

APT802R4BN	800V	5.5A	2.40Ω
APT752R4BN	750V	5.5A	2.40Ω
APT802R8BN	800V	5.0A	2.80Ω
APT752R8BN	750V	5.0A	2.80Ω

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
		752R4BN	802R4BN	752R8BN	802R8BN	
V_{DSS}	Drain-Source Voltage	750	800	750	800	Volts
I_D	Continuous Drain Current	5.5		5.0		Amps
I_{DM}	Pulsed Drain Current ^①	22		20		Amps
V_{GS}	Gate-Source Voltage	±30				Volts
P_D	Total Power Dissipation @ $T_C = 25^\circ\text{C}$, Derate Above 25°C	180				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 ($V_{GS} = 0V, I_D = 250 \mu\text{A}$)	APT802R4BN / APT802R8BN		800	Volts	
		APT752R4BN / APT752R8BN		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, $V_{GS} = 10V$)	APT802R4BN / APT752R4BN		5.5	Amps	
		APT802R8BN / APT752R8BN		5.0	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 ($V_{GS} = 10V, I_D = 0.5 I_D [\text{Cont.}]$)	APT802R4BN / APT752R4BN			2.40	Ohms
		APT802R8BN / APT752R8BN			2.80	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.

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C _{iss}	Input Capacitance	V _{GS} = 0V V _{DS} = 25V f = 1 MHz		790	950	pF
C _{oss}	Output Capacitance			116	163	pF
C _{rss}	Reverse Transfer Capacitance			44	66	pF
Q _g	Total Gate Charge ^③	V _{GS} = 10V, I _D = I _D [Cont.] V _{DD} = 0.5 V _{DSS}		38	55	nC
Q _{gs}	Gate-Source Charge			4.5	7	nC
Q _{gd}	Gate-Drain ("Miller") Charge			16	24	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		10	21	ns
t _r	Rise Time			11	21	ns
t _{d(off)}	Turn-off Delay Time			35	53	ns
t _f	Fall Time			13	26	ns

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions / Part Number	MIN	TYP	MAX	UNIT
I _S	Continuous Source Current (Body Diode)	APT802R4BN / APT752R4BN		5.5	Amps
		APT802R8BN / APT752R8BN		5.0	Amps
I _{SM}	Pulsed Source Current ^① (Body Diode)	APT802R4BN / APT752R4BN		22	Amps
		APT802R8BN / APT752R8BN		20	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)	160	320	640	ns
Q _{rr}	Reverse Recovery Charge	1.5	3.0	6.0	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.	180			Watts
SOA2	Safe Operating Area	I _{DS} = I _D [Cont.], V _{DS} = P _D / I _D [Cont.], t = 1 Sec.	180			Watts
I _{LM}	Inductive Current Clamped	APT802R4BN / APT752R4BN	22			Amps
		APT802R8BN / APT752R8BN	20			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.

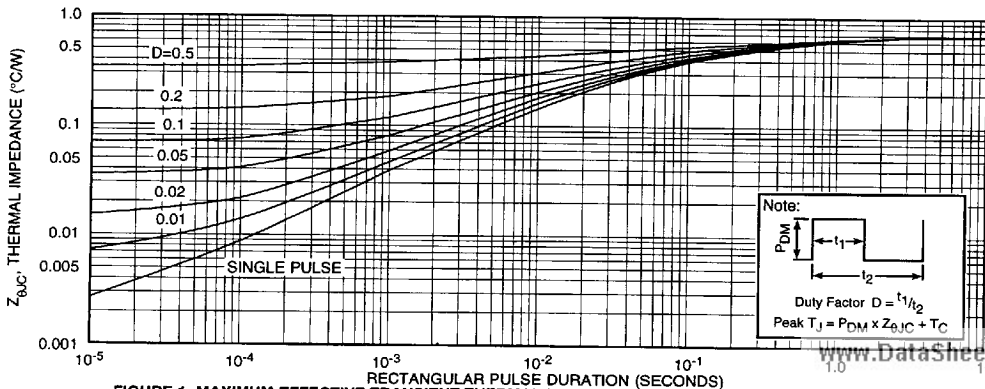


FIGURE 1. MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

APT802R4/752R4/802R8/752R8BN

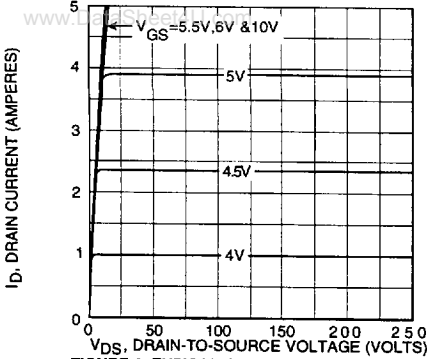


FIGURE 2, TYPICAL OUTPUT CHARACTERISTICS

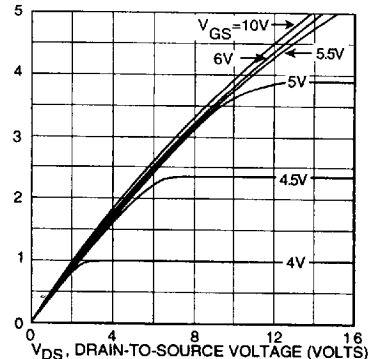


FIGURE 3, TYPICAL OUTPUT CHARACTERISTICS

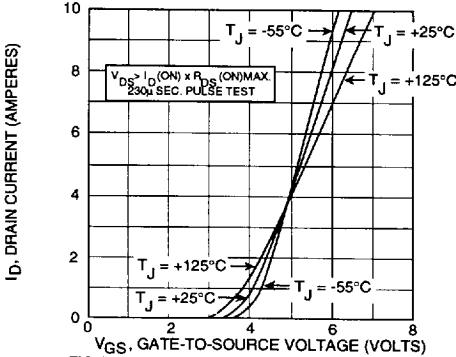


FIGURE 4, TYPICAL TRANSFER CHARACTERISTICS

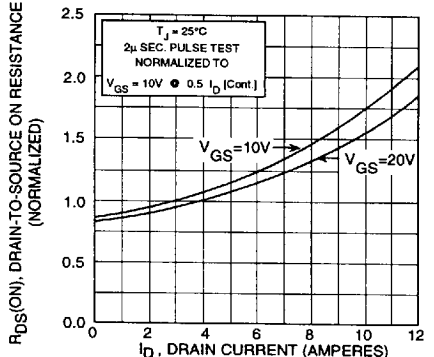


FIGURE 5, $R_{DS(ON)}$ vs DRAIN CURRENT

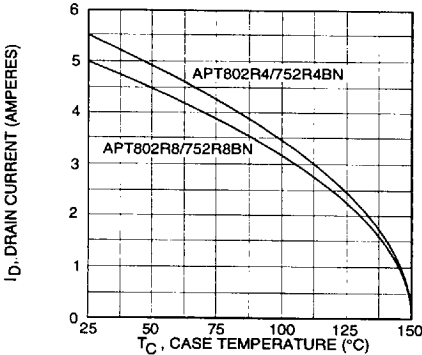


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

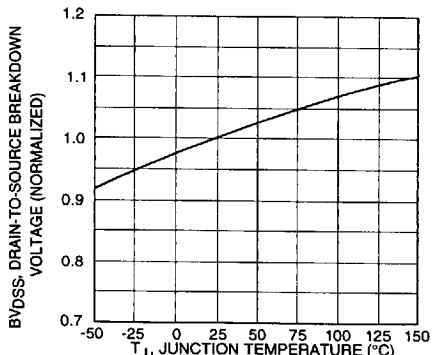


FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

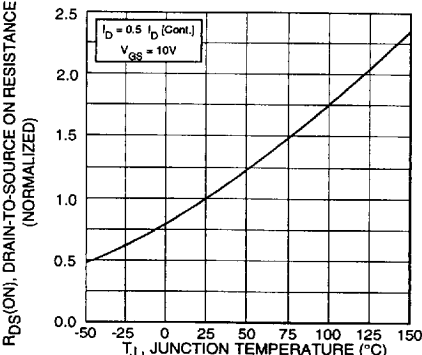


FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

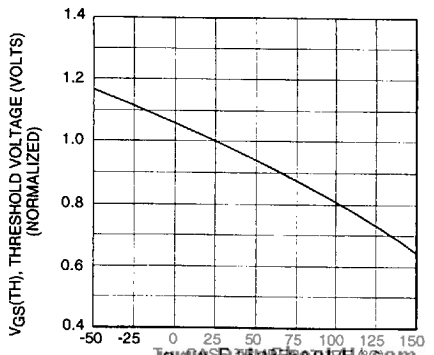


FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

APT802R4/752R4/802R8/752R8BN

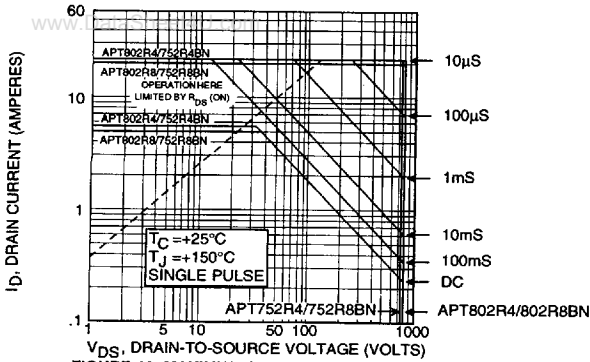


FIGURE 10, MAXIMUM SAFE OPERATING AREA

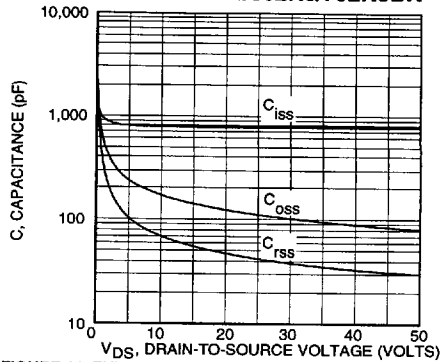


FIGURE 11, TYPICAL CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

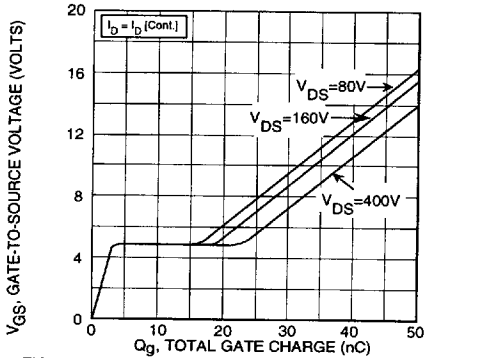


FIGURE 12, GATE CHARGES vs GATE-TO-SOURCE VOLTAGE

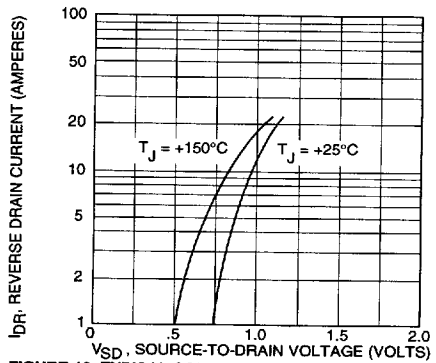
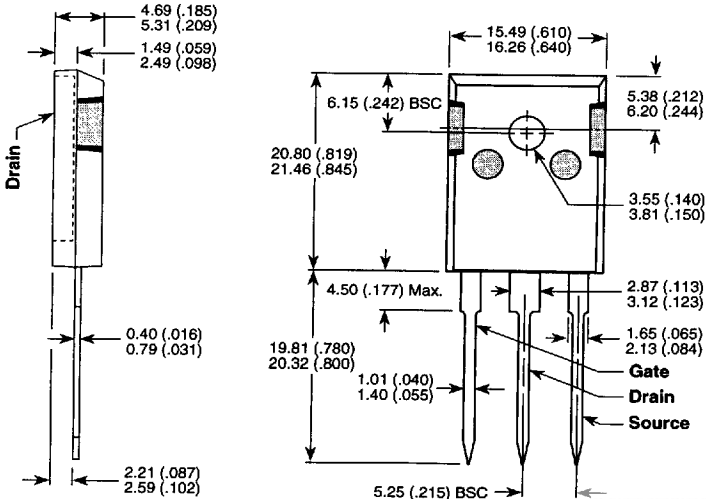


FIGURE 13, TYPICAL SOURCE-DRAIN DIODE FORWARD VOLTAGE

TO-247AD Package Outline



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