GSM3131RF

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.

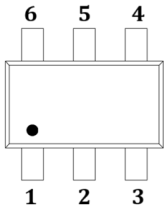
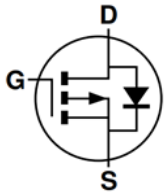
Features

- -30V, -5.5A, $R_{DS(ON)}$=32mΩ@V_{GS}=10V
- Fast switching
- Suit for -4.5V Gate Drive Applications
- SOT-23-6L Package
- RoHS Compliant and Halogen Free

Applications

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

Package & Pin Assignment

GSM3131RF (SOT-23-6L)	Equivalent Circuit
 Top View	

Pin	Symbol	Description	Pin	Symbol	Description
1	D	Drain	6	D	Drain
2	D	Drain	5	D	Drain
3	G	Gate	4	S	Source

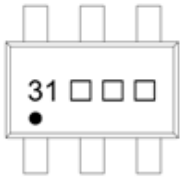
Ordering and Marking Information

Ordering Information			
Part Number	**Package**	**Part Marking**	**Quantity / Reel**
GSM3131RF	SOT-23-6L	31□□□	3,000 PCS

GSM3131 1 2

- **Product Code:** GSM3131
- **Package Code:** 1 is **R** for SOT-23-6L
- **Green Level:** 2 is **F** for RoHS Compliant and Halogen Free

Marking Information



- **Product Code:** 31
- **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℃	-5.5	A
		T_A=70℃	-4.4	
I_{DM}	Pulsed Drain Current [1]		-22	A
E_{AS}	Single Pulse Avalanche Energy [1,2]		19.6	mJ
P_D	Power Dissipation (T_A=25℃)		1.56	W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient [3]		80	℃/W
T_J	Maximum Temperature Range		+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}=-14A.
3. Surface Mounted on 1in^2 pad area.

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
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	
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0V, V_{GS}=±20V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	-1.3	-	-2.3	V
$R_{DS(on)}$	Drain-Source On-Resistance [4]	V_{GS}=10V, I_D=-4A		27	32	mΩ
		V_{GS}=4.5V, I_D=-3A,		42	46	
g_{FS}	Forward Transconductance	V_{DS}=-10V, I_D=-3A		5		S
V_{SD}	Diode Forward Voltage [4]	V_{GS}=0V, I_S=-1A			-1	V
I_S	Continuous Source Current				-1.5	A
Dynamic Characteristics						
Q_g	Total Gate Charge	V_{DS}=-15V, V_{GS}=-10V, I_D=-5A		17.8	35	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

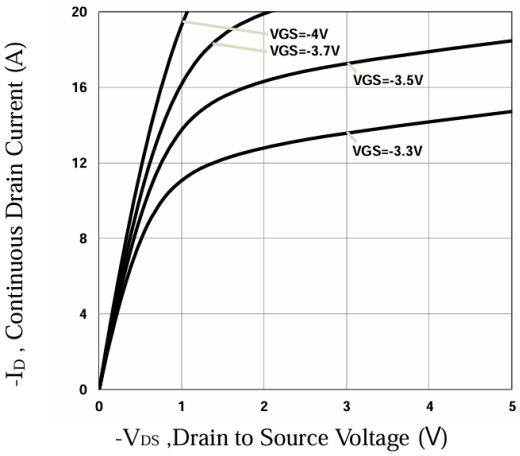


Fig 1. Output Characteristics

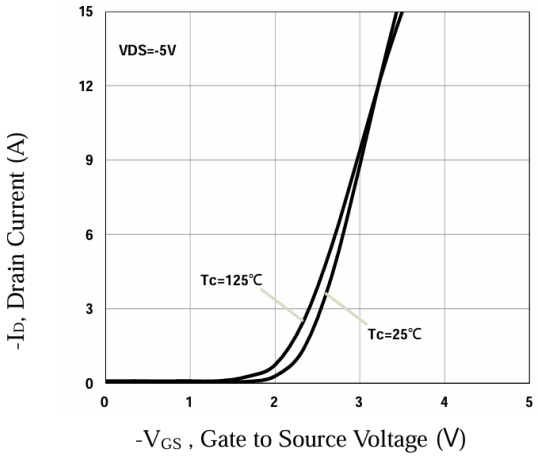


Fig 2. Transfer Characteristics

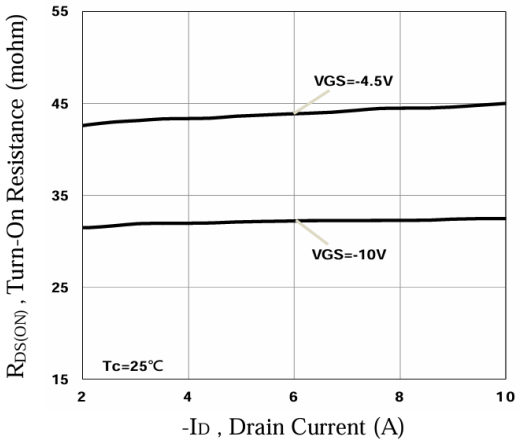


Fig 3. R_{DSON} vs. I_D

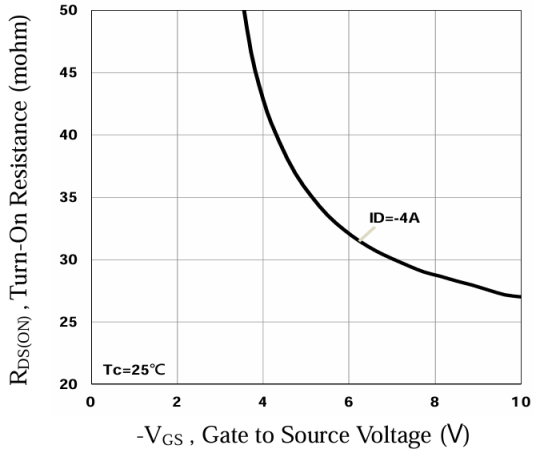


Fig 4. R_{DSON} vs. V_{GS}

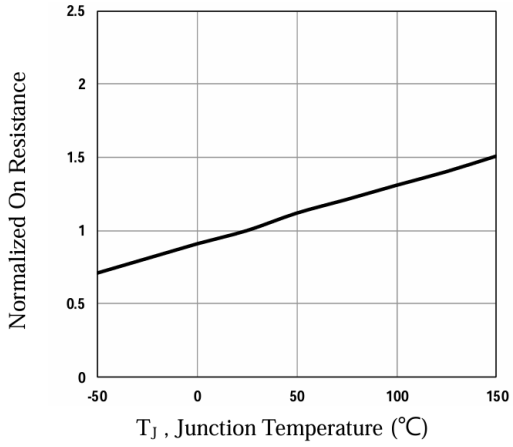


Fig 5. Normalized R_{DSON} vs. T_J

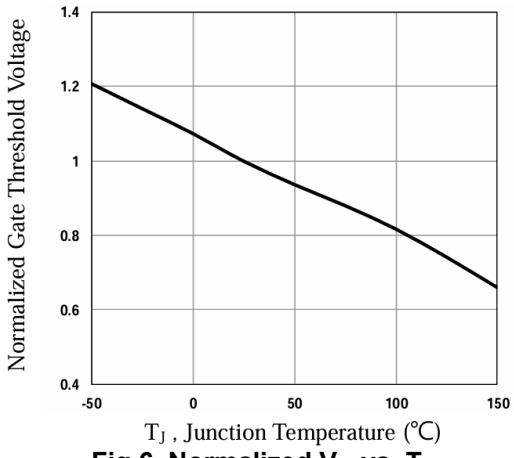


Fig 6. Normalized V_{th} vs. T_J

Typical Performance Characteristics (Continued)

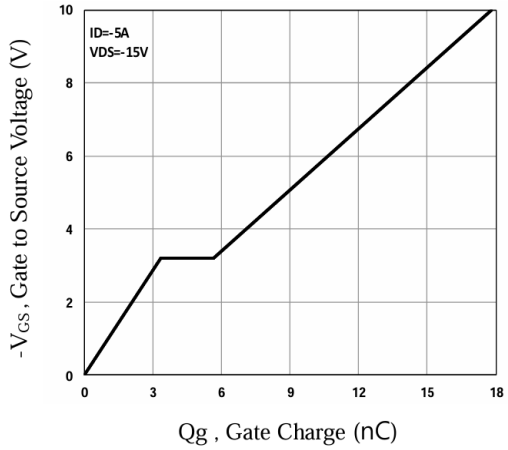


Fig 7. Gate Charge Characteristics

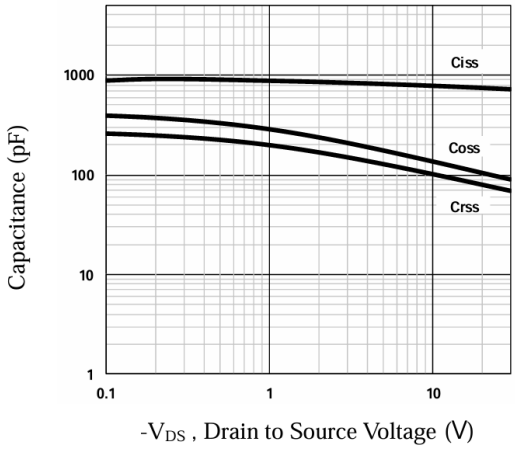


Fig 8. Capacitance Characteristics

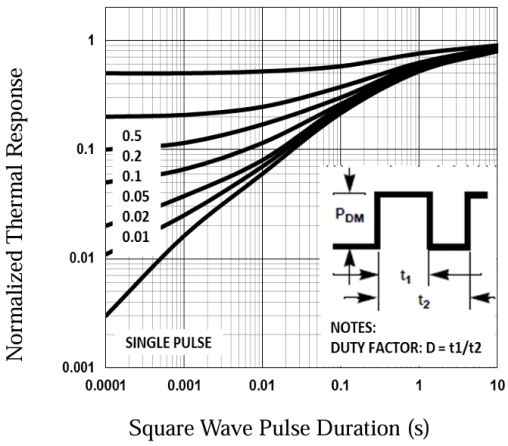


Fig 9. Normalized Transient Impedance

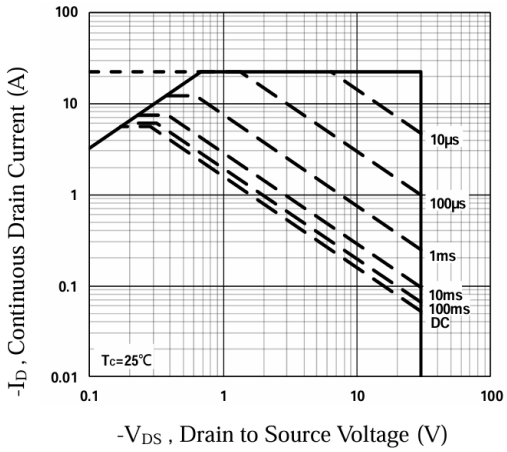
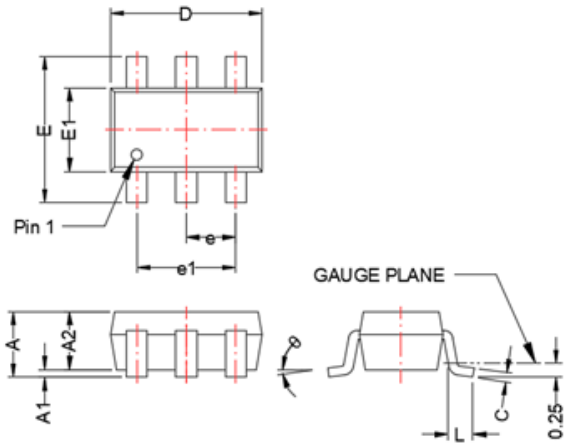


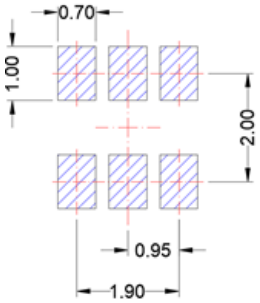
Fig 10. Maximum Safe Operation Area

SOT-23-6L

Package Dimension



Recommended Land Pattern



(Unit: mm)

Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.90	1.45	0.035	0.057
A1	0.00	0.15	0.000	0.006
A2	0.90	1.30	0.035	0.051
b	0.30	0.50	0.012	0.020
c	0.08	0.26	0.003	0.010
D	2.70	3.10	0.106	0.122
E	2.20	3.00	0.087	0.118
E1	1.30	1.75	0.051	0.069
e	0.95 BSC		0.037 BSC	
e1	1.90 BSC		0.075 BSC	
L	0.30	0.60	0.012	0.024
θ	0°	8°	0°	8°

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

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