

Click | Here



This sheet: index

Sheet: OTG



File: neo900_SS_2.sch

OTG & Switches

Sheet: Charger/OTG-Booster



File: neo900_SS_3.sch

Charger/OTG-Booster

Sheet: Modem Power



File: neo900_SS_4.sch

Modem Power

Sheet: Fuel Gauge



File: neo900_SS_5.sch

Fuel Gauge

Sheet: 3G/4G Modem + SIM



File: neo900_SS_6.sch

3G/4G Modem + SIM

Sheet: Dual SIM switch



File: neo900_SS_7.sch

Dual SIM switch

Sheet: Antenna connections



File: neo900_SS_8.sch

Antenna connections

Sheet: WLAN, Bluetooth, FM



File: neo900_SS_9.sch

WLAN, Bluetooth, FM

Sheet: Sensors



File: neo900_SS_10.sch

Sensors

Sheet: Audio Codec



File: neo900_SS_11.sch

Audio Codec

Sheet: Audio Headset + Mic



File: neo900_SS_12.sch

Audio Headset + Mic

Sheet: ECI



File: neo900_SS_13.sch

ECI

Sheet: Audio Handsfree



File: neo900_SS_14.sch

Audio Handsfree

Sheet: Misc



File: neo900_SS_15.sch

Misc

Sheet: RFID/NFC Reader



File: neo900_SS_16.sch

RFID/NFC Reader

Sheet: RFID/NFC Controller



File: neo900_SS_17.sch

RFID/NFC Controller

Sheet: Hackerbus



File: neo900_SS_18.sch

Hackerbus

Sheet: Infrared



File: neo900_SS_19.sch

Infrared

Sheet: B2B LOWER-UPPER



File: neo900_SS_20.sch

B2B LOWER-UPPER

Sheet: uSD Breakout Board



File: neo900_SS_21.sch

uSD Breakout Board

Sheet: empty



File: neo900_SS_22.sch

empty

Sheet: Keypad



File: neo900_SS_23.sch

Keypad

Sheet: Display-Peripherals



File: neo900_SS_24.sch

Display-Peripherals

Sheet: Display-Panel&Power



File: neo900_SS_25.sch

Display-Panel&Power

Click | Here



Sheet: CPU + PoP RAM/NAND



File: neo900_SS_26.sch

CPU + PoP RAM/NAND

Sheet: eMMC



File: neo900_SS_27.sch

eMMC

Sheet: PMU+Codec



File: neo900_SS_28.sch

PMU+Codec

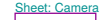
Sheet: BB-XM Dummy (TWL4030)



File: neo900_SS_29.sch

BB-XM Dummy (TWL4030)

Sheet: Camera



File: neo900_SS_30.sch

Camera

Sheet: Fancy LEDs



File: neo900_SS_31.sch

Fancy LEDs

Sheet: Basic LEDs



File: neo900_SS_32.sch

Basic LEDs

Sheet: Connector to BB-XM



File: neo900_SS_33.sch

Connector to BB-XM

Sheet: BB-XM Adapter (CPU)



File: neo900_SS_34.sch

BB-XM Adapter (CPU)

Sheet: BB-XM Adapter (DISP)



File: neo900_SS_35.sch

BB-XM Adapter (DISP)

Sheet: BB-XM Adapter (CAM)



File: neo900_SS_36.sch

BB-XM Adapter (CAM)

Sheet: No-Solder Components



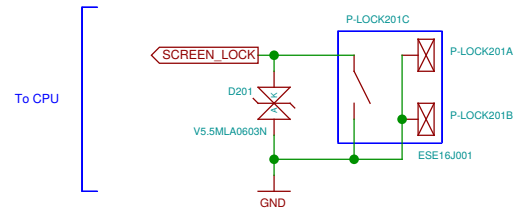
File: neo900_SS_37.sch

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>

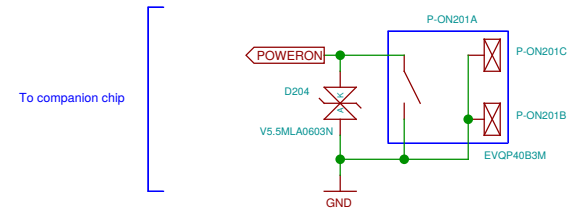
Sheet: /	
File: neo900.sch	
Title: Neo900	
Size: A3	Date: 2016-10-31 08:32:45
Plotted by eeshow 01a1b57+ 20161103-02:14Z	Rev: Id: 1/37

Lock switch



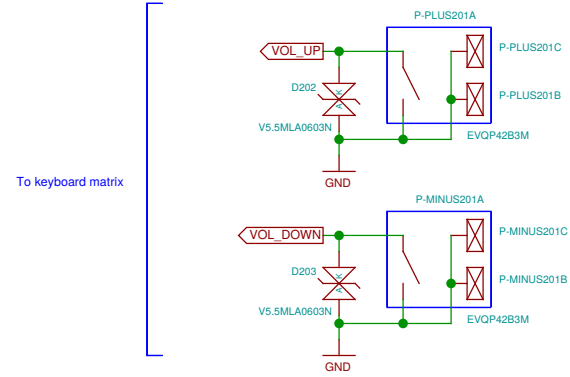
To CPU

On-off



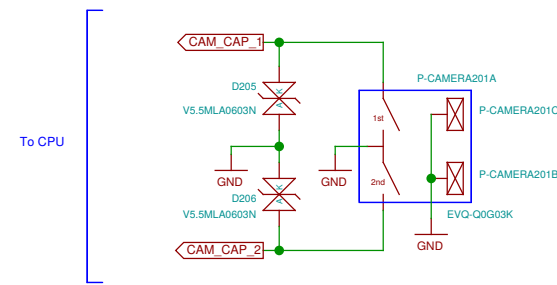
To companion chip

Volume



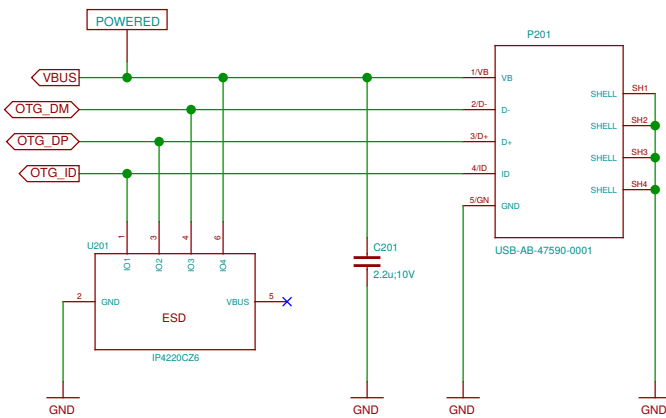
To keyboard matrix

Camera trigger



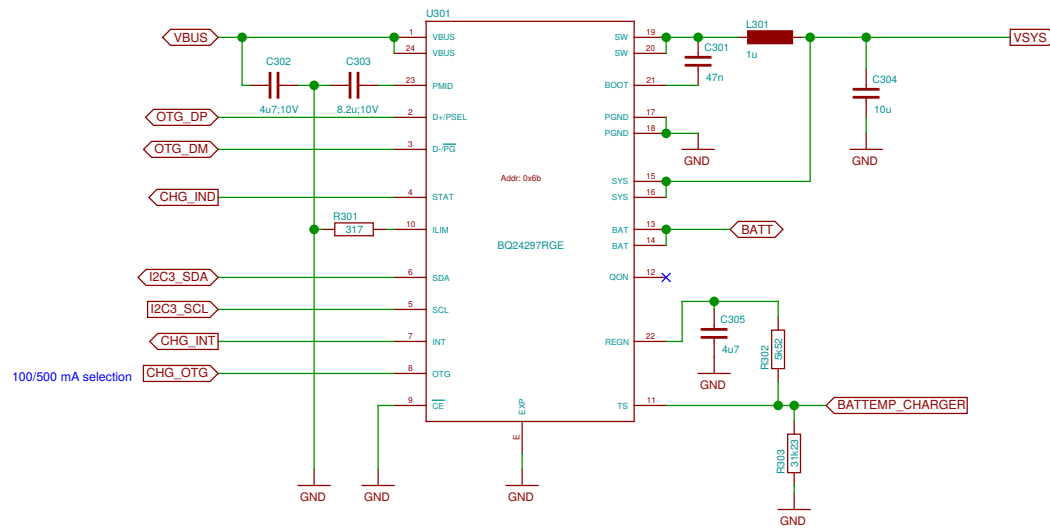
To CPU

USB OTG connector



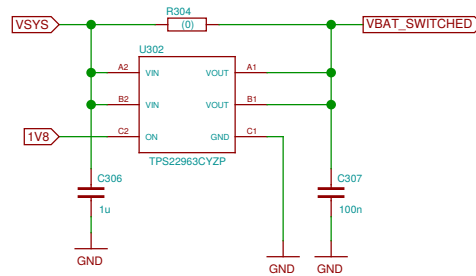
Sheet: ./OTG/		
File: neo900_SS_2.sch		
Title: OTG		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 2/37

Battery charger with USB OTG

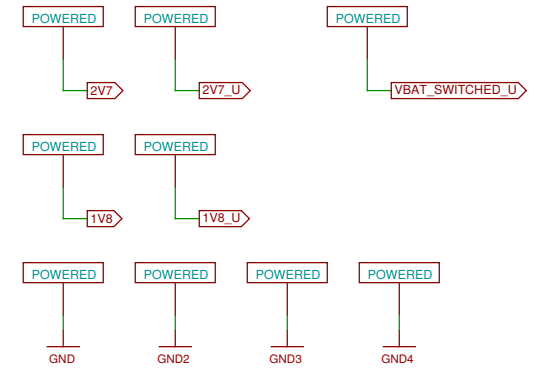


Power distribution and sequencing

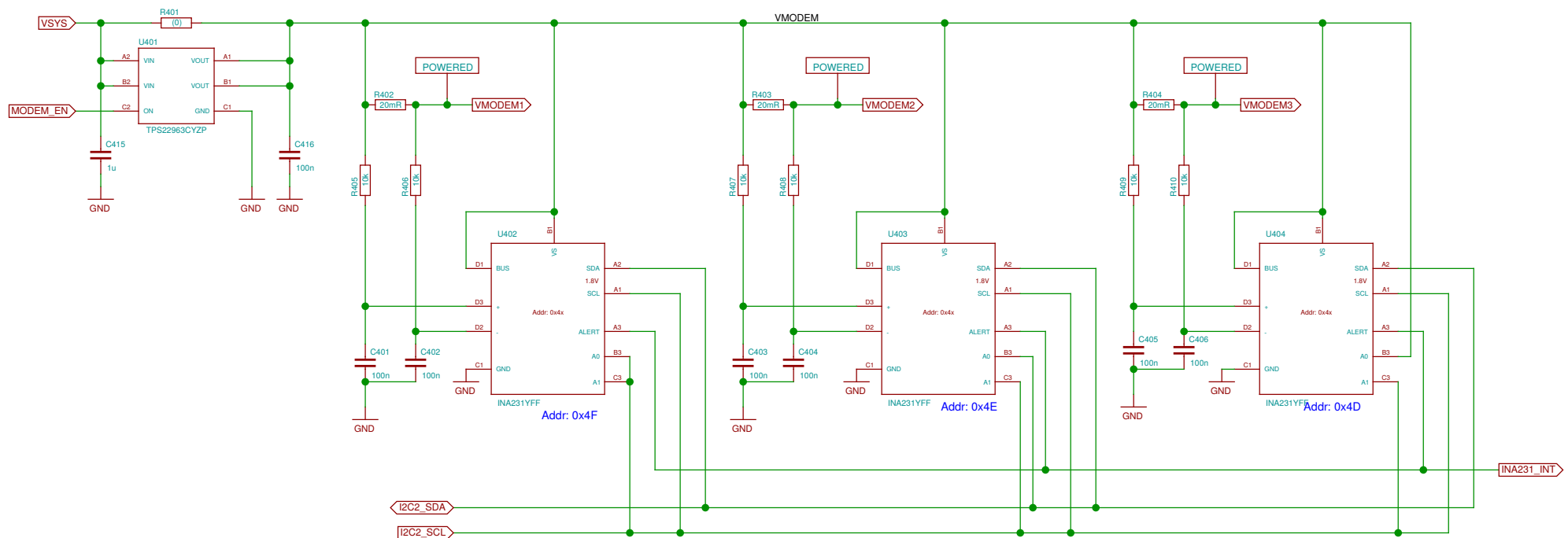
Most high-current consumers are on VBAT_SWITCHED.
1V8 signals that the regulators on UPPER are operational.



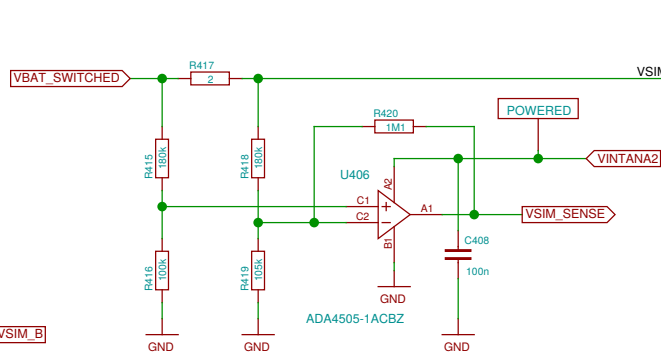
KiCad bureaucracy



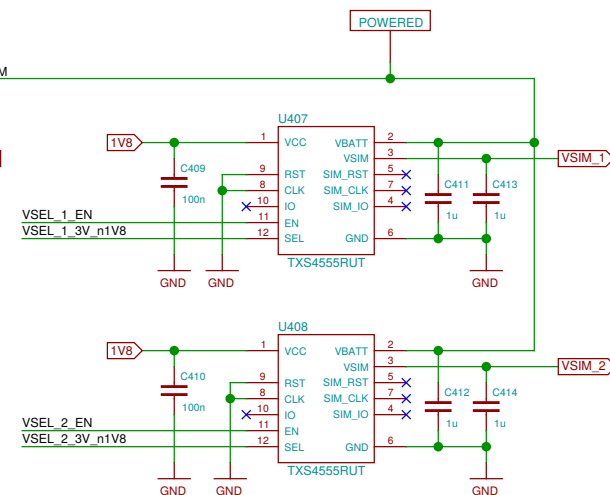
Modem current monitor



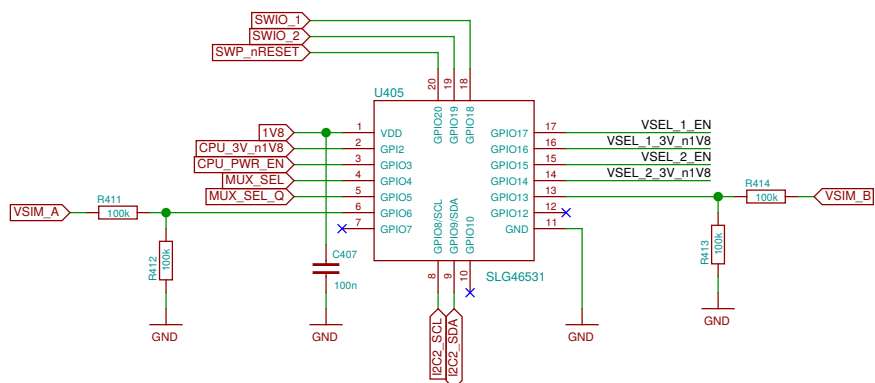
SIM current sensing



SIM power supply



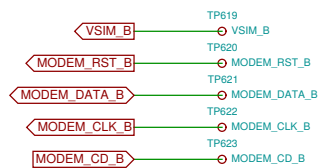
SIM power selection



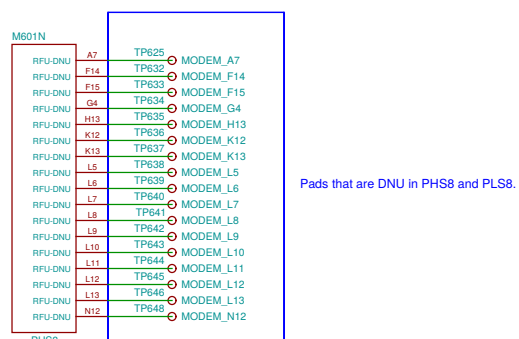
TODO: update SLG design for changed pins

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

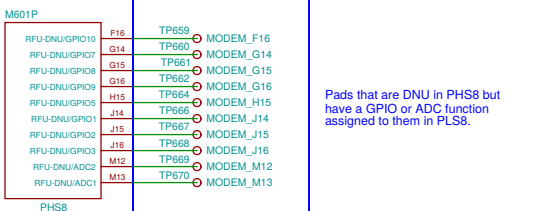
SIM B bus



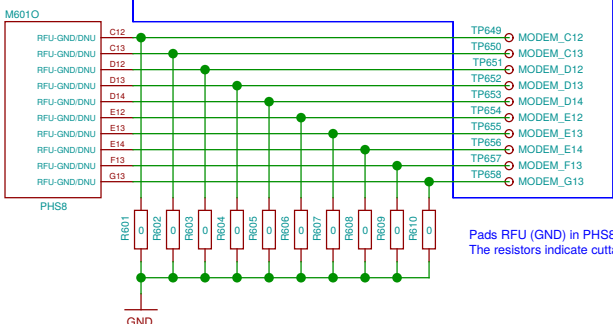
17+10+10 = 37 test points. PCB space permitting, to be in arranged a 6 x 6 + 1 grid with 1.0 mm pitch. This patchfield is to be placed adjacent to the SIM B bus test points.



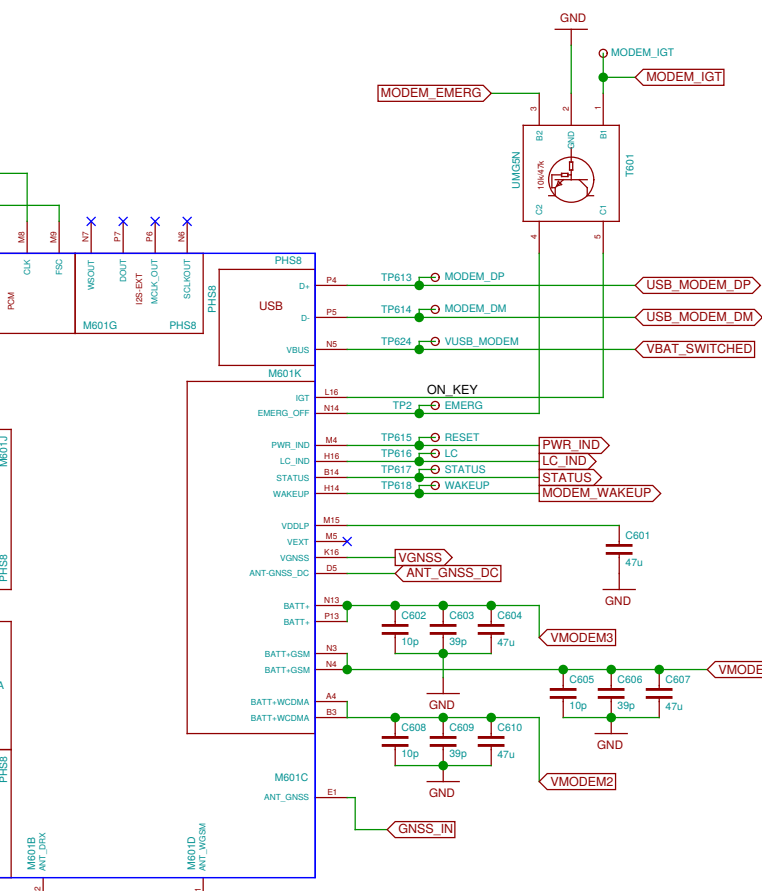
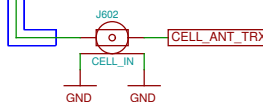
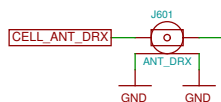
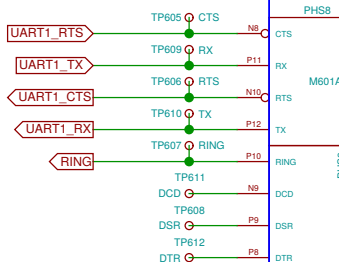
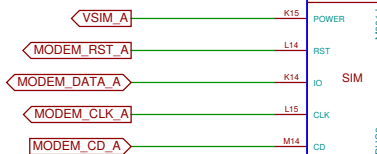
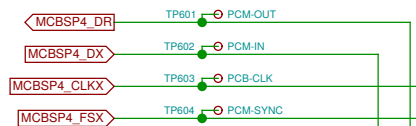
Pads that are DNU in PHS8 and PLS8.



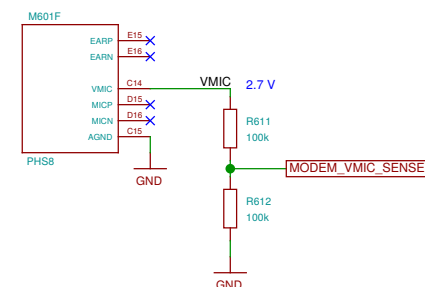
Pads that are DNU in PHS8 but have a GPIO or ADC function assigned to them in PLS8.

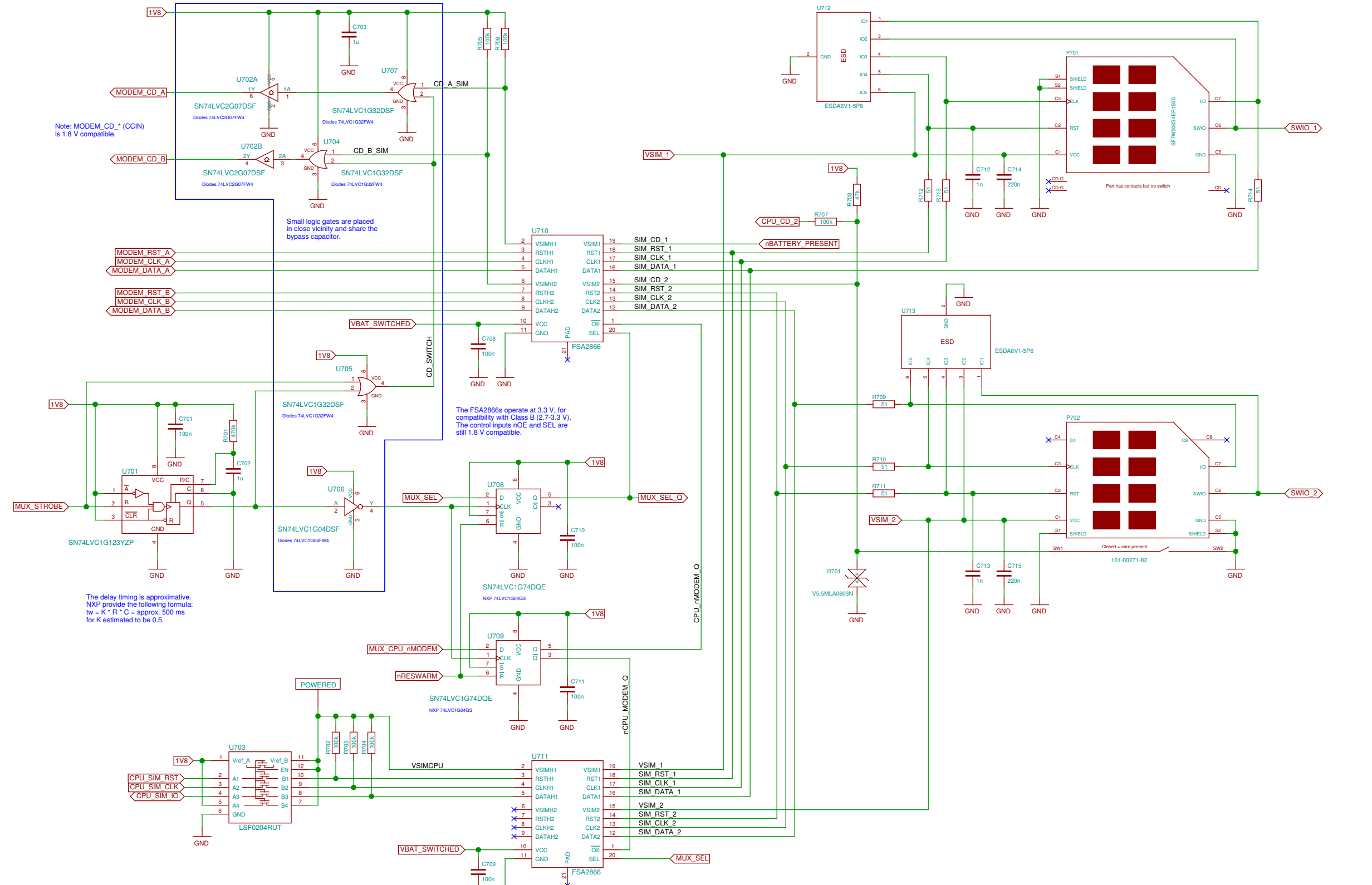


Pads RFU (GND) in PHS8 and RFU (DNU) in PLS8. The resistors indicate cuttable traces.



Anti-eavesdropping





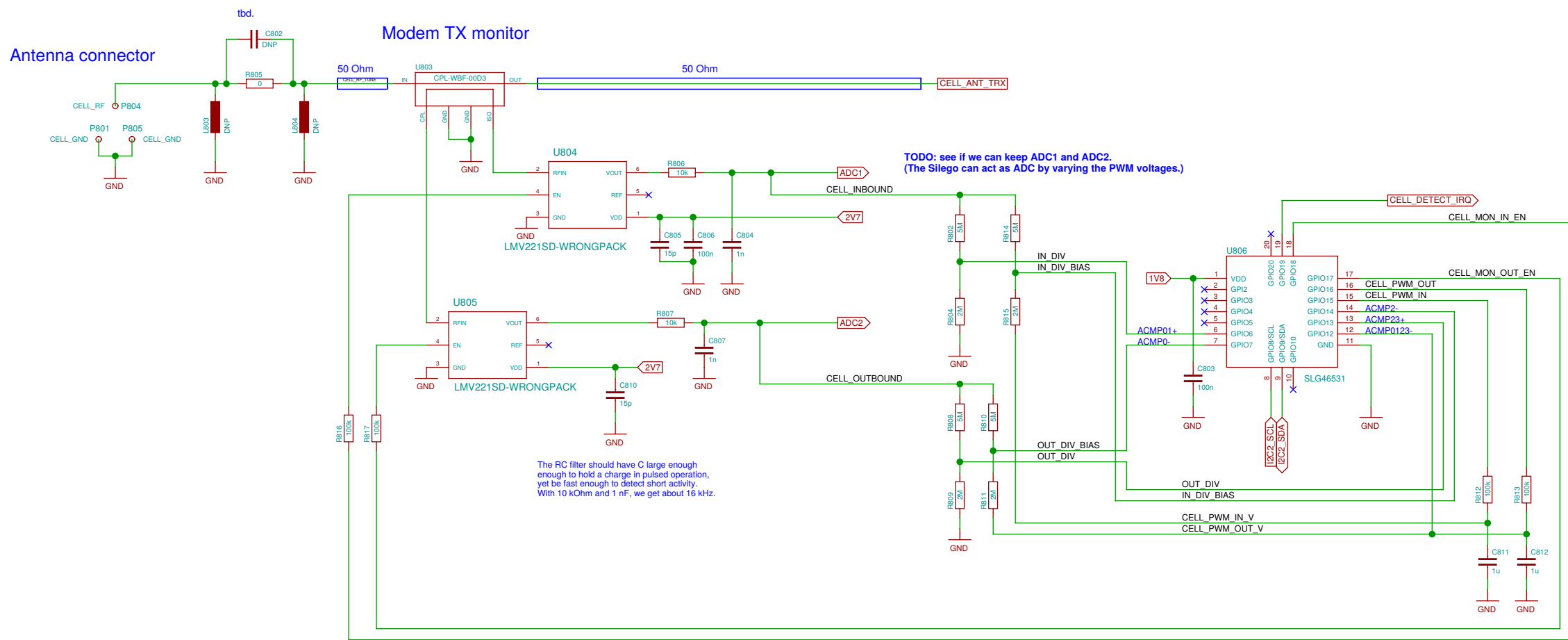
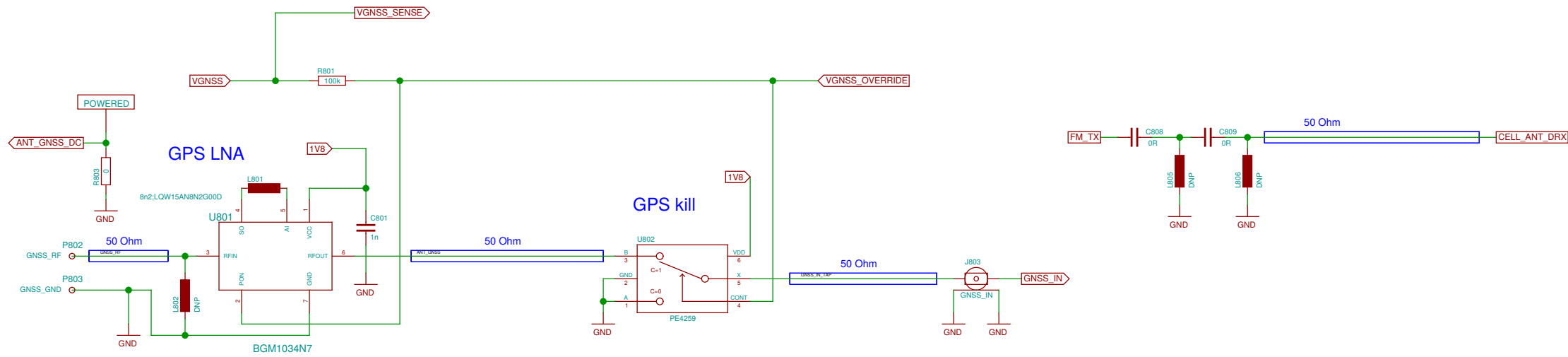
Note: MODEM_CD_* (CCIN) is 1.8 V compatible.

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: $t_w = K * R * C$ = approx. 500 ms for K estimated to be 0.5.

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

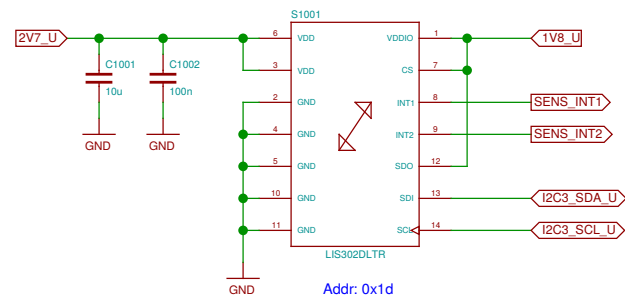


TODO: see if we can keep ADC1 and ADC2.
(The Silego can act as ADC by varying the PWM voltages.)

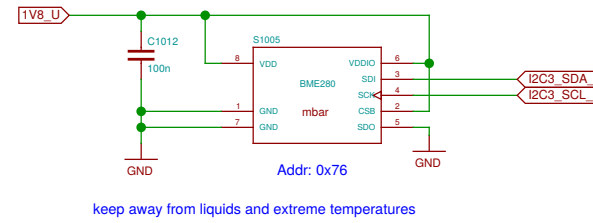
The RC filter should have C large enough enough to hold a charge in pulsed operation, yet be fast enough to detect short activity. With 10 kOhm and 1 nF, we get about 16 kHz.

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

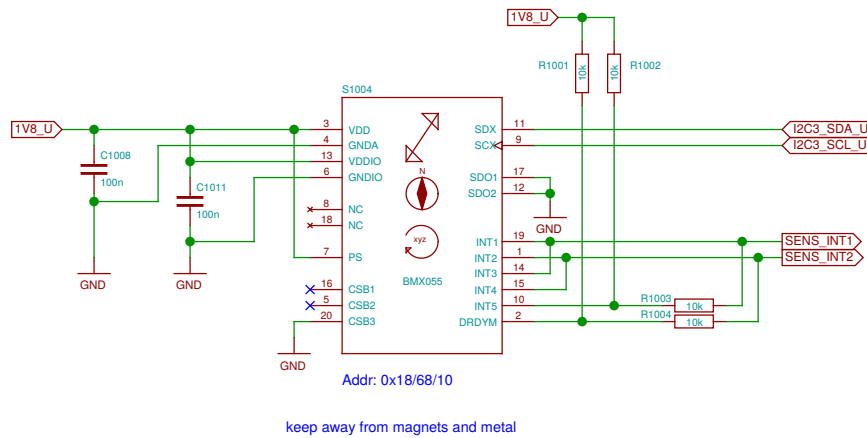
Acceleration (legacy)



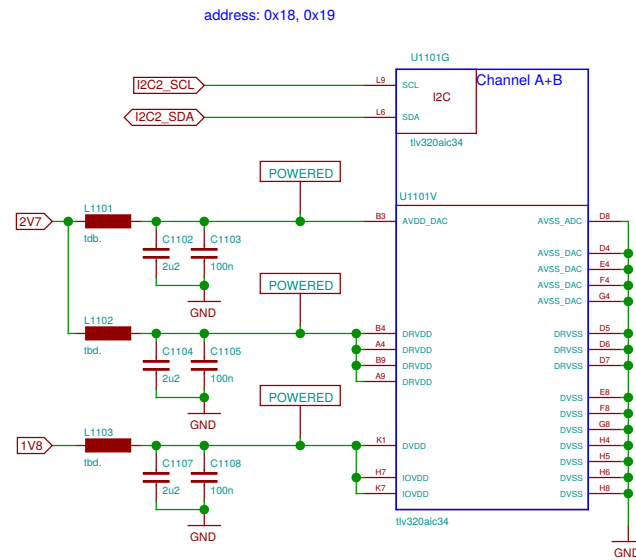
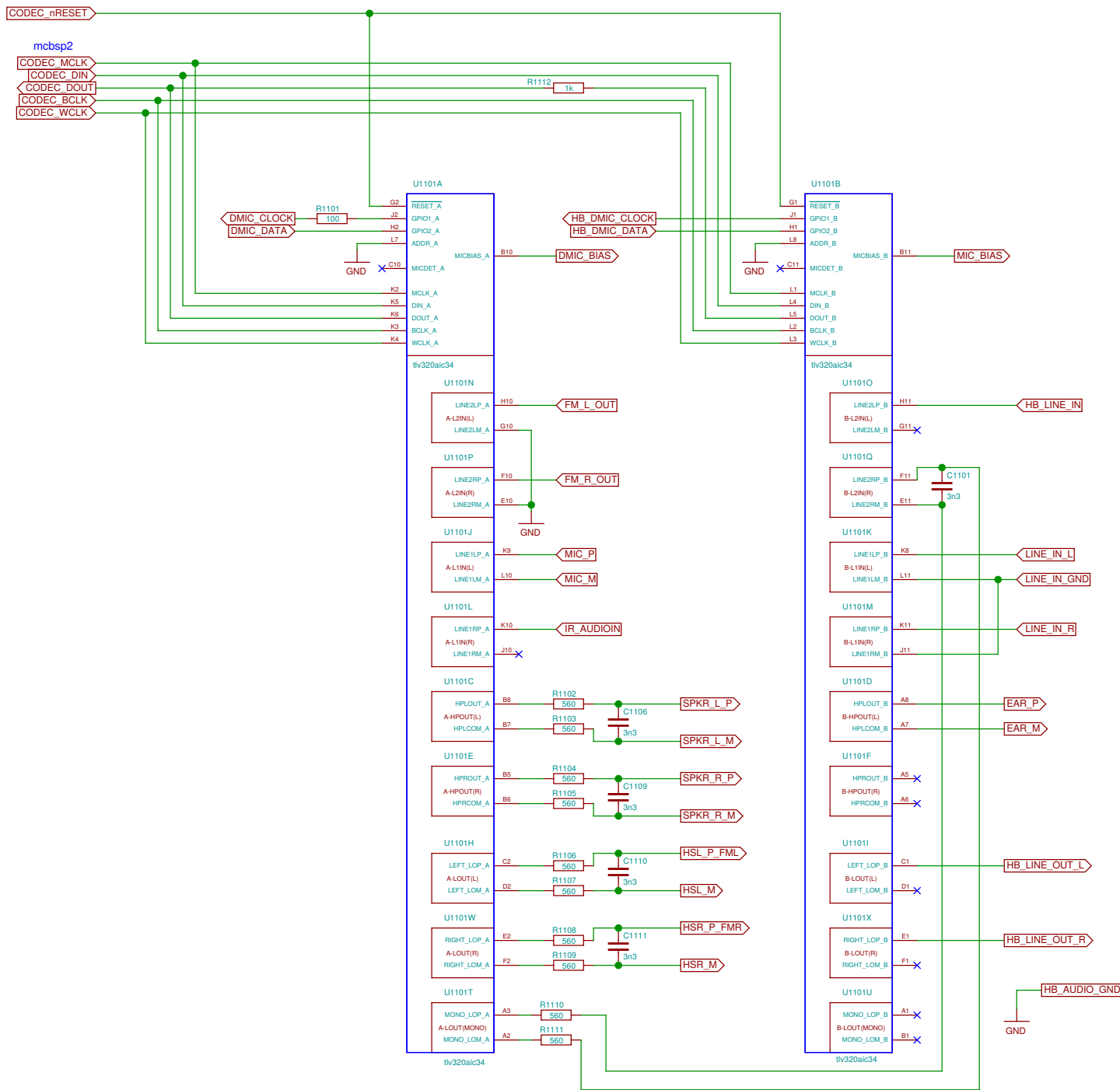
Pressure, humidity



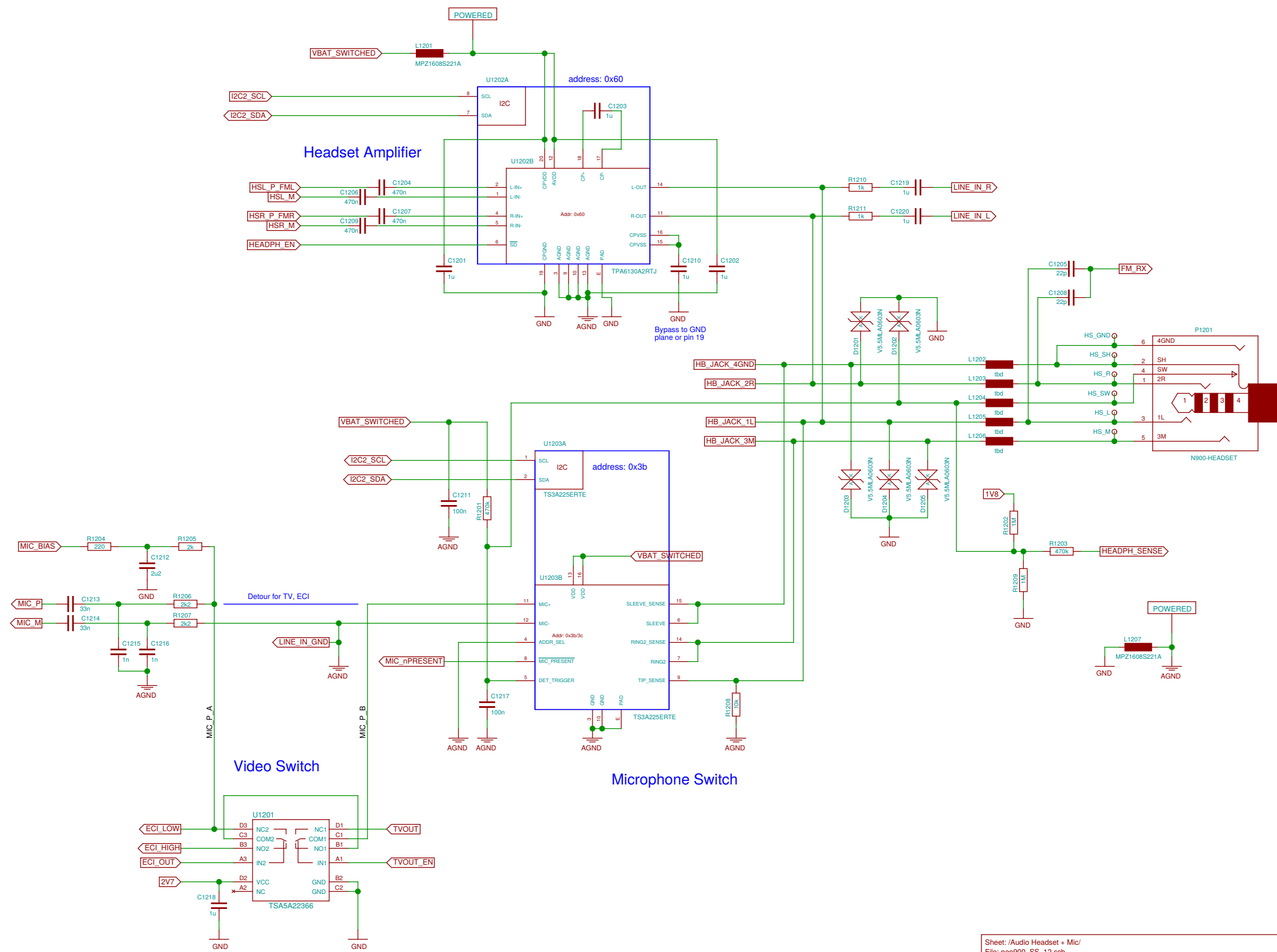
9-axis (acceleration, gyroscope, magnetometer)



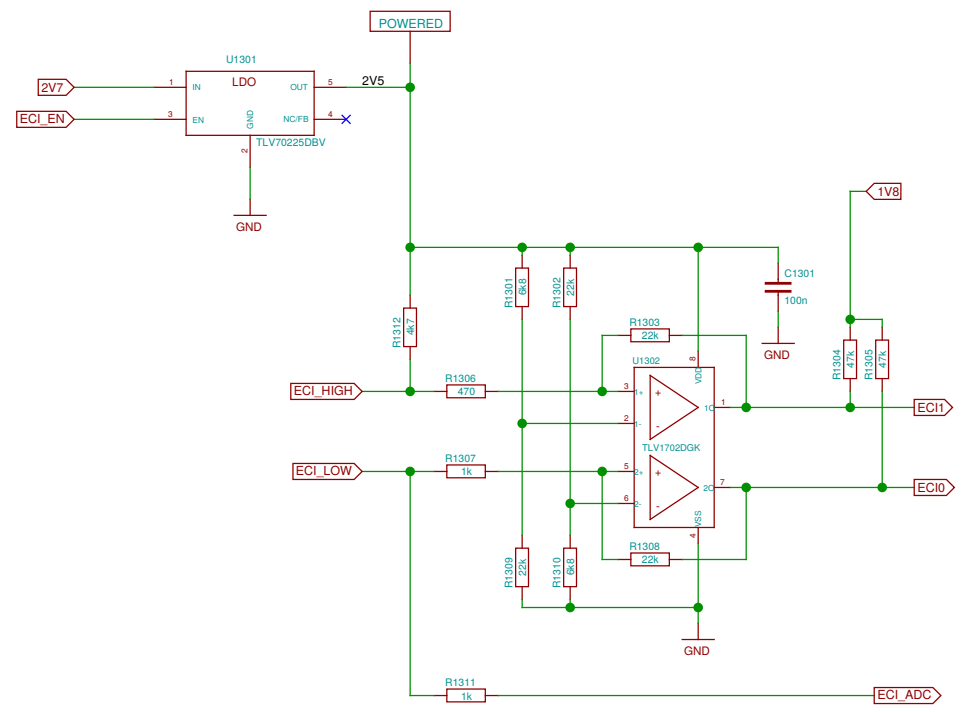
Sheet: ./Sensors/		
File: neo900_SS_10.sch		
Title: Sensors		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 10/37



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

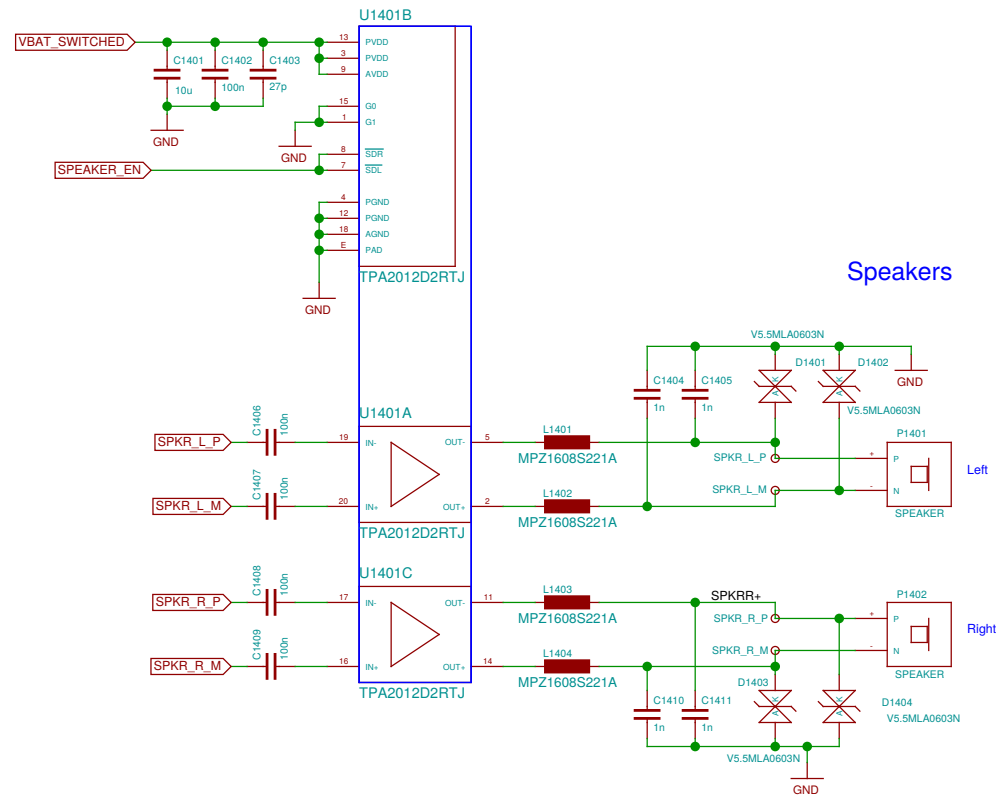


Sheet: /Audio Headset + Mic/		
File: neo900_SS_12.sch		
Title: Audio Headset + Mic		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 12/37

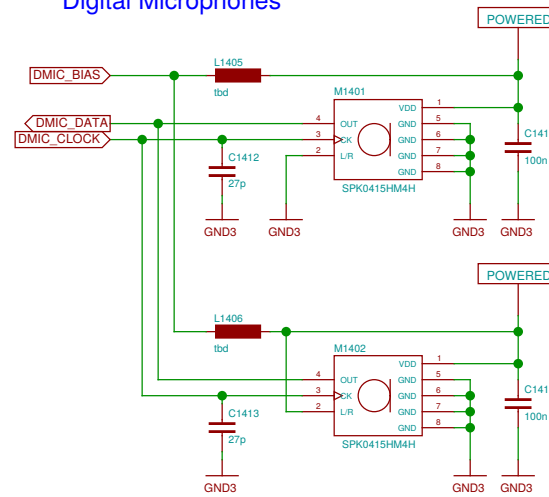


Sheet: /ECI/		
File: neo900_SS_13.sch		
Title: ECI		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 13/37

Hands-free



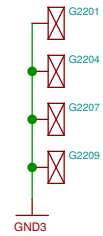
Digital Microphones



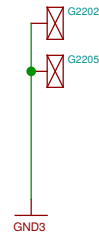
Sheet: /Audio Handsfree/		
File: neo900_SS_14.sch		
Title: Audio Handsfree		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 14/37

Shield Contacts on UPPER

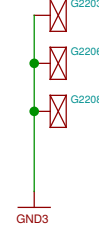
For the display



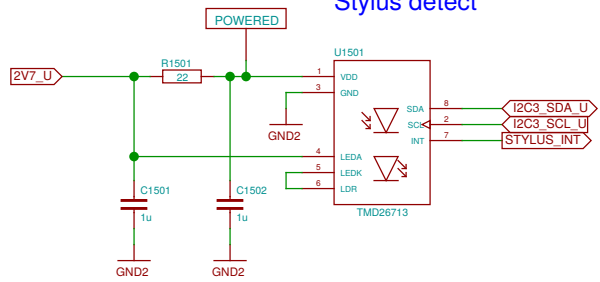
For the key mat



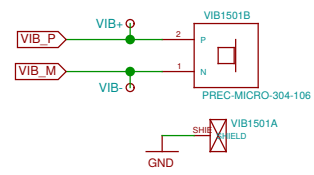
For the "key frame hook"



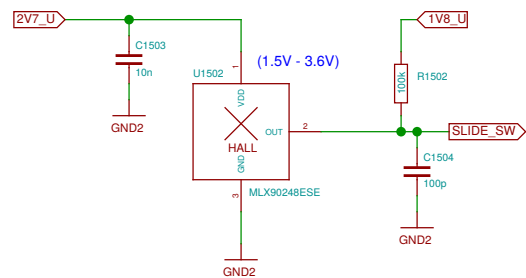
Stylus detect



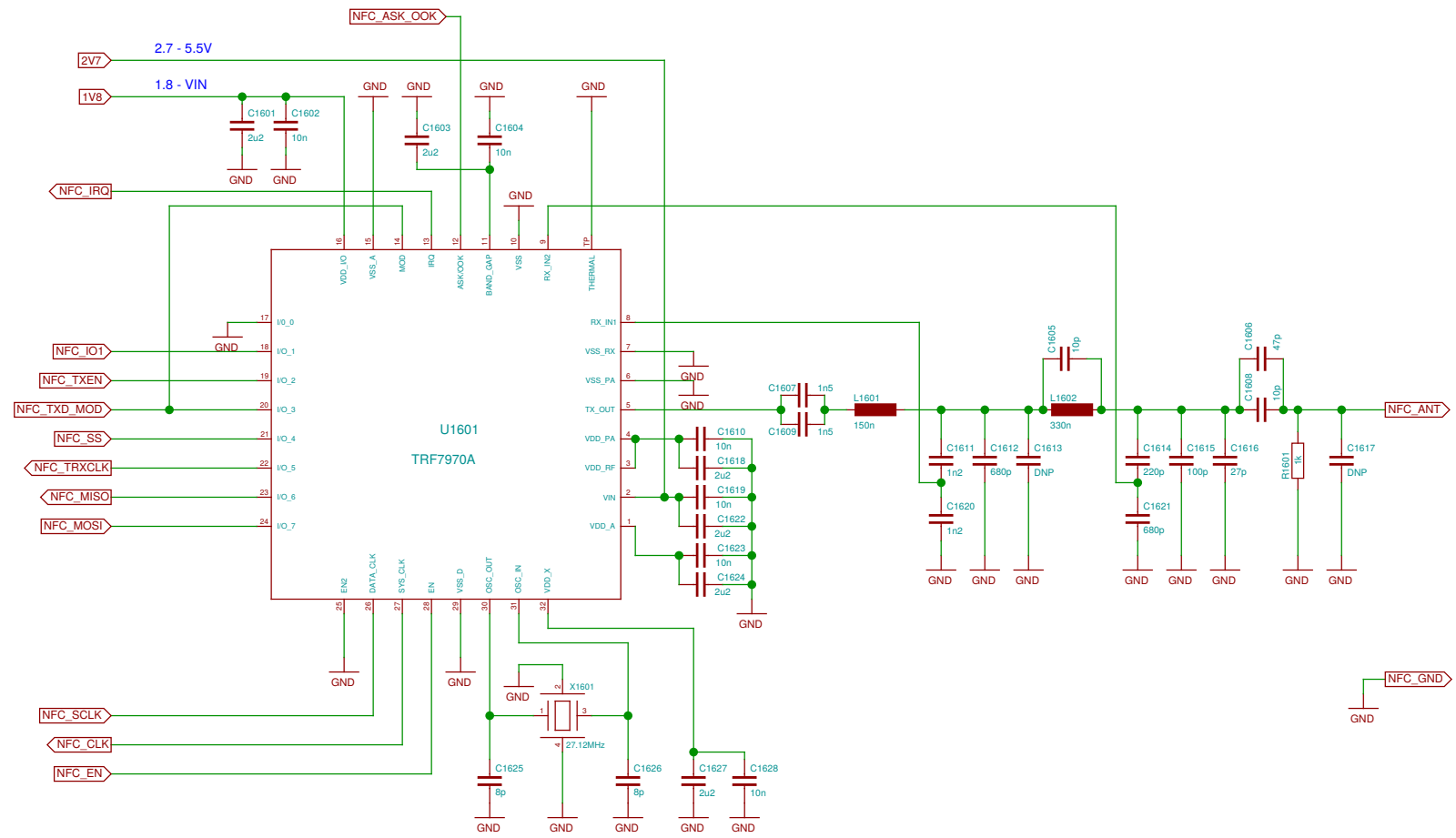
Vibramotor



Slide sensor

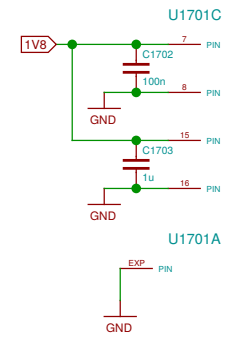
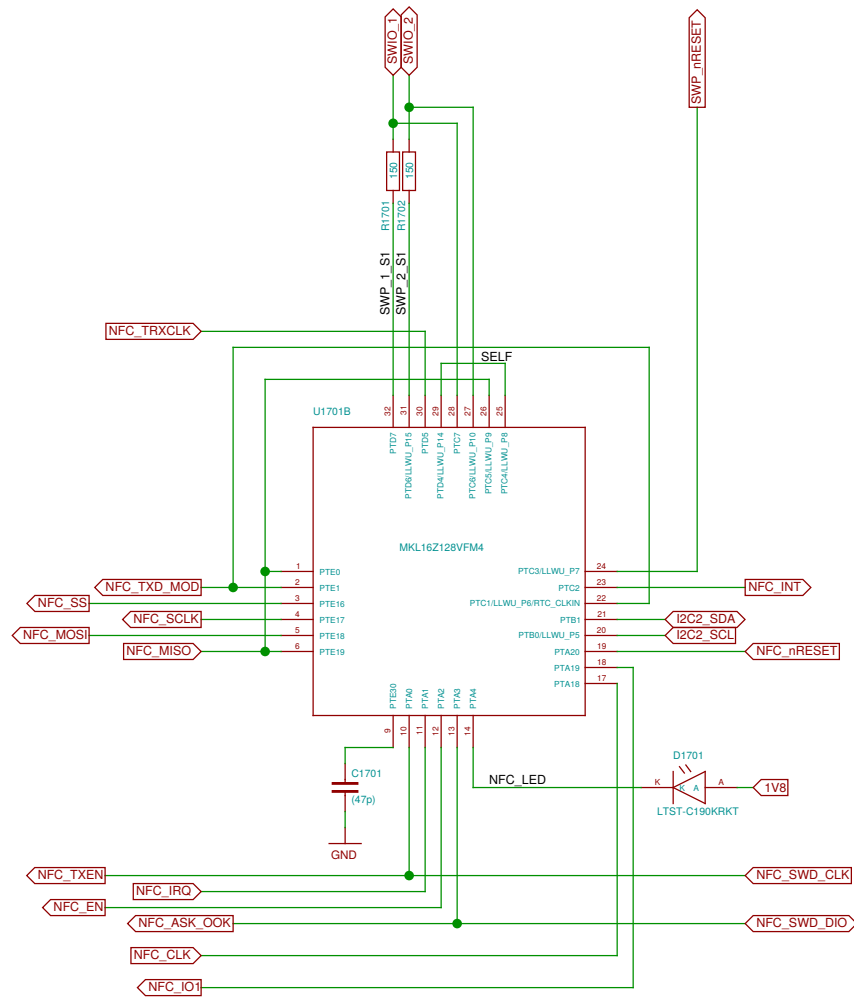


Sheet: /Misc/		
File: neo900_SS_15.sch		
Title: Misc		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 15/37



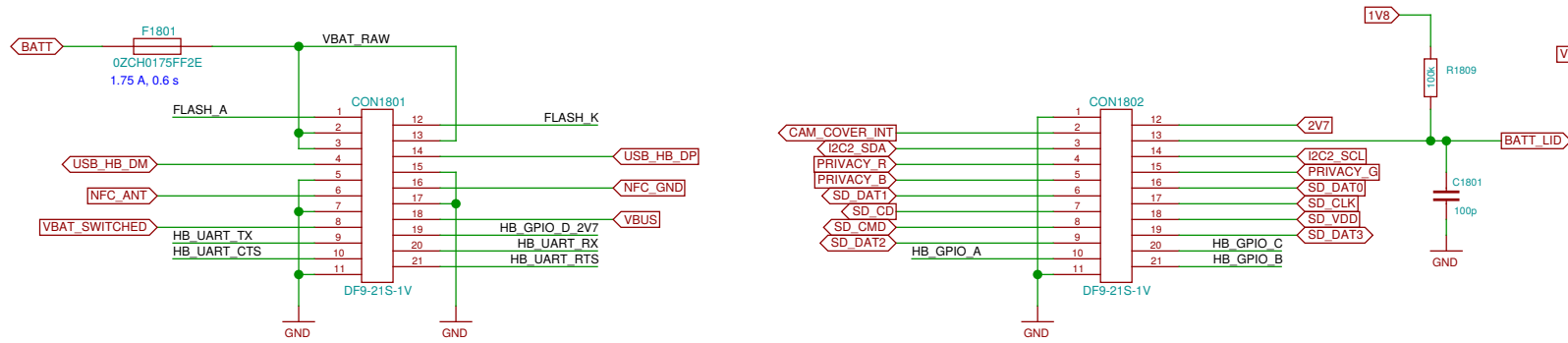
Some choices, 3.2 x 2.6 mm, 8-10 pF:
 NDK NX3225GA-27.12M-STD-CRG-2
 NDK NX3225SA-27.12M-STD-CSR-3
 Taitien XXCCEINANF-27.120000

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

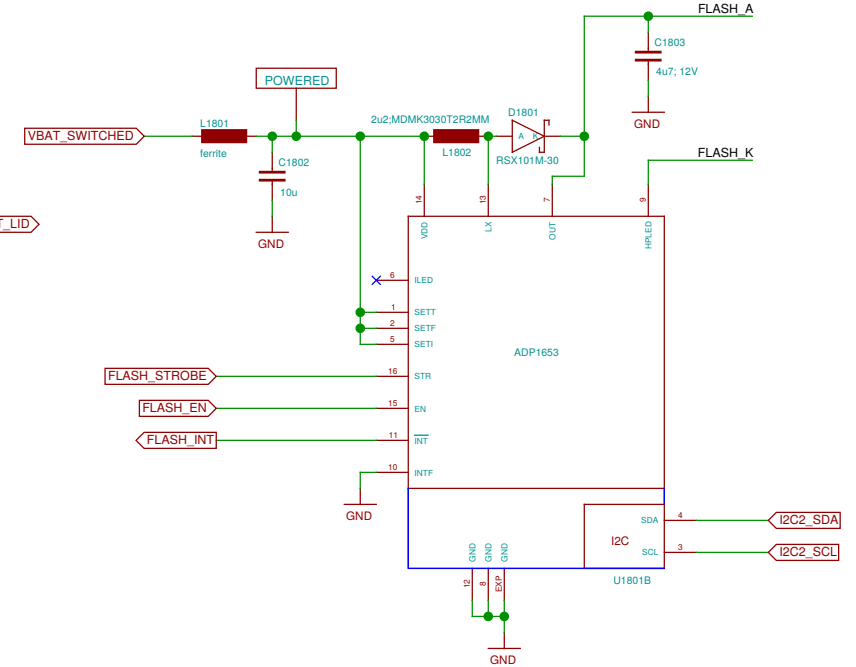


LOWER-BOB Interconnect (LOWER side)

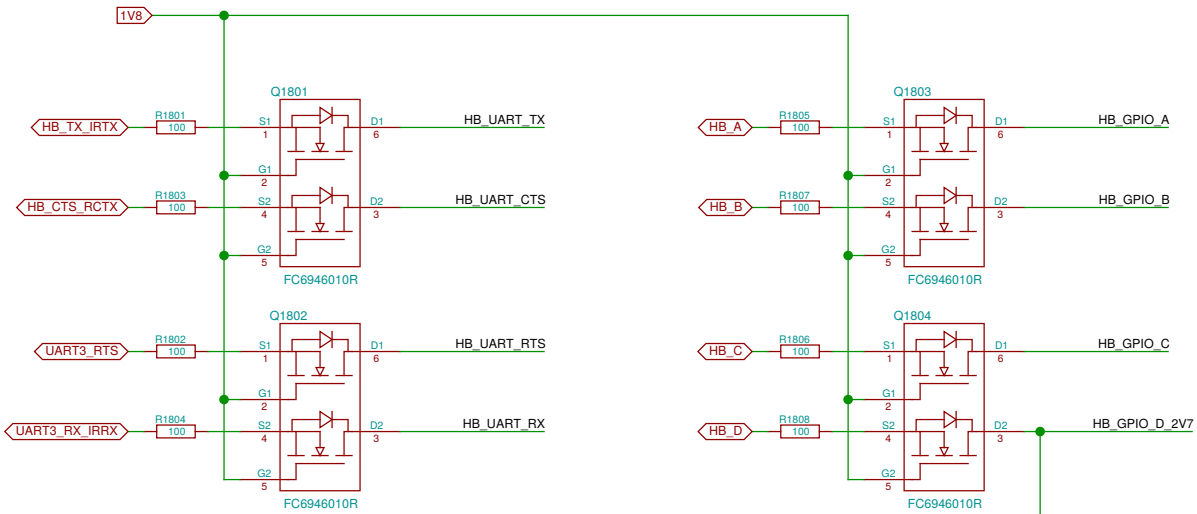
Defined in the Hackerbus specification, <http://neo900.org/stuff/papers/hb.pdf>



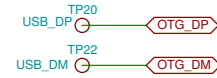
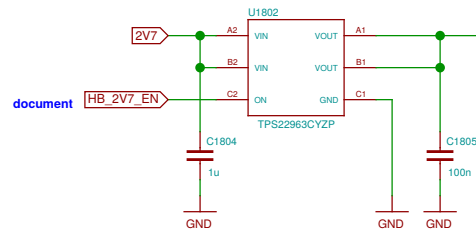
Flash/Torch



Level shifters for Hackerbus GPIO and UART



Q18xx alternative: DMN63D8LV by Diodes Inc.



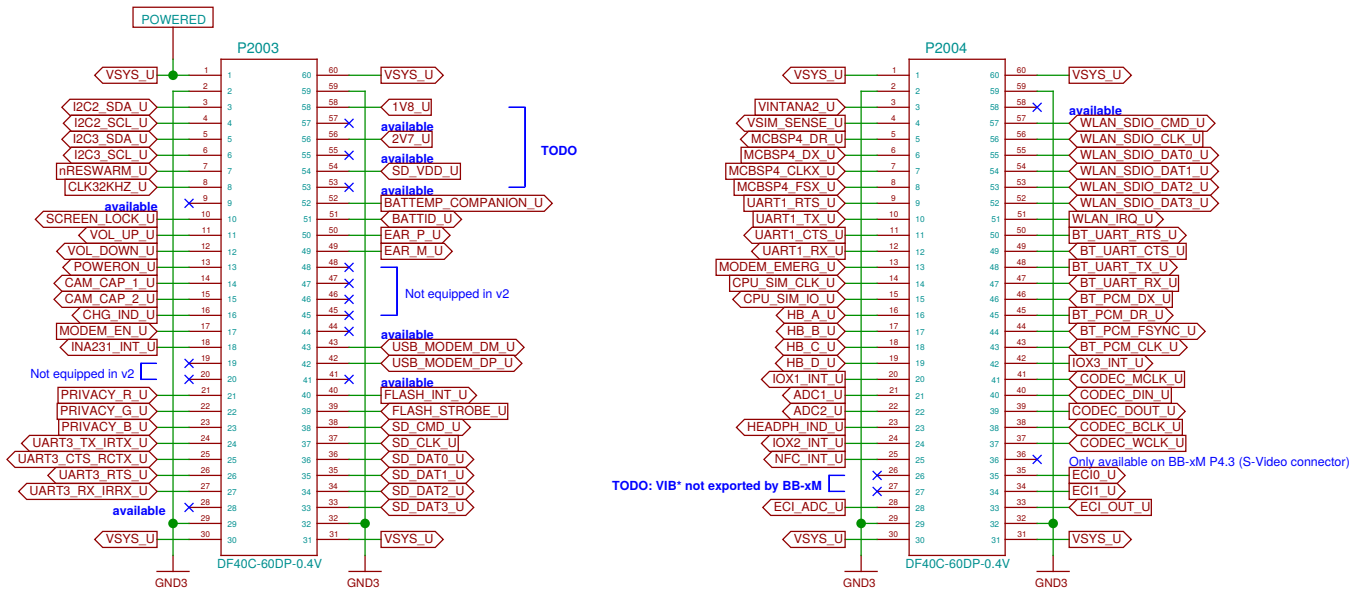
Patchfield

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.

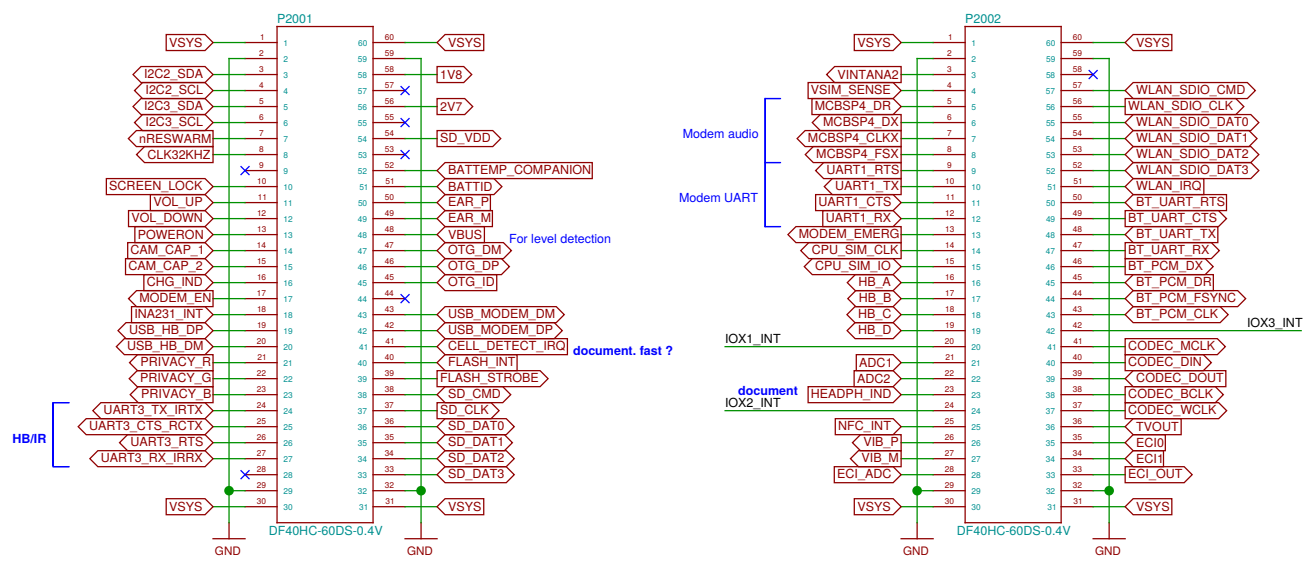
- TP1801 \rightarrow I2C3_SDA
- TP1802 \rightarrow I2C3_SCL
- TP1803 \rightarrow OTG_ID
- TP1804 \rightarrow HB_LINE_OUT_L
- TP1805 \rightarrow HB_LINE_OUT_R
- TP1806 \rightarrow HB_LINE_IN
- TP1807 \rightarrow HB_AUDIO_GND
- TP1808 \rightarrow HB_JACK_1L
- TP1809 \rightarrow HB_JACK_2R
- TP1810 \rightarrow 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

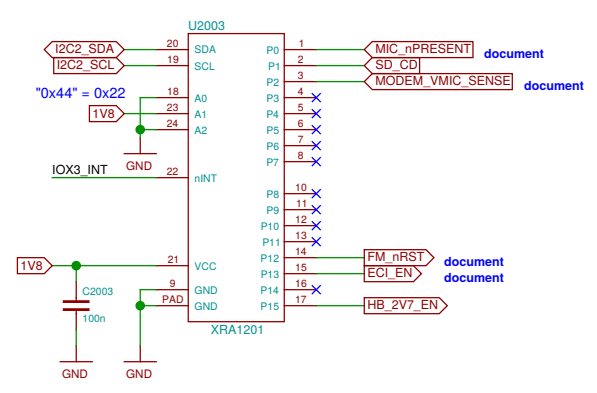
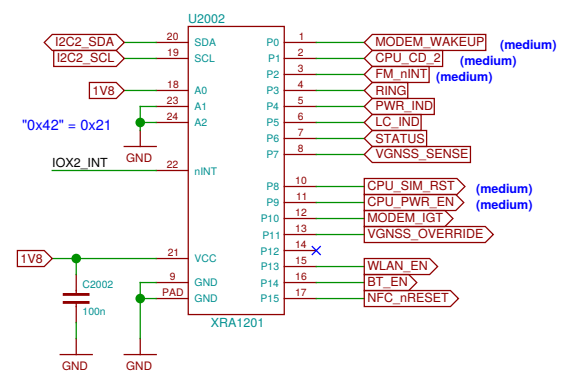
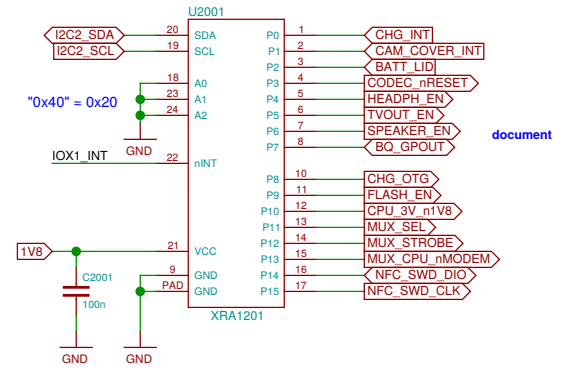
This is just the collection of signals we have. Proper assignment still pending.



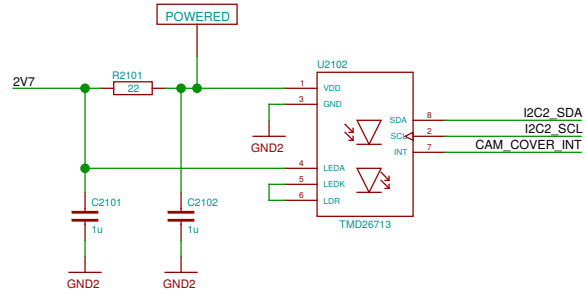
UPPER
LOWER



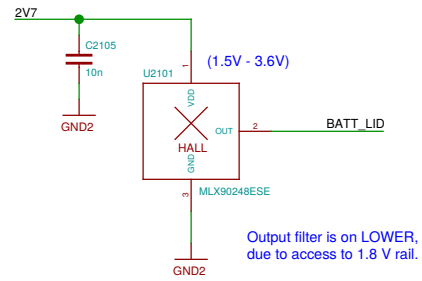
Current rating per contact: 0.3 A



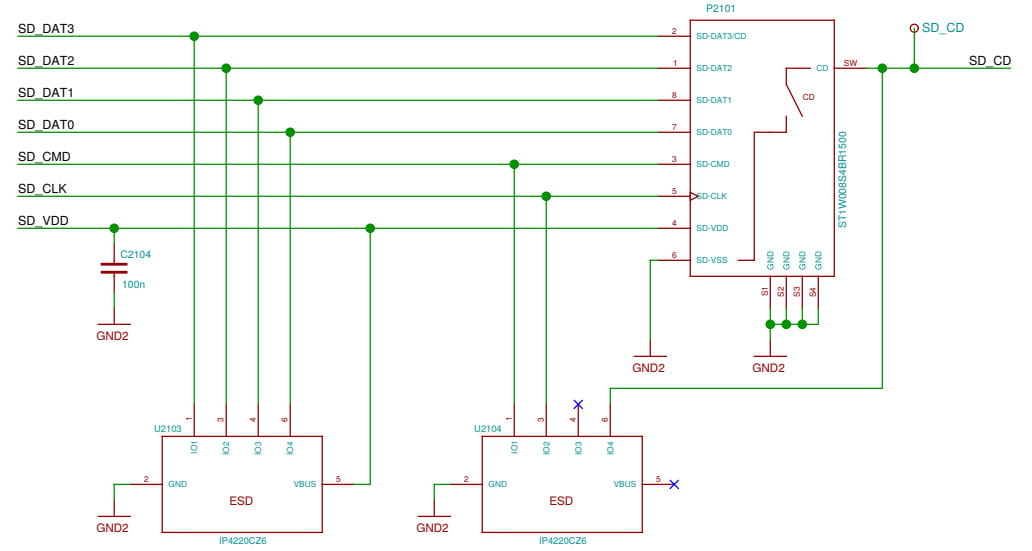
Camera Cover detect



Battery Cover detect

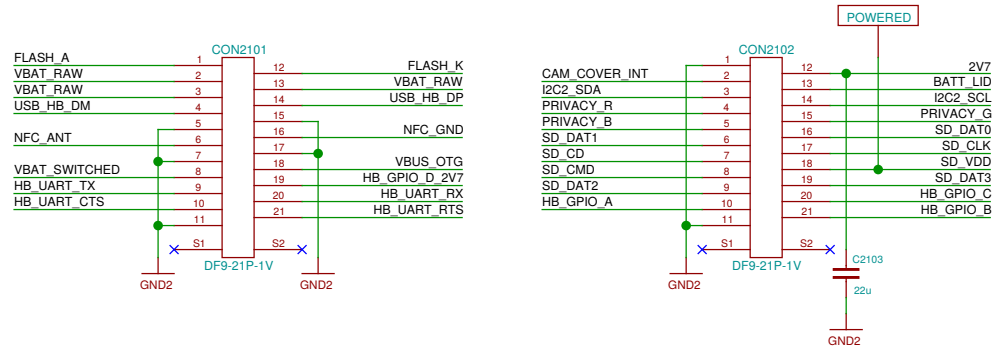


Memory card holder

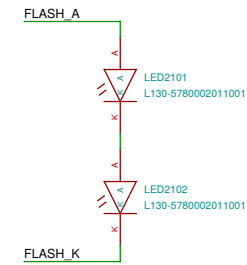


LOWER-BOB Interconnect (BOB side)

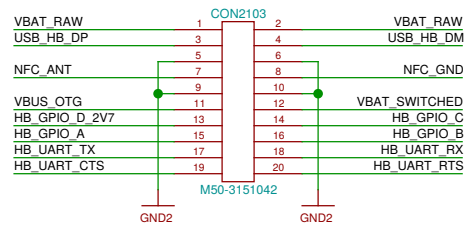
Defined in the Hackerbus specification, <http://neo900.org/stuff/papers/hb.pdf>



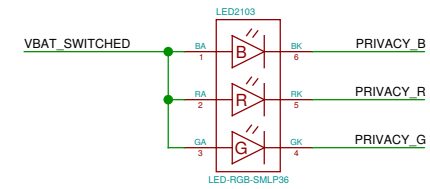
Camera flash



Hackerbus



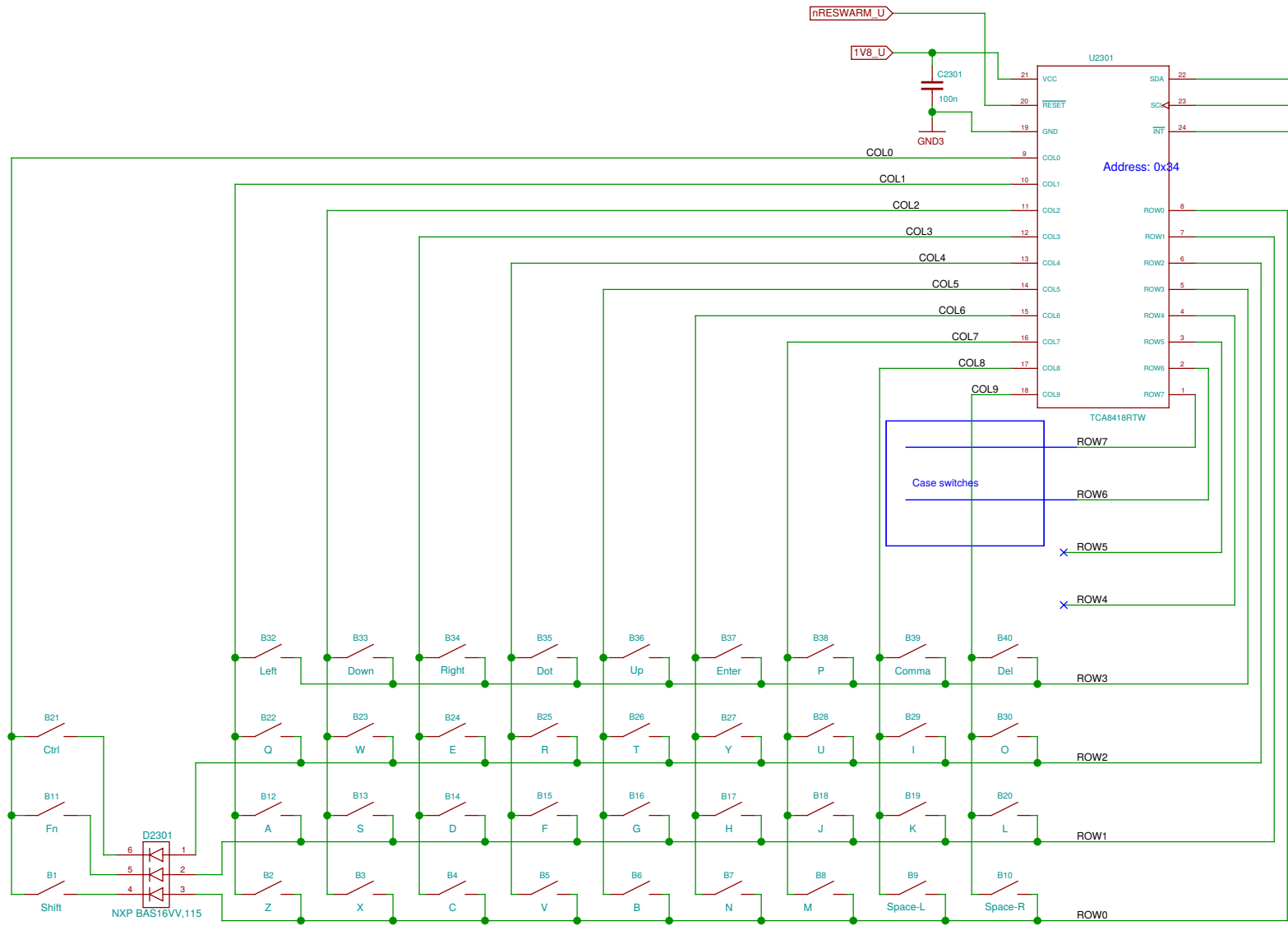
Privacy LED



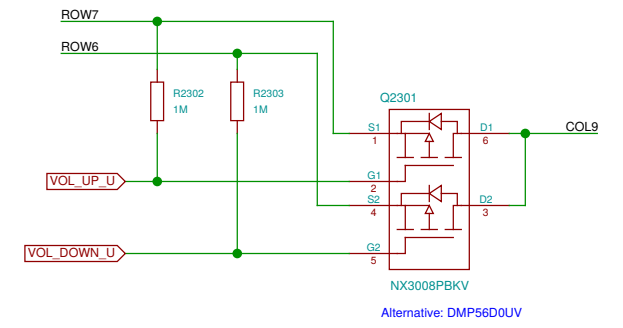
Sheet: /uSD Breakout Board/ File: neo900_SS_21.sch		
Title: uSD Breakout Board		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 21/37

TODO: consider sheet for deletion

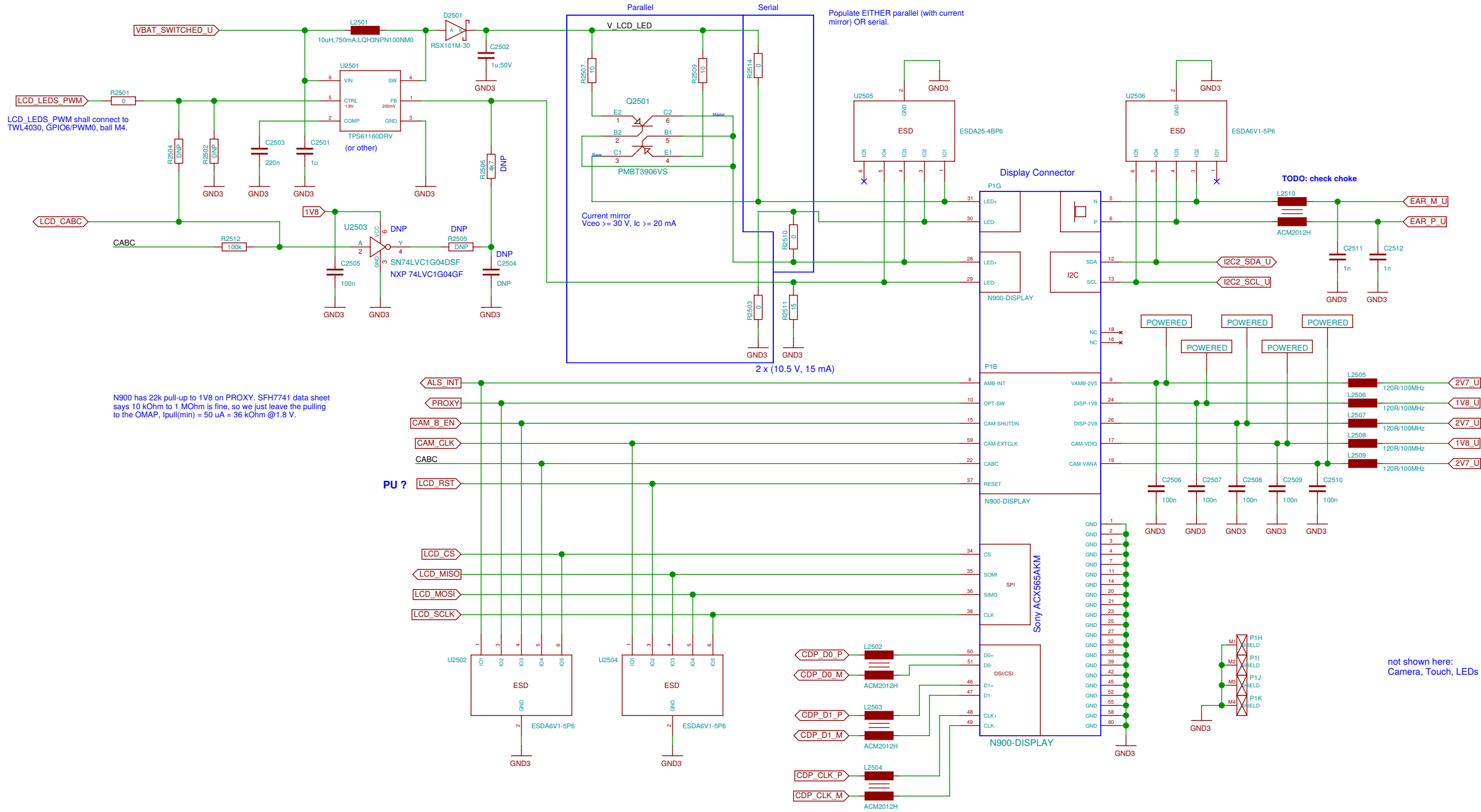
Sheet: /empty/		
File: neo900_SS_22.sch		
Title: empty		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 22/37



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



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: 2016-10-31 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

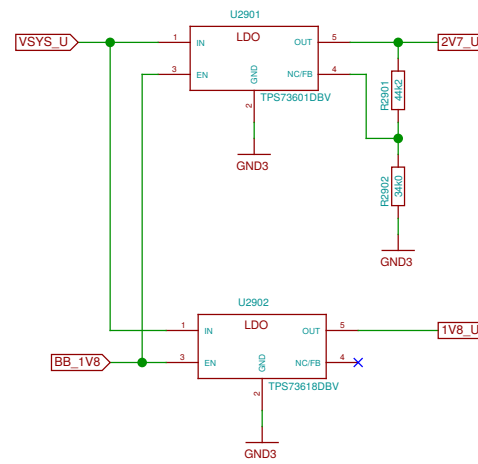
eMMC is not part of v2

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

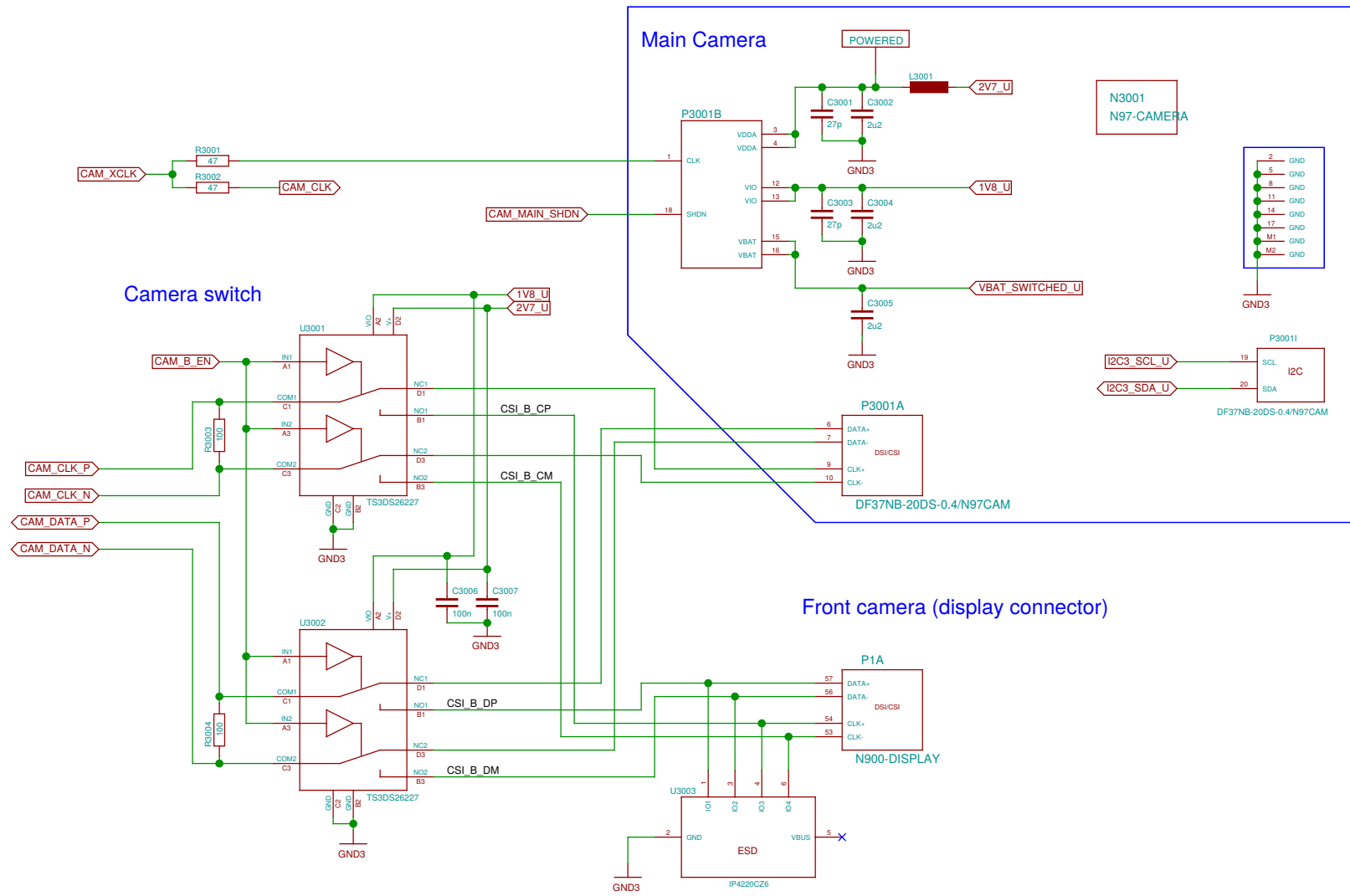
Sheet: /PMU+Codec/		
File: neo900_SS_28.sch		
Title: PMU+Codec		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 28/37

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

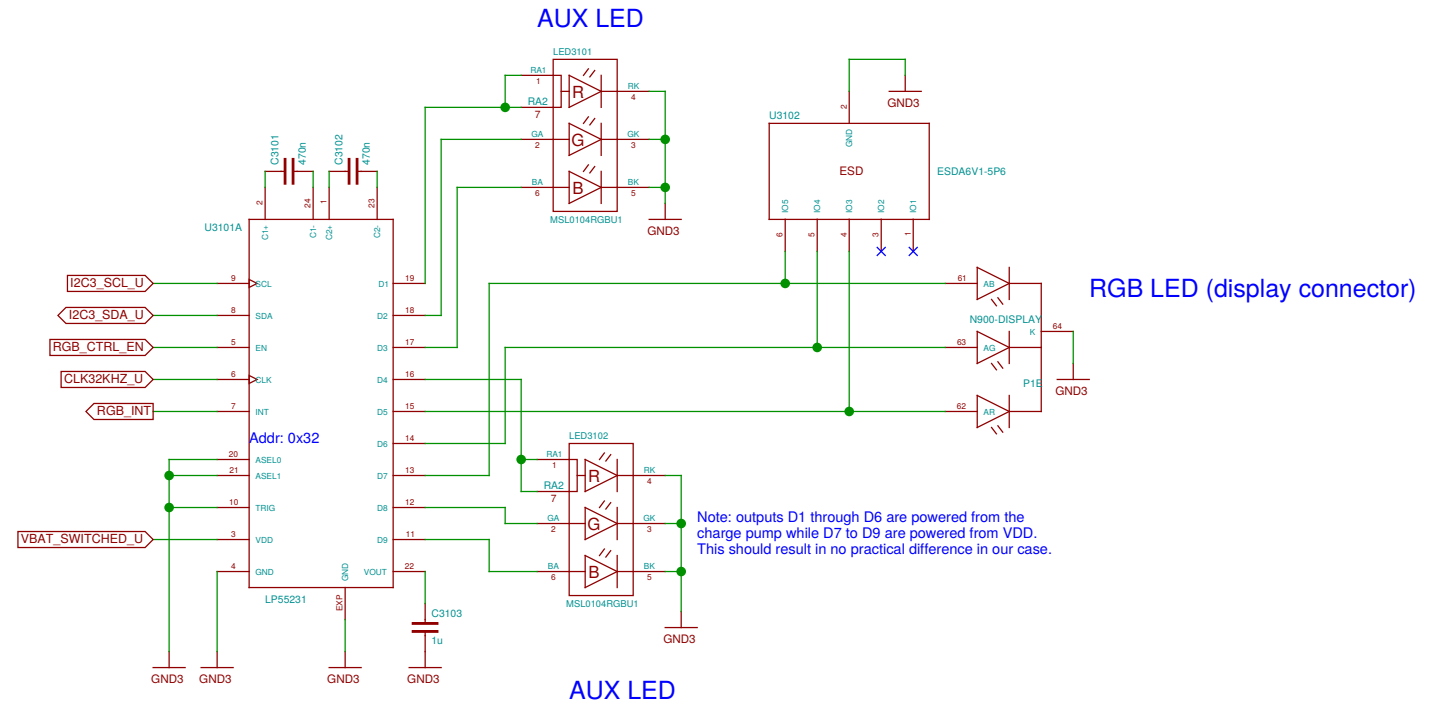


TODO: use REGEN ?

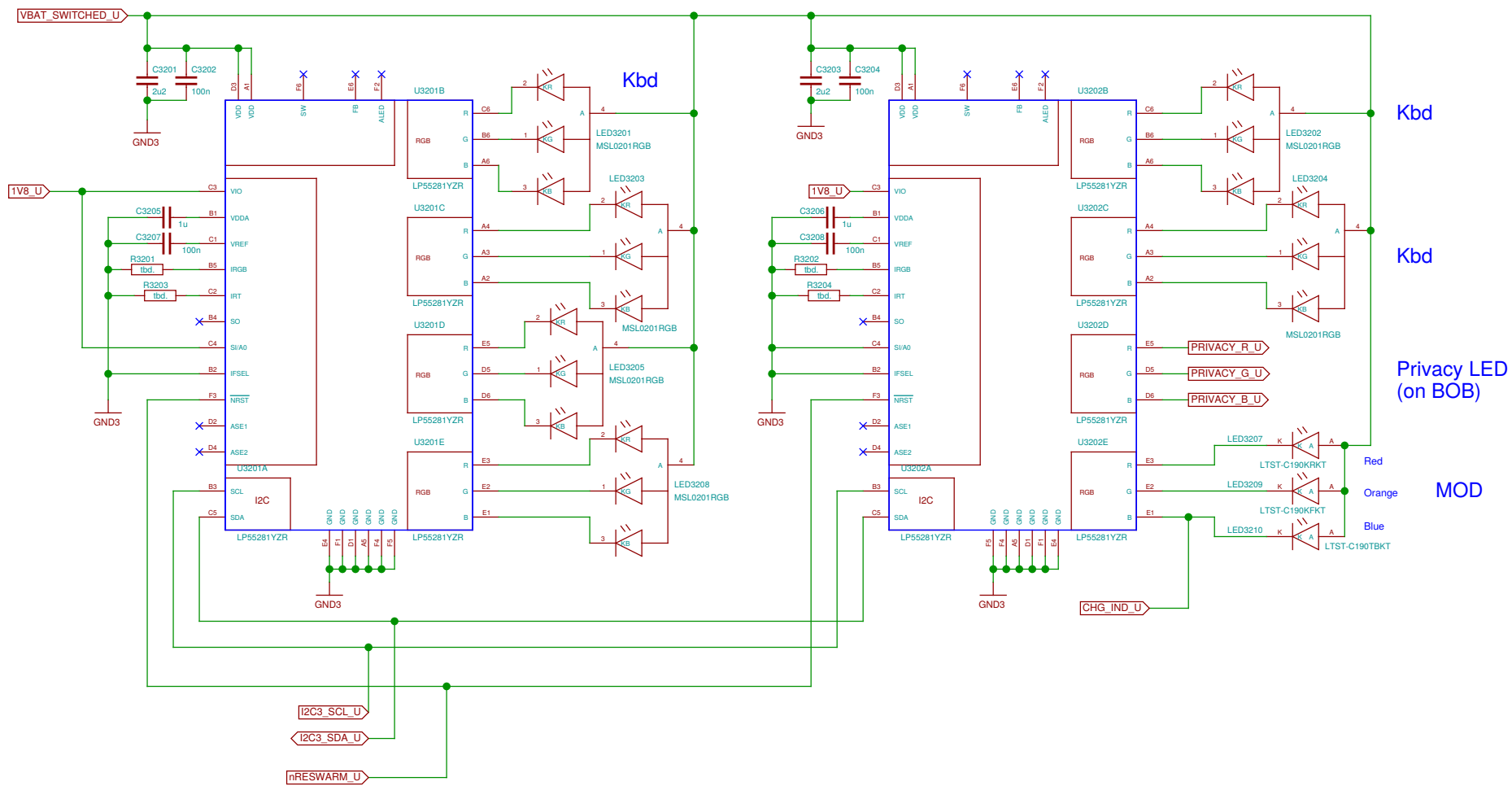
Sheet: /BB-XM Dummy (TWL4030)/		
File: neo900_SS_29.sch		
Title: BB-XM Dummy (TWL4030)		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 29/37



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



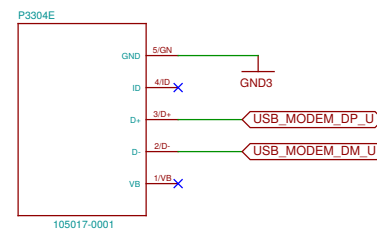
Sheet: /Fancy LEDs/		
File: neo900_SS_31.sch		
Title: Fancy LEDs		
Size: A3	Date: 2016-10-31 19:05:55	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 31/37



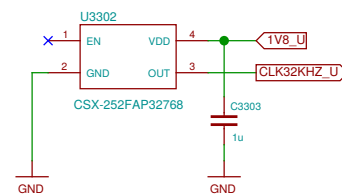
Cleaning up. The connections to BB-xM are on the next sheets.

connect to BB
by some Micro-USB cable

Modem USB



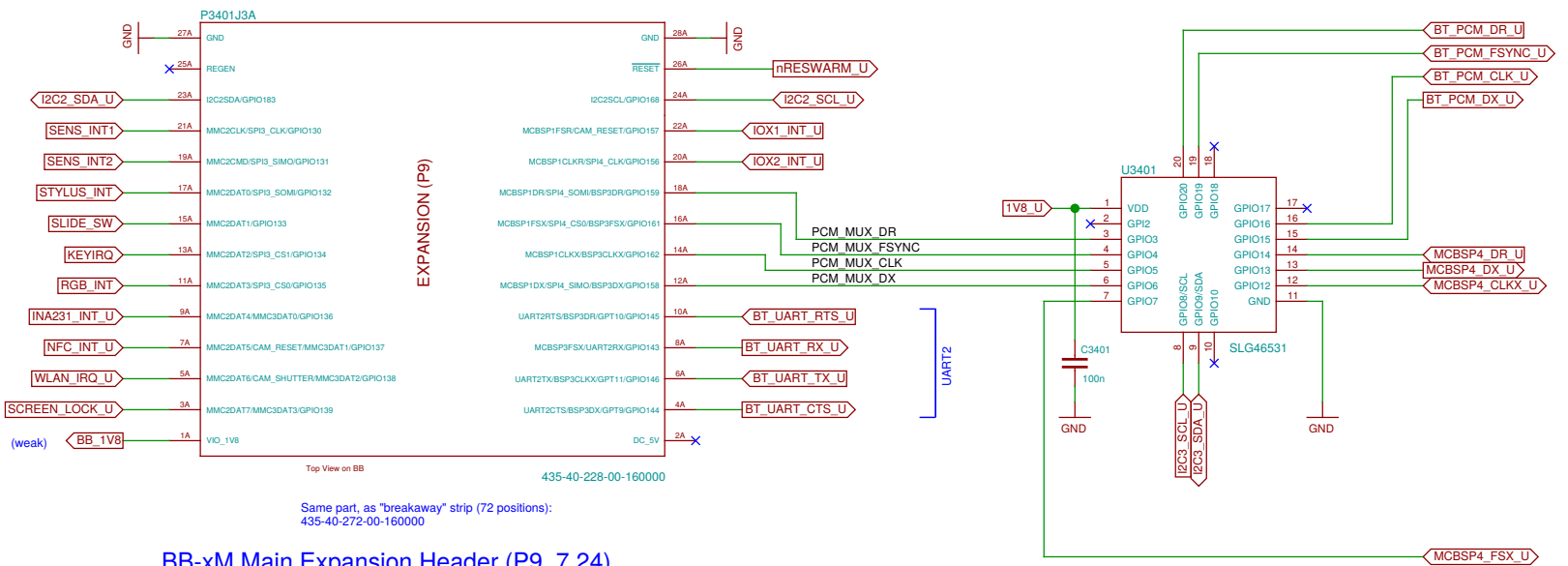
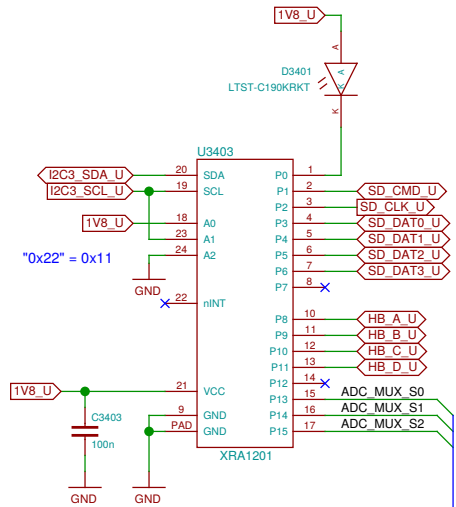
32 kHz clock



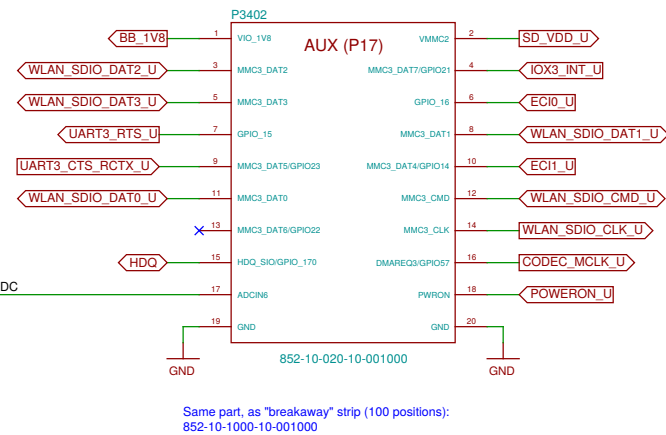
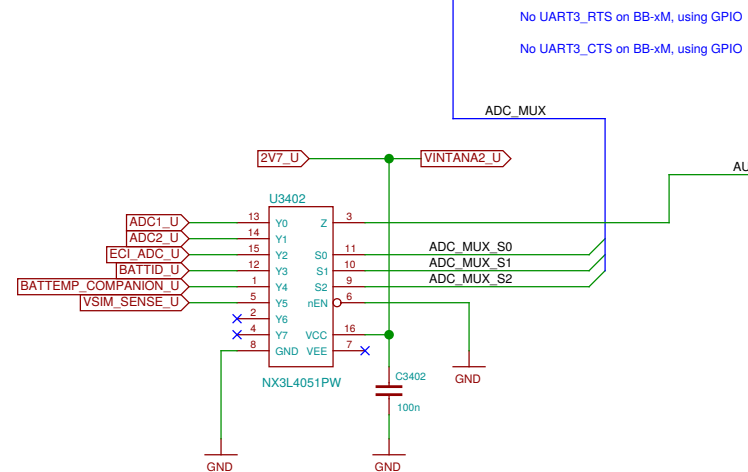
Alternative: OYKTGLJANF-0.032768

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



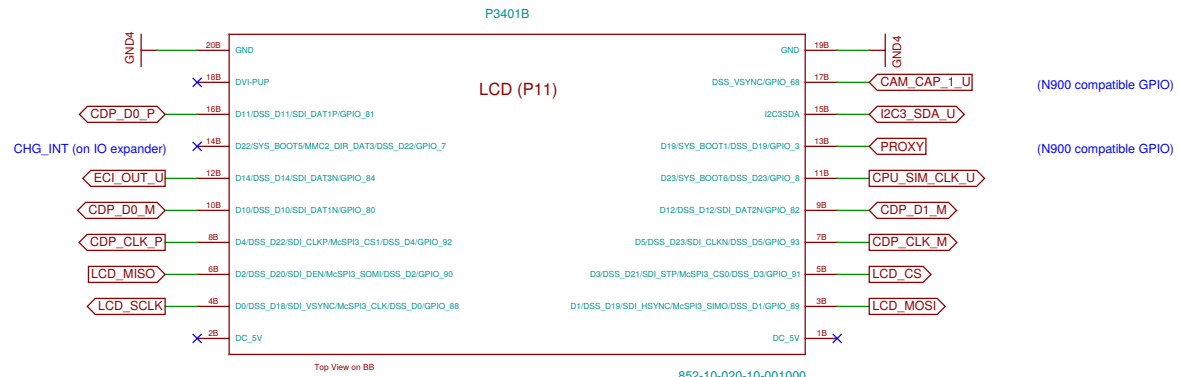
BB-xM Main Expansion Header (P9, 7.24)



FM_nINT (on IO expander)

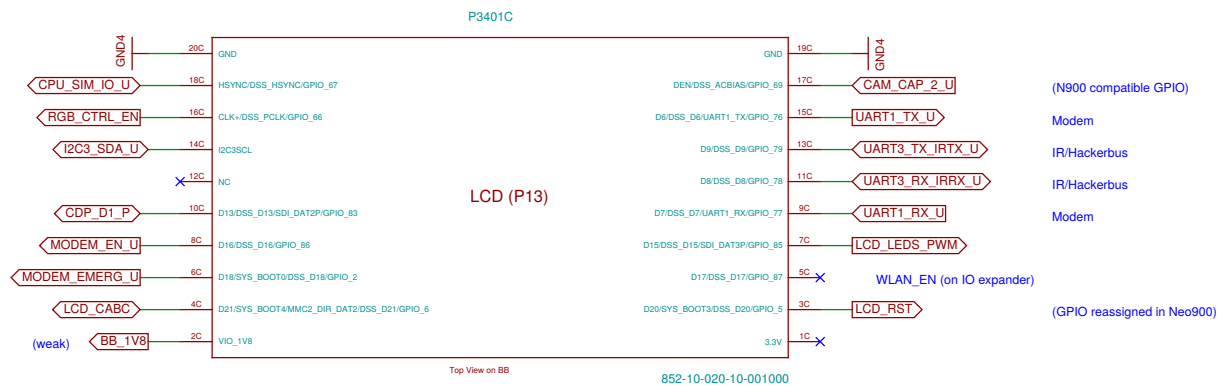
Sheet: /BB-XM Adapter (CPU)		
File: neo900_SS_34.sch		
Title: BB-XM Adapter (CPU)		
Size: A3	Date: 2016-10-31 06:53:09	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 34/37

P11 (7.25)



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

P13 (7.25)

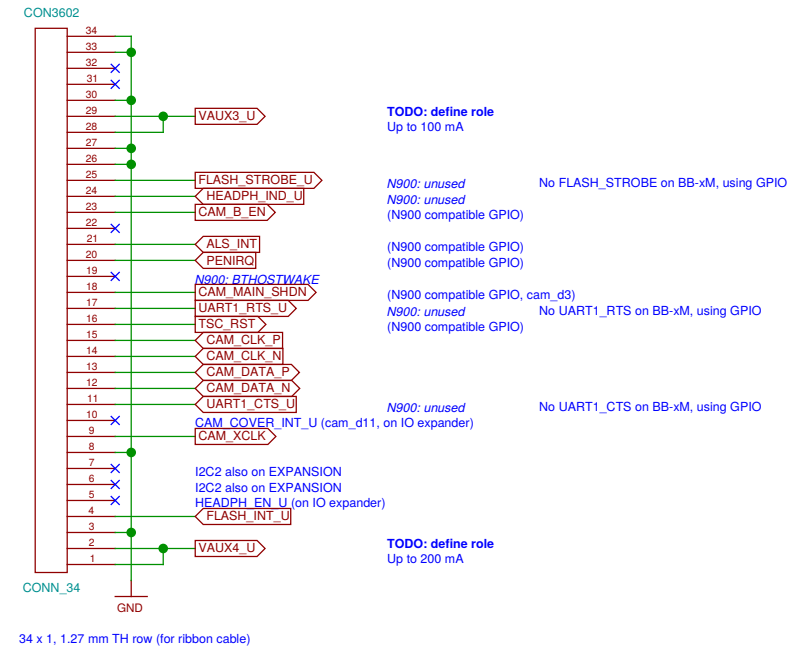
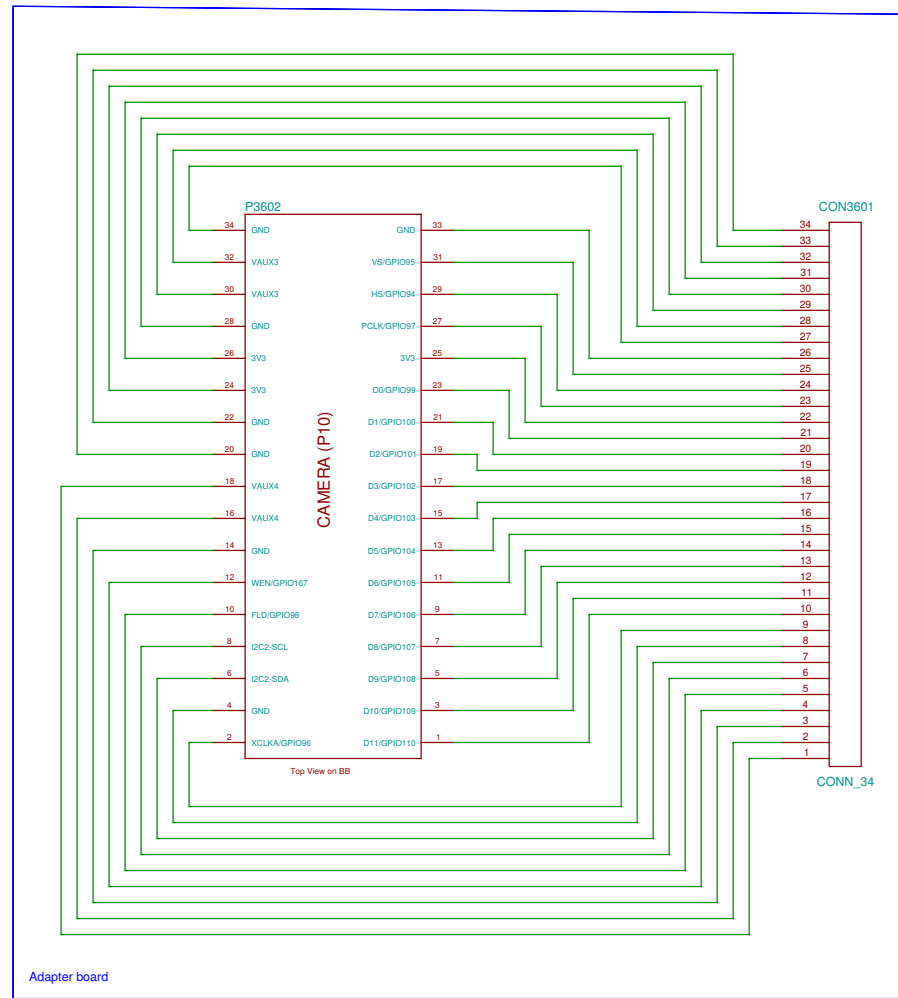


Same part, as "breakaway" strip (100 positions):
852-10-1000-10-001000

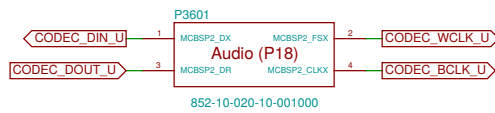
TODO: update pin names in footprint

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

N3705 N97-CAMERA-HOLE

N3706 headset jack

N3707 STENCIL-TOP

N3708 STENCIL-BOTTOM
