

# GSM3117XF

## 30V P-Channel MOSFETs

### Product Description

These P-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.

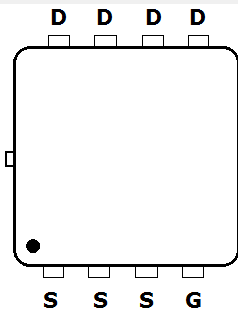
### Features

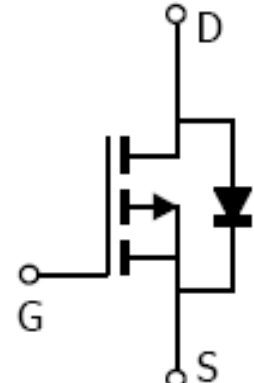
- -30V, -42A,  $R_{DS(ON)} < 14.5m\Omega @ V_{GS} = -10V$
- Fast switching
- Suit for -4.5V Gate Drive Applications
- Green Device Available
- DFN5X6-8L package design

### Applications

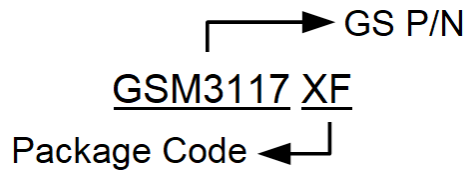
- MB / VGA / Vcore
- POL Applications
- Load Switch
- LED Application

### Packages & Pin Assignments

GSM3117XF (DFN5X6-8L)	
 <p>Top View</p>	
Pin	Description
1	Source
2	Source
3	Source
4	Gate
5	Drain
6	Drain
7	Drain
8	Drain

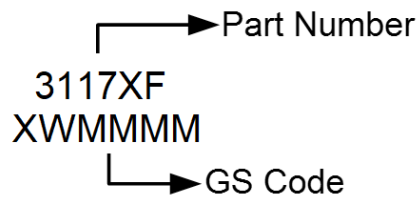


## Ordering Information


  
 GS P/N
   
**GSM3117 XF**
  
 Package Code

Part Number	Package	Quantity Reel
GSM3117XF	DFN5X6-8L	3000 PCS

## Marking Information


  
 Part Number
   
**3117XF**
  
**XWMMMM**
  
 GS Code

## Absolute Maximum Ratings

$T_C=25^\circ\text{C}$  Unless otherwise noted

Symbol	Parameter	Typical	Unit
$V_{DS}$	Drain-Source Voltage	-30	V
$V_{GS}$	Gate-Source Voltage	$\pm 25$	V
$I_D$	Continuous Drain Current <sup>1</sup>	$T_C=25^\circ\text{C}$	-42
		$T_C=100^\circ\text{C}$	-27
$I_{DM}$	Pulsed Drain Current	-140	A
$E_{AS}$	Single Pulse Avalanche Energy <sup>2</sup>	18	mJ
$P_D$	Power Dissipation <sup>1</sup>	$T_C=25^\circ\text{C}$	42
		$T_C=100^\circ\text{C}$	17
$T_J$	Operating Junction Temperature Range	-55 to +150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to +150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient <sup>1</sup>	50	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	3	$^\circ\text{C}/\text{W}$

## Electrical Characteristics

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</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 Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±25V			±100	nA
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V			-1	uA
V <sub>SD</sub>	Diode Forward Voltage <sup>3</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A			-1	V
R <sub>DS(on)</sub>	Drain-Source On-Resistance <sup>3</sup>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-10A		11.9	14.5	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-6A		19	23	
<b>Gate charge characteristics</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DD</sub> =-15V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-15A		22		nC
Q <sub>gs</sub>	Gate-Source Charge			8.7		
Q <sub>gd</sub>	Gate-Drain Charge			7.2		
<b>Dynamic characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1.0MHz		2215		pF
C <sub>oss</sub>	Output Capacitance			310		
C <sub>rss</sub>	Reverse Transfer Capacitance			237		
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =-15V, V <sub>GS</sub> =-10V, R <sub>g</sub> =3.3Ω, I <sub>D</sub> =-15A		8		ns
t <sub>r</sub>	Rise Time			73.7		
t <sub>d(off)</sub>	Turn-Off Time			61.8		
t <sub>f</sub>	Fall Time			24.4		

### Note

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2oz copper.
2. The E<sub>AS</sub> data shows Max. rating . The test condition is V<sub>DD</sub>=-20V, V<sub>GS</sub>=-10V, L=0.1mH, I<sub>AS</sub>=-19A.
3. The data tested by pulsed , pulse width ≤300us , duty cycle ≤2%.

## Typical Performance Characteristics

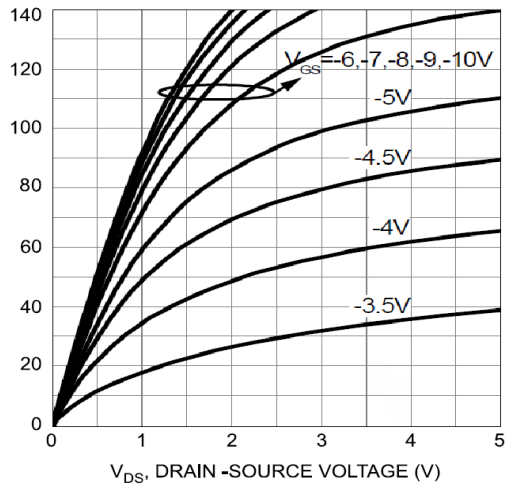


Figure 1. Output Characteristics

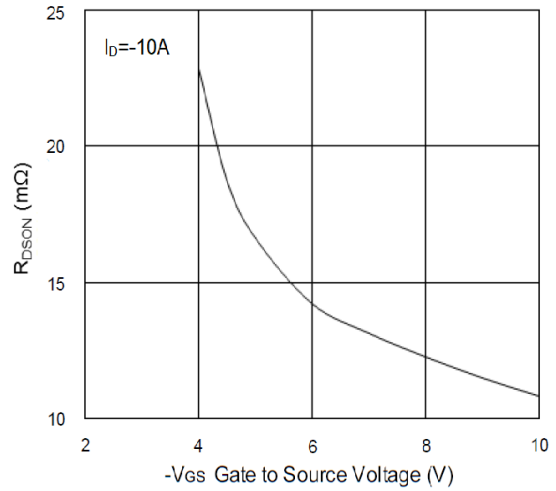


Figure 2. On-Resistance Variation with  $V_{GS}$

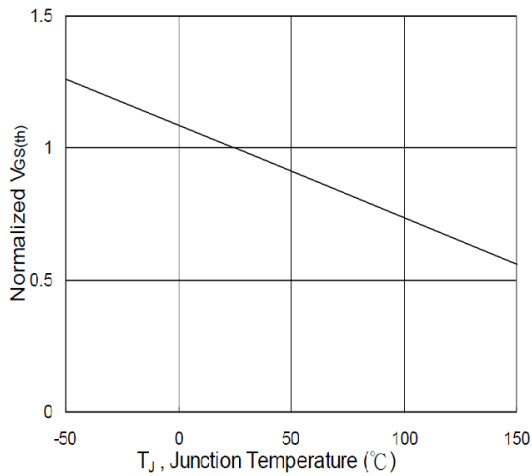


Figure 3. Normalized  $V_{GS(th)}$  vs.  $T_J$

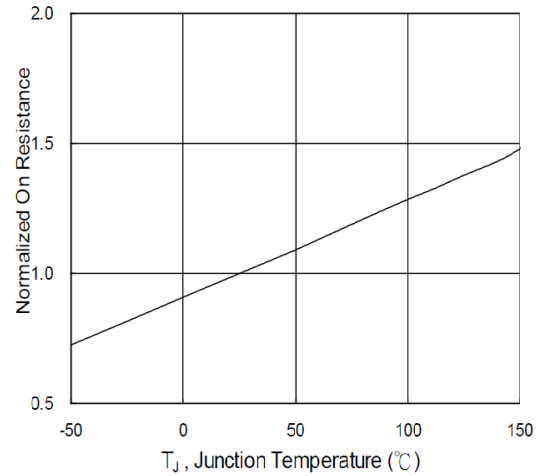


Figure 4. Normalized  $R_{DS(on)}$  vs.  $T_J$

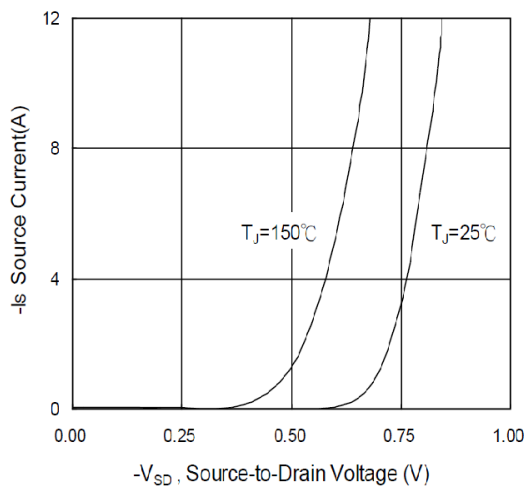


Figure 5. Diode Forward Voltage vs. Current

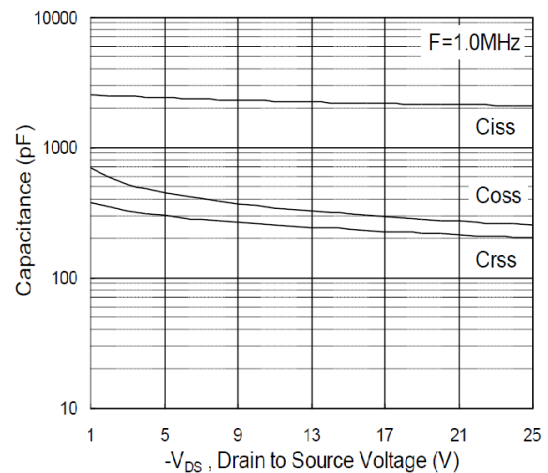


Figure 6. Capacitance

## Typical Performance Characteristics (Continue)

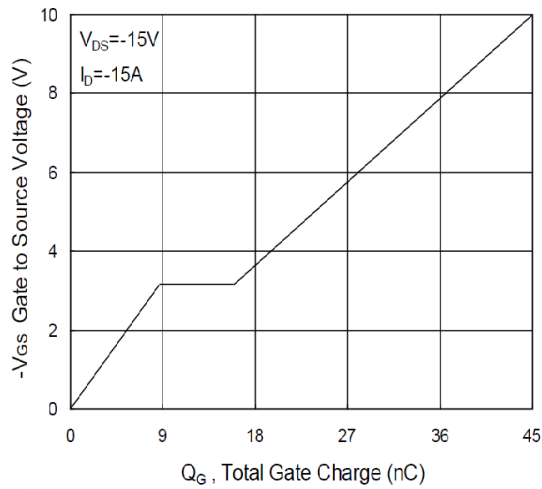


Figure 7. Gate Charge Waveform

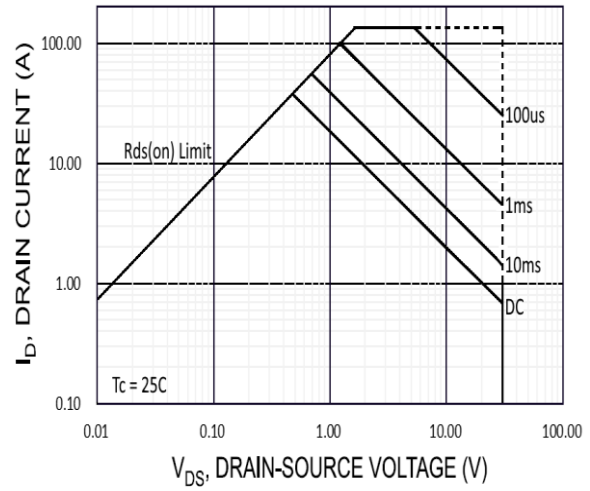


Figure 8. Maximum Safe Operating Area

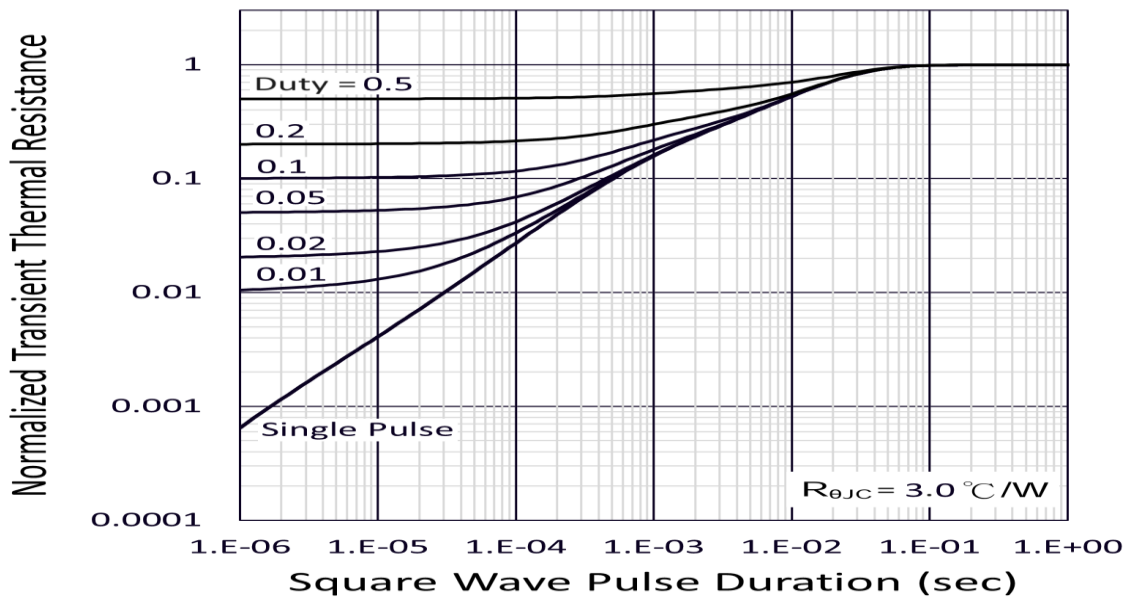
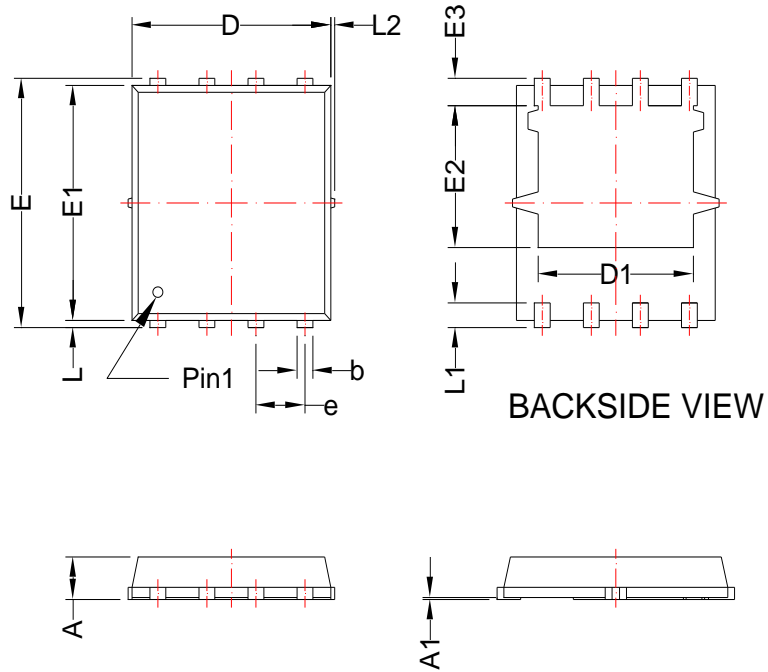


Figure 9. Normalized Transient Thermal Resistance

## Package Dimension

### DFN5X6-8L









Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
<b>A</b>	1.40	1.60	0.055	0.063
<b>b</b>	0.30	0.55	0.012	0.022
<b>b1</b>	0.40	0.60	0.016	0.024
<b>c</b>	0.35	0.44	0.014	0.017
<b>D</b>	4.40	4.60	0.173	0.181
<b>D1</b>	1.40	1.83	0.055	0.072
<b>D2</b>	1.75 REF		0.069 REF	
<b>E</b>	3.94	4.25	0.155	0.167
<b>E1</b>	2.30	2.60	0.091	0.102
<b>E2</b>	2.84 REF		0.112 REF	
<b>e</b>	1.50 BSC		0.059 BSC	
<b>e1</b>	3.00 BSC		0.118 BSC	
<b>L</b>	0.89	1.20	0.035	0.047

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