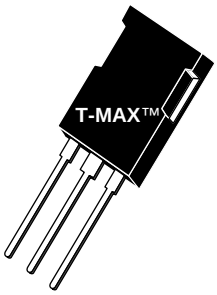
APT10M11B2VR

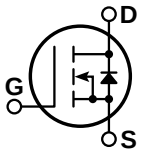
100V 100A 0.011Ω

POWER MOS V®

Power MOS V® is a new generation of high voltage N-Channel enhancement mode power MOSFETs. This new technology minimizes the JFET effect, increases packing density and reduces the on-resistance. Power MOS V® also achieves faster switching speeds through optimized gate layout.



- **Faster Switching**
- **Lower Leakage**
- **100% Avalanche Tested**
- **New T-MAX™ Package** (Clip-mounted TO-247 Package)



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

Symbol	Parameter	APT10M1B2VR	UNIT
V_{DSS}	Drain-Source Voltage	100	Volts
I_D	Continuous Drain Current @ T_C = 25°C ⑥	100	Amps
I_{DM}	Pulsed Drain Current ① ⑥	400	
V_{GS}	Gate-Source Voltage Continuous	±30	Volts
V_{GSM}	Gate-Source Voltage Transient	±40	
P_D	Total Power Dissipation @ T_C = 25°C	520	Watts
	Linear Derating Factor	4.16	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 ⑥ (Repetitive and Non-Repetitive)	100	Amps
E_{AR}	Repetitive Avalanche Energy ①	50	mJ
E_{AS}	Single Pulse Avalanche Energy ④	2500	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
BV_{DSS}	Drain-Source Breakdown Voltage (V_{GS} = 0V, I_D = 250μA)	100			Volts
$I_{D(on)}$	On State Drain Current ② ⑥ (V_{DS} > $I_{D(on)}$ x $R_{DS(on)}$ Max, V_{GS} = 10V)	100			Amps
$R_{DS(on)}$	Drain-Source On-State Resistance ② (V_{GS} = 10V, 0.5 $I_{D[Cont.]}$)			0.011	Ohms
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} = ±30V, V_{DS} = 0V)			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 2.5mA)	2		4	Volts

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

APT Website - http://www.advancedpower.com

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050-5617 Rev C

DYNAMIC CHARACTERISTICS

APT10M11B2VR

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1 MHz		8600	10300	pF
C_{oss}	Output Capacitance			3200	4480	
C_{rss}	Reverse Transfer Capacitance			1180	1770	
Q_g	Total Gate Charge ③	V_{GS} = 10V V_{DD} = 0.5 V_{DSS} I_D = 0.5 $I_{D[Cont.]}$ @ 25°C		300	450	nC
Q_{gs}	Gate-Source Charge			95	145	
Q_{gd}	Gate-Drain ("Miller") Charge			110	165	
$t_{d(on)}$	Turn-on Delay Time	V_{GS} = 15V V_{DD} = 0.5 V_{DSS} I_D = $I_{D[Cont.]}$ @ 25°C R_G = 0.6Ω		16	32	ns
t_r	Rise Time			33	66	
$t_{d(off)}$	Turn-off Delay Time			46	70	
t_f	Fall Time			8	16	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
I_S	Continuous Source Current ⑥ (Body Diode)			100	Amps
I_{SM}	Pulsed Source Current ① ⑥ (Body Diode)			400	
V_{SD}	Diode Forward Voltage ② (V_{GS} = 0V, I_S = -$I_{D[Cont.]}$)			1.5	Volts
t_{rr}	Reverse Recovery Time (I_S = -$I_{D[Cont.]}$, dI_S/dt = 100A/µs)		250		ns
Q_{rr}	Reverse Recovery Charge (I_S = -$I_{D[Cont.]}$, dI_S/dt = 100A/µs)		2.5		µC

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.24	°C/W
$R_{\theta JA}$	Junction to Ambient			40	

① Repetitive Rating: Pulse width limited by maximum T_j

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

③ See MIL-STD-750 Method 3471

④ Starting T_j = +25°C, L = 500µH, R_G = 25Ω, Peak I_L = 100A

⑤ These dimensions are equal to the TO-247AD without mounting hole.

⑥ The maximum current is limited by lead temperature.

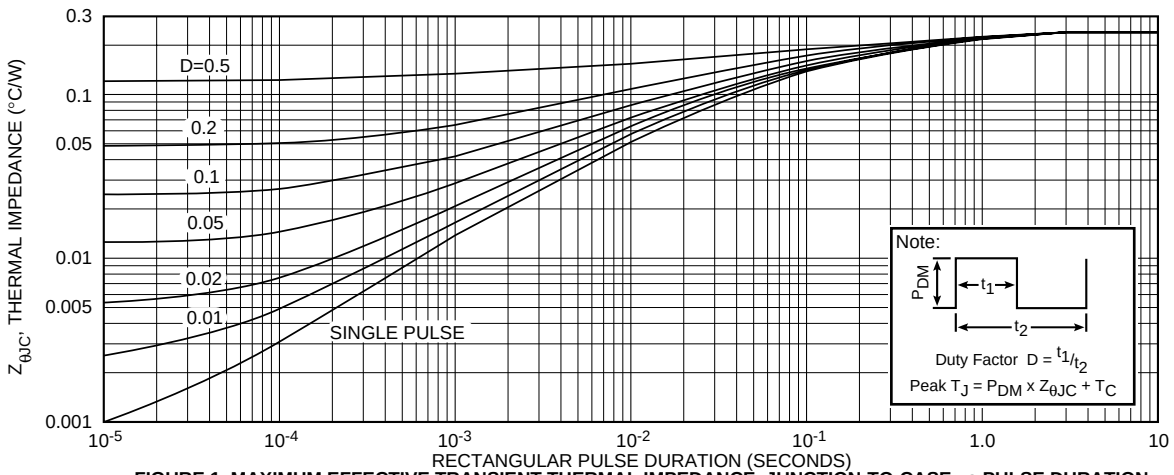


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

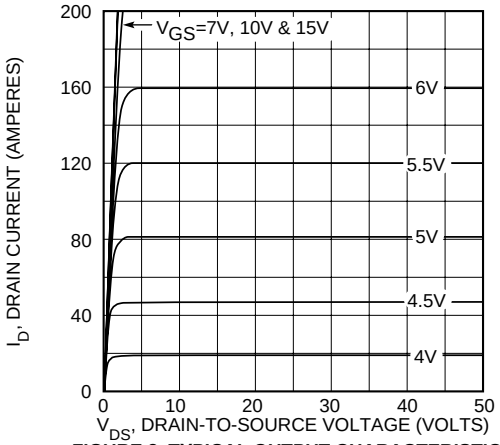


FIGURE 2, TYPICAL OUTPUT CHARACTERISTICS

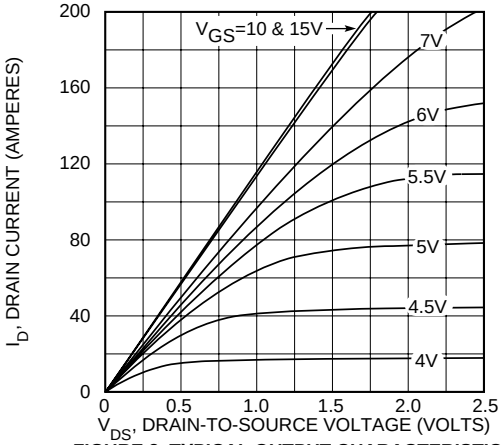


FIGURE 3, TYPICAL OUTPUT CHARACTERISTICS

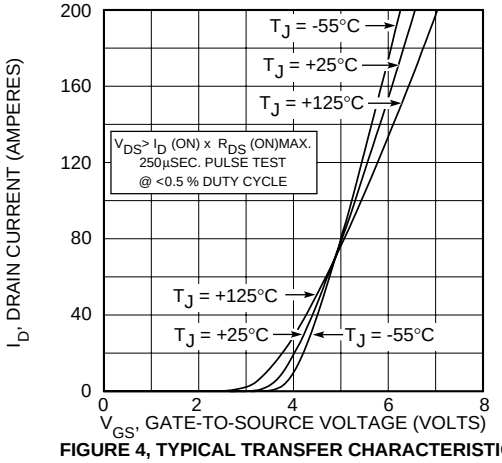


FIGURE 4, TYPICAL TRANSFER CHARACTERISTICS

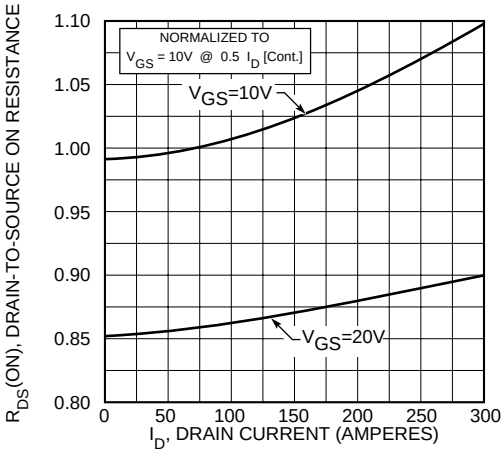


FIGURE 5, R_{DS}(ON) vs DRAIN CURRENT

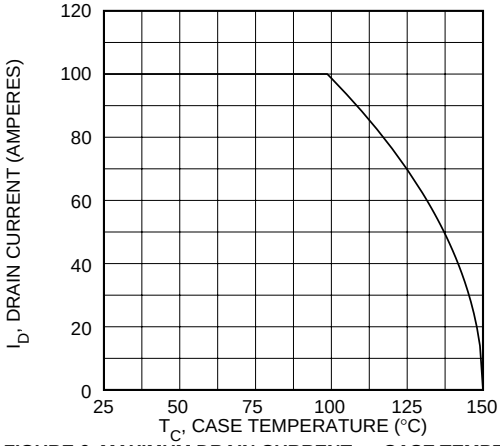


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

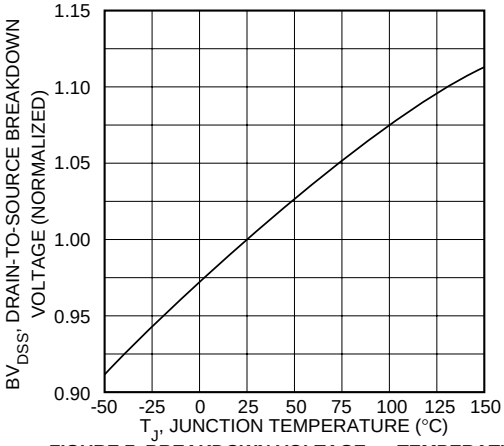


FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

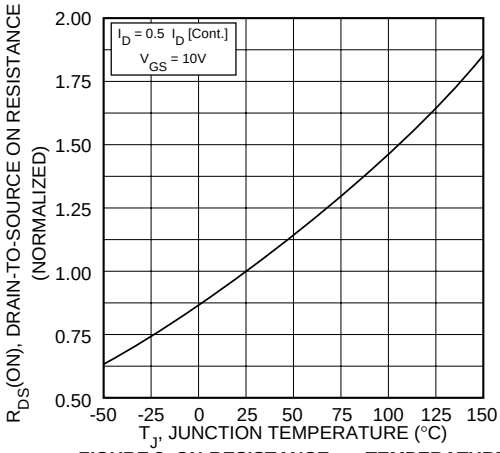


FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

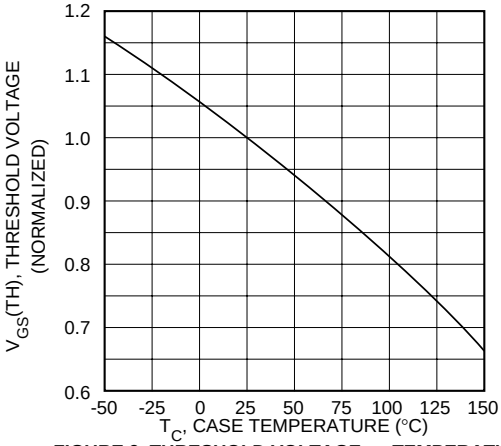


FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

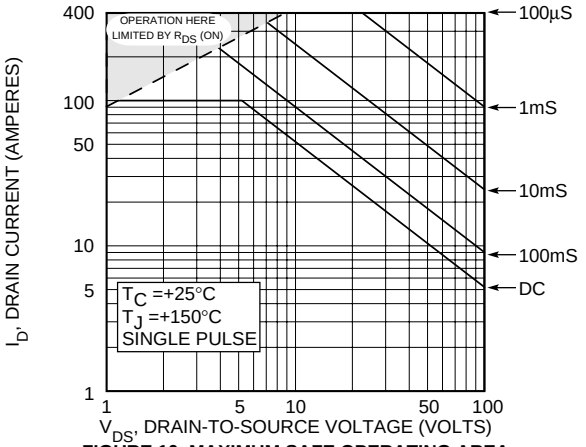


FIGURE 10, MAXIMUM SAFE OPERATING AREA

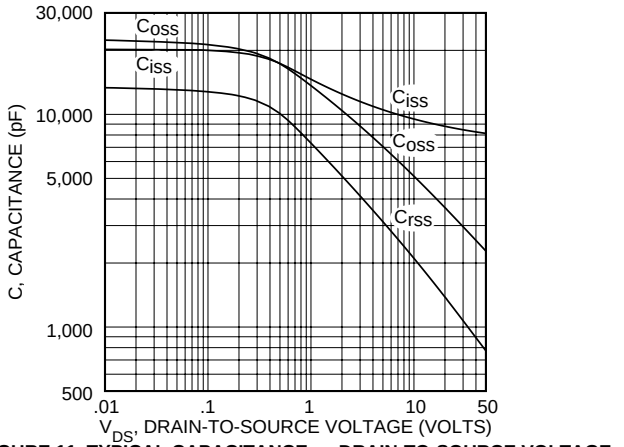


FIGURE 11, TYPICAL CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

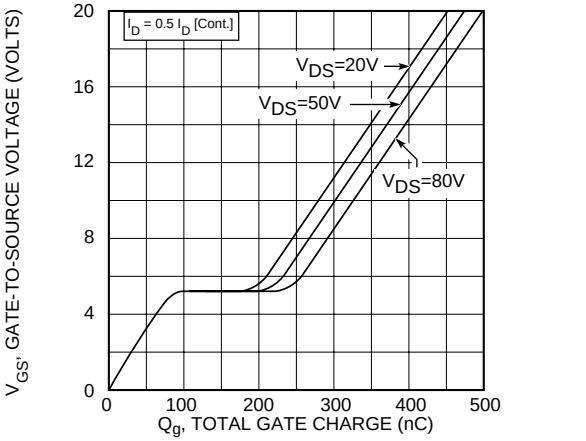


FIGURE 12, GATE CHARGES vs GATE-TO-SOURCE VOLTAGE

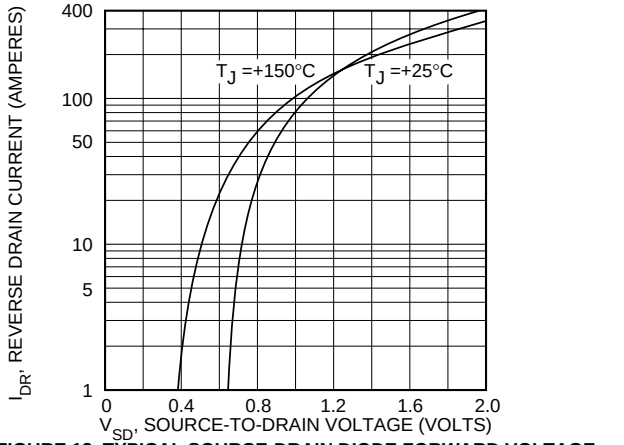
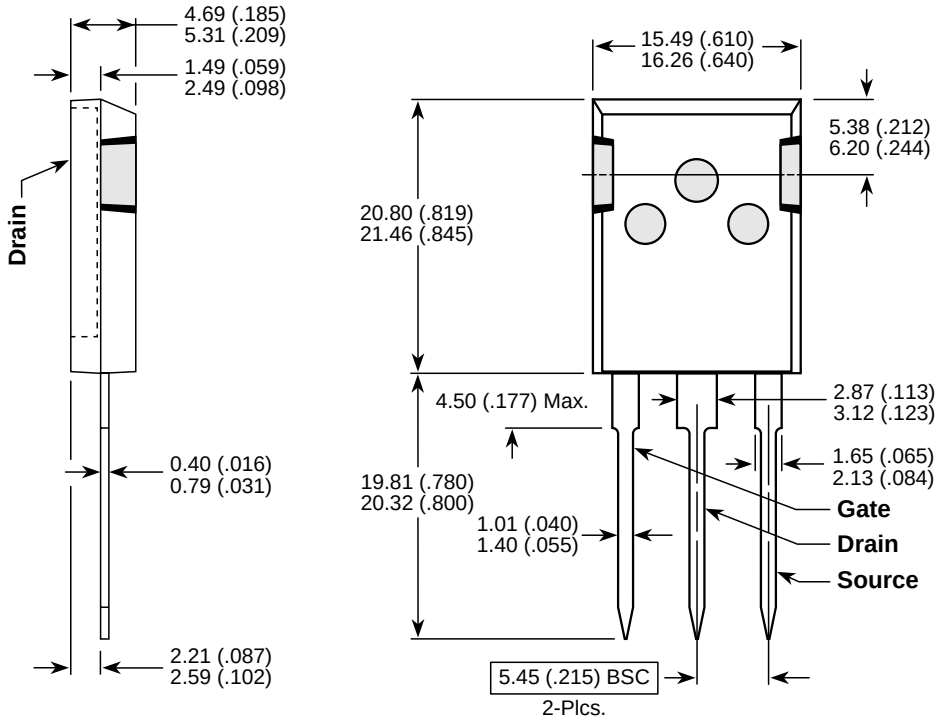


FIGURE 13, TYPICAL SOURCE-DRAIN DIODE FORWARD VOLTAGE

T-MAX™ Package Outline ⑤



Dimensions in Millimeters and (Inches)