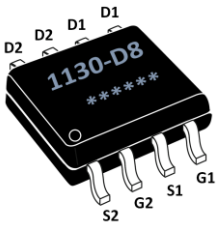
## *GL Silicon N-Channel Power MOSFET*

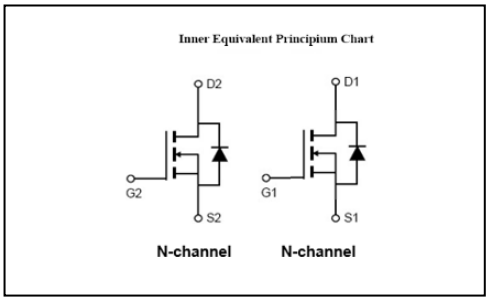
| | | |
|---|---|---|
| $V_{DSS}$ | 30 | V |
| $I_D$ | 8 | A |
| $P_D$ | 2.5 | W |
| $R_{DS(ON)MAX}$ | 20 | mΩ |

**General Description:**

The GL1130-D8 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 SOP-8, which accords with the RoHS standard.

SOP-8




**Features:**

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

**Applications:**

- PWM applications
- Load switch
- Power management

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

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DSS}$ | Drain-to-Source Voltage | 30 | V |
| $I_D$ | Continuous Drain Current | 8 | A |
| | Continuous Drain Current $T_C$ = 70 °C | 6 | A |
| $I_{DM}$[a1] | Pulsed Drain Current | 32 | A |
| $V_{GS}$ | Gate-to-Source Voltage | ±20 | V |
| Eas [a2] | L=0.1mH | 28 | mJ |
| dv/dt [a3] | Peak Diode Recovery dv/dt | 5.0 | V/ns |
| $P_D$ | Power Dissipation | 2.5 | W |
| $T_J$, $T_{stg}$ | Operating Junction and Storage Temperature Range | 150, −55 to 150 | ℃ |
| $T_L$ | Maximum Temperature for Soldering | 300 | ℃ |

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**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 |
| $\Delta BV_{DSS}/\Delta T_J$ | Bvdss Temperature Coefficient | $I_D$=250uA,Reference25℃ | -- | 0.1 | -- | V/℃ |
| $I_{DSS}$ | Drain to Source Leakage Current | $V_{DS}$=30,$V_{GS}$=0V,$T_a$= 25℃ | -- | -- | 1 | μA |
| | | $V_{DS}$=24V,$V_{GS}$= 0V,$T_a$=125℃ | -- | -- | 250 | |
| $I_{GSS(F)}$ | Gate to Source Forward Leakage | $V_{GS}$=+20V | -- | -- | 1 | μA |
| $I_{GSS(R)}$ | Gate to Source Reverse Leakage | $V_{GS}$=-20V | -- | -- | -1 | μA |

| **ON Characteristics** | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Rating | | | Units |
| | | | Min. | Typ. | Max. | |
| $R_{DS(ON)}$ | Drain-to-Source On-Resistance | $V_{GS}$=10V,$I_D$=5A | -- | 13 | 20 | mΩ |
| $R_{DS(ON)}$ | Drain-to-Source On-Resistance | $V_{GS}$=4.5V,$I_D$=5.0A | -- | 16 | 26 | mΩ |
| $V_{GS(TH)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$,$I_D$=250μA | 0.7 | -- | 1.5 | V |
| Pulse width tp≤380μs,δ≤2% | | | | | | |

| **Dynamic Characteristics** | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Rating | | | Units |
| | | | Min. | Typ. | Max. | |
| $g_{fs}$ | Forward Transconductance | $V_{DS}$=5V,$I_D$=10A | 15 | -- | -- | S |
| $C_{iss}$ | Input Capacitance | $V_{GS}$=0V,$V_{DS}$=15V f=1.0MHz | -- | 680 | -- | pF |
| $C_{oss}$ | Output Capacitance | | -- | 160 | -- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | -- | 80 | -- | |

| **Resistive Switching Characteristics** | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Rating | | | Units |
| | | | Min. | Typ. | Max. | |
| $t_{d(ON)}$ | Turn-on Delay Time | $I_D$=1A,$V_{DD}$=25V $V_{GS}$=10V,$R_G$=6Ω | -- | 13 | -- | ns |
| $t_r$ | Rise Time | | -- | 8 | -- | |
| $t_{d(OFF)}$ | Turn-Off Delay Time | | -- | 40 | -- | |
| $t_f$ | Fall Time | | -- | 30 | -- | |
| $Q_g$ | Total Gate Charge | $I_D$=5A,$V_{DD}$=30V $V_{GS}$=5V | -- | 8 | -- | nC |
| $Q_{gs}$ | Gate to Source Charge | | -- | 4.8 | -- | |
| $Q_{gd}$ | Gate to Drain (“Miller”)Charge | | -- | 2.2 | -- | |

*GL Silicon N-Channel Power MOSFET*

| Source-Drain Diode Characteristics | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Parameter | Test Conditions | Rating | | | Units |
| | | | Min. | Typ. | Max. | |
| $I_S$ | Continuous Source Current (Body Diode) | | -- | -- | 8 | A |
| $I_{SM}$ | Maximum Pulsed Current (Body Diode) | | -- | -- | 32 | A |
| $V_{SD}$ | Diode Forward Voltage | $I_S$=8A,$V_{GS}$=0V | -- | -- | 1.5 | V |
| $t_{rr}$ | Reverse Recovery Time | $I_S$=8A,$T_j$=25°C | -- | 60 | -- | ns |
| $Q_{rr}$ | Reverse Recovery Charge | $dI_F/dt$=100A/us,$V_{GS}$=0V | -- | 150 | -- | nC |
| Pulse width tp≤380μs,δ≤2% | | | | | | |

| Symbol | Parameter | Typ. | Units |
|---|---|---|---|
| $R_{\theta JA}$ | Junction-to-Ambient | 50 | °C/W |

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

[a2]: $T_J$=25°C, $V_{DD}$=15V, $V_G$=10V,L=0.1mH

[a3]: $I_{SD}$ =8A,di/dt ≤100A/us,$V_{DD}$≤$BV_{DS}$, Start $T_J$=25°C

## Typical Electrical and Thermal Characteristics

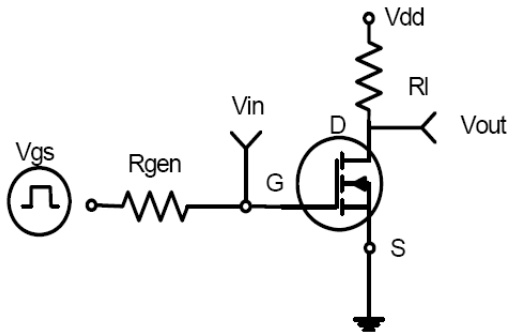


Figure 1:Switching Test Circuit

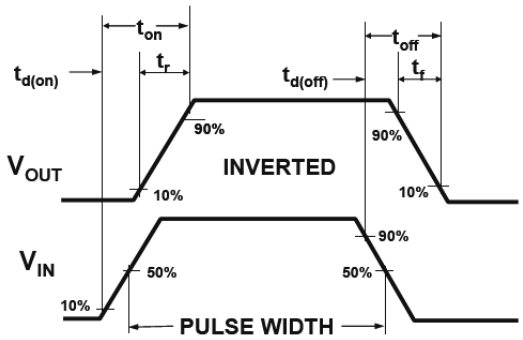


Figure 2:Switching Waveforms

## Typical Electrical and Thermal Characteristics (Curves)

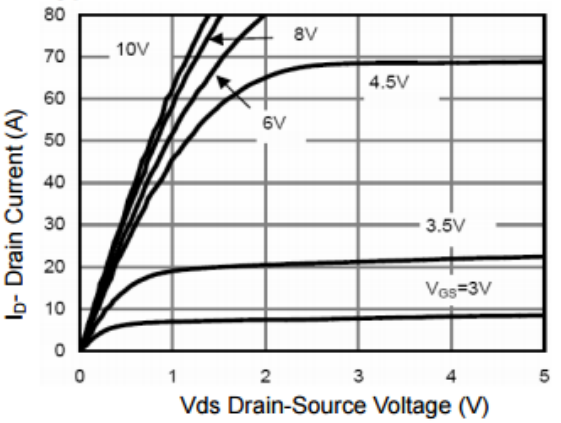


**Figure 1 Output Characteristics**

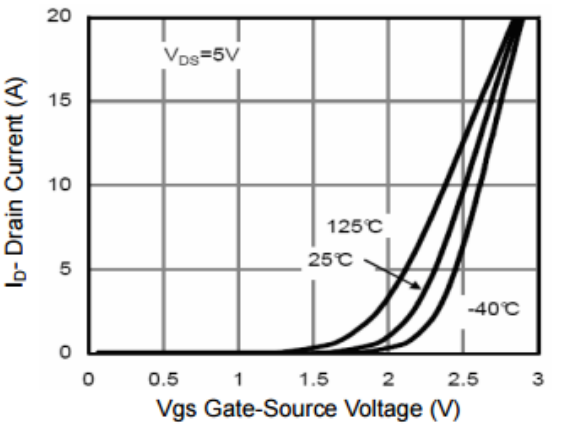


**Figure 2 Transfer Characteristics**

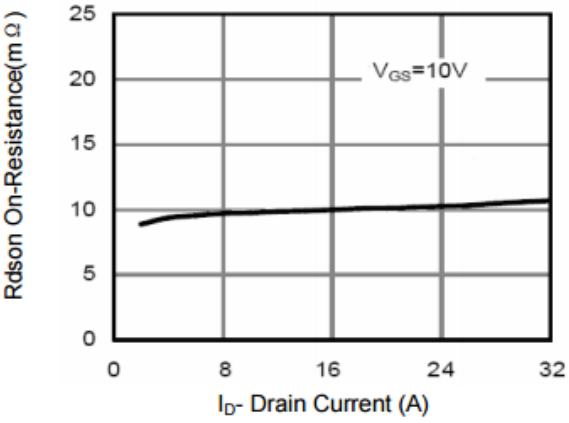


**Figure 3 Rdson- Drain Current**

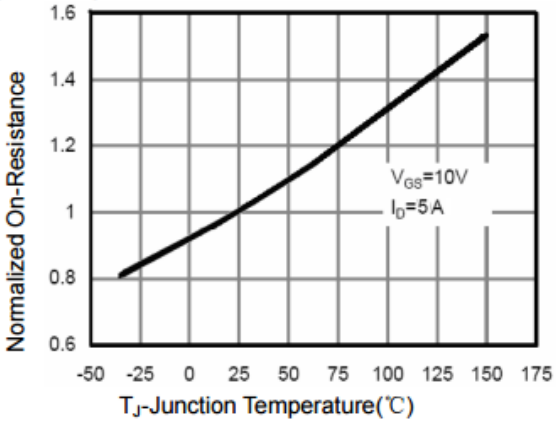


**Figure 4 Rdson-Junction Temperature**

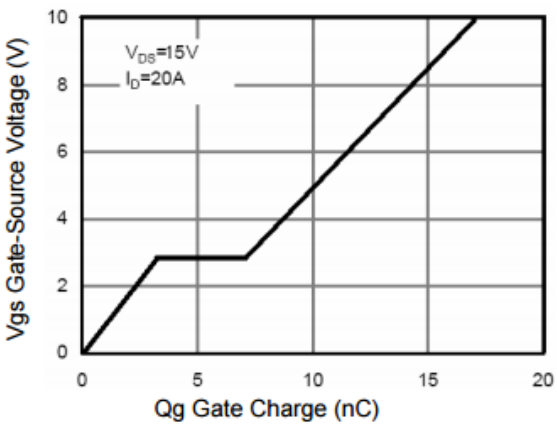


**Figure 5 Gate Charge**

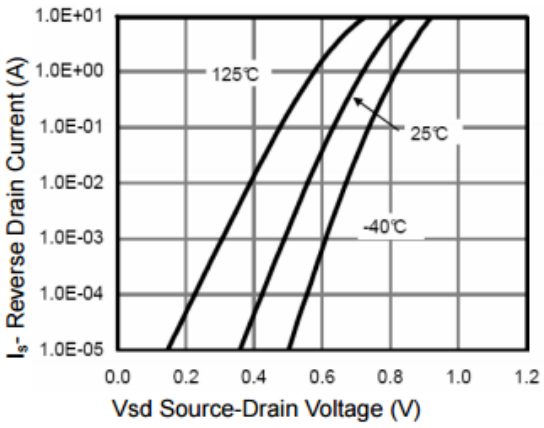


**Figure 6 Source- Drain Diode Forward**

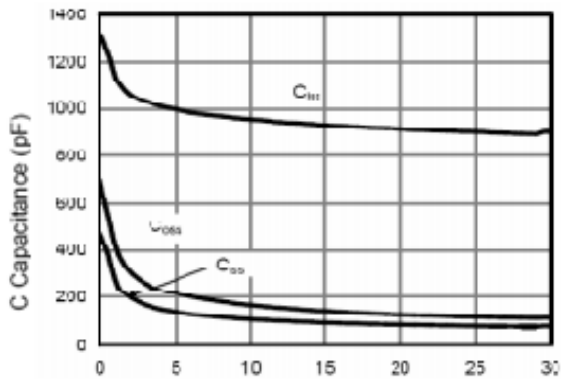


**Figure 7 Capacitance vs Vds**

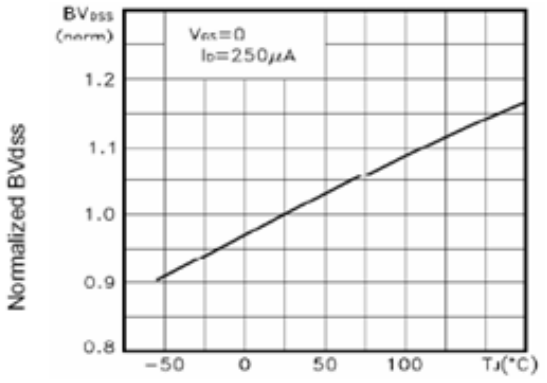


**Figure 9 $BV_{DSS}$ vs Junction Temperature**

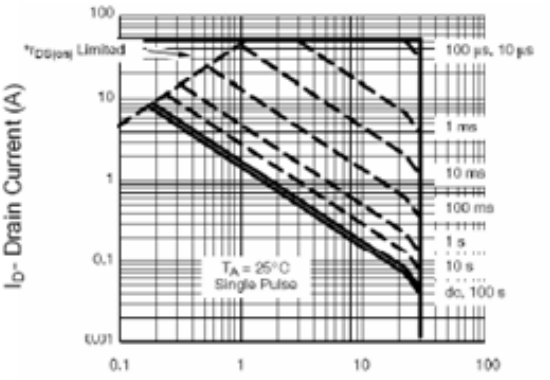


**Figure 8 Safe Operation Area**

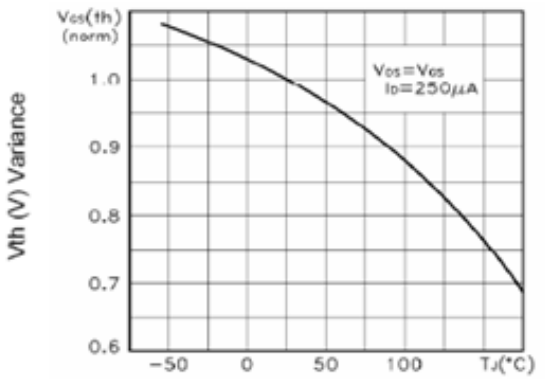


**Figure 10 $V_{GS(th)}$ vs Junction Temperature**

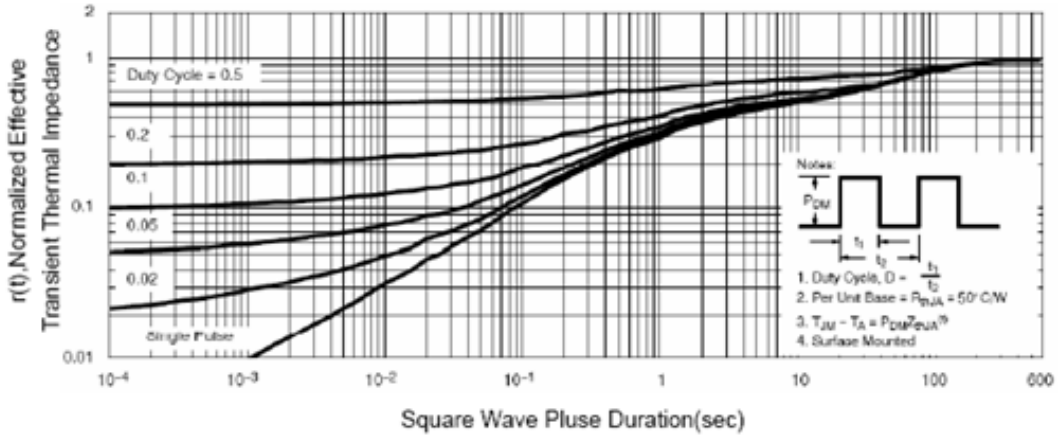


**Figure 11 Normalized Maximum Transient Thermal Impedance**

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