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CPU + PoP RAM/NAND

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BB-XM Adapter (DISP)

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BB-XM Adapter (CAM)

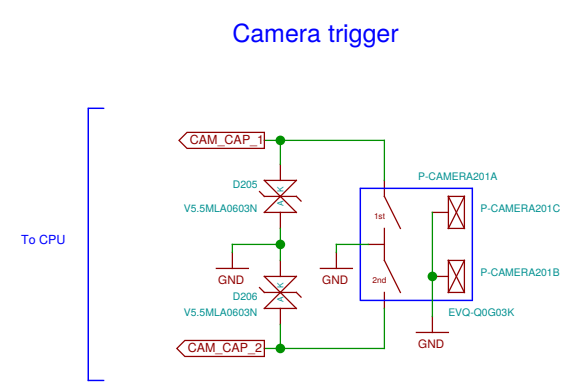
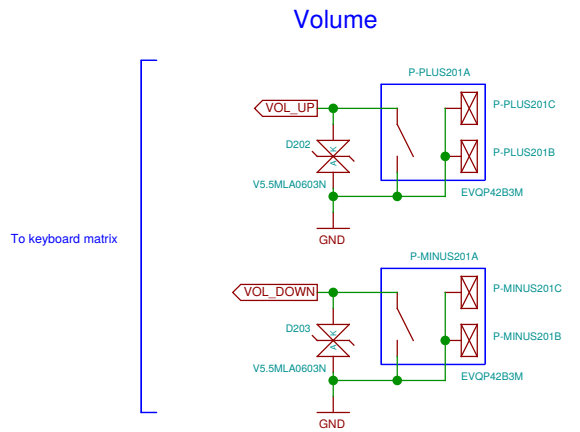
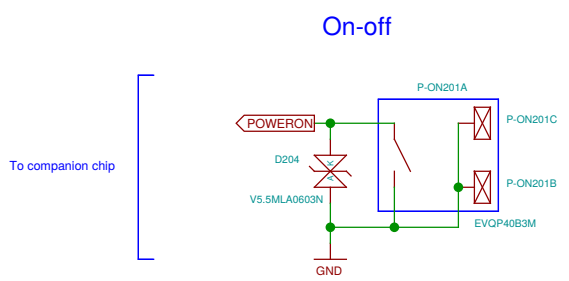
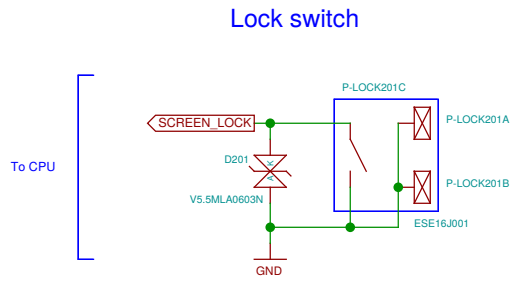
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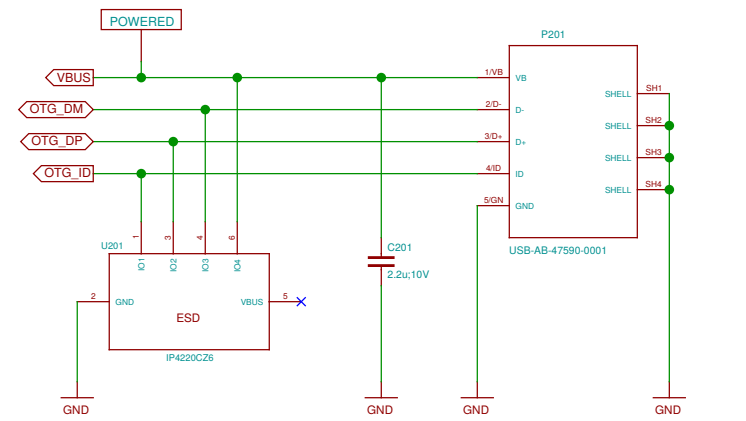
No-Solder Components

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: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		
Id: 1/37		

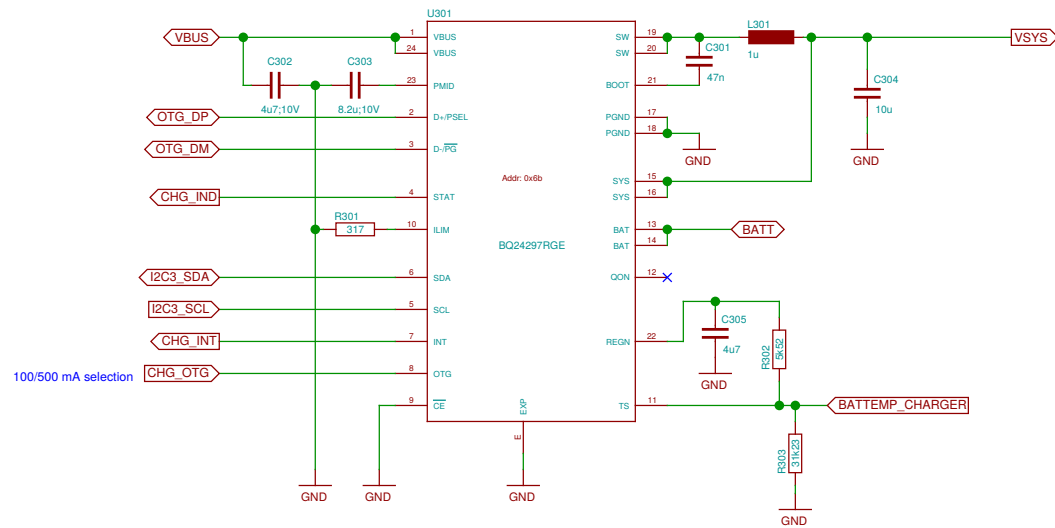


USB OTG connector



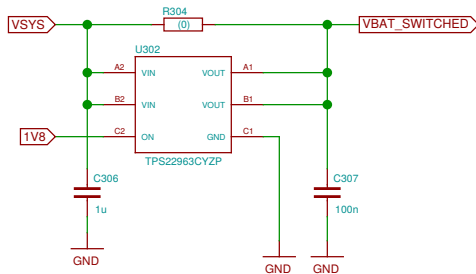
Sheet: /OTG/ File: neo900_SS_2.sch		
Title: OTG		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 2/37

Battery charger with USB OTG

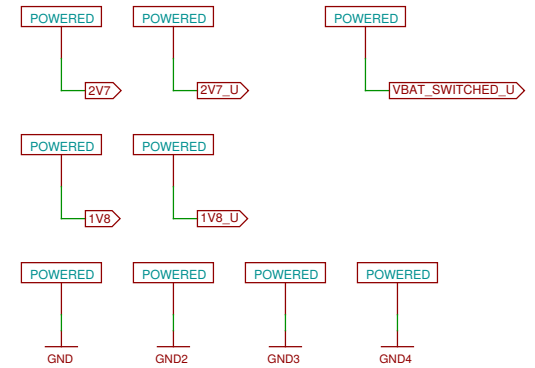


Power distribution and sequencing

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

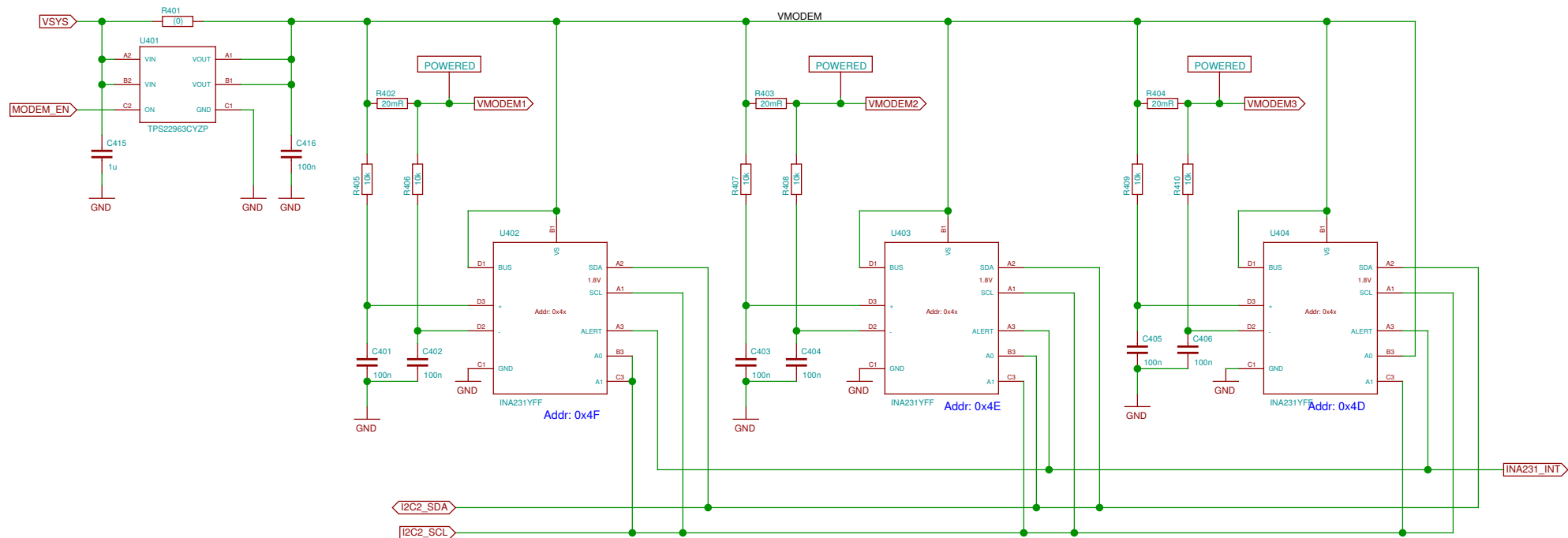


KiCad bureaucracy

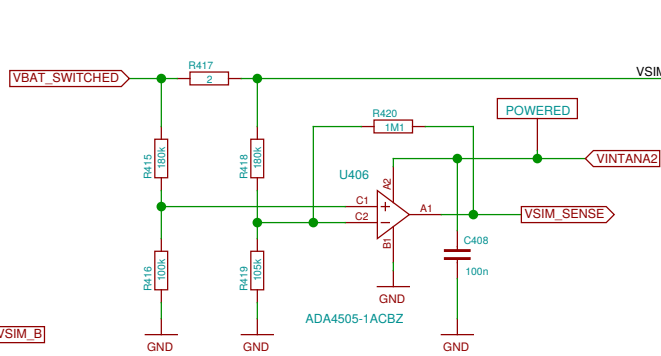


Sheet: /Charger/OTG-Booster/		
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Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 3/37

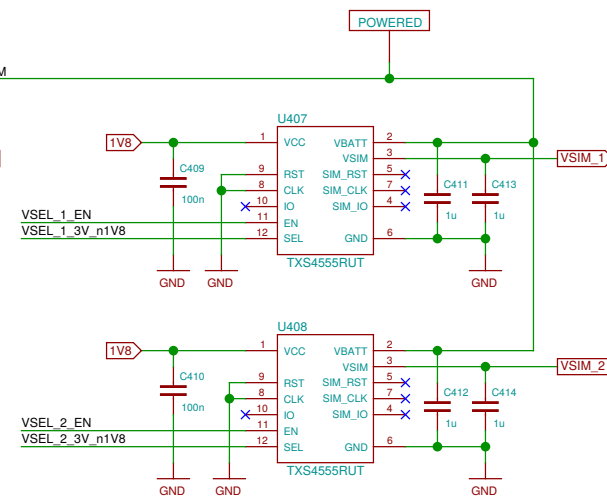
Modem current monitor



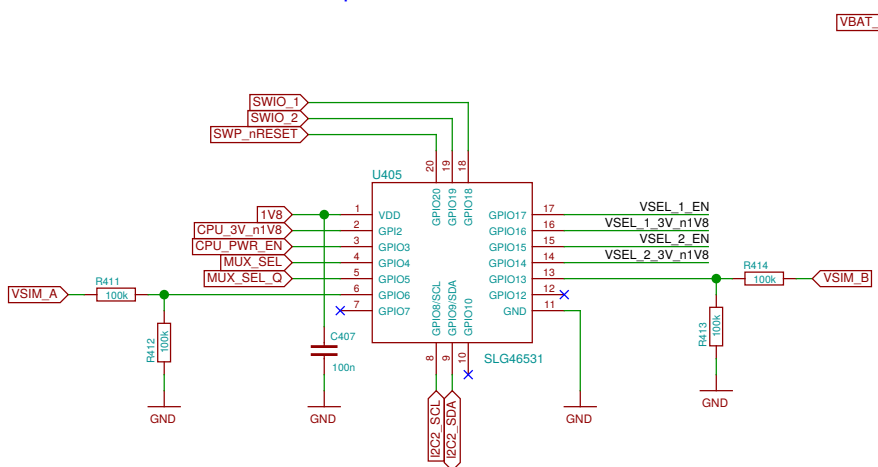
SIM current sensing



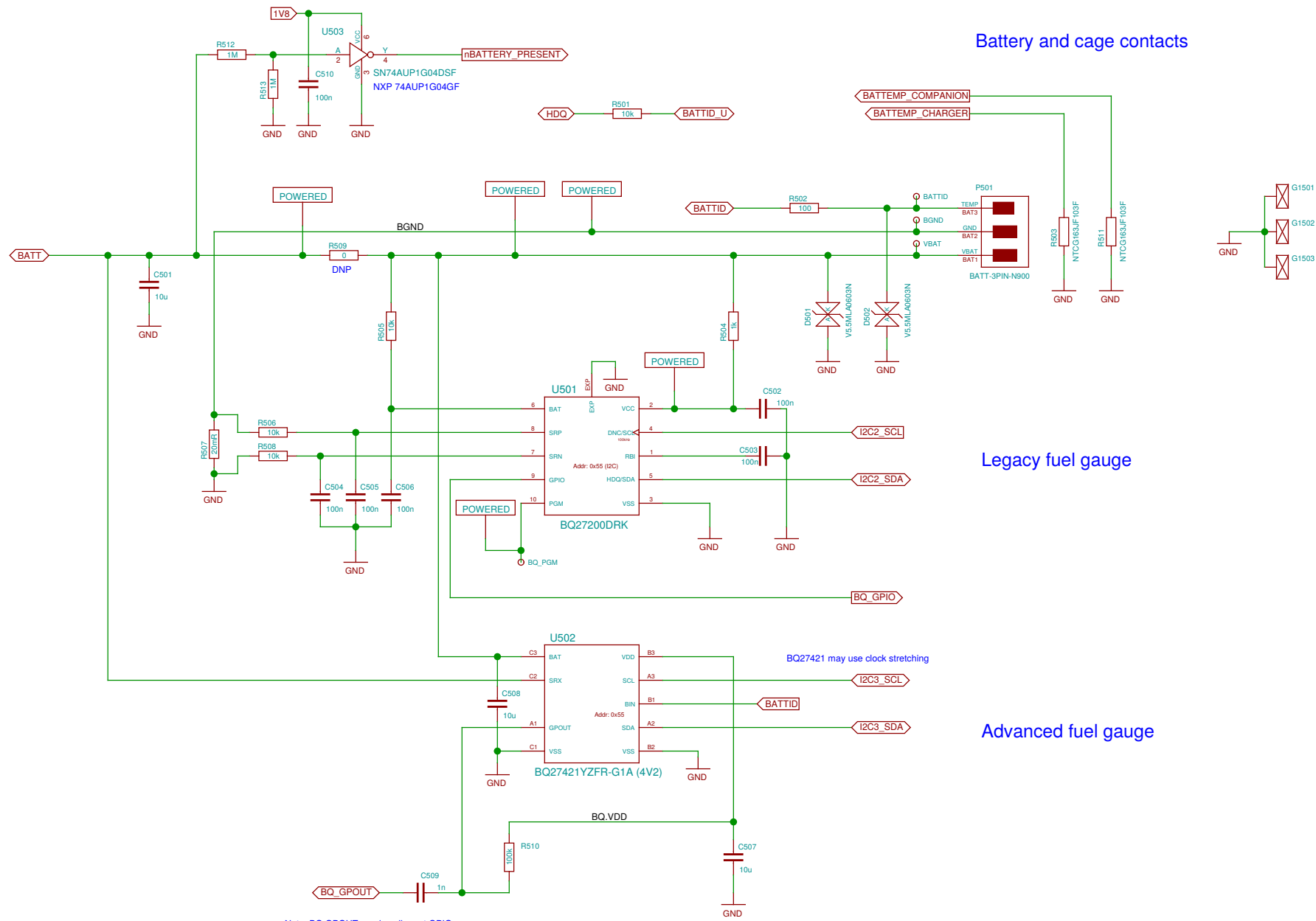
SIM power supply



SIM power selection



TODO: update SLG design for changed pins



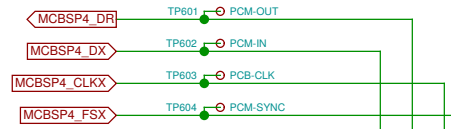
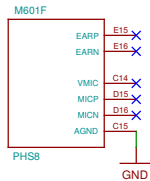
Battery and cage contacts

Legacy fuel gauge

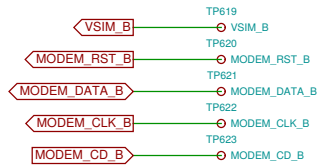
Advanced fuel gauge

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

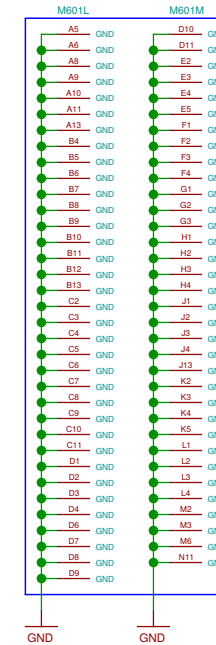
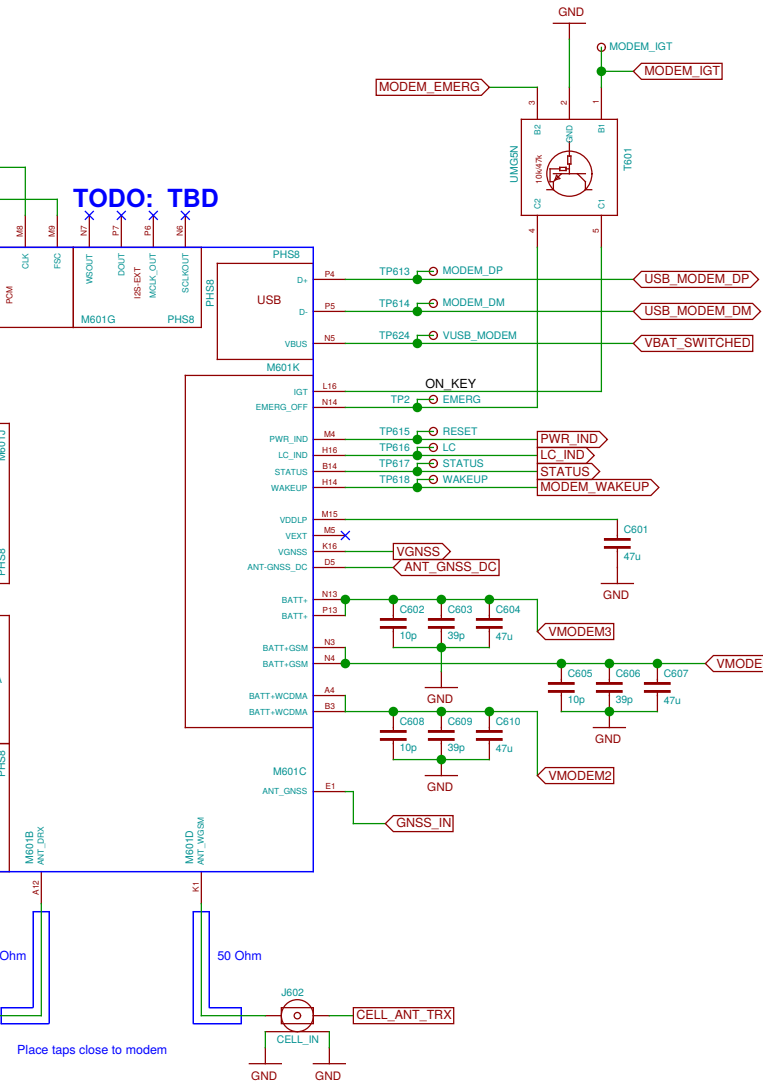
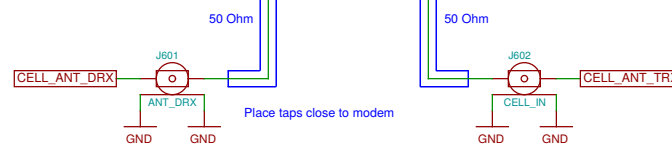
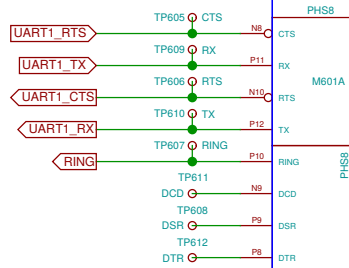
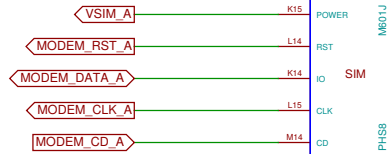
Sheet: /Fuel Gauge/		
File: neo900_SS_5.sch		
Title: Fuel Gauge		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 5/37



TODO: TBD



TODO: B-SIM bus FFS



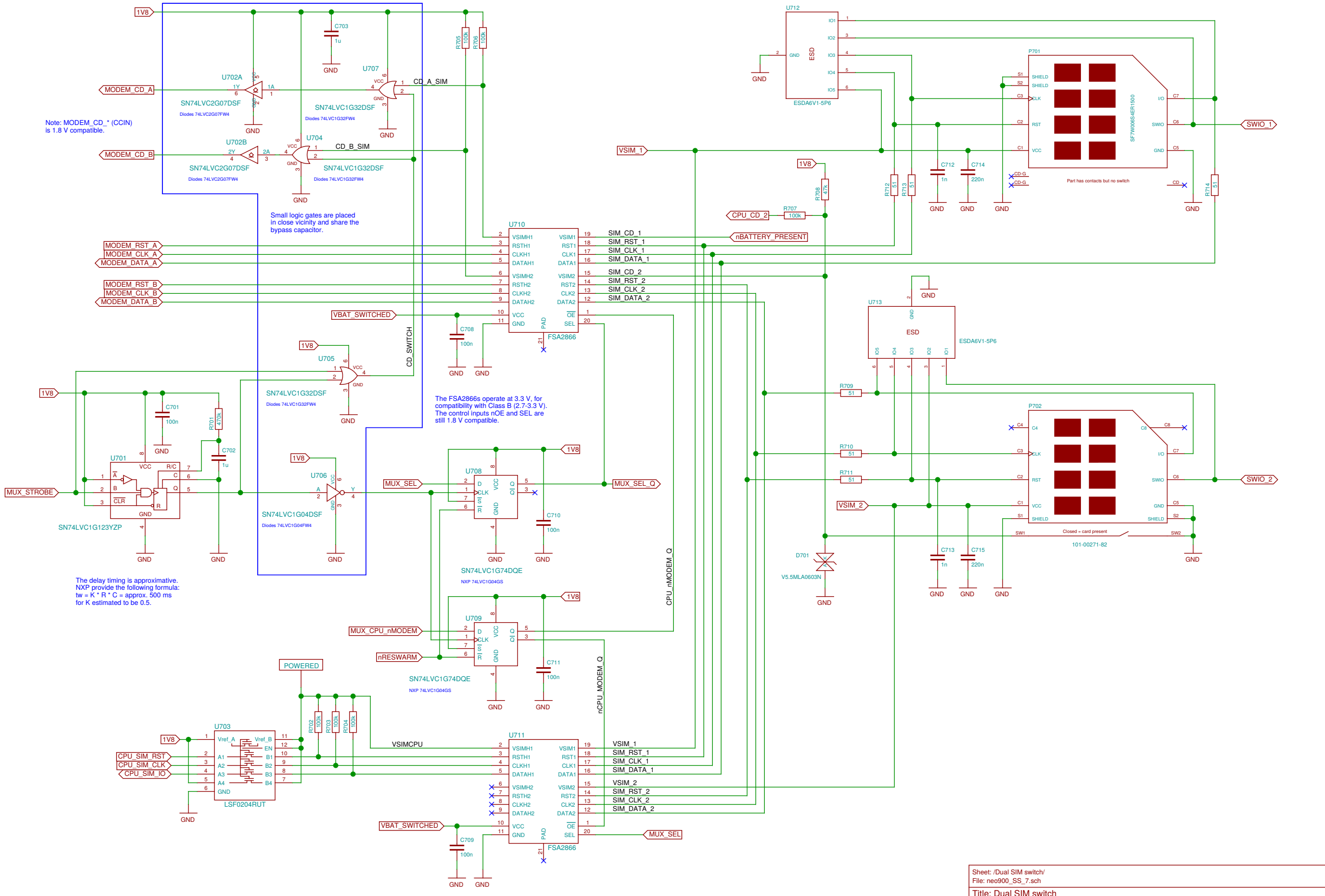
Sheet: /3G/4G Modem + SIM/		
File: neo900_SS_6.sch		
Title: 3G/4G Modem + SIM		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 6/37

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

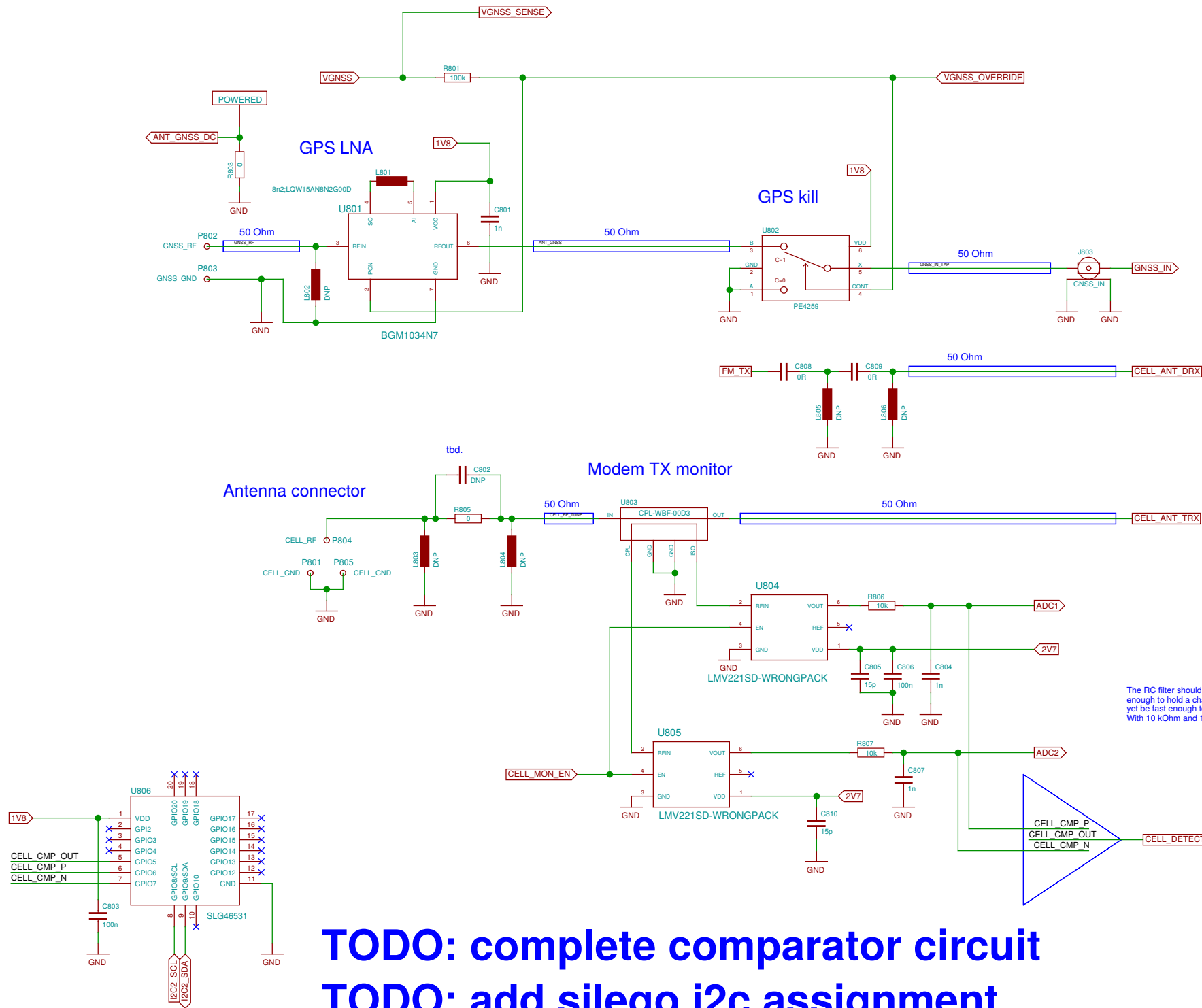
Small logic gates are placed in close vicinity and share the bypass capacitor.

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



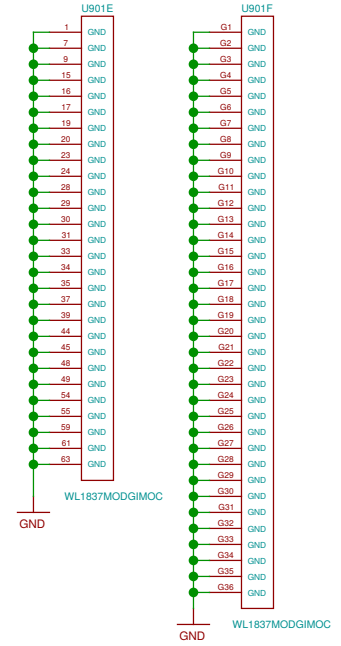
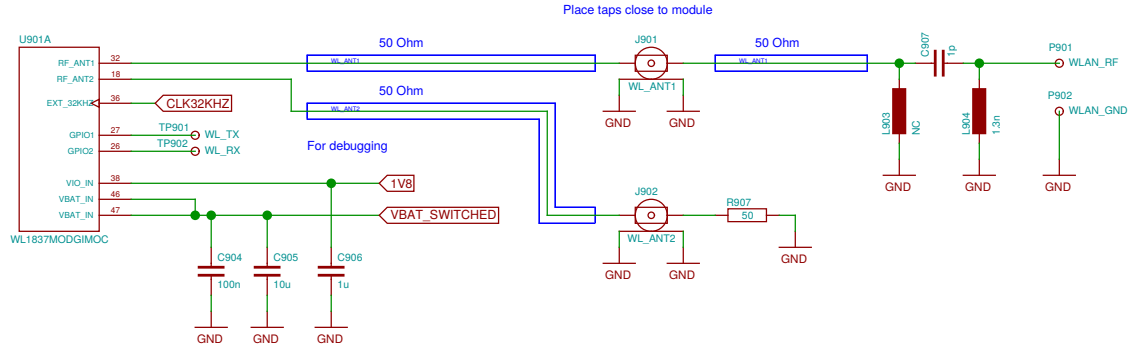
Sheet: /Dual SIM switch/		
File: neo900_SS_7.sch		
Title: Dual SIM switch		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 7/37



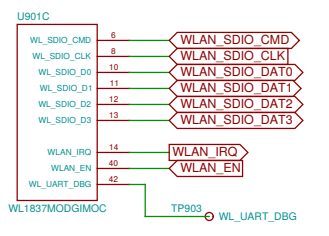
TODO: complete comparator circuit
TODO: add silego i2c assignment

TODO: assign footprints for c-spring contacts

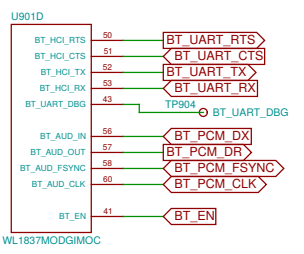
WLAN/BT antenna



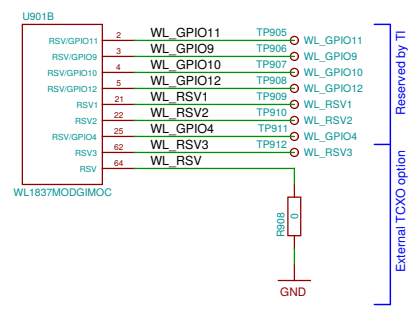
WLAN



Bluetooth

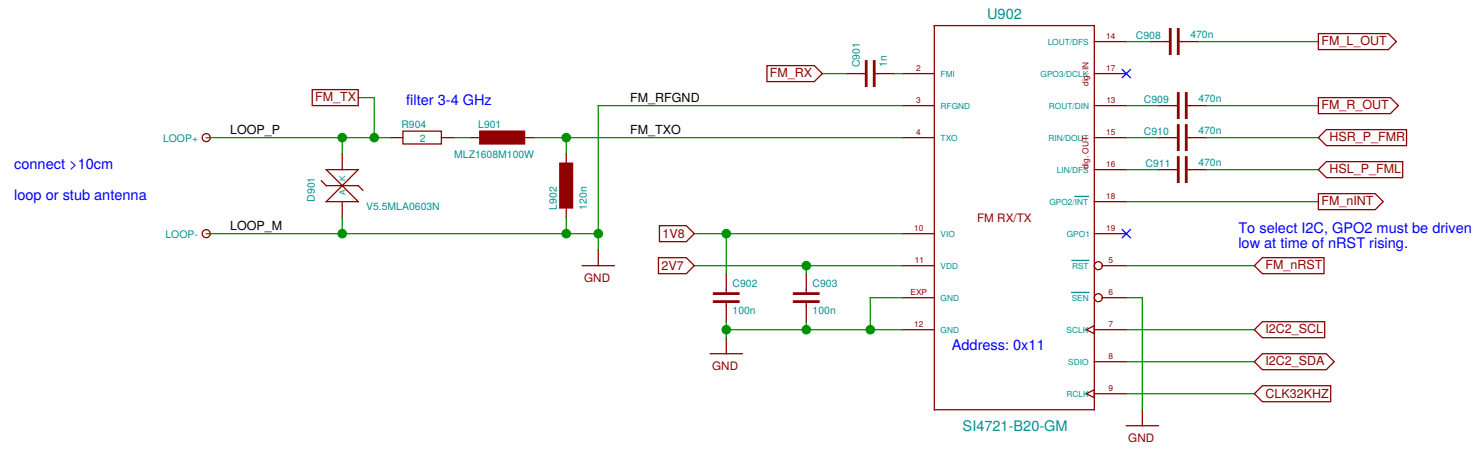


Reserved / Debugging



FM Radio (TX/RX)

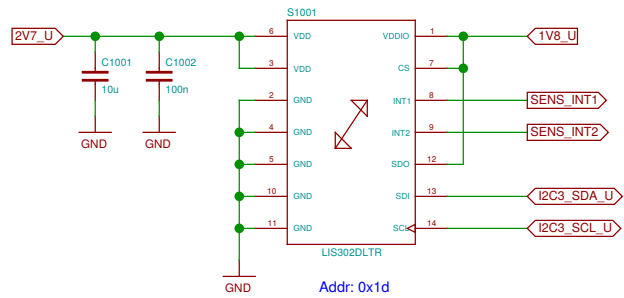
TODO: check caps



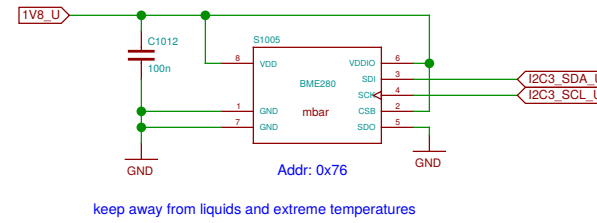
SI4705 is pin compatible (mostly) but RX-only

Sheet: /WLAN, Bluetooth, FM/		
File: neo900_SS_9.sch		
Title: WLAN, Bluetooth, FM		
Size: A3	Date: 2016-10-28 23:06:03	Rev:
Plotted by eeshow 07e710f+		20161030-15:27Z
Id: 9/37		

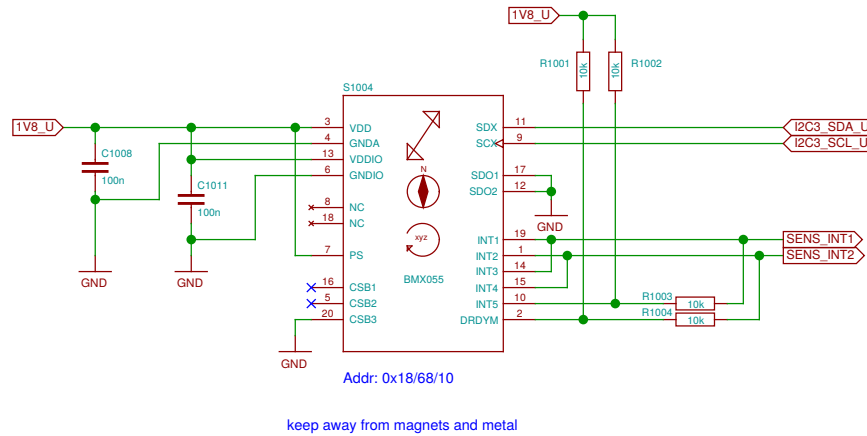
Acceleration (legacy)



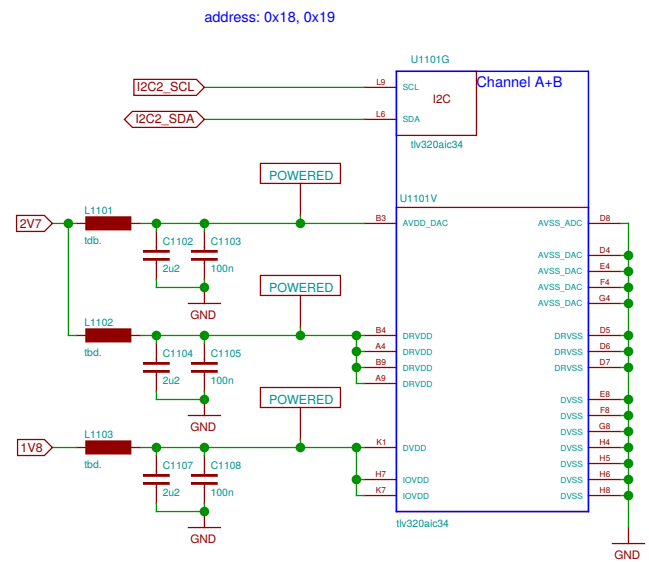
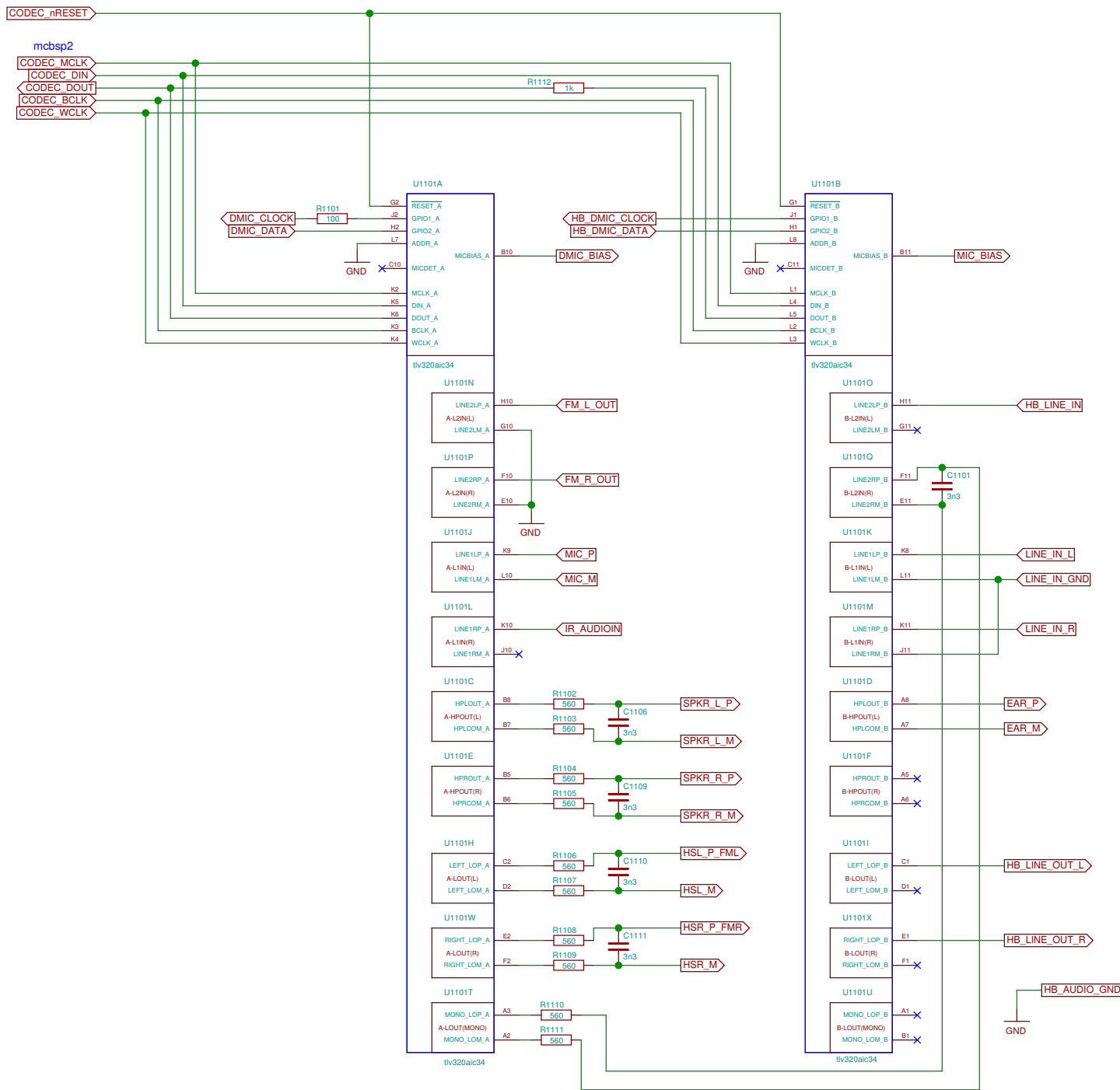
Pressure, humidity



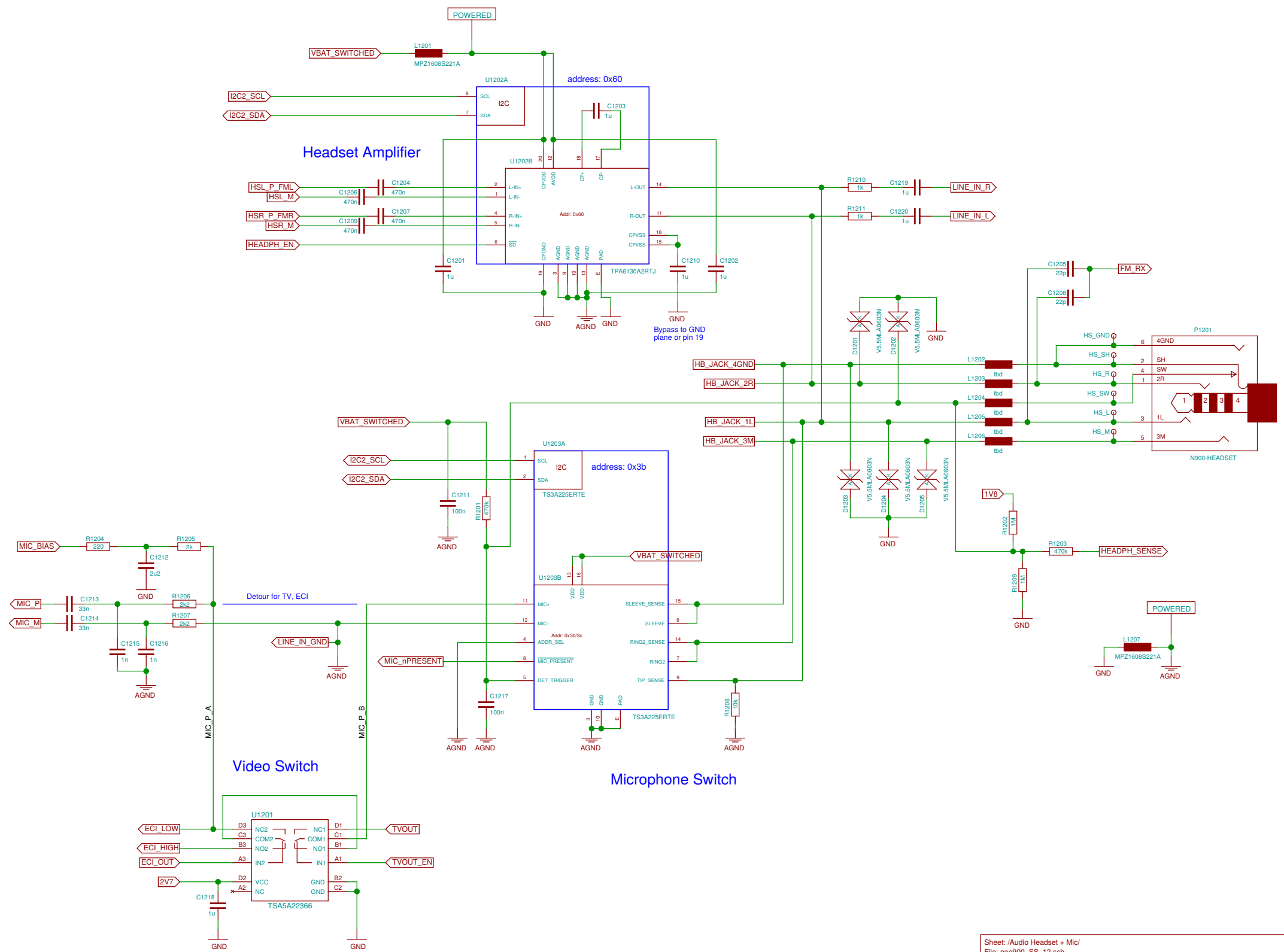
9-axis (acceleration, gyroscope, magnetometer)

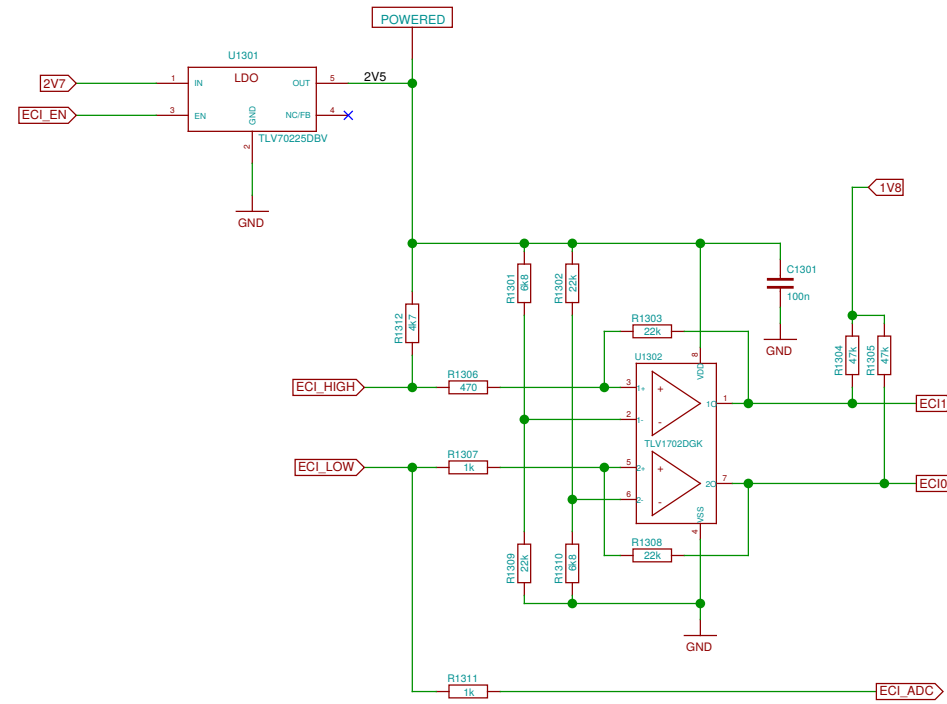


Sheet: /Sensors/		
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Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 10/37



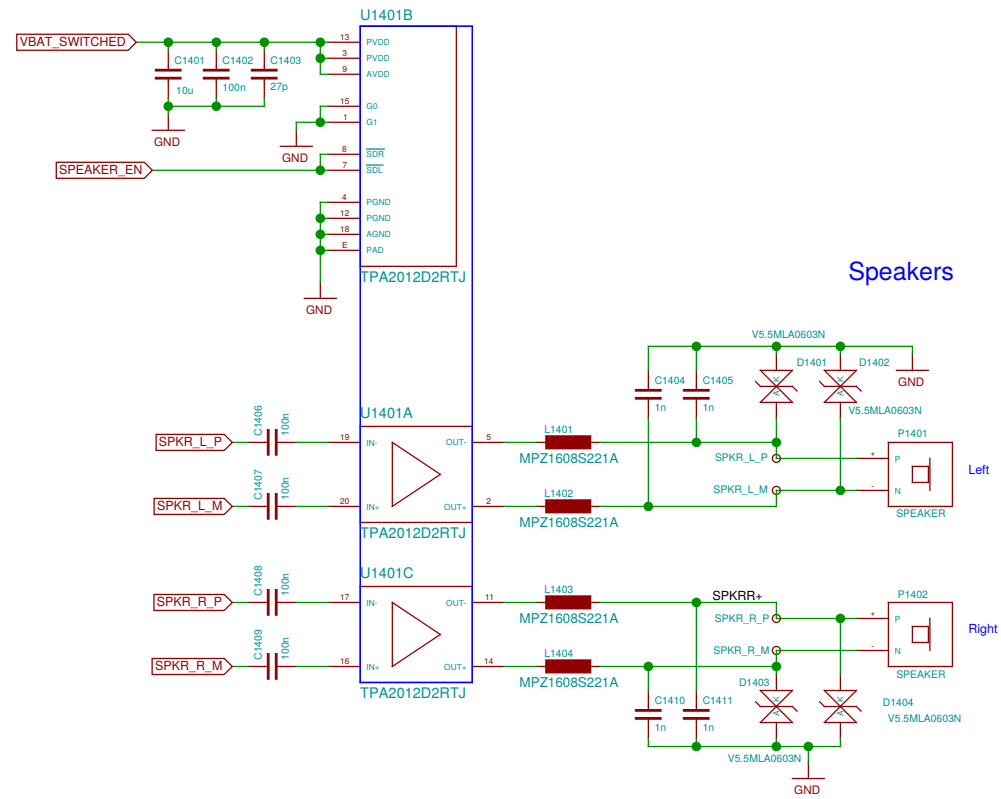
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File: neo900_SS_11.sch		
Title: Audio Codec		
Size: A3	Date: 2016-10-30 17:08:14	Rev:
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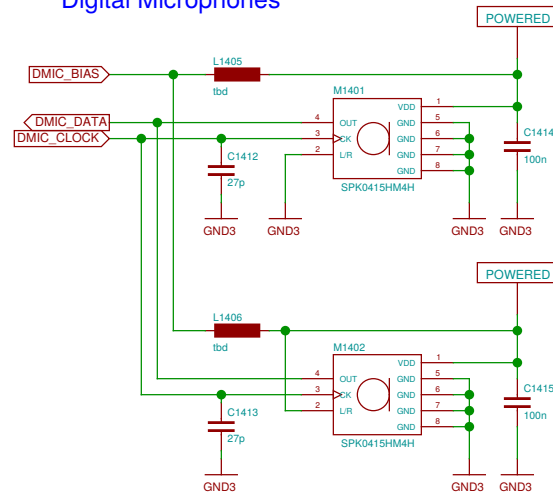


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Title: ECI		
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Hands-free



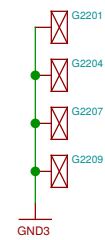
Digital Microphones



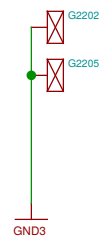
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Title: Audio Handsfree		
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Shield Contacts on UPPER

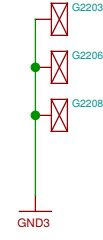
For the display



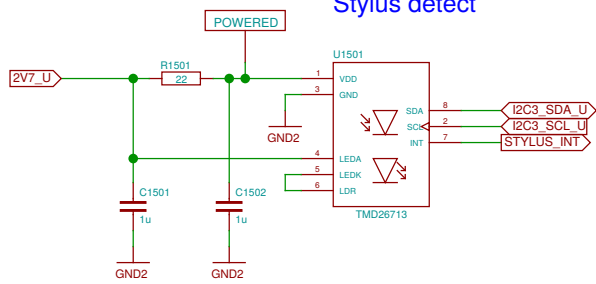
For the key mat



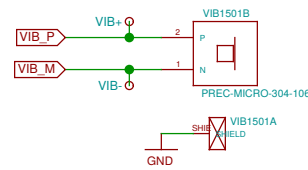
For the "key frame hook"



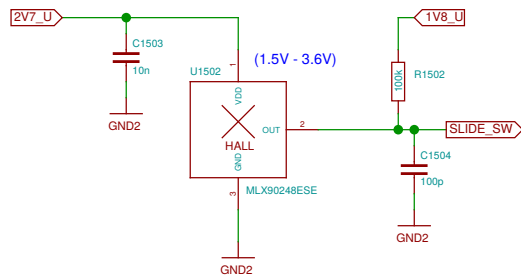
Stylus detect



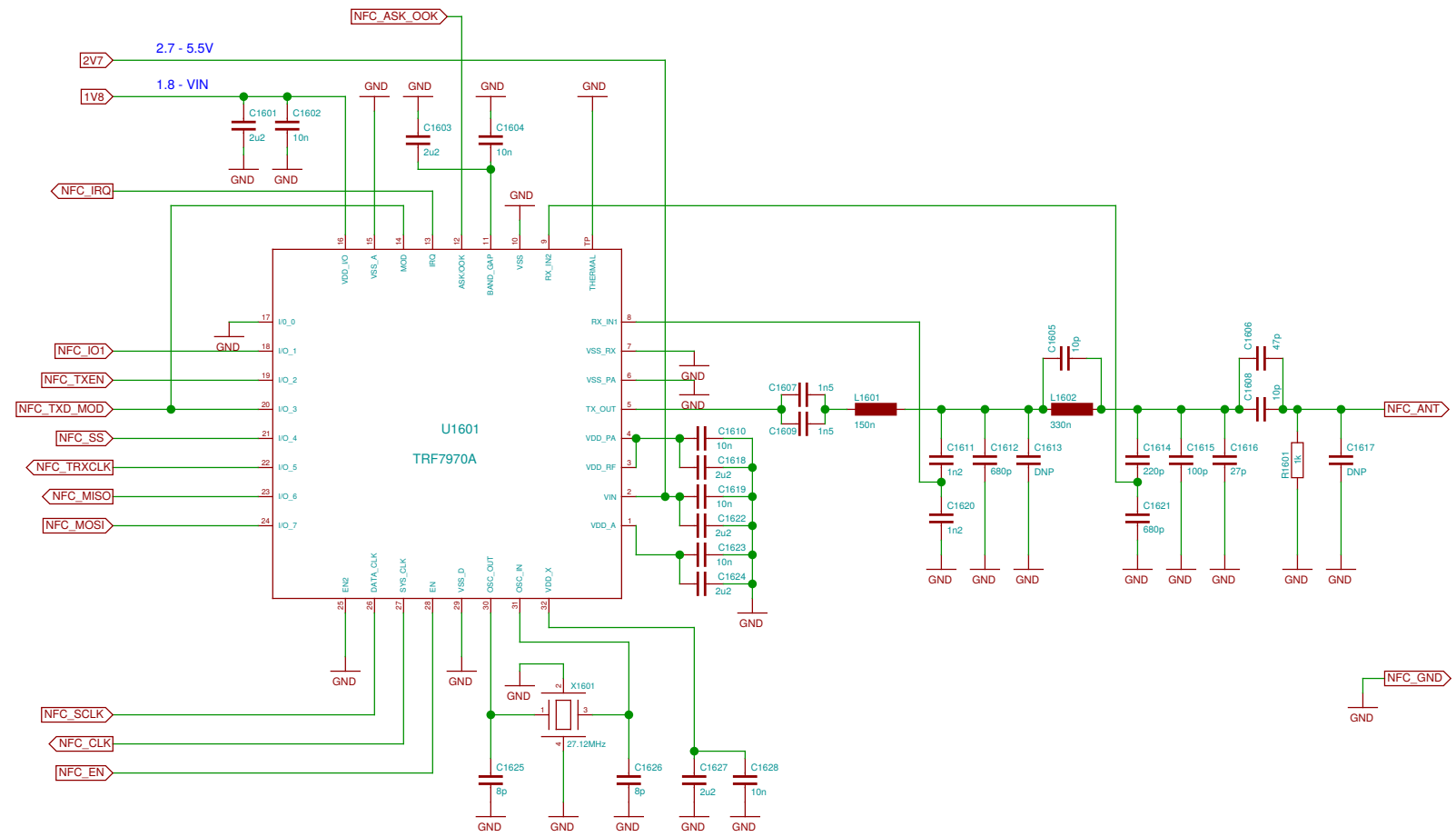
Vibramotor



Slide sensor

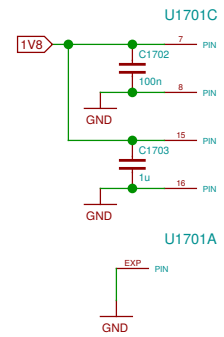
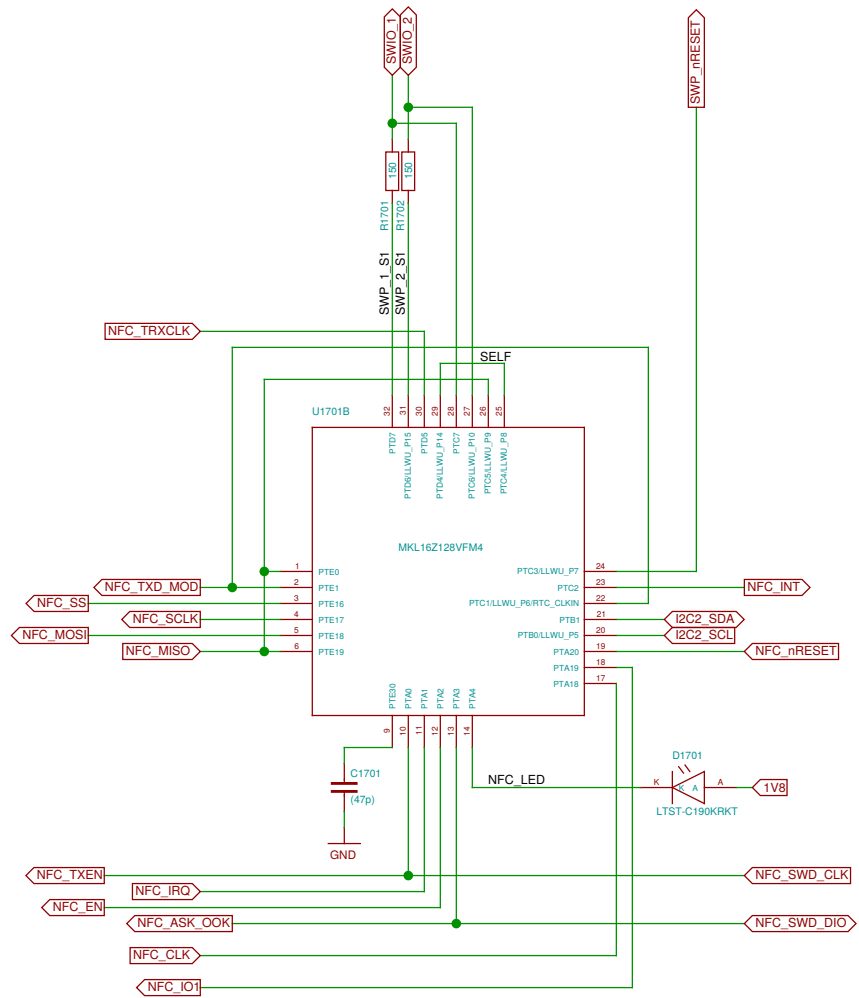


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Title: Misc		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 15/37



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

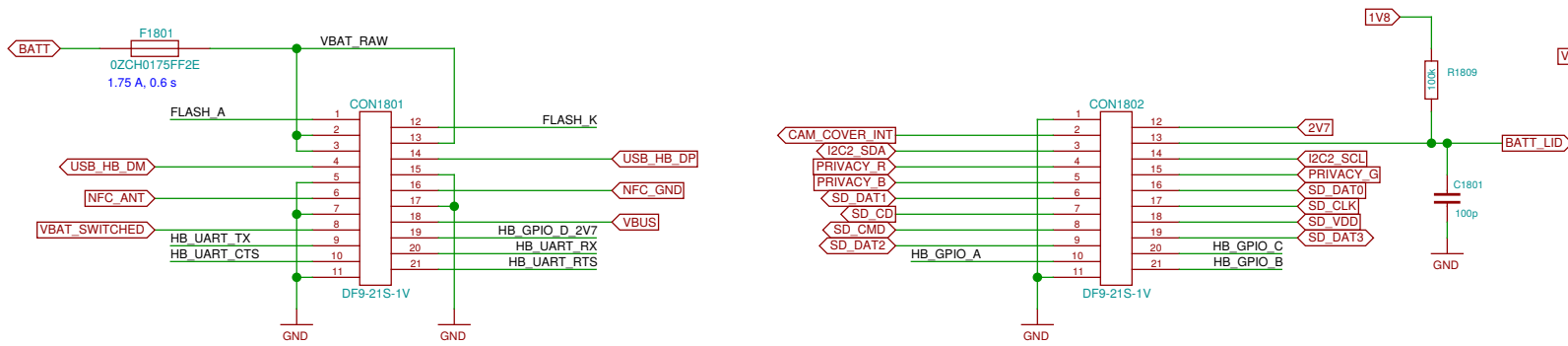
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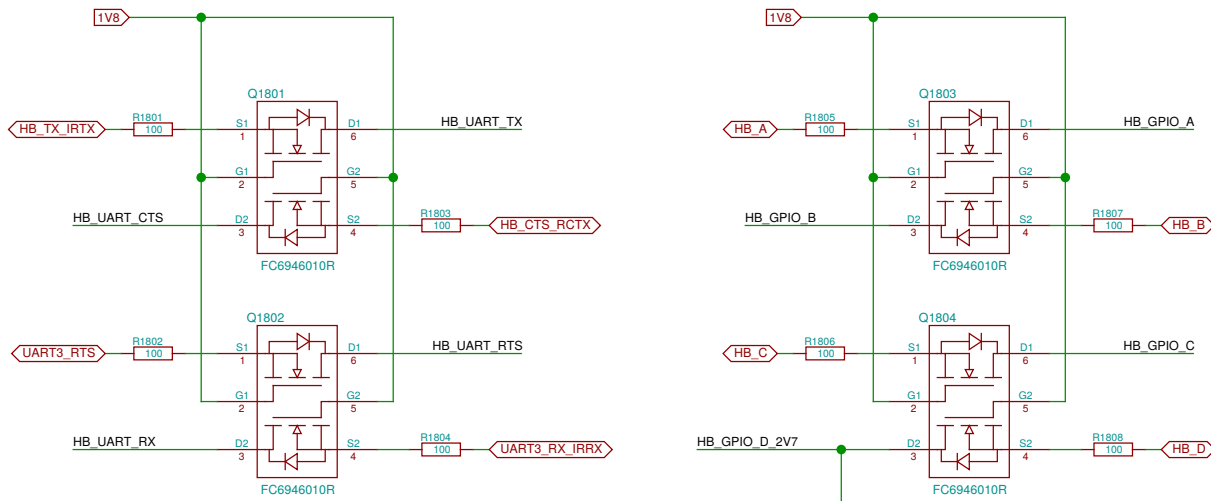
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File: neo900_SS_17.sch		
Title: RFID/NFC Controller		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 17/37

LOWER-BOB Interconnect (LOWER side)

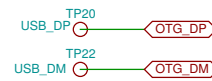
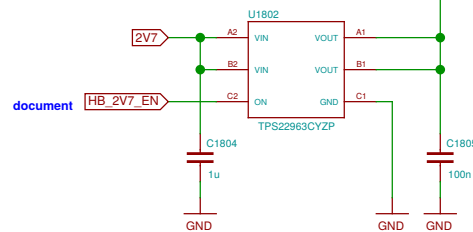
Defined in the Hackerbus specification, <http://neo900.org/stuff/papers/hb.pdf>



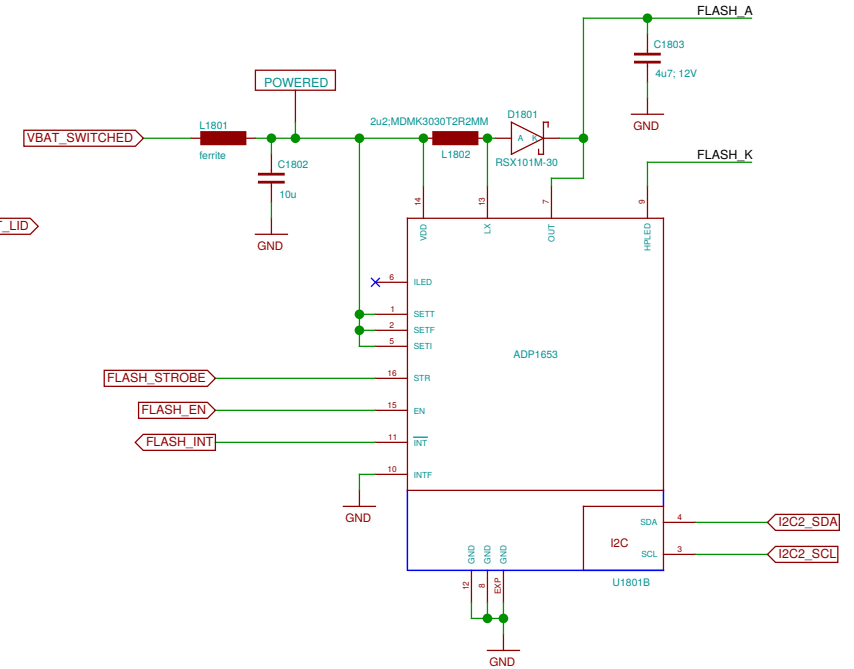
Level shifters for Hackerbus GPIO and UART



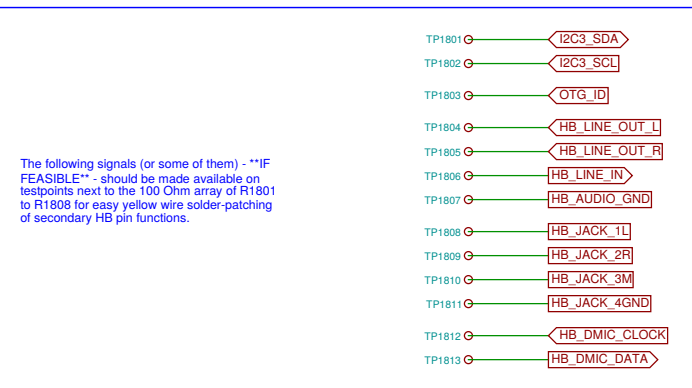
Q18xx alternative: Diodes DMN63D8LV



Flash/Torch

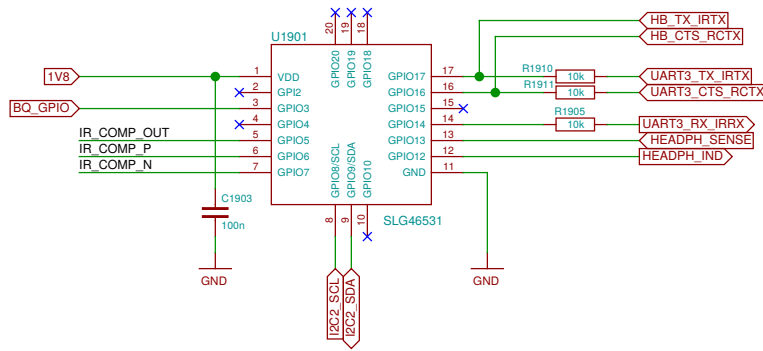
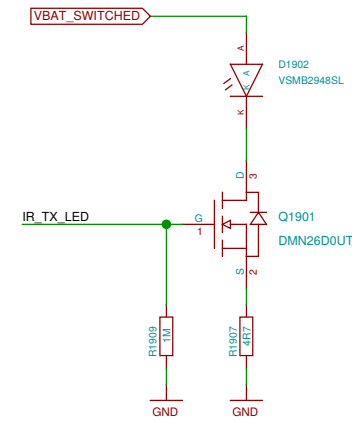
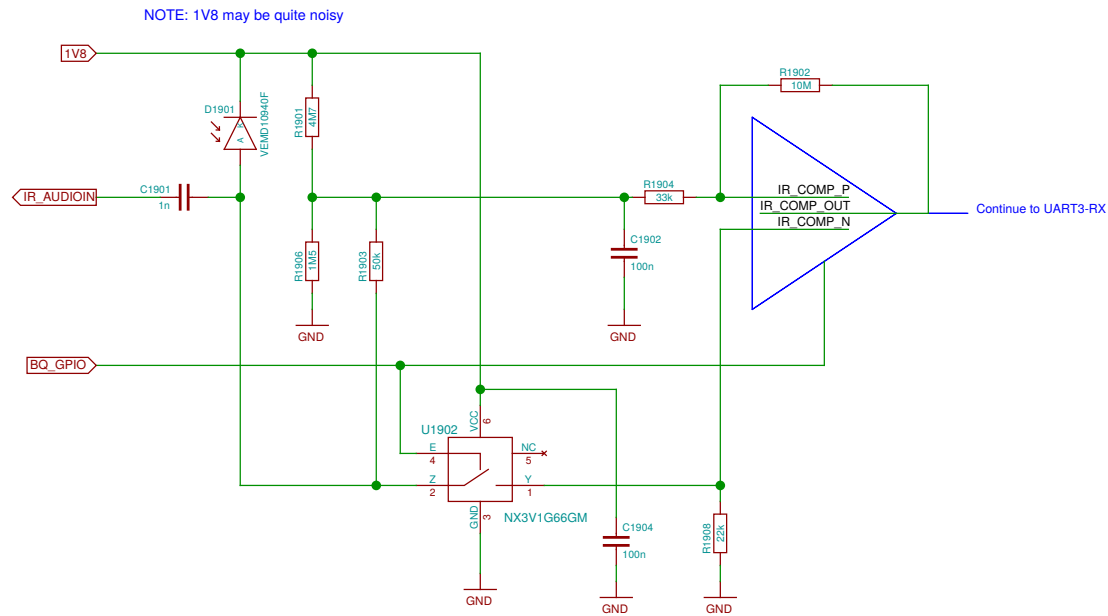


Patchfield



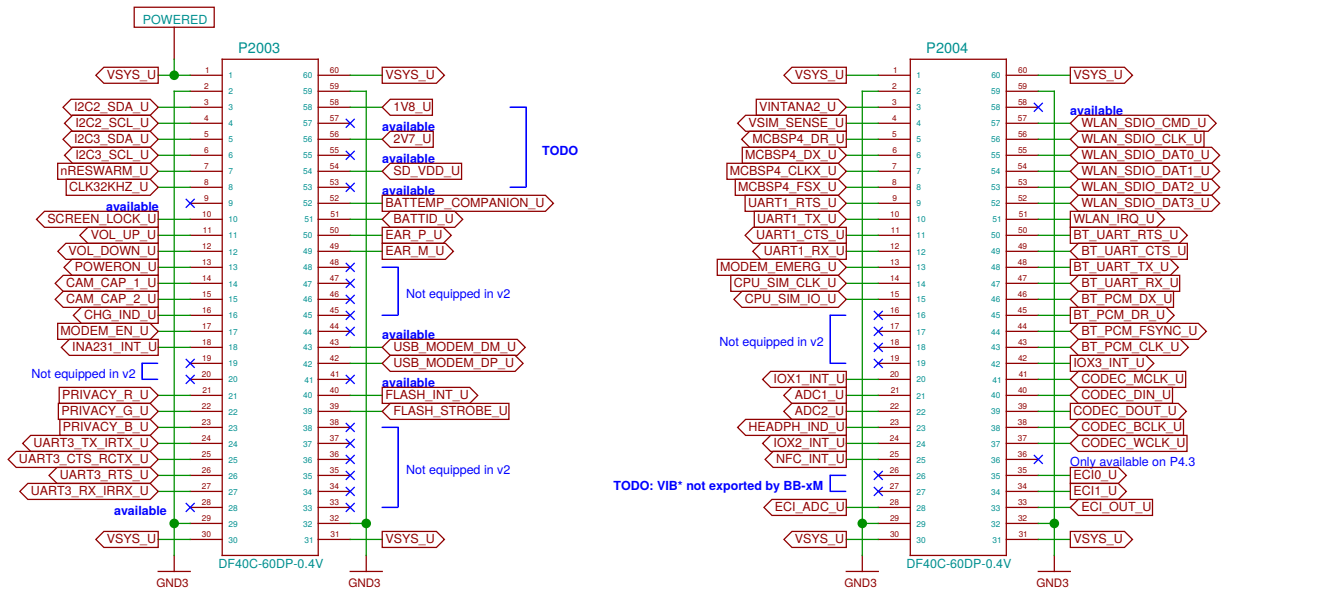
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Title: Hackerbus		
Size: A3	Date: 2016-10-30 17:08:14	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 18/37

TODO: update D1901 footprint

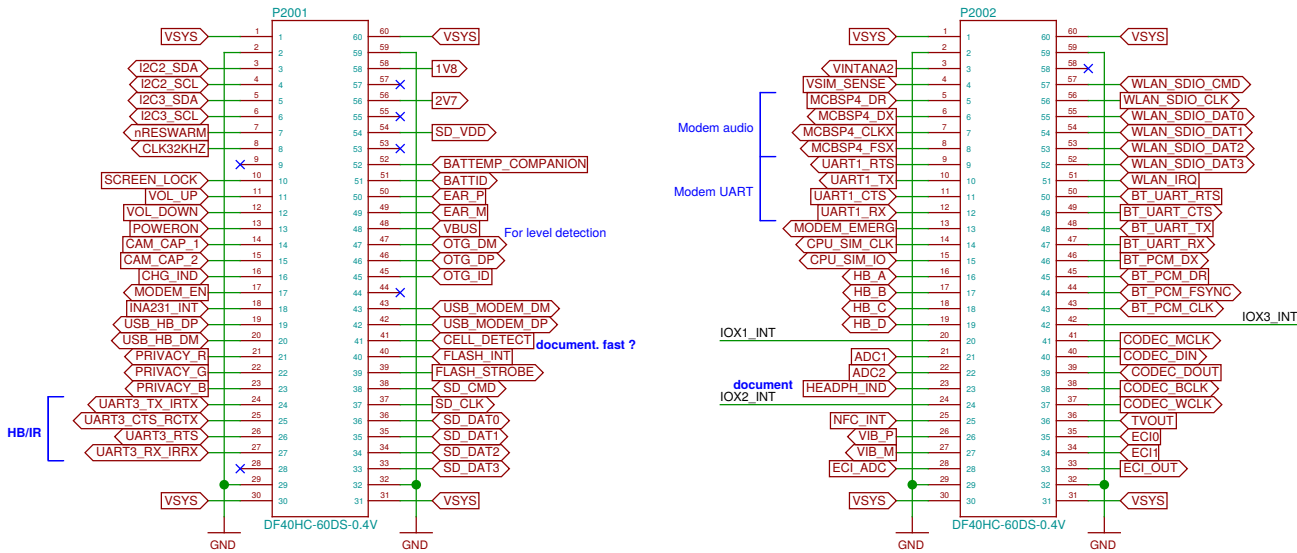


Sheet: /Infrared/ File: neo900_SS_19.sch		
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Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 19/37

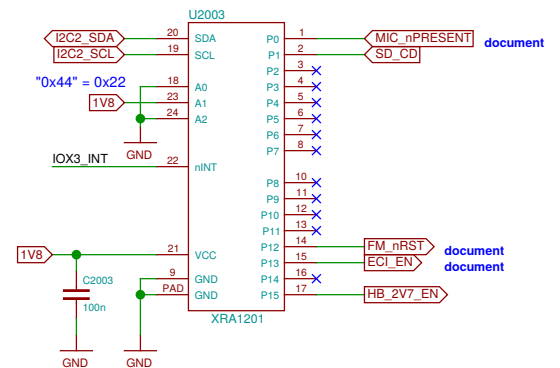
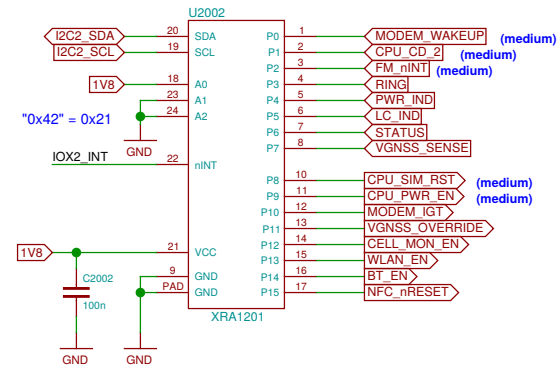
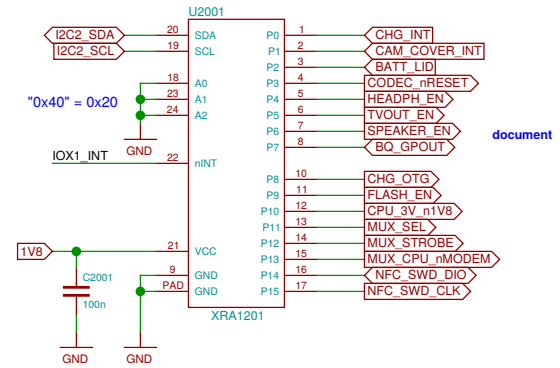
This is just the collection of signals we have. Proper assignment still pending.



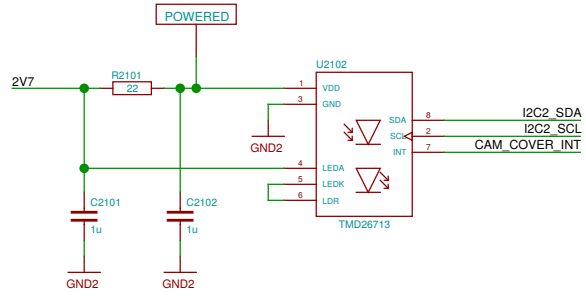
UPPER
LOWER



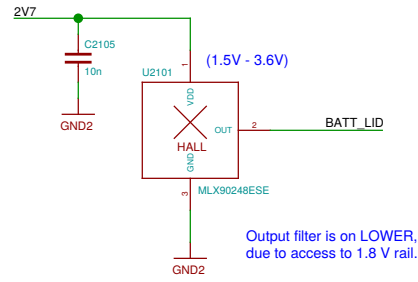
Current rating per contact: 0.3 A



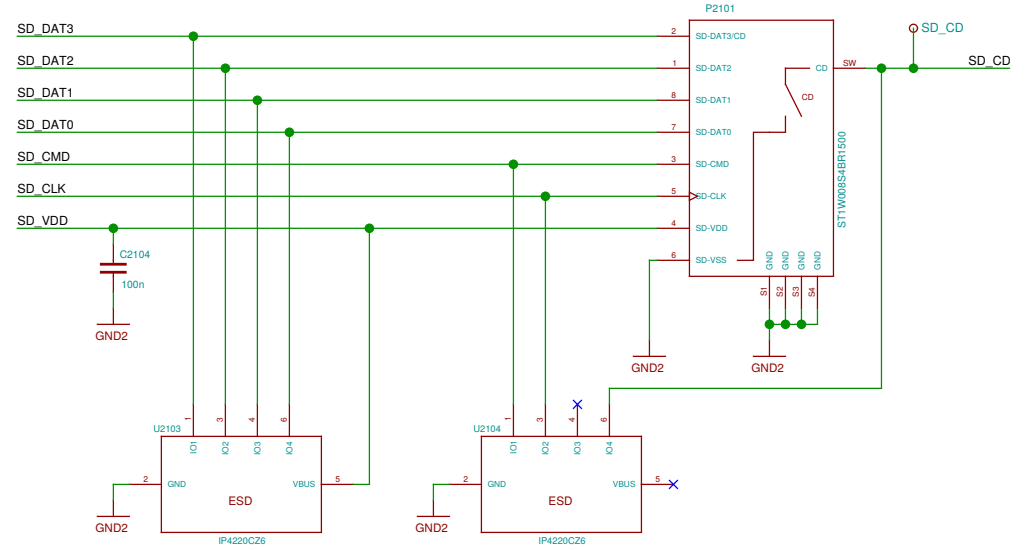
Camera Cover detect



Battery Cover detect

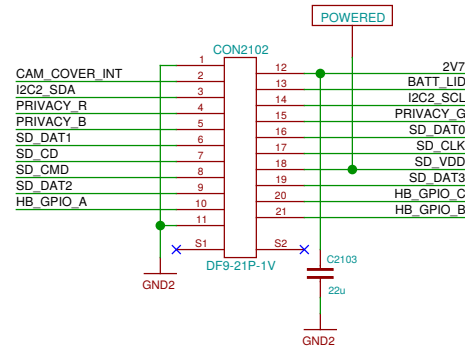
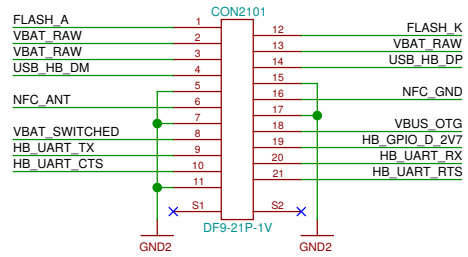


Memory card holder

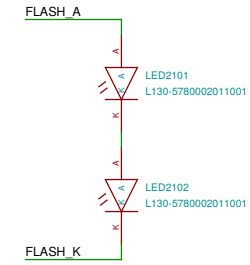


LOWER-BOB Interconnect (BOB side)

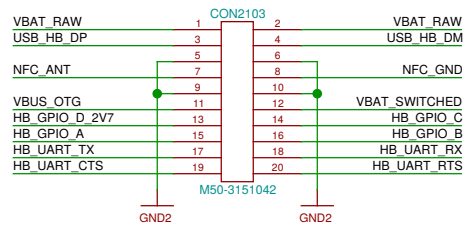
Defined in the Hackerbus specification, <http://neo900.org/stuff/papers/hb.pdf>



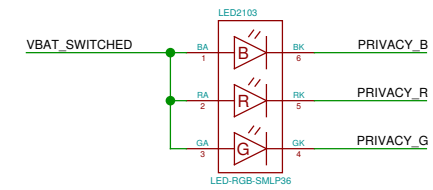
Camera flash



Hackerbus



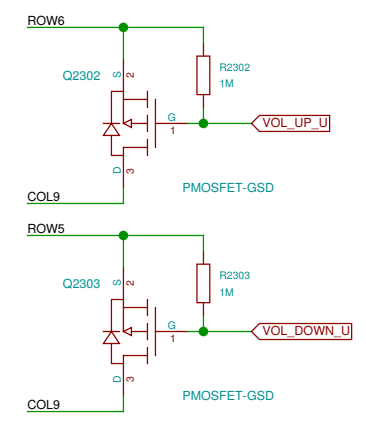
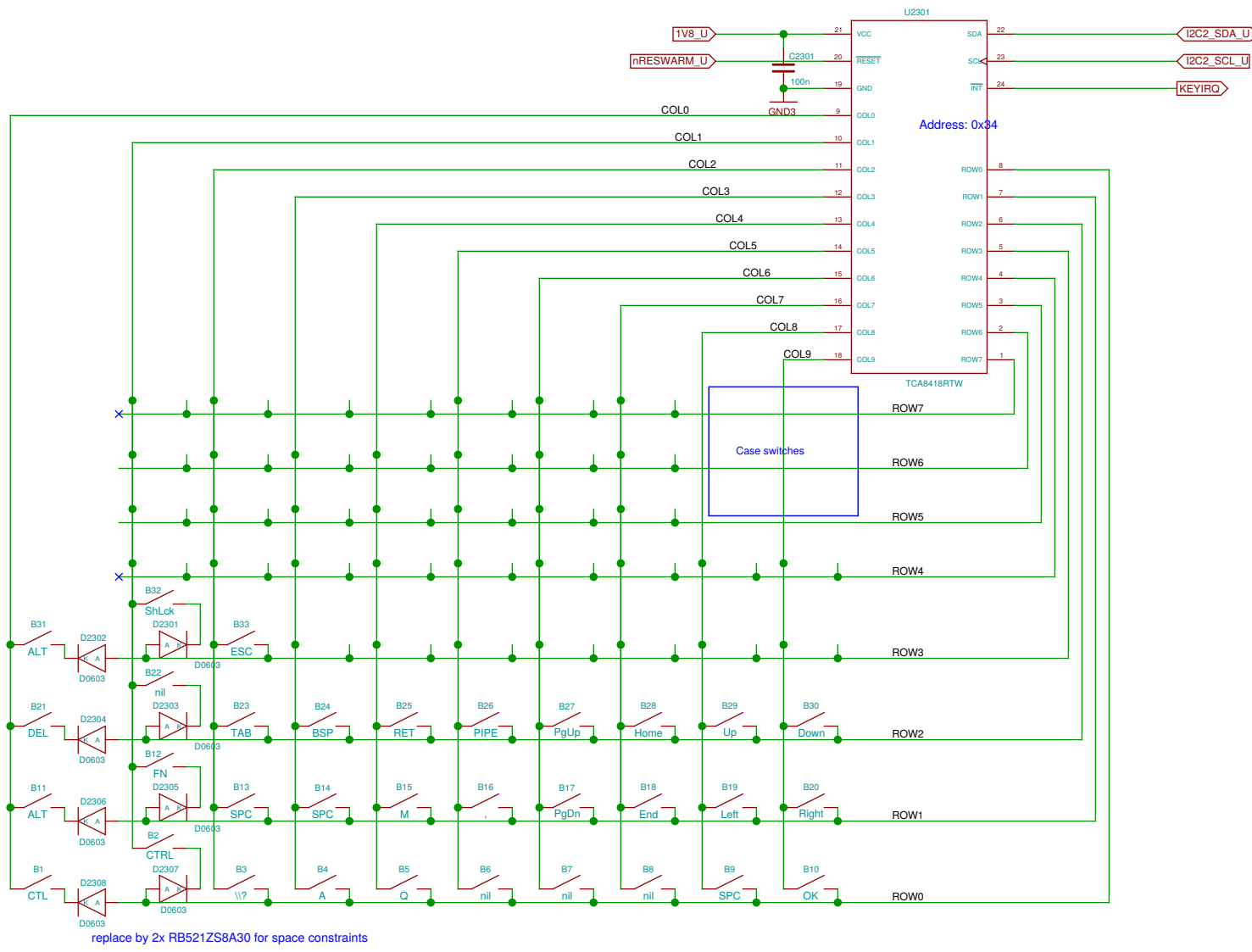
Privacy LED



Sheet: /uSD Breakout Board/ File: neo900_SS_21.sch		
Title: uSD Breakout Board		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 21/37

TODO: consider sheet for deletion

Sheet: /empty/ File: neo900_SS_22.sch		
Title: empty		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 22/37



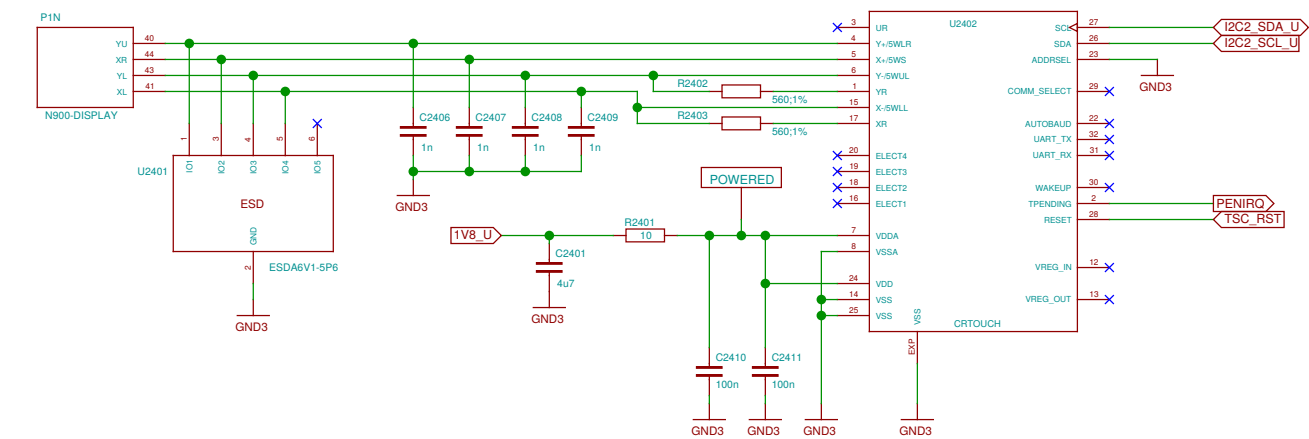
TODO: key names are nonsense

TODO: rearrange matrix to avoid diodes ?

Sheet: /Keypad/		
File: neo900_SS_23.sch		
Title: Keypad		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 23/37

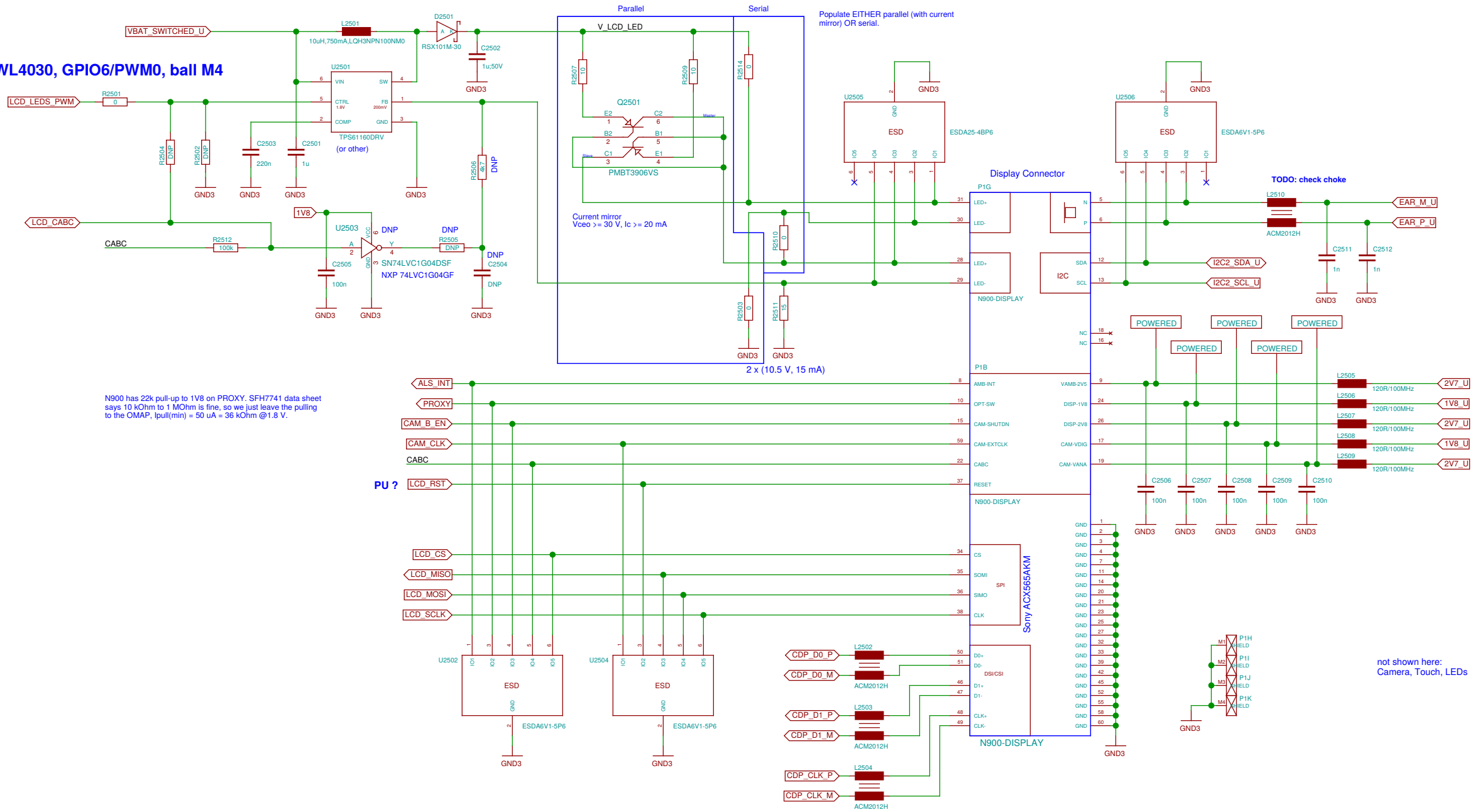
Resistive Touch (display connector)

Touch screen controller



Sheet: /Display-Peripherals/ File: neo900_SS_24.sch		
Title: Display-Peripherals		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 24/37

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.

PU ?

Populate EITHER parallel (with current mirror) OR serial.

Current mirror
V_{ceo} >= 30 V, I_c >= 20 mA

2 x (10.5 V, 15 mA)

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: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		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: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 26/37

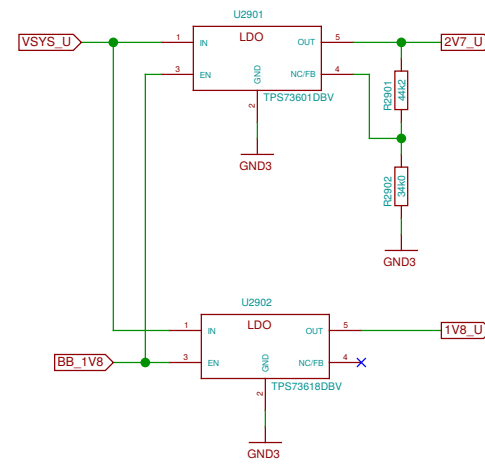
eMMC is not part of v2

Sheet: /eMMC/ File: neo900_SS_27.sch		
Title: eMMC		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 27/37

Companion chip (TPS65950) is not part of v2

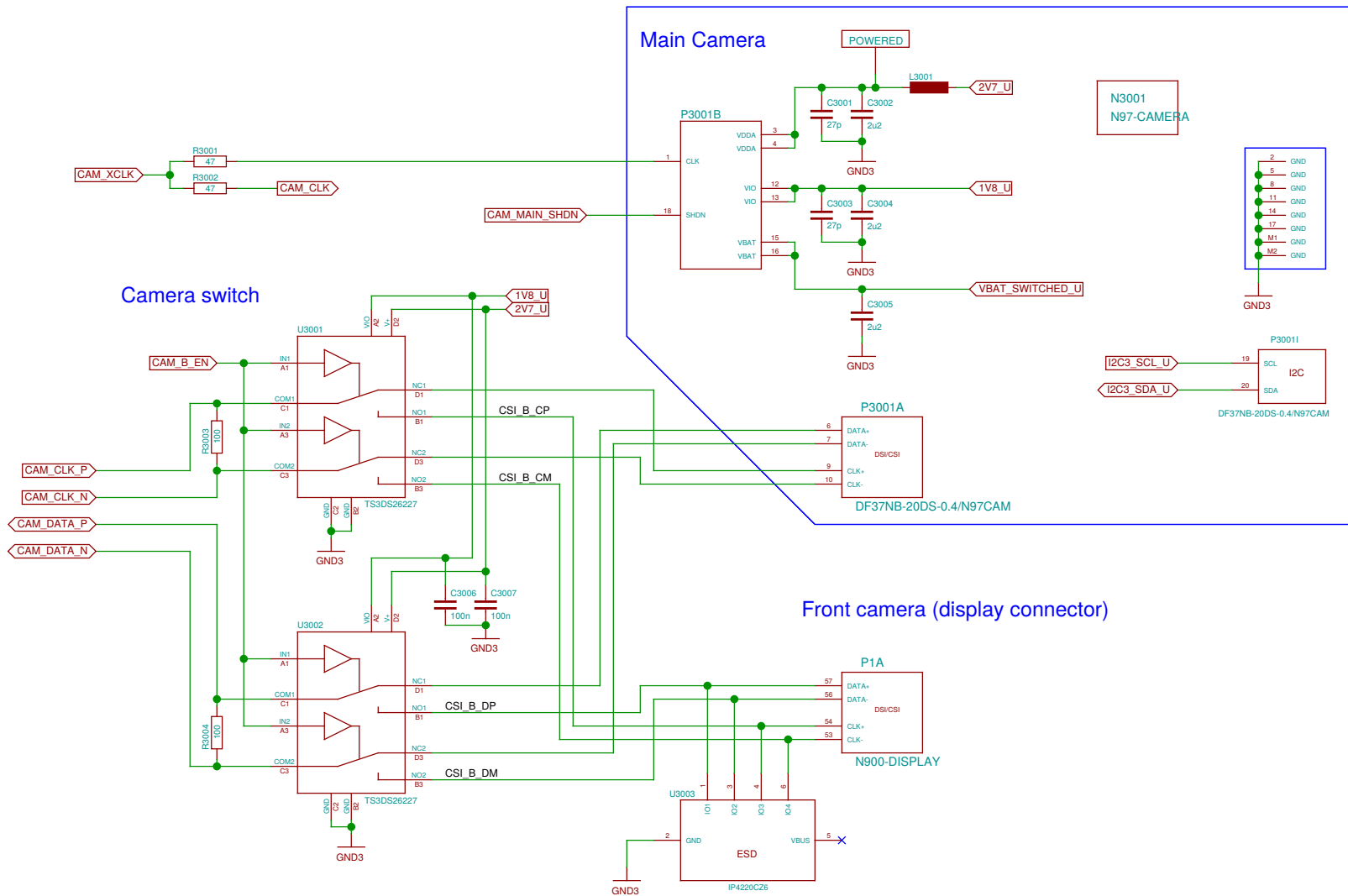
Sheet: /PMU+Codec/ File: neo900_SS_28.sch		
Title: PMU+Codec		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 28/37

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

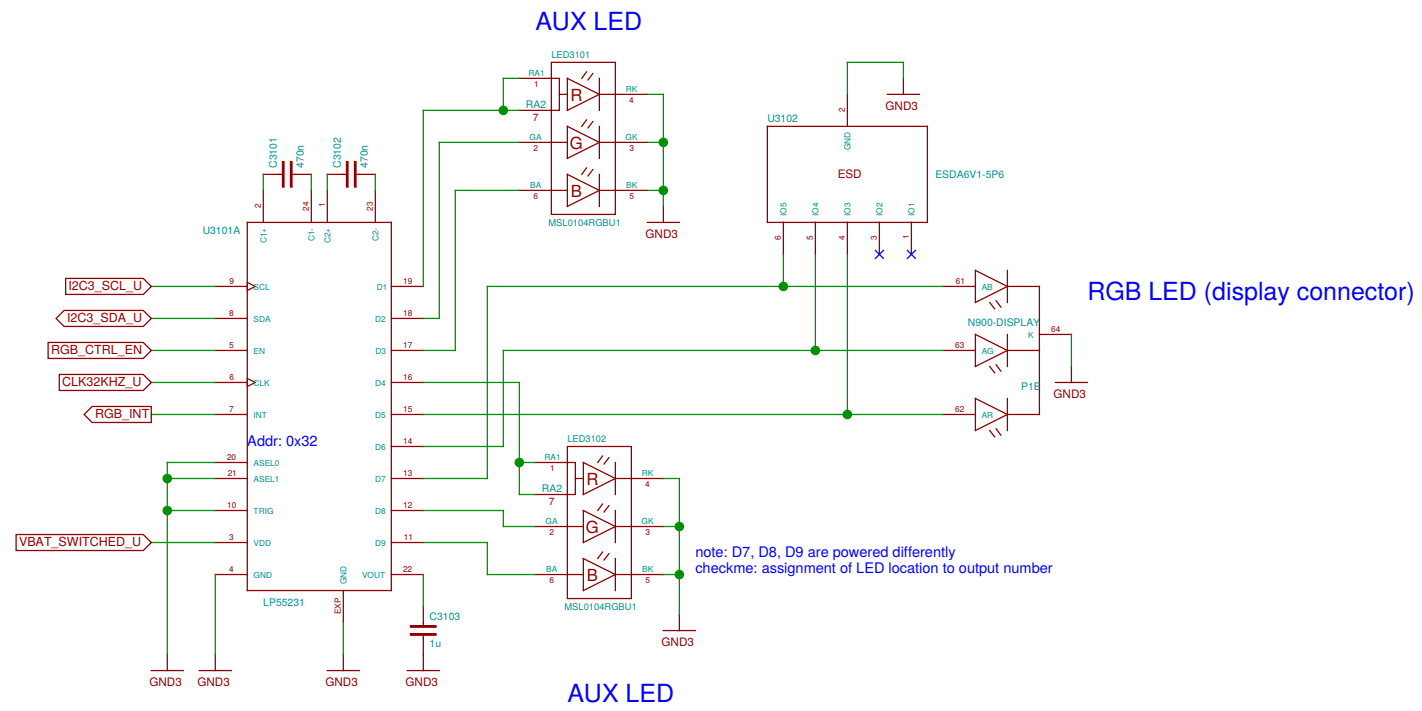


TODO: use REGEN ?

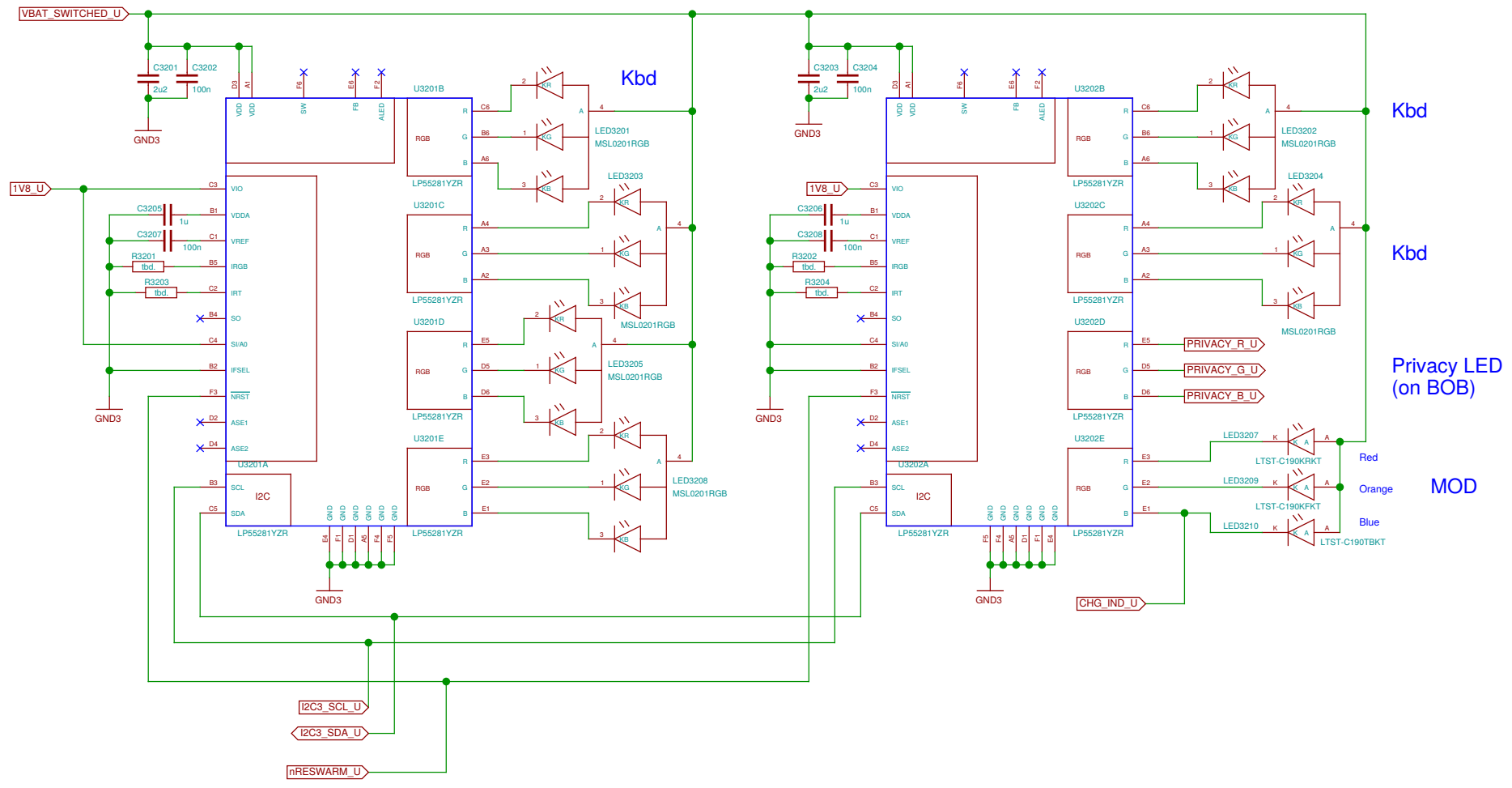
Sheet: /BB-XM Dummy (TWL4030)/		
File: neo900_SS_29.sch		
Title: BB-XM Dummy (TWL4030)		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 29/37



Sheet: /Camera/ File: neo900_SS_30.sch		
Title: Camera		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 30/37



Sheet: /Fancy LEDs/		
File: neo900_SS_31.sch		
Title: Fancy LEDs		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 31/37

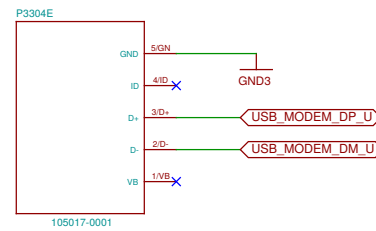


Sheet: /Basic LEDs/		Date: 2016-10-28 21:16:24	
File: neo900_SS_32.sch		Rev:	
Title: Basic LEDs			
Size: A3	Date: 2016-10-28 21:16:24		Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z			Id: 32/37

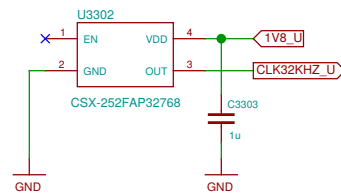
Cleaning up. The connections to BB-xM are on the next sheets.

connect to BB
by some Micro-USB cable

Modem USB



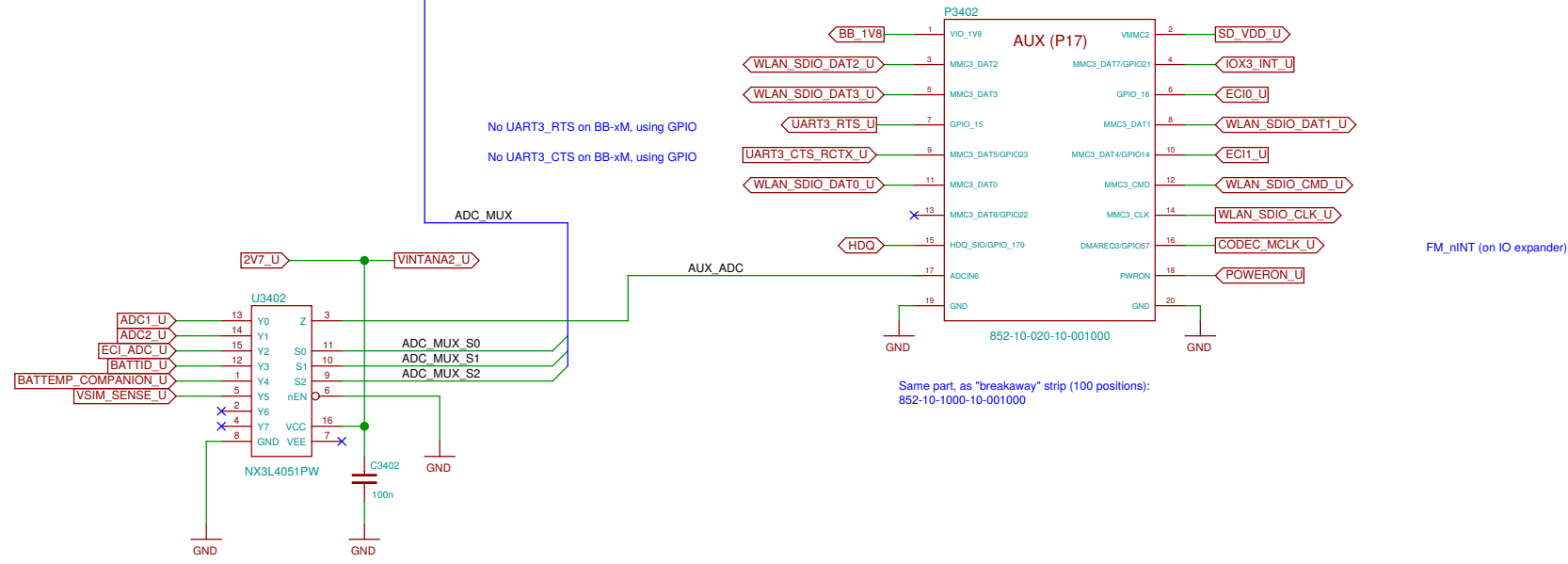
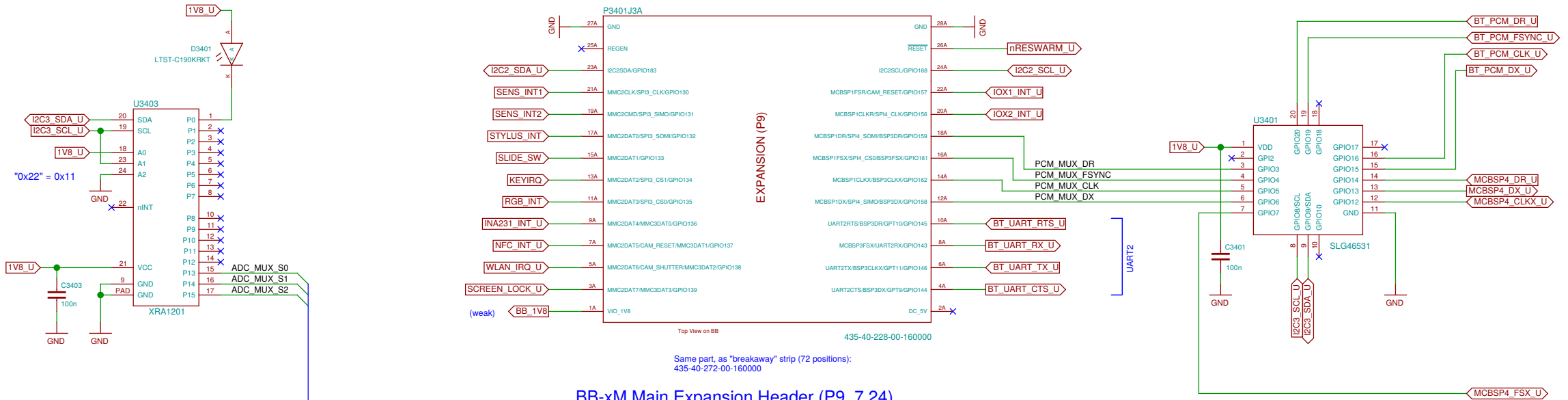
32 kHz clock



Alternative: OYKTGLJANF-0.032768

Sheet: /Connector to BB-XM/ File: neo900_SS_33.sch		
Title: Connector to BB-XM		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 33/37

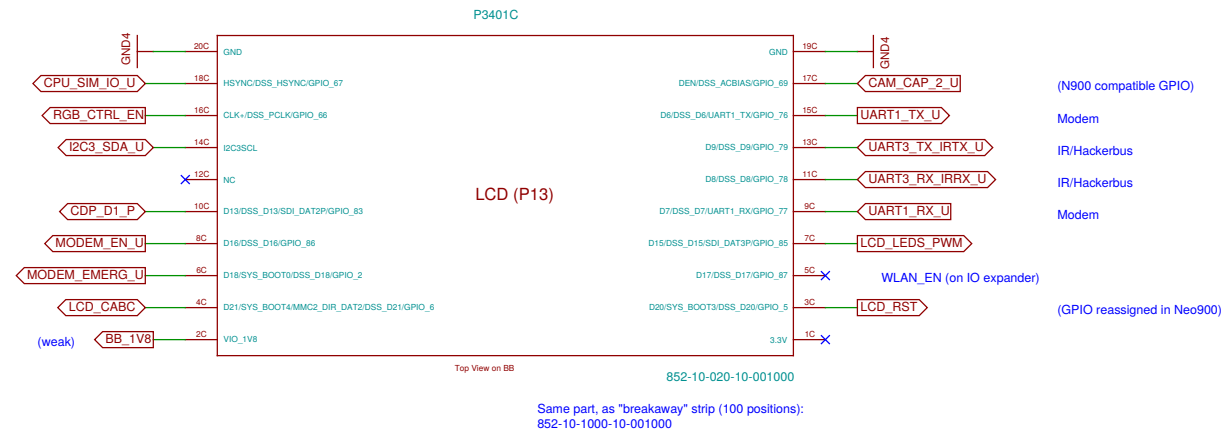
TODO: update pin names in footprint



P11 (7.25)



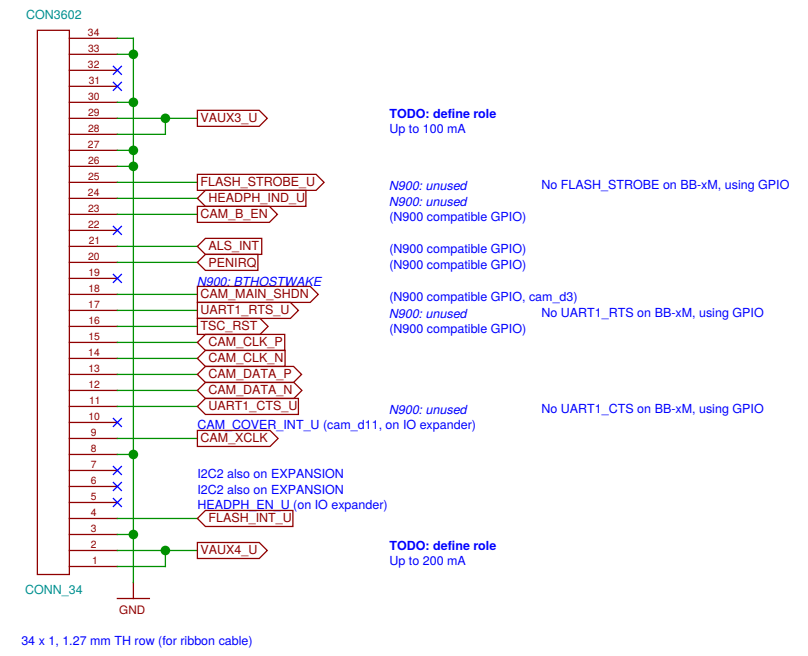
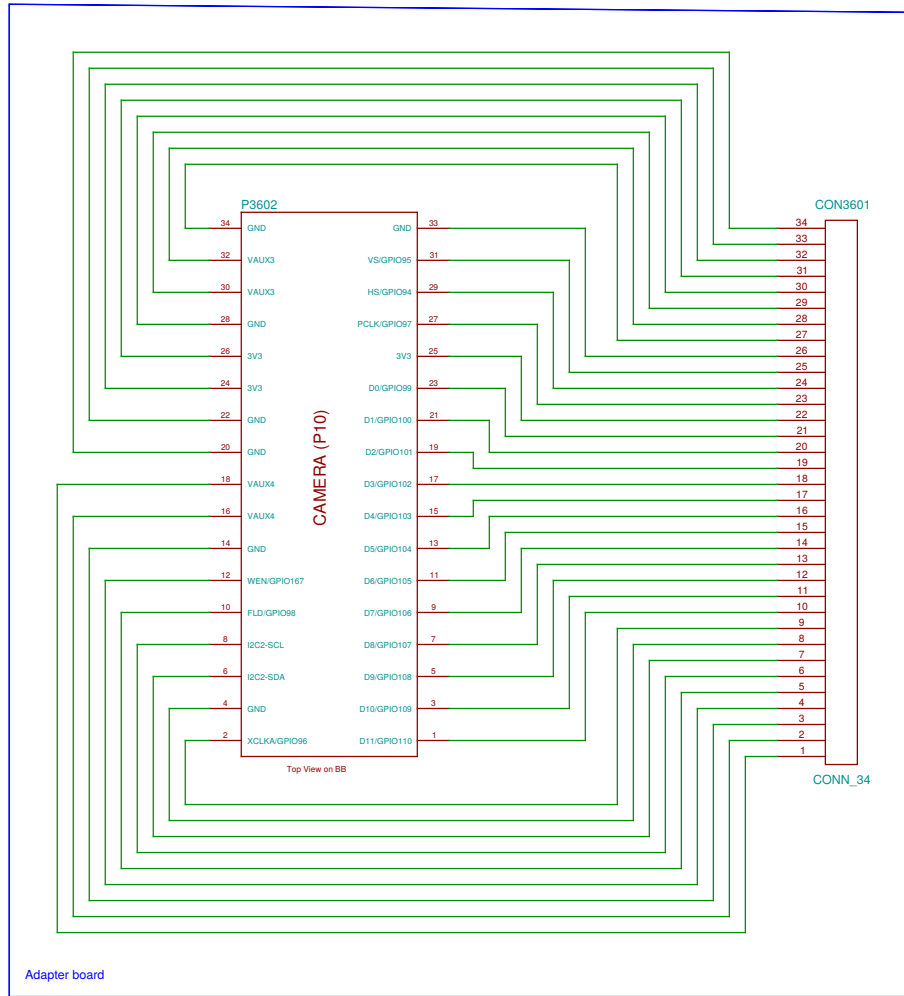
P13 (7.25)



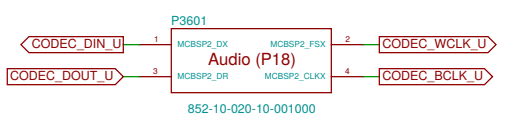
TODO: update pin names in footprint

Sheet: /BB-XM Adapter (DISP)/		
File: neo900_SS_35.sch		
Title: BB-XM Adapter (DISP)		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		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: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		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

Sheet: /No-Solder Components/ File: neo900_SS_37.sch		
Title: No-Solder Components		
Size: A3	Date: 2016-10-28 21:16:24	Rev:
Plotted by eeshow 07e710f+ 20161030-15:27Z		Id: 37/37