

# GSMDD4906

## 40V N-Channel MOSFETs

### Product Description

These N-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.

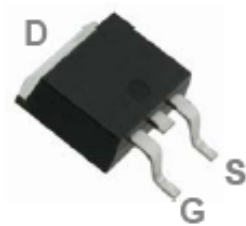
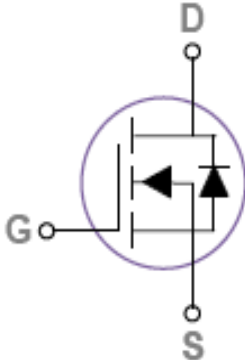
### Features

- 40V, 50A,  $R_{DS(ON)}=8.5m\Omega @ V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available

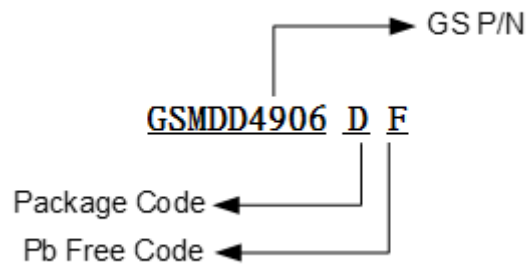
### Applications

- Notebook
- Load Switch
- LED applications
- Hand-Held Device

### Packages & Pin Assignments

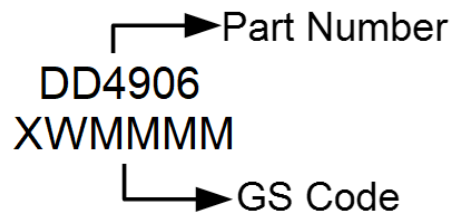
GSMDD4906DF (TO-252)	
 <p>Top View</p>	
Description	
Gate	
Source	
Drain	

## Ordering Information



Part Number	Package	Quantity Reel
GSMDD4906DF	TO-252	2500 PCS

## Marking Information



## Absolute Maximum Ratings

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

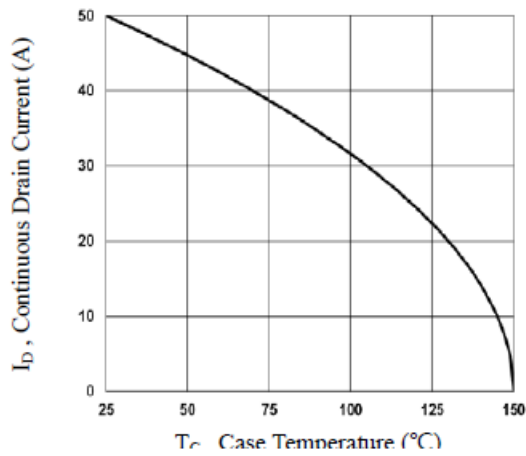
Symbol	Parameter	Typical	Unit
$V_{DS}$	Drain-Source Voltage	40	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current	$T_A=25^{\circ}\text{C}$	A
		$T_A=100^{\circ}\text{C}$	
$I_{DM}$	Pulsed Drain Current	200	A
$P_D$	Power Dissipation ( $T_A=25^{\circ}\text{C}$ )	54	W
	Power Dissipation (Derate above $25^{\circ}\text{C}$ )	0.43	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	2.31	$^{\circ}\text{C}/\text{W}$

## Electrical Characteristics

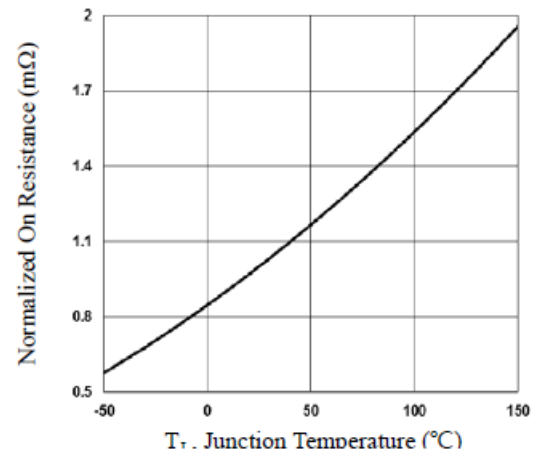
T<sub>A</sub>=25°C Unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V,I <sub>D</sub> =250uA	40	---	---	V
△BV <sub>DSS</sub> /△T <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25℃, I <sub>D</sub> =1mA	---	0.03	---	V/℃
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> ,I <sub>D</sub> =250uA	1.2	1.8	2.5	V
△V <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	-5	---	mV/℃
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V,V <sub>GS</sub> =±20V	---	---	±100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =40V,V <sub>GS</sub> =0V T <sub>J</sub> =25℃	---	---	1	uA
		V <sub>DS</sub> =32V,V <sub>GS</sub> =0V, T <sub>J</sub> =85℃	---	---	10	
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	50	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> =8A	---	6.5	8.5	mΩ
		V <sub>GS</sub> =4.5V,I <sub>D</sub> =4A	---	9	12	mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =10V,I <sub>D</sub> =10A	---	13	---	S
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V,I <sub>S</sub> =1A T <sub>J</sub> =25℃	---	---	1	V
t <sub>rr</sub>	Reverse Recovery Time	V <sub>GS</sub> =0V,I <sub>S</sub> =1A, di/dt=100A/us T <sub>J</sub> =25℃	---	17	---	ns
Q <sub>rr</sub>	Reverse Recovery Charge		---	2.8	---	nC
Dynamic						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =20V,V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A	---	12.2	24	nC
Q <sub>gs</sub>	Gate-Source Charge		---	3.3	7	
Q <sub>gd</sub>	Gate-Drain Charge		---	6.7	13	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V,V <sub>GS</sub> =0V, f=1MHz	---	1220	2200	pF
C <sub>oss</sub>	Output Capacitance		---	130	250	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	55	110	
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =15V,I <sub>D</sub> =1A, V <sub>GS</sub> =10V,R <sub>G</sub> =3.3Ω	---	13.2	25	ns
t <sub>r</sub>			---	2.2	5	
t <sub>d(off)</sub>	Turn-Off Time		---	72	130	
t <sub>f</sub>			---	4.5	10	
R <sub>g</sub>	Gate Resistance		V <sub>DS</sub> =0V,V <sub>GS</sub> =0V, f=1MHz	---	2.2	

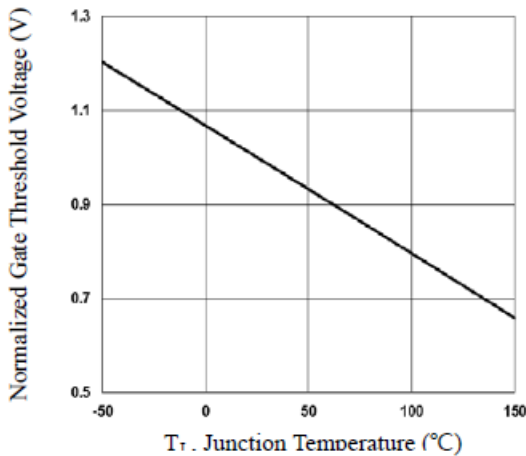
## Typical Performance Characteristics



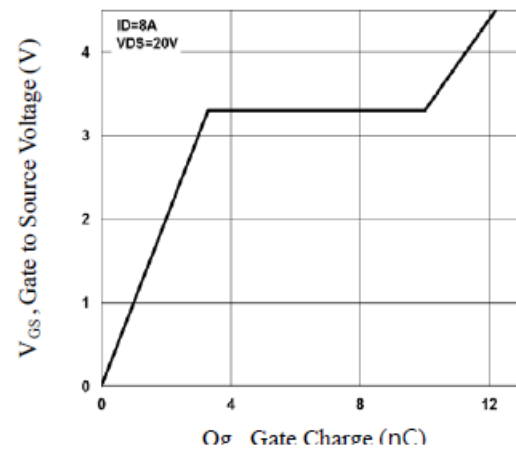
**Fig.1 Continuous Drain Current vs.  $T_C$**



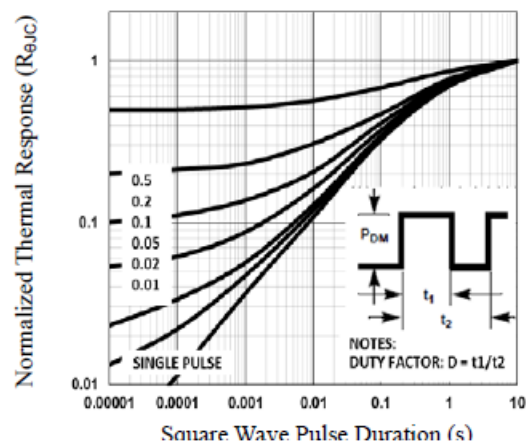
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_J$**



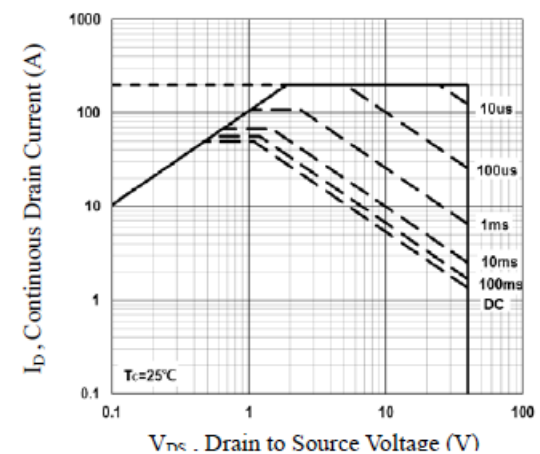
**Fig.3 Normalized  $V_{th}$  vs.  $T_J$**



**Fig.4 Gate Charge Waveform**

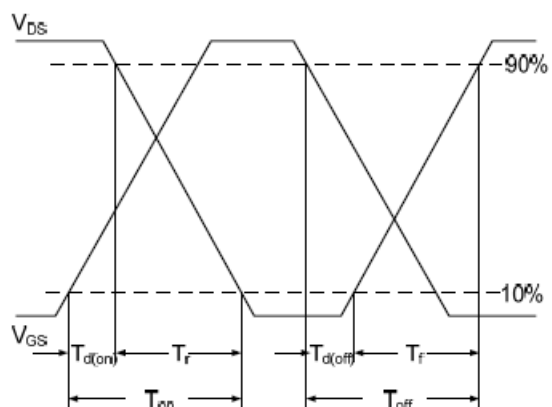


**Fig.5 Normalized Transient Impedance**

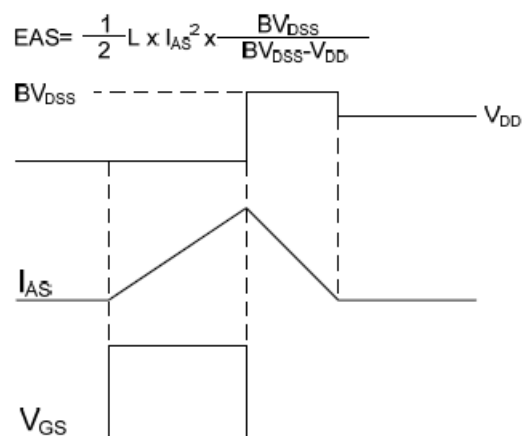


**Fig.6 Maximum Safe Operation Area**

## Typical Performance Characteristics (Continue)



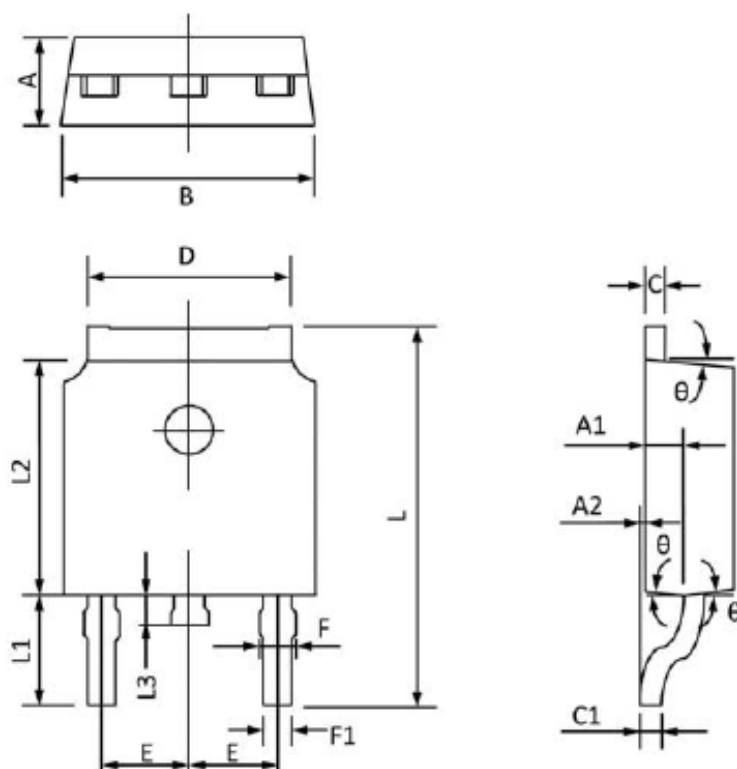
**Fig.7 Switching Time Waveform**



**Fig.8 EAS Waveform**

## Package Dimension

### TO-252-2L









Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.400	2.200	0.094	0.087
A1	1.110	0.910	0.044	0.036
A2	0.150	0.000	0.006	0.000
B	6.700	6.500	0.264	0.256
C	0.580	0.460	0.023	0.018
C1	0.580	0.460	0.023	0.018
D	5.460	5.100	0.215	0.201
E	2.386	2.186	0.094	0.086
F	0.940	0.740	0.037	0.029
F1	0.860	0.660	0.034	0.026
L	10.400	9.800	0.409	0.386
L1	2.9REF		0.114REF	
L2	6.200	6.000	0.244	0.236
L3	1.000	0.600	0.039	0.024
θ	9°	3°	9°	3°

## 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 Neihs 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