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

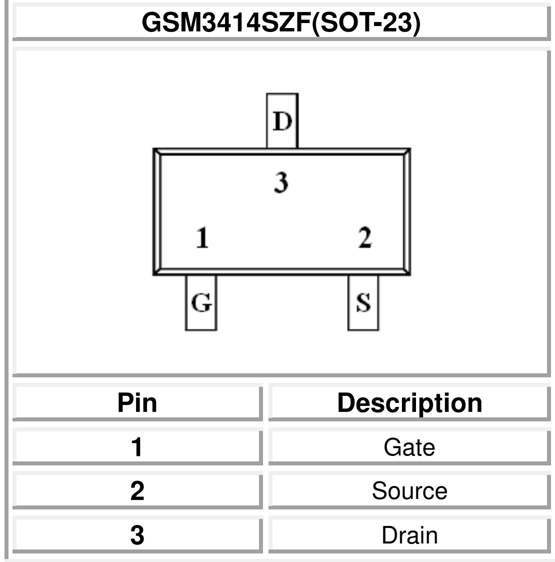
- 20V/5.8A,$R_{DS(ON)}$=25mΩ@V_{GS}=4.5V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-23 package design

Applications

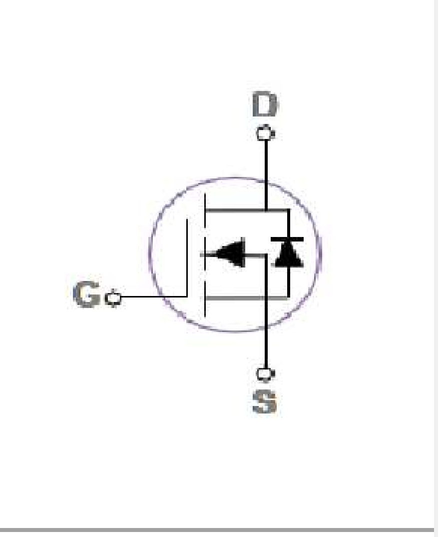
- Portable Equipment
- Battery Powered System
- Net Working System

Packages & Pin Assignments

GSM3414SZF(SOT-23)

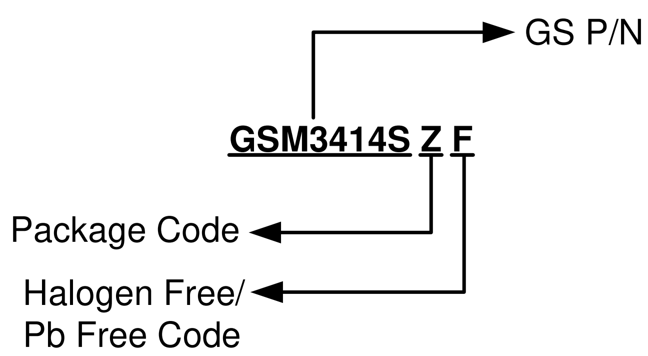


Pin	Description
1	Gate
2	Source
3	Drain



GSM3414S

Ordering Information



Marking Information

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

Absolute Maximum Ratings

T_A=25ºC unless otherwise noted

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		20	V
V_{GS}	Gate –Source Voltage		±10	V
I_D	Continuous Drain Current(T_J=150℃)	T_A=25ºC	5.8	A
		T_A=100ºC	3.7	
I_{DM}	Pulsed[1] Drain Current		23.2	A
P_D	Power Dissipation	T_A=25ºC	1.56	W
		T_A=25ºC	0.012	W/ ºC
T_J	Operating Junction Temperature		-55/150	ºC
T_{STG}	Storage Temperature Range		-55/150	ºC
$R_{θJA}$	Thermal Resistance-Junction to Ambient		80	ºC/W

Electrical Characteristics

T_A=25ºC unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	20			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	0.4	0.6	0.8	V
	VGS(th) Temperature Coefficient			2		mV/℃
△BVDSS /△TJ	BVDSS Temperature Coefficient	Reference to 25℃, ID=1mA		0.02		V/℃
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=±10V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=16V,V_{GS}=0V TJ=25℃			1	uA
		V_{DS}=16V, V_{GS}=0V,T_J=85ºC			10	
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=4.5V,I_D=4A		20	25	mΩ
		V_{GS}=2.5V,I_D=3A		27	35	
		V_{GS}=1.8V,I_D=2A		39	55	
g_{FS}	Forward Transconductance	V_{DS}=10V,I_D=3A		6.5		S
Dynamic						
I_S	Continuous Source Current	VD=VG=DV, Force Current			5.8	A
I_{SM}	Pulsed Source Current				23.2	
V_{SD}	Diode Forward Voltage	IS=1A,VGS=0V,TJ=25℃			1	V
C_{iss}	Input Capacitance	V_{DS}=10V, V_{GS}=0V,f=1MHz		535	775	pF
C_{oss}	Output Capacitance			60	85	
C_{rss}	Reverse Transfer Capacitance			34	50	
Q_g	Total Gate Charge[2、3]	V_{DS}=10V, V_{GS}=4.5V, I_D≡4A		7.7	11	nC
Q_{gs}	Gate-Source Charge[2、3]			0.9	1	
Q_{gd}	Gate-Drain Charge[2、3]			2.4	5	
$t_{d(on)}$	Turn-On Time[2、3]	V_{DD}=10V, R_G=25Ω,I_D≡1A, V_{GS}=4.5V		4.1	8	ns
T_r				11.6	22	
$t_{d(off)}$	Turn-Off Time[2、3]			23.9	45	
T_f				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

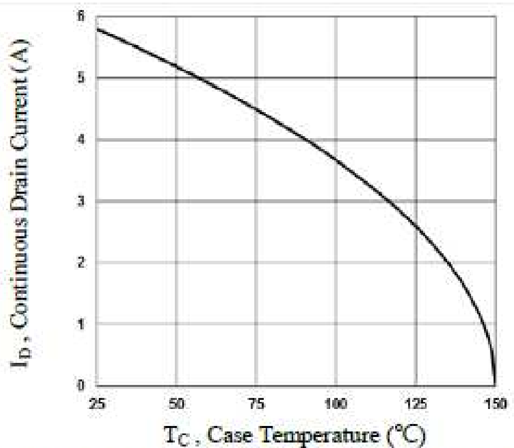


Fig.1 Continuous Drain Current vs. T_C

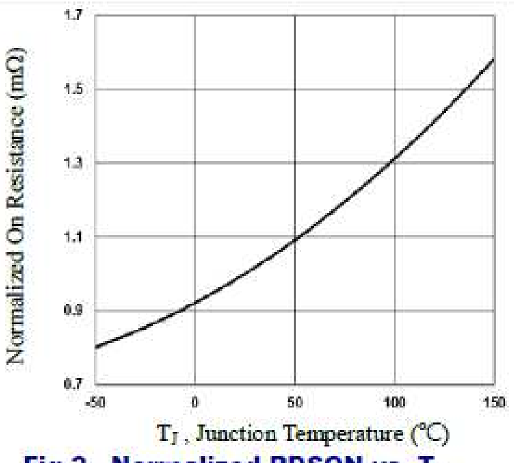


Fig.2 Normalized RDSON vs. T_J

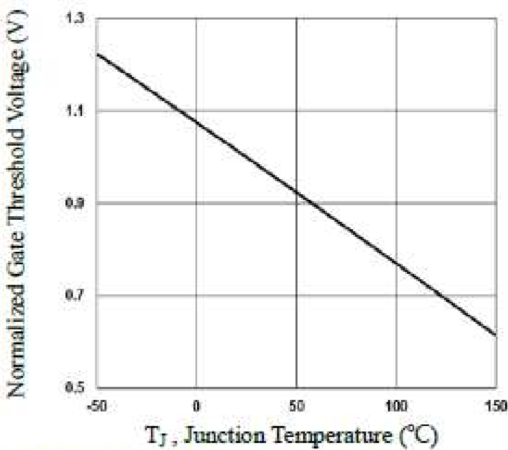


Fig.3 Normalized V_{th} vs. T_J

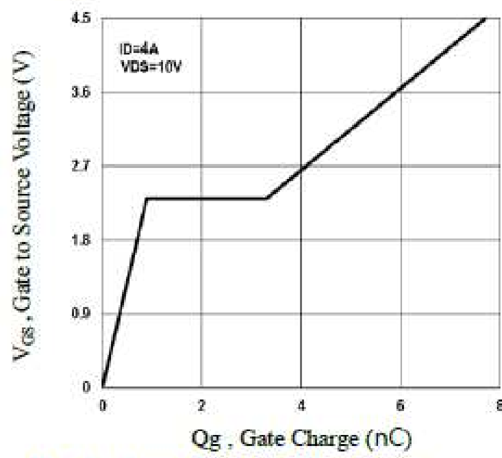


Fig.4 Gate Charge Waveform

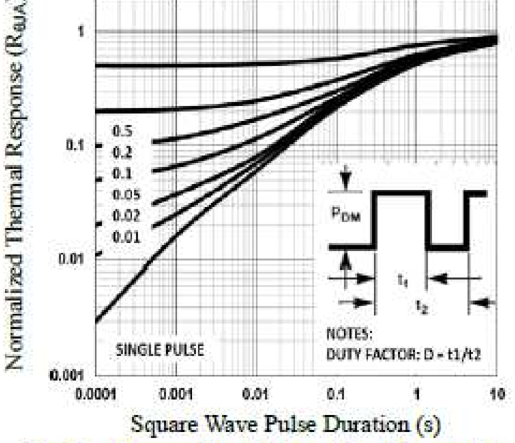


Fig.5 Normalized Transient Impedance

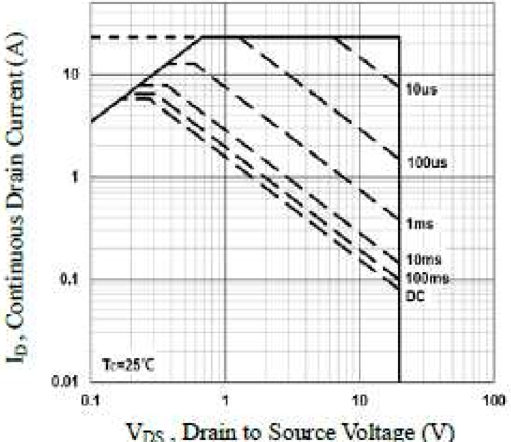


Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (continue)

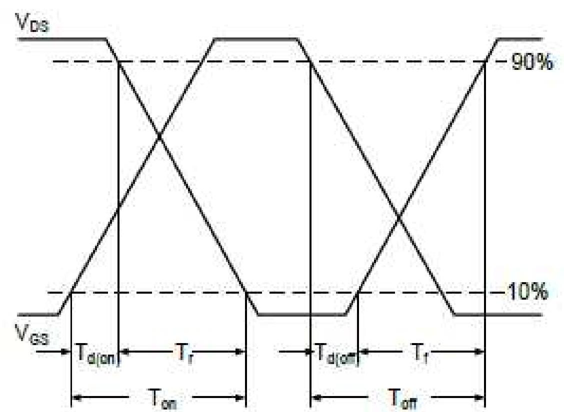


Fig.7 Switching Time Waveform

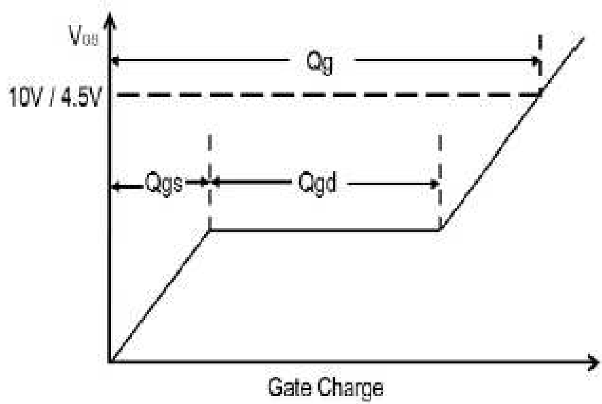
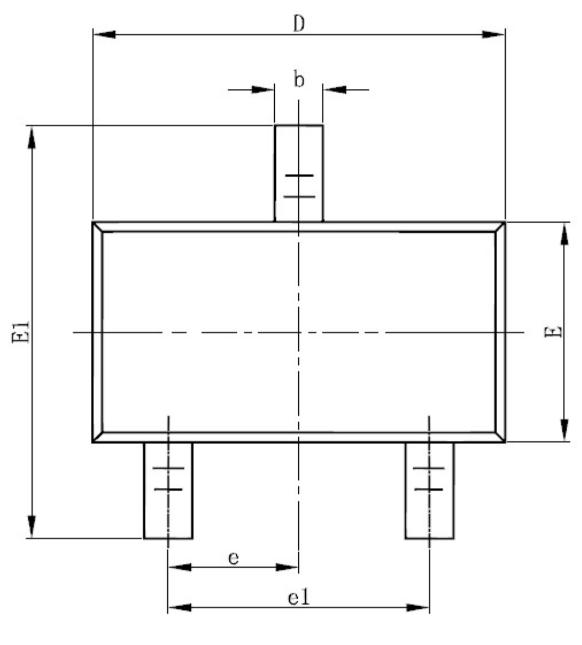
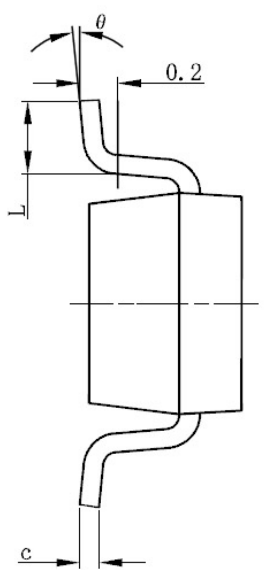


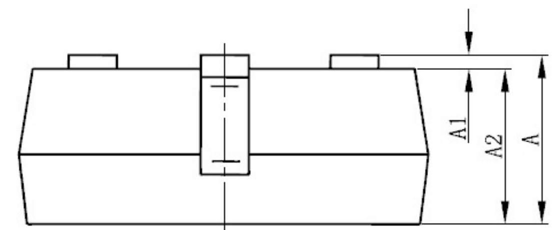
Fig.8 Gate Charge Waveform

Package Dimension

SOT23







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

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