

# HUMMINGBOARD PRO

Rev 3.6

To Extract BOM:

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-----  
Item\tQuantity\tAssemblyOption\tPart\tDescription\tManufacturer\tManufacturer P\tPriorityPN\tPCB Footprint\tReference  
{Item}\t{Quantity}\t{ASSY_OPT}\t{Value}\t{DESCRIPTION}\t{MFG_NAME01}\t{MFG_PN01}\t{PRIORITY_PN}\t{PCB Footprint}\t{Reference}
```

PAGE NO.	DESCRIPTION
01	INDEX, REVISION NOTES, BOM STRINGS
02	SOM CONNECTORS, MAIN POWER
03	LAN, SECONDARU POWER, SD, RESET, HEADERS
04	HDMI, USB
05	CAMERA I/F, LVDS DISPLAY I/F
06	PCIE, MSATA, IRDA, RTC
07	AUDIO CODEC

2017-05-18 Rev 3.6

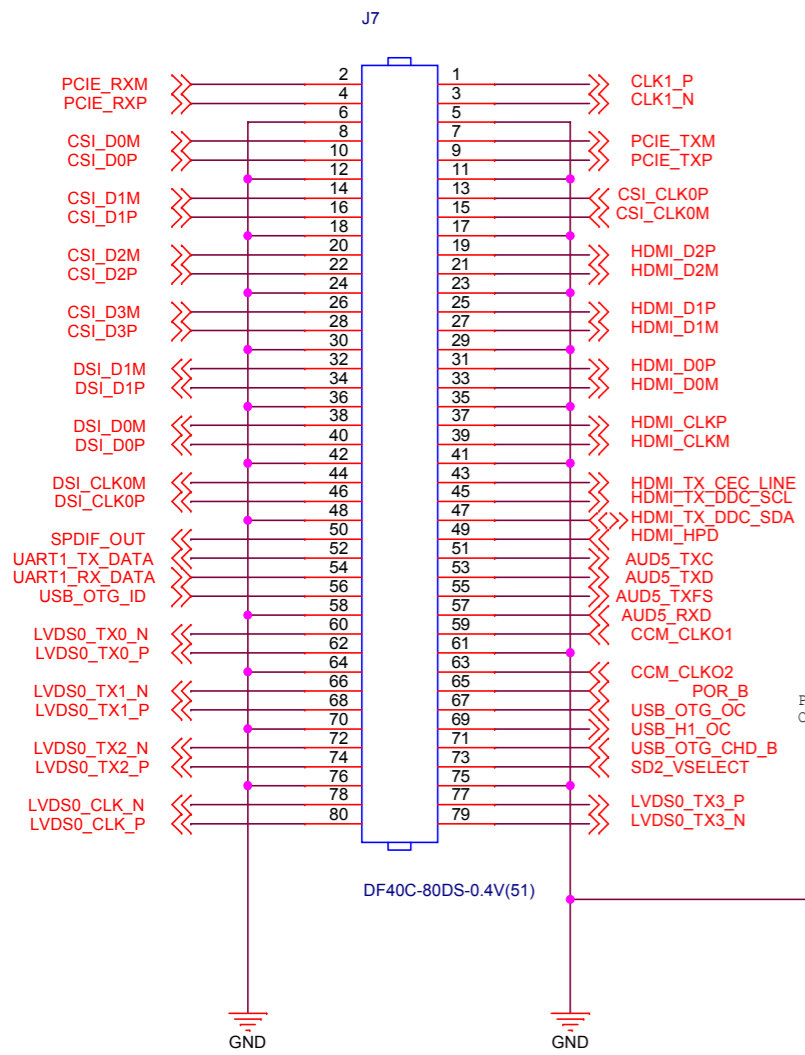
- \* VCC\_1P8 connected to VDDD pin of audio codec U4 (pin 30)
- \* ESD protection added on USB interfaces
- \* POR\_B decoupled with 0.1uF capacitor to GND
- \* POR\_B separated from POR\_BASE with a buffer
- \* POR\_B decoupled with 0.1uG capacitor to GND



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Size A	Title HUMMINGBOARD PRO 3.6	Rev 3.6
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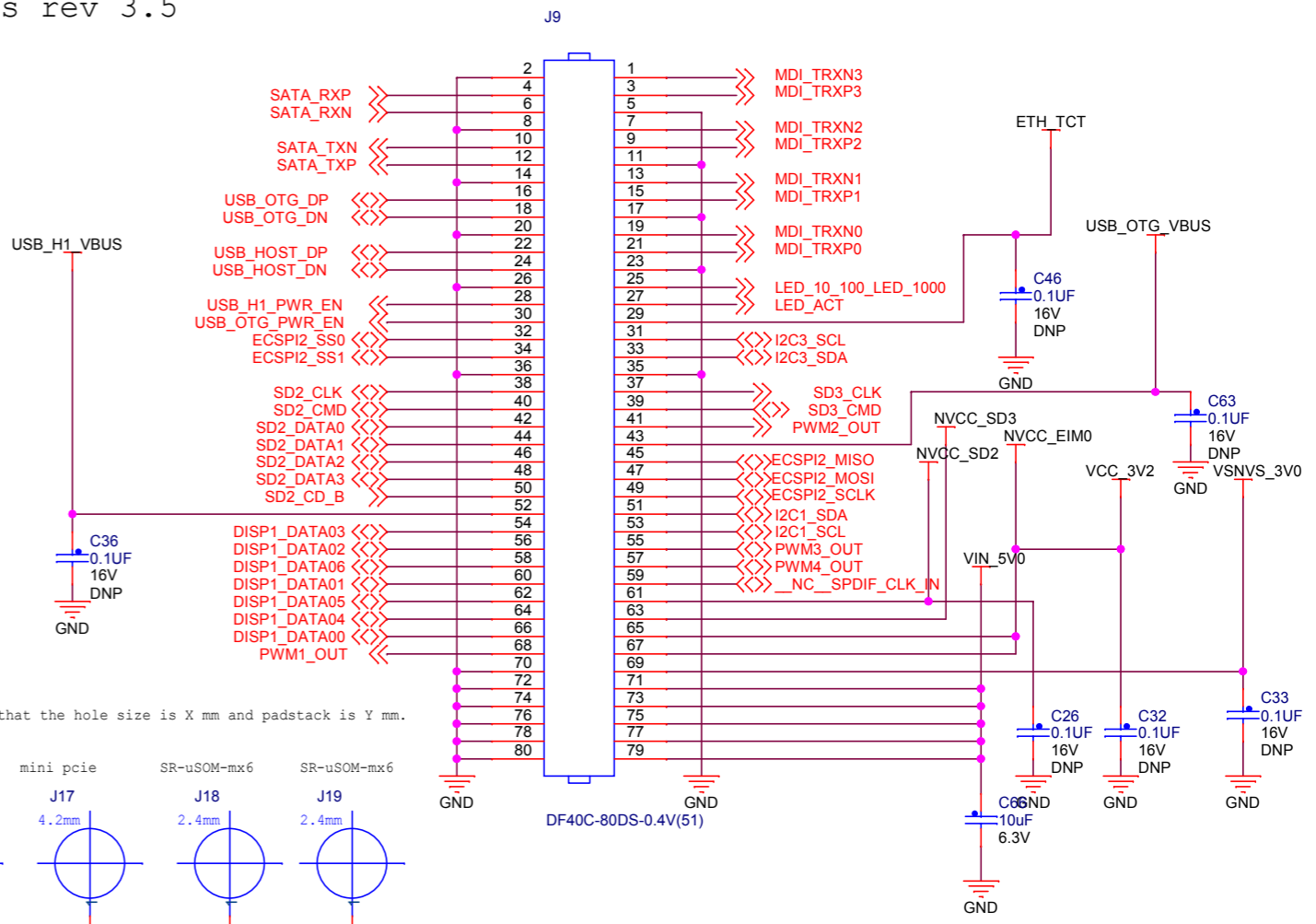
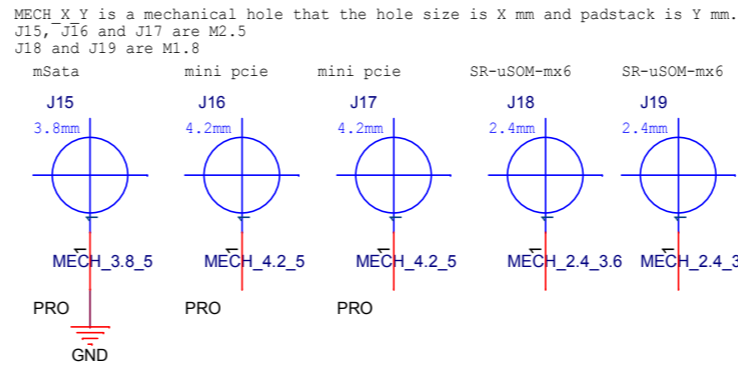
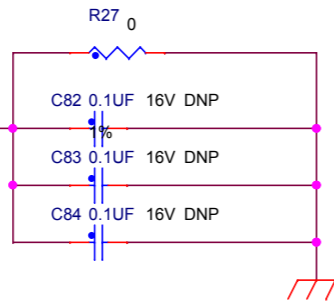
# HummingBoard Schematics rev 3.5



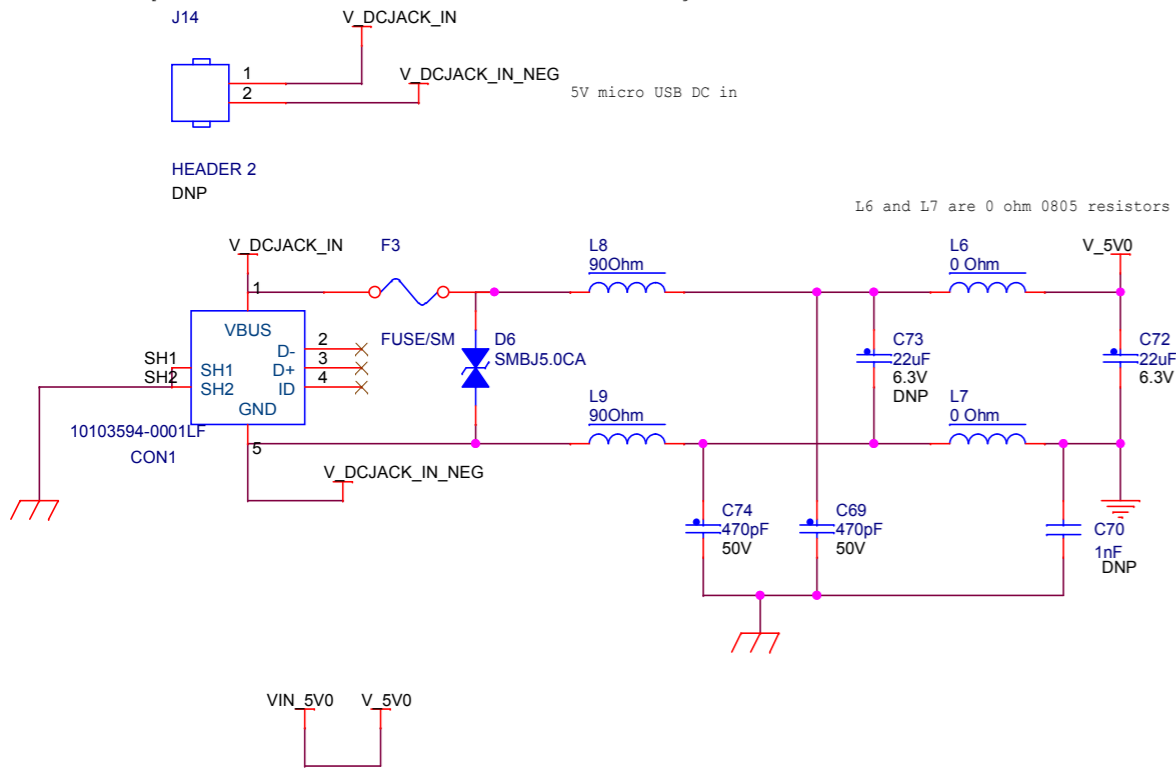
SR-uSOM-iMX6 connectivity  
Two out of three board to board only required by HummingBoard (J7 and J9)

- General notes -
- There are mainly two assembly options. Those versions are marked as base and pro
  - DNP stands for do not place. This is assembly option that means that this part is not assembled.
  - The 3.2V rail is important not to be 3.3V since the same rail is provided to SNVS where it's max AC characteristics is 3.3V.

Place around four corners of SOM  
Can be mainly used as GND to GNDC coupling capacitors for EMI

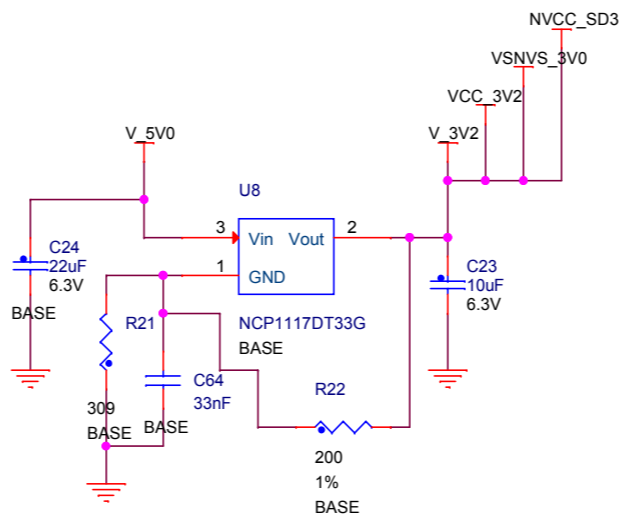


J14 is a 2 pin thru hole 100mil connector to bypass micro USB DC-in.  
This can provide more power than the rating of a micro USB connector.  
The two pins are located near the micro USB connector near the edge of the board.



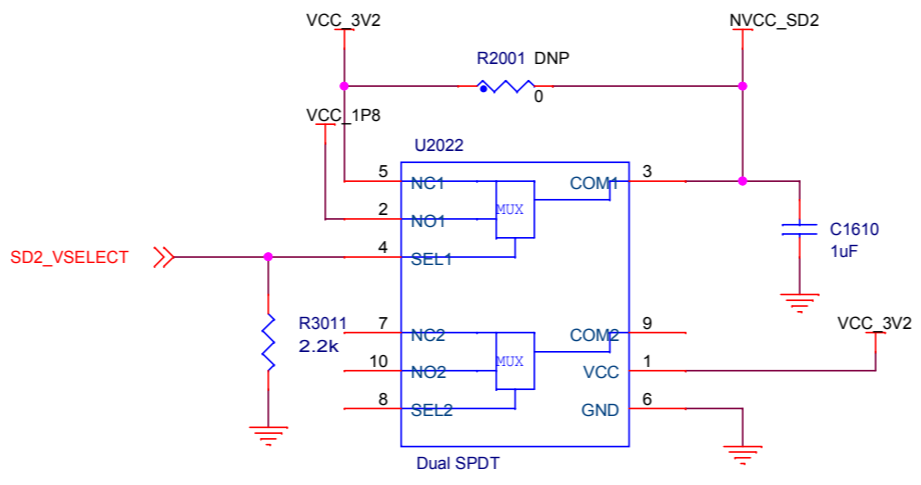
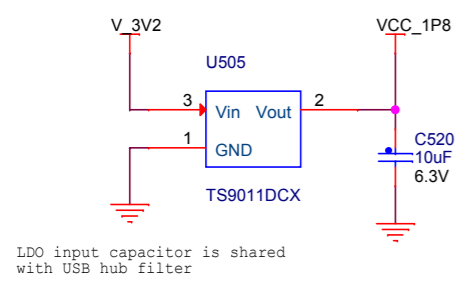
5V to 3.2v (base)

Notice assembly option -  
HummingBoard Base - LDO is used  
HummingBoard Pro - DC-DC is used

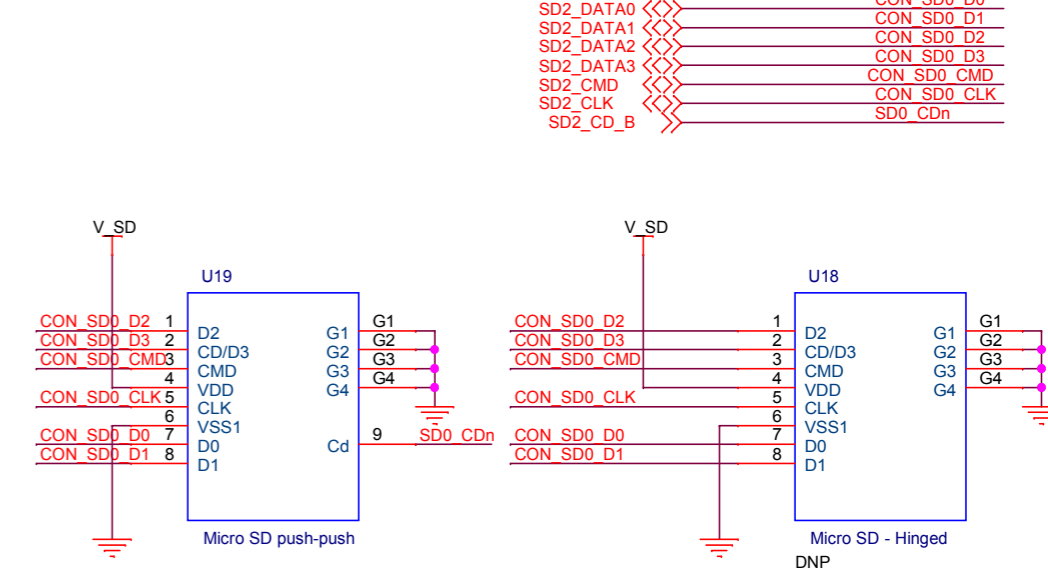


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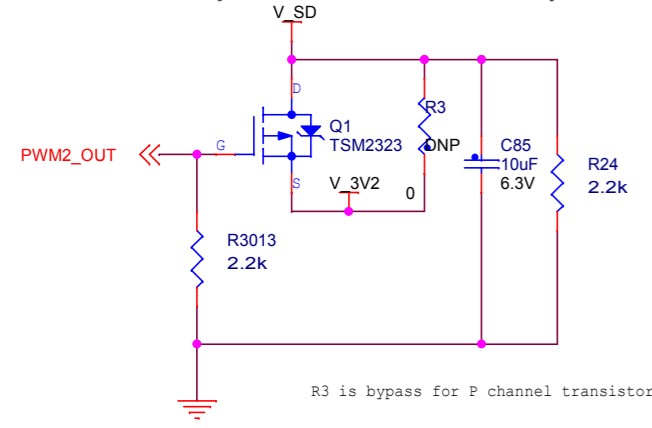
SDIO 3.3v / 1.8v switch circuitry



micro SD connectors (assembly option of push-push type and hinged type)



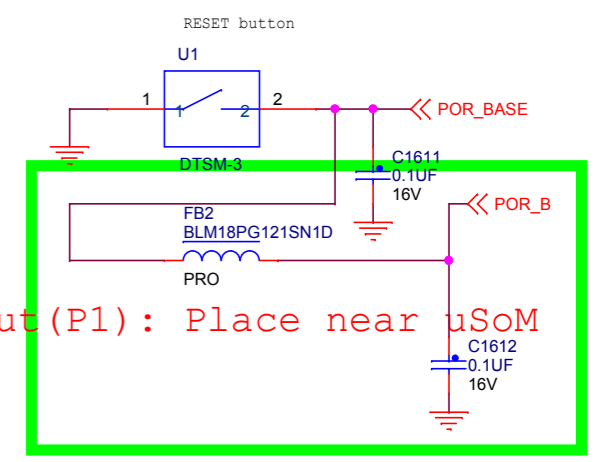
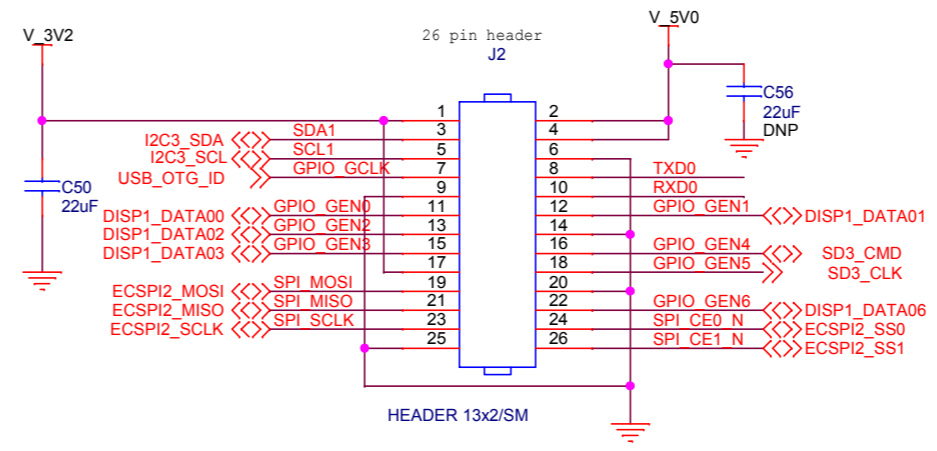
micro SD power on/off  
Change C85 to be 1uF instead of 10uF to prevent in-rush



GPIO pin mapping -

Pin	GPIO
7	(1, 1)
11	(3, 9)
12	(3, 8)
13	(3, 7)
15	(3, 6)
16	(7, 2)
18	(7, 3)
22	(3, 3)

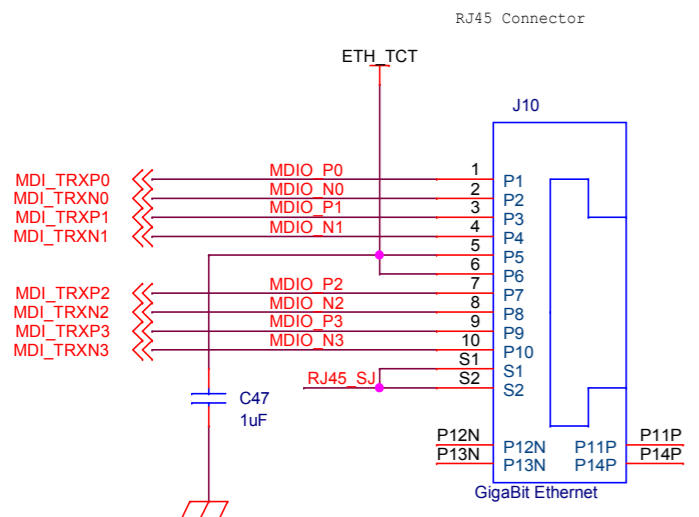
SPI and I2C can be also muxed to be GPIO



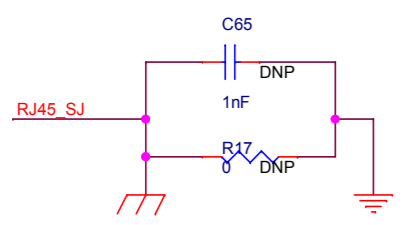
Layout (P1): Place near uSoM

UART buffer (notice either U17 or U3 is assembled)

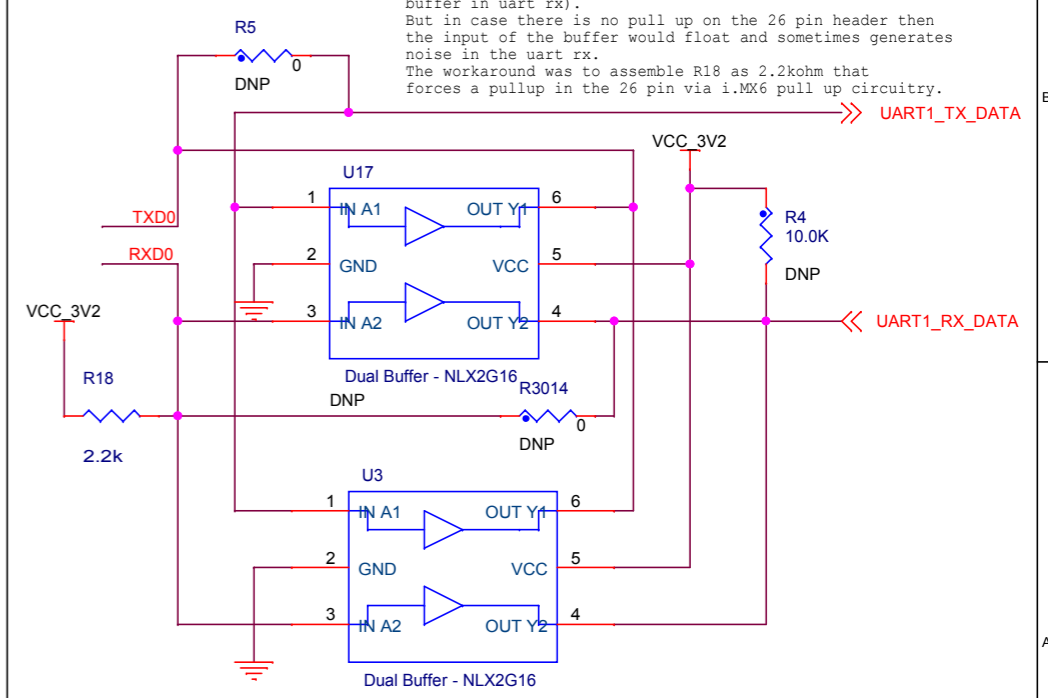
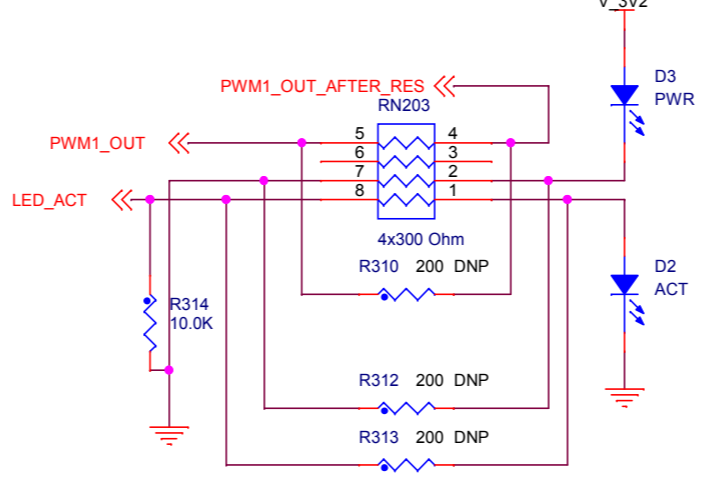
UART buffer (notice either U17 or U3 is assembled).  
R18 was initial 0 ohm and marked as DNP (to bypass the buffer in uart rx).  
But in case there is no pull up on the 26 pin header then the input of the buffer would float and sometimes generates noise in the uart rx.  
The workaround was to assemble R18 as 2.2kohm that forces a pullup in the 26 pin via i.MX6 pull up circuitry.



GND and GNDC decoupling caps



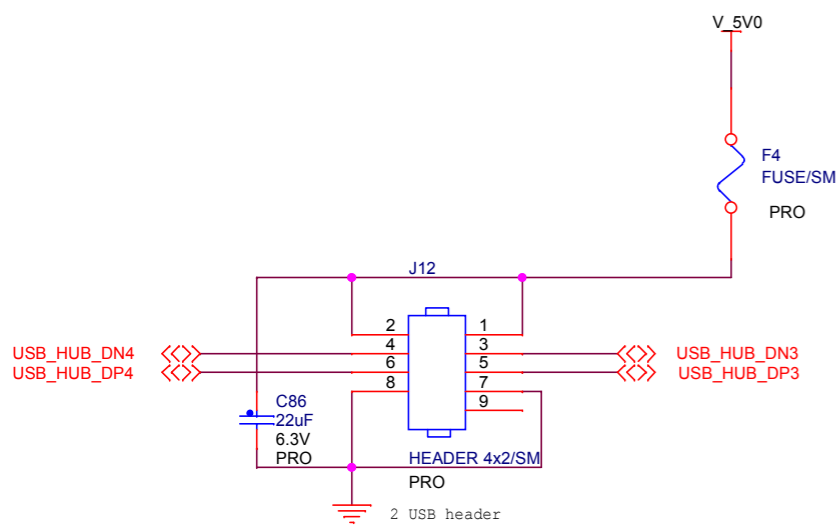
LEDs. Power and Ethernet ACT/Link



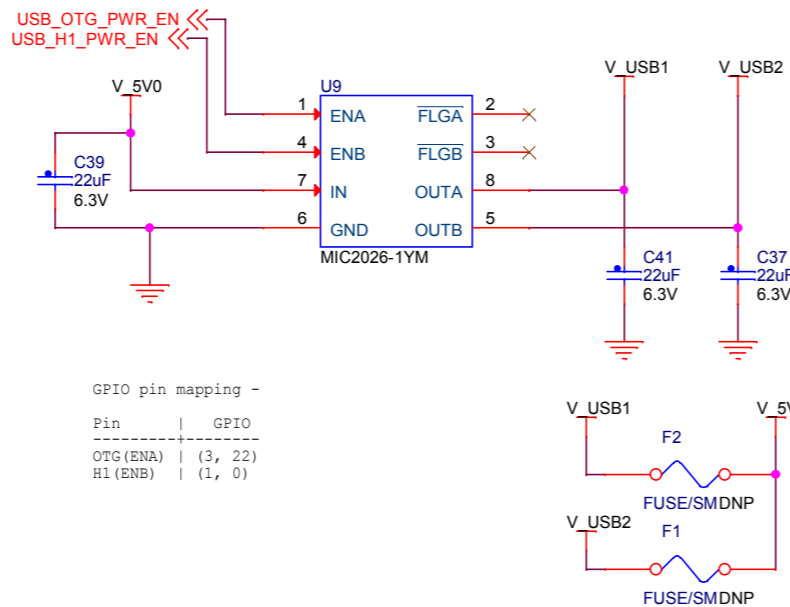
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Size	A3	Title	HummingBoard - 26 pin header, RJ45, uSD, reset and uart level shifter	Rev	3.6
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Dual USB header  
Notice dual USB header is current limited to 350mA both channels



USB current limiter

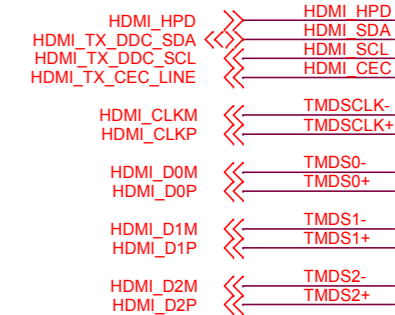
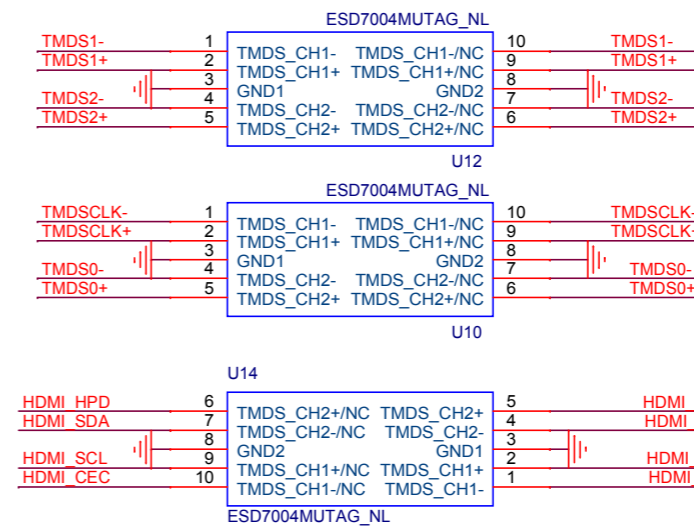


GPIO pin mapping -

Pin	GPIO
OTG (ENA)	(3, 22)
H1 (ENB)	(1, 0)

HDMI out

HDMI ESD protection



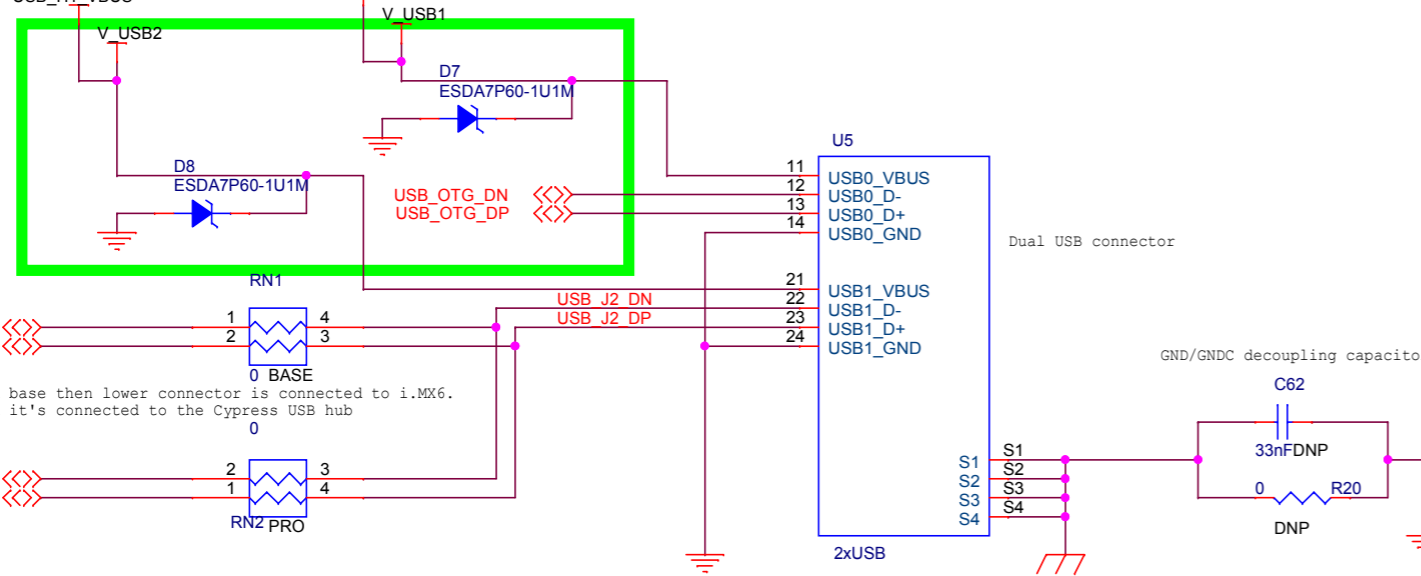
V\_3V2

R15 10.0K

D5 RB521CS-30

HDMI 3P3\_CEC HDMI\_CEC

USB\_OTG\_VBUS



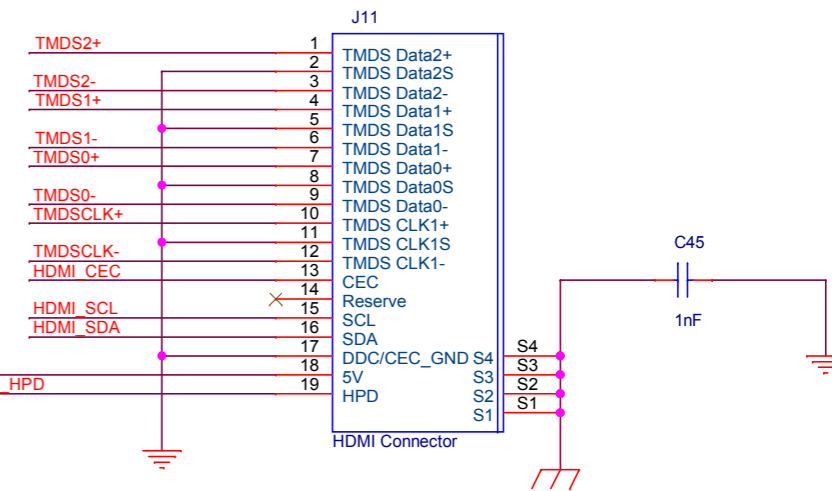
Dual USB connector

GND/GND decoupling capacitors

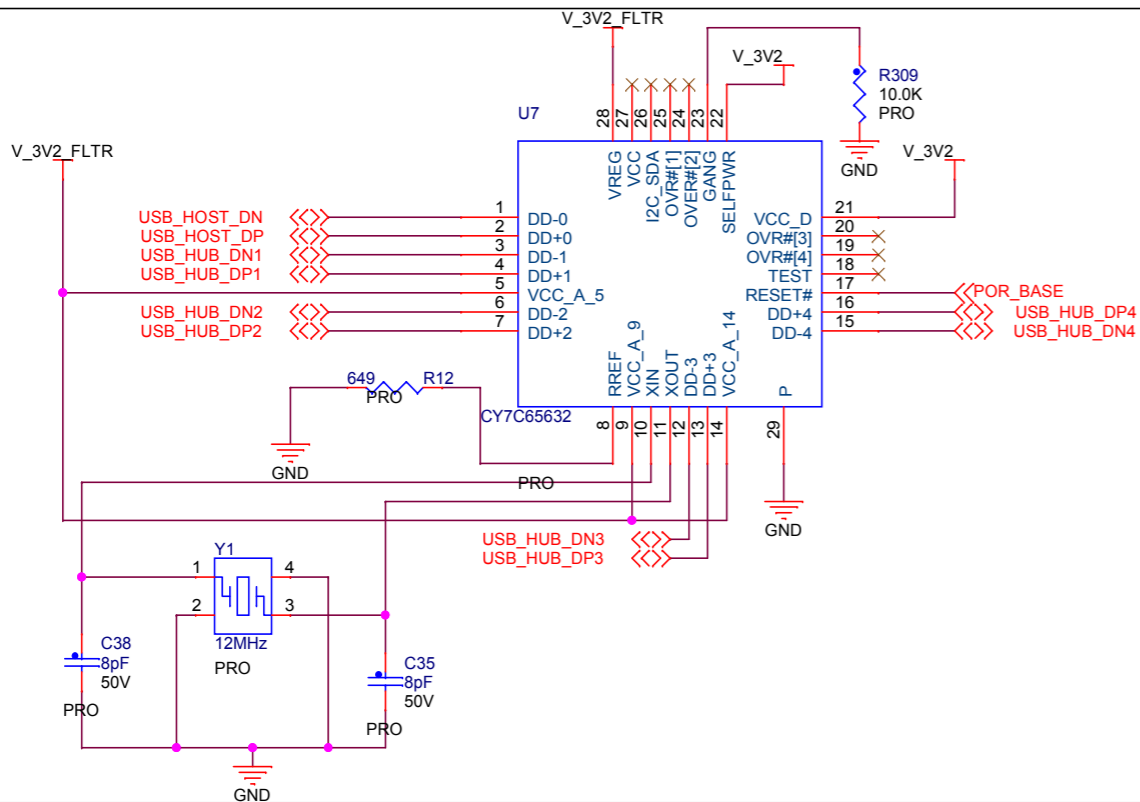
USB\_HOST\_DN  
USB\_HOST\_DP

Notice that in base then lower connector is connected to i.MX6.  
In pro version it's connected to the Cypress USB hub

USB\_HUB\_DN1  
USB\_HUB\_DP1

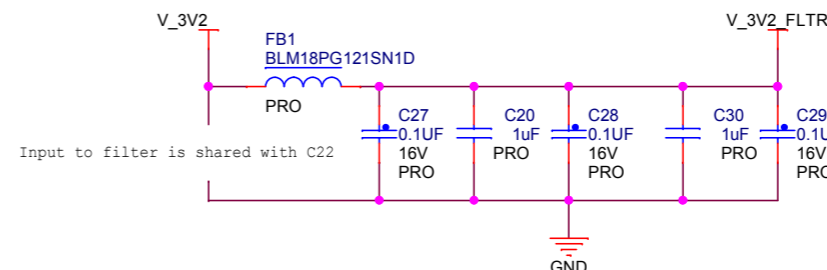


V\_3V2\_FLTR

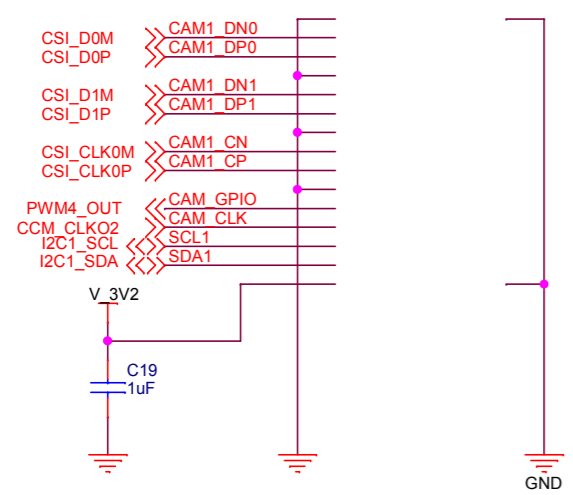


- 1 to 4 USB HUB. The HUB outputs goes to -
1. Lower USB port in the HummingBoard pro configuration.
2. Dual USB header.
3. mini PCIe connector

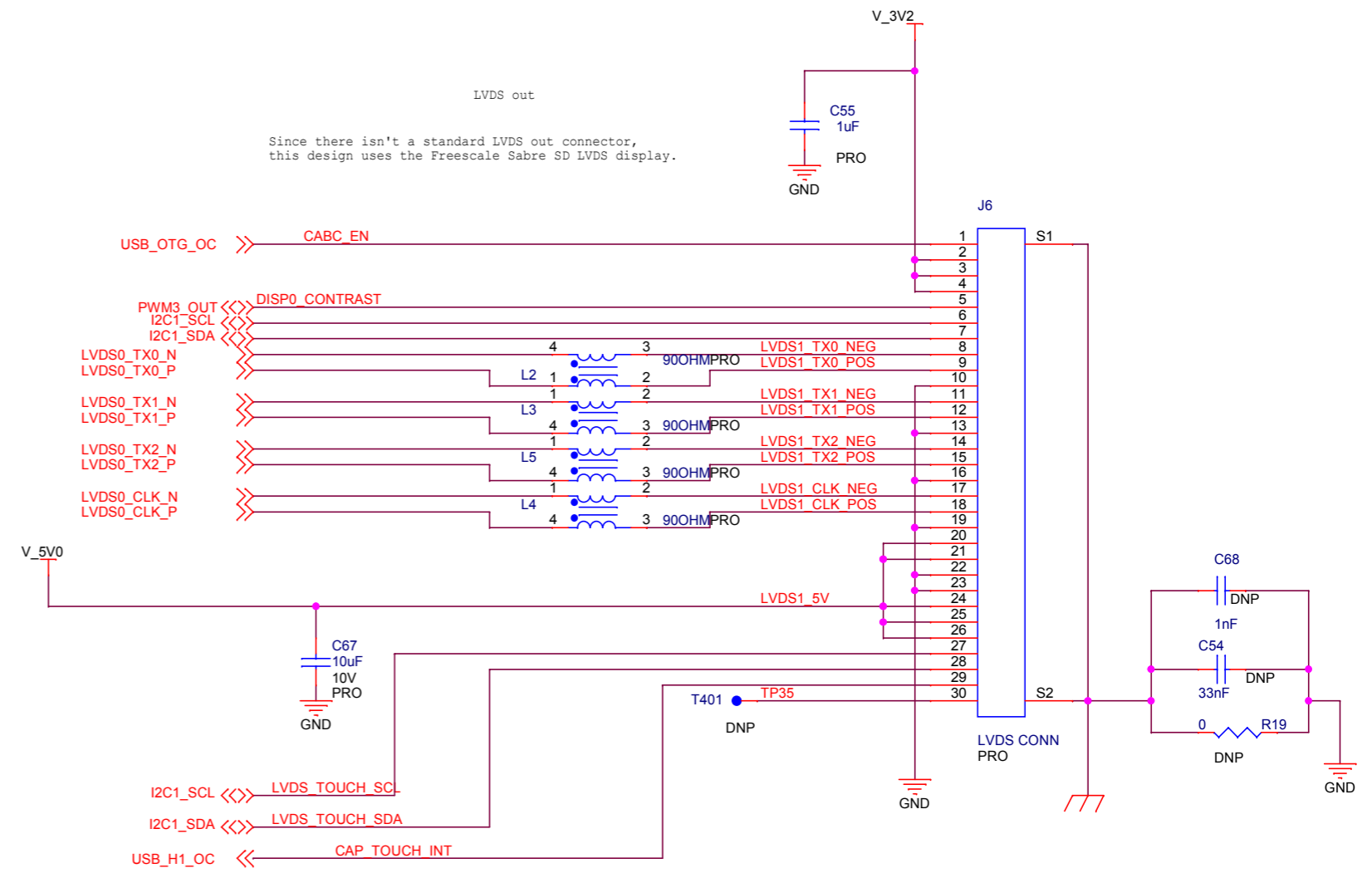
USB hub analog phy filter



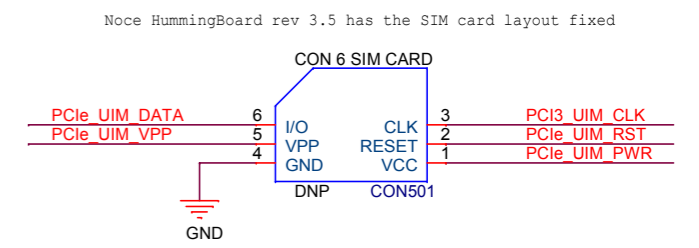
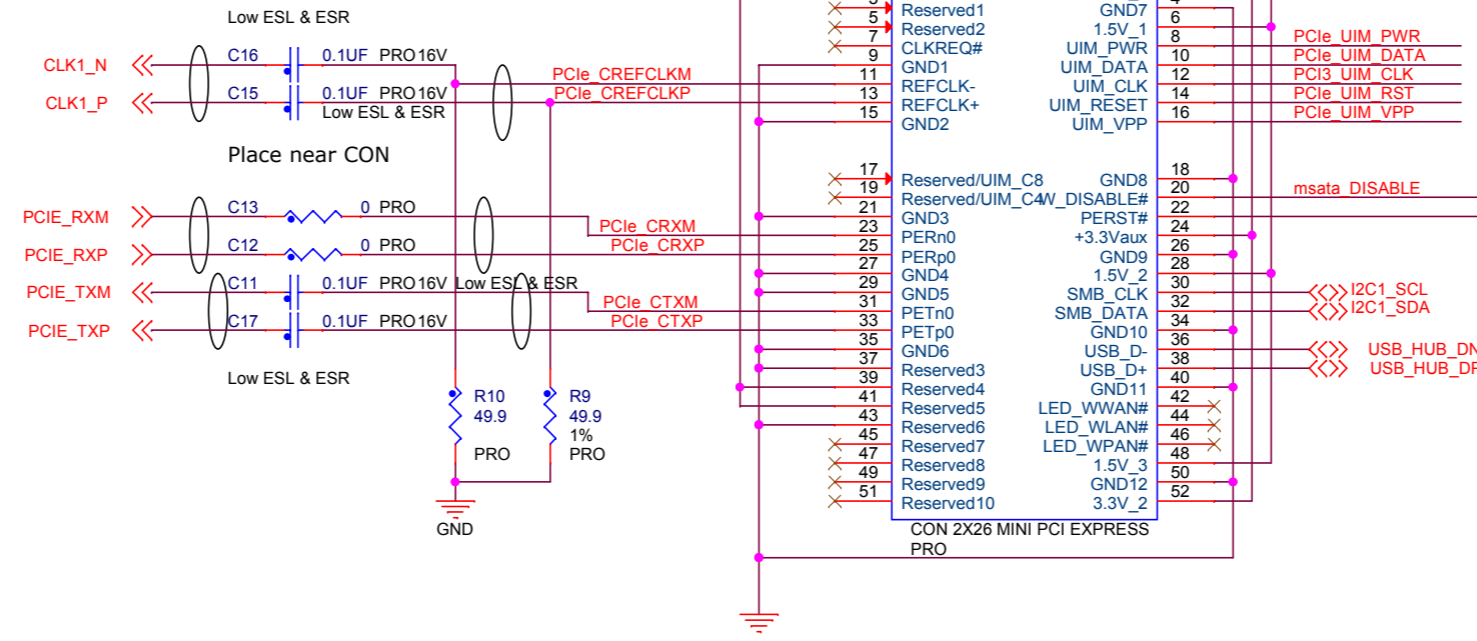
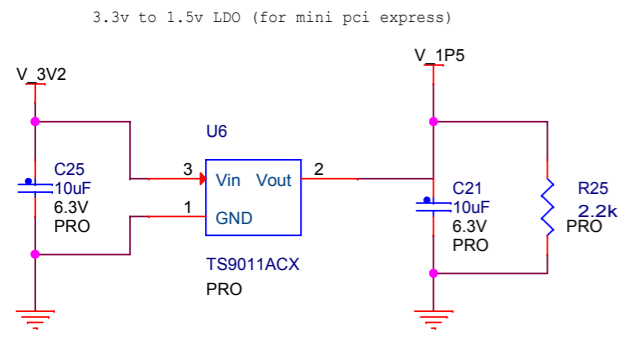
MIPI CSI-2 serial interface



Since there isn't a standard LVDS out connector, this design uses the Freescale Sabre SD LVDS display.

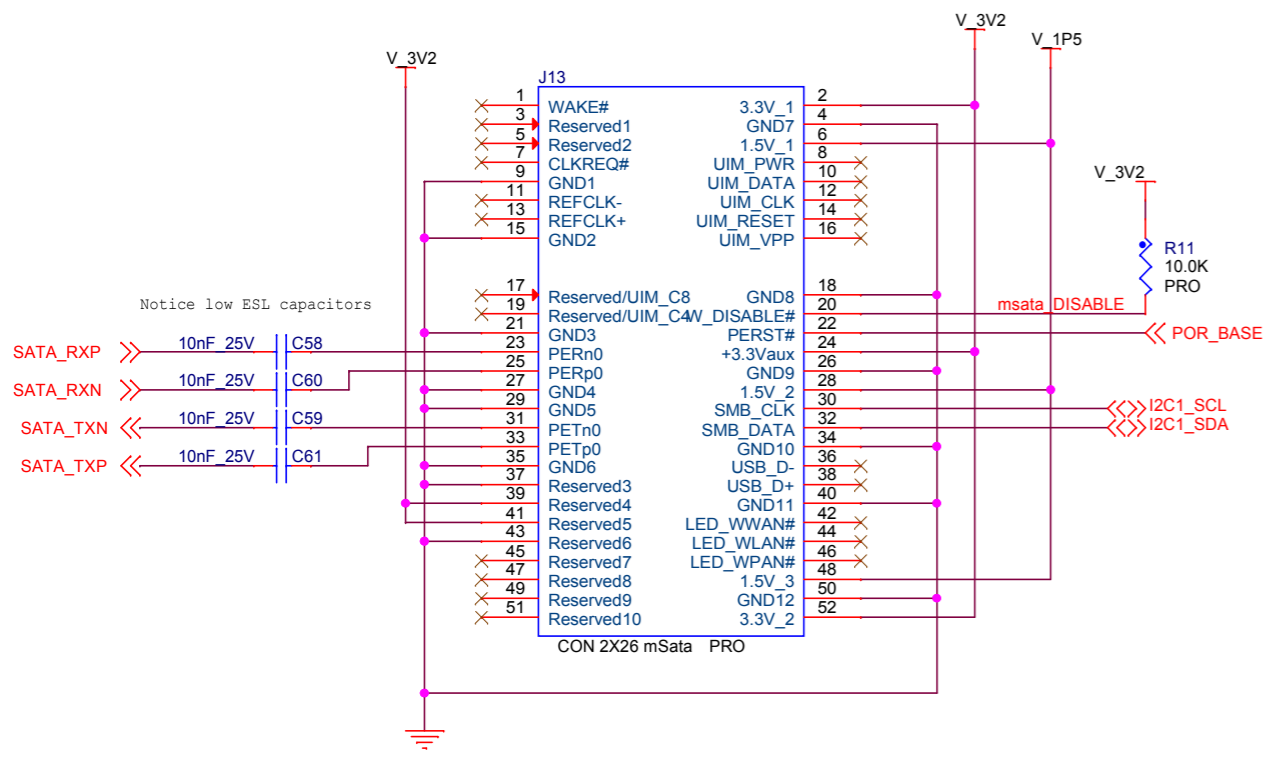


PCI express with optional sim card

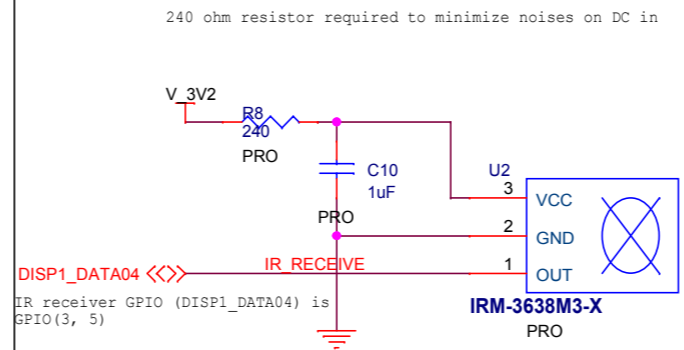


R23 must be always assembled since this is a signature for HB 3.x (vs. HB 1.0 and CuBox-i)

msata (pro and can be used by i.MX6D and i.MX6Q)

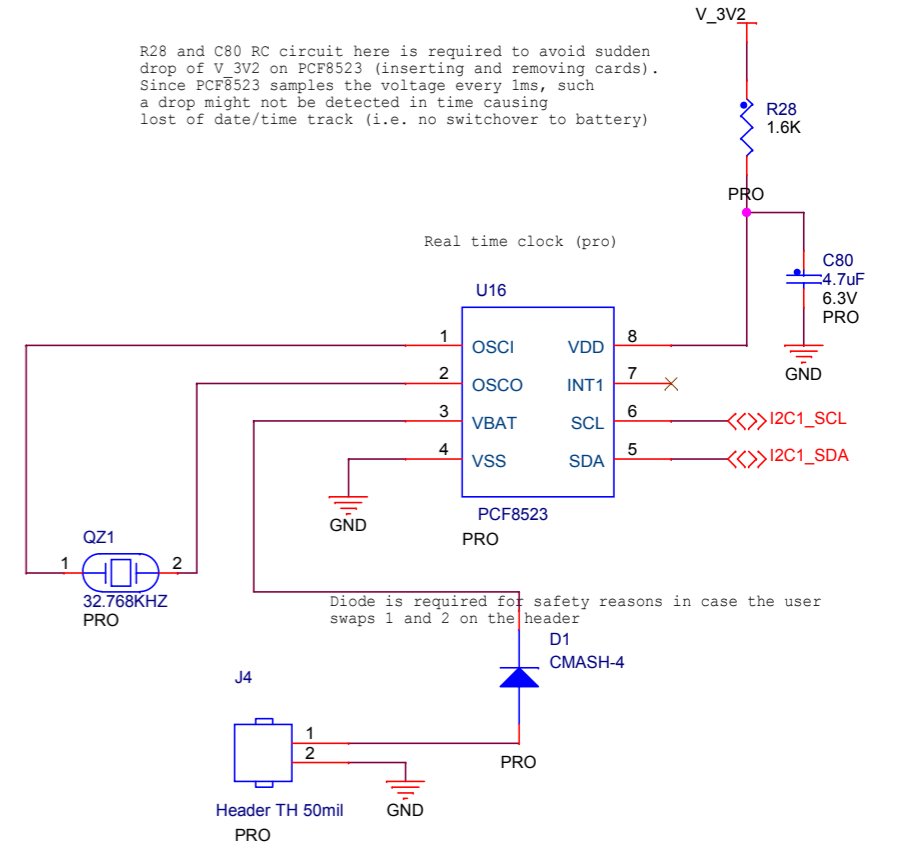


Infra red receiver



IR receiver GPIO (DISP1\_DATA04) is GPIO(3, 5)

R28 and C80 RC circuit here is required to avoid sudden drop of V\_3V2 on PCF8523 (inserting and removing cards). Since PCF8523 samples the voltage every 1ms, such a drop might not be detected in time causing lost of date/time track (i.e. no switchover to battery)



Diode is required for safety reasons in case the user swaps 1 and 2 on the header

