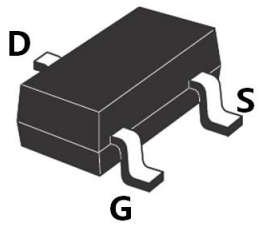
GL Silicon N-Channel Power MOSFET

General Description

The GL14N03 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 SOT-23, which accords with the RoHS standard.

V_{DSS}	30	V
I_D	14	A
P_D	1.5	W
$R_{DS(ON)MAX}$	15	mΩ

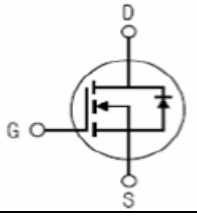
SOT-23



Features

- $R_{DS(ON)}$ <15mΩ @ V_{GS}=10V
- 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	14	A
I_{DM}	Pulsed Drain Current	48	A
V_{GS}	Gate-to-Source Voltage	±12	V
P_D	Power Dissipation	1.5	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, −55 to 150	℃

Symbol	Parameter	Typ.	Units
$R_{\theta JA}$	Junction-to-Ambient[a2]	83	℃/W

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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
I_{DSS}	Drain to Source Leakage Current	V_{DS}=24V,V_{GS}=0V,T_a=25℃	--	--	1.0	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=+12V	--	--	0.1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-12V	--	--	-0.1	μA

ON Characteristics[a3]						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	V_{GS}=10V,I_D=7A	--	--	15	mΩ
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	V_{GS}=4.5V,I_D=5A	--	--	20	mΩ
$R_{DS(ON)3}$	Drain-to-Source On-Resistance	V_{GS}=2.5V,I_D=5A	--	--	25	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	0.5	--	1.5	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=10A	10	--	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=15V f=1.0MHz	--	1450	--	pF
C_{oss}	Output Capacitance		--	150	--	
C_{rss}	Reverse Transfer Capacitance		--	110	--	

Resistive Switching Characteristics[a4]						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=10V,R_L=2.7Ω V_{GS}=10V,R_G=3Ω	--	--	10	ns
t_r	Rise Time		--	--	14	
$t_{d(OFF)}$	Turn-Off Delay Time		--	--	70	
t_f	Fall Time		--	--	12	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{SD}	Diode Forward Voltage[a3]	I_S=7A,V_{GS}=0V	--	--	1.5	V

[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

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

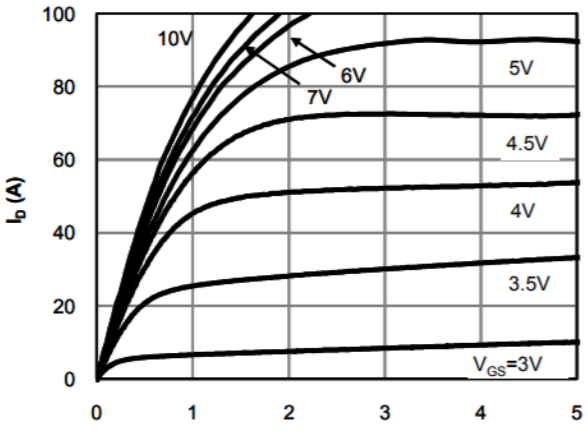

Fig 1: On-Region Characteristics

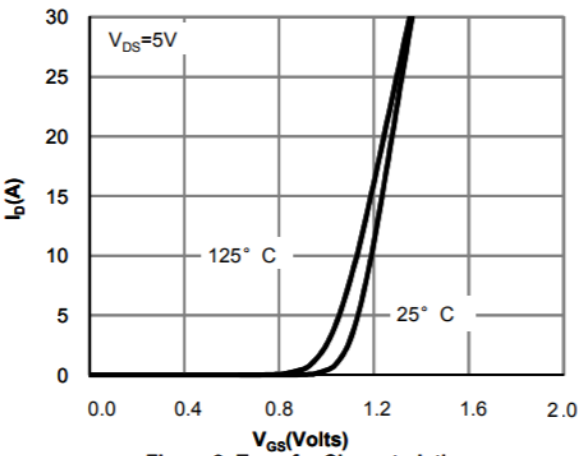

Figure 2: Transfer Characteristics

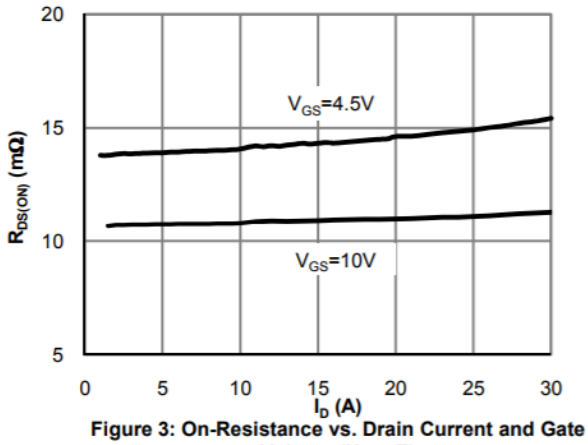

Figure 3: On-Resistance vs. Drain Current and Gate

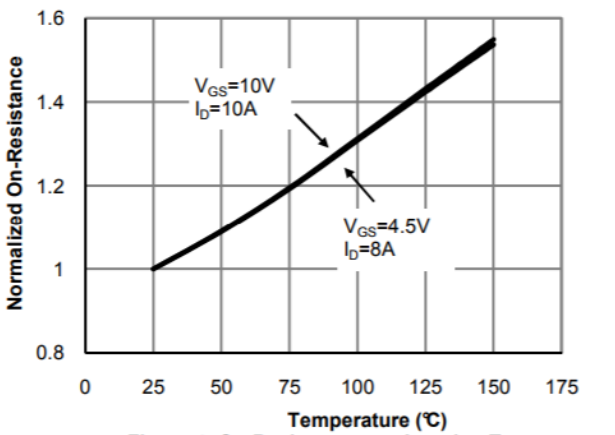

Figure 4: On-Resistance vs. Junction Temperature

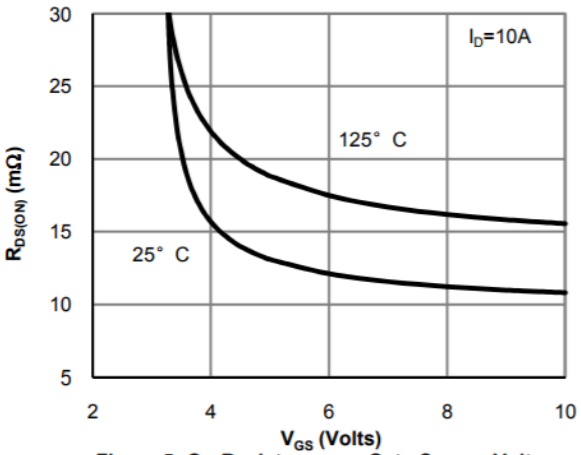

Figure 5: On-Resistance vs. Gate-Source Voltage

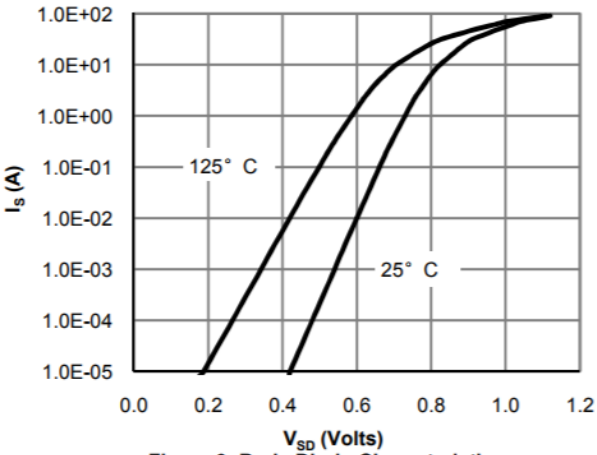

Figure 6: Body-Diode Characteristics

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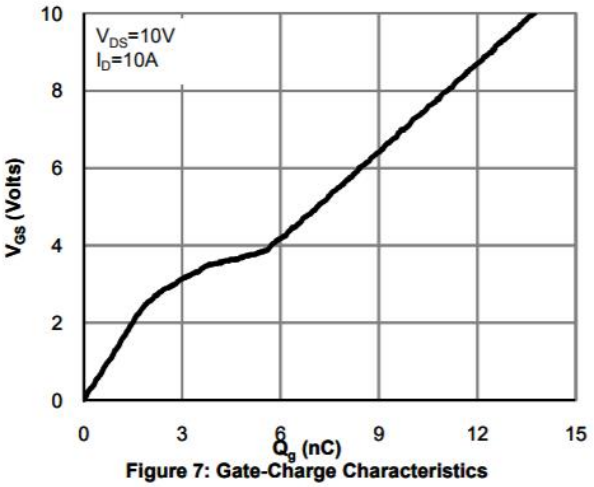

Figure 7: Gate-Charge Characteristics

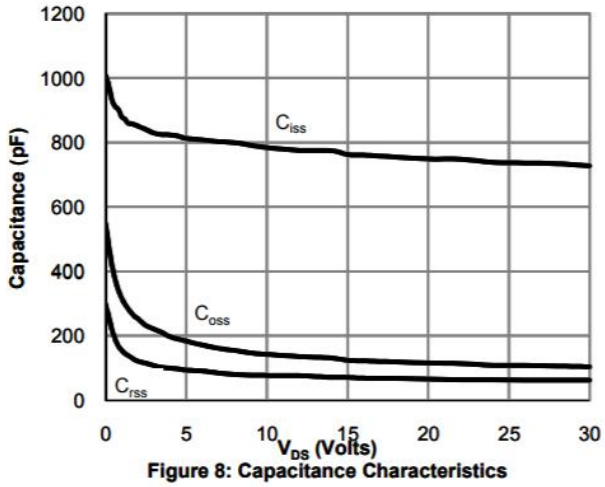

Figure 8: Capacitance Characteristics

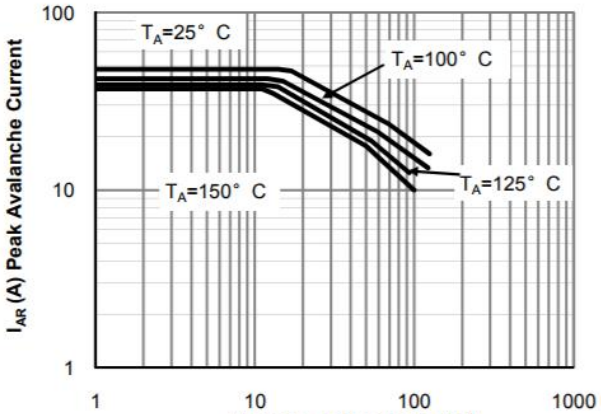

Figure 9: Single Pulse Avalanche capability

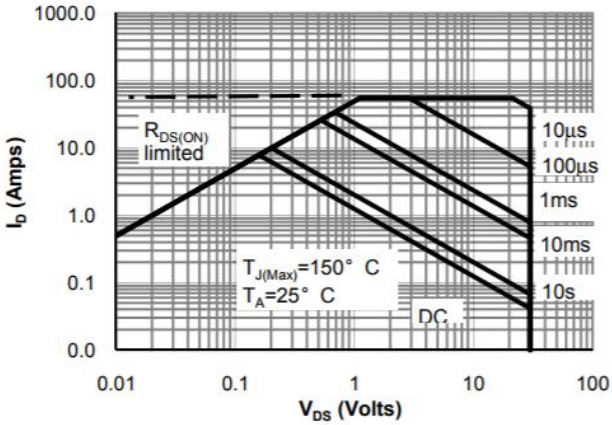

Figure 10: Maximum Forward Biased Safe Operating Area

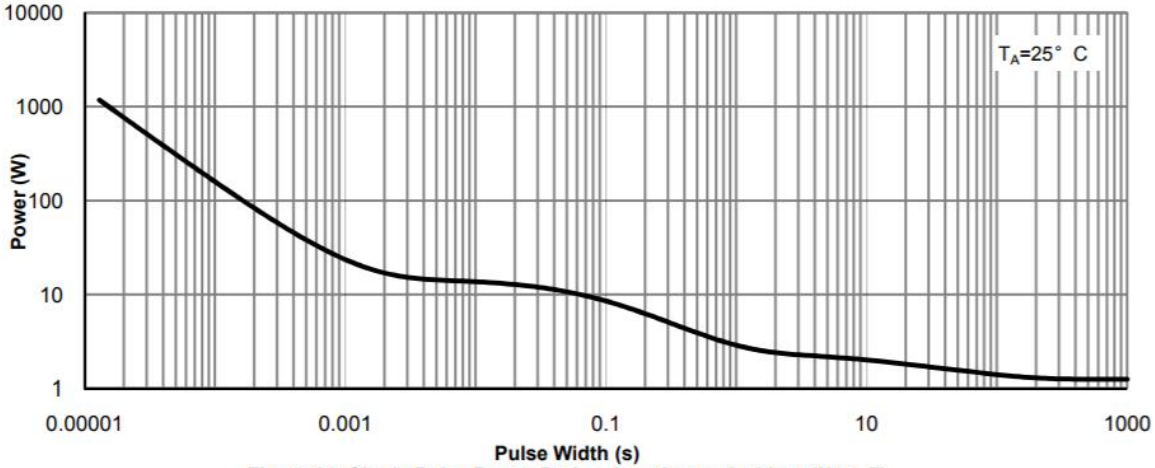

Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)

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