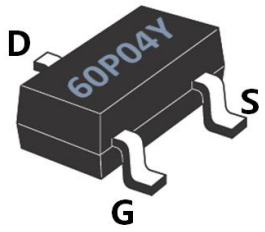
GL Silicon P-Channel Power MOSFET

General Description :

The GL4P06 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 SOT-23, which accords with the RoHS standard.

V_{DSS}	-60	V
I_D	-4	A
P_D	1.5	W
$R_{DS(ON)type}$	100	mΩ

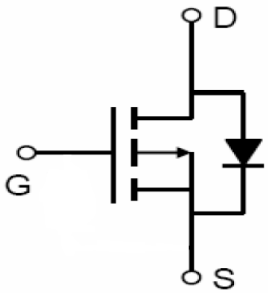
SOT-23



Features :

- $R_{DS(ON)}$<120mΩ @ V_{GS}=10V (Typ100mΩ)
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

Inner Equivalent Principium Chart



Applications :

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

Absolute (Tc= 25℃ unless otherwise specified) :

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	-60	V
I_D	Continuous Drain Current	-4	A
I_{DM}	Pulsed Drain Current	-12	A
V_{GS}	Gate-to-Source Voltage	±20	V
P_D	Power Dissipation	1.5	W
T_J , T_{stg}	Operating Junction and Storage Temperature Range	150 , −55 to 150	℃

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Electrical Characteristics (Tc= 25℃ 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=250μA	-60	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=-60V, V_{GS}= 0V,T_a=25℃	--	--	-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=-4A	--	100	120	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	-1.5	--	-3.0	V
Pulse width tp≤380μs,δ≤2%						

Dynamic Characteristics[a4]						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	V_{DS}=-5V,I_D=-4A	--	10	--	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=7.5A V_{GS}=-10V,R_G=3Ω	--	8	--	ns
tr	Rise Time		--	4	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	32	--	
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	--	

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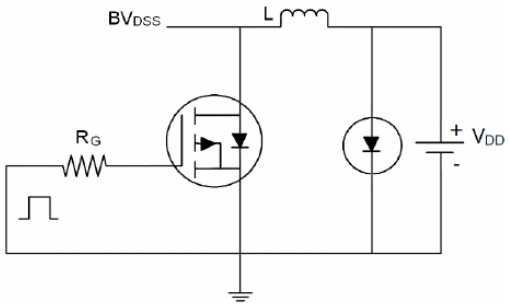
Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current [a2](Body Diode)		--	--	-4	A
V_{SD}	Diode Forward Voltage[a3]	I_S=-10A,V_{GS}=0V	--	--	-1.2	V

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case[a2]	83.3	℃/W

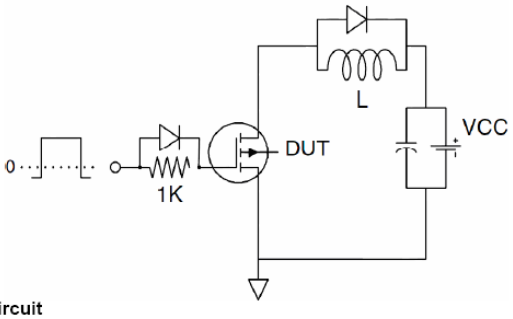
[a1] : Repetitive Rating: Pulse width limited by maximum junction temperature.
[a2] : Surface Mounted on FR4 Board, t≤10sec.
[a3] : Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.
[a4] : Guaranteed by design, not subject to production

Test circurt

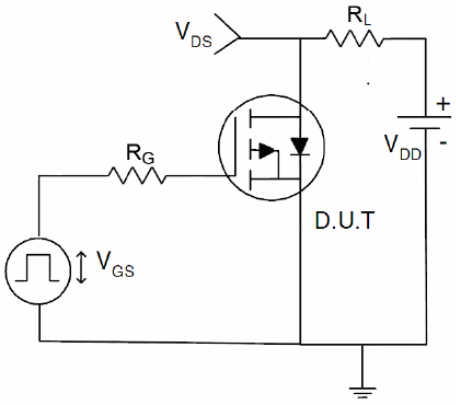
1) E_{AS} Test Circuit



2) Gate Charge Test Circuit



3) Switch Time Test Circuit



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Characteristics Curve :

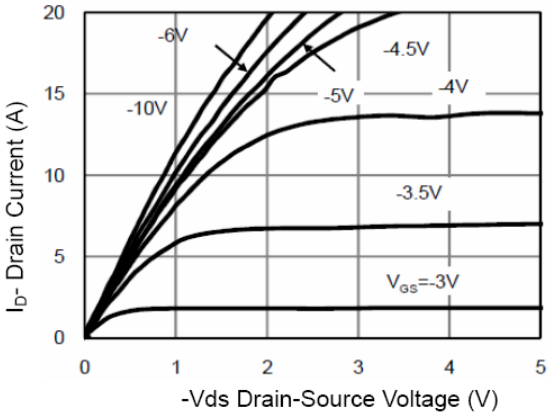

Figure 1 Output Characteristics

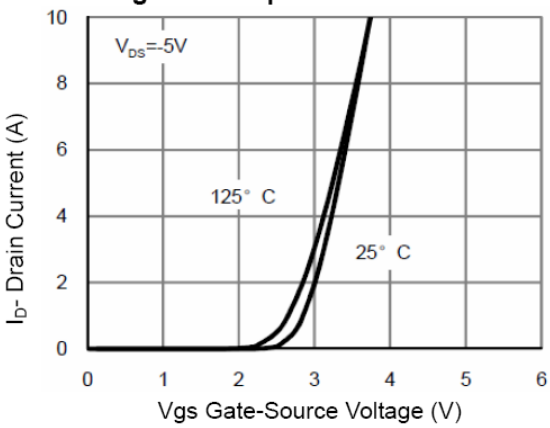

Figure 2 Transfer Characteristics

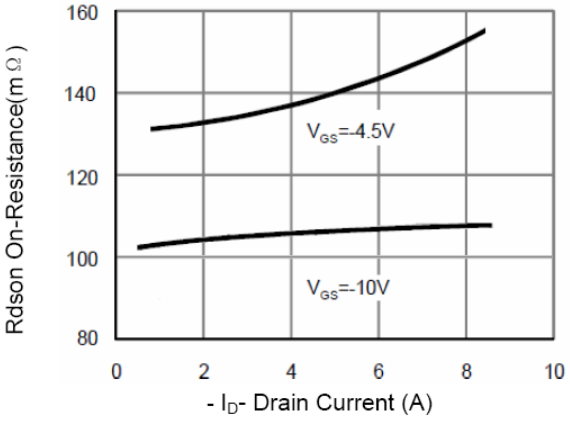

Figure 3 Rdson- Drain Current

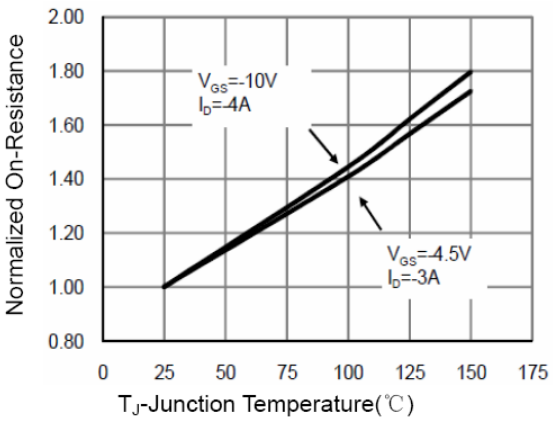

Figure 4 Rdson-Junction Temperature

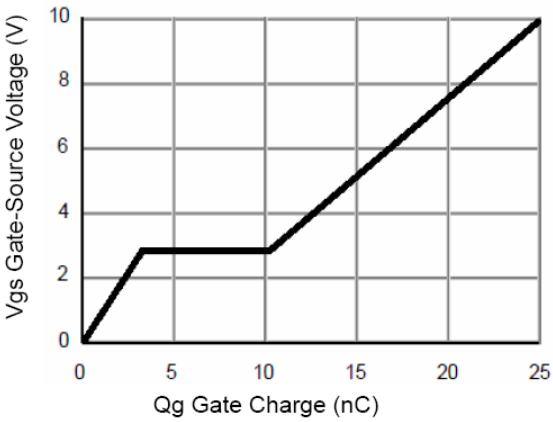

Figure 5 Gate Charge

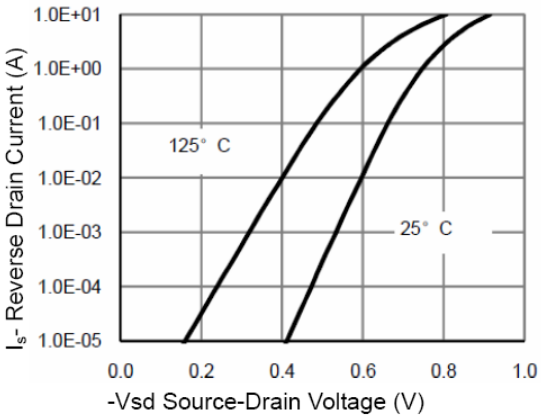

Figure 6 Source- Drain Diode Forward

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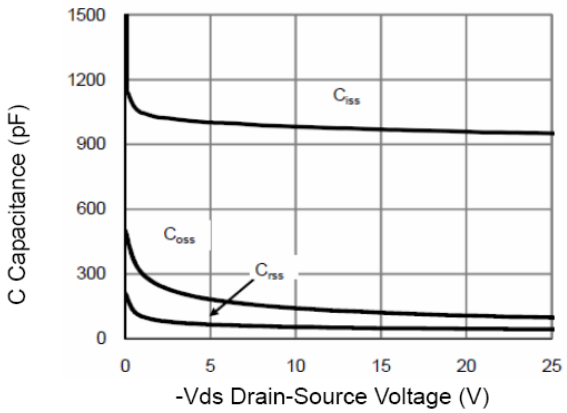

Figure 7 Capacitance vs Vds

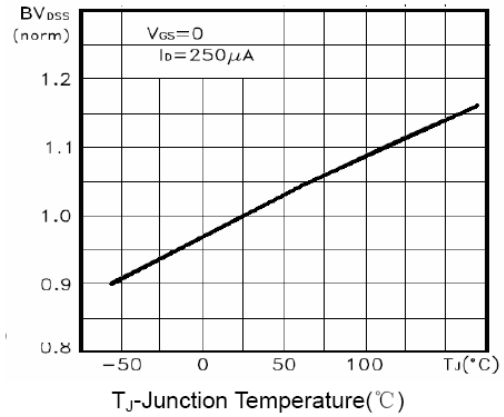

Figure 9 BV_{DSS} vs Junction Temperature

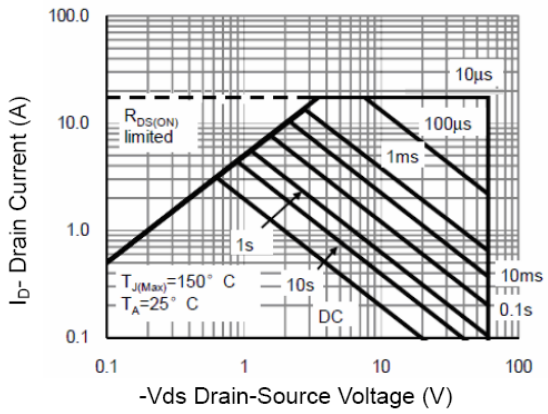

Figure 8 Safe Operation Area

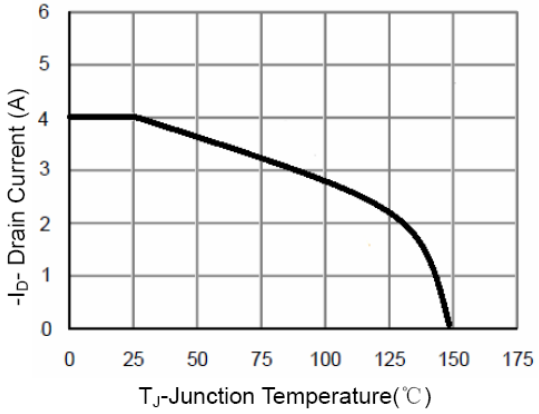

Figure 10 ID Current De-rating

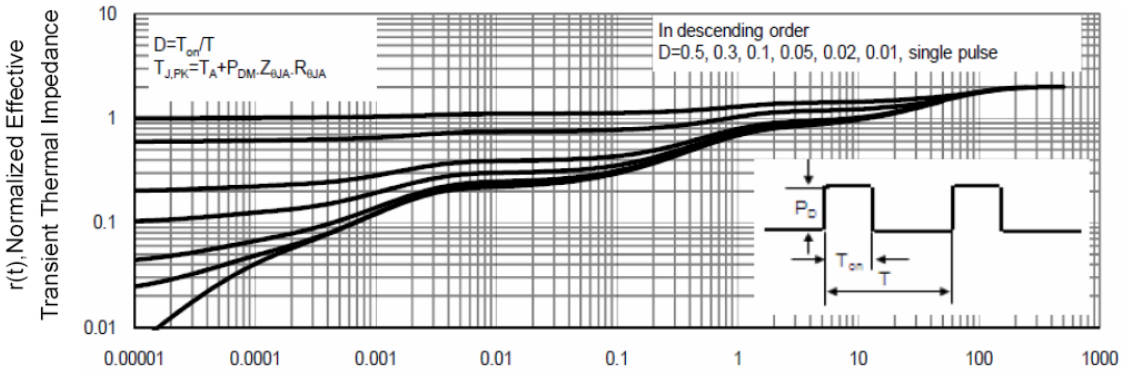

Figure 11 Normalized Maximum Transient Thermal Impedance

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