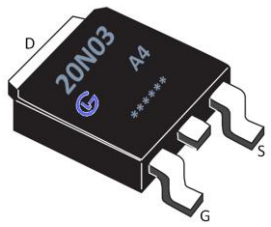
GL Silicon N-Channel Power MOSFET

General Description

The GL20N03A4 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-252, which accords with the RoHS standard.

V_{DSS}	30	V
I_D	20	A
P_D	32.5	W
$R_{DS(ON)TYPE}$	16	mΩ

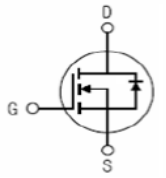
TO-252



Features

- $R_{DS(ON)}$ <20mΩ @ 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	30	V
I_D	Continuous Drain Current	20	A
I_{DM}	Pulsed Drain Current	80	A
V_{GS}	Gate-to-Source Voltage	±12	V
P_D	Power Dissipation	32.5	W
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	30	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=30V, V_{GS}= 0V,T_a=25℃	--	--	1.0	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=+12V	--	--	0.1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-12V	--	--	-0.1	μA

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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=6A	--	--	20	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	0.7	--	1.5	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}=15V,I_D=2A	--	3	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=20V f=1.0MHz	--	247	--	pF
C_{oss}	Output Capacitance		--	34	--	
C_{rss}	Reverse Transfer Capacitance		--	19.5	--	

Resistive Switching Characteristics[a4]						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=15V,I_D=3A V_{GS}=10V,R_G=1Ω	--	6	--	ns
t_r	Rise Time		--	15	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	15	--	
t_f	Fall Time		--	10	--	
Q_g	Total Gate Charge	V_{DD}=15V,I_D=3A V_{GS}=4.5V	--	6	--	nC
Q_{gs}	Gate to Source Charge		--	1	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	1.3	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current [a2](Body Diode)		--	--	20	A
V_{SD}	Diode Forward Voltage[a3]	I_S=20A,V_{GS}=0V	--	--	1.5	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

Characteristics Curves

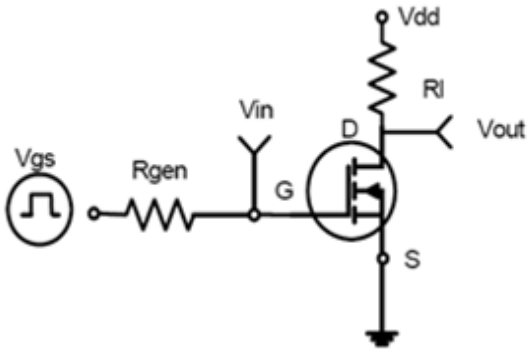

Figure 1:Switching Test Circuit

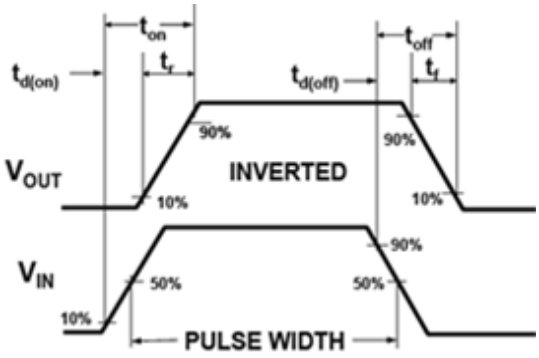

Figure 2:Switching Waveforms

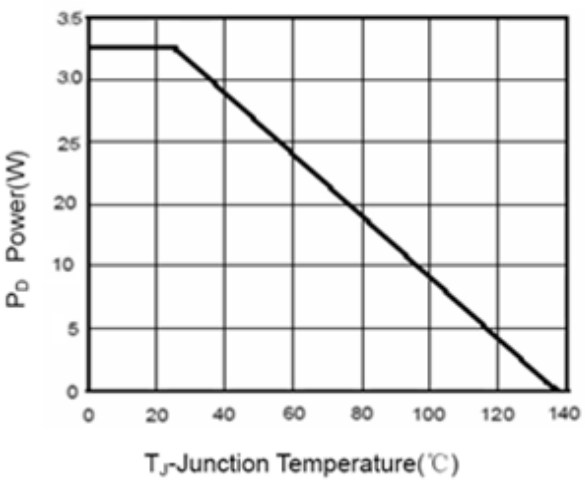

Figure 3 Power Dissipation

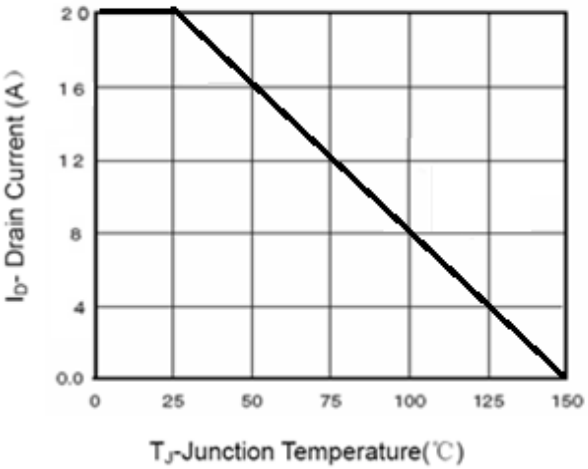

Figure 4 Drain Current

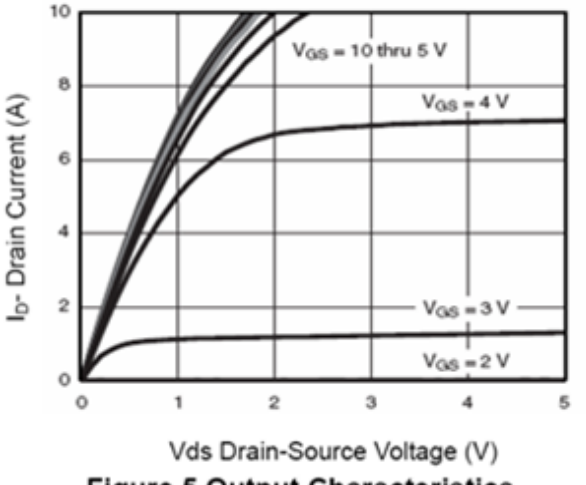

Figure 5 Output Characteristics

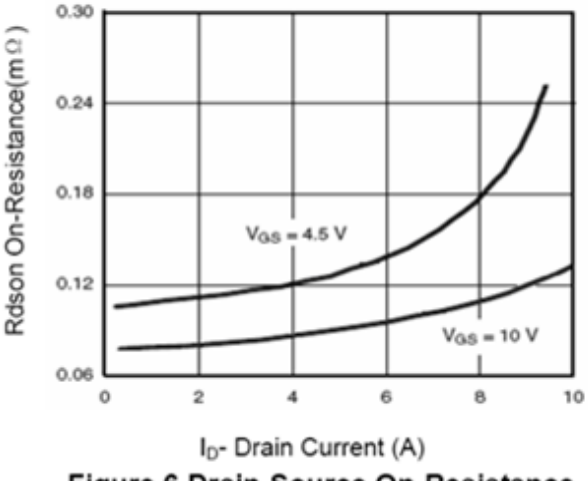

Figure 6 Drain-Source On-Resistance

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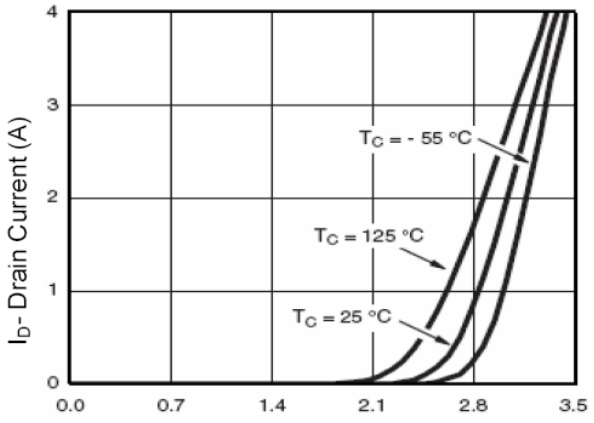

Figure 7 Transfer Characteristics

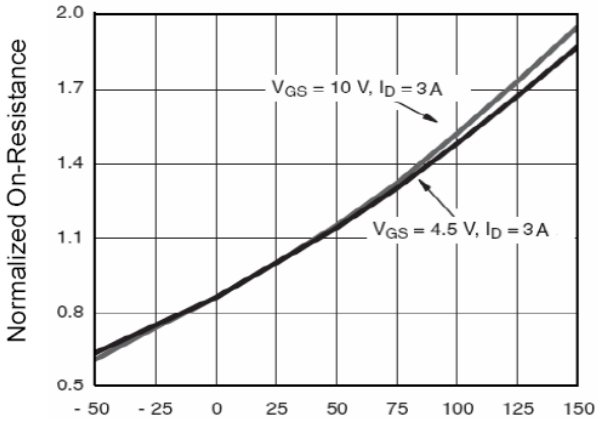

Figure 8 Drain-Source On-Resistance

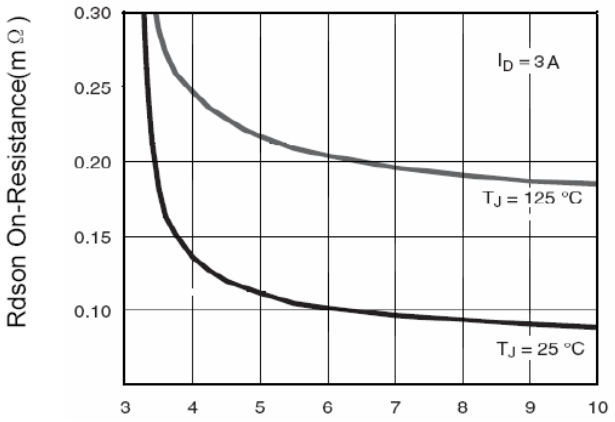

Figure 9 Rdson vs Vgs

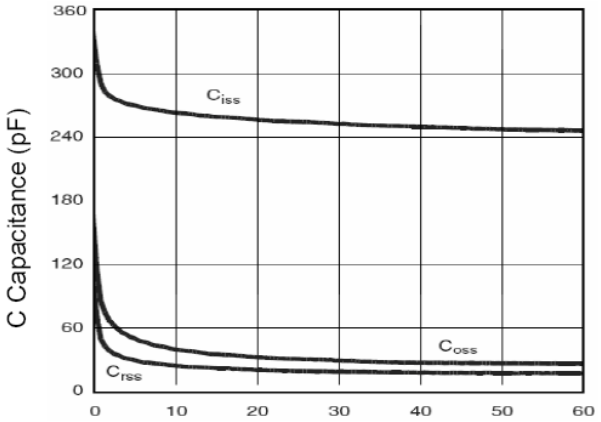

Figure 10 Capacitance vs Vds

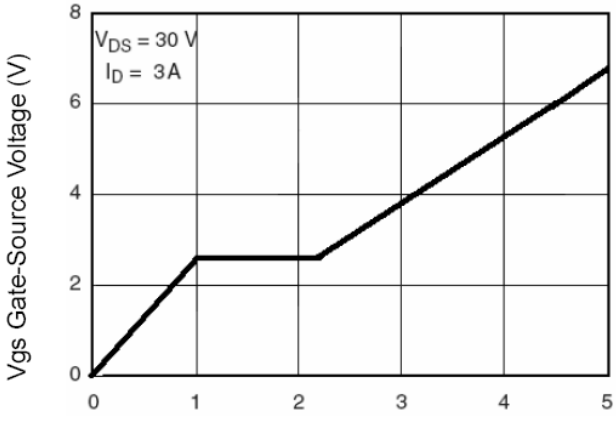

Figure 11 Gate Charge

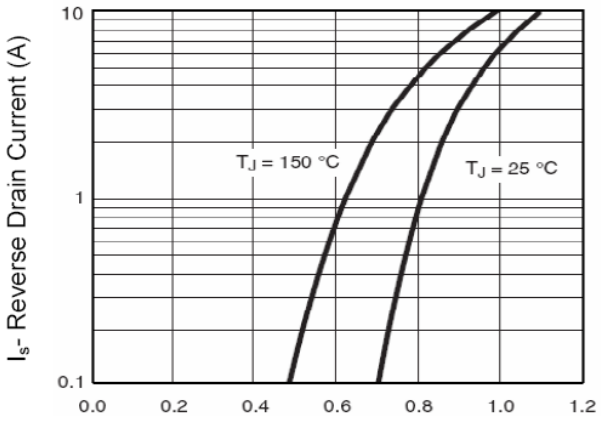

Figure 12 Source- Drain Diode Forward

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