GSM5112DF

150V N-Channel MOSFET

Product Description

The N-Channel enhancement mode power field effect transistor is 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.

The device is well suited for high efficiency fast switching applications.

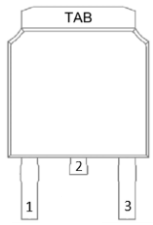
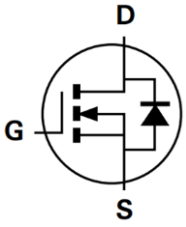
Features

- $R_{DS(ON)}$ = 11.5mΩ @ V_{GS}=10V
- $R_{DS(ON)}$ = 13.5mΩ @ V_{GS}=6V
- TO-252-2L Package
- RoHS Compliant and Halogen Free

Applications

- MB / VGA / Vcore
- POL Applications
- SMPS

Packages & Pin Assignments

TO-252-2L	Equivalent Circuit
	

Pin	Symbol	Description	Pin	Symbol	Description
1	G	Gate	**2**	D	Drain
3	S	Source	**TAB**	D	Drain

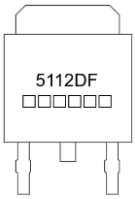
Ordering and Marking Information

Ordering Information			
Part Number	**Package**	**Part Marking**	**Quantity / Reel**
GSM5112DF	TO-252-2L	5112DF □□□□□□	2,500 PCS

GSM5112 □1 □2

- **Product Code:** GSM5112
- **Package Code:** □1 is **D** for TO-252-2L
- **Green Level:** □2 is **F** for RoHS Compliant and Halogen Free

Marking Information



- **Product Code:** 5112DF
- **GS Code:** □□□□□□

Absolute Maximum Ratings (T_C= 25ºC unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{DSS}	Drain-Source Voltage		150	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current (Silicon Limited)	T_C=25ºC	70	A
		T_C=100ºC	44	
	Continuous Drain Current (Package Limited)		50	
I_{DM}	Pulsed Drain Current [1]		200	A
I_{AS}	Single Pulse Avalanche Current, L = 0.1mH [1]		40	A
E_{AS}	Single Pulse Avalanche Energy, L = 0.1mH [1]		120	mJ
P_D	Power Dissipation	T_C=25ºC	138	W
		T_C=100ºC	55	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.9	ºC/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient [2]		62	ºC/W
T_J	Operating Junction Temperature Range		-55 to +150	ºC
T_{STG}	Storage Temperature Range		-55 to +150	ºC

NOTE:
1. Single pulse width is limited by max junction temperature.
2. The device mounted on 1in^2 FR4 PCB with 2oz. Coppe

Electrical Characteristics (T_J = 25ºC unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	150	-	-	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=150V, V_{GS}=0V	-	-	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	2.5	-	4.5	V
$R_{DS(ON)}$	Drain-Source On-Resistance	V_{GS}=10V, I_D=20A	-	8.9	11.5	mΩ
		V_{GS}=6V, I_D=10A	-	10.8	13.5	
gfs	Forward Transconductance	V_{DS}=5V, I_D=20A	-	40	-	S
Dynamic Characteristics						
R_g	Gate Resistance	f=1MHz		1		Ω
C_{iss}	Input Capacitance	V_{DS}=75V, V_{GS}=0V, f=1MHz	-	2450	3650	pF
C_{oss}	Output Capacitance		-	210	-	
C_{rss}	Reverse Transfer Capacitance		-	15	-	
Q_g	Total Gate Charge	V_{DS}=75V, I_D=20A V_{GS}=10V	-	47	72	nC
Q_{gs}	Gate-Source Charge		-	8	-	
Q_{gd}	Gate-Drain Charge		-	17	-	
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=75V, I_D=20A V_{GS}=10V, R_g=6Ω	-	15	-	ns
t_r	Turn-On Rise Time		-	28	-	
$t_{d(off)}$	Turn-Off Delay Time		-	45	-	
t_f	Turn-Off Fall Time		-	32	-	
Diode Characteristics						
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_S=1A	-	-	1	V
t_{rr}	Reverse Recovery Time	V_R=100V, I_F=10A , dI/dt=100A/μs	-	75	-	ns
Q_{rr}	Reverse Recovery Charge		-	230	-	nC

Typical Performance Characteristics

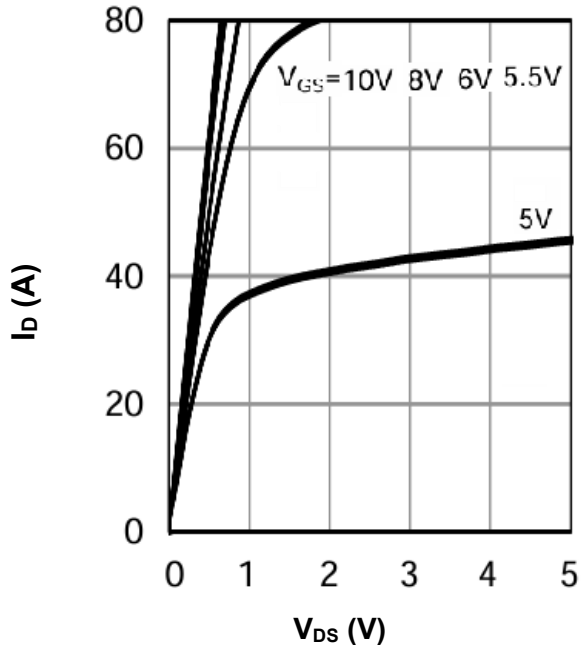


FIG.1 Output Characteristics

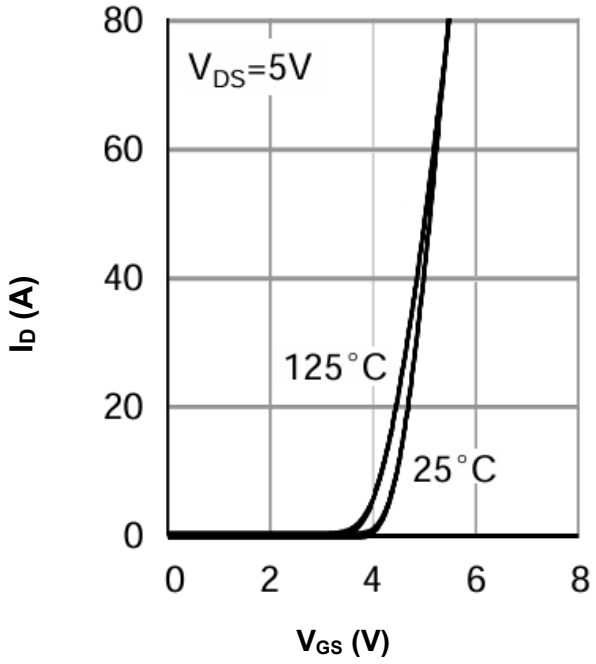


FIG.2 Transfer Characteristics

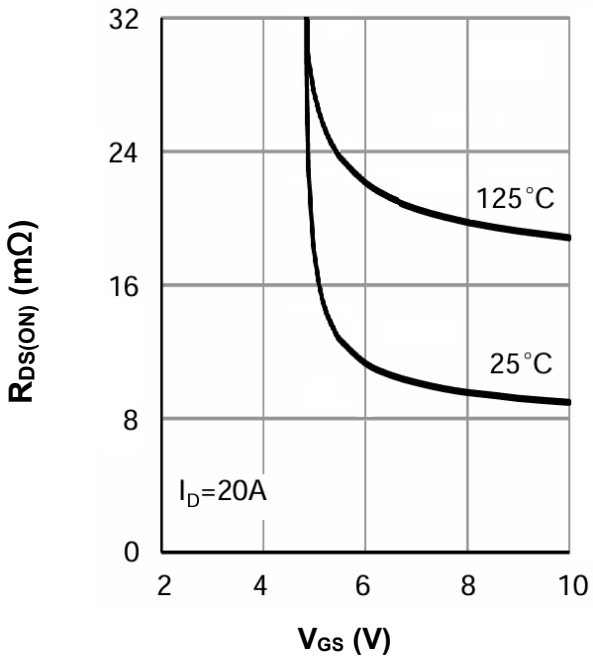


FIG.3 On-Resistance vs. Gate Voltage

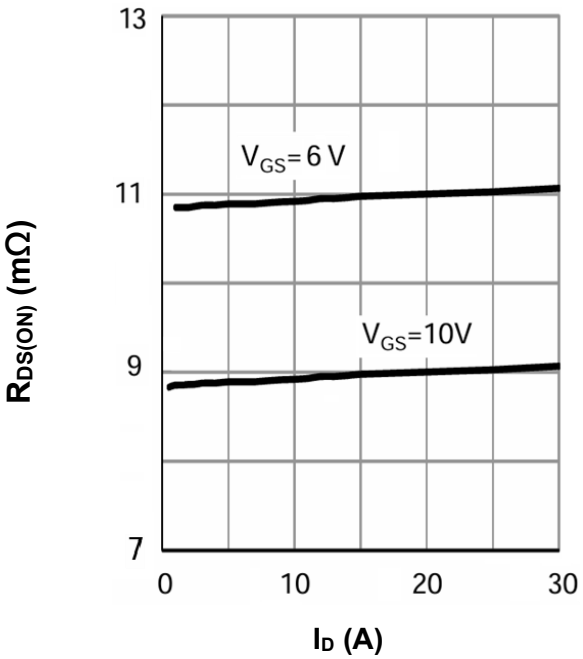


FIG.4 On-Resistance vs. Drain Current

Typical Performance Characteristics

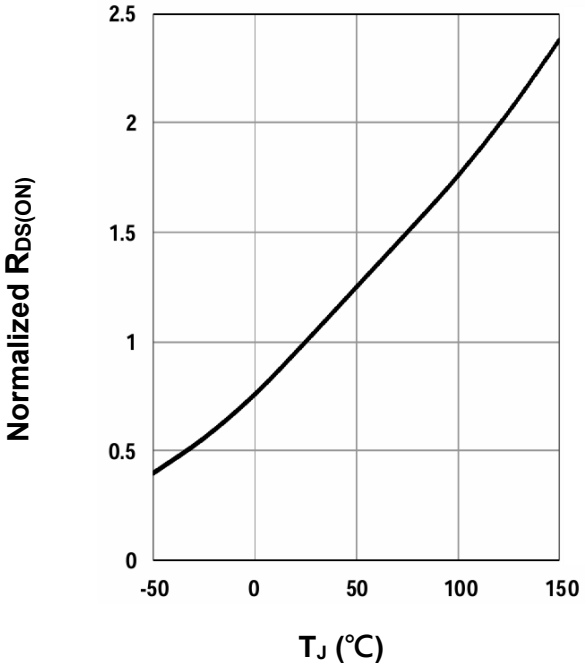


FIG.5 Normalized On-Resistance vs. T_J

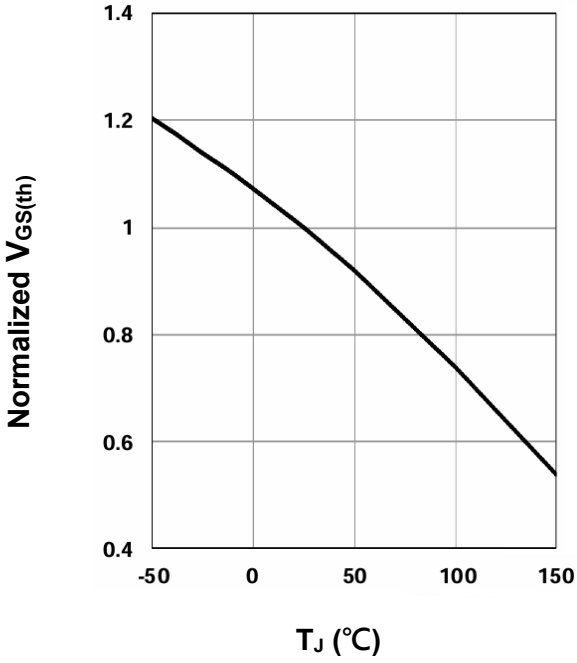


FIG.6 Normalized $V_{GS(th)}$ vs. T_J

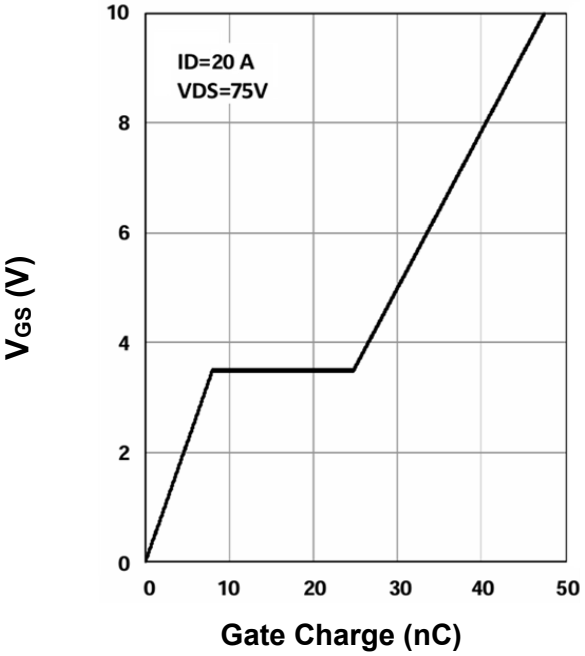


FIG.7 Gate Charge Characteristics

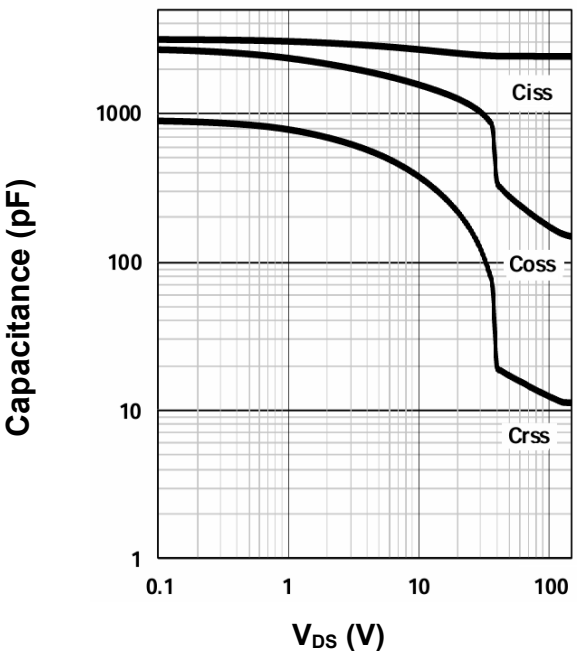


FIG.8 Capacitance Characteristics

Typical Performance Characteristics

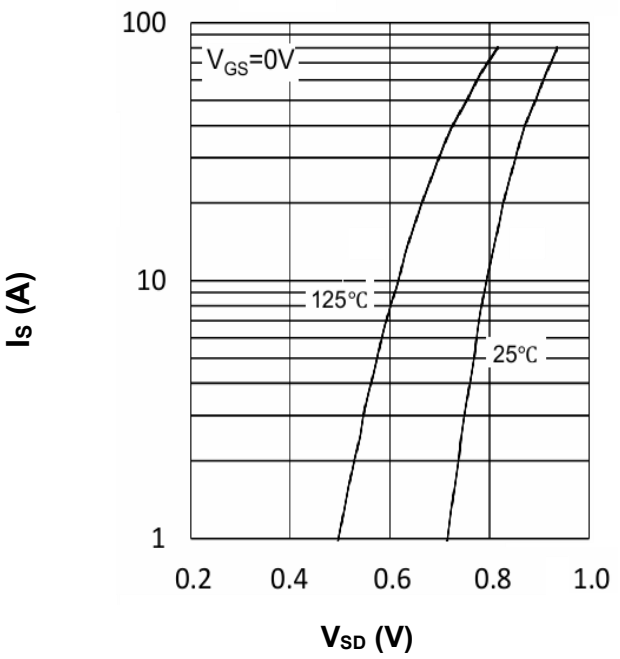


FIG.9 Diode Characteristics

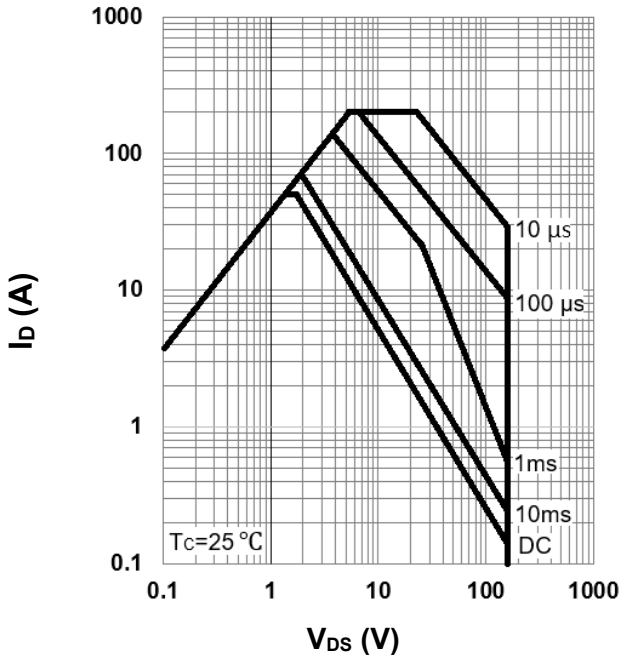


FIG.10 Maximum Safe Operation Area

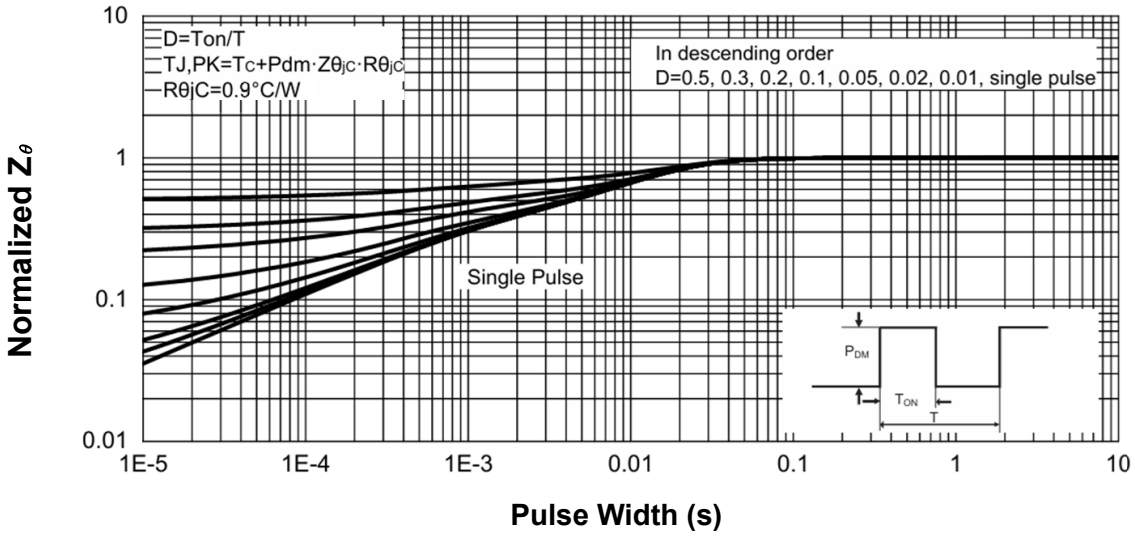
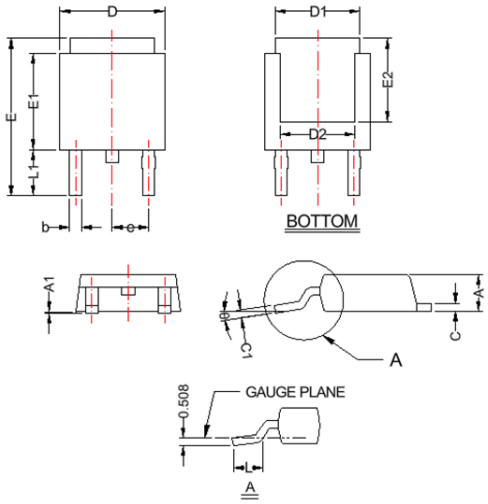


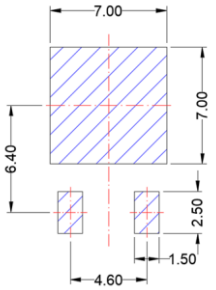
FIG.11 Normalized Transient Impedance

TO-252-2L(AA)

Package Dimension



Recommended Land Pattern



Unit:mm

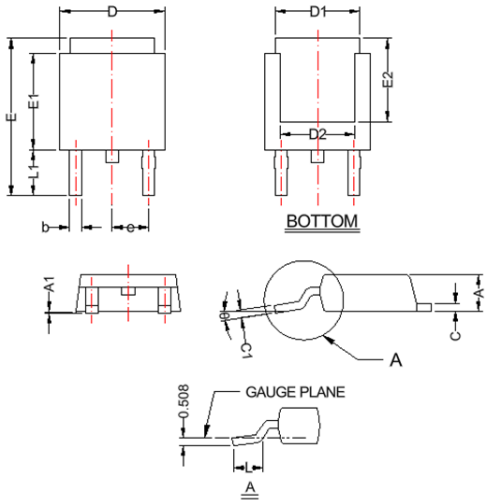
Dimensions (1)				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.18	2.40	0.086	0.094
A1	0.00	0.15	0.000	0.006
b	0.64	0.90	0.025	0.035
c	0.40	0.89	0.016	0.035
c1	0.40	0.61	0.016	0.024
D	6.35	6.73	0.250	0.265
D1	4.95	5.46	0.195	0.215
D2	4.32	---	0.170	---
E	9.40	10.41	0.370	0.410
E1	5.97	6.22	0.235	0.245
E2	4.95	---	0.195	---
e	2.286 BSC		0.090 BSC	
L	1.40	1.77	0.055	0.070
L1	2.67	3.07	0.105	0.121
θ	0°	8°	0°	8°

NOTE:

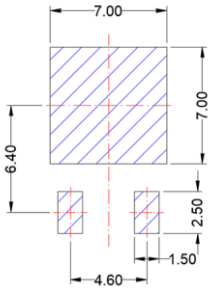
1. Dimensions are exclusive of Burrs, Mold Flash and Tie Bar extrusions.
2. The drawing is used to express the dimension while the actual appearance may vary

TO-252-2L(AB)

Package Dimension (2)



Recommended Land Pattern



Unit:mm

Dimensions (1)				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.18	2.40	0.086	0.094
A1	0.00	0.15	0.000	0.006
b	0.50	0.90	0.020	0.035
c	0.45	0.89	0.018	0.035
c1	0.40	0.61	0.016	0.024
D	6.35	6.80	0.250	0.268
D1	4.95	5.50	0.195	0.217
D2	3.81	---	0.150	---
E	9.40	10.41	0.370	0.410
E1	5.33	5.80	0.210	0.228
E2	4.57	---	0.180	---
e	2.286 BSC		0.090 BSC	
L	1.40	1.78	0.055	0.070
L1	2.40	3.00	0.094	0.118
θ	0°	8°	0°	8°

NOTE:

1 Dimensions are exclusive of Burrs, Mold Flash and Tie Bar extrusions.
2 The drawing is used to express the dimension while the actual appearance may vary

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