GL300N04A0

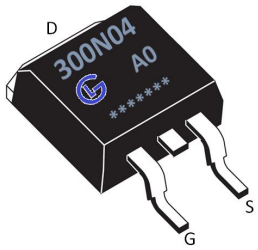
GL Silicon N-Channel Power MOSFET

General Description:

The GL300N04A0 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 TO-263, which accords with the RoHS standard.

V_{DSS}	40	V
I_D	300	A
P_D	250	W
$R_{DS(ON)type}$	1.2	mΩ

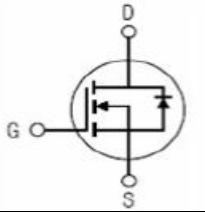
TO-263



Features:

- $R_{DS(ON)}$ <1.6mΩ @ V_{GS}=10V (Typ1.2mΩ)
- 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	40	V
I_D	Continuous Drain Current	300	A
I_{DM}	Pulsed Drain Current	1200	A
V_{GS}	Gate-to-Source Voltage	±20	V
P_D	Power Dissipation	250	W
E_{AS}	Single pulse avalanche energy[a5]	238	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, −55 to 150	℃

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	40	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=40V, 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.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V,I_D=100A	--	1.2	1.6	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.0	--	2.5	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}=5V,I_D=80A	--	160	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=20V f=1.0MHz	--	6020	--	pF
C_{oss}	Output Capacitance		--	2230	--	
C_{rss}	Reverse Transfer Capacitance		--	170	--	

Resistive Switching Characteristics[a4]						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=20V,I_D=80A V_{GS}=10V,R_G=3.0Ω	--	25	--	ns
t_r	Rise Time		--	80	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	60	--	
t_f	Fall Time		--	20	--	
Q_g	Total Gate Charge	V_{DD}=20V, I_D=80A V_{GS}=10V	--	50	--	nC
Q_{gs}	Gate to Source Charge		--	18	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	21	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current [a2](Body Diode)		--	--	300	A
V_{SD}	Diode Forward Voltage[a3]	I_S=100A,V_{GS}=0V	--	--	1.2	V

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case[a2]	0.42	℃/W

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

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

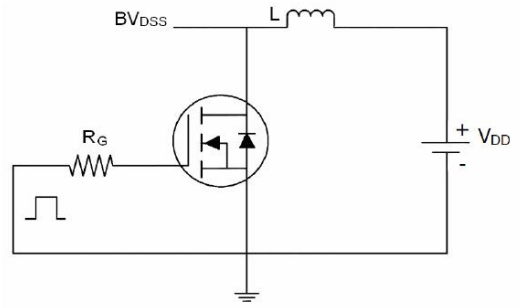
[a3]: Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.

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

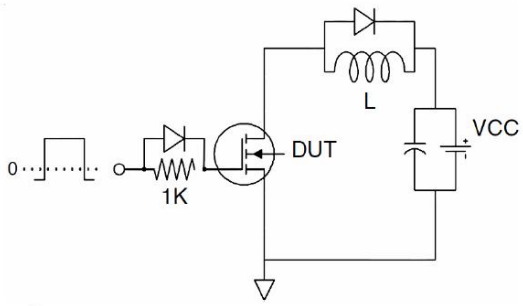
[a5]: EAS condition: Tj=25℃,V_{DD}=20V,V_G=10V,L=0.5mH,Rg=25Ω

Test circurt

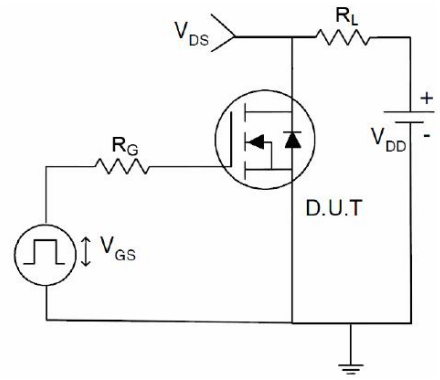
1) EAS test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



Characteristics Curve:

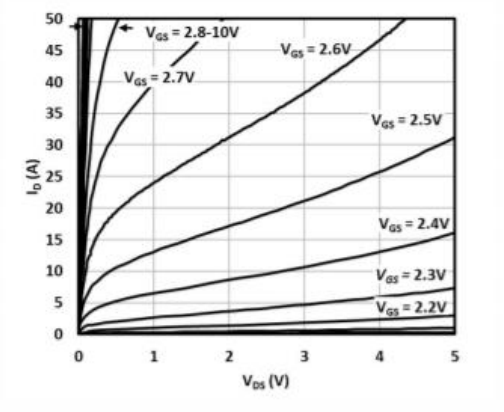


Fig. 1 Output characteristics

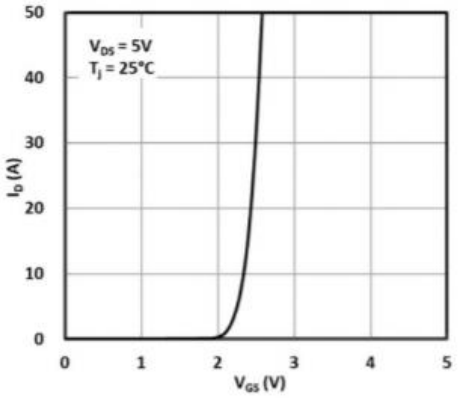


Fig. 2 Transfer characteristics

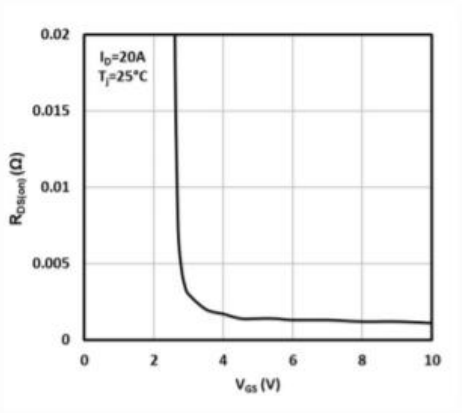


Fig.3 On-resistance vs. gate voltage

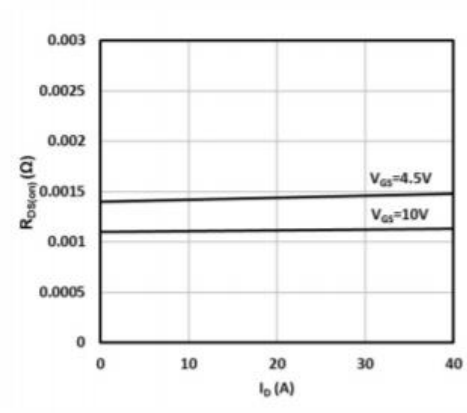


Fig.4 On-resistance vs. drain current

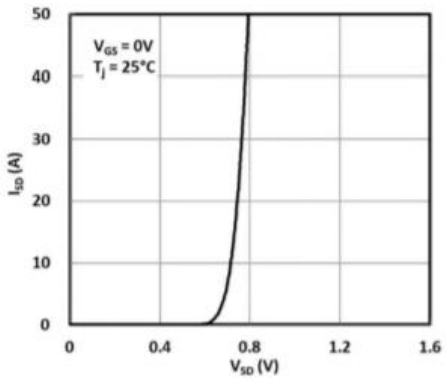


Fig.5 Source-to-drain diode forward characteristics

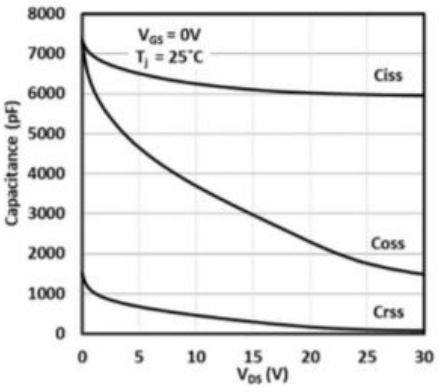


Fig.6 Capacitance vs. drain-to-source voltage

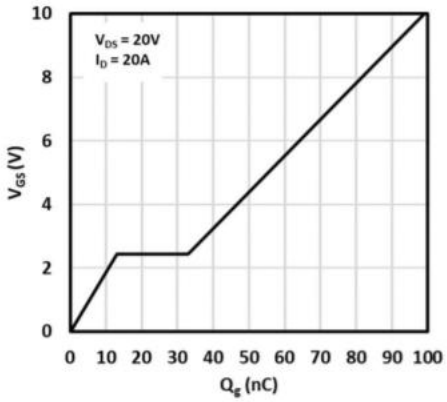


Fig.7 Gate-to-source voltage vs. gate charge

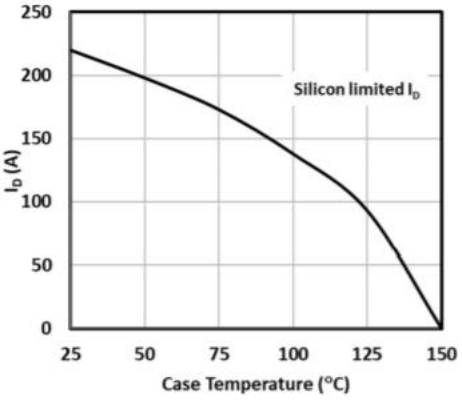


Fig.8 Maximum drain current vs. case temperature

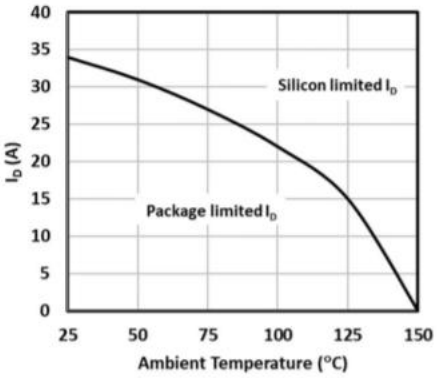


Fig. 9 Maximum drain current vs. ambient temperature