GSMD18N20

200V 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

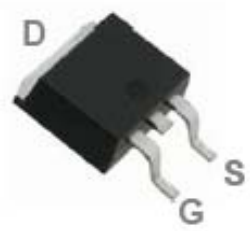
- 200V, 18A, $R_{DS(ON)}$=140mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- V_{GS} Guaranteed ±25V
- Green Device Available
- TO-252-2L package

Applications

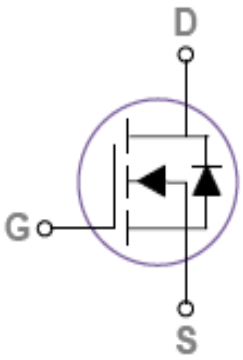
- LED Backlight & Lighting
- UPS
- High Voltage Switching
- Motor Drive Applications

Packages & Pin Assignments

GSMD18N20DF (TO-252-2L)

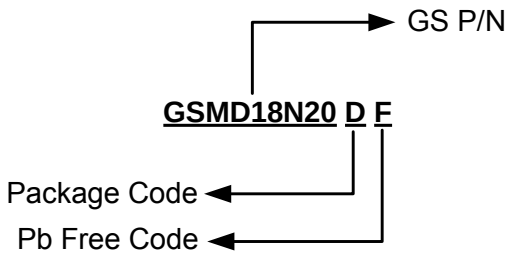


Top View



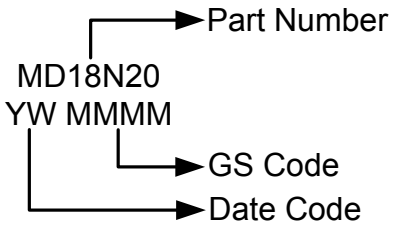
Description
Gate
Source
Drain

Ordering Information



Part Number	Package	Quantity Reel
GSMD18N20DF	TO-252-2L	2500 PCS

Marking Information



Absolute Maximum Ratings

T_C=25ºC Unless otherwise noted

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		200	V
V_{GS}	Gate-Source Voltage		±25	V
I_D	Continuous Drain Current	T_C=25℃	18	A
		T_C=100℃	11	
I_{DM}	Pulsed Drain Current		72	A
EAS	Single Pulse Avalanche Energy		100	mJ
IAS	Single Pulse Avalanche Current		10	A
P_D	Power Dissipation (T_C=25℃)		104	W
	Power Dissipation (Derate above 25℃)		0.83	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		1.2	℃/W

Note 1: Repetitive Rating : Pulsed width limited by maximum junction temperature.
Note 2: V_{DD}=50V, V_{GS}=10V, L=2mH, I_{AS}=10A, R_G=25Ω, Starting T_J=25℃

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	200			V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃, I_D=1mA		0.08		V/℃
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	2	3	4	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient			-6		mV/℃
I_{GSS}	Gate Source Leakage Current	V_{DS}=0V,V_{GS}=±25V			±100	nA
I_{DSS}	Drain Source Leakage Current	V_{DS}=160V,V_{GS}=0V			1	uA
		V_{DS}=160V,V_{GS}=0V, T_J=125℃			30	
I_S	Continuous Source Current	V_G=V_D=0V, Force Current			18	A
I_{SM}	Pulsed Source Current				72	
$R_{DS(on)}$	Static Drain Source On-Resistance	V_{GS} =10V,I_D=9A		110	140	mΩ
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=1A			1.3	V
t_{rr}	Reverse Recovery Time	V_{GS}=0V,I_S=1A, di/dt=100A/us		105		ns
Q_{rr}	Reverse Recovery Charge			360		nC
Dynamic						
Q_g	Total Gate Charge	V_{DS}=100V,V_{GS}=10V, I_D=8A		40		nC
Q_{gs}	Gate-Source Charge			10		
Q_{gd}	Gate-Drain Charge			10		
C_{iss}	Input Capacitance	V_{DS}=30V,V_{GS}=0V, f=1MHz		2000		pF
C_{oss}	Output Capacitance			145		
C_{rss}	Reverse Transfer Capacitance			60		
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=30V,V_{GS}=10V, R_G=6Ω, I_D=1A		9		ns
t_r	Rise Time			6		
$t_{d(off)}$	Turn-Off Delay Time			48		
t_f	Fall Time			12		

Note 3: The data tested by pulsed, pulse width≦300us, duty cycle≦2%.

Note 4: Essentially independent of operating temperature.

Typical Performance Characteristics

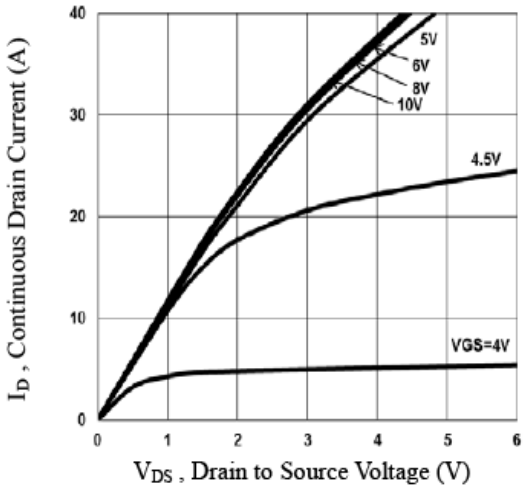


Fig.1 Output Characteristics

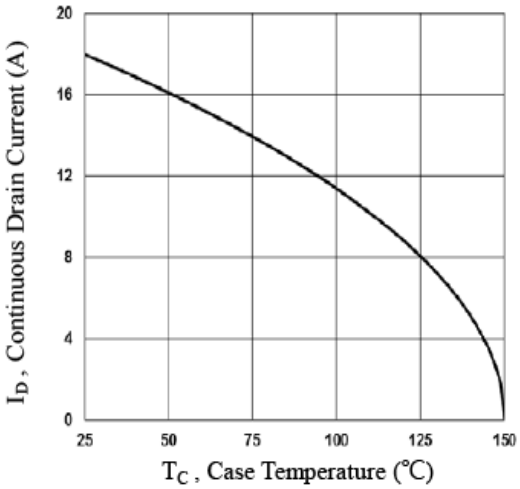


Fig.2 Continuous Drain Current vs. T_c

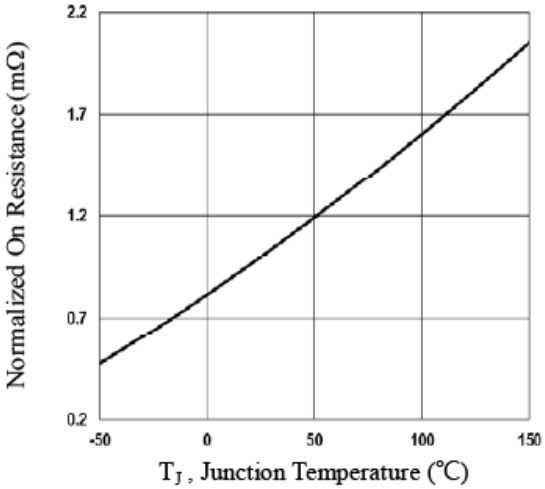


Fig.3 Normalized RDSON vs. T_J

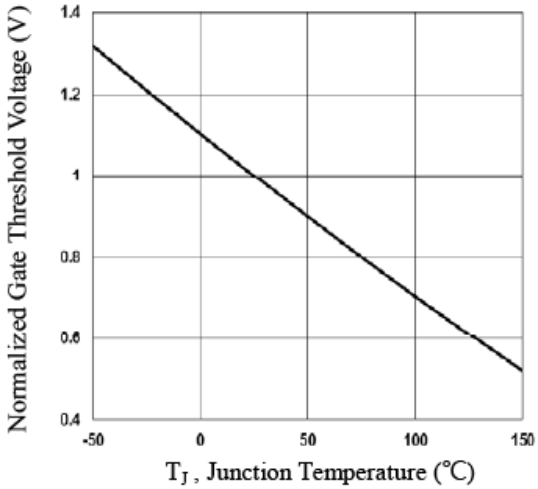


Fig.4 Normalized V_{th} vs. T_J

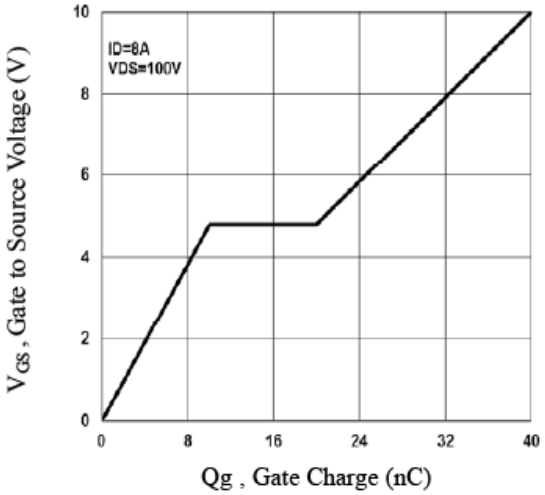


Fig.5 Gate Charge Waveform

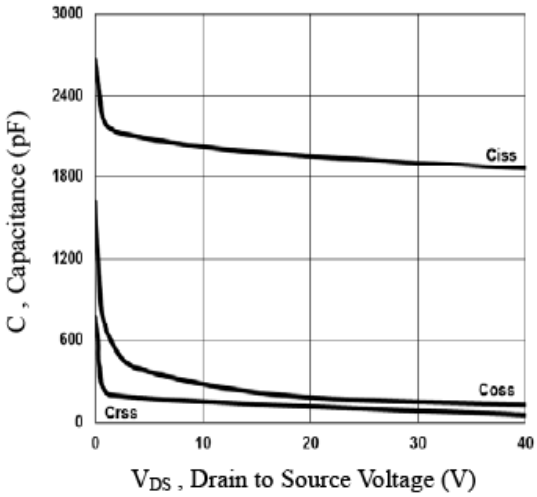


Fig.6 Capacitance Characteristics

Typical Performance Characteristics (Continue)

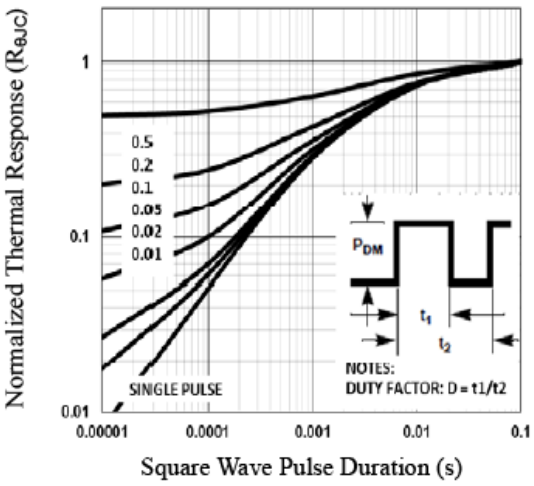


Fig.7 Normalized Transient Impedance

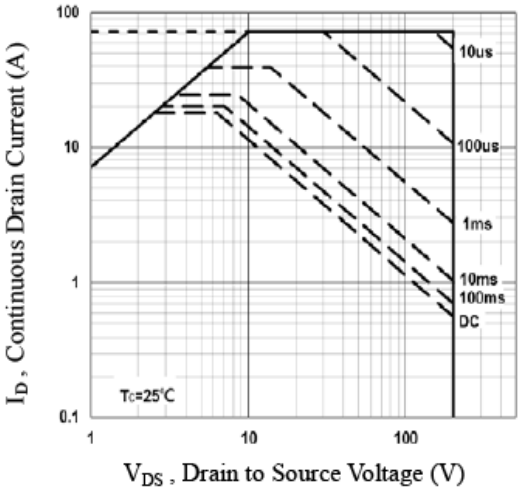
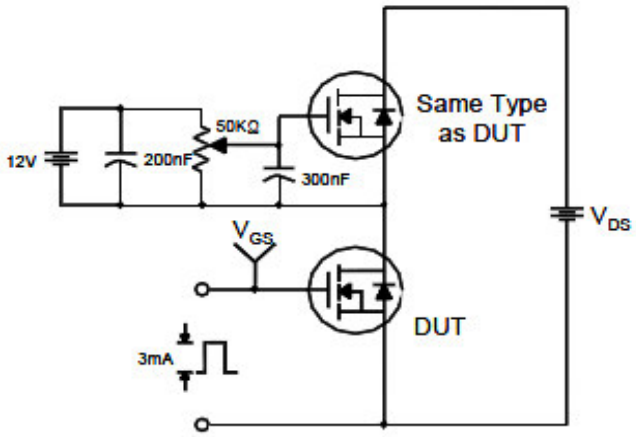
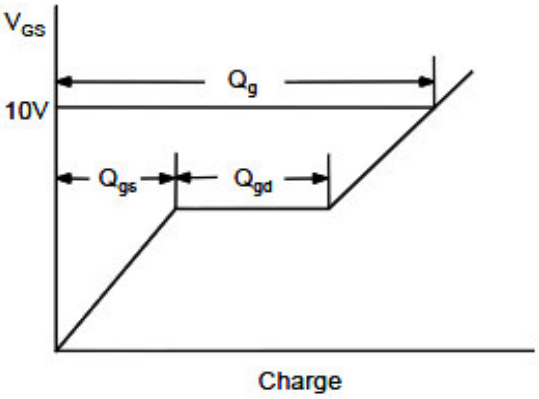


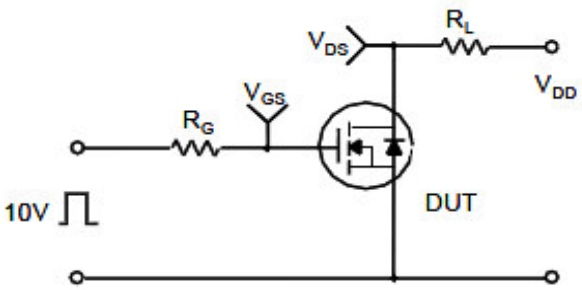
Fig.8 Maximum Safe Operation Area

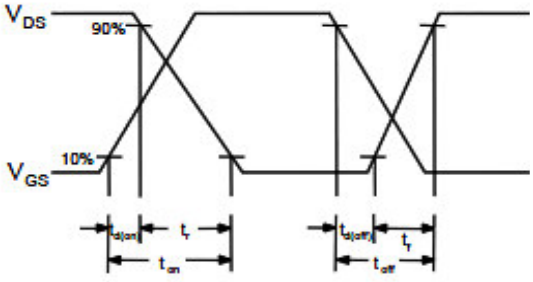
Gate Charge Test Circuit & Waveform





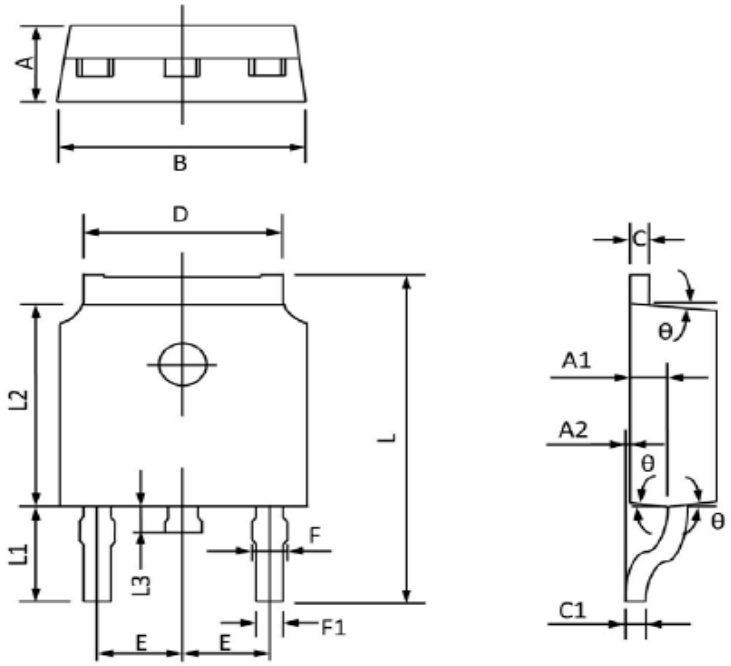
Resistive Switching Test Circuit & Waveforms





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	0.580	0.018	0.230
C1	0.46	0.580	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	0.660	0.860	0.026	0.034
L	9.80	10.40	0.386	0.409
L1	2.9REF		0.114REF	
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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