GSMDL6910

60V N-Channel MOSFETs

Product Description

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

These devices are well suited for high efficiency fast switching applications.

Features

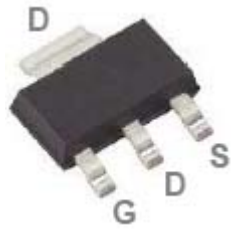
- 60V, 6.8A, $R_{DS(ON)}$=60mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- 100% EAS guaranteed
- Green Device Available
- SOT-223 package design

Applications

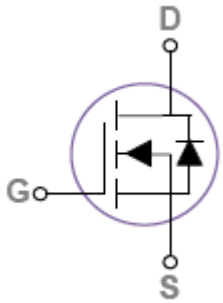
- Motor Drive
- Power Tools
- LED Lighting

Packages & Pin Assignments

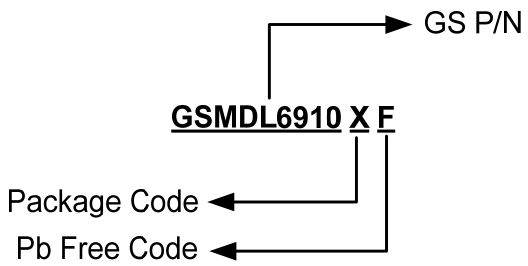
GSMDL6910XF (SOT-223)



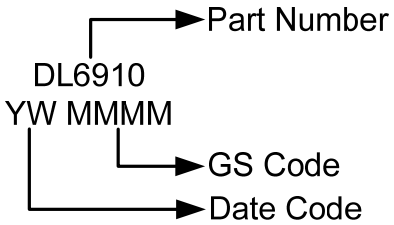
Pin	Description
1	Gate
2	Drain
3	Source



Ordering Information



Marking Information



Part Number	Package	Quantity
GSMDL6910XF	SOT-223	2500 PCS

Absolute Maximum Ratings

T_C=25ºC Unless otherwise noted

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		60	V
V_{GS}	Gate –Source Voltage		±20	V
I_D	Continuous Drain Current	T_C=25℃	6.8	A
		T_C=100℃	4.3	
I_{DM}	Pulsed Drain Current (*1)		27.2	A
EAS	Single Pulse Avalanche Energy (*2)		11	mJ
IAS	Single Pulse Avalanche Current (*2)		15	A
P_D	Power Dissipation (T_C=25℃)		5.4	W
	Power Dissipation (Derate above 25℃)		0.043	W/℃
T_J	Operating Junction Temperature Range		-50 to +150	℃
T_{STG}	Storage Temperature Range		-50 to +150	℃
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		85	℃/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		23	℃/W

Note 1: Repetitive Rating: Pulsed width limited by maximum junction temperature.
Note 2: V_{DD}=25V, V_{GS}=10V, L=0.1mH, IAS=15A, Starting T_J=25℃.

Electrical Characteristics

T_J=25℃ Unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	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/℃
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1.2	1.8	2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient			-4.2		mV/℃
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V,V_{GS}=0V			1	uA
		V_{DS}=48V,V_{GS}=0V, T_J=125℃			10	
I_S	Continuous Source Current	V_G=V_D=0V, Force Current			6.8	A
I_{SM}	Pulsed Source Current				13.6	
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS} =10V,I_D=6A		50	60	mΩ
		V_{GS} =4.5V,I_D=3A		56	70	
g_{FS}	Forward Transconductance	V_{DS}=10V,I_D=4A		10		S
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=1A			1	V
t_{rr}	Reverse Recovery Time (*3)	V_{GS}=30V,I_S=1A, di/dt=100A/us		14.6		ns
Q_{rr}	Reverse Recovery Charge (*3)			6.6		nC
Dynamic						
Q_g	Total Gate Charge (*3,4)	V_{DS}=48V,V_{GS}=10V, I_D=6A		14	21	nC
Q_{gs}	Gate-Source Charge (*3,4)			2.9	5	
Q_{gd}	Gate-Drain Charge (*3,4)			2.4	4	
C_{iss}	Input Capacitance	V_{DS}=25V,V_{GS}=0V, f=1MHz		835	1300	pF
C_{oss}	Output Capacitance			69	130	
C_{rss}	Reverse Transfer Capacitance			40	80	
$t_{d(on)}$	Turn-On Time (*3,4)	V_{DD}=30V,I_D=6A, V_{GS}=10V,R_G=6Ω		14	27	ns
t_r				4	8	
$t_{d(off)}$	Turn-Off Time (*3,4)			32	60	
t_f				2	4	
R_g	Gate Resistance	V_{DS}=0V,V_{GS}=0V, f=1MHz		1.7	3.4	Ω

Note 3: The data tested by pulsed, pulse width≦300us, duty cycle≦2%.

Note 4: Essentially independent of operating temperature.

Typical Performance Characteristics

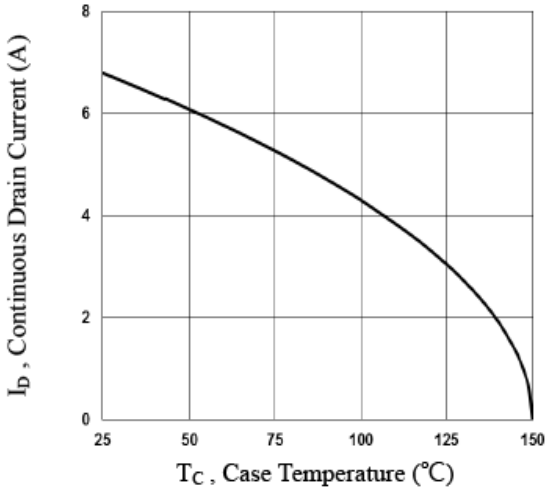


Fig.1 Continuous Drain Current vs. T_c

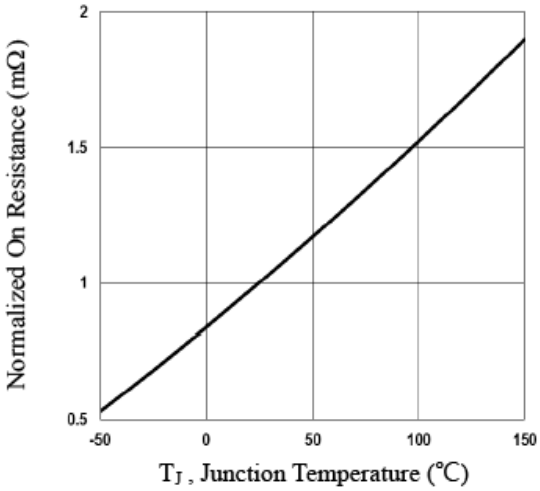


Fig.2 Normalized RDSON vs. T_J

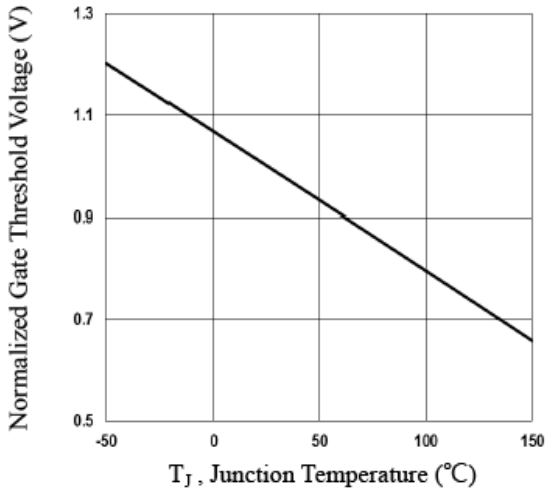


Fig.3 Normalized V_{th} vs. T_J

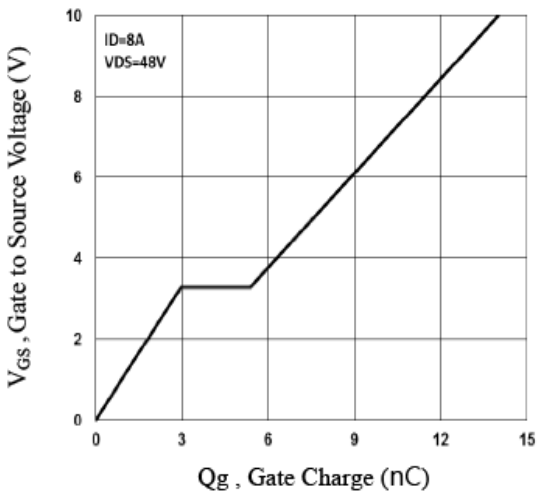


Fig.4 Gate Charge Waveform

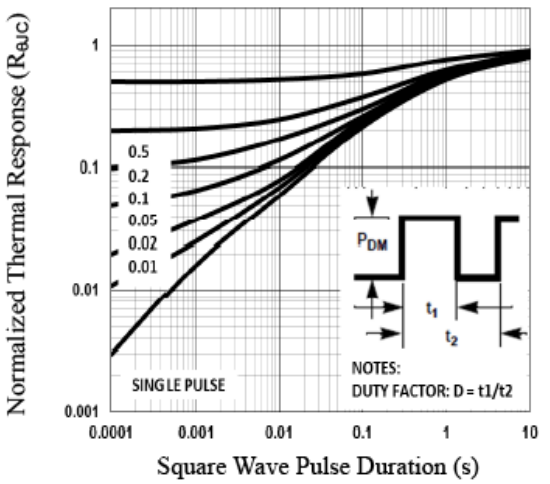


Fig.5 Normalized Transient Impedance

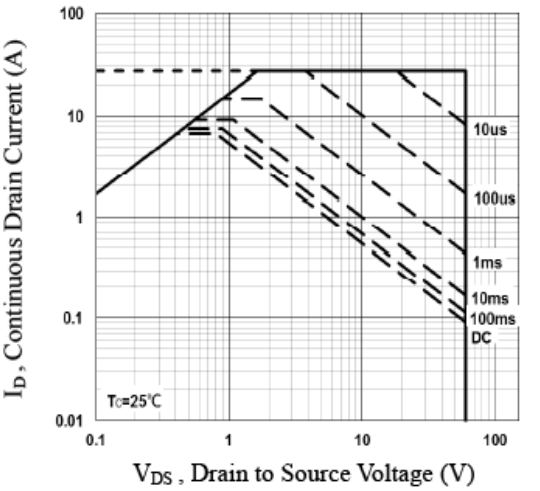
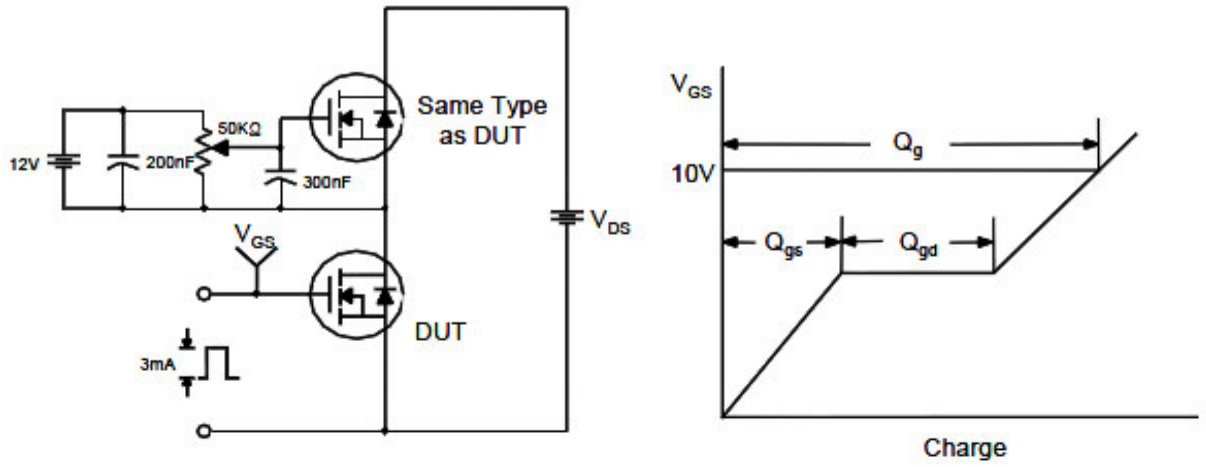


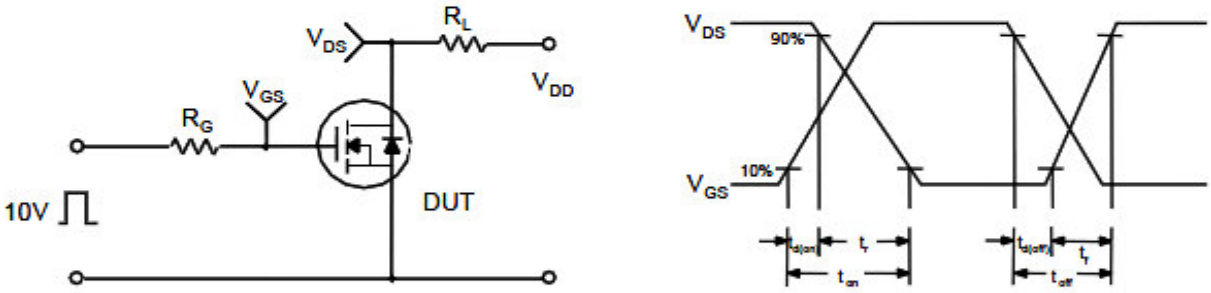
Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

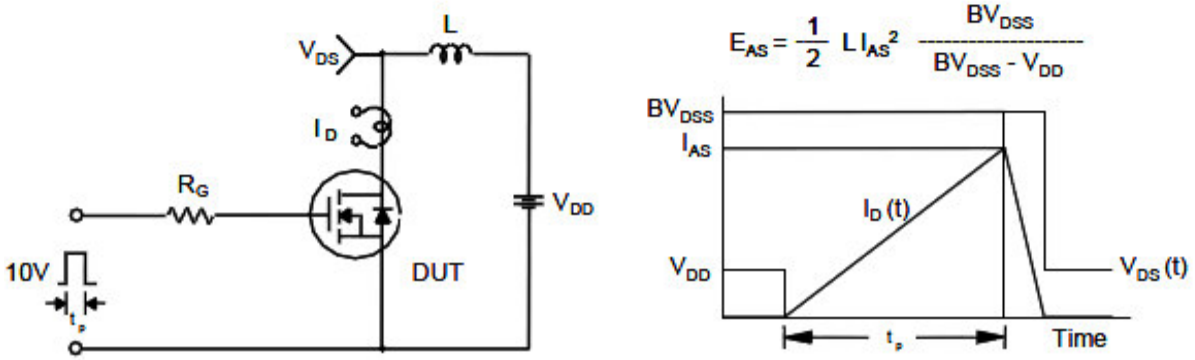
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

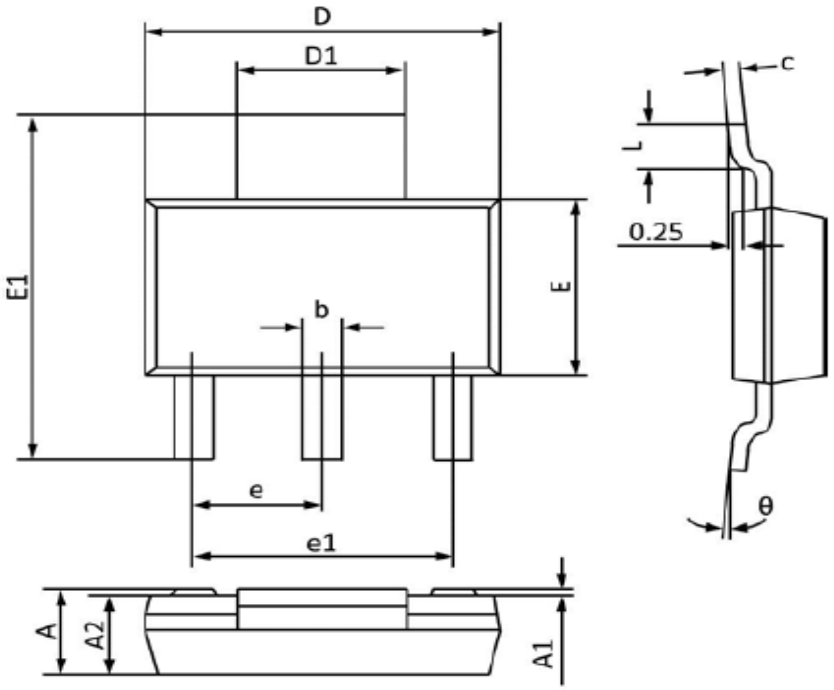


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

SOT-223



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300 (BSC)		0.091 (BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	0°	10°

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