

Click | Here
V

This sheet: index

Sheet: Charger/OTG

 **Charger/OTG**

File: charger.sch

Sheet: Battery

 **Battery**

File: battery.sch

Sheet: Modem Power

 **Modem Power**

File: modempwr.sch

Sheet: 3G/4G Modem

 **3G/4G Modem**


File: modem.sch

Sheet: SIM cards and switch

 **SIM cards and switch**


File: sims.sch

Sheet: Modem Antennas

 **Modem Antennas**


File: ants.sch

Sheet: WLAN, Bluetooth, FM

 **WLAN, Bluetooth, FM**

File: wlan.sch

Sheet: Sensors

 **Sensors**

File: sensors.sch

Sheet: Audio Codec

 **Audio Codec**

File: codec.sch

Sheet: Audio Headset, ECI

 **Audio Headset, ECI**

File: jack.sch

Sheet: Misc

 **Misc**

File: misc.sch

Click | Here
V

Sheet: RFID/NFC

 **RFID/NFC**

File: nfc.sch

Sheet: Infrared

 **Infrared**

File: ir.sch

Sheet: B2B LOWER-UPPER

 **B2B LOWER-UPPER**

File: b2b.sch

Sheet: Hackerbus

 **Hackerbus**

File: hb.sch

Sheet: uSD Breakout Board

 **uSD Breakout Board**

File: bob.sch

Sheet: Keypad and buttons

 **Keypad and buttons**

File: keys.sch

Sheet: Display

 **Display**

File: display.sch

Sheet: Cameras

 **Cameras**

File: cams.sch

Sheet: LEDs

 **LEDs**

File: leds.sch

Click | Here
V

Sheet: Adaptation (v2 only)

 **Adaptation (v2 only)**

File: v2.sch

Sheet: BB-xM Adapter (CPU)

 **BB-xM Adapter (CPU)**

File: bbcpu.sch

Sheet: BB-xM Adapter (DISP)

 **BB-xM Adapter (DISP)**

File: bbdisp.sch

Sheet: BB-xM Adapter (CAM)

 **BB-xM Adapter (CAM)**

File: bbcam.sch

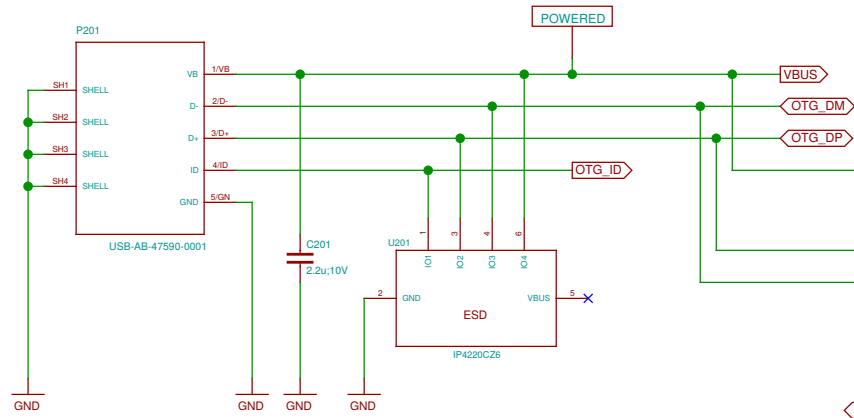
Circuits that exist in the v2 prototype only
and that will not be part of the final design.

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

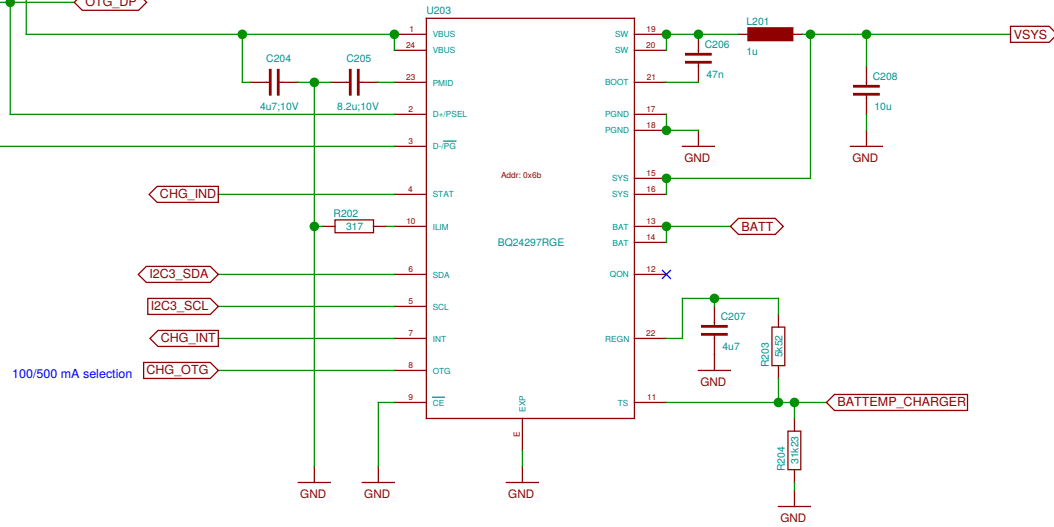
Signals that exist on both LOWER and UPPER (and maybe also BOB)
have a _U suffix on UPPER. No suffix is needed to distinguish
between LOWER and BOB because all BOB components are on
the same sheet and wires connecting them use sheet-local labels.

Sheet: /			
File: neo900.sch			
Title: Neo900			
Size: A3	Date: 2016-11-18 15:49:26	Rev:	
Plotted by eeshow e90e612+ 20161120-16:10Z			Id: 1/25

USB OTG connector

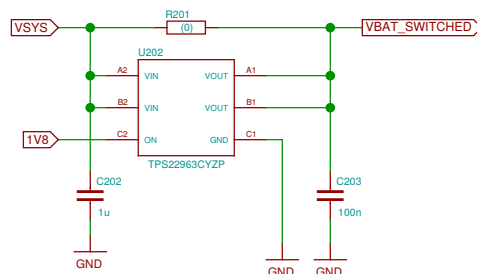


Battery charger with USB OTG

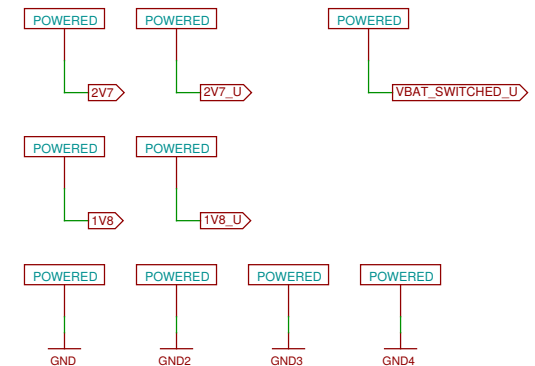


Power distribution and sequencing

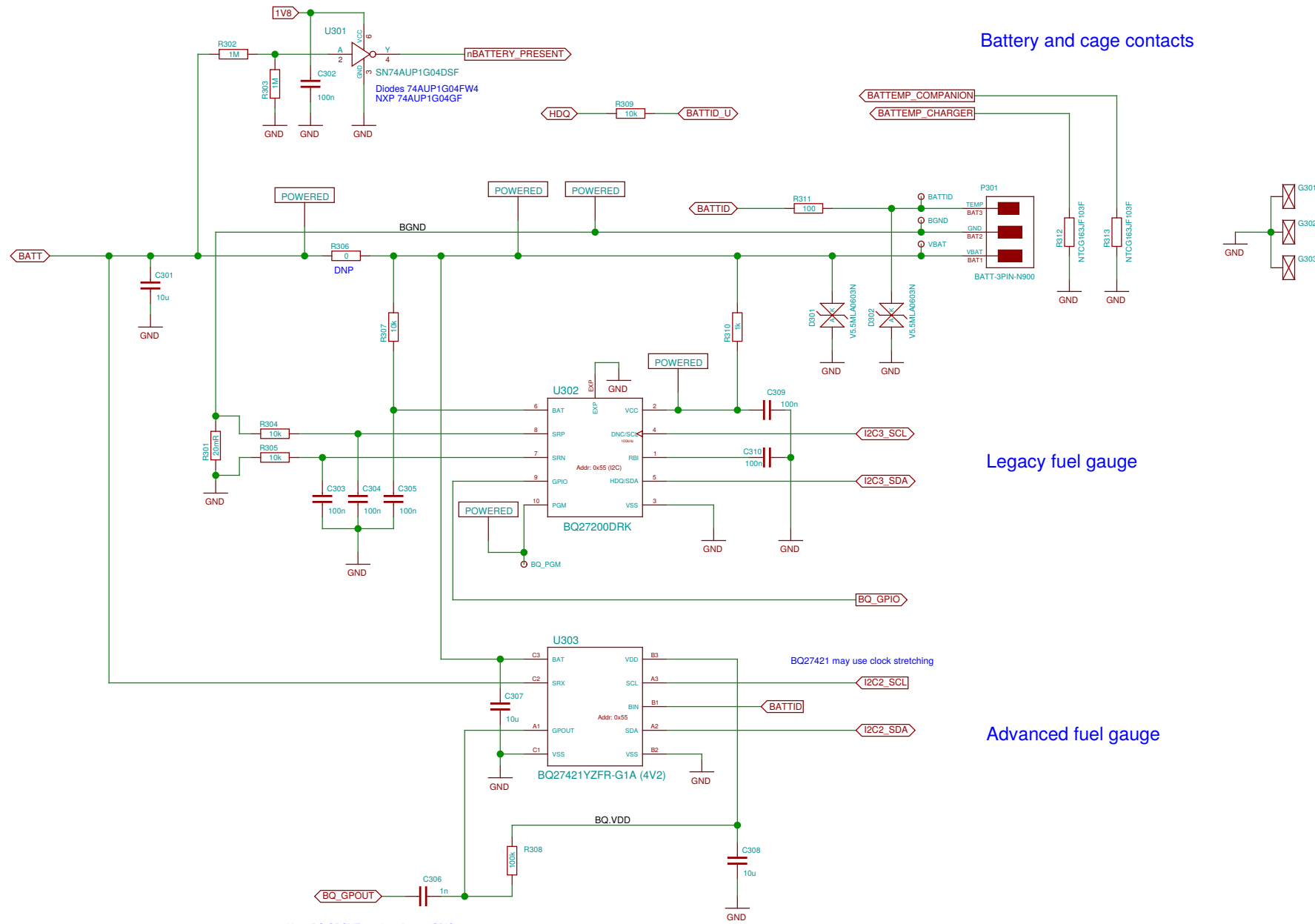
Most high-current consumers are on VBAT_SWITCHED, 1V8 signals that the regulators on UPPER are operational.



KiCad bureaucracy



Sheet: /Charger/OTG/		File: charger.sch	
Title: Charger/OTG			
Size: A3	Date: 2016-11-18 15:49:26	Rev:	
Plotted by eeshow e90e612+ 20161120-16:10Z		Id: 2/25	



Battery and cage contacts

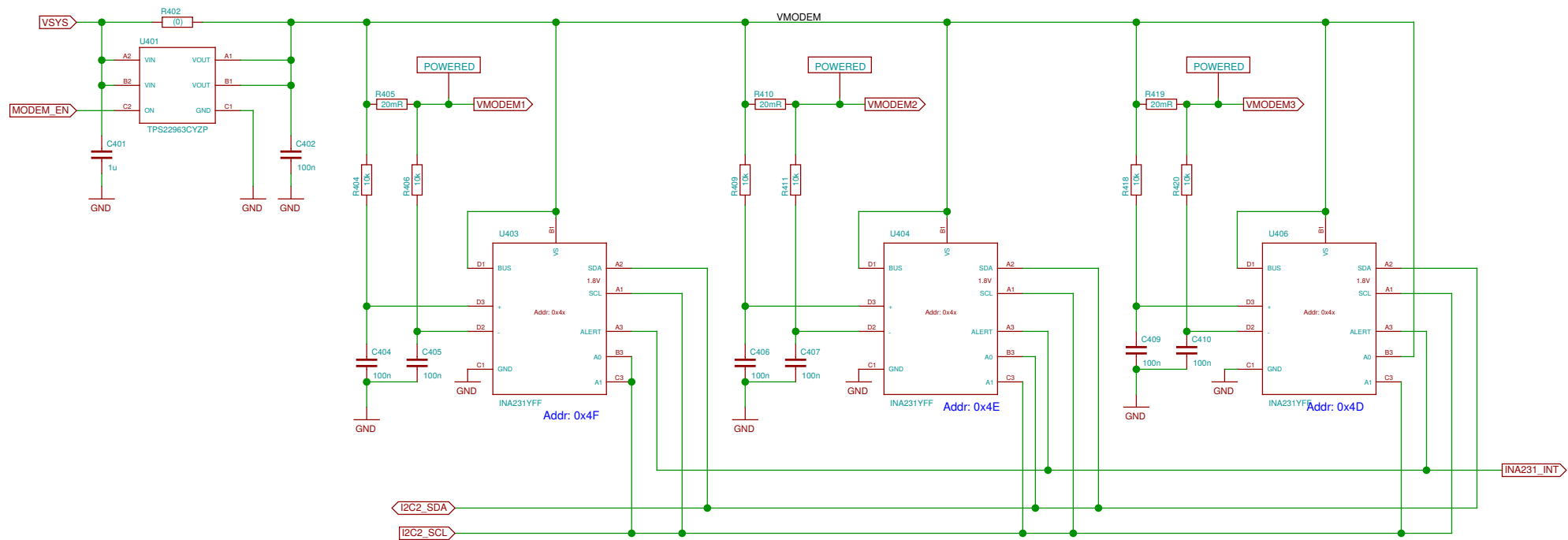
Legacy fuel gauge

Advanced fuel gauge

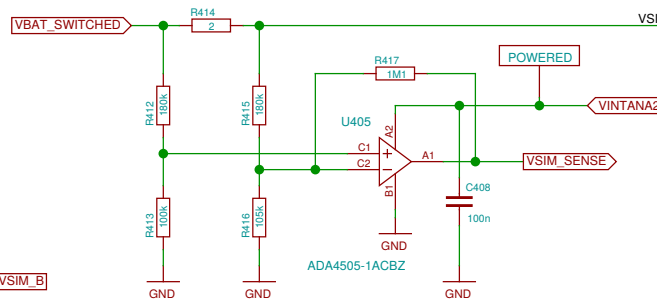
Note: BQ.GPOUT needs pull-up at GPIO.

Sheet: /Battery/		Date: 2016-11-22 19:57:21	
File: battery.sch		Rev: 3/25	
Title: Battery		Plotted by eeshow e90e612+ 20161120-16:10Z	
Size: A3			

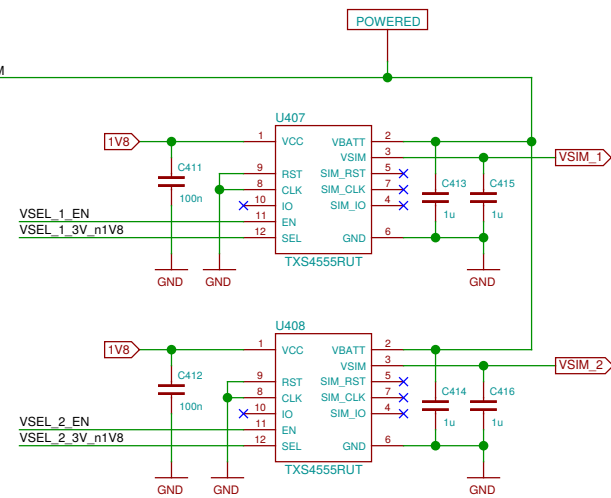
Modem current monitor



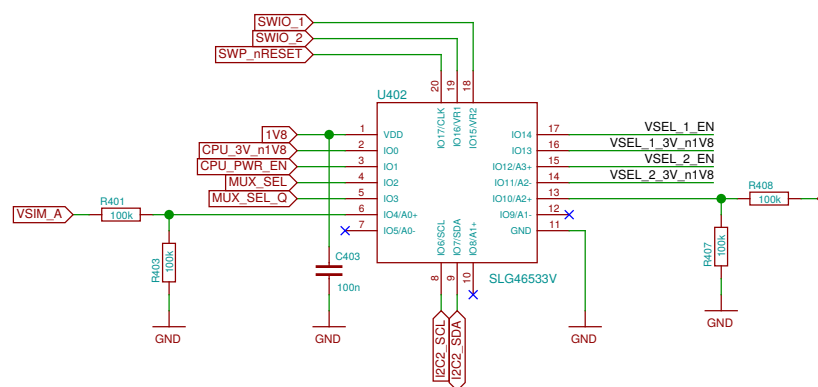
SIM current sensing



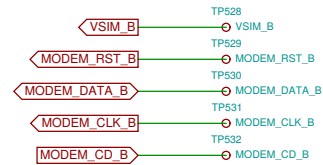
SIM power supply



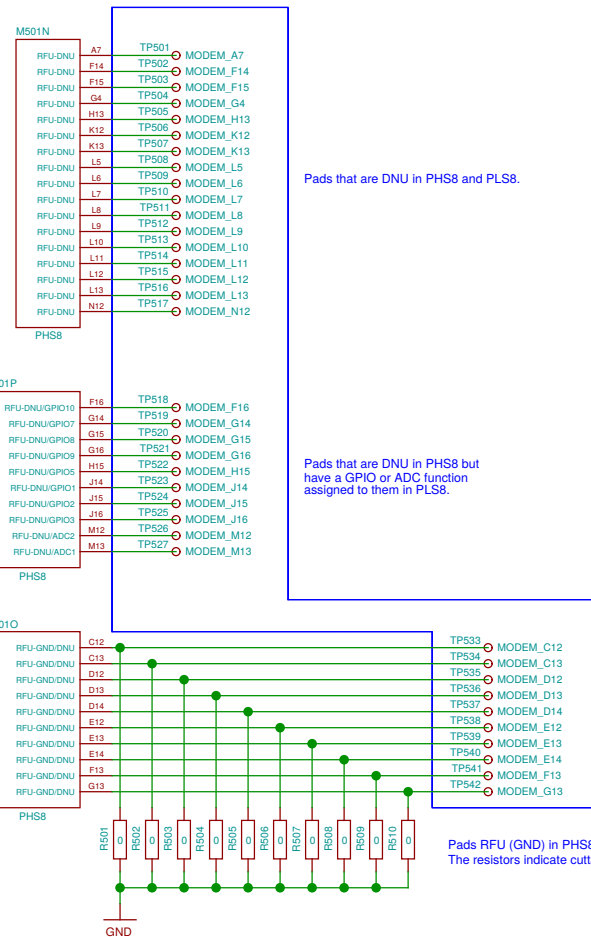
SIM power selection



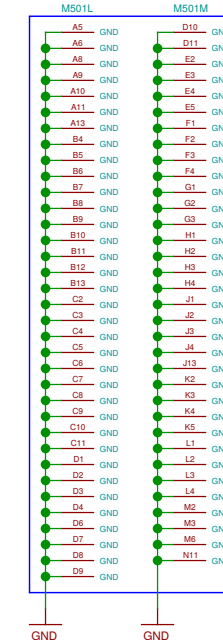
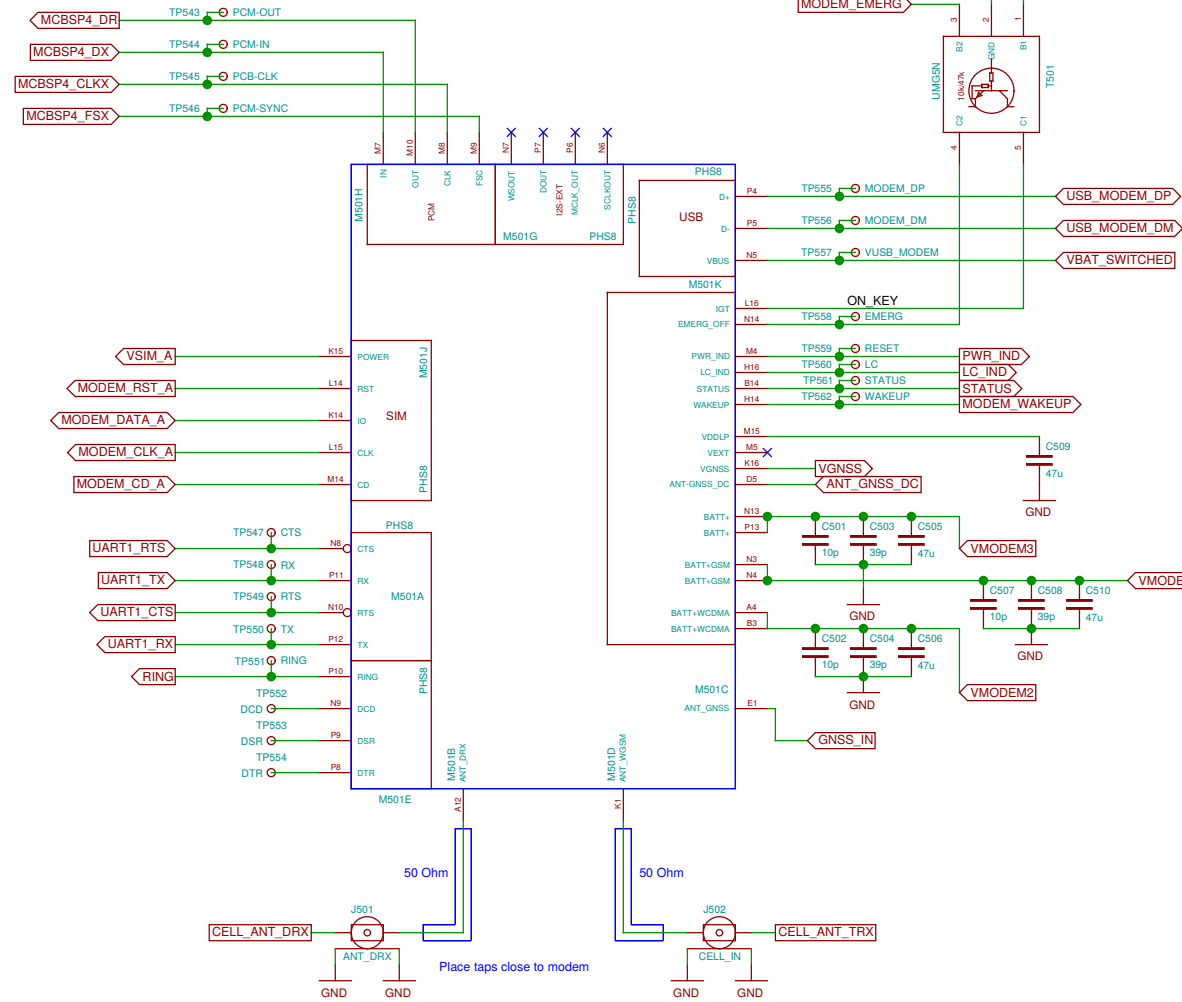
SIM B bus



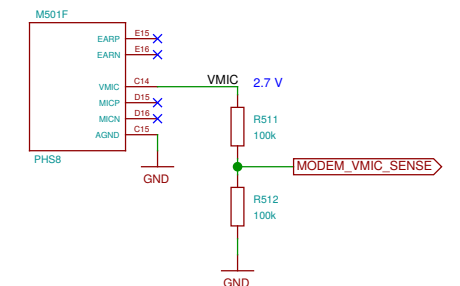
17+10+10 = 37 test points. PCB space permitting, to be arranged in a 6 x 6 + 1 grid with 1.0 mm pitch. This patch field is to be placed adjacent to the SIM B bus test points.

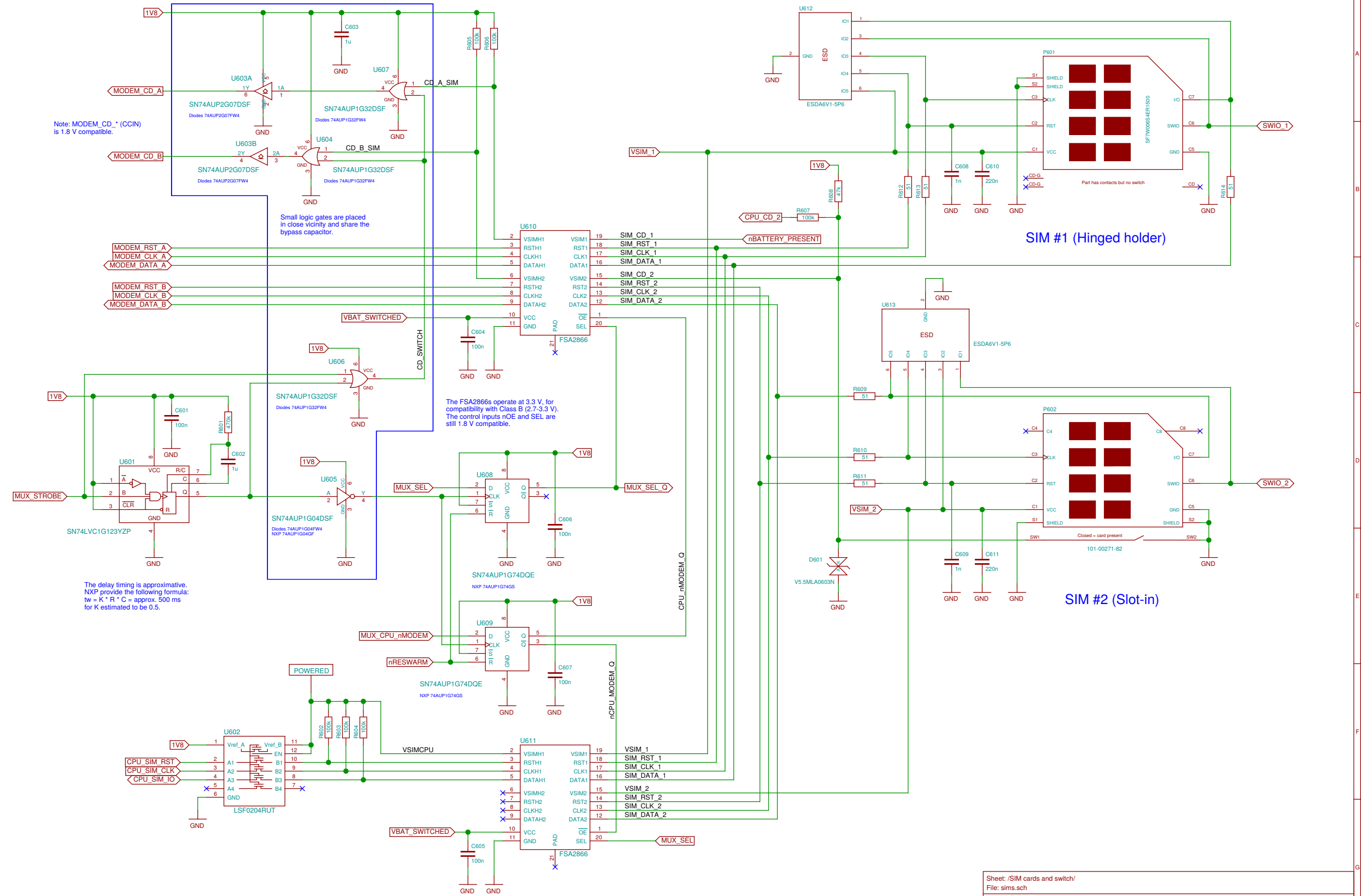


Modem (module)

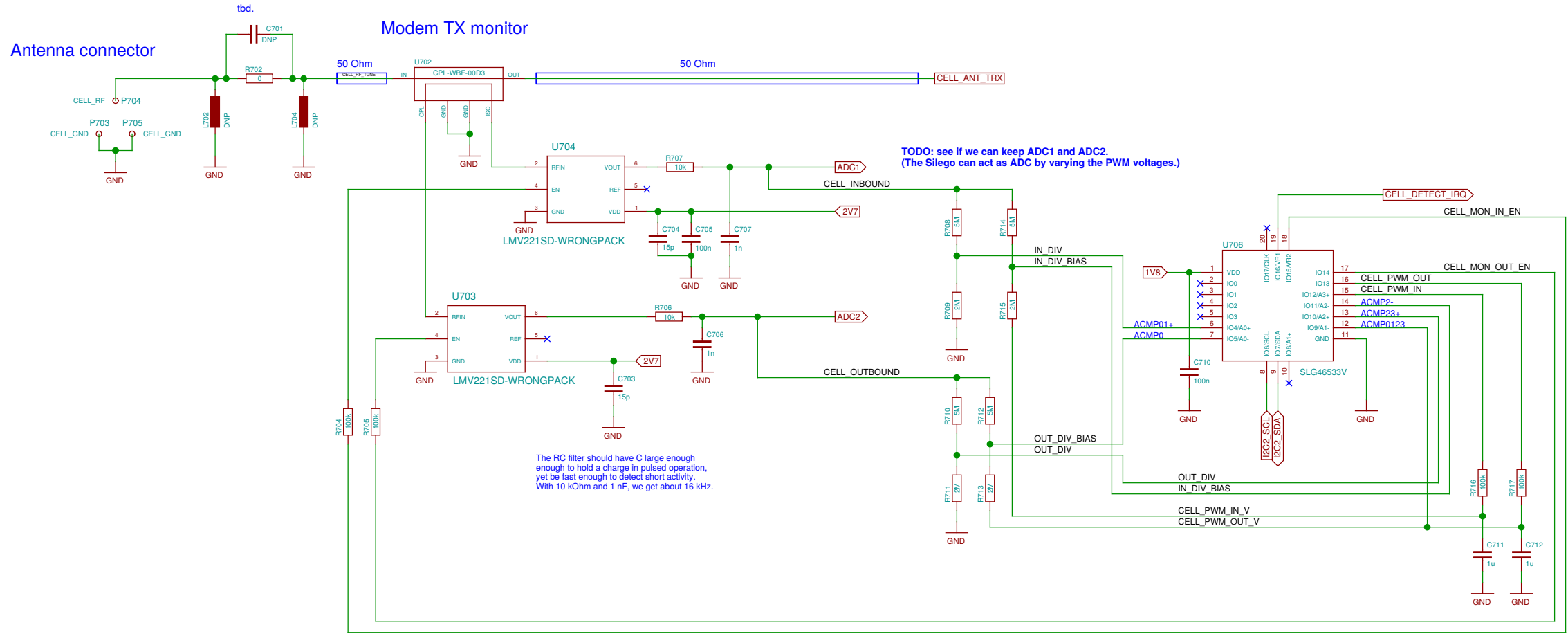
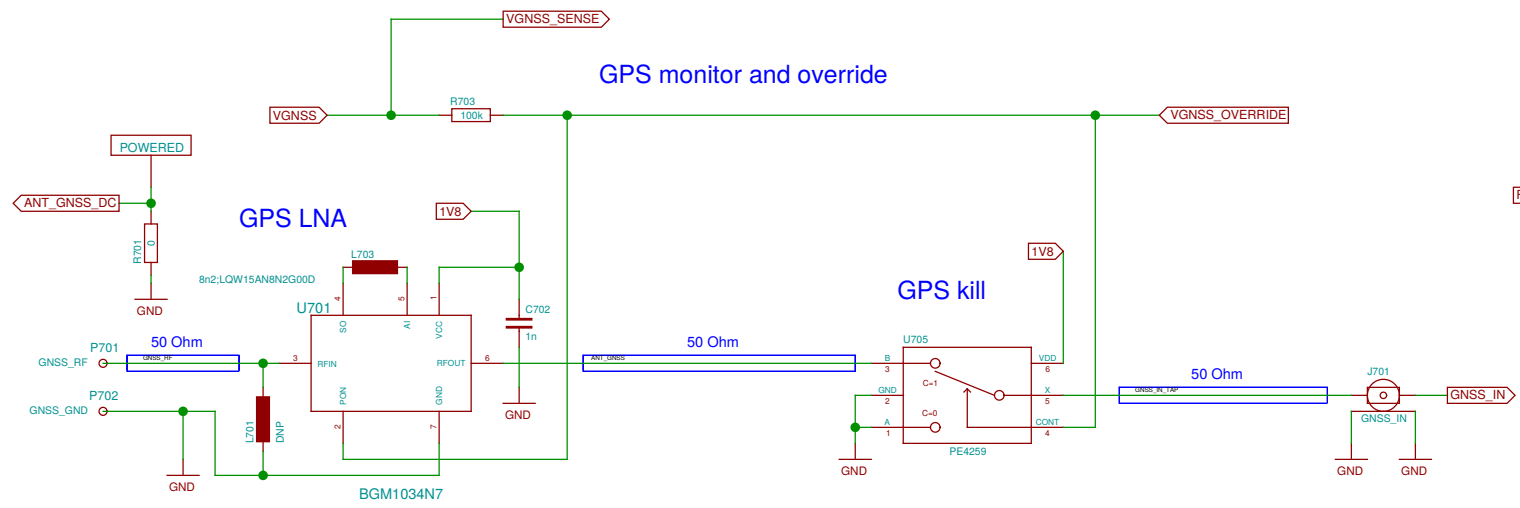


Anti-eavesdropping

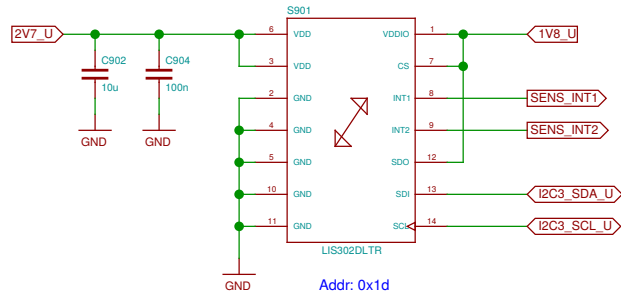




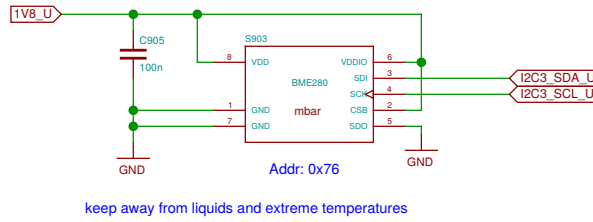
Sheet: /SIM cards and switch/ File: sims.sch		
Title: SIM cards and switch		
Size: A3	Date: 2016-11-21 23:56:50	Rev:
Plotted by eeshow e90e812+ 20161120-16:10Z		Id: 6/25



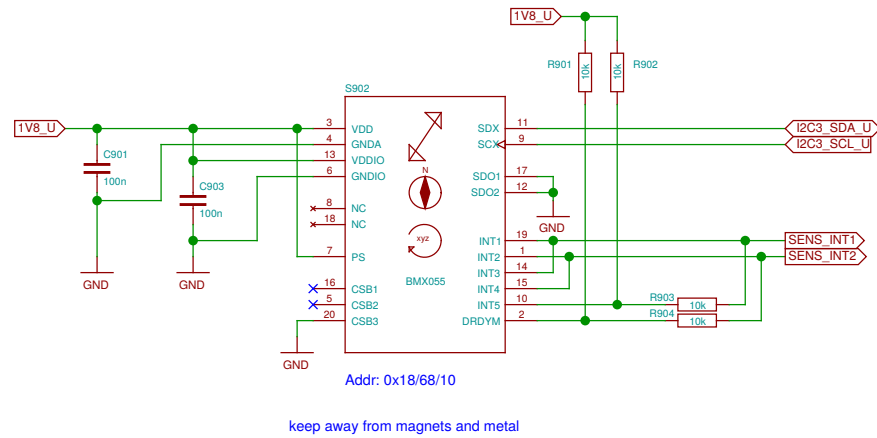
Acceleration (legacy)



Pressure, humidity

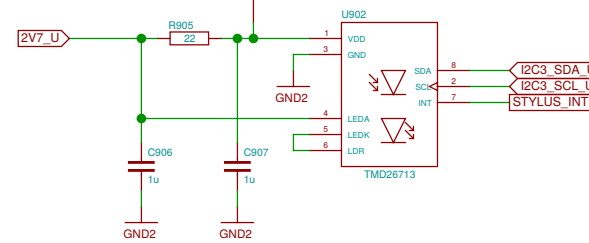


9-axis (acceleration, gyroscope, magnetometer)

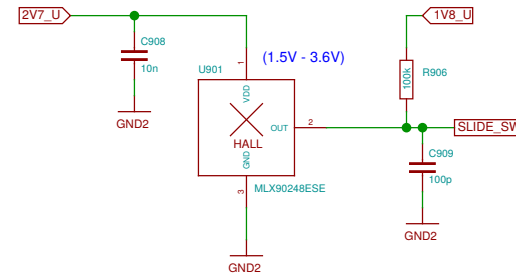


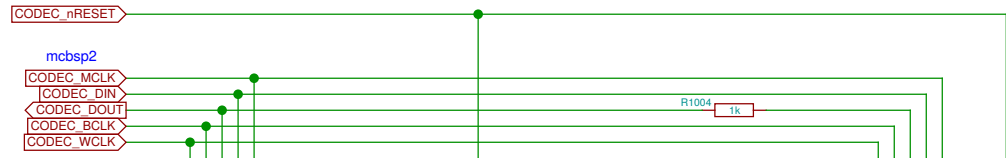
UPPER LOWER

Stylus detect

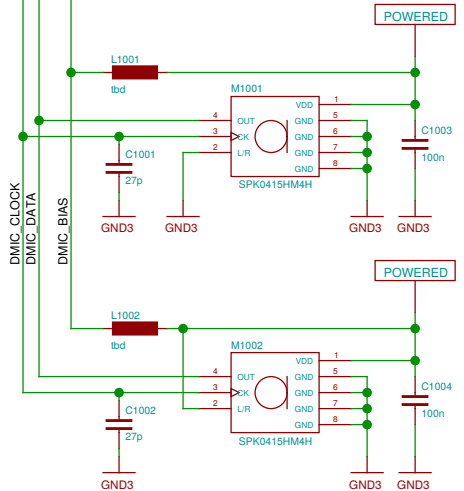


Slide sensor

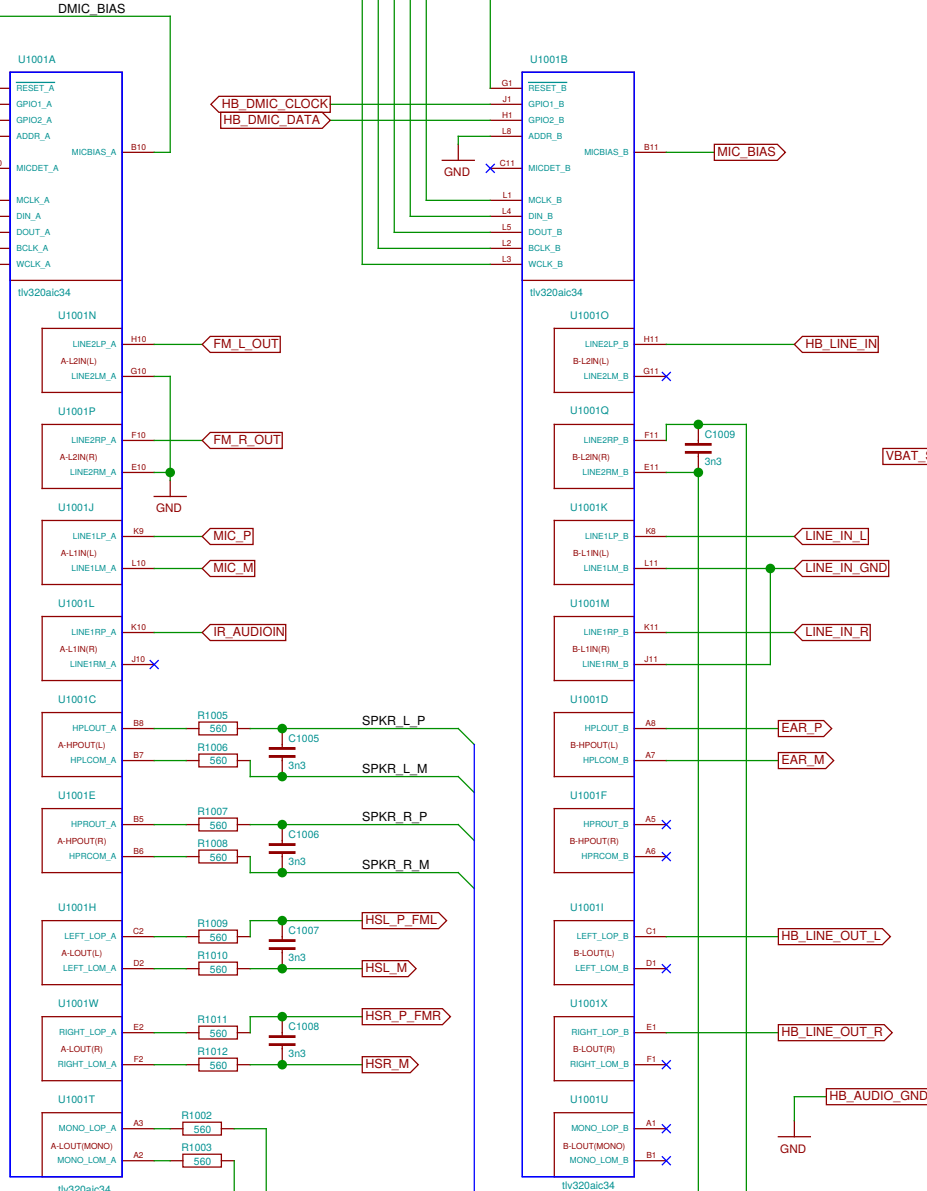




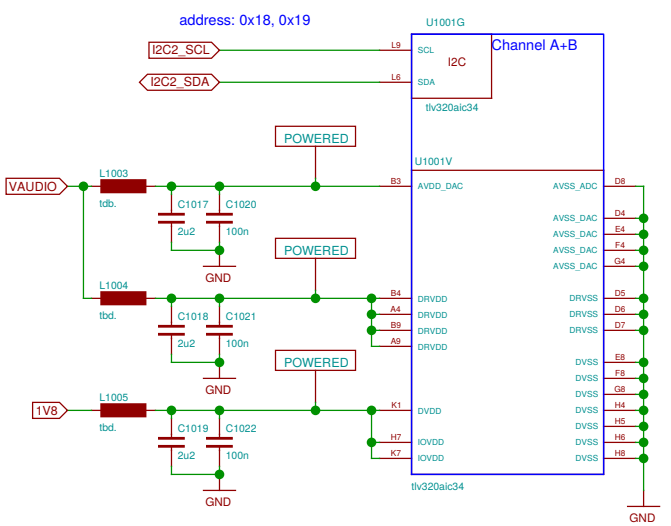
Digital Microphones



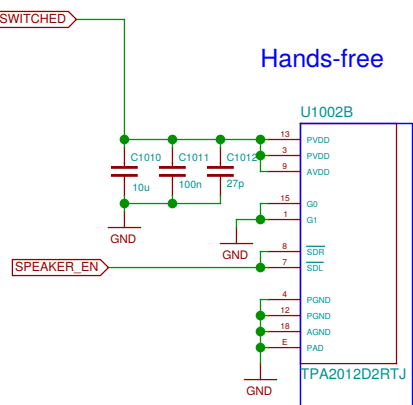
Codec



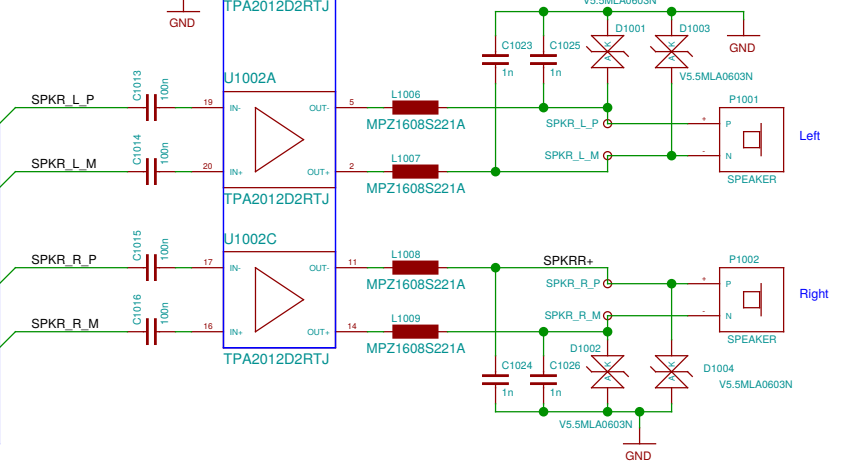
Codec power and I2C



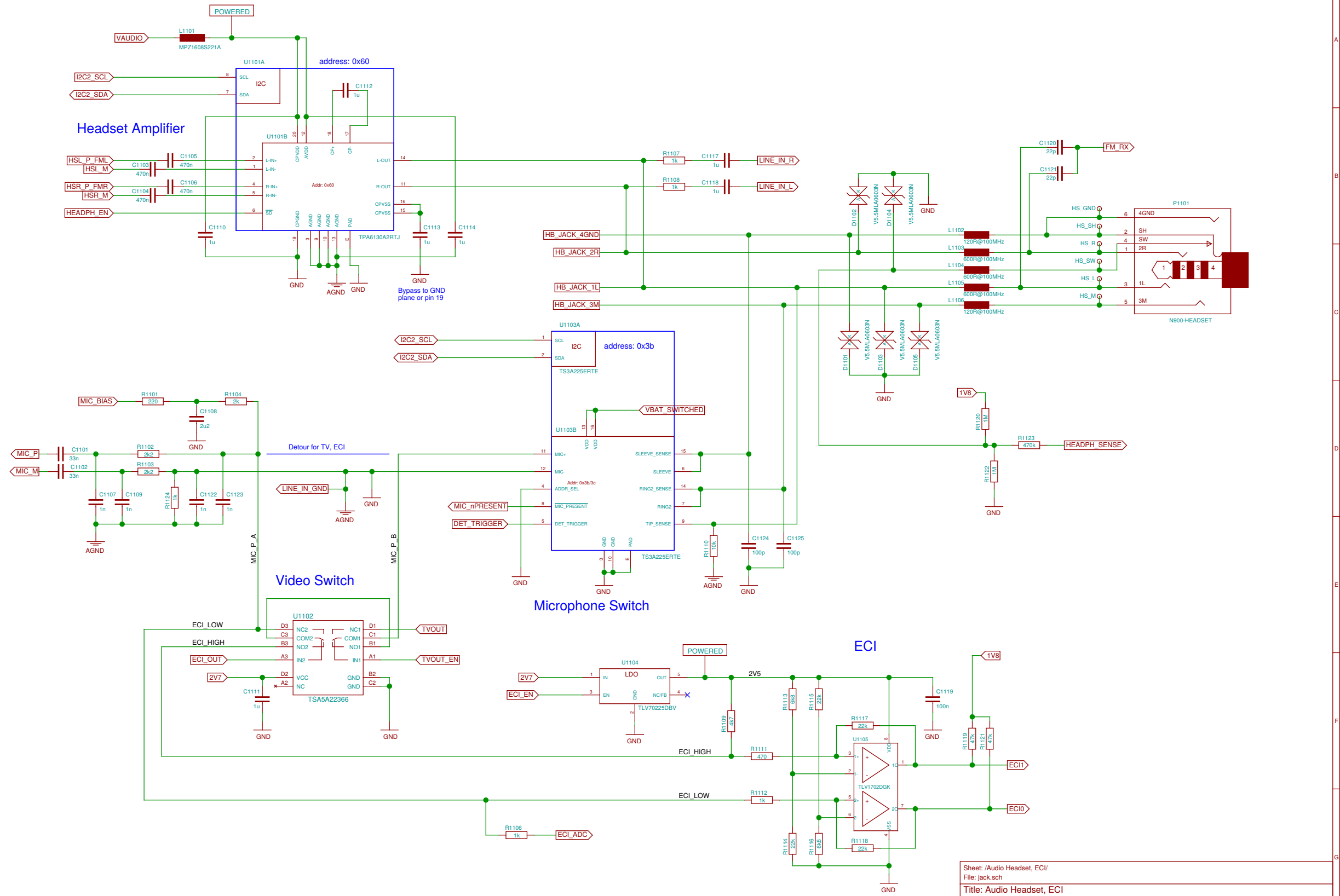
Hands-free



Speakers



Sheet: /Audio Codec/		Date: 2016-11-18 15:49:26	
File: codec.sch		Rev: 1	
Title: Audio Codec		Plotted by eeshow e90e812+ 20161120-16:10Z	
Size: A3	Date: 2016-11-18 15:49:26	Rev: 1	Id: 10/25



Sheet: /Audio Headset, ECI/		File: jack.sch	
Title: Audio Headset, ECI			
Size: A3	Date: 2016-11-18 15:49:26	Rev:	
Plotted by: eeshow e90e812*		20161120-16:10Z	
Id: 11/25			

No-Solder Components

N1201
N900 case assembly

N1202
N97-CAMERA-HOLE

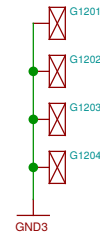
N1205
headset jack

N1203
STENCIL-TOP

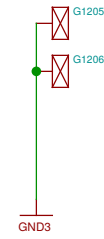
N1204
STENCIL-BOTTOM

Shield Contacts on UPPER

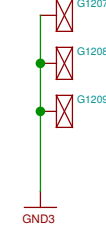
For the display



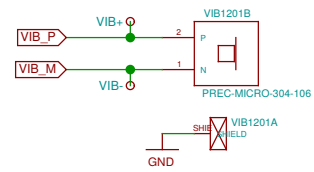
For the key mat



For the "key frame hook"

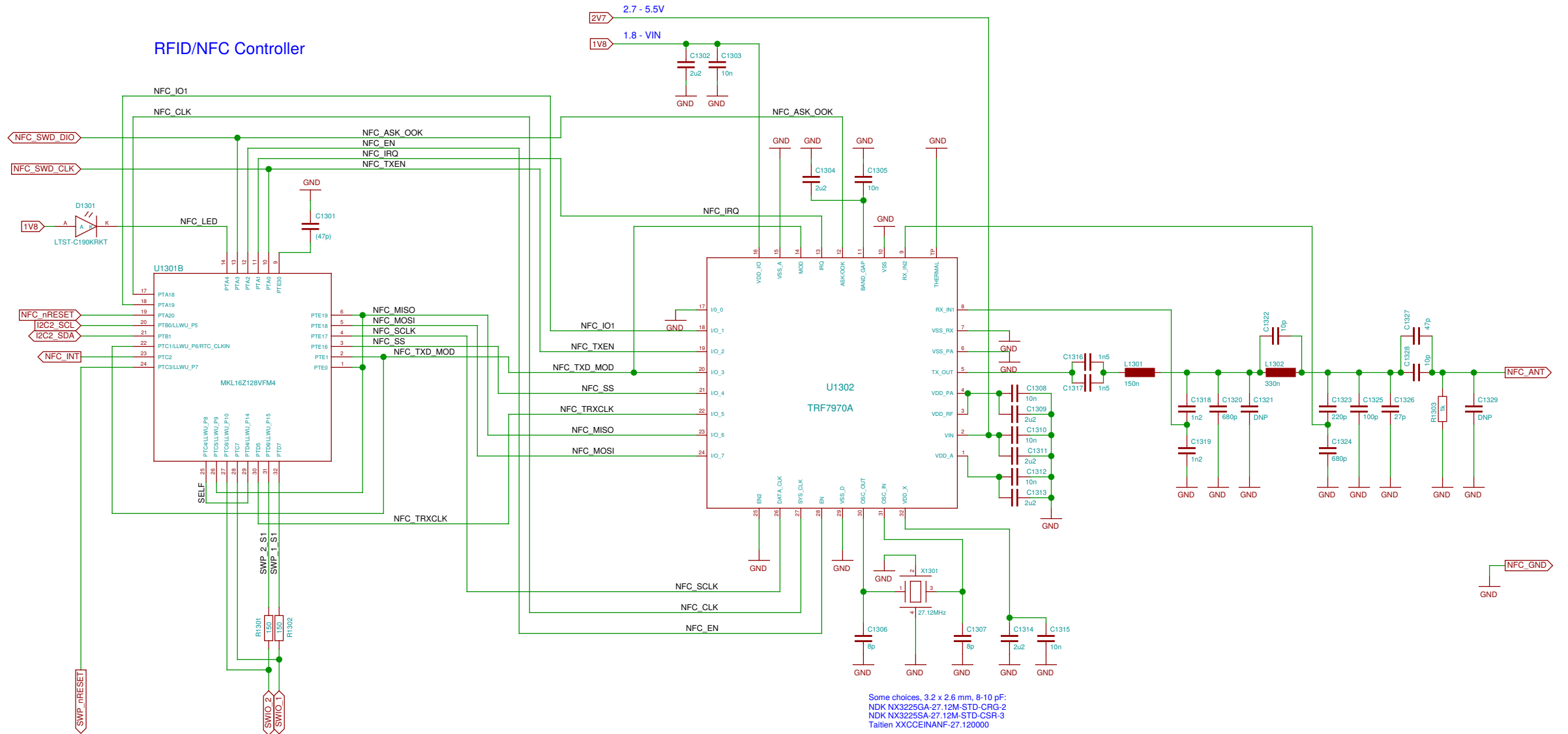


Vibramotor

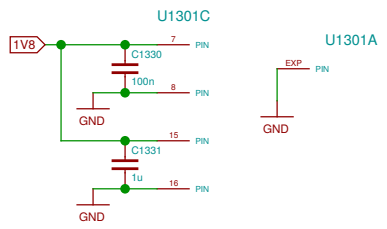


Sheet: /Misc/		
File: misc.sch		
Title: Misc		
Size: A3	Date: 2016-11-18 15:49:26	Rev:
Plotted by eeshow e90e612+ 20161120-16:10Z		Id: 12/25

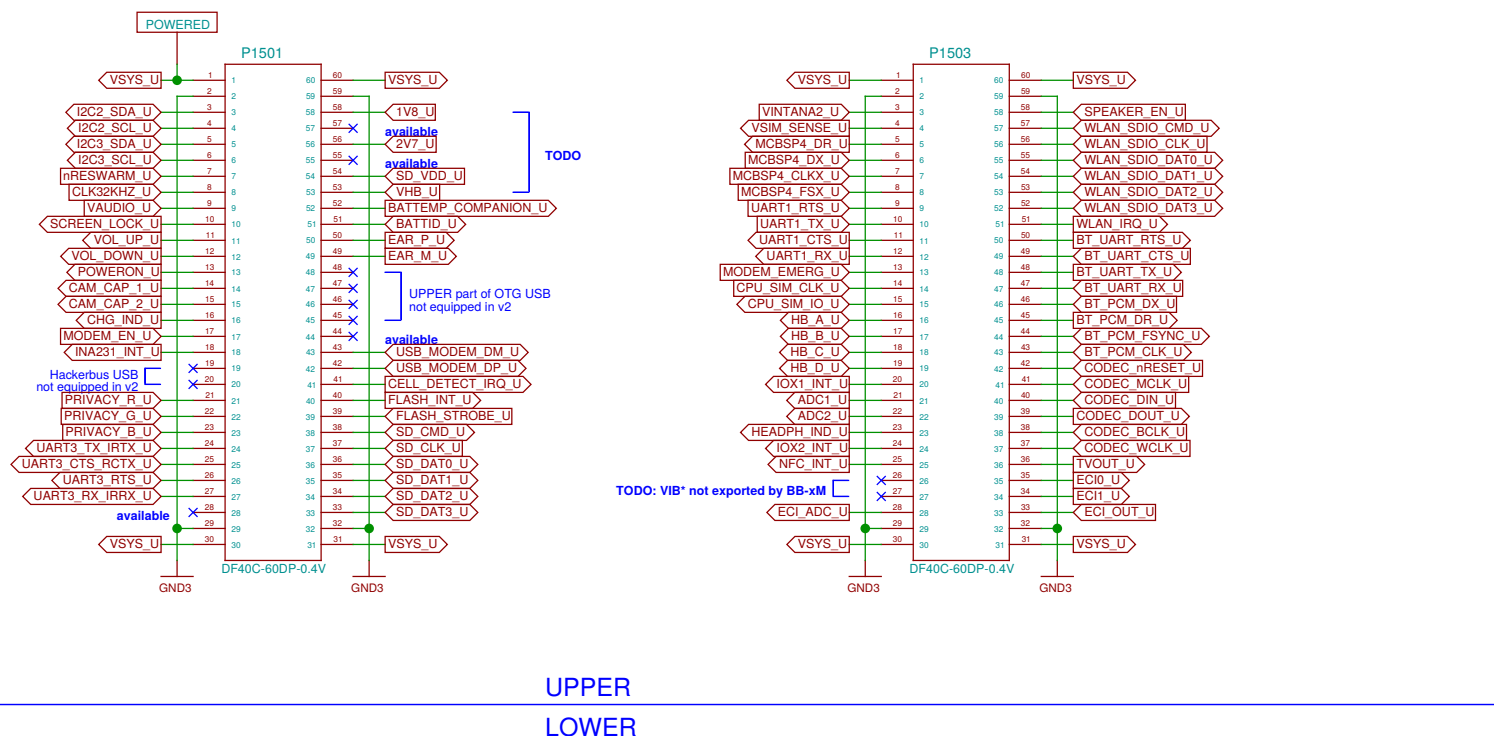
RFID/NFC Transceiver



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
 Tallien XXCCEINANF-27.120000

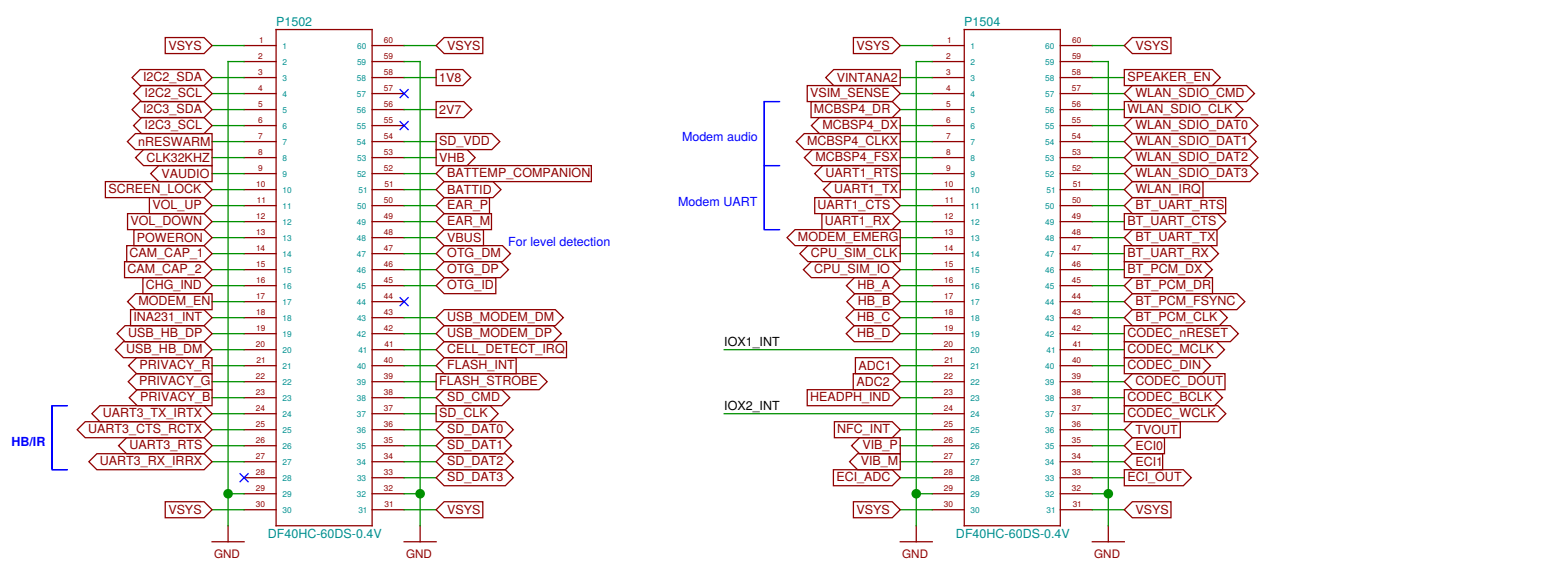
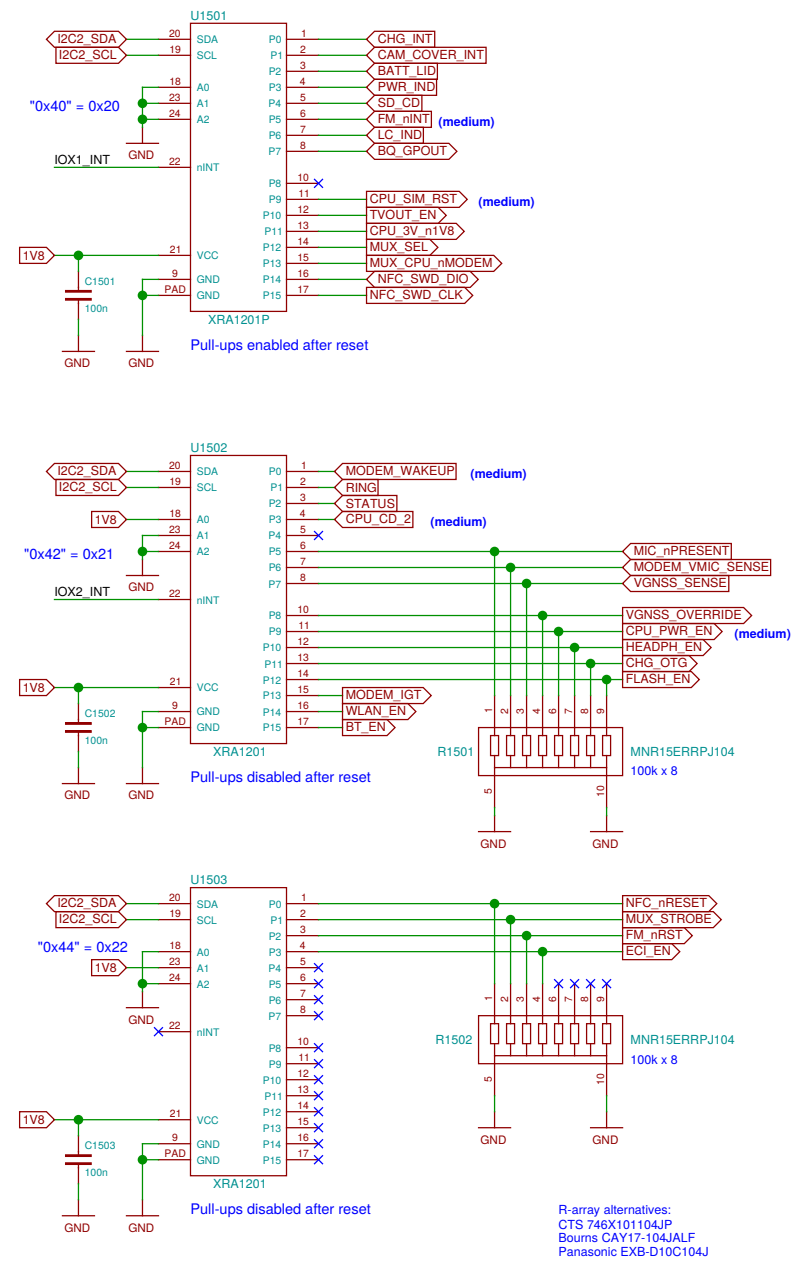


This is just the collection of signals we have. Assignment can still change, e.g., to improve layout.



UPPER
LOWER

IO expanders (on LOWER)

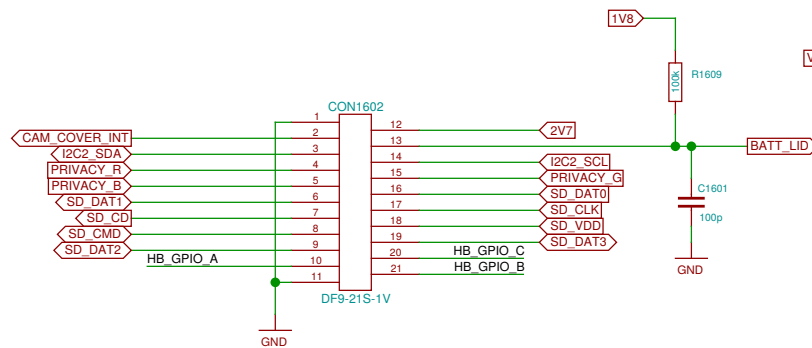
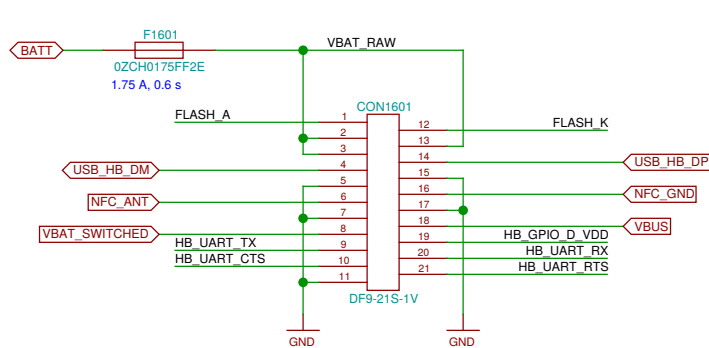


Current rating per contact: 0.3 A

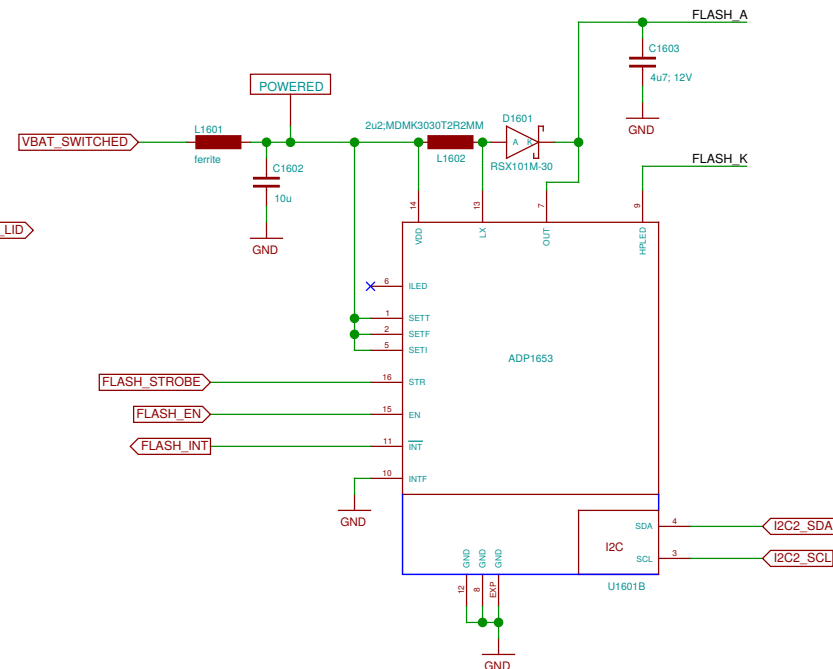
Sheet: /B2B LOWER-UPPER/ File: b2b.sch		Rev: 15/25	
Title: B2B LOWER-UPPER			
Size: A3	Date: 2016-11-22 10:44:58	Plotted by eeshow e90e812+ 20161120-16:10Z	

LOWER-BOB Interconnect (LOWER side)

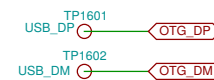
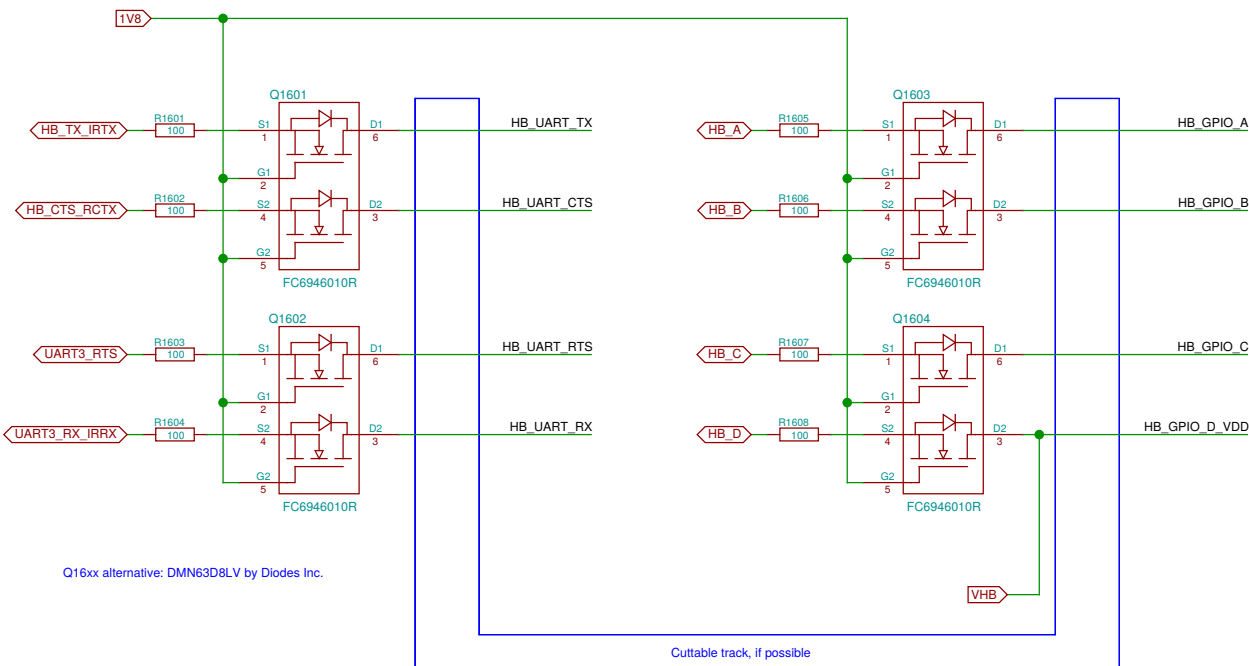
Defined in the Hackerbus specification, <http://neo900.org/stuff/papers/hb.pdf>



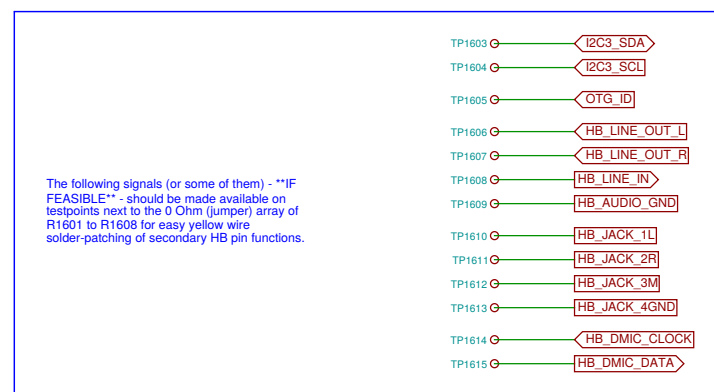
Flash/Torch



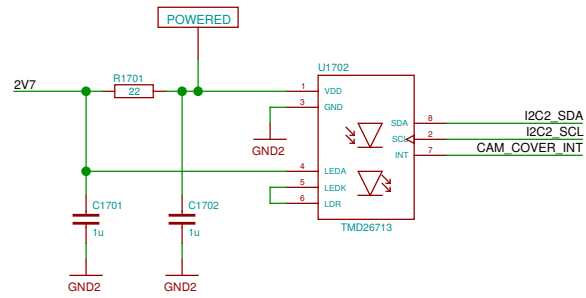
Level shifters for Hackerbus GPIO and UART



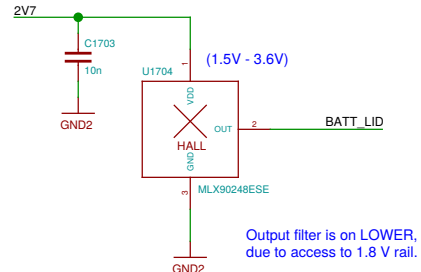
Patch field



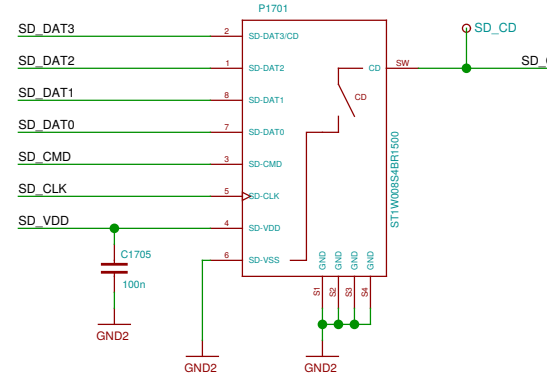
Camera Cover detect



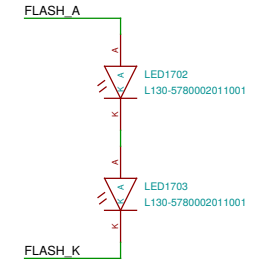
Battery Cover detect



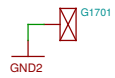
Memory card holder



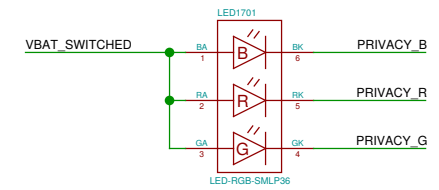
Camera flash



Camera lens plate

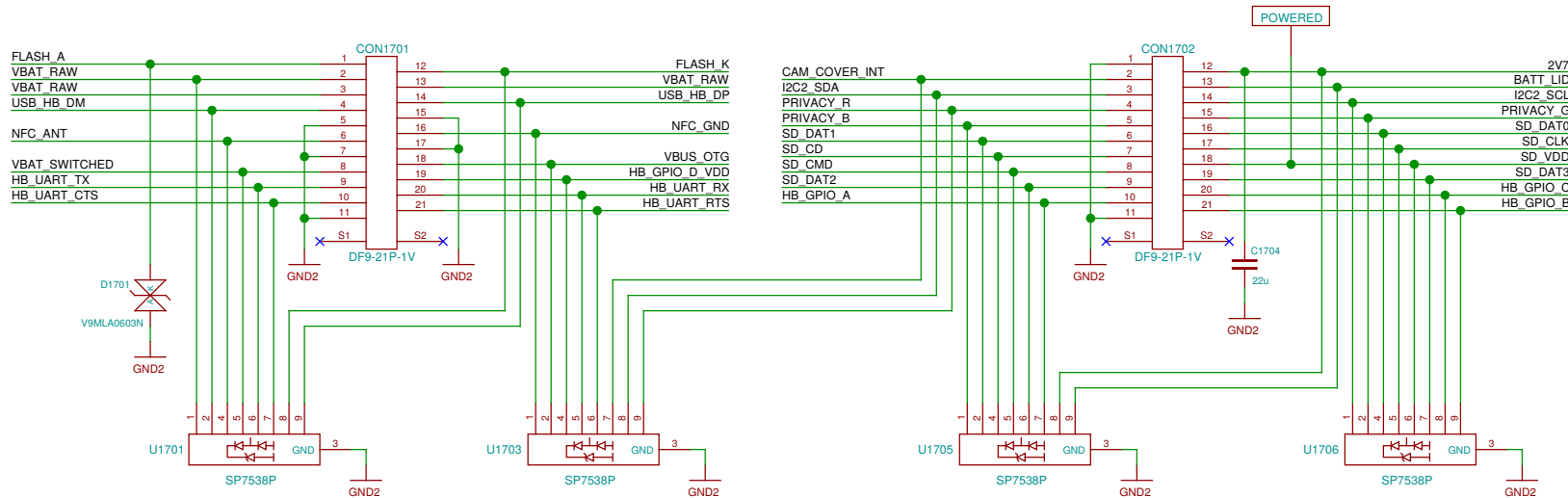


Privacy LED

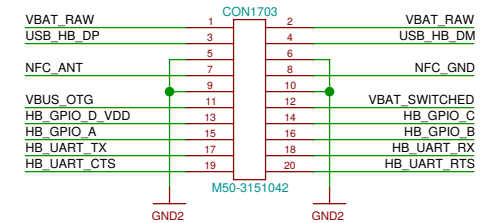


LOWER-BOB Interconnect (BOB side)

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

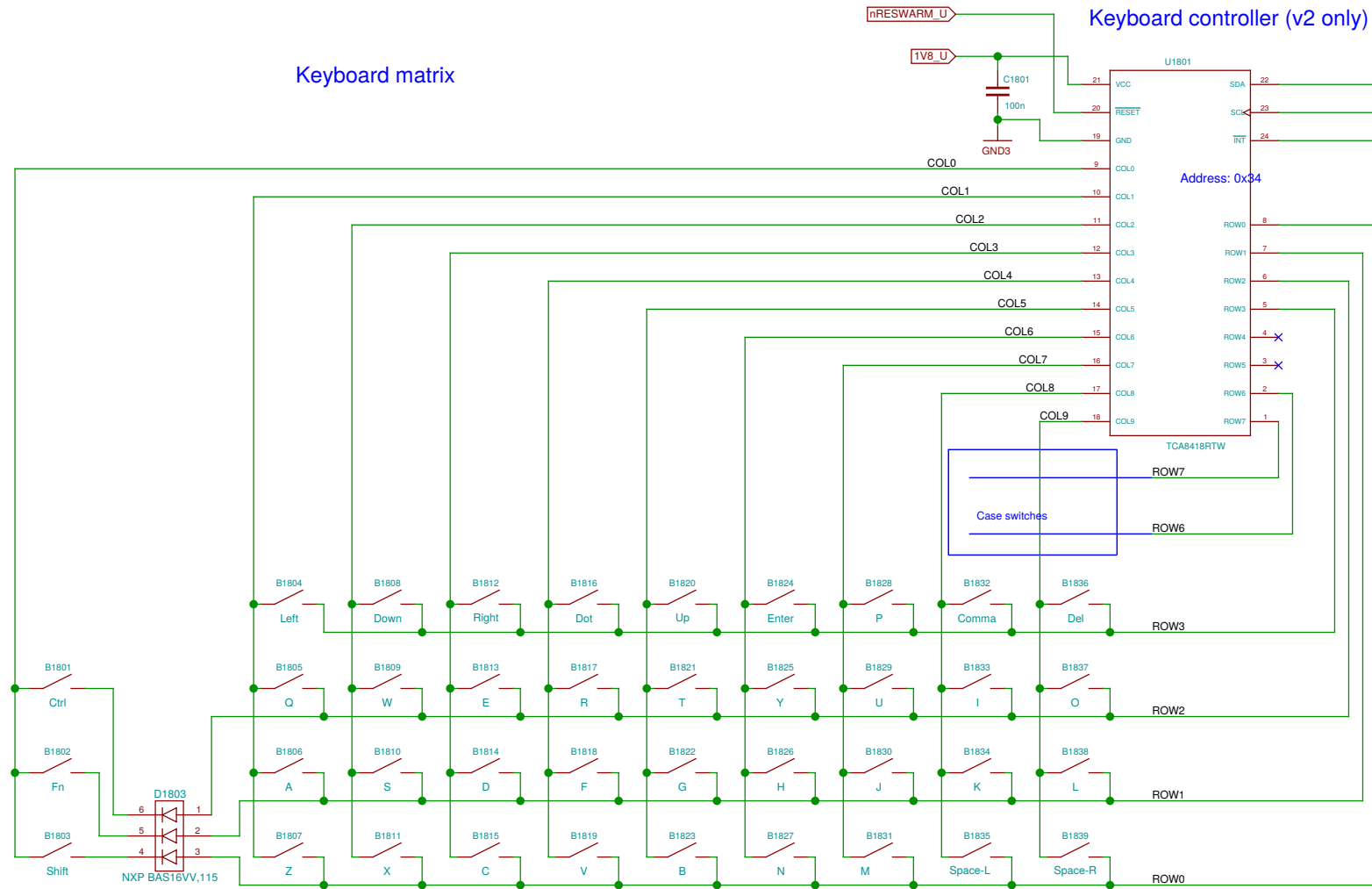


Hackerbus

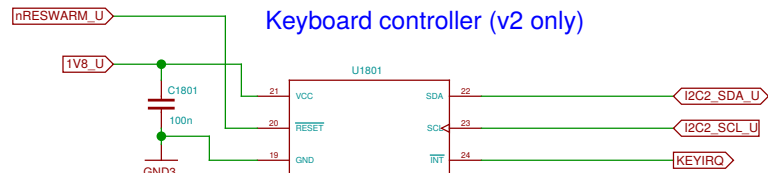


**ESD pin assignment is only indicative.
Actual assignment to be defined by layout.**

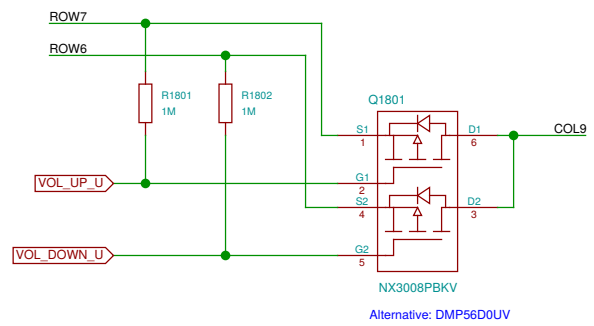
Keyboard matrix



Keyboard controller (v2 only)



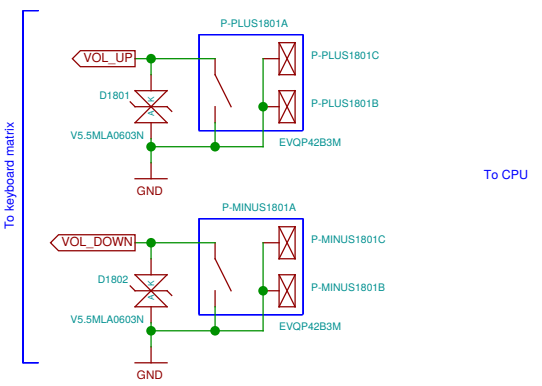
Address: 0x34



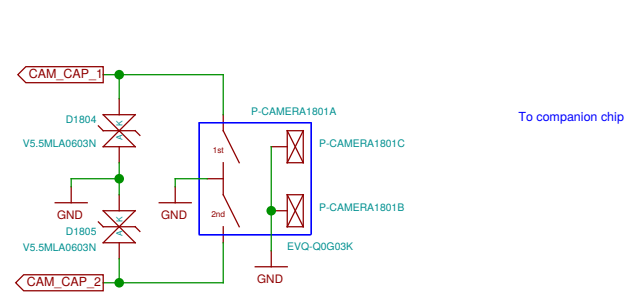
Alternative: Diodes Inc. BAS16VV-7
Warning: Diodes Inc. have cathodes on pin 1 side, NXP anodes!

UPPER
LOWER

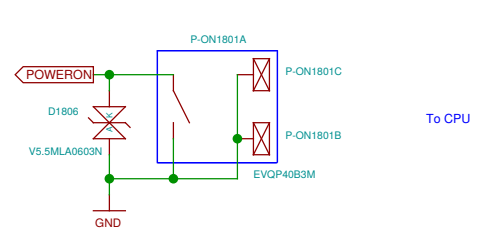
Volume



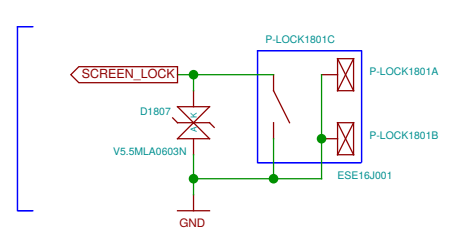
Camera trigger



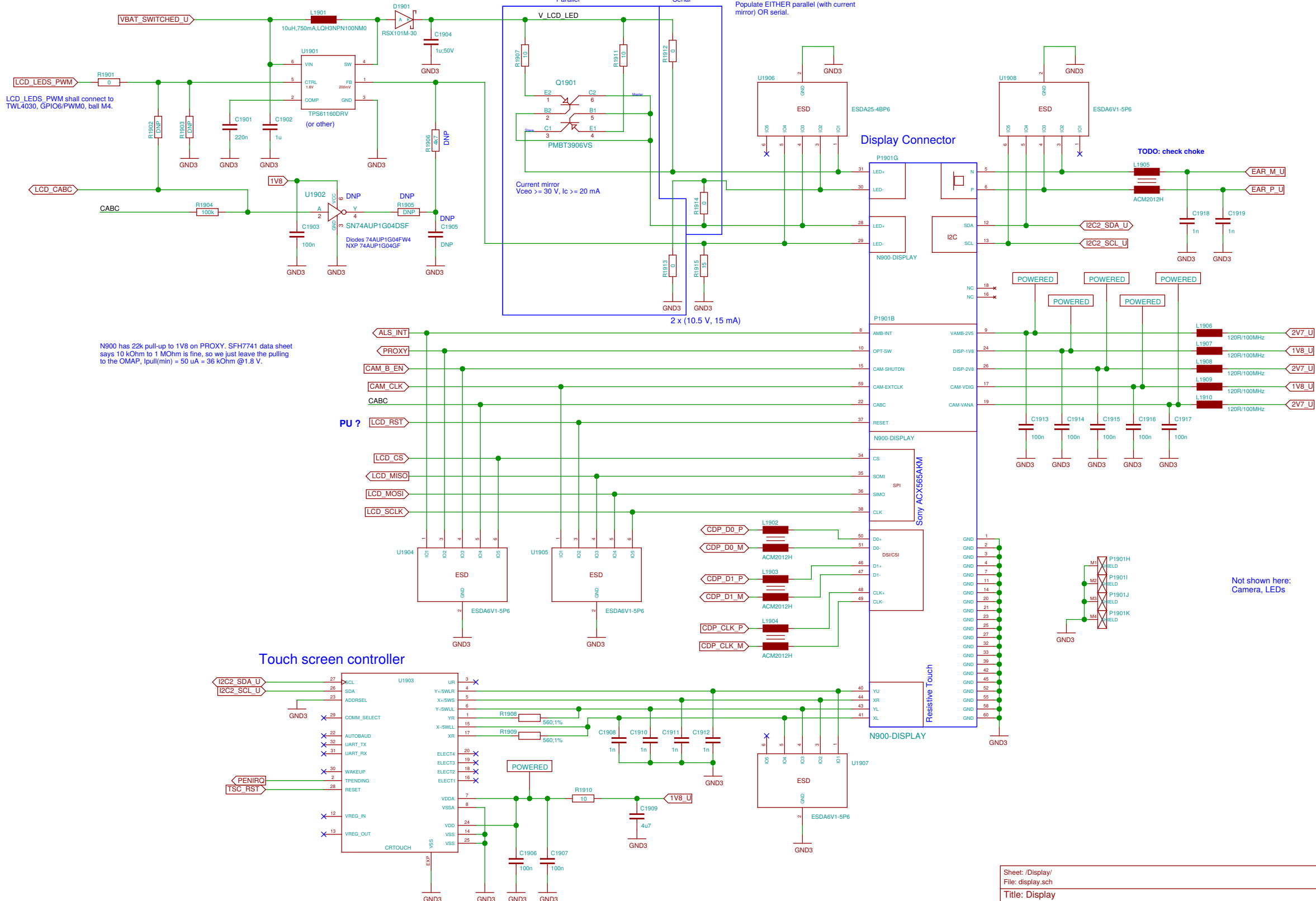
On-off

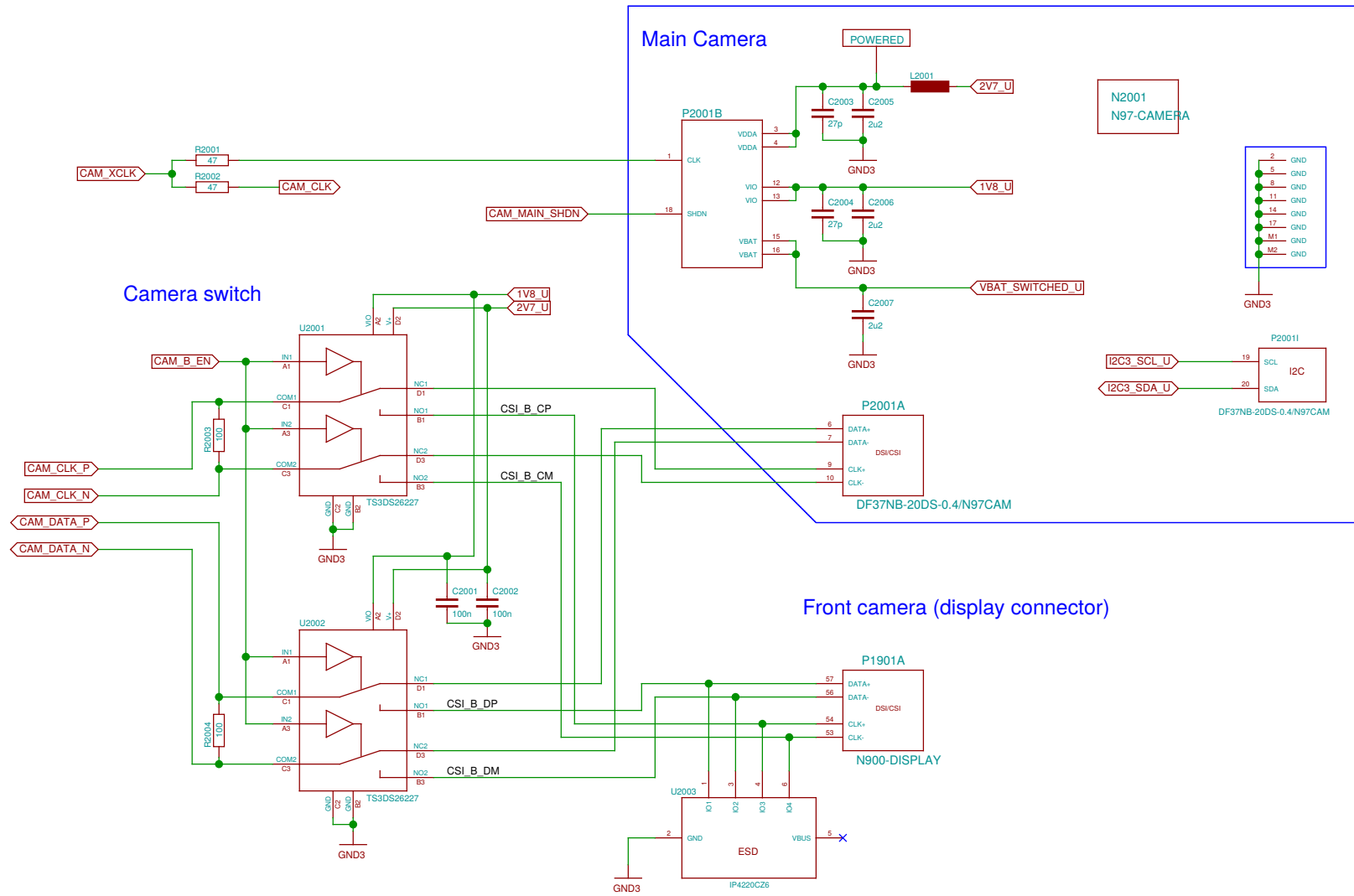


Lock switch

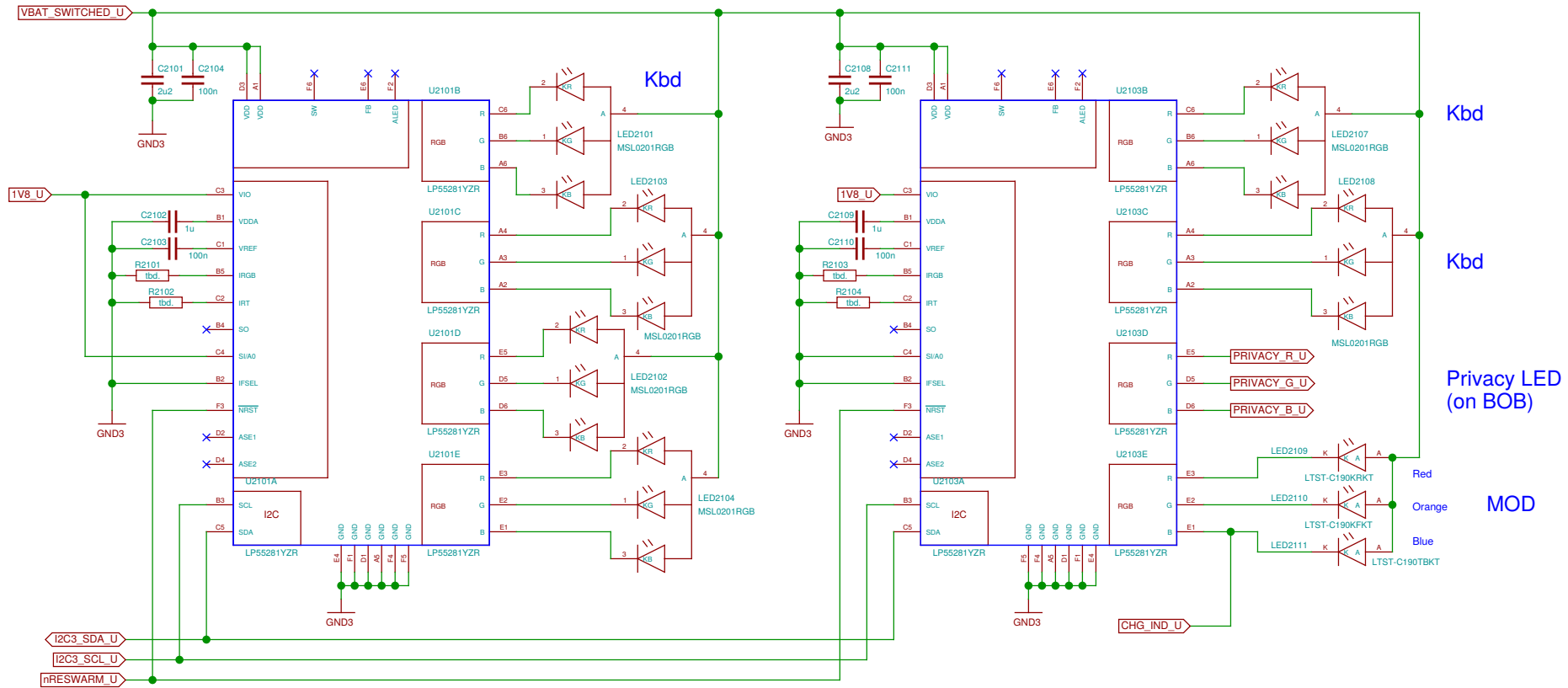


Sheet: /Keypad and buttons/		
File: keys.sch		
Title: Keypad and buttons		
Size: A3	Date: 2016-11-18 15:48:54	Rev:
Plotted by eeshow e90e812+ 20161120-16:10Z		Id: 18/25

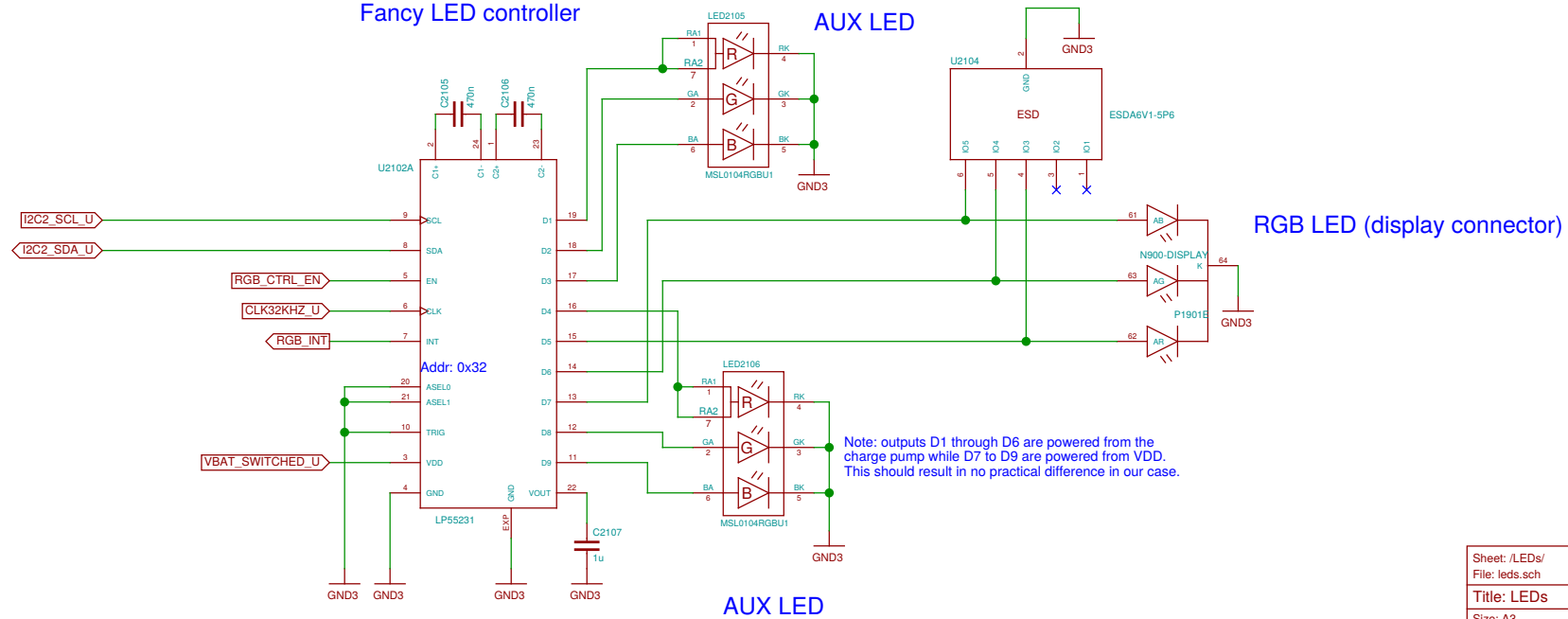




Basic LED controllers

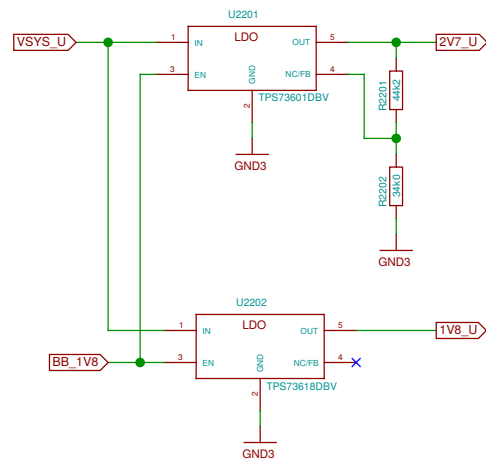


Fancy LED controller



Sheet: /LEDs/		Date: 2016-11-22 20:16:45	
File: leds.sch		Rev:	
Title: LEDs		Id: 21/25	
Size: A3	Plotted by: eeshow e90e812+	20161120-16:10Z	

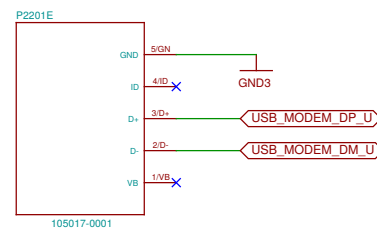
simple capless 400mA LDO for TPS65950 substitute
(only for prototype)



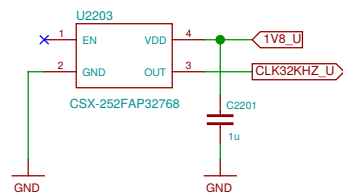
TODO: use REGEN ?

Modem USB

connect to BB
by some Micro-USB cable

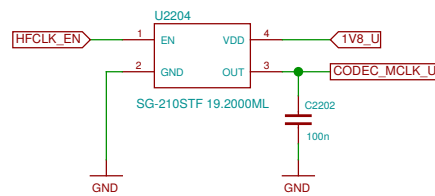


32 kHz clock



Alternative: OYKTGLJANF-0.032768

19.2 MHz clock

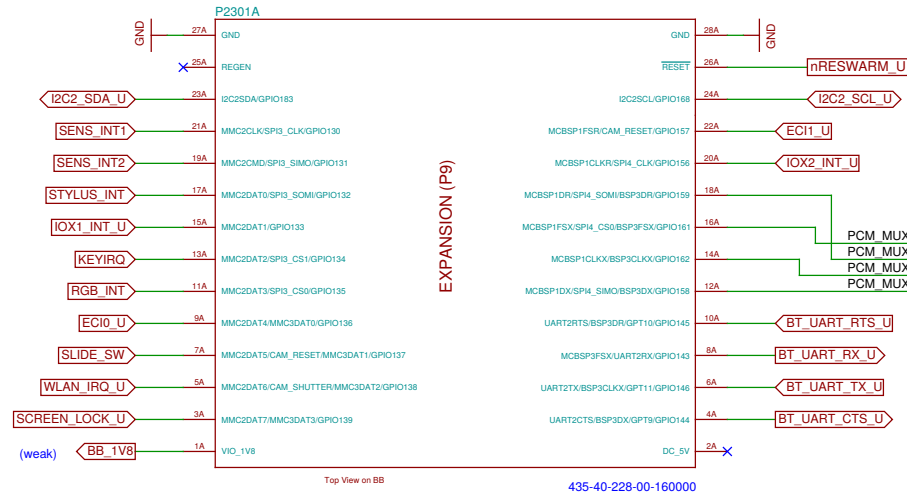


Alternative: KC2520B19.2000C1GE00

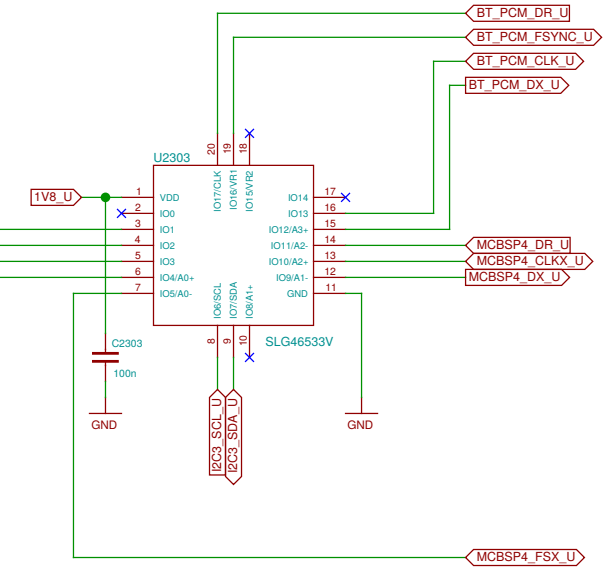
Sheet: /Adaptation (v2 only)/		
File: v2.sch		
Title: Adaptation (v2 only)		
Size: A3	Date: 2016-11-18 15:49:26	Rev:
Plotted by eeshow e90e612+ 20161120-16:10Z		Id: 22/25

TODO: update pin names in footprint

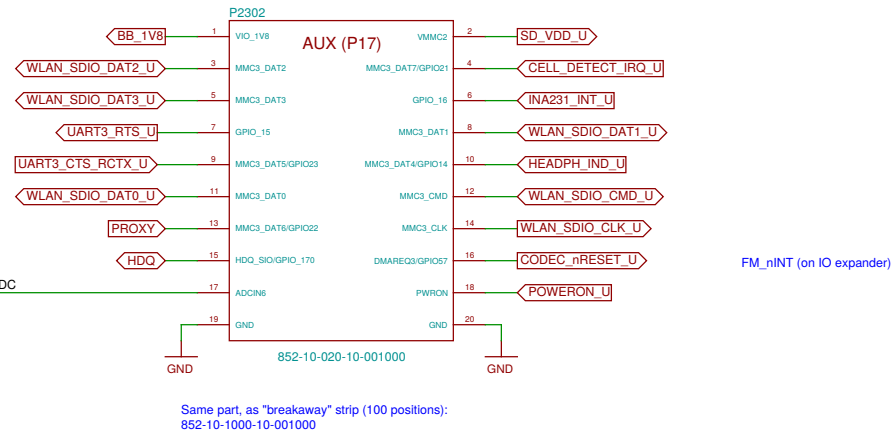
BB-xM Main Expansion Header (P9, 7.24)



PCM switch



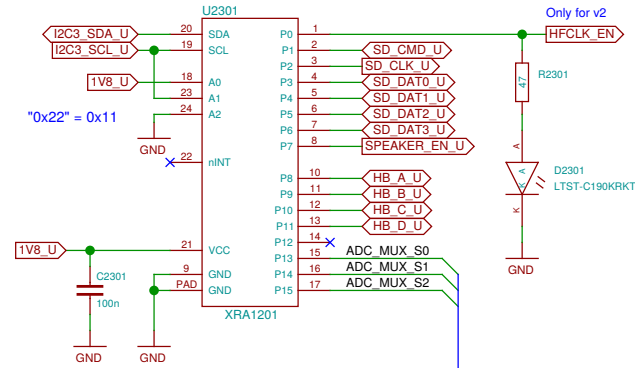
Auxiliary Expansion Header (P17, 7.26)



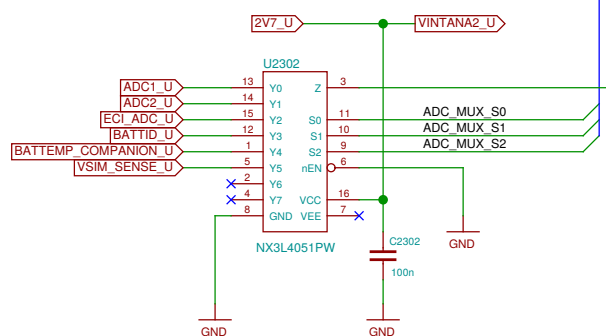
No UART3_RTS on BB-xM, using GPIO
No UART3_CTS on BB-xM, using GPIO

FM_nINT (on IO expander)

IO expander

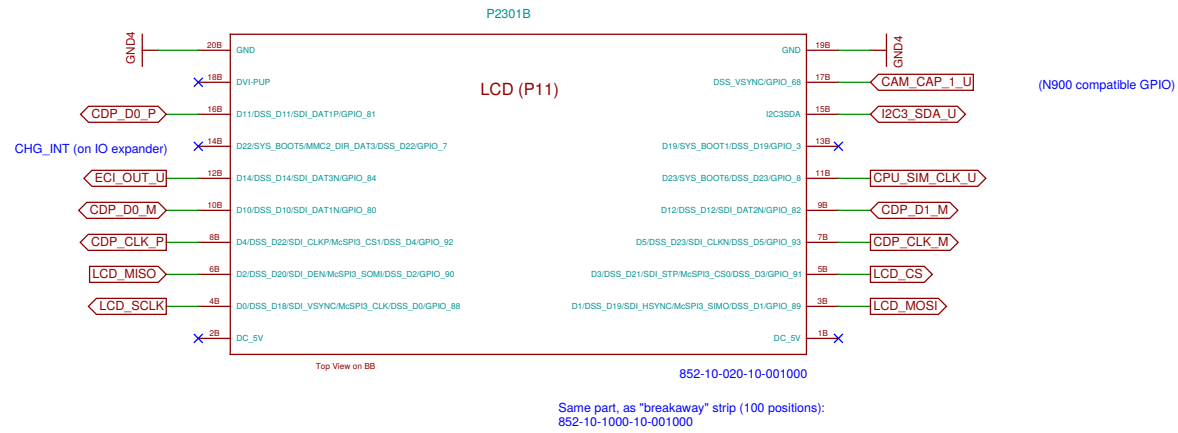


ADC multiplexer

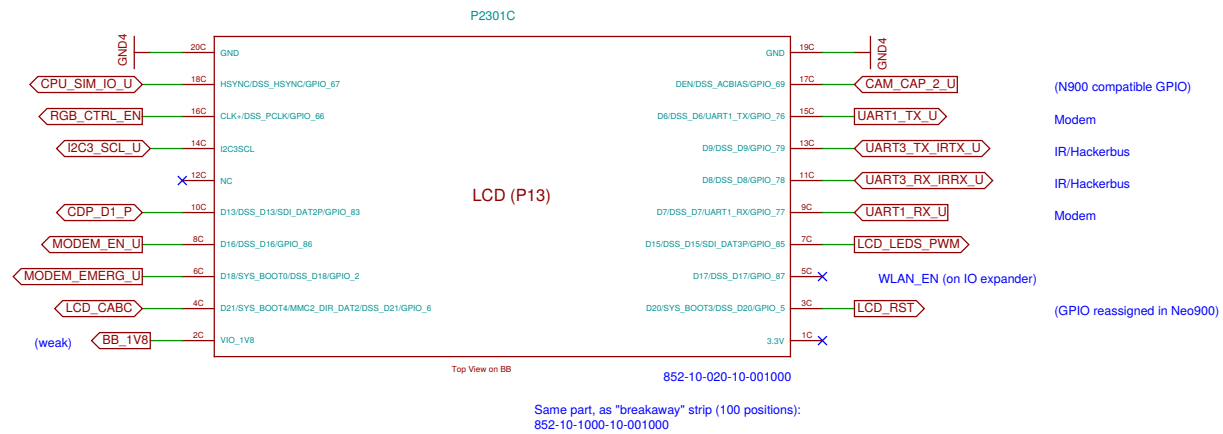


TODO: update pin names in footprint

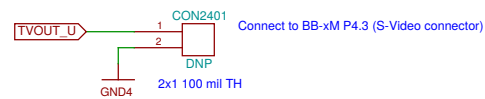
P11 (7.25)



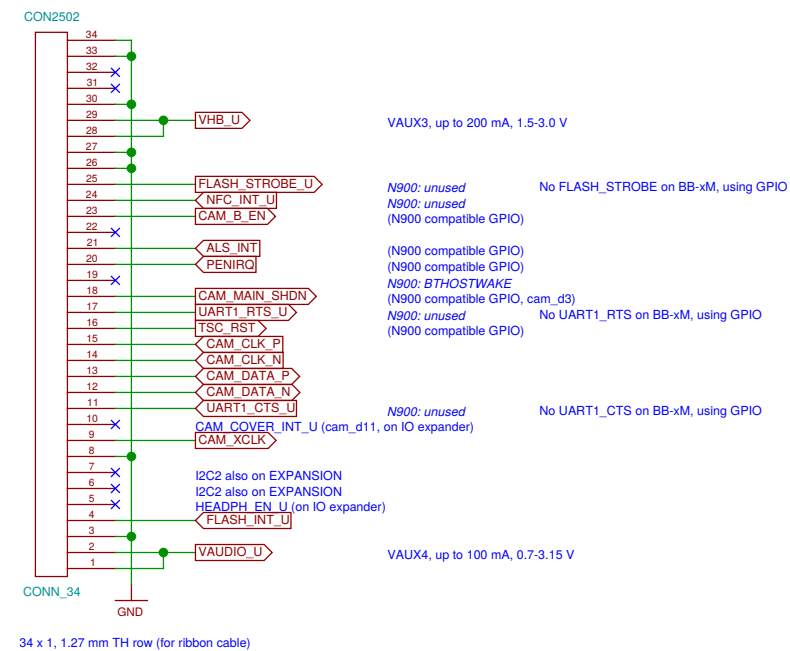
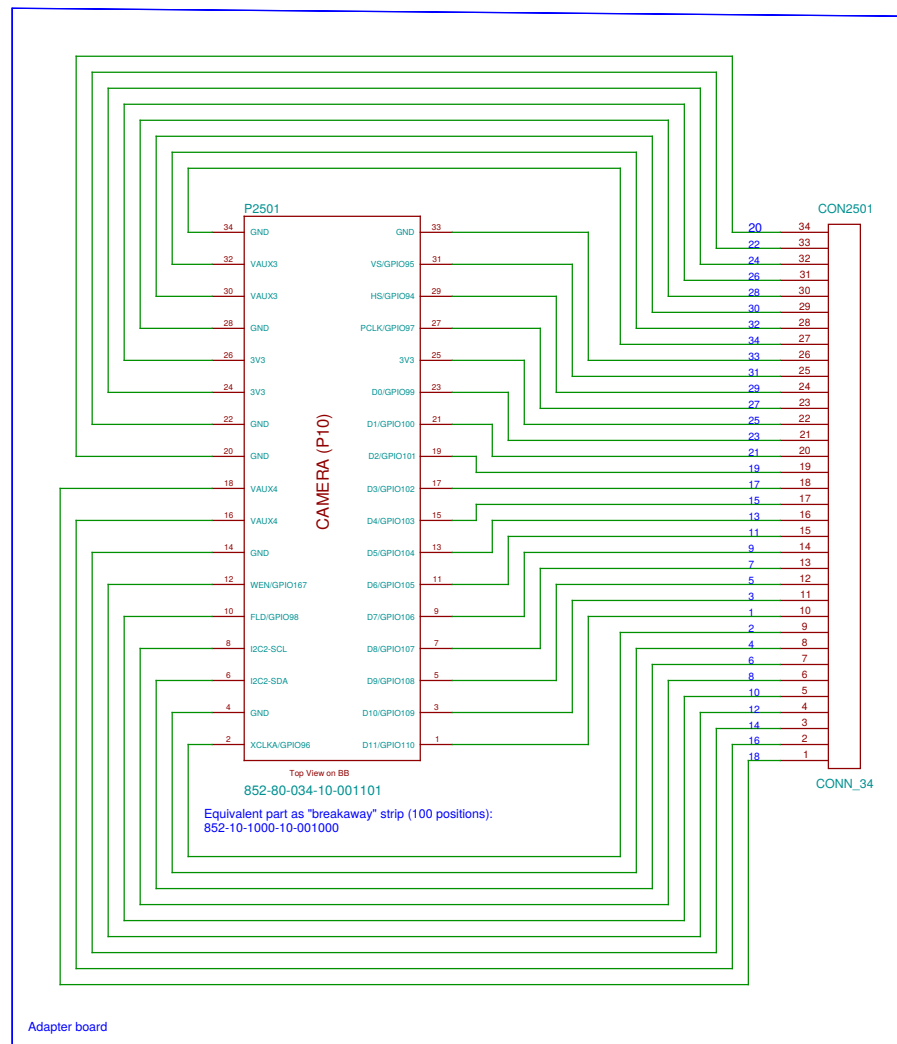
P13 (7.25)



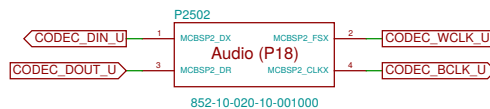
P4 (7.19)



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: bbcam.sch

Title: BB-xM Adapter (CAM)

Size: A3 Date: 2016-11-18 15:49:26
Plotted by eeshow e90e612- 20161120-16:10Z

Rev:
Id: 25/25