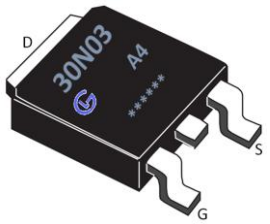
# *GL Silicon N-Channel Power MOSFET*

## General Description:

The GL30N03A4 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-252, which accords with the RoHS standard.

| | | |
|---|---|---|
| $V_{DSS}$ | 30 | V |
| $I_D$ | 30 | A |
| $P_D$ | 40 | W |
| $R_{DS(ON)type}$ | 10 | mΩ |

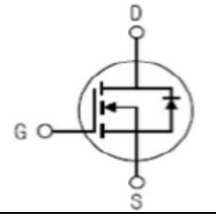
TO-252




## Features:

- $R_{DS(ON)}$ <14mΩ @ $V_{GS}$=10V (Typ:10mΩ)
- 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 | 30 | V |
| $I_D$ | Continuous Drain Current | 30 | A |
| $I_{DM}$ | Pulsed Drain Current[a1] | 80 | A |
| $V_{GS}$ | Gate-to-Source Voltage | ±20 | V |
| $P_D$ | Power Dissipation | 40 | W |
| $E_{AS}$ | Single pulse avalanche energy[a5] | 72 | mJ |
| $T_J$, $T_{stg}$ | Operating Junction and Storage Temperature Range | 175, −55 to 175 | ℃ |

**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 | 30 | -- | -- | V |
| $I_{DSS}$ | Drain to Source Leakage Current | $V_{DS}$=30V, $V_{GS}$= 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,$I_D$=20A | -- | 10 | 15 | mΩ |
| $R_{DS(ON)}$ | Drain-to-Source On-Resistance | $V_{GS}$=4.5V,$I_D$=15A | -- | 13 | 25 | mΩ |
| $V_{GS(TH)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$,$I_D$=250μA | 1.0 | 1.5 | 2.5 | V |
| Pulse width tp≤380μs,δ≤2% | | | | | | |

| **Dynamic Characteristics**[a4] | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Rating | | | Units |
| | | | Min. | Typ. | Max. | |
| $g_{fs}$ | Forward Transconductance | $V_{DS}$=5V,$I_D$=20A | 26 | -- | -- | S |
| $C_{iss}$ | Input Capacitance | $V_{GS}$=0V,$V_{DS}$=15V f=1.0MHz | -- | 938 | -- | pF |
| $C_{oss}$ | Output Capacitance | | -- | 142 | -- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | -- | 99 | -- | |

| **Resistive Switching Characteristics**[a4] | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Rating | | | Units |
| | | | Min. | Typ. | Max. | |
| $t_{d(ON)}$ | Turn-on Delay Time | $R_L$=0.75Ω,$V_{DD}$=15V $V_{GS}$=10V,$R_G$=3.0Ω | -- | 5 | -- | ns |
| $t_r$ | Rise Time | | -- | 12 | -- | |
| $t_{d(OFF)}$ | Turn-Off Delay Time | | -- | 19 | -- | |
| $t_f$ | Fall Time | | -- | 6 | -- | |
| $Q_g$ | Total Gate Charge | $I_D$=20A,$V_{DD}$=15V $V_{GS}$=10V | -- | 17.5 | -- | nC |
| $Q_{gs}$ | Gate to Source Charge | | -- | 3.0 | -- | |
| $Q_{gd}$ | Gate to Drain (“Miller”)Charge | | -- | 4.1 | -- | |

## GL Silicon N-Channel Power MOSFET

| Source-Drain Diode Characteristics | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Rating | | | Units |
| | | | Min. | Typ. | Max. | |
| $I_S$ | Continuous Source Current [a2](Body Diode) | | -- | -- | 30 | A |
| $V_{SD}$ | Diode Forward Voltage[a3] | $I_S$=20A,$V_{GS}$=0V | -- | -- | 1.2 | V |

| Symbol | Parameter | Typ. | Units |
|---|---|---|---|
| $R_{\theta JC}$ | Junction-to-Case[a2] | 3.125 | ℃/W |

[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

[a5]: EAS condition: Tj=25℃,VDD=30V,VG=10V,L=0.5mH,Rg=25Ω

*GL Silicon N-Channel Power MOSFET*

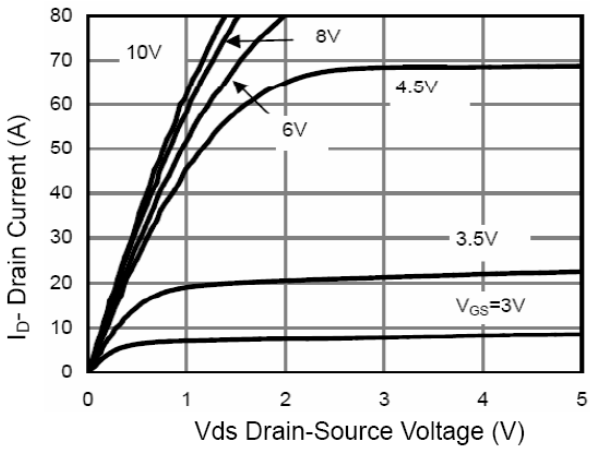



**Figure 1 Output Characteristics**

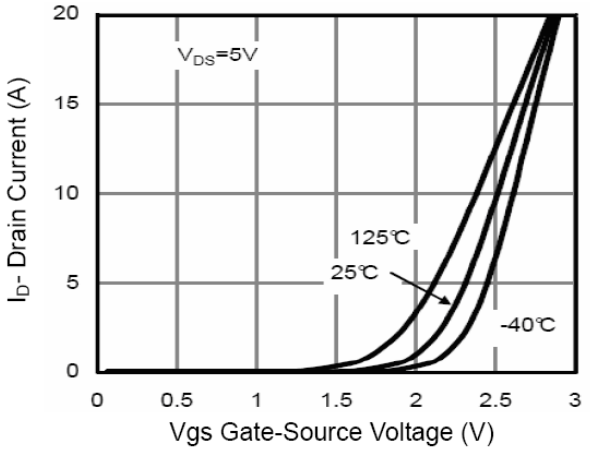
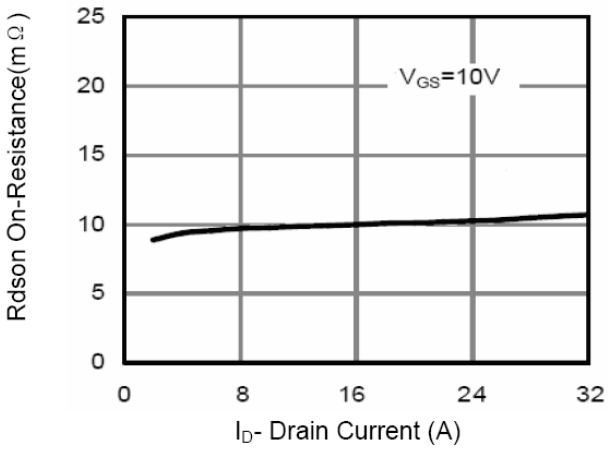



**Figure 2 Transfer Characteristics**



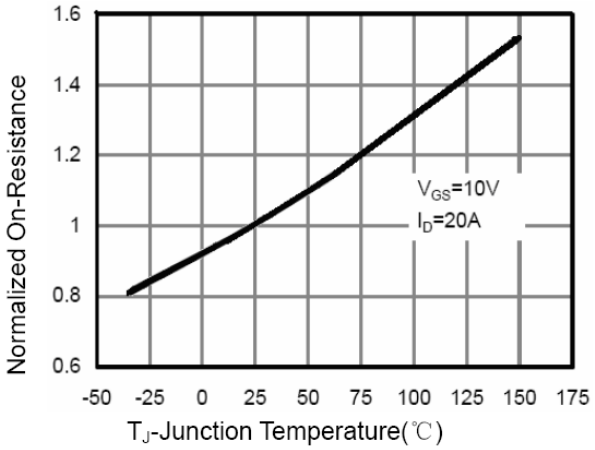




**Figure 4 Rdson-Junction Temperature**

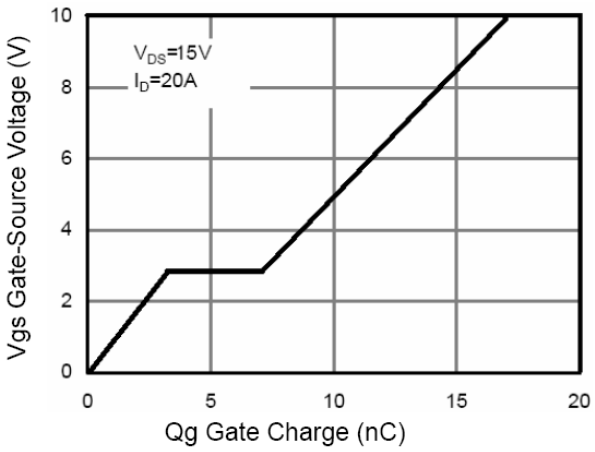
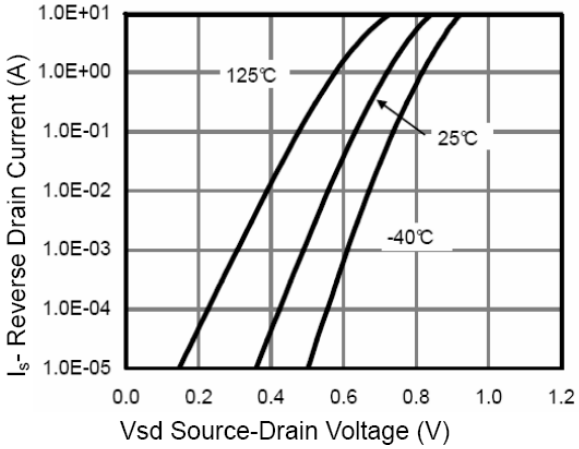



**Figure 5 Gate Charge**



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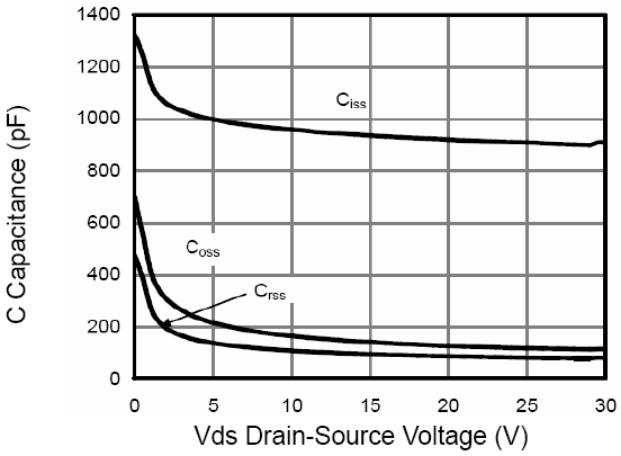



**Figure 7 Capacitance vs Vds**

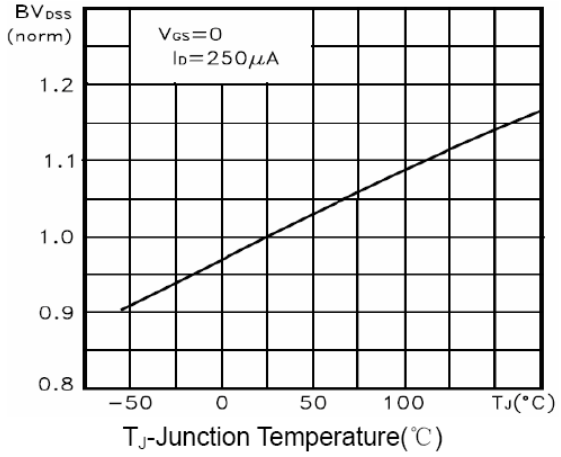



**Figure 9 $BV_{DSS}$ vs Junction Temperature**

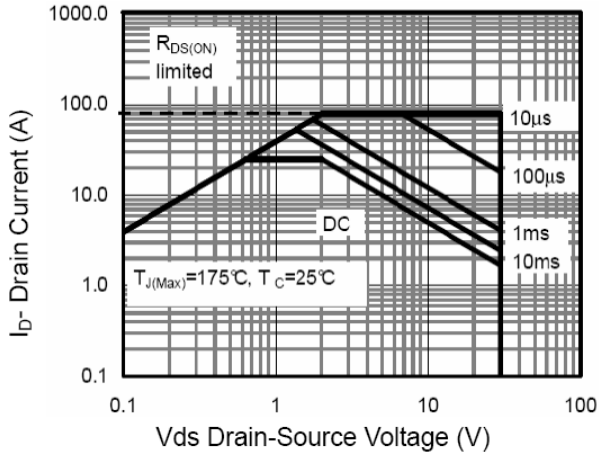



**Figure 8 Safe Operation Area**

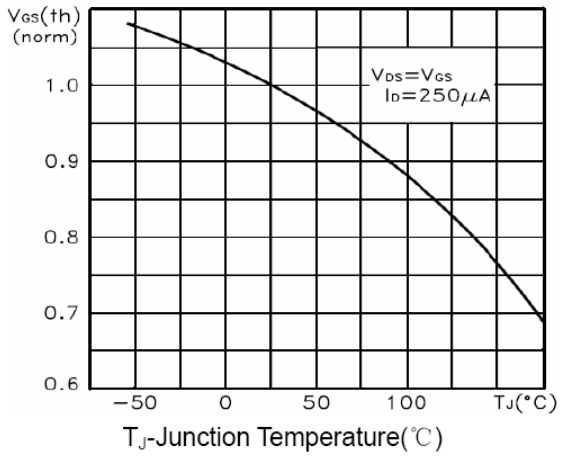
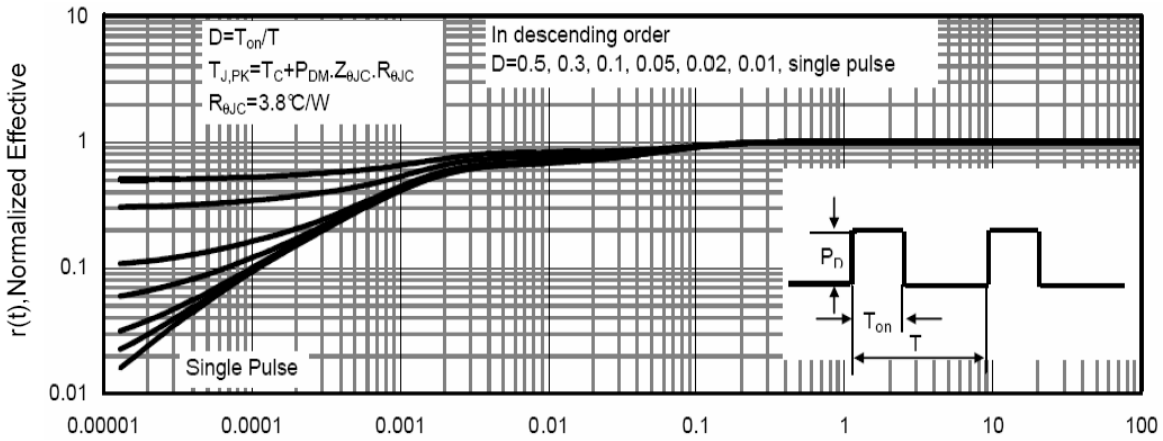



**Figure 10 $V_{GS(th)}$ vs Junction Temperature**




TEL:0755-23068119