GL250N04B8

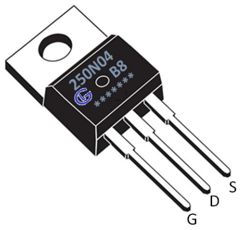
GL Silicon N-Channel Power MOSFET

General Description

The GL250N04B8 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-220AB, which accords with the RoHS standard.

V_{DSS}	40	V
I_D	250	A
P_D	242	W
$R_{DS(ON)type}$	2.1	mΩ

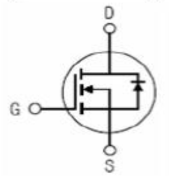
TO-220AB



Features

- $R_{DS(ON)}$ <2.7mΩ @ V_{GS}=10V (Typ2.1mΩ)
- 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	40	V
I_D	Continuous Drain Current	250	A
I_{DM}	Pulsed Drain Current	1000	A
V_{GS}	Gate-to-Source Voltage	±20	V
P_D	Power Dissipation	242	W
E_{AS}	Single pulse avalanche energy	2200	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range	175, –55 to 175	℃

Caution Stresses greater than those in the "Absolute Maximum Ratings" may cause permanent damage to the device

Thermal Characteristics

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case^{a2}	0.62	℃/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}=32V, 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=80A	--	2.1	2.7	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	2.0	--	4.0	V

Pulse width tp≤380μs,δ≤2%

Dynamic Characteristics[a4]

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=20V f=1.0MHz	--	5500	--	pF
C_{oss}	Output Capacitance		--	900	--	
C_{rss}	Reverse Transfer Capacitance		--	290	--	

Resistive Switching Characteristics[a4]

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=20V,I_D=80A V_{GS}=10V,R_G=1.6Ω,R_L=0.5Ω	--	19	--	ns
t_r	Rise Time		--	65	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	49	--	
t_f	Fall Time		--	31	--	
Q_g	Total Gate Charge	V_{DD}=20V, I_D=80A V_{GS}=10V	--	75	--	nC
Q_{gs}	Gate to Source Charge		--	23	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	25	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
t_{rr}	Reverse Recovery Time	I_S=240A,T_j=25℃ dI_F/dt=100A/μs,V_{GS}=0V	--	77	--	ns
Q_{rr}	Reverse Recovery Charge		--	68	--	μC
I_S	Continuous Source Current [a2](Body Diode)		--	--	250	A
V_{SD}	Diode Forward Voltage[a3]	I_S=80A,V_{GS}=0V	--	--	1.2	V

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

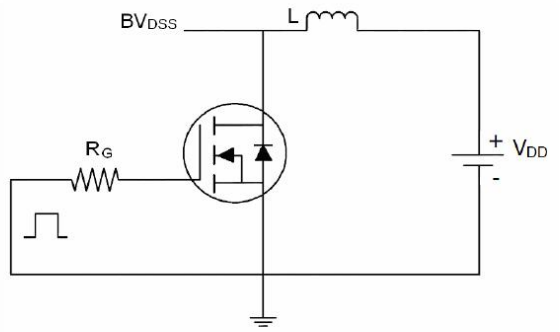
[a2]: Surface Mounted on FR4 Board, t≤10sec.

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

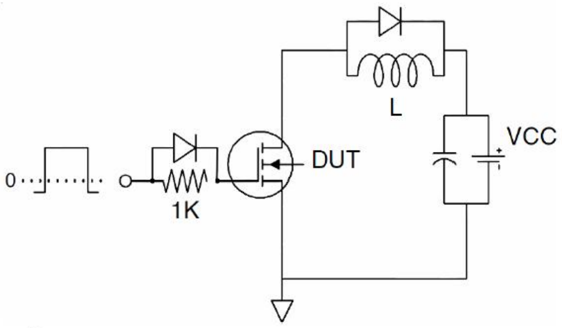
[a4]: Guaranteed by design, not subject to production

Test Circuits

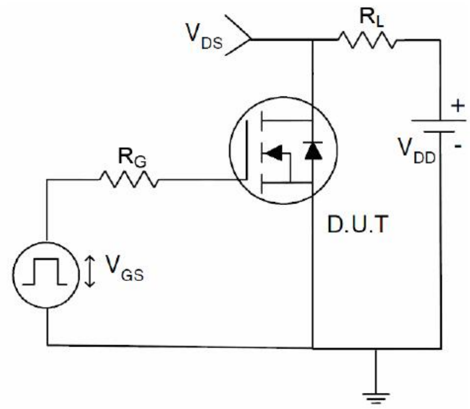
1) EAS test Circuit



2) Gate charge test Circuit

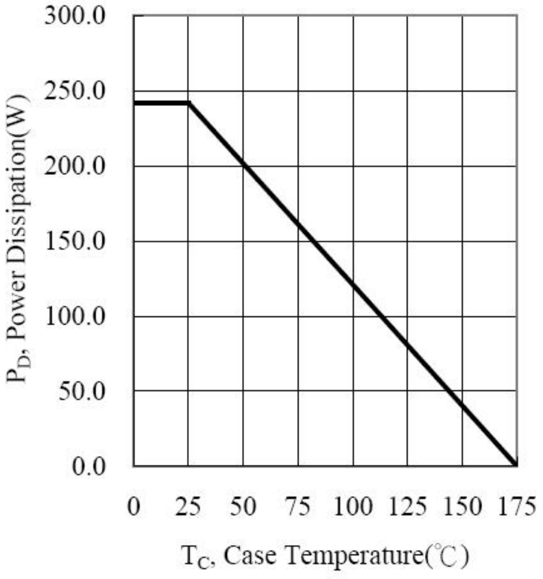


3) Switch Time Test Circuit

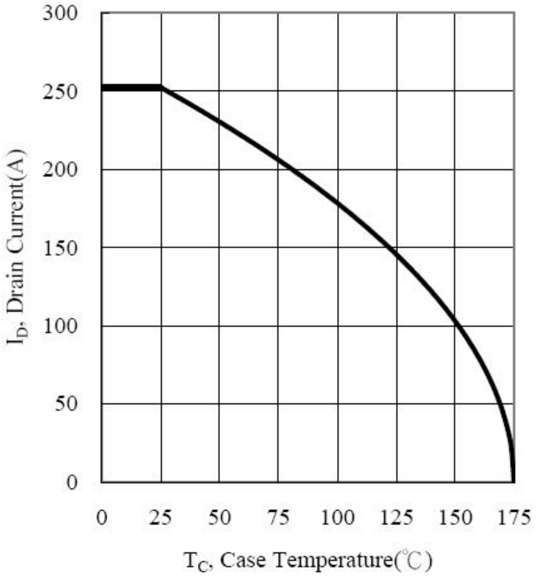


Characteristics Curves

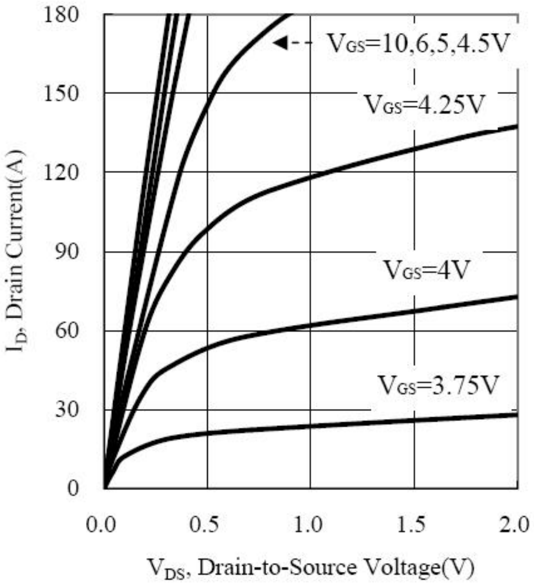
1. Power Dissipation



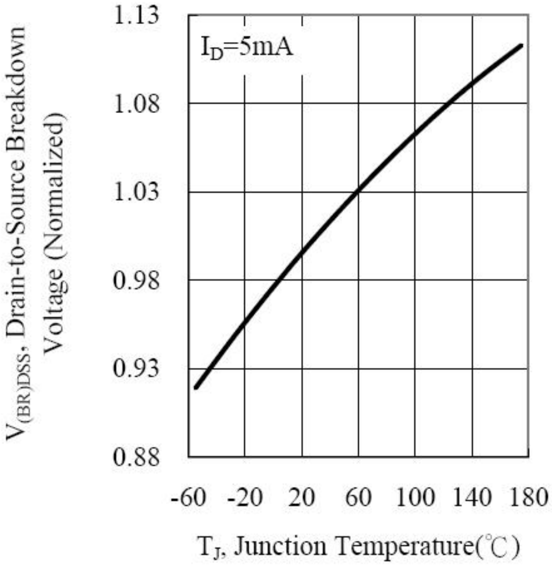
2. Drain Current



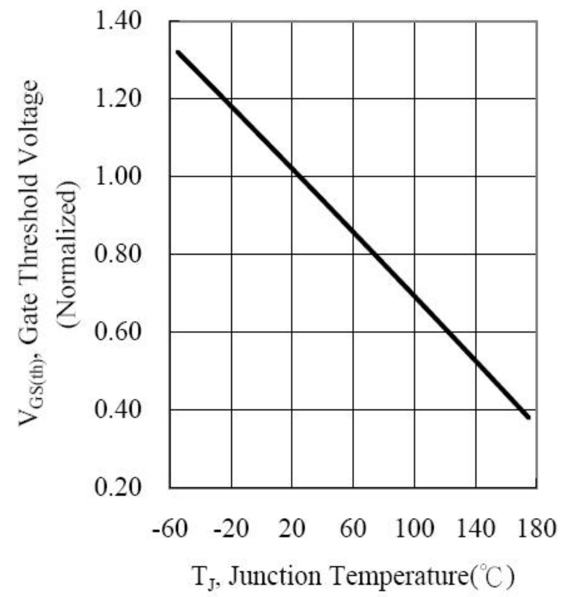
3. Output Characteristics T_C=25°C



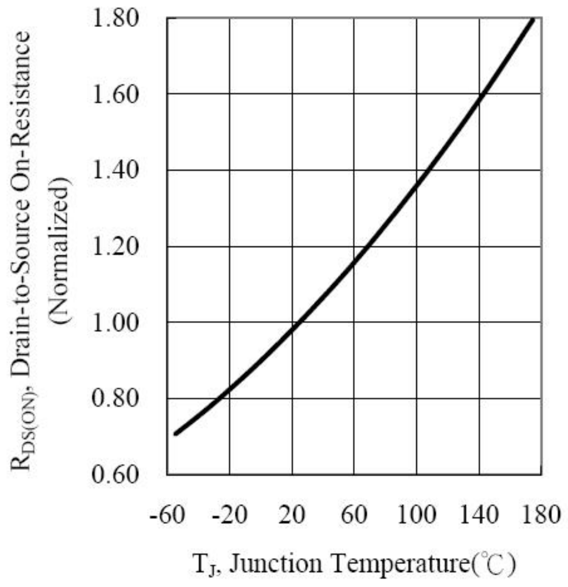
4. Drain-to-Source Breakdown Voltage



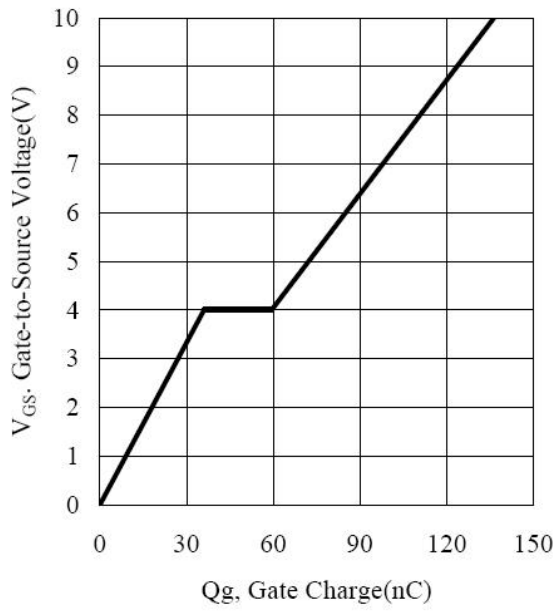
5. Gate Threshold Voltage



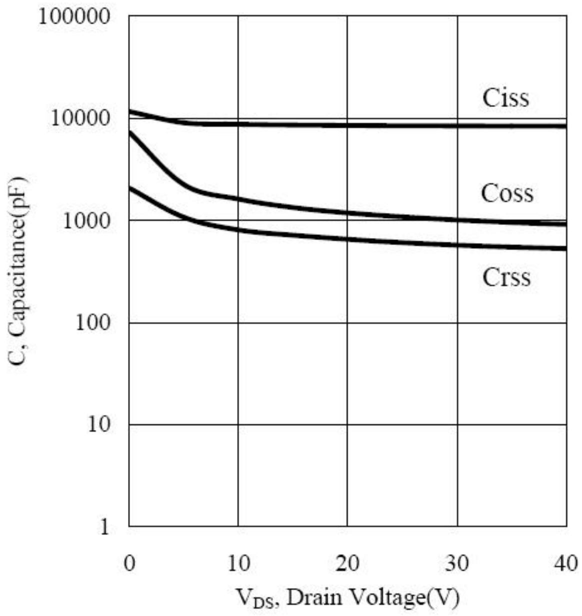
6. Drain-to-Source On-Resistance



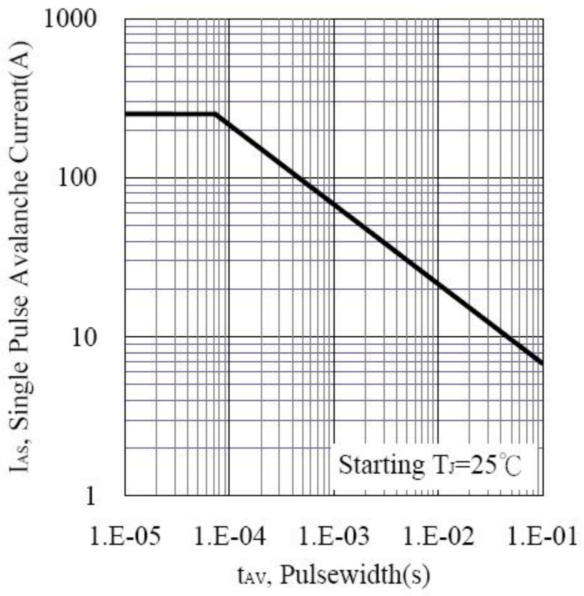
7. Typ. Gate Charge



8. Typ. Capacitance



9. Avalance Characteristics



10. Forward Characteristics of reverse diode