

Click | Here

## 01# Switches

Sheet: OTG  
File: neo900\_SS\_2\_5.sch

## 02# OTG

Sheet: Charger/OTG-Booster  
File: neo900\_SS\_3\_3.sch

## Charger/OTG-Booster

Sheet: Modem Power  
File: neo900\_SS\_4\_4.sch

## Modem Power

Sheet: Fuel Gauge  
File: neo900\_SS\_5\_5.sch

## Fuel Gauge

Sheet: 3G/4G Modem + SIM  
File: neo900\_SS\_6\_5.sch

## 3G/4G Modem + SIM

Sheet: Dual SIM switch  
File: neo900\_SS\_7\_5.sch

## Dual SIM switch

Sheet: Antenna connections  
File: neo900\_SS\_8.sch

## Antenna connections

Sheet: WLAN, Bluetooth, FM  
File: neo900\_SS\_9.sch

## WLAN, Bluetooth, FM

Sheet: Sensors

## Sensors

Sheet: Audio Codec  
File: neo900\_SS\_10.sch

## Audio Codec

Sheet: Audio Headset + Mic  
File: neo900\_SS\_12.sch

## Audio Headset + Mic

Sheet: ECI

File: neo900\_SS\_13.sch

Sheet: Audio Handsfree

## Audio Handsfree

Sheet: Misc (lower)

## Misc (lower)

Sheet: RFID/NFC Reader  
File: neo900\_SS\_16.sch

## RFID/NFC Reader

Sheet: RFID/NFC Controller  
File: neo900\_SS\_17.sch

## RFID/NFC Controller

Sheet: Hackerbus

## Hackerbus

Sheet: Infrared

File: neo900\_SS\_19.sch

Sheet: B2B to UPPER

## B2B to UPPER

Sheet: uSD Breakout Board

## uSD Breakout Board

Sheet: B2B to LOWER

## B2B to LOWER

Sheet: Keypad

File: neo900\_SS\_23.sch

Sheet: Display-Peripherals

## Display-Peripherals

Sheet: Display-Panel&Power

## Display-Panel&Power

File: neo900\_SS\_25.sch

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## CPU + PoP RAM/NAND

Sheet: CPU + PoP RAM/NAND  
File: neo900\_SS\_26.sch

## eMMC

Sheet: PMU+Codec  
File: neo900\_SS\_28.sch

## PMU+Codec

Sheet: BB-XM Dummy (TWL4030)  
File: neo900\_SS\_29.sch

## BB-XM Dummy (TWL4030)

Sheet: Camera

## Camera

Sheet: LEDs

File: neo900\_SS\_31.sch

Sheet: Fancy LEDs

File: neo900\_SS\_32.sch

## Fancy LEDs

Sheet: Connector to BB-XM

## Connector to BB-XM

File: neo900\_SS\_33.sch

## BB-XM Adapter (CPU)

Sheet: BB-XM Adapter (DISP)

File: neo900\_SS\_34.sch

Sheet: BB-XM Adapter (CAM)

File: neo900\_SS\_36.sch

Sheet: No-Solder Components

File: neo900\_SS\_37.sch

## No-Solder Components

Sheet: / neo900.sch  
File: neo900.sch

**Title: Neo900**

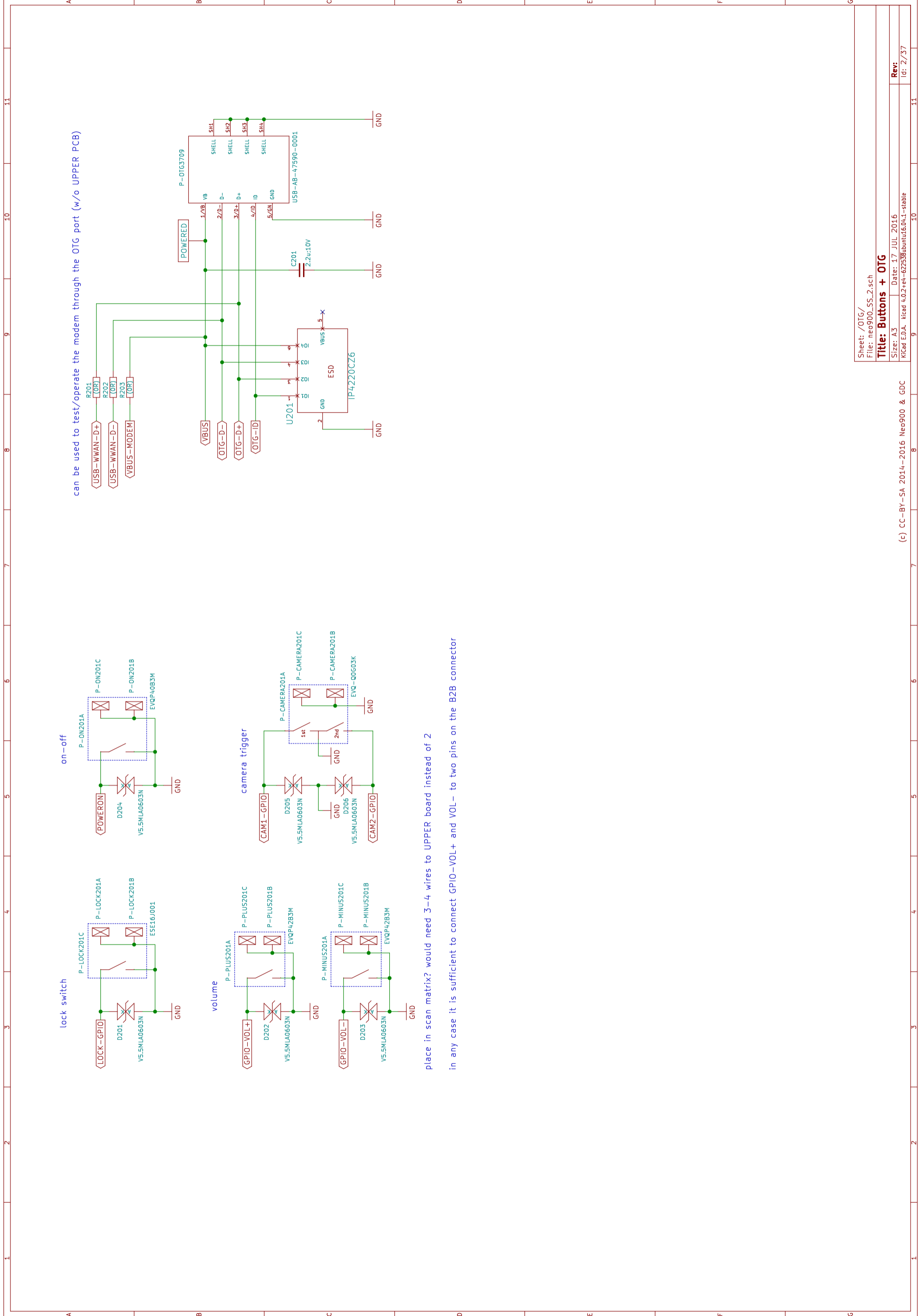
Size: A3

Date: 16 JUL 2016

Rev:

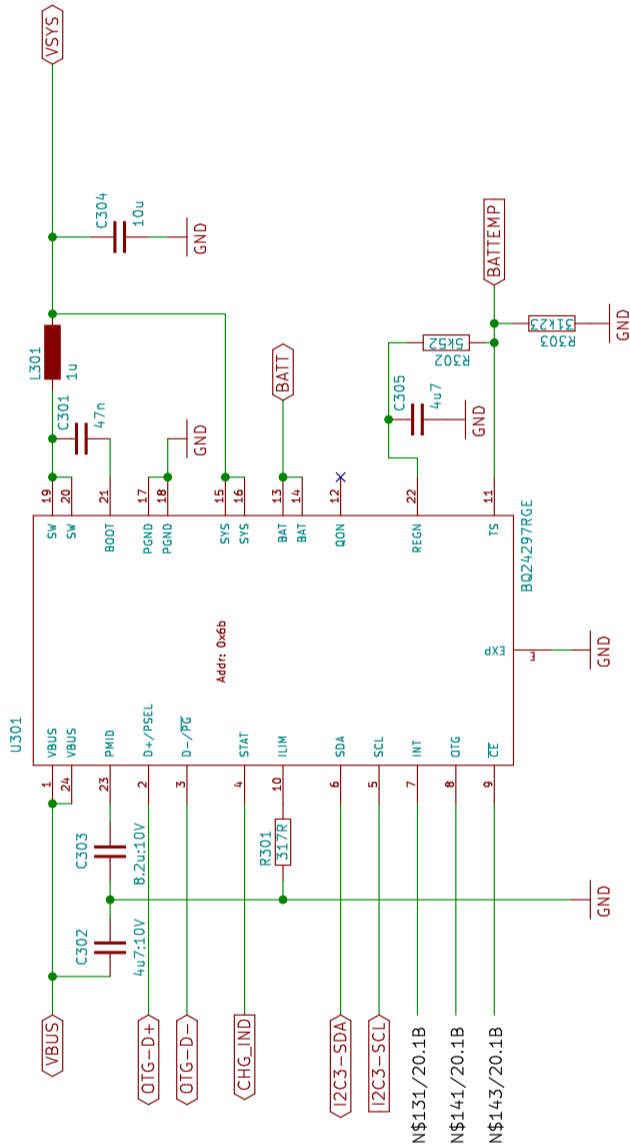
KiCad E.D.A. KiCad 4.0.2+e4-622538ubuntu16.04.1-stable

Id: 1/37

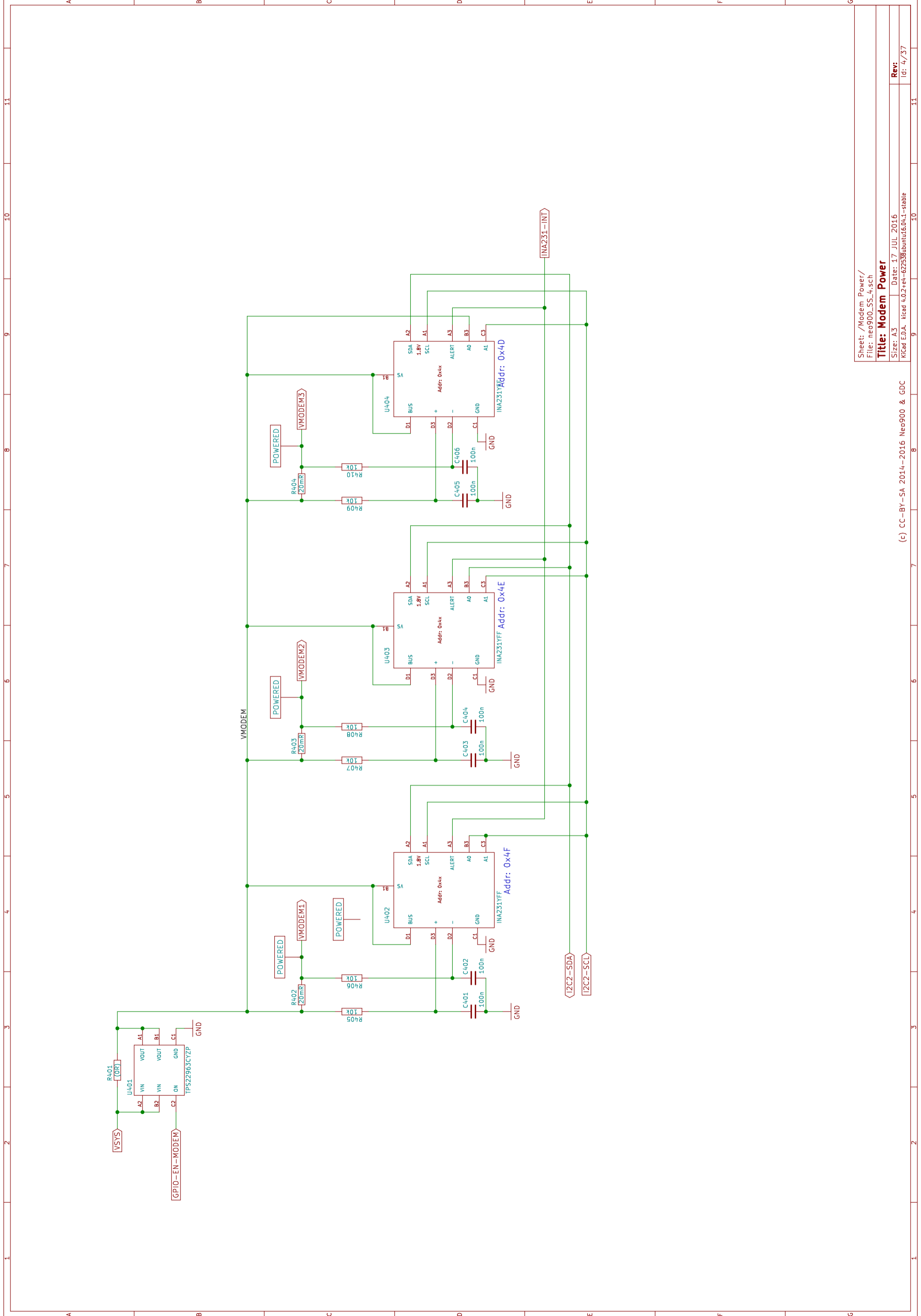


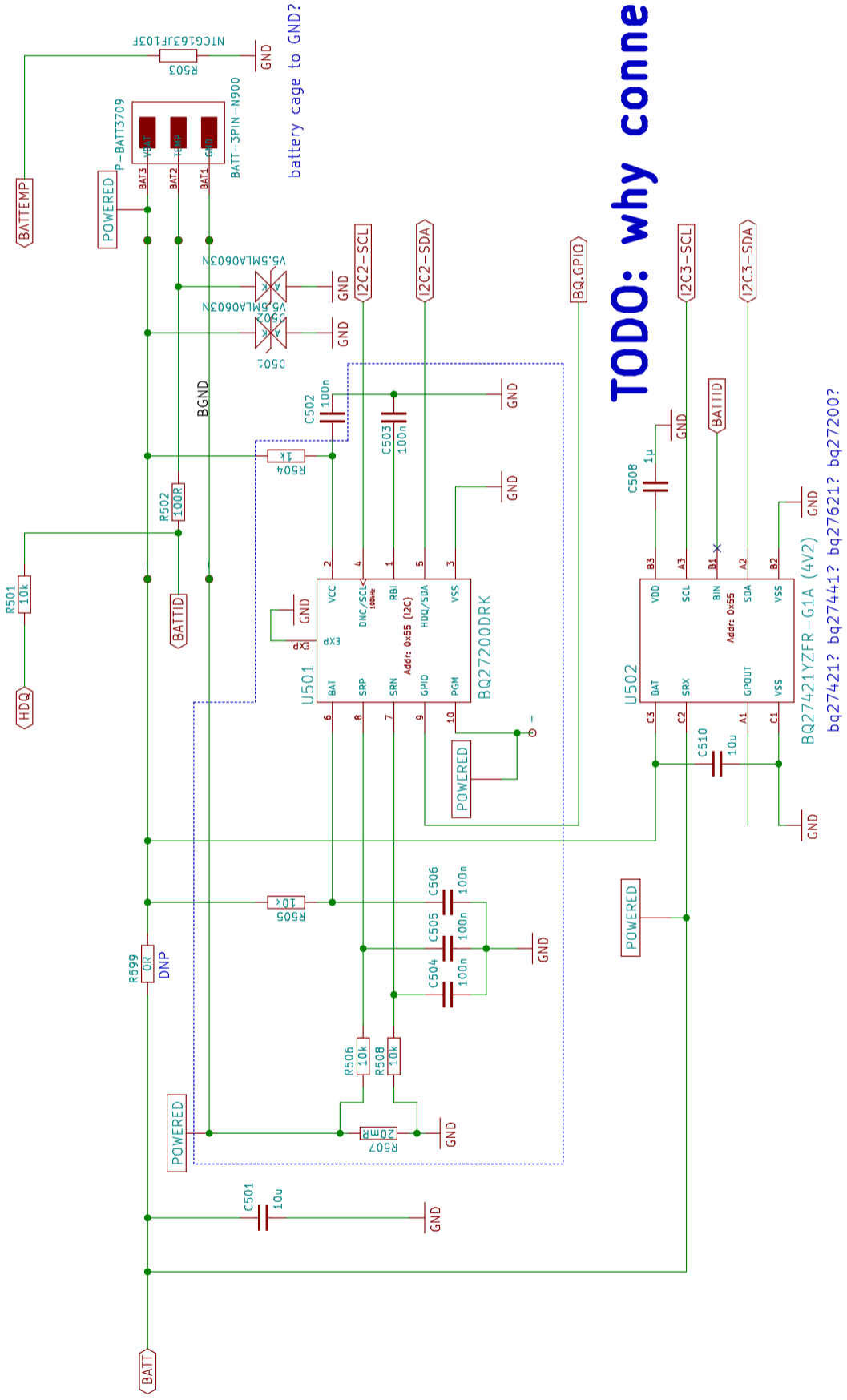
can be used to test/operate the modem through the OTG port (w/o UPPER PCB)

place in scan matrix? would need 3-4 wires to UPPER board instead of 2  
 in any case it is sufficient to connect GPIO-VOL+ and VOL- to two pins on the B2B connector



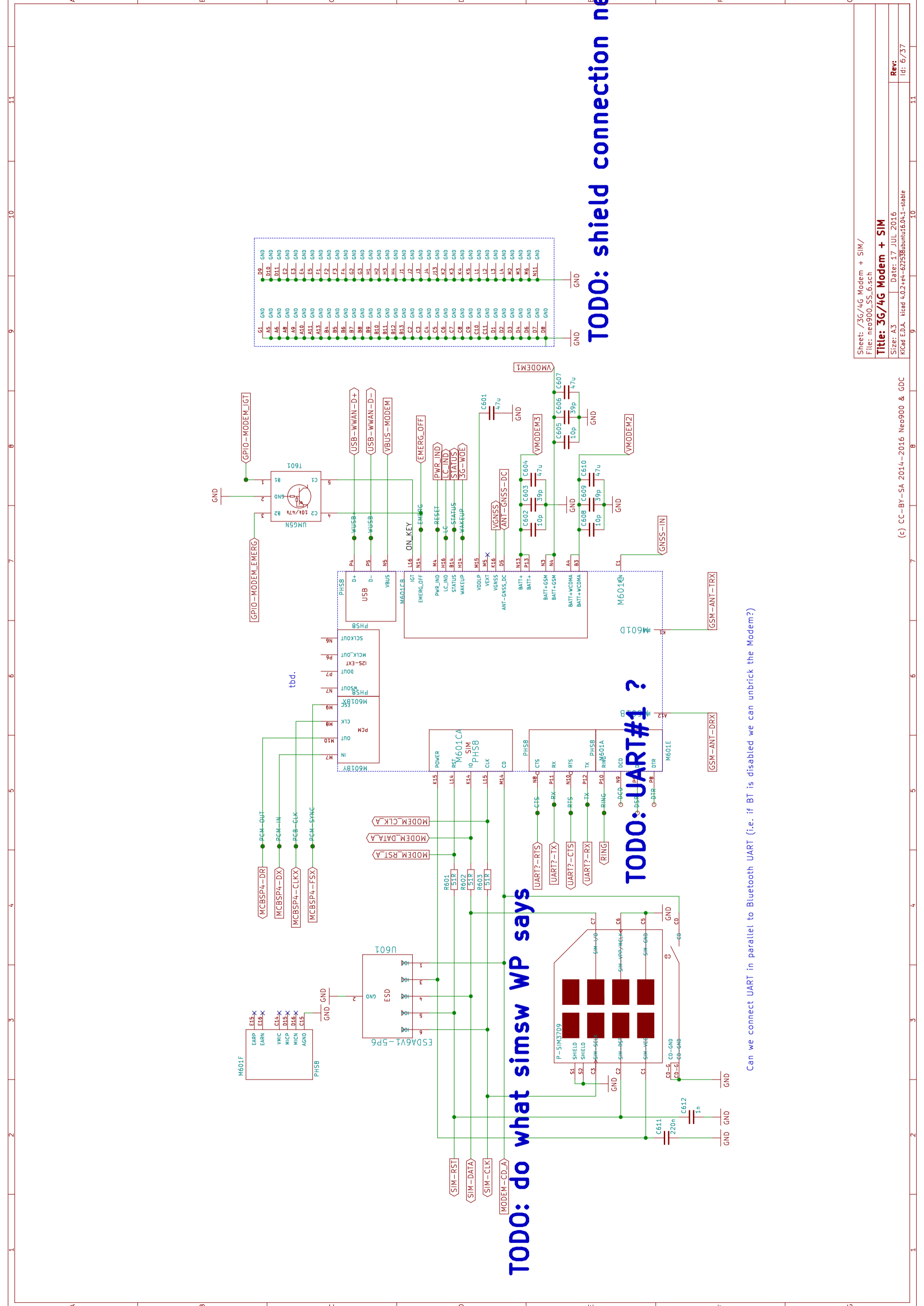
**TODO**





**TODO: why connect to VCC ?**

**TODO: can U501 and U502 coexist ?**  
**TODO: BQ27421YZFR-G1A**



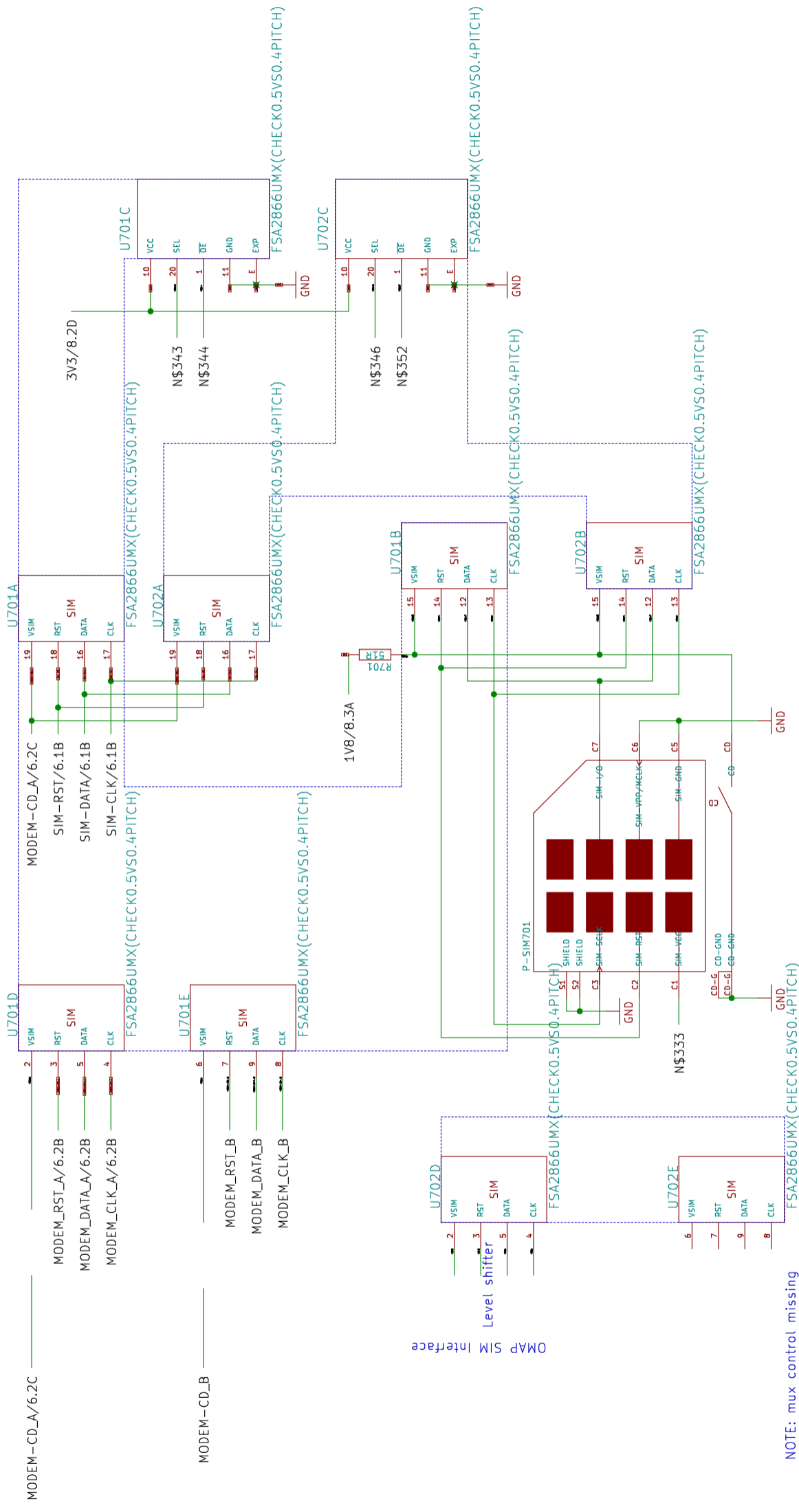
**TODO: do what simsw WP says**

**TODO: UART#1?**

**TODO: shield connection near**

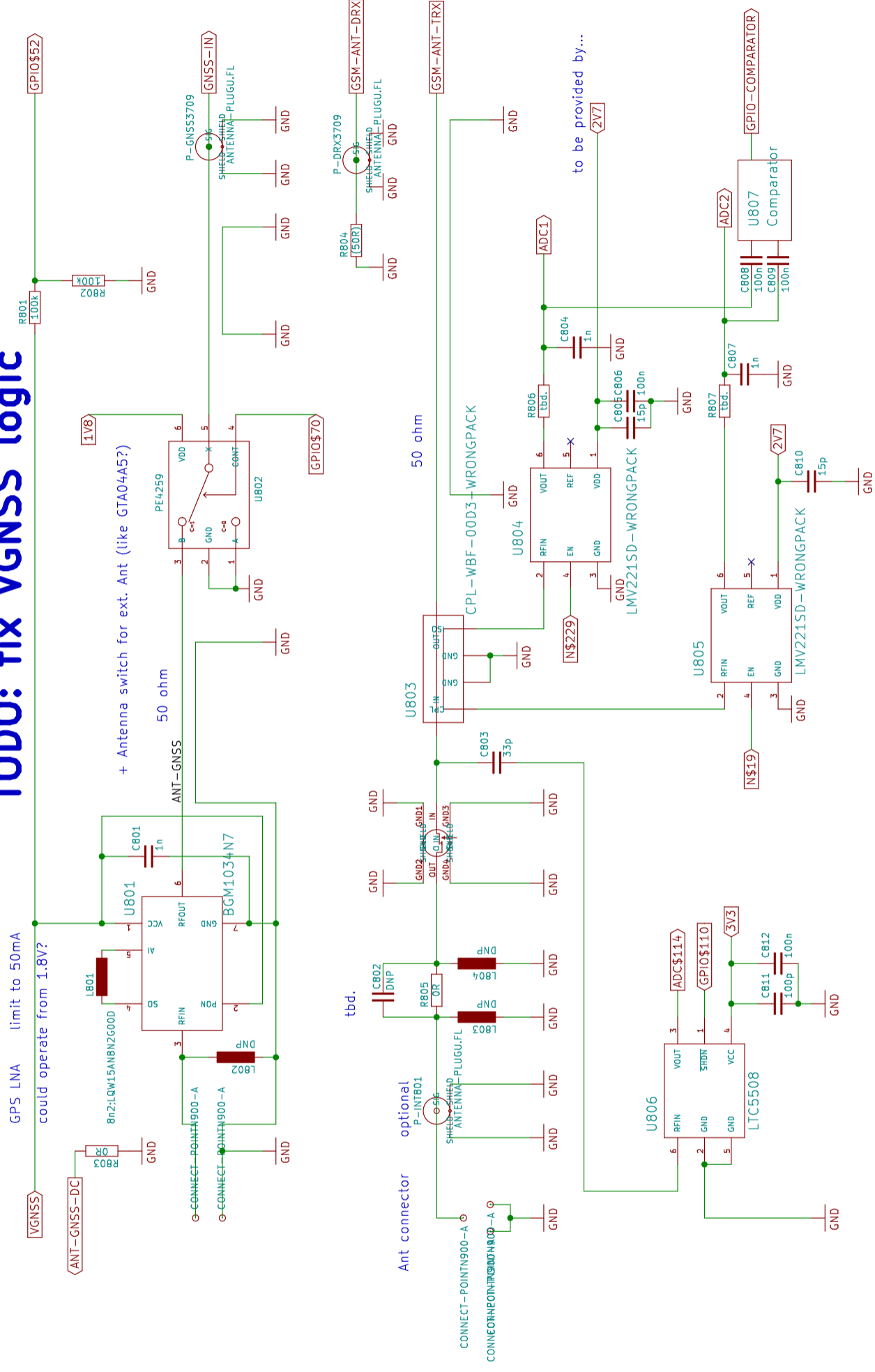
Can we connect UART in parallel to Bluetooth UART (i.e. if BT is disabled we can unbrick the Modem?)

**TODO: not cleaned up – needs total rewrite**



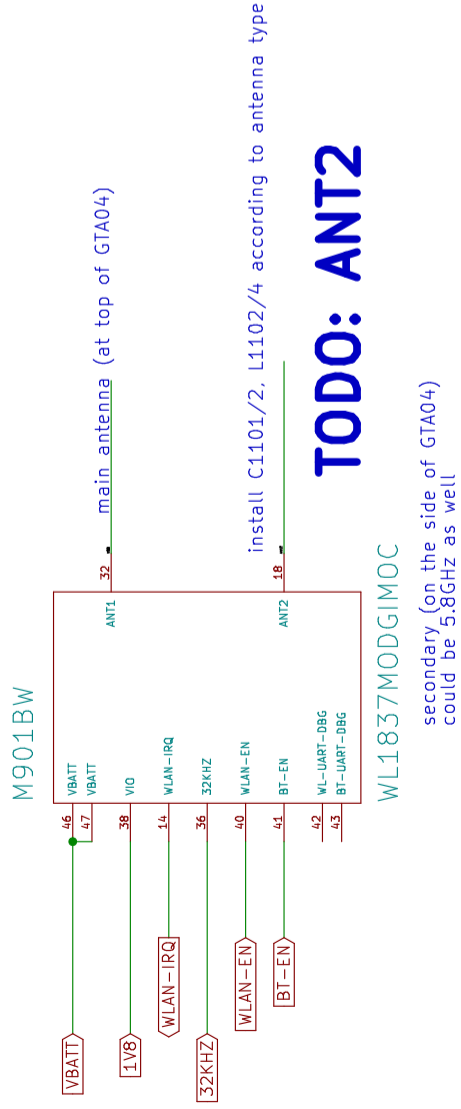
NOTE: mux control missing  
 NOTE: CD logic missing  
 NOTE: SIM power supply missing

**TODO: fix VGNSS logic**



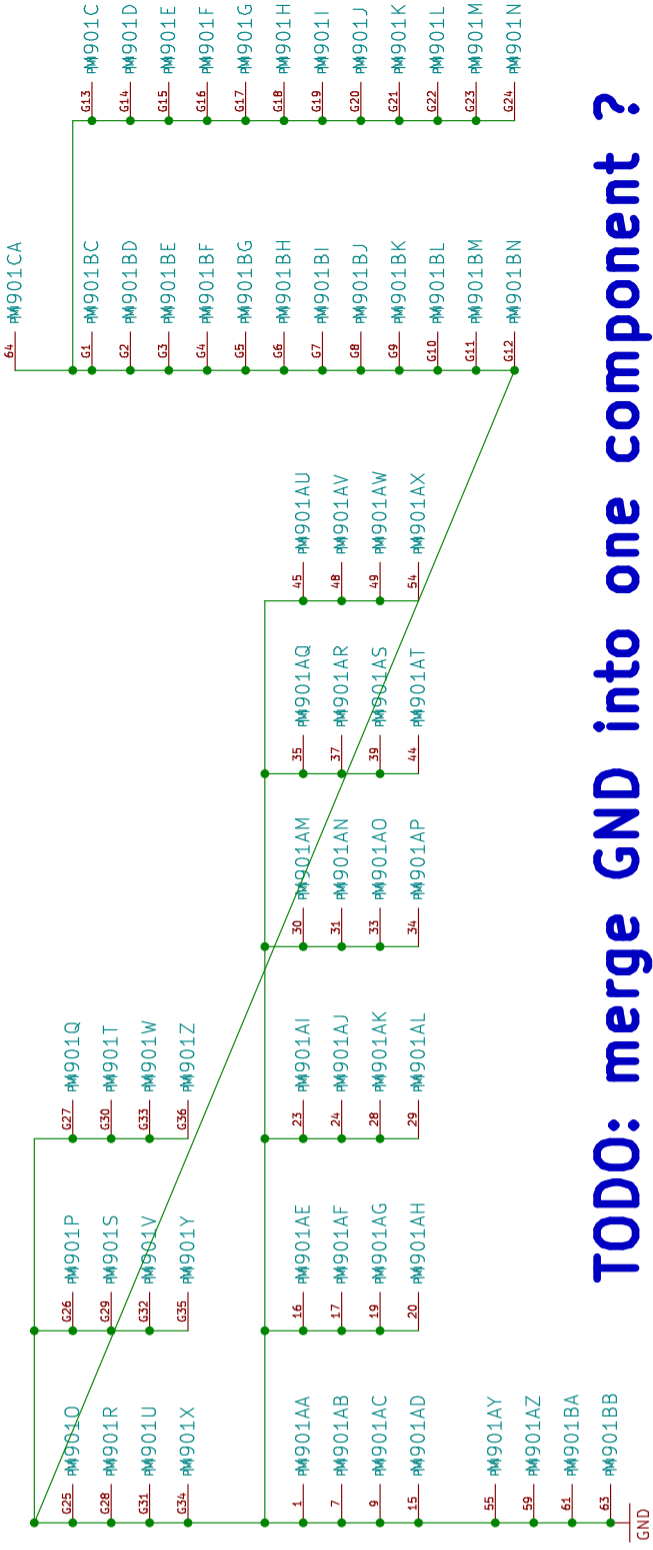
**TODO: name all the \*\$\***



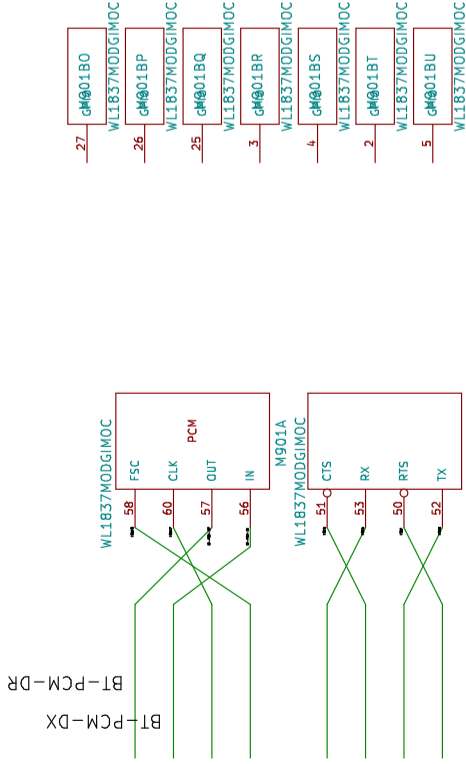


**TODO: ANT2**

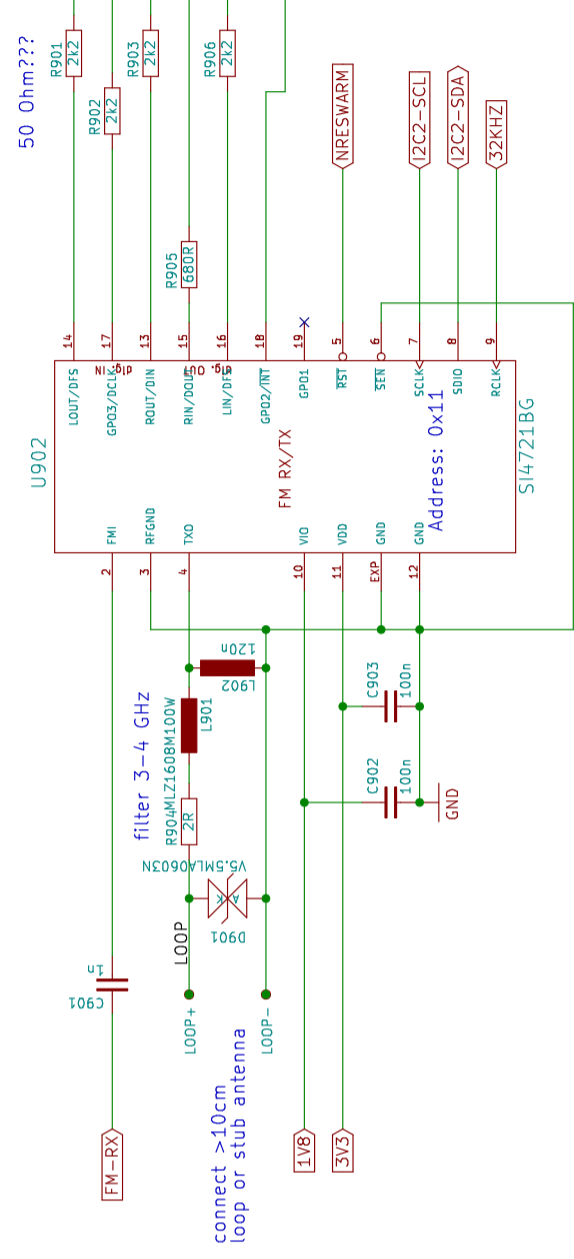
secondary, (on the side of GTA04) could be 5.8GHz as well



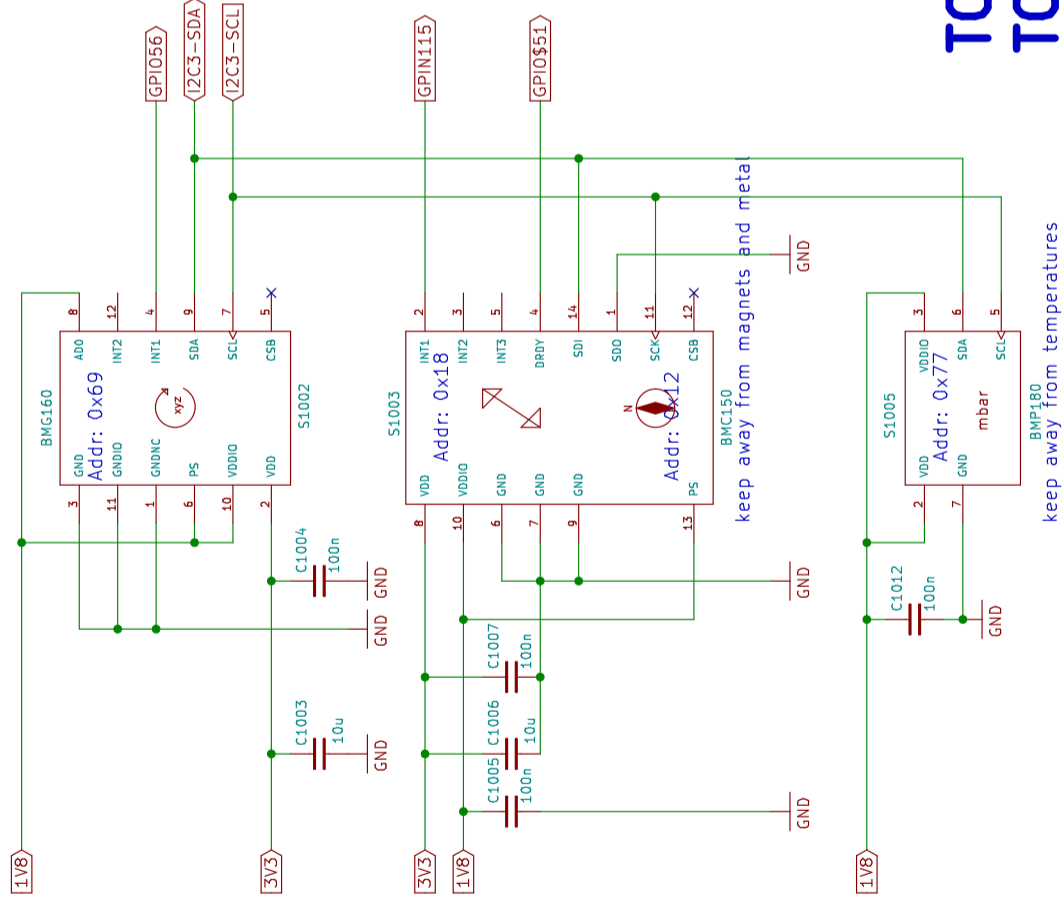
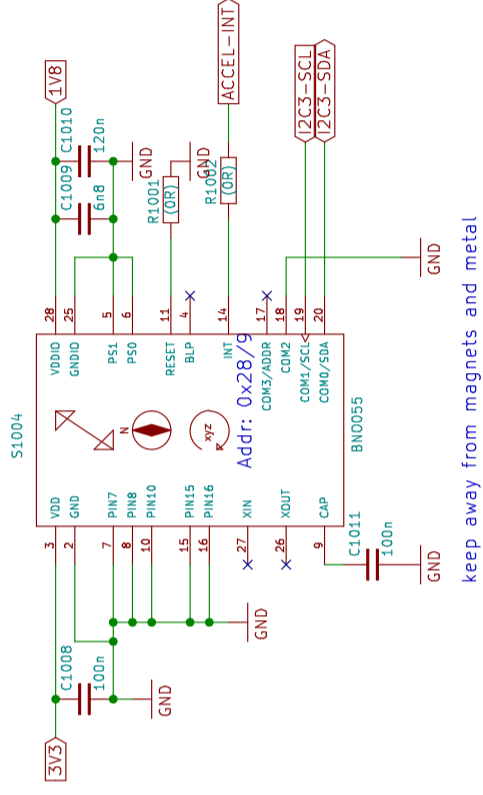
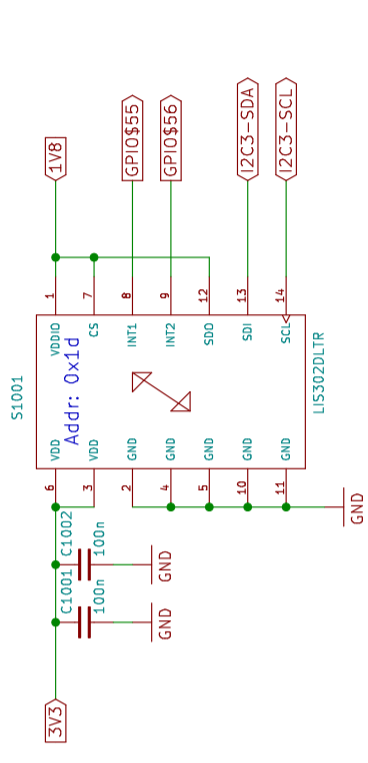
**TODO: merge GND into one component ?**



**TODO: unfinished**

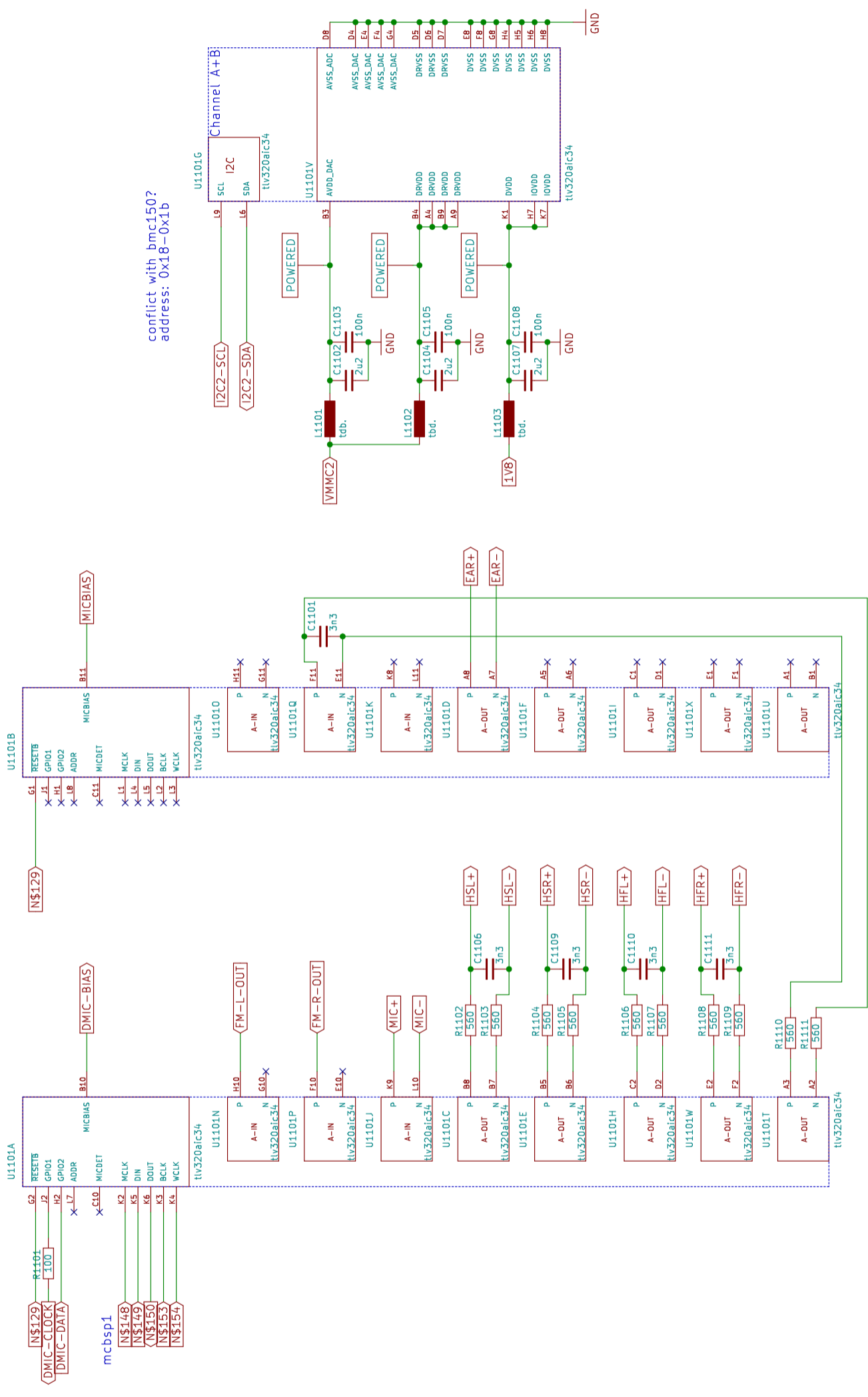


**TODO: unfinished**

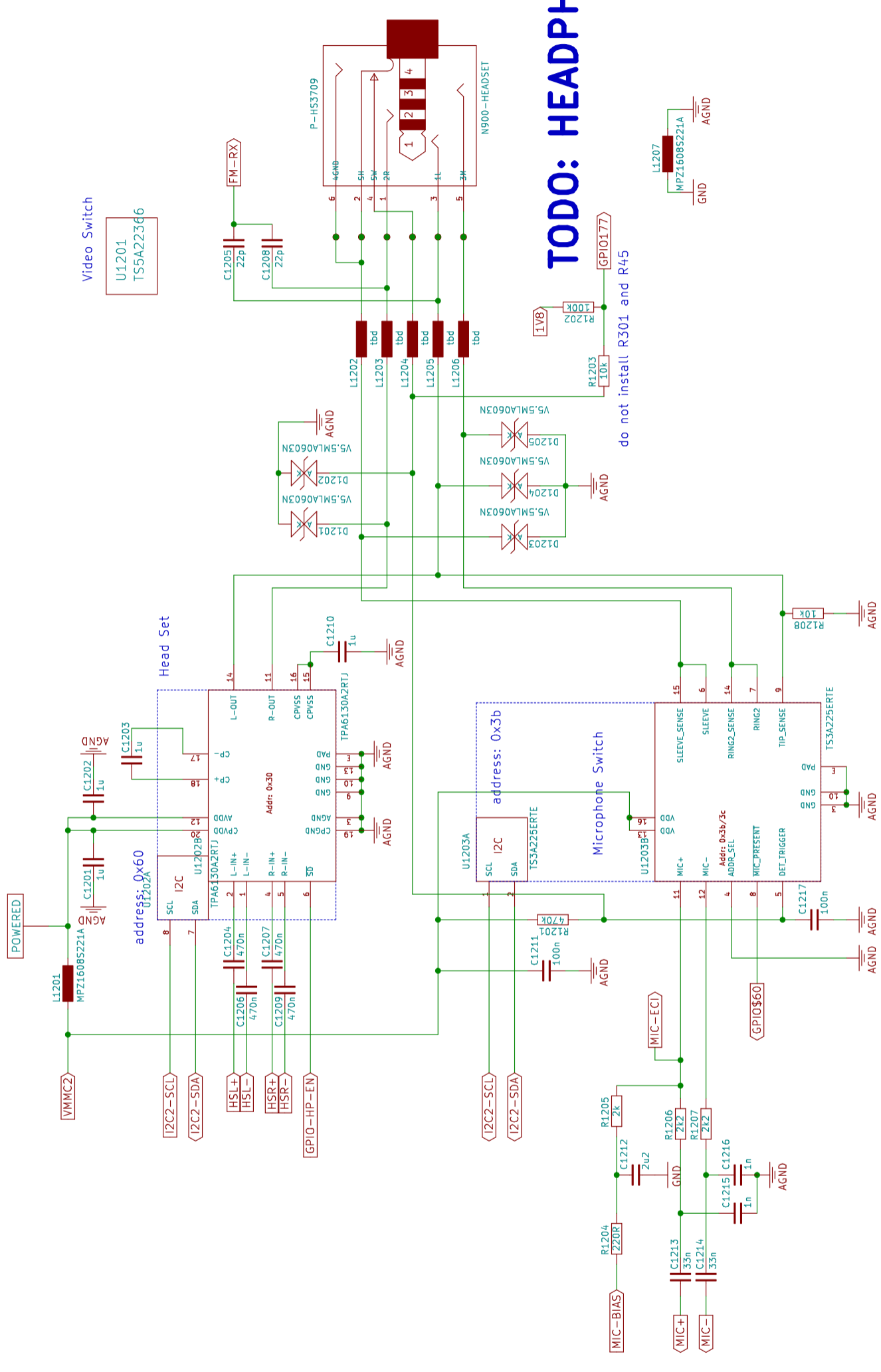


**TODO: no BMG160, BMC150**  
**TODO: BMP180 -> BME280**  
**TODO: BNO055 -> BMX055**  
**TODO: INT1/2 sharing**

problem: this is a 0.5mm BGA making lower board expensive but it appears to be not extremely critical (only 3 rows and inner ring is GND)  
 problem: analog mic is on upper board alternative: place on upper board (to be evaluated)

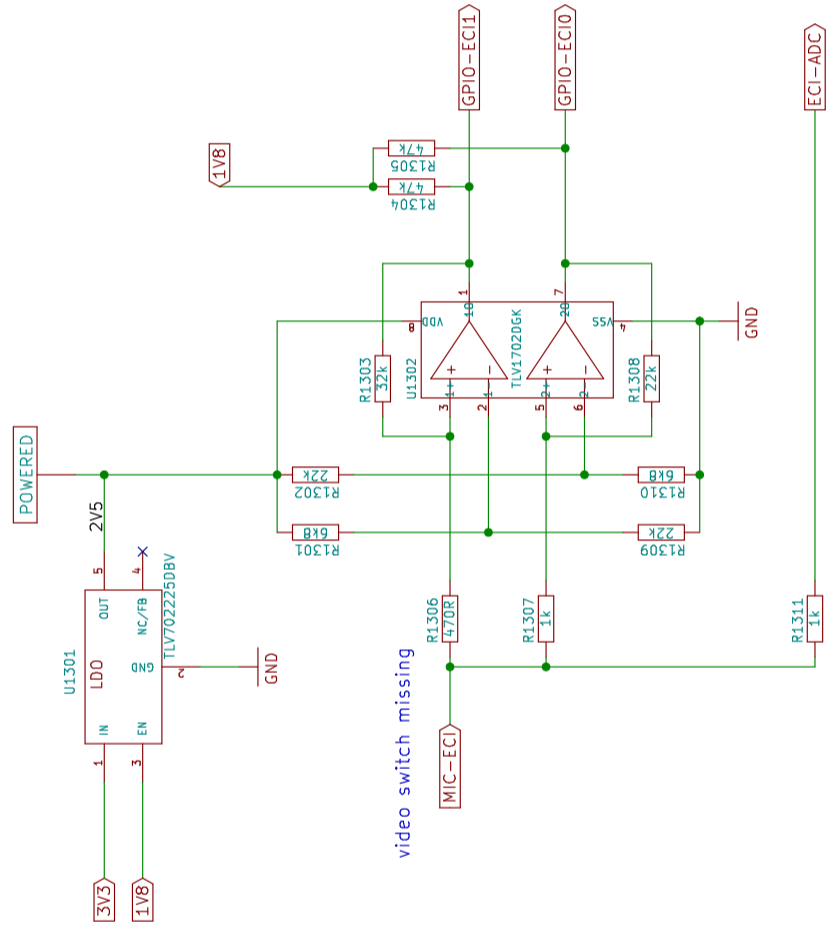


conflict with bmc150?  
 address: 0x18-0x1b

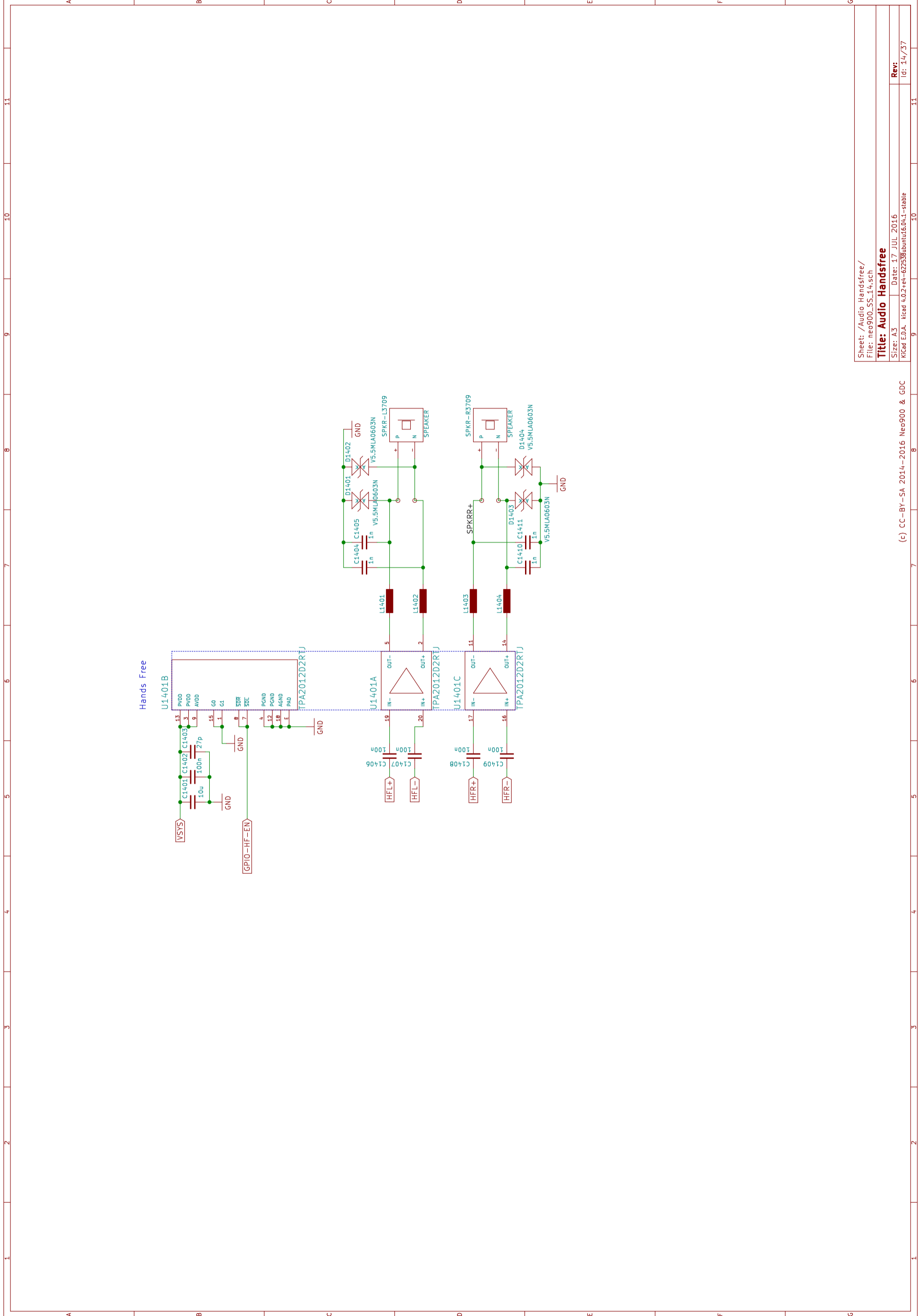


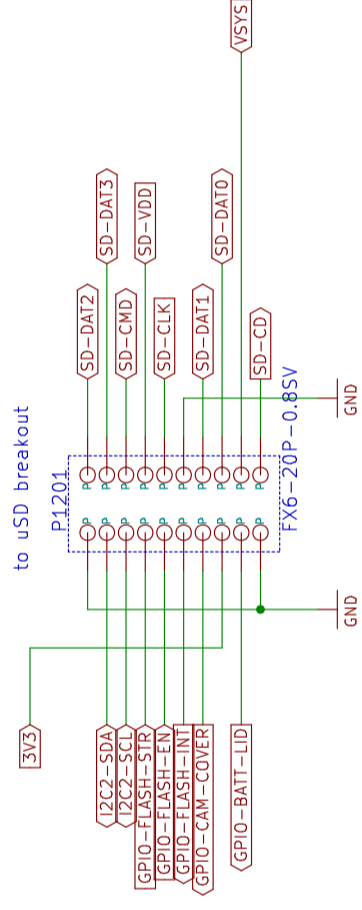
**TODO: HEADPH\_IND ?**

do not install R301 and R45



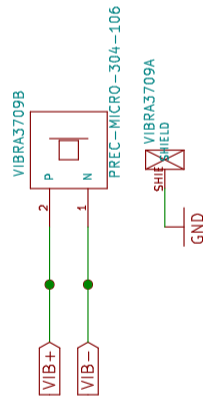
**TODO: draw comparator right**



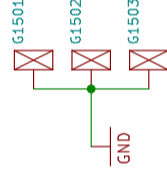


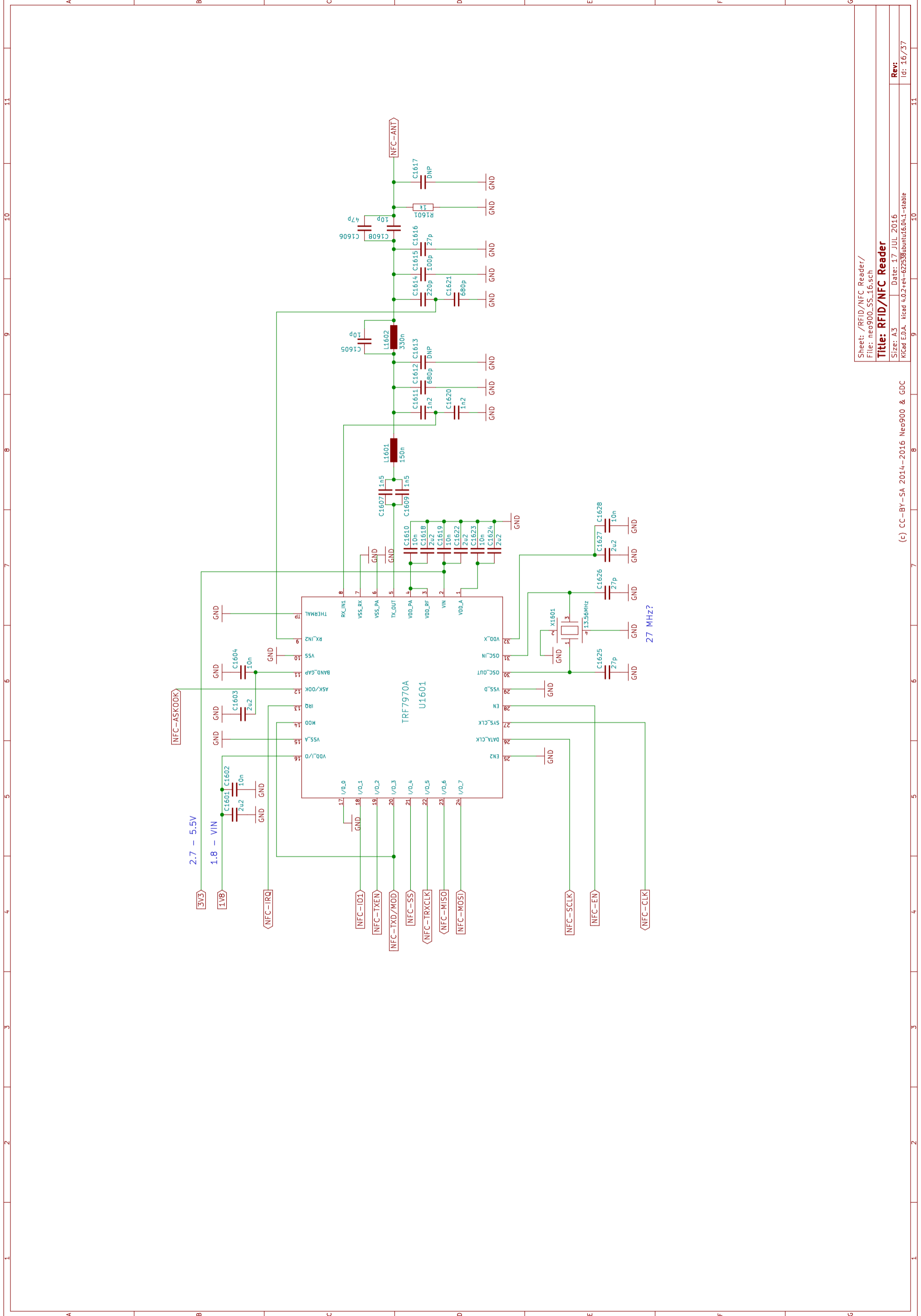
**TODO: bogus connector (see HB WP)**

Vibramotor

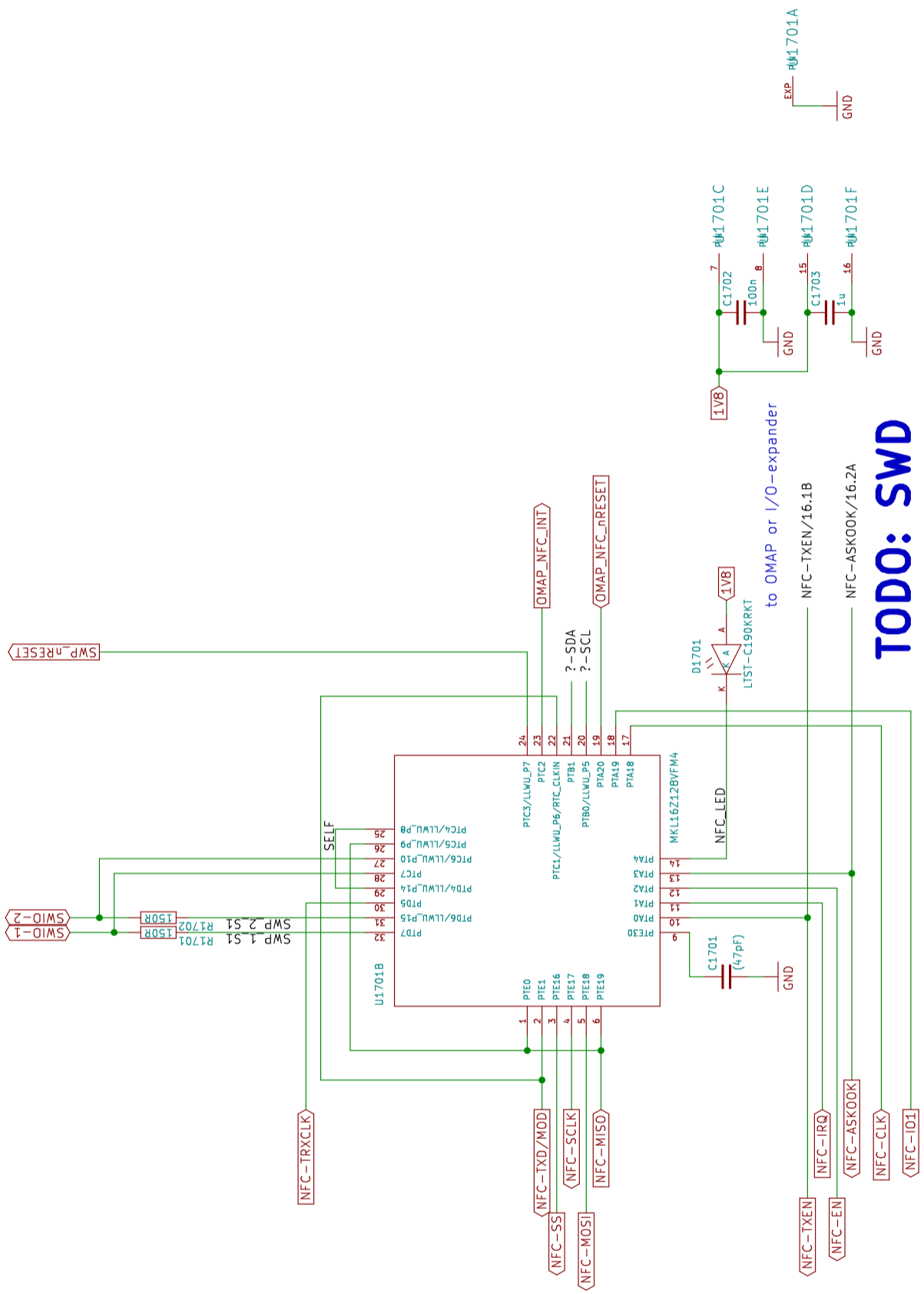


Shield



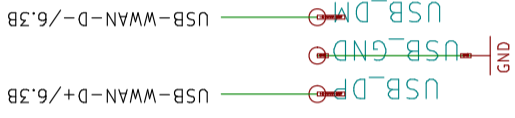




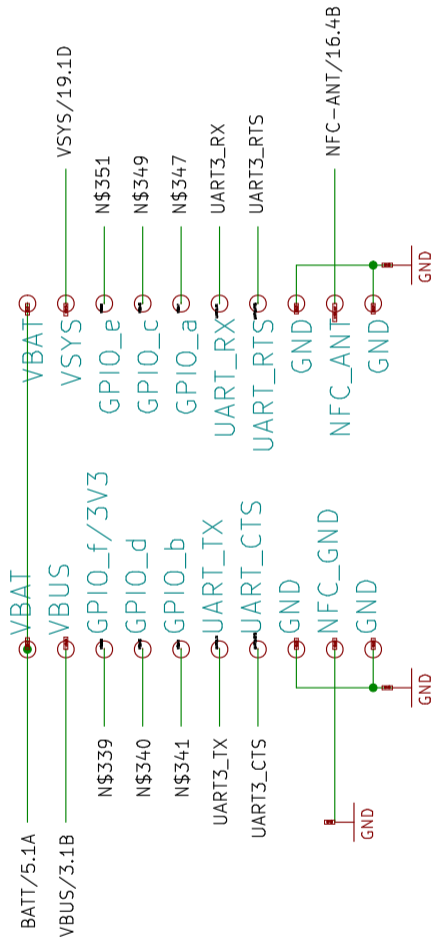


**TODO: SWD**

NOTE: this is mangling up Breakout and Lower board connectors  
 Signals may have to be fed through the breakout board connector increasing resistance



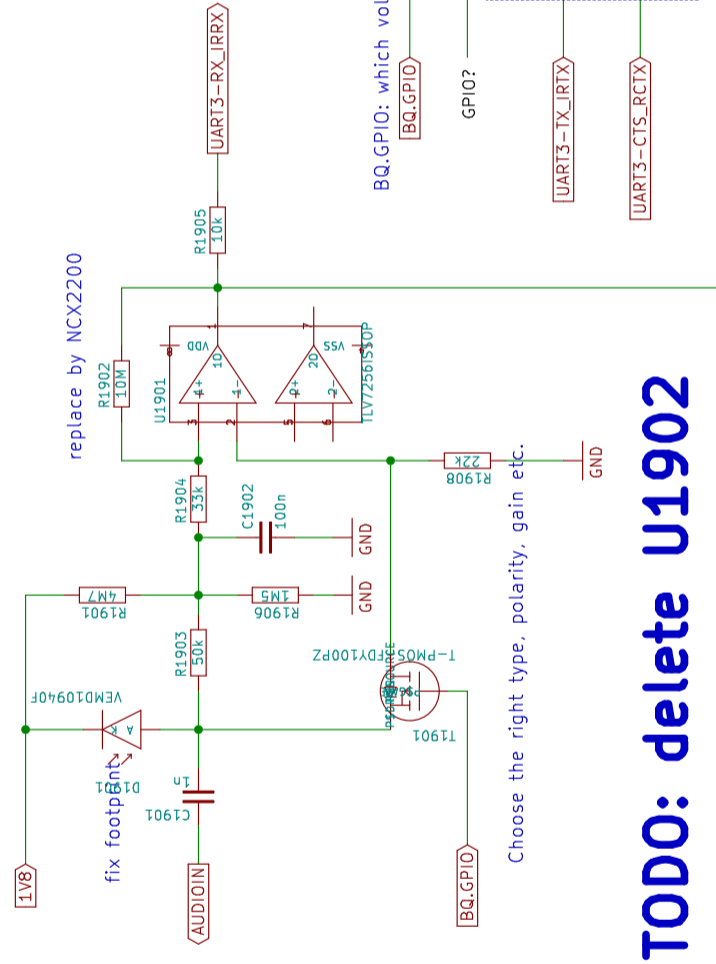
## TODO: align with HB WP



Missing 10 level shifter chip (or do we really have the space for 10x discrete T+R+D ca. 3x3mm each?)  
 Missing 6x 2R for alternate function select (do we have the space for ca. 2.5 x 5mm?)

## TODO: align with HB WP

NOTE: 1V8 may be quite noisy



replace by NCX2200

fix footprint

fix footprint

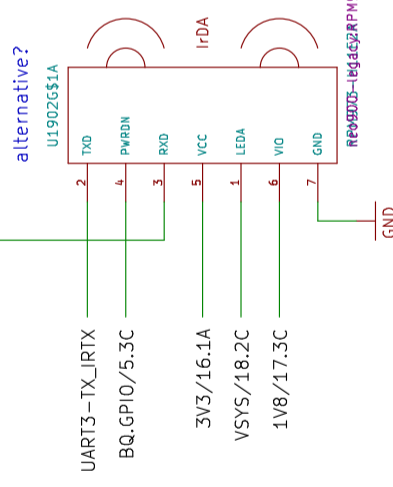
BQ.GPIOD: which voltage level?

GPIOD?

fix footprint

Choose the right type, polarity, gain etc.

**TODO: delete U1902**



alternative?

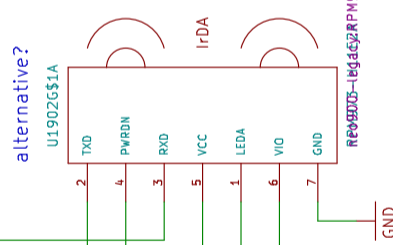
UART3-TX\_IRTX

BQ.GPIOD/5.3C

3V3/16.1A

VSYS/18.2C

1V8/17.3C



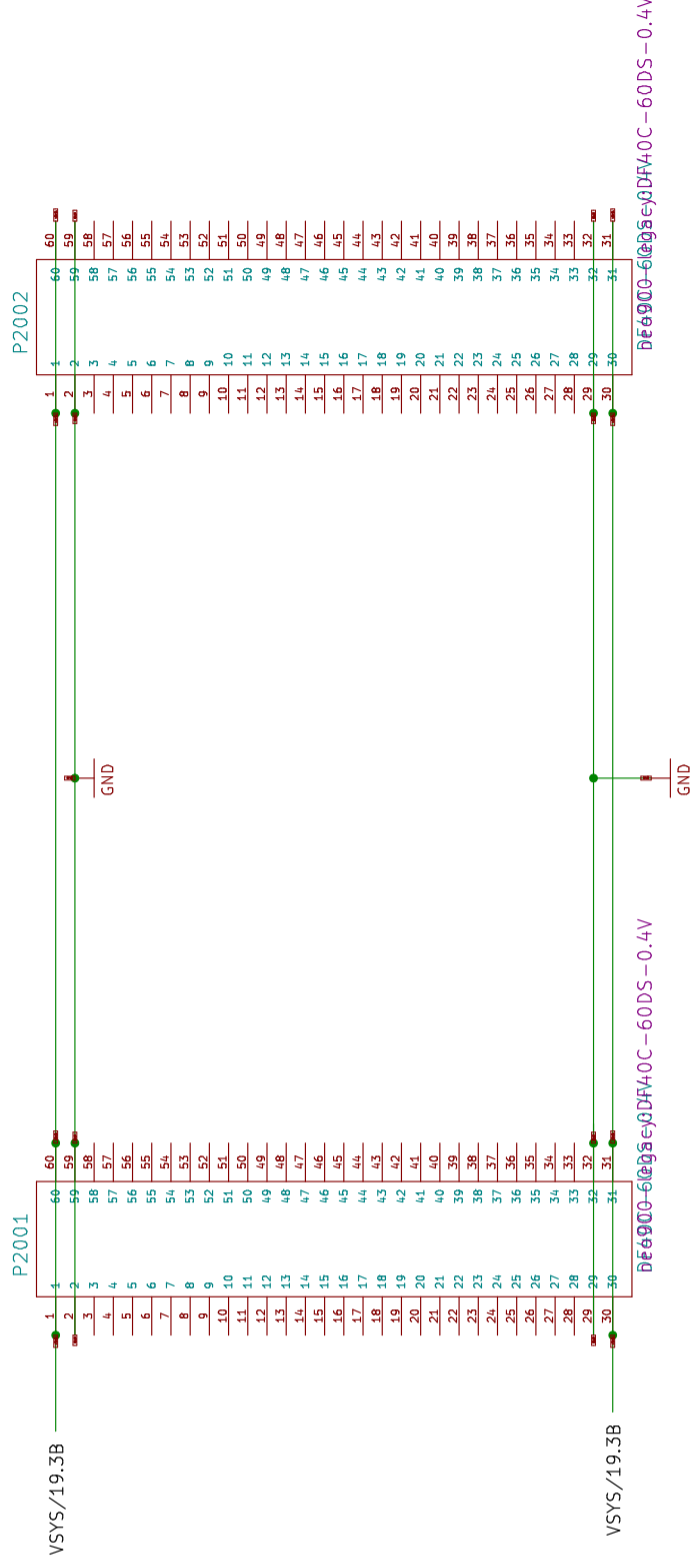
**TODO: update to design in IR WP**

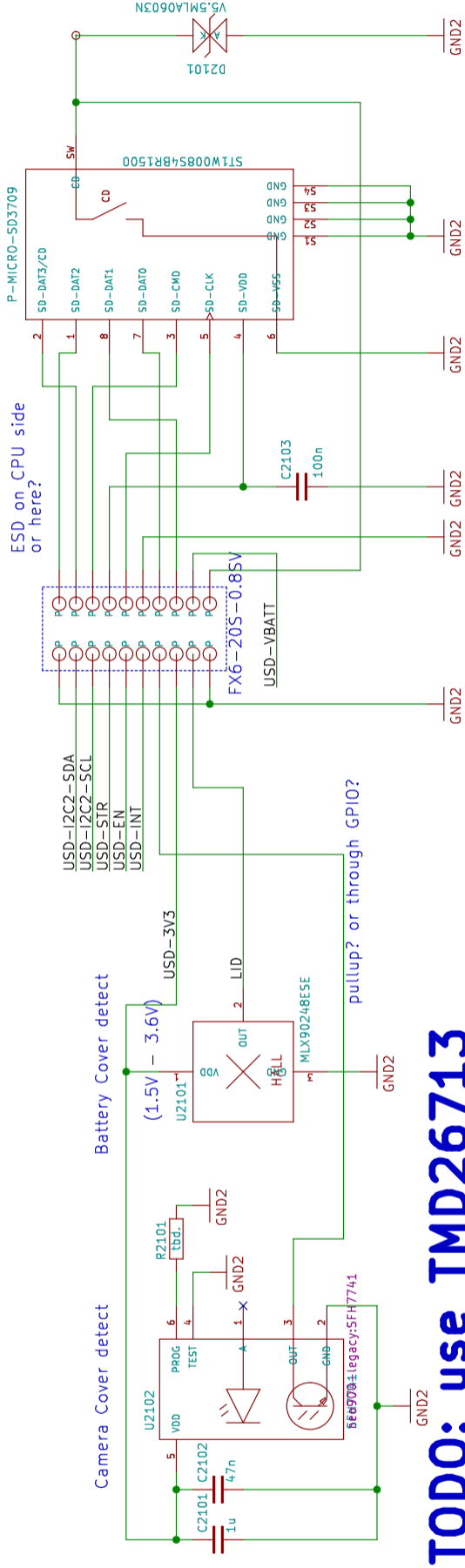
# TODO: update when details settle

ca. 130 signals (to be counted exactly after definition of upper/lower split)

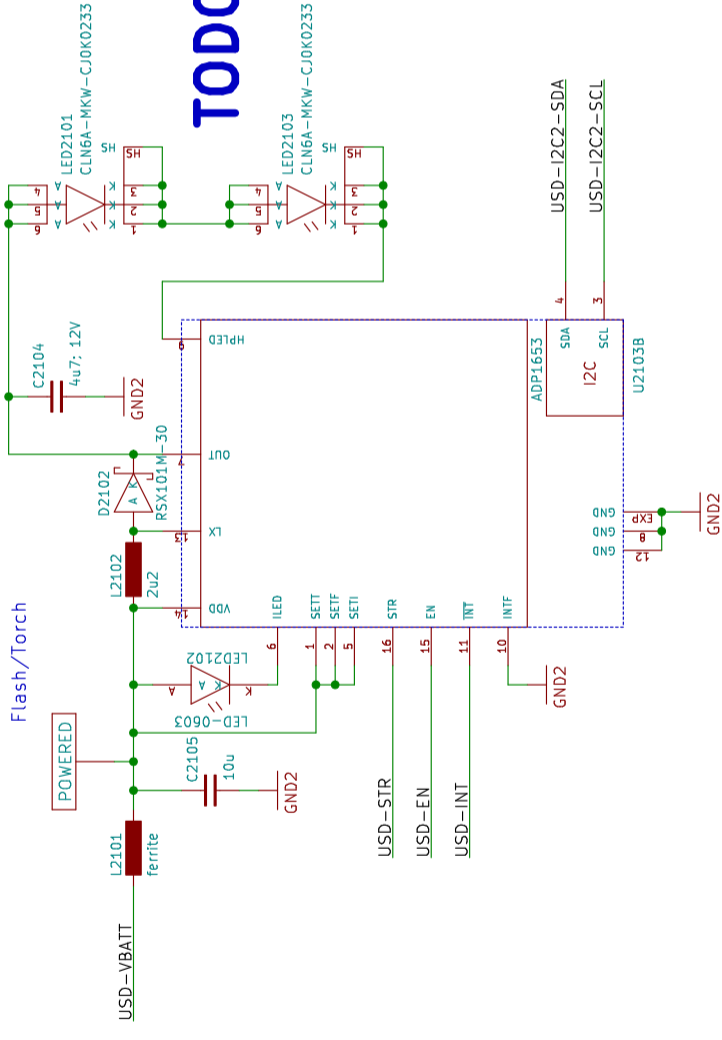
- MMC3-DATA1/9.1A
- MMC3-DATA2/9.1A
- MMC3-DATA3/9.1A
- GPIO-WLAN-IRQ/9.1A
- GPIO-BT-EN/9.1C
- UART1-RX/9.1C
- UART1-RTS/9.1C
- UART1-CTS/9.1D
- UART1-TX/9.1D
- MCBSP3-FCK/9.1D
- MCBSP3-CLK/9.1D
- MCBSP3-DR/9.1D
- MCBSP3-DX/9.1D
- SYSCLK/9.3C
- 32KHZ/9.4A
- GPIO-FM-EN/9.3A
- GPIO-FMIRQ/9.3A
- MCBSP2-FCK/9.3A
- MCBSP2-CLK/9.3A
- MCBSP2-DR/9.3A
- MCBSP2-DX/9.3A
- GPIOI15/10.3B
- GPIOI56/10.3A
- GPIO\$51/10.3B
- GPIO\$55/10.4A
- GPIO\$56/10.4A
- ACCCEL-INT/10.4C
- N\$129/11.2A
- N\$148/11.1A
- N\$149/11.1A
- N\$150/11.1A
- N\$153/11.1A
- N\$154/11.1A
- GPIO-ECI1/13.3B
- GPIO-ECI0/13.3C
- ECI-ADC/13.3C
- VMMC2/12.1A
- GPIO-HP-EN/12.1B
- GPIO\$60/12.2D
- GPIOI77/12.4C
- GPIO-HF-EN/14.1B
- GPIO-FLASH-STR/15.1A
- GPIO-FLASH-EN/15.1A
- GPIO-BATT-LID/15.1A
- SD-CMD/15.2A
- SD-CLK/15.2A
- SD-CD/15.2B
- SD-VDD/15.2A
- SD-DAT0/15.2B
- SD-DAT1/15.2B
- SD-DAT2/15.2A
- SD-DAT3/15.2A
- VIB+/15.1D
- VIB-/15.1D
- 3V3/19.1D
- 2V5/13.3B
- 1V8/19.1D
- VBUS/18.1C
- OTG-D-/3.1B
- OTG-D+/3.1B
- OTG-ID/2.2B
- VBUS-MODEM/6.3B
- USB-WWAN-D+/18.3A
- USB-WWAN-D-/18.3A
- 2V7/8.4C
- GPIO-CAM-COVER/15.1B
- N\$38
- LOCK-GPIO/1.2A
- POWERON/1.3A
- GPIO-VOL+/1.2B
- GPIO-VOL-/1.2B
- CAM1-GPIO/1.3B
- CAM2-GPIO/1.3C
- I2C3-SDA/10.4C
- I2C3-SCL/10.4C
- CHG\_IND/3.1B
- N\$131/3.1C
- N\$141/3.1C
- N\$143/3.1C
- BATTEMP/5.4A
- GPIO-EN-MODEM/4.1A
- I2C2-SDA/15.1A
- I2C2-SCL/15.1A
- INA231-INT/4.4C
- HDQ/5.2A
- GPIO\$70/8.3B
- GPIO\$110/8.1D
- N\$19/8.2D
- N\$229/8.3C
- ADC\$114/8.1C
- ADC1/8.4C
- ADC2/8.4C
- GPIO-COMPARATOR/8.4D
- MCBSP4-DR/6.2A
- MCBSP4-DX/6.2A
- MCBSP4-CLKX/6.2A
- MCBSP4-FSX/6.2A
- UART?-RIS/6.2C
- UART?-CTS/6.2C
- UART?-RX/6.2C
- UART?-TX/6.2C
- UART?-RING/6.2C
- GPIO-MODEM-IGT/6.3A
- EMERG\_OFF/6.3B
- PWR\_IND/6.3B
- LC\_IND/6.3B
- STATUS/6.3B
- 3G-WOE/6.3B
- GPIO\$52/8.4A
- GPIO-WLAN-EN/9.1A
- MMC3-CLK/9.1A
- MMC3-CMD/9.1A
- MMC3-DATA0/9.1A

Pin assignment musr.be optimized for final component placement we might have to switch to 80 or 100 pin connectors





**TODO: use TMD26713**

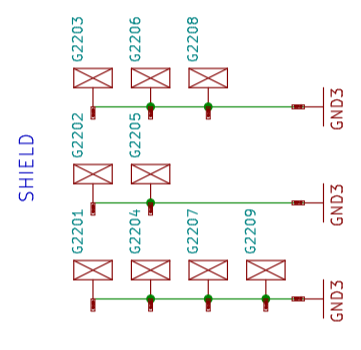
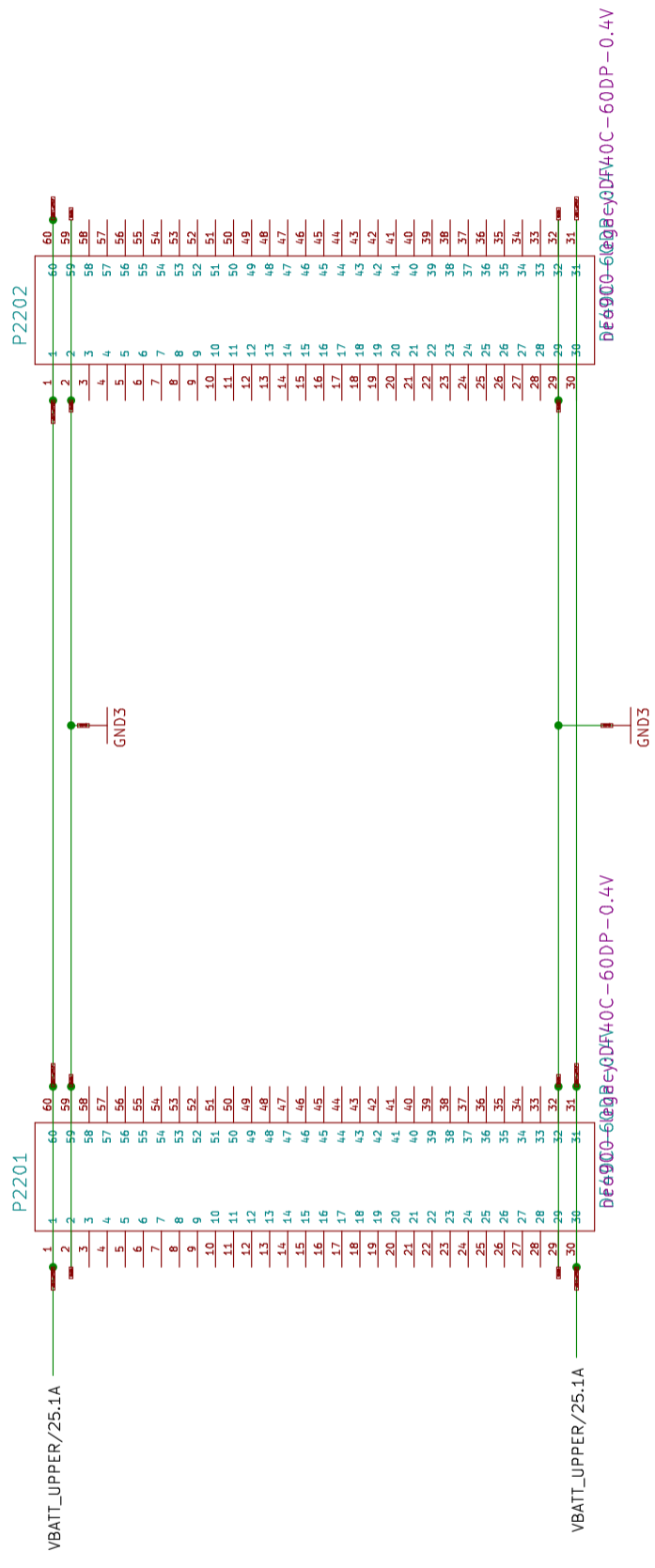
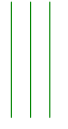


**TODO: wrong LEDs**

**TODO: flash controller is now on LOWER, not BOB**

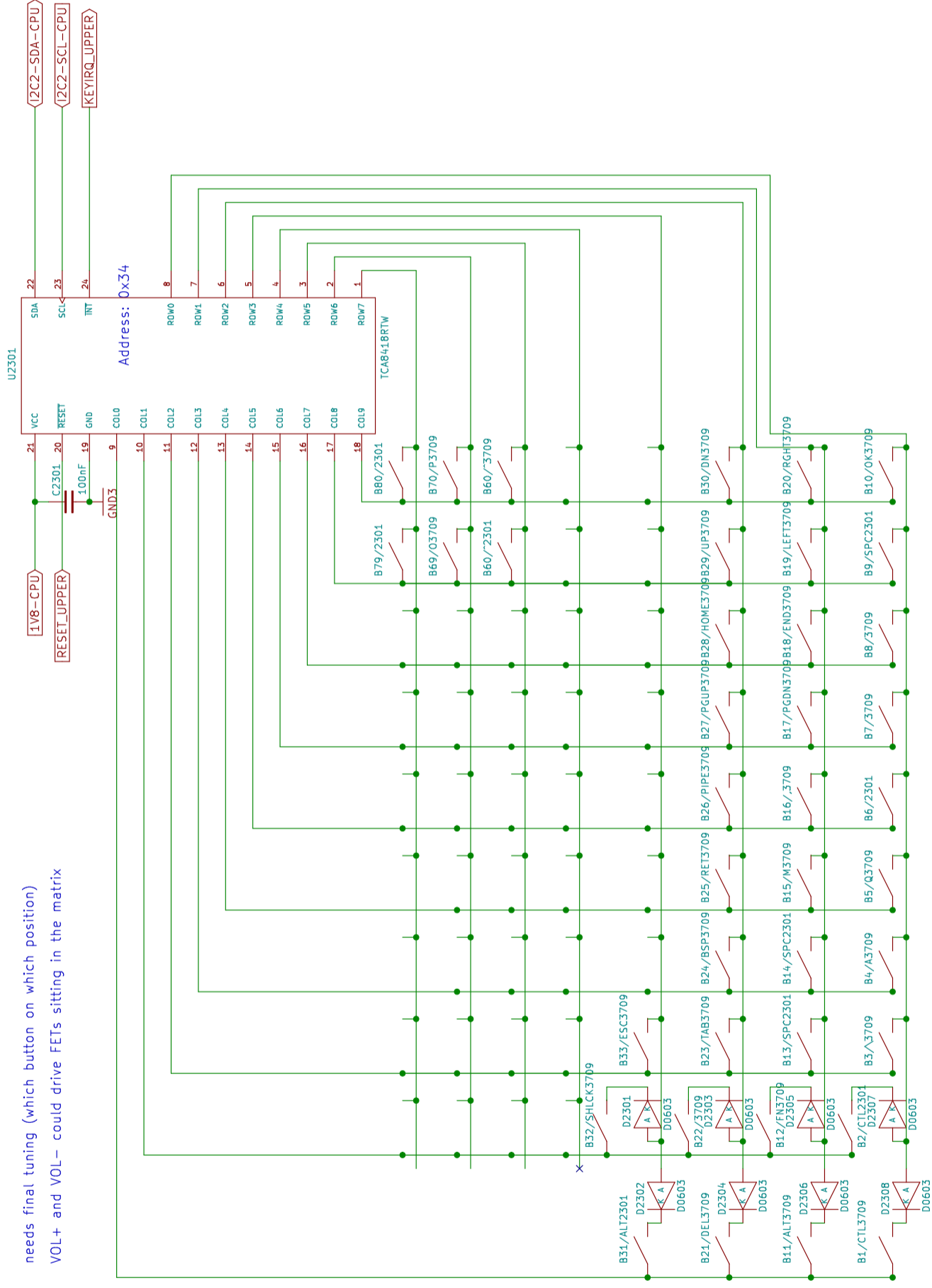
# TODO: track B2B to UPPER

to be adjusted to lower board connector

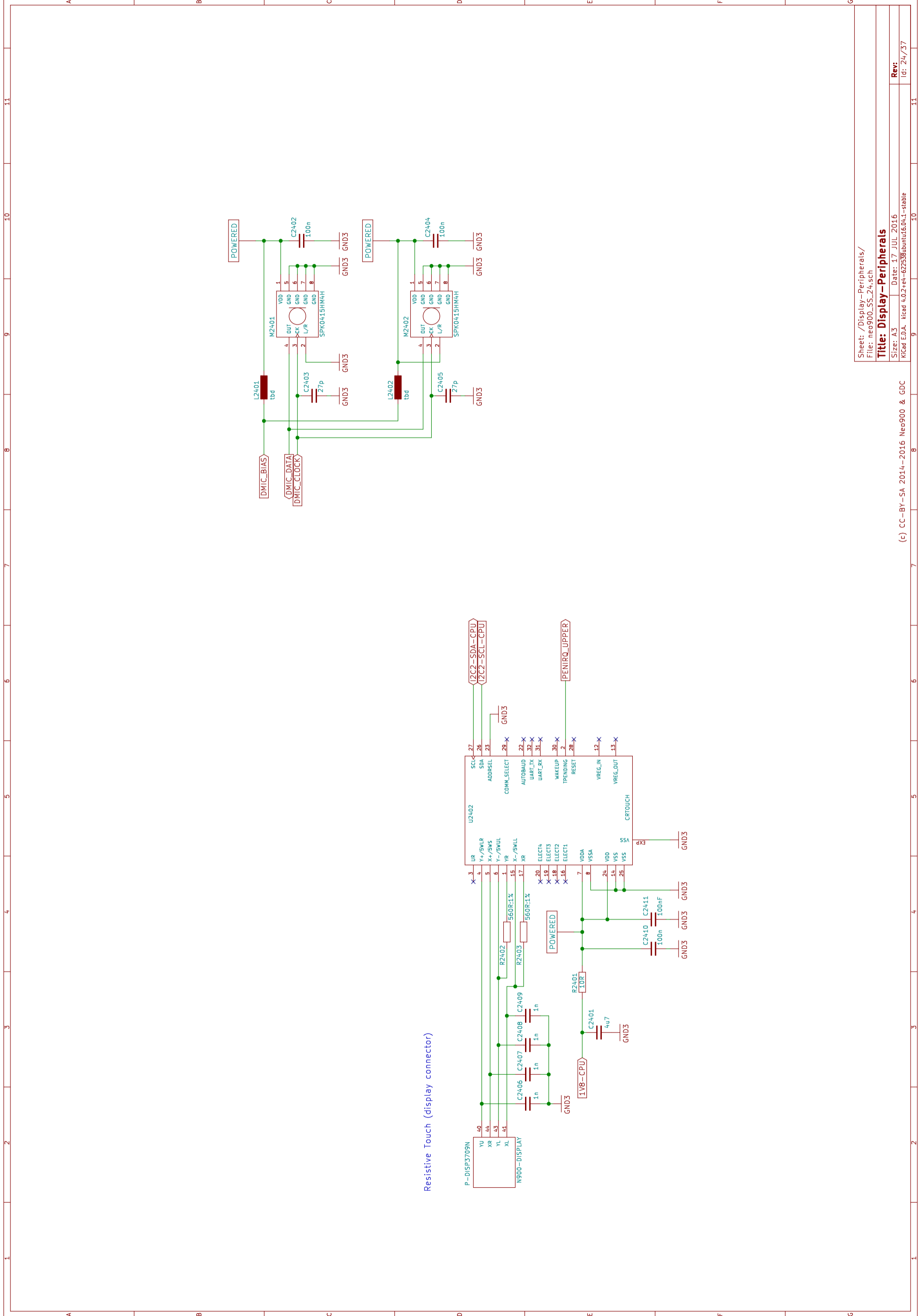


# TODO: \*\_UPPER names ?

needs final tuning (which button on which position)  
 VOL+ and VOL- could drive FETs sitting in the matrix



- TODO: remove 3709 in comp ref**
- TODO: remove keycap from comp ref**
- TODO: sort out 6 "ext" buttons**
- TODO: rearrange matrix to avoid diodes ?**

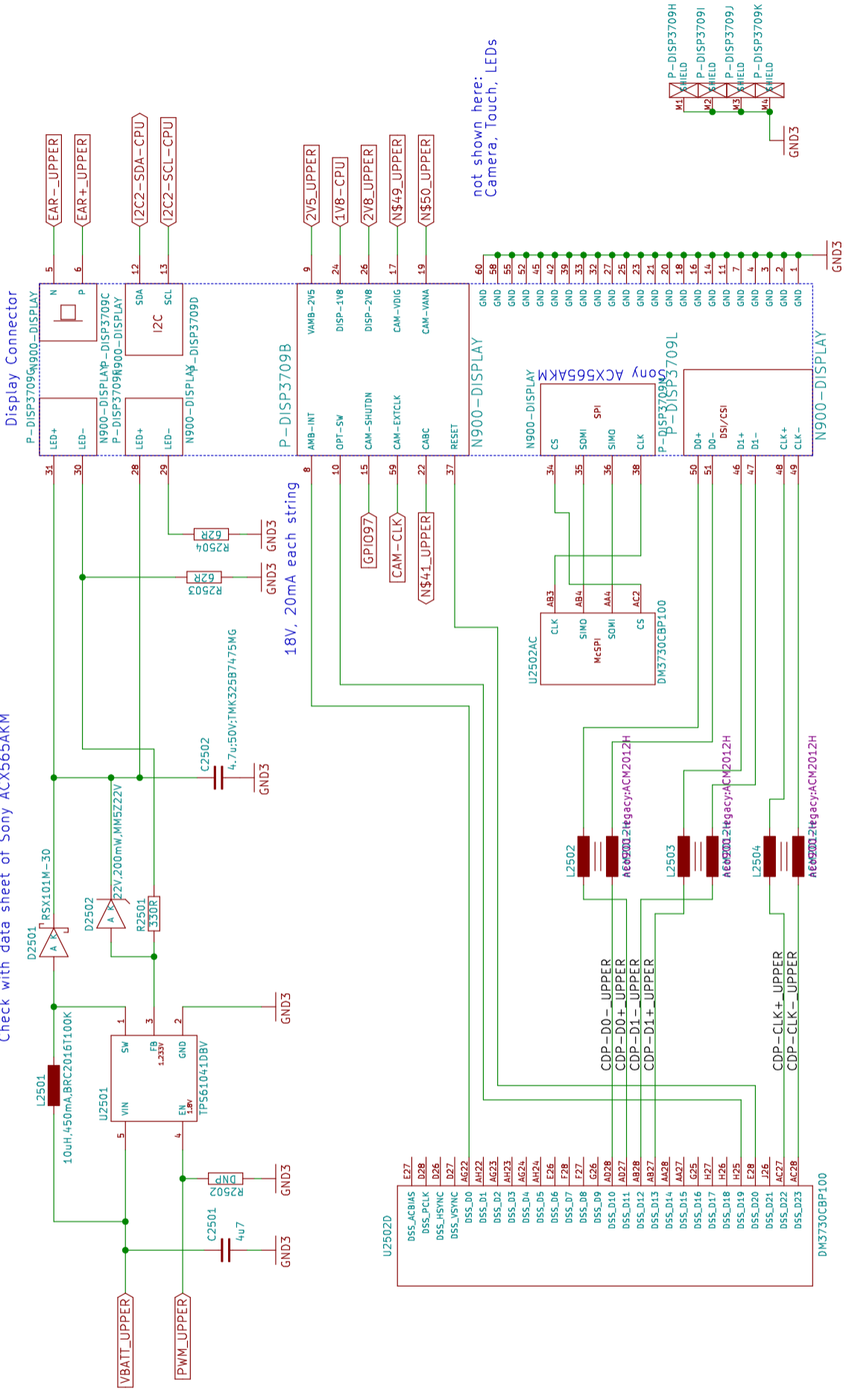


Resistive Touch (display connector)



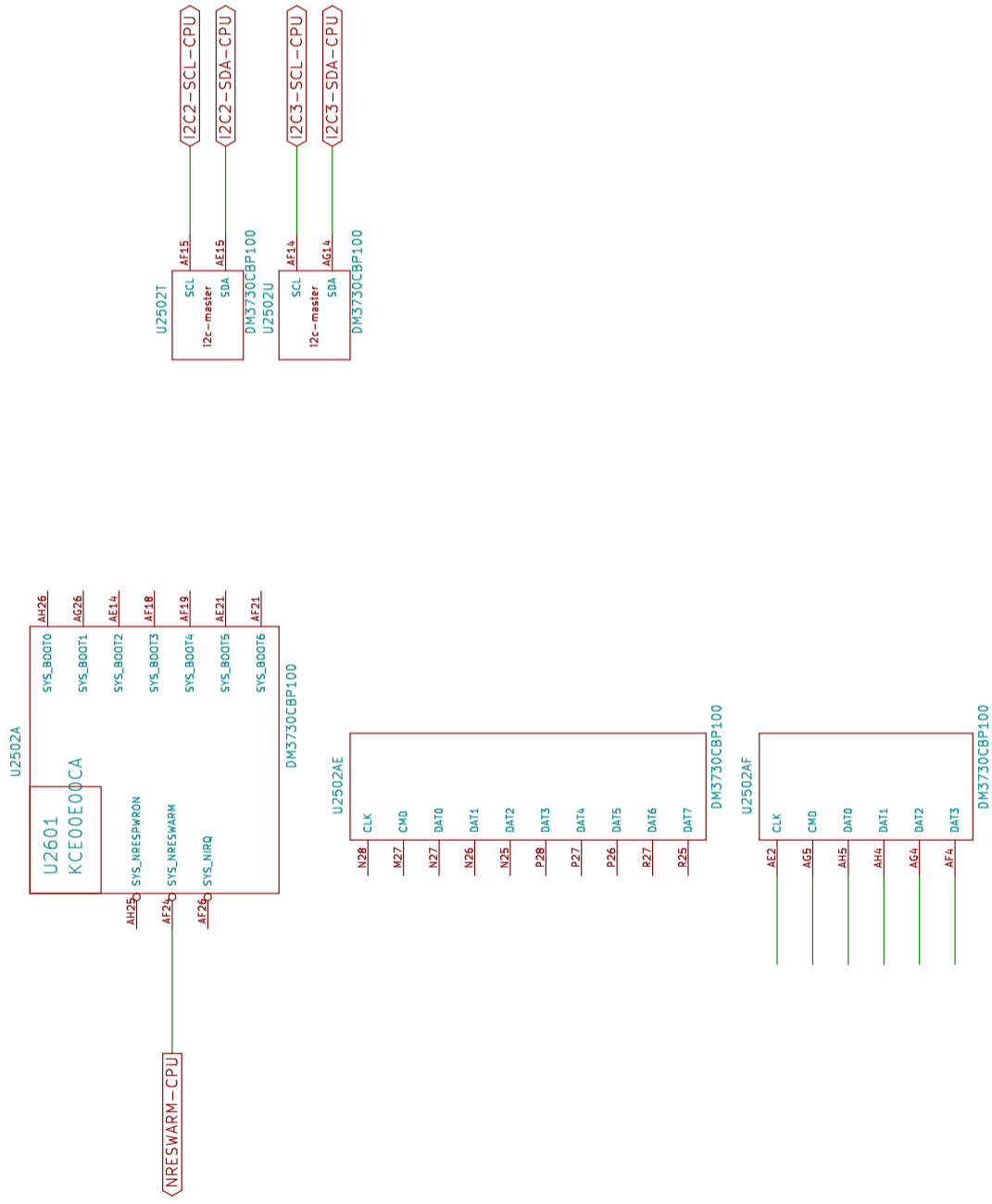
# TODO: connector pin assignment needs intensive review

Adjust sense resistor+Z-Diode to voltage&current  
Check with data sheet of Sony ACX565AKM

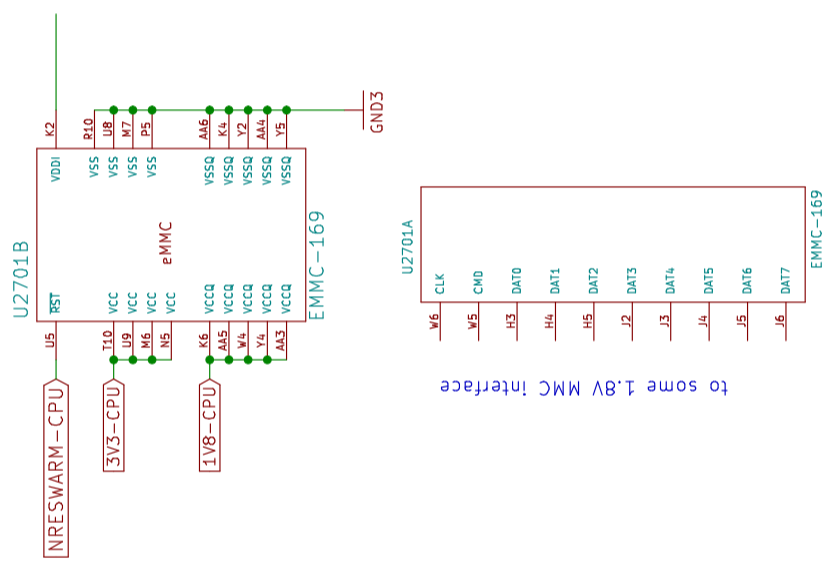


not shown here:  
Camera, Touch, LEDs

INCOMPLETE in V2



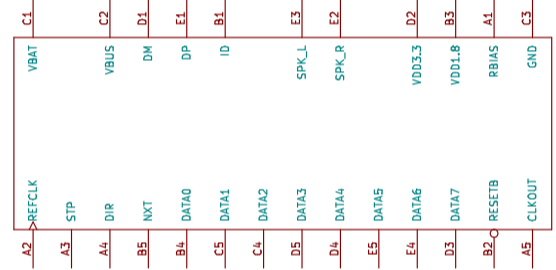
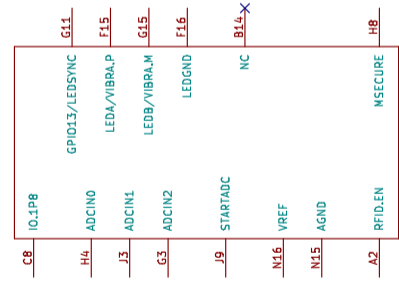
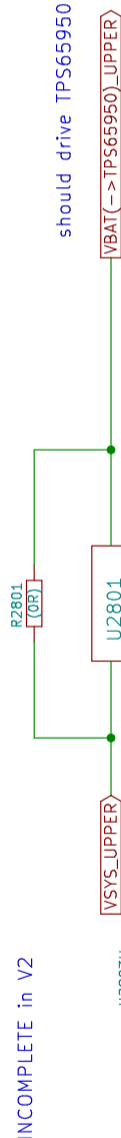
INCOMPLETE in V2



to some 1.8V MMC interface

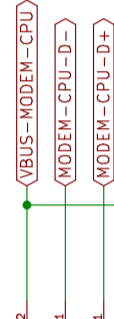
# TODO: check role

INCOMPLETE in V2

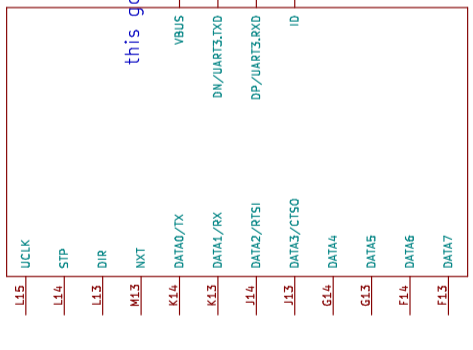


this goes through B2B to modem

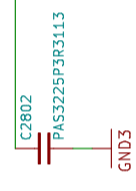
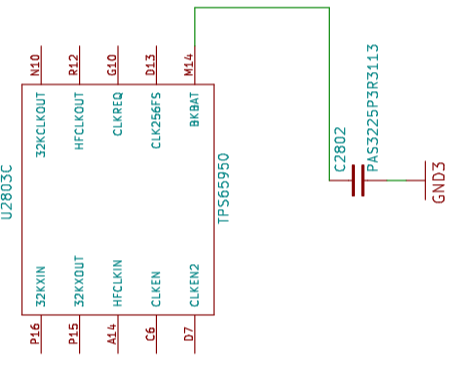
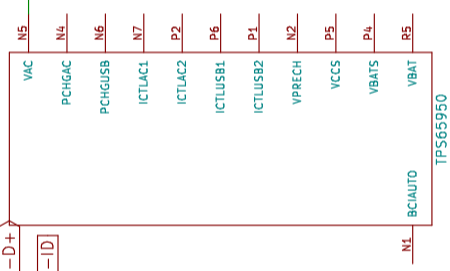
# TODO: VBUS-MODEM ?

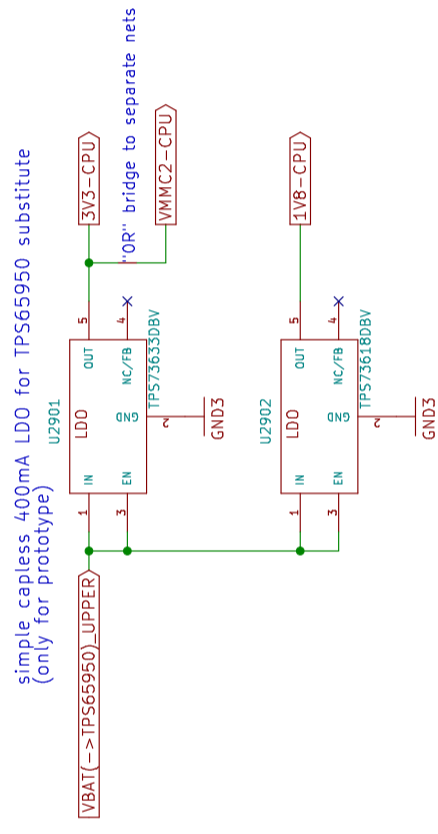


needs a small charge pump to generate 5V 50mA.

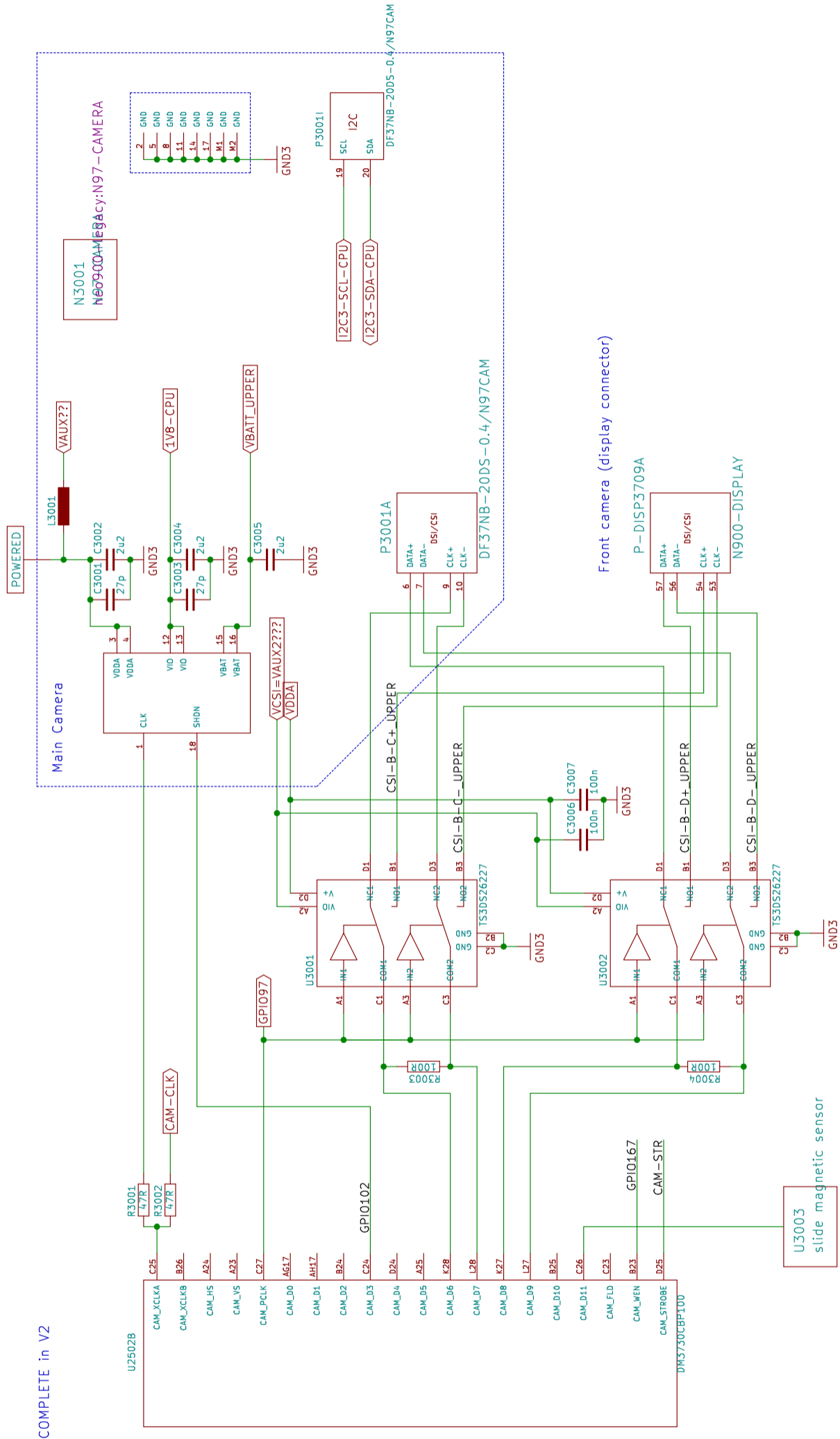


this goes through B2B to OTG socket

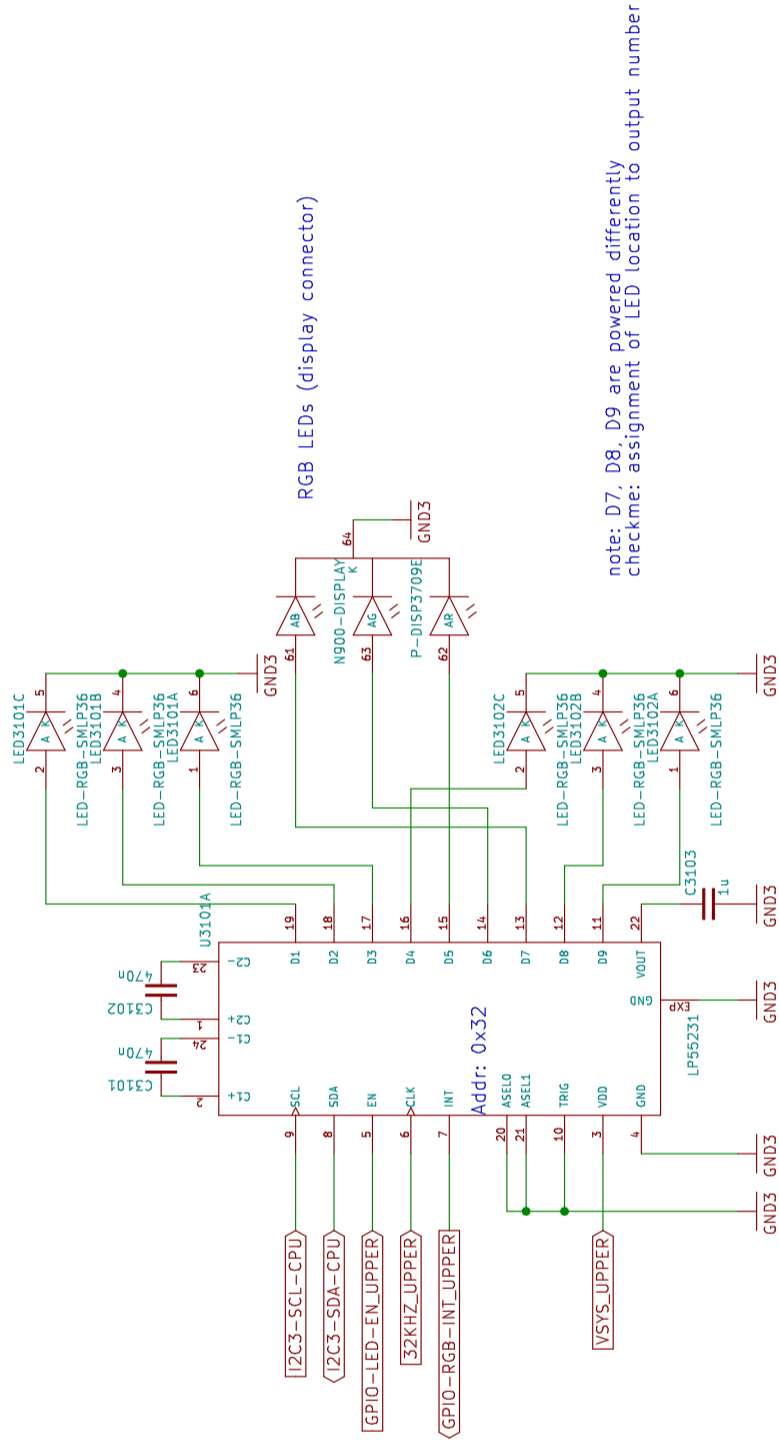




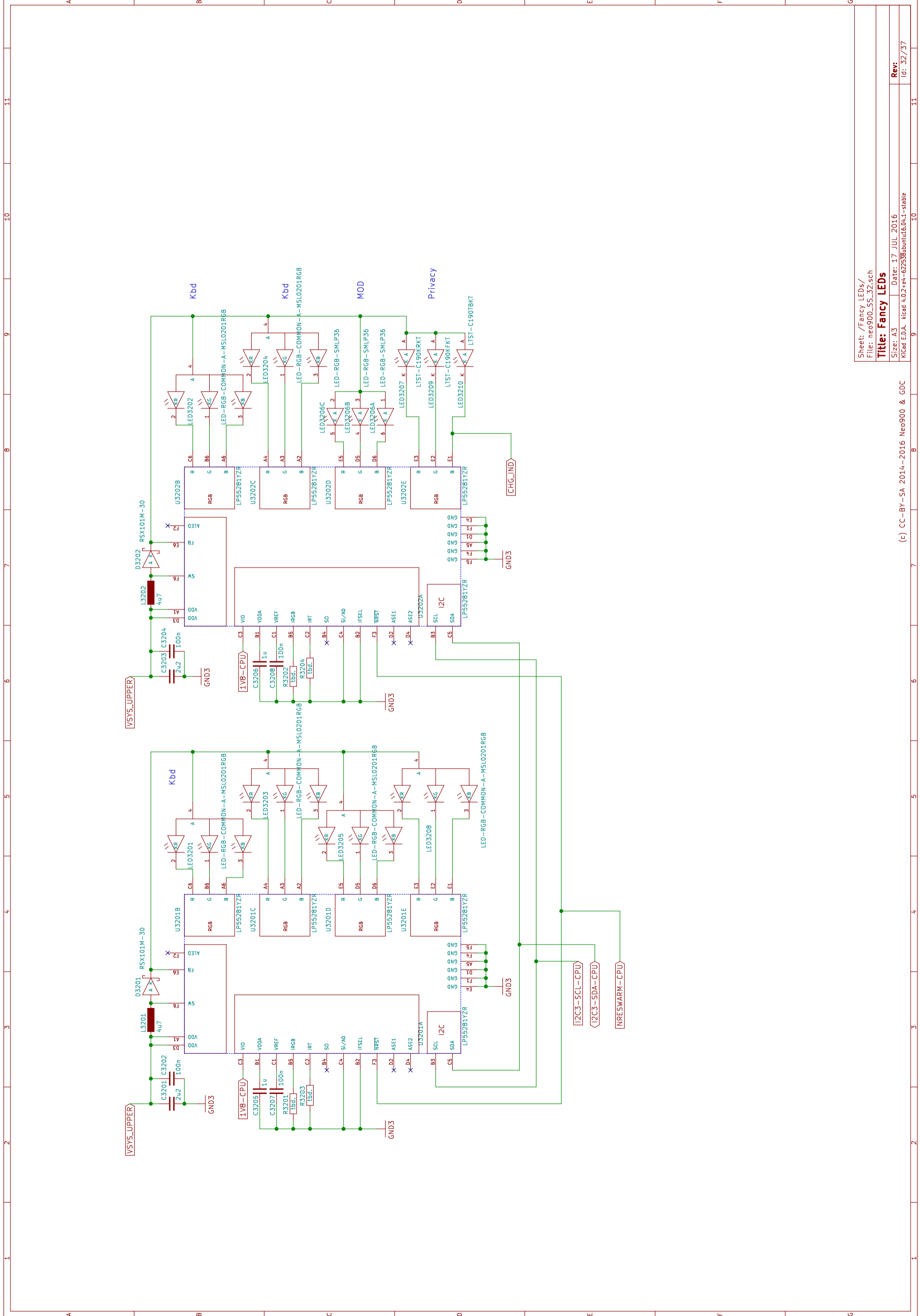
INCOMPLETE in V2



AUX and Display LEDs



note: D7, D8, D9 are powered differently  
 checkme: assignment of LED location to output number

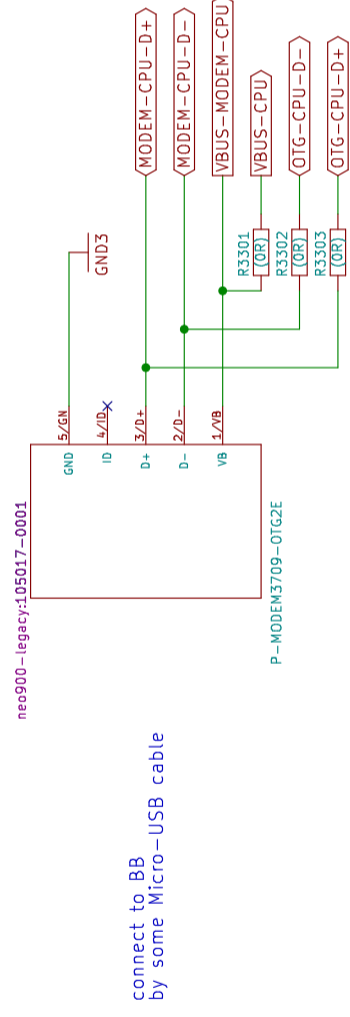
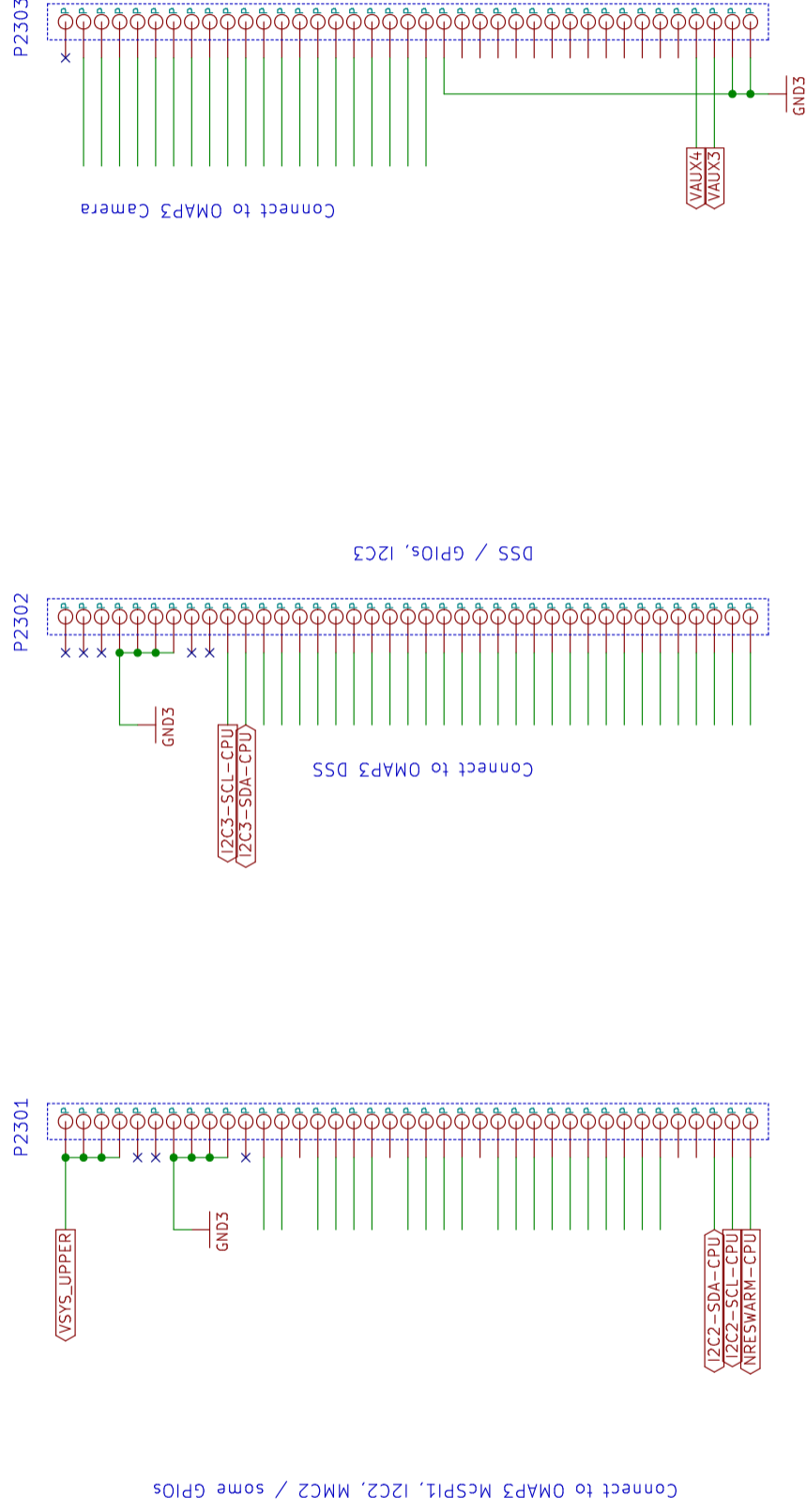




These connectors allow to "emulate" the DM3730 by connecting a BB-XM

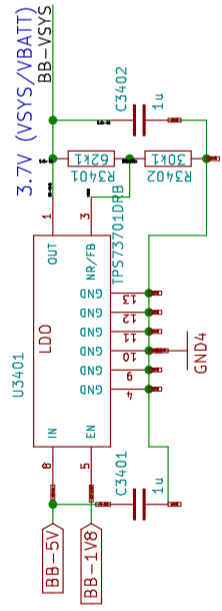
INCOMPLETE  
prototype only

connect to respective CPU-pads

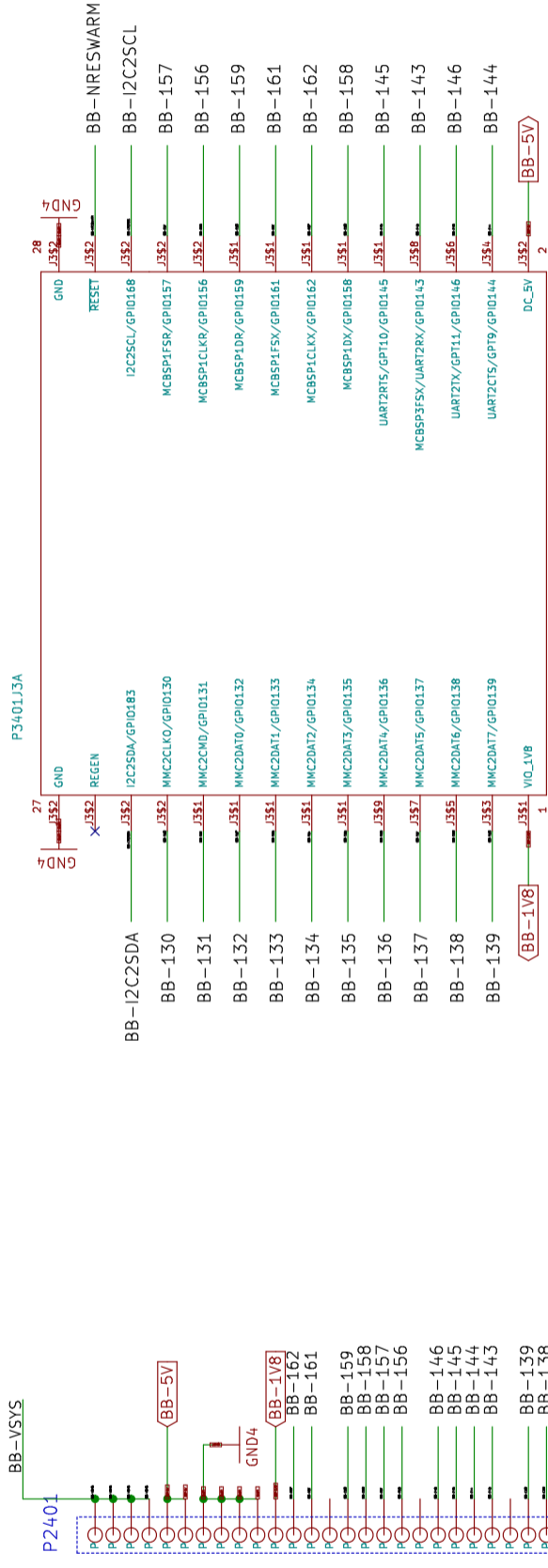


connect to BB  
by some Micro-USB cable

## TODO: VBUS-MODEM ?



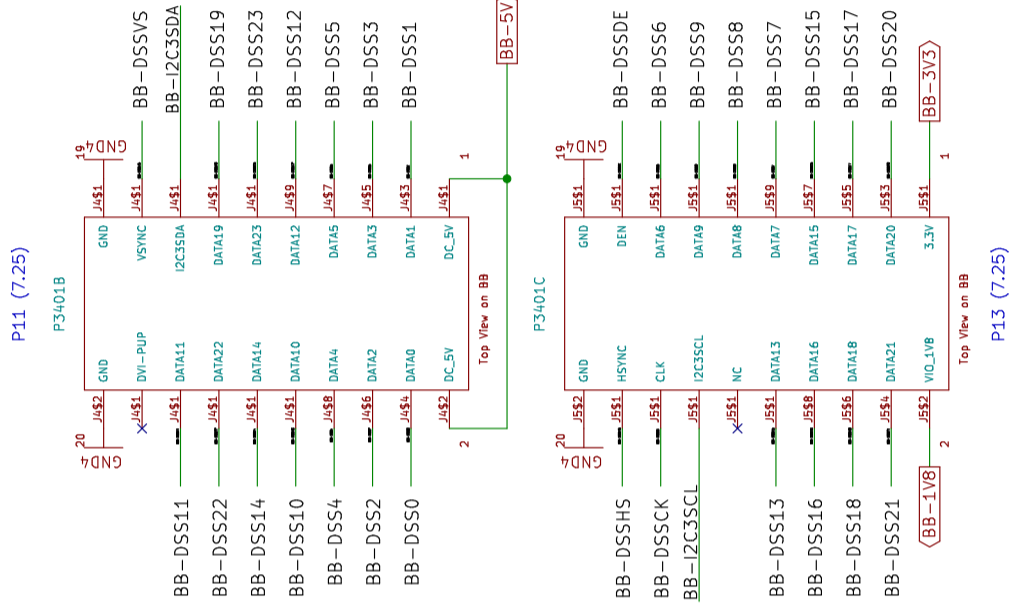
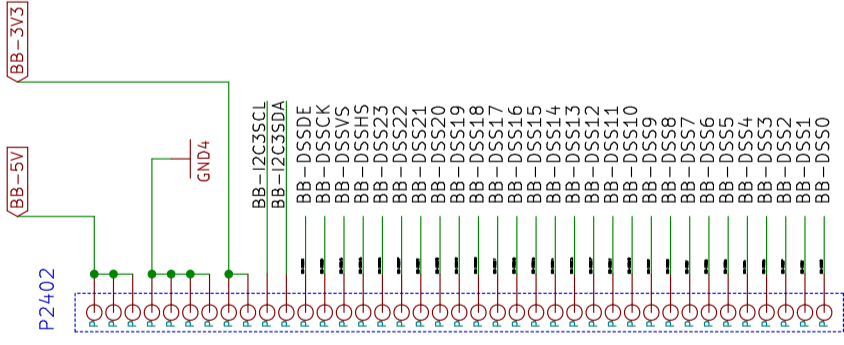
Ersetzen durch 2A buck converter



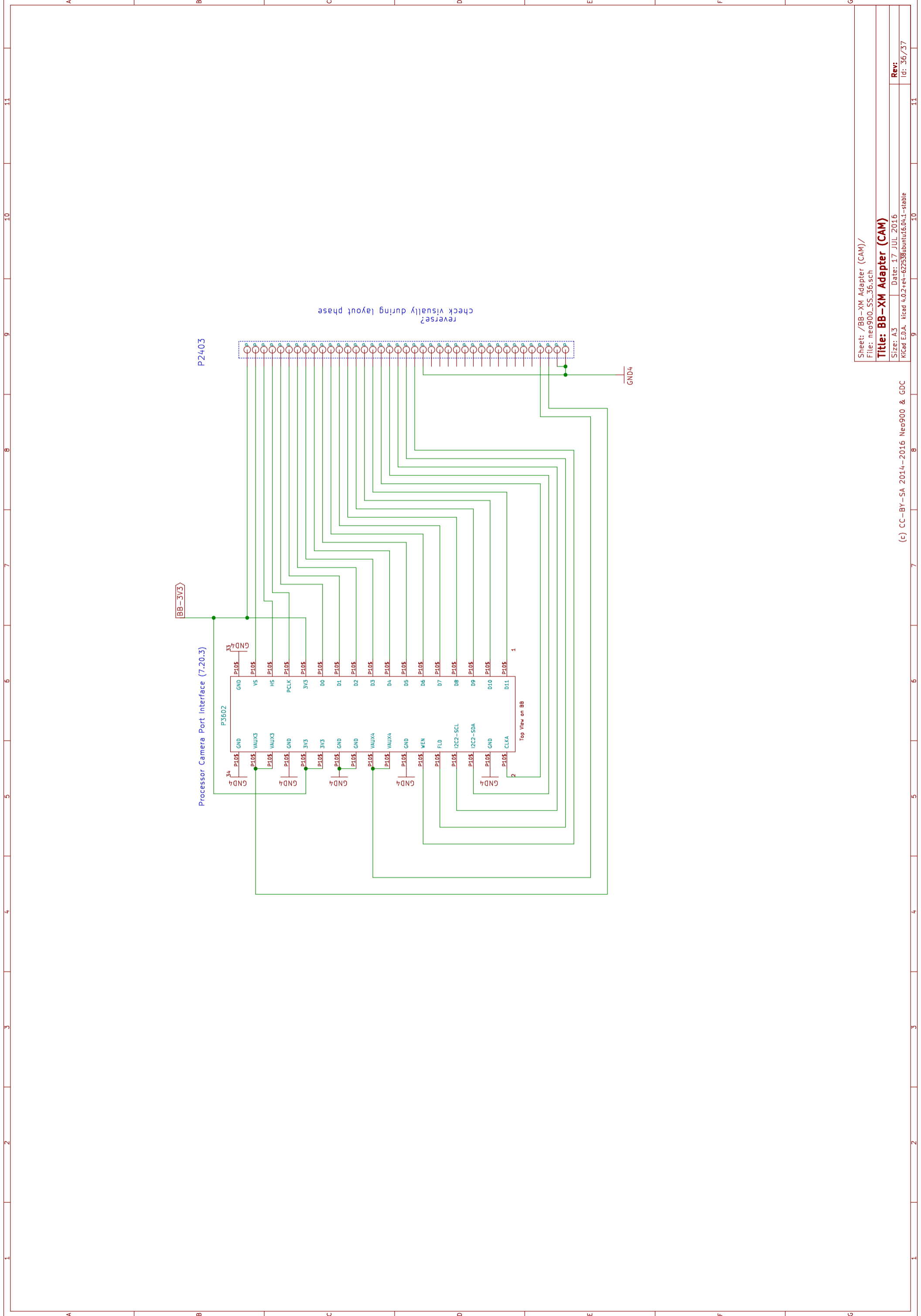
BB-xM Main Expansion Header (7.24)

BB-12C2SDA  
BB-12C2SCL  
BB-NRESWARM

**TODO: needs decision on where to take this**



**TODO: needs decision on where to take this**



Molex Jumper cables to connect BB-XM-Adapter to Uppwer board

N3701  
15015-0439

CPU

N3702  
15015-0439

DISP

N3703  
15015-0439

CAM

N3704  
N900 case assembly

N3705  
N97-CAMERA-HOLE

N3706  
headset jack

N3707  
STENCIL-TOP

N3708  
STENCIL-BOTTOM