7575/8090/7590BN

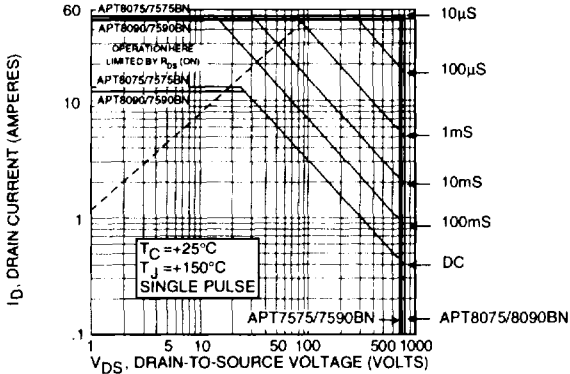


FIGURE 10, MAXIMUM SAFE OPERATING AREA

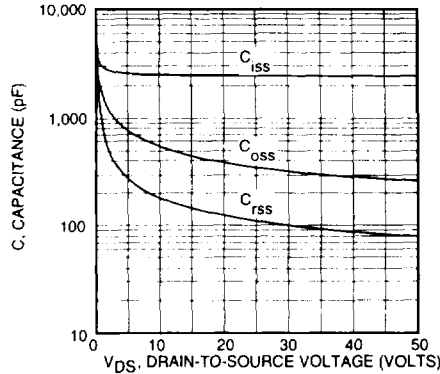


FIGURE 11, TYPICAL CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

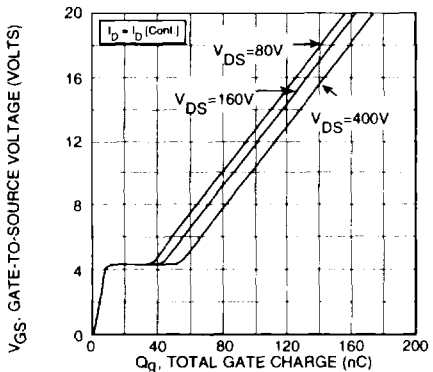


FIGURE 12, GATE CHARGES vs GATE-TO-SOURCE VOLTAGE

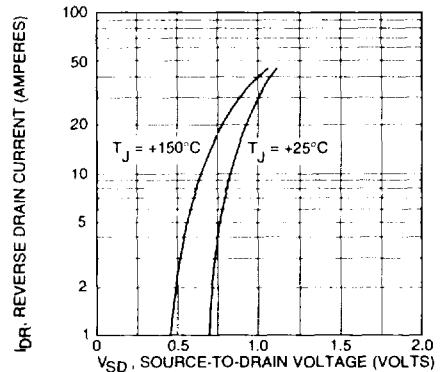


FIGURE 13, TYPICAL SOURCE-DRAIN DIODE FORWARD VOLTAGE

TO-247AD Package Outline

