GL13N90AN

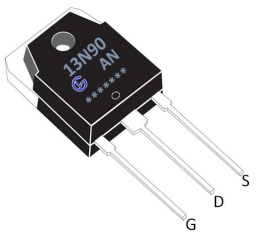
GL Silicon N-Channel Power MOSFET

V_{DSS}	900	V
I_D	13	A
$P_D(T_C=25℃)$	300	W
$R_{DS(ON)TYP}$	0.73	Ω

General Description

GL13N90AN the silicon N-channel Enhanced VDMOSFETS, is obtained by the self-aligned HV-MOS Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency. The package form is TO-3P(N), which accords with the RoHS standard.

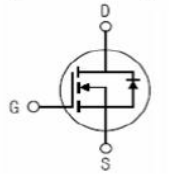
TO-3P(N)



Features

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

Inner Equivalent Principium Chart



Applications

- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply(UPS)
- Power Factor Correction(PFC)

Absolute (Tc=25℃ unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	900	V
I_D	Continuous Drain Current	13	A
I_{DM} [a1]	Pulsed Drain Current	52	A
V_{GS}	Gate-to-Source Voltage	±30	V
E_{AS} [a2]	Single Pulse Avalanche Energy	630	mJ
P_D	Power Dissipation	300	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, −55 to 150	℃
T_L	Maximum Temperature for Soldering	300	℃

Caution Stresses greater than those in the "Absolute Maximum Ratings" may cause permanent damage to the device

Thermal Characteristics

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case	2.4	℃/W
$R_{\theta JA}$	Junction-to-Ambient	55	℃/W

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	900	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=900V,V_{GS}=0V,T_a= 25℃	--	--	1.0	μA
		V_{DS}=720V,V_{GS}=0V,T_a=150℃	--	--	250	
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS} =+30V	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS} =-30V	--	--	-100	nA

ON Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$ [a3]	Drain-to-Source On-Resistance	V_{GS}=10V,I_D=7A	--	0.73	0.85	Ω
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	2.0	--	4.5	V

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs} [a3]	Forward Transconductance	V_{DS}=10V, I_D=7A	--	12	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_D=25V f=1.0MHz	--	3500	--	pF
C_{oss}	Output Capacitance		--	300	--	
C_{rss}	Reverse Transfer Capacitance		--	150	--	

Resistive Switching Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=350V,I_D=13A, V_{GS}=10V R_g=25Ω	--	45	--	ns
t_r	Rise Time		--	90	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	66	--	
t_f	Fall Time		--	74	--	
Q_g	Total Gate Charge	I_D =7A,V_{DD}=480V V_{GS}=0 to 10V	--	130	--	nC
Q_{gs}	Gate to Source Charge		--	50	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	28	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	13	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	52	A
V_{SD}	Diode Forward Voltage	I_S=13A,V_{GS}=0V	--	--	1.5	V
t_{rr}	Reverse Recovery Time	I_S=13A, V_{GS}=0V	--	500	--	ns
Q_{rr}	Reverse Recovery Charge	I_S=I_F,d_i/d_t=100A/us	--	2.2	--	uC
Pulse width tp≤380μs,δ≤2%						

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

[a2]: I_{AS}=10A,V_{DD}=50V,R_G=25Ω, Starting T_J= 25°C

[a3]: Pulse Test: Pulse width≤380us, Duty Cycle≤2%

Characteristics Curves

Fig. 1. Output Characteristics

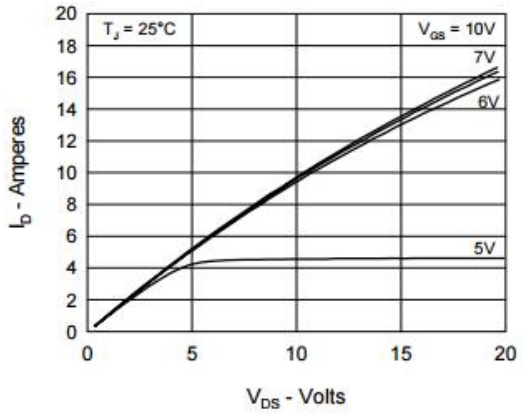


Fig. 2. Input Admittance

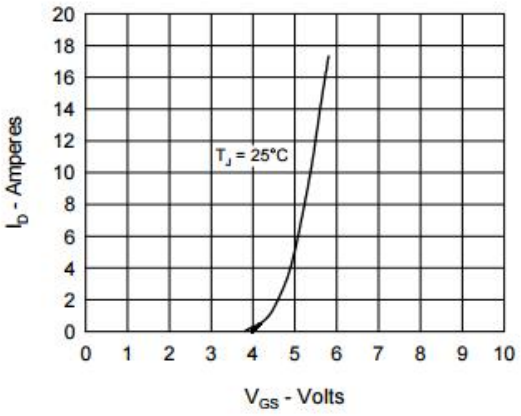


Fig. 3. $R_{DS(on)}$ vs. Drain Current

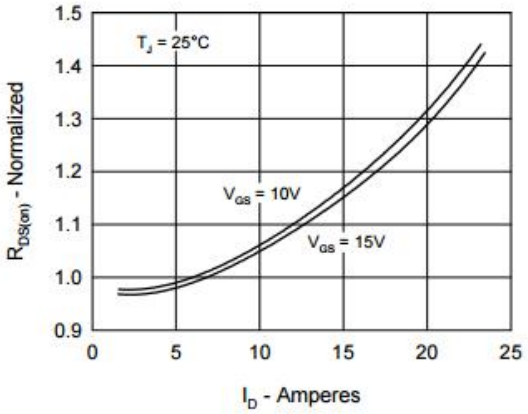


Fig. 4. Temperature Dependence of Drain to Source Resistance

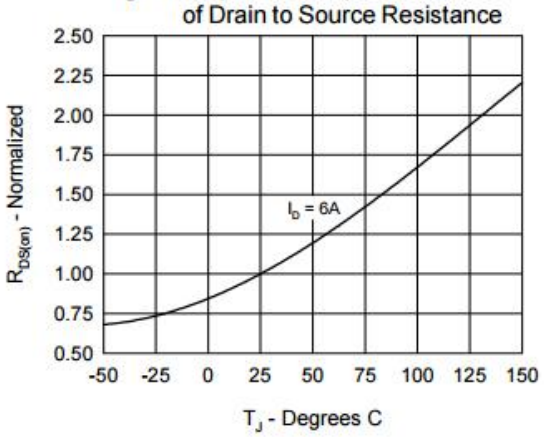


Fig. 5. Drain Current vs. Case Temperature

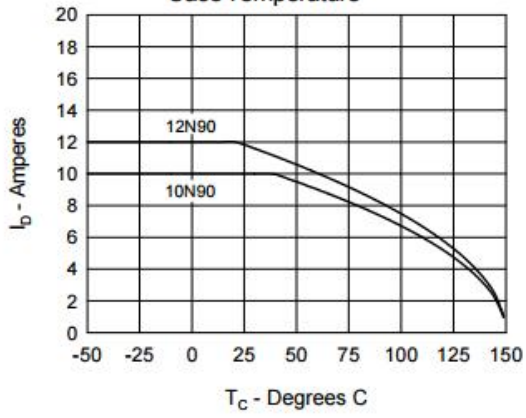


Fig. 6. Temperature Dependence of Breakdown and Threshold Voltage

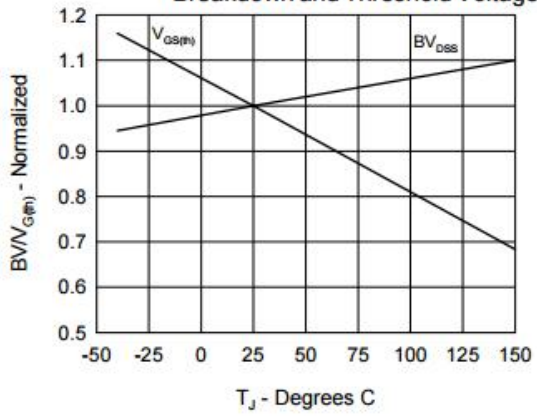


Fig.7. Gate Charge Characteristic Curve

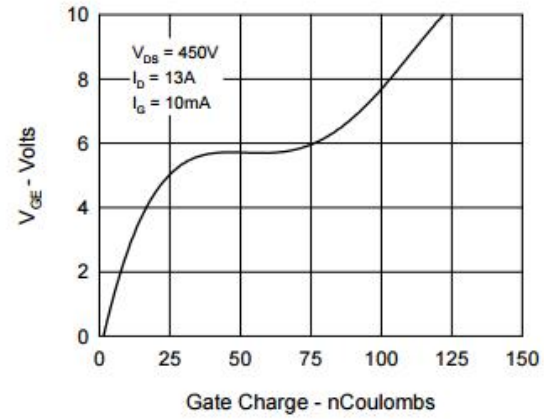


Fig.8. Capacitance Curves

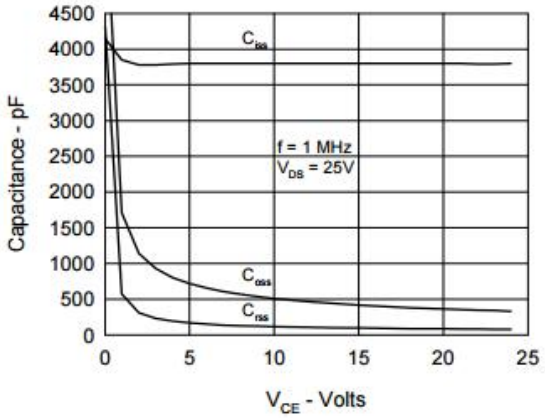


Fig.9. Source Current vs. Source to Drain Voltage

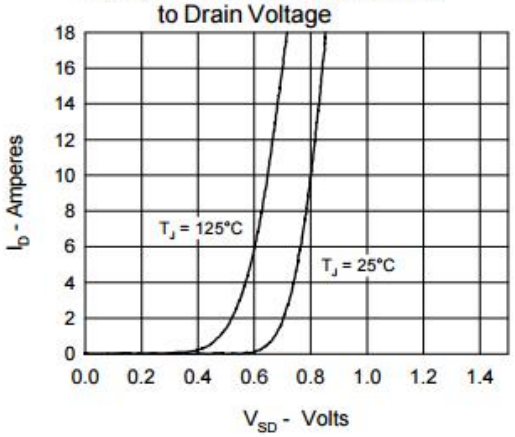


Fig.10. Transient Thermal Impedance