

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

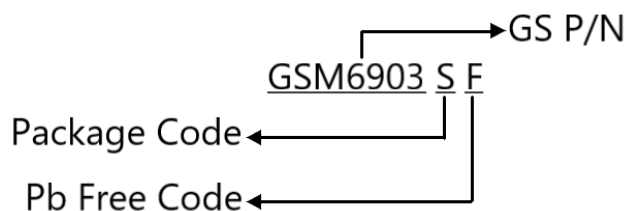
Applications

- POL Applications
- Load Switch
- LED Application

Packages & Pin Assignments

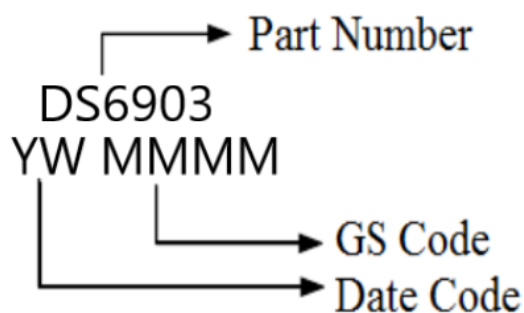
GSM6903SF (SOP-8)		
Pin No	Symbol	Description
1,2,3	S	Source
4	G	Gate
5,6,7,8	D	Drain

Ordering Information



Part Number	Package	Quantity
GSM6903SF	SOP-8	4000pcs

Marking Information



Absolute Maximum Ratings

$T_C=25^\circ\text{C}$ 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	$T_C=25^\circ\text{C}$	-8.5
		$T_C=70^\circ\text{C}$	-5.4
I_{DM}	Pulsed Drain Current ¹	-34	A
P_D	Power Dissipation	4.1	W
	Power Dissipation-Derate above 25°C	0.033	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	62	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	30	$^\circ\text{C}/\text{W}$

Note :

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

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	-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°C	---	---	-1	μA
		V _{DS} =-48V, V _{GS} =0V, T _J =125°C	---	---	-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	---	73	90	mΩ
		V _{GS} =4.5V, I _D =-1.5A,	---	78	100	
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-1A	---	---	-1	V
g _{fs}	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 :

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

Typical Performance Characteristics

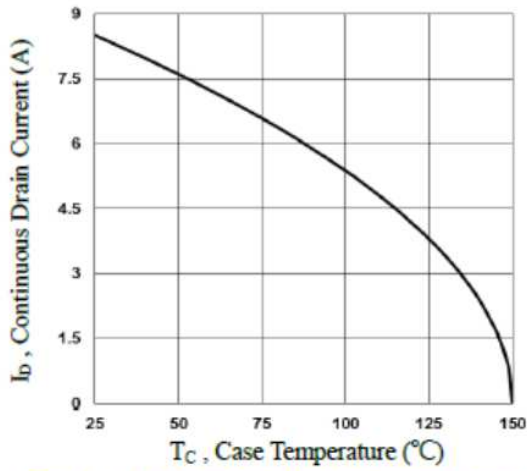


Fig.1 Continuous Drain Current vs. T_c

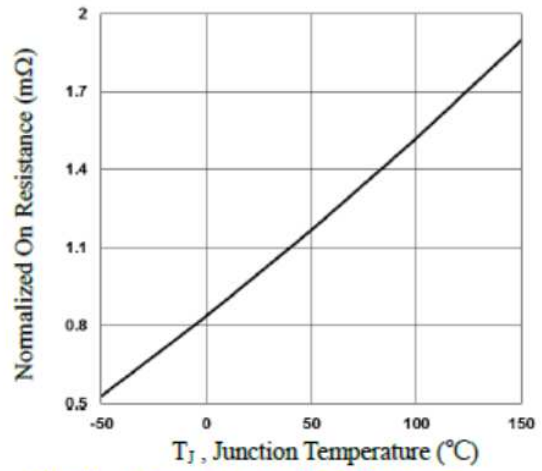


Fig.2 Normalized R_{DSON} vs. T_j

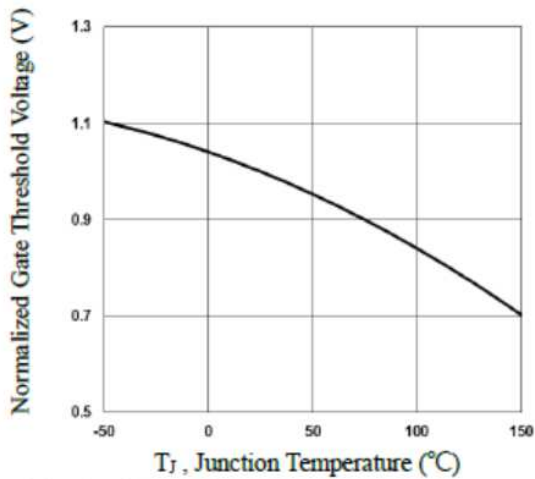


Fig.3 Normalized V_{th} vs. T_j

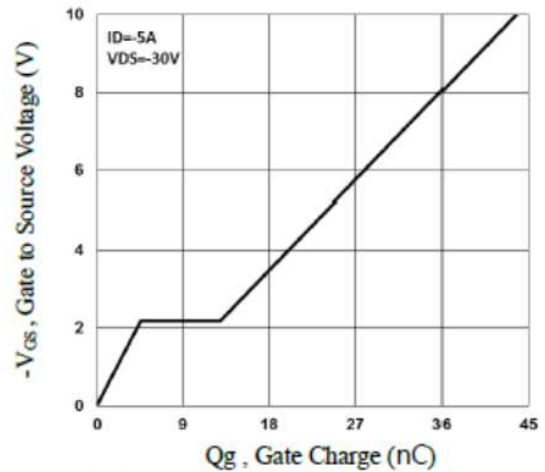


Fig.4 Gate Charge Waveform

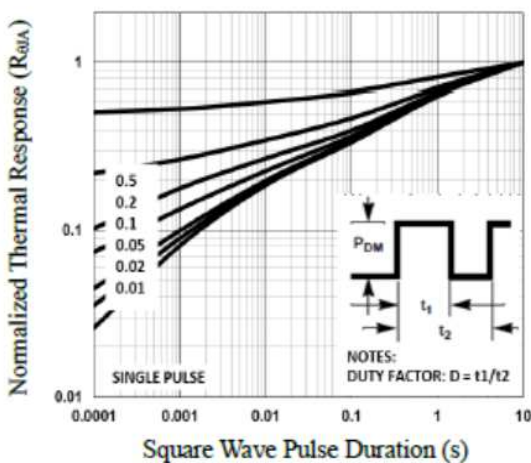


Fig.5 Normalized Transient Impedance

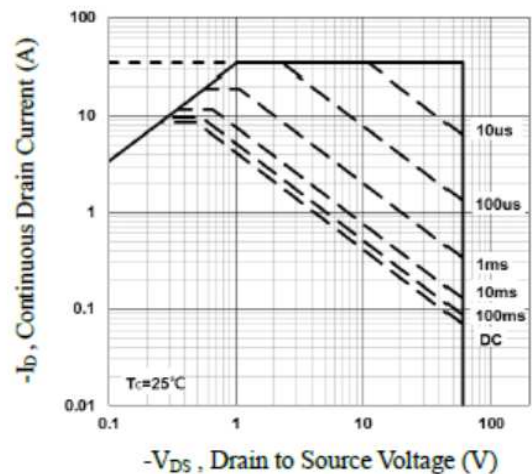


Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics(continue)

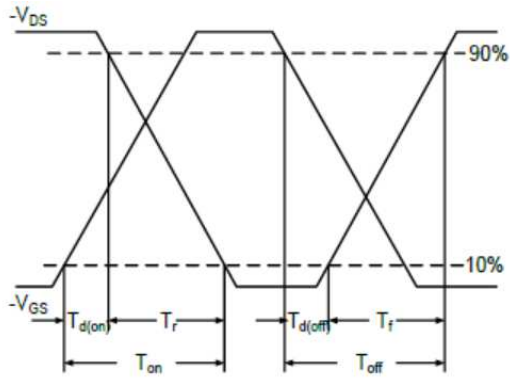


Fig.7 Switching Time Waveform

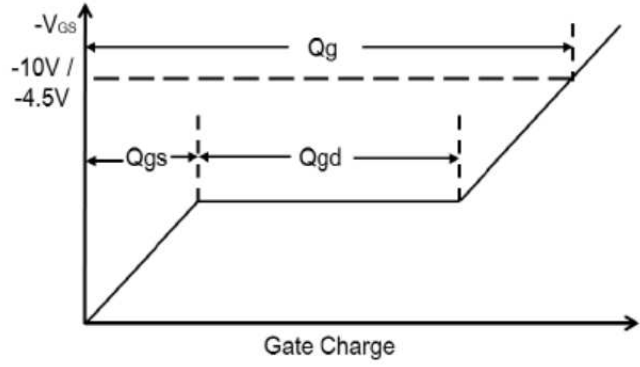
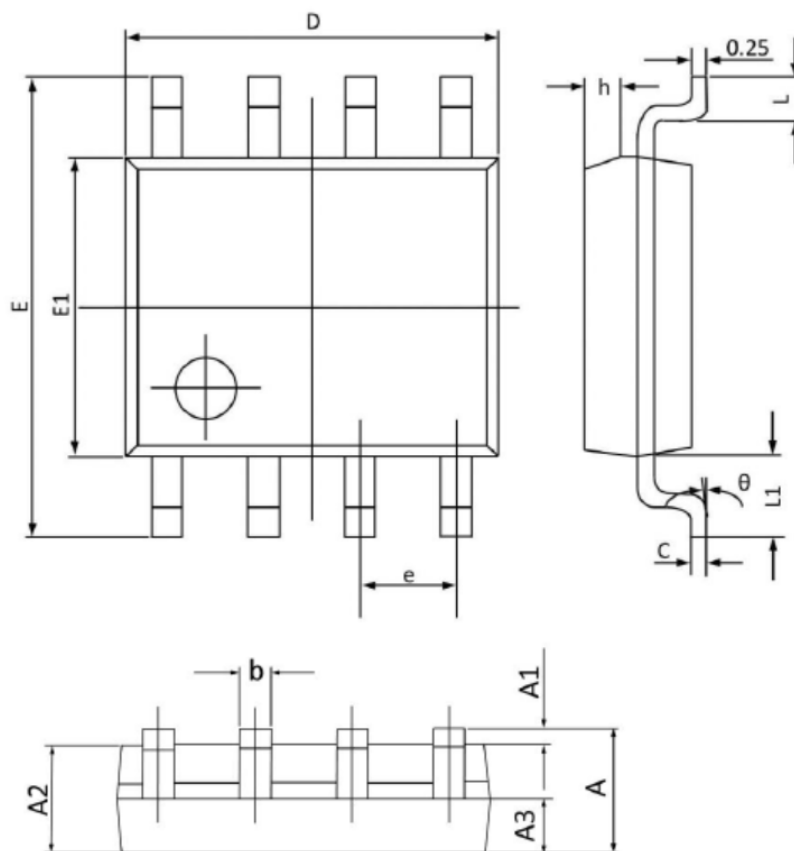


Fig.8 Gate Charge Waveform

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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