

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)

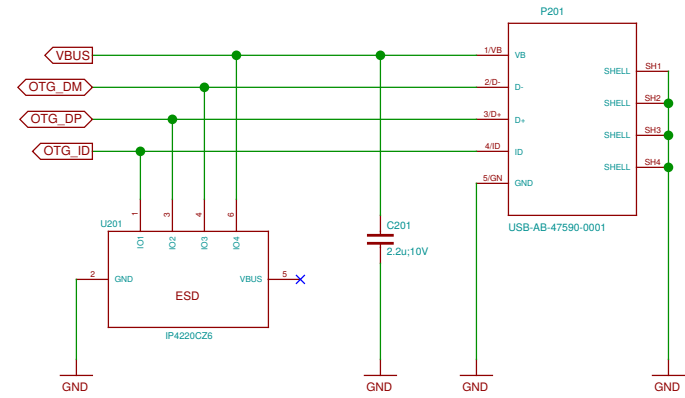
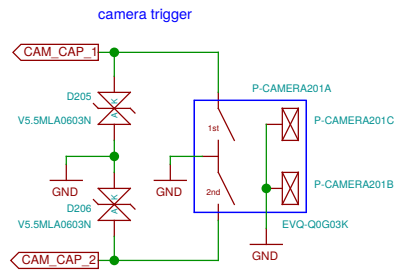
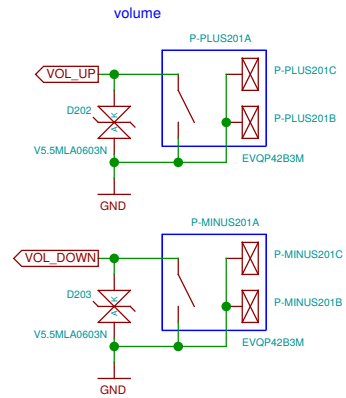
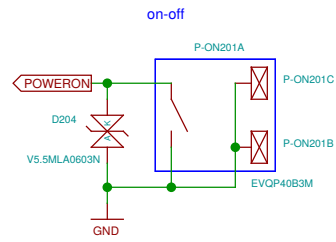
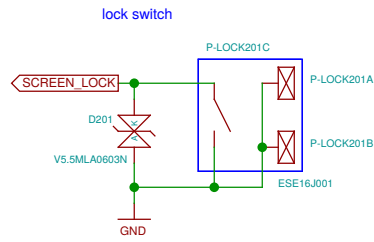
Sheet: [BB-XM Adapter \(DISP\)](#)
File: neo900_SS_35.sch
BB-XM Adapter (DISP)

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

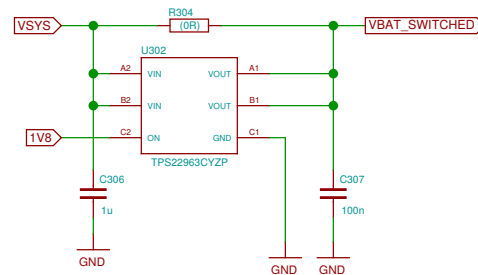
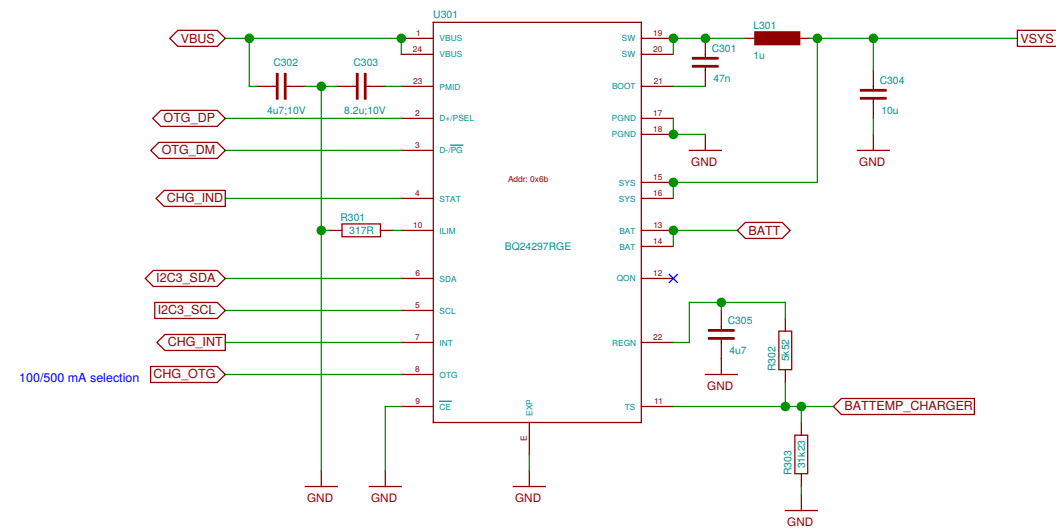
Note regarding I2C addresses:
Addresses in the schematics are provided for convenience.
The authoritative source is
<https://neo900.org/git?p=misc;a=tree;f=i2c>

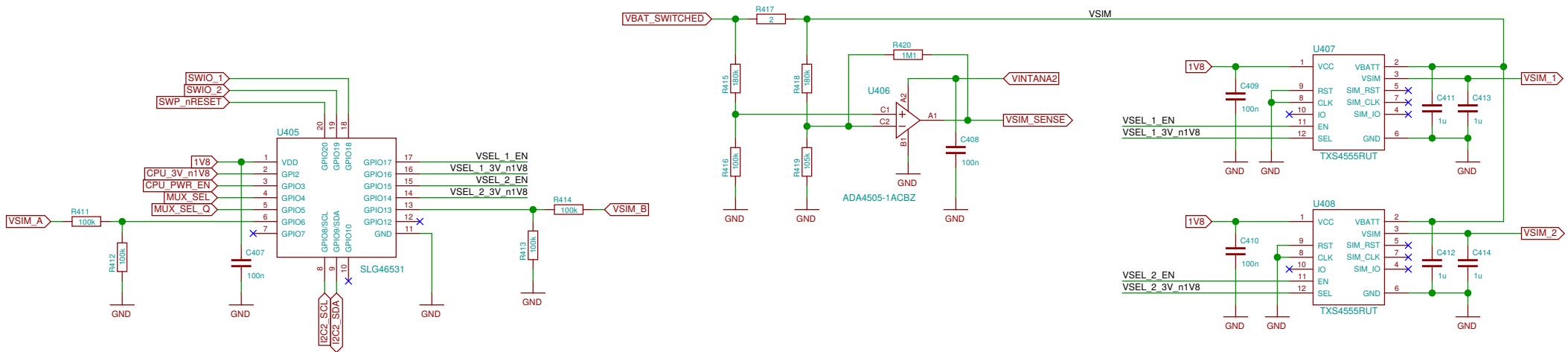
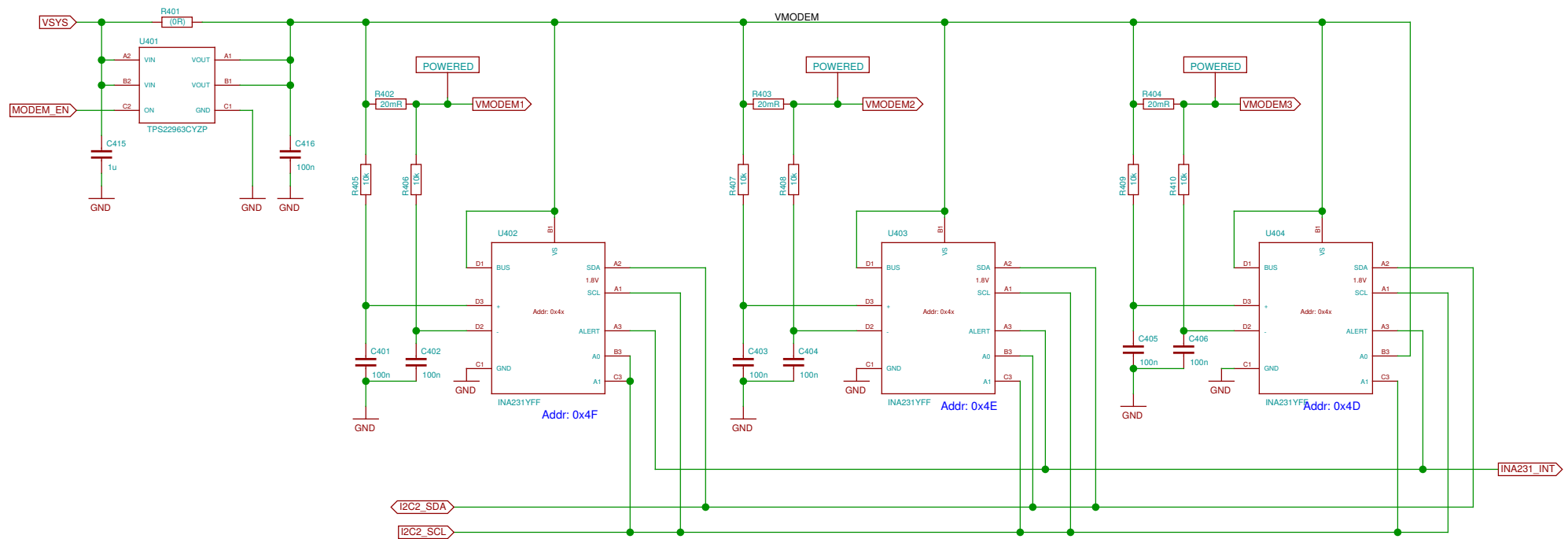
Sheet: /	
File: neo900.sch	
Title: Neo900	
Size: A3	Date: 16 JUL 2016
Plotted by eeshow 2f031f5+ 20161019-02:26Z	
Rev:	Id: 1/37



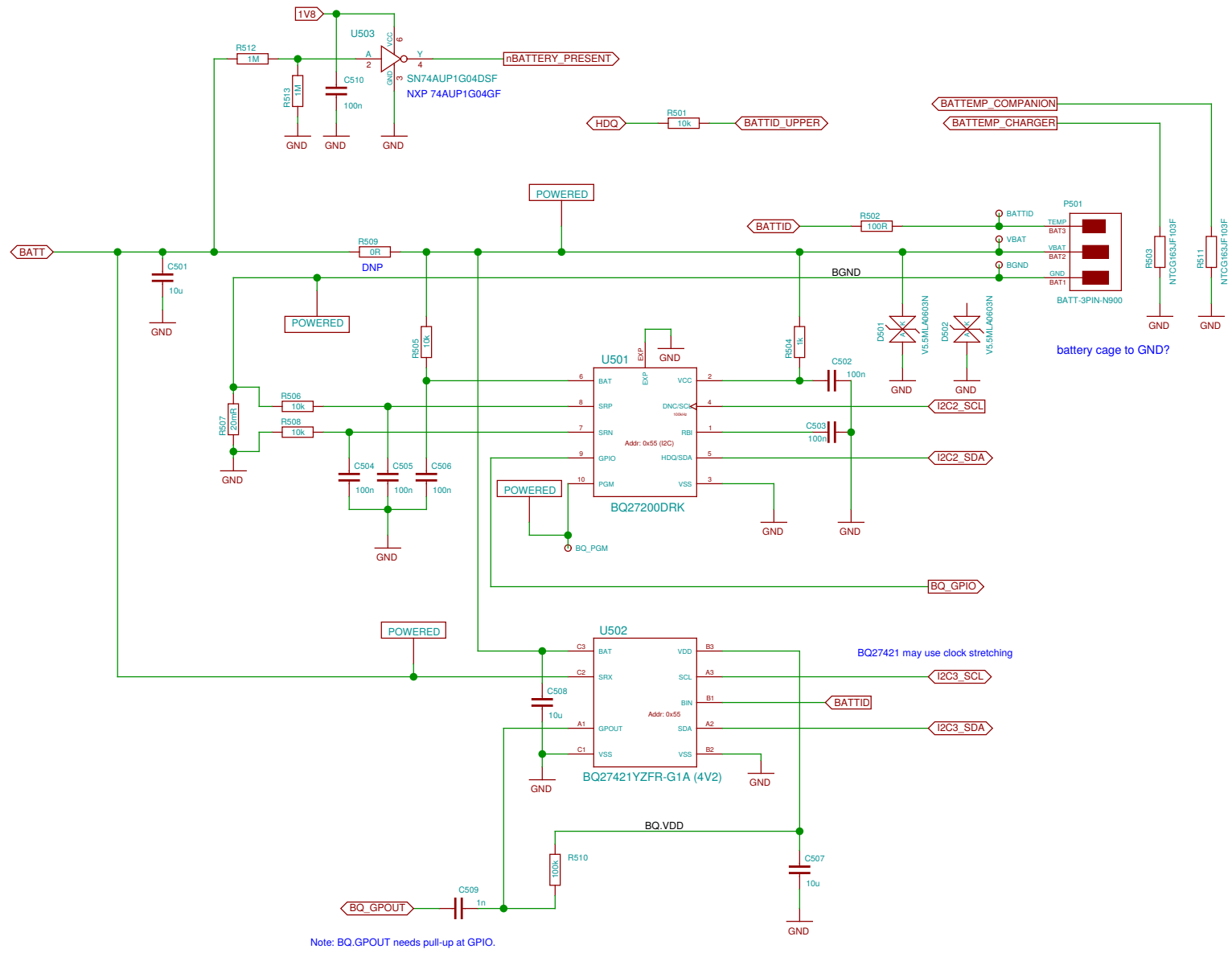
place in scan matrix? would need 3-4 wires to UPPER board instead of 2

in any case it is sufficient to connect GPIO-VOL+ and VOL- to two pins on the B2B connector





TODO: update SLG design for changed pins

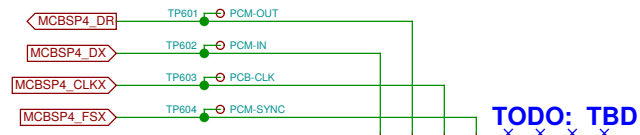
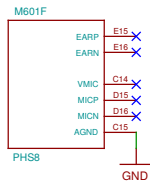


Note: BQ.GPOUT needs pull-up at GPIO.

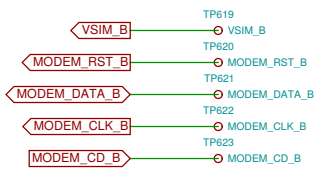
battery cage to GND?

BQ27421 may use clock stretching

Sheet: /Fuel Gauge/		Date: 17 JUL 2016	
File: neo900_SS_5.sch		Rev:	
Title: Fuel Gauge			
Size: A3	Date: 17 JUL 2016	Rev:	
Plotted by eeshow 2f031f5+ 20161019-02:26Z		Id: 5/37	

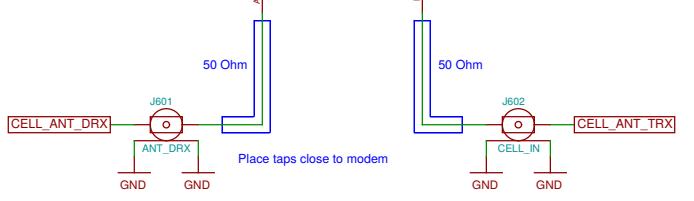
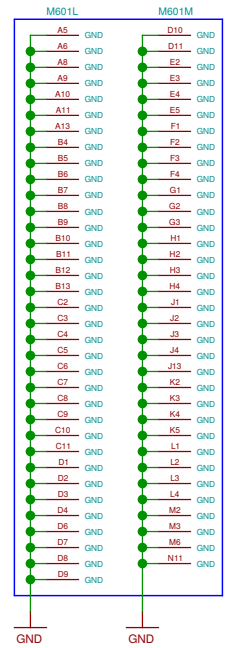
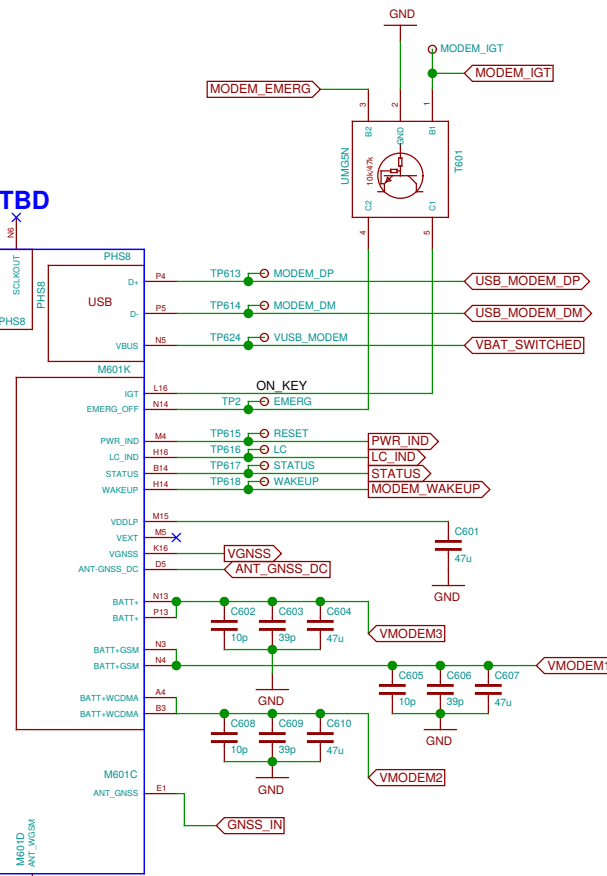
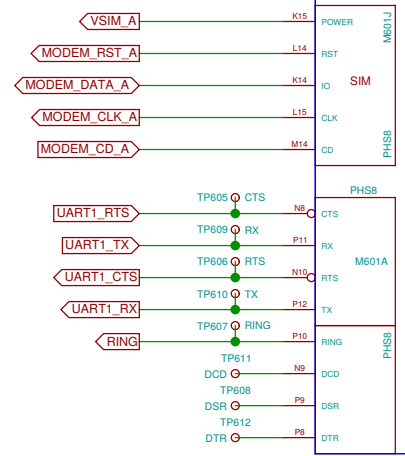


TODO: TBD



TODO: B-SIM bus FFS

Can we connect UART in parallel to Bluetooth UART (i.e. if BT is disabled we can unbrick the Modem?)



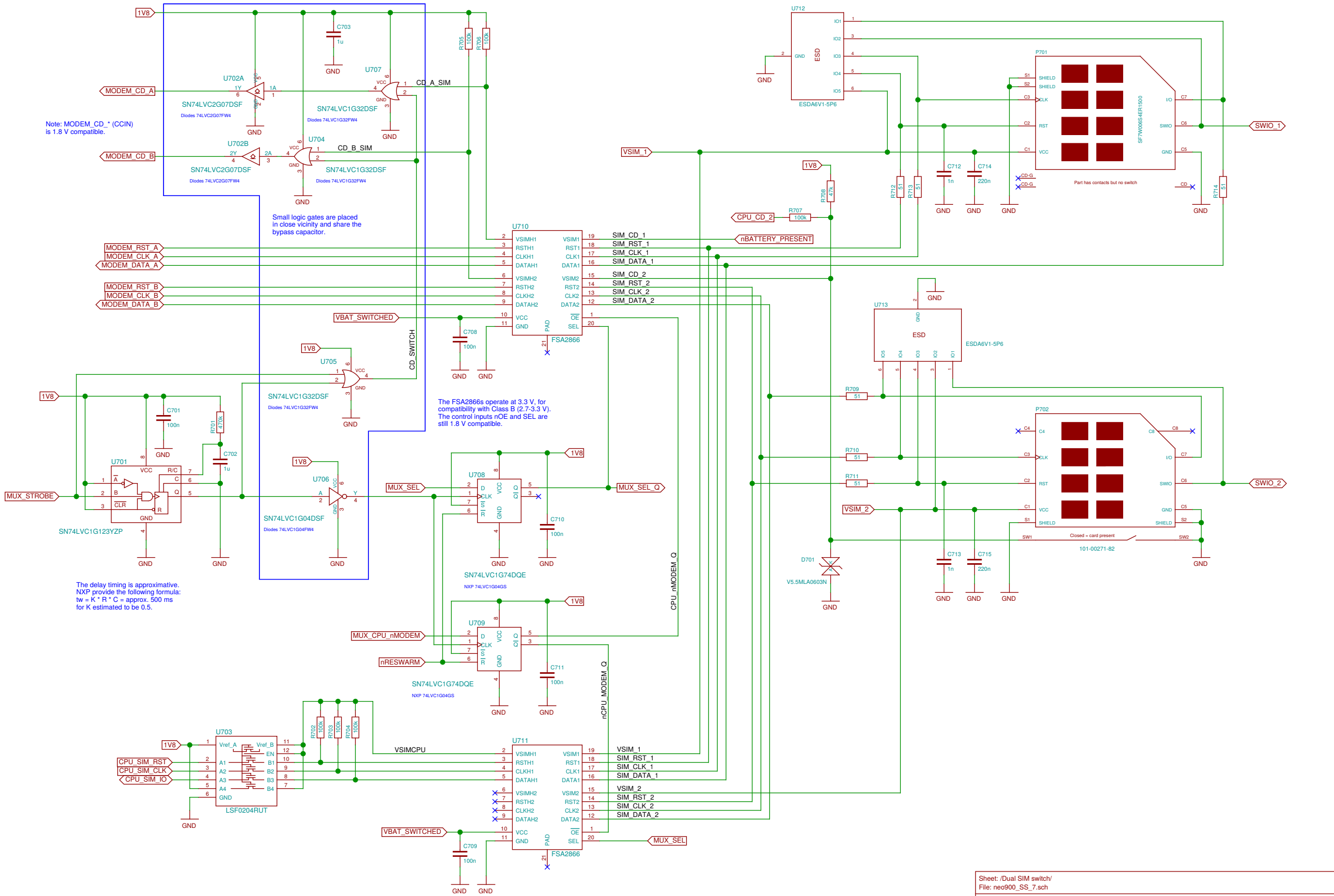
Place taps close to modem

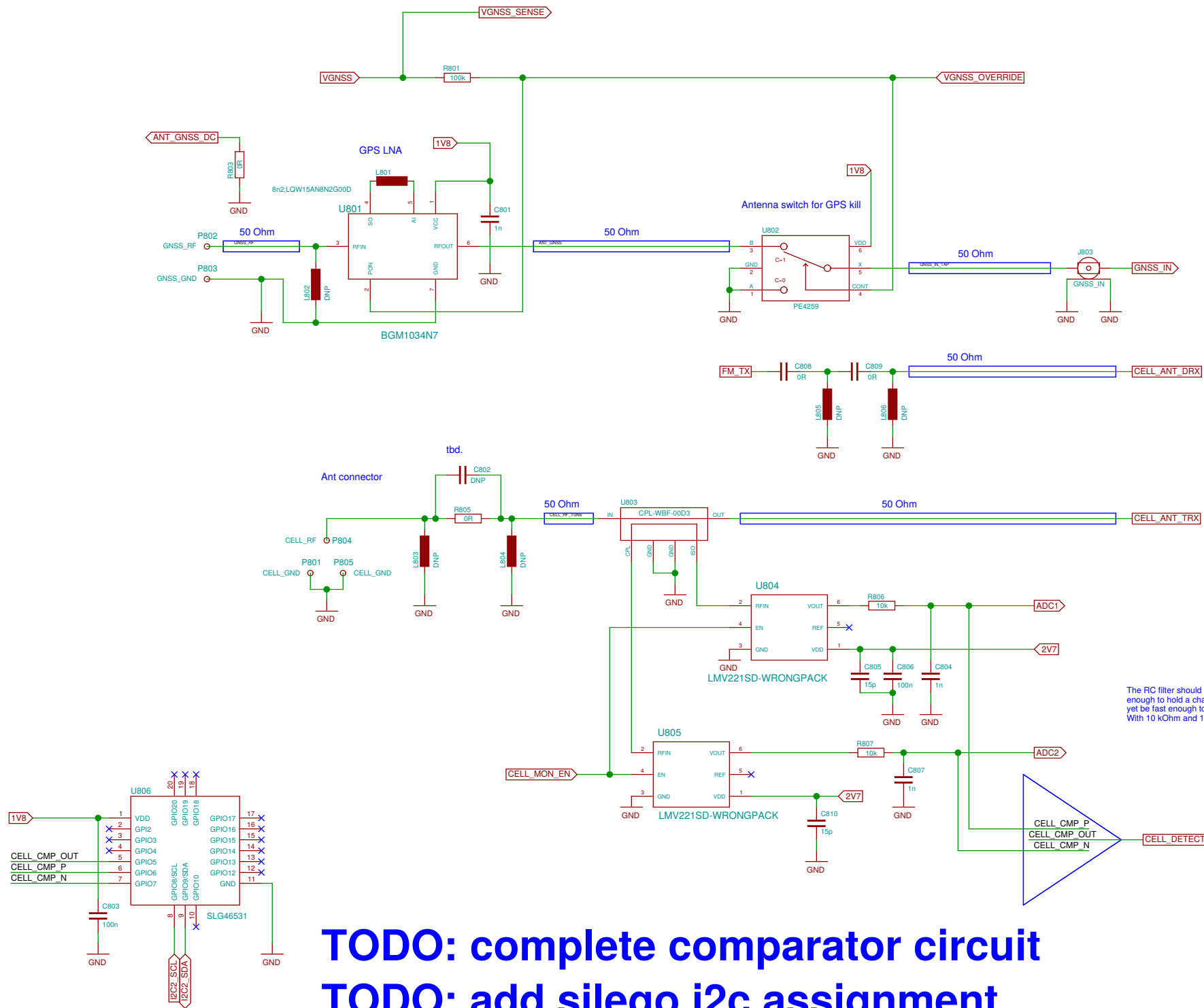
Note: MODEM_CD_* (CCIN) is 1.8 V compatible.

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.

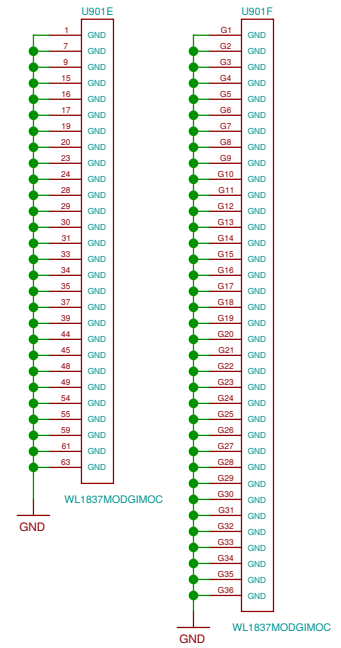
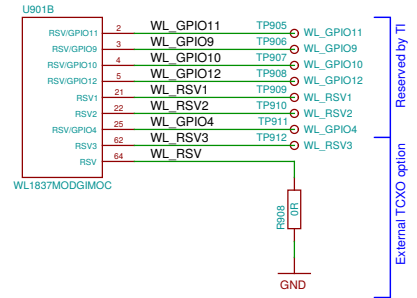
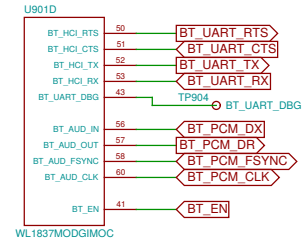
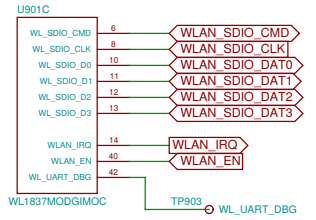
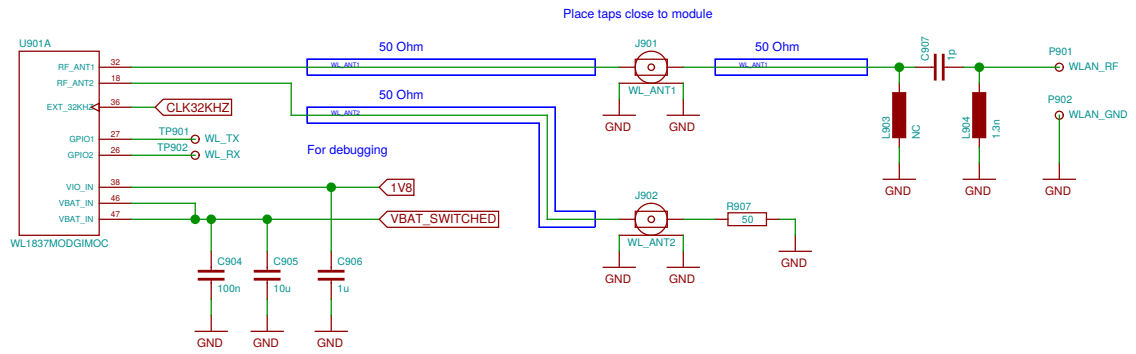
The delay timing is approximative. NXP provide the following formula: $t_w = K * R * C = \text{approx. } 500 \text{ ms}$ for K estimated to be 0.5.



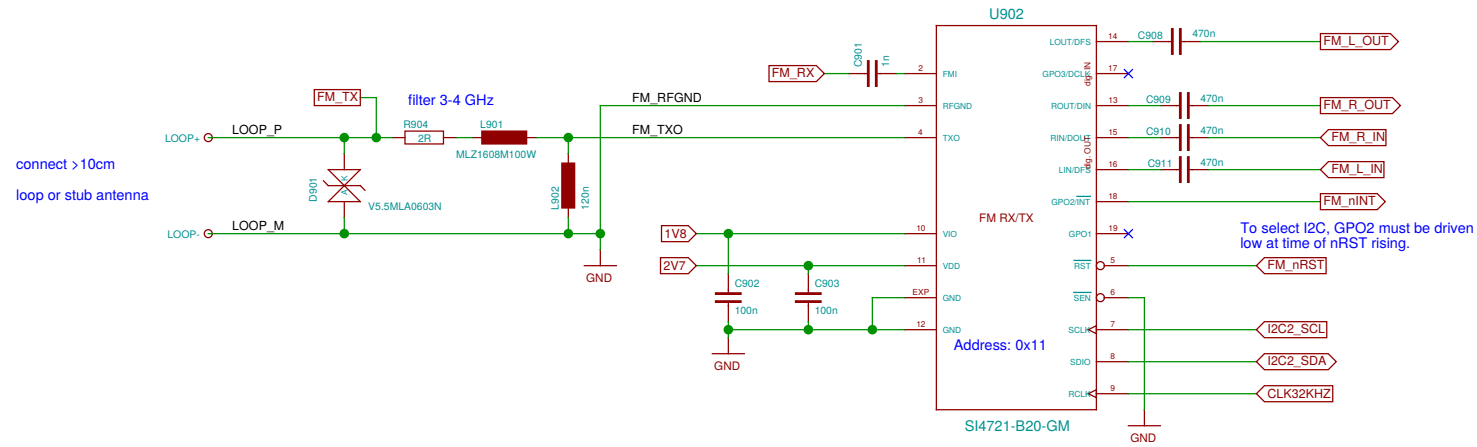


TODO: complete comparator circuit
TODO: add silego i2c assignment
TODO: iox

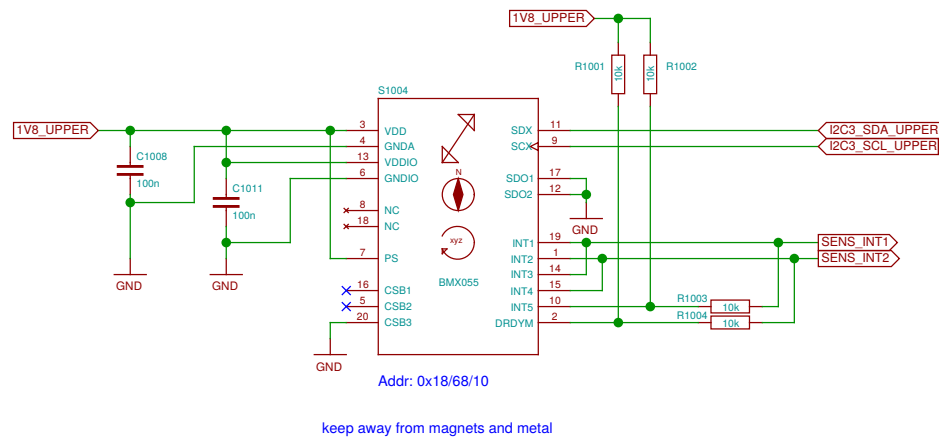
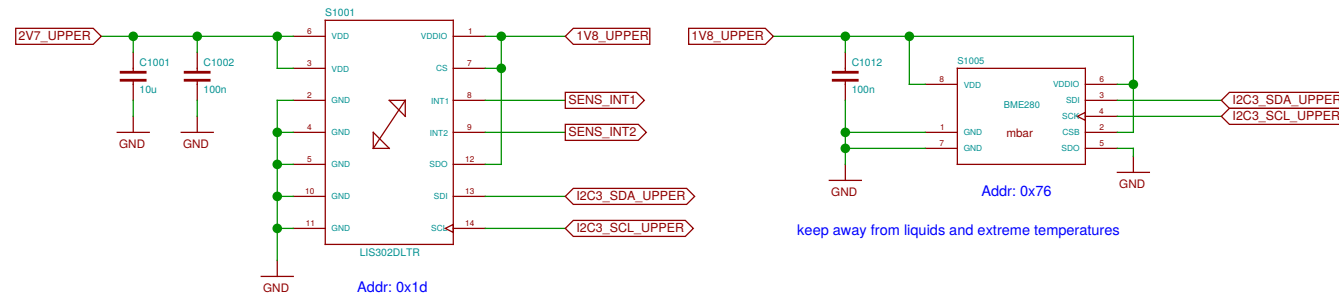
TODO: assign footprints for c-spring contacts



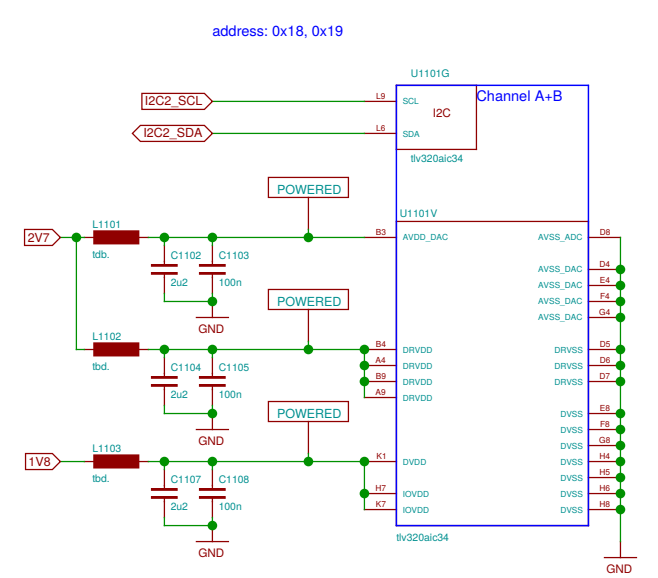
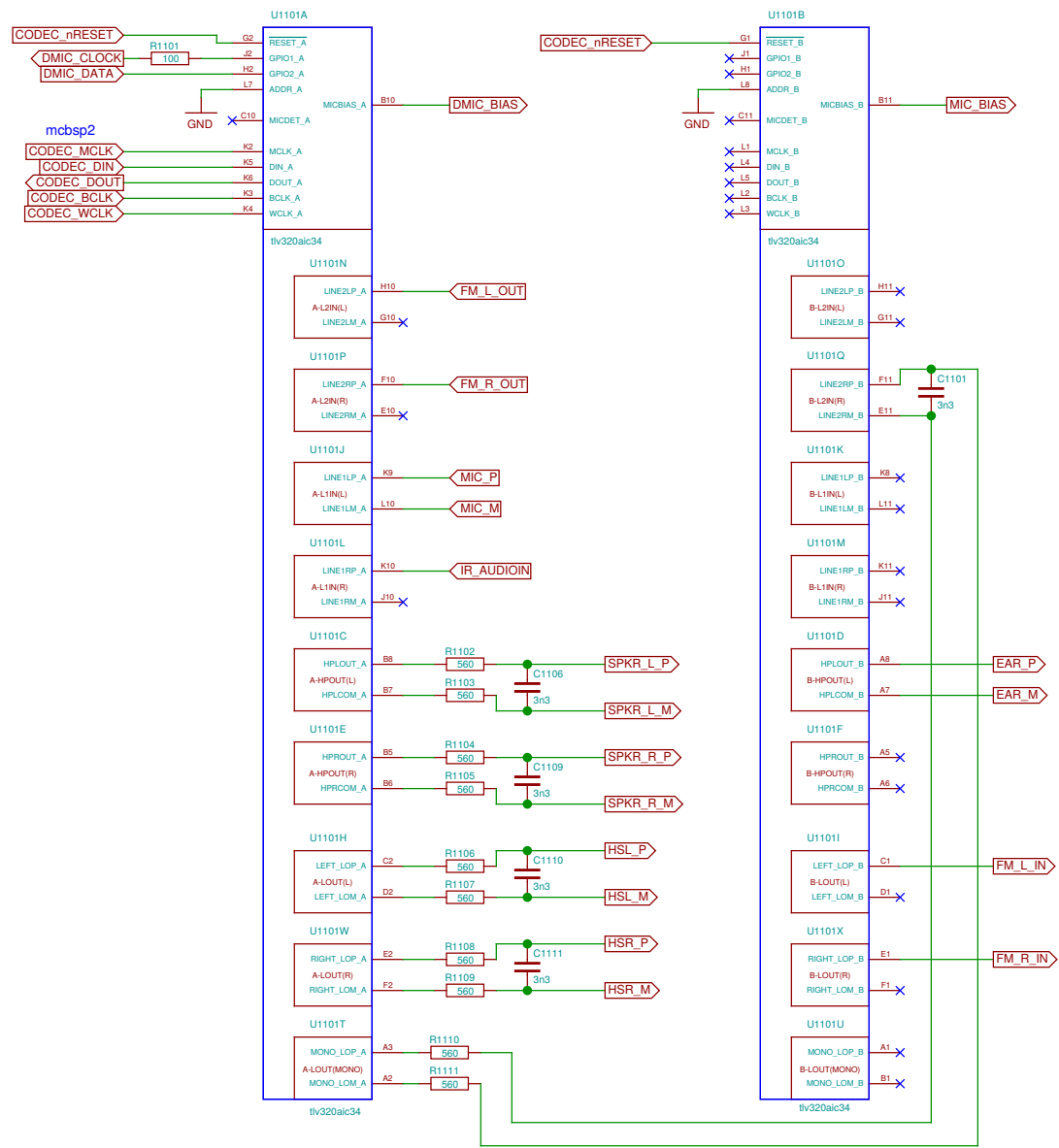
TODO: check caps

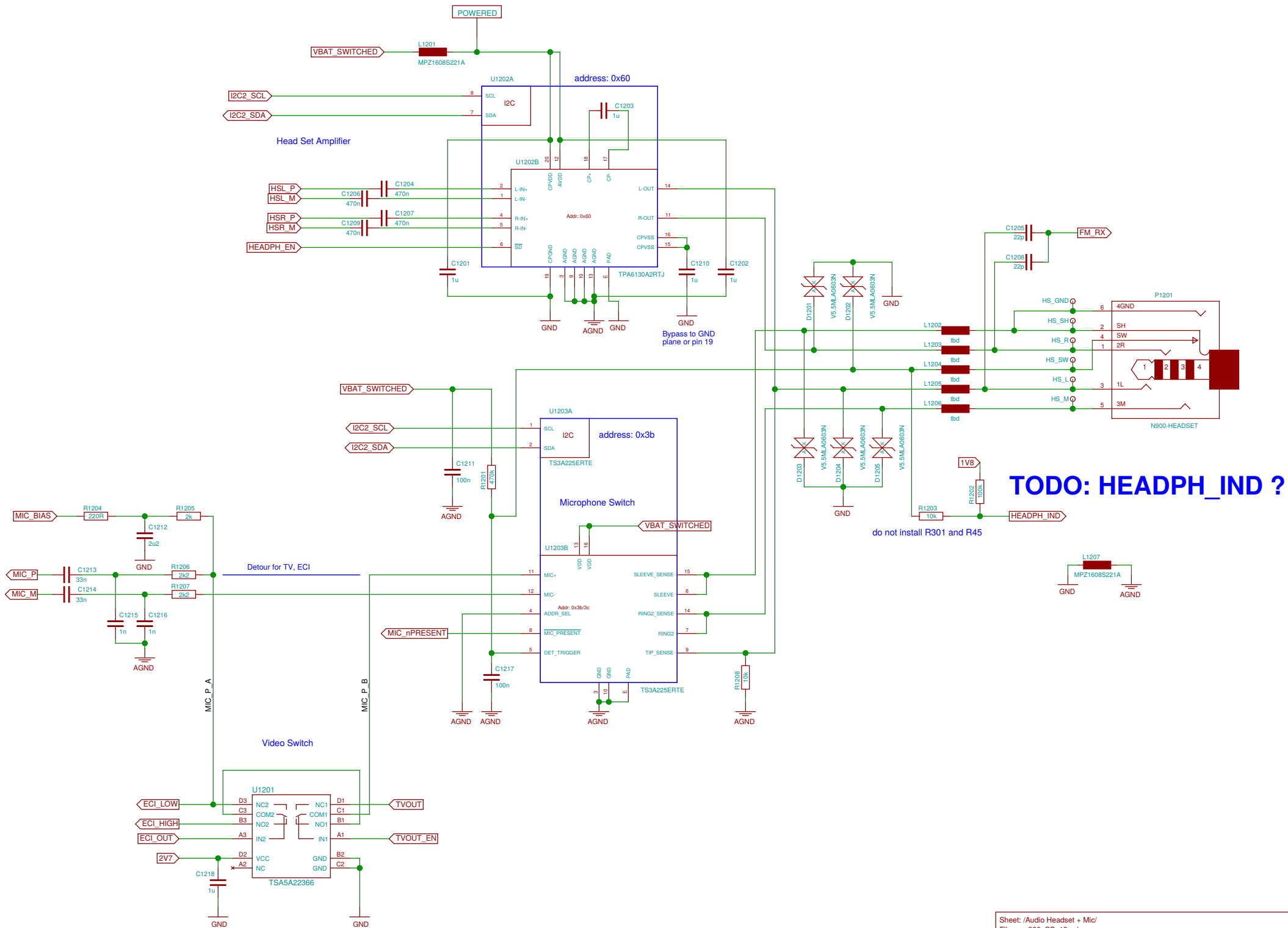


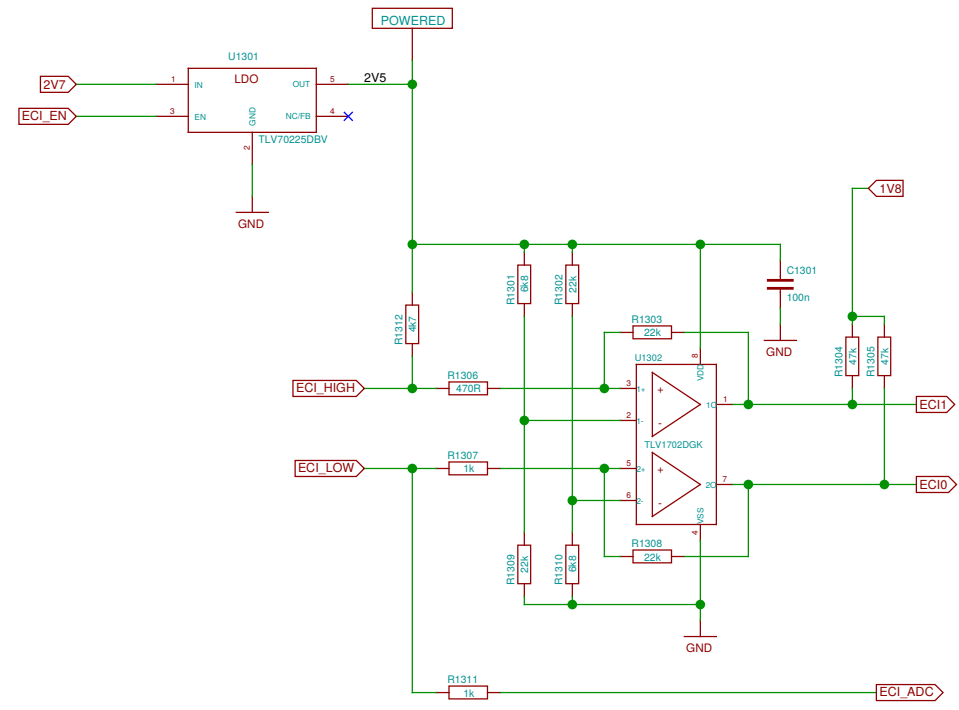
Si4705 is pin compatible (mostly) but RX-only



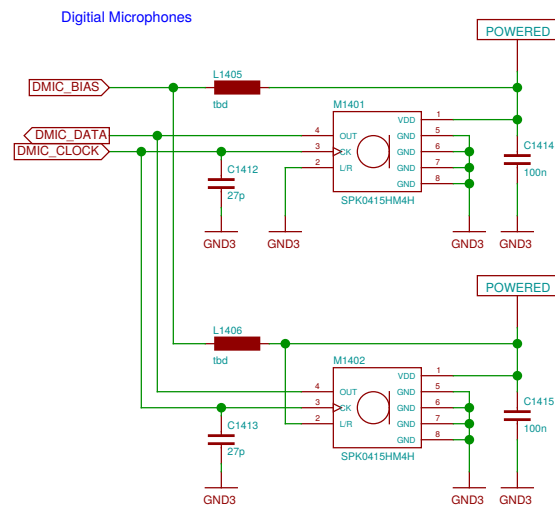
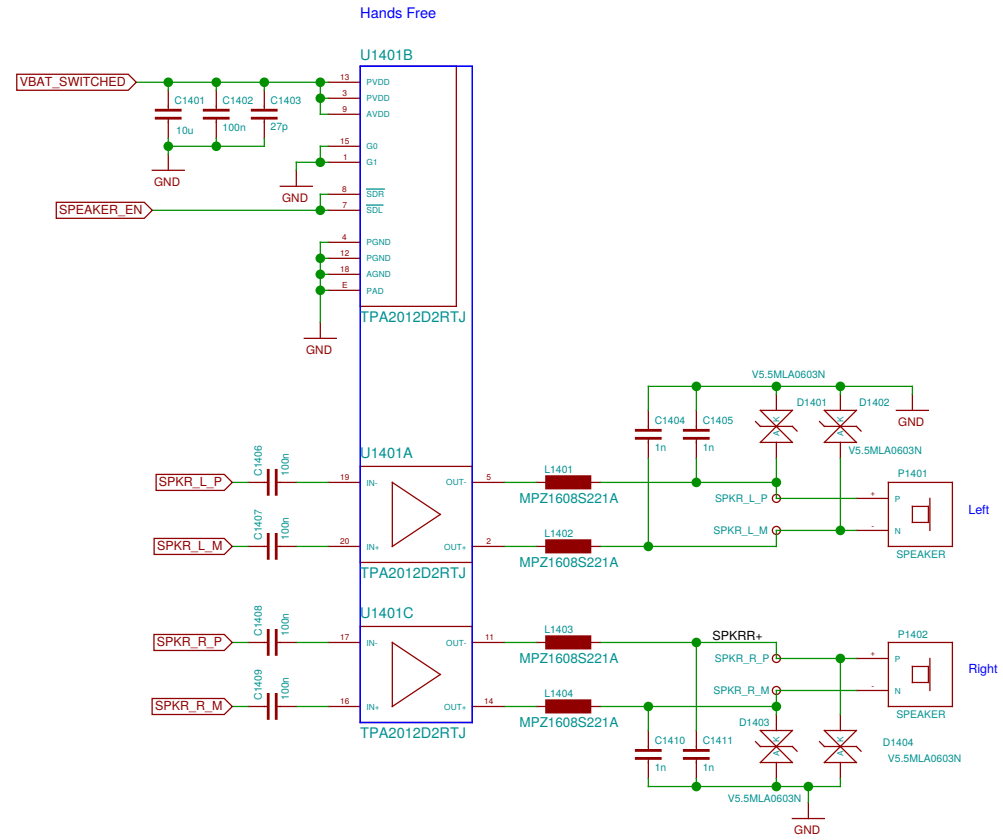
problem: this is a 0.5mm BGA making lower board expensive
 but it appears to be not extremely critical (only 3 rows and inner ring is GND)
 problem: analog mic is on upper board
 alternative: place on upper board (to be evaluated)

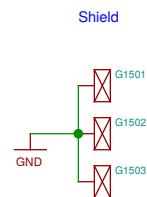
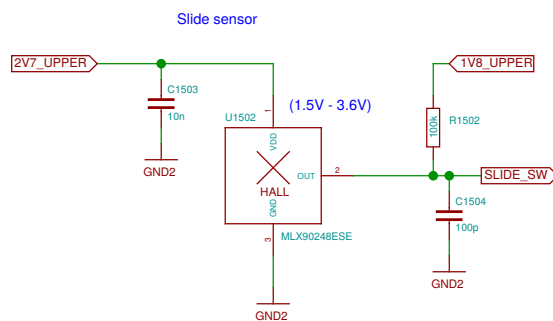
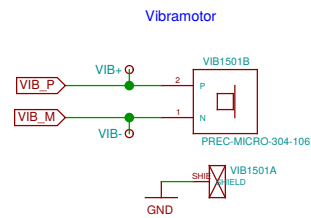
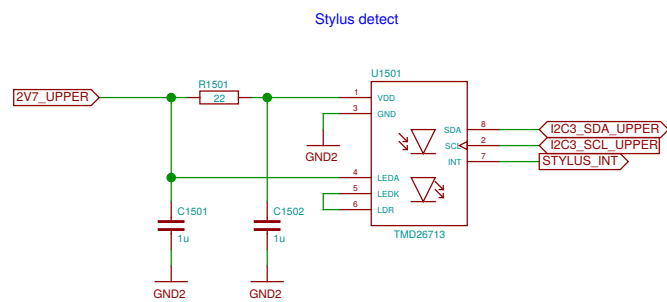




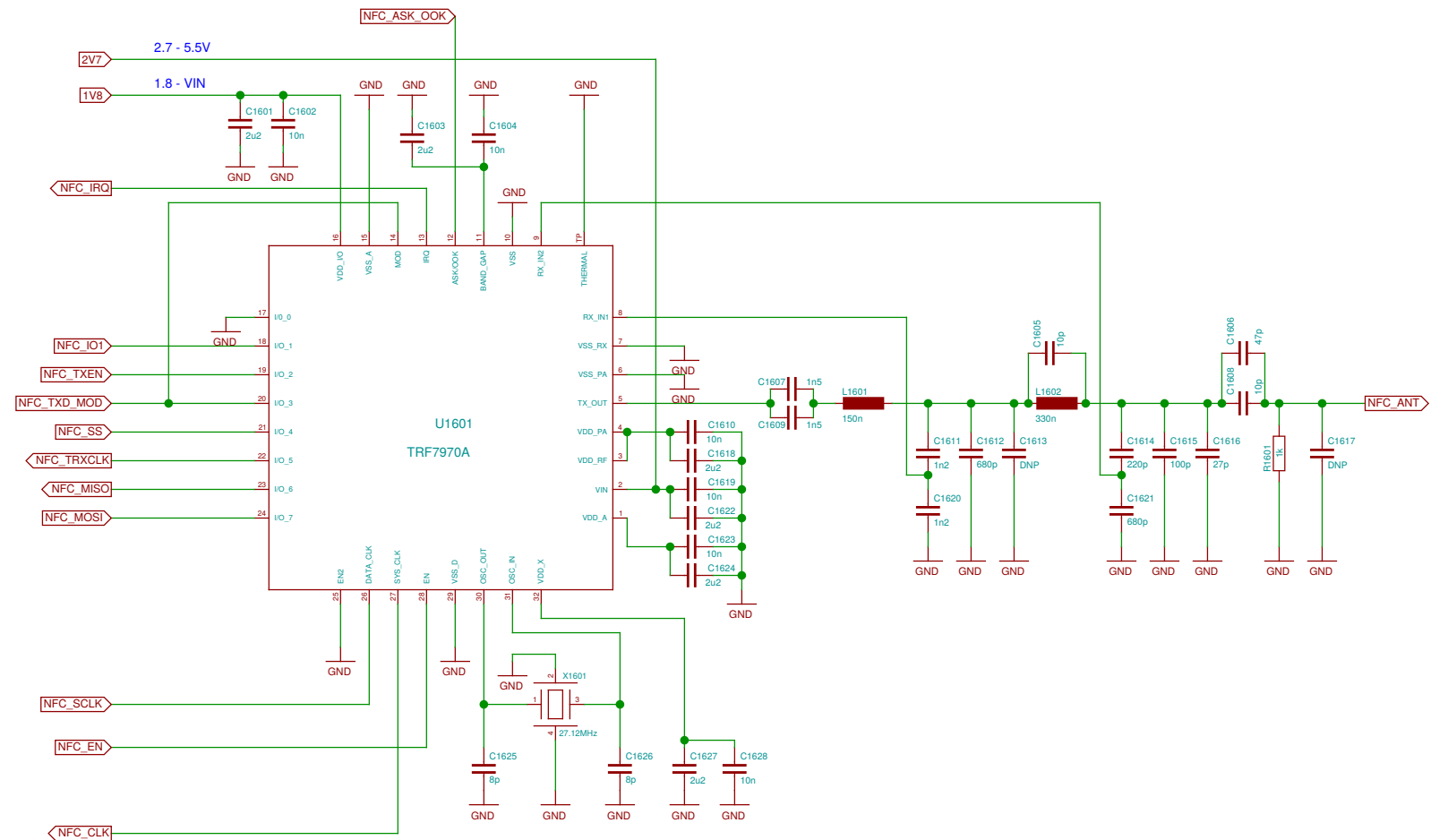


Sheet: /ECI/		
File: neo900_SS_13.sch		
Title: ECI		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 2/03/15- 2016/10/19-02:26Z		Id: 13/37

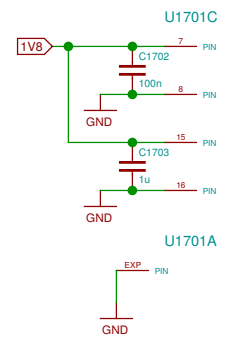
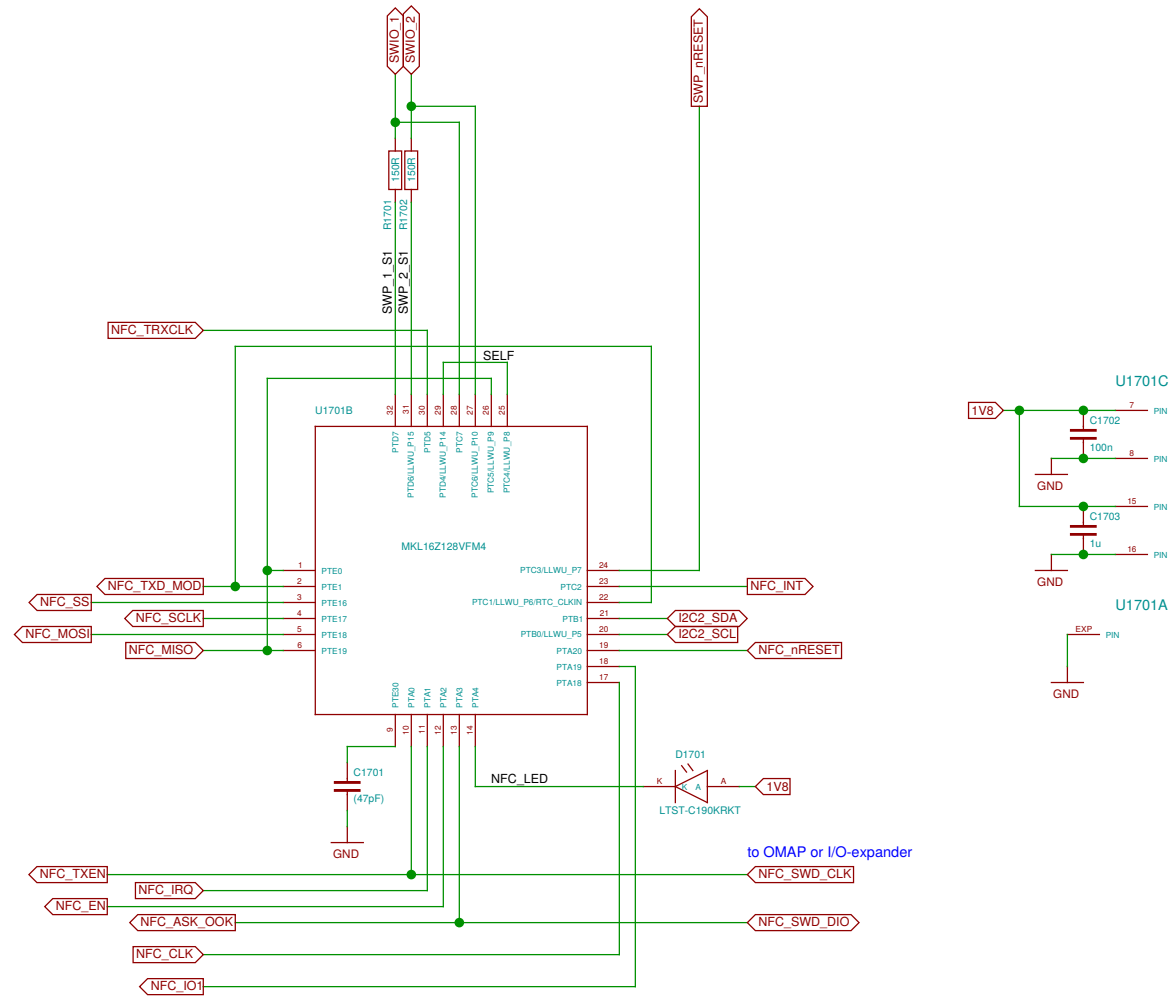




Sheet: /Misc/ File: neo900_SS_15.sch	
Title: Misc	
Size: A3	Date: 17 JUL 2016
Plotted by: eeshow 2f031f5+ 20161019-02:26Z	Rev: Id: 15/37

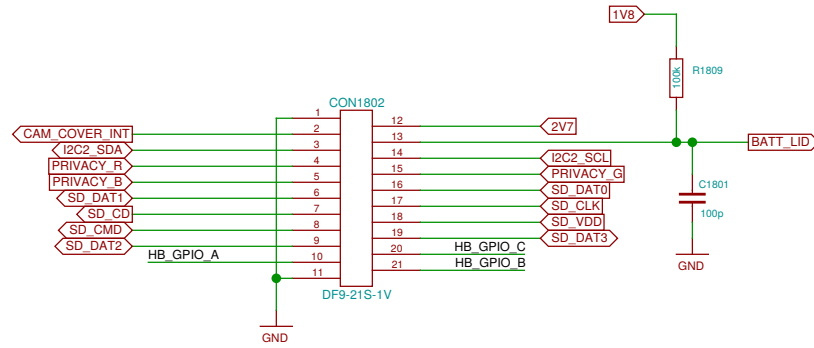
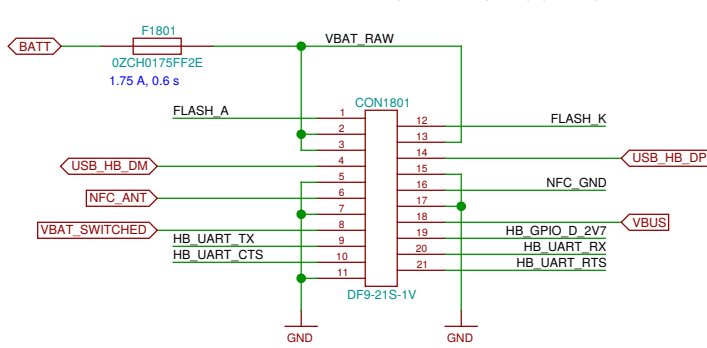


Some choices, 3.2 x 2.6 mm, 8-10 pF:
 NDK NX3225GA-27.12M-STD-CRG-2
 NDK NX3225SA-27.12M-STD-CSR-3
 Tattien XXCCEINANF-27.120000

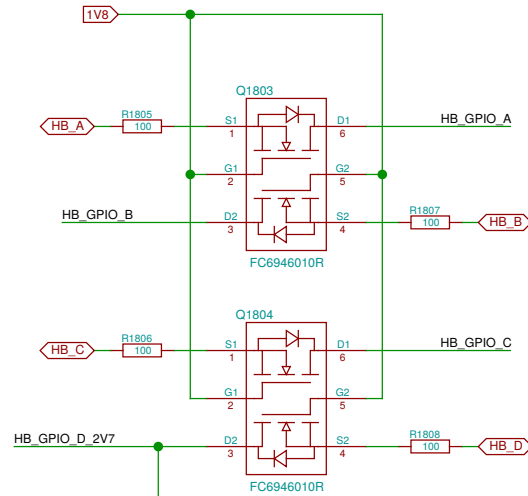
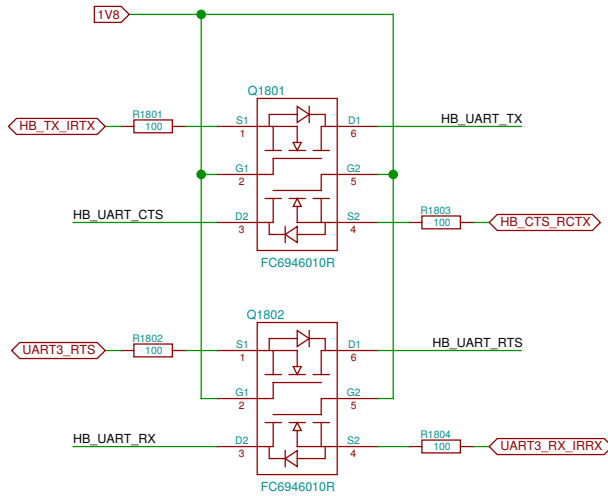
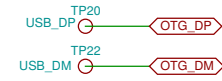


The LOWER-BOB interconnect is defined in the Hackerbus specification
<http://neo900.org/stuff/papers/hb.pdf>

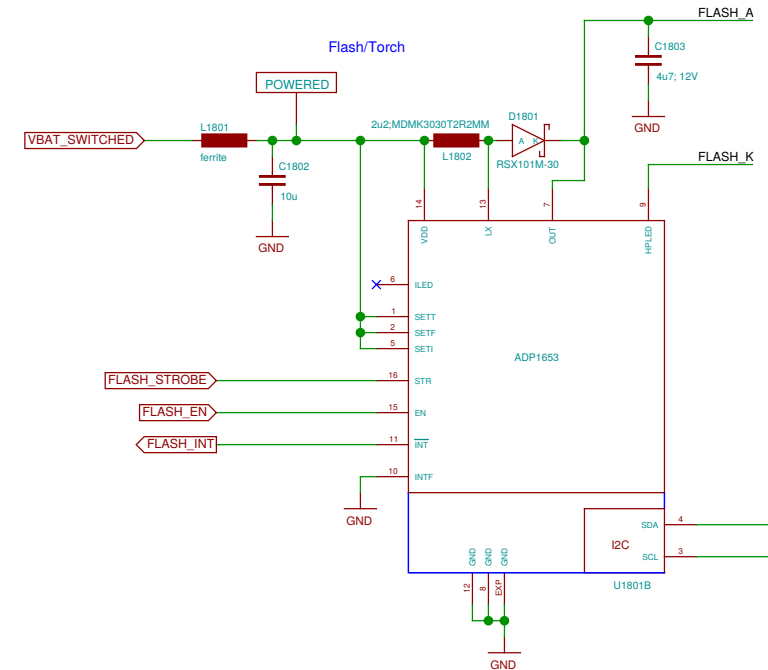
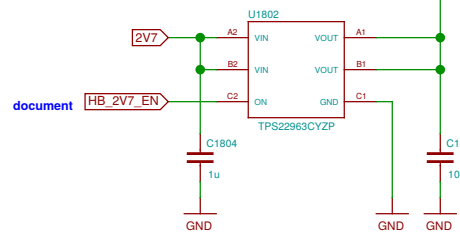
NOTE: this is mangling up Breakout and Lower board connectors
 Signals may have to be fed through the breakout board connector increasing resistance



TODO: define NFC-GND



Q18xx alternative: Diodes DMN63D8LV



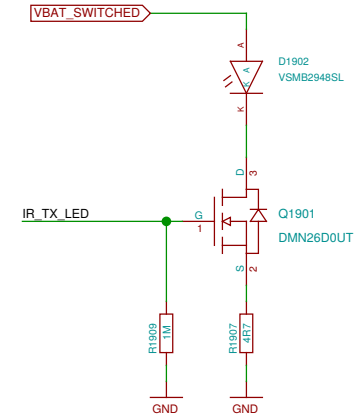
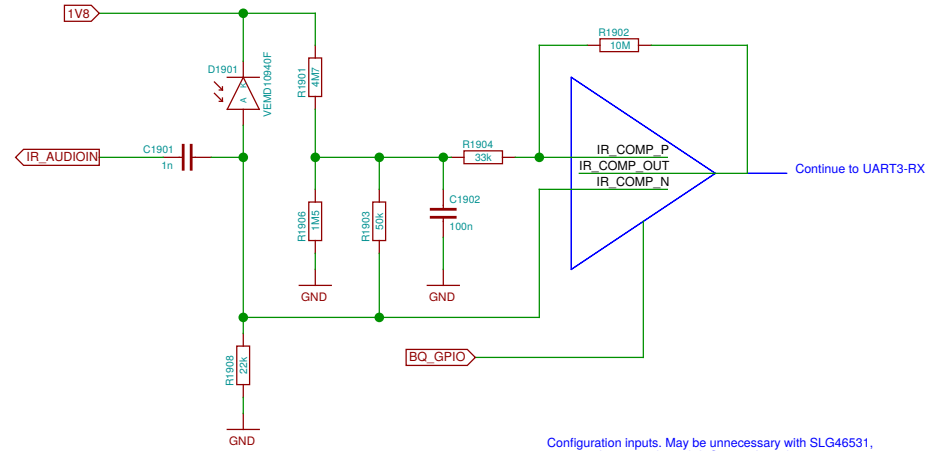
TODO: HB USB PHY may go here

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

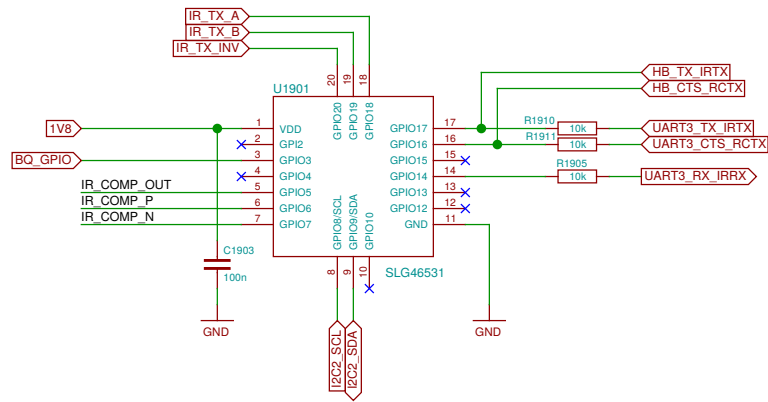
Sheet: /Hackerbus/		File: neo900_SS_18.sch	
Title: Hackerbus			
Size: A3	Date: 17 JUL 2016	Rev:	
Plotted by: eeshow 2103115- 20161019-02:26Z		Id: 18/37	

TODO: update D1901 footprint

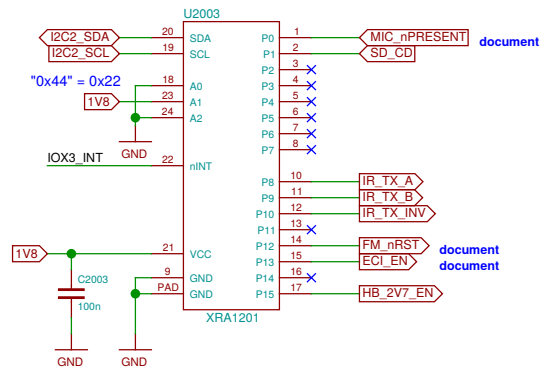
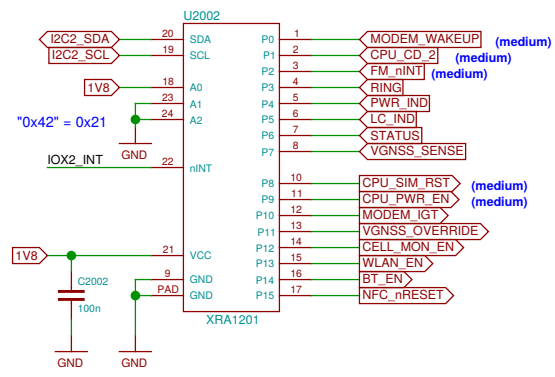
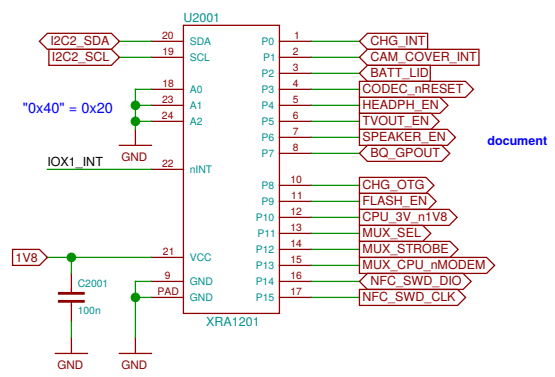
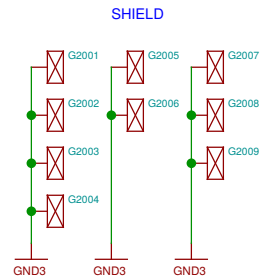
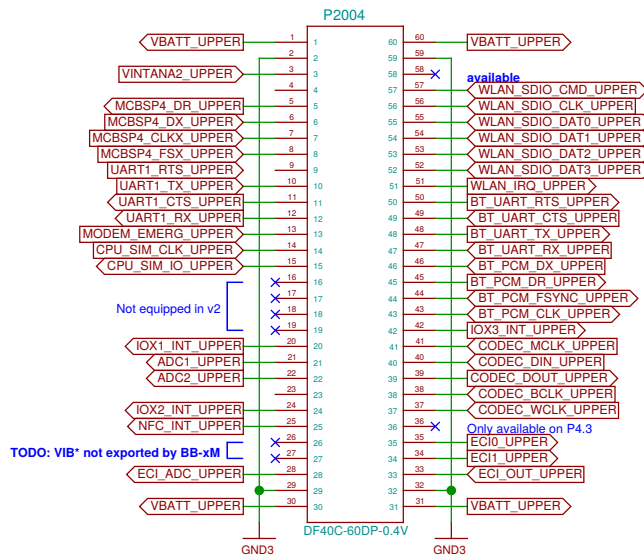
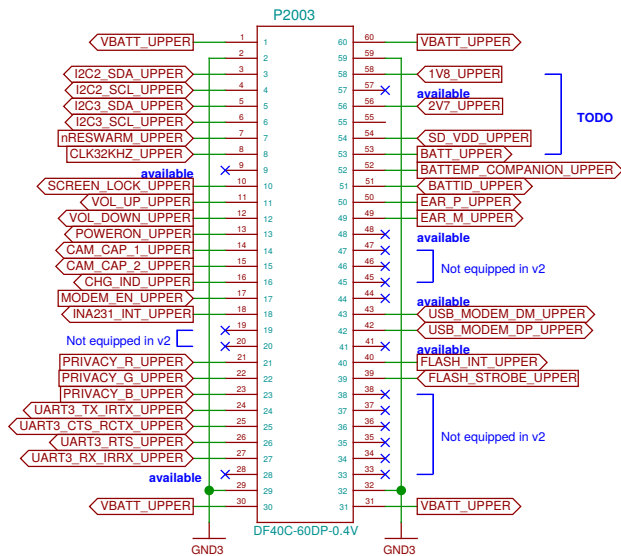
NOTE: 1V8 may be quite noisy



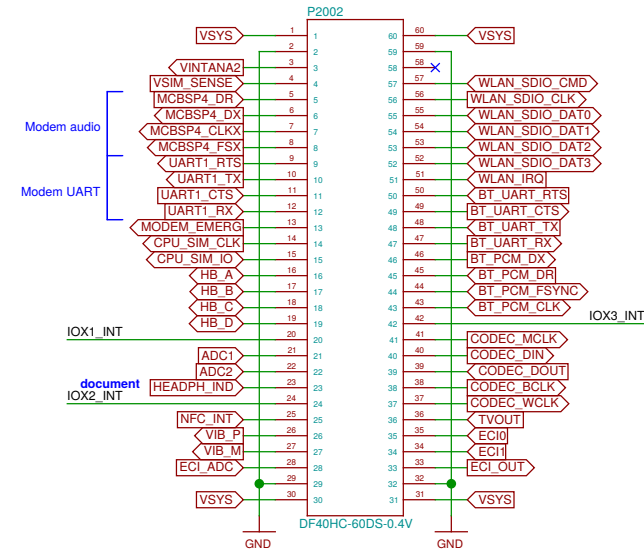
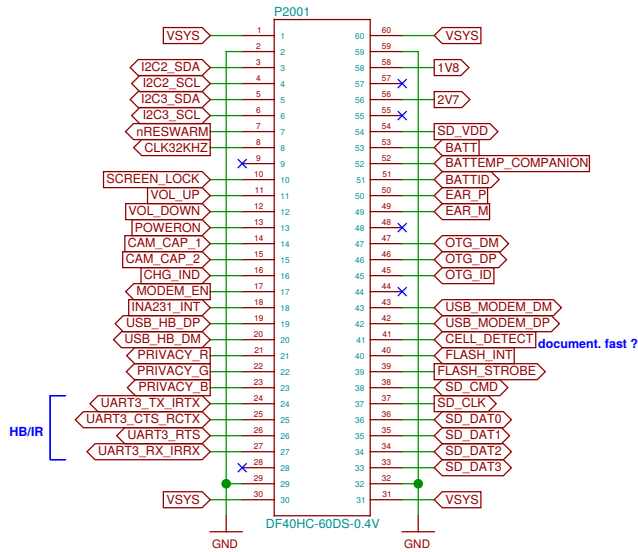
Configuration inputs. May be unnecessary with SLG46531, once configuration through I2C is confirmed.



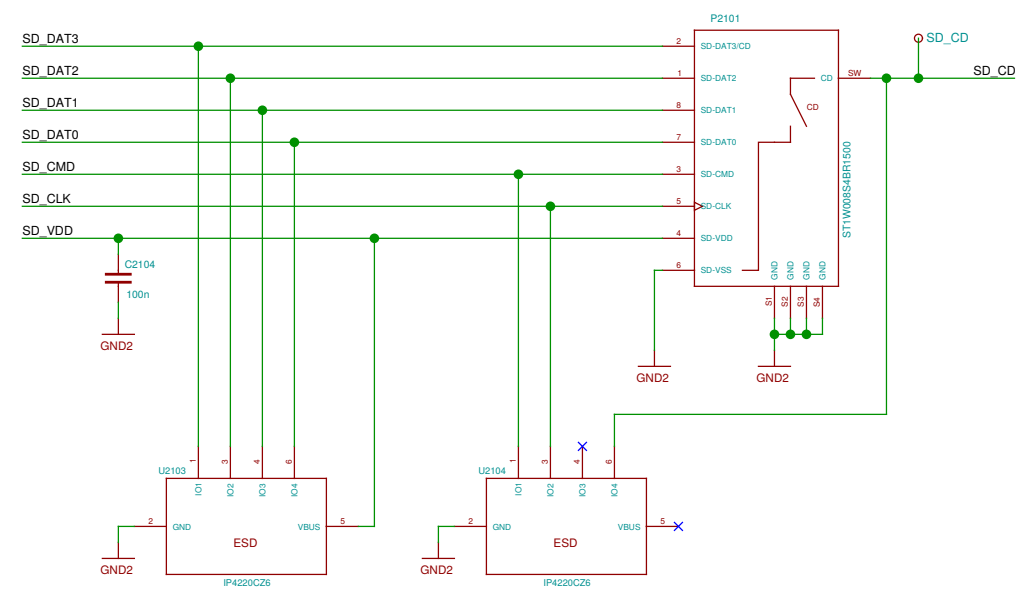
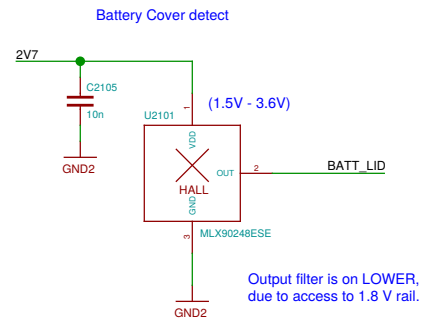
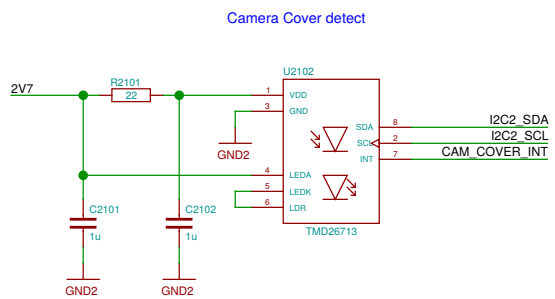
This is just the collection of signals we have.
Proper assignment still pending.



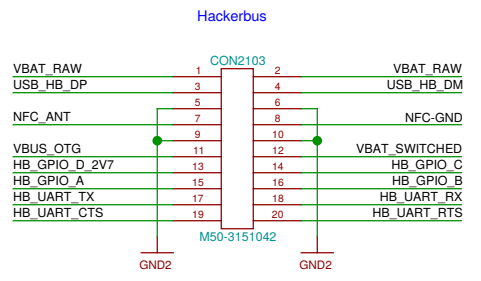
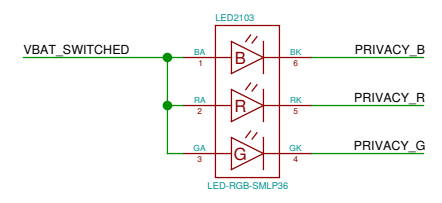
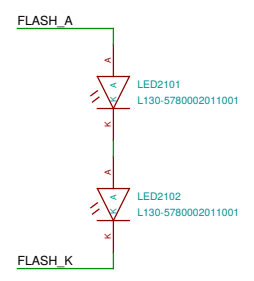
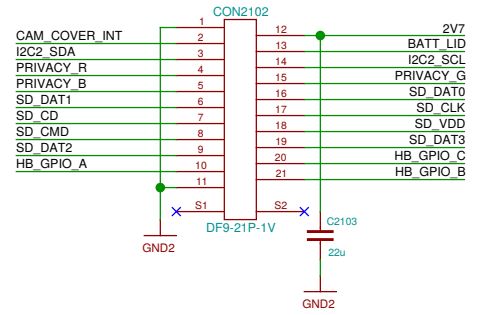
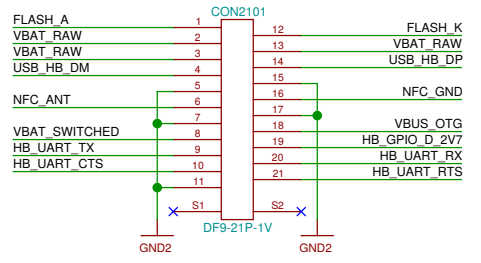
UPPER
LOWER



Current rating per contact: 0.3 A



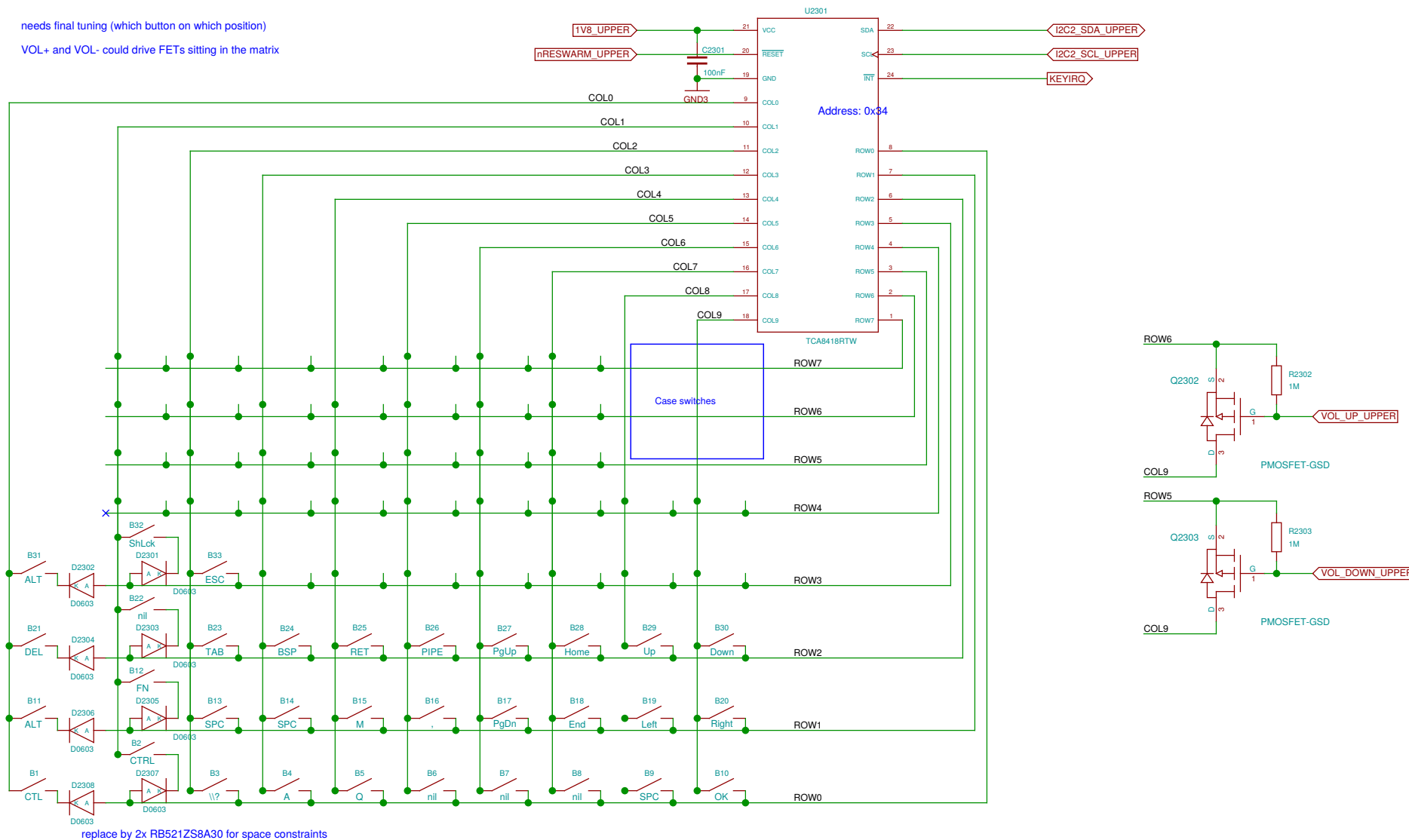
The LOWER_BOB interconnect is defined in the Hackabus specification
<http://neo900.org/stuff/papers/hb.pdf>



TODO: consider sheet for deletion

Sheet: /empty/ File: neo900_SS_22.sch		
Title: empty		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 2103115+ 20161019-02:26Z		Id: 22/37

needs final tuning (which button on which position)
 VOL+ and VOL- could drive FETs sitting in the matrix



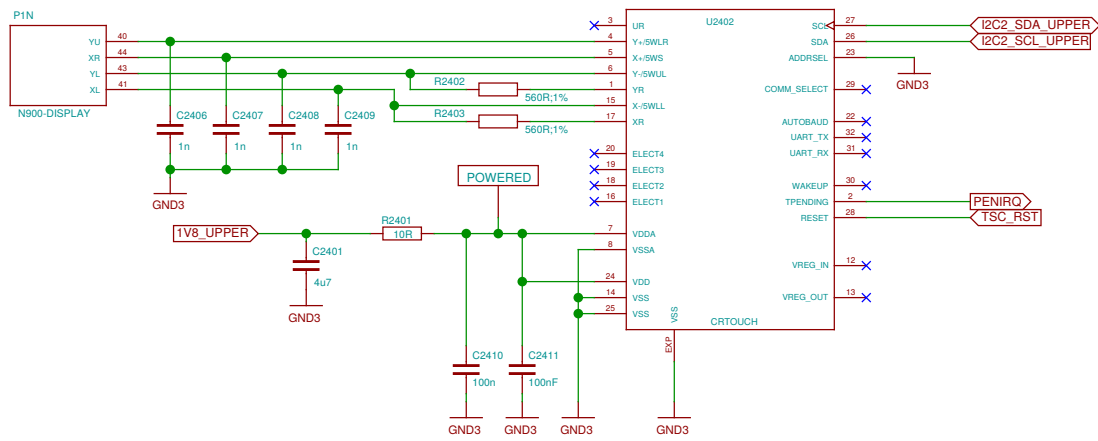
replace by 2x RB521ZS8A30 for space constraints

TODO: key names are nonsense

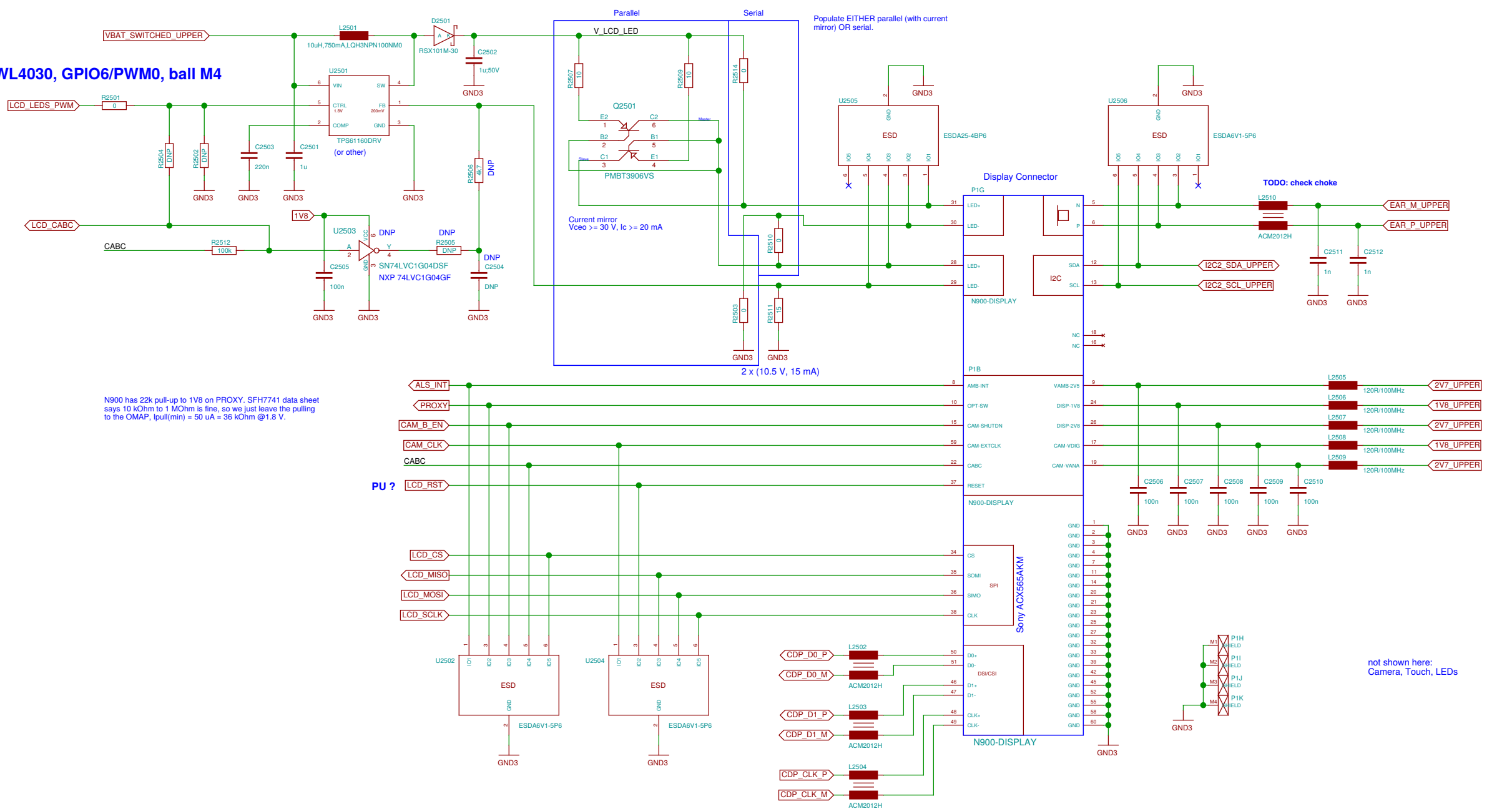
TODO: rearrange matrix to avoid diodes ?

Sheet: /Keypad/		
File: neo900_SS_23.sch		
Title: Keypad		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 2103115+ 20161019-02:26Z		Id: 23/37

Resistive Touch (display connector)



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.

Current mirror
Vceo >= 30 V, Ic >= 20 mA

2 x (10.5 V, 15 mA)

Populate EITHER parallel (with current mirror) OR serial.

TODO: check choke

not shown here:
Camera, Touch, LEDs

OMAP is not part of v2

Sheet: /CPU + PoP RAM/NAND/		
File: neo900_SS_26.sch		
Title: CPU + PoP RAM/NAND		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 2103115+ 20161019-02:26Z		Id: 26/37

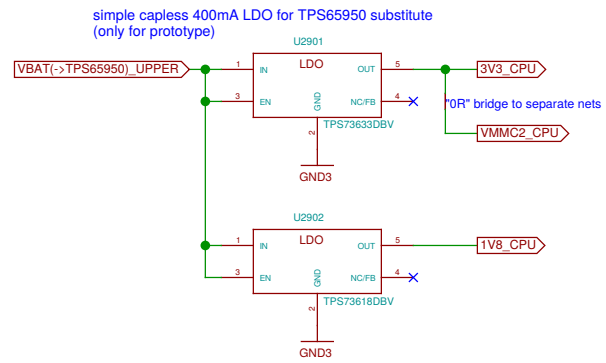
eMMC is not part of v2

Sheet: /eMMC/ File: neo900_SS_27.sch		
Title: eMMC		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 2103115+ 20161019-02:26Z		Id: 27/37

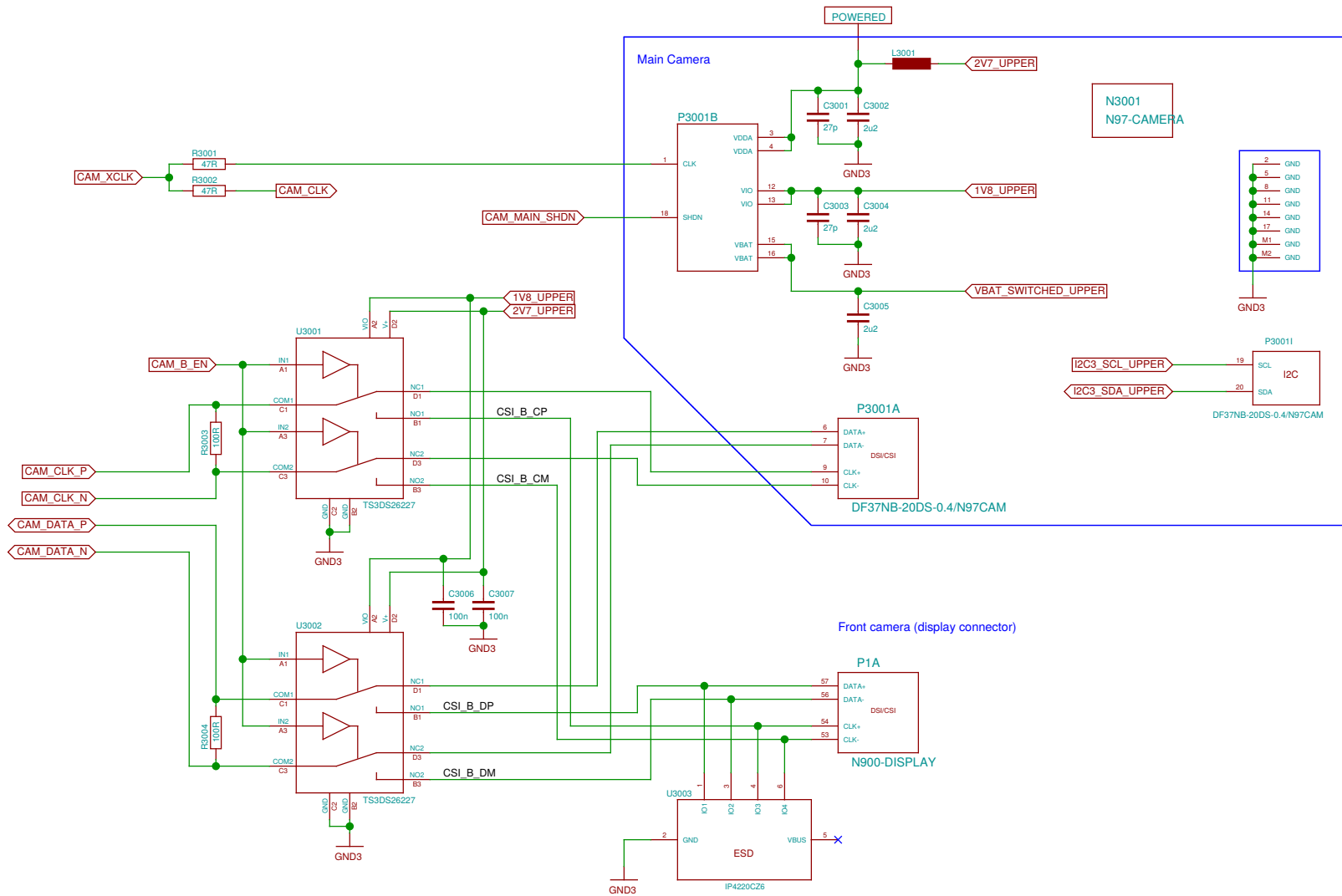
Companion chip (TPS65950) is not part of v2

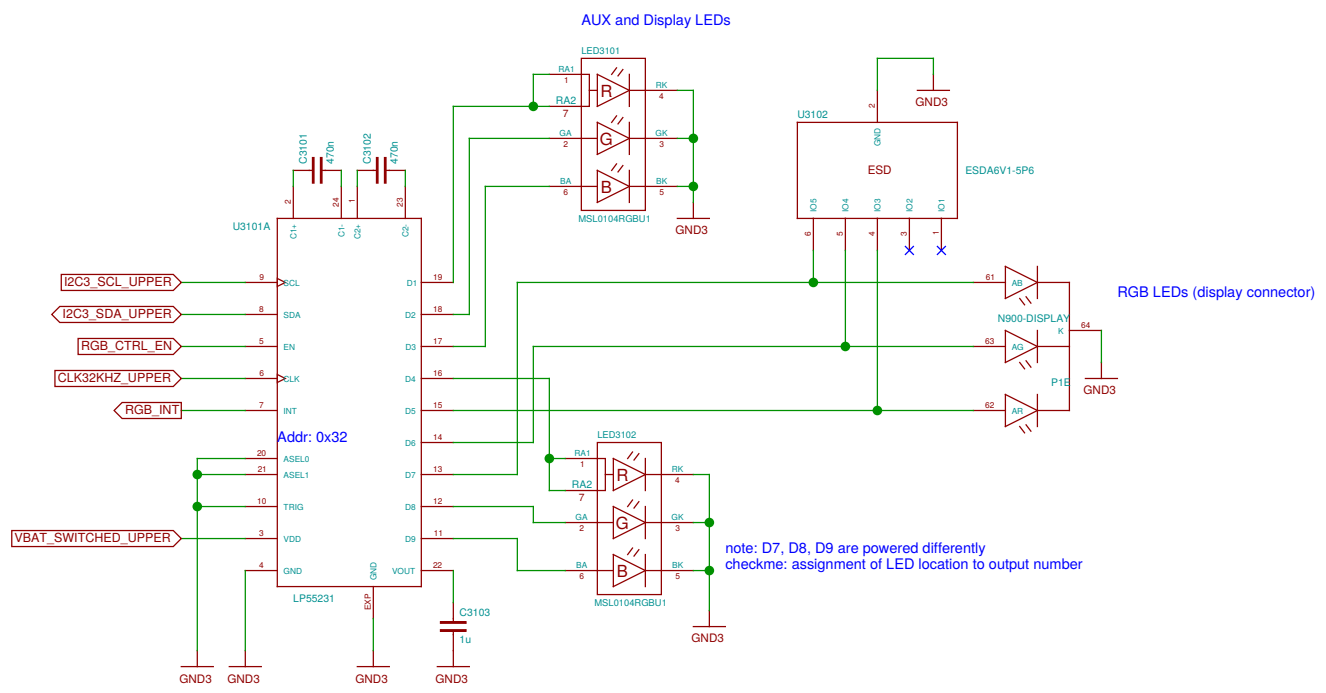
Sheet: /PMU+Codec/ File: neo900_SS_28.sch		
Title: PMU+Codec		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 2103115+ 20161019-02:26Z		Id: 28/37

TODO: empty this sheet, too ?



Sheet: /BB-XM Dummy (TWL4030)/	
File: neo900_SS_29.sch	
Title: BB-XM Dummy (TWL4030)	
Size: A3	Date: 17 JUL 2016
Plotted by eeshow 2f031f5+ 20161019-02:26Z	Rev:
	Id: 29/37



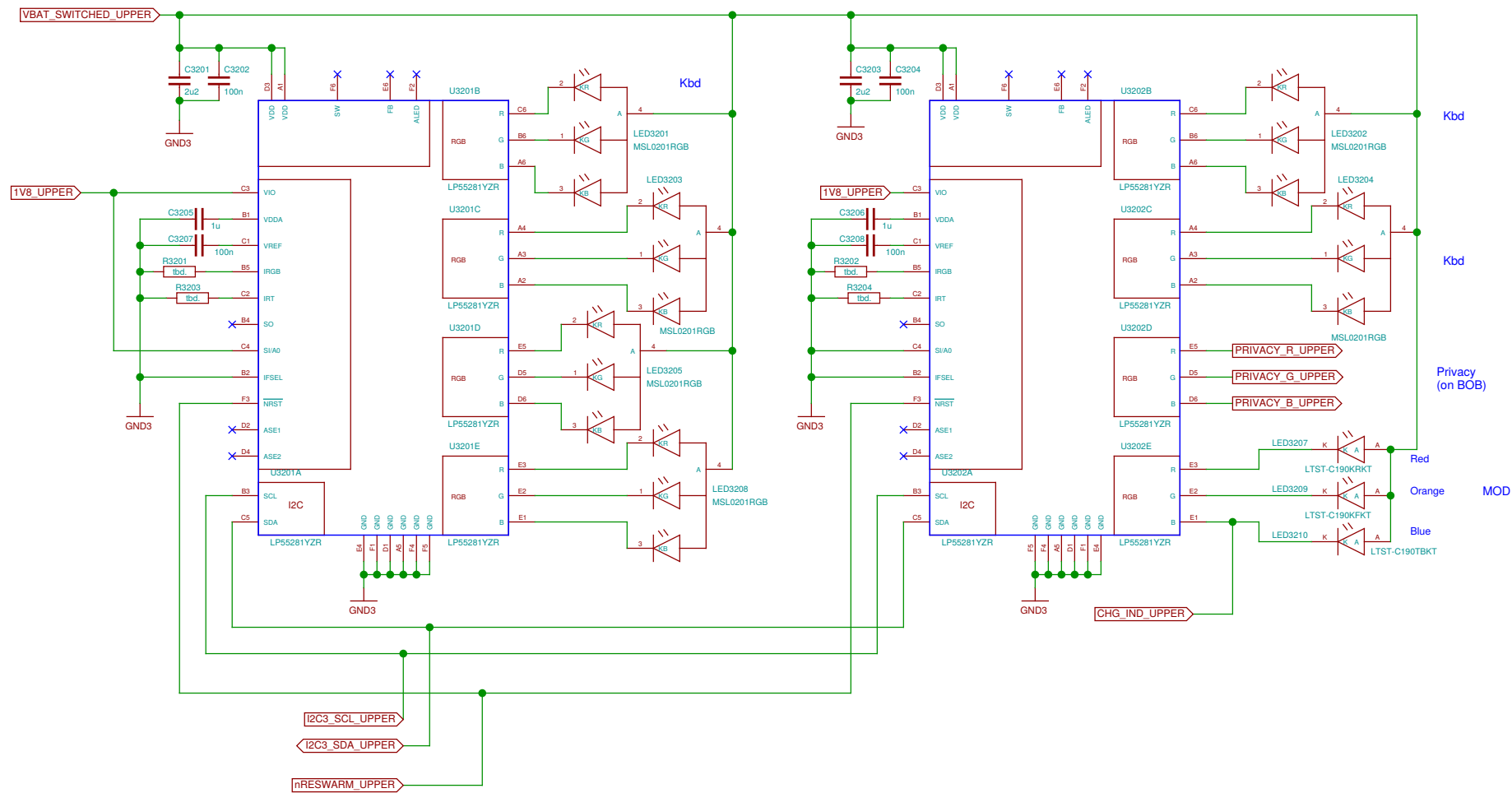


AUX and Display LEDs

RGB LEDs (display connector)

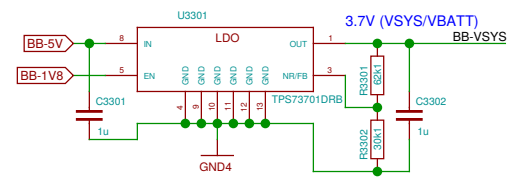
note: D7, D8, D9 are powered differently
checkme: assignment of LED location to output number

Sheet: /Fancy LEDs/		
File: neo900_SS_31.sch		
Title: Fancy LEDs		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 2f031f5+ 20161019-02:26Z		Id: 31/37



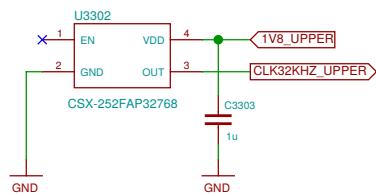
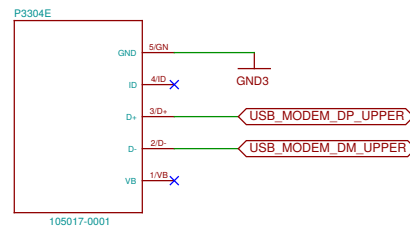
Cleaning up. The connections to BB-xM are on the next sheets.

TODO: v2 power supply still needs designing



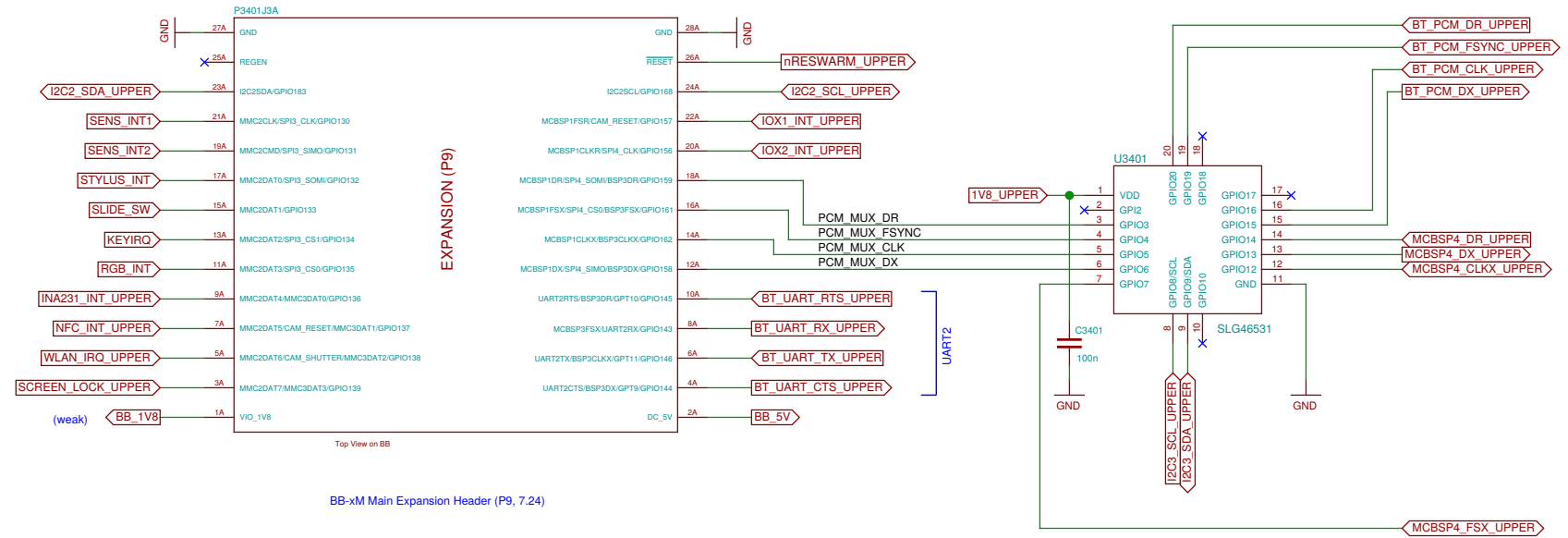
Ersetzen durch 2A buck converter

connect to BB by some Micro-USB cable

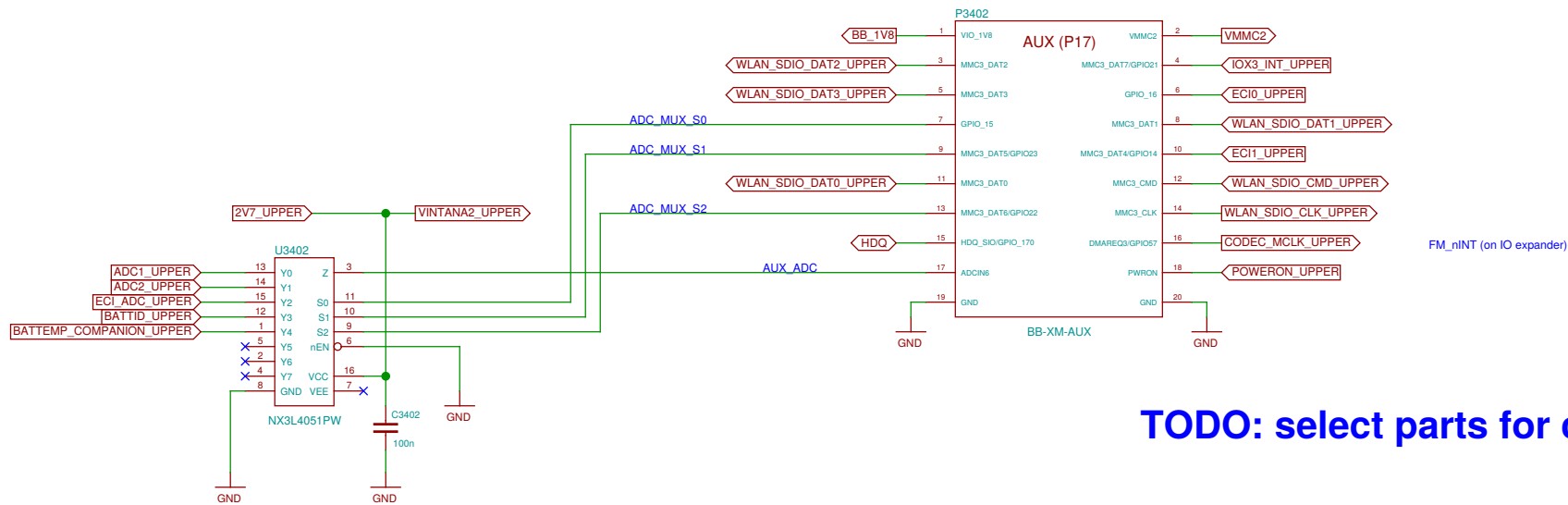


Alternative: OYKTGLJANF-0.032768

Sheet: /Connector to BB-XM/		
File: neo900_SS_33.sch		
Title: Connector to BB-XM		
Size: A3	Date: 17 JUL 2016	Rev:
Plotted by eeshow 2103115+ 20161019-02:26Z		Id: 33/37

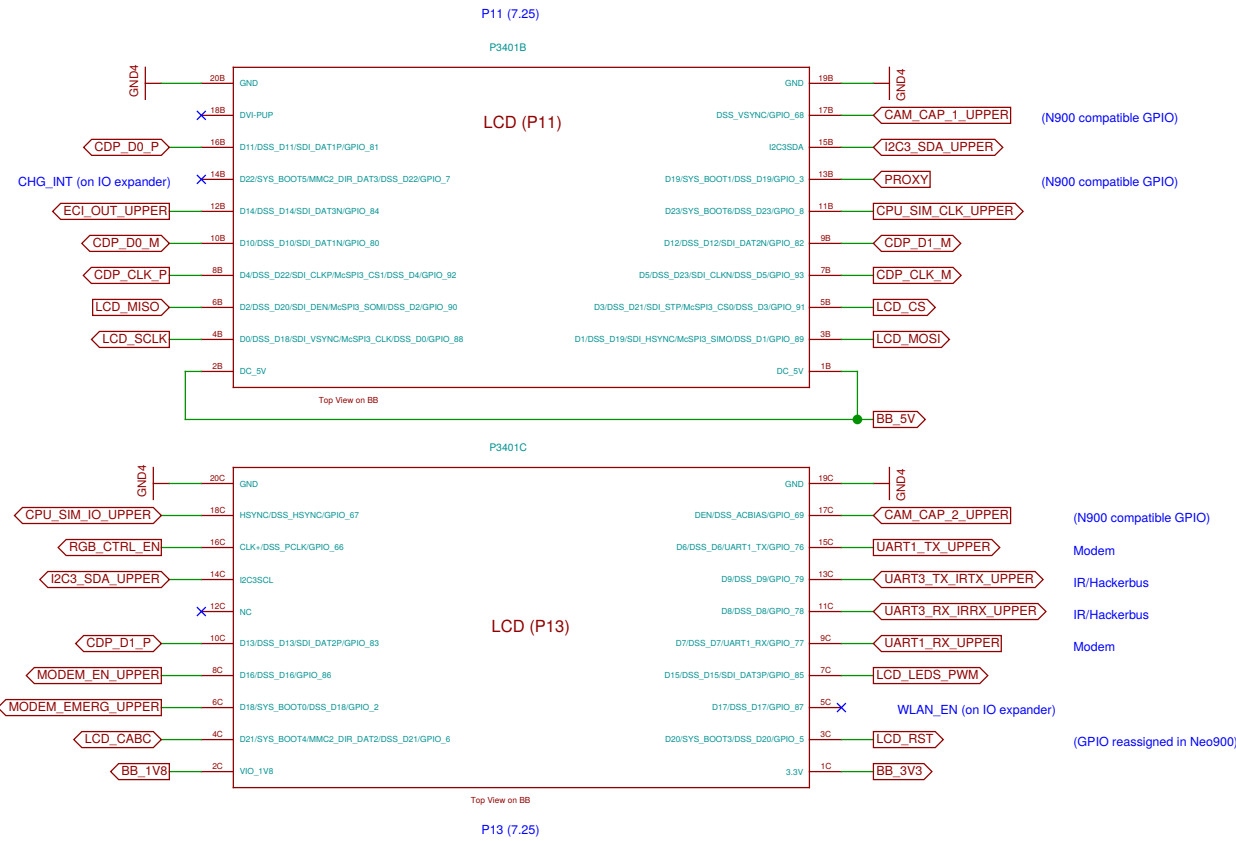


TODO: update pin names in footprint



TODO: select parts for connectors

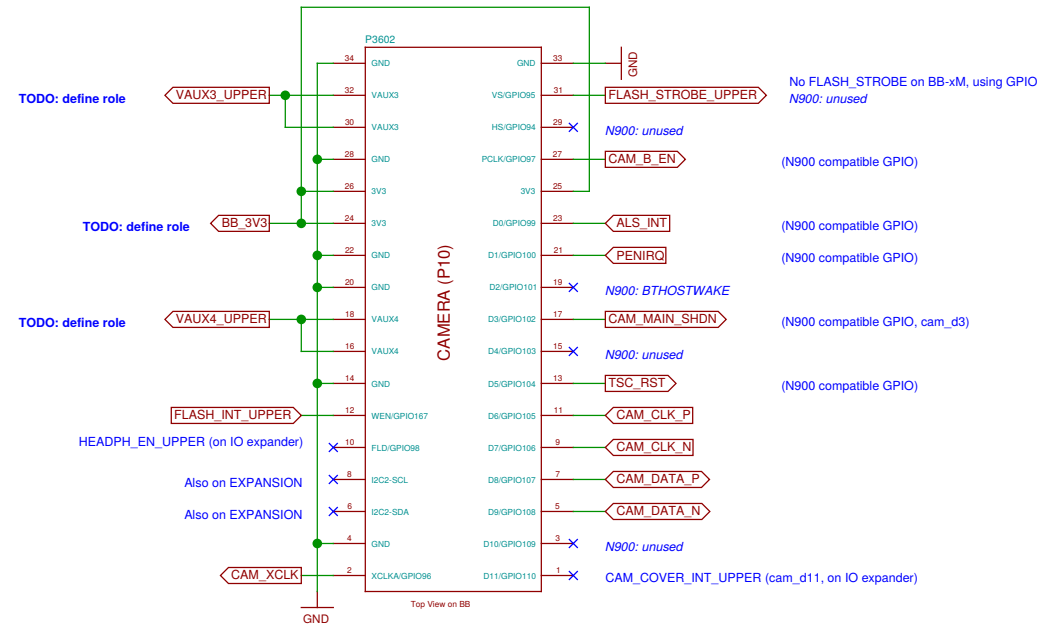
Sheet: /BB-XM Adapter (CPU)/		File: neo900_SS_34.sch	
Title: BB-XM Adapter (CPU)			
Size: A3	Date: 17 JUL 2016	Rev:	
Plotted by eeshow 2103115- 20161019-02:26Z		Id: 34/37	



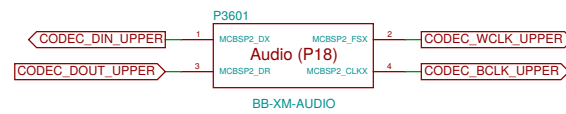
TODO: update pin names in footprint

- ~~UART1_RTS_UPPER~~ → **TODO**
- ~~UART1_CTS_UPPER~~ → **TODO**
- ~~UART3_CTS_RCTX_UPPER~~ → **TODO**
- ~~UART3_RTS_UPPER~~ → **TODO**

Processor Camera Port Interface (P10, 7.20.3)



TODO: update pin names in footprint



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: 17 JUL 2016	Rev:
Plotted by eeshow 2103115+ 20161019-02:26Z		Id: 37/37