

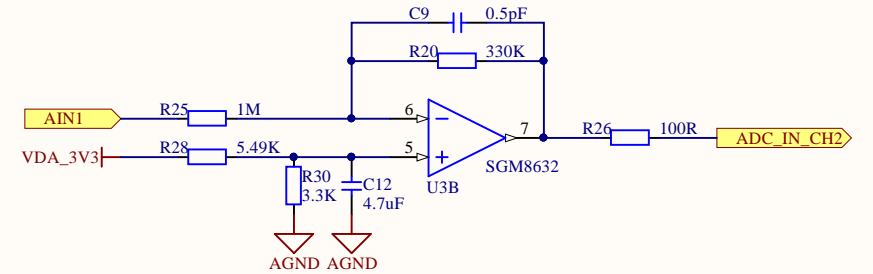
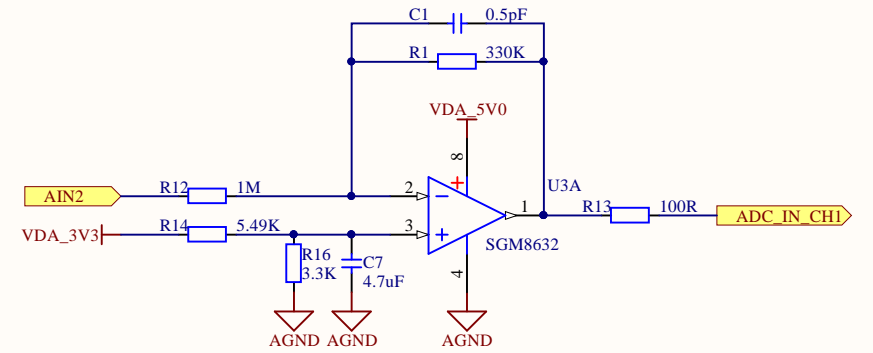
模拟电压3.0V修改为3.3V，与STM32的模拟部分一起供电，区分数字与模拟电源和地
运放电路电阻重新计算，保持与EEtree-SCOPE技术指标一致或更好

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

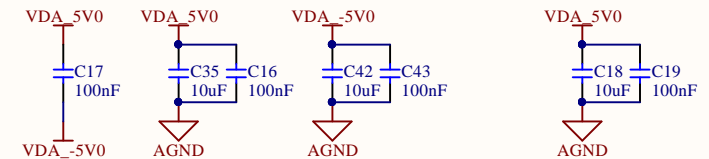
(淘汰此配置)
PWM_DCx = 0.75-2.75V
DC_OUTx = 4V -4V
GAIN = $4 = 12K/3K = 12K/(2K + 1K)$
 $(V_{in} - 1.65V)/(3K) = (1.65V - 3.3V)/(4.3K + 11.5K) + (1.65V - V_{out})/12K$
 $V_{out} = -4V_{in} + 7$
对应TIM15 count 227-833

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($\pm 30mA$)



输入信号幅度最大10Vpp
AINx: -55V ADC_IN_CHx: 0-3.3V
双通道1Mps采样率，200KHz模拟带宽



Title **SCOPE-F07x: analog**

Draw By: OldGerman

Size: A4

Number: *

Revision: v1.1

* <https://github.com/oldgerman/SCOPE-F07x>

Date: 2022/8/11

Time: 17:32:27

Sheet 2 of 5

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

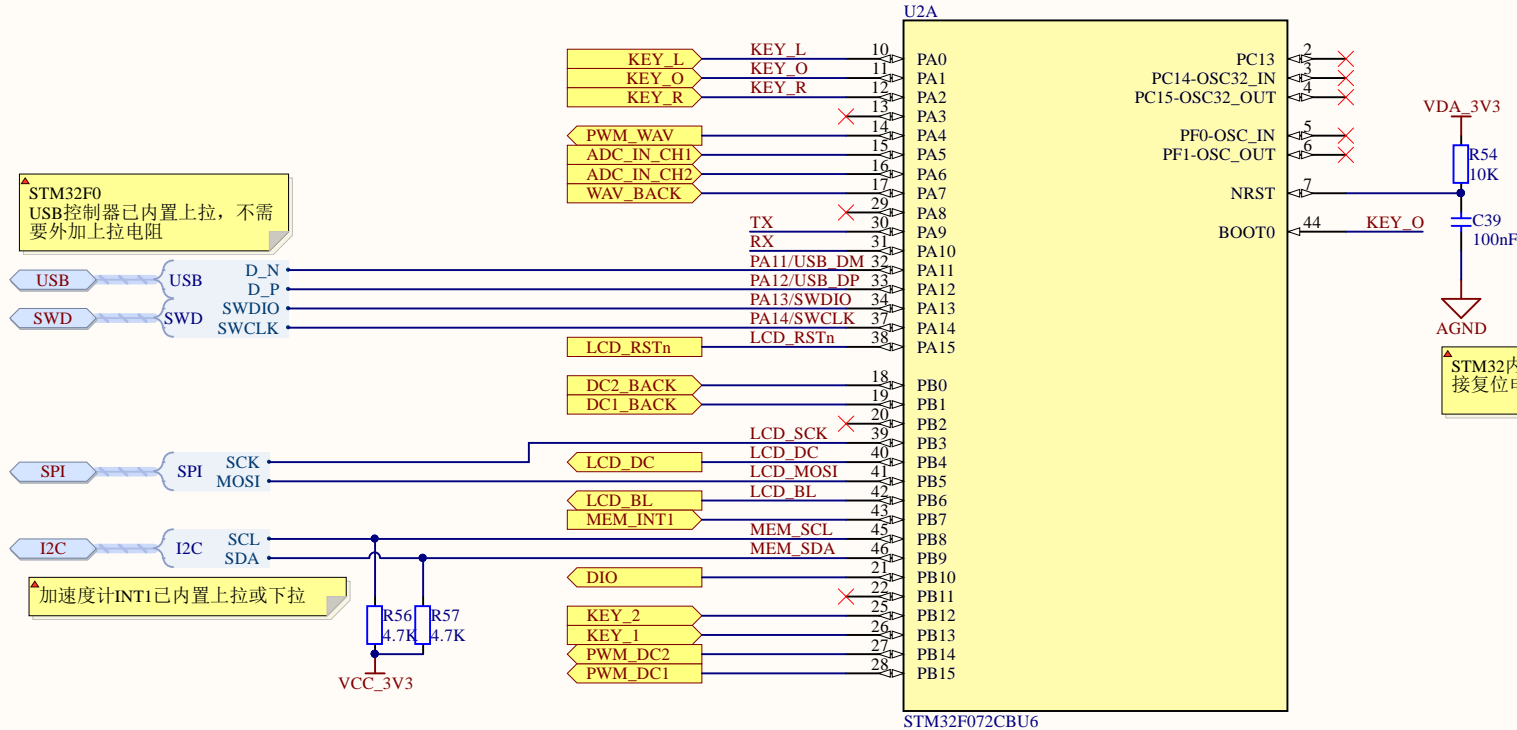


1

2

3

4



STM32F0
USB控制器已内置上拉，不需要外加上拉电阻

SPI

I2C

加速度计INT1已内置上拉或下拉

STM32内部VDDA也为复位电路供电，外接复位电路并入模拟电源和地没问题

A

A

B

B

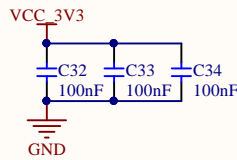
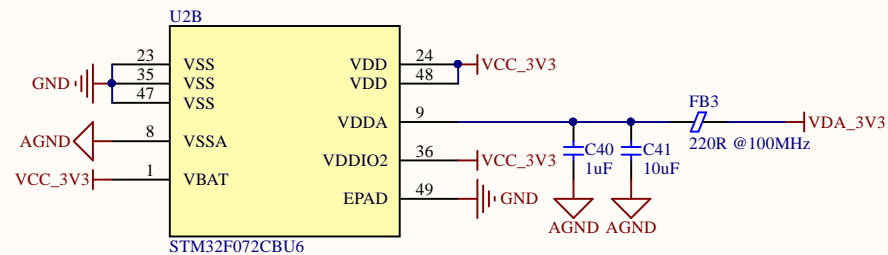
C

C

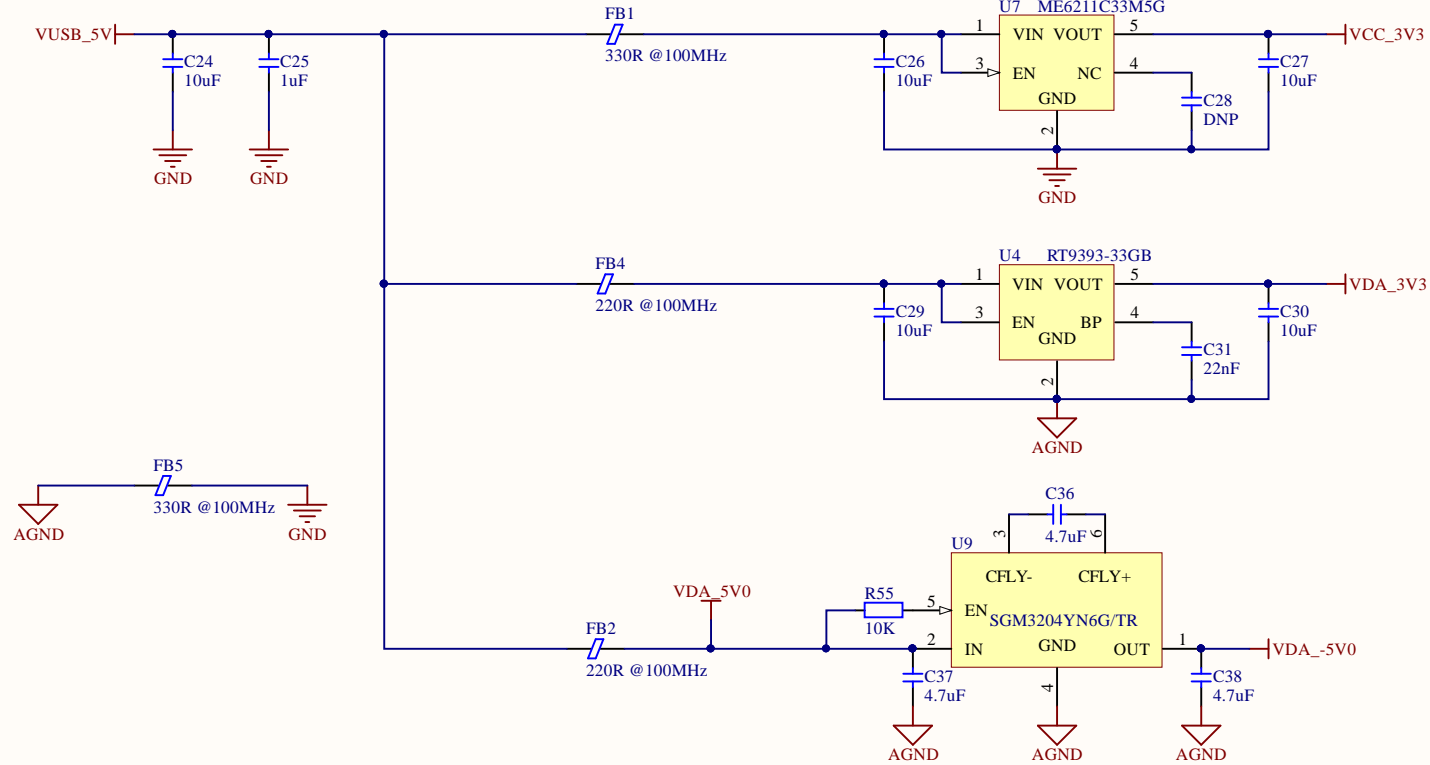
D

D


交换了LCD_DC和LCD_nRST
交换了I2C和MEM_INT、LCD_BL
更改了大多数ADC通道引脚
更改了所有KEY引脚

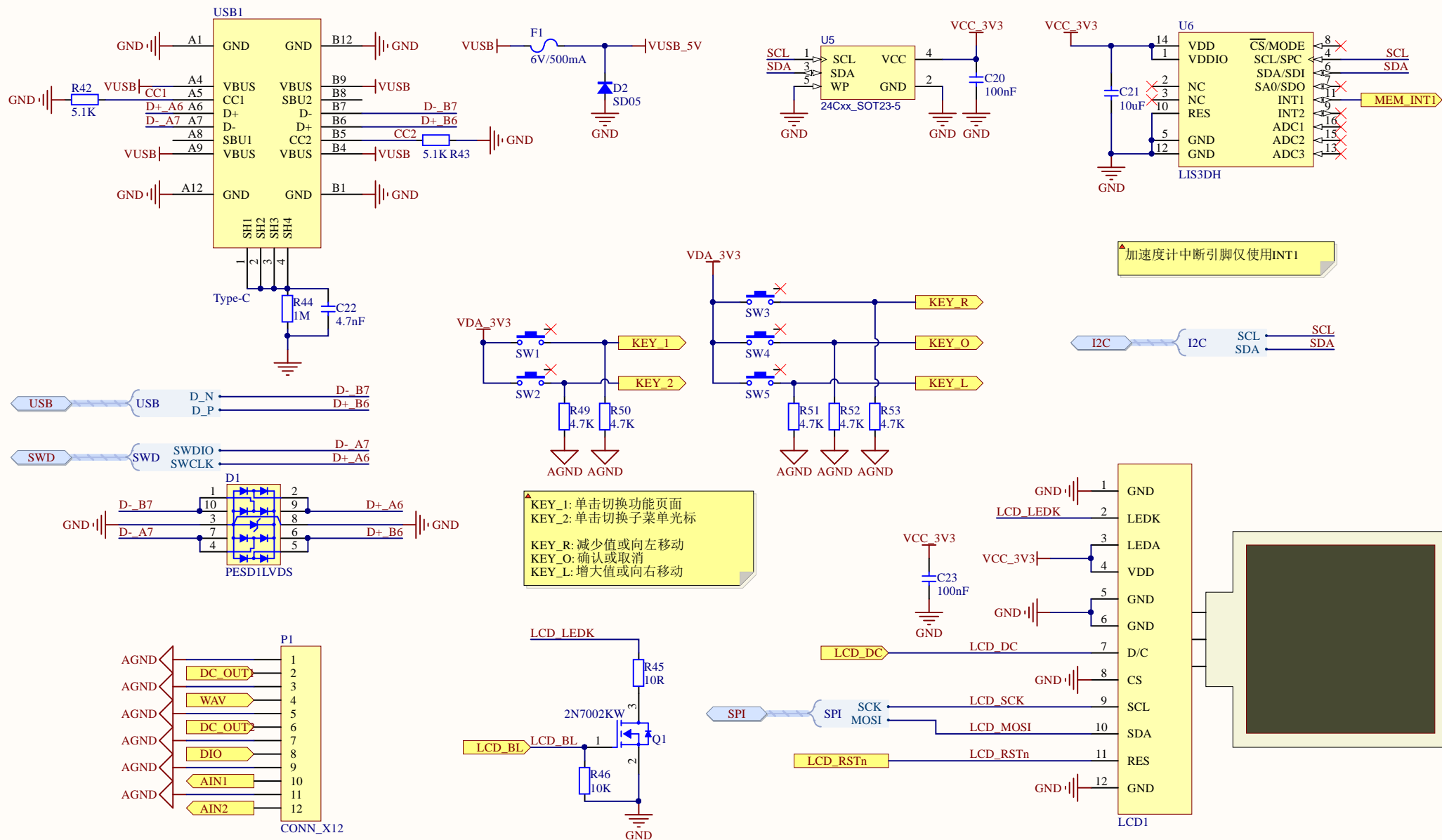


Title SCOPE-F07x: mcu			Draw By: OldGerman	
Size: A4	Number:*	Revision: v1.1	* https://github.com/oldgerman/SCOPE-F07x	
Date: 2022/8/11	Time: 17:32:28	Sheet 3 of 5	*	
File: D:\ODG-PROJECT\SCOPE_F07x\HardWare\AD_Project\SCOPE_F07x\mcu.SchDoc				



▲ 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 SCOPE-F07x: power_supply			Draw By: OldGerman	
Size: A4	Number:*	Revision v1.1	https://github.com/oldgerman/SCOPE-F07x	
Date: 2022/8/11	Time: 17:32:29	Sheet 4 of 5	*	
File: D:\ODG-PROJECT\SCOPE_F07x\HardWare\AD_Project\SCOPE_F07x\power_supply.SchDoc				



Title **SCOPE-F07x: misc**

Draw By: OldGerman

Size: A4

Number:*

Revision: v1.1

* <https://github.com/oldgerman/SCOPE-F07x>

Date: 2022/8/11

Time: 17:32:29

Sheet 5 of 5

* <https://github.com/oldgerman/SCOPE-F07x>

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