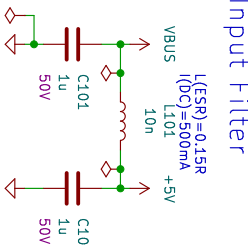


LP	
Sheet: /	
File: rp2040_audioboard.kicad_sch	
Title: RP2040 Audio Board	
Size: A4	Date: 2023-05-01
KiCad E.D.A. kicad (7.0.0)	
	Rev: 0.1
	Id: 1/5

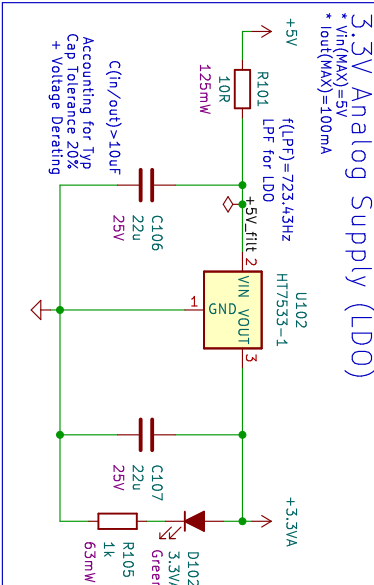


VBUS power comes from USB Type C Connector

Input Filter

$L(ESR)=0.15R$

$I(DC)=500mA$



3.3V Analog Supply (LDO)

$V_{in}(MAX)=5V$

$I_{out}(MAX)=100mA$

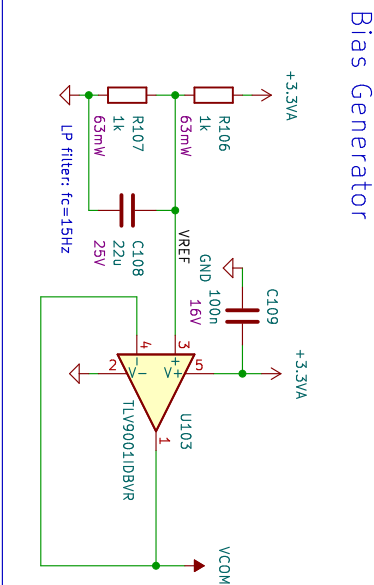
$f(PF)=723.43Hz$

LPF for LDO

Accounting for Typ

Cap Tolerance 20%

+ Voltage Derating



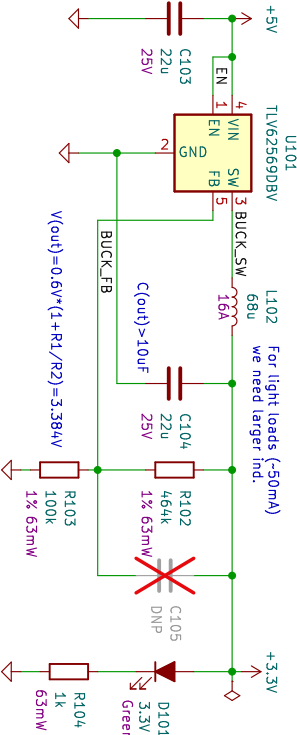
Bias Generator

3.3V Digital Supply (BUCK)

$V_{in}(MAX)=5V$

$I_{out}(MAX)=250mA$

$f(sw)=1.5MHz$



$L(Loadmax) = \frac{V_o(V_i - V_o)}{dI_L \cdot f(sw) \cdot V_i}$
 $= \frac{3.3(5 - 3.3)}{0.25 \cdot 1.56e6 \cdot 5}$
 $= 3.3(5 - 3.3) / 0.25 \cdot 1.56e6 \cdot 5$
 $= 12uH \rightarrow \text{next size } 15uH$

For light loads (~50mA)
we need larger ind.

$V_{out} = 0.6V \cdot (1 + R1/R2) = 3.384V$

Test Points



LP

Sheet: / [1] Power /

File: power.kicad_sch

Title: **RP2040 Audio Board**

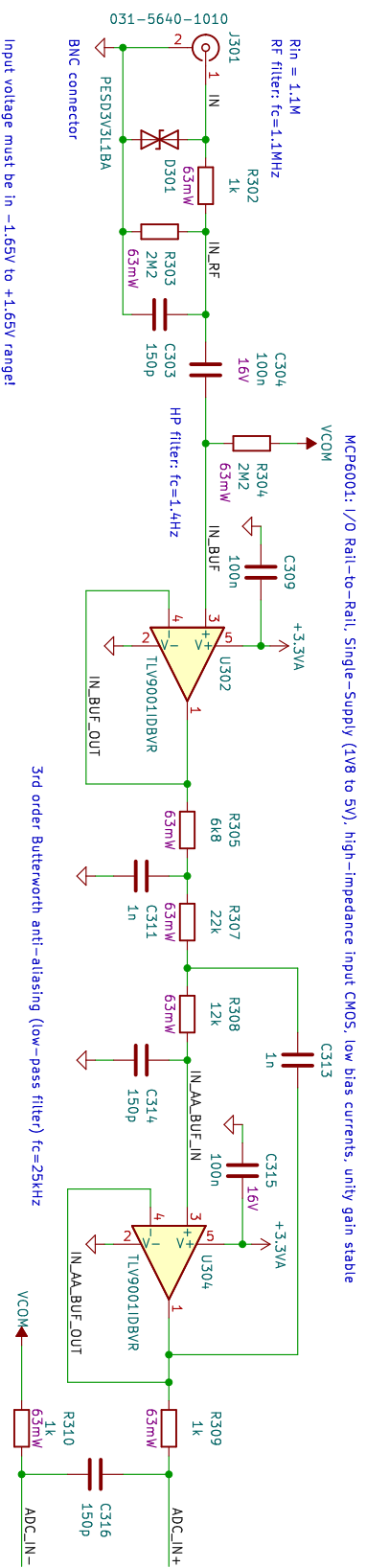
Size: A4

Kicad E.D.A. kicad (7.0.0)

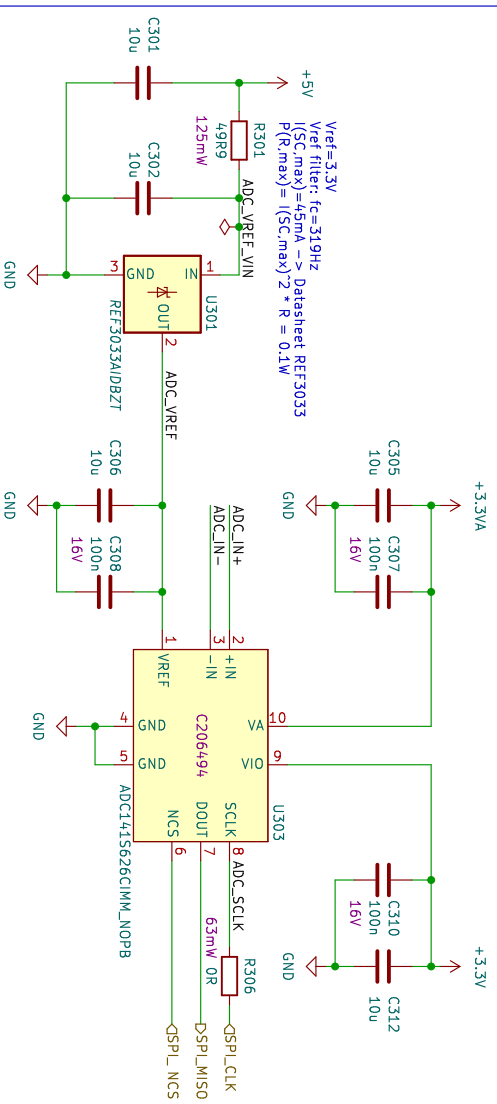
Rev: 0.1

Id: 2/5

Analog Front End



14-Bit S/H ADC



LP

Sheet: / [3] ADC /

File: adc.kicad_sch

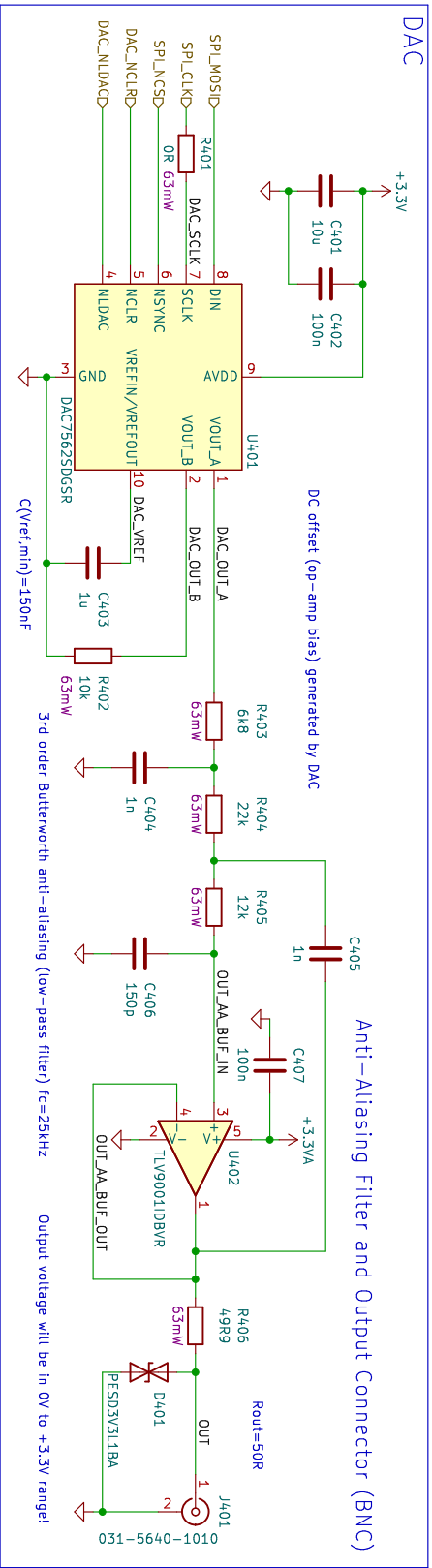
Title: RP2040 Audio Board

Size: A4

Date: 2023-05-01

Size: A1	Desc: Z
Kicad E.D.A. kicad (7.0.0)	

Rev: 0.1
Id: 4/5



LP

Sheet: / [4] DAC/

File: dac.kicad_sch

Title: **RP2040 Audio Board**

Size: A4

Date: 2023-05-01

KiCad E.D.A. kicad (7.0.0)

Rev: 0.1

Id: 5/5