GL5N20A3

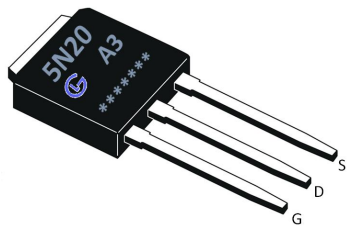
GL Silicon N-Channel Power MOSFET

General Description

GL5N20A3, the silicon N-channel Enhanced VDMOSFETs, 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-251, which accords with the RoHS standard.

V_{DSS}	200	V
I_D	4.8	A
P_D (T_C=25℃)	40	W
$R_{DS(ON)typ}$	0.49	Ω

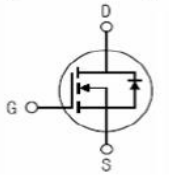
TO-251



Features

- Fast Switching
- Low ON Resistance(Rdson≤0.65Ω)
- Low Gate Charge (Typical Data:7nC)
- Low Reverse transfer capacitances(Typical:8pF)
- 100% Single Pulse avalanche energy Test

Inner Equivalent Principium Chart



Applications

- Power switch circuit of Video door phone

Absolute (Tc=25℃ unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	200	V
I_D	Continuous Drain Current	4.8	A
	Continuous Drain Current T_C=100 °C	3.4	A
I_{DM}[a1]	Pulsed Drain Current	19.2	A
V_{GS}	Gate-to-Source Voltage	±30	V
E_{AS}[a2]	Single Pulse Avalanche Energy	125	mJ
E_{AR}[a1]	Avalanche Energy ,Repetitive	12	mJ
I_{AR}[a1]	Avalanche Current	1.6	A
dv/dt[a3]	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	40	W
	Derating Factor above 25°C	0.32	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

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	200	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	BVdss Temperature Coefficient	I_D=250uA,Reference25℃	--	0.26	--	V/℃
I_{DSS}	Drain to Source Leakage Current	V_{DS}=200V,V_{GS}=0V,T_a=25℃	--	--	1	μA
		V_{DS}=160V,V_{GS}=0V,T_a=125℃	--	--	100	
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=+30V	--	--	100	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-30V	--	--	-100	μA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V,I_D=2.9A	--	0.49	0.65	Ω
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	0.5	--	2.0	V
Pulse width tp≤300μs,δ≤2%						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	V_{DS}=15V,I_D=2.9A	--	2.0	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=25V f=1.0MHz	--	255	--	pF
C_{oss}	Output Capacitance		--	52	--	
C_{rss}	Reverse Transfer Capacitance		--	8	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D=4.8A,V_{DD}=100V R_G=10Ω,R_G=10Ω	--	7	--	ns
t_r	Rise Time		--	13	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	27	--	
t_f	Fall Time		--	11	--	
Q_g	Total Gate Charge	I_D=4.8A,V_{DD}=100V V_{GS}=10V	--	7	--	nC
Q_{gs}	Gate to Source Charge		--	2	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	3	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	4.8	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	19.2	A
V_{SD}	Diode Forward Voltage	I_S=8.0A,V_{GS}=0V	--	--	1.5	V
t_{rr}	Reverse Recovery Time	I_S=4.8A,T_j=25°C dI_F/dt=100A/us,V_{GS}=0V	--	105	--	ns
Q_{rr}	Reverse Recovery Charge		--	380	--	uC
I_{RRM}	Reverse Recovery Current		--	7.2	--	A
Pulse width tp≤300μs,δ≤2%						

Thermal Characteristics

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case	3.13	℃/W
$R_{\theta JA}$	Junction-to-Ambient	62.5	℃/W

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

[a2]: L=10.0mH, I_D=6.3A, Start T_J=25℃

[a3]: I_{SD} =4A,di/dt ≤100A/us,V_{DD}≤BV_{DS}, Start T_J=25℃

The name and content of poisonous and harmful material in products

Part’s Name	有毒有害物质或元素					
	Pb	Hg	Cd	Cr（VI）	PBB	PBDE
	≤0.1%	≤0.1%	≤0.01%	≤0.1%	≤0.1%	≤0.1%
引线框	○	○	○	○	○	○
塑封树脂	○	○	○	○	○	○
管芯	○	○	○	○	○	○
内引线	○	○	○	○	○	○
焊料	×	○	○	○	○	○
说明	○：表示该元素的含量在 SJ/T11363-2006 标准的限量要求以下。 ×：表示该元素的含量超出 SJ/T11363-2006 标准的限量要求。 目前产品的焊料中含有铅（Pb）成份，但属于欧盟 RoHS 指令豁免范围。					

Characteristics Curves

Figure 1. Maximum Effective Thermal Impedance, Junction-to-Case

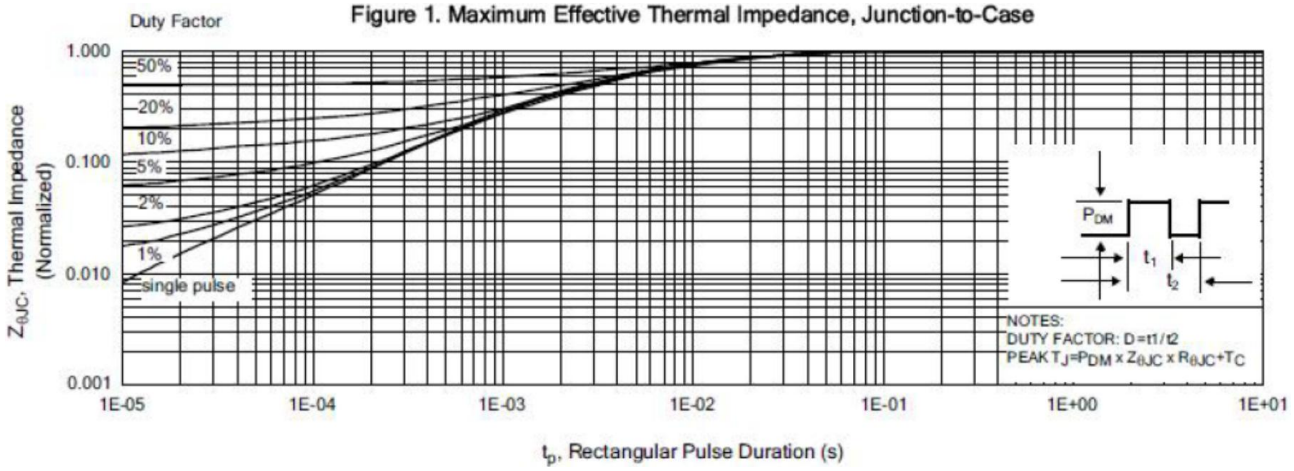


Figure 2. Maximum Power Dissipation vs Case Temperature

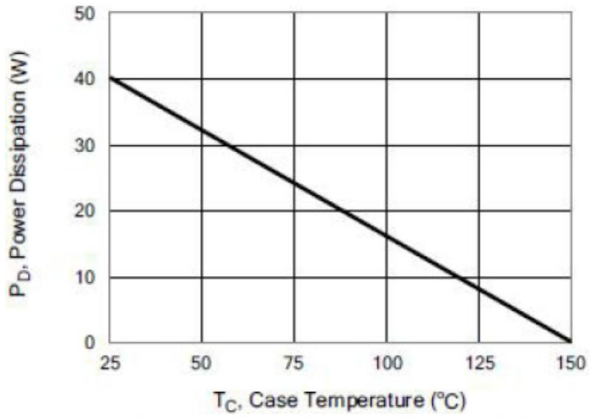


Figure3. Maximum Continuous Drain Current vs Case Temperature

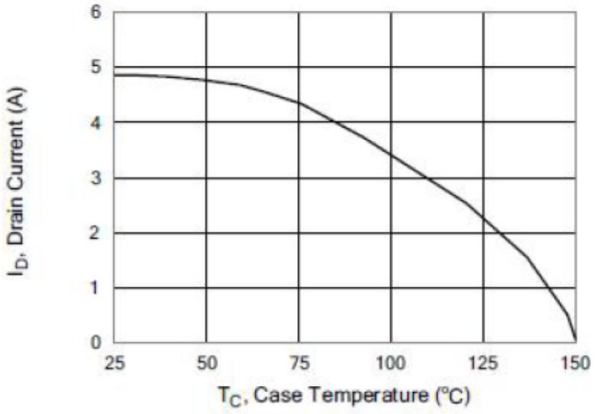


Figure 4. Typical Output Characteristics

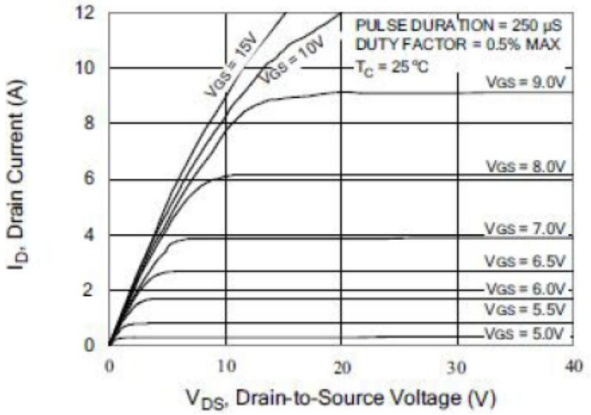


Figure5. Typical Drain-to-Source ON Resistance vs Gate Voltage and Drain Current

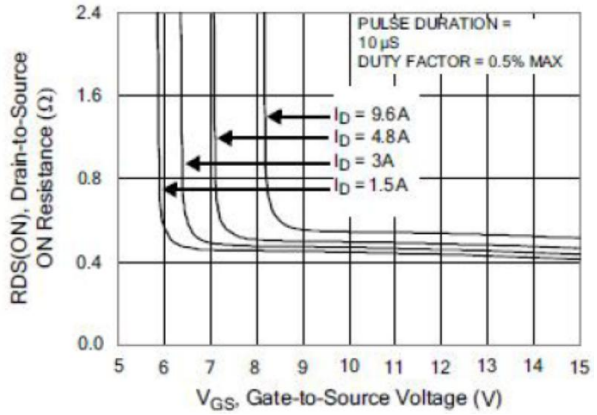


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Figure 6. Maximum Peak Current Capability

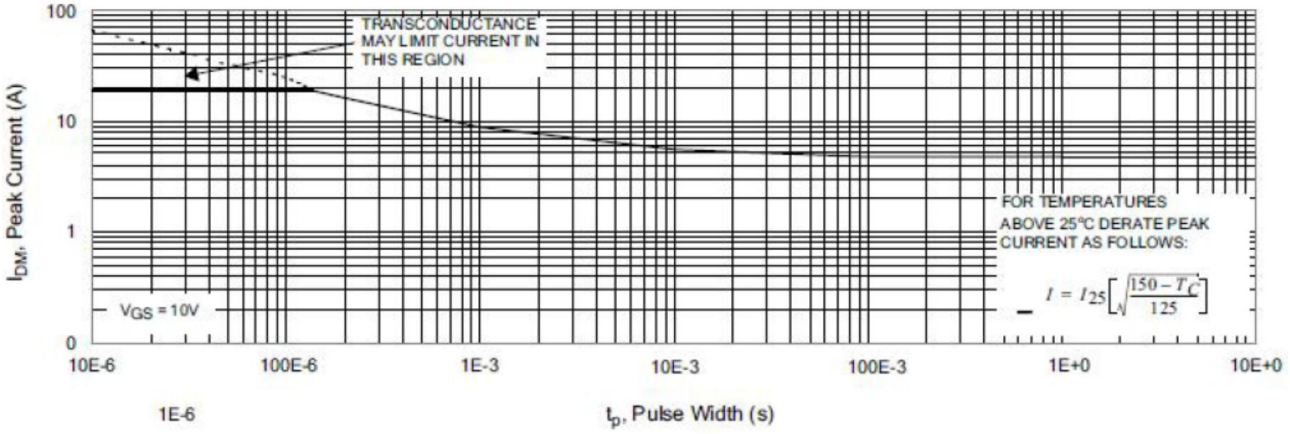

Figure 7. Typical Transfer Characteristics

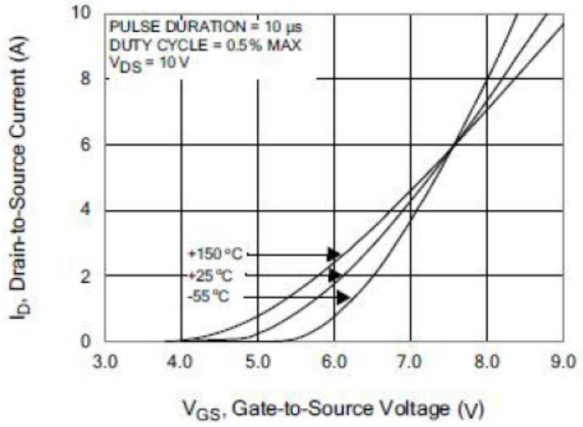

Figure 8. Unclamped Inductive Switching Capability

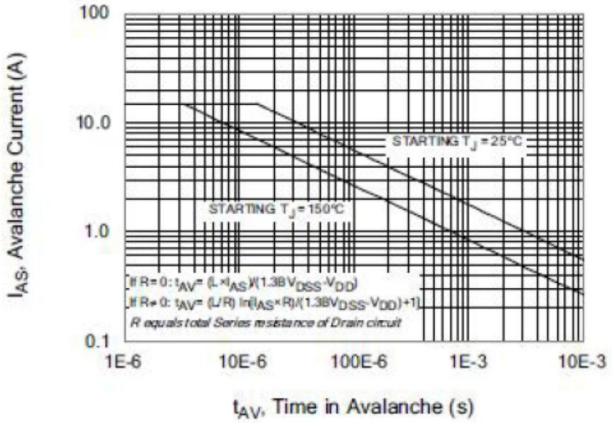

Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current

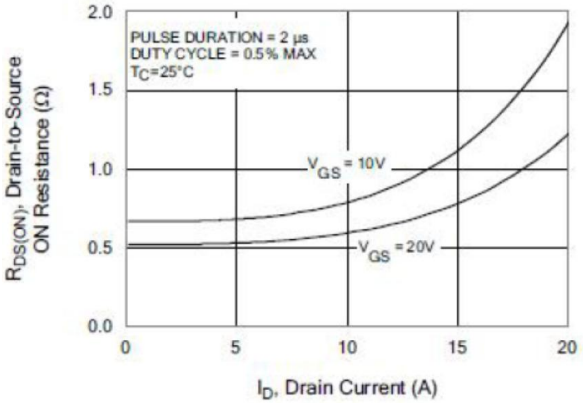

Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature

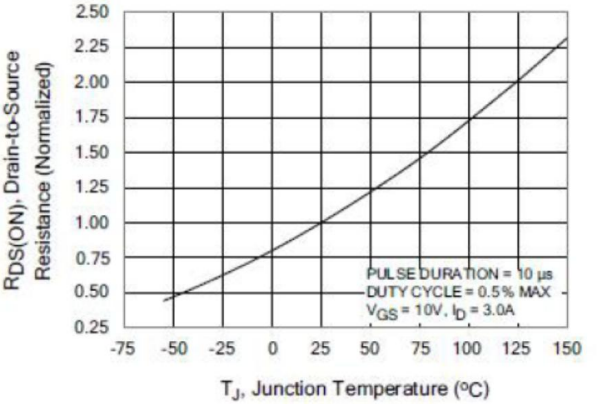

Figure 11. Typical Breakdown Voltage vs Junction Temperature

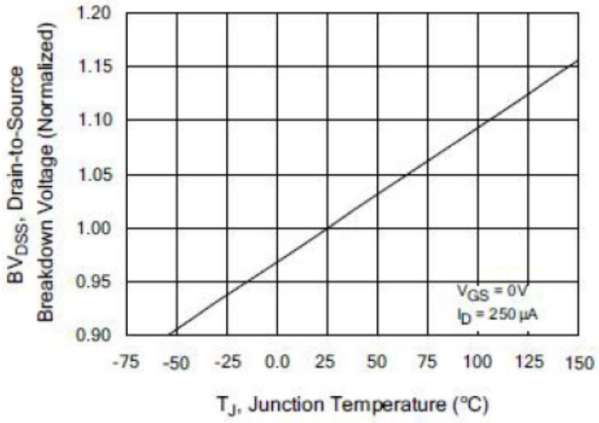

Figure 12. Typical Threshold Voltage vs Junction Temperature

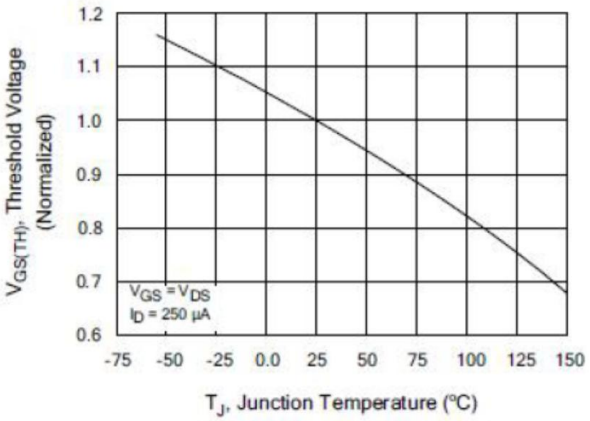

Figure 13. Maximum Forward Bias Safe Operating Area

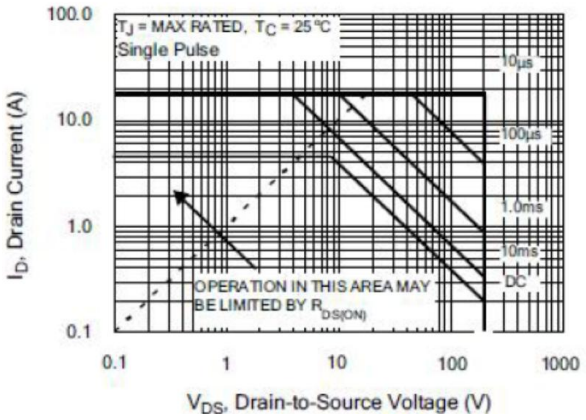

Figure 14. Typical Capacitance vs Drain-to-Source Voltage

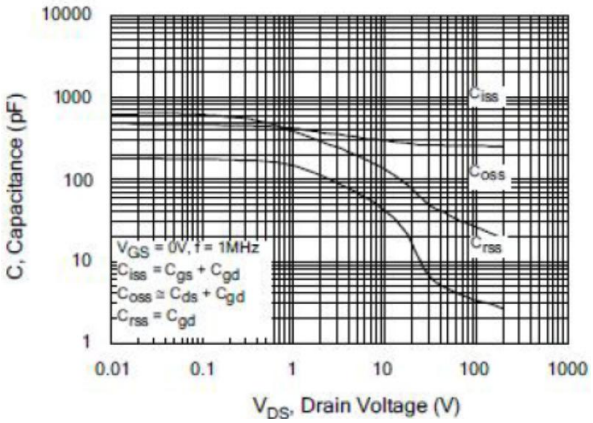

Figure 15. Typical Gate Charge vs Gate-to-Source Voltage

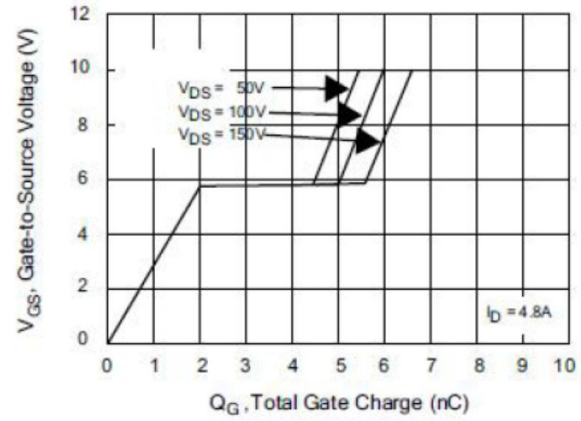

Figure 16. Typical Body Diode Transfer Characteristics