

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

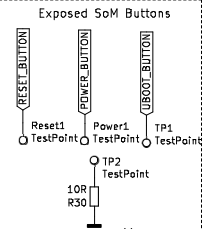
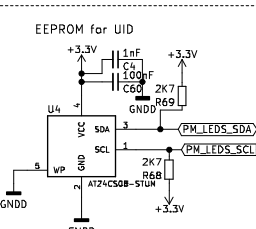
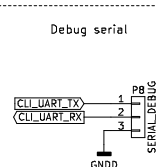
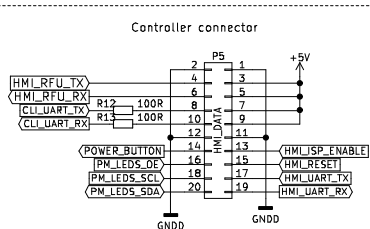
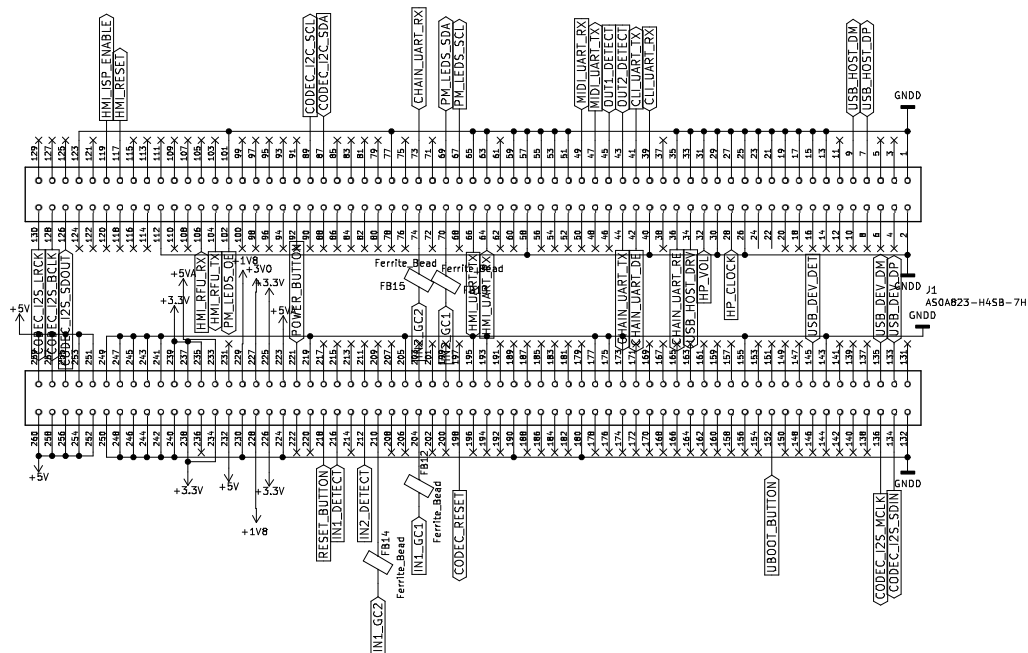
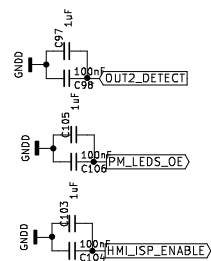
Sheet: /
File: bottom-board.sch

Title: MOD Dwarf – Main Board

Size: A4 Date: 2021-11-10
KiCad E.D.A. kicad 5.1.11-e4df9d881f92ubuntu20.04.1

Rev: 1.05
Id: 1/11

Rev: 1.05
Id: 2/11

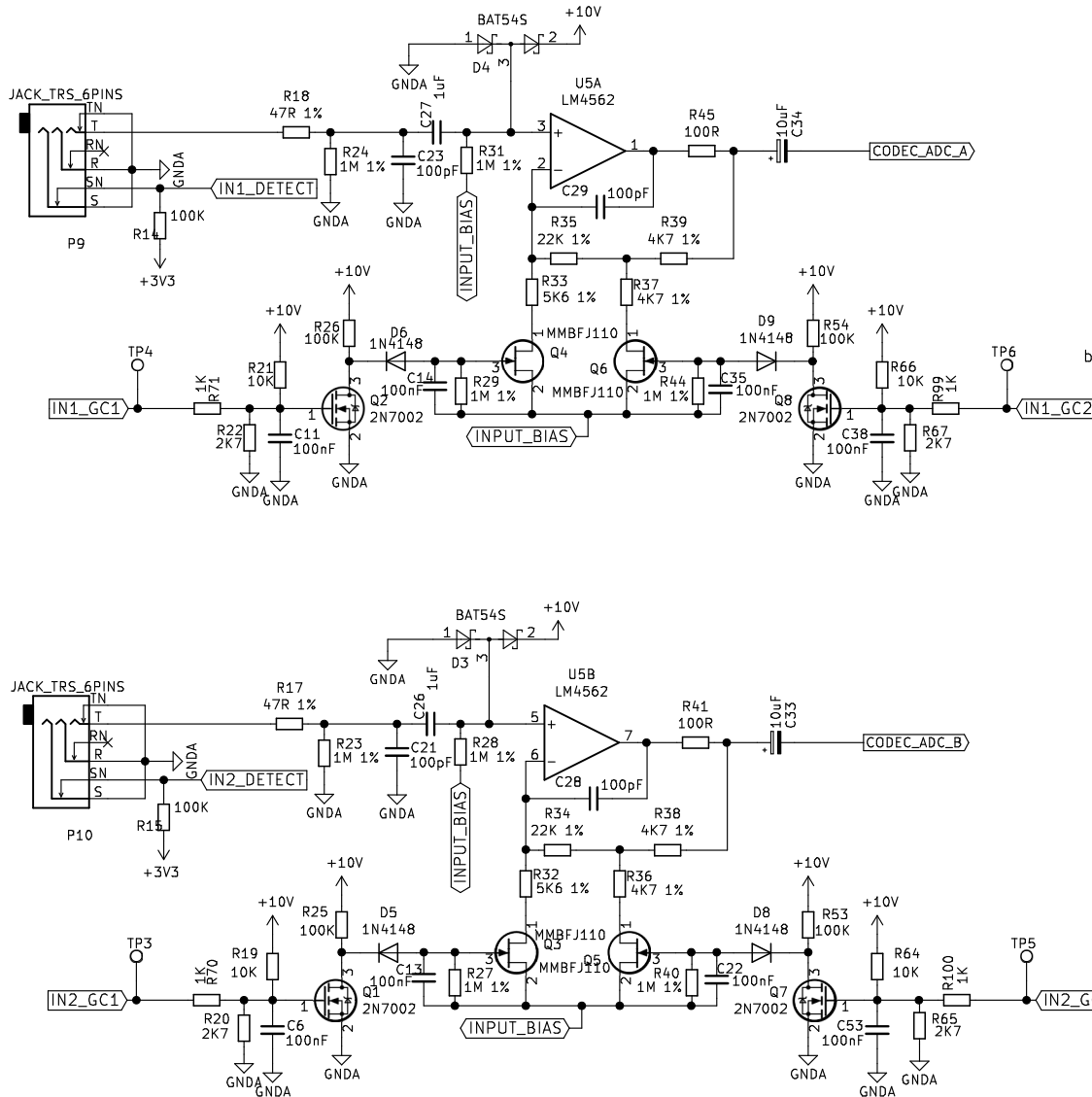


USB outp Power: 500mA
Inp Power: 12V 500mA
<https://github.com/moddevices/hw-mod-dwarf>
Dwarf Audio processing board
MOD Devices GmbH
Sheet: /coreboard/
File: coreboard.sch

Title: MOD Dwarf – Main Board

Size: A3	Date: 2021-11-10
KICad E.D.A. kicad 5.1.11-e4df9d881f92ubuntu20.04.1	

Rev: 1.05
Id: 4/11



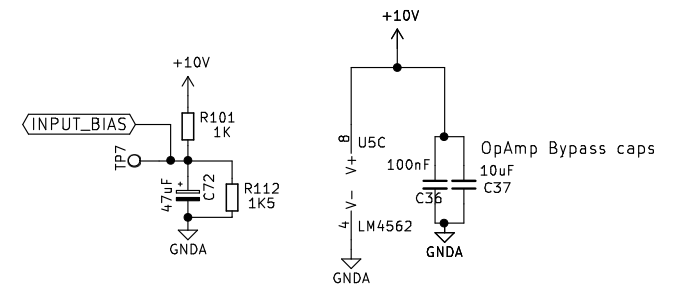
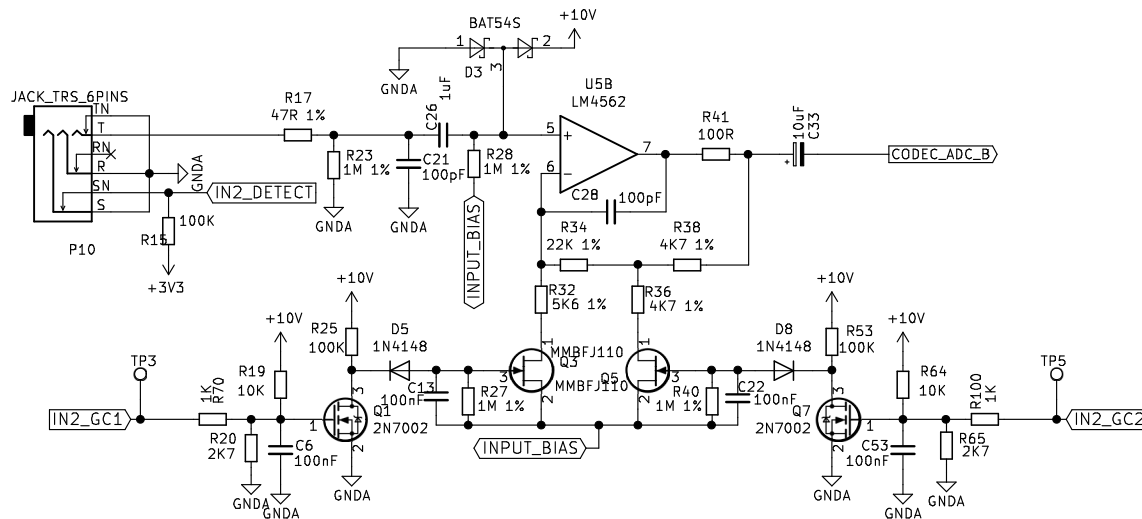
GC2, GC1	GAIN (dB)
1, 1	0.0
1, 0	6.0
0, 1	15.0
0, 0	20.4

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



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

MOD Devices GmbH

Sheet: /audio-inputs/

File: audio-inputs.sch

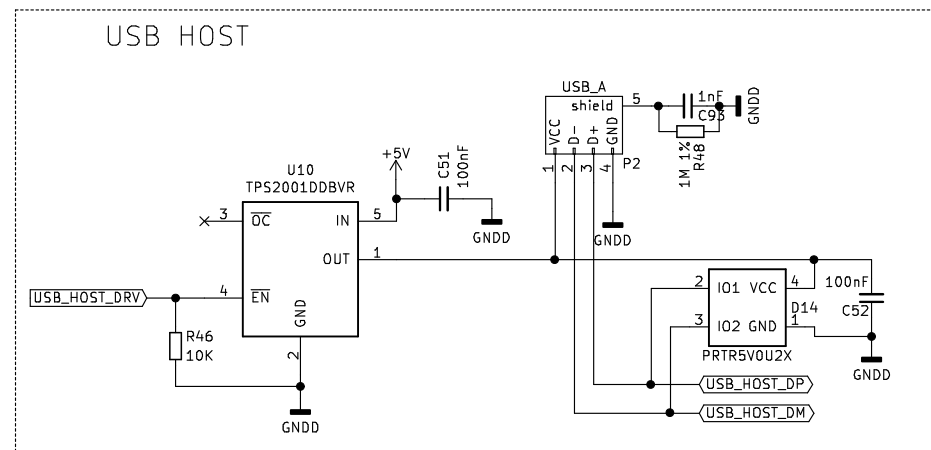
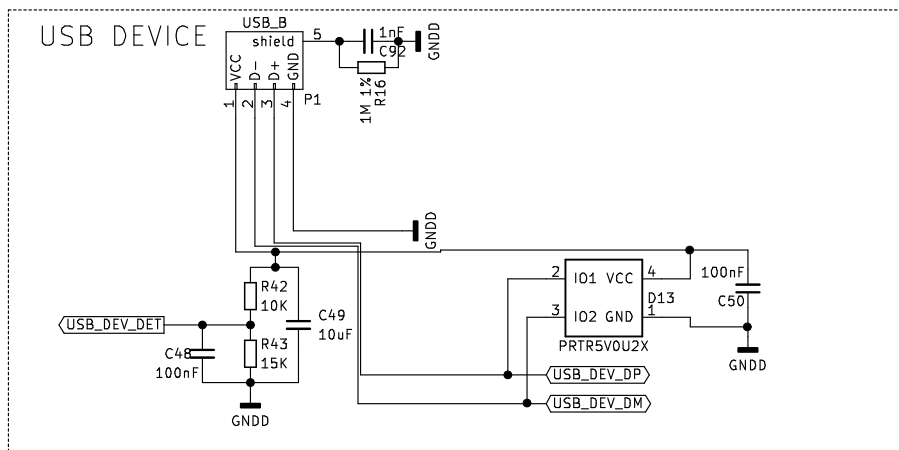
Title: MOD Dwarf – Main Board

Size: A4 Date: 2021-11-10

KiCad E.D.A. kicad 5.1.11-e4df9d881f92ubuntu20.04.1

Rev: 1.05

Id: 5/11



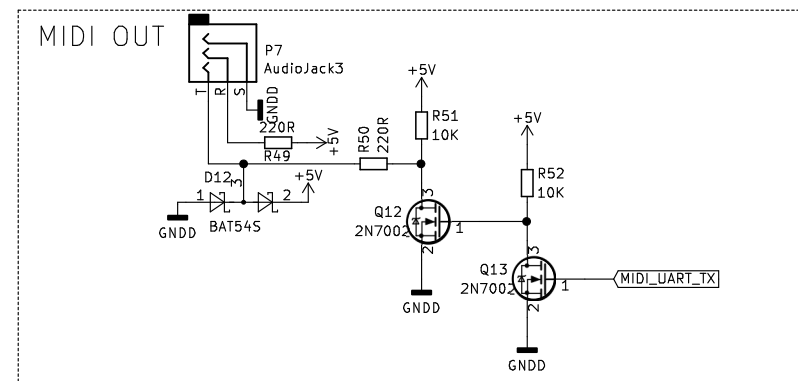
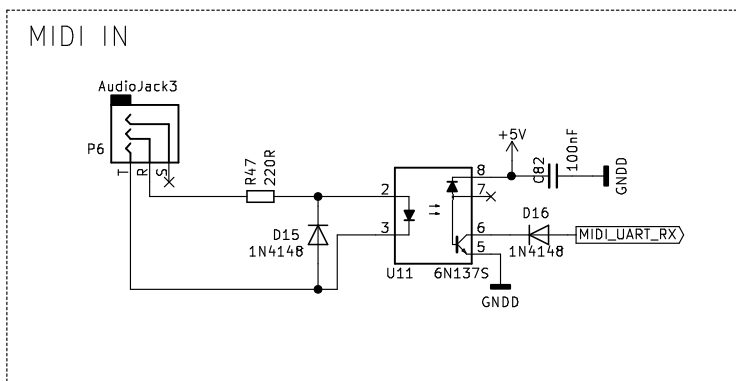
USB outp Power: 500mA
 Inp Power: 12V 500mA
<https://github.com/moddevices/hw-mod-dwarf>
 Dwarf Audio processing board
MOD Devices GmbH

Sheet: /usb/
 File: usb.sch

Title: MOD Dwarf – Main Board

Size: A4 Date: 2021-11-10
 KiCad E.D.A. kicad 5.1.11-e4df9d881f92ubuntu20.04.1

Rev: 1.05
 Id: 7/11



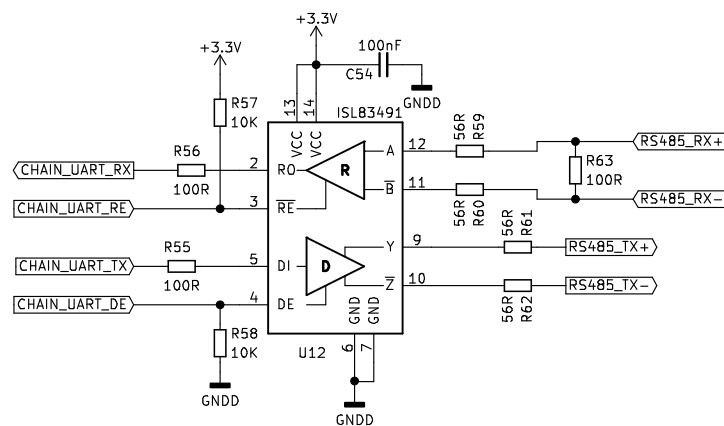
USB outp Power: 500mA
 Inp Power: 12V 500mA
<https://github.com/moddevices/hw-mod-dwarf>
 Dwarf Audio processing board
MOD Devices GmbH

Sheet: /midi/
 File: midi.sch

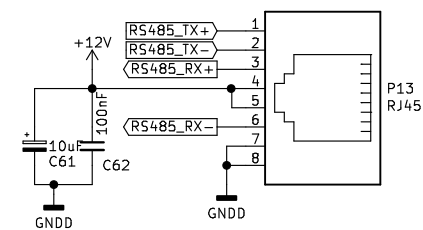
Title: MOD Dwarf – Main Board

Size: A4 Date: 2021-11-10
 KiCad E.D.A. kicad 5.1.11-e4df9d881f92ubuntu20.04.1

Rev: 1.05
 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
<https://github.com/moddevices/hw-mod-dwarf>
Dwarf Audio processing board

MOD Devices GmbH

Sheet: /control-chain/

File: control-chain.sch

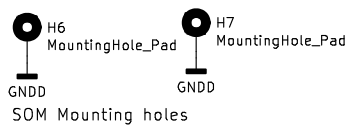
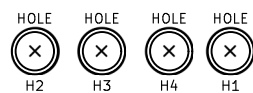
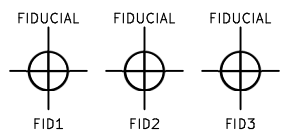
Title: MOD Dwarf – Main Board

Size: A4 Date: 2021-11-10

KiCad E.D.A. kicad 5.1.11-e4df9d881f92ubuntu20.04.1

Rev: 1.05

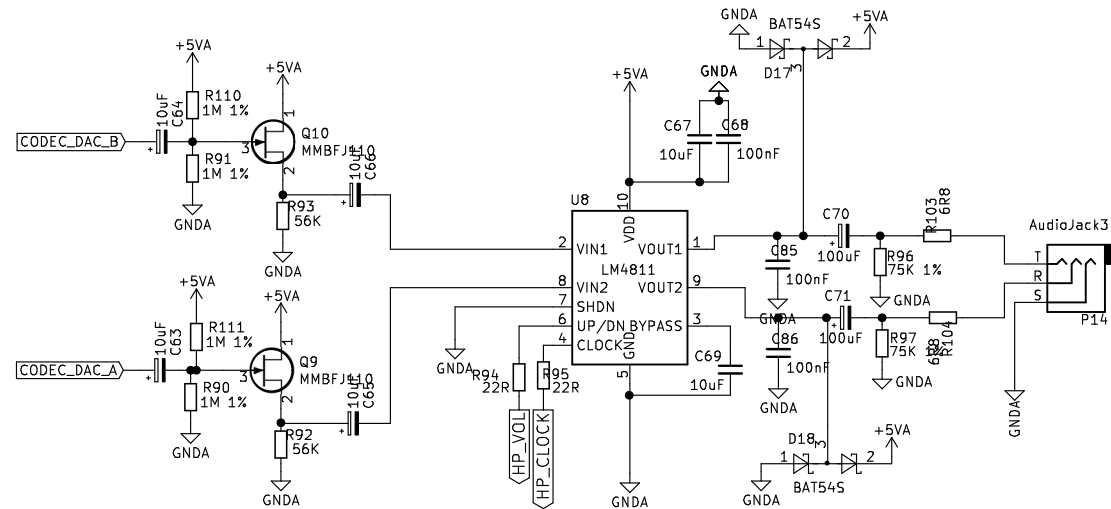
Id: 9/11



USB outp Power: 500mA		
Inp Power: 12V 500mA		
https://github.com/moddevices/hw-mod-dwarf		
Dwarf Audio processing board		
MOD Devices GmbH		
Sheet: /mechanics/		
File: mechanics.sch		
Title: MOD Dwarf – Main Board		
Size: A4	Date: 2021-11-10	Rev: 1.05
KiCad E.D.A. kicad 5.1.11-e4df9d881f92ubuntu20.04.1		Id: 10/11

LM4811 has adjustable gain of -33dB to $+12\text{dB}$, 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.sch

Title: MOD Dwarf – Main Board

Size: A4 Date: 2021-11-10
KiCad E.D.A. kicad 5.1.11-e4df9d881f92ubuntu20.04.1

Rev: 1.05
Id: 11/11