

GSM3131RF

30V P-Channel MOSFETs

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.

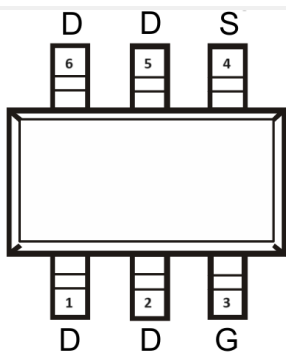
Features

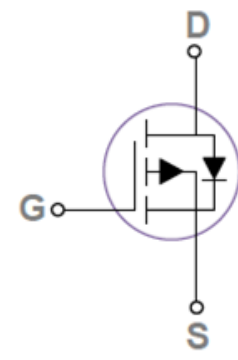
- -30V, -5.5A, $R_{DS(ON)}=32m\Omega@V_{GS}=10V$
- Fast switching
- Suit for -4.5V Gate Drive Applications
- Green Device Available

Applications

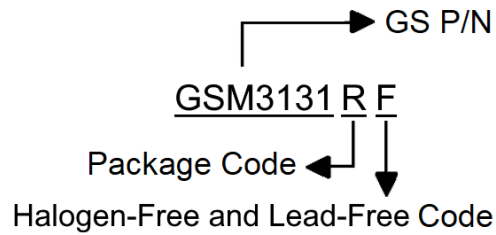
- Notebook
- Load Switch
- Battery Protection
- Hand-held Instruments

Packages & Pin Assignments

GSM3131RF (SOT-23-6L)	
	
Top Views	
Pin	Description
1	Drain
2	Drain
3	Gate
4	Source
5	Drain
6	Drain

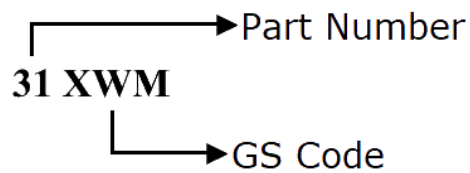


Ordering Information



Part Number	Package	Part Marking	Quantity
GSM3131RF	SOT-23-6L	31XWM	3000pcs

Marking Information



Absolute Maximum Ratings

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

Symbol	Parameter	Typical	Unit
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_A=25^{\circ}\text{C}$	-5.5
		$T_A=70^{\circ}\text{C}$	-4.4
I_{DM}	Pulsed Drain Current ¹	-22	A
EAS	Single Pulse Avalanche Energy ²	39.2	mJ
IAS	Single Pulse Avalanche Current ²	-28	A
P_D	Power Dissipation ($T_A=25^{\circ}\text{C}$)	1.56	W
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	80	$^{\circ}\text{C}/\text{W}$

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.

Electrical Characteristics

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	-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°C			-1	uA
		V _{DS} =-24V, V _{GS} =0V, T _J =125°C			-10	
I _S	Continuous Source Current	V _G =V _D =0V, Force Current			-5.5	A
I _{SM}	Pulsed Source Current				-11	
R _{DS(on)}	Drain-Source On-Resistance	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	V _{GS} =0V, I _S =-1A			-1	V
Dynamic						
Q _g	Total Gate Charge ^{2,3}	V _{DS} =-15V, V _{GS} =-4.5V, I _D =-5A		8	15	nC
Q _{gs}	Gate-Source Charge ^{2,3}			3.3	6	
Q _{gd}	Gate-Drain Charge ^{2,3}			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 ^{2,3}	V _{DD} =15V, I _D =-1A, V _{GS} =-10V, R _G =6Ω		4.6	9	ns
t _r	Rise Time ^{2,3}			14	26	
t _{d(off)}	Turn-Off Time ^{2,3}			34	58	
t _f	Fall Time ^{2,3}			18	35	

Note :

- The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
- Essentially independent of operating temperature.

Typical Performance Characteristics

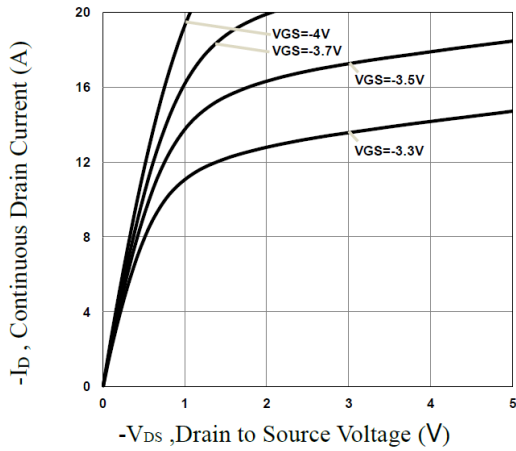


Fig.1 Typical Output Characteristics

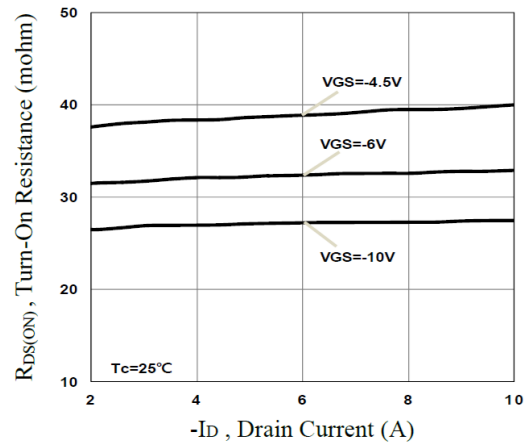


Fig.2 Turn-On Resistance vs I_D

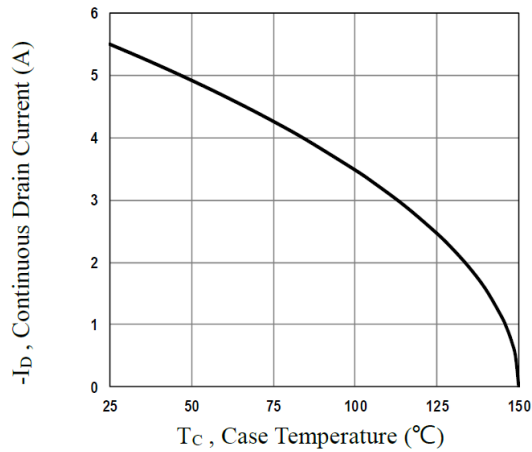


Fig.3 Continuous Drain Current vs T_C

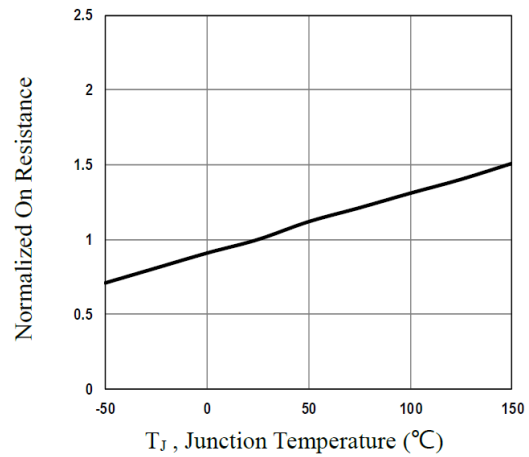


Fig.4 Normalized $R_{DS(ON)}$ vs T_J

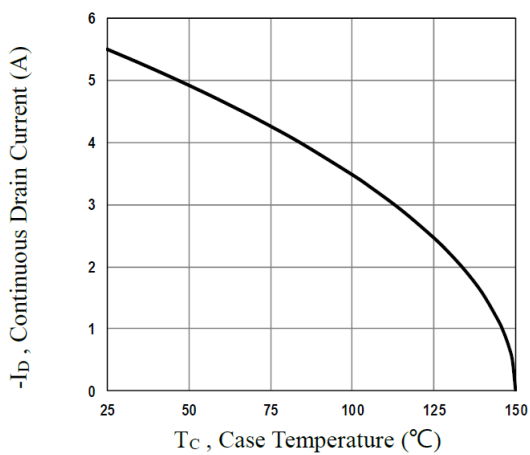


Fig.5 Normalized V_{th} vs T_J

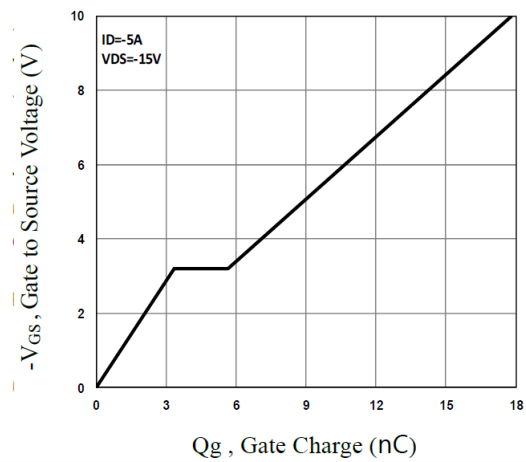


Fig.6 Gate Charge Characteristics

Typical Performance Characteristics (Continue)

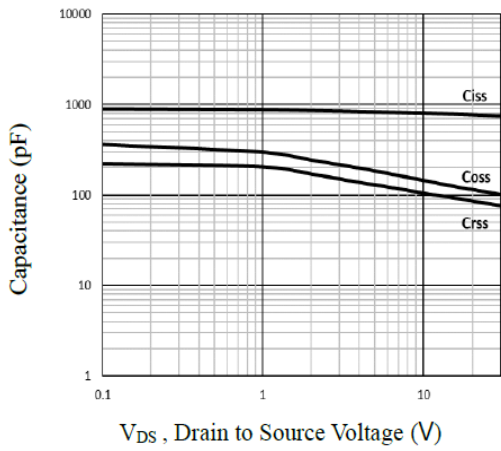


Fig.7 Capacitance Characteristics

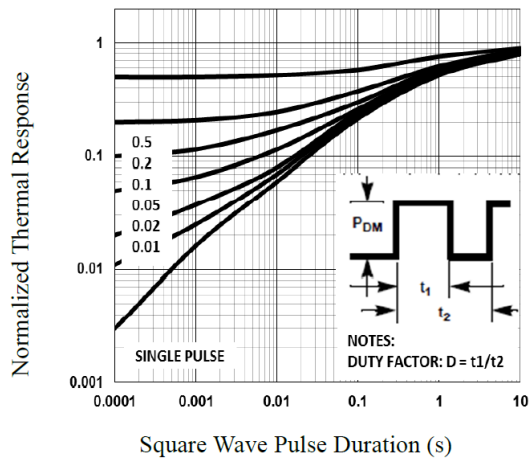


Fig.8 Normalized Transient Impedance

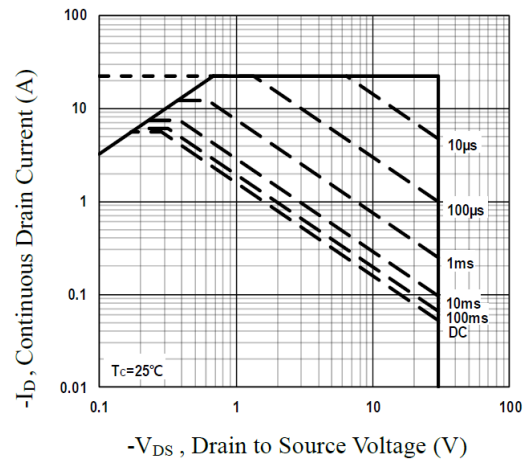


Fig.9 Maximum Safe Operation Area

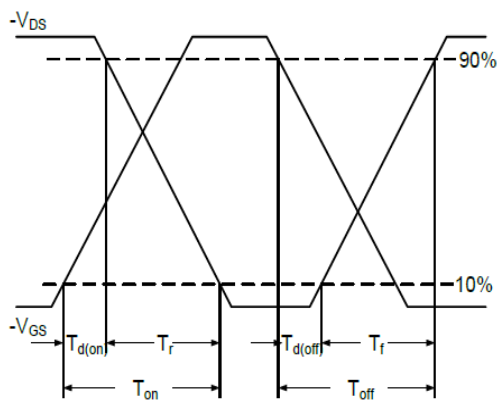


Fig.10 Switching Time Waveform

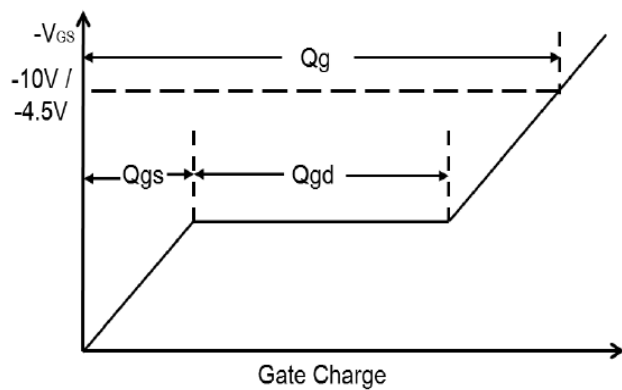
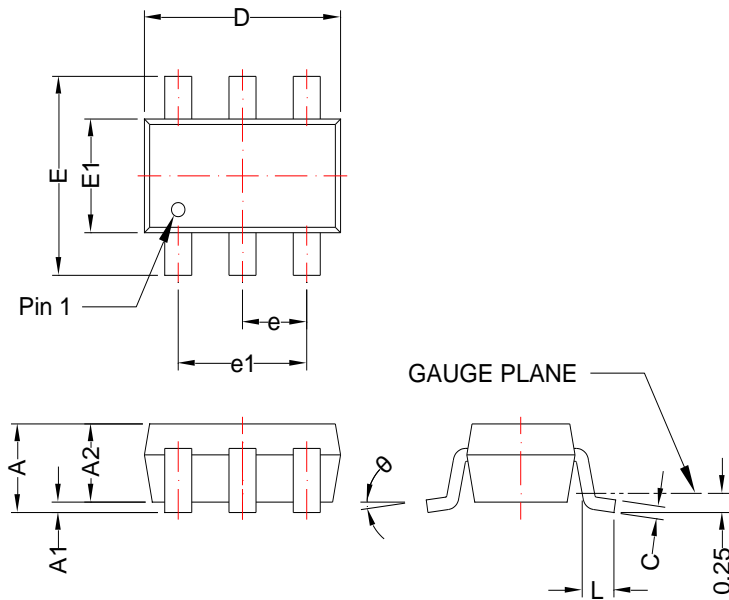


Fig.11 Gate Charge Waveform

Package Dimension

SOT-23-6L







DIMENSION D DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.25mm PER INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25mm PER SIDE.



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	0.3	0.6	0.012	0.024
θ	0°	8°	0°	8°

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