



GLN4013ASD

GL Silicon N-Channel Power MOSFET

General Description:

The GLN4013ASD 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 and two dies in this form.

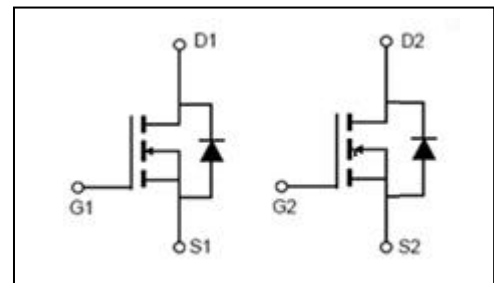
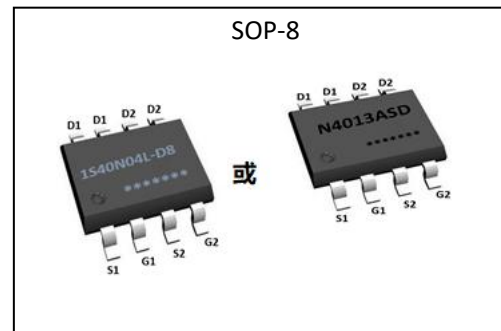
Features:

- 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

V _{DSS}	40	V
I _D	10	A
P _D	3	W
R _{DS(ON)TYP}	15	mΩ



Absolute (T_c= 25°C unless otherwise specified):

Symbol	Parameter	Rating	Units
V _{DSS}	Drain-to-Source Voltage	40	V
I _D	Continuous Drain Current	10	A
	Continuous Drain Current T _c = 100 °C	7	A
I _{DM}	Pulsed Drain Current	40	A
V _{GS}	Gate-to-Source Voltage	± 20	V
E _{AS} ^{a2}	Single Pulse Avalanche Energy	80	mJ
E _{AR} ^{a1}	Avalanche Energy ,Repetitive	20	mJ
I _{AR} ^{a1}	Avalanche Current	6	A
dv/dt ^{a3}	Peak Diode Recovery dv/dt	5.0	V/ns
P _D	Power Dissipation	3.0	W
T _J , T _{stg}	Operating Junction and Storage Temperature Range	150, -55 to 150	°C
T _L	Maximum Temperature for Soldering	300	°C



GLN4013ASD

GL Silicon N-Channel Power MOSFET

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

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	40	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	Bvdss Temperature Coefficient	$I_D=250\mu A$, Reference 25°C	--	0.1	--	V/°C
I_{DSS}	Drain to Source Leakage Current	$V_{DS}=40V, V_{GS}=0V, T_a=25^\circ C$	--	--	1	μA
		$V_{DS}=32V, V_{GS}=0V, T_a=125^\circ C$	--	--	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	$V_{GS}=10V, I_D=10A$	--	15	20	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.7	2.5	V
Pulse width $t_p \leq 380\mu s, \delta \leq 2\%$						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=20V$ $f=1.0MHz$	--	960	--	pF
C_{oss}	Output Capacitance		--	100	--	
C_{rss}	Reverse Transfer Capacitance		--	95	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_D=10A, V_{DD}=20V$ $V_{GS}=10V, R_G=3.0\Omega$	--	5.5	--	ns
t_r	Rise Time		--	14	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	24.0	--	
t_f	Fall Time		--	12	--	
Q_g	Total Gate Charge	$I_D=10A, V_{DD}=20V$ $V_{GS}=10V$	--	22	--	nC
Q_{gs}	Gate to Source Charge		--	3	--	
Q_{gd}	Gate to Drain ("Miller") Charge		--	5	--	

Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	10	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	40	A
V_{SD}	Diode Forward Voltage	$I_S=10A, V_{GS}=0V$	--	--	1.5	V
t_{rr}	Reverse Recovery Time	$I_S=10A, T_J=25^\circ C$	--	30	--	ns
Q_{rr}	Reverse Recovery Charge	$dI_F/dt=100A/us, V_{GS}=0V$	--	40	--	nC

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

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

^{a1}: Repetitive rating; pulse width limited by maximum junction temperature

^{a2}: EAS condition : $T_J=25^\circ C, V_{DD}=30V, V_G=10V, L=0.5mH, R_g=25\Omega$

^{a3}: $I_{SD}=10A, di/dt \leq 100A/us, V_{DD} \leq BV_{DS}, \text{Start } T_J=25^\circ C$

Test Circuit and Waveform

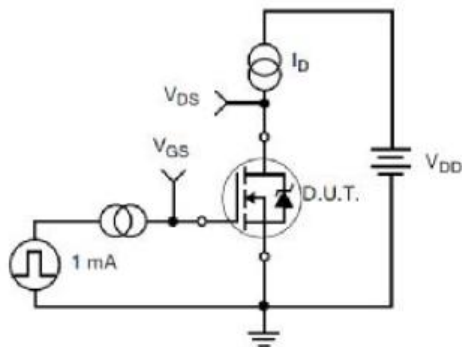


Figure 17. Gate Charge Test Circuit

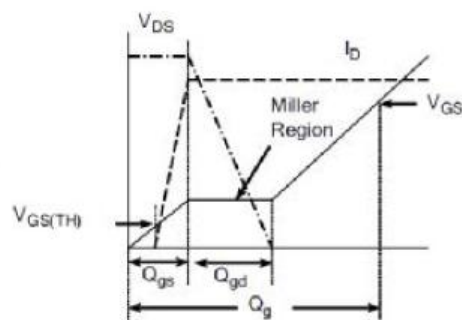


Figure 18. Gate Charge Waveform

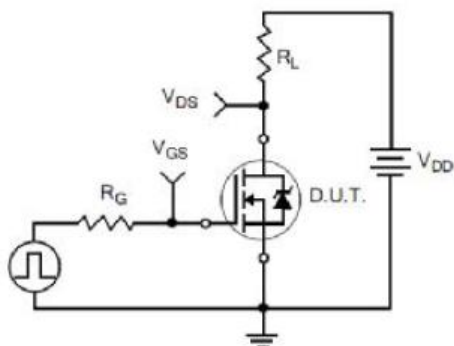


Figure 19. Resistive Switching Test Circuit

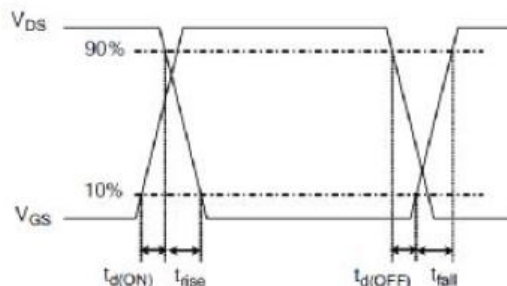


Figure 20. Resistive Switching Waveforms

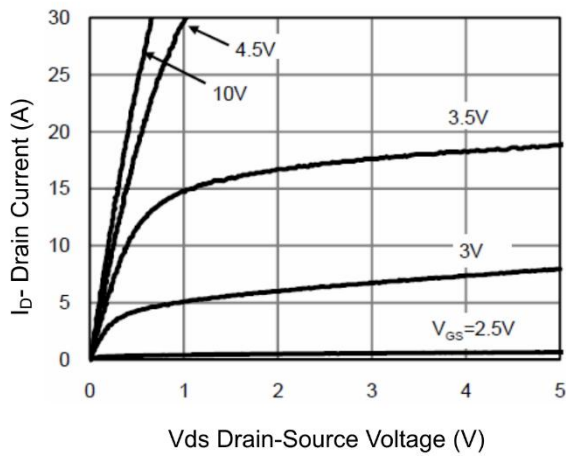


Figure 1 Output Characteristics

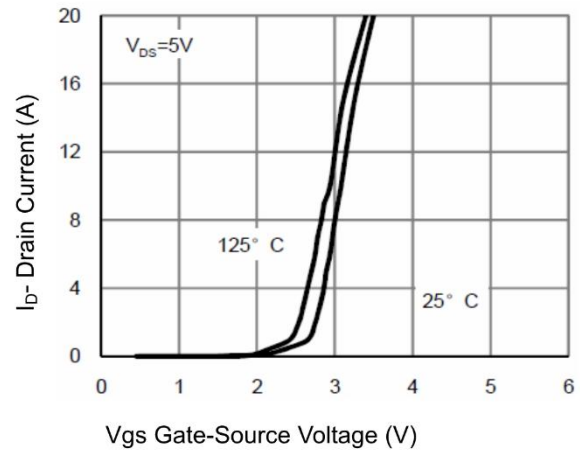


Figure 2 Transfer Characteristics

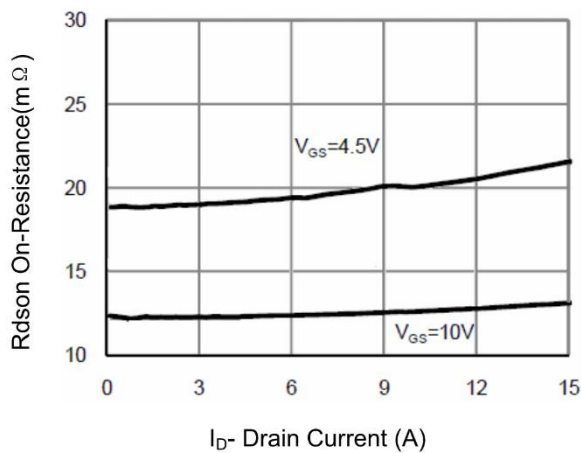


Figure 3 Drain-Source On-Resistance

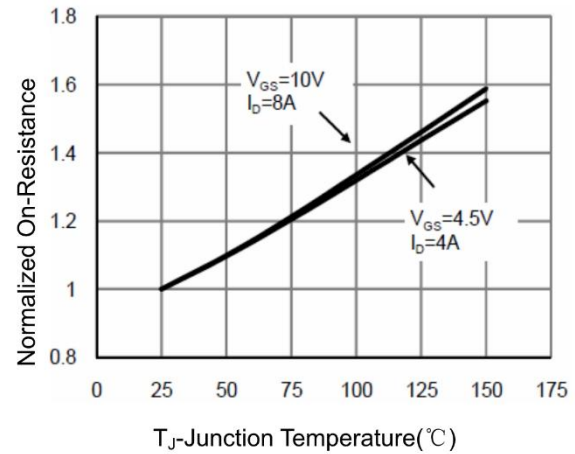


Figure 4 Drain-Source On-Resistance

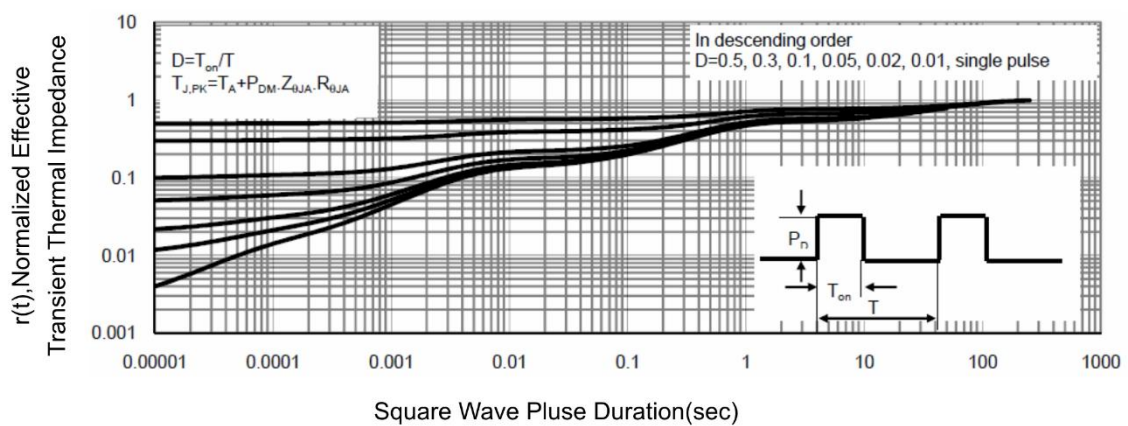


Figure 5 Normalized Maximum Transient Thermal Impedance

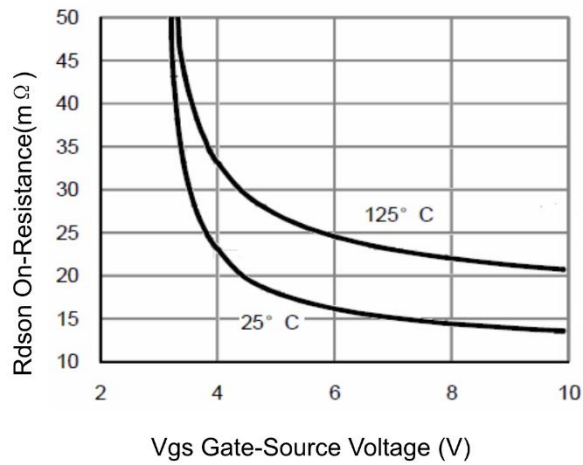


Figure 6 Rdson vs Vgs

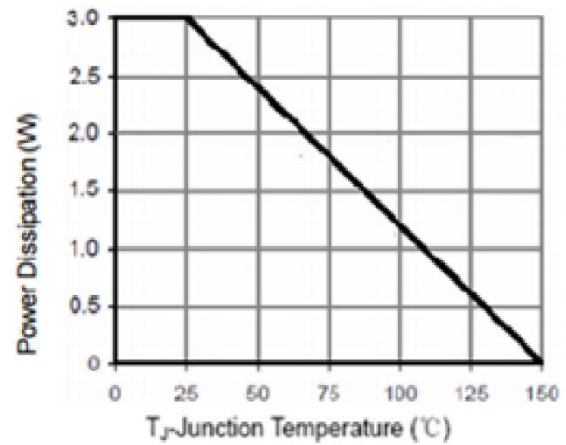


Figure7 Power Dissipation

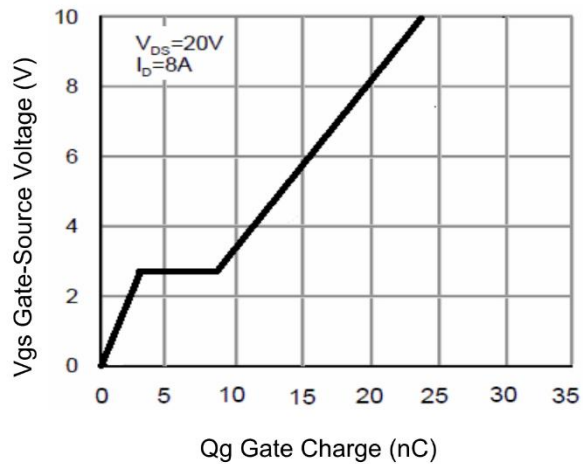


Figure 8 Gate Charge

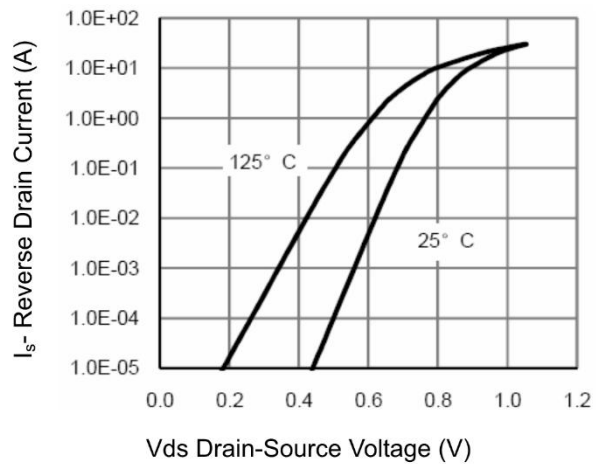


Figure 9 Source- Drain Diode Forward

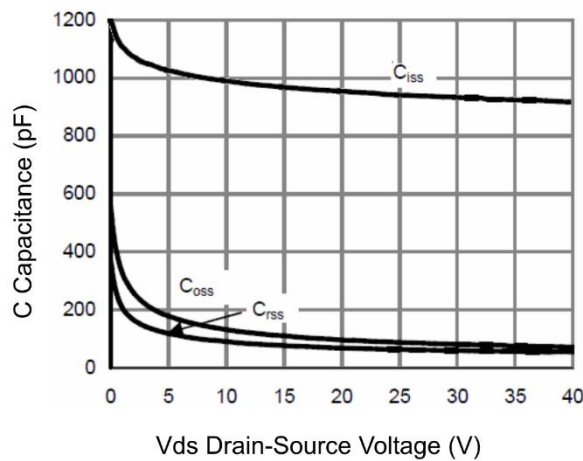


Figure 10 Capacitance vs Vds

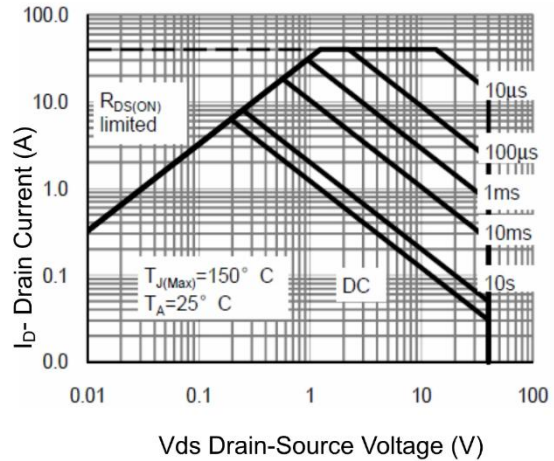


Figure 11 Safe Operation Area