GL4N04-D6

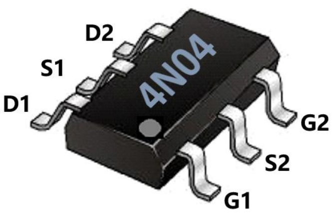
GL Silicon N-Channel Power MOSFET

V_{DSS}	40	V
I_D	4	A
P_D	1.15	W
$R_{DS(ON)TYPE}$	30	mΩ

General Description

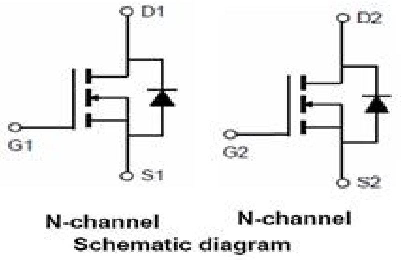
The GL4N04A-D6 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications. The package form is SOT-23-6, which accords with the RoHS standard.

SOT-23-6



Features

- Fast Switching
- Low Gate Charge and Rdson
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test



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	4	A
	Continuous Drain Current T_C = 100 °C	3.2	A
I_{DM}	Pulsed Drain Current	16	A
V_{GS}	Gate-to-Source Voltage	±20	V
dv/dt [a3]	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	1.15	W
T_J，T_{stg}	Operating Junction and Storage Temperature Range	175，−55 to 175	℃
T_L	Maximum Temperature for Soldering	300	℃

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	150	℃/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
$\Delta BV_{DSS}/\Delta T_J$	Bvdss Temperature Coefficient	I_D=250uA,Reference25℃	--	0.1	--	V/℃
I_{DSS}	Drain to Source Leakage Current	V_{DS}=40V,V_{GS}=0V,T_a=25℃	--	--	1	μA
		V_{DS}=48V,V_{GS}=0V,T_a=125℃	--	--	250	
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=+20V	--	--	1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-20V	--	--	-1	μA

ON Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	V_{GS}=10V,I_D=2A	--	30	40	mΩ
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	V_{GS}=4.5V,I_D=1.8A	--	36	50	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

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	V_{DS}=10V,I_D=2A	4	--	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=20V f=1.0MHz	--	500	--	pF
C_{oss}	Output Capacitance		--	40	--	
C_{rss}	Reverse Transfer Capacitance		--	25	--	

Resistive Switching Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D=2A,V_{DD}=30V V_{GS}=10V,R_G=3.0Ω	--	3	--	ns
t_r	Rise Time		--	5.1	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	18	--	
t_f	Fall Time		--	4.2	--	
Q_g	Total Gate Charge	I_D=2A,V_{DD}=30V V_{GS}=10V	--	3.8	--	nC
Q_{gs}	Gate to Source Charge		--	1.3	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	1.2	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	2	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	8	A
V_{SD}	Diode Forward Voltage	I_S=2A,V_{GS}=0V	--	--	1.5	V
t_{rr}	Reverse Recovery Time	I_S=2A,T_j=25°C dI_F/dt=100A/us,V_{GS}=0V	--	11	--	ns
Q_{rr}	Reverse Recovery Charge		--	20	--	nC
Pulse width tp≤380μs,δ≤2%						

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

[a2]: EAS condition : Tj=25℃ ,V_{DD}=30V,VG=10V,L=0.5mH,Rg=25Ω

[a3]: I_{SD} =2A,di/dt ≤100A/us,V_{DD}≤BV_{DS}, Start T_J=25℃

Test Circuit and Waveform

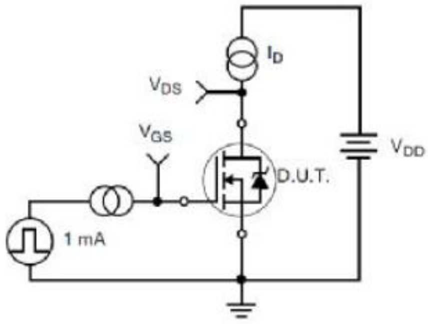


Figure 17. Gate Charge Test Circuit

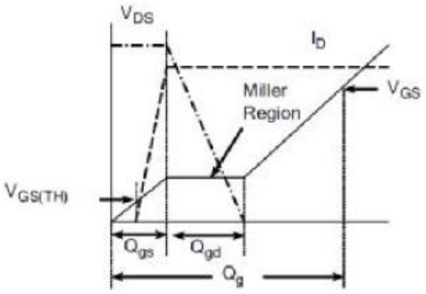


Figure 18. Gate Charge Waveform

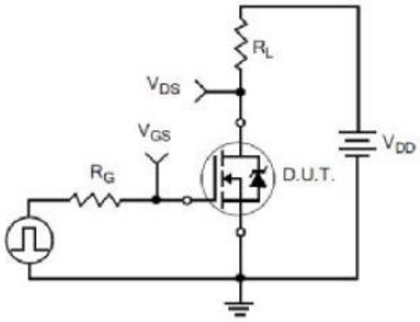


Figure 19. Resistive Switching Test Circuit

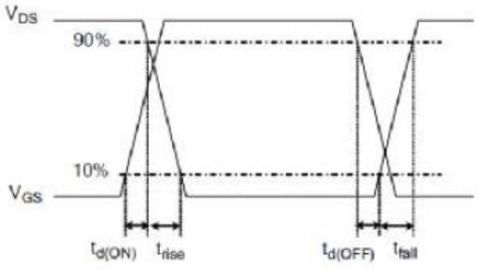


Figure 20. Resistive Switching Waveforms