

## Description

### Features

- 900V, 9A
- $R_{DS(ON)} = 1.0 \Omega$  (Typ.) @  $V_{GS} = 10V$ ,  $I_D = 4.5A$
- Fast Switching
- 100% Avalanche Tested
- Improved dv/dt Capability

### Application

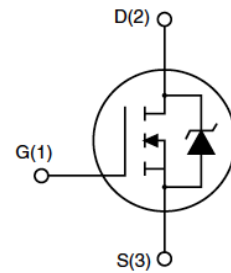
- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)



TO-247



TO-220F



Schematic Diagram

## Absolute Maximum Ratings ( $T_C = 25^\circ C$ unless otherwise specified)

Symbol	Parameter		Max.		Units
			TO-220F	TO-247	
V <sub>DSS</sub>	Drain-Source Voltage		900		V
V <sub>GSS</sub>	Gate-Source Voltage		±30		V
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> = 25°C	9		A
		T <sub>C</sub> = 100°C	5.4		A
I <sub>DM</sub>	Pulsed Drain Current <sup>note1</sup>		36		A
E <sub>AS</sub>	Single Pulsed Avalanche Energy <sup>note2</sup>		562		mJ
P <sub>D</sub>	Power Dissipation	T <sub>C</sub> = 25°C	65	255	W
R <sub>θJC</sub>	Thermal Resistance, Junction to Case		1.92	0.49	°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient		62.5	41	°C/W
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range		-55 to +150		°C

**Electrical Characteristics** ( $T_C=25^{\circ}\text{C}$  unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0V,I <sub>D</sub> = 250μA	900	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 900V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 25℃	-	-	1	μA
		V <sub>DS</sub> = 720V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125℃			100	
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>GS</sub> = ±30V	-	-	±100	nA
On Characteristics						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> ,I <sub>D</sub> = 250μA	3.0	-	4.0	V
R <sub>DS(on)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> = 4.5A	-	1	1.2	Ω
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1.0MHz	-	1979	-	pF
C <sub>oss</sub>	Output Capacitance		-	233	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	53	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DD</sub> = 720V, I <sub>D</sub> =9A, V <sub>GS</sub> = 10V	-	83	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	9	-	nC
Q <sub>gd</sub>	Gate-Drain(“Miller”) Charge		-	49	-	nC
Switching Characteristics						
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> = 450V, I <sub>D</sub> =9A, R <sub>G</sub> = 25Ω	-	23	-	ns
t <sub>r</sub>	Turn-On Rise Time		-	15	-	ns
t <sub>d(off)</sub>	Turn-Off Delay Time		-	90	-	ns
t <sub>f</sub>	Turn-Off Fall Time		-	30	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	9	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	36	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> = 0V, I <sub>SD</sub> = 9A, T <sub>J</sub> = 25℃	-	-	1.4	V
t <sub>rr</sub>	Reverse Recovery Time	V <sub>GS</sub> = 0V, I <sub>S</sub> = 9A,	-	320	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt =100A/μs	-	4.2	-	μC

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature

2.  $I_{AS} = 7.5A, V_{DD} = 50V$ , Starting  $T_J = 25^{\circ}\text{C}$

3. Pulse Test: Pulse width  $\leq 300\mu s$ , Duty Cycle  $\leq 1\%$

## Typical Performance Characteristics

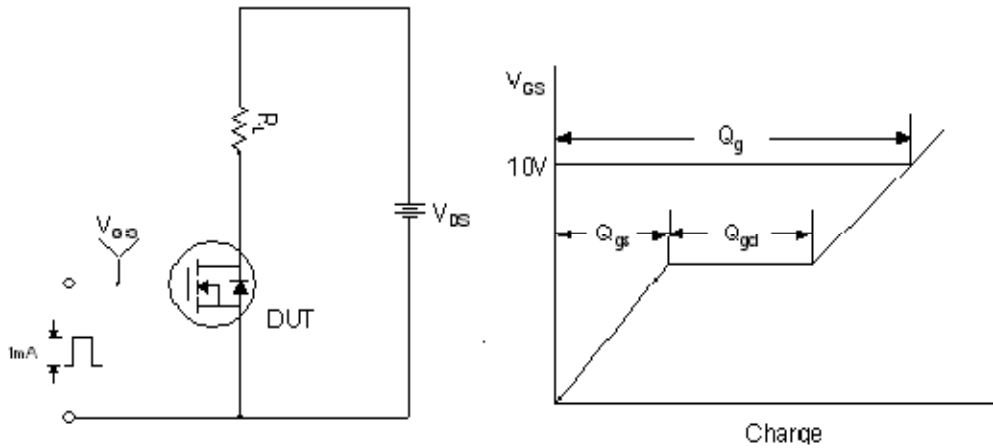


Figure 1. Gate Charge Test Circuit & Waveform

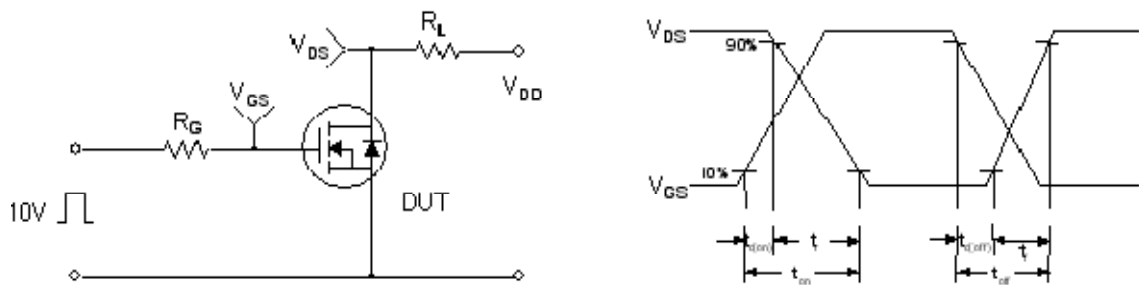


Figure 2. Resistive Switching Test Circuit & Waveforms

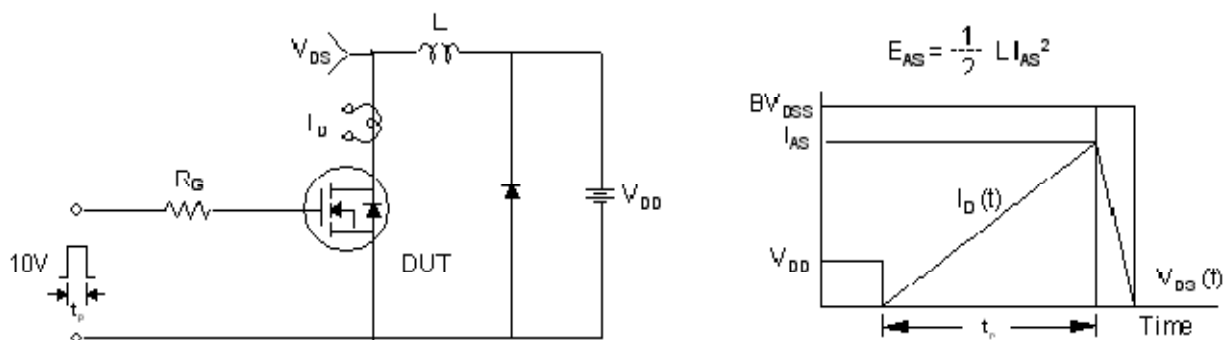
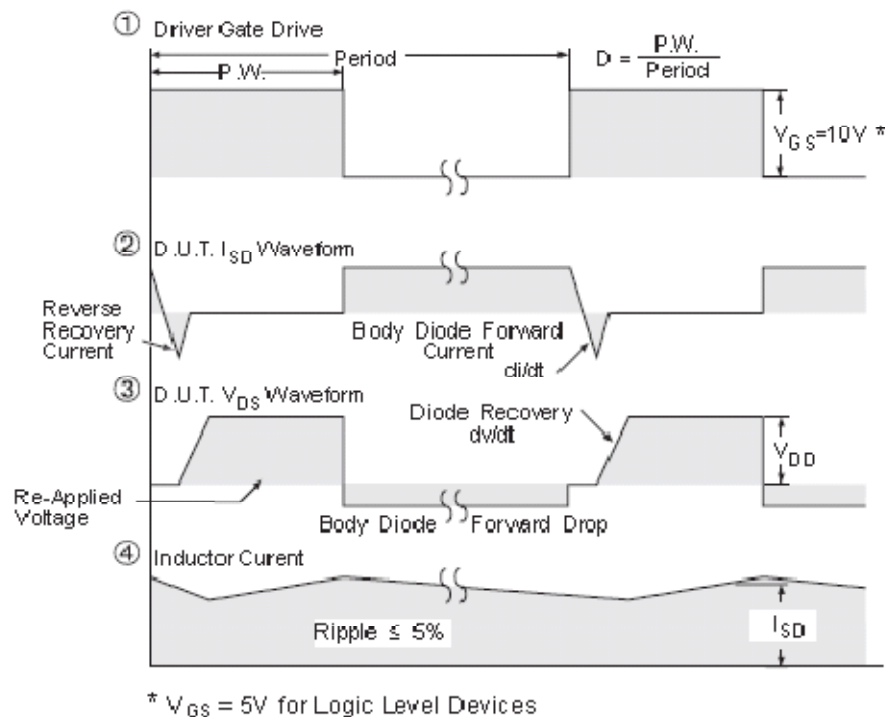
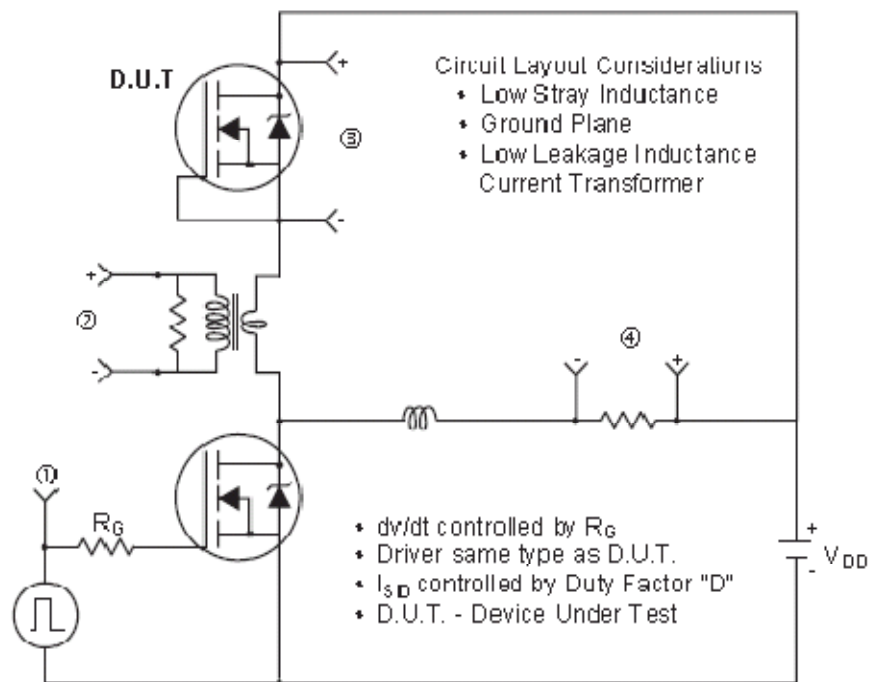


Figure 3. Unclamped Inductive Switching Test Circuit & Waveforms



**Figure 4. Peak Diode Recovery  $dv/dt$  Test Circuit & Waveforms (For N-channel)**