

# GSM3118D

## 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.

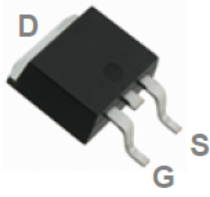
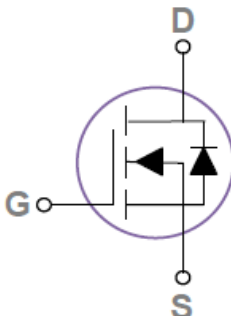
### Features

- 30V, 9.2A,  $R_{DS(ON)} = 24m\Omega @ V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available
- 100% EAS Guaranteed

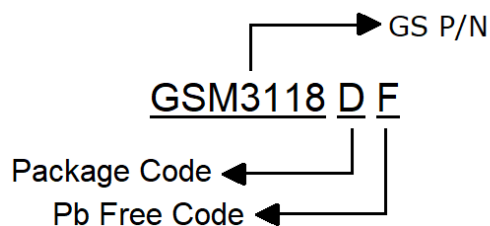
### Applications

- MB / VGA / Vcore
- POL Applications
- SMPS 2<sup>nd</sup> SR

### Packages & Pin Assignments

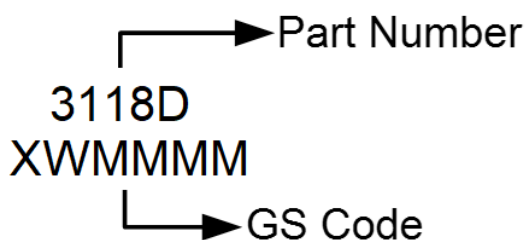
GSM3118DF (TO-252-2L)		
 <p>Top View</p>		
<b>Description</b>		
Gate		
Drain		
Source		

## Ordering Information



Part Number	Package	Quantity Reel
GSM3118DF	TO-252-2L	2500 PCS

## Marking Information



## Absolute Maximum Ratings

T<sub>c</sub>=25°C Unless otherwise noted

Symbol	Parameter	Typical	Unit
V <sub>DS</sub>	Drain-Source Voltage	30	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>A</sub> =25°C	9.2
		T <sub>A</sub> =70°C	6.8
I <sub>DM</sub>	Pulsed Drain Current <sup>1</sup>	36	A
EAS	Single Pulse Avalanche Energy <sup>2</sup>	10	mJ
IAS	Single Pulse Avalanche Current <sup>2</sup>	14	A
P <sub>D</sub>	Power Dissipation	T <sub>A</sub> =25°C	2.8
		T <sub>A</sub> =70°C	1.56
T <sub>J</sub>	Operating Junction Temperature Range	-55 to +150	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to +150	°C
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient	45	°C/W

## Electrical Characteristics

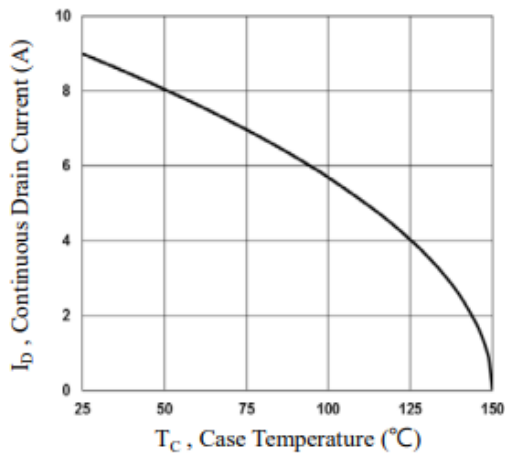
T<sub>j</sub>=25°C Unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
<b>Static</b>							
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30			V	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.2	1.6	2.5	V	
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA	
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C			1	uA	
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current			28	A	
I <sub>SM</sub>	Pulsed Source Current				56		
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =8A		20	24	mΩ	
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A		25	28		
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =6A		8		S	
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C			1	V	
<b>Dynamic</b>							
Q <sub>g</sub>	Total Gate Charge <sup>3,4</sup>	V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =6A		4.1		nC	
Q <sub>gs</sub>	Gate-Source Charge <sup>3,4</sup>			1.3			
Q <sub>gd</sub>	Gate-Drain Charge <sup>3,4</sup>			2.1			
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, F=1MHz		500		pF	
C <sub>oss</sub>	Output Capacitance			108			
C <sub>rss</sub>	Reverse Transfer Capacitance			58			
t <sub>d(on)</sub>	Turn-On Time <sup>3,4</sup>	V <sub>DD</sub> =15V, I <sub>D</sub> =1A, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω		6		ns	
t <sub>r</sub>				10			
t <sub>d(off)</sub>			Turn-Off Time <sup>3,4</sup>		15.8		
t <sub>f</sub>					4.6		

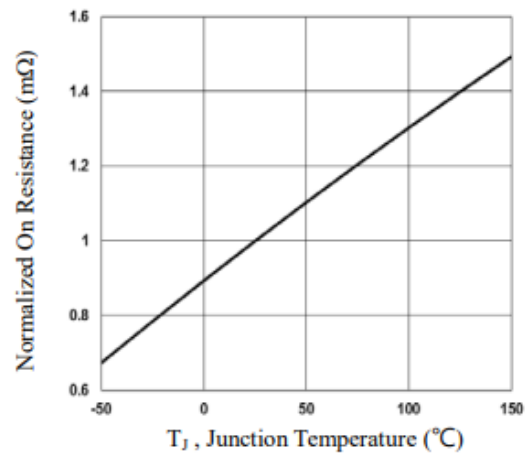
Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=0.1mH, I<sub>AS</sub>=19A., R<sub>G</sub>=25Ω, Starting T<sub>J</sub>=25°C
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

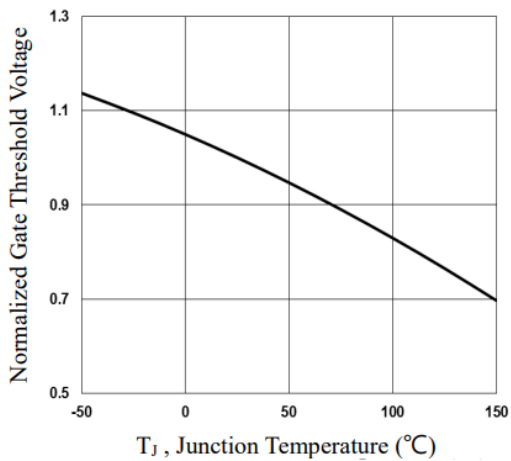
## Typical Performance Characteristics



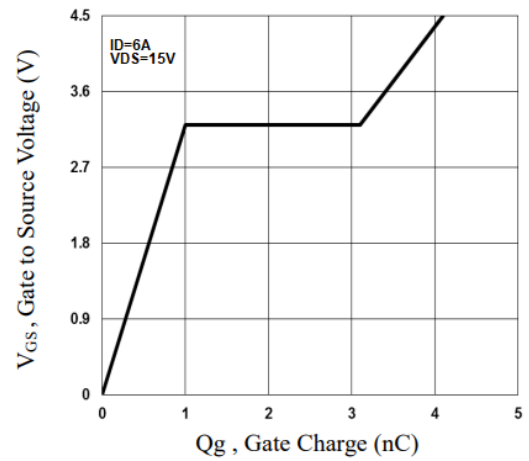
**Fig.1 Continuous Drain Current vs.  $T_c$**



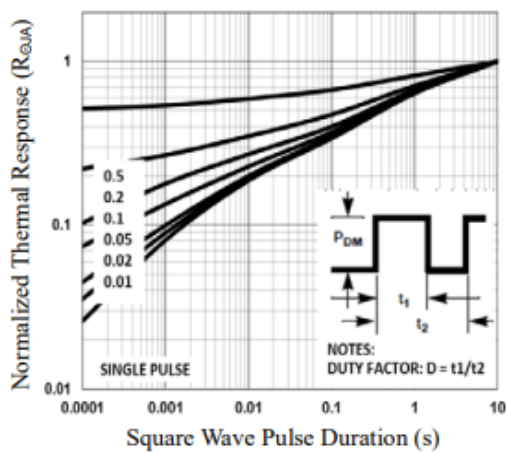
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$**



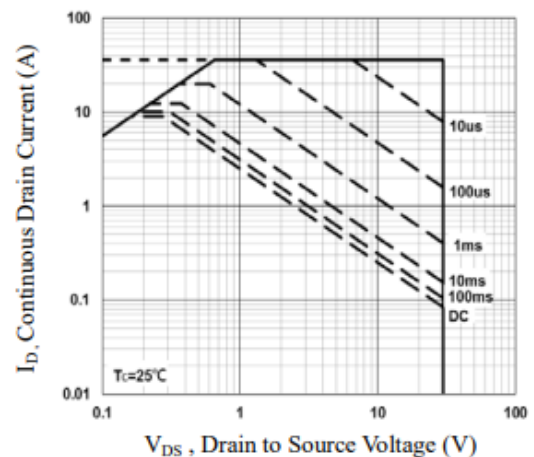
**Fig.3 Normalized  $V_{th}$  vs.  $T_j$**



**Fig.4 Gate Charge Waveform**

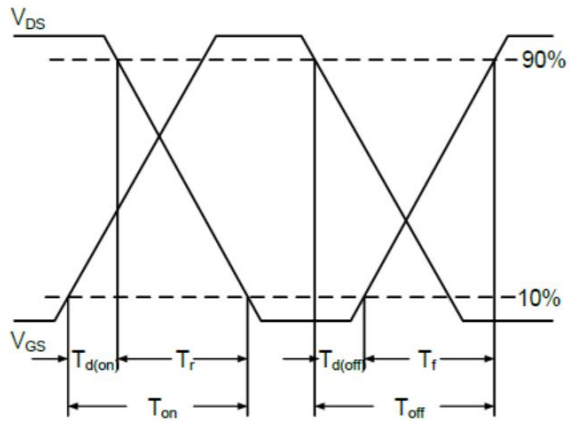


**Fig.5 Normalized Transient Response**

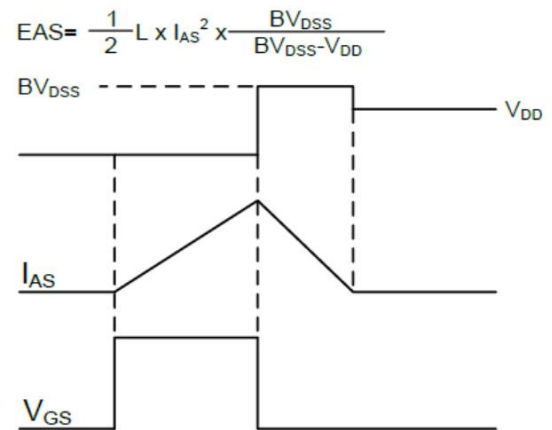


**Fig.6 Maximum Safe Operation Area**

## Typical Performance Characteristics (continue)



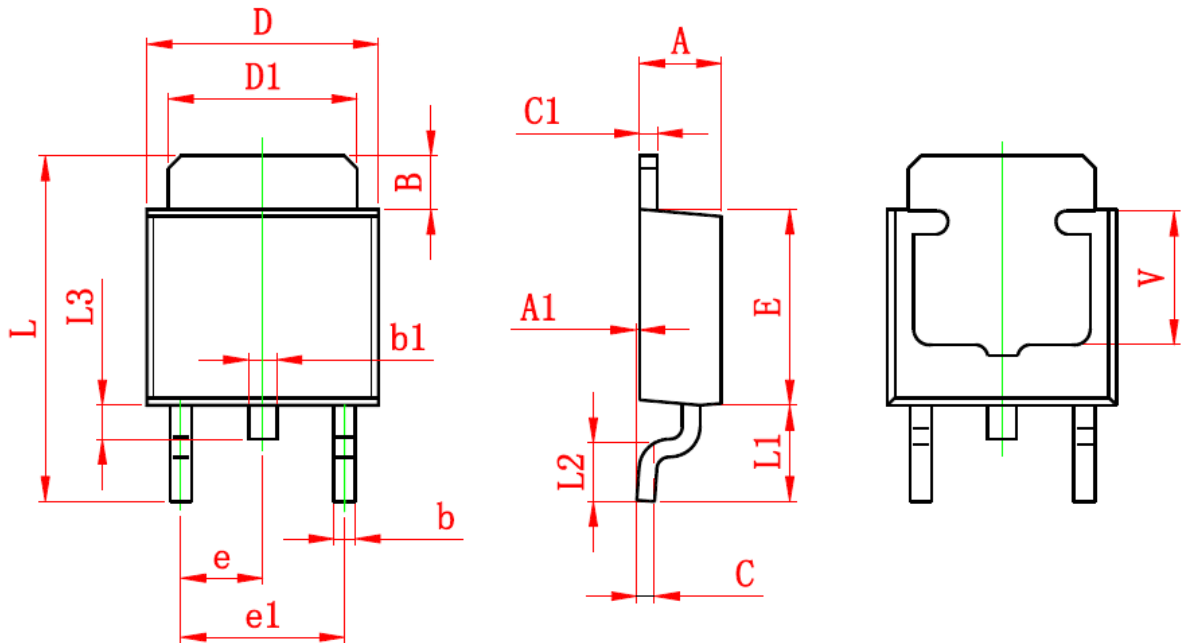
**Fig.10 Switching Time Waveform**



**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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