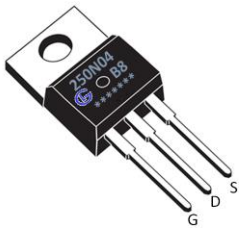
GL Silicon N-Channel Power MOSFET

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

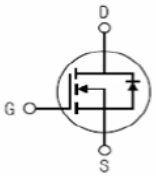
TO-220AB



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

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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	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	--	

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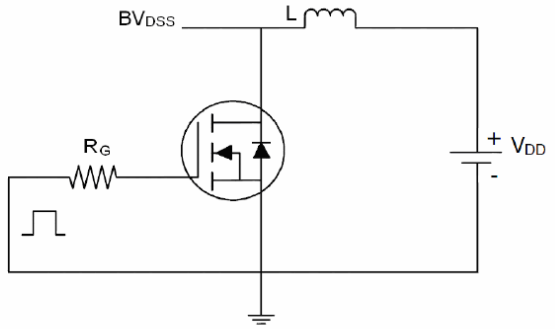
Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
t_{rr}	Reverse Recovery Time	I_S=240A,T_j=25℃	--	77	--	ns
Q_{rr}	Reverse Recovery Charge	dI_F/dt=100A/μs,V_{GS}=0V	--	68	--	μC
I_S	Continuous Source Current [a2](Body Diode)		--	--	250	A
V_{SD}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

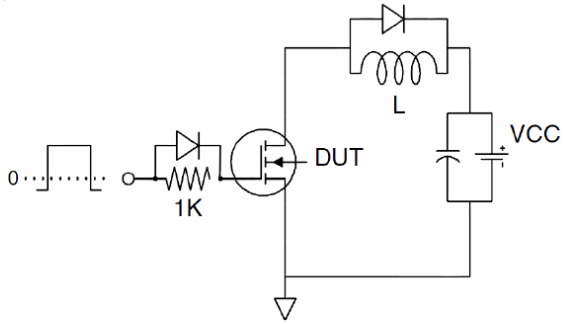
[a1]: Repetitive Rating: Pulse width limited by maximum junction temperature.
[a2]: Surface Mounted on FR4 Board, t≤10sec.
[a3]: Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.
[a4]: Guaranteed by design, not subject to production

Test Circuits

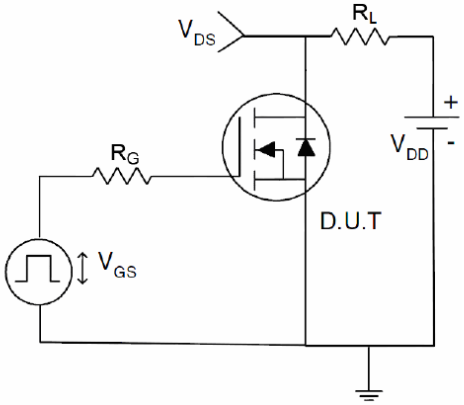
1) EAS test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



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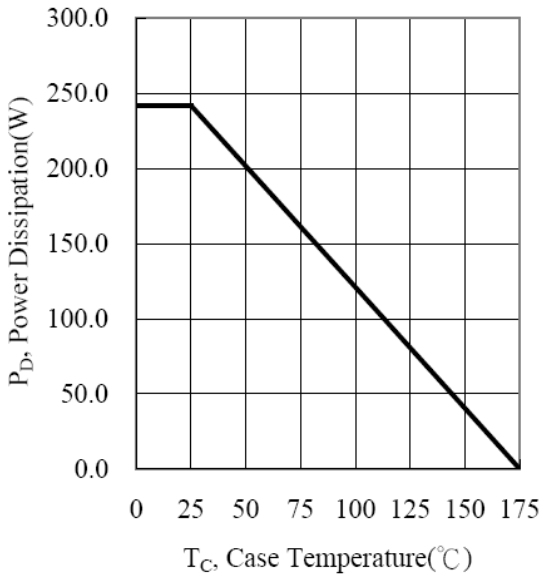
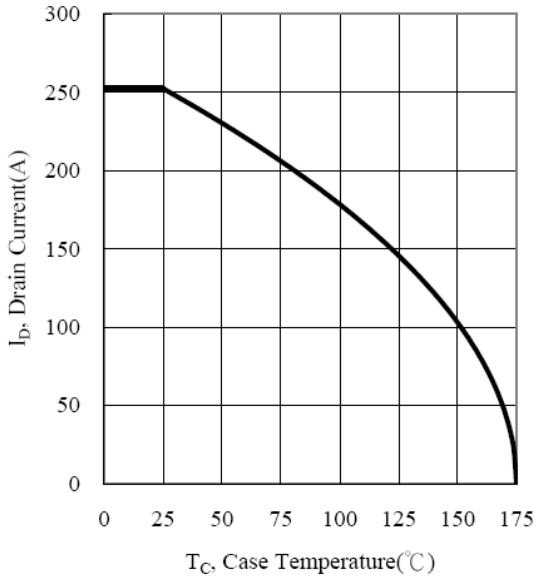
Characteristics Curves

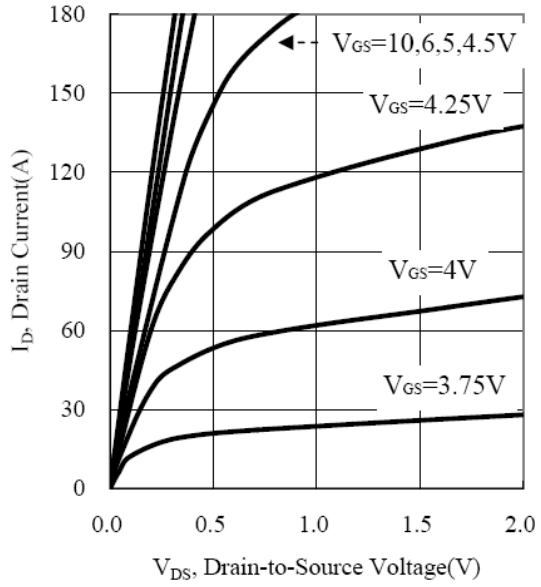
1. Power Dissipation



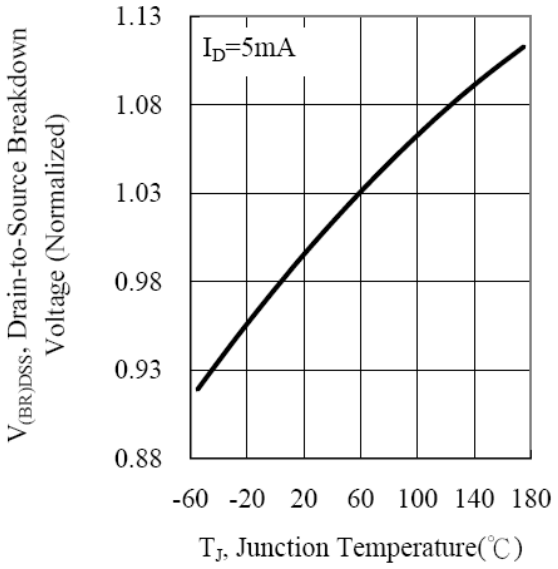
2. Drain Current



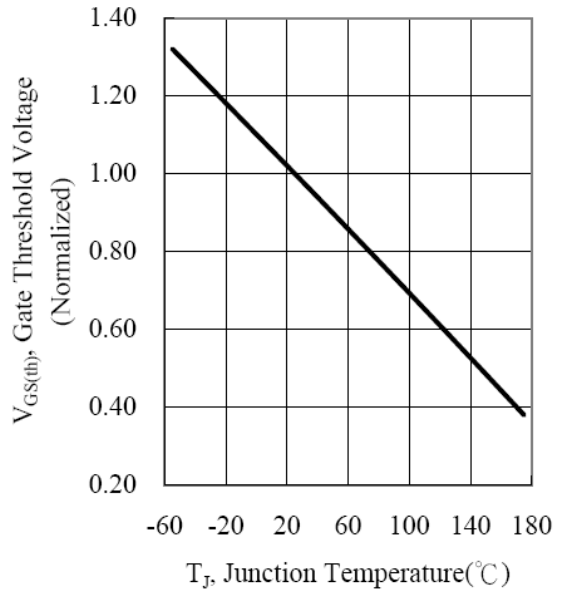
3. Output Characteristics T_C=25°C



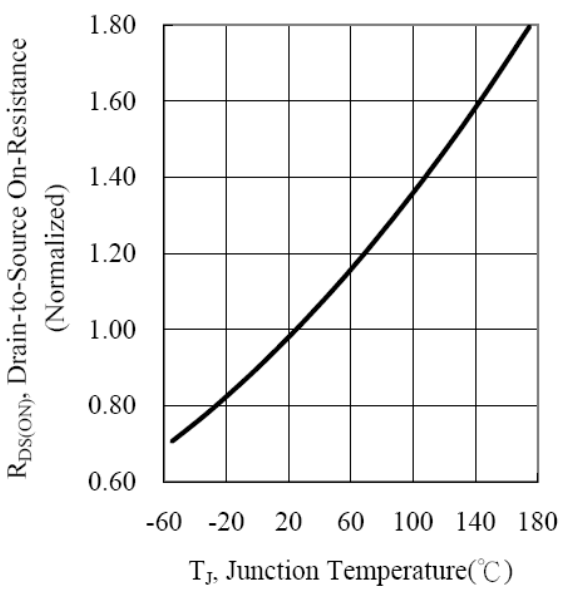
4. Drain-to-Source Breakdown Voltage



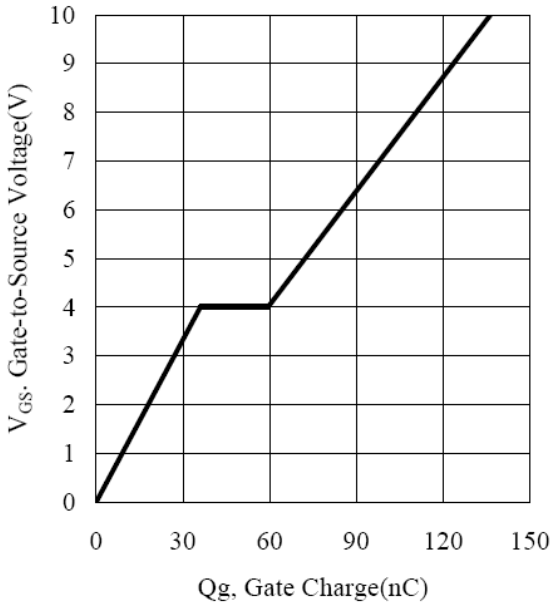
5. Gate Threshold Voltage



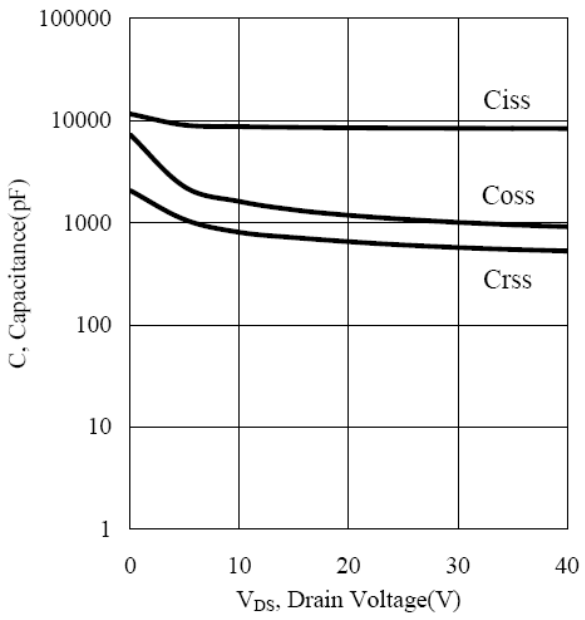
6. Drain-to-Source On-Resistance



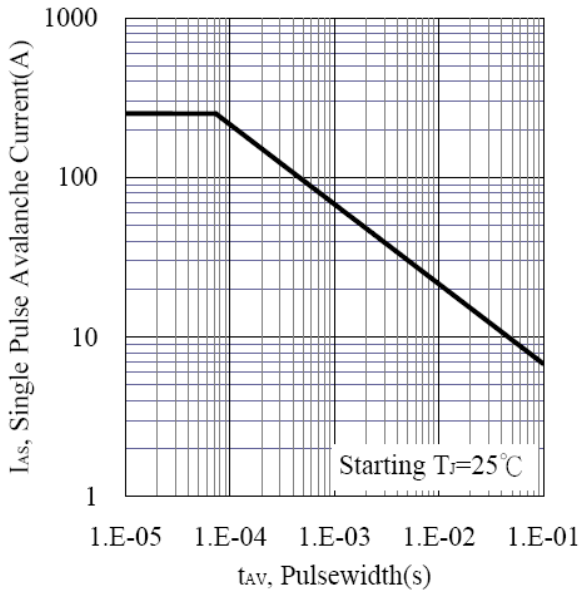
7. Typ. Gate Charge

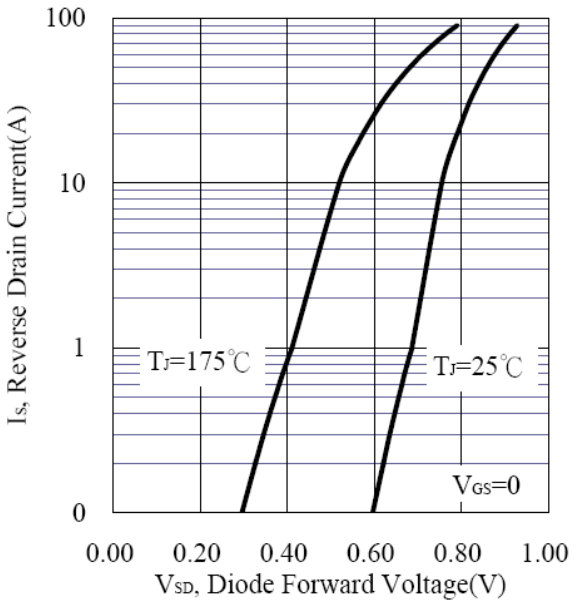


8. Typ. Capacitance



9. Avalance Characteristics	10. Forward Characteristics of reverse diode





Company: Wuxi Guang Lei electronic technology co., LTD

TEL: 13961734102 Mr.yuan