

# GSMD0903

## 100V 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.

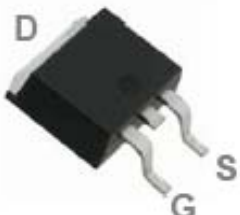
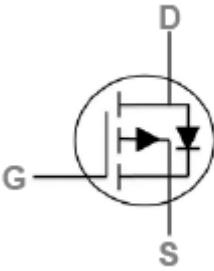
### Features

- -100V, -25A,  $R_{DS(ON)}=42m\Omega@V_{GS}=-10V$
- Improved dv/dt capability
- Fast switching
- VGS guarantee  $\pm 25V$
- Green Device Available
- TO-252-2L package design

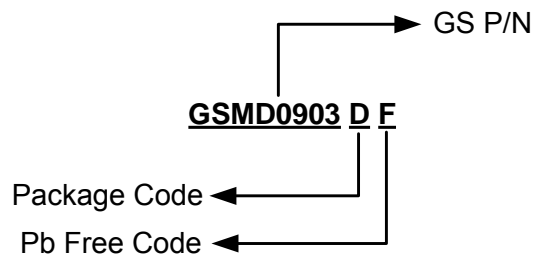
### Applications

- Networking
- Load Switch
- LED applications

### Packages & Pin Assignments

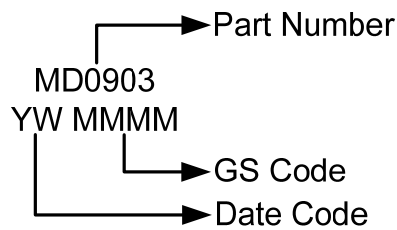
GSMD0903DF (TO-252-2L)	
 <p>Top View</p>	
<b>Description</b>	
Gate	
Source	
Drain	

## Ordering Information



Part Number	Package	Quantity Reel
GSMD0903DF	TO-252-2L	2500 PCS

## Marking Information



## Absolute Maximum Ratings

T<sub>A</sub>=25°C Unless otherwise noted

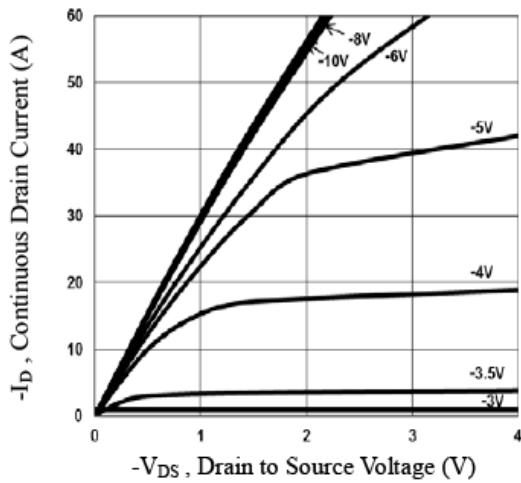
Symbol	Parameter	Typical	Unit
V <sub>DS</sub>	Drain-Source Voltage	-100	V
V <sub>GS</sub>	Gate –Source Voltage	±25	V
I <sub>D</sub>	Continuous Drain Current	T <sub>A</sub> =25°C	-25
		T <sub>A</sub> =100°C	-16
I <sub>DM</sub>	Pulsed Drain Current	-100	A
EAS	Single Pulse Avalanche Energy	150	mJ
IAS	Single Pulse Avalanche Current	-24.5	A
P <sub>D</sub>	Power Dissipation (T <sub>A</sub> =25°C)	50	W
	Power Dissipation (Derate above 25°C)	0.4	W/°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to +150	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to +150	°C
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient	62	°C/W
R <sub>θJC</sub>	Thermal Resistance-Junction to Case	2.5	°C/W

## Electrical Characteristics

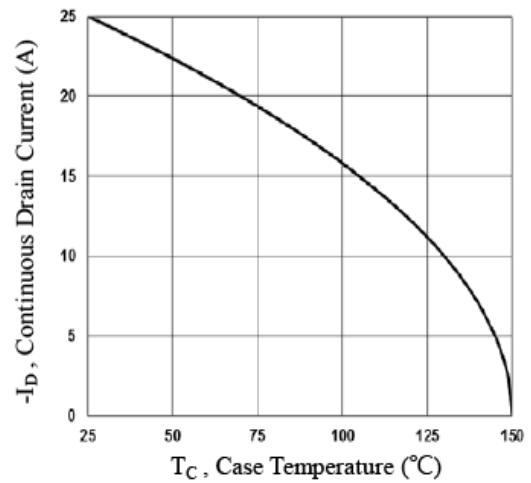
T<sub>A</sub>=25°C Unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-100			V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =-1mA		-0.05		V/°C
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-1.5	-2.2	-3.0	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±25V			±100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-100V, V <sub>GS</sub> =0V			-1	uA
		V <sub>DS</sub> =-80V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C			-30	
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current			-25	A
I <sub>SM</sub>	Pulsed Source Current				-100	
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> = -10V, I <sub>D</sub> =-20A		33	42	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> =-10A		39	52	
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A		-0.8	-1.1	V
t <sub>rr</sub>	Reverse Recovery Time	V <sub>GS</sub> = 0V, I <sub>S</sub> = -1A, di/dt=100A/us		41		ns
Q <sub>rr</sub>	Reverse Recovery Charge			73		uC
<b>Dynamic</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =-50V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-20A		76.4		nC
Q <sub>gs</sub>	Gate-Source Charge			13.6		
Q <sub>gd</sub>	Gate-Drain Charge			18.5		
C <sub>iSS</sub>	Input Capacitance	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V, f=1MHz		3250		pF
C <sub>oss</sub>	Output Capacitance			310		
C <sub>rSS</sub>	Reverse Transfer Capacitance			180		
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =-30V, I <sub>D</sub> =-1A, V <sub>GS</sub> =-10V, R <sub>G</sub> =6Ω		13	24	ns
t <sub>r</sub>				7	14	
t <sub>d(off)</sub>	Turn-Off Time			108	195	
t <sub>f</sub>				46	84	
R <sub>g</sub>	Gate Resistance		V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz		3.4	

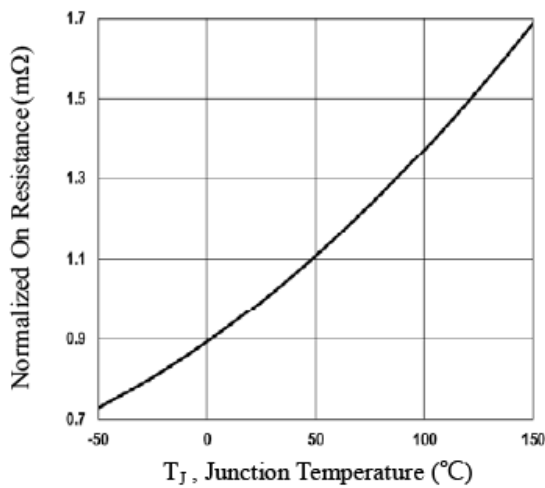
## Typical Performance Characteristics



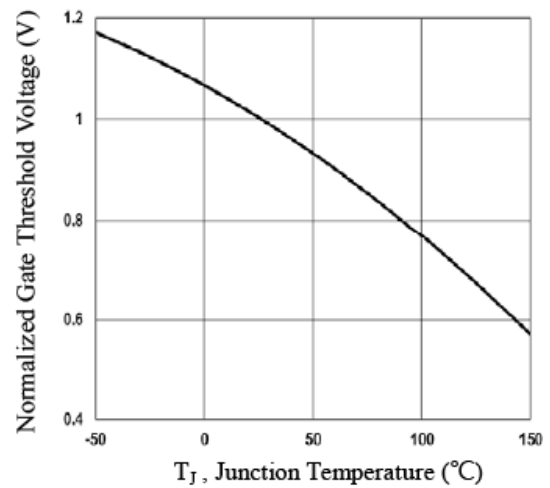
**Fig.1 Output Characteristics**



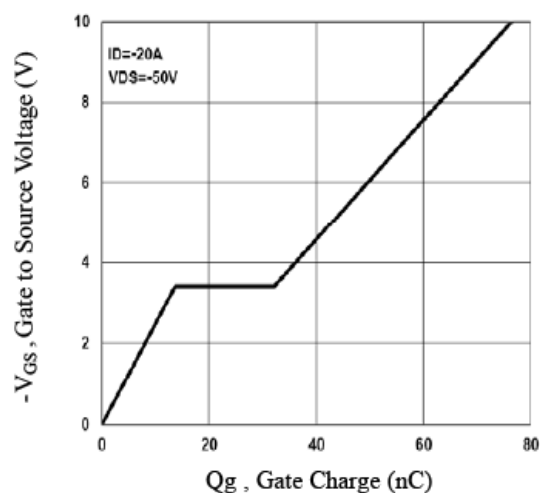
**Fig.2 Continuous Drain Current vs.  $T_C$**



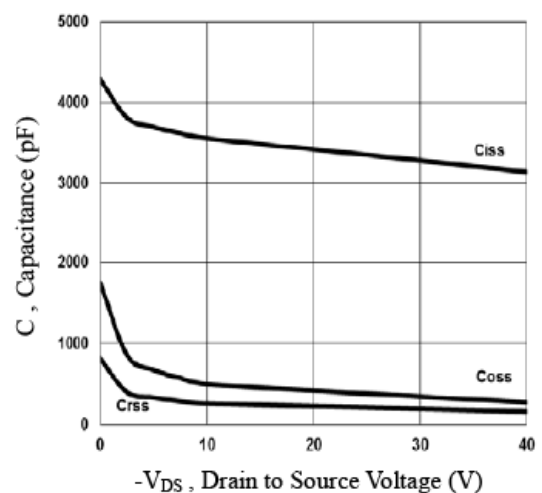
**Fig.3 Normalized  $R_{DS(on)}$  vs.  $T_J$**



**Fig.4 Normalized  $V_{th}$  vs.  $T_J$**



**Fig.5 Gate Charge Waveform**



**Fig.6 Capacitance Characteristics**

## Typical Performance Characteristics (Continue)

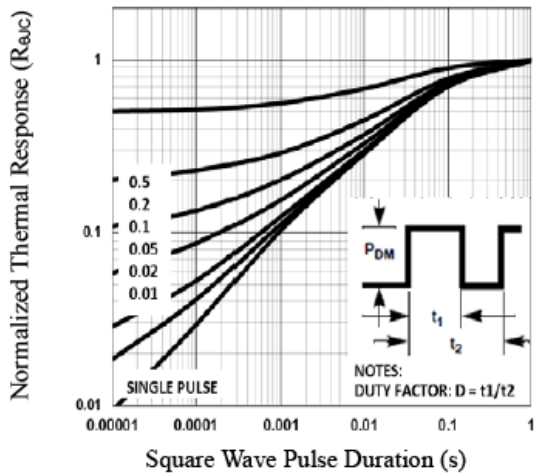


Fig.7 Normalized Transient Impedance

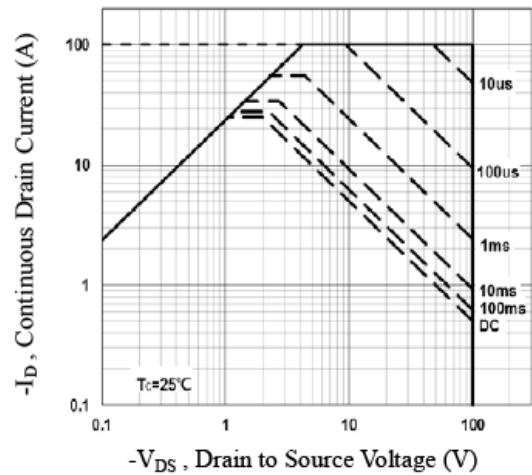
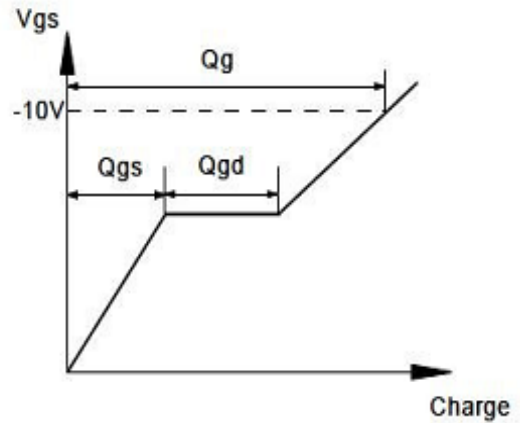
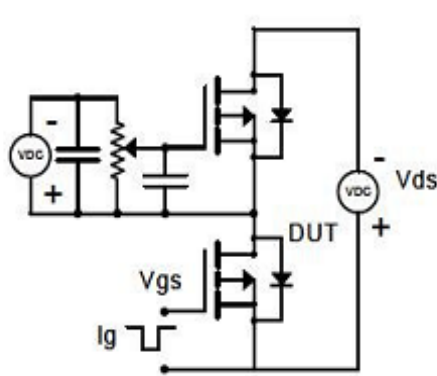
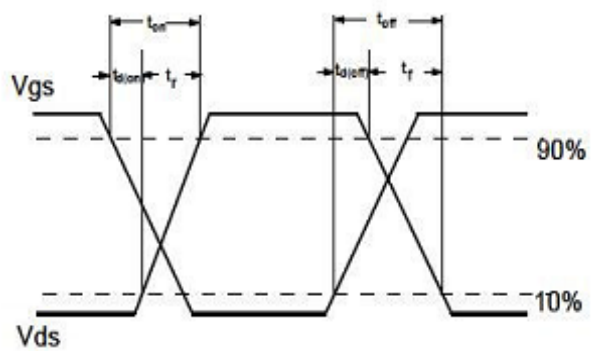
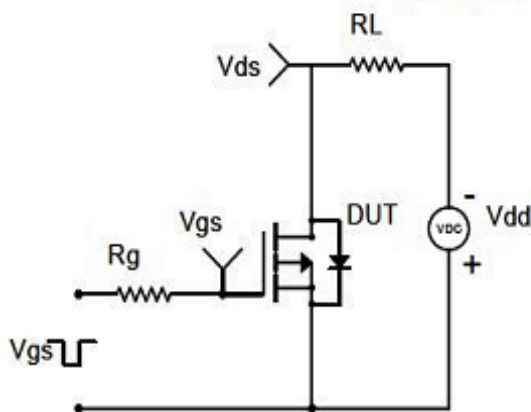


Fig.8 Maximum Safe Operation Area

### Gate Charge Test Circuit & Waveform

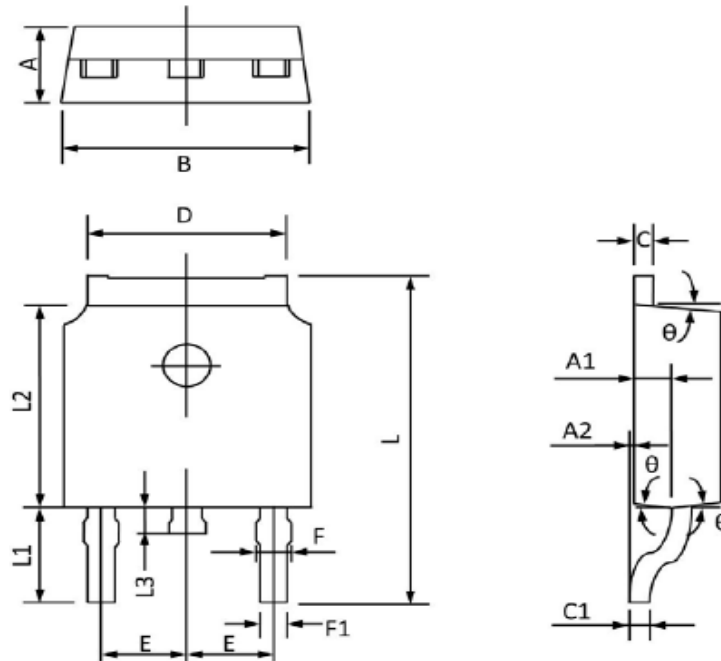


### Resistive Switching Test Circuit & Waveforms



Package Dimension

TO-252-2L










Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.20	2.40	0.087	0.094
A1	0.91	1.11	0.036	0.044
A2	0.00	0.15	0.000	0.006
B	6.50	6.70	0.256	0.264
C	0.46	0.58	0.018	0.030
C1	0.46	0.58	0.018	0.030
D	5.10	5.46	0.201	0.215
E	2.186	2.386	0.086	0.094
F	0.74	0.94	0.029	0.037
F1	0.66	0.86	0.026	0.034
L	9.80	10.40	0.386	0.409
L1	2.9 (REF)		0.114 (REF)	
L2	6.00	6.20	0.236	0.244
L3	0.60	1.00	0.024	0.039
θ	3°	9°	3°	9°



## NOTICE

Information furnished is believed to be accurate and reliable. However Globaltech Semiconductor assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties, which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Globaltech Semiconductor. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information without express written approval of Globaltech Semiconductor.

## 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

Shenzhen Branch(China)	
	1113 B Building, Happiness Washington, Baoan Nan Road, Luohu District, Shenzhen City, China
	0755-22208941
	sales_cn@gs-power.com

RD Division	
	824 Bolton Drive Milpitas. CA. 95035
	1-408-457-0587