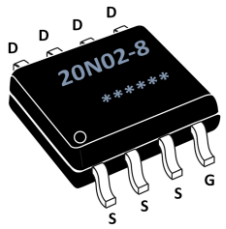
GL Silicon N-Channel Power MOSFET

General Description :

The GL20N02-8 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 SOP-8, which accords with the RoHS standard.

V_{DSS}	20	V
I_D	20	A
P_D	3	W
$R_{DS(ON)type}$	4.0	mΩ

SOP-8



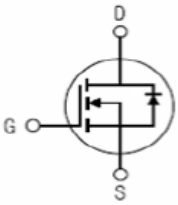
Features :

- $R_{DS(ON)}$ <5.0mΩ @ V_{GS}=10V (Typ4.0mΩ)
- 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	20	V
I_D	Continuous Drain Current	20	A
I_{DM}	Pulsed Drain Current	60	A
V_{GS}	Gate-to-Source Voltage	±12	V
P_D	Power Dissipation	3	W
E_{AS}	Single pulse avalanche energy[a5]	200	mJ
T_J , T_{stg}	Operating Junction and Storage Temperature Range	175 , −55 to 150	℃

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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	20	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=20V, 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

ON Characteristics[a3]						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	V_{GS}=10V,I_D=10A	--	4.0	5.0	mΩ
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	V_{GS}=4.5V,I_D=10A	--	4.4	5.5	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	0.5		1.2	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}=5V,I_D=10A	15	--	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=10V f=1.0MHz	--	2000	--	pF
C_{oss}	Output Capacitance		--	500	--	
C_{rss}	Reverse Transfer Capacitance		--	210	--	

Resistive Switching Characteristics[a4]						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=10V,I_D=25A V_{GS}=5V,R_G=1.8Ω	--	7	--	ns
t_r	Rise Time		--	18	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	30	--	
t_f	Fall Time		--	17	--	
Q_g	Total Gate Charge	V_{DD}=10V, I_D=25A V_{GS}=10V	--	28	--	nC
Q_{gs}	Gate to Source Charge		--	7	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	6.8	--	

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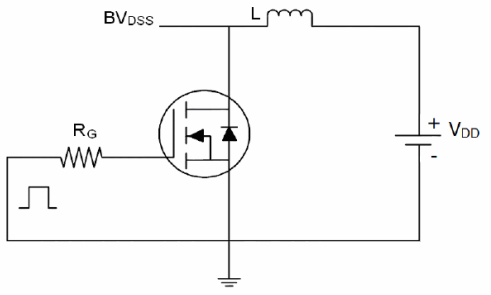
Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current [a2](Body Diode)		--	--	20	A
V_{SD}	Diode Forward Voltage[a3]	I_S=20A,V_{GS}=0V	--	--	1.2	V

Symbol	Parameter	Typ.	Units
$R_{\theta JA}$	Junction-to-Ambient	42	℃/W

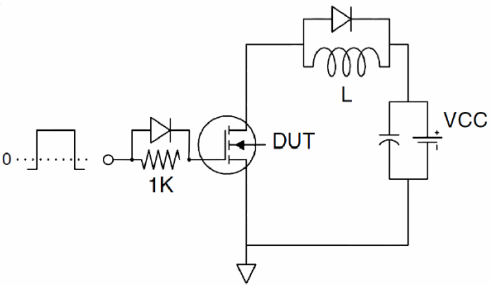
[a1] : Repetitive Rating: Pulse width limited by maximum junction temperature.
[a2] : Surface Mounted on FR4 Board, t≤10sec.
[a3] : Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.
[a4] : Guaranteed by design, not subject to production
[a5] : EAS condition : Tj=25℃,V_{DD}=15V,V_{GS}=10V,L=1.0mH,Rg=25Ω

Test circurt

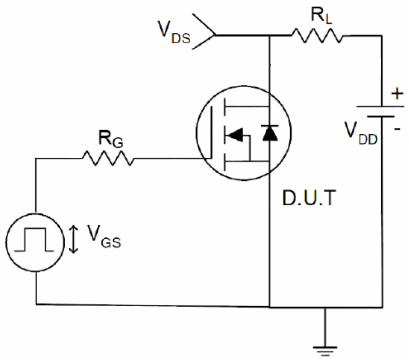
1）E_{AS} test Circuits



2）Gate charge test Circuit:



3）Switch Time Test Circuit：



Characteristics Curve :

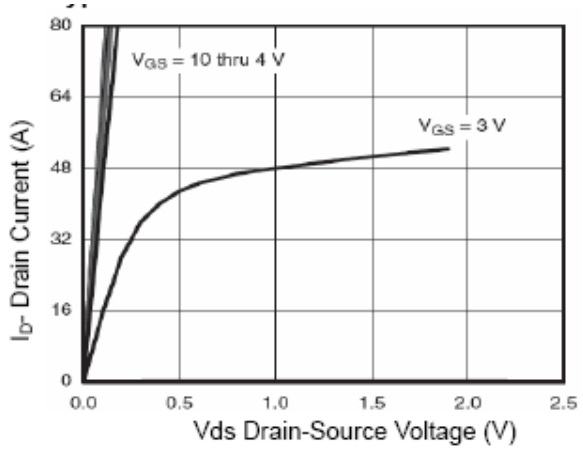


Figure 1 Output Characteristics

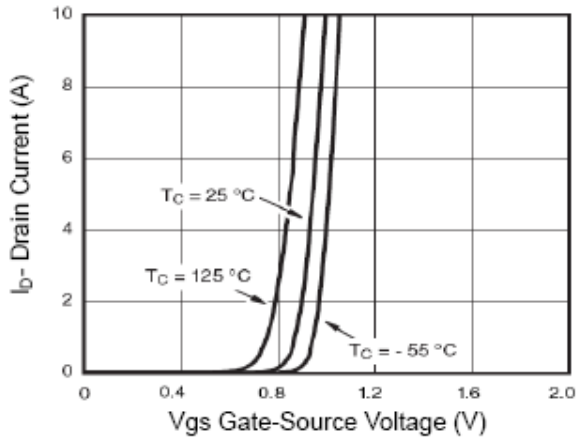


Figure 2 Transfer Characteristics

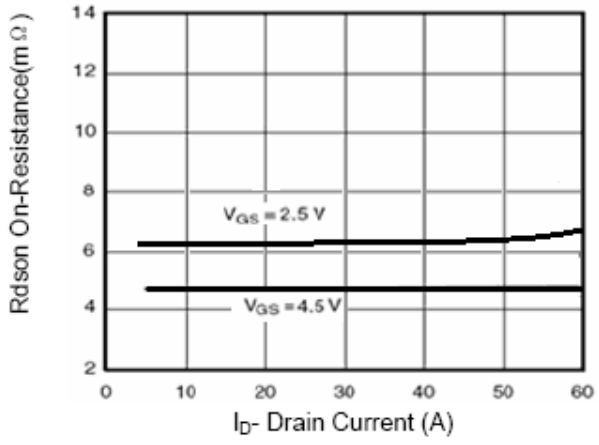


Figure 3 Rdson- Drain Current

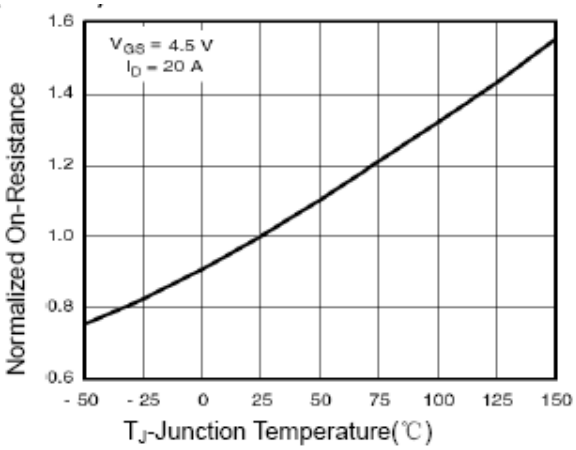


Figure 4 Rdson-JunctionTemperature

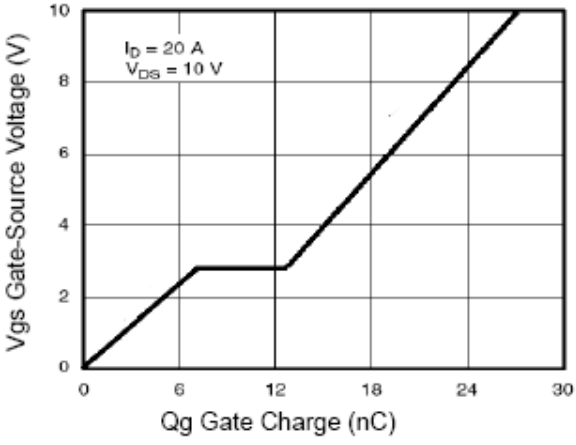


Figure 5 Gate Charge

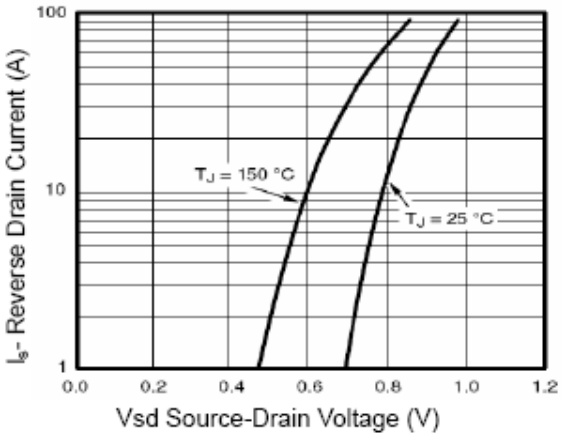


Figure 6 Source- Drain Diode Forward

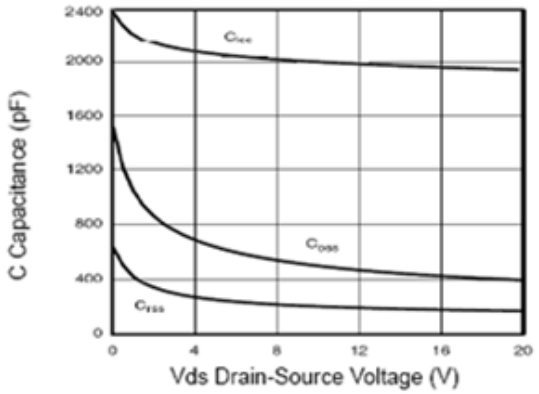


Figure 7 Capacitance vs Vds

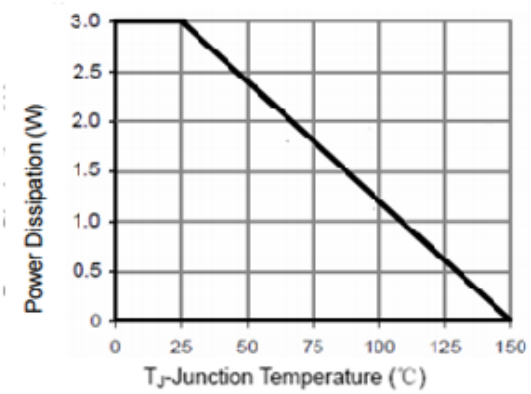


Figure 9 Power De-rating

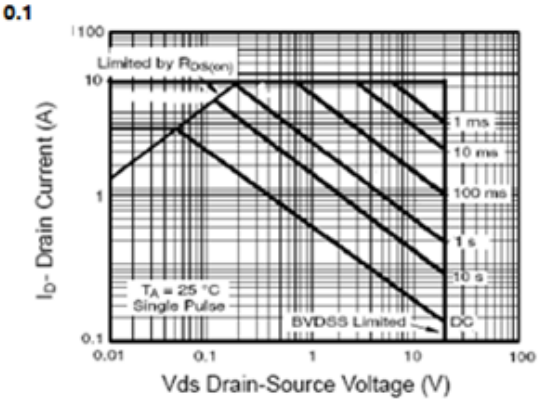


Figure 8 Safe Operation Area

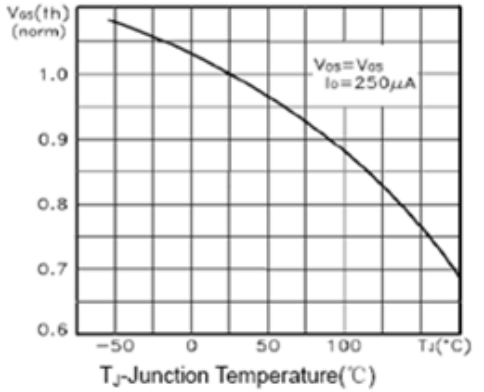


Figure 10 $V_{GS(th)}$ vs Junction Temperature

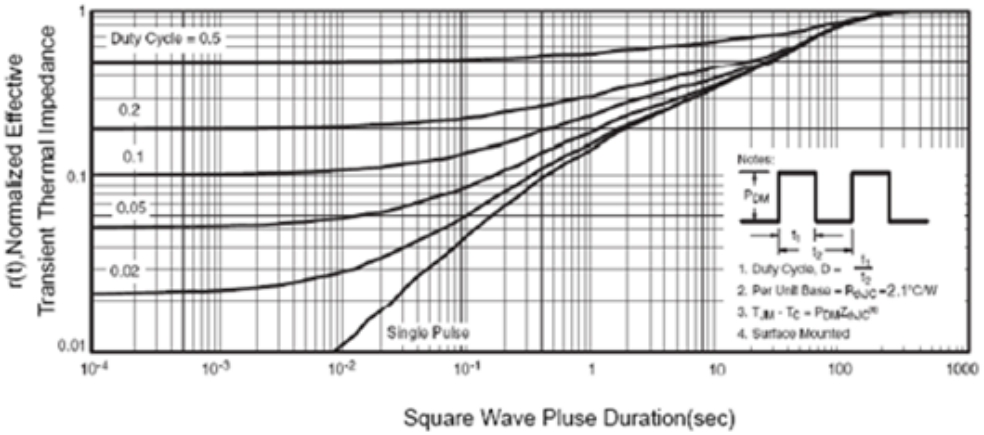


Figure 11 Normalized Maximum Transient Thermal Impedance

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