# GL100P06B0

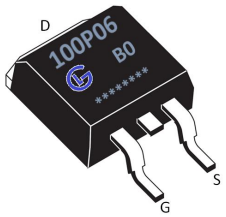
*GL Silicon P-Channel Power MOSFET*

## General Description

The GL100P06B0 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 TO-263, which accords with the RoHS standard.

| | | |
|---|---|---|
| $V_{DSS}$ | -60 | V |
| $I_D$ | -100 | A |
| $P_D$ | 250 | W |
| $R_{DS(ON)\ TYPE}$ | 5.5 | mΩ |

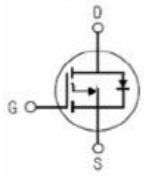
TO-263




## Features

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

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 | -60 | V |
| $I_D$ | Continuous Drain Current | -100 | A |
| | Continuous Drain Current $T_C$ = 100 °C | -80 | A |
| $I_{DM}$ [a1] | Pulsed Drain Current | -400 | A |
| $V_{GS}$ | Gate-to-Source Voltage | ±20 | V |
| dv/dt [a3] | Peak Diode Recovery dv/dt | 5.0 | V/ns |
| $P_D$ | Power Dissipation | 250 | W |
| $T_J$, $T_{stg}$ | Operating Junction and Storage Temperature Range | 175, −55 to 175 | ℃ |
| $T_L$ | Maximum Temperature for Soldering | 300 | ℃ |

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

## Thermal Characteristics

| Symbol | Parameter | Typ. | Units |
|---|---|---|---|
| $R_{\theta Jc}$ | Junction-to-Case | 1.61 | ℃/W |
| $R_{\theta JA}$ | Junction-to-Ambient | 62.5 | ℃/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 | -60 | -- | -- | V |
| $\Delta BV_{DSS}/\Delta T_J$ | Bvdss Temperature Coefficient | $I_D$=-250uA,Reference25℃ | -- | 0.06 | -- | V/℃ |
| $I_{DSS}$ | Drain to Source Leakage Current | $V_{DS}$=-60,$V_{GS}$= 0V,$T_a$=25℃ | -- | -- | -1 | μA |
| | | $V_{DS}$=-48V,$V_{GS}$= 0V,$T_a$=125℃ | -- | -- | -250 | |
| $I_{GSS(F)}$ | 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. | |
| $R_{DS(ON)1}$ | Drain-to-Source On-Resistance | $V_{GS}$=-10V,$I_D$=-50A | -- | 5.5 | 6.8 | mΩ |
| $R_{DS(ON)1}$ | Drain-to-Source On-Resistance | $V_{GS}$=-4.5V,$I_D$=-20A | -- | 7.0 | 8.5 | mΩ |
| $V_{GS(TH)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$,$I_D$=-250μA | -3.0 | -- | -1.0 | V |
| Pulse width tp≤380μs,δ≤2% | | | | | | |

| **Dynamic Characteristics** | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Rating | | | Units |
| | | | Min. | Typ. | Max. | |
| $g_{fs}$ | Forward Transconductance | $V_{DS}$=-10V,$I_D$=-50A | -- | 70 | -- | S |
| $C_{iss}$ | Input Capacitance | $V_{GS}$=0V,$V_{DS}$=-25V f=1.0MHz | -- | 10200 | -- | pF |
| $C_{oss}$ | Output Capacitance | | -- | 950 | -- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | -- | 840 | -- | |

| **Resistive Switching Characteristics** | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Rating | | | Units |
| | | | Min. | Typ. | Max. | |
| $t_{d(ON)}$ | Turn-on Delay Time | $R_L$=1.5Ω,$V_{DD}$=-30V $V_{GS}$=-10V,$R_G$=1.5Ω | -- | 50 | -- | ns |
| $t_r$ | Rise Time | | -- | 45 | -- | |
| $t_{d(OFF)}$ | Turn-Off Delay Time | | -- | 110 | -- | |
| $t_f$ | Fall Time | | -- | 75 | -- | |
| $Q_g$ | Total Gate Charge | $I_D$ =-50.0A,$V_{DD}$=-30V $V_{GS}$=-10V | -- | 180 | -- | nC |
| $Q_{gs}$ | Gate to Source Charge | | -- | 48 | -- | |
| $Q_{gd}$ | Gate to Drain ( “Miller” )Charge | | -- | 45 | -- | |

| **Source-Drain Diode Characteristics** | | | | |
|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Rating | Units |

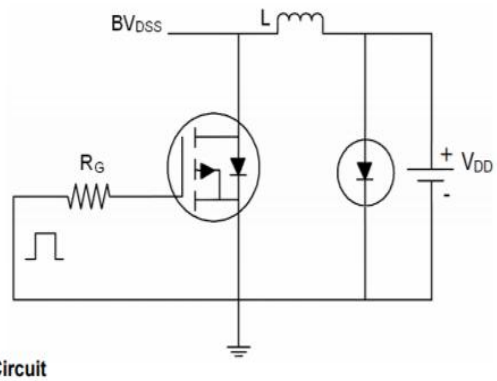
| | | | Min. | Typ. | Max. | |
|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current (Body Diode) | | -- | -- | -100 | A |
| $I_{SM}$ | Maximum Pulsed Current (Body Diode) | | -- | -- | -400 | A |
| $V_{SD}$ | Diode Forward Voltage | $I_S$=-100A,$V_{GS}$=0V | -- | -- | 1.5 | V |
| $t_{rr}$ | Reverse Recovery Time | $I_S$=-100A,$T_j$ = 25°C | -- | 75 | -- | ns |
| $Q_{rr}$ | Reverse Recovery Charge | $dI_F/dt$=100A/us,$V_{GS}$=0V | -- | 210 | -- | nC |
| Pulse width tp≤380μs,δ≤2% | | | | | | |

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

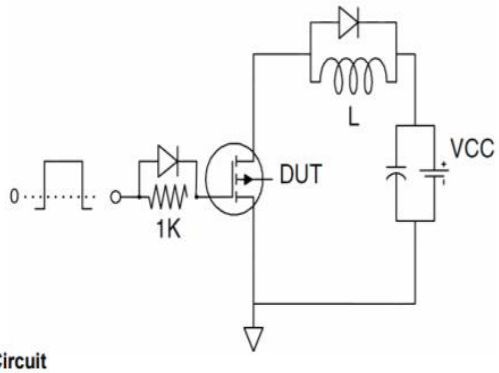
[a3]: $I_{SD}$ =-100A,di/dt ≤100A/us,$V_{DD}$≤$BV_{DS}$, Start $T_J$=25℃

## Test Circuits

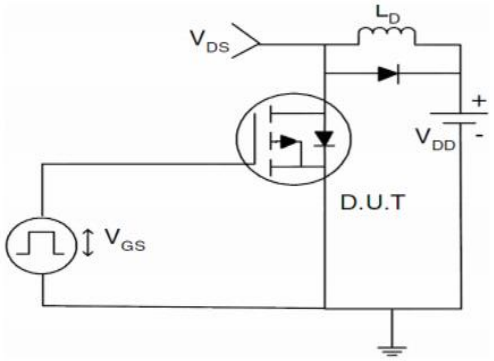
**1) $E_{AS}$ Test Circuit**



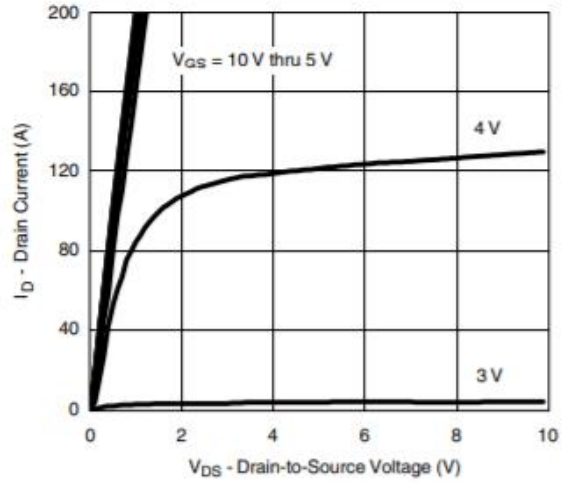

**2) Gate Charge Test Circuit**



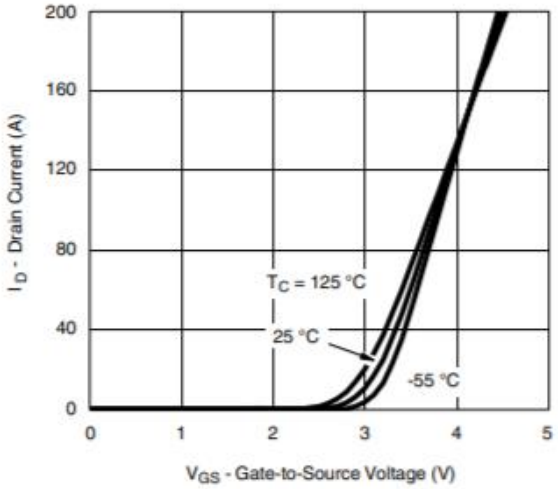

**3) Switch Time Test Circuit**



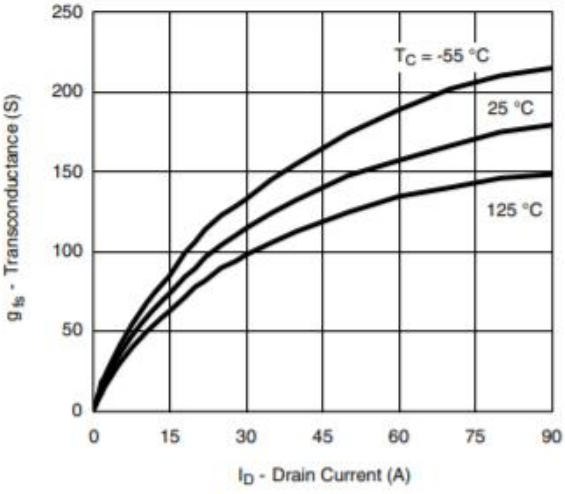

## Characteristics Curves



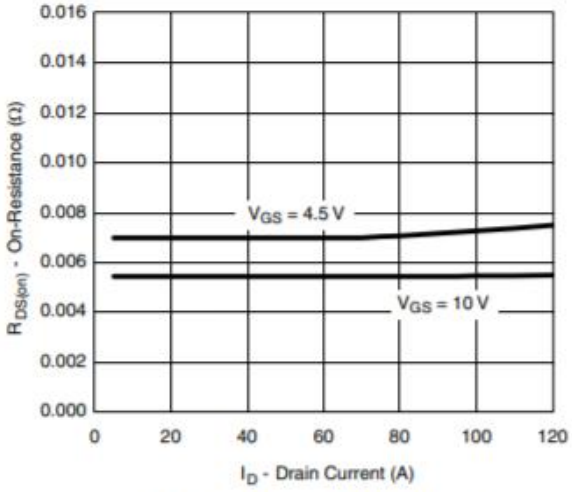

**Output Characteristics**



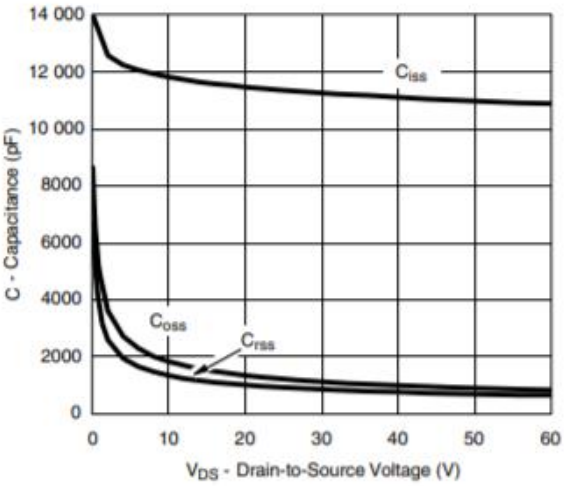

**Transfer Characteristics**



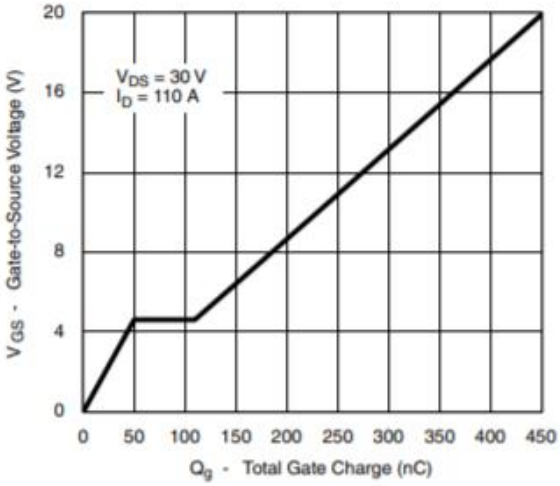

**Transconductance**



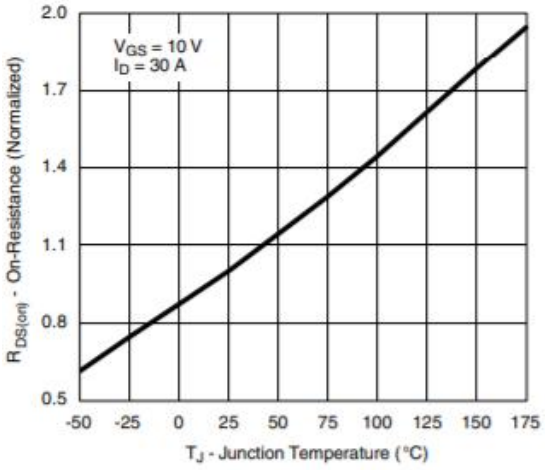

**On-Resistance vs. Drain Current**



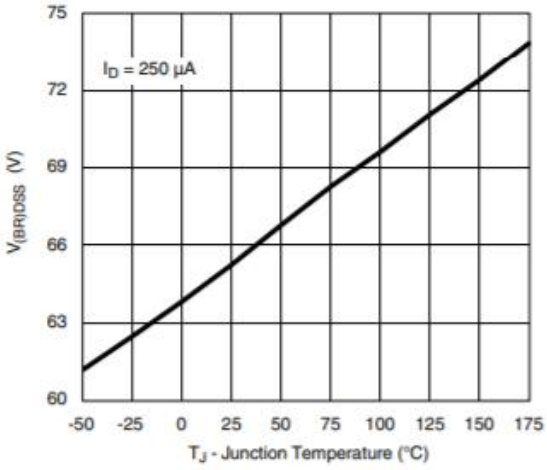

**Capacitance**



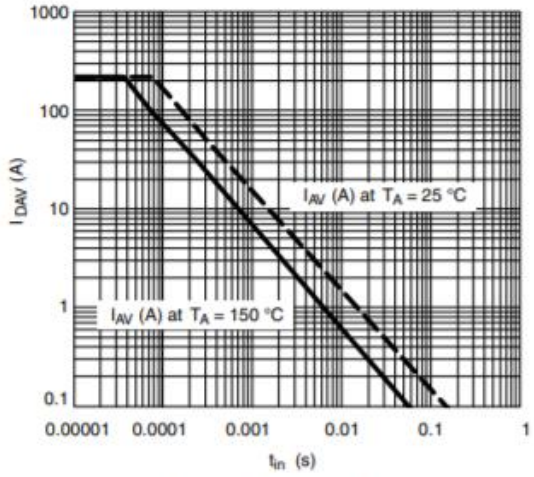

**Gate Charge**



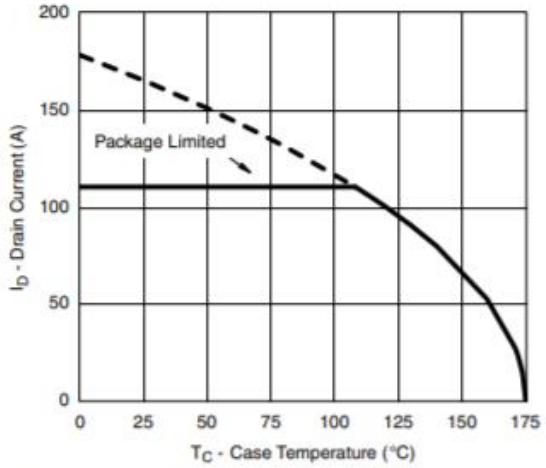

**On-Resistance vs. Junction Temperature**



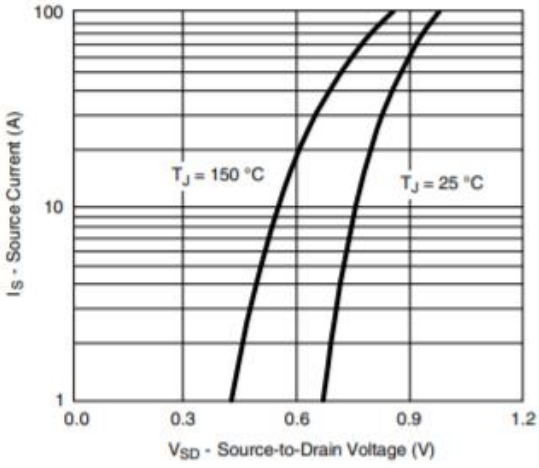

**Drain Source Breakdown vs. Junction Temperature**



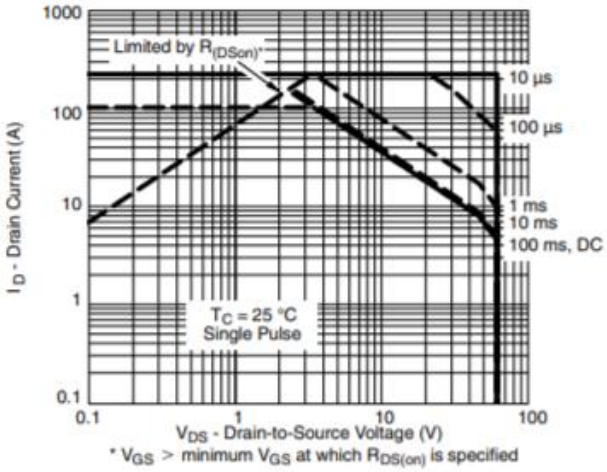

**Avalanche Current vs. Time**




**Maximum Avalanche and Drain Current vs. Case Temperature**




**Source-Drain Diode Forward Voltage**




**Safe Operating Area**