Mixed-Signal_STM_AudioScope_And_Sine_Generator

[1] PDN

File: PDN_P1_sheet.kicad_sch

[2] STMuC

File: untitled.kicad_sch

[3] ADC

File: ADC_P4_sheet.kicad_sch

[4] DAC

File: DAC_P5_file.kicad_sch

Mounting Holes no Pad (M3)

- H1 MountingHole
- H2 MountingHole
- H3 MountingHole
- H4 MountingHole

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Sheet: /
File: mixed_signal_STM with Kicak backup2.kicad_sch

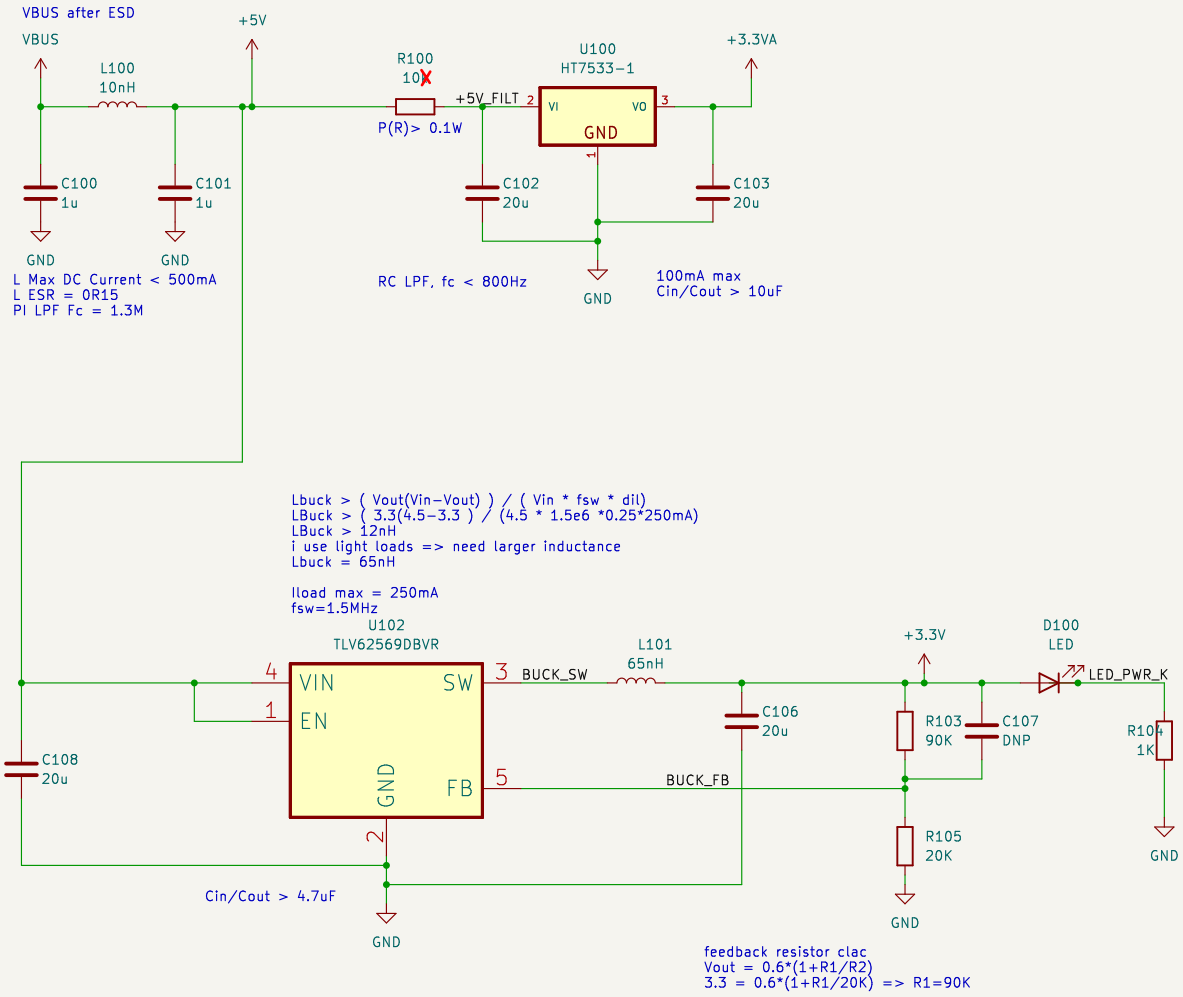
Title: Mixed_Signal_STM

Size: A4	Date: 2023-11-26	**Rev: 1.0**
KiCad E.D.A. kicad 7.0.9		Id: 1/5

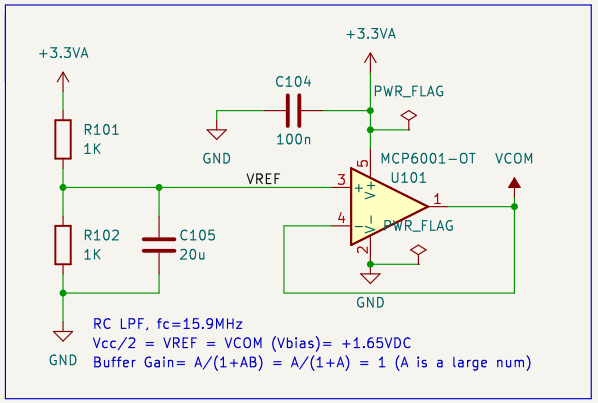
PDN

Input filtering, Analog supply and Didital supply

VBUS Power comes from USB Type C (Schematic page2)



Bias voltage Generator



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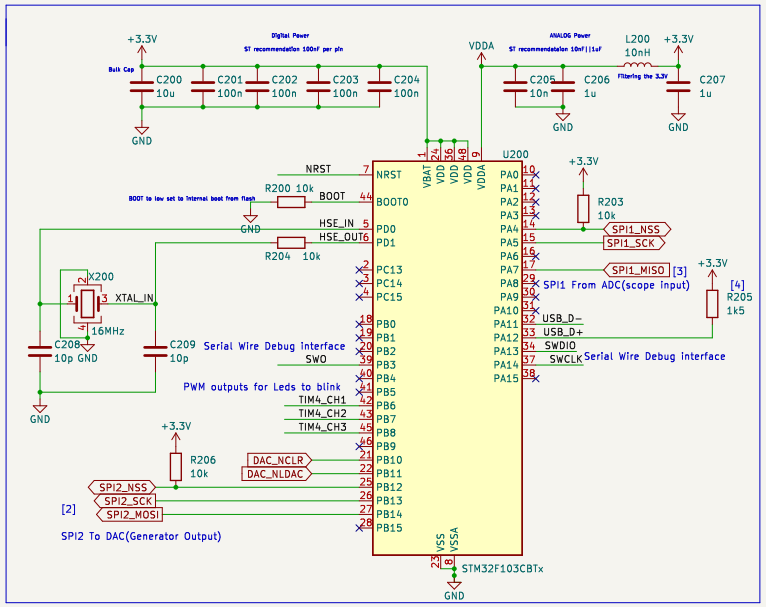
Sheet: /[1] PDN/
File: PDN_P1_sheet.kicad_sch

Title: PDN

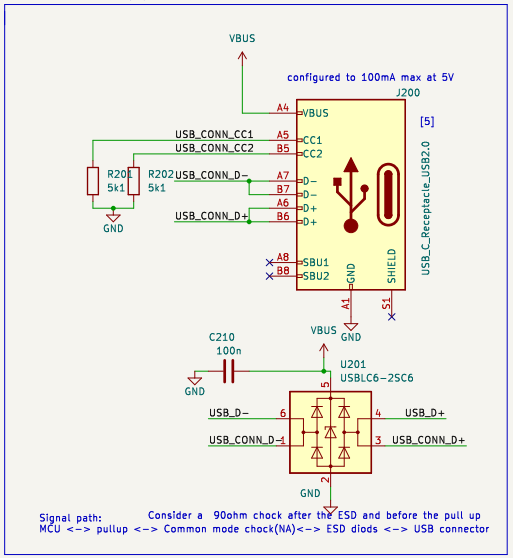
Size: A4	Date: 2023-11-26	**Rev:**
KiCad E.D.A. kicad 7.0.9		Id: 2/5

STM32 MicroController

STM uC



USB 2.0 TypeC connector



Notes

[1]
Xtal:
using External Xtal(and not the internal one) since I want timing accuracy for the USB 2.0 FS
Cap values calculated from the STM AN2867 Application note

F0=16MHz
C0=10pF
ESR=80Ohms

Rext=10% of 1/(2*pi*F0*C0)= 99.47 =>100Ohm

Cs is stray capacitance(parisitic) and it's 3-5pF

CL = CL1 = CL2 = 2*(C0-Cs) = 10pf -14pF

using Rext of 0 ohm

[2]
SPI2 will only send data to the DAC

chosen Mode:"Transmit only master" at STM32CubeIDE
NSS is the Chip select ping and was configured as "Hardware NSS Signal" since the STM is the SPI Master

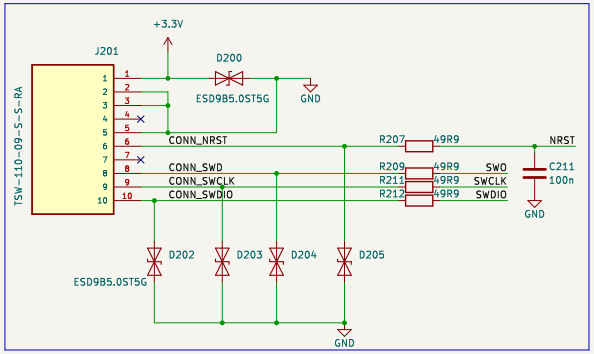
[3]
SPI1 will only receive data from the ADC

chosen Mode:"Receive only master" at STM32CubeIDE
NSS is the Chip select ping and was configured as "Hardware NSS Signal"

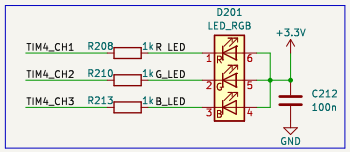
[4]
USB Application note AN4879
is requestion this pull up

[5]
USB typeC Application note TA0357
see section 3.2 -Sink Port (consumer)
This port is able to consume power over VBUS (from 5 V to 20 V and up to 5 A) and must assert a pull-down resistor (Rd) on the CC pins.
Source CC termination (Rp) requirements
the table indicading 4k7k sink on the CC pins but i took 5k1 for BOM consideration

SWD Header



RGB Led Traffic Indication



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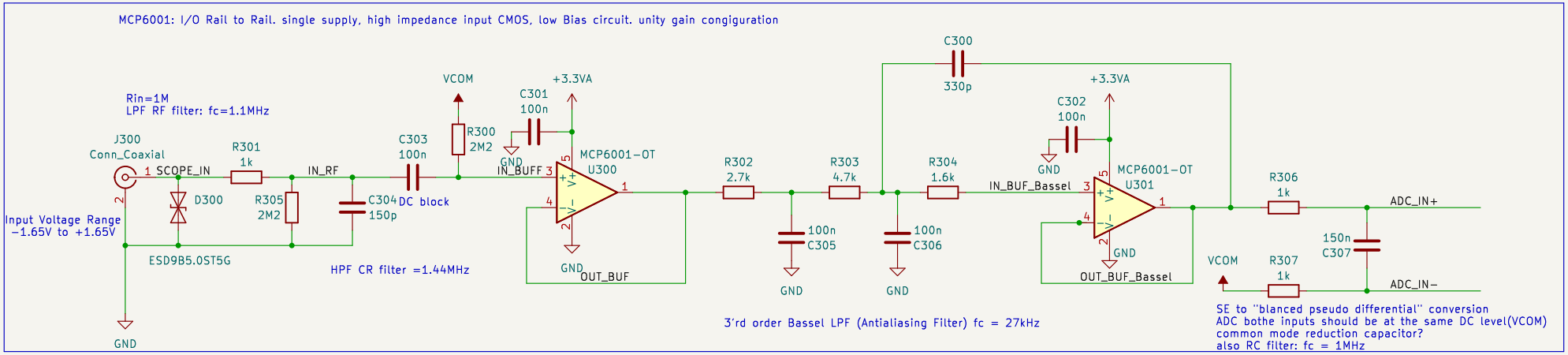
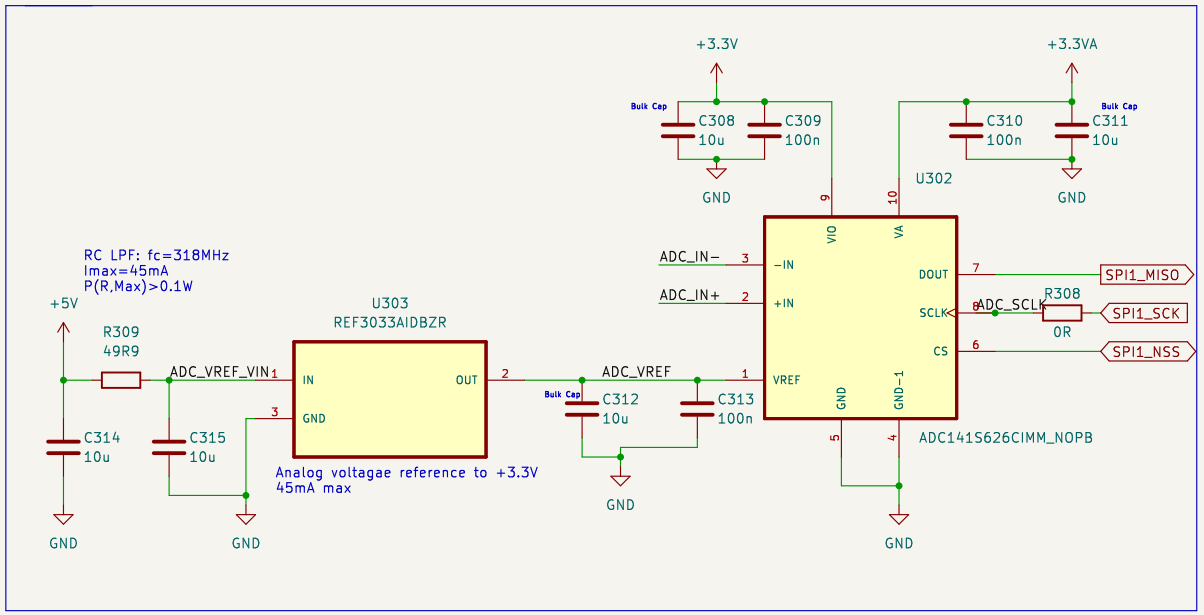
Sheet: /[2] STMuC/		
File: untitled.kicad_sch		
Title: STM32 uC		
Size: A3	Date: 2023-11-26	**Rev: 1.0**
KiCad E.D.A. kicad 7.0.9		Id: 3/5

ADC – Scope



ADC 14-Bit



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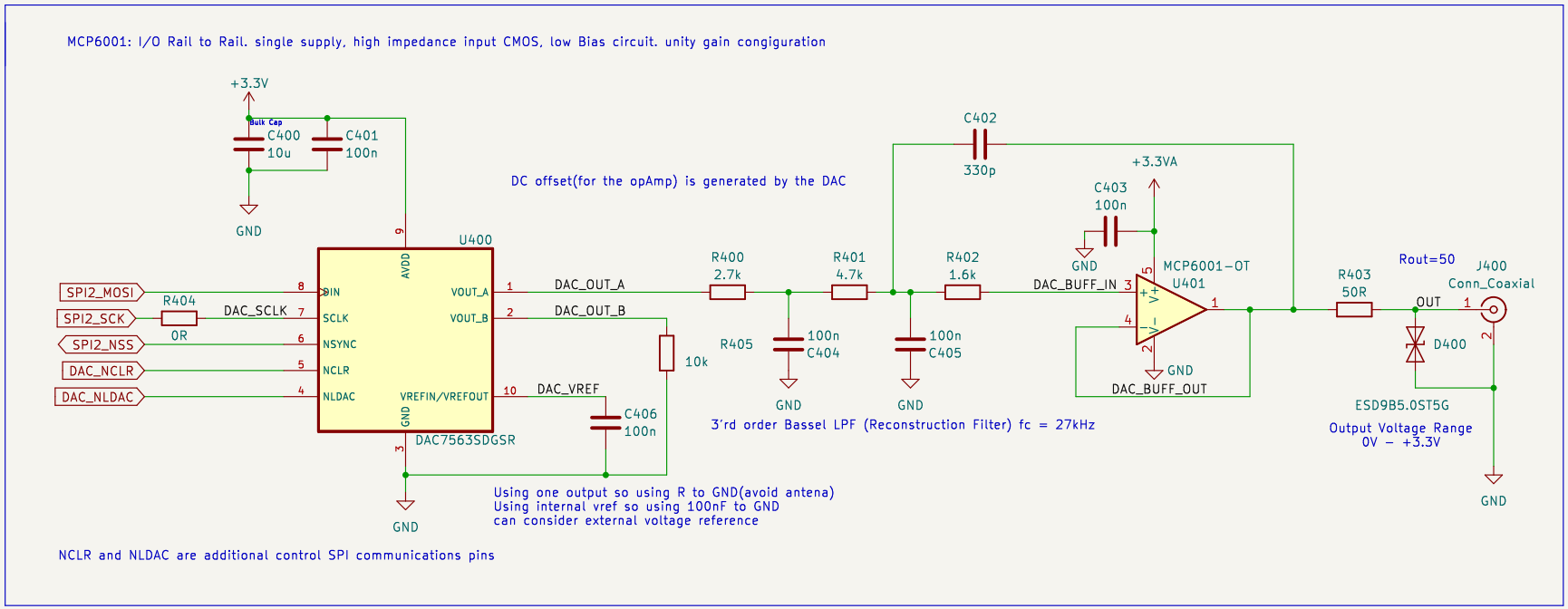
Sheet: /[3] ADC/
File: ADC_P4_sheet.kicad_sch

Title: ADC – Scope

Size: A4	Date: 2023-11-26	**Rev:**
KiCad E.D.A. kicad 7.0.9		Id: 4/5

DAC – Signal generator



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Sheet: /[4] DAC/		
File: DAC_P5_file.kicad_sch		
Title: DAC – Signal Generator		
Size: A4	Date: 2023-11-16	**Rev: 1**
KiCad E.D.A. kicad 7.0.9		Id: 5/5