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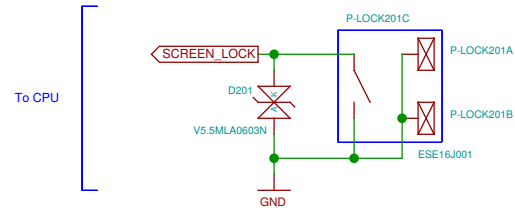
Sheet: No-Solder Components  
[No-Solder Components](#)

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

Signal that exist on both LOWER and UPPER (and maybe also BOB)  
have a \_U suffix on UPPER. No suffix is needed to distinguish  
between LOWER and BOB because all BOB components are on  
the same sheet and wires connecting them use sheet-local labels.

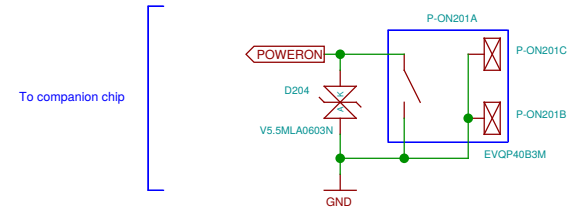
Sheet: /		
File: neo900.sch		
Title: Neo900		
Size: A3	Date: 2016-11-12 04:52:29	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 1/37

### Lock switch



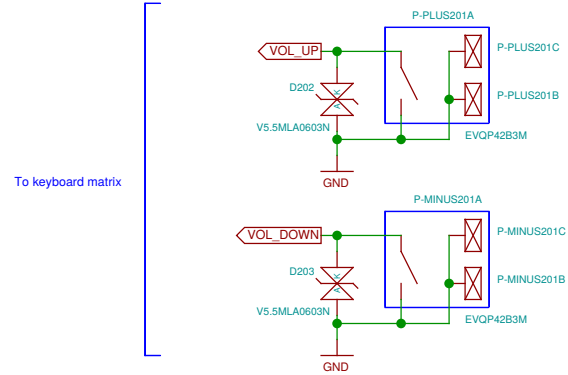
To CPU

### On-off



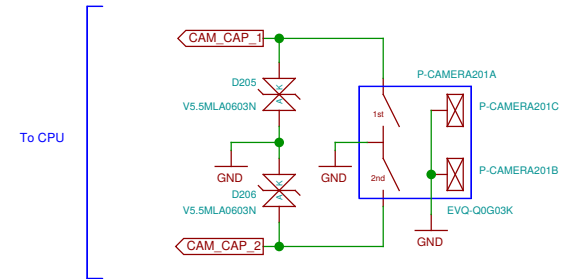
To companion chip

### Volume



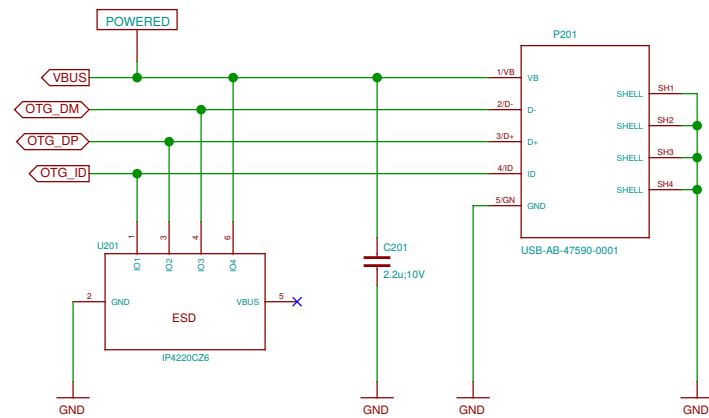
To keyboard matrix

### Camera trigger



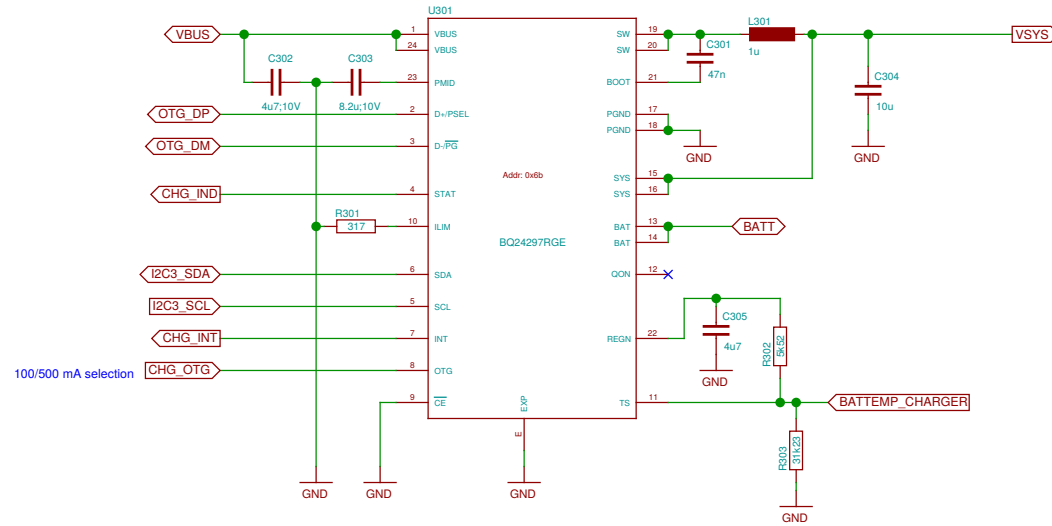
To CPU

### USB OTG connector



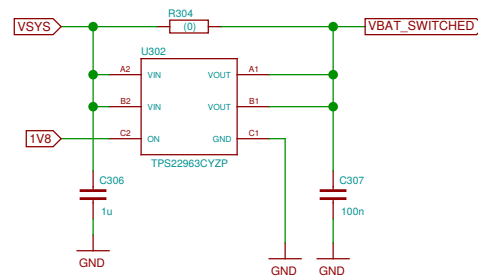
Sheet: /OTG/ File: neo900_SS_2.sch	
Title: OTG	
Size: A3	Date: 2016-11-07 20:19:27
Plotted by: eeshow 01a1b57+ 20161103-02:14Z	Rev: Id: 2/37

## Battery charger with USB OTG

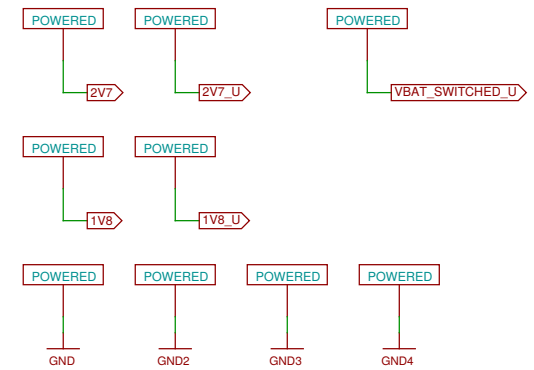


## Power distribution and sequencing

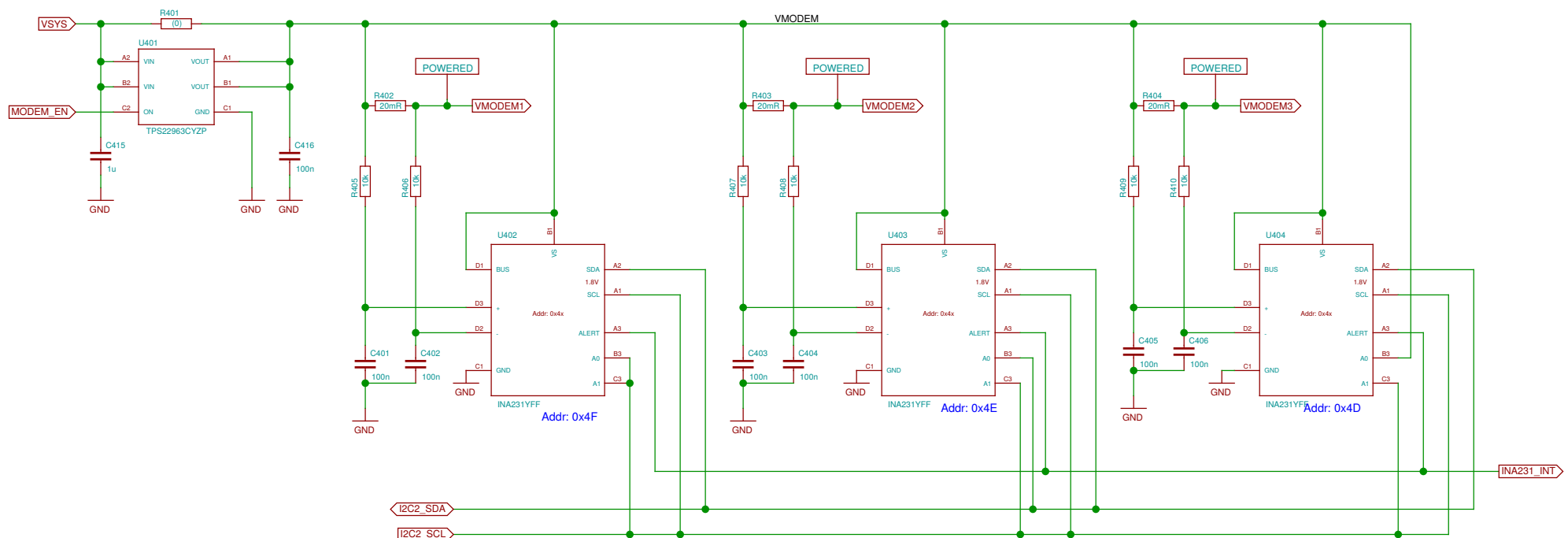
Most high-current consumers are on VBAT\_SWITCHED.  
1V8 signals that the regulators on UPPER are operational.



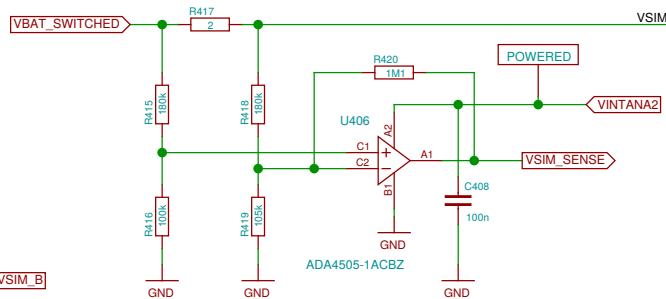
## KiCad bureaucracy



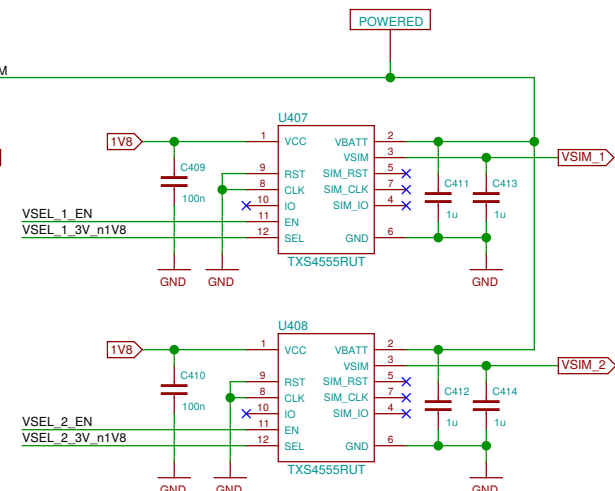
### Modem current monitor



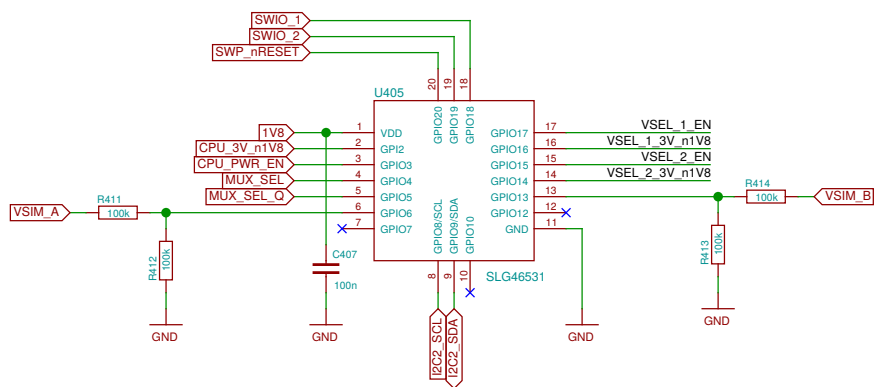
### SIM current sensing



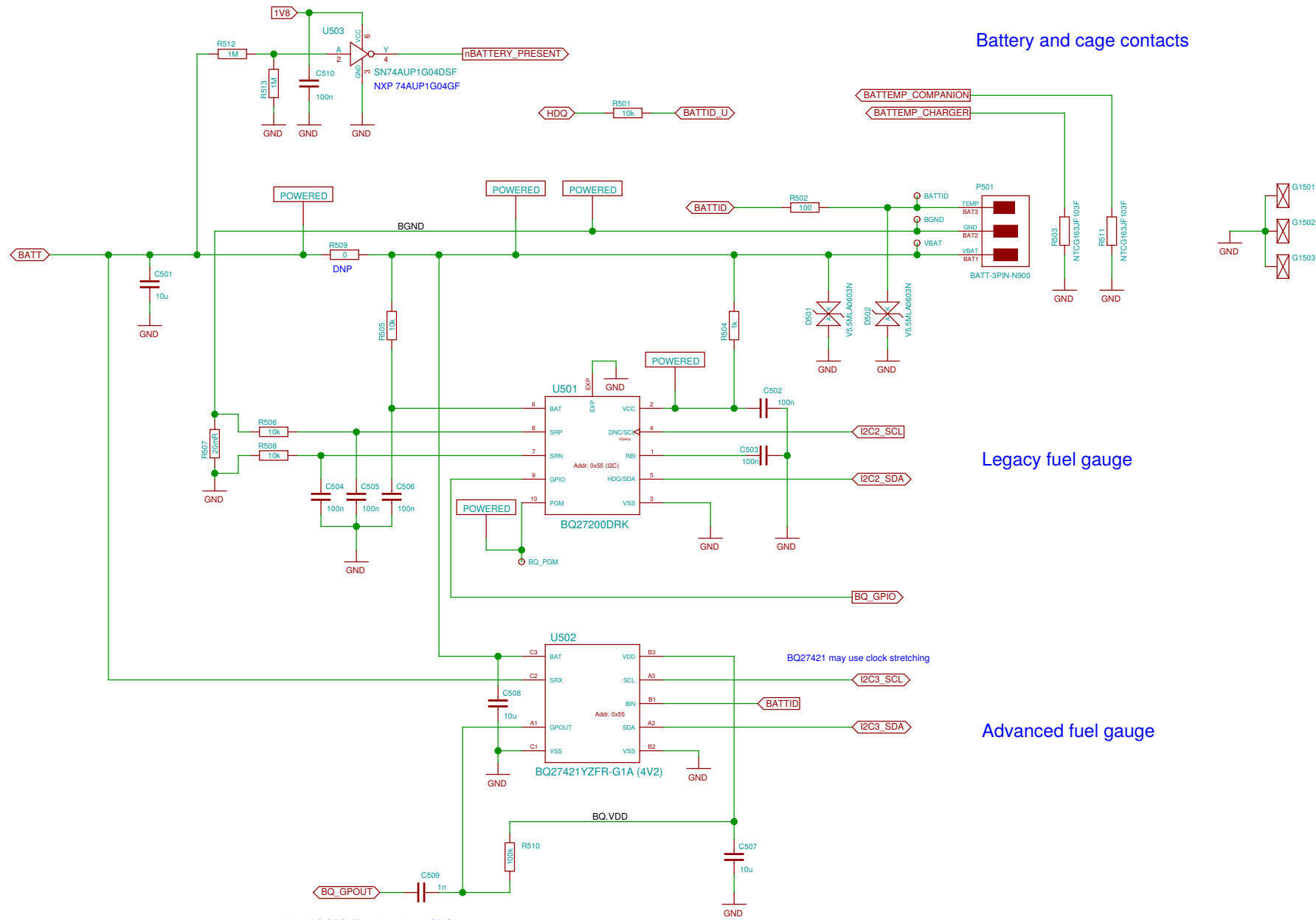
### SIM power supply



### SIM power selection



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



Battery and cage contacts

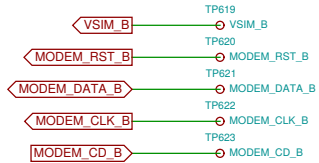
Legacy fuel gauge

Advanced fuel gauge

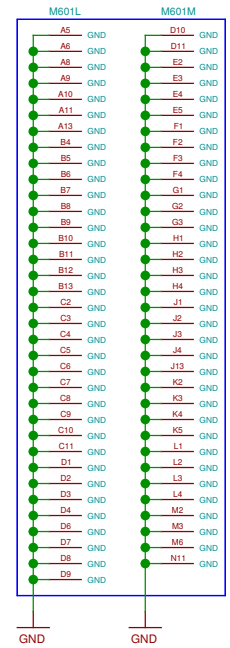
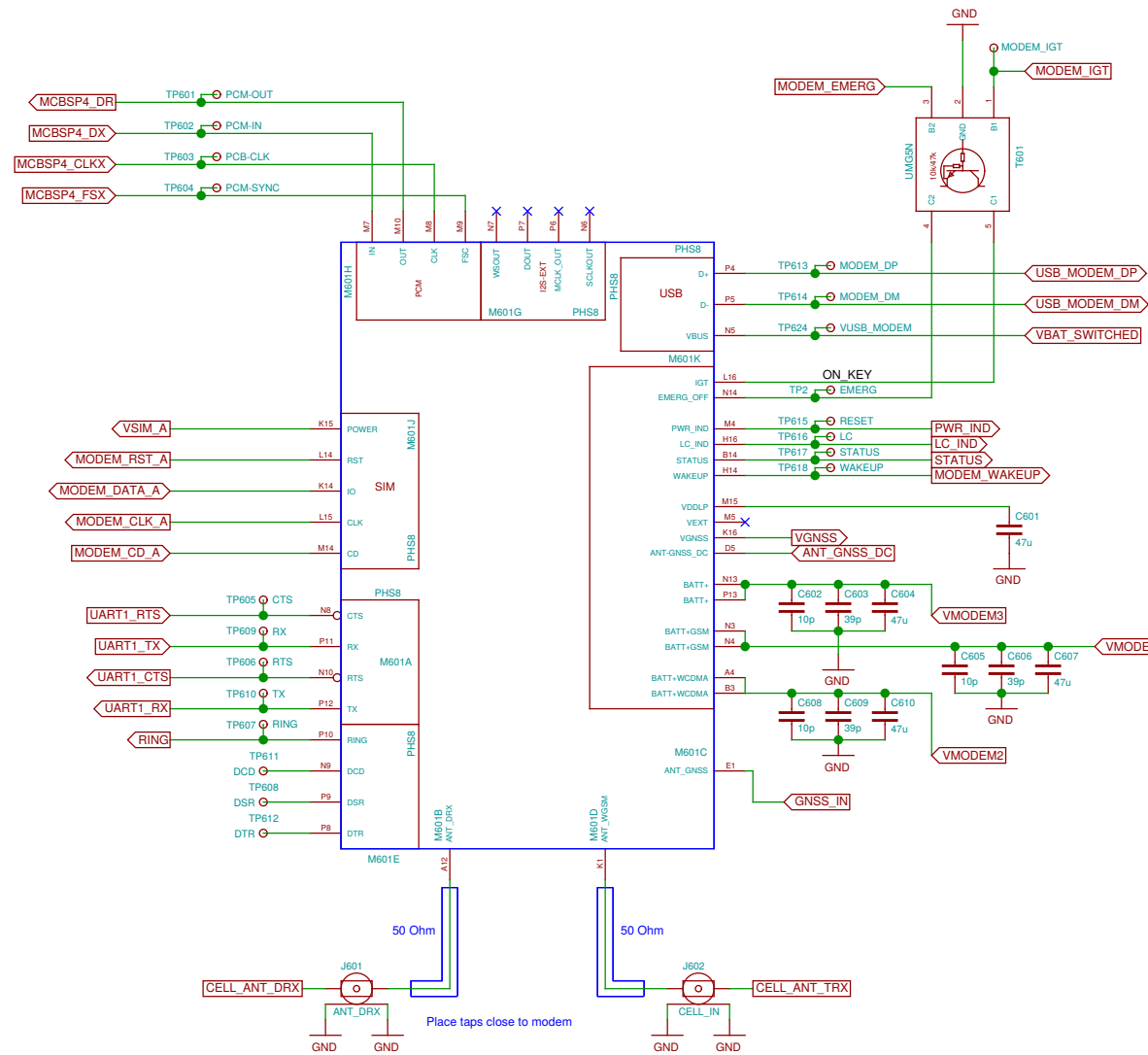
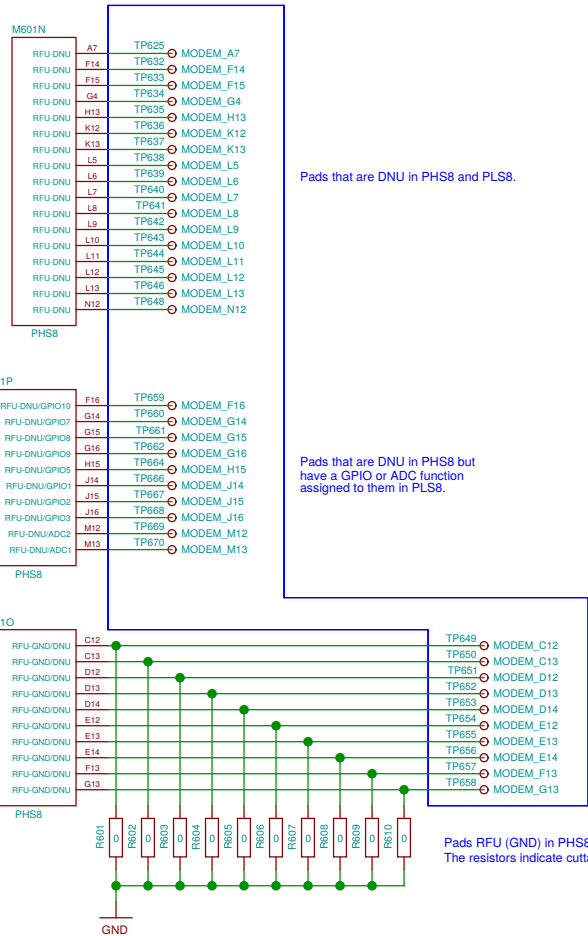
Note: BQ.GPOUT needs pull-up at GPIO.

Sheet: /Fuel Gauge/		Date: 2016-11-07 20:30:05	
File: neo900_SS_5.sch		Rev:	
Title: Fuel Gauge			
Size: A3	Plotted by: eeshow 01a1b57+ 20161103-02:14Z		Id: 5/37

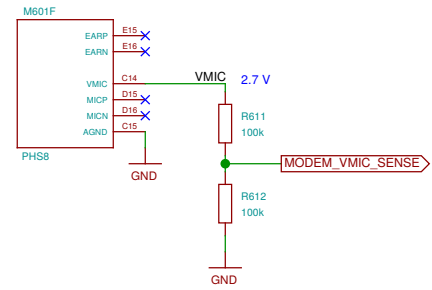
### SIM B bus

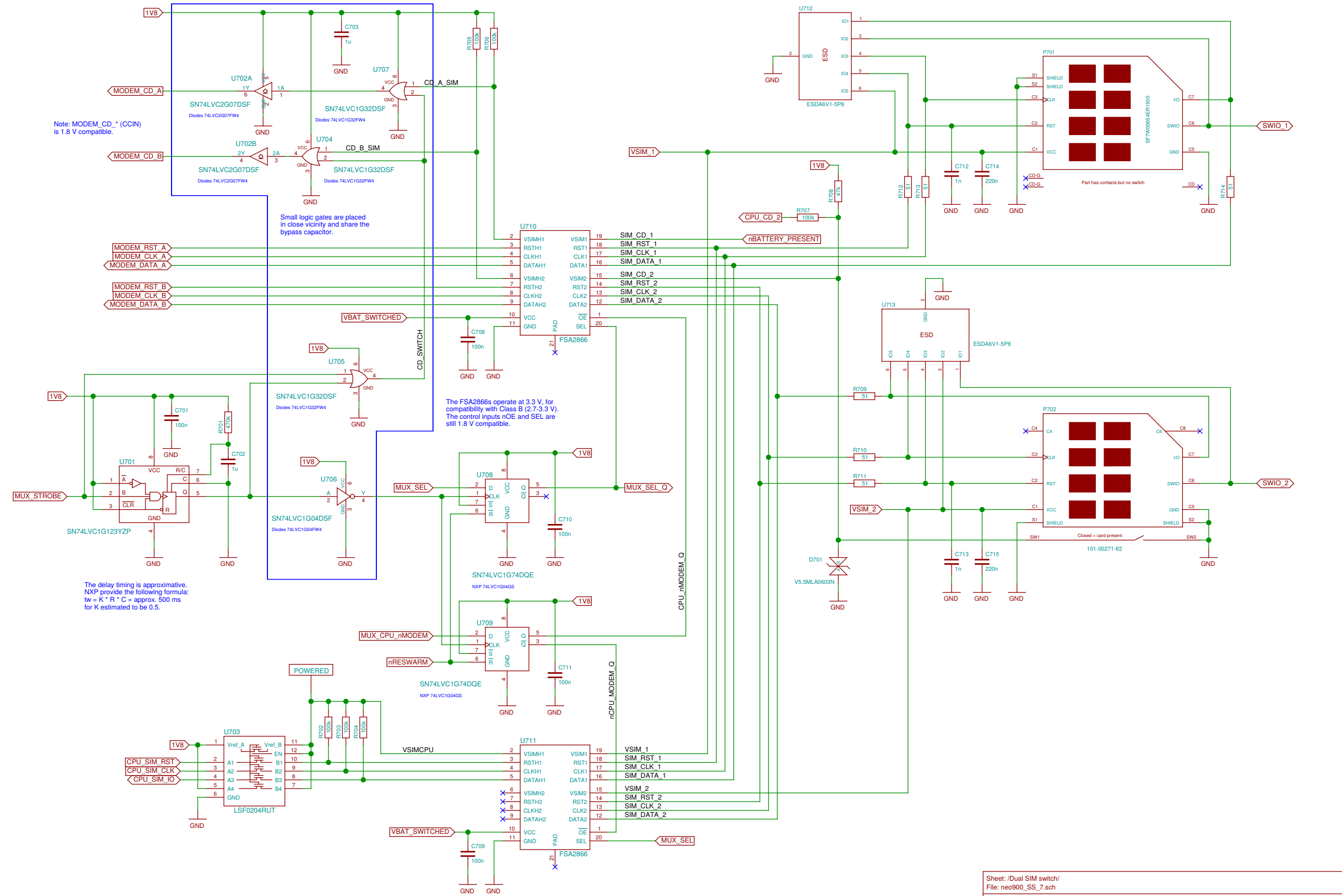


17+10+10 = 37 test points. PCB space permitting, to be arranged in a 6 x 6 + 1 grid with 1.0 mm pitch. This patchfield is to be placed adjacent to the SIM B bus test points.



### Anti-eavesdropping





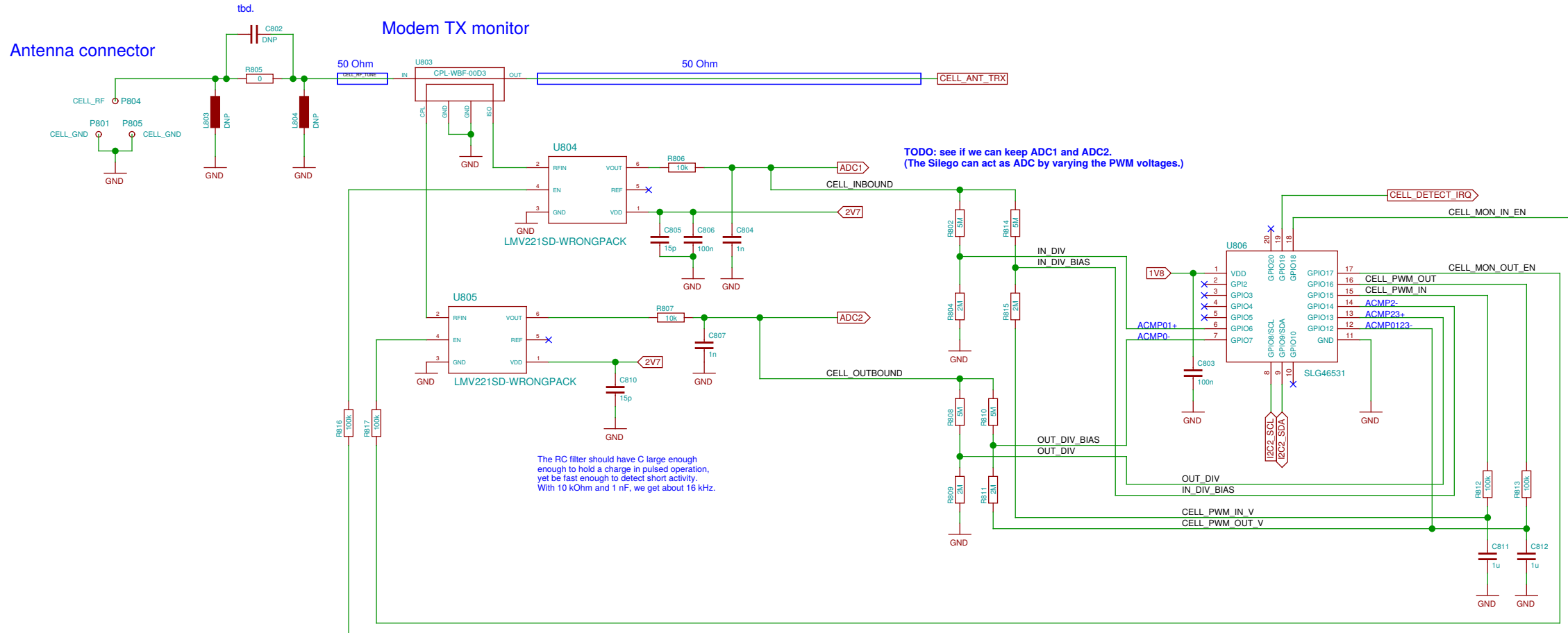
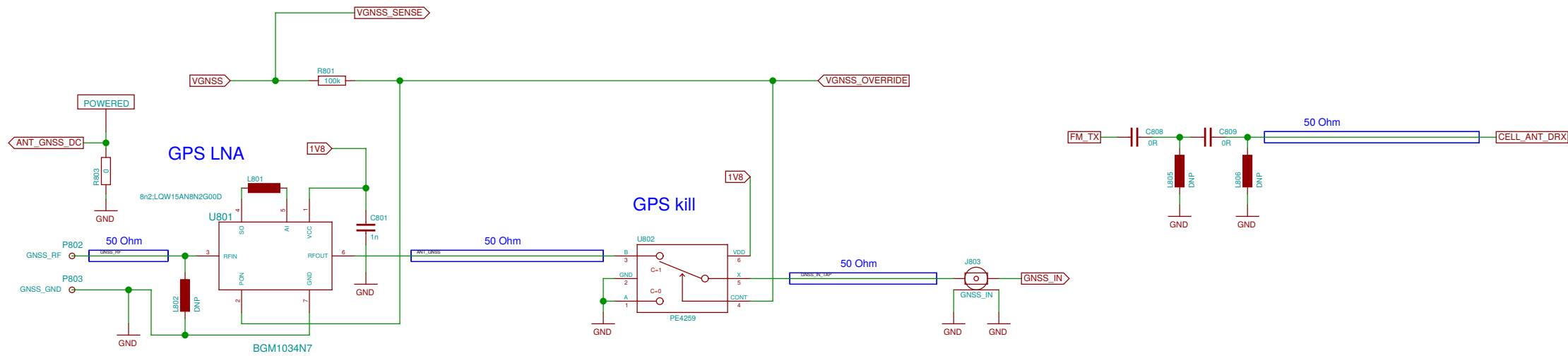
Note: MODEM\_CD\_\* (CCIN) is 1.8 V compatible.

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.

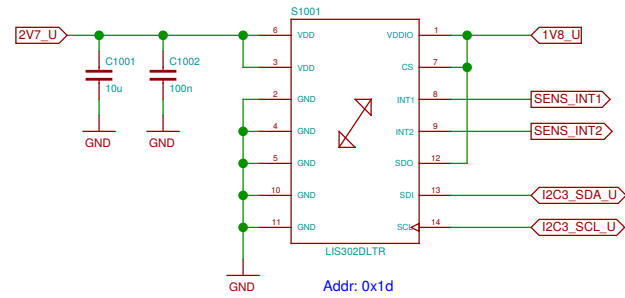
Sheet: /Dual SIM switch/		
File: neo900_SS_7.sch		
Title: Dual SIM switch		
Size: A3	Date: 2016-11-07 20:30:05	Rev:
Plotted by: eeshow 01a1b57+ 20161103-02:14Z		Id: 7/37



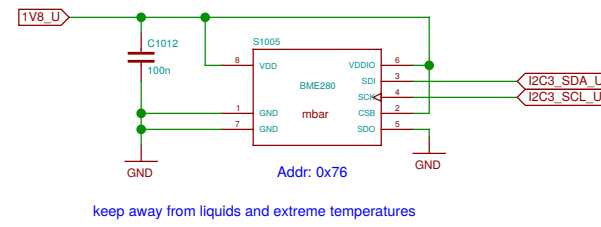




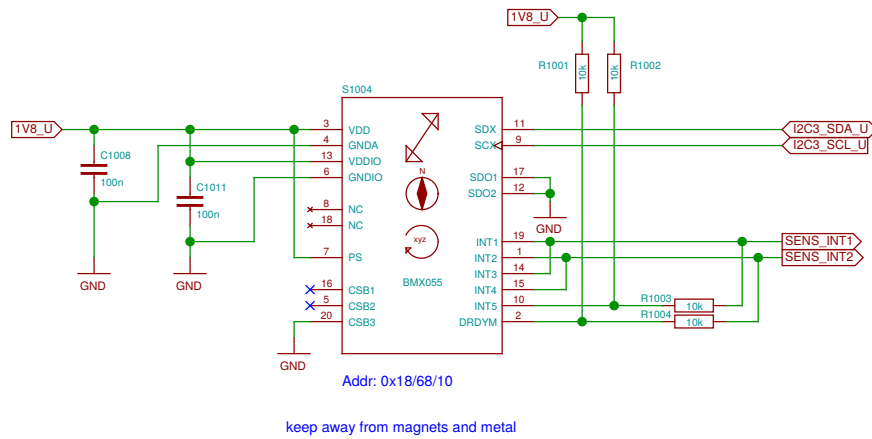
### Acceleration (legacy)



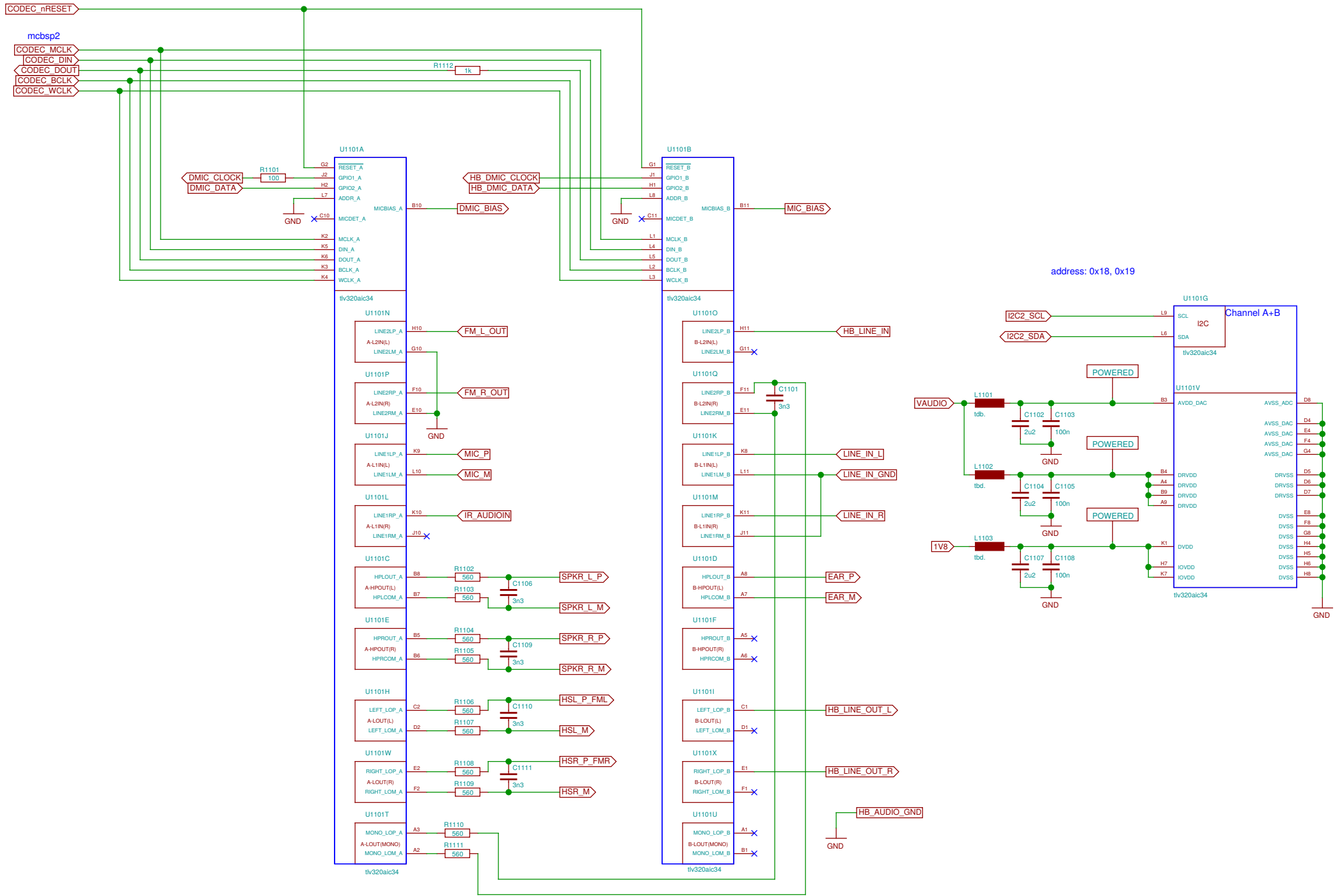
### Pressure, humidity

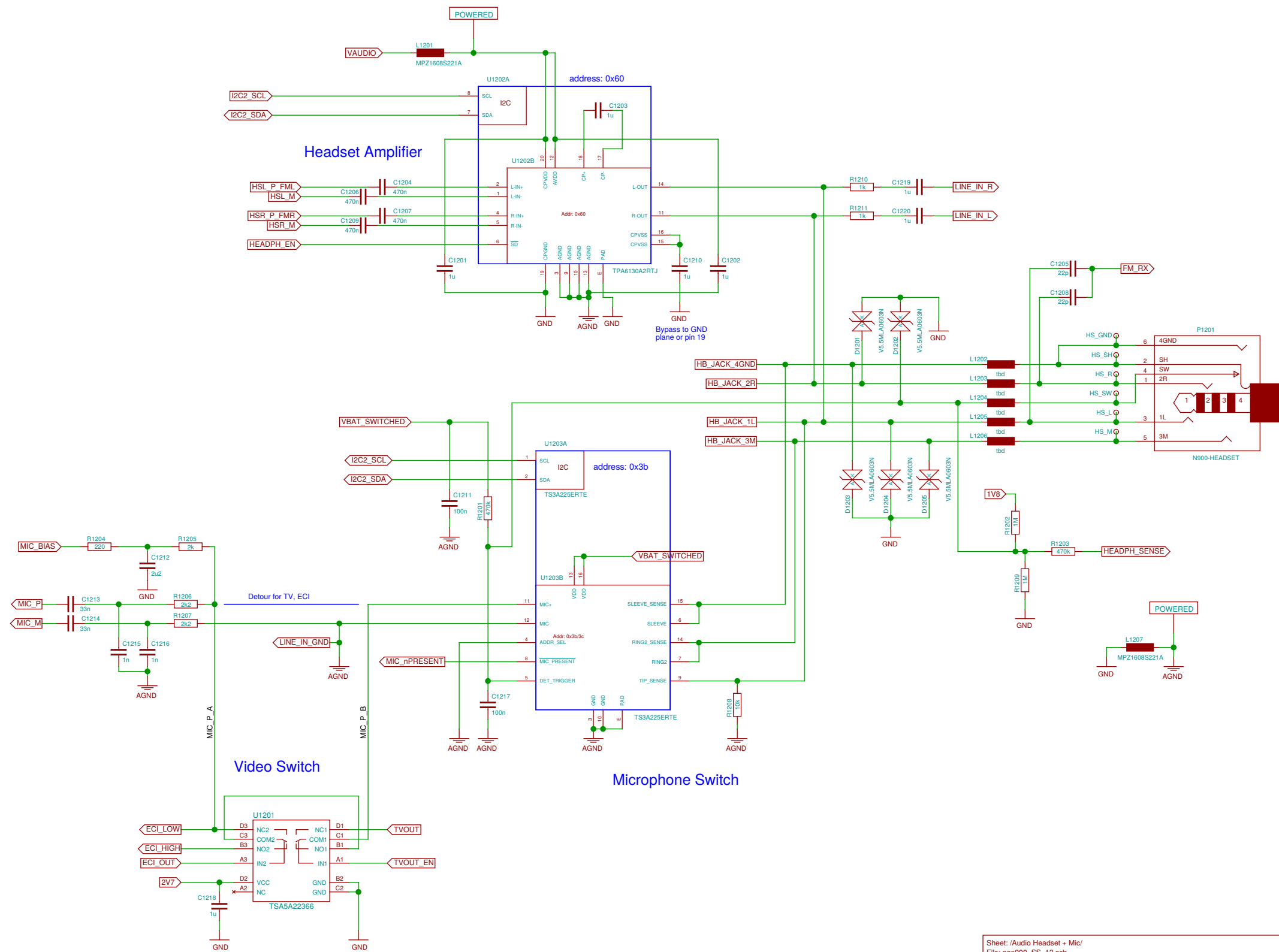


### 9-axis (acceleration, gyroscope, magnetometer)

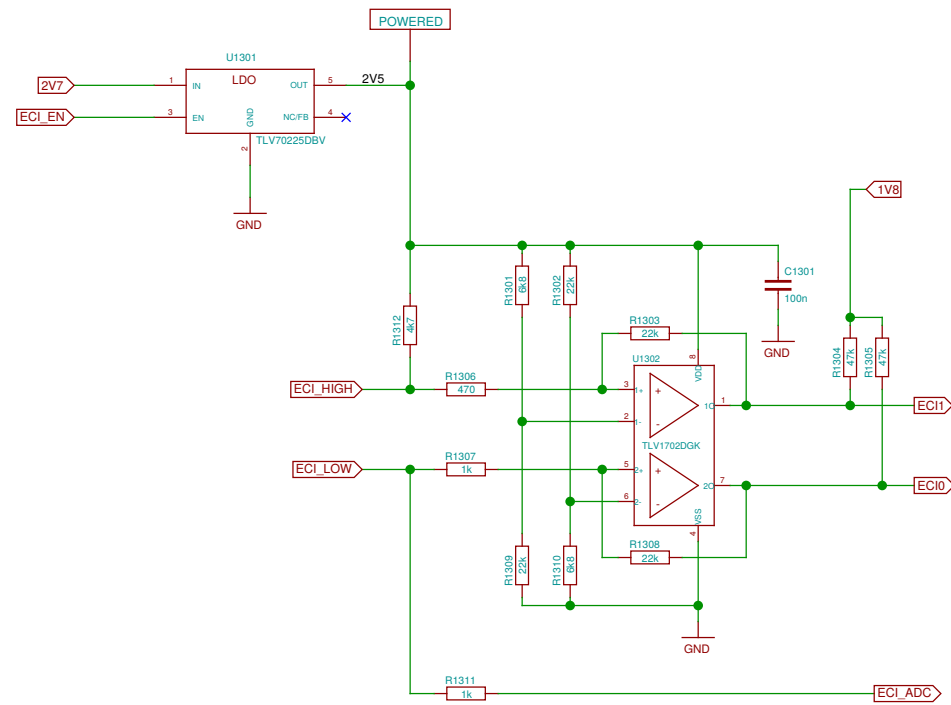


Sheet: /Sensors/ File: neo900_SS_10.sch		
Title: Sensors		
Size: A3	Date: 2016-11-07 20:30:05	Rev:
Plotted by: eeshow 01a1b57+ 20161103-02:14Z		Id: 10/37



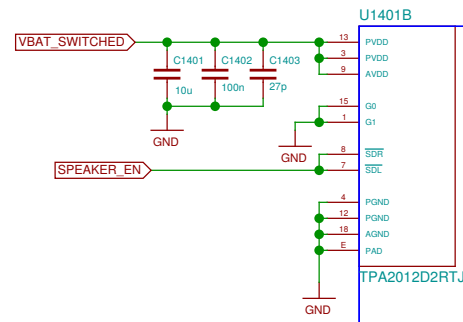


Sheet: /Audio Headset + Mic/		File: neo900_SS_12.sch	
Title: Audio Headset + Mic			
Size: A3	Date: 2016-11-07 21:18:35	Rev:	
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 12/37	

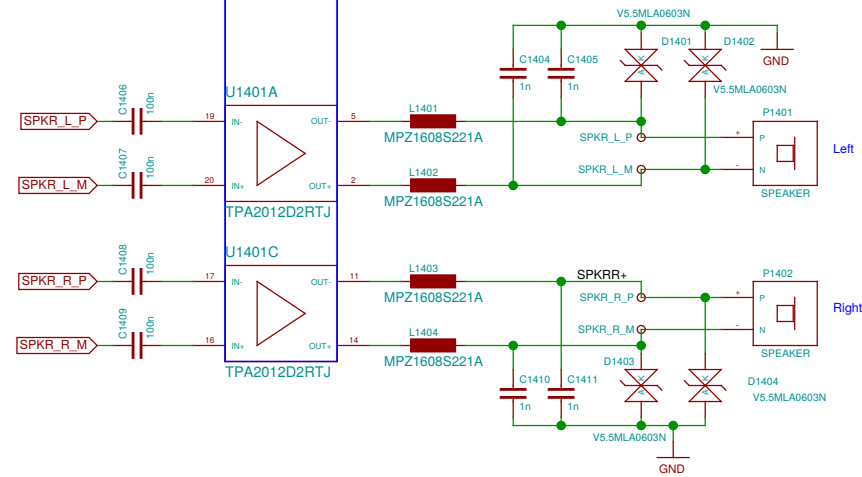


Sheet: /ECI/	
File: neo900_SS_13.sch	
Title: ECI	
Size: A3	Date: 2016-11-07 20:30:05
Plotted by: eeshow 01a1b57+ 20161103-02:14Z	Rev: Id: 13/37

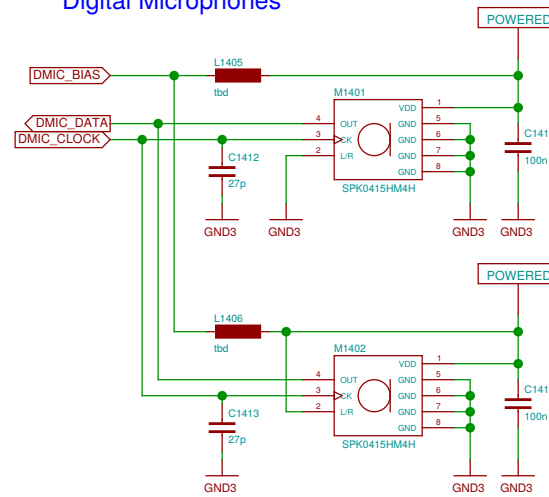
### Hands-free



### Speakers

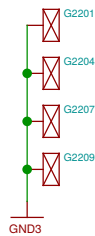


### Digital Microphones

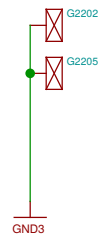


### Shield Contacts on UPPER

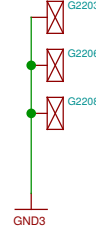
For the display



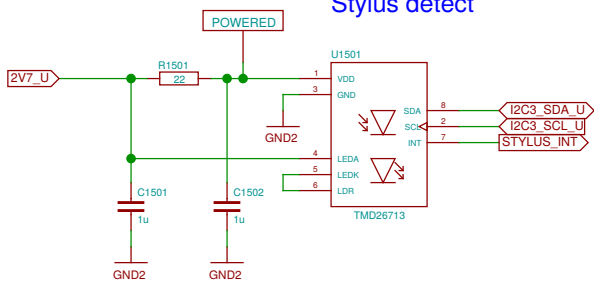
For the key mat



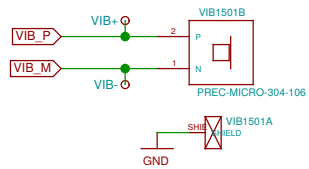
For the "key frame hook"



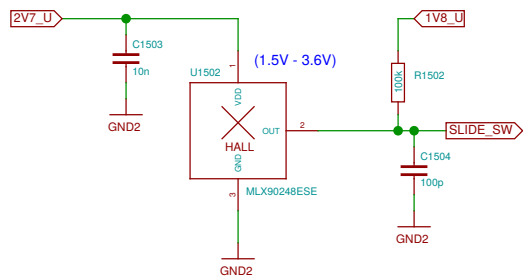
### Stylus detect



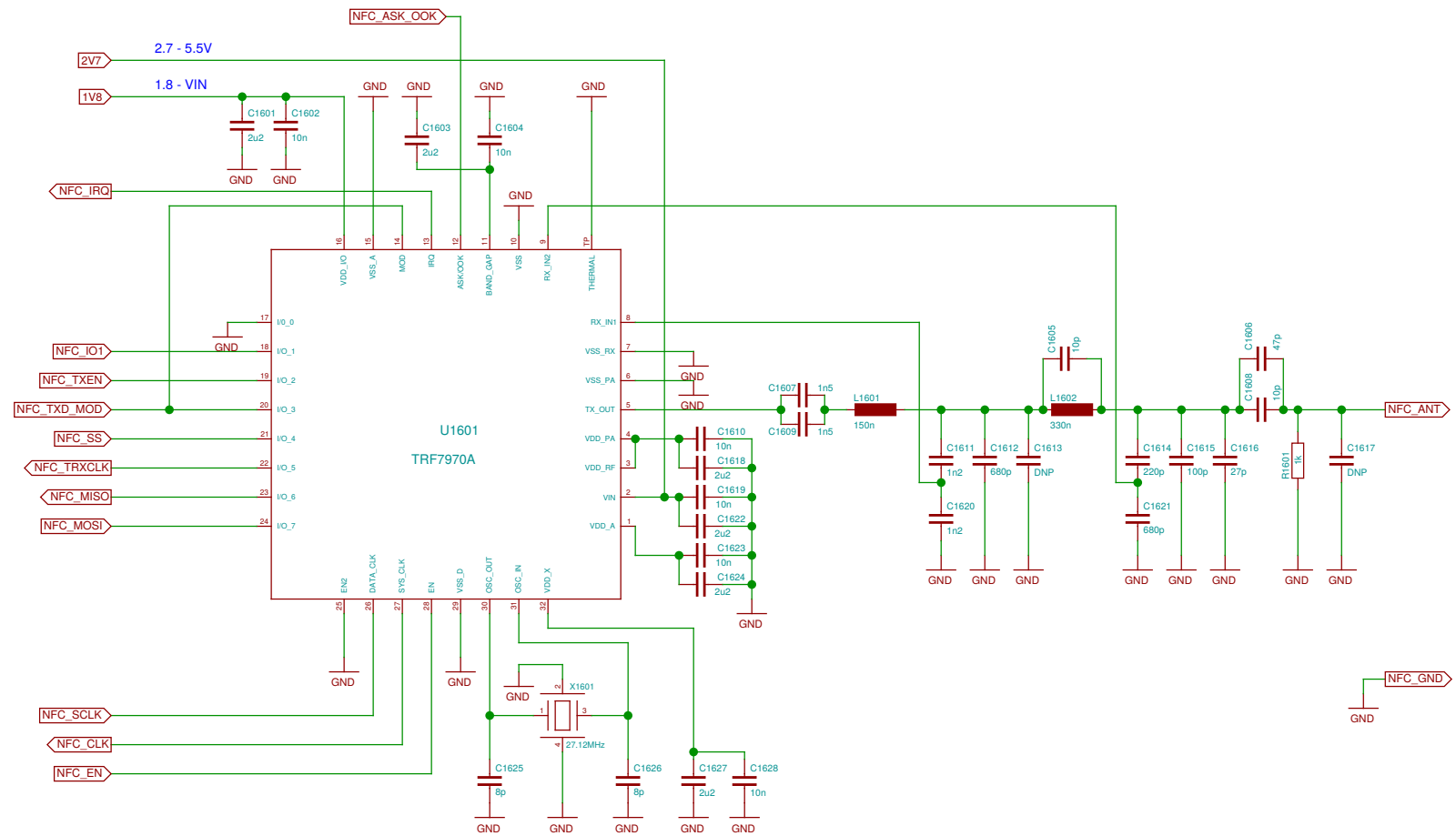
### Vibramotor



### Slide sensor



Sheet: /Misc/		File: neo900_SS_15.sch	
Title: Misc			
Size: A3	Date: 2016-11-07 20:30:05	Rev:	
Plotted by eeshow 01a1b57+ 20161103-02:14Z			Id: 15/37



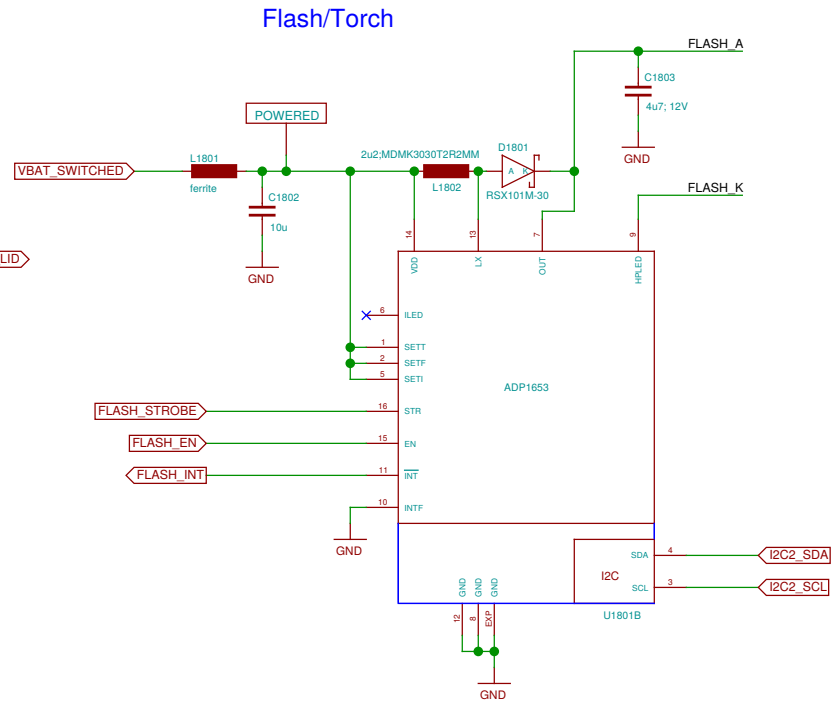
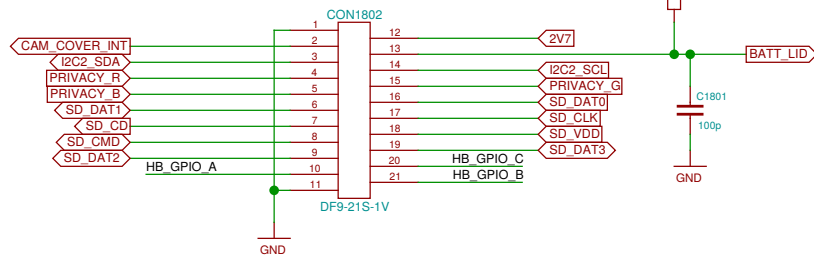
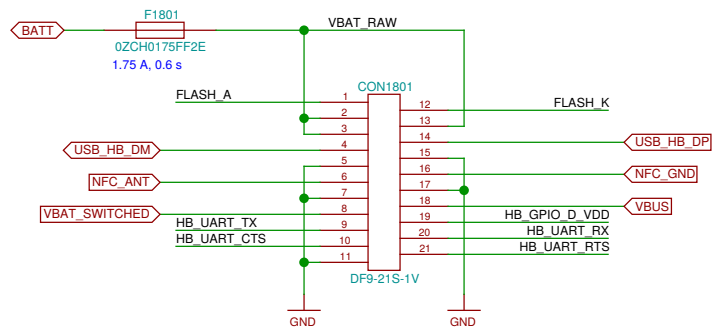
Some choices, 3.2 x 2.6 mm, 8-10 pF:  
 NDK NX3225GA-27.12M-STD-CRG-2  
 NDK NX3225SA-27.12M-STD-CSR-3  
 Taitien XXCCEINANF-27.120000



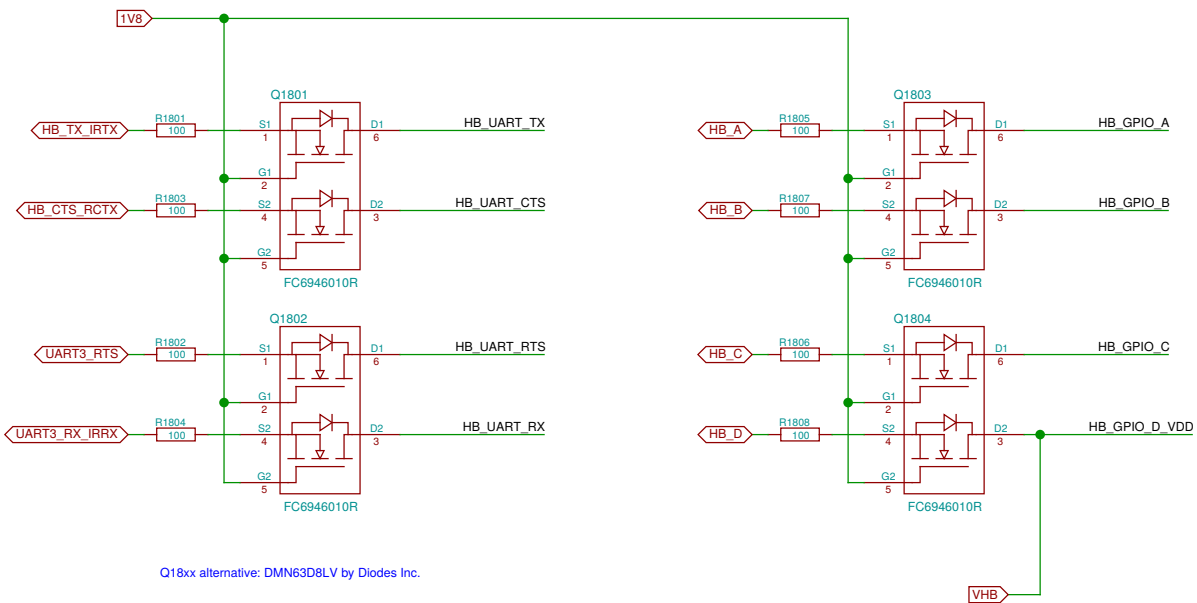


# LOWER-BOB Interconnect (LOWER side)

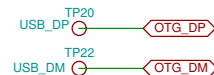
Defined in the Hackerbus specification, <http://neo900.org/stuff/papers/hb.pdf>



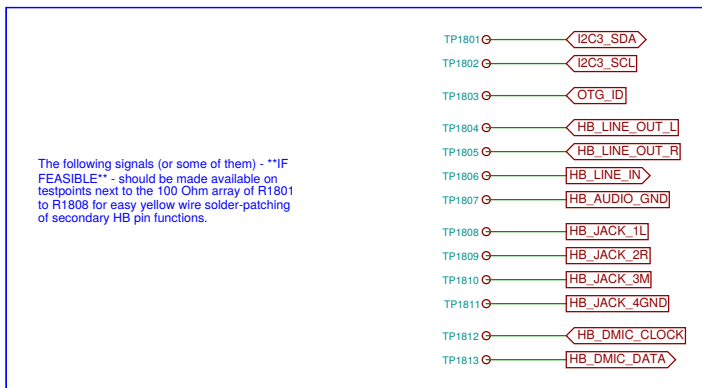
## Level shifters for Hackerbus GPIO and UART



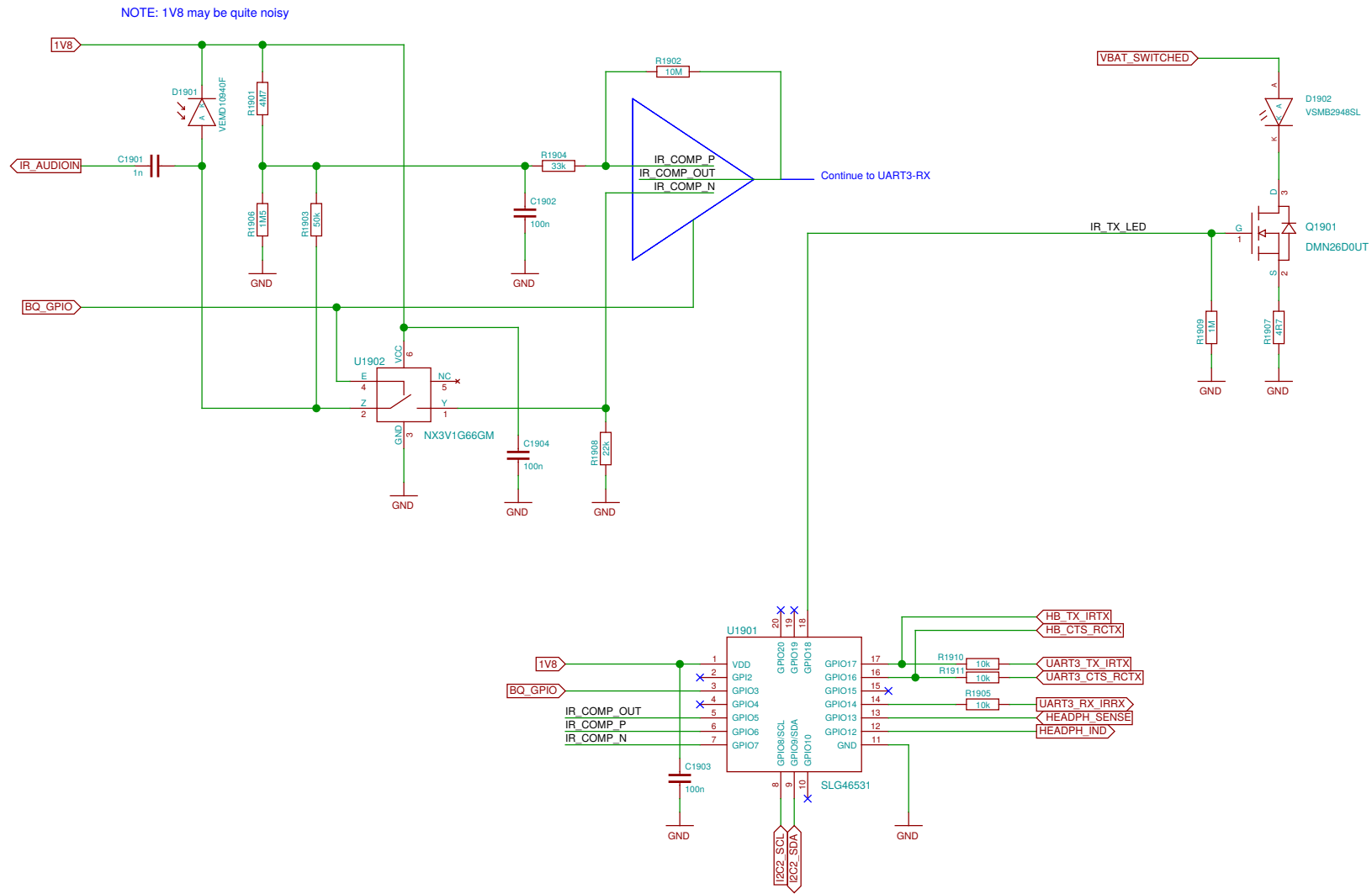
Q18xx alternative: DMN63D8LV by Diodes Inc.



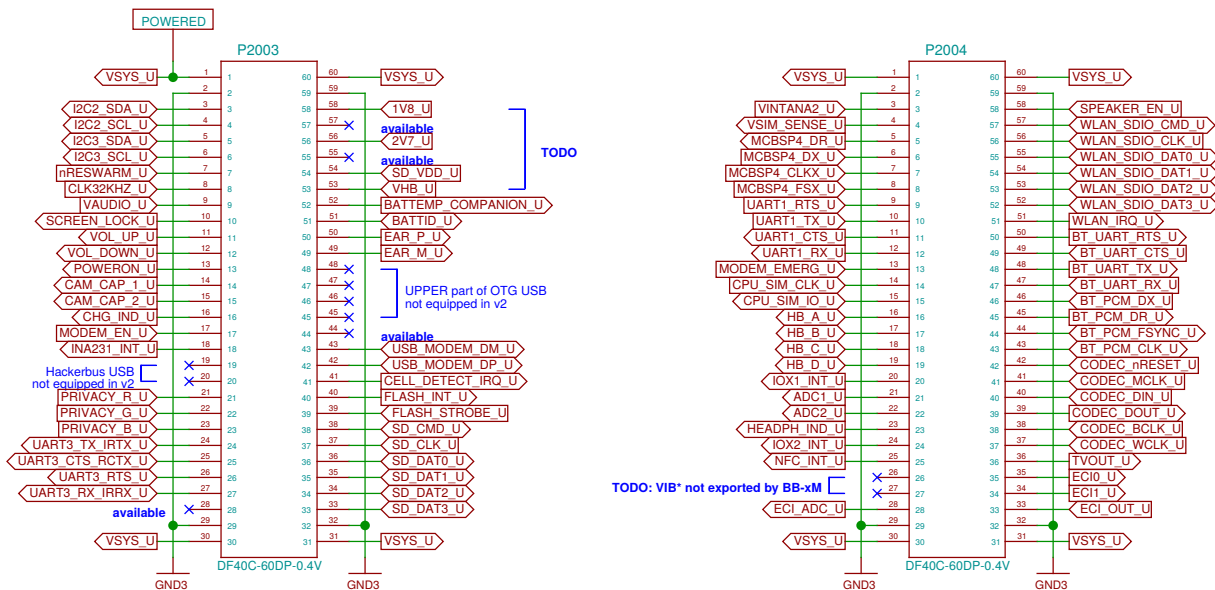
## Patchfield



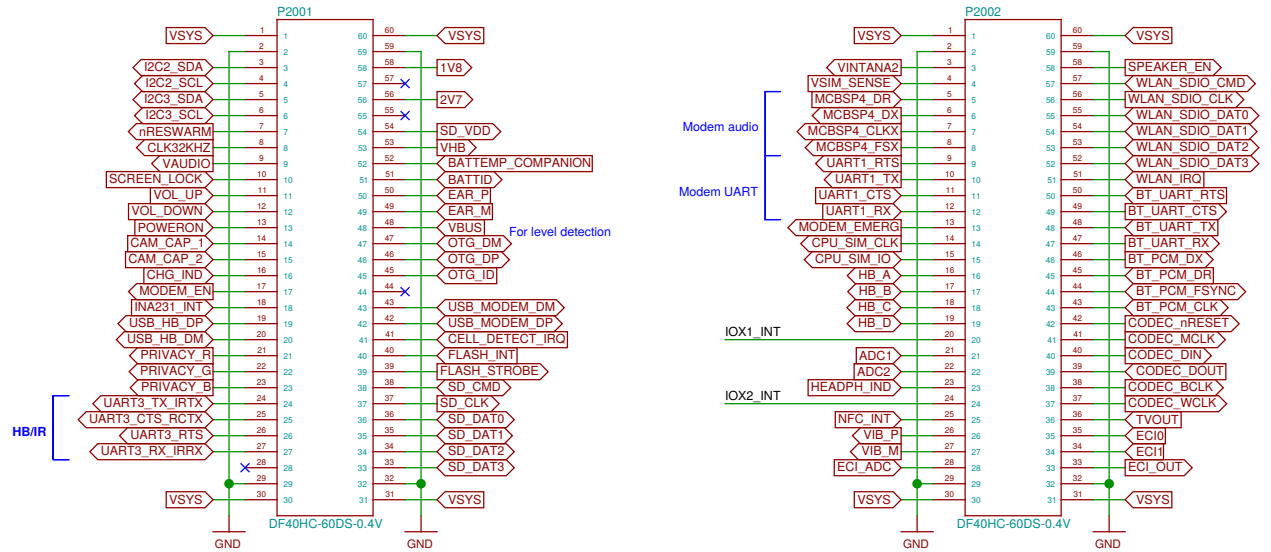
# TODO: update D1901 footprint



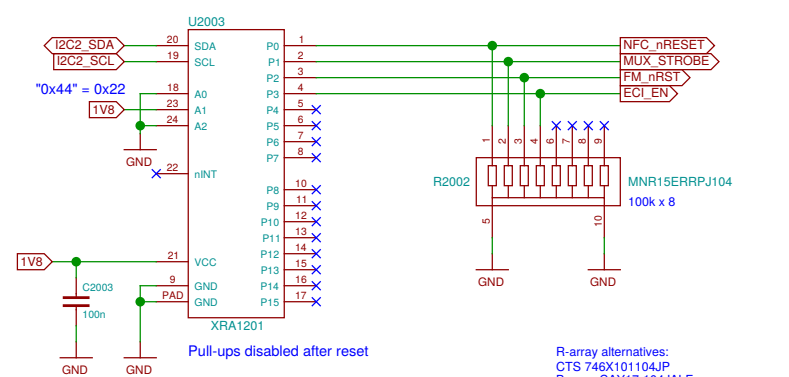
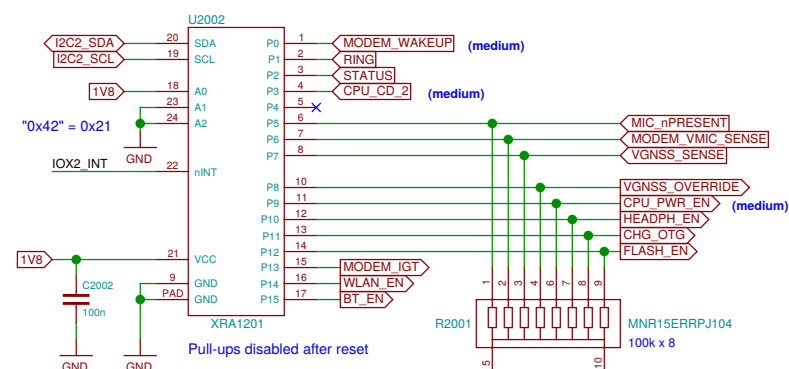
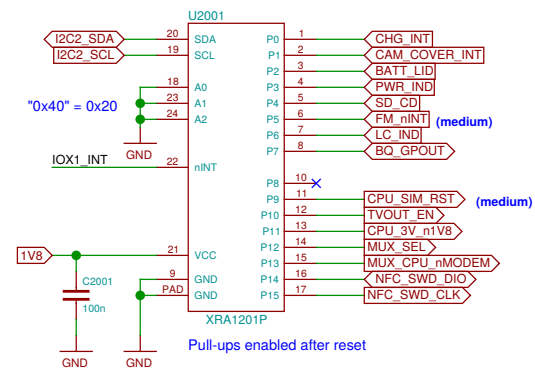
# This is just the collection of signals we have. Proper assignment still pending.



UPPER  
LOWER

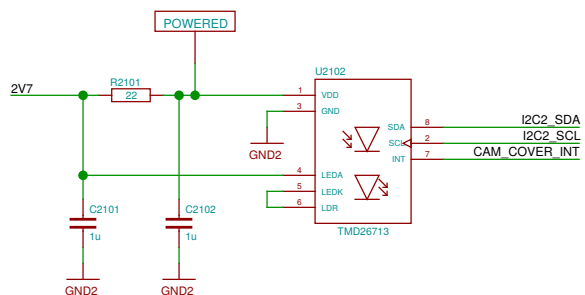


Current rating per contact: 0.3 A

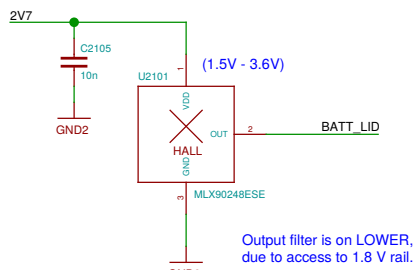


R-array alternatives:  
CTS 746X101104JP  
Bourns CAY17-104JALF  
Panasonic EXB-D10C104J

### Camera Cover detect

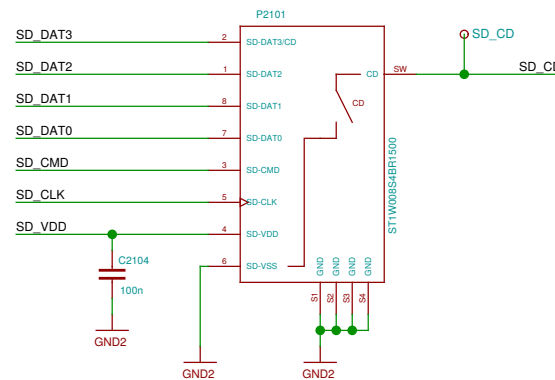


### Battery Cover detect

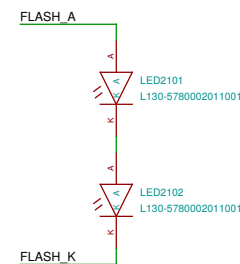


Output filter is on LOWER, due to access to 1.8 V rail.

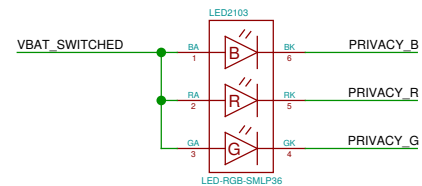
### Memory card holder



### Camera flash

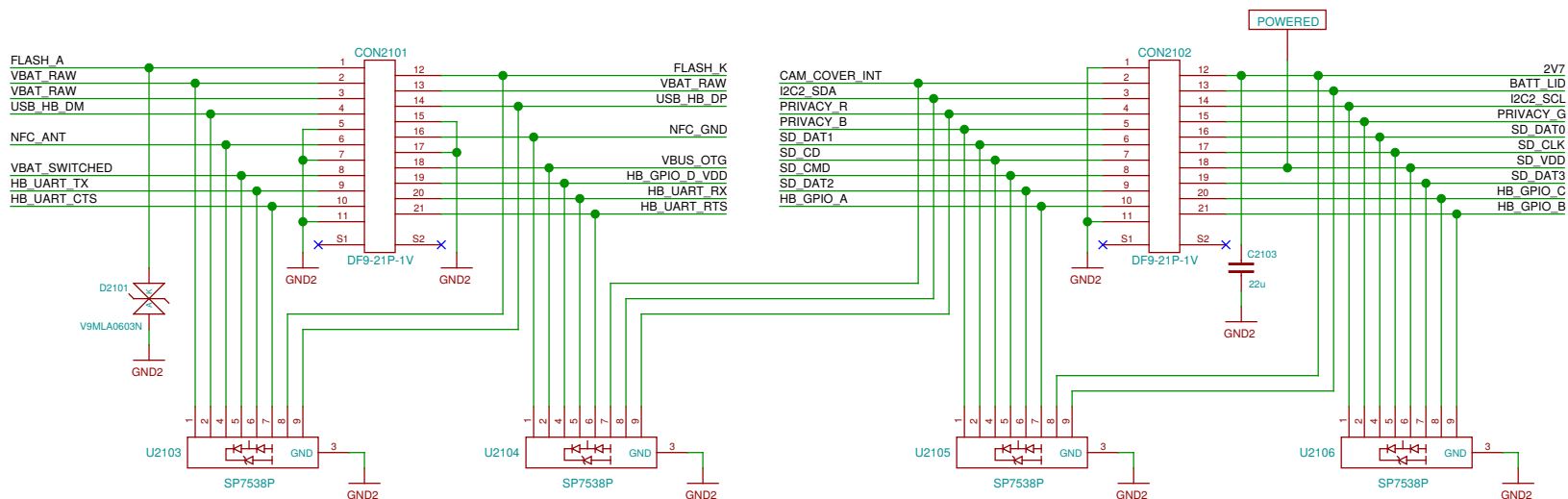


### Privacy LED

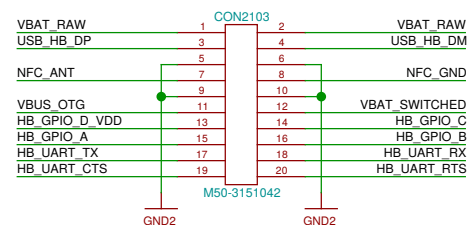


### LOWER-BOB Interconnect (BOB side)

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



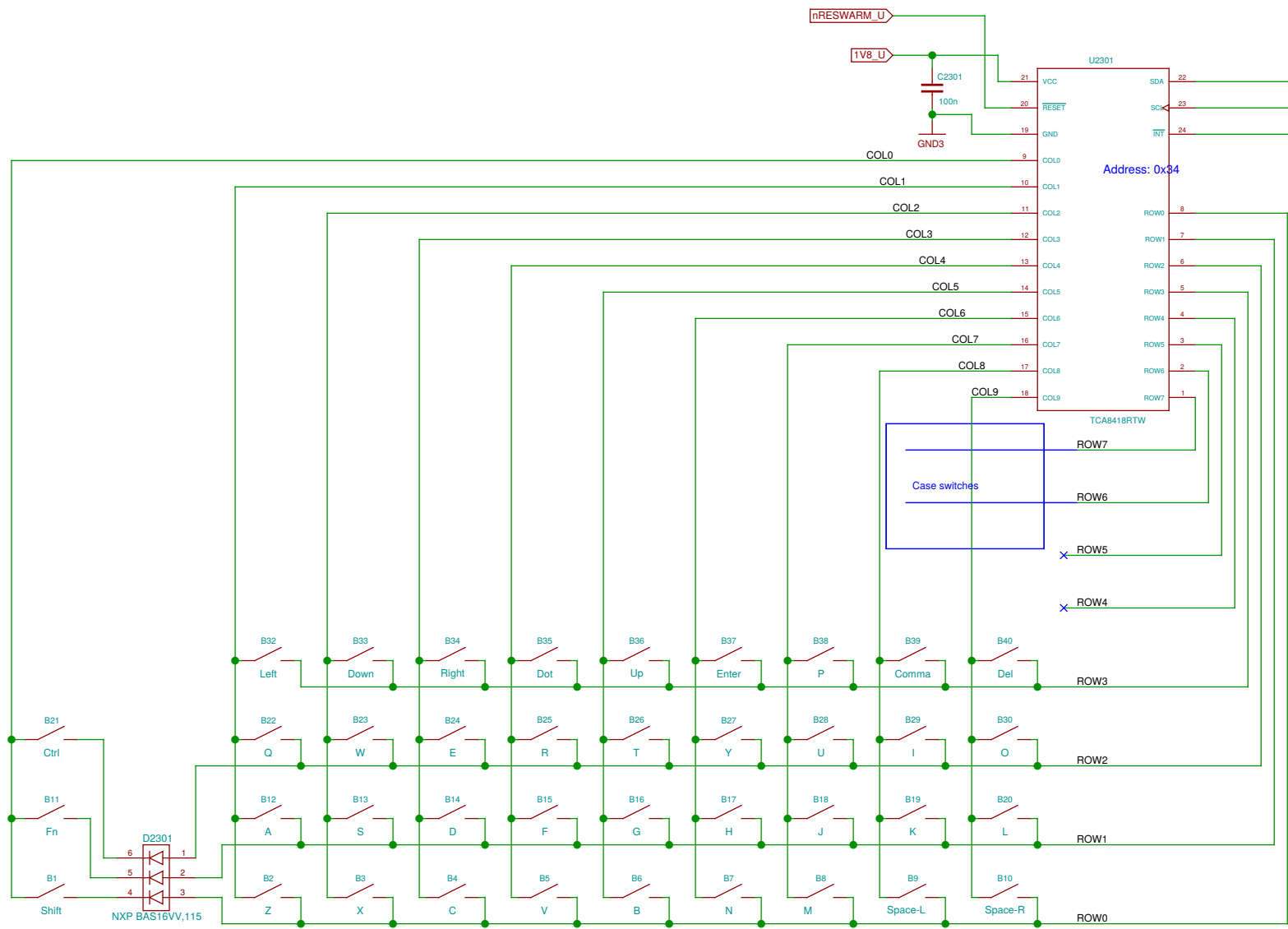
### Hackerbus



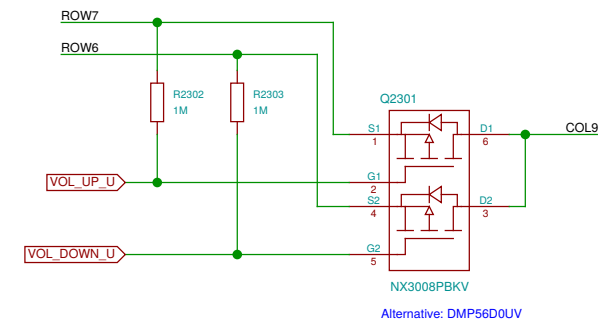
ESD pin assignment is only indicative. Actual assignment to be defined by layout.

**TODO: consider sheet for deletion**

Sheet: /empty/ File: neo900_SS_22.sch		
Title: empty		
Size: A3	Date: 2016-11-07 20:30:05	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 22/37

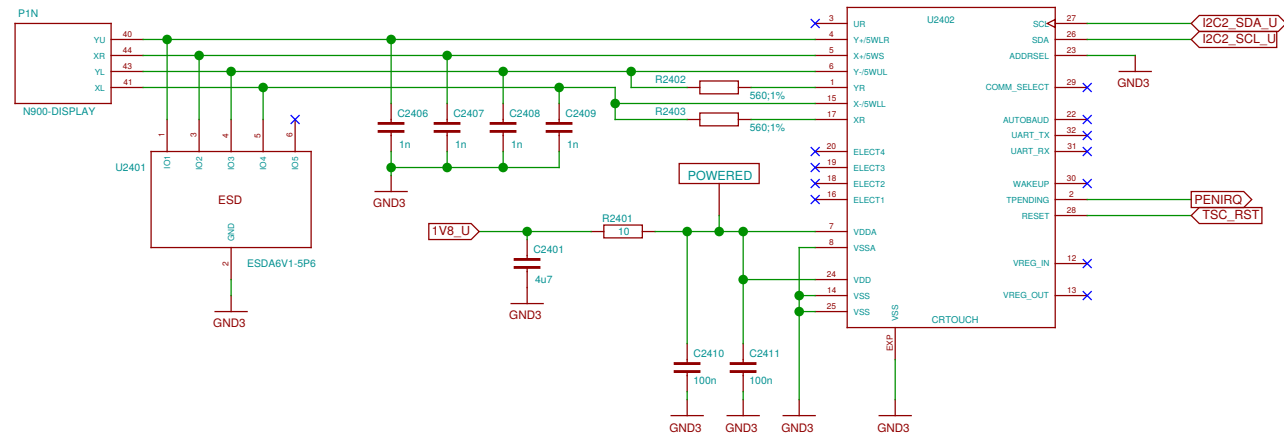


Alternative: Diodes Inc. BAS16VV-7  
 Warning: Diodes Inc. have cathodes on pin 1 side, NXP anodes !

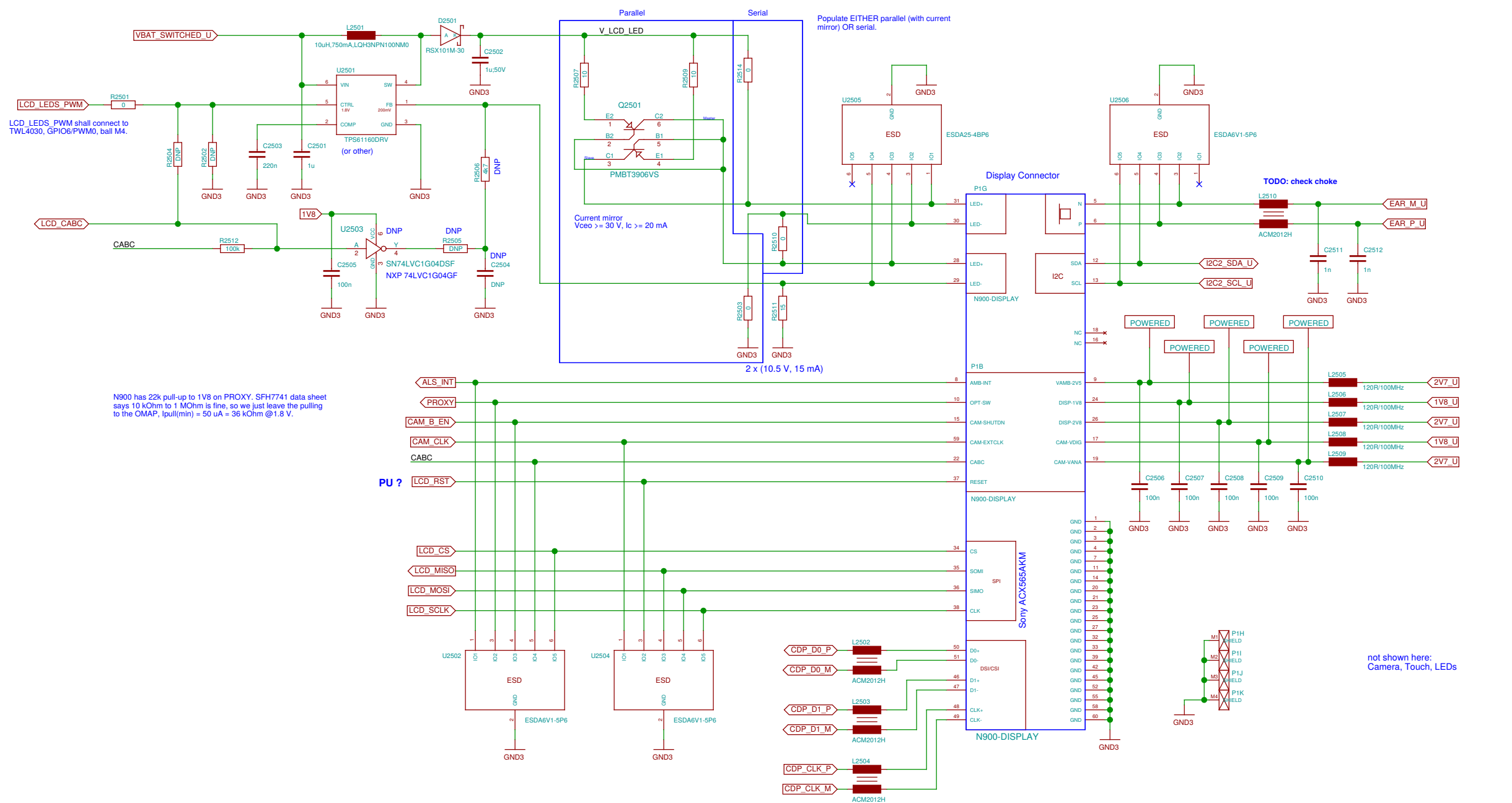


Resistive Touch (display connector)

Touch screen controller







LCD\_LEDS\_PWM shall connect to 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.

TODO: check choke

not shown here:  
Camera, Touch, LEDs

Sheet: /Display-Panel&Power/		File: neo900_SS_25.sch	
Title: Display-Panel&Power			
Size: A3	Date: 2016-11-07 20:30:05	Rev:	
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 25/37	

**OMAP is not part of v2**

Sheet: /CPU + PoP RAM/NAND/ File: neo900_SS_26.sch		
Title: CPU + PoP RAM/NAND		
Size: A3	Date: 2016-11-07 20:30:05	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 26/37

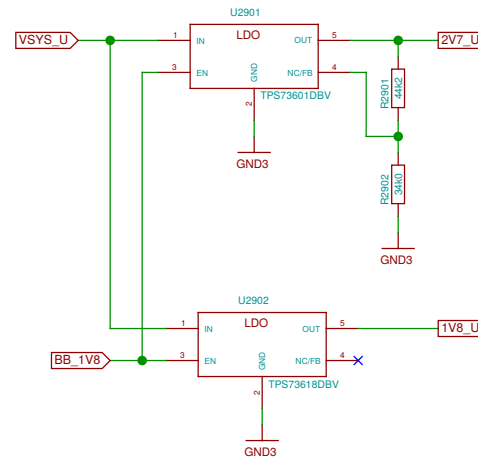
**eMMC is not part of v2**

Sheet: /eMMC/ File: neo900_SS_27.sch		
Title: eMMC		
Size: A3	Date: 2016-11-07 20:30:05	Rev:
Plotted by: eeshow 01a1b57+ 20161103-02:14Z		Id: 27/37

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

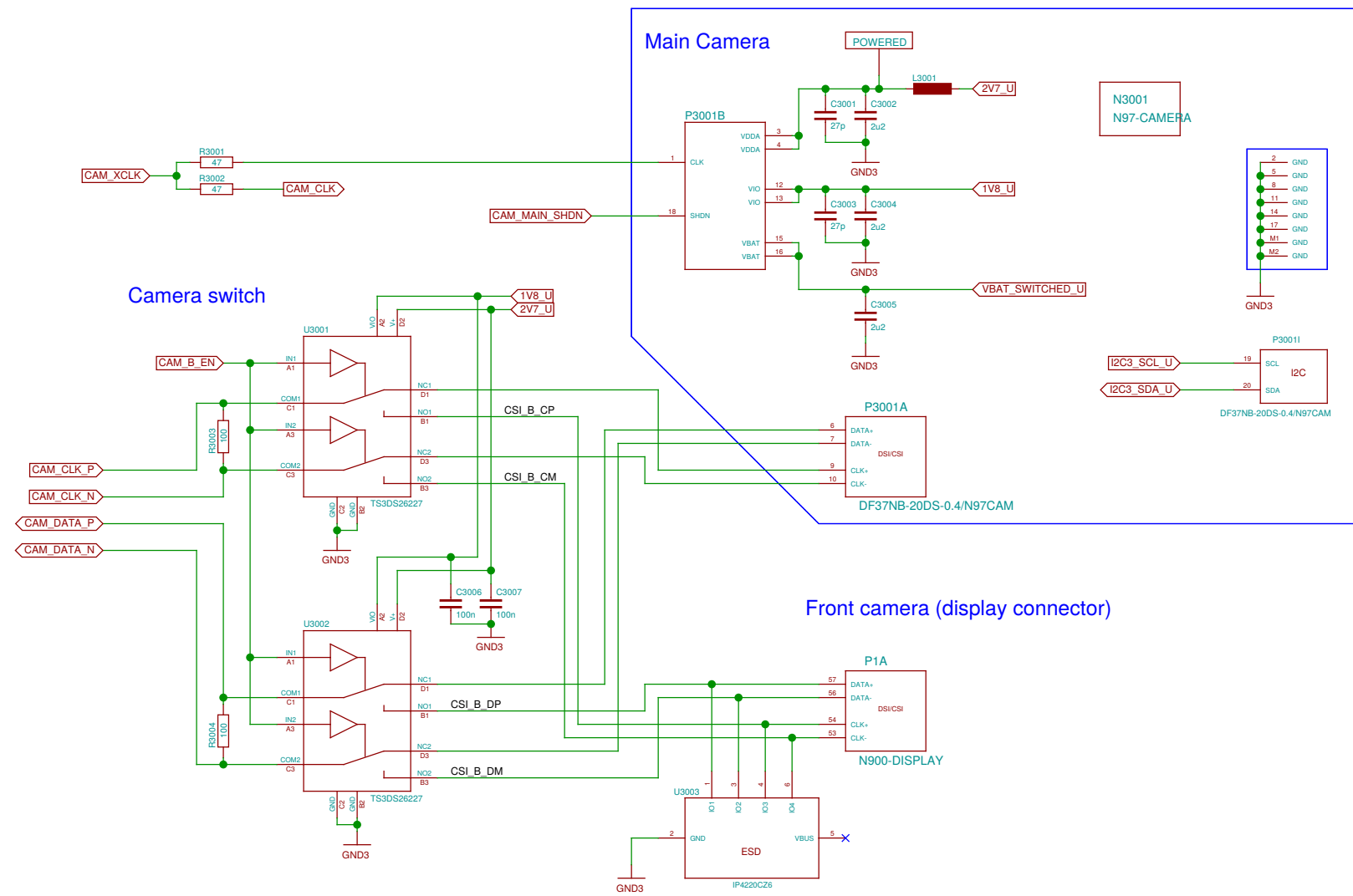
Sheet: /PMU+Codec/ File: neo900_SS_28.sch		
Title: PMU+Codec		
Size: A3	Date: 2016-11-07 20:30:05	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 28/37

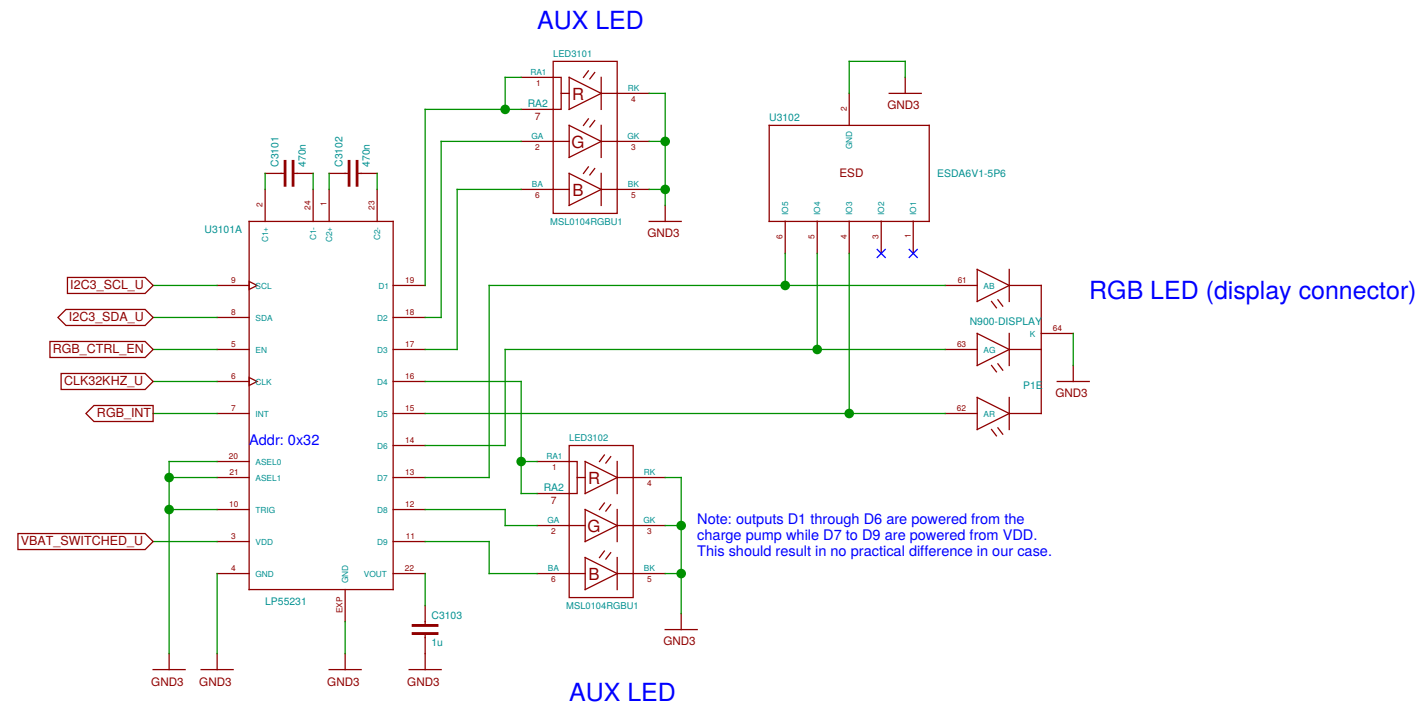
simple capless 400mA LDO for TPS65950 substitute  
(only for prototype)

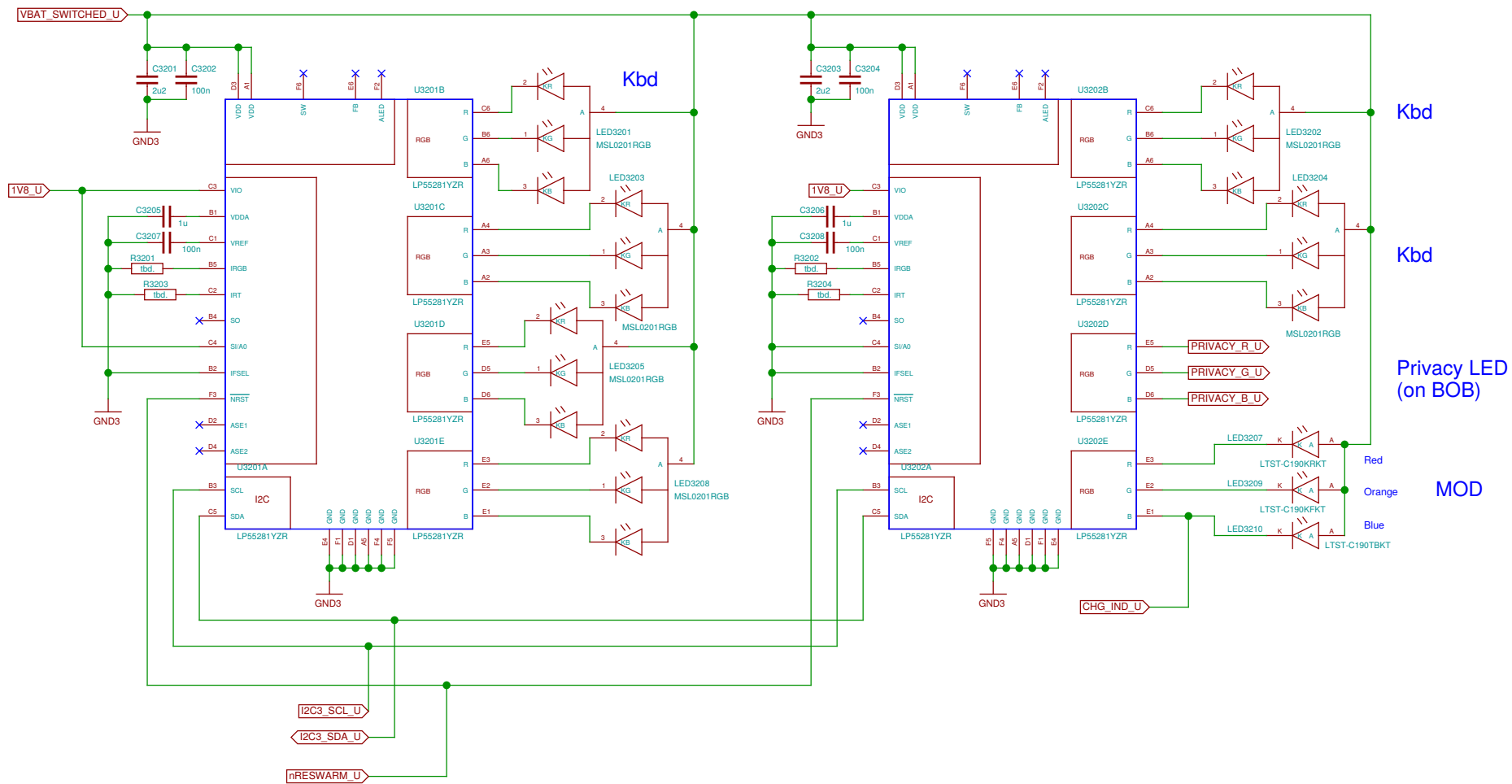


TODO: use REGEN ?

Sheet: /BB-XM Dummy (TWL4030)/		
File: neo900_SS_29.sch		
Title: BB-XM Dummy (TWL4030)		
Size: A3	Date: 2016-11-07 20:30:05	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 29/37





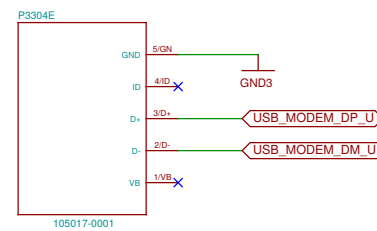




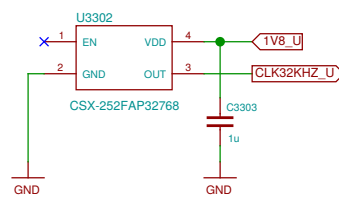
**Cleaning up. The connections to BB-xM are on the next sheets.**

connect to BB  
by some Micro-USB cable

### Modem USB

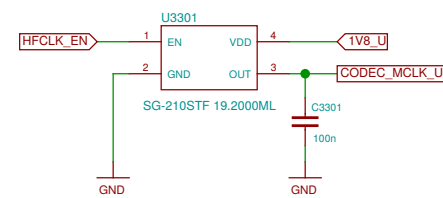


### 32 kHz clock



Alternative: OYKTGLJANF-0.032768

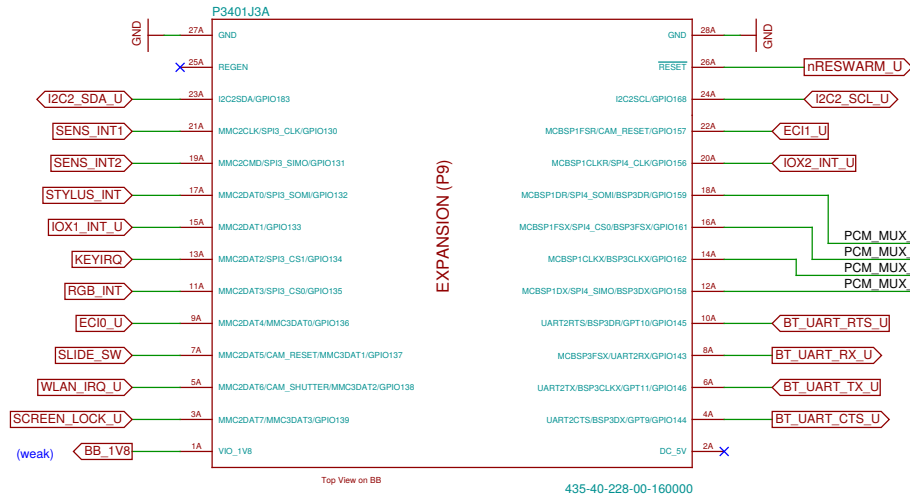
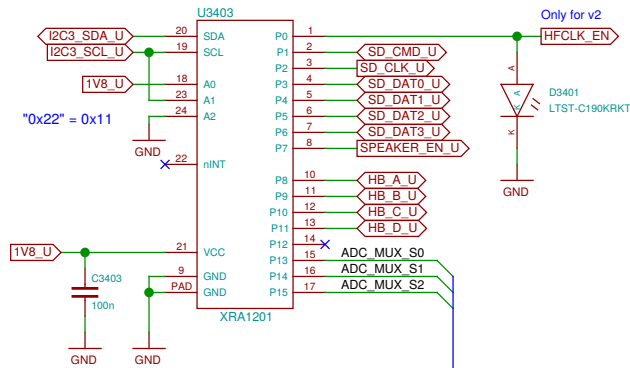
### 19.2 MHz clock



Alternative: KC2520B19.2000C1GE00

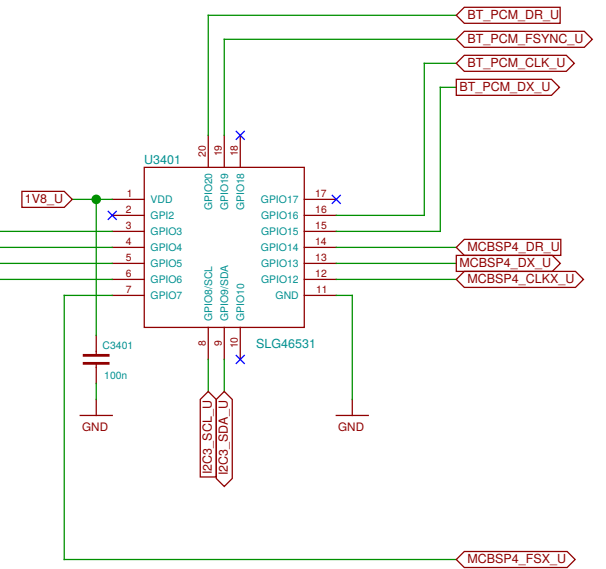
Sheet: /Connector to BB-XM/ File: neo900_SS_33.sch		
Title: Connector to BB-XM		
Size: A3	Date: 2016-11-07 20:13:58	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 33/37

**TODO: update pin names in footprint**

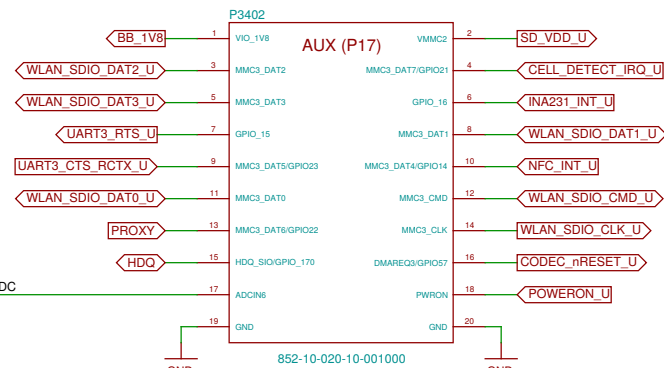


Top View on BB  
435-40-228-00-160000  
Same part, as "breakaway" strip (72 positions):  
435-40-272-00-160000

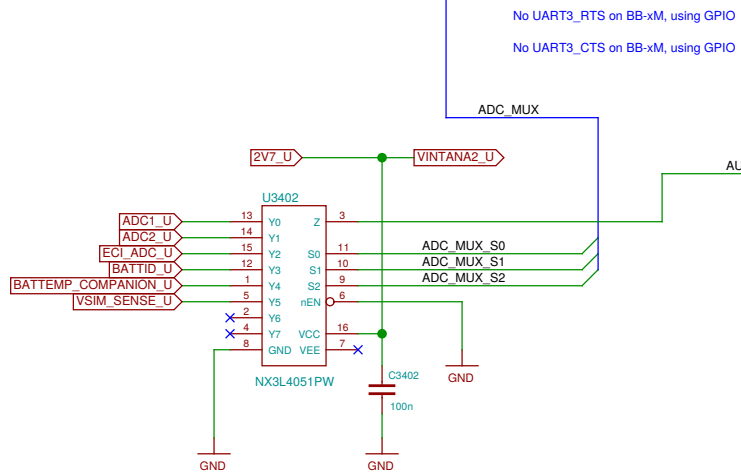
**BB-xM Main Expansion Header (P9, 7.24)**



**Auxiliary Expansion Header (P17, 7.26)**



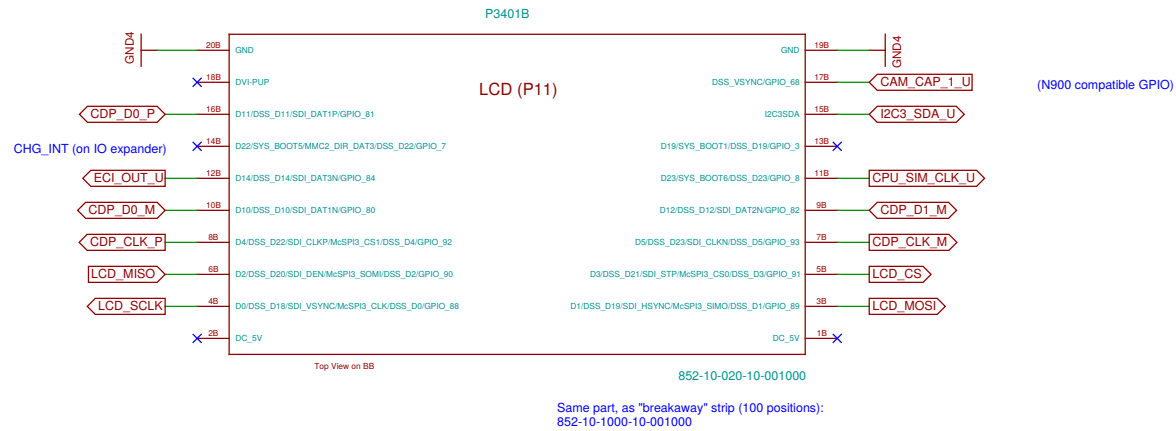
852-10-020-10-001000  
Same part, as "breakaway" strip (100 positions):  
852-10-1000-10-001000



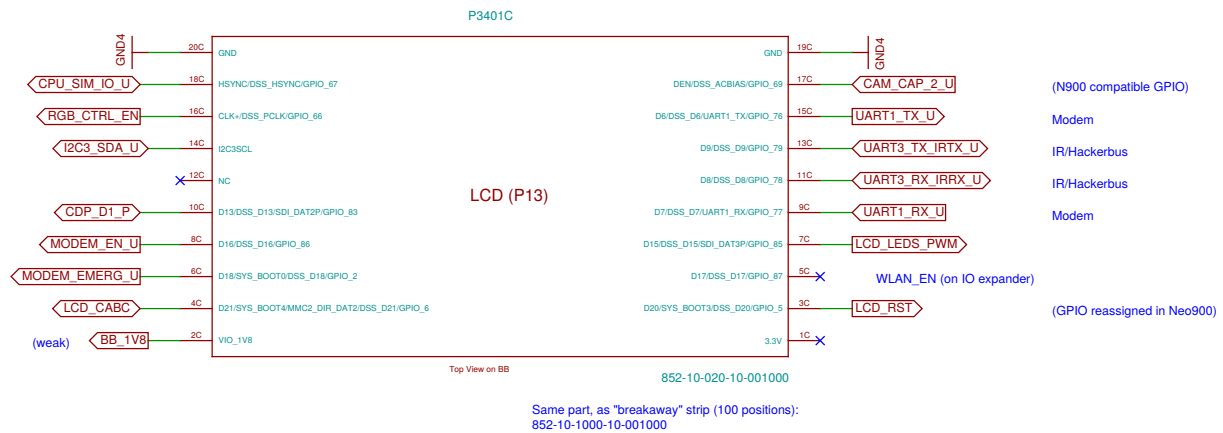
FM\_nINT (on IO expander)

# TODO: update pin names in footprint

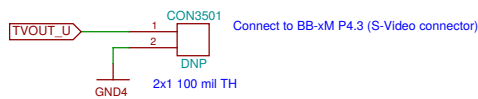
P11 (7.25)



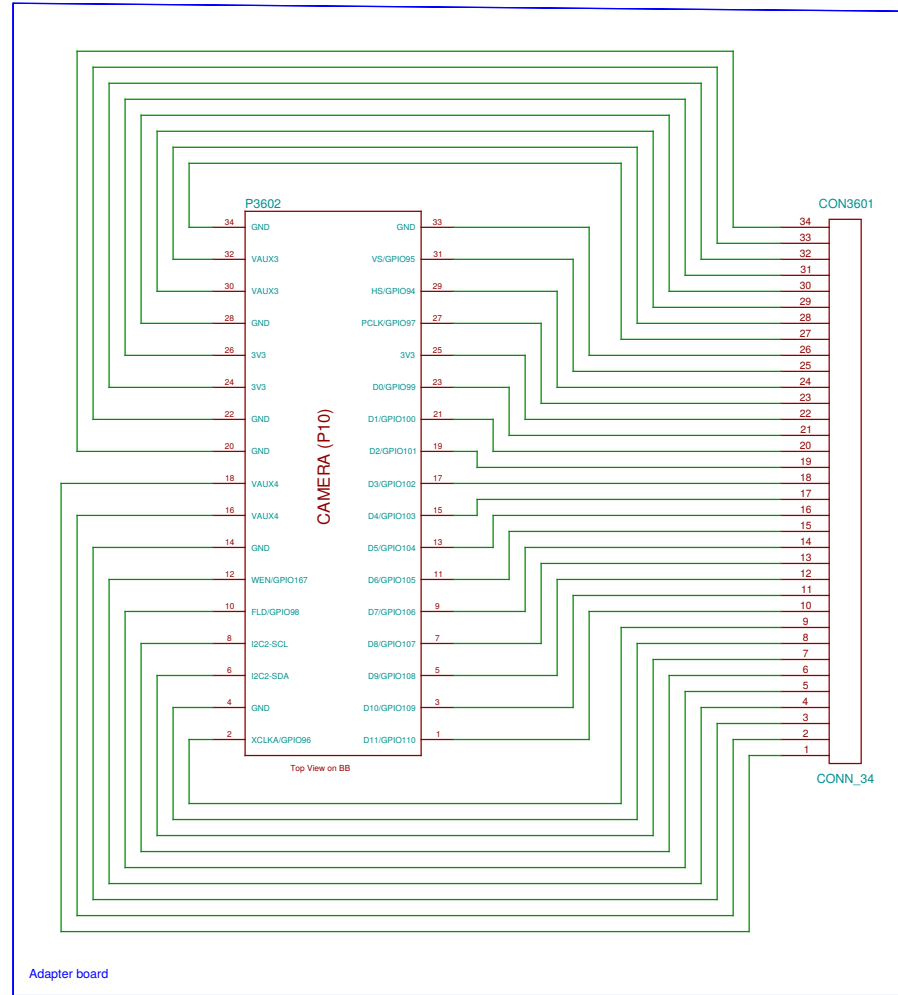
P13 (7.25)



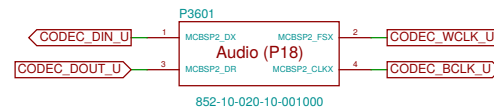
P4 (7.19)



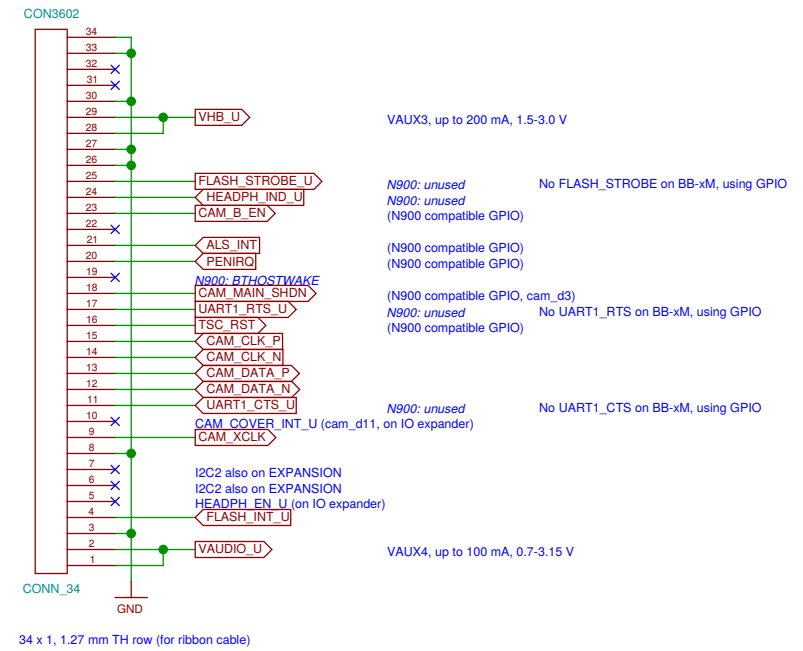
## Processor Camera Port Interface (P10, 7.20.3)



**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

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

Sheet: /No-Solder Components/ File: neo900_SS_37.sch		
Title: No-Solder Components		
Size: A3	Date: 2016-11-07 20:30:05	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 37/37