

C212-NORA-B126

NORA-B126 Bluetooth LE audio application board

User guide



Abstract

The C212-NORA-B126 Bluetooth LE audio application board is designed for evaluation of Bluetooth LE audio and Auracast applications using the NORA-B1 series modules. Fully compliant with the Bluetooth 5.3 standard, the board hosts the NORA-B126 stand-alone Bluetooth Low Energy module. This user guide provides an overview and full functional description of the audio board, including a detailed pin list, block diagram, mechanical and electrical specifications, and ordering information. Aimed towards developers and other technical staff, this document provides the information necessary for evaluation and design of LE audio applications on the NORA-B1 series modules.

Document information

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This document applies to the following products:

Product name
C212-NORA-B126

 Regulatory limitations: C212-NORA-B126 is an application board. It has not been RF certified with worldwide agencies. It may not be offered for sale as an end-user product.

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1 Functional description

1.1 Overview

The C212-NORA-B126 Bluetooth LE audio application board is a platform for evaluation, development, and prototyping of products with Bluetooth LE Audio and Auracast technology. It contains everything needed to start development. The board is configurable and can function in a wide range of use cases, such as a broadcast audio transmitter or receiver (Auracast), a USB dongle to send or receive audio data from a computer, a wireless headset, or a True Wireless Stereo (TWS) earbud. For most use cases, we recommend using two or more application boards.

The application board (C212-NORA-B126) is based on the existing the nRF5340 Audio Development Kit that already provides a tool for developing your Bluetooth® Low Energy Audio products like a USB dongle for sending or receiving audio data from a computer, a business headset, a broadcast receiver to catch audio streams, true Wireless Stereo (TWS) earbuds for personal audio playback. The kit is also equipped with features like the Low Complexity Communications Codec (LC3) for improved audio quality at lower data rates, which is essential for minimizing power consumption in wireless audio products.

Integrating the NORA-B126 Bluetooth Low Energy Module which incorporates the nRF5340 MCU and front-end module (FEM) and the CS47L63 Audio Digital Signal Processor (DSP), developers can use the C212-NORA-B126 application board to create comprehensive audio solutions that combine seamless wireless connectivity with advanced audio processing. The CS47L63's high-performance DAC and differential output driver are optimized for direct connection to an external headphone load. It is perfect for earbuds with mono-only and direct speaker output.

The C212-NORA-B126 application board is typically powered via USB. The current consumption can be measured by using the dedicated current measurement pins. Nordic's Power Profiler Kit II is recommended for that purpose.

The new "Low Complexity Communications Codec" (LC3) that replaced Bluetooth Classic's "Low Complexity Subband Codec" (SBC) is also available for this application board. The LC3 codec has superior audio quality compared to SBC – even at half the wireless data rate. This low data rate is a key factor in minimizing the power consumption of your products.

1.2 Product features

 As the C212-NORA-B126 application board supports all the features supported in the integrated NORA-B126 module, this document aims to describe only the features of the C212-NORA-B126 board specifically. For more information about the NORA-B126 module, see the NORA-B1 data sheet [1].

Table 1 describes the key features of the C212-NORA-B126 application board.

Item	C212-NORA-B126
Bluetooth version	5.3
Band support	2.402 GHz – 2.480 GHz
Supported 2.4 GHz radio modes	Bluetooth Low Energy
Supported Bluetooth LE modes	LE 1M PHY (1 Mbps) LE 2M PHY (2 Mbps) LE Coded PHY S=2 (500 kbps) LE Coded PHY S=8 (125 kbps)
3.5 mm Audio jacks	Line-in headphone
Audio DSP	Cirrus Logic CS47L63

Item	C212-NORA-B126
User-programmable buttons	5
User-programmable LEDs	4
SEGGER J-Link debugger on board	Yes
Pins for measuring power consumption	Yes
Connectors to access the analog/digital interfaces, and GPIOs	Yes
uSD-Card holder for additional storage	Yes
Board Size	85.6 x 53.98 mm

Table 1: Key features of the C212-NORA-B126 Bluetooth LE audio application board

1.3 Ordering information

Ordering code	Description
C212-NORA-B126	LE audio application board with NORA-B126 stand-alone Bluetooth module

Table 2: Product description

1.4 Block diagram

Figure 1 shows a block diagram of the C212-NORA-B126 LE audio board. The board includes I/O ports accessible through pin header connectors. These connectors provide the physical interface for any external device and the USB type C interface used for power supply and communication. The board also features four user-programmable LEDs, five user-programmable buttons, and a microSD card holder for additional storage.

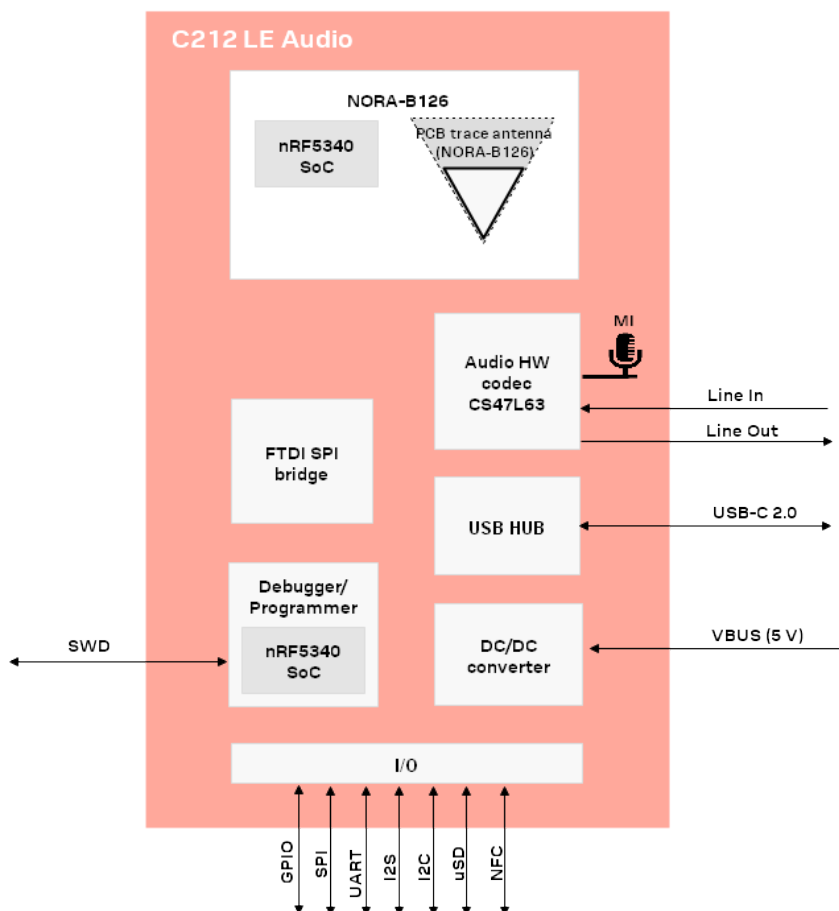


Figure 1: C212-NORA-B126 LE audio block diagram

2 Hardware

2.1 Interfaces

The application board supports several interfaces that help users control the application using the predefined switches and buttons. Several LED indicators display the status and state of specific tasks.

2.1.1 Switches

C212-NORA-B126 has two switches, Power On-Off and DEBUG ENABLE On-Off. The switches are located at the bottom-side and top-side of the board respectively, as shown in [Figure 2](#) and [Figure 3](#).

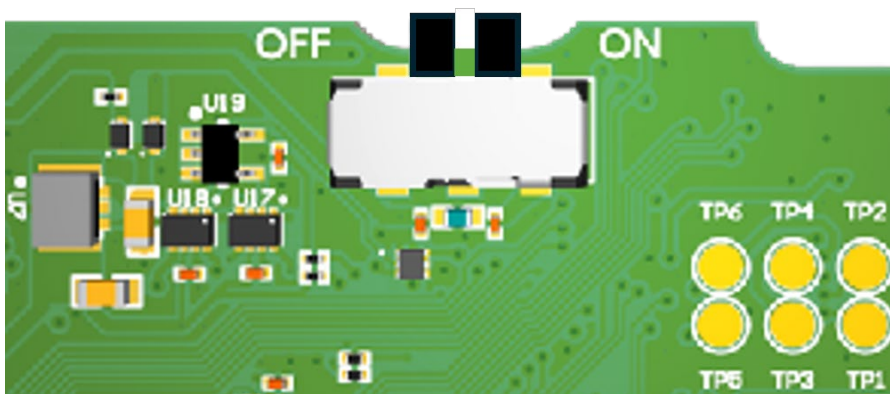


Figure 2: Power On-Off switch on the bottom-side of the board

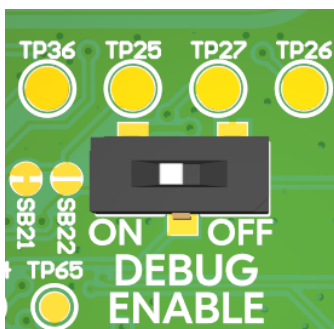


Figure 3: DEBUG ENABLE switch on the top-side of the board

[Table 3](#) describes the functionality of the board switches.

Switch	Function
POWER (On - Off)	Turns the development kit on or off
DEBUG ENABLE (On - Off)	Turns on or off power for debug features. This switch is useful for accurate power and current measurements.

Table 3: Board switches

2.1.2 Buttons

There are six user buttons, located at the top of the board, as shown in [Figure 4](#).

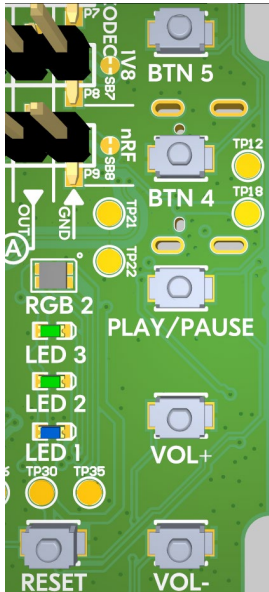


Figure 4: Board buttons

Buttons functionality depends on the application. For more details, see the nRF5340 Audio DK User Interface description [\[11\]](#).

2.1.3 Microphone

C212-NORA-B126 has on-board Pulse Density Modulation (PDM) microphone at the bottom side as seen in [Figure 5](#). The PDM microphone (U5) captures audio input.

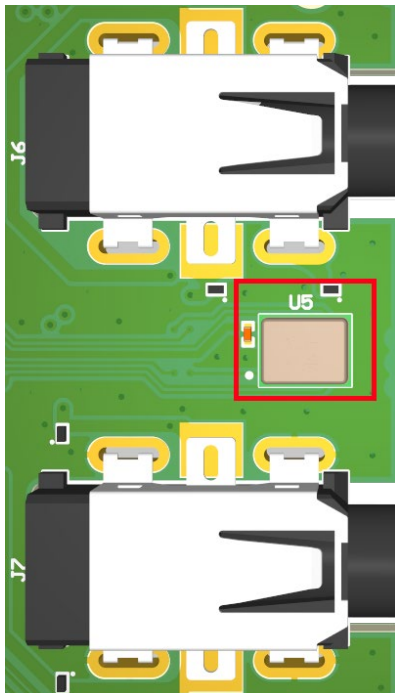


Figure 5 Pulse Density Modulation (PDM) microphone

2.1.4 LEDs

C212-NORA-B126 has LED indicators that are located on the top and bottom side of the board, as shown in [Figure 6](#) and [Figure 7](#).

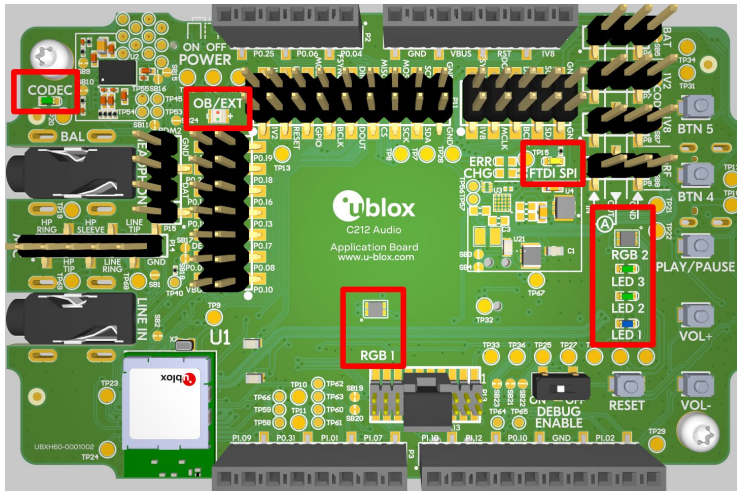


Figure 6: LEDs on top side

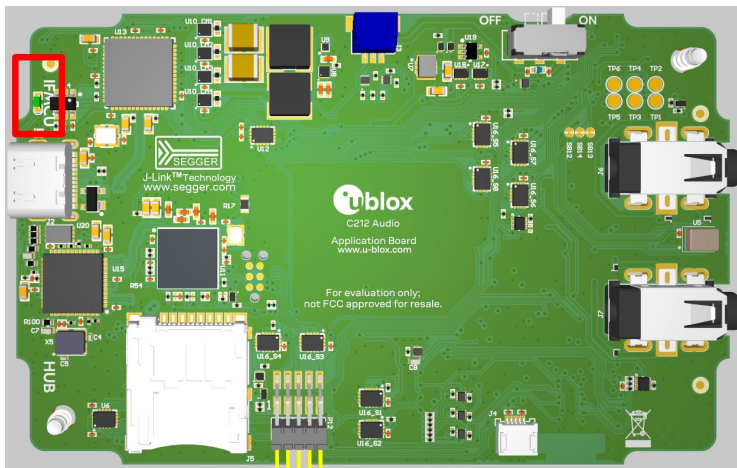


Figure 7: LEDs on bottom side

LED functionality depends on the application. For more details, see the nRF5340 Audio DK User Interface [\[11\]](#).

2.2 Connector interface

On the top side of the C212-NORA-B126 board, several pin headers provide the physical interface for communication with external devices. The pin connections for each of the headers are shown in [Figure 8](#), [Figure 9](#) and [Figure 10](#). Access to the General-Purpose Input/Output (GPIO)s for the board is available from the connectors P1-P5, P10-P11, and P14-P15.

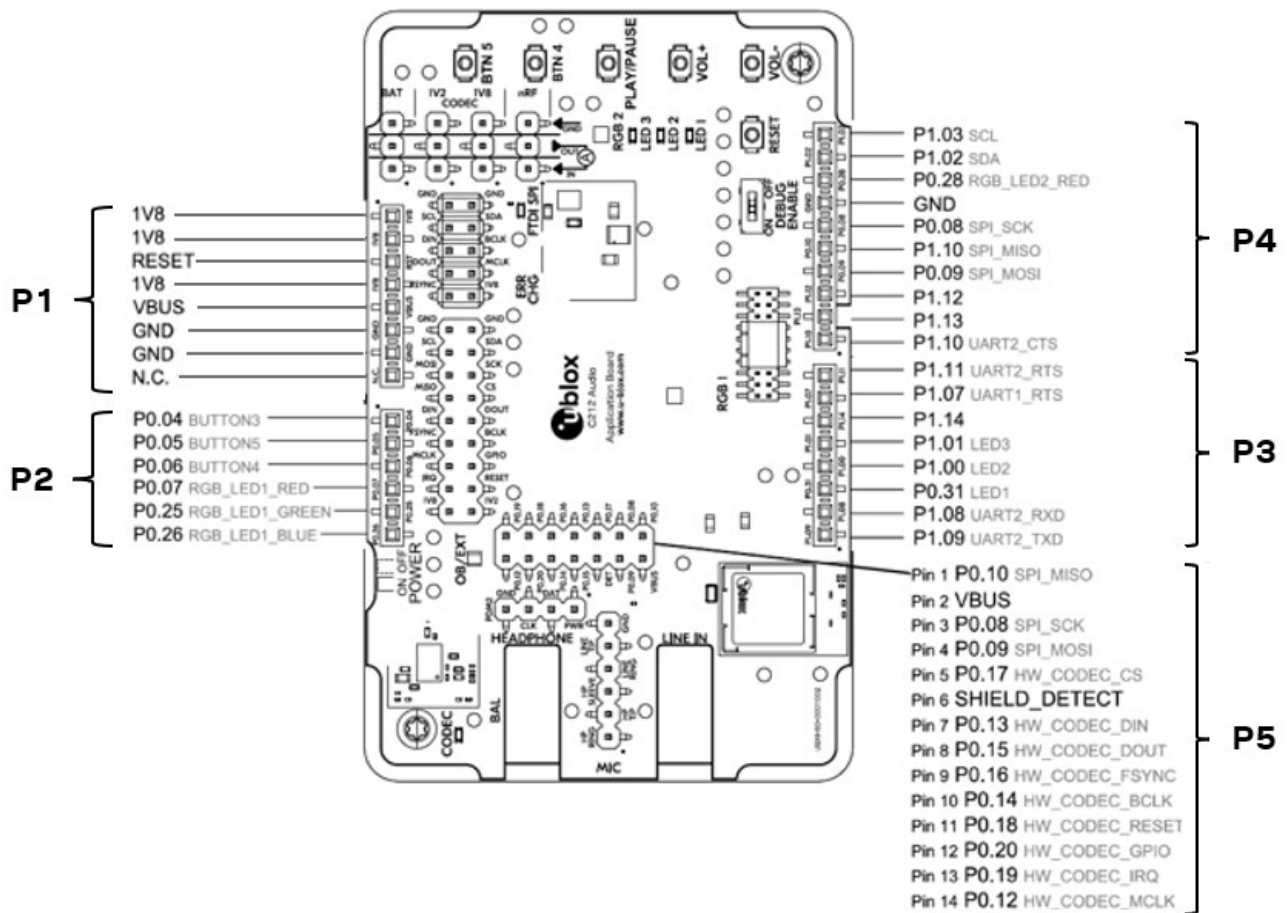


Figure 8: C212-NORA-B126 board pin headers P1 – P5

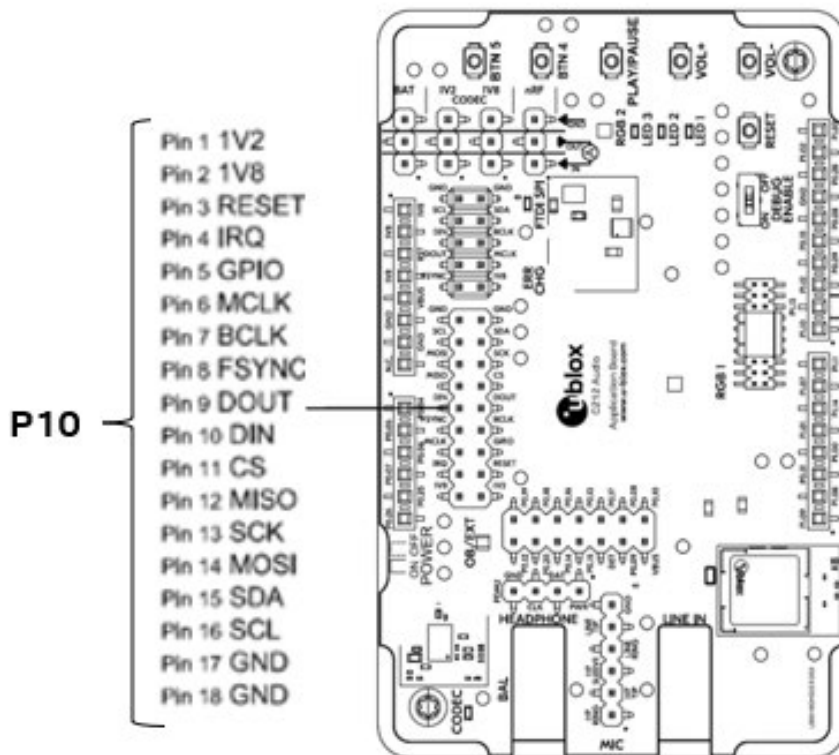


Figure 9: C212-NORA-B126 board pin headers P10

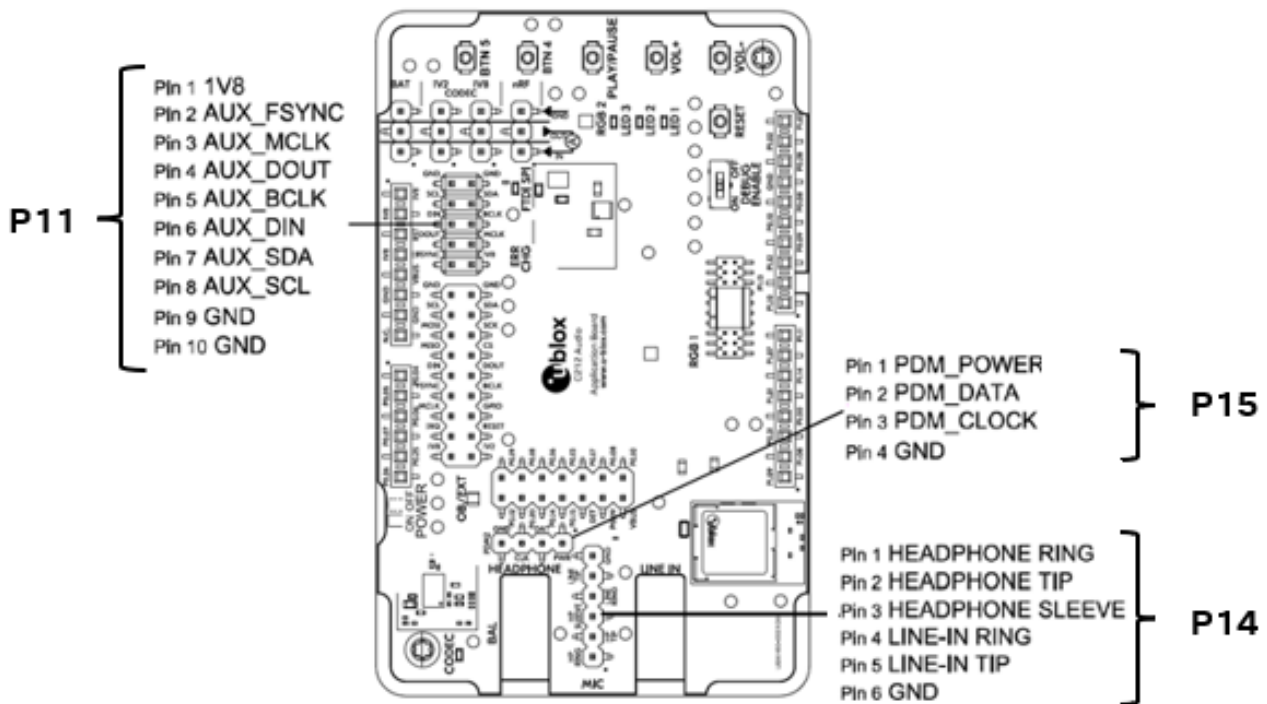


Figure 10: C212-NORA-B126 board pin headers P11, P14- P15

2.3 Solder bridges

The C212-NORA-B126 LE audio application board has a range of solder bridges for enabling or disabling selected functionalities. Changes to these are not needed for normal use of the board.

[Table 4](#) is a complete overview of the solder bridges on the board.

Designator	Description	Default state	Board side
SB1	Short to connect digital microphone DOUT to P1.06	Open	Top
SB2	Cut to disconnect P0.12 from TRACE	Shorted	Top
SB3	Short to connect PMIC MODE to VOUTB, must not be shorted while SB4 is shorted (PMIC not supported)	Open	Top
SB4	Cut to disable PMIC MODE from GND, must not be shorted while SB3 is shorted (PMIC not supported)	Shorted	Top
SB5	Cut to enable VBAT current measurements on P6 (battery not supported)	Shorted	Top
SB6	Cut to enable HW CODEC 1.2V current measurements on P7	Shorted	Top
SB7	Cut to enable HW CODEC 1.8V current measurements on P8	Shorted	Top
SB8	Cut to enable VDD_nRF current measurements on P9	Shorted	Top
SB9	Cut to disconnect filter from OUTP	Shorted	Top
SB10	Cut to disconnect filter from OUTN	Shorted	Top
SB11	Cut to disconnect the LED for the HW CODEC GPIO	Shorted	Top
SB12	Cut to disconnect digital microphone POWER from the HW CODEC	Shorted	Bottom
SB13	Cut to disconnect digital microphone DATA from the HW CODEC	Shorted	Bottom
SB14	Cut to disconnect digital microphone CLOCK from the HW CODEC	Shorted	Bottom
SB15	Short to connect AUX I2S MCLK to HW CODEC MCLK1	Open	Top
SB16	Short to connect AUX I2S MCLK to HW CODEC MCLK2	Open	Top
SB17	Short to connect P5 pin 6 to GND	Open	Top
SB18	Cut to disconnect P5 pin 6 from SHIELD DETECT	Shorted	Top
SB19	Cut to disconnect RTS and CTS flow control lines on UART1	Shorted	Top

Designator	Description	Default state	Board side
SB20	Cut to disconnect RTS and CTS flow control lines on UART2	Shorted	Top
SB21	Cut to disconnect nRF53 RESET from RESET button when debug is disabled	Shorted	Top
SB22	Short to permanently connect RESET button to nRF53 RESET	Open	Top
SB23	Cut to disconnect RESET button from interface MCU	Shorted	Top
SB24	Short to bypass analog switch for MCLK	Open	Top

Table 4: Solder Bridges

2.4 Test points

Table 5 describes the test points on the C212-NORA-B126 Bluetooth LE audio application board.

Designator	Net	Description	Size	Board side
TP1	NetTP1-1	IN1LP_1 pin of CS47L63	1.5 mm	Bottom
TP2	NetTP2-1	IN1LN_1 pin of CS47L63	1.5 mm	Bottom
TP3	NetTP3-1	IN1RP pin of CS47L63	1.5 mm	Bottom
TP4	NetTP4-1	IN1RN pin of CS47L63	1.5 mm	Bottom
TP5	NetTP5-1	IN2LN pin of CS47L63	1.5 mm	Bottom
TP6	NetTP6-1	IN2RN pin of CS47L63	1.5 mm	Bottom
TP7	HW_CODEC_AUX_I2C.SCL	AUX SCL pin of CS47L63	1.5 mm	Top
TP8	HW_CODEC_AUX_I2C.SDA	AUX SDA pin of CS47L63	1.5 mm	Top
TP9	P0.07/AIN3	RGB LED 1 Red color input pin	1.5 mm	Top
TP10	P0.28/AIN7	RGB LED 2 Red color input pin	1.5 mm	Top
TP11	P1.01	LED 3 input pin	1.5 mm	Top
TP12	P0.04/AINO	Button 3	1.5 mm	Top
TP13	VDD_EXT_HW_CODEC.1V2	External HW CODEC 1.2 V supply	1.5 mm	Top
TP14	VDD_EXT_HW_CODEC.1V8	External HW CODEC 1.8 V supply	1.5 mm	Top
TP15	BAT_NTC	Li-poly battery NTC pin (battery not supported)	1.5 mm	Top
TP16	BATTERY	Li-poly battery voltage after power switch (battery not supported)	1.5 mm	Top
TP17	NetC41-1	USB voltage after power switch	1.5 mm	Top
TP18	NetC43-2	USB voltage before power switch	1.5 mm	Top
TP19	HEADPHONE.OUTPUT	Headphone jack tip	1.5 mm	Top
TP20	HEADPHONE.OUTPUTN	Headphone jack sleeve	1.5 mm	Top
TP21	DU_N	USB connector D-	1.5 mm	Top
TP22	DU_P	USB connector D+	1.5 mm	Top
TP23	SWDIO	nRF5340 Serial Wire Debug data	1.5 mm	Top
TP24	SWDCLK	nRF5340 Serial Wire Debug clock	1.5 mm	Top
TP25	RESET	nRF5340 Reset	1.5 mm	Top
TP26	SD_CS	SD card slot CS line	1.5 mm	Top
TP27	SD_SCK	SD card slot SCK line	1.5 mm	Top
TP28	VDD_IN_1V	1.2V regulator output	1.5 mm	Top
TP29	SUPPLY_1V8	nPM1100 1.8 V output	1.5 mm	Top
TP30	SUPPLY_3V3	3.3 V regulator output	1.5 mm	Top
TP31	VDD_DBG_3V3	Debug regulator 3.3 V output	1.5 mm	Top
TP32	VDD_DBG_1V8	Debug regulator 1.8 V output	1.5 mm	Top
TP33	SW_EN	Load switch enable signal	1.5 mm	Top
TP34	GND	Ground	1.5 mm	Top

Designator	Net	Description	Size	Board side
TP35	GND	Ground	1.5 mm	Top
TP36	NetQ9-1	Debug enable signal	1.5 mm	Top
TP37	IMCU_SWDIO	Interface MCU Serial Wire Debug data	1.5 mm	Top
TP38	IMCU_RESET	Interface MCU Reset	1.5 mm	Top
TP39	IMCU_SWDCLK	Interface MCU Serial Wire Debug clock	1.5 mm	Top
TP40	SHIELD_DETECT	Detect signal for Arduino compatible shield	1.0 mm	Top
TP41	HW_CODEC_IF.SPI.MISO	SPI MISO pin of CS47L63	1.0 mm	Top
TP42	HW_CODEC_IF.SPI.MOSI	SPI MOSI pin of CS47L63	1.0 mm	Top
TP43	HW_CODEC_IF.SPI.SCK	SPI SCK pin of CS47L63	1.0 mm	Top
TP44	HW_CODEC_IF.SPI.CS	SPI SS pin of CS47L63	1.0 mm	Top
TP45	HW_CODEC_IF.CTRL.GPIO	GPIO pin of CS47L63	1.0 mm	Top
TP46	HW_CODEC_IF.CTRL.IRQ	IRQ pin of CS47L63	1.0 mm	Top
TP47	HW_CODEC_IF.CTRL.RESET	RESET pin of CS47L63	1.0 mm	Top
TP48	HW_CODEC_IF.I2S.MCLK	MCLK1 pin of CS47L63	1.0 mm	Top
TP49	HW_CODEC_IF.I2S.DOUT	I2S DOUT pin of CS47L63	1.0 mm	Top
TP50	HW_CODEC_IF.I2S.DIN	I2S DIN pin of CS47L63	1.0 mm	Top
TP51	HW_CODEC_IF.I2S.BCLK	I2S BCLK pin of CS47L63	1.0 mm	Top
TP52	HW_CODEC_IF.I2S.FSYNC	I2S FSYNC pin of CS47L63	1.0 mm	Top
TP53	NetSB12-1	MICBIASB pin of CS47L63	1.0 mm	Top
TP54	NetSB13-1	IN1_PDMDATA pin of CS47L63	1.0 mm	Top
TP55	NetSB14-1	IN1_PDMCLK pin of CS47L6	1.0 mm	Top
TP56	PMIC_ERR	nPM1100 error indication (PMIC not supported)	1.0 mm	Top
TP57	PMIC_CHG	nPM1100 charge indication (PMIC not supported)	1.0 mm	Top
TP58	P0.29	RGB LED 2 Green color input pin	1.0 mm	Top
TP59	P0.30	RGB LED 2 Blue color input pin	1.0 mm	Top
TP60	P1.04	UART1 RXD	1.0 mm	Top
TP61	P1.05	UART1 TXD	1.0 mm	Top
TP62	P1.06	UART1 CTS	1.0 mm	Top
TP63	P1.07	UART1 RTS	1.0 mm	Top
TP64	NetJ5-10	SD card slot card detect	1.0 mm	Top
TP65	P0.11	SD card slot level translator enable	1.0 mm	Top
TP66	P1.15	Current shunt monitor alert signal	1.0 mm	Top
TP67	GND	Ground	1.5 mm	Top
TP68	LINE_IN.LEFT	Line-in jack tip	1.5 mm	Top
TP69	LINE_IN.RIGHT	Line-in jack ring	1.5 mm	Top

Table 5: Test Points

3 Electrical specifications

 Operating the module at any conditions other than those specified in the [Operating conditions](#) should be avoided. Exposure to absolute maximum rating conditions for extended periods can affect device reliability.

 Where application information is given, it is only advisory and does not form part of the specification.

3.1.1 Operating conditions

Unless otherwise specified, all operating condition specifications are given for an ambient temperature of 25 °C and a supply voltage of 5 V through USB.

3.1.2 Operating temperature range

Parameter	Min	Typ	Max	Unit
Storage temperature	−40		+105	°C
Operating temperature	−40		+85	°C

Table 6: Temperature range

3.1.3 Supply/Power pins

Symbol	Parameter	Min	Typ	Max	Unit
VBUS	USB input supply voltage	4.5	5.0	5.5	V

Table 7: Input characteristics of voltage supply pins

3.1.4 Current consumption

[Table 8](#) shows the current consumption of C212-NORA-B126 LE audio board during a typical use (USB powered).

Mode	Condition	5V	
		Average	Peak
Active with FEM enabled (Debugger ON)	On	82.5 mA	111.5 mA
Active with FEM enabled (Debugger OFF)	On	32.5 mA	55.7 mA
Active with FEM bypass (Debugger ON)	OFF	85 mA	113 mA
Active with FEM bypass (Debugger OFF)	OFF	32 mA	52.5 mA

Table 8: Current consumption during typical use (USB powered)

[Table 9](#) shows the current consumption of NORA-B126 module

Mode	Condition	1V8	
		Average ¹	Peak ¹
Active with FEM enabled (Debugger OFF)	On	12 mA	40.5 mA
Active with FEM bypass (Debugger OFF)	OFF	11.3 mA	29.5 mA

Table 9: Current consumption of module

¹ Nordic Profiler Kit II used on connector P9

4 Software

The C212-NORA-B126 application board functions in a similar way to the Nordic Semiconductor nRF5340 Audio DK - albeit for the placement of an RGB1 LED display that makes for a notable visual distinction between the two. On the RF5340 Audio DK, the LED is located on the underside of the board and illuminates the Nordic Semiconductor logo. The same LED on the C212-NORA-B126 board is placed in the center of the top side of the C212-NORA-B126. Moreover, C212-NORA-B126 uses the NORA-B126 module, which includes the nRF5340 chip and a front-end module PA/LNA (FEM) for better range and coverage.

[Installation of nRF Connect SDK \[3\]](#) is required to build C212-NORA-B126 applications (v2.4.2 is suggested for the following instructions).

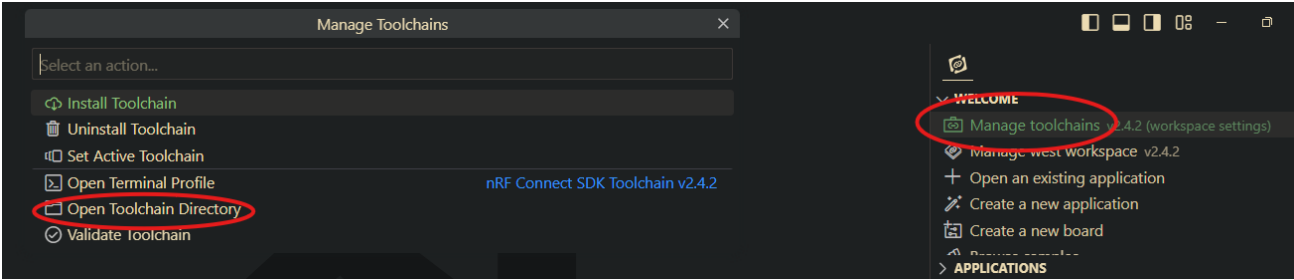
4.1 Usage without FEM support (FEM bypass)

To use the C212-NORA-B126 board without FEM support (FEM bypass) refer to the [nRF5340 Audio DK guide \[4\]](#).

4.2 Usage with FEM support

It is recommended to complete the previous guide [\[4\]](#) and test the boards functionality without FEM support before proceeding.

To use the C212-NORA-B126 with FEM support (FEM enabled):

1. Create a new `bin` folder inside your application folder:
(`C:\ncs\v2.x.x\nrf\applications\nrf5340_audio\bin`). The default nRF Connect SDK path is `C:\ncs\v2.x.x\` but it can also be found from the nRF Connect for VS Code extension:

2. Download the latest precompiled Bluetooth Low Energy Controller binary file or copy the `ble-ctr-rpmsg*.hex` file from `C:\ncs\v2.x.x\nrf\lib\bin\bt_ll_acs_nrf53\bin` to `C:\ncs\v2.x.x\nrf\applications\nrf5340_audio\bin` (version `ble5-ctr-rpmsg_3393.hex` or later is suggested).
3. Backup the `C:\ncs\v2.x.x\nrf\boards\shields\nrf21540ek` folder (`nrf21540_ek` in older nRF Connect SDK versions).
4. Replace the configuration of `nrf21540ek\nrf21540ek.overlay` file with:

```
/ {
  nrf_radio_fem: sky66405 {
    compatible = "skyworks,sky66403-11", "generic-fem-two-ctrl-pins";
    ctx-gpios = <&gpio1 8 GPIO_ACTIVE_HIGH>;
    crx-gpios = <&gpio1 9 GPIO_ACTIVE_HIGH>;
  };
};
```

The NORA-B126 GPIO characteristics that control the CTX and CRX FEM signals are defined with the `ctx-gpios` and `crx-gpios` properties respectively. See also [Adding support for front-end modules using Simple GPIO interface \[5\]](#).

5. Replace the configuration of `nrf21540ek\nrf21540ek_fwd.overlay` file with:

```
&gpio_fwd {
nrf21540-gpio-if {
gpios = <&gpio1 8 0>,
        <&gpio1 9 0>,
        <&arduino_header 15 0>,      /* pdn-gpios */
        <&arduino_header 10 0>,      /* ant-sel-gpios */
        <&arduino_header 8 0>;       /* mode-gpios */
};
nrf21540-spi-if {
gpios = <&arduino_header 16 0>,      /* cs-gpios */
        <&gpio1 15 0>,               /* SPIM_SCK */
        <&gpio1 14 0>,               /* SPIM_MISO */
        <&gpio1 13 0>;               /* SPIM_MOSI */
};
};
```

With this overlay the GPIO pins that control the FEM should be forwarded by the application core to the network core. See also [Zephyr GPIO forwarder \[6\]](#).

6. Change the `prj.conf` file according to your application.

As an example, for the [walkie-talkie-demo \[7\]](#) add the following line at the end of `prj.conf`:

```
CONFIG_WALKIE_TALKIE_DEMO=y
```

The Walkie-talkie demo enables the communication through the PDM microphones of a C212-NORA-B126 board programmed as gateway and another board programmed as headset – with no button press required.

7. Build the application. In order to run west commands in VS Code an nRF Connect terminal [\[8\]](#) should be opened.

- Build command for headset:

```
west build -b nrf5340_audio_dk_nrf5340_cpuapp --build-dir build_fem_on_headset --pristine -- -DCONFIG_AUDIO_DEV=1 -DSHIELD=nrf21540ek_fwd -DCONF_FILE=prj.conf -Dmultiprotocol_rpmsg_SHIELD=nrf21540ek
```

- Build command for gateway:

```
west build -b nrf5340_audio_dk_nrf5340_cpuapp --build-dir build_fem_on_gateway --pristine -- -DCONFIG_AUDIO_DEV=2 -DSHIELD=nrf21540ek_fwd -DCONF_FILE=prj.conf -Dmultiprotocol_rpmsg_SHIELD=nrf21540ek
```

- Build command for testing without FEM enabled (FEM bypass) for headset:

```
west build -b nrf5340_audio_dk_nrf5340_cpuapp --build-dir build_fem_off_headset --pristine -- -DCONFIG_AUDIO_DEV=1 -DCONF_FILE=prj.conf
```

(`nrf21540ek_fwd` should be `nrf21540_ek_fwd` and `nrf21540ek` should be `nrf21540_ek` in older nRF Connect SDK versions)

8. Program the application:

- a) Program the network core:

```
nrfjprog --program bin\<ble5-ctr-rpmsg_*.hex> --chiperase -coprocessor CP_NETWORK -r
```

- b) Program the application core:

```
nrfjprog --program <BUILD_FOLDER>\zephyr\zephyr.hex --coprocessor CP_APPLICATION -chiperase -r
```

BUILD_FOLDER should be: `build_fem_on_headset`, `build_fem_on_gateway` or `build_fem_off_headset`.

More information can be found in [Programming the application \[9\]](#) section.

5 Mechanical specification

5.1 Physical dimensions

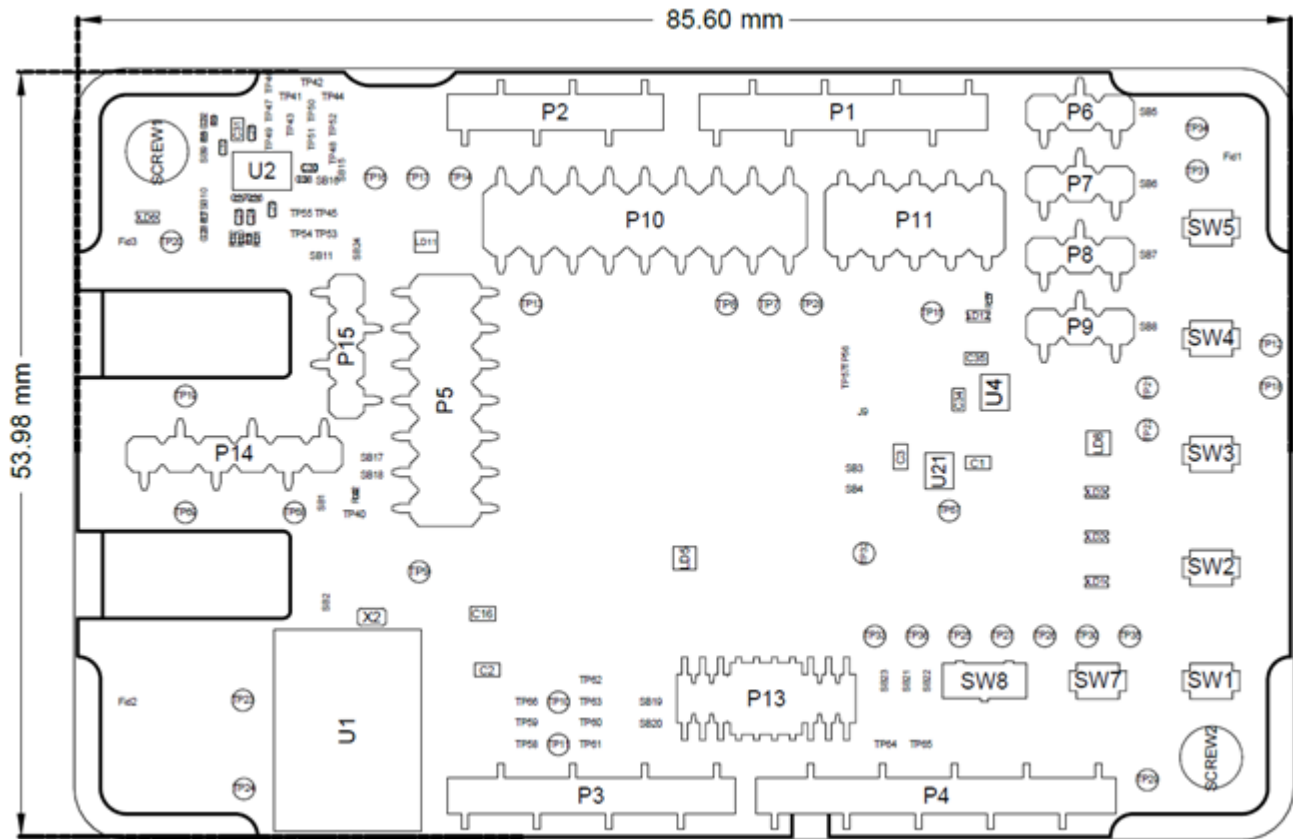


Figure 11: Physical dimensions of the C212-NORA-B126 LE Audio board

6 Limitations

 Regulatory limitations: C212-NORA-B126 is an application board. It has not been RF certified with worldwide agencies. It may not be offered for sale as an end-user product.

6.1 Hardware

The current hardware revision can only accommodate a single microSD card with a storage capacity of up to 16 GB. Cards that have more than 16 GB capacity might not work.

6.2 Software

nRF Connect SDK v2.4.2 [\[10\]](#) is currently supported.

7 Schematics

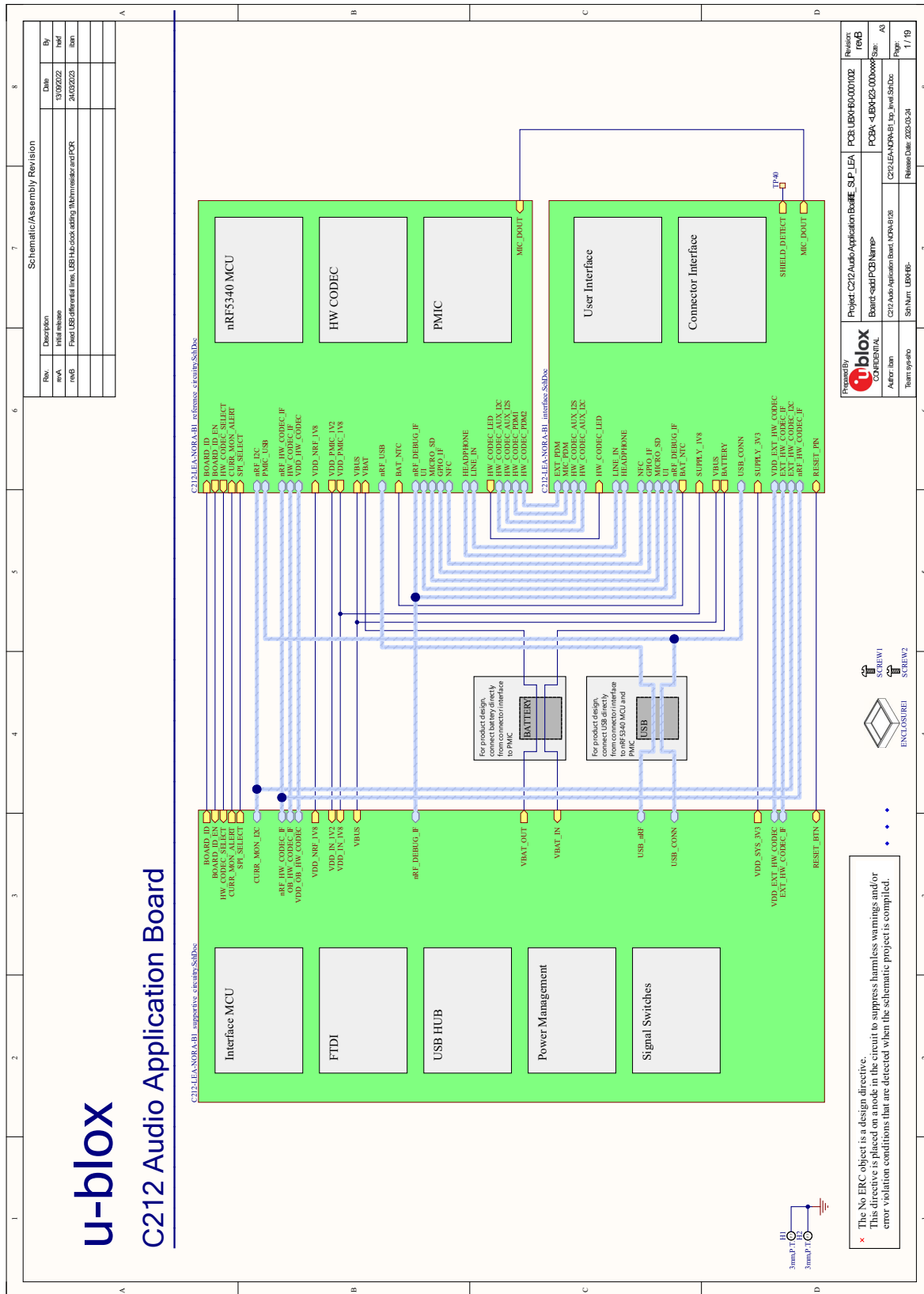


Figure 12: Top-level schematic (1 of 19)

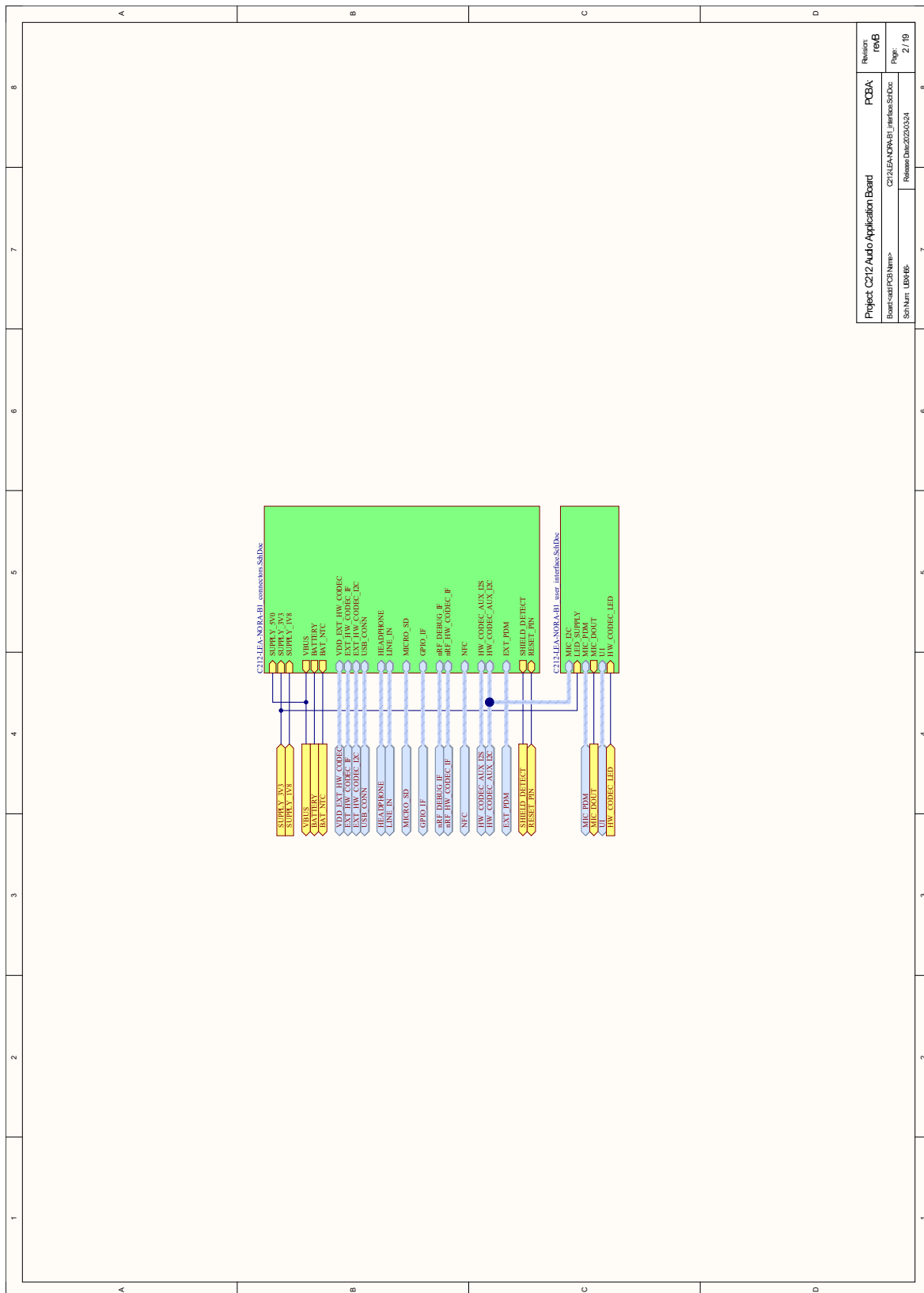


Figure 13: Interface schematic (2 of 19)

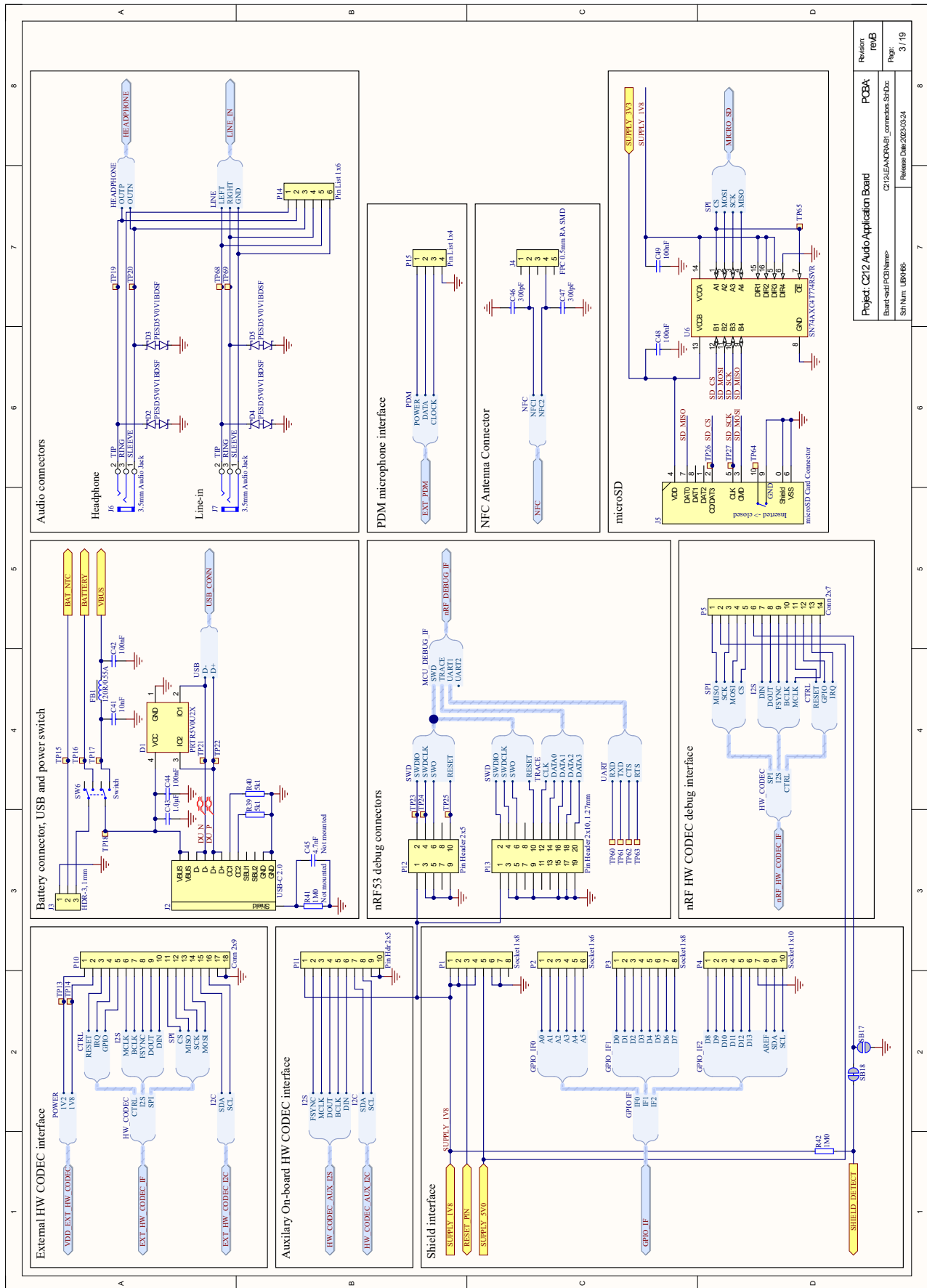


Figure 14: Connectors schematic (3 of 19)

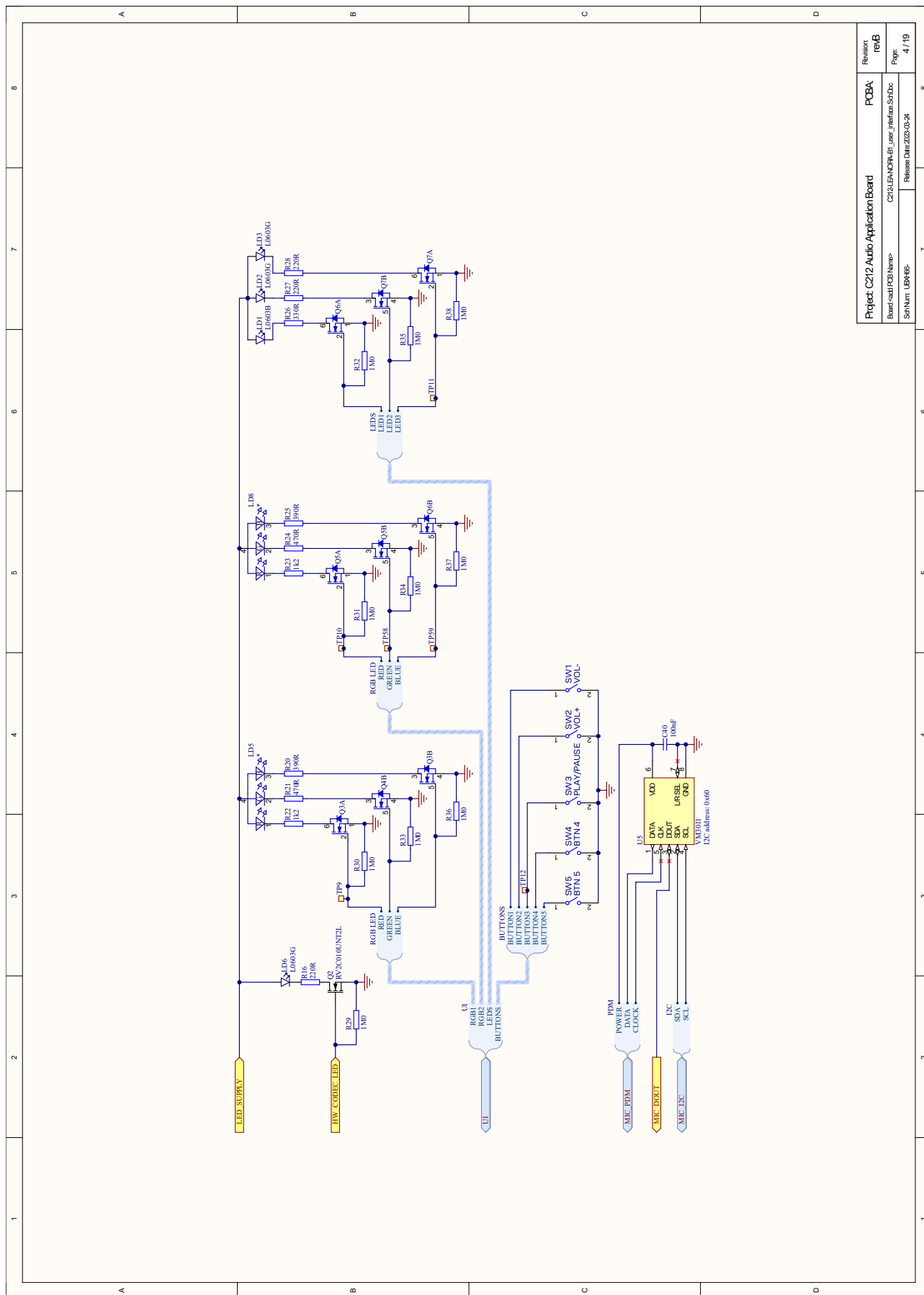


Figure 15: User interface schematic (4 of 19)

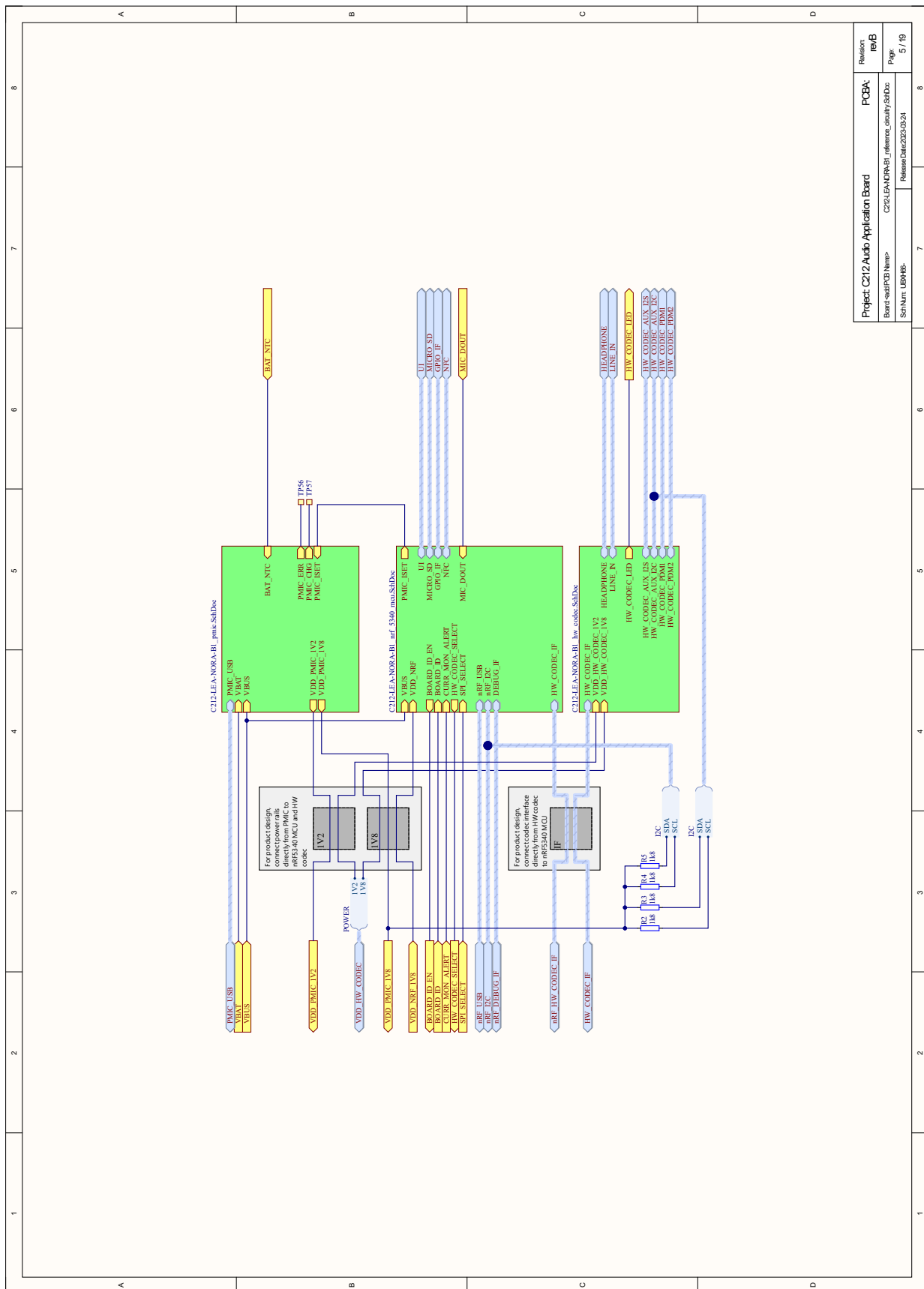


Figure 16: Reference circuitry schematic (5 of 19)

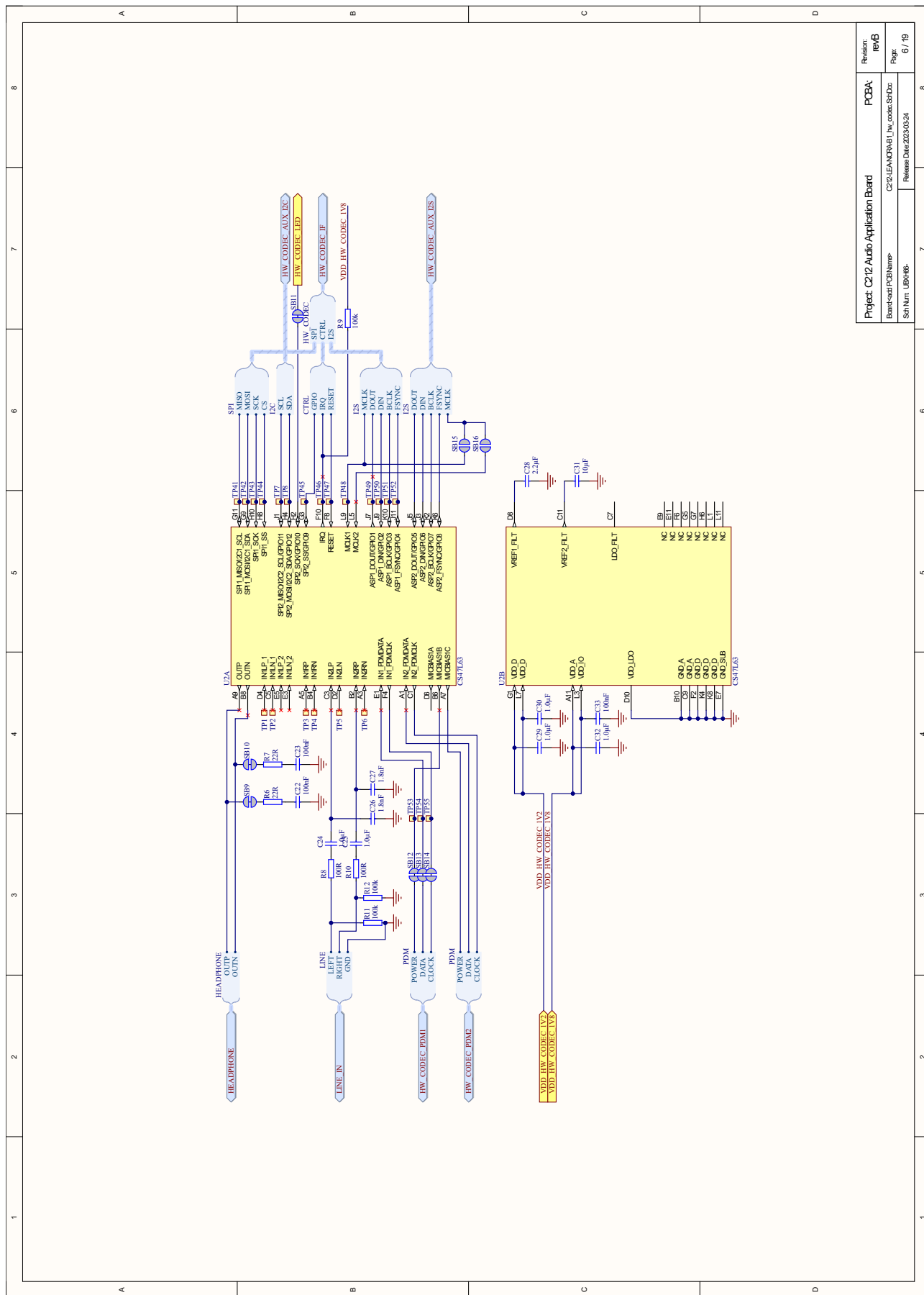


Figure 17: Hardware codex schematic (6 of 19)

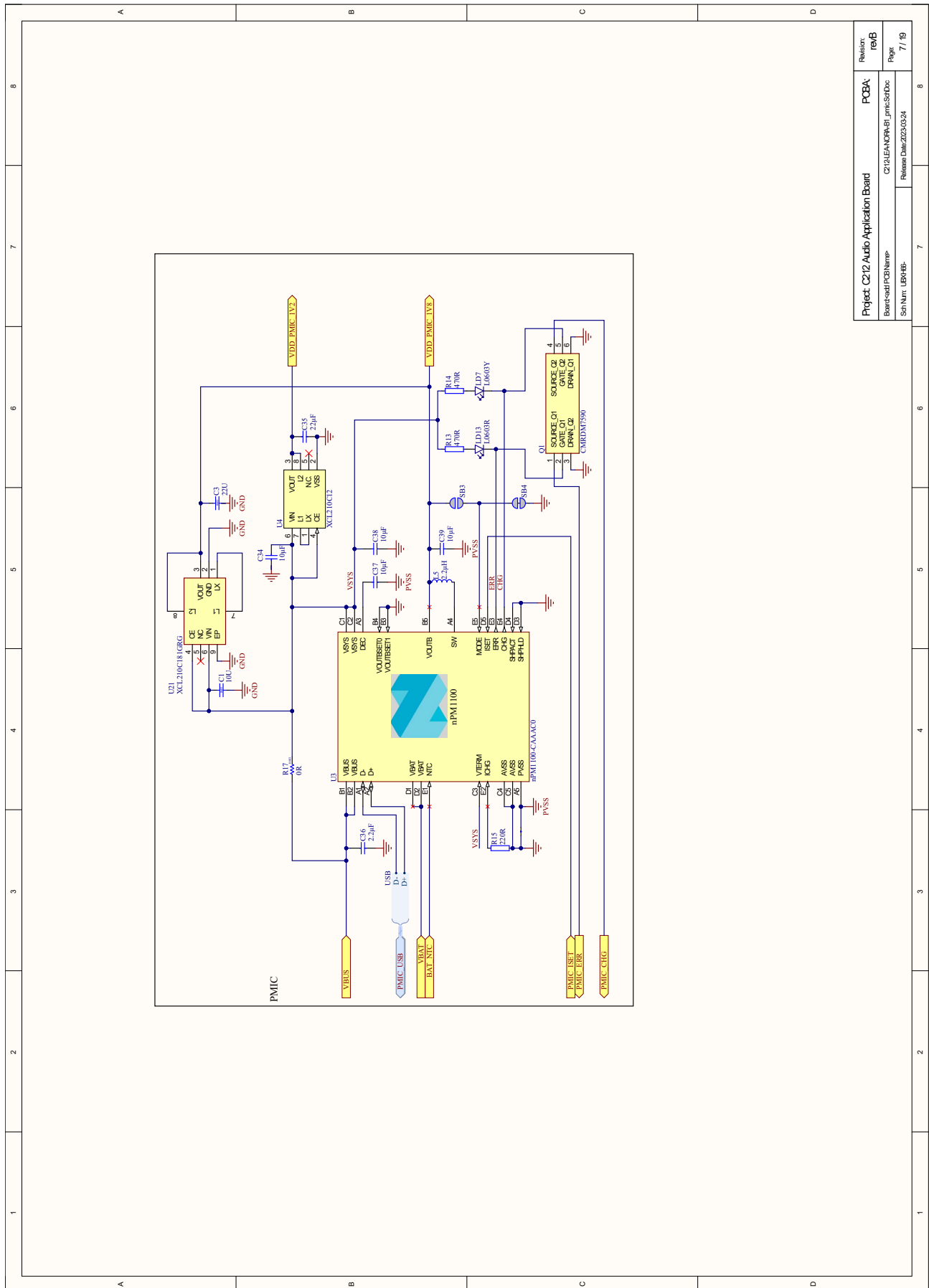


Figure 18: PMIC schematic (7 of 19)



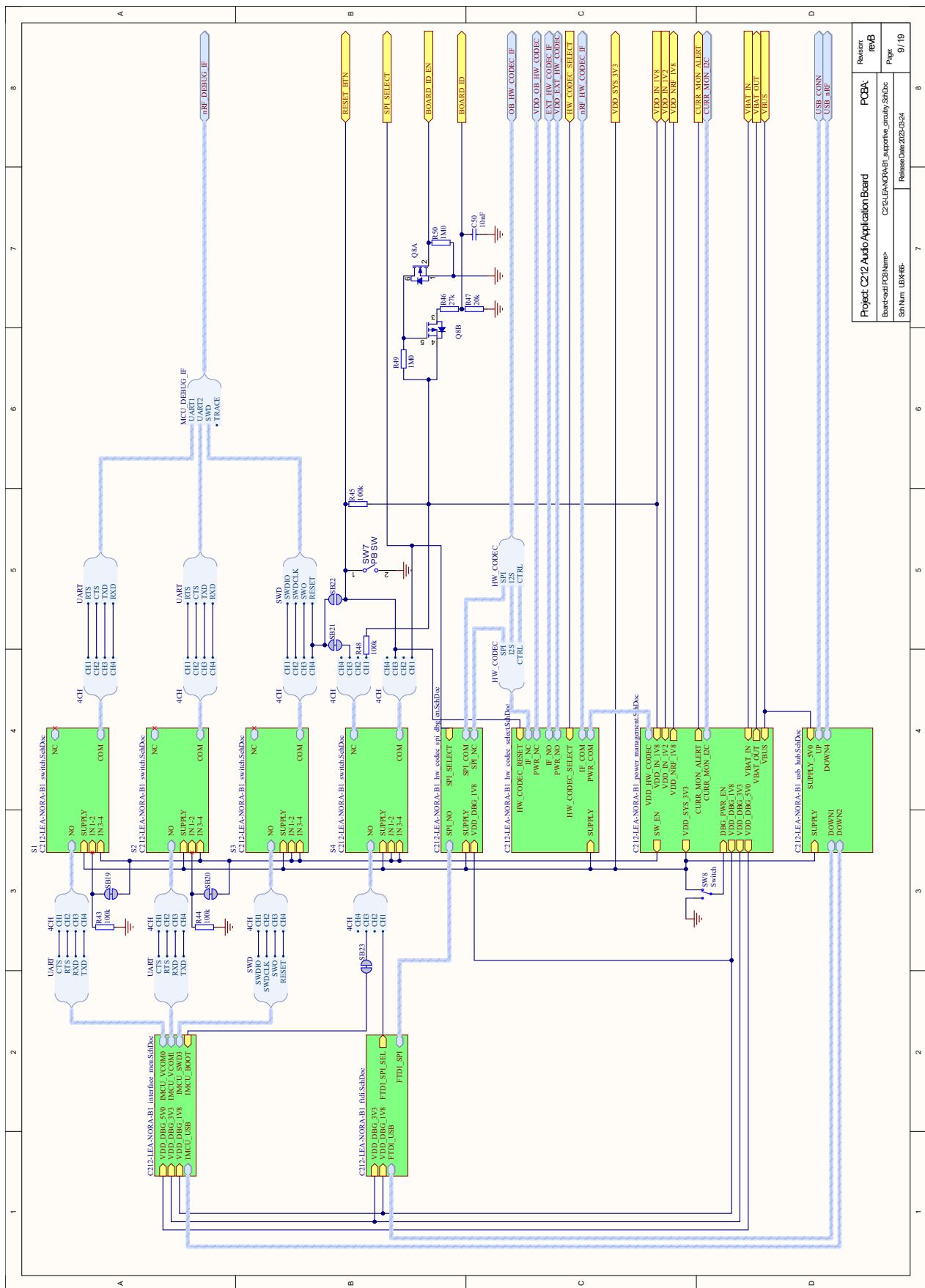
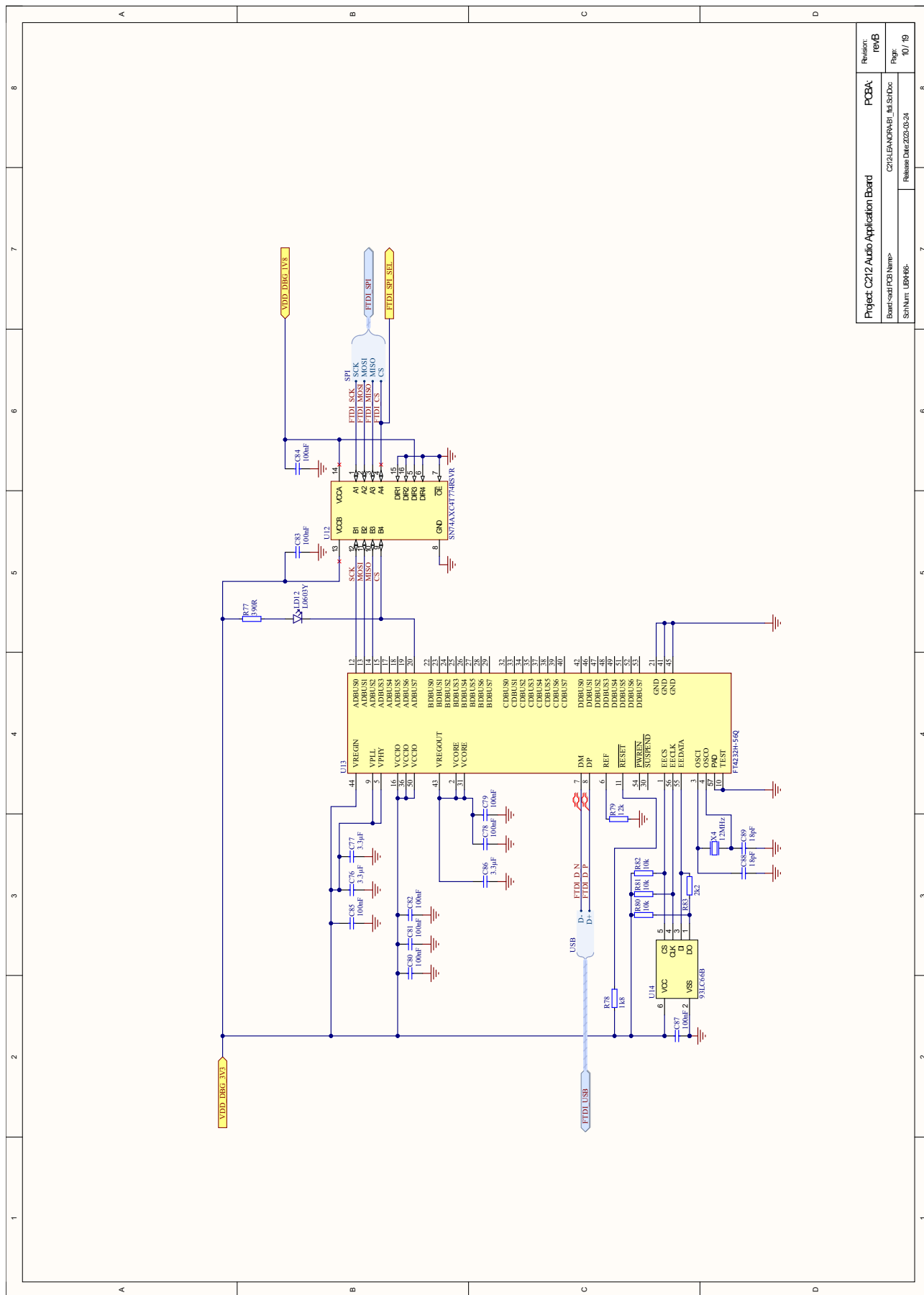


Figure 20: Supportive circuitry schematic (9 of 19)



Revision	revB
PCBA	PCBA
Board-part PCB Name	C212-LEA-NORA-B126-126
SchName	UBX466
Release Date	2023-03-24
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Figure 21: FTDI schematic (10 of 19)

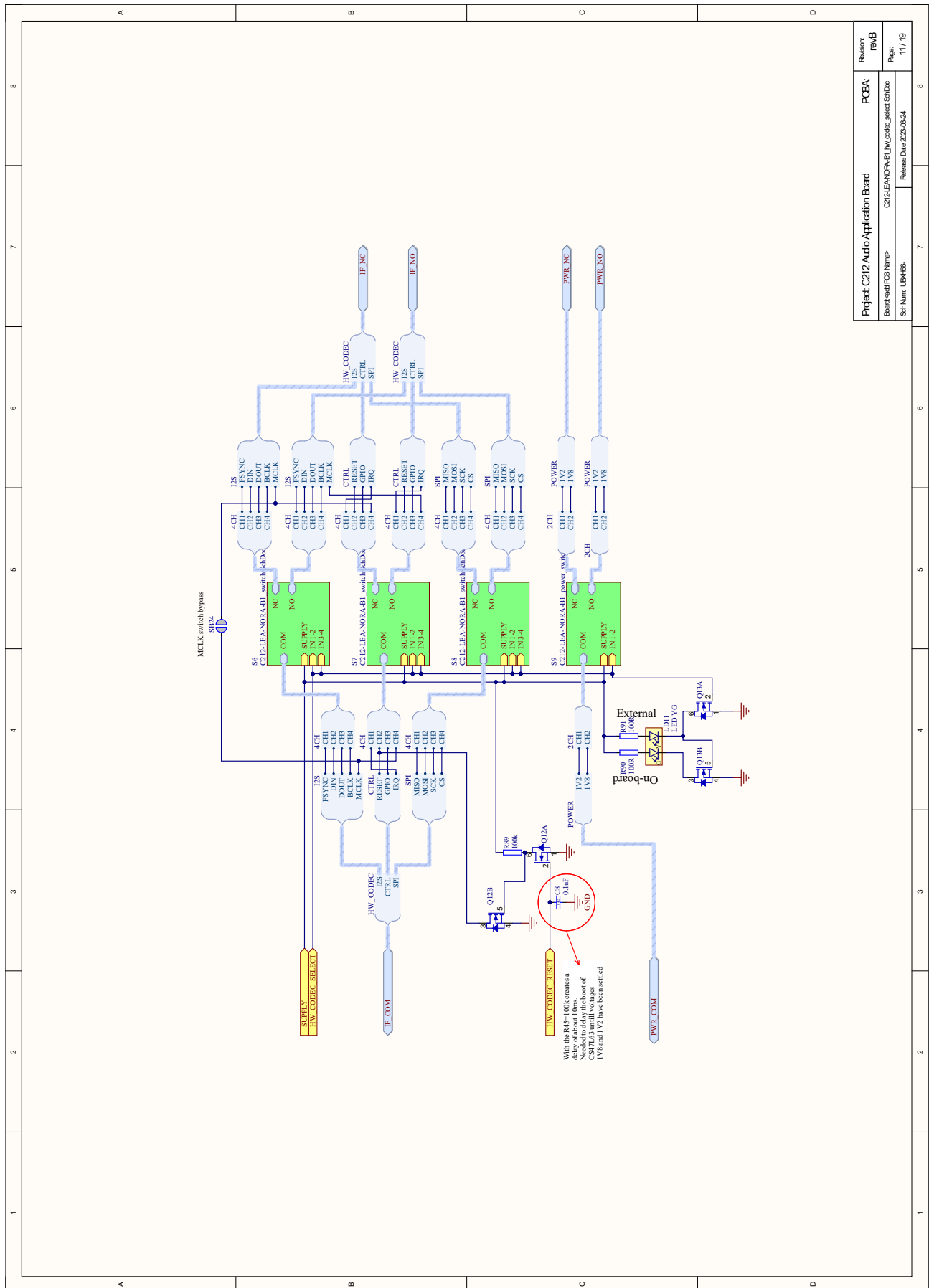


Figure 22: Hardware codec select (11 of 19)

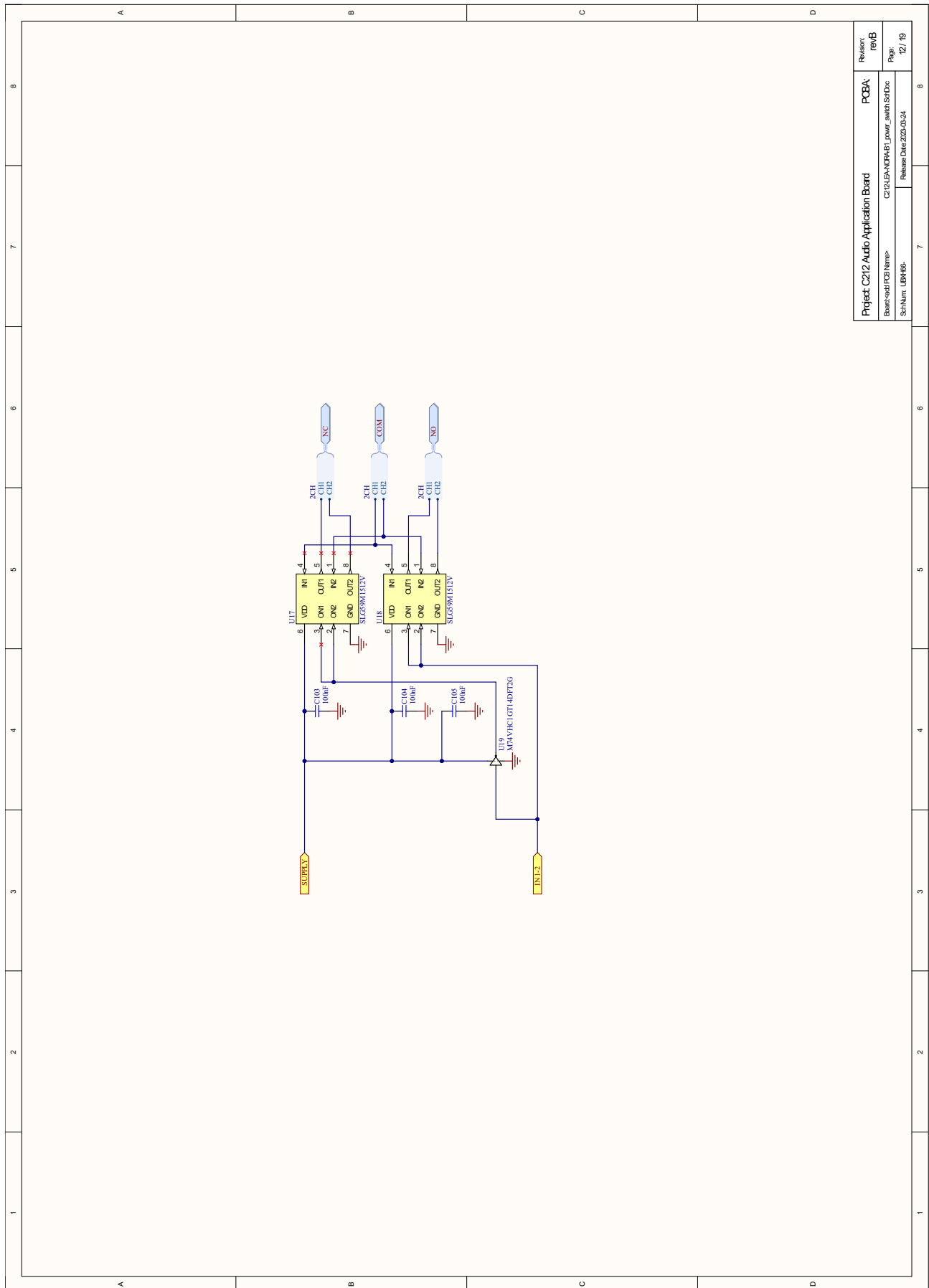


Figure 23: Power switch (12 of 19)

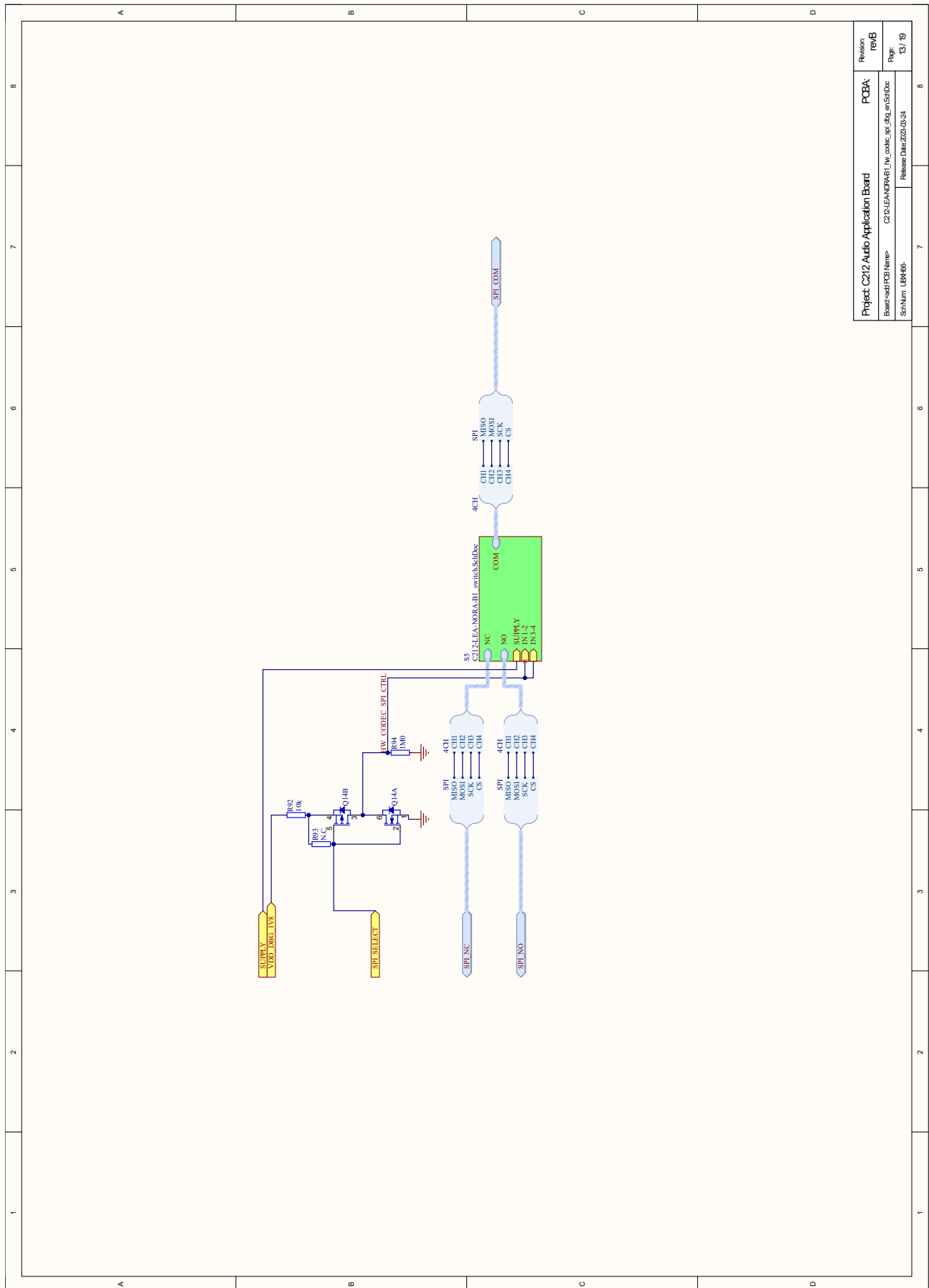


Figure 24: Hardware codec SPI debug (13 of 19)

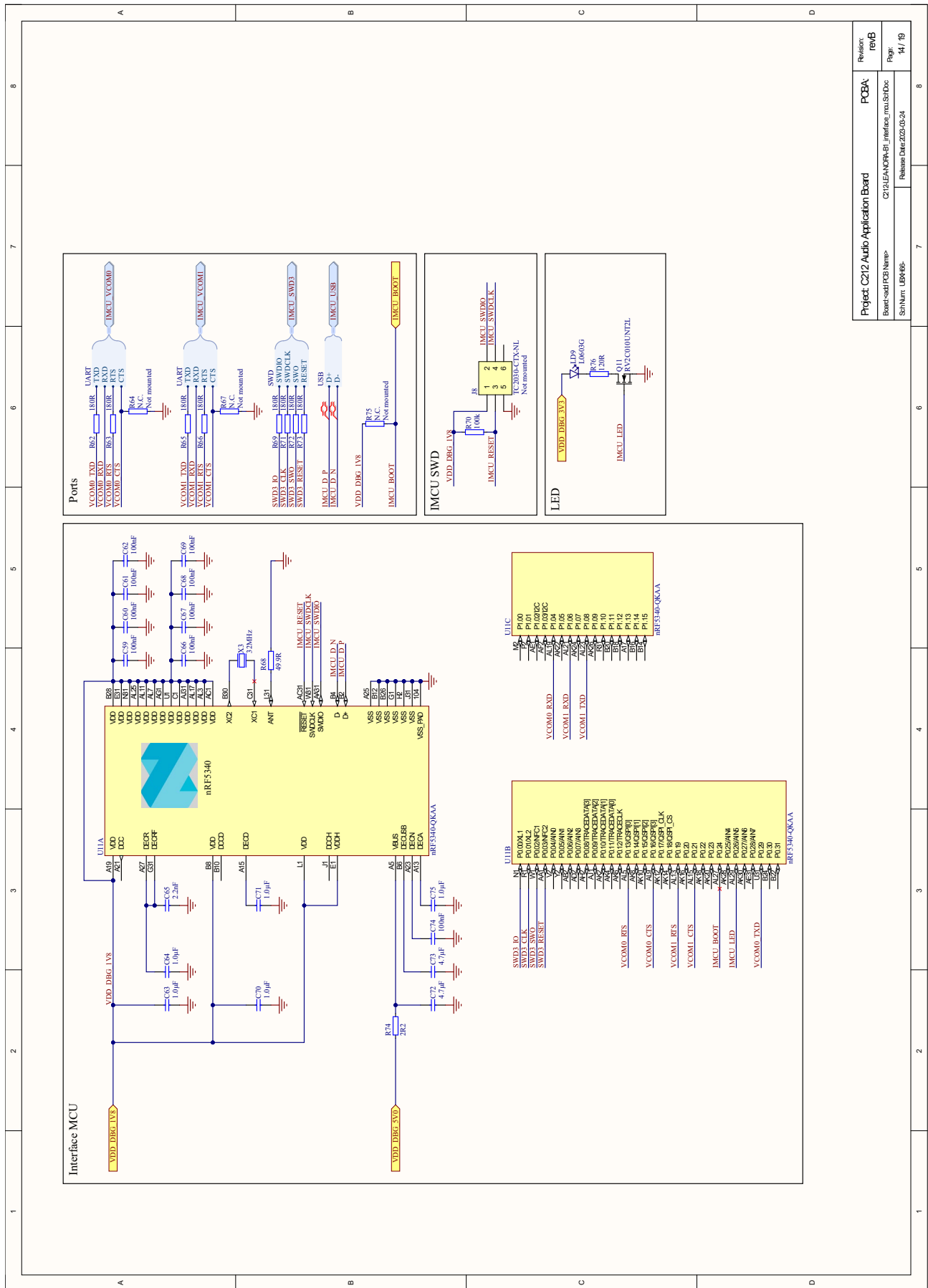
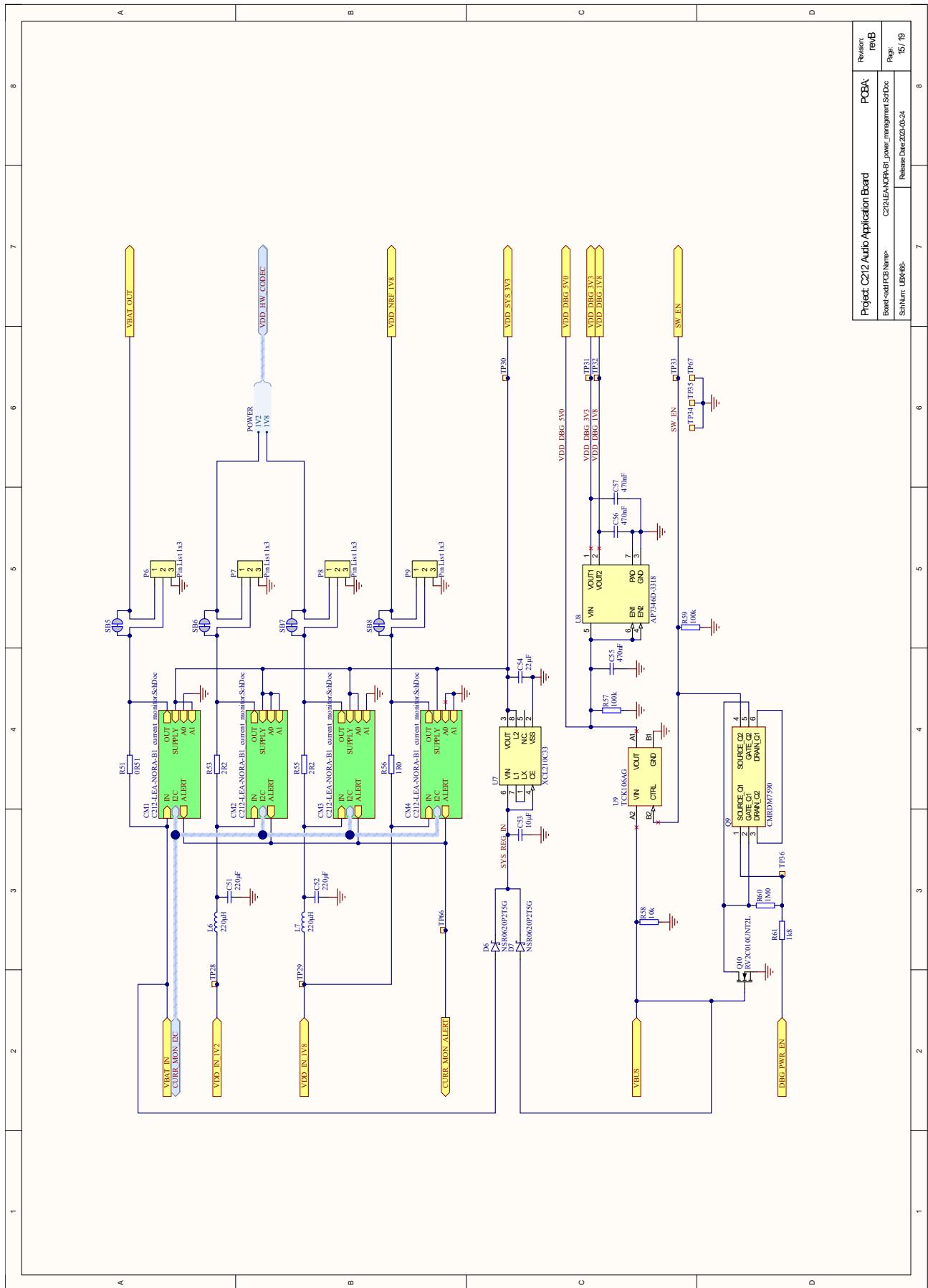
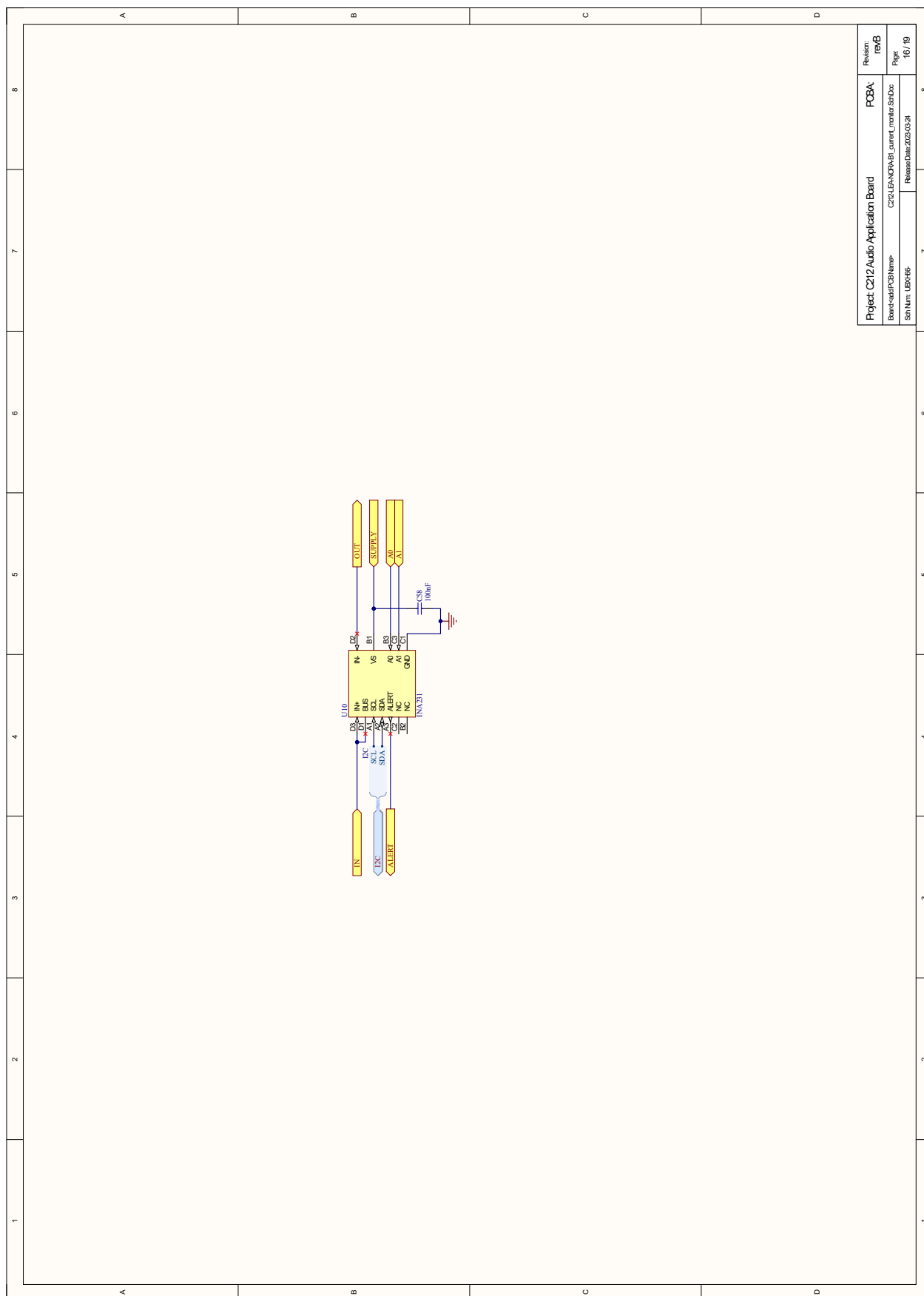


Figure 25: MCU interface schematic (14 of 19)



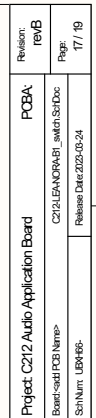
Revision	revB
PCBA	PCBA
Board-set PCB Name	C212-LEA-NORA-B1_power_management_SchDoc
SchName	UBX466-
Release Date	2023-03-24
Page	15 / 19

Figure 26: Power management schematic (15 of 19)



Project: C212 Audio Application Board	PCBA:	Revision:
Board<add>PCB Name:	C212-LEA-NORA-B126_General_Monitor_SchDoc	revB
SPN Num: LB00466	Release Date: 2023-03-24	Page:
		16 / 19

Figure 27: Current monitor (16 of 19)



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C1-Public

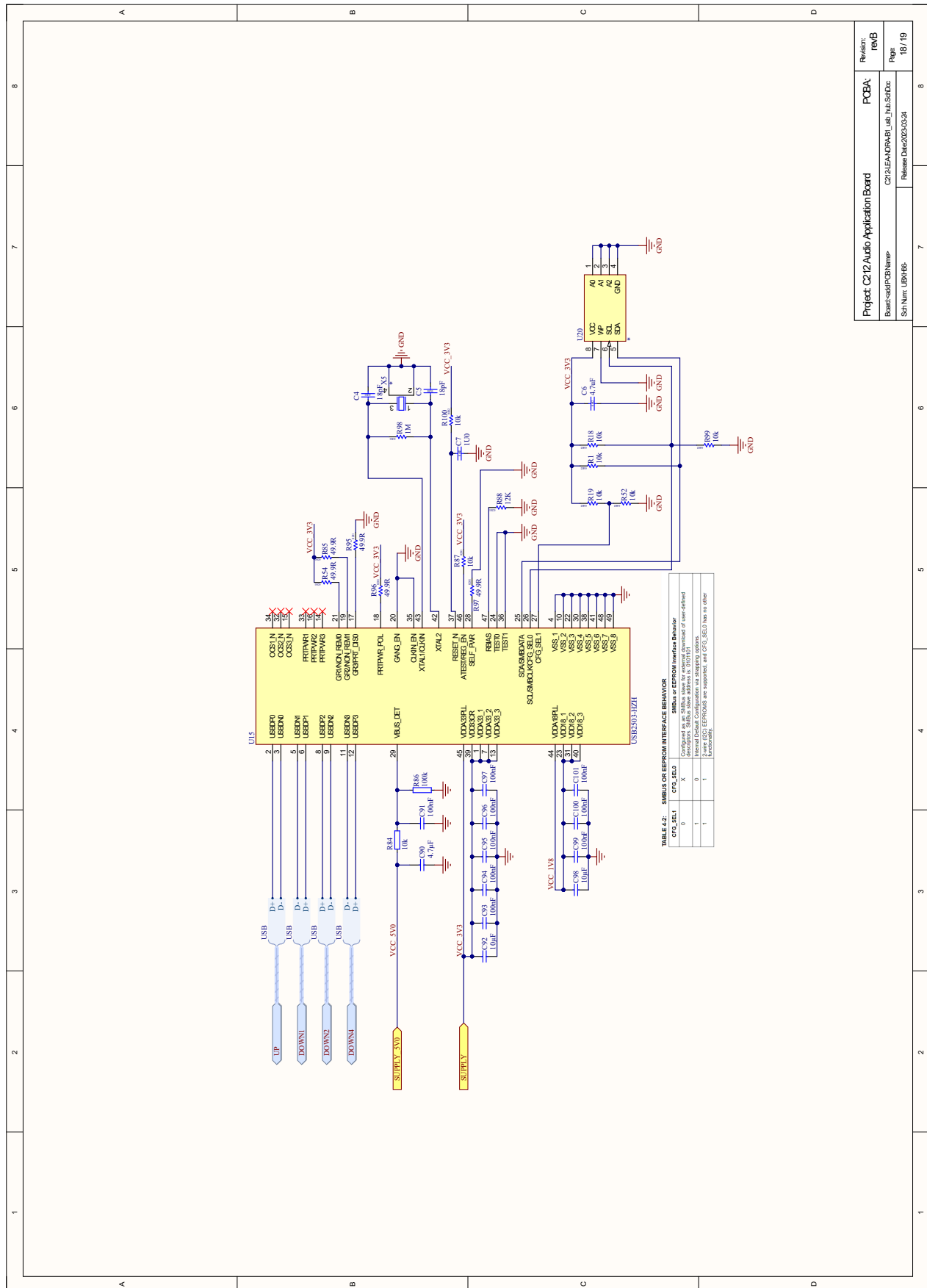


Figure 29: USB Hub (18 of 19)

Appendix

A Glossary

Abbreviation	Definition
I2S	Inter-IC-Sound
IC	Integrated Circuit
PDM	Pulse Density Modulation
microSD card	micro Secure Digital card
SPI	Serial Peripheral Interface
UART	Universal Asynchronous Receiver-Transmitter
USB	Universal Serial Bus
VIO	Input /Output Voltage

Table 10: Explanation of the abbreviations and terms used

Related documentation

- [1] NORA-B1 series data sheet, [UBX-20027119](#)
- [2] NORA-B1 system integration manual, [UBX-20027617](#)
- [3] nRF Connect SDK [installation guide](#)
- [4] Nordic Semiconductor nRF5340 Audio DK [application guide](#)
- [5] Nordic Semiconductor nRF Connect SDK, [Adding support for front-end modules using Simple GPIO interface](#)
- [6] Nordic Semiconductor Zephyr [GPIO forwarder](#)
- [7] Nordic Semiconductor nRF Connect SDK, Testing the [walkie-talkie demo](#)
- [8] Nordic Semiconductor [nRF Terminal](#)
- [9] Nordic Semiconductor nRF Connect SDK, [Programming the application](#)
- [10] Nordic Semiconductor nRF Connect SDK v2.6.0, [Release Notes](#)
- [11] Nordic Semiconductor nRF Connect SDK, [User interface](#)

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Revision history

Revision	Date	Name	Comments
R01	24-May -2024	iban	Initial release
R02	16-Aug-2024	mape	Minor corrections in chapter Software .
R03	12-Sep-2024	mape	Corrected text in Usage without FEM support (FEM bypass)

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