GSM3131SF

30V P-Channel MOSFET

Product Description

These P-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

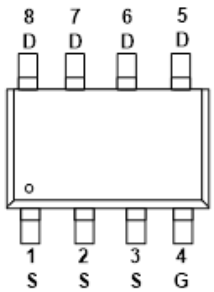
- -30V, -6A, $R_{DS(ON)}$ = 32mΩ @ V_{GS}=-10V
- Suit for -4.5V Gate Drive Applications
- SOP-8L Package
- RoHS Compliant and Halogen Free

Applications

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

Packages & Pin Assignments

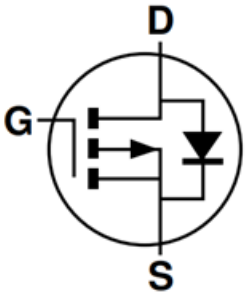
GSM3131SF (SOP-8L)



Top View

Pin	Description	Pin	Description
1	Source	8	Drain
2	Source	7	Drain
3	Source	6	Drain
4	Gate	5	Drain

Equivalent Circuit



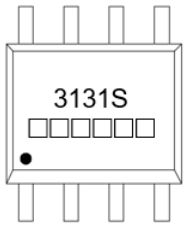
Ordering and Marking Information

Ordering Information			
Part Number	**Package**	**Part Marking**	**Quantity / Reel**
GSM3131SF	SOP-8L	3131S □□□□□□	4,000 PCS

GSM3131 1 2

- **Product Code:** GSM3131
- **Package Code:** 1 is **S** for SOP-8L
- **Green Level:** 2 is **F** for RoHS Compliant and Halogen Free

Marking Information



- **Product Code:** 3131S
- **GS Code:** □□□□□□

Absolute Maximum Ratings (T_J=25ºC Unless otherwise noted)

Symbol	Parameter		Value	Unit
V_{DS}	Drain-Source Voltage		-30	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A=25℃	-6	A
		T_A=70℃	-4.7	
I_{DM}	Pulsed Drain Current [1]		-24	A
I_{AS}	Single Pulse Avalanche Current [2]		-15	A
E_{AS}	Single Pulse Avalanche Energy [2]		22.5	mJ
P_D	Power Dissipation (T_A=25℃)		1.47	W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient [3]		72	℃/W
T_J	Operating Junction Temperature Range		-55 to +150	℃
T_{STG}	Storage Temperature Range		-55 to +150	℃

Note:
1. Pulsed width is limited by the maximum junction temperature.
2. V_{DD}=-15V, V_{GS}=-10V, L=0.1mH, I_{AS}=-15A.
3. Surface mounted on 1in^2 FR-4 board with 2oz. Copper.

Electrical Characteristics (T_J=25℃ Unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
$V_{(BR)DSS}$	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	-1.3	-1.7	-2.3	V
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0V, V_{GS}=±20V			±100	nA
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-30V, V_{GS}=0V T_J=25℃			-1	uA
		V_{DS}=-24V, V_{GS}=0V, T_J=125℃			-10	
$R_{DS(on)}$	Drain-Source On-Resistance [4]	V_{GS}=10V, I_D=-4A		26	32	mΩ
		V_{GS}=4.5V, I_D=-3A,		42	46	
g_{FS}	Forward Transconductance [4]	V_{DS}=-10V, I_D=-3A		8		S
V_{SD}	Diode Forward Voltage [4]	V_{GS}=0V, I_S=-1A			-1	V
I_S	Continuous Source Current	V_G=V_D=0V, Force Current			-1.47	A
Dynamic Characteristics						
Q_g	Total Gate Charge	V_{DS}=-15V, V_{GS}=-4.5V, I_D=-5A		8	15	nC
Q_{gs}	Gate-Source Charge			3.3	6	
Q_{gd}	Gate-Drain Charge			2.3	5	
C_{iss}	Input Capacitance	V_{DS}=15V,V_{GS}=0V, f=1MHz		757	1280	pF
C_{oss}	Output Capacitance			122	210	
C_{rss}	Reverse Transfer Capacitance			88	175	
$t_{d(on)}$	Turn-On Time	V_{DD}=15V, I_D=-1A, V_{GS}=-10V, R_G=6Ω		4.6	9	ns
t_r	Rise Time			14	26	
$t_{d(off)}$	Turn-Off Time			34	58	
t_f	Fall Time			18	35	

Note :

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

Typical Performance Characteristics

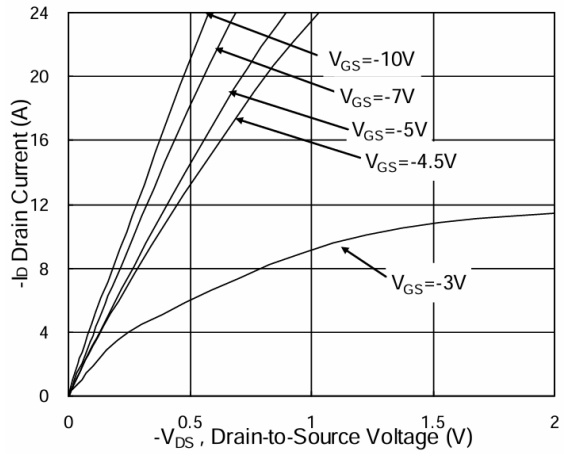


Fig.1 Output Characteristics

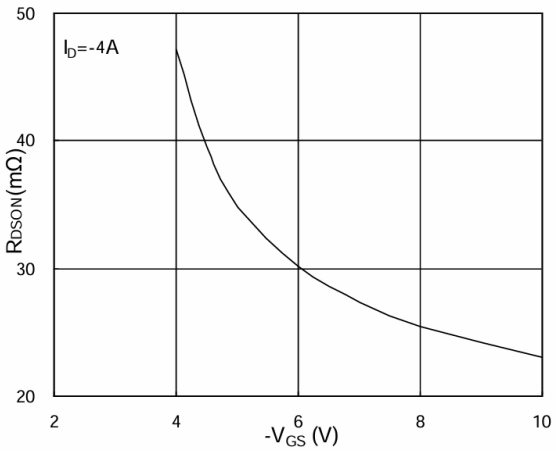


Fig.2 On-Resistance vs. Gate Voltage

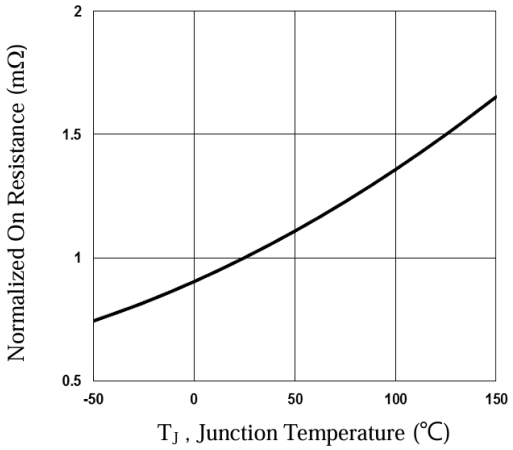


Fig.3 Normalized On-Resistance vs. T_J

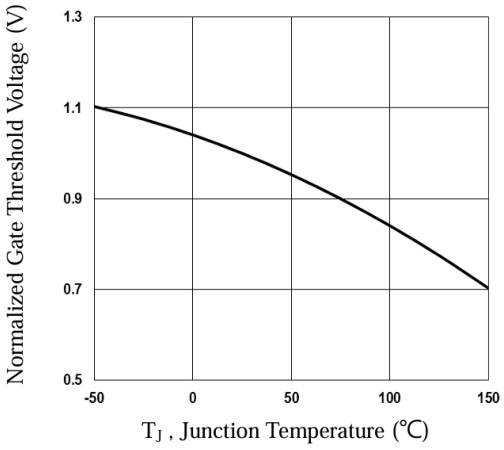


Fig.4 Normalized $V_{GS(th)}$ vs. T_J

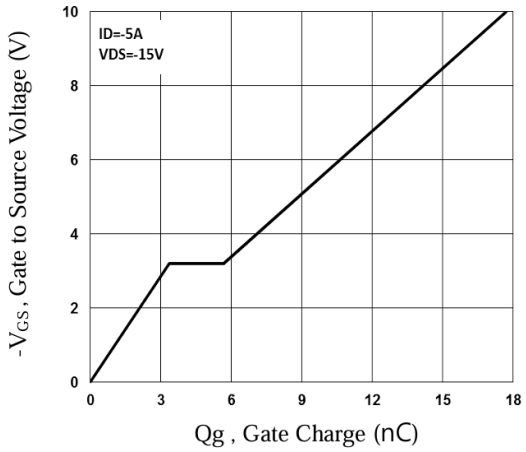


Fig.5 Gate Charge Characteristics

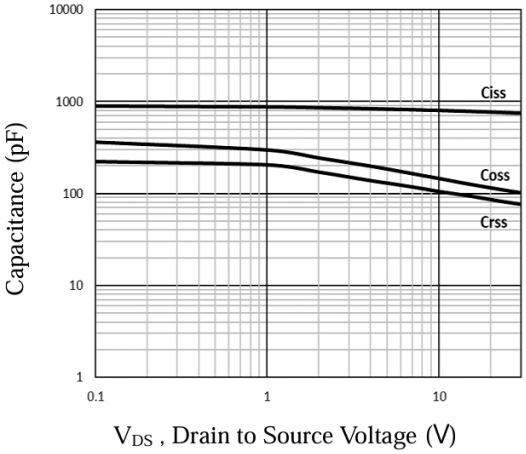


Fig.6 Capacitance Characteristics

Typical Performance Characteristics (Continued)

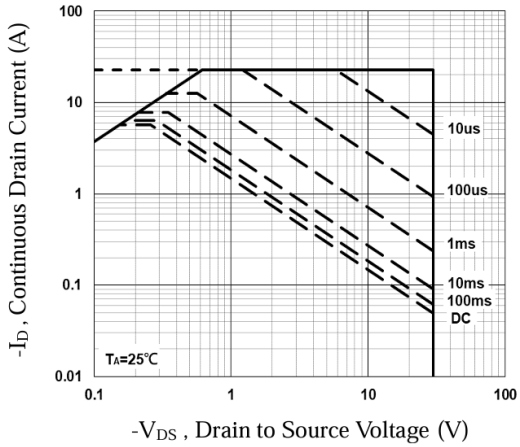


Fig.7 Maximum Safe Operation Area

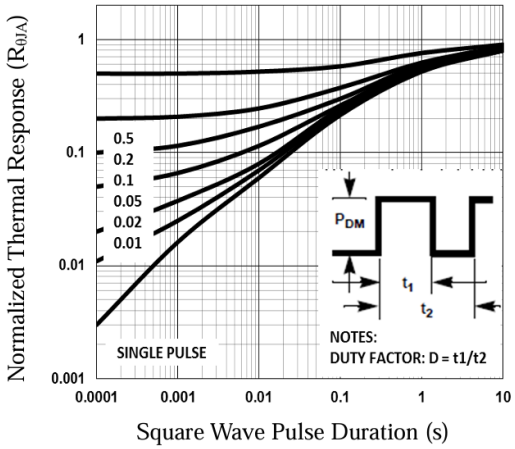
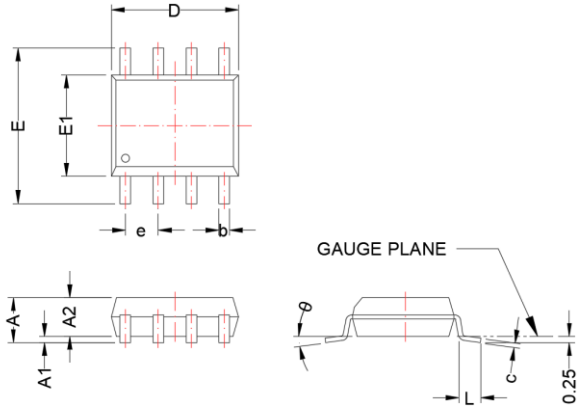


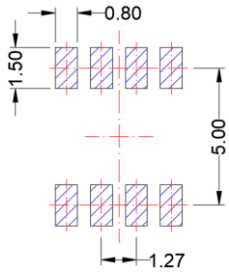
Fig.8 Normalized Transient Impedance

SOP-8L

Package Dimension



Recommended Land Pattern



Unit:mm

Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	---	1.75	---	0.069
A1	0.10	0.25	0.004	0.010
A2	1.25	---	0.049	---
b	0.31	0.51	0.012	0.020
c	0.10	0.25	0.004	0.010
D	4.70	5.10	0.185	0.201
E	5.80	6.20	0.228	0.244
E1	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
L	0.40	1.27	0.016	0.050
θ	0°	8°	0°	8°

NOTE:
Dimensions are exclusive of Burrs, Mold Flash and Tie Bar extrusions.

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