

20V N-Channel Mosfet

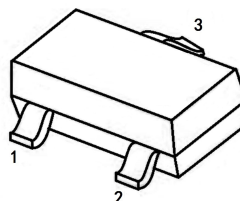
FEATURES

- $R_{DS(ON)} \leq 21m\Omega$ (16 m Ω Typ.)
@ $V_{GS}=4.5V$
- $R_{DS(ON)} \leq 30m\Omega$ (20 m Ω Typ.)
@ $V_{GS}=2.5V$

APPLICATIONS

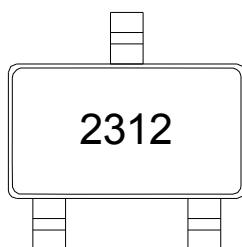
- Battery Protection
- Load Switch
- Power Management

SOT-23



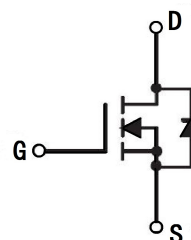
1. GATE
2. SOURCE
3. DRAIN

MARKING



2312: Device Code
Other marks: "S12"

N-CHANNEL MOSFET



MAXIMUM RATINGS (Ta=25°C unless otherwise noted)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		20	V
V_{GSS}	Gate-Source Voltage		± 10	V
I_D	Continuous Drain Current	$T_a = 25^\circ C$	5	A
		$T_a = 100^\circ C$	3.2	
I_{DM}	Pulsed Drain Current ^{note1}		20	A
P_D	Power Dissipation	$T_a = 25^\circ C$	1.25	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		100	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	$^\circ C$

MOSFET ELECTRICAL CHARACTERISTICS Ta=25 °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	20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =20V, V _{GS} = 0V,	-	-	1	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±10V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	0.5	0.65	0.9	V
R _{DS(on)}	Static Drain-Source on-Resistance note2	V _{GS} =4.5V, I _D =5A	-	16	21	mΩ
		V _{GS} =2.5V, I _D =4.7A	-	20	30	
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =5A	6	-	-	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f = 1.0MHz	-	865	-	pF
C _{oss}	Output Capacitance		-	105	-	pF
C _{rss}	Reverse Transfer Capacitance		-	55	-	pF
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =10V, I _D =4A, R _G = 1Ω, V _{GEN} =5V,	-	-	10	ns
t _r	Turn-on Rise Time		-	-	20	ns
t _{d(off)}	Turn-off Delay Time		-	-	32	ns
t _f	Turn-off Fall Time		-	-	12	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	5	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	20	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S =4A	-	0.75	1.2	V

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

2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

TYPICAL PERFORMANCE CHARACTERISTICS

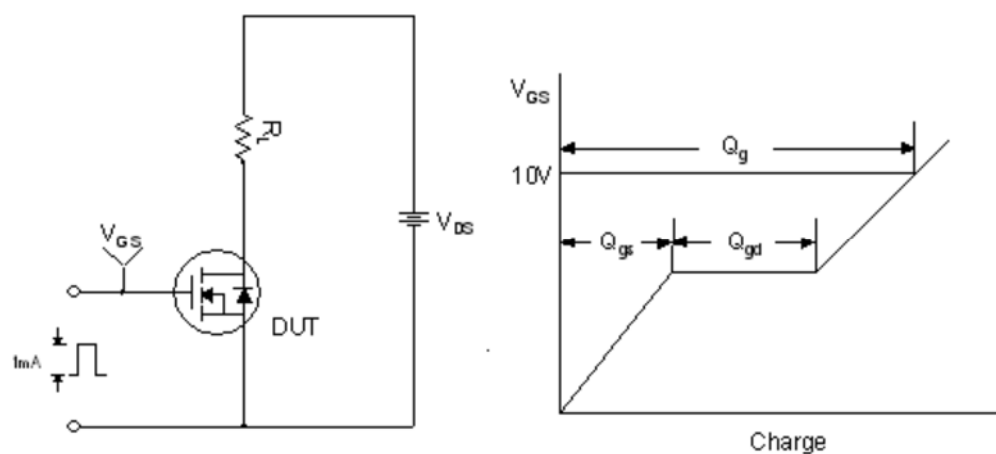


Figure 1. Gate Charge Test Circuit & Waveform

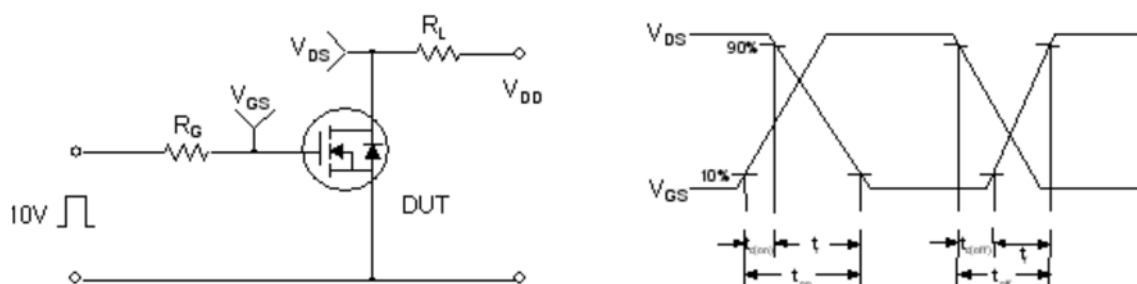


Figure 2. Resistive Switching Test Circuit & Waveforms

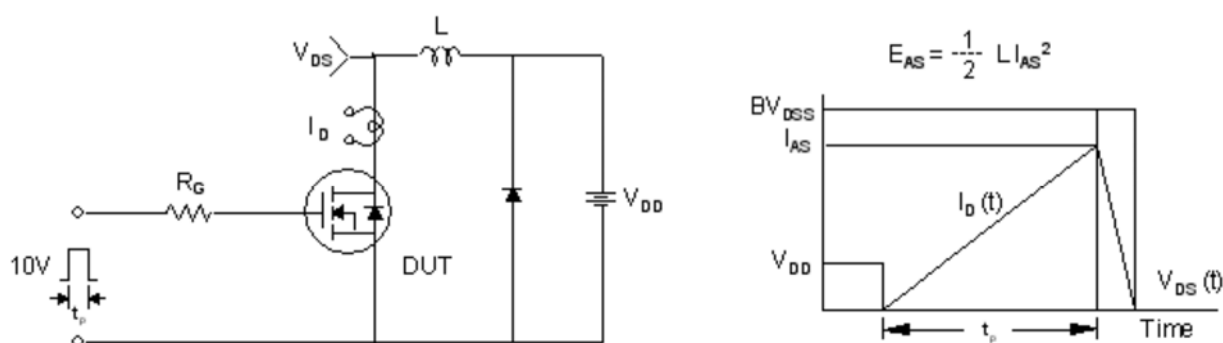


Figure 3. Unclamped Inductive Switching Test Circuit & Waveforms

TYPICAL PERFORMANCE CHARACTERISTICS

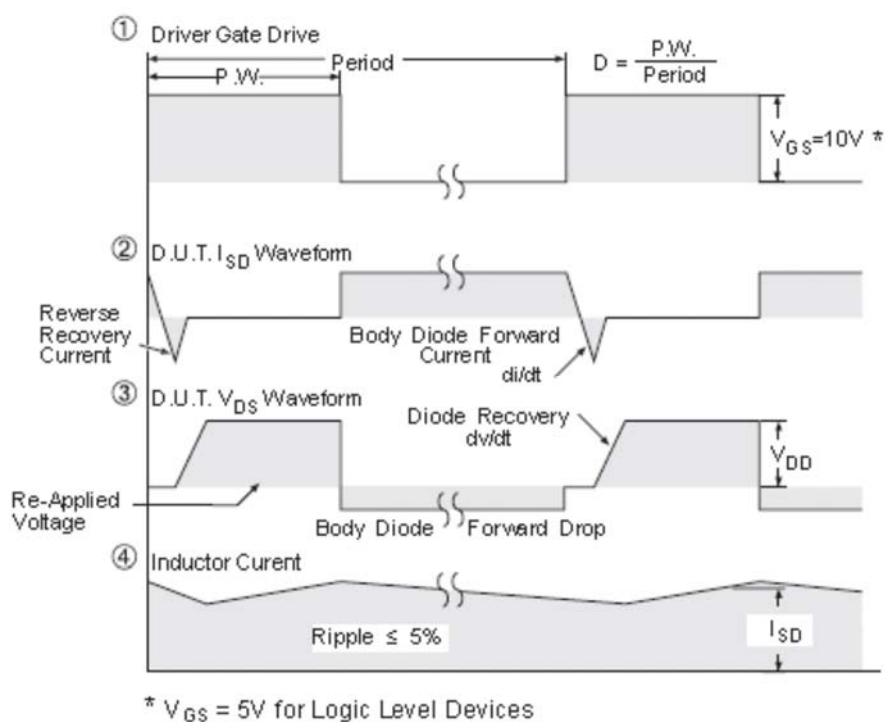
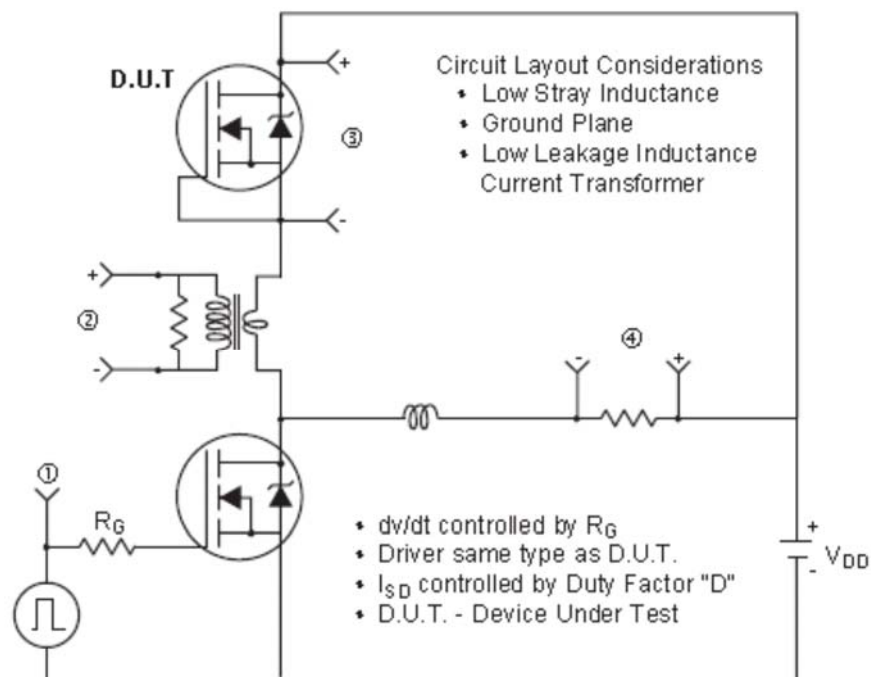
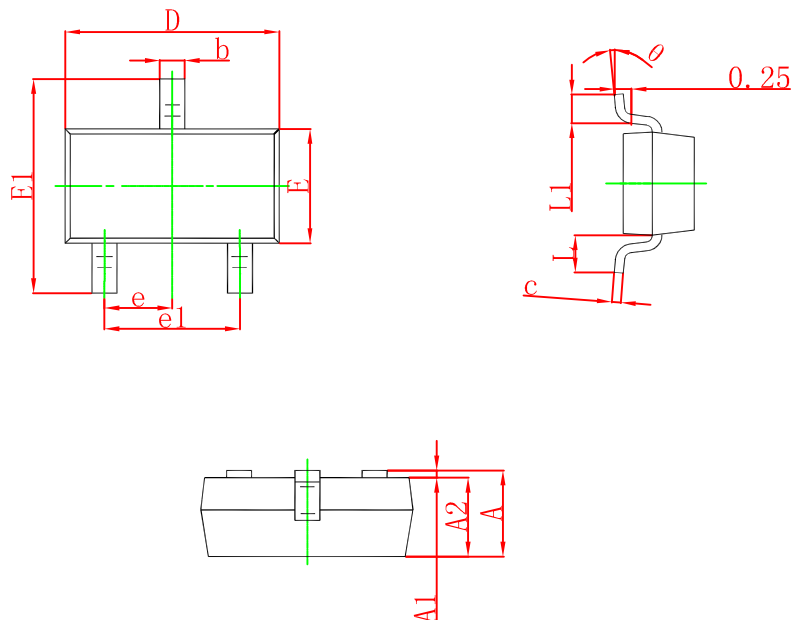


Figure 4. Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

SOT-23 PACKAGE OUTLINE DRAWING



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°