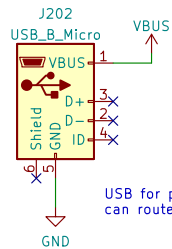
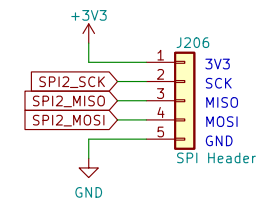
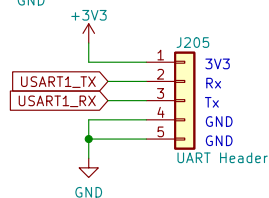
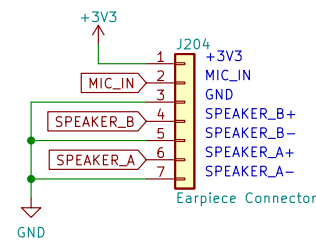
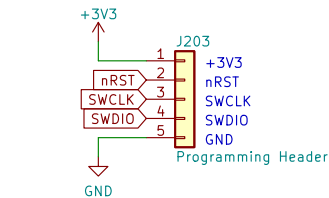
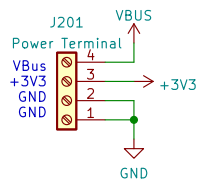


Designer: Wesley Soo-Hoo		
Global Health		
Affordable Design and Entrepreneurship		
Olin College of Engineering		
Sheet: /		
File: oae.kicad_sch		
Title: OAE		
Size: A4	Date: 2022-10-19	Rev: 0
KiCad E.D.A. kicad (6.0.1-0)		Id: 1/7



USB for power only for now. In the future we can route data through this USB port as well.



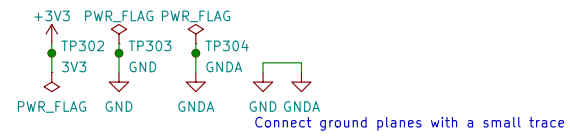
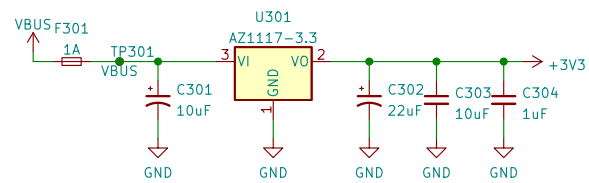
Sheet: /Interface/
File: interface.kicad_sch

Title:

Size: A4
KiCad E.D.A. kicad (6.0.1-0)

Date:

Rev:
Id: 2/7



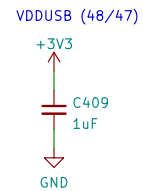
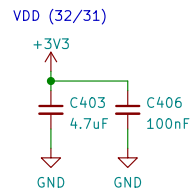
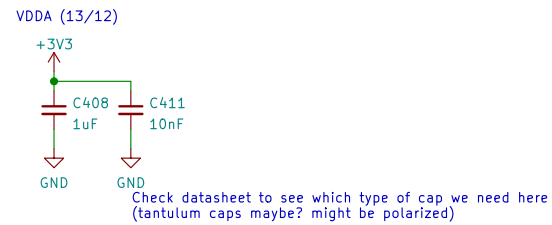
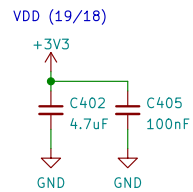
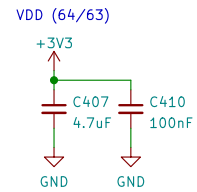
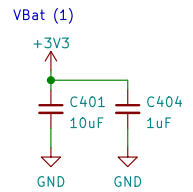
Sheet: /Power/
File: power.kicad_sch

Title:

Size: A4
KiCad E.D.A. kicad (6.0.1-0)

Date:

Rev:
Id: 3/7



Layout note: Make sure these bypass caps are
physically close to the noted pin

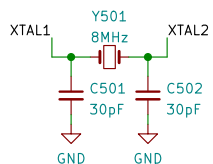
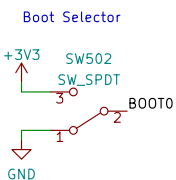
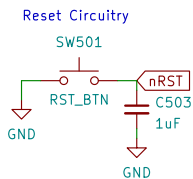
Sheet: /Microcontroller/Bypass Capacitors for Microcontroller/
File: bypass_micro.kicad_sch

Title:

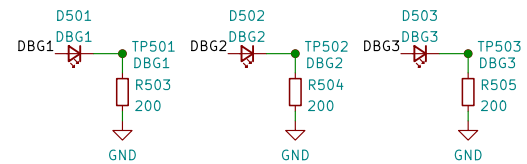
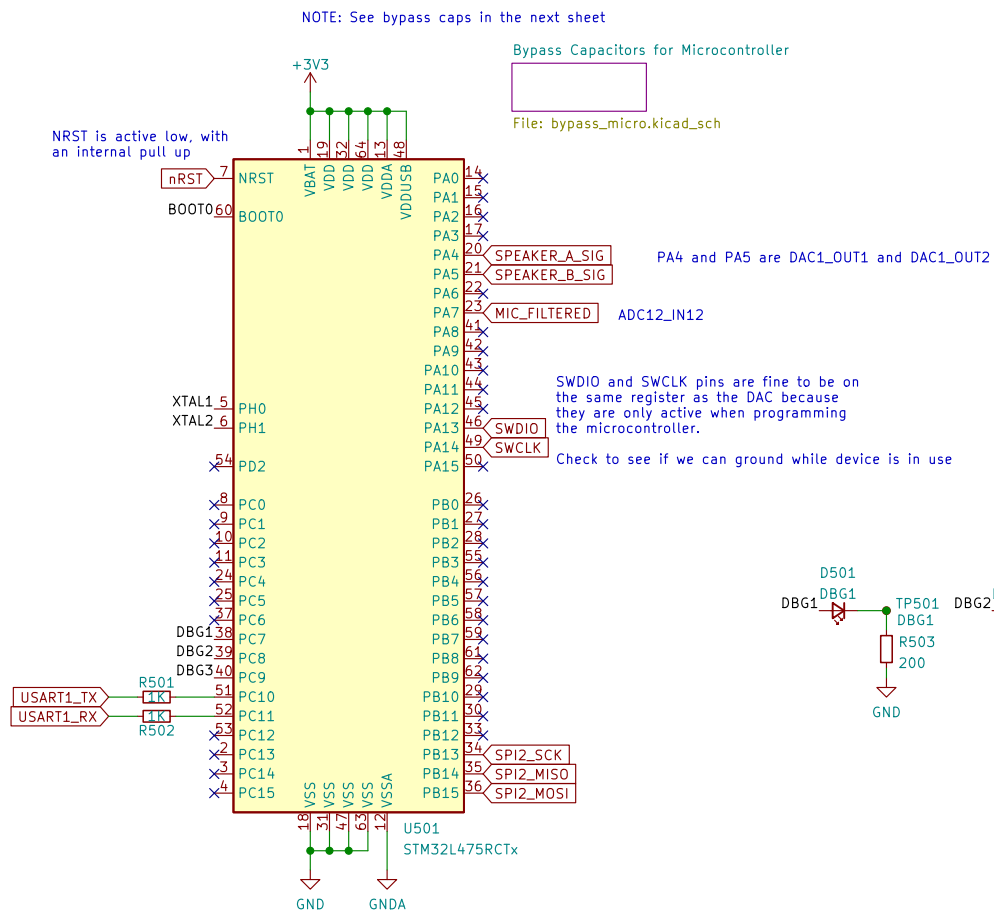
Size: A4
KiCad E.D.A. kicad (6.0.1-0)

Date:

Rev:
Id: 5/7



Assuming 3pF stray capacitance
 $CX1 = CX2 = 2(\text{load cap} - \text{stray cap})$
 $= 2(18\text{pF} - 3\text{pF}) = 30\text{pF}$



Sheet: /Microcontroller/
File: microcontroller.kicad_sch

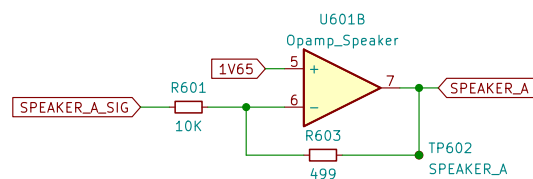
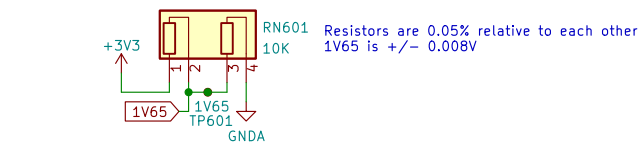
Title:

Size: A4
KiCad E.D.A. kicad (6.0.1-0)

Date:

Rev:

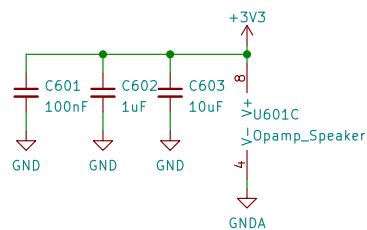
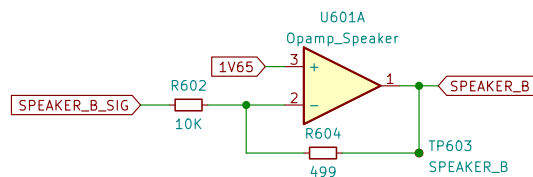
Id: 4/7



Op Amp gain:

$$\text{gain} = -R_f/R_{in} = 0.05$$

3 V ish signal -> 150 mV signal (centered around 1V65)



Sheet: /Speaker Amps/
File: speaker_amp.kicad_sch

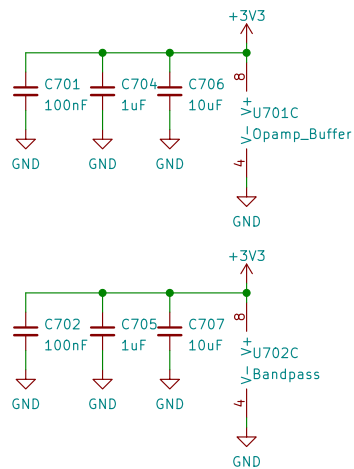
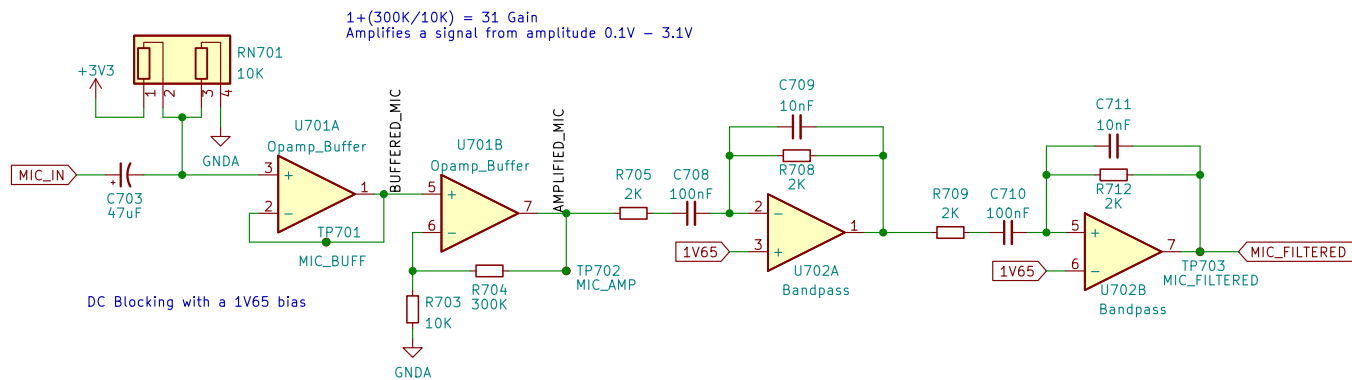
Title:

Size: A4
KiCad E.D.A. kicad (6.0.1-0)

Date:

Rev:

Id: 6/7



Frequency range of distortion products: 1.89kHz, 2.49kHz, 4.5kHz

Cutoff Frequencies:
 Lower: $1/(2\pi \cdot R \cdot C) = 1/(2\pi \cdot 2K \cdot 100nF) = 795Hz$
 Upper: $1/(2\pi \cdot R \cdot C) = 1/(2\pi \cdot 2K \cdot 10nF) = 7.96kHz$

Sheet: /Microphone Filters and Amp/
 File: microphone_filter.kicad_sch

Title:

Size: A4

Date:

KiCad E.D.A. kicad (6.0.1-0)

Rev:

Id: 7/7