DYNAMIC CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1 MHz		7650		pF
C_{oss}	Output Capacitance			5045		
C_{rss}	Reverse Transfer Capacitance			550		
Q_g	Total Gate Charge ⑤	V_{GS} = 10V V_{DD} = 325V I_D = 97A @ 25°C		300		nC
Q_{gs}	Gate-Source Charge			50		
Q_{gd}	Gate-Drain ("Miller") Charge			160		
$t_{d(on)}$	Turn-on Delay Time	**INDUCTIVE SWITCHING** V_{GS} = 15V V_{DD} = 433V I_D = 97A @ 25°C R_G = 2.2Ω		25		ns
t_r	Rise Time			60		
$t_{d(off)}$	Turn-off Delay Time			275		
t_f	Fall Time			130		
E_{on}	Turn-on Switching Energy ⑥	**INDUCTIVE SWITCHING @ 25°C** V_{DD} = 433V, V_{GS} = 15V I_D = 97A, R_G = 2.2Ω		2860		µJ
E_{off}	Turn-off Switching Energy			3500		
E_{on}	Turn-on Switching Energy ⑥	**INDUCTIVE SWITCHING @ 125°C** V_{DD} = 433V, V_{GS} = 15V I_D =97A, R_G = 2.2Ω		4030		
E_{off}	Turn-off Switching Energy			3695		

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic / Test Conditions		MIN	TYP	MAX	UNIT
I_S	Continuous Source Current (Body Diode)				97	Amps
I_{SM}	Pulsed Source Current ② (Body Diode)				291	
V_{SD}	Diode Forward Voltage ④ (V_{GS} = 0V, I_S = -48.5A)			0.9	1.2	Volts
$^{dv}/_{dt}$	Peak Diode Recovery $^{dv}/_{dt}$ ⑦				50	V/ns
t_{rr}	Reverse Recovery Time (I_S = -97A, $^{di}/_{dt}$ = 100A/µs)	T_j = 25°C		790		ns
Q_{rr}	Reverse Recovery Charge (I_S = -97A, $^{di}/_{dt}$ = 100A/µs)	T_j = 25°C		19		µC
I_{RRM}	Peak Recovery Current (I_S = -97A, $^{di}/_{dt}$ = 100A/µs)	T_j = 25°C		43		Amps

THERMAL CHARACTERISTICS

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.145	°C/W
$R_{\theta JA}$	Junction to Ambient			40	

1 Continuous current limited by package lead temperature.

2 Repetitive Rating: Pulse width limited by maximum junction temperature

3 Repetitive avalanche causes additional power losses that can be calculated as ***$P_{AV} = E_{AR}*f$. Pulse width tp limited by Tj max.***

4 Pulse Test: Pulse width < 380 µs, Duty Cycle < 2%

5 See MIL-STD-750 Method 3471

6 Eon includes diode reverse recovery.

7 Maximum 125°C diode commutation speed = di/dt 600A/µs

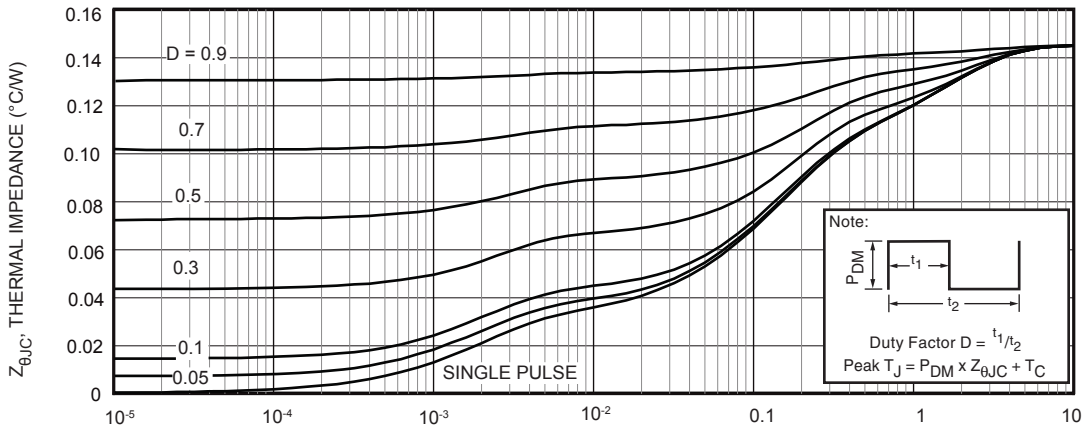


Figure 1, Maximum Effective Transient Thermal Impedance, Junction-To-Case vs Pulse Duration

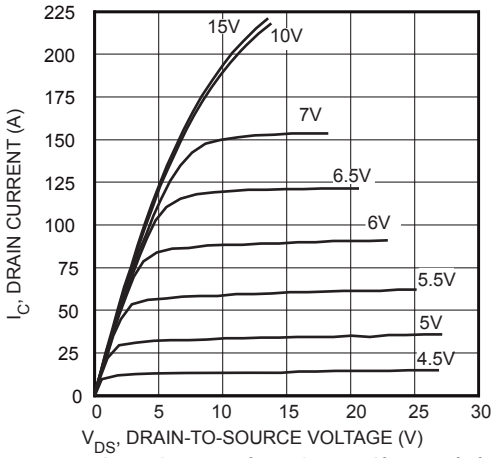


FIGURE 2, Low Voltage Output Characteristics

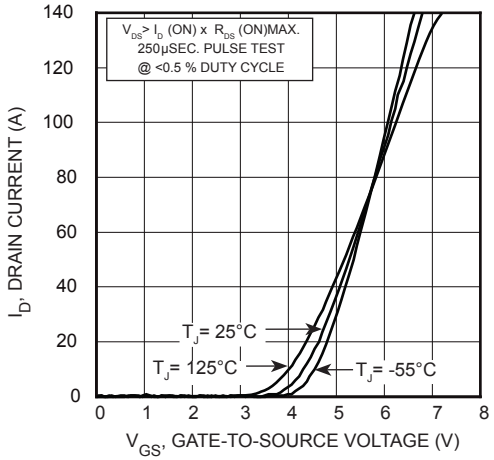


FIGURE 3, Transfer Characteristics

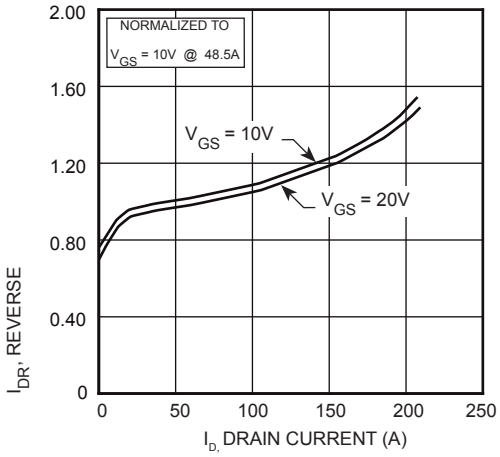


FIGURE 4, R_{DS}(ON) vs Drain Current

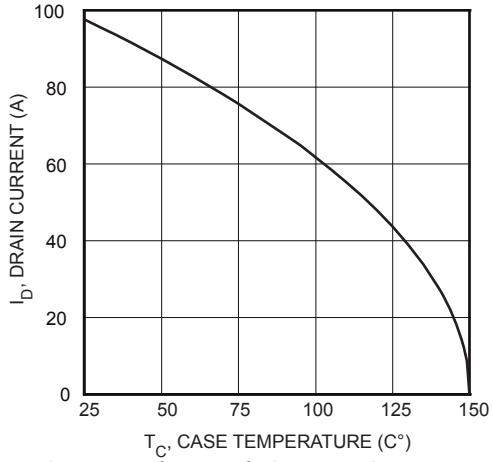


FIGURE 5, Maximum Drain Current vs Case Temperature

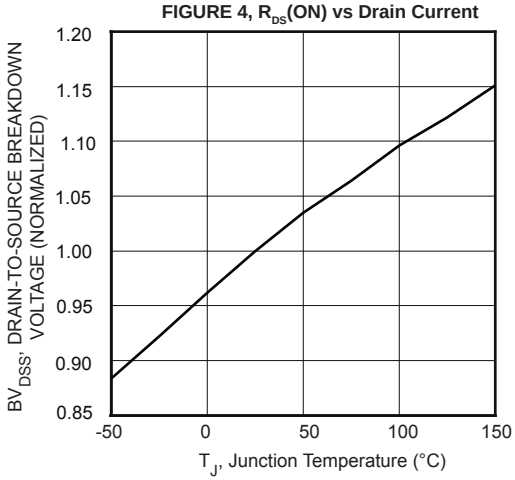


FIGURE 6, Breakdown Voltage vs Temperature

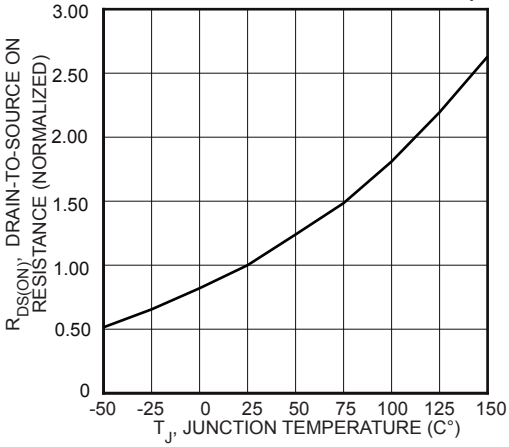


FIGURE 7, On-Resistance vs Temperature

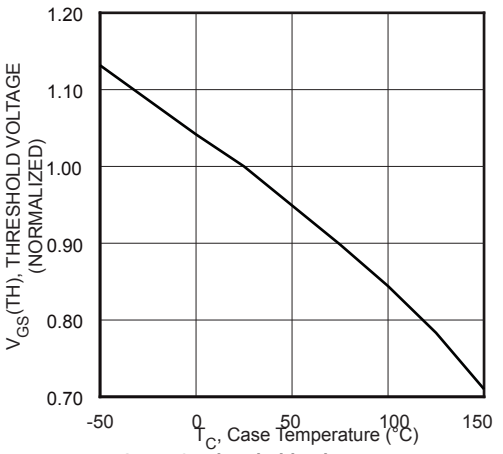


FIGURE 8, Threshold Voltage vs Temperature

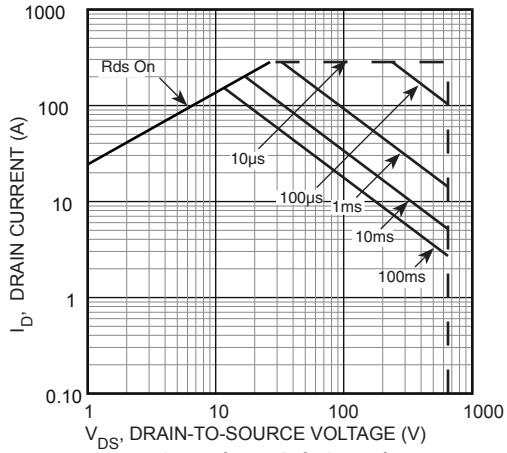


FIGURE 9, Maximum Safe Operating Area

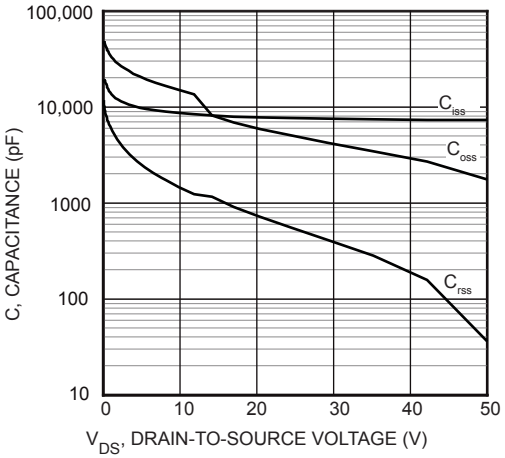


FIGURE 10, Capacitance vs Drain-To-Source Voltage

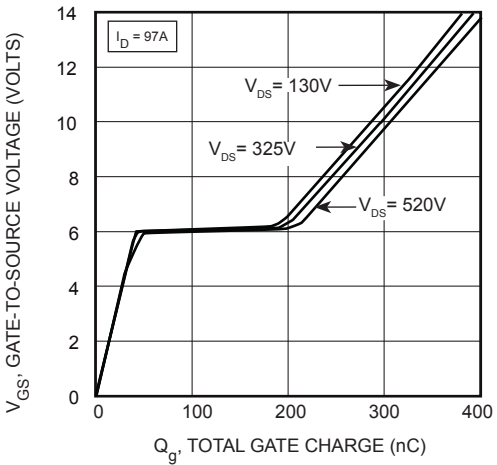


FIGURE 11, Gate Charges vs Gate-To-Source Voltage

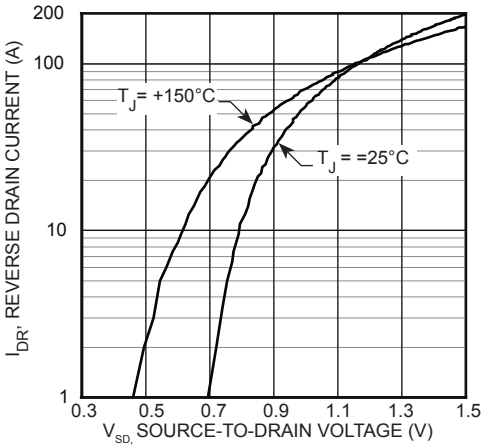


FIGURE 12, Source-Drain Diode Forward Voltage

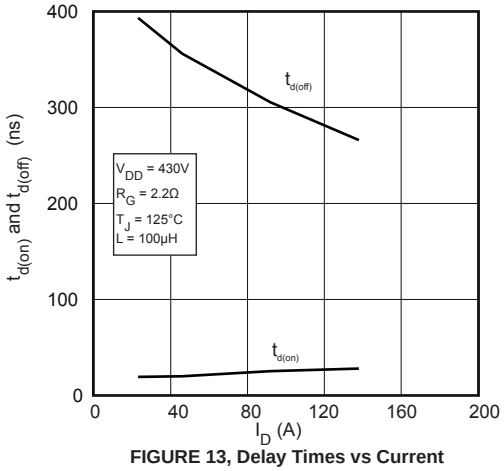


FIGURE 13, Delay Times vs Current

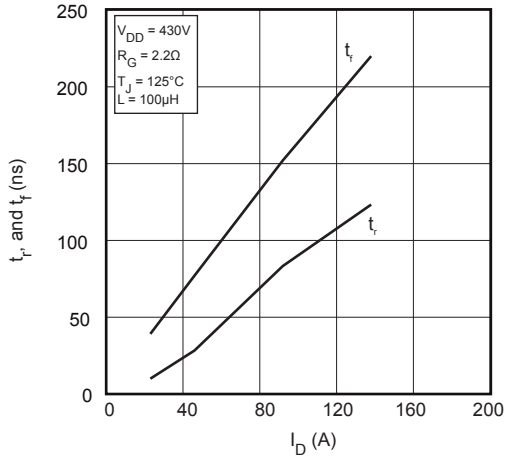


FIGURE 14 , Rise and Fall Times vs Current

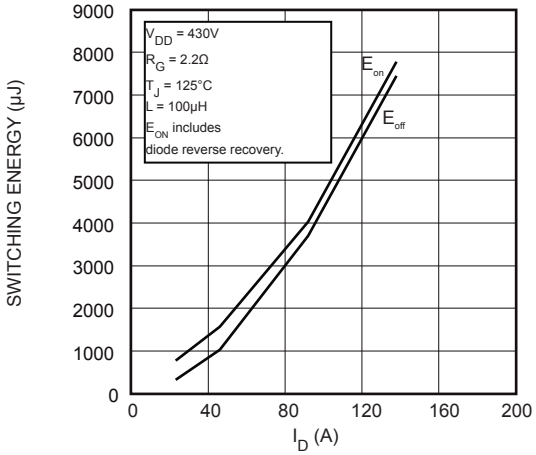


FIGURE 15, Switching Energy vs Current

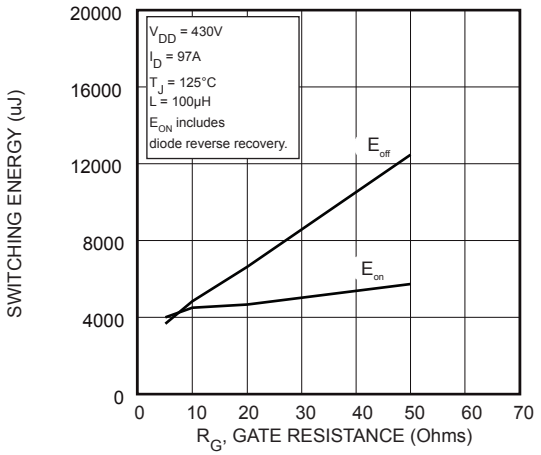


FIGURE 16, Switching Energy vs Gate Resistance

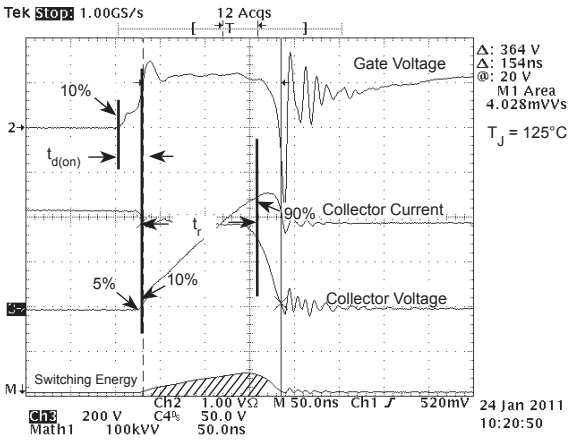


Figure 17, Turn-on Switching Waveforms and Definitions

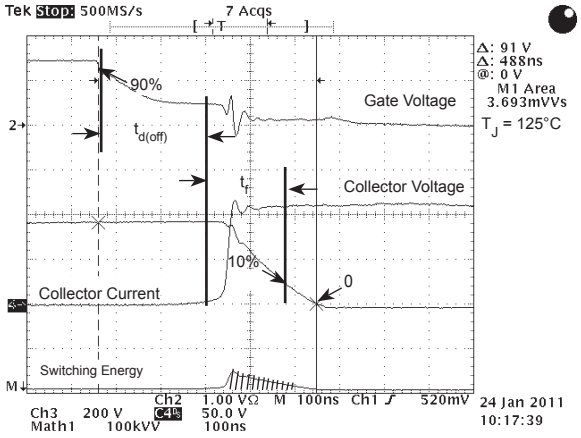


Figure 18, Turn-off Switching Waveforms and Definitions

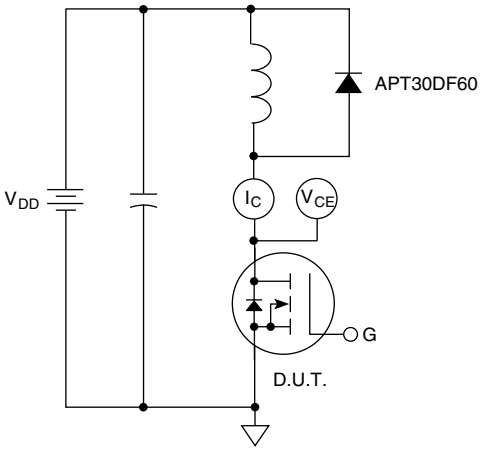
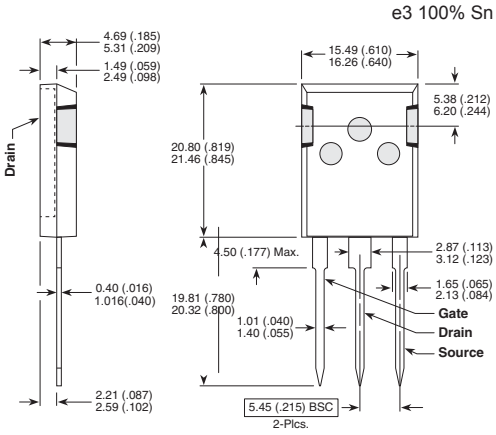


Figure 19, Inductive Switching Test Circuit

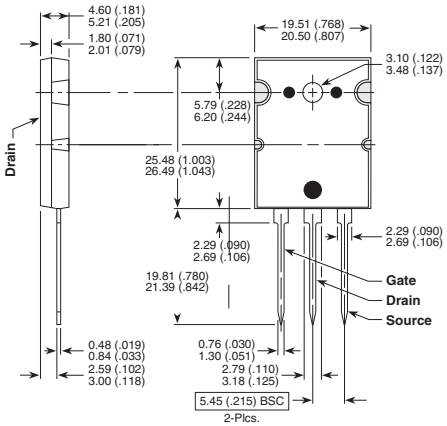
T-MAX® (B2) Package Outline



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

Dimensions in Millimeters and (Inches)

TO-264 (L) Package Outline



Dimensions in Millimeters and (Inches)