GL100P08FA9

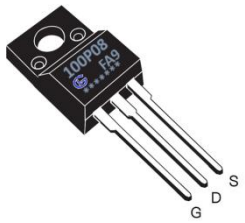
GL Silicon P-Channel Power MOSFET

General Description

The GL100P08FA9 uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications. The package form is TO-220F, which accords with the RoHS standard.

V_{DSS}	-80	V
I_D	-100	A
P_D	40	W
$R_{DS(ON).TYP}$	7.3	mΩ

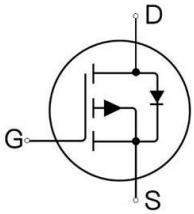
TO-220F



Features

- Fast Switching
- Low Gate Charge and Rdson
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

Inner Equivalent Principium Chart



Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Absolute (Tc=25℃ unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	-80	V
I_D	Continuous Drain Current	-100	A
	Continuous Drain Current T_C=100 °C	-70	A
I_{DM} [a1]	Pulsed Drain Current	-400	A
V_{GS}	Gate-to-Source Voltage	±20	V
E_{AS} [a2]	Single Pulse Avalanche Energy	468	mJ
P_D	Power Dissipation	40	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, −55 to 150	℃
T_L	Maximum Temperature for Soldering	300	℃

Electrical Characteristics (Tc=25℃ unless otherwise specified)

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V,I_D=-250μA	-80	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=-80,V_{GS}= 0V,T_a=25℃	--	--	-10	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=+16V	--	--	1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-16V	--	--	-1	μA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=-10V,I_D=-50A	--	7.3	8.0	mΩ
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=-4V,I_D=-50A	--	8.9	11	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250μA	-1.2	--	-2.6	V
Pulse width tp≤380μs,δ≤2%						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	V_{DS}=-10V,I_D=-50A	--	140	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=-20V f=1.0MHz	--	13400	--	pF
C_{oss}	Output Capacitance		--	1000	--	
C_{rss}	Reverse Transfer Capacitance		--	740	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	R_L=-0.96Ω,V_{DD}=-40V V_{GS}=-10V	--	95	--	ns
t_r	Rise Time		--	1000	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	800	--	
t_f	Fall Time		--	820	--	
Q_g	Total Gate Charge	I_D=-100A,V_{DD}=-48V V_{GS}=-10V	--	280	--	nC
Q_{gs}	Gate to Source Charge		--	50	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	55	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	-100	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	-200	A
V_{SD}	Diode Forward Voltage	I_S=-100A,V_{GS}=0V	--	--	1.5	V
t_{rr}	Reverse Recovery Time	I_S=-100A,T_j = 25°C	--	120	--	ns
Q_{rr}	Reverse Recovery Charge	dI_F/dt=100A/us,V_{GS}=0V	--	380	--	nC
Pulse width tp≤380μs,δ≤2%						

Symbol	Parameter	Typ.	Units
$R_{\theta JA}$	Junction-to-Ambient	3.125	°C/W

[a1]: Repetitive rating; pulse width limited by maximum junction temperature

[a2]: V_{DD}=-48V, L=100μH, I_{AV}=-60A

Test Circuits

Fig.1 Unclamped Inductive Switching Test Circuit

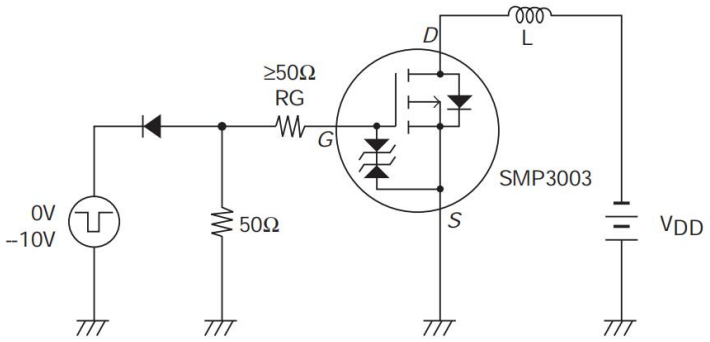


Fig.2 Switching Time Test Circuit

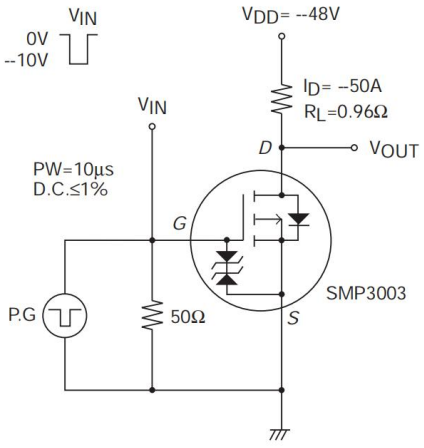
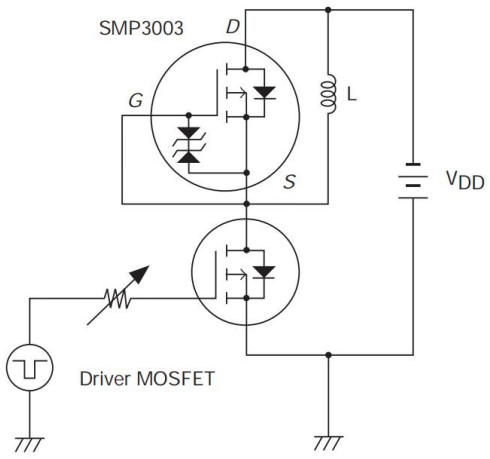
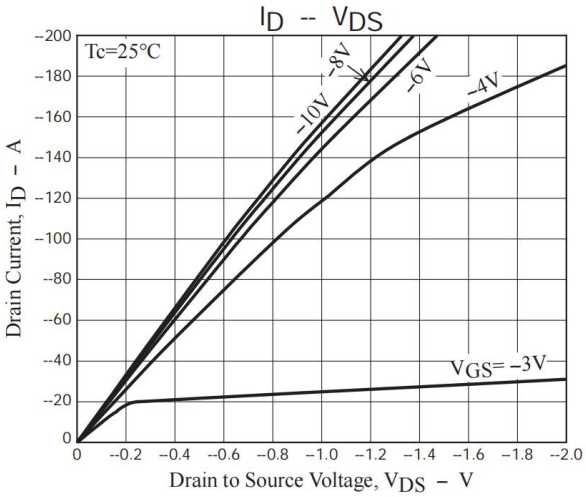
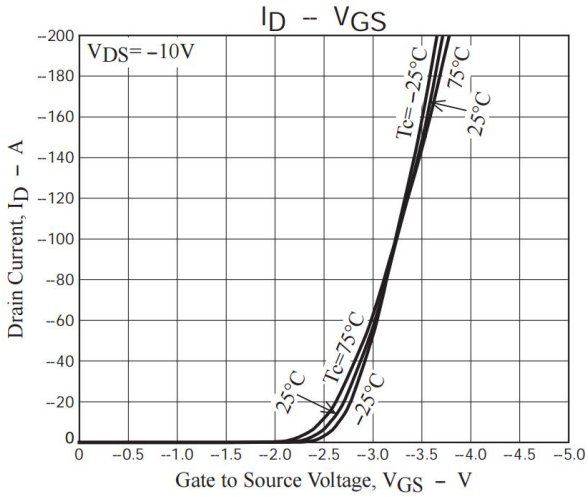


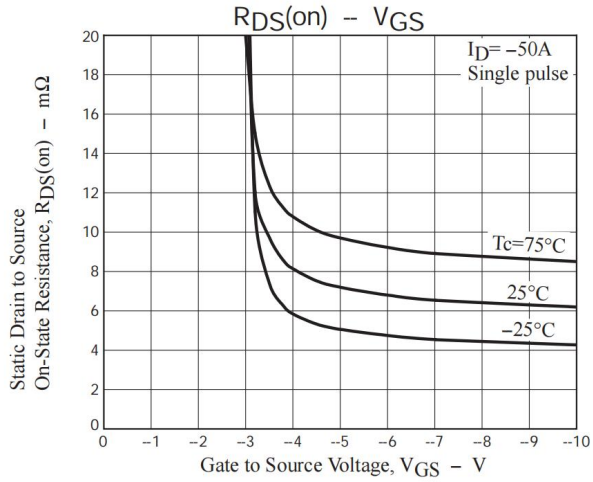
Fig.3 Reverse Recovery Time Test Circuit

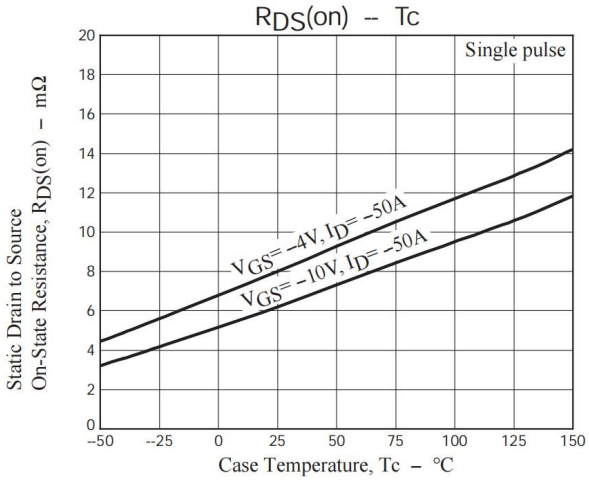


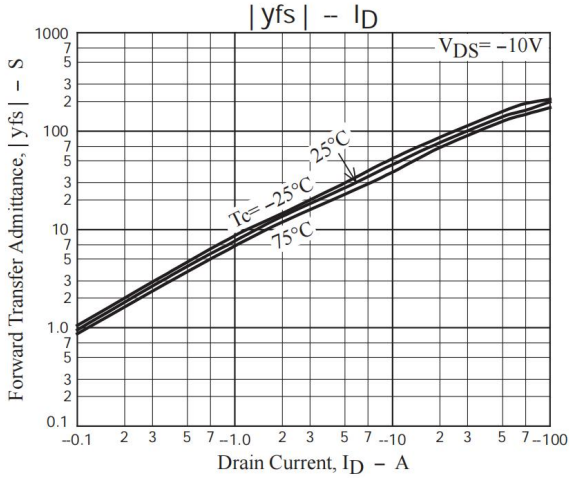
Characteristics Curves

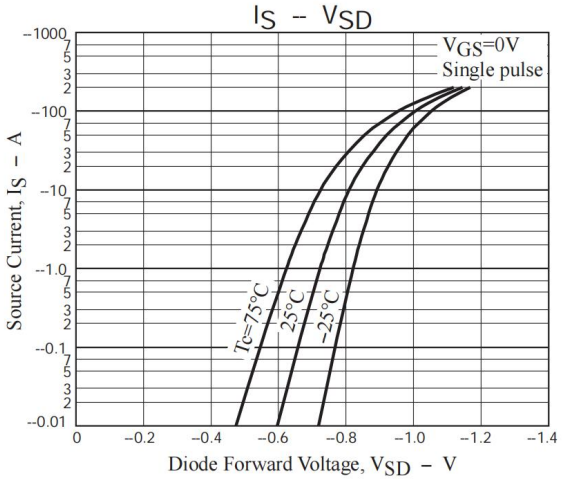


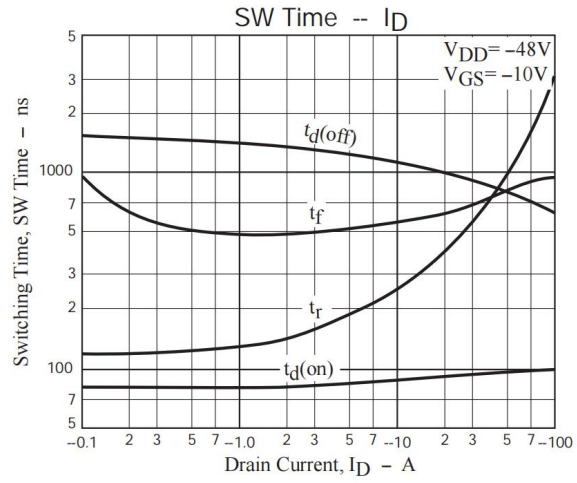


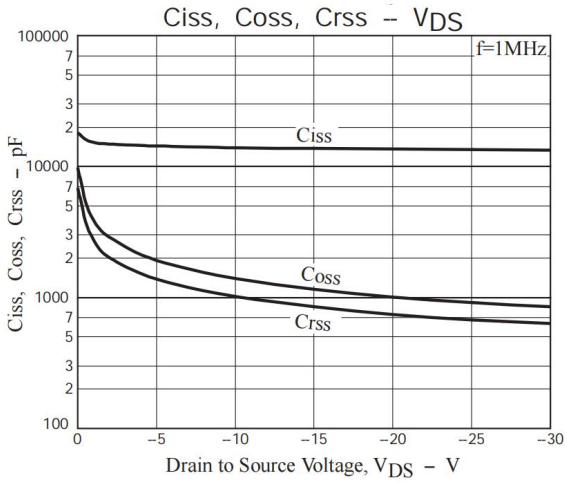


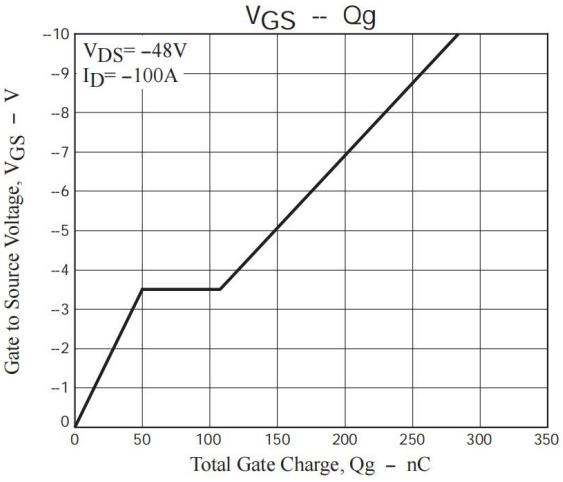


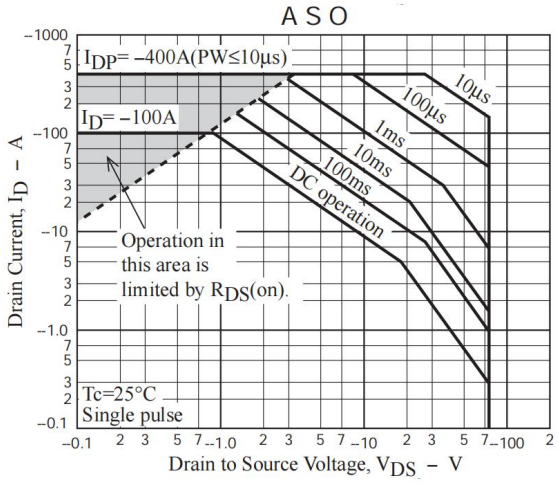


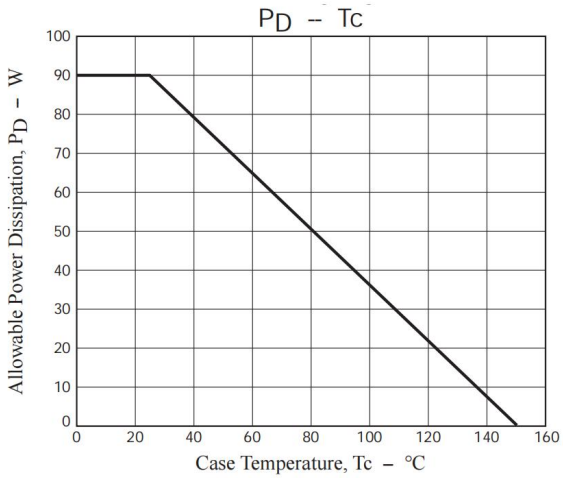


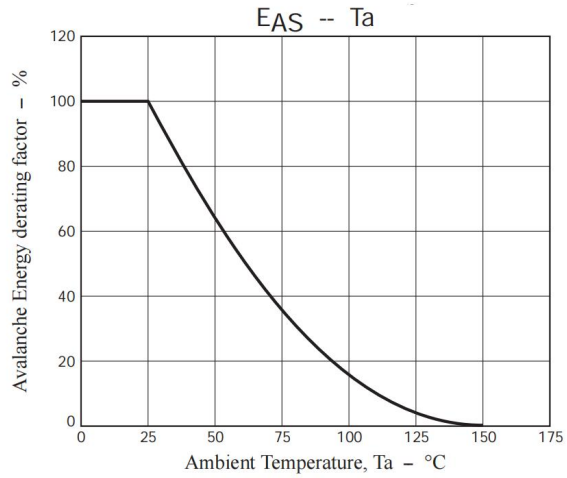

SW Time -- ID
VDD= -48V
VGS= -10V
td(off)
tf
tr
td(on)
Switching Time, SW Time - ns
Drain Current, ID - A


Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss - pF
Drain to Source Voltage, VDS - V


VGS -- Qg
VDS= -48V
ID= -100A
Gate to Source Voltage, VGS - V
Total Gate Charge, Qg - nC


A S O
IDP= -400A(PW≤10μs)
ID= -100A
10μs
100μs
1ms
10ms
100ms
DC operation
Operation in
this area is
limited by RDS(on).
Tc=25°C
Single pulse
Drain Current, ID - A
Drain to Source Voltage, VDS - V


PD -- Tc
Allowable Power Dissipation, PD - W
Case Temperature, Tc - °C


EAS -- Ta
Avalanche Energy derating factor - %
Ambient Temperature, Ta - °C