

# GSM3414S

## 20V N-Channel Enhancement Mode MOSFET

### Product Description

GSM3414S, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge.

These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

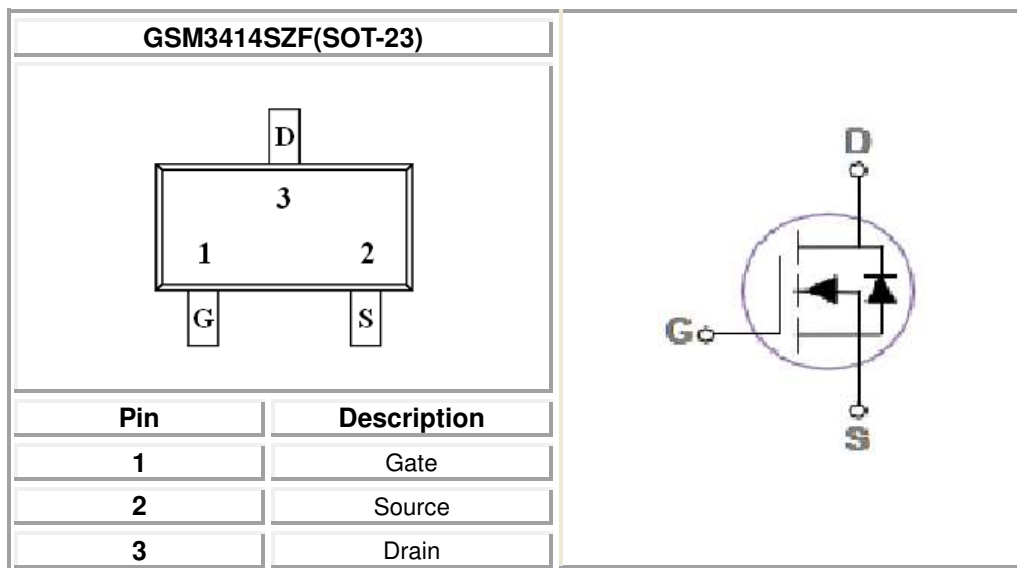
### Features

- 20V/5.8A,  $R_{DS(ON)}=25m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-23 package design

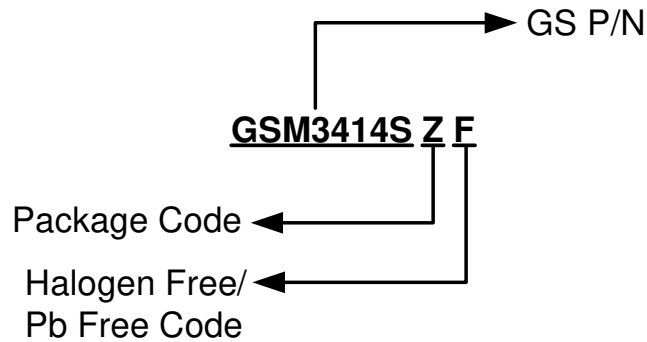
### Applications

- Portable Equipment
- Battery Powered System
- Net Working System

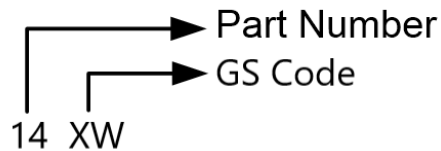
### Packages & Pin Assignments



## Ordering Information



## Marking Information



Part Number	Package	Part Marking	Quantity
GSM3414SZF	SOT-23	14XW	3000pcs

## Absolute Maximum Ratings

$T_A=25^{\circ}\text{C}$  unless otherwise noted

Symbol	Parameter	Typical	Unit
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate –Source Voltage	$\pm 10$	V
$I_D$	Continuous Drain Current( $T_J=150^{\circ}\text{C}$ )	$T_A=25^{\circ}\text{C}$	5.8
		$T_A=100^{\circ}\text{C}$	3.7
$I_{DM}$	Pulsed <sup>1</sup> Drain Current	23.2	A
$P_D$	Power Dissipation	$T_A=25^{\circ}\text{C}$	1.56
		$T_A=25^{\circ}\text{C}$	0.012
$T_J$	Operating Junction Temperature	-55/150	$^{\circ}\text{C}$
$T_{STG}$	Storage Temperature Range	-55/150	$^{\circ}\text{C}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	80	$^{\circ}\text{C}/\text{W}$

## Electrical Characteristics

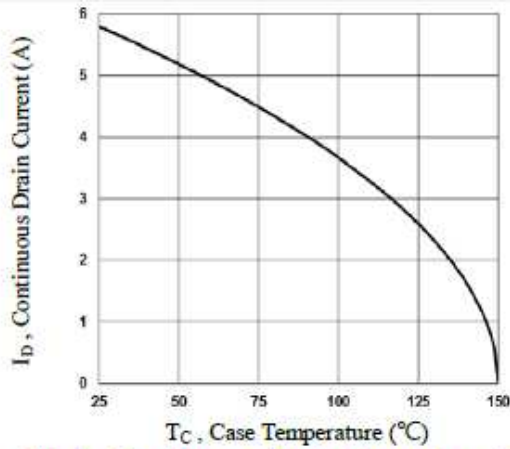
T<sub>A</sub>=25°C unless otherwise noted

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> =250μA	20			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.4	0.6	0.8	V
	V <sub>GS(th)</sub> Temperature Coefficient			2		mV/°C
ΔBVDSS /ΔT <sub>J</sub>	BVDSS Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA		0.02		V/°C
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±10V			±100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =16V, V <sub>GS</sub> =0V T <sub>J</sub> =25°C			1	μA
		V <sub>DS</sub> =16V, V <sub>GS</sub> =0V, T <sub>J</sub> =85°C			10	
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =4A		20	25	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =3A		27	35	
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =2A		39	55	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =3A		6.5		S
<b>Dynamic</b>						
I <sub>S</sub>	Continuous Source Current	V <sub>D</sub> =V <sub>G</sub> =D <sub>V</sub> , Force Current			5.8	A
I <sub>SM</sub>	Pulsed Source Current				23.2	
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =1A, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C			1	V
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHz		535	775	pF
C <sub>oss</sub>	Output Capacitance			60	85	
C <sub>rss</sub>	Reverse Transfer Capacitance			34	50	
Q <sub>g</sub>	Total Gate Charge <sup>2</sup> 、 <sup>3</sup>	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =4A		7.7	11	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>2</sup> 、 <sup>3</sup>			0.9	1	
Q <sub>gd</sub>	Gate-Drain Charge <sup>2</sup> 、 <sup>3</sup>			2.4	5	
t <sub>d(on)</sub>	Turn-On Time <sup>2</sup> 、 <sup>3</sup>	V <sub>DD</sub> =10V, R <sub>G</sub> =25Ω, I <sub>D</sub> =1A, V <sub>GS</sub> =4.5V		4.1	8	ns
T <sub>r</sub>				11.6	22	
t <sub>d(off)</sub>	Turn-Off Time <sup>2</sup> 、 <sup>3</sup>			23.9	45	
T <sub>f</sub>				7.6	14	

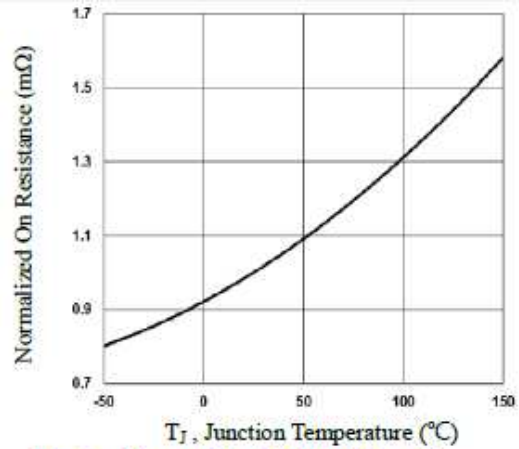
Note :

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.

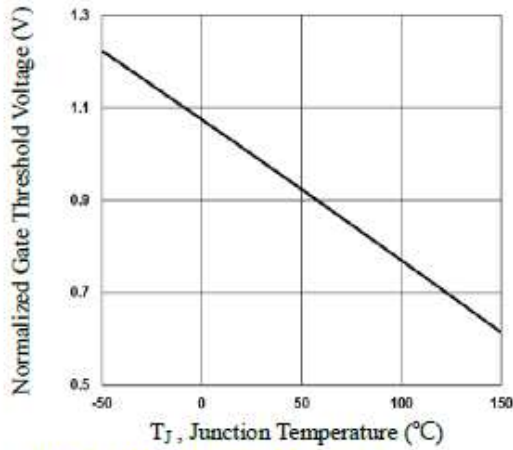
## Typical Performance Characteristics



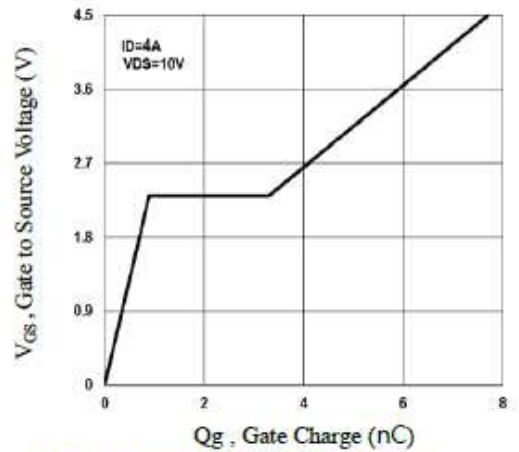
**Fig.1** Continuous Drain Current vs.  $T_c$



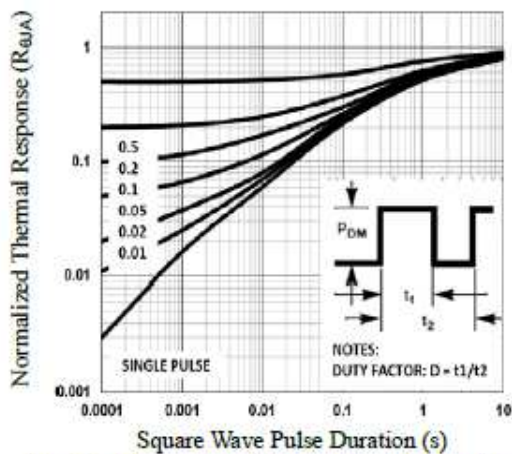
**Fig.2** Normalized  $R_{DS(on)}$  vs.  $T_j$



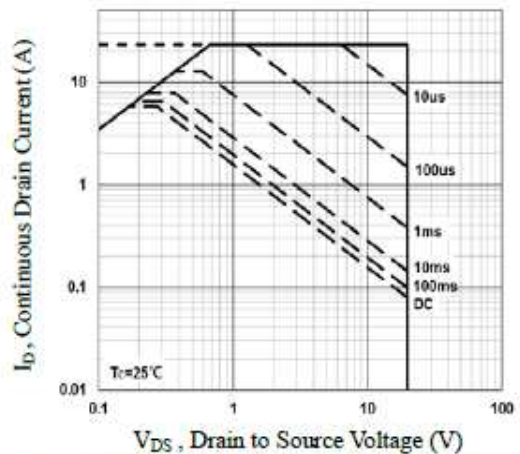
**Fig.3** Normalized  $V_{th}$  vs.  $T_j$



**Fig.4** Gate Charge Waveform



**Fig.5** Normalized Transient Impedance



**Fig.6** Maximum Safe Operation Area

Typical Performance Characteristics (continue)

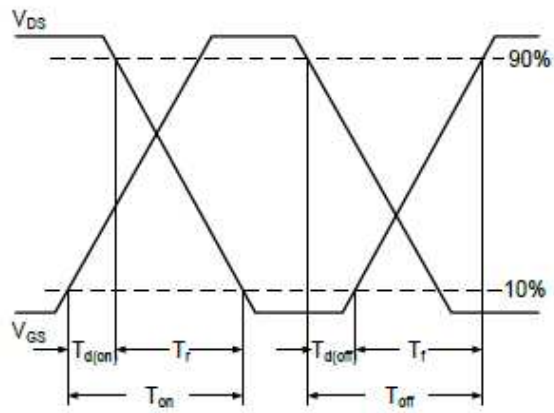


Fig.7 Switching Time Waveform

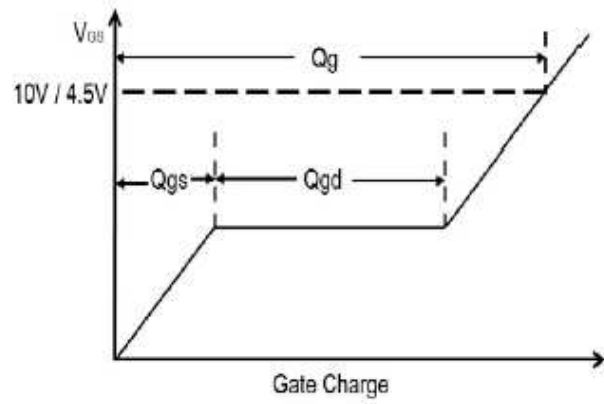
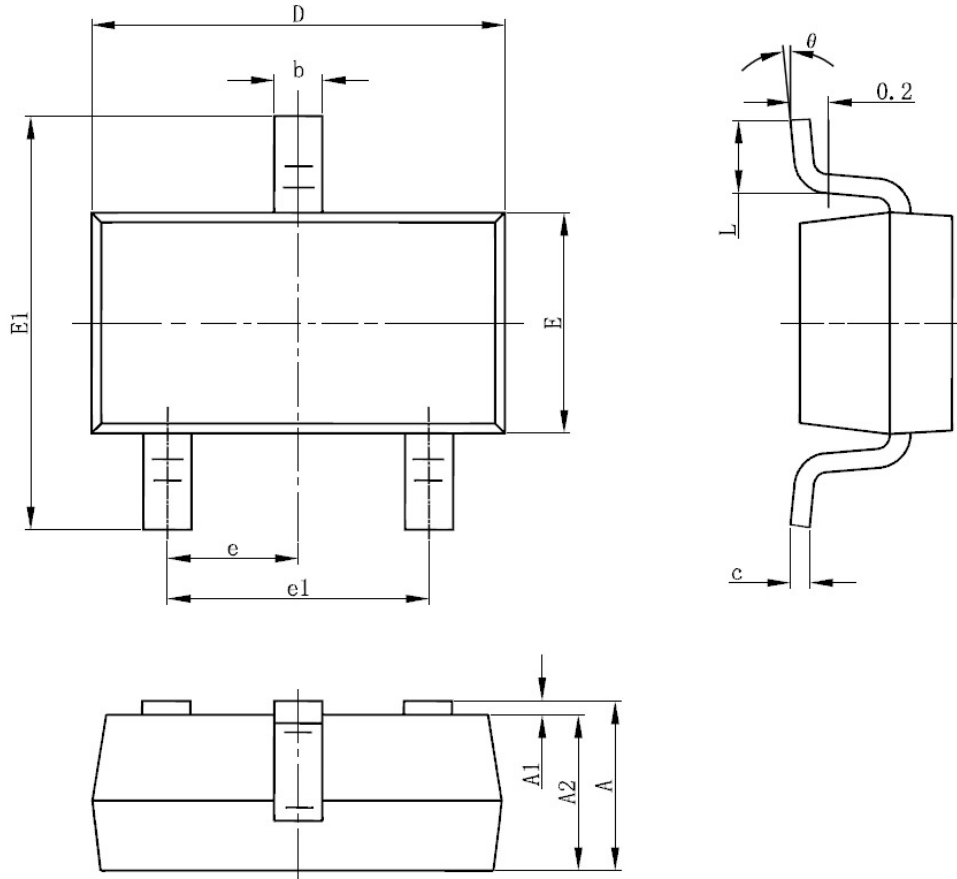


Fig.8 Gate Charge Waveform

## Package Dimension

### SOT23







### Dimensions



SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
<b>A</b>	0.900	1.200	0.035	0.043
<b>A1</b>	0.000	0.100	0.000	0.004
<b>A2</b>	0.900	1.100	0.035	0.039
<b>b</b>	0.300	0.500	0.012	0.020
<b>c</b>	0.080	0.150	0.003	0.006
<b>D</b>	2.800	3.000	0.110	0.118
<b>E</b>	1.200	1.400	0.047	0.055
<b>E1</b>	2.250	2.550	0.089	0.100
<b>e</b>	0.950 (TYP)		0.037 (TYP)	
<b>e1</b>	1.800	2.000	0.071	0.079
<b>L</b>	0.550 REF		0.022 REF	
<b>L1</b>	0.300	0.500	0.012	0.020
<b><math>\theta</math></b>	0°	8°	0°	6°

## NOTICE

Information furnished is believed to be accurate and reliable. However Globaltech Semiconductor assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties, which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Globaltech Semiconductor. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information without express written approval of Globaltech Semiconductor.

## CONTACT US

GS Headquarter	
	4F.,No.43-1,Lane11,Sec.6,Minquan E.Rd Neihu District Taipei City 114, 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