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**CPU + PoP RAM/NAND**

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**Connector to BB-XM**

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**BB-XM Adapter (CPU)**

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**BB-XM Adapter (DISP)**

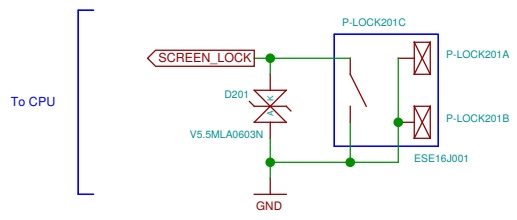
[Sheet: BB-XM Adapter \(CAM\)](#)  
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**BB-XM Adapter (CAM)**

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**No-Solder Components**

Note regarding I2C addresses:  
Addresses in the schematics are provided for convenience.  
The authoritative source is  
<https://neo900.org/git/misc/tree/i2c>

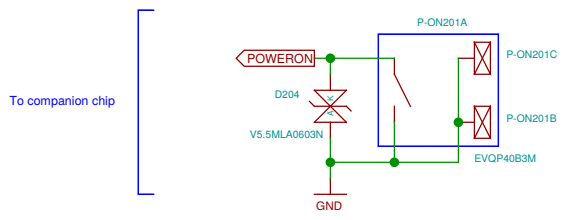
Sheet: /		
File: neo900.sch		
Title: Neo900		
Size: A3	Date: 16 JUL 2016	Rev:
Plotted by eeshow 889ed73+ 20161025-16:59Z		Id: 1/37

### Lock switch



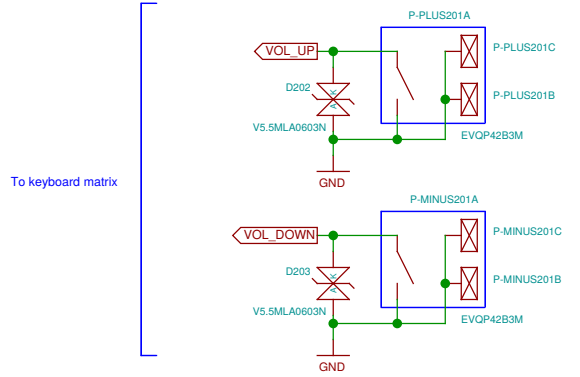
To CPU

### On-off



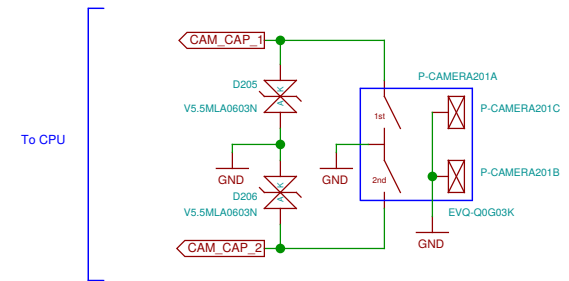
To companion chip

### Volume



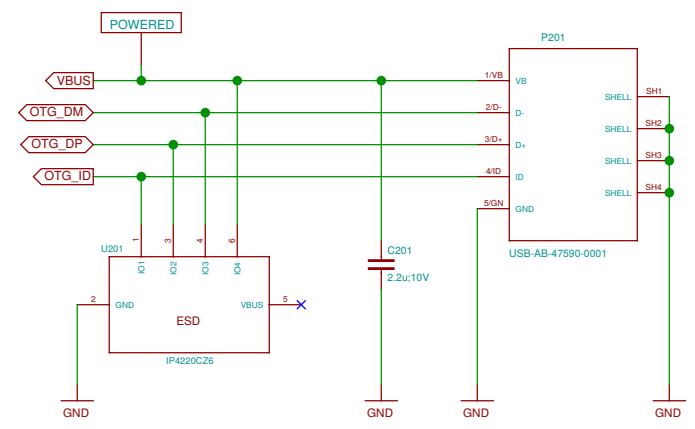
To keyboard matrix

### Camera trigger



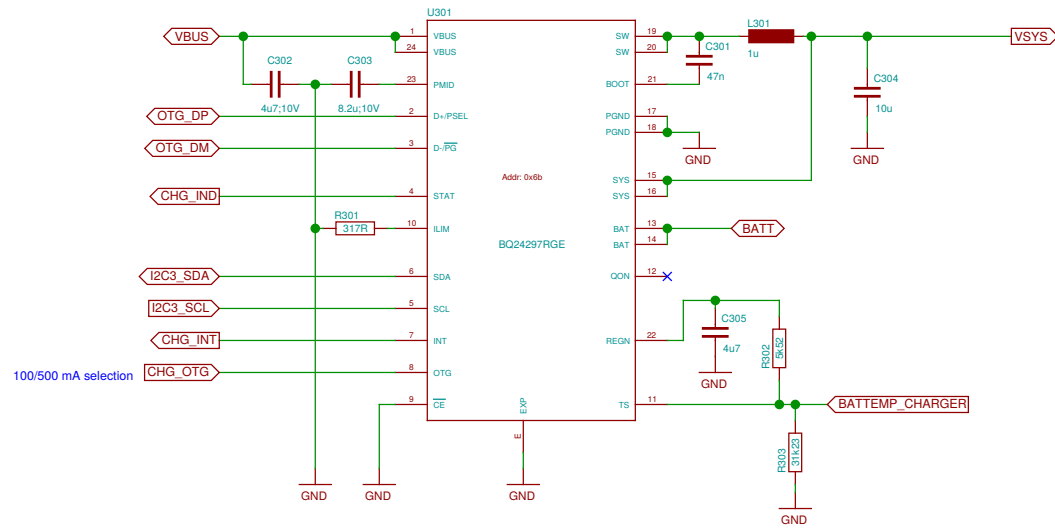
To CPU

### USB OTG connector



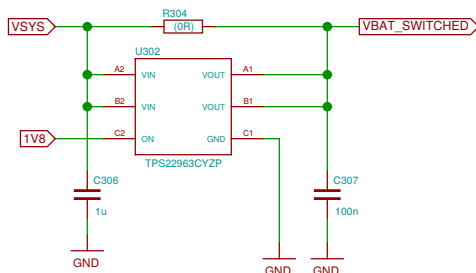
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Title: OTG	
Size: A3	Date: 17 JUL 2016
Plotted by eeshow 889ed73+ 20161025-16:59Z	
Rev:	Id: 2/37

### Battery charger with USB OTG

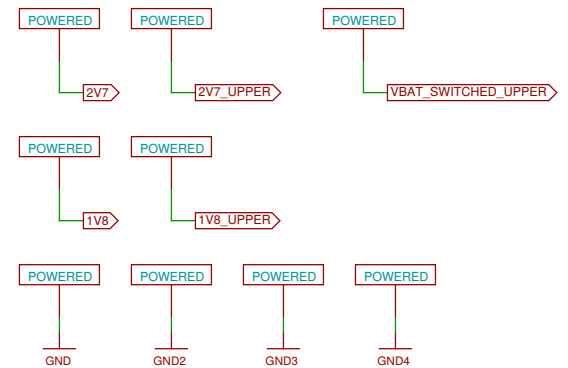


### Power distribution and sequencing

Most high-current consumers are on VBAT\_SWITCHED.  
 1V8 signals that the regulators on UPPER are operational.

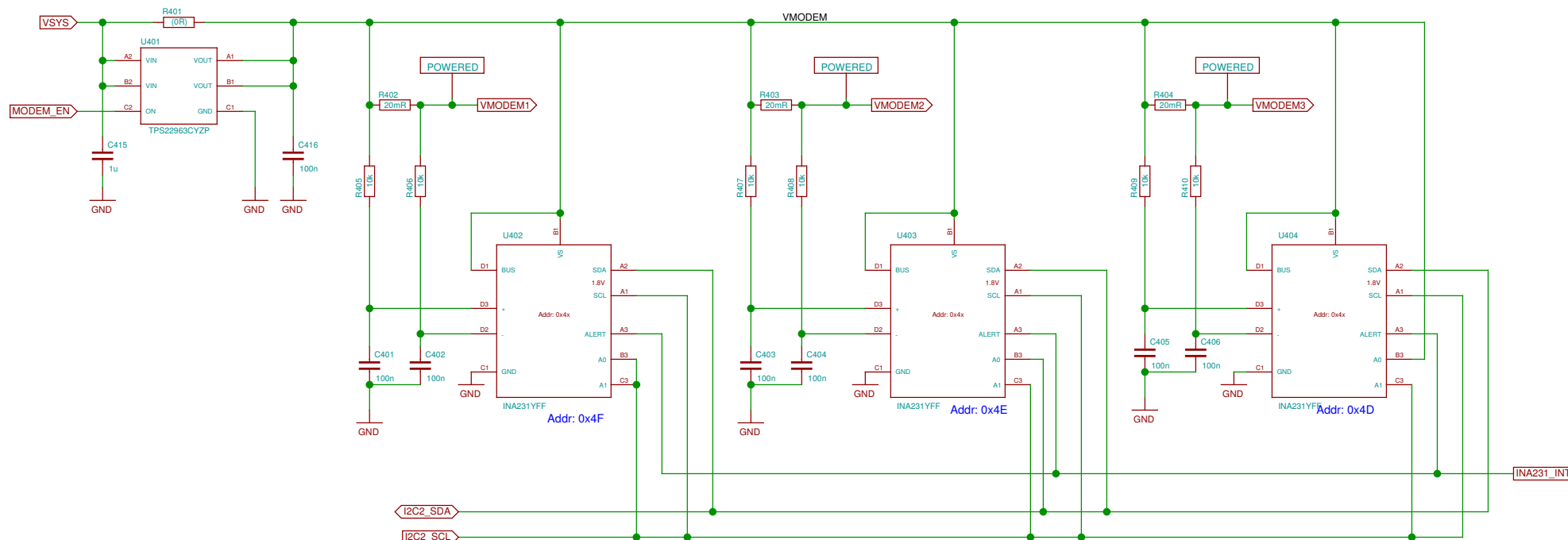


### KiCad bureaucracy

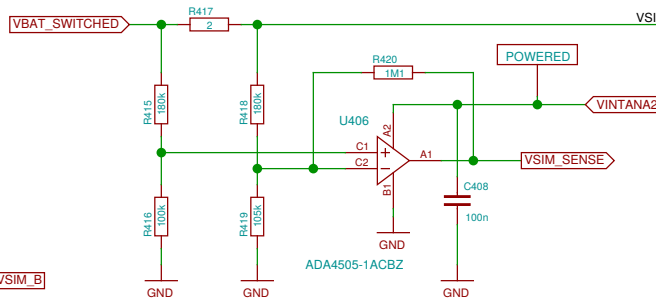


Sheet: /Charger/OTG-Booster/		
File: neo900_SS_3.sch		
Title: Charger/OTG-Booster		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 889ed73+ 20161025-16:59Z		Id: 3/37

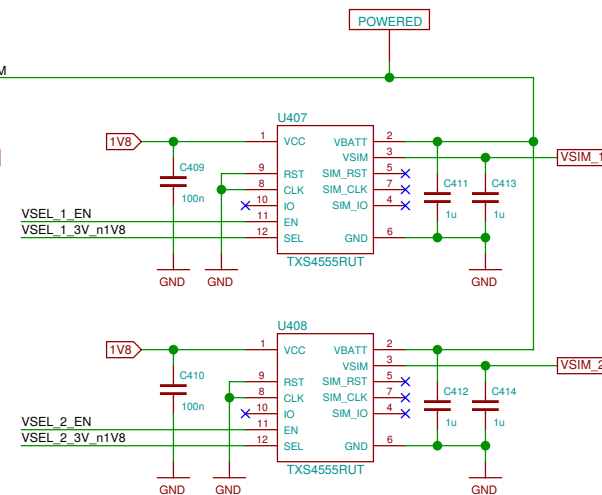
### Modem current monitor



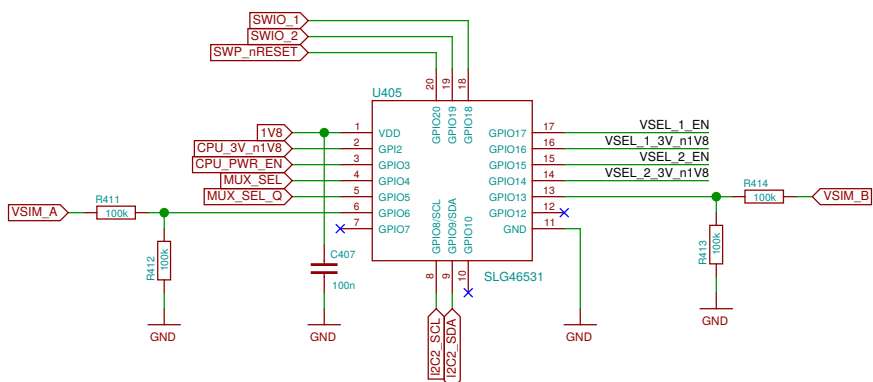
### SIM current sensing



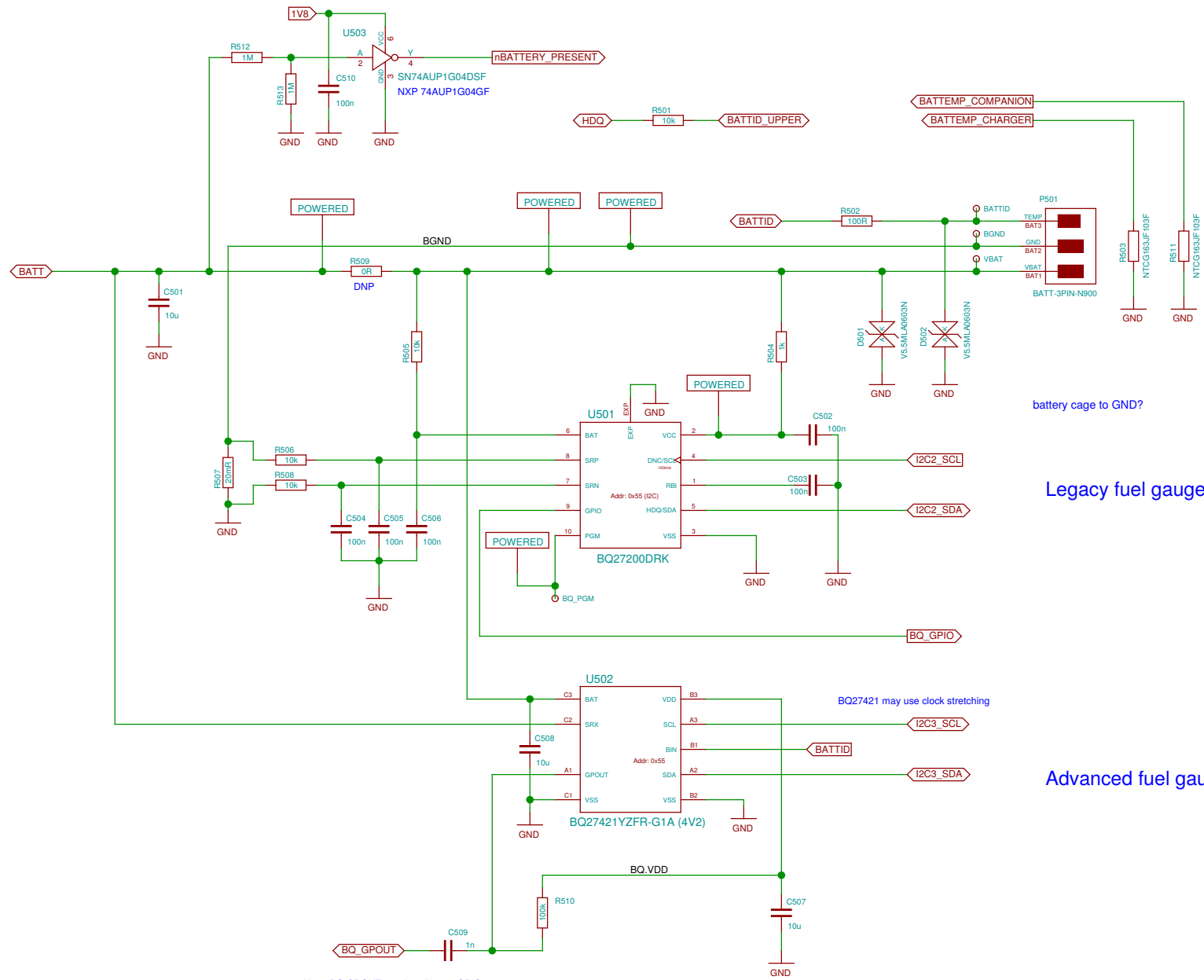
### SIM power supply



### SIM power selection



**TODO: update SLG design for changed pins**



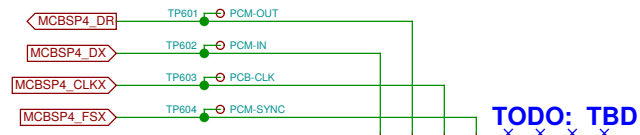
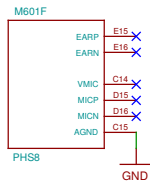
battery cage to GND?

Legacy fuel gauge

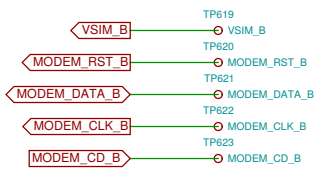
Advanced fuel gauge

Note: BQ.GPOUT needs pull-up at GPIO.

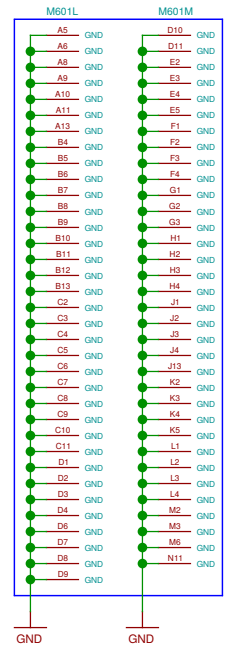
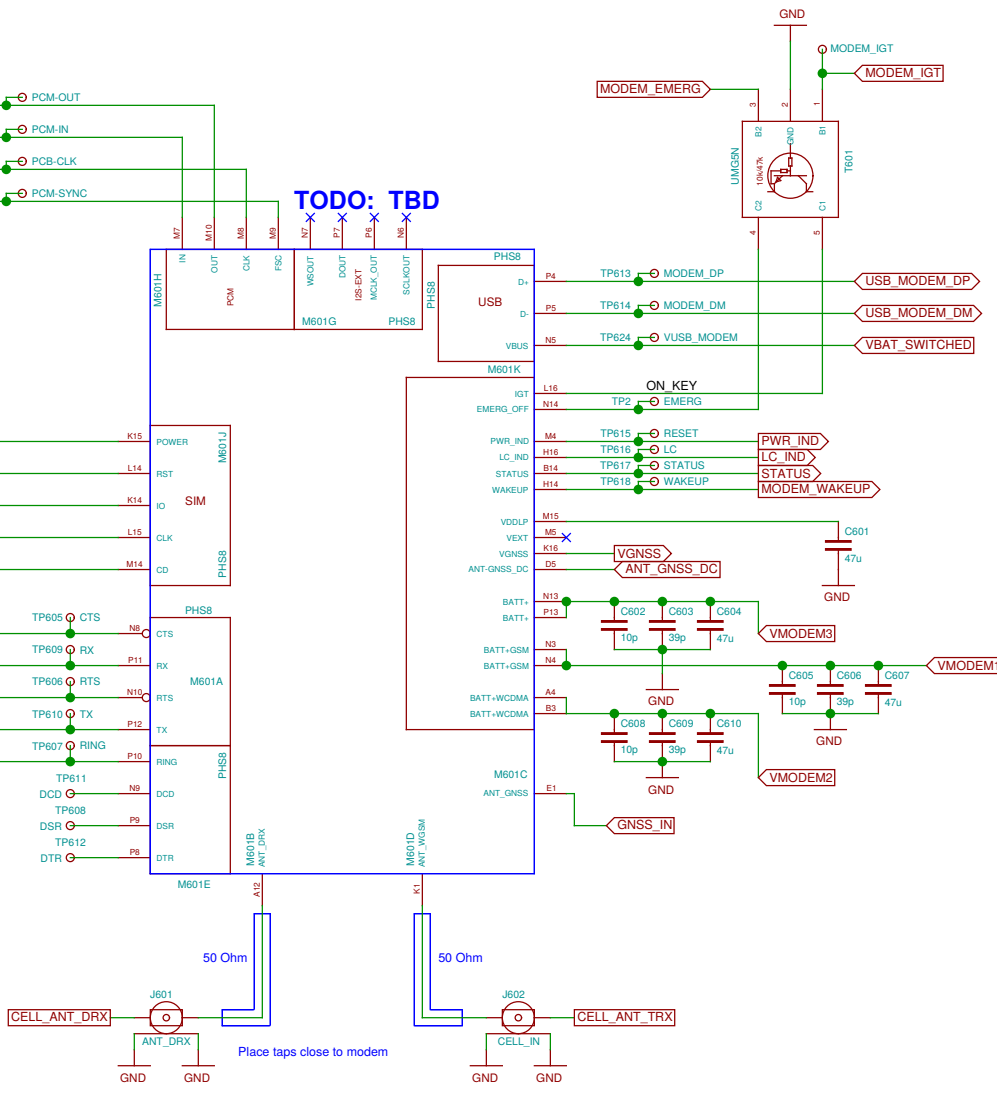
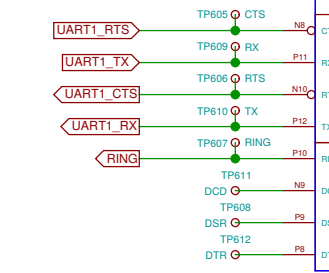
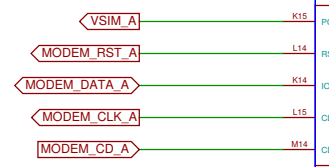
Sheet: /Fuel Gauge/		
File: neo900_SS_5.sch		
Title: Fuel Gauge		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 889ed73+ 20161025-16:59Z		Id: 5/37



TODO: TBD



TODO: B-SIM bus FFS

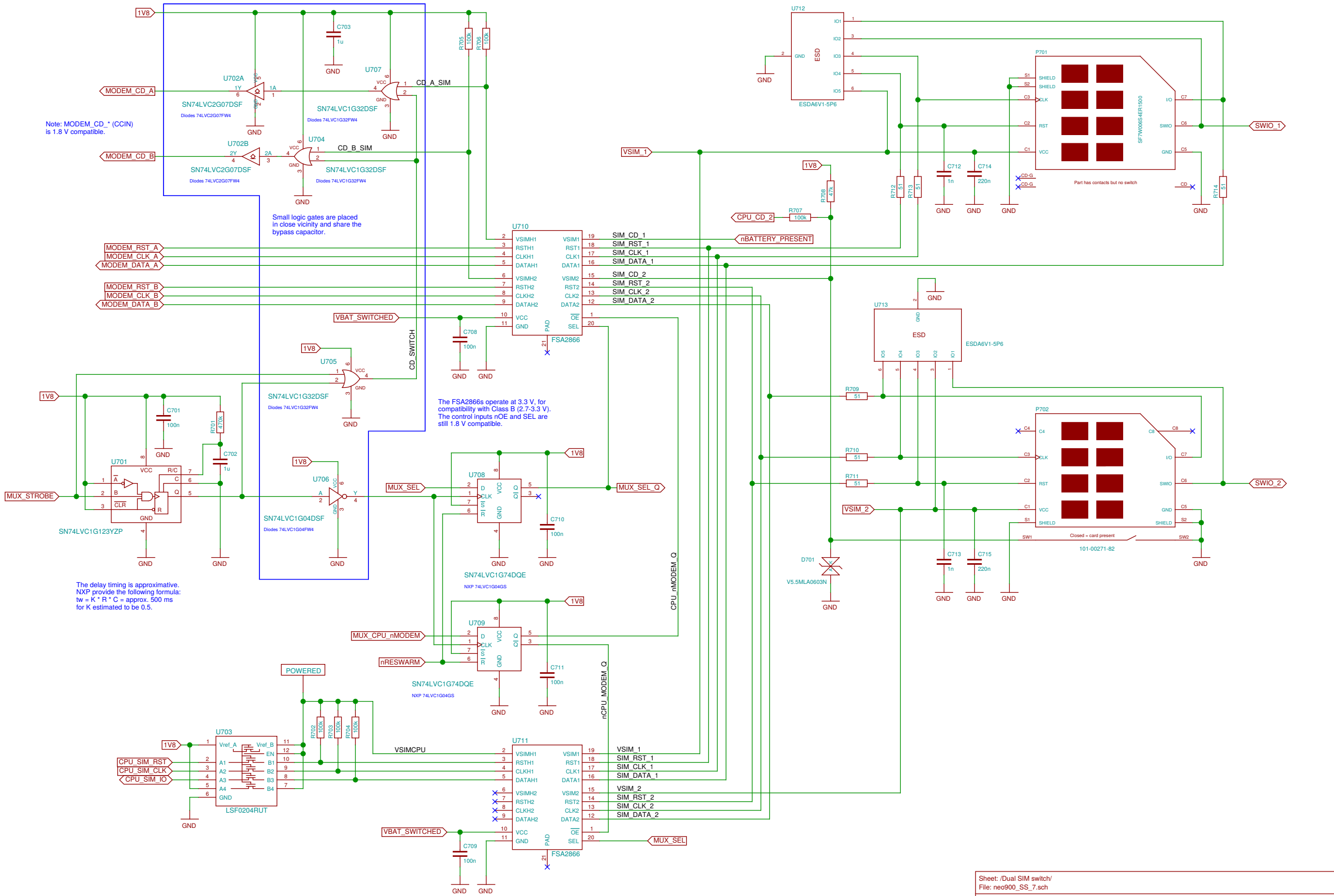


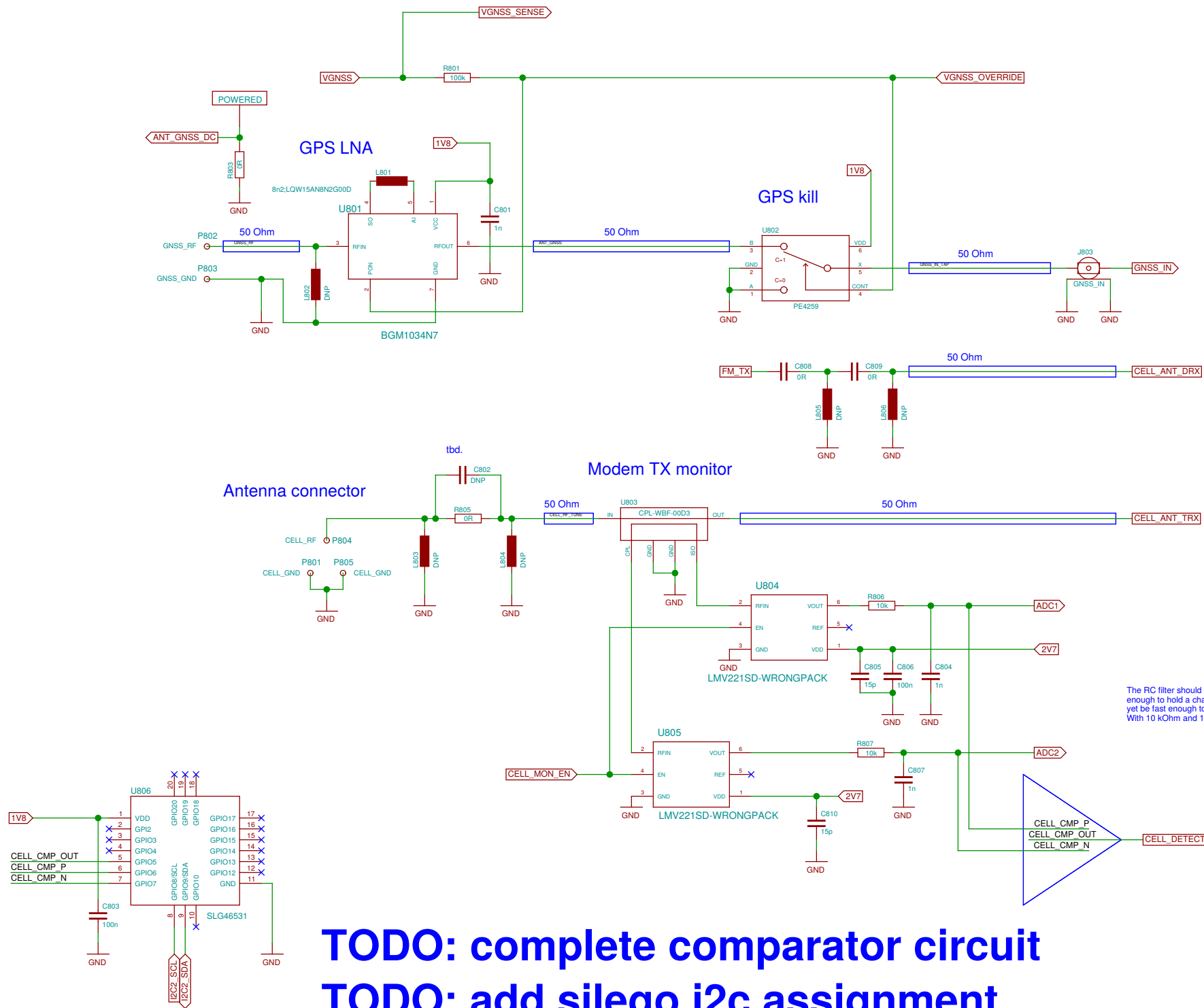
Note: MODEM\_CD\_\* (CCIN) is 1.8 V compatible.

Small logic gates are placed in close vicinity and share the bypass capacitor.

The FSA2866s operate at 3.3 V, for compatibility with Class B (2.7-3.3 V). The control inputs nOE and SEL are still 1.8 V compatible.

The delay timing is approximative. NXP provide the following formula:  $t_w = K * R * C = \text{approx. } 500 \text{ ms}$  for K estimated to be 0.5.



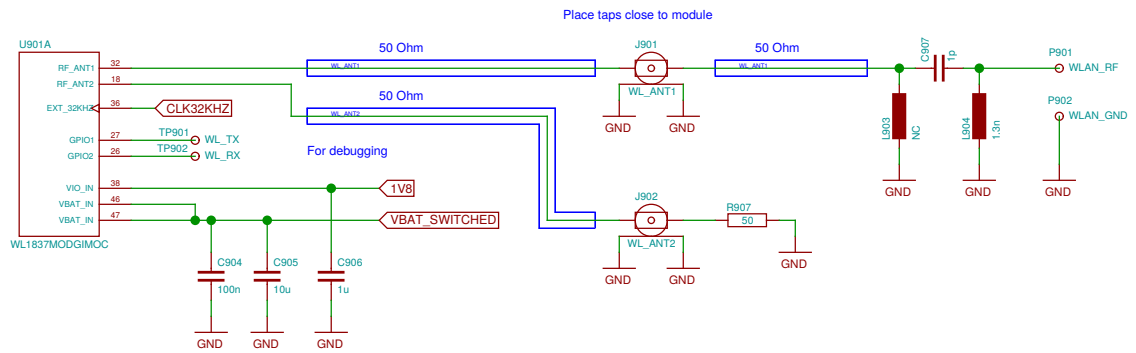


**TODO: complete comparator circuit**  
**TODO: add silego i2c assignment**

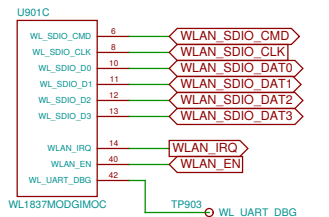


TODO: assign footprints for c-spring contacts

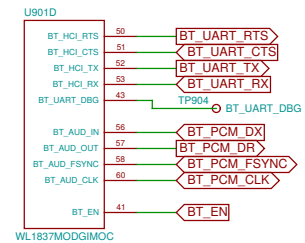
WLAN/BT antenna



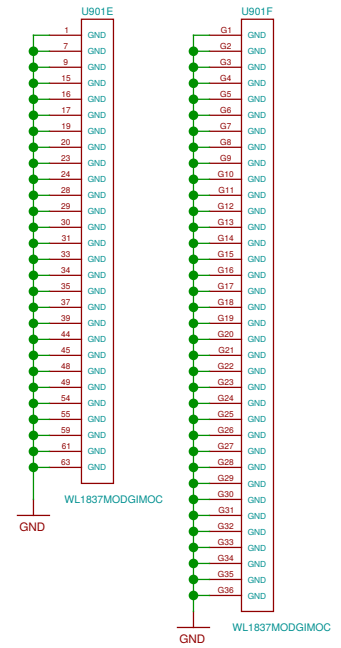
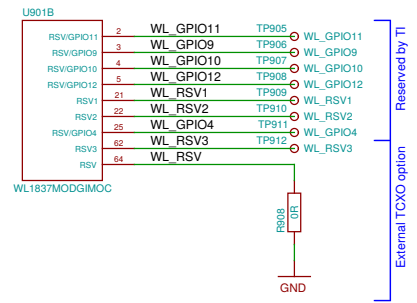
WLAN



Bluetooth



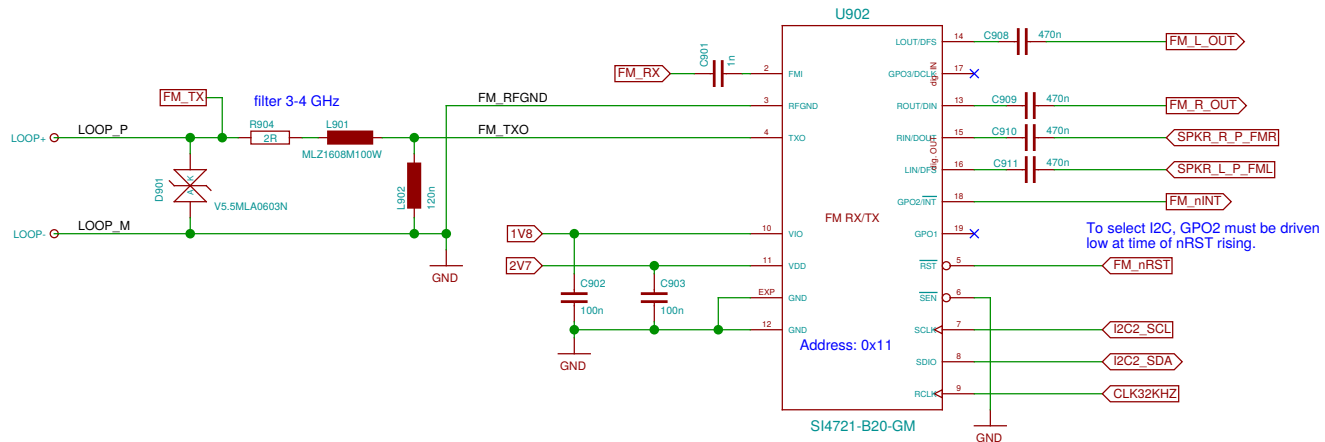
Reserved / Debugging



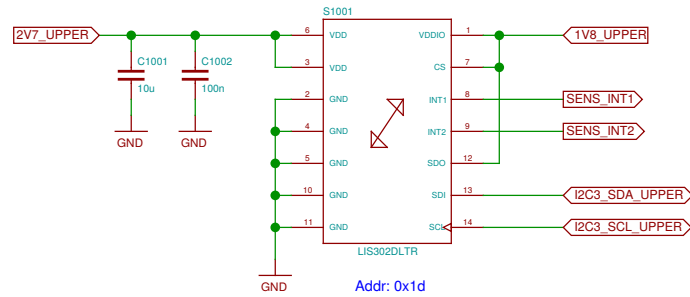
FM Radio (TX/RX)

TODO: check caps

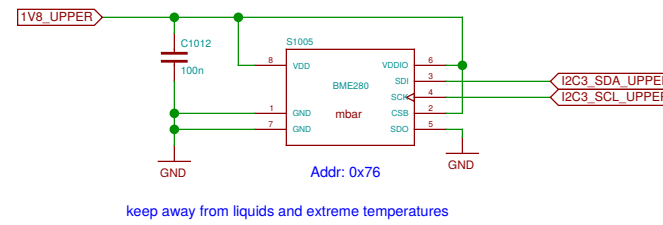
connect >10cm loop or stub antenna



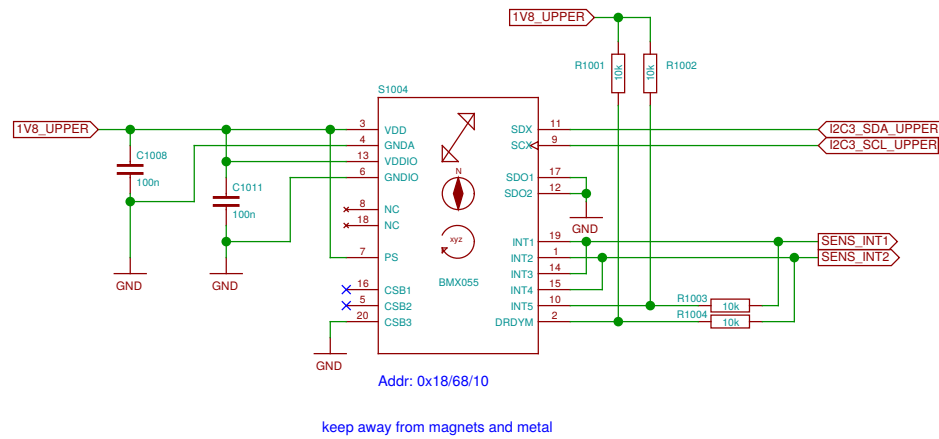
### Acceleration (legacy)



### Pressure, humidity

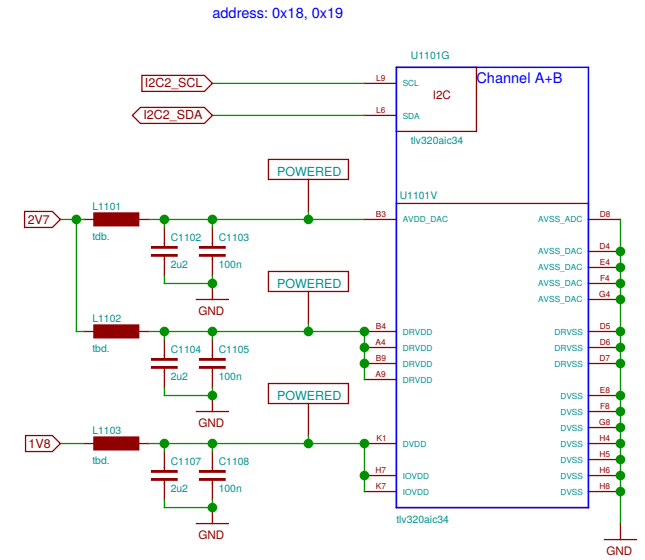
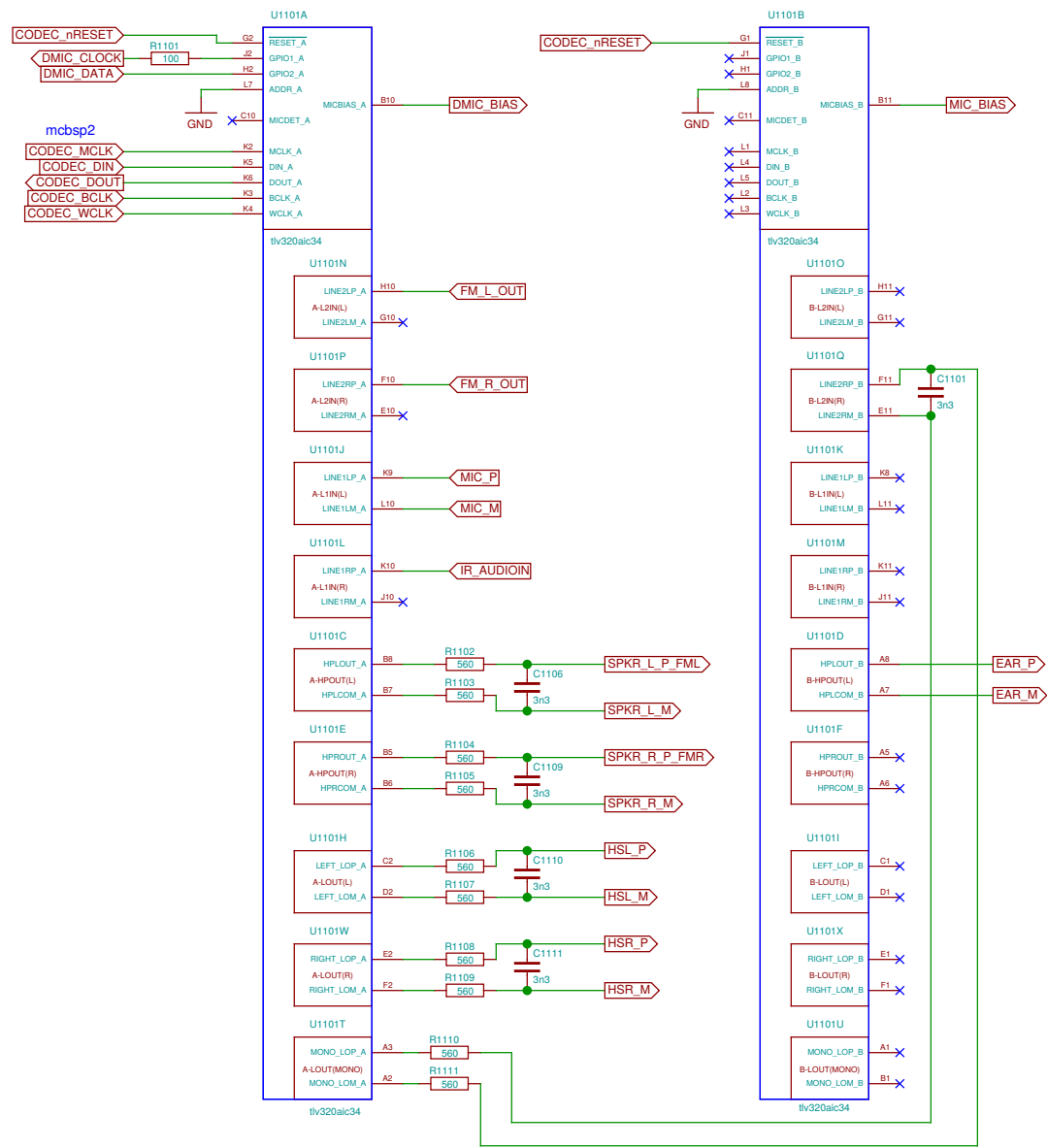


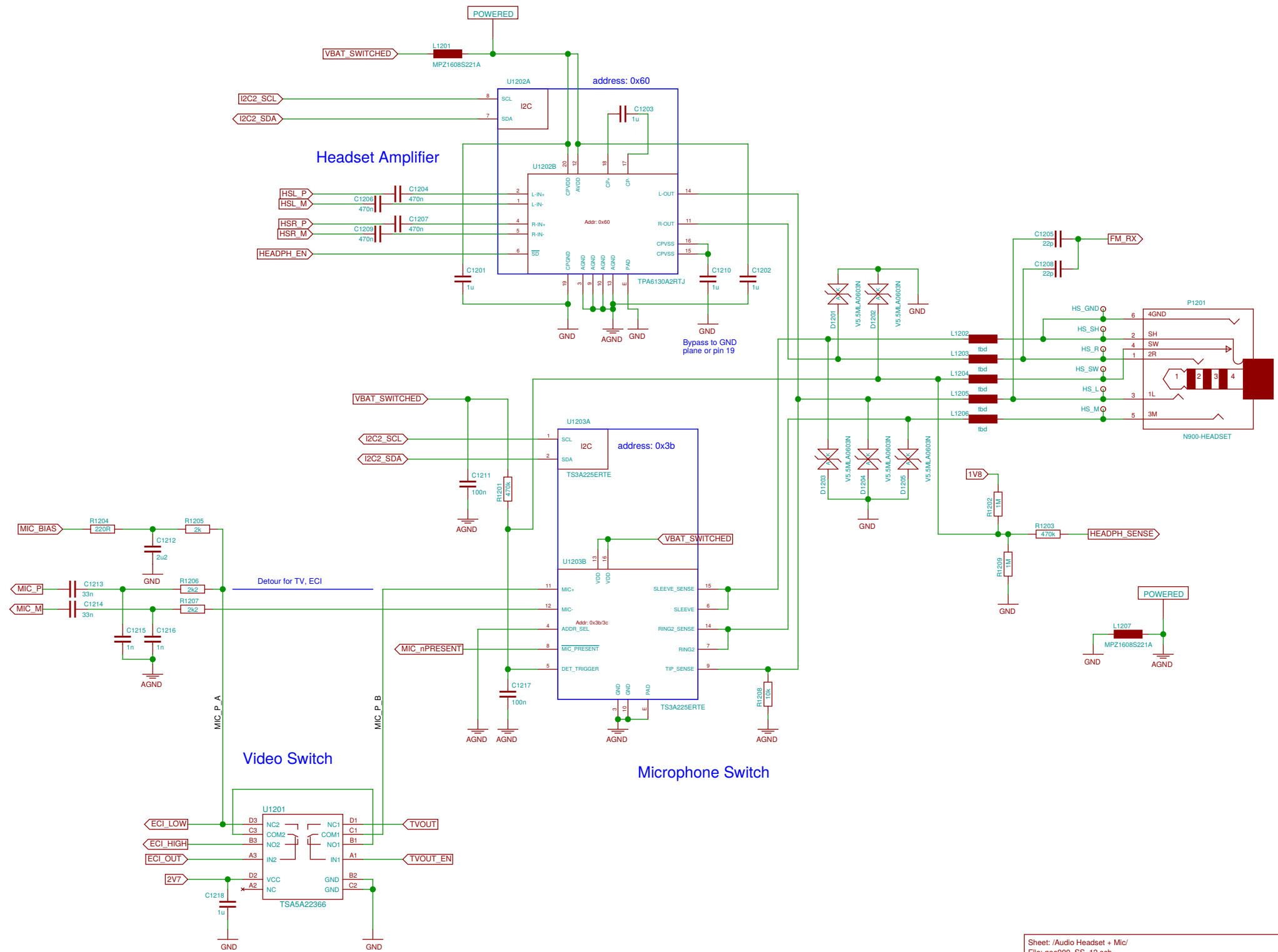
### 9-axis (acceleration, gyroscope, magnetometer)

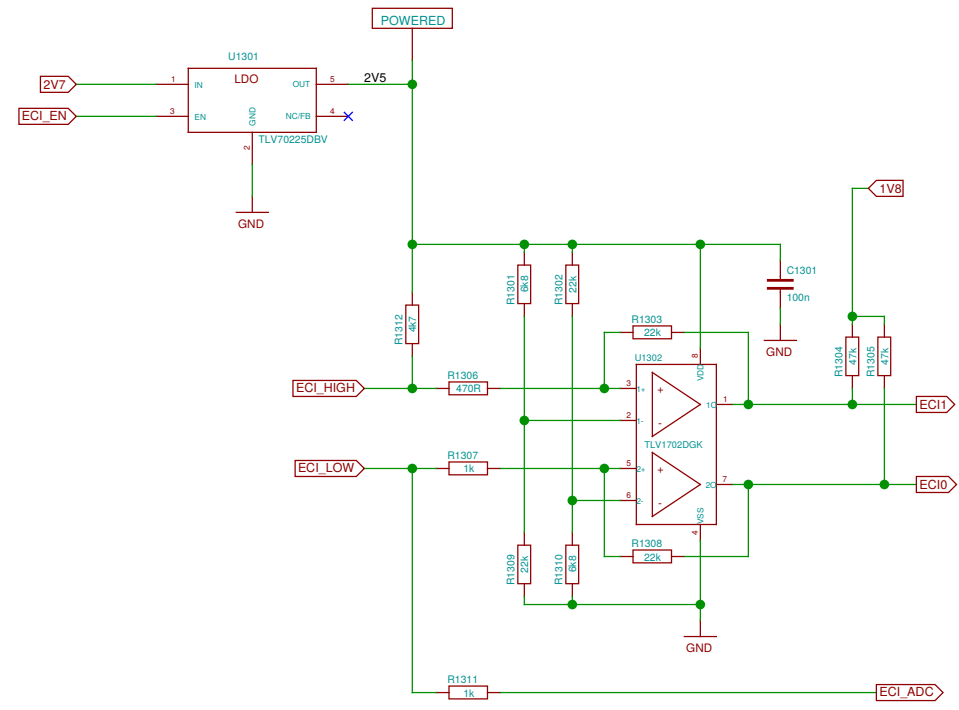


Sheet: /Sensors/ File: neo900_SS_10.sch	
Title: Sensors	
Size: A3	Date: 17 JUL 2016
Plotted by: eeshow 889ed73+ 20161025-16:59Z	Rev: Id: 10/37

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)

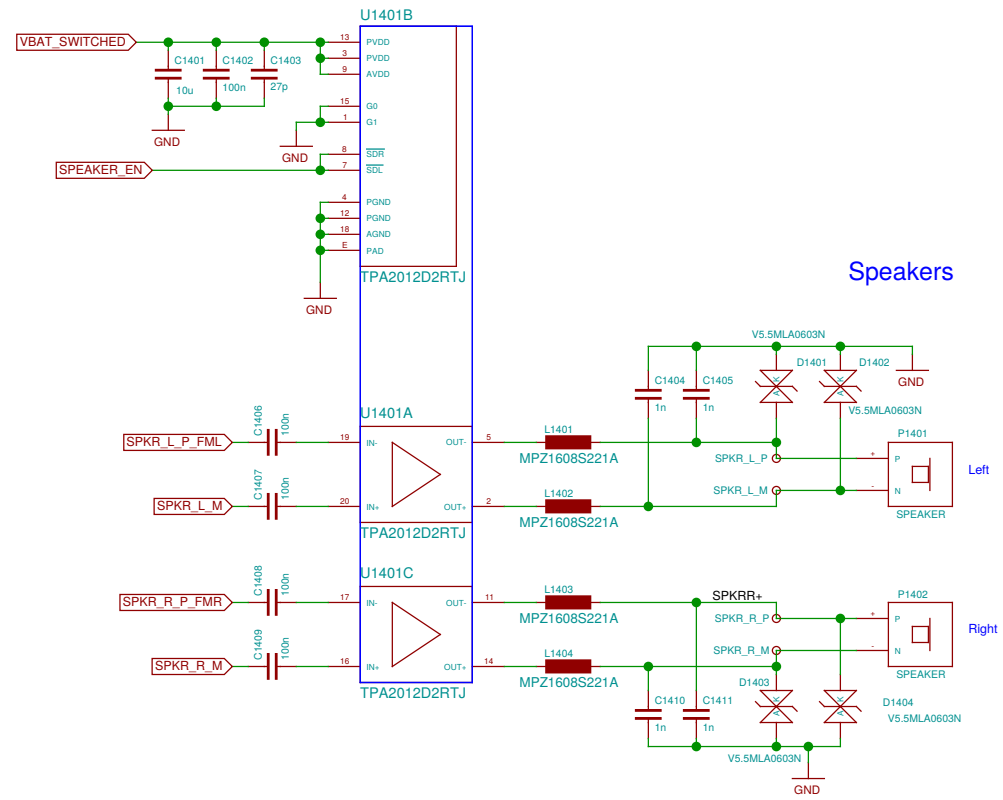






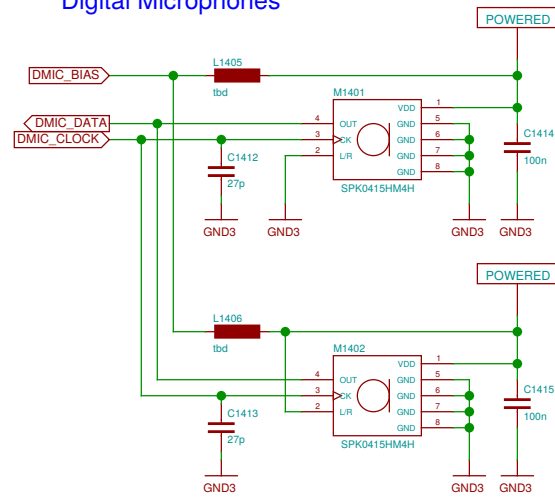
Sheet: /ECI/		
File: neo900_SS_13.sch		
Title: ECI		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 889ed73+ 20161025-16:59Z		Id: 13/37

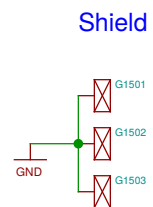
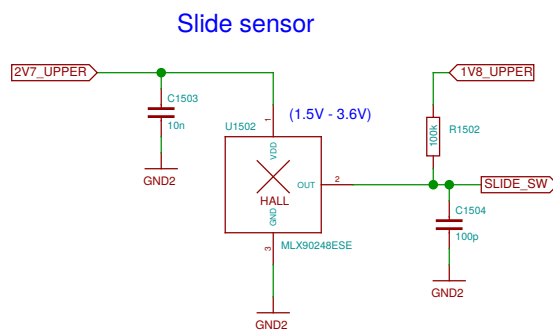
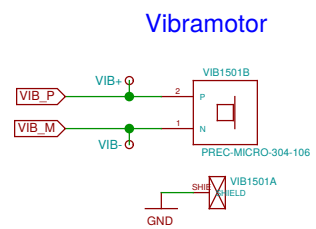
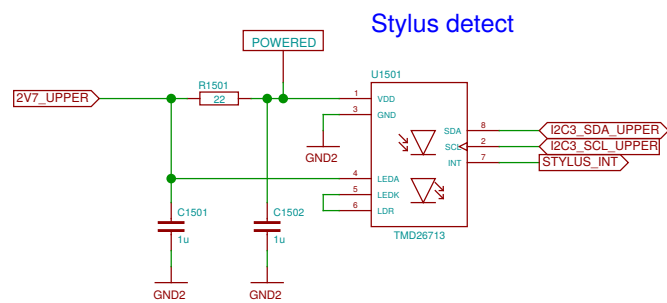
### Hands-free



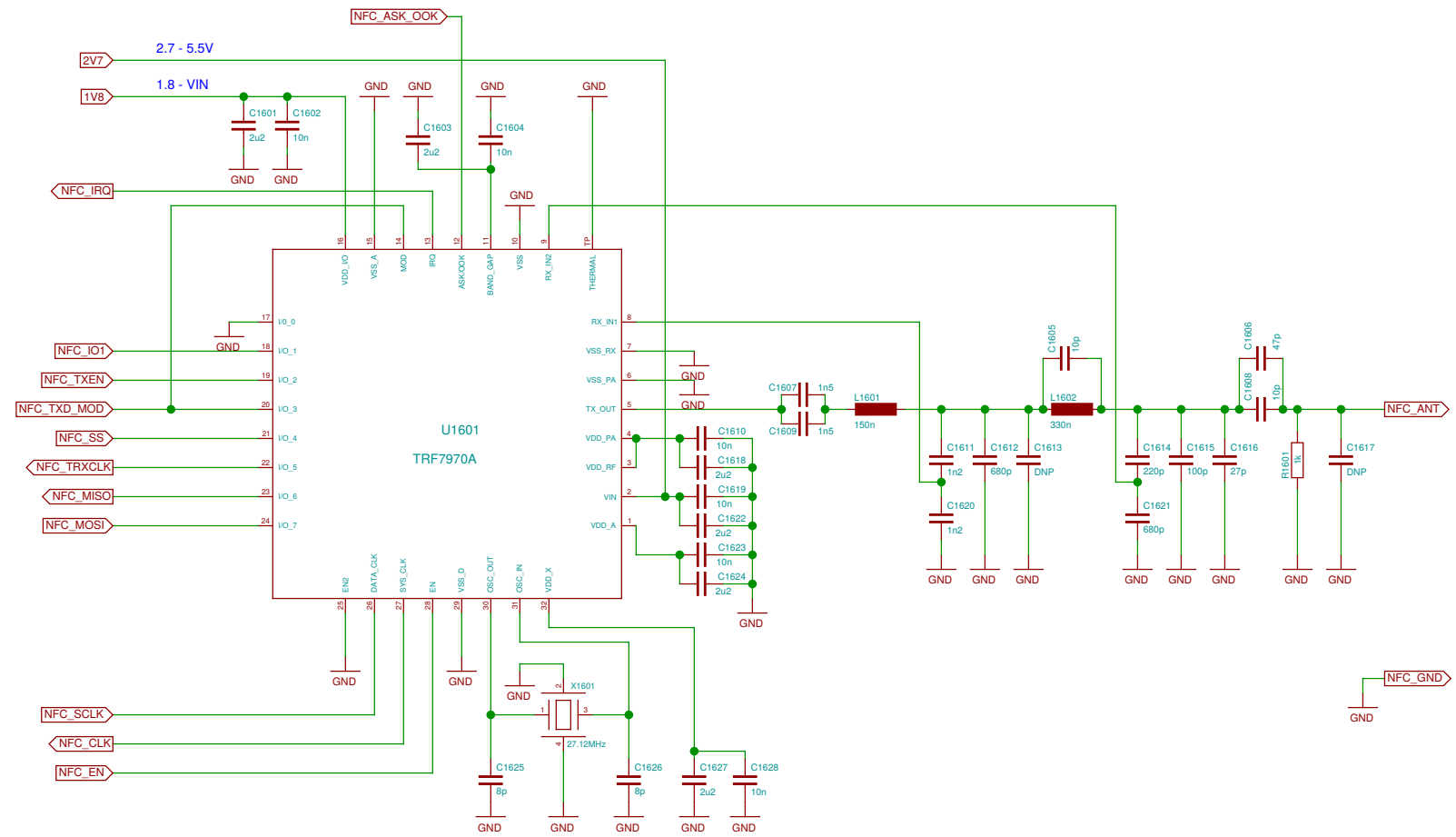
### Speakers

### Digital Microphones



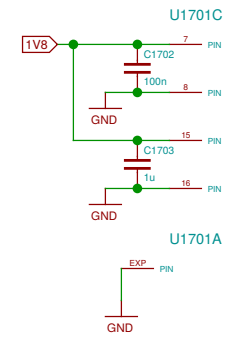
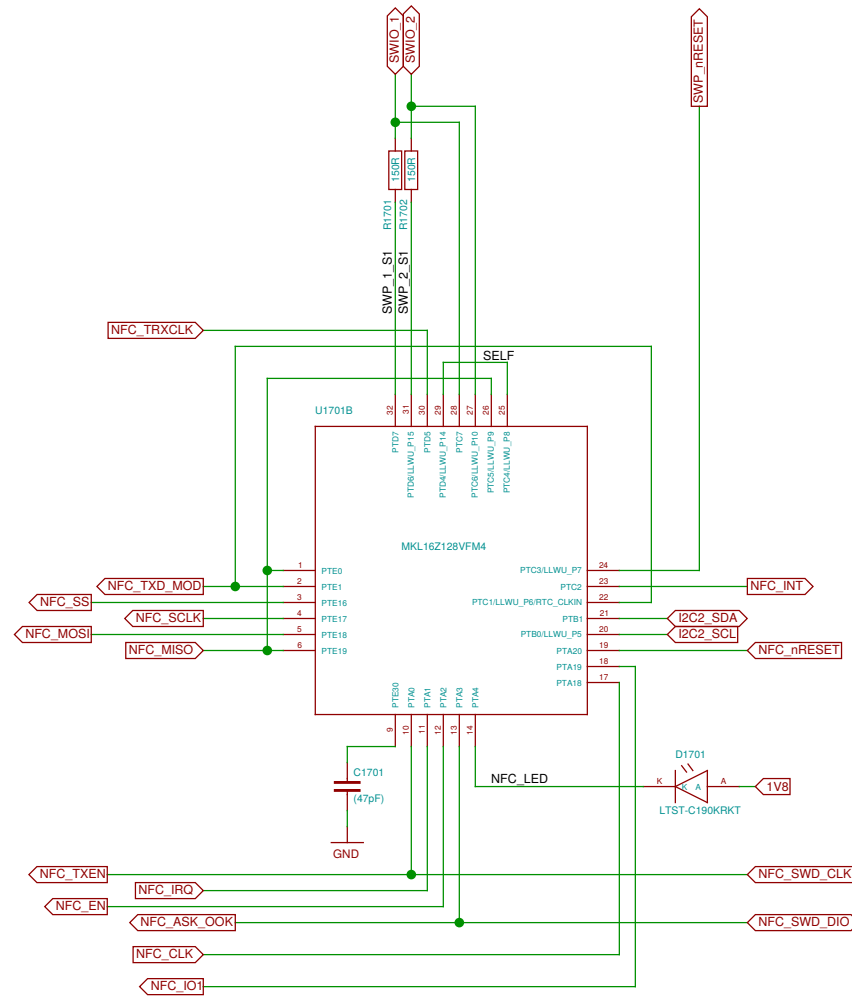


Sheet: /Misc/ File: neo900_SS_15.sch	
Title: Misc	
Size: A3	Date: 17 JUL 2016
Plotted by eeshow 889ed73+ 20161025-16:59Z	
Rev:	Id: 15/37



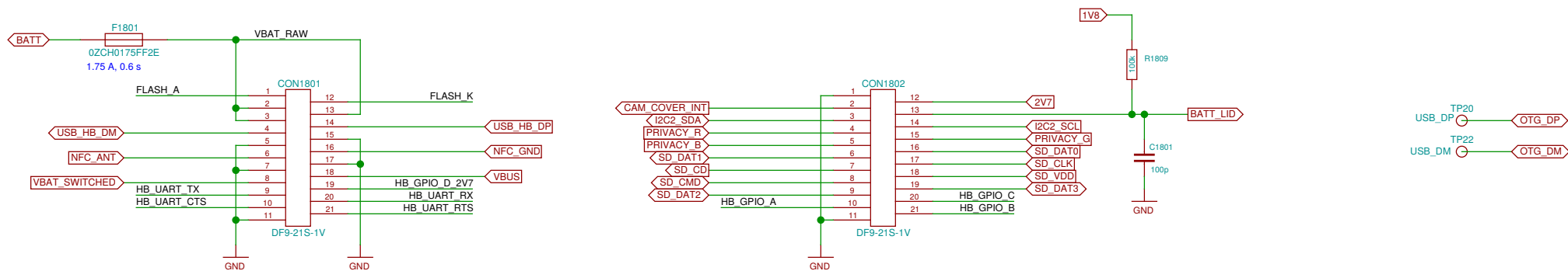
Some choices, 3.2 x 2.6 mm, 8-10 pF:  
 NDK NX3225GA-27.12M-STD-CRG-2  
 NDK NX3225SA-27.12M-STD-CSR-3  
 Tattien XXCCEINANF-27.120000



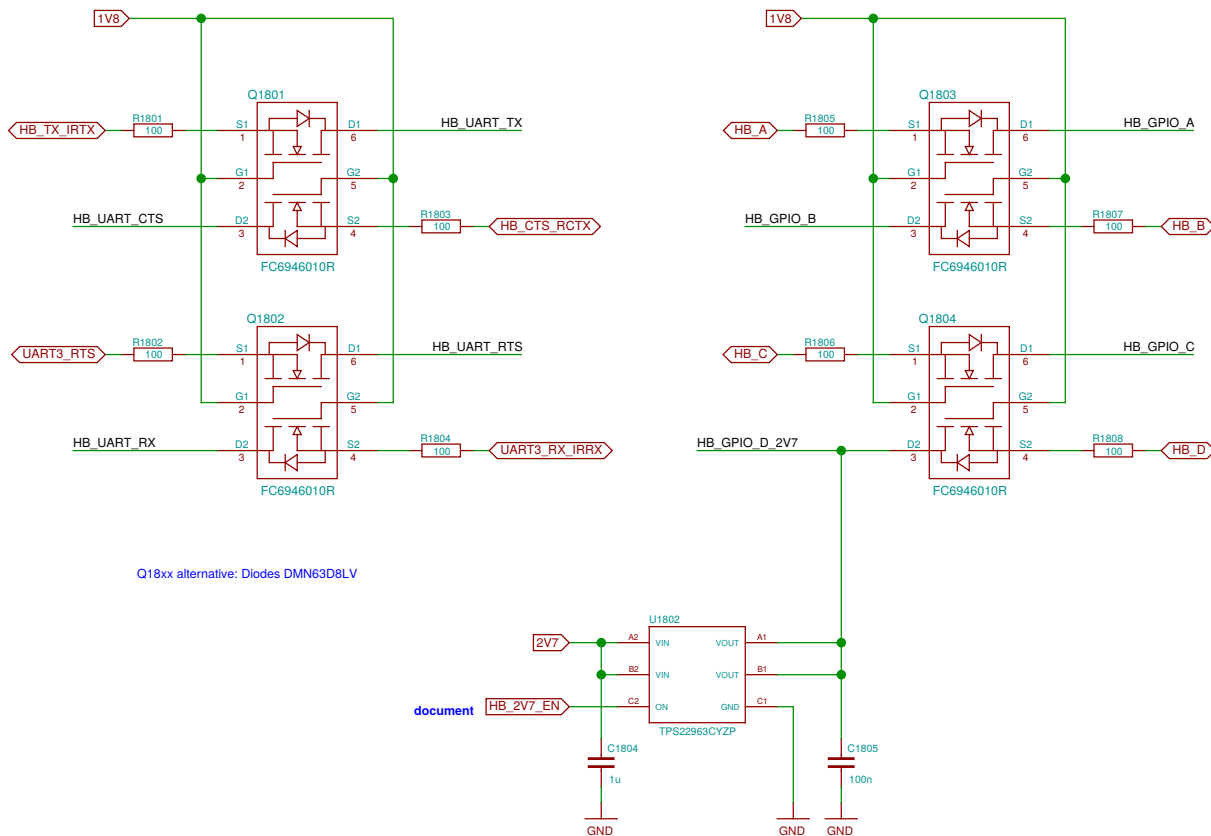


# LOWER-BOB Interconnect (LOWER side)

Defined in the Hackerbus specification, <http://neo900.org/stuff/papers/hb.pdf>

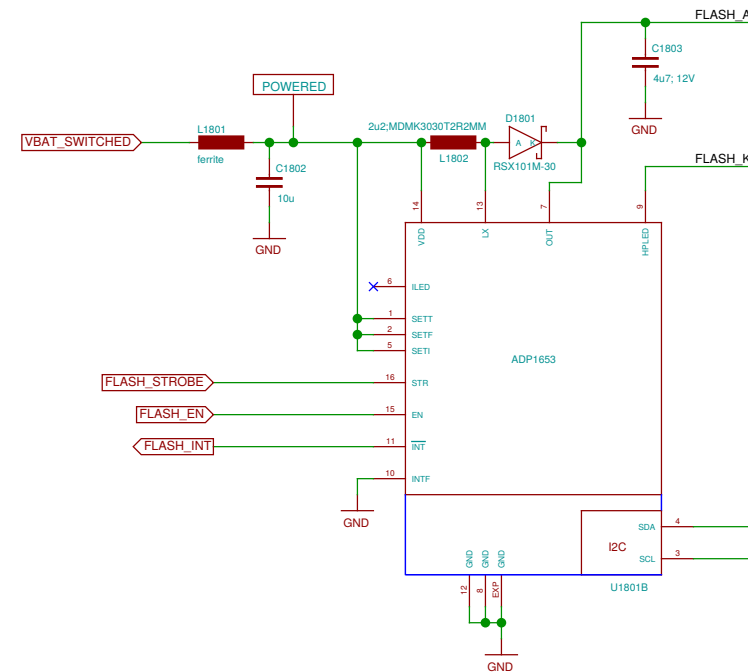


## Level shifters for Hackerbus GPIO and UART



Q18xx alternative: Diodes DMN63D8LV

## Flash/Torch



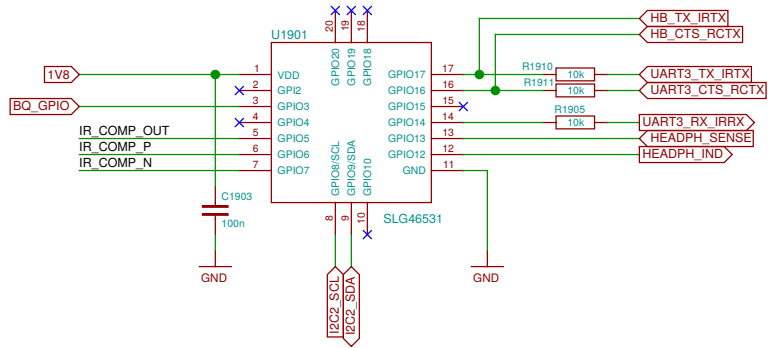
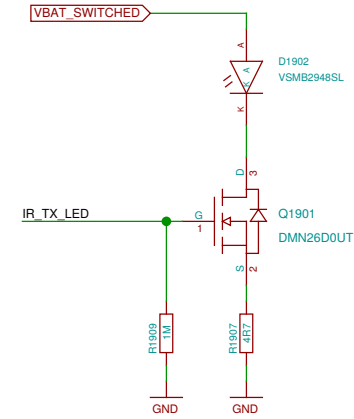
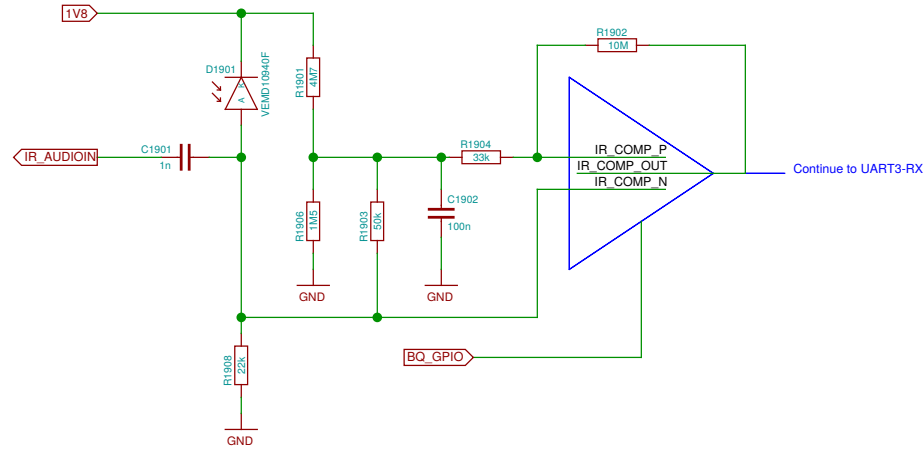
**TODO: HB USB PHY may go here**

Missing 6x 2R for alternate function select (do we have the space for ca. 2.5 x 5mm?)

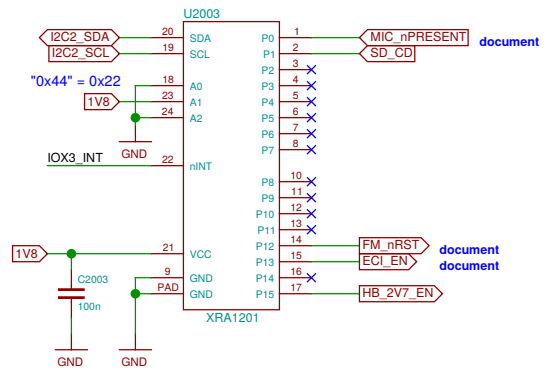
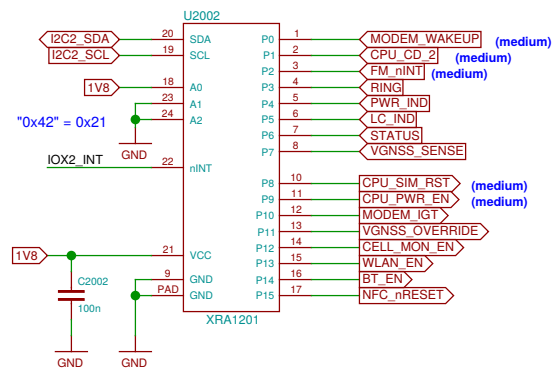
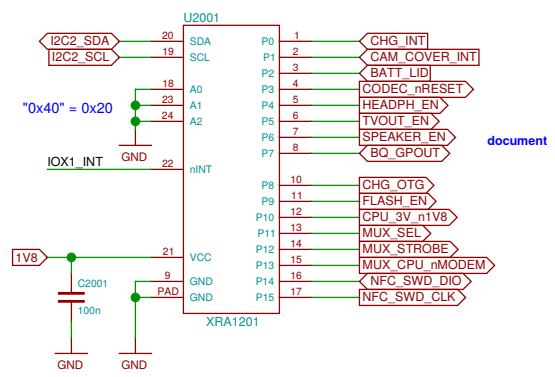
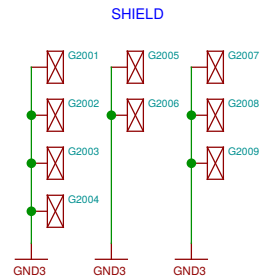
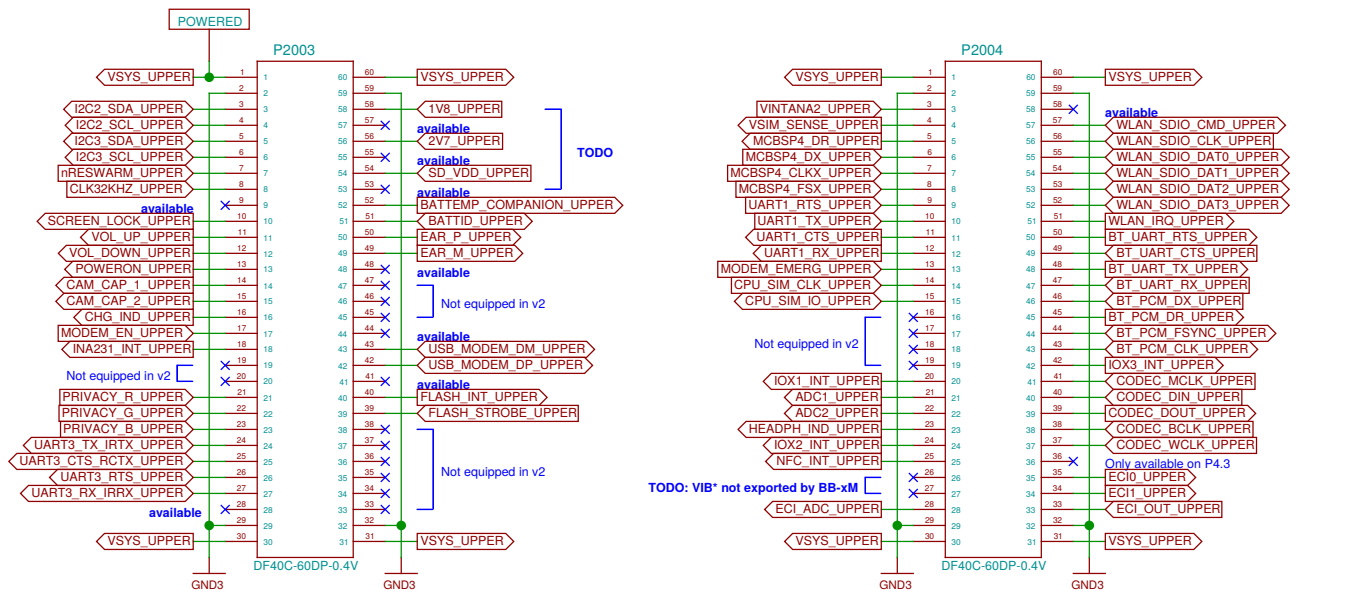
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Title: Hackerbus			
Size: A3	Date: 17 JUL 2016	Rev:	
Plotted by eeshow 889ed73+ 20161025-16:59Z		Id: 18/37	

# TODO: update D1901 footprint

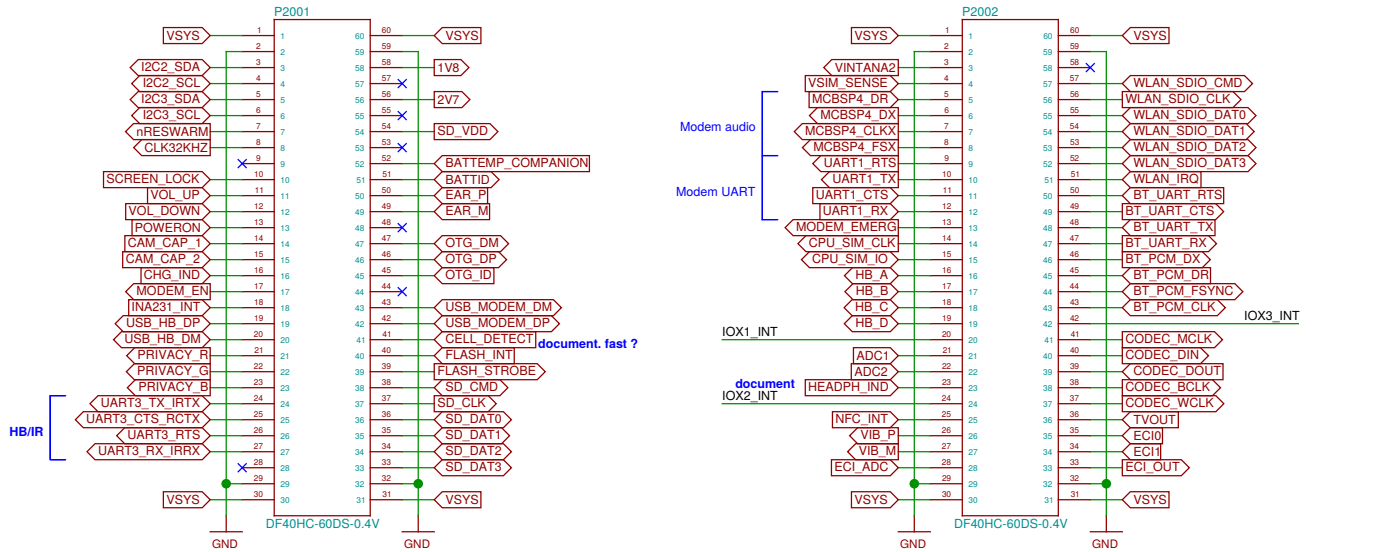
NOTE: 1V8 may be quite noisy



This is just the collection of signals we have.  
Proper assignment still pending.

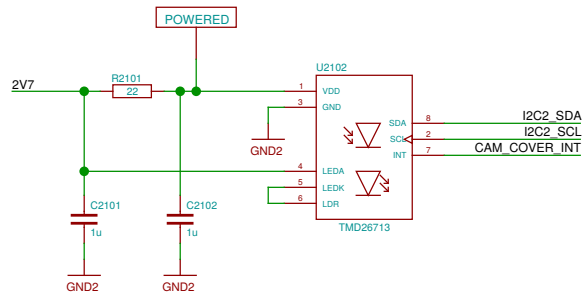


UPPER  
LOWER

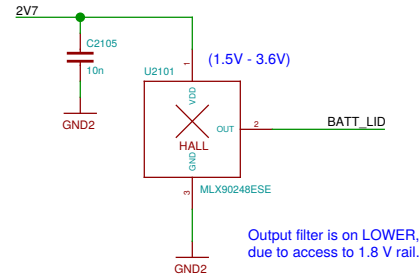


Current rating per contact: 0.3 A

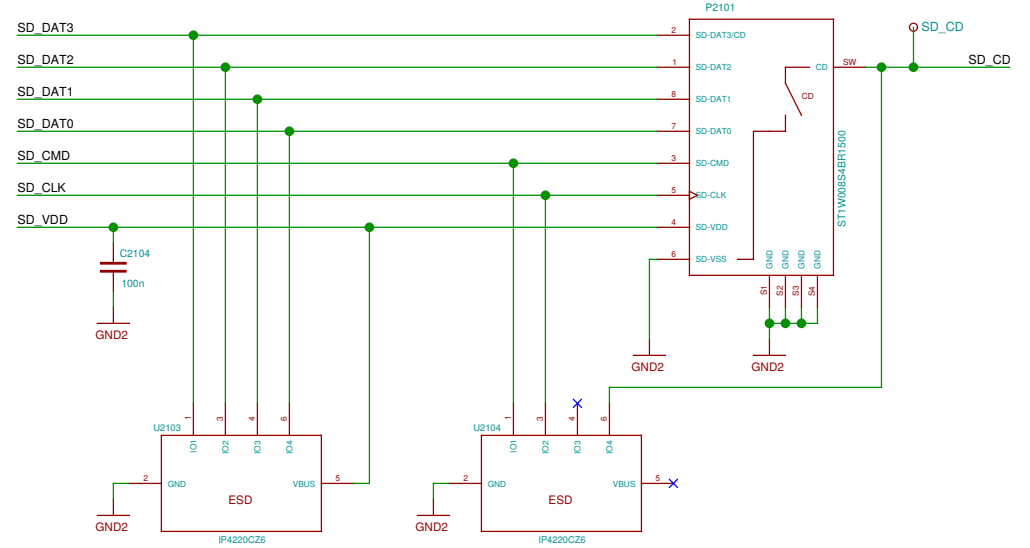
### Camera Cover detect



### Battery Cover detect

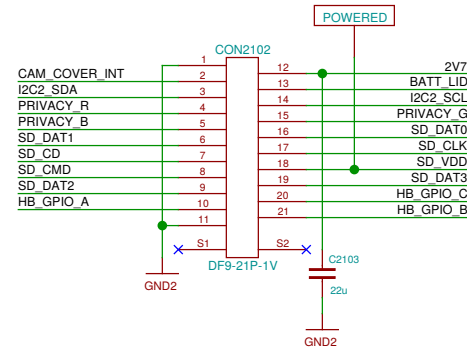
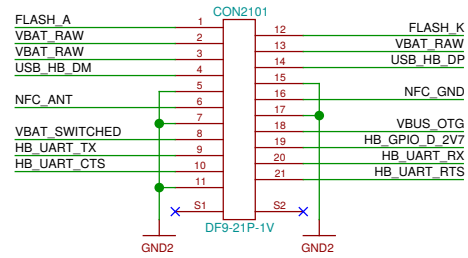


### Memory card holder

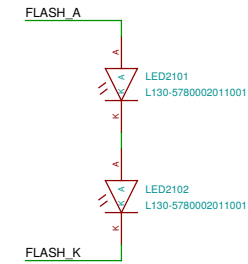


### LOWER-BOB Interconnect (BOB side)

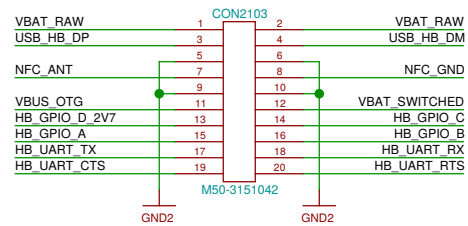
Defined in the Hackerbus specification, <http://neo900.org/stuff/papers/hb.pdf>



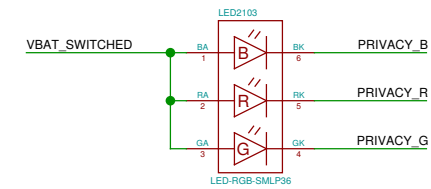
### Camera flash



### Hackerbus

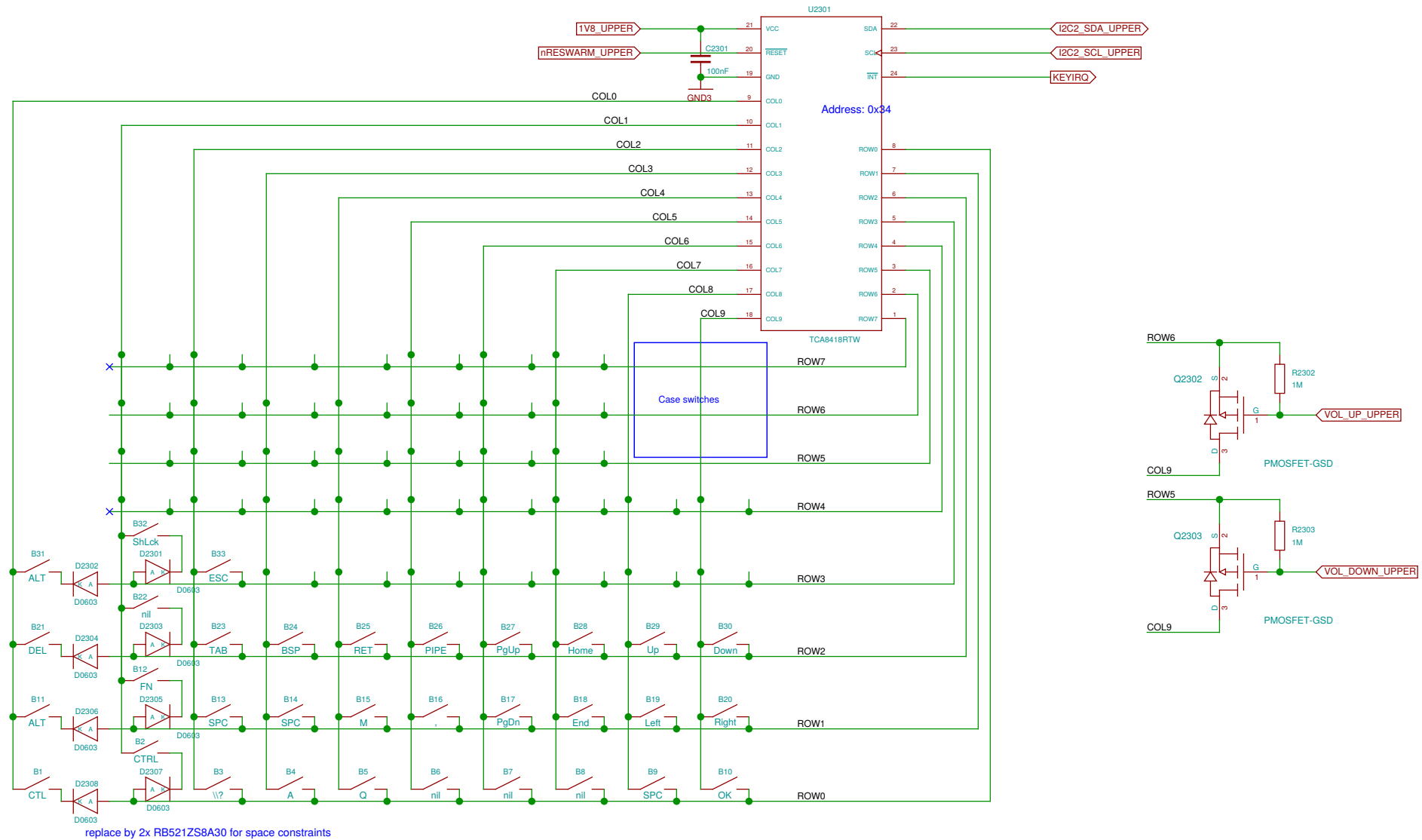


### Privacy LED



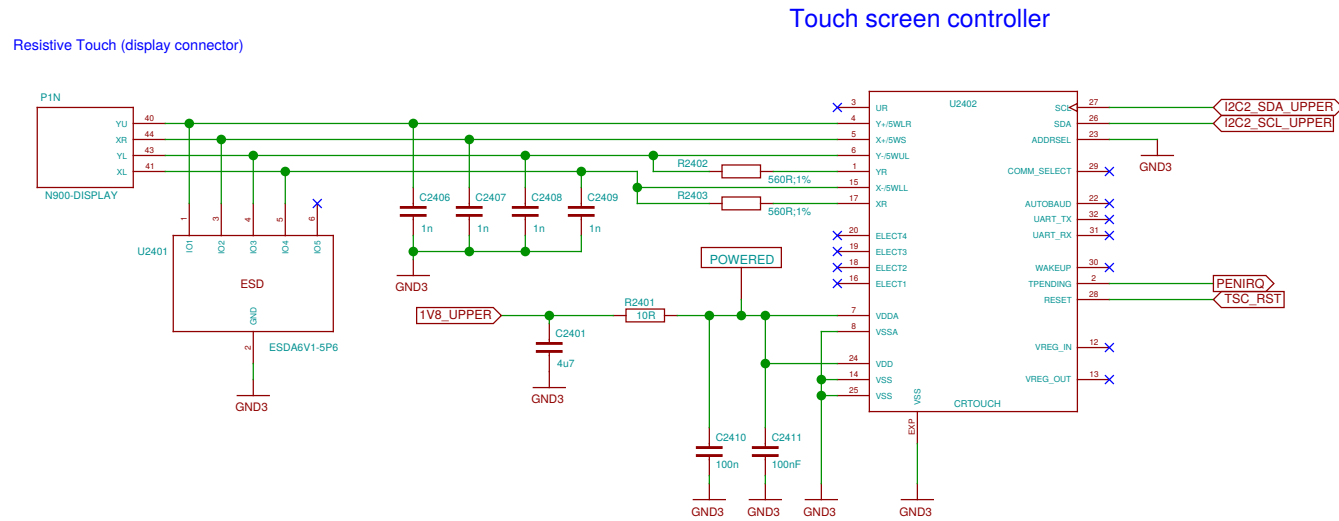
**TODO: consider sheet for deletion**

Sheet: /empty/ File: neo900_SS_22.sch		
Title: empty		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 889ed73+ 20161025-16:59Z		Id: 22/37



**TODO: key names are nonsense**

**TODO: rearrange matrix to avoid diodes ?**

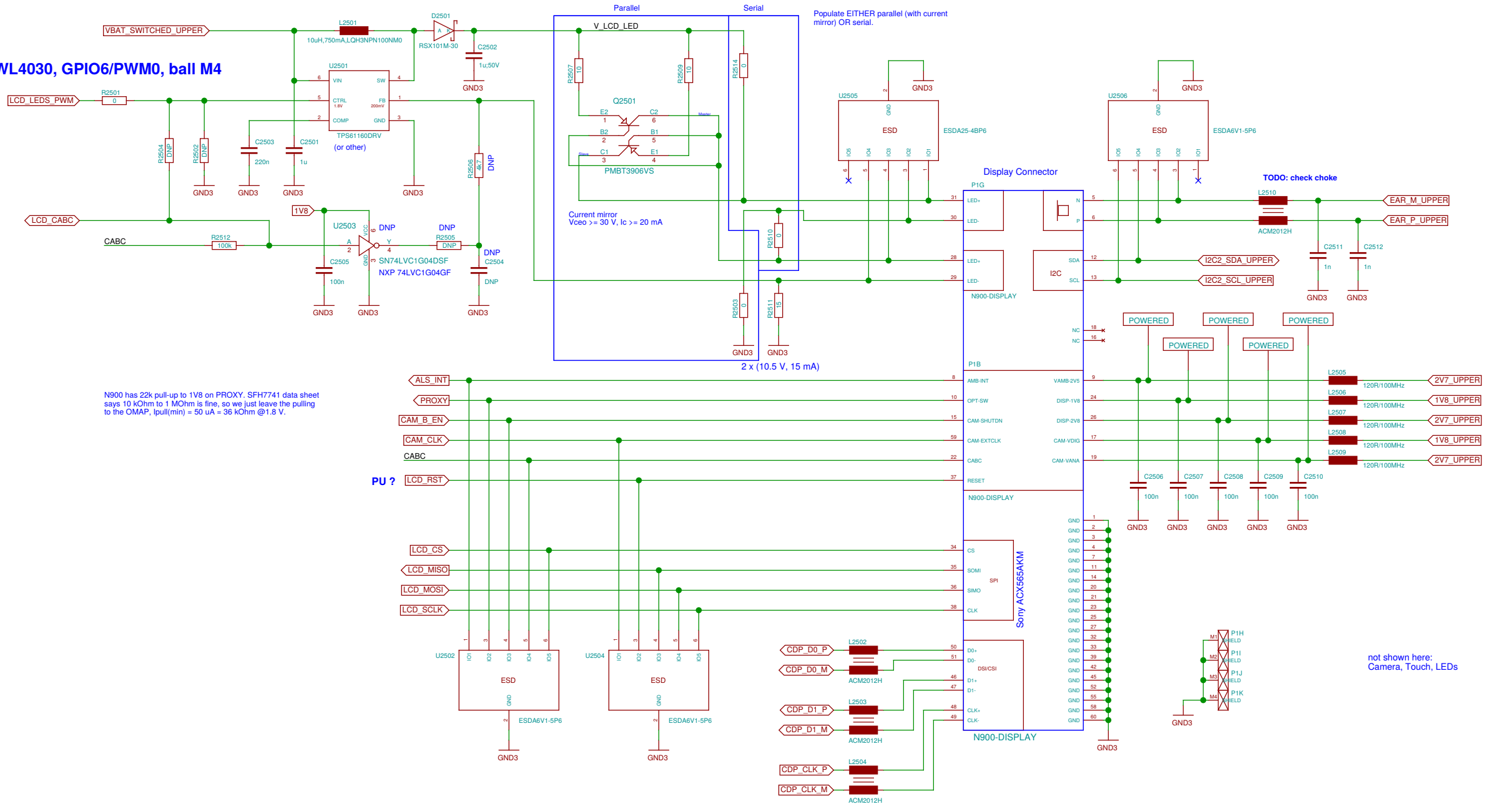


Touch screen controller

Resistive Touch (display connector)



**TWL4030, GPIO6/PWM0, ball M4**



N900 has 22k pull-up to 1V8 on PROXY. SFH7741 data sheet says 10 kOhm to 1 MOhm is fine, so we just leave the pulling to the OMAP, Ipull(min) = 50 uA = 36 kOhm @1.8 V.

Current mirror  
Vceo >= 30 V, Ic >= 20 mA

2 x (10.5 V, 15 mA)

TODO: check choke

not shown here:  
Camera, Touch, LEDs

**OMAP is not part of v2**

Sheet: /CPU + PoP RAM/NAND/ File: neo900_SS_26.sch		
Title: CPU + PoP RAM/NAND		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 889ed73+ 20161025-16:59Z		Id: 26/37

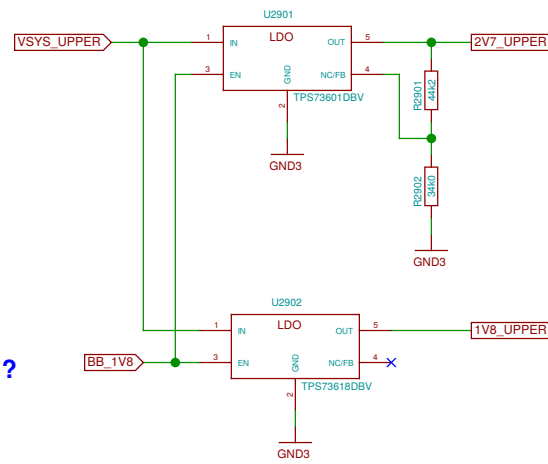
**eMMC is not part of v2**

Sheet: /eMMC/ File: neo900_SS_27.sch		
Title: eMMC		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 889ed73+ 20161025-16:59Z		Id: 27/37

**Companion chip (TPS65950) is not part of v2**

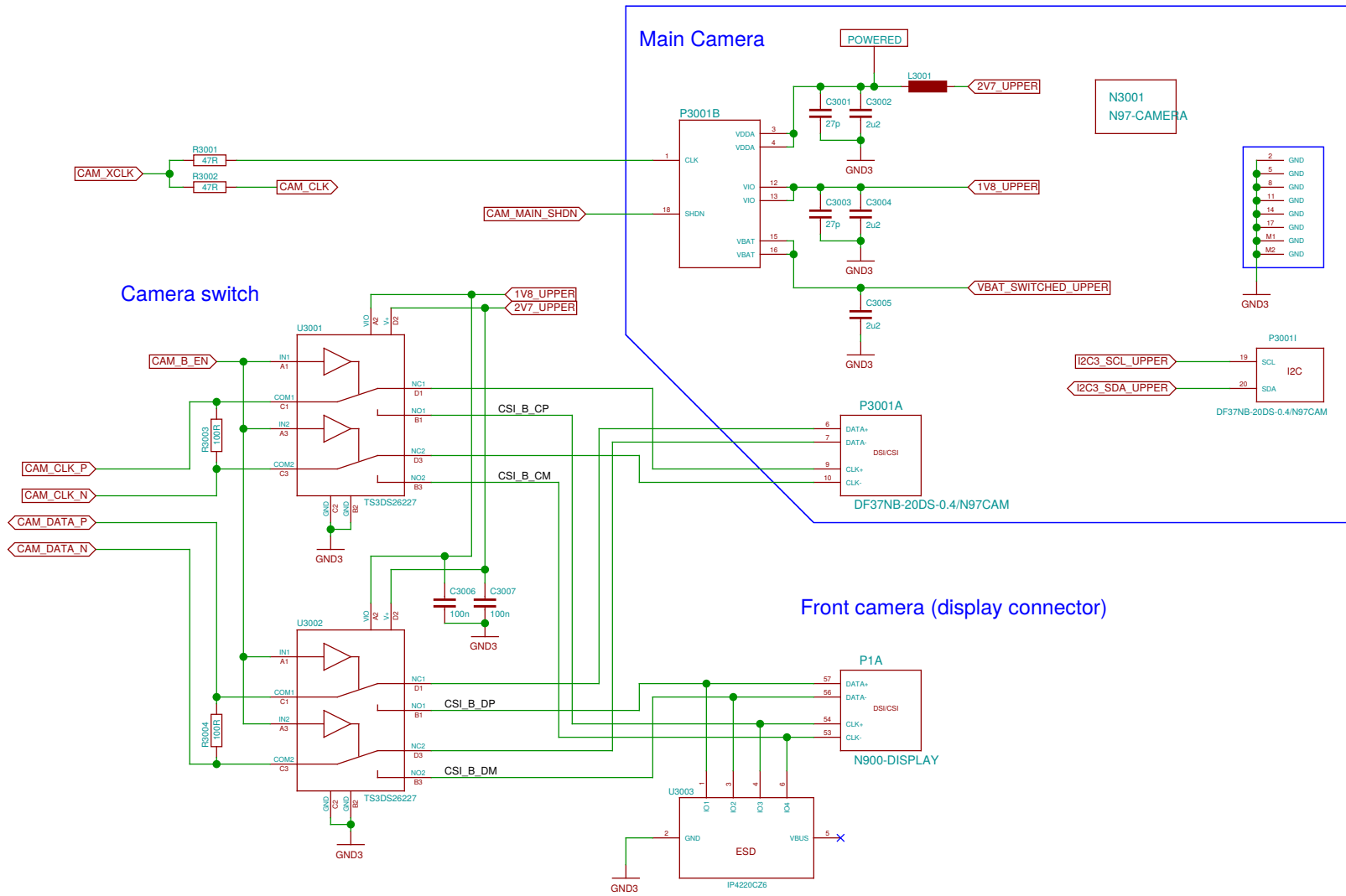
Sheet: /PMU+Codec/ File: neo900_SS_28.sch		
Title: PMU+Codec		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 889ed73+ 20161025-16:59Z		Id: 28/37

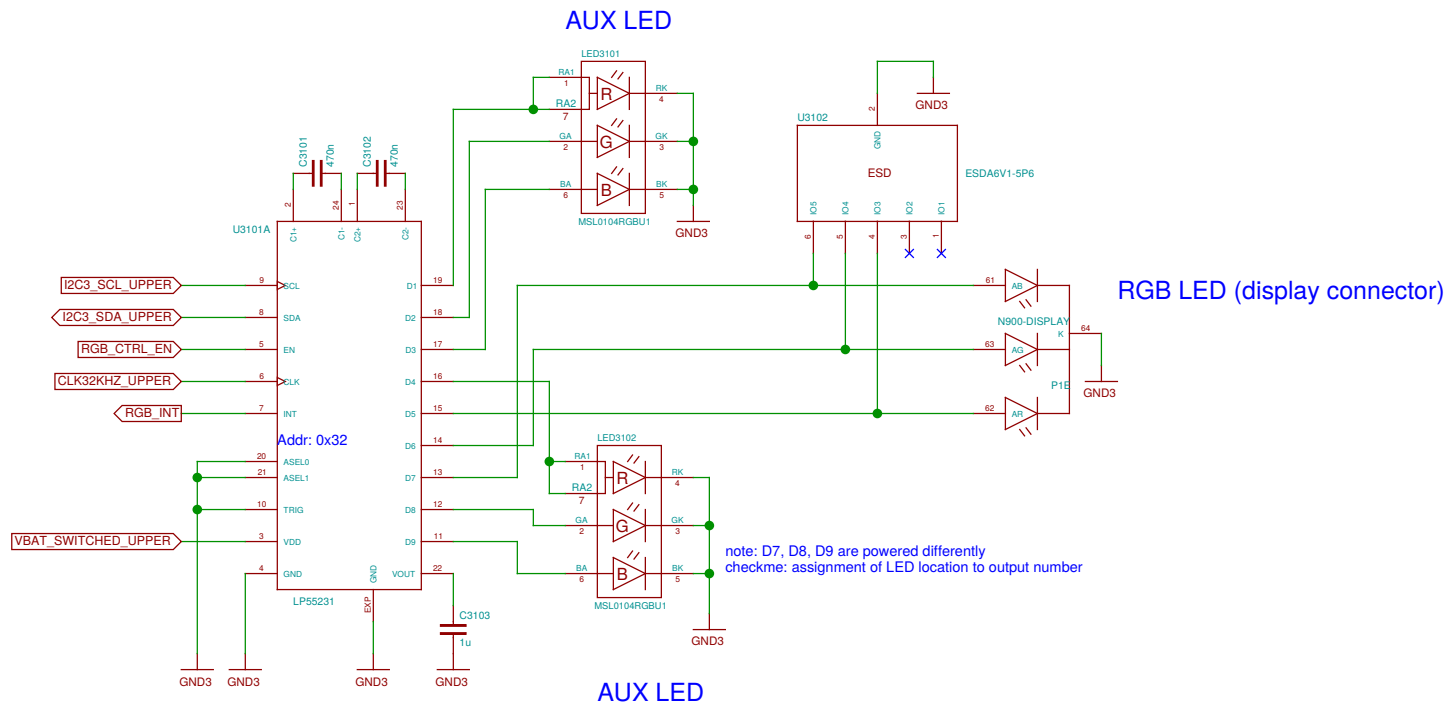
simple capless 400mA LDO for TPS65950 substitute  
(only for prototype)



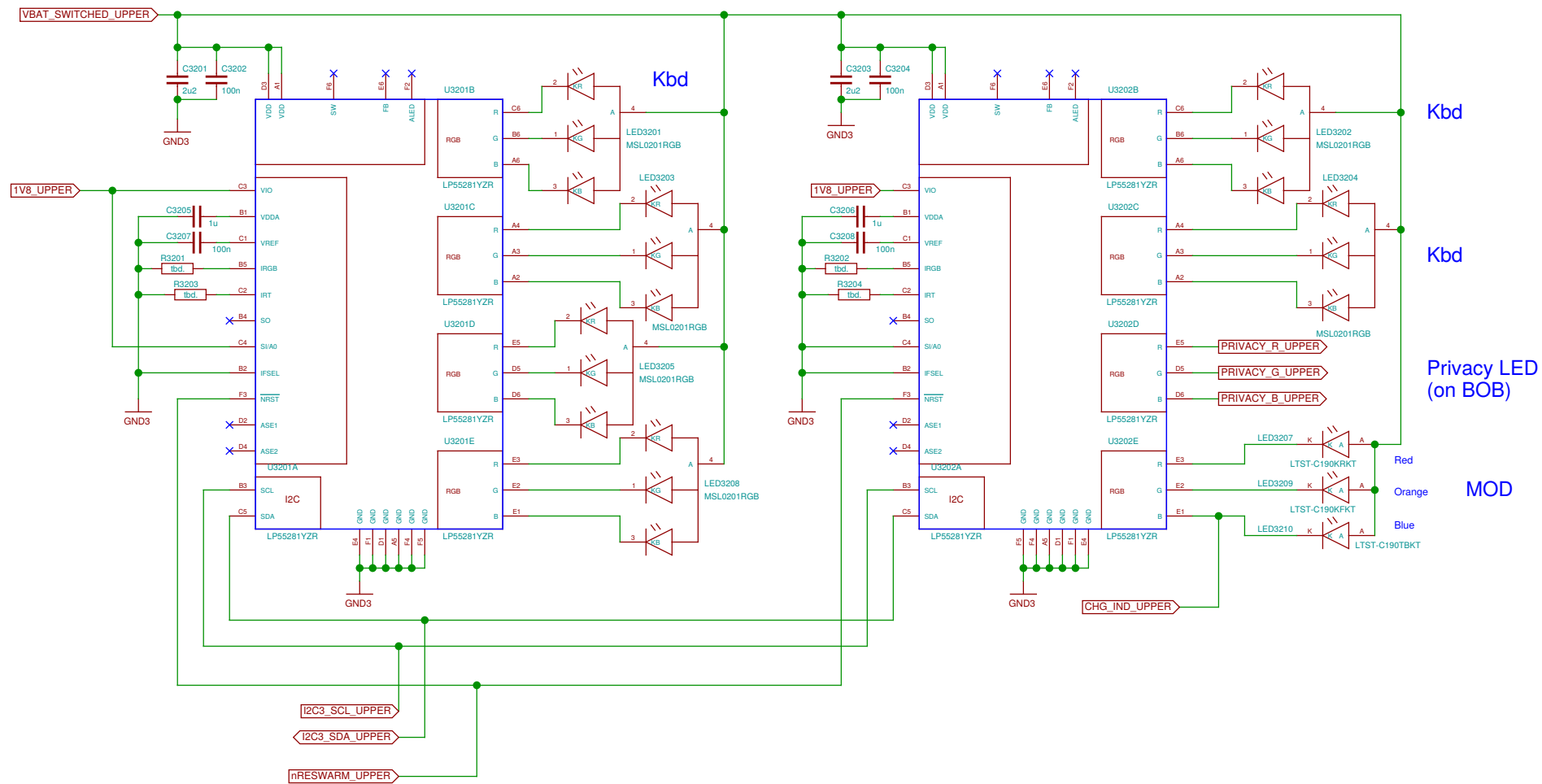
TODO: use REGEN ?

Sheet: /BB-XM Dummy (TWL4030)/		
File: neo900_SS_29.sch		
Title: BB-XM Dummy (TWL4030)		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 889ed73+ 20161025-16:59Z		Id: 29/37





Sheet: /Fancy LEDs/ File: neo900_SS_31.sch		
Title: Fancy LEDs		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 889ed73+ 20161025-16:59Z		Id: 31/37

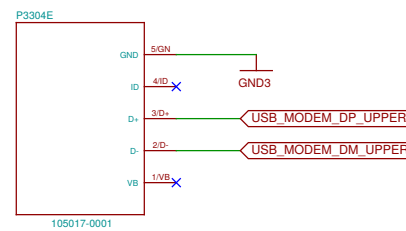




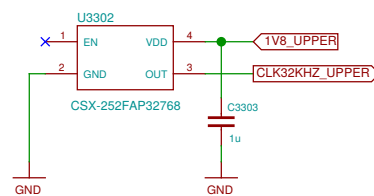
**Cleaning up. The connections to BB-xM are on the next sheets.**

connect to BB  
by some Micro-USB cable

### Modem USB



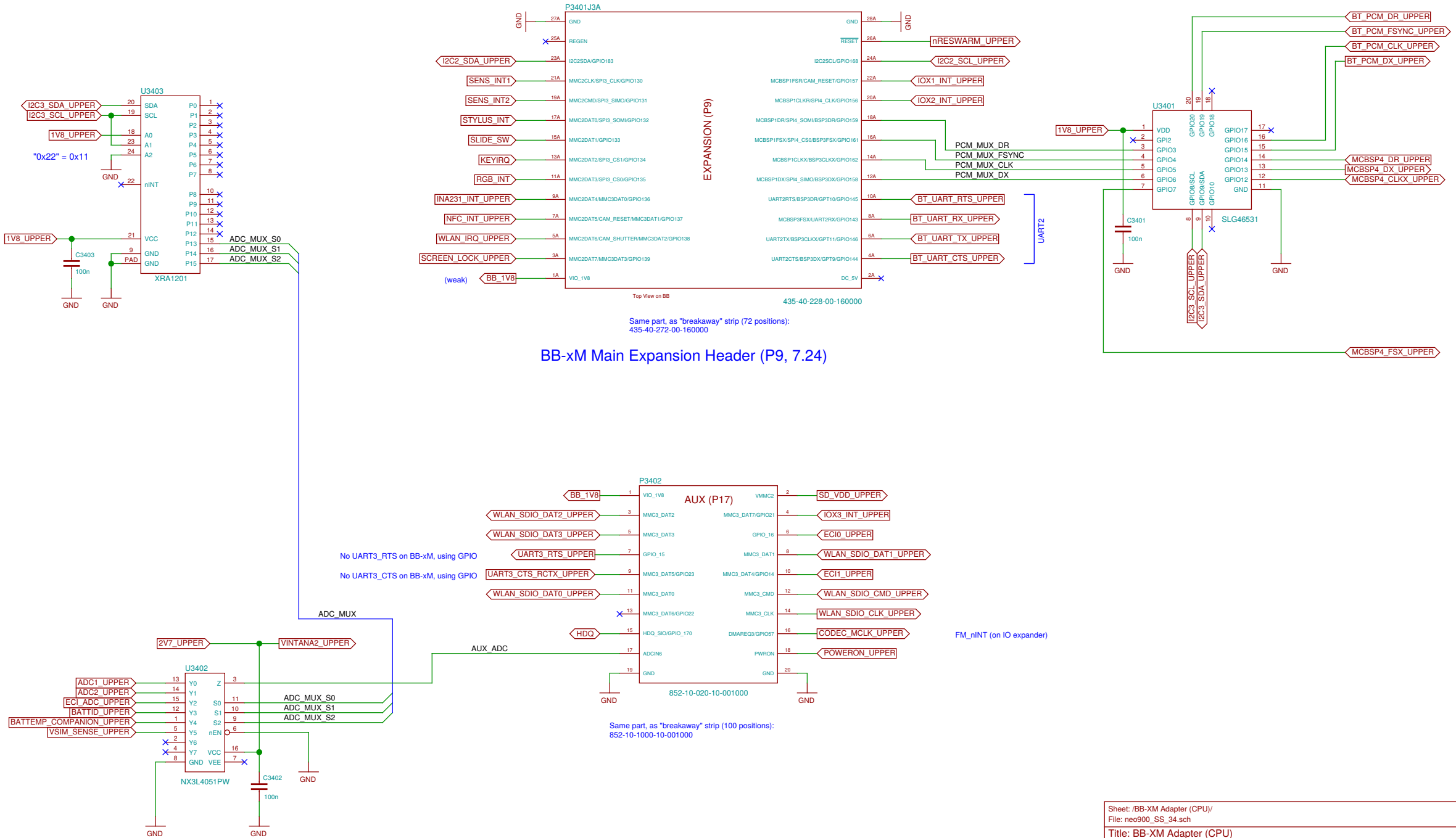
### 32 kHz clock



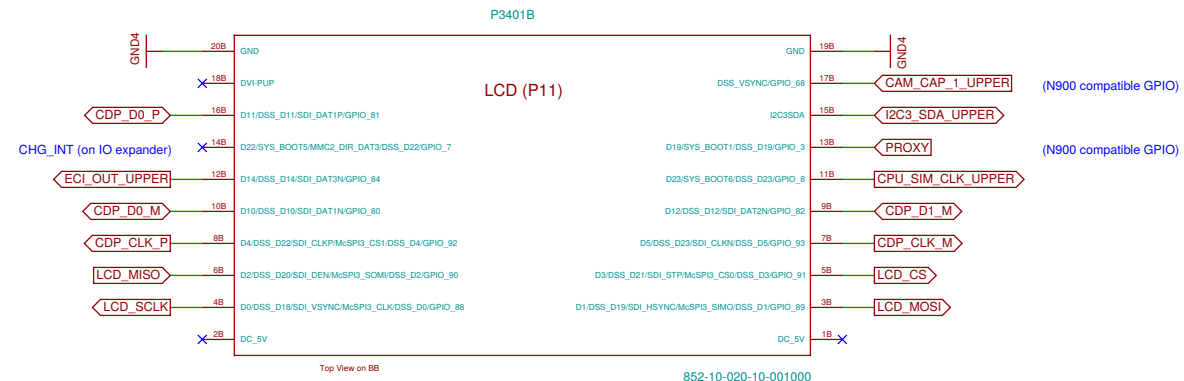
Alternative: OYKTGLJANF-0.032768

Sheet: /Connector to BB-XM/ File: neo900_SS_33.sch		
Title: Connector to BB-XM		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 889ed73+ 20161025-16:59Z		Id: 33/37

# TODO: update pin names in footprint

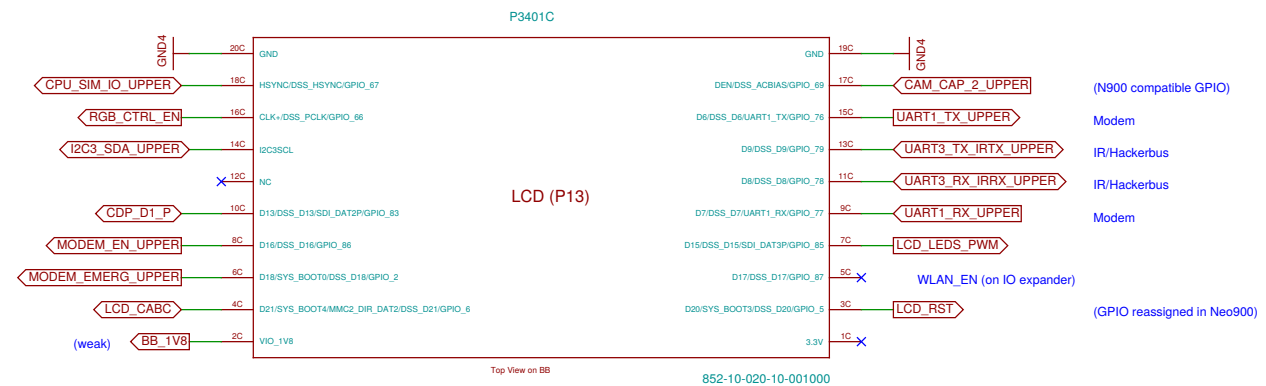


### P11 (7.25)



Same part, as "breakaway" strip (100 positions):  
852-10-1000-10-001000

### P13 (7.25)

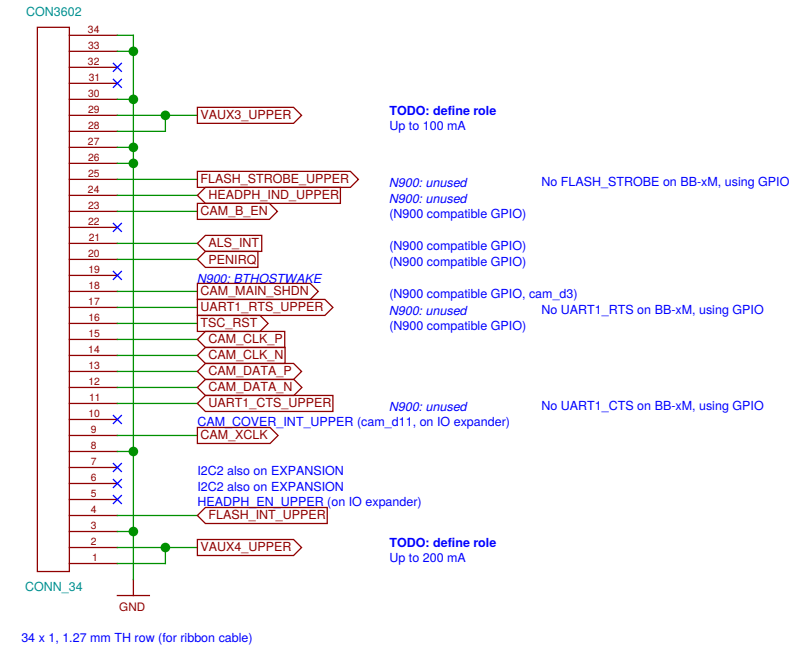
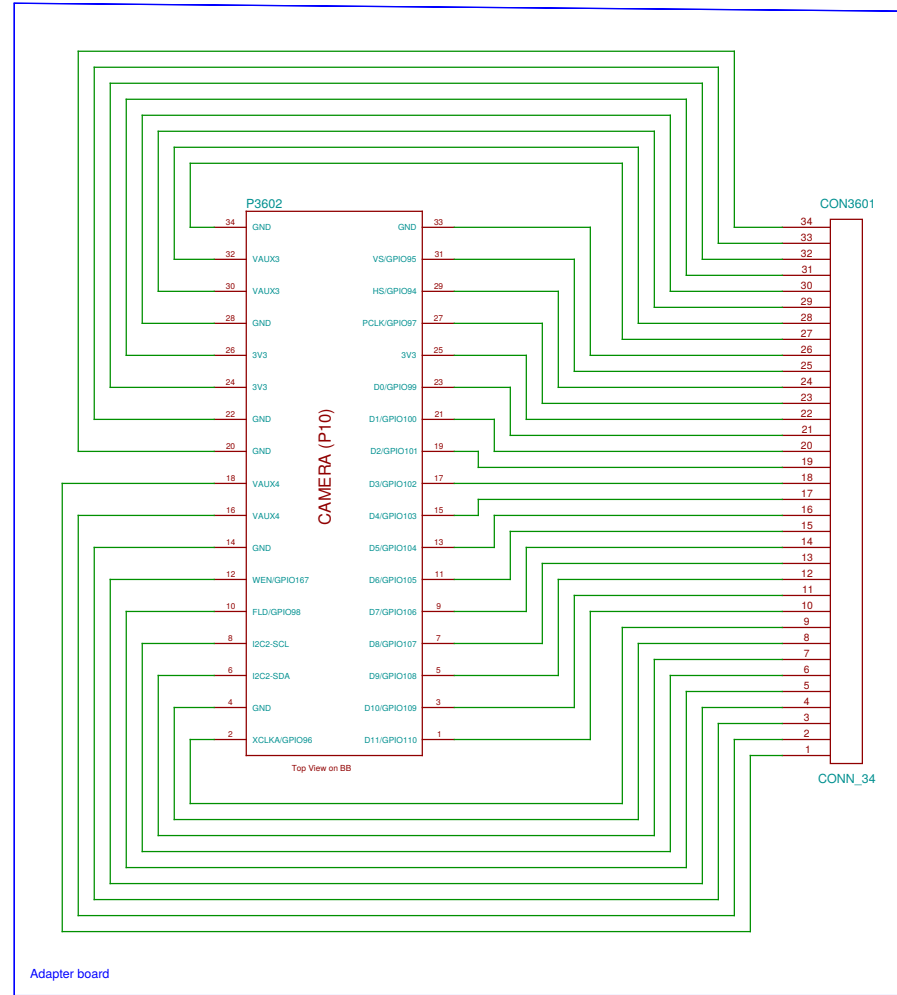


Same part, as "breakaway" strip (100 positions):  
852-10-1000-10-001000

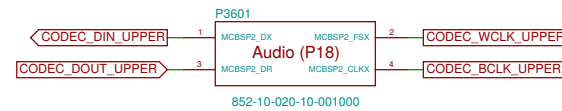
**TODO: update pin names in footprint**

Sheet: /BB-XM Adapter (DISP)/		
File: neo900_SS_35.sch		
Title: BB-XM Adapter (DISP)		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 889ed73+ 20161025-16:59Z		Id: 35/37

## Processor Camera Port Interface (P10, 7.20.3)



**TODO: update pin names in footprint**



This part is a "breakaway" strip (20 positions) and needs to be customized (cut) before assembly.  
Alternatively, 852-10-100-10-001000 (100 positions) could be used.

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

N3701 15015-0439	N3702 15015-0439	N3703 15015-0439
CPU	DISP	CAM

N3704 N900 case assembly
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N3705 N97-CAMERA-HOLE
--------------------------

N3706 headset jack
-----------------------

N3707 STENCIL-TOP
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N3708 STENCIL-BOTTOM
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Sheet: /No-Solder Components/ File: neo900_SS_37.sch		
Title: No-Solder Components		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 889ed73+ 20161025-16:59Z		Id: 37/37