

GSMDD6912

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.

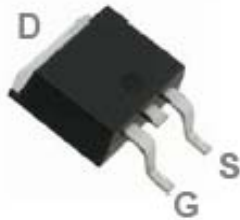
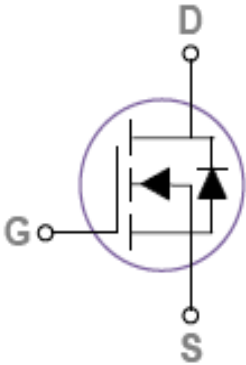
Features

- 60V, 11A, $R_{DS(ON)}=90m\Omega@V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available
- TO-252-2L package design

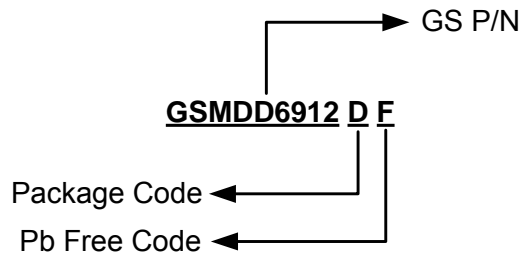
Applications

- Motor Drive
- Power Tools
- LED Lighting

Packages & Pin Assignments

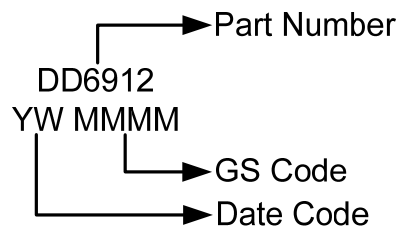
GSMDD6912DF (TO-252-2L)	
 <p>Top View</p>	
Description	
Gate	
Source	
Drain	

Ordering Information



Part Number	Package	Quantity Reel
GSMDD6912DF	TO-252-2L	2500 PCS

Marking Information



Absolute Maximum Ratings

$T_C=25^{\circ}\text{C}$ 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	$T_C=25^{\circ}\text{C}$	11
		$T_C=100^{\circ}\text{C}$	7
I_{DM}	Pulsed Drain Current	44	A
EAS	Single Pulse Avalanche Energy	25	mJ
IAS	Single Pulse Avalanche Current	7	A
P_D	Power Dissipation ($T_C=25^{\circ}\text{C}$)	25	W
	Power Dissipation (Derate above 25°C)	0.2	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	62	$^{\circ}\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	5	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics

T_J=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			11	A
I _{SM}	Pulsed Source Current				44	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =10V, I _D =6A		68	90	mΩ
		V _{GS} =4.5V, I _D =3A		78	100	mΩ
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =3A		4		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 =6A		9.3	13	nC
Q _{gs}	Gate-Source Charge			2.1	3	
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

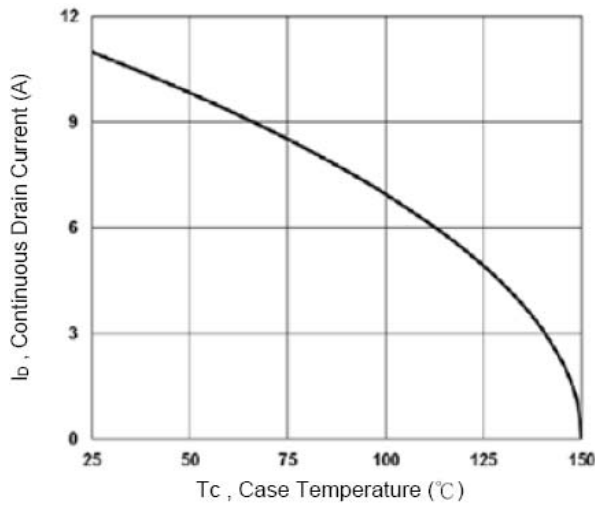


Fig.1 Continuous Drain Current vs. T_c

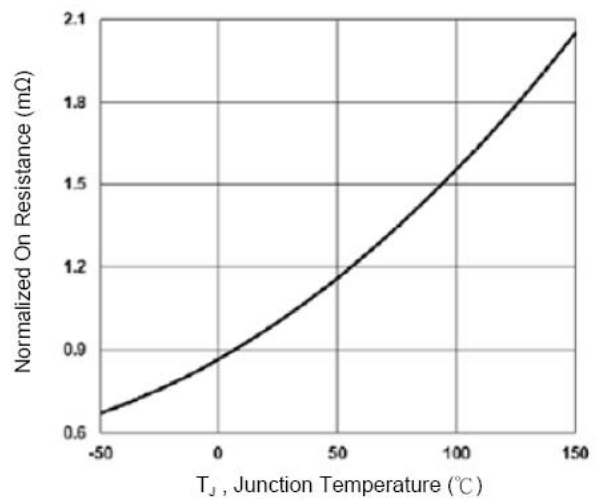


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

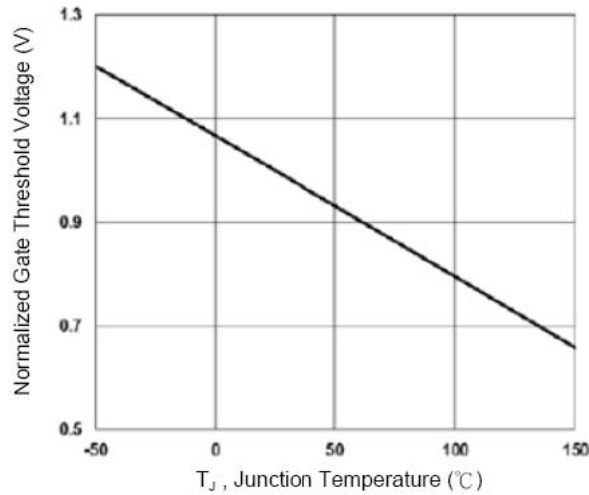


Fig.3 Normalized V_{th} vs. T_j

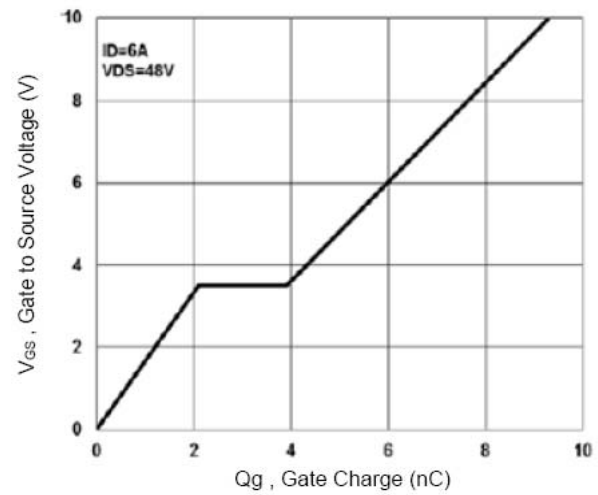


Fig.4 Gate Charge Characteristics

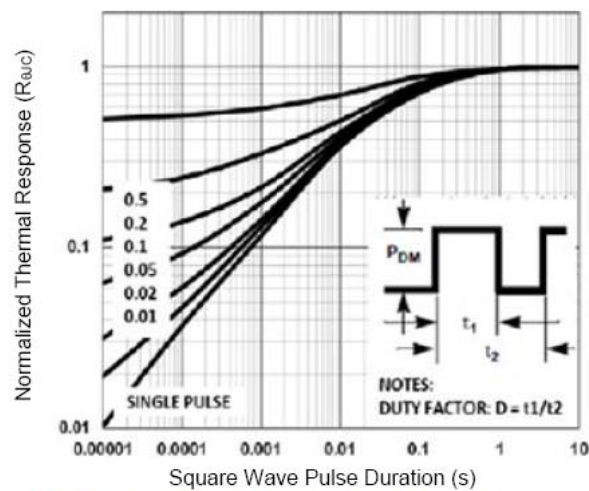


Fig.5 Normalized Transient Impedance

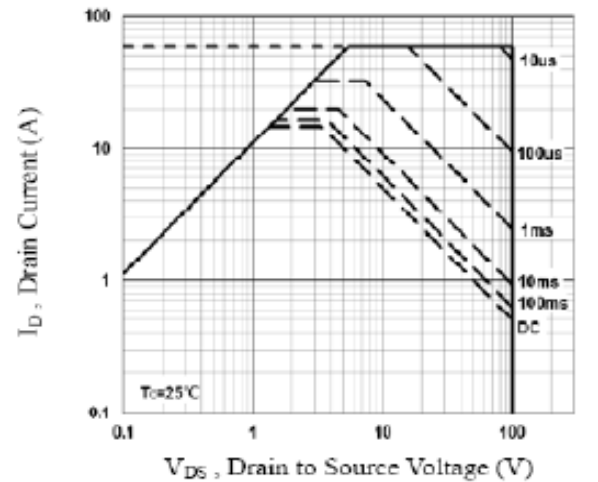
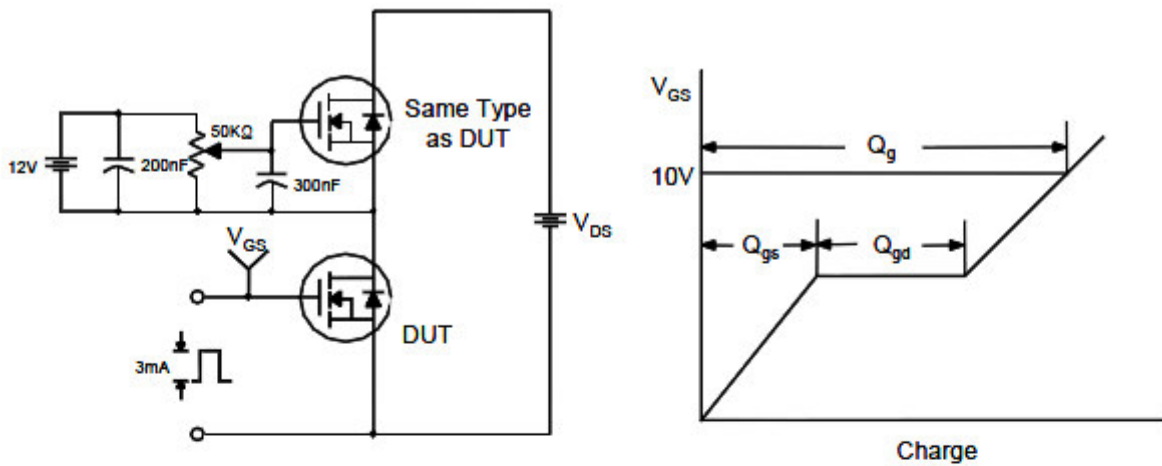


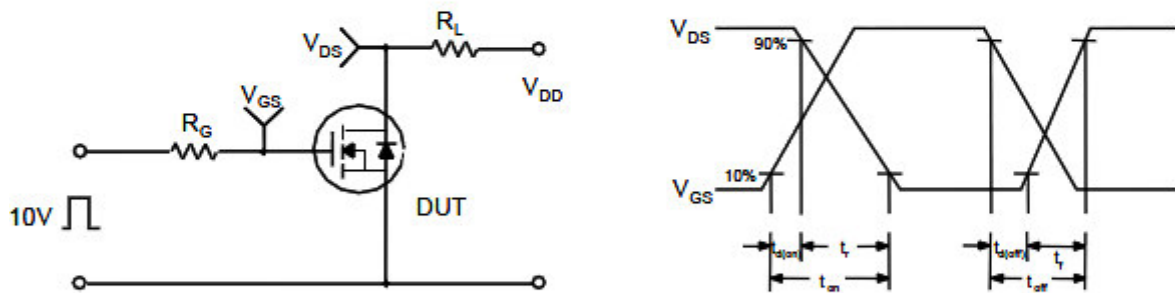
Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

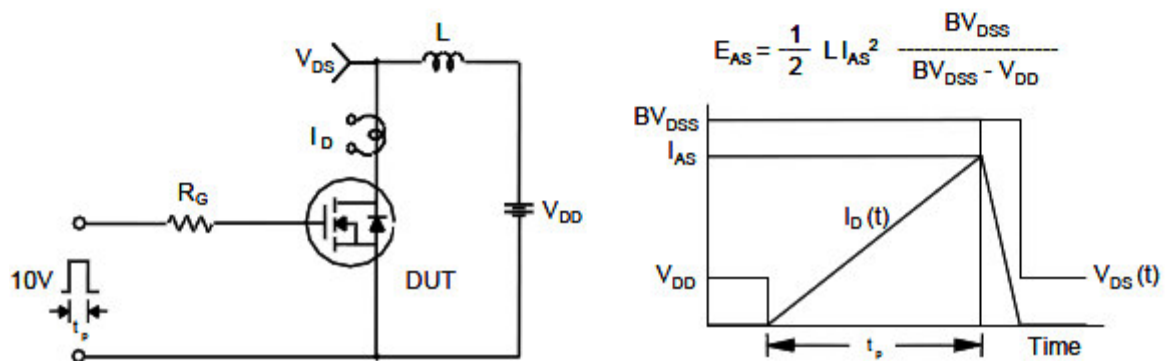
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

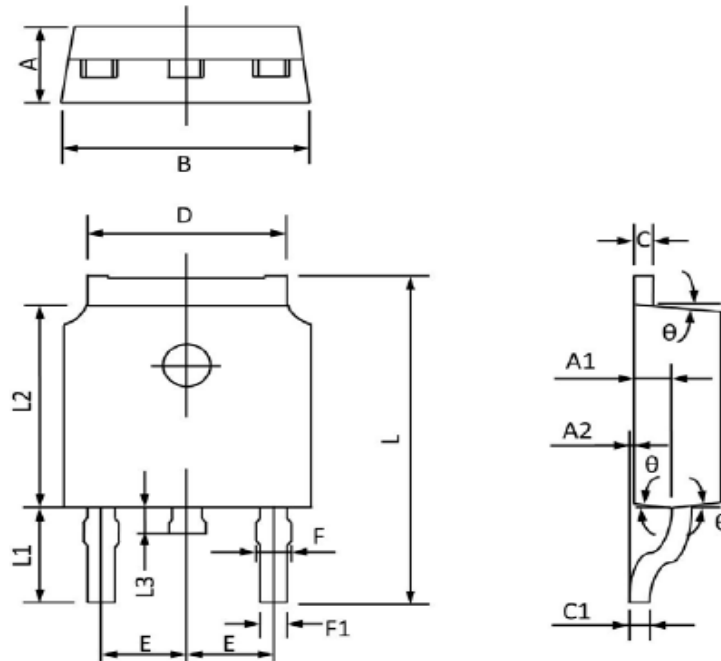


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

TO-252-2L










Dimensions				
Symbol	Millimeters		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	0.58	0.018	0.030
C1	0.46	0.58	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	0.66	0.86	0.026	0.034
L	9.80	10.40	0.386	0.409
L1	2.9 (REF)		0.114 (REF)	
L2	6.00	6.20	0.236	0.244
L3	0.60	1.00	0.024	0.039
θ	3°	9°	3°	9°



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