GL150N03AD

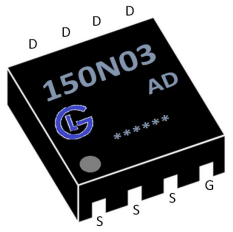
GL Silicon N-Channel Power MOSFET

V_{DSS}	30	V
I_D	150	A
P_D	78	W
$R_{DS(ON)}$	1.9	mΩ

General Description

The GL150N03AD 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 QFN5×6, which accords with the RoHS standard.

QFN5×6



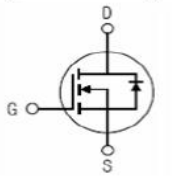
Features

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

Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Inner Equivalent Principium Chart



Absolute (Tc= 25℃ unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	30	V
I_D	Continuous Drain Current	150	A
	Continuous Drain Current T_C = 100 °C	90	A
I_{DM}	Pulsed Drain Current	480	A
V_{GS}	Gate-to-Source Voltage	±20	V
P_D	Power Dissipation	78	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	175, −55 to 150	℃
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	1.6	℃/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	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}=30V,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=15A	--	1.9	2.5	mΩ
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=4.5V,I_D=12A	--	2.5	3.5	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1		3	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=20A	15	--	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=10V f=1.0MHz	--	4000	--	pF
C_{oss}	Output Capacitance		--	100	--	
C_{rss}	Reverse Transfer Capacitance		--	420	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=10V,I_D=25A V_{GS}=5V,R_G=1.8Ω	--	7	--	ns
t_r	Rise Time		--	18	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	30	--	
t_f	Fall Time		--	17	--	
Q_g	Total Gate Charge	V_{DD}=10V, I_D=25A V_{GS}=10V	--	28	--	nC
Q_{gs}	Gate to Source Charge		--	7	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	6.8	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	120	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	240	A
V_{SD}	Diode Forward Voltage	I_S=12A,V_{GS}=0V	--	--	1.5	V
t_{rr}	Reverse Recovery Time	I_S=10A,T_j = 25°C	--	30	--	ns
Q_{rr}	Reverse Recovery Charge	dI_F/dt=100A/us,V_{GS}=0V	--	44	--	nC
Pulse width tp≤380μs,δ≤2%						

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

Test Circuit and Waveform

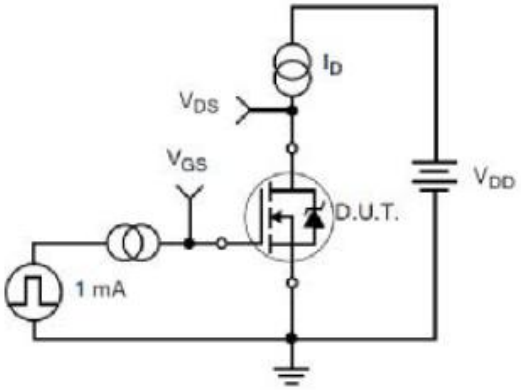


Figure 17. Gate Charge Test Circuit

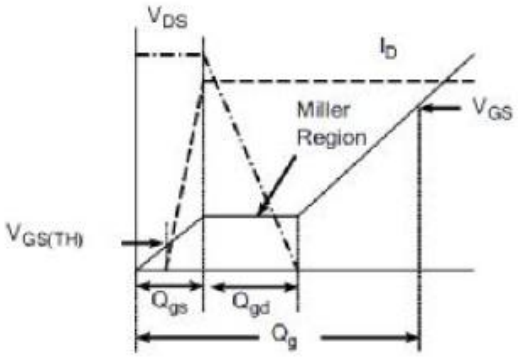


Figure 18. Gate Charge Waveform

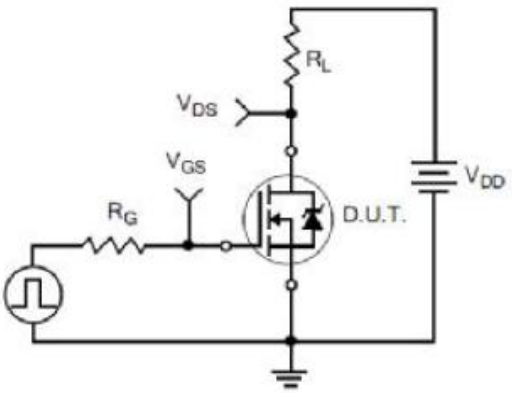


Figure 19. Resistive Switching Test Circuit

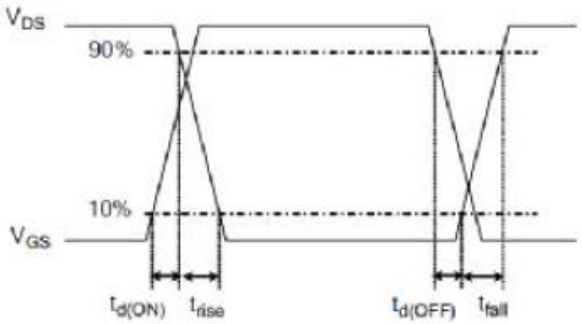


Figure 20. Resistive Switching Waveforms

Characteristics Curves

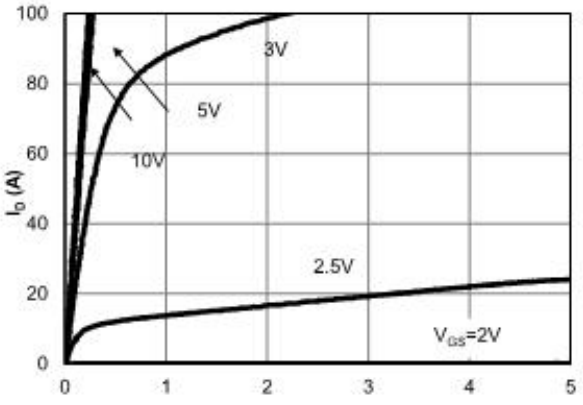


Figure 1: On-Region Characteristics (Note E)

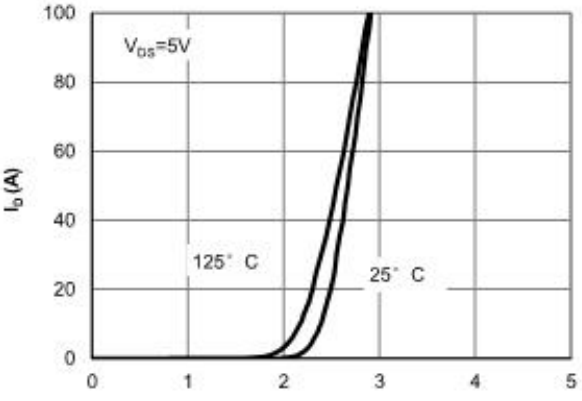


Figure 2: Transfer Characteristics (Note E)

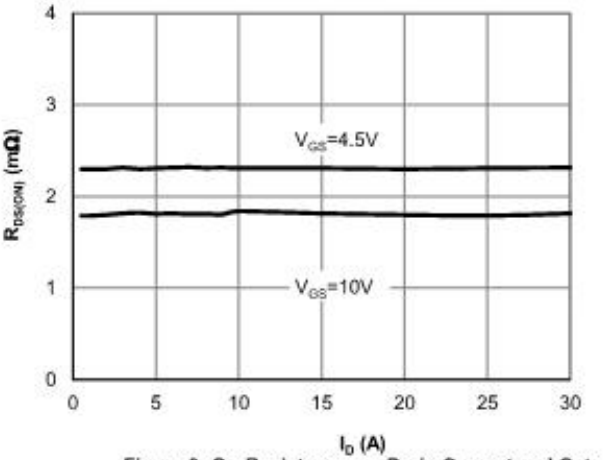


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

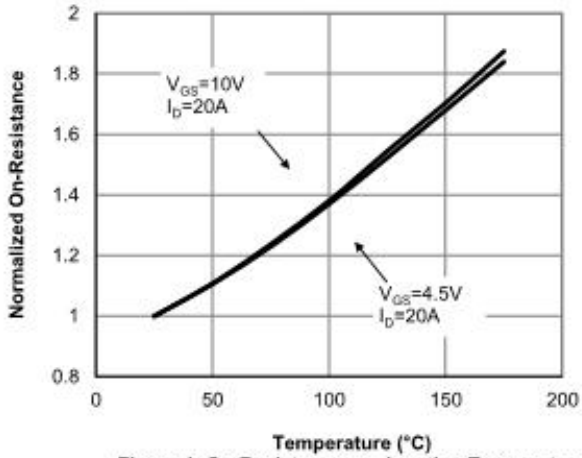


Figure 4: On-Resistance vs. Junction Temperature (Note E)

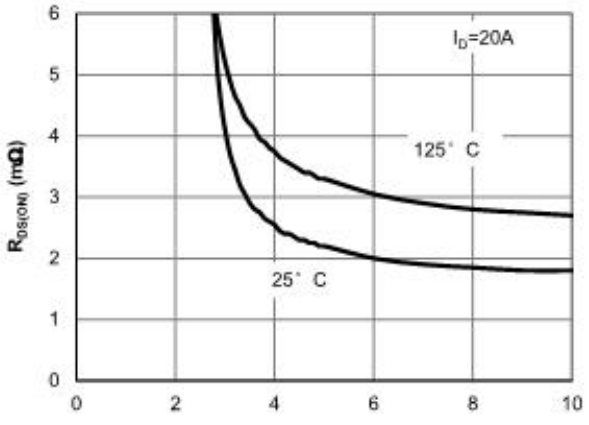


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

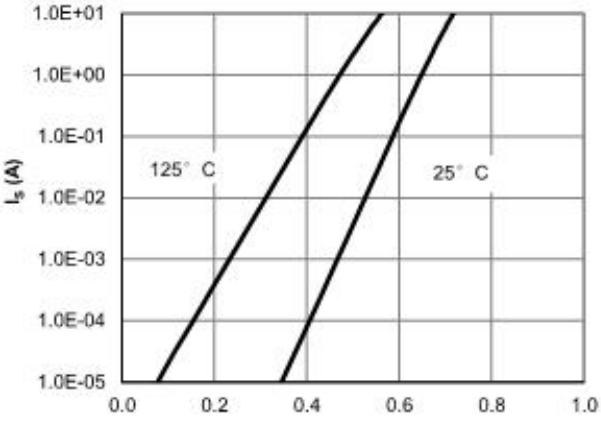


Figure 6: Body-Diode Characteristics (Note E)

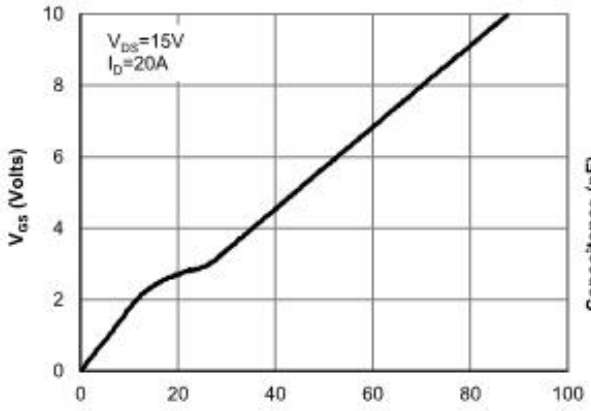


Figure 7: Gate-Charge Characteristics

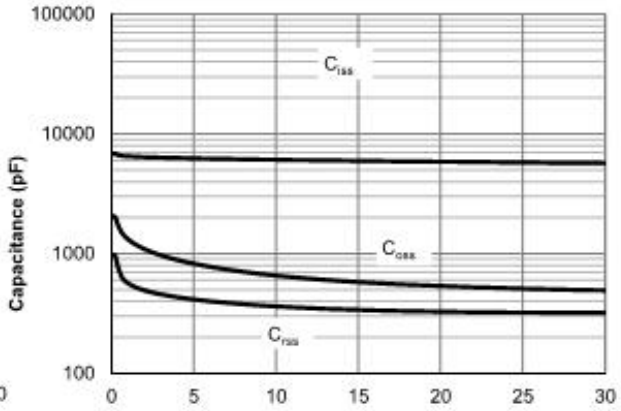


Figure 8: Capacitance Characteristics

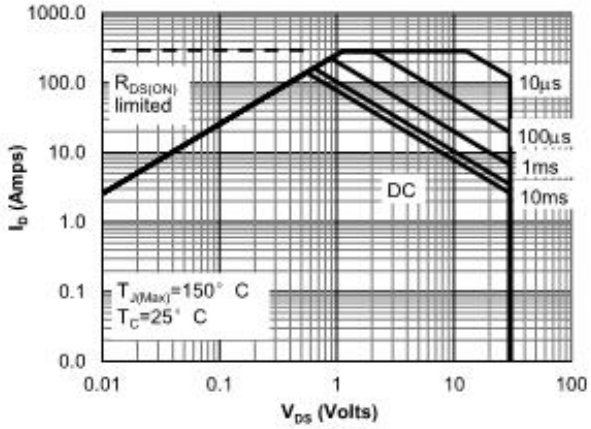


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

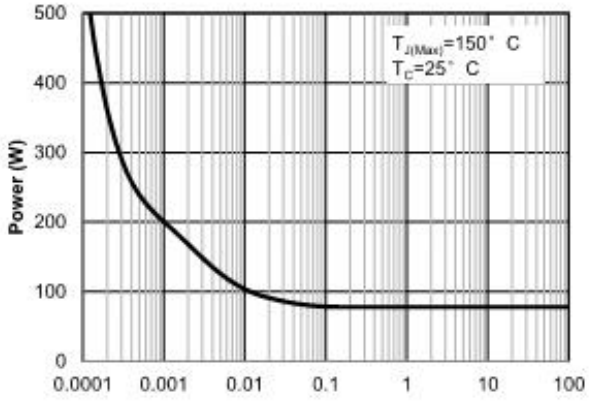


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

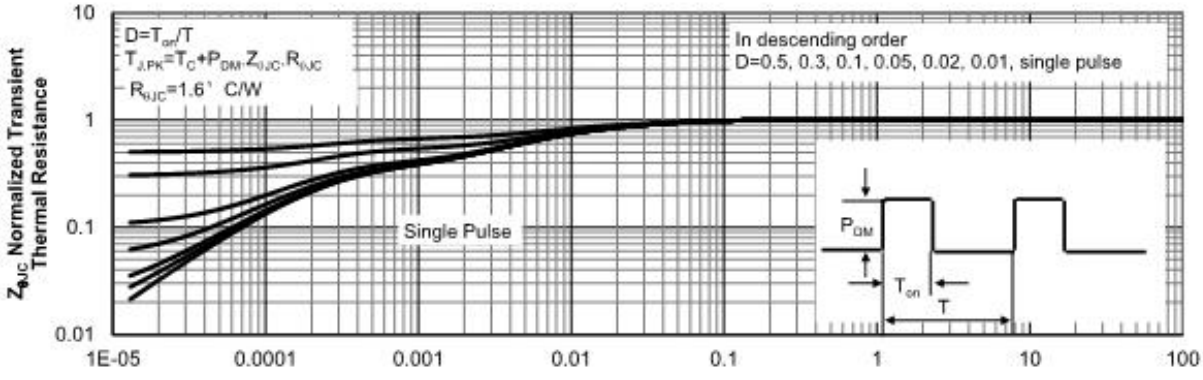


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

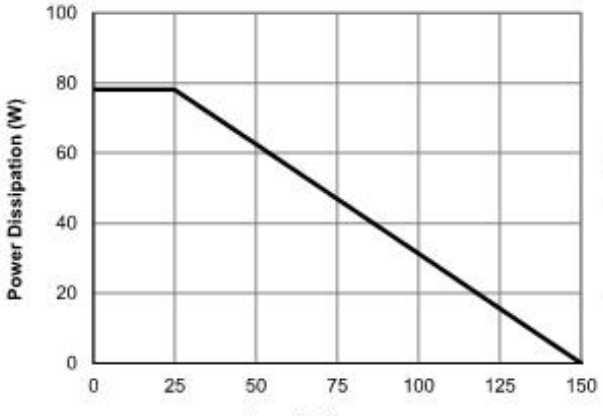


Figure 12: Power De-rating (Note F)

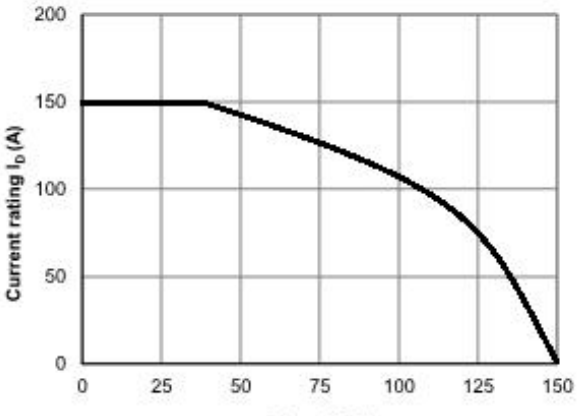


Figure 13: Current De-rating (Note F)

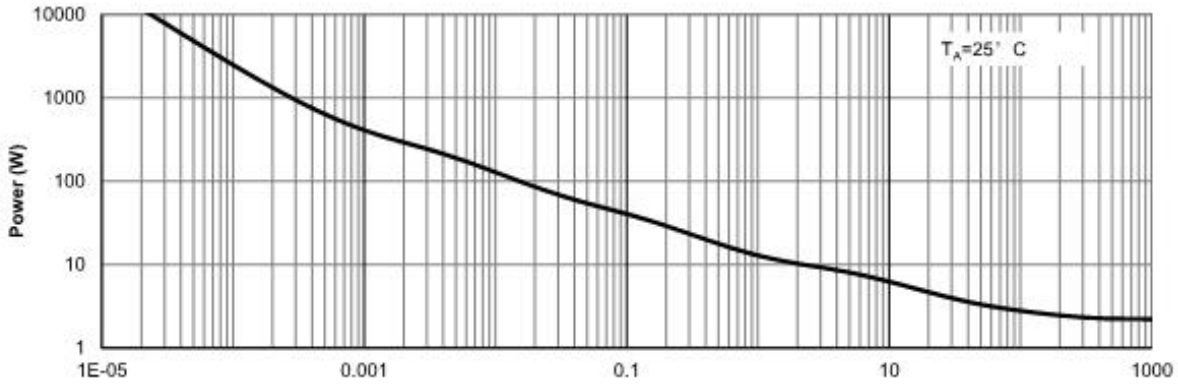


Figure 14: Single Pulse Power Rating Junction-to-Ambient (Note H)

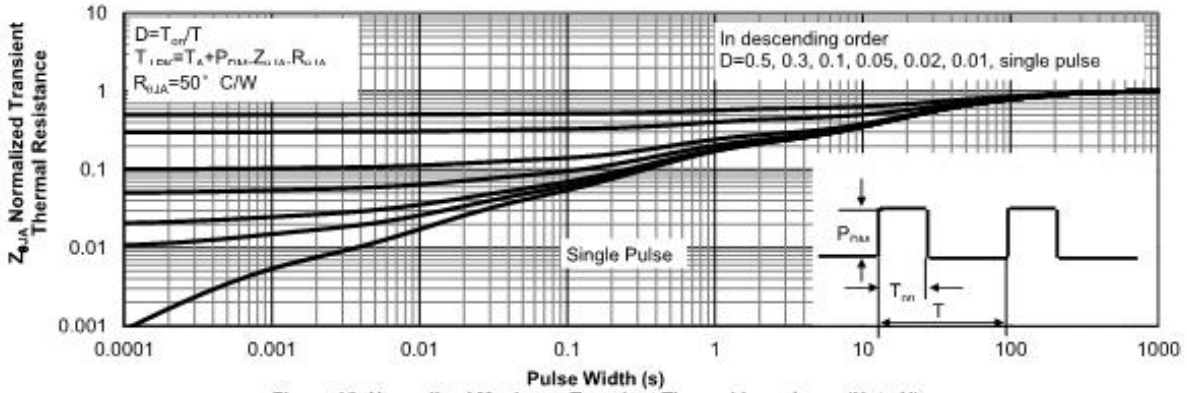


Figure 15: Normalized Maximum Transient Thermal Impedance (Note H)