GSM6912

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

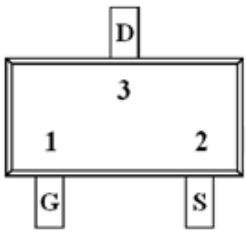
- 60V, 3.2A, $R_{DS(ON)}$=75mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- 100% EAS guaranteed
- Green Device Available

Applications

- Motor Drive
- Power Tools
- LED Lighting

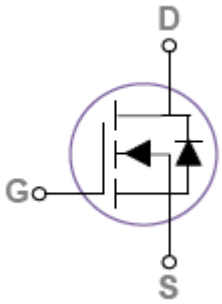
Packages & Pin Assignments

GSM6912JZF (SOT-23)

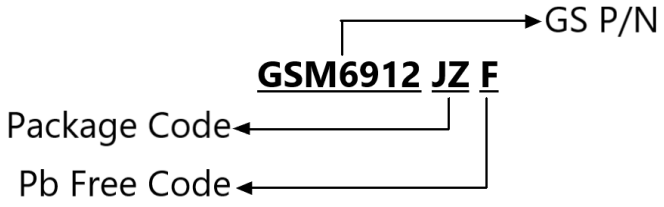


Top Views

Pin	Description
1	Gate
2	Source
3	Drain

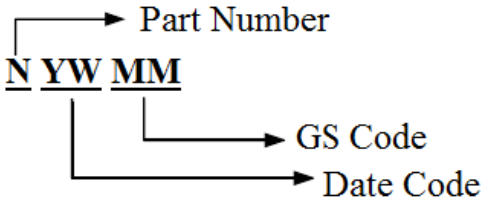


Ordering Information



Part Number	Package	Part Marking	Quantity
GSM6912JZF	SOT-23	NYWMM	3000pcs

Marking Information



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℃	3.2	A
		T_C=100℃	2	
I_{DM}	Pulsed Drain Current[1]		12.8	A
P_D	Power Dissipation (T_C=25℃)		1.56	W
	Power Dissipation (Derate above 25℃)		0.012	W/℃
T_J	Operating Junction Temperature Range		-55 to +150	℃
T_{STG}	Storage Temperature Range		-55 to +150	℃
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		80	℃/W

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			-5		mV/℃
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0V,V_{GS}=±20V			±100	nA
I_{DSS}	Drain-Source Leakage 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			3.2	A
I_{SM}	Pulsed Source Current				6.4	
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=10V,I_D=3A		60	75	mΩ
		V_{GS}=4.5V,I_D=1.5A		70	90	
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[2]	V_{GS}=30V,I_S=1A, di/dt=100A/us		23.2		ns
Q_{rr}	Reverse Recovery Charge[2]			14.3		nC
Dynamic						
Q_g	Total Gate Charge[2,3]	V_{DS}=48V,V_{GS}=10V, I_D=3A		9.3	14	nC
Q_{gs}	Gate-Source Charge[2,3]			2.1	4	
Q_{gd}	Gate-Drain Charge[2,3]			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[2,3]	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[2,3]			18.4	35	
t_f				5.3	10	
R_g	Gate Resistance	V_{DS}=0V,V_{GS}=0V, f=1MHz		2	4	Ω

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

Typical Performance Characteristics

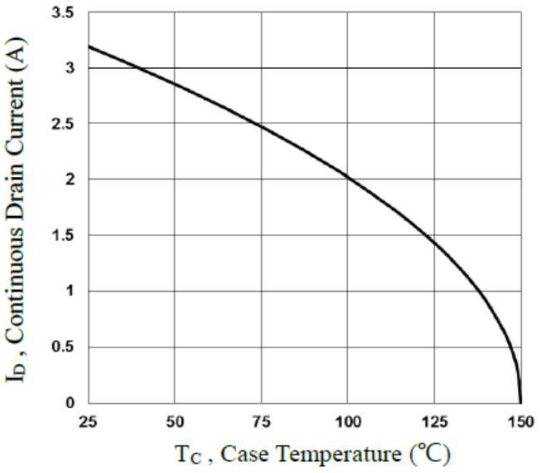


Fig.1 Continuous Drain Current vs. T_C

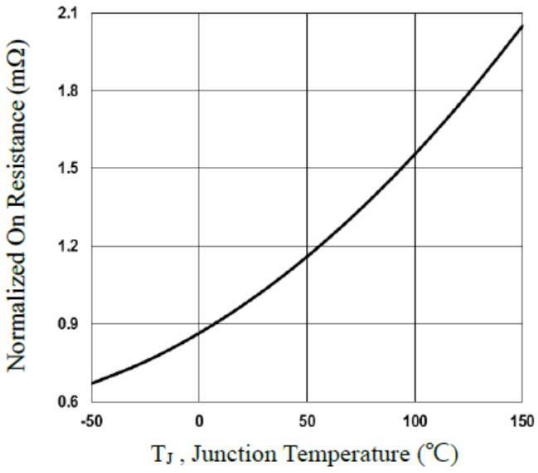


Fig.2 Normalized RDSON vs. T_J

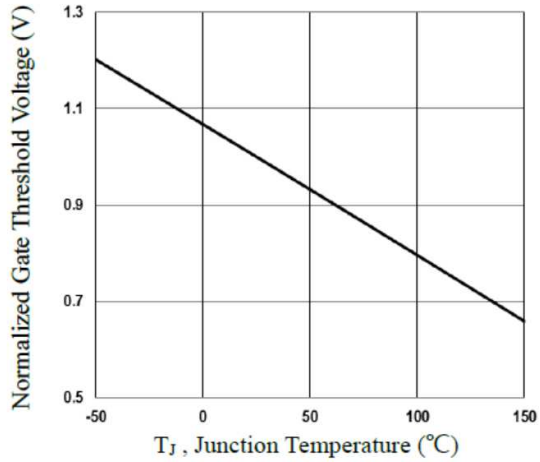


Fig.3 Normalized V_{th} vs. T_J

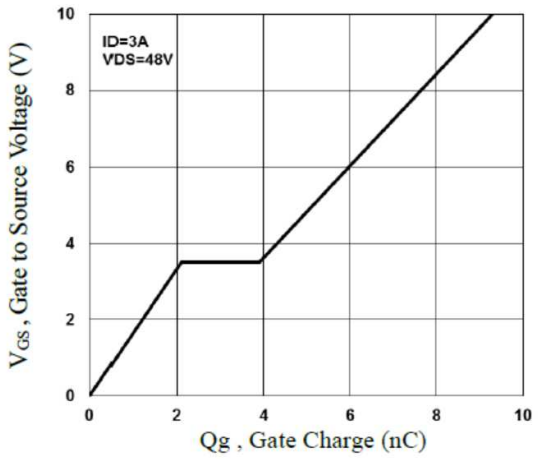


Fig.4 Gate Charge Waveform

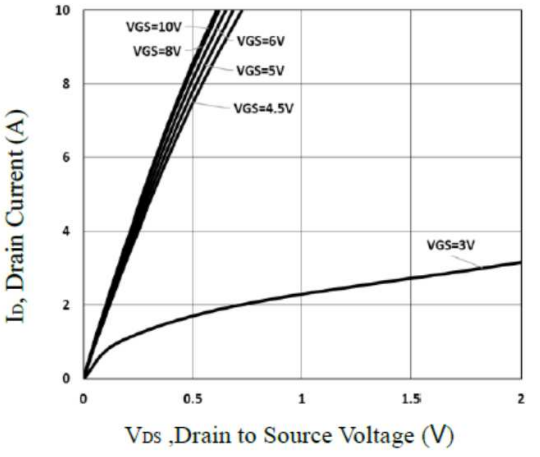


Fig.5 Typical Output Characteristics

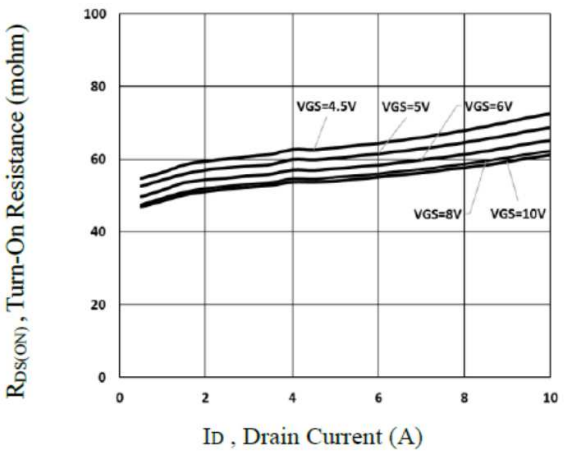


Fig.6 Turn-On Resistance vs. ID

Typical Performance Characteristics (Continue)

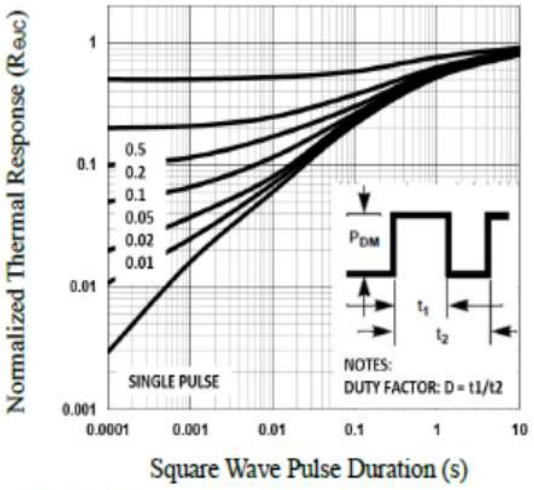


Fig.7 Normalized Transient Response

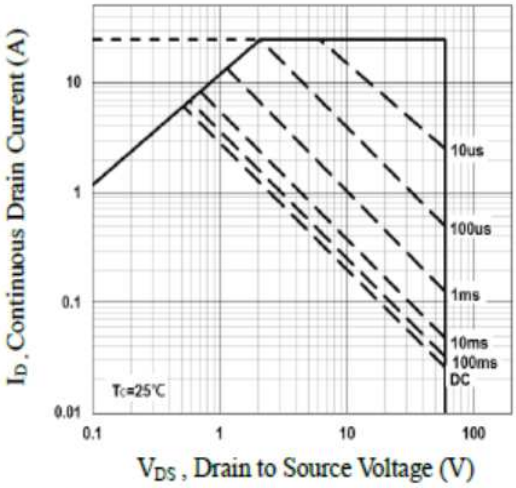


Fig.8 Maximum Safe Operation Area

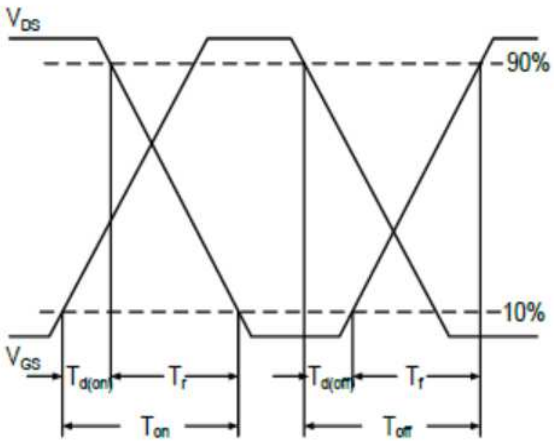


Fig.9 Switching Time Waveform

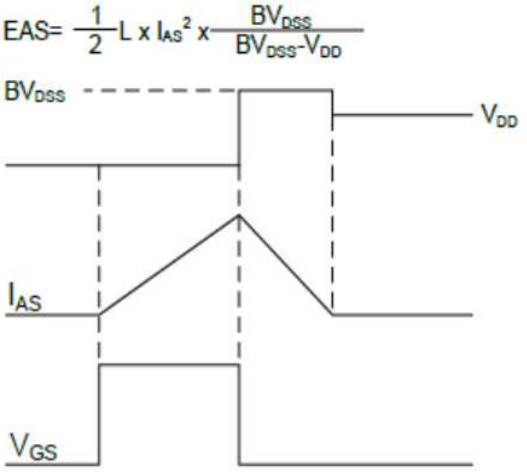
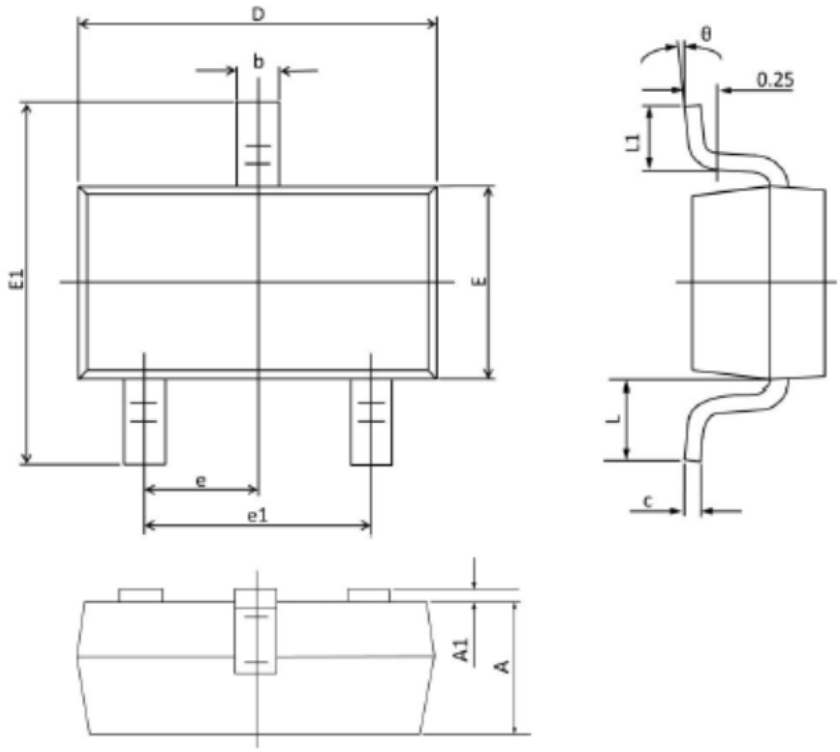


Fig.10 EAS Waveform

Package Dimension

SOT-23



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.900	1.000	0.035	0.039
A1	0.000	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.090	0.110	0.003	0.004
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	1º	7º	1º	7º

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