GL150N06AD

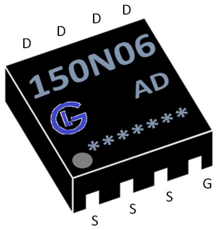
GL Silicon N-Channel Power MOSFET

General Description

The GL150N06AD uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications. The package form is QFN 5×6 which accords with the RoHS standard.

V_{DSS}	60	V
I_D	150	A
P_D	200	W
$R_{DS(ON)max}$	3.6	mΩ

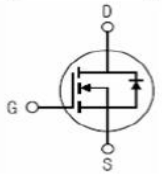
QFN 5╳6



Features

- $R_{DS(ON)}$ <3.6mΩ @ V_{GS}=10V
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

Inner Equivalent Principium Chart



Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Absolute（Tc=25℃ unless otherwise specified）

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	60	V
I_D	Continuous Drain Current	150	A
I_{DM}	Pulsed Drain Current	600	A
V_{GS}	Gate-to-Source Voltage	±20	V
P_D	Power Dissipation	200	W
E_{AS}	Single pulse avalanche energy^{a5}	820	mJ
T_J，T_{stg}	Operating Junction and Storage Temperature Range	150，-55 to 150	℃

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

Thermal Characteristics

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case^{a2}	0.625	℃/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	60	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=60V, V_{GS}= 0V,T_a=25℃	--	--	1.0	µA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=+20V	--	--	0.1	µA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-20V	--	--	-0.1	µA

ON Characteristics[a3]

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	V_{GS}=10V,I_D=20A	--	--	3.6	mΩ
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	V_{GS}=4.5V,I_D=20A	--	--	4.6	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250µA	1.0	--	3.0	V
Pulse width tp≤380µs,δ≤2%						

Dynamic Characteristics[a4]

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	V_{DS}=10V,I_D=20A	50	--	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=30V f=1.0MHz	--	4500	--	pF
C_{oss}	Output Capacitance		--	950	--	
C_{rss}	Reverse Transfer Capacitance		--	24	--	

Resistive Switching Characteristics[a4]

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=30V,I_D=20A V_{GS}=10V,R_G=4.7Ω	--	6	--	ns
t_r	Rise Time		--	11	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	23	--	
t_f	Fall Time		--	3	--	
Q_g	Total Gate Charge	V_{DD}=30V, I_D=20A V_{GS}=10V	--	70	--	nC
Q_{gs}	Gate to Source Charge		--	18.5	--	
Q_{gd}	Gate to Drain（“Miller”）Charge		--	15.5	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current [a2](Body Diode)		--	--	150	A
V_{SD}	Diode Forward Voltage[a3]	I_S=150A,V_{GS}=0V	--	--	1.2	V

[a1]: Repetitive Rating: Pulse width limited by maximum junction temperature.

[a2]: Surface Mounted on FR4 Board, t≤10sec.

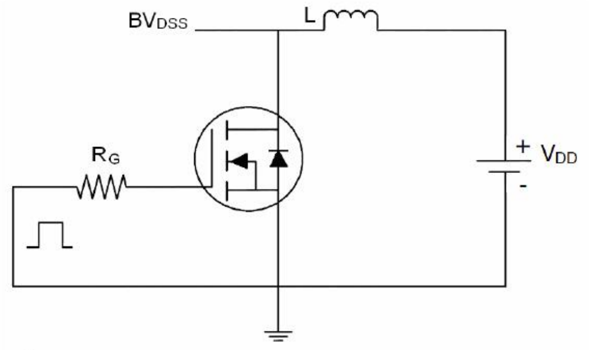
[a3]: Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.

[a4]: Guaranteed by design, not subject to production

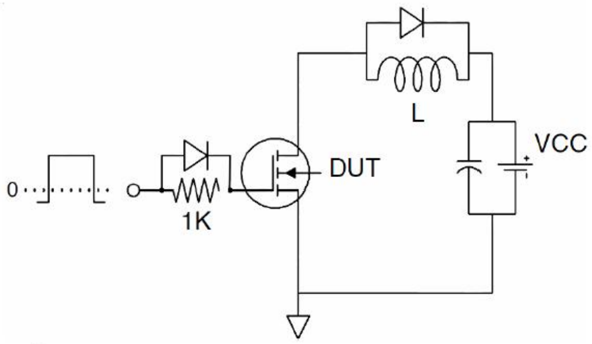
[a5]: EAS condition: Tj=25℃,V_{DD}=30V,V_G=10V,L=0.5mH,Rg=25Ω

Test Circuits

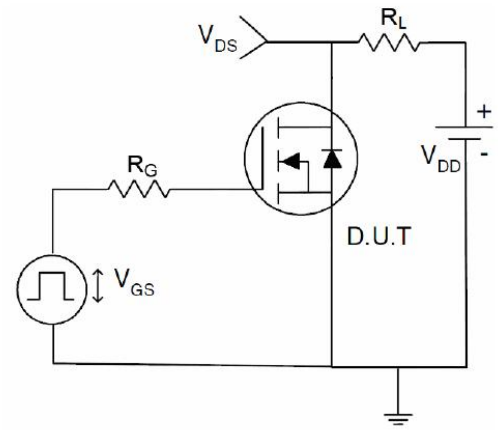
1) EAS test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



Characteristics Curves

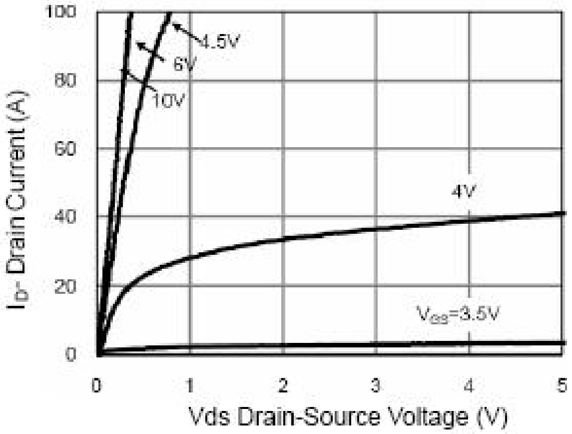


Figure 1 Output Characteristics

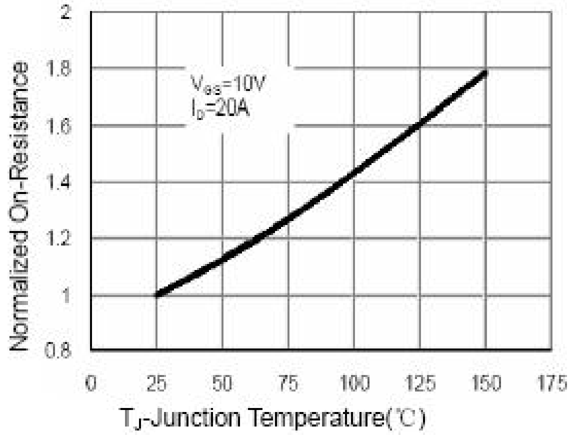


Figure 4 Rdson-Junction Temperature

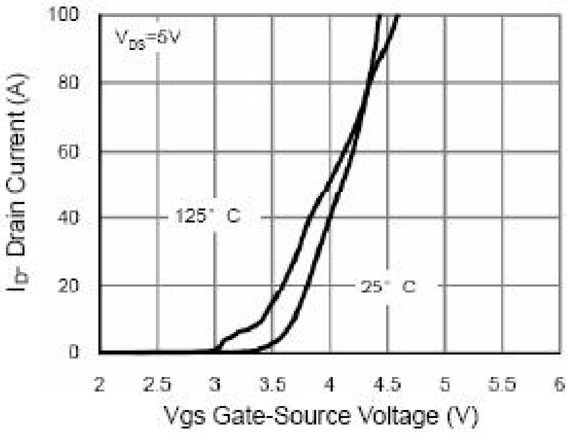


Figure 2 Transfer Characteristics

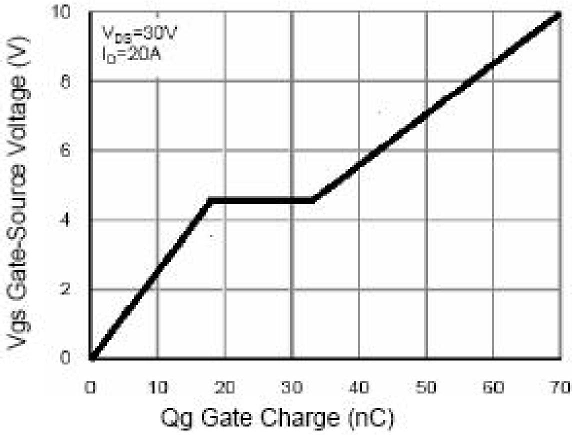


Figure 5 Gate Charge

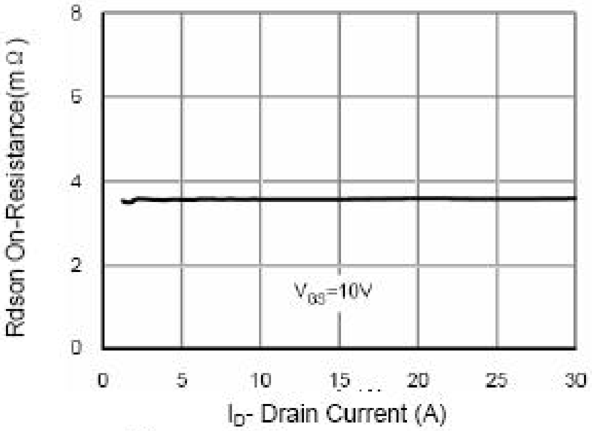


Figure 3 Rdson- Drain Current

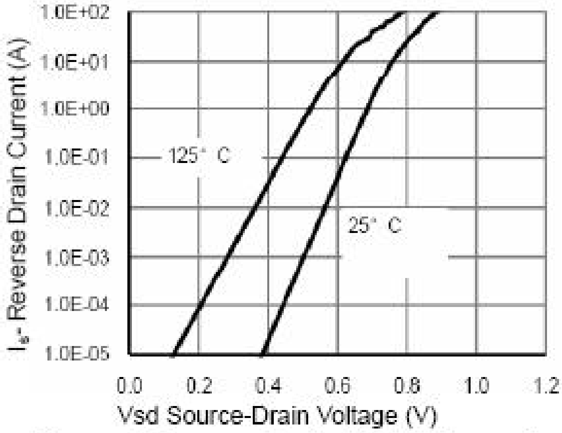


Figure 6 Source- Drain Diode Forward

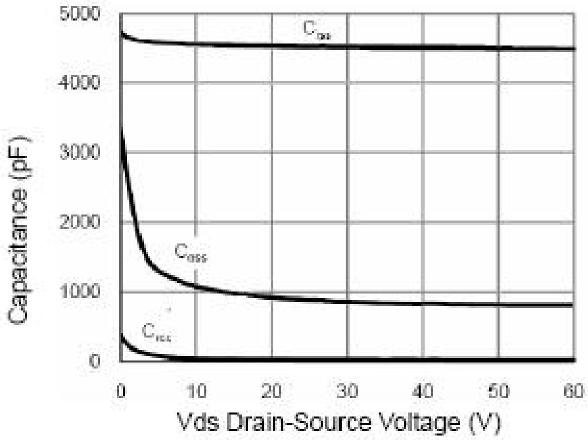


Figure 7 Capacitance vs Vds

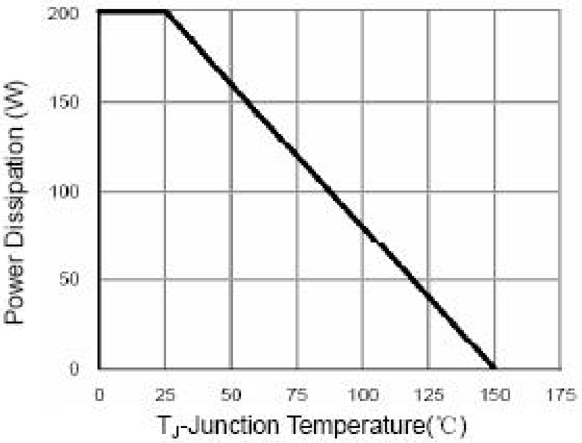


Figure 9 Power De-rating

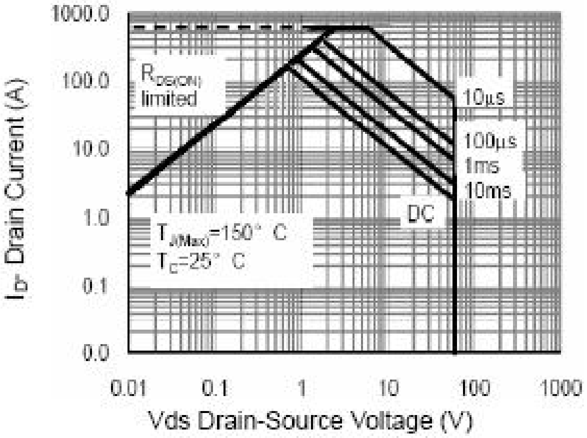


Figure 8 Safe Operation Area

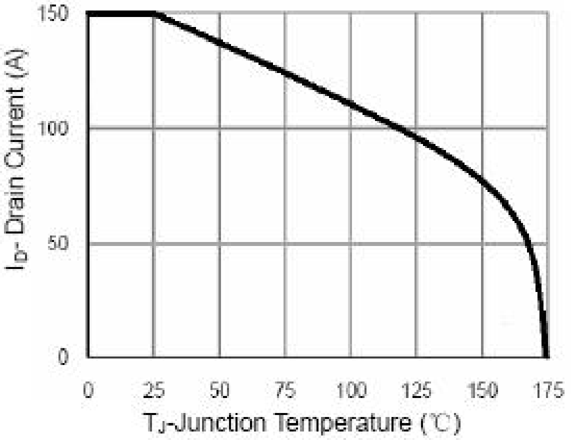


Figure 10 Current De-rating

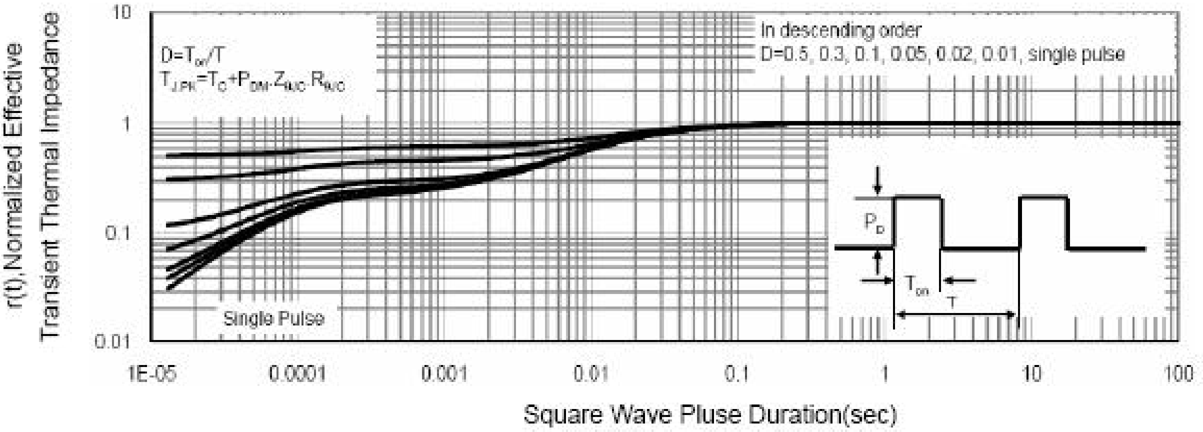


Figure 11 Normalized Maximum Transient Thermal Impedance