

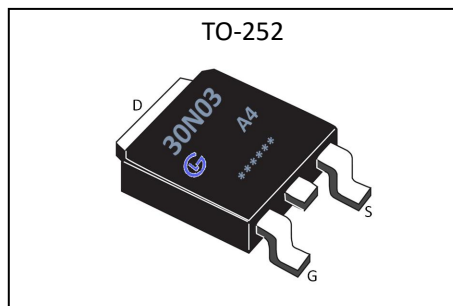
General Description

The GL30N03A4 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	30	A
P_D	40	W
$R_{DS(ON)type}$	10	m Ω

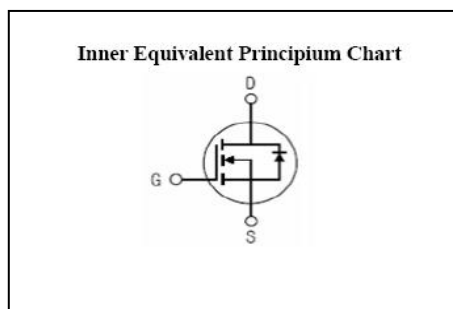
Features

- $R_{DS(ON)} < 14m\Omega$ @ $V_{GS}=10V$ (Typ:10m Ω)
- 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	30	A
I_{DM}	Pulsed Drain Current ^{a1}	80	A
V_{GS}	Gate-to-Source Voltage	± 20	V
P_D	Power Dissipation	40	W
E_{AS}	Single pulse avalanche energy ^{a5}	72	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range	175, -55 to 175	°C

Caution :Stresses greater than those in the "Absolute Maximum Ratings" may cause permanent damage to the device



GL30N03A4

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	$V_{GS}=0V, I_D=250\mu A$	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	$V_{GS}=+20V$	--	--	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	$V_{GS}=10V, I_D=20A$	--	10	15	m Ω
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=4.5V, I_D=15A$	--	13	25	m Ω
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.5	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	$V_{DS}=5V, I_D=20A$	26	--	--	S
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=15V$ $f=1.0MHz$	--	938	--	pF
C_{oss}	Output Capacitance		--	142	--	
C_{rss}	Reverse Transfer Capacitance		--	99	--	

Resistive Switching Characteristics^{a4}

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$R_L=0.75\Omega, V_{DD}=15V$ $V_{GS}=10V, R_G=3.0\Omega$	--	5	--	ns
t_r	Rise Time		--	12	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	19	--	
t_f	Fall Time		--	6	--	
Q_g	Total Gate Charge	$I_D=20A, V_{DD}=15V$ $V_{GS}=10V$	--	17.5	--	nC
Q_{gs}	Gate to Source Charge		--	3.0	--	
Q_{gd}	Gate to Drain ("Miller") Charge		--	4.1	--	



GL30N03A4

GL Silicon N-Channel Power MOSFET

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current ^{a2} (Body Diode)		--	--	30	A
V_{SD}	Diode Forward Voltage ^{a3}	$I_S=20A, V_{GS}=0V$	--	--	1.2	V

Thermal Characteristics

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case ^{a2}	3.125	°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

^{a5}: EAS condition: $T_j=25^\circ\text{C}, V_{DD}=30V, V_G=10V, L=0.5\text{mH}, R_g=25\Omega$

Characteristics Curves

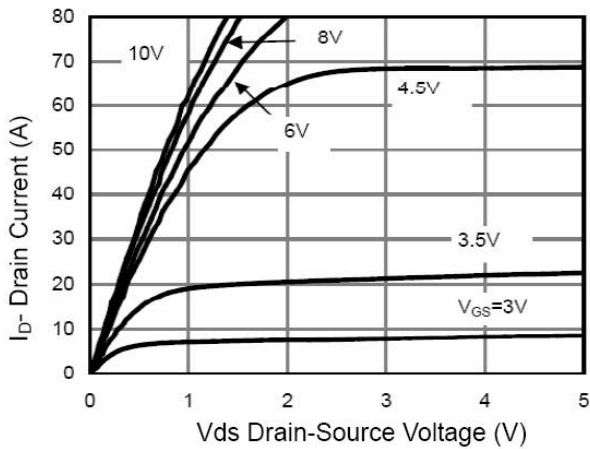


Figure 1 Output Characteristics

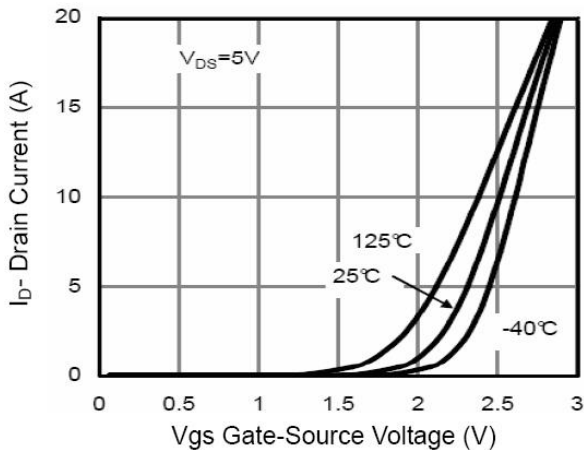


Figure 2 Transfer Characteristics

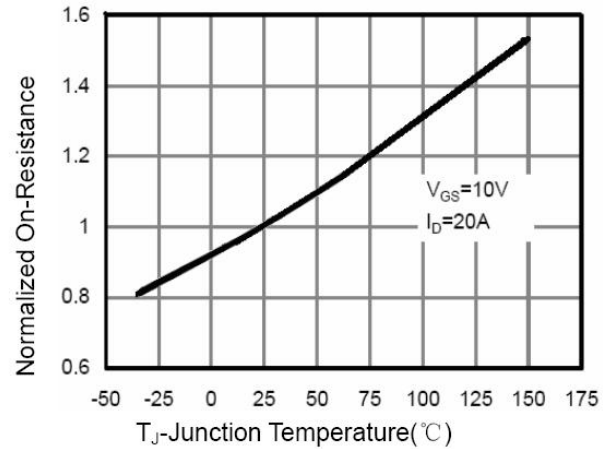
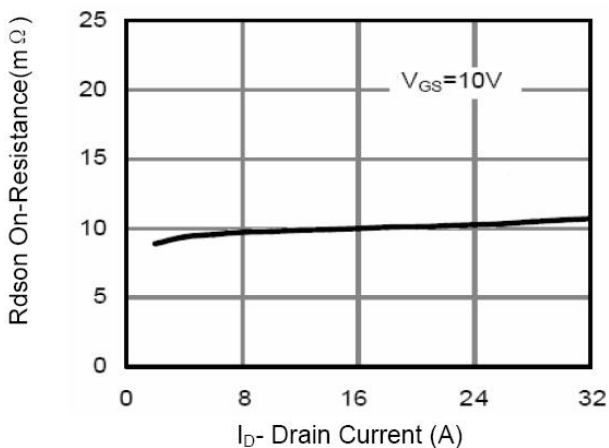


Figure 4 Rdson-Junction Temperature

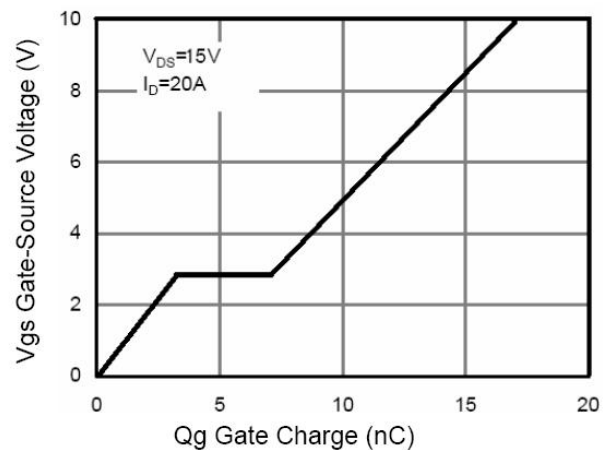
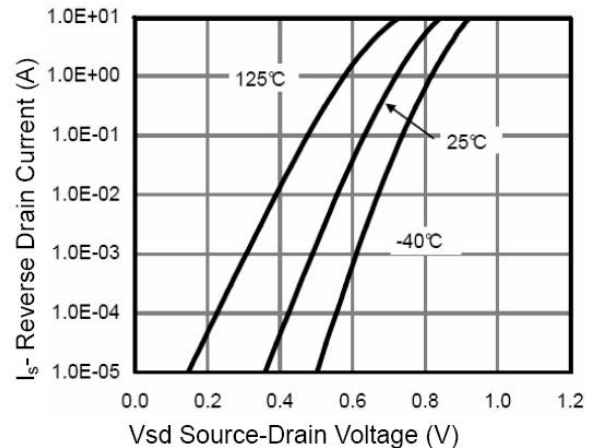


Figure 5 Gate Charge



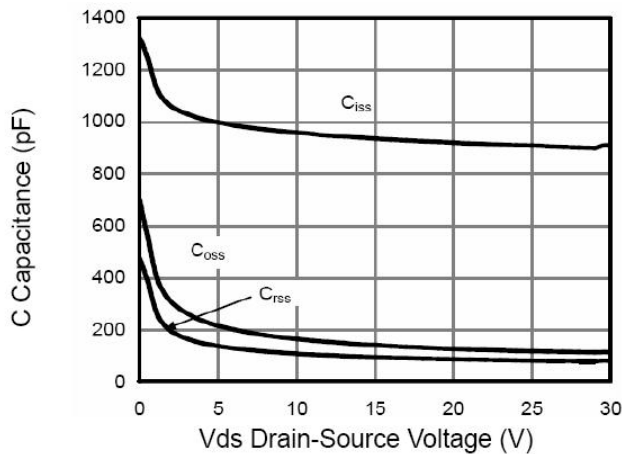


Figure 7 Capacitance vs Vds

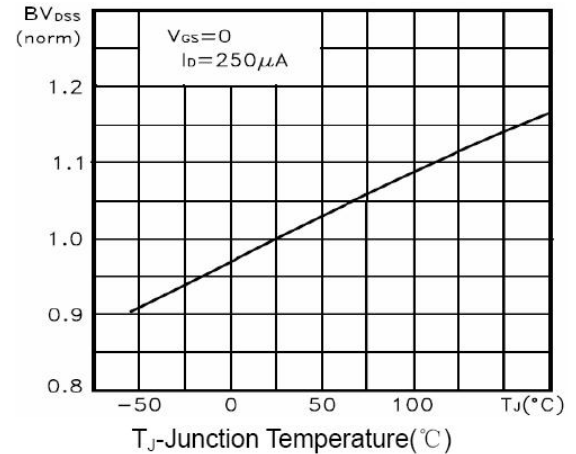


Figure 9 BV_{DSS} vs Junction Temperature

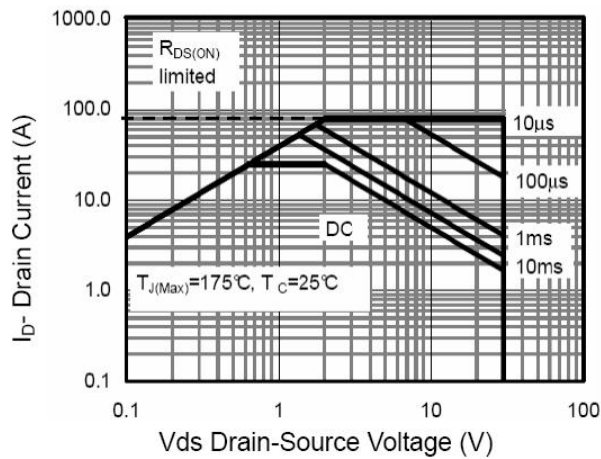


Figure 8 Safe Operation Area

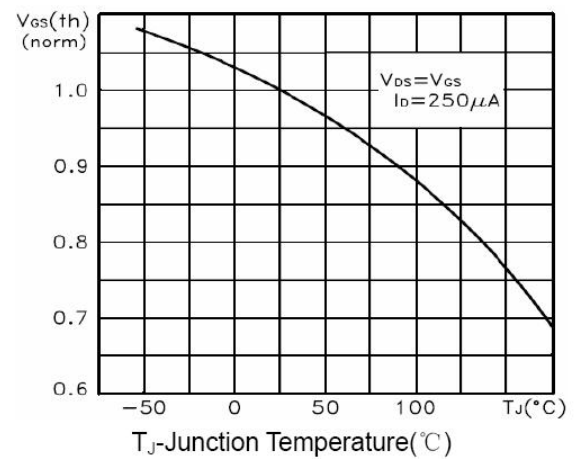


Figure 10 $V_{GS(th)}$ vs Junction Temperature

