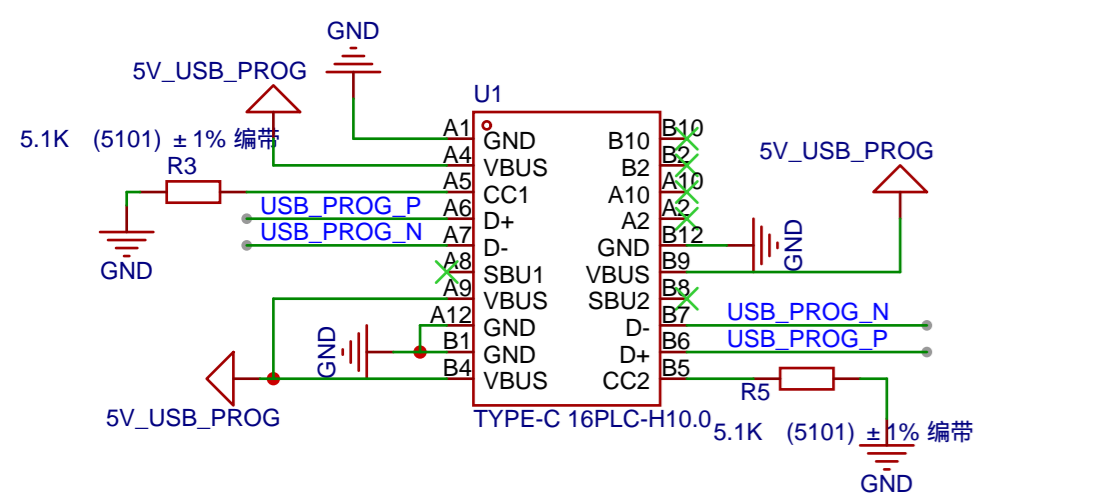
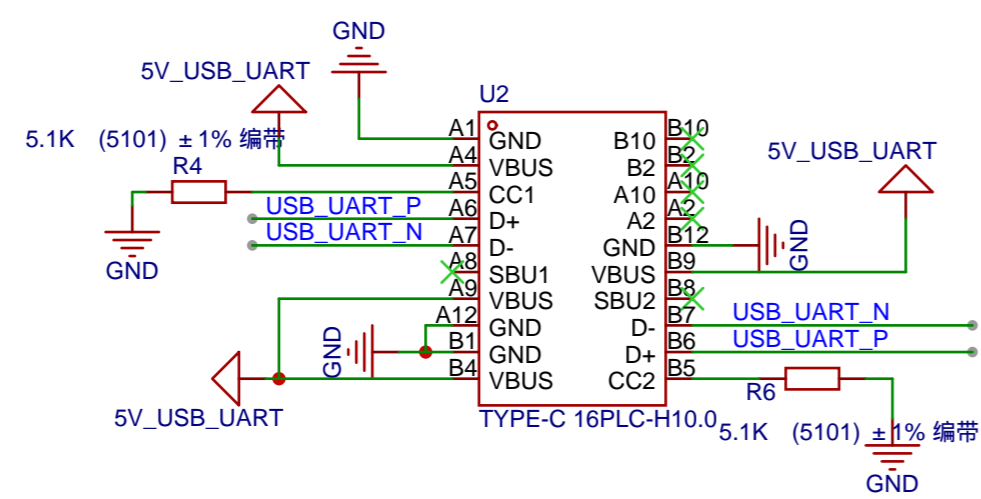


# Connectors

## USB C Prog

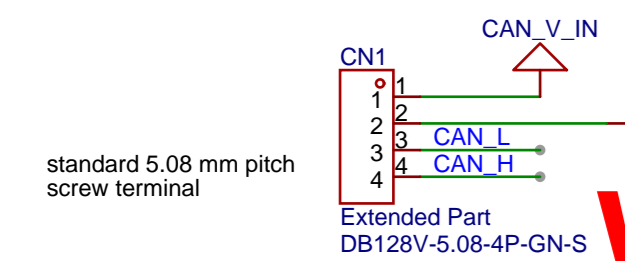


## USB C UART



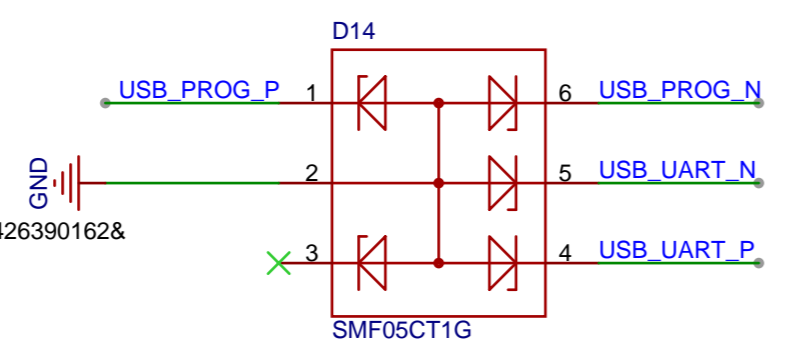
## CAN Bus / PWR In

External power supply (laying out for 5V-30V)



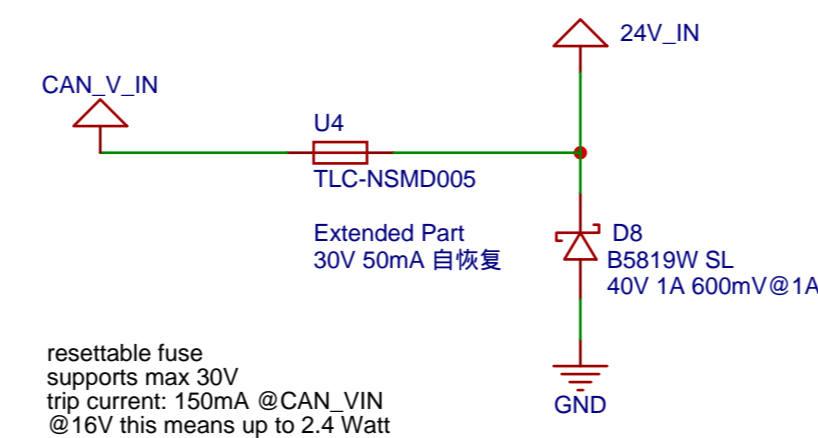
USB 2 data TVS protection

<https://www.ti.com/lit/an/siva82a/siva82a.pdf?ts=1680426390162&>

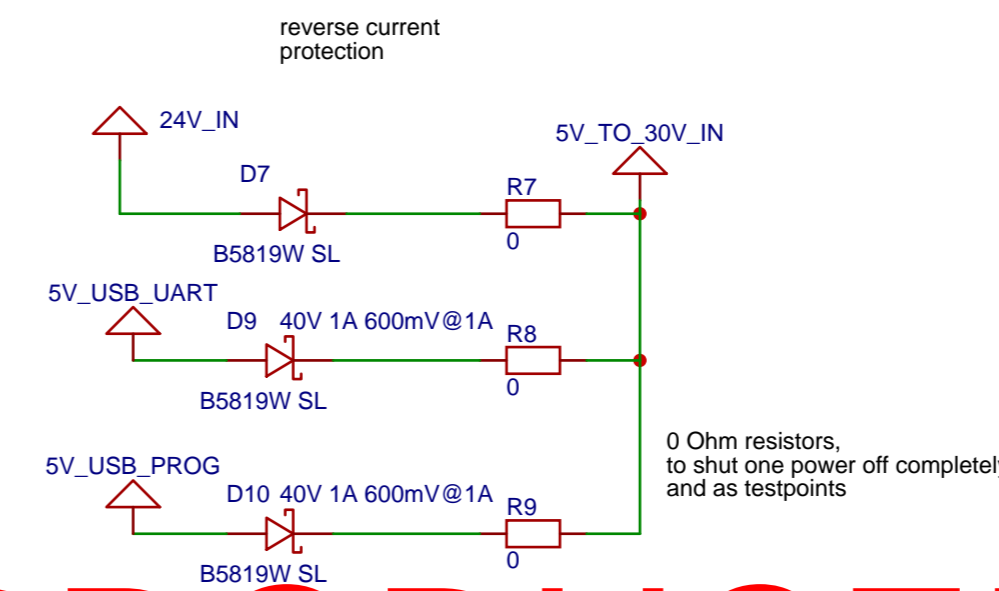


# Power Supply

CAN power: short and reverse polarity protection

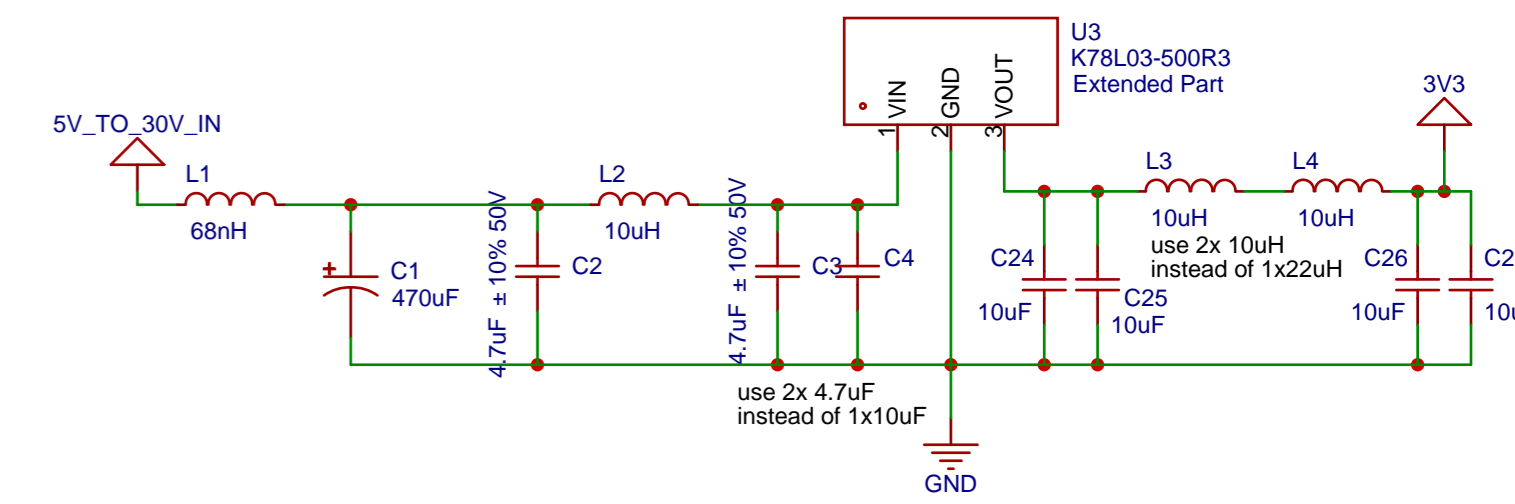


Power or-ing: USB XOR external power



4.5V-24V (30V) to 3V3

I have good experience with the Mornsun K78L03 switcher (high efficiency) including EMC compliance

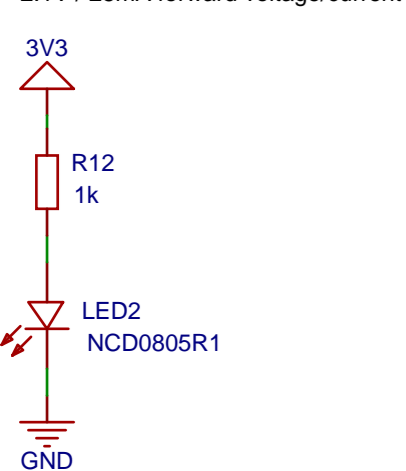


# WARNING: UNFINISHED, UNPRODUCED, UNTESTED!

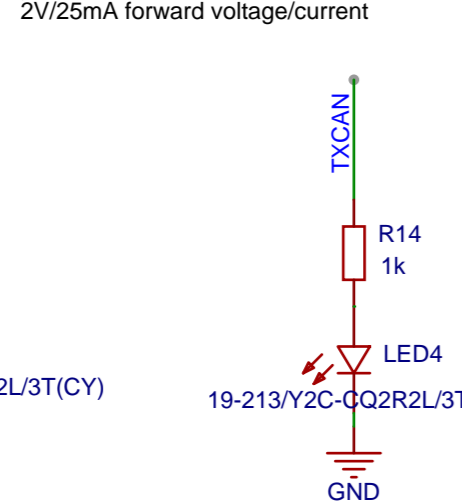
## LED

limiting LED current to 1mA, we do not want them too bright :)

red for power 2.1V / 25mA forward voltage/current



yellow for RX, TX and ESP alive indicator 2V/25mA forward voltage/current



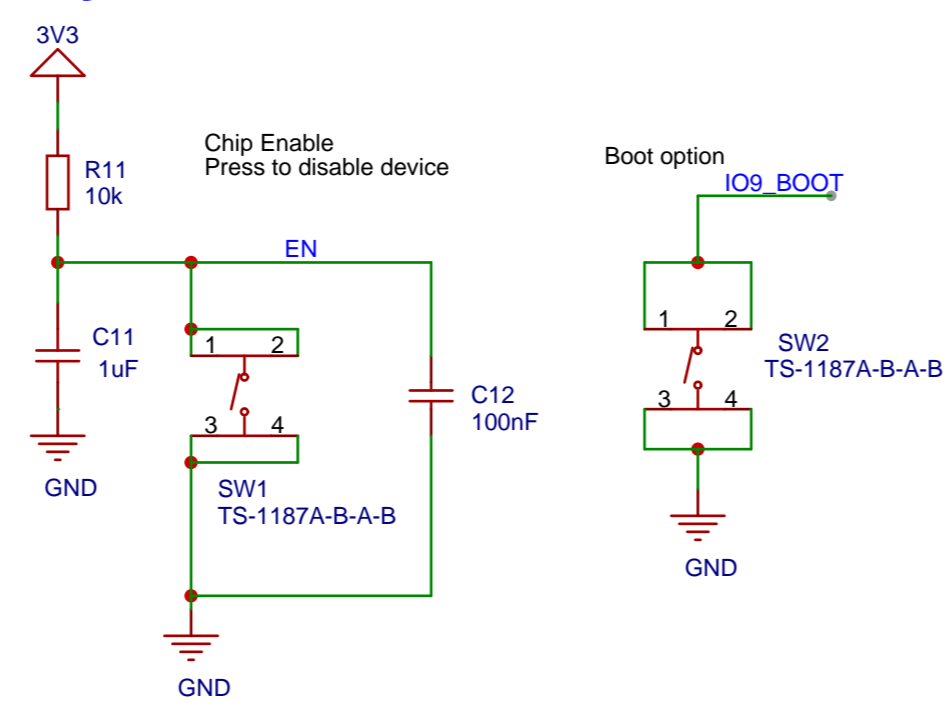
TXCAN



GPIO0\_ESP\_LED

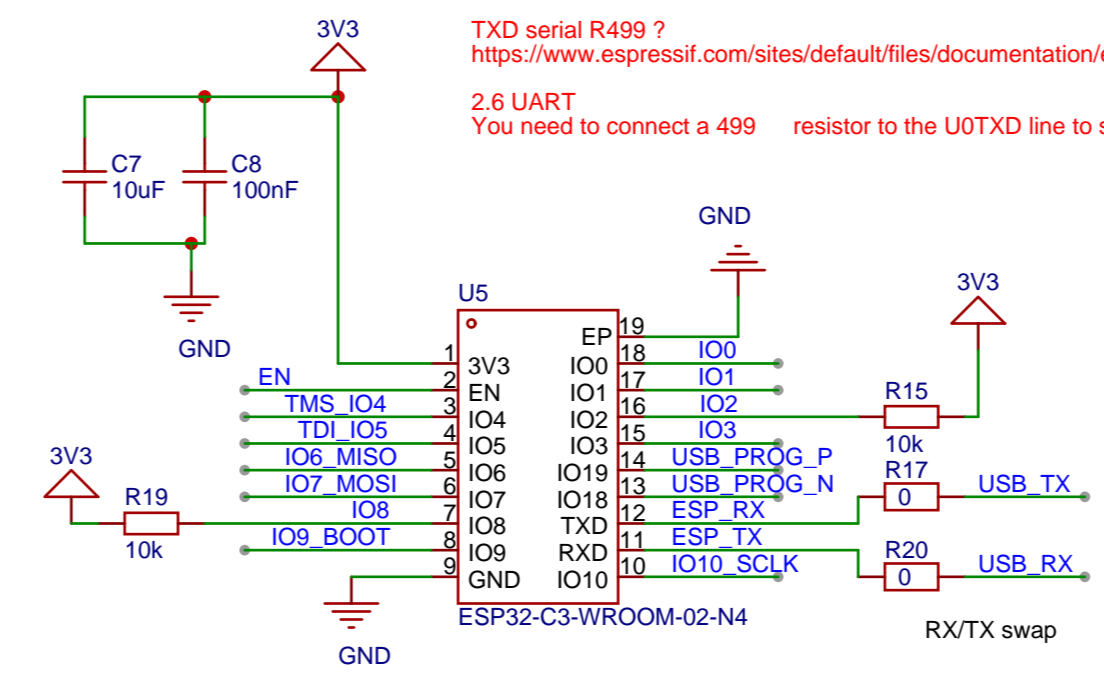


## ESP32 C3 as System on Module



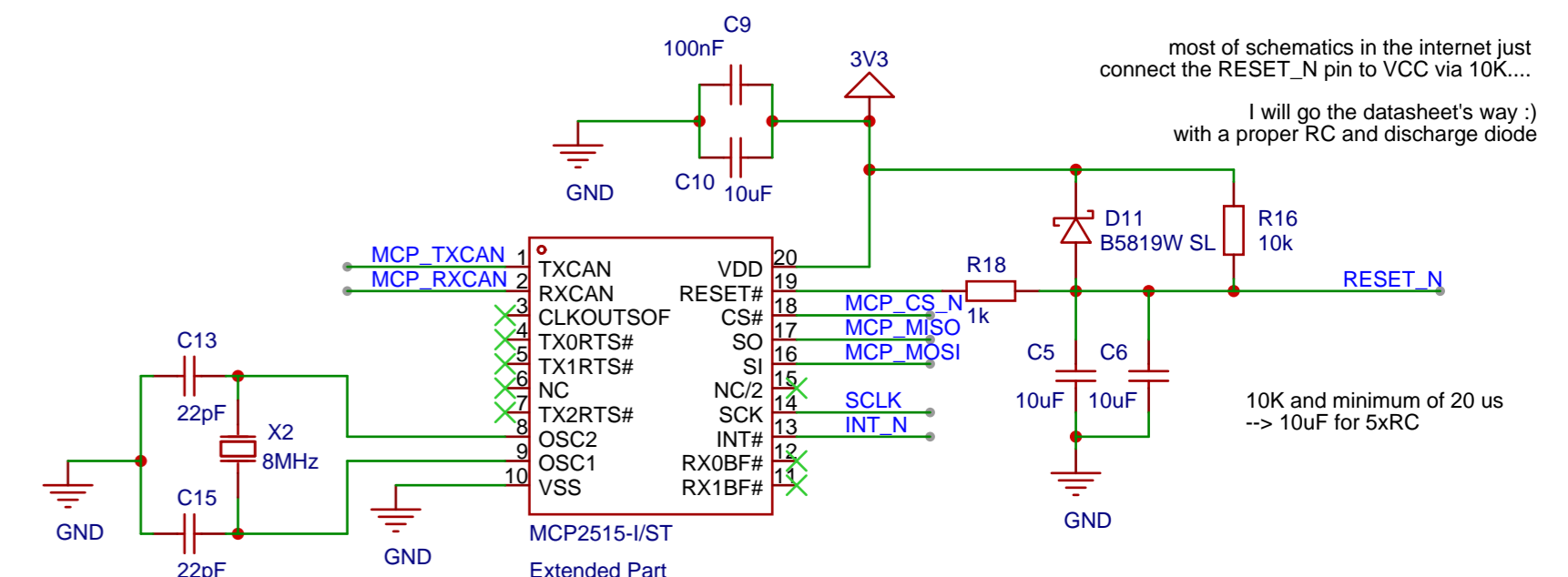
see [https://www.espressif.com/sites/default/files/documentation/esp32-c3-wroom-02\\_datasheet\\_en.pdf](https://www.espressif.com/sites/default/files/documentation/esp32-c3-wroom-02_datasheet_en.pdf)

Fig 7 Peripheral Schematics



TXD serial R499 ? [https://www.espressif.com/sites/default/files/documentation/esp32-c3\\_hardware\\_design\\_guidelines\\_en.pdf](https://www.espressif.com/sites/default/files/documentation/esp32-c3_hardware_design_guidelines_en.pdf)  
2.6 UART You need to connect a 499 resistor to the U0TXD line to suppress the 80 MHz harmonics.

## CAN Controller

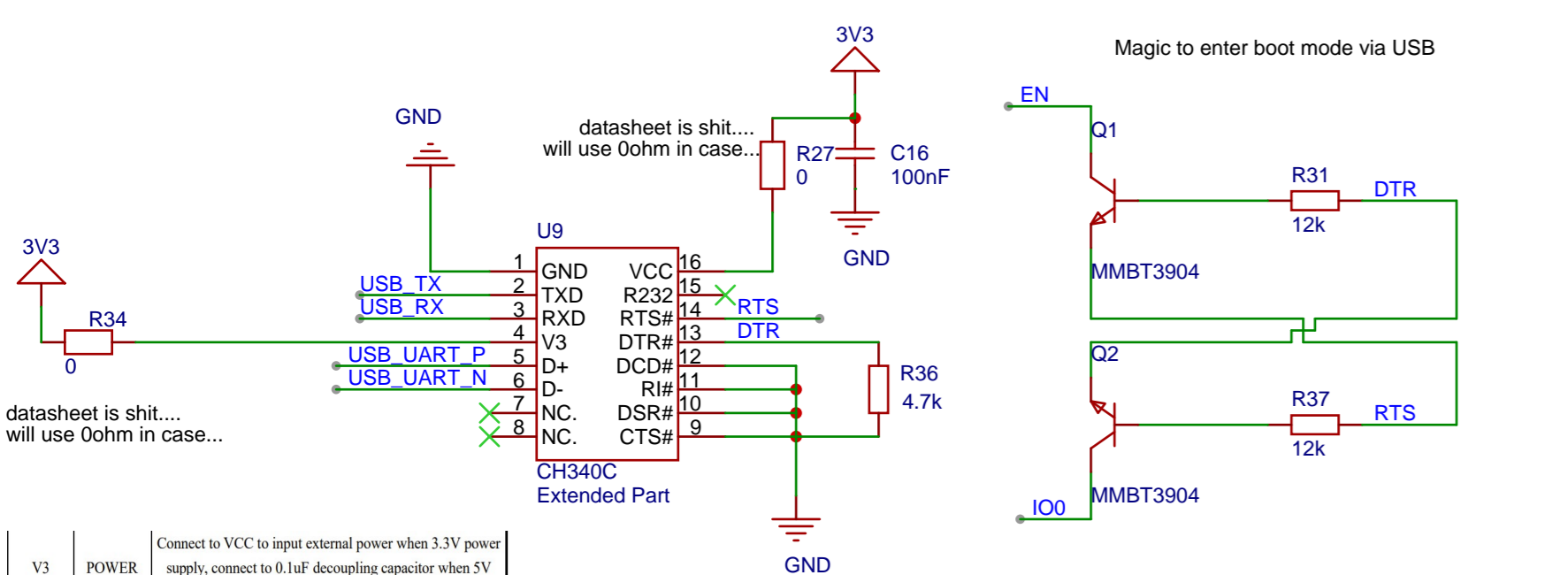


most of schematics in the internet just connect the RESET\_N pin to VCC via 10k...

I will go the datasheet's way ;) with a proper RC and discharge diode

10K and minimum of 20 us -> 10uF for 5xRC

## USB to UART (backup if native USB fails)

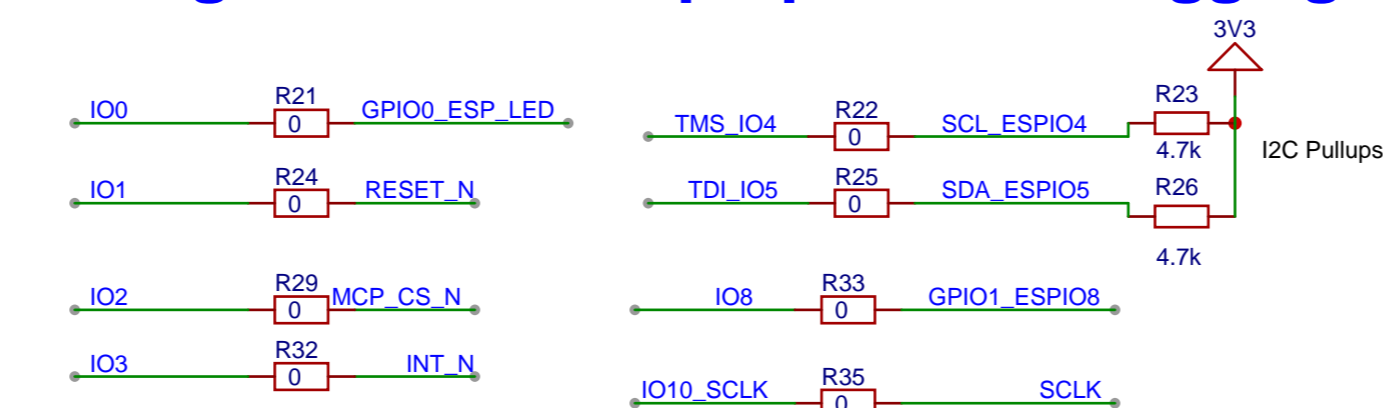


datasheet is shit... will use 0ohm in case...

datasheet is shit... will use 0ohm in case...

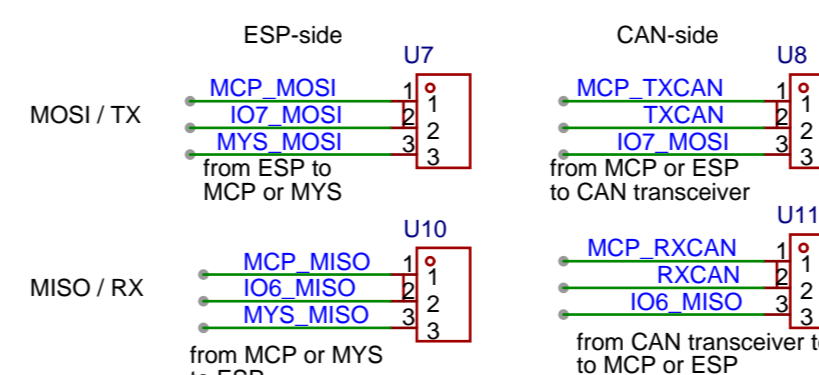
The DTR# pin of CH340 is used as a configuration input pin before the USB configuration is complete. An external 4.7k pull-down resistor can be connected with this pin to generate default low level during USB enumeration, apply larger supply current to the USB bus via the configuration descriptor.

## Configuration / multi purpose / Debugging

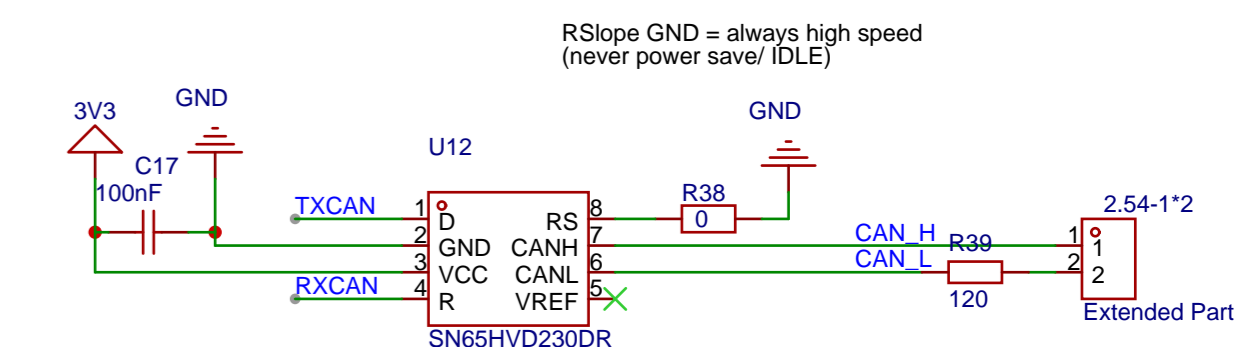


3-way Solderbriges to route MISO / MOSI to MCP, directly to CAN or to the Mys connector.

generates ugly stubs, but the CAN is driven very slowly...



## 3V3 CAN transceiver



RSlope GND = always high speed (never power save/ IDLE)

optional 120 Ohm termination via Jumper.

Only required, if the bus is not terminated, yet on BOTH sides.

Leave open, if this device is added to an existing system.

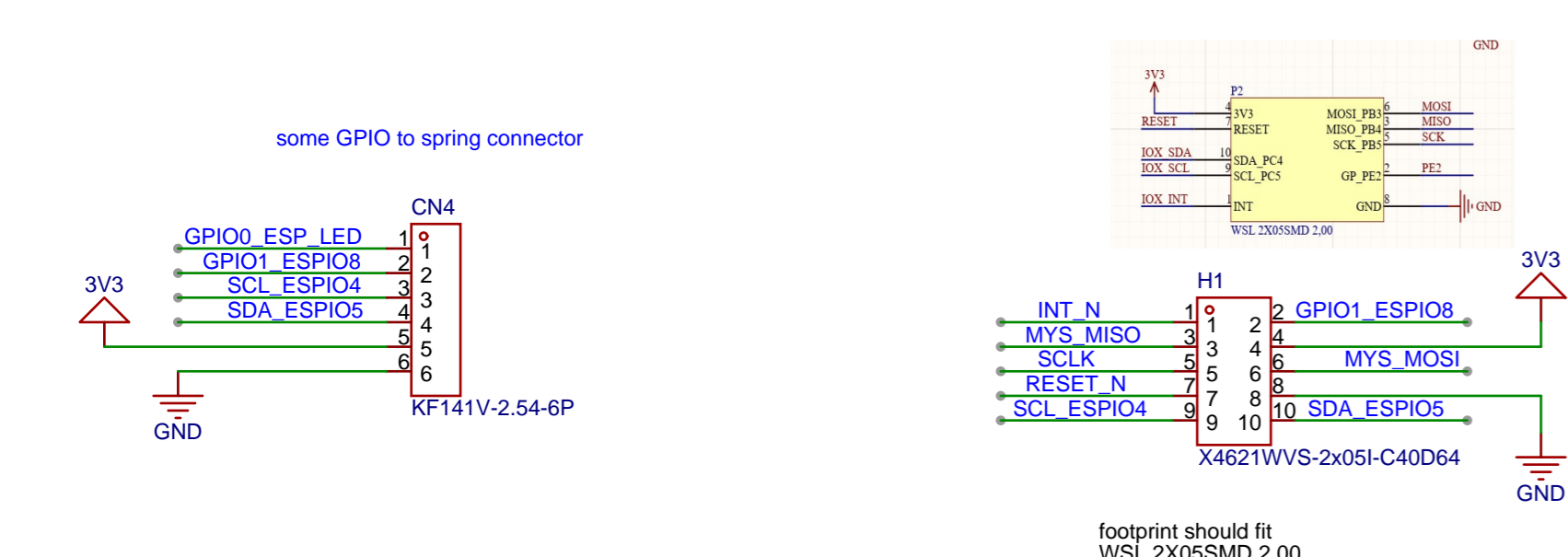
The CAN Bus of my Tecalor TTF 07 cool heatpump operates at 5V.

Fortunately, CAN supports a mixed 3V3 and 5V operation: <https://www.analog.com/en/technical-articles/can-bus-transceivers-operate-from-33v-or-5v-and-withstand-60v-faults.html> (Analog.com is a well-established manufacturer. They know what they are publishing!)

-> This means we can use a 3V3 transceiver and can be on the same 3V3 power rail as the ESP. No need to go to 5V

## Unrelated to CAN for testing and multi purpose

2x5 pol 2mm MySensors wired connector (want to re-use the board for other projects)

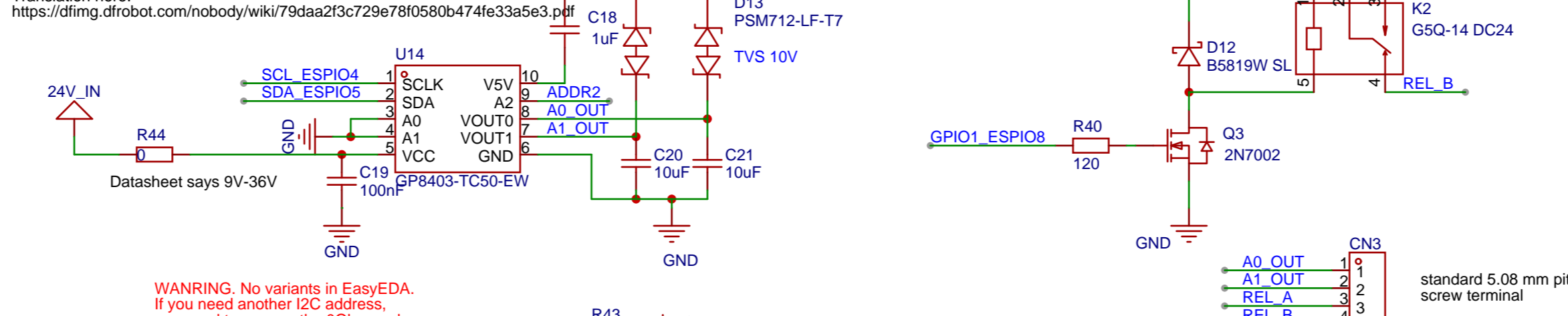


## Unrelated to CAN control ventilation (TVZ 170 e plus) via 2x 0..10V analog out and 1 potential free bypass relay

inspired by <https://www.drobot.com/product-2613.html>

datasheet is very unreadable.

Translation here: <https://dfimg.drobot.com/nobody/wiki/79daa2f3c729e78f0580b474fe33a5e3.pdf>



WARNING: No variants in EasyEDA. If you need another I2C address, you need to remove the 0Ohm and solder a wire to 3V3

Schematic	Schematic1	Update Date	2023-04-06
Page		Create Date	2023-03-07
Drawn	Martin Kaiser	Part Number	
Reviewed	-	ESP32_CAN	
VER	V0.2	SIZE	A2
		PAGE	1 OF 1
EasyEDA			