

Files at github.com/Gregification/BeeMS

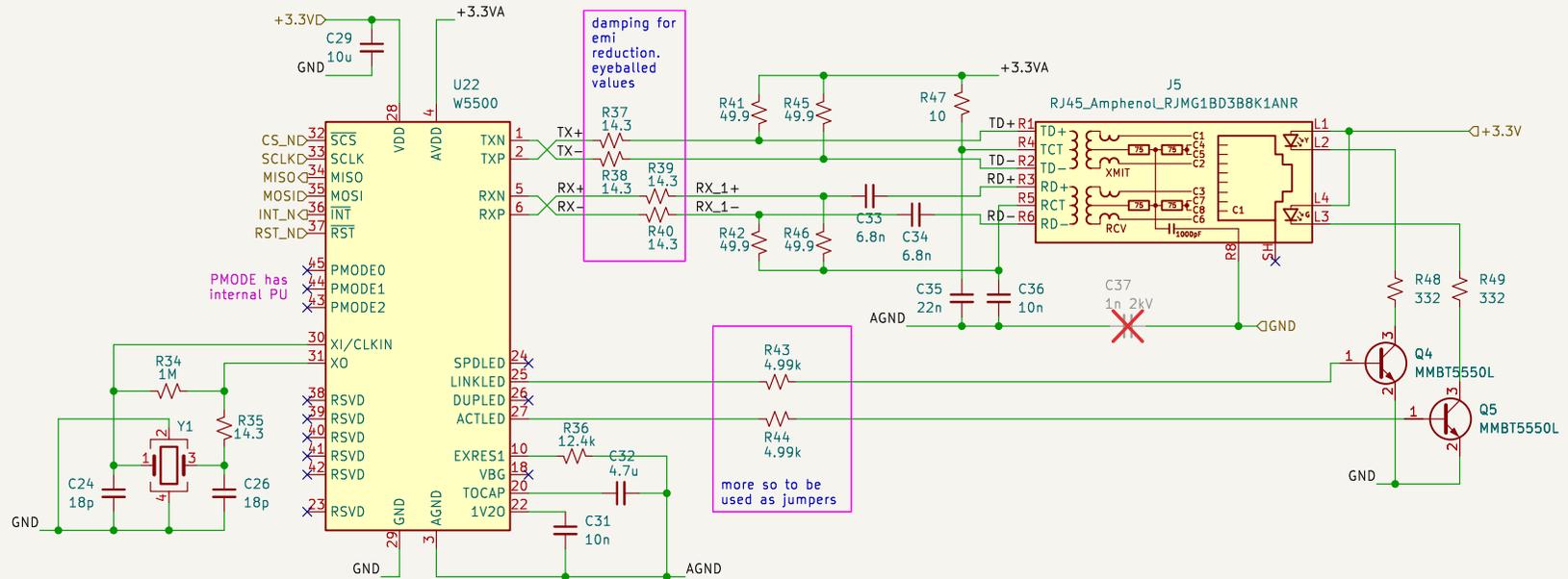
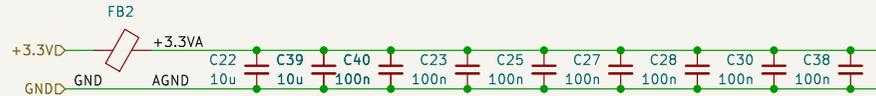
UTA Racing

Sheet: /
File: CAN_Eth_Bridge.kicad_sch

Title: BeeMS Master Board (A)

Size: A4 Date: 2026-01-08
KiCad E.D.A. 9.0.0

Rev: 1.1
Id: 0/3



damping for emi reduction. eyeballed values

more so to be used as jumpers

layout notes

- all VDD and VDD need 100nF decoupling
- official wiznet docs & examples consistently show split power planes, occasionally show split grounds.
 - joining A/D grounds should be done under the device that uses both
 - considering just separating A/D components, instead of split ground
 - "what do u call a engineer who splits a ground plane?" "a customer"
 - split ground trades a noise issue for a emi issue, emi is more acceptable for us though
 - we split in fear of the enviroment, not of other stuff on our boards
- TRX lines are differential. use differential routing
- no planes under magnetic stuff. including internal transformers of RJ45
- pin 18 (VBG) should measure as 1.2V at 25C
- pin 20 (TOCAP) cap must be especially close
- consider running ground strip on top plane along entire edge of board
 - >0.5mm sep from power plane.
 - via stich to ground plane below. - 1/10th dk wave len
 - fr4 Dk = 4, 300MHz -> 0.5m , 800MHz -> 0.1875m ; eyeballed via pitch <10mm
- note: probably irreverent for our use case, but doesnt hurt
- note: more yapping about grounding : youtu.be/vAlt6Sd9vI?t=3009
- use "replicate layout" plug in to clone layout of hierarchiat sheet

miscellaneous

- rj45 sheilding sucks. sheild goes elsewhere
- FSAE rule (updated 2026) : EV.5.2.5 Each wire used in a Tractive Battery Container, whether it is part of the GLV or Tractive System, must be rated to the maximum Tractive System voltage
- i know other teams use ethernet for segment interconnects, not sure how they get away with it.
- smallest part 0805 inch. is hand solderable
- suggest paste + heatgun oscillator on first, then iron everything else starting with w5500 and ending with rj45 jack
- "RSVD" pins can be GND to for routing ease

100Mbps	
Wizchip has reference schematics & layout docs. not always in sync, use own judgement	
BeeMS	
Sheet: /Ethernet/ File: wizard.kicad_sch	
Title: spi ethernet controller	
Size: A4	Date: 2025-12-26
KiCad E.D.A. 9.0.0	Rev: 1.0 Id: 3/3

	1	2	3	4	5	6
A						A
B						B
C						C
D						D
	1	2	3	4	5	6



Sheet: /common designs/
File: common designs.kicad_sch

Title:		Rev:
Size: A4	Date:	Id: 999/3
KiCad E.D.A. 9.0.0		