



# GL1130-8

## GL Silicon N-Channel Power MOSFET

### General Description:

The GL1130-8 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.

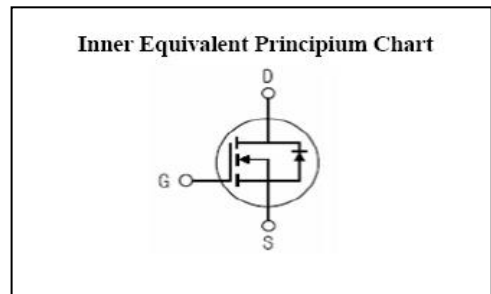
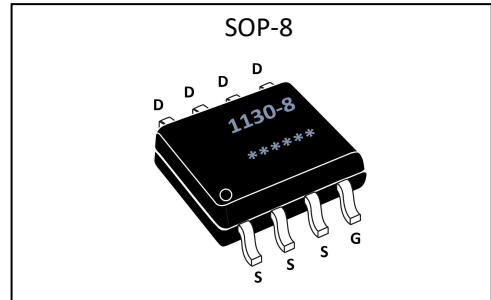
### Features:

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

### Applications:

- PWM applications
- Load switch
- Power management

V <sub>DSS</sub>	30	V
I <sub>D</sub>	8	A
P <sub>D</sub>	2.5	W
R <sub>DS(ON)MAX</sub>	20	mΩ



### Absolute (T<sub>c</sub>=25°C unless otherwise specified):

Symbol	Parameter	Rating	Units
V <sub>DSS</sub>	Drain-to-Source Voltage	30	V
I <sub>D</sub>	Continuous Drain Current	8	A
	Continuous Drain Current T <sub>c</sub> = 70 °C	6	A
I <sub>DM</sub> <sup>a1</sup>	Pulsed Drain Current	32	A
V <sub>GS</sub>	Gate-to-Source Voltage	±20	V
E <sub>as</sub> <sup>a2</sup>	L=0.1mH	28	mJ
dv/dt <sup>a3</sup>	Peak Diode Recovery dv/dt	5.0	V/ns
P <sub>D</sub>	Power Dissipation	2.5	W
T <sub>J</sub> , T <sub>stg</sub>	Operating Junction and Storage Temperature Range	150, -55 to 150	°C
T <sub>L</sub>	Maximum Temperature for Soldering	300	°C



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**Electrical Characteristics** (Tc=25°C unless otherwise specified):

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V <sub>DSS</sub>	Drain to Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	30	--	--	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Bvdss Temperature Coefficient	I <sub>D</sub> =-250uA, Reference 25°C	--	0.1	--	V/°C
I <sub>DSS</sub>	Drain to Source Leakage Current	V <sub>DS</sub> =30V, V <sub>GS</sub> = 0V, T <sub>a</sub> =25°C	--	--	1	μA
		V <sub>DS</sub> =24V, V <sub>GS</sub> =0V, T <sub>a</sub> =125°C	--	--	250	
I <sub>GSS(F)</sub>	Gate to Source Forward Leakage	V <sub>GS</sub> = +20V	--	--	1	μA
I <sub>GSS(R)</sub>	Gate to Source Reverse Leakage	V <sub>GS</sub> = -20V	--	--	-1	μA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
R <sub>DS(ON)</sub>	Drain-to-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =5A	--	11	20	mΩ
R <sub>DS(ON)</sub>	Drain-to-Source On-Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =5.0A	--	15	26	mΩ
V <sub>GS(TH)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.5	--	1.5	V

Pulse width tp ≤ 380μs, δ ≤ 2%

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =10A	15	--	--	S
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V f=1.0MHz	--	680	--	pF
C <sub>oss</sub>	Output Capacitance		--	160	--	
C <sub>rss</sub>	Reverse Transfer Capacitance		--	80	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
t <sub>d(ON)</sub>	Turn-on Delay Time	I <sub>D</sub> =1A, V <sub>DD</sub> =25V V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω	--	13	--	ns
t <sub>r</sub>	Rise Time		--	8	--	
t <sub>d(OFF)</sub>	Turn-Off Delay Time		--	40	--	
t <sub>f</sub>	Fall Time		--	30	--	
Q <sub>g</sub>	Total Gate Charge	I <sub>D</sub> =5A, V <sub>DD</sub> =30V V <sub>GS</sub> =5V	--	8	--	nC
Q <sub>gs</sub>	Gate to Source Charge		--	4.8	--	
Q <sub>gd</sub>	Gate to Drain ( "Miller" ) Charge		--	2.2	--	

### 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	$I_S=8A, T_J=25^\circ C$	--	60	--	ns
$Q_{rr}$	Reverse Recovery Charge	$di_f/dt=100A/us, V_{GS}=0V$	--	150	--	nC

Pulse width  $t_p \leq 380\mu s, \delta \leq 2\%$

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

<sup>a1</sup>: Repetitive rating; pulse width limited by maximum junction temperature

<sup>a2</sup>:  $T_J=25^\circ C, V_{DD}=15V, V_G=10V, L=0.1mH$

<sup>a3</sup>:  $I_{SD}=8A, di/dt \leq 100A/us, V_{DD} \leq BV_{DS}, \text{Start } T_J=25^\circ C$

### Typical Electrical and Thermal Characteristics

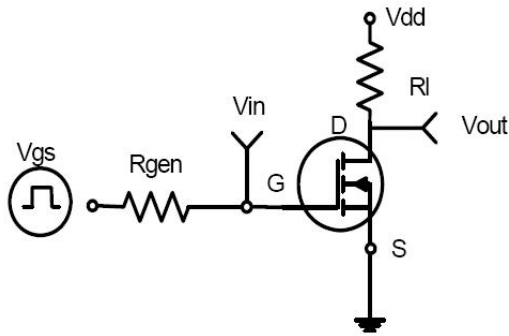


Figure 1: Switching Test Circuit

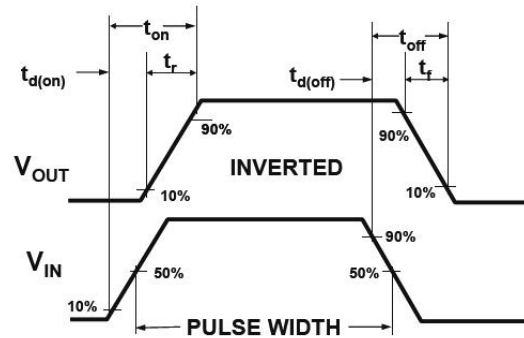


Figure 2: Switching Waveforms



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### Typical Electrical and Thermal Characteristics (Curves)

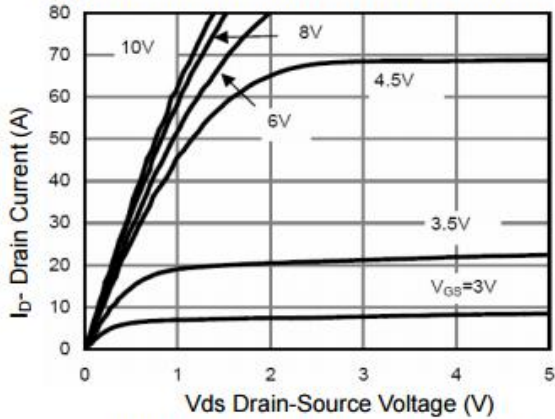


Figure 1 Output Characteristics

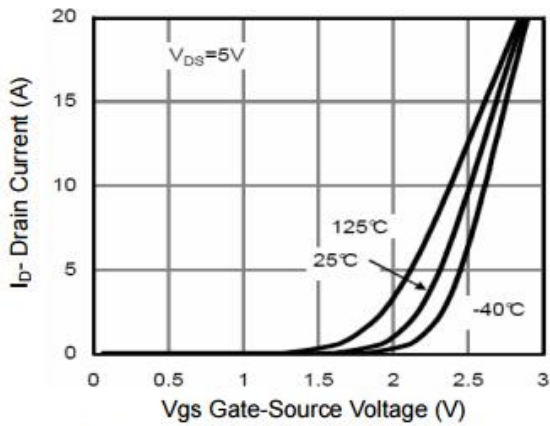


Figure 2 Transfer Characteristics

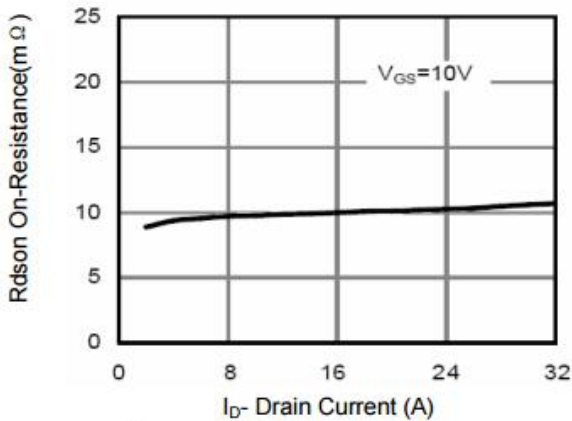


Figure 3 Rdson- Drain Current

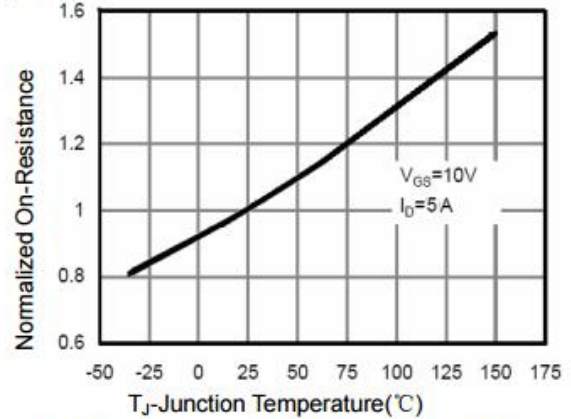


Figure 4 Rdson-Junction Temperature

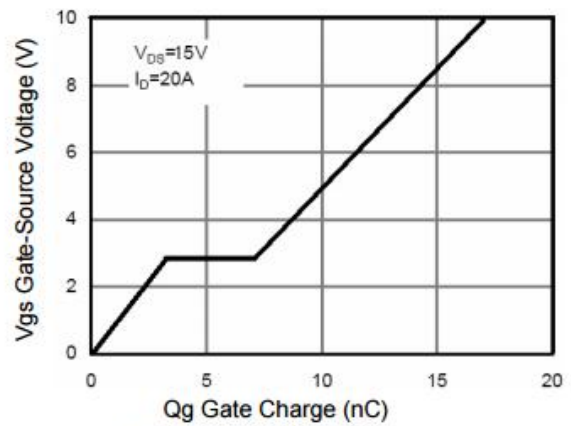


Figure 5 Gate Charge

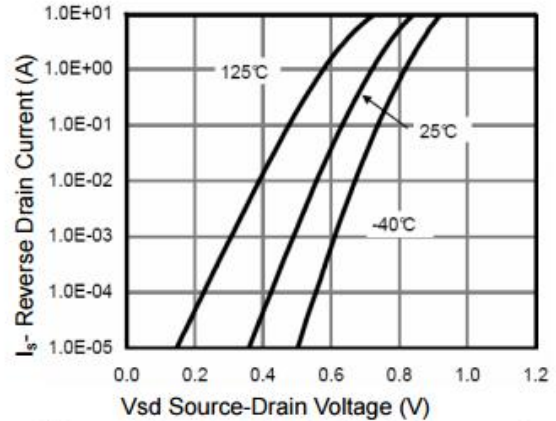


Figure 6 Source- Drain Diode Forward



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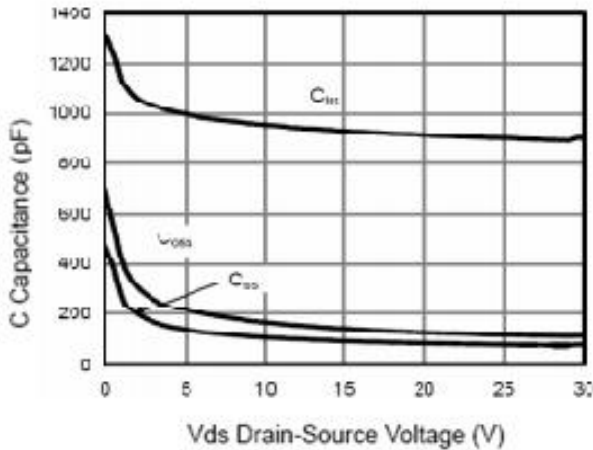


Figure 7 Capacitance vs Vds

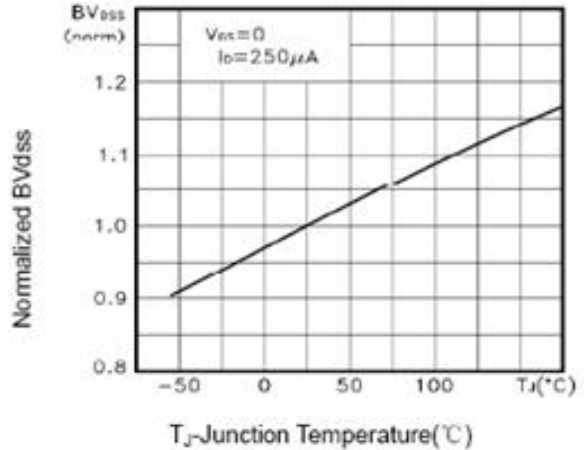


Figure 9  $BV_{DSS}$  vs Junction Temperature

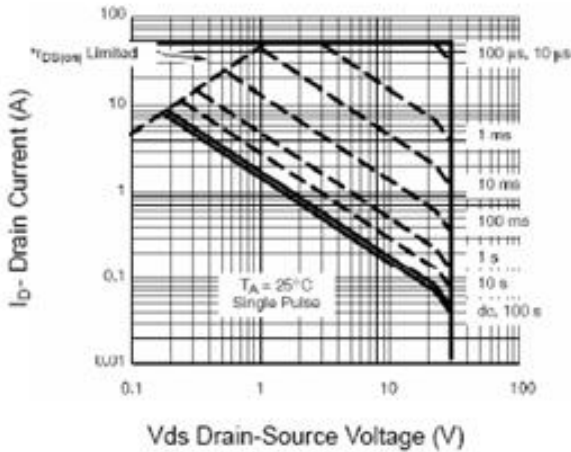


Figure 8 Safe Operation Area

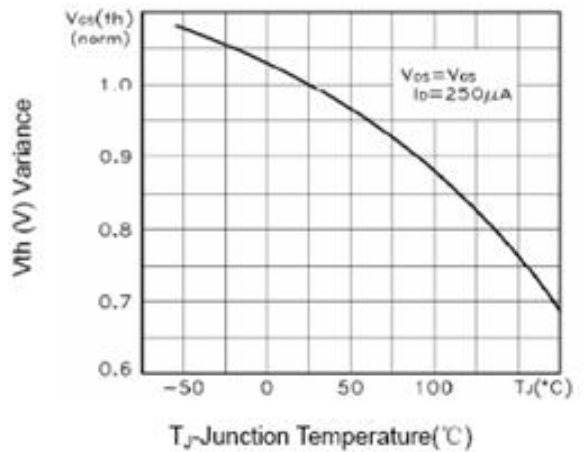


Figure 10  $V_{GS(th)}$  vs Junction Temperature

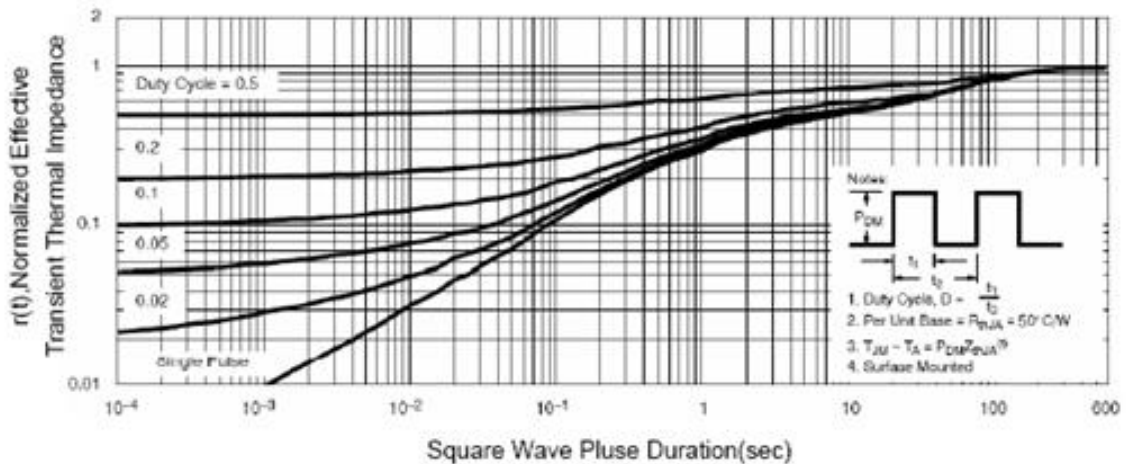


Figure 11 Normalized Maximum Transient Thermal Impedance