

APT601R3BN	600V	7.5A	1.30Ω
APT551R3BN	550V	7.5A	1.30Ω
APT601R6BN	600V	6.5A	1.60Ω
APT551R6BN	550V	6.5A	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	APT				UNIT
		551R3BN	601R3BN	551R6BN	601R6BN	
V _{DSS}	Drain-Source Voltage	550	600	550	600	Volts
I _D	Continuous Drain Current	7.5		6.5		Amps
I _{DM}	Pulsed Drain Current ①	30		26		Amps
V _{GS}	Gate-Source Voltage	±30				Volts
P _D	Total Power Dissipation @ T _C = 25°C, Derate Above 25°C	180				Watts
T _J , T _{STG}	Operating and Storage Junction Temperature Range	- 55 to 150				°C

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions / Part Number		MIN	TYP	MAX	UNIT
BV_{DS}	Drain-Source Breakdown Voltage ($V_{GS} = 0\text{V}$, $I_D = 250\ \mu\text{A}$)	APT601R3BN / APT601R6BN	600			Volts
		APT551R3BN / APT551R6BN	550			Volts
I_{DSS}	Zero Gate Voltage Drain Current ($V_{DS} = V_{DSS}$, $V_{GS} = 0\text{V}$)				250	μA
	($V_{DS} = 0.8 V_{DSS}$, $V_{GS} = 0\text{V}$, $T_C = 125^\circ\text{C}$)				1000	
I_{GSS}	Gate-Source Leakage Current ($V_{GS} = \pm 30\text{V}$, $V_{DS} = 0\text{V}$)				± 100	nA
$I_{D(ON)}$	On State Drain Current ^② ($V_{DS} > I_{D(ON)} \times R_{DS(ON)}$ Max, $V_{GS} = 10\text{V}$)	APT601R3BN / APT551R3BN	7.5			Amps
		APT601R6BN / APT551R6BN	6.5			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 ($V_{GS} = 10\text{V}$, $I_D = 0.5 I_D [\text{Cont.}]$)	APT601R3BN / APT551R3BN			1.30	Ohms
		APT601R6BN / APT551R6BN			1.60	Ohms

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.68	$^\circ\text{C/W}$
$R_{\theta JA}$	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

APT601R3/551R3/601R6/551R6BN

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1\text{ MHz}$		764	950	pF
C_{oss}	Output Capacitance			153	214	pF
C_{rss}	Reverse Transfer Capacitance			54	81	pF
Q_g	Total Gate Charge ^③	$V_{GS} = 10V, I_D = I_D [\text{Cont.}]$ $V_{DD} = 0.5 V_{DSS}$		34	55	nC
Q_{gs}	Gate-Source Charge			4.6	7	nC
Q_{gd}	Gate-Drain ("Miller") Charge			15	23	nC
$t_d(\text{on})$	Turn-on Delay Time	$V_{DD} = 0.5 V_{DSS}$ $I_D = I_D [\text{Cont.}], V_{GS} = 15V$ $R_G = 1.8\Omega$		10	20	ns
t_r	Rise Time			12	24	ns
$t_d(\text{off})$	Turn-off Delay Time			36	49	ns
t_f	Fall Time			11	22	ns

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions / Part Number	MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)	APT601R3BN / APT551R3BN		7.5	Amps
		APT601R6BN / APT551R6BN		6.5	Amps
I_{SM}	Pulsed Source Current ^① (Body Diode)	APT601R3BN / APT551R3BN		30	Amps
		APT601R6BN / APT551R6BN		26	Amps
V_{SD}	Diode Forward Voltage ^② ($V_{GS} = 0V, I_S = -I_D [\text{Cont.}]$)			1.3	Volts
t_{rr}	Reverse Recovery Time ($I_S = -I_D [\text{Cont.}], dI_S/dt = 100A/\mu s$)	130	260	520	ns
Q_{rr}	Reverse Recovery Charge	1.3	2.6	5.2	μC

SAFE OPERATING AREA CHARACTERISTICS

Symbol	Characteristic	Test Conditions / Part Number	MIN	TYP	MAX	UNIT
SOA1	Safe Operating Area	$V_{DS} = 0.4 V_{DSS}, I_{DS} = P_D / 0.4 V_{DSS}, t = 1\text{ Sec.}$	180			Watts
SOA2	Safe Operating Area	$I_{DS} = I_D [\text{Cont.}], V_{DS} = P_D / I_D [\text{Cont.}], t = 1\text{ Sec.}$	180			Watts
I_{LM}	Inductive Current Clamped	APT601R3BN / APT551R3BN	30			Amps
		APT601R6BN / APT551R6BN	26			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.

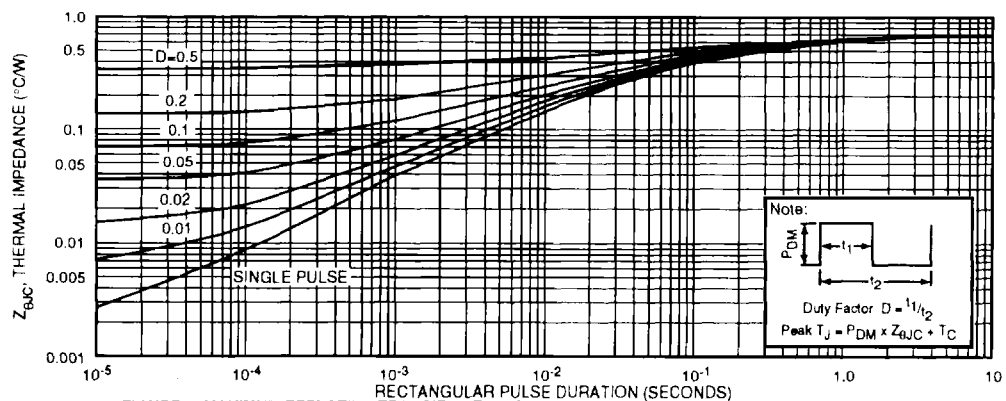
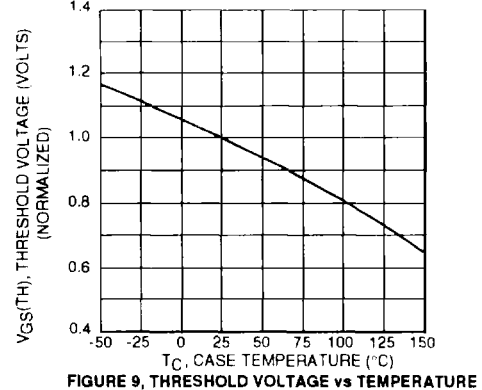
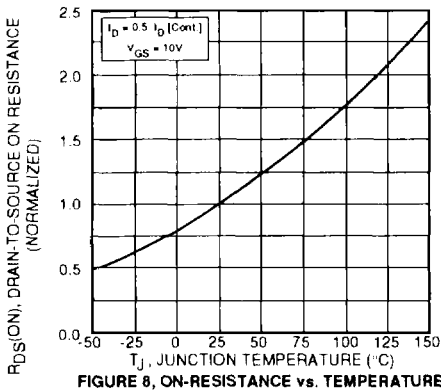
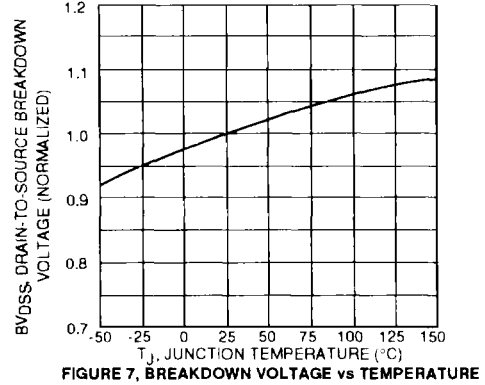
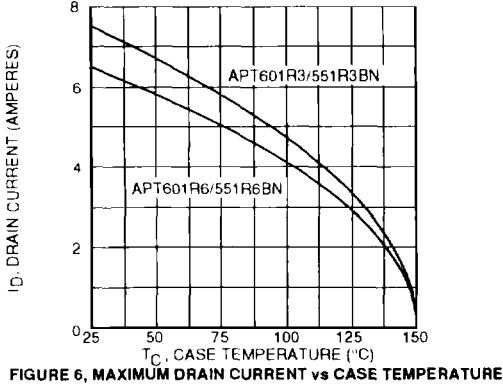
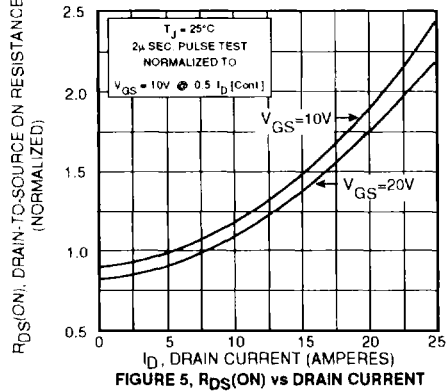
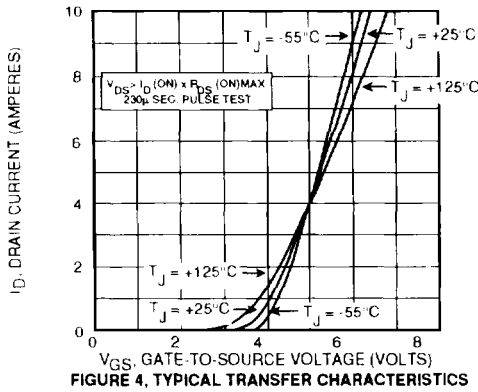
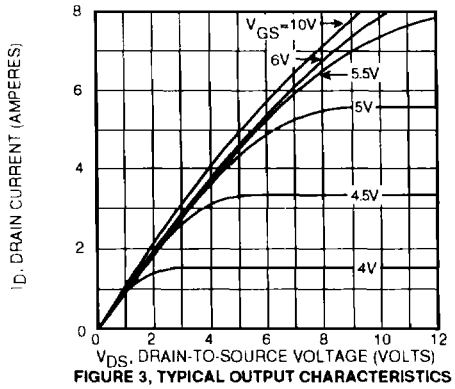
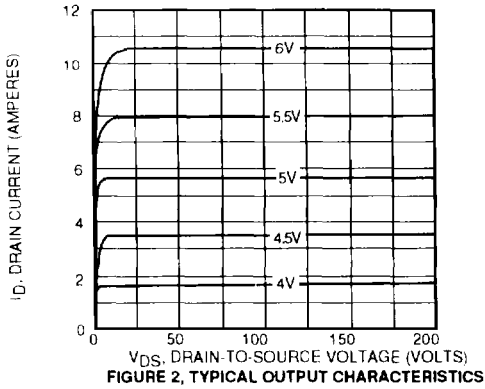
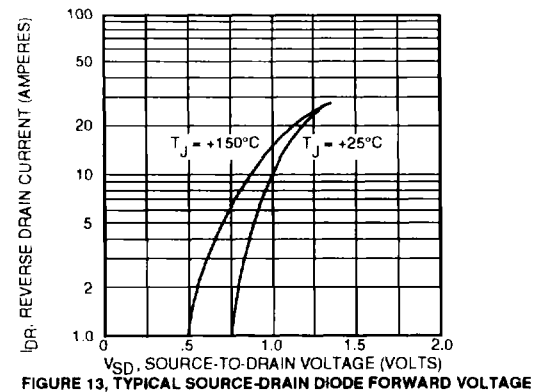
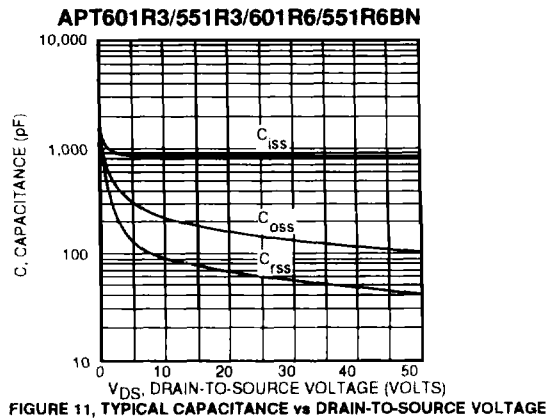
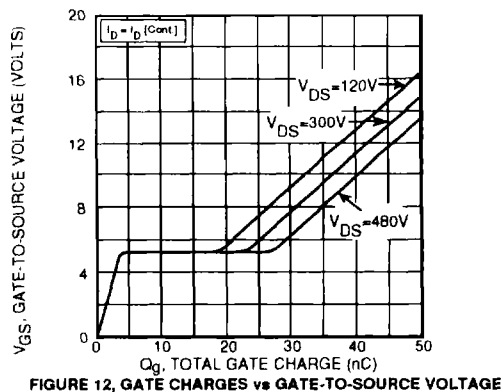
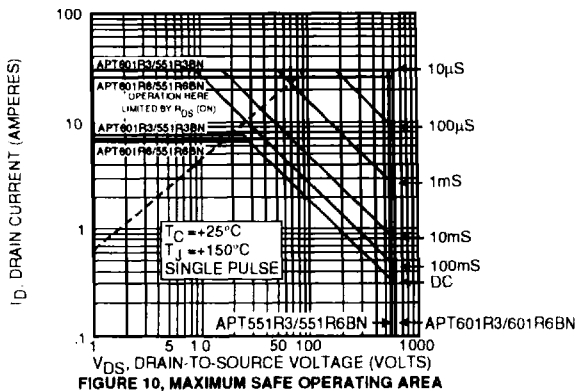


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

APT601R3/551R3/601R6/551R6BN





TO-247AD Package Outline

