®

GL5N105FA9

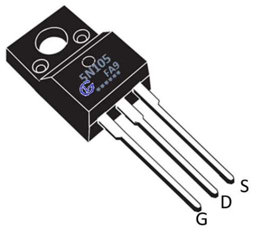
Silicon N-Channel Power MOSFET

V_{DSS}	1050	V
I_D	5	A
$P_D(T_C=25℃)$	50	W
$R_{DS(ON).TYP.}$	2.0	Ω

General Description

GL5N105FA9, 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.

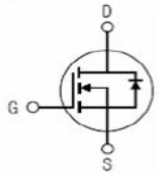
TO-220F



Features

- Fast Switching
- Low ON Resistance(R_{dson}≤2.5Ω)
- Low Gate Charge
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

Inner Equivalent Principium Chart



Applications

- Power switch circuit of adaptor and charger

Absolute (Tc=25℃ unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	1050	V
I_D	Continuous Drain Current	5	A
$I_{DM}{}^{a1}$	Pulsed Drain Current	20	A
V_{GS}	Gate-to-Source Voltage	±30	V
$E_{As}{}^{a2}$	Single Pulse Avalanche Energy	450	mJ
dv/dt^{a3}	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	50	W
	Derating Factor above 25°C	0.4	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	Rating	Units
$R_{θJC}$	Thermal Resistance, Junction-to-Case	2.5	℃/ W
$R_{θJA}$	Thermal Resistance, Junction-to-Ambient	100	℃/ W

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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	1050	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	Bvdss Temperature Coefficient	I_D=250uA,Reference25℃	--	0.55	--	V/℃
I_{DSS}	Drain to Source Leakage Current	V_{DS}=1000V, V_{GS}=0V,T_a=25℃	--	--	1.0	μA
		V_{DS}=900V, V_{GS}=0V,T_a=125℃	--	--	100	
$I_{GSS(F)}$	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=2.5A	--	2.0	2.5	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=2.5A	--	5	--	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	--	1400	--	pF
C_{oss}	Output Capacitance		--	115	--	
C_{rss}	Reverse Transfer Capacitance		--	21	--	

Resistive Switching Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D=5A,V_{DD}=500V V_{GS}=10V,R_g=9.1Ω	--	21	--	ns
t_r	Rise Time		--	23	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	28	--	
t_f	Fall Time		--	26	--	
Q_g	Total Gate Charge	I_D=5A,V_{DD}=500V V_{GS}=10V	--	36	--	nC
Q_{gs}	Gate to Source Charge		--	8	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	15	--	

Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_{SD}	Continuous Source Current (Body Diode)		--	--	5	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	20	A
V_{SD}	Diode Forward Voltage	I_S=5A,V_{GS}=0V	--	--	1.5	V
t_{rr}	Reverse Recovery Time	I_S=5A,T_j=25℃ dI_F/dt=100A/μs,V_{GS}=0V	--	--	570	ns
Q_{rr}	Reverse Recovery Charge		--	--	4.4	μC

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

a2： L=10mH, I_D=9.3A, Start T_J=25℃

a3： I_{SD}=5A,di/dt ≤100A/us,V_{DD}≤BV_{DS}, Start T_J=25℃

Characteristics Curves

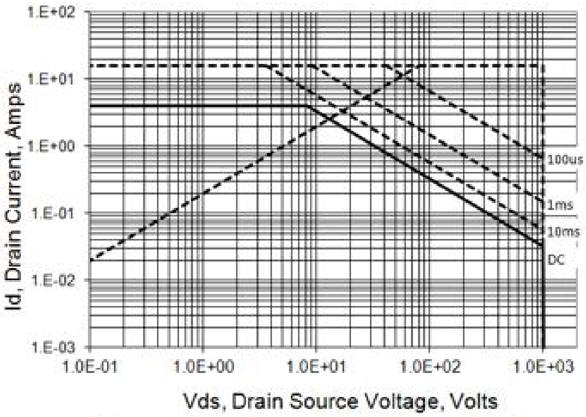

Figure 1 . Maximum Safe Operating Area

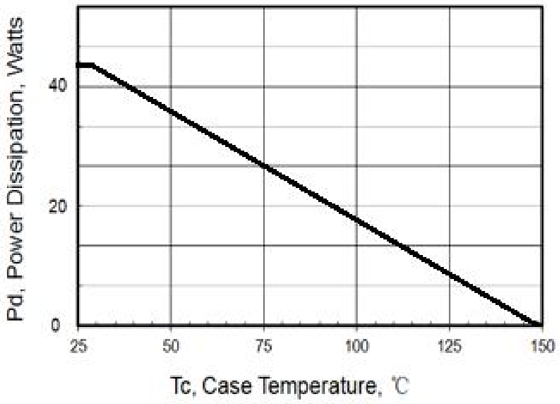

Figure 2 . Maximum Power Dissipation vs Tc

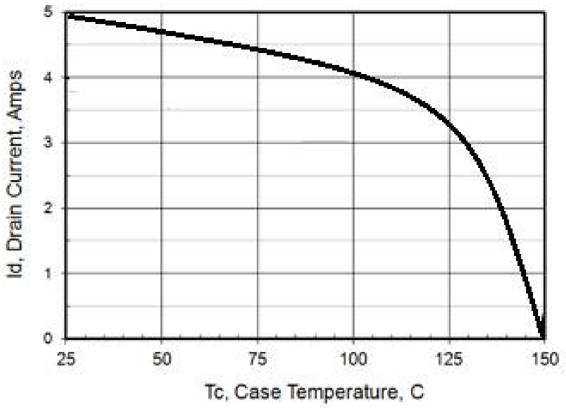

Figure 3 .Id vs Case Temperature

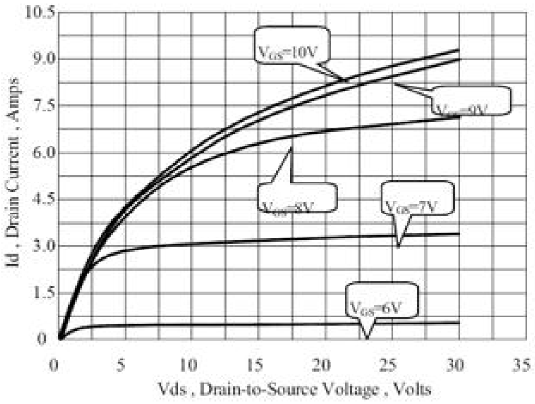

Figure 4 Typical Output Characteristics

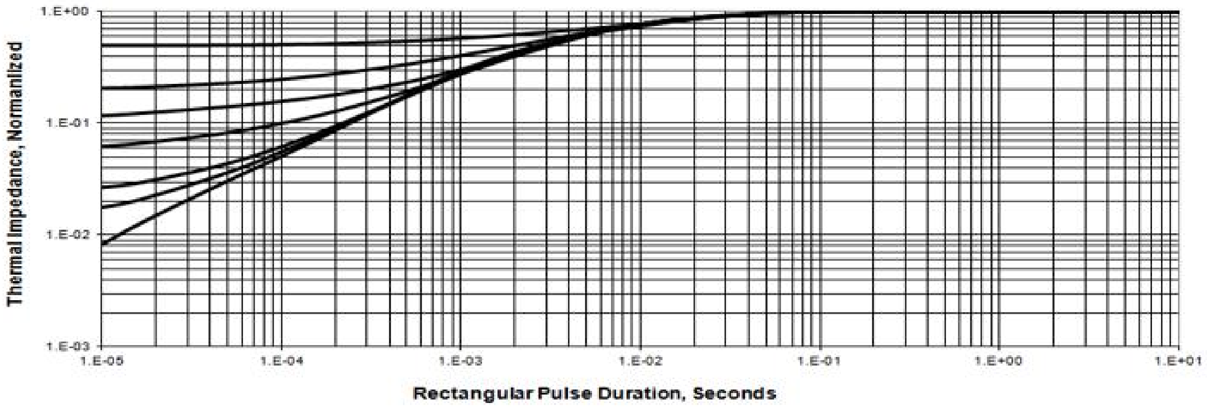

Figure 5. Maximum Transient Thermal Impedance

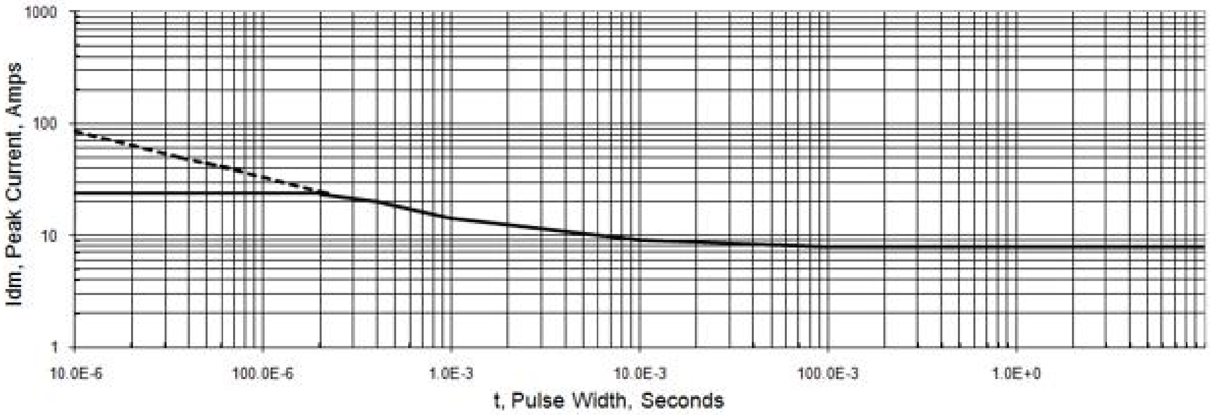

Figure 6. Peak Current Capability

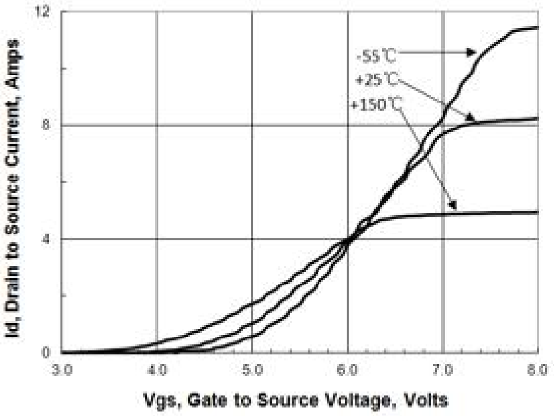

Figure 7. Transfer Characteristics

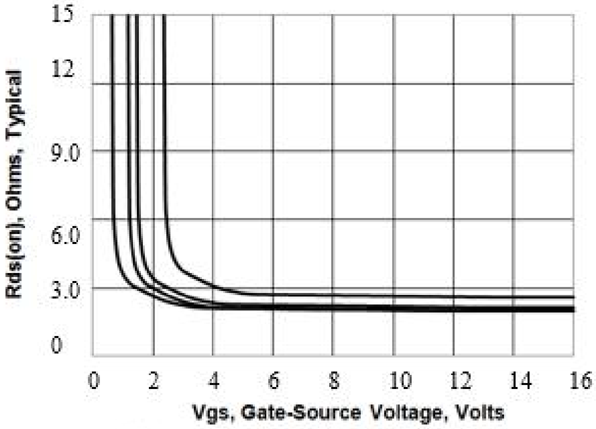

Figure 5. RDSONvs Gate Voltage

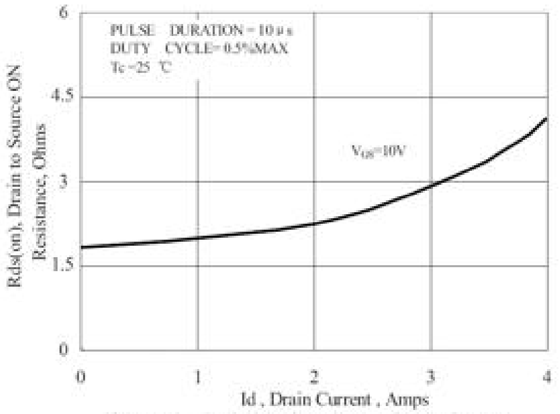

Figure 9 Typical Drain to Source ON Resistance vs Drain Current

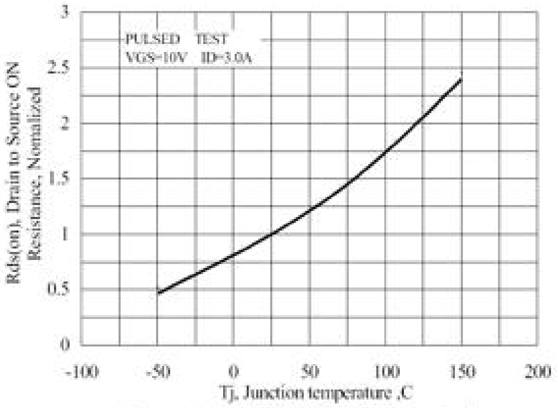

Figure 10 Typical Drian to Source on Resistance vs Junction Temperature