GSM03N20

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

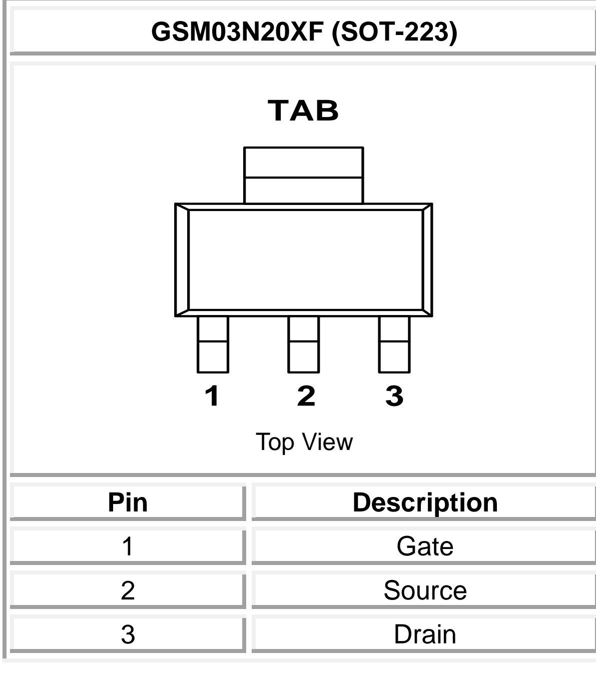
Features

- 200V, 3A, RDS(ON)=850mΩ@VGS=15V
- Improved dv/dt capability
- Fast switching
- Green Device Available

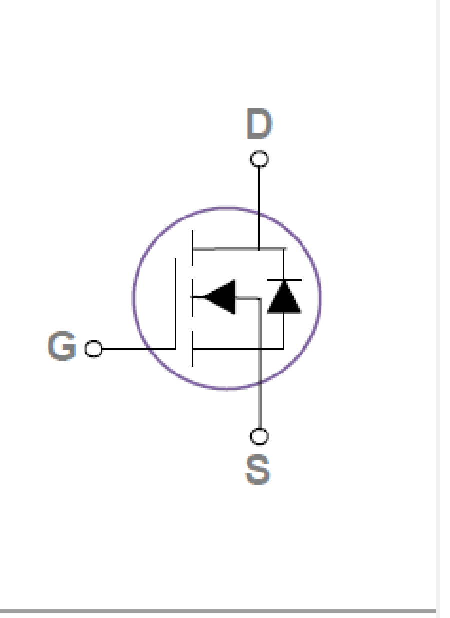
Applications

- Networking
- TV Power
- Adapter/charger
- Server Power
- High efficient switched mode power supplies

Packages & Pin Assignments



Pin	Description
1	Gate
2	Source
3	Drain



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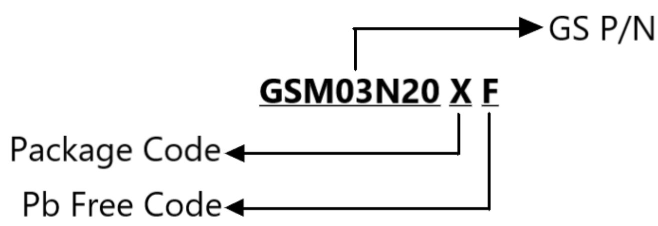
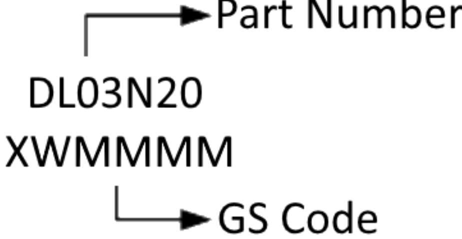
Ordering Information



Part Number	Package	Quantity Reel
GSM03N20XF	SOT-223	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		±30	V
I_D	Continuous Drain Current	T_C=25℃	3	A
		T_C=100℃	1.9	
I_{DM}	Pulsed Drain Current[1]		12	A
P_D	Power Dissipation (T_C=25℃)		1.78	W
	Power Dissipation (Derate above 25℃)		0.014	W/℃
T_J	Operating Junction Temperature Range		-55 to +150	℃
T_{STG}	Storage Temperature Range		-55 to +150	℃
$R_{θJA}$	Thermal Resistance-Junction to Ambient		70	℃/W
$R_{θJC}$	Thermal Resistance-Junction to Case		20	℃/W

Note:
1.Repetitive Rating: Pulsed width limited by maximum junction temperature.

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	200	---	---	V
$\triangle V_{(BR)DSS}/\triangle T_J$	$V_{(BR)DSS}$ 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
$\triangle V_{GS(th)}$	$V_{GS(th)}$ 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 T_J=25℃	---	---	1	uA
		V_{DS}=160V, V_{GS}=0V, T_J=125℃	---	---	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, T_J=25℃	---	---	1	V
Dynamic						
Q_g	Total Gate Charge[2,3]	V_{DS}=160V, V_{GS}=10V, I_D=1A	---	4.8	9	nC
Q_{gs}	Gate-Source Charge[2,3]		---	2	4	
Q_{gd}	Gate-Drain Charge[2,3]		---	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[2,3]	V_{DD}=100V, V_{GS}=10V, R_G=25Ω, I_D=1A	---	10	20	ns
t_r			---	35	70	
$t_{d(off)}$	Turn-Off Time[2,3]		---	10	20	
t_f			---	28	56	
R_g	Gate resistance	V_{DS}=0V, V_{GS}=0V, f=1MHZ		1.5	3	Ω

Note:

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

3.Essentially independent of operating temperature.

Typical Performance Characteristics

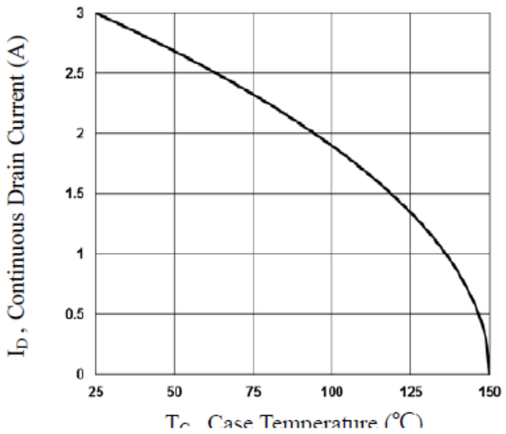


Fig.1 Continuous Drain Current vs. T_C

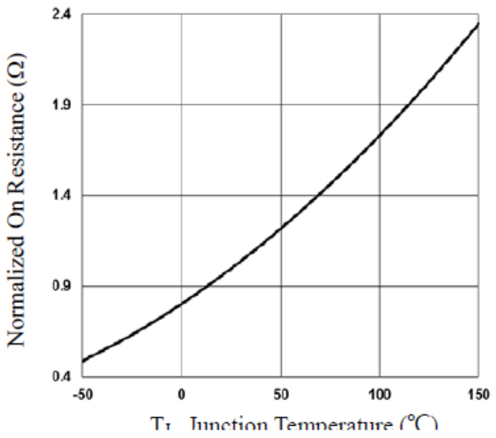


Fig.2 Normalized RDSON vs. T_J

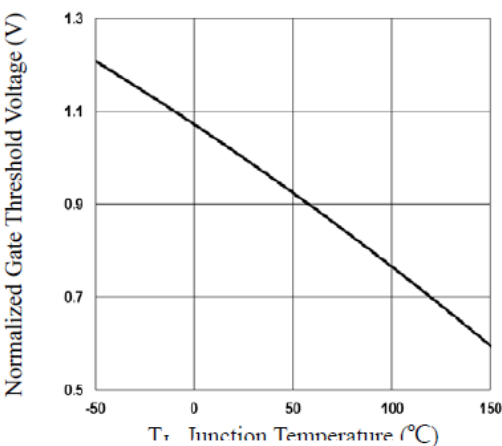


Fig.3 Normalized V_{th} vs. T_J

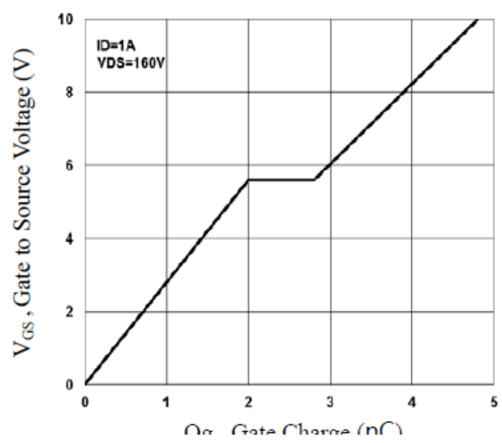


Fig.4 Gate Charge Waveform

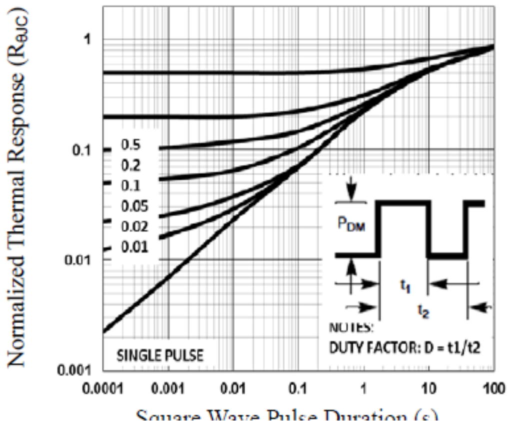


Fig.5 Normalized Transient Impedance

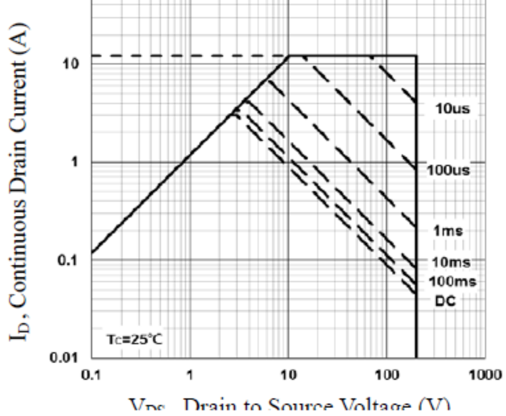


Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

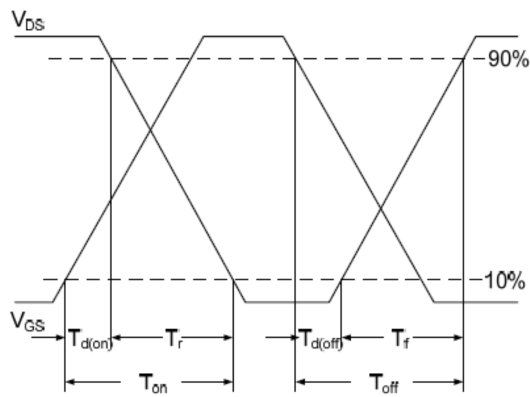


Fig.7 Switching Time Waveform

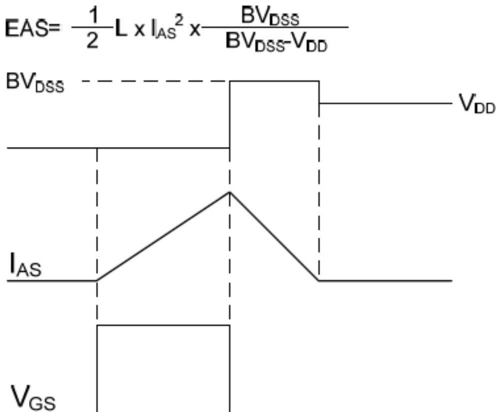
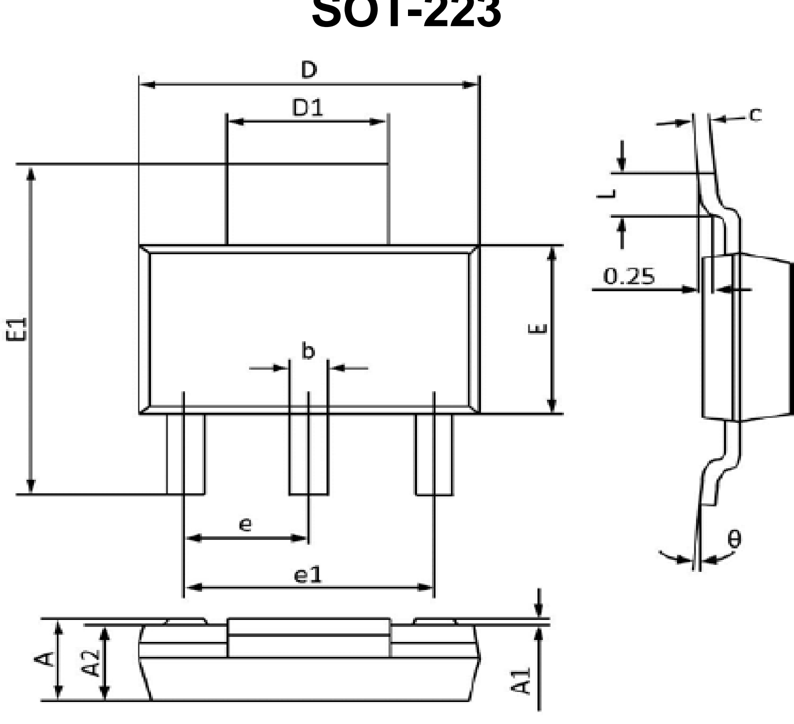


Fig.8 EAS Waveform

Package Dimension

SOT-223



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300 (BSC)		0.091 (BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	0°	10°

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