GL8N04

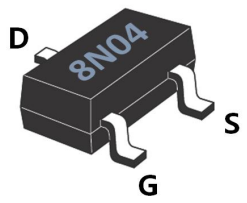
GL Silicon N Channel Power MOSFET

General Description

The GL8N04 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 SOT-23, which accords with the RoHS standard.

V_{DSS}	40	V
I_D	8	A
P_D	2	W
$R_{DS(ON)type}$	18	mΩ

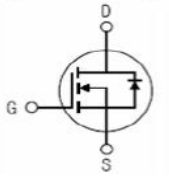
SOT-23



Features

- $R_{DS(ON)}$ <22mΩ @ V_{GS}=10V (Typ18mΩ)
- 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	N-Channel	Units
V_{DSS}	Drain-to-Source Voltage	40	V
I_D	Continuous Drain Current	8	A
I_{DM}	Pulsed Drain Current	40	A
V_{GS}	Gate-to-Source Voltage	±20	V
P_D	Power Dissipation	2	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	–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
$R_{\theta JA}$	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	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}=+10V	--	--	0.1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-10V	--	--	-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=8A	--	18	22	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.0	1.5	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}=15V,I_D=8A	3	--	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=20V f=1.0MHz	--	415	--	pF
C_{oss}	Output Capacitance		--	115	--	
C_{rss}	Reverse Transfer Capacitance		--	11	--	

Resistive Switching Characteristics[a4]						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=15V,R_L=2.5Ω V_{GS}=10V,R_G=3Ω	--	4.5	--	ns
t_r	Rise Time		--	3.0	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	14.5	--	
t_f	Fall Time		--	3.0	--	
Q_g	Total Gate Charge	V_{DD}=20V,I_D=8A V_{GS}=10V	--	12	--	nC
Q_{gs}	Gate to Source Charge		--	3.2	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	3.1	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current [a2](Body Diode)		--	--	8	A
V_{SD}	Diode Forward Voltage[a3]	I_S=8A,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
[a5]: EAS condition: Tj=25℃,V_{DD}=15V,V_{GS}=10V,L=1.0mH,Rg=25Ω

Characteristics Curves

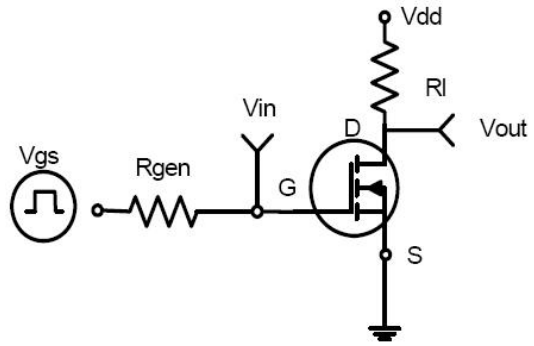


Figure 1:Switching Test Circuit

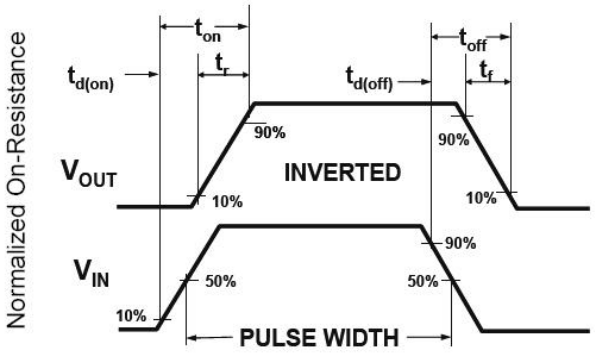


Figure 2:Switching Waveforms

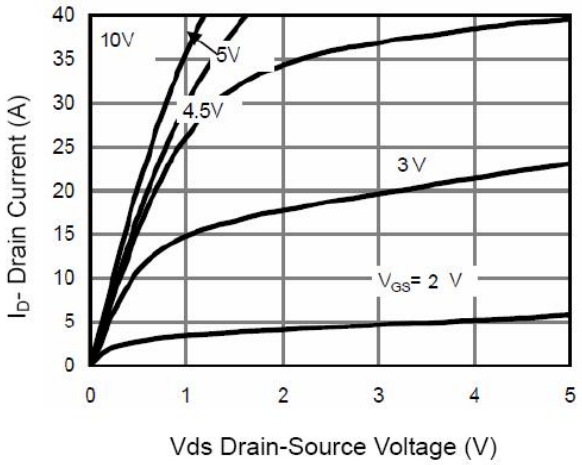


Figure 3 Output Characteristics

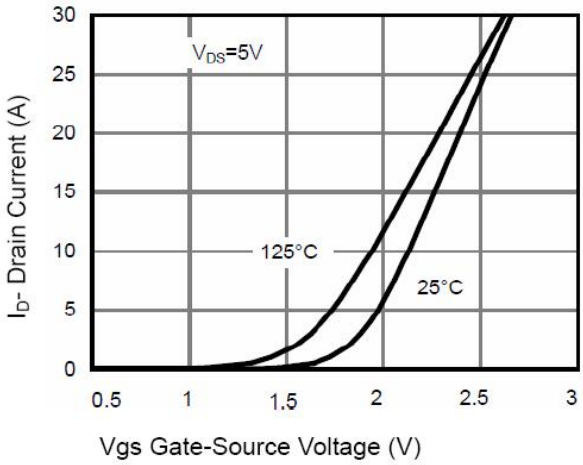


Figure 4 Transfer Characteristics

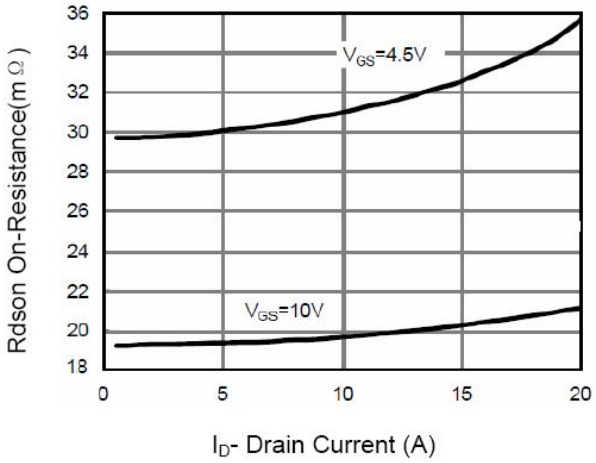


Figure 5 Drain-Source On-Resistance

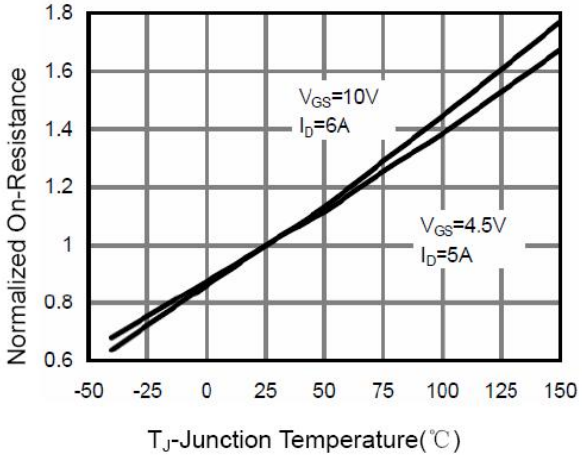


Figure 6 Drain-Source On-Resistance

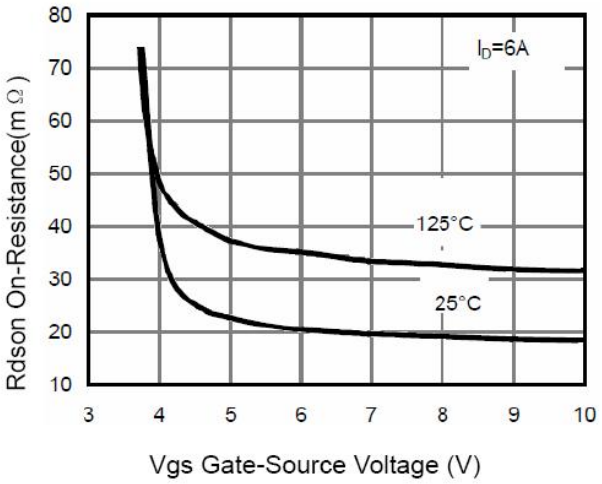


Figure7 Rdson vs Vgs

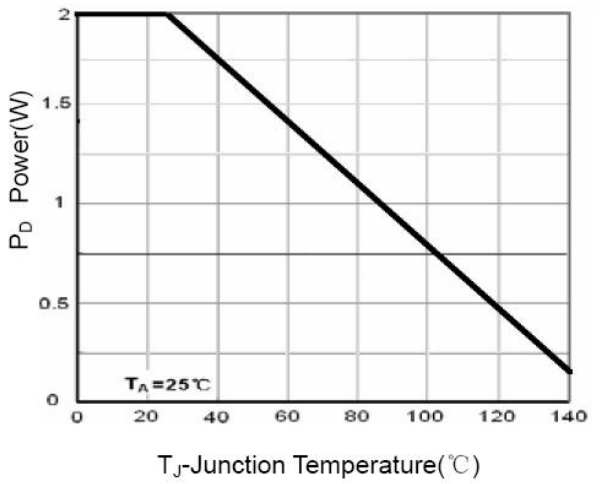


Figure 8 Power Dissipation

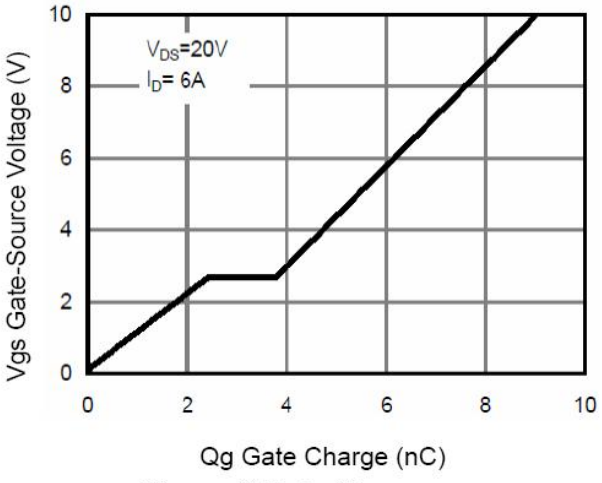


Figure 9 Gate Charge

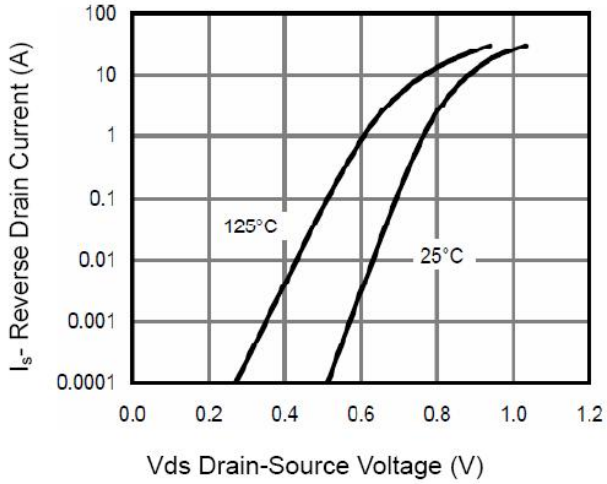


Figure 10 Source- Drain Diode Forward

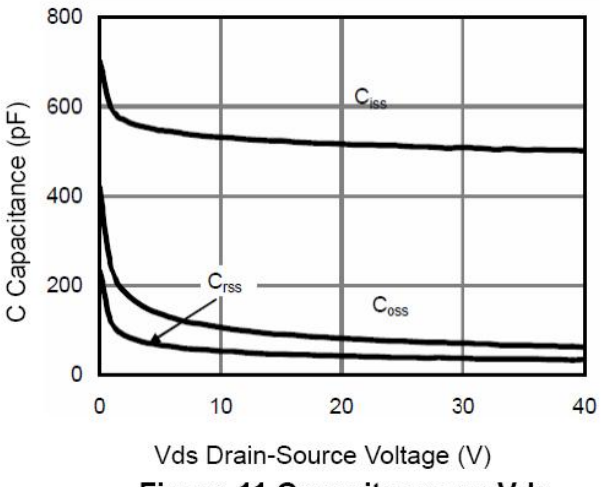


Figure 11 Capacitance vs Vds

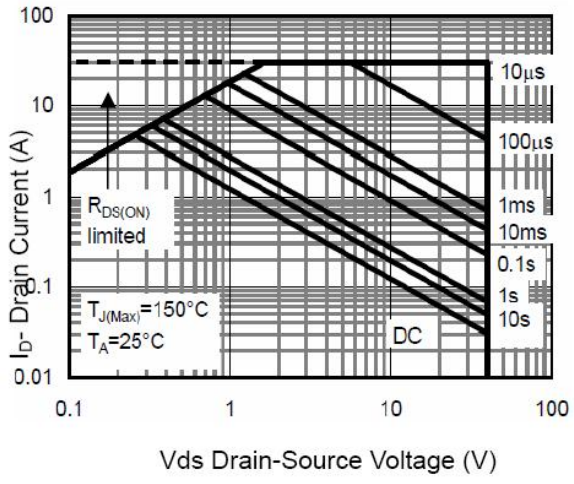


Figure 12 Safe Operation Area

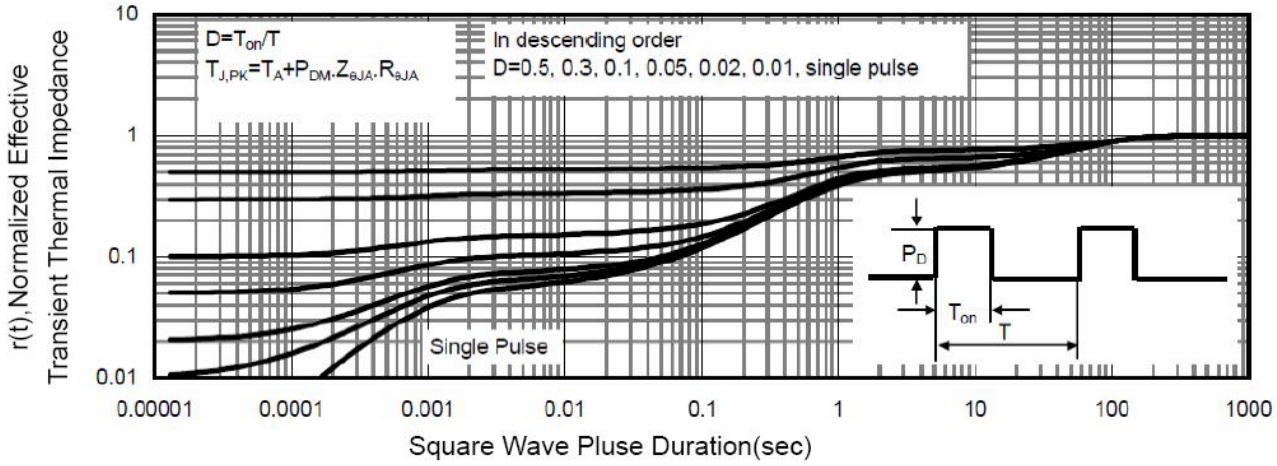


Figure 13 Normalized Maximum Transient Thermal Impedance