

GSMDD03N20

200V N-Channel MOSFETs

Product Description

These N-Channel enhancement mode power field effect transistors are planar stripe, 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 switch mode power supply.

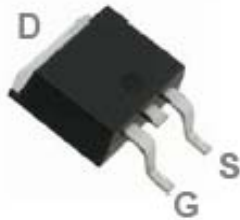
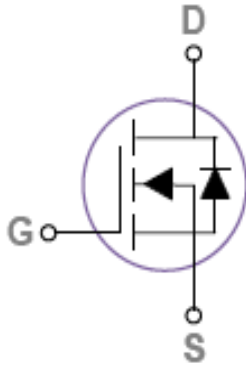
Features

- 200V, 3A, $R_{DS(ON)}=0.85\Omega@V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS guaranteed
- Green Device Available
- TO-252-2L package design

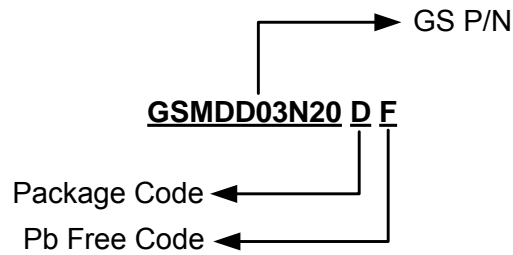
Applications

- High efficient switched mode power supplies
- TV Power
- Adapter/charger
- Server Power
- PV Inverter / UPS

Packages & Pin Assignments

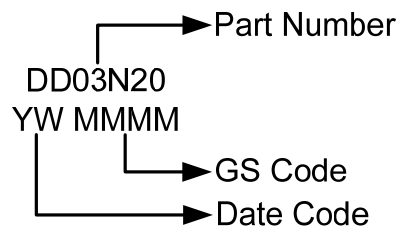
GSMDD03N20DF (TO-252-2L)	
 <p>Top View</p>	
Description	
Gate	
Source	
Drain	

Ordering Information



Part Number	Package	Quantity Reel
GSMDD03N20DF	TO-252-2L	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	200	V
V_{GS}	Gate –Source Voltage	± 30	V
I_D	Continuous Drain Current	$T_A=25^{\circ}\text{C}$	3
		$T_A=100^{\circ}\text{C}$	1.9
I_{DM}	Pulsed Drain Current	12	A
EAS	Single Pulse Avalanche Energy	4.5	mJ
IAS	Single Pulse Avalanche Current	3	A
P_D	Power Dissipation ($T_A=25^{\circ}\text{C}$)	46	W
	Power Dissipation (Derate above 25°C)	0.37	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	2.7	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics

T_A=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 =250uA	200			V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA		0.5		V/°C
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	3	4	5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient			-8		mV/°C
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±30V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =200V, V _{GS} =0V			1	uA
		V _{DS} =160V, V _{GS} =0V, T _J =125°C			10	
I _S	Continuous Source Current	V _G =V _D =0V, Force Current			3	A
I _{SM}	Pulsed Source Current				6	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =10V, I _D =2A		0.7	0.85	Ω
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =2A		3.6		S
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A			1	V
Dynamic						
Q _g	Total Gate Charge	V _{DS} =160V, V _{GS} =10V, I _D =1A		4.8	9	nC
Q _{gs}	Gate-Source Charge			2	4	
Q _{gd}	Gate-Drain Charge			0.8	2	
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz		266	500	pF
C _{oss}	Output Capacitance			160	300	
C _{rss}	Reverse Transfer Capacitance			55	110	
t _{d(on)}	Turn-On Time	V _{DD} =100V, I _D =1A, V _{GS} =10V, R _G =25Ω		10	20	ns
t _r				35	70	
t _{d(off)}	Turn-Off Time			10	20	
t _f				28	56	
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz		1.5	3	Ω

Typical Performance Characteristics

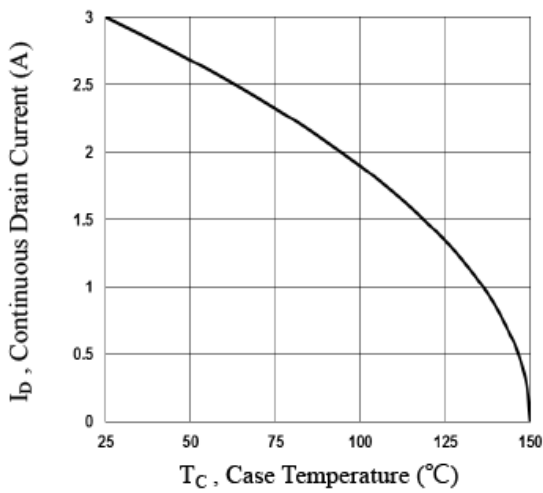


Fig.1 Continuous Drain Current vs. T_c

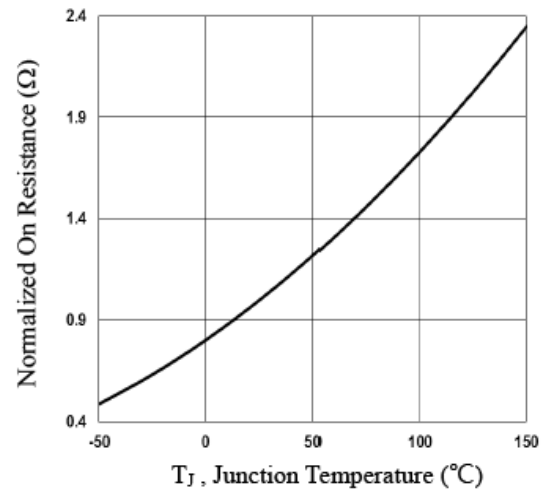


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

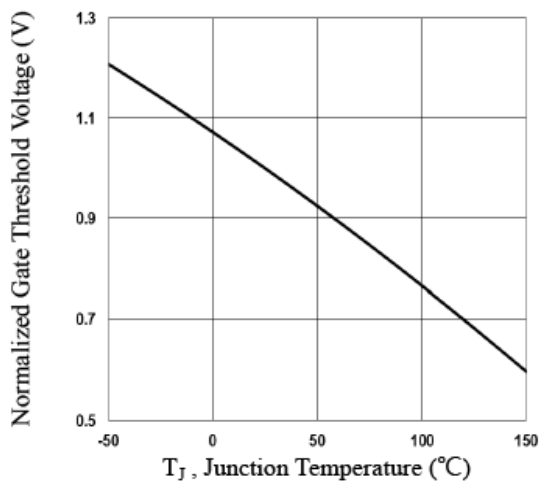


Fig.3 Normalized V_{th} vs. T_j

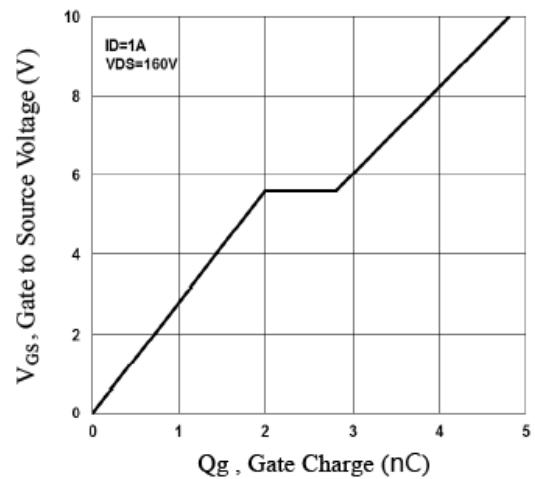


Fig.4 Gate Charge Waveform

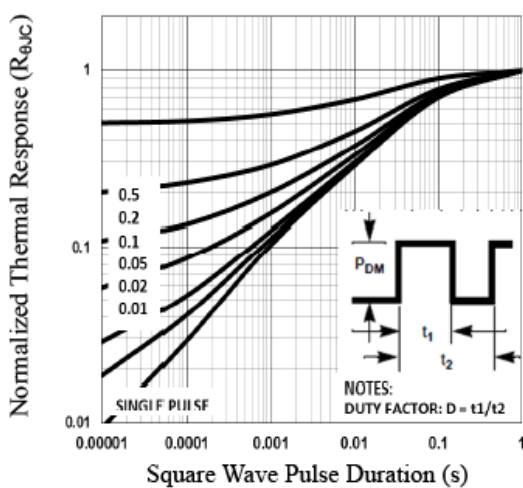


Fig.5 Normalized Transient Impedance

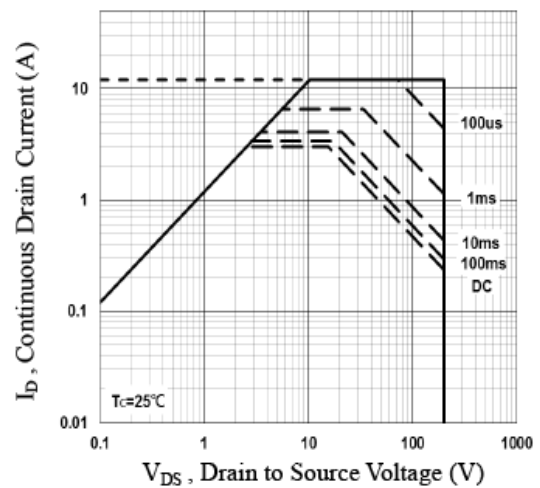
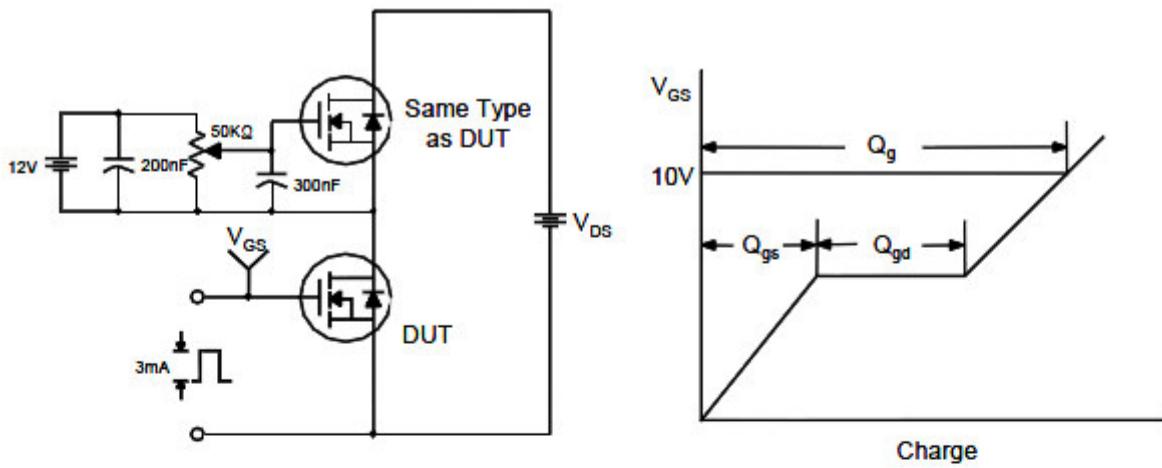


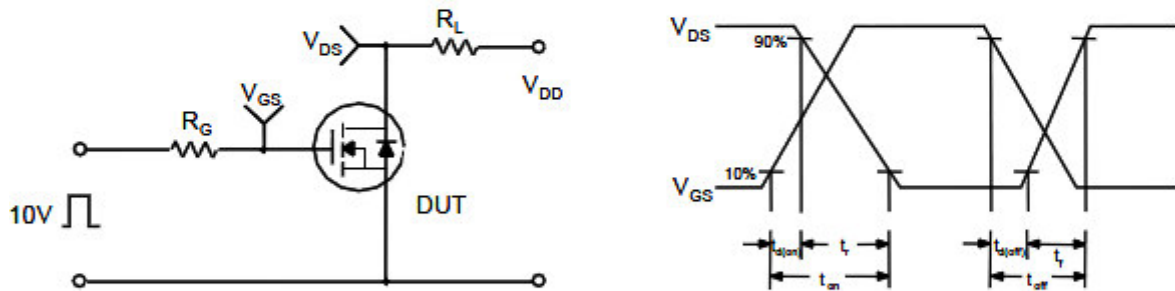
Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

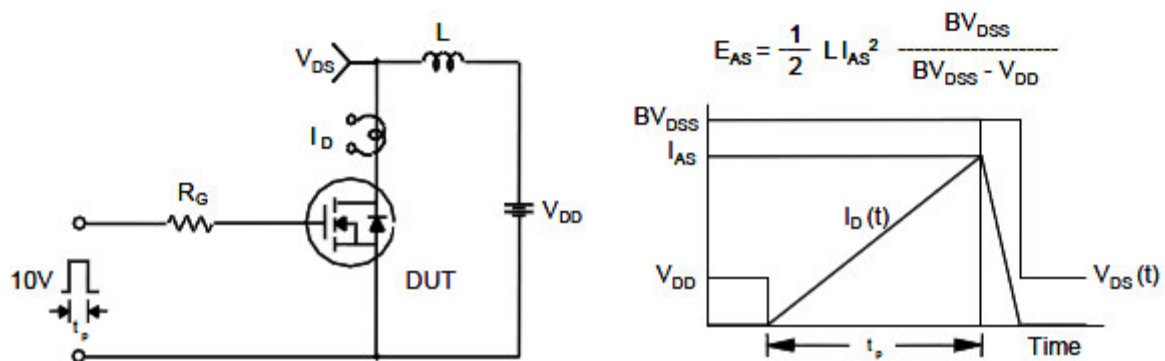
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

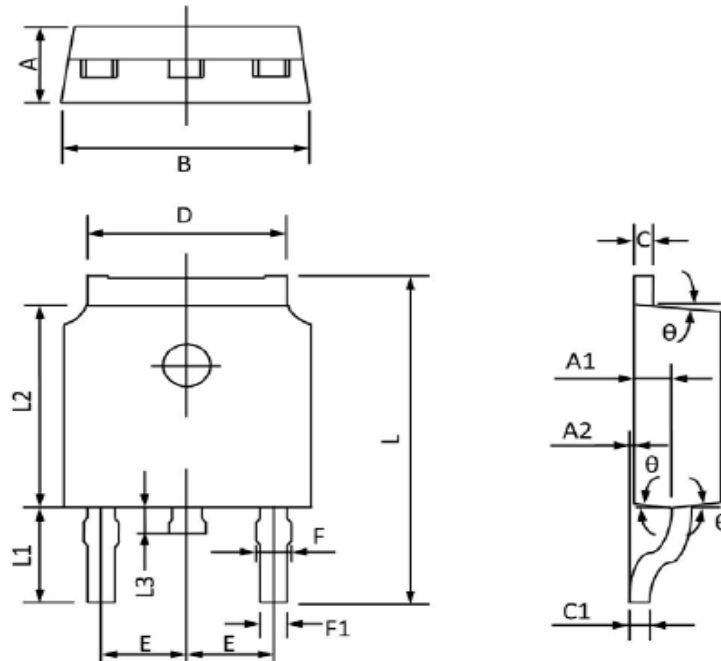


Unclamped Inductive Switching Test Circuit & Waveforms



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	6.40	6.80	0.252	0.268
C	0.45	0.58	0.018	0.023
C1	0.46	0.58	0.018	0.023
D	5.10	5.50	0.201	0.217
E	2.186	2.386	0.086	0.094
F	0.60	0.94	0.024	0.037
F1	0.50	0.86	0.020	0.034
L	9.40	10.40	0.370	0.409
L1	2.40	3.00	0.094	0.118
L2	5.40	6.20	0.213	0.244
L3	0.60	1.20	0.024	0.047
θ	3°	9°	3°	9°



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