power

File: power.kicad_sch

coreboard

File: coreboard.kicad_sch

mechanics

File: mechanics.kicad_sch

audio-codec

File: audio-codec.kicad_sch

audio-inputs

File: audio-inputs.kicad_sch

audio-outputs

File: audio-outputs.kicad_sch

headphone

File: Headphone.kicad_sch

usb

File: usb.kicad_sch

midi

File: midi.kicad_sch

control-chain

File: control-chain.kicad_sch

Notes

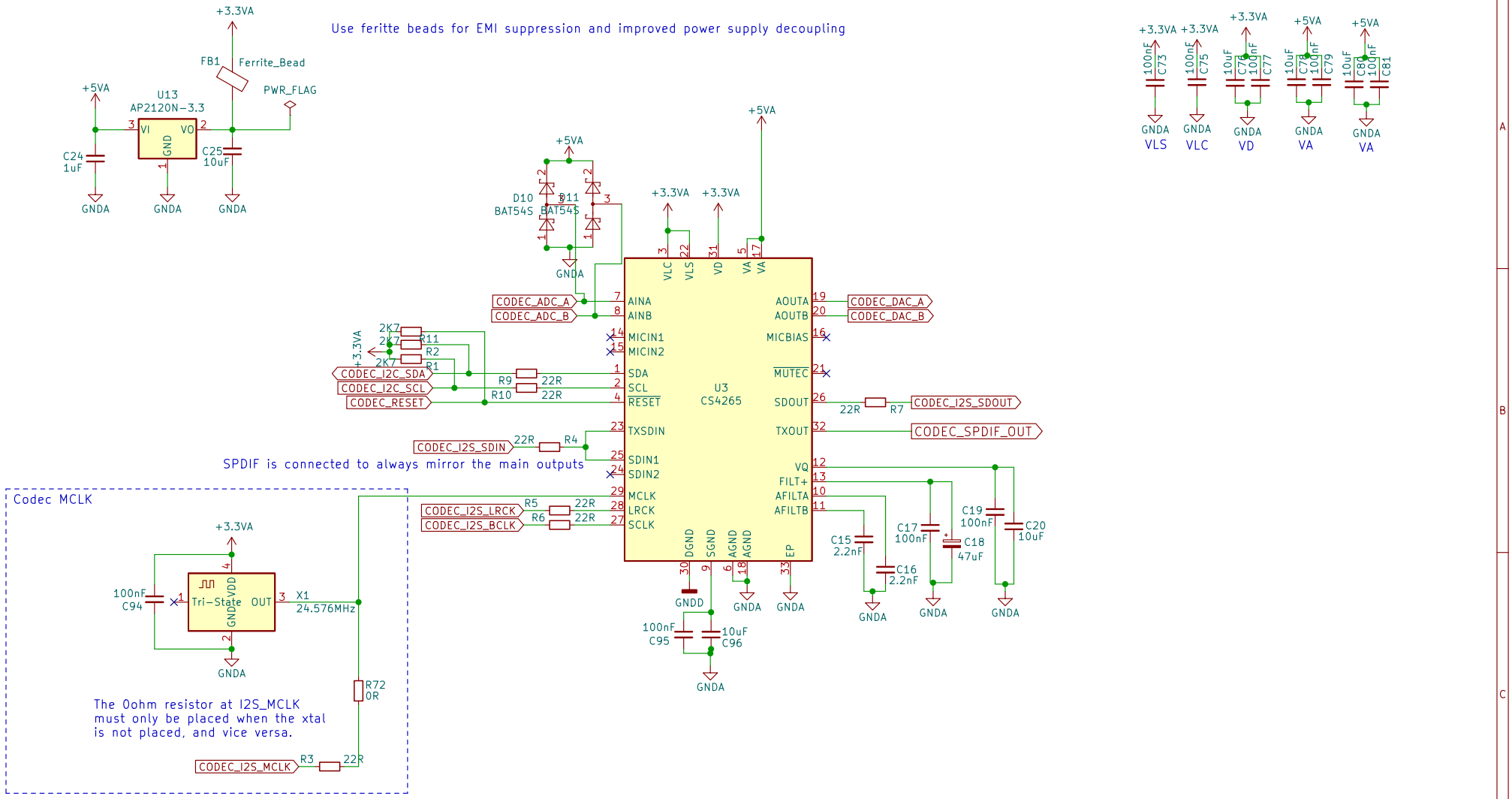
- All resistors named as RA* must have 1% tolerance
- All non-polarized capacitors named as CA* must use NP0 Temp. Coef.
- All other non-polarized capacitors should use X7R Temp. Coef.
- Decoupling caps must be placed as close as possible of the IC power pins

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.kicad_sch

Title: MOD Dwarf - Main Board

Size: A4	Date: 2021-09-06	**Rev: 3.0**
KiCad E.D.A.	kicad 6.0.4-6f826c9f35~116~ubuntu20.04.1	Id: 1/11

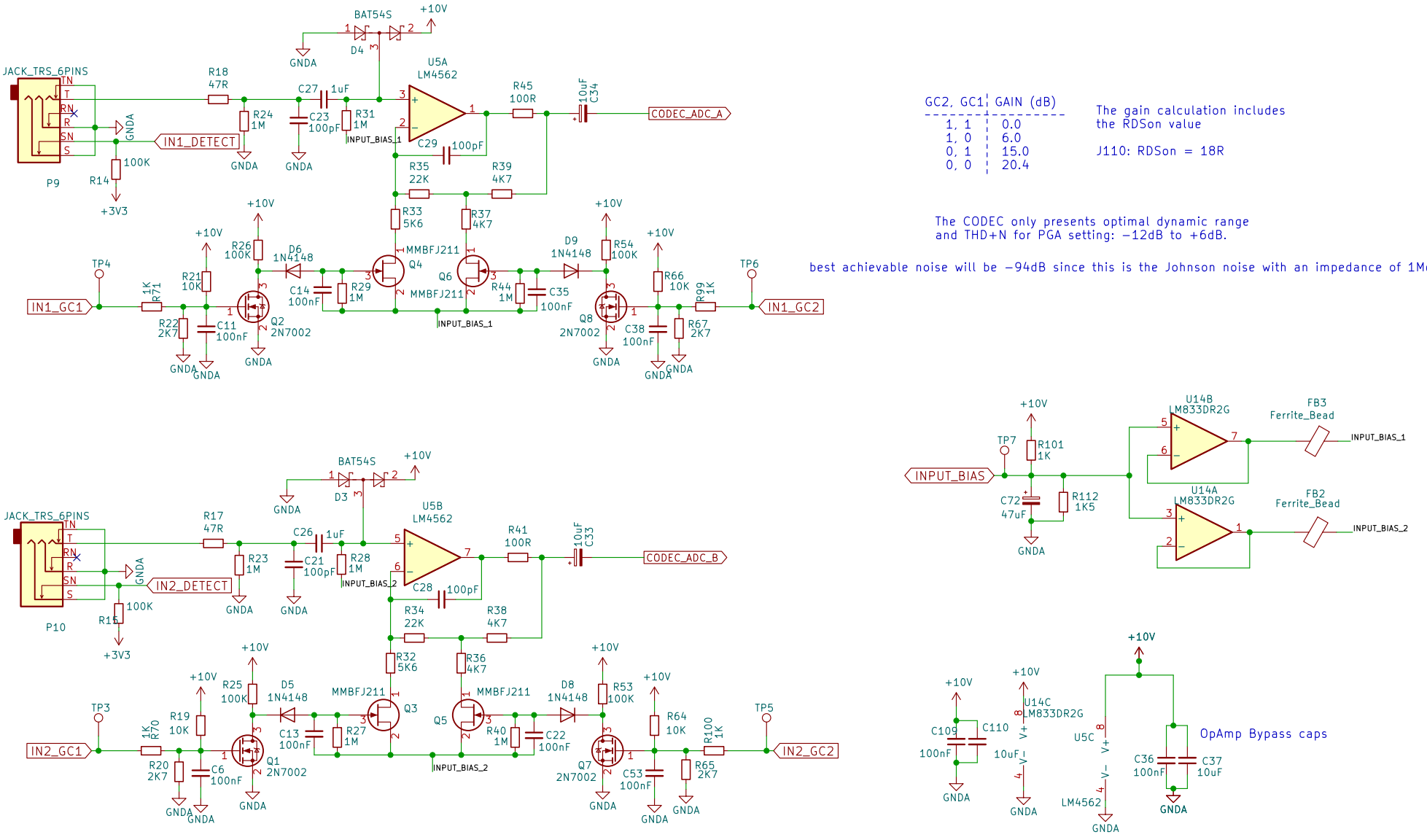


USB outp Power: 500mA
Inp Power: 12V 500mA
https://github.com/moddevices/hw-mod-dwarf
Dwarf Audio processing board
MOD Devices GmbH

Sheet: /audio-codec/
File: audio-codec.kicad_sch

Title: MOD Dwarf – Main Board

Size: A4	Date: 2021-09-06	**Rev: 3.0**
KiCad E.D.A. kicad 6.0.4-6f826c9f35-116-ubuntu20.04.1		Id: 2/11



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 RDSon value

J110: RDSon = 18R

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

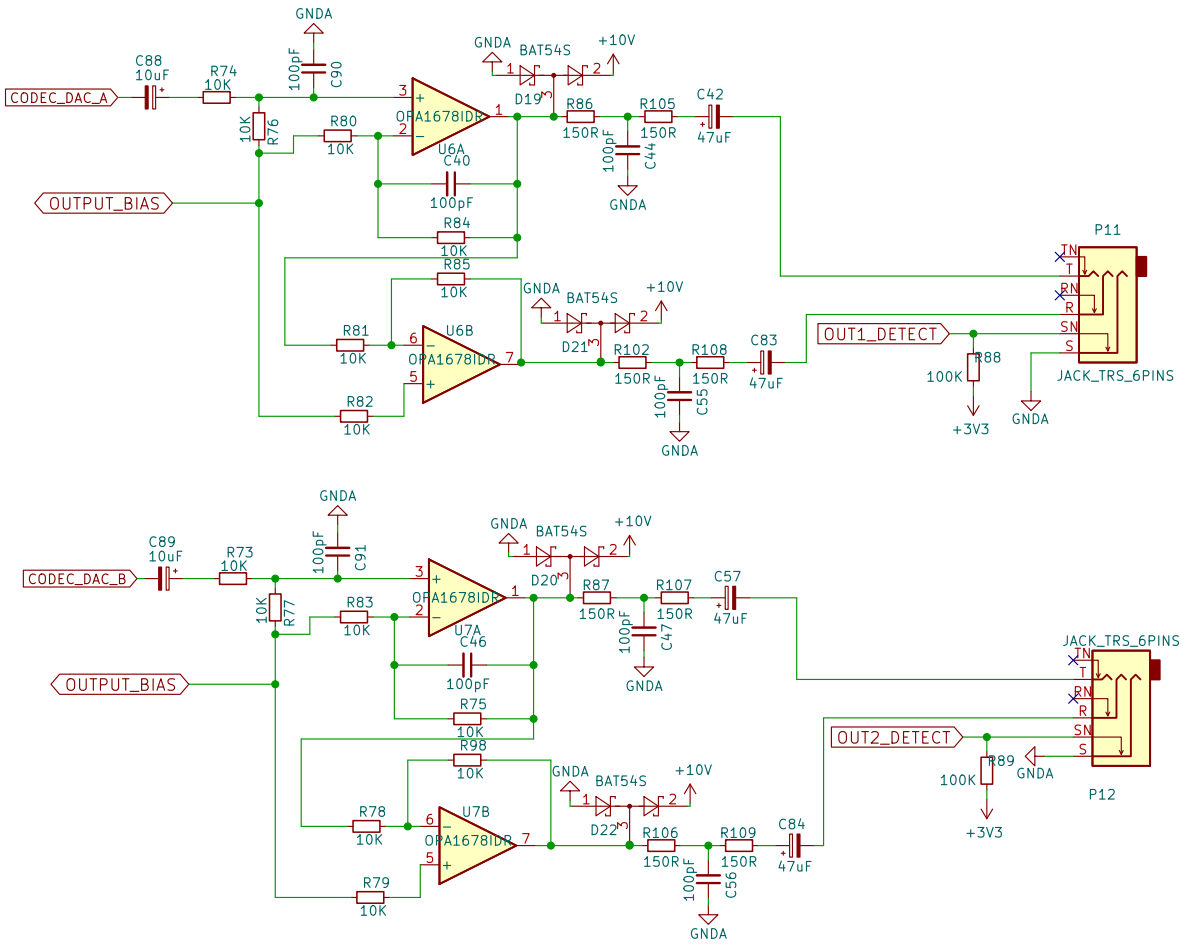
best achievable noise will be −94dB since this is the Johnson noise with an impedance of 1Meg

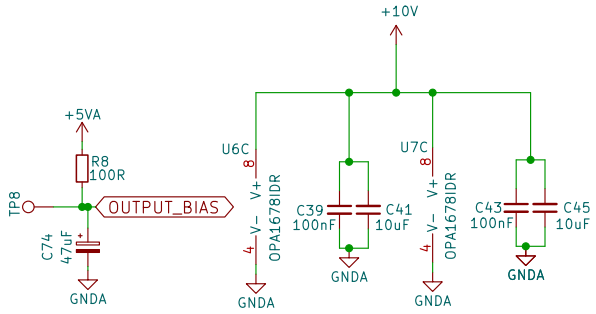
https://github.com/moddevices/hw-mod-dwarf
Dwarf Audio processing board
MOD Devices GmbH

Sheet: /audio-inputs/
File: audio-inputs.kicad_sch

Title: MOD Dwarf – Main Board

Size: A4	Date: 2021-09-06	**Rev: 3.0**
KiCad E.D.A.	kicad 6.0.4-6f826c9f35-116-ubuntu20.04.1	Id: 3/11





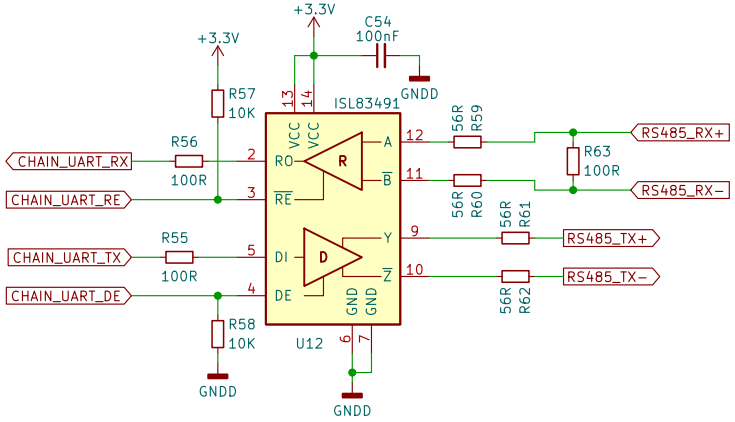
OpAmp Bypass caps

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

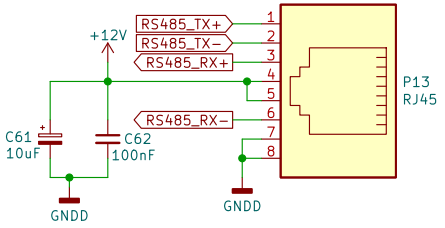
Sheet: /audio-outputs/
File: audio-outputs.kicad_sch

Title: MOD Dwarf – Main Board

Size: A4	Date: 2021-09-06	**Rev: 3.0**
KiCad E.D.A.	kicad 6.0.4-6f826c9f35~116~ubuntu20.04.1	Id: 4/11



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



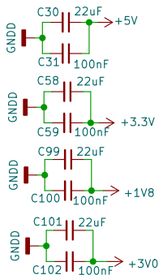
USB outp Power: 500mA
Inp Power: 12V 500mA
https://github.com/moddevices/hw-mod-dwarf
Dwarf Audio processing board
MOD Devices GmbH

Sheet: /control-chain/
File: control-chain.kicad_sch

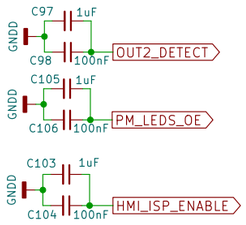
Title: MOD Dwarf — Main Board

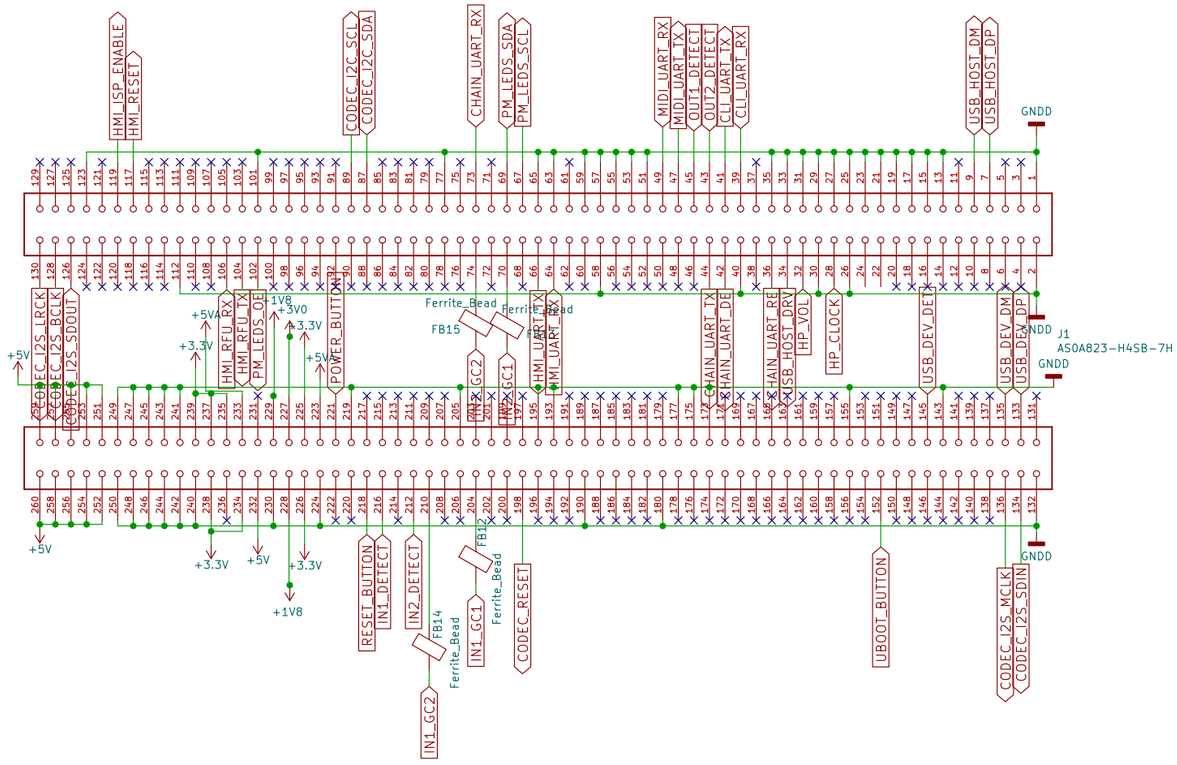
Size: A4	Date: 2021-09-06	**Rev: 3.0**
KiCad E.D.A. kicad 6.0.4-6f826c9f35~116~ubuntu20.04.1		Id: 5/11

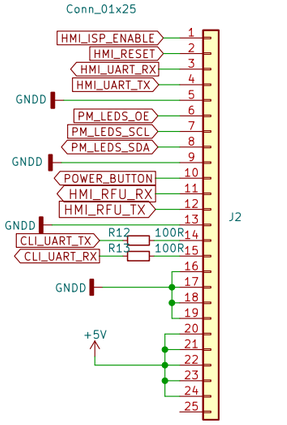
SoM power and power filters



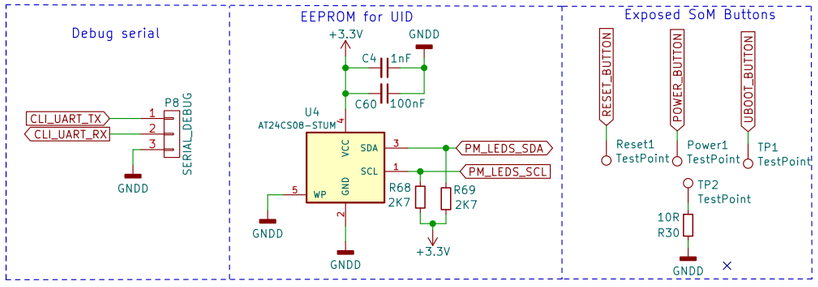
Filter for each used I/O group







Controller connector



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

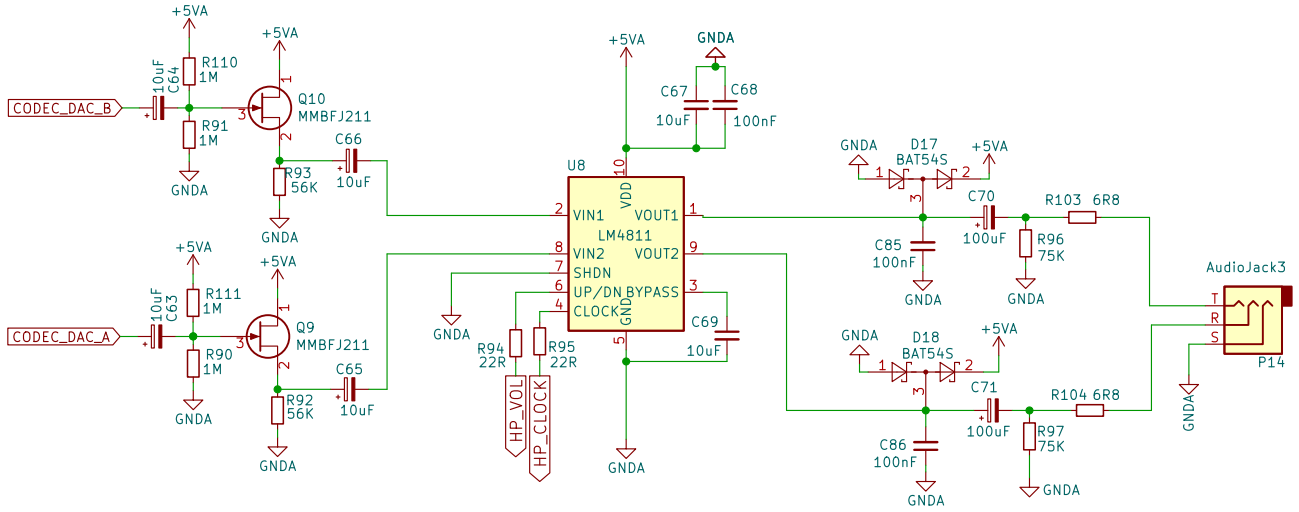
Sheet: /coreboard/
File: coreboard.kicad_sch

Title: MOD Dwarf – Main Board

Size: A3	Date: 2021-09-06	**Rev: 3.0**
KiCad E.D.A. kicad 6.0.4-6f826c9f35~116~ubuntu20.04.1		Id: 6/11

LM4811 has adjustable gain of −33dB to +12dB, this is applied to the main out signal

Minimal load of 16 ohm with 0.1% THD+N
Max power 105mW

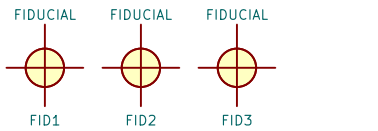


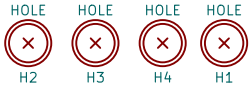
USB outp Power: 500mA
Inp Power: 12V 500mA
https://github.com/moddevices/hw-mod-dwarf
Dwarf Audio processing board
MOD Devices GmbH

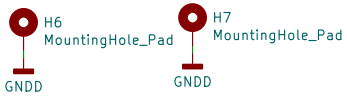
Sheet: /headphone/
File: Headphone.kicad_sch

Title: MOD Dwarf – Main Board

Size: A4	Date: 2021-09-06	**Rev: 3.0**
KiCad E.D.A. kicad 6.0.4-6f826c9f35~116~ubuntu20.04.1		Id: 7/11







SOM Mounting holes

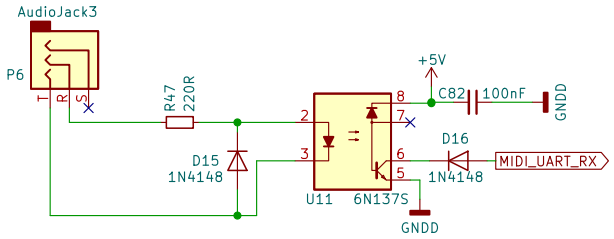
USB outp Power: 500mA
Inp Power: 12V 500mA
https://github.com/moddevices/hw-mod-dwarf
Dwarf Audio processing board
MOD Devices GmbH

Sheet: /mechanics/
File: mechanics.kicad_sch

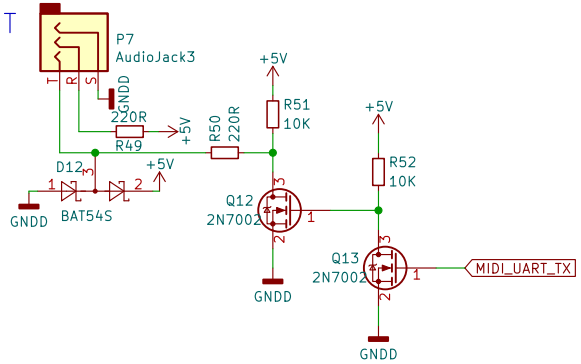
Title: MOD Dwarf – Main Board

Size: A4	Date: 2021-09-06	**Rev: 3.0**
KiCad E.D.A. kicad 6.0.4-6f826c9f35-116-ubuntu20.04.1		Id: 8/11

MIDI IN



MIDI OUT

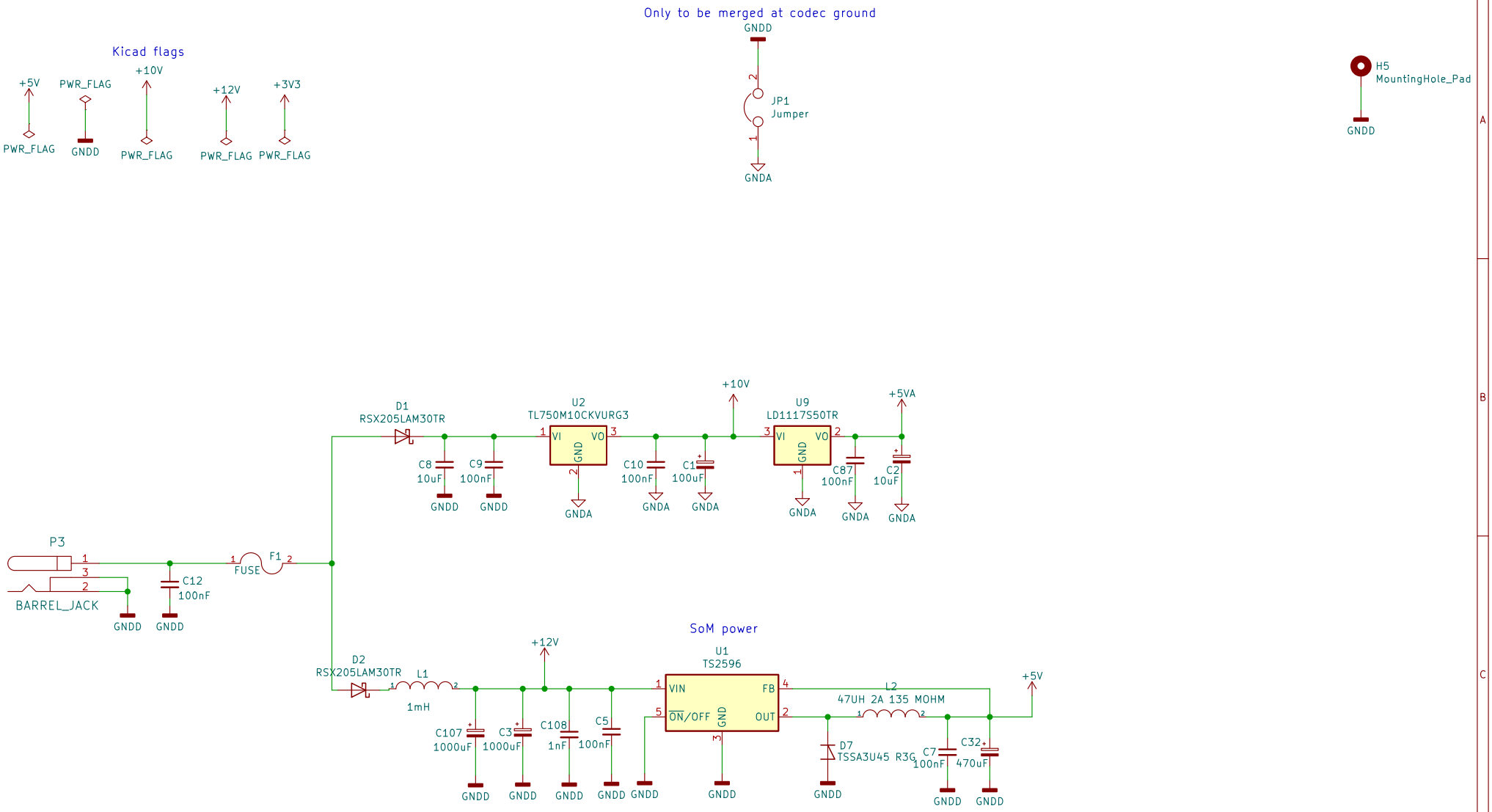


USB outp Power: 500mA
Inp Power: 12V 500mA
https://github.com/moddevices/hw-mod-dwarf
Dwarf Audio processing board
MOD Devices GmbH

Sheet: /midi/
File: midi.kicad_sch

Title: MOD Dwarf – Main Board

Size: A4	Date: 2021-09-06	**Rev: 3.0**
KiCad E.D.A. kicad 6.0.4-6f826c9f35~116~ubuntu20.04.1		Id: 9/11

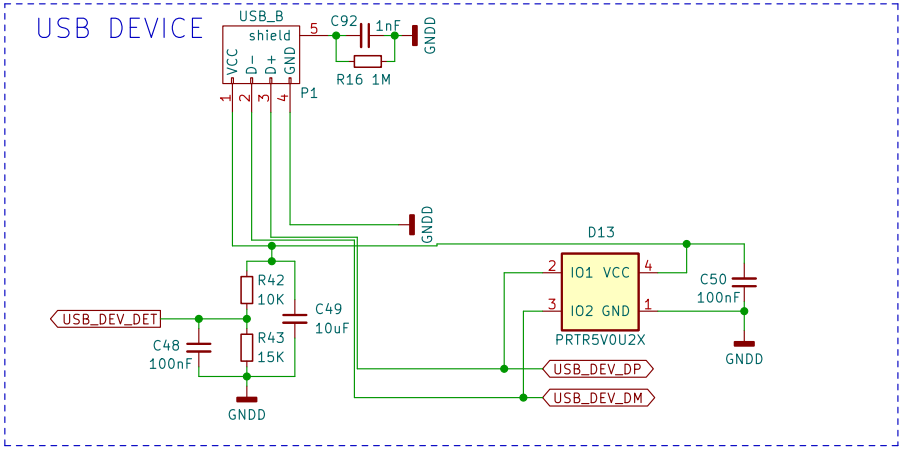


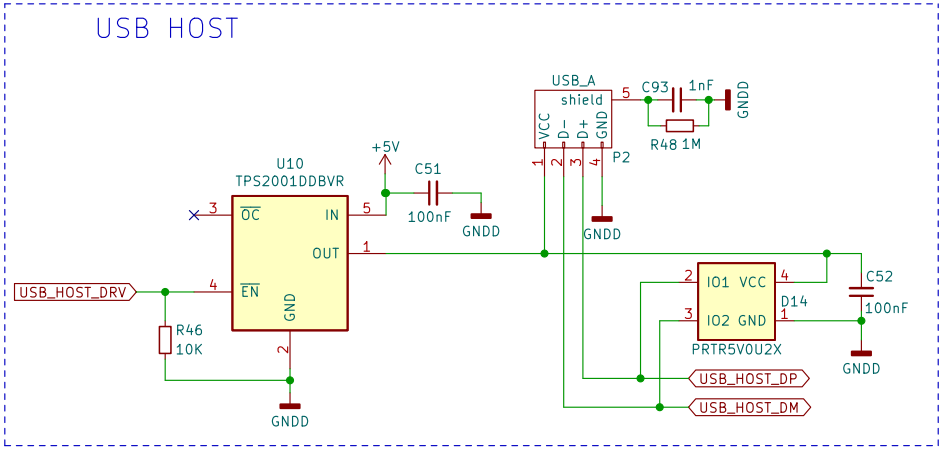
USB outp Power: 500mA
Inp Power: 12V 500mA
https://github.com/moddevices/hw-mod-dwarf
Dwarf Audio processing board
MOD Devices GmbH

Sheet: /power/
File: power.kicad_sch

Title: MOD Dwarf – Main Board

Size: A4	Date: 2021-09-06	**Rev: 3.0**
KiCad E.D.A. kicad 6.0.4-6f826c9f35~116~ubuntu20.04.1		Id: 10/11





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

Sheet: /usb/
File: usb.kicad_sch

Title: MOD Dwarf – Main Board

Size: A4	Date: 2021-09-06	**Rev: 3.0**
KiCad E.D.A. kicad 6.0.4-6f826c9f35-116-ubuntu20.04.1		Id: 11/11