GSMDD3094

30V 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

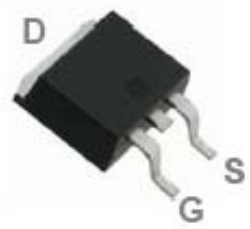
- 30V, 90A, $R_{DS(ON)}$=4mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- 100% EAS guaranteed
- Green Device Available
- TO-252-2L package design

Applications

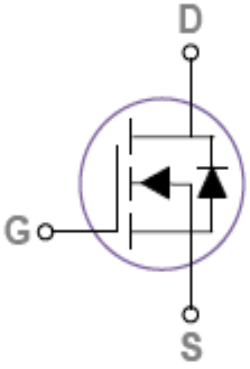
- MB / VGA / Vcore
- POL Applications
- SMPS 2nd SR

Packages & Pin Assignments

GSMDD3094DF (TO-252-2L)

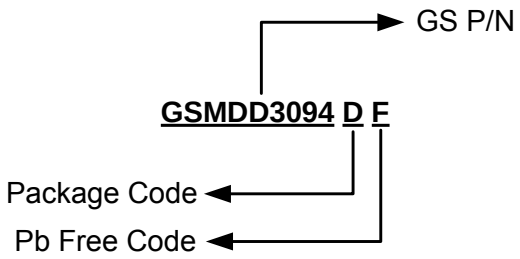


Top View



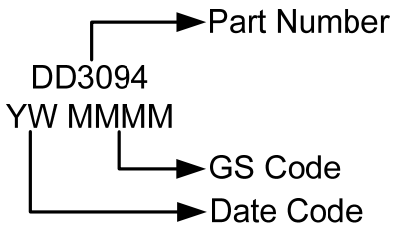
Description
Gate
Source
Drain

Ordering Information



Part Number	Package	Quantity Reel
GSMDD3094DF	TO-252-2L	2500 PCS

Marking Information



Absolute Maximum Ratings

T_A=25ºC Unless otherwise noted

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		30	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A=25℃	90	A
		T_A=100℃	57	
I_{DM}	Pulsed Drain Current		360	A
EAS	Single Pulse Avalanche Energy		125	mJ
IAS	Single Pulse Avalanche Current		50	A
P_D	Power Dissipation (T_A=25℃)		88	W
	Power Dissipation (Derate above 25℃)		0.59	W/℃
T_J	Operating Junction Temperature Range		-55 to +175	℃
T_{STG}	Storage Temperature Range		-55 to +175	℃
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62	℃/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		1.7	℃/W

Electrical Characteristics

T_A=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	30			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 Leakage Current	V_{DS}=0V,V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V,V_{GS}=0V			1	uA
		V_{DS}=24V,V_{GS}=0V, T_J=125℃			10	
I_S	Continuous Source Current	V_G=V_D=0V, Force Current			90	A
I_{SM}	Pulsed Source Current				360	
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=10V,I_D=24A		3.1	4	mΩ
		V_{GS}=4.5V,I_D=12A		4.5	6	mΩ
g_{FS}	Forward Transconductance	V_{DS}=10V,I_D=10A		15.5		S
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=1A			1	V
EAS	Single Pulse Avalanche Energy	V_{DD}=25V,L=0.1mH, IAS=24A	31			mJ
Dynamic						
Q_g	Total Gate Charge	V_{DS}=15V,V_{GS}=4.5V, I_D=24A		24	34	nC
Q_{gs}	Gate-Source Charge			4.2	8	
Q_{gd}	Gate-Drain Charge			13	20	
C_{iss}	Input Capacitance	V_{DS}=25V,V_{GS}=0V, f=1MHz		2200	3300	pF
C_{oss}	Output Capacitance			280	410	
C_{rss}	Reverse Transfer Capacitance			177	260	
$t_{d(on)}$	Turn-On Time	V_{DD}=15V,I_D=15A, V_{GS}=10V,R_G=3.3Ω		12.6	24	ns
t_r				19.5	37	
$t_{d(off)}$	Turn-Off Time			42.8	81	
t_f				13.2	25	
R_g	Gate Resistance	V_{DS}=0V,V_{GS}=0V, f=1MHz		2	4	Ω

Typical Performance Characteristics

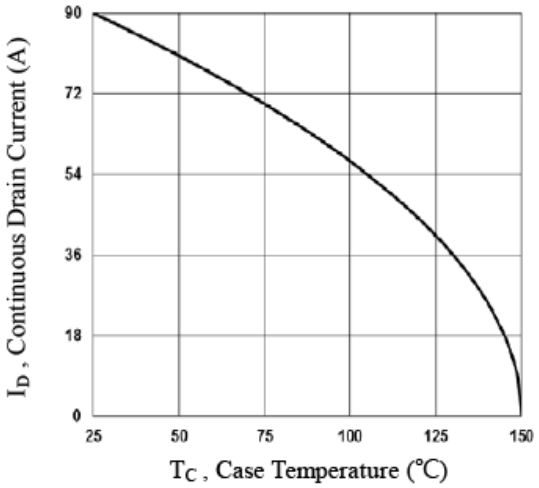


Fig.1 Continuous Drain Current vs. T_c

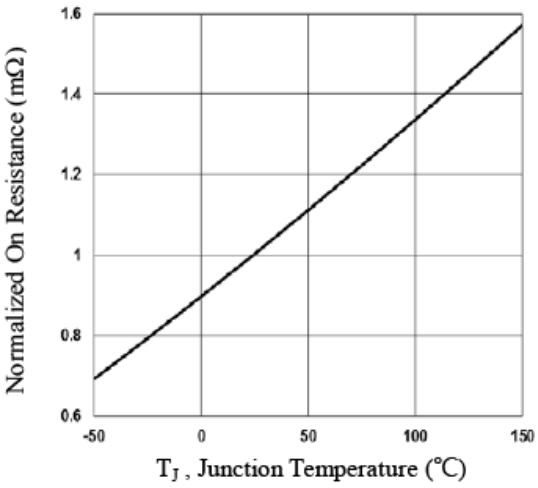


Fig.2 Normalized RDSON vs. T_J

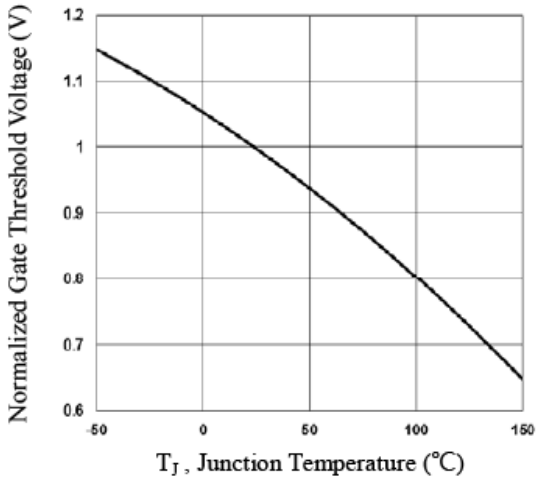


Fig.3 Normalized V_{th} vs. T_J

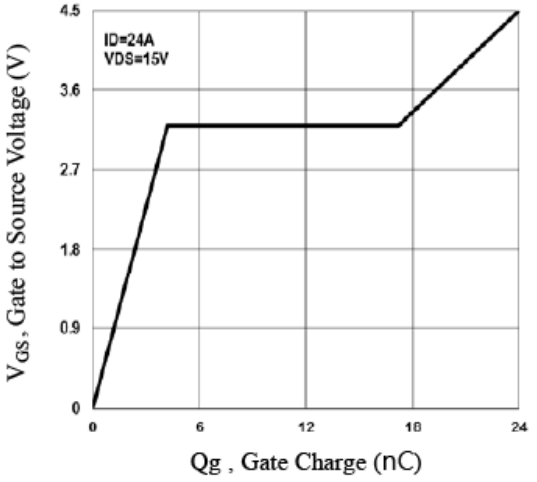


Fig.4 Gate Charge Waveform

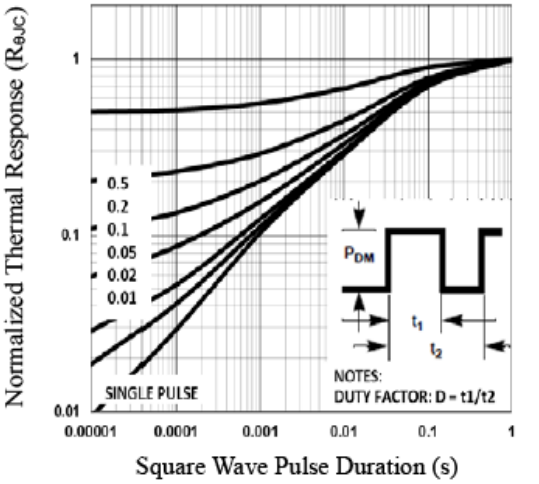


Fig.5 Normalized Transient Impedance

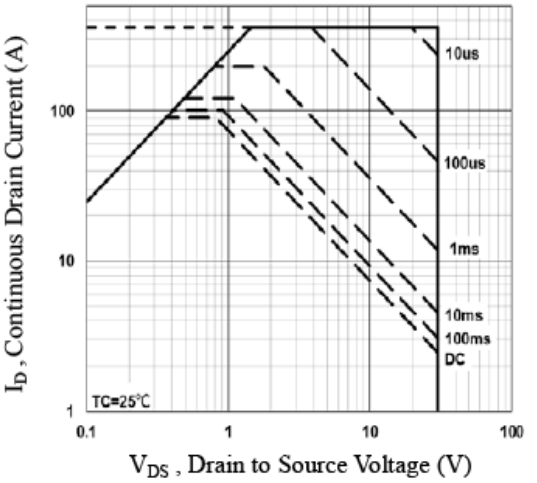
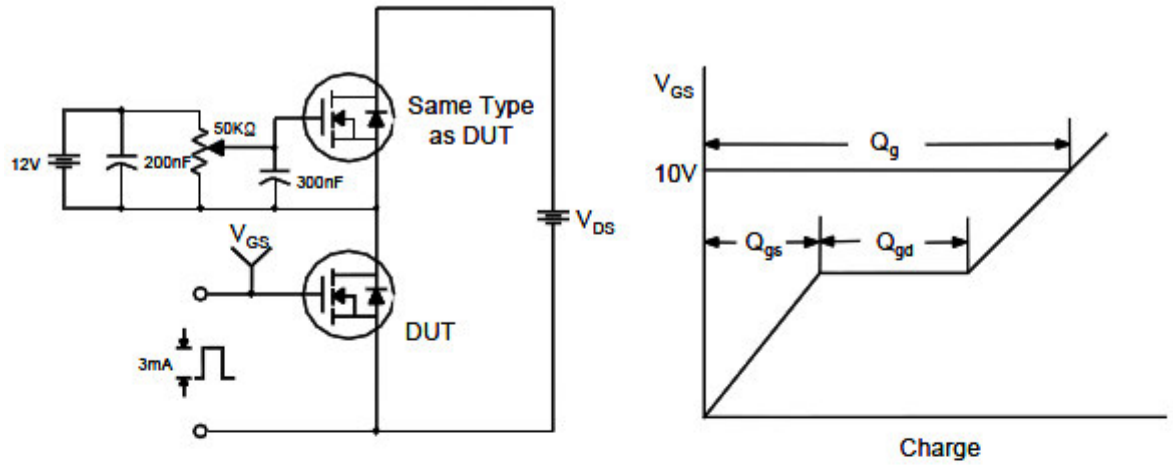


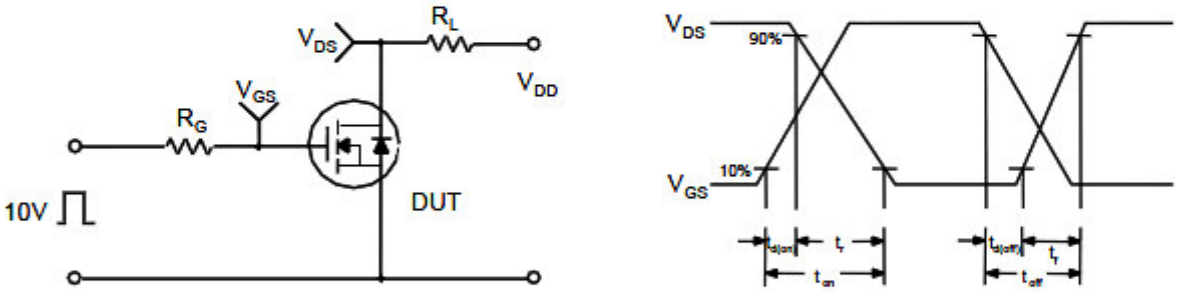
Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

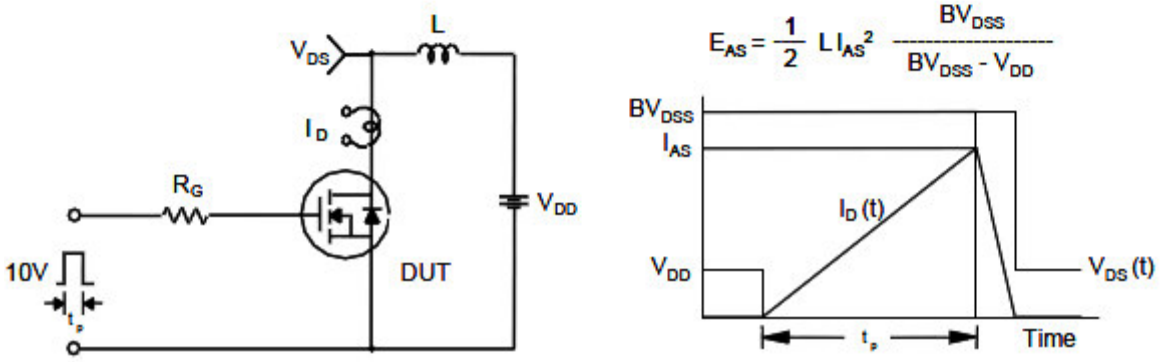
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

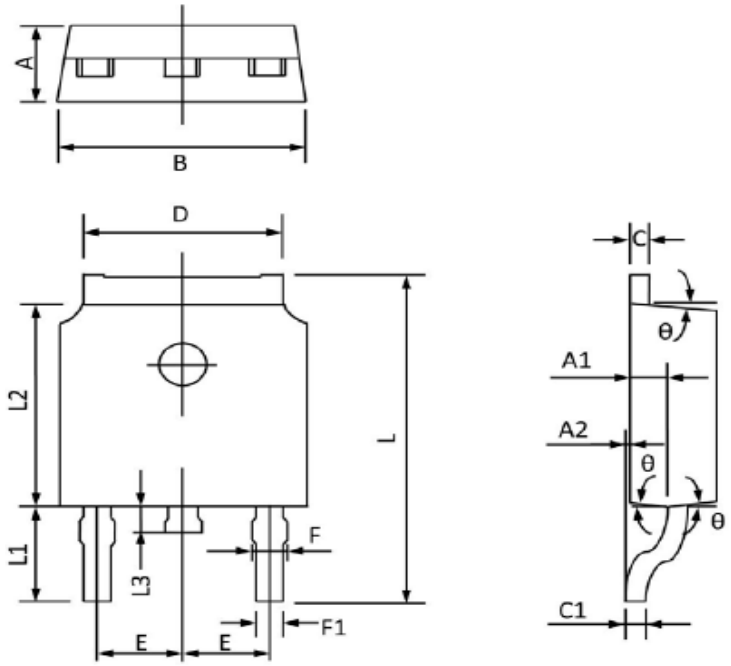


Unclamped Inductive Switching Test Circuit & Waveforms



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°

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