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

[BB-XM Adapter \(CAM\)](#)

File: neo900_SS_36.sch

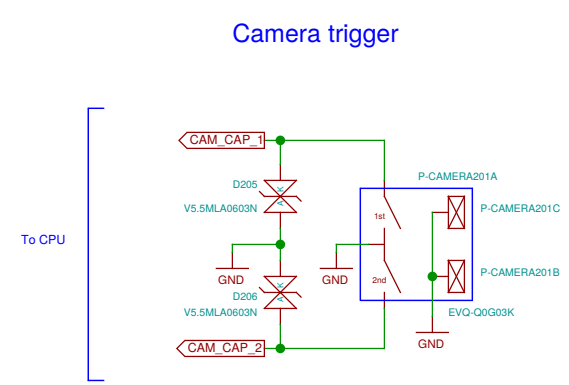
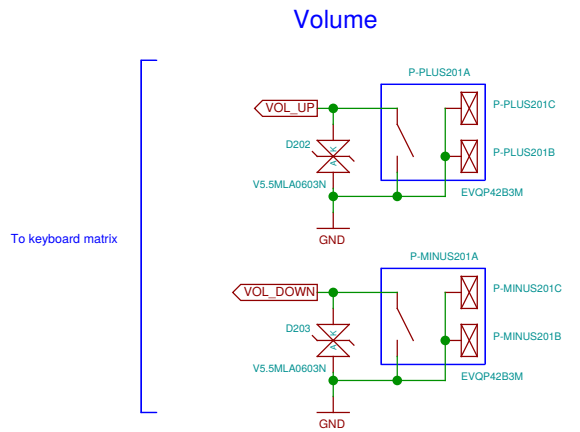
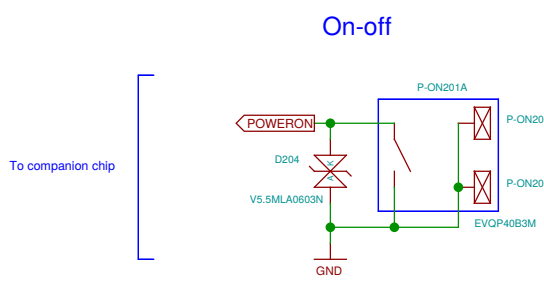
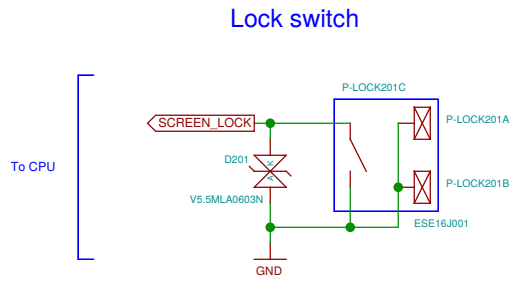
Sheet: [No-Solder Components](#)

[No-Solder Components](#)

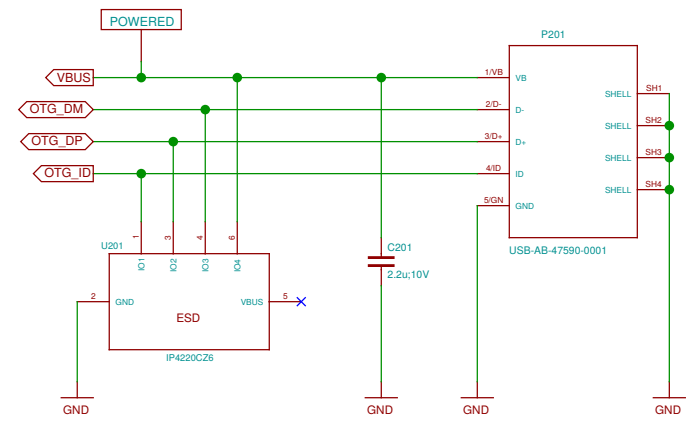
File: neo900_SS_37.sch

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		

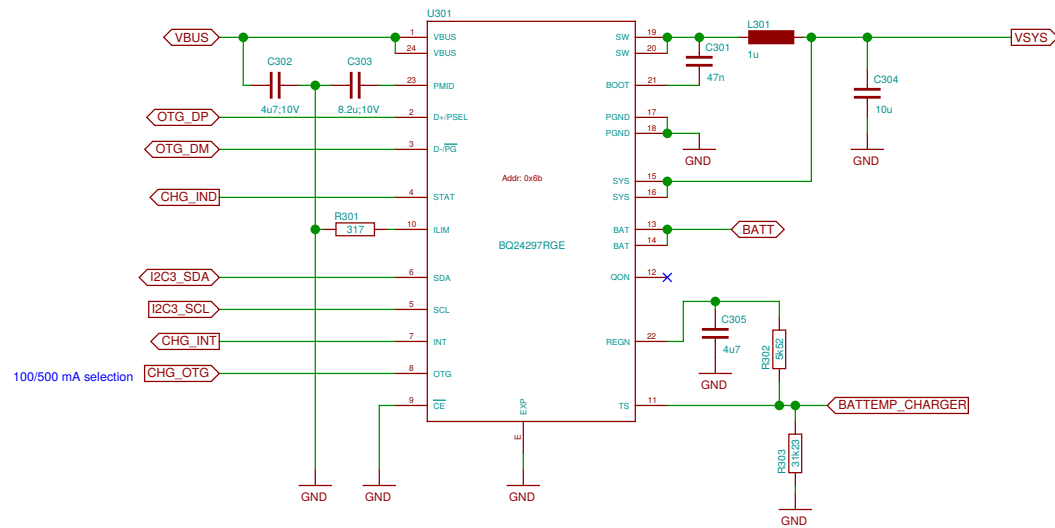


USB OTG connector



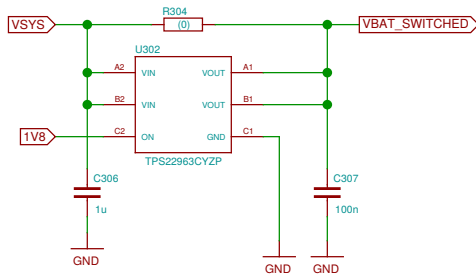
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Title: OTG		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 2/37

Battery charger with USB OTG

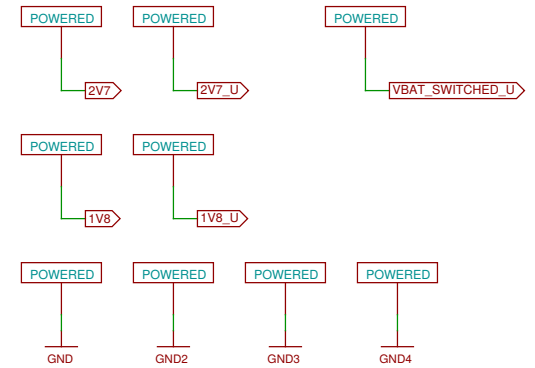


Power distribution and sequencing

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

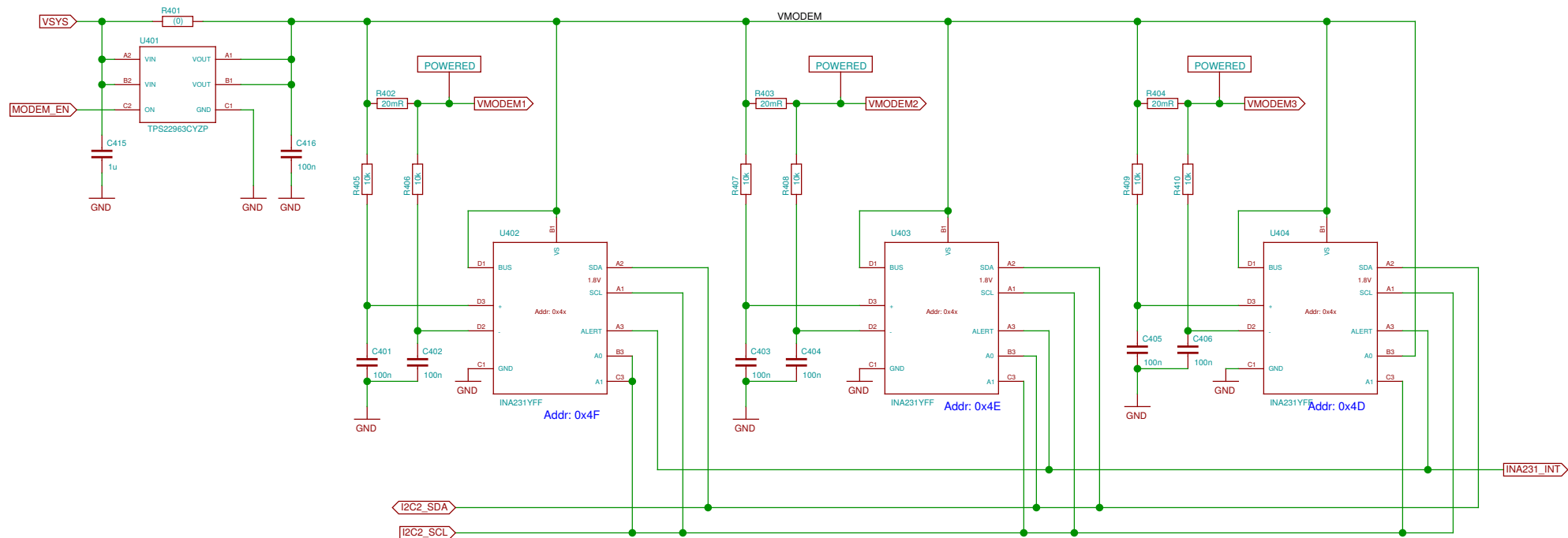


KiCad bureaucracy

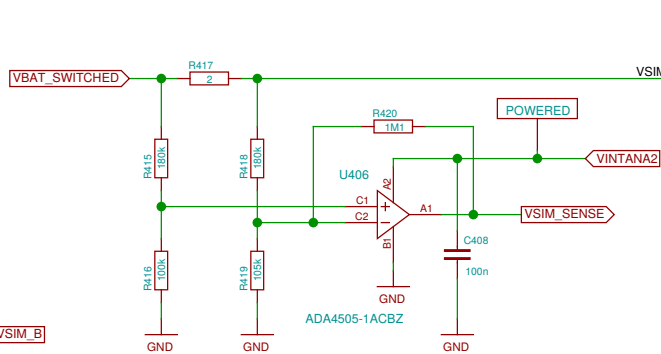


Sheet: /Charger/OTG-Booster/		
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Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 3/37

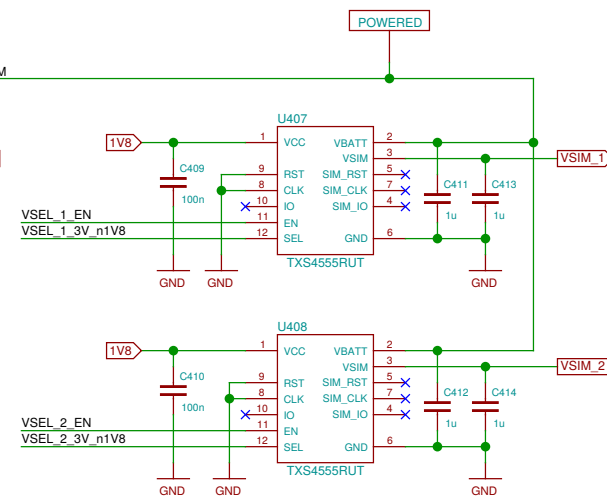
Modem current monitor



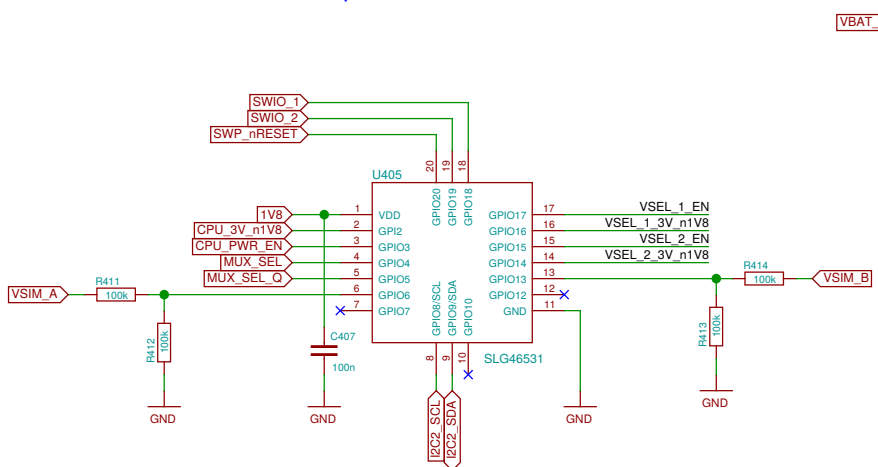
SIM current sensing



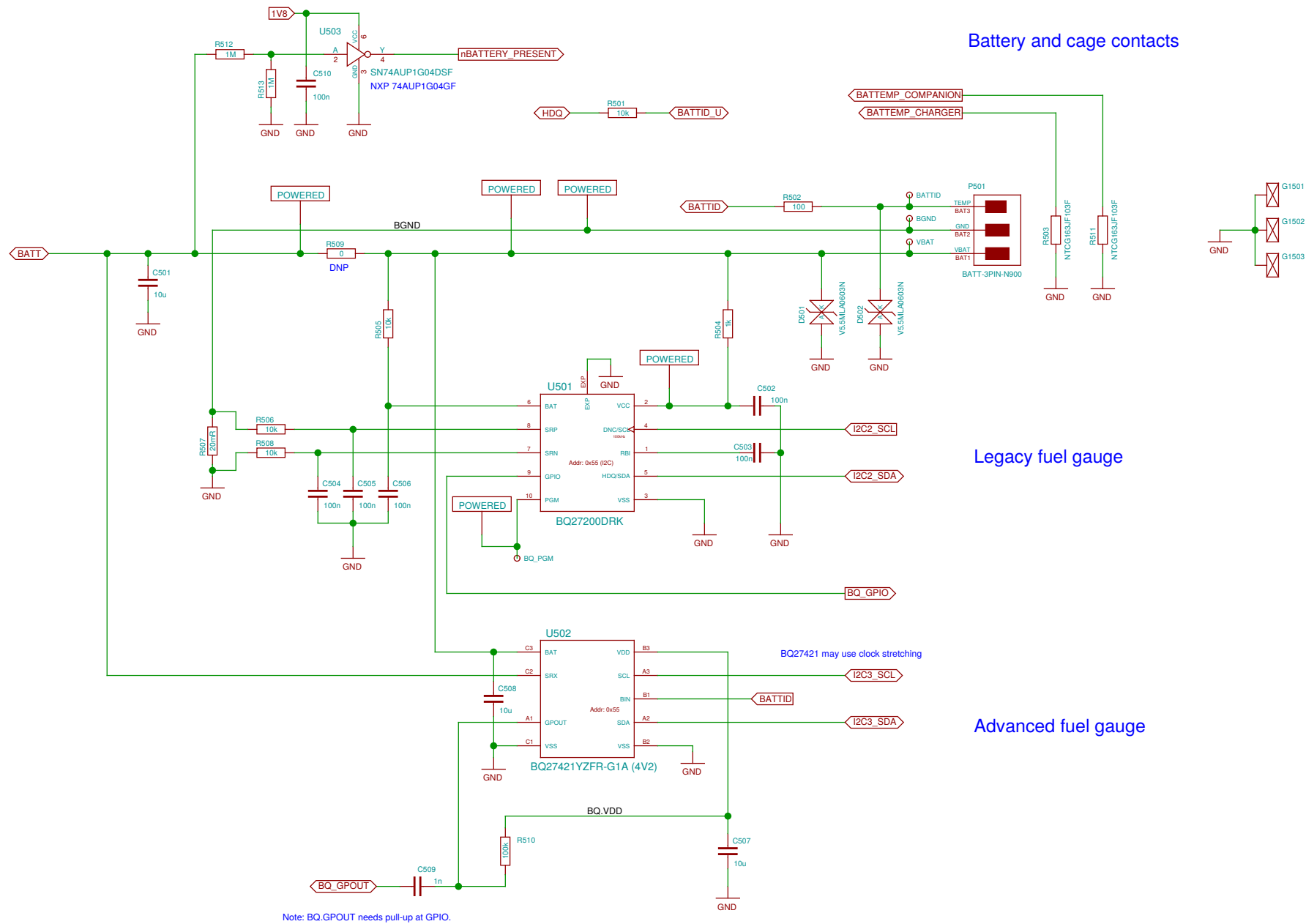
SIM power supply



SIM power selection

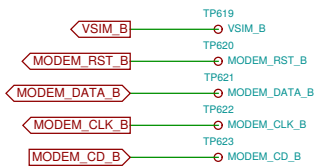


TODO: update SLG design for changed pins

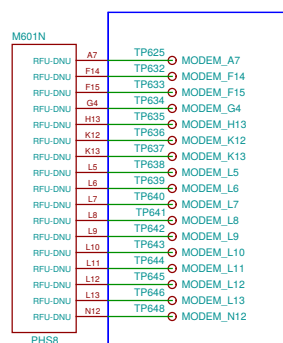


Sheet: /Fuel Gauge/		
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Plotted by eeshow 01atb57+ 20161103-02:14Z		Id: 5/37

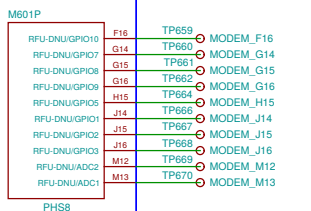
SIM B bus



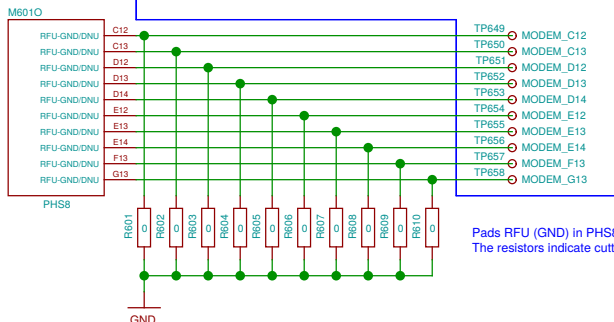
17+10+10 = 37 test points. PCB space permitting, to be in arranged a 6 x 6 + 1 grid with 1.0 mm pitch. This patchfield is to be placed adjacent to the SIM B bus test points.



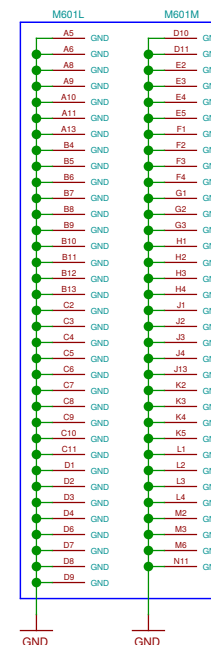
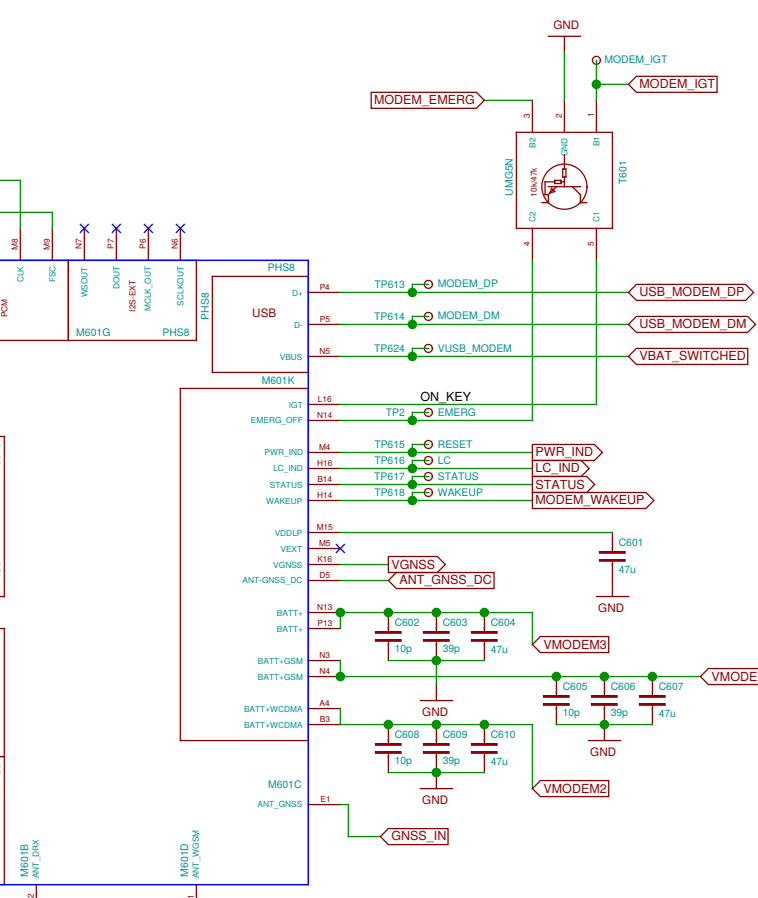
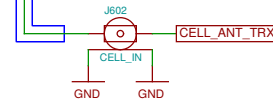
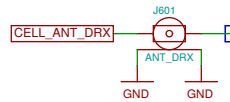
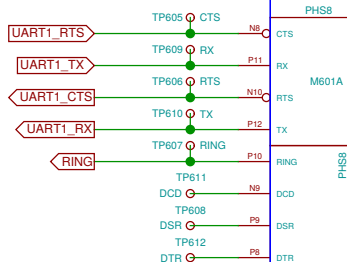
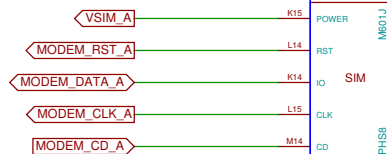
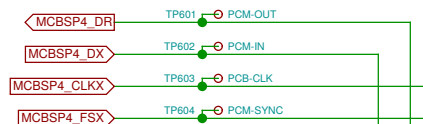
Pads that are DNU in PHS8 and PLS8.



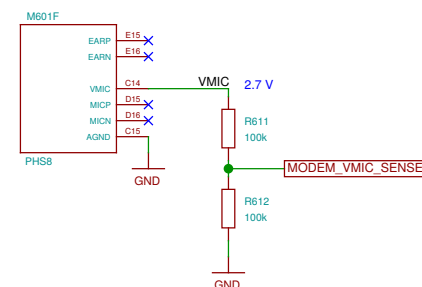
Pads that are DNU in PHS8 but have a GPIO or ADC function assigned to them in PLS8.



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



Anti-eavesdropping

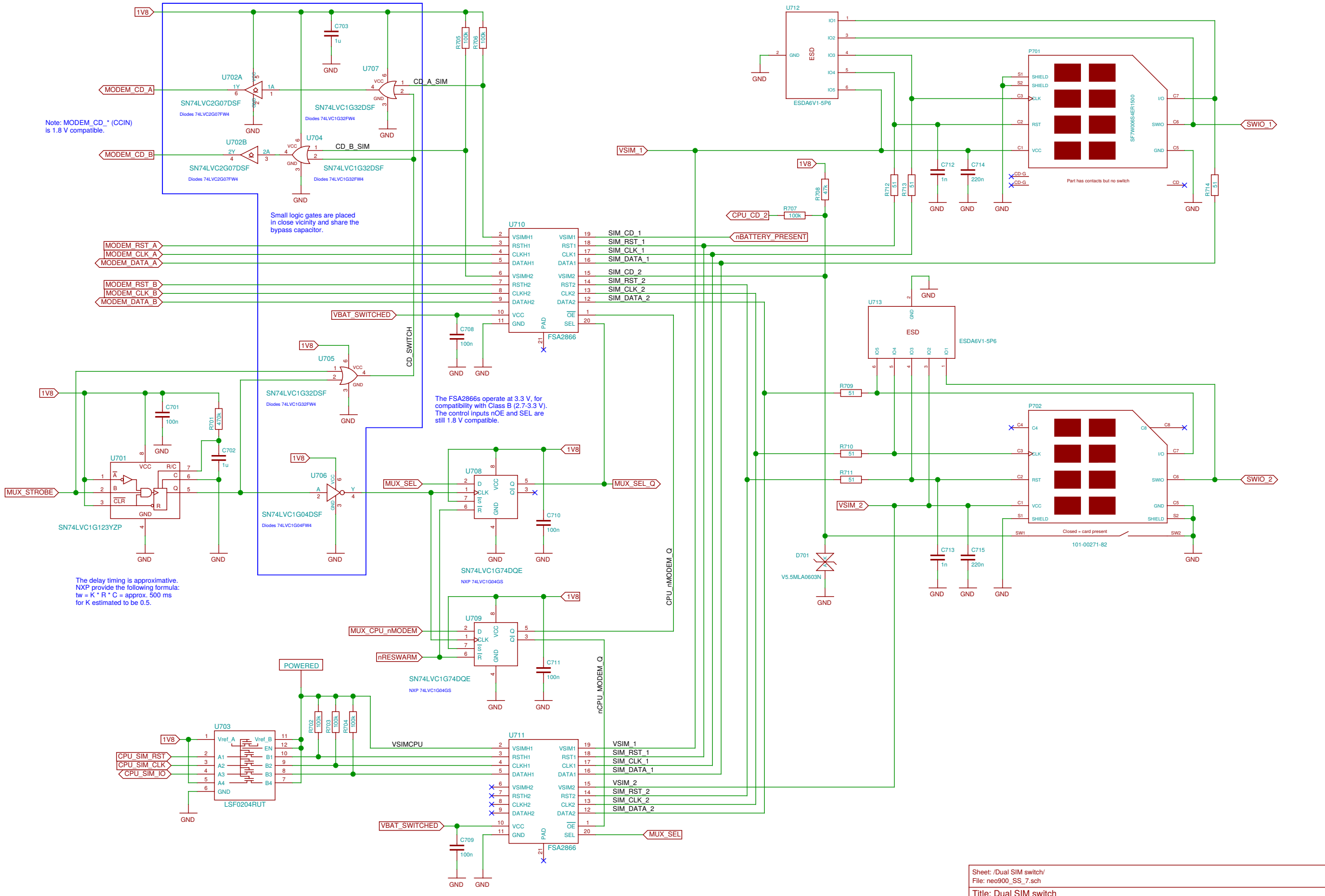


Note: MODEM_CD_* (CCIN) is 1.8 V compatible.

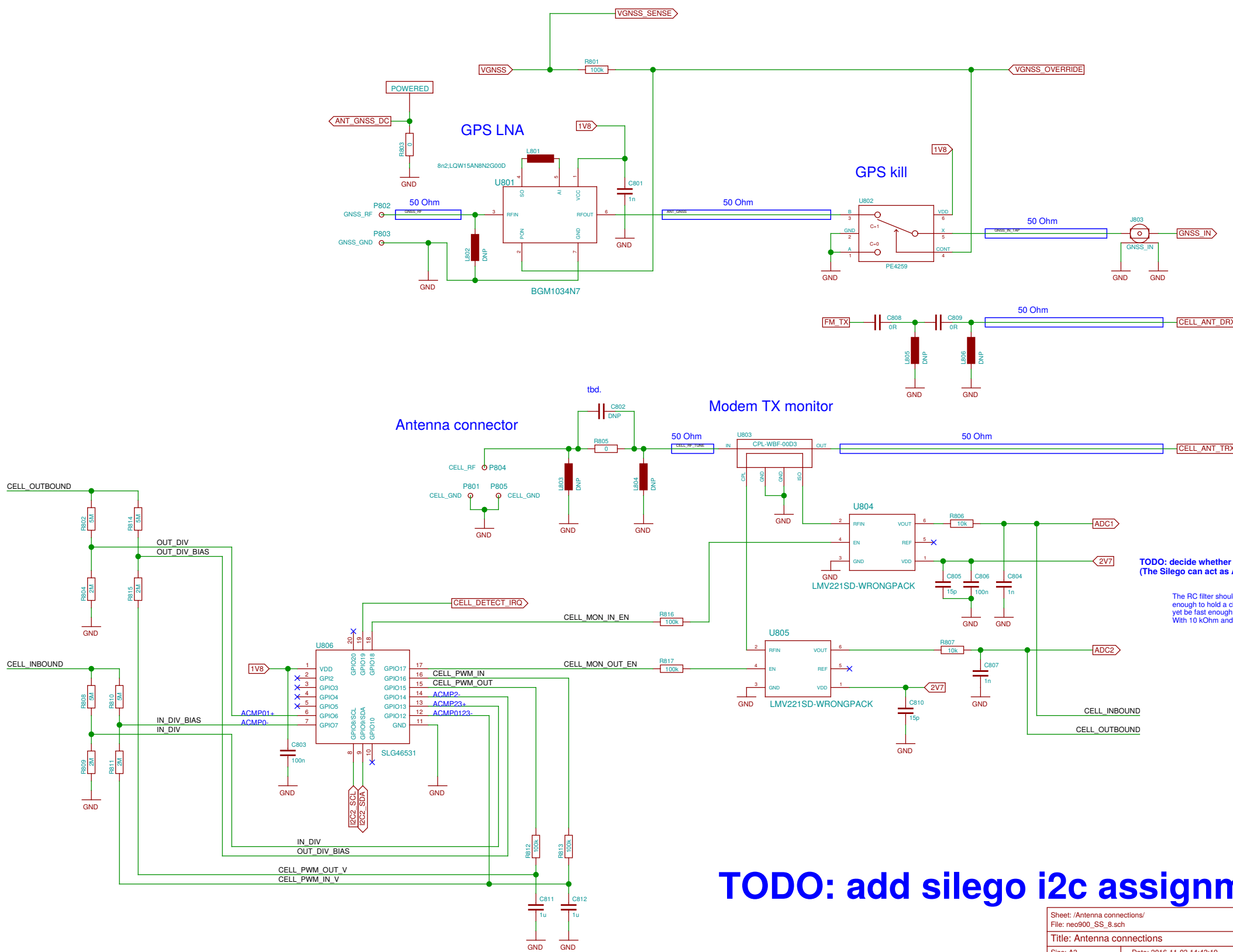
Small logic gates are placed in close vicinity and share the bypass capacitor.

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



Sheet: /Dual SIM switch/		
File: neo900_SS_7.sch		
Title: Dual SIM switch		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01atb57+ 20161103-02:14Z		Id: 7/37



TODO: decide whether to keep or remove ADC1 and ADC2. (The Silego can act as ADC by varying the PWM volrages.)

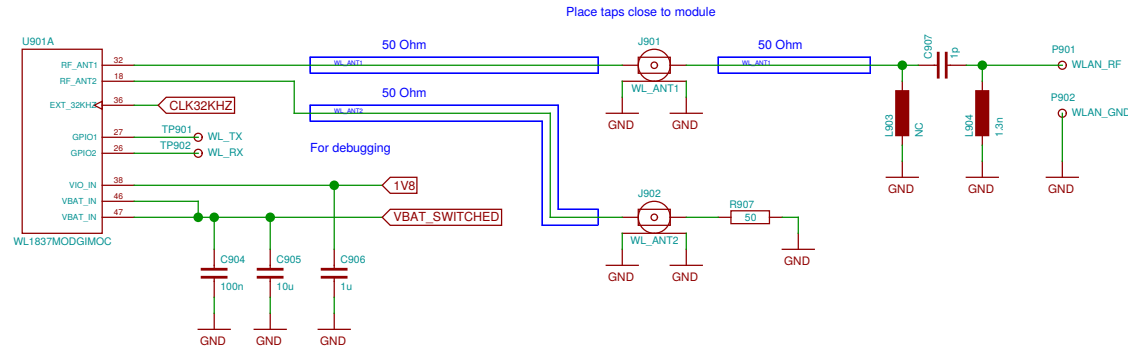
The RC filter should have C large enough enough to hold a charge in pulsed operation, yet be fast enough to detect short activity. With 10 kOhm and 1 nF, we get about 16 kHz.

TODO: add silego i2c assignment

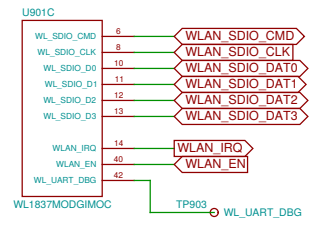
Sheet: /Antenna connections/ File: neo900_SS_8.sch		
Title: Antenna connections		
Size: A3	Date: 2016-11-03 14:43:19	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 8/37

TODO: assign footprints for c-spring contacts

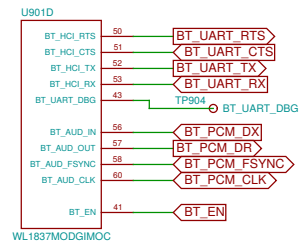
WLAN/BT antenna



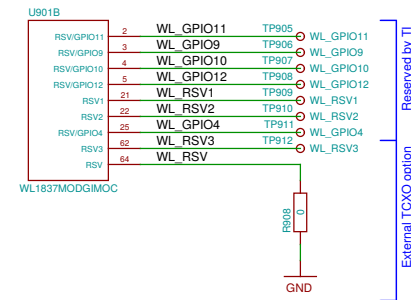
WLAN



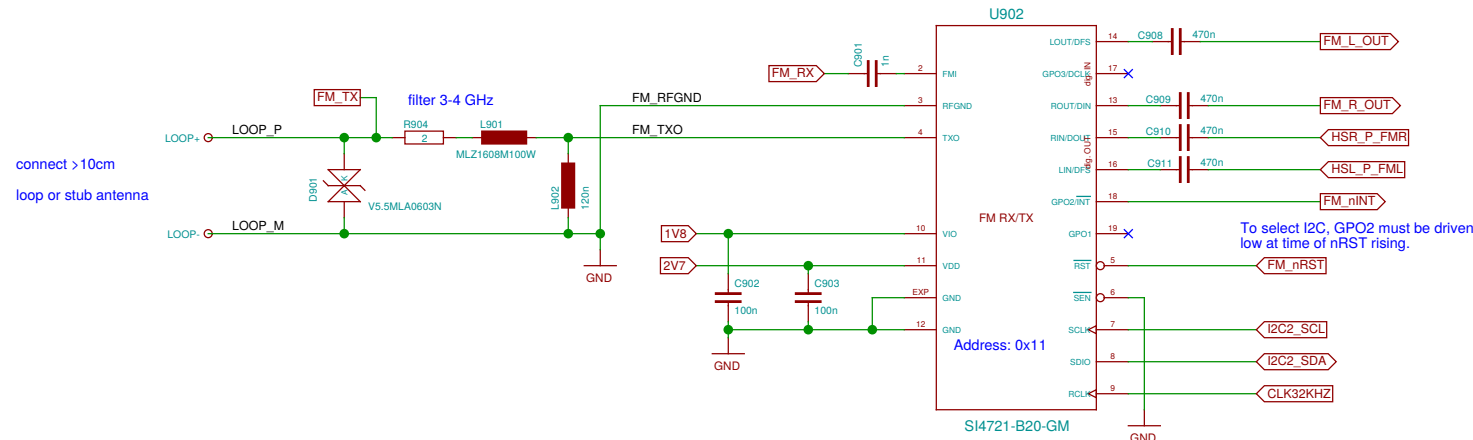
Bluetooth



Reserved / Debugging

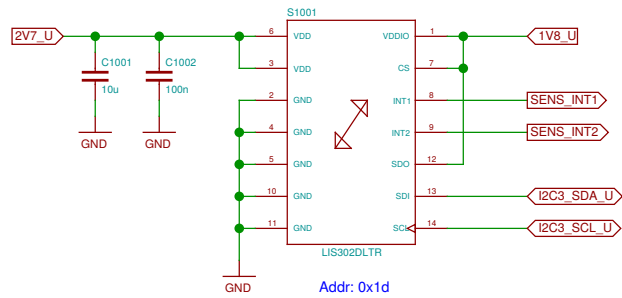


FM Radio (TX/RX)

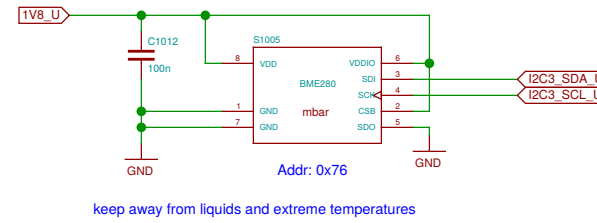


SI4705 is pin compatible (mostly) but RX-only

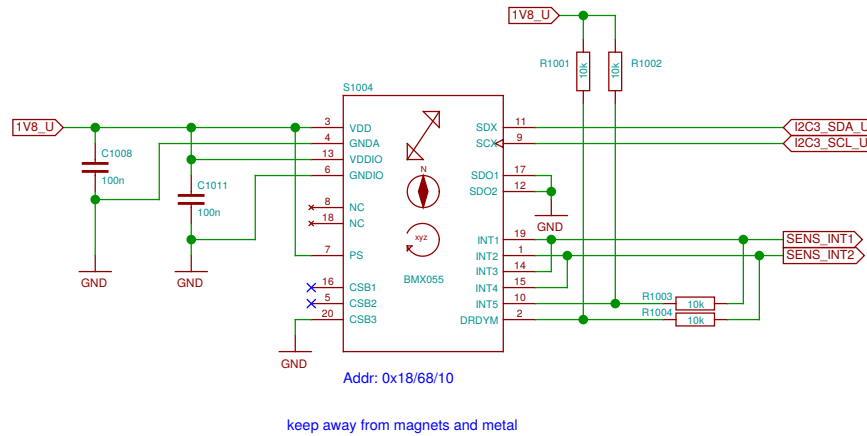
Acceleration (legacy)



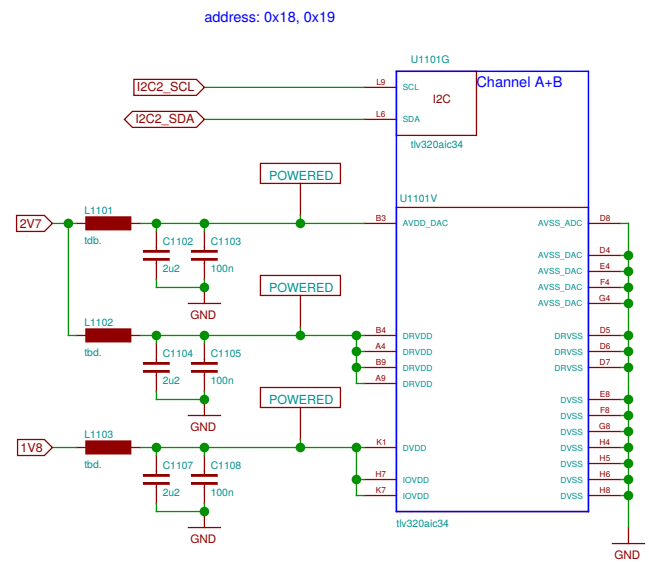
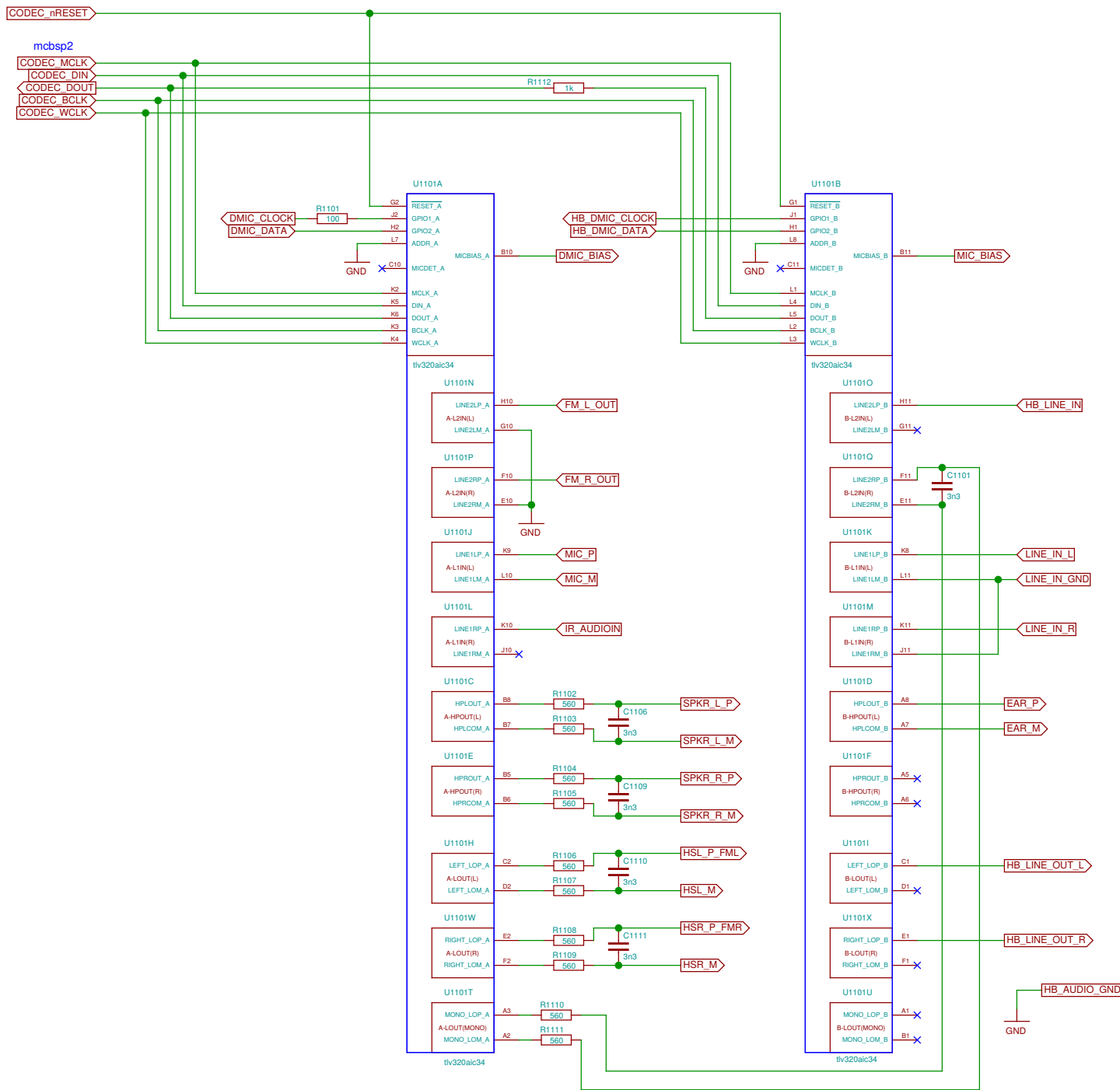
Pressure, humidity



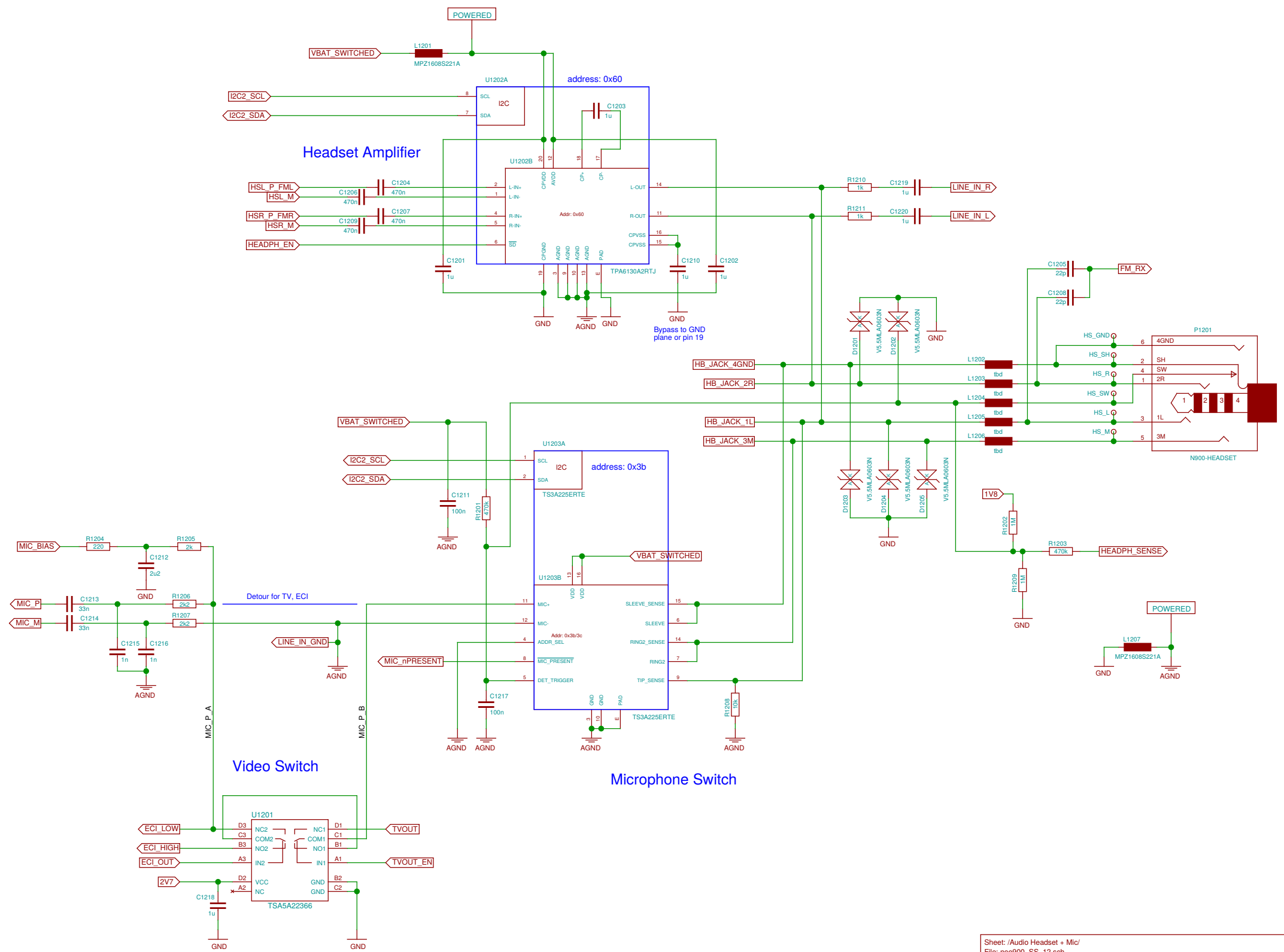
9-axis (acceleration, gyroscope, magnetometer)



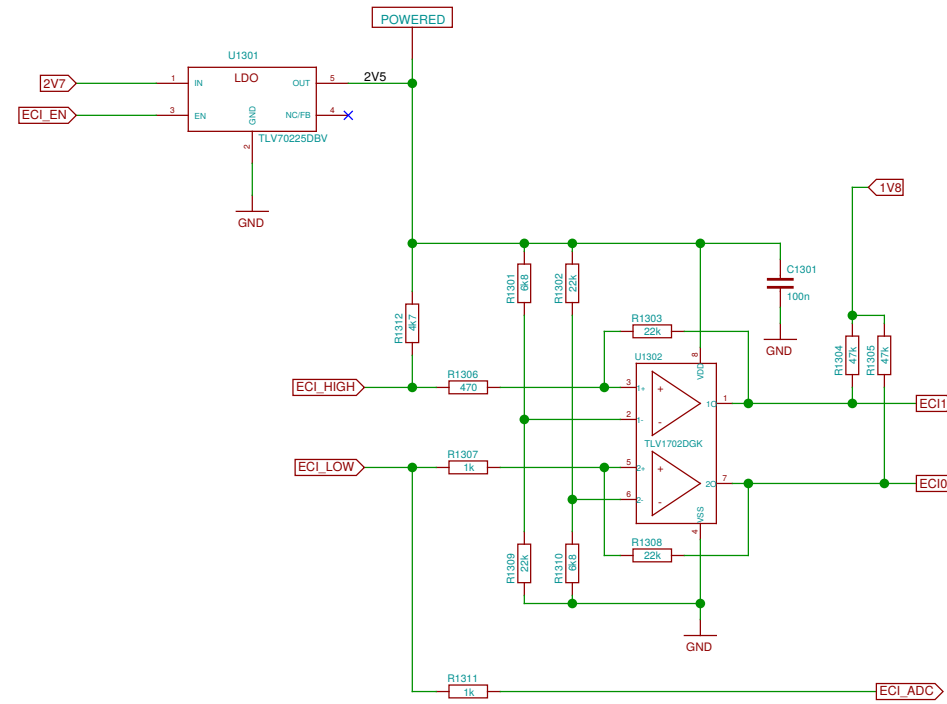
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Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01atb57+ 20161103-02:14Z		Id: 10/37



Sheet: /Audio Codec/		
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Title: Audio Codec		
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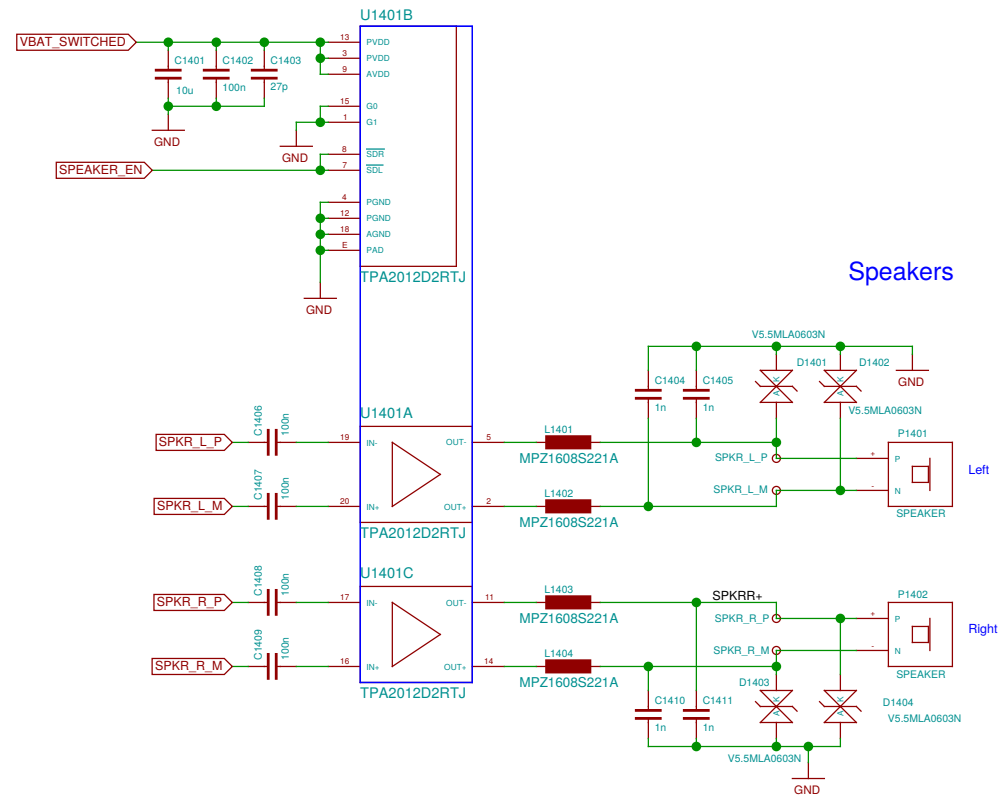


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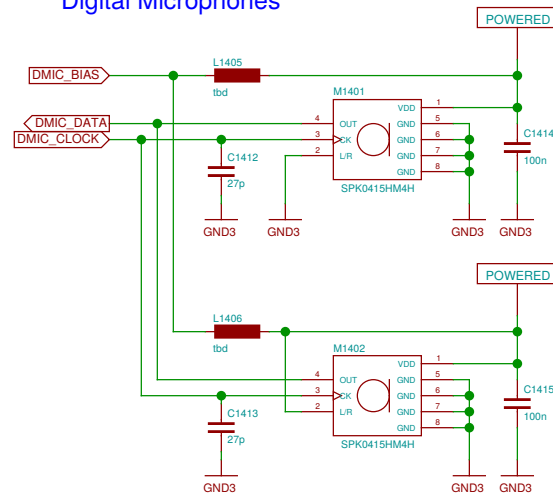
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Title: ECI		
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Hands-free



Speakers

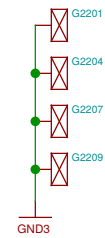
Digital Microphones



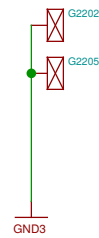
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Shield Contacts on UPPER

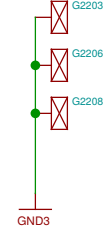
For the display



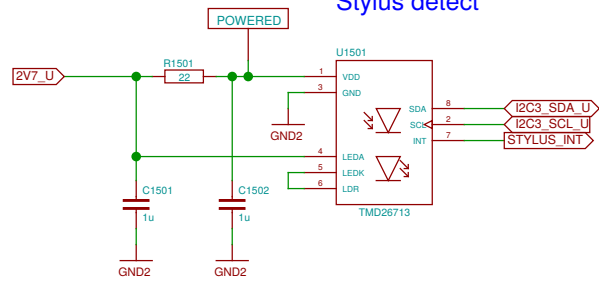
For the key mat



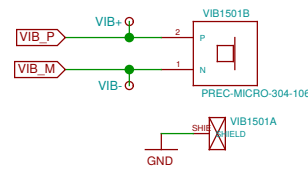
For the "key frame hook"



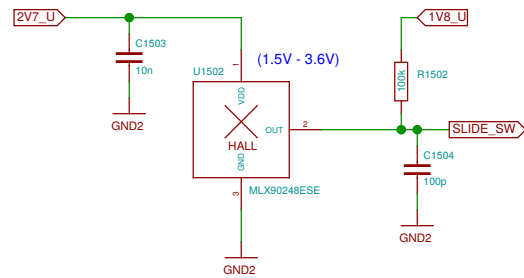
Stylus detect



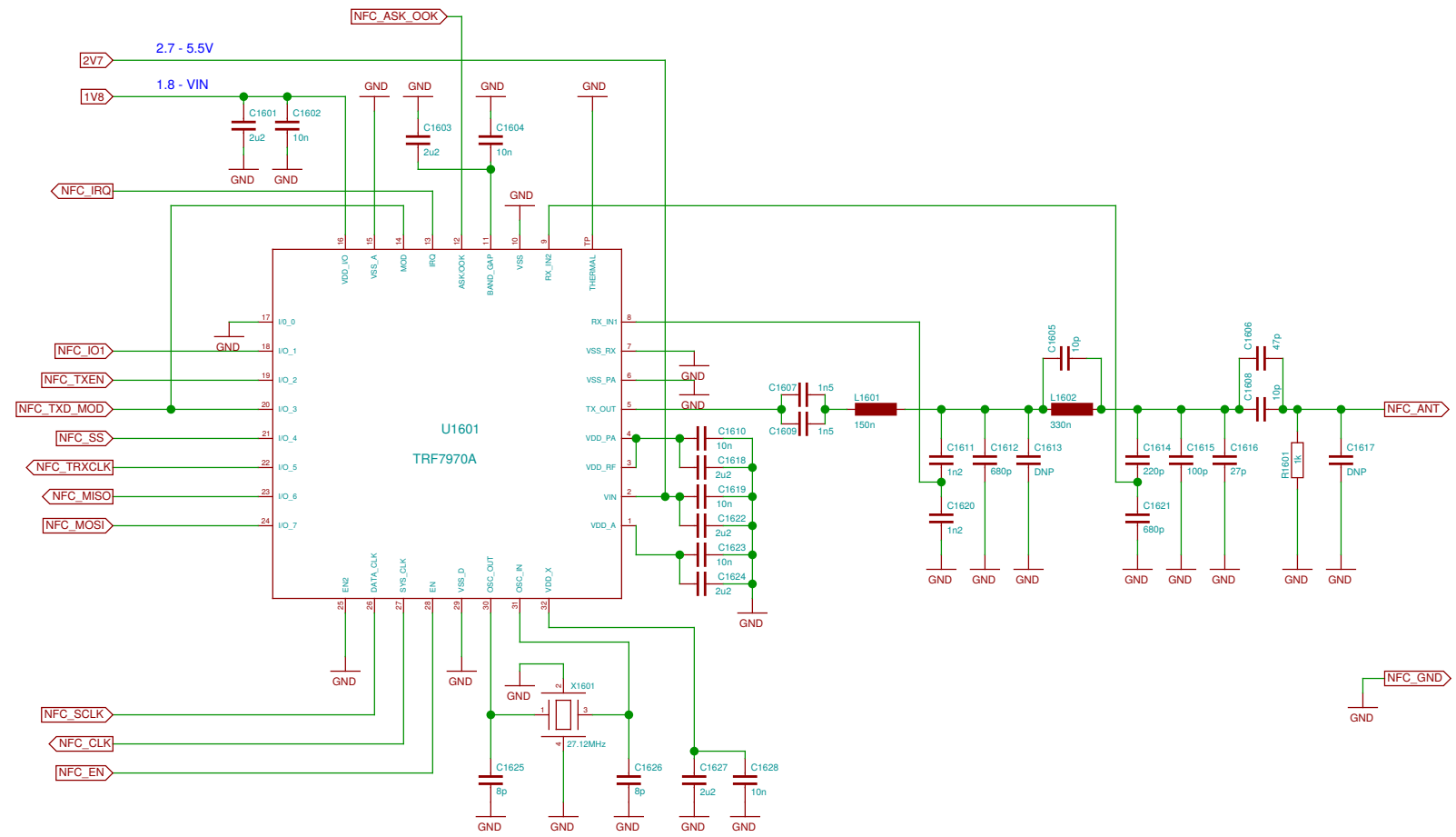
Vibramotor



Slide sensor

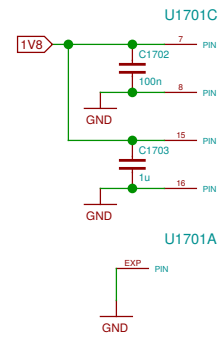
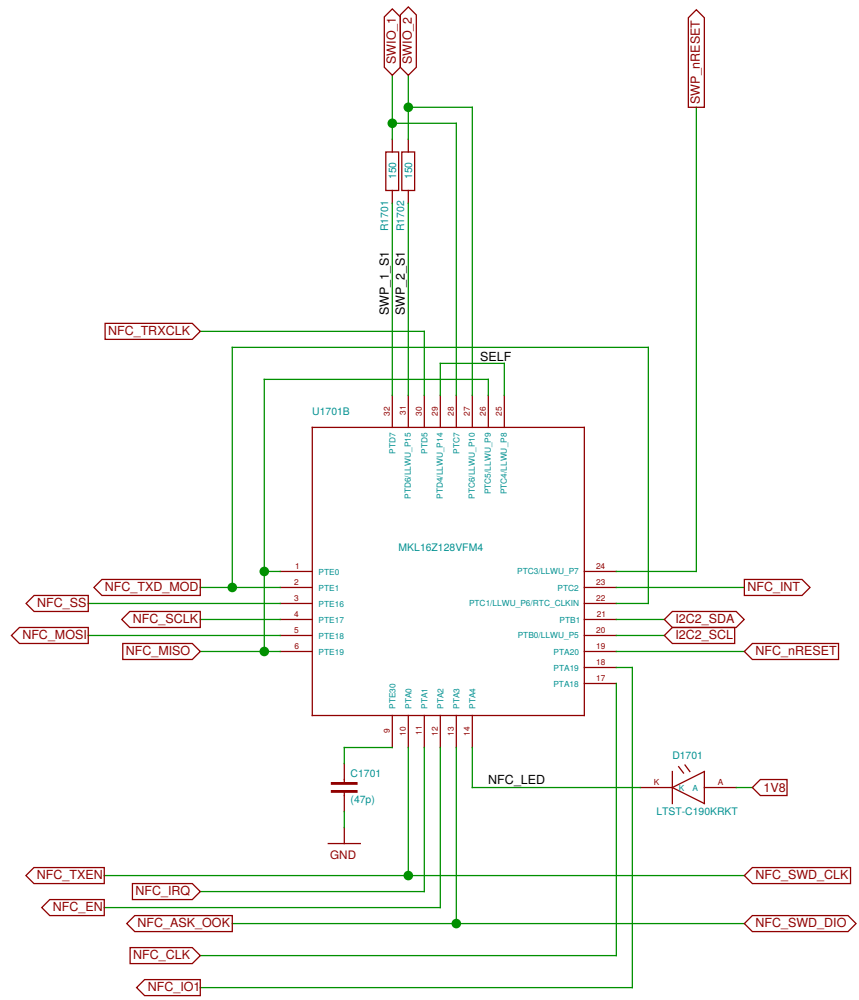


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Title: Misc		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 15/37



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
 Tattien XXCCEINANF-27.120000

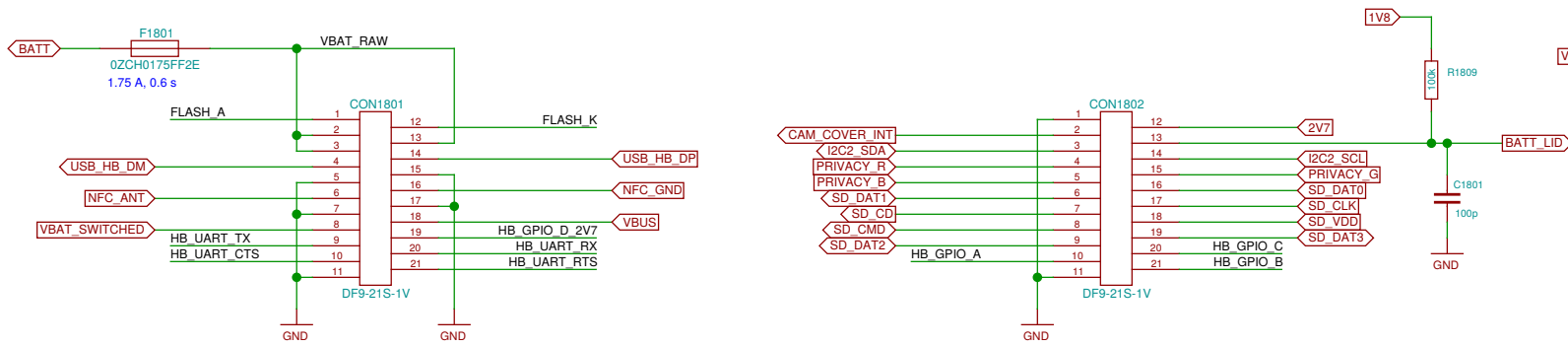
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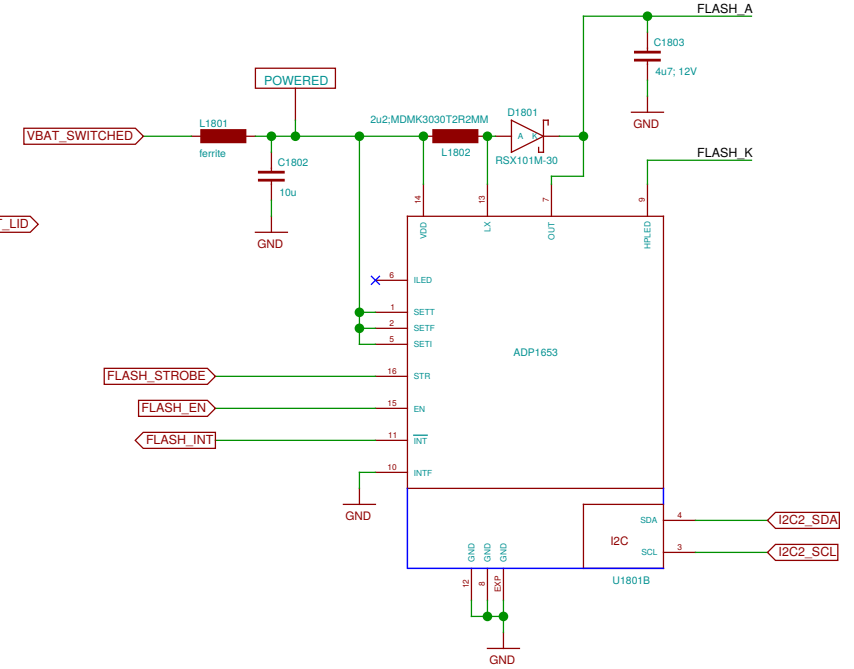
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Title: RFID/NFC Controller		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01atb57+ 20161103-02:14Z		Id: 17/37

LOWER-BOB Interconnect (LOWER side)

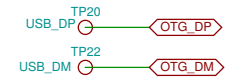
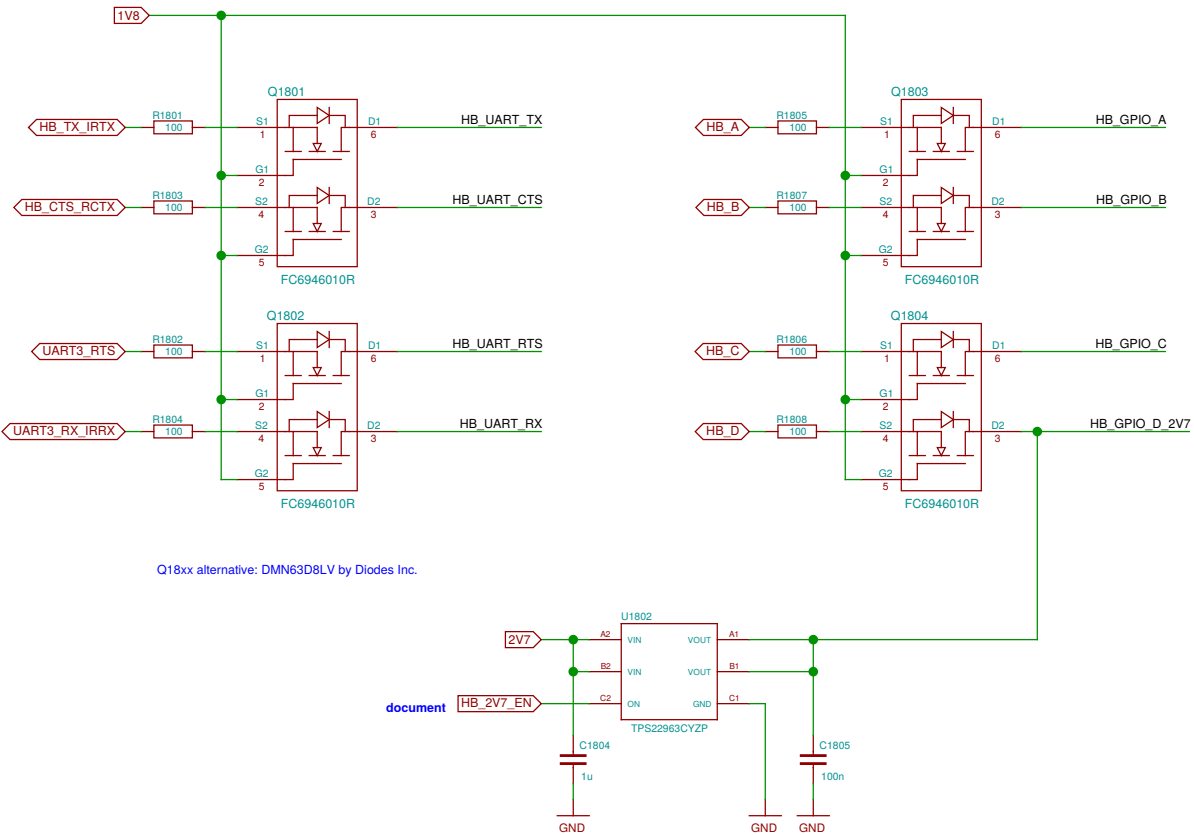
Defined in the Hackerbus specification, <http://neo900.org/stuff/papers/hb.pdf>



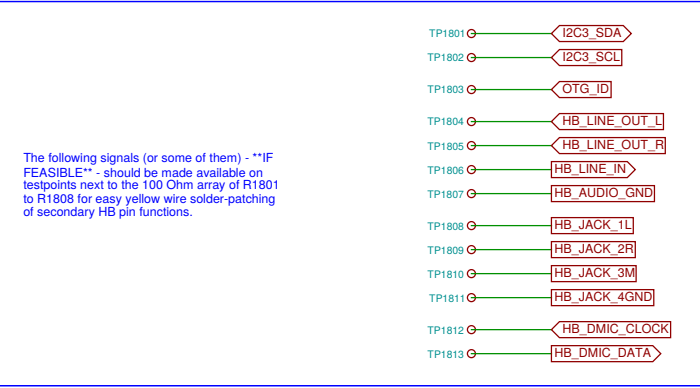
Flash/Torch



Level shifters for Hackerbus GPIO and UART



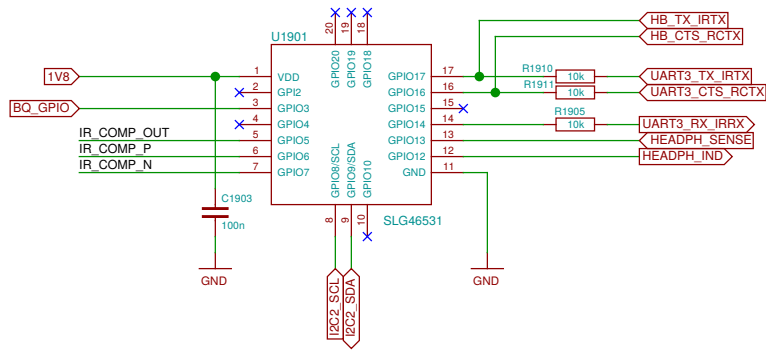
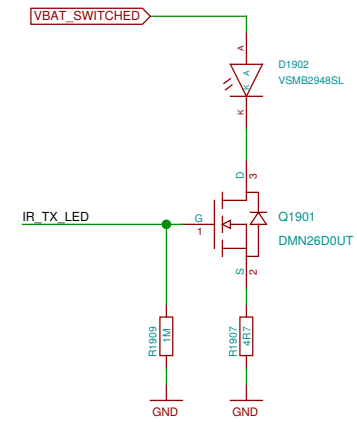
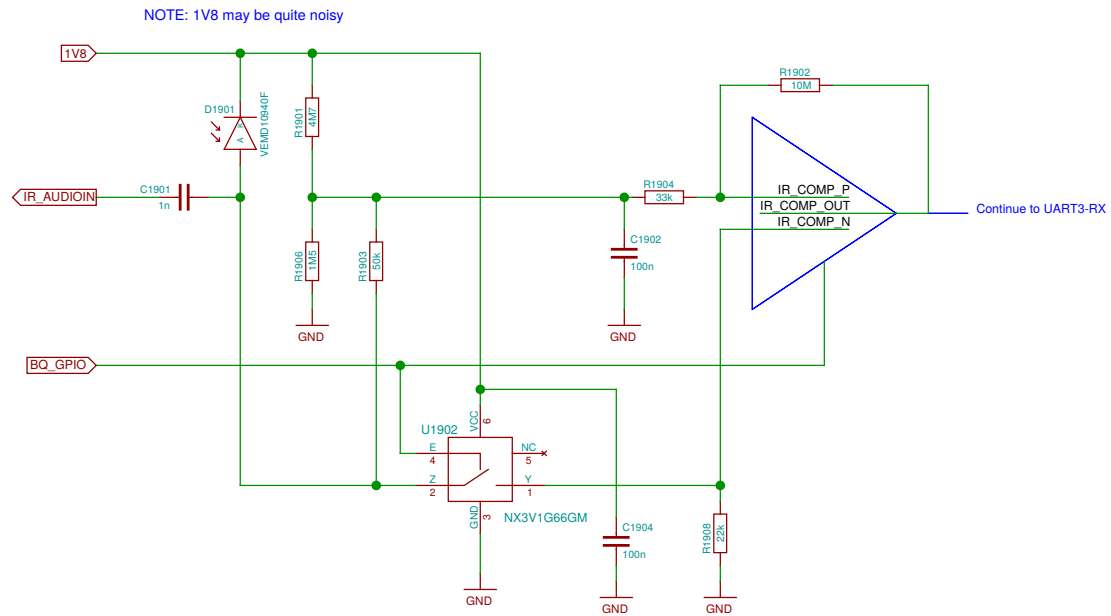
Patchfield



Sheet: /Hackerbus/ File: neo900_SS_18.sch		
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Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01atb57+ 20161103-02:14Z		Id: 18/37

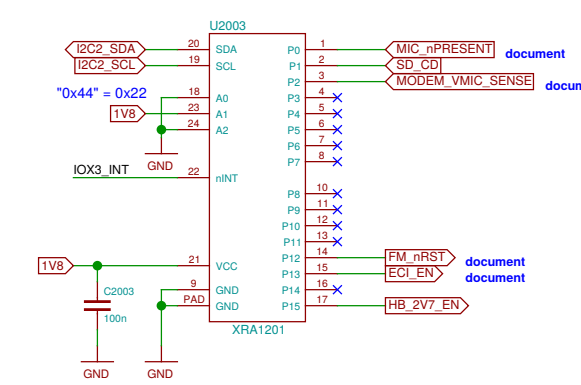
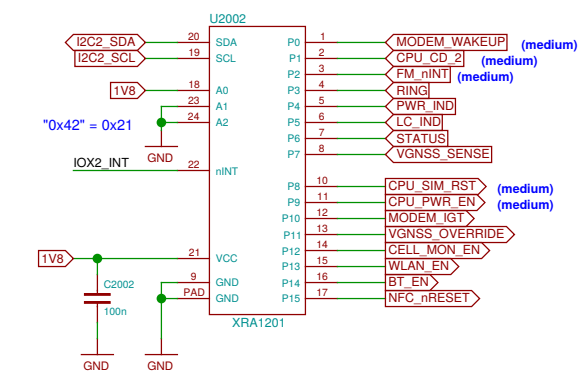
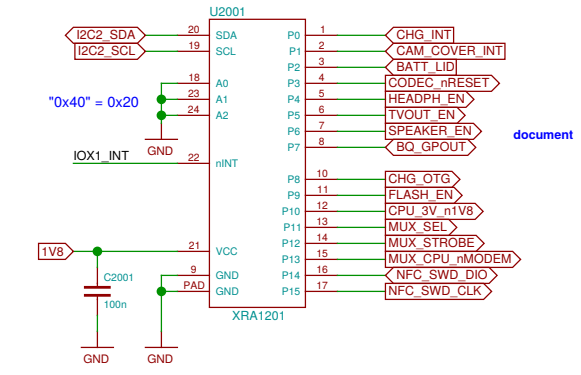
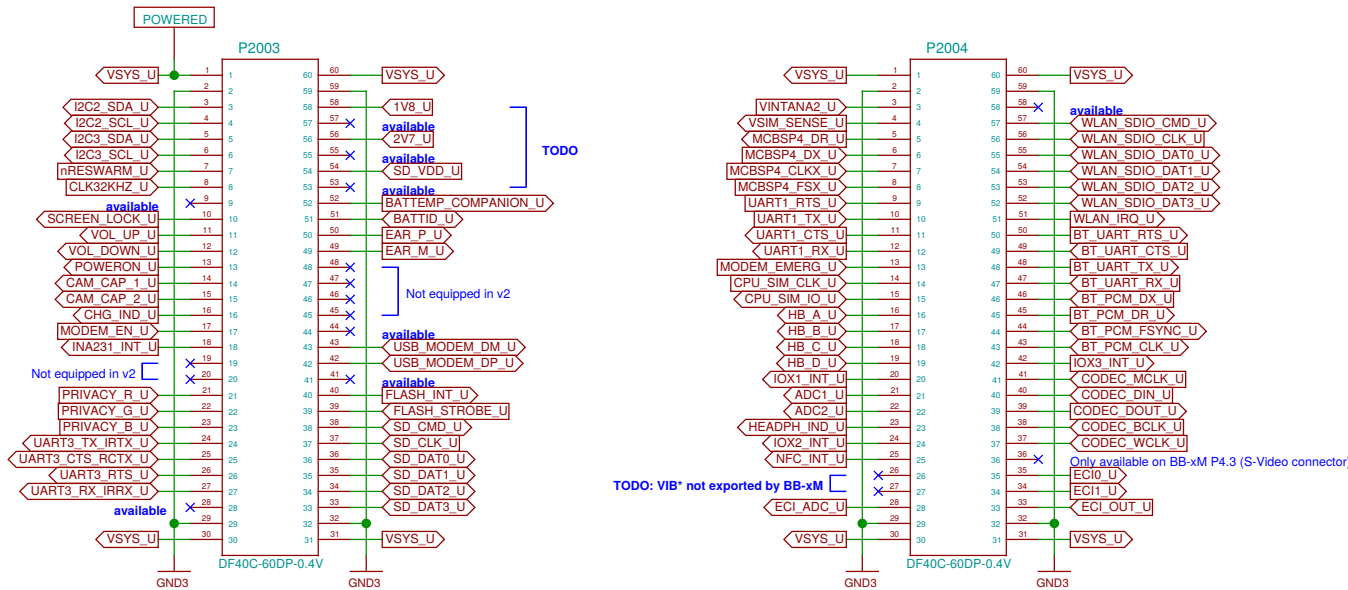
Missing 6x 2R for alternate function select (do we have the space for ca. 2.5 x 5mm?)

TODO: update D1901 footprint

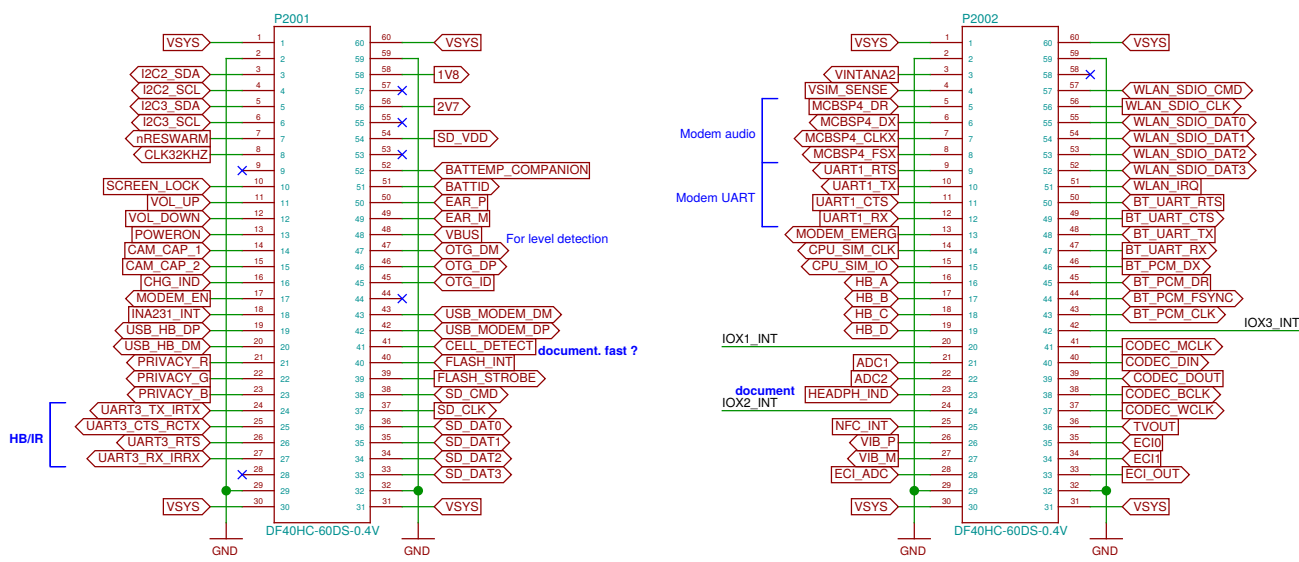


Sheet: /Infrared/ File: neo900_SS_19.sch		
Title: Infrared		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 19/37

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

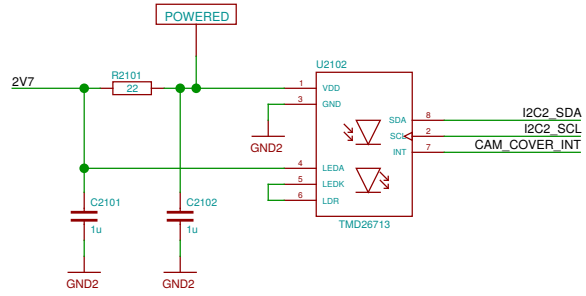


UPPER
LOWER

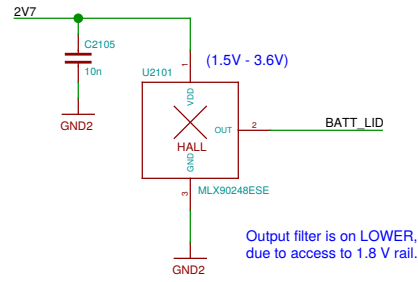


Current rating per contact: 0.3 A

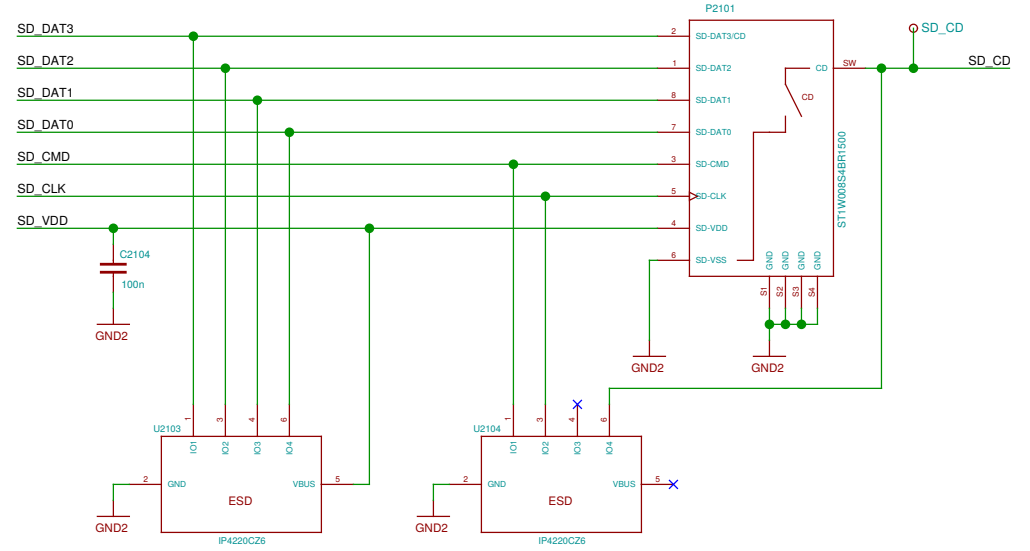
Camera Cover detect



Battery Cover detect

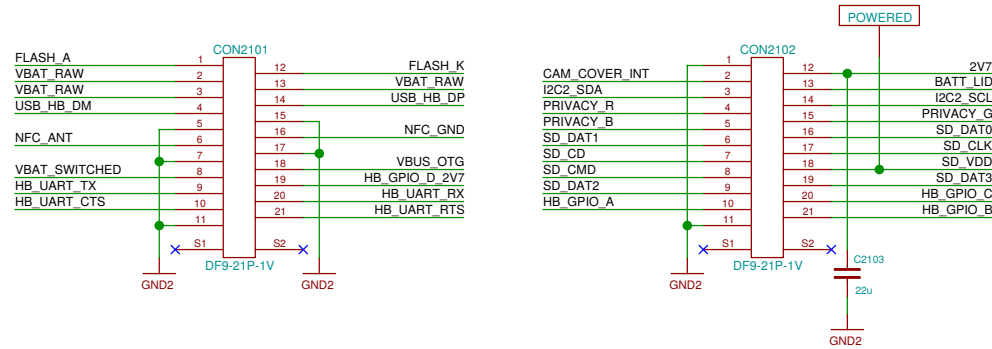


Memory card holder

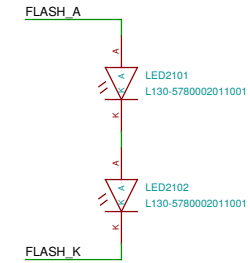


LOWER-BOB Interconnect (BOB side)

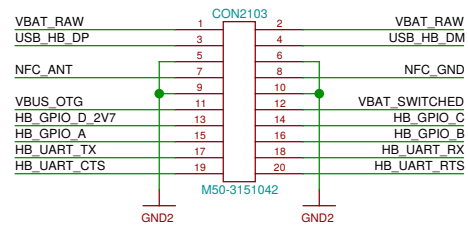
Defined in the Hackerbus specification, <http://neo900.org/stuff/papers/hb.pdf>



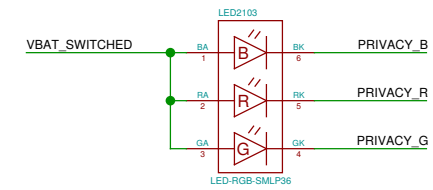
Camera flash



Hackerbus



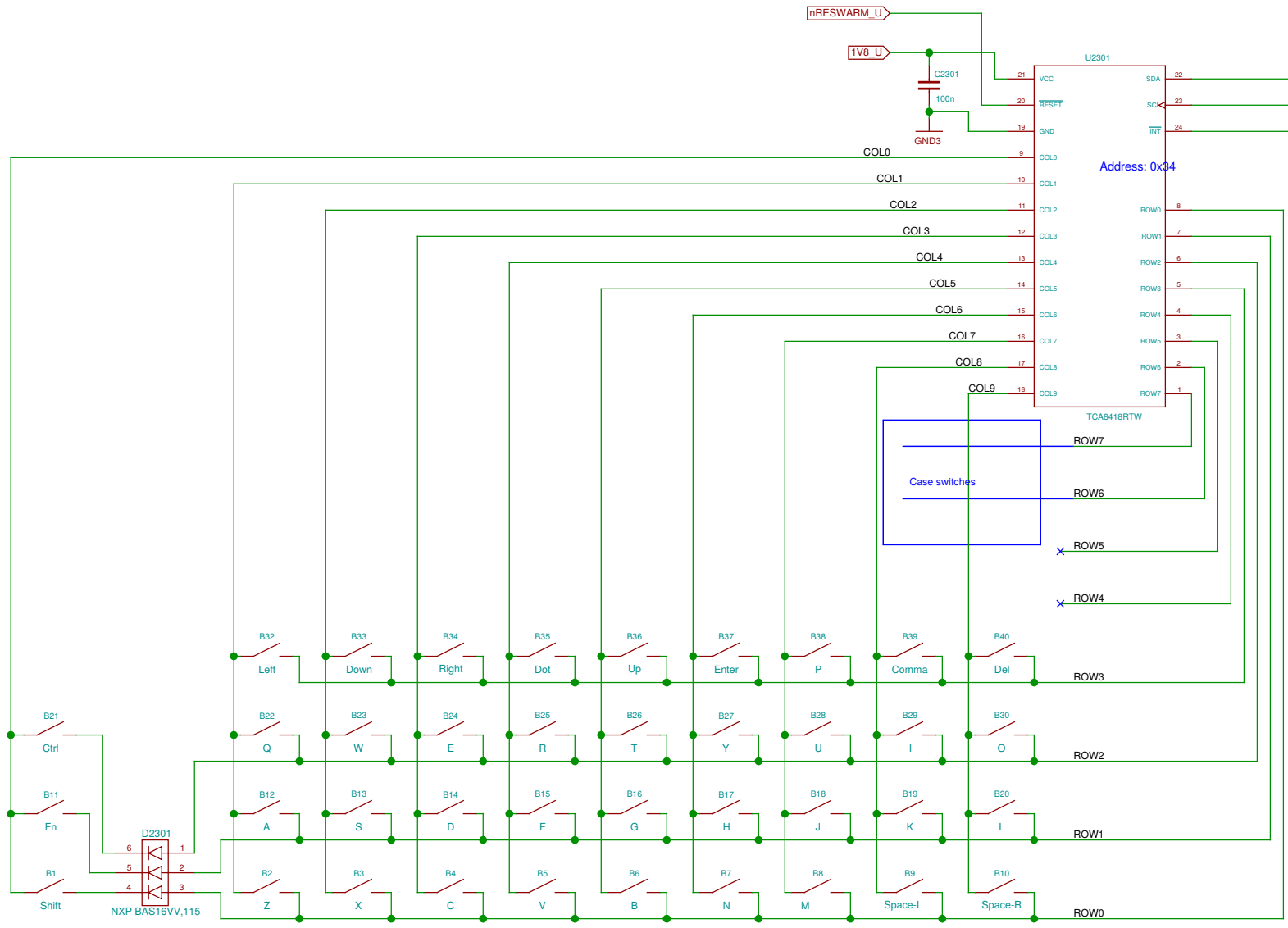
Privacy LED



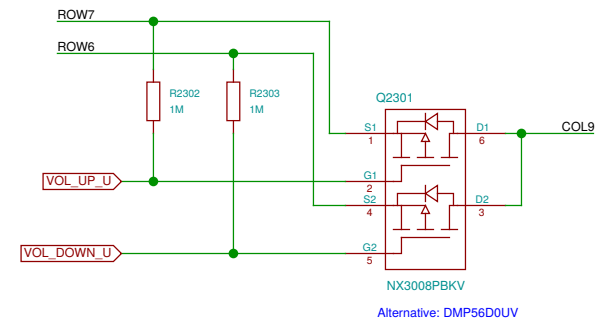
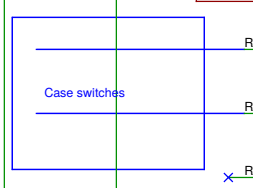
Sheet: /uSD Breakout Board/ File: neo900_SS_21.sch		
Title: uSD Breakout Board		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 21/37

TODO: consider sheet for deletion

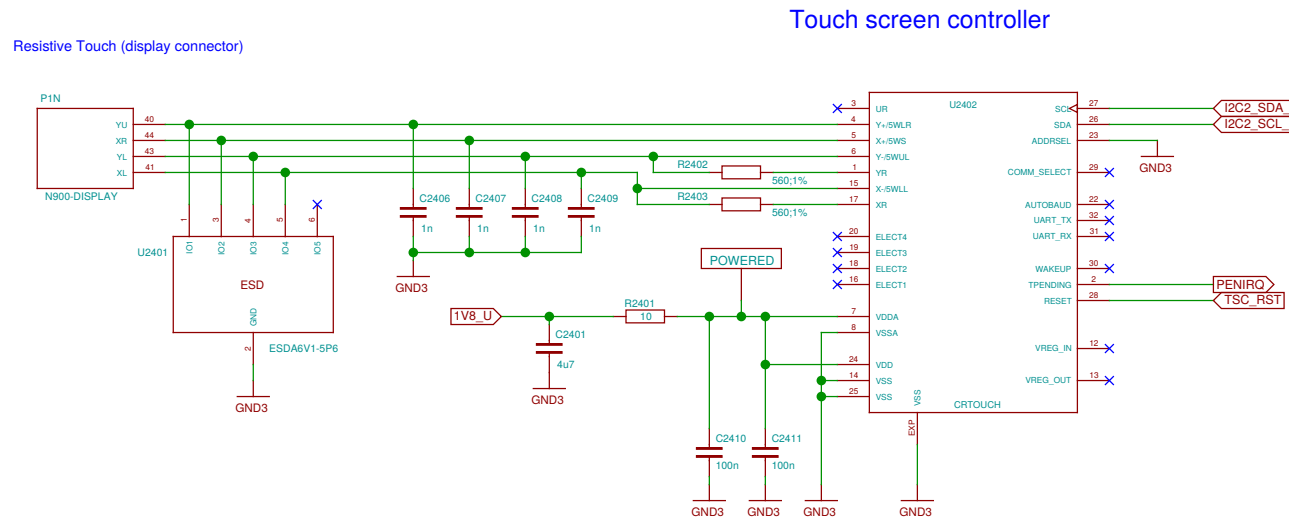
Sheet: /empty/ File: neo900_SS_22.sch		
Title: empty		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01atb57+ 20161103-02:14Z		Id: 22/37



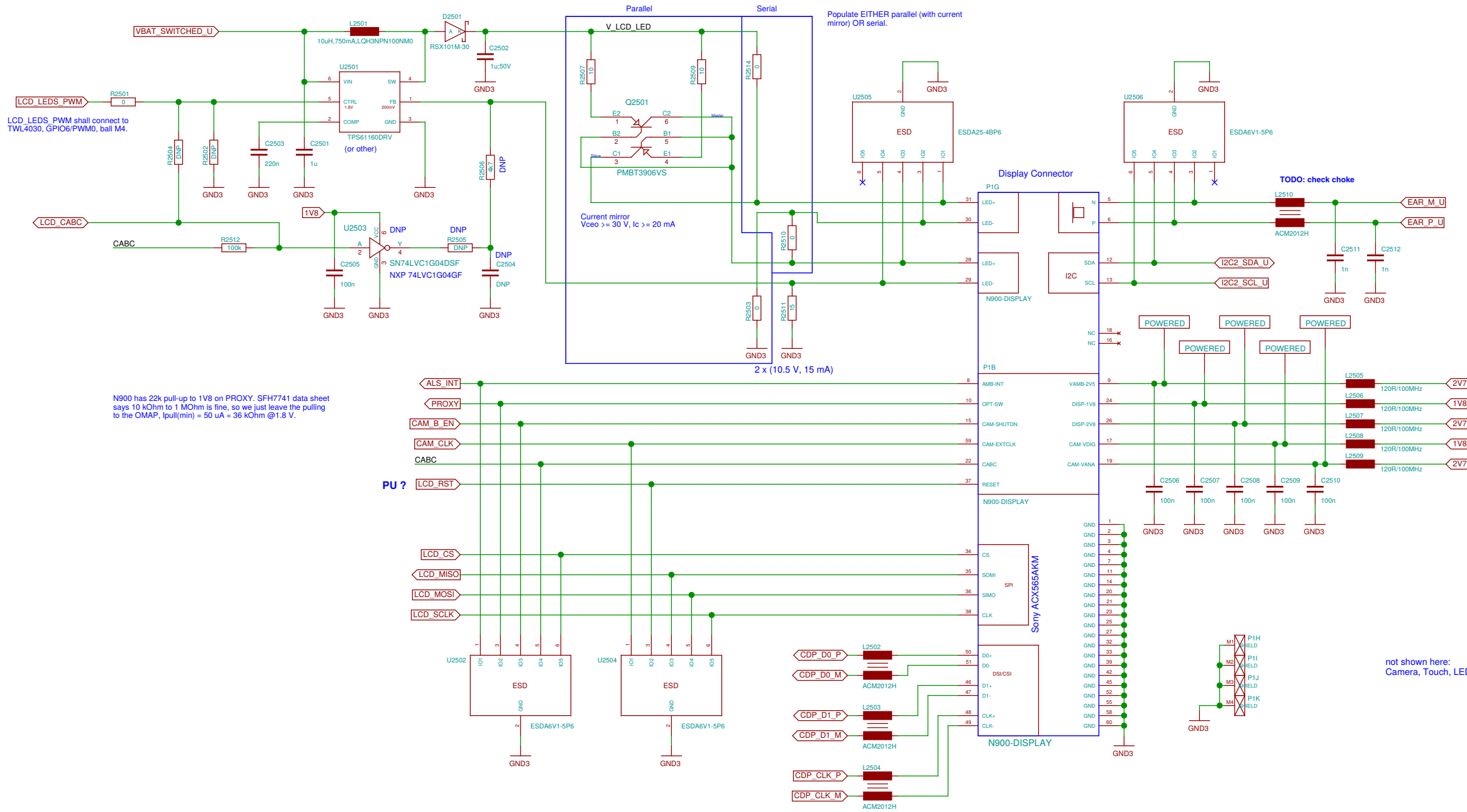
Alternative: Diodes Inc. BAS16VV-7
 Warning: Diodes Inc. have cathodes on pin 1 side, NXP anodes !



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



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, GPIOs/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, I_{pull(min)} = 50 uA = 36 kOhm @ 1.8 V.

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

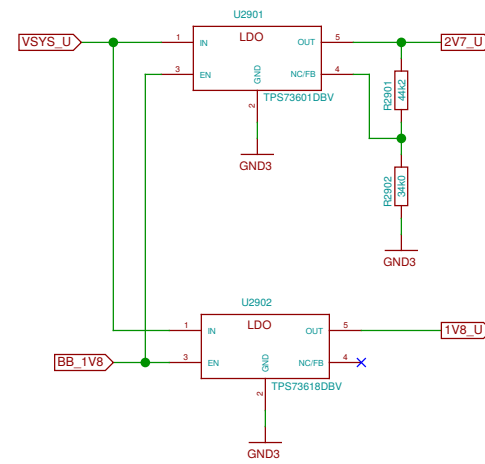
eMMC is not part of v2

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

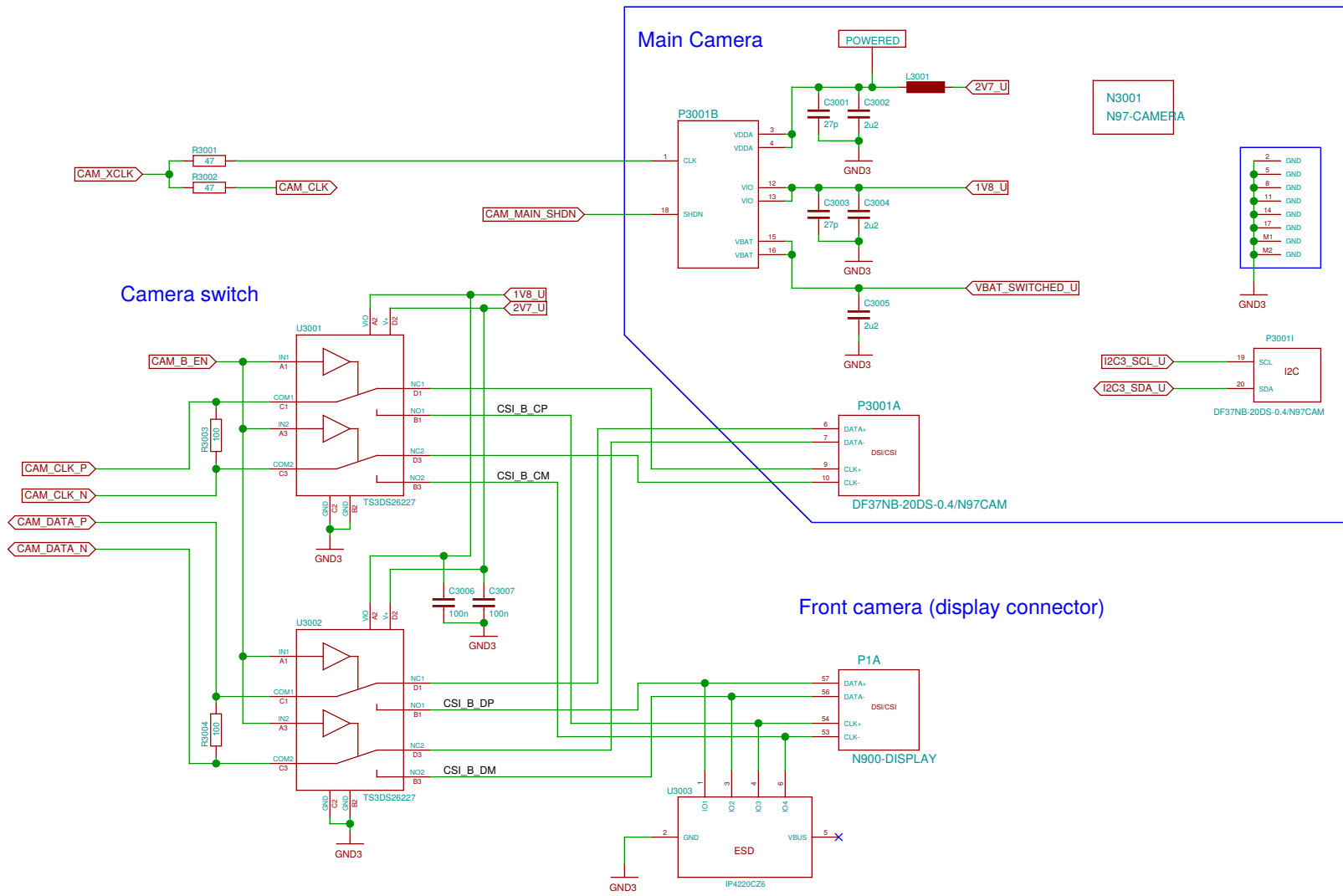
Sheet: /PMU+Codec/ File: neo900_SS_28.sch		
Title: PMU+Codec		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 28/37

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

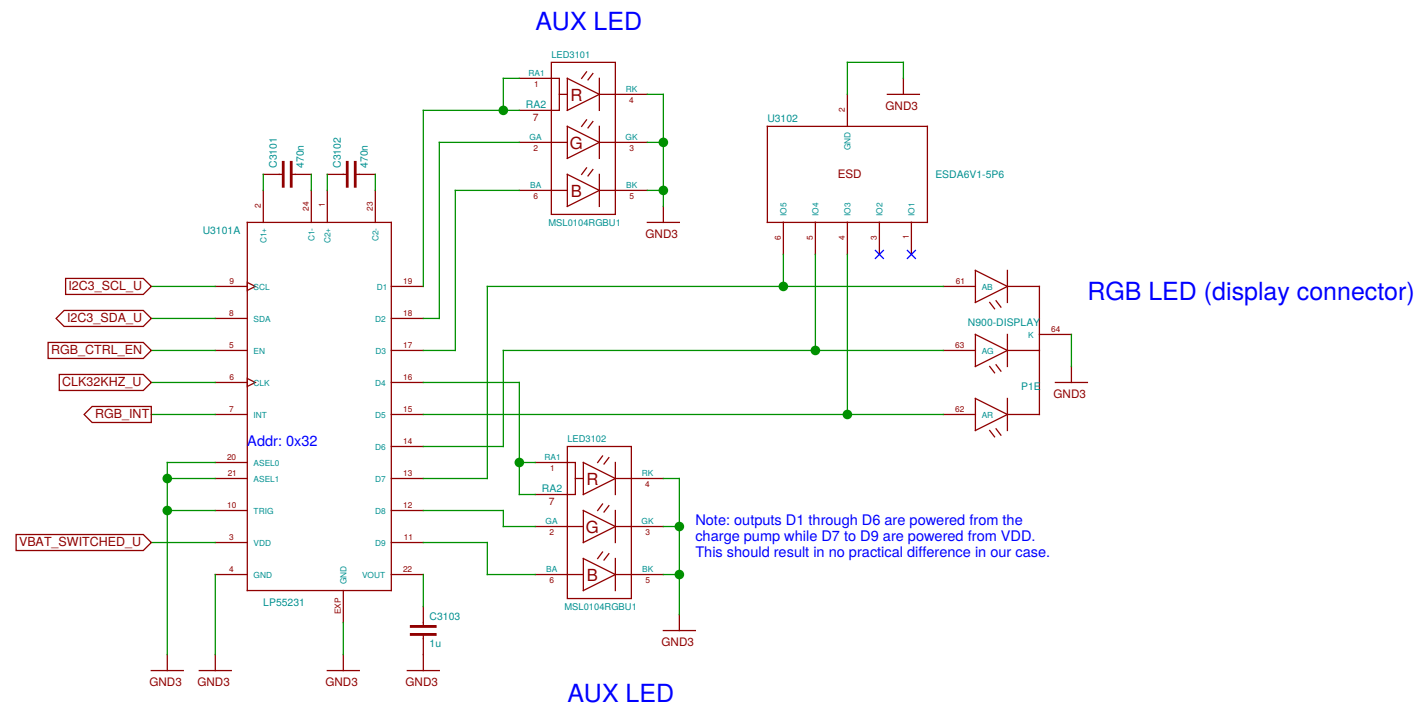


TODO: use REGEN ?

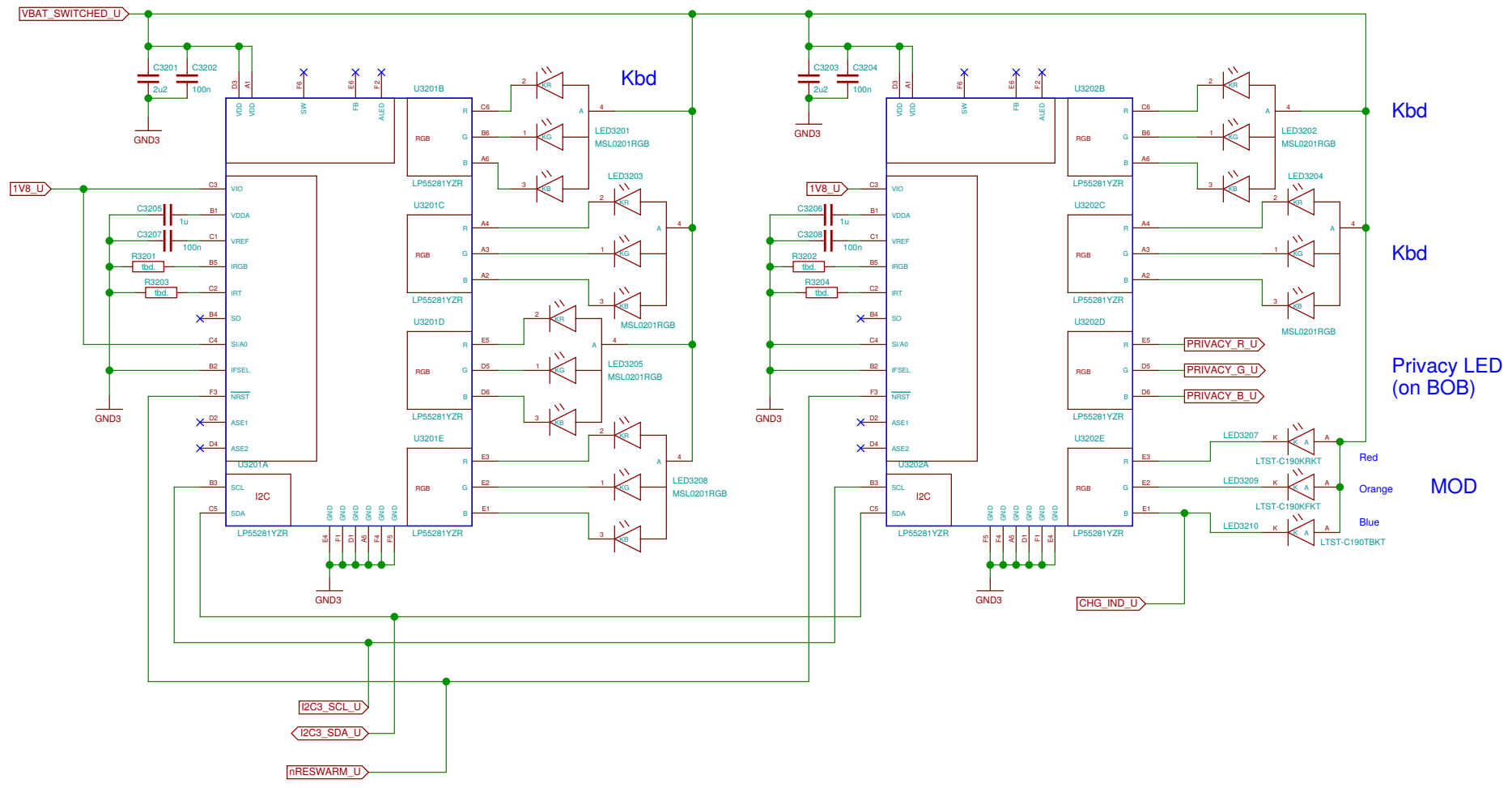
Sheet: /BB-XM Dummy (TWL4030)/		
File: neo900_SS_29.sch		
Title: BB-XM Dummy (TWL4030)		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01a1b57+ 20161103-02:14Z		Id: 29/37



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

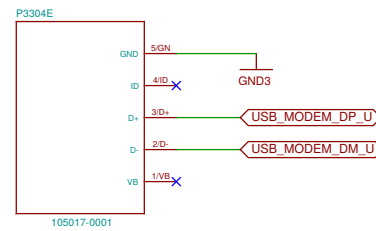


Sheet: /Basic LEDs/		
File: neo900_SS_32.sch		
Title: Basic LEDs		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01atb57+ 20161103-02:14Z		Id: 32/37

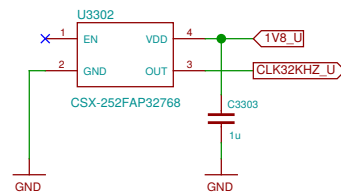
Cleaning up. The connections to BB-xM are on the next sheets.

connect to BB
by some Micro-USB cable

Modem USB



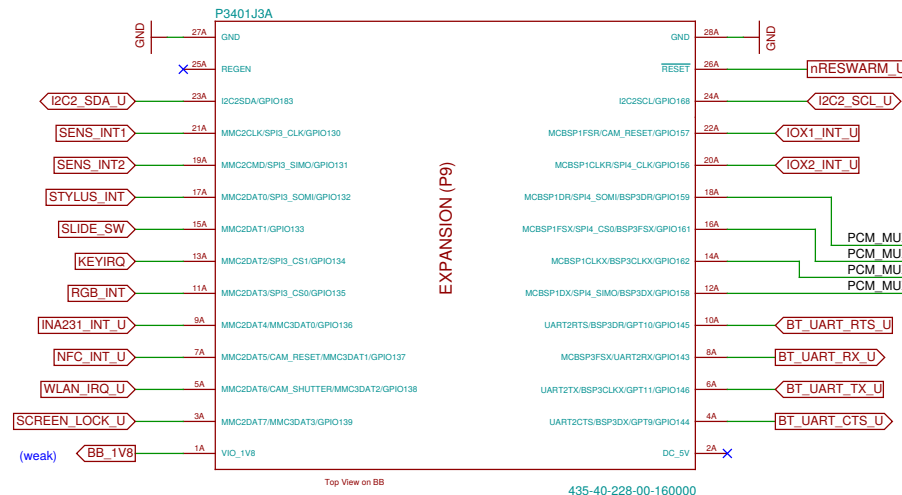
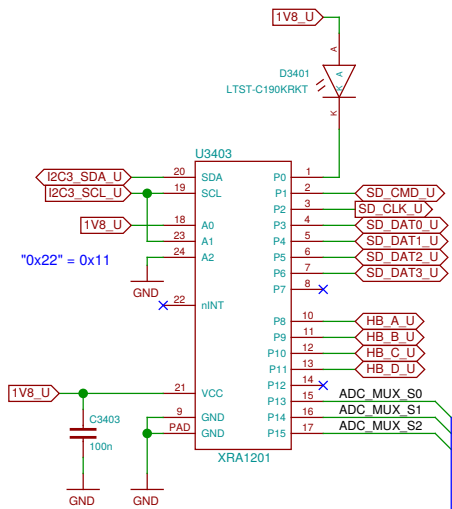
32 kHz clock



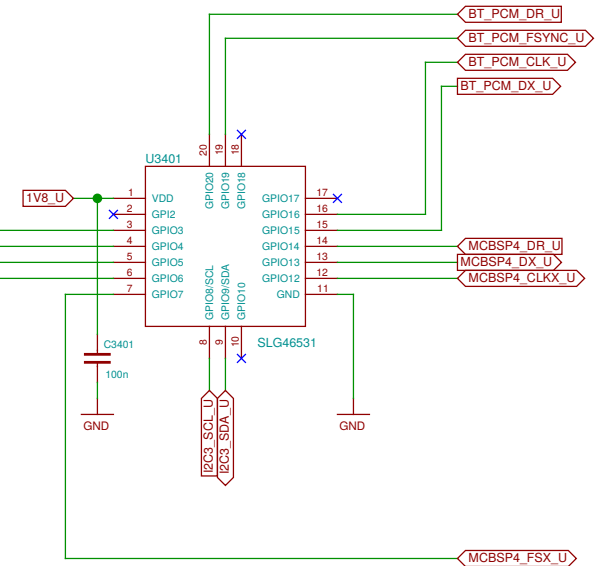
Alternative: OYKTGLJANF-0.032768

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

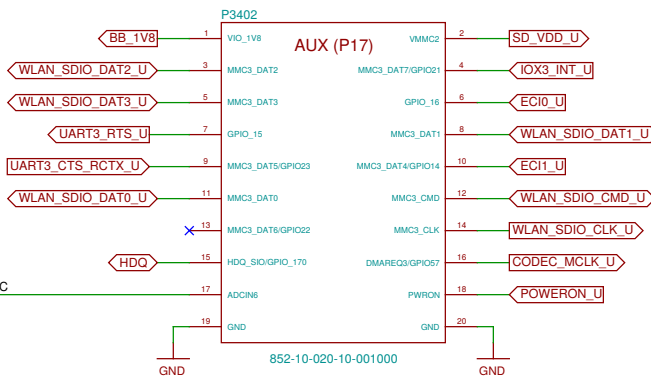
TODO: update pin names in footprint



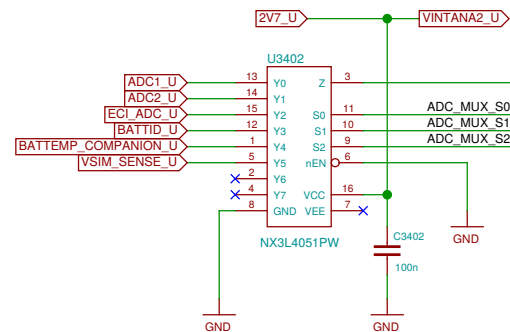
BB-xM Main Expansion Header (P9, 7.24)



No UART3_RTS on BB-xM, using GPIO
No UART3_CTS on BB-xM, using GPIO



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

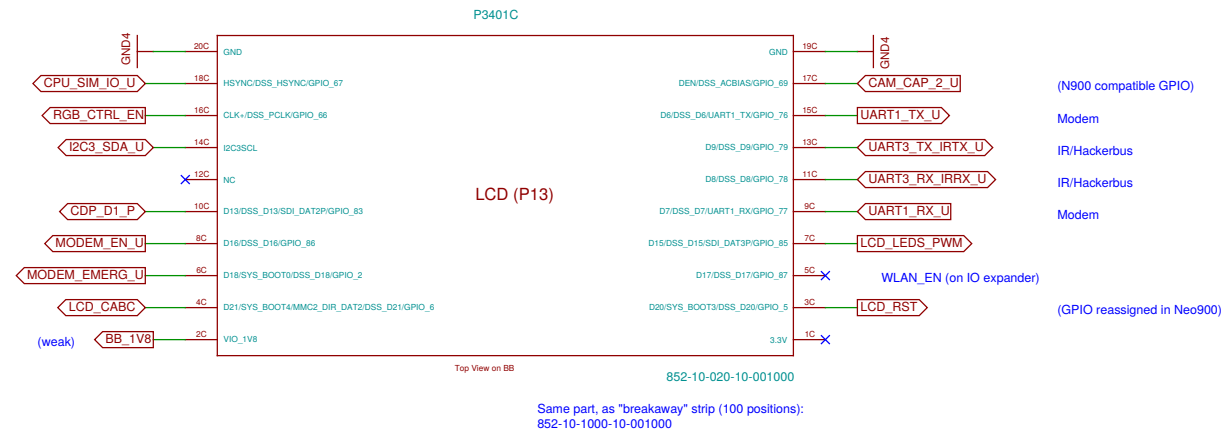


FM_nINT (on IO expander)

P11 (7.25)



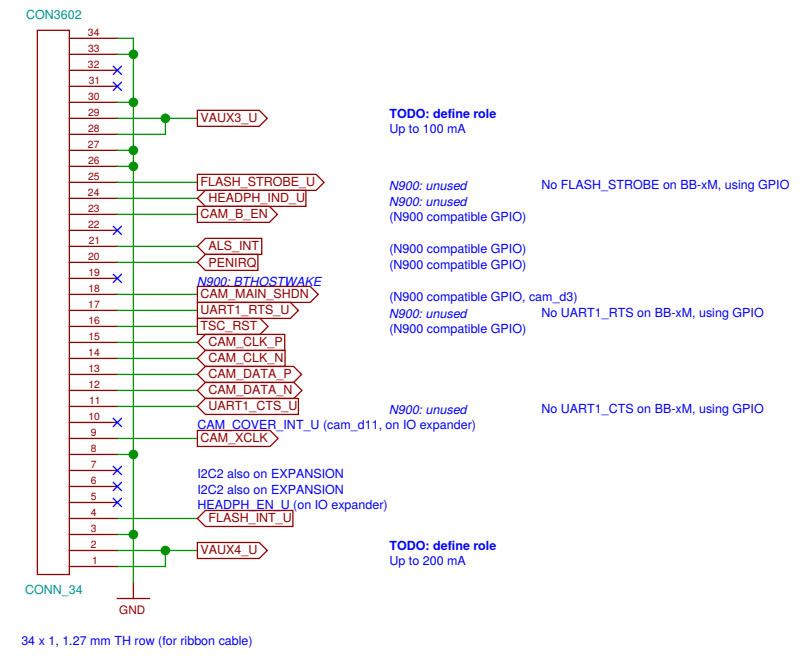
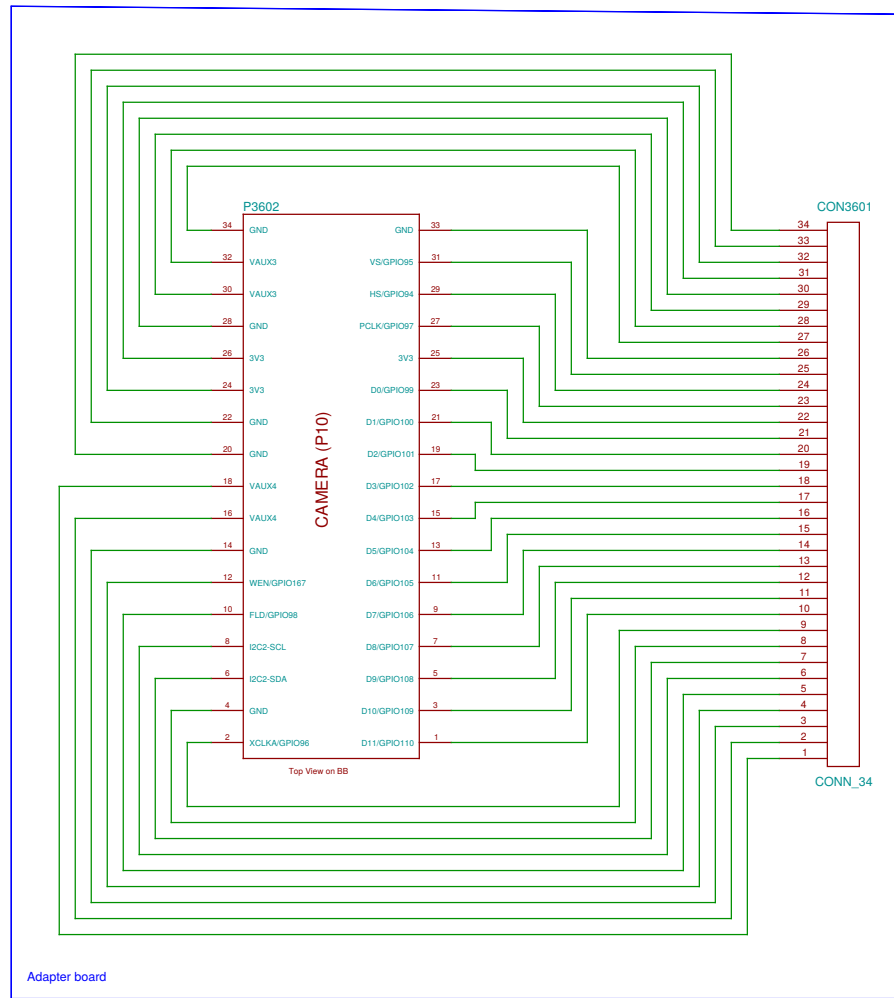
P13 (7.25)



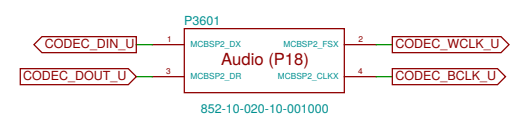
TODO: update pin names in footprint

Sheet: /BB-XM Adapter (DISP)/		
File: neo900_SS_35.sch		
Title: BB-XM Adapter (DISP)		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01atb57+ 20161103-02:14Z		Id: 35/37

Processor Camera Port Interface (P10, 7.20.3)



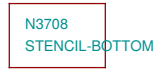
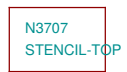
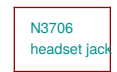
TODO: update pin names in footprint



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



Sheet: /No-Solder Components/ File: neo900_SS_37.sch		
Title: No-Solder Components		
Size: A3	Date: 2016-10-31 08:32:45	Rev:
Plotted by eeshow 01atb57+ 20161103-02:14Z		Id: 37/37