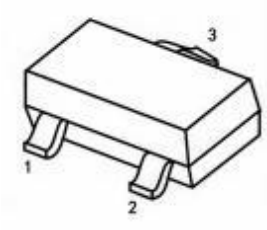
20V N-Channel Mosfet

FEATURES

- $R_{DS(ON)}$ ≤ 14mΩ (11mΩ Typ.) @V_{GS}=4.5V

SOT-23-3L



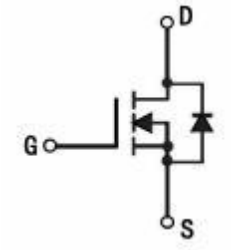
1. GATE
2. SOURCE
3. DRAIN

APPLICATIONS

- Battery Protection
- Load Switch
- Power Management

MARKING

N-CHANNEL MOSFET



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

Symbol	Param		Max.	Units
V_{DSS}	Drain-Source Voltage		20	V
V_{GSS}	Gate-Source Voltage		±12	V
I_D	Continuous Drain Current	T_a= 25℃	6	A
		T_a = 100℃	4	
I_{DM}	Pulsed Drain Current note1		24	A
P_D	Power Dissipation	T_a= 25℃	1.4	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		100	℃/ W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

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 = 250 μA	20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 20V, V_{GS} = 0V, T_J = 25℃	-	-	1	μA
I_{GSS}	Gate to Body Leakage Current	V_{GS} = ± 12V,V_{DS} = 0V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} =V_{GS} ,I_D = 250 μA	0.5	0.7	1.2	V
$R_{DS(on)}$	Static Drain-Source On-Resistance note2	V_{GS} =4.5V, I_D =6A	-	11	14	mΩ
g_{FS}	Forward Transconductance	V_{DS} =5V, I_D =6A	10	-	-	S
Dynamic Characteristics note3						
C_{iss}	Input Capacitance	V_{DS} =10V, V_{GS}= 0V f = 1.0MHz	-	900	-	pF
C_{oss}	Output Capacitance		-	162	-	pF
C_{rss}	Reverse Transfer Capacitance			105	-	pF
Q_g	Total Gate Charge	V_{DS}=10V, I_D=6A V_{GS}=10V	-	15	-	nC
Q_{gs}	Gate-Source Charge		-	1.8	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	2.8	-	nC
Switching Characteristics note3						
$t_{d(on)}$	Turn-On Delay Time	V_{GS} = 10V, V_{DS}=10V, R_G =3Ω, RL =0.5Ω	-	4.5	-	ns
t_r	Turn-On Rise Time		-	9.2	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	18.7	-	ns
t_f	Turn-Off Fall Time		-	3.3	-	ns
Drain- Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	6	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_{SD}=6A, T_J = 25℃	-	-	1.2	V
t_{rr}	Reverse Recovery Time	V_{GS} = 0V, I_S =6A, di/dt =100A/ μs	-	18	-	ns
Q_{rr}	Reverse Recovery Charge		-	9.5	-	nC

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 2%
3. Guaranteed by design, not subject to production testing

TYPICAL PERFORMANCE CHARACTERISTICS

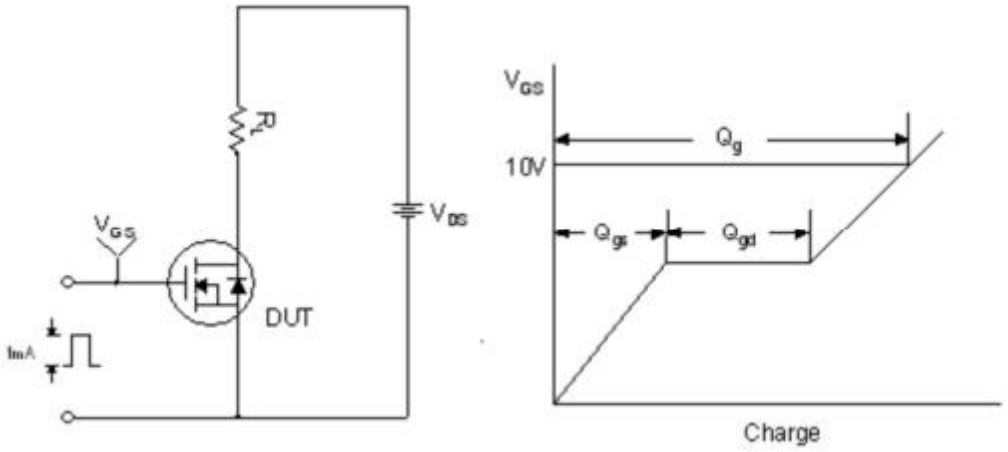


Figure 1. Gate Charge Test Circuit & Waveform

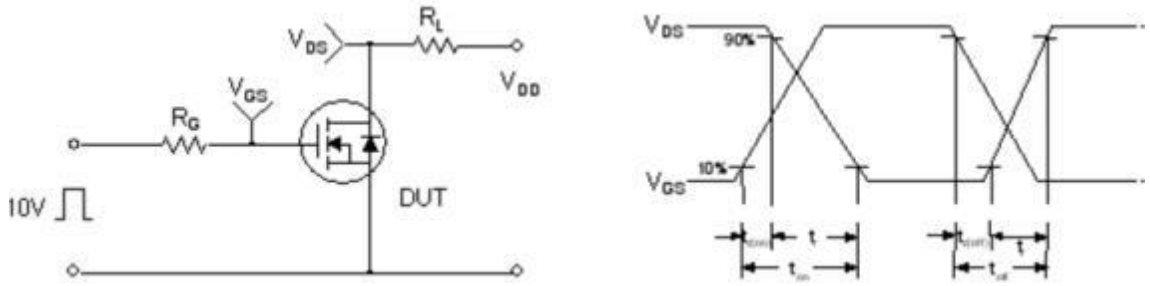


Figure 2. Resistive Switching Test Circuit & Waveforms

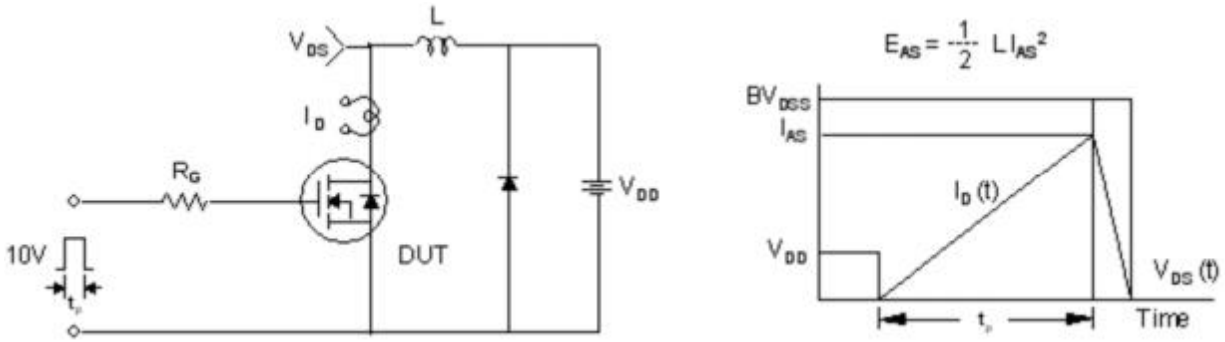


Figure 3. Unclamped Inductive Switching Test Circuit & Waveforms

TYPICAL PERFORMANCE CHARACTERISTICS (cont.)

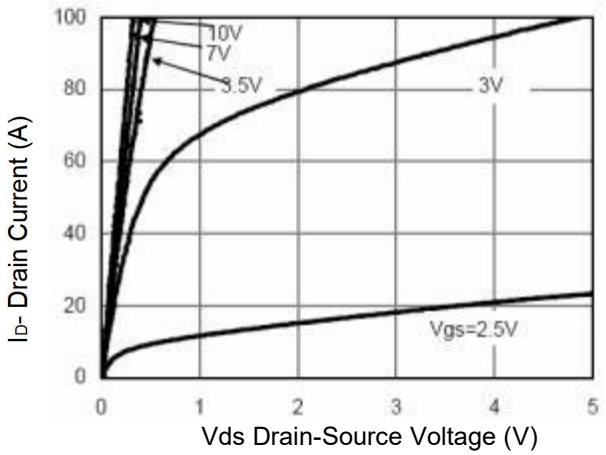


Figure 1 Output Characteristics

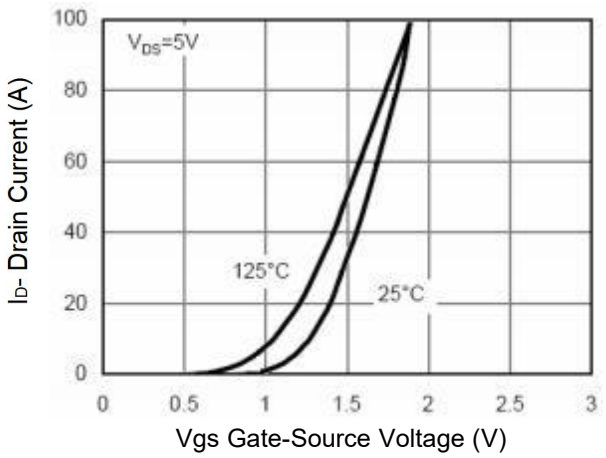


Figure 2 Transfer Characteristics

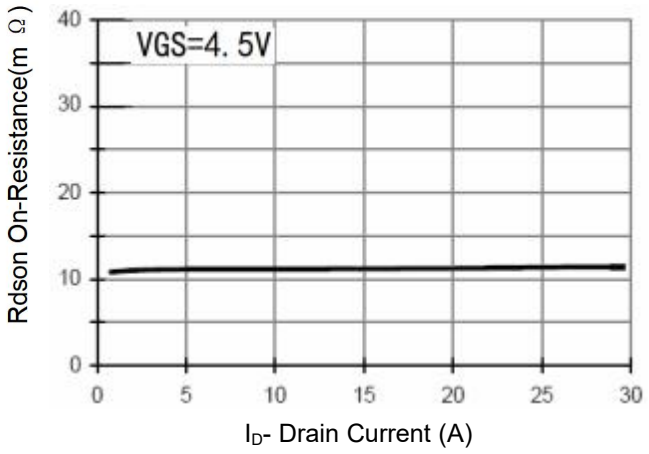


Figure 3 Rdson- Drain Current

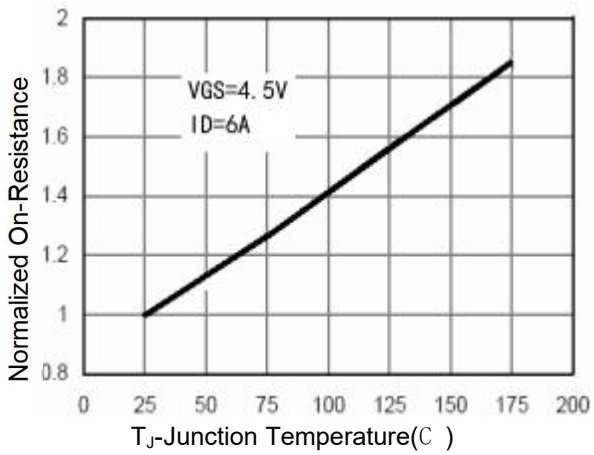


Figure 4 Rdson-Junction Temperature

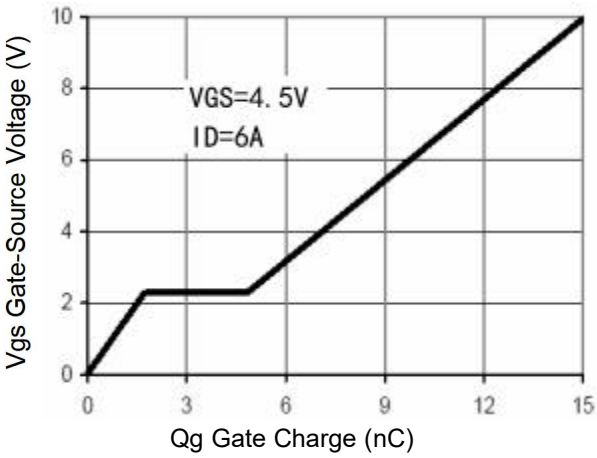


Figure 5 Gate Charge

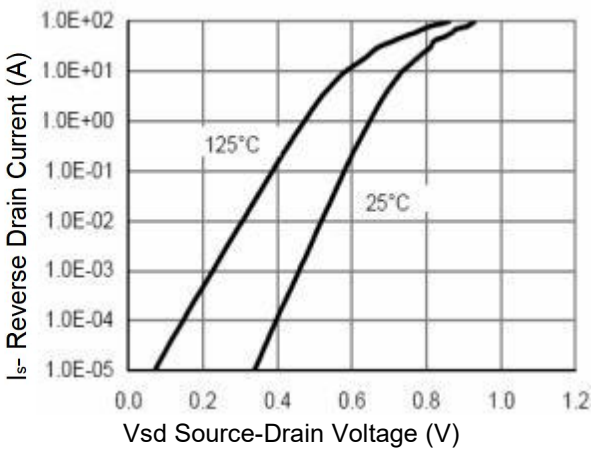
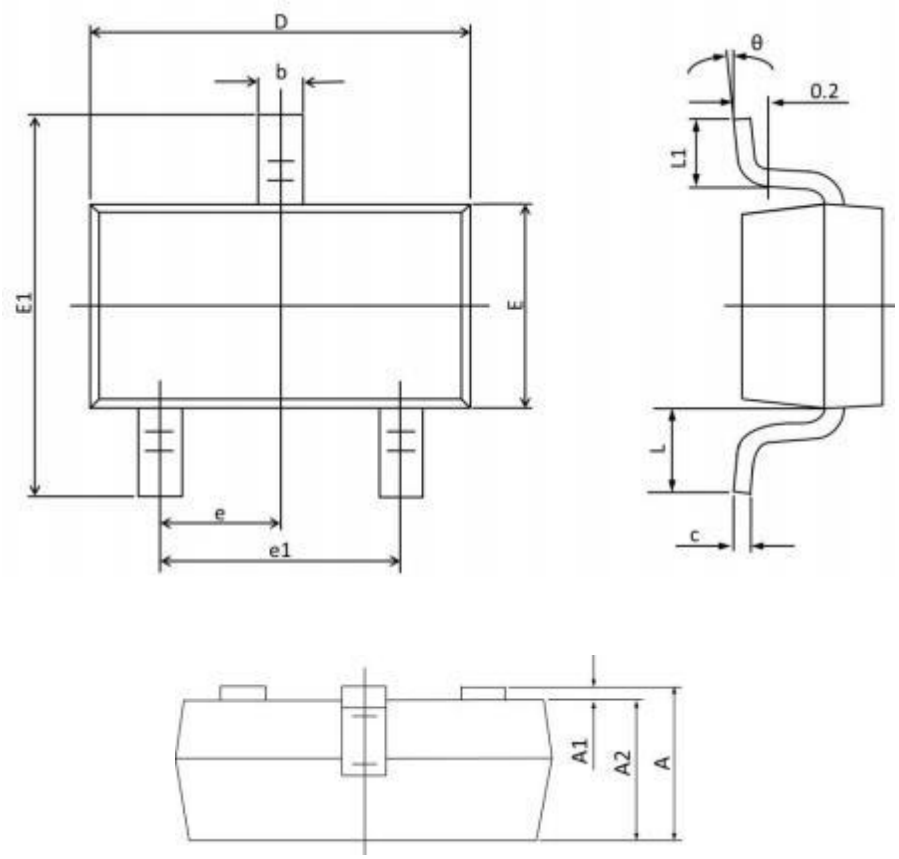


Figure 6 Source- Drain Diode Forward

SOT-23-3L PACKAGE OUTLINE DRAWING



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.700 REF.		0.028 REF.	
L1	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°