GL25N60FA9

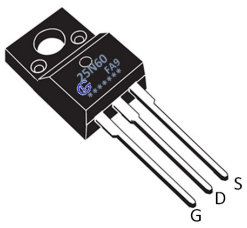
Silicon N-Channel Power MOSFET

General Description

GL25N60FA9, 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.

V_{DSS}	600	V
I_D	25	A
$P_D(T_C=25℃)$	85	W
$R_{DS(ON).type.}$	250	mΩ

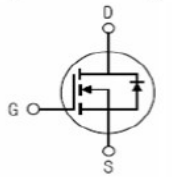
TO-220F



Features

- Fast Switching
- Low ON Resistance(Typical Data:0.25Ω)
- Low Gate Charge Minimize Switching loss
- Fast Recovery Body Diode
- 100% Single Pulse avalanche energy Test

Inner Equivalent Principium Chart



Applications

- Adaptor
- Charger
- SMPS Standby Power

Absolute (Tc= 25℃ unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	600	V
I_D	Continuous Drain Current	25	A
I_{DM}	Pulsed Drain Current at V_{GS}=10V	100	A
V_{GS}	Gate-to-Source Voltage	±30	V
E_{AS}	Single Pulse Avalanche Energy	2500	mJ
dv/dt	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	85	W
	Derating Factor above 25°C	0.68	W/℃
T_J,T_{stg}	Operating Junction and Storage Temperature Range	150,–55 to 150	℃
T_L	Maximum Temperature for Soldering	300	℃
T_{PAK}	Leads at 0.63 in(1.6mm) from Case for 10 seconds, Package Body for 10 seconds	260	

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

Thermal Characteristics

Symbol	Parameter	Rating	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.47	℃/ W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	100	℃/ 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	600	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=600V, V_{GS}=0V,T_a=25℃	--	--	10	μA
		V_{DS}=480V, V_{GS}=0V,T_a=125℃	--	--	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.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V,I_D=12.5A	--	250	290	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	2.0	--	4.0	V
g_{fs}	Forward Transconductance	V_{DS}=15V,I_D=12.5A	--	20	--	S

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS}=0V V_{DS}=25V f=1.0MHz	--	4200	--	pF
C_{oss}	Output Capacitance		--	380	--	
C_{rss}	Reverse Transfer Capacitance		--	39	--	

Resistive Switching Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D=25A,V_{DD}=300V V_{GS}=10V,R_g=25Ω	--	55	--	ns
t_r	Rise Time		--	121	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	315	--	
t_f	Fall Time		--	140	--	
Q_g	Total Gate Charge	I_D=25A,V_{DD}=300V V_{GS}=10V	--	101	--	nC
Q_{gs}	Gate to Source Charge		--	18	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	43	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_{SD}	Continuous Source Current (Body Diode)		--	--	25	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	100	A
V_{SD}	Diode Forward Voltage	I_S=25A,V_{GS}=0V	--	--	1.5	V
t_{rr}	Reverse Recovery Time	I_S=25A,T_j=25℃	--	580	--	ns
Q_{rr}	Reverse Recovery Charge	di/dt=100A/μs,V_{GS}=0V	--	6.5	--	uC
*Pulse width tp≤380μs,δ≤2%						

Characteristics Curves

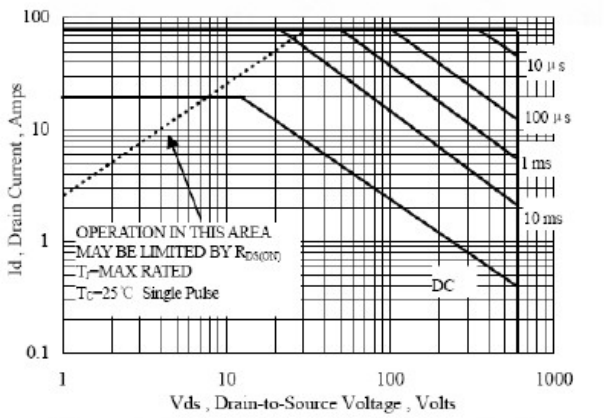


Figure 1 Maximum Forward Bias Safe Operating Area

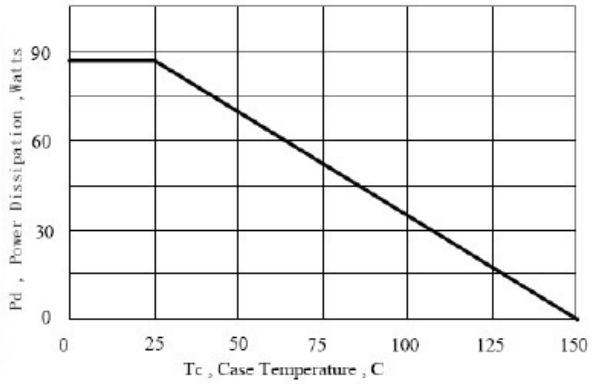


Figure 2 Maximum Power Dissipation vs Case Temperature

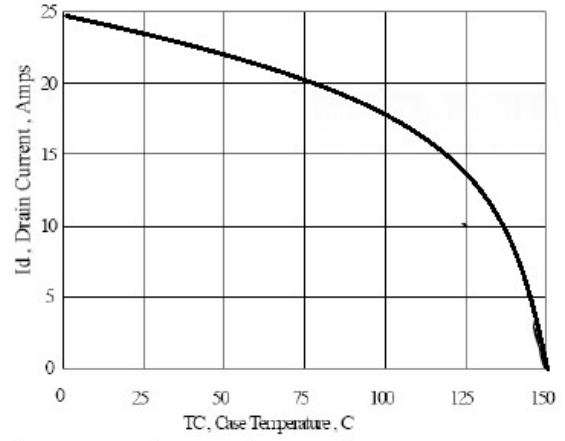


Figure 3 Maximum Continuous Drain Current vs Case Temperature

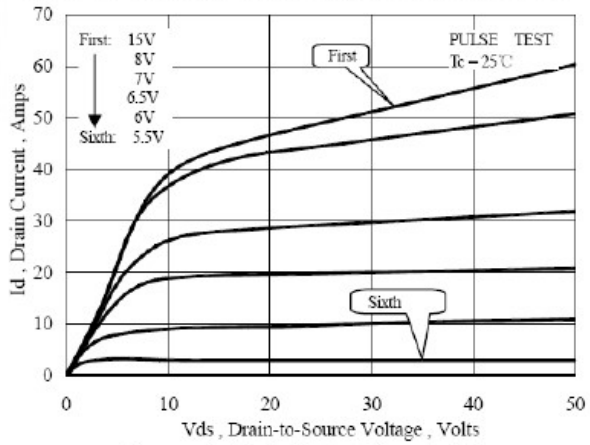


Figure 4 Typical Output Characteristics

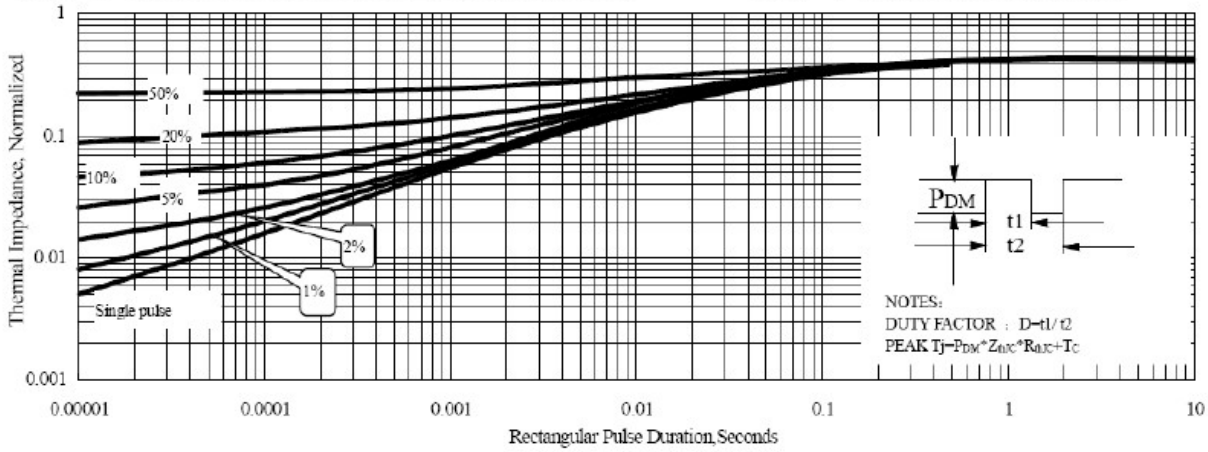


Figure 6. Maximum Peak Current Capability

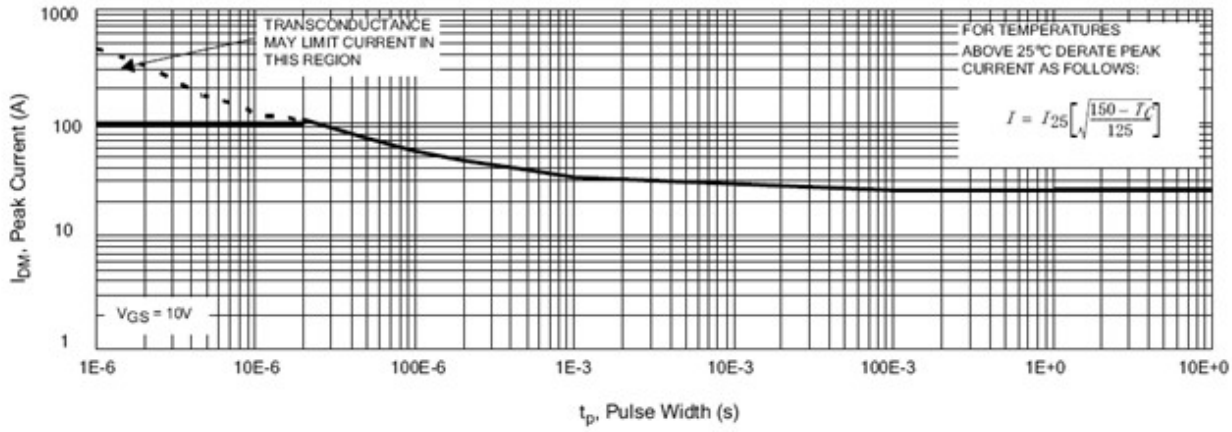


Figure 7. Typical Transfer Characteristics

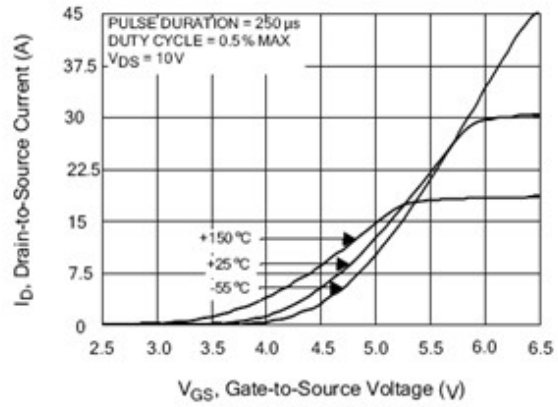


Figure8. Unclamped Inductive Switching Capability

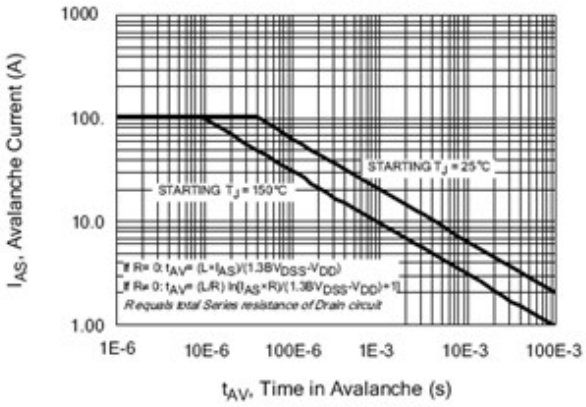


Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current

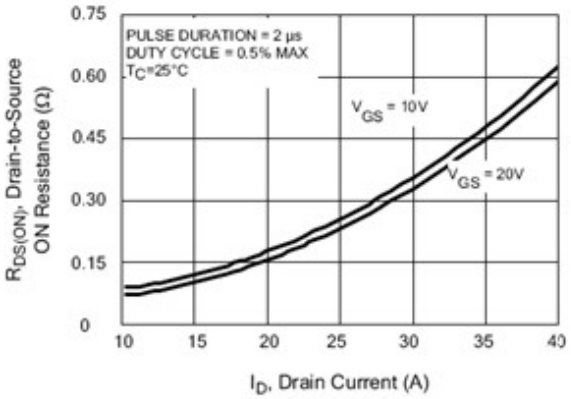


Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature

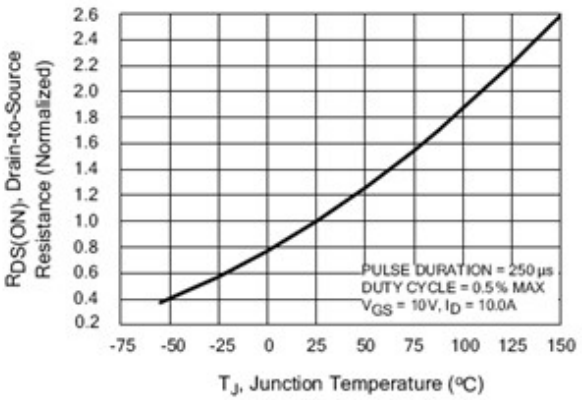


Figure 11. Typical Breakdown Voltage vs Junction Temperature

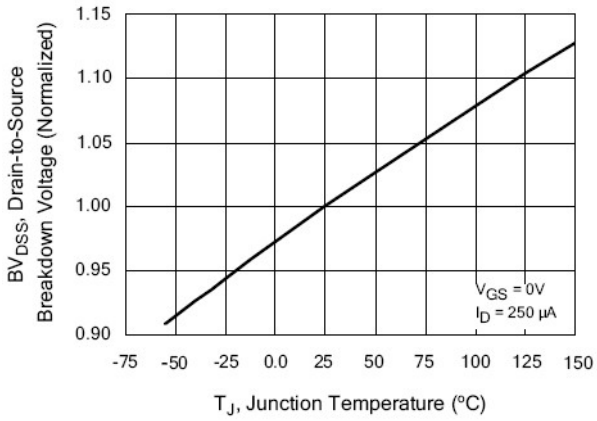


Figure 12. Typical Threshold Voltage vs Junction Temperature

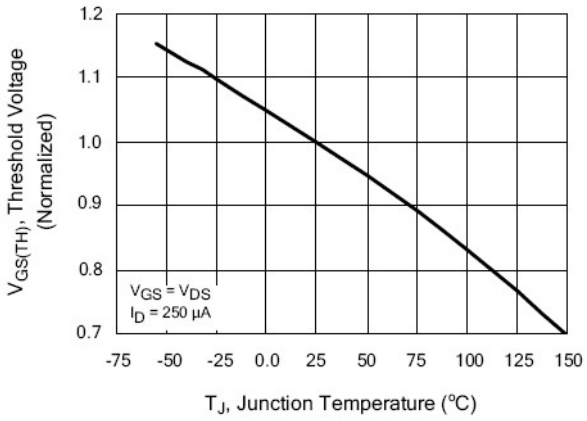


Figure 13. Maximum Forward Bias Safe Operating Area

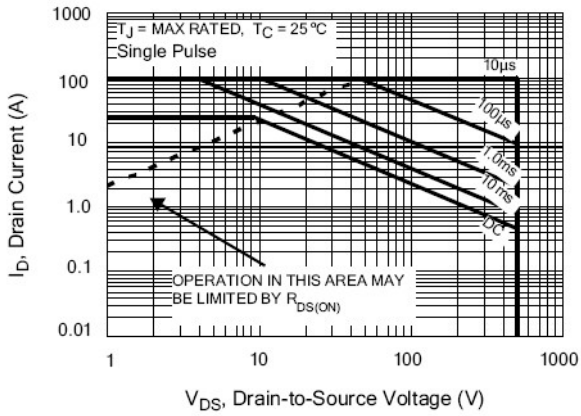


Figure 14. Typical Capacitance vs

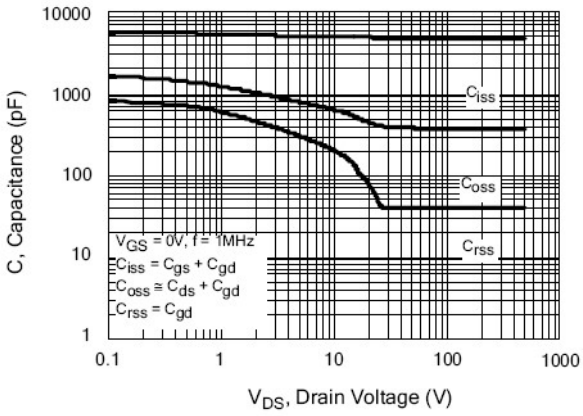


Figure 15. Typical Gate Charge vs Gate-to-Source Voltage

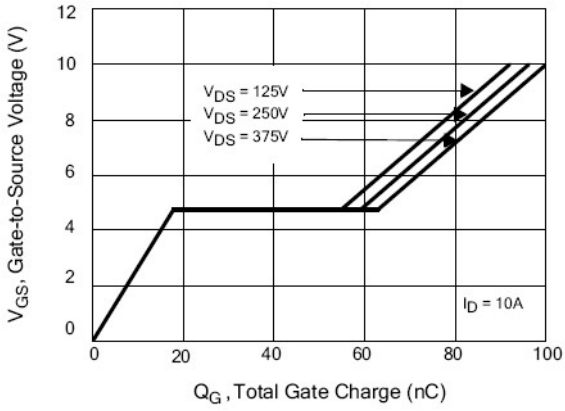


Figure 16. Typical Body Diode Transfer Characteristics