GSM6903S

60V 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

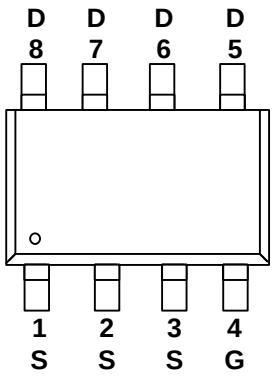
- -60V, -8.5A, $R_{DS(ON)}$=30mΩ@V_{GS}= -10V
- Fast switching
- Suit for -4.5V Gate Drive Applications
- Green Device Available

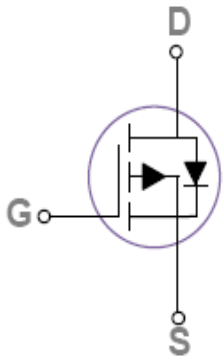
Applications

- POL Applications
- Load Switch
- LED Application

Packages & Pin Assignments

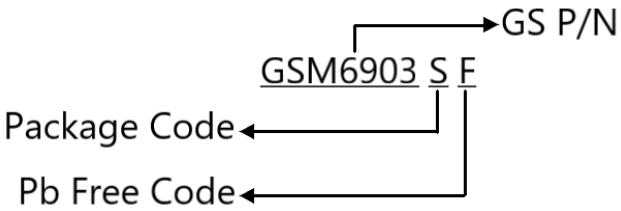
GSM6903SF (SOP-8)





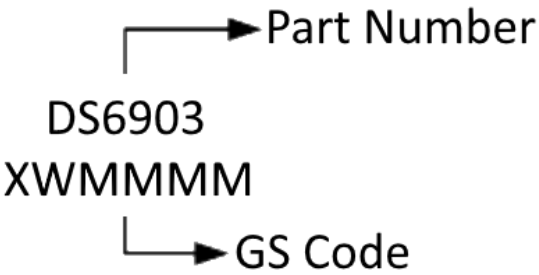
Pin No	Symbol	Description
1,2,3	S	Source
4	G	Gate
5,6,7,8	D	Drain

Ordering Information



Part Number	Package	Quantity
GSM6903SF	SOP-8	4000pcs

Marking Information



Absolute Maximum Ratings

T_C=25ºC Unless otherwise noted

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		-60	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C=25℃	-8.5	A
		T_C=70℃	-5.4	
I_{DM}	Pulsed Drain Current[1]		-34	A
P_D	Power Dissipation		4.1	W
	Power Dissipation-Derate above 25℃		0.033	W/℃
T_J	Operating Junction Temperature Range		-55 to +150	℃
T_{STG}	Storage Temperature Range		-55 to +150	℃
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62	℃/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		30	℃/W

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.

Electrical Characteristics

T_J=25℃ Unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	-60	---	---	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}=-60V, V_{GS}=0V T_J=25℃	---	---	-1	μA
		V_{DS}=-48V, V_{GS}=0V, T_J=125℃	---	---	-10	
I_S	Continuous Source Current	V_G=V_D=0V, Force Current	---	---	-8.5	A
I_{SM}	Pulsed Source Current		---	---	-17	
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=10V, I_D=-1.8A	---	23	30	mΩ
		V_{GS}=4.5V, I_D=-1.5A,	---	28	40	
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_S=-1A	---	---	-1	V
gfs	Forward Transconductance	V_{DS}=-10V, I_D=-3A	---	18	---	S
Dynamic						
Q_g	Total Gate Charge[2,3]	V_{DS}=-30V, V_{GS}=-10V, I_D=-5A	---	43.8	88	nC
Q_{gs}	Gate-Source Charge[2,3]		---	4.6	9	
Q_{gd}	Gate-Drain Charge[2,3]		---	8.3	17	
C_{iss}	Input Capacitance	V_{DS}=-25V,V_{GS}=0V, f=1MHz	---	2595	3900	pF
C_{oss}	Output Capacitance		---	162	240	
C_{rss}	Reverse Transfer Capacitance		---	115	170	
$t_{d(on)}$	Turn-On Time[2,3]	V_{DD}=-30V, I_D=-1A, V_{GS}=-10V, R_G=6Ω	---	25	50	ns
t_r	Rise Time[2,3]		---	13.8	28	
$t_{d(off)}$	Turn-Off Time[2,3]		---	148	290	
t_f	Fall Time[2,3]		---	51	100	

Note :

2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

Typical Performance Characteristics

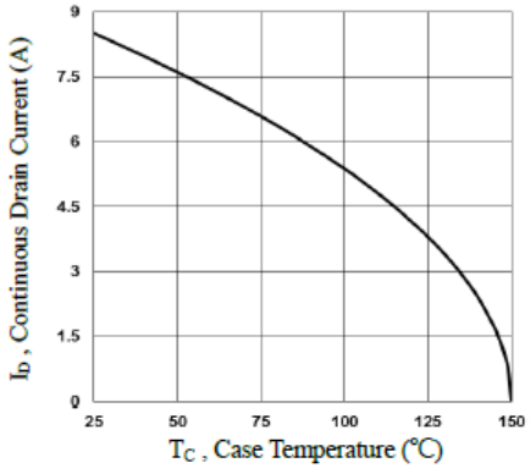


Fig.1 Continuous Drain Current vs. T_C

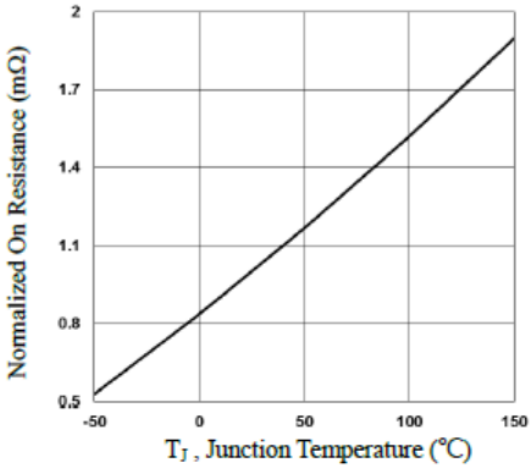


Fig.2 Normalized RDSON vs. T_J

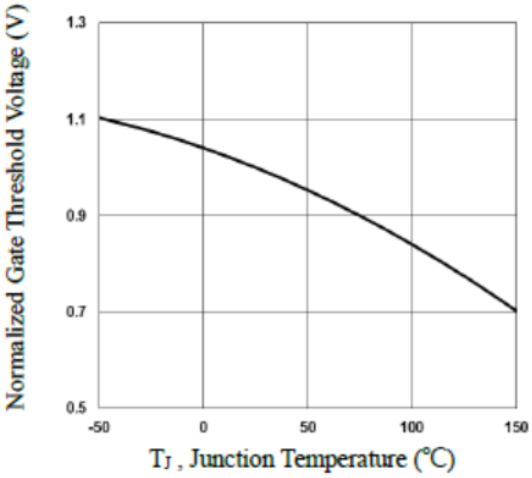


Fig.3 Normalized V_{th} vs. T_J

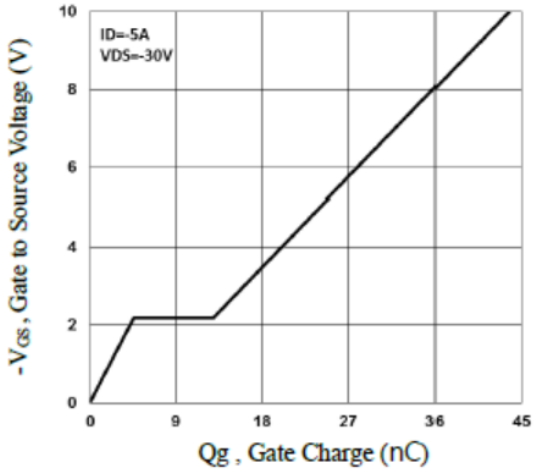


Fig.4 Gate Charge Waveform

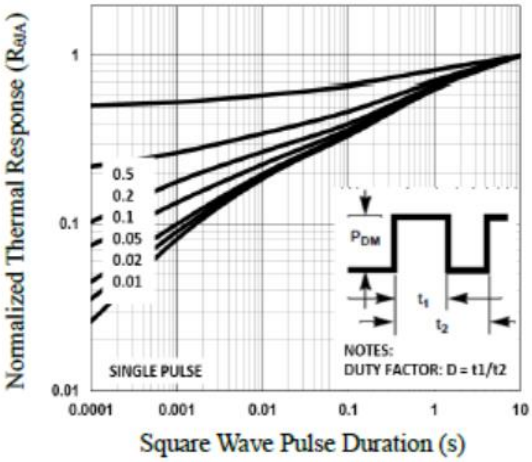


Fig.5 Normalized Transient Impedance

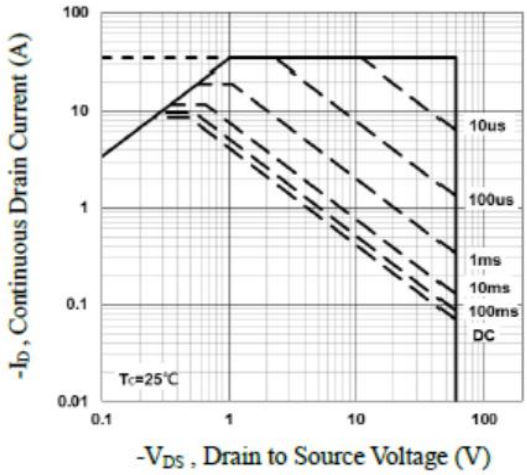


Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics(continue)

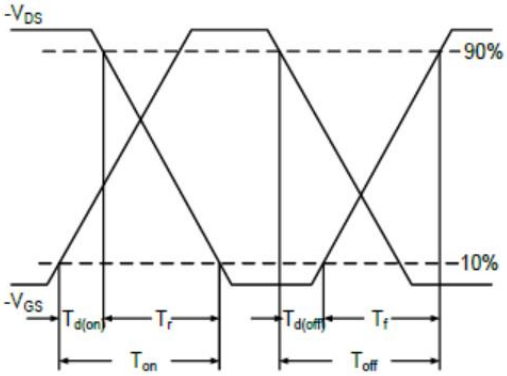


Fig.7 Switching Time Waveform

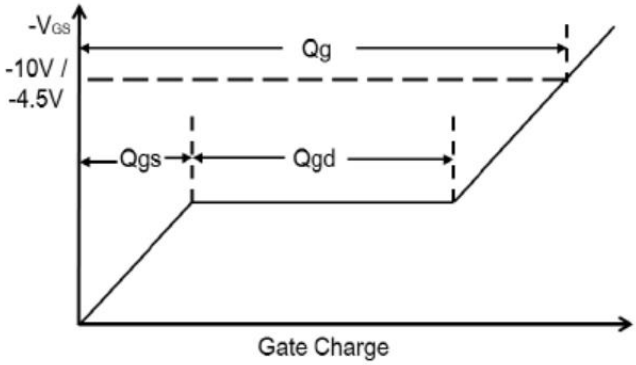
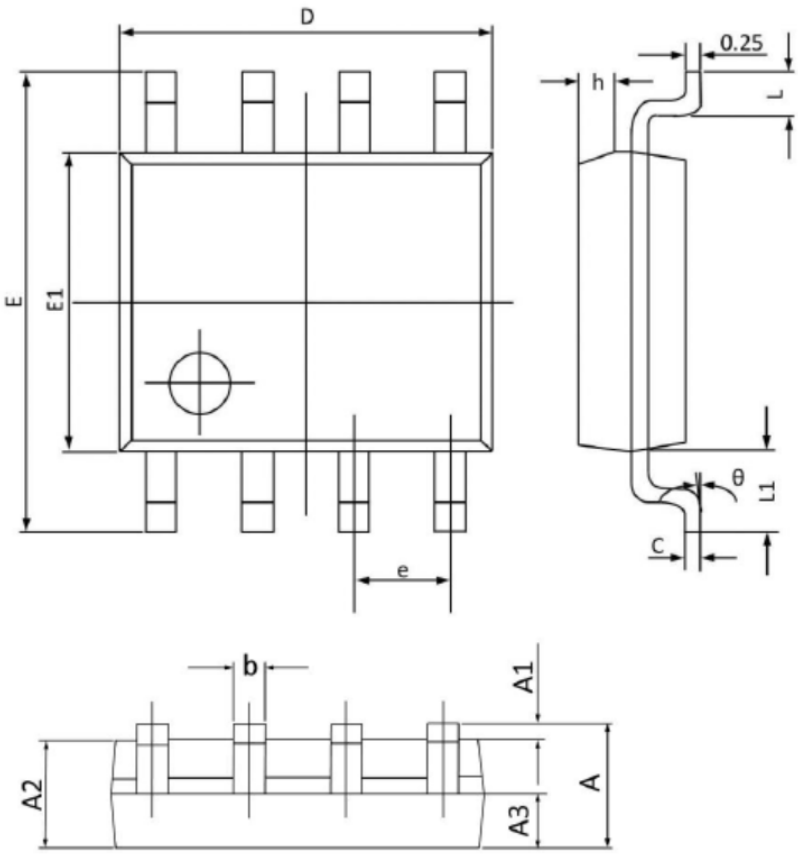


Fig.8 Gate Charge Waveform

Package Dimension

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)	
θ	0°	8°	0°	8°

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