

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.

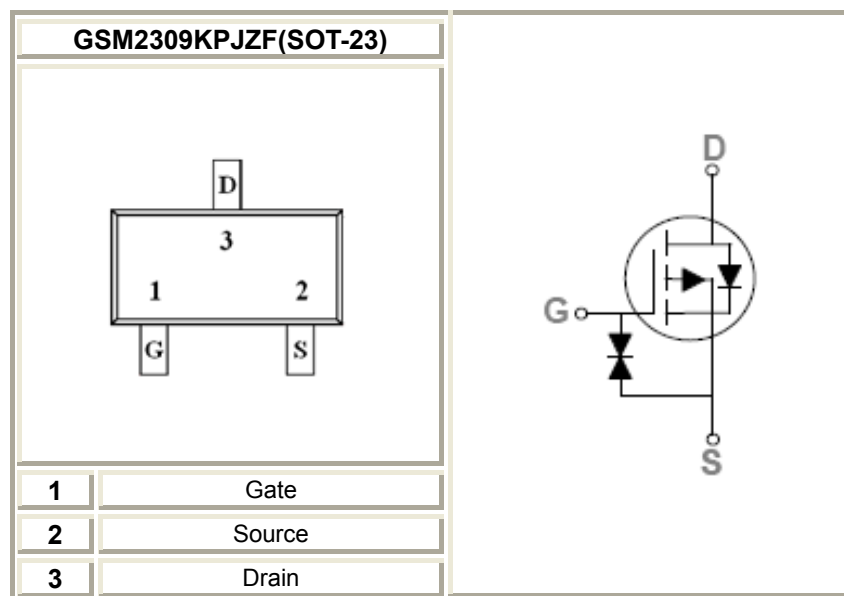
Features

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

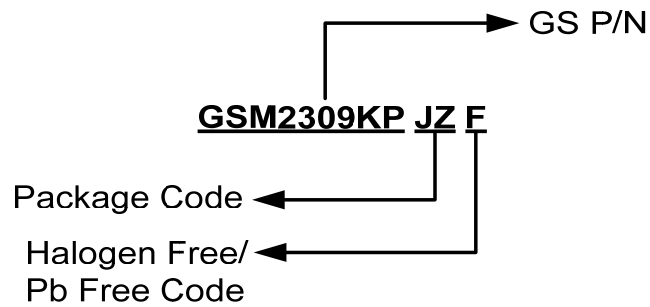
Applications

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

Packages & Pin Assignments

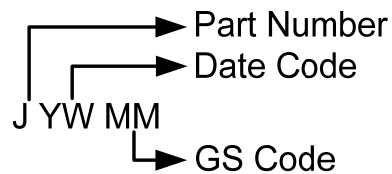


Ordering Information



Part Number	Package	Quantity Reel
GSM2309KPJZF	SOT-23	3000 PCS

Marking Information



Absolute Maximum Ratings

(T_A=25°C 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°C)	T _A =25°C	-3.8
		T _A =100°C	-2.4
I _{DM}	Pulsed Drain Current	-15.2	A
P _D	Power Dissipation	1.56	W
T _J	Operating Junction Temperature Range	-55 to +150	°C
T _{STG}	Storage Temperature Range	-55 to +150	°C
R _{θJA}	Thermal Resistance-Junction to Ambient	80	°C/ W

Electrical Characteristics

(T_A=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	-1.2	-1.6	-2.2	
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient	V _{DS} =V _{GS} , I _D =-250uA		4		mV/°C
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 =125°C			-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	V _{DS} =-15V, V _{GS} =-4.5V, I _D =-3A		4.2	6	nC
Q _{gs}	Gate-Source Charge			1.9	2.5	
Q _{gd}	Gate-Drain Charge			1.4	2	
t _{d(on)}	Turn-On Time	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			21.4	41	
T _f				5.7	11	

Typical Performance Characteristics

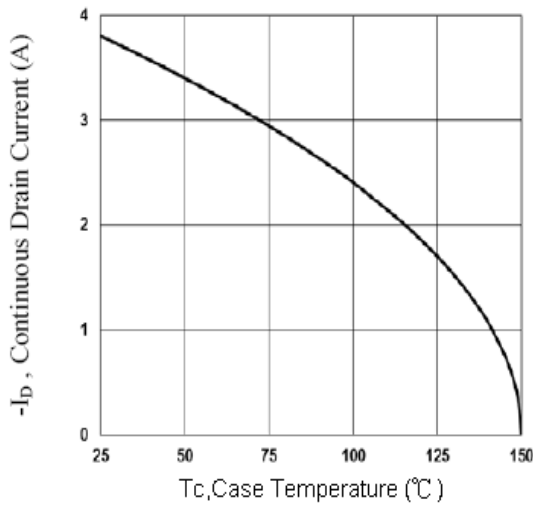


Fig.1 Continuous Drain Current vs. T_c

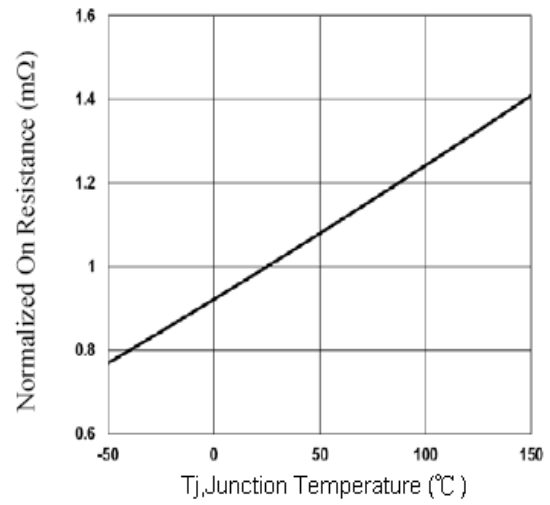


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

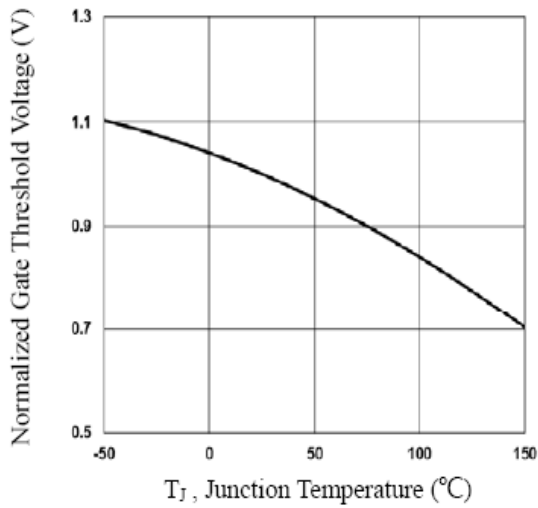


Fig.3 Normalized V_{th} vs. T_j

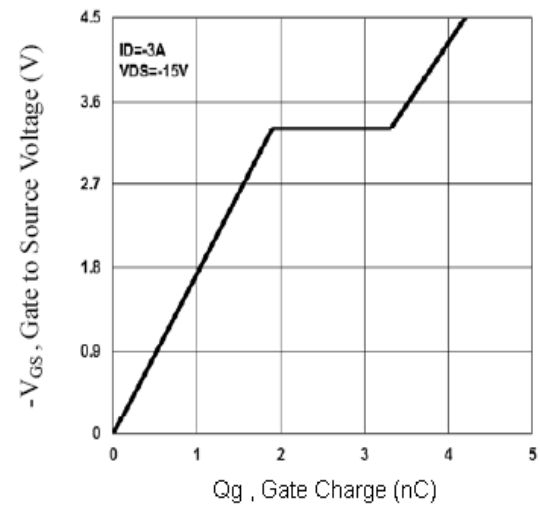


Fig.4 Gate Charge Waveform

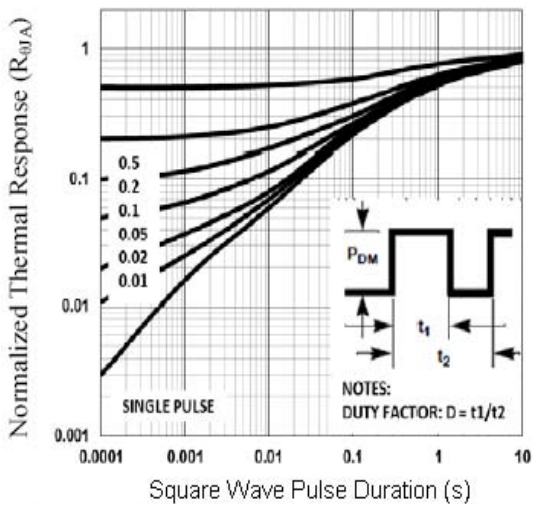


Fig.5 Normalized Transient Impedance

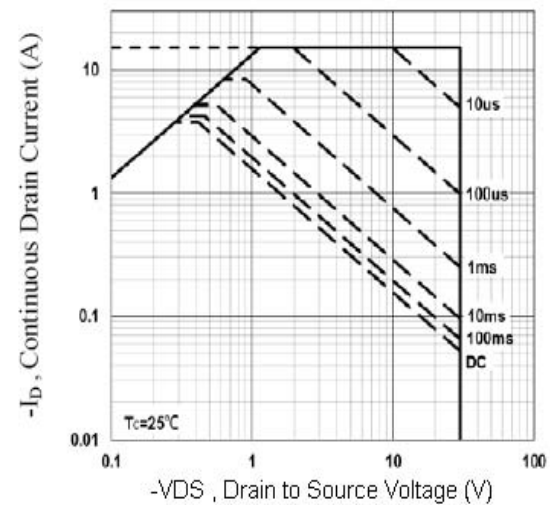
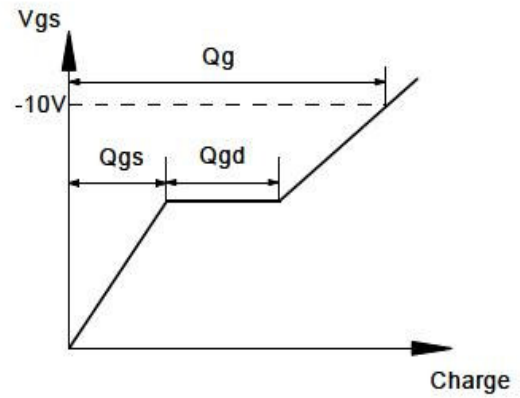
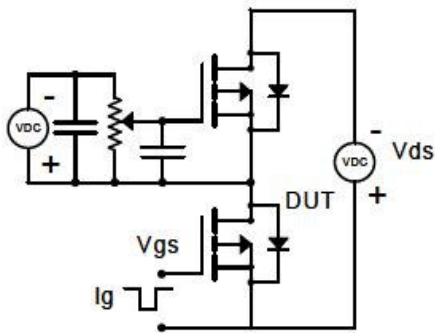


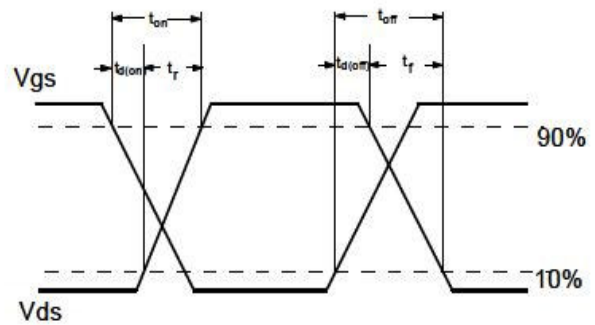
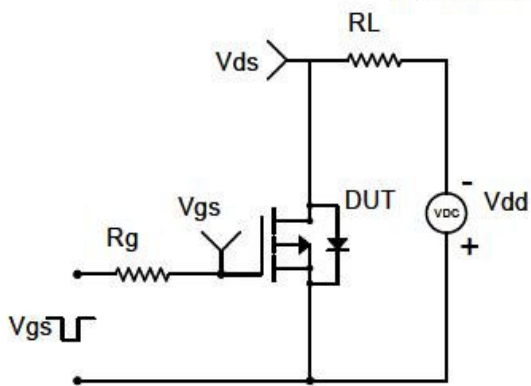
Fig.6 Maximum Safe Operation Area

Typical Characteristics

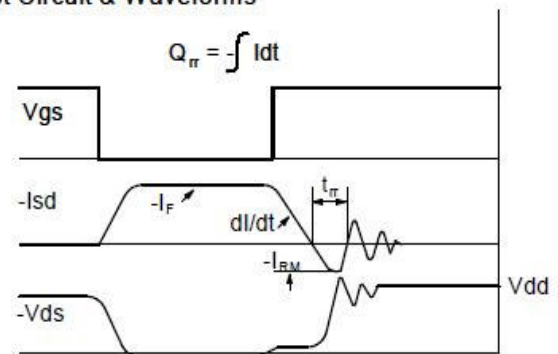
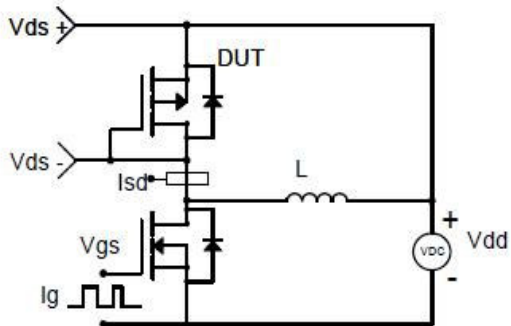
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

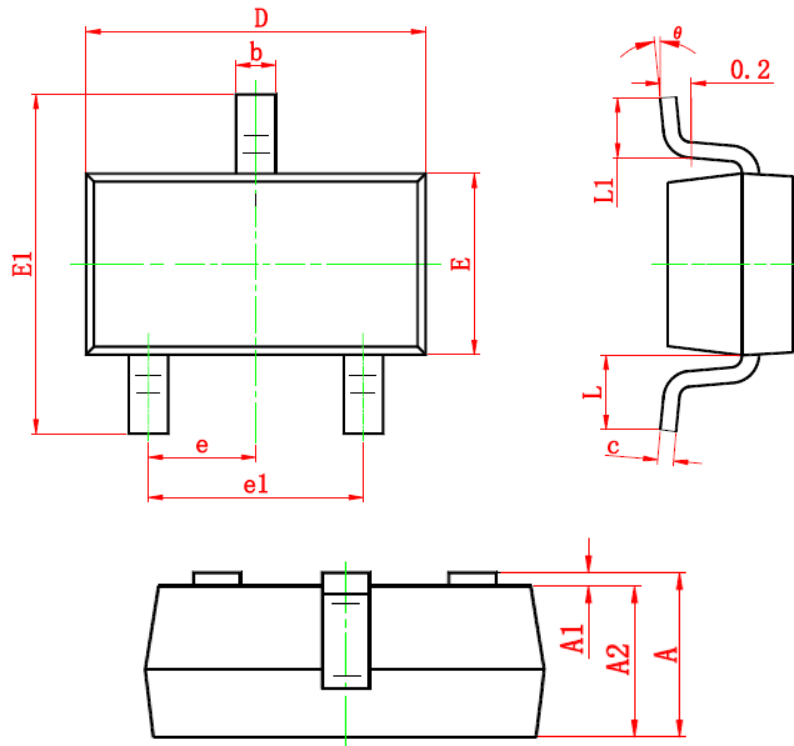


Diode Recovery Test Circuit & Waveforms



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	0°	8°	0°	6°



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