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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 \(CAM\)](#)

Sheet: No-Solder Components

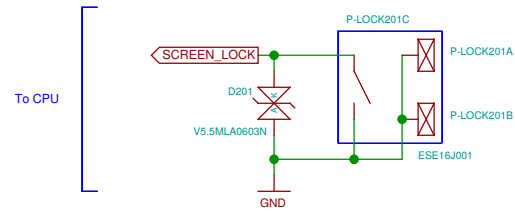
File: neo900\_SS\_37.sch

[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>

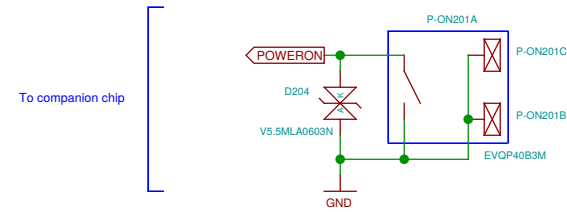
Sheet: /		
File: neo900.sch		
Title: Neo900		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 1/37

### Lock switch



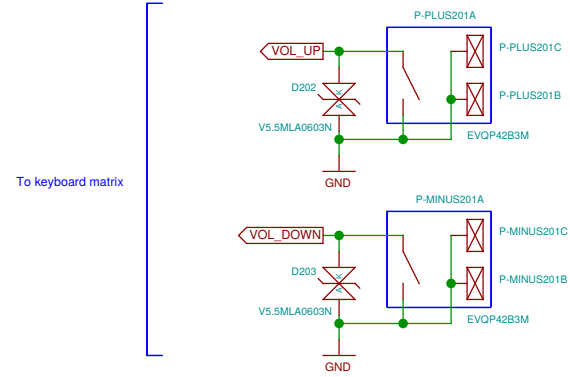
To CPU

### On-off



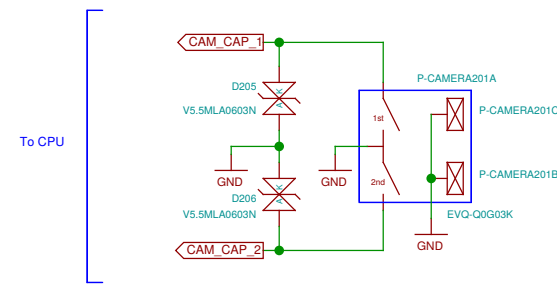
To companion chip

### Volume



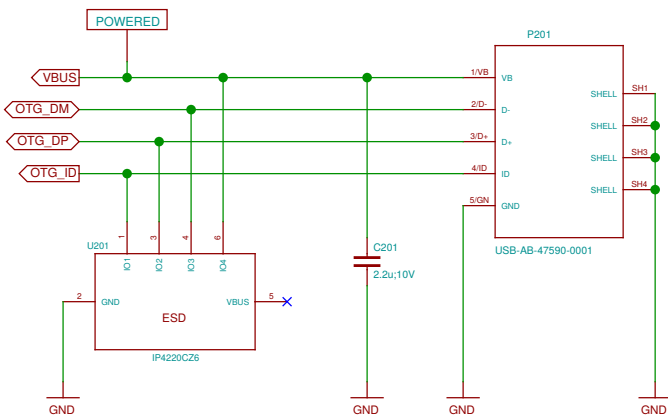
To keyboard matrix

### Camera trigger



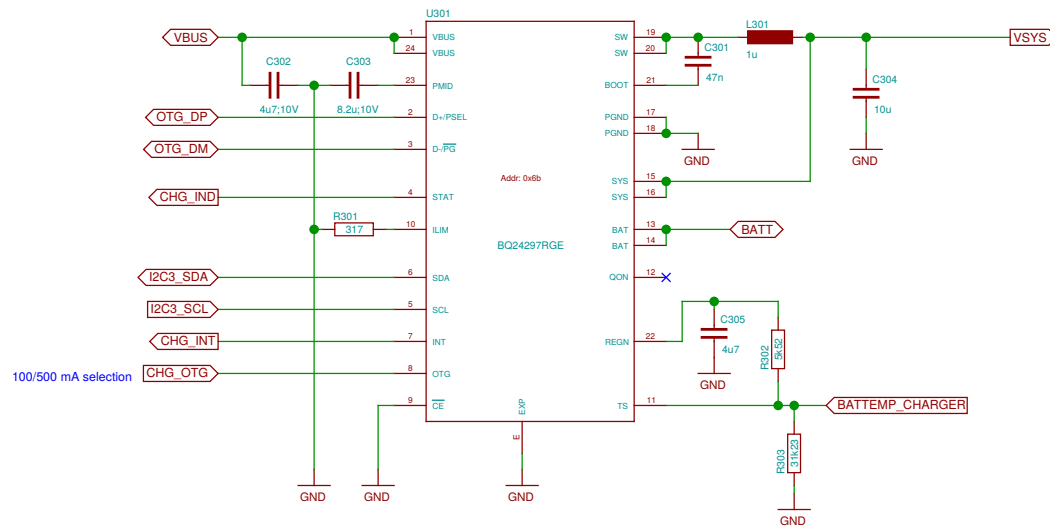
To CPU

### USB OTG connector



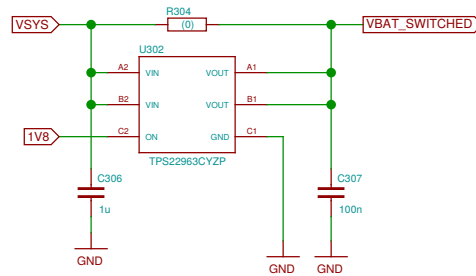
Sheet: ./OTG/ File: neo900_SS_2.sch		
Title: OTG		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 2/37

## Battery charger with USB OTG

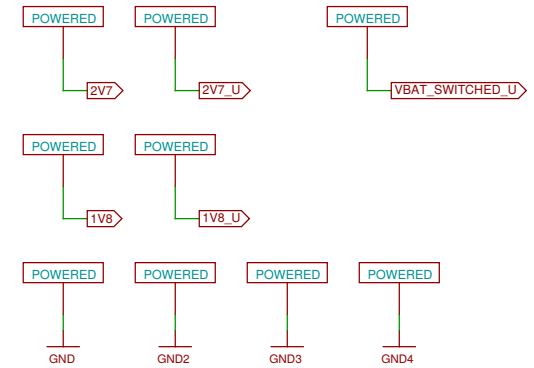


## Power distribution and sequencing

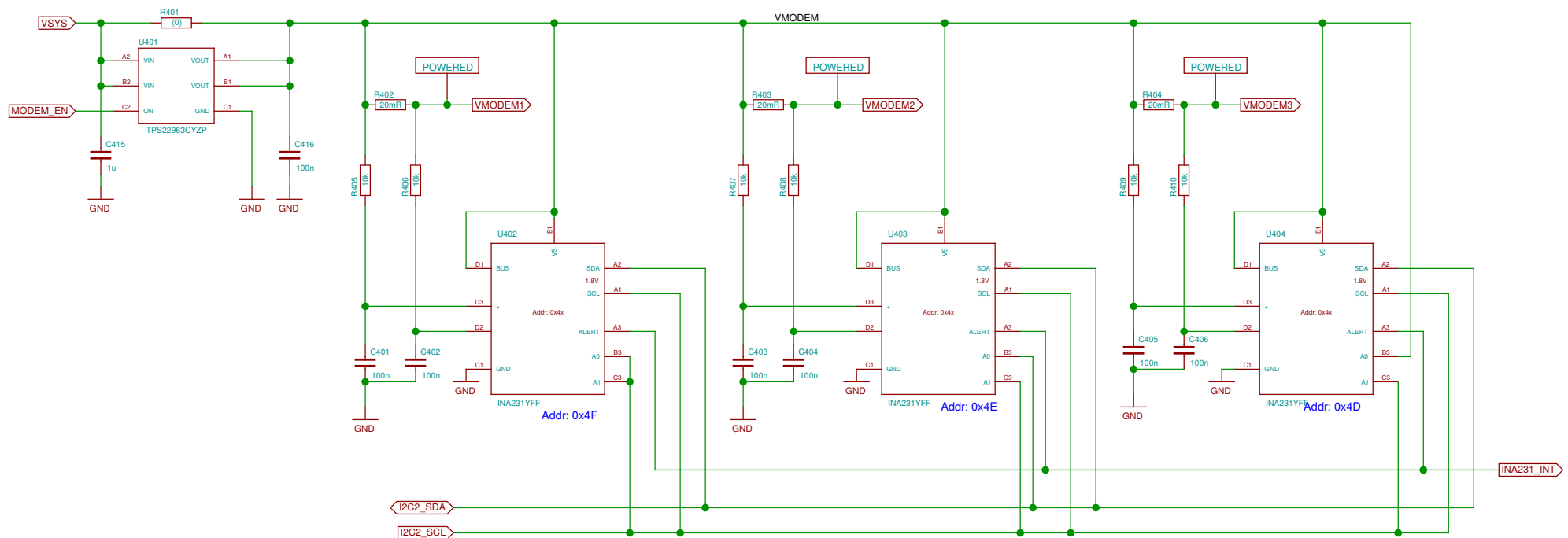
Most high-current consumers are on VBAT\_SWITCHED.  
1V8 signals that the regulators on UPPER are operational.



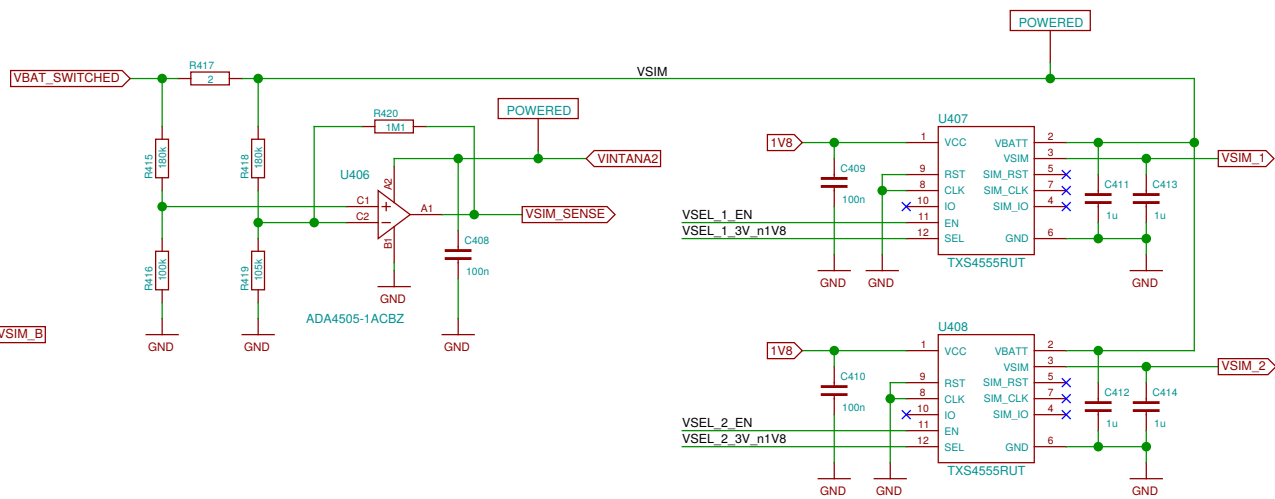
## KiCad bureaucracy



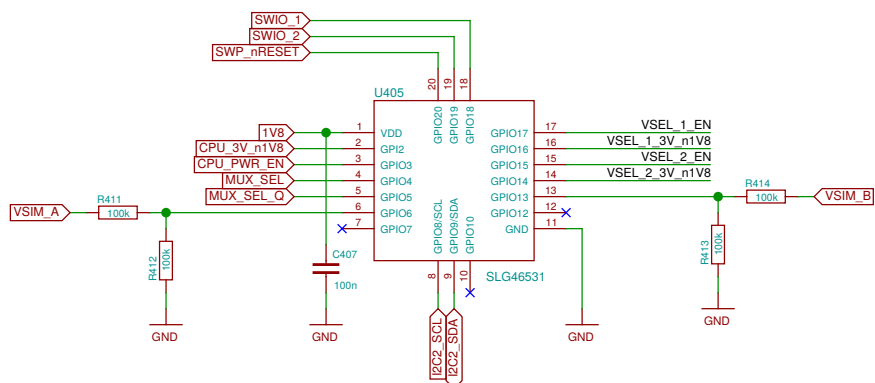
### Modem current monitor



### SIM current sensing

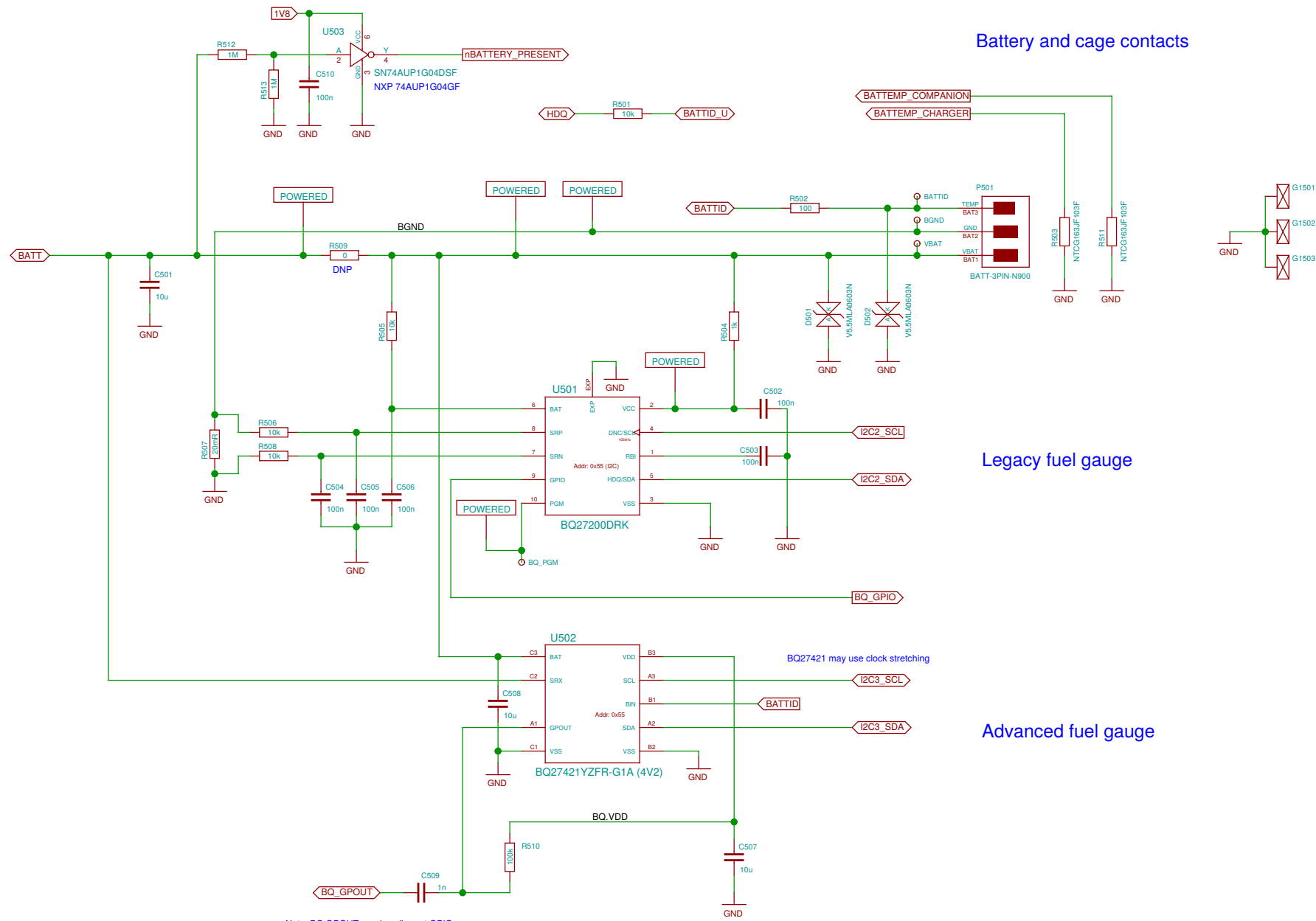


### SIM power selection



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

Sheet: /Modem Power/ File: neo900_SS_4.sch		
Title: Modem Power		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 4/37



Battery and cage contacts

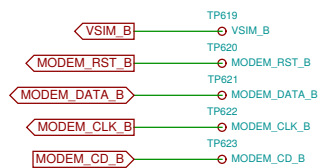
Legacy fuel gauge

Advanced fuel gauge

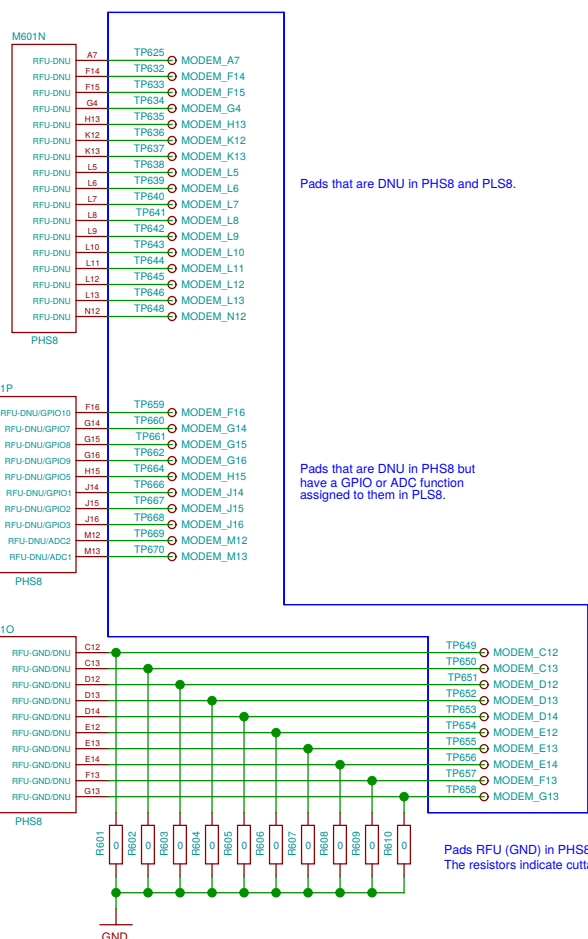
Note: BQ.GPOUT needs pull-up at GPIO.

Sheet: /Fuel Gauge/		
File: neo900_SS_5.sch		
Title: Fuel Gauge		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 5/37

### SIM B bus

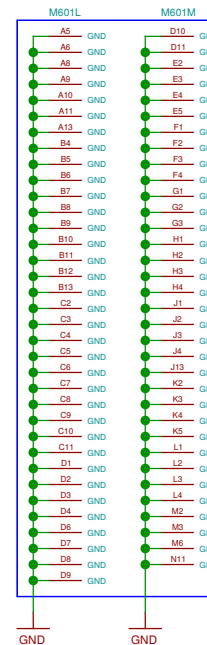
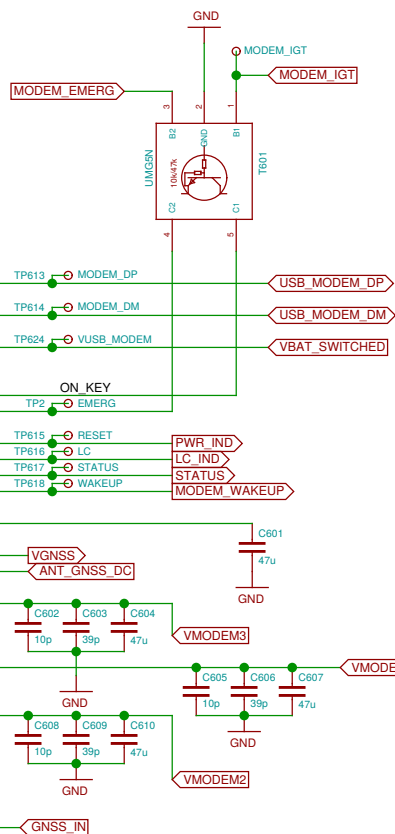
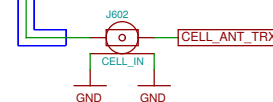
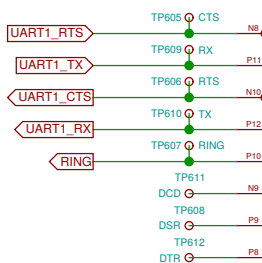
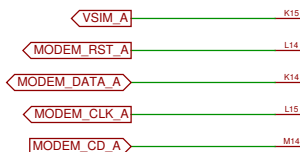
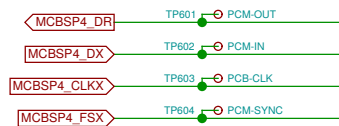


17+10+10 = 37 test points. PCB space permitting, to be in arranged a 6 x 6 + 1 grid with 1.0 mm pitch. This patchfield is to be placed adjacent to the SIM B bus test points.

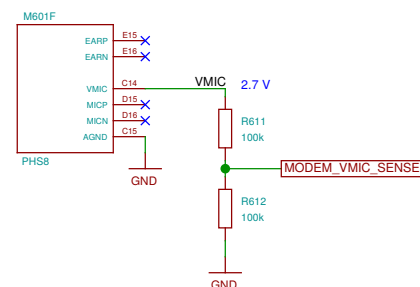


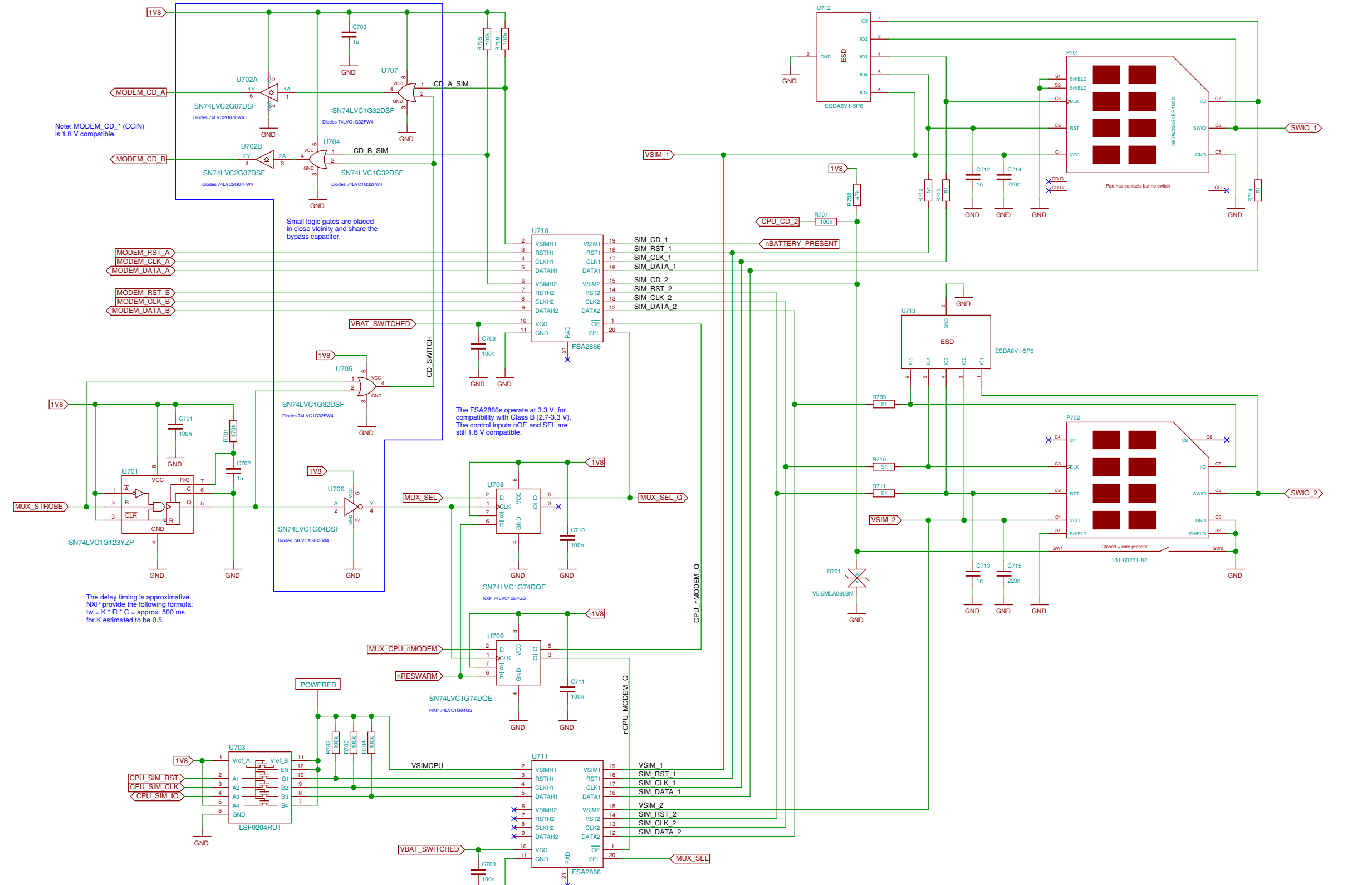
Pads that are DNU in PHS8 and PLS8.

Pads that are DNU in PHS8 but have a GPIO or ADC function assigned to them in PLS8.

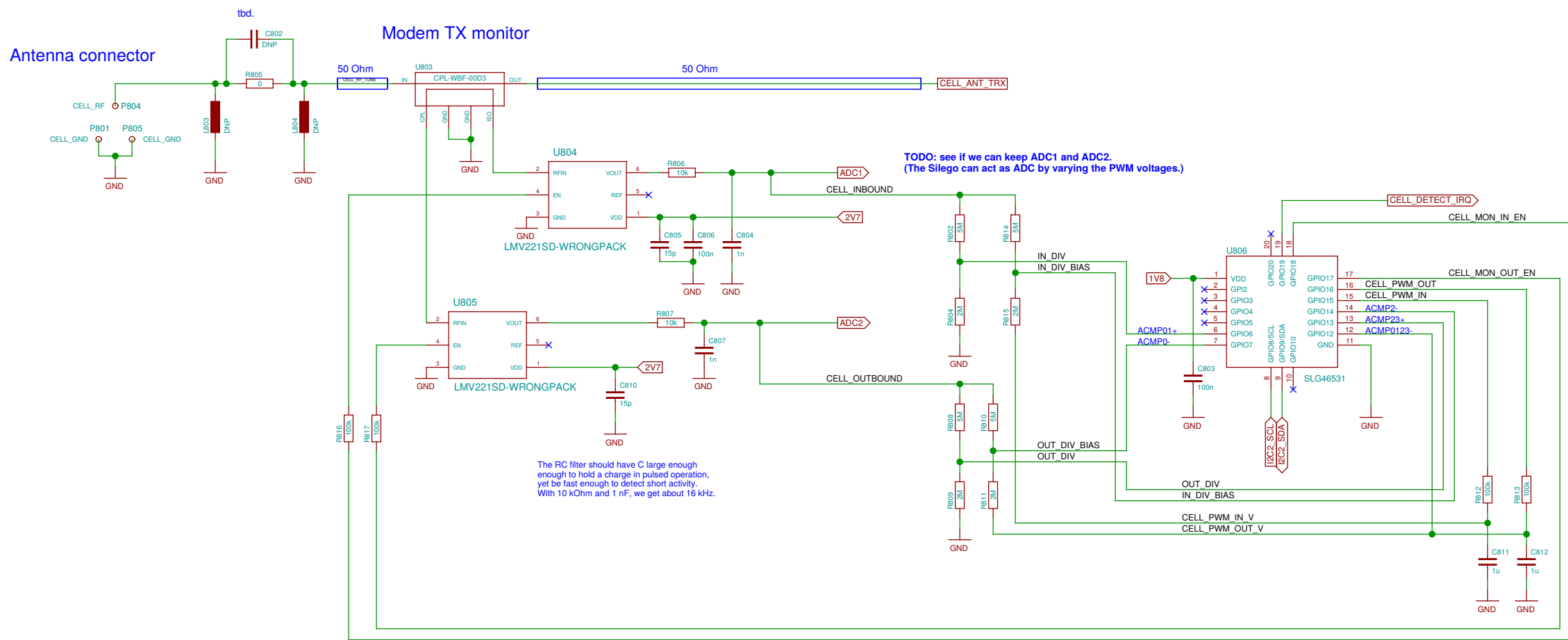
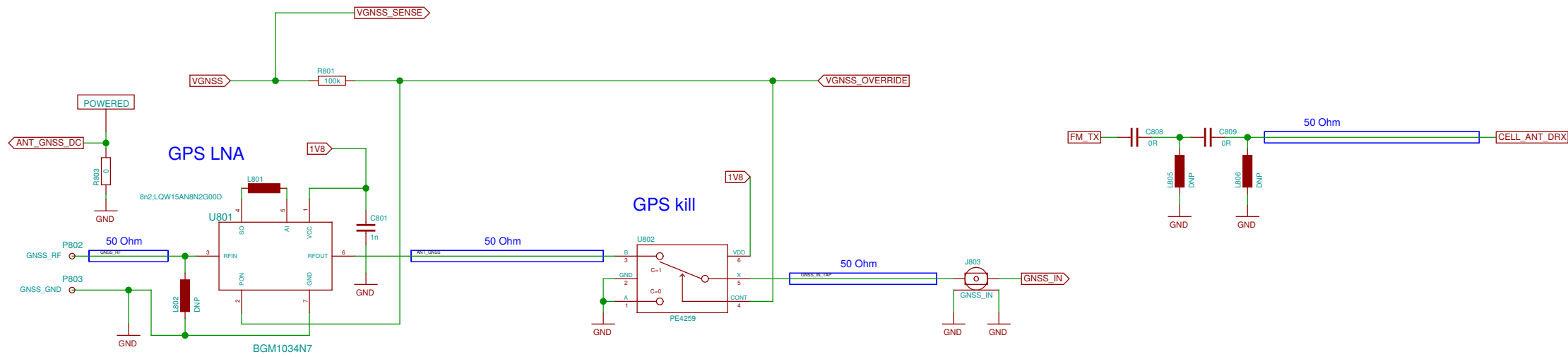


### Anti-eavesdropping





Sheet: ./Dual SIM switch/ File: neo900_SS_7.sch		
Title: Dual SIM switch		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 7/37



TODO: see if we can keep ADC1 and ADC2.  
(The Silego can act as ADC by varying the PWM voltages.)

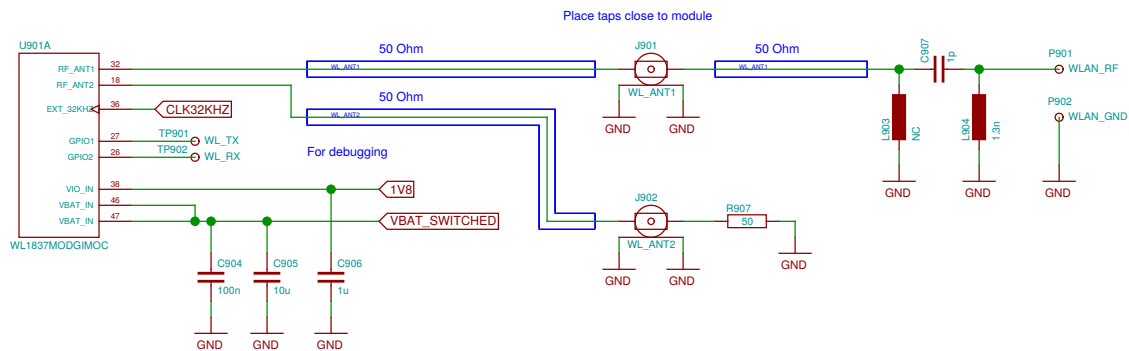
The RC filter should have C large enough enough to hold a charge in pulsed operation, yet be fast enough to detect short activity. With 10 kOhm and 1 nF, we get about 16 kHz.

Sheet: /Antenna connections/ File: neo900_SS_8.sch		
Title: Antenna connections		
Size: A3	Date: 2016-11-03 17:00:16	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 8/37

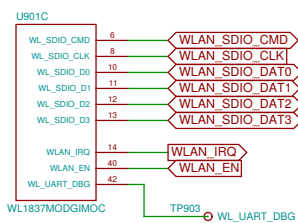


TODO: assign footprints for c-spring contacts

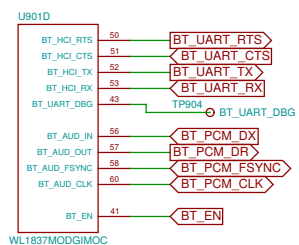
WLAN/BT antenna



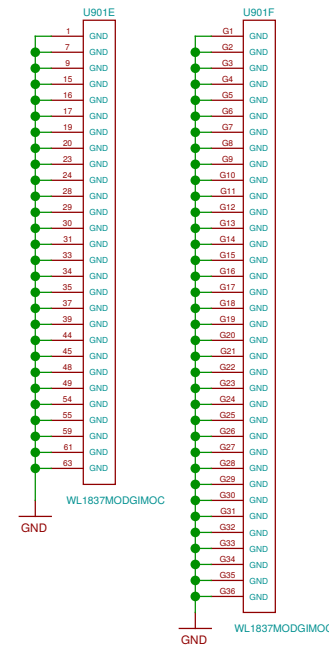
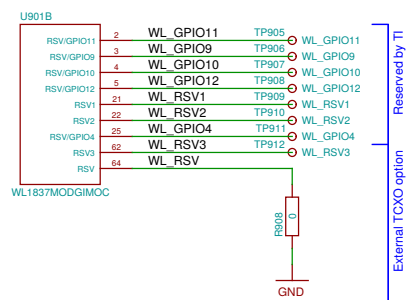
WLAN



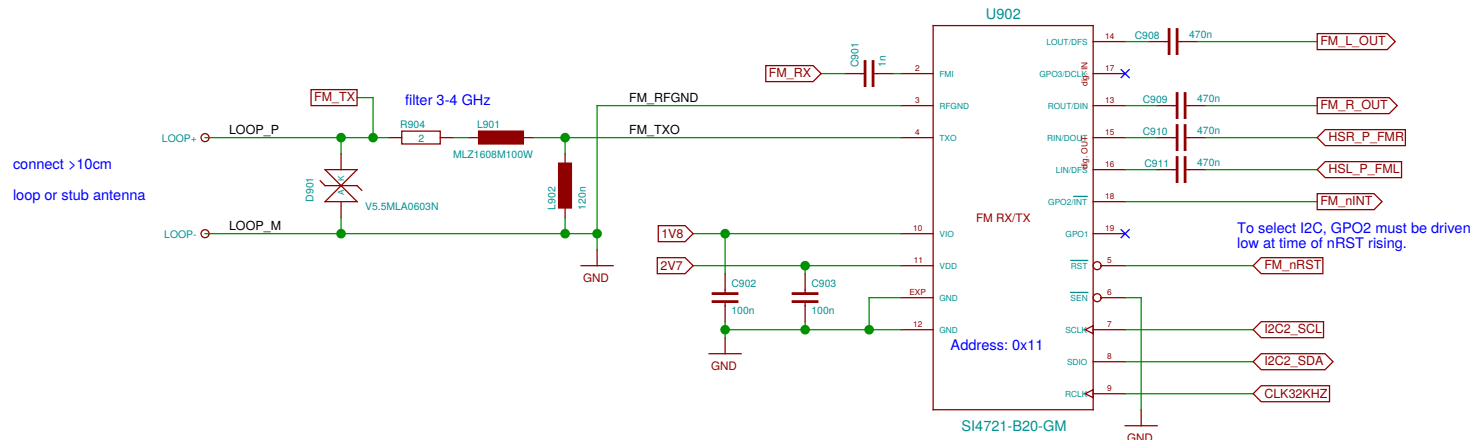
Bluetooth



Reserved / Debugging



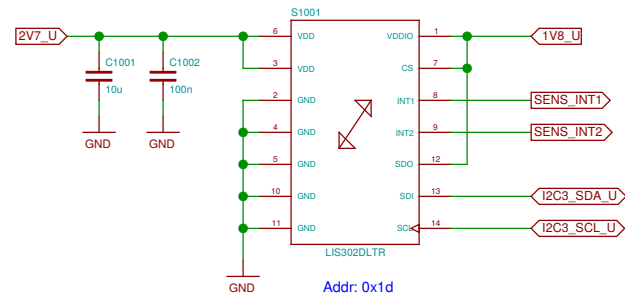
FM Radio (TX/RX)



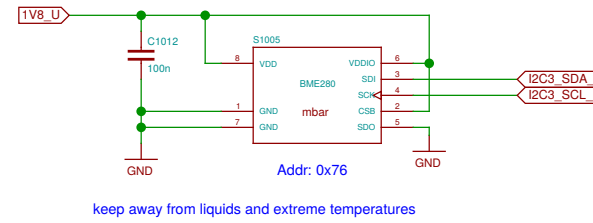
SI4705 is pin compatible (mostly) but RX-only

Sheet: /WLAN, Bluetooth, FM/		
File: neo900_SS_9.sch		
Title: WLAN, Bluetooth, FM		
Size: A3	Date: 2016-10-31 22:24:58	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 9/37

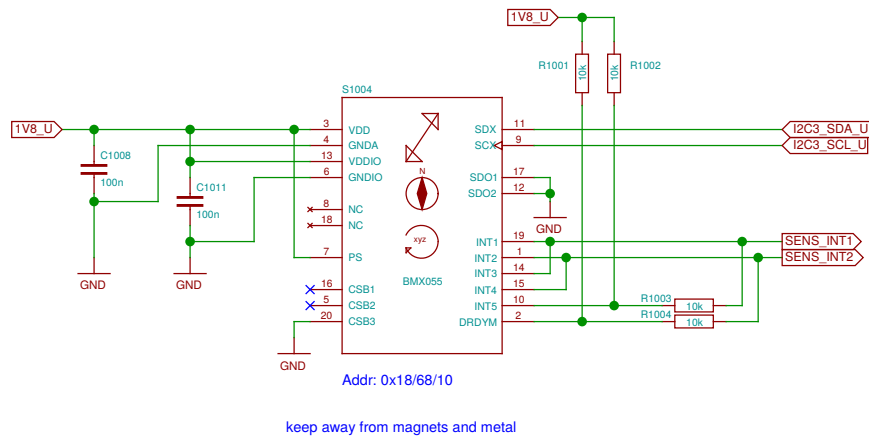
### Acceleration (legacy)



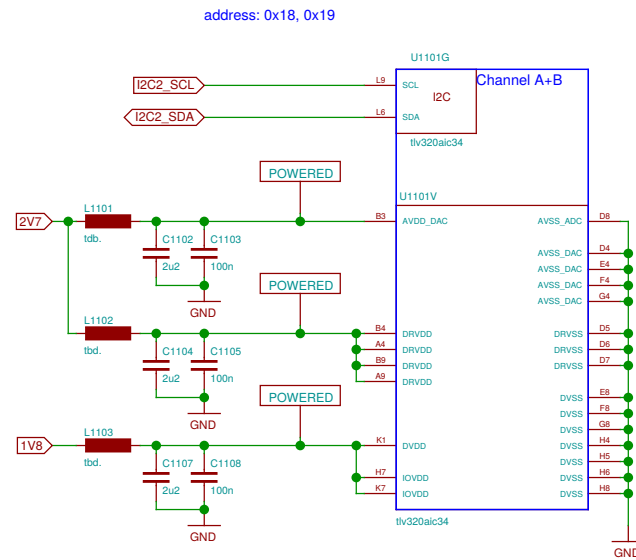
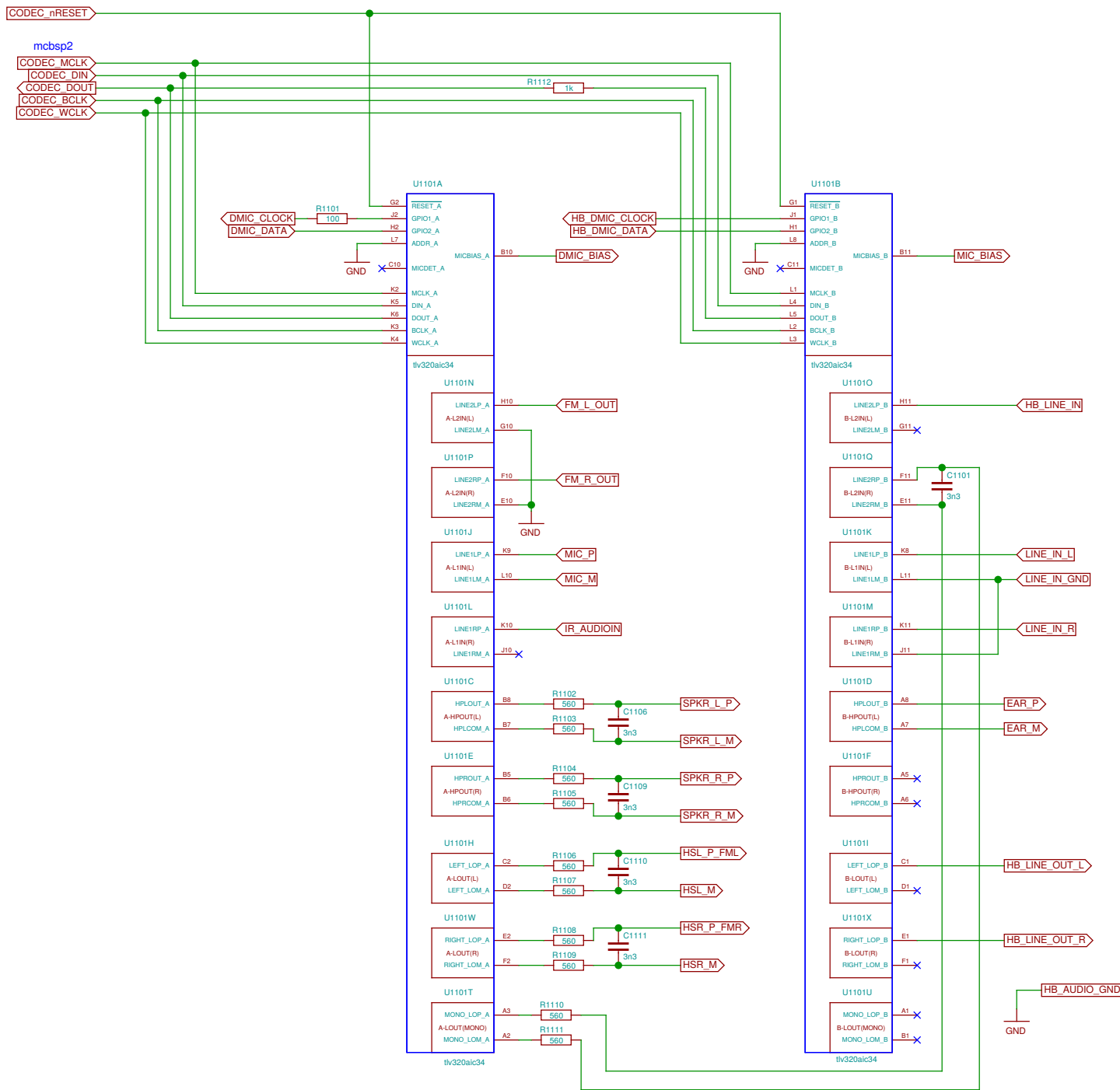
### Pressure, humidity



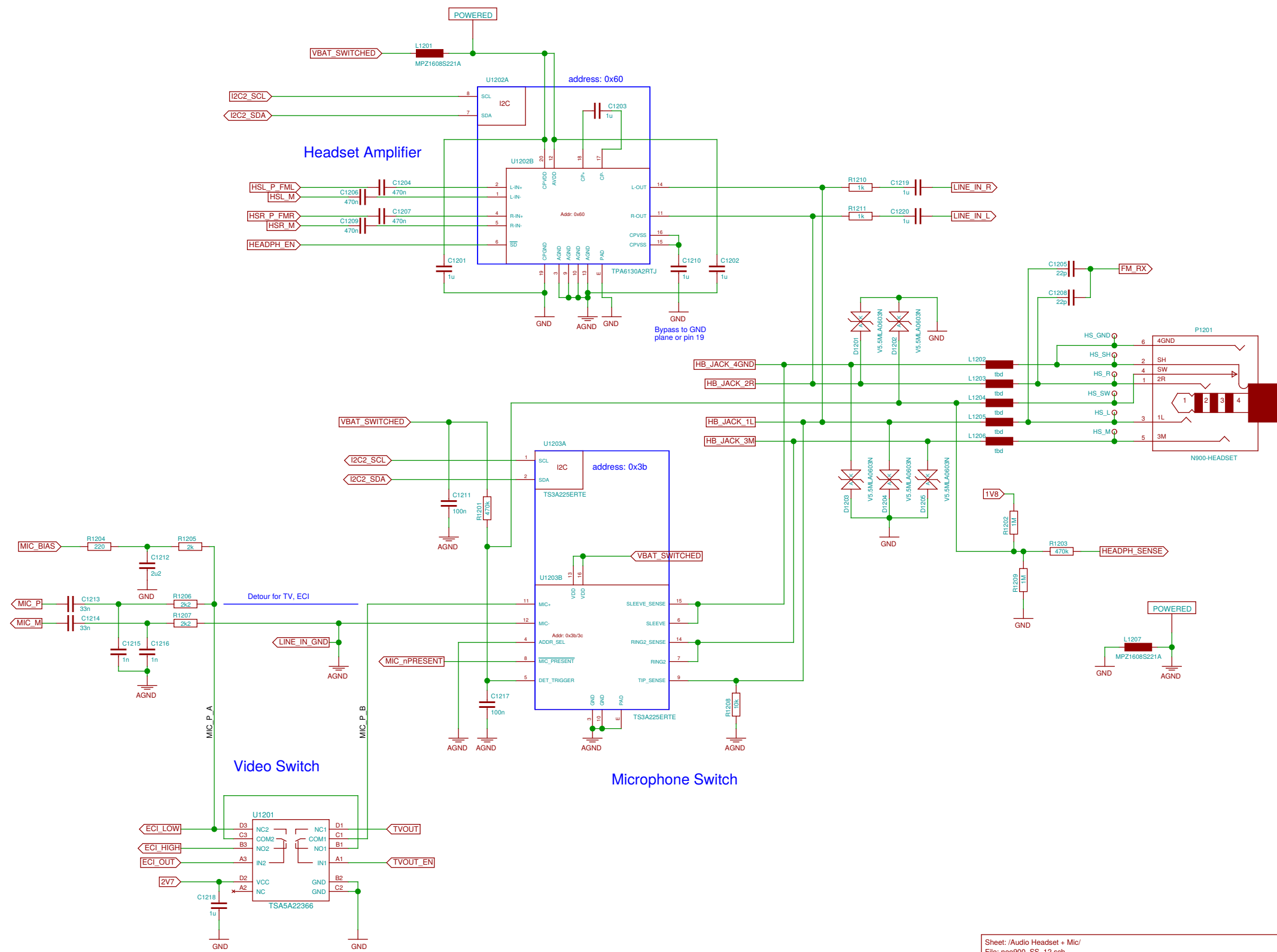
### 9-axis (acceleration, gyroscope, magnetometer)



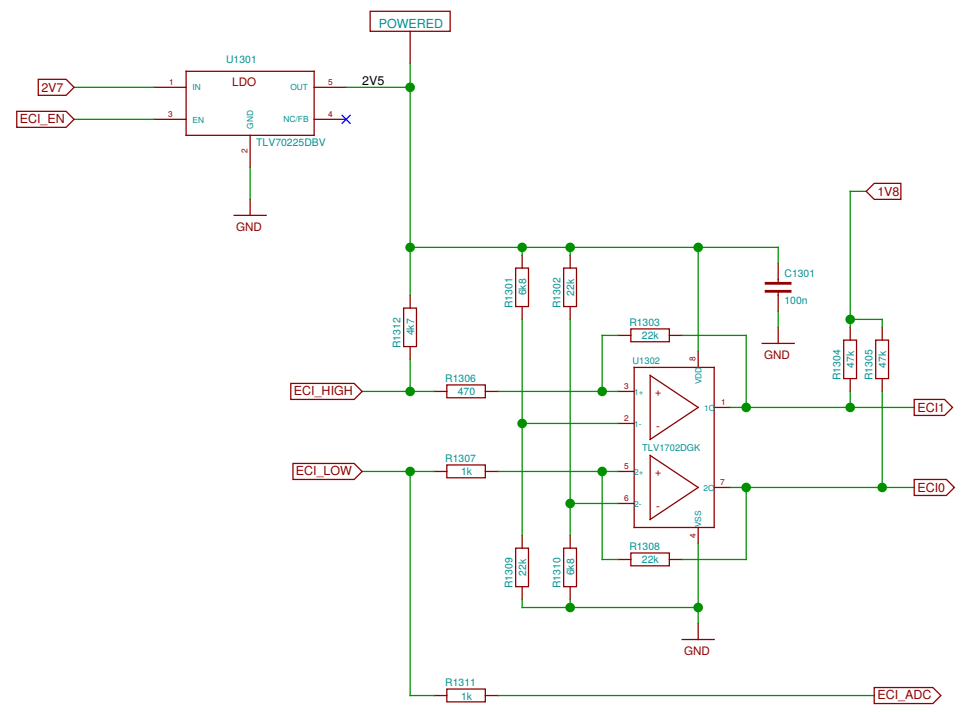
Sheet: /Sensors/		
File: neo900_SS_10.sch		
Title: Sensors		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 10/37



Sheet: /Audio Codec/		
File: neo900_SS_11.sch		
Title: Audio Codec		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 11/37

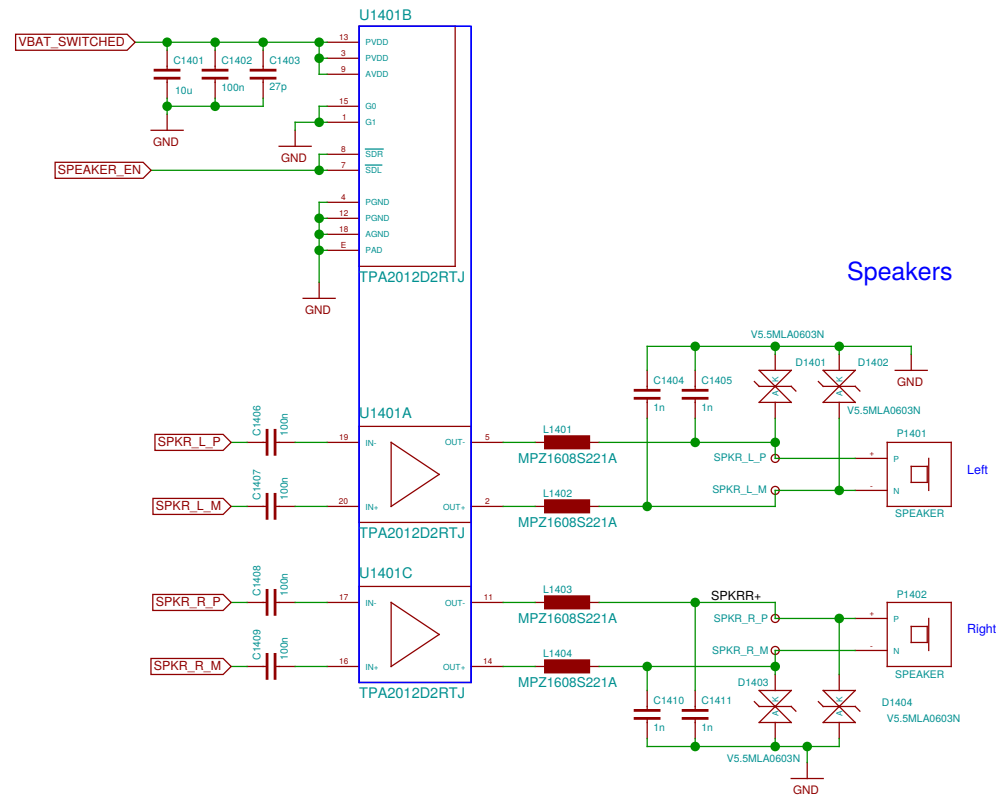


Sheet: /Audio Headset + Mic/		
File: neo900_SS_12.sch		
Title: Audio Headset + Mic		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 12/37

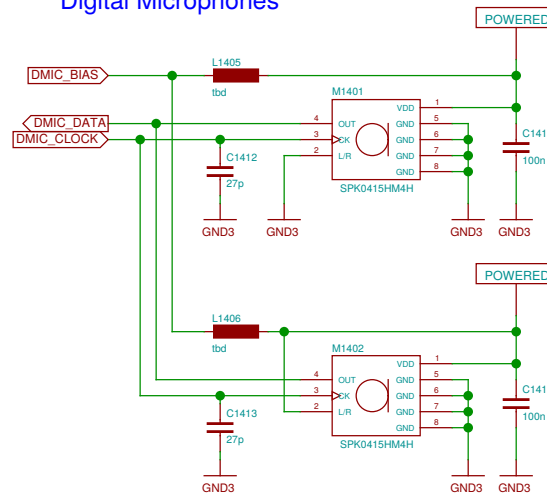


Sheet: /ECI/		
File: neo900_SS_13.sch		
Title: ECI		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 13/37

### Hands-free



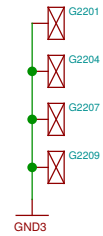
### Digital Microphones



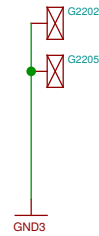
Sheet: /Audio Handsfree/		
File: neo900_SS_14.sch		
Title: Audio Handsfree		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 14/37

### Shield Contacts on UPPER

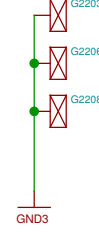
For the display



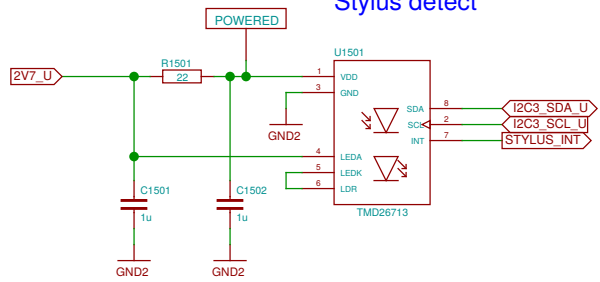
For the key mat



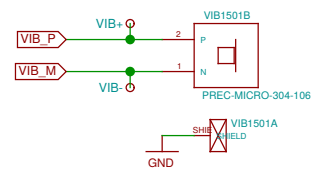
For the "key frame hook"



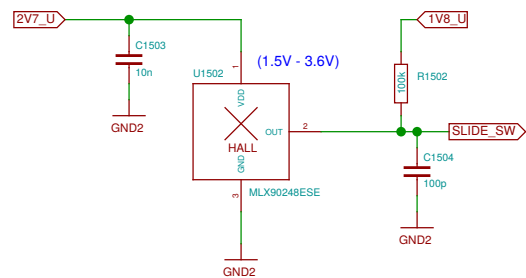
### Stylus detect



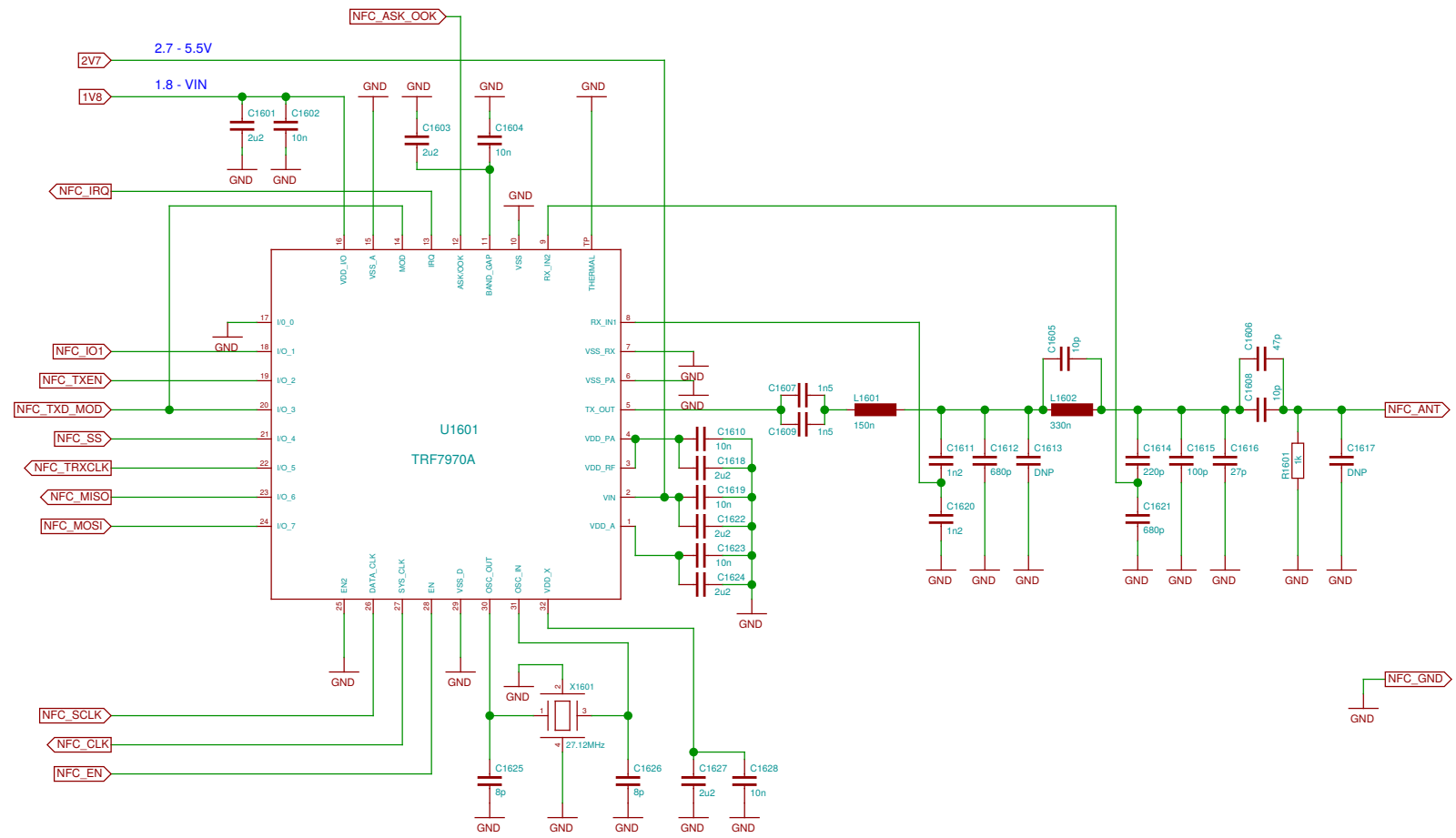
### Vibramotor



### Slide sensor



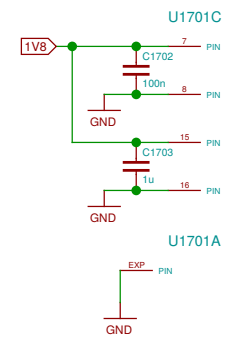
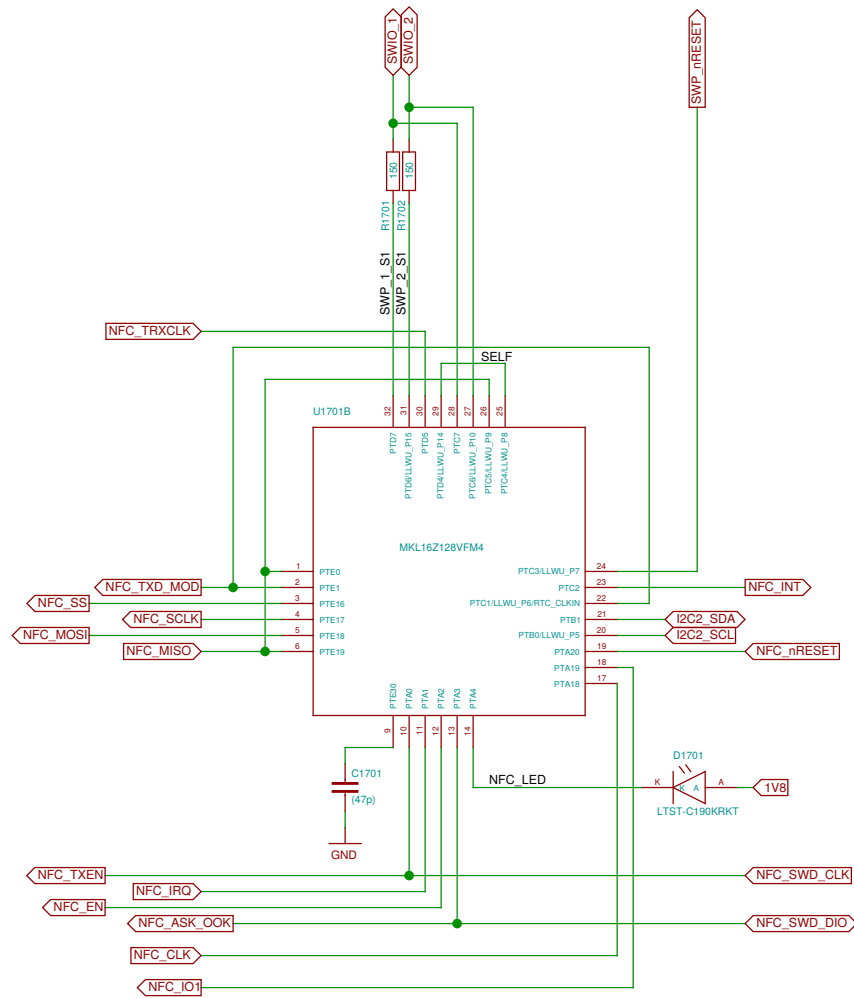
Sheet: /Misc/		
File: neo900_SS_15.sch		
Title: Misc		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 15/37



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

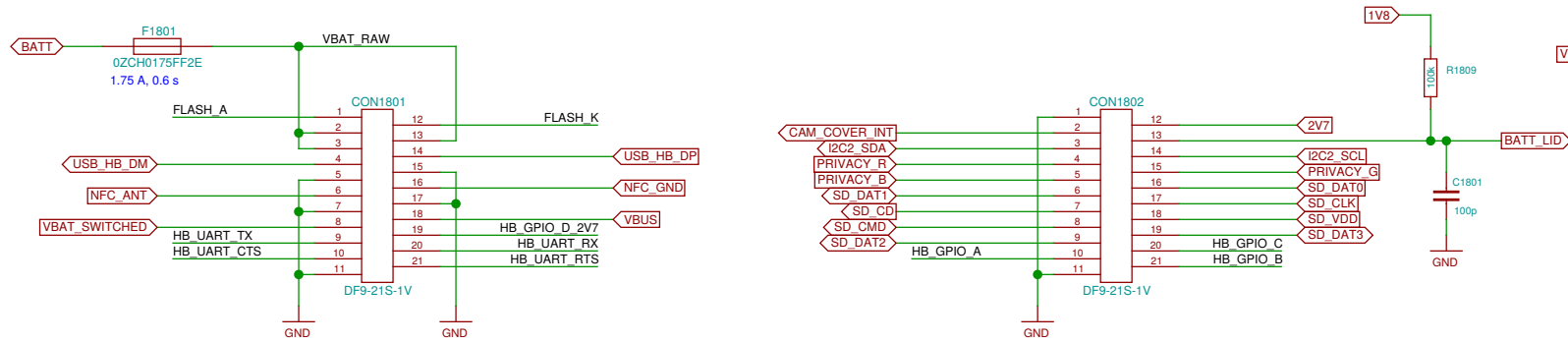
Sheet: /RFID/NFC Reader/ File: neo900_SS_16.sch		
Title: RFID/NFC Reader		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 16/37



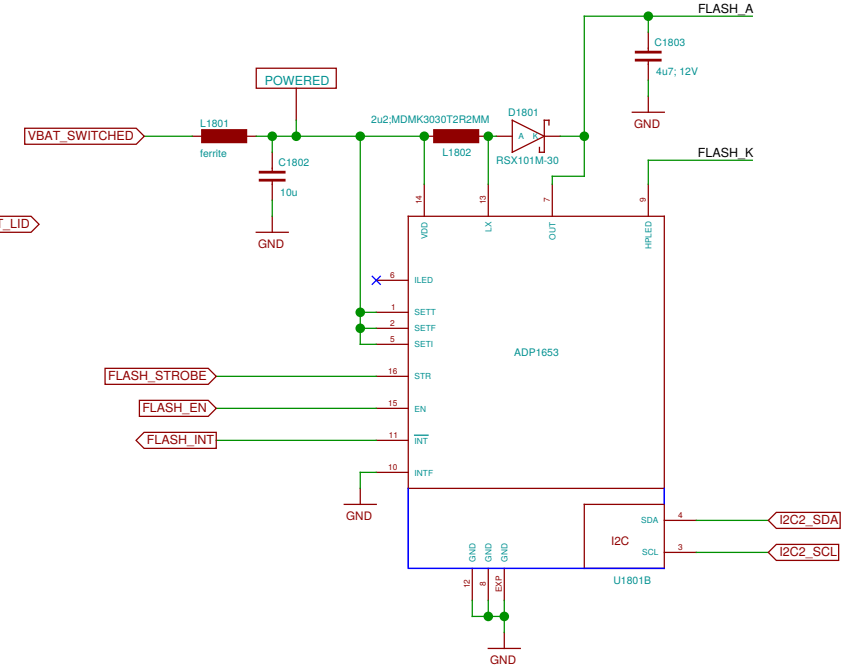


## LOWER-BOB Interconnect (LOWER side)

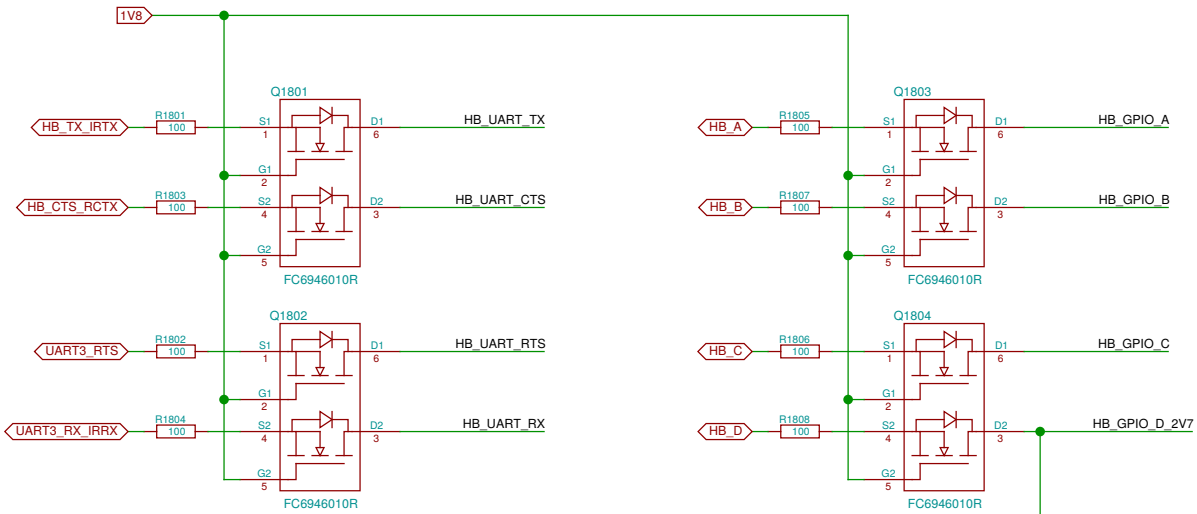
Defined in the Hackerbus specification, <http://neo900.org/stuff/papers/hb.pdf>



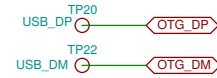
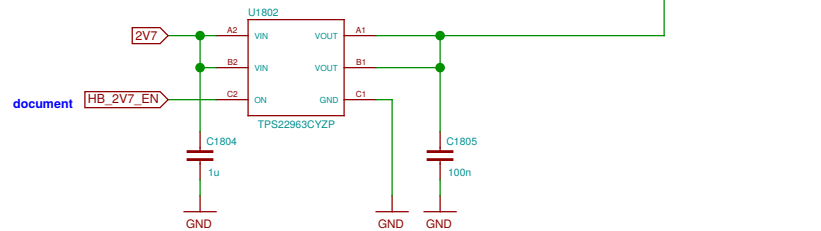
## Flash/Torch



## Level shifters for Hackerbus GPIO and UART



Q18xx alternative: DMN63D8LV by Diodes Inc.



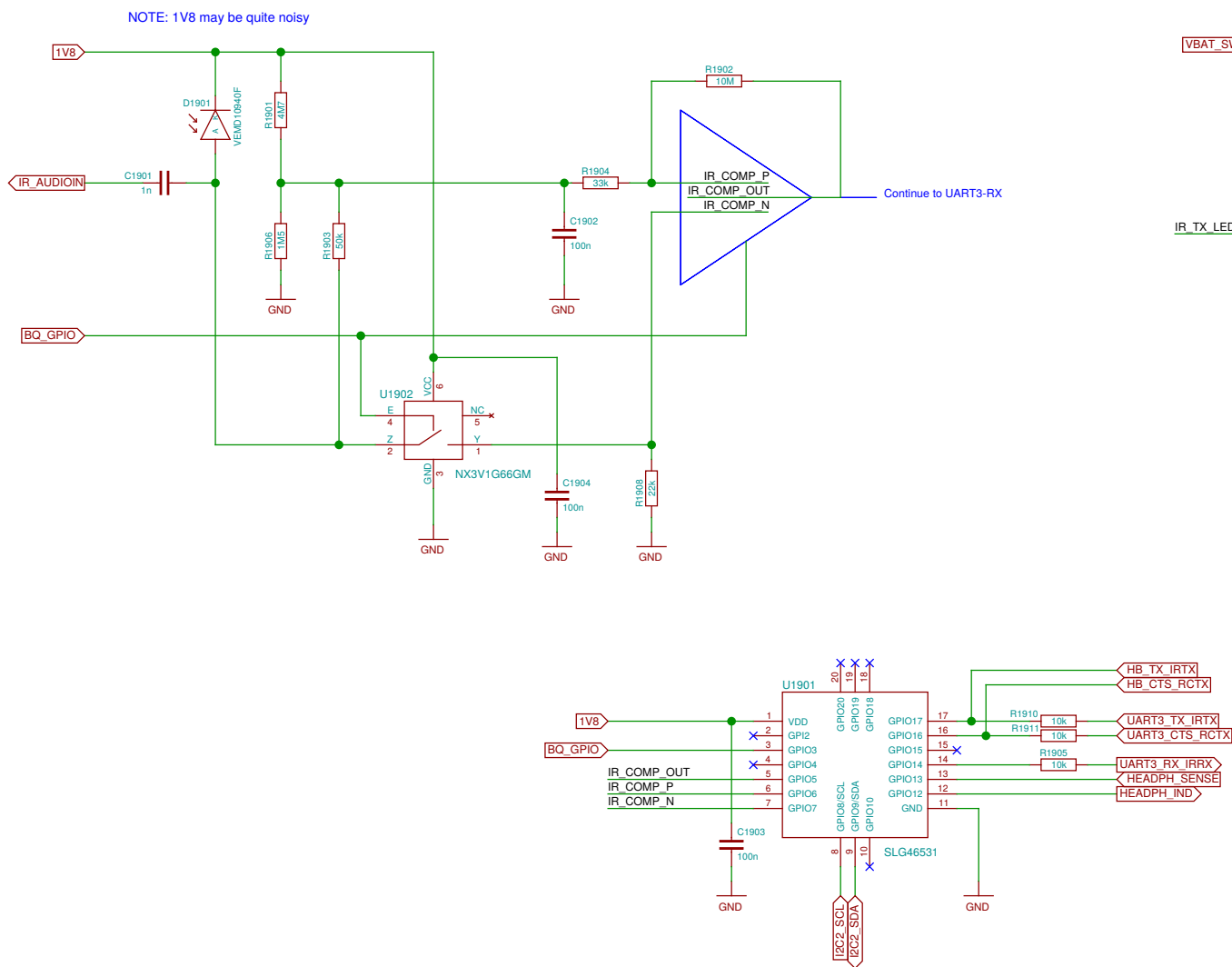
## Patchfield

The following signals (or some of them) - \*\*IF FEASIBLE\*\* - should be made available on testpoints next to the 100 Ohm array of R1801 to R1808 for easy yellow wire solder-patching of secondary HB pin functions.

- TP1801  $\rightarrow$  I2C3\_SDA
- TP1802  $\rightarrow$  I2C3\_SCL
- TP1803  $\rightarrow$  OTG\_ID
- TP1804  $\rightarrow$  HB\_LINE\_OUT\_L
- TP1805  $\rightarrow$  HB\_LINE\_OUT\_R
- TP1806  $\rightarrow$  HB\_LINE\_IN
- TP1807  $\rightarrow$  HB\_AUDIO\_GND
- TP1808  $\rightarrow$  HB\_JACK\_1L
- TP1809  $\rightarrow$  HB\_JACK\_2R
- TP1810  $\rightarrow$  HB\_JACK\_3M
- TP1811  $\rightarrow$  HB\_JACK\_4GND
- TP1812  $\rightarrow$  HB\_DMIC\_CLOCK
- TP1813  $\rightarrow$  HB\_DMIC\_DATA

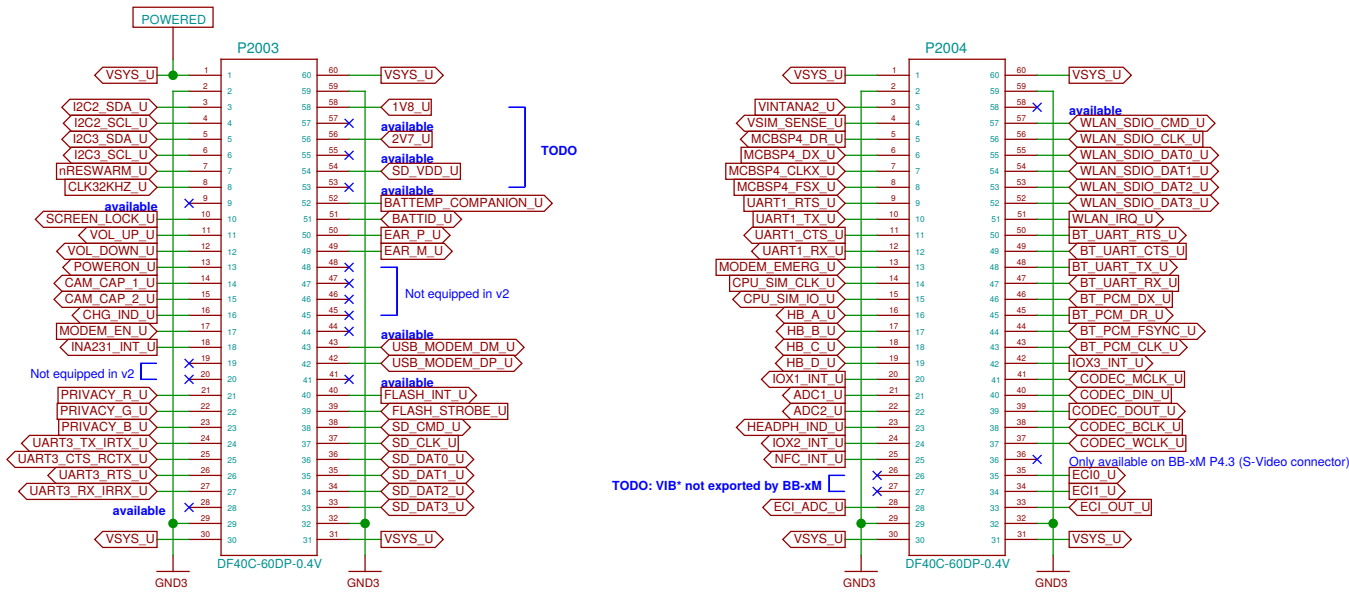
Sheet: /Hackerbus/ File: neo900_SS_18.sch	
Title: Hackerbus	
Size: A3	Date: 2016-10-31 08:32:45
Plotted by eeshow 01a1b57+ 20161103-02:14Z	Rev: Id: 18/37

# TODO: update D1901 footprint

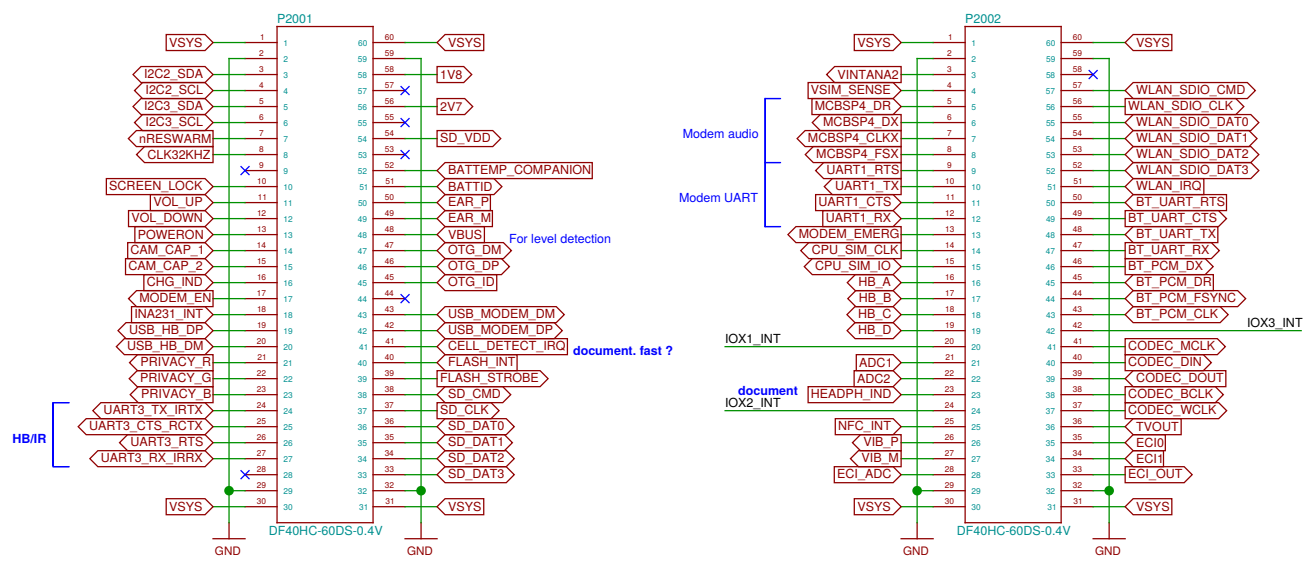


Sheet: /Infrared/		
File: neo900_SS_19.sch		
Title: Infrared		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 19/37

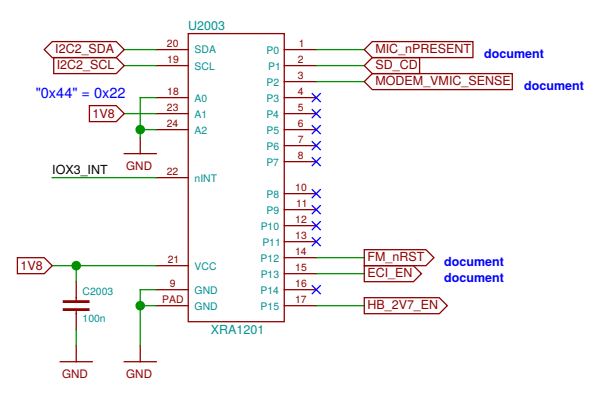
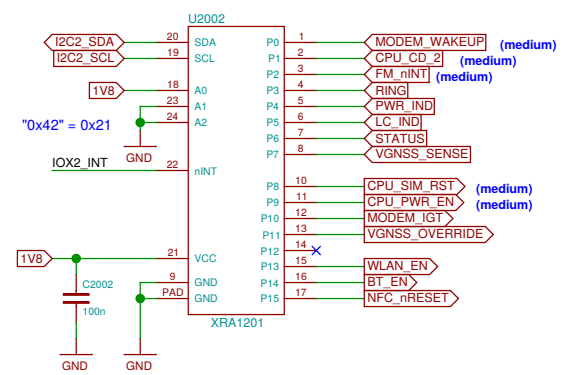
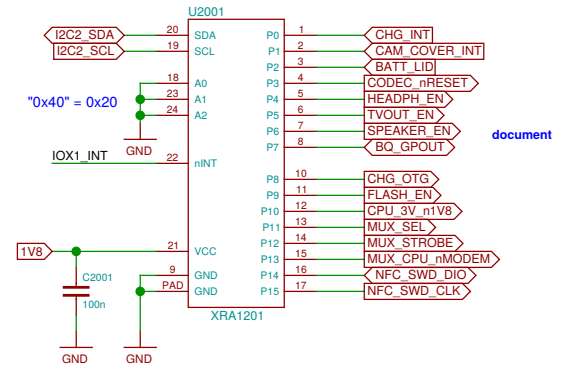
# This is just the collection of signals we have. Proper assignment still pending.



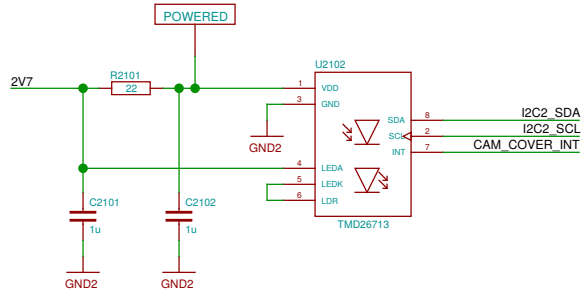
UPPER  
LOWER



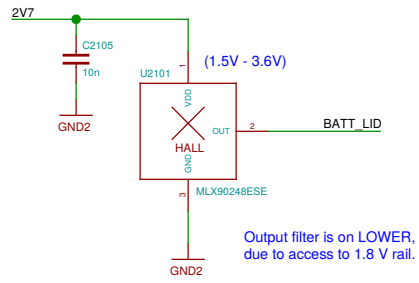
Current rating per contact: 0.3 A



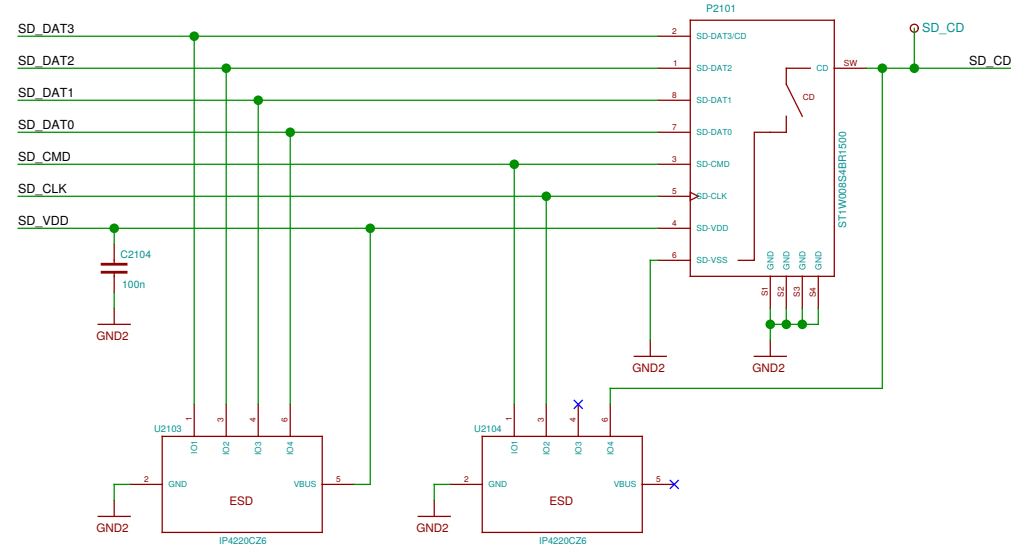
### Camera Cover detect



### Battery Cover detect

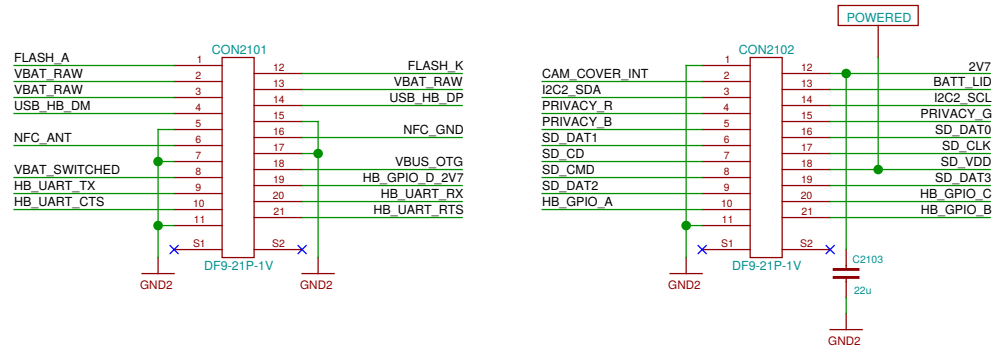


### Memory card holder

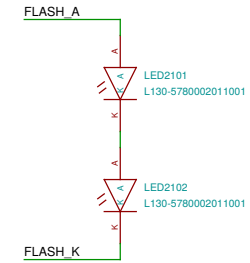


### LOWER-BOB Interconnect (BOB side)

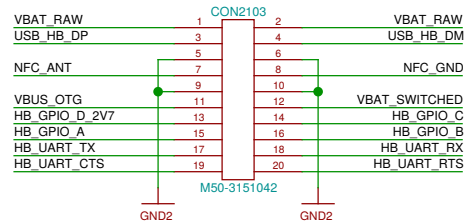
Defined in the Hackerbus specification, <http://neo900.org/stuff/papers/hb.pdf>



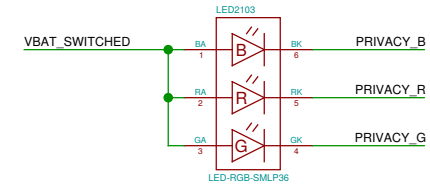
### Camera flash



### Hackerbus



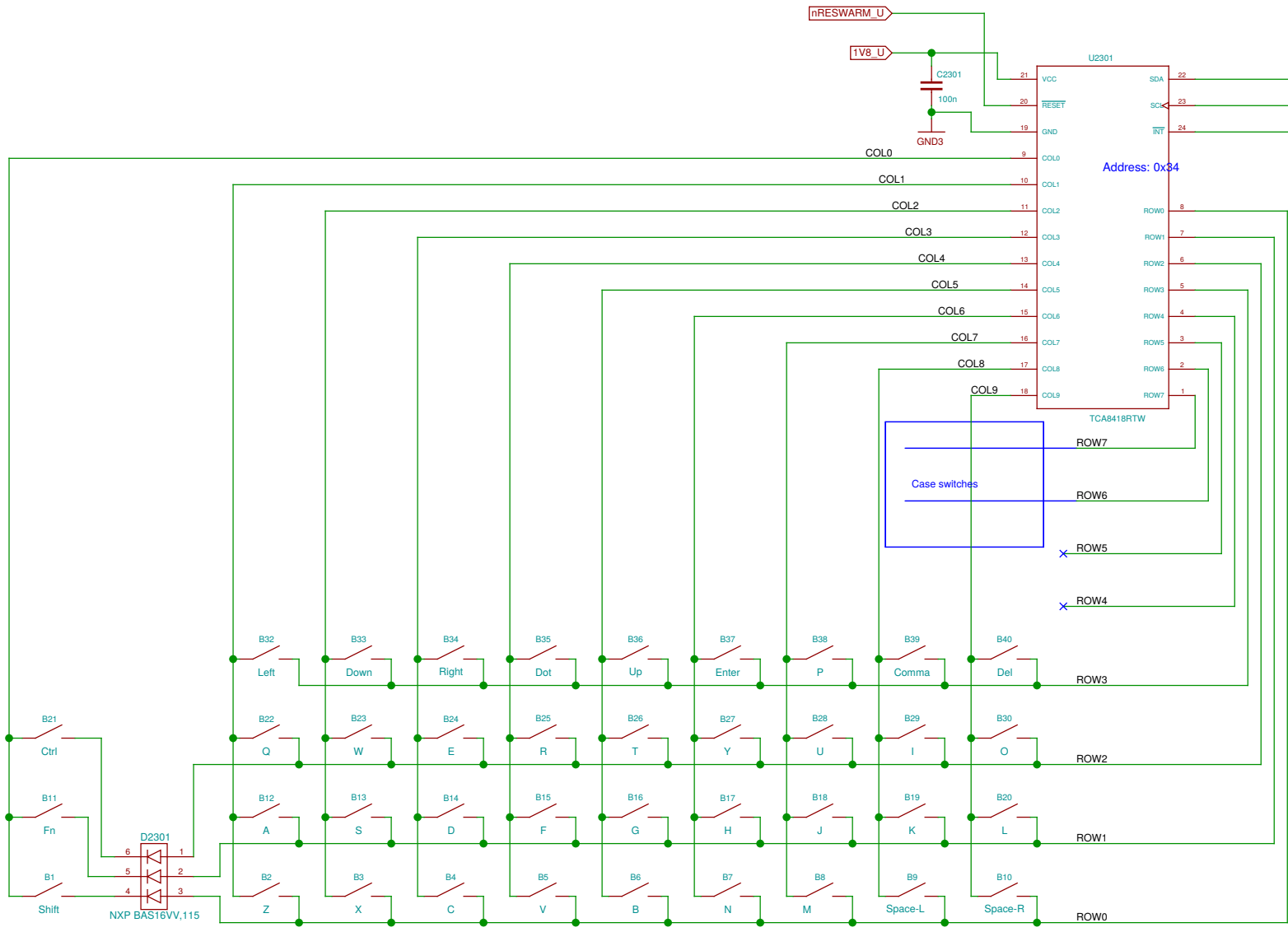
### Privacy LED



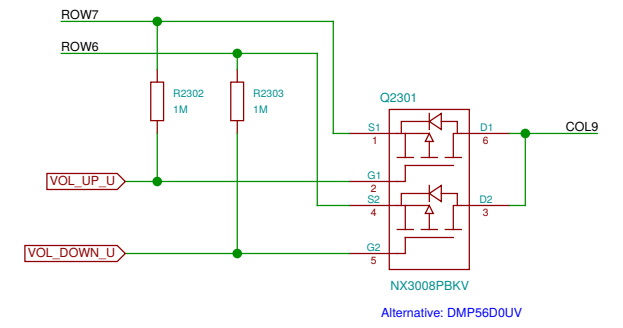
Sheet: /uSD Breakout Board/ File: neo900_SS_21.sch		
Title: uSD Breakout Board		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 21/37

**TODO: consider sheet for deletion**

Sheet: /empty/		
File: neo900_SS_22.sch		
Title: empty		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 22/37



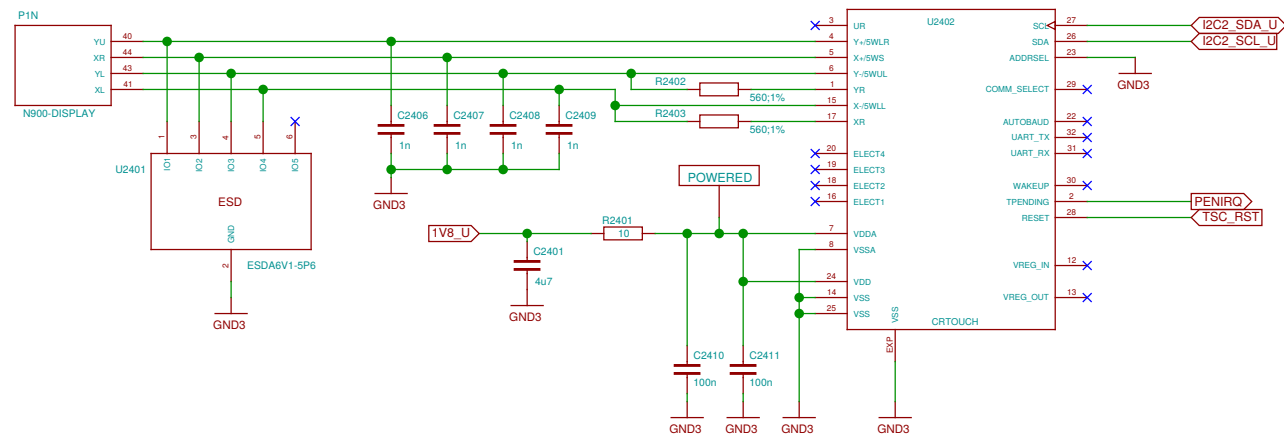
Alternative: Diodes Inc. BAS16VV-7  
 Warning: Diodes Inc. have cathodes on pin 1 side, NXP anodes !



Sheet: /Keypad/		
File: neo900_SS_23.sch		
Title: Keypad		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 23/37

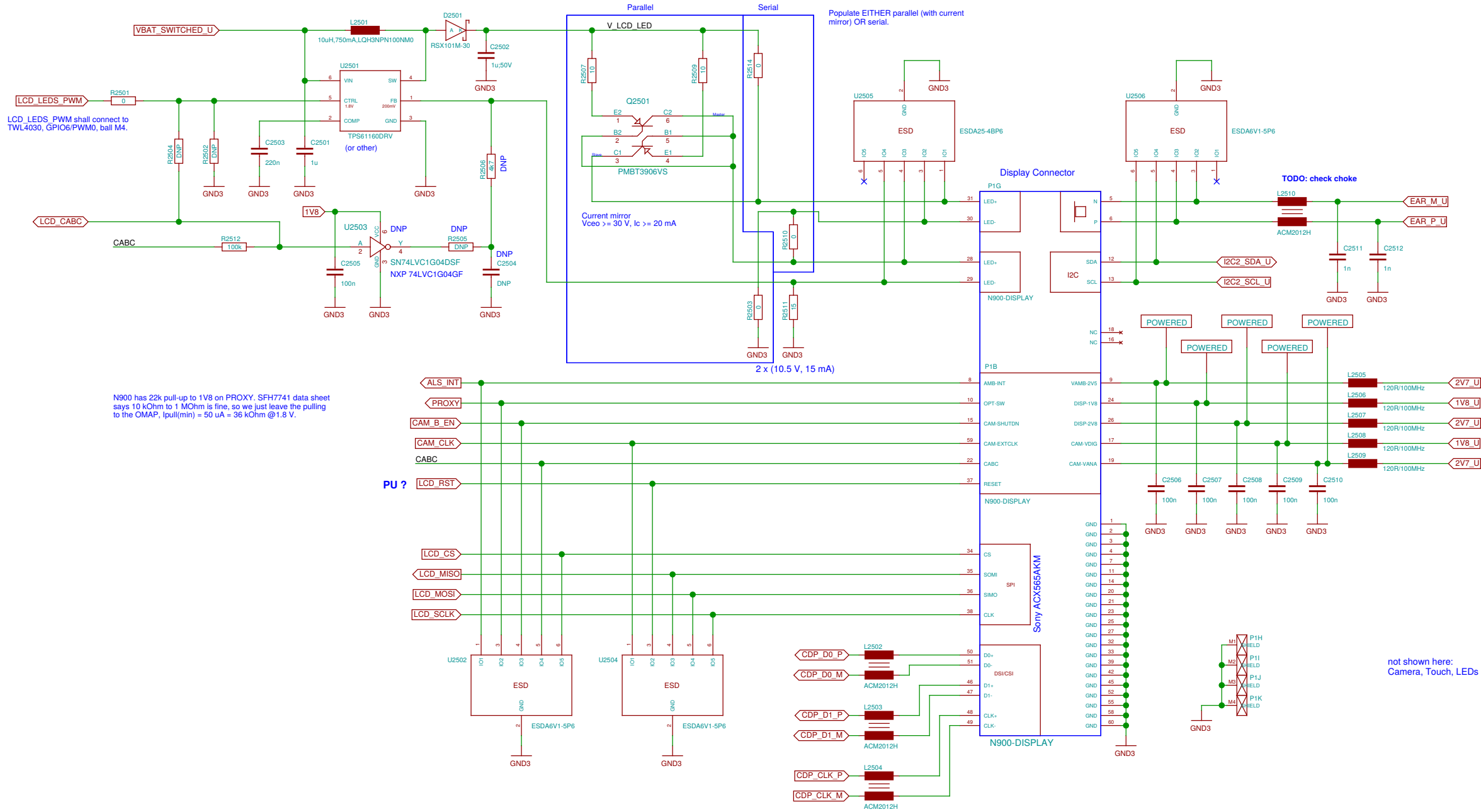
Resistive Touch (display connector)

Touch screen controller



Sheet: /Display-Peripherals/		
File: neo900_SS_24.sch		
Title: Display-Peripherals		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 24/37





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.

not shown here: Camera, Touch, LEDs

Sheet: /Display-Panel&Power/		
File: neo900_SS_25.sch		
Title: Display-Panel&Power		
Size: A3	Date: 2016-10-31 22:21:41	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: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 26/37

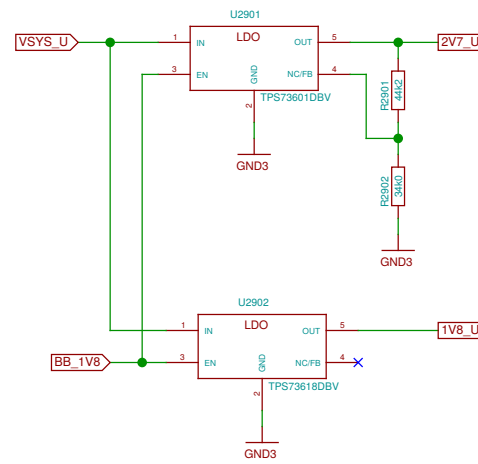
**eMMC is not part of v2**

Sheet: /eMMC/		
File: neo900_SS_27.sch		
Title: eMMC		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 27/37

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

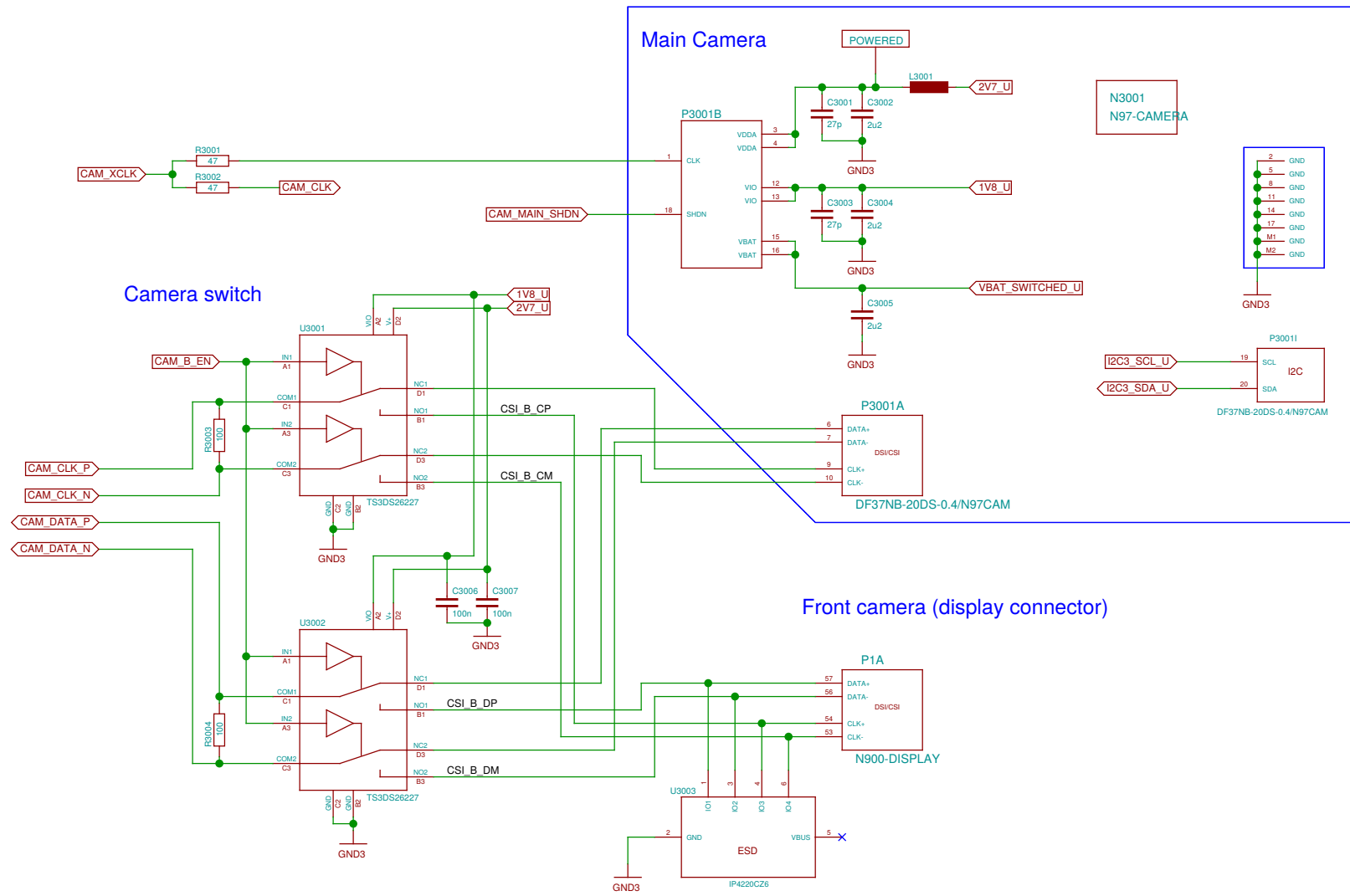
Sheet: /PMU+Codec/		
File: neo900_SS_28.sch		
Title: PMU+Codec		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 28/37

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

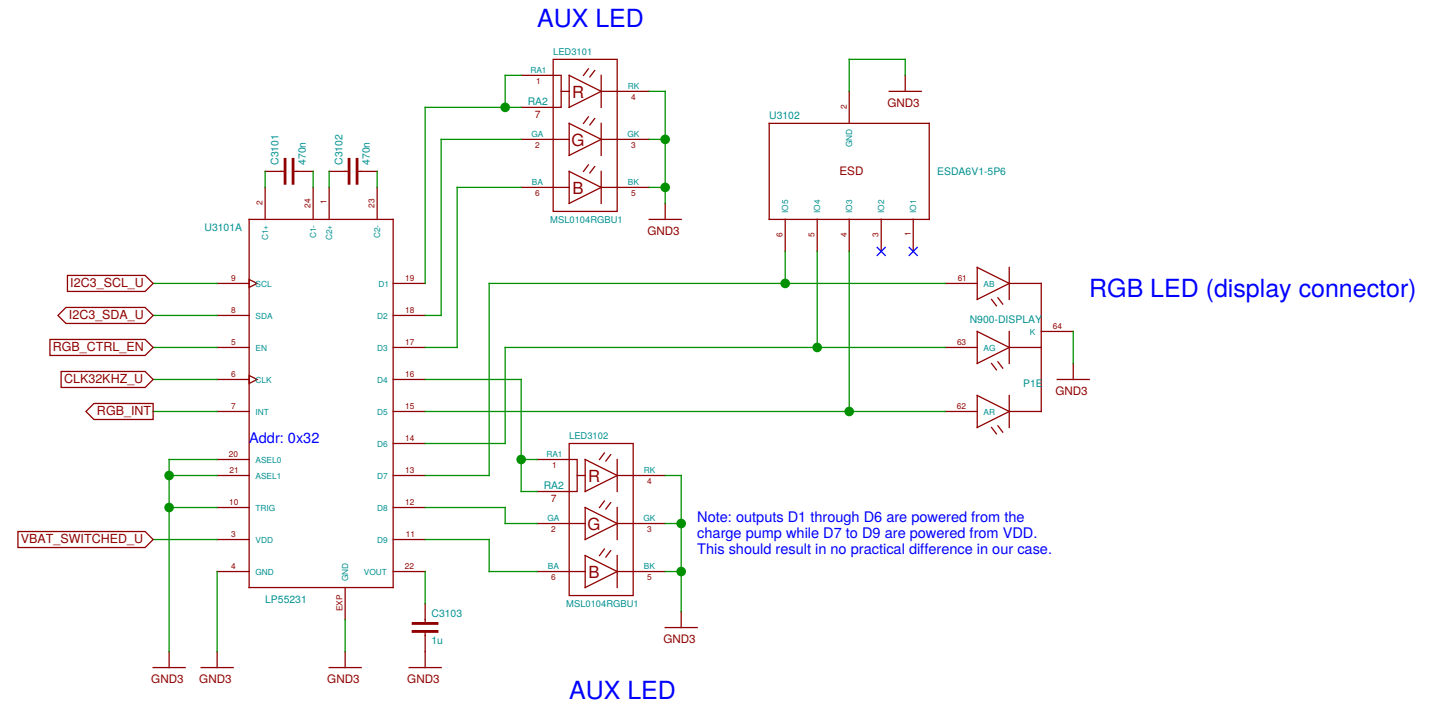


TODO: use REGEN ?

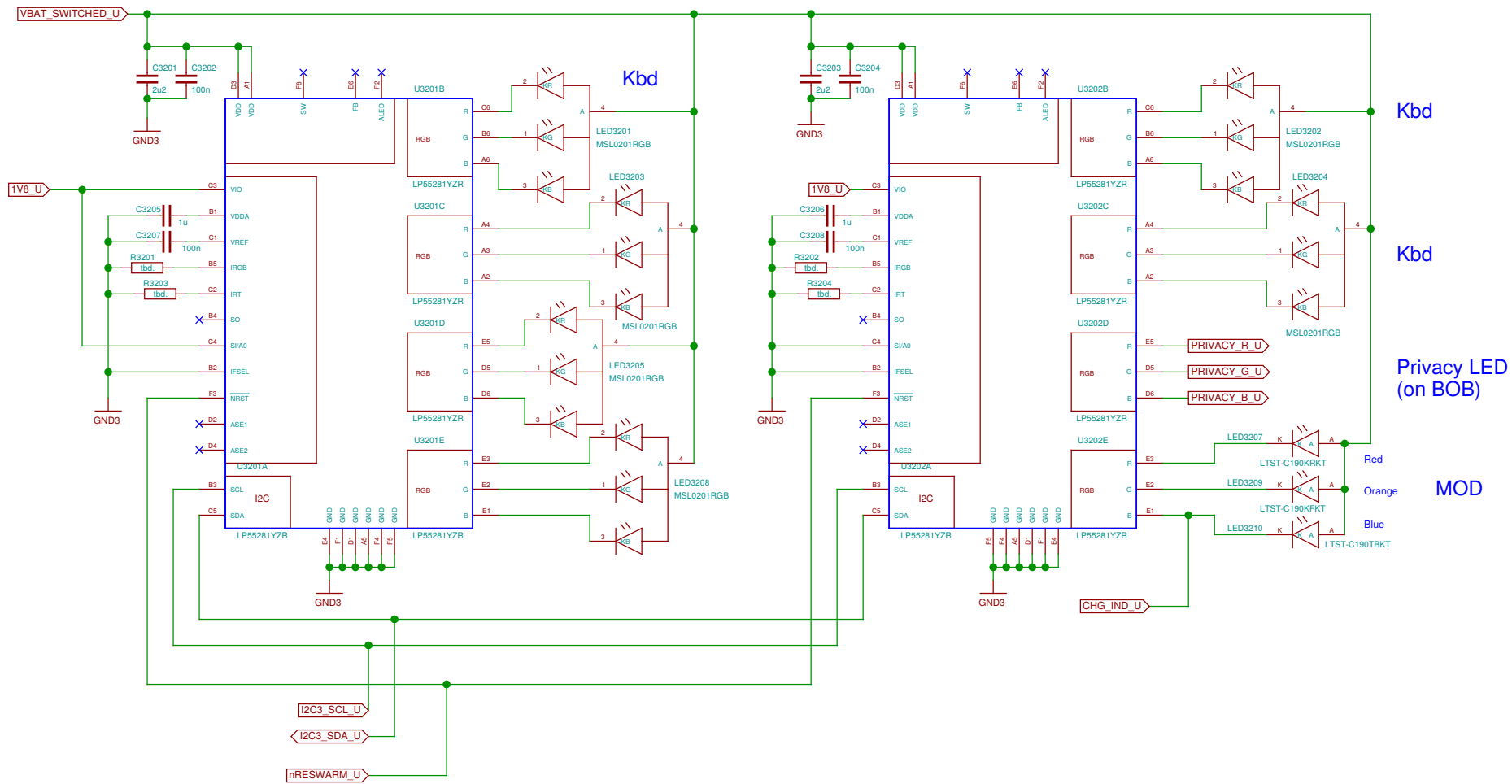
Sheet: /BB-XM Dummy (TWL4030/		
File: neo900_SS_29.sch		
Title: BB-XM Dummy (TWL4030)		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 29/37



Sheet: ./Camera/		
File: neo900_SS_30.sch		
Title: Camera		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 30/37



Sheet: /Fancy LEDs/		
File: neo900_SS_31.sch		
Title: Fancy LEDs		
Size: A3	Date: 2016-10-31 19:05:55	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 31/37

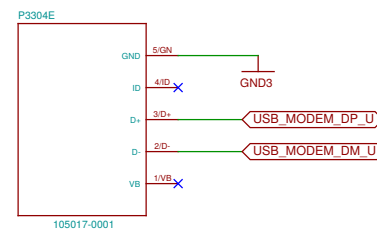




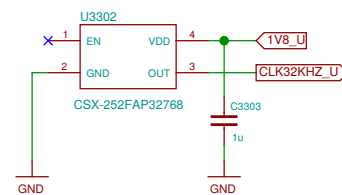
**Cleaning up. The connections to BB-xM are on the next sheets.**

connect to BB  
by some Micro-USB cable

### Modem USB



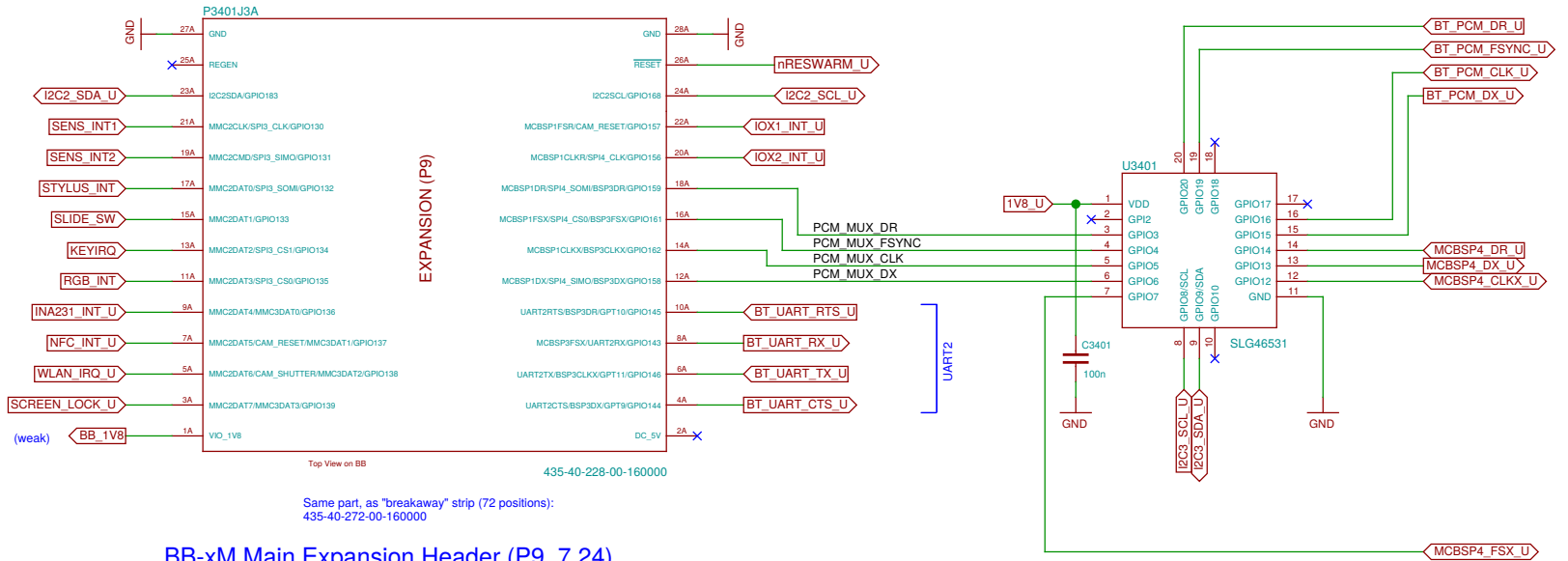
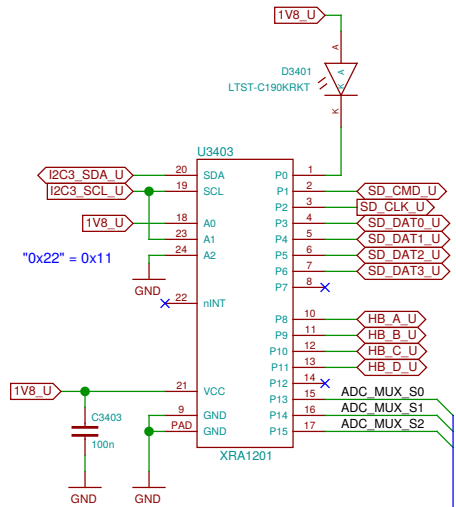
### 32 kHz clock



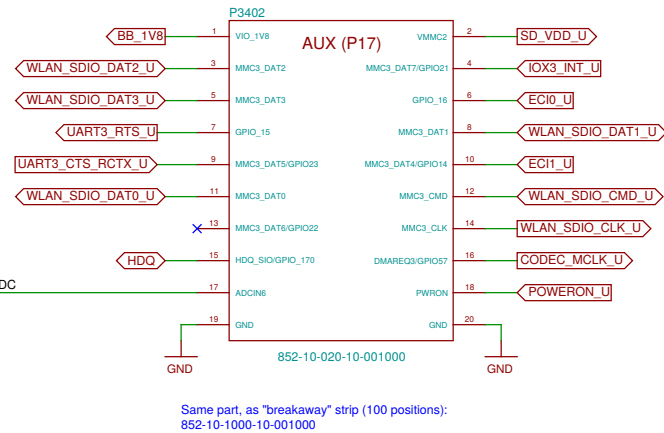
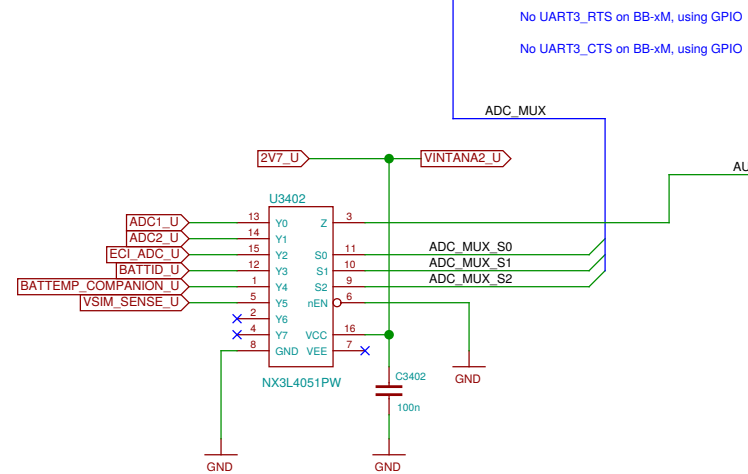
Alternative: OYKTGLJANF-0.032768

Sheet: ./Connector to BB-XM/ File: neo900_SS_33.sch		
Title: Connector to BB-XM		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 33/37

# TODO: update pin names in footprint



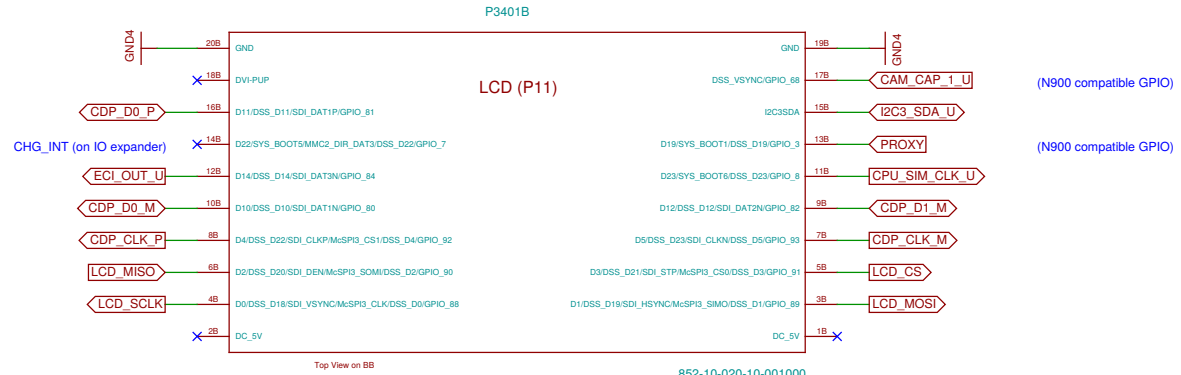
BB-xM Main Expansion Header (P9, 7.24)



FM\_nINT (on IO expander)

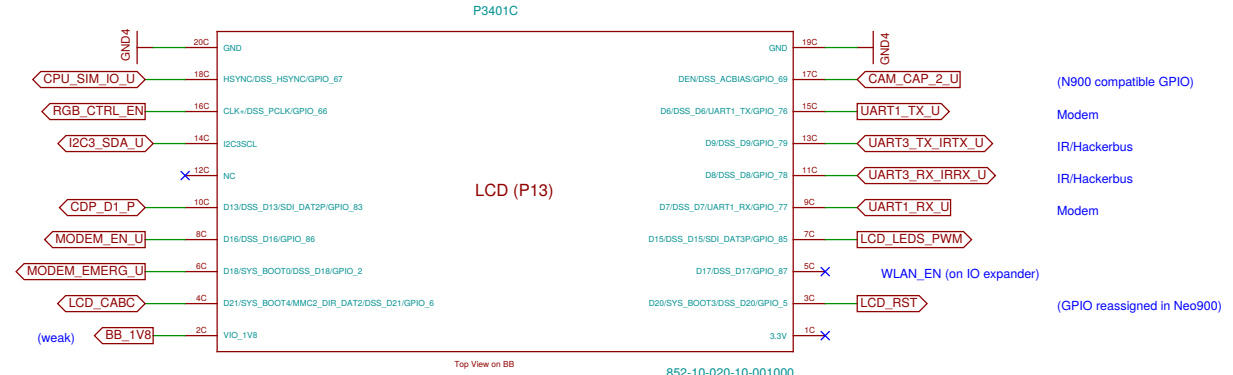
Sheet: /BB-XM Adapter (CPU)		
File: neo900_SS_34.sch		
Title: BB-XM Adapter (CPU)		
Size: A3	Date: 2016-10-31 06:53:09	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 34/37

### P11 (7.25)



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

### P13 (7.25)

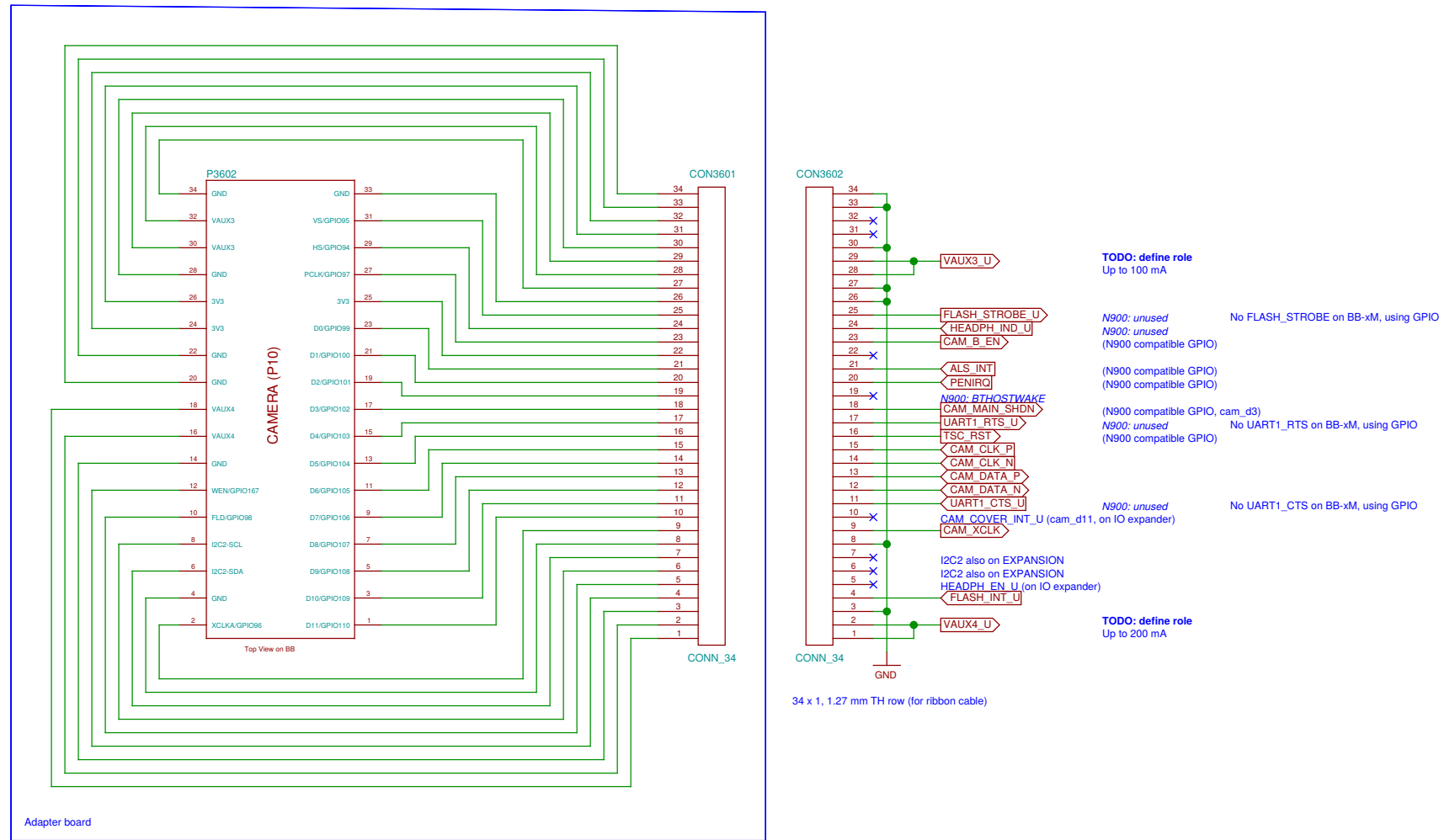


Same part, as "breakaway" strip (100 positions):  
852-10-1000-10-001000

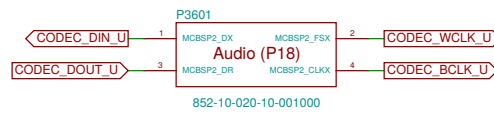
**TODO: update pin names in footprint**

Sheet: /BB-XM Adapter (DISP)/		
File: neo900_SS_35.sch		
Title: BB-XM Adapter (DISP)		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		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.

Sheet: /BB-XM Adapter (CAM)/		
File: neo900_SS_36.sch		
Title: BB-XM Adapter (CAM)		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 36/37

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
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N3706 headset jack
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N3707 STENCIL-TOP
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N3708 STENCIL-BOTTOM
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