

GSM3983S

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.

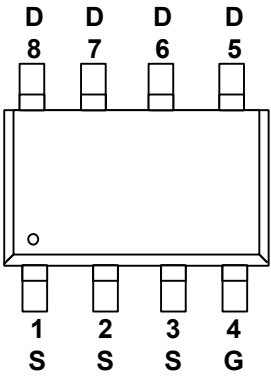
Features

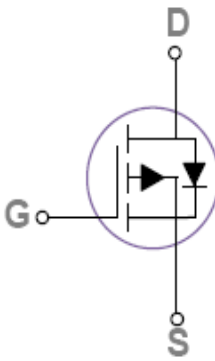
- -30V, -16A, $R_{DS(ON)} = 7.2m\Omega @ V_{GS} = -10V$
- Fast switching
- Suit for -4.5V Gate Drive Applications
- Green Device Available

Applications

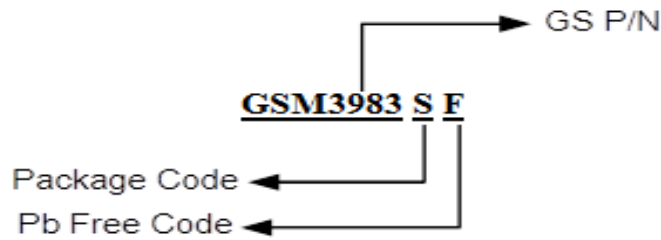
- MB / VGA / Vcore
- Load Switch
- LED Application
- POL Applications

Packages & Pin Assignments

GSM3983SF (SOP-8)		
		
Pin No	Symbol	Description
1,2,3	S	Source
4	G	Gate
5,6,7,8	D	Drain

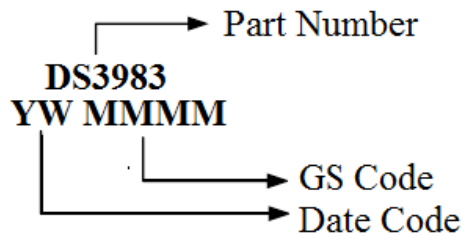


Ordering Information



Part Number	Package	Quantity
GSM3983SF	SOP-8	4000pcs

Marking Information



Absolute Maximum Ratings

T_C=25°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 _A =25°C	-16
		T _A =70°C	-12.8
I _{DM}	Pulsed Drain Current ¹	-64	A
EAS	Single Pulse Avalanche Energy ²	125	mJ
IAS	Single Pulse Avalanche Current ²	-50	A
P _D	Power Dissipation (T _A =25°C)	3.1	W
	Power Dissipation-Derate above 25°C	0.025	W/°C
T _J	Operating Junction Temperature Range	-55 to +150	°C
T _{STG}	Storage Temperature Range	-55 to +150	°C
R _{θJA}	Thermal Resistance-Junction to Ambient	40	°C/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
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	-1.0	-1.6	-2.5	V
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 T _J =25°C	---	---	-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	---	---	-16	A
I _{SM}	Pulsed Source Current		---	---	-32	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =10V, I _D =-6A	---	6	7.2	mΩ
		V _{GS} =4.5V, I _D =-4A,	---	8.6	11.2	
g _{FS}	Forward Transconductance	V _{DS} =-10V, I _D =-1A	---	7	---	S
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-1A	---	---	-1	V
T _{rr}	Reverse Recovery Time	V _R =30V, I _S =10A, di/dt=100A/us	---	235	---	ns
Q _{rr}	Reverse Recovery Charge		---	337	---	nC
Dynamic						
Q _g	Total Gate Charge ^{3,4}	V _{DS} =-24V, V _{GS} =-10V, I _D =-8A	---	65.8	100	nC
Q _{gs}	Gate-Source Charge ^{3,4}		---	20	30	
Q _{gd}	Gate-Drain Charge ^{3,4}		---	11	16	
C _{iss}	Input Capacitance	V _{DS} =24V, V _{GS} =0V, f=1MHz	---	3875	5810	pF
C _{oss}	Output Capacitance		---	505	560	
C _{rss}	Reverse Transfer Capacitance		---	380	570	
t _{d(on)}	Turn-On Time ^{3,4}	V _{DD} =15V, I _D =-1A, V _{GS} =-10V, R _G =3.3Ω	---	35	---	ns
t _r	Rise Time ^{3,4}		---	14	---	
t _{d(off)}	Turn-Off Time ^{3,4}		---	235	---	
t _f	Fall Time ^{3,4}		---	85	---	
R _g	Gate resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	6.9	---	Ω

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=50A., R_G=25 , Starting T_J=25°C.
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

Typical Performance Characteristics

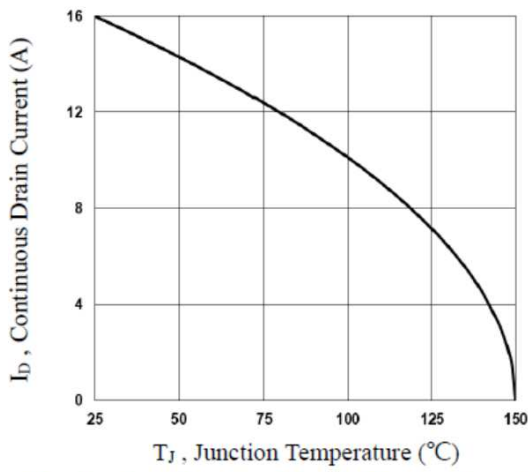


Fig.1 Continuous Drain Current vs. T_J

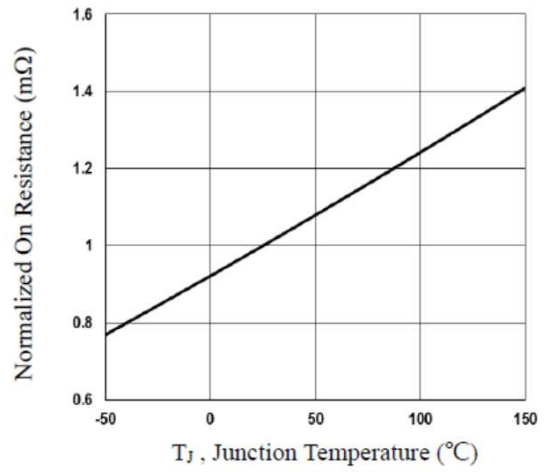


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

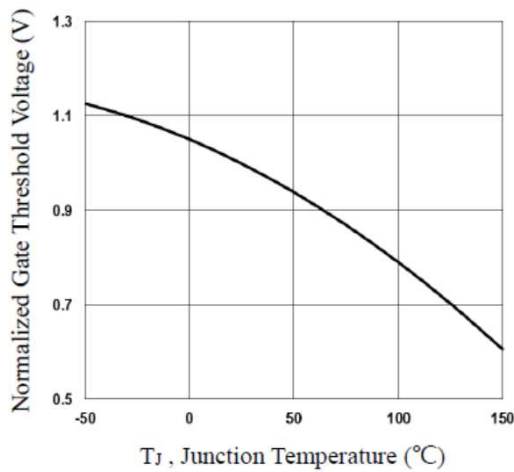


Fig.3 Normalized V_{th} vs. T_J

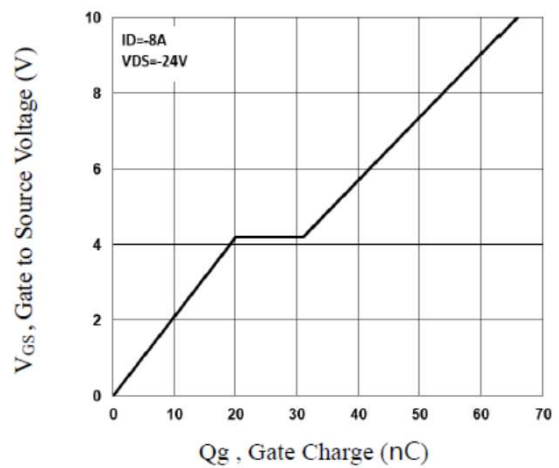


Fig.4 Gate Charge Waveform

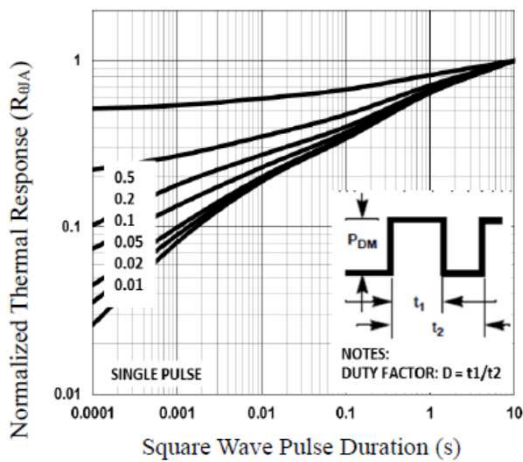


Fig.5 Normalized Transient Impedance

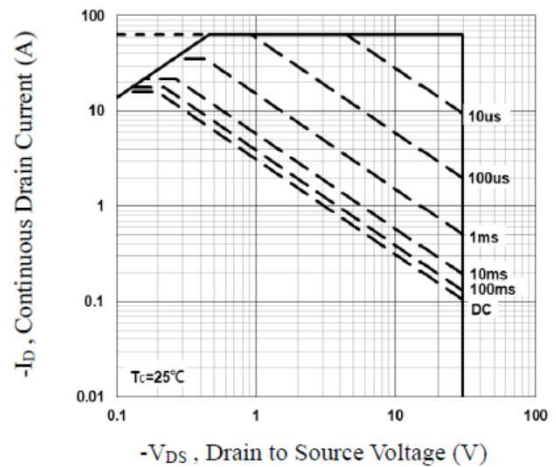


Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (continue)

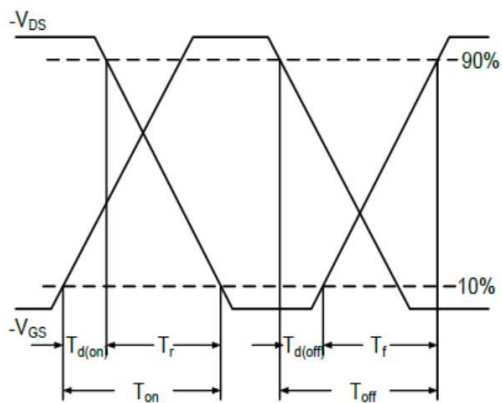


Fig.7 Switching Time Waveform

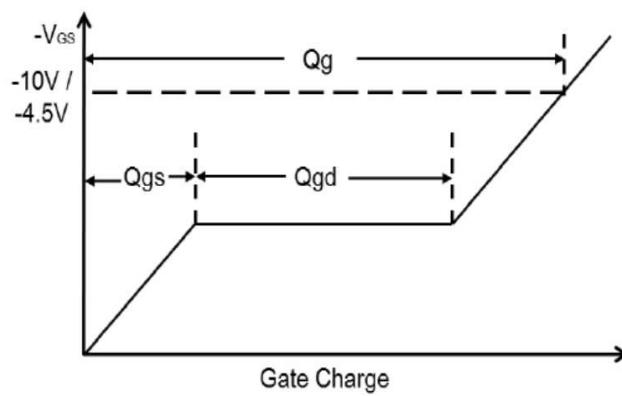
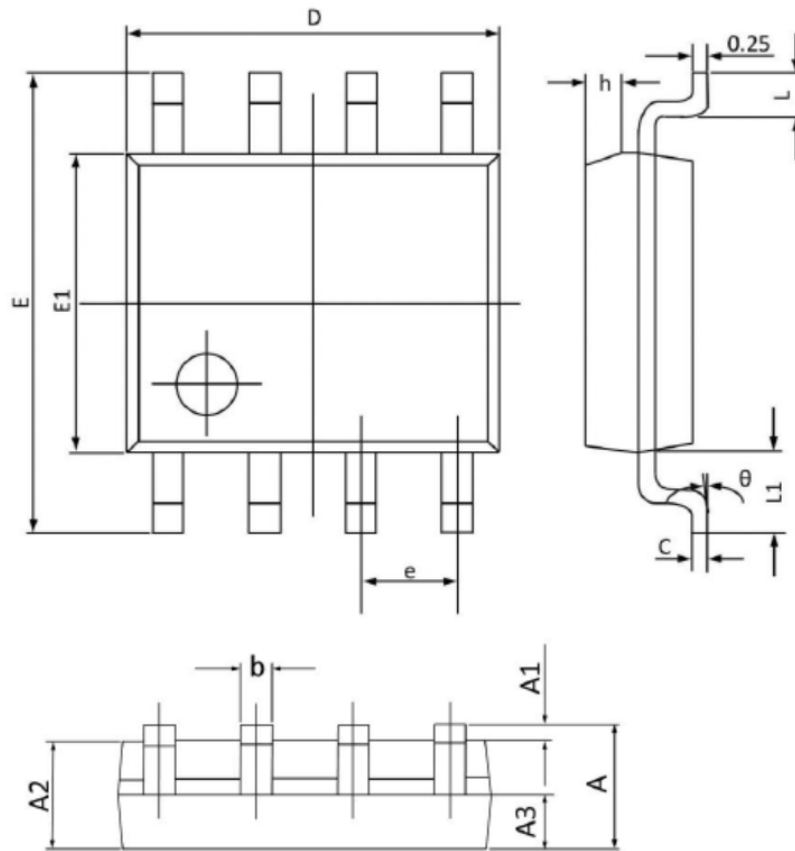


Fig.8 Gate Charge Waveform

Package Dimension

SOP-8









Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	1.350	1.750	0.053	0.068
A1	0.100	0.250	0.004	0.009
A2	1.300	1.500	0.052	0.059
A3	0.600	0.700	0.024	0.027
b	0.390	0.480	0.016	0.018
c	0.210	0.260	0.009	0.010
D	4.700	5.100	0.186	0.200
E	5.800	6.200	0.229	0.244
E1	3.700	4.100	0.146	0.161
e	1.270(BSC)		0.050(BSC)	
h	0.250	0.500	0.010	0.019
L	0.500	0.800	0.019	0.031
L1	1.050(BSC)		0.041(BSC)	
theta	0°	8°	0°	8°

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