GL Silicon N-Channel Power MOSFET

V_{DSS}	45	V
I_D	330	A
P_D	300	W
$R_{DS(ON)type}$	1.2	mΩ

TOLL-8L

General Description:

The GL330N045ALL uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications. The package form is TOLL-8L, which accords with the RoHS standard.

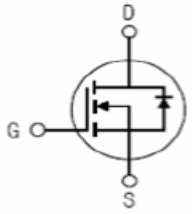
Features:

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

Applications:

- SMPS 2 nd Synchronous Rectifier
- POL application
- MB/VGA Vcore
- BLDC Motor driver

Inner Equivalent Principium Chart



Absolute (Tc= 25℃ unless otherwise specified) :

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	45	V
I_D	Continuous Drain Current (Si limited)	330	A
	Continuous Drain Current T_C = 100 °C (Si limited)	255	A
	Continuous Drain Current T_C = 25 °C (Package limited)	250	A
I_{DM}	Pulsed Drain Current	1000	A
V_{GS}	Gate-to-Source Voltage	±20	V
E_{AS} [a2]	Single Pulse Avalanche Energy	1650	mJ
dv/dt [a3]	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	300	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	175, −55 to 175	℃
T_L	Maximum Temperature for Soldering	300	℃

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	45	--	--	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}=45V,V_{GS}=0V,T_a=25℃	--	--	1	μA
		V_{DS}=36V,V_{GS}=0V,T_a=125℃	--	--	250	
$I_{GSS(F)}$	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						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V,I_D=20A	--	1.2	1.6	mΩ
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=4.5V,I_D=20A	--	1.6	2.0	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						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	V_{DS}=5V,I_D=50A	40	--	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=20V f=1.0MHz	--	5600	--	pF
C_{oss}	Output Capacitance		--	2200	--	
C_{rss}	Reverse Transfer Capacitance		--	68	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D=20A,V_{DD}=20V V_{GS}=10V,R_G=1.6Ω	--	15	--	ns
t_r	Rise Time		--	8	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	60	--	
t_f	Fall Time		--	10	--	
Q_g	Total Gate Charge	I_D=20A,V_{DD}=20V V_{GS}=10V	--	90	--	nC
Q_{gs}	Gate to Source Charge		--	30	--	
Q_{gd}	Gate to Drain（“Miller”）Charge		--	20	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	330	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	1000	A
V_{SD}	Diode Forward Voltage	I_S=50A,V_{GS}=0V	--	--	1.1	V
t_{rr}	Reverse Recovery Time	I_S=50A,T_j = 25°C	--	48	--	ns
Q_{rr}	Reverse Recovery Charge	dI_F/dt=100A/us,V_{GS}=0V	--	38	--	nC
Pulse width tp≤380μs,δ≤2%						

Symbol	Parameter	Typ.	Units
$R_{\theta c}$	Junction-to-Case	0.5	℃/W

[a1]: Repetitive rating; pulse width limited by maximum junction temperature
[a2]: EAS condition : Tj=25℃ ,V_{DD}= 30V,V_G=10V,L=0.5mH,Rg=25Ω
[a3]: I_{SD} =100A,di/dt ≤100A/us,V_{DD}≤BV_{DS}, Start T_J=25℃

Test Circuit and Waveform

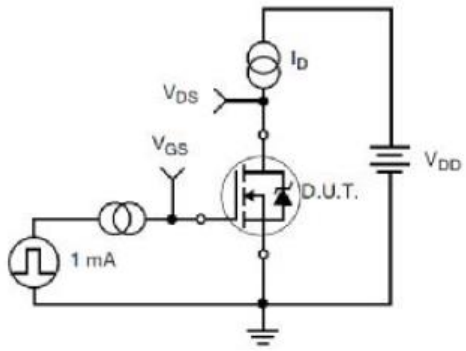


Figure 17. Gate Charge Test Circuit

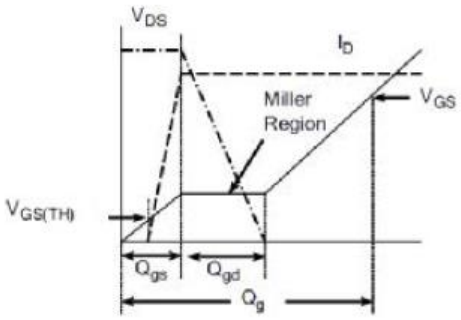


Figure 18. Gate Charge Waveform

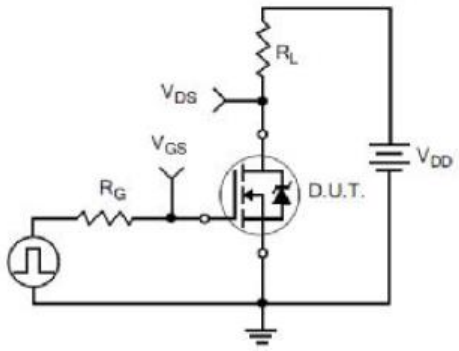


Figure 19. Resistive Switching Test Circuit

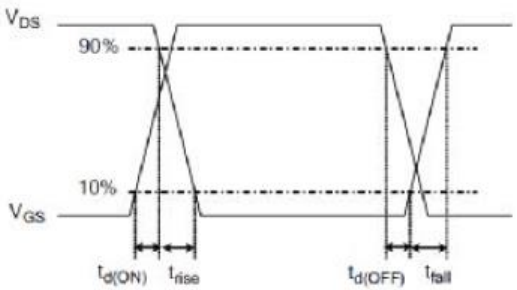


Figure 20. Resistive Switching Waveforms

Characteristics Curve

Figure 1 Output Characteristics

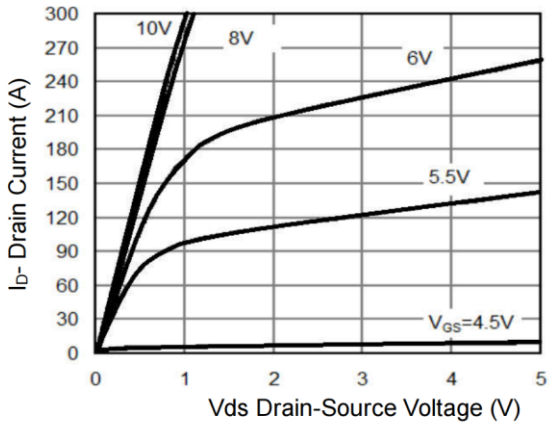


Figure 2 Transfer Characteristics

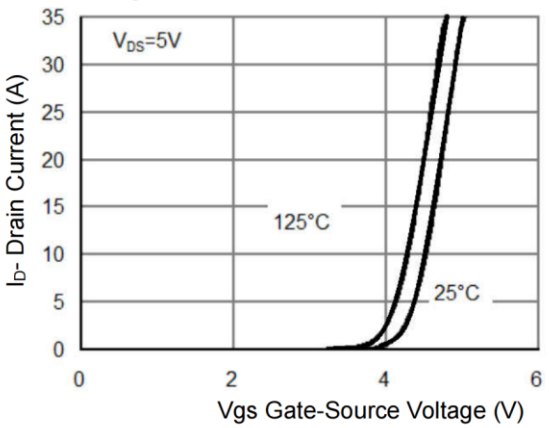


Figure 3 Rdson- Drain Current

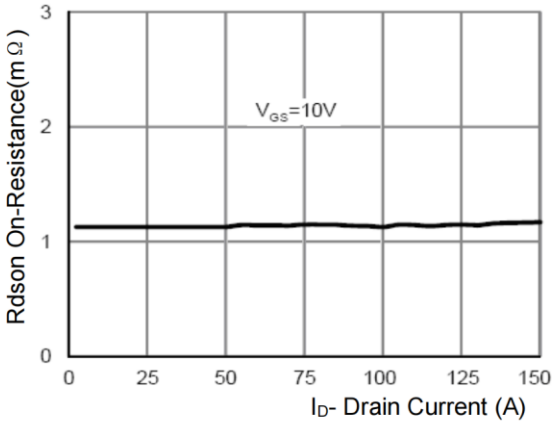


Figure 4 Rdson-Junction Temperature

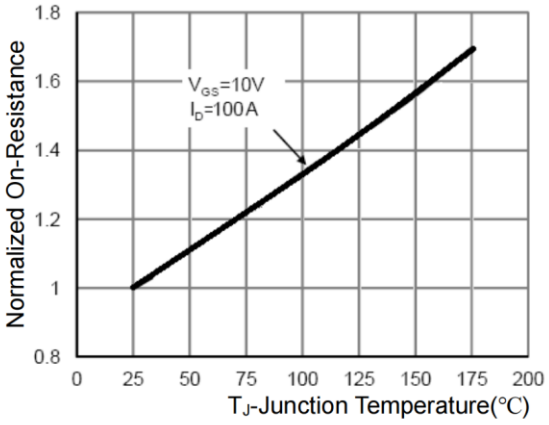


Figure 5 Gate Charge

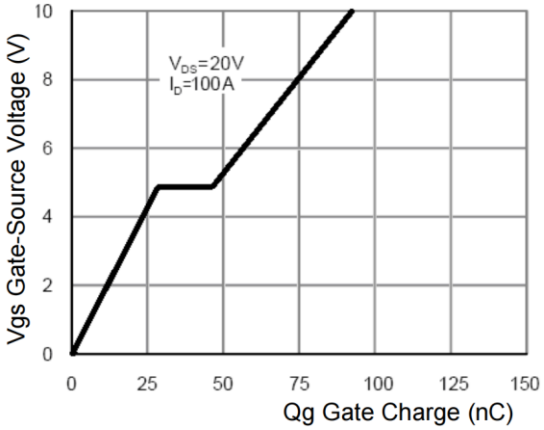


Figure 6 Source- Drain Diode Forward

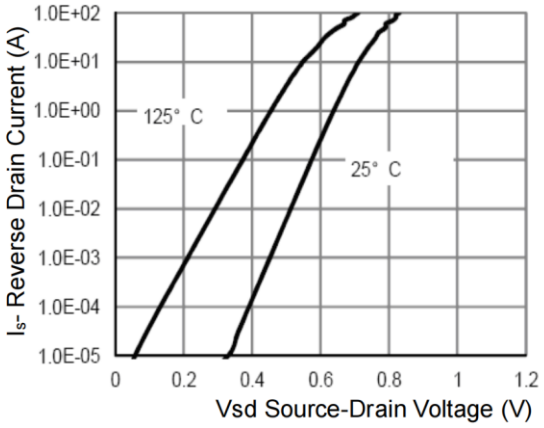


Figure 7 Capacitance vs Vds

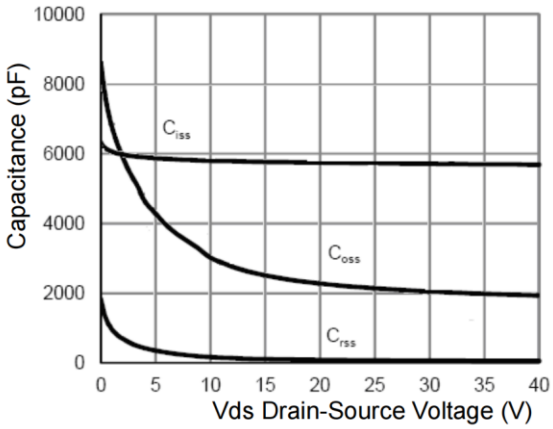


Figure 8 Safe Operation Area

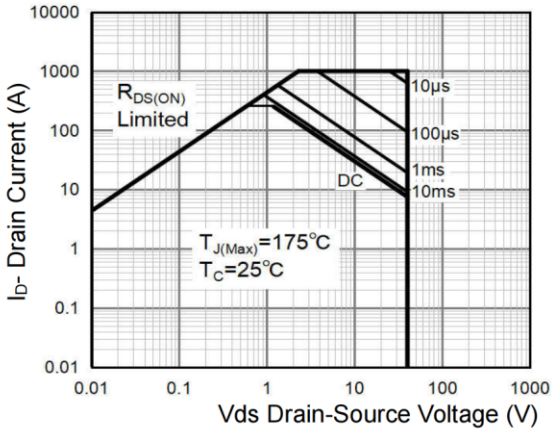


Figure 9 Power De-rating

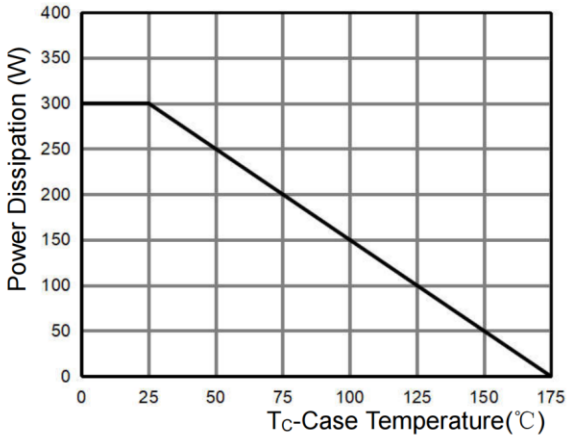


Figure 10 Current De-rating

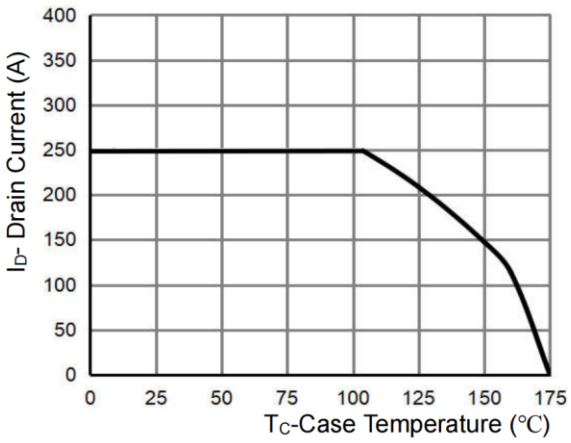


Figure11 BV_{DSS}-Junction Temperature

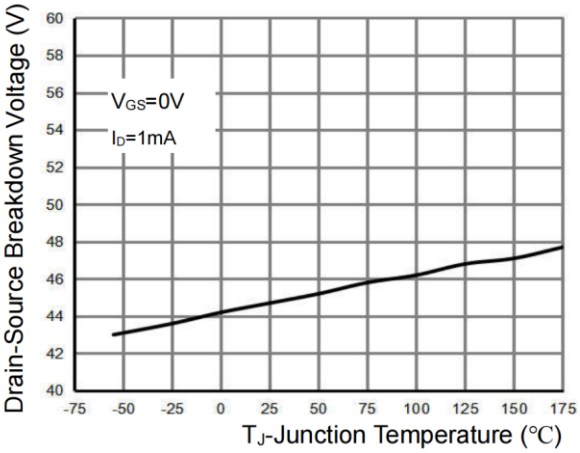


Figure 12 $V_{GS(th)}$-Junction Temperature

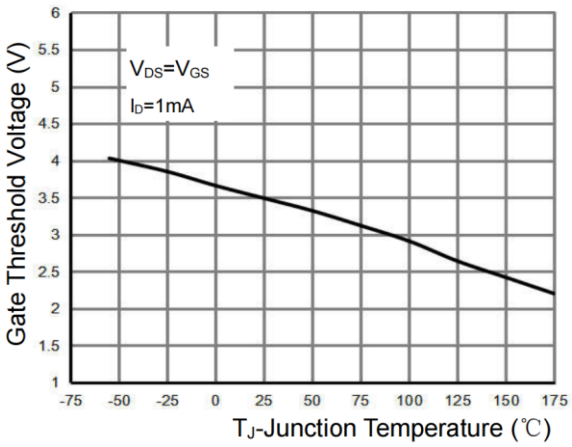


Figure 13 Normalized Maximum Transient Thermal Impedance