

GSMDL6912

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.

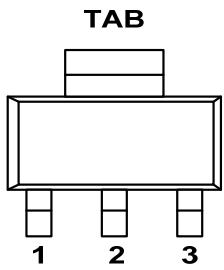
Features

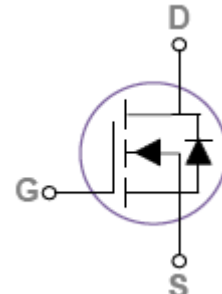
- 60V, 5A, $R_{DS(ON)}=90m\Omega@V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS guaranteed
- Green Device Available
- SOT-223 package design

Applications

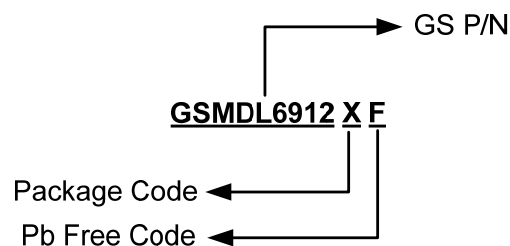
- Motor Drive
- Power Tools
- LED Lighting

Packages & Pin Assignments

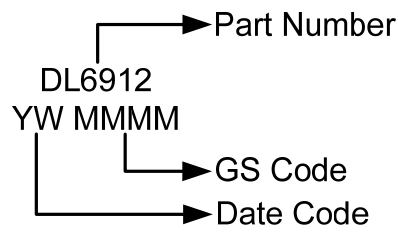
GSMDL6912XF (SOT-223)	
	
Pin	Description
1	Gate
2	Drain
3	Source



Ordering Information



Marking Information



Part Number	Package	Quantity
GSMDL6912XF	SOT-223	2500pcs

Absolute Maximum Ratings

$T_A=25^\circ\text{C}$ 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	$T_A=25^\circ\text{C}$	5
		$T_A=100^\circ\text{C}$	3.2
I_{DM}	Pulsed Drain Current	20	A
EAS	Single Pulse Avalanche Energy	25	mJ
IAS	Single Pulse Avalanche Current	7	A
P_D	Power Dissipation ($T_A=25^\circ\text{C}$)	1.79	W
	Power Dissipation (Derate above 25°C)	0.014	W/ $^\circ\text{C}$
T_J	Operating Junction Temperature Range	-50 to +150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-50 to +150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	70	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	30	$^\circ\text{C}/\text{W}$

Electrical Characteristics

T_A=25°C 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
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA		0.05		V/°C
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1.2	1.8	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient			-5		mV/°C
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°C			10	
I _S	Continuous Source Current	V _G =V _D =0V, Force Current			5	A
I _{SM}	Pulsed Source Current				20	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =10V, I _D =5A		76	90	mΩ
		V _{GS} =4.5V, I _D =3A		87	100	
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =3A		7		S
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A			1	V
t _{rr}	Reverse Recovery Time	V _{GS} =30V, I _S =1A, di/dt=100A/us		23.2		ns
Q _{rr}	Reverse Recovery Charge			14.3		nC
Dynamic						
Q _g	Total Gate Charge	V _{DS} =48V, V _{GS} =10V, I _D =5A		9.3	14	nC
Q _{gs}	Gate-Source Charge			2.1	4	
Q _{gd}	Gate-Drain Charge			1.8	4	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz		500	725	pF
C _{oss}	Output Capacitance			45	65	
C _{rss}	Reverse Transfer Capacitance			16	30	
t _{d(on)}	Turn-On Time	V _{DD} =30V, I _D =1A, V _{GS} =10V, R _G =3.3Ω		2.9	6	ns
t _r				9.5	18	
t _{d(off)}	Turn-Off Time			18.4	35	
t _f				5.3	10	
R _g	Gate Resistance		V _{DS} =0V, V _{GS} =0V, f=1MHz		2	

Typical Performance Characteristics

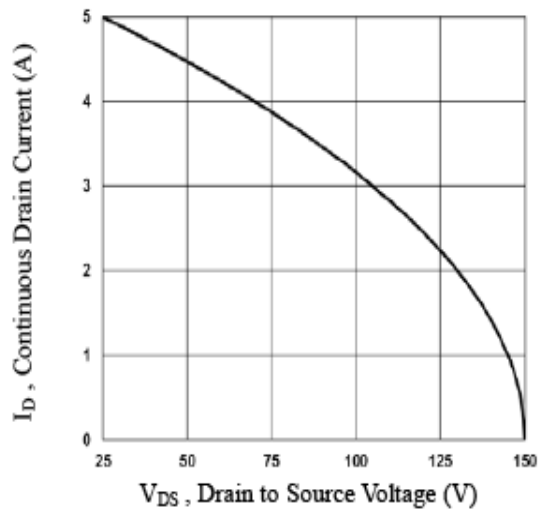


Fig.1 Output Characteristics

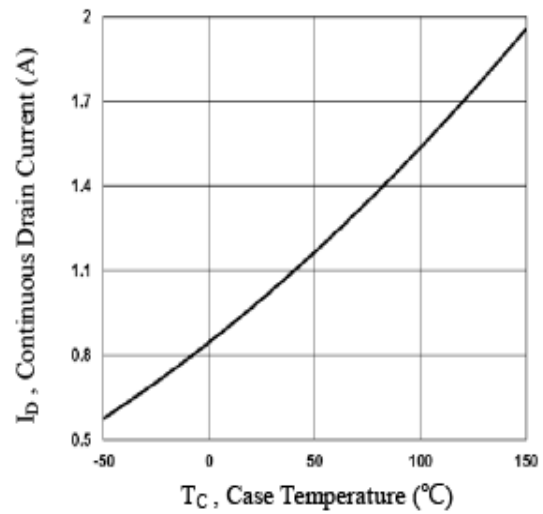


Fig.2 Continuous Drain Current vs. T_c

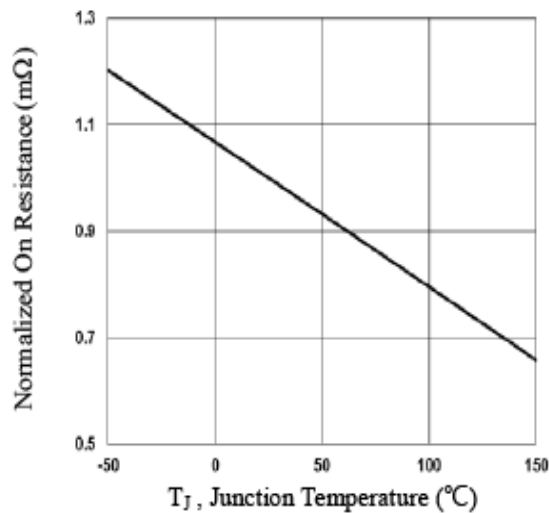


Fig.3 Normalized R_{DSon} vs. T_j

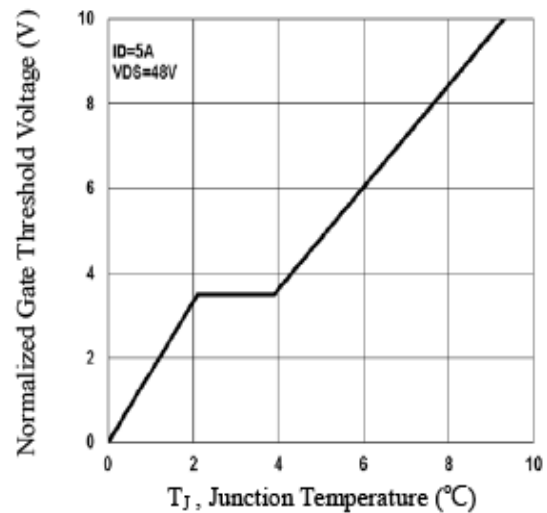


Fig.4 Normalized V_{th} vs. T_j

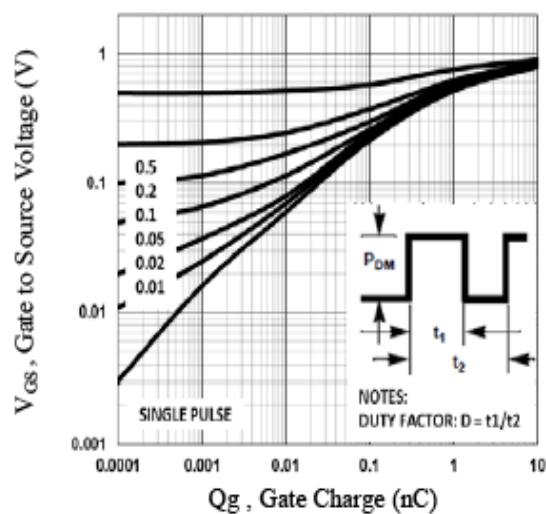


Fig.5 Gate Charge Waveform

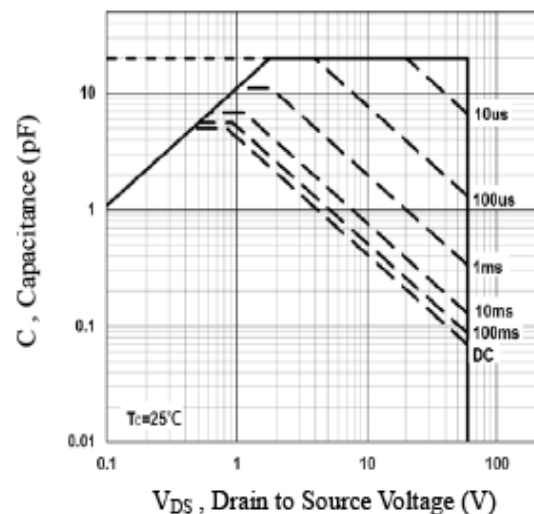
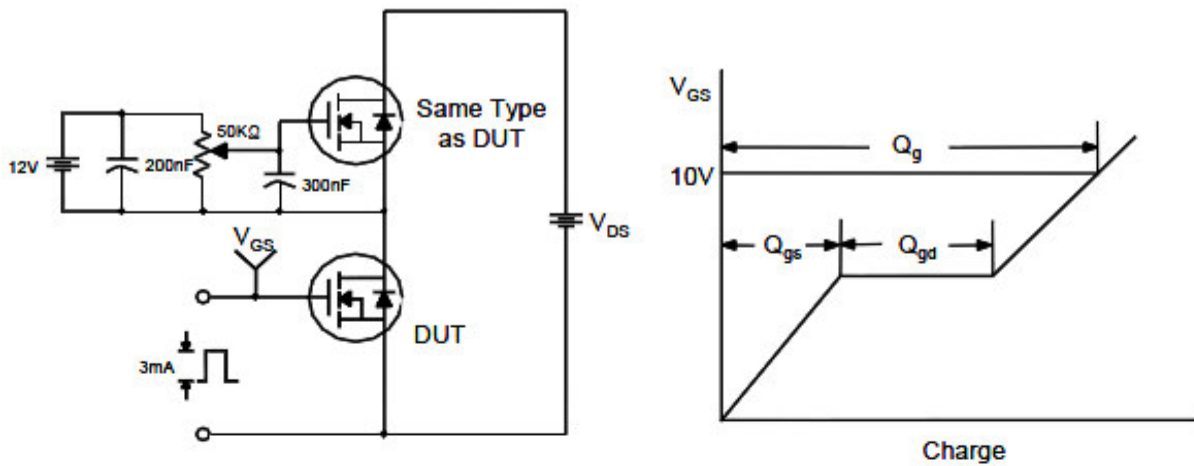


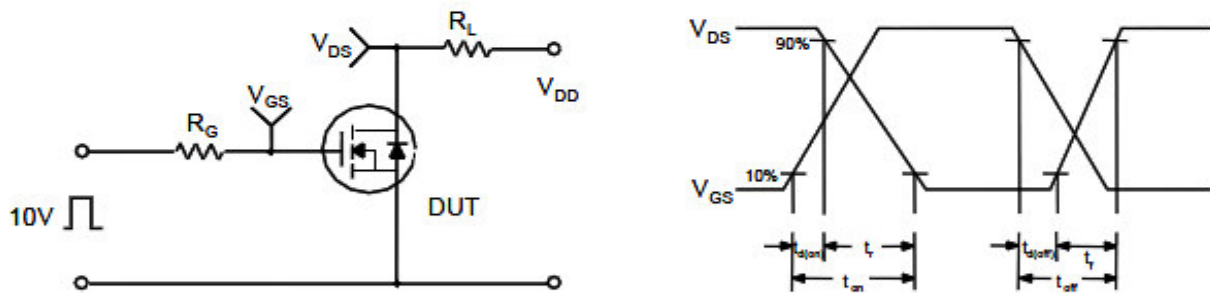
Fig.6 Capacitance Characteristics

Typical Performance Characteristics (Continue)

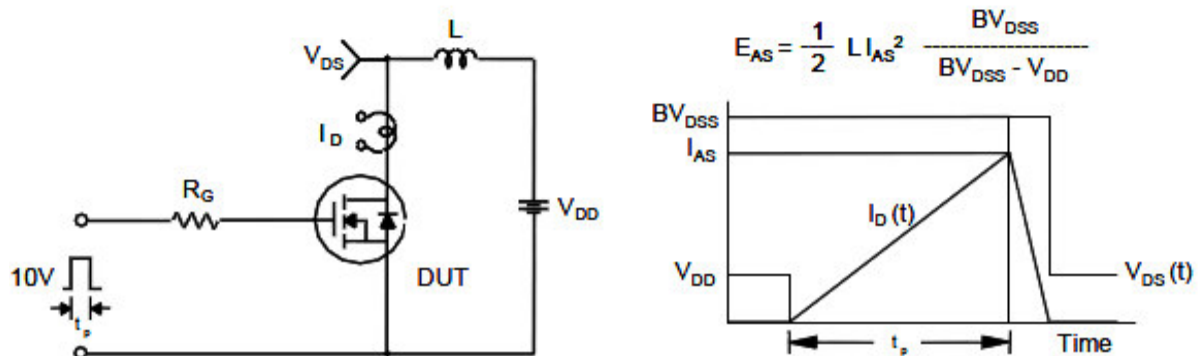
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

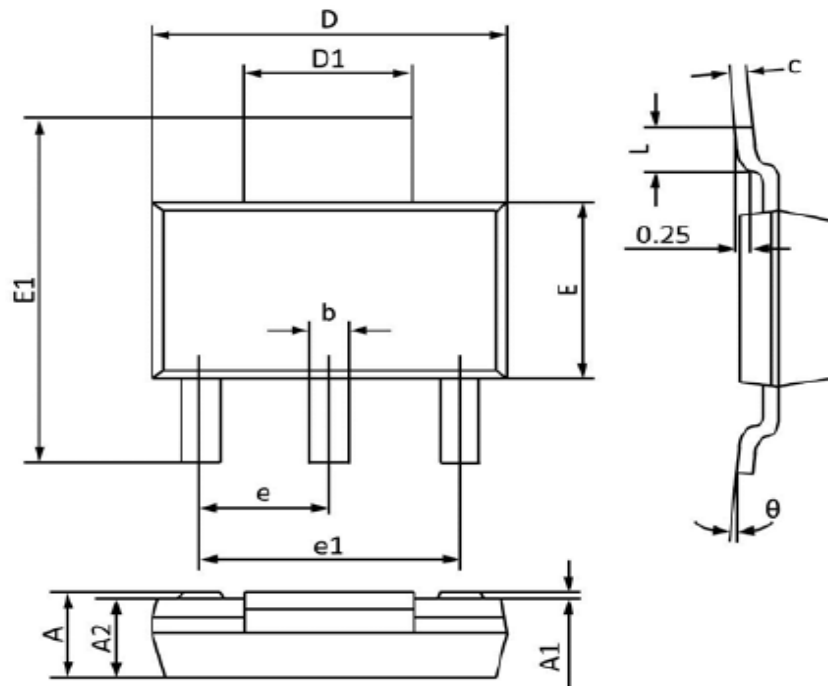


Unclamped Inductive Switching Test Circuit & Waveforms



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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