



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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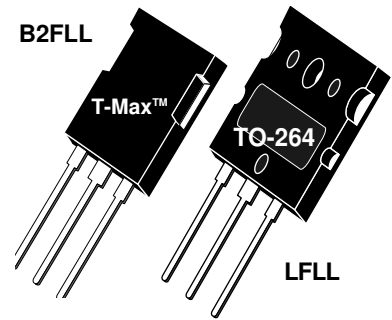
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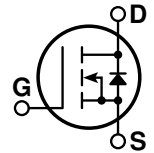


**POWER MOS 7® FREDFET**

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,  $Q_g$
- Increased Power Dissipation
- Easier To Drive
- Popular T-MAX™ or TO-264 Package


**MAXIMUM RATINGS**

 All Ratings:  $T_C = 25^\circ\text{C}$  unless otherwise specified.

Symbol	Parameter	APT50M65B2FLL_LFLL	UNIT
$V_{DSS}$	Drain-Source Voltage	500	Volts
$I_D$	Continuous Drain Current @ $T_C = 25^\circ\text{C}$	67	Amps
$I_{DM}$	Pulsed Drain Current <sup>①</sup>	268	
$V_{GS}$	Gate-Source Voltage Continuous	$\pm 30$	Volts
$V_{GSM}$	Gate-Source Voltage Transient	$\pm 40$	
$P_D$	Total Power Dissipation @ $T_C = 25^\circ\text{C}$	694	Watts
	Linear Derating Factor	5.5	W/ $^\circ\text{C}$
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to 150	$^\circ\text{C}$
$T_L$	Lead Temperature: 0.063" from Case for 10 Sec.	300	
$I_{AR}$	Avalanche Current <sup>①</sup> (Repetitive and Non-Repetitive)	67	Amps
$E_{AR}$	Repetitive Avalanche Energy <sup>①</sup>	50	mJ
$E_{AS}$	Single Pulse Avalanche Energy <sup>④</sup>	3000	

**STATIC ELECTRICAL CHARACTERISTICS**

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$BV_{DSS}$	Drain-Source Breakdown Voltage ( $V_{GS} = 0V, I_D = 250\mu\text{A}$ )	500			Volts
$R_{DS(on)}$	Drain-Source On-State Resistance <sup>②</sup> ( $V_{GS} = 10V, 33.5A$ )			0.065	Ohms
$I_{DSS}$	Zero Gate Voltage Drain Current ( $V_{DS} = 500V, V_{GS} = 0V$ )			250	$\mu\text{A}$
	Zero Gate Voltage Drain Current ( $V_{DS} = 400V, V_{GS} = 0V, T_C = 125^\circ\text{C}$ )			1000	
$I_{GSS}$	Gate-Source Leakage Current ( $V_{GS} = \pm 30V, V_{DS} = 0V$ )			$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage ( $V_{DS} = V_{GS}, I_D = 2.5mA$ )	3		5	Volts

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

**DYNAMIC CHARACTERISTICS**

**APT50M65 B2FLL - LFLL**

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
$C_{iss}$	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1\text{ MHz}$		7010		pF
$C_{oss}$	Output Capacitance			1390		
$C_{riss}$	Reverse Transfer Capacitance			87		
$Q_g$	Total Gate Charge ③	$V_{GS} = 10V$ $V_{DD} = 250V$ $I_D = 67A @ 25^\circ C$		141		nC
$Q_{gs}$	Gate-Source Charge			40		
$Q_{gd}$	Gate-Drain ("Miller") Charge			70		
$t_{d(on)}$	Turn-on Delay Time	<b>RESISTIVE SWITCHING</b> $V_{GS} = 15V$ $V_{DD} = 250V$ $I_D = 67A @ 25^\circ C$ $R_G = 0.6\Omega$		12		ns
$t_r$	Rise Time			28		
$t_{d(off)}$	Turn-off Delay Time			29		
$t_f$	Fall Time			30		
$E_{on}$	Turn-on Switching Energy ⑥	<b>INDUCTIVE SWITCHING @ 25°C</b> $V_{DD} = 333V, V_{GS} = 15V$ $I_D = 67A, R_G = 3\Omega$		1035		$\mu J$
$E_{off}$	Turn-off Switching Energy			845		
$E_{on}$	Turn-on Switching Energy ⑥	<b>INDUCTIVE SWITCHING @ 125°C</b> $V_{DD} = 333V, V_{GS} = 15V$ $I_D = 67A, R_G = 3\Omega$		1556		
$E_{off}$	Turn-off Switching Energy			1013		

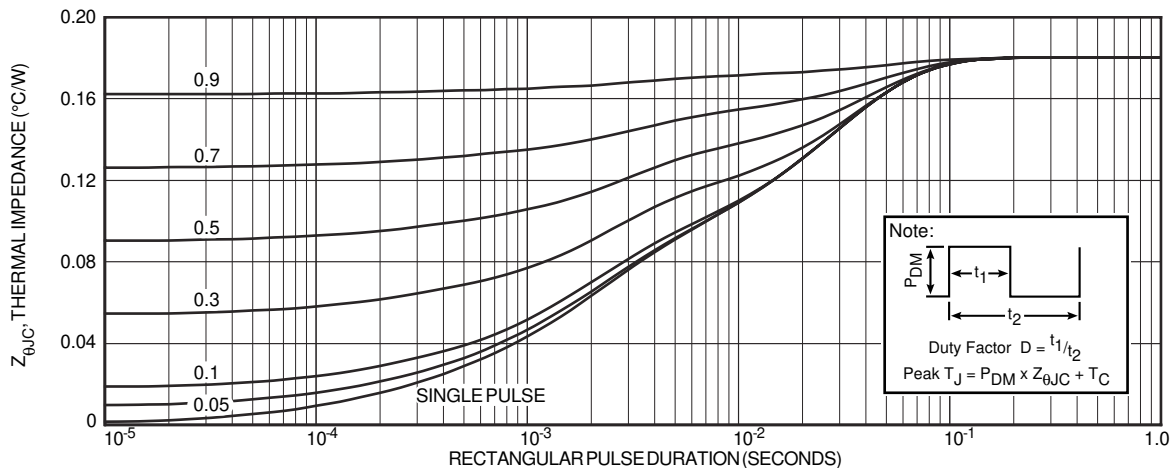
**SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS**

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$I_S$	Continuous Source Current (Body Diode)			67	Amps
$I_{SM}$	Pulsed Source Current ① (Body Diode)			268	
$V_{SD}$	Diode Forward Voltage ② ( $V_{GS} = 0V, I_S = -67A$ )			1.3	Volts
$dv/dt$	Peak Diode Recovery $dv/dt$ ⑤			15	V/ns
$t_{rr}$	Reverse Recovery Time ( $I_S = -67A, di/dt = 100A/\mu s$ )	$T_j = 25^\circ C$		270	ns
		$T_j = 125^\circ C$		540	
$Q_{rr}$	Reverse Recovery Charge ( $I_S = -67A, di/dt = 100A/\mu s$ )	$T_j = 25^\circ C$		2.6	$\mu C$
		$T_j = 125^\circ C$		9.6	
$I_{RRM}$	Peak Recovery Current ( $I_S = -67A, di/dt = 100A/\mu s$ )	$T_j = 25^\circ C$		17	Amps
		$T_j = 125^\circ C$		31	

**THERMAL CHARACTERISTICS**

Symbol	Characteristic	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to Case			0.18	$^\circ C/W$
$R_{\theta JA}$	Junction to Ambient			40	

- ① Repetitive Rating: Pulse width limited by maximum junction temperature
  - ② Pulse Test: Pulse width < 380  $\mu s$ , Duty Cycle < 2%
  - ③ See MIL-STD-750 Method 3471
  - ④ Starting  $T_j = +25^\circ C, L = 1.34mH, R_G = 25\Omega$ , Peak  $I_L = 67A$
  - ⑤  $dv/dt$  numbers reflect the limitations of the test circuit rather than the device itself.  $I_S \leq -67A, di/dt \leq 700A/\mu s, V_R \leq 500V, T_j \leq 150^\circ C$
  - 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

APT50M65B2FLL - LFLL

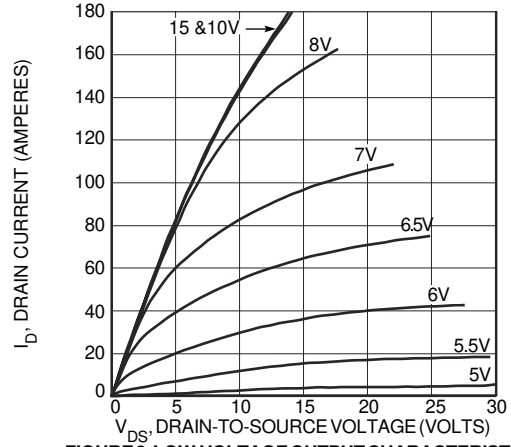
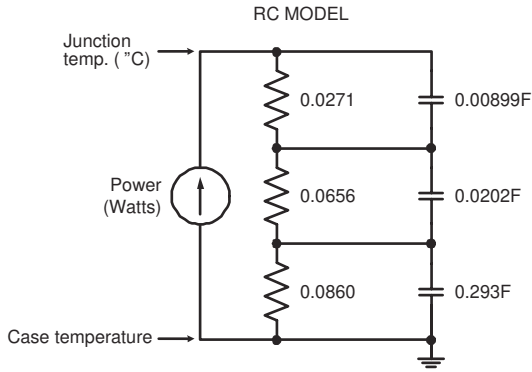


FIGURE 2, TRANSIENT THERMAL IMPEDANCE MODEL

FIGURE 3, LOW VOLTAGE OUTPUT CHARACTERISTICS

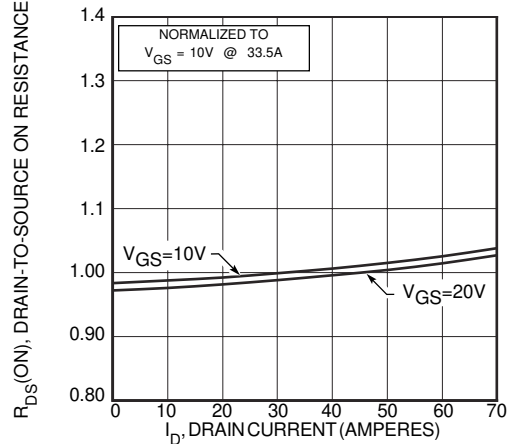
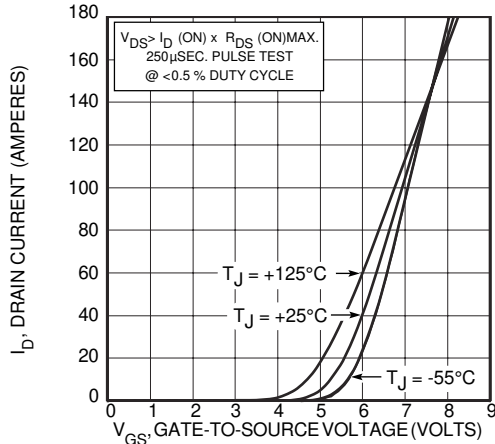


FIGURE 4, TRANSFER CHARACTERISTICS

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

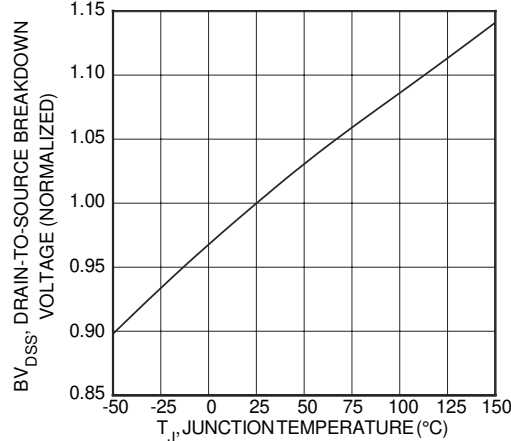
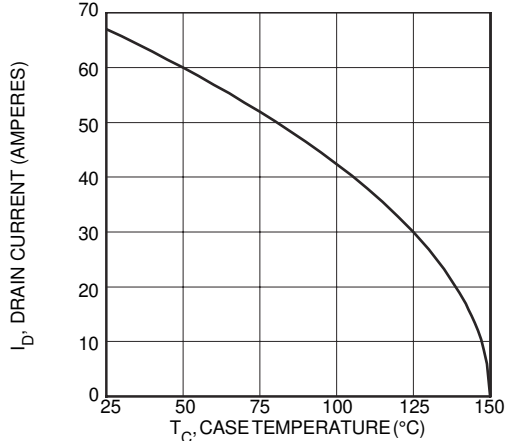


FIGURE 6, MAXIMUM DRAIN CURRENT vs CASE TEMPERATURE

FIGURE 7, BREAKDOWN VOLTAGE vs TEMPERATURE

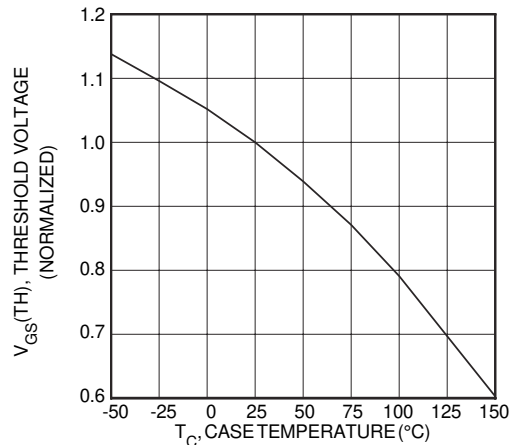
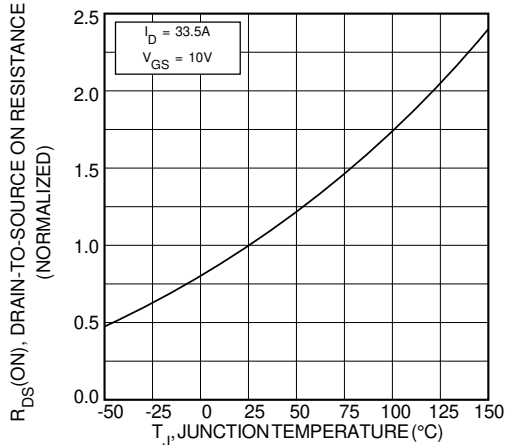


FIGURE 8, ON-RESISTANCE vs. TEMPERATURE

FIGURE 9, THRESHOLD VOLTAGE vs TEMPERATURE

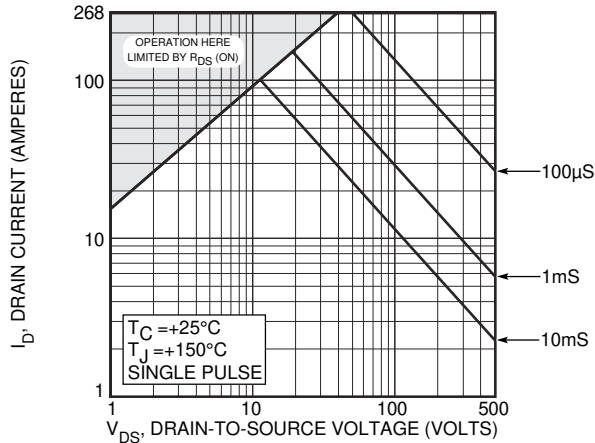


FIGURE 10, MAXIMUM SAFE OPERATING AREA

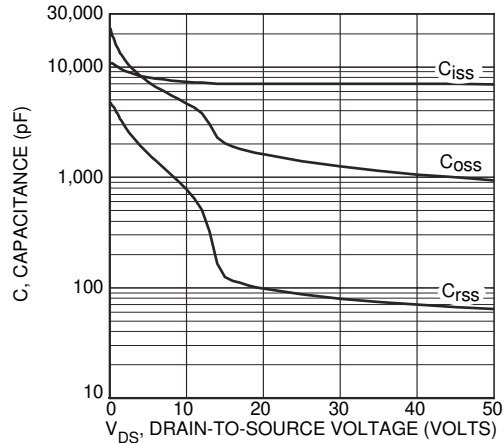


FIGURE 11, CAPACITANCE vs DRAIN-TO-SOURCE VOLTAGE

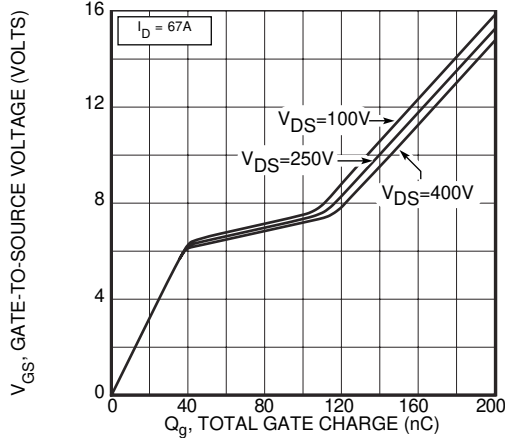


FIGURE 12, GATE CHARGES vs GATE-TO-SOURCE VOLTAGE

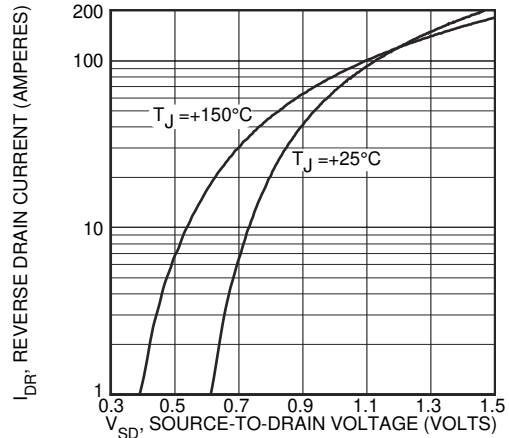


FIGURE 13, SOURCE-DRAIN DIODE FORWARD VOLTAGE

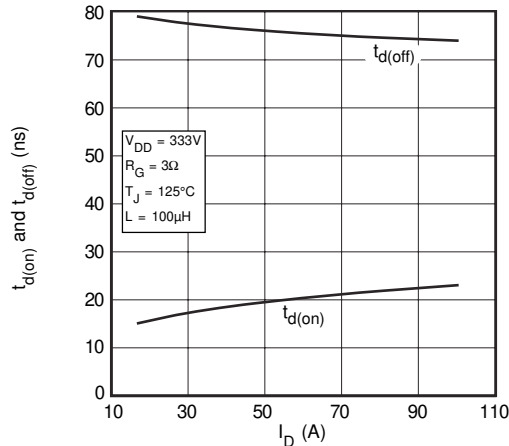


FIGURE 14, DELAY TIMES vs CURRENT

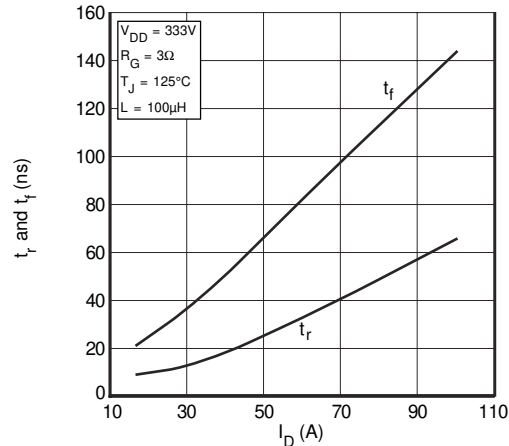


FIGURE 15, RISE AND FALL TIMES vs CURRENT

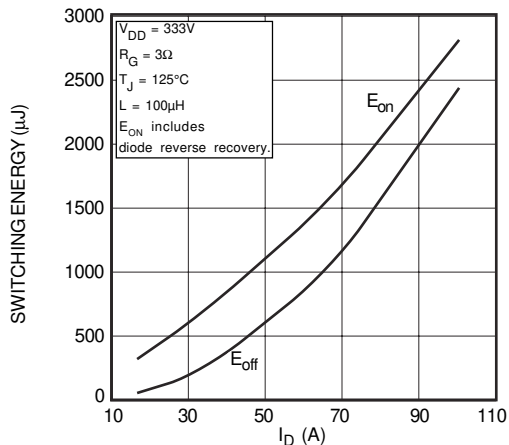


FIGURE 16, SWITCHING ENERGY vs CURRENT

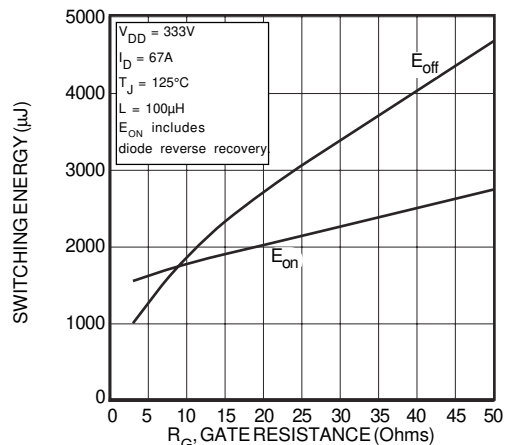


FIGURE 17, SWITCHING ENERGY vs. GATE RESISTANCE

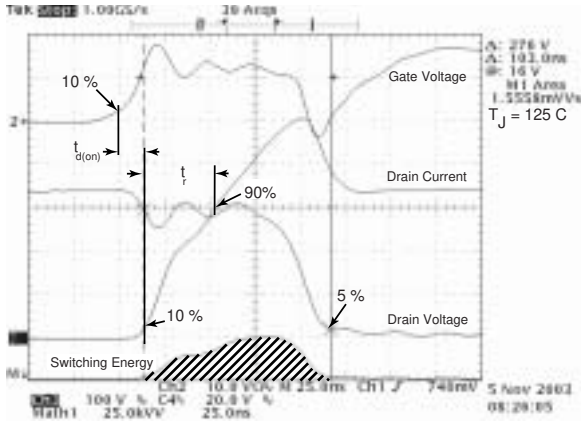


Figure 18, Turn-on Switching Waveforms and Definitions

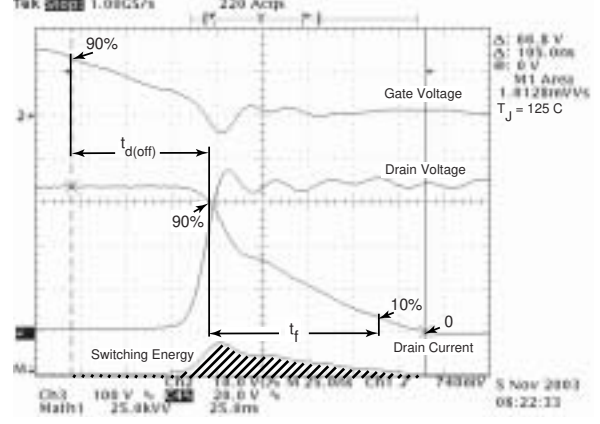


Figure 19, Turn-off Switching Waveforms and Definitions

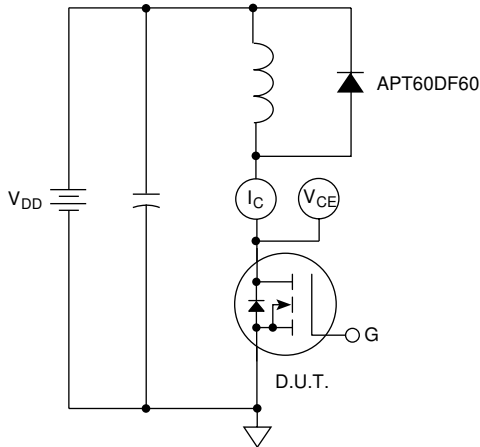
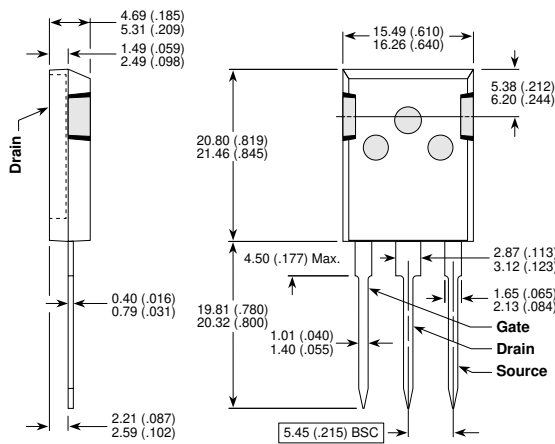


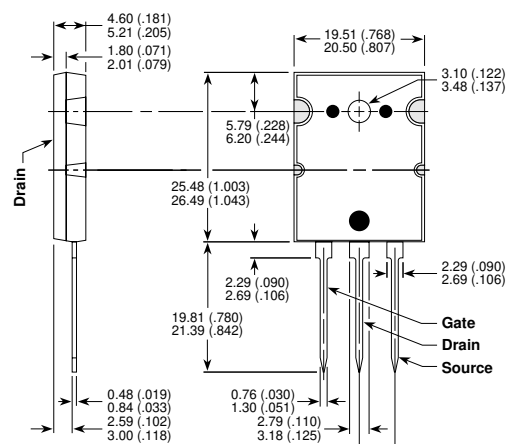
Figure 20. Inductive Switching Test Circuit

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)