

GSM2312P

20V 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.

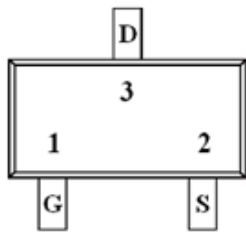
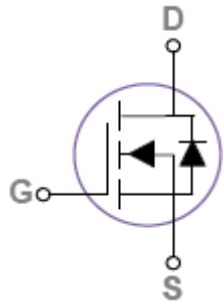
Features

- 20V, 6.7A, $R_{DS(ON)}=19m\Omega@V_{GS}=4.5V$
- Improved dv/dt capability
- Fast switching
- Suit for 1.8V Gate Drive Applications
- Green Device Available
- SOT-23 package design

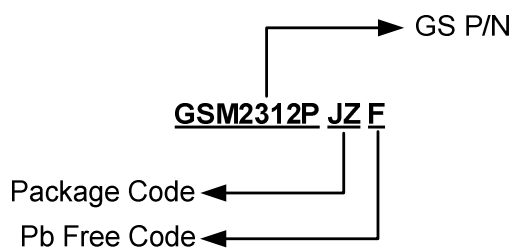
Applications

- Notebook
- Load Switch
- Hand-Held Instruments

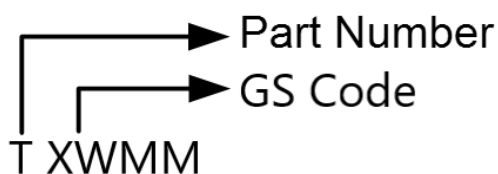
Packages & Pin Assignments

GSM2312PJZF (SOT-23)	
 <p>Top Views</p>	
	
Pin	Description
1	Gate
2	Source
3	Drain

Ordering Information



Marking Information



Part Number	Package	Part Marking	Quantity
GSM2312PJZF	SOT-23	TXWMM	3000pcs

Absolute Maximum Ratings

$T_C=25^{\circ}\text{C}$ Unless otherwise noted

Symbol	Parameter	Typical	Unit
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 10	V
I_D	Continuous Drain Current	$T_C=25^{\circ}\text{C}$	6.7
		$T_C=100^{\circ}\text{C}$	4.2
I_{DM}	Pulsed Drain Current ¹	26.8	A
P_D	Power Dissipation ($T_C=25^{\circ}\text{C}$)	1.56	W
	Power Dissipation (Derate above 25°C)	0.012	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	80	$^{\circ}\text{C}/\text{W}$

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 =250uA	20			V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA		0.02		V/°C
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	0.3	0.6	0.8	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient			2		mV/°C
I _{GSS}	Gate-Source Leakage Current	V _{DS} =0V, V _{GS} =±10V			±100	nA
I _{DSS}	Drain-Source Leakage Current	V _{DS} =20V, V _{GS} =0V			1	uA
		V _{DS} =16V, V _{GS} =0V, T _J =125°C			10	
I _S	Continuous Source Current	V _G =V _D =0V, Force Current			6.7	A
I _{SM}	Pulsed Source Current				26.8	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =4.5V, I _D =4A		15	19	mΩ
		V _{GS} =2.5V, I _D =3A		18	24	
		V _{GS} =1.8V, I _D =2A		23	32	
g _{FS}	Forward Transconductance	V _{DS} =10V, I _S =4A		9.5		S
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A			1	V
Dynamic						
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _D =4A		5.8	8	nC
Q _{gs}	Gate-Source Charge			0.6	1	
Q _{gd}	Gate-Drain Charge			2	4	
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1MHz		600	870	pF
C _{oss}	Output Capacitance			70	100	
C _{rss}	Reverse Transfer Capacitance			45	65	
t _{d(on)}	Turn-On Time	V _{DD} =10V, I _D =1A, V _{GS} =4.5V, R _G =25Ω		5	9	ns
t _r				14.4	27	
t _{d(off)}	Turn-Off Time			30	55	
t _f				9.2	17	

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

Typical Performance Characteristics

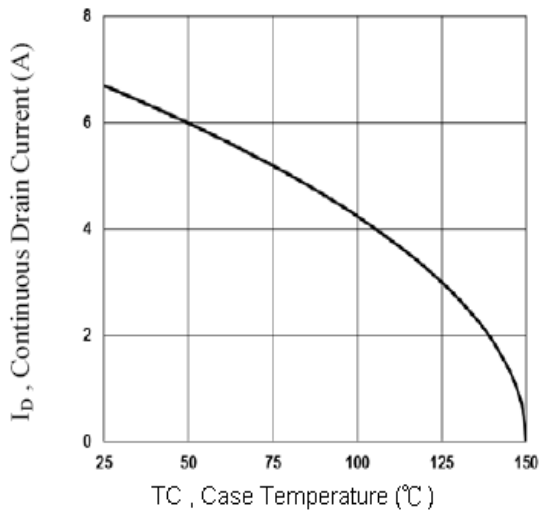


Fig.1 Continuous Drain Current vs. T_c

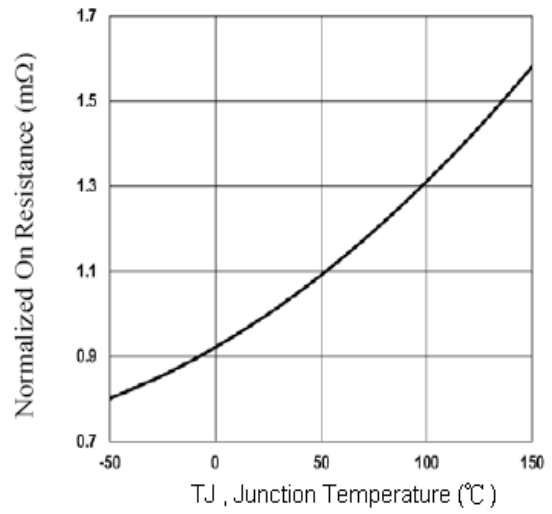


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

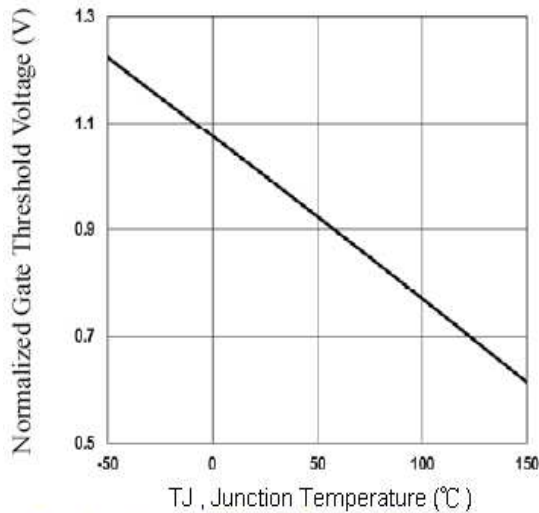


Fig.3 Normalized V_{th} vs. T_j

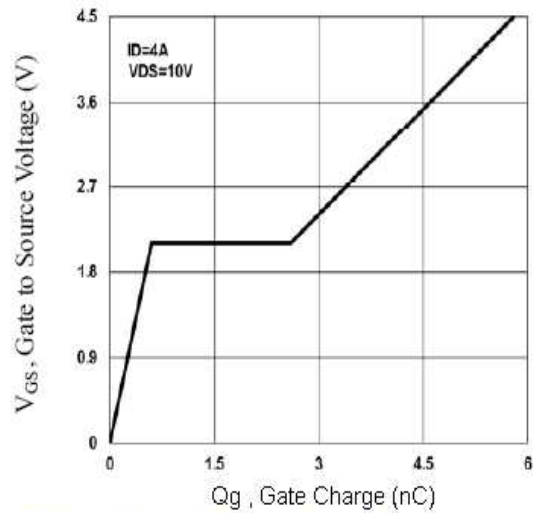


Fig.4 Gate Charge Waveform

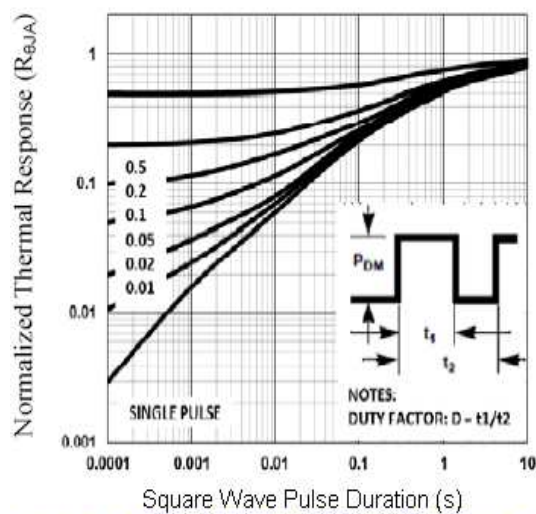


Fig.5 Normalized Transient Impedance

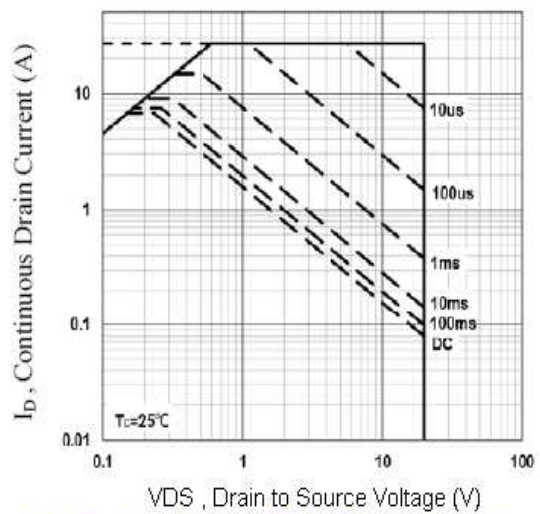
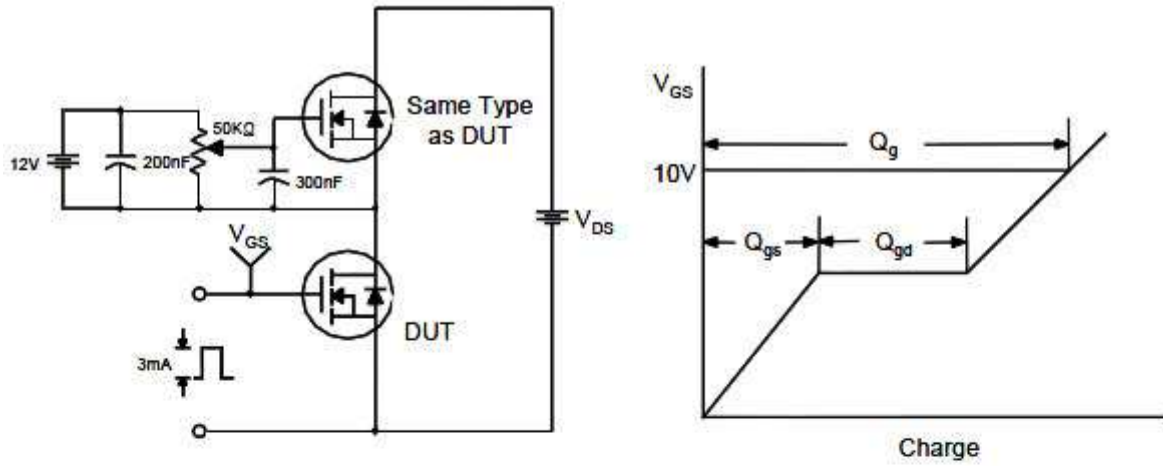


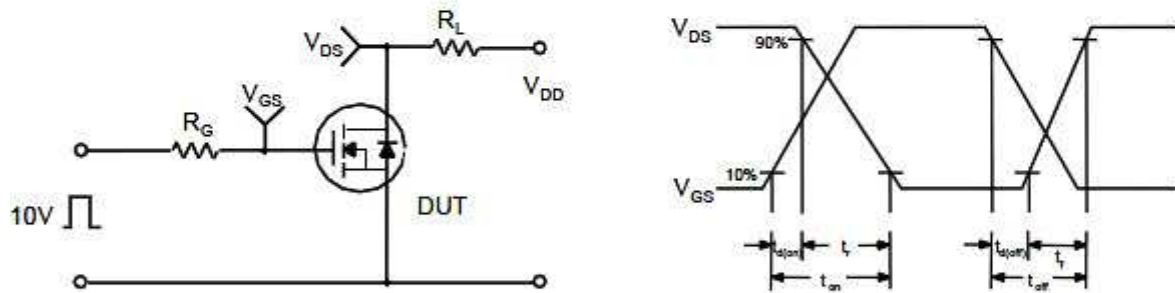
Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

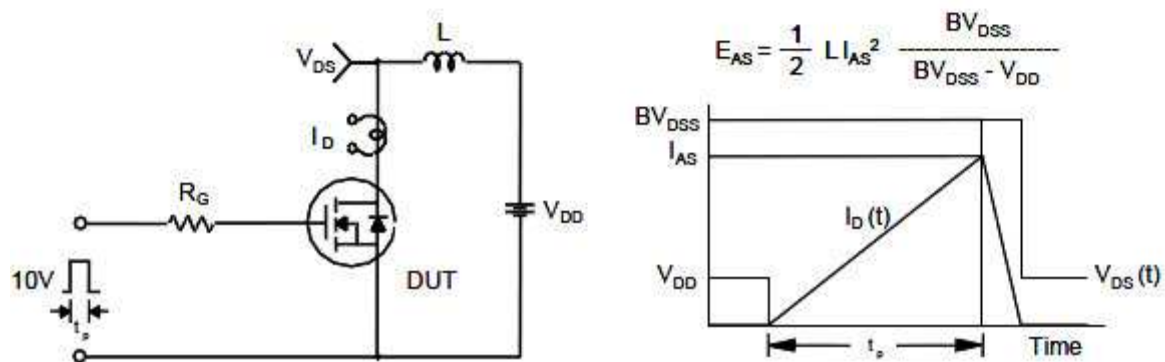
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

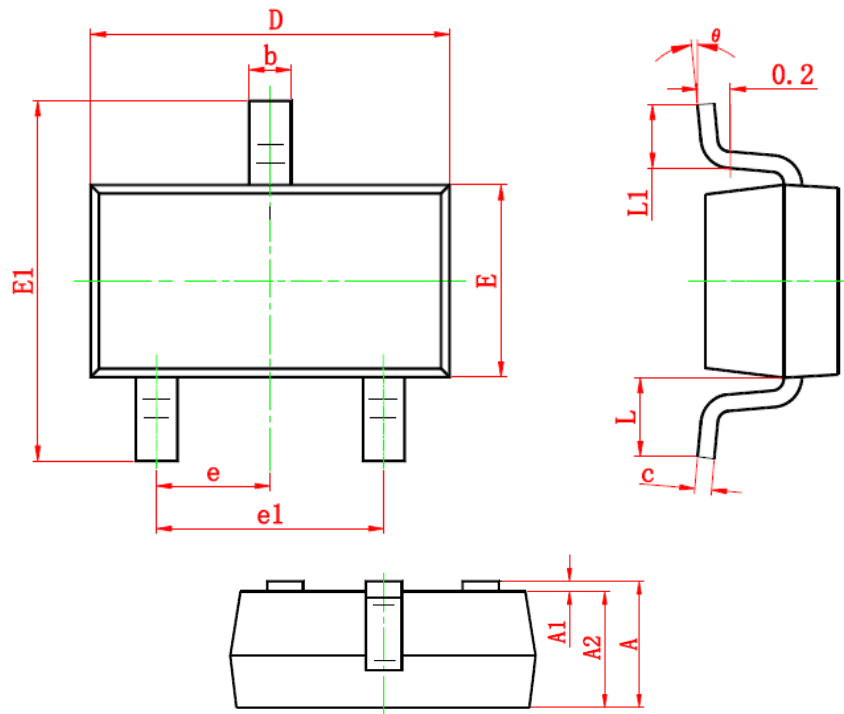


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

SOT-23







Dimensions



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.900	1.200	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.100	0.035	0.039
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	6°

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