GSM5112TIF

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.

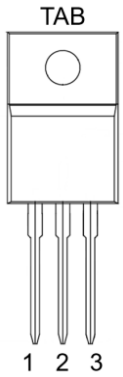
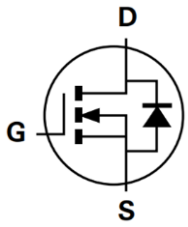
Features

- $R_{DS(ON)}$ = 10mΩ @ V_{GS}=10V
- $R_{DS(ON)}$ = 12.5mΩ @ V_{GS}=6V
- TO-220F-3L Isolated Package
- RoHS Compliant and Halogen Free

Applications

- MB / VGA / Vcore
- POL Applications
- SMPS

Packages & Pin Assignments

TO-220F-3L	Equivalent Circuit
	

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

Ordering and Marking Information

Ordering Information			
Part Number	**Package**	**Part Marking**	**Quantity / Tube**
GSM5112TIF	TO-220F-3L	5112TIF □□□□□□	50 PCS

GSM5112 1 2

- **Product Code:** GSM5112
- **Package Code:** 1 is **TI** for TO-220F-3L
- **Green Level:** 2 is **F** for RoHS Compliant and Halogen Free

Marking Information



- **Product Code:** 5112TIF
- **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	57	A
		T_C=100ºC	35	
I_{DM}	Pulsed Drain Current [1]		180	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	78	W
		T_C=100ºC	31	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		1.6	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
V_{ISO}	Isolation Voltage [3]		2500	V_{AC}

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

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	-	8.5	10	mΩ
		V_{GS}=6V, I_D=10A	-	9.5	12.5	
gfs	Forward Transconductance	V_{DS}=5V, I_D=20A	-	40	-	S
Dynamic Characteristics						
R_g	Gate Resistance	f=1MHz		1.3		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

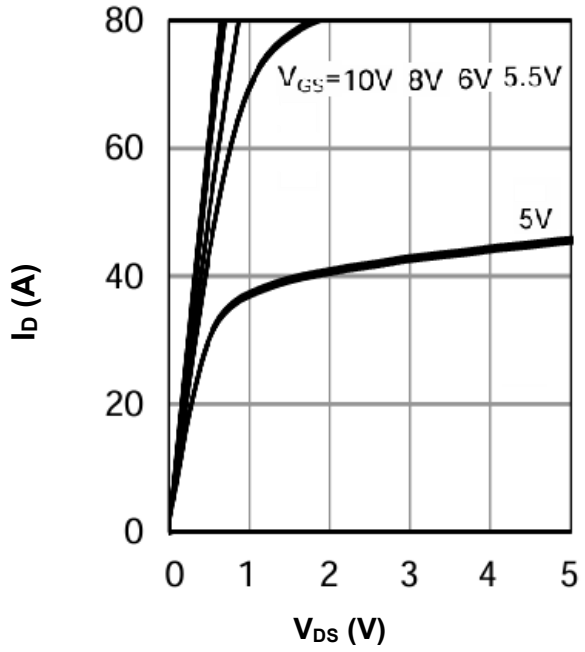


FIG.1 Output Characteristics

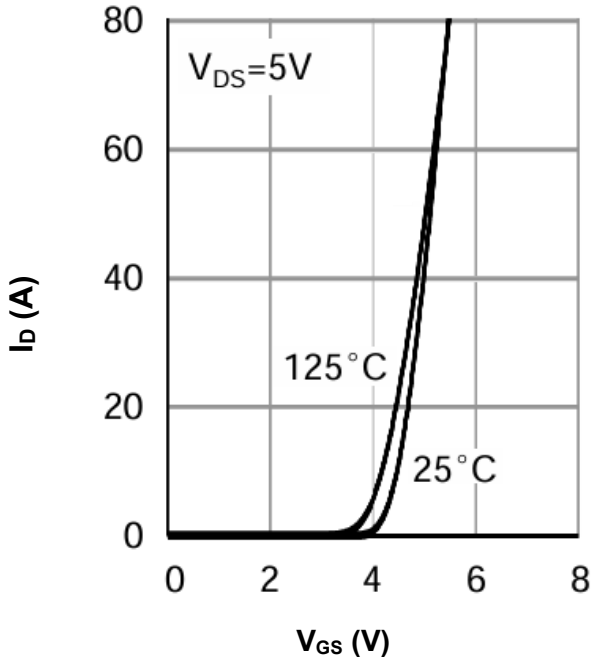


FIG.2 Transfer Characteristics

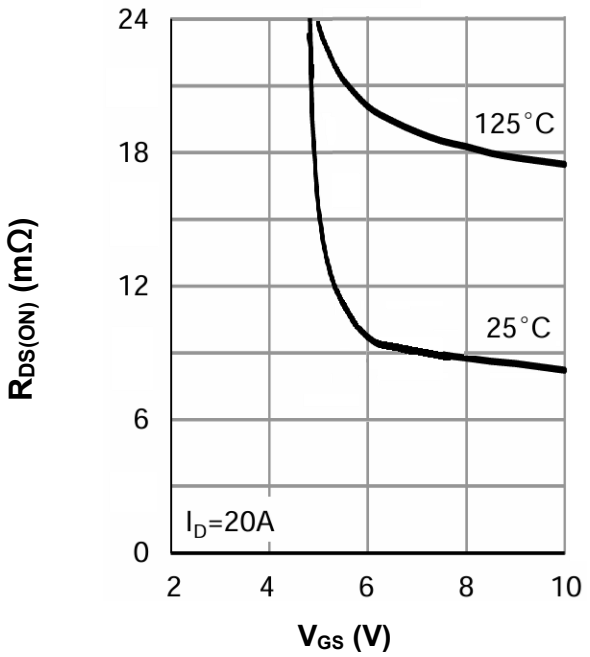


FIG.3 On-Resistance vs. Gate Voltage

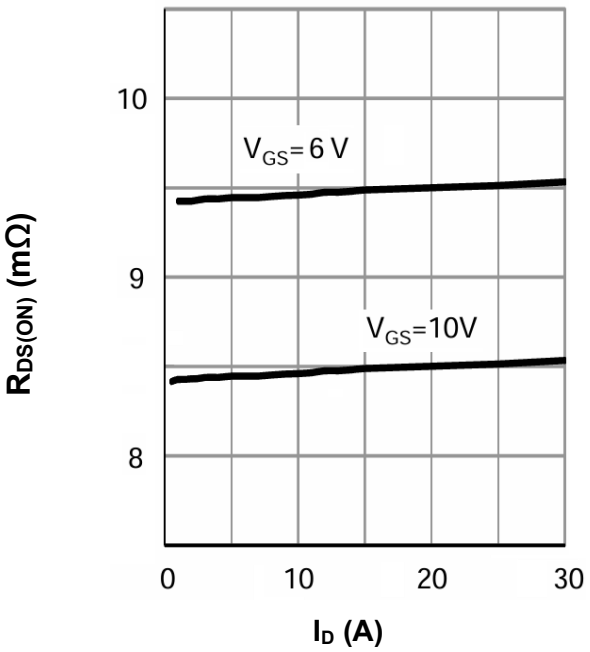


FIG.4 On-Resistance vs. Drain Current

Typical Performance Characteristics

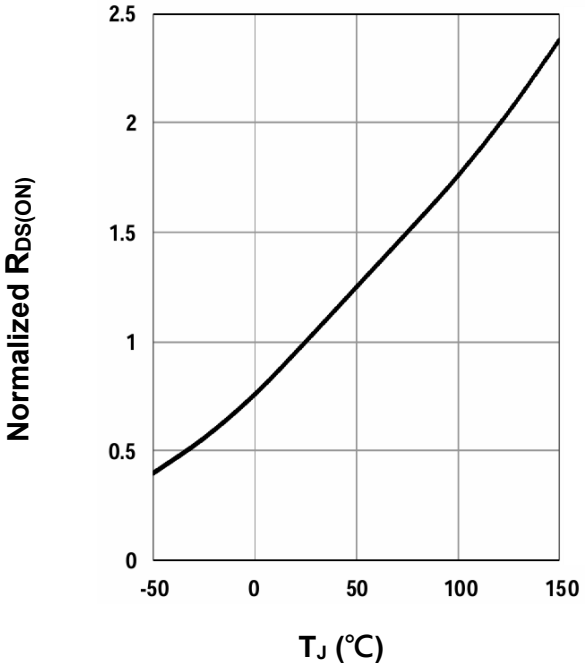


FIG.5 Normalized On-Resistance vs. T_J

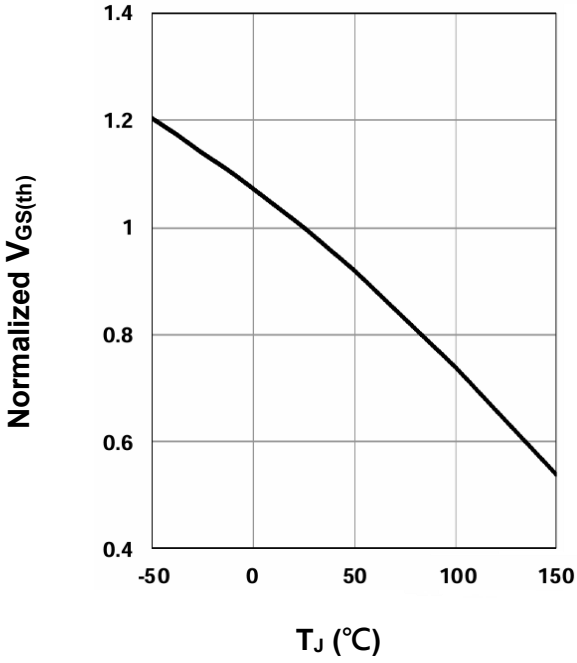


FIG.6 Normalized $V_{GS(th)}$ vs. T_J

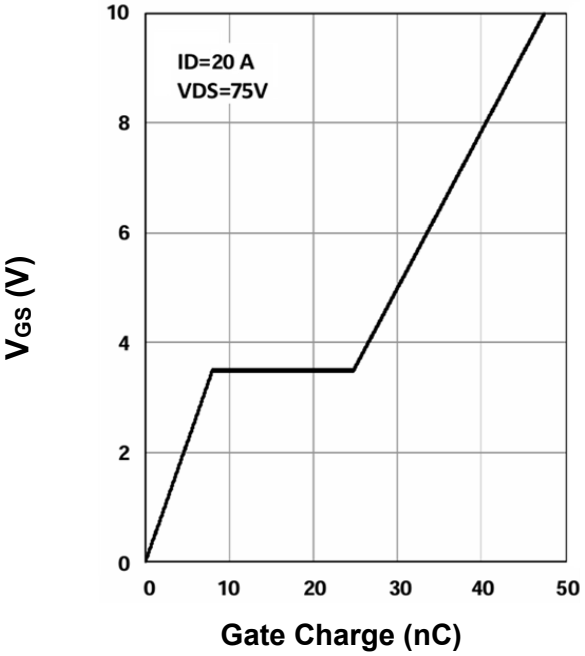


FIG.7 Gate Charge Characteristics

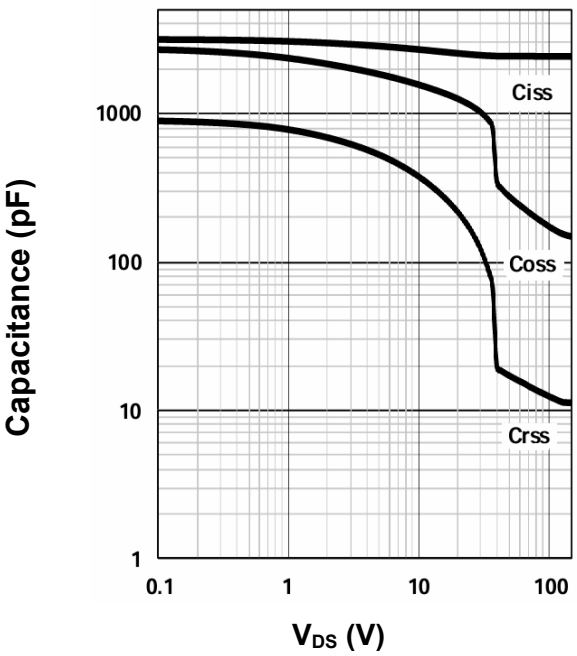


FIG.8 Capacitance Characteristics

Typical Performance Characteristics

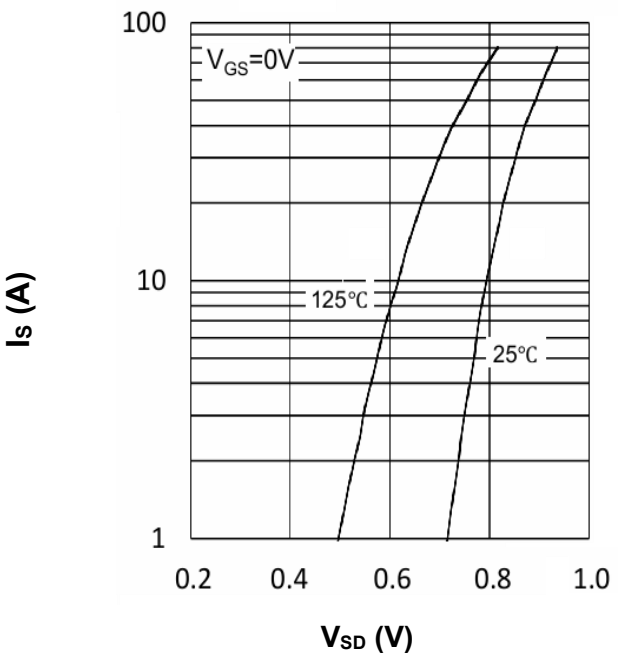


FIG.9 Diode Characteristics

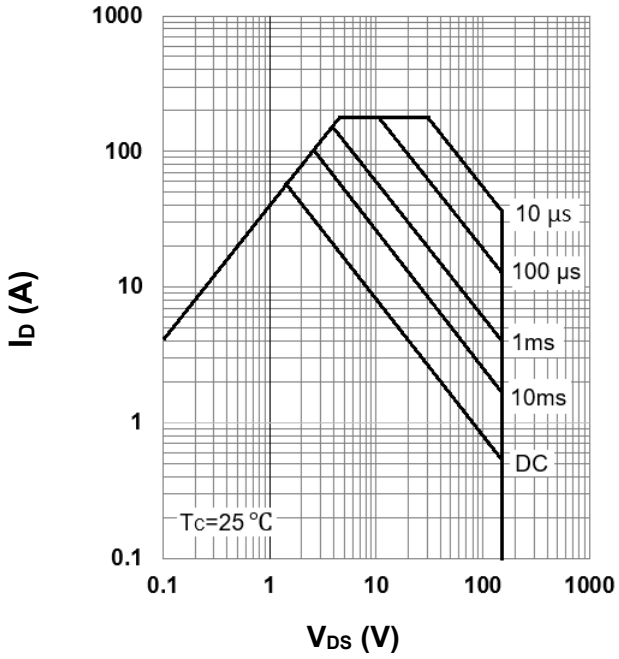


FIG.10 Maximum Safe Operation Area

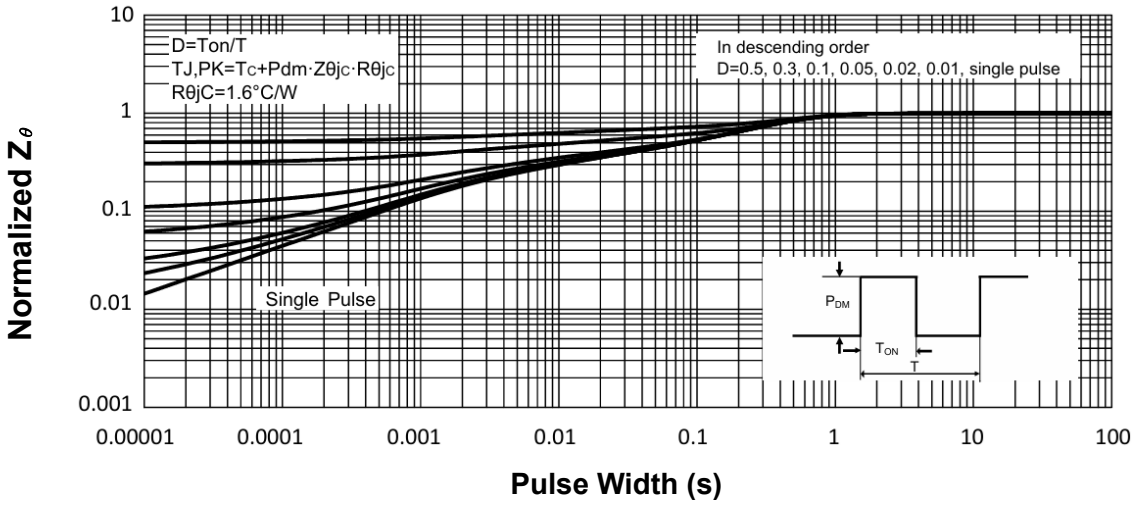
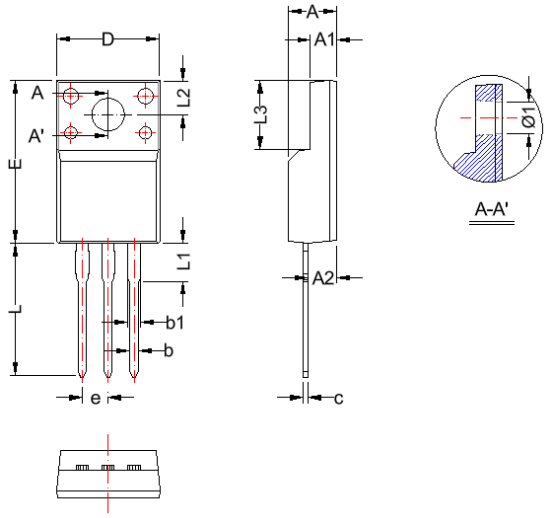


FIG.11 Normalized Transient Impedance

TO-220F-3L

Package Dimension



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	4.30	4.90	0.169	0.193
A1	2.34	3.10	0.092	0.122
A2	2.10	3.10	0.083	0.122
b	0.50	1.00	0.020	0.039
b1	0.95	1.60	0.037	0.063
c	0.40	0.90	0.016	0.035
D	9.60	10.36	0.378	0.408
E	14.50	16.17	0.571	0.637
e	2.54 TYP		1.00 TYP	
L	11.20	---	0.441	---
L1	3.03	5.60	0.119	0.220
L2	2.40	3.65	0.094	0.144
L3	6.20	7.20	0.244	0.283
ø1	3.15	3.70	0.124	0.146

NOTE:

1. Dimensions are exclusive of Burrs, Mold Flash and Tie Bar extrusions.

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CONTACT US

GS Headquarter	
	4F, NO.43-1, Lane 11, Sec. 6, Minquan E. Rd Neihu District, Taipei City 114761, Taiwan (R.O.C).
	886-2-2657-9980
	886-2-2657-3630
	sales_twn@gs-power.com

RD Division	
	824 Bolton Drive Milpitas. CA. 95035
	1-408-457-0587