


[ODG_LOGO]
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Title SCOPE-F07x: top			Draw By: OldGerman	
Size: A4	Number:*	Revision: v1.1	* https://github.com/oldgerman/SCOPE-F07x	
Date: 2022/8/12	Time: 14:51:43	Sheet 1 of 5	*	
File: D:\ODG-PROJECT\SCOPE_F07x\HardWare\AD_Project\SCOPE_F07x\Scope_top.SchDoc				

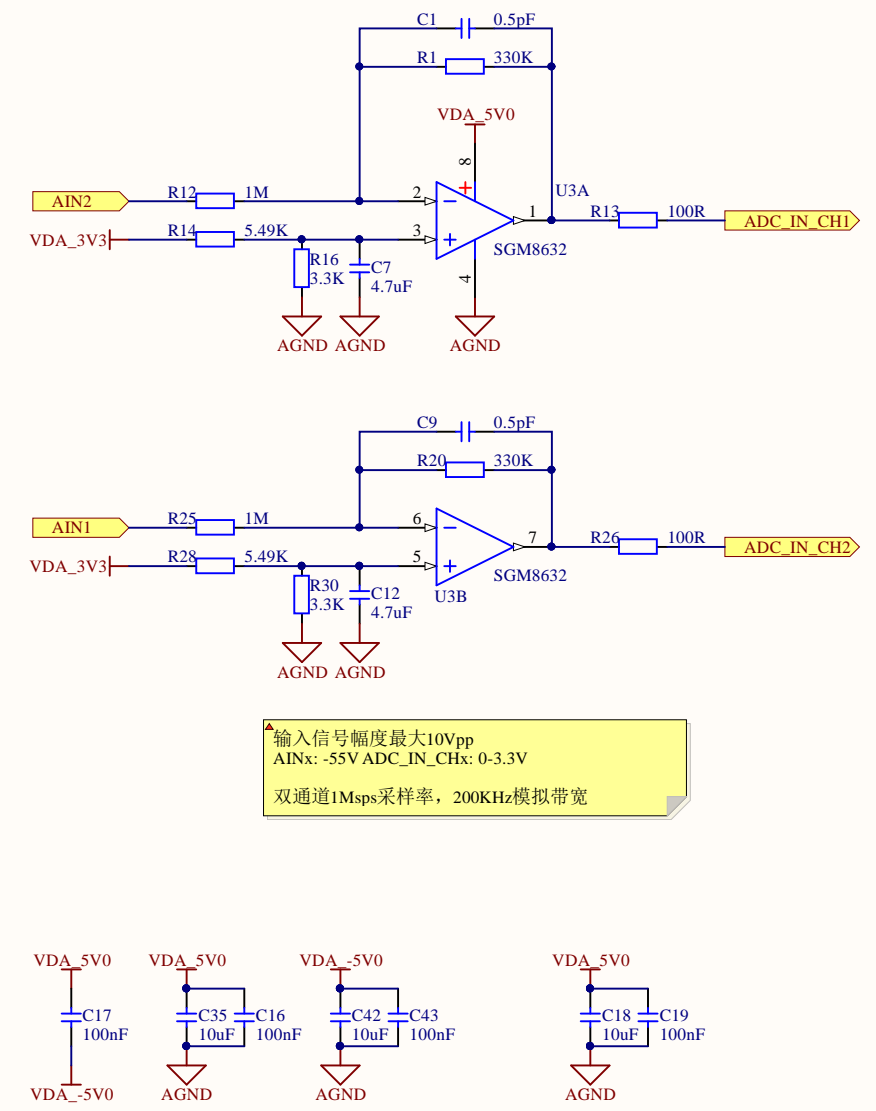
▲模拟电压3.0V修改为3.3V，与STM32的模拟部分一起供电，区分数字与模拟电源和地
运放电路电阻重新计算，保持与EEtree-SCOPE技术指标一致或更好

▲PWM_WAVE = 0.2-3.1V (DAC Output Buffer Enable)
WAV = 4V -4V
GAIN = $4.3K/1.556K = 4.3K/(536 + 750 + 270) \approx 8/2.9$
 $(V_{in} - 1.65V)/(1.556K) = (1.65V - 3.3V)/(3.3K + 1K) + (1.65V - V_{out})/4.3K$
 $V_{out} = -4.3/1.556V_{in} + 1.65/1.556 \times 4.3$

▲(淘汰此配置)
PWM_DCx = 0.75-2.75V
DC_OUTx = 4V -4V
GAIN = $4 = 12K/3K = 12K/(2K + 1K)$
 $(V_{in} - 1.65V)/(3K) = (1.65V - 3.3V)/(4.3K + 11.5K) + (1.65V - V_{out})/12K$
 $V_{out} = -4V_{in} + 7$
对应TIM15 count 227-833

▲PWM_DCx = 0-3.3V
DC_OUTx = 4V -4V
GAIN = $2.4242 = 12K/4.95K = 12K/(3.3K + 1.65K)$
 $(V_{in} - 1.65V)/(4.95K) = (1.65V - 3.3V)/(2K + 10K) + (1.65V - V_{out})/12K$
 $V_{out} = -2.4242V_{in} + 4$
对应TIM15 count 0-1000

▲TL974使用LTspice仿真拉电流1.5mA压降就很明显，但灌电流还行，淘汰此方案
改用OPA4197，拥有高输出电流($\pm 65mA$)，LTspice仿真在 $I(sc) = \pm 20mA$ 时无明显压降
实测自然对流散热下，OPA4197单通道输出正3.3V负载30mA无明显压降，但发热大，长
时间请务必做好散热或者减小负载电流，40mA时电压很不稳定，推荐小于($\pm 30mA$)

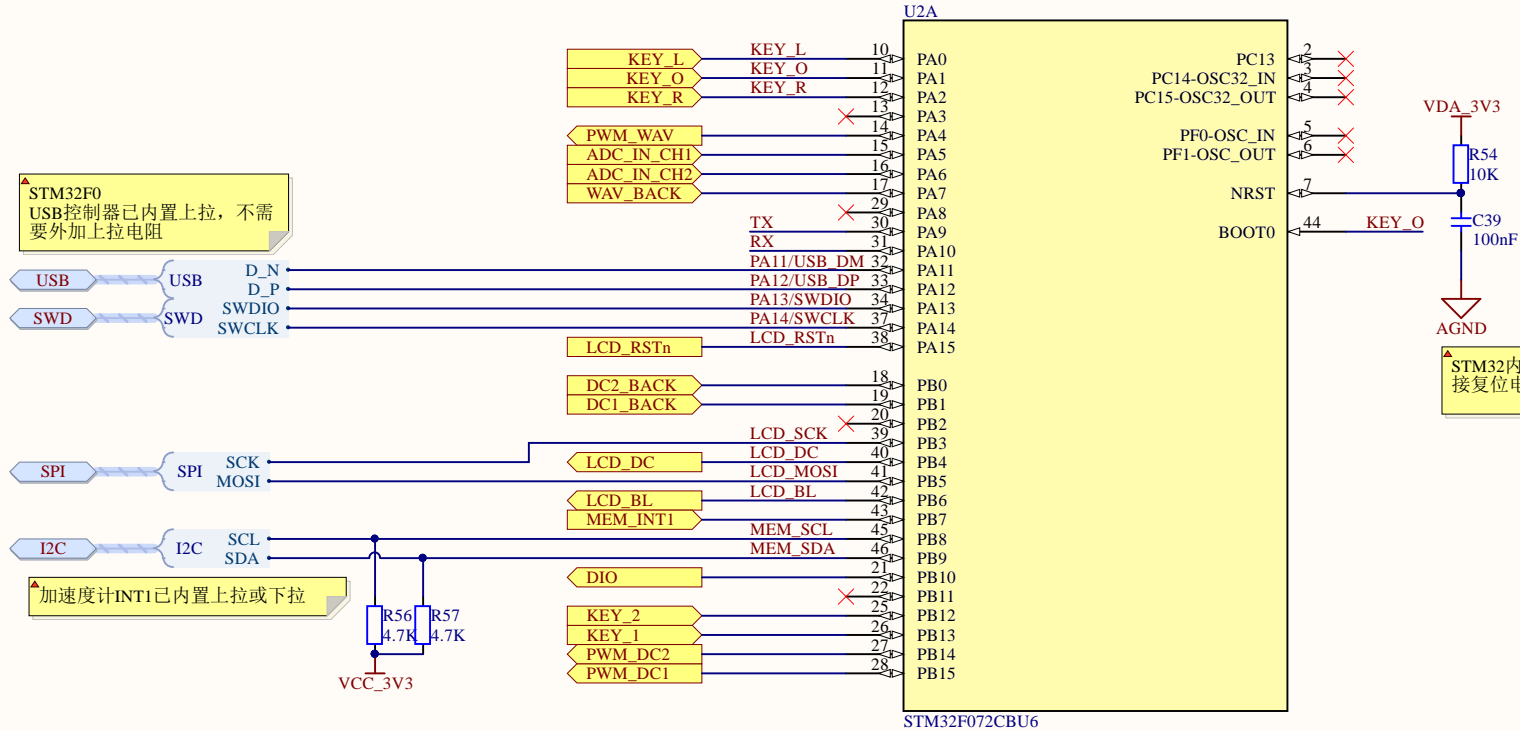


1

2

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4

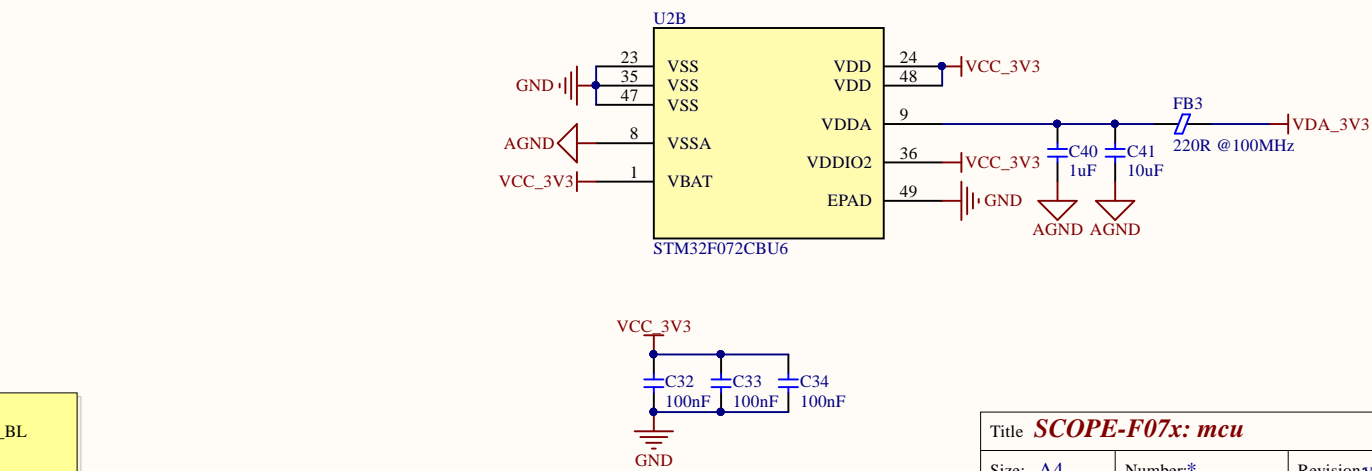


1

2

3

4



1

2

3

4

Title **SCOPE-F07x: mcu**

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Date: 2022/8/12

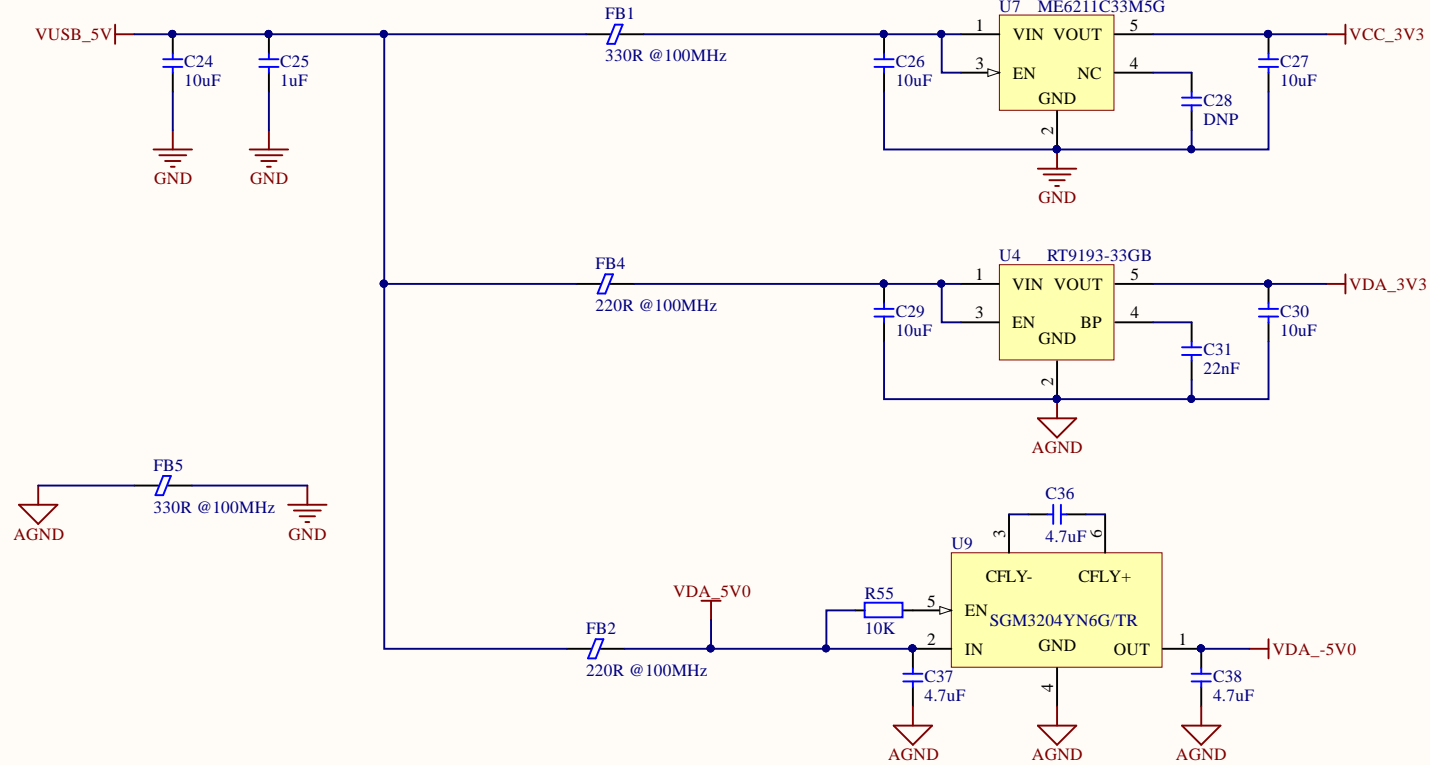
Time: 14:51:44

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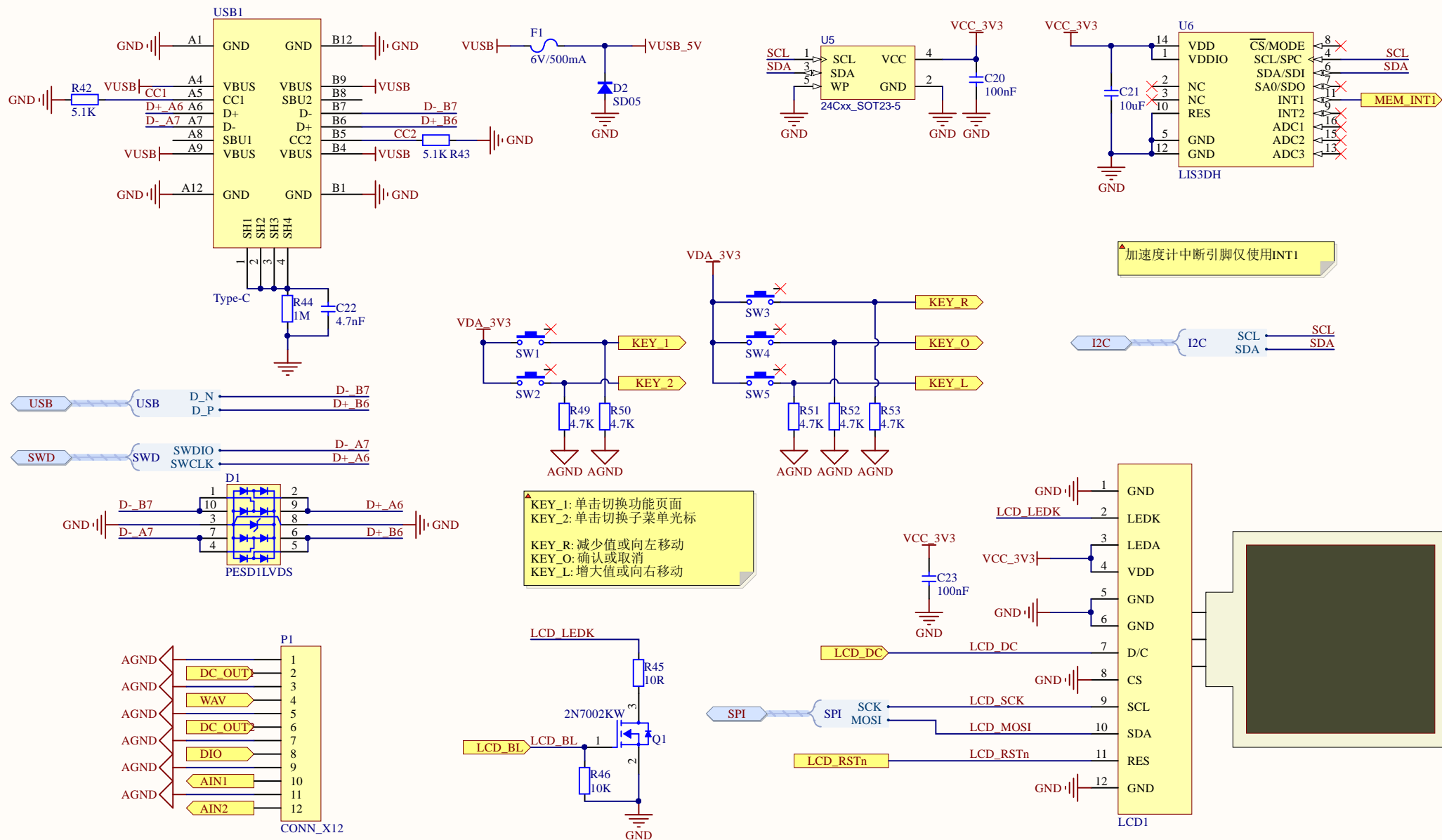
File: D:\ODG-PROJECT\SCOPE_F07x\HardWare\AD_Project\SCOPE_F07x\mcu.SchDoc

Altium



▲ SGM3204手册:
为获得最大输出电流和最佳性能, 建议使用三个3.3uF的陶瓷电容器。
对于较低电流或更高允许的输出电压纹波, 也可以使用其他电容器。
建议输出电容的最小值为 3.3uF。C36低于 3.3uF, 最大输出功率将减少

Title <i>SCOPE-F07x: power_supply</i>			Draw By: OldGerman	
Size: A4	Number:*	Revision:v1.1	* https://github.com/oldgerman/SCOPE-F07x	
Date: 2022/8/12	Time: 14:51:45	Sheet4 of 5	*	
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Title SCOPE-F07x: misc			Draw By: OldGerman
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File: D:\ODG-PROJECT\SCOPE_F07x\HardWare\AD_Project\SCOPE_F07x\misc.SchDoc			

