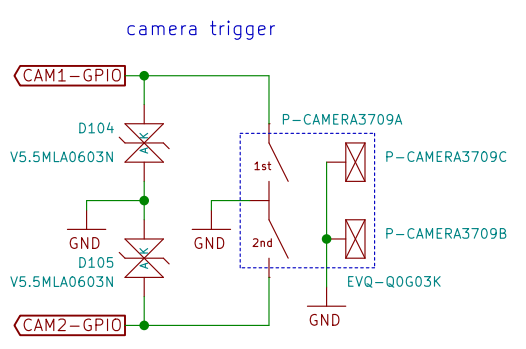
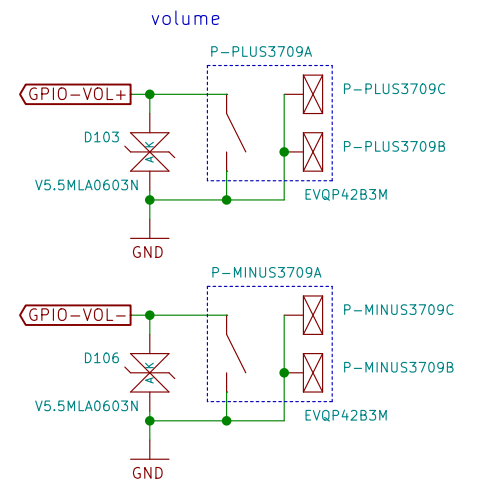
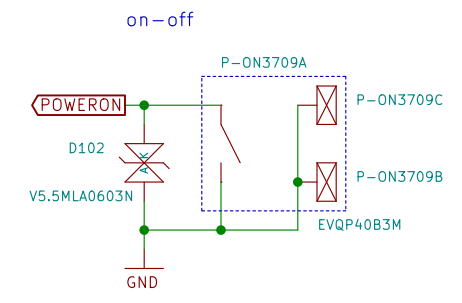
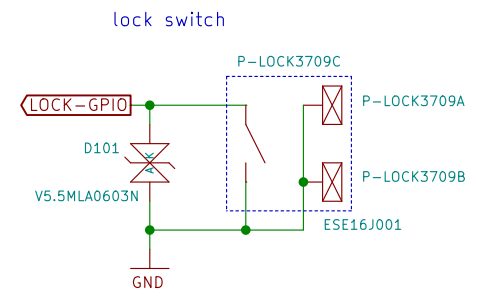


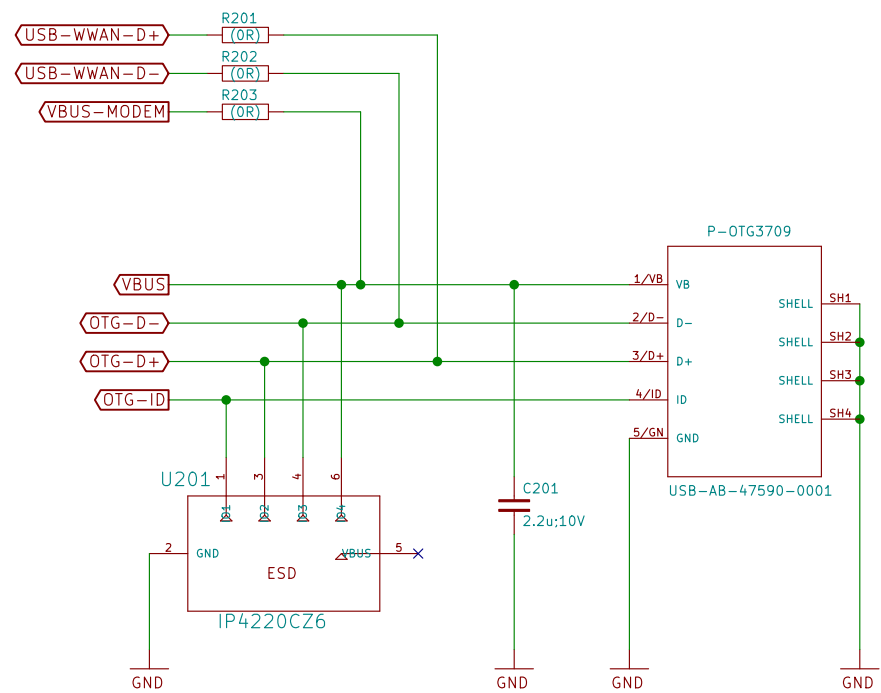
|   |                   |                  |  |
|---|-------------------|------------------|--|
| Sheet: /  |                   | File: neo900.sch |  |
| <b>Title: Neo900</b>  |                   |                  |  |
| Size: A3  | Date: 16 JUL 2016 | Rev:             |  |
| KiCad E.D.A. eschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 1/38         |  |



place in scan matrix? would need 3-4 wires to UPPER board instead of 2  
 No. VOL+ or VOL- can either be connected to GPIOs  
 or drive two FETs that sit in the keyboard matrix  
 in any case it is sufficient to connect GPIO-VOL+ and VOL- to two pins on the B2B connector

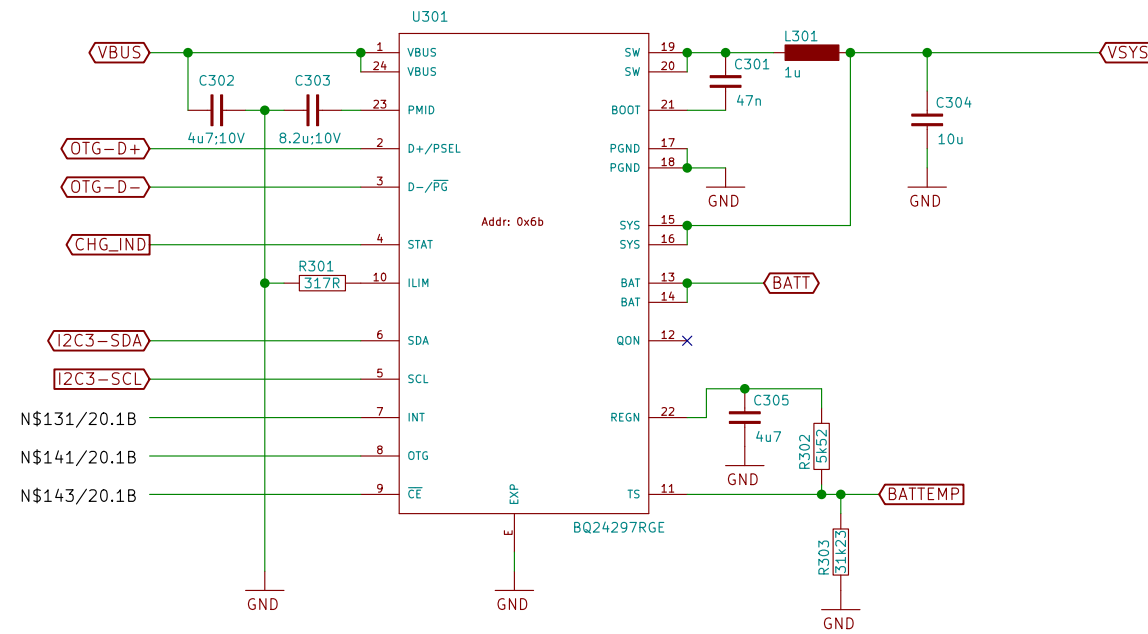
|  |                   |          |
|--|-------------------|----------|
| Sheet: /Buttons/<br>File: neo900_SS_1.sch                                  |                   |          |
| <b>Title: Buttons</b>  |                   |          |
| Size: A3   | Date: 16 JUL 2016 | Rev:     |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 2/38 |

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

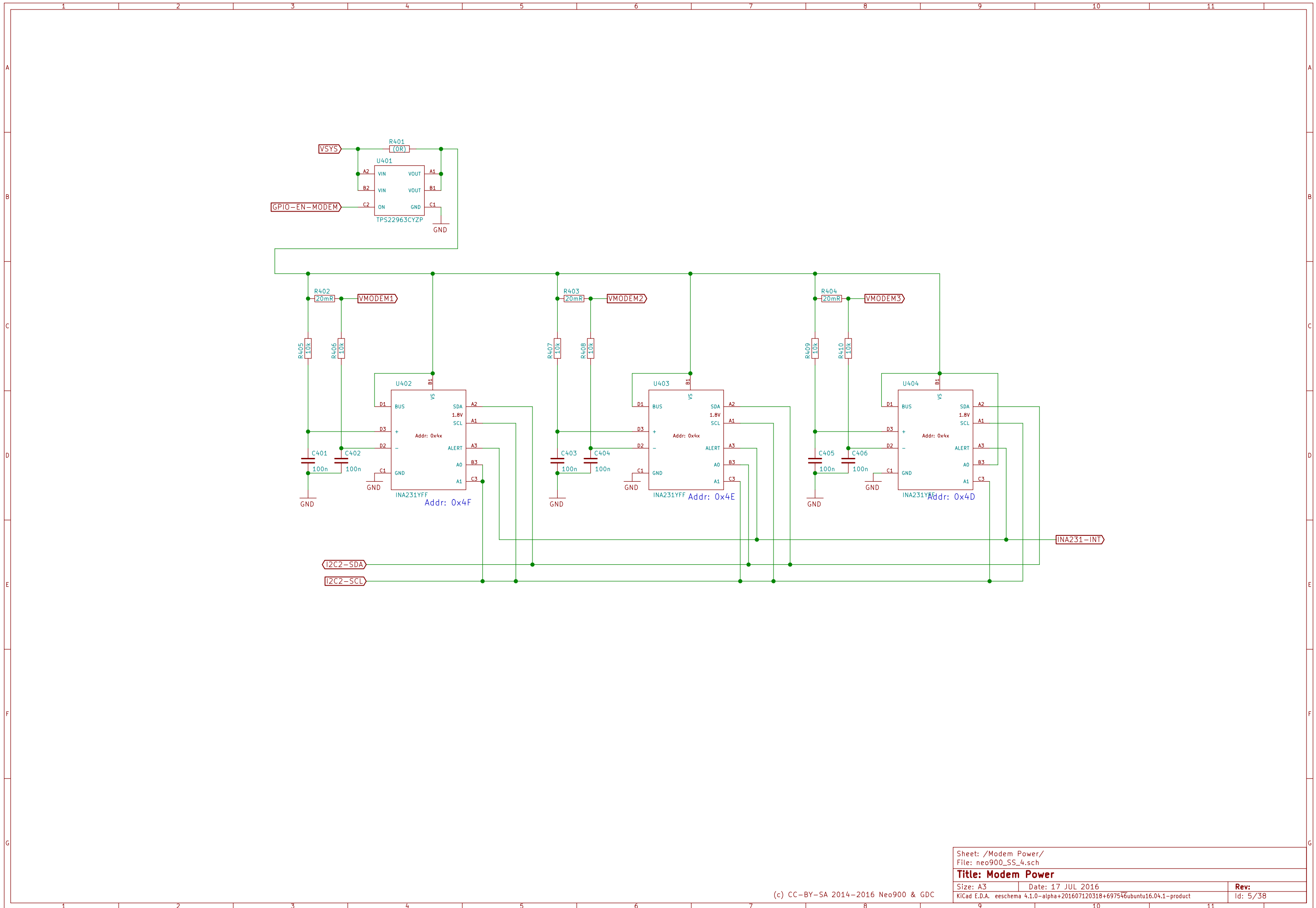


|  |                   |          |
|--|-------------------|----------|
| Sheet: /OTG/<br>File: neo900_SS_2.sch                                      |                   |          |
| <b>Title: OTG</b>  |                   |          |
| Size: A3   | Date: 17 JUL 2016 | Rev:     |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 3/38 |

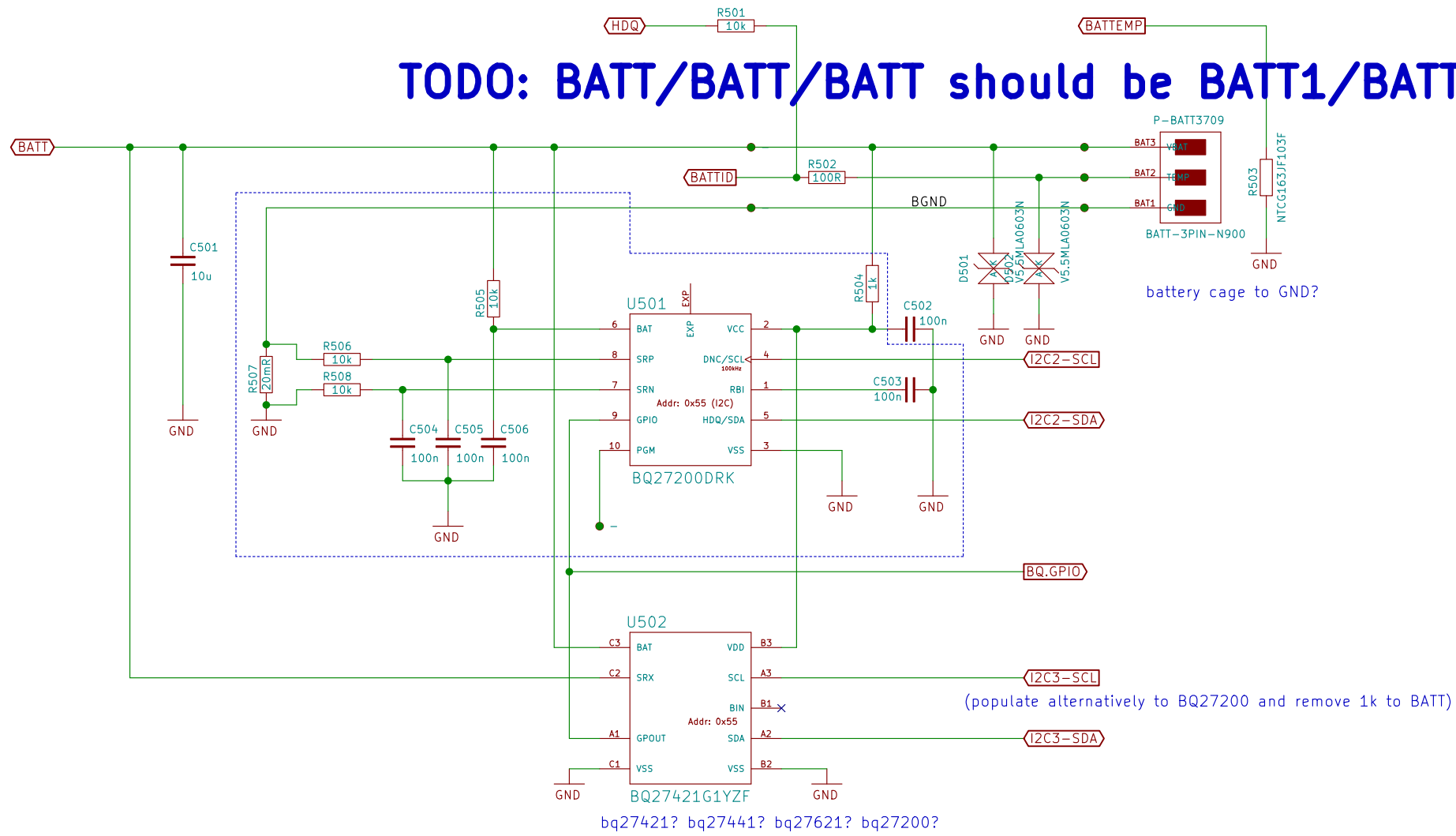
TODO



|   |                   |          |
|---|-------------------|----------|
| Sheet: /Charger/OTG-Booster/<br>File: neo900_SS_3.sch                     |                   |          |
| <b>Title: Charger/OTG-Booster</b>   |                   |          |
| Size: A3  | Date: 17 JUL 2016 | Rev:     |
| KiCad E.D.A. eschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 4/38 |



|  |                   |          |
|--|-------------------|----------|
| Sheet: /Modem Power/<br>File: neo900_SS_4.sch                              |                   |          |
| <b>Title: Modem Power</b>  |                   |          |
| Size: A3   | Date: 17 JUL 2016 | Rev:     |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 5/38 |



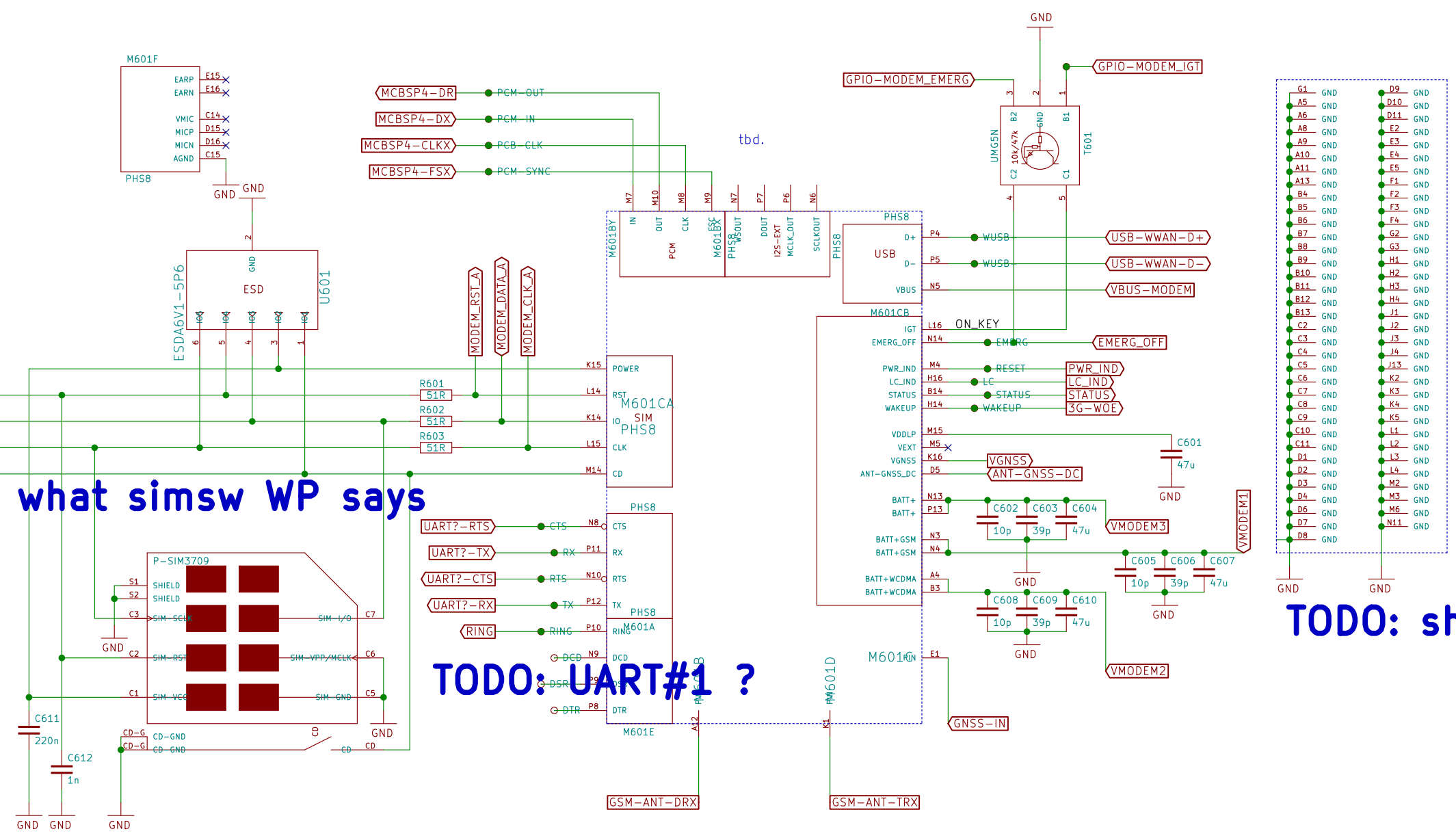
|  |                   |          |
|--|-------------------|----------|
| Sheet: /Fuel Gauge/<br>File: neo900_SS_5.sch                               |                   |          |
| <b>Title: Fuel Gauge</b>   |                   |          |
| Size: A3   | Date: 17 JUL 2016 | Rev:     |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 6/38 |

TODO: do what simsw WP says

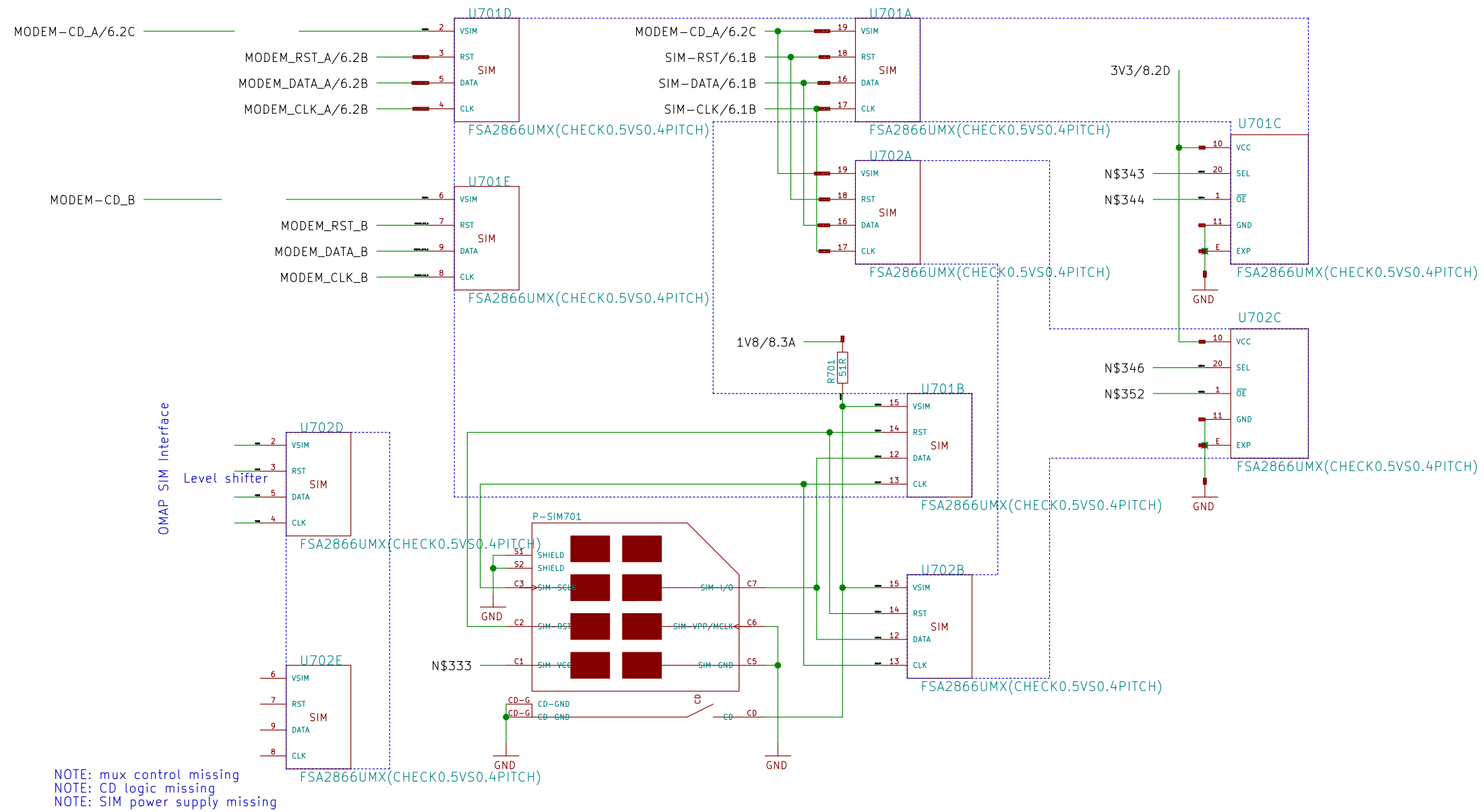
TODO: UART#1 ?

TODO: shield connection near

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



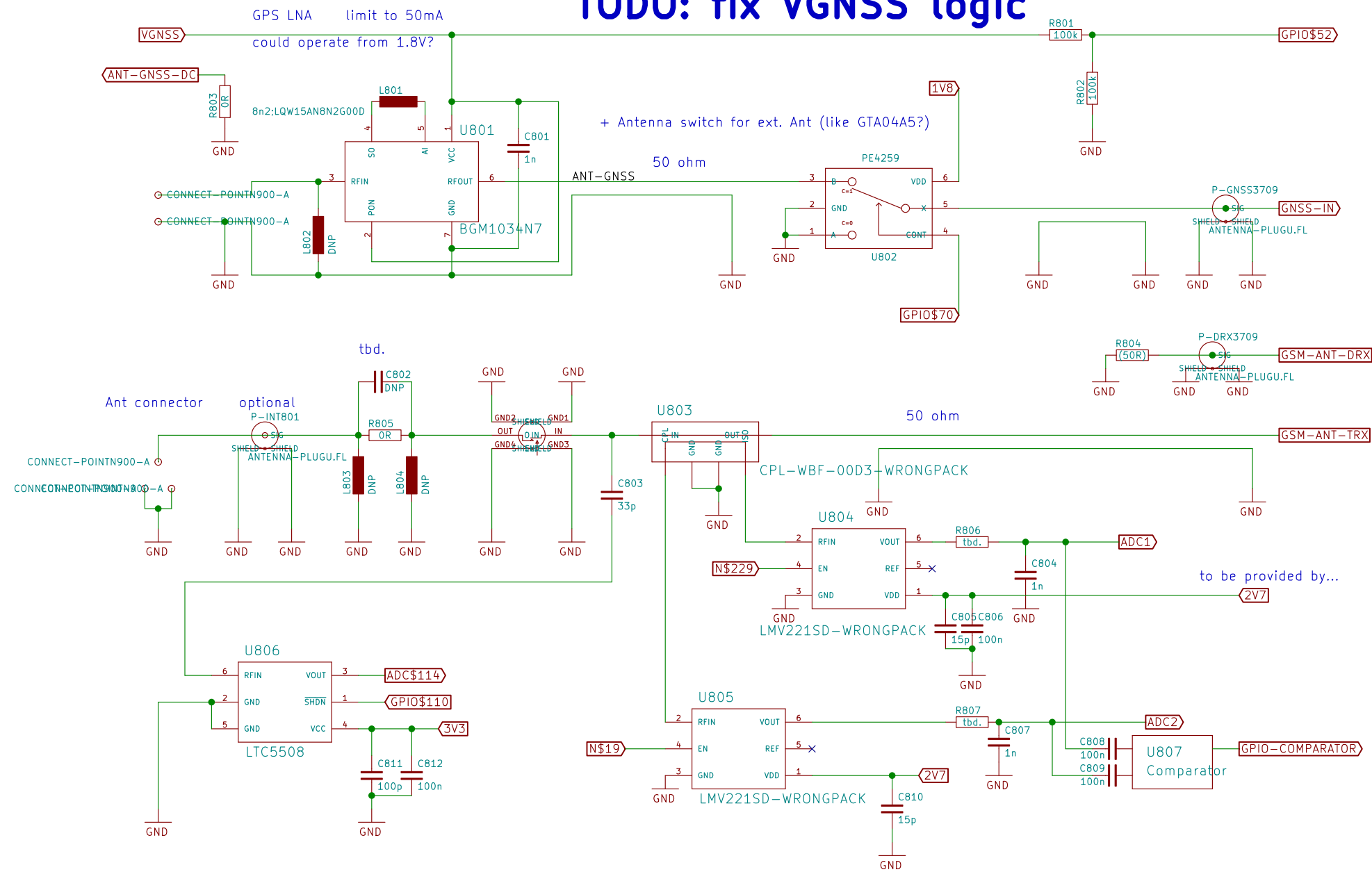
**TODO: not cleaned up – needs total rewrite**



|  |                   |          |
|--|-------------------|----------|
| Sheet: /Dual SIM switch/<br>File: neo900_SS_7.sch                          |                   |          |
| <b>Title: Dual SIM switch</b>  |                   |          |
| Size: A3   | Date: 17 JUL 2016 | Rev:     |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 8/38 |

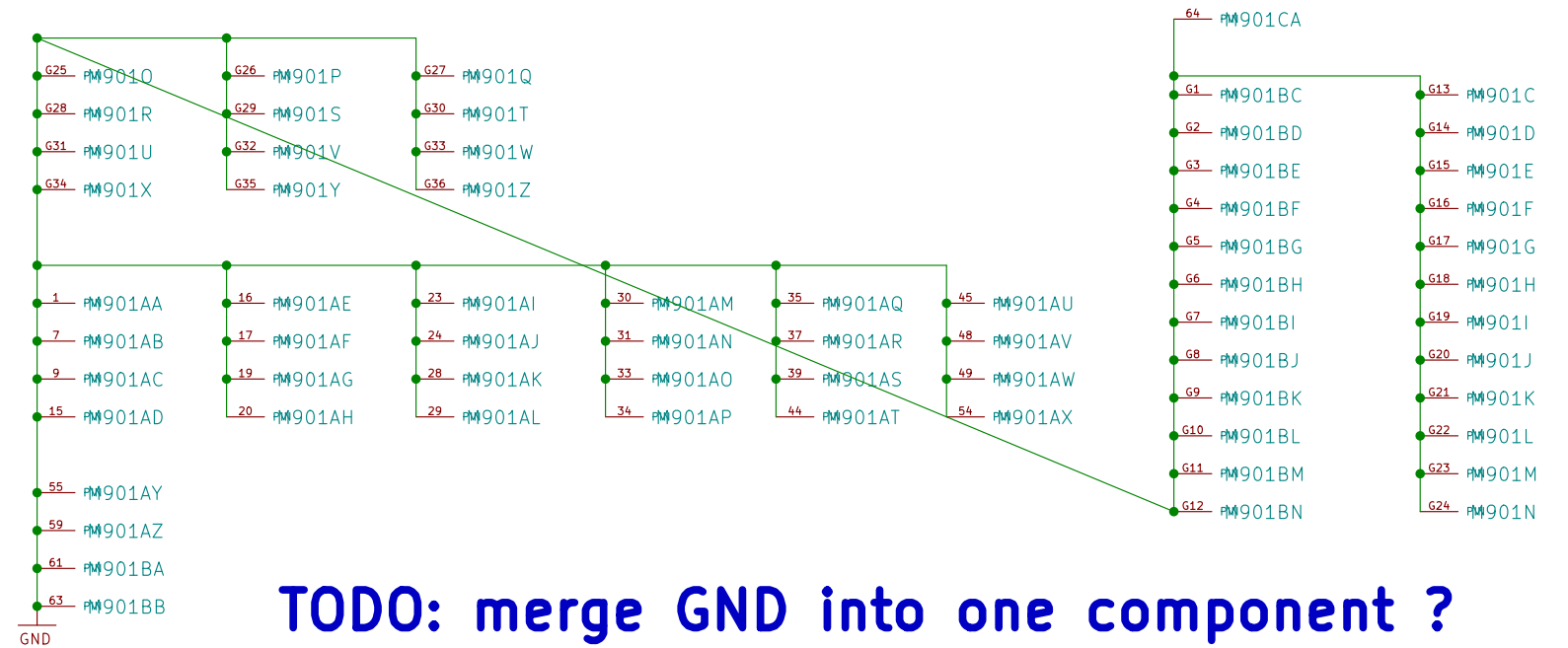
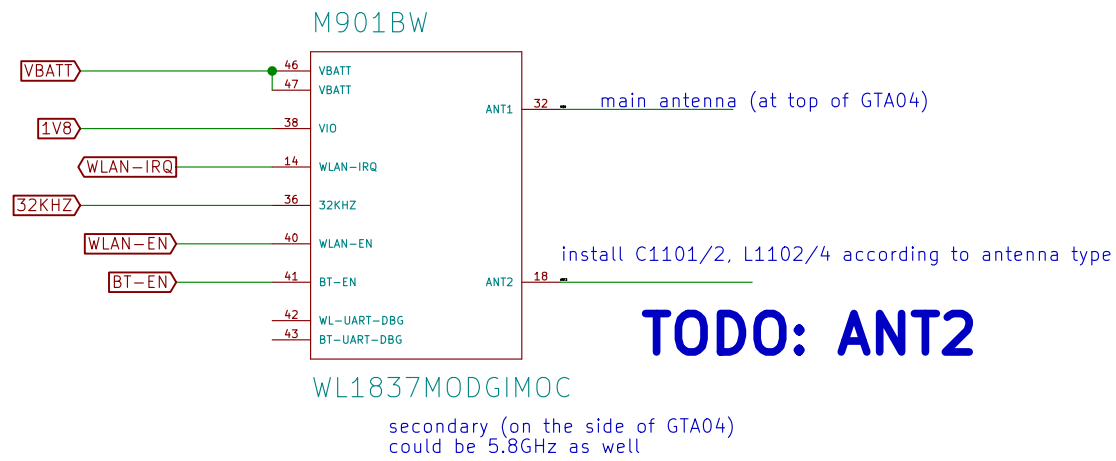


TODO: fix VGNSS logic

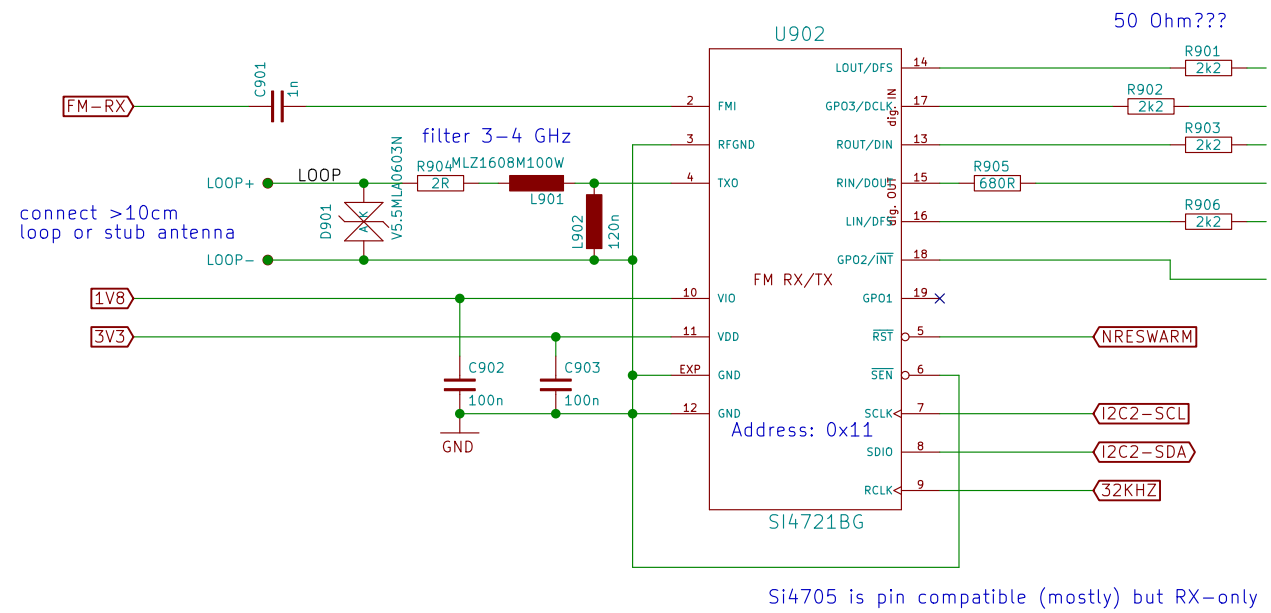
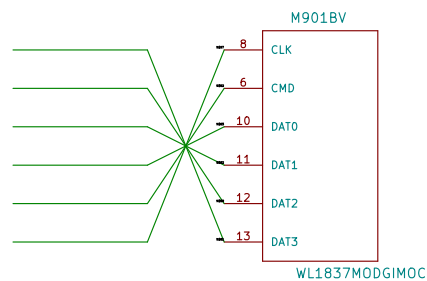
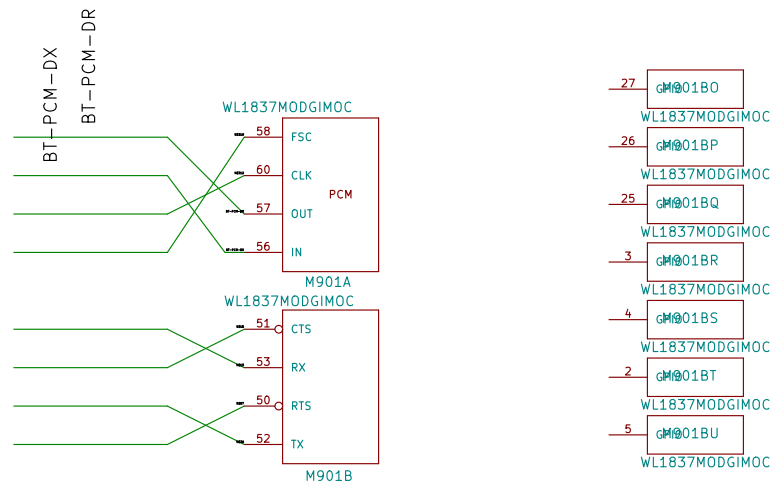


TODO: name all the \*\$\*

|  |                   |          |
|--|-------------------|----------|
| Sheet: /Antenna connections/<br>File: neo900_SS_8.sch                      |                   |          |
| <b>Title: Antenna connections</b>  |                   |          |
| Size: A3   | Date: 17 JUL 2016 | Rev:     |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 9/38 |

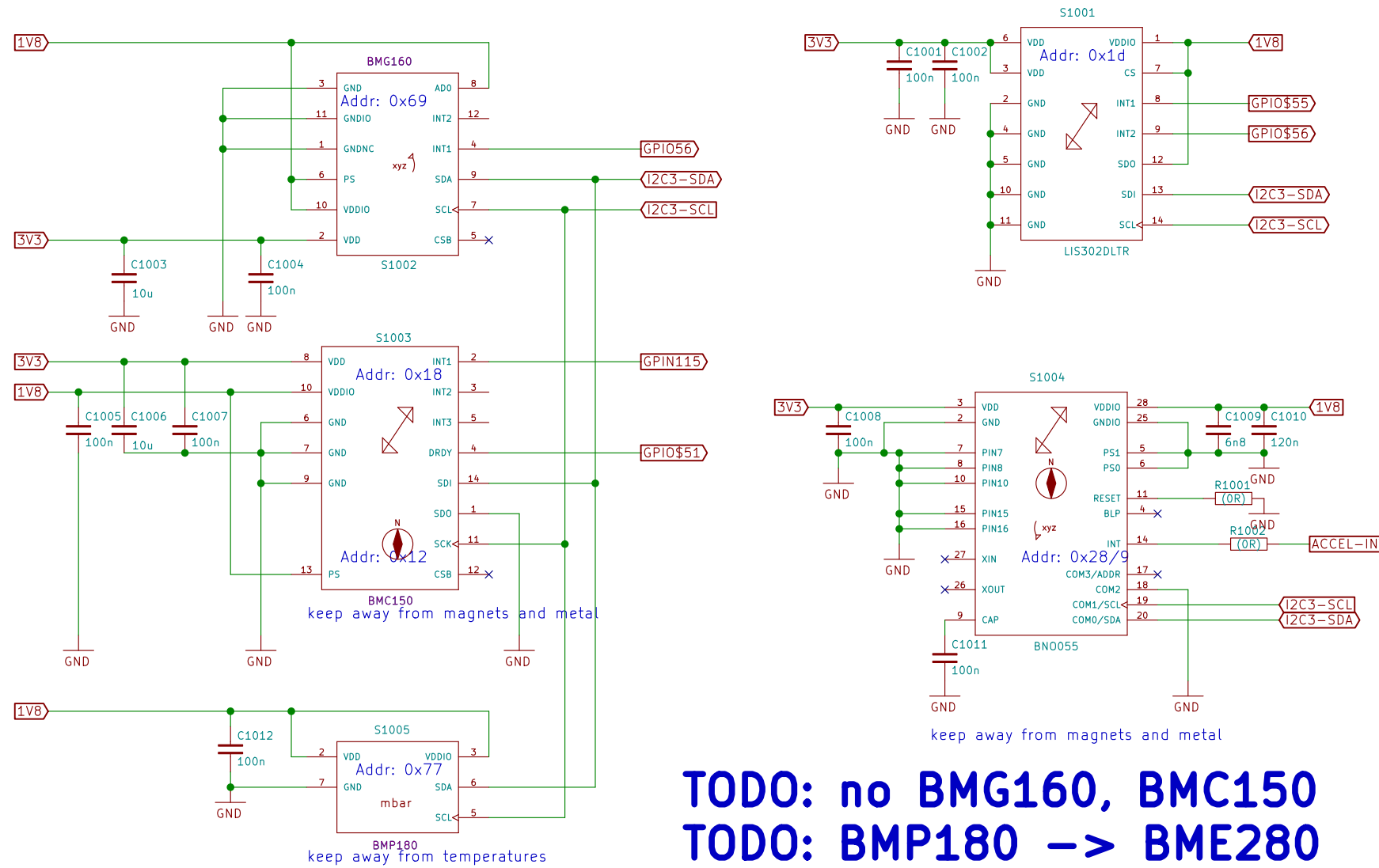


**TODO: unfinished**



**TODO: unfinished**

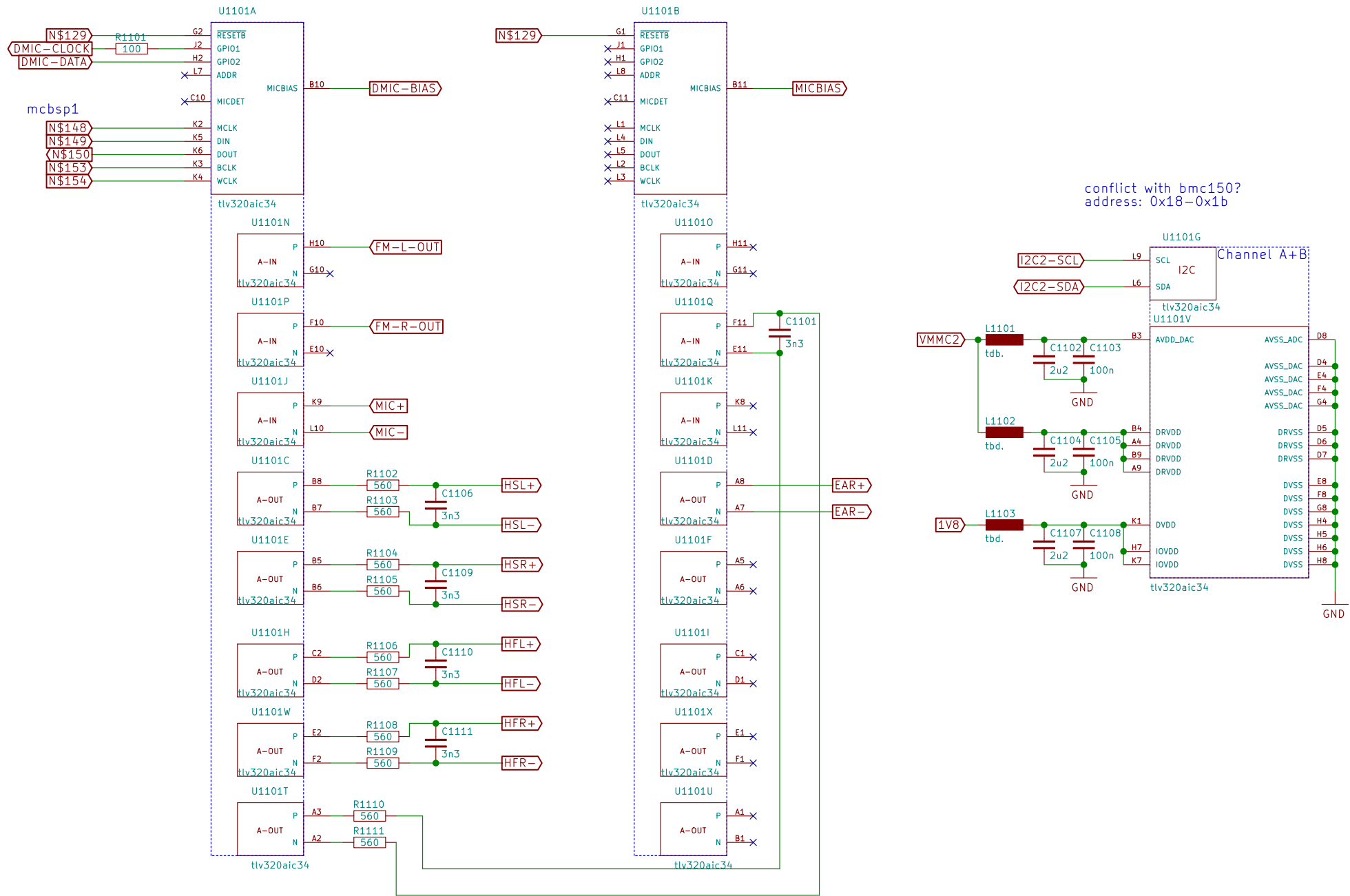
- FSX
- CLKX
- DX
- DR
- FSR
- CLKR



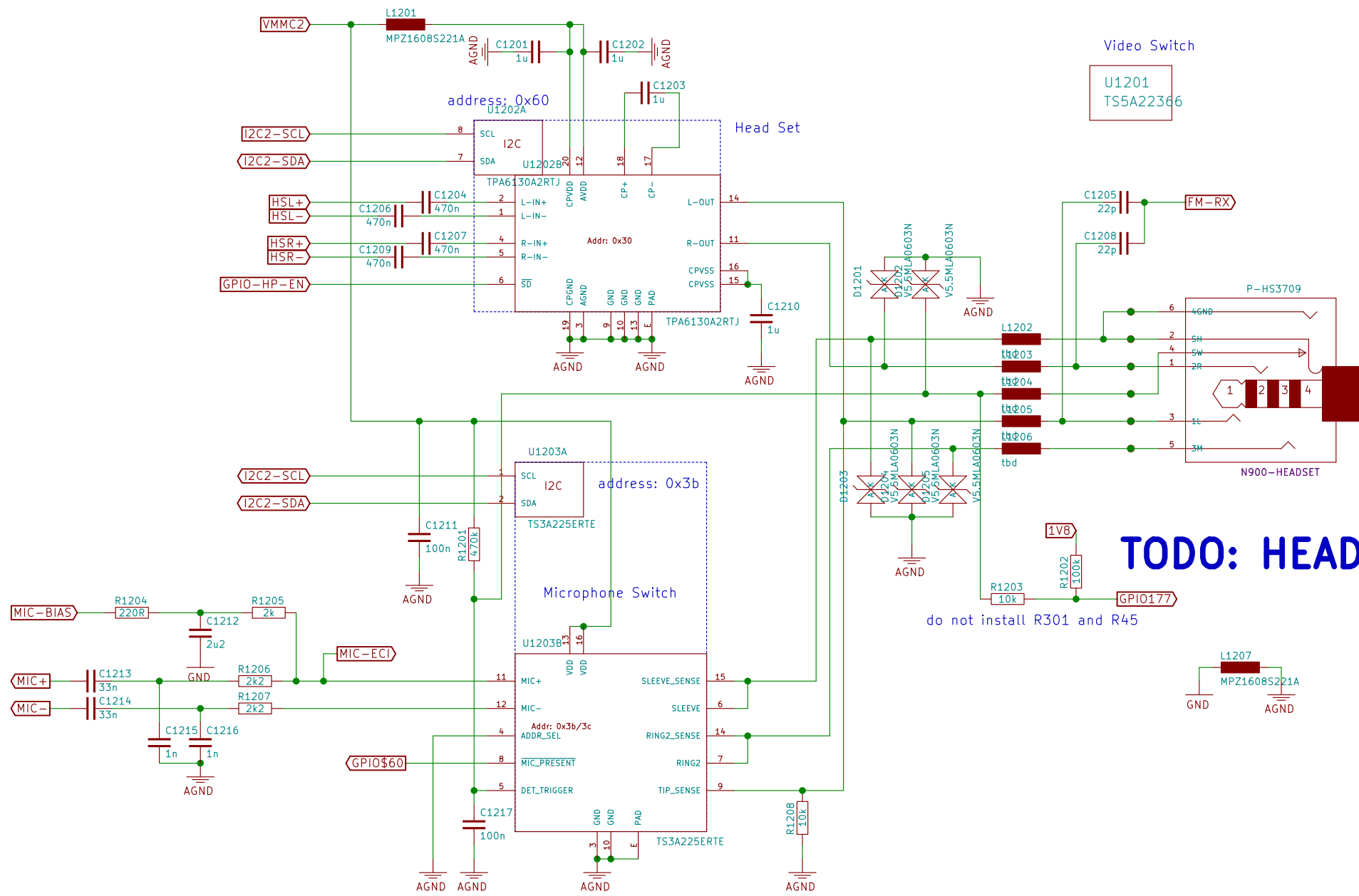
**TODO: no BMG160, BMC150**  
**TODO: BMP180 -> BME280**  
**TODO: BNO055 -> BMX055**  
**TODO: INT1/2 sharing**

|  |                   |           |
|--|-------------------|-----------|
| Sheet: /Sensors/<br>File: neo900_SS_10.sch                                 |                   |           |
| <b>Title: Sensors</b>  |                   |           |
| Size: A3   | Date: 17 JUL 2016 | Rev:      |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 11/38 |

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



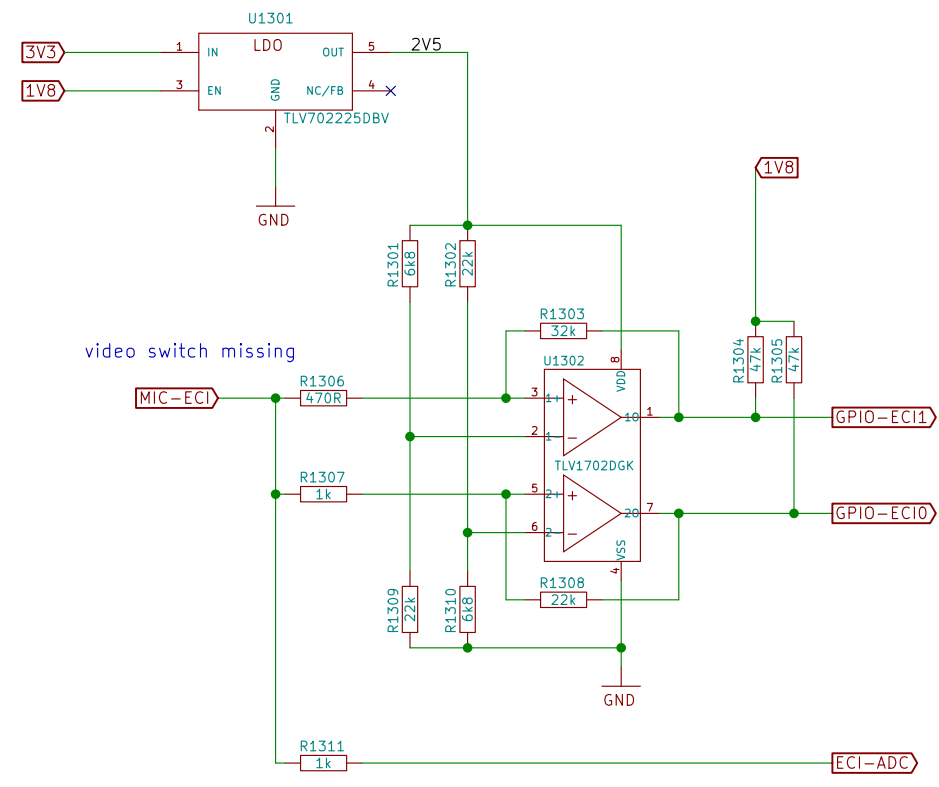
Video Switch  
U1201  
TS5A22366

**TODO: HEADPH\_IND ?**

do not install R301 and R45



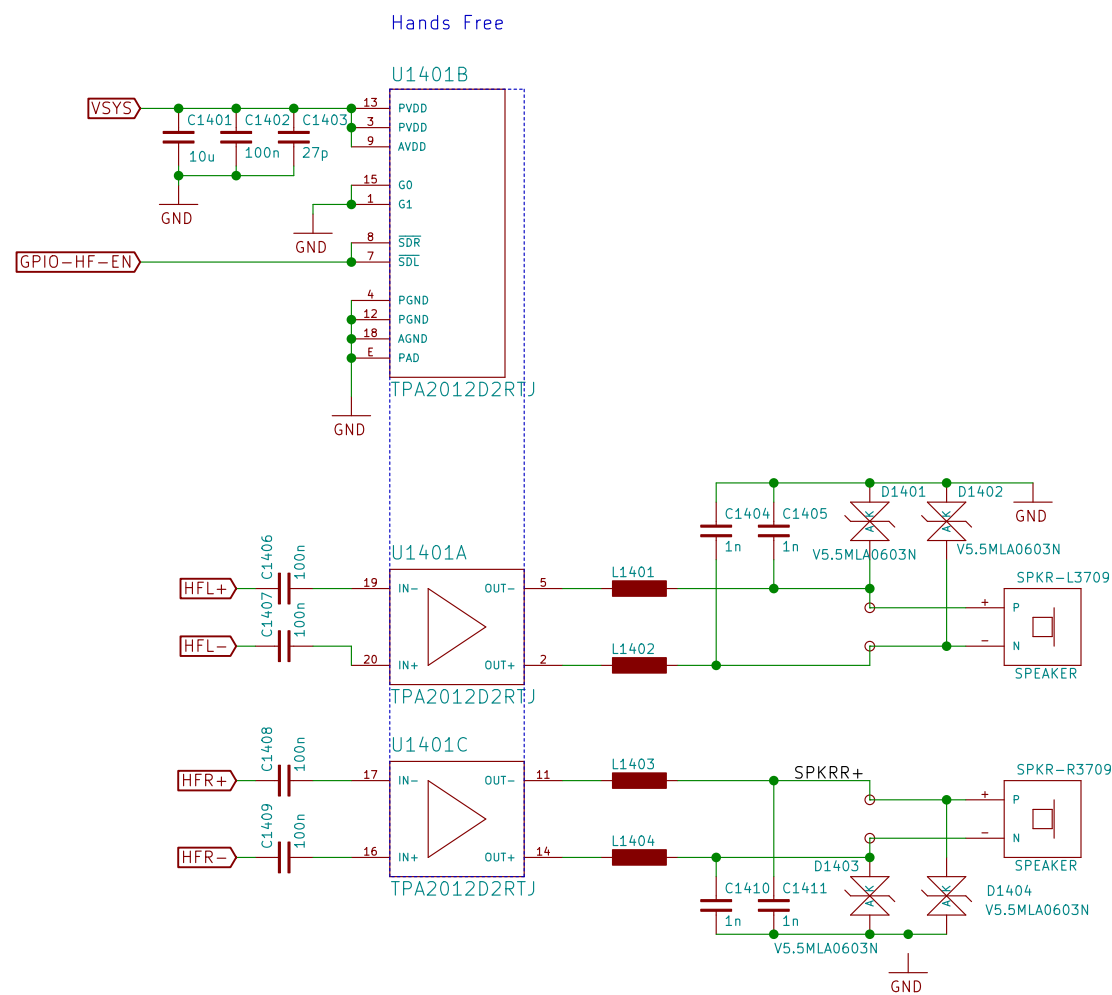
|  |                   |           |
|--|-------------------|-----------|
| Sheet: /Audio Headset + Mic/   |                   |           |
| File: neo900_SS_12.sch   |                   |           |
| <b>Title: Audio Headset &amp; Mic</b>                                      |                   |           |
| Size: A3   | Date: 17 JUL 2016 | Rev:      |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 13/38 |



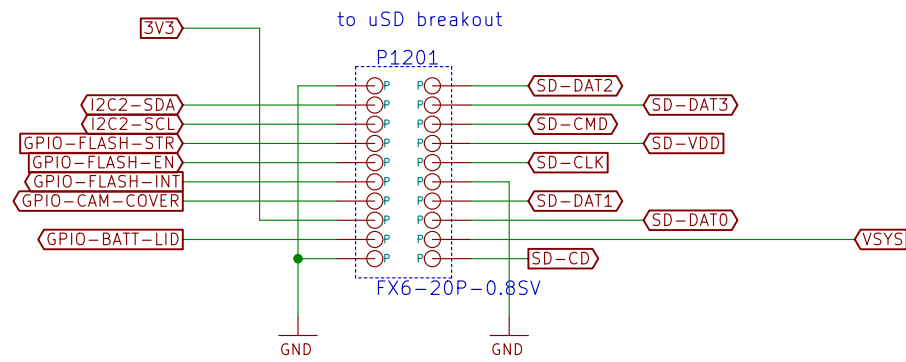
video switch missing

**TODO: draw comparator right**

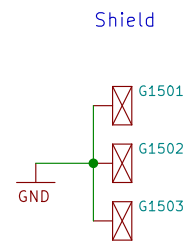
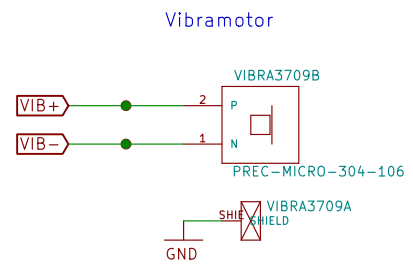
|  |                   |           |
|--|-------------------|-----------|
| Sheet: /ECI/<br>File: neo900_SS_13.sch                                     |                   |           |
| <b>Title: ECI</b>  |                   |           |
| Size: A3   | Date: 17 JUL 2016 | Rev:      |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 14/38 |



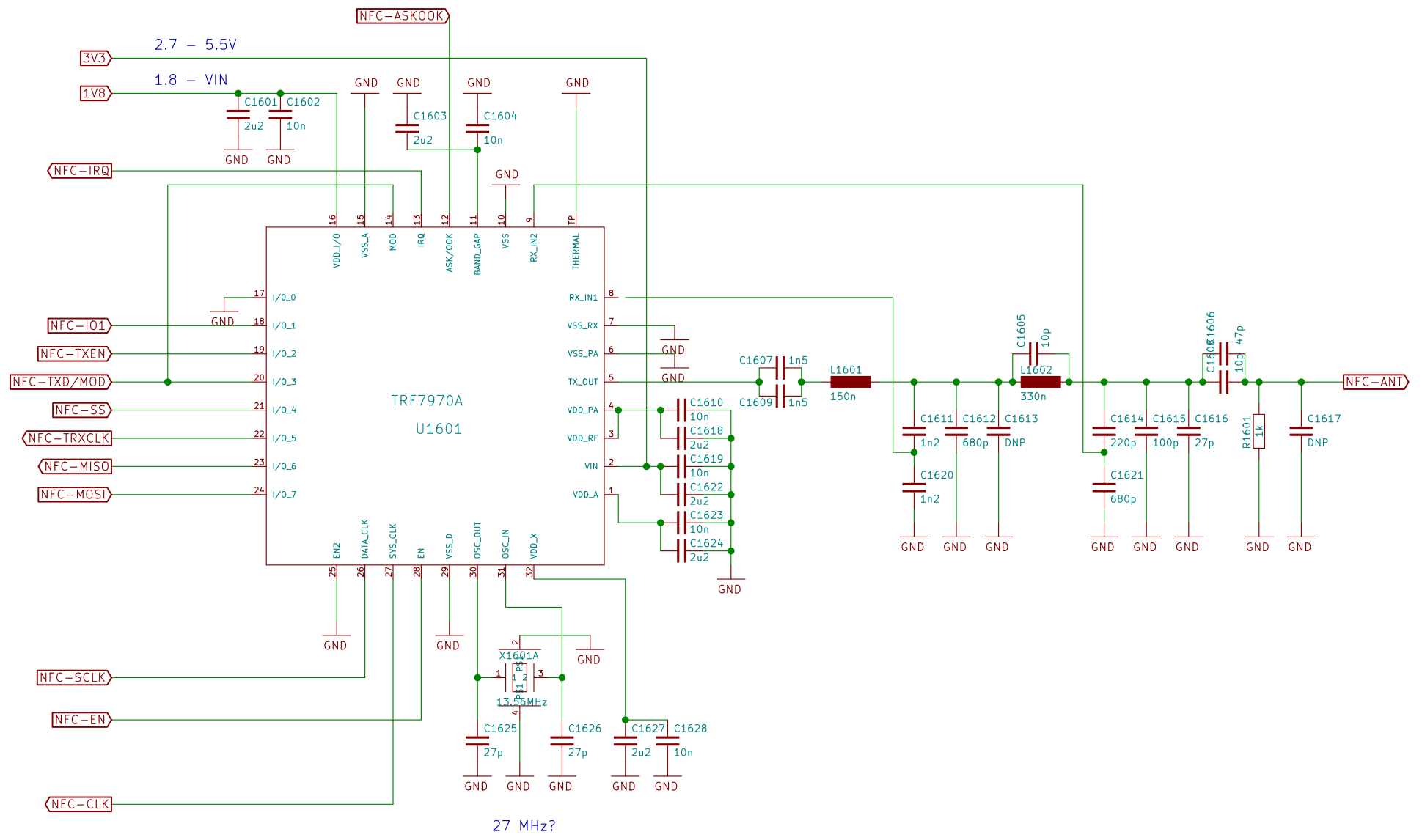
|  |                   |           |
|--|-------------------|-----------|
| Sheet: /Audio Handsfree/<br>File: neo900_SS_14.sch                         |                   |           |
| <b>Title: Audio Handsfree</b>  |                   |           |
| Size: A3   | Date: 17 JUL 2016 | Rev:      |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 15/38 |



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

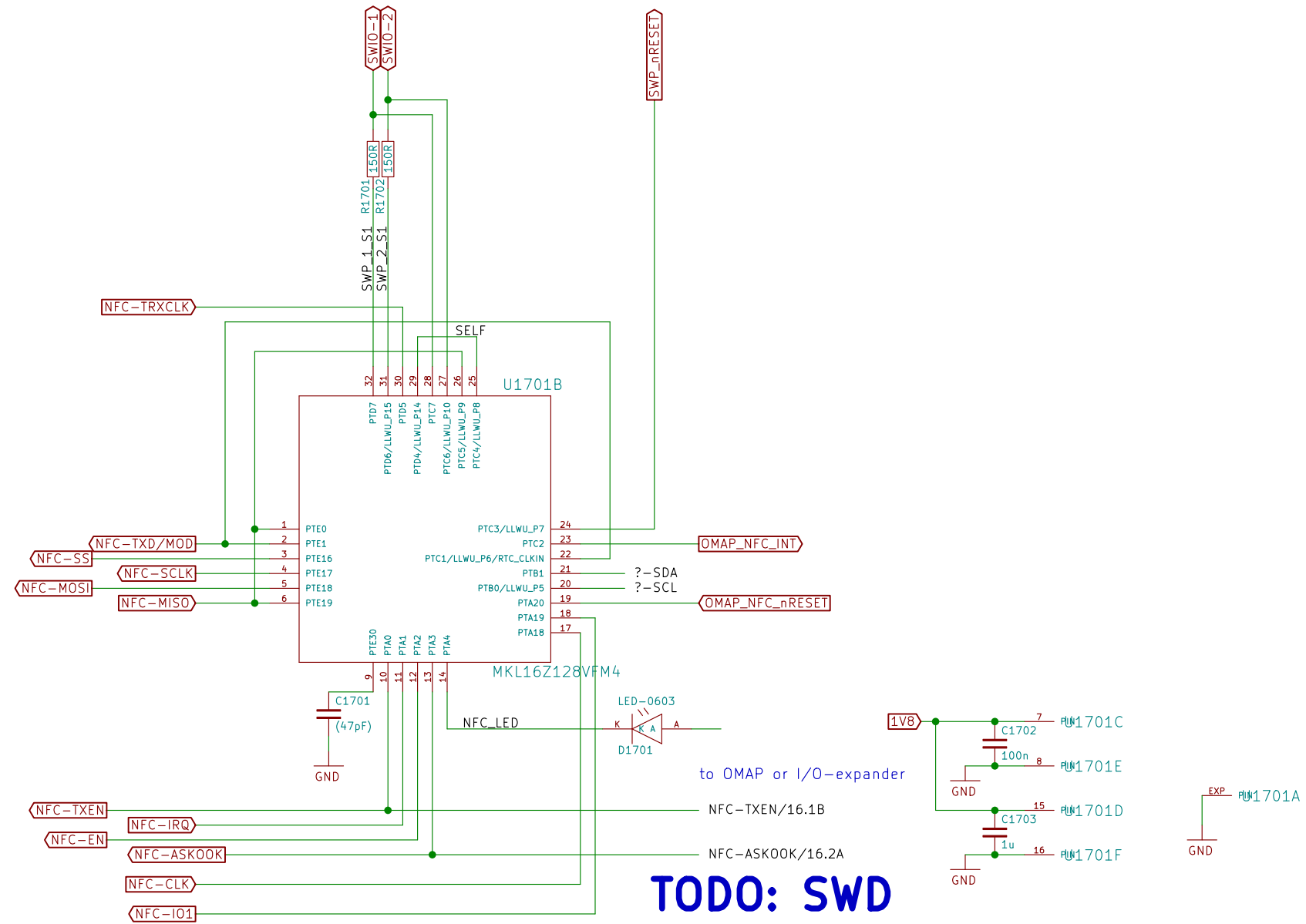






27 MHz?

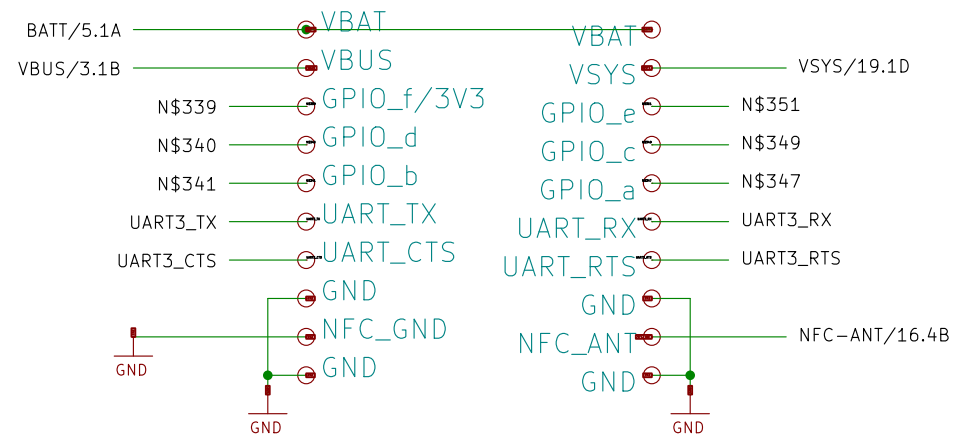
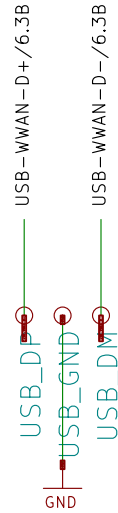
|  |                   |           |
|--|-------------------|-----------|
| Sheet: /RFID/NFC Reader/   |                   |           |
| File: neo900_SS_16.sch   |                   |           |
| <b>Title: RFID/NFC Reader</b>  |                   |           |
| Size: A3   | Date: 17 JUL 2016 | Rev:      |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 17/38 |



|  |                   |           |
|--|-------------------|-----------|
| Sheet: /RFID/NFC Controller/<br>File: neo900_SS_17.sch                     |                   |           |
| <b>Title: RFID/NFC Controller</b>  |                   |           |
| Size: A3   | Date: 17 JUL 2016 | Rev:      |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 18/38 |

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**

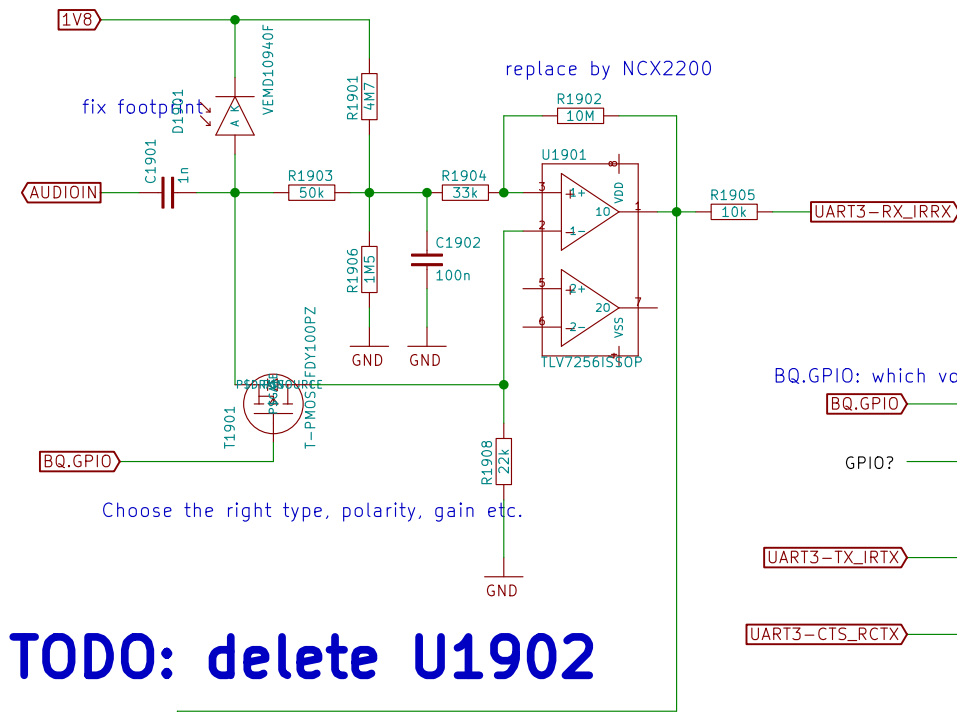


Missing 10 level shifter chip (or do we really have the space for 10x discrete T+R+D ca. 3x3mm each?)  
 Missing 6x 2R for alternate function select (do we have the space for ca. 2.5 x 5mm?)

**TODO: align with HB WP**

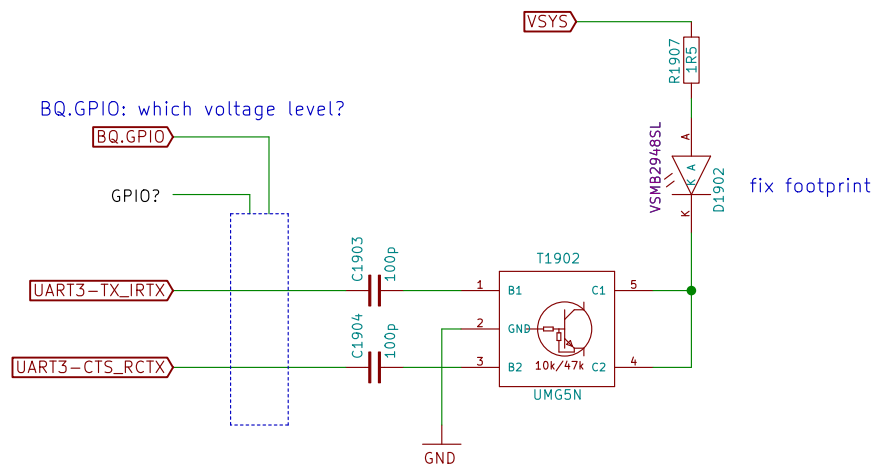
|   |                   |           |
|---|-------------------|-----------|
| Sheet: /Hackerbus/<br>File: neo900_SS_18.sch                              |                   |           |
| <b>Title: Hackerbus</b>   |                   |           |
| Size: A3  | Date: 17 JUL 2016 | Rev:      |
| KiCad E.D.A. eschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 19/38 |

NOTE: 1V8 may be quite noisy



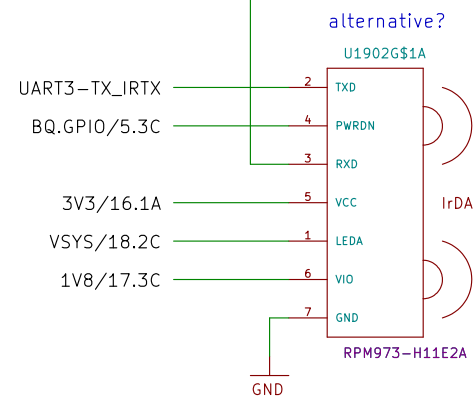
Choose the right type, polarity, gain etc.

**TODO: delete U1902**



fix footprint

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



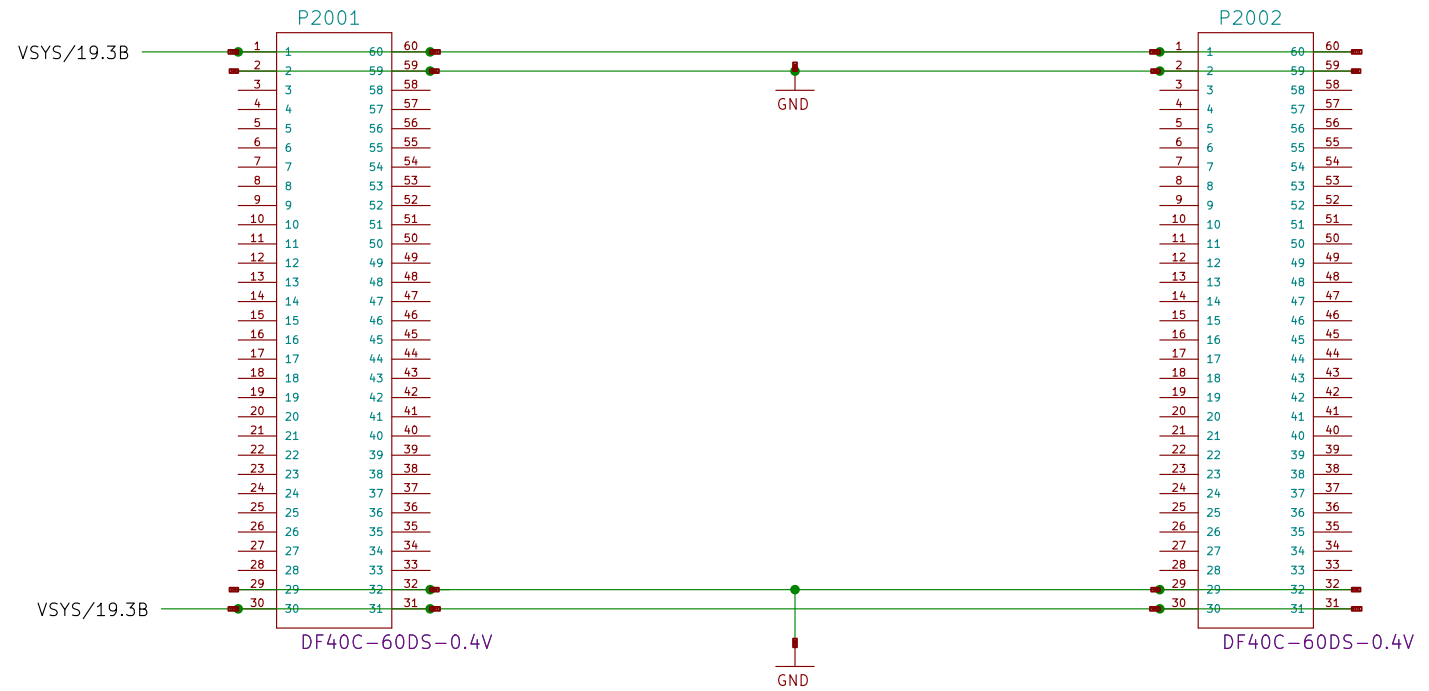
|  |                   |           |
|--|-------------------|-----------|
| Sheet: /Infrared/<br>File: neo900_SS_19.sch                                |                   |           |
| <b>Title: Infrared</b>   |                   |           |
| Size: A3   | Date: 17 JUL 2016 | Rev:      |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 20/38 |

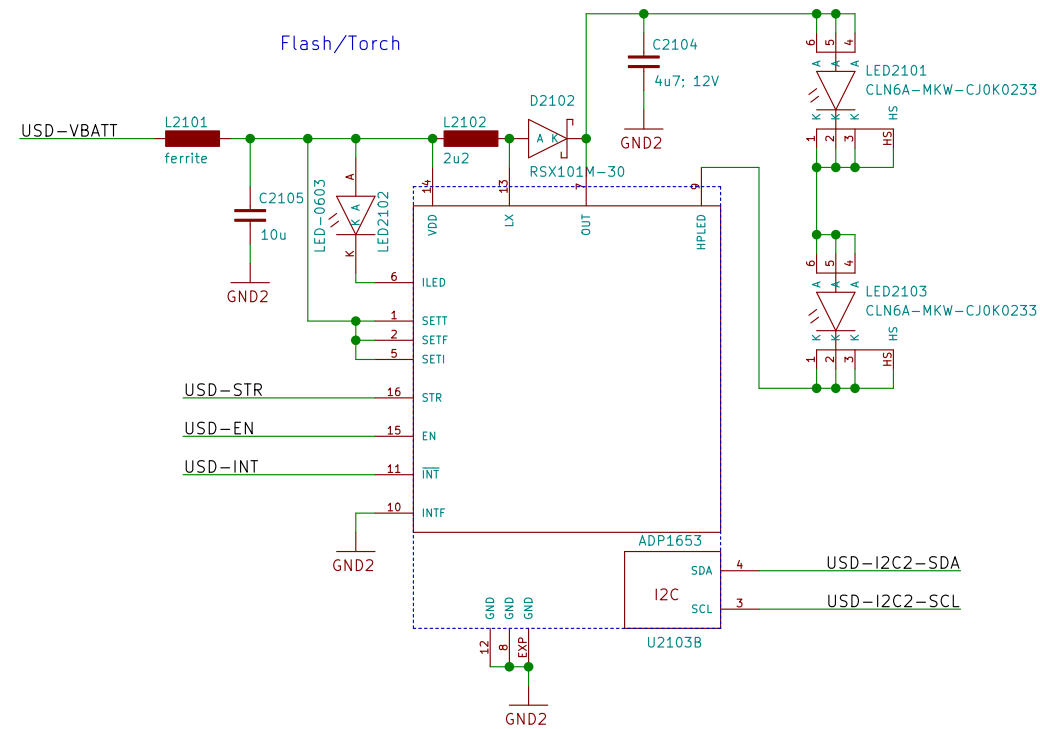
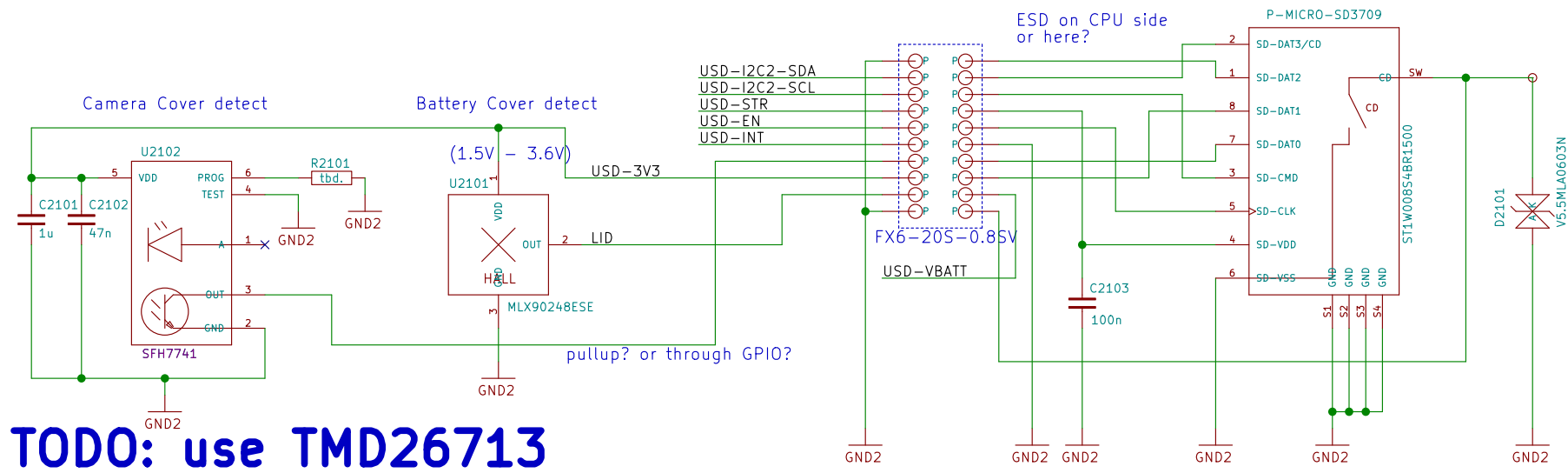
# TODO: update when details settle

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

|                       |       |                      |       |
|-----------------------|-------|----------------------|-------|
| LOCK-GPIO/1.2A        | _____ | MMC3-DATA1/9.1A      | _____ |
| POWERON/1.3A          | _____ | MMC3-DATA2/9.1A      | _____ |
| GPIO-VOL+/1.2B        | _____ | MMC3-DATA3/9.1A      | _____ |
| GPIO-VOL-/1.2B        | _____ | GPIO-WLAN-IRQ/9.1A   | _____ |
| CAM1-GPIO/1.3B        | _____ | GPIO-BT-EN/9.1C      | _____ |
| CAM2-GPIO/1.3C        | _____ | UART1-RX/9.1C        | _____ |
| I2C3-SDA/10.4C        | _____ | UART1-RTS/9.1C       | _____ |
| I2C3-SCL/10.4C        | _____ | UART1-CTS/9.1D       | _____ |
| CHG_IND/3.1B          | _____ | UART1-TX/9.1D        | _____ |
| N\$131/3.1C           | _____ | MCBSP3-FCK/9.1D      | _____ |
| N\$141/3.1C           | _____ | MCBSP3-CLK/9.1D      | _____ |
| N\$143/3.1C           | _____ | MCBSP3-DR/9.1D       | _____ |
| BATTEMP/5.4A          | _____ | MCBSP3-DX/9.1D       | _____ |
| GPIO-EN-MODEM/4.1A    | _____ | SYSCLK/9.3C          | _____ |
| I2C2-SDA/15.1A        | _____ | 32KHZ/9.4A           | _____ |
| I2C2-SCL/15.1A        | _____ | GPIO-FM-EN/9.3A      | _____ |
| INA231-INT/4.4C       | _____ | GPIO-FMIRQ/9.3A      | _____ |
| HDQ/5.2A              | _____ | MCBSP2-FCK/9.3A      | _____ |
| GPIO\$70/8.3B         | _____ | MCBSP2-CLK/9.3A      | _____ |
| GPIO\$110/8.1D        | _____ | MCBSP2-DR/9.3A       | _____ |
| N\$19/8.2D            | _____ | MCBSP2-DX/9.3A       | _____ |
| N\$229/8.3C           | _____ | MCBSP2-DR/9.3A       | _____ |
| ADC\$114/8.1C         | _____ | MCBSP2-DX/9.3A       | _____ |
| ADC1/8.4C             | _____ | GPIN115/10.3B        | _____ |
| ADC2/8.4C             | _____ | GPIO56/10.3A         | _____ |
| GPIO-COMPARATOR/8.4D  | _____ | GPIO\$51/10.3B       | _____ |
| MCBSP4-DR/6.2A        | _____ | GPIO\$55/10.4A       | _____ |
| MCBSP4-DX/6.2A        | _____ | GPIO\$56/10.4A       | _____ |
| MCBSP4-CLKX/6.2A      | _____ | ACCEL-INT/10.4C      | _____ |
| MCBSP4-FSX/6.2A       | _____ | N\$129/11.2A         | _____ |
| UART?-RTS/6.2C        | _____ | N\$148/11.1A         | _____ |
| UART?-CTS/6.2C        | _____ | N\$149/11.1A         | _____ |
| UART?-RX/6.2C         | _____ | N\$150/11.1A         | _____ |
| UART?-TX/6.2C         | _____ | N\$153/11.1A         | _____ |
| RING/6.2C             | _____ | N\$154/11.1A         | _____ |
| GPIO-MODEM_JGT/6.3A   | _____ | GPIO-ECI1/13.3B      | _____ |
| GPIO-MODEM_EMERG/6.3A | _____ | GPIO-ECIO/13.3C      | _____ |
| EMERG_OFF/6.3B        | _____ | ECI-ADC/13.3C        | _____ |
| PWR_IND/6.3B          | _____ | VMMC2/12.1A          | _____ |
| LC_IND/6.3B           | _____ | GPIO-HP-EN/12.1B     | _____ |
| STATUS/6.3B           | _____ | GPIO\$60/12.2D       | _____ |
| 3G-WOE/6.3B           | _____ | GPIO177/12.4C        | _____ |
| GPIO\$52/8.4A         | _____ | GPIO-HF-EN/14.1B     | _____ |
| GPIO-WLAN-EN/9.1A     | _____ | GPIO-FLASH-STR/15.1A | _____ |
| MMC3-CLK/9.1A         | _____ | GPIO-FLASH-EN/15.1A  | _____ |
| MMC3-CMD/9.1A         | _____ | GPIO-FLASH-INT/15.1A | _____ |
| MMC3-DATA0/9.1A       | _____ | GPIO-BATT-LID/15.1B  | _____ |
|                       |       | 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                | _____ |

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

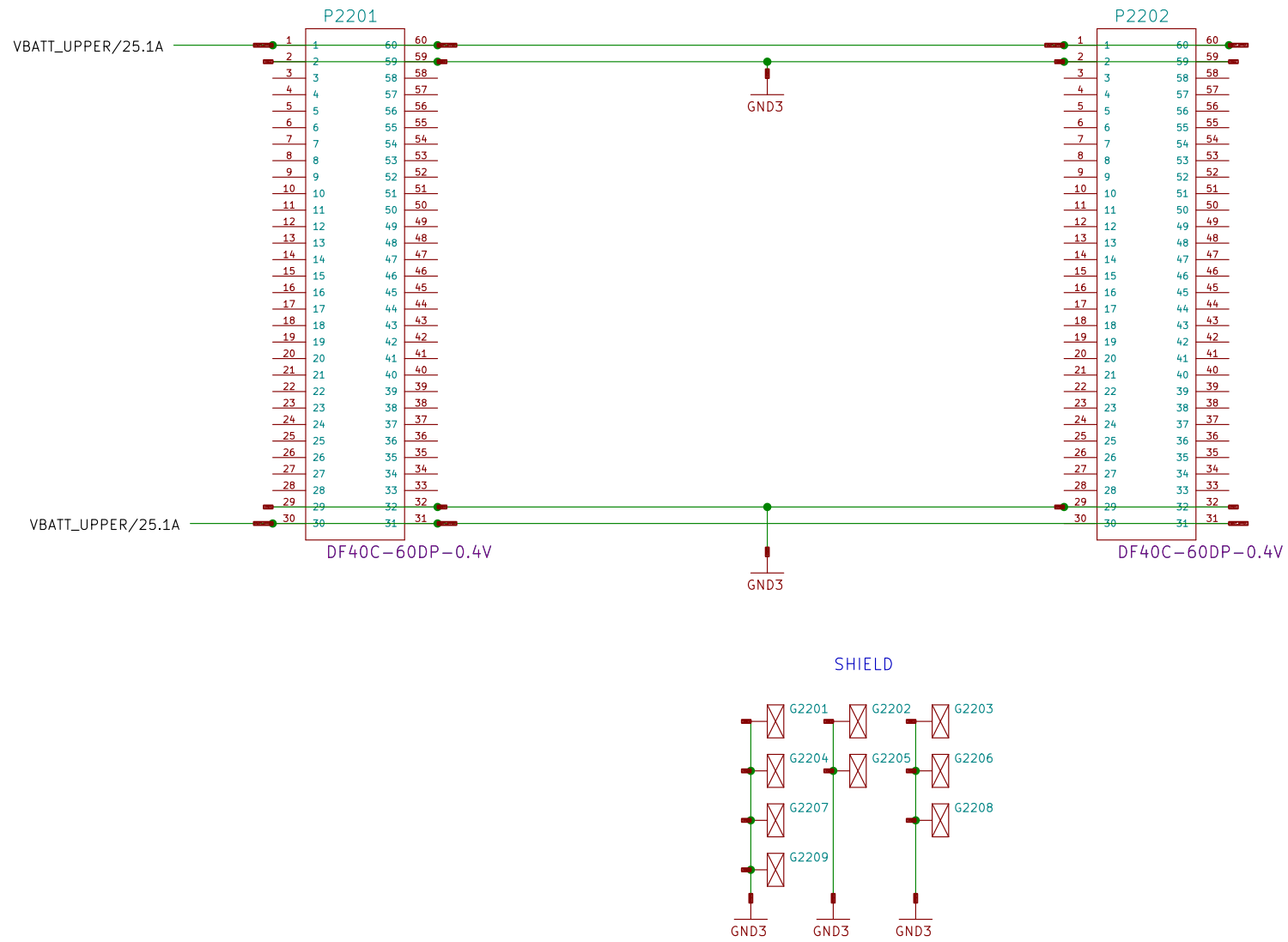




|  |                   |           |
|--|-------------------|-----------|
| Sheet: /uSD Breakout Board/<br>File: neo900_SS_21.sch                      |                   |           |
| <b>Title: uSD Breakout Board</b>   |                   |           |
| Size: A3   | Date: 17 JUL 2016 | Rev:      |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 22/38 |

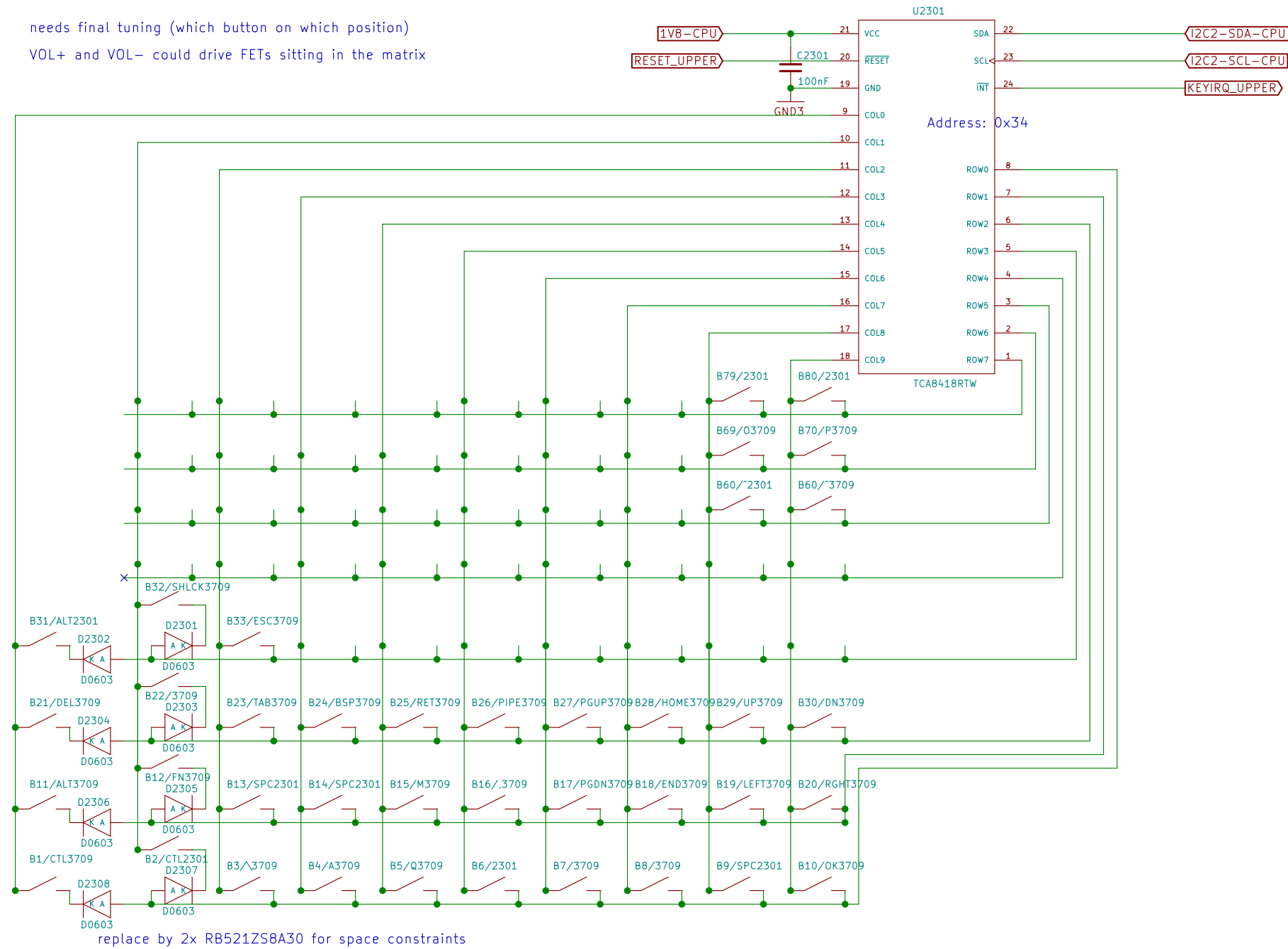
# TODO: track B2B to UPPER

to be adjusted to lower board connector



# TODO: \*\_UPPER names ?

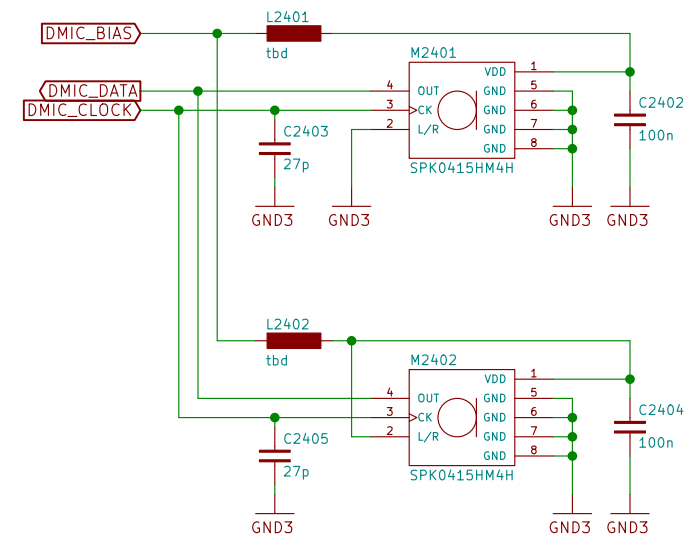
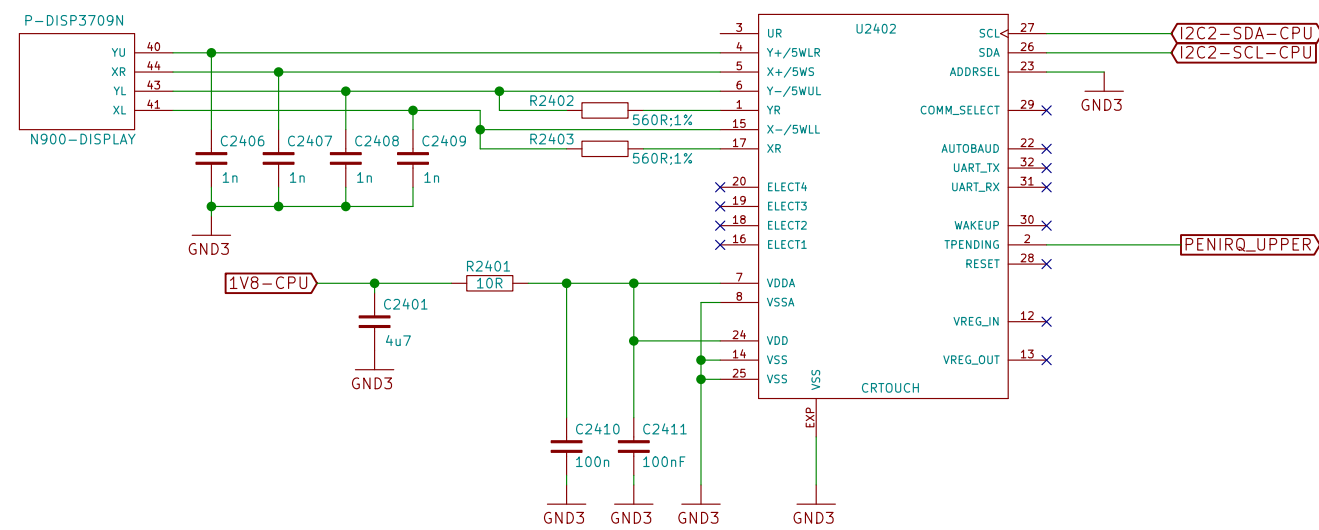
needs final tuning (which button on which position)  
VOL+ and VOL- could drive FETs sitting in the matrix

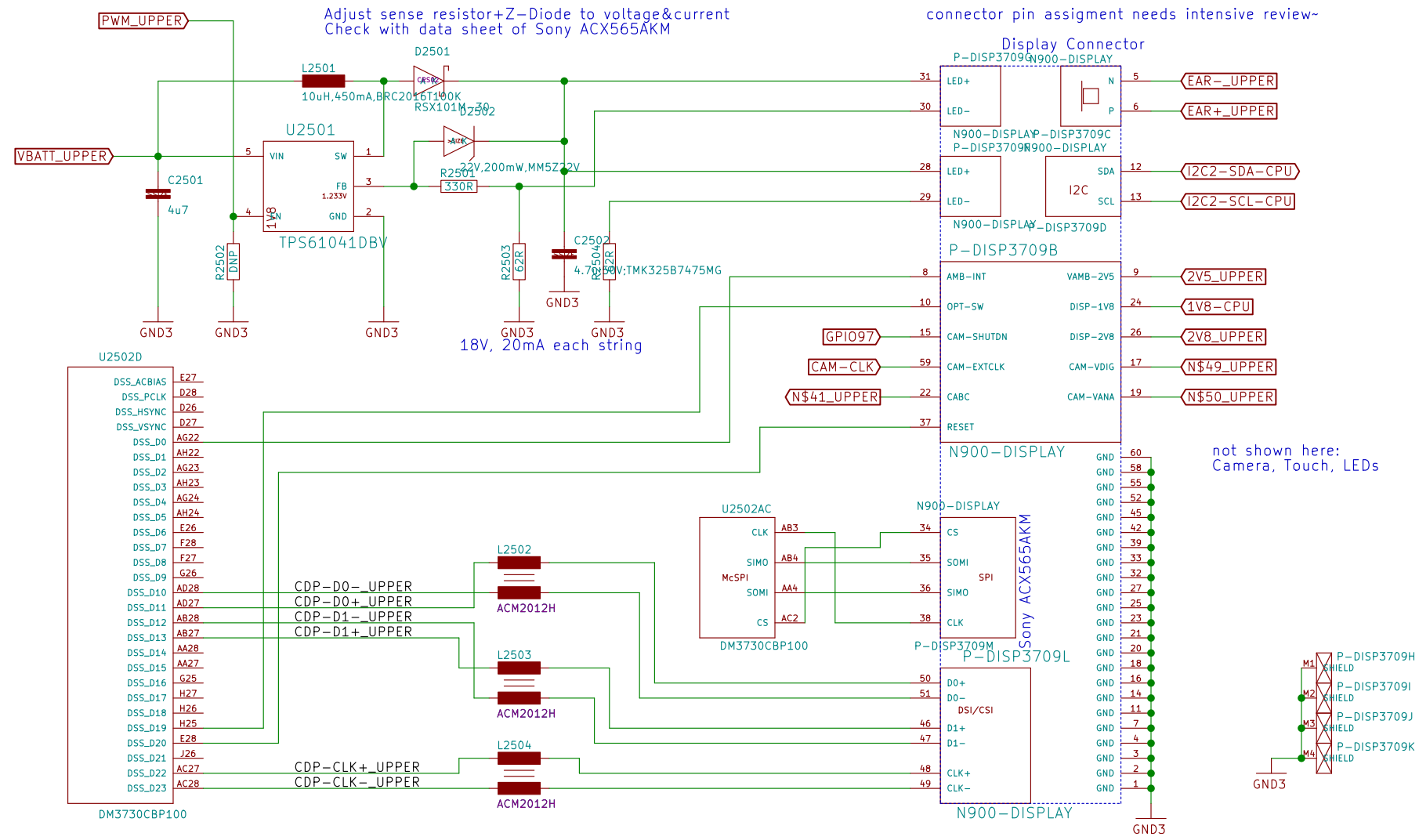


- TODO: remove 3709 in comp ref
- TODO: remove keycap from comp ref
- TODO: sort out 6 "ext" buttons
- TODO: rearrange matrix to avoid diodes ?

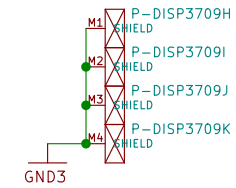


Resistive Touch (display connector)

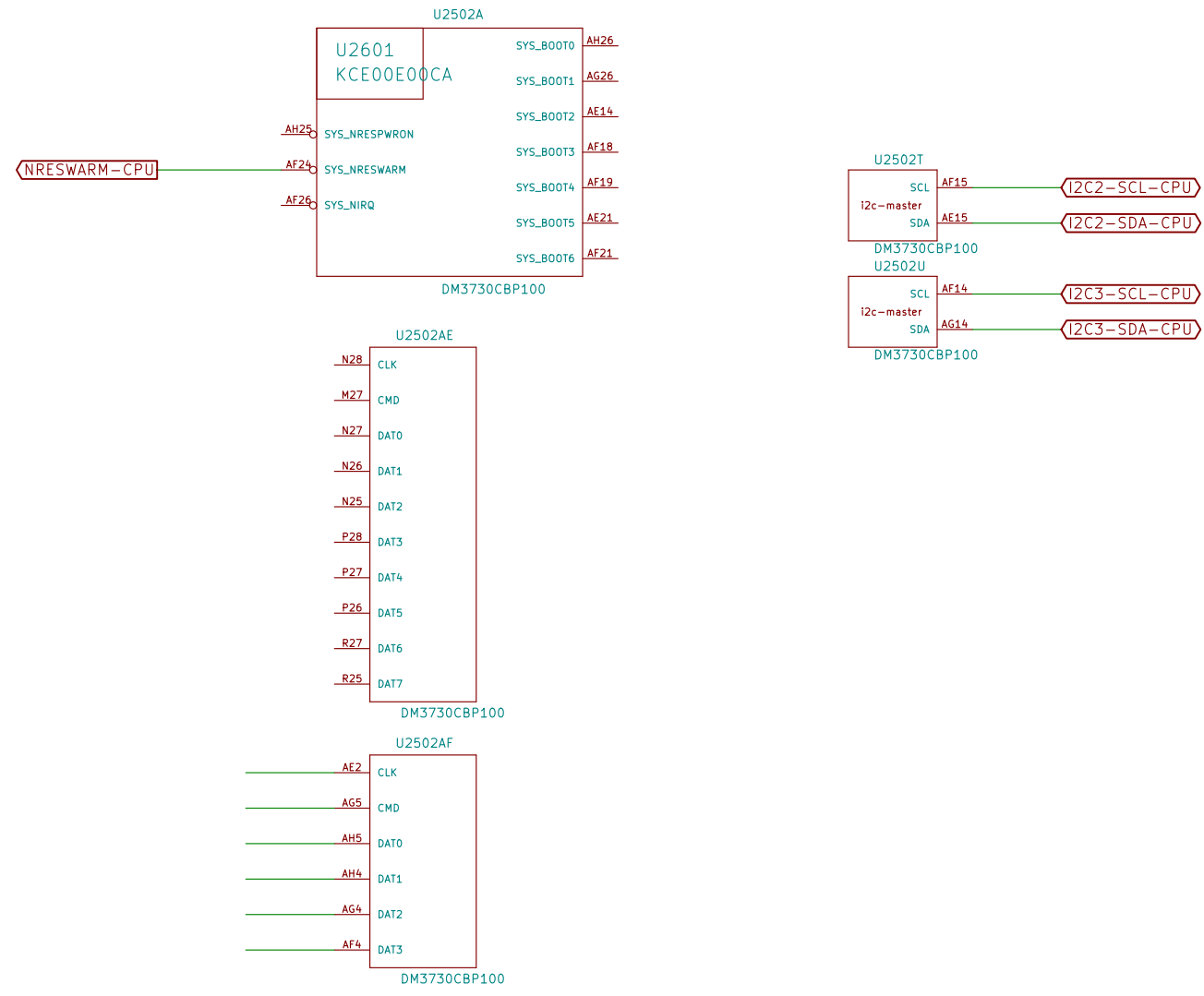




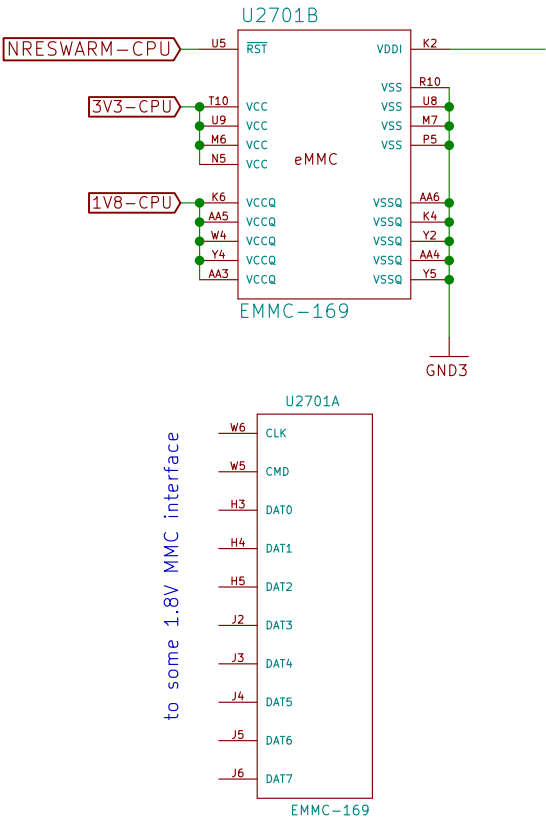
not shown here:  
Camera, Touch, LEDs



INCOMPLETE in V2



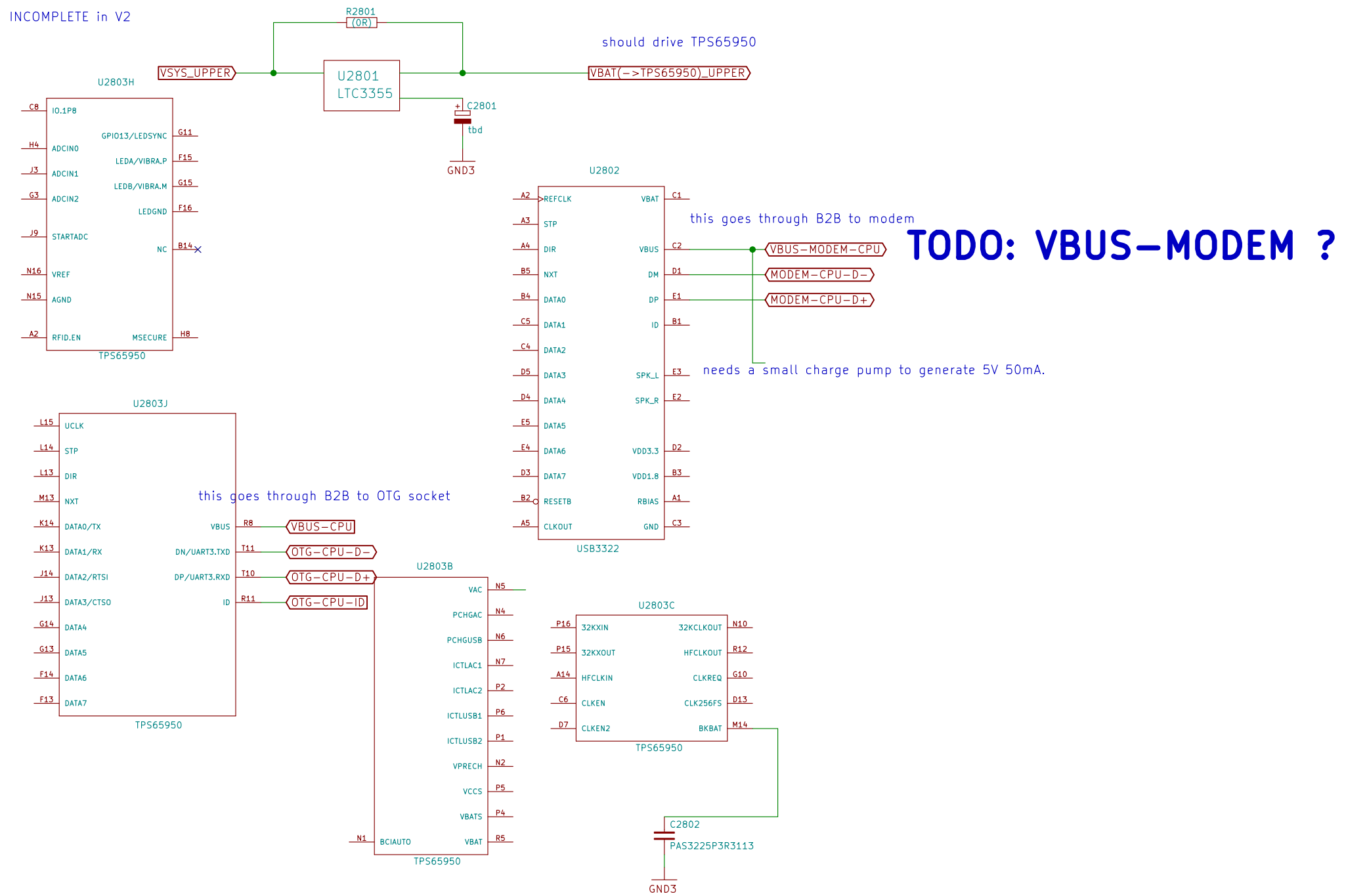
INCOMPLETE in V2



|  |                   |           |
|--|-------------------|-----------|
| Sheet: /eMMC/<br>File: neo900_SS_27.sch                                    |                   |           |
| <b>Title: eMMC</b>   |                   |           |
| Size: A3   | Date: 17 JUL 2016 | Rev:      |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 28/38 |

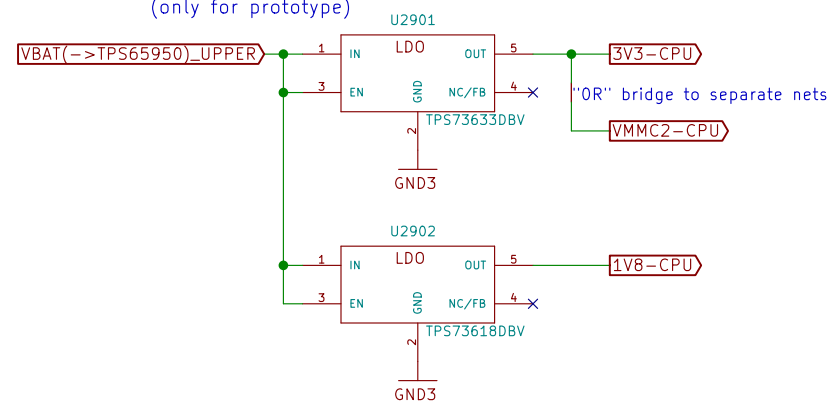
# TODO: check role

INCOMPLETE in V2



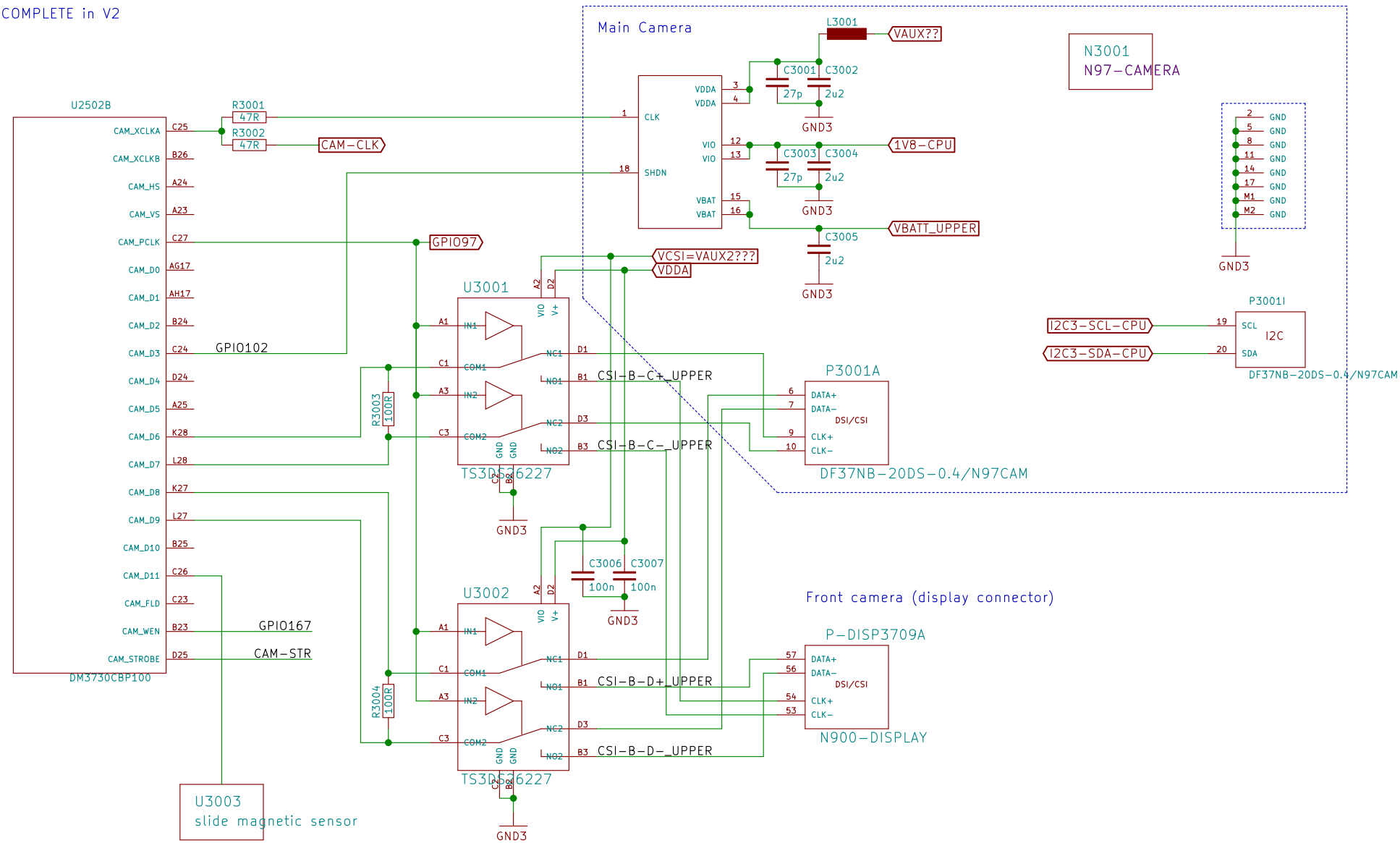
# TODO: VBUS-MODEM ?

simple capless 400mA LDO for TPS65950 substitute  
(only for prototype)



|  |                   |           |
|--|-------------------|-----------|
| Sheet: /BB-XM Dummy (TWL4030)/   |                   |           |
| File: neo900_SS_29.sch   |                   |           |
| <b>Title: BB-XM Dummy (TWL4030)</b>  |                   |           |
| Size: A3   | Date: 17 JUL 2016 | Rev:      |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 30/38 |

INCOMPLETE in V2



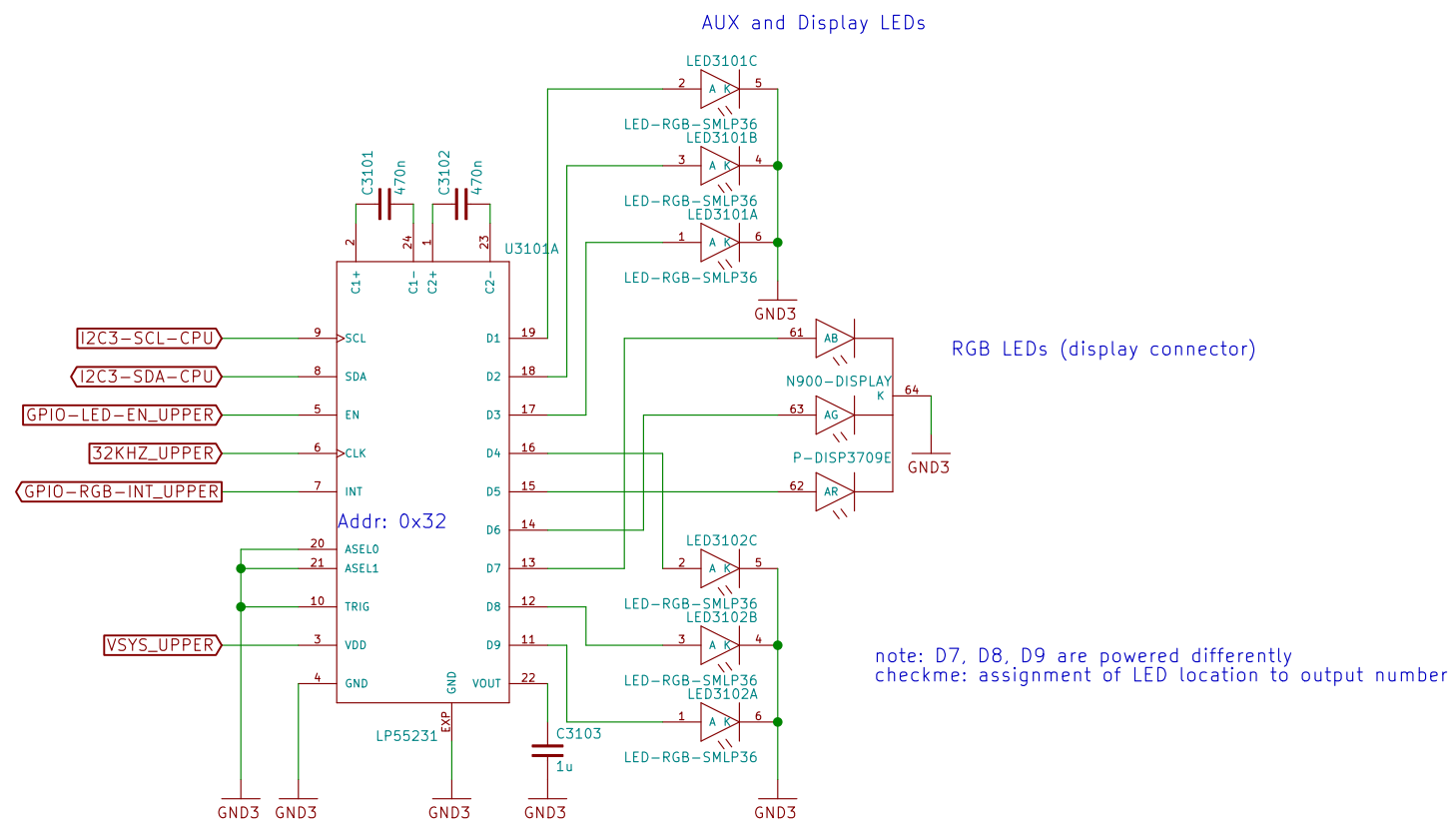
Sheet: /Camera/  
File: neo900\_SS\_30.sch

**Title: Camera**

Size: A3 Date: 17 JUL 2016

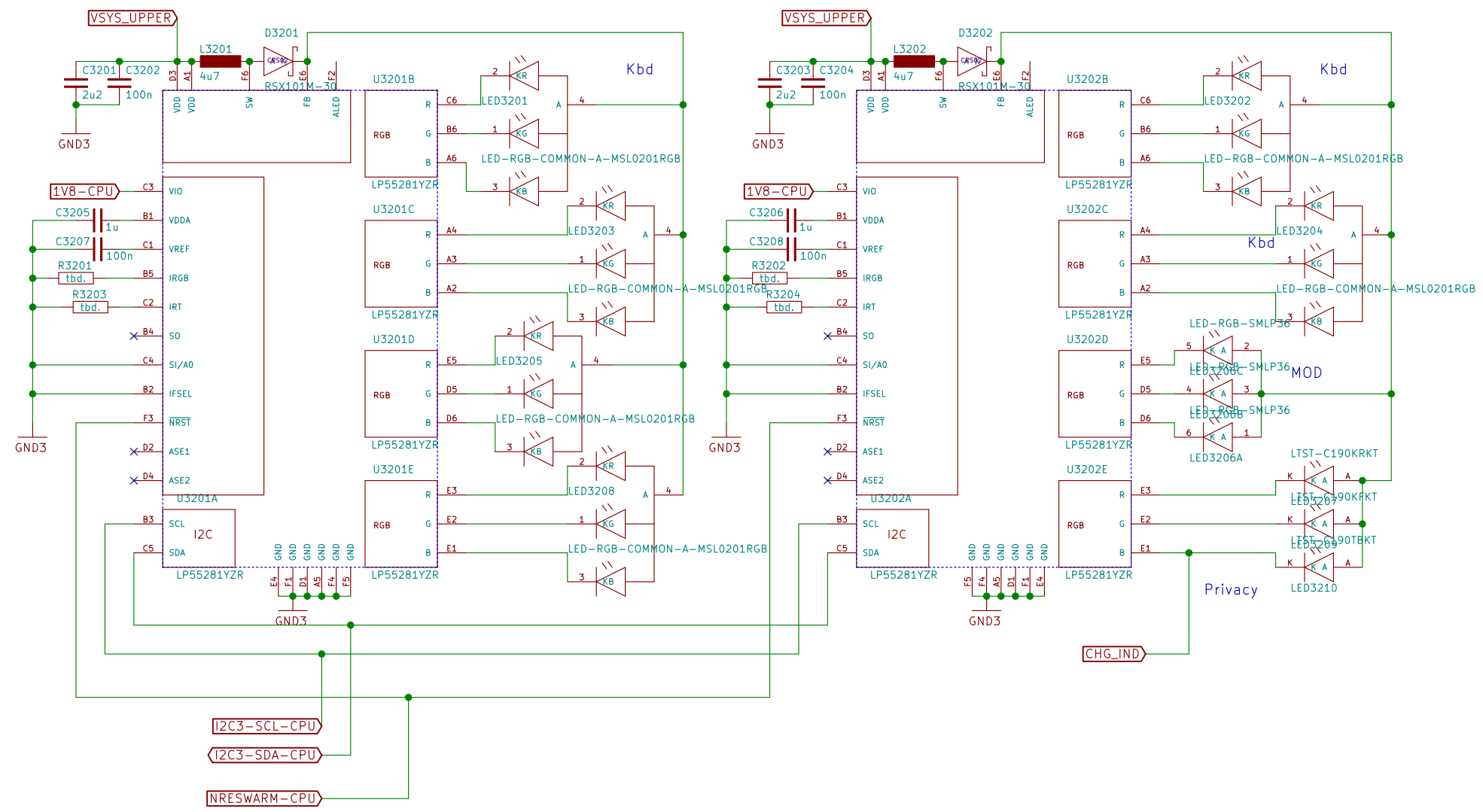
KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product

Rev:  
Id: 31/38



|   |                   |           |
|---|-------------------|-----------|
| Sheet: /LEDs/<br>File: neo900_SS_31.sch                                   |                   |           |
| <b>Title: LEDs</b>  |                   |           |
| Size: A3  | Date: 17 JUL 2016 | Rev:      |
| KiCad E.D.A. eschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 32/38 |



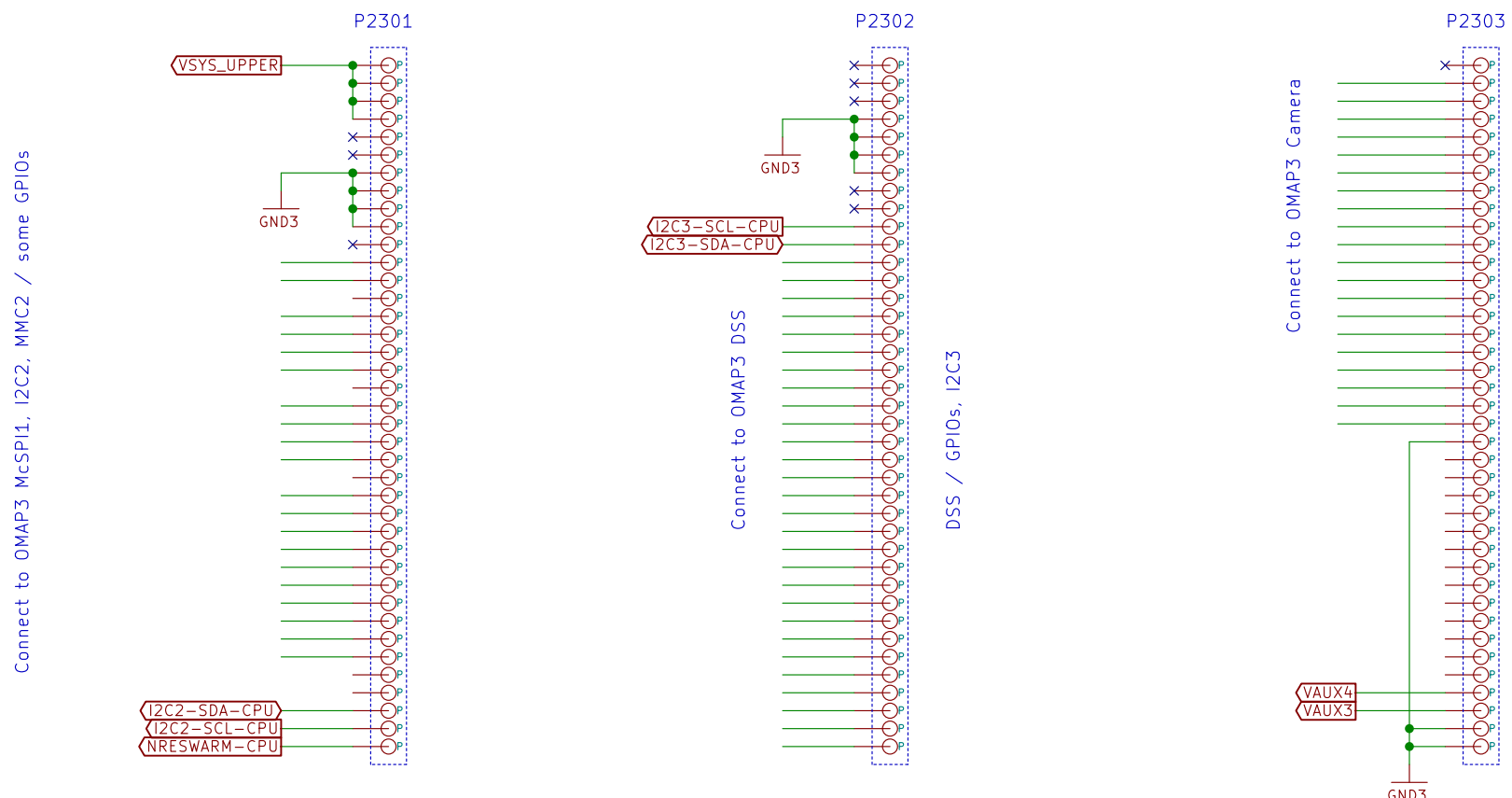


|  |                   |           |
|--|-------------------|-----------|
| Sheet: /Fancy LEDs/<br>File: neo900_SS_32.sch                              |                   |           |
| <b>Title: Fancy LEDs</b>   |                   |           |
| Size: A3   | Date: 17 JUL 2016 | Rev:      |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 33/38 |

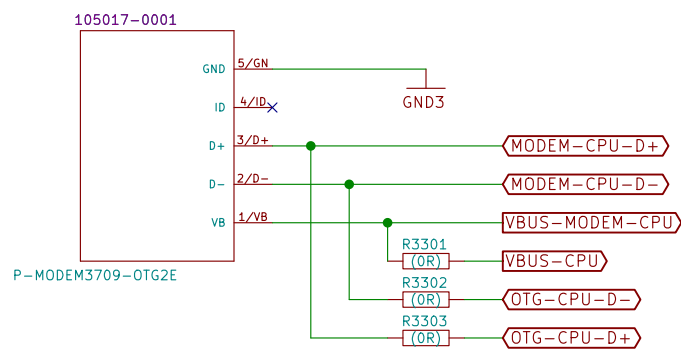
These connectors allow to "emulate" the DM3730 by connecting a BB-XM

INCOMPLETE  
prototype only

connect to respective CPU-pads

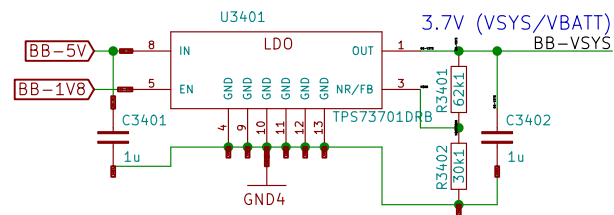


connect to BB  
by some Micro-USB cable

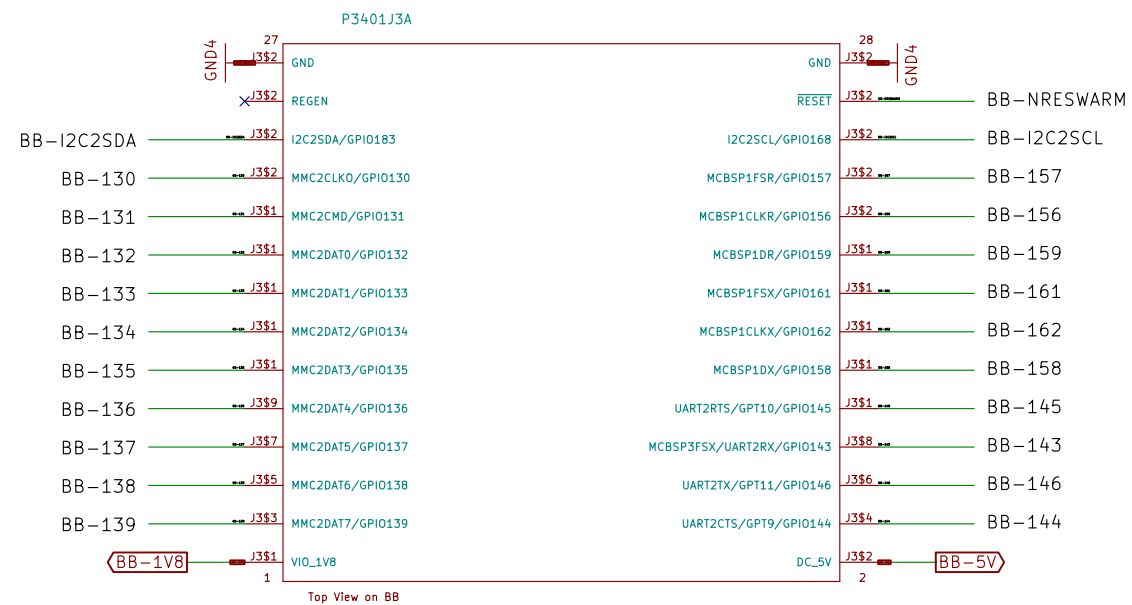
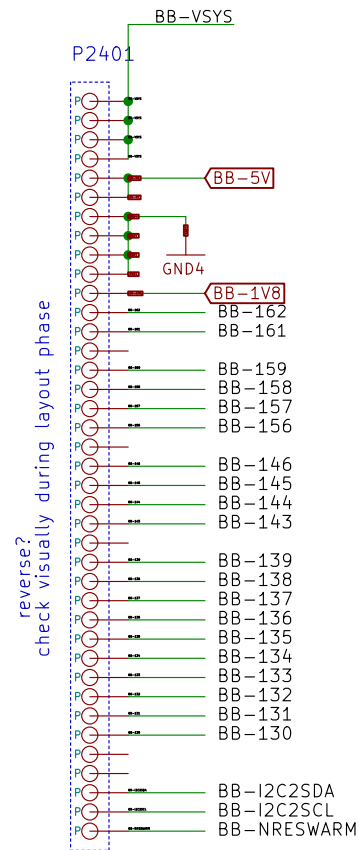


**TODO: VBUS-MODEM ?**

|  |                   |           |
|--|-------------------|-----------|
| Sheet: /Connector to BB-XM/<br>File: neo900_SS_33.sch                      |                   |           |
| <b>Title: Connector to BB-XM</b>   |                   |           |
| Size: A3   | Date: 17 JUL 2016 | Rev:      |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 34/38 |

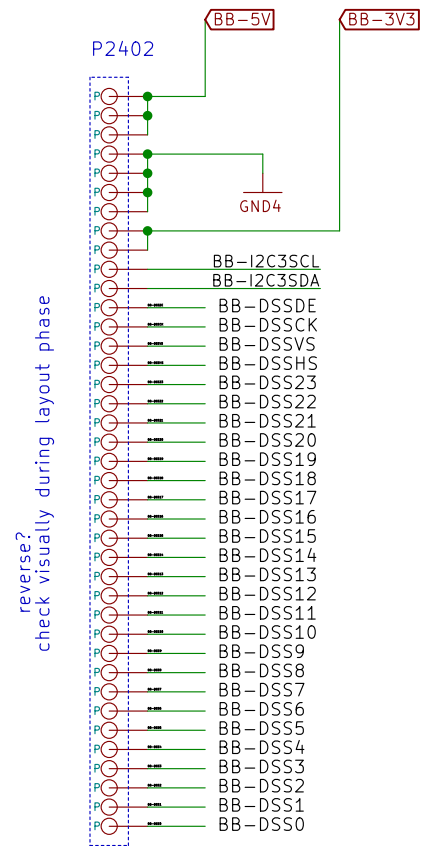


Ersetzen durch 2A buck converter

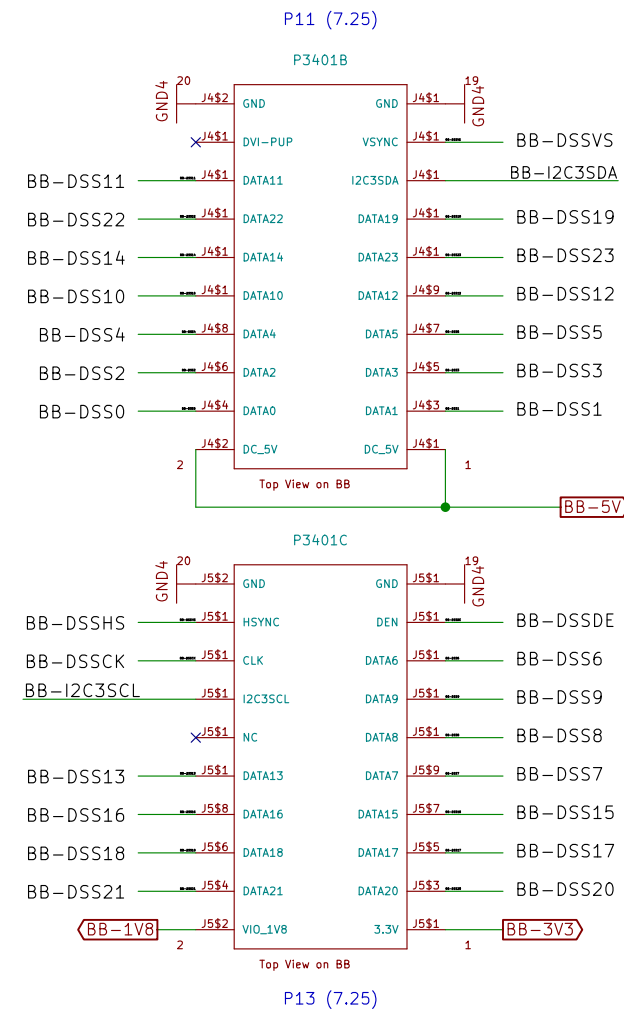


BB-xM Main Expansion Header (7.24)

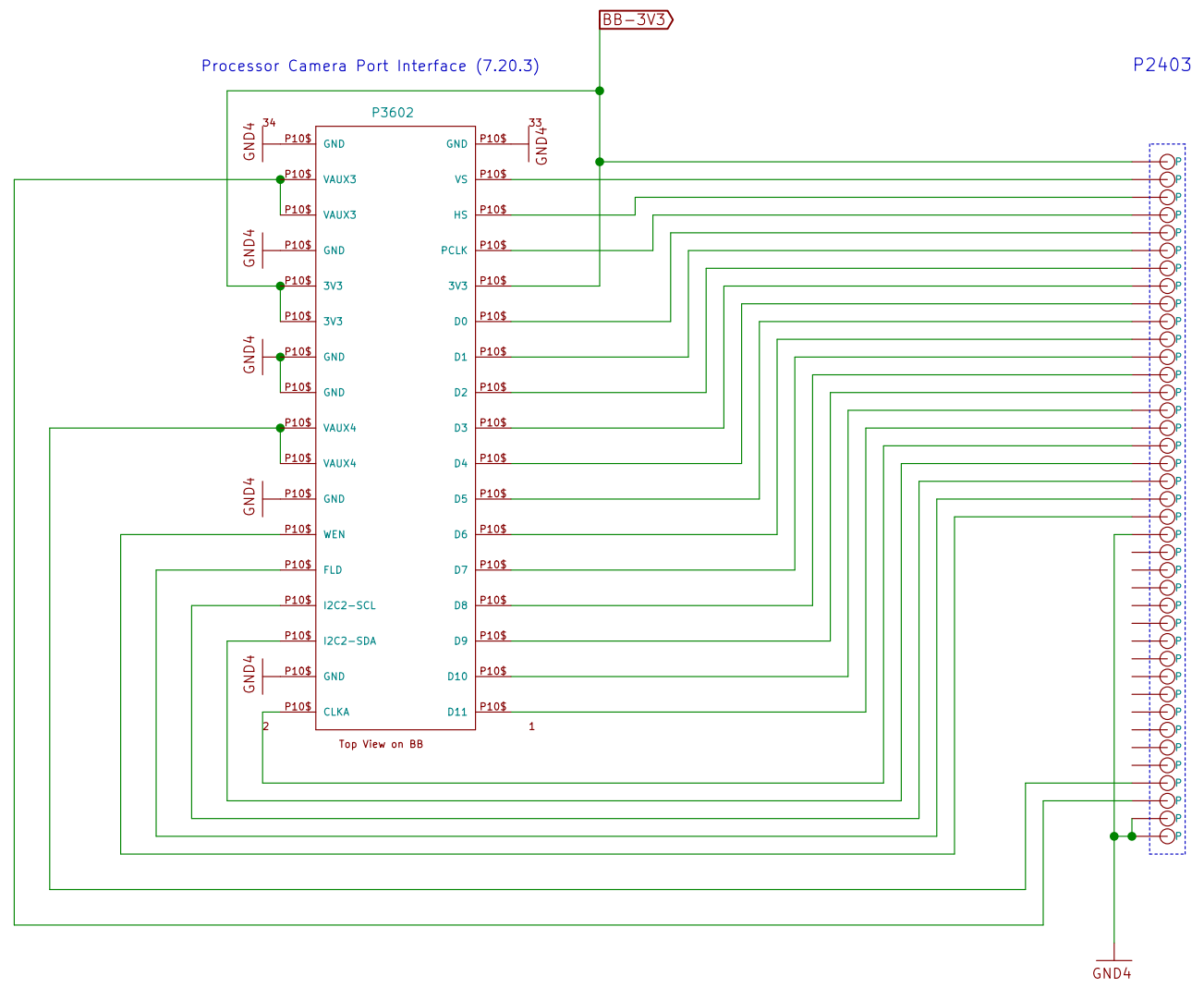
**TODO: needs decision on where to take this**



reverse?  
check visually during layout phase



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



|  |                   |           |
|--|-------------------|-----------|
| Sheet: /BB-XM Adapter (CAM)/   |                   |           |
| File: neo900_SS_36.sch   |                   |           |
| <b>Title: BB-XM Adapter (CAM)</b>  |                   |           |
| Size: A3   | Date: 17 JUL 2016 | Rev:      |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 37/38 |

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

|                     |                     |                     |
|---------------------|---------------------|---------------------|
| N3701<br>15015-0439 | N3702<br>15015-0439 | N3703<br>15015-0439 |
| CPU                 | DISP                | CAM                 |

|                             |
|-----------------------------|
| N3704<br>N900 case assembly |
|-----------------------------|

|                          |
|--------------------------|
| N3705<br>N97-CAMERA-HOLE |
|--------------------------|

|                       |
|-----------------------|
| N3706<br>headset jack |
|-----------------------|

|                      |
|----------------------|
| N3707<br>STENCIL-TOP |
|----------------------|

|                         |
|-------------------------|
| N3708<br>STENCIL-BOTTOM |
|-------------------------|

|  |                   |           |
|--|-------------------|-----------|
| Sheet: /No-Solder Components/<br>File: neo900_SS_37.sch                    |                   |           |
| <b>Title: No-Solder Components</b>   |                   |           |
| Size: A3   | Date: 17 JUL 2016 | Rev:      |
| KiCad E.D.A. eeschema 4.1.0-alpha+201607120318+697546ubuntu16.04.1-product |                   | Id: 38/38 |