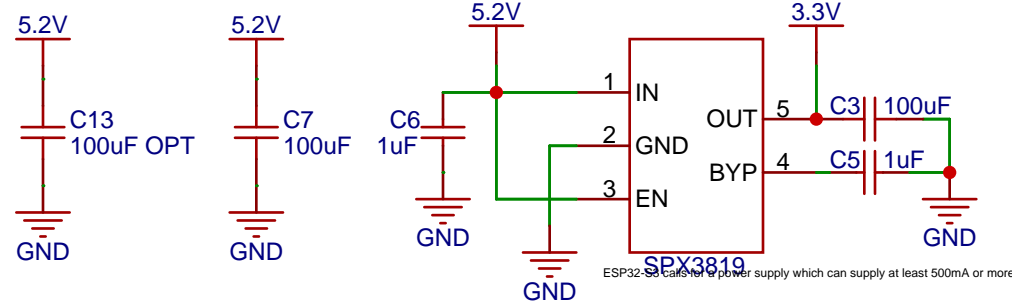
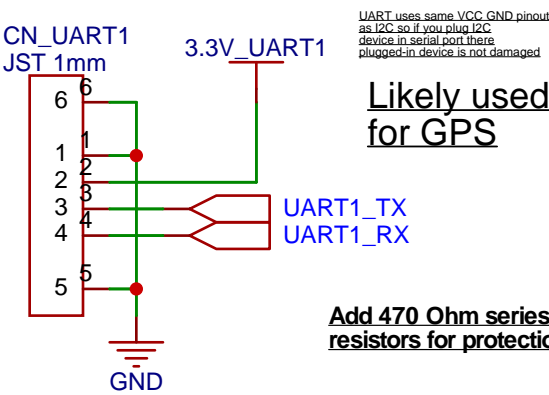


TODO: use DC-DC converter for 3.3V rail
Use TI IC TLV62569DBV

Do not input external 3.3V or you'd compete with the regulator



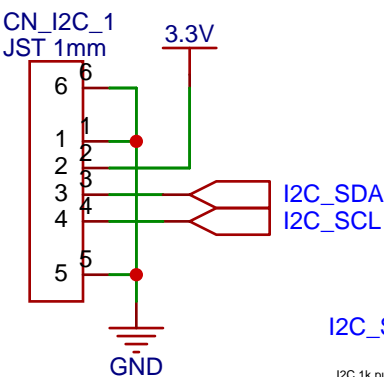
Can add electrolytic caps using 5.2V and GND pads, and 3.3V and GND pads



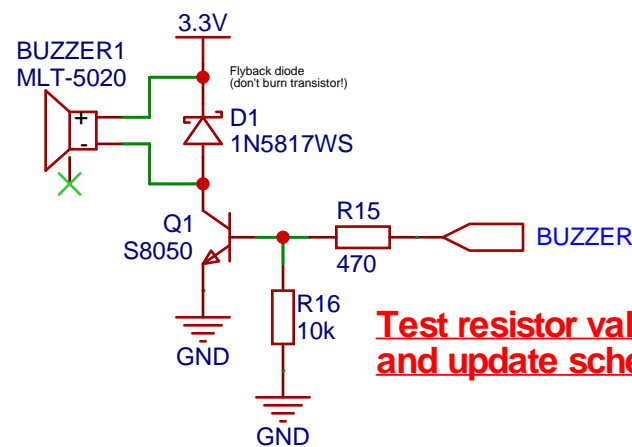
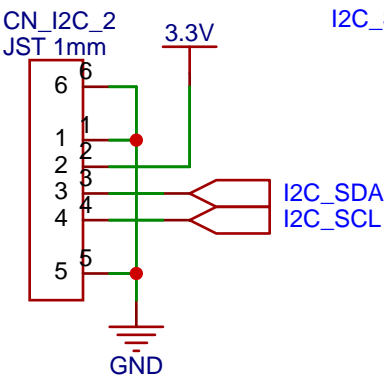
UART uses same VCC GND pinout as I2C so if you plug I2C device in serial port there plugged-in device is not damaged

Likely used for GPS

Add 470 Ohm series resistors for protection?

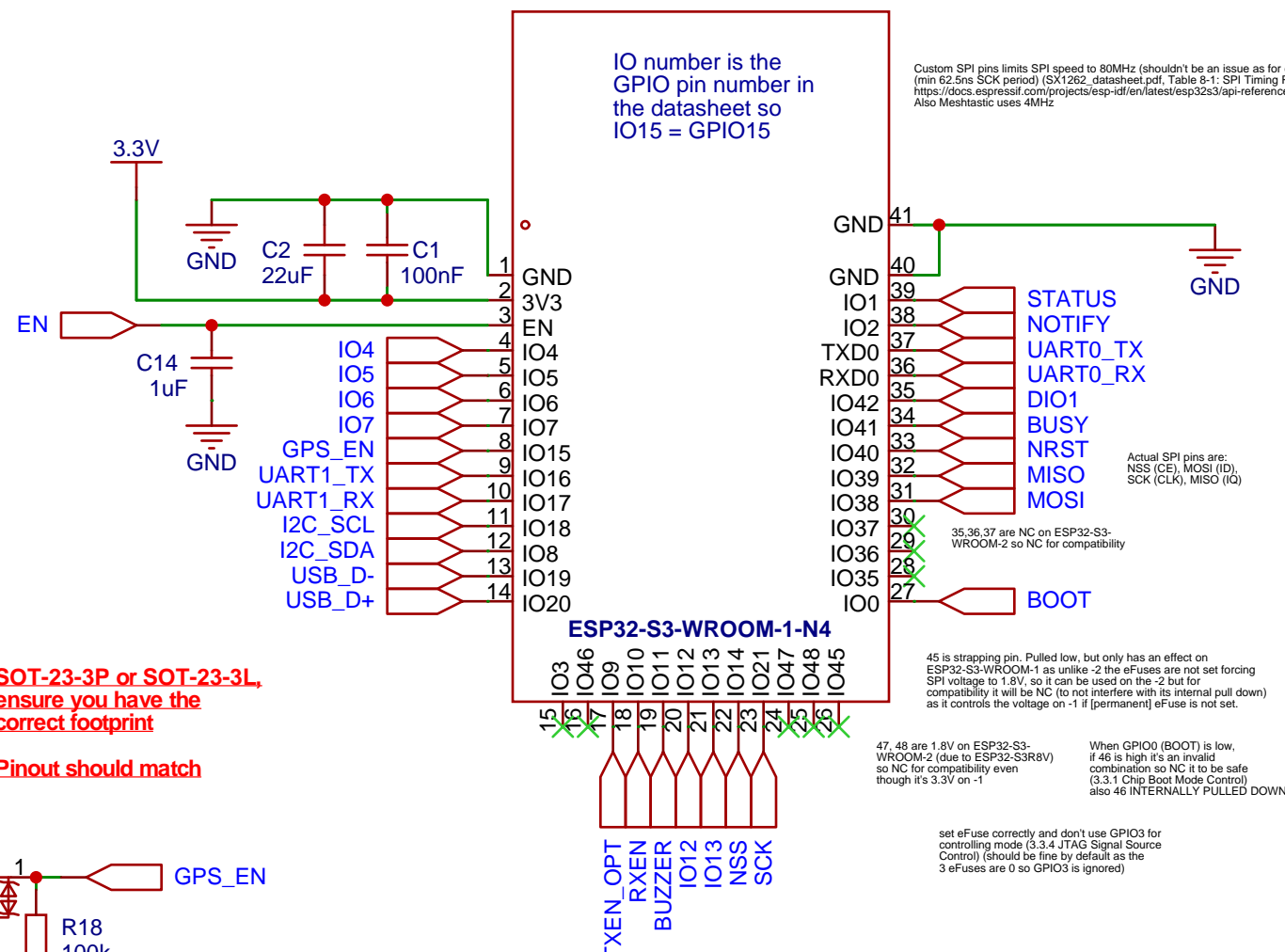


I2C 1k pullup resistor value is an educated estimate



Test resistor values and update schematic

Can use PCB antenna or '-U' clip-on antenna version, same pad footprint



IO number is the GPIO pin number in the datasheet so IO15 = GPIO15

Custom SPI pins limits SPI speed to 80MHz (shouldn't be an issue as for example the SX1262 is max 16MHz (min 62.5ns SCK period) (SX1262_datasheet.pdf, Table 8-1: SPI Timing Requirements, I3))
https://docs.espressif.com/projects/esp-idf/en/latest/esp32s3/api-reference/peripherals/spi_master.html#gpio-matrix-and-io-mux
Also Meshastic uses 4MHz

Actual SPI pins are: NSS (CE), MOSI (IO), SCK (CLK), MISO (IO2)

35,36,37 are NC on ESP32-S3-WROOM-2 so NC for compatibility

45 is strapping pin. Pulled low, but only has an effect on ESP32-S3-WROOM-1 as unlike -2 the eFuses are not set forcing SPI voltage to 1.8V, so it can be used on the -2 but for compatibility it will be NC (to not interfere with its internal pull down) as it controls the voltage on -1 if [permanent] eFuse is not set.

When GPIO0 (BOOT) is low, if 46 is high it's an invalid combination so NC it to be safe (3.3V Chip Boot Mode Control) also 46 INTERNALLY PULLED DOWN

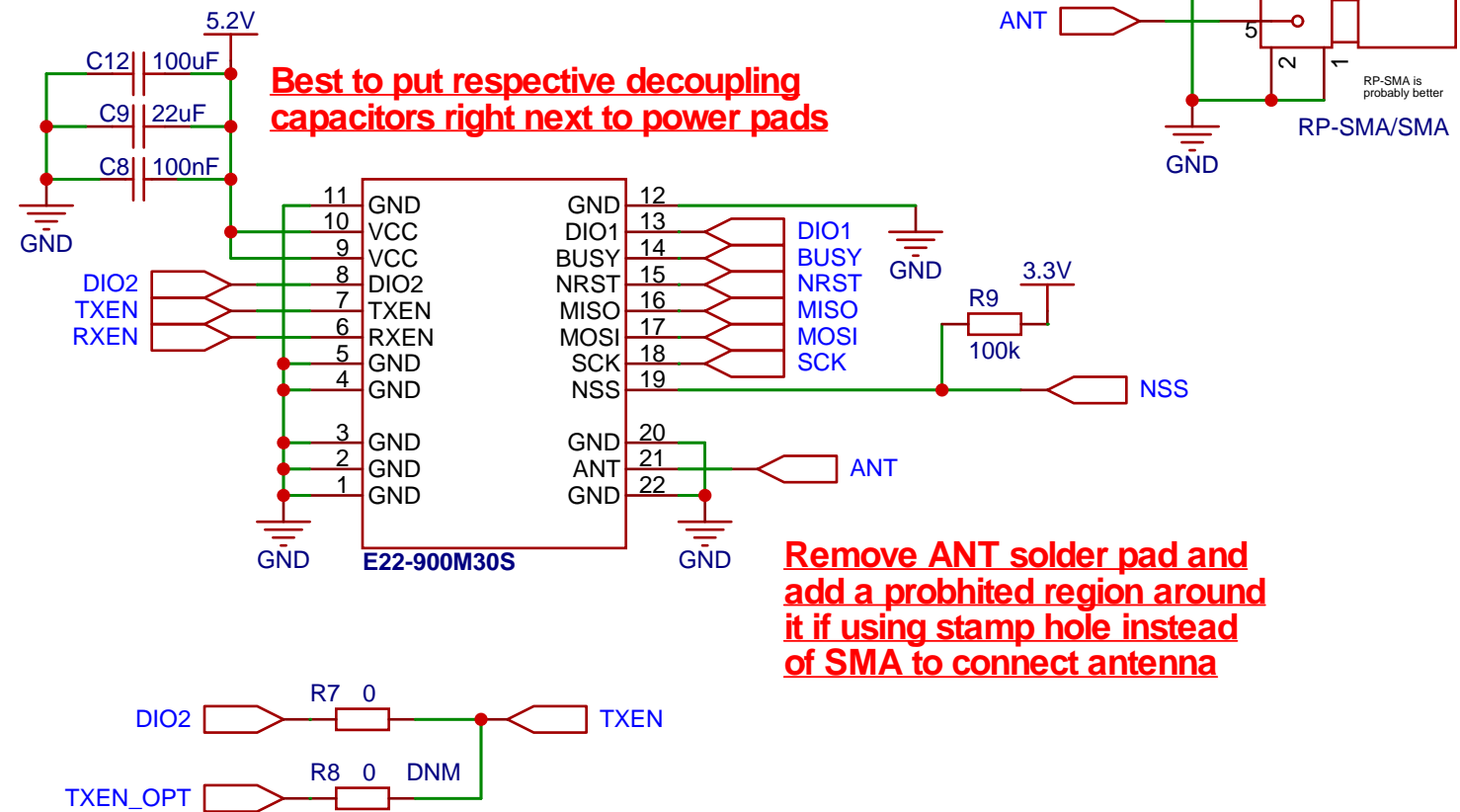
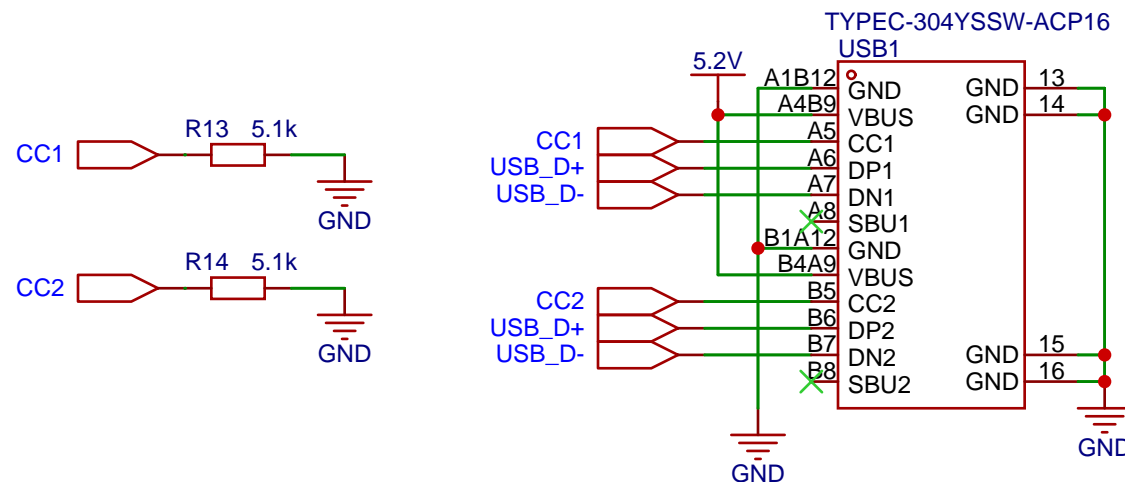
set eFuse correctly and don't use GPIO3 for controlling mode (3.3.4 JTAG Signal Source Control) (should be fine by default as the 3 eFuses are 0 so GPIO3 is ignored)

Table 8-1. BOOT is internally pulled up but in testing the value is too high, approx. 2.5 MOhms so we need to pull it up some more

MAX809T used to ensure the MCU is always turned on / reset when power is connected/reconnected

Leave enough space under buttons to comfortably press with fingers from below in the orientation the board is held

TODO?: Add ESD protection for USB?



Best to put respective decoupling capacitors right next to power pads

Remove ANT solder pad and add a prohibited region around it if using stamp hole instead of SMA to connect antenna

Choose one or the other!
See ALL available options in variant.h