GL65N20A8

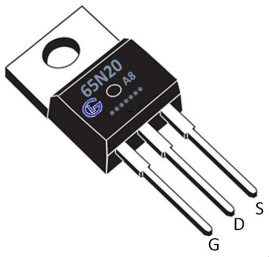
Silicon N-Channel Power MOSFET

General Description:

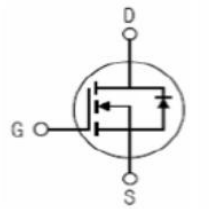
The GL65N20A8 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency. The package form is TO-220AB, which accords with the RoHS standard.

V_{DSS}	200	V
I_D	65	A
$P_D(T_C=25℃)$	330	W
$R_{DS(ON)TYP}$	18	mΩ

TO-220AB



Inner Equivalent Principium Chart



Features:

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

Applications:

- Power switch circuit of POWER
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)

Absolute Maximum Ratings (TA= 25℃ unless otherwise specified):

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	200	V
I_D	Continuous Drain Current	65	A
	Continuous Drain Current T_C=100 °C	44	A
I_{DM}[a1]	Pulsed Drain Current (pulse width limited by T_{JM})	260	A
V_{GS}	Gate-to-Source Voltage	±20	V
E_{AS}	Single Pulse Avalanche Energy	240	mJ
E_{Ar}[a1]	Avalanche Energy, Repetitive	60	mJ
I_{AR}[a1]	Avalanche Current	40	A
dv/dt[a2]	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	330	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, −55 to 150	℃
T_L	Maximum Temperature for Soldering	300	℃

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

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	200	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=200V, V_{GS}=0V,T_a=25℃	--	--	1.0	μA
		V_{DS}=200V, V_{GS}=0V,T_a=125℃	--	--	100	
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=+20V	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-20V	--	--	-100	nA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V, I_D=33A	--	18	22	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	3.0	--	5.0	V
g_{fs}	Forward Trans conductance	V_{DS}=25V, I_D=10A	5			S
Pulse width<380μs; duty cycle<2%.						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS}=0V V_{DS}=25V f=1.0MHz	--	7500	--	pF
C_{oss}	Output Capacitance		--	500	--	
C_{rss}	Reverse Transfer Capacitance		--	210	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D=40A, V_{DS}=50V V_{GS}=10V, R_g=2.5Ω	--	45	--	ns
t_r	Rise Time		--	70	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	110	--	
t_f	Fall Time		--	90	--	
Q_g	Total Gate Charge	I_D=40A, V_{DD}=100V V_{GS}=10V	--	85	--	nC
Q_{gs}	Gate to Source Charge		--	15	--	
Q_{gd}	Gate to Drain (“Miller”) Charge		--	25	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_{SD}	Continuous Source Current (Body Diode)		--	--	65	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	260	A
V_{SD}	Diode Forward Voltage	I_S=40A, V_{GS}=0V	--	--	1.5	V
t_{rr}	Reverse Recovery Time	I_S=30A,T_j=25℃, V_{DD}=50V	--	110	--	ns
Q_{rr}	Reverse Recovery Charge	dI_F/dt=100A/μs, V_{GS}=0V	--	0.55	--	uC

Thermal Characteristics

Symbol	Parameter	Rating	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.38	℃/ W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	℃/ W

a1: TJ = 25°C, L = 0.3mH, R_G = 25Ω, V_{DD}=50V, V_{GS}=10V

a2: I_{SD}=40A,di/dt≤100A/us, V_{DD}≤BV_{DS}, Start T_J=25℃

Test Circuits and Waveforms

Figure A: Gate Charge Test Circuit and Waveform

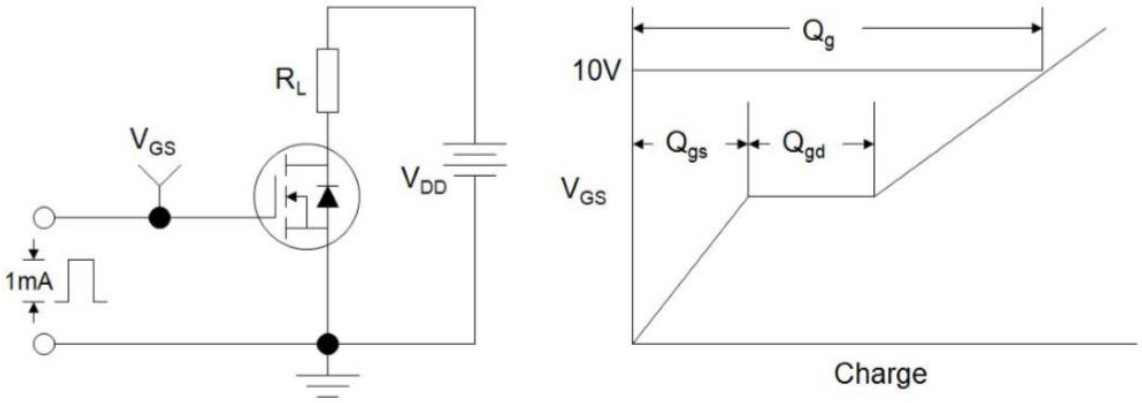


Figure B: Resistive Switching Test Circuit and Waveform

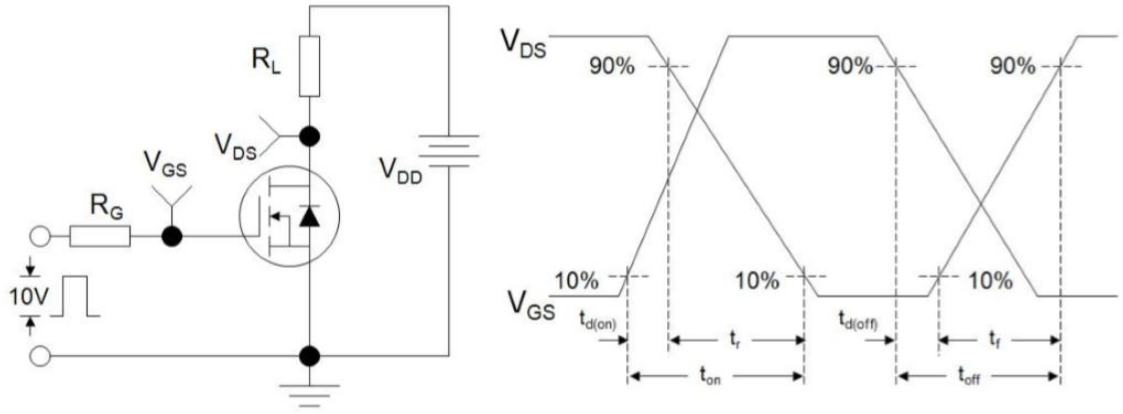
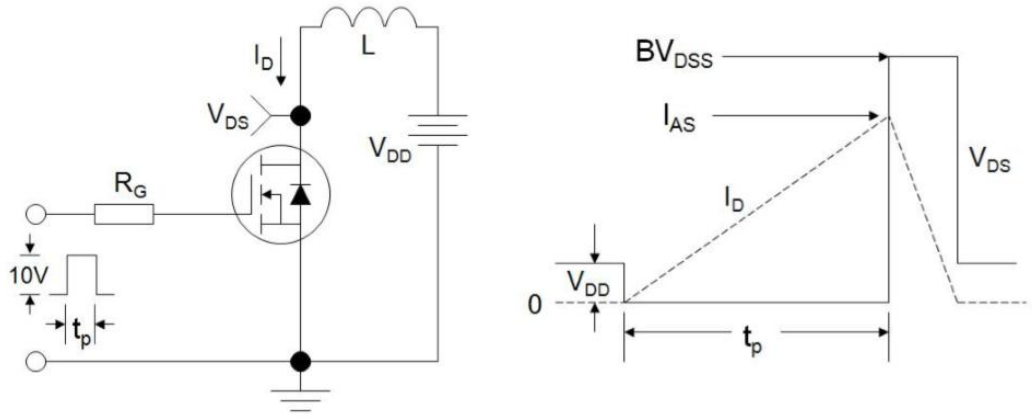


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



Characteristics Curve:

Figure 1. Maximum Effective Thermal Impedance, Junction-to-Case

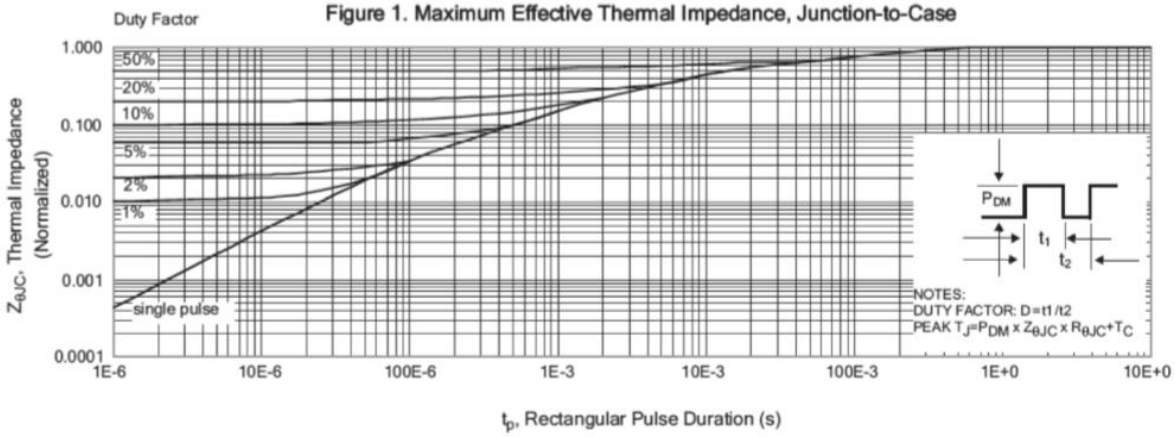


Figure 2 . Max. Power Dissipation vs Case Temperature

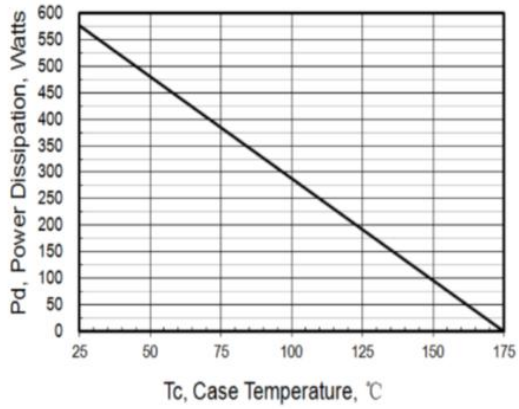


Figure 3 .Maximum Continuous Drain Current vs Tc

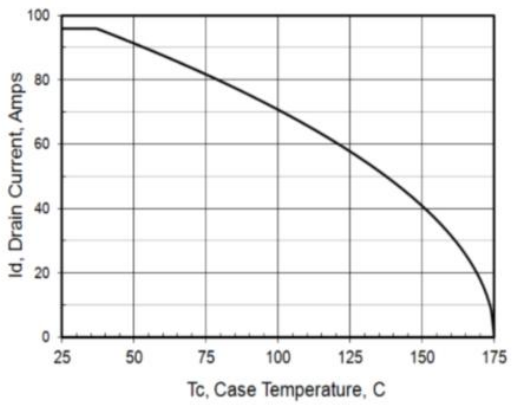


Figure 4. Typical Output Characteristics

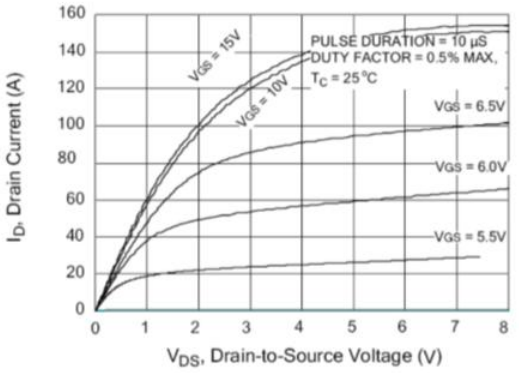


Figure5. Typical Drain-to-Source ON Resistance vs Gate Voltage and Drain Current

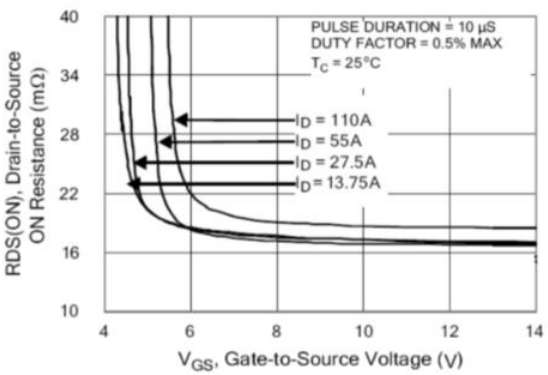


Figure 6. Peak Current Capability

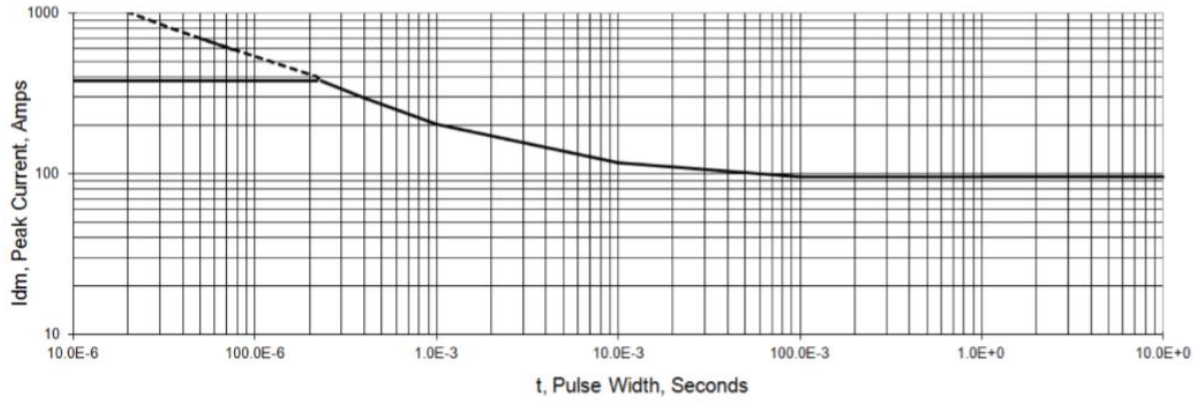


Figure 7. Typical Transfer Characteristics

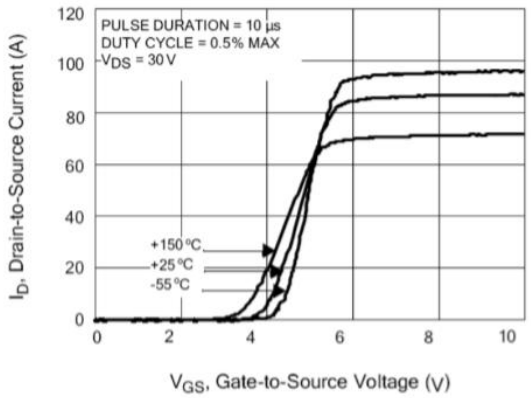


Figure 8. Unclamped Inductive Switching Capability

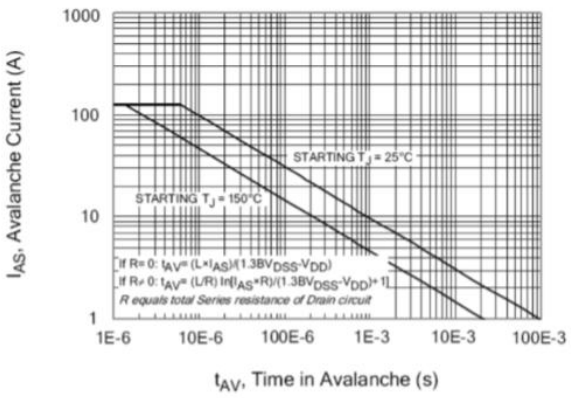


Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current

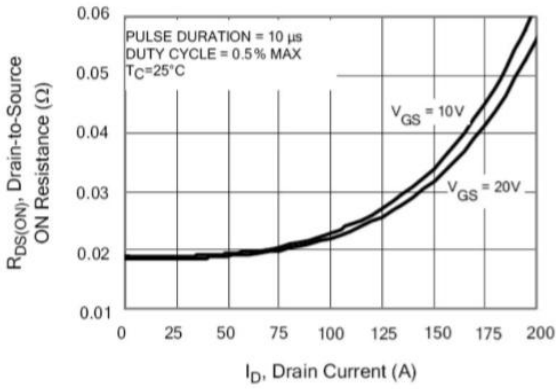


Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature

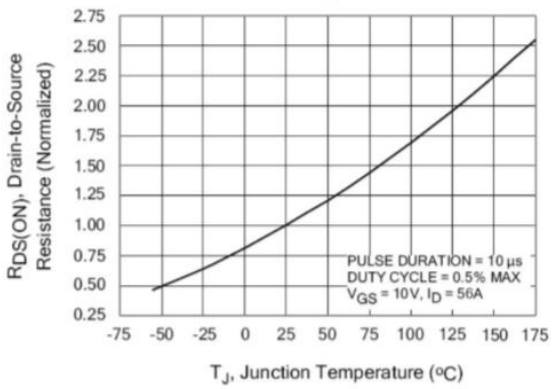


Figure 11. Typical Breakdown Voltage vs Junction Temperature

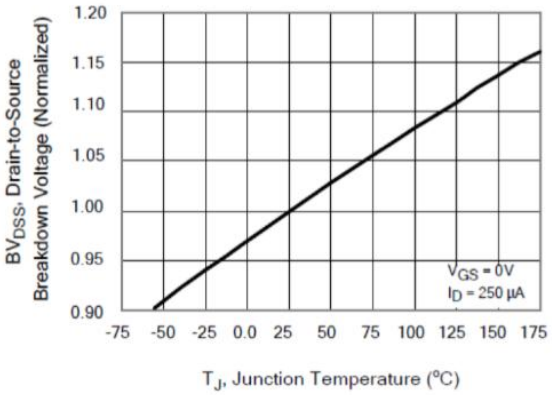


Figure 12. Typical Threshold Voltage vs Junction Temperature

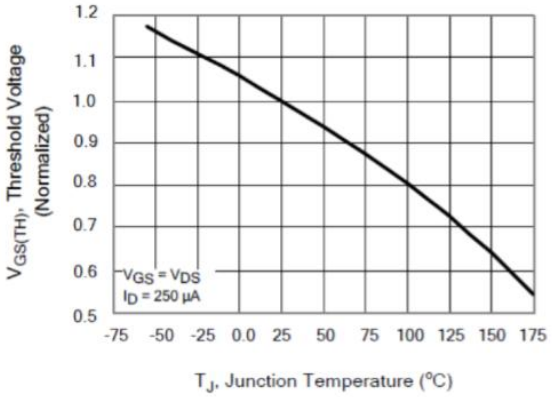


Figure 13 . Maximum Safe Operating Area

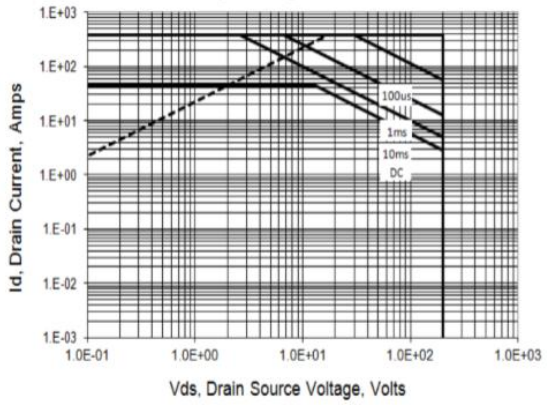


Figure 14. Capacitance vs Vds

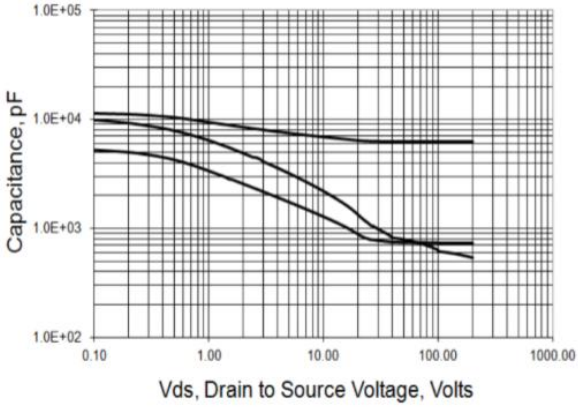


Figure 15 .Typical Gate Charge

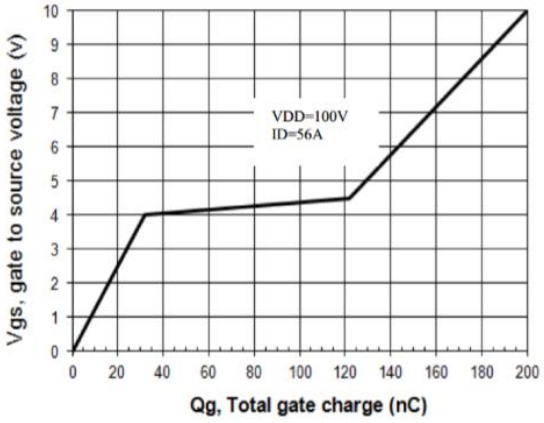


Figure 16. Typical Body Diode Transfer Characteristics