

Sheet: power

File: power.sch

Sheet: coreboard

File: coreboard.sch

Sheet: mechanics

File: mechanics.sch

Sheet: audio-codec

File: audio-codec.sch

Sheet: audio-inputs

File: audio-inputs.sch

Sheet: audio-outputs

File: audio-outputs.sch

Sheet: headphone

File: Headphone.sch

Sheet: usb

File: usb.sch

Sheet: midi

File: midi.sch

Sheet: control-chain

File: control-chain.sch

## Notes

- All resistors named as RA\* must have 1% tolerance
- All non-polarized capacitors named as CA\* must use NP0 Temp. Coef.
- All other non-polarized capacitors should use X7R Temp. Coef.
- Decoupling caps must be placed as close as possible of the IC power pins

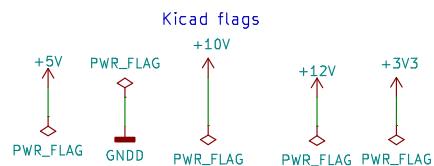
USB outp Power: 500mA  
Inp Power: 12V 500mA  
<https://github.com/moddevices/hw-mod-dwarf>  
Dwarf Audio processing board  
**MOD Devices GmbH**

Sheet: /  
File: bottom-board.sch

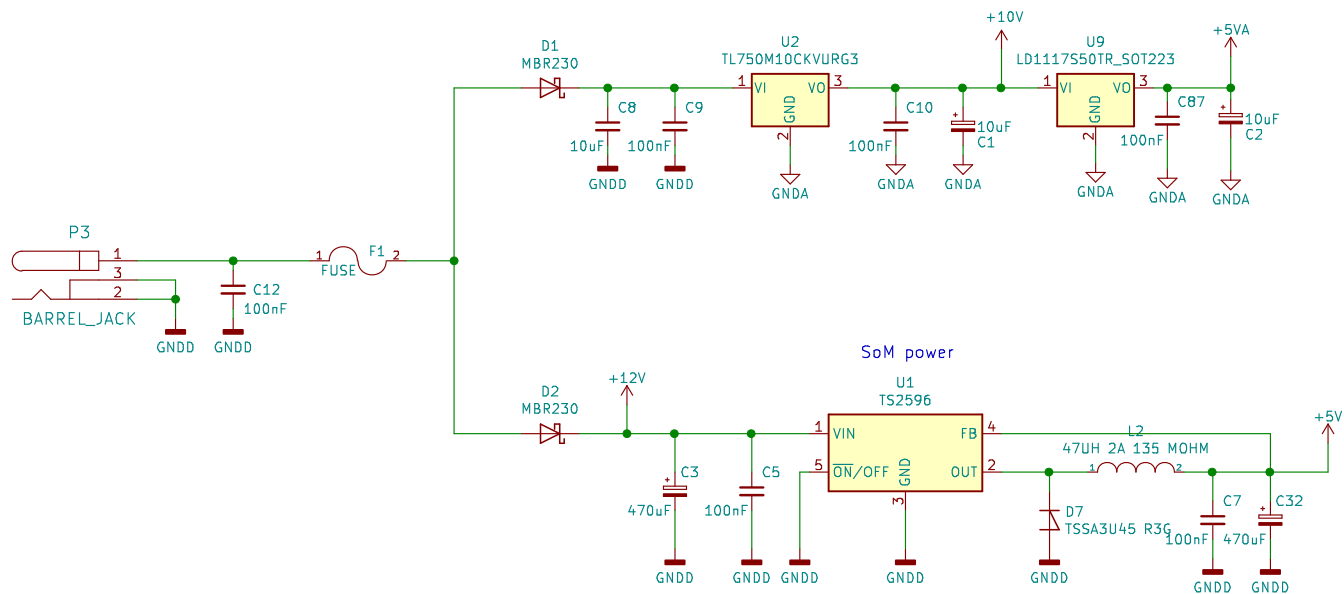
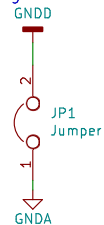
**Title: MOD Dwarf – Main Board**

Size: A4 Date: 2019-12-18  
KiCad E.D.A. kicad 5.1.7-a382d34a887ubuntu20.04.1

**Rev: 0.2**  
Id: 1/11



Only to be merged at codec ground



USB outp Power: 500mA  
 Inp Power: 12V 500mA  
<https://github.com/moddevices/hw-mod-uno>  
 Uno Audio processing board

**MOD Devices GmbH**

Sheet: /power/

File: power.sch

**Title: MOD Uno – Main Board**

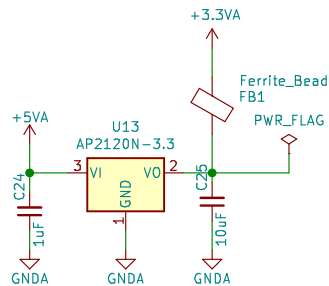
Size: A4

Date: 2019-08-16

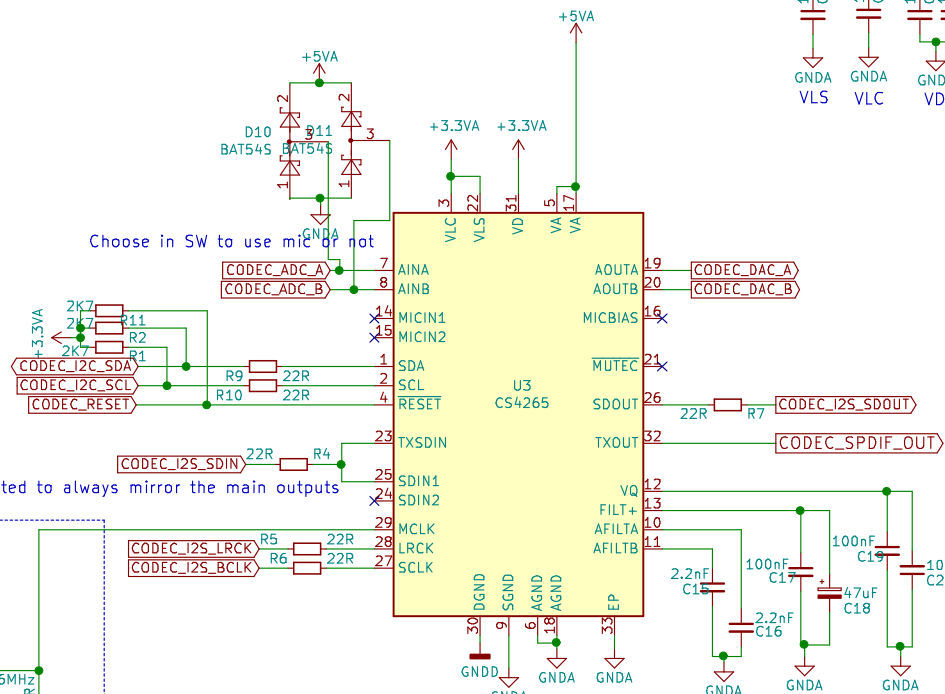
Rev: 0.1

KiCad E.D.A. kicad 5.1.7-a382d34a887ubuntu20.04.1

Id: 2/11



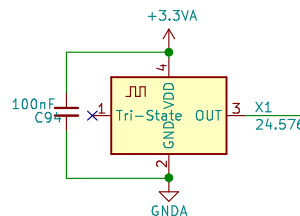
Use ferrite beads for EMI suppression and improved power supply decoupling



Choose in SW to use mic or not

SPDIF is connected to always mirror the main outputs

Codec MCLK



The series resistor at I2S\_MCLK must only be placed when the xtal is not placed, and vice versa.

USB outp Power: 500mA  
Inp Power: 12V 500mA  
<https://github.com/moddevices/hw-mod-uno>  
Uno Audio processing board

**MOD Devices GmbH**

Sheet: /audio-codec/

File: audio-codec.sch

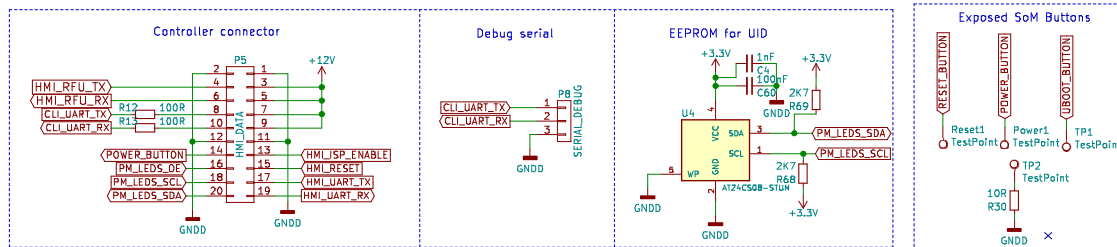
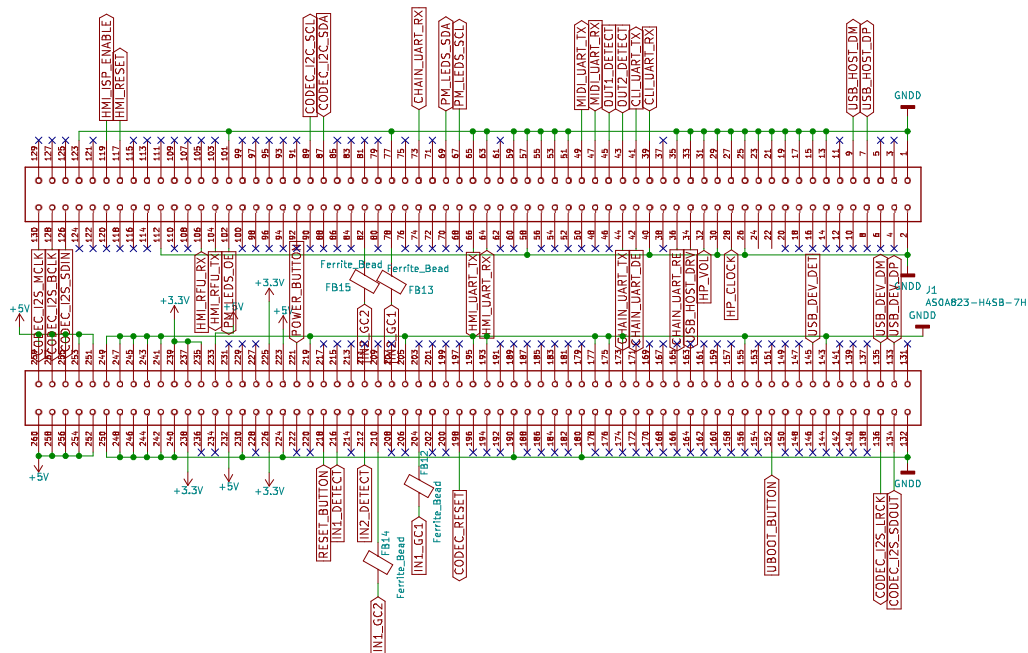
**Title: MOD Uno – Main Board**

Size: A4 Date: 2019-08-16

KiCad E.D.A. kicad 5.1.7-a382d34a887ubuntu20.04.1

**Rev: 0.1**

Id: 3/11

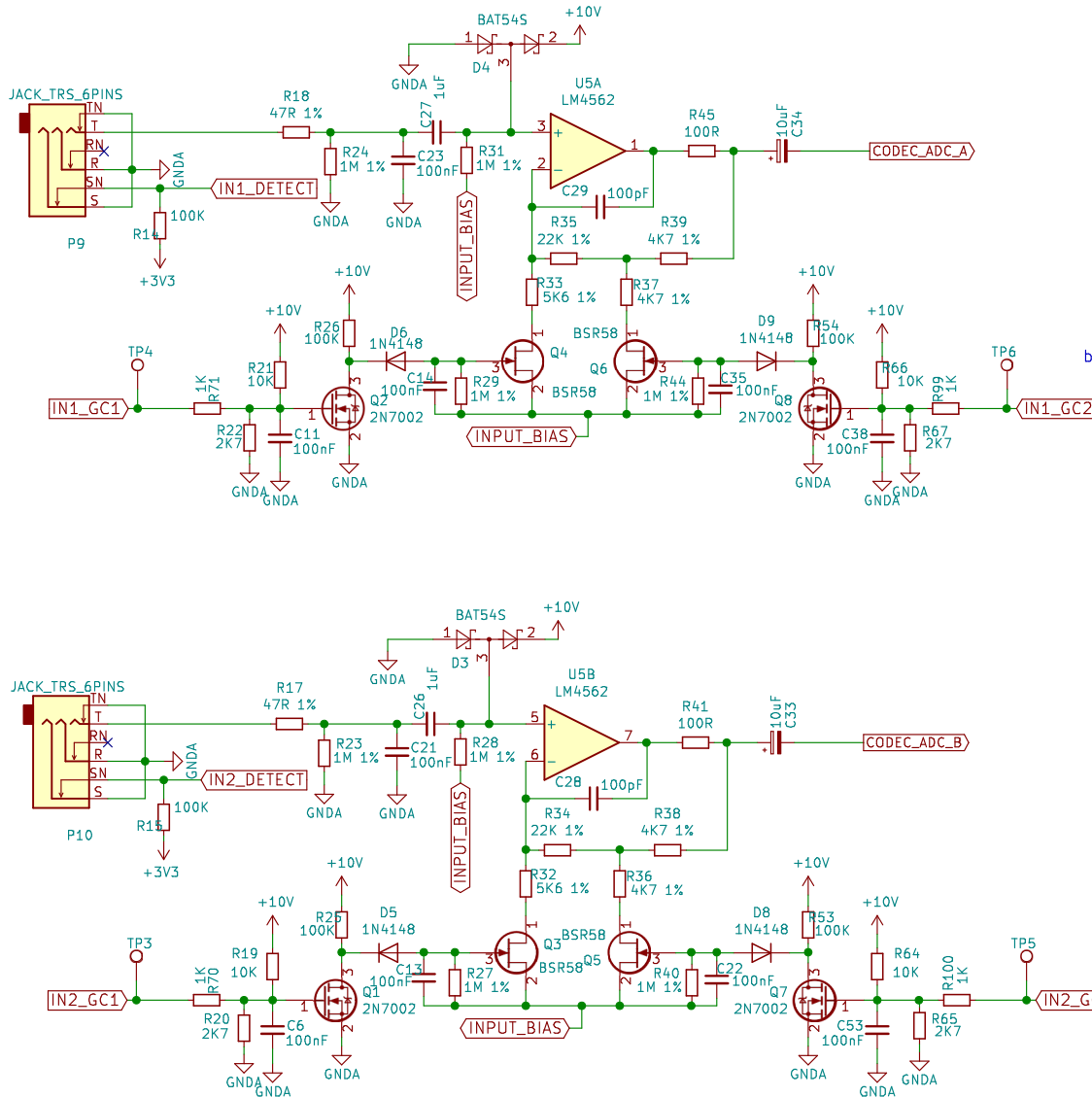


USB outp Power: 500mA  
Inp Power: 12V 500mA  
<https://github.com/moddevices/hw-mod-dwarf>  
Dwarf Audio processing board  
**MOD Devices GmbH**  
Sheet: /coreboard/  
File: coreboard.sch

**Title: MOD Dwarf – Main Board**

Size: A3	Date: 2019-08-16
KiCad E.D.A. kicad 5.1.7-a382d34a887ubuntu20.04.1	

Rev: 0.2
Id: 4/11



GC2, GC1	GAIN (dB)
1, 1	0.0
1, 0	6.0
0, 1	15.0
0, 0	20.4

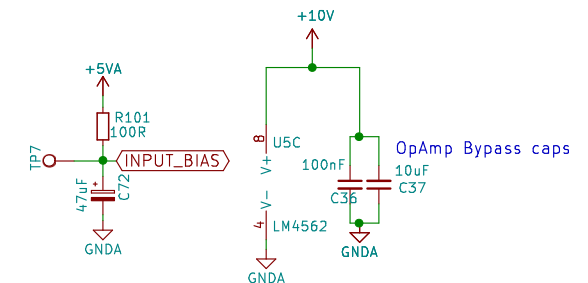
The gain calculation includes the  $R_{DSon}$  value

J110:  $R_{DSon} = 18R$

The CODEC only presents optimal dynamic range and THD+N for PGA setting:  $-12dB$  to  $+6dB$ .

best achievable noise will be  $-94dB$  since this is the Johnson noise with an impedance of 1Meg

Use ferrite beads for EMI suppression and improved power supply decoupling



USB outp Power: 500mA  
Inp Power: 12V 500mA  
<https://github.com/moddevices/hw-mod-uno>  
Uno Audio processing board

**MOD Devices GmbH**

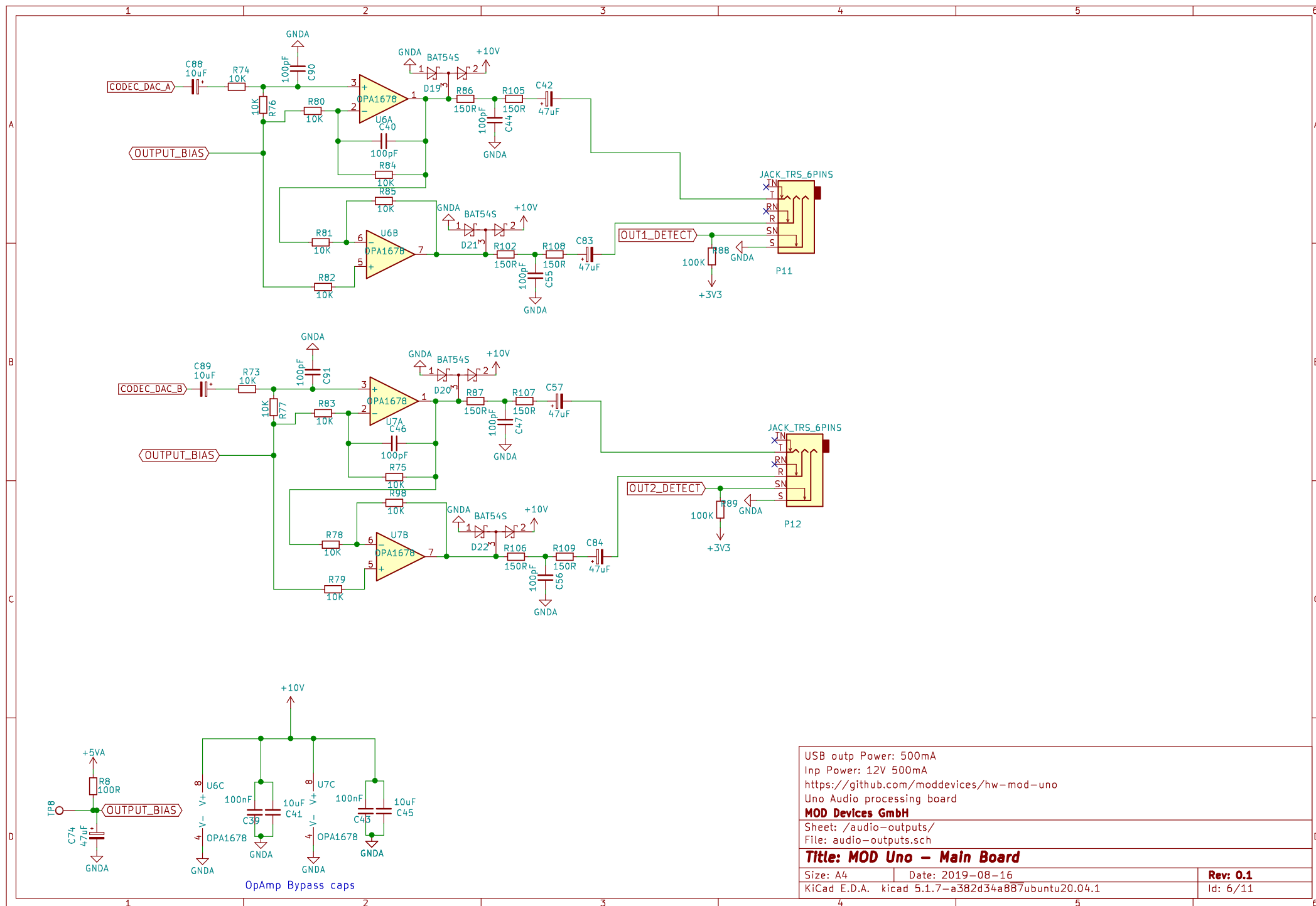
Sheet: /audio-inputs/

File: audio-inputs.sch

**Title: MOD Uno – Main Board**

Size: A4 Date: 2019-08-16  
KiCad E.D.A. kicad 5.1.7-a382d34a887ubuntu20.04.1

Rev: 0.1  
Id: 5/11



USB outp Power: 500mA  
 Inp Power: 12V 500mA  
<https://github.com/moddevices/hw-mod-uno>  
 Uno Audio processing board

**MOD Devices GmbH**

Sheet: /audio-outputs/

File: audio-outputs.sch

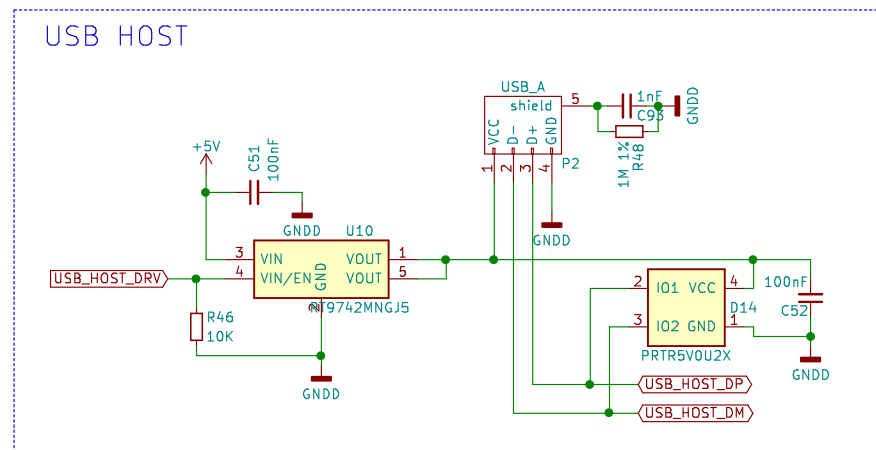
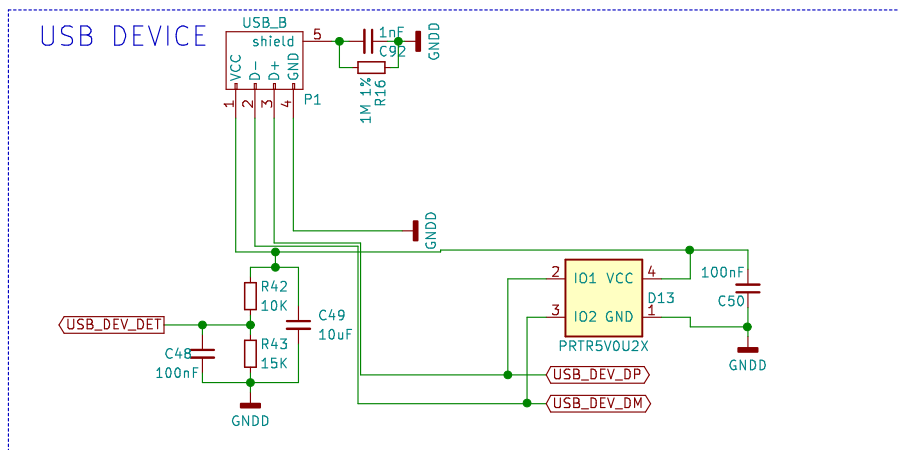
**Title: MOD Uno – Main Board**

Size: A4 Date: 2019-08-16

KiCad E.D.A. kicad 5.1.7-a382d34a887ubuntu20.04.1

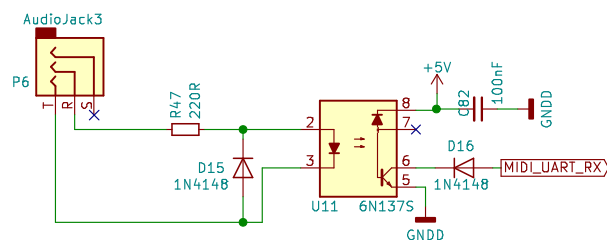
**Rev: 0.1**

Id: 6/11

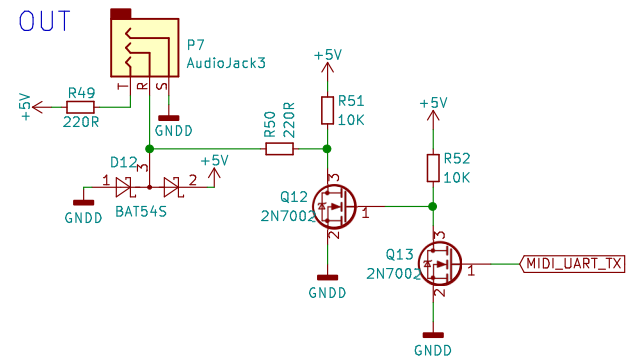


USB outp Power: 500mA		
Inp Power: 12V 500mA		
<a href="https://github.com/moddevices/hw-mod-uno">https://github.com/moddevices/hw-mod-uno</a>		
Uno Audio processing board		
<b>MOD Devices GmbH</b>		
Sheet: /usb/		
File: usb.sch		
<b>Title: MOD Uno – Main Board</b>		
Size: A4	Date: 2019-08-16	Rev: 0.1
KiCad E.D.A. kicad 5.1.7-a382d34a887ubuntu20.04.1		Id: 7/11

## MIDI IN



## MIDI OUT



USB outp Power: 500mA  
 Inp Power: 12V 500mA  
<https://github.com/moddevices/hw-mod-uno>  
 Uno Audio processing board  
**MOD Devices GmbH**

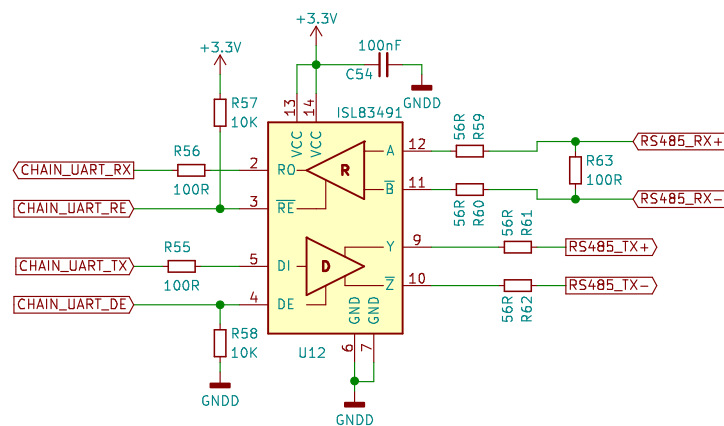
Sheet: /midi/  
 File: midi.sch

### Title: MOD Uno – Main Board

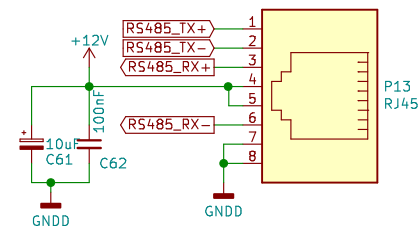
Size: A4 Date: 2019-08-16  
 KiCad E.D.A. kicad 5.1.7-a382d34a887ubuntu20.04.1

Rev: 0.1  
 Id: 8/11

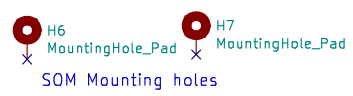
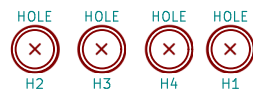
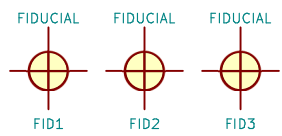




This port is NOT used for ethernet, but for a serial protocol that includes power over the RJ-45 connector



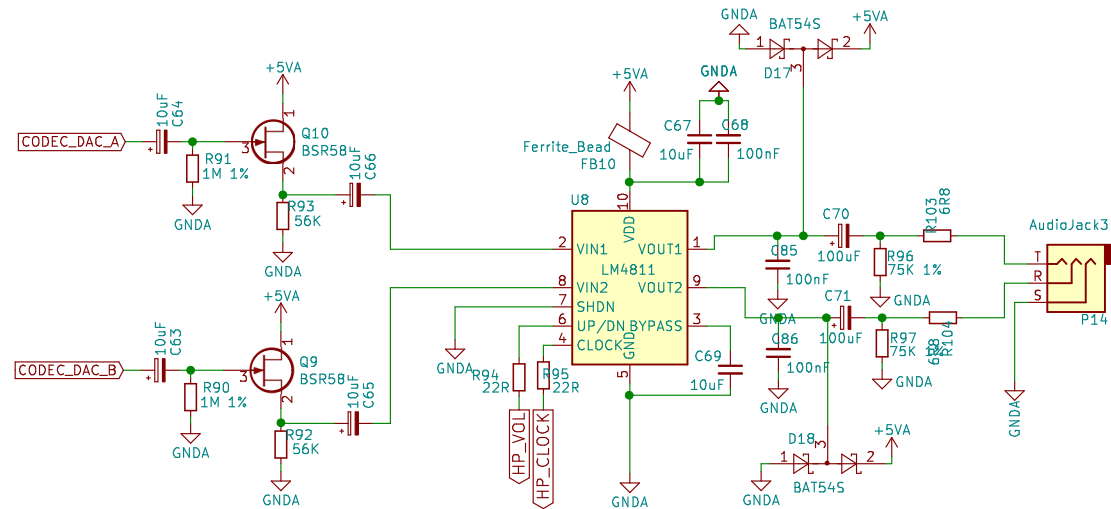
USB outp Power: 500mA	
Inp Power: 12V 500mA	
<a href="https://github.com/moddevices/hw-mod-uno">https://github.com/moddevices/hw-mod-uno</a>	
Uno Audio processing board	
<b>MOD Devices GmbH</b>	
Sheet: /control-chain/	
File: control-chain.sch	
<b>Title: MOD Uno – Main Board</b>	
Size: A4	Date: 2019-08-16
KiCad E.D.A. kicad 5.1.7-a382d34a887ubuntu20.04.1	Rev: 0.1
	Id: 9/11



USB outp Power: 500mA		
Inp Power: 12V 500mA		
<a href="https://github.com/moddevices/hw-mod-uno">https://github.com/moddevices/hw-mod-uno</a>		
Uno Audio processing board		
MOD Devices GmbH		
Sheet: /mechanics/		
File: mechanics.sch		
Title: MOD Uno – Main Board		
Size: A4	Date: 2019-08-16	Rev: 0.1
KiCad E.D.A. kicad 5.1.7-a382d34a887ubuntu20.04.1		Id: 10/11

LM4811 has adjustable gain of  $-33\text{dB}$  to  $+12\text{dB}$ , this is applied to the main out signal

Minimal load of  $16\ \Omega$  with  $0.1\%$  THD+N  
Max power  $105\text{mW}$



Sheet: /headphone/  
File: Headphone.sch

**Title:**

Size: A4  
KiCad E.D.A. kicad 5.1.7-a382d34a887ubuntu20.04.1

Date:

**Rev:**  
Id: 11/11