

# GSM2220Y

## 20V Dual N-Channel MOSFETs

### Product Description

These Dual 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,  $R_{DS(ON)}=300m\Omega@V_{GS}=4.5V$
- Fast switching
- Suit for 1.5V Gate Drive Applications
- Green Device Available
- SOT-563 package design

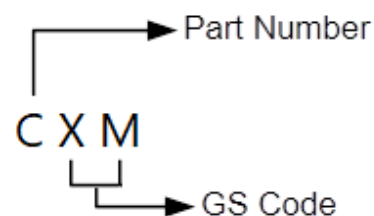
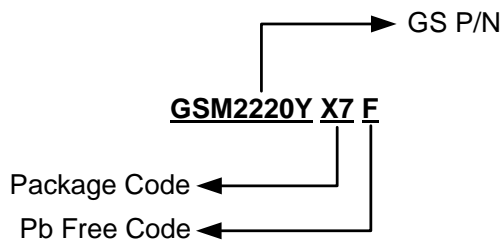
### Applications

- Notebook
- Load Switch
- Networking
- Hand-Held Instruments

### Packages & Pin Assignments

GSM2220YX7F (SOT-563)			
<p>Top Views</p>			
<b>Pin</b>	<b>Description</b>	<b>Pin</b>	<b>Description</b>
1	Source 1	4	Source 2
2	Gate 1	5	Gate 2
3	Drain 2	6	Drain 1

### Ordering & Marking Information



Part Number	Package	Part Marking	Quantity
GSM2220YX7F	SOT-563	CXM	3000pcs

## Absolute Maximum Ratings

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

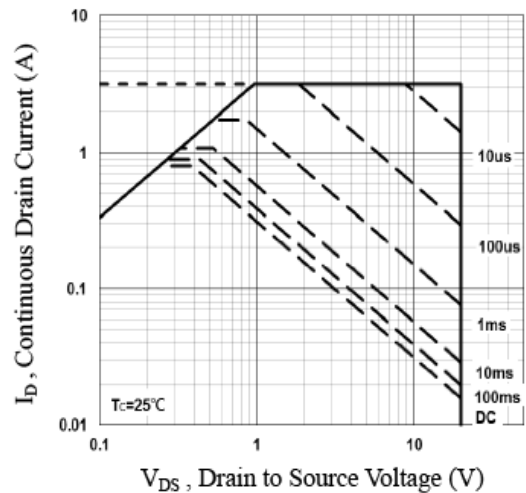
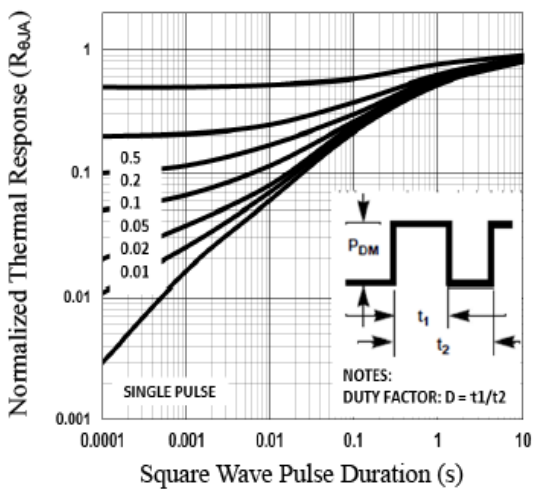
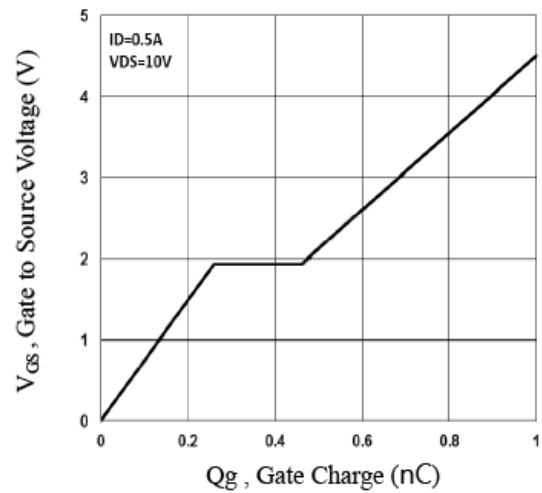
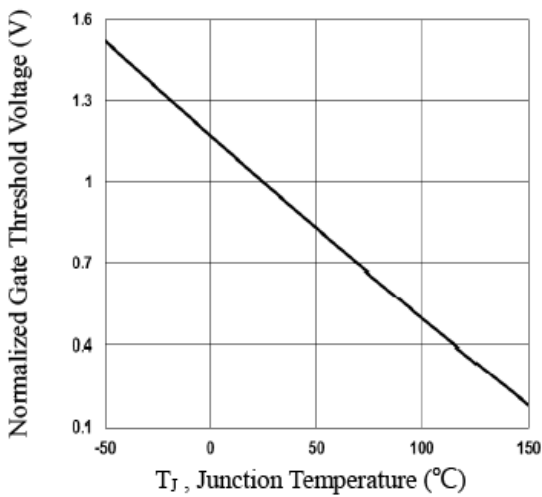
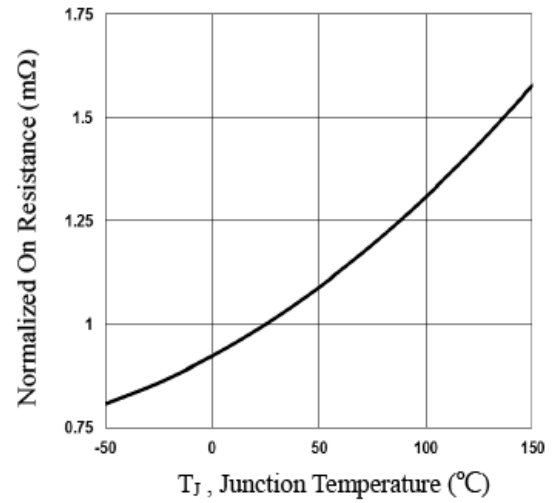
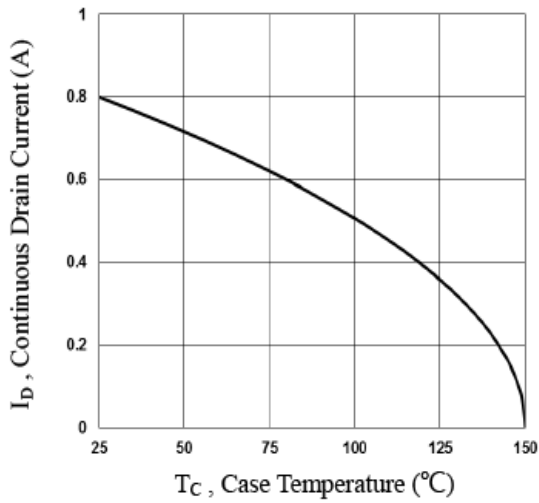
Symbol	Parameter	Typical	Unit
V <sub>DS</sub>	Drain-Source Voltage	20	V
V <sub>GS</sub>	Gate-Source Voltage	±8	V
I <sub>D</sub>	Continuous Drain Current	T <sub>A</sub> =25°C	800
		T <sub>A</sub> =70°C	640
I <sub>DM</sub>	Pulsed Drain Current	3.2	A
P <sub>D</sub>	Power Dissipation (T <sub>A</sub> =25°C)	312	mW
	Power Dissipation (Derate above 25°C)	2.5	mW/°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to +150	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to +150	°C
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient	400	°C/W

## Electrical Characteristics

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

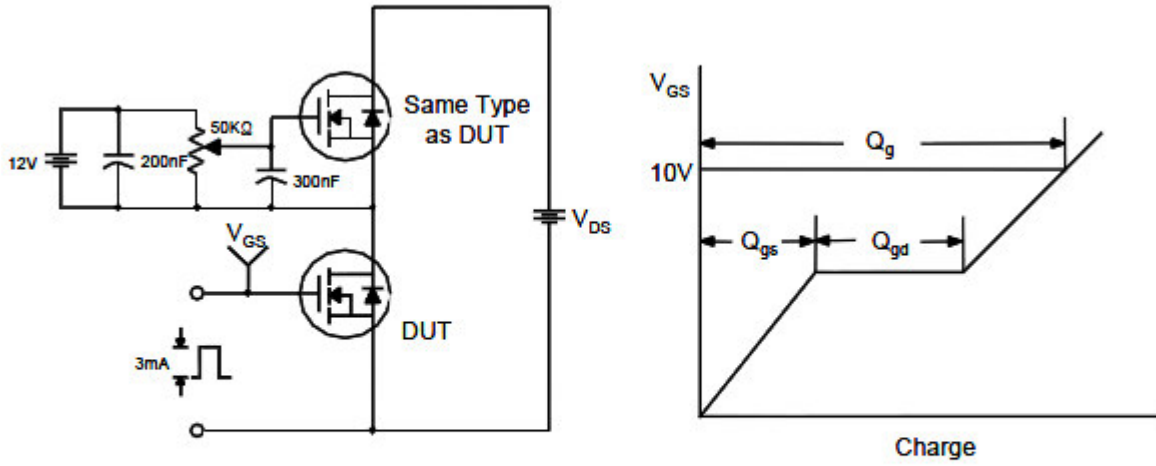
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	20			V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA		-0.01		V/°C
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	0.3	0.6	1.0	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient				3	
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±6V			±20	uA
I <sub>DSS</sub>	Drain Current Leakage 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 Delay 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>	Rise Time			3.5	7	
t <sub>d(off)</sub>	Turn-Off Delay Time			14	28	
t <sub>f</sub>	Fall Time			6	12	

## Typical Performance Characteristics

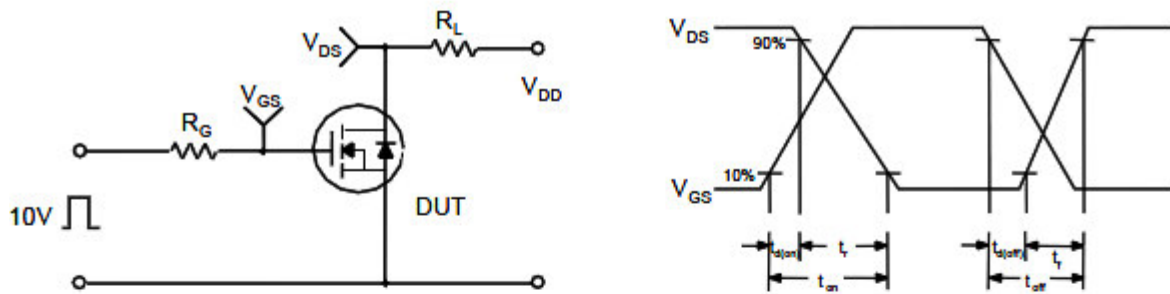


## Typical Performance Characteristics (Continue)

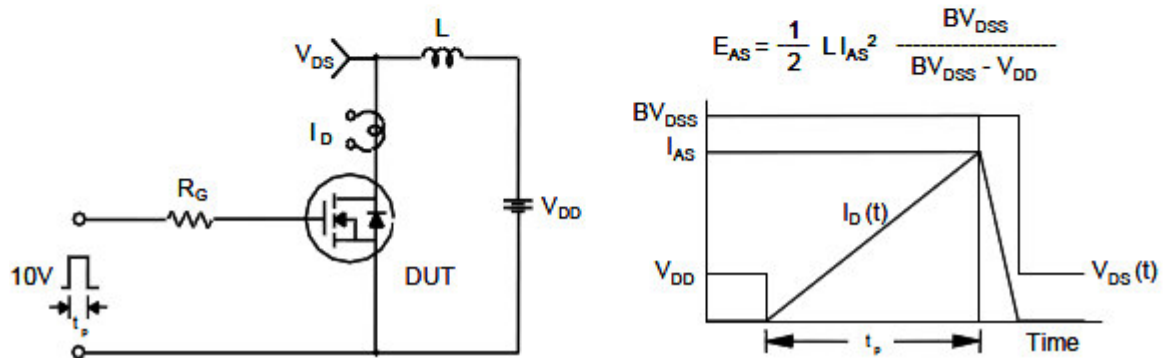
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

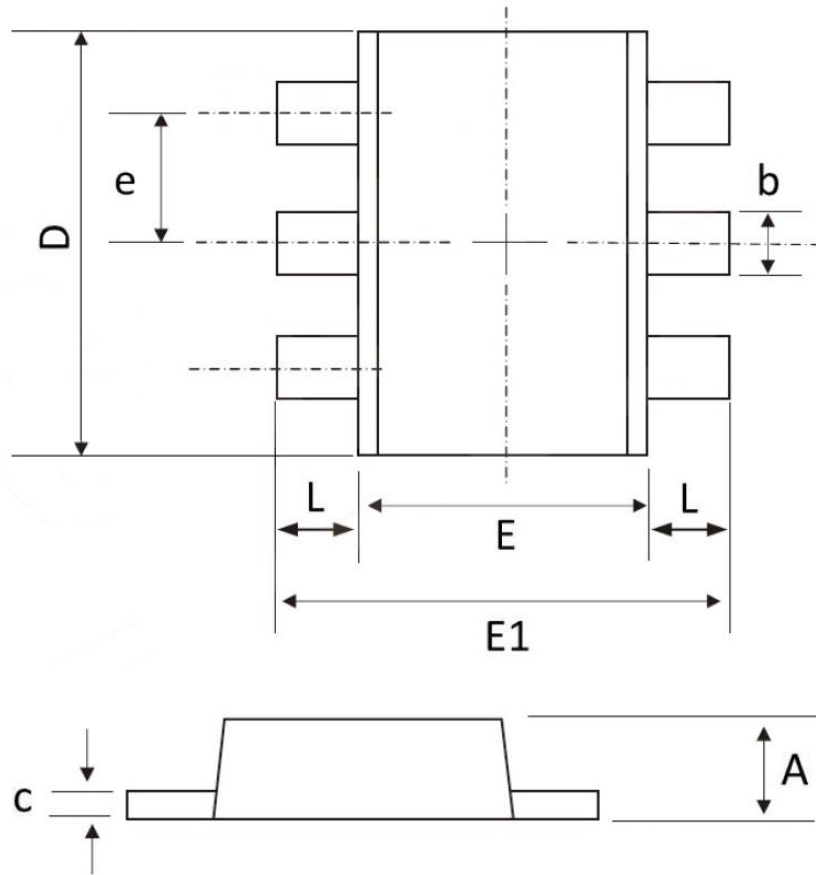


Unclamped Inductive Switching Test Circuit & Waveforms



## Package Dimension

### SOT-563









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

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