

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.

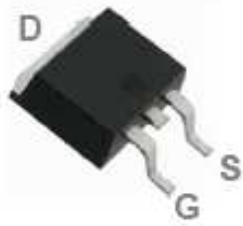
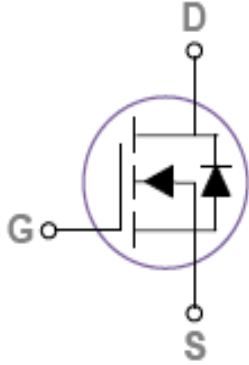
Features

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

Applications

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

Packages & Pin Assignments

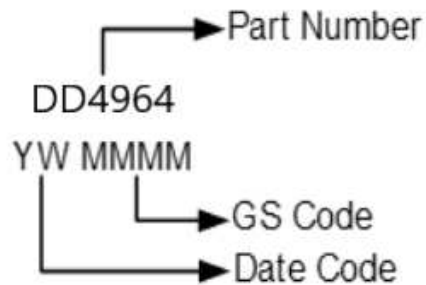
GSMDD4964DF (TO-252)	
	
Description	
Gate	
Source	
Drain	

Ordering Information



Part Number	Package	Quantity Reel
GSMDD4964DF	TO-252-	2500 PCS

Marking Information



Absolute Maximum Ratings

T_C=25°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 _C =25°C	60
		T _C =100°C	38
I _{DM}	Pulsed Drain Current	240	A
P _D	Power Dissipation (T _C =25°C)	62	W
	Power Dissipation (Derate above 25°C)	0.496	W/°C
T _J	Operating Junction Temperature Range	-55 to +150	°C
T _{STG}	Storage Temperature Range	-55 to +150	°C
R _{θJA}	Thermal Resistance-Junction to Ambient	62	°C/W
R _{θJC}	Thermal Resistance-Junction to Case	2.01	°C/W
EAS	Single Pulse Avalanche Energy ²	76	mJ
IAS	Single Pulse Avalanche Current ²	39	A

Electrical Characteristics

T_J=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 =250μA	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	V _{DS} =V _{GS} , I _D =250μA	1.2	1.6	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-5	---	mV/°C
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°C	---	---	1	μA
		V _{DS} =32V, V _{GS} =0V, T _J =125°C	---	---	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°C	---	---	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	

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. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=39A., Starting T_J=25°C

Typical Performance Characteristics

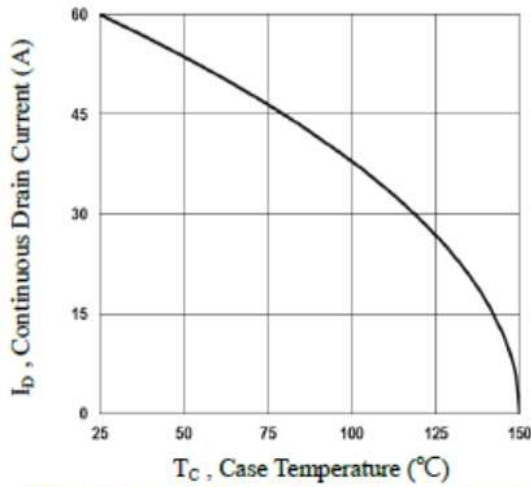


Fig.1 Continuous Drain Current vs. T_c

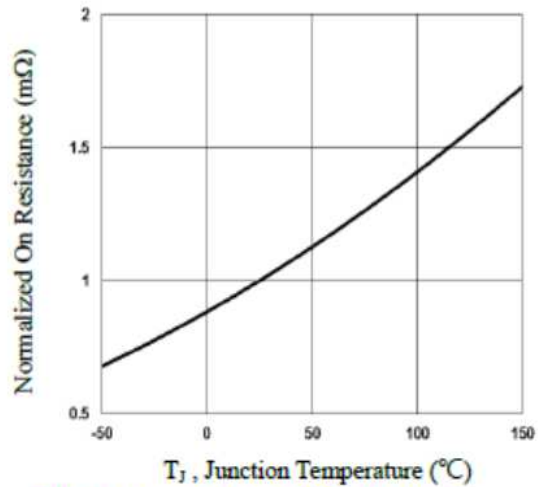


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

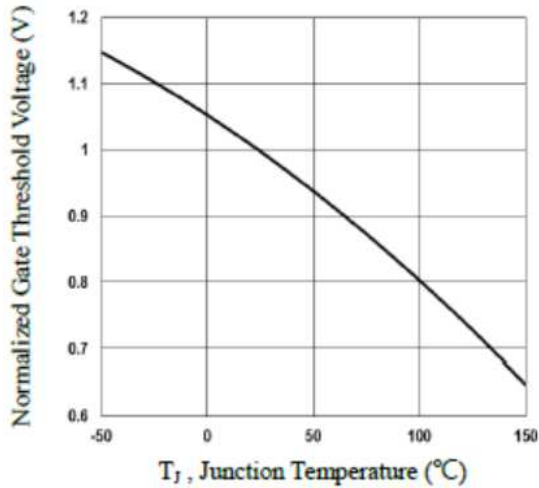


Fig.3 Normalized V_{th} vs. T_j

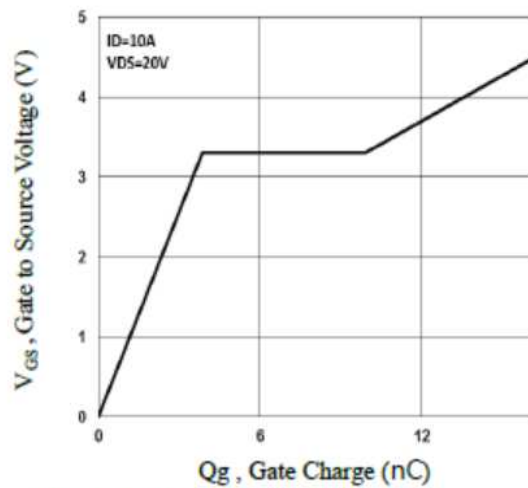


Fig.4 Gate Charge Waveform

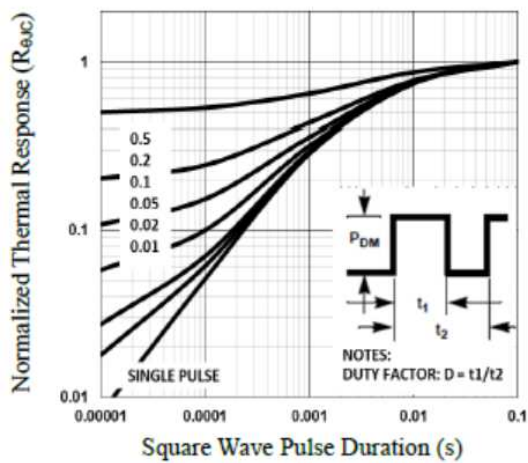


Fig.5 Normalized Transient Impedance

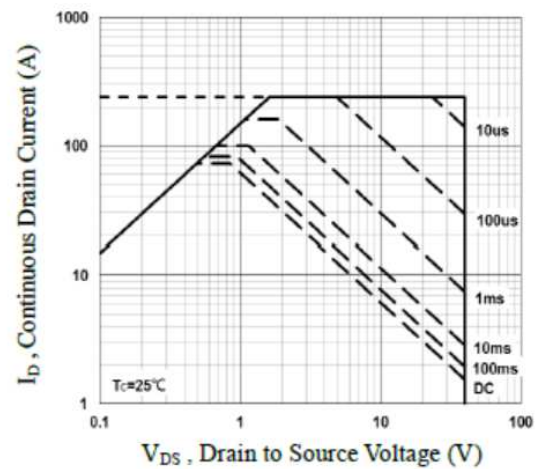


Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

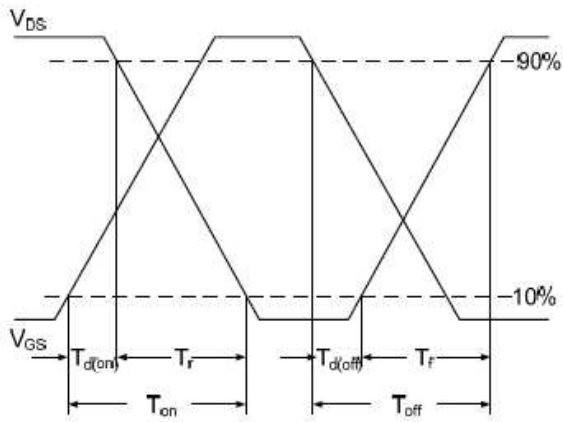


Fig.7 Switching Time Waveform

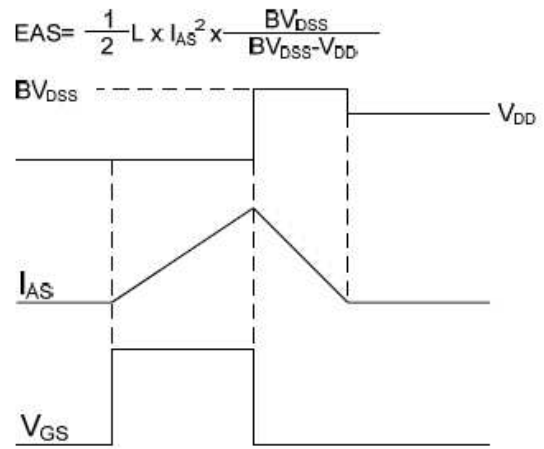
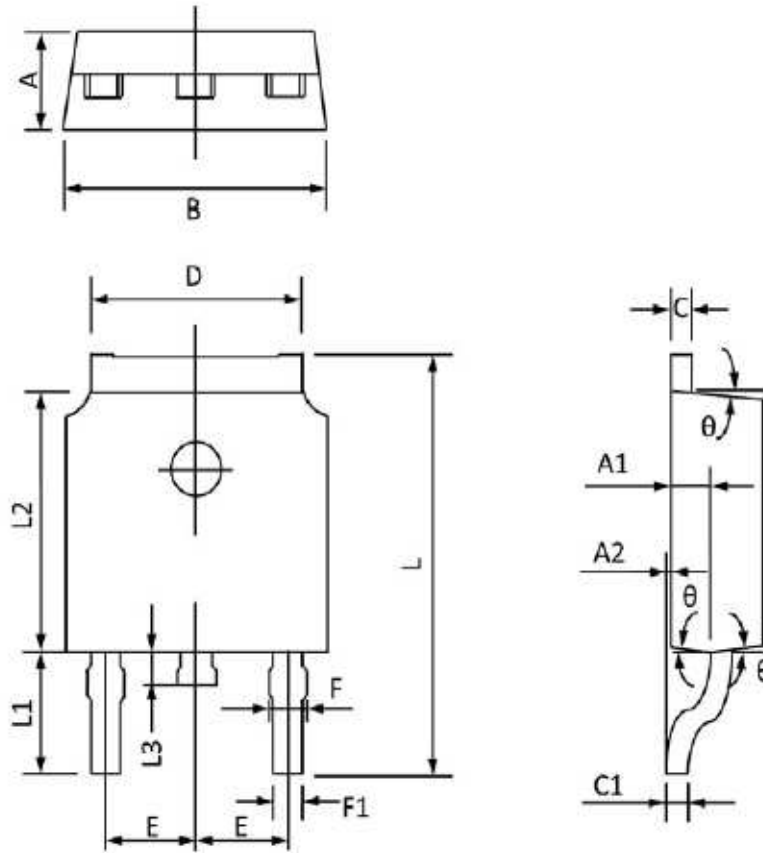


Fig.8 EAS Waveform

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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