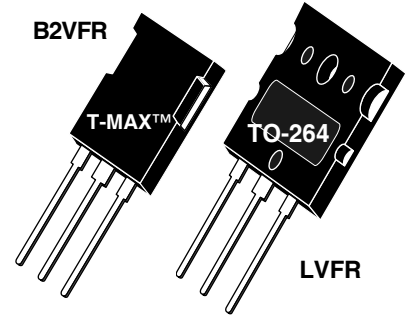
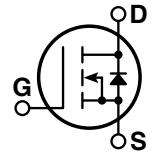


POWER MOS V[®] FREDFET

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.



- T-MAX™ or TO-264 Package
- Avalanche Energy Rated
- Faster Switching
- **FAST RECOVERY BODY DIODE**
- Lower Leakage




MAXIMUM RATINGS

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

Symbol	Parameter	APT10M09B2VFR_LVFR	UNIT
V _{DSS}	Drain-Source Voltage	100	Volts
I _D	Continuous Drain Current ^⑥ @ T _C = 25°C	100	Amps
I _{DM}	Pulsed Drain Current ^①	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	625	Watts
	Linear Derating Factor	5.00	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 (Repetitive and Non-Repetitive)	100	Amps
E _{AR}	Repetitive Avalanche Energy ^①	50	mJ
E _{AS}	Single Pulse Avalanche Energy ^④	3000	

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
R _{DS(on)}	Drain-Source On-State Resistance ^② (V _{GS} = 10V, I _D = 50A)			0.01	Ohms
I _{DSS}	Zero Gate Voltage Drain Current (V _{DS} = 100V, V _{GS} = 0V)			100	μA
	Zero Gate Voltage Drain Current (V _{DS} = 80V, V _{GS} = 0V, T _C = 125°C)			500	
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.

DYNAMIC CHARACTERISTICS

APT10M09B2VFR_LVFR

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1\text{ MHz}$		9875		pF
C_{oss}	Output Capacitance			3940		
C_{rss}	Reverse Transfer Capacitance			1470		
Q_g	Total Gate Charge ③	$V_{GS} = 10V$ $V_{DD} = 50V$ $I_D = 100A @ 25^\circ C$		350		nC
Q_{gs}	Gate-Source Charge			60		
Q_{gd}	Gate-Drain ("Miller") Charge			180		
$t_{d(on)}$	Turn-on Delay Time	$V_{GS} = 15V$ $V_{DD} = 50V$ $I_D = 100A @ 25^\circ C$ $R_G = 0.6\Omega$		18		ns
t_r	Rise Time			36		
$t_{d(off)}$	Turn-off Delay Time			50		
t_f	Fall Time			9		

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)			100	Amps
I_{SM}	Pulsed Source Current ① (Body Diode)			400	
V_{SD}	Diode Forward Voltage ② ($V_{GS} = 0V, I_S = -100A$)			1.3	Volts
dv/dt	Peak Diode Recovery dv/dt ⑤			8	V/ns
t_{rr}	Reverse Recovery Time ($I_S = -100A, di/dt = 100A/\mu s$)	$T_j = 25^\circ C$		190	ns
		$T_j = 125^\circ C$		370	
Q_{rr}	Reverse Recovery Charge ($I_S = -100A, di/dt = 100A/\mu s$)	$T_j = 25^\circ C$		0.4	μC
		$T_j = 125^\circ C$		1.7	
I_{RRM}	Peak Recovery Current ($I_S = -100A, di/dt = 100A/\mu s$)	$T_j = 25^\circ C$		9	Amps
		$T_j = 125^\circ C$		15	

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.20	$^\circ C/W$
$R_{\theta JA}$	Junction to Ambient			40	

- ① Repetitive Rating: Pulse width limited by maximum junction temperature
- ② Pulse Test: Pulse width < 380 μs , Duty Cycle < 2%
- ③ See MIL-STD-750 Method 3471

- ④ Starting $T_j = +25^\circ C$, $L = 0.60mH$, $R_G = 25\Omega$, Peak $I_L = 100A$
- ⑤ dv/dt numbers reflect the limitations of the test circuit rather than the device itself. $I_S \leq -I_D 100A$ $di/dt \leq 200A/\mu s$ $V_R \leq 100V$ $T_j \leq 150^\circ C$
- ⑥ The maximum current is limited by lead temperature.

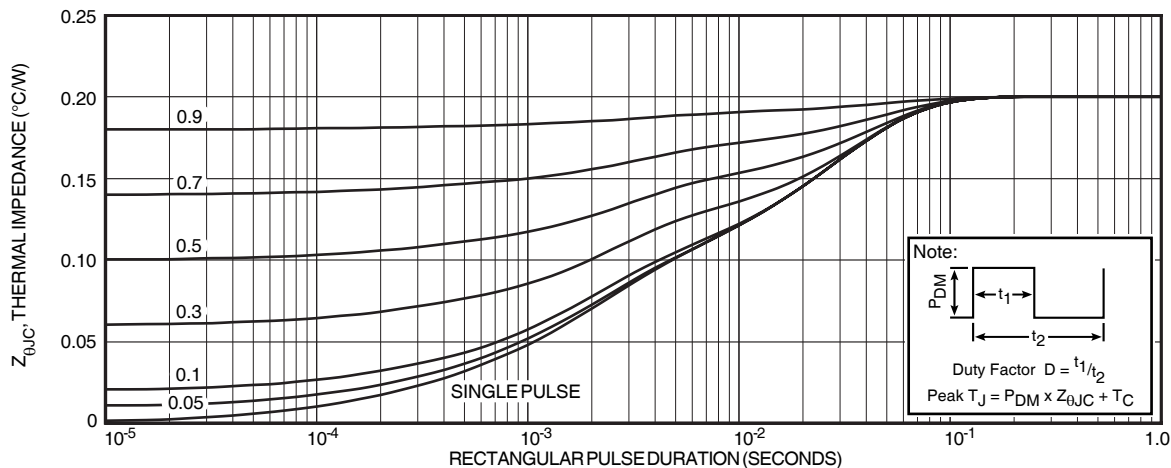


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

Typical Performance Curves

APT10M09B2VFR_LVFR

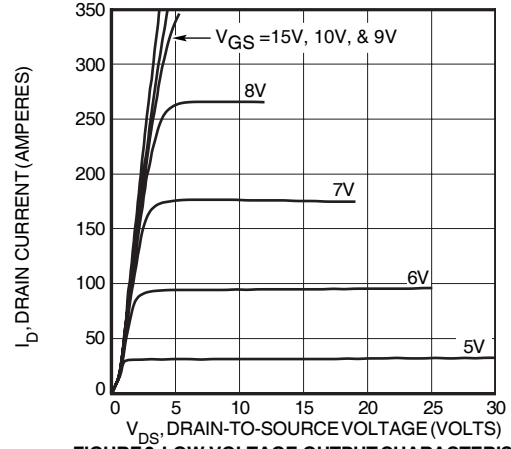
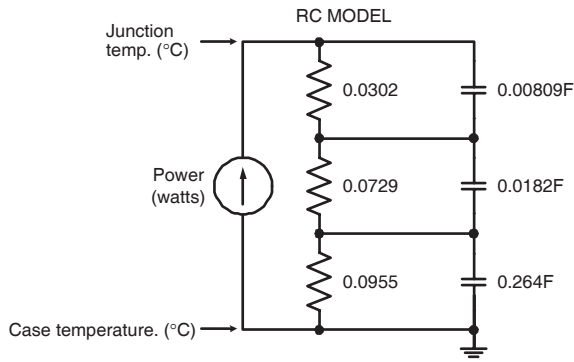


FIGURE 3, LOW VOLTAGE OUTPUT CHARACTERISTICS

FIGURE 2, TRANSIENT THERMAL IMPEDANCE MODEL

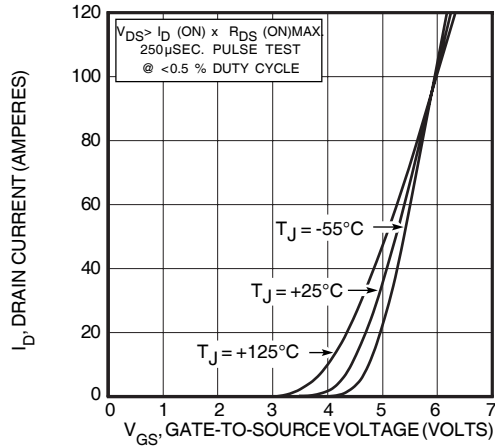


FIGURE 4, TRANSFER CHARACTERISTICS

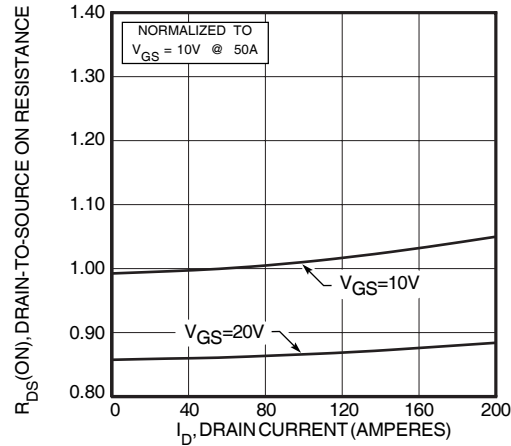


FIGURE 5, $R_{DS(ON)}$ vs DRAIN CURRENT

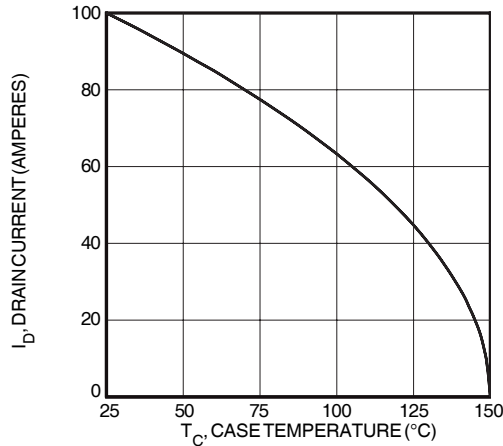


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

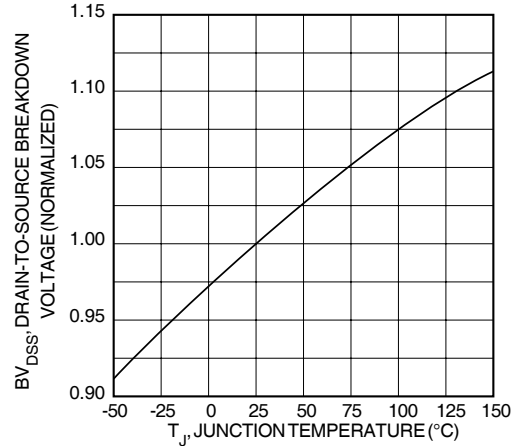


FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

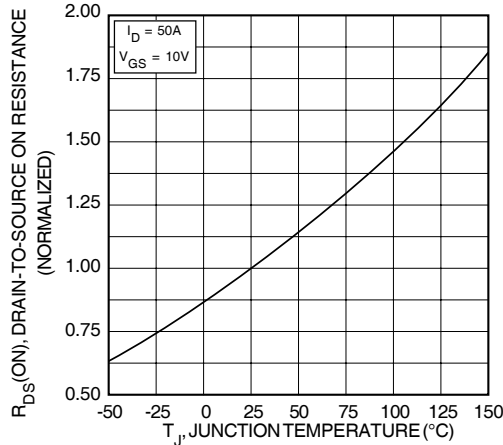


FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

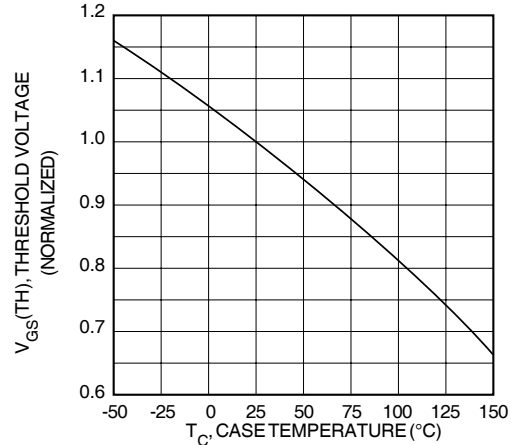


FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

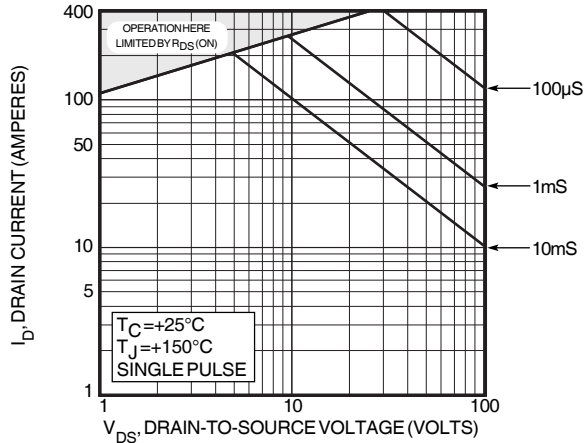


FIGURE 10, MAXIMUM SAFE OPERATING AREA

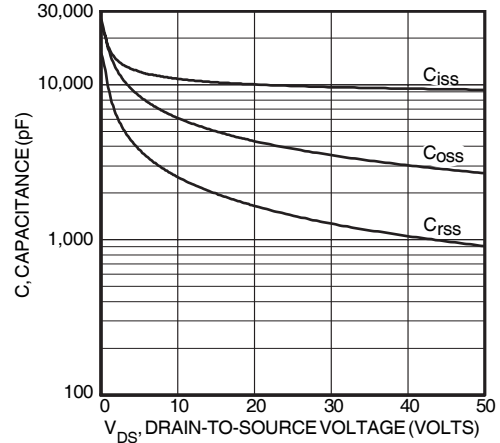


FIGURE 11, CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

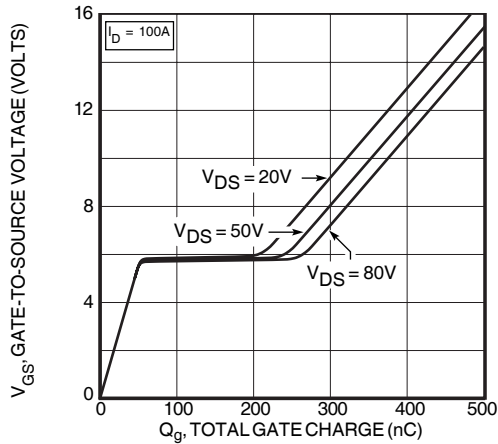


FIGURE 12, GATE CHARGE vs GATE-TO-SOURCE VOLTAGE

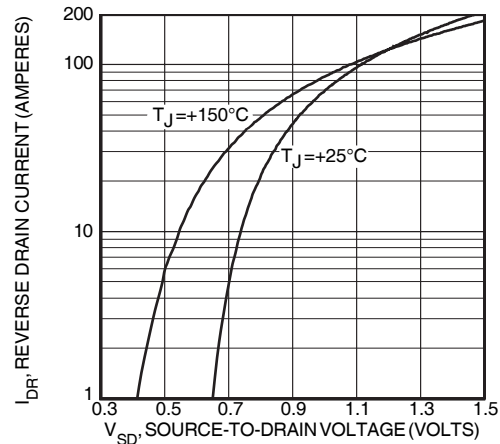
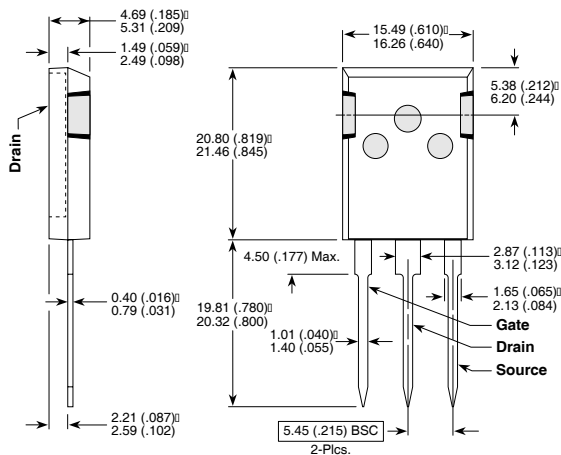


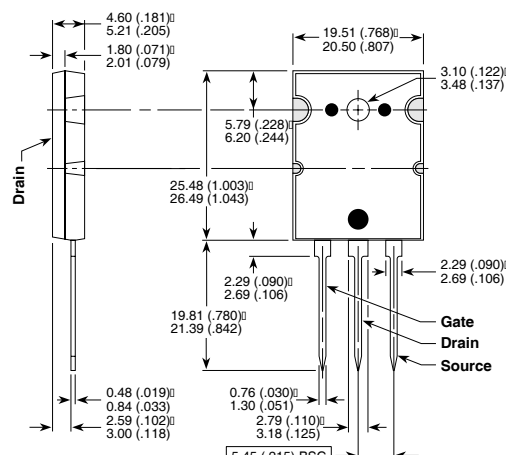
FIGURE 13, SOURCE-DRAIN DIODE FORWARD VOLTAGE

T-MAX™ (B2) Package Outline (B2VFR)



These dimensions are equal to the TO-247 without the mounting hole.
Dimensions in Millimeters and (Inches)

TO-264 (L) Package Outline (LVFR)



Dimensions in Millimeters and (Inches)

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