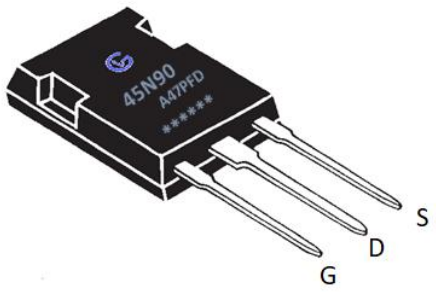
GL45N90A47PFD

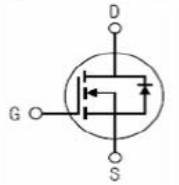
Silicon N-Channel Power MOSFET

V_{DSS}	900	V
I_D	45	A
$P_D(T_C=25℃)$	1250	W
$R_{DS(ON).TYP.}$	0.185	Ω

TO-247PLUS



Inner Equivalent Principium Chart



General Description:

GL45N90A47PFD, 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-247PLUS, which accords with the RoHS standard.

Features:

- Fast body diode
- Low ON Resistance(R_{dson}≤0.22Ω)
- Low Gate Charge
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

Applications:

- Power switch circuit of adaptor and charger
- Motor Control applications
- Zero Voltage Switching SMPS

Absolute (Tc=25℃ unless otherwise specified):

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	900	V
I_D	Continuous Drain Current	45	A
I_{DM}[a1]	Pulsed Drain Current	135	A
V_{GS}	Gate-to-Source Voltage	±30	V
E_{As}[a2]	Single Pulse Avalanche Energy	4000	mJ
P_D	Power Dissipation	1250	W
	Derating Factor above 25°C	10	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
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.1	℃/ W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	35.7	℃/ 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
$\Delta BV_{DSS}/\Delta T_J$	Bvdss Temperature Coefficient	I_D=250uA,Reference25℃	--	0.55	--	V/℃
I_{DSS}	Drain to Source Leakage Current	V_{DS}=900V, V_{GS}=0V,T_a=25℃	--	--	50	μA
		V_{DS}=720V, V_{GS}=0V,T_a=125℃	--	--	5000	
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=+30V	--	--	500	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-30V	--	--	-500	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=22.5A	--	0.15	0.22	Ω
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	2.0	--	5.0	V
g_{fs}	Forward Trans conductance	V_{DS}=10V,I_D=10A	--	15	--	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	--	13500	--	pF
C_{oss}	Output Capacitance		--	1100	--	
C_{rss}	Reverse Transfer Capacitance		--	24	--	

Resistive Switching Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D=45A,V_{DD}=450V V_{GS}=10V,R_g=10Ω	--	12	--	ns
t_r	Rise Time		--	21	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	38	--	
t_f	Fall Time		--	30	--	
Q_g	Total Gate Charge	I_D=45A,V_{DD}=450V V_{GS}=10V	--	31	--	nC
Q_{gs}	Gate to Source Charge		--	8.6	--	
Q_{gd}	Gate to Drain ("Miller")Charge		--	10	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_{SD}	Continuous Source Current (Body Diode)		--	--	45	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	135	A
V_{SD}	Diode Forward Voltage	I_S=45A,V_{GS}=0V	--	--	1.5	V
t_{rr}	Reverse Recovery Time	I_S=45A,T_j=25℃	--	170	--	ns
Q_{rr}	Reverse Recovery Charge	dI_F/dt=100A/μs,V_{GS}=0V	--	480	--	nC

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

a2: L=10mH, I_D=13A, Start T_J=25℃

Characteristics Curve:

Fig. 1. Output Characteristics @ 25°C

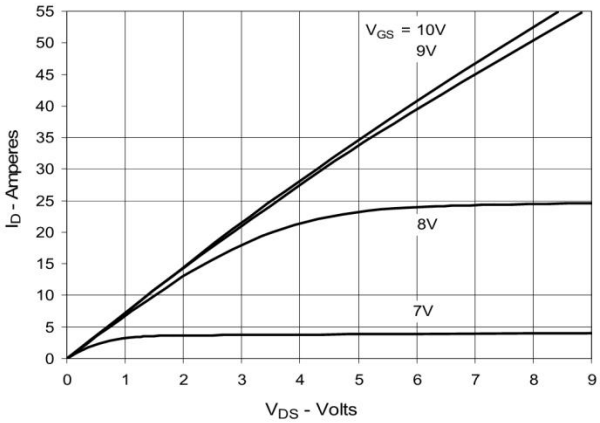


Fig. 2. Extended Output Characteristics @ 25°C

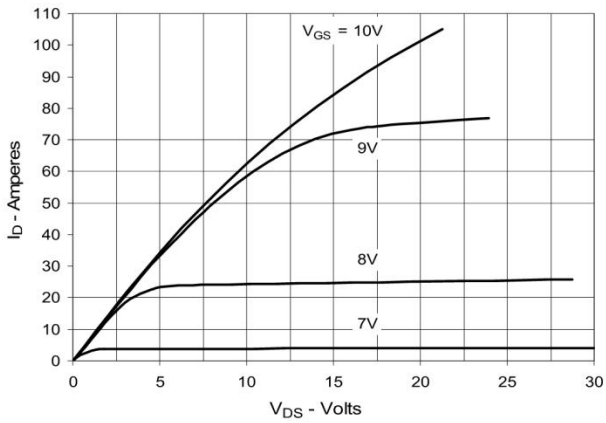


Fig. 3. Output Characteristics @ 125°C

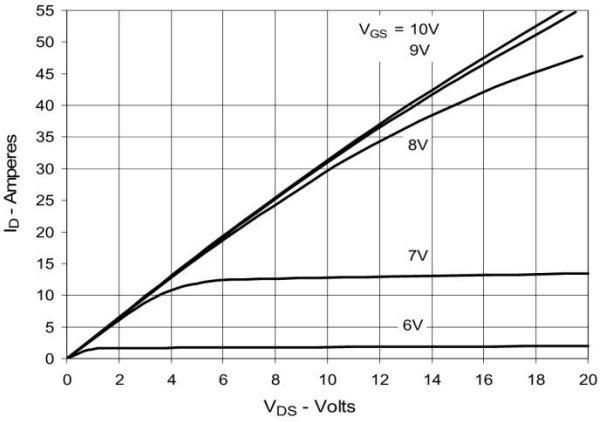


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 26A Value vs. Junction Temperature

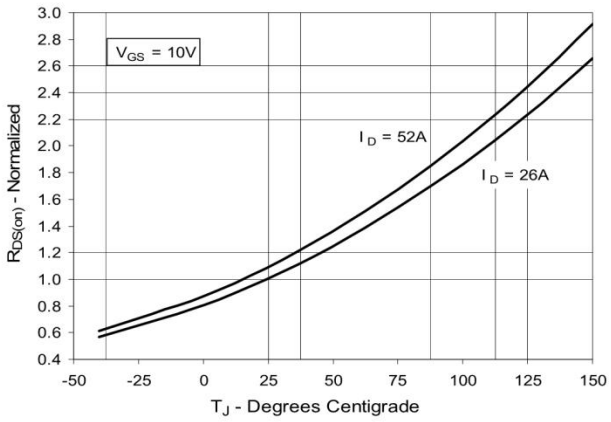


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 26A Value vs. Drain Current

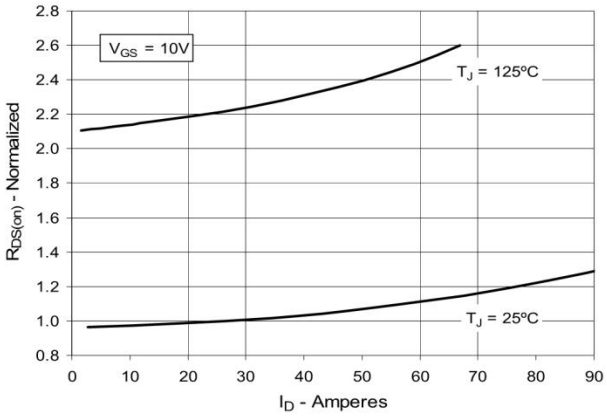


Fig. 6. Maximum Drain Current vs. Case Temperature

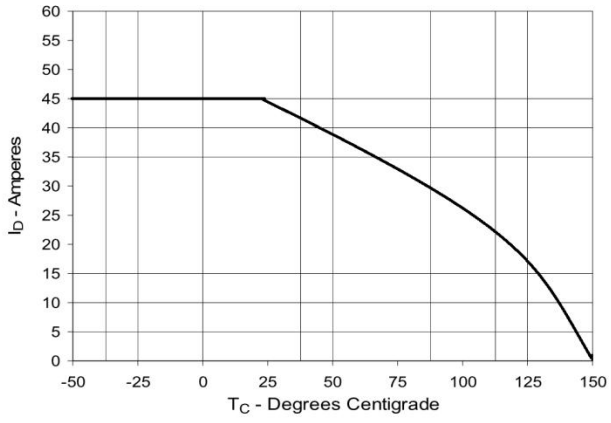


Fig. 7. Input Admittance

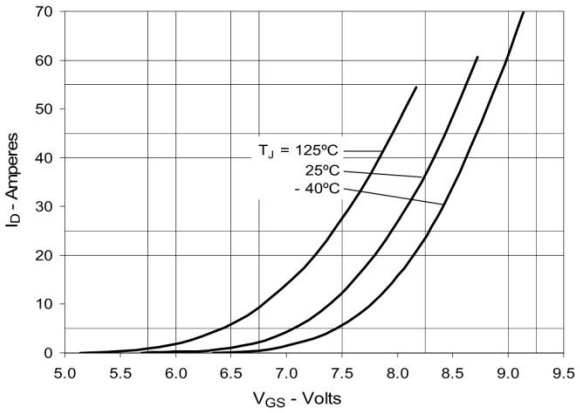


Fig. 8. Transconductance

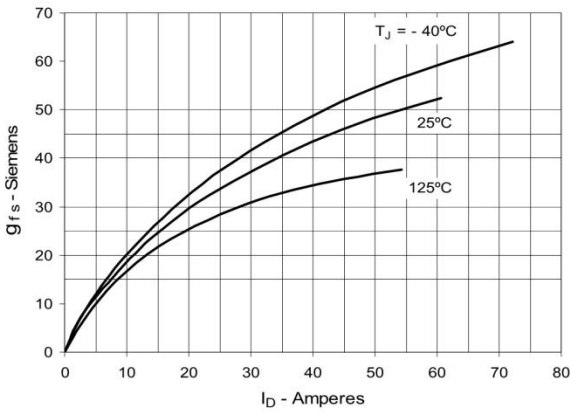


Fig. 9. Forward Voltage Drop of Intrinsic Diode

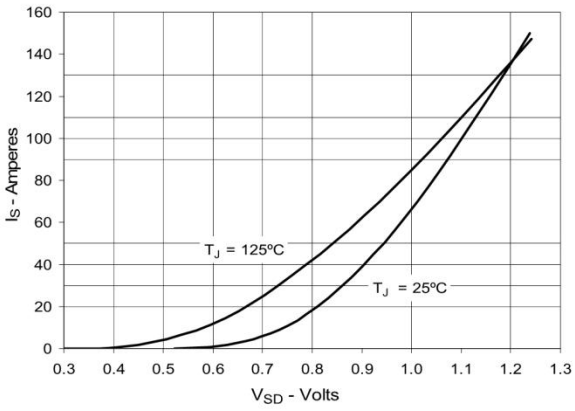


Fig. 10. Gate Charge

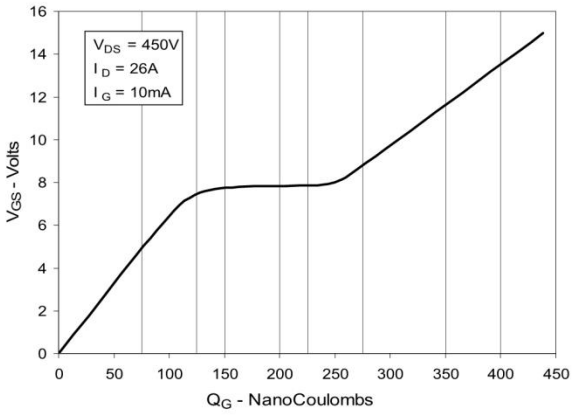


Fig. 11. Capacitance

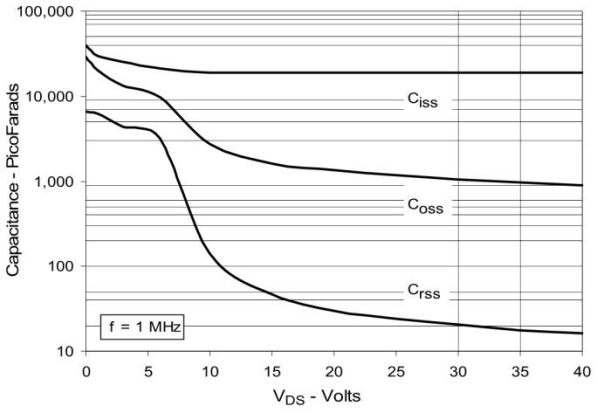


Fig. 12. Maximum Transient Thermal Impedance