GL25N40A8

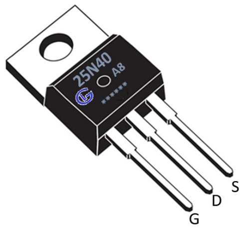
Silicon N-Channel Power MOSFET

General Description

V_{DSS}	400	V
I_D	25	A
$P_D(T_C=25℃)$	250	W
$R_{DS(ON).TYP.}$	0.13	Ω

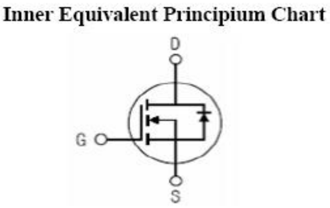
GL25N40A8, the silicon N-channel Enhanced VDMOSFET, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency. The package form is TO-220 which accords with the RoHS standard.

TO-220



Features

- Fast Switching
- Low ON Resistance(R_{dson}≤0.155Ω)
- Low Gate Charge (Typical Data:60nC)
- Low Reverse transfer capacitances(Typical:25pF)
- 100% Single Pulse avalanche energy Test



Applications

- Power switch circuit of adaptor and charger

Absolute (Tc=25℃ unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	400	V
I_D	Continuous Drain Current	25	A
	Continuous Drain Current T_C=100 °C	17.5	A
$I_{DM}{}^{a1}$	Pulsed Drain Current	100	A
V_{GS}	Gate-to-Source Voltage	±30	V
$E_{As}{}^{a2}$	Single Pulse Avalanche Energy	1850	mJ
$E_{Ar}{}^{a1}$	Avalanche Energy ,Repetitive	155	mJ
$I_{AR}{}^{a1}$	Avalanche Current	25	A
dv/dt^{a3}	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	250	W
	Derating Factor above 25°C	2.0	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	0.5	℃/ W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	℃/ 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	400	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	Bvdss Temperature Coefficient	I_D=250uA,Reference25℃	--	0.53	--	V/℃
I_{DSS}	Drain to Source Leakage Current	V_{DS}=400V, V_{GS}=0V,T_a=25℃	--	--	1.0	μA
		V_{DS}=320V, 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=12.5A	--	0.13	0.155	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=12.5A	--	16	--	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	--	2650	--	pF
C_{oss}	Output Capacitance		--	320	--	
C_{rss}	Reverse Transfer Capacitance		--	25	--	

Resistive Switching Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D=25A,V_{DD}=200V V_{GS}=10V,R_g=25Ω	--	35	--	ns
tr	Rise Time		--	71	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	160	--	
t_f	Fall Time		--	72	--	
Q_g	Total Gate Charge	I_D=25A,V_{DD}=200V V_{GS}=10V	--	60	--	nC
Q_{gs}	Gate to Source Charge		--	12	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	19	--	

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℃ dI_F/dt=100A/μs,V_{GS}=0V	--	303	--	ns
Q_{rr}	Reverse Recovery Charge		--	1867	--	μC

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

a2： L=10mH, I_D=19A, Start T_J=25℃

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

Characteristics Curves

Figure 1. On-Region Characteristics

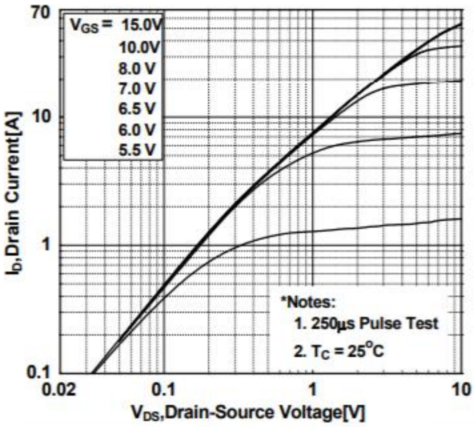


Figure 2. Transfer Characteristics

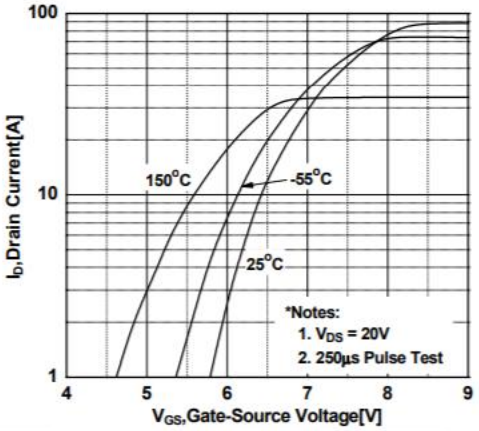


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

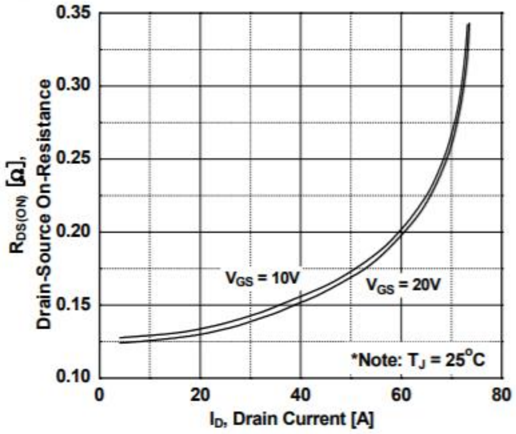


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

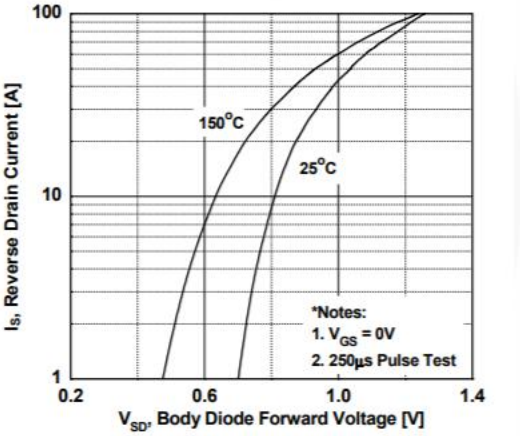


Figure 5. Capacitance Characteristics

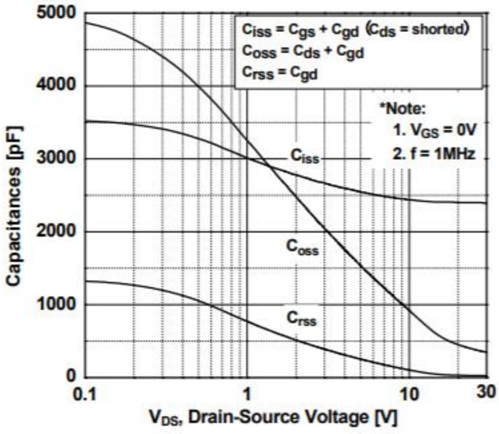


Figure 6. Gate Charge Characteristics

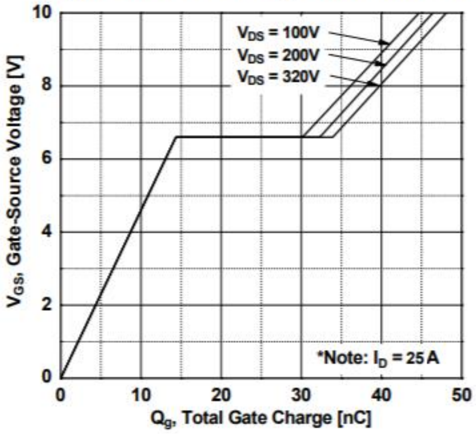


Figure 7. Breakdown Voltage Variation vs. Temperature

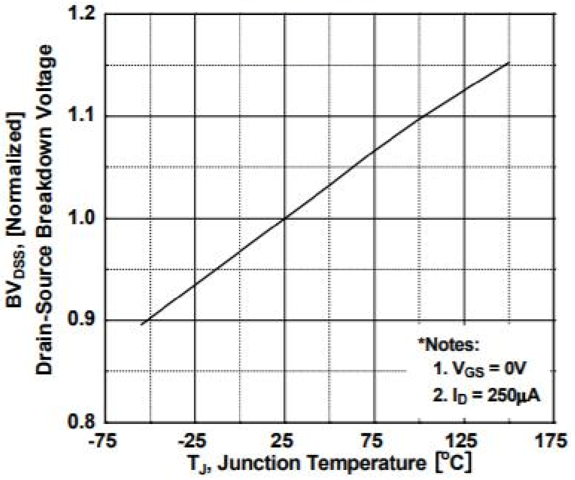


Figure 8. On-Resistance Variation vs. Temperature

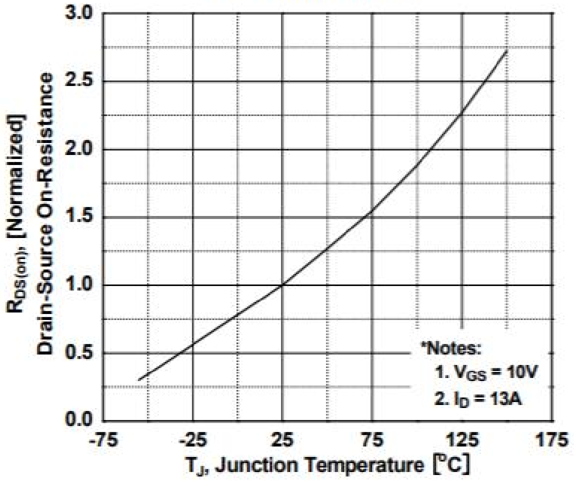


Figure 9. Maximum Safe Operating Area

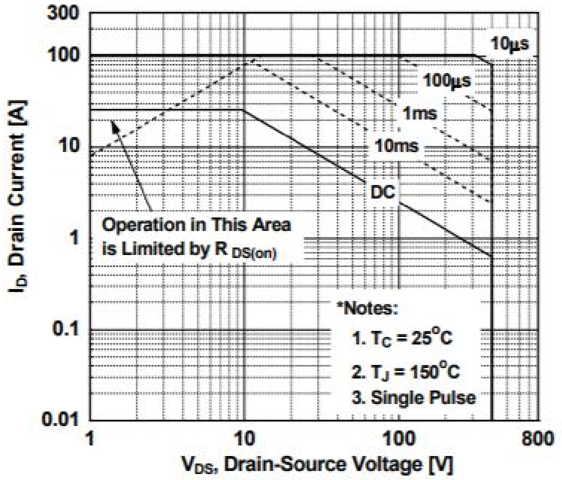


Figure 10. Maximum Drain Current vs. Case Temperature

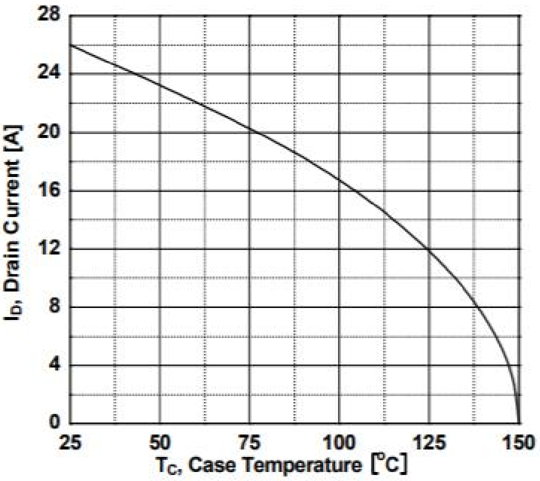


Figure 11. Transient Thermal Response Curve