GSM2320Y

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

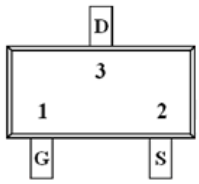
- 20V, 800mA, $R_{DS(ON)}$=300mΩ@V_{GS}=4.5V
- Improved dv/dt capability
- Fast switching
- Suit for 1.5V Gate Drive Applications
- Green Device Available
- SOT-523 package design

Applications

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

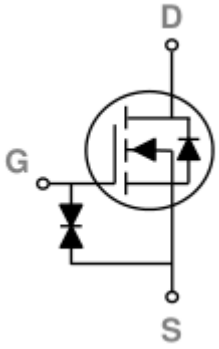
Packages & Pin Assignments

GSM2320YX7F (SOT-523)

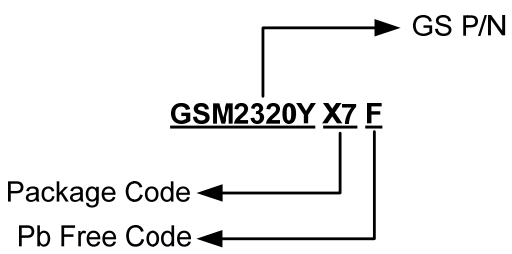


Top Views

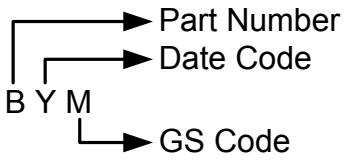
Pin	Description
1	Gate
2	Source
3	Drain



Ordering Information



Marking Information



Part Number	Package	Part Marking	Quantity
GSM2320YX7F	SOT-523	BYM	3000pcs

Absolute Maximum Ratings

T_C=25ºC Unless otherwise noted

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		20	V
V_{GS}	Gate-Source Voltage		±8	V
I_D	Continuous Drain Current	T_C=25℃	800	mA
		T_C=100℃	510	
I_{DM}	Pulsed Drain Current		3.2	A
P_D	Power Dissipation (T_C=25℃)		312	mW
	Power Dissipation (Derate above 25℃)		2.5	mW/℃
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		400	℃/W

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	20			V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃, I_D=1mA		-0.01		V/℃
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	0.3	0.6	1.0	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient			3		mV/℃
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=±6V			±20	uA
I_{DSS}	Drain Current Leakage Current	V_{DS}=20V,V_{GS}=0V			1	uA
		V_{DS}=16V,V_{GS}=0V, T_J=125℃			10	
I_S	Continuous Source Current	V_G=V_D=0V, Force Current			0.8	A
I_{SM}	Pulsed Source Current				1.6	
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=4.5V,I_D=0.5A		200	300	mΩ
		V_{GS}=2.5V,I_D=0.4A		235	400	
		V_{GS}=1.8V,I_D=0.2A		295	550	
		V_{GS}=1.5V,I_D=0.1A		365	800	
		V_{GS}=1.2V,I_D=0.1A		600	1500	
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=0.2A			1	V
Dynamic						
Q_g	Total Gate Charge	V_{DS}=10V,V_{GS}=4.5V, I_D=0.5A		1	2	nC
Q_{gs}	Gate-Source Charge			0.26	0.5	
Q_{gd}	Gate-Drain Charge			0.2	0.4	
C_{iss}	Input Capacitance	V_{DS}=10V,V_{GS}=0V, F=1MHz		38.2	75	pF
C_{oss}	Output Capacitance			14.4	28	
C_{rss}	Reverse Transfer Capacitance			6	12	
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=10V,I_D=0.5A, V_{GS}=4.5V,R_G=10Ω		5	10	ns
t_r	Rise TIme			3.5	7	
$t_{d(off)}$	Turn-Off Delay Time			14	28	
t_f	Fall Time			6	12	

Typical Performance Characteristics

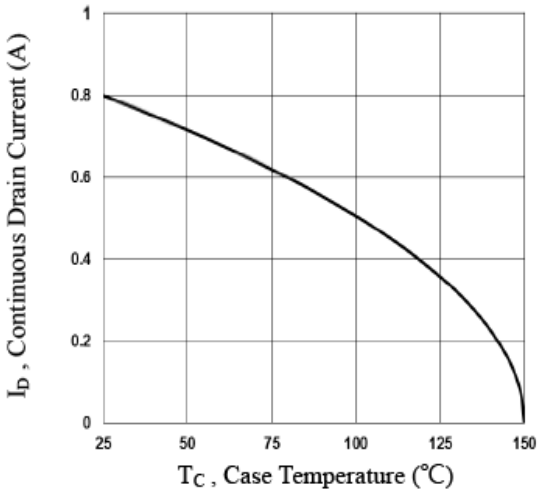


Fig.1 Continuous Drain Current vs. T_c

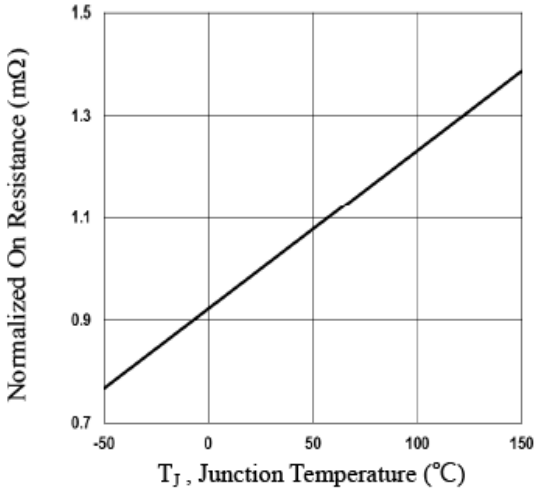


Fig.2 Normalized RDSON vs. T_J

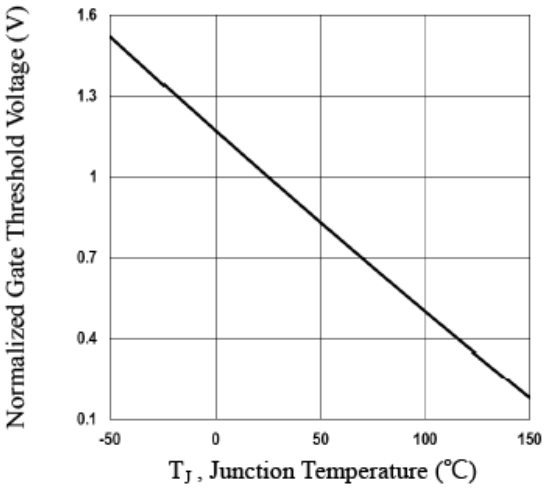


Fig.3 Normalized V_{th} vs. T_J

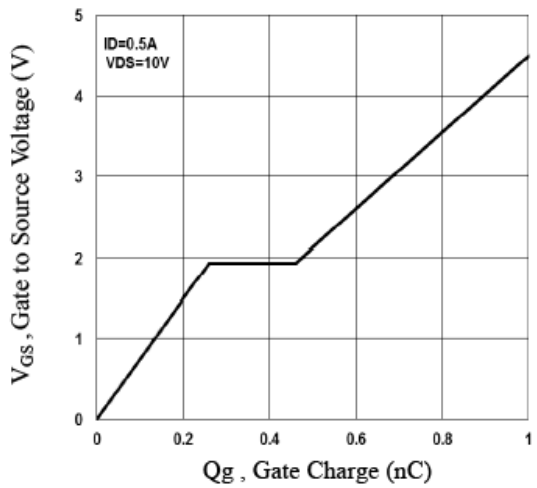


Fig.4 Gate Charge Waveform

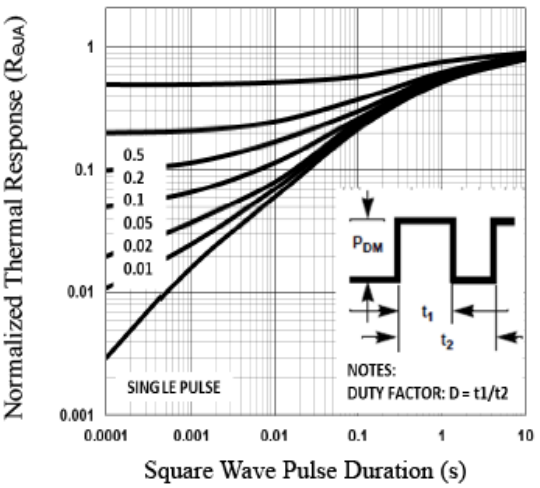


Fig.5 Normalized Transient Response

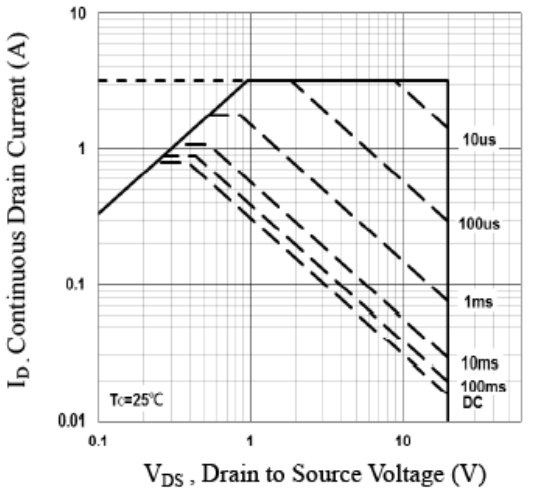
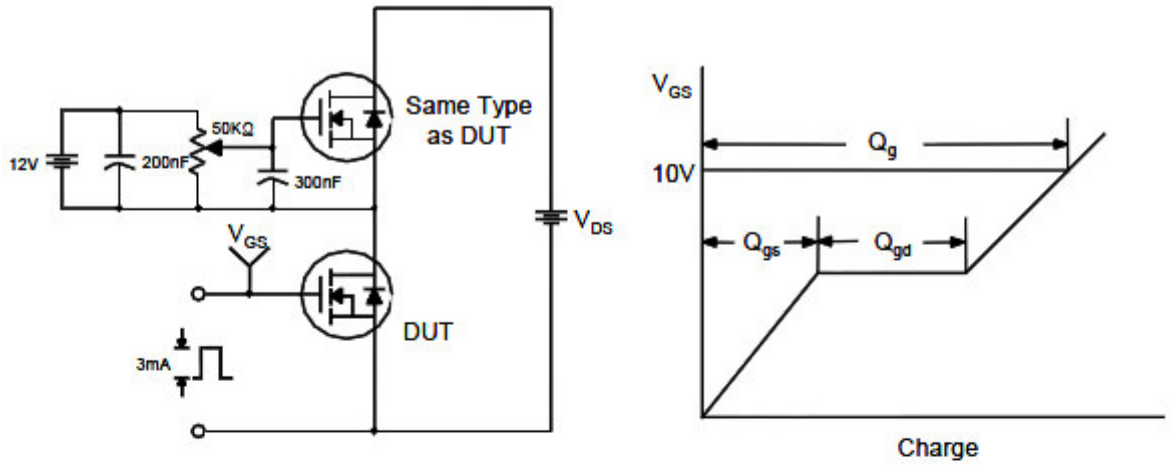


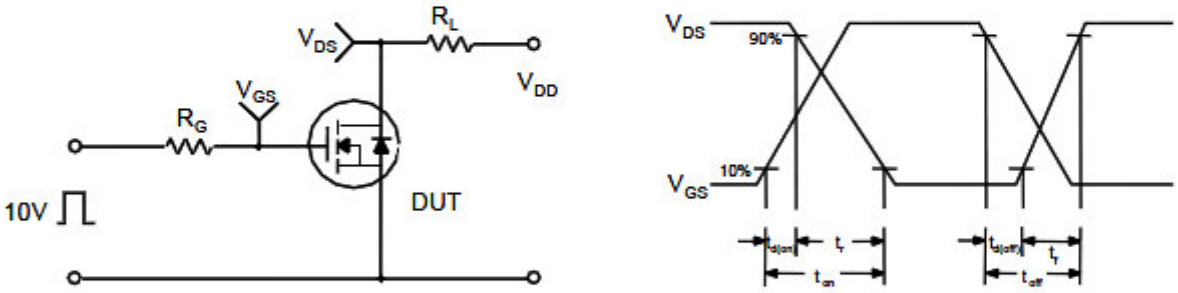
Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

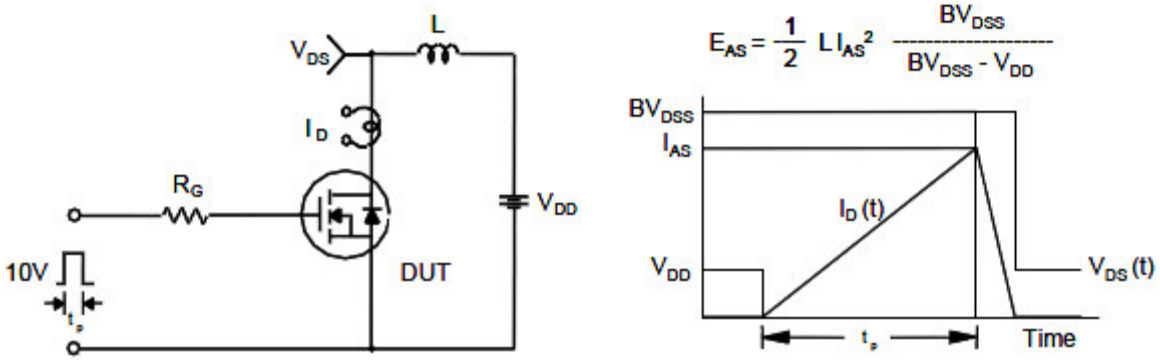
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

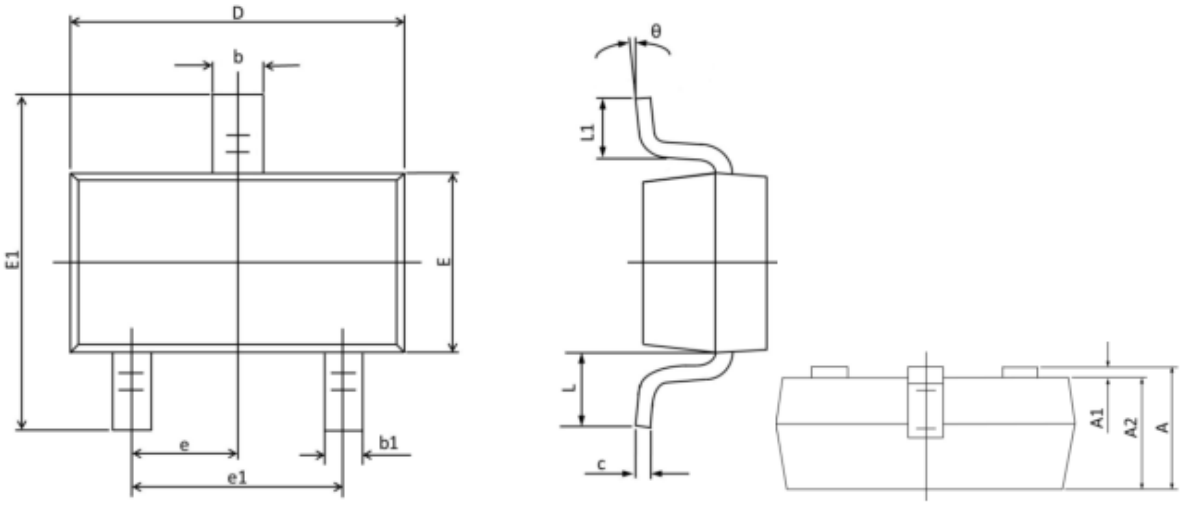


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

SOT-523



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.014
b1	0.150	0.250	0.006	0.010
c	0.100	0.200	0.004	0.008
D	1.500	1.750	0.059	0.069
E	0.700	0.900	0.028	0.035
E1	1.400	1.750	0.055	0.069
e	0.5 TYP		0.02TYP	
e1	0.9	1.100	0.035	0.043
L	0.300	0.460	0.012	0.018
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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