

GSM2120Y

20V N+P Dual Channel MOSFETs

Product Description

These N+P dual 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

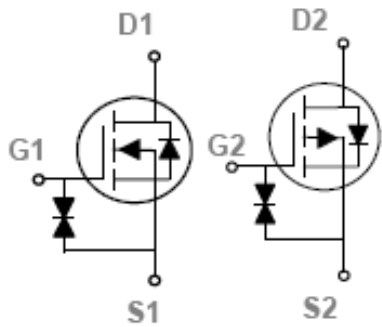
- N-Channel
20V, 0.8A, $R_{DS(ON)}=300m\Omega@V_{GS}=4.5V$
- P-Channel
-20V, -0.4A, $R_{DS(ON)}=600m\Omega@V_{GS}=-4.5V$
- Fast switching
- Suit for 1.5V/-1.5V Gate Drive Applications
- Green Device Available
- SOT-563 package design

Applications

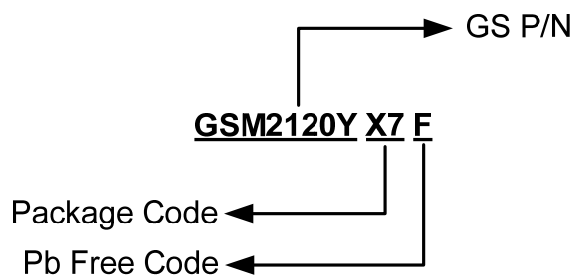
- Notebook
- Load Switch
- Networking
- Hand-held Instruments

Packages & Pin Assignments

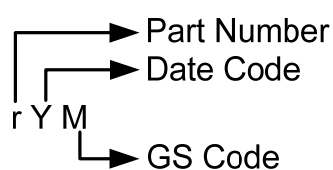
GSM2120YX7F (SOT-563)	
 Top Views	
Pin	Description
1	Source 1
2	Gate 1
3	Drain 2
4	Source 2
5	Gate 2
6	Drain 1



Ordering Information



Marking Information



Part Number	Package	Part Marking	Quantity
GSM2120YX7F	SOT-563	rYM	3000pcs

Absolute Maximum Ratings

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

Symbol	Parameter		Typical		Unit
			N-Channel	P-Channel	
V_{DS}	Drain-Source Voltage		20	-20	V
V_{GS}	Gate-Source Voltage		± 8	± 8	V
I_D	Continuous Drain Current ($T_J=150^{\circ}\text{C}$)	$T_C=25^{\circ}\text{C}$	800	-400	mA
		$T_C=100^{\circ}\text{C}$	510	-250	
I_{DM}	Pulsed Drain Current		3.2	-1.6	A
P_D	Power Dissipation	$T_C=25^{\circ}\text{C}$	312		mW
		Derate above 25°C	2.5		mW/ $^{\circ}\text{C}$
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		400		$^{\circ}\text{C}/\text{W}$

Electrical Characteristics (N-Channel)

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℃ , 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
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient			3		mV/℃
I _{GSS}	Gate Leakage Current	V _{DS} =0V,V _{GS} =±6V			±20	uA
I _{DSS}	Zero Gate Voltage Drain 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 Time	V _{DD} =10V,I _D =0.5A, V _{GS} =4.5V,R _G =10Ω		5	10	ns
t _r				3.5	7	
t _{d(off)}	Turn-Off Time			14	28	
t _f				6	12	

Electrical Characteristics (P-Channel)

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℃, 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
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient			3		mV/℃
I _{GSS}	Gate Leakage Current	V _{DS} =0V,V _{GS} =±8V			±20	uA
I _{DSS}	Zero Gate Voltage Drain 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			-0.4	A
I _{SM}	Pulsed Source Current				-0.8	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =-4.5V,I _D =-0.3A		440	600	mΩ
		V _{GS} =-2.5V,I _D =-0.2A		610	850	
		V _{GS} =-1.8V,I _D =-0.1A		810	1200	
		V _{GS} =-1.5V,I _D =-0.1A		1020	1600	
		V _{GS} =-1.2V,I _D =-0.1A		1800	3000	
V _{SD}	Diode Forward Voltage	V _{GS} =0V,I _S =-0.2A			-1	V
Dynamic						
Q _q	Total Gate Charge	V _{DS} =-10V,V _{GS} =-4.5V, I _D =-0.2A		1	2	nC
Q _{gs}	Gate-Source Charge			0.28	0.5	
Q _{gd}	Gate-Drain Charge			0.18	0.4	
C _{iss}	Input Capacitance	V _{DS} =-10V,V _{GS} =0V, f=1MHz		40	78	pF
C _{Oss}	Output Capacitance			15	30	
C _{rss}	Reverse Transfer Capacitance			6.5	13	
t _{d(on)}	Turn-On Time	V _{DD} =-10V,I _D =-0.2A, V _{GS} =-4.5V,R _G =10Ω		8	16	ns
t _r				5.2	10	
t _{d(off)}	Turn-Off Time			30	60	
t _f				18	36	

Typical Performance Characteristics (N-Channel)

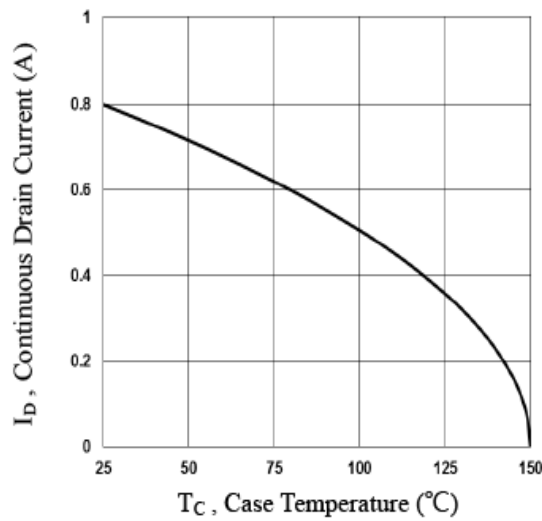


Fig.1 Continuous Drain Current vs. T_C

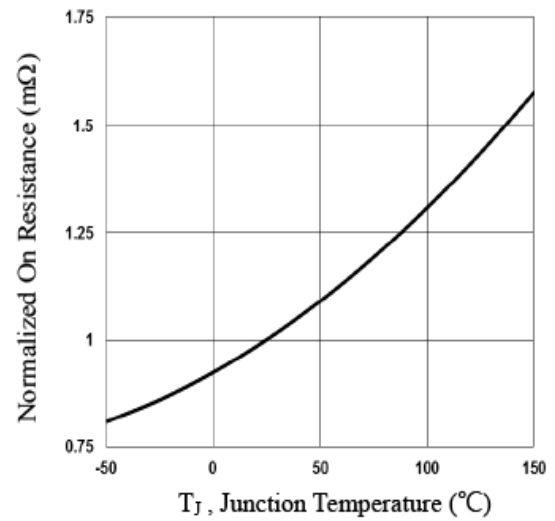


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

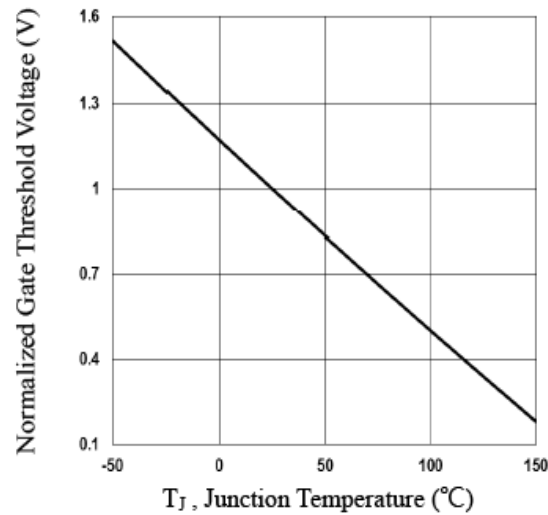


Fig.3 Normalized V_{th} vs. T_J

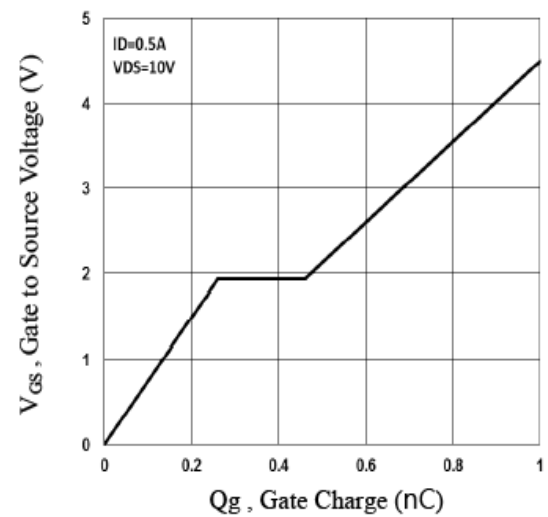


Fig.4 Gate Charge Waveform

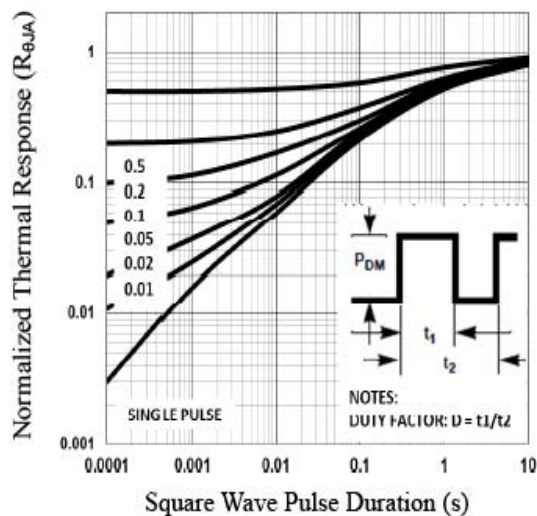


Fig.5 Normalized Transient Impedance

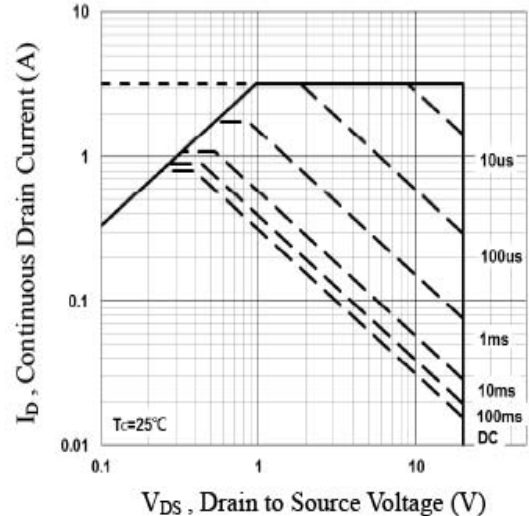
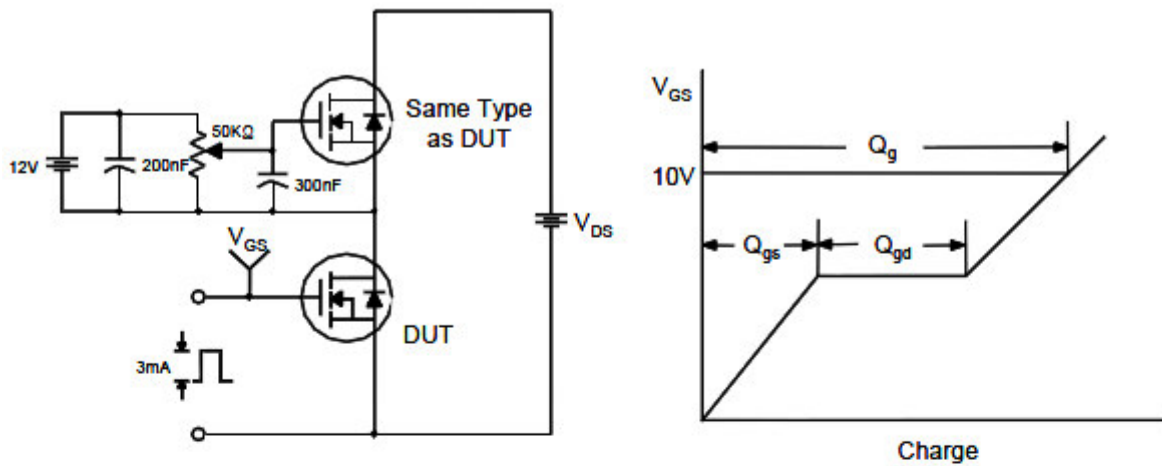


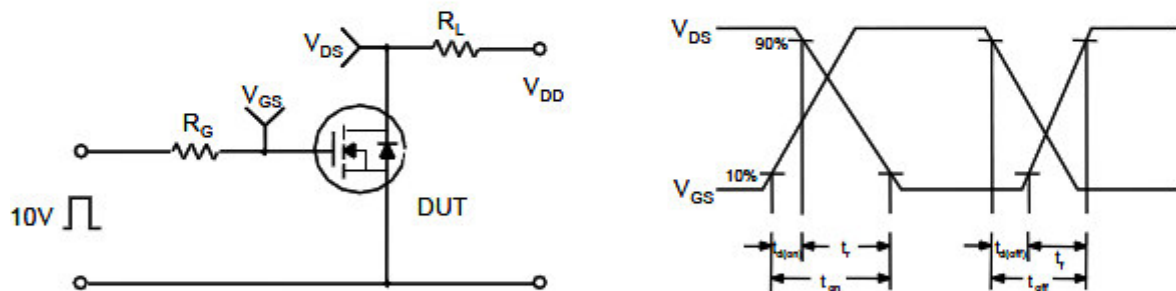
Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (N-Channel)

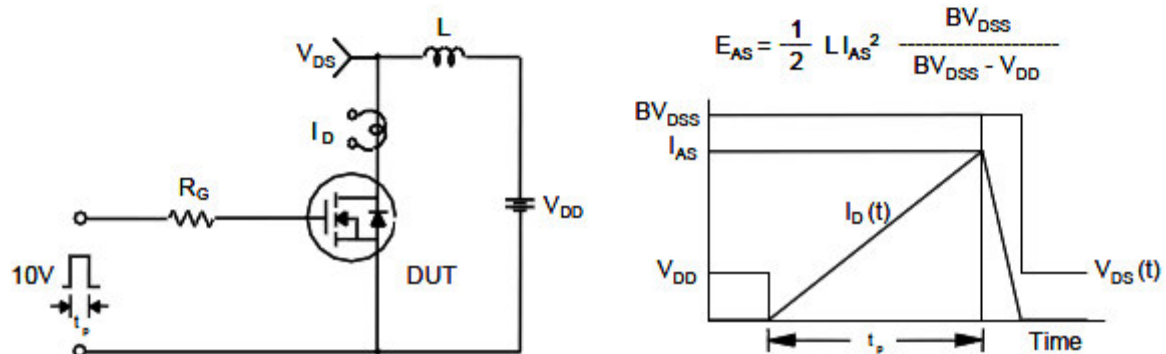
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Typical Performance Characteristics (P-Channel)

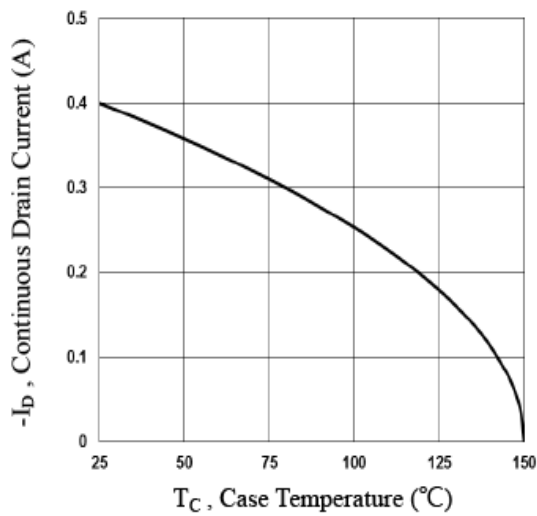


Fig.7 Continuous Drain Current vs. T_C

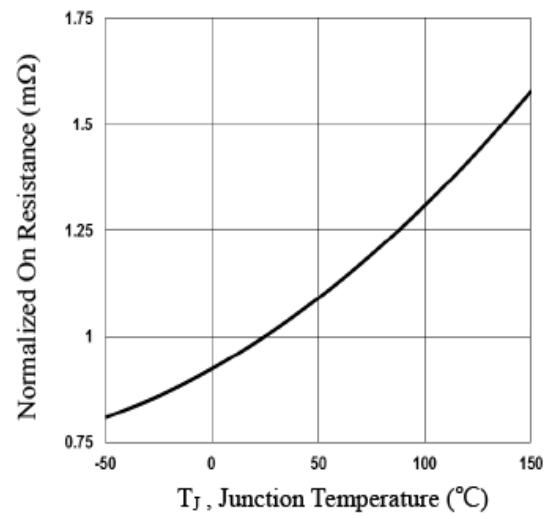


Fig.8 Normalized $R_{DS(on)}$ vs. T_J

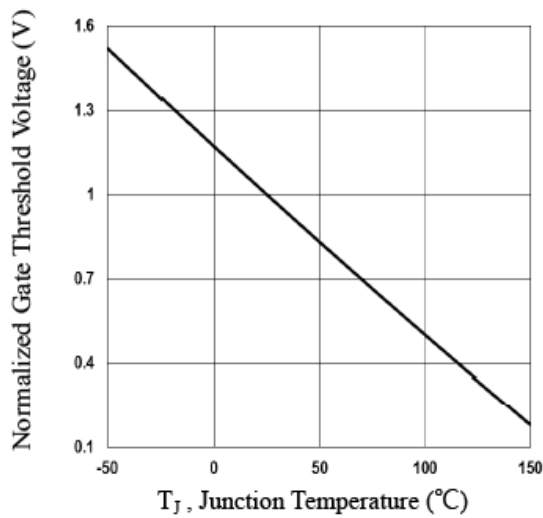


Fig.9 Normalized V_{th} vs. T_J

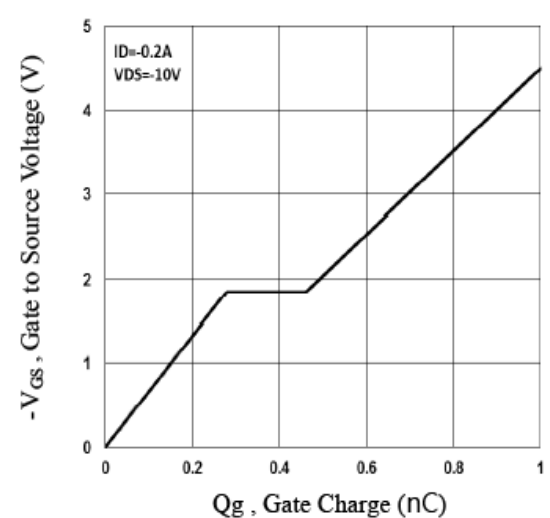


Fig.10 Gate Charge Waveform

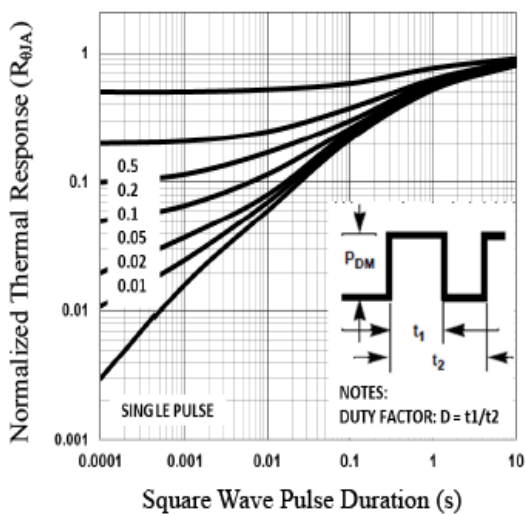


Fig.11 Normalized Transient Impedance

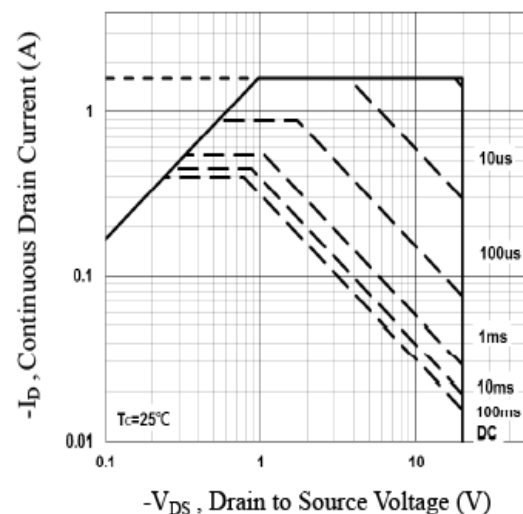
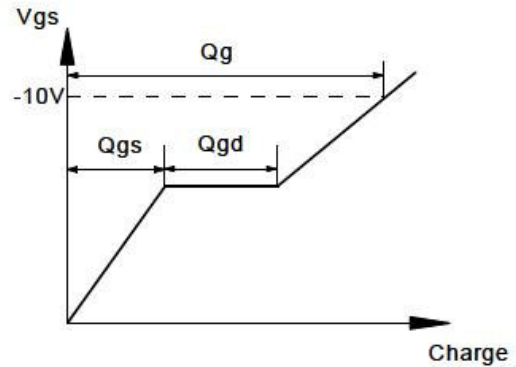
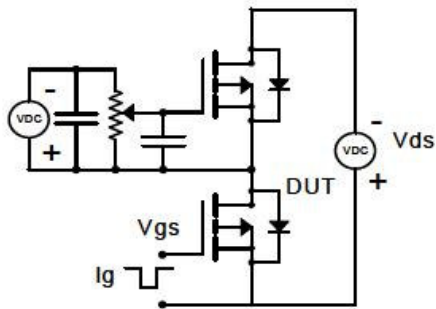


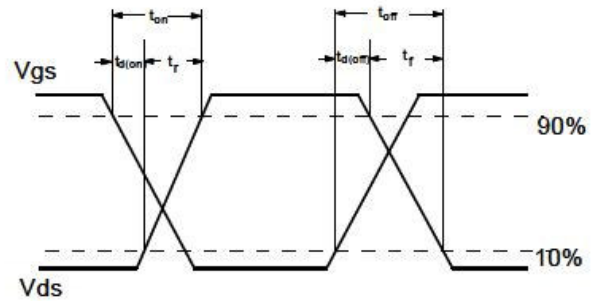
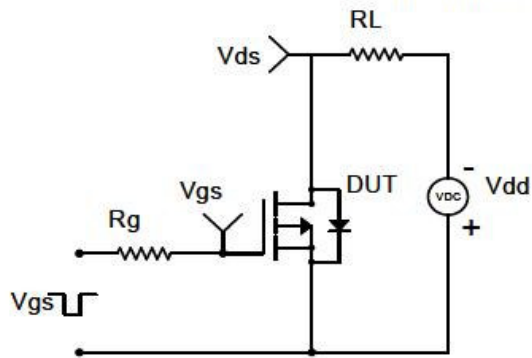
Fig.12 Maximum Safe Operation Area

Typical Performance Characteristics (P-Channel)

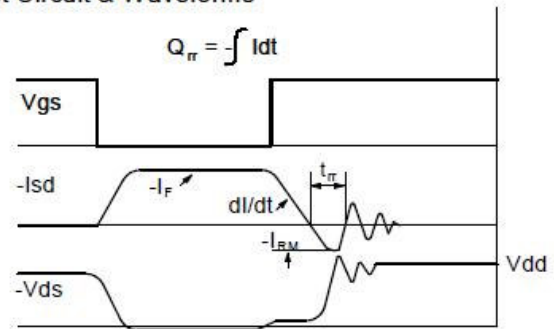
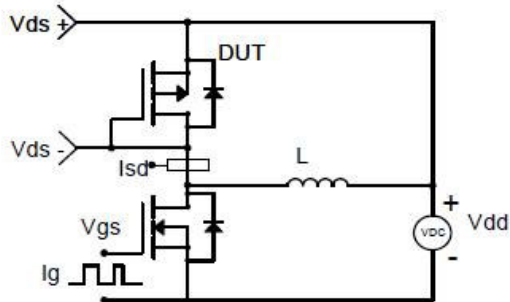
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

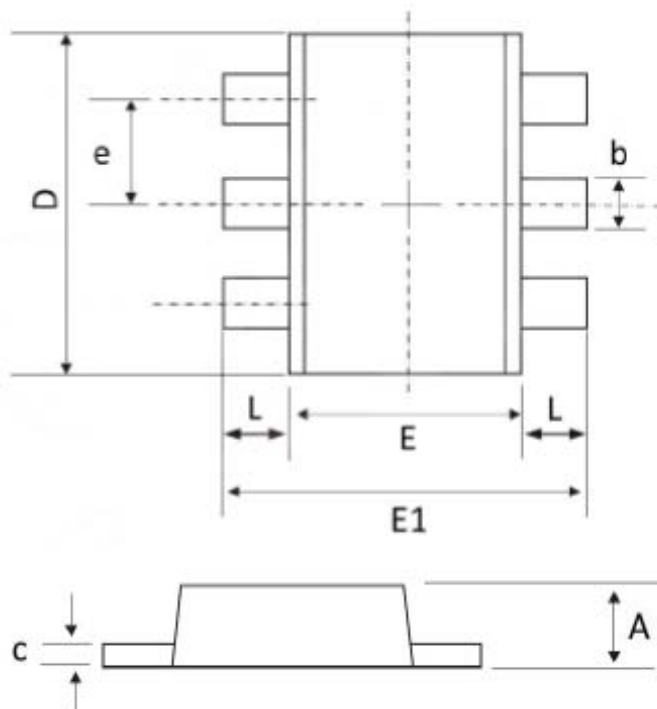


Diode Recovery Test Circuit & Waveforms



Package Dimension

SOT-563



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.500	0.600	0.020	0.024
b	0.150	0.300	0.006	0.012
c	0.100	0.180	0.004	0.007
D	1.500	1.700	0.059	0.067
E	1.100	1.250	0.043	0.049
E1	1.550	1.700	0.061	0.067
e	0.5(BSC)		0.02(BSC)	
L	0.100	0.300	0.004	0.012

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