

APT8075HN	800V	11.5A	0.75Ω
APT7575HN	750V	11.5A	0.75Ω
APT8090HN	800V	10.5A	0.90Ω
APT7590HN	750V	10.5A	0.90Ω

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	APT 7575HN	APT 8075HN	APT 7590HN	APT 8090HN	UNIT
V _{DSS}	Drain-Source Voltage	750	800	750	800	Volts
I _D	Continuous Drain Current @ T _C = 25°C	11.5		10.5		Amps
I _{DM}	Pulsed Drain Current ①	46		42		
V _{GS}	Gate-Source Voltage	±30				Volts
P _D	Total Power Dissipation @ T _C = 25°C	250				Watts
	Linear Derating Factor	2.0				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 ($V_{GS} = 0V, I_D = 250 \mu A$)	APT8075HN / APT8090HN		800	Volts
		APT7575HN / APT7590HN		750	
$I_{D(ON)}$	On State Drain Current ② ($V_{DS} > I_{D(ON)} \times R_{DS(ON)} \text{ Max}, V_{GS} = 10V$)	APT8075HN / APT7575HN		11.5	Amps
		APT8090HN / APT7590HN		10.5	
$R_{DS(ON)}$	Drain-Source On-State Resistance ② ($V_{GS} = 10V, 0.5 I_D [\text{Cont.}]$)	APT8075HN / APT7575HN		0.75	Ohms
		APT8090HN / APT7590HN		0.90	
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 ($V_{DS} = V_{GS}, I_D = 1.0mA$)	2		4	Volts

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.50	°C/W
$R_{\theta JA}$	Junction to Ambient			40	

105 S.W. COLUMBIA STREET
BEND, OREGON 97702-1035
U.S.A.

PHONE ... (503) 382-8028

FAX (503) 388-0364

DYNAMIC CHARACTERISTICS

APT8075/7575/8090/7590HN

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{DC}	Drain-to-Case Capacitance	$f = 1 \text{ MHz}$		24	36	pF
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1 \text{ MHz}$		2505	2950	
C_{oss}	Output Capacitance			330	465	
C_{rss}	Reverse Transfer Capacitance			110	165	
Q_g	Total Gate Charge ③	$V_{GS} = 10V$ $V_{DD} = 0.5 V_{DSS}$ $I_D = I_D [\text{Cont.}] @ 25^\circ\text{C}$		88	130	nC
Q_{gs}	Gate-Source Charge			8.9	13	
Q_{gd}	Gate-Drain ("Miller") Charge			44	67	
$t_{d(on)}$	Turn-on Delay Time	$V_{GS} = 15V$ $V_{DD} = 0.5 V_{DSS}$ $I_D = I_D [\text{Cont.}] @ 25^\circ\text{C}$ $R_G = 1.8\Omega$		15	30	ns
t_r	Rise Time			15	30	
$t_{d(off)}$	Turn-off Delay Time			64	96	
t_f	Fall Time			18	36	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)	APT8075HN / APT7575HN		11.5	Amps
		APT8090HN / APT7590HN		10.5	
I_{SM}	Pulsed Source Current ① (Body Diode)	APT8075HN / APT7575HN		46	
		APT8090HN / APT7590HN		42	
V_{SD}	Diode Forward Voltage ② ($V_{GS} = 0V$, $I_S = -I_D [\text{Cont.}]$)			1.3	Volts
t_{rr}	Reverse Recovery Time ($I_S = -I_D [\text{Cont.}]$, $dI_S/dt = 100A/\mu s$)	328	656	1300	ns
Q_{rr}	Reverse Recovery Charge ($I_S = -I_D [\text{Cont.}]$, $dI_S/dt = 100A/\mu s$)	3.1	6.2	12	μC

SAFE OPERATING AREA CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
SOA1	Safe Operating Area	$V_{DS} = 0.4 V_{DSS}$, $I_{DS} = P_D / 0.4 V_{DSS}$, $t = 1 \text{ Sec.}$	250			Watts
SOA2	Safe Operating Area	$I_{DS} = I_D [\text{Cont.}]$, $V_{DS} = P_D / I_D [\text{Cont.}]$, $t = 1 \text{ Sec.}$	250			
I_{LM}	Inductive Current Clamped	APT8075HN / APT7575HN	46			Amps
		APT8090HN / APT7590HN	42			

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

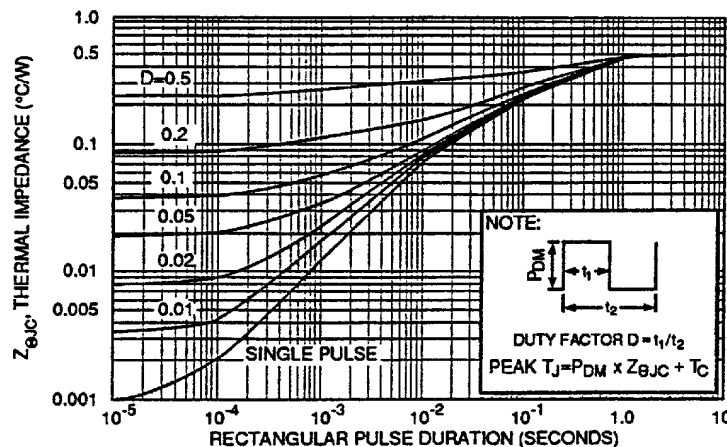


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

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APT8075/7575/8090/7590HN

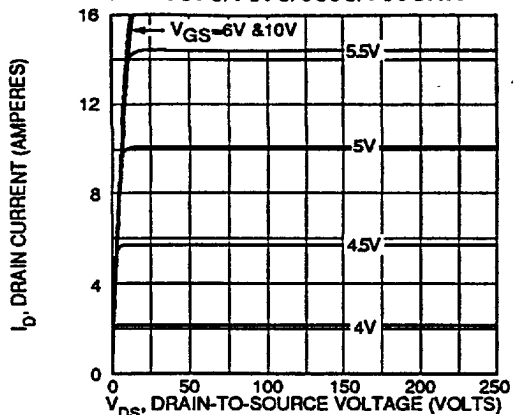


FIGURE 2, TYPICAL OUTPUT CHARACTERISTICS

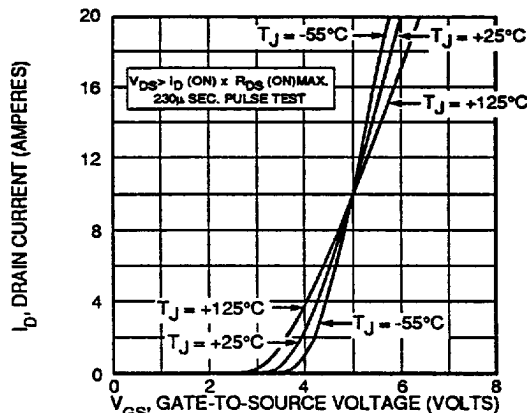


FIGURE 4, TYPICAL TRANSFER CHARACTERISTICS

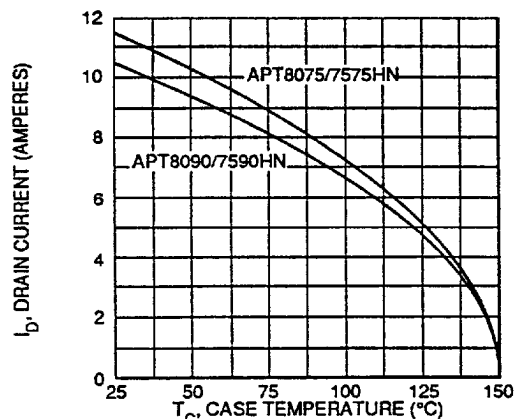


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

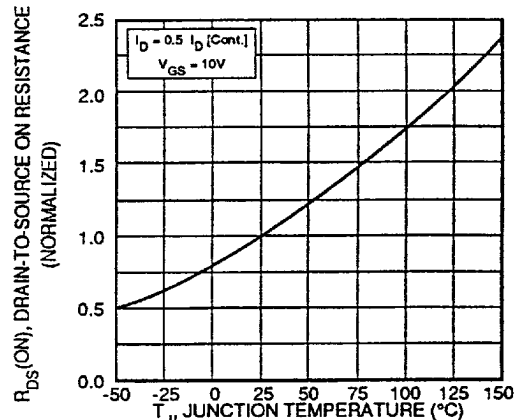


FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

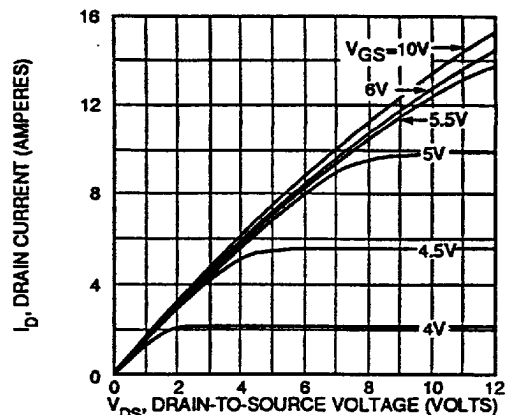


FIGURE 3, TYPICAL OUTPUT CHARACTERISTICS

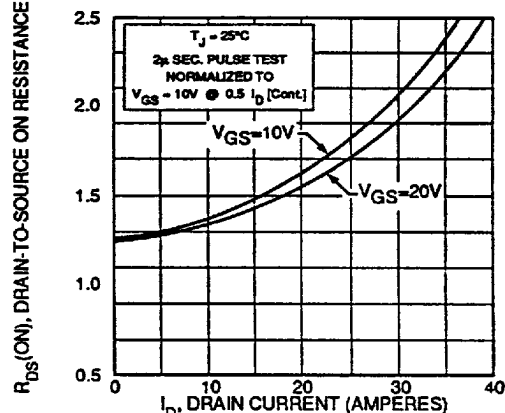


FIGURE 5, $R_{DS(ON)}$ vs DRAIN CURRENT

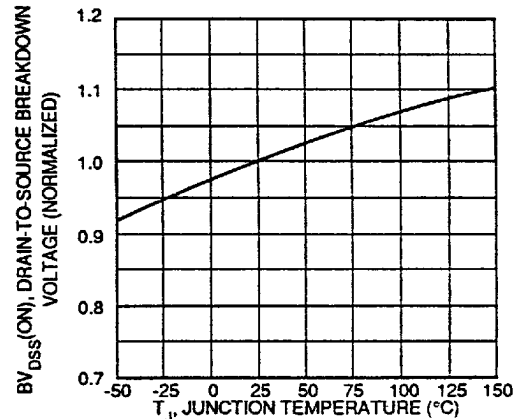


FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

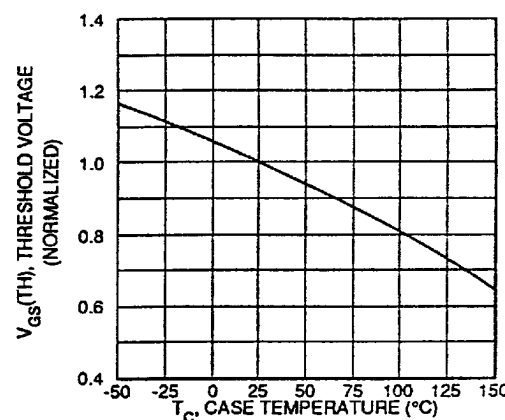
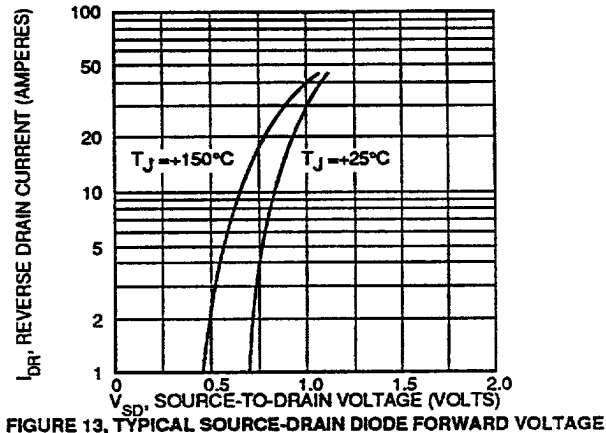
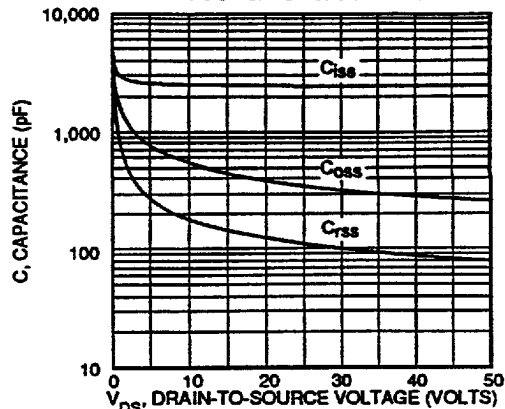
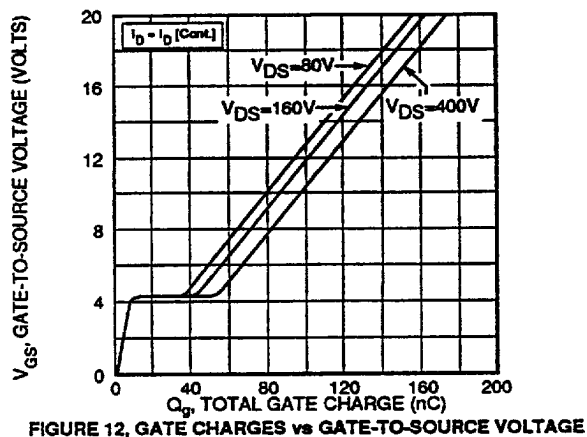
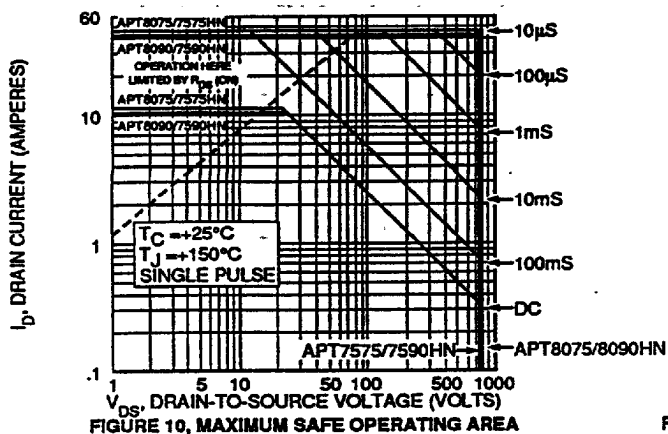
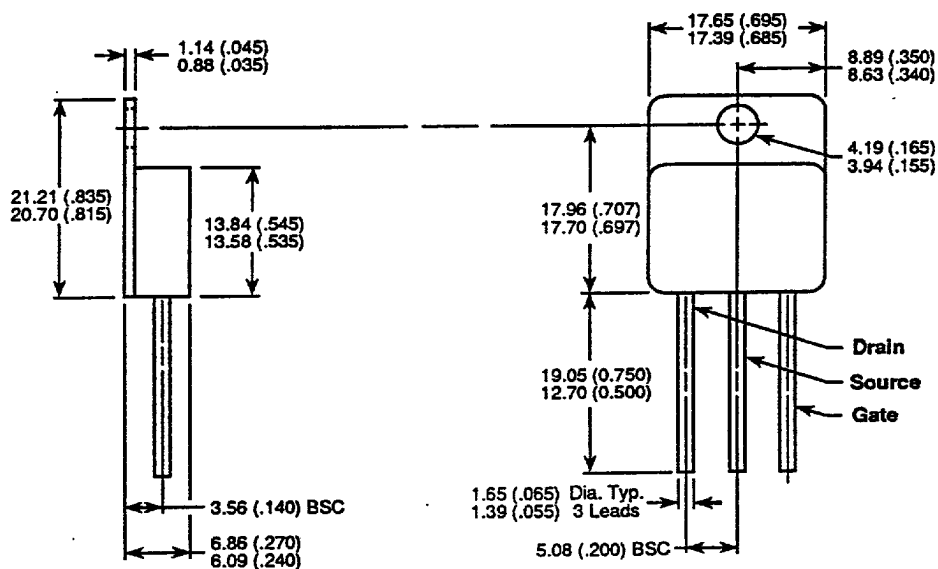


FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

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TO-258AA Package Outline



Dimensions in Millimeters and (Inches)