

A

A

B

B

C

C

D

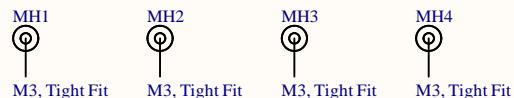
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Changes:

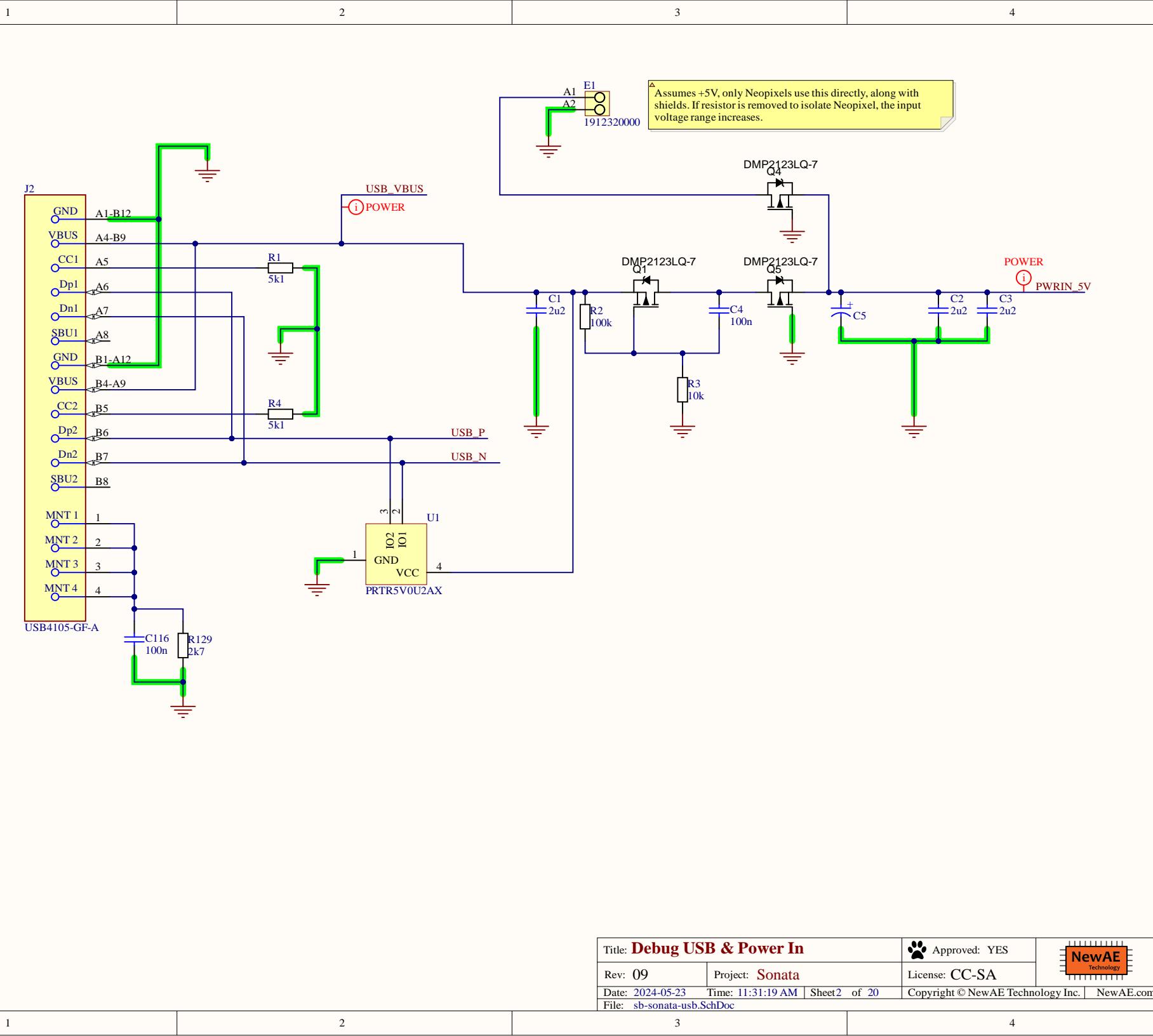
- 05:
* Fix ethernet termination
- 06:
* Add option for RGBLED pull direction
* Add I2C pull-ups on R-Pi Header
- 07:
* Add RGBLED0 driven by RP2040 option
- 08:
* Minor PCB silkscreen changes, production version
- 09:
* PUDC has pull-up resistor
* Input protection is PMOS
* Remove D1/D2

Known Issues:

- * See issues on <https://github.com/newaetech/sonata-pcb> for tracking
- 08:
* RGB leds are always powered on, which can have random or old data loaded.



| | | | |
|---|------------------------|----------------|---|
| Title: Mechanical & Title Page | | Approved: YES |  |
| Rev: 09 | Project: Sonata | License: CC-SA | |
| Date: 2024-05-23 | Time: 11:31:19 AM | Sheet 1 of 20 | Copyright © NewAE Technology Inc. NewAE.com |
| File: sb-sonata-mech.SchDoc | | | |



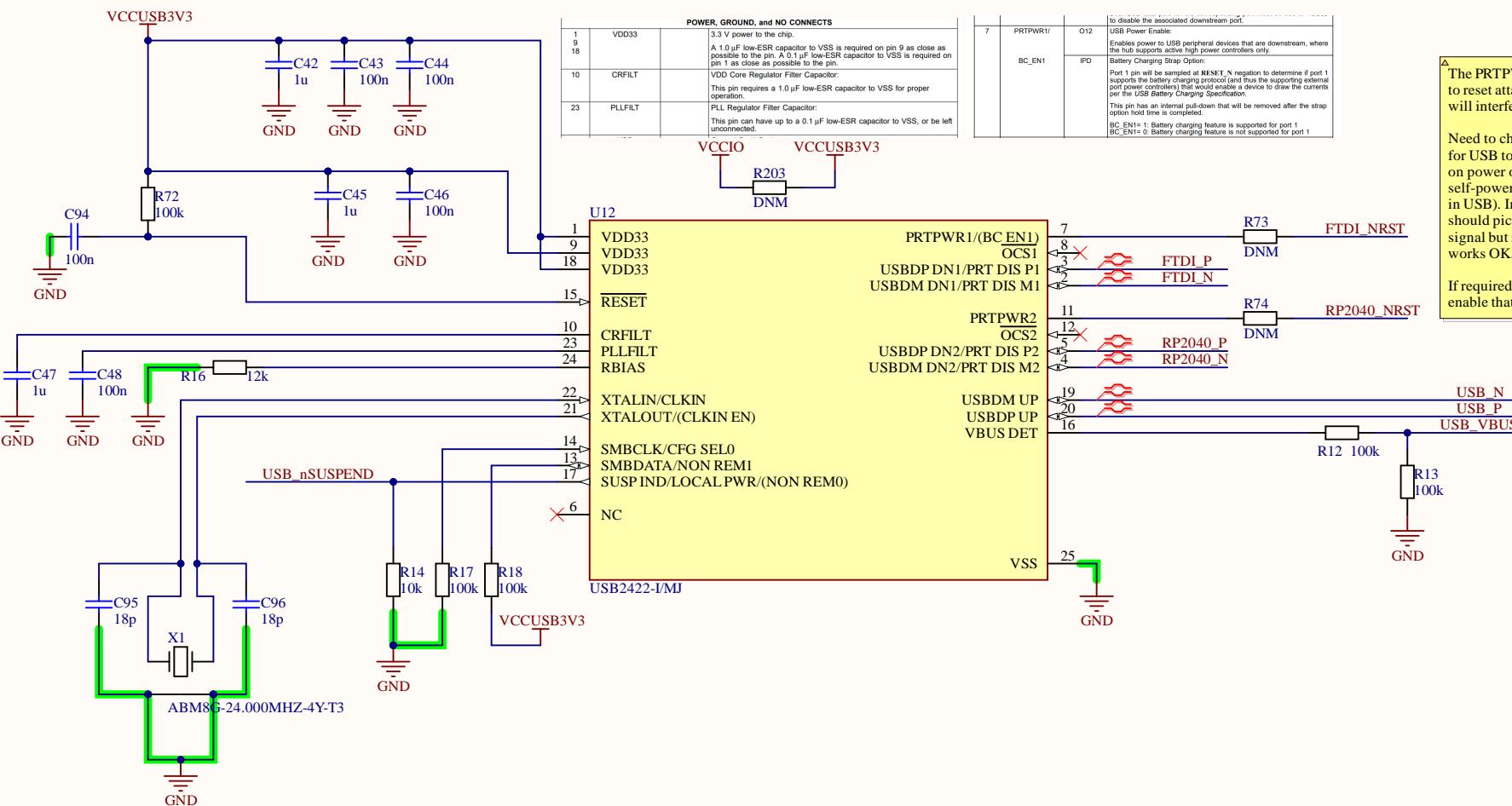


TABLE 4-1: HUB CONFIGURATION OPTIONS

| CFG_SEL | Description |
|---------|--|
| 0 | Default configuration: • Strap options enabled • Hub descriptors indicate the hub as "self-powered" |
| 1 | The hub is configured externally over SMBus (as an SMBus slave device with address 0101100b): • Strap options disabled • Self-powered or bus-powered depending on register settings • All registers configured over SMBus |

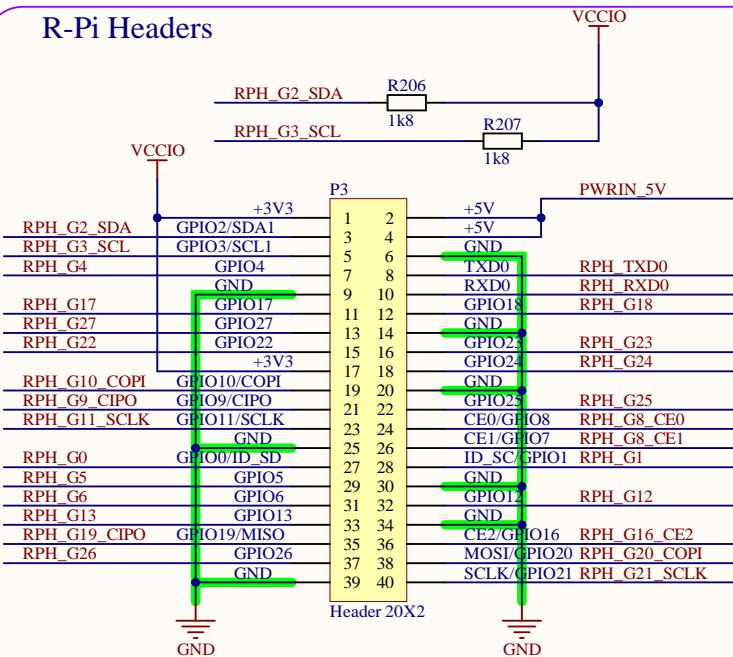
Strap config, non-removable ports.

The PRTPWR pins could be used to reset attached devices. But that will interfere with stand-alone usage.

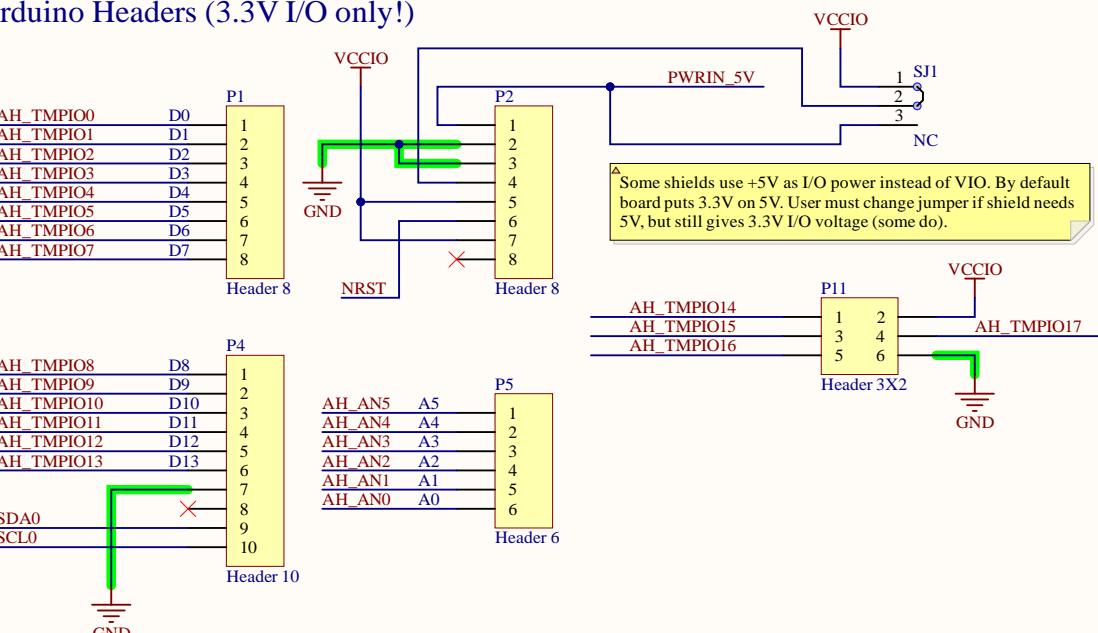
Need to check if reset is required for USB to be picked up depending on power order (e.g. if board is self-powered, then someone plugs in USB). In theory attached devices should pick up the USB suspend signal but something to confirm works OK.

If required the series resistors will enable that for now.

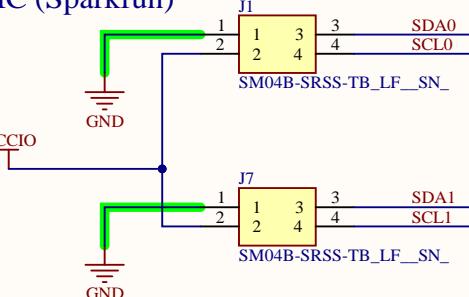
R-Pi Headers



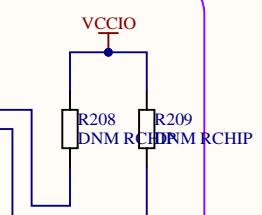
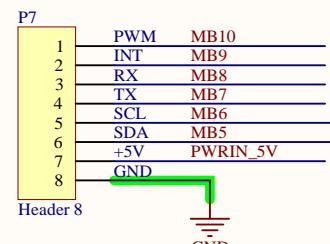
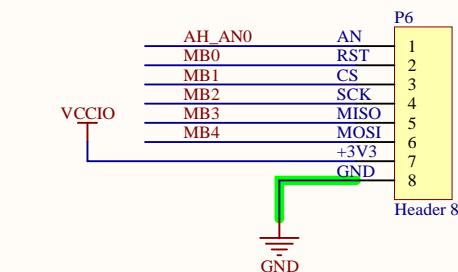
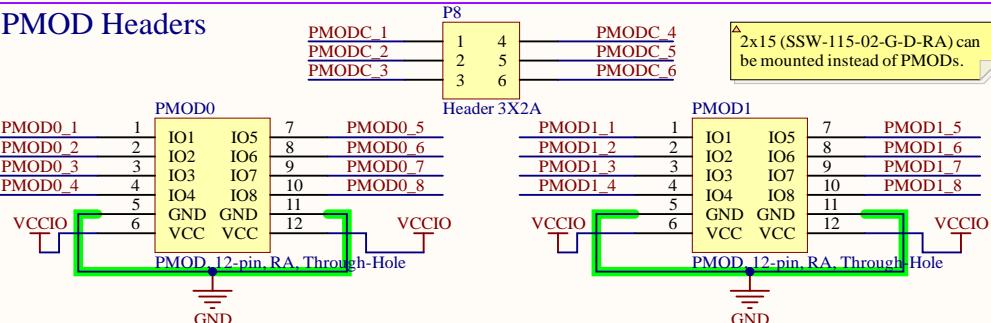
Arduino Headers (3.3V I/O only!)



QWIIC (Sparkfun)

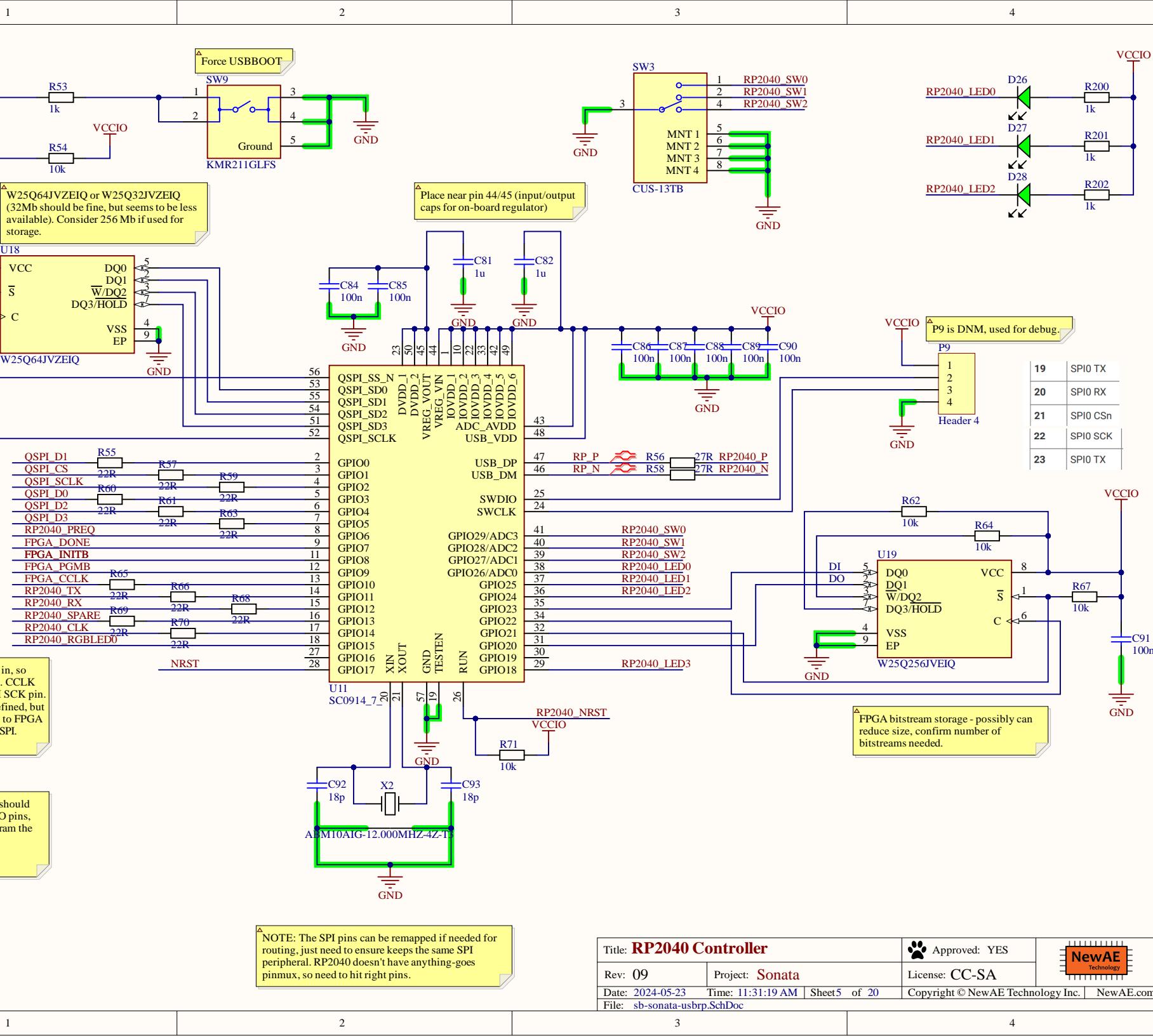


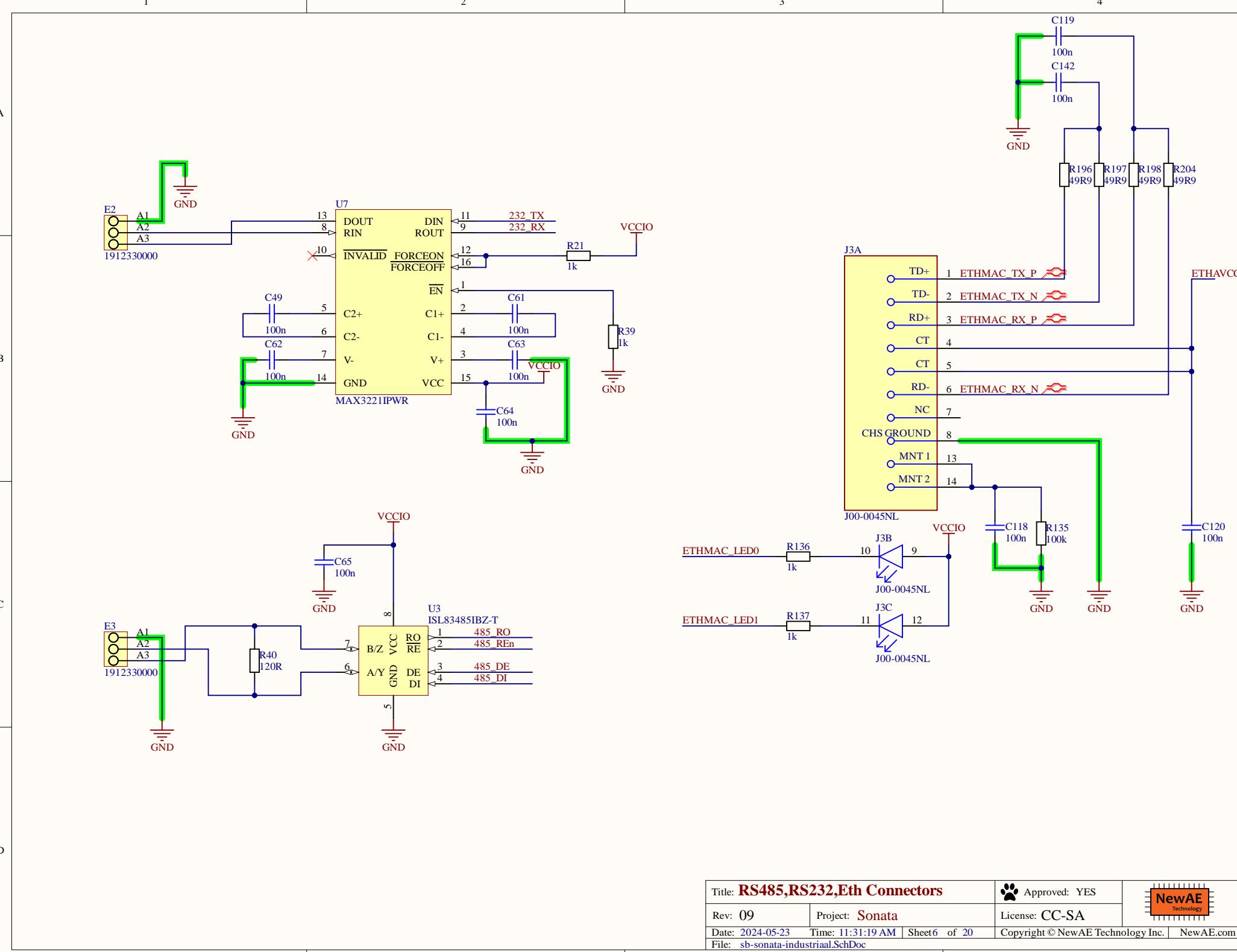
PMOD Headers

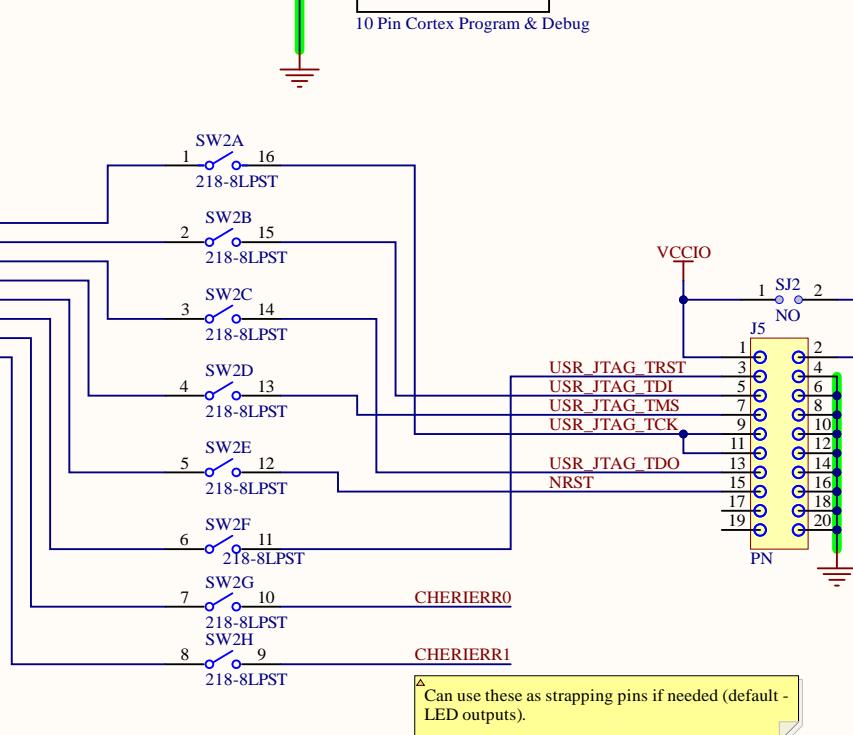
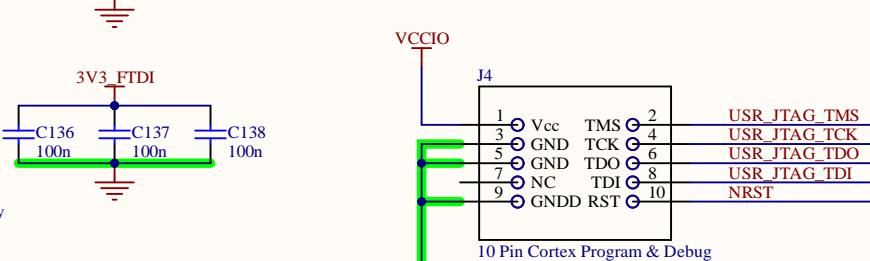
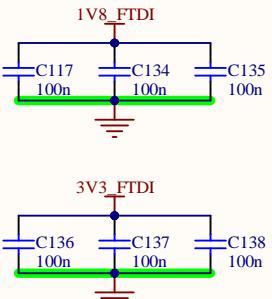
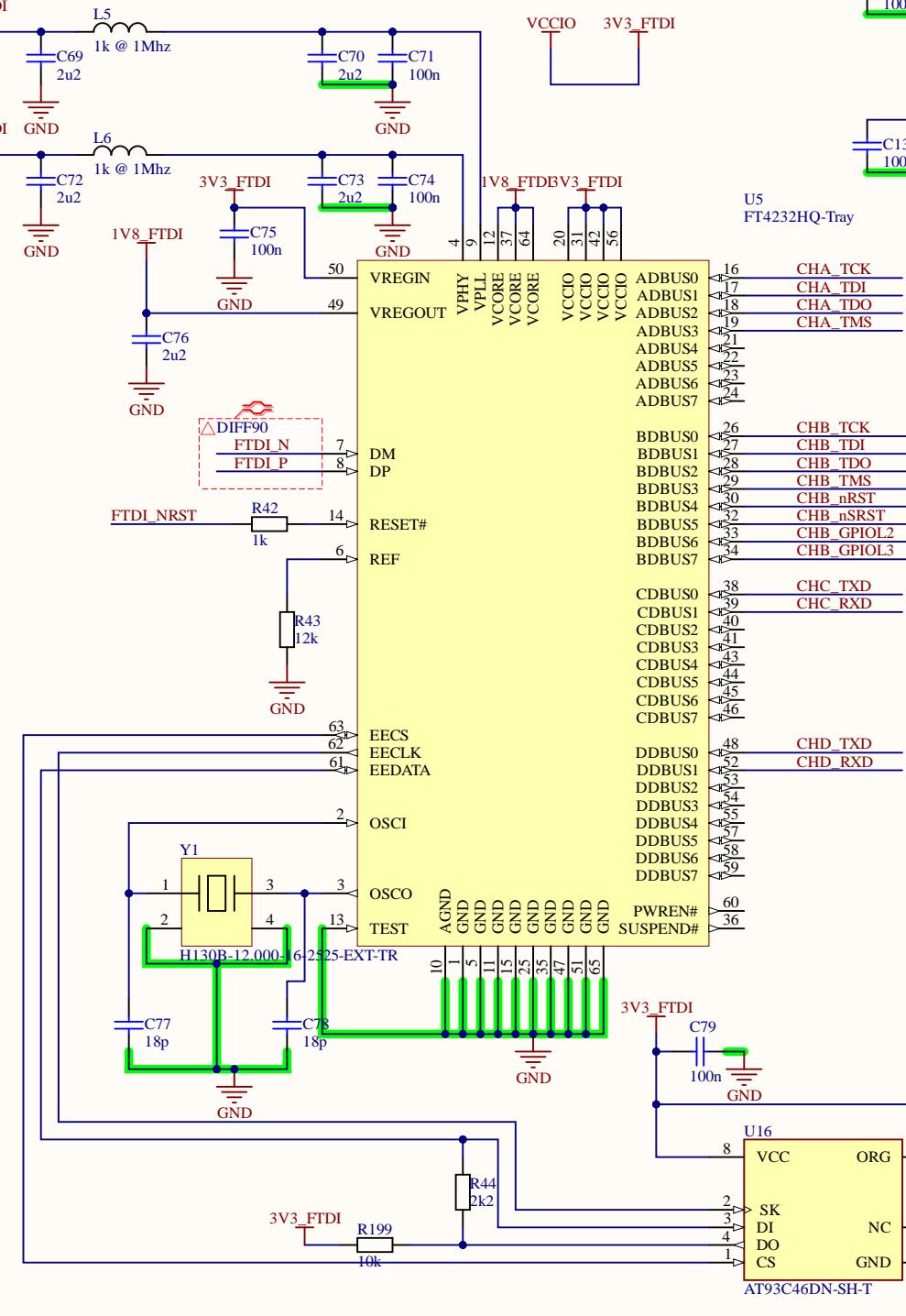


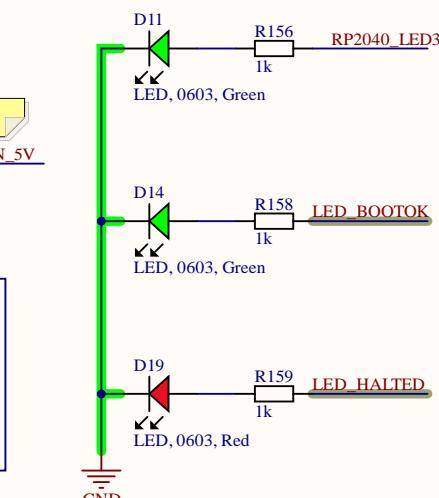
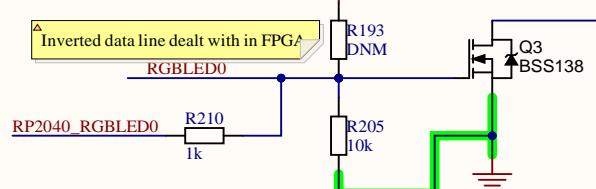
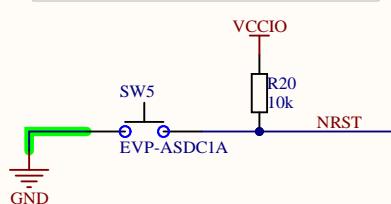
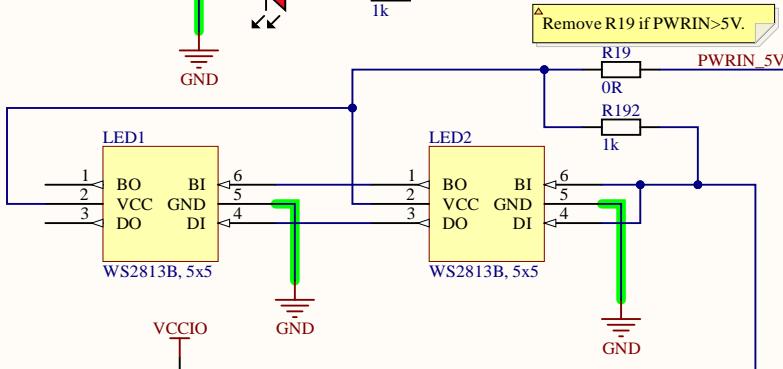
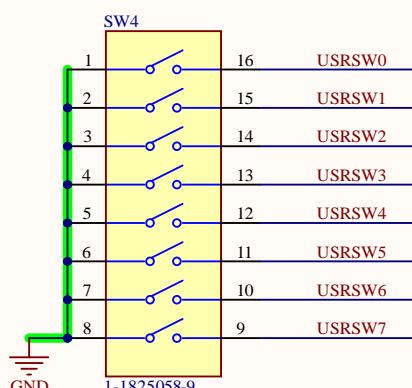
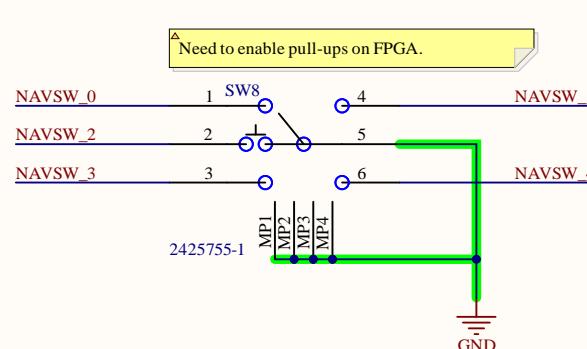
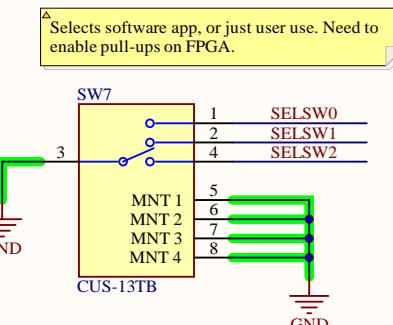
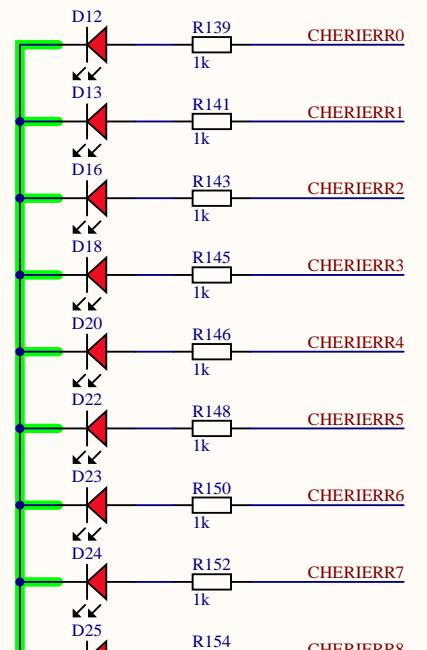
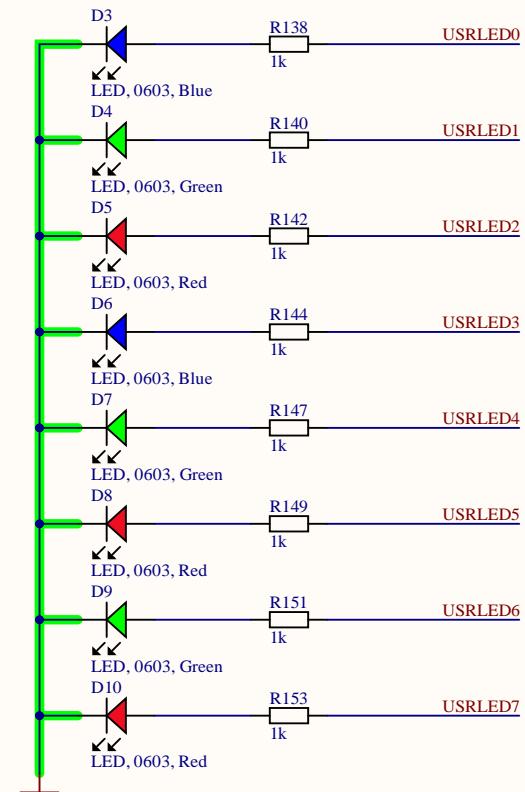
mikroBUS Click

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| Title: Header Pins | | Approved: YES | |
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| File: sb-sonata-headers1.SchDoc | | | |









Title: LEDs and Switches

| | |
|----------------------------|---|
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A

A

B

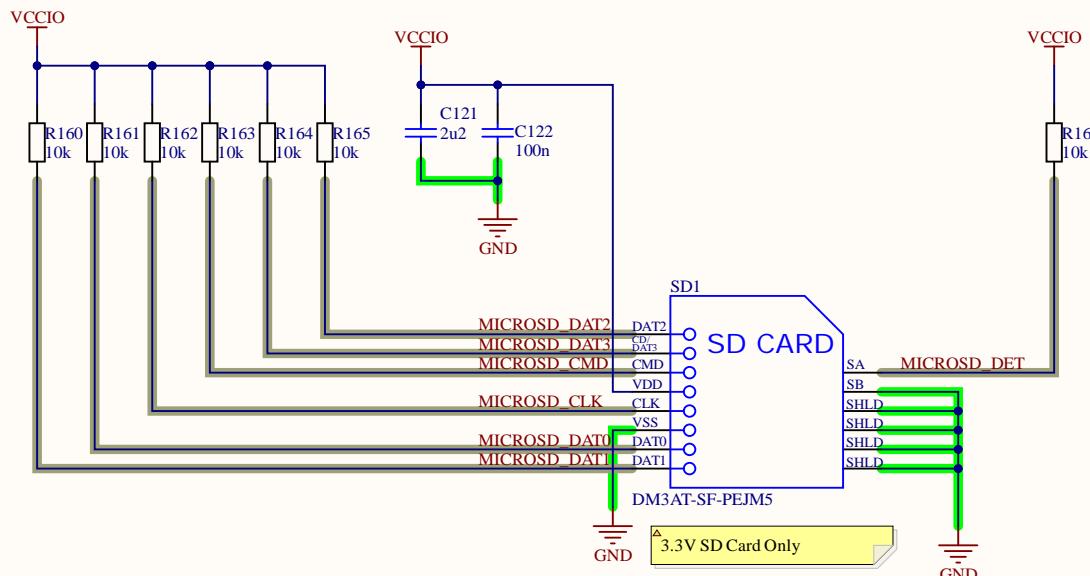
B

C

C

D

D



Title: MicroSD Card Connector

Approved: YES



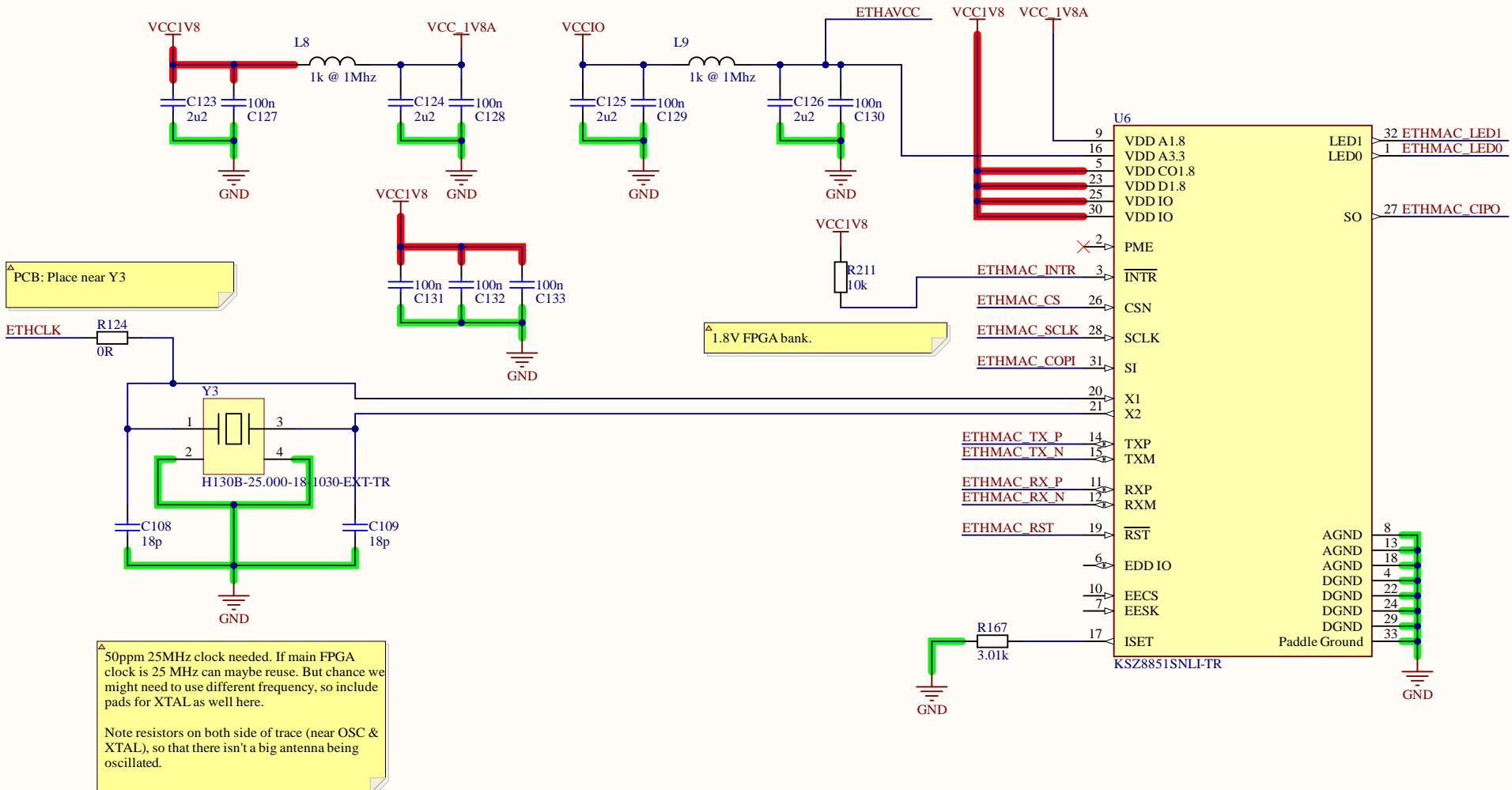
Rev: 09

Project: Sonata

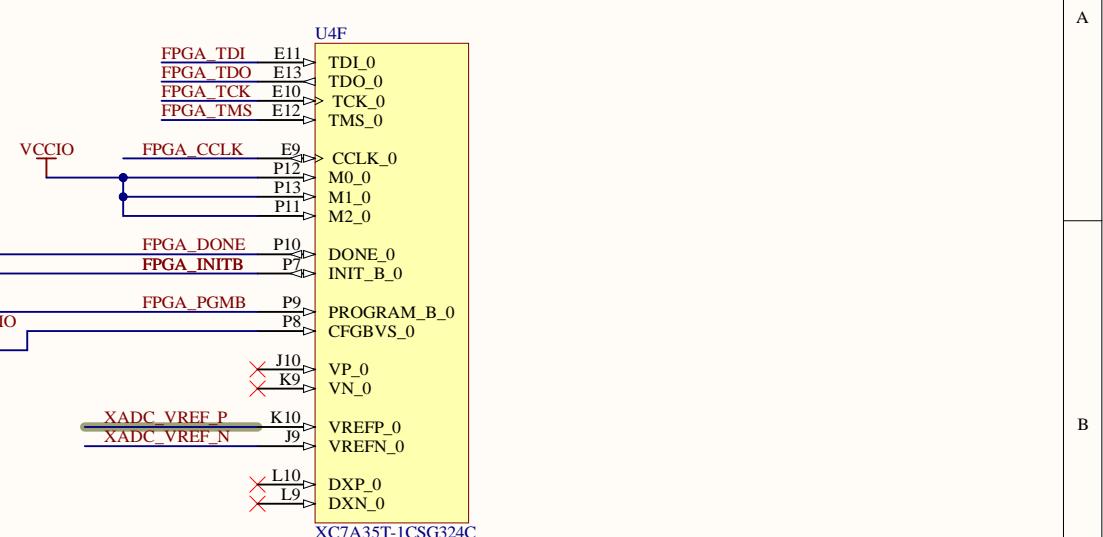
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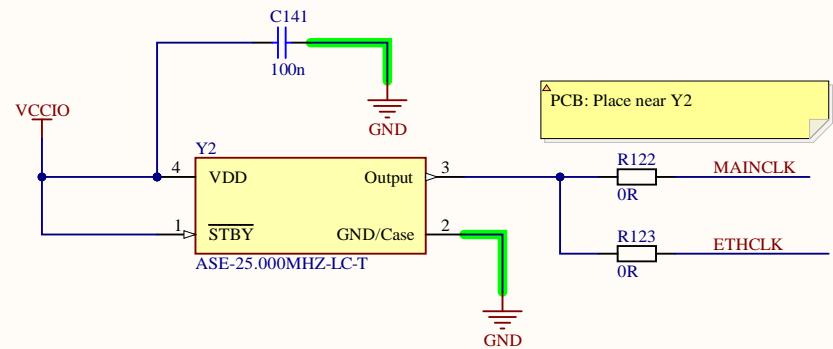
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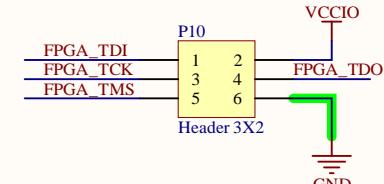
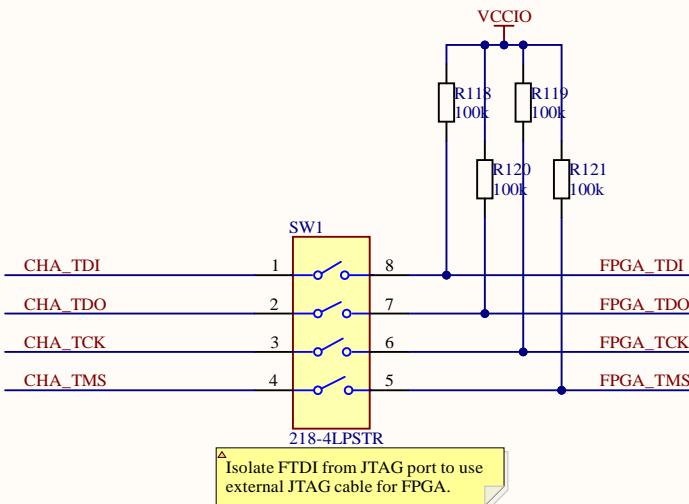
A



B



C



Non-standard. Roughly based on AVR 6-pin ISP header.

U4A

| | | | | |
|------------------------------|-----|-------|-----|--------------|
| IO_0_14 | R11 | R183C | 33R | RPH_G8_CE1 |
| IO_L19P_T3_A10_D26_14 | T11 | R188A | 33R | AH_TMPIO0 |
| IO_L20P_T3_A08_D24_14 | U12 | R188B | 33R | AH_TMPIO1 |
| IO_L5P_T0_D06_14 | R12 | R188C | 33R | AH_TMPIO2 |
| IO_L23N_T3_A02_D18_14 | U13 | R188D | 33R | AH_TMPIO3 |
| IO_25_14 | R10 | R189A | 33R | AH_TMPIO4 |
| IO_L20N_T3_A07_D23_14 | V12 | R189B | 33R | AH_TMPIO5 |
| IO_L19N_T3_A09_D25_VREF_14 | U11 | R189C | 33R | AH_TMPIO6 |
| IO_L4N_T0_D05_14 | M18 | R189D | 33R | AH_TMPIO7 |
| IO_L17N_T2_A13_D29_14 | U18 | R190A | 33R | AH_TMPIO8 |
| IO_L15N_T2_DQS_DOUT_CS0_B_14 | T16 | R190B | 33R | AH_TMPIO9 |
| IO_L18P_T2_A12_D28_14 | U16 | R190C | 33R | AH_TMPIO10 |
| IO_L7N_T1_D10_14 | T18 | R190D | 33R | AH_TMPIO11 |
| IO_L15P_T2_DQS_RDWR_B_14 | R16 | R191A | 33R | AH_TMPIO12 |
| IO_L12N_T1_MRCC_14 | R17 | R191B | 33R | AH_TMPIO13 |
| IO_L7P_T1_D09_14 | R18 | R191C | 33R | AH_TMPIO14 |
| IO_L8N_T1_D12_14 | P14 | R191D | 33R | AH_TMPIO15 |
| IO_L9P_T1_DQS_14 | N17 | R168 | 22R | AH_TMPIO16 |
| IO_L6N_T0_D08_VREF_14 | M13 | R169 | 22R | AH_TMPIO17 |
| IO_L10P_T1_D14_14 | M16 | R175D | 33R | RPH_G3_SCL |
| IO_L10N_T1_D15_14 | M17 | | | RP2040_RX |
| IO_L4P_T0_D04_14 | L18 | R175A | 33R | RPH_RXD0 |
| IO_L1P_T0_D00_MOSL_14 | K17 | R175B | 33R | RPH_TXD0 |
| IO_L6P_T0_FCS_B_14 | L13 | R175C | 33R | RPH_G2_SDA |
| IO_L1N_T0_D01_DIN_14 | K18 | R175D | 33R | RP2040_TX |
| IO_L13P_T2_MRCC_14 | P15 | | | MAINCLK |
| IO_L11P_T1_SRCC_14 | N15 | R177A | 33R | RPH_G4 |
| IO_L2N_T0_D03_14 | M14 | R177B | 33R | RPH_G17 |
| IO_L2P_T0_D02_14 | L14 | R177C | 33R | RPH_G27 |
| IO_L3N_T0_DQS_EMCCCLK_14 | L16 | R177D | 33R | RPH_G22 |
| IO_L16N_T2_A15_D31_14 | V16 | R179A | 33R | RPH_G10_COPI |
| IO_L18N_T2_A11_D27_14 | V17 | R179B | 33R | RPH_G9_CIPO |
| IO_L12P_T1_MRCC_14 | P17 | R179C | 33R | RPH_G11_SCLK |
| IO_L17P_T2_A14_D30_14 | U17 | R179D | 33R | RPH_G0 |
| IO_L23P_T3_A03_D19_14 | T13 | R181A | 33R | RPH_G5 |
| IO_L22P_T3_A05_D21_14 | U14 | R181B | 33R | RPH_G6 |
| IO_L5N_T0_D07_14 | R13 | R181C | 33R | RPH_G13 |
| IO_L22N_T3_A04_D20_14 | V14 | R181D | 33R | RPH_G19_CIPO |
| IO_L13N_T2_MRCC_14 | R15 | R182A | 33R | RPH_G26 |
| IO_L9N_T1_DQS_D13_14 | P18 | R182B | 33R | RPH_G18 |
| IO_L8P_T1_D11_14 | N14 | R182C | 33R | RPH_G23 |
| IO_L11N_T1_SRCC_14 | N16 | R182D | 33R | RPH_G24 |
| IO_L3P_T0_DQS_PUDC_B_14 | L15 | R183A | 33R | RPH_G25 |
| IO_L16P_T2_CSR_B_14 | V15 | R183B | 33R | RPH_G8_CE0 |
| IO_L14P_T2_SRCC_14 | T14 | | | RP2040_CLK |
| IO_L14N_T2_SRCC_14 | T15 | R183D | 33R | RPH_G1 |
| IO_L21P_T3_DQS_14 | V10 | R184A | 33R | RPH_G12 |
| IO_L24P_T3_A01_D17_14 | T9 | R184B | 33R | RPH_G16_CE2 |
| IO_L24N_T3_A00_D16_14 | T10 | R185C | 33R | RPH_G20_COPI |
| IO_L21N_T3_DQS_A06_D22_14 | V11 | R185D | 33R | RPH_G21_SCLK |

XC7A35T-1CSG324C

U4D

| | | | | |
|--------------------|----|---------|-----|---------------|
| IO_0_34 | K6 | | | CHERIERR0 |
| IO_L1P_T0_34 | L1 | | | CHERIERR1 |
| IO_L1N_T0_34 | M1 | | | CHERIERR2 |
| IO_L2P_T0_34 | K3 | | | CHERIERR3 |
| IO_L2N_T0_34 | L3 | | | CHERIERR4 |
| IO_L3P_T0_DQS_34 | N2 | | | CHERIERR5 |
| IO_L3N_T0_DQS_34 | N1 | | | CHERIERR6 |
| IO_L4P_T0_34 | M3 | | | CHERIERR7 |
| IO_L4N_T0_34 | M2 | | | CHERIERR8 |
| IO_L5P_T0_34 | K5 | | | LED_LEGACY |
| IO_L5N_T0_34 | L4 | | | LED_CHERI |
| IO_L6P_T0_34 | L6 | | | LED_HALTED |
| IO_L6N_T0_VREF_34 | L5 | | | LED_BOOTOK |
| IO_L22N_T3_34 | U6 | | | MICROSD_CLK |
| IO_L10N_T1_34 | V4 | | | MICROSD_DAT0 |
| IO_L23P_T3_34 | R7 | | | MICROSD_DAT1 |
| IO_L10P_T1_34 | V5 | | | MICROSD_DAT2 |
| IO_L24N_T3_34 | T8 | | | MICROSD_DAT3 |
| IO_L24P_T3_34 | R8 | | | MICROSD_CMD |
| IO_L22P_T3_34 | U7 | R170A | 33R | SDA0 |
| IO_L22P_T3_34 | V9 | R170B | 33R | SCL0 |
| IO_L20P_T3_34 | V7 | R170C | 33R | SDA1 |
| IO_L21P_T3_DQS_34 | U9 | R170D | 33R | SCL1 |
| IO_L12P_T1_MRCC_34 | T5 | | | NRST |
| IO_L12N_T1_MRCC_34 | T4 | | | FPGAIO_TURBO |
| IO_L13P_T2_MRCC_34 | N5 | | | LCD_BACKLIGHT |
| IO_L8N_T1_34 | U3 | R171 | 22R | RP2040_PREQ |
| IO_L14P_T2_SRCC_34 | P3 | | | RP2040_SPARE |
| IO_L14N_T2_SRCC_34 | N6 | | | 232_RX |
| IO_L18N_T2_34 | R2 | 485_RO | | |
| IO_L16N_T2_34 | M4 | 485_DE | | |
| IO_L16N_T2_34 | N4 | 485_REn | | |
| IO_L18P_T2_34 | M6 | 485_DI | | |
| IO_L15P_T2_DQS_34 | P2 | R178A | 33R | MB0 |
| IO_L17P_T2_34 | R1 | R178B | 33R | MB1 |
| IO_L17N_T2_34 | T1 | R178C | 33R | MB2 |
| IO_L7P_T1_34 | U1 | R178D | 33R | MB3 |
| IO_L11N_T1_SRCC_34 | T3 | R180A | 33R | MB4 |
| IO_L7N_T1_34 | V1 | R180B | 33R | MB5 |
| IO_L9P_T1_DQS_34 | U2 | R180C | 33R | MB6 |
| IO_L9N_T1_DQS_34 | V2 | R180D | 33R | MB7 |
| IO_25_34 | U8 | R184A | 33R | MB8 |
| IO_L23N_T3_34 | T6 | R184B | 33R | MB9 |
| IO_L20N_T3_34 | V6 | R184C | 33R | MB10 |
| IO_L19P_T3_34 | R6 | | | LCD_RST |
| IO_L8P_T1_34 | U4 | | | LCD_DC |
| IO_L11P_T1_SRCC_34 | R3 | | | LCD_COP1 |
| IO_L19N_T3_VREF_34 | R5 | | | LCD_CLK |
| IO_L13N_T2_MRCC_34 | P5 | | | LCD_CS |

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R184D 33R

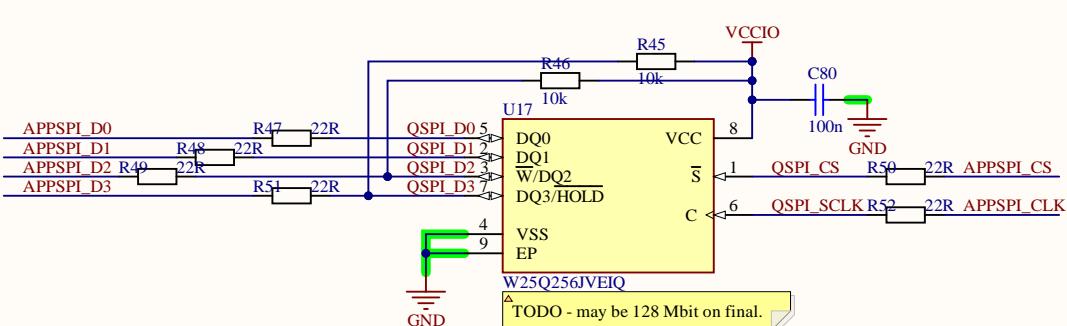
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10k

RPH_G25

R213
DNM RCHIP

GND

Title: **IO Banks 14+34 + Flash**

Approved: YES



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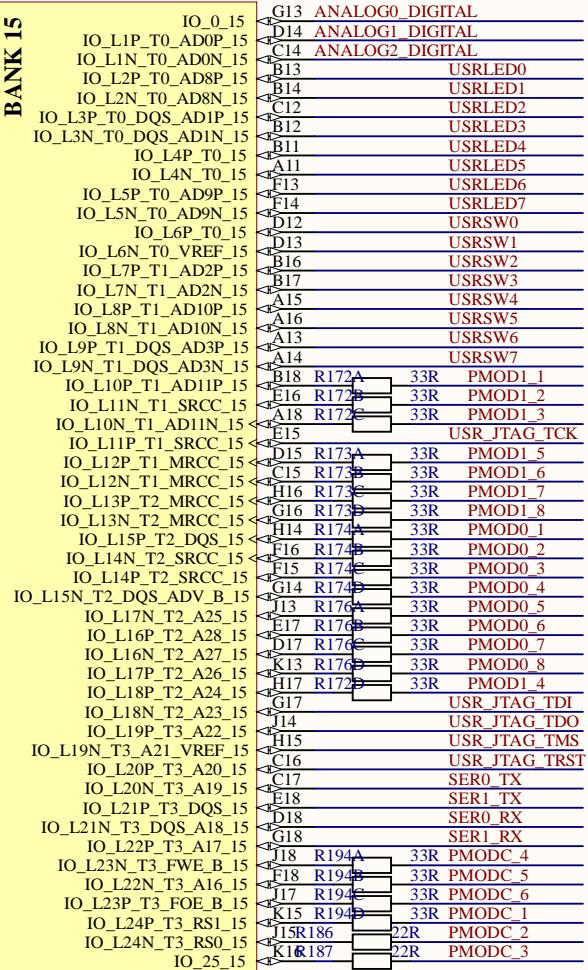
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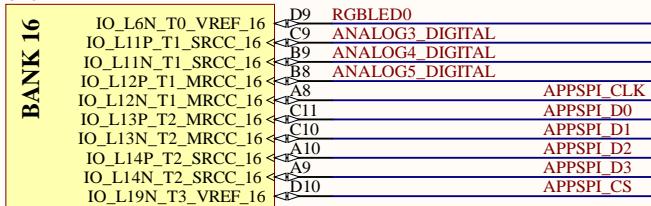
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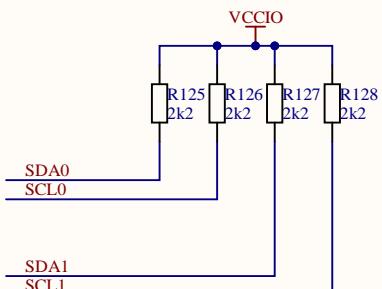


XC7A35T-1CSG324C

U4C



XC7A35T-1CSG324C



Title: IO Banks 15 + 16

Rev: 09

Project: Sonata

Date: 2024-05-23

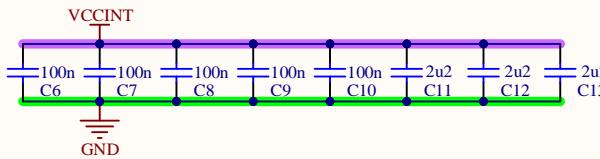
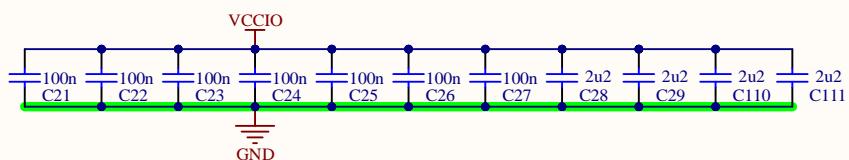
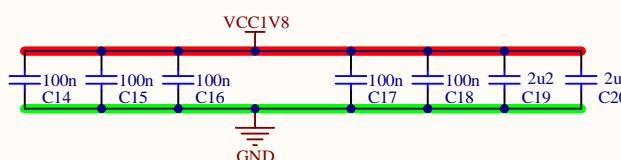
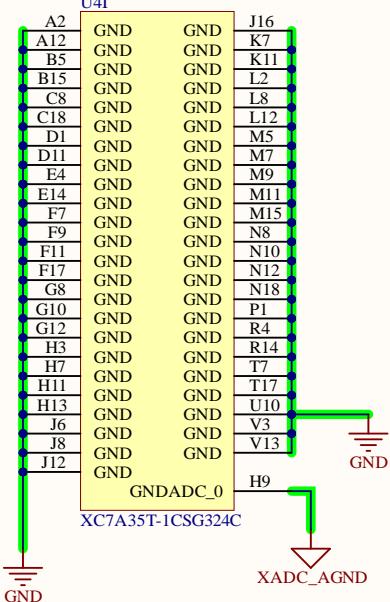
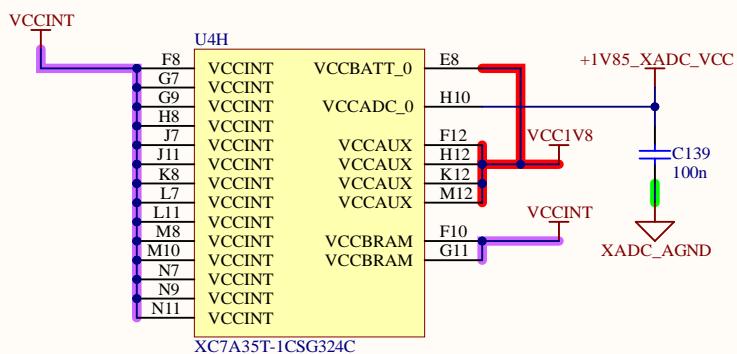
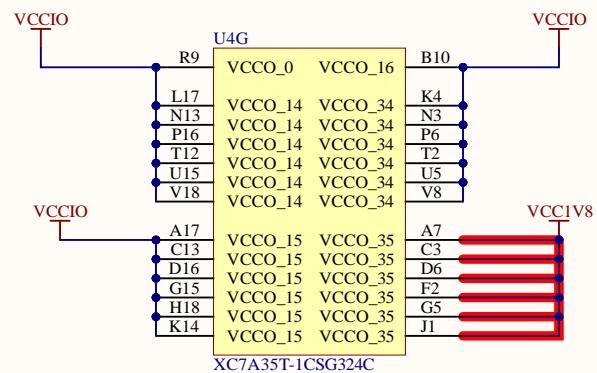
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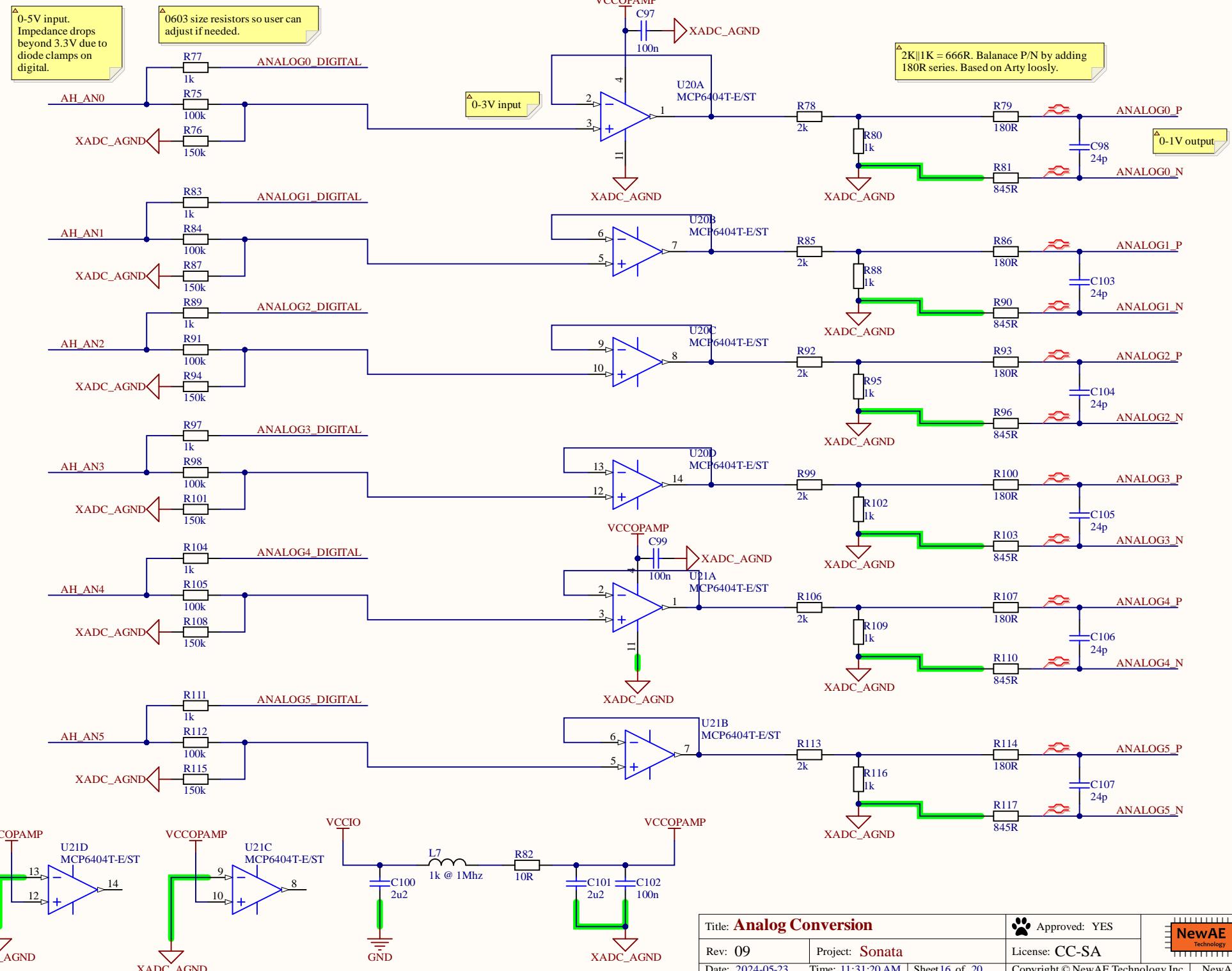
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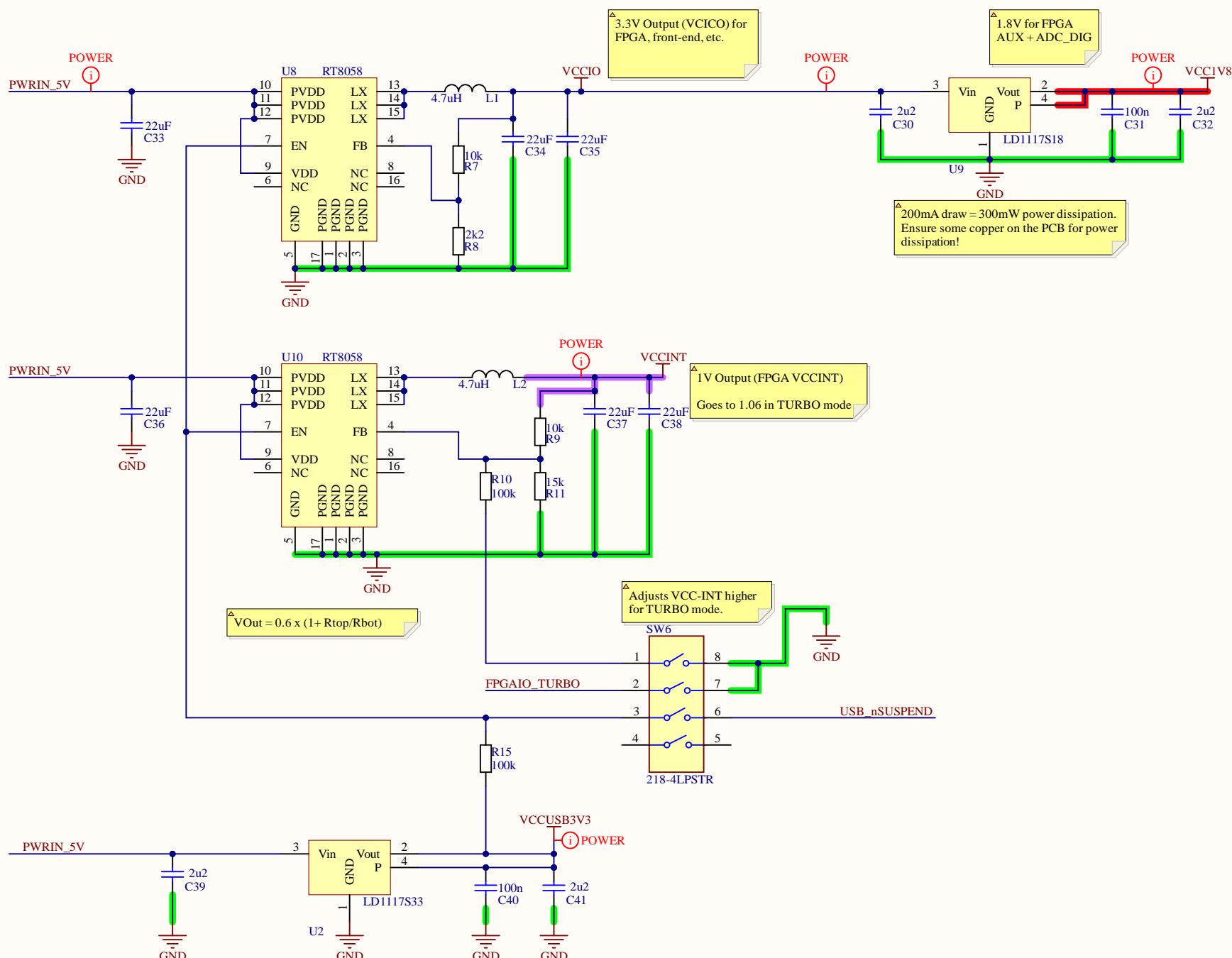
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Approved: YES

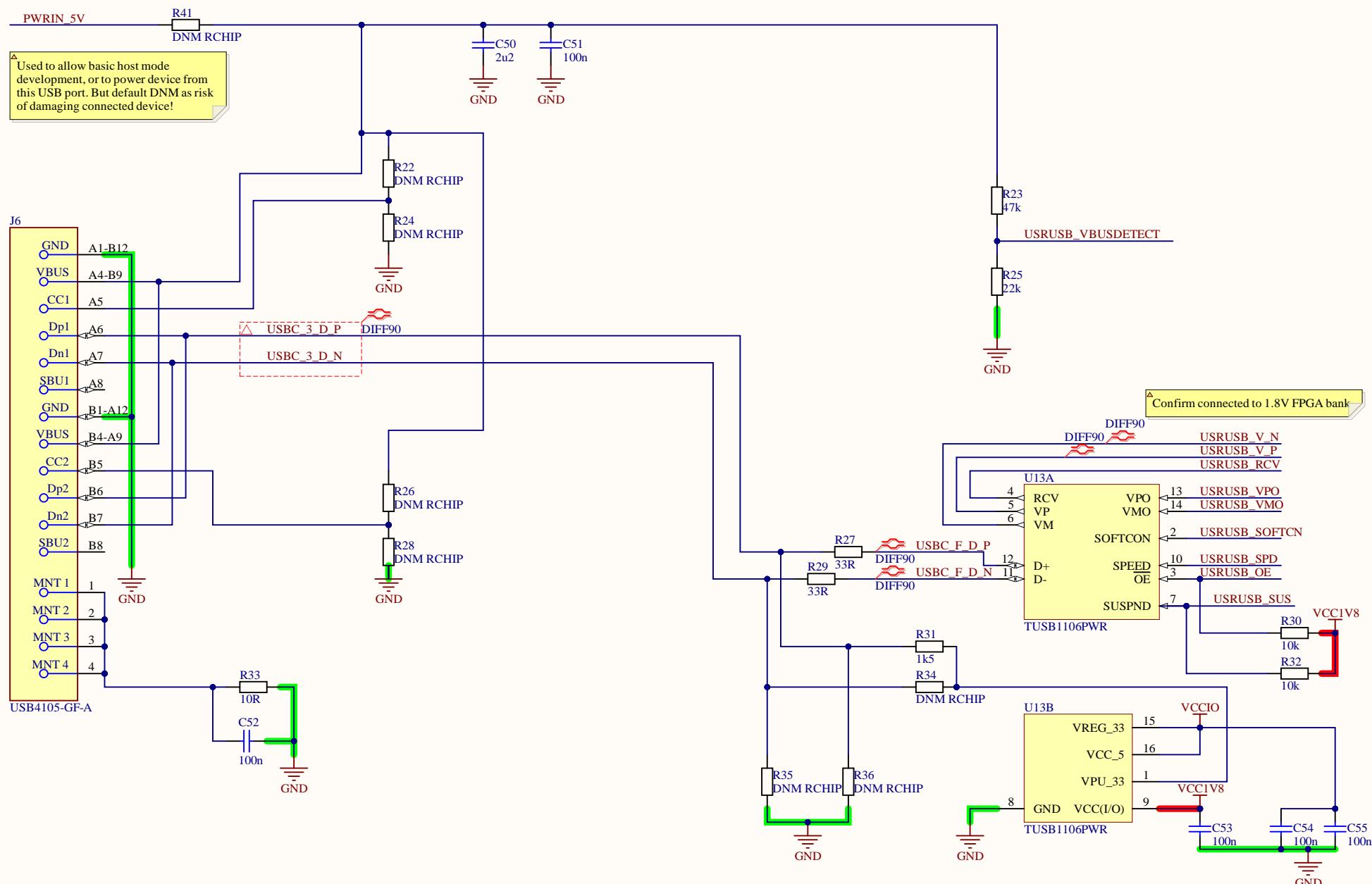






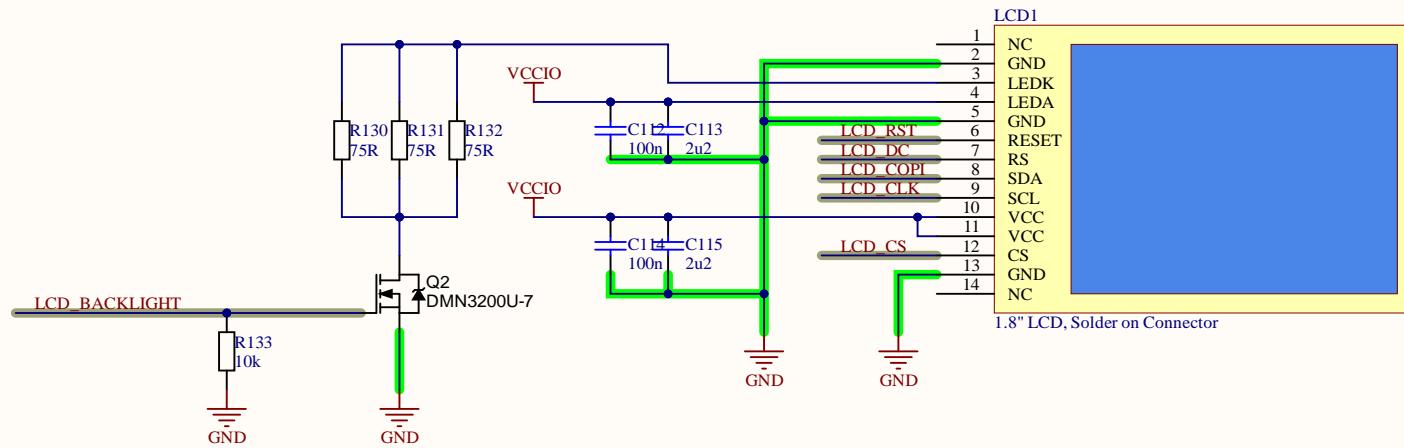


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|-------------------------------|------------------------|----------------|---|
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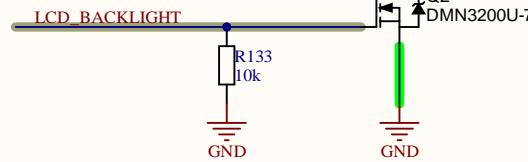
A

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|----------------------------|------------------------|----------------|---|
| Title: LCD | | Approved: YES | NewAE Technology |
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