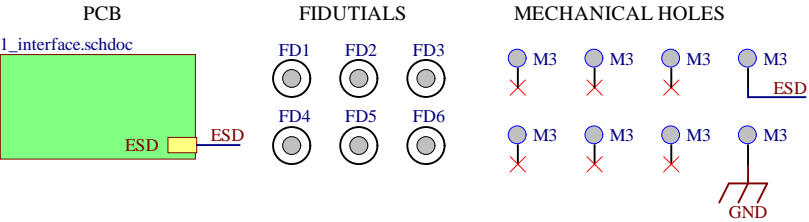


Rev	Description	Date	Author
0.5	- Updated templates. - Added missing schematic to layout elements. - Updated PC-104 interface. - Reviewed circuits and architecture.	26-Aug-2020	Andre M. P. Mattos
0.7	- Updated SpaceLab logo, added FRAM memory, updated resistor values for system leds, fixing non-connected CS memory pin and added test point to RTCCLK MCU pin.	04-Jun-2021	Andre M. P. Mattos

Revision History

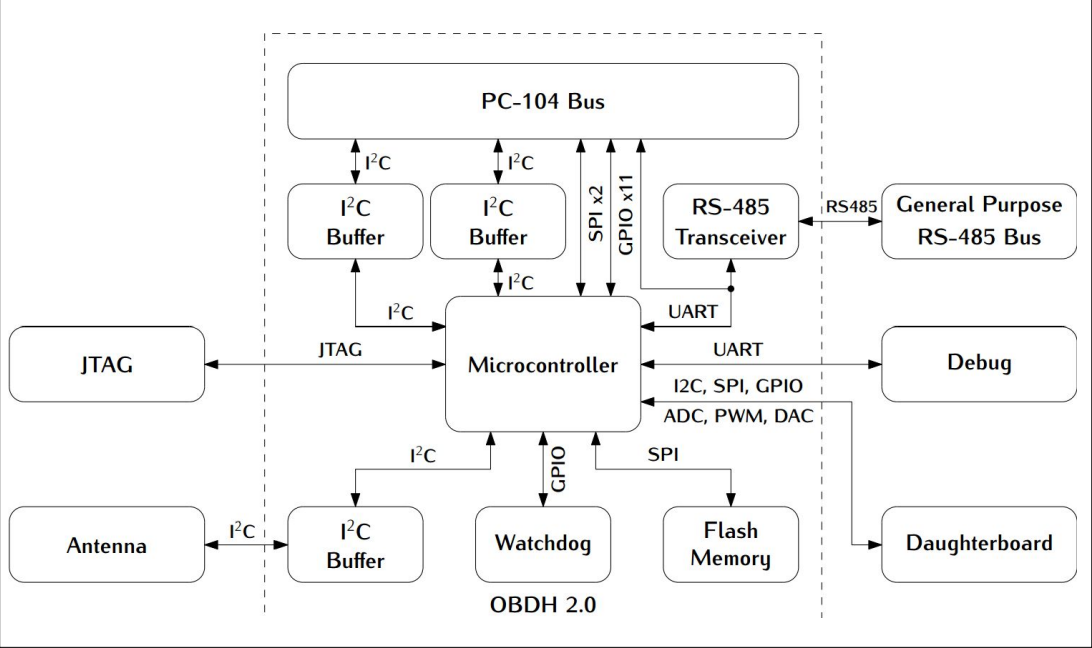


PCB Elements

OBDH2 Hardware:

- Drawn by: André M. P. Mattos
- Reviewers: Cezar A. Rigo, Kleber Gouveia and Yan C. Azeredo
- Based on FloripaSat-I OBDH designed by: Sara V. Martinez
- Support: Gabriel M. Marcelino

Project Contributions



Block Diagram


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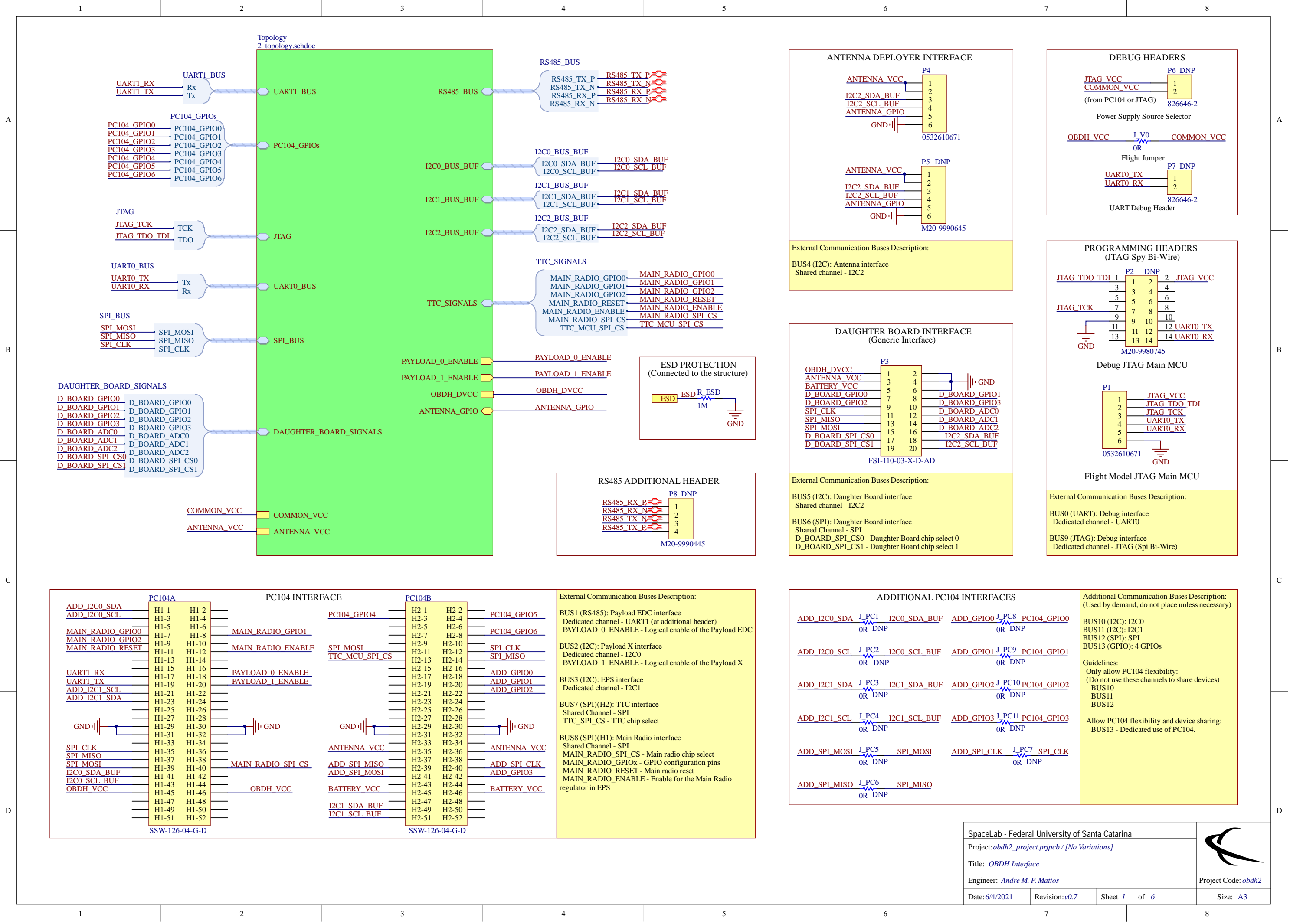
OBDH2 Hardware
Based on the FloripaSat-I OBDH 2.0

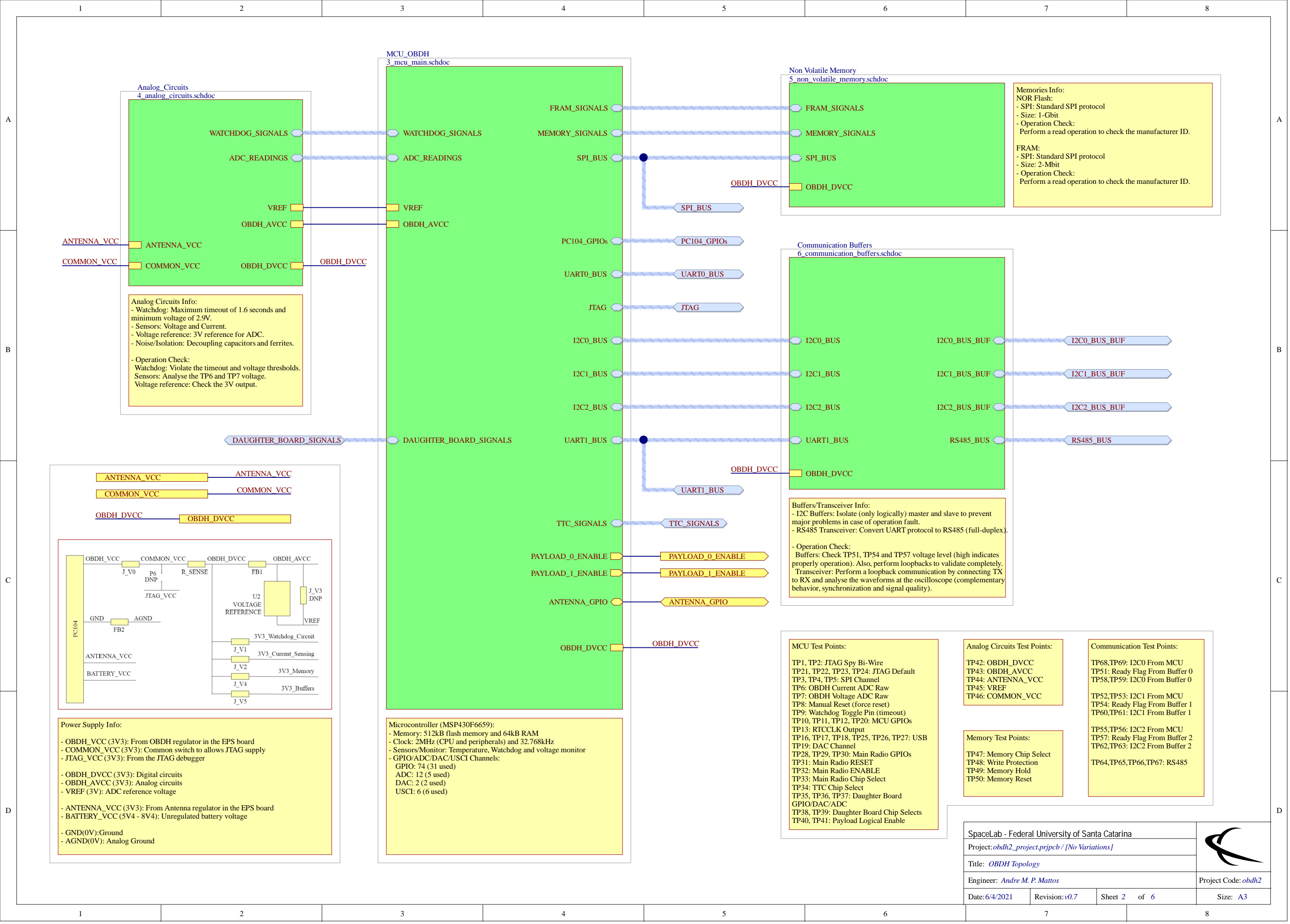
This work is licensed under the CERN-OHL-S Open Hardware License version 2.
To view a copy of this license, visit <https://ohwr.org/project/cehnohl/wikis/Documents/CERN-OHL-version-2>.

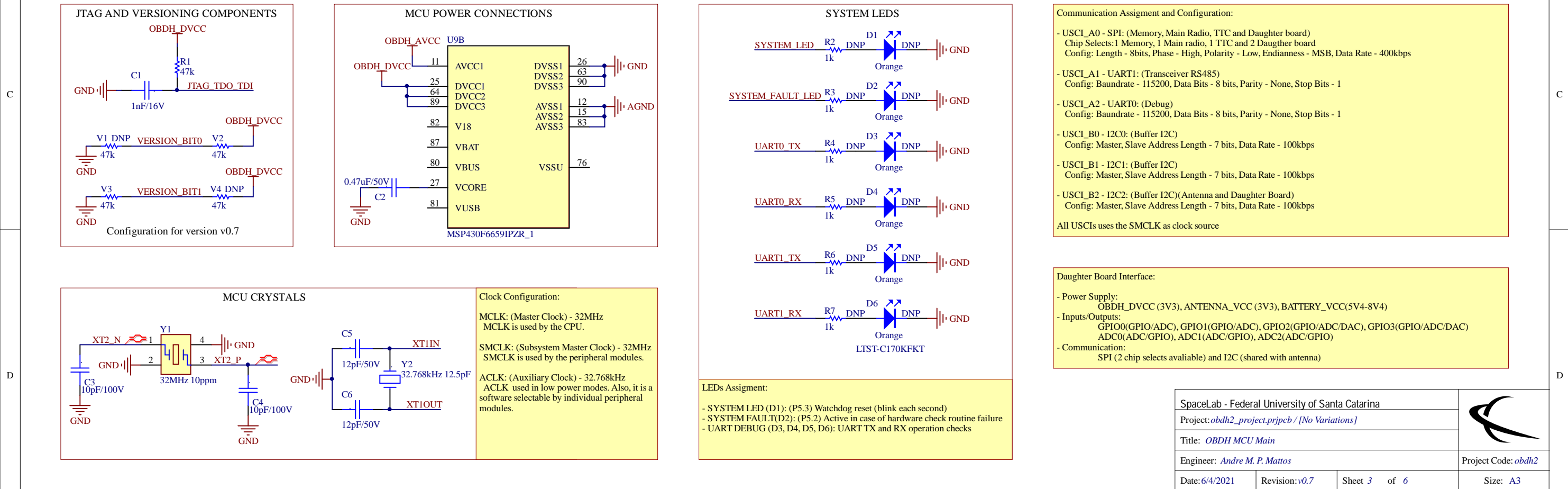
Github repository: <https://github.com/spacelab-ufsc/obdh2>
More info about SpaceLab: <https://spacelab.ufsc.br/>

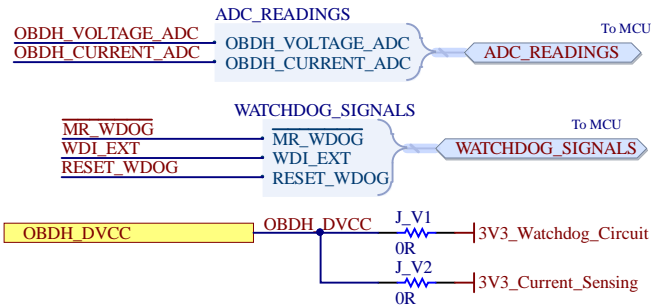
Project Information

SpaceLab - Federal University of Santa Catarina			
Project: <i>obdh2_project.pripcb</i> / [No Variations]			
Title: <i>OBDH Hardware Architecture</i>			
Designed by: <i>Andre M. P. Mattos</i>			Project Code: <i>obdh2</i>
Date: <i>6/4/2021</i>	Revision: <i>v0.7</i>	Sheet <i>0</i> of <i>6</i>	Size: <i>A4</i>

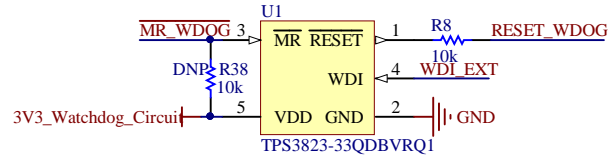








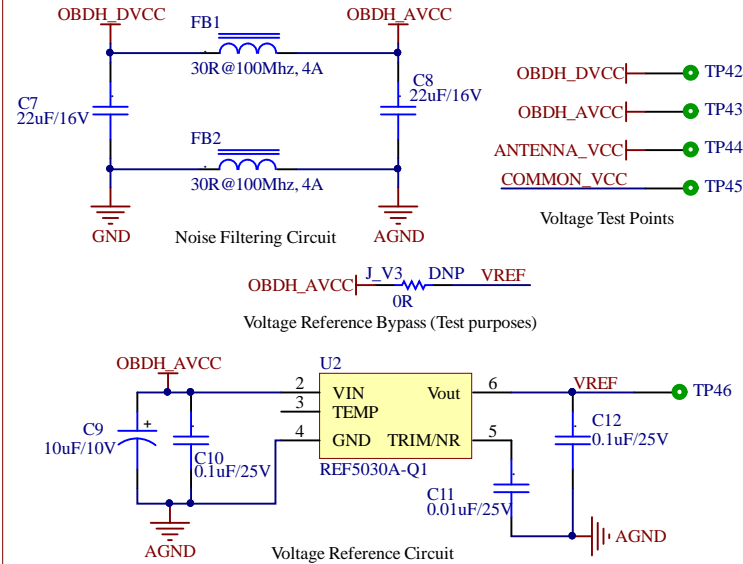
EXTERNAL VOLTAGE MONITOR WITH WATCHDOG TIMER



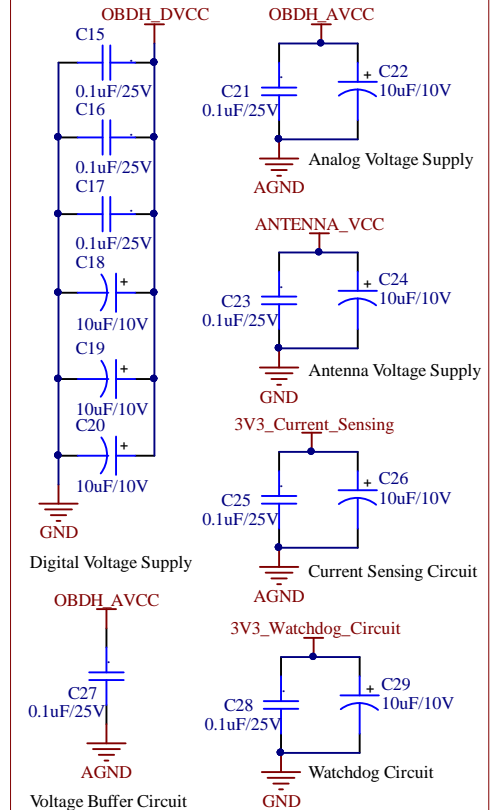
Watchdog Operation:

- MR (Manual Reset): Resets MCU. (Active low)
- RESET: Used by the JTAG interface.
- WDI (Timeout Counter): Resets case any change within 1.6 seconds (typically), both falling and rising edges.
- Resets case the voltage supply drops below 2.9V (typically).

VOLTAGE REFERENCES

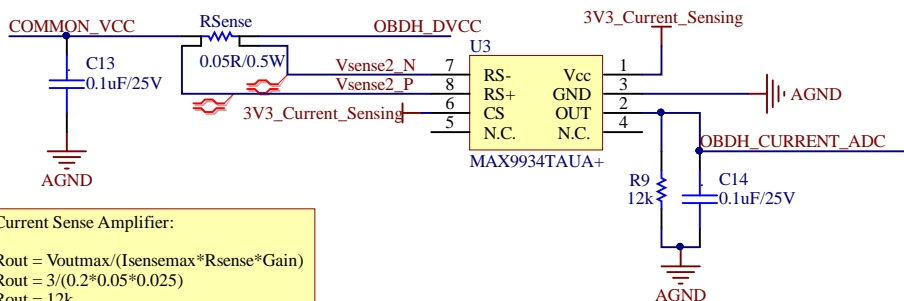


DECOUPLING CAPACITORS



INTERNAL MEASUREMENT CIRCUITS

Current Sensing Circuit



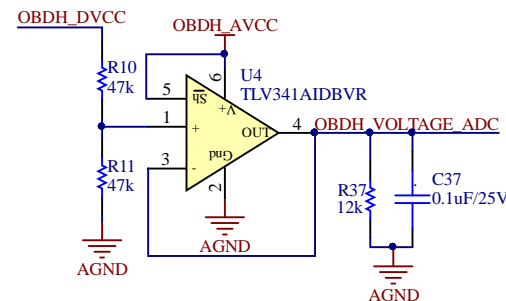
Current Sense Amplifier:

$$R_{out} = V_{outmax} / (I_{sensemax} * R_{sense} * Gain)$$

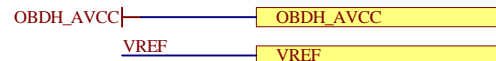
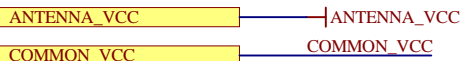
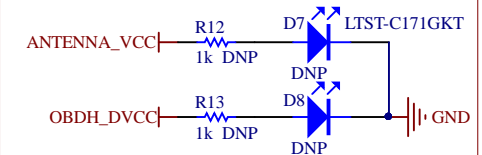
$$R_{out} = 3 / (0.2 * 0.05 * 0.025)$$

$$R_{out} = 12k$$

Voltage Buffer Circuit



LEDS SYSTEM



SpaceLab - Federal University of Santa Catarina

Project: obdh2_project.pripcb / [No Variations]

Title: Analog Circuits

Designed by: Andre M. P. Mattos

Date: 6/4/2021

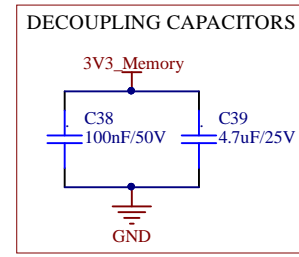
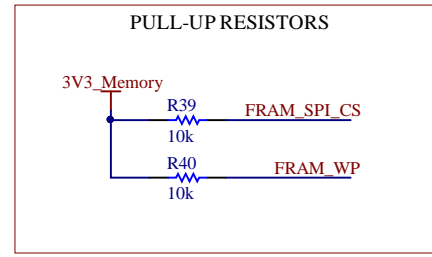
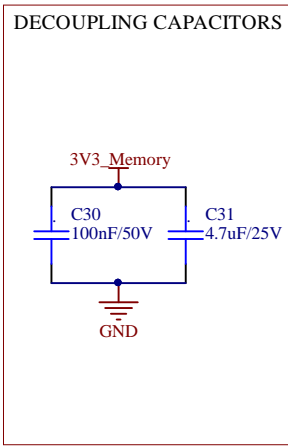
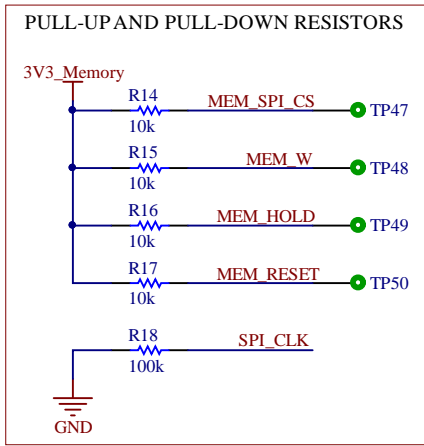
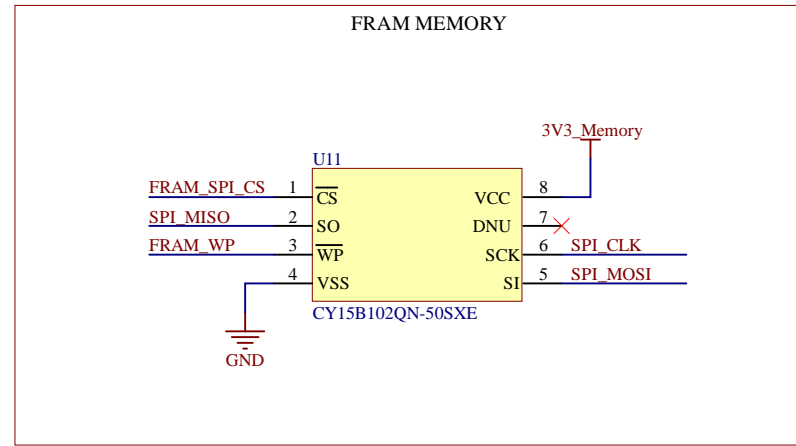
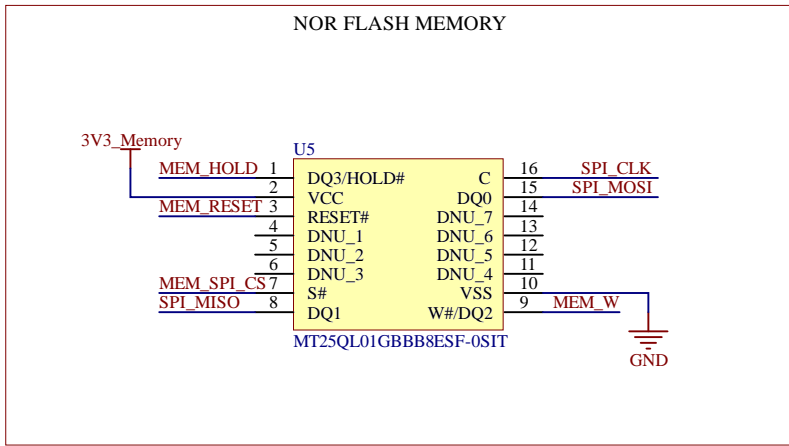
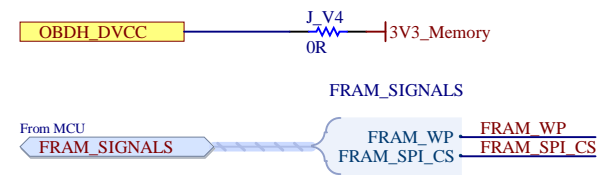
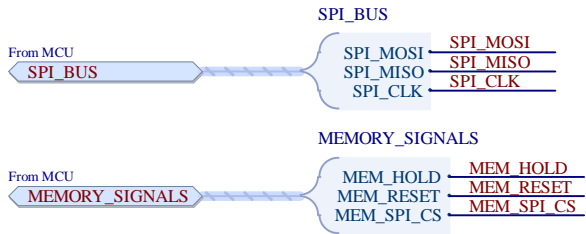
Revision: v0.7

Sheet 4 of 6

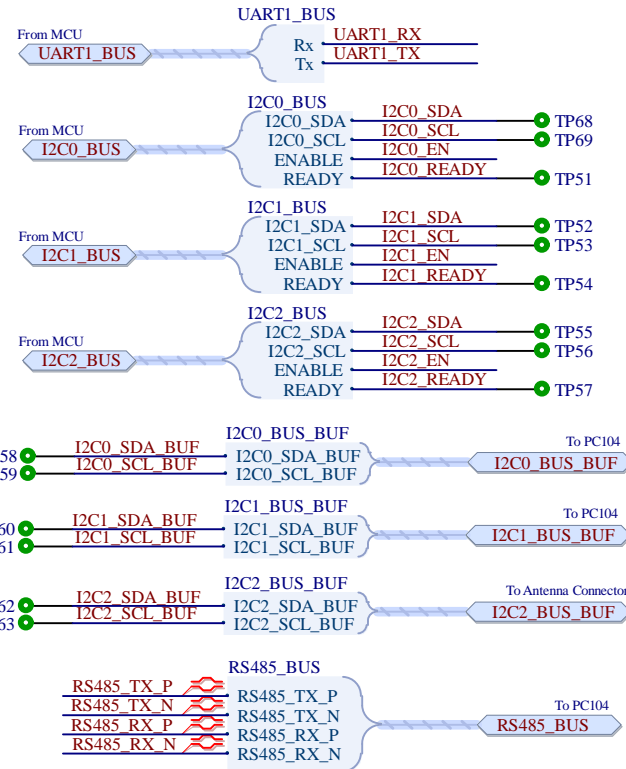
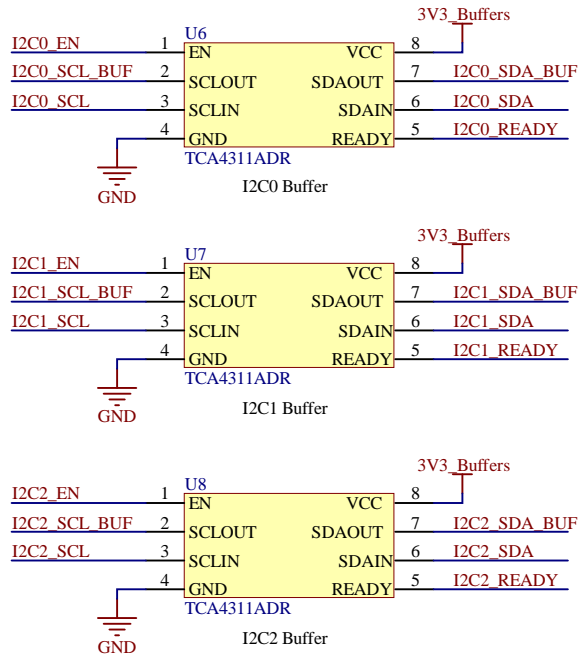
Project Code: obdh2

Size: A4

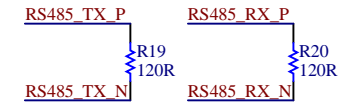




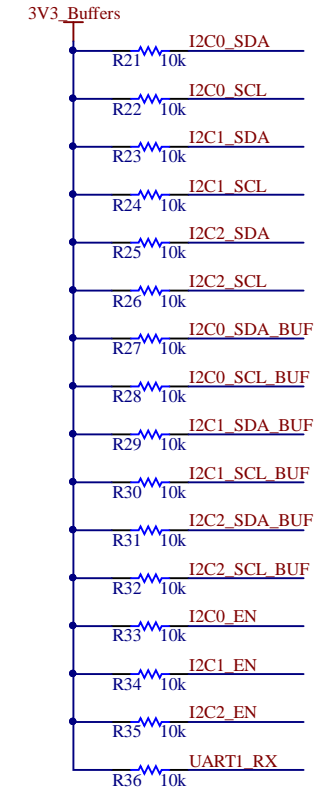
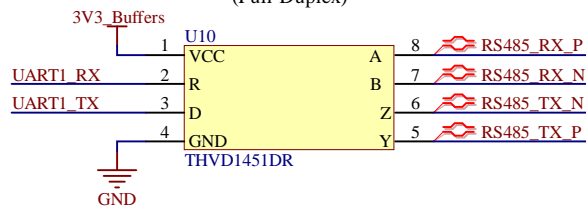
I2C BUFFERS



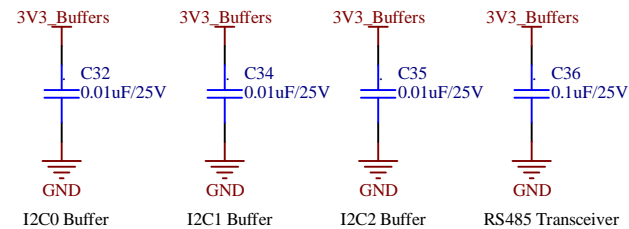
TERMINATION RESISTORS



PULL-UP RESISTORS

RS485 TRANSCEIVER
(Full-Duplex)

DECOUPLING CAPACITORS



SpaceLab - Federal University of Santa Catarina

Project: obdh2_project.pripcb / [No Variations]

Title: Communication Buffers

Designed by: Andre M. P. Mattos

Date: 6/4/2021

Revision: v0.7

Sheet 6 of 6

Project Code: obdh2

Size: A4

