

DYNAMIC CHARACTERISTICS

APT30M61BLL - SLL

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1 \text{ MHz}$		3720		pF
C_{oss}	Output Capacitance			920		
C_{rss}	Reverse Transfer Capacitance			41		
Q_g	Total Gate Charge ③	$V_{GS} = 10V$ $V_{DD} = 150V$ $I_D = 54A @ 25^\circ C$		64		nC
Q_{gs}	Gate-Source Charge			23		
Q_{gd}	Gate-Drain ("Miller") Charge			26		
$t_{d(on)}$	Turn-on Delay Time	RESISTIVE SWITCHING $V_{GS} = 15V$ $V_{DD} = 150V$ $I_D = 54A @ 25^\circ C$ $R_G = 0.6\Omega$		12		ns
t_r	Rise Time			20		
$t_{d(off)}$	Turn-off Delay Time			36		
t_f	Fall Time			13		
E_{on}	Turn-on Switching Energy ⑥	INDUCTIVE SWITCHING @ 25°C $V_{DD} = 200V, V_{GS} = 15V$ $I_D = 54A, R_G = 5\Omega$		367		μJ
E_{off}	Turn-off Switching Energy			319		
E_{on}	Turn-on Switching Energy ⑥	INDUCTIVE SWITCHING @ 125°C $V_{DD} = 200V, V_{GS} = 15V$ $I_D = 54A, R_G = 5\Omega$		451		
E_{off}	Turn-off Switching Energy			348		

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)			54	Amps
I_{SM}	Pulsed Source Current ① (Body Diode)			216	
V_{SD}	Diode Forward Voltage ② ($V_{GS} = 0V, I_S = -54A$)			1.3	Volts
t_{rr}	Reverse Recovery Time ($I_S = -54A, di_S/dt = 100A/\mu s$)		440		ns
Q_{rr}	Reverse Recovery Charge ($I_S = -54A, di_S/dt = 100A/\mu s$)		5.8		μC
dv/dt	Peak Diode Recovery dv/dt ⑤			5	V/ns

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.31	$^\circ C/W$
$R_{\theta JA}$	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 $T_J = +25^\circ C$, $L = 0.89mH$, $R_G = 25\Omega$, Peak $I_L = 54A$

⑤ dv/dt numbers reflect the limitations of the test circuit rather than the device itself. $I_S \leq -54A$ $di/dt \leq 700A/\mu s$ $V_R \leq 300V$ $T_J \leq 150^\circ C$

⑥ E_{on} includes diode reverse recovery. See figures 18, 20.

APT Reserves the right to change, without notice, the specifications and information contained herein.

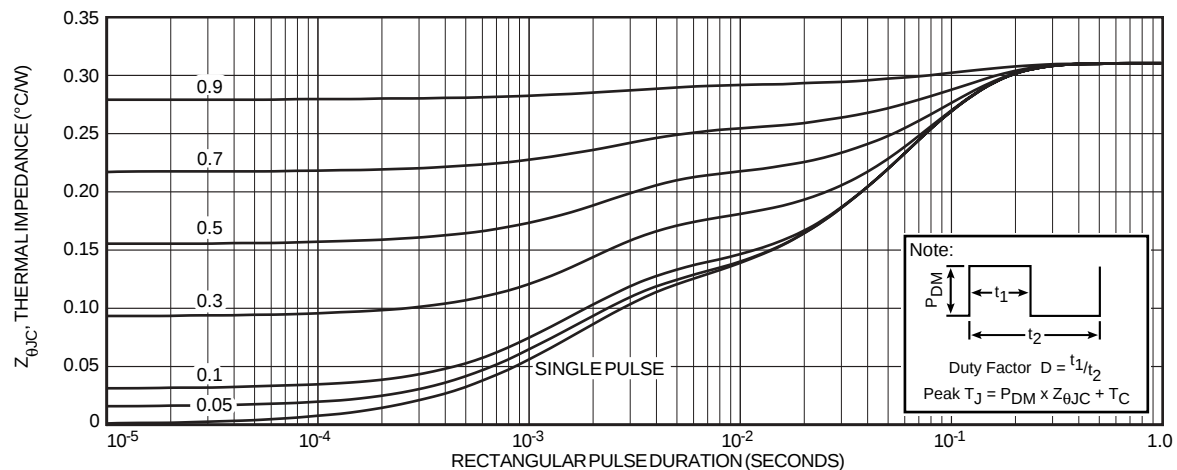


FIGURE 1, MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs PULSE DURATION

Typical Performance Curves

APT30M61BLL - SLL

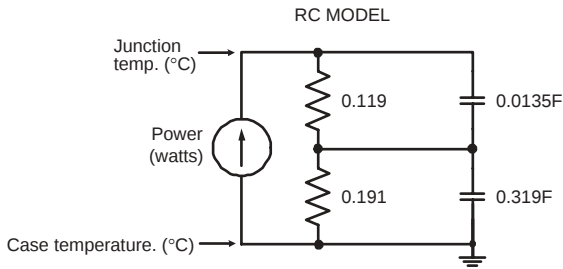


FIGURE 2, TRANSIENT THERMAL IMPEDANCE MODEL

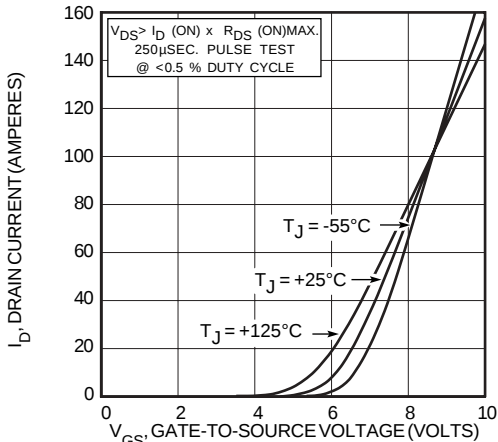


FIGURE 4, TRANSFER CHARACTERISTICS

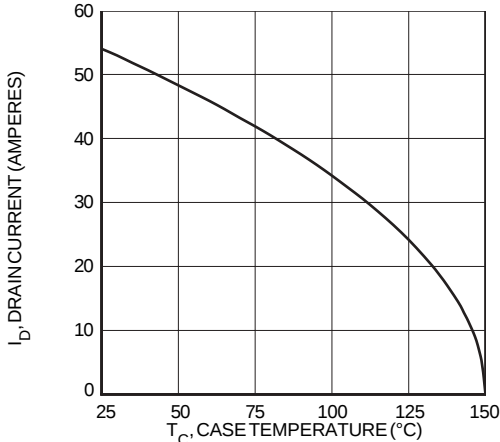


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

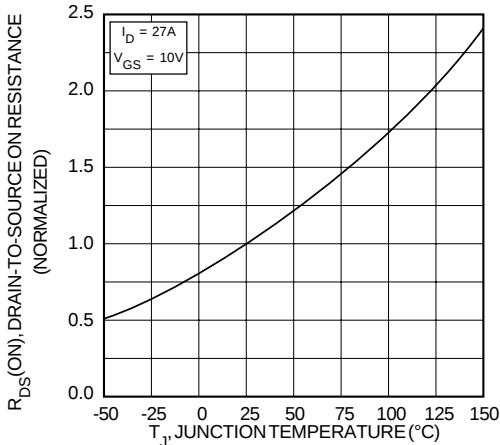


FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

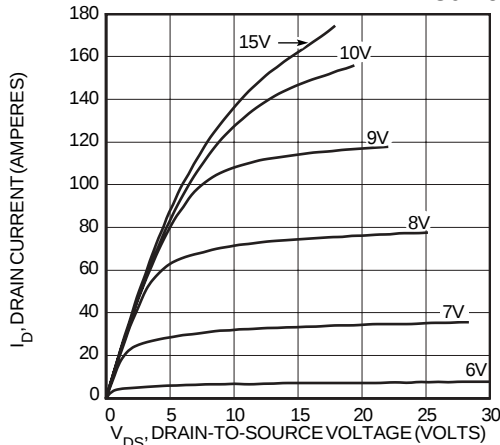


FIGURE 3, LOW VOLTAGE OUTPUT CHARACTERISTICS

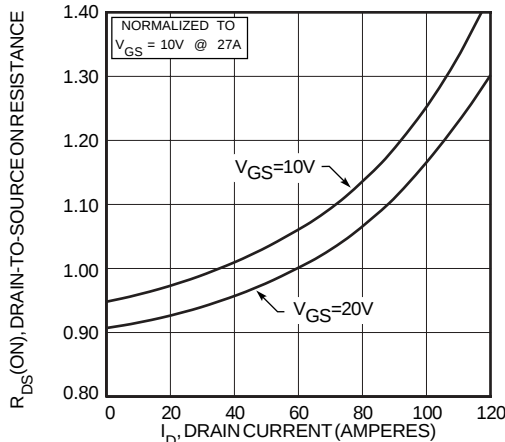


FIGURE 5, $R_{DS(ON)}$ vs DRAIN CURRENT

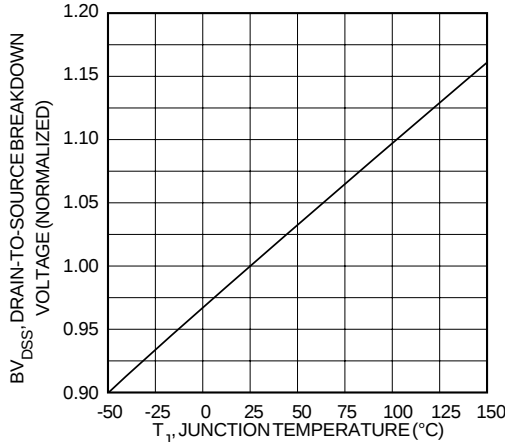


FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

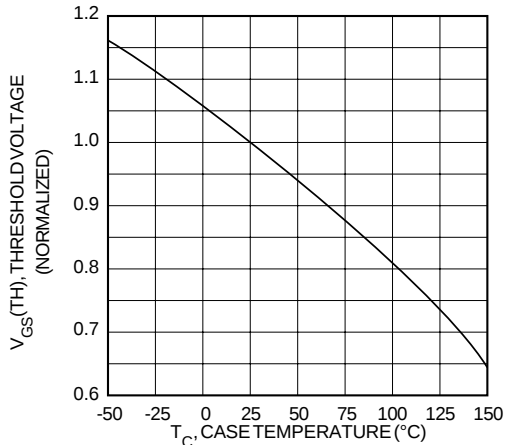
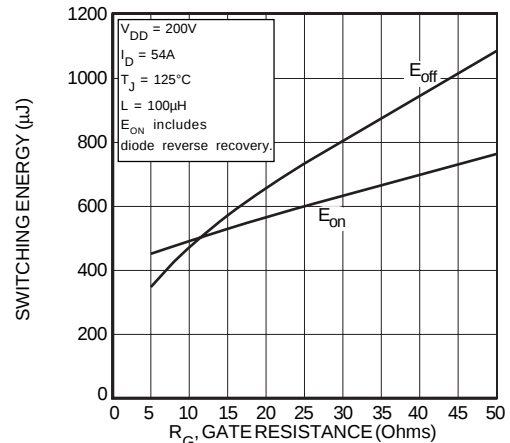
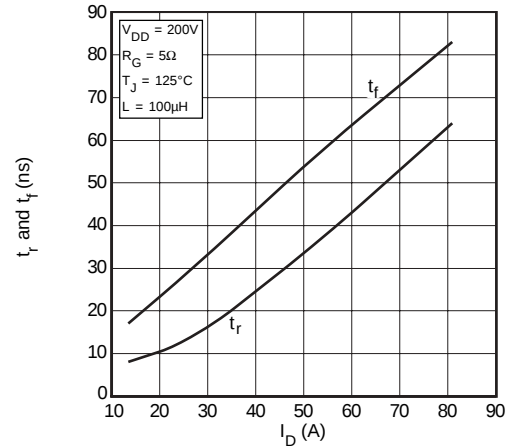
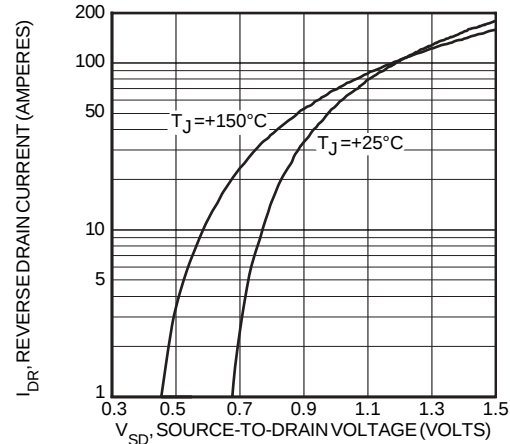
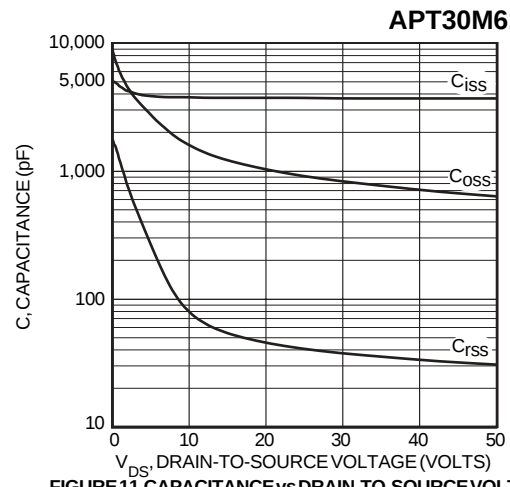
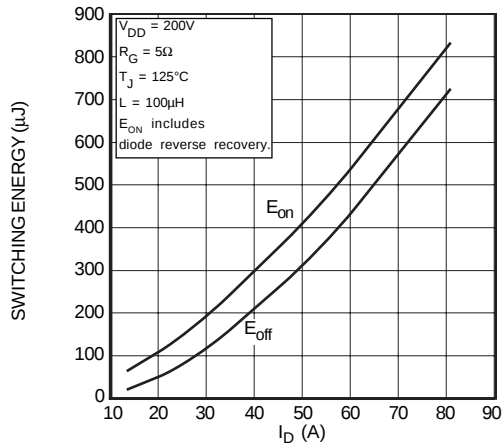
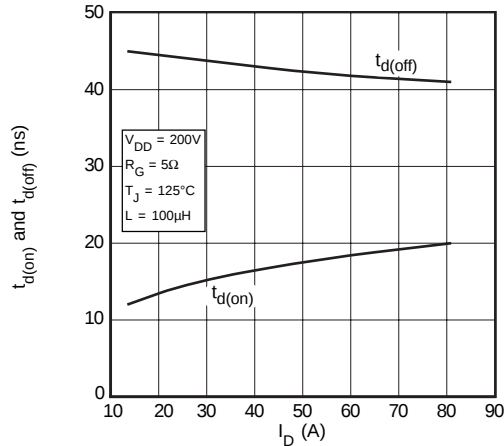
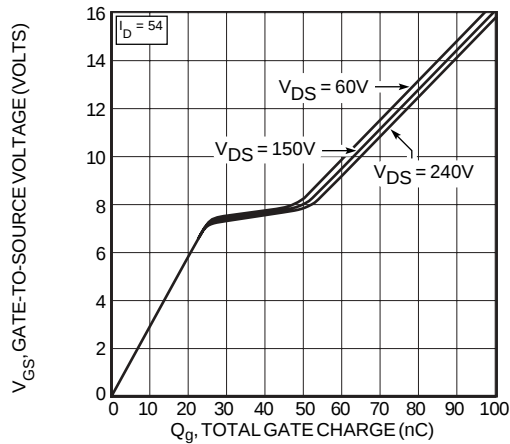
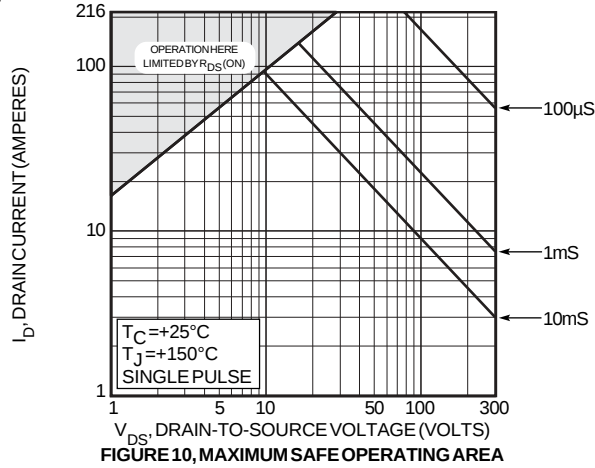


FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

Typical Performance Curves



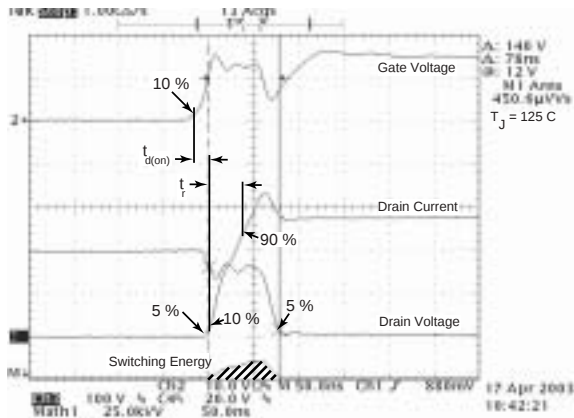


Figure 18, Turn-on Switching Waveforms and Definitions

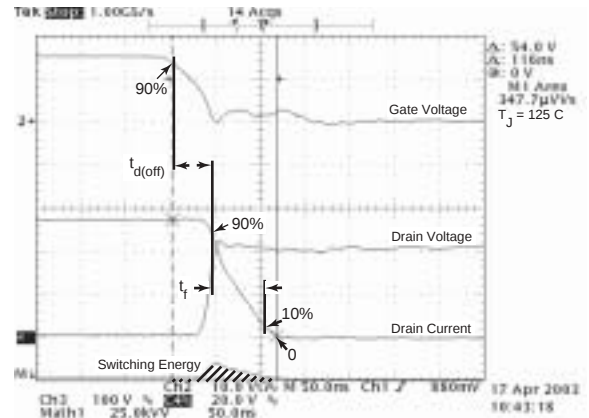


Figure 19, Turn-off Switching Waveforms and Definitions

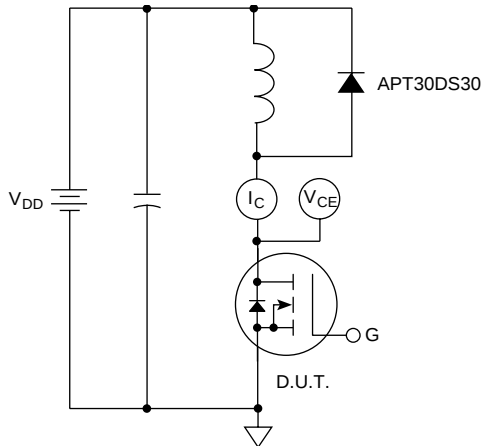
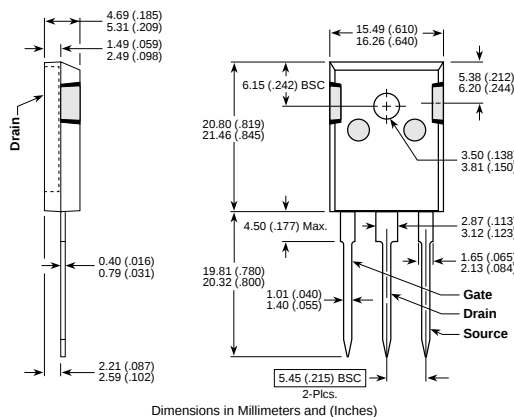


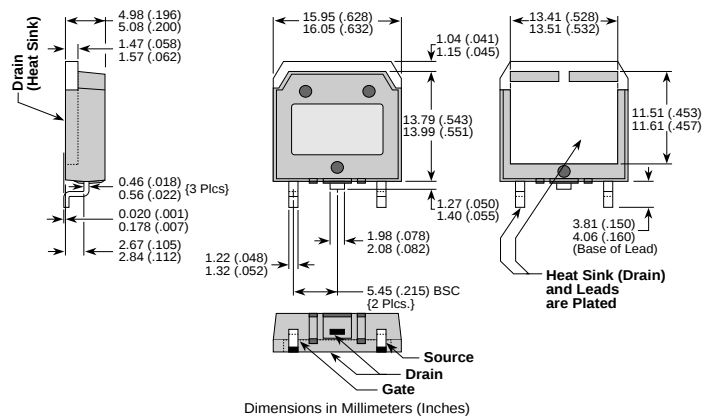
Figure 20. Inductive Switching Test Circuit

TO-247 Package Outline



Dimensions in Millimeters and (Inches)

D³PAK Package Outline



Dimensions in Millimeters and (Inches)

APT's products are covered by one or more of U.S. patents 4,895,810 5,045,903 5,089,434 5,182,234 5,019,522

5,262,336 6,503,786 5,256,583 4,748,103 5,283,202 5,231,474 5,434,095 5,528,058 and foreign patents. US and Foreign patents pending. All Rights Reserved.