GSMDD4964

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

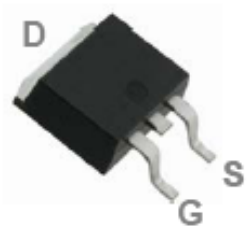
- 40V, 60A, $R_{DS(ON)}$=6.7mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- Green Device Available

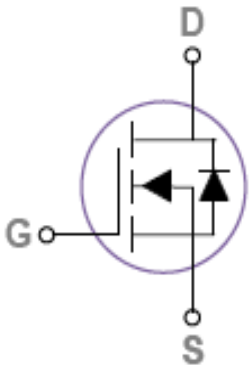
Applications

- MB / VGA / Vcore
- POL Applications
- SMPS 2nd SR

Packages & Pin Assignments

GSMDD4964DF (TO-252)



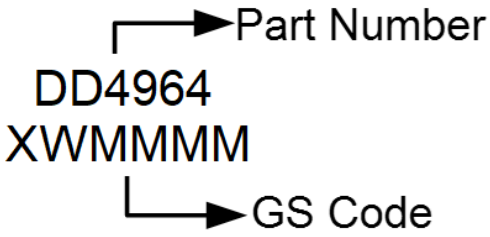


Description
Gate
Source
Drain

Ordering Information

Part Number	Package	Quantity Reel
GSMDD4964DF	TO-252	2500 PCS

Marking Information



Absolute Maximum Ratings

T_C=25ºC 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	Tc=25℃	60	A
		Tc=100℃	38	
I_{DM}	Pulsed Drain Current		240	A
P_D	Power Dissipation (Tc=25℃)		62	W
	Power Dissipation (Derate above 25℃)		0.496	W/℃
T_J	Operating Junction Temperature Range		-55 to +150	℃
T_{STG}	Storage Temperature Range		-55 to +150	℃
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62	℃/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		2.01	℃/W
EAS	Single Pulse Avalanche Energy[2]		76	mJ
IAS	Single Pulse Avalanche Current[2]		39	A

Electrical Characteristics

T_j=25℃ 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
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃, I_D=1mA	---	0.03	---	V/℃
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1.2	1.6	2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-5	---	mV/℃
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0V, V_{GS}=±20V	---	---	±100	nA
I_{DSS}	Drain-Source Leakage Current	V_{DS}=40V, V_{GS}=0V T_J=25℃	---	---	1	uA
		V_{DS}=32V, V_{GS}=0V, T_J=125℃	---	---	10	
I_S	Continuous Source Current[2]	V_G=V_D=0V, Force Current	---	---	60	A
I_{SM}	Pulsed Source Current[2]		---	---	120	
$R_{DS(on)}$	Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=10A	---	5.7	6.7	mΩ
		V_{GS}=4.5V, I_D=5A	---	7.0	8.8	mΩ
g_{FS}	Forward Transconductance	V_{DS}=10V, I_D=3A	---	16	---	S
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_S=1A T_J=25℃	---	---	1	V
Dynamic						
Q_g	Total Gate Charge[2,3]	V_{DS}=20V, V_{GS}=4.5V, I_D=10A	---	16.2	32	nC
Q_{gs}	Gate-Source Charge[2,3]		---	3.85	7	
Q_{gd}	Gate-Drain Charge[2,3]		---	6.05	12	
C_{iss}	Input Capacitance	V_{DS}=25V,V_{GS}=0V, f=1MHz	---	1540	2500	pF
C_{oss}	Output Capacitance		---	171	330	
C_{rss}	Reverse Transfer Capacitance		---	115	220	
$t_{d(on)}$	Turn-On Time[2,3]	V_{DD}=15V, I_D=1A, V_{GS}=10V, R_G=6Ω	---	13.6	25	ns
t_r			---	2.5	5	
$t_{d(off)}$	Turn-Off Time[2,3]		---	68	120	
t_f			---	5	10	
R_g	Gate Resistance	V_{DS}=0V, V_{GS}=0V, f=1MHz	---	1.2	2.2	Ω

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.
4. VDD=25V,VGS=10V,L=0.1mH,IAS=39A., Starting TJ=25℃

Typical Performance Characteristics

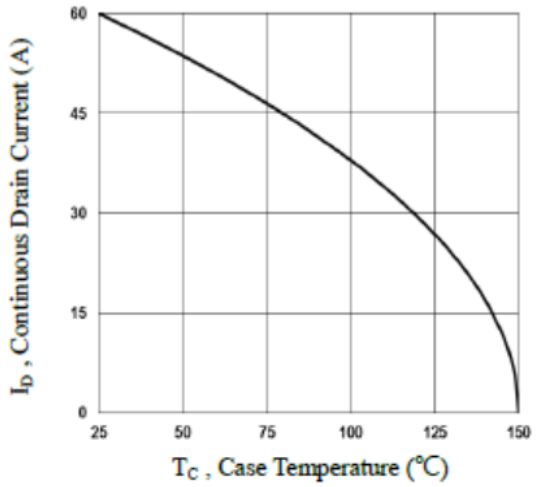


Fig.1 Continuous Drain Current vs. T_C

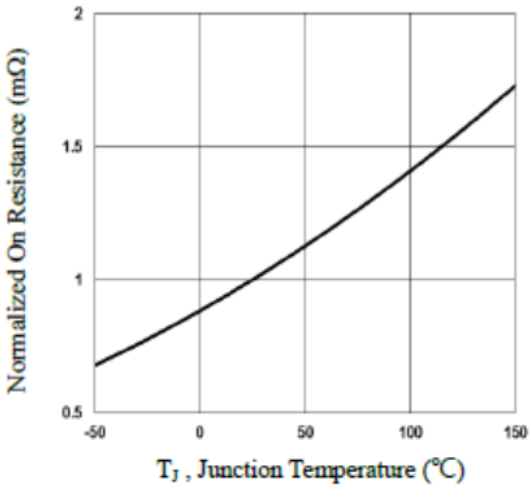


Fig.2 Normalized RDSON vs. T_J

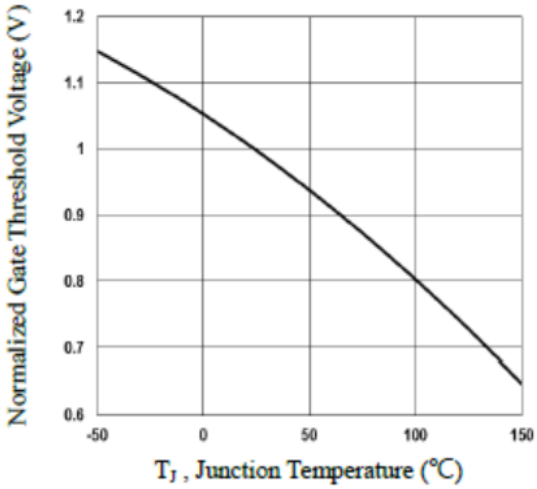


Fig.3 Normalized V_{th} vs. T_J

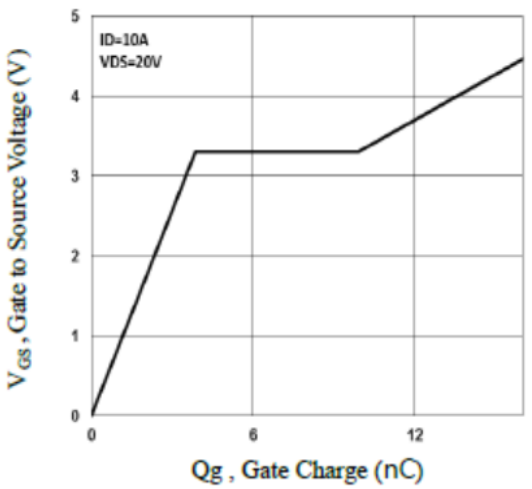


Fig.4 Gate Charge Waveform

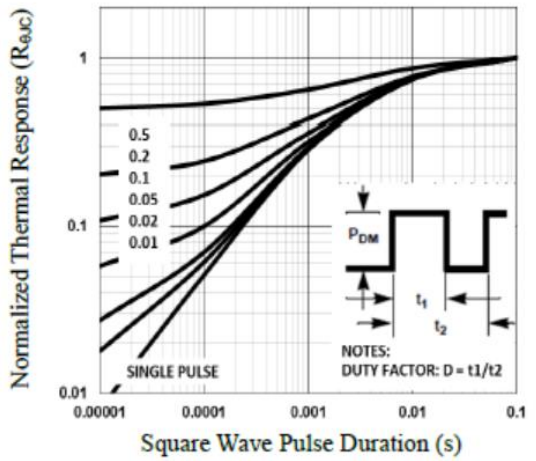


Fig.5 Normalized Transient Impedance

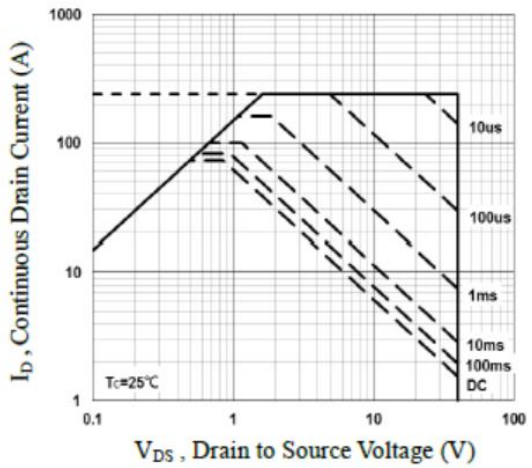


Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

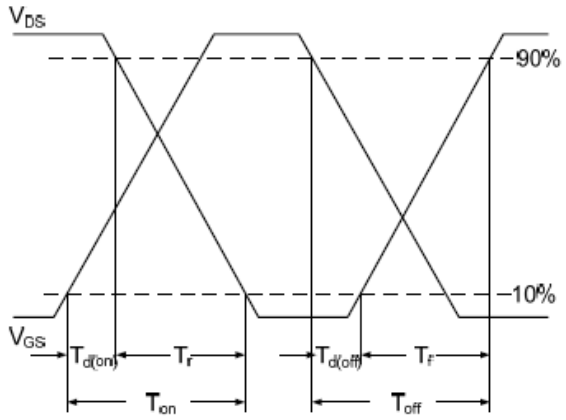


Fig.7 Switching Time Waveform

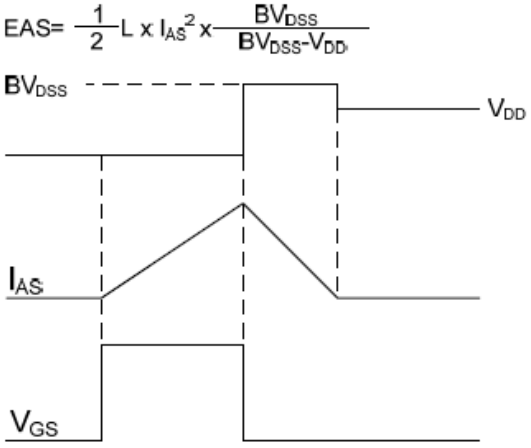
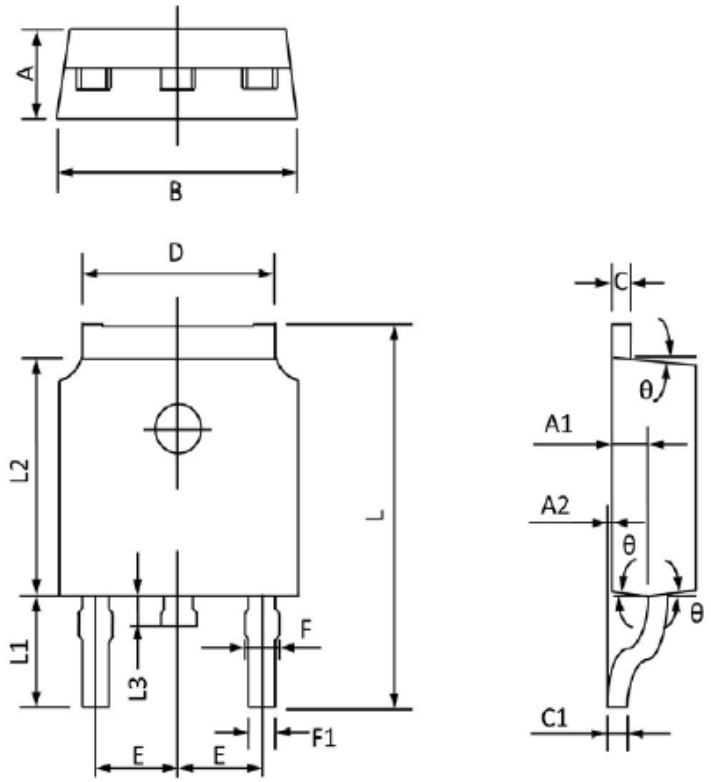


Fig.8 EAS Waveform

Package Dimension

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	6.800	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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