

GL Silicon N-Channel Power MOSFET

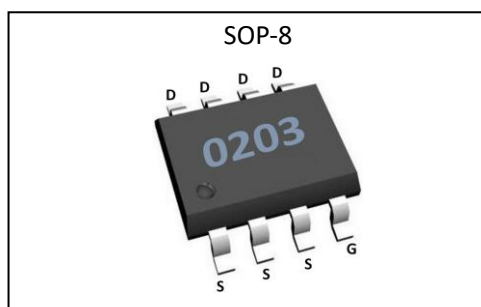
General Description :

The GL0203S 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 SOP-8, which accords with the RoHS standard.

V_{DSS}	200	V
I_D	3.9	A
P_D	3	W
$R_{DS(ON)type}$	56	mΩ

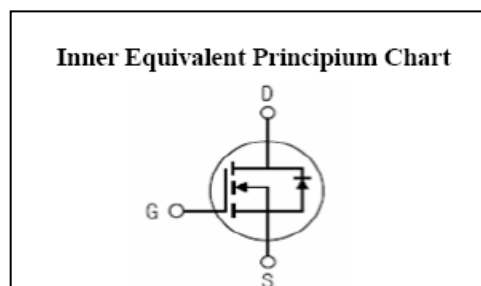
Features :

- $R_{DS(ON)} < 79m\Omega$ @ $V_{GS}=10V$ (Typ56mΩ)
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation



Applications :

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



Absolute ($T_c=25^\circ C$ unless otherwise specified) :

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	200	V
I_D	Continuous Drain Current	3.9	A
I_{DM}	Pulsed Drain Current	30	A
V_{GS}	Gate-to-Source Voltage	± 20	V
P_D	Power Dissipation	3	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	155 , -55 to 155	$^\circ C$

**GL Silicon N-Channel Power MOSFET****Electrical Characteristics** ($T_c = 25^\circ\text{C}$ unless otherwise specified) :

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	200	--	--	V
I_{DSS}	Drain to Source Leakage Current	$V_{DS}=200V, V_{GS}=0V, T_a=25^\circ\text{C}$	--	--	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	$V_{GS}=10V, I_D=3.7A$	--	56	79	$m\Omega$
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	--	4.0	V
Pulse width $t_p \leq 380\mu s, \delta \leq 2\%$						

Dynamic Characteristics^{a4}						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	$V_{DS}=50V, I_D=3.9A$	7	--	--	S
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=25V$ $f=1.0MHz$	--	4200	--	pF
C_{oss}	Output Capacitance		--	163	--	
C_{rss}	Reverse Transfer Capacitance		--	75	--	

Resistive Switching Characteristics^{a4}						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=100V, I_D=2.2A$ $V_{GS}=10V, R_G=6.5\Omega$	--	15	--	ns
t_r	Rise Time		--	13	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	26	--	
t_f	Fall Time		--	14	--	
Q_g	Total Gate Charge	$V_{DD}=100V, I_D=2.2A$ $V_{GS}=10V$	--	38	--	nC
Q_{gs}	Gate to Source Charge		--	9	--	
Q_{gd}	Gate to Drain ("Miller") Charge		--	15	--	

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Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current ^{a2} (Body Diode)		--	--	4	A
V_{SD}	Diode Forward Voltage ^{a3}	$I_S=3.7A, V_{GS}=0V$	--	--	1.2	V

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case ^{a2}	41.7	°C/W

^{a1} : Repetitive Rating: Pulse width limited by maximum junction temperature.

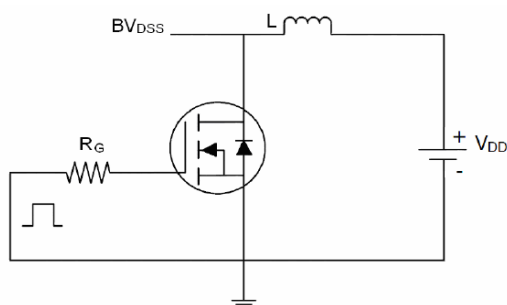
^{a2} : Surface Mounted on FR4 Board, $t \leq 10\text{sec}$.

^{a3} : Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

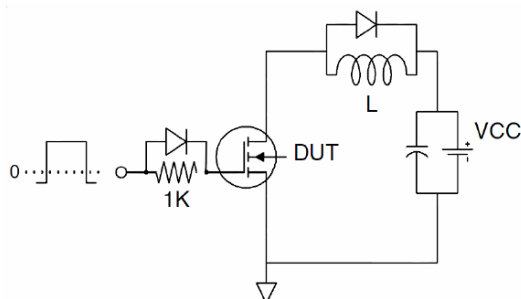
^{a4} : Guaranteed by design, not subject to production

Test circuit

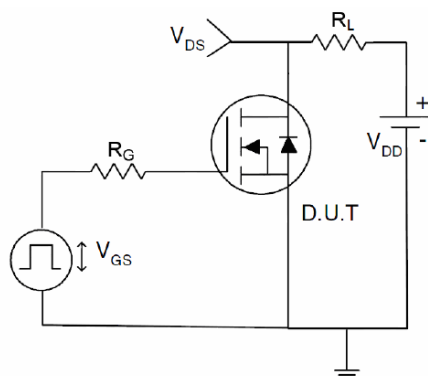
1) EAS test Circuit



2) Gate charge test Circuit

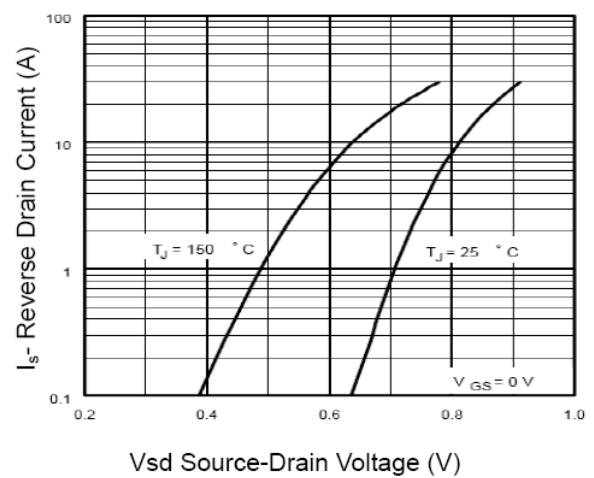
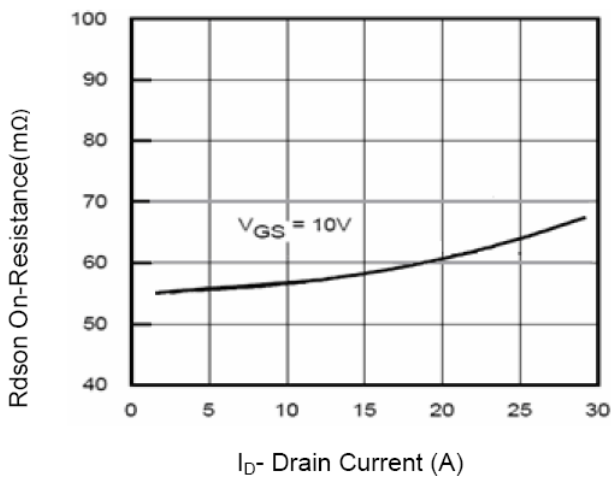
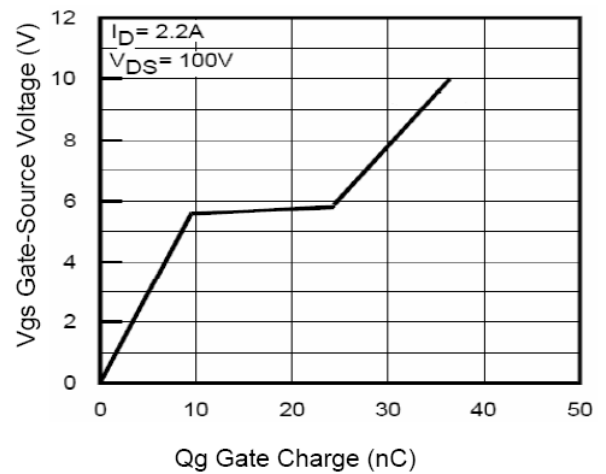
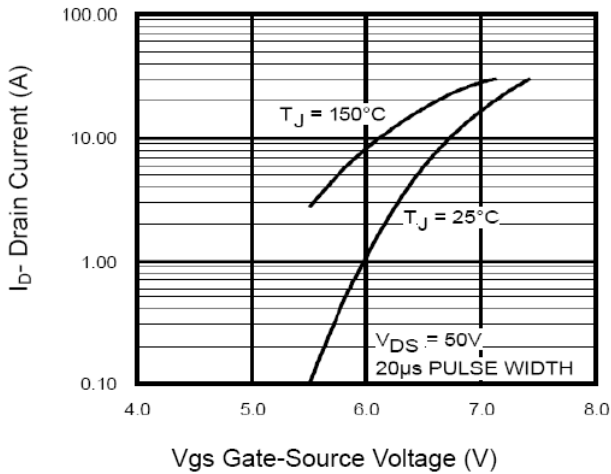
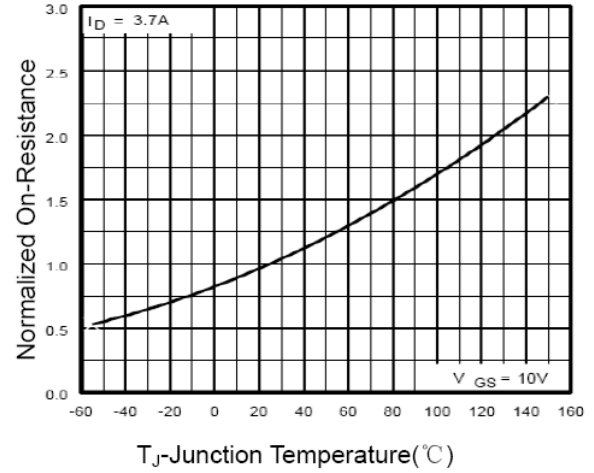
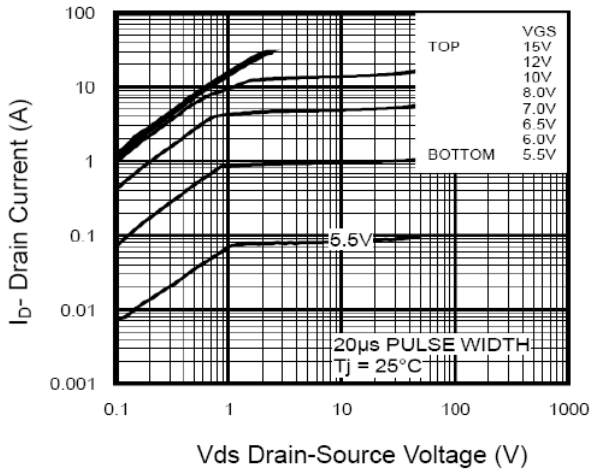


3) Switch Time Test Circuit



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Characteristics Curve :



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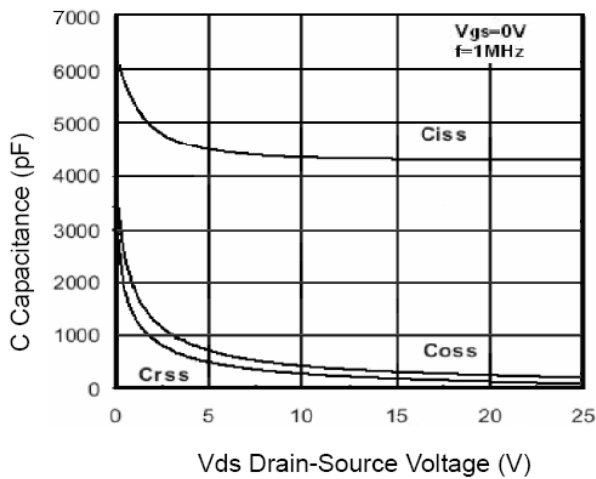


Figure 7 Capacitance vs V_{ds}

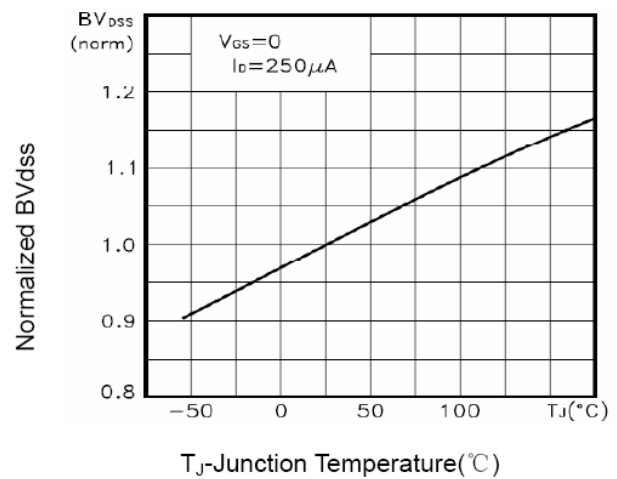


Figure 9 BV_{DSS} vs Junction Temperature

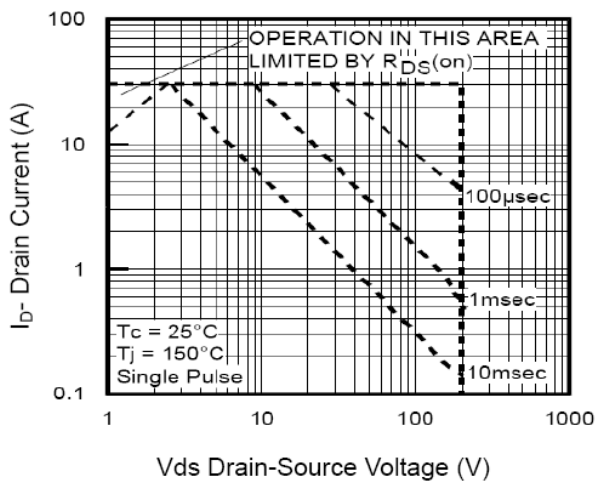


Figure 8 Safe Operation Area

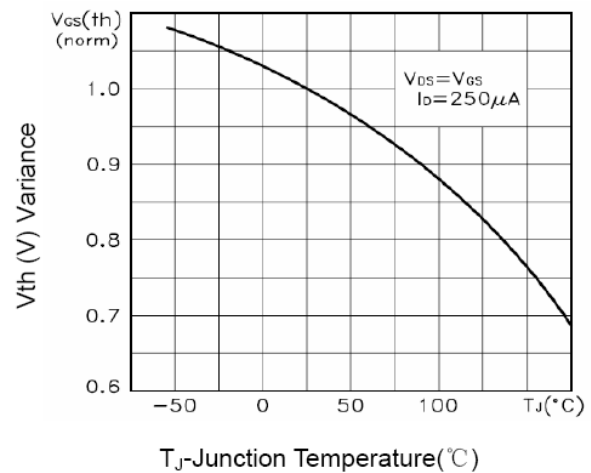


Figure 10 $V_{GS(th)}$ vs Junction Temperature

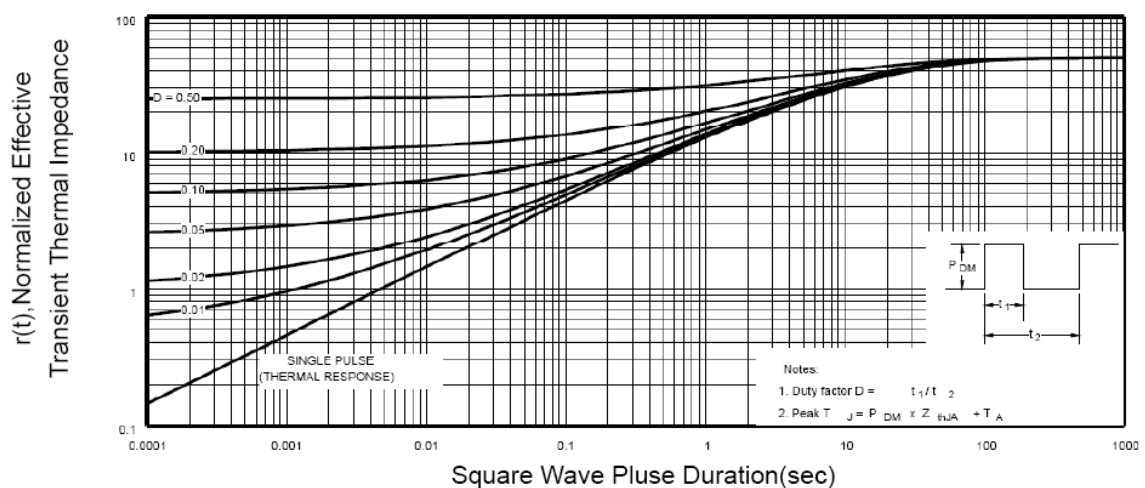


Figure 11 Normalized Maximum Transient Thermal Impedance

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GL0203S

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