

TACNPR project

Tatu OH2EAT, Lasse OH3HZB & Tommi OH1GJV & SCOMS team
Special thanks to: Mikko OH2FLO & Vili OH5GE

SUBSHEETS (revision E):

cpu

MCU, SRAM,
SERIAL

File: cpu-sheet.kicad_sch

radio

Si4463 &
RF switching

File: radio-sheet.kicad_sch

RF-PA

RF LNA
& PA

File: RF-PA-sheet.kicad_sch

tacbucks

DC/DC
converters

File: tacbuck-sheet.kicad_sch

linear-regs

3V3 lin.reg.
& terminals

File: linreg-sheet.kicad_sch

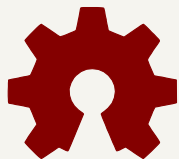
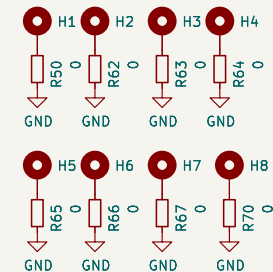
ethernet

W5500
Ethernet

File: ethernet-sheet.kicad_sch

Major changes since revA:

- revA: first release
- revB: integrated Ethernet
- revC: enhanced RF performance
- revD: Powerpole connector
- revE: RX_LED (J4), minor enhancements



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TACNPR project

OH1GJV, OH2EAT, OH2FLO, OH3HZB, OH5GE



Sheet: /
File: TACNPR.kicad_sch

Title: TACNPR

Size: A4 Date: 2021-03-22

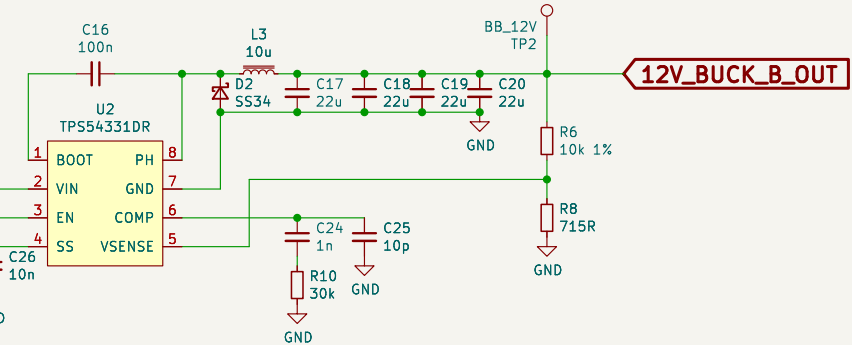
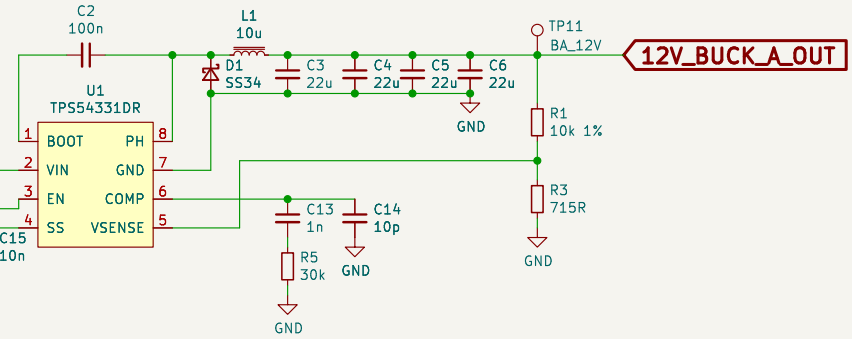
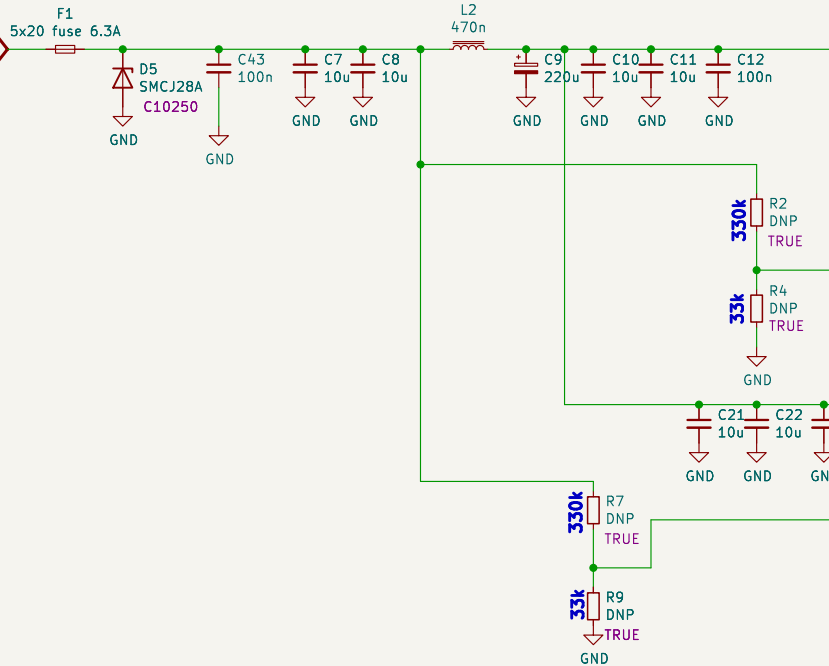
KiCad E.D.A. 9.0.0

Rev: E

Id: 1/7

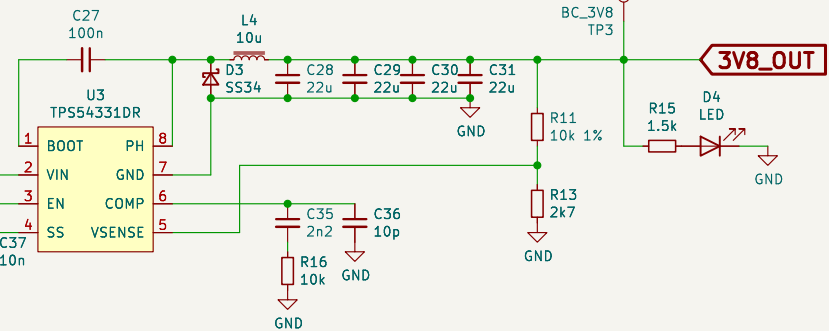
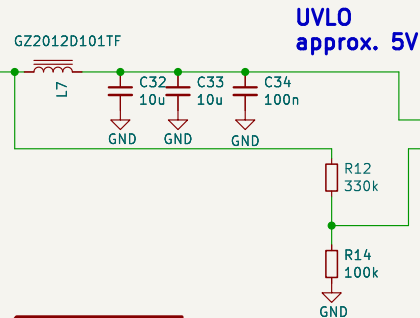
IN -> 12V:

RAW_PSU_IN



12V -> 3V8:

12V_TO_BUCKC



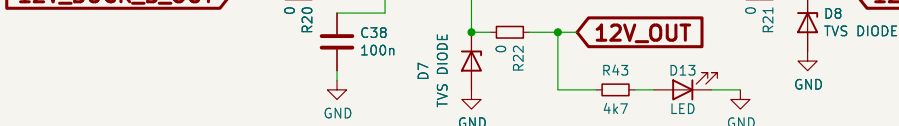
12V_BUCK_A_OUT

12V_BUCK_B_OUT

12V_TO_RFPA

12V_TO_BUCKC

12V_OUT



TACNPR / DC/DC converters

based on TACBUCK design by Tommi OH1GJV

Sheet: /tacbucks/

File: tacbuck-sheet.kicad_sch

Title: TACNPR (TACBUCKs)

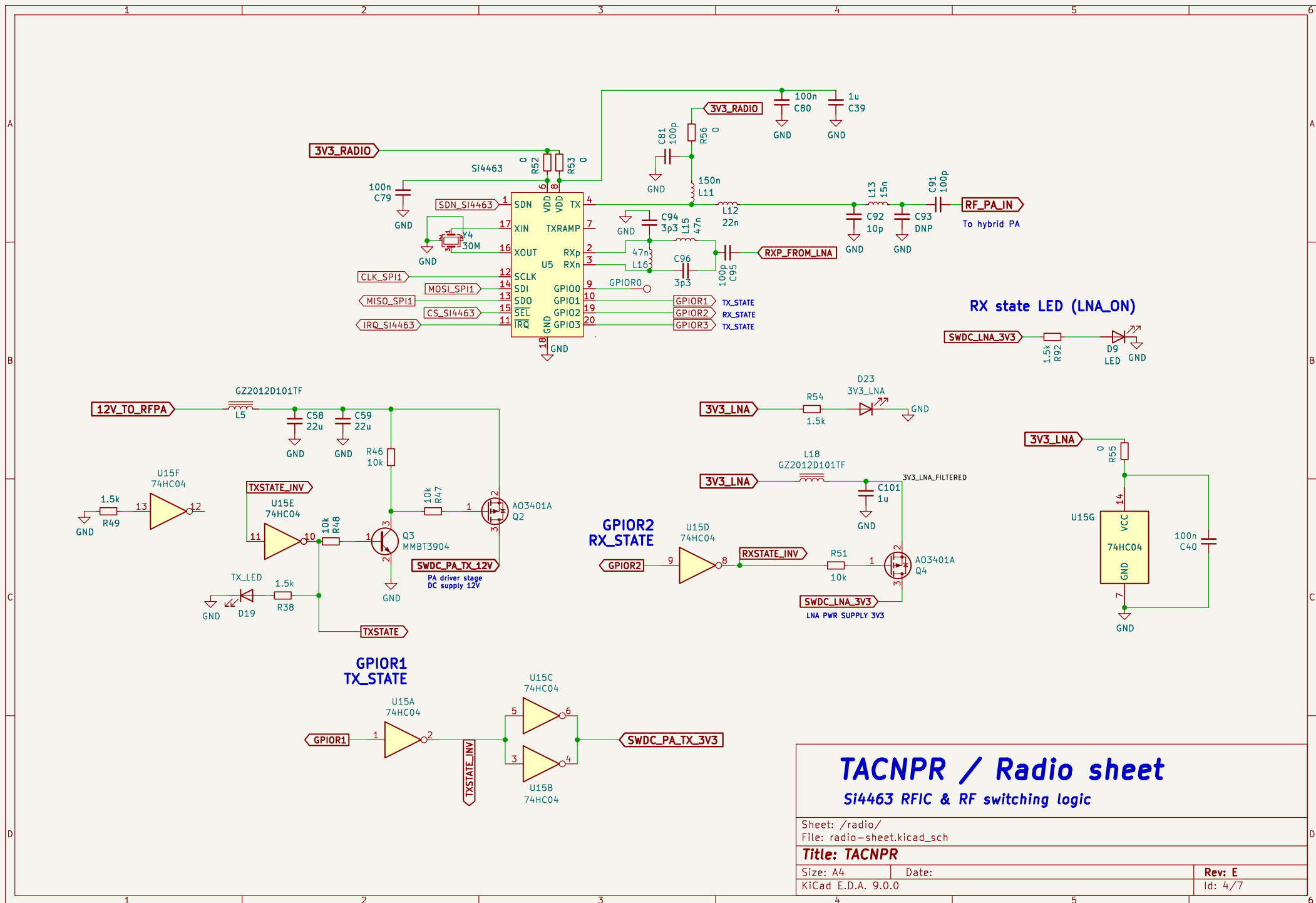
Size: A4

Date:

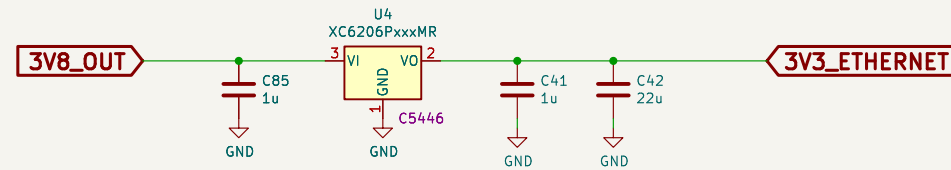
KiCad E.D.A. 9.0.0

Rev: E

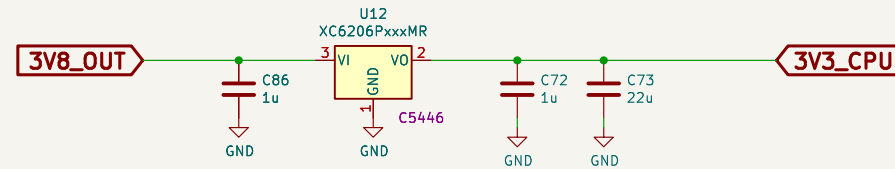
Id: 3/7



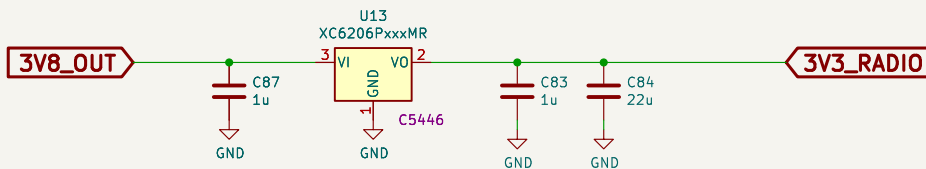
3V3 for Ethernet transceiver



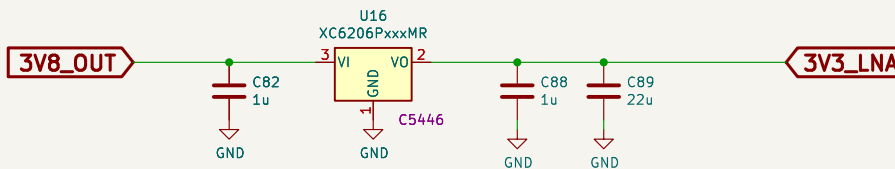
3V3 for STM32 CPU



3V3 for Si4463 radio chip

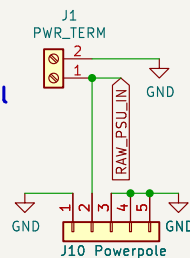


3V3 for LNA

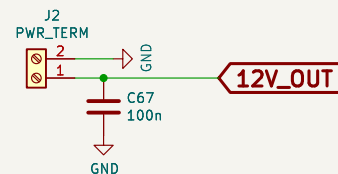


Screw terminals (power in and 12V DC out)

DC power can be fed either using screw terminal or Anderson Powerpole connector (7,9mm pitch)



Powerpole strain relief options:
1) solder a wire around it into GND pads 3 and 4
2) use the mounting hole (machine screw and nut)



TACNPR / regulators & terminals

3V8 -> 3V3 LDO linear regulators & screw terminals

Sheet: /linear-regs/
File: linreg-sheet.kicad_sch

Title: TACNPR (linear regulators)

Size: A4

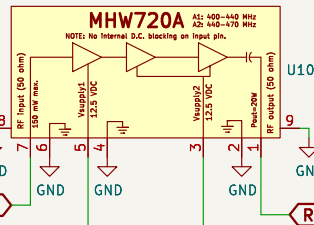
Date:

KiCad E.D.A. 9.0.0

Rev: E

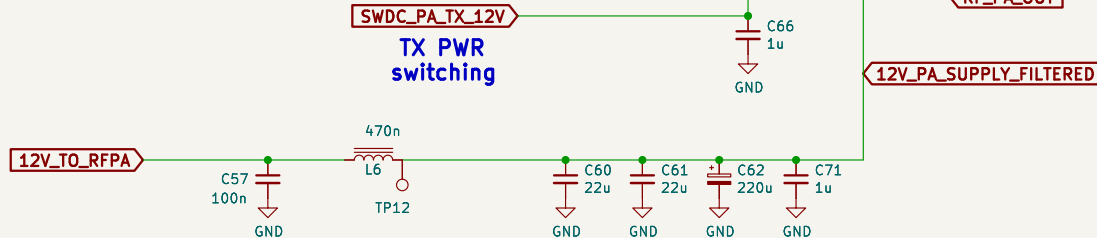
Id: 5/7

MHW720A



RF strip widths
on the keepout area:

50 ohm: 2 mm (millimeters)
100 ohm: 0,5 mm

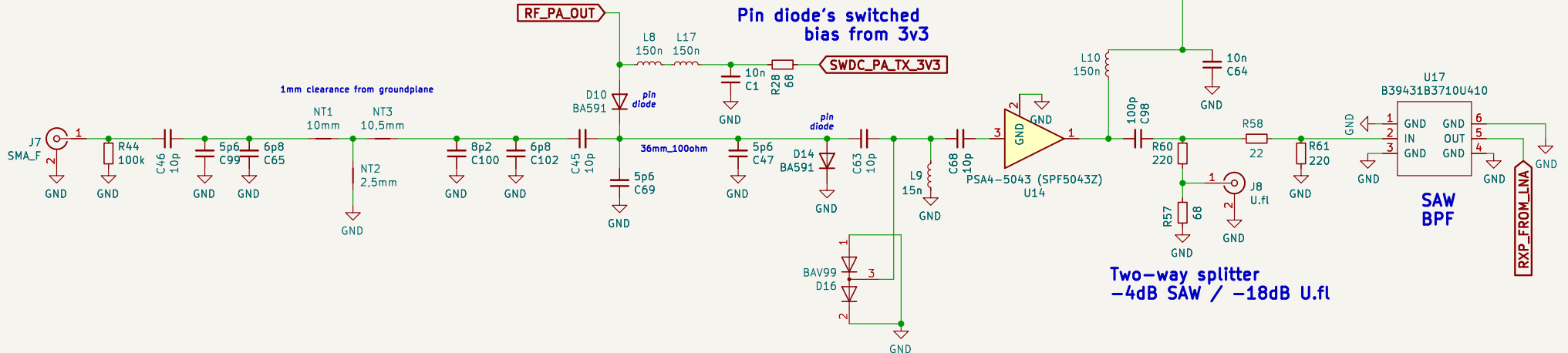


LNA's switched
DC supply 3v3

SWDC_LNA_3V3

Pin diode's switched
bias from 3v3

SWDC_PA_TX_3V3



TACNPR / RF PA & TRX switch

Motorola MHW720A 20W RF PA, design & simulations: Tatu OH2EAT

Sheet: /RF-PA/

File: RF-PA-sheet.kicad_sch

Title: TACNPR (RF PA & LNA)

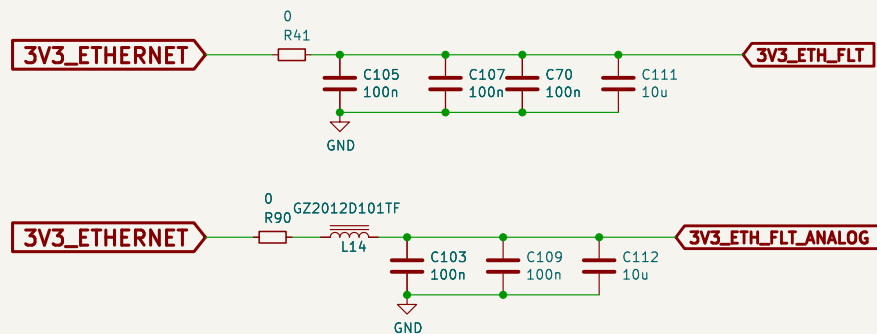
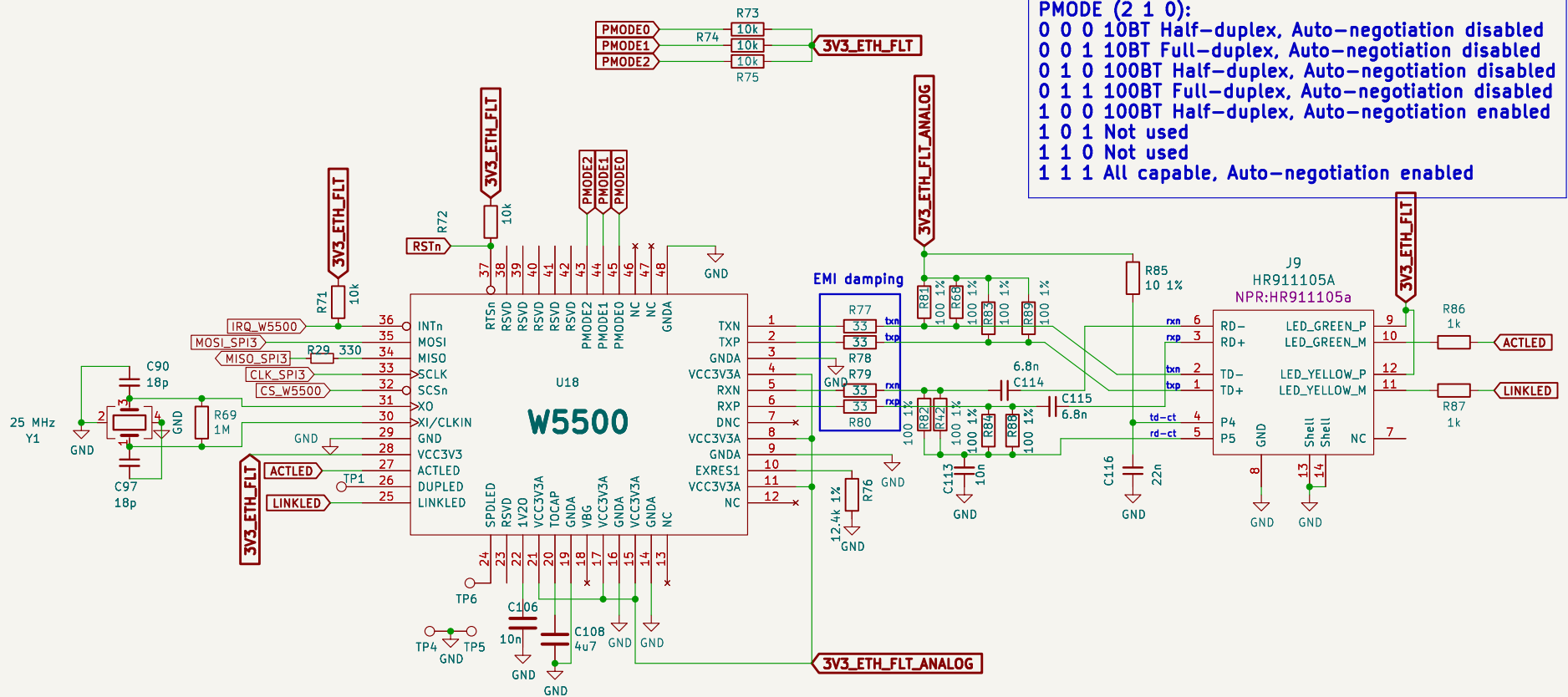
Size: A4

Date:

KiCad E.D.A. 9.0.0

Rev: E

Id: 6/7



W5500 reference schematic:
<https://docs.wiznet.io/Product/iEthernet/W5500/ref-schematic>
 W5500 Ref.Schematic – RJ45 with Transformer

See also the HR911105A datasheet.
 On page 1 (REV A/2): "Connect CHS GND to PCB ground".
 The connector is equipped with an internal 1nF 2kV CAP (P8).

TACNPR Ethernet

Reviewed by OH2EAT 2023
 Drawn by OH3HZB 2022–2023
Scoms

Sheet: /ethernet/
 File: ethernet-sheet.kicad_sch

Title: TACNPR (Ethernet)

Size: A4

Date:

KiCad E.D.A. 9.0.0

Rev: E

Id: 7/7