DYNAMIC CHARACTERISTICS

APT94N65B2C3G

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1 MHz		13940		pF
C_{oss}	Output Capacitance			5200		
C_{rss}	Reverse Transfer Capacitance			229		
Q_g	Total Gate Charge ④	V_{GS} = 10V V_{DD} = 300V I_D = 94A @ 25°C		580		nC
Q_{gs}	Gate-Source Charge			72		
Q_{gd}	Gate-Drain ("Miller") Charge			234		
$t_{d(on)}$	Turn-on Delay Time	**INDUCTIVE SWITCHING** V_{GS} = 15V V_{DD} = 400V I_D = 94A @ 25°C R_G = 4.3Ω		32		ns
t_r	Rise Time			59		
$t_{d(off)}$	Turn-off Delay Time			498		
t_f	Fall Time			167		
E_{on}	Turn-on Switching Energy ⑤	**INDUCTIVE SWITCHING @ 25°C** V_{DD} = 400V, V_{GS} = 15V I_D = 94A, R_G = 4.3Ω		2684		µJ
E_{off}	Turn-off Switching Energy			4448		
E_{on}	Turn-on Switching Energy ⑤	**INDUCTIVE SWITCHING @ 125°C** V_{DD} = 400V, V_{GS} = 15V I_D = 94A, R_G = 4.3Ω		3391		
E_{off}	Turn-off Switching Energy			5082		

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions		MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)				94	Amps
I_{SM}	Pulsed Source Current② (Body Diode)				282	
V_{SD}	Diode Forward Voltage ④ (V_{GS} = 0V, I_S = -94A)			0.9	1.2	Volts
t_{rr}	Reverse Recovery Time (I_S = -94A, di/dt = 100A/µs)	T_j = 25°C		960		ns
				1271		
Q_{rr}	Reverse Recovery Charge (I_S = -94A, di/dt = 100A/µs)	T_j = 25°C		31		µC
				43		
I_{RRM}	Peak Recovery Current (I_S = -94A, di/dt = 100A/µs)	T_j = 25°C		58		Amps
				56		

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.15	°C/W
$R_{\theta JA}$	Junction to Ambient			31	

① Repetitive Rating: Pulse width limited by maximum junction temperature.
② Repetitive avalanche causes additional power losses that can be calculated as ***$P_{AV} = E_{AR}*f$. Pulse width tp limited by Tj max.***
③ Pulse Test: Pulse width < 380 µs, Duty Cycle < 2%
④ See MIL-STD-750 Method 3471
⑤ Eon includes diode reverse recovery.
⑥ Maximum 125°C diode commutation speed = di/dt 600A/µs

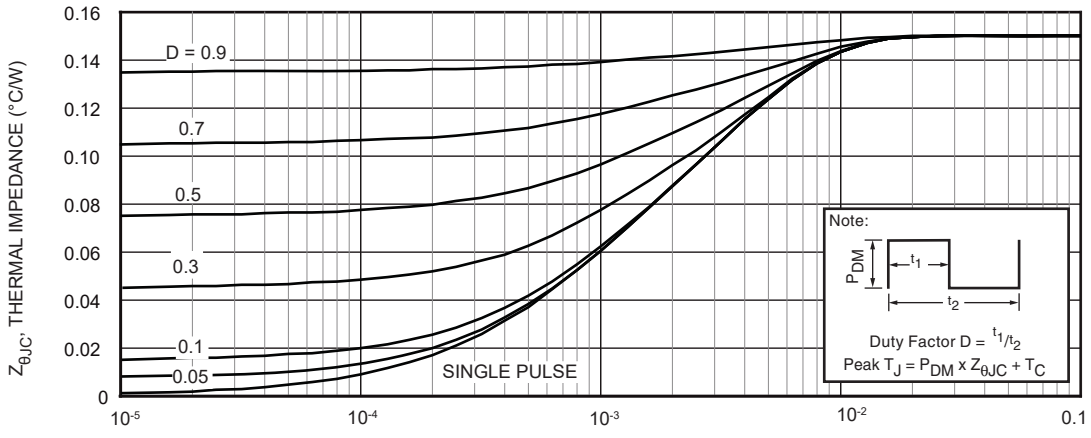


Figure 1, Maximum Effective Transient Thermal Impedance, Junction-To-Case vs Pulse Duration

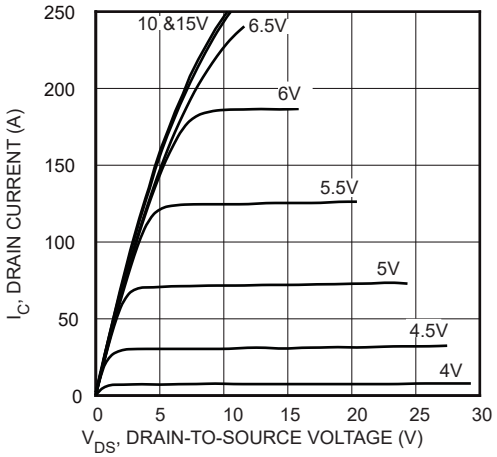


FIGURE 2, Low Voltage Output Characteristics

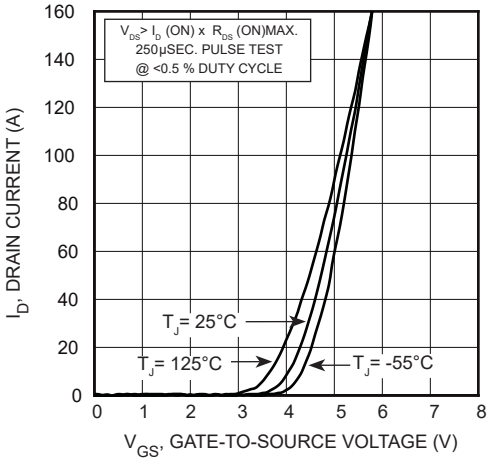


FIGURE 3, Transfer Characteristics

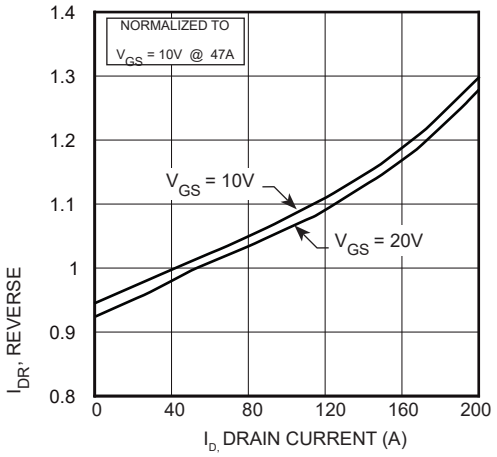


FIGURE 4, R_{DS}(ON) vs Drain Current

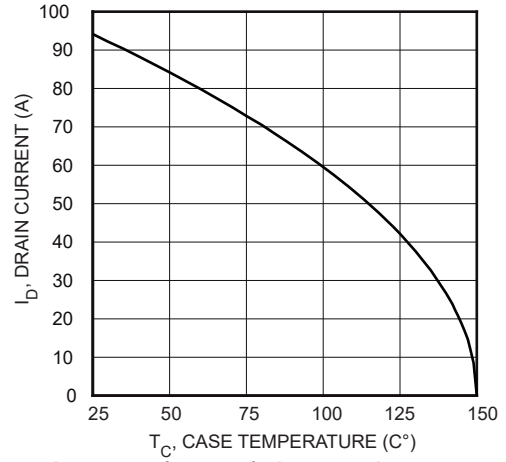


FIGURE 5, Maximum Drain Current vs Case Temperature

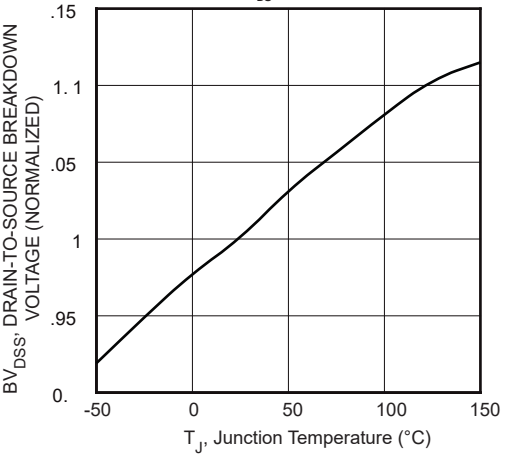


FIGURE 6, Breakdown Voltage vs Temperature

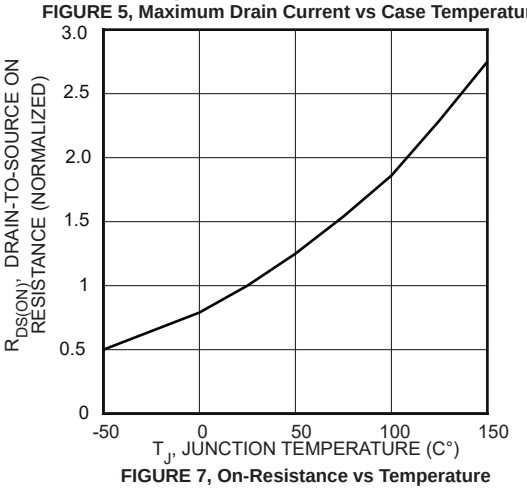


FIGURE 7, On-Resistance vs Temperature

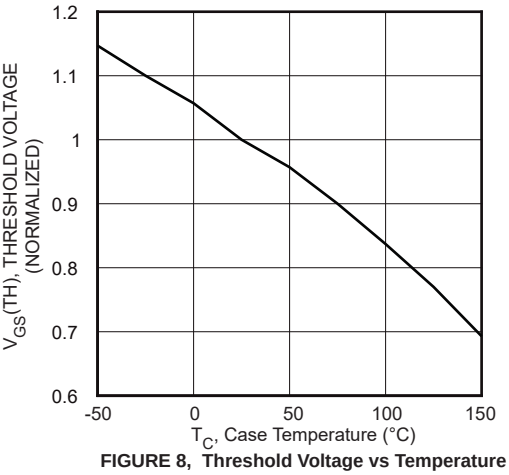


FIGURE 8, Threshold Voltage vs Temperature

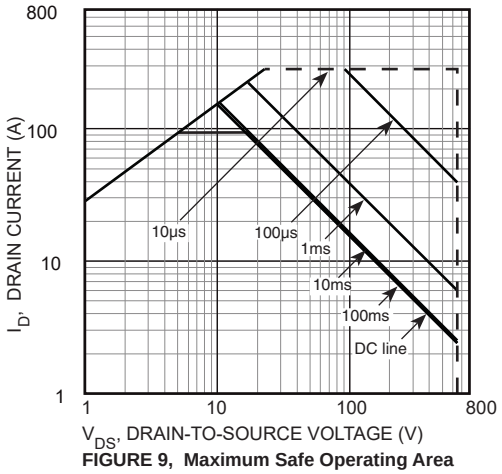


FIGURE 9, Maximum Safe Operating Area

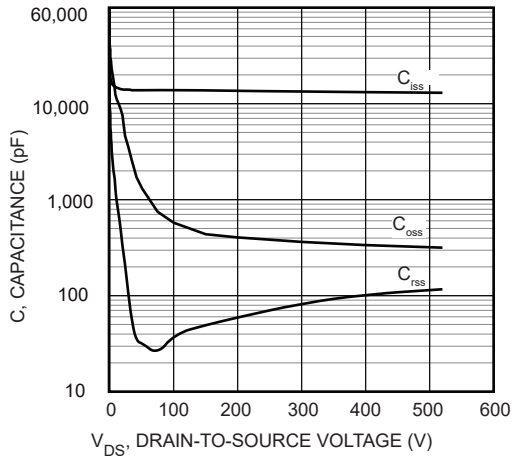


FIGURE 10, Capacitance vs Drain-To-Source Voltage

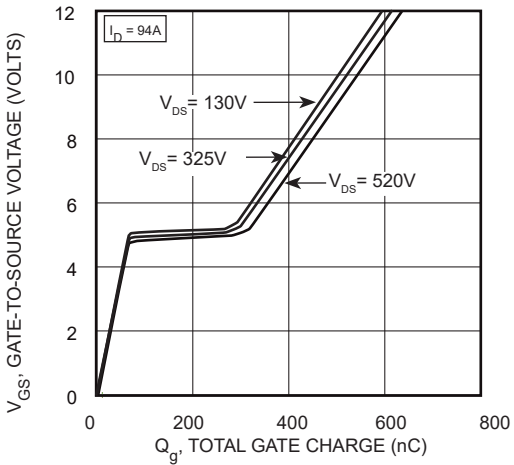


FIGURE 11, Gate Charges vs Gate-To-Source Voltage

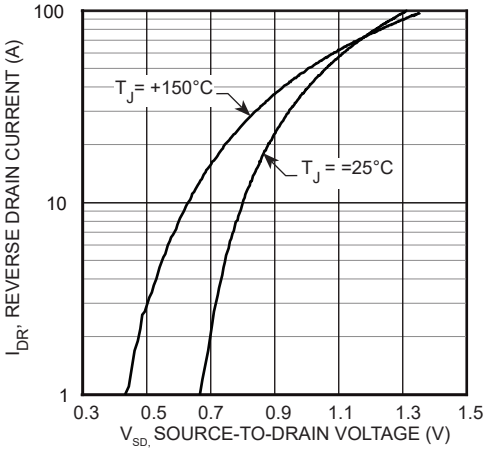


FIGURE 12, Source-Drain Diode Forward Voltage

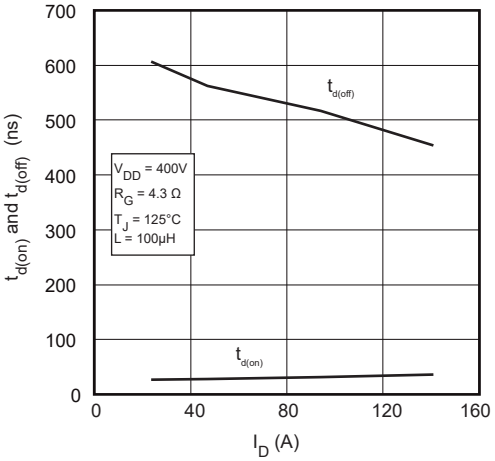


FIGURE 13, Delay Times vs Current

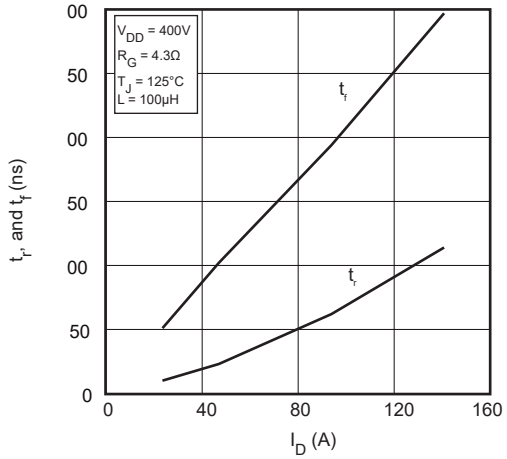


FIGURE 14 , Rise and Fall Times vs Current

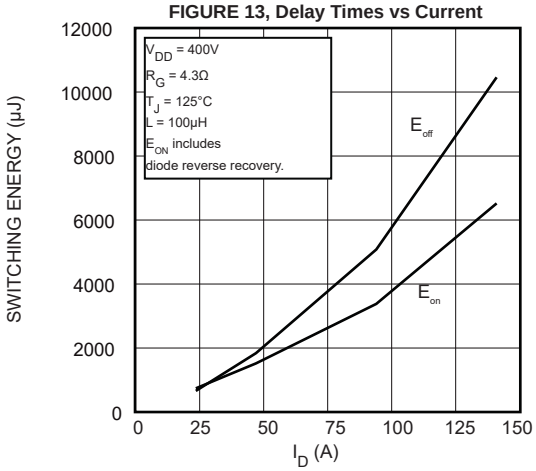


FIGURE 15, Switching Energy vs Current

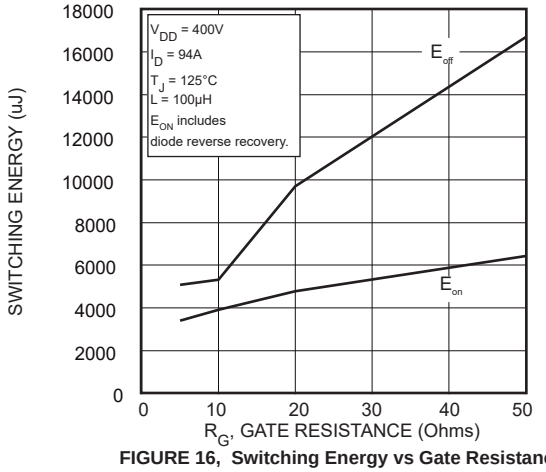


FIGURE 16, Switching Energy vs Gate Resistance

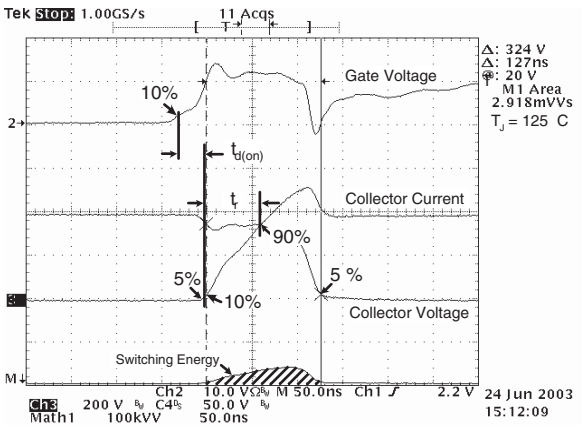


Figure 17, Turn-on Switching Waveforms and Definitions

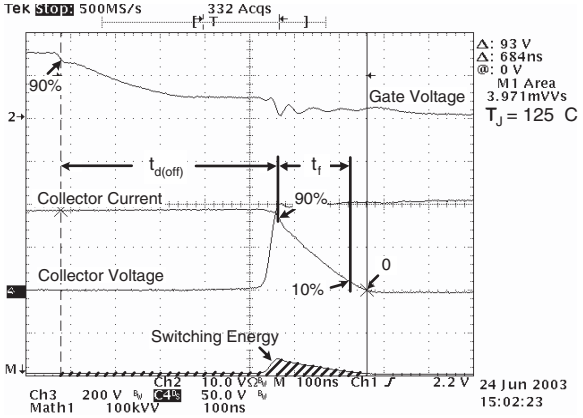


Figure 18, Turn-off Switching Waveforms and Definitions

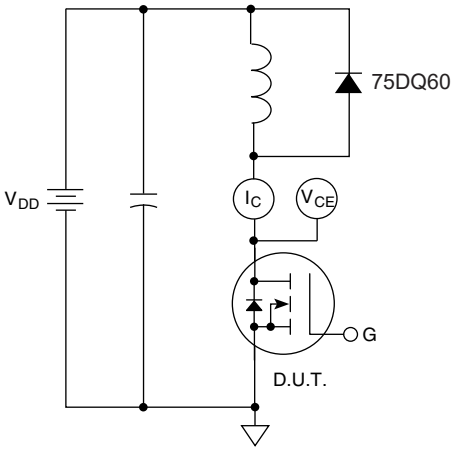
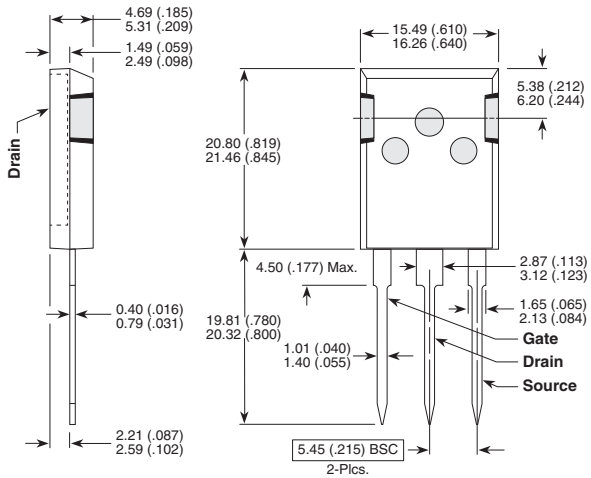


Figure 19, Inductive Switching Test Circuit

T-MAX® (B2) Package Outline

e1 SAC: Tin, Silver, Copper



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

Dimensions in Millimeters and (Inches)