Description

Features

- 600V, 2A
- $R_{DS(ON)}$ = 4.3Ω (Typ.) @ V_{GS} = 10V, I_D =1A
- Fast Switching
- Improved dv/dt Capability
- 100% Avalanche Tested

Application

- Switch Mode Power Supply(SMPS)
- Charger, LED
- Power Factor Correction (PFC)


SOT-223

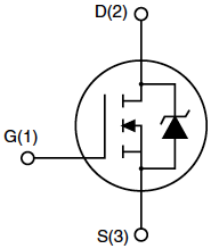

SOT-89


TO-251


TO-252


TO-220F


TO-220C



Schematic Diagram

Absolute Maximum Ratings (T_C=25℃ unless otherwise specified)

Symbol	Parameter		Max.				Units
			TO-251/ TO-252/ TO-251	TO-220F	TO-220C	SOT-89/ SOT-223	
V_{DSS}	Drain-Source Voltage		600				V
V_{GSS}	Gate-Source Voltage		±30				V
I_D	Continuous Drain Current	T_C = 25℃	2				A
		T_C = 100℃	1.2				A
I_{DM}	Pulsed Drain Current note1		8				A
E_{AS}	Single Pulsed Avalanche Energy note2		6.4				mJ
P_D	Power Dissipation	T_C = 25℃	25	20	32.5	9.6	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		5	6.25	3.85	13	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		60	62.5	60	65	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150				℃

Electrical Characteristics (T_C=25℃ 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	600	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 600V, V_{GS} = 0V, T_J= 25℃	-	-	1	μA
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	3.0	4.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS} =10V, I_D =1.0A	-	4.3	5	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	310	-	pF
C_{oss}	Output Capacitance		-	39	-	pF
C_{rss}	Reverse Transfer Capacitance		-	6	-	pF
Q_g	Total Gate Charge	V_{DD} = 480V, I_D = 2.0A, V_{GS} = 10V	-	8	-	nC
Q_{gs}	Gate-Source Charge		-	1.2	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	5.0	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD} = 250V, I_D = 2.0A, R_G = 25Ω	-	7.8	-	ns
t_r	Turn-on Rise Time		-	33	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	23	-	ns
t_f	Turn-off Fall Time		-	59	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	2	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	8	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_{SD} = 2.0A	-	-	1.4	V
t_{rr}	Reverse Recovery Time	V_{GS} =0V, I_S=2.0A, di/dt=100A/μs	-	80	-	ns
Q_{rr}	Reverse Recovery Charge		-	1.8	-	μC

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

2. I_{AS} = 2.0A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤1%

Typical Performance Characteristics

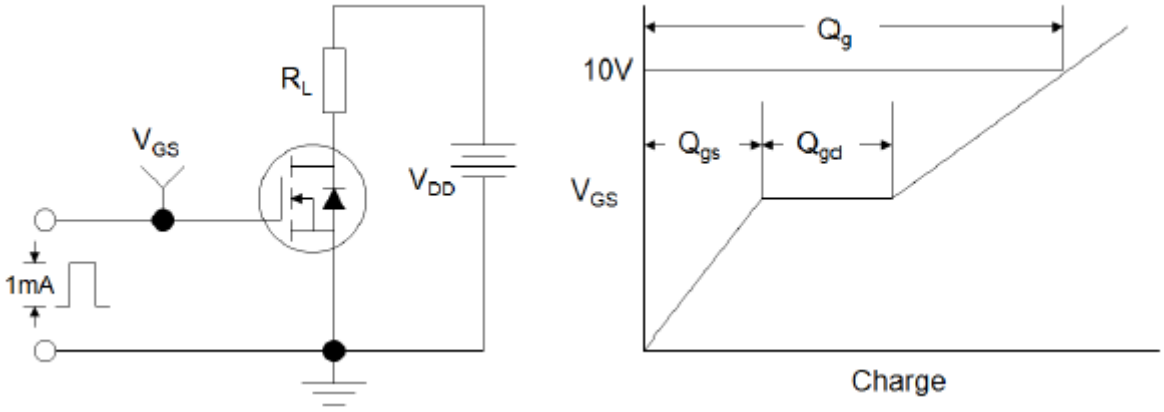


Figure1:Gate Charge Test Circuit & Waveform

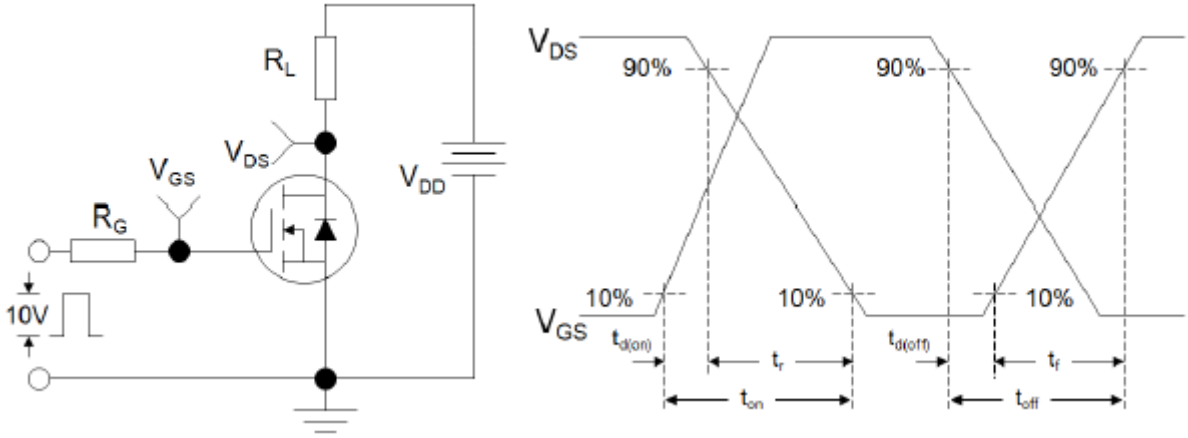


Figure 2: Resistive Switching Test Circuit & Waveforms

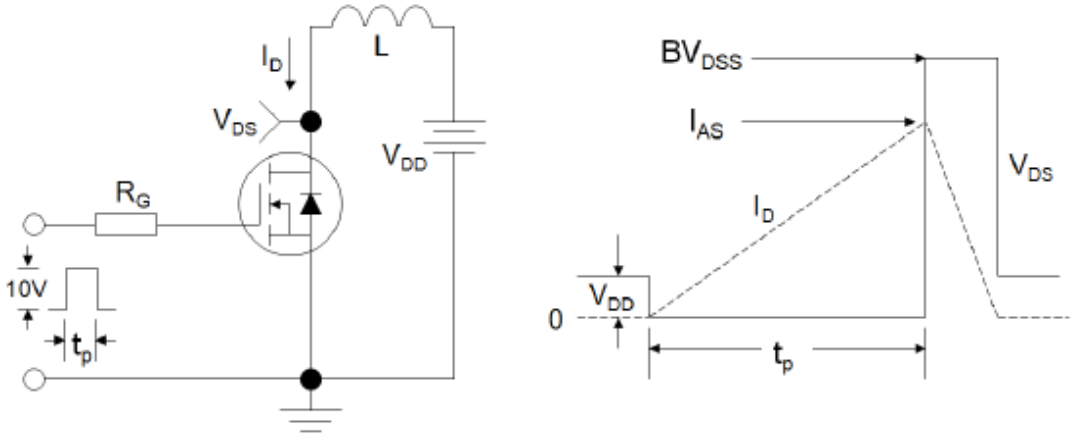


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

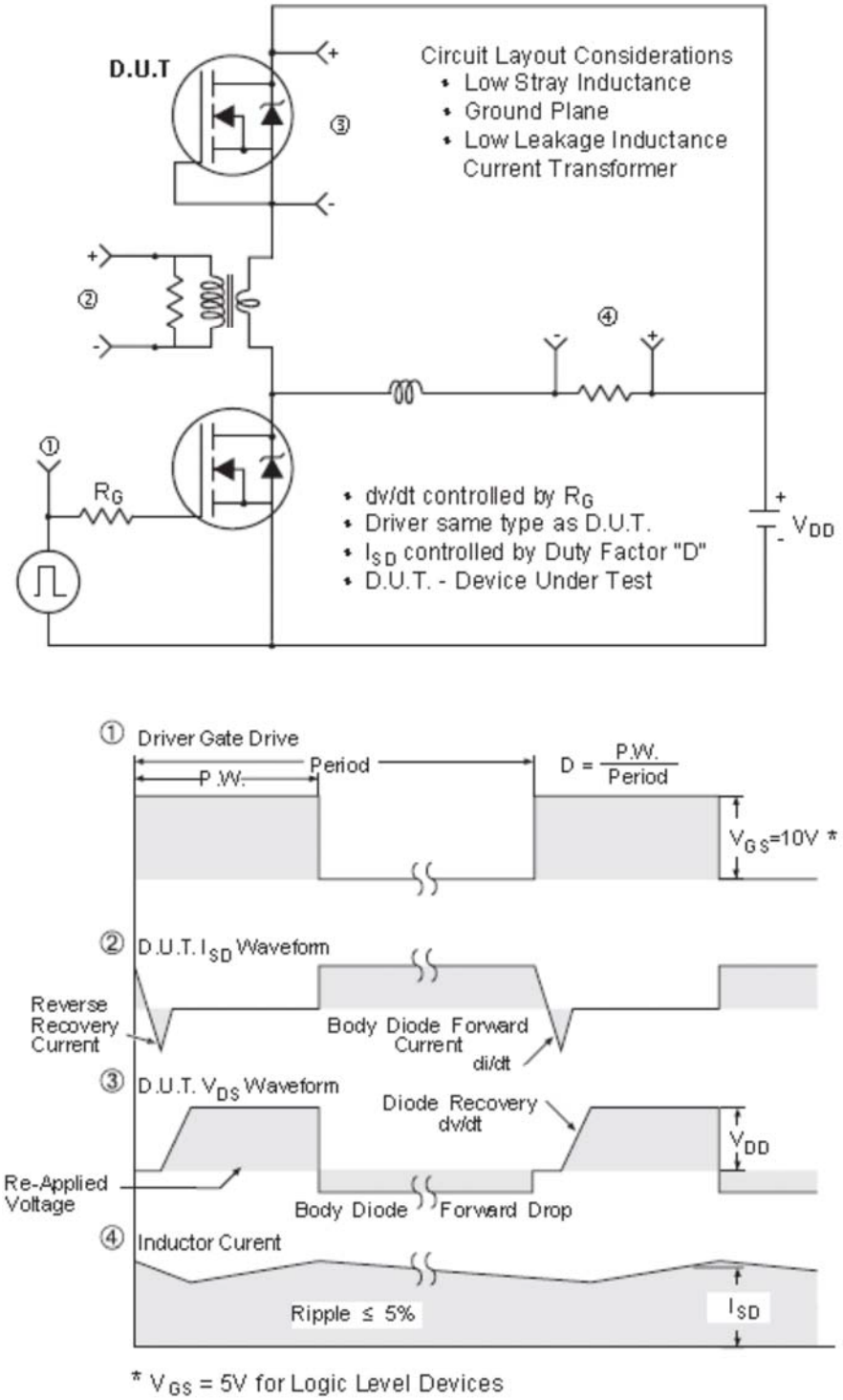


Figure 4:Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)