

GSMDS4903

40V 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

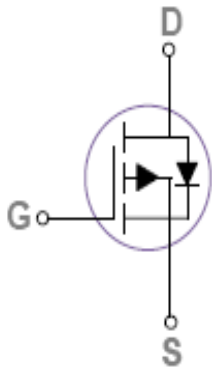
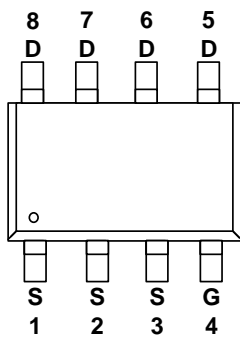
- -40V, -10A, $R_{DS(ON)}=15m\Omega@V_{GS}=-10V$
- Fast switching
- Suit for -4.5V Gate Drive Applications
- Green Device Available
- SOP-8 package design

Applications

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

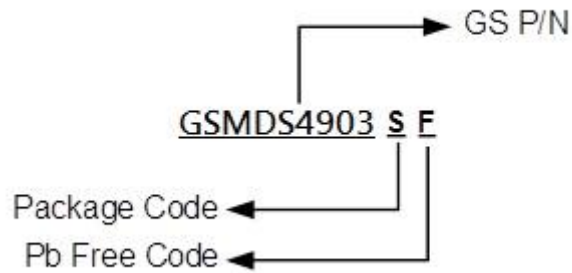
Packages & Pin Assignments

GSMDS4903SF (SOP-8)



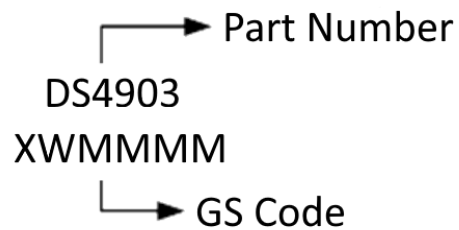
Pin	Description	Pin	Description
1	Source	5	Drain
2	Source	6	Drain
3	Source	7	Drain
4	Gate	8	Drain

Ordering Information



Part Number	Package	Quantity Reel
GSMDS4903SF	SOP-8	4000 PCS

Marking Information



Absolute Maximum Ratings

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

Symbol	Parameter	Typical	Unit
V_{DS}	Drain-Source Voltage	-40	V
V_{GS}	Gate –Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_A=25^\circ\text{C}$	-10
		$T_A=100^\circ\text{C}$	-6.3
I_{DM}	Pulsed Drain Current	-40	A
P_D	Power Dissipation ($T_A=25^\circ\text{C}$)	4.2	W
	Power Dissipation (Derate above 25°C)	0.034	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	60	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	30	$^\circ\text{C}/\text{W}$

Electrical Characteristics

T_A=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	-40			V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =-1mA		-0.03		V/°C
V _{GS(th)}	Gate Threshold Voltage		-1.0	-1.6	-2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient	V _{DS} =V _{GS} , I _D =-250uA		4		mV/°C
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±20V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-30V, V _{GS} =0V			-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			-13	A
I _{SM}	Pulsed Source Current				-26	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =-10V, I _D =-10A		11.5	15	mΩ
		V _{GS} =-4.5V, I _D =-8A		16	22	
g _{FS}	Forward Transconductance	V _{DS} =-10V, I _D =-10A		13		S
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-1A			-1	V
Dynamic						
Q _g	Total Gate Charge	V _{DS} =-32V, V _{GS} =-4.5V, I _D =-10A		22	40	nC
Q _{gs}	Gate-Source Charge			8.2	16	
Q _{gd}	Gate-Drain Charge			8.8	16	
C _{iss}	Input Capacitance	V _{DS} =-25V, V _{GS} =0V, f=1MHz		2757	4000	pF
C _{oss}	Output Capacitance			240	360	
C _{rss}	Reverse Transfer Capacitance			137	200	
t _{d(on)}	Turn-On Time	V _{DD} =-20V, I _D =-1A, V _{GS} =-10V, R _G =6Ω		23	40	ns
t _r				10	20	
t _{d(off)}	Turn-Off Time			135	250	
t _f				46	90	

Typical Performance Characteristics

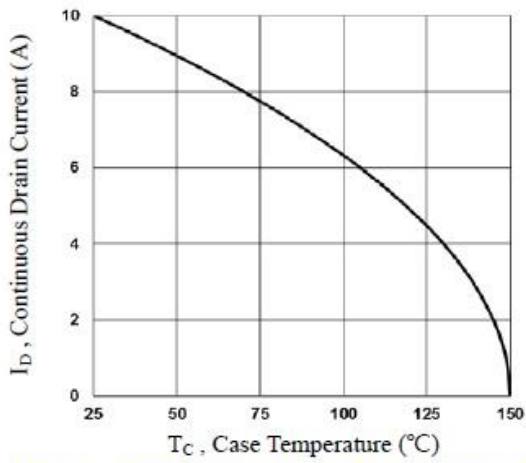


Fig.1 Continuous Drain Current vs. T_c

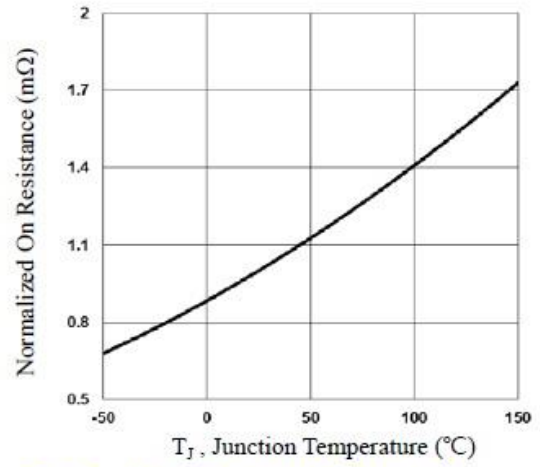


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

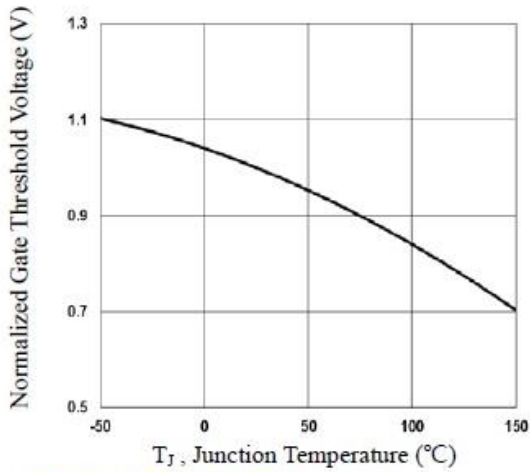


Fig.3 Normalized V_{th} vs. T_j

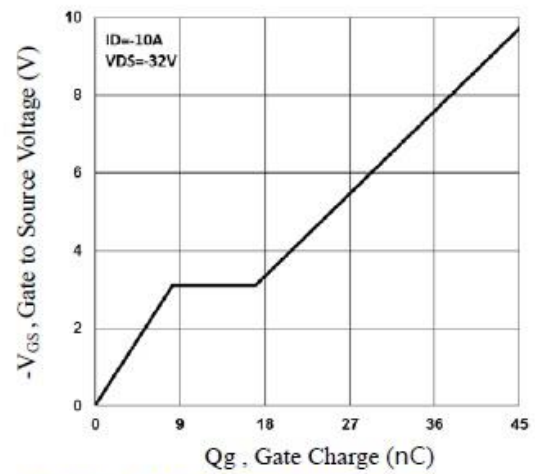


Fig.4 Gate Charge Waveform

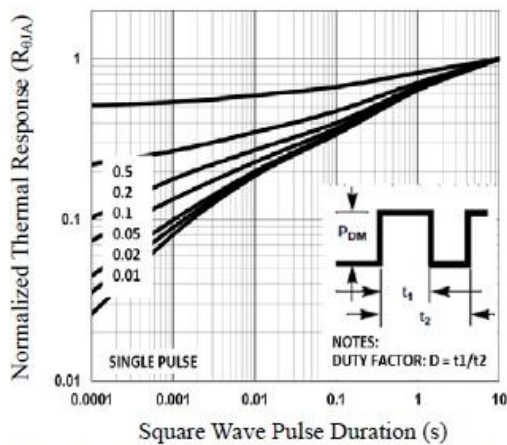


Fig.5 Normalized Transient Impedance

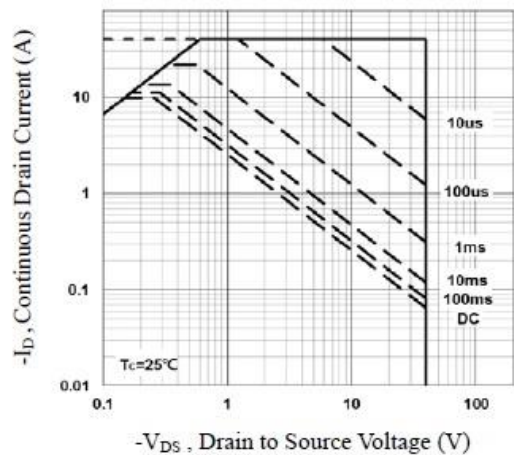


Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

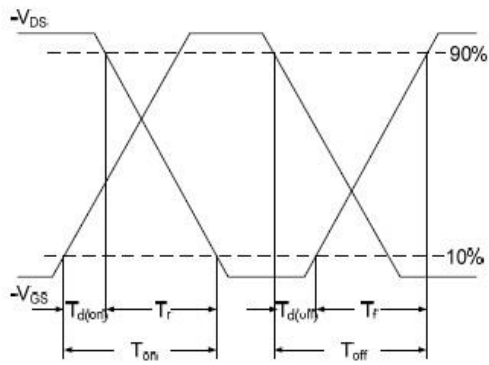


Fig.7 Switching Time Waveform

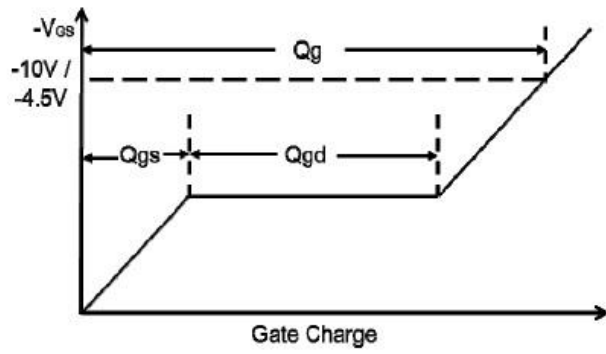
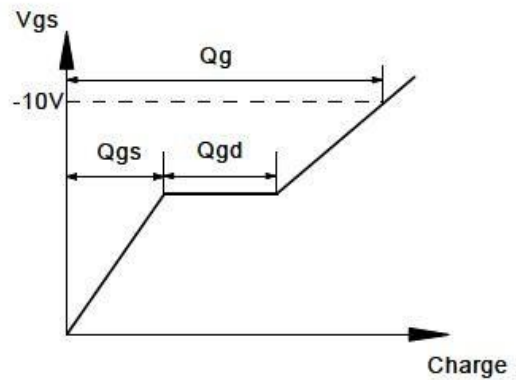
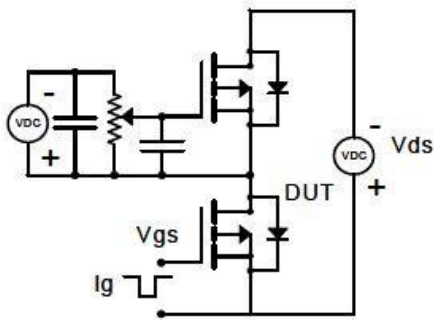


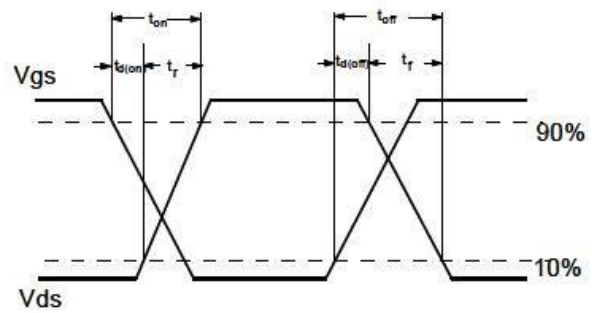
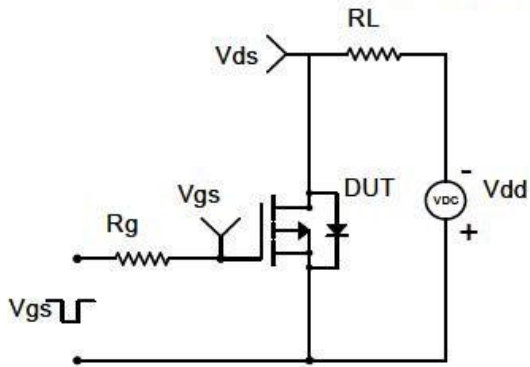
Fig.8 Gate Charge Waveform

Typical Performance Characteristics (Continue)

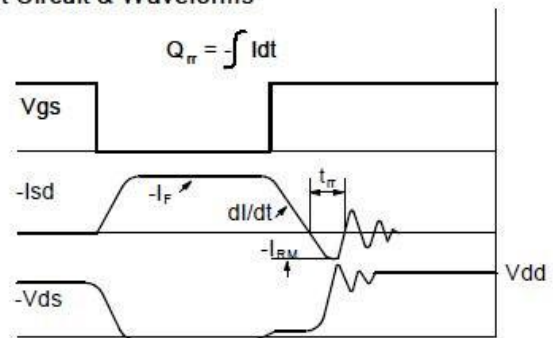
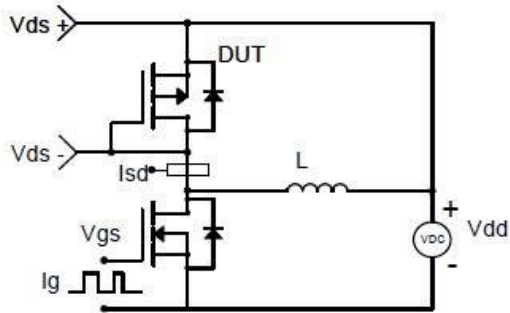
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

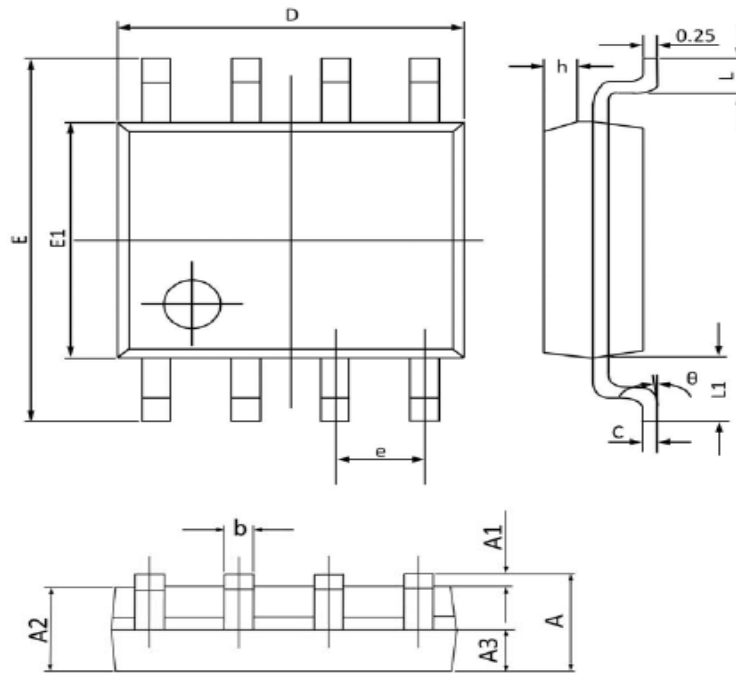


Diode Recovery Test Circuit & Waveforms



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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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