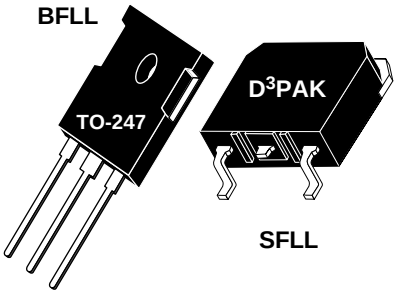
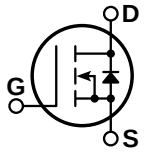
APT30M75BFLL
APT30M75SFLL
300V 44A 0.075Ω

POWER MOS 7® FREDFET



Power MOS 7® is a new generation of low loss, high voltage, N-Channel enhancement mode power MOSFETS. Both conduction and switching losses are addressed with Power MOS 7® by significantly lowering $R_{DS(ON)}$ and Q_g. Power MOS 7® combines lower conduction and switching losses along with exceptionally fast switching speeds inherent with APT's patented metal gate structure.

- **Lower Input Capacitance**
- **Lower Miller Capacitance**
- **Lower Gate Charge, Qg**
- **Increased Power Dissipation**
- **Easier To Drive**
- **TO-247 or Surface Mount D³PAK Package**
- **FAST RECOVERY BODY DIODE**



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

Symbol	Parameter	APT30M75	UNIT
V_{DSS}	Drain-Source Voltage	300	Volts
I_D	Continuous Drain Current @ T_C = 25°C	44	Amps
I_{DM}	Pulsed Drain Current ①	176	
V_{GS}	Gate-Source Voltage Continuous	±30	Volts
V_{GSM}	Gate-Source Voltage Transient	±40	
P_D	Total Power Dissipation @ T_C = 25°C	329	Watts
	Linear Derating Factor	2.63	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)	44	Amps
E_{AR}	Repetitive Avalanche Energy ①	30	mJ
E_{AS}	Single Pulse Avalanche Energy ④	1300	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
BV_{DSS}	Drain-Source Breakdown Voltage (V_{GS} = 0V, I_D = 250µA)	300			Volts
$I_{D(on)}$	On State Drain Current ② ($V_{DS} > I_{D(on)} \times R_{DS(on)}$ Max, V_{GS} = 10V)	44			Amps
$R_{DS(on)}$	Drain-Source On-State Resistance ② (V_{GS} = 10V, 22A)			0.075	Ohms
I_{DSS}	Zero Gate Voltage Drain Current (V_{DS} = 300V, V_{GS} = 0V)			250	µA
	Zero Gate Voltage Drain Current (V_{DS} = 240V, 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 = 1mA)	3		5	Volts

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

DYNAMIC CHARACTERISTICS

APT30M75 BFLL - SFLL

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	V_{GS} = 0V		3018		pF
C_{oss}	Output Capacitance	V_{DS} = 25V		771		
C_{rss}	Reverse Transfer Capacitance	f = 1 MHz		43		
Q_g	Total Gate Charge ③	V_{GS} = 10V		57		nC
Q_{gs}	Gate-Source Charge	V_{DD} = 200V		21		
Q_{gd}	Gate-Drain ("Miller") Charge	I_D = 44A @ 25°C		23		
$t_{d}(on)$	Turn-on Delay Time	V_{GS} = 15V		13		ns
t_r	Rise Time	V_{DD} = 200V		3		
$t_{d}(off)$	Turn-off Delay Time	I_D = 44A @ 25°C		20		
t_f	Fall Time	R_G = 0.6Ω		2		

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions		MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)				44	Amps
I_{SM}	Pulsed Source Current ① (Body Diode)				176	
V_{SD}	Diode Forward Voltage ② (V_{GS} = 0V, I_S = -44A)				1.3	Volts
$^{dv}/_{dt}$	Peak Diode Recovery $^{dv}/_{dt}$ ⑤				8	V/ns
t_{rr}	Reverse Recovery Time (I_S = -44A, $^{di}/_{dt}$ = 100A/µs)	T_j = 25°C			200	ns
		T_j = 125°C			400	
Q_{rr}	Reverse Recovery Charge (I_S = -44A, $^{di}/_{dt}$ = 100A/µs)	T_j = 25°C		1.1		µC
		T_j = 125°C		2.7		
I_{RRM}	Peak Recovery Current (I_S = -44A, $^{di}/_{dt}$ = 100A/µs)	T_j = 25°C		10		Amps
		T_j = 125°C		15.1		

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.38	°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 = 1.34mH, R_G = 25Ω, Peak I_L = 44A

⑤ $^{dv}/_{dt}$ numbers reflect the limitations of the test circuit rather than the device itself. $I_S \le -I_D 44A$ $^{di}/_{dt} \le 700A/\mu s$ $V_R \le V_{DSS}$ $T_J \le 150°C$

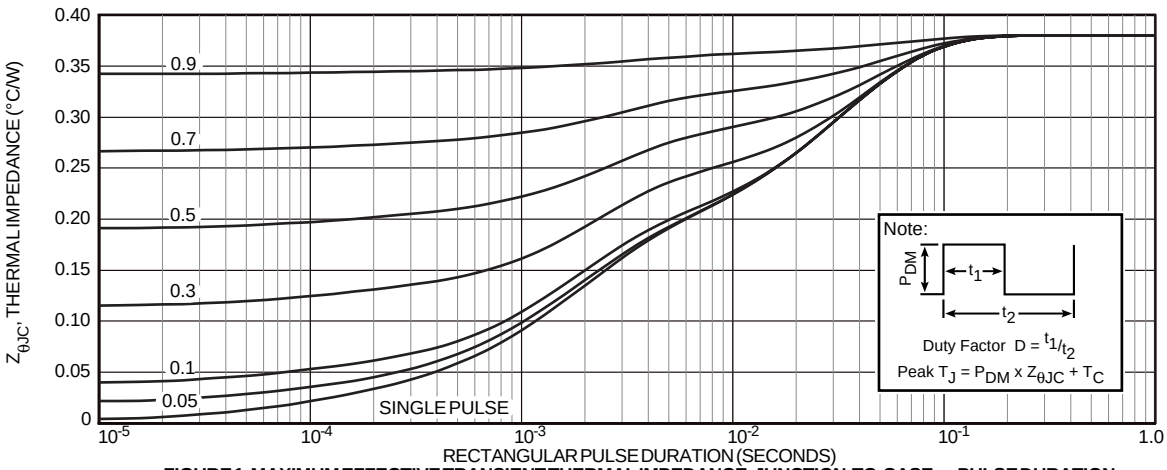


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

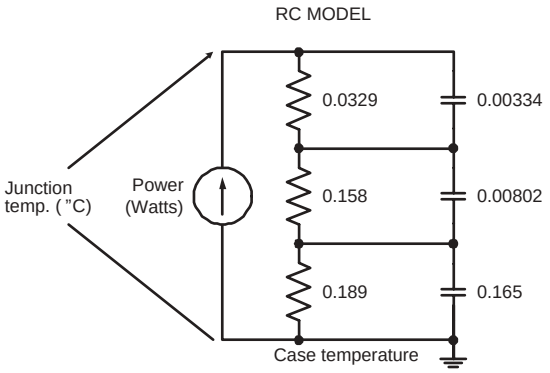


FIGURE 2, TRANSIENT THERMAL IMPEDANCE MODEL

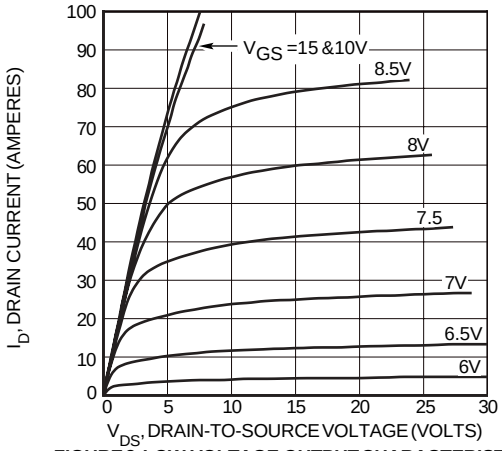


FIGURE 3, LOW VOLTAGE OUTPUT CHARACTERISTICS

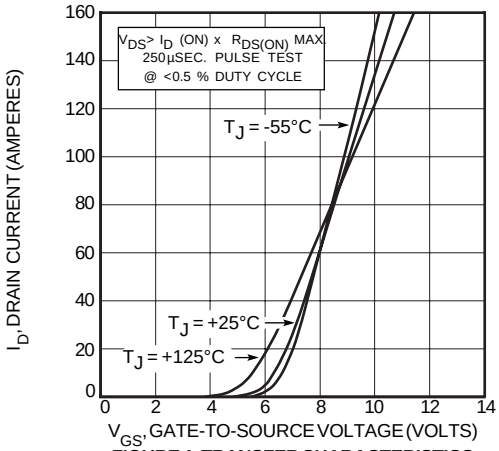


FIGURE 4, TRANSFER CHARACTERISTICS

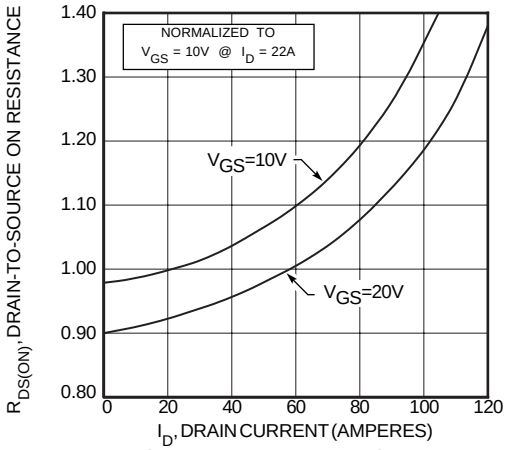


FIGURE 5, $R_{DS(ON)}$ vs DRAIN CURRENT

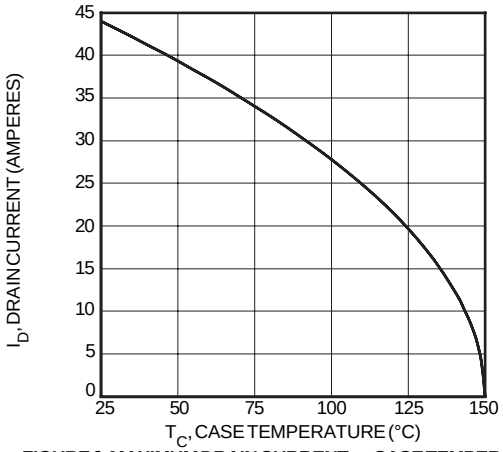


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

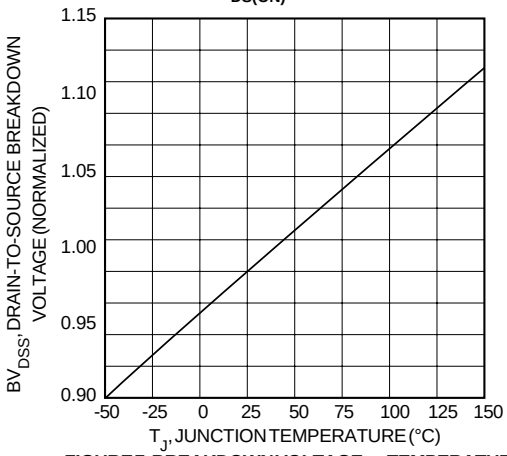


FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

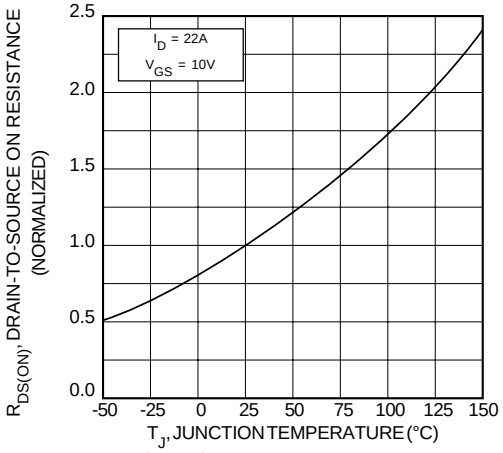


FIGURE 8, $R_{DS(ON)}$ vs. TEMPERATURE

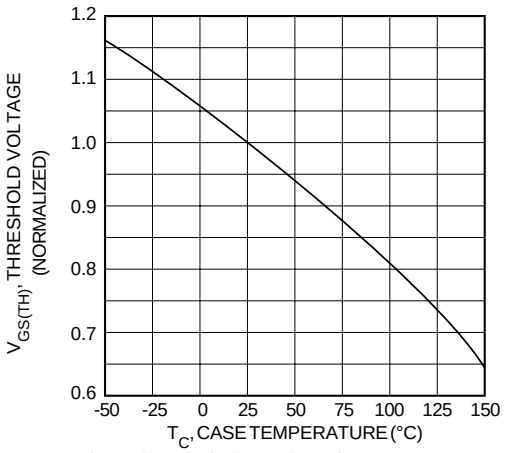


FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

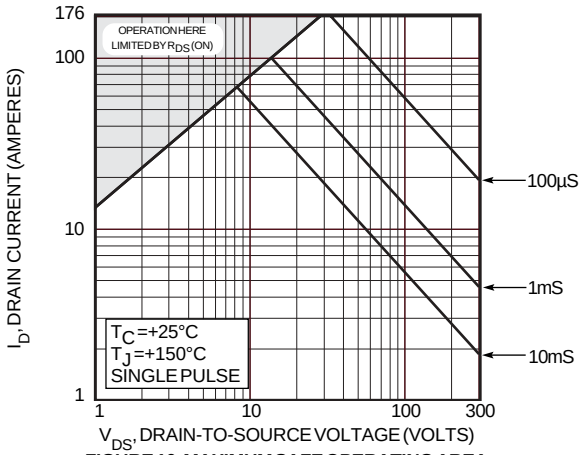


FIGURE 10, MAXIMUM SAFE OPERATING AREA

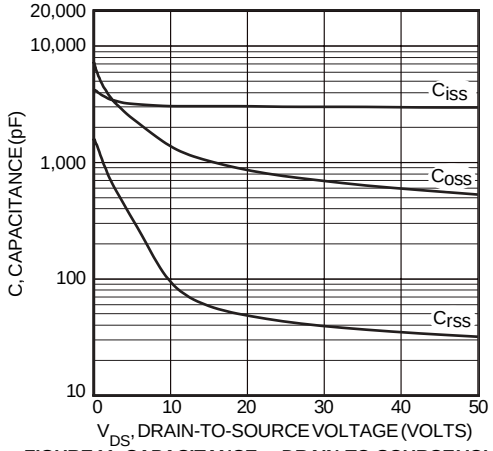


FIGURE 11, CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

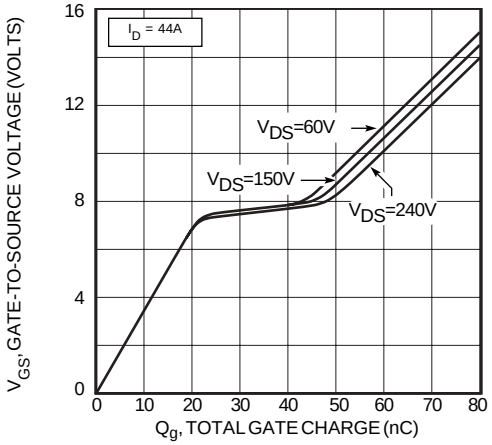


FIGURE 12, GATE CHARGE vs GATE-TO-SOURCE VOLTAGE

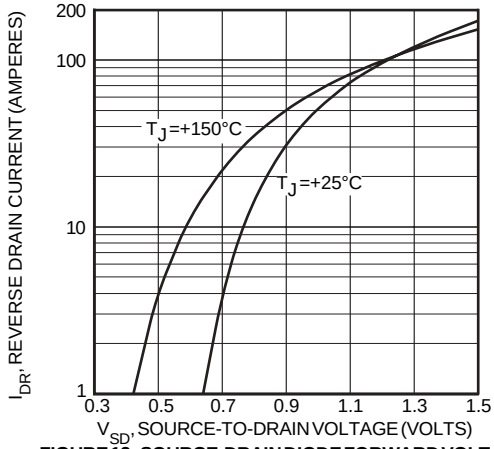
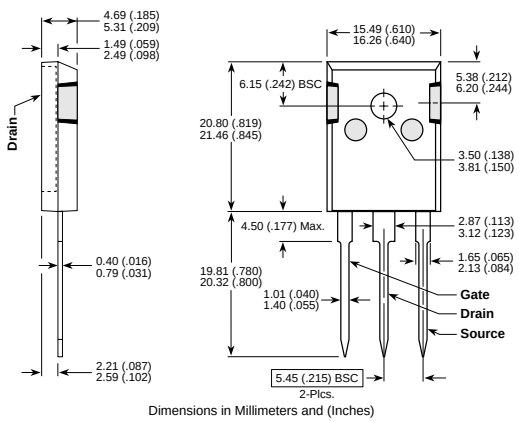


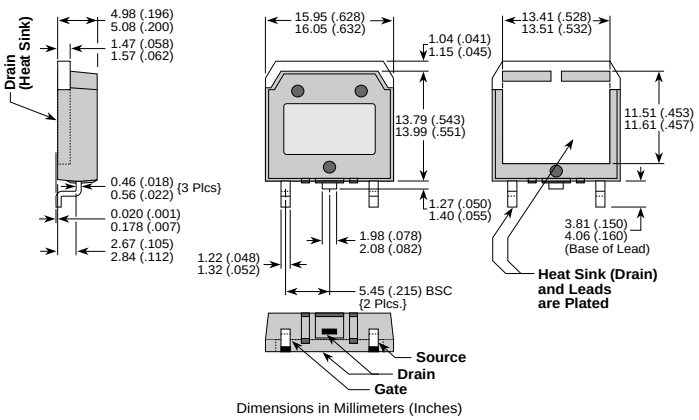
FIGURE 13, SOURCE-DRAIN DIODE FORWARD VOLTAGE

TO-247 Package Outline



Dimensions in Millimeters and (Inches)

D^{3}PAK Package Outline



Dimensions in Millimeters (Inches)