GL33N25FA9

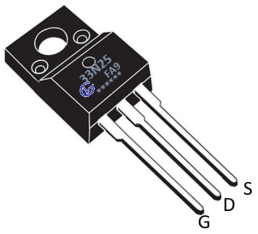
Silicon N-Channel Power MOSFET

V_{DSS}(T_C=150℃)	250	V
I_D	33	A
P_D(T_C=25℃)	55	W
$R_{DS(ON)}$ max	0.120	Ω

General Description

GL33N25FA9, the silicon N-channel Enhanced VDMOSFET, is obtained by the self-aligned planar 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-220F, which accords with the RoHS standard.

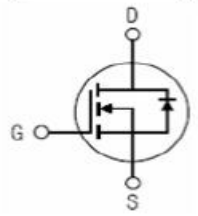
TO-220F



Features

- Fast Switching
- Low ON Resistance(Typical: 0.10Ω)
- Low Gate Charge (Typical Data: 35nC)
- Low Reverse transfer capacitances(Typical: 35pF)
- 100% Single Pulse avalanche energy Test

Inner Equivalent Principium Chart



Applications

- Power switch circuit of PC POWER

Absolute (Tc=25℃ unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	250	V
I_D	Continuous Drain Current	33	A
	Continuous Drain Current T_C=100 °C	20	A
I_{DM}[a1]	Pulsed Drain Current	132	A
V_{GS}	Gate-to-Source Voltage	±30	V
E_{AS}	Single Pulse Avalanche Energy	950	mJ
E_{Ar}[a1]	Avalanche Energy ,Repetitive	40	mJ
I_{AR}[a1]	Avalanche Current	33	A
dv/dt[a3]	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	55	W
	Derating Factor above 25°C	0.44	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

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	250	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=250V,V_{GS}=0V,T_a=25℃	--	--	1.0	μA
		V_{DS}=200V,V_{GS}=0V,T_a=125℃	--	--	10	
$I_{GSS(F)}$	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.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V,I_D=20A	--	0.1	0.12	Ω
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	2.0	--	4.0	V
g_{fs}	Forward Trans conductance	V_{DS}=15V,I_D=16.5A	--	8.0	--	S
Pulse width<380μs; duty cycle<2%.						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=25V f=1.0MHz	--	1580	--	pF
C_{oss}	Output Capacitance		--	330	--	
C_{rss}	Reverse Transfer Capacitance		--	35	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D=33A,V_{DD}=125V V_{GS}=10V,R_g=2.4Ω	--	33	--	ns
t_r	Rise Time		--	230	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	76	--	
t_f	Fall Time		--	110	--	
Q_g	Total Gate Charge	I_D=33A,V_{DD}=200V V_{GS}=10V	--	35	--	nC
Q_{gs}	Gate to Source Charge		--	19	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	16	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_{SD}	Continuous Source Current (Body Diode)		--	--	33	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	132	A
V_{SD}	Diode Forward Voltage	I_S=33A,V_{GS}=0V	--	--	1.5	V
t_{rr}	Reverse Recovery Time	I_S=33A,T_j=25℃	--	210	--	ns
Q_{rr}	Reverse Recovery Charge	dI_F/dt=100A/μs,V_{GS}=0V	--	1.60	--	uC

Thermal Characteristics

Symbol	Parameter	Rating	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	2.27	℃/ W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	100	℃/ W

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

a2: L=1.0mH, I_D=35A, Start TJ=25℃

a3: I_{SD}=33A,di/dt≤100A/us,V_{DD}≤BV_{DS}, Start TJ=25℃

Characteristics Curves

Figure 1. On-Region Characteristics

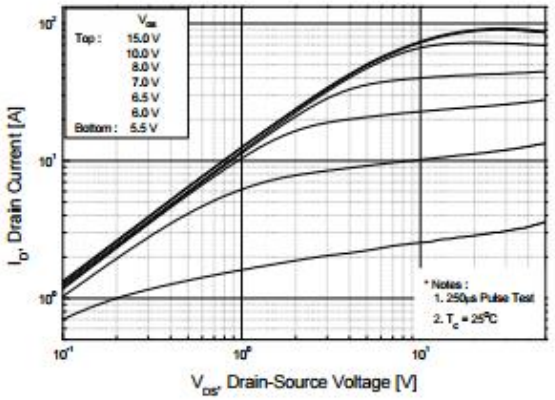


Figure 2. Transfer Characteristics

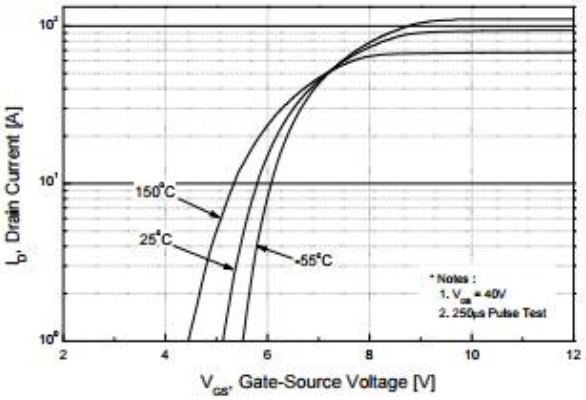


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

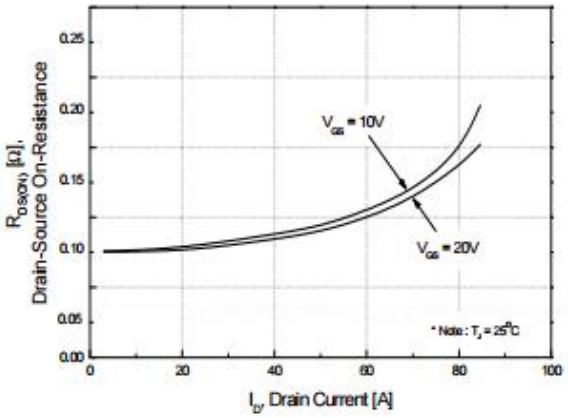


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperatue

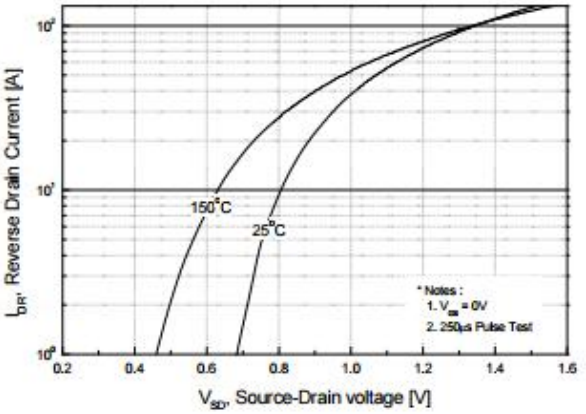


Figure 5. Capacitance Characteristics

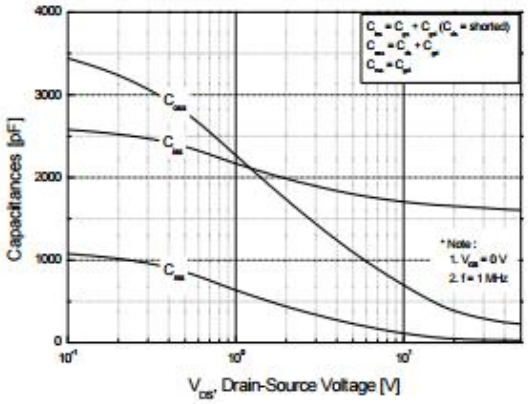


Figure 6. Gate Charge Characteristics

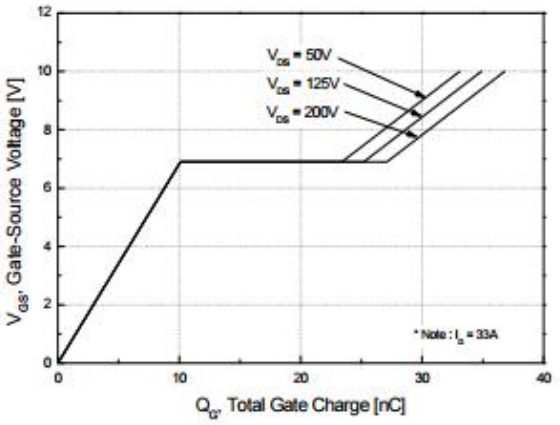


Figure 7. Breakdown Voltage Variation vs. Temperature

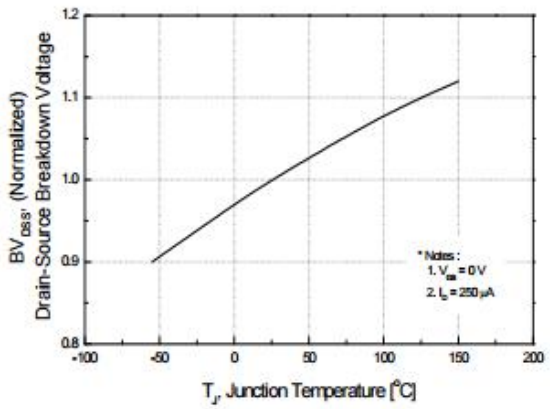


Figure 8. On-Resistance Variation vs. Temperature

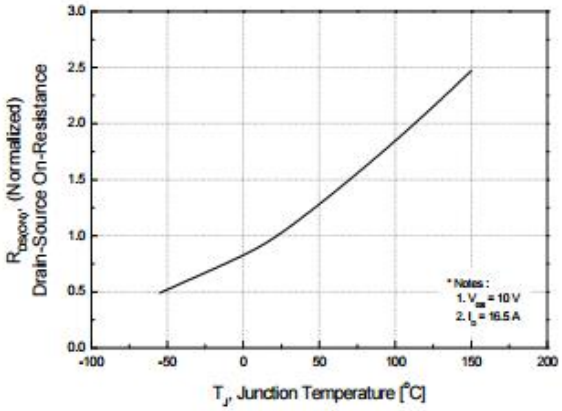


Figure 9. Maximum Safe Operating Area

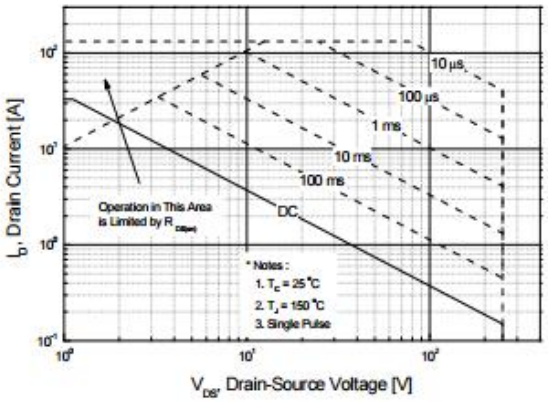


Figure 10. Maximum Drain Current vs. Case Temperature

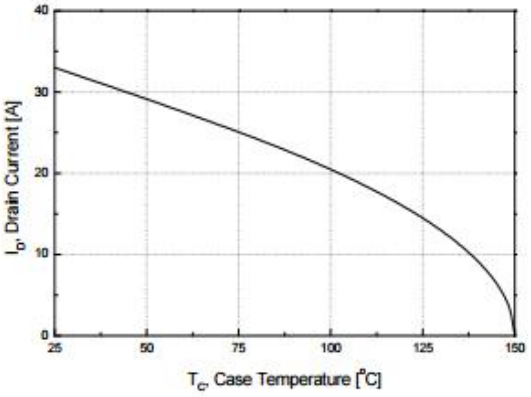


Figure 11. Transient Thermal Response Curve