®

GL20N10A4

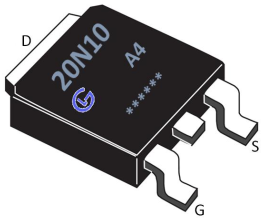
GL Silicon N-Channel Power MOSFET

General Description

The GL20N10A4 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}	100	V
I_D	20	A
P_D	55	W
$R_{DS(ON)type}$	40	mΩ

TO-252



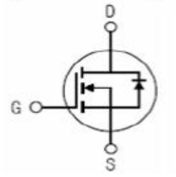
Features

- $R_{DS(ON)}$ <60mΩ @ V_{GS}=10V
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Inner Equivalent Principium Chart



Absolute (Tc= 25℃ unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	100	V
I_D	Continuous Drain Current	20	A
I_{DM}	Pulsed Drain Current	80	A
V_{GS}	Gate-to-Source Voltage	±20	V
P_D	Power Dissipation5	5	W
E_{AS}	Single pulse avalanche energy[a5]	250	mJ
T_J， T_{stg}	Operating Junction and Storage Temperature Range	175，–55 to 175	℃

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	100	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=100V, 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=15A	--	40	60	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}=50V,I_D=10A	--	10	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=25V f=1.0MHz	--	1650	--	pF
C_{oss}	Output Capacitance		--	90	--	
C_{rss}	Reverse Transfer Capacitance		--	60	--	

Resistive Switching Characteristics[a4]						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=50V,I_D=10A V_{GS}=10V,R_G=3.0Ω	--	18	--	ns
t_r	Rise Time		--	6	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	35	--	
t_f	Fall Time		--	7	--	
Q_g	Total Gate Charge	V_{DD}=50V, I_D=10A V_{GS}=10V	--	45	--	nC
Q_{gs}	Gate to Source Charge		--	6	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	8	--	

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

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case[a2]	2.73	℃/W

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

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

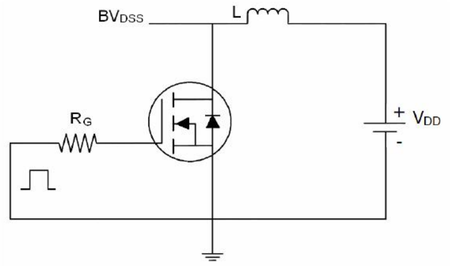
[a3]: Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.

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

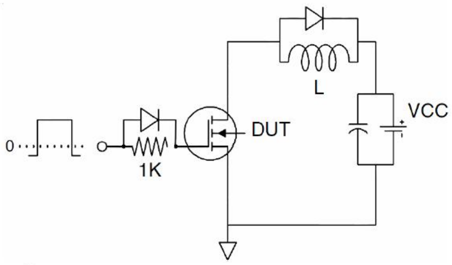
[a5]: EAS condition: Tj=25℃,V_{DD}=40V,V_G=10V,L=0.5mH,Rg=25Ω

Test Circuits

1) EAS test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit