

FPGA power



File: fpga_power.kicad_sch

FPGA VCC



File: fpga_vcc_gnd.kicad_sch

FPGA config



File: fpga_config.kicad_sch

FPGA pins



File: fpga_pins.kicad_sch

FPGA PS



File: fpga_ps.kicad_sch

DDR3



File: ddr3.kicad_sch

Clock generator



File: clock_generator.kicad_sch

ADC



File: adc.kicad_sch

DAC



File: dac.kicad_sch

PLL



File: pll.kicad_sch

Demodulator



File: demodulator.kicad_sch

PA



File: pa.kicad_sch

Modulator



File: modulator.kicad_sch

RF front end



File: rf_front_end.kicad_sch

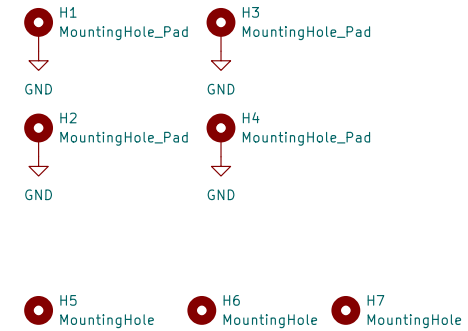
Analog power



File: analog_power.kicad_sch

Errata:

- U15 (FPGA PS reset IC) needs pull-up to output or changed to version that isn't open collector output.
- Needs IF amplifier or more gain at RF. Not enough RX gain.
- Pulldown resistor needed on CLKG_PDN (in place of C204) to keep the clock generator off when FPGA is not programmed.
- PA isolation from RX should be better or PA switching should be quicker to reduce the noise leaking from TX to RX.



6 GHz pulse radar

Henrik Forstén

Sheet: /

File: pulsed_radar.kicad_sch

Title: Top level

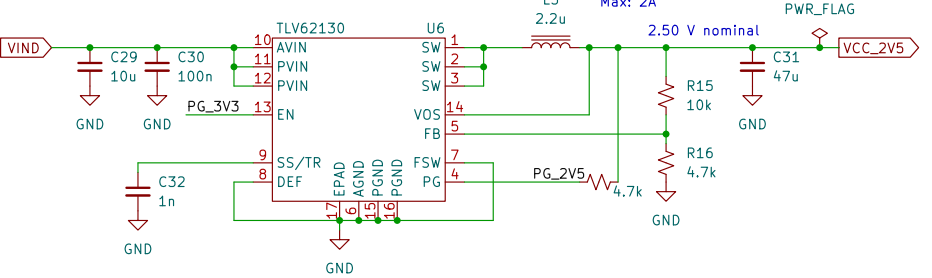
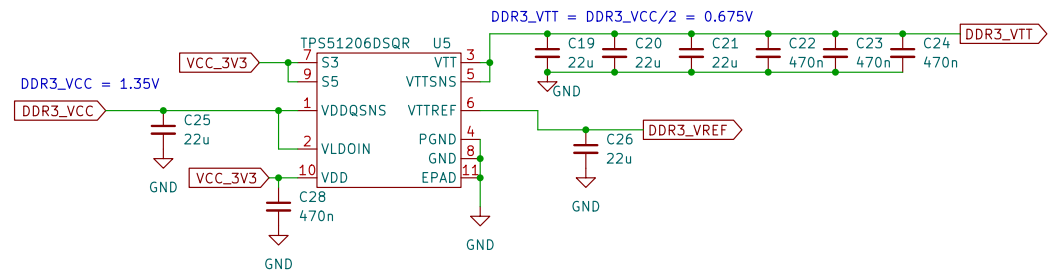
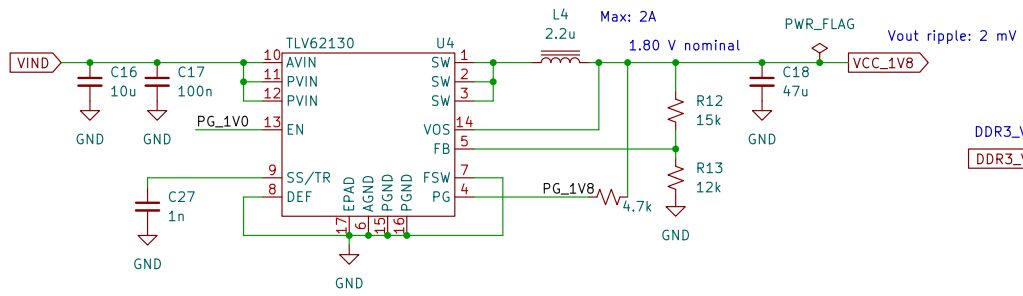
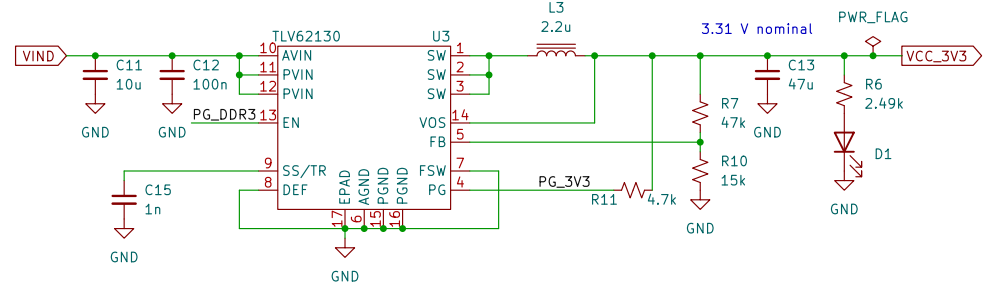
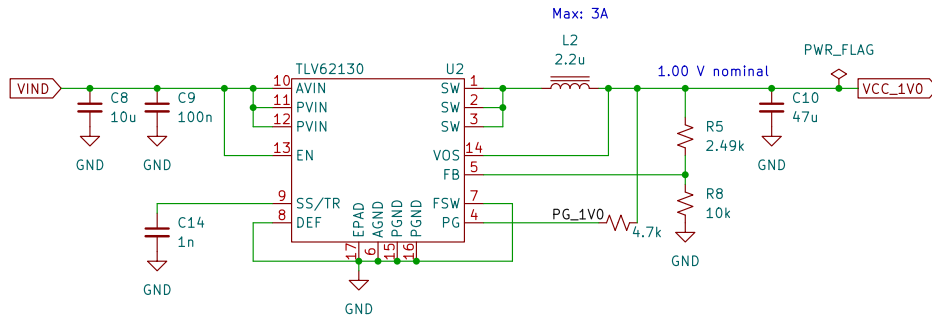
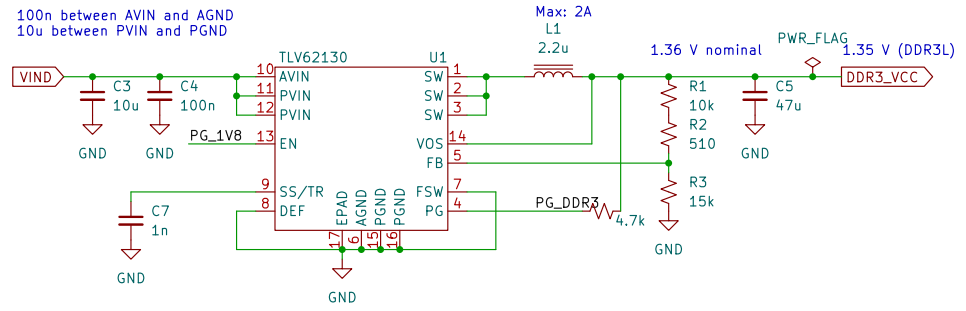
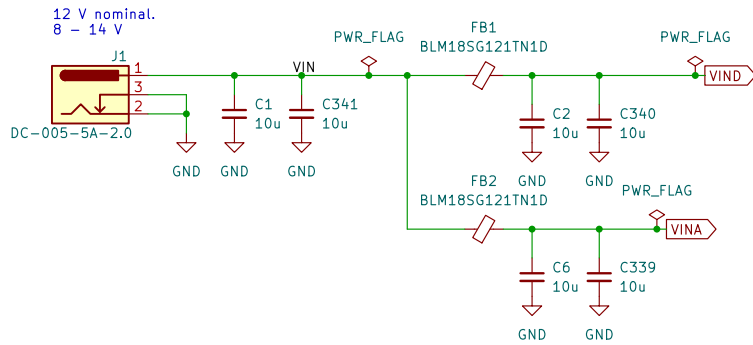
Size: A4

Date: 2023-10-25

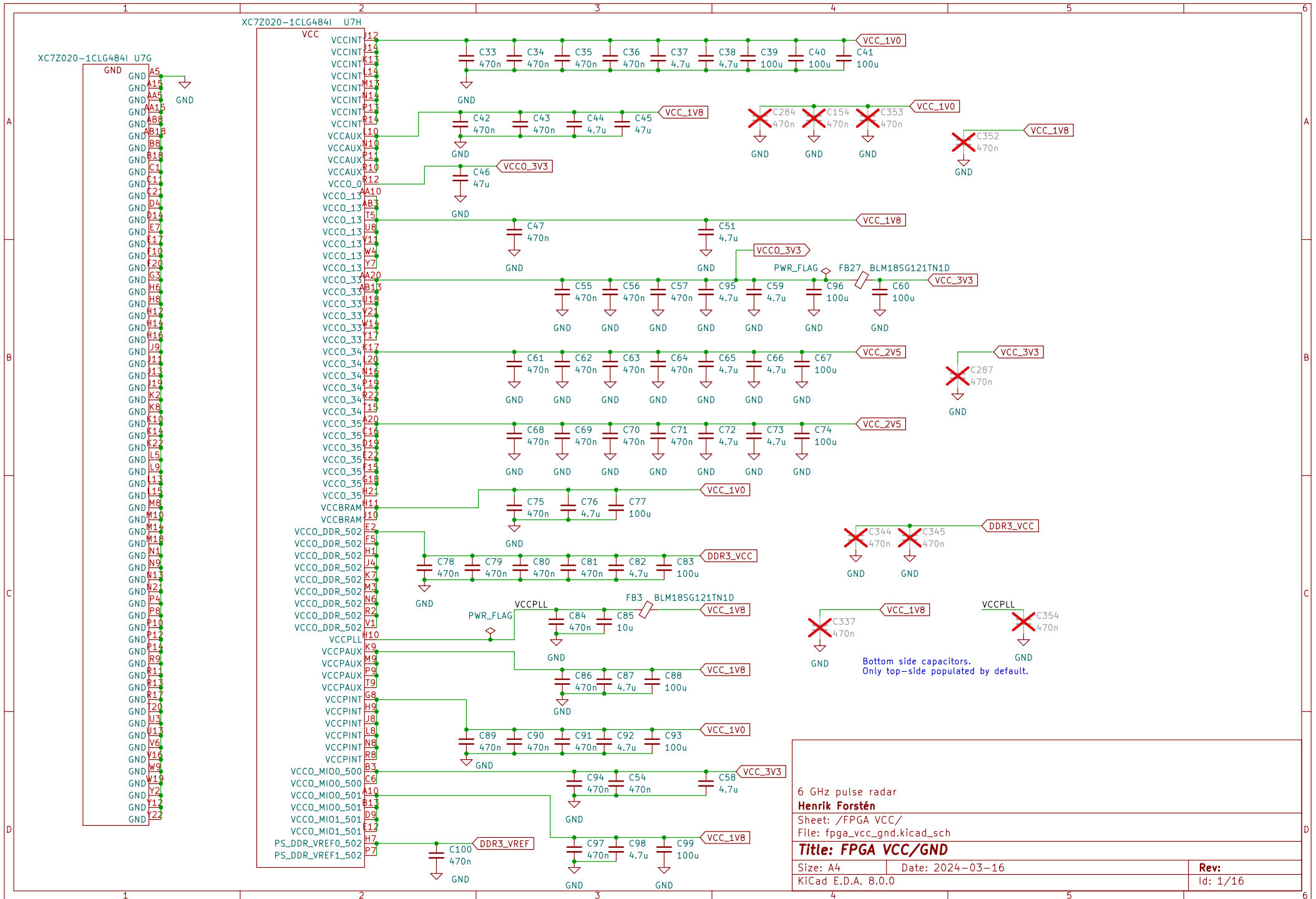
Rev:

KiCad E.D.A. 8.0.0

Id: 1/16

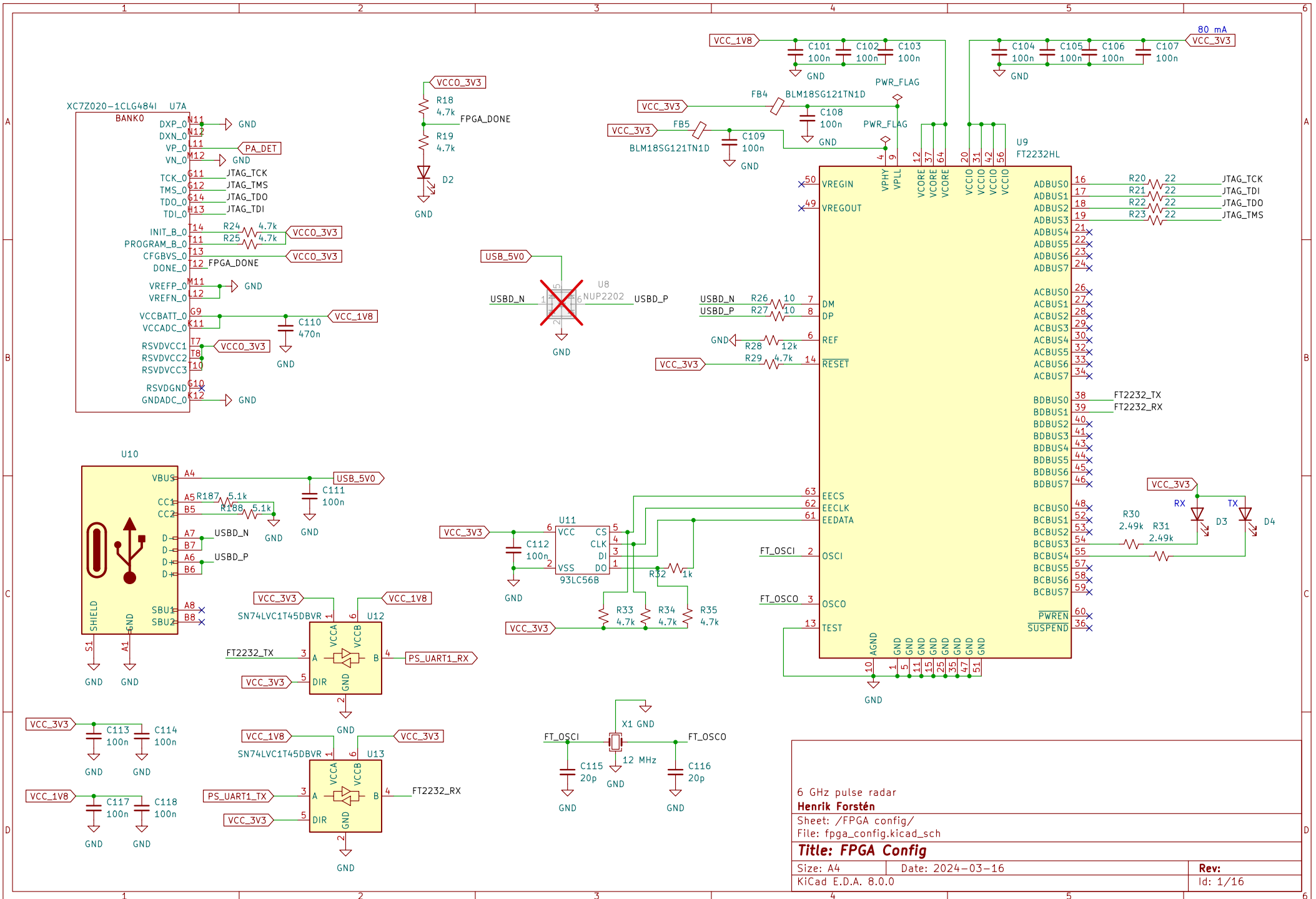


6 GHz pulse radar
Henrik Forstén
 Sheet: /FPGA power/
 File: fpga_power.kicad_sch
Title: FPGA Power
 Size: A4 | Date: 2024-03-16
 KiCad E.D.A. 8.0.0 | Rev: | Id: 1/16



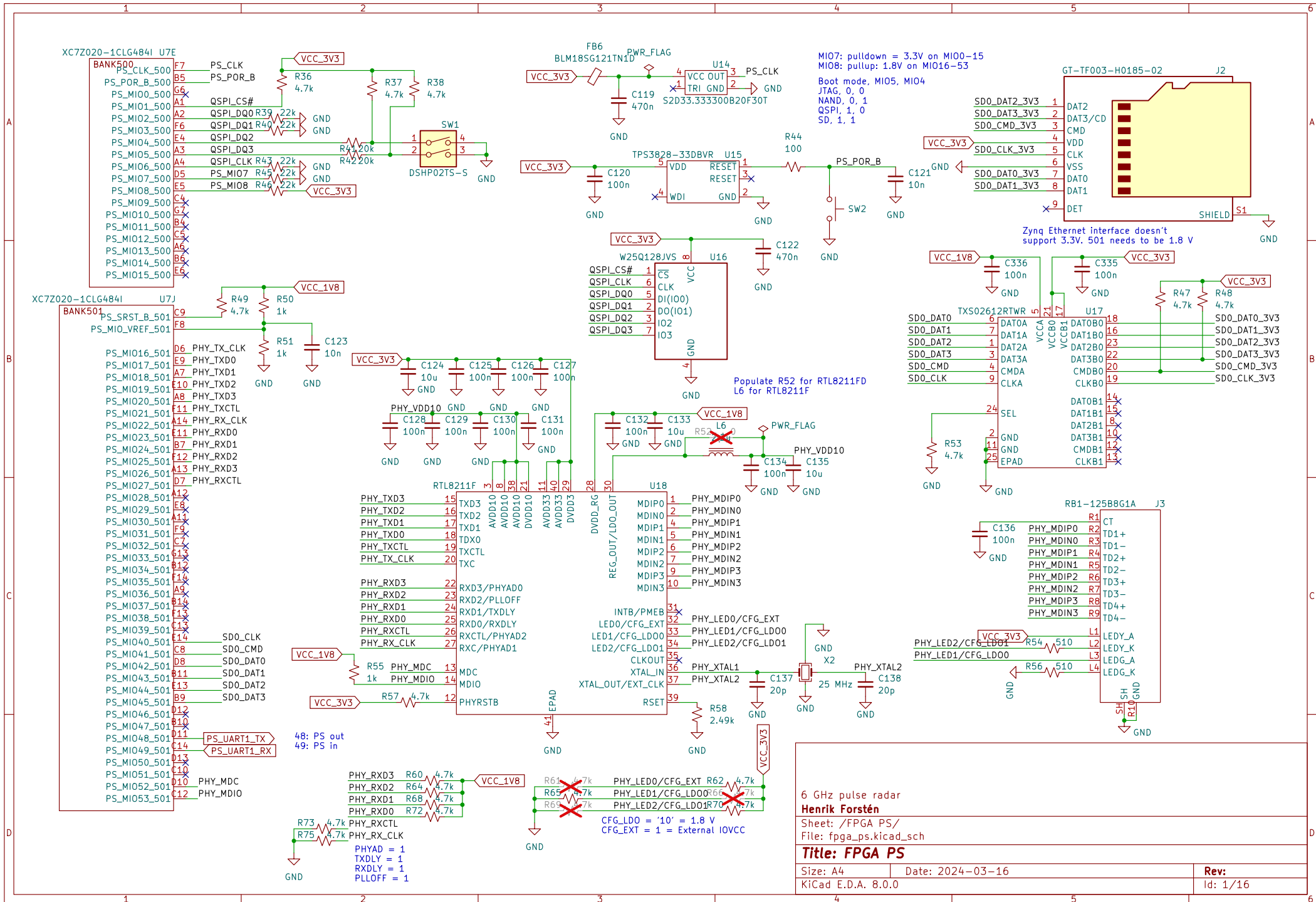
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 Sheet: /FPGA VCC/
 File: fpga_vcc_gnd.kicad_sch
Title: FPGA VCC/GND

Size: A4	Date: 2024-03-16	Rev:
KiCad E.D.A. 8.0.0		Id: 1/16



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 Sheet: /FPGA config/
 File: fpga_config.kicad_sch
Title: FPGA Config

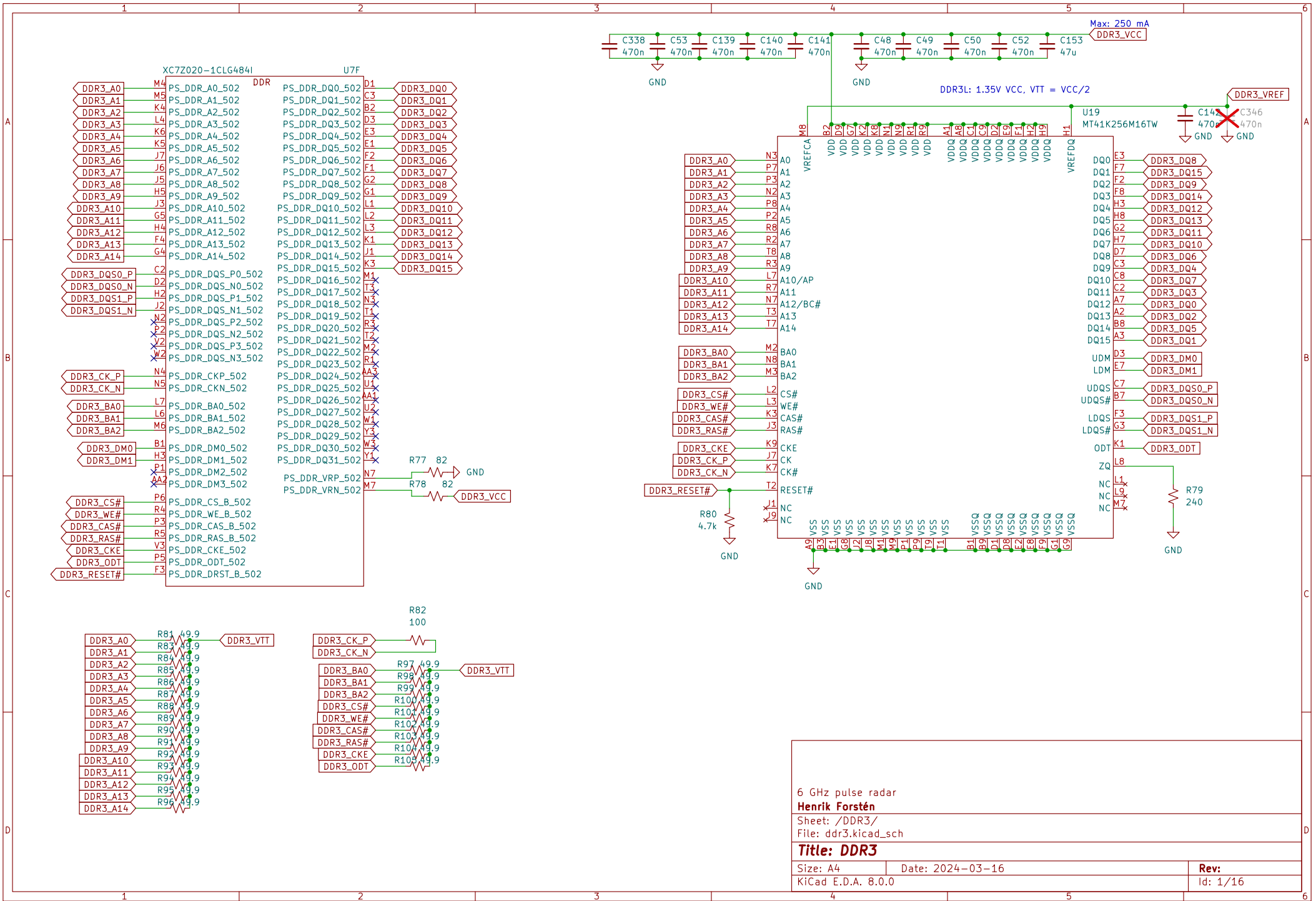
Size: A4	Date: 2024-03-16
KiCad E.D.A. 8.0.0	Rev: Id: 1/16



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 Sheet: /FPGA PS/
 File: fpga_ps.kicad_sch

Title: FPGA PS

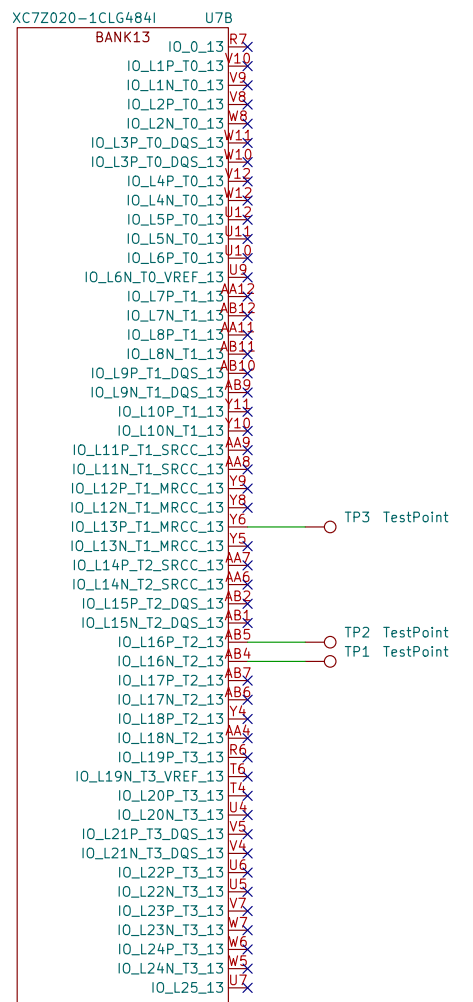
Size: A4	Date: 2024-03-16
KiCad E.D.A. 8.0.0	Rev: Id: 1/16



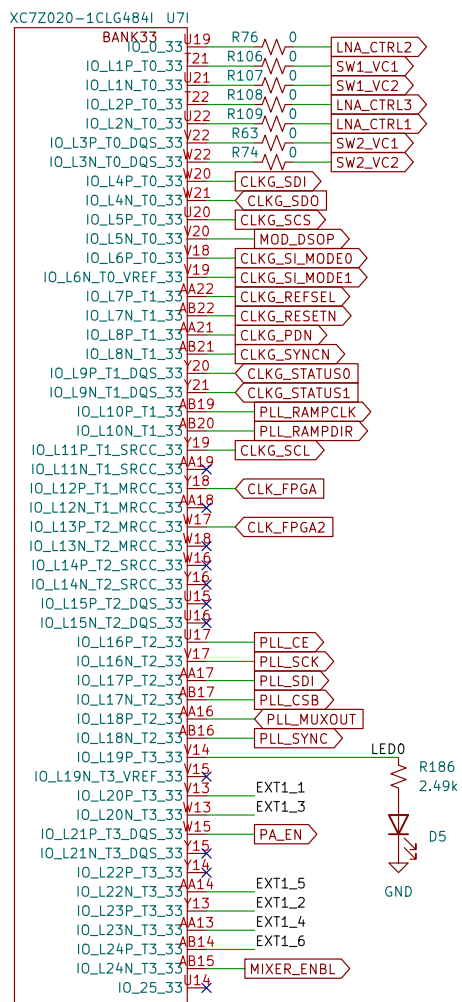
ADC swapped: A0, A2, A4, A6, A8, A10, DB0, DB2, DB4, DB6

DAC swapped: 0, 1, 10, 13, SYNC

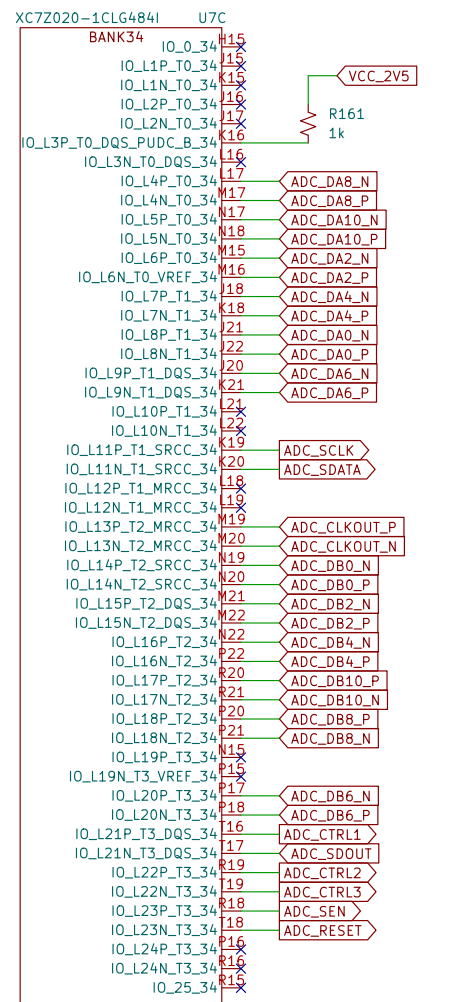
NC in 7010
1.8 V



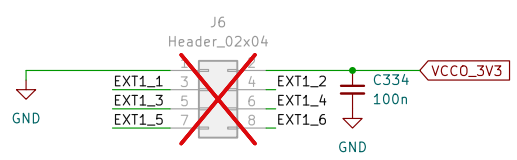
3.3 V



2.5 V



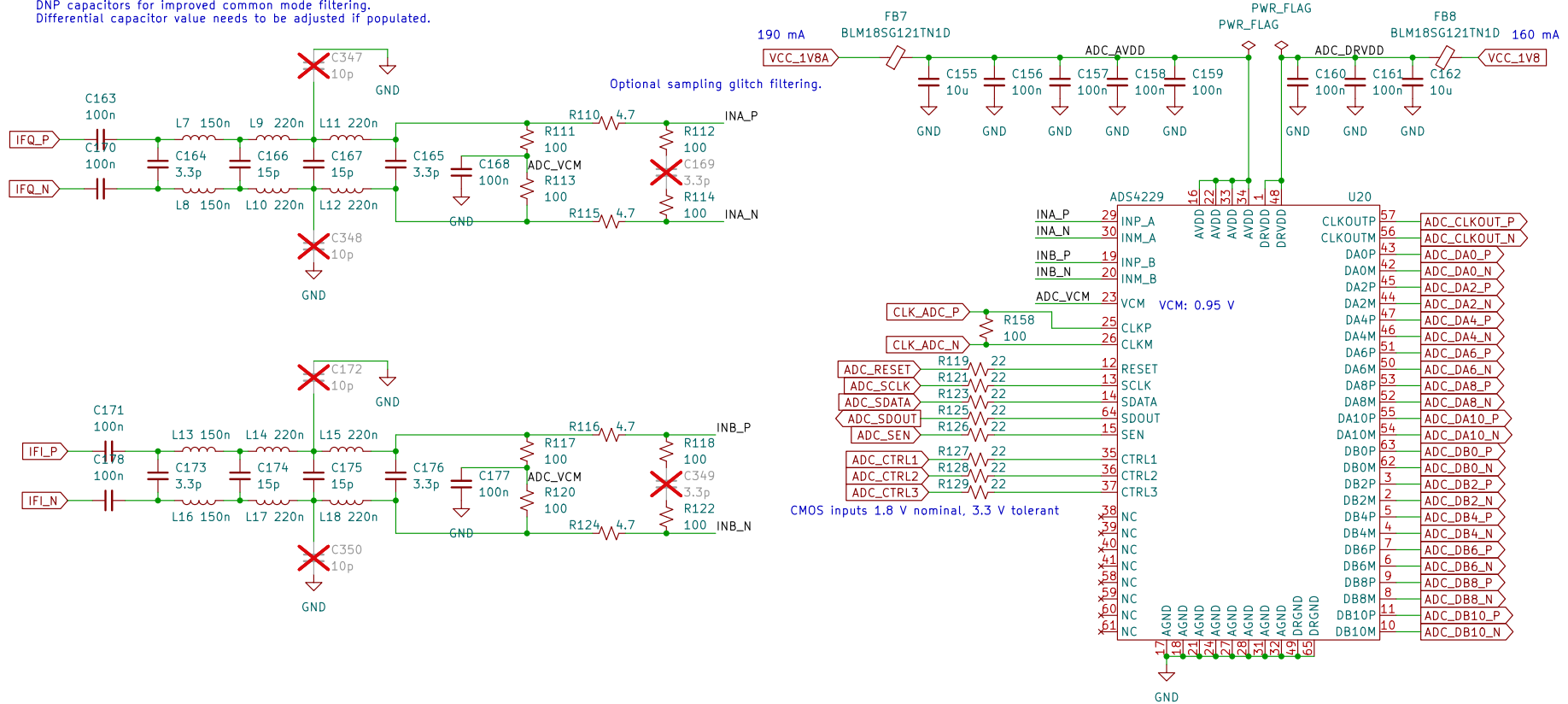
ADC CMOS pins 1.8 V but compatible with 2.5/3.3 V



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Sheet: /FPGA pins/
File: fpga_pins.kicad_sch

Title: FPGA pins	
Size: A4	Date: 2024-03-16
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DNP capacitors for improved common mode filtering.
Differential capacitor value needs to be adjusted if populated.



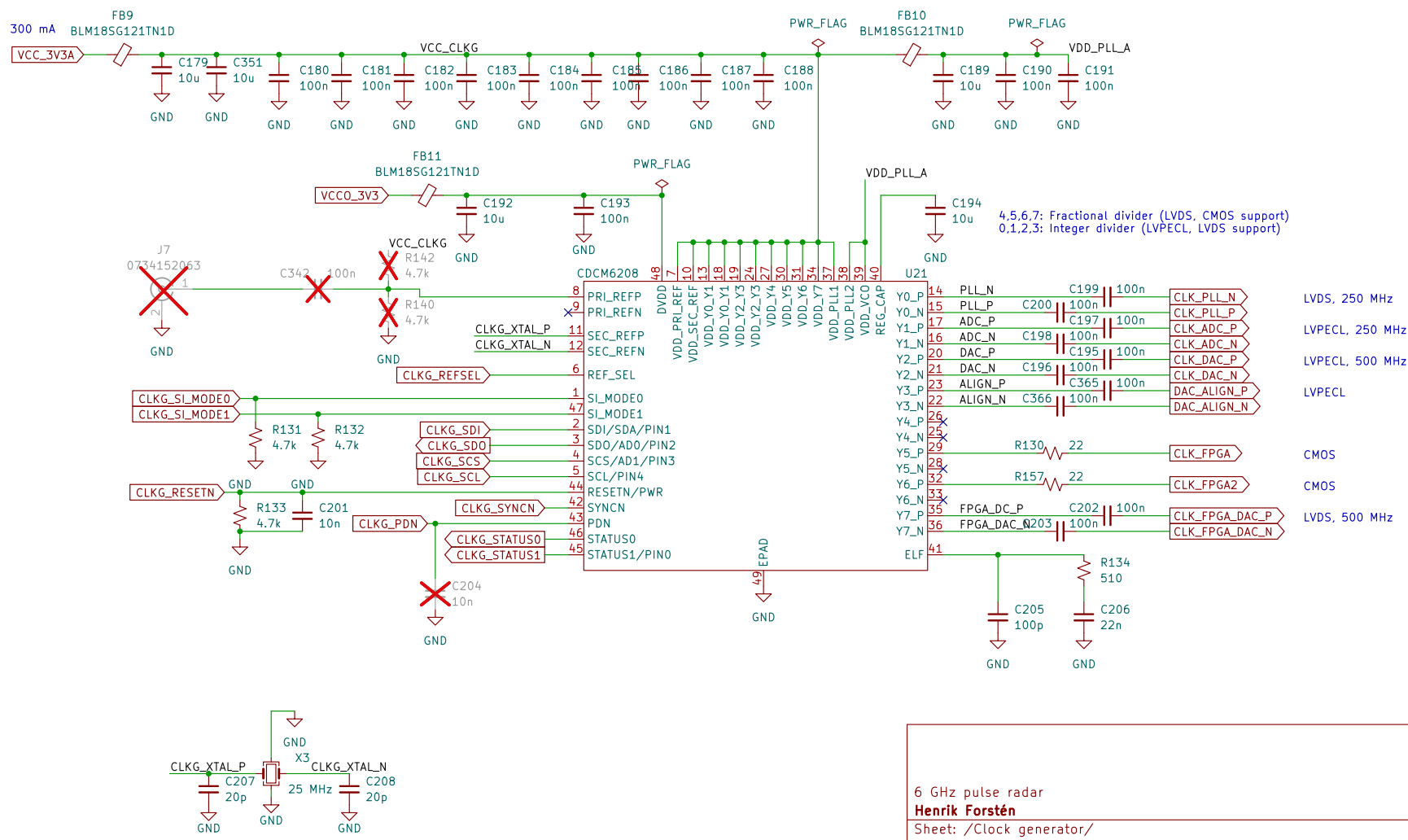
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Sheet: /ADC/
File: adc.kicad_sch

Title: ADC

Size: A4 Date: 2024-03-16

KiCad E.D.A. 8.0.0

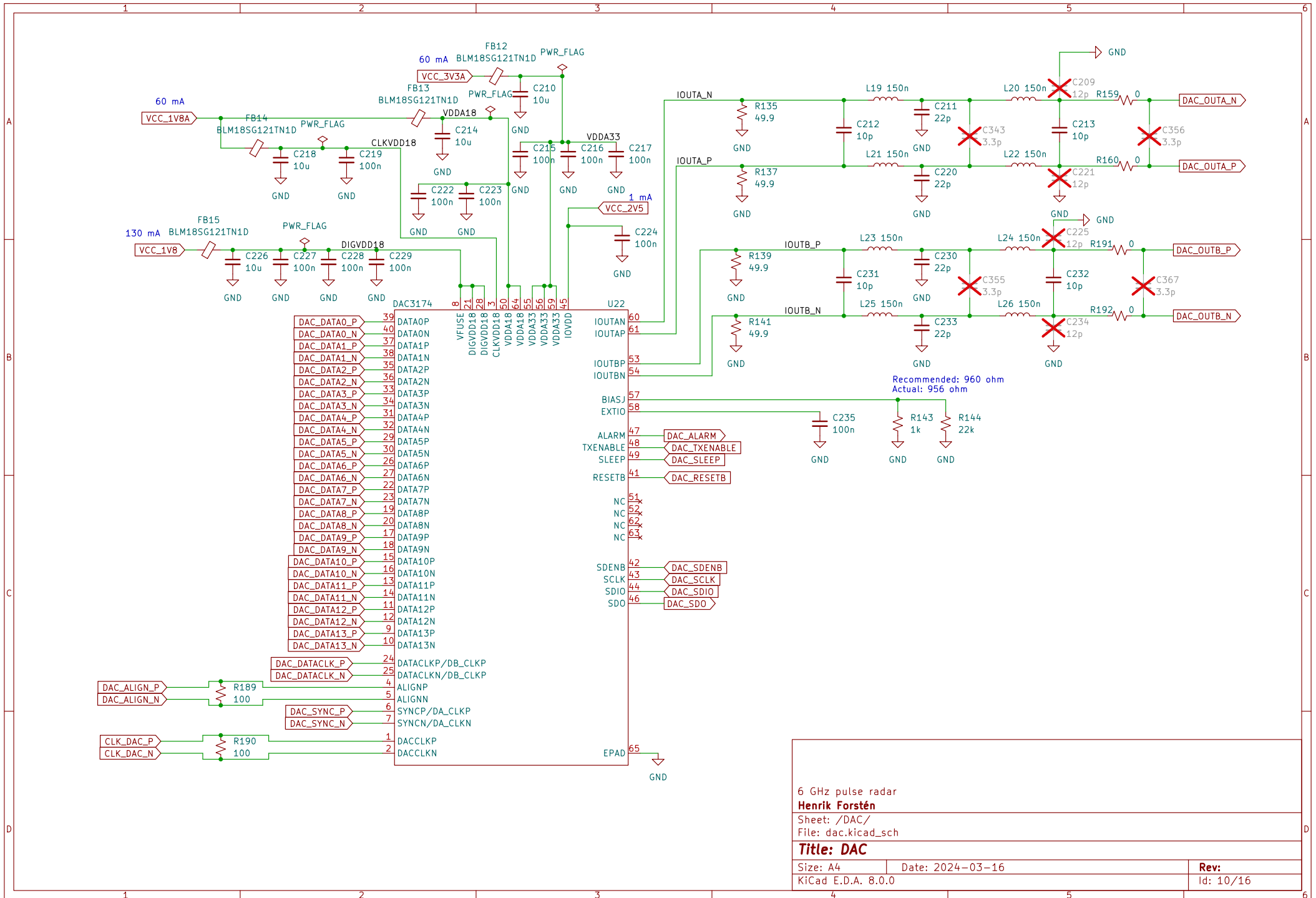
Rev:
Id: 1/16



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 Sheet: /Clock generator/
 File: clock_generator.kicad_sch

Title: Clock generator

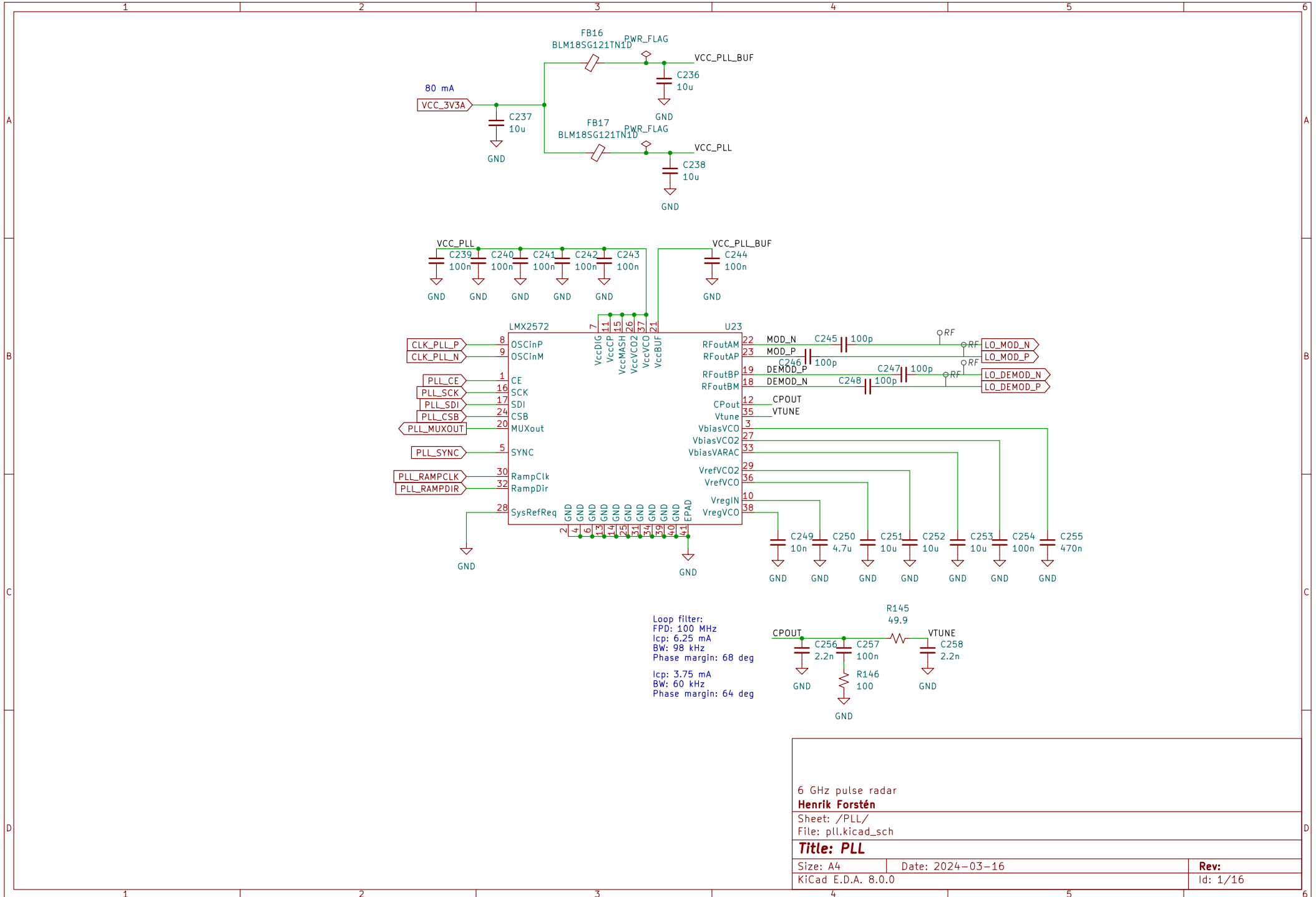
Size: A4	Date: 2024-03-16	Rev:
KiCad E.D.A. 8.0.0		Id: 1/16



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 Sheet: /DAC/
 File: dac.kicad_sch

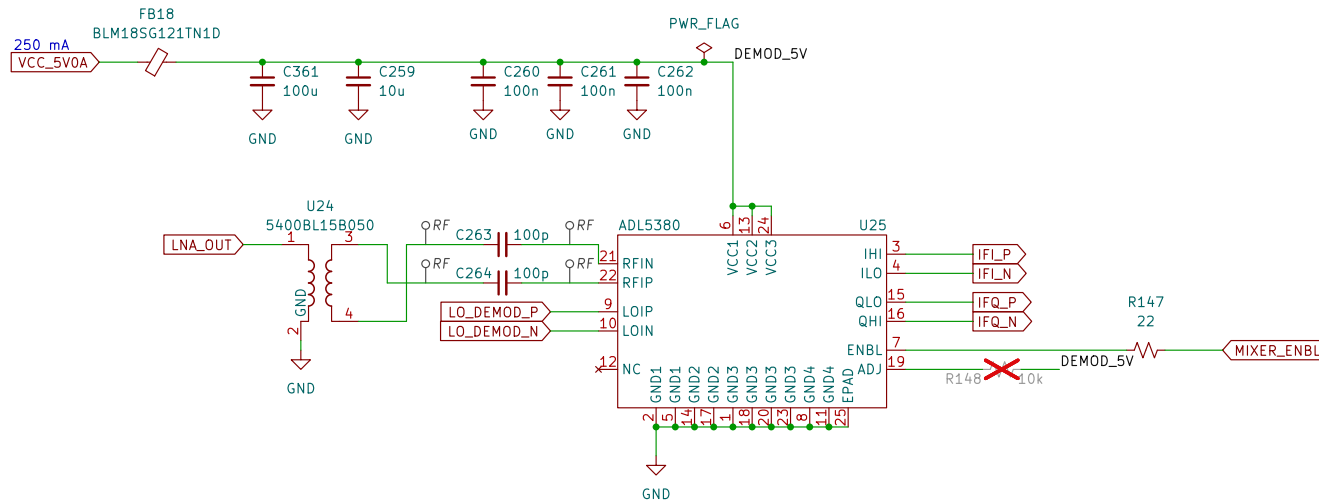
Title: DAC

Size: A4	Date: 2024-03-16	Rev:
KiCad E.D.A. 8.0.0		Id: 10/16



Loop filter:
 FPD: 100 MHz
 Icp: 6.25 mA
 BW: 98 kHz
 Phase margin: 68 deg
 Icp: 3.75 mA
 BW: 60 kHz
 Phase margin: 64 deg

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Sheet: /PLL/	
File: pll.kicad_sch	
Title: PLL	
Size: A4	Date: 2024-03-16
KiCad E.D.A. 8.0.0	Rev: Id: 1/16



6 GHz pulse radar

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Sheet: /Demodulator/

File: demodulator.kicad_sch

Title: Demodulator

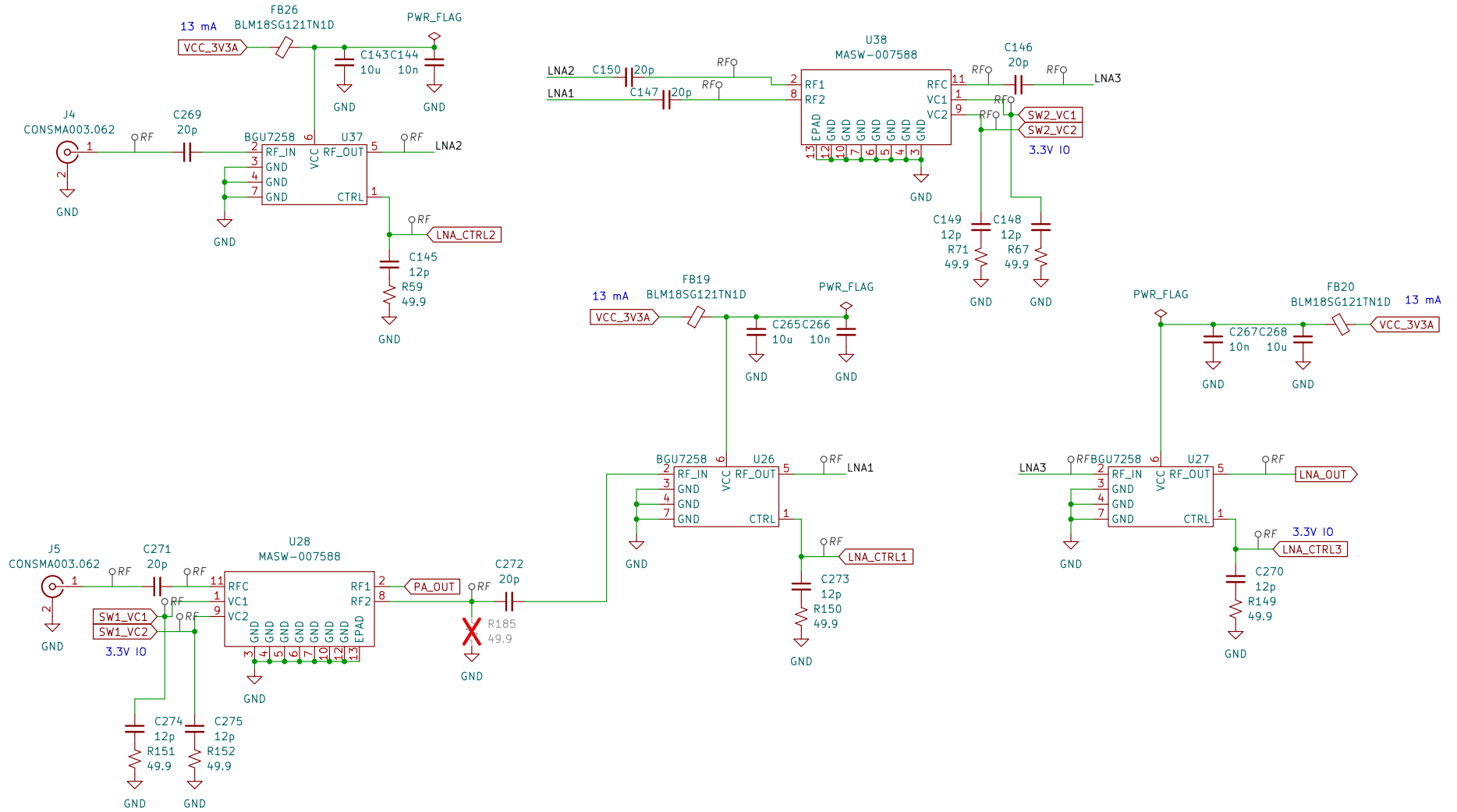
Size: A4

Date: 2024-03-16

Rev:

KiCad E.D.A. 8.0.0

Id: 1/16



6 GHz pulse radar

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Sheet: /RF front end/

File: rf_front_end.kicad_sch

Title: RF front end

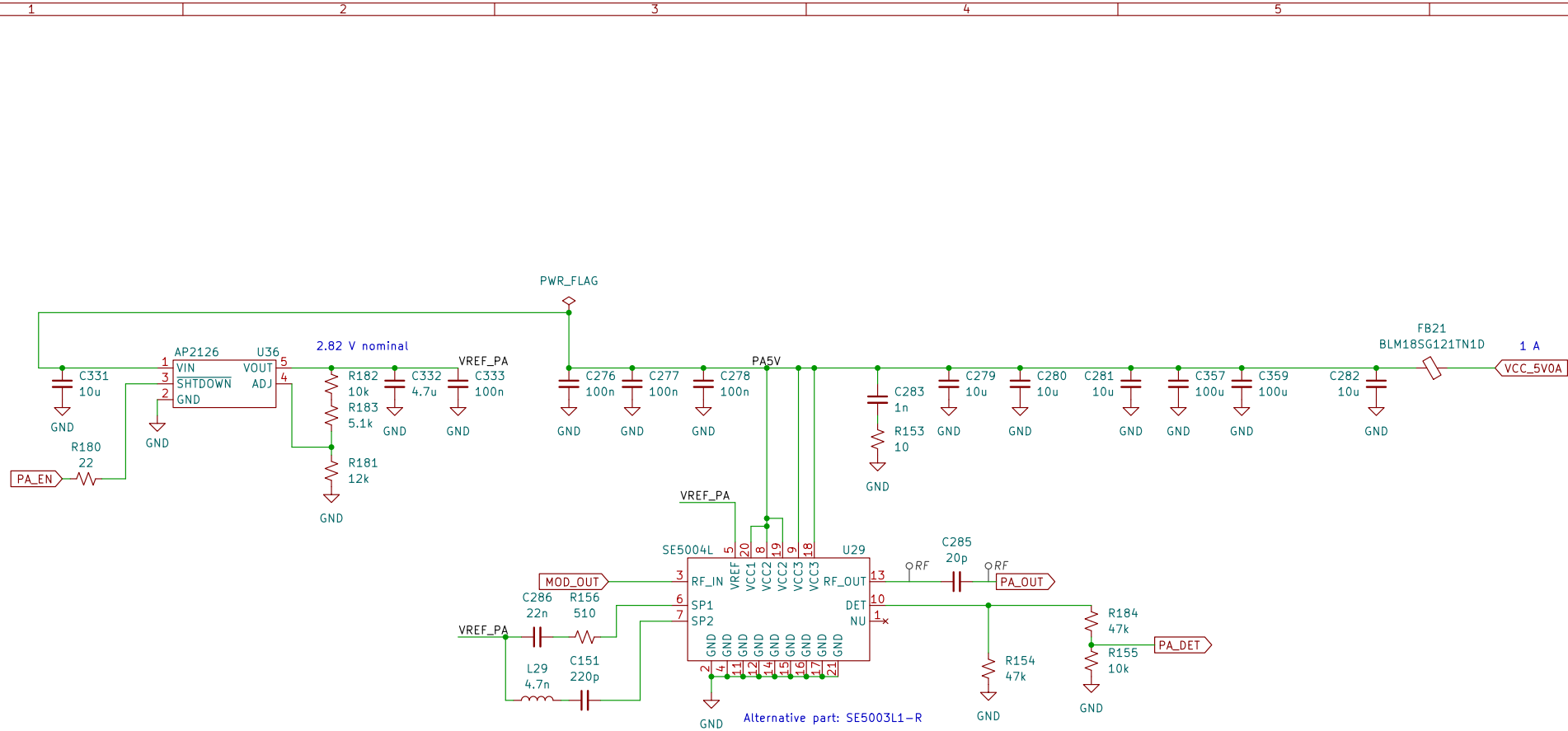
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Date: 2024-03-16

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Rev:

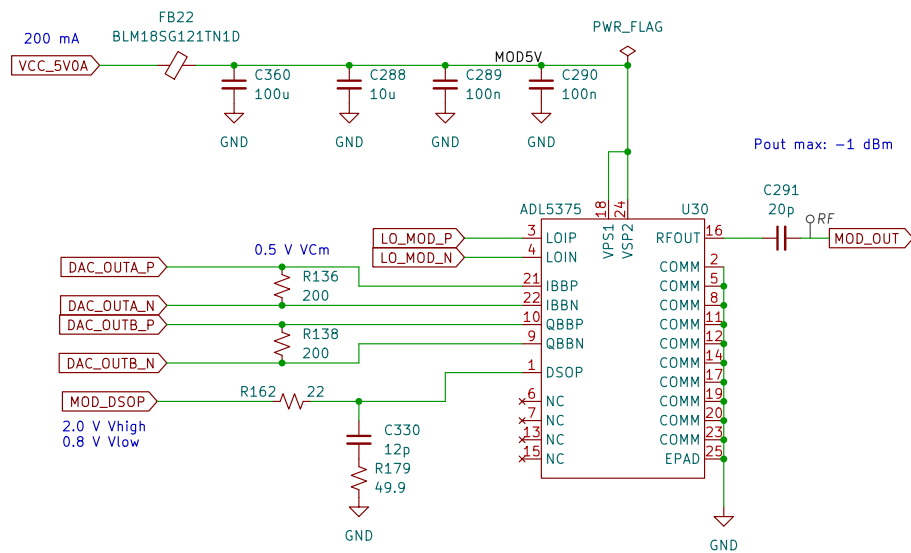
Id: 1/16



Gain: 32 dB
Pout -1dB: 34 dBm

Alternative part: SE5003L1-R

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Sheet: /PA/	
File: pa.kicad_sch	
Title: PA	
Size: A4	Date: 2024-03-16
KiCad E.D.A. 8.0.0	Rev: Id: 14/16



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Sheet: /Modulator/

File: modulator.kicad_sch

Title: Modulator

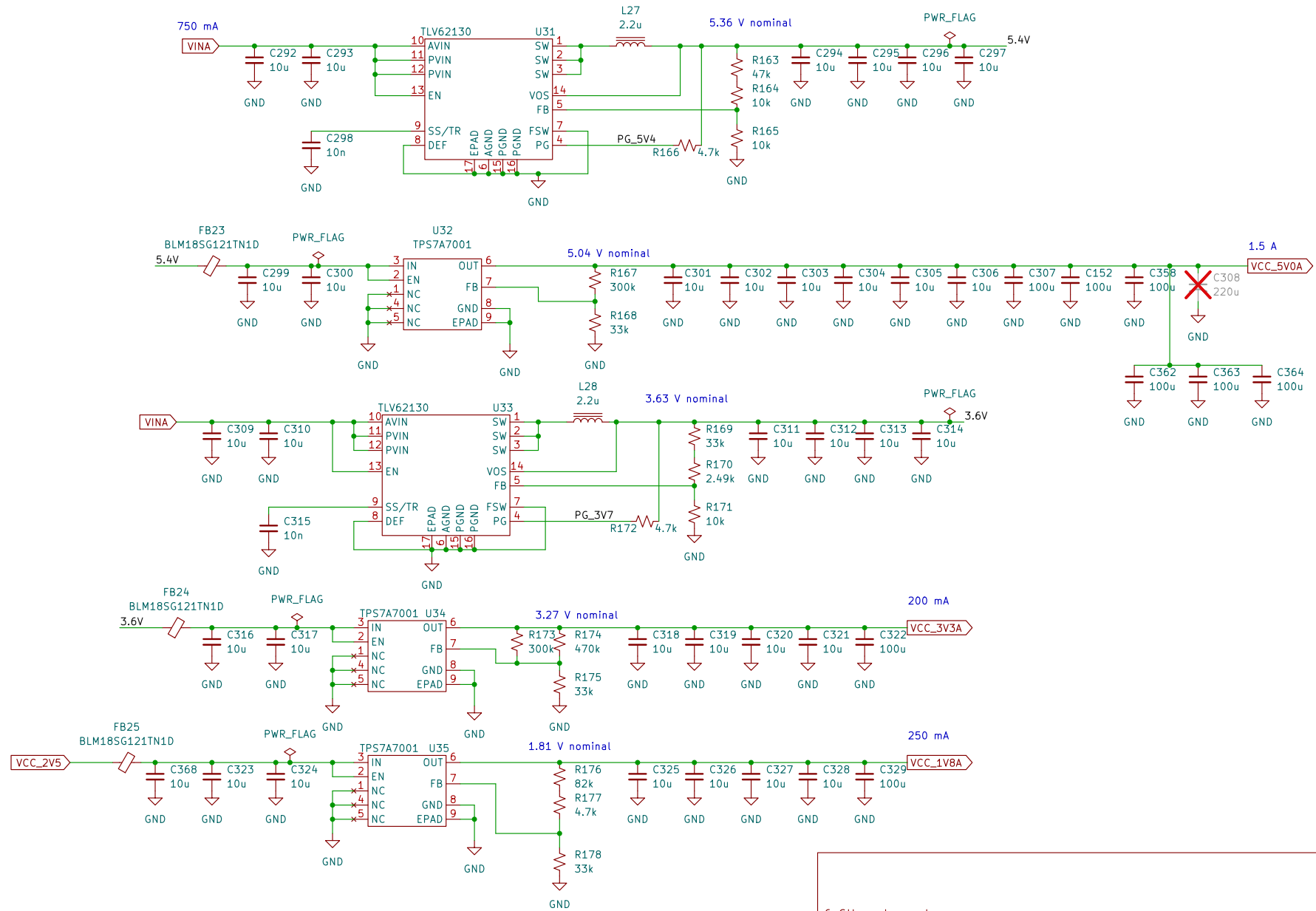
Size: A4

Date: 2024-03-16

Rev:

KiCad E.D.A. 8.0.0

Id: 15/16



6 GHz pulse radar	
Henrik Forstén	
Sheet: /Analog power/	
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Title: Analog power	
Size: A4	Date: 2024-03-16
KiCad E.D.A. 8.0.0	Rev: 1/16