

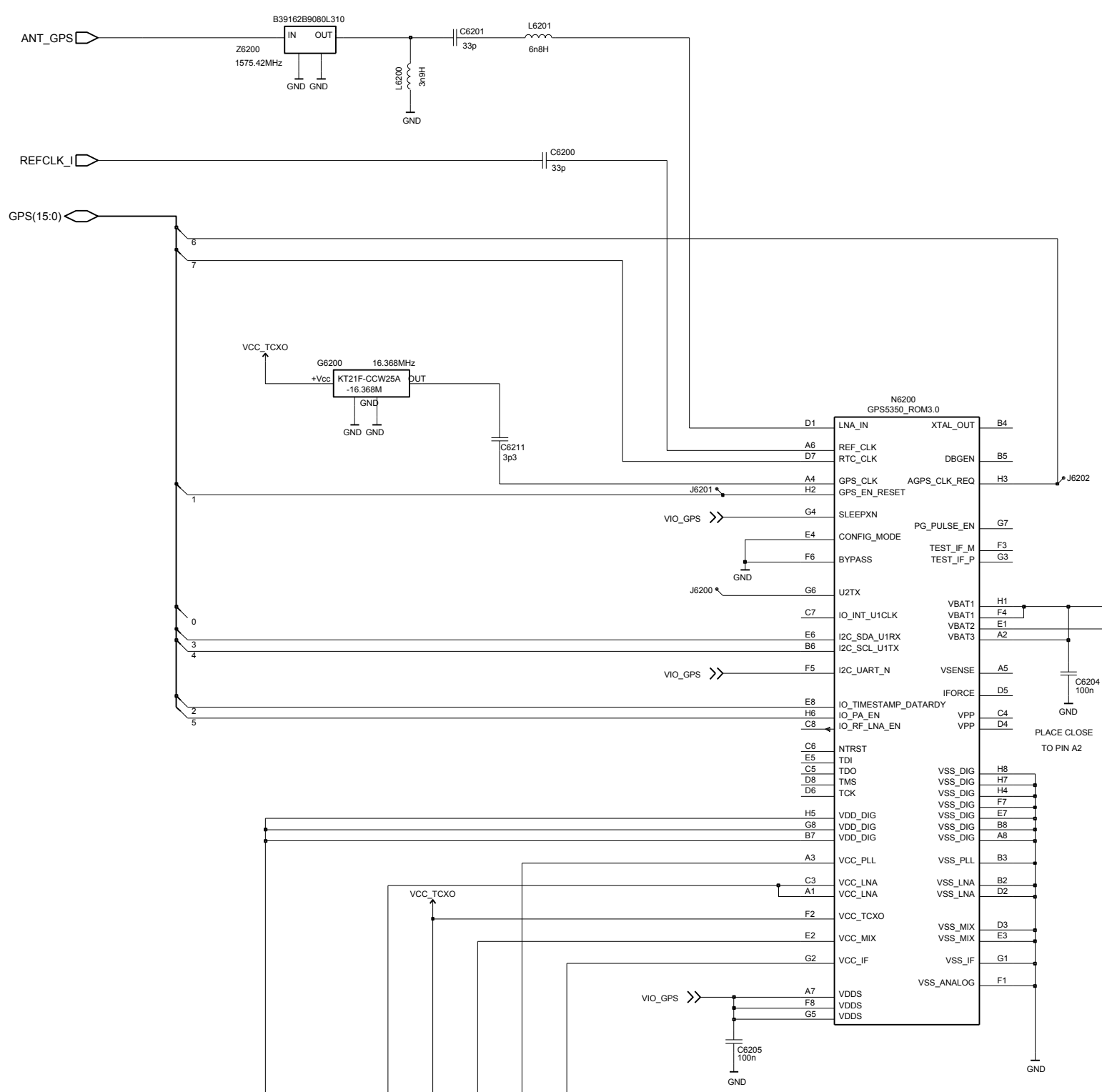
Nokia Customer Care

Service Manual

**RM-469; RM-481; RM-482; RM-483 (Nokia E52;
Nokia E55; L3&4)
Schematics
*Part No: (Issue 1)***

COMPANY CONFIDENTIAL





GPS COST 4.0

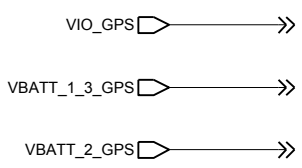
NOTES

- 1) TRACK INDUCTANCE FROM VDD_DIG, N6200-H5 TO C6212 MUST BE 1nH MAX.
- 2) TRACK INDUCTANCE FROM VCC_XXX, N6200 TO DECOUPLING CAPS MUST BE 1nH MAX.

| MODE | CONNECT N6200 (PIN) | TO |
|---------------------------------|---------------------|----------------------------------|
| CUSTOMERS NOT USING PA BLANKING | IO_PA_EN | GND (PREVENTS FLOATING INPUT) |
| MODE | | |

PLACE CLOSE TO PIN H5
SEE NOTE 1

SEE NOTE 2

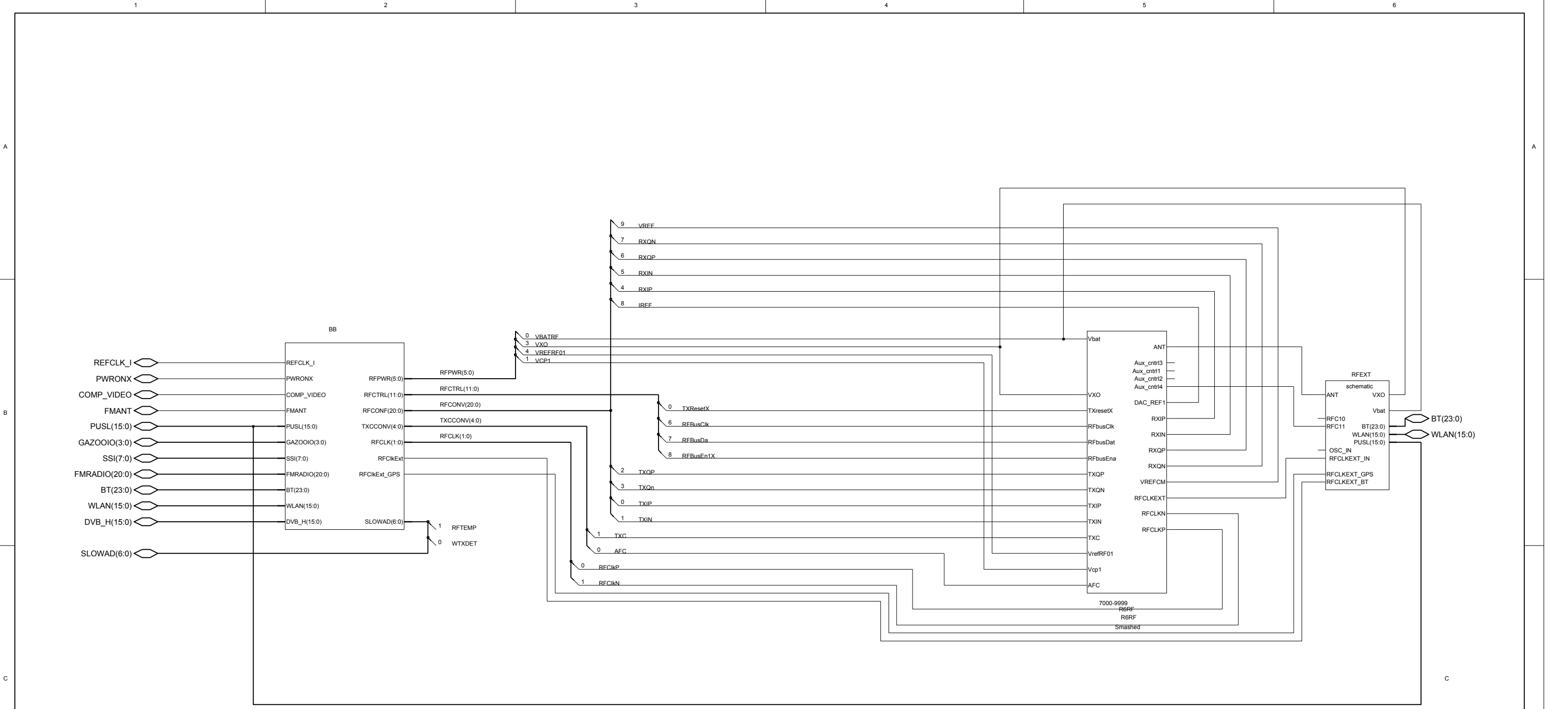


REF RANGE = 6200-6299

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NOKIA

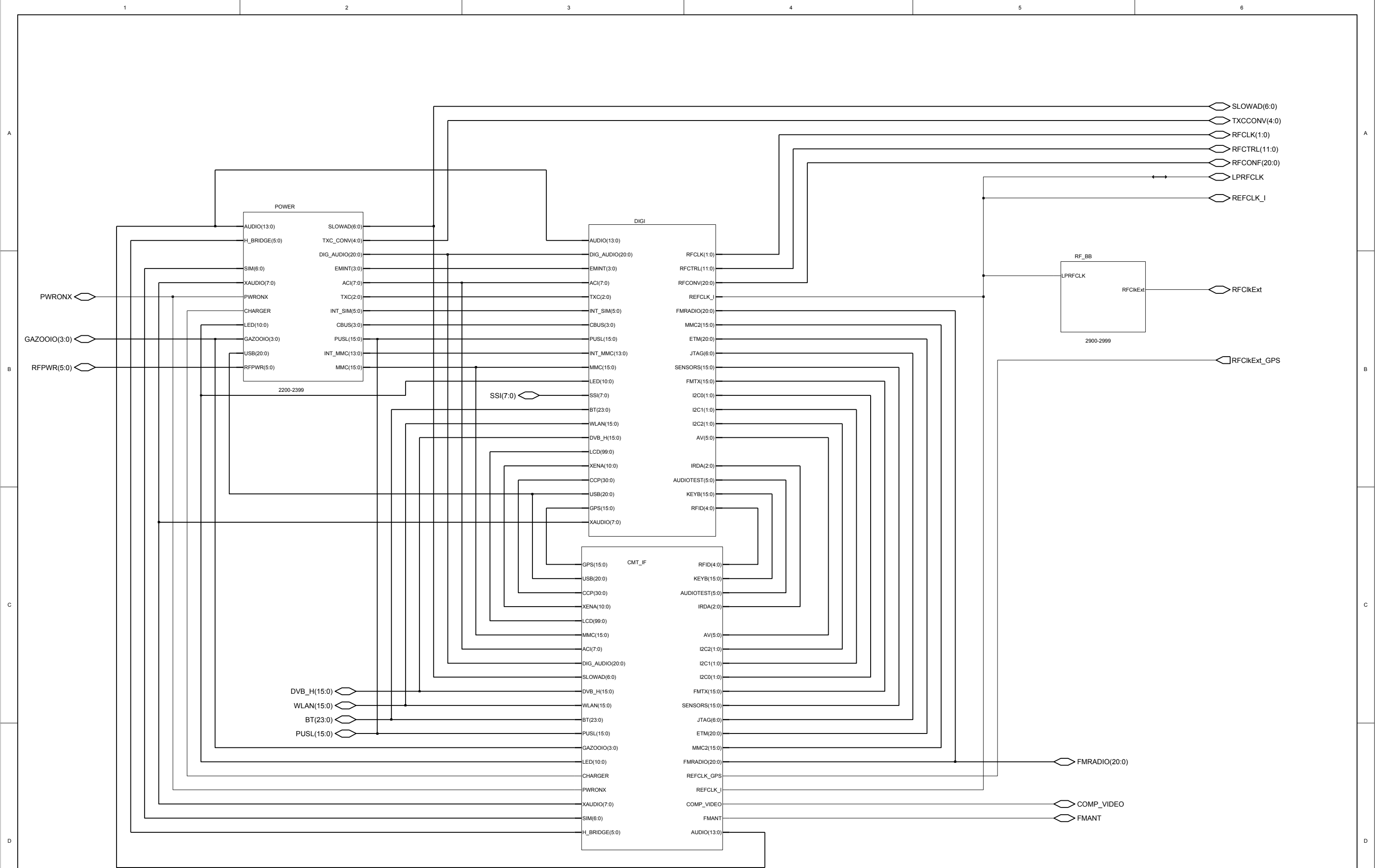
| | | | |
|------|--------------|------|--|
| Name | GPS COST 4.0 | Appr | |
|------|--------------|------|--|



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Name CMT ENGINE Appr



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Name BB TOP LEVEL Appr

1

2

3

4

5

6

A

A

B

B

C

C

D

D

CBB5X

TOP SHEET

LPRFCLK



RFClkExt

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Name RF_BB

Appr

1

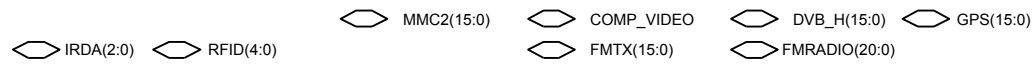
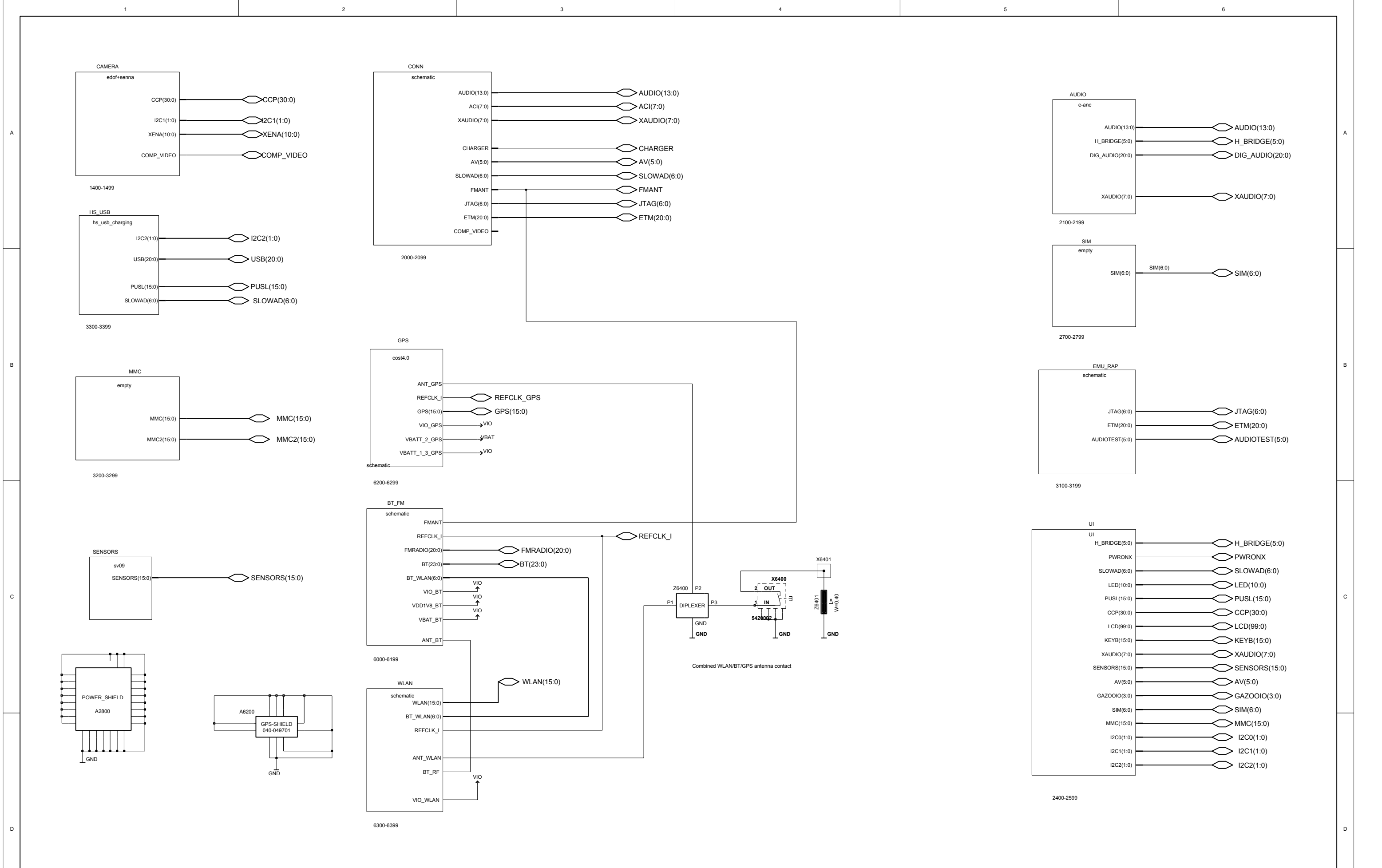
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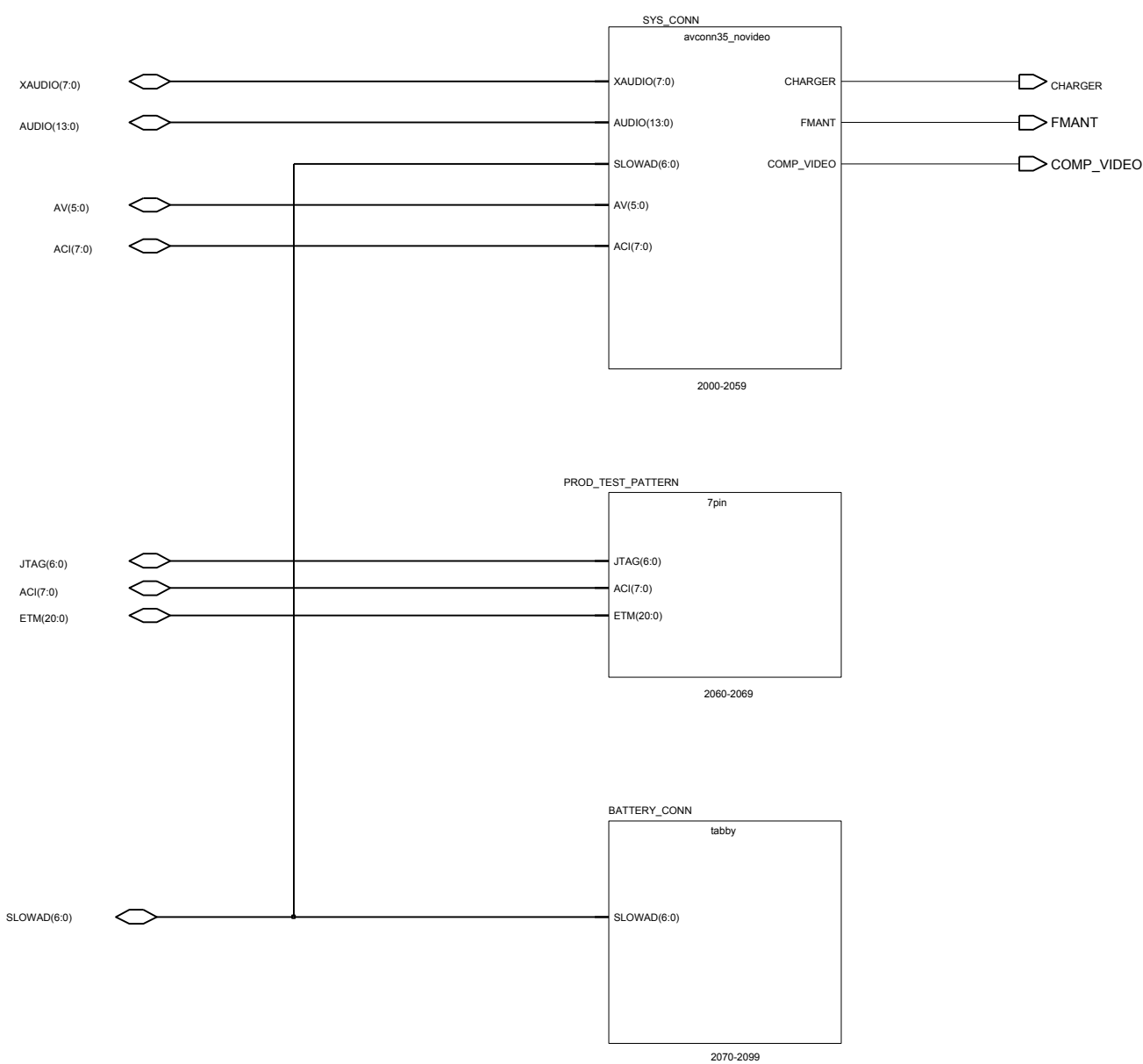
3

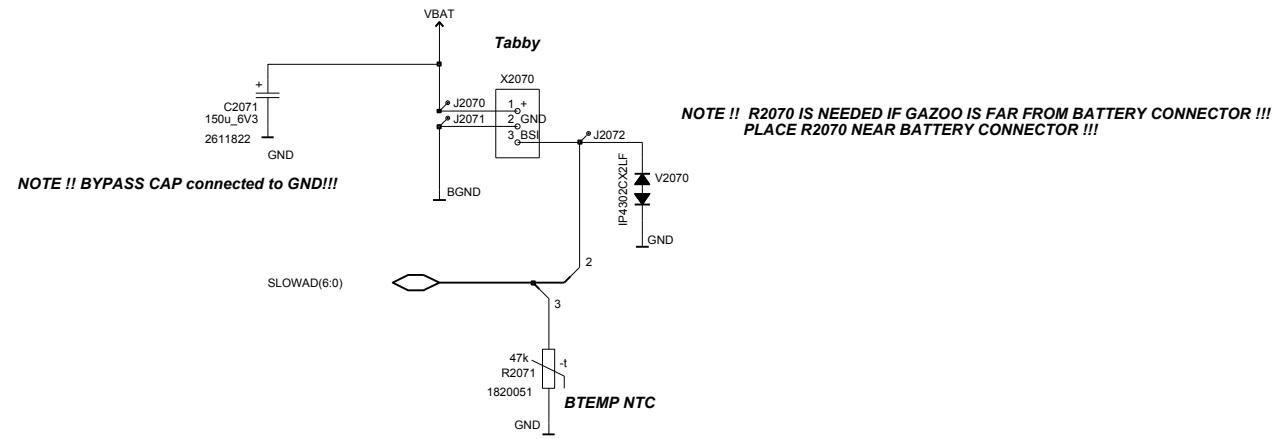
4

5

6



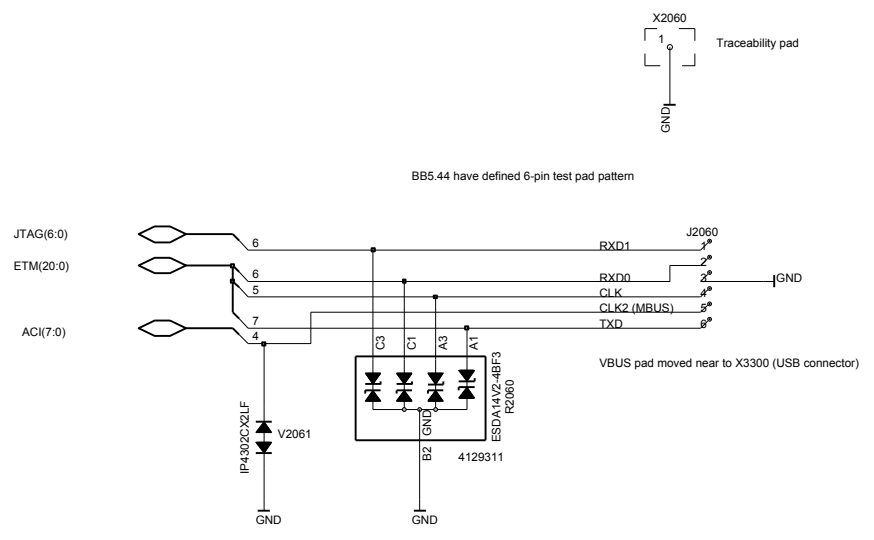




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Name Battery Connector Appr

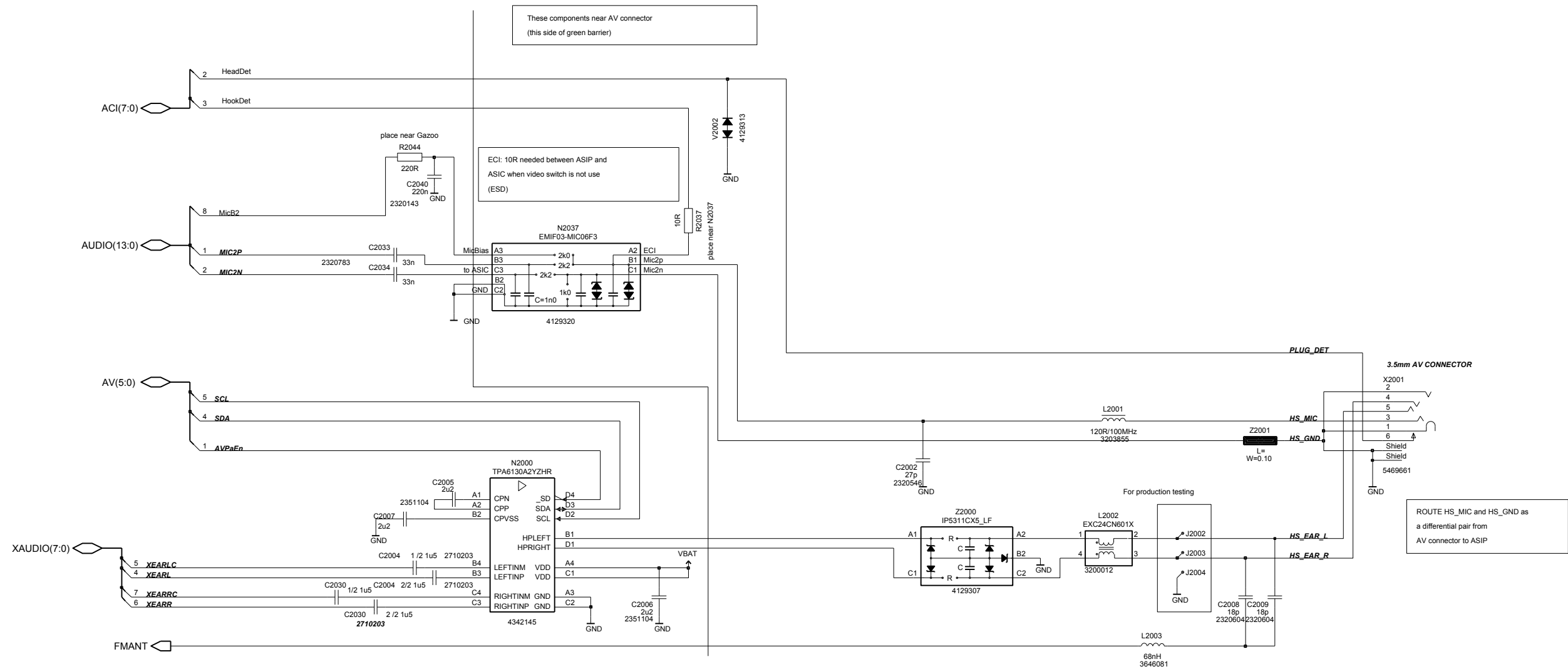


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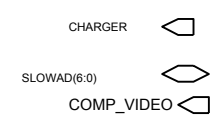
Name Production test pad Appr

USB charging only

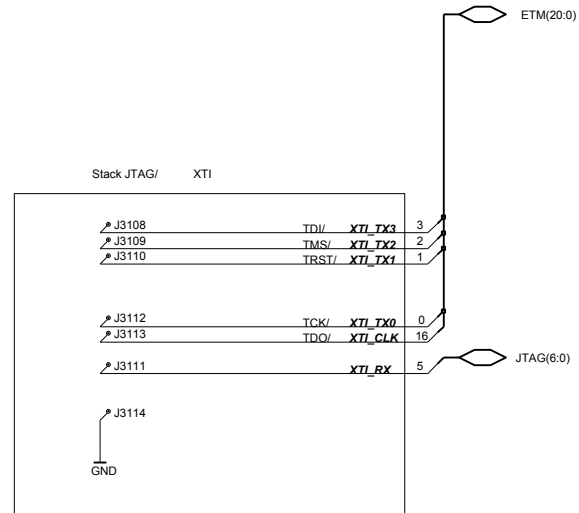
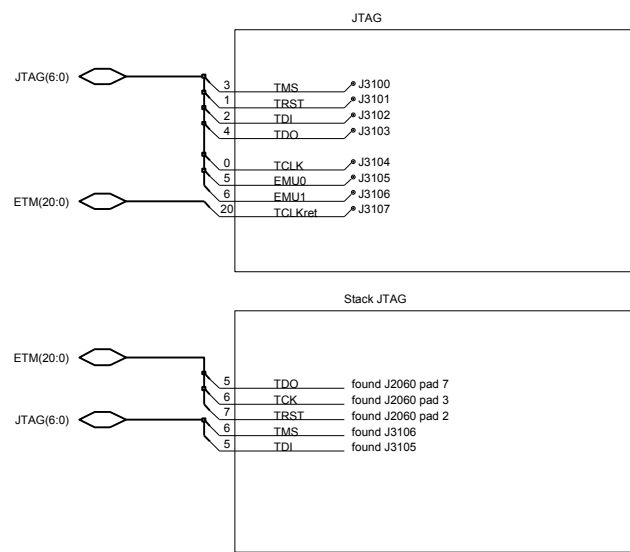


A
B
C
D

A
B
C
D



| | | | |
|--|--|--------------------------|-------------|
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|--|--|--------------------------|-------------|



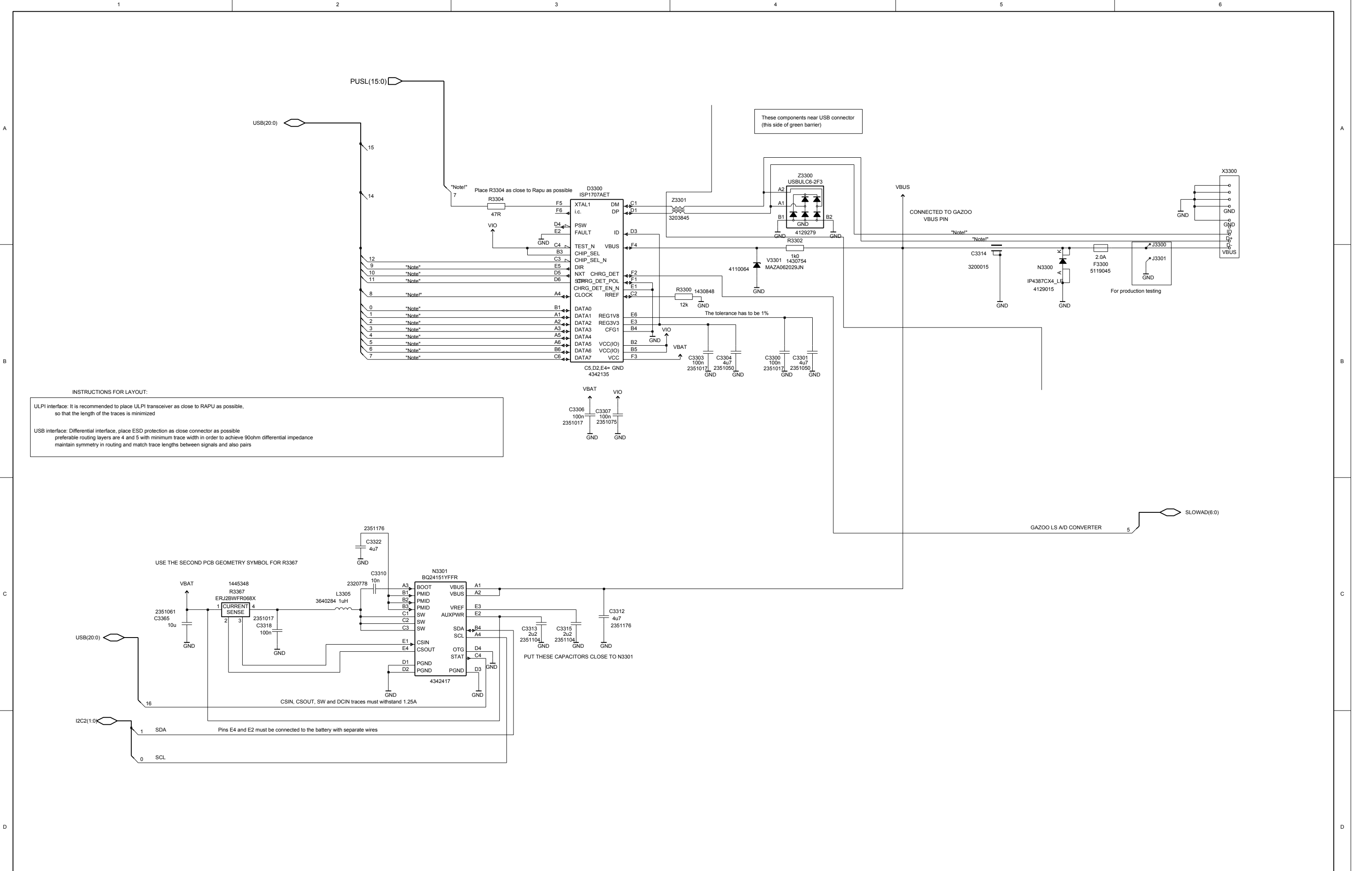
AUDIOTEST(5:0)

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Name Test Interface

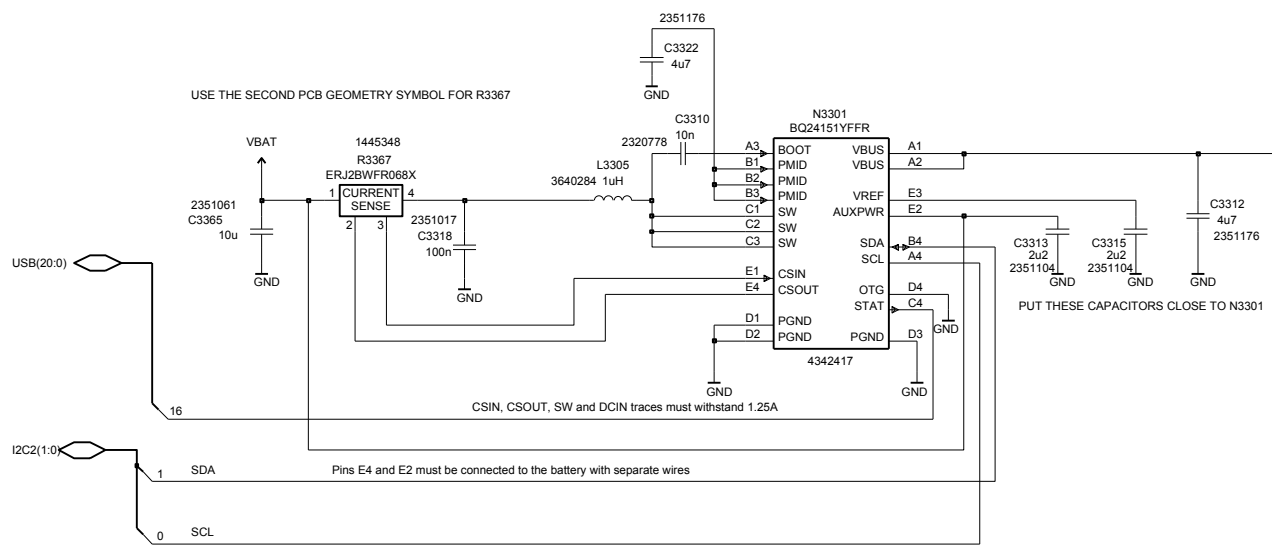
Appr

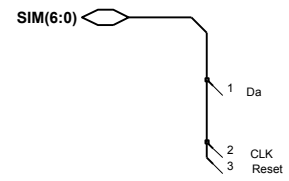


INSTRUCTIONS FOR LAYOUT:

ULPI interface: It is recommended to place ULPI transceiver as close to RAPU as possible, so that the length of the traces is minimized

USB interface: Differential interface, place ESD protection as close connector as possible preferable routing layers are 4 and 5 with minimum trace width in order to achieve 90ohm differential impedance maintain symmetry in routing and match trace lengths between signals and also pairs



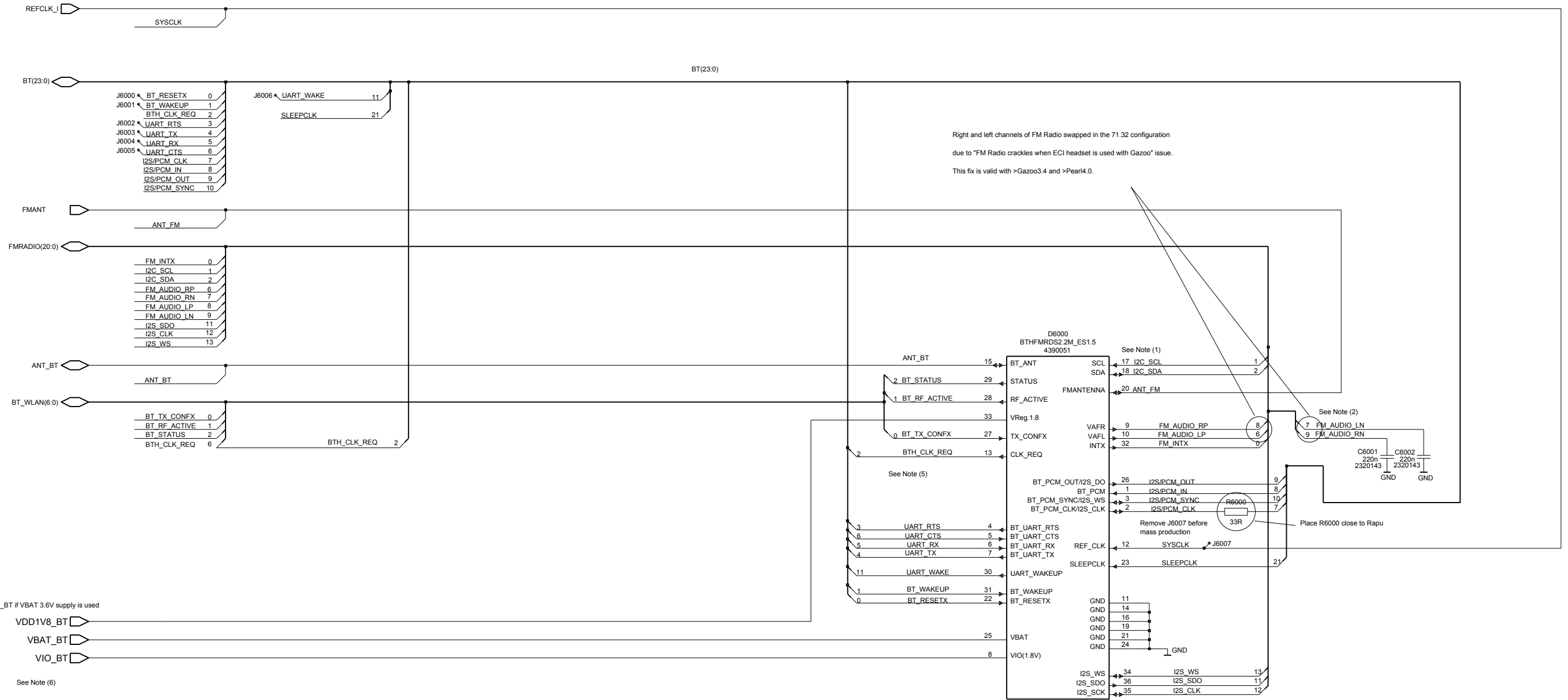


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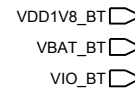


| | | |
|------|---------------|------|
| Name | SIM interface | Appr |
|------|---------------|------|

BLUETOOTH & FM RADIO MODULE WITHOUT RF FILTER



Do not connect VDD1V8_BT if VBAT 3.6V supply is used

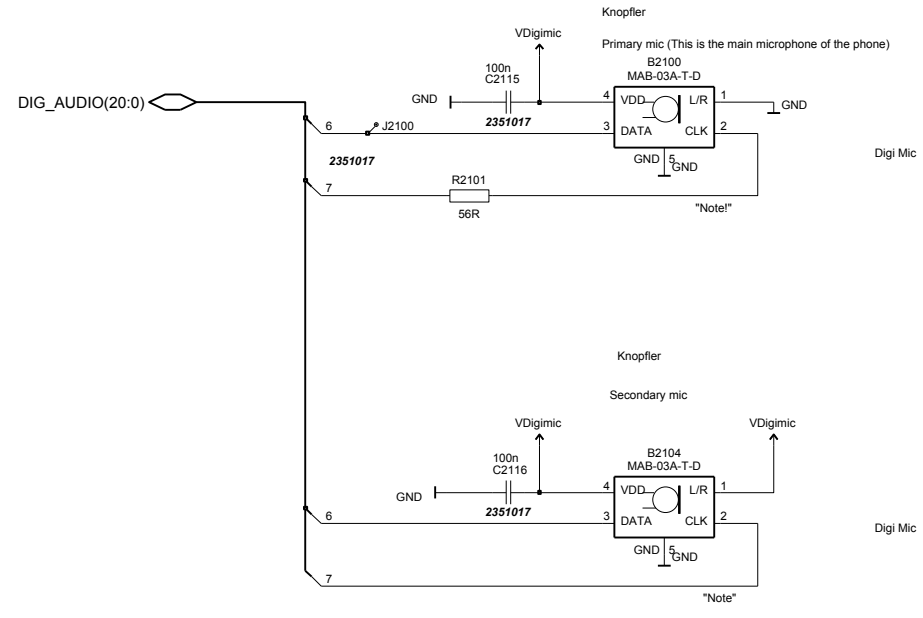


See Note (6)

- Notes
- (1) 3k3 Pull-up Resistors are required on I2C_SCL, I2C_SDA.
 - (2) C6001 and C6002 should be placed in the Bluetooth area, so that the differential audio lines to Retu ASIC are equal length.
 - (3) D6000 BTHFMRDS2.1M_WLAN module includes an internal dc blocking capacitor between BT_ANT (pin 15) and ASIC BT_ANT RF terminal.
 - (4) Additional components for phone wing boards are given in BTHFMRDS2.1_TEST release
 - (5) Pull-down is required on BTH_CLK_REQ signal (see release note)
 - (6) For 3.6V supply voltage connect VBAT_BT input to VBAT 3.6V supply, VDD1V8_BT input must be Not Connected
- For 1.8V supply voltage connect VDD1V8_BT and VBAT_BT inputs to 1.8V supply

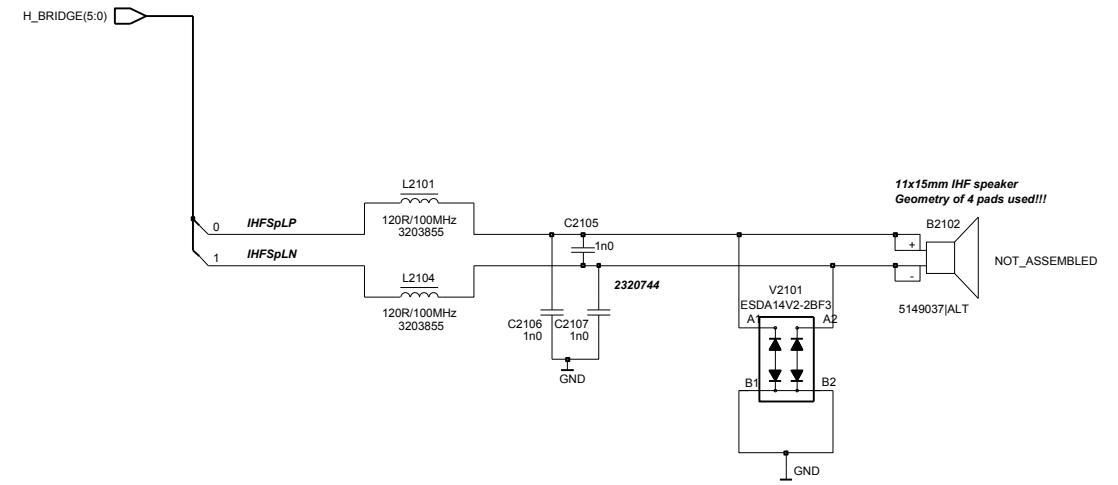
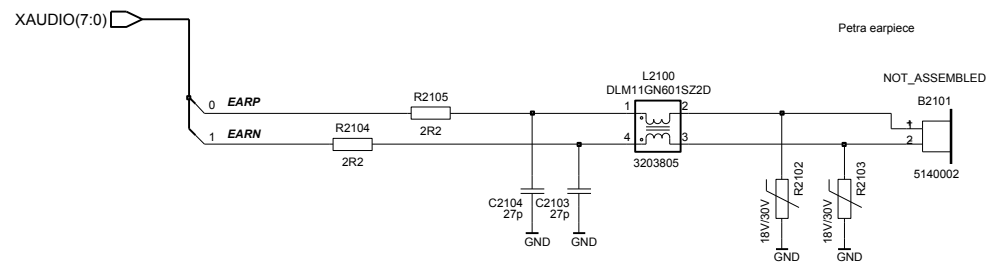
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|--|--|----------------------------|-------------|

2-mic noise cancellation (uplink)



INSTRUCTIONS FOR LAYOUT:

AudioCik/DigiMicCik: Shield AudioCik trace from every direction in order to avoid crosstalk injected to it.
 If AudioCik is shared from RAPU to both Gazoo and DigiMic then it is recommended to put termination resistors in the beginning of both traces (Values have to be defined case by case with simulations)



AUDIO(13:0)

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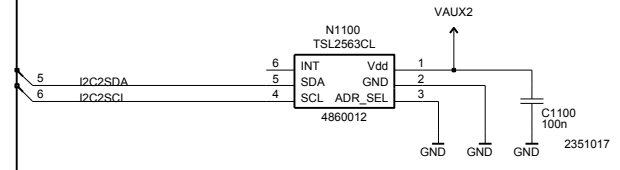


Name AUDIO

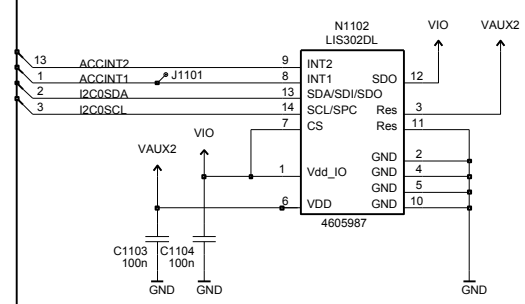
Appr

SENSORS(15:0)

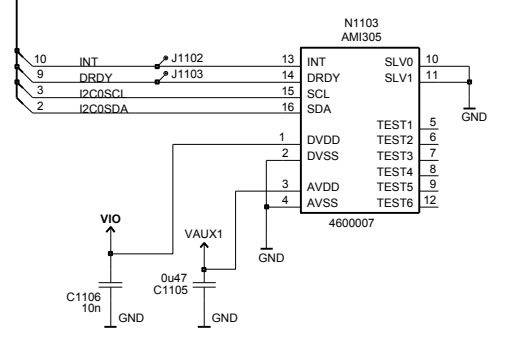
Digital Ambient Light Sensor AGUMON




Accelerometer

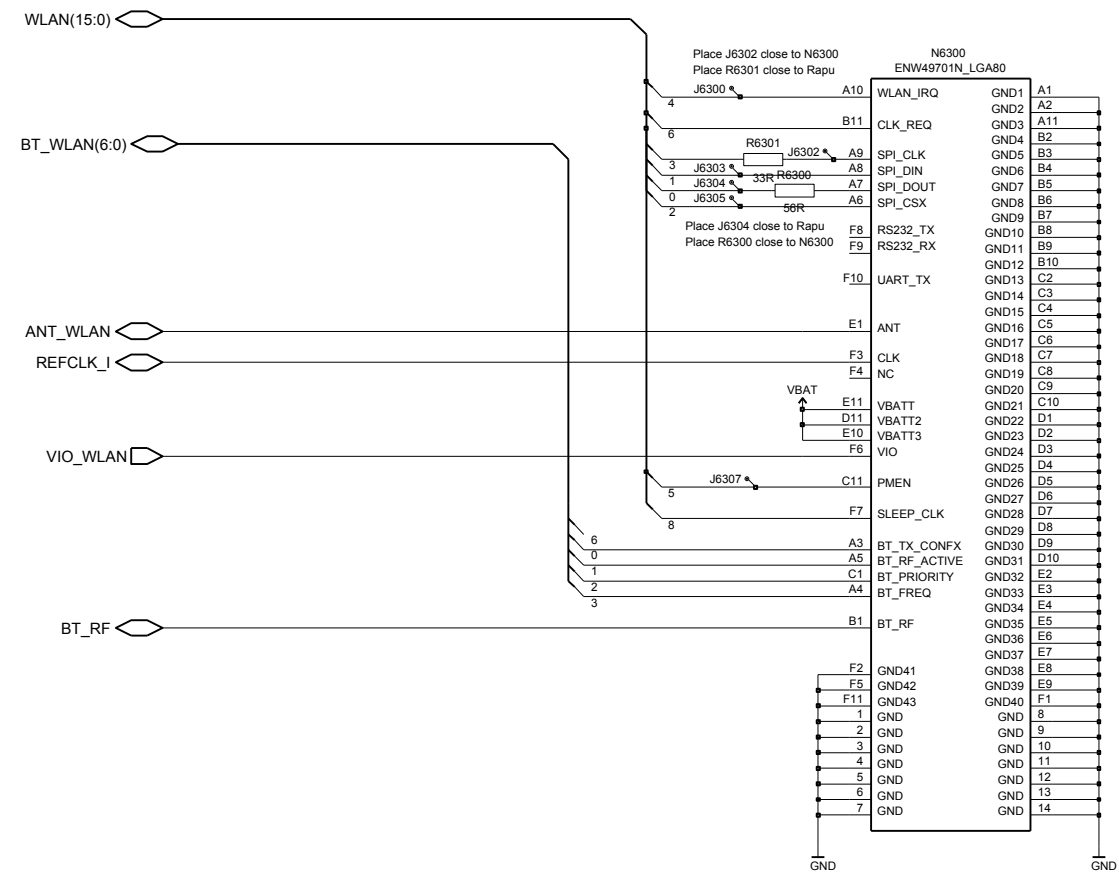


Entry 3D Magnetometer



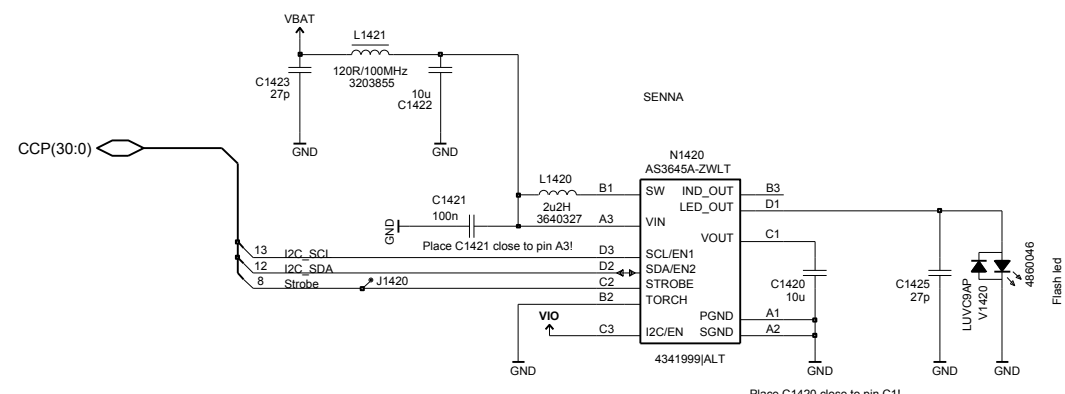
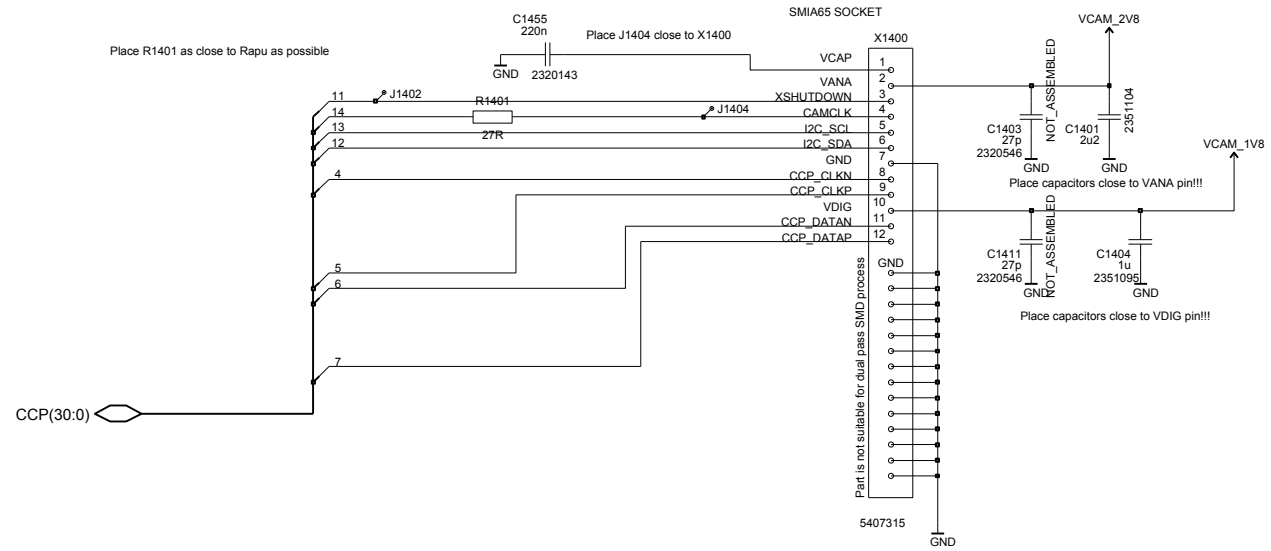
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|--|---|---------------------------|--------------|

WLAN SIZE 4.0



NOTE:- ALL TEST POINTS ARE OPTIONAL
HOWEVER THE FOLLOWING ARE
RECOMMENDED FOR CUSTOMER CARE.
J6301, J6302, J6306 & J6307

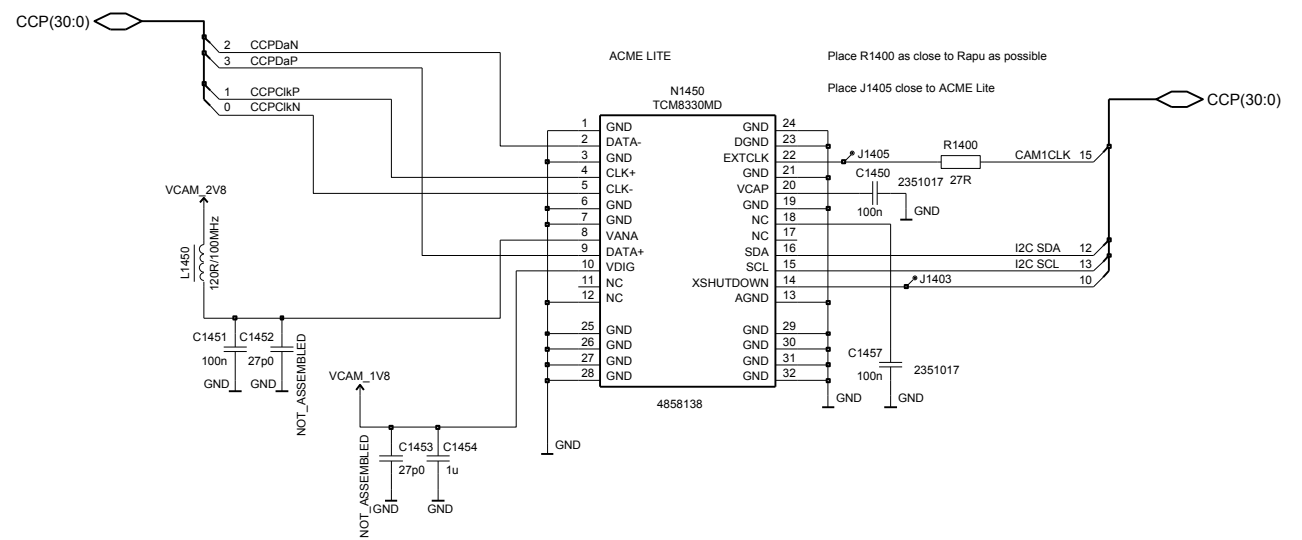
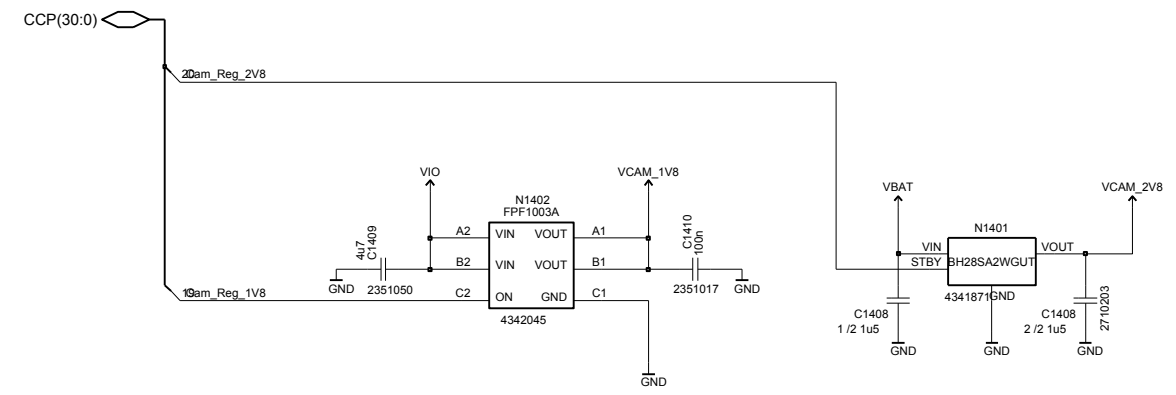
3.2MPiX SMI A65 CAMERA (EDOF) + SENNA + POLARIS 2 FLASH



4341999 is a Master code of the Senna
The GND of the components C1420, C1421, C1422 and N1420 need to be connected together

INSTRUCTIONS FOR LAYOUT:

CCP interfaces: Differential interface, termination resistors as close to RAPU as possible without any stubs, preferable routing layers are 4 and 5 with minimum trace width in order to achieve 100ohm differential impedance maintain symmetry in routing and match trace lengths between signals and also pairs
Cam Clks: Shield Cam Clk traces from every direction in order to avoid crosstalk problems

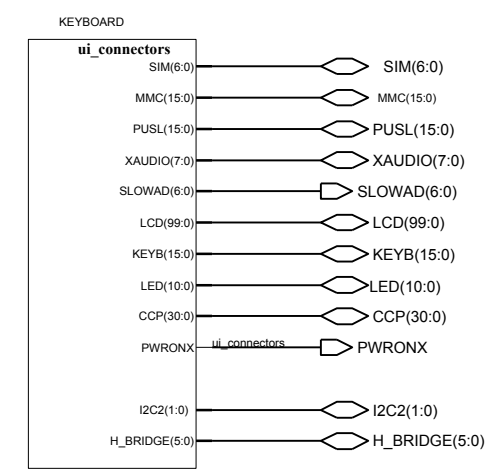
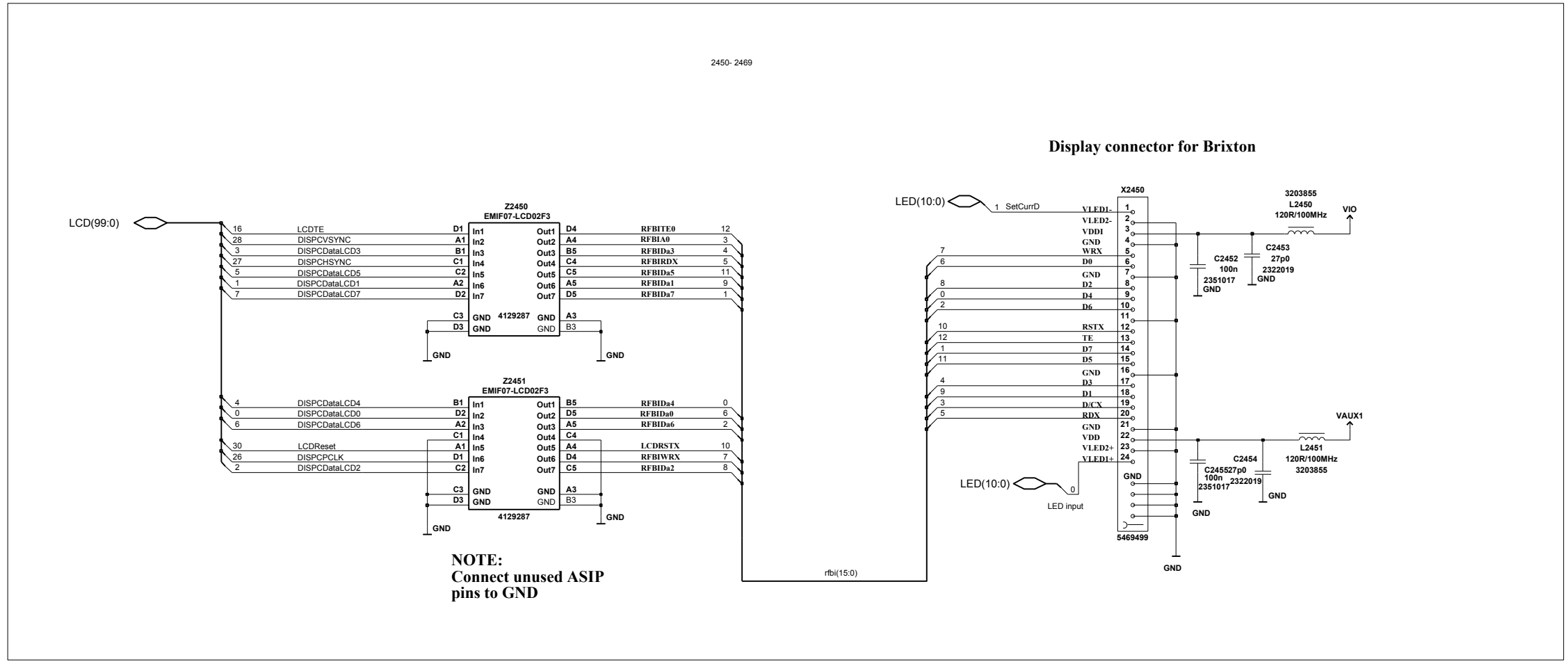


- ⊖ CCP(30:0)
- ⊖ XENA(10:0)
- ⊖ COMP_VIDEO
- ⊖ I2C1(1:0)

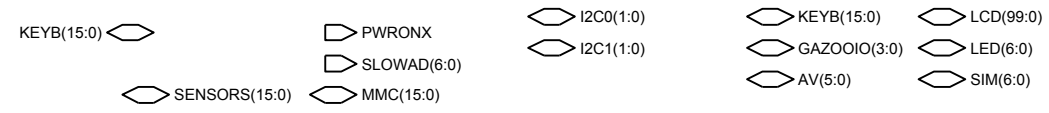
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Name CAMERA HW71 RAPU1.1 Appr



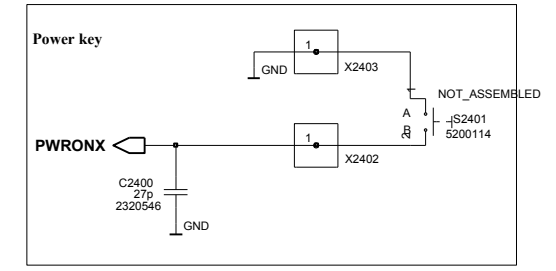
2400- 2449



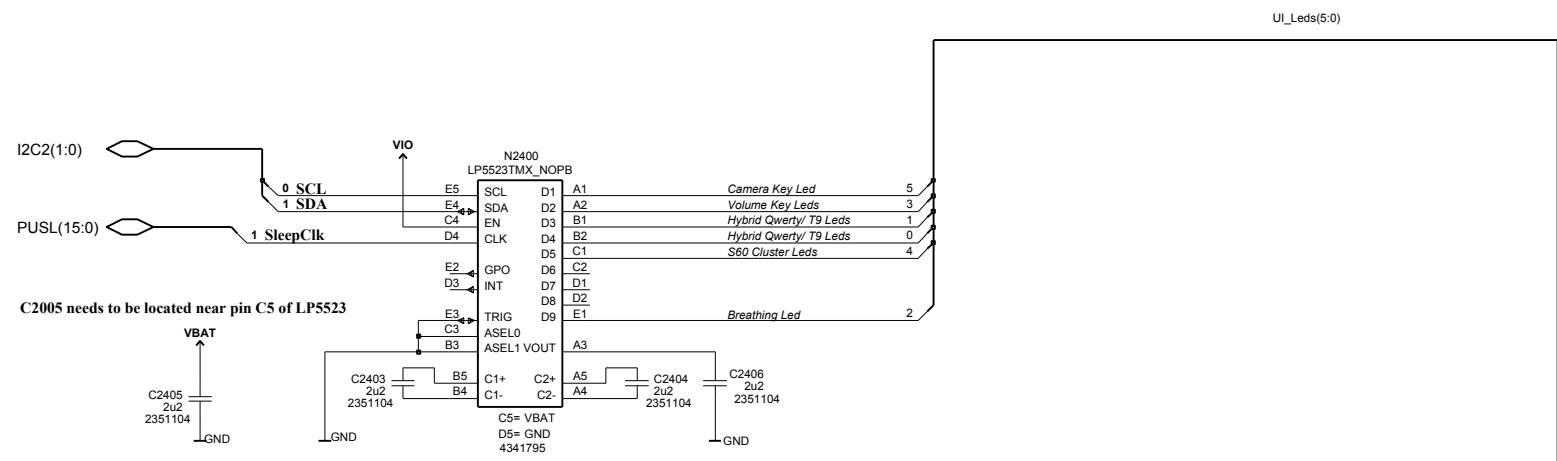
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Name UI Appr

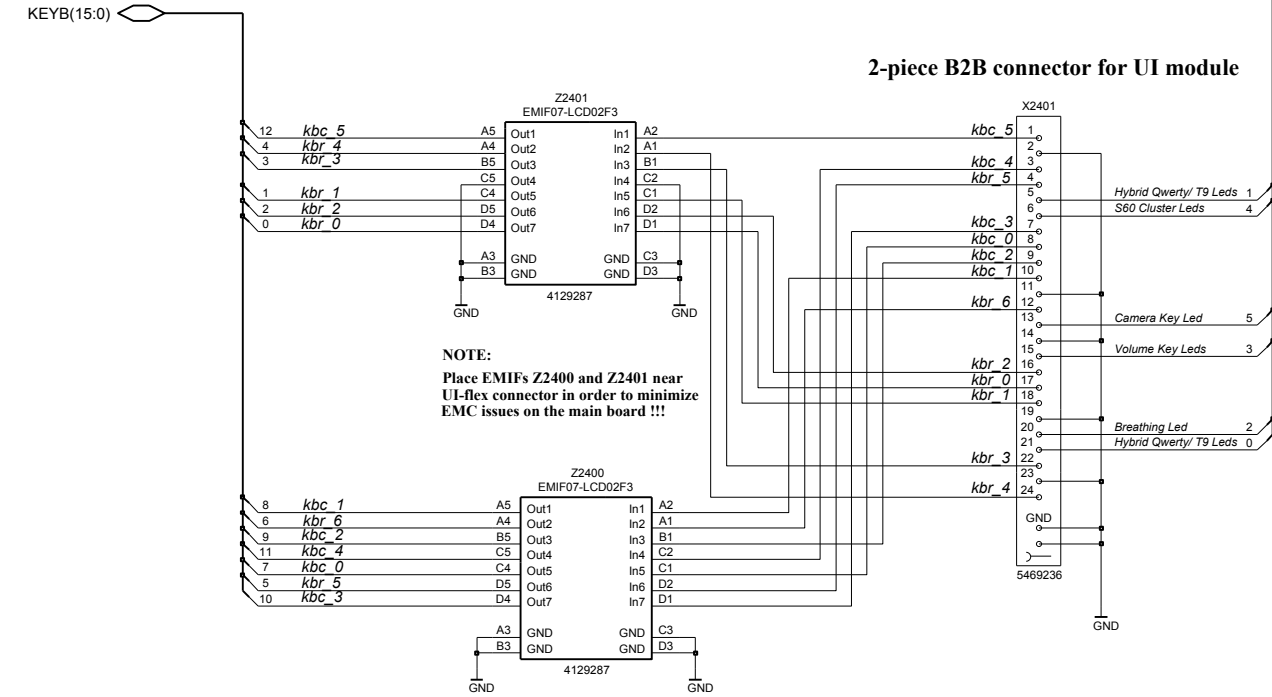


ESD CRITICAL LINES!



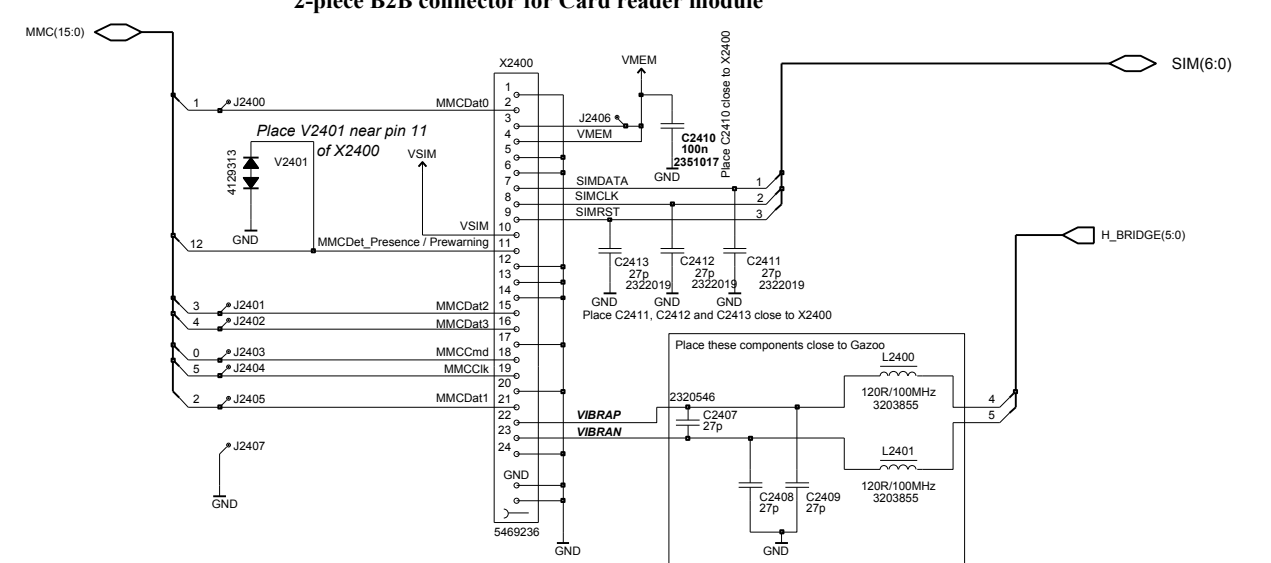
C2005 needs to be located near pin C5 of LP5523

2-piece B2B connector for UI module



NOTE:
Place EMIFs Z2400 and Z2401 near UI-flex connector in order to minimize EMC issues on the main board !!!

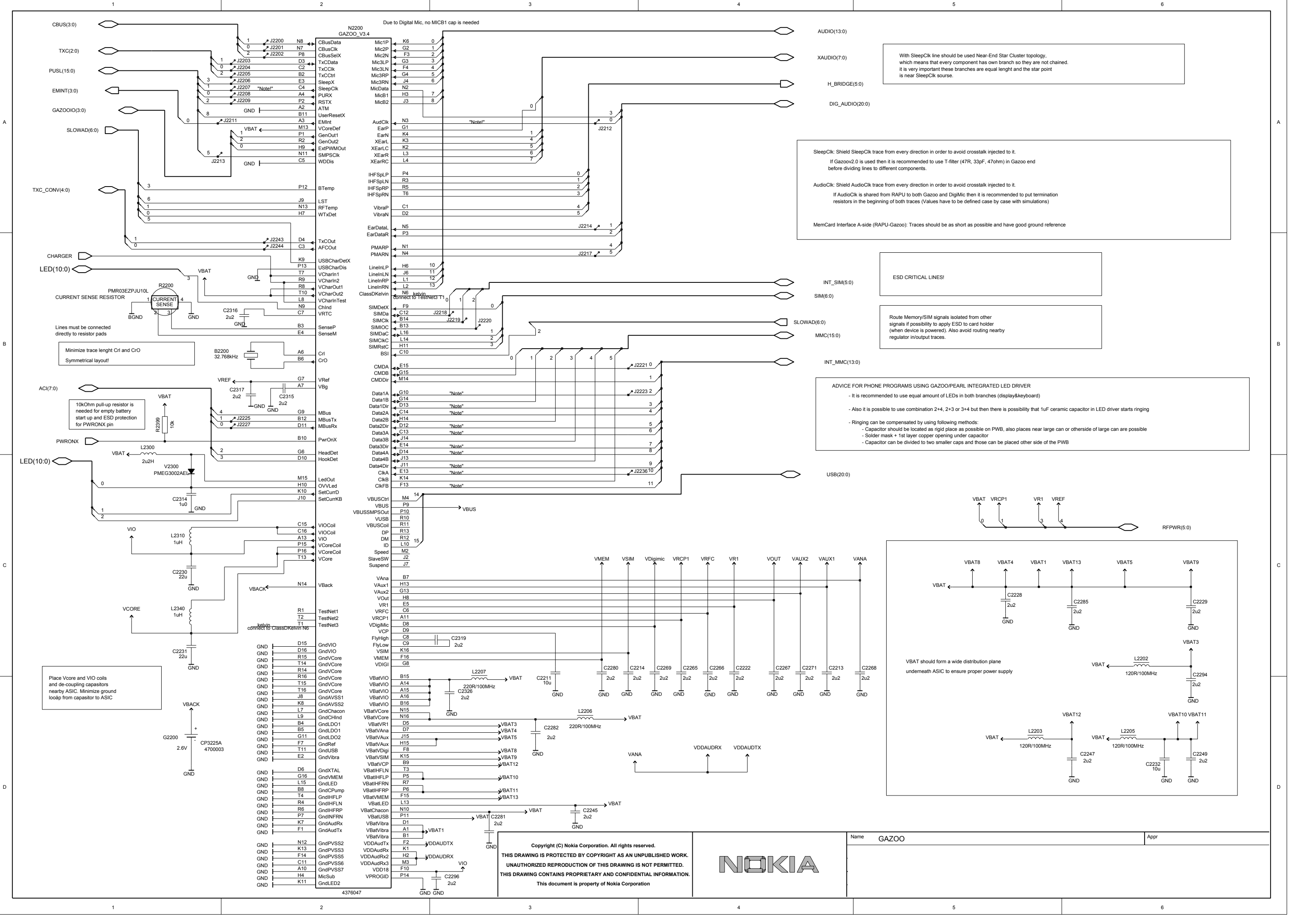
2-piece B2B connector for Card reader module



Test points J2400 - J2407 for production testing purposes

- SLOWAD(6:0)
- LED(10:0)
- CCP(30:0)
- LED(10:0)
- LCD(99:0)
- XAUDIO(7:0)

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|--|--|---|



With SleepClk line should be used Near-End Star Cluster topology, which means that every component has own branch so they are not chained. It is very important these branches are equal length and the star point is near SleepClk source.

SleepClk: Shield SleepClk trace from every direction in order to avoid crosstalk injected to it. If GazooV2.0 is used then it is recommended to use T-filter (47R, 33pF, 47ohm) in Gazoo end before dividing lines to different components.

AudioClk: Shield AudioClk trace from every direction in order to avoid crosstalk injected to it. If AudioClk is shared from RPU to both Gazoo and DigMic then it is recommended to put termination resistors in the beginning of both traces (Values have to be defined case by case with simulations)

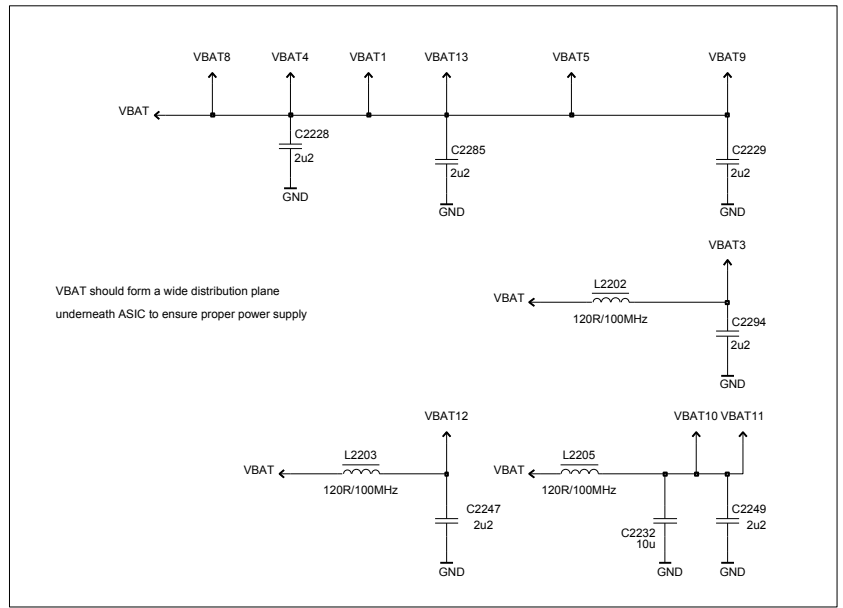
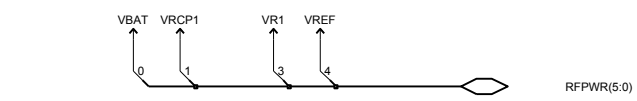
MemCard Interface A-side (RPU-Gazoo): Traces should be as short as possible and have good ground reference

ESD CRITICAL LINES!

Route Memory/SIM signals isolated from other signals if possible to apply ESD to card holder (when device is powered). Also avoid routing nearby regulator in/output traces.

ADVICE FOR PHONE PROGRAMS USING GAZOO/PEARL INTEGRATED LED DRIVER

- It is recommended to use equal amount of LEDs in both branches (display&keyboard)
- Also it is possible to use combination 2+4, 2+3 or 3+4 but then there is possibility that 1uF ceramic capacitor in LED driver starts ringing
- Ringing can be compensated by using following methods:
 - Capacitor should be located as rigid place as possible on PWB, also places near large can or outside of large can are possible
 - Solder mask + 1st layer copper opening under capacitor
 - Capacitor can be divided to two smaller caps and those can be placed other side of the PWB

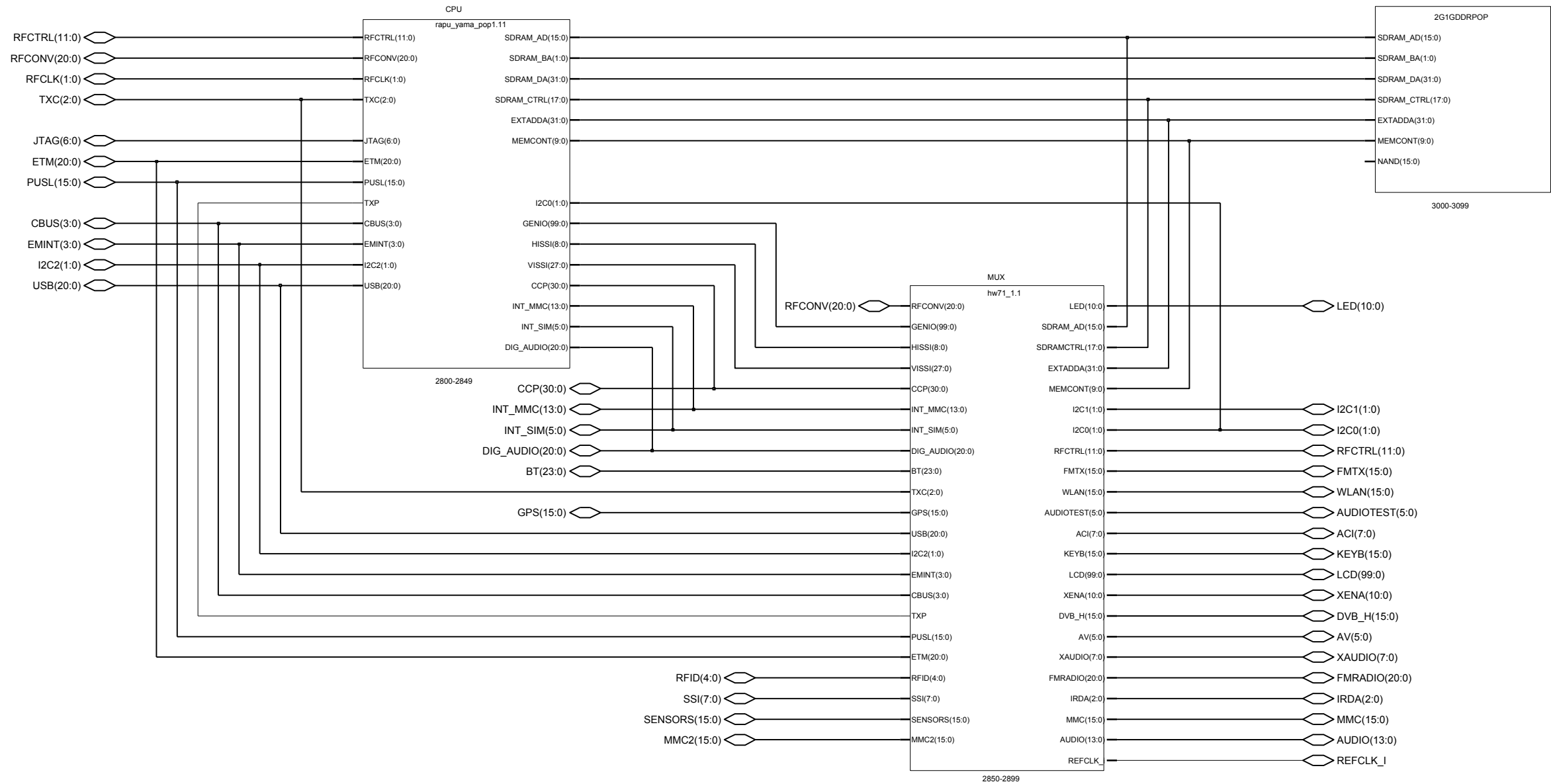


Place Vcore and VIO coils and de-coupling capacitors nearby ASIC. Minimize ground loop from capacitor to ASIC

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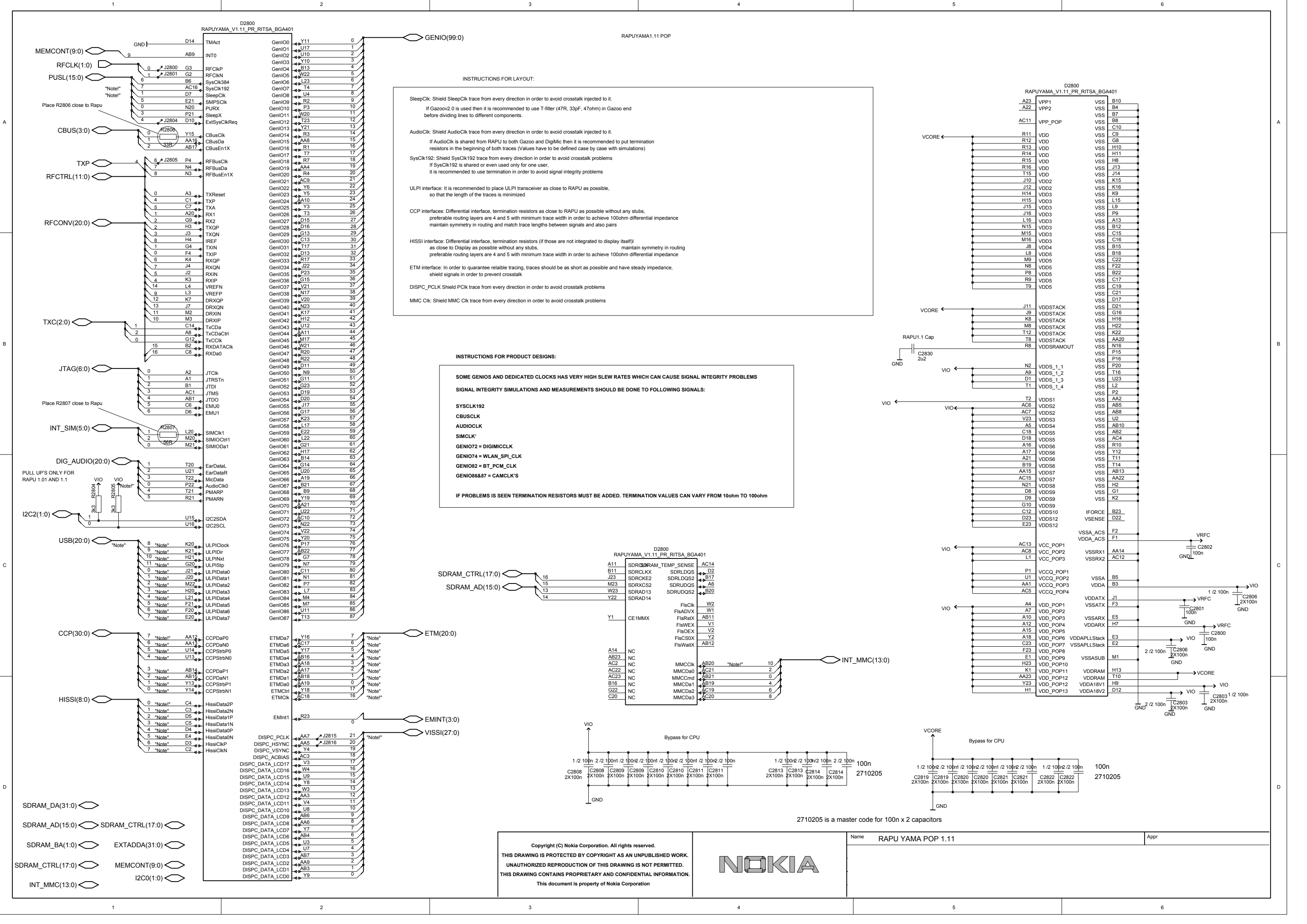
Name: GAZOO Appr: _____



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| | | |
|------|------|------|
| Name | DIGI | Appr |
|------|------|------|



INSTRUCTIONS FOR LAYOUT:

SleepCk: Shield SleepCk trace from every direction in order to avoid crosstalk injected to it.
If GazooV2.0 is used then it is recommended to use T-filter (47R, 33pF, 47ohm) in Gazoo end before dividing lines to different components.

AudioCk: Shield AudioCk trace from every direction in order to avoid crosstalk injected to it.
If AudioCk is shared from RAPU to both Gazoo and DigIMic then it is recommended to put termination resistors in the beginning of both traces (Values have to be defined case by case with simulations)

SysCk192: Shield SysCk192 trace from every direction in order to avoid crosstalk problems.
If SysCk192 is shared or even used only for one user, it is recommended to use termination in order to avoid signal integrity problems

ULPI interface: It is recommended to place ULPI transceiver as close to RAPU as possible, so that the length of the traces is minimized

CCP interfaces: Differential interface, termination resistors as close to RAPU as possible without any stubs, preferable routing layers are 4 and 5 with minimum trace width in order to achieve 100ohm differential impedance maintain symmetry in routing and match trace lengths between signals and also pairs

HSSI interface: Differential interface, termination resistors (if those are not integrated to display itself) as close to Display as possible without any stubs, maintain symmetry in routing preferable routing layers are 4 and 5 with minimum trace width in order to achieve 100ohm differential impedance

ETM interface: In order to guarantee reliable tracing, traces should be as short as possible and have steady impedance, shield signals in order to prevent crosstalk

DISPC_PCLK Shield Pclk trace from every direction in order to avoid crosstalk problems

MMC Ck: Shield MMC Ck trace from every direction in order to avoid crosstalk problems

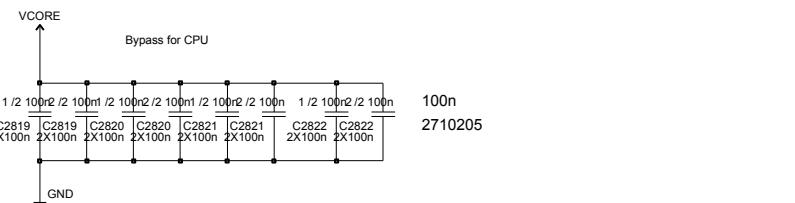
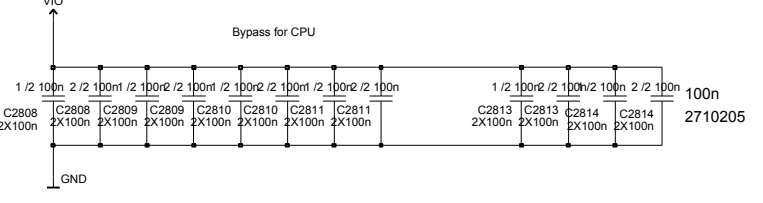
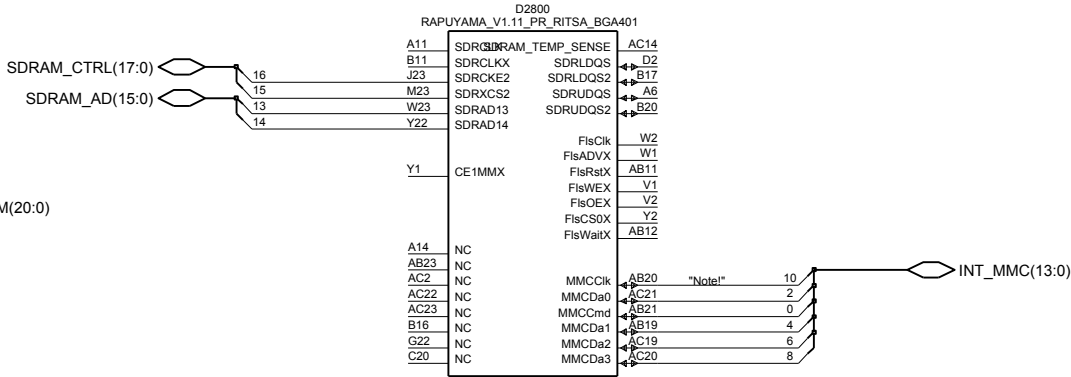
INSTRUCTIONS FOR PRODUCT DESIGNS:

SOME GENIOS AND DEDICATED CLOCKS HAS VERY HIGH SLEW RATES WHICH CAN CAUSE SIGNAL INTEGRITY PROBLEMS

SIGNAL INTEGRITY SIMULATIONS AND MEASUREMENTS SHOULD BE DONE TO FOLLOWING SIGNALS:

- SYSClk192**
- CBUSCLK**
- AUDIOCLK**
- SIMCLK'**
- GENIO72 = DIGIMICCLK**
- GENIO74 = WLAN_SPI_CLK**
- GENIO82 = BT_PCM_CLK**
- GENIO86&87 = CAMCLK'S**

IF PROBLEMS IS SEEN TERMINATION RESISTORS MUST BE ADDED. TERMINATION VALUES CAN VARY FROM 10ohm TO 100ohm



2710205 is a master code for 100n x 2 capacitors

1

2

3

4

5

6

A

A

B

B
















C

C

D

D

D3000
 K5WZG1GACI-AL60
 A1 COMBO 32Mx32 DDR
 128Mx16 M3
 43470S2|NONET

NAND(15:0) 
 SDRAM_AD(15:0)   SDRAM_AD(15:0)
 SDRAM_CTRL(17:0)   SDRAM_CTRL(17:0)
 SDRAM_DA(31:0)   SDRAM_DA(31:0)
 SDRAM_BA(1:0)   SDRAM_BA(1:0)
 MEMCONT(9:0)   MEMCONT(9:0)
 EXTADDA(31:0)   EXTADDA(31:0)
 NAND(15:0)   NAND(15:0)

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Name MEMORY 2G+1GDDR POP

Appr

1

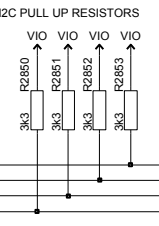
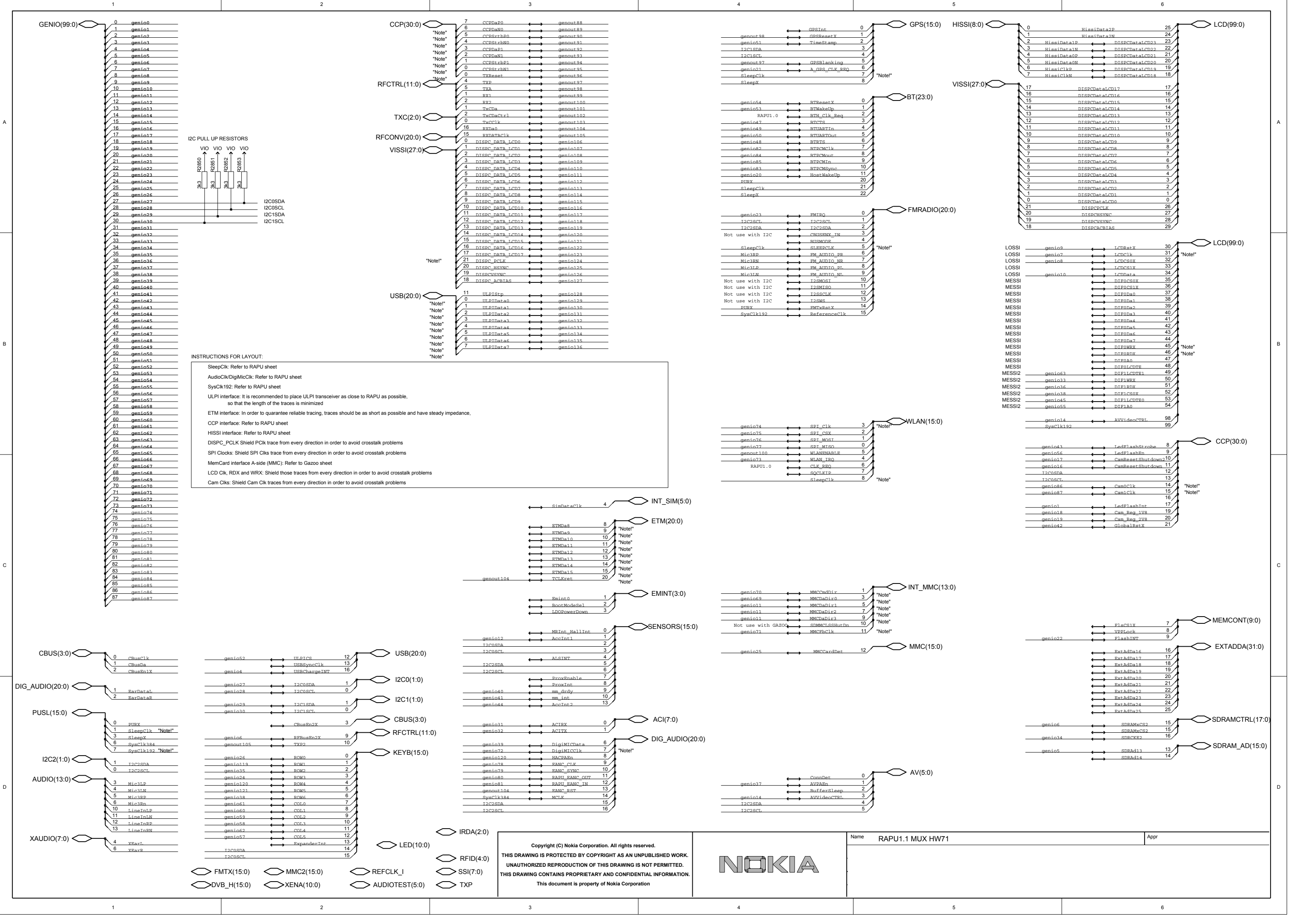
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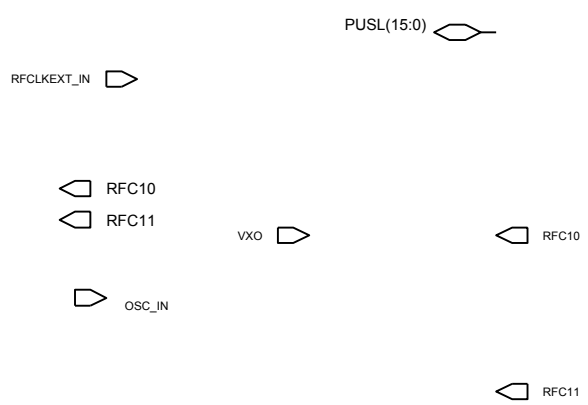
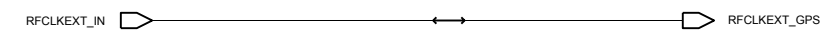
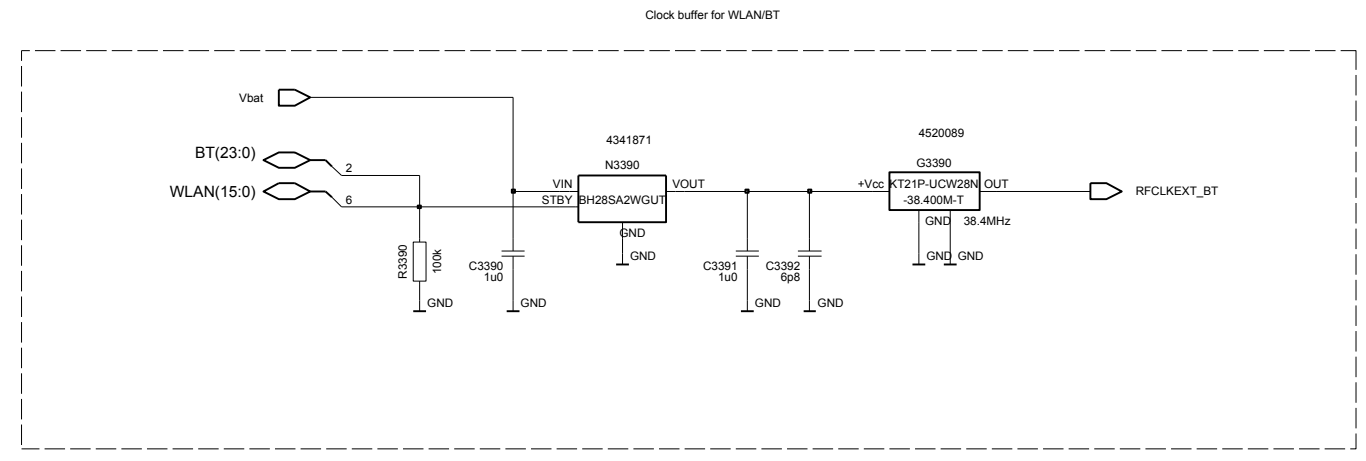
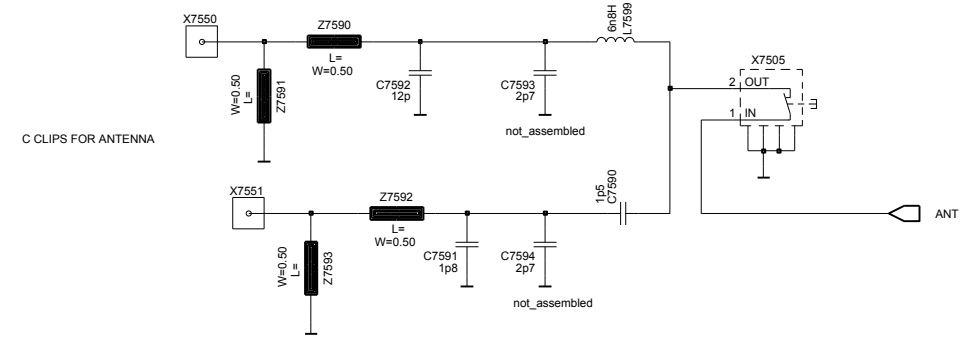
INSTRUCTIONS FOR LAYOUT:

- SleepClk: Refer to RAPU sheet
- AudioClk/DigiMicClk: Refer to RAPU sheet
- SysClk192: Refer to RAPU sheet
- ULPI interface: It is recommended to place ULPI transceiver as close to RAPU as possible, so that the length of the traces is minimized
- ETM interface: In order to guarantee reliable tracing, traces should be as short as possible and have steady impedance.
- CCP interface: Refer to RAPU sheet
- HISSI interface: Refer to RAPU sheet
- DISPC_PCLK Shield PCLK trace from every direction in order to avoid crosstalk problems
- SPI Clocks: Shield SPI Clks trace from every direction in order to avoid crosstalk problems
- MemCard interface A-side (MMC): Refer to Gazoo sheet
- LCD Clk, RDX and WRX: Shield those traces from every direction in order to avoid crosstalk problems
- Cam Clks: Shield Cam Clk traces from every direction in order to avoid crosstalk problems

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Name: RAPU1.1 MUX HW1
 Appr: _____



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