

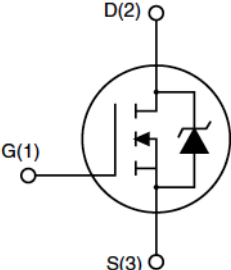


Description

Features <ul style="list-style-type: none"> ● 800V,7A ● $R_{DS(ON)} = 1.35\Omega$ (Typ.) @ $V_{GS} = 10V, I_D = 3.5A$ ● Fast Switching ● Improved dv/dt Capability ● 100% Avalanche Tested 	Application <ul style="list-style-type: none"> ● Switch Mode Power Supply(SMPS) ● Uninterruptible Power Supply(UPS) ● Power Factor Correction (PFC) 	
 TO-220F	 TO-220C	 Schematic Diagram

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Symbol	Parameter	Max.		Units	
		TO-220C	TO-220F		
V _{DSS}	Drain-Source Voltage	800		V	
V _{GSS}	Gate-Source Voltage	±30		V	
I _D	Continuous Drain Current	T _C = 25°C	7	A	
		T _C = 100°C	4.5	A	
I _{DM}	Pulsed Drain Current ^{note1}	28		A	
E _{AS}	Single Pulsed Avalanche Energy ^{note2}	245		mJ	
E _{AR}	Repetitive Avalanche Energy	147		mJ	
P _D	Power Dissipation	T _C = 25°C	70	25	W
R _{θJC}	Thermal Resistance, Junction to Case	1.78	5	°C/W	
R _{θJA}	Thermal Resistance, Junction to Ambient	60	62.5	°C/W	
T _J , T _{STG}	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						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	800	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=800V, V_{GS}=0V,$ $T_J=25^\circ\text{C}$	-	-	1	μA
		$V_{DS}=640V, V_{GS}=0V,$ $T_J=125^\circ\text{C}$	-	-	100	nA
I_{GSS}	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 30V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	-	4.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note3</small>	$V_{GS}=10V, I_D=3.5A$	-	1.35	1.6	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V,$ $f=1.0\text{MHz}$	-	1178	-	pF
C_{oss}	Output Capacitance		-	128	-	pF
C_{rss}	Reverse Transfer Capacitance		-	27	-	pF
Q_g	Total Gate Charge	$V_{DD}=640V, I_D=7A,$ $V_{GS}=10V$	-	49	-	nC
Q_{gs}	Gate-Source Charge		-	6	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	26	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=400V, I_D=7A,$ $R_G=25\Omega$	-	43	-	ns
t_r	Turn-on Rise Time		-	28	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	244	-	ns
t_f	Turn-off Fall Time		-	54	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	7	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	28	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_{SD}=3.5A$	-	-	1.4	V
t_{rr}	Reverse Recovery Time	$V_{GS}=0V, I_S=7A,$	-	295	-	ns
Q_{rr}	Reverse Recovery Charge	$di/dt=100A/\mu s$	-	1.7	-	μC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

 2. $L=10\text{mH}, V_{DD}=50V, R_G=25\Omega, \text{Starting } T_J=25^\circ\text{C}$

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

Typical Performance Characteristics

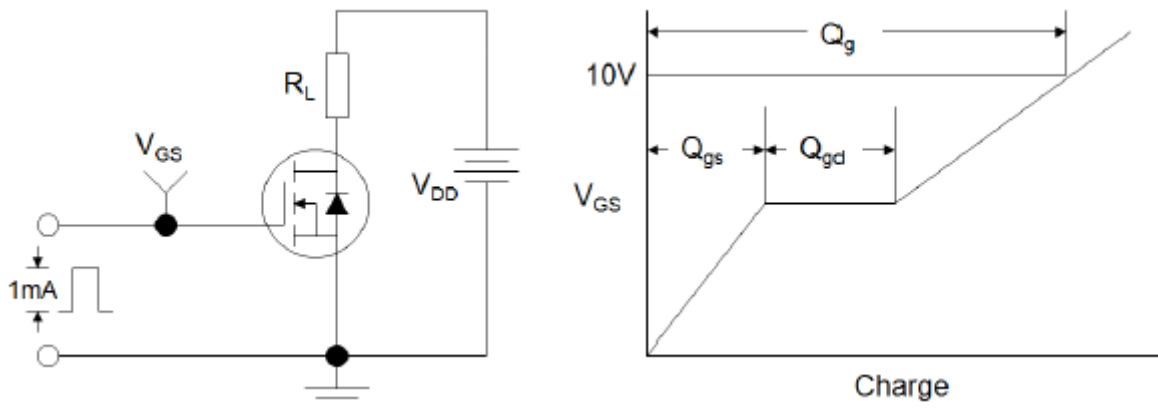


Figure1:Gate Charge Test Circuit & Waveform

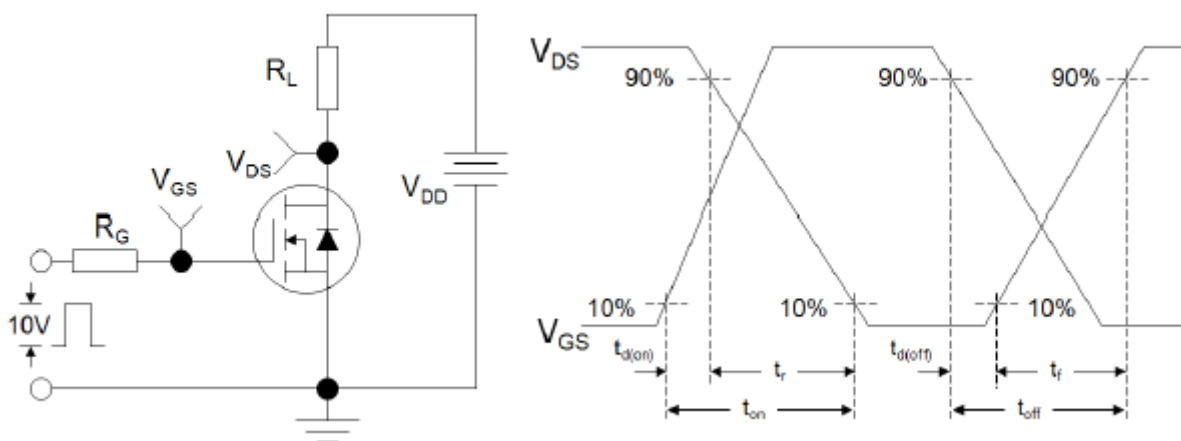


Figure 2: Resistive Switching Test Circuit & Waveforms

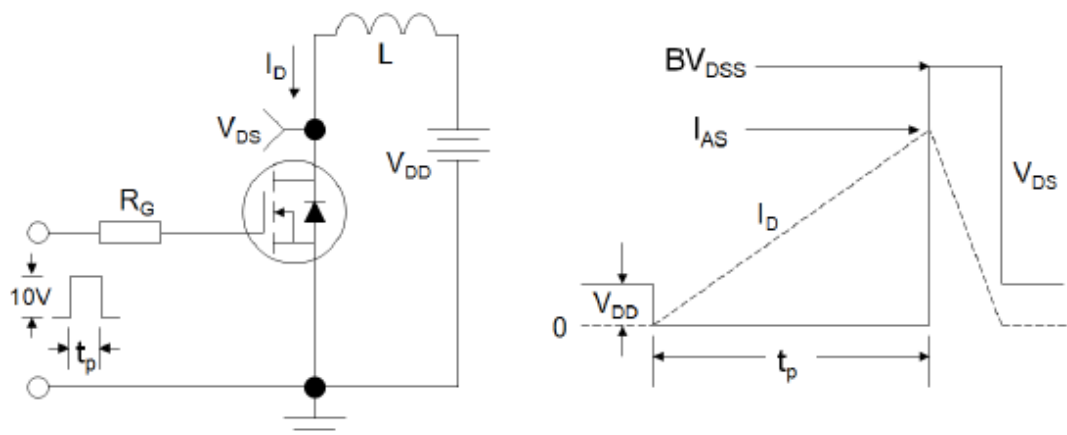
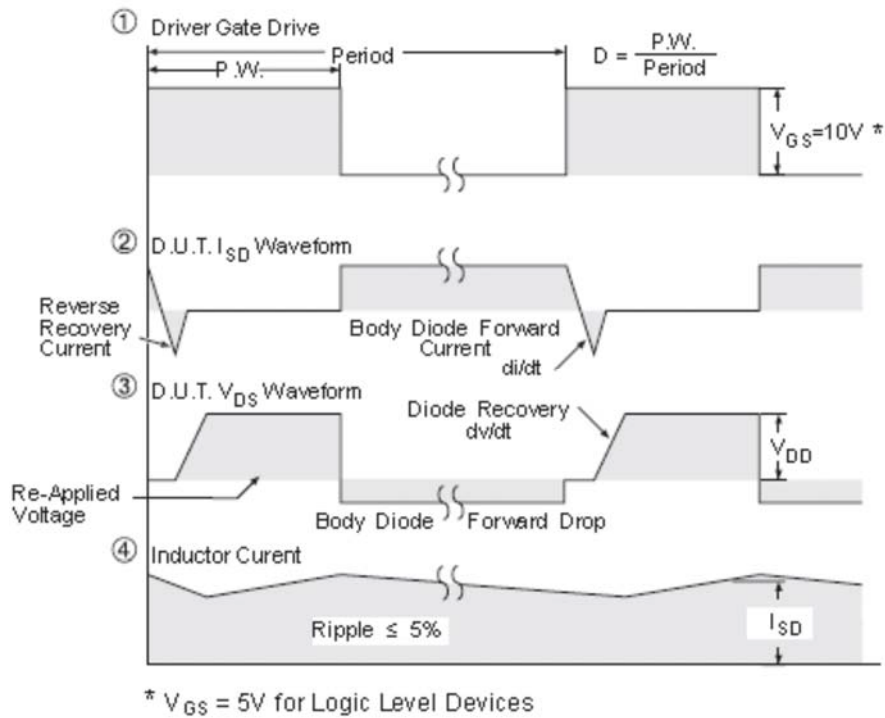
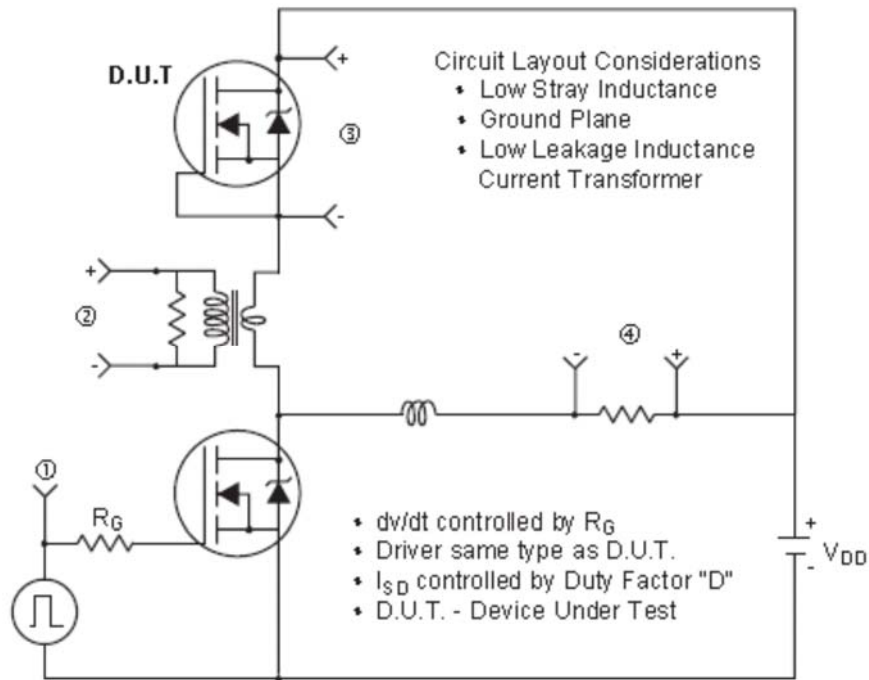


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms


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