®

GL20J65A8

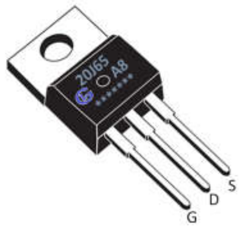
GL Silicon N-Channel Super-Junction Power MOSFET

$V_{DSS}(T_J=150℃)$	700	V
V_{DSS}	650	V
I_D	20	A
$P_D(T_C=25℃)$	176	W
$R_{DS(ON)TYP}$	0.13	Ω

General Description

GL20J65A8 the silicon N-channel Enhanced VDMOSFETS, is obtained by the self-aligned Super-junction Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency. The package form is TO-220, which accords with the RoHS standard.

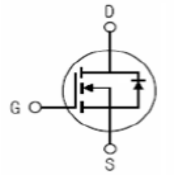
TO-220



Features

- Fast Switching
- Low Gate Charge and R_{dson}
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

Inner Equivalent Principium Chart



Applications

- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply(UPS)
- Power Factor Correction(PFC)

Absolute (Tc= 25℃ unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	650	V
I_D	Continuous Drain Current	20	A
$I_{DM}{}^{a1}$	Pulsed Drain Current	60	A
V_{GS}	Gate-to-Source Voltage	±30	V
$E_{AS}{}^{a2}$	Single Pulse Avalanche Energy	562	mJ
P_D	Power Dissipation	176	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 listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

Thermal Characteristics

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case	0.71	℃/W
$R_{\theta JA}$	Junction-to-Ambient	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	650	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=650V,V_{GS}=0V,T_a= 25℃	--	--	1.0	μA
		V_{DS}=520V,V_{GS}=0V,T_a=150℃	--	--	100	
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS} =+30V	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS} =-30V	--	--	-100	nA

ON Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}{}^{a3}$	Drain-to-Source On-Resistance	V_{GS}=10V,I_D=10A	--	0.13	0.15	Ω
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	2.0	--	4.0	V

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$g_{fs}{}^{a3}$	Forward Transconductance	V_{DS}=10V, I_D=20A	--	19	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_D=50V f=1.0MHz	--	1600	--	pF
C_{oss}	Output Capacitance		--	220	--	
C_{rss}	Reverse Transfer Capacitance		--	15	--	

Resistive Switching Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=400V,I_D=20A, V_{GS}=10V R_g=25Ω	--	15	--	ns
t_r	Rise Time		--	15	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	95	--	
t_f	Fall Time		--	10	--	
Q_g	Total Gate Charge	I_D =20A,V_{DD}=520V V_{GS}=0 to 10V	--	40	--	nC
Q_{gs}	Gate to Source Charge		--	7.5	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	15	--	

Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	20	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	60	A
V_{SD}	Diode Forward Voltage	I_S=20A,V_{GS}=0V	--	--	1.2	V
t_{rr}	Reverse Recovery Time	V_R=480V, V_{GS}=0V I_S=I_F,d_i/d_t=100A/us	--	450	--	ns
Q_{rr}	Reverse Recovery Charge		--	8.0	--	uC
Pulse width tp≤380μs,δ≤2%						

[a1]: Repetitive rating; pulse width limited by maximum junction temperature

[a2]: I_{AS}=10A,V_{DD}=50V,R_G=25Ω, Starting T_J= 25°C

[a3]: Pulse Test: Pulse width≤380us, Duty Cycle≤2%

Characteristics Curves

Figure 1. Output Characteristics

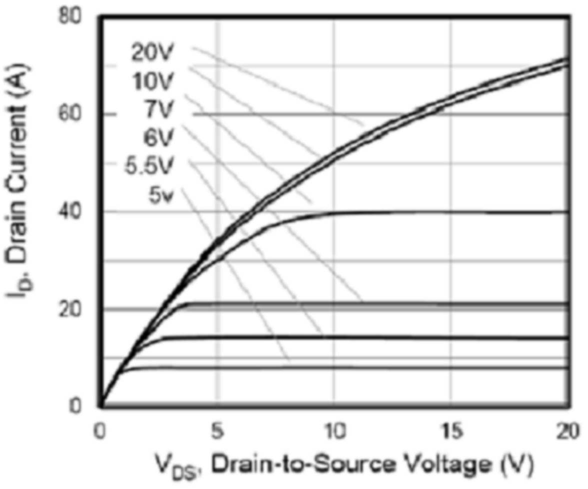


Figure 2. Transfer Characteristics

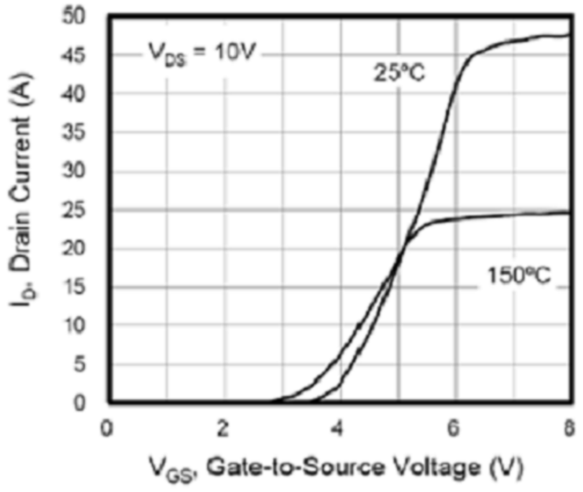


Figure 3. On-Resistance vs. Drain Current

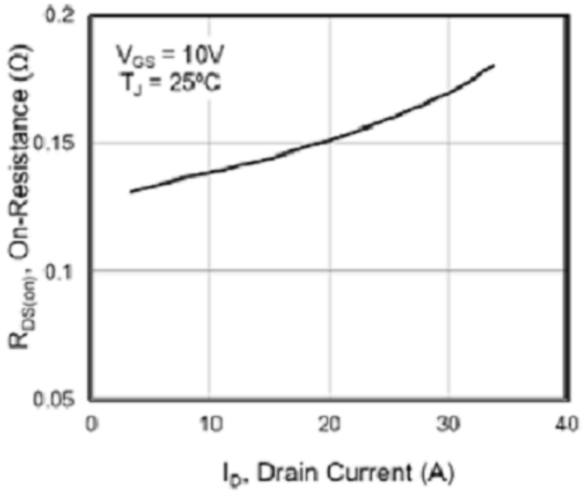


Figure 4. Capacitance

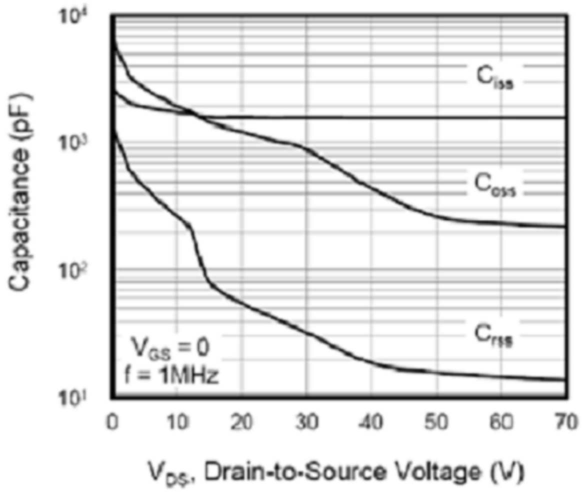


Figure 5. Gate Charge

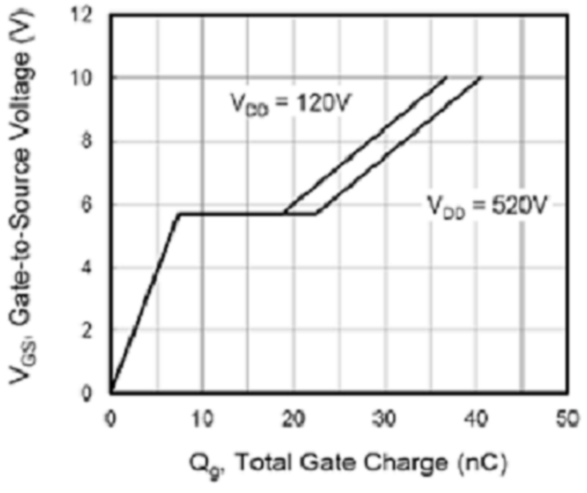


Figure 6. Body Diode Forward Voltage

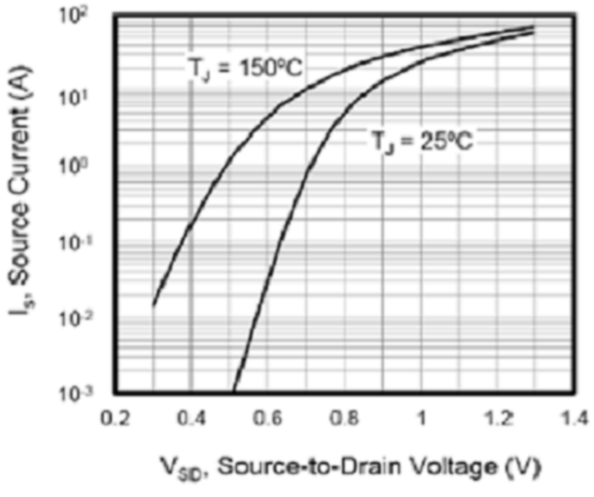


Figure 7. On-Resistance vs. Junction Temperature

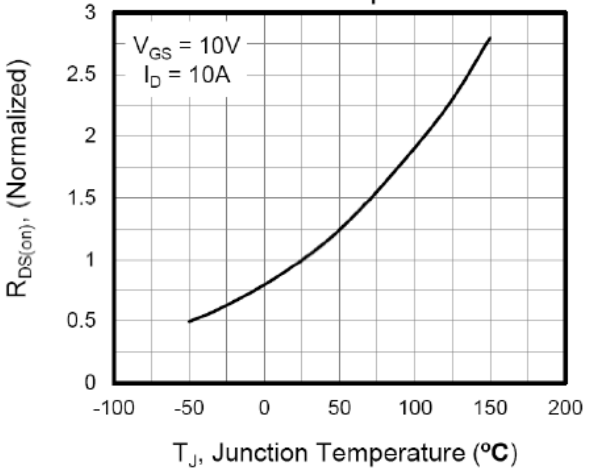


Figure 8. Threshold Voltage vs. Junction Temperature

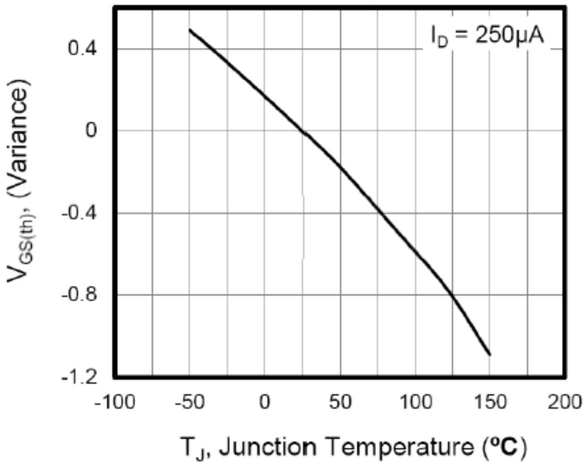


Figure 9. Transient Thermal Impedance TO-220