

TMS570_CPU



File: tms570_cpu.kicad_sch

BUS_IO_Interface



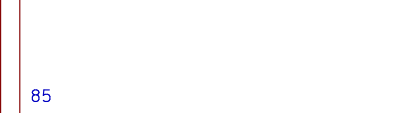
File: BUS_IO_Interface.kicad_sch

Memory



File: memorg.kicad_sch

Power



File: power.kicad_sch

RF_Power_AMP_FET



File: Power_Amp.kicad_sch

TX_ax5043



File: TX_ax5043.kicad_sch

RX_1_ax5044



File: RX_1_ax5043.kicad_sch

RX_2_ax5045



File: RX_2_ax5043.kicad_sch

RX_3_ax5045



File: RX_3_ax5043.kicad_sch

RX_4_ax5045



File: RX_4_ax5043.kicad_sch

Rx_Power_Divider



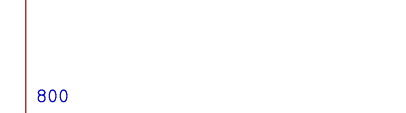
File: Power_Divider.kicad_sch

Clocks



File: Clocks.kicad_sch

SPL_CTL

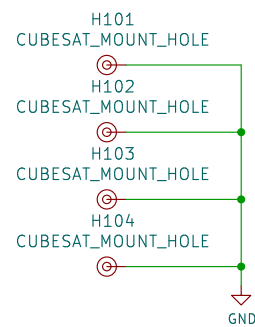


File: SPL_CTL.kicad_sch

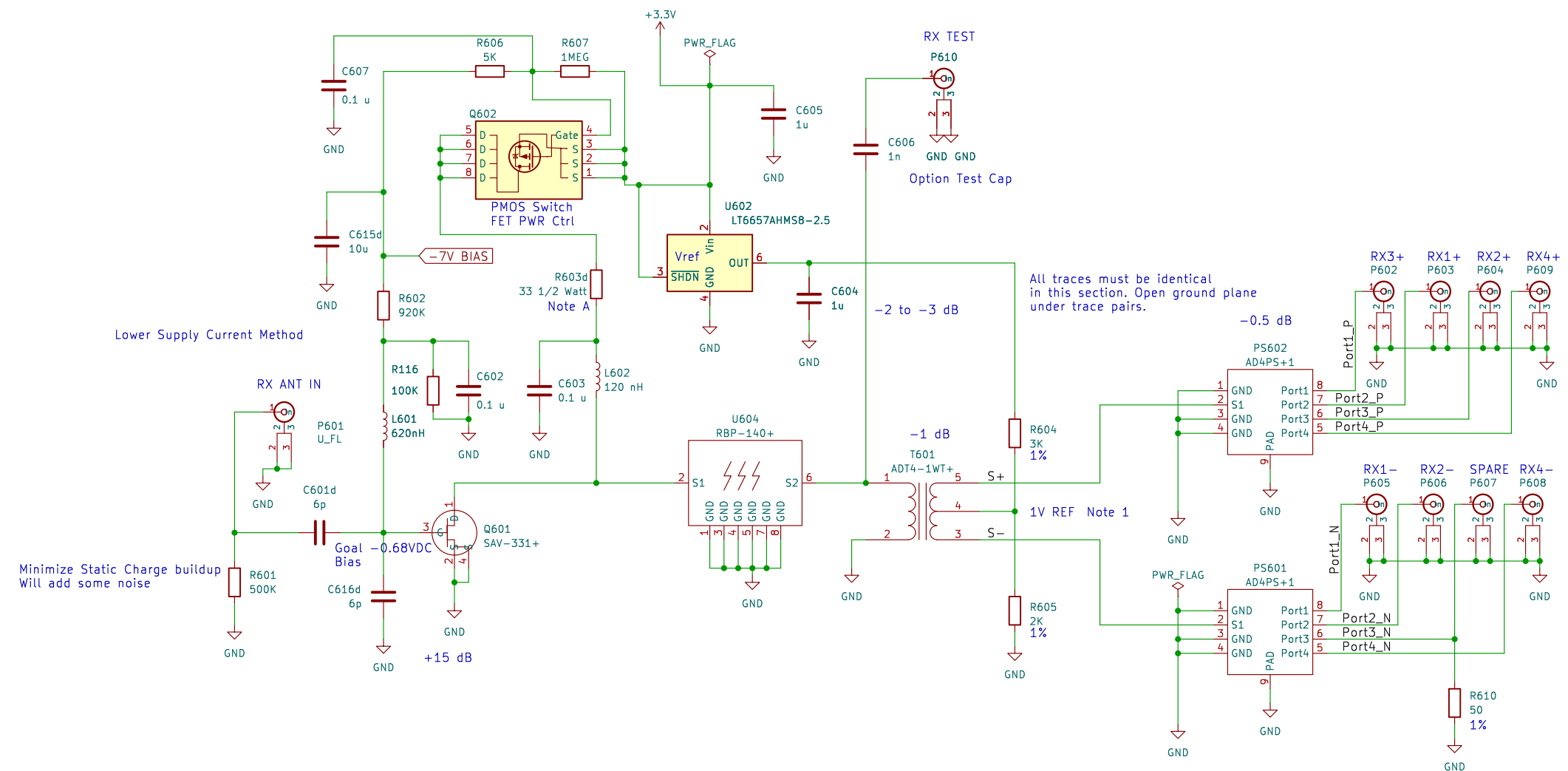
PC104_IO



File: PC104_io_conn.kicad_sch



N5BRG		
AMSAT-NA		
Sheet: /		
File: PacSat_Dev_RevD_231018.kicad_sch		
Title: Radiation Tolerant Internal Housekeeping Unit (IHU)		
Size: USLedger	Date: 2022-12-27	Rev: 1.2
KiCad E.D.A. kicad 7.0.10-7.0.10-ubuntu22.04.1		Id: 1/15



Lower Supply Current Method

Minimize Static Charge buildup
Will add some noise

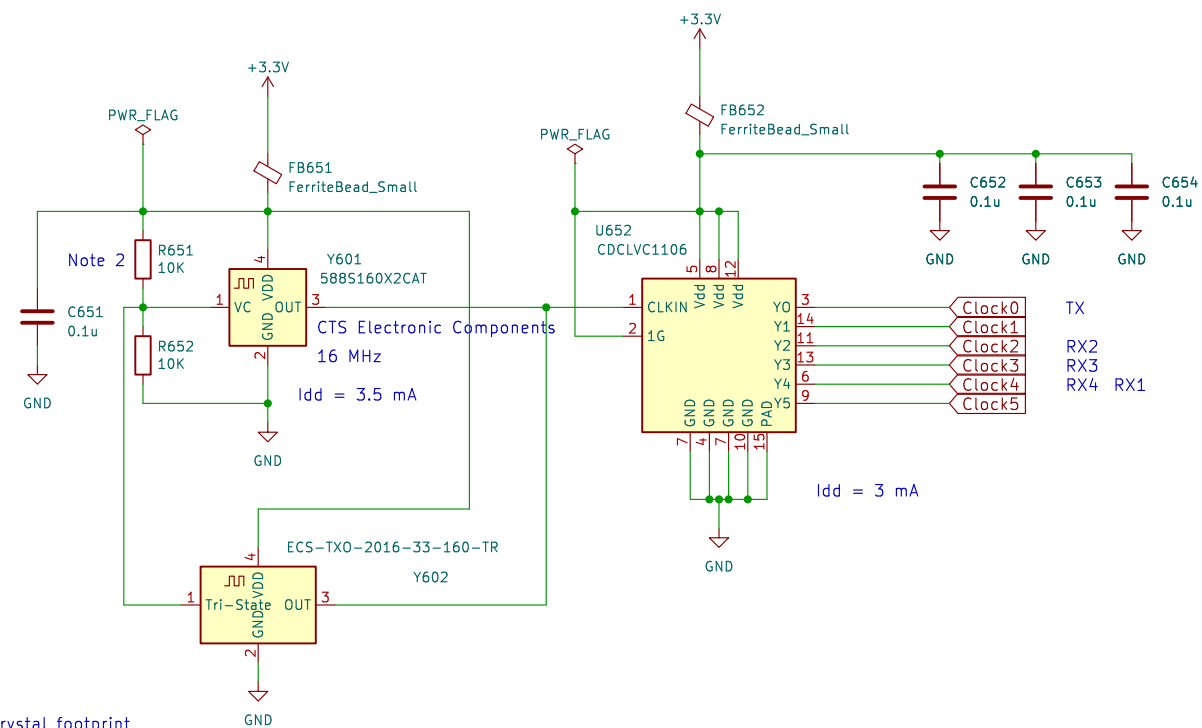
All traces must be identical
in this section. Open ground plane
under trace pairs.

Inductors Ref Murata LQW18AN_00 series
Note A:
Tune resistor for best gain and lowest current.
May replace the FET bia with an active
bias network.

Note 1
Test performance at different offset bias levels and ground.
One AX5043 note suggested 1.0 volts for best results.

Symbol Numbers 600 up

RX INPUT POWER DIVIDER		
N5BRG		
AMSAT-NA		
Sheet: /Rx_Power_Divider/		
File: Power_Divider.kicad_sch		
Title: Radiation Tolerant PacSat Communication		
Size: USLdger	Date: 2023-06-17	Rev: A
KiCad E.D.A. kicad 7.0.10-7.0.10-ubuntu22.04.1		Id: 2/15



Review crystal footprint
 May have to change due to availability
 When ECS crystal is used leave off R652.

Note:

1. Review FILT voltage node and adjust current if needed per ap note AND9315-D.PDF
2. Seletec best resitor values after assembly and use one percent resistors to put frequency at 16 MHz.

Symbol Numbers 650 up

N5BRG CLOCK

AMSAT-NA

Sheet: /Clocks/

File: Clocks.kicad_sch

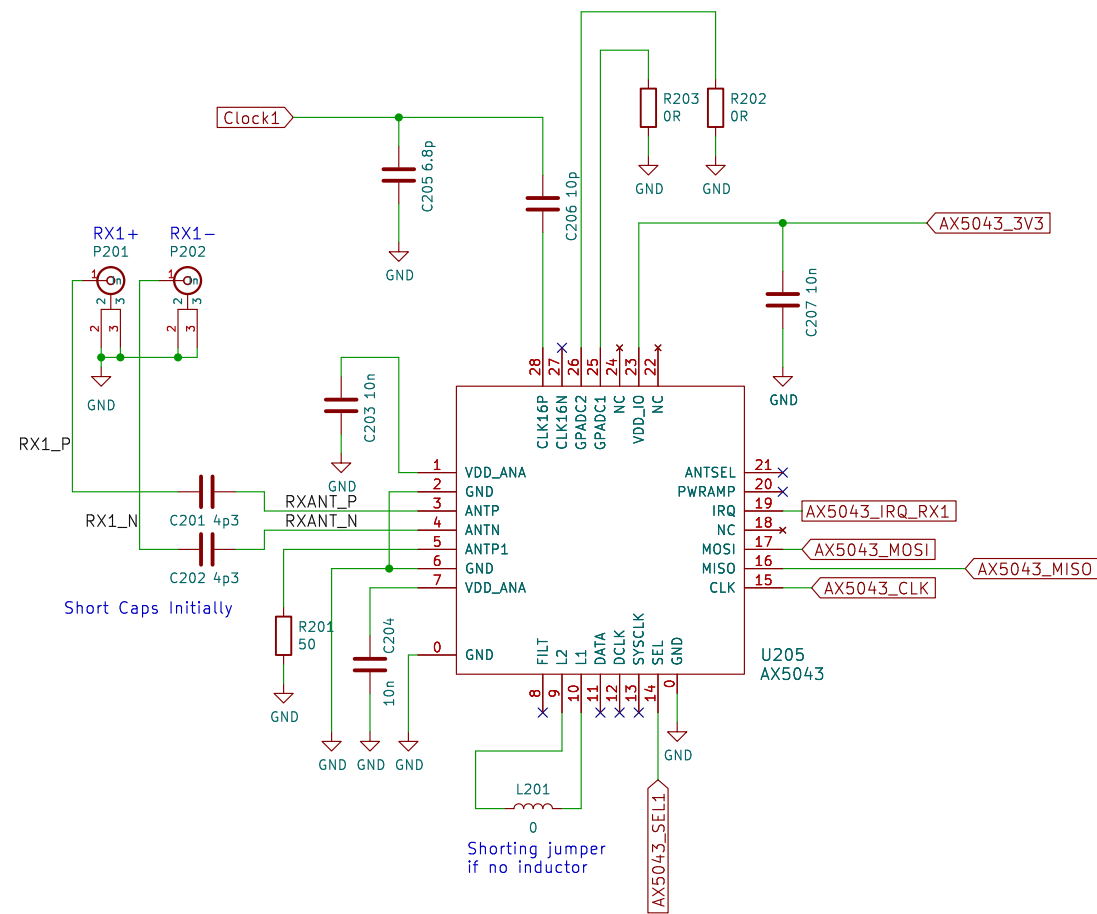
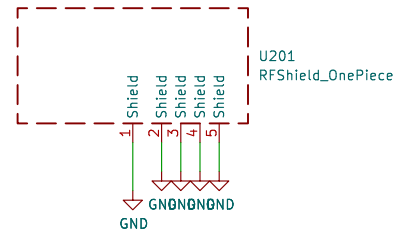
Title: Radiation Tolerant PacSat Communication

Size: USLedger Date: 2023-06-17

Rev: A

KiCad E.D.A. kicad 7.0.10-7.0.10-ubuntu22.04.1

Id: 4/15



Short Caps Initially

Shorting jumper if no inductor

Inductors Ref Murata LQW18AN_00 series

Symbol Numbers 200 up

RECEIVER 1

N5BRG
AMSAT-NA

Sheet: /RX_1_ax5044/
File: RX_1_ax5043.kicad_sch

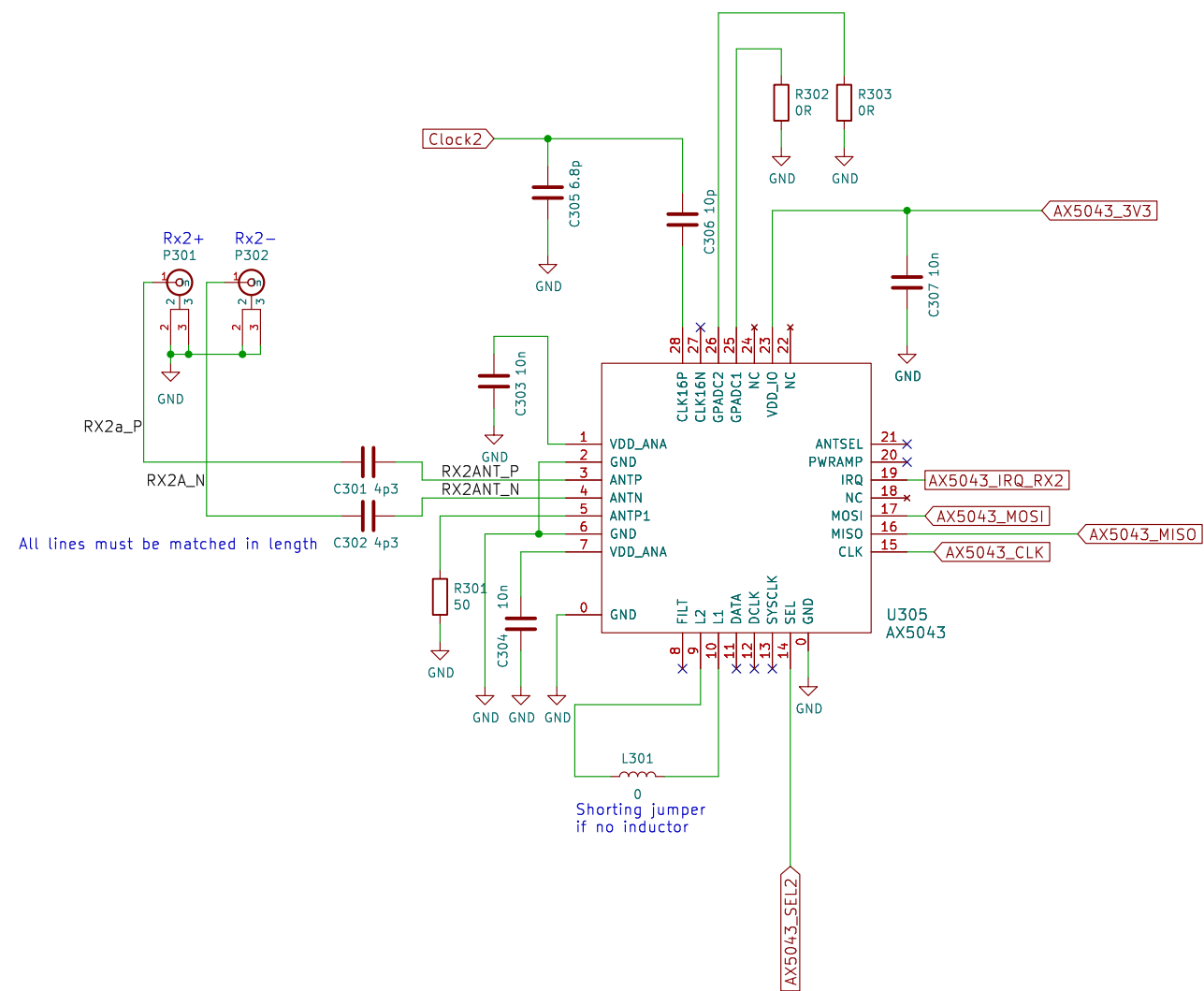
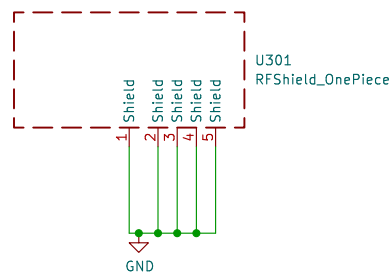
Title: Radiation Tolerant PacSat Communication

Size: USLedger | Date: 2023-06-17

KiCad E.D.A. kicad 7.0.10-7.0.10-ubuntu22.04.1

Rev: A

Id: 5/15



Inductors Ref Murata LQW18AN_00 series

Symbol Numbers 300 up

RECEIVER 2

N5BRG
AMSAT-NA

Sheet: /RX_2_ax5045/
File: RX_2_ax5043.kicad_sch

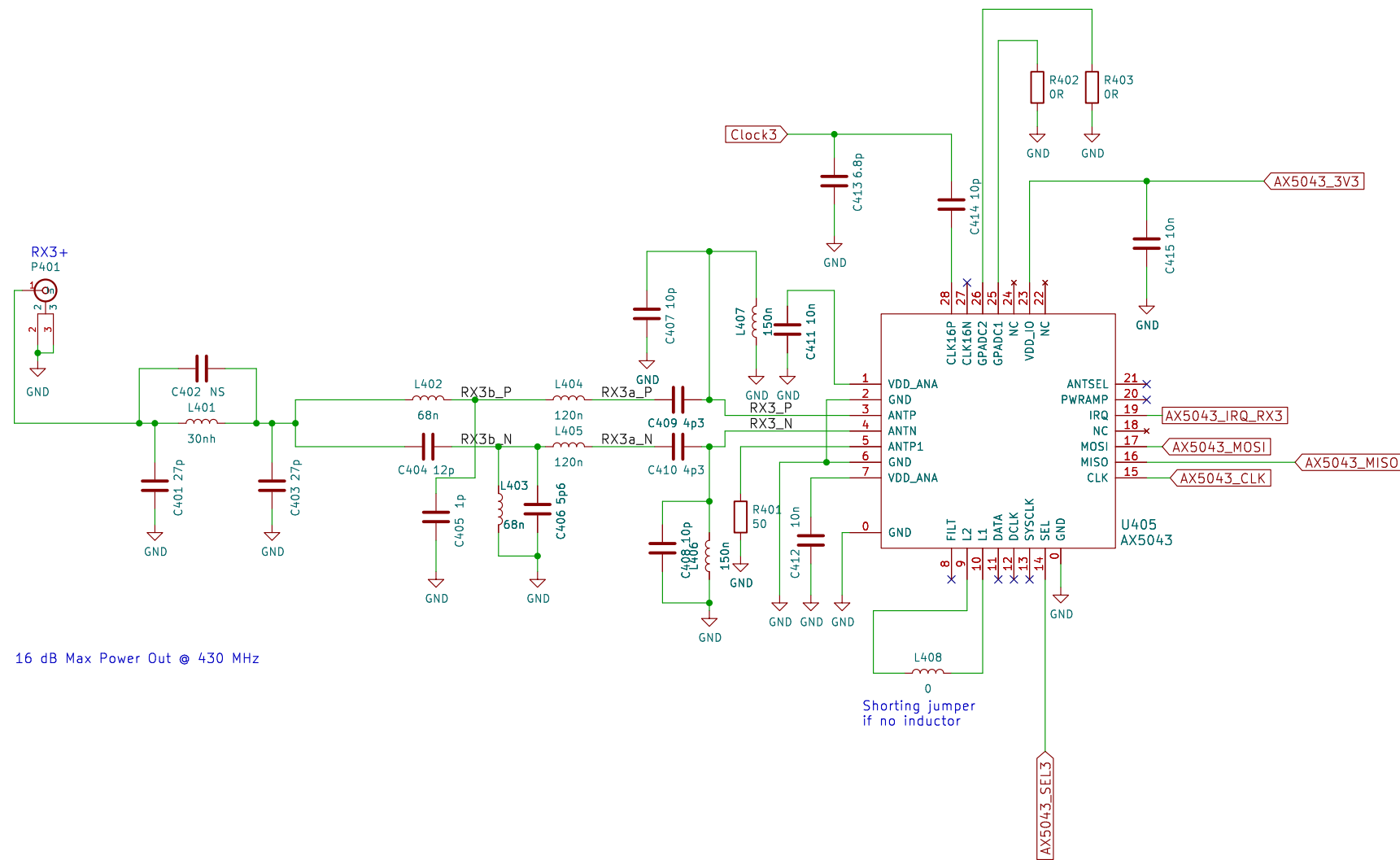
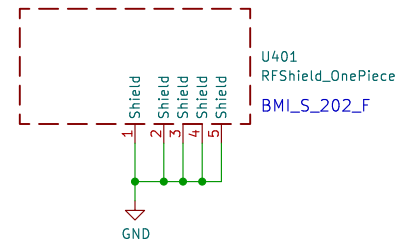
Title: Radiation Tolerant PacSat Communication

Size: USLedger | Date: 2023-06-17

KiCad E.D.A. kicad 7.0.10-7.0.10-ubuntu22.04.1

Rev: A

Id: 7/15



16 dB Max Power Out @ 430 MHz

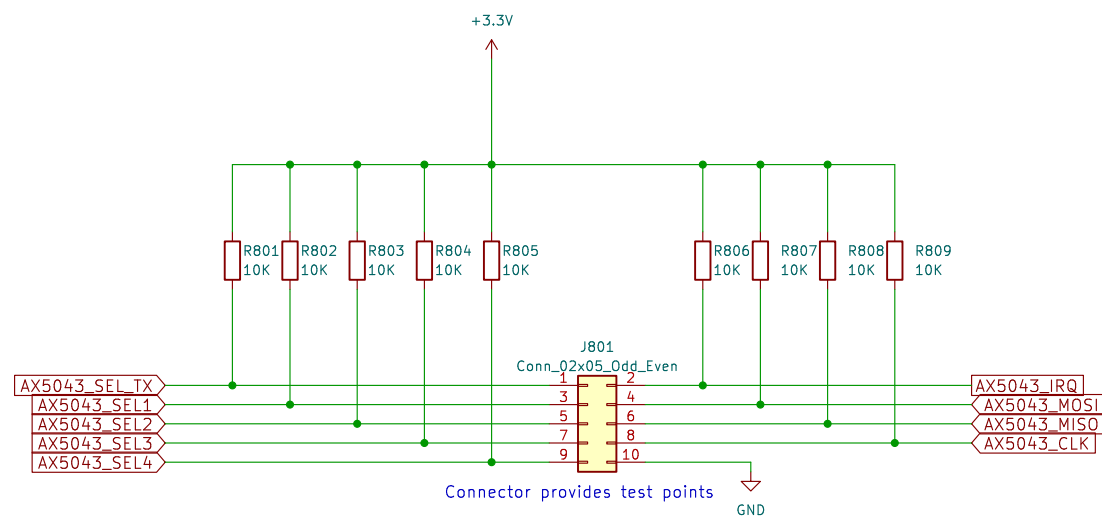
Shorting jumper if no inductor

Inductors Ref Murata LQW18AN_00 series

Symbol Numbers 400 up

RECEIVER 3

N5BRG		AMSAT-NA	
Sheet: /RX_3_ax5045/		File: RX_3_ax5043.kicad_sch	
Title: Radiation Tolerant PacSat Communication			
Size: USLedger	Date: 2023-06-17	Rev: A	
KiCad E.D.A. kicad 7.0.10-7.0.10-ubuntu22.04.1		Id: 9/15	



Symbol Numbers 800 up

N5BRG

COPNTOL LINES

AMSAT-NA

Sheet: /SPI_CTL/

File: SPI_CTL.kicad_sch

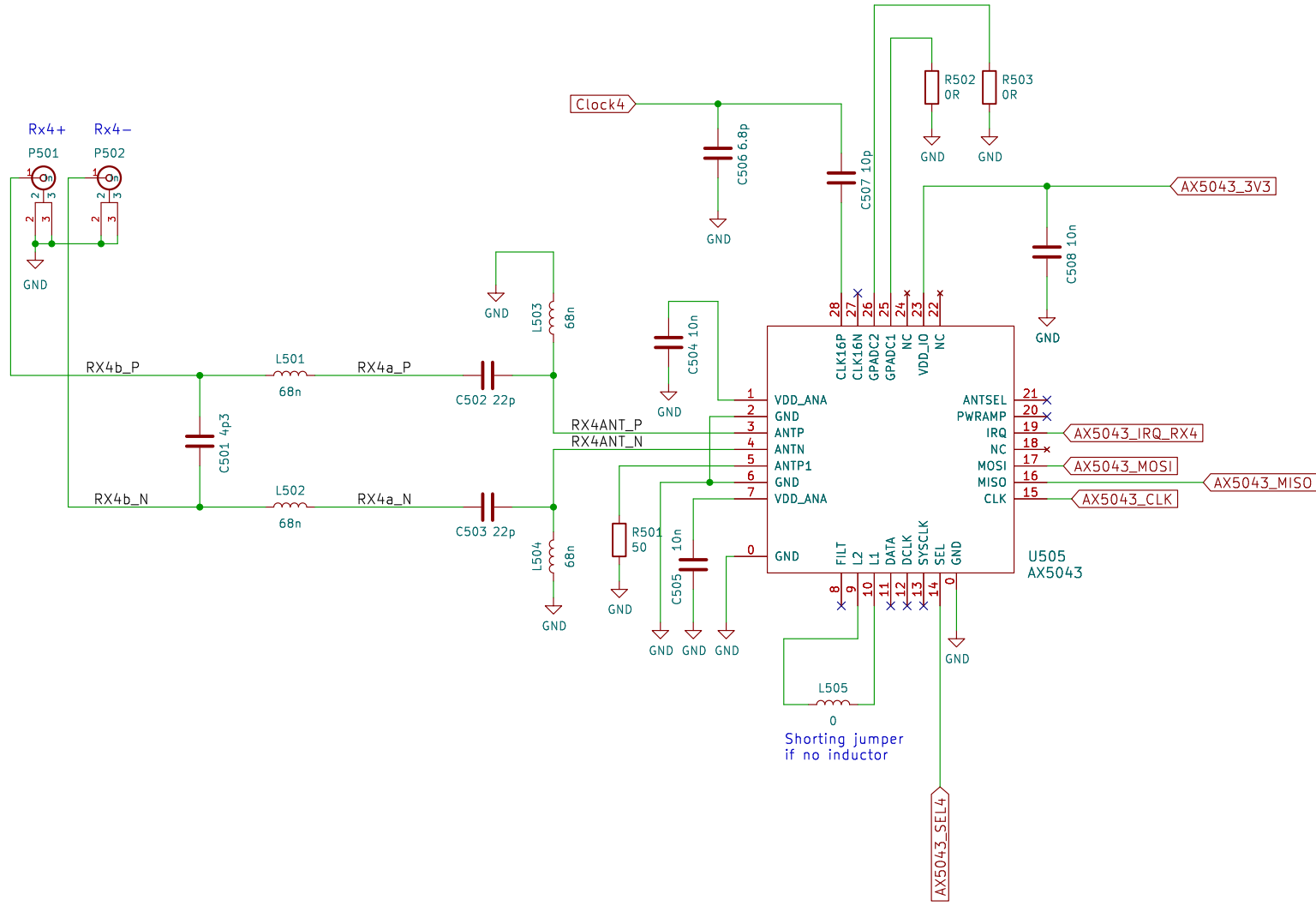
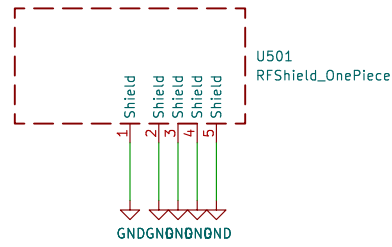
Title: Radiation Tolerant PacSat Communication

Size: USLedger | Date: 2023-06-17

Rev: A

KiCad E.D.A. kicad 7.0.10-7.0.10-ubuntu22.04.1

Id: 10/15



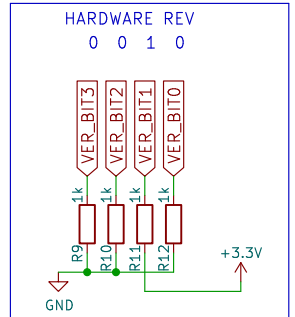
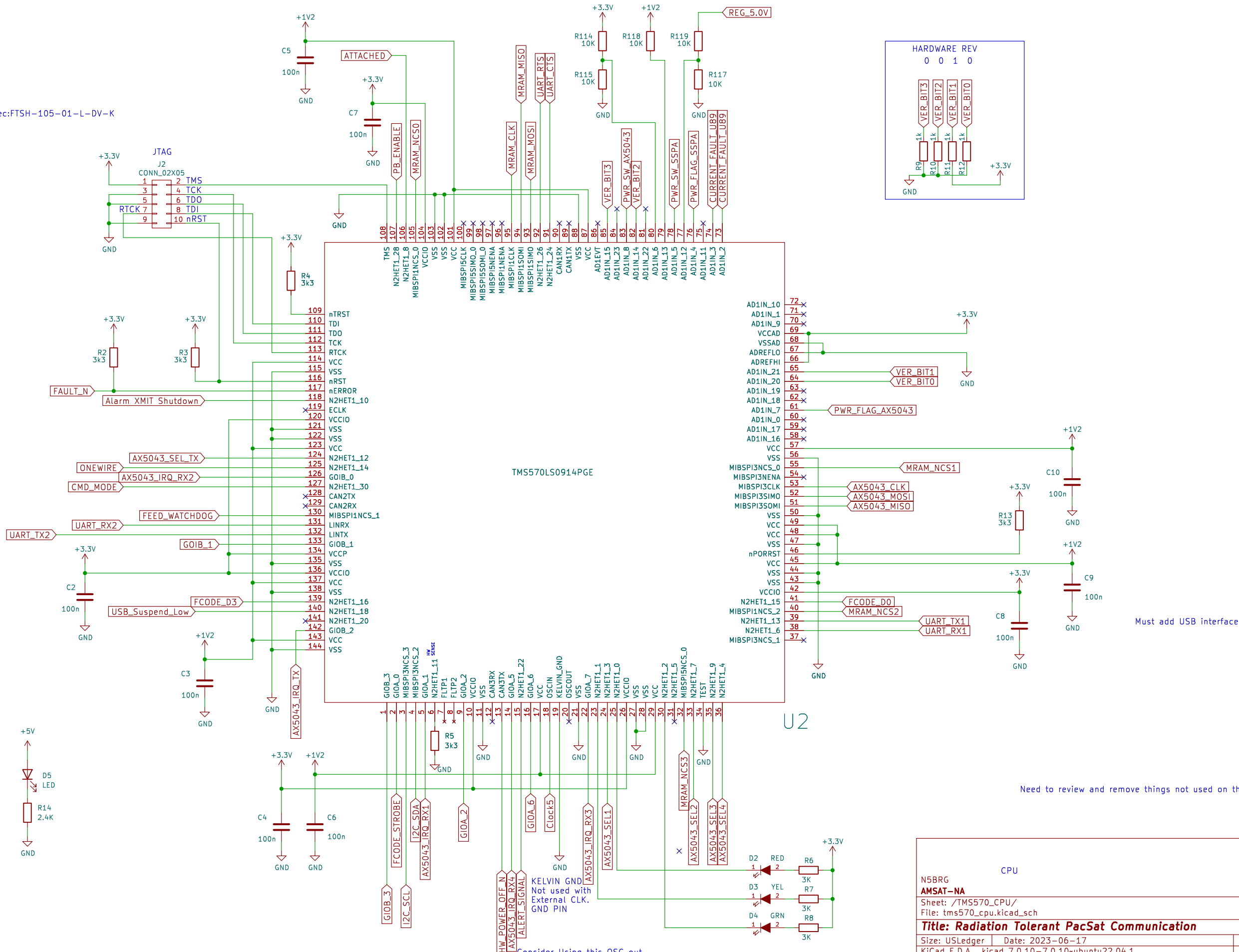
Inductors Ref Murata LQW18AN_00 series

Symbol Numbers 500 up

RECEIVER 4

N5BRG		
AMSAT-NA		
Sheet: /RX_4_ax5045/		
File: RX_4_ax5043.kicad_sch		
Title: Radiation Tolerant PacSat Communication		
Size: USLedger	Date: 2023-06-17	Rev: A
KiCad E.D.A. kicad 7.0.10-7.0.10-ubuntu22.04.1		Id: 11/15

PacSatDev_samtec:FTSH-105-01-L-DV-K



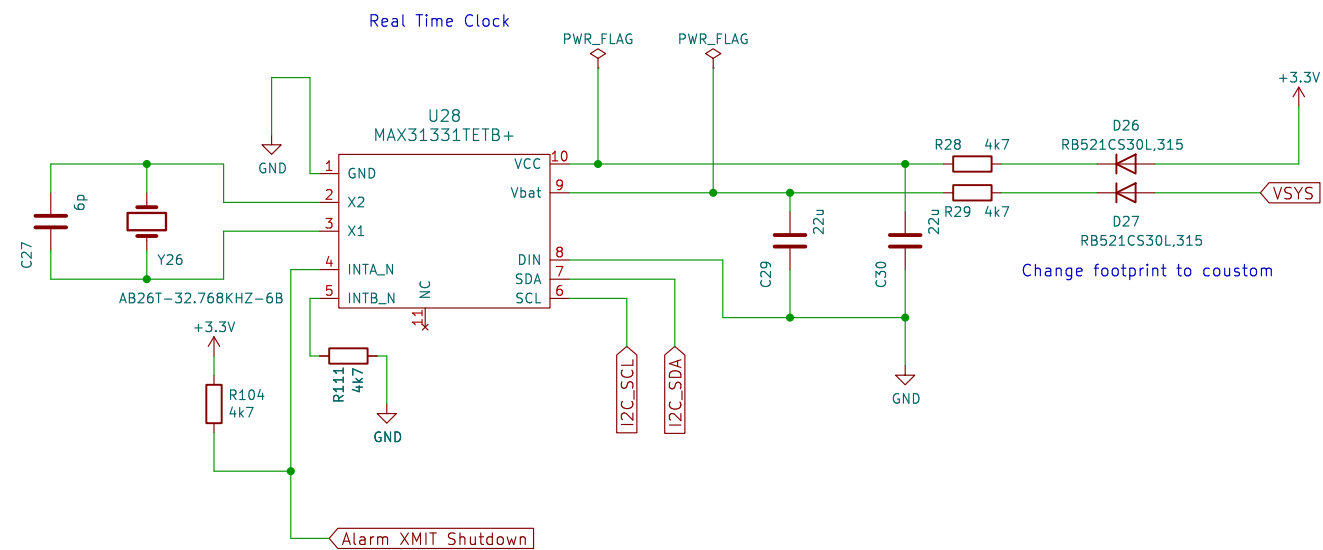
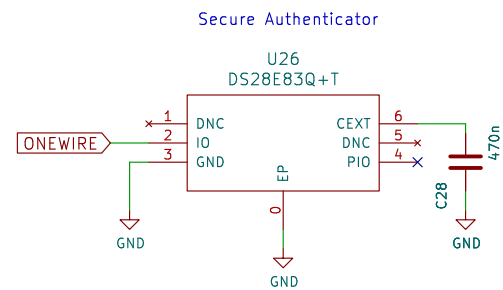
Must add USB interface

Need to review and remove things not used on this design.

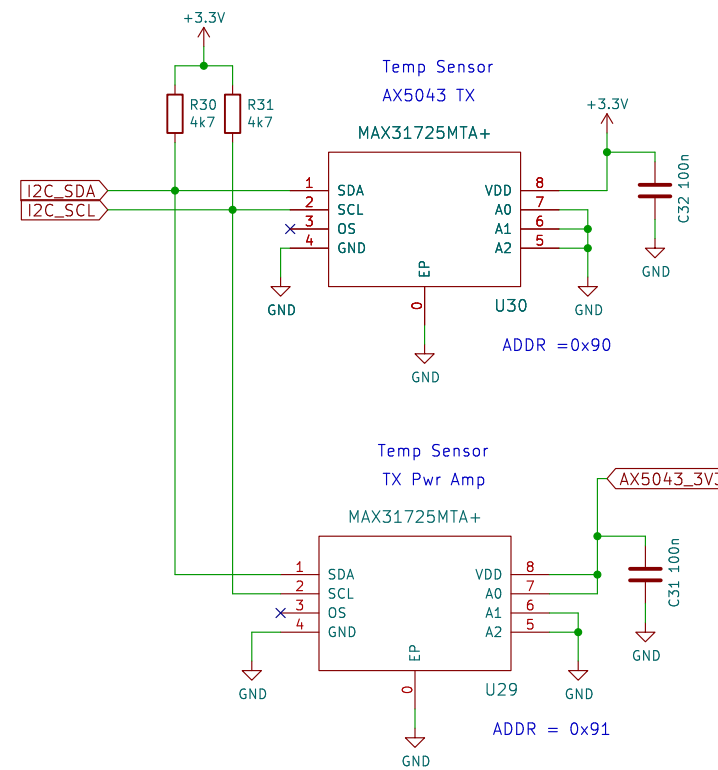
CPU	
N5BRG	
AMSAT-NA	
Sheet: /TMS570_CPU/	
File: tms570_cpu.kicad_sch	
Title: Radiation Tolerant PacSat Communication	
Size: USLedger	Date: 2023-06-17
KiCad E.D.A.	Rev: 1.1
Id: 12/15	

Start with 1

Consider Using this OSC out.

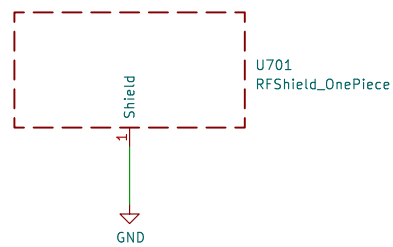


Idd 2.5 uA/600 uA

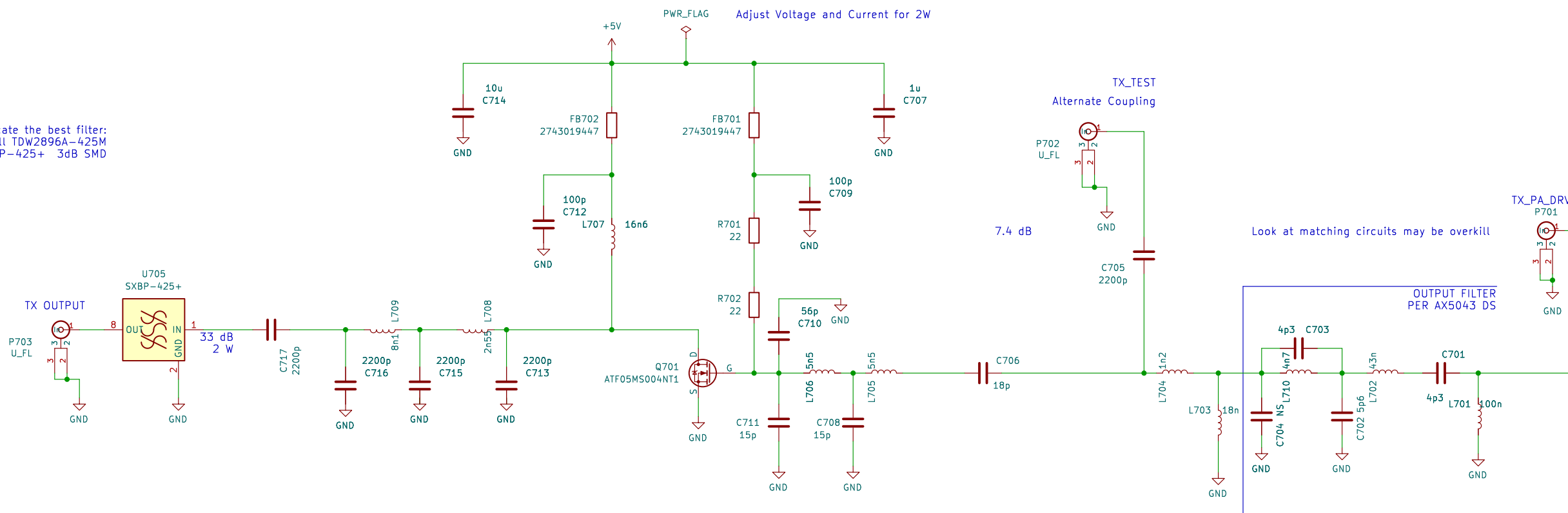


Start with 25

BUS IO		
N5BRG		
AMSAT-NA		
Sheet: /BUS_IO_Interface/		
File: BUS_IO_Interface.kicad_sch		
Title: Radiation Tolerant PacSat Communication		
Size: USLedger	Date: 2023-06-17	Rev: 1.1
KiCad E.D.A. kicad 7.0.10-7.0.10-ubuntu22.04.1		Id: 13/15



Locate the best filter:
Temwell TDW2896A-425M
MiniCircuits SXBP-425+ 3dB SMD



RF Shield over these parts.

Class AB

Use Hi Q Caps in all matching circuits (Ultra low ESR at 435 MHz)

Symbol Numbers 700 up

RF POWER AMP

N5BRG

AMSAT-NA

Sheet: /RF_Power_Amp_FET/

File: Power_Amp.kicad_sch

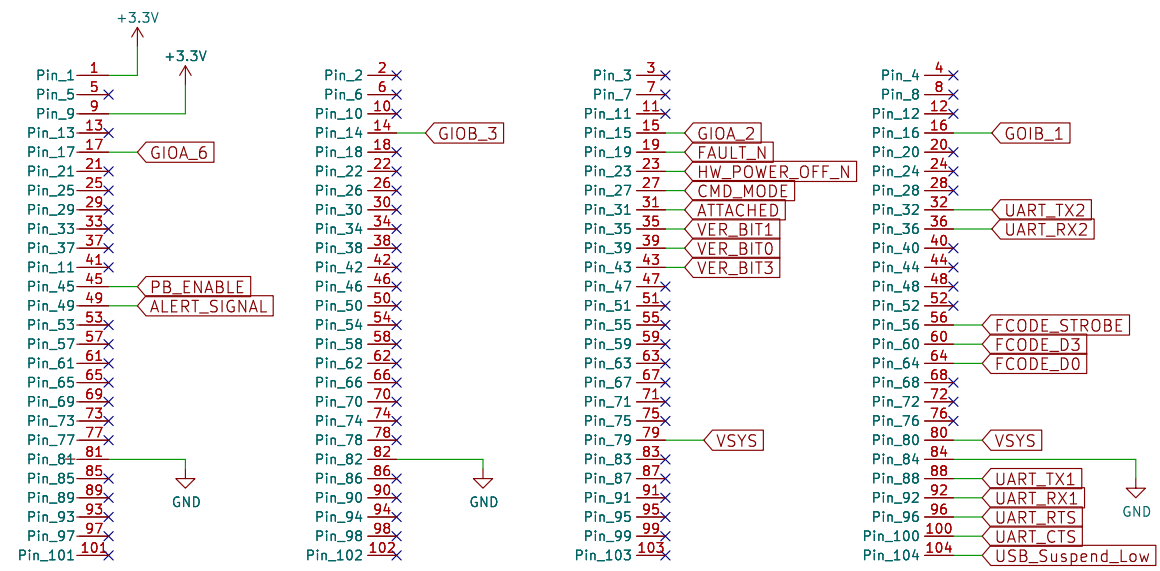
Title: Radiation Tolerant PacSat Communication

Size: USLedger Date: 2023-06-17

Rev: A

KiCad E.D.A. kicad 7.0.10-7.0.10-ubuntu22.04.1

Id: 14/15



PacSat_Dev_CONN_04X26
Conn_04x26_Pin
P651

Timer Signals

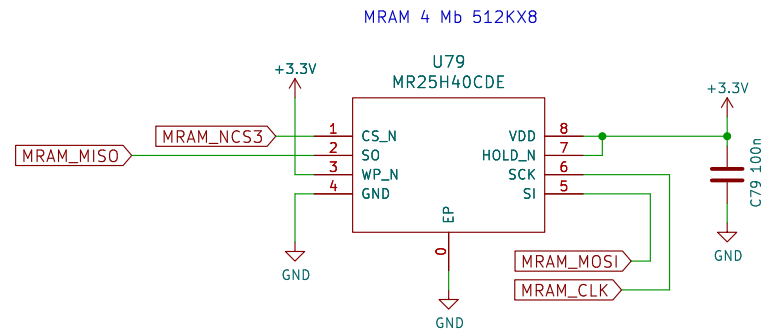
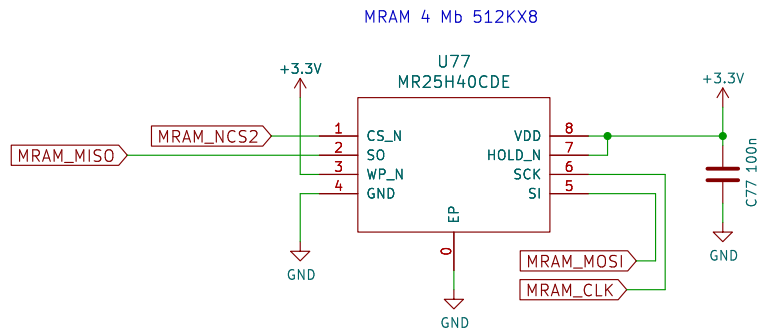
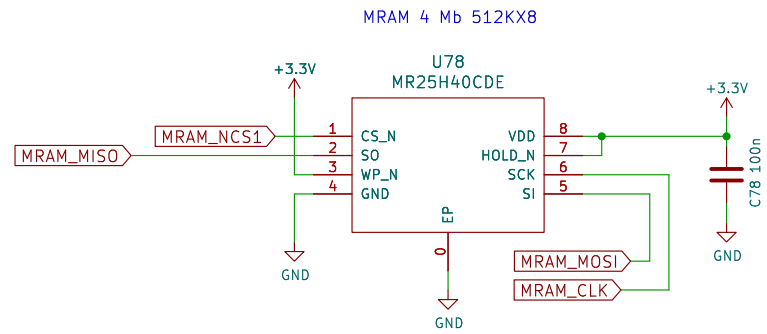
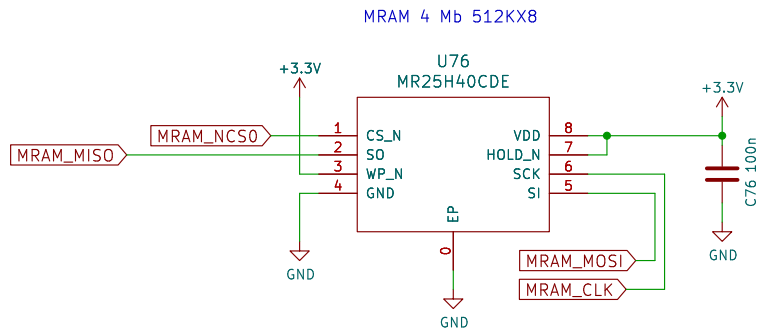
EXTERNAL
USB Interface

Needs a lot of work to define all IO and put the connections on proper pins.

Samtec Q Series Connectors
QSS mates with QTS
This connector accomidates stacking PCBs

Symbol Numbers 925 up

PACSAT BOARD IO		
N5BRG		
AMSAT-NA		
Sheet: /PC104_IO/		
File: PC104_io_conn.kicad_sch		
Title: Radiation Tolerant PacSat Communication		
Size: USLedger	Date: 2023-06-17	Rev: A
KiCad E.D.A. kicad 7.0.10-7.0.10-ubuntu22.04.1		Id: 15/15



Memory Chips
400 uA standby
11 to 18.5 mA active

Start with 75

Memory		
N5BRG		
AMSAT-NA		
Sheet: /Memory/		
File: memorg.kicad_sch		
Title: Radiation Tolerant PacSat Communication		
Size: A4	Date: 2023-06-17	Rev: A
KiCad E.D.A. kicad 7.0.10-7.0.10-ubuntu22.04.1	Id: 17/15	