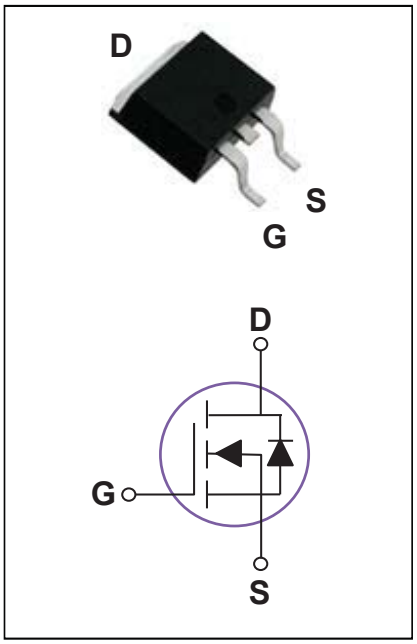
30V N-Channel MOSFETS LDD3906

TO-252 Pin Configuration

BVDSS	RDSON	ID
30V	6mΩ	80A



FEATURES

- *30V,80A, RDS(ON) =6mΩ@VGS = 10V*
- *Improved dv/dt capability*
- *Fast switching*
- *100% EAS Guaranteed*
- *Green Device Available*

APPLICATIONS

- *MB / VGA / Vcore*
- *POL Applications*
- *SMPS 2nd SR*

MAXIMUM RATINGS AND CHARACTERISTICS

@ 25°C Ambient Temperature (unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	VDS	30	V
Gate-Source Voltage	VGS	±20	V
Drain Current – Continuous (TC=25˚C)	ID	80	A
Drain Current – Continuous (TC=100˚C)		51	A
Drain Current – Pulsed[1]	IDM	320	A
Single Pulse Avalanche Energy[2]	EAS	88	mJ
Single Pulse Avalanche Current[2]	IAS	42	A
Power Dissipation (TC=25˚C)	PD	54	W
Power Dissipation – Derate above 25˚C		0.43	W/˚C
Storage Temperature Range	TSTG	-55 to+150	˚C
Operating Junction Temperature Range	TJ	-55 to+150	˚C

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction to ambient	RθJA	---	62	˚C/W
Thermal Resistance Junction to Case	RθJC	---	2.3	˚C/W

MOSFET ELECTRICAL CHARACTERISTICS T_A=25℃ unless otherwise specified

Off Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=250uA	30	---	---	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25℃ , I_D=1mA	---	0.04	---	
Drain-Source Leakage Current	I_{DSS}	V_{DS}=30V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=125℃	---	---	10	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Static Drain-Source On-Resistance[3]	$R_{DS(ON)}$	V_{GS}=10V , I_D=20A	---	4.8	6	mΩ
		V_{GS}=4.5V , I_D=10A	---	6.5	9	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	1	1.6	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		---	-4	---	mV/℃
Forward Transconductance	gfs	V_{DS}=10V , I_D=10A	---	18	---	S

Dynamic Characteristics

Total Gate Charge[3,4]	Q_g	V_{DS}=15V , V_{GS}=4.5V , I_D=20A	---	11.1	---	nC
Gate-Source Charge[3,4]	Q_{gs}		---	1.85	---	
Gate-Drain Charge[3,4]	Q_{gd}		---	6.8	---	
Turn-On Delay Time[3,4]	$T_{d(on)}$	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω I_D=15A	---	7.5	---	ns
Rise Time[3,4]	T_r		---	14.5	---	
Turn-Off Delay Time[3,4]	$T_{d(off)}$		---	35.2	---	
Fall Time[3,4]	T_f		---	9.6	---	
Input Capacitance	C_{iss}	V_{DS}=25V , V_{GS}=0V , F=1MHz	---	1160	---	pF
Output Capacitance	C_{oss}		---	200	---	
Reverse Transfer Capacitance	C_{rss}		---	180	---	
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	2.5	---	Ω

Guaranteed Avalanche Energy

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Single Pulse Avalanche Energy	EAS	V_{DD}=25V, L=0.1mH, IAS=20A	20	---	---	mJ

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	V_G=V_D=0V , Force Current	---	---	80	A
Pulsed Source Current[3]	I_{SM}		---	---	320	A
Diode Forward Voltage[3]	V_{SD}	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1	V
Reverse Recovery Time	t_{rr}	V_{GS}=0V,I_S=1A , di/dt=100A/μs T_J=25℃	---	---	---	ns
Reverse Recovery Charge	Q_{rr}		---	---	---	nC

Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=42A.,R_G=25Ω, Starting T_J=25℃.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

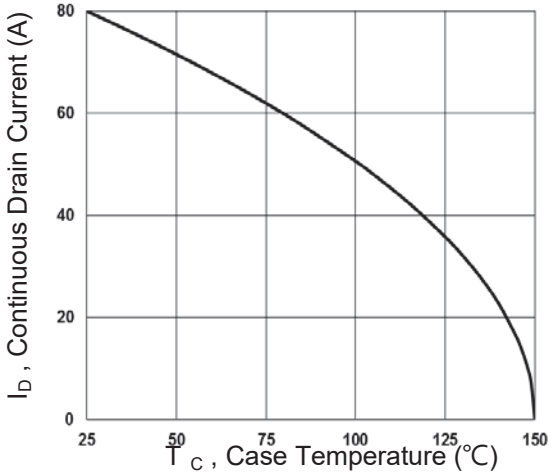
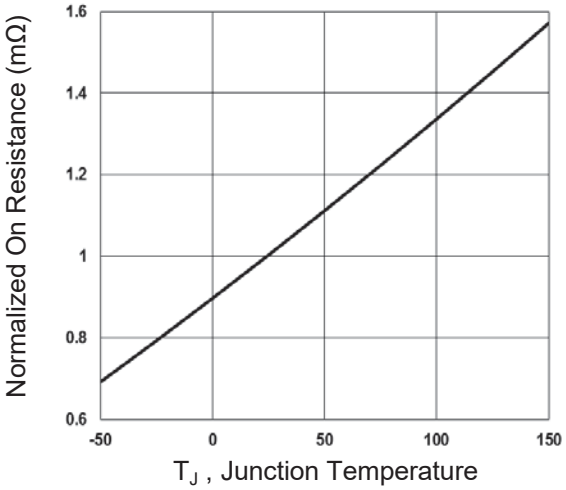


Fig.1 Continuous Drain Current vs. T_C



(℃) **Fig.2 Normalized RDSON vs. T_J**

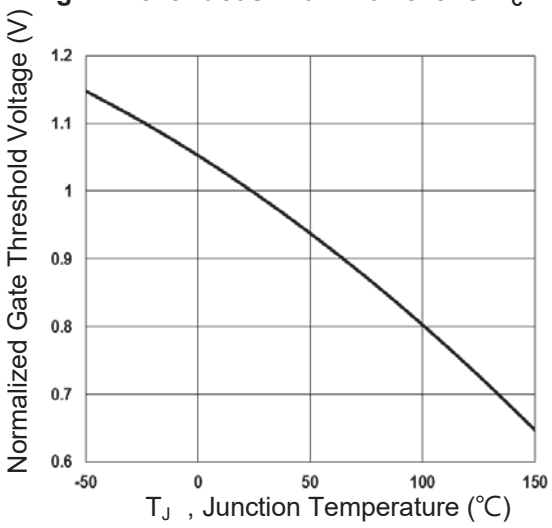


Fig.3 Normalized V_{th} vs. T_J

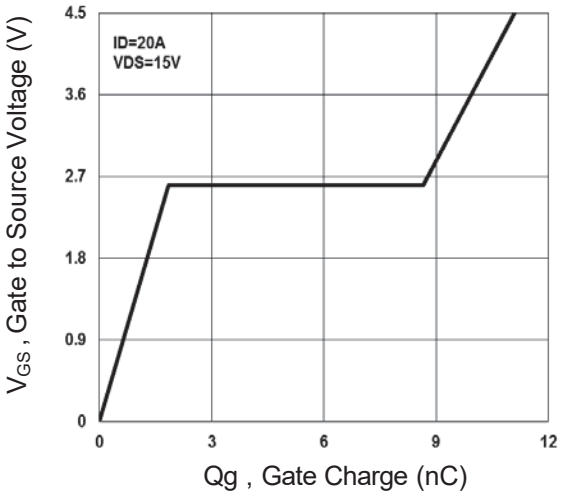


Fig.4 Gate Charge Waveform

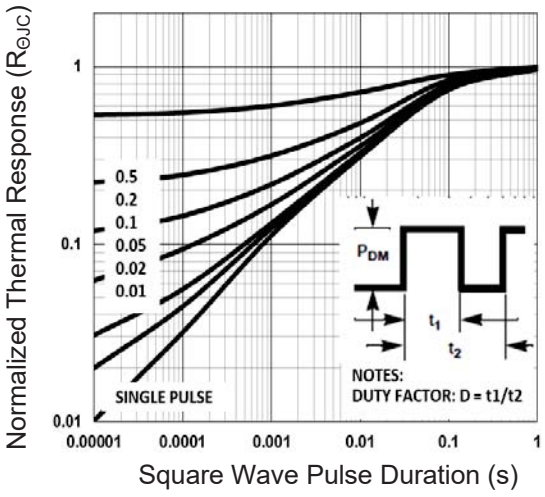


Fig.5 Normalized Transient Impedance

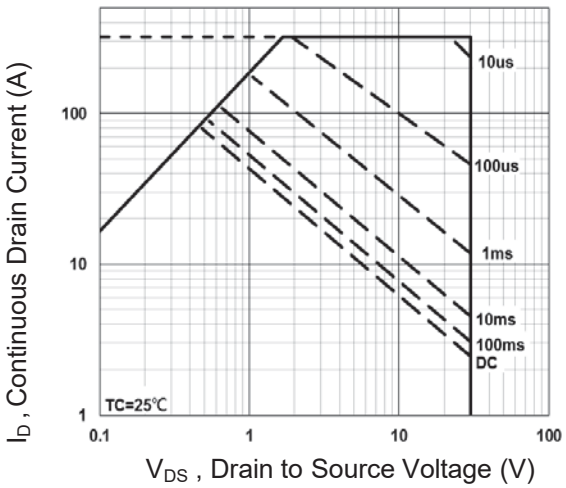


Fig.6 Maximum Safe Operation Area

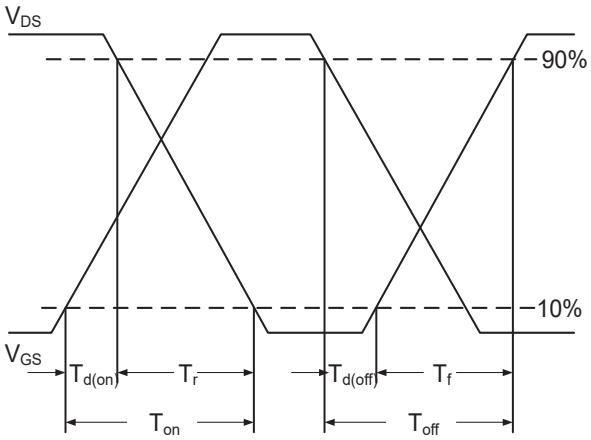


Fig.7 Switching Time Waveform

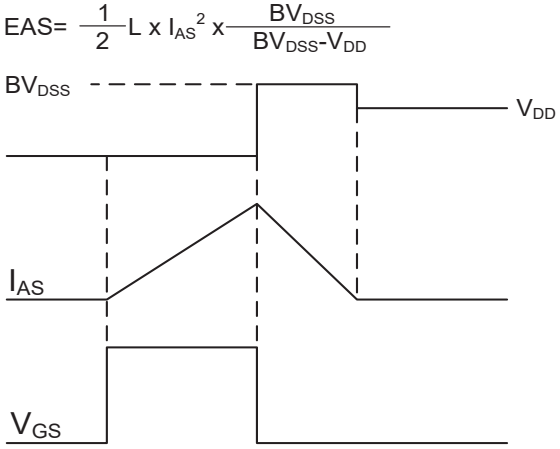
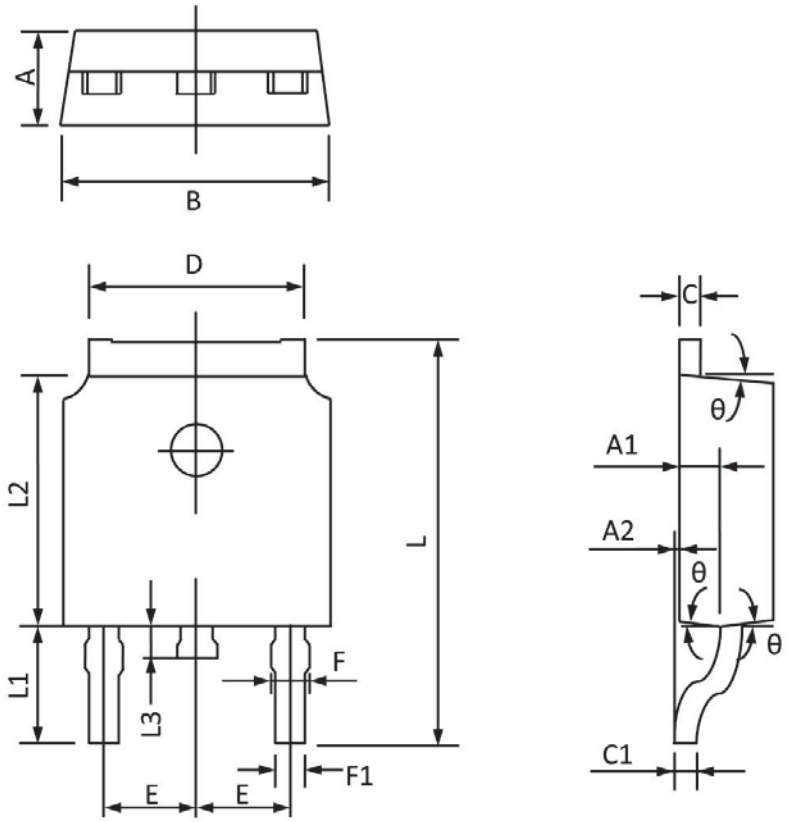


Fig.8 EAS Waveform

TO-252 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°