GL150N03FA9

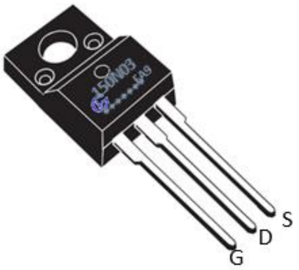
GL Silicon N-Channel Power MOSFET

General Description:

The GL150N03FA9 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 TO-220F, which accords with the RoHS standard.

V_{DSS}	30	V
I_D	150	A
P_D	105	W
$R_{DS(ON)type}$	2.0	mΩ

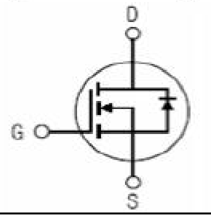
TO-220F



Features:

- $R_{DS(ON)}$ <2.5mΩ @ V_{GS}=10V (Typ2.0mΩ)
- 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	150	A
	Continuous Drain Current (T_C=100℃)	120	A
I_{DM}	Pulsed Drain Current	400	A
V_{GS}	Gate-to-Source Voltage	±20	V
P_D	Power Dissipation	105	W
E_{AS}	Single pulse avalanche energy^{a5}	890	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range	175, –55 to 175	℃

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}=30V, V_{GS}= 0V,T_a = 25℃	--	--	1.0	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=+20V	--	--	0.1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-20V	--	--	-0.1	μA

ON Characteristics[a3]

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V,I_D=25A	--	2.0	2.5	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.0	1.7	3.0	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=75A	--	80	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=15V f=1.0MHz	--	6150	--	pF
C_{oss}	Output Capacitance		--	1550	--	
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}=15V,I_D=75A V_{GS}=10V,R_G=1.6Ω	--	13	--	ns
tr	Rise Time		--	7.5	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	51	--	
t_f	Fall Time		--	8.6	--	
Q_g	Total Gate Charge	V_{DD}=15V, I_D=75A V_{GS}=10V	--	98	--	nC
Q_{gs}	Gate to Source Charge		--	16	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	11	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current ^{a2}(Body Diode)		--	--	150	A
V_{SD}	Diode Forward Voltage^{a3}	I_S=100A,V_{GS}=0V	--	--	1.5	V

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case^{a2}	1.43	℃/W

[a1]: Repetitive Rating: Pulse width limited by maximum junction temperature.

[a2]: Surface Mounted on FR4 Board, t≤10sec.

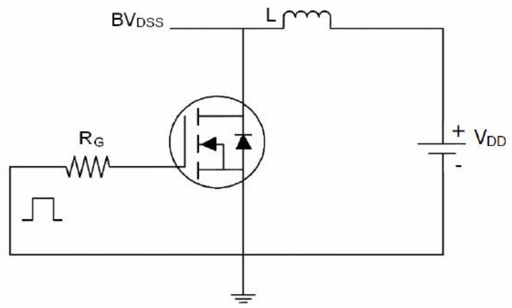
[a3]: Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.

[a4]: Guaranteed by design, not subject to production

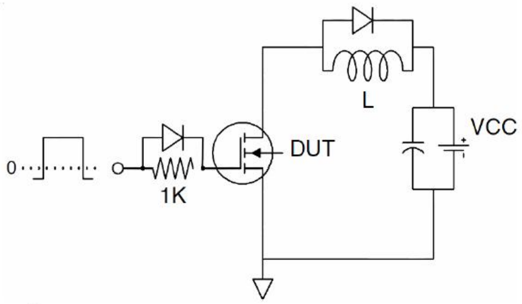
[a5]: EAS condition: Tj=25℃,V_{DD}=15V,V_G=10V,L=0.5mH,Rg=25Ω

Test circurt

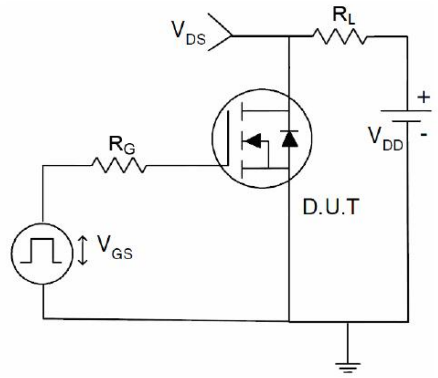
1) EAS test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics

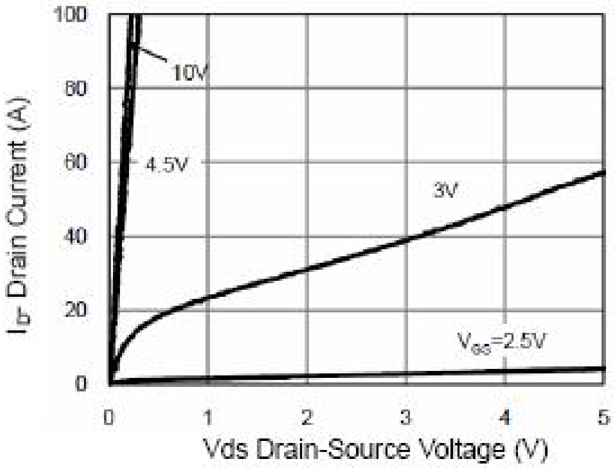


Figure 1 Output Characteristics

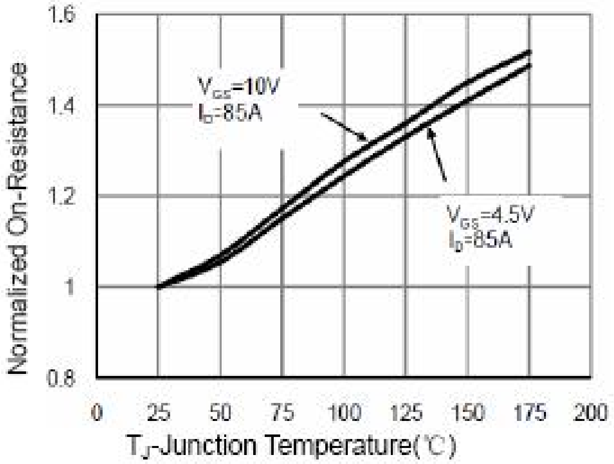


Figure 4 Rdson-Junction Temperature

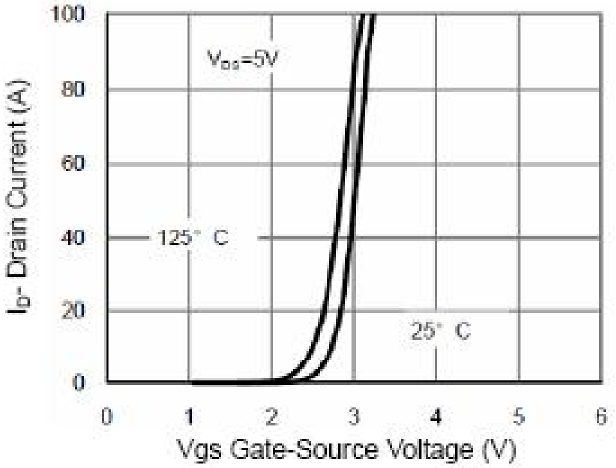


Figure 2 Transfer Characteristics

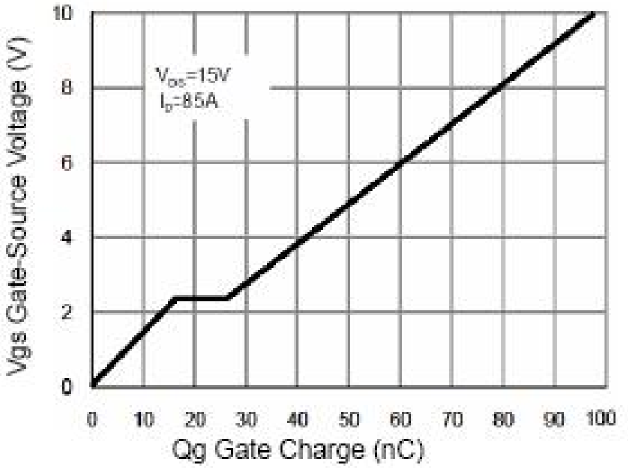


Figure 5 Gate Charge

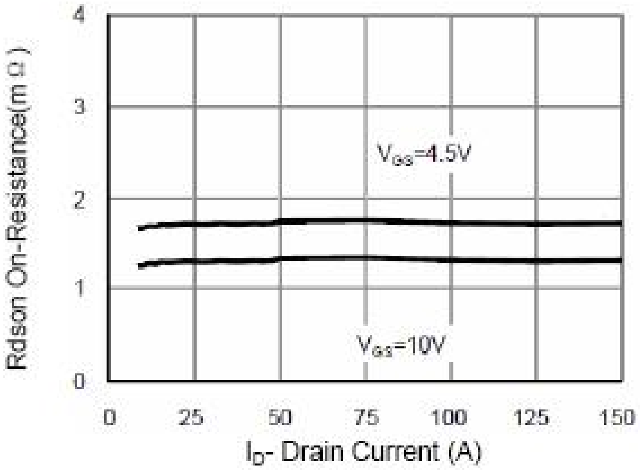


Figure 3 Rdson- Drain Current

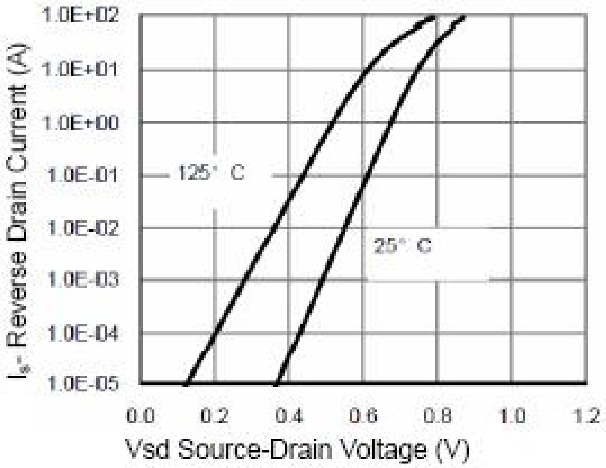


Figure 6 Source- Drain Diode Forward

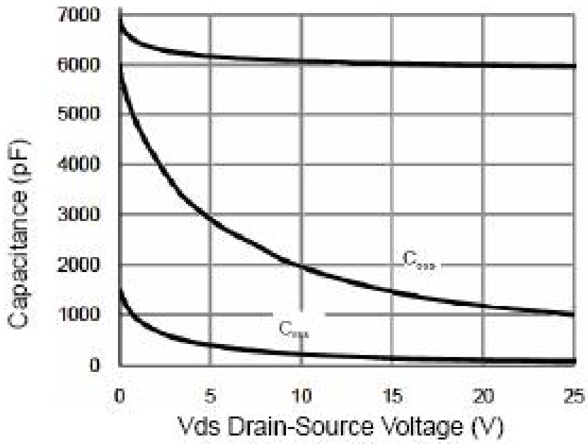


Figure 7 Capacitance vs Vds

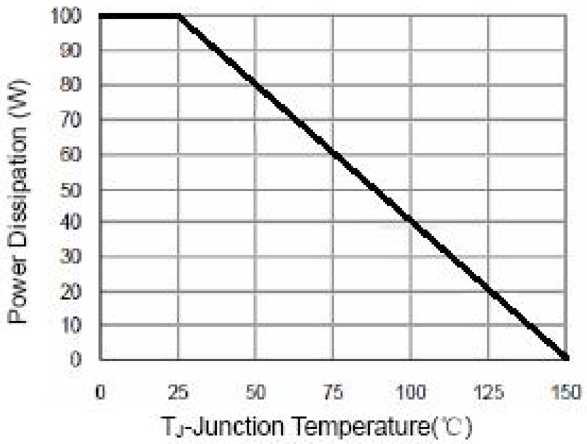


Figure 9 Power De-rating

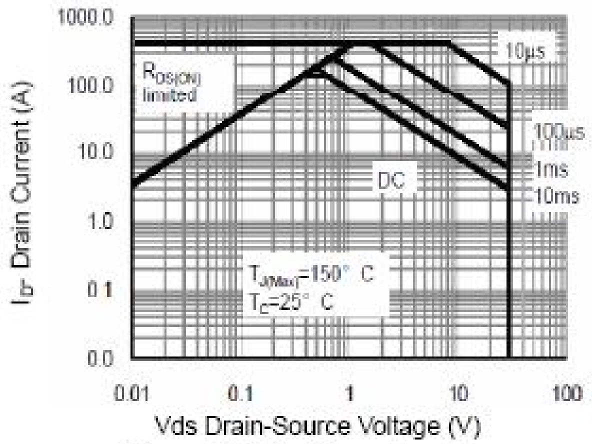


Figure 8 Safe Operation Area

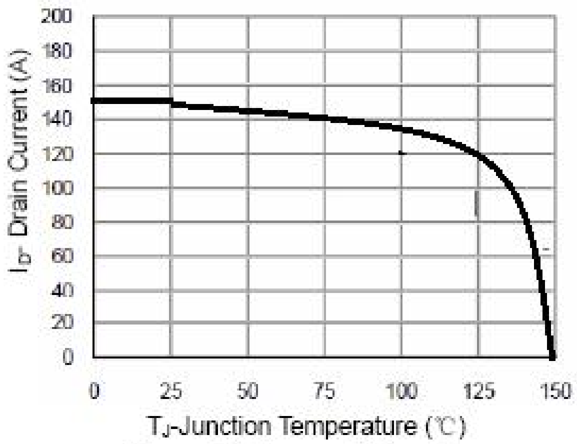


Figure 10 Current De-rating

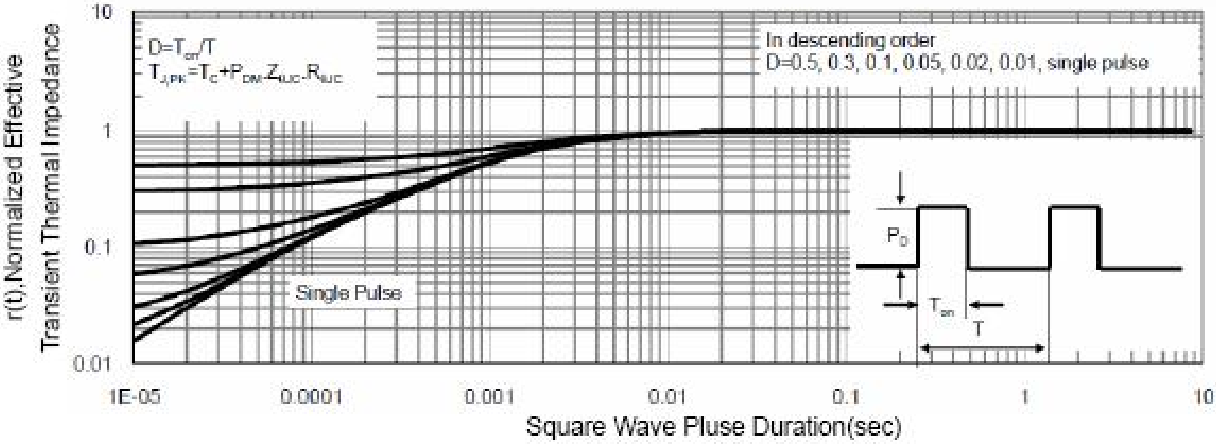


Figure 11 Normalized Maximum Transient Thermal Impedance