

GSM3912D

30V N-Channel MOSFET

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.

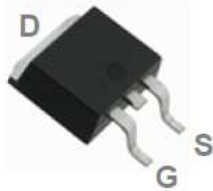
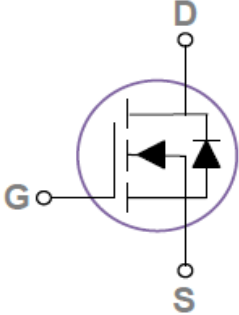
Features

- 30V, 28A, $R_{DS(ON)} = 18m\Omega @ V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available
- 100% EAS Guaranteed

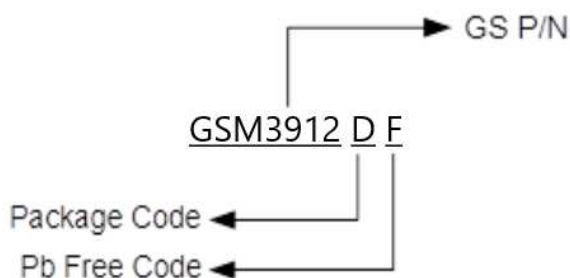
Applications

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

Packages & Pin Assignments

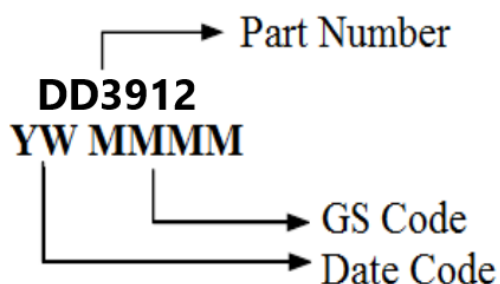
GSM3912DF (TO-252-2L)	
 <p>Top View</p>	
Description	
Gate	
Drain	
Source	

Ordering Information



Part Number	Package	Quantity Reel
GSM3912DF	TO-252-2L	2500 PCS

Marking Information



Absolute Maximum Ratings

T_c=25°C Unless otherwise noted

Symbol	Parameter	Typical	Unit
V _{DS}	Drain-Source Voltage	30	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Continuous Drain Current	T _c =25°C	28
		T _c =100°C	17.7
I _{DM}	Pulsed Drain Current ¹	112	A
EAS	Single Pulse Avalanche Energy ²	18	mJ
IAS	Single Pulse Avalanche Current ²	19	A
P _D	Power Dissipation (T _c =25°C)	24.9	W
	Power Dissipation (Derate above 25°C)	0.20	W/°C
T _J	Operating Junction Temperature Range	-55 to +150	°C
T _{STG}	Storage Temperature Range	-55 to +150	°C
R _{θJA}	Thermal Resistance-Junction to Ambient	62	°C/W
R _{θJC}	Thermal Resistance-Junction to Case	5.02	°C/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	30			V
ΔV _{DSS} /ΔT _J	V _{DSS} Temperature Coefficient	Reference to 25°C , I _D =1mA		0.04		V/°C
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1.2	1.6	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient			-4		mV/°C
I _{GSS}	Gate-Source Leakage Current	V _{DS} =0V, V _{GS} =±20V			±100	nA
I _{DSS}	Drain-Source Leakage Current	V _{DS} =30V, V _{GS} =0V, T _J =25°C			1	uA
		V _{DS} =24V, V _{GS} =0V, T _J =125°C			10	
I _S	Continuous Source Current	V _G =V _D =0V, Force Current			28	A
I _{SM}	Pulsed Source Current				56	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =10V, I _D =12A		14	18	mΩ
		V _{GS} =4.5V, I _D =8A		18	24	
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =6A		8		S
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A, T _J =25°C			1	V
Dynamic						
Q _g	Total Gate Charge ^{3,4}	V _{DS} =15V, V _{GS} =10V, I _D =10A		5.2	10	nC
Q _{gs}	Gate-Source Charge ^{3,4}			0.6	1.2	
Q _{gd}	Gate-Drain Charge ^{3,4}			2	4	
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, F=1MHz		370	740	pF
C _{oss}	Output Capacitance			70	140	
C _{rss}	Reverse Transfer Capacitance			50	100	
t _{d(on)}	Turn-On Time ^{3,4}	V _{DD} =15V, I _D =1A, V _{GS} =10V, R _G =6Ω		2.8	5	ns
t _r				7.2	14	
t _{d(off)}	Turn-Off Time ^{3,4}			15.8	30	
t _f				4.6	9	
R _g	Gate Resistance		V _{DS} =0V, V _{GS} =0V, F=1MHz		2.2	

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=19A., R_G=25Ω, Starting T_J=25°C
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

Typical Performance Characteristics

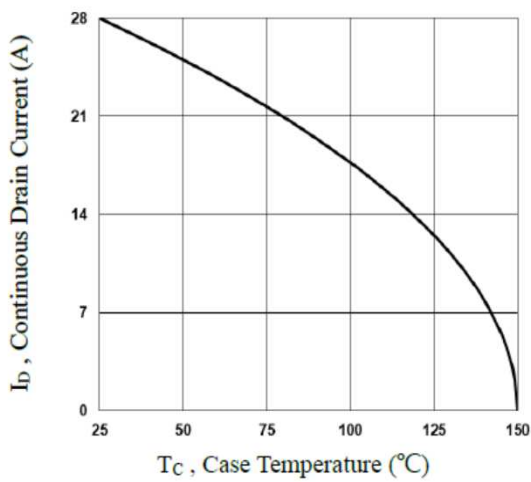


Fig.1 Continuous Drain Current vs. T_c

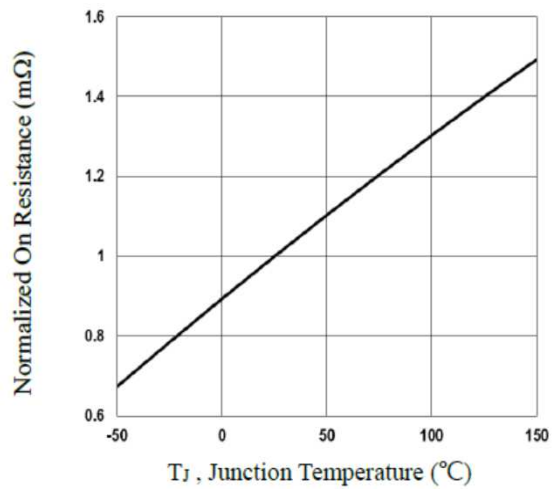


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

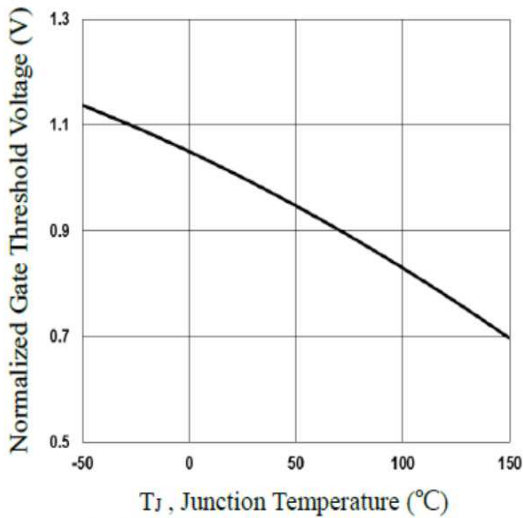


Fig.3 Normalized V_{th} vs. T_j

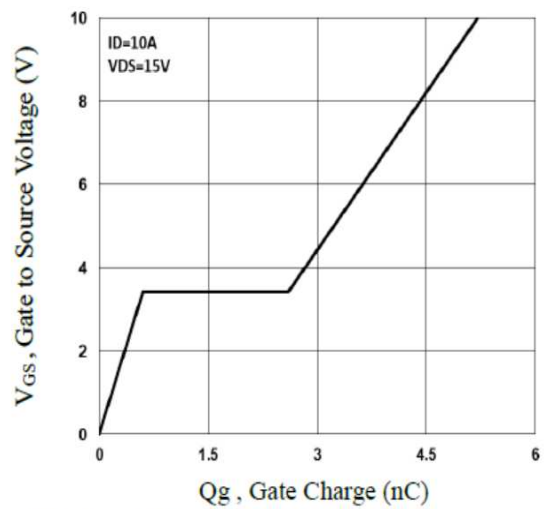


Fig.4 Gate Charge Waveform

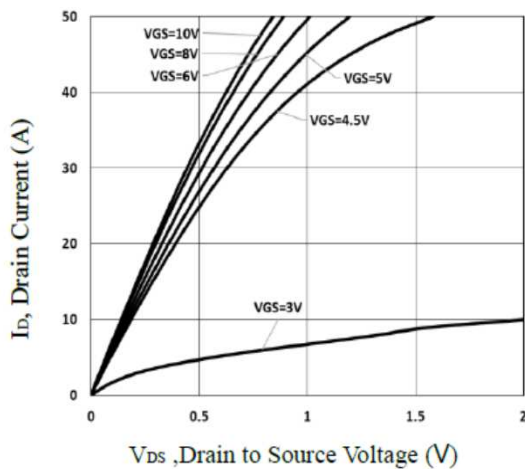


Fig.5 Typical Output Characteristics

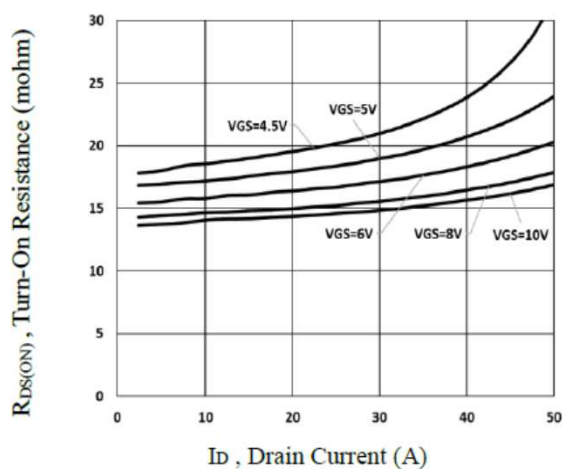


Fig.6 Turn-On Resistance vs. I_D

Typical Performance Characteristics (continue)

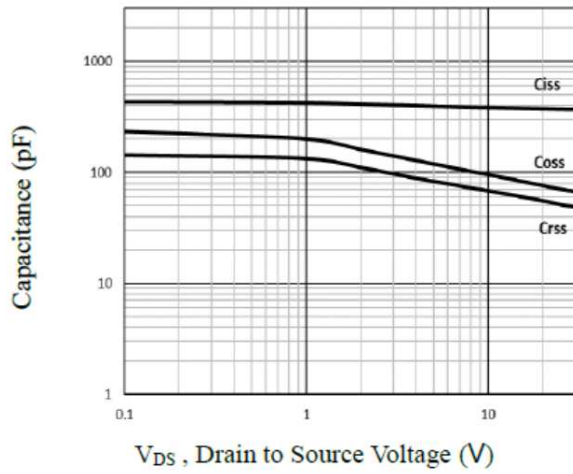


Fig.7 Capacitance Characteristics

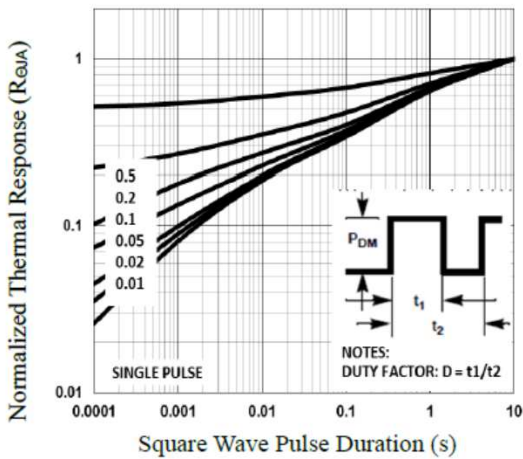


Fig.8 Normalized Transient Response

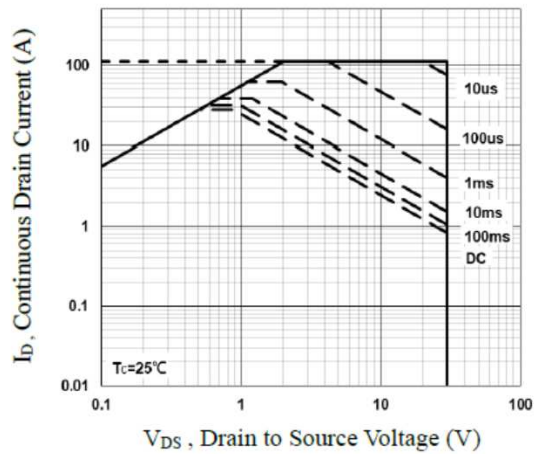


Fig.9 Maximum Safe Operation Area

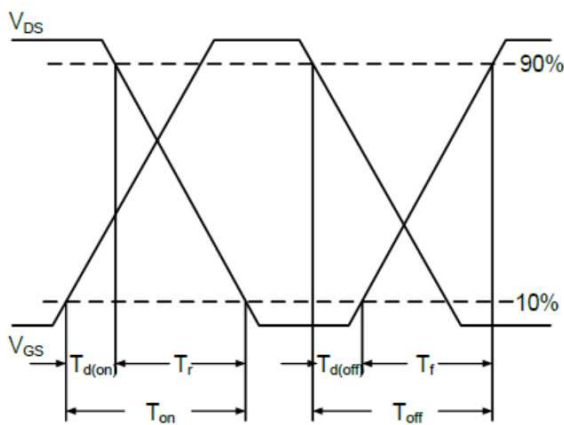


Fig.10 Switching Time Waveform

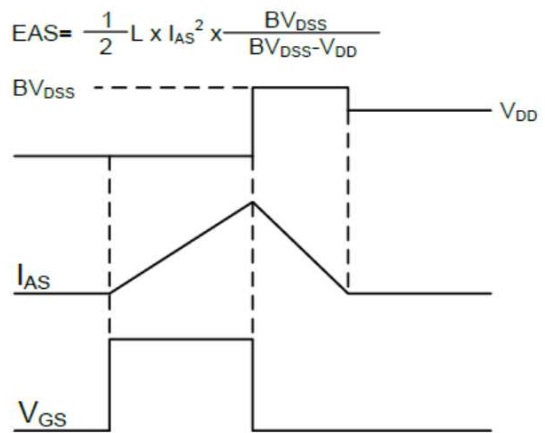
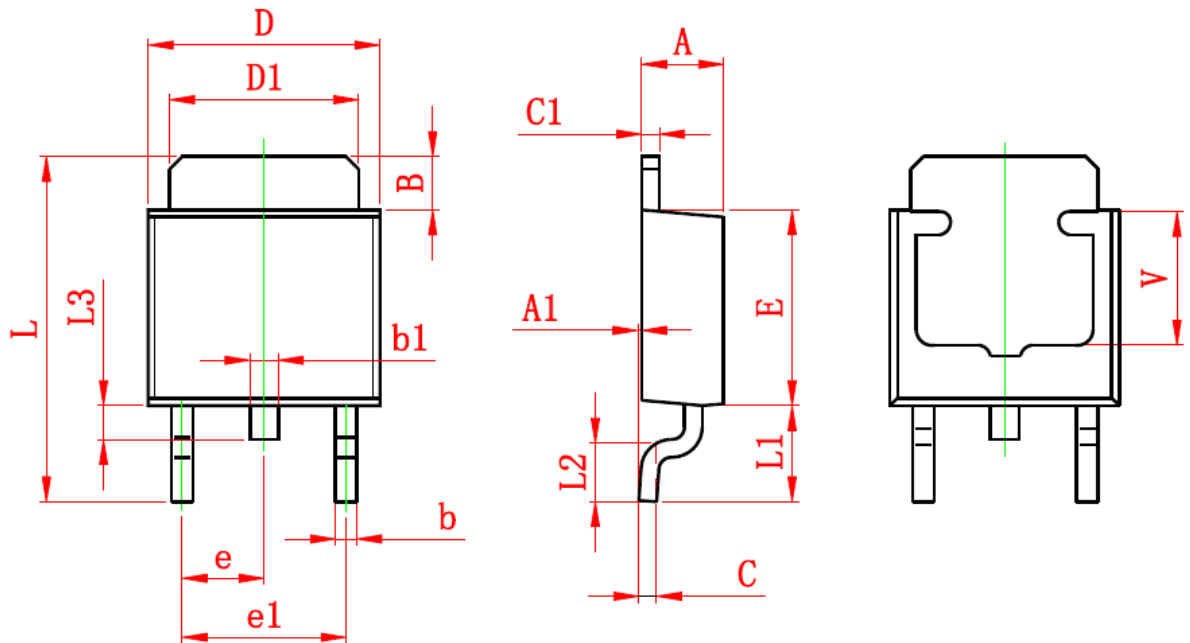


Fig.11 EAS Waveform

Package Dimension

TO-252-2L









Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
C	0.430	0.580	0.017	0.023
C1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF.		0.150 REF.	

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