

# GSM2320P

## 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.

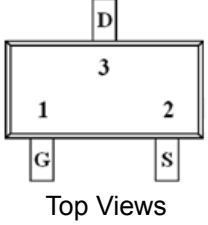
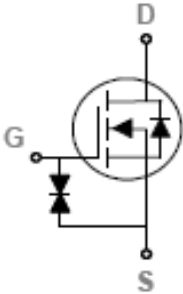
### Features

- 20V, 0.8A,  $R_{DS(ON)}=300m\Omega@V_{GS}=4.5V$
- Improved dv/dt capability
- Fast switching
- Suit for 1.2V Gate Drive Applications
- Green Device Available
- SOT-323 package design

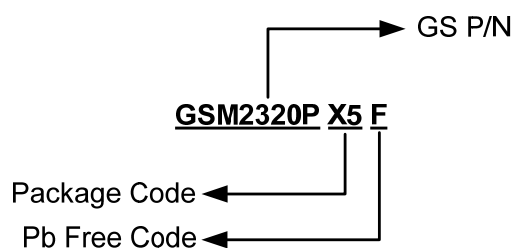
### Applications

- Notebook
- Load Switch
- Battery Protection
- Hand-Held Instruments

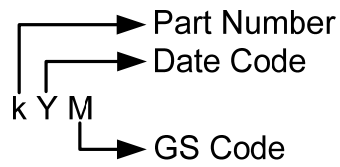
### Packages & Pin Assignments

GSM2320PX5F (SOT-323)	
 <p>Top Views</p>	
	
Pin	Description
1	Gate
2	Source
3	Drain

### Ordering Information



## Marking Information



Part Number	Package	Part Marking	Quantity
GSM2320PX5F	SOT-323	kYM	3000pcs

## Absolute Maximum Ratings

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

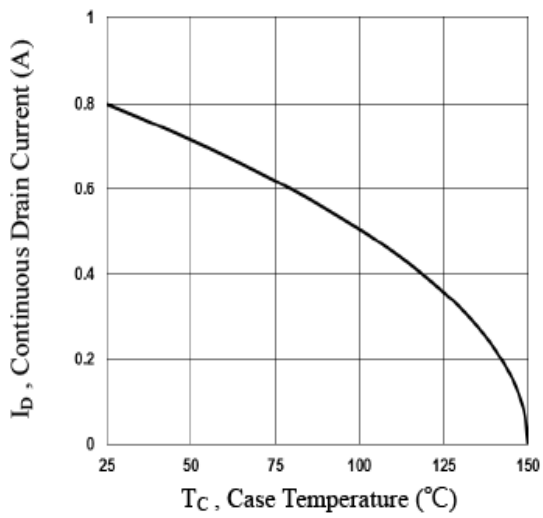
Symbol	Parameter	Typical	Unit
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate-Source Voltage	$\pm 8$	V
$I_D$	Continuous Drain Current	$T_A=25^\circ\text{C}$	0.8
		$T_A=100^\circ\text{C}$	0.51
$I_{DM}$	Pulsed Drain Current	3.2	A
$P_D$	Power Dissipation ( $T_A=25^\circ\text{C}$ )	0.275	W
	Power Dissipation (Derate above $25^\circ\text{C}$ )	0.0022	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	450	$^\circ\text{C}/\text{W}$

## Electrical Characteristics

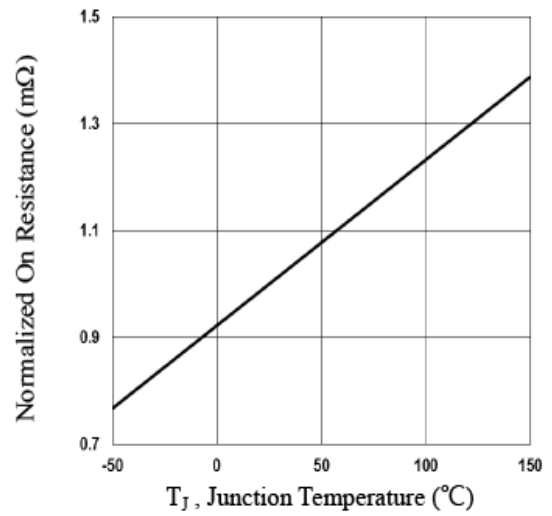
T<sub>A</sub>=25°C Unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	20			V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA		0.01		V/°C
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	0.45	0.6	1.0	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient			-3		mV/°C
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±6V			±20	uA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V			1	uA
		V <sub>DS</sub> =16V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C			10	
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current			0.8	A
I <sub>SM</sub>	Pulsed Source Current				1.6	
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.5A		200	300	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.4A		235	400	
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =0.2A		295	550	
		V <sub>GS</sub> =1.5V, I <sub>D</sub> =0.1A		365	800	
		V <sub>GS</sub> =1.2V, I <sub>D</sub> =0.1A		600	1500	
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =0.2A			1	V
<b>Dynamic</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.5A		1	2	nC
Q <sub>gs</sub>	Gate-Source Charge			0.26	0.5	
Q <sub>gd</sub>	Gate-Drain Charge			0.2	0.4	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHz		38.2	75	pF
C <sub>oss</sub>	Output Capacitance			14.4	28	
C <sub>rss</sub>	Reverse Transfer Capacitance			6	12	
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =10V, I <sub>D</sub> =0.5A, V <sub>GS</sub> =4.5V, R <sub>G</sub> =10Ω		5	10	ns
t <sub>r</sub>				3.5	7	
t <sub>d(off)</sub>	Turn-Off Time			14	28	
t <sub>f</sub>				6	12	

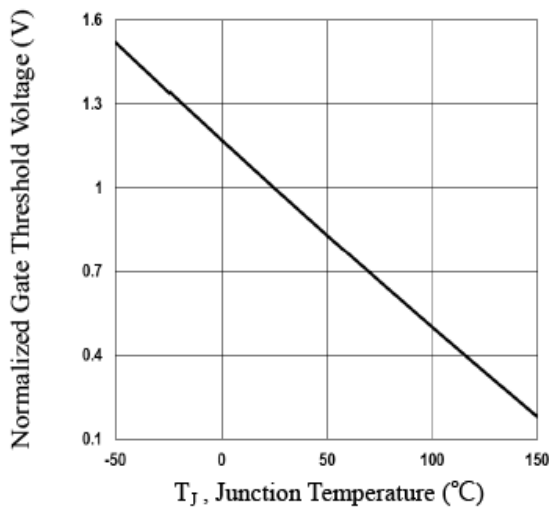
## Typical Performance Characteristics



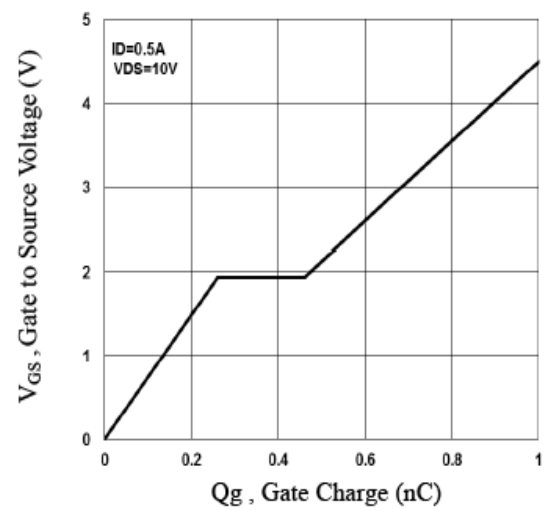
**Fig.1** Continuous Drain Current vs.  $T_c$



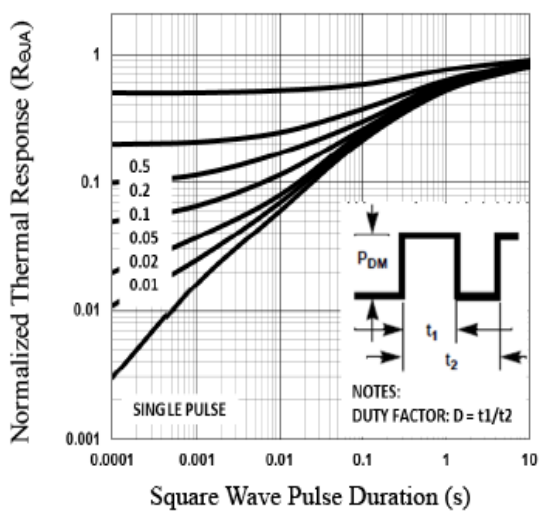
**Fig.2** Normalized  $R_{DS(on)}$  vs.  $T_j$



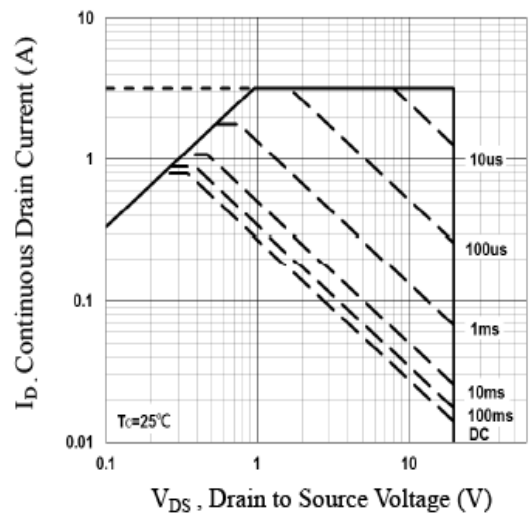
**Fig.3** Normalized  $V_{th}$  vs.  $T_j$



**Fig.4** Gate Charge Waveform



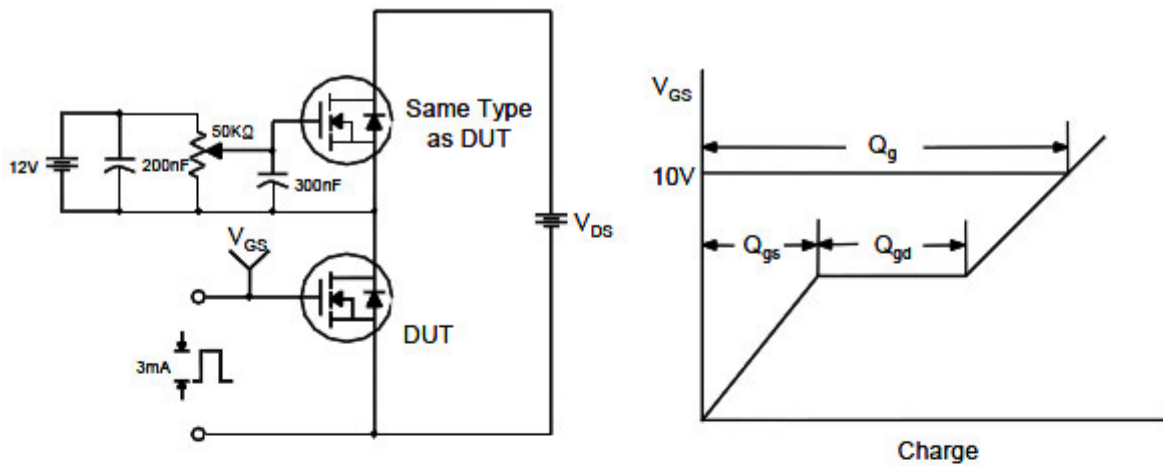
**Fig.5** Normalized Transient Response



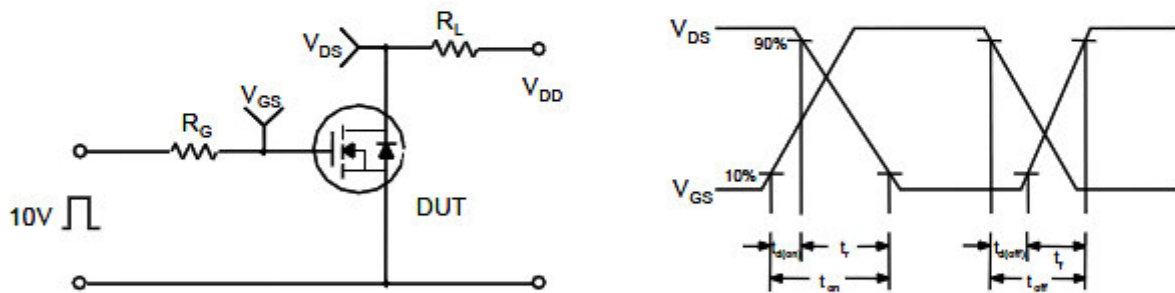
**Fig.6** Maximum Safe Operation Area

## Typical Performance Characteristics (Continue)

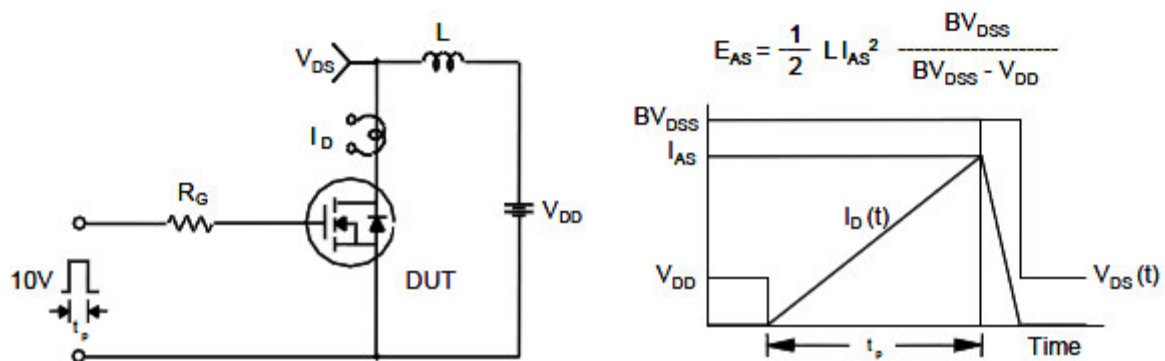
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms

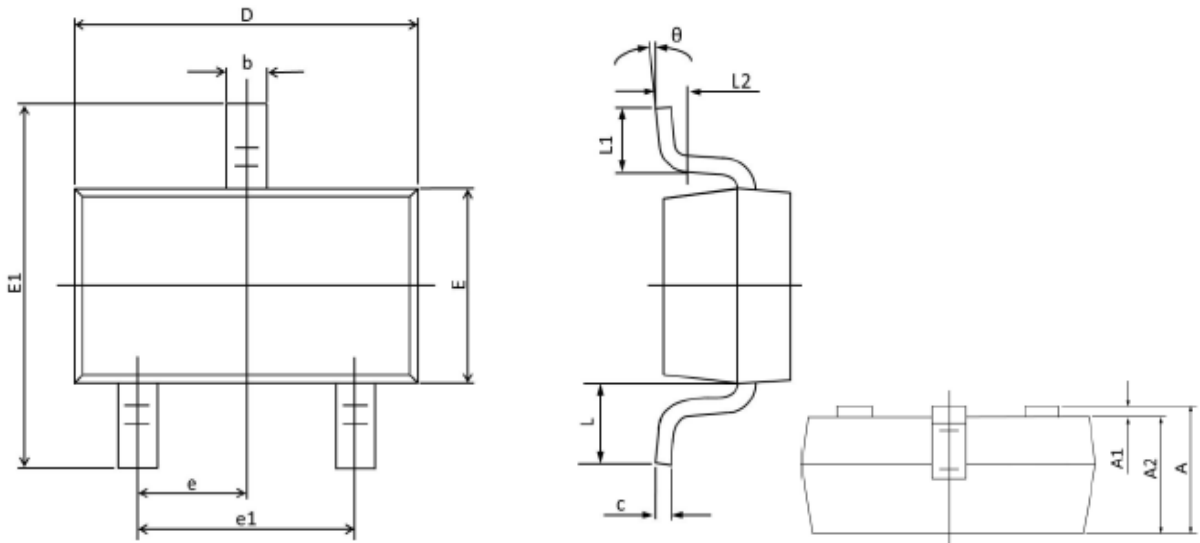


### Unclamped Inductive Switching Test Circuit & Waveforms



## Package Dimension

# SOT-323










Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.800	1.100	0.031	0.043
A1	0.000	0.100	0.000	0.004
A2	0.800	1.000	0.031	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.250	0.003	0.010
D	1.800	2.200	0.071	0.087
E	1.150	1.350	0.045	0.053
E1	1.800	2.450	0.071	0.096
e	0.650 (BSC)		0.026 (BSC)	
e1	1.200	1.40	0.047	0.055
L	0.525 (REF)		0.021 (REF)	
L1	0.150	0.460	0.006	0.018
L2	0.000	0.200	0.000	0.008
θ	0°	8°	0°	8°



## NOTICE

Information furnished is believed to be accurate and reliable. However Globaltech Semiconductor assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties, which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Globaltech Semiconductor. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information without express written approval of Globaltech Semiconductor.

## CONTACT US

GS Headquarter	
	4F.,No.43-1,Lane11,Sec.6,Minquan E.Rd NeiHu District Taipei City 114, Taiwan (R.O.C)
	886-2-2657-9980
	886-2-2657-3630
	sales_twn@gs-power.com

Shenzhen Branch(China)	
	1113 B Building, Happiness Washington, Baoan Nan Road, Luohu District, Shenzhen City, China
	0755-22208941
	sales_cn@gs-power.com

RD Division	
	824 Bolton Drive Milpitas. CA. 95035
	1-408-457-0587