

GSM3911

30V P-Channel MOSFET

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.

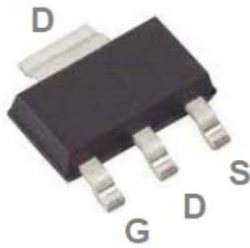
Features

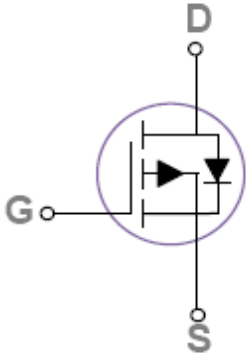
- -30V,-4.5A, $R_{DS(ON)} = 55m\Omega @ V_{GS} = -10V$
- Fast switching
- Green Device Available
- Suit for -4.5V Gate Drive Applications

Applications

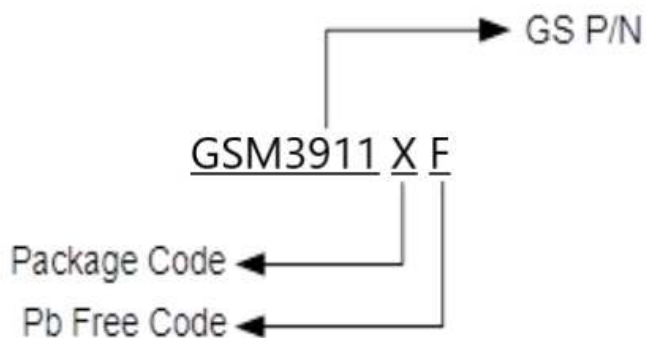
- Notebook
- Load Switch
- Battery Protection
- Hand-held Instruments

Packages & Pin Assignments

GSM3911XF (SOT-223)		
		
Pin No	Symbol	Description
1	G	Gate
2	D	Drain
3	S	Source

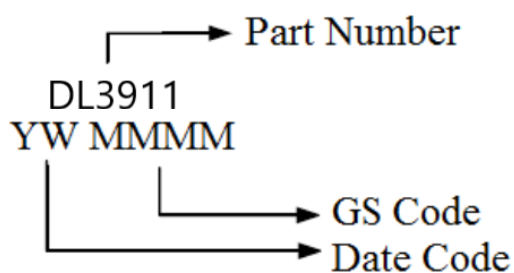


Ordering & Marking Information



Part Number	Package	Quantity
GSM3911XF	SOT-223	2500pcs

Marking Information



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	± 20	V
I_D	Continuous Drain Current	$T_C=25^{\circ}\text{C}$	-4.5
		$T_C=100^{\circ}\text{C}$	-2.85
I_{DM}	Pulsed Drain Current ¹	-18	A
P_D	Power Dissipation	1.78	W
	Power Dissipation-Derate above 25°C	0.014	W/ $^{\circ}\text{C}$
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	70	$^{\circ}\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	45	$^{\circ}\text{C}/\text{W}$

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
$\frac{\Delta V_{(BR)DSS}}{\Delta T_J}$	V _{(BR)DSS} Temperature Coefficient	Reference to 25°C, I _D =-1mA		-0.03		V/°C
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	-1.2	-1.6	-2.2	V
$\Delta V_{GS(th)}$	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			-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			-4.1	A
I _{SM}	Pulsed Source Current				-8.2	A
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =-10V, I _D =-4A		45	55	mΩ
		V _{GS} =-4.5V, I _D =-3A		65	85	
g _{FS}	Forward Transconductance	V _{DS} =-10V, I _D =-3A		3.5		S
V _{SD}	Diode Forward Voltage	I _S =-1A, V _{GS} =0V			-1	V

Electrical Characteristics (Continue)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Dynamic						
Q _g	Total Gate Charge ^{2,3}	V _{DS} =-15V, V _{GS} =-4.5V, I _D =-3A		5.1	7	nC
Q _{gs}	Gate-Source Charge ^{2,3}			2	3	
Q _{gd}	Gate-Drain Charge ^{2,3}			2.2	4	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz		560	810	pF
C _{oss}	Output Capacitance			55	80	
C _{rss}	Reverse Transfer Capacitance			40	60	
t _{d(on)}	Turn-On Time ^{2,3}	V _{DD} =-15V, I _D =-1A, V _{GS} =-10V, R _G =6Ω		3.4	6	ns
t _r	Rise Time ^{2,3}			10.8	21	
t _{d(off)}	Turn-Off Time ^{2,3}			26.9	51	
t _f	Fall Time ^{2,3}			6.9	13	

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

Typical Performance Characteristics

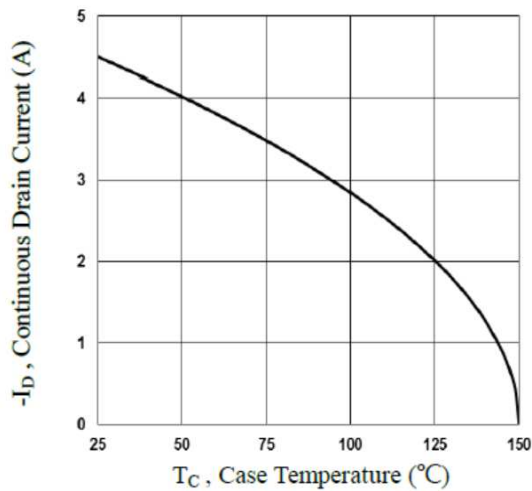


Fig.1 Continuous Drain Current vs. T_c

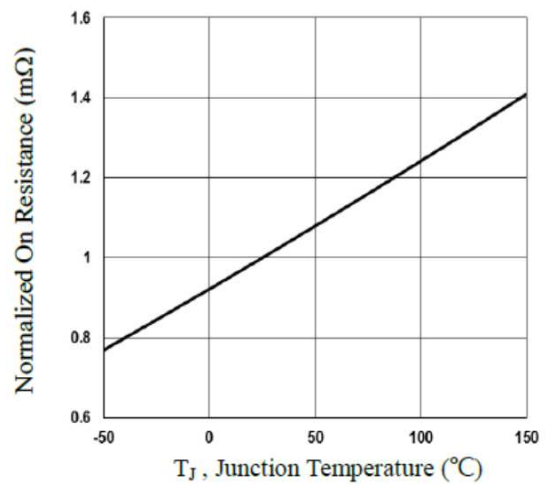


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

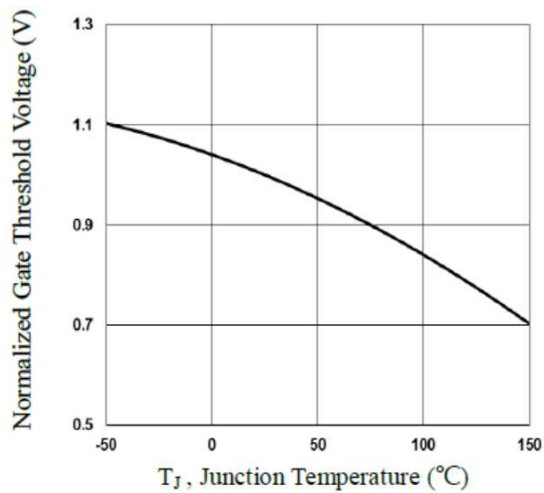


Fig.3 Normalized V_{th} vs. T_j

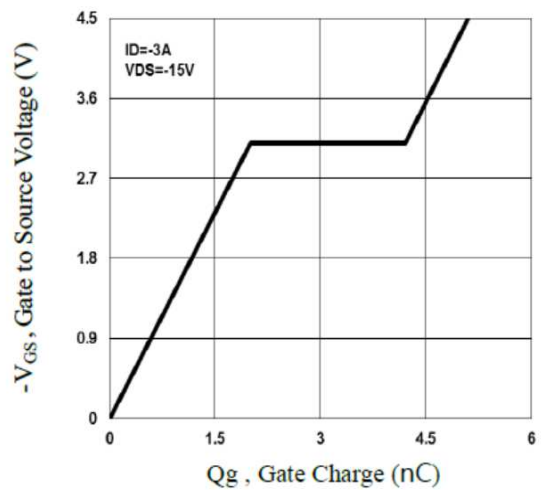


Fig.4 Gate Charge Waveform

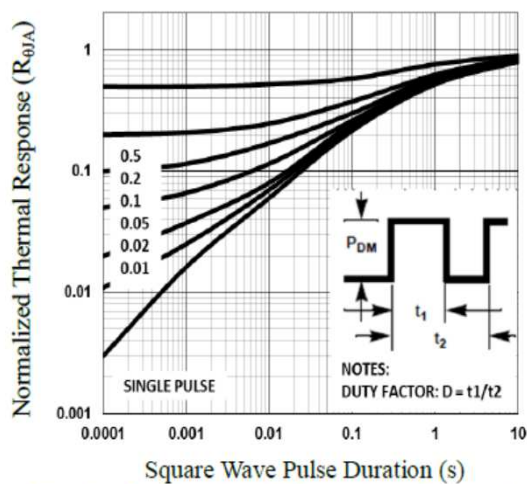


Fig.5 Normalized Transient Impedance

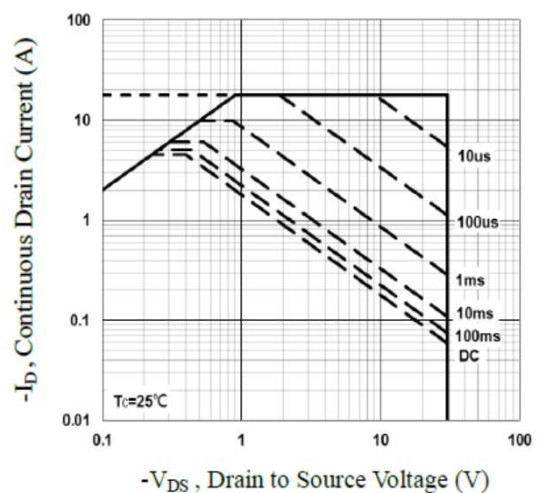


Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

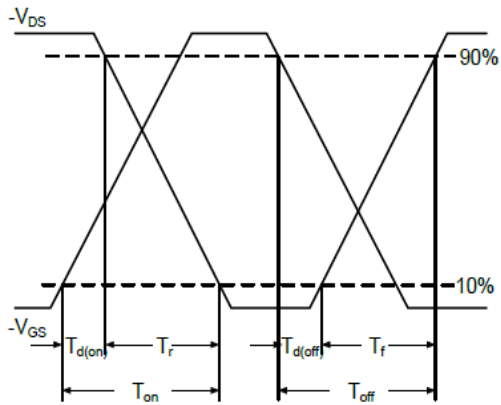


Fig.7 Switching Time Waveform

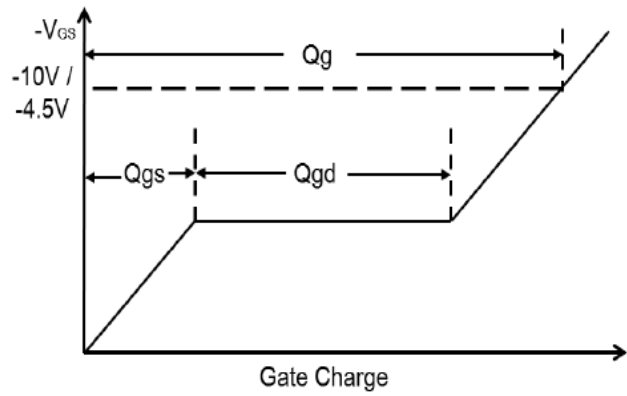
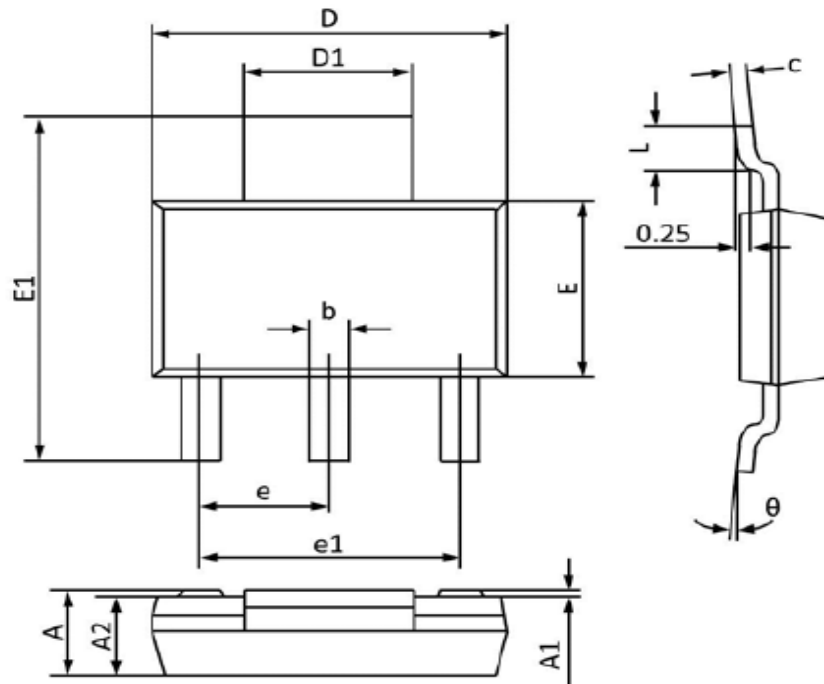


Fig.8 Gate Charge Waveform

Package Dimension

SOT-223







Dimensions



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300 (BSC)		0.091 (BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	0°	10°

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