



GL20P06A4

GL Silicon P-Channel Power MOSFET

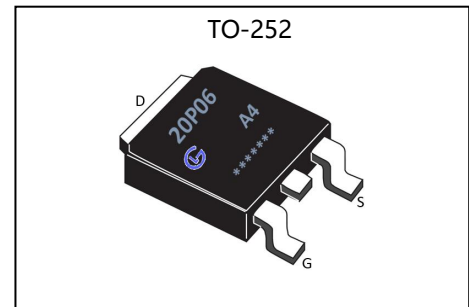
General Description

The GL20P06A4 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}	-60	V
I_D	-20	A
P_D	50	W
$R_{DS(ON)type}$	60	m Ω

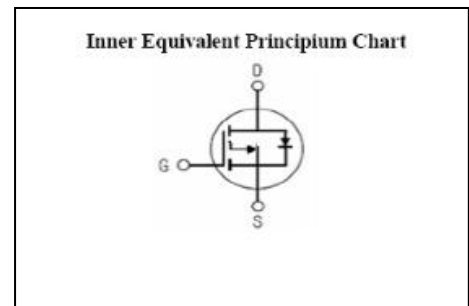
Features

- $R_{DS(ON)} < 73m\Omega$ @ $V_{GS} = 10V$ (Typ 60m 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	-60	V
I_D	Continuous Drain Current	-20	A
I_{DM}	Pulsed Drain Current	-60	A
V_{GS}	Gate-to-Source Voltage	± 20	V
P_D	Power Dissipation	50	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, -55 to 150	°C

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

Thermal Characteristics

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case ^{a2}	2.5	°C/W



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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	$V_{GS}=0V, I_D=250\mu A$	-60	--	--	V
I_{DSS}	Drain to Source Leakage Current	$V_{DS}=-60V, V_{GS}=0V, T_a=25^\circ C$	--	--	-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	$V_{GS}=-10V, I_D=-10A$	--	60	73	m Ω
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	-1.0	--	-3.0	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	$V_{DS}=-10V, I_D=-10A$	--	15	--	S
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=-30V$ $f=1.0MHz$	--	930	--	pF
C_{oss}	Output Capacitance		--	85	--	
C_{rss}	Reverse Transfer Capacitance		--	35	--	

Resistive Switching Characteristics ^{a4}						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-30V, R_L=7.5\Omega$ $V_{GS}=-10V, R_G=3\Omega$	--	8	--	ns
t_r	Rise Time		--	4	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	30	--	
t_f	Fall Time		--	7	--	
Q_g	Total Gate Charge	$V_{DD}=-30V, I_D=-4A$ $V_{GS}=-10V$	--	25	--	nC
Q_{gs}	Gate to Source Charge		--	3	--	
Q_{gd}	Gate to Drain ("Miller") Charge		--	7	--	

Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Rating			Unit
			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.

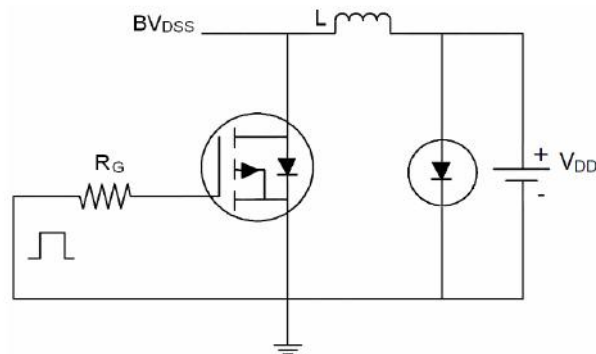
^{a2}: Surface Mounted on FR4 Board, $t \leq 10\text{sec}$.

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

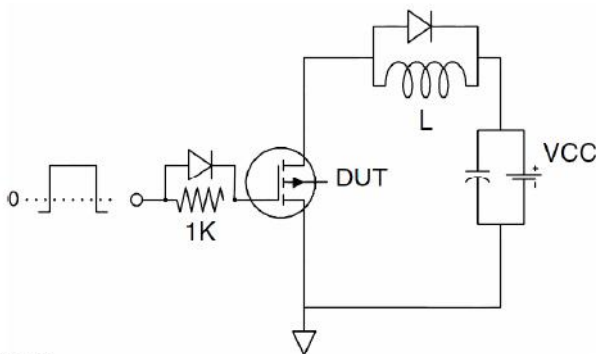
^{a4}: Guaranteed by design, not subject to production

Test Circuits

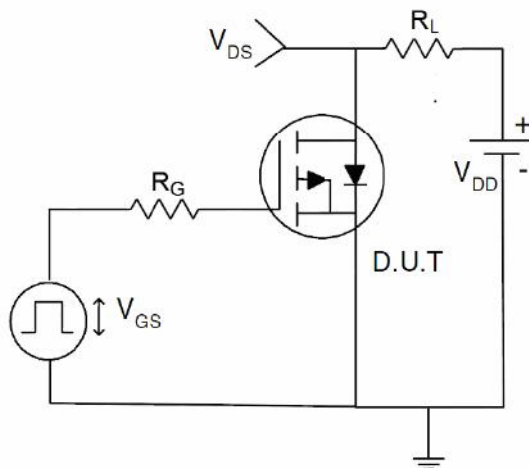
1) E_{AS} Test Circuit



2) Gate Charge Test Circuit



3) Switch Time Test Circuit



Characteristics Curves

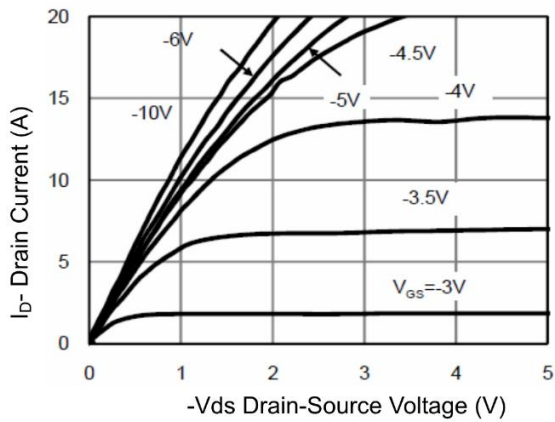


Figure 1 Output Characteristics

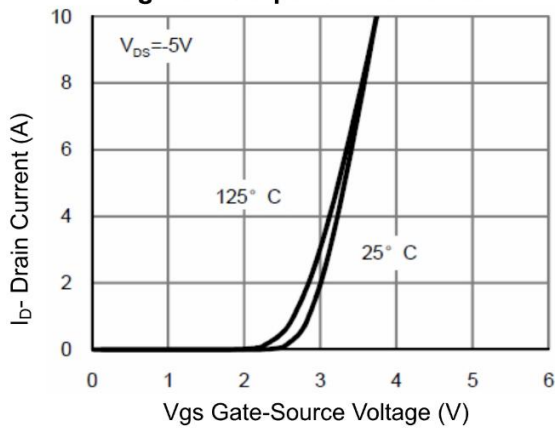


Figure 3 Transfer Characteristics

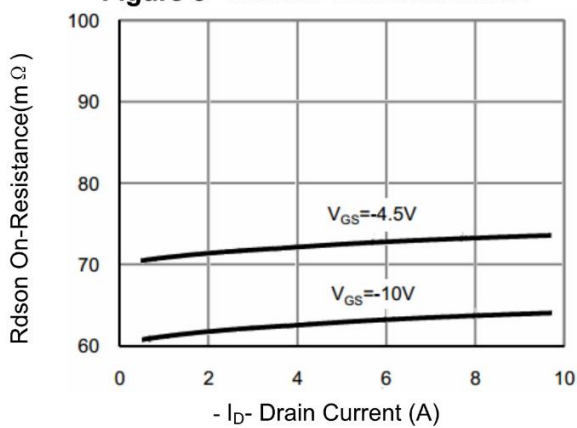


Figure 5 $R_{DS(on)}$ - Drain Current

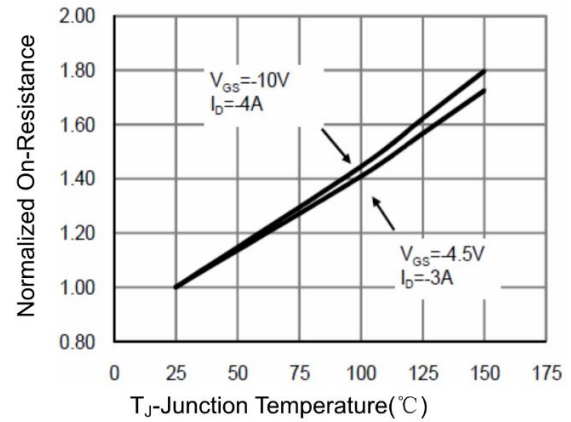


Figure 2 $R_{DS(on)}$ -Junction Temperature

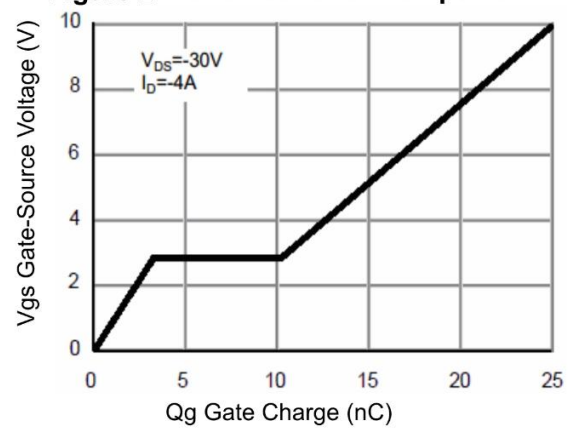


Figure 4 Gate Charge

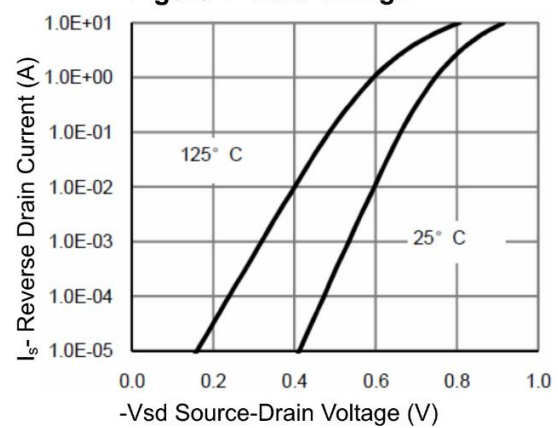


Figure 6 Source- Drain Diode Forward

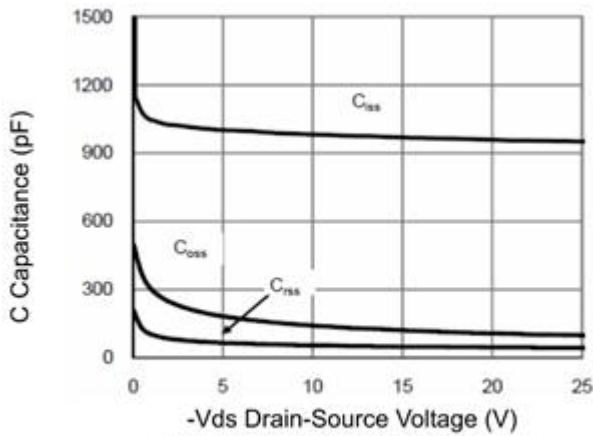


Figure 7 Capacitance vs Vds

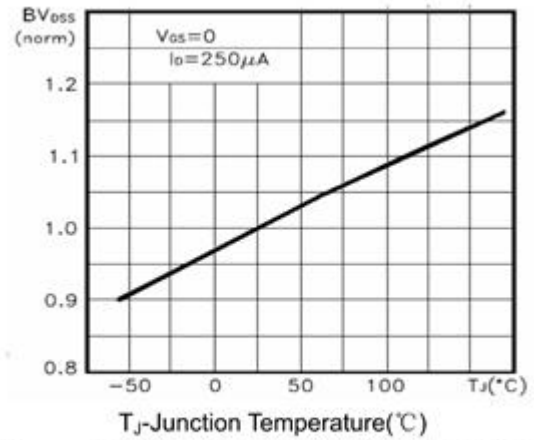


Figure 8 BV_{DSS} vs Junction Temperature

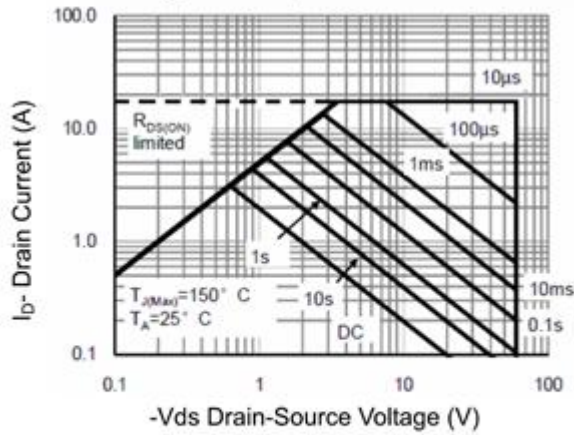


Figure 9 Safe Operation Area

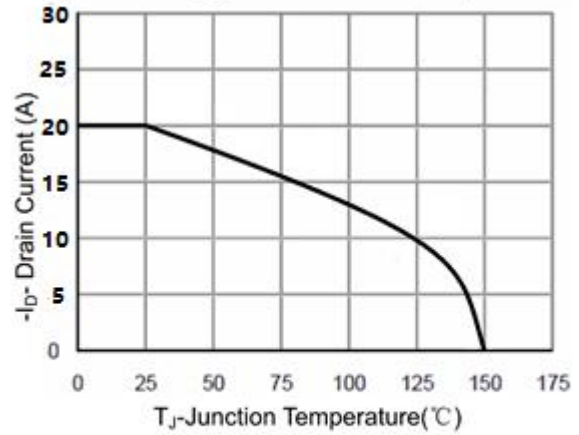


Figure 10 ID Current De-rating

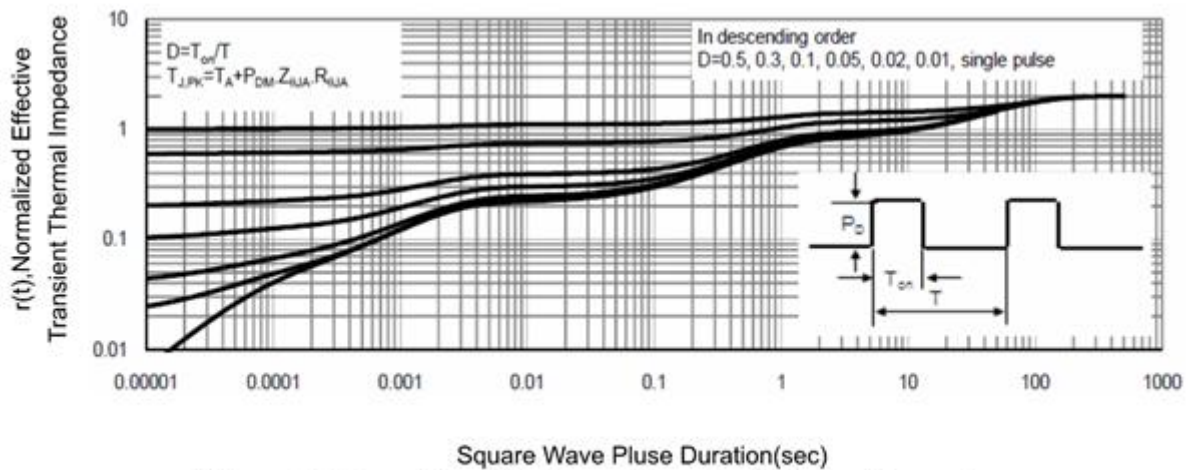


Figure 11 Normalized Maximum Transient Thermal Impedance