# GL20N20A4L

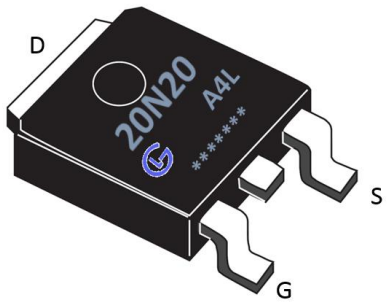
*GL Silicon N-Channel Power MOSFET*

| | | |
|---|---|---|
| $V_{DSS}$ | 200 | V |
| $I_D$ | 20 | A |
| $P_D$ ($T_C$=25℃) | 96 | W |
| $R_{DS(ON)max}$ | 0.12 | Ω |

## General Description

GL20N20A4L the silicon N-channel Enhanced VDMOSFETS, is obtained by the self-aligned planar 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-252, which accords with the RoHS standard.

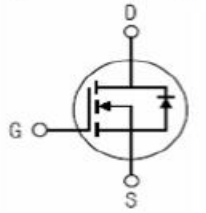
TO-252




## Features

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

Inner Equivalent Principium Chart




## Applications

- LED Lighting
- Charger
- Standby Power

**Absolute** (Tc= 25℃ unless otherwise specified)

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DSS}$ | Drain-to-Source Voltage | 200 | V |
| $I_D$ | Continuous Drain Current | 20 | A |
| | Continuous Drain Current $T_C$ = 100 °C | 12.7 | A |
| $I_{DM}$ [a1] | Pulsed Drain Current | 80 | A |
| $V_{GS}$ | Gate-to-Source Voltage | ±20 | V |
| $E_{AS}$ [a2] | Single Pulse Avalanche Energy | 500 | mJ |
| dv/dt [a3] | Peak Diode Recovery dv/dt | 5.0 | V/ns |
| $P_D$ | Power Dissipation | 96 | W |
| | Derating Factor above 25°C | 0.77 | W/℃ |
| $T_J$, $T_{stg}$ | Operating Junction and Storage Temperature Range | 150, −55 to 150 | ℃ |
| $T_L$ | 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 | 200 | -- | -- | V |
| $\Delta BV_{DSS}/\Delta T_J$ | Bvdss Temperature Coefficient | $I_D$=250uA,Reference25℃ | -- | 0.21 | -- | V/℃ |
| $I_{DSS}$ | Drain to Source Leakage Current | $V_{DS}$=200V,$V_{GS}$=0V,$T_a$=25℃ | -- | -- | 1 | μA |
| | | $V_{DS}$=160V,$V_{GS}$=0V,$T_a$=125℃ | -- | -- | 100 | |
| $I_{GSS(F)}$ | Gate to Source Forward Leakage | $V_{GS}$=+20V | -- | -- | 100 | μA |
| $I_{GSS(R)}$ | Gate to Source Reverse Leakage | $V_{GS}$=-20V | -- | -- | -100 | μA |

| **ON Characteristics** | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Rating | | | Units |
| | | | Min. | Typ. | Max. | |
| $R_{DS(ON)}$ | Drain-to-Source On-Resistance | $V_{GS}$=10V,$I_D$=10A | -- | -- | 0.12 | Ω |
| $R_{DS(ON)}$ | Drain-to-Source On-Resistance | $V_{GS}$=5V,$I_D$=8A | -- | -- | 0.125 | Ω |
| $R_{DS(ON)}$ | Drain-to-Source On-Resistance | $V_{GS}$=3V,$I_D$=6A | -- | -- | 0.135 | Ω |
| $V_{GS(TH)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 0.5 | -- | 1.5 | V |
| Pulse width tp≤300μs,δ≤2% | | | | | | |

| **Dynamic Characteristics** | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Rating | | | Units |
| | | | Min. | Typ. | Max. | |
| $g_{fs}$ | Forward Transconductance | $V_{DS}$=10V,$I_D$=10A | -- | 50 | -- | S |
| $C_{iss}$ | Input Capacitance | $V_{GS}$=0V,$V_{DS}$=25V f=1.0MHz | -- | 1600 | -- | pF |
| $C_{oss}$ | Output Capacitance | | -- | 190 | -- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | -- | 60 | -- | |

| **Resistive Switching Characteristics** | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Rating | | | Units |
| | | | Min. | Typ. | Max. | |
| $t_{d(ON)}$ | Turn-on Delay Time | $I_D$=20A,$V_{DD}$=100V $R_G$=10Ω | -- | 24 | -- | ns |
| $t_r$ | Rise Time | | -- | 42 | -- | |
| $t_{d(OFF)}$ | Turn-Off Delay Time | | -- | 45 | -- | |
| $t_f$ | Fall Time | | -- | 15 | -- | |
| $Q_g$ | Total Gate Charge | $I_D$=20A,$V_{DD}$=100V $V_{GS}$=5V | -- | 26 | -- | nC |
| $Q_{gs}$ | Gate to Source Charge | | -- | 9 | -- | |
| $Q_{gd}$ | Gate to Drain ( “Miller” )Charge | | -- | 9.5 | -- | |

| 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) | | -- | -- | 80 | A |
| $V_{SD}$ | Diode Forward Voltage | $I_S$=20A,$V_{GS}$=0V | -- | -- | 1.5 | V |
| $t_{rr}$ | Reverse Recovery Time | $I_S$=20A,$T_j$=25°C<br>$dI_F/dt$=100A/us,$V_{GS}$=0V | -- | 245 | -- | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | -- | 1200 | -- | uC |
| $I_{RRM}$ | Reverse Recovery Current | | -- | 12.8 | -- | A |
| Pulse width tp≤300μs,δ≤2% | | | | | | |

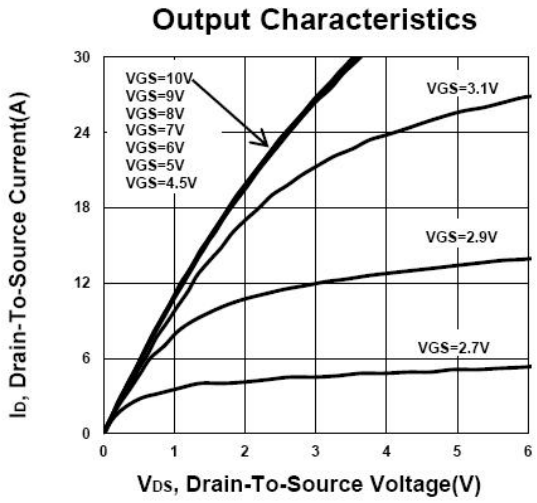
| Symbol | Parameter | Typ. | Units |
|---|---|---|---|
| $R_{\theta JC}$ | Junction-to-Case | 1.30 | ℃/W |
| $R_{\theta JA}$ | Junction-to-Ambient | 83.3 | ℃/W |

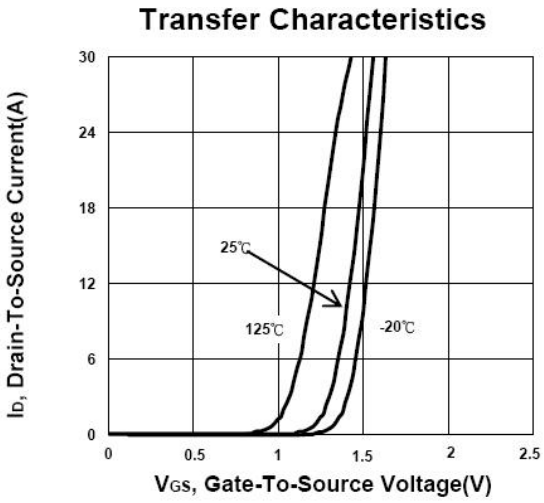
[a1]: Repetitive rating; pulse width limited by maximum junction temperature

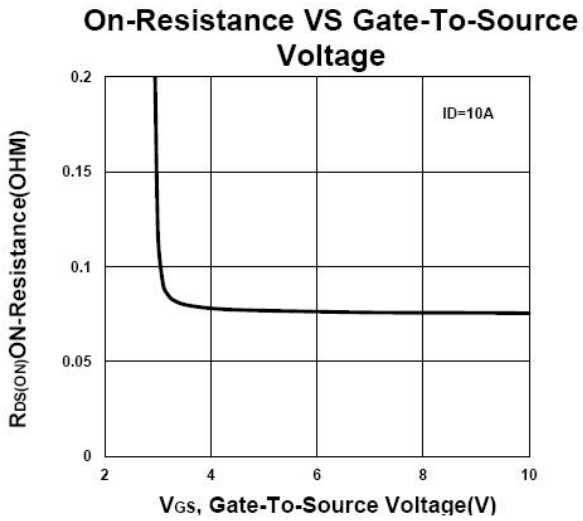
[a2]: L=10.0mH, $I_D$=13A, Start $T_J$=25℃

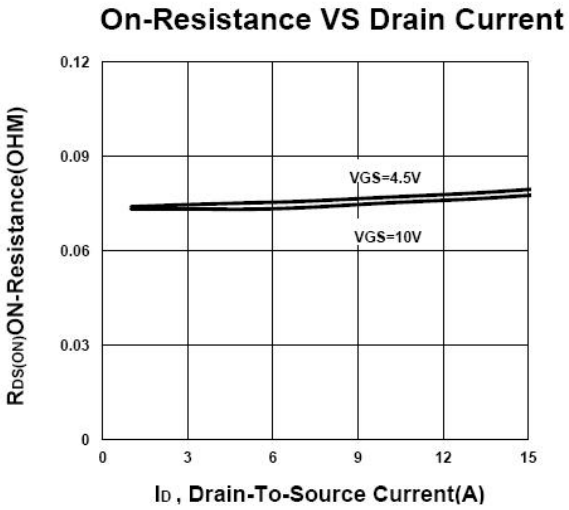
[a3]: $I_{SD}$ =209A,di/dt ≤100A/us,$V_{DD}$≤$BV_{DS,}$ Start $T_J$=25℃

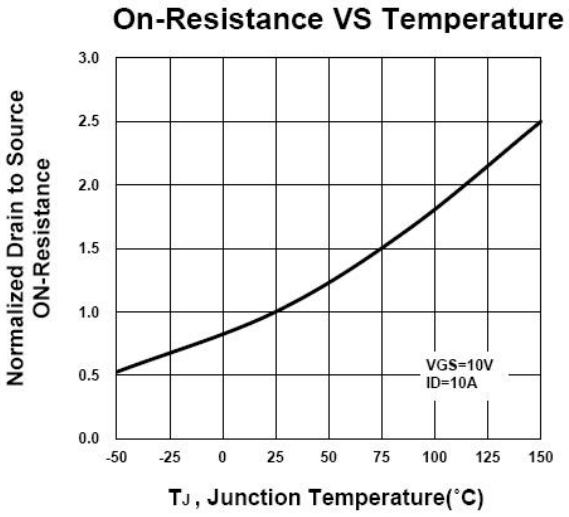
## Characteristics Curve

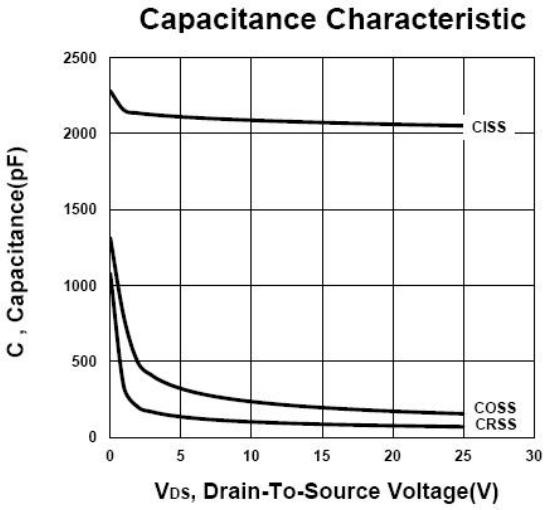


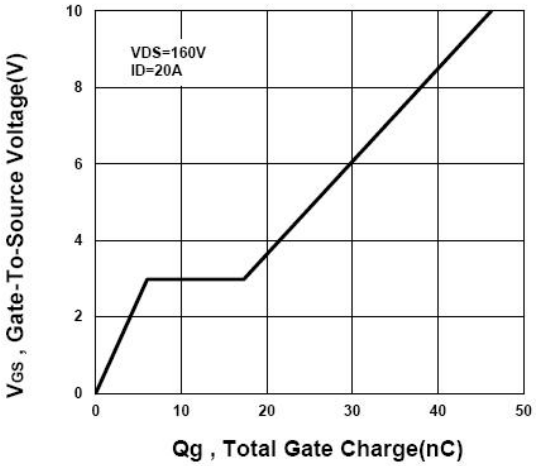



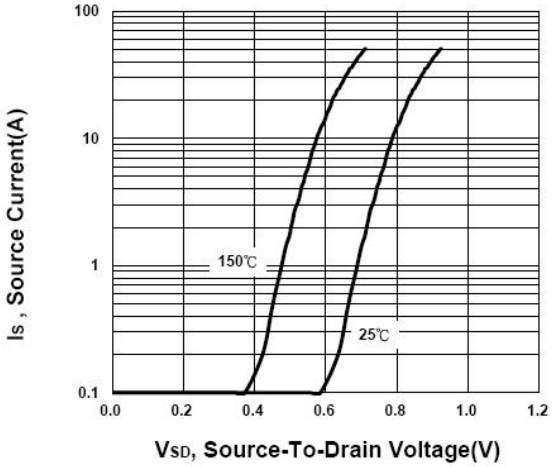



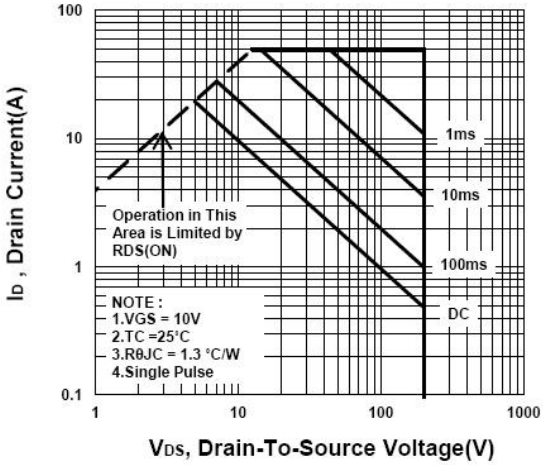
## Gate charge Characteristics



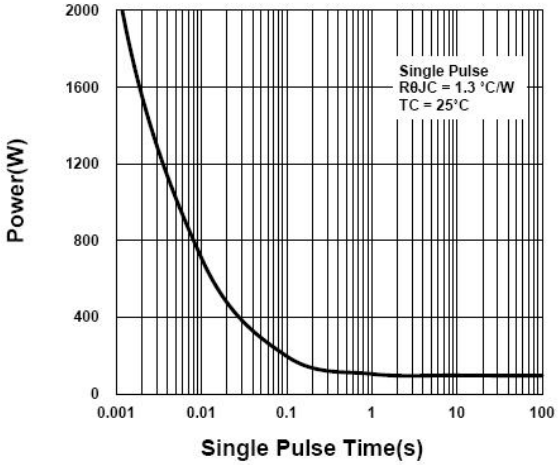

## Source-Drain Diode Forward Voltage




## Safe Operating Area




## Single Pulse Maximum Power Dissipation




## Transient Thermal Response Curve