GSM2309KP

30V P-Channel Enhancement Mode 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

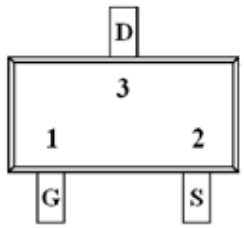
- -30V, -3.8A, $R_{DS(ON)}$=75mΩ@V_{GS}=-10V
- Fast switching
- Suit for -4.5V Gate Drive Applications
- G-S ESD Protection Diode Embedded
- Green Device Available
- SOT-23 package design

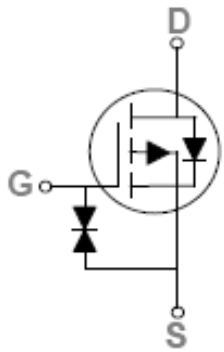
Applications

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

Packages & Pin Assignments

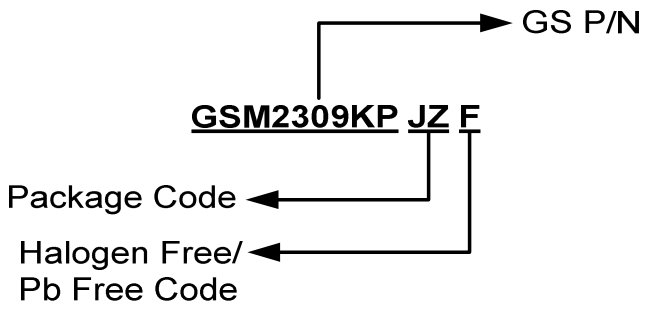
GSM2309KPJZF(SOT-23)





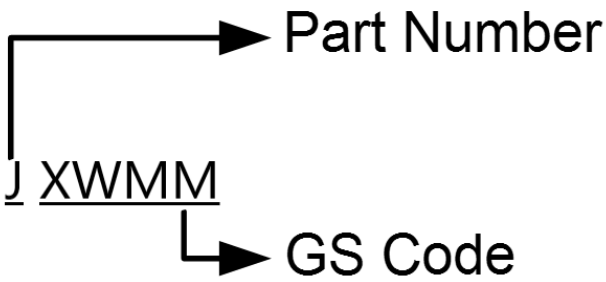
1	Gate
2	Source
3	Drain

Ordering Information



Part Number	Package	Quantity Reel
GSM2309KPJZF	SOT-23	3000 PCS

Marking Information



Absolute Maximum Ratings

(T_A=25ºC unless otherwise noted)

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		-30	V
V_{GS}	Gate-Source Voltage		±25	V
I_D	Continuous Drain Current(T_J=150℃)	T_A=25ºC	-3.8	A
		T_A=70ºC	-3.0	
I_{DM}	Pulsed Drain Current[1]		-15.2	A
P_D	Power Dissipation		1.56	W
	Power Dissipation (Derate above 25℃)		0.012	W/ ºC
T_J	Operating Junction Temperature Range		-55 to +150	ºC
T_{STG}	Storage Temperature Range		-55 to +150	ºC
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		80	ºC/ W

Electrical Characteristics

(T_J=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	-1.2	-1.6	-2.2	
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient	V_{DS}=V_{GS},I_D=-250uA		4		mV/ºC
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=±25V			±20	uA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-30V,V_{GS}=0V			-1	uA
		V_{DS}=-24V,V_{GS}=0V, T_J=125ºC			-10	
I_S	Continuous Source Current	V_G=V_D=0V, Force Current			-3.8	A
I_{SM}	Pulsed Source Current				-15.2	
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=-10V,I_D=-3A		64	75	mΩ
		V_{GS}=-4.5V,I_D=-2A		105	130	
g_{fs}	Forward Transconductance	V_{DS}=-10V,I_D=-3A		3.5		S
V_{SD}	Diode Forward Voltage	I_S=-1A,V_{GS}=0V			-1	V
Dynamic						
C_{iss}	Input Capacitance	V_{DS}=-15V, V_{GS}=0V,f=1MHz		460	665	pF
C_{oss}	Output Capacitance			45	65	
C_{rss}	Reverse Transfer Capacitance			30	45	
Q_g	Total Gate Charge[2,3]	V_{DS}=-15V, V_{GS}=-4.5V, I_D=-3A		4.2	6	nC
Q_{gs}	Gate-Source Charge[2,3]			1.9	2.5	
Q_{gd}	Gate-Drain Charge[2,3]			1.4	2	
$t_{d(on)}$	Turn-On Time[2,3]	V_{DD}=-15V,I_D=-1A, V_{GS}=-10V,R_G=6Ω		2.8	5	ns
T_r				8.7	17	
$t_{d(off)}$	Turn-Off Time[2,3]			21.4	41	
T_f				5.7	11	

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

Typical Performance Characteristics

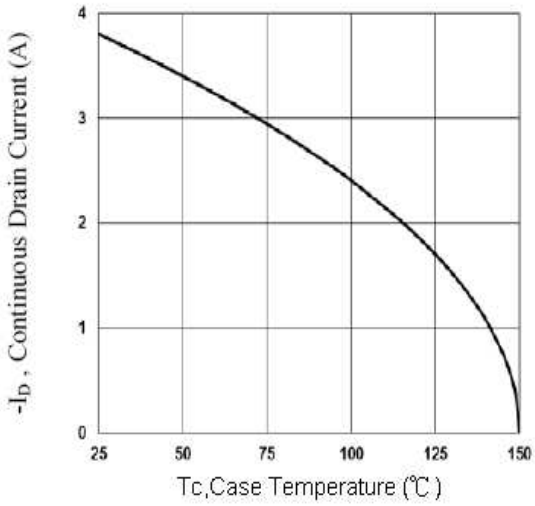


Fig.1 Continuous Drain Current vs. T_c

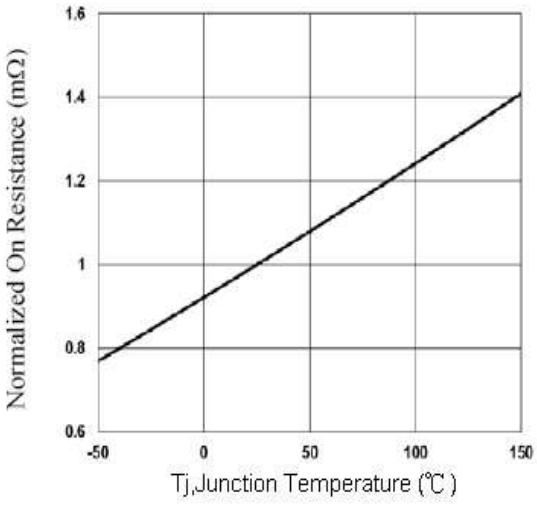


Fig.2 Normalized RDSON vs. T_J

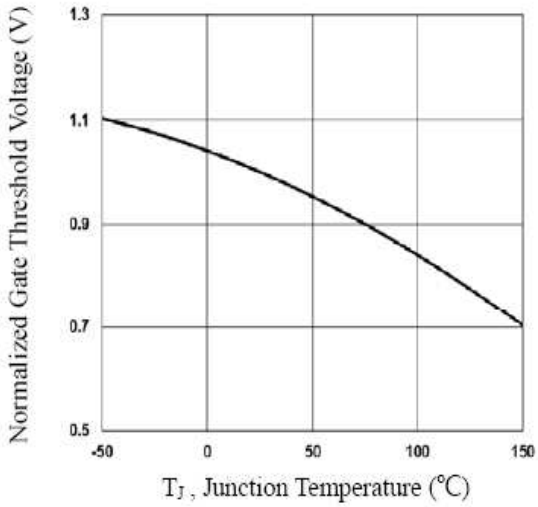


Fig.3 Normalized V_{th} vs. T_J

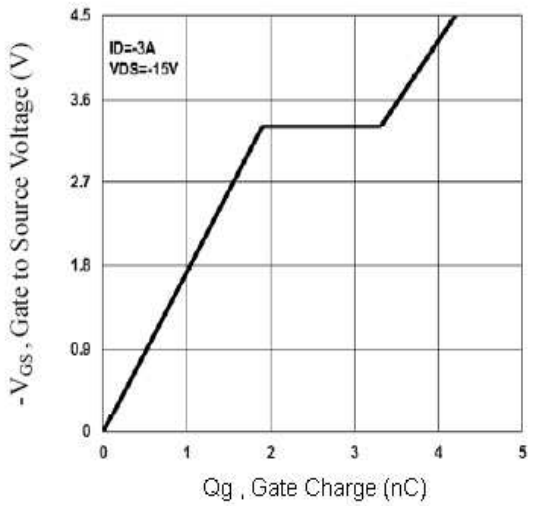


Fig.4 Gate Charge Waveform

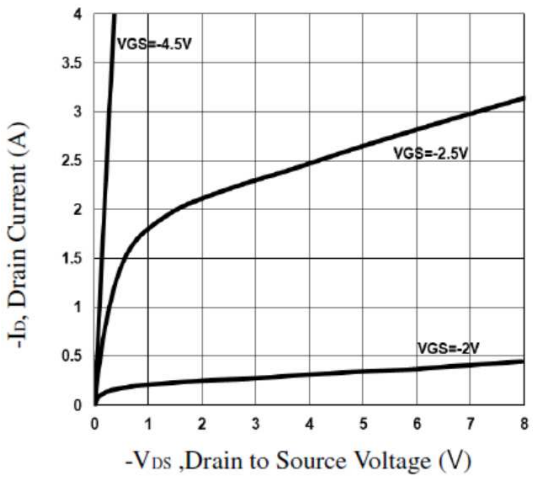


Fig.5 Typical Output Characteristics

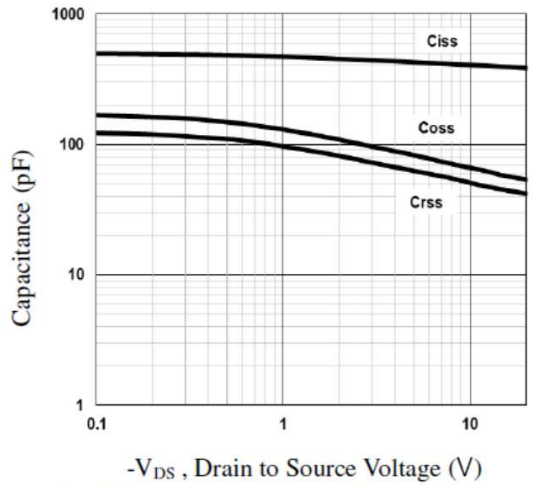


Fig.6 Capacitance Characteristics

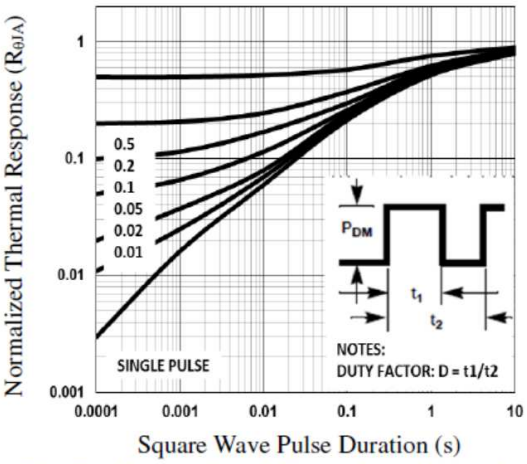


Fig.7 Normalized Transient Impedance

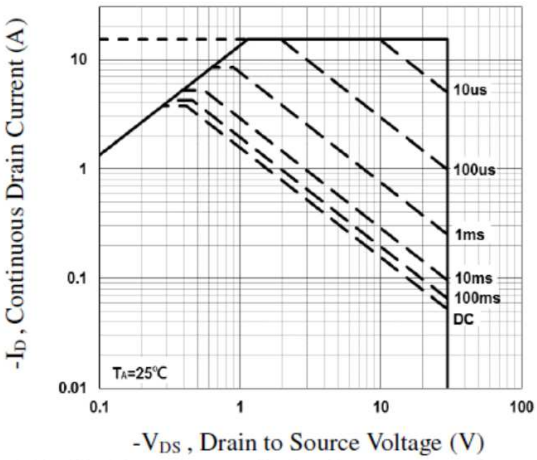
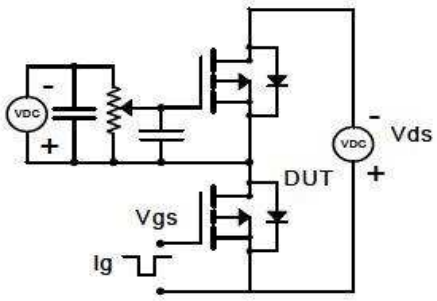
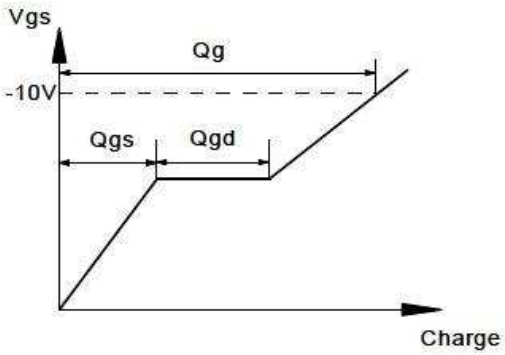


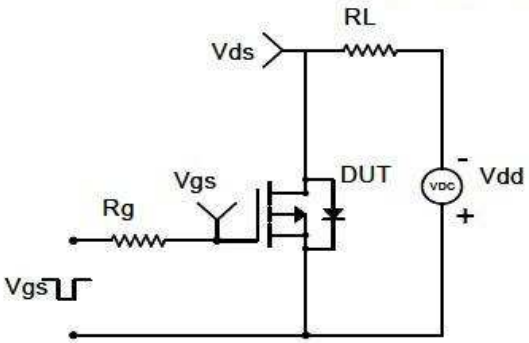
Fig.8 Maximum Safe Operation Area

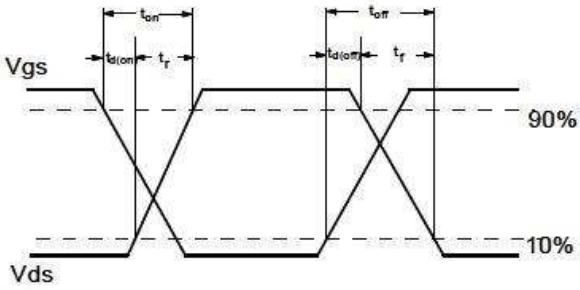
Gate Charge Test Circuit & Waveform



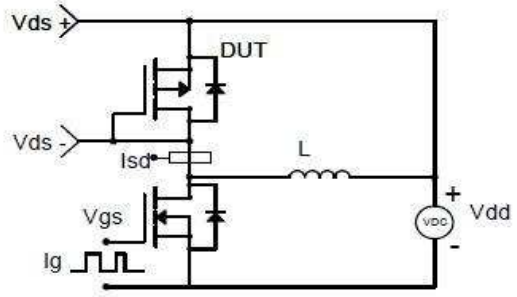


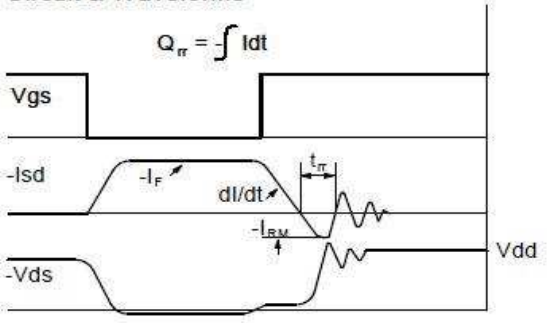
Resistive Switching Test Circuit & Waveforms





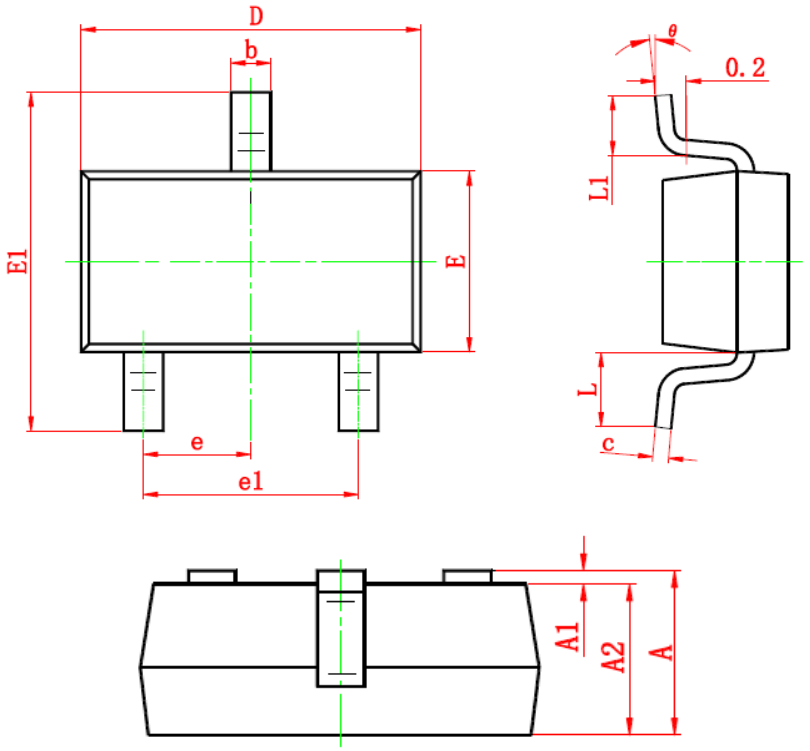
Diode Recovery Test Circuit & Waveforms





Package Dimension

SOT-23



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	-	0.035
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0º	8º	0º	6º

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