



GL20N03A4

GL Silicon N-Channel Power MOSFET

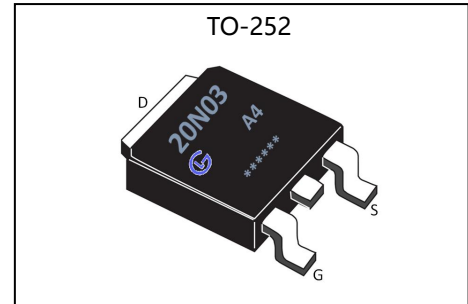
General Description

The GL20N03A4 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-252, which accords with the RoHS standard.

V_{DSS}	30	V
I_D	20	A
P_D	32.5	W
$R_{DS(ON)TYPE}$	16	m Ω

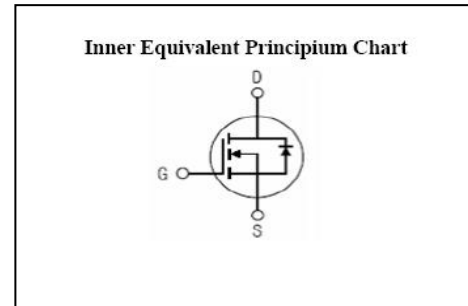
Features

- $R_{DS(ON)} < 20m\Omega @ V_{GS}=10V$
- 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 (Tc= 25°C unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	30	V
I_D	Continuous Drain Current	20	A
I_{DM}	Pulsed Drain Current	80	A
V_{GS}	Gate-to-Source Voltage	± 12	V
P_D	Power Dissipation	32.5	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, -55 to 150	$^{\circ}C$

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	$V_{GS}=0V, I_D=250\mu A$	30	--	--	V
I_{DSS}	Drain to Source Leakage Current	$V_{DS}=30V, V_{GS}=0V, T_a=25^{\circ}C$	--	--	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



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ON Characteristics ^{a3}						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=10V, I_D=6A$	--	--	20	m Ω
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.7	--	1.5	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	$V_{DS}=15V, I_D=2A$	--	3	--	S
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=20V$ $f=1.0MHz$	--	247	--	pF
C_{oss}	Output Capacitance		--	34	--	
C_{rss}	Reverse Transfer Capacitance		--	19.5	--	

Resistive Switching Characteristics ^{a4}						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=15V, I_D=3A$ $V_{GS}=10V, R_G=1\Omega$	--	6	--	ns
t_r	Rise Time		--	15	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	15	--	
t_f	Fall Time		--	10	--	
Q_g	Total Gate Charge	$V_{DD}=15V, I_D=3A$ $V_{GS}=4.5V$	--	6	--	nC
Q_{gs}	Gate to Source Charge		--	1	--	
Q_{gd}	Gate to Drain ("Miller") Charge		--	1.3	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current ^{a2} (Body Diode)		--	--	20	A
V_{SD}	Diode Forward Voltage ^{a3}	$I_S=20A, V_{GS}=0V$	--	--	1.5	V

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

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

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

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

Characteristics Curves

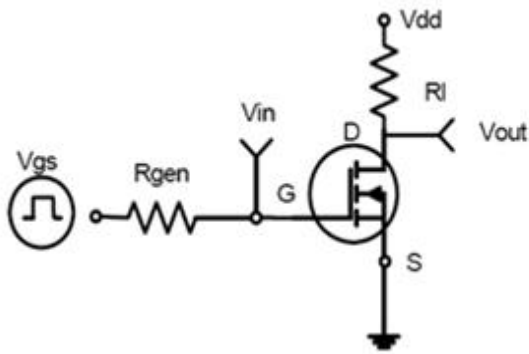


Figure 1: Switching Test Circuit

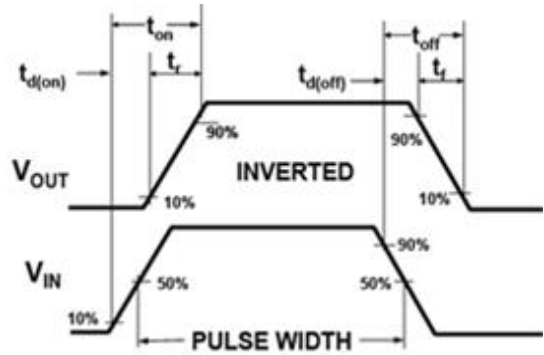


Figure 2: Switching Waveforms

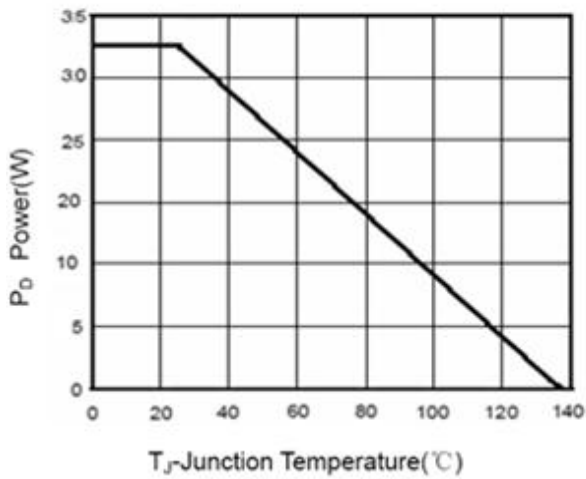


Figure 3 Power Dissipation

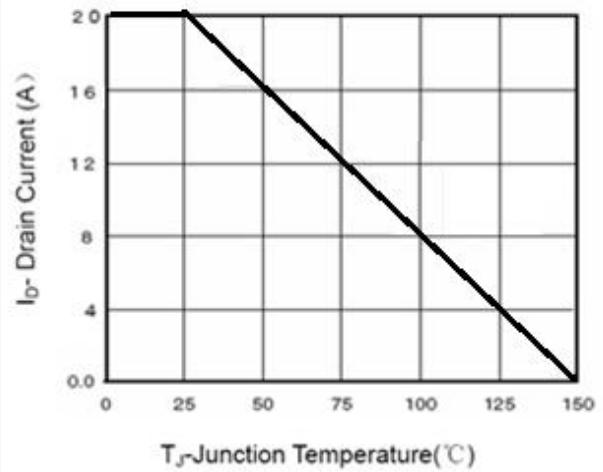


Figure 4 Drain Current

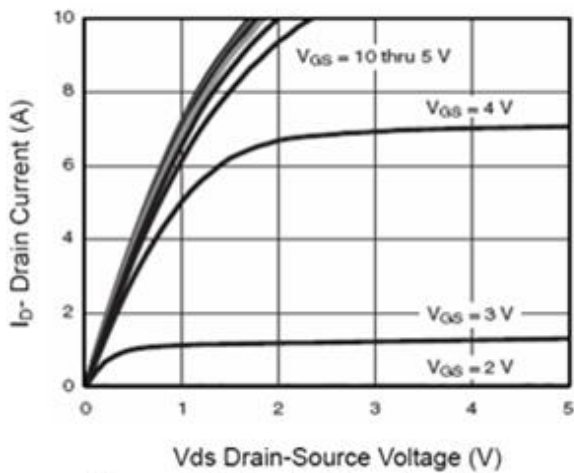


Figure 5 Output Characteristics

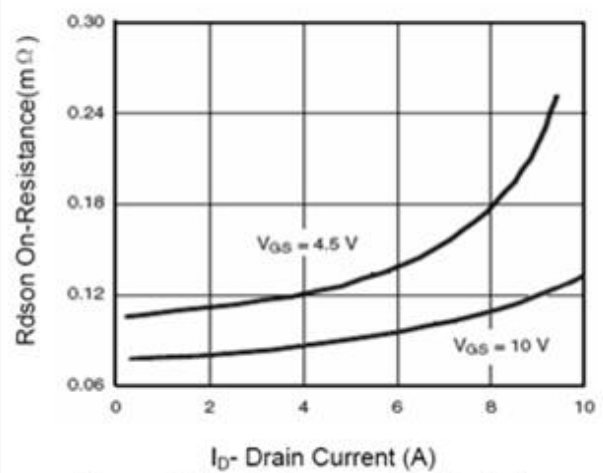
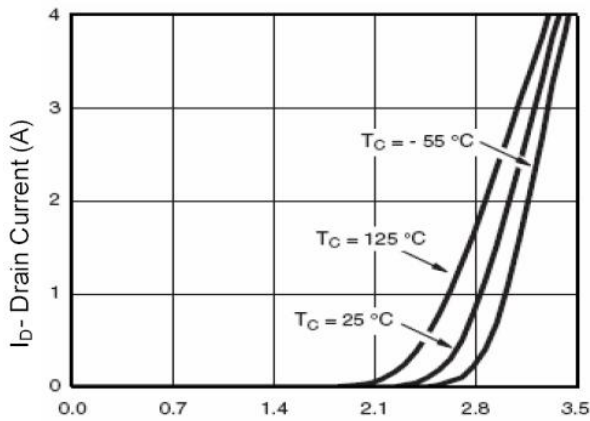


Figure 6 Drain-Source On-Resistance

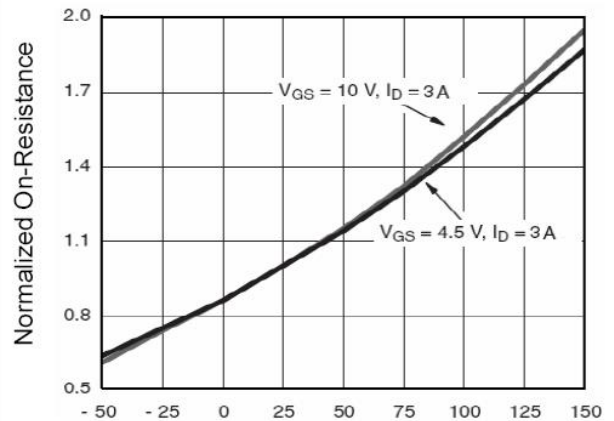


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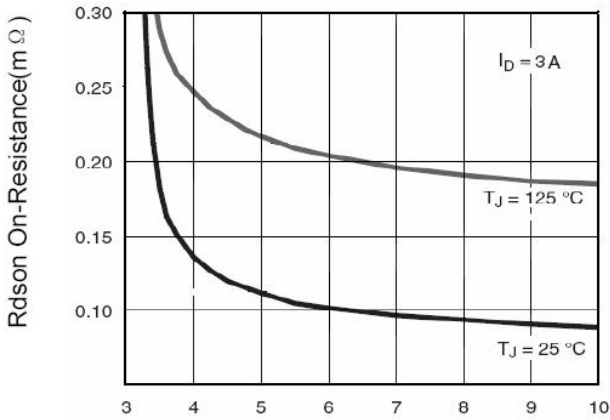
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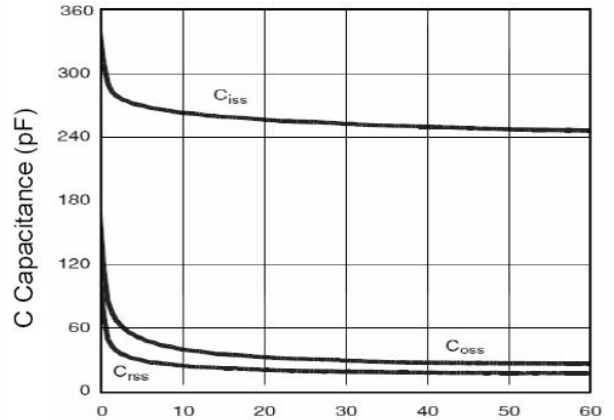
Vgs Gate-Source Voltage (V)
Figure 7 Transfer Characteristics



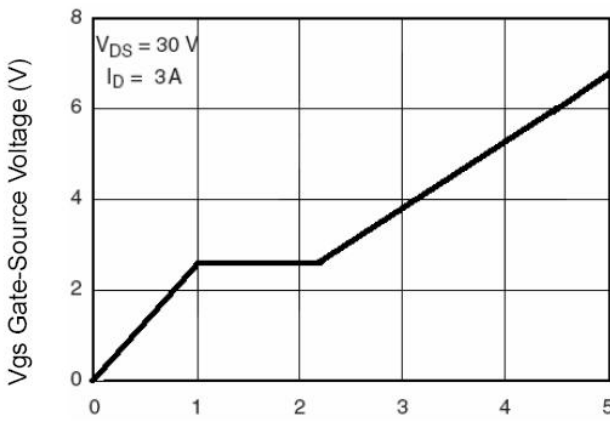
T_J-Junction Temperature(°C)
Figure 8 Drain-Source On-Resistance



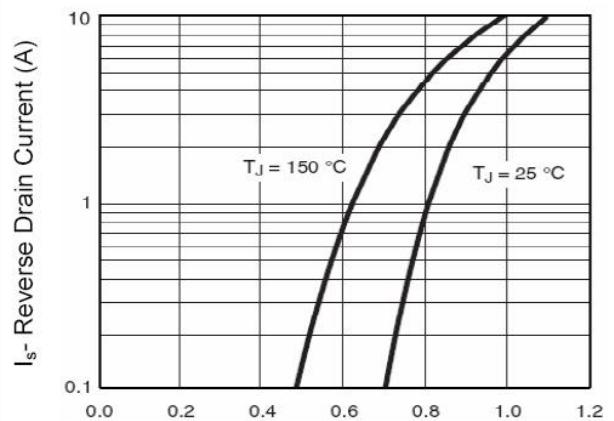
Vgs Gate-Source Voltage (V)
Figure 9 Rdson vs Vgs



Vds Drain-Source Voltage (V)
Figure 10 Capacitance vs Vds



Qg Gate Charge (nC)
Figure 11 Gate Charge



Vsd Source-Drain Voltage (V)
Figure 12 Source- Drain Diode Forward