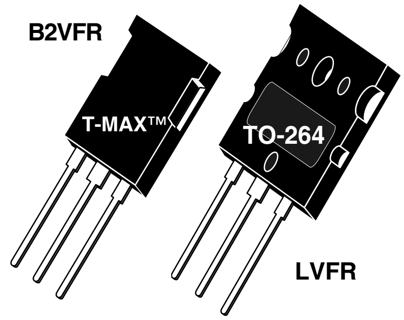
APT10M09B2VFR
APT10M09LVFR

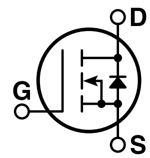
100V 100A 0.01Ω

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**
- **Faster Switching**
- **Lower Leakage**
- **Avalanche Energy Rated**
- **FAST RECOVERY BODY DIODE**



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	Amps
V_{GS}	Gate-Source Voltage Continuous	±30	Volts
V_{GSM}	Gate-Source Voltage Transient	±40	Volts
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	°C
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	mJ

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	μA
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

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ f = 1 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°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°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 ($I_S = -100A$, $di/_{dt} = 100A/\mu s$)	$T_j = 25°C$			190	ns
		$T_j = 125°C$			370	
Q_{rr}	Reverse Recovery Charge ($I_S = -100A$, $di/_{dt} = 100A/\mu s$)	$T_j = 25°C$		0.4		μC
		$T_j = 125°C$		1.7		
I_{RRM}	Peak Recovery Current ($I_S = -100A$, $di/_{dt} = 100A/\mu s$)	$T_j = 25°C$		9		Amps
		$T_j = 125°C$		15		

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.20	°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 $T_j = +25°C$, 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. $I_S \le -I_D 100A$ $di/_{dt} \le 200A/\mu s$ $V_R \le 100V$ $T_J \le 150°C$
⑥ The maximum current is limited by lead temperature.

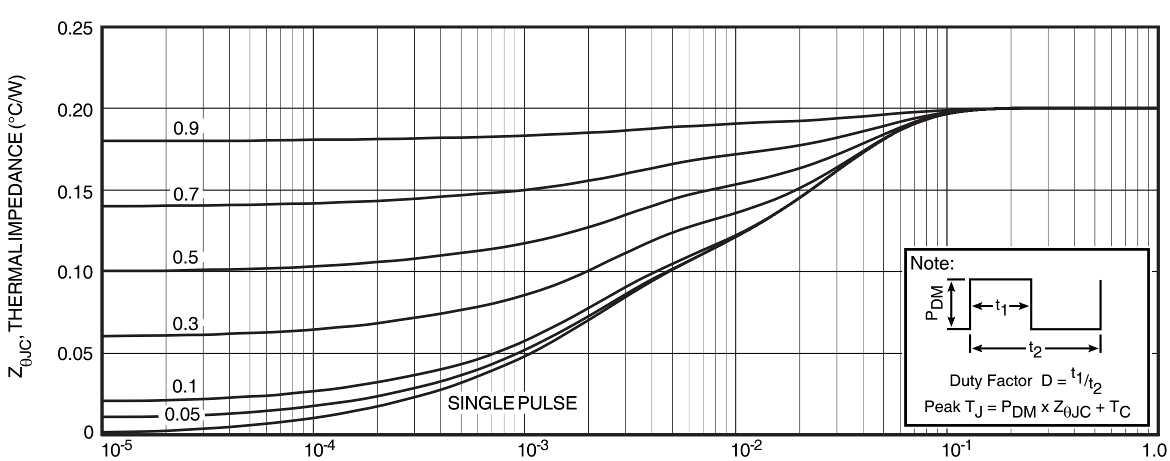


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

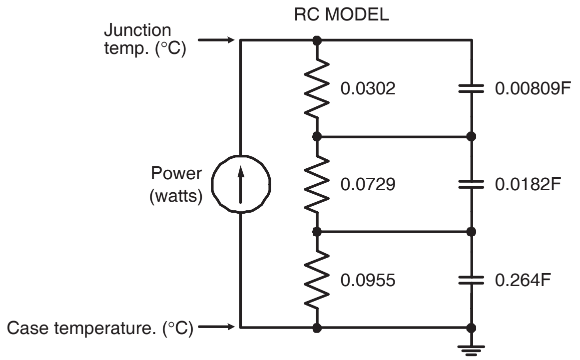


FIGURE 2, TRANSIENT THERMAL IMPEDANCE MODEL

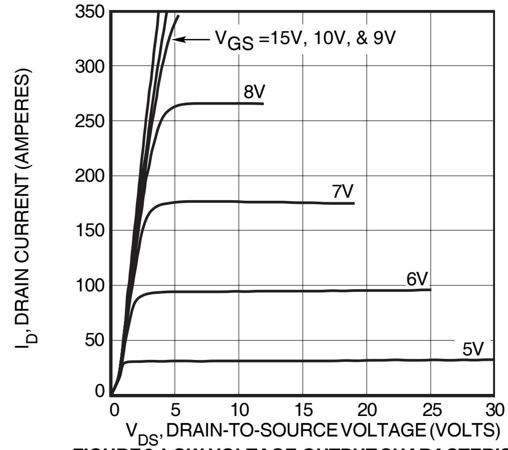


FIGURE 3, LOW VOLTAGE OUTPUT CHARACTERISTICS

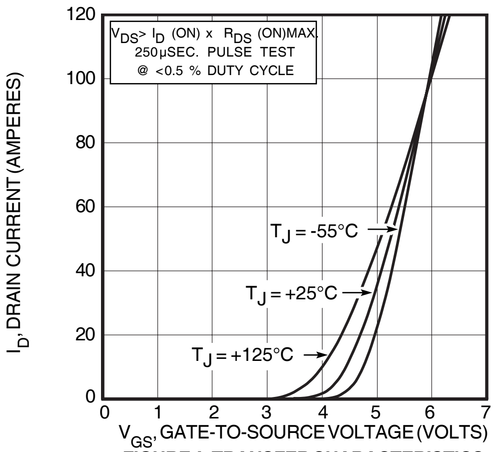


FIGURE 4, TRANSFER CHARACTERISTICS

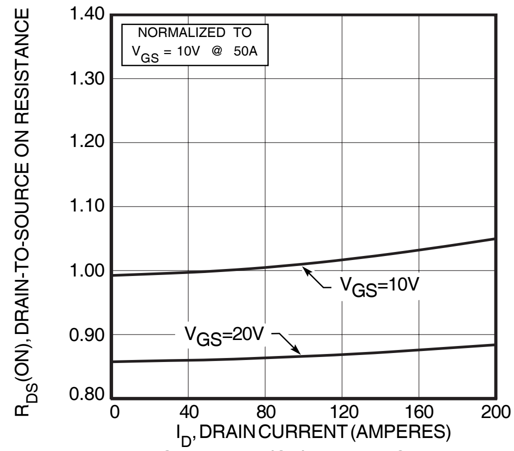


FIGURE 5, R_{DS}(ON) vs DRAIN CURRENT

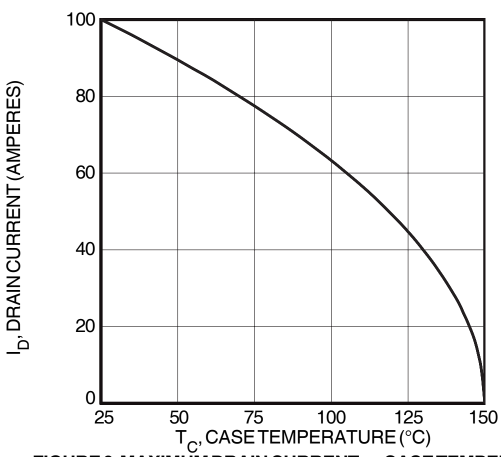


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

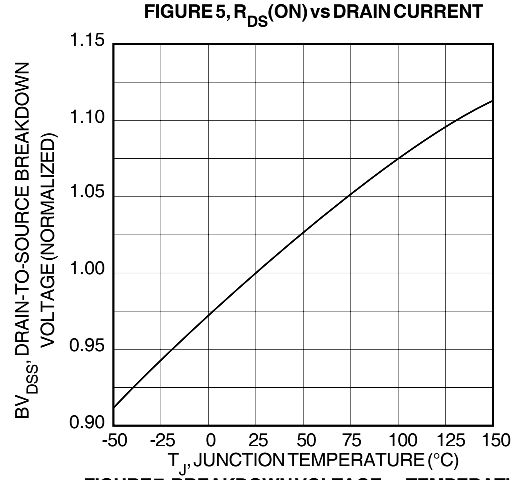


FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

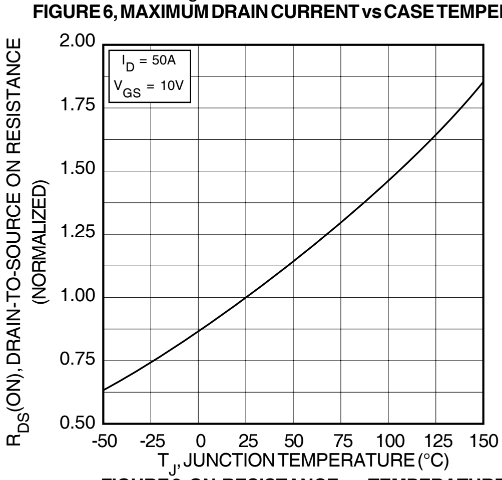


FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

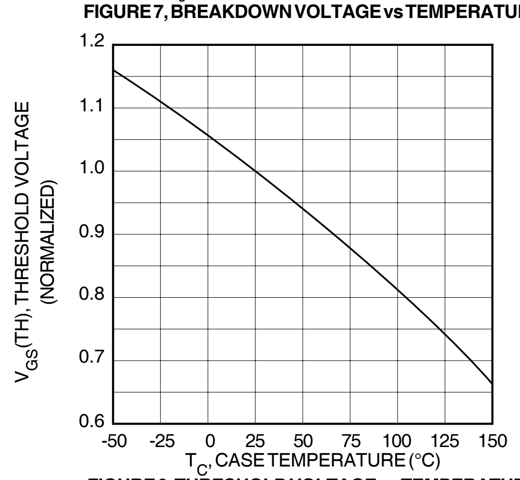


FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

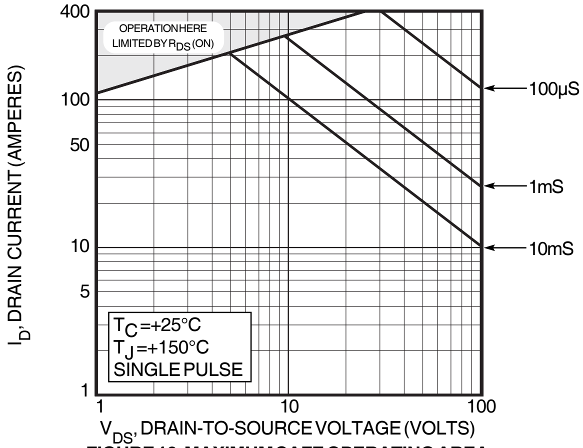


FIGURE 10, MAXIMUM SAFE OPERATING AREA

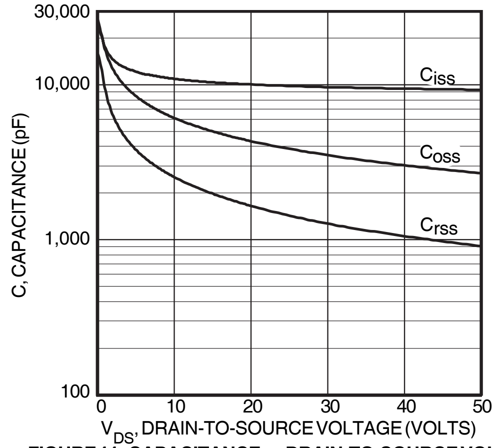


FIGURE 11, CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

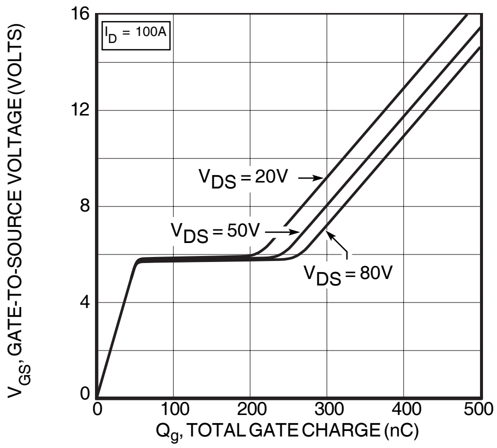


FIGURE 12, GATE CHARGE vs GATE-TO-SOURCE VOLTAGE

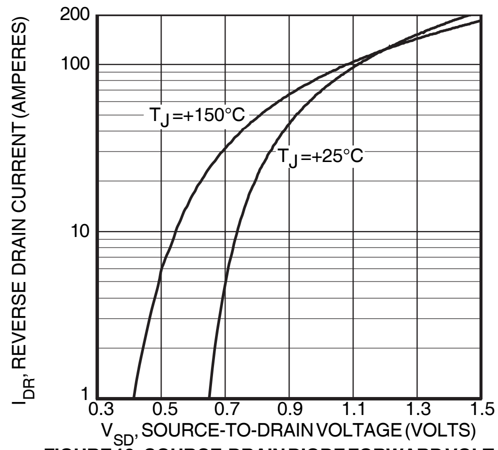
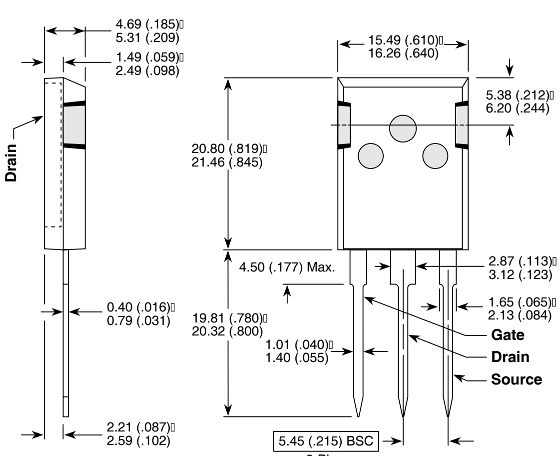


FIGURE 13, SOURCE-DRAIN DIODE FORWARD VOLTAGE

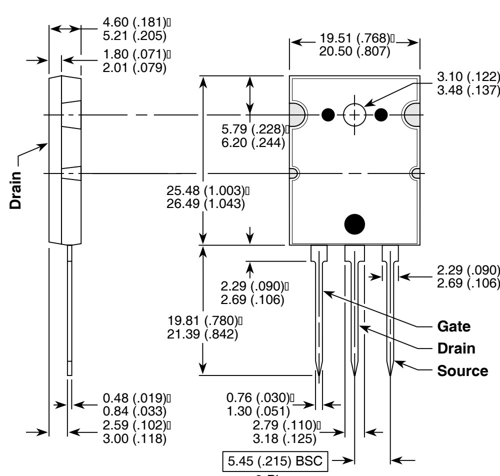
T-MAX™ (B2) Package Outline (B2VFR)



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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