GSM3164X5F

30V 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

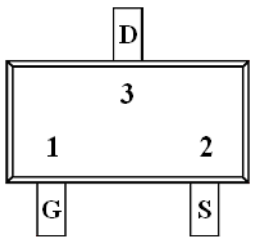
- 30V/3.4A, $R_{DS(ON)}$=65mΩ@V_{GS}=10V
  30V/3.0A, $R_{DS(ON)}$=75mΩ@V_{GS}=4.5V
  30V/2.0A, $R_{DS(ON)}$=90mΩ@V_{GS}=2.5V
- Low Gate Threshold Voltage
- Low On-Resistance
- Fast Switching Speed
- SOT-323 package design

Applications

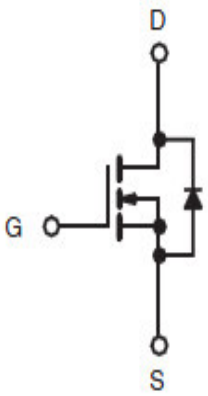
- Power Management in Notebook
- Battery Powered System
- DC/DC Converter

Packages & Pin Assignments

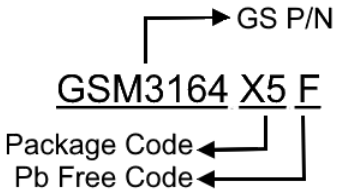
GSM3164X5F (SOT-323)



Pin	Description
1	Gate
2	Source
3	Drain

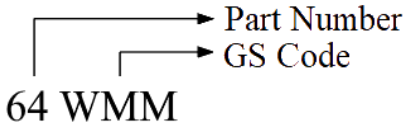


Ordering Information



Part Number	Package	Quantity Reel
GSM3164X5F	SOT-323	3000 PCS

Marking Information



Absolute Maximum Ratings

(T_A=25ºC Unless otherwise noted)

Symbol	Parameter		Typical	Unit
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate –Source Voltage		±12	V
I_D	Continuous Drain Current	T_A=25ºC	3.8	A
		T_A=70ºC	3	
I_{DM}	Pulsed Drain Current		16	A
P_D	Power Dissipation	T_A=25ºC	1.2	W
		T_A=70ºC	0.8	
T_J	Operating Junction Temperature		-55/150	ºC
T_{STG}	Storage Temperature Range		-55/150	ºC
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		110	℃/W

Electrical Characteristics

(T_A=25ºC unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	30			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	0.4		1.2	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±12V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=24V, V_{GS}=0V T_J=25ºC			1	uA
		V_{DS}=24V, V_{GS}=0V, T_J=55ºC			5	
$R_{DS(on)}$	Drain-Source On-Resistance (Note 2)	V_{GS}=10V, I_D=3.4A		55	65	mΩ
		V_{GS}=4.5V, I_D=3.0A		65	75	
		V_{GS}=2.5V, I_D=2.0A		80	90	
g_{FS}	Forward Transconductance	V_{DS}=5V, I_D=3.4A		6		S
V_{SD}	Diode Forward Voltage (Note 2)	I_S=1A, V_{GS}=0V			1.2	V
Dynamic						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V,f=1MHz		662		pF
C_{oss}	Output Capacitance			52		
C_{rss}	Reverse Transfer Capacitance			45		
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}=4.5V, I_D=3.0A		8.4		nC
Q_{gs}	Gate-Source Charge			1.6		
Q_{gd}	Gate-Drain Charge			1.8		
$t_{d(on)}$	Turn-On Time	V_{DD}=10V, R_G=3.3Ω, I_D=3.0A, V_{GS}=4.5V		3.2		ns
T_r				41.8		
$t_{d(off)}$	Turn-Off Time			21.2		
T_f				6.4		

Note:

1.The data testing by surface mounting on a 1 inch2 / FR4 board/ 2 OZ copper.

2.The data testing by pulsed, pulse width≦ 300us, duty cycle≦ 2%

3.The power dissipation is limited by 150ºC junction temperature

4.The data is theoretically the same as ID and IDM, in real applications, should be limited by total power dissipation.

Typical Performance Characteristics

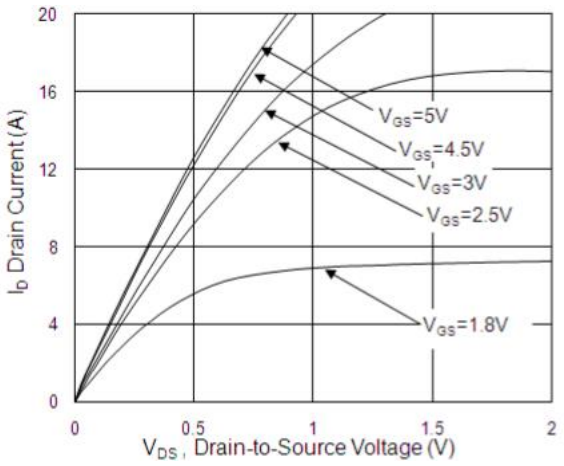


Fig.1 Typical Output Characteristics

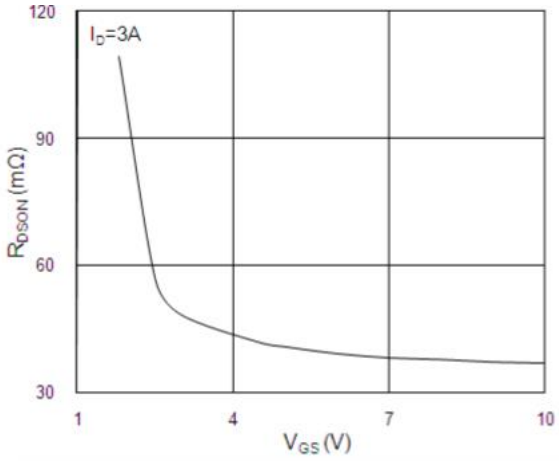


Fig.2 On-Resistance vs.Gate-Source

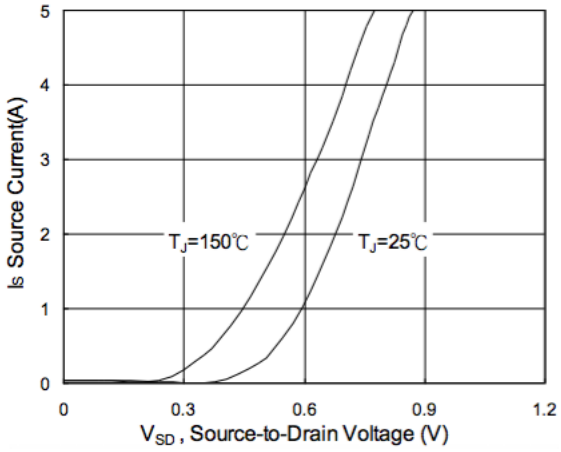


Fig.3 Forward Characteristics of Reverse

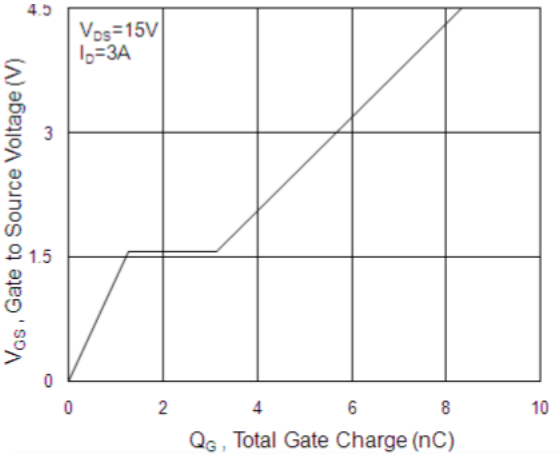


Fig.4 Gate-Charge Characteristics

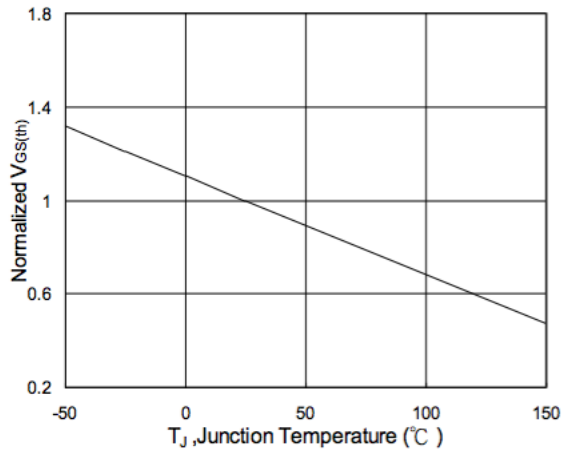


Fig.5 Normalized $V_{GS(th)}$vs.T_J

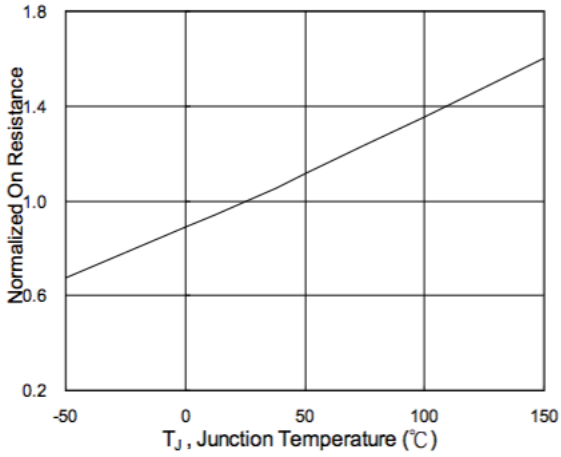


Fig.6 Normalized R_{DSON} vs.T_J

Typical Performance Characteristics (N-Channel Continue)

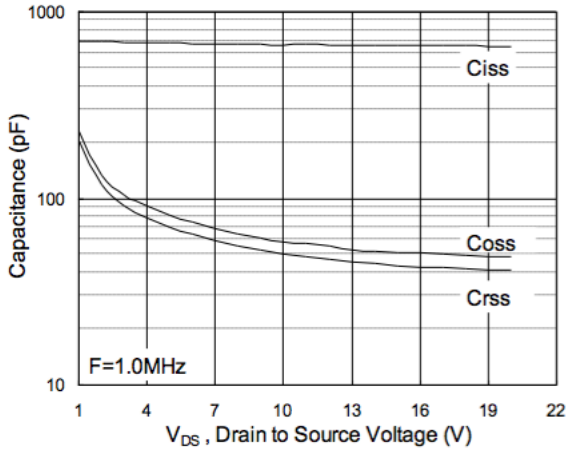


Fig.7 Capacitance

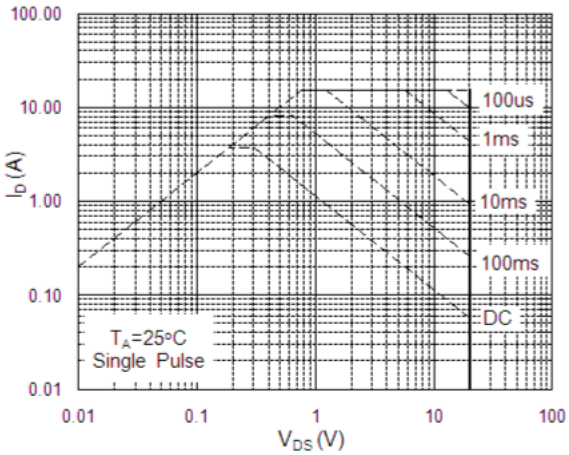


Fig.8 Safe Operating Area

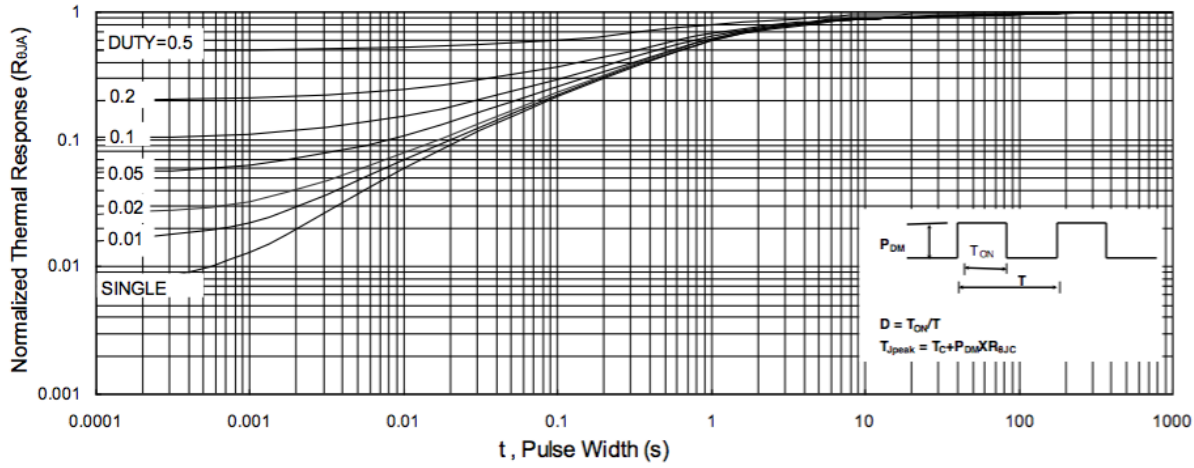
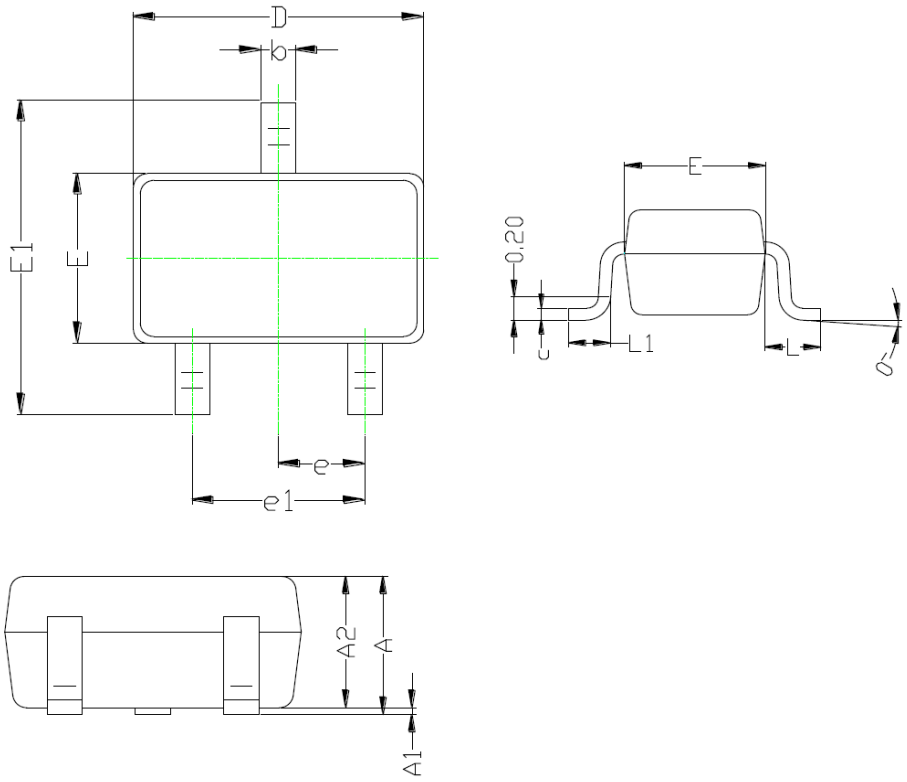


Fig.9 Normalized Maximum Transient Thermal Impedance

Package Dimension

SOT-323



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.900	1.000	0.035	0.039
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.015
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.086
E	1.150	1.350	0.059	0.053
E1	2.150	2.400	0.084	0.094
e	0.650 TYP		0.025 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.450	0.010	0.017
θ	0º	8º	0º	8º

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