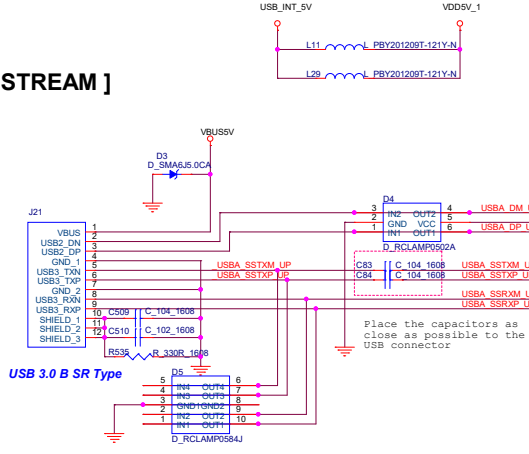


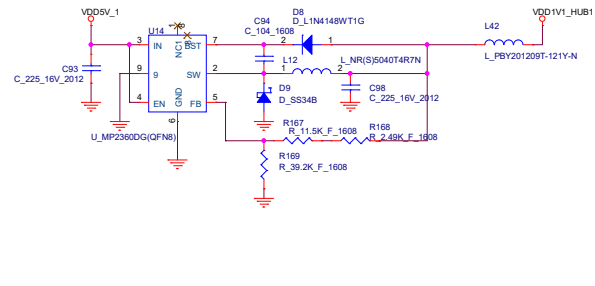
USB 3.0 HUB 1

USB signal line trace:
 1. Keep traces of USB bus D+ and D- the same length.
 2. Achieve 90 ohm differential characteristic impedance.
 3. Achieve 45 ohm common characteristic impedance.
 4. Maintain parallelism between D+ and D-.
 5. Do not route USB2.0 D+ and D- over the power plane split.
 6. Do not route USB2.0 D+ and D- over the other high frequency signals.

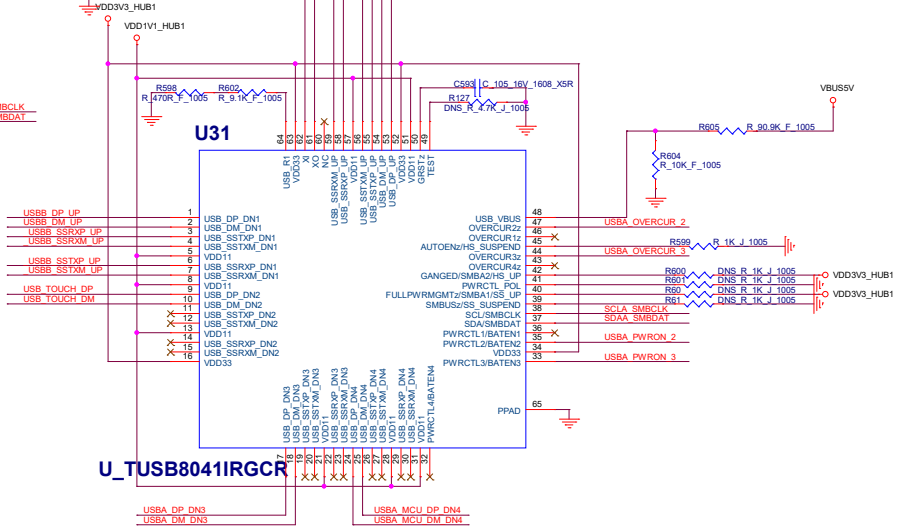
[USB UP STREAM]



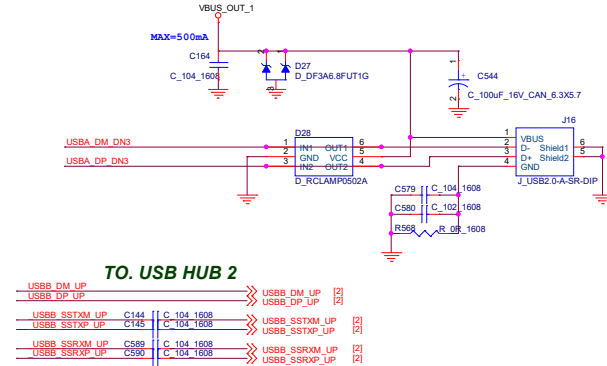
[USB DOWN STREAM_1 - Lower OP Panel USB]



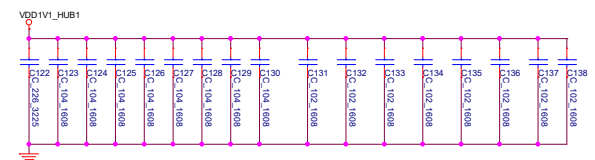
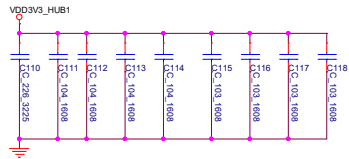
TO. USB HUB 2



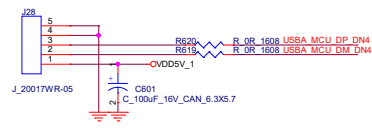
TO. USB HUB 2



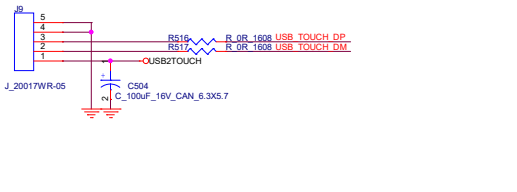
Power bypass capacitor



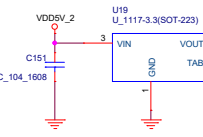
[MICOM]



[TOUCH PANEL]

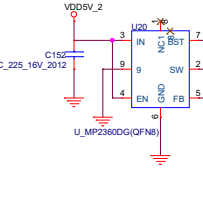


USB 3.0 HUB 2

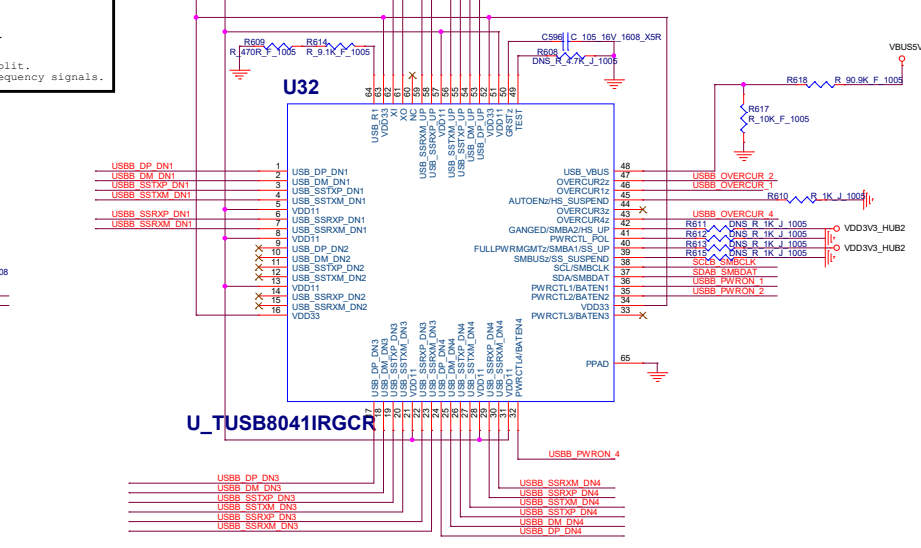
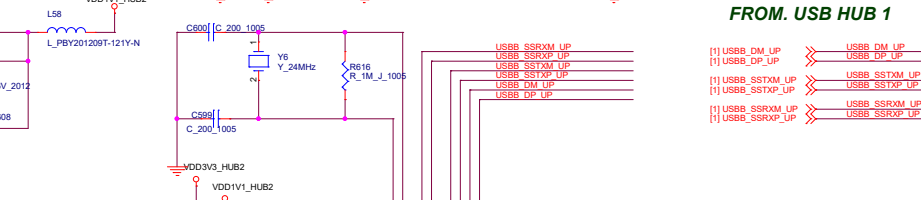
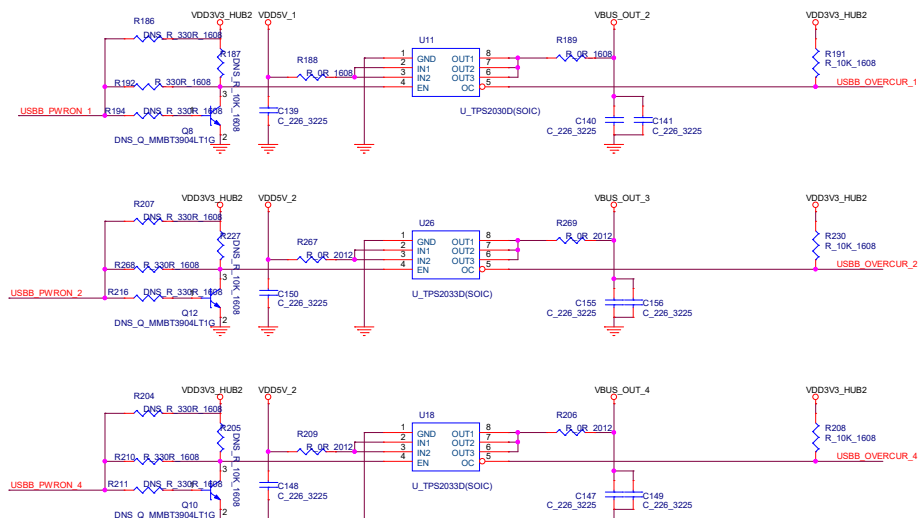
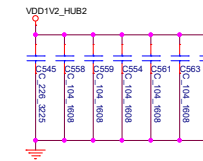
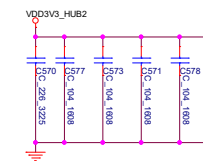
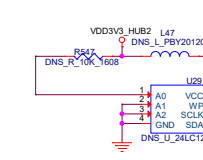


* Place the LDO as far away as possible from the IC, X-tal and USB-lines
(LDO는 가능한 IC, X-tal 및 USB라인과 떨어져어함.)

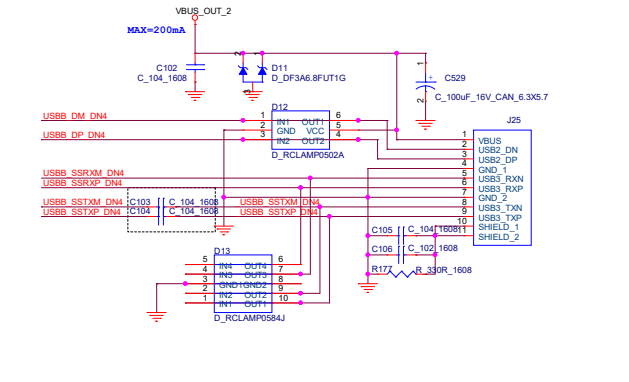
Equation1, R2= R1/(V(OUT)-R1)-1
Equation2, Vout = (R1+R2)/R1*R2
(Above Vout = ((11.5+2.49+39.2)*0.81)/39.2+1.099V)



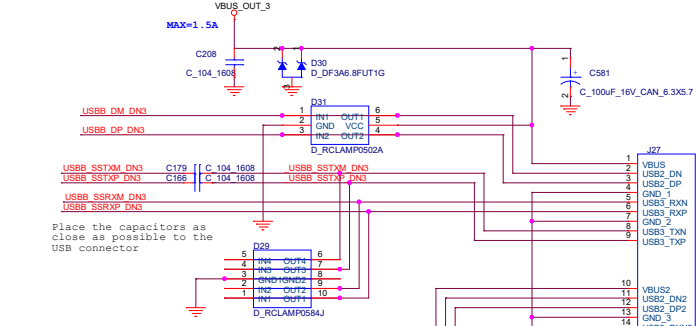
USB signal line trace:
1.Keep traces of USB bus D+ and D- the same length.
2.Achieve 90 ohm differential characteristic impedance.
3.Achieve 45 ohm common characteristic impedance.
4.Maintain parallelism between D+ and D-
5.Do not route USB2.0 D+ and D- over the power plane split.
6.Do not route USB2.0 D+ and D- over the other high frequency signals.



[USB DOWN STREAM1 - Main Display USB Power]



[USB DOWN STREAM_3 -Customer Port USB1]



[USB DOWN STREAM_4 -Customer Port USB2]

