

ABOUT

The Very Bad Board Schematic

SHEETS

This board is designed for a 5-year low Earth orbit mission. It is mission critical.

It consists of a microcontroller that interacts with:

- EEPROM (memory)
- PHY (ethernet transceiver)
- RS-422 transceiver
- I/O connector

The stackup is the 4-layer recommended by our fabricator. Layers:

- 1) Signal + ground fill
- 2) Power + ground fill
- 3) Ground
- 4) Signal + ground fill

This is the first revision and I'm looking for input on my physical design.
Our initial reviewer found about 35 SI/EMI issues in the design.

How many SI/EMI related issues can you find in this design? Look for things that could cause:

- Ringing in digital signals
- Crosstalk
- Electromagnetic emissions
- Noise on the power rails
- Noise on sensitive signals
- Anything else you can think of!

How would you recommend fixing these issues?

Notes:

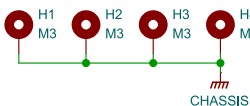
- 1) Pinouts may not be correct on the microcontroller. Pretend they're connected correctly.
- 2) Ignore any DRC warnings in KiCAD.

Power

ICs

Connectors

Chassis
Mounting
Holes



Chassis Tie



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Sheet: /
File: non-ideal.kicad_sch

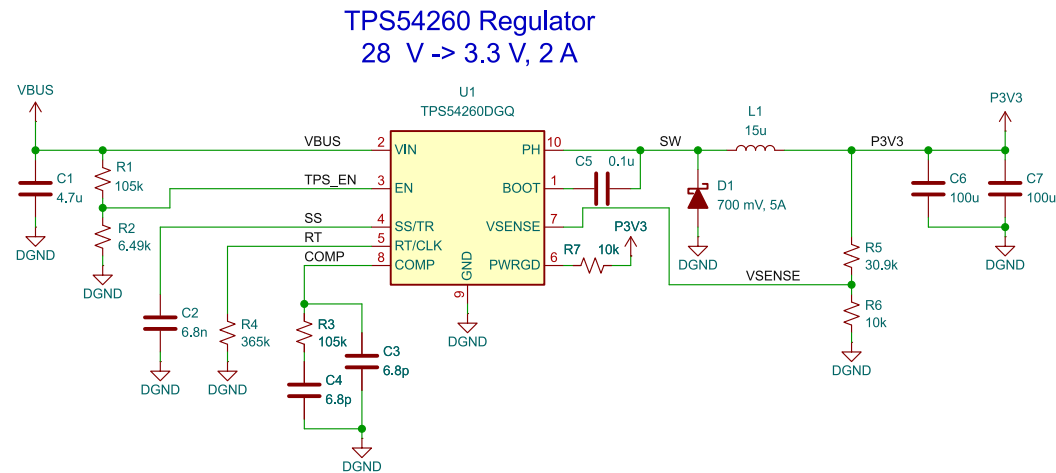
Title: **The Very Bad Board**

Size: A3 Date: 2024-11-22
KiCad E.D.A. 8.0.6

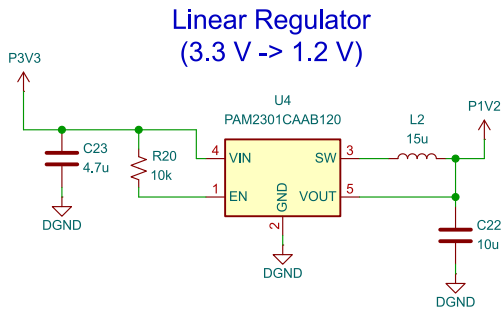
Rev: 1
Id: 1/4

POWER

3.3 V

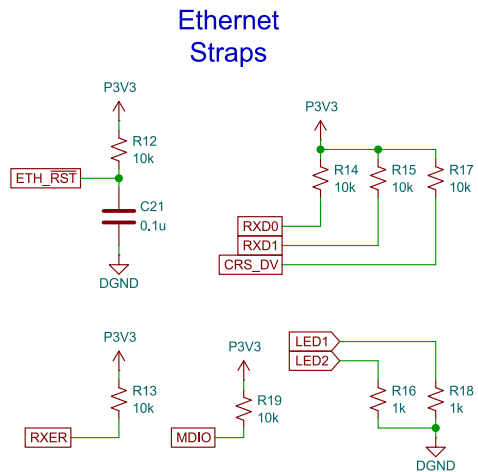
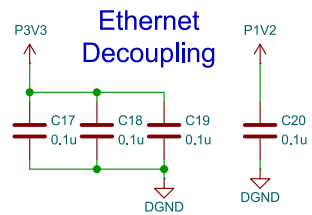
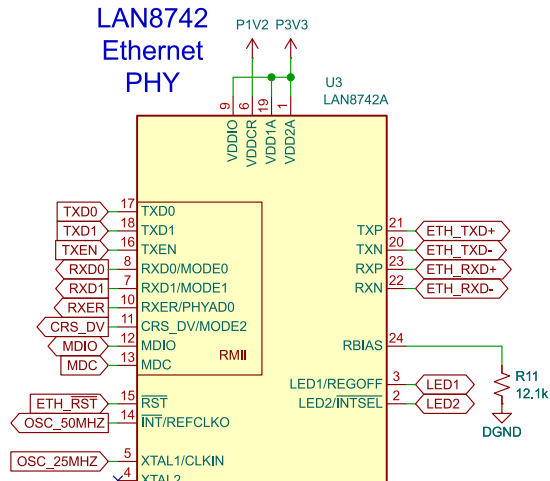
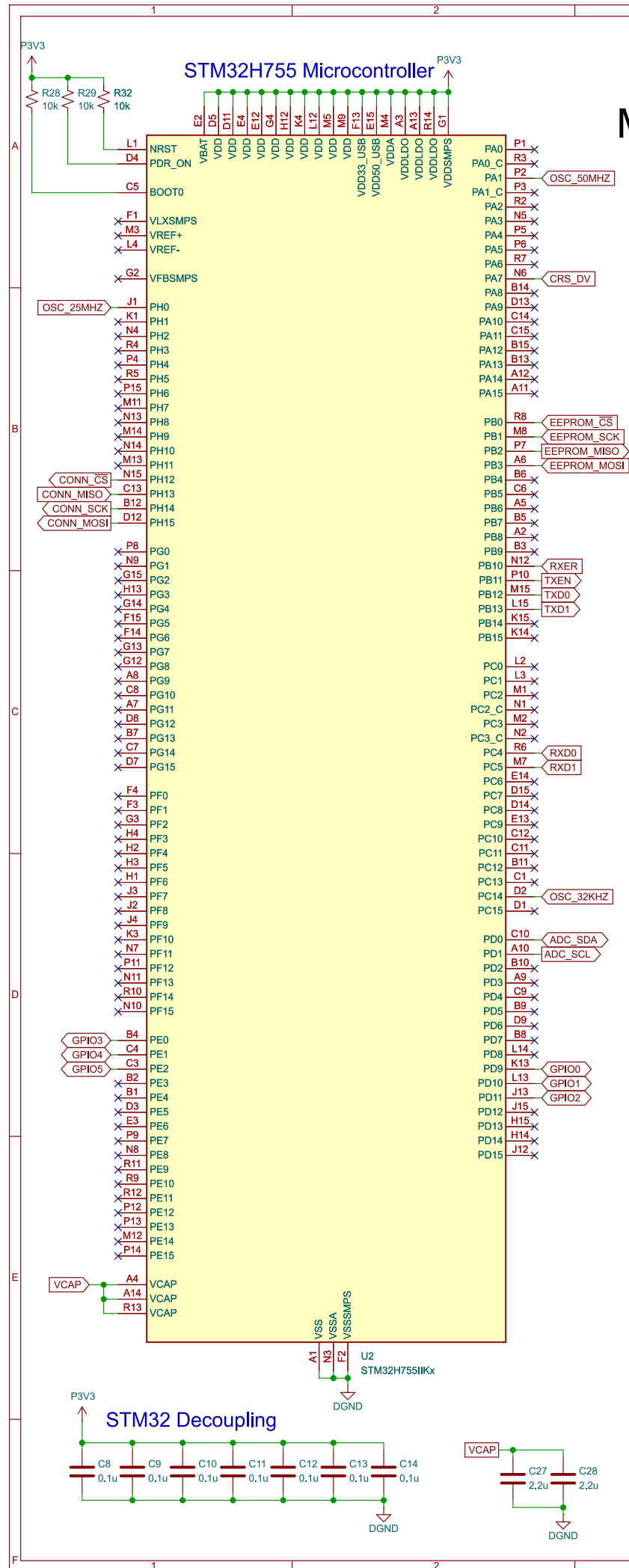


1.2 V

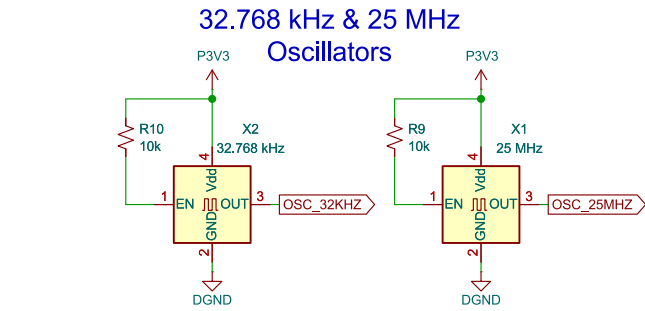


ICs

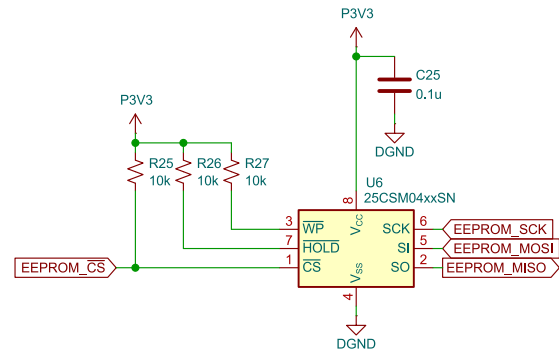
MCU Ethernet



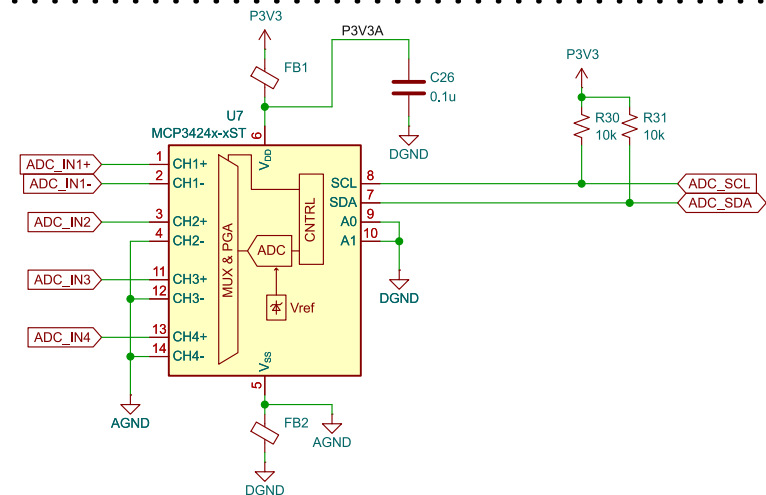
Oscillators



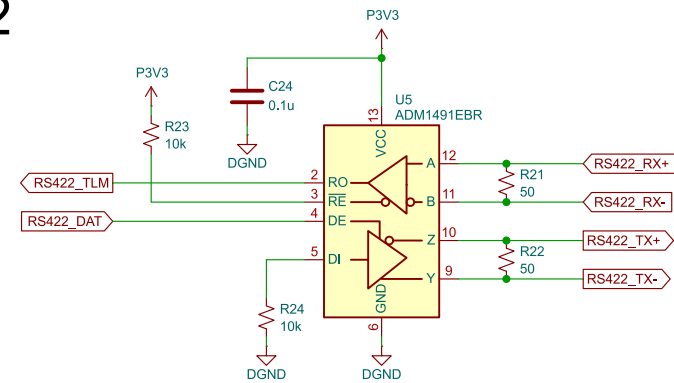
EEPROM



ADC



RS-422



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Sheet: /ICs/

File: ics.kicad_sch

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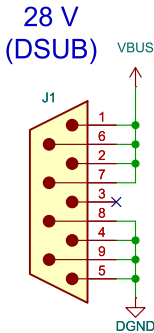
Rev: 1

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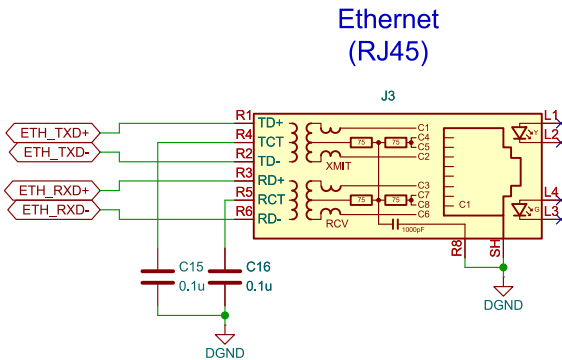
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CONNECTORS

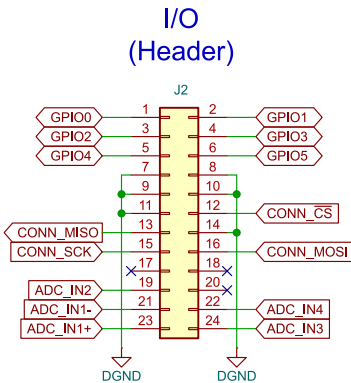
Power



Ethernet

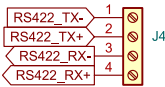


I/O



RS-422

RS-422 (Screw Terminal)



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