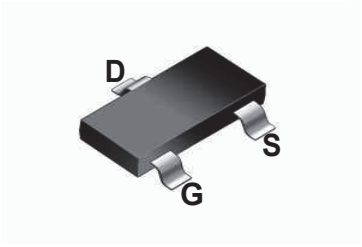
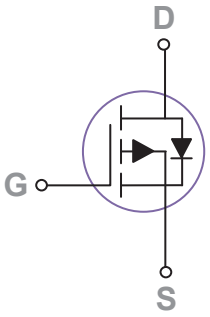
60V P-Channel MOSFETS LDN6911S

SOT-23-3S Pin Configuration

BVDSS	RDSON	ID
-60V	190mΩ	-2A





Feature

- *-60V,-2A, RDS(ON) =190mΩ@VGS = -10V*
- *Improved dv/dt capability*
- *Fast switching*
- *Green Device Available*

Applications

- *Motor Drive*
- *Power Tools*
- *LED Lighting*

MAXIMUM RATINGS AND CHARACTERISTICS

@ 25°C Ambient Temperature (unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_C=25˚C)	-2	A
	Drain Current – Continuous (T_C=100˚C)	-1.25	A
I_{DM}	Drain Current – Pulsed[1]	-8	A
P_D	Power Dissipation (T_C=25˚C)	1.56	W
	Power Dissipation – Derate above 25˚C	0.012	W/˚C
T_{STG}	Storage Temperature Range	-50 to 150	˚C
T_J	Operating Junction Temperature Range	-50 to 150	˚C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	80	˚C/W

MOSFET ELECTRICAL CHARACTERISTICS T_A= 25℃ unless otherwise specified

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-60	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.05	---	V/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-60V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-48V , V_{GS}=0V , T_J=125℃	---	---	-10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V , I_D=-2A	---	160	190	mΩ
		V_{GS}=-4.5V , I_D=-1.5A	---	200	240	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=-250uA	-1.2	-1.9	-2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	5	---	mV/℃
gfs	Forward Transconductance	V_{DS}=-10V , I_D=-2A	---	3.5	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[2,3]	V_{DS}=-30V , V_{GS}=-10V , I_D=-2A	---	8.2	12	nC
Q_{gs}	Gate-Source Charge[2,3]		---	1.8	3.6	
Q_{gd}	Gate-Drain Charge[2,3]		---	1.5	3	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DD}=-30V , V_{GS}=-10V , R_G=6Ω I_D=-1A	---	5.2	10	ns
T_r	Rise Time[2,3]		---	19	36	
$T_{d(off)}$	Turn-Off Delay Time[2,3]		---	35	67	
T_f	Fall Time[2,3]		---	10.6	20	
C_{iss}	Input Capacitance	V_{DS}=-30V , V_{GS}=0V , F=1MHz	---	425	615	pF
C_{oss}	Output Capacitance		---	35	50	
C_{rss}	Reverse Transfer Capacitance		---	20	30	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	-2	A
I_{SM}	Pulsed Source Current		---	---	-4	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2 % .
3. Essentially independent of operating temperature.

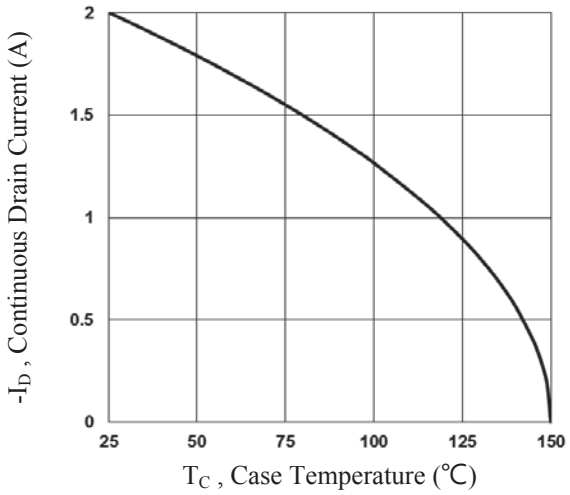


Fig.1 Continuous Drain Current vs. T_C

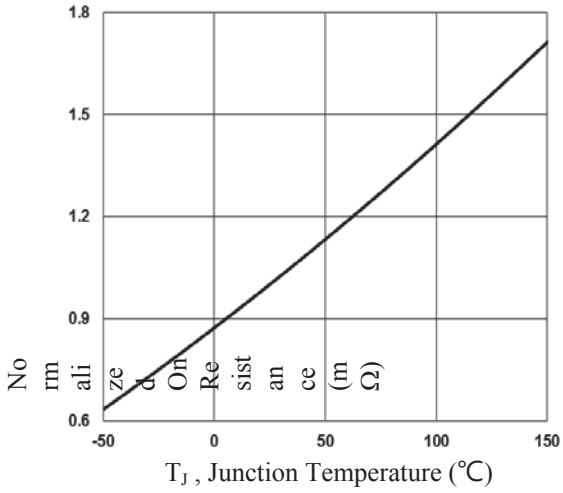


Fig.2 Normalized RDSON vs. T_J

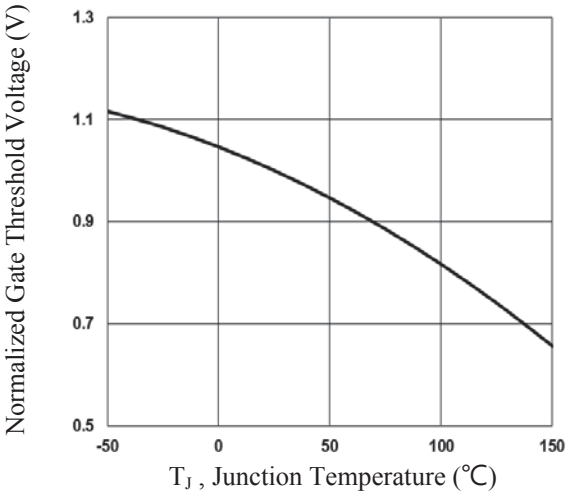


Fig.3 Normalized V_{th} vs. T_J

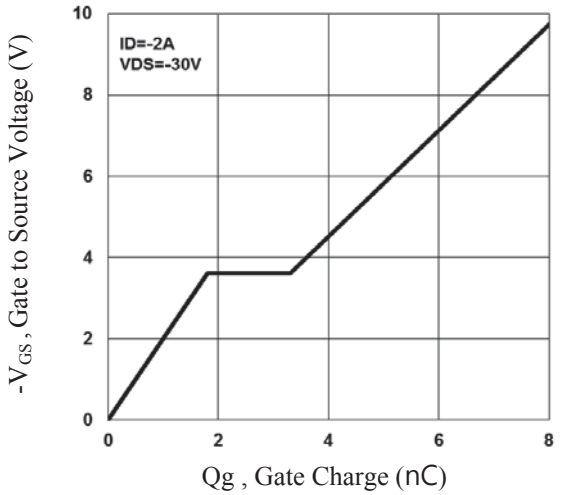


Fig.4 Gate Charge Waveform

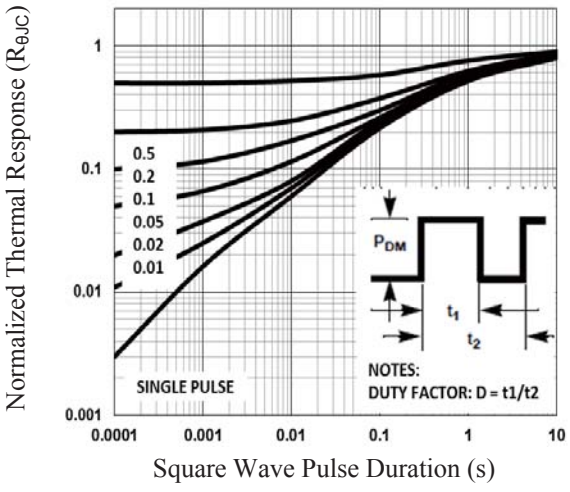


Fig.5 Normalized Transient Impedance

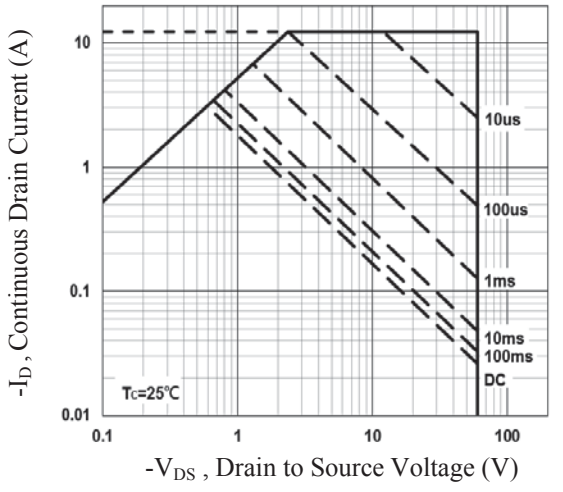


Fig.6 Maximum Safe Operation Area

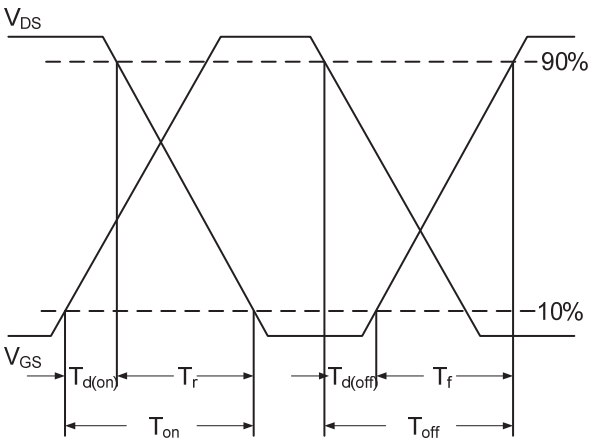


Fig.7 Switching Time Waveform

$$EAS = \frac{1}{2} L \times (-I_{AS})^2 \times \frac{-BVDSS}{-BVDSS-(-VDD)}$$

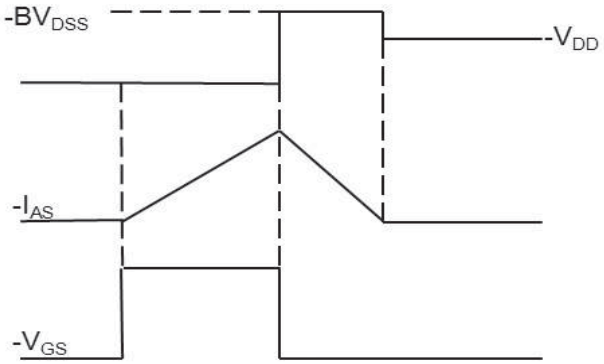
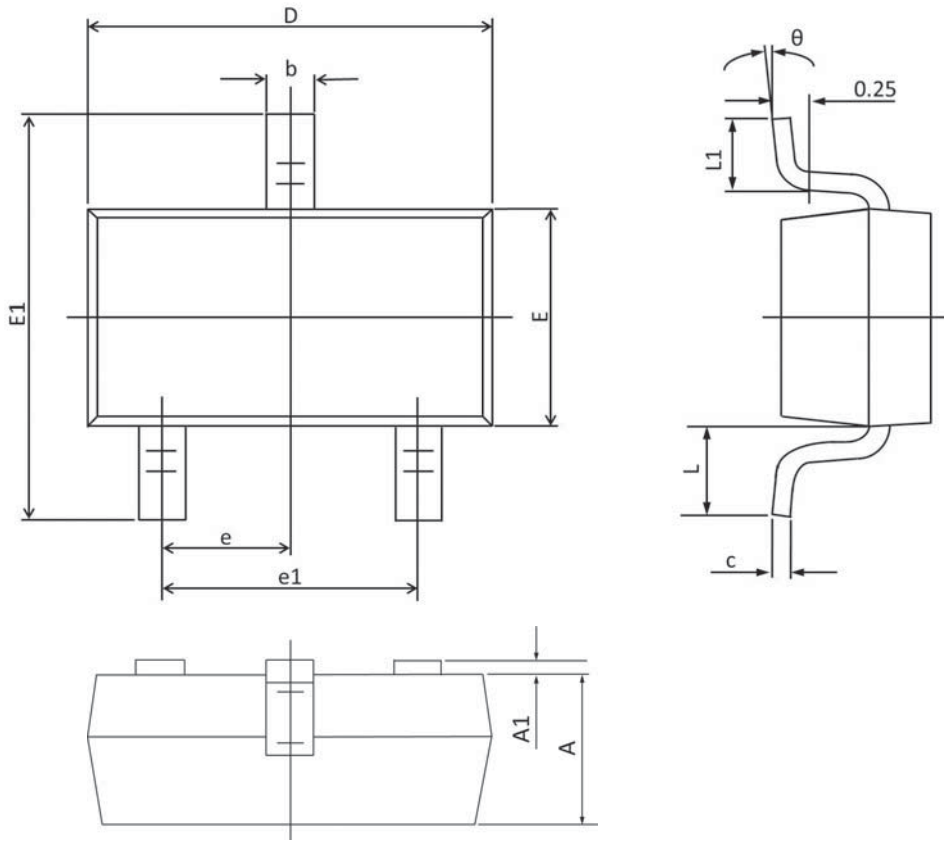


Fig.8 EAS Waveform

SOT23-3S PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.000	0.035	0.039
A1	0.000	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.090	0.110	0.003	0.004
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	1°	7°	1°	7°