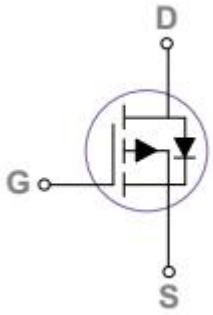
SL11P06DN1

P-Channel Power MOSFET

General Features

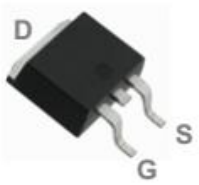
- V_{DS} =-60V,I_D =-11A
  $R_{DS(ON)}$ <175 mΩ @ V_{GS}=-10V
  $R_{DS(ON)}$ <210 mΩ @ V_{GS}=-4.5V
- Improved dv/dt capability
- Fast switching
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation



Schematic diagram

Applications

- Power switching application
- Hard switched and high frequency circuits
- LED Lighting



TO252 Pin Configuration

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_C=25℃)	I_D(25℃)	-11	A
Drain Current-Continuous (T_C=100℃)	I_D (100℃)	-8	A
Pulsed Drain Current	I_{DM}	-28	A
Maximum Power Dissipation (T_C=25℃)	P_D	15.3	W
Derating factor		0.125	W/℃
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-50 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case (Note 2)	$R_{\theta JC}$	3.3	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	-60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-60V,V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-1.2	-1.6	-2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D= -3A	-	150	175	mΩ
		V_{GS}=-4.5V, I_D=-1.5A		193	210	
Forward Transconductance	g_{FS}	V_{DS}=-10V,I_D=-2A	-	3	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=-30V,V_{GS}=0V, F=1.0MHz	-	425	615	PF
Output Capacitance	C_{oss}		-	35	50	PF
Reverse Transfer Capacitance	C_{rss}		-	20	30	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-30V, I_D=-1A V_{GS}=-10V,R_G=6Ω	-	5.2	10	nS
Turn-on Rise Time	t_r		-	19	36	nS
Turn-Off Delay Time	$t_{d(off)}$		-	35	67	nS
Turn-Off Fall Time	t_f		-	10.6	20	nS
Total Gate Charge	Q_g	V_{DS}=-30V,I_D=-3A, V_{GS}=-10V	-	8.2	12	nC
Gate-Source Charge	Q_{gs}		-	1.8	3.6	nC
Gate-Drain Charge	Q_{gd}		-	1.5	3	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=-1A,TJ = 25°C	-		-1.0	V
Diode Forward Current (Note 2)	I_S	V_G=V_D=0V	-	-	-7	A
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics (Curves)

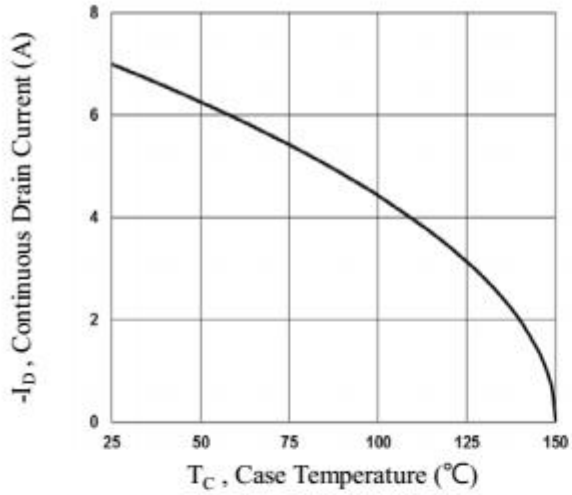


Fig.1 Continuous Drain Current vs. T_C

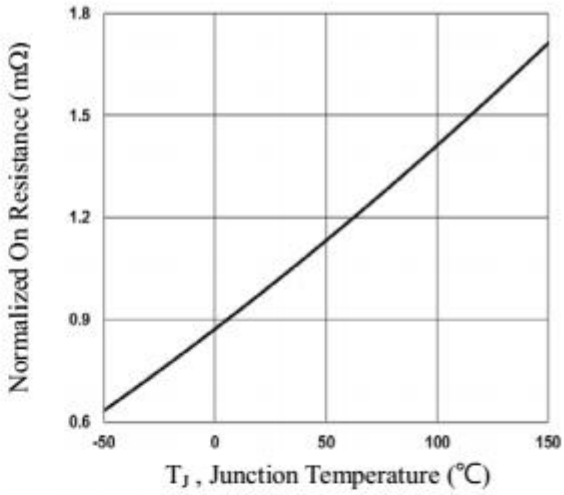


Fig.2 Normalized RDSON vs. T_J

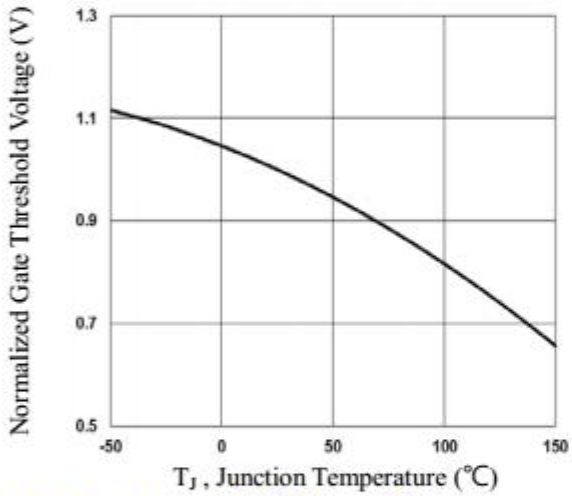


Fig.3 Normalized V_{th} vs. T_J

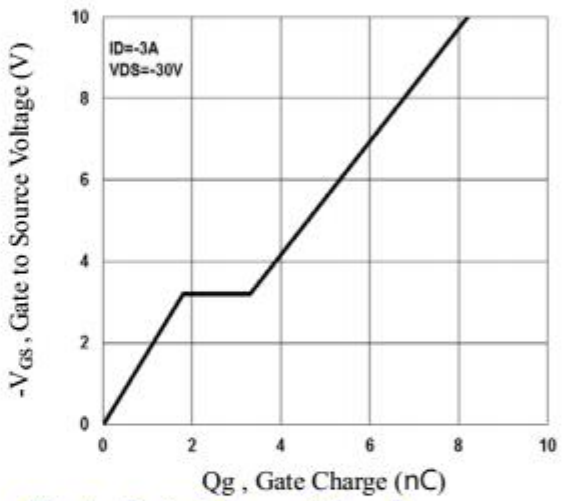


Fig.4 Gate Charge Waveform

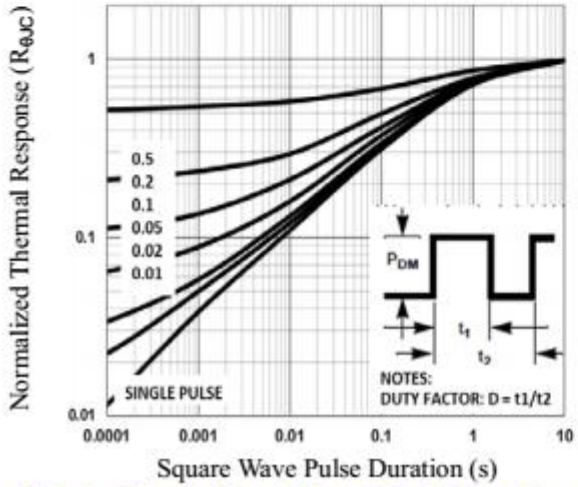


Fig.5 Normalized Transient Impedance

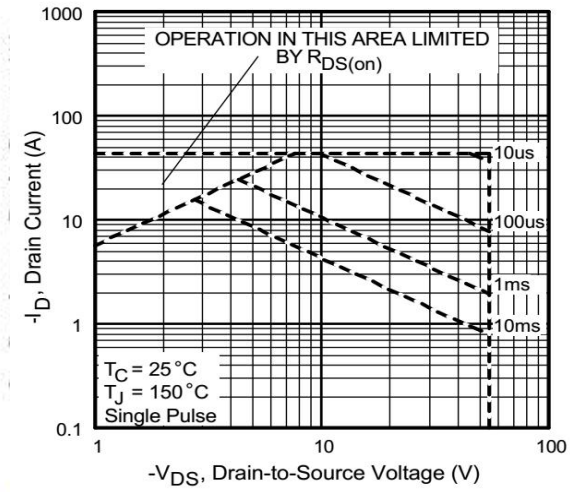


Fig.6 Maximum Safe Operation Area

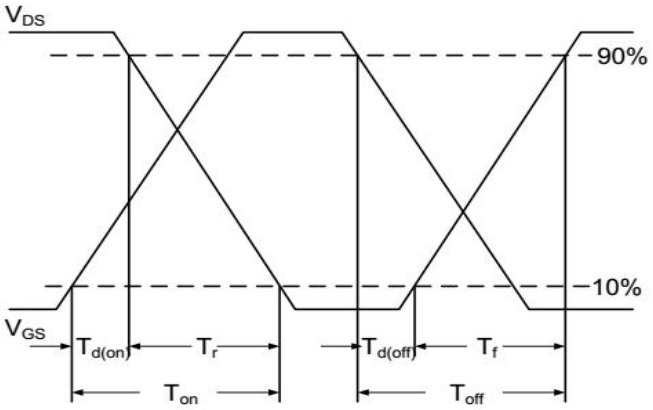


Fig.7 Switching Time Waveform

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

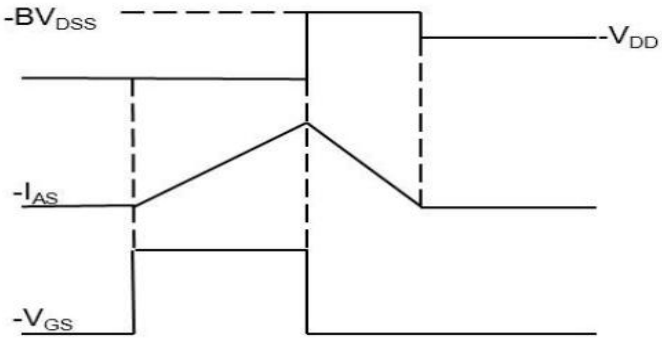
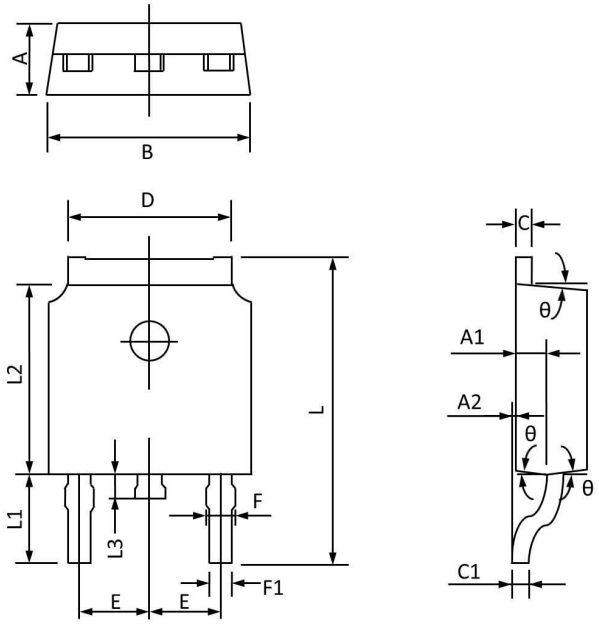


Fig.8 EAS Waveform

TO252 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.20	2.40	0.087	0.094
A1	0.91	1.11	0.036	0.044
A2	0.00	0.15	0.000	0.006
B	6.50	6.70	0.256	0.264
C	0.46	0.580	0.018	0.230
C1	0.46	0.580	0.018	0.030
D	5.10	5.46	0.201	0.215
E	2.186	2.386	0.086	0.094
F	0.74	0.94	0.029	0.037
F1	0.660	0.860	0.026	0.034
L	9.80	10.40	0.386	0.409
L1	2.9REF		0.114REF	
L2	6.00	6.20	0.236	0.244
L3	0.60	1.00	0.024	0.039
θ	3°	9°	3°	9°