

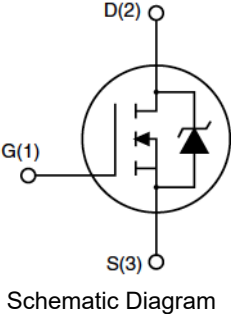


Description

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)
 <p>TO-220C</p>	 <p>TO-220F</p>  <p>Schematic Diagram</p>

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ 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 =250μA	800	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =800V, V _{GS} = 0V, T _J = 25℃	-	-	1	μA
		V _{DS} =640V, V _{GS} = 0V, T _J =125℃	-	-	100	nA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V,V _{GS} = ±30V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =250μA	2.0	-	4.0	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	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 = 1.0MHz	-	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 = 25Ω	-	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/μs	-	1.7	-	μC

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

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

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

Typical Performance Characteristics

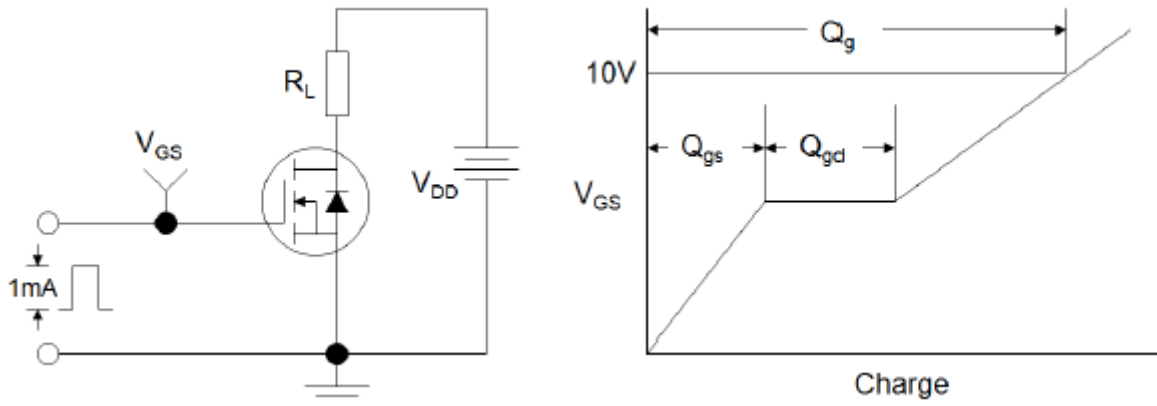


Figure1:Gate Charge Test Circuit & Waveform

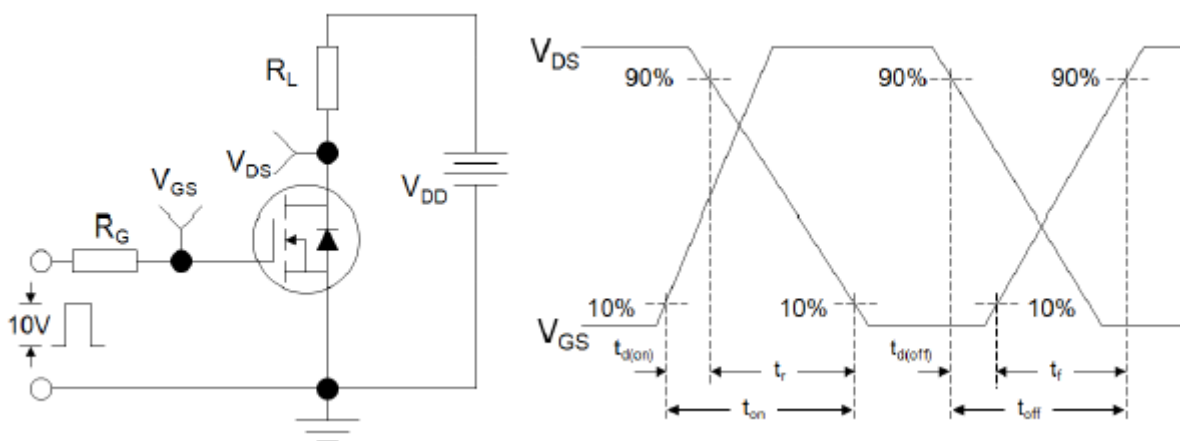


Figure 2: Resistive Switching Test Circuit & Waveforms

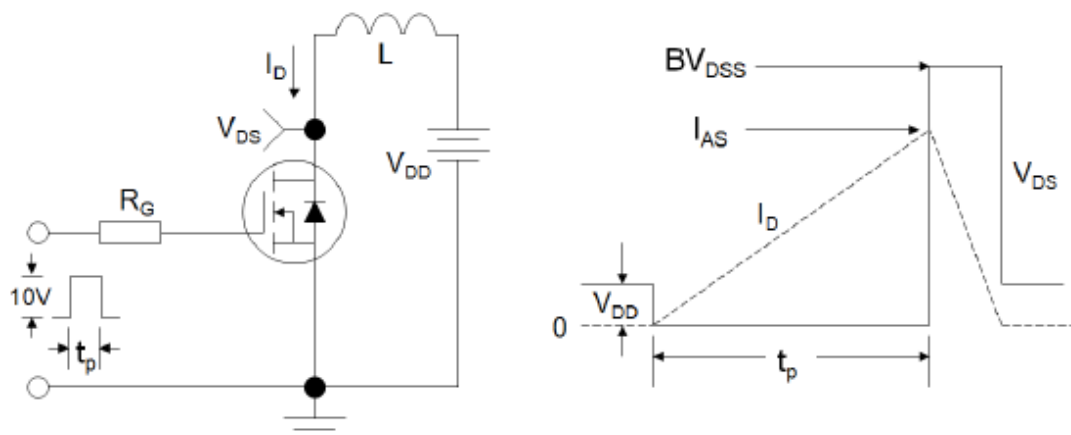


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

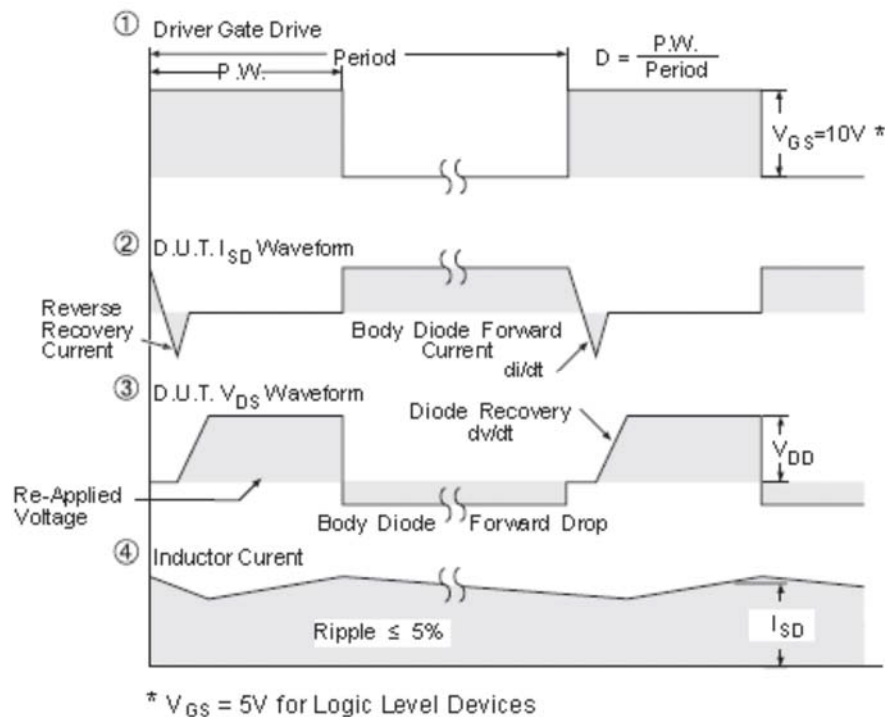
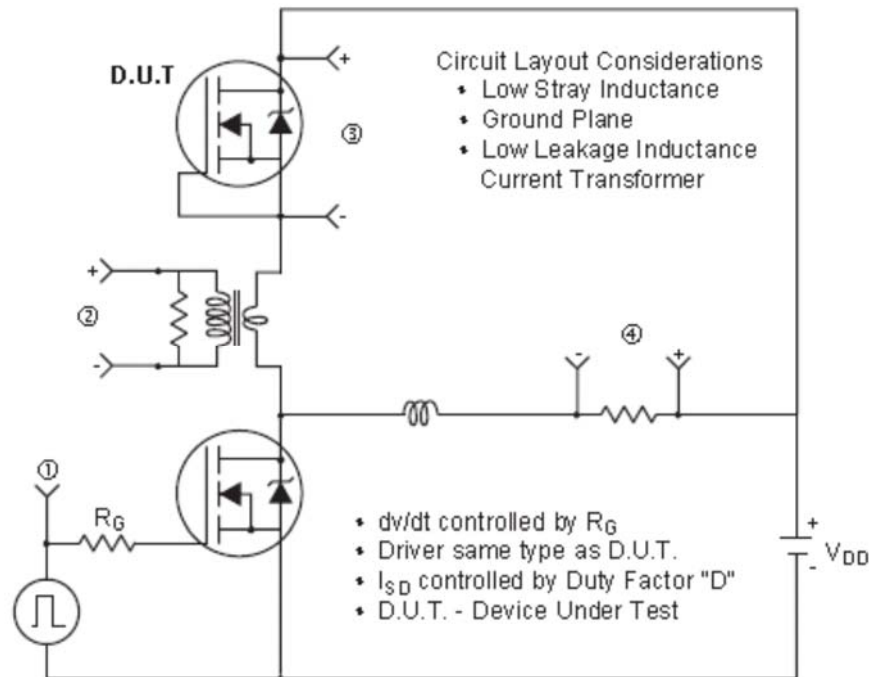


Figure 4: Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)