

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

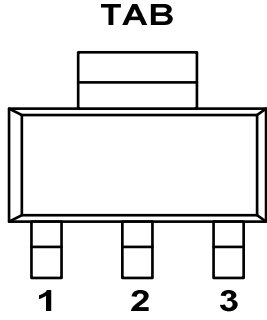
Features

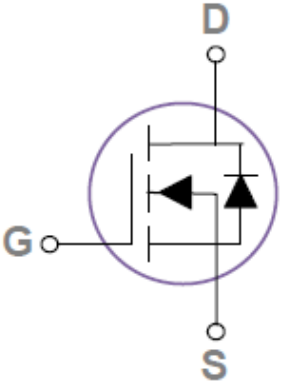
- 200V, 3A, $R_{DS(ON)}=850m\Omega@V_{GS}=15V$
- Improved dv/dt capability
- Fast switching
- Green Device Available

Applications

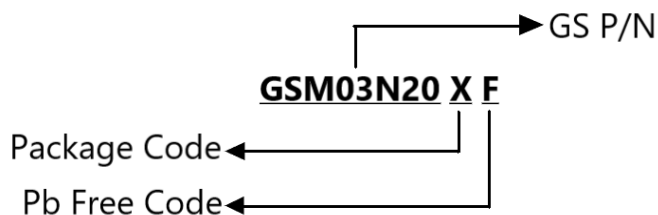
- Networking
- TV Power
- Adapter/charger
- Server Power
- High efficient switched mode power supplies

Packages & Pin Assignments

GSM03N20XF (SOT-223)	
 <p>Top View</p>	
Pin	Description
1	Gate
2	Source
3	Drain

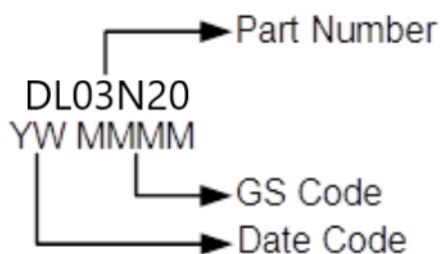


Ordering Information



Part Number	Package	Quantity Reel
GSM03N20XF	SOT-223	2500 PCS

Marking Information



Absolute Maximum Ratings

$T_C=25^\circ\text{C}$ 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	$T_C=25^\circ\text{C}$	3
		$T_C=100^\circ\text{C}$	1.9
I_{DM}	Pulsed Drain Current ¹	12	A
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	1.78	W
	Power Dissipation (Derate above 25°C)	0.014	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	70	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	20	$^\circ\text{C}/\text{W}$

Note:

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

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	200	---	---	V
$\frac{\Delta V_{(BR)DSS}}{\Delta T_J}$	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 =250μA	3	4	5	V
$\Delta V_{GS(th)}$	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°C	---	---	1	μA
		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, T _J =25°C	---	---	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

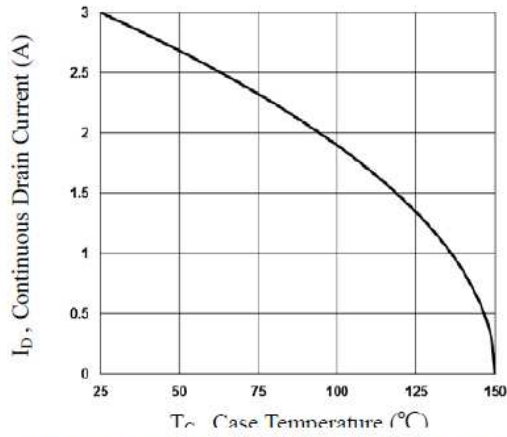


Fig.1 Continuous Drain Current vs. T_c

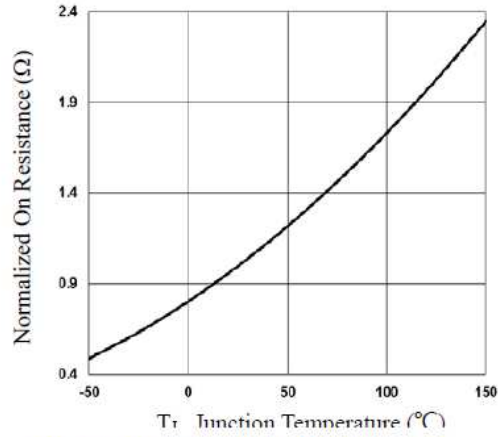


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

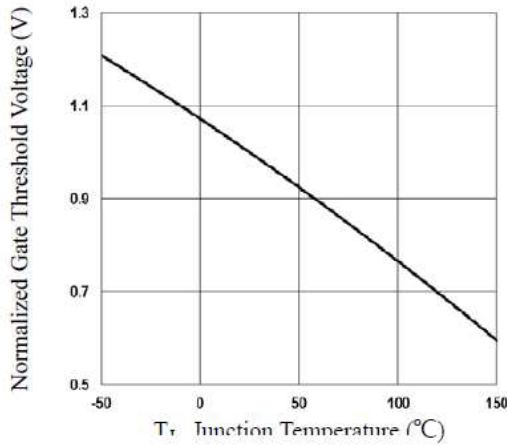


Fig.3 Normalized V_{th} vs. T_j

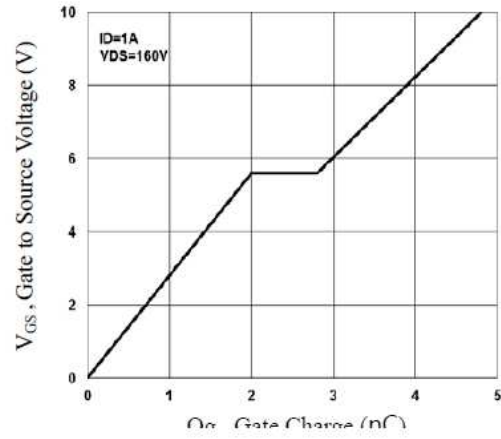


Fig.4 Gate Charge Waveform

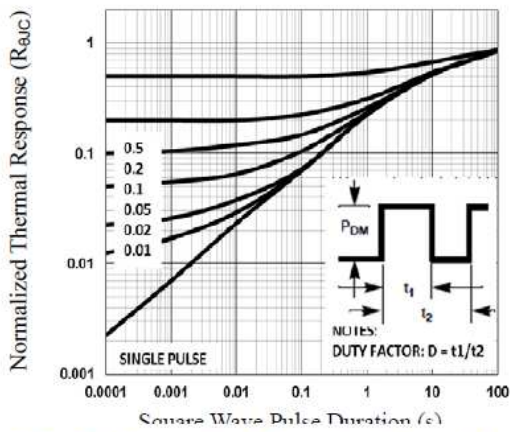


Fig.5 Normalized Transient Impedance

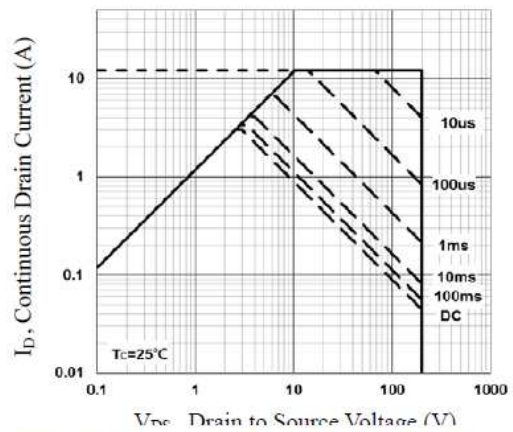


Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

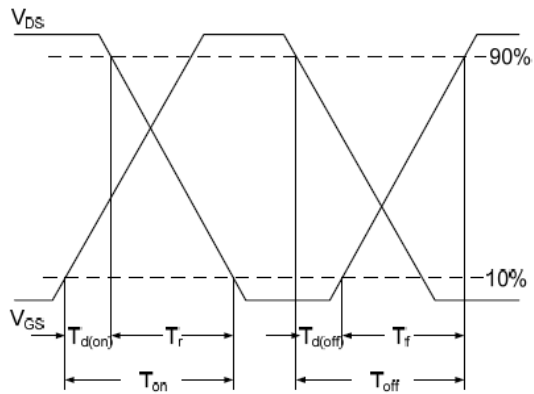


Fig.7 Switching Time Waveform

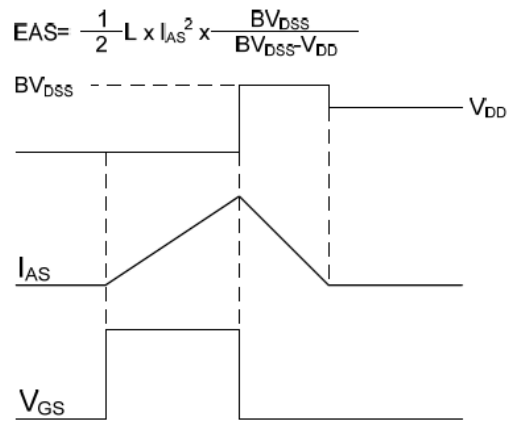
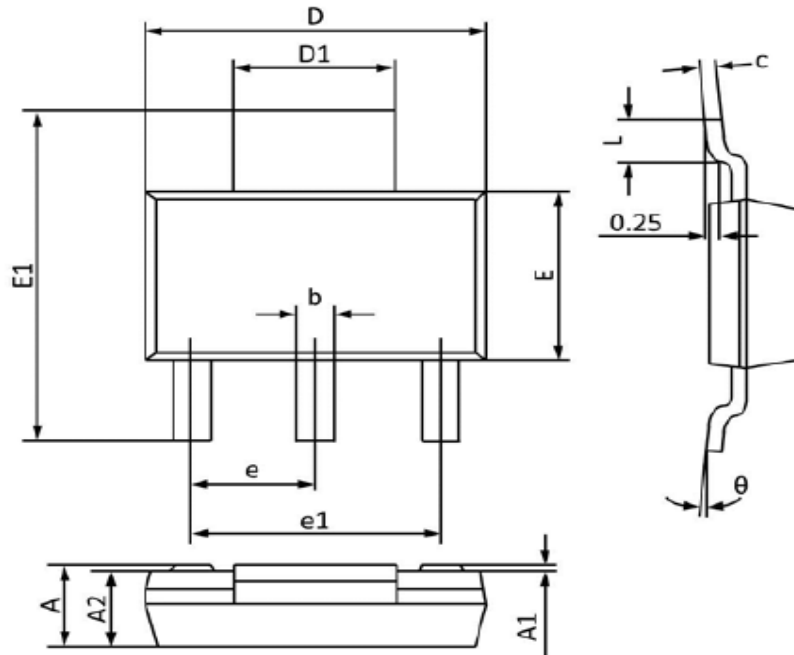


Fig.8 EAS Waveform

Package Dimension

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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