

# GSMDD4904

## 40V N-Channel MOSFETs

### Product Description

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advance 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.

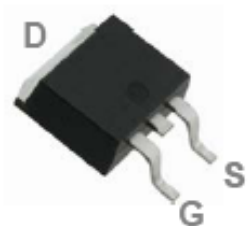
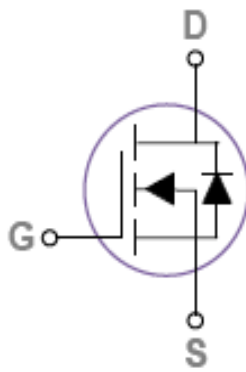
### Features

- 40V, 80A,  $R_{DS(ON)}=5.5\Omega@V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available

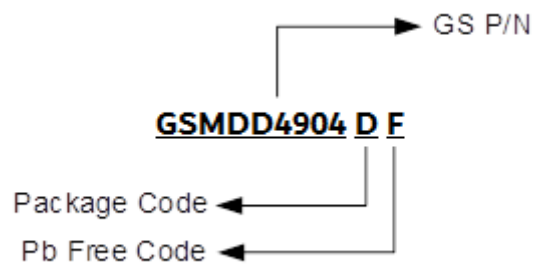
### Applications

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

### Packages & Pin Assignments

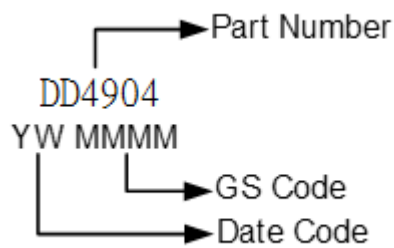
GSMDD4904DF (TO-252)	
	
<b>Description</b>	
Gate	
Source	
Drain	

## Ordering Information



Part Number	Package	Quantity Reel
GSMDD4904DF	TO-252-	2500 PCS

## Marking Information



## Absolute Maximum Ratings

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

Symbol	Parameter	Typical	Unit
V <sub>DS</sub>	Drain-Source Voltage	40	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>c</sub> =25°C	80
		T <sub>c</sub> =100°C	50
I <sub>DM</sub>	Pulsed Drain Current	320	A
P <sub>D</sub>	Power Dissipation (T <sub>c</sub> =25°C)	88	W
	Power Dissipation (Derate above 25°C)	0.59	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	1.7	°C/W

## Electrical Characteristics

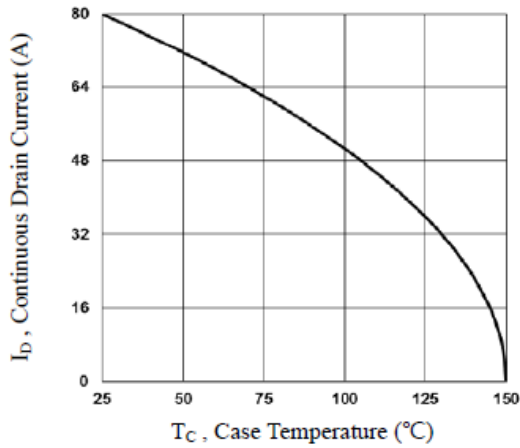
T<sub>J</sub>=25°C Unless otherwise noted

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	40	---	---	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA	---	0.03	---	V/°C
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.0	1.6	2.5	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	-5	---	mV/°C
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V	---	---	±100	nA
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =40V, V <sub>GS</sub> =0V T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =32V, V <sub>GS</sub> =0V, T <sub>J</sub> =85°C	---	---	10	
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	80	A
I <sub>SM</sub>	Pulsed Source Current		---	---	160	
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	---	4.2	5.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A	---	5.3	7	mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =10A	---	16	---	S
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =1A T <sub>J</sub> =25°C	---	---	1	V
<b>Dynamic</b>						
Q <sub>g</sub>	Total Gate Charge <sup>2,3</sup>	V <sub>DS</sub> =32V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A	---	25	50	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>2,3</sup>		---	6.4	13	
Q <sub>gd</sub>	Gate-Drain Charge <sup>2,3</sup>		---	12.1	24	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz	---	2410	3600	pF
C <sub>oss</sub>	Output Capacitance		---	233	400	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	152	230	
t <sub>d(on)</sub>	Turn-On Time <sup>2,3</sup>	V <sub>DD</sub> =20V, I <sub>D</sub> =1A, V <sub>GS</sub> =10V, R <sub>G</sub> =3.3Ω	---	14.2	28	ns
t <sub>r</sub>			---	18.3	36	
t <sub>d(off)</sub>	Turn-Off Time <sup>2,3</sup>		---	38.8	76	
t <sub>f</sub>			---	13.9	28	
R <sub>g</sub>	Gate Resistance		V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	---	1.6	

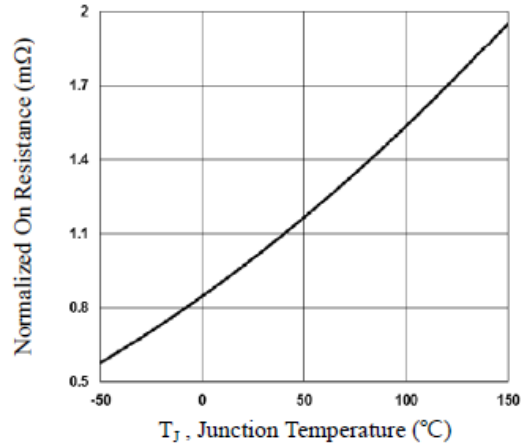
Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

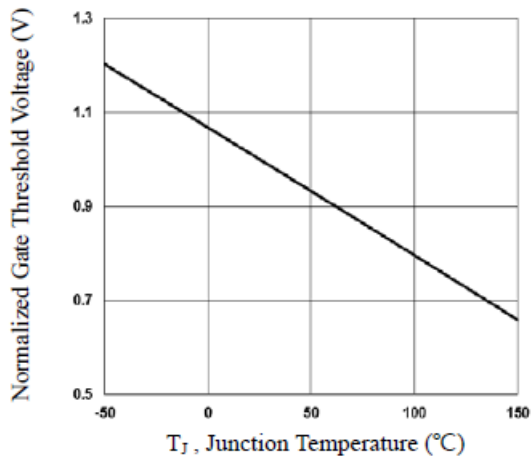
## Typical Performance Characteristics



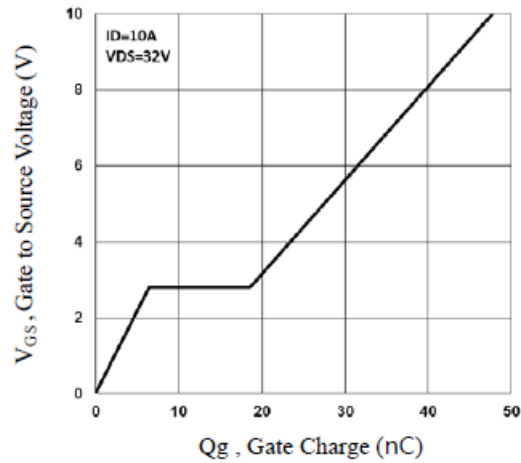
**Fig.1 Continuous Drain Current vs.  $T_c$**



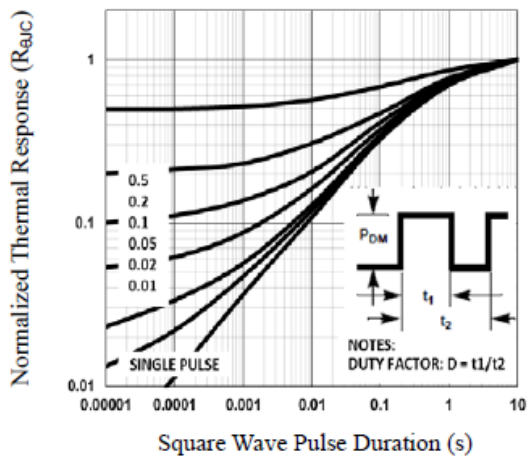
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$**



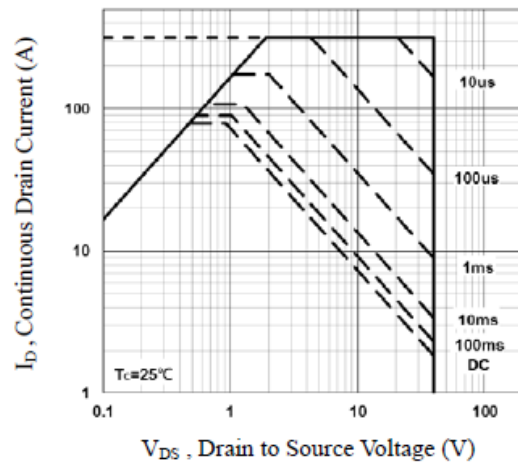
**Fig.3 Normalized  $V_{th}$  vs.  $T_j$**



**Fig.4 Gate Charge Waveform**

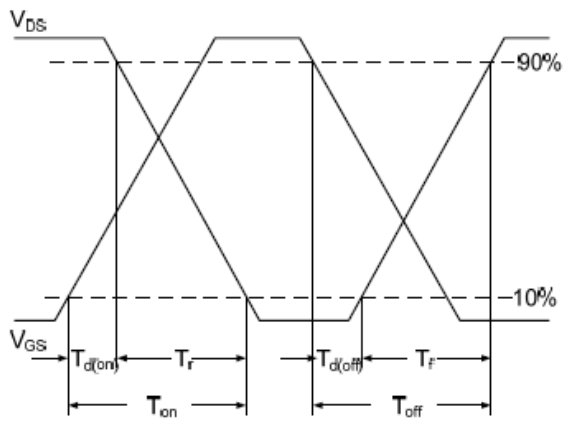


**Fig.5 Normalized Transient Impedance**

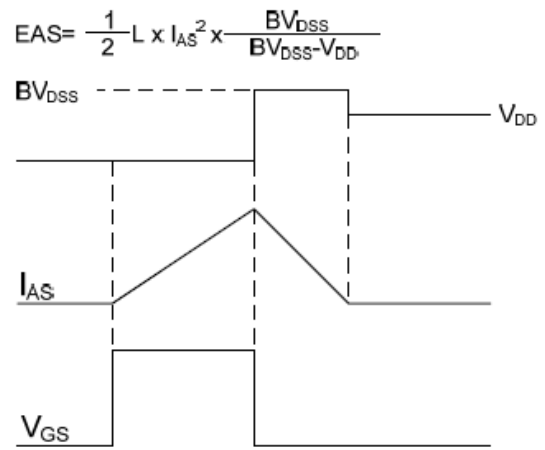


**Fig.6 Maximum Safe Operation Area**

## Typical Performance Characteristics (Continue)



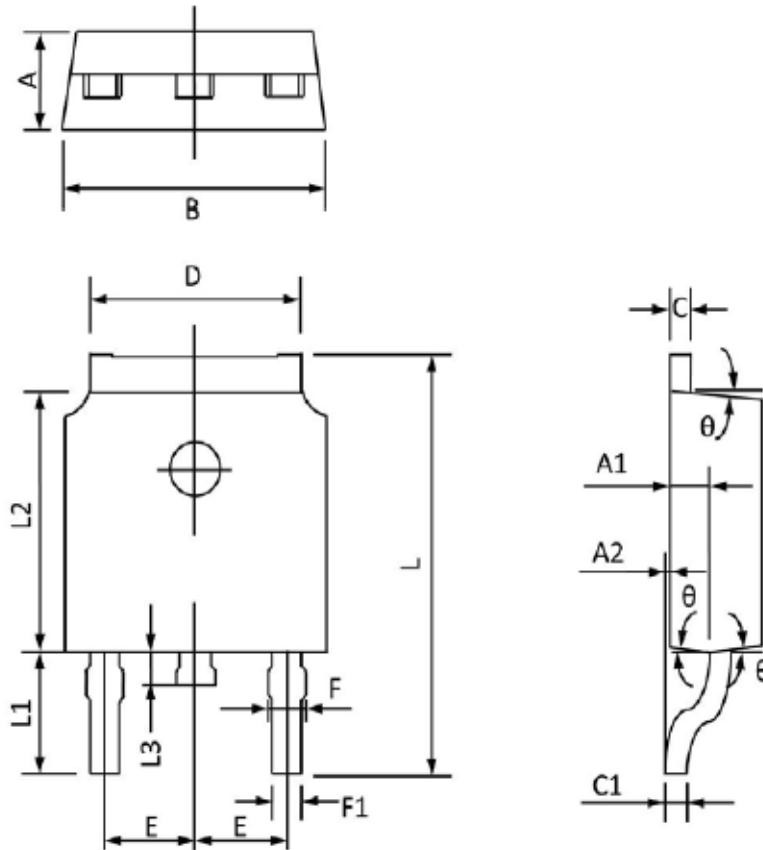
**Fig.7 Switching Time Waveform**



**Fig.8 EAS Waveform**

Package Dimension

## TO252 PACKAGE INFORMATION







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	6.800	6.400	0.268	0.252
C	0.580	0.450	0.023	0.018
C1	0.580	0.460	0.023	0.018
D	5.500	5.100	0.217	0.201
E	2.386	2.186	0.094	0.086
F	0.940	0.600	0.037	0.024
F1	0.860	0.500	0.034	0.020
L	10.400	9.400	0.409	0.370
L1	3.000	2.400	0.118	0.094
L2	6.200	5.400	0.244	0.213
L3	1.200	0.600	0.047	0.024
θ	9°	3°	9°	3°



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