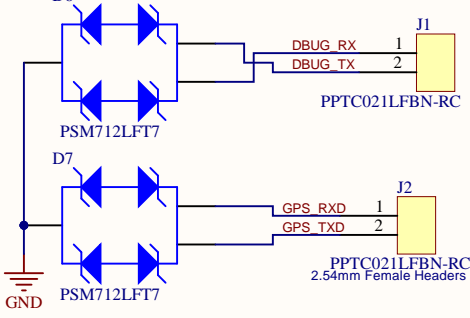
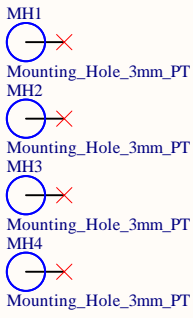


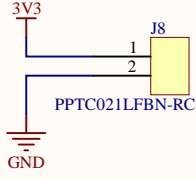
Serial Debug Headers



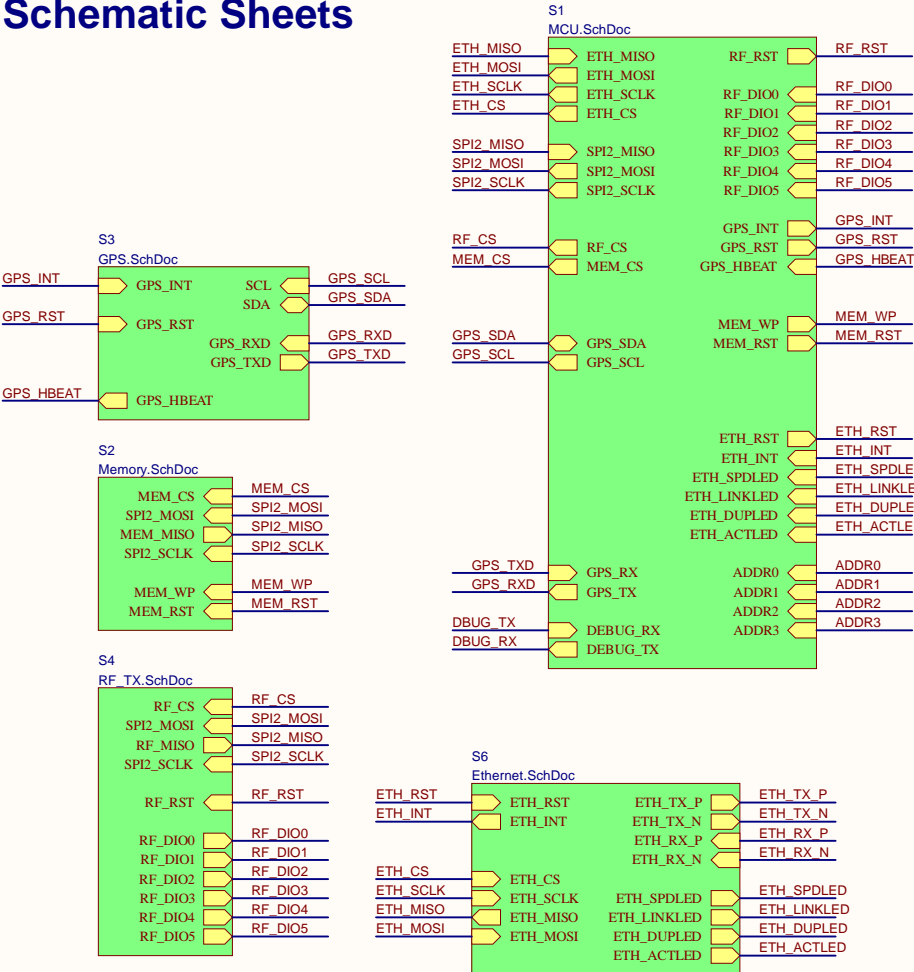
Mouting Holes



Voltage Headers

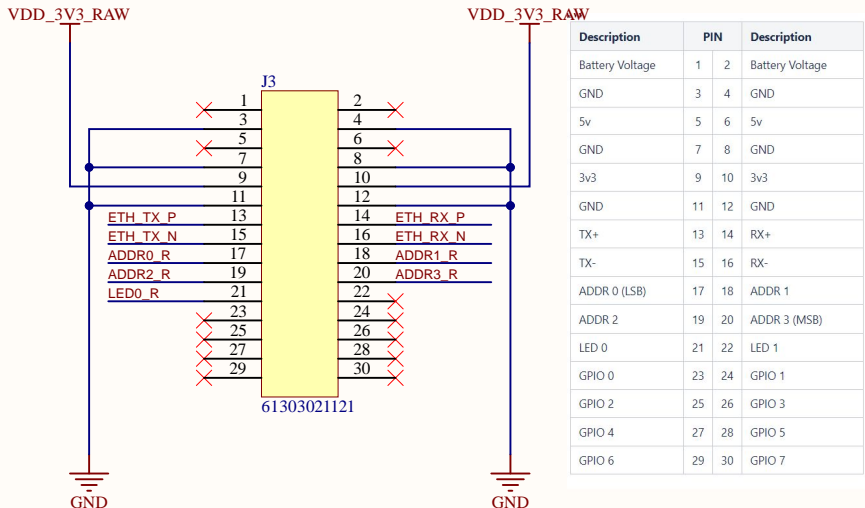


Schematic Sheets



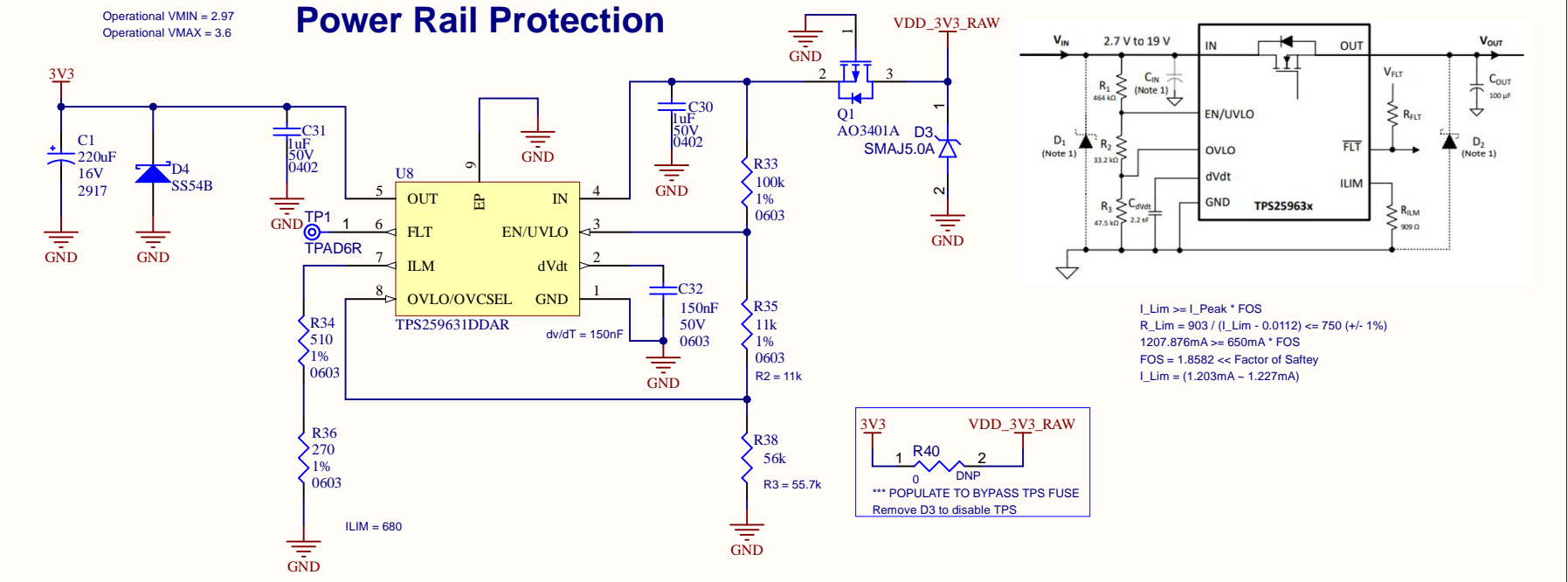
Peak Current Calculation  
GPS - 50mA  
Memory - 25mA  
RF\_TX - 120mA  
Ethernet - 150mA  
MCU - 260mA  
  
Total: 605mA

Backplane Connector

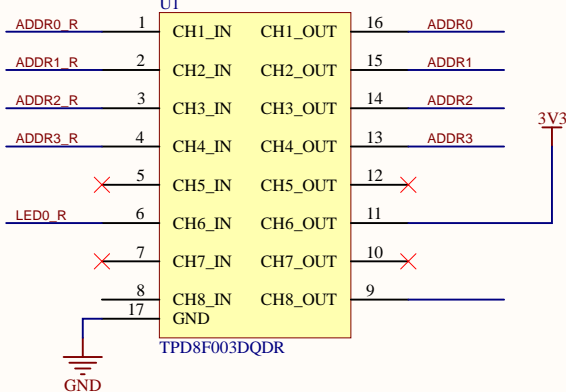


Description	PIN	Description
Battery Voltage	1 2	Battery Voltage
GND	3 4	GND
5v	5 6	5v
GND	7 8	GND
3v3	9 10	3v3
GND	11 12	GND
TX+	13 14	RX+
TX-	15 16	RX-
ADDR 0 (LSB)	17 18	ADDR 1
ADDR 2	19 20	ADDR 3 (MSB)
LED 0	21 22	LED 1
GPIO 0	23 24	GPIO 1
GPIO 2	25 26	GPIO 3
GPIO 4	27 28	GPIO 5
GPIO 6	29 30	GPIO 7

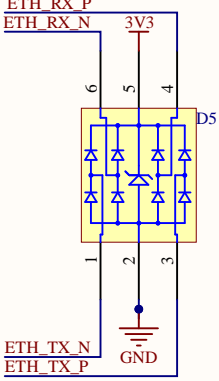
Power Rail Protection

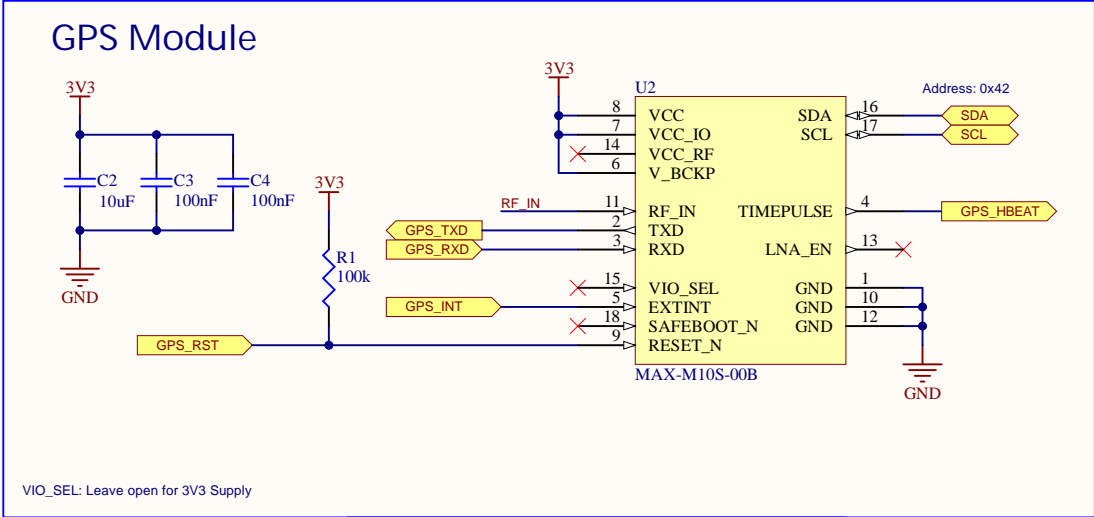


Backplane ESD



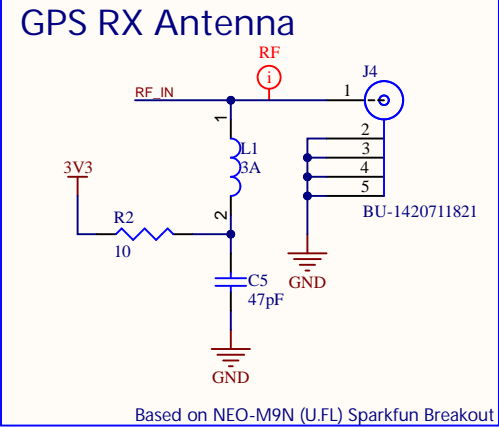
Ethernet ESD



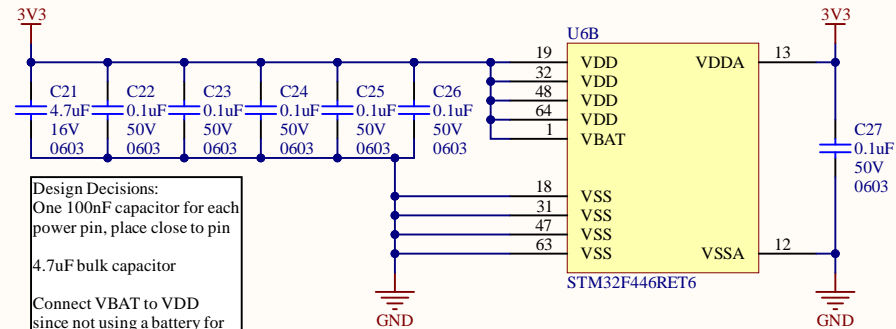


Current Draw of Sheet  
Component - Nominal (Peak)  
MAX-M10 - 19mA (50mA)

Design Notes:  
3v3 used on RF network on  
100Ohm resistor instead of  
VCC\_RF.



## STM32 Power



### Design Decisions:

One 100nF capacitor for each power pin, place close to pin

4.7uF bulk capacitor

Connect VBAT to VDD since not using a battery for RTC

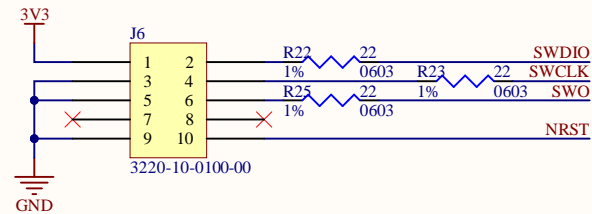
Don't need separate analog and digital domains, so connect VDDA and VSSA to regular power

## SWD Connector

### Design Decisions:

1.27mm header for SWD flashing + debugging

22ohm series termination resistors on each data line to reduce reflections



## Boot Mode

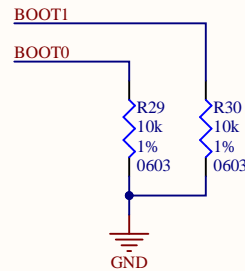
Table 2. Boot modes

BOOT1	BOOT0	Boot mode	Aliasing
x	0	Main Flash memory	Main Flash memory is selected as the boot area
0	1	System memory	System memory is selected as the boot area
1	1	Embedded SRAM	Embedded SRAM is selected as the boot area

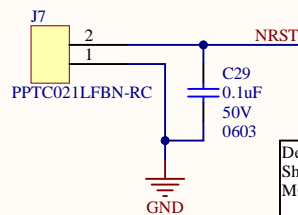
### Design Decisions:

Connect both BOOTx pins to GND for booting from flash

Don't foresee needing to boot from elsewhere

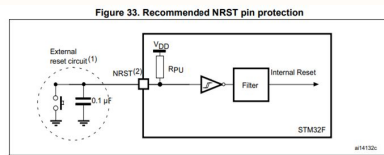


## Reset



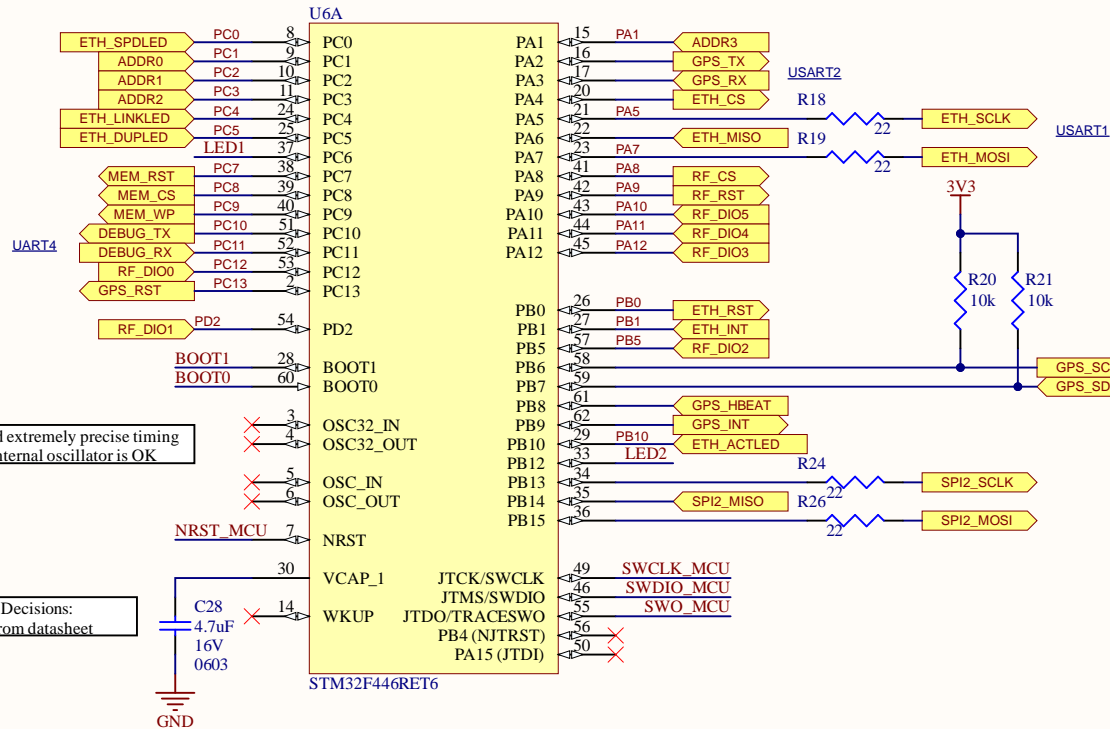
### Design Decisions:

Short jumper to reset MCU, as per datasheet



1. The reset network protects the device against parasitic resets.
2. The user must ensure that the level on the NRST pin can go below the  $V_{IL,RESET}$  max level specified in Table 86. Otherwise the reset is not taken into account by the device.
3. The external capacitor on NRST must be placed as close as possible to the device.

Make a project in STM32CubeIDE and use the GUI to determine pinout of device

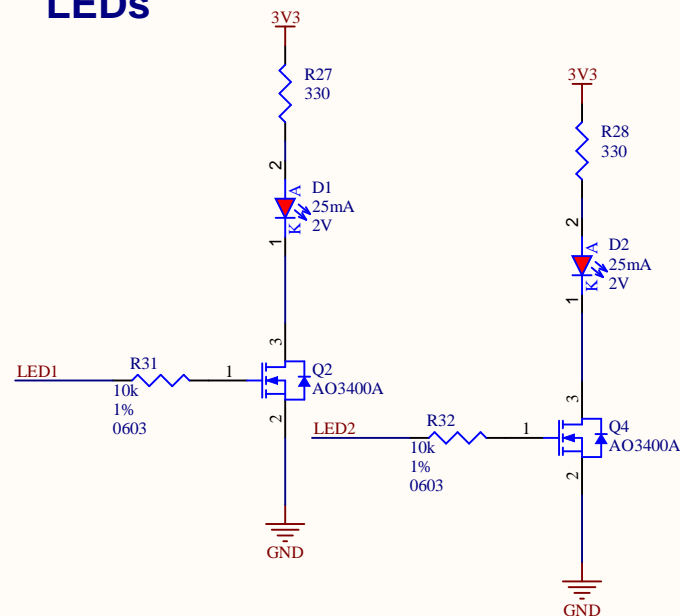


Don't need extremely precise timing so using internal oscillator is OK

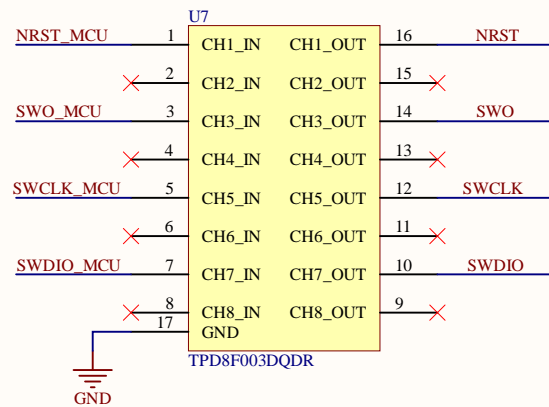
Design Decisions:  
Value from datasheet

Current Draw of Sheet Component - Nominal (Peak)  
STM32 - (240mA)  
LEDs - 20mA

## LEDs



## ESD for SWD

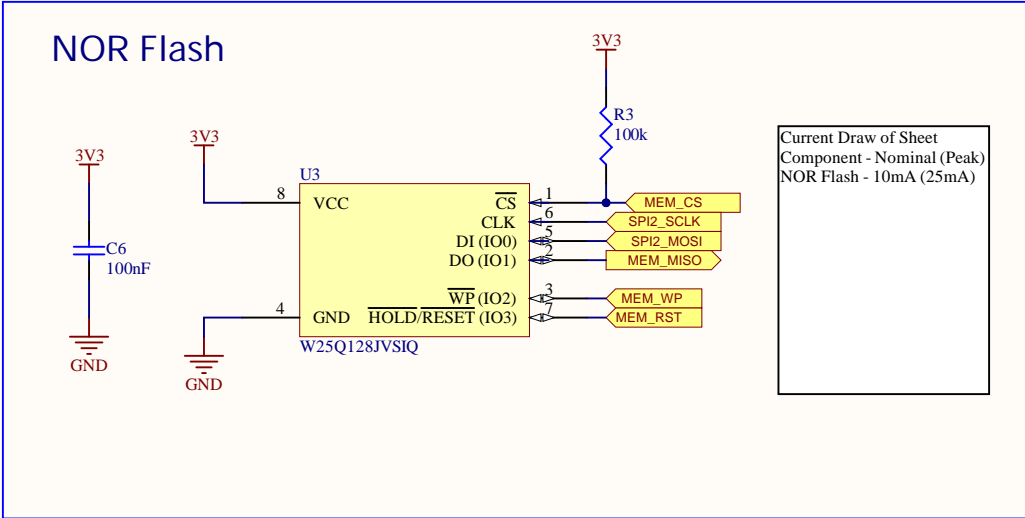


SHEET NAME: MCU.SchDoc

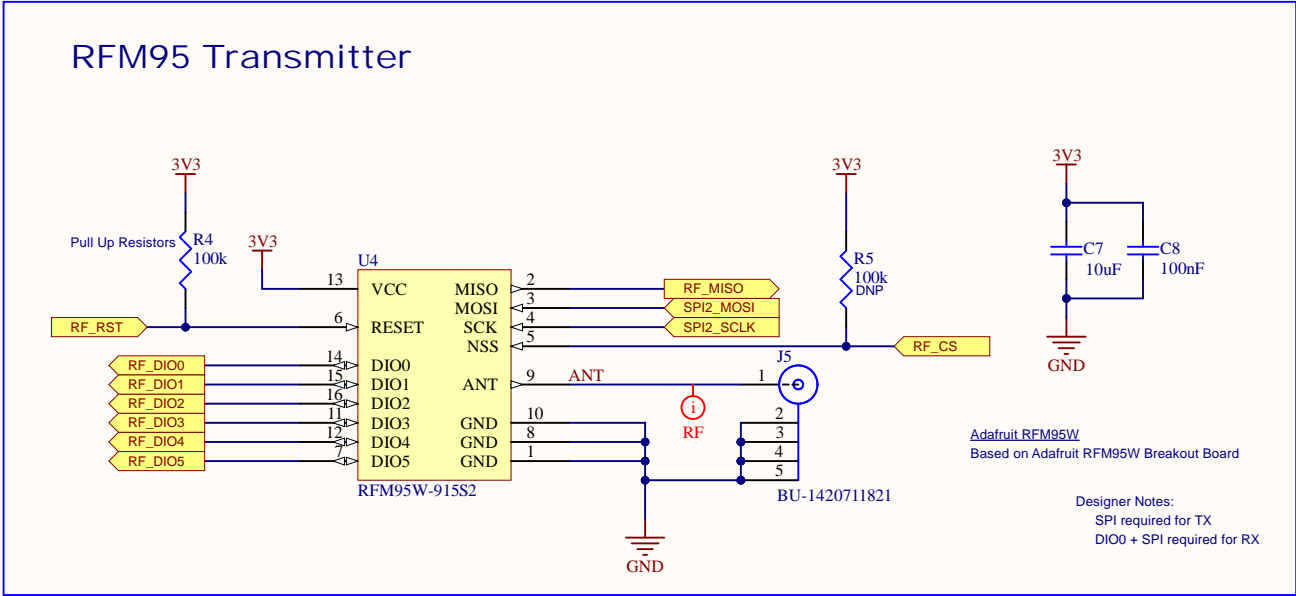
ENGINEER: Dante Sivo

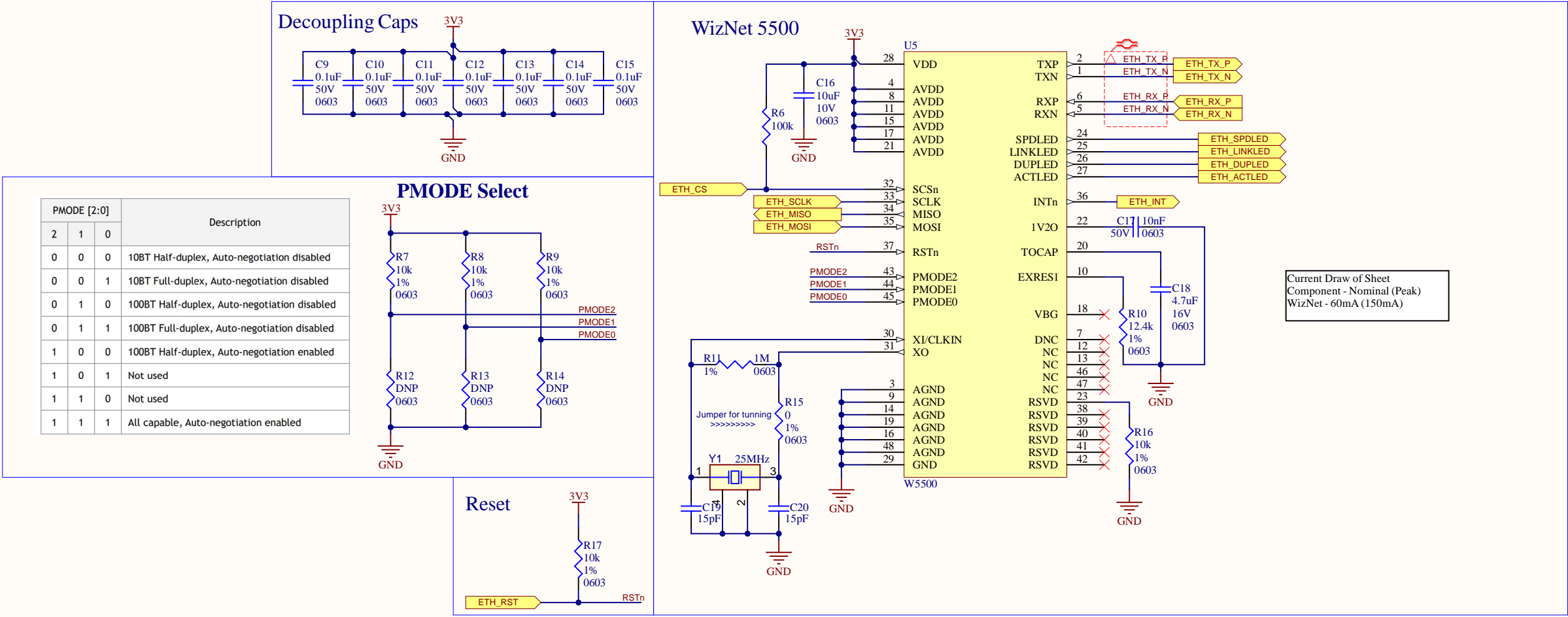
PROJECT: Radio\_Module\_2023-v2.PrjPcb

DATE: 5/19/2024



Current Draw of Sheet  
Component - Nominal (Peak)  
LoRa Radio - 120mA (120mA)





Current Draw of Sheet  
Component - Nominal (Peak)  
WizNet - 60mA (150mA)