AIROC™ CYW55913 Wi-Fi & Bluetooth® Low Energy connected MCU Evaluation Kit user guide

About this document

Scope and purpose

The Infineon AIROC™ CYW55913 Wi-Fi and Bluetooth® Low Energy (LE) connected MCU Evaluation Kit (CYW955913EVK-01) enables the evaluation, prototyping, and development of a wide array of Internet of Things (IoT) applications using the AIROC™ CYW55913, ultra-low-power, single-chip, connected MCU that support 1x1 Wi-Fi 6/6E, Bluetooth® LE 5.4, Matter, IP networking, with integrated PMU, targeted at IoT applications for standalone operation or to offload a host-processor. An integrated 192 MHz Arm® Cortex®-CM33 runs the Wi-Fi and Networking Stacks, Bluetooth® LE 5.4 and supports a wide array of peripherals.

The integrated Arm® Cortex®-CM33 can operate up to 192 MHz, supporting:

- 2048 KB of ROM and 768 KB of SRAM
- Three Serial Control Blocks (SCB) and supporting I2C/SPI/UART
- 9x TCPWM blocks
- PDM interface for digital microphone support
- 12-bit ADC with seven-channel mux input for analog microphone support or seven channels of DC sensing
- A pair of time-division multiplexing (TDM) interfaces enables a flexible interface for various audio use cases
- 4-wire UART or SDIO (shared with Wi-Fi) interface is available for interfacing with the host processor

Intended audience

The target audience for this evaluation board comprises technical specialists with expertise in connectivity, particularly those interested in Wi-Fi® and Bluetooth® LE development with connected MCU. Its intended usage is within laboratory conditions.

Important notice

“Evaluation Boards and Reference Boards” shall mean products embedded on a printed circuit board (PCB) for demonstration and/or evaluation purposes, which include, without limitation, demonstration, reference and evaluation boards, kits and design (collectively referred to as “Reference Board”).

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Safety precautions

***Note**: Please note the following warnings regarding the hazards associated with development systems*

Table 1 Safety precautions

	**Caution:** *The evaluation or reference board contains parts and assemblies sensitive to electrostatic discharge (ESD). Electrostatic control precautions are required when installing, testing, servicing or repairing the assembly. Component damage may result if ESD control procedures are not followed. If you are not familiar with electrostatic control procedures, refer to the applicable ESD protection handbooks and guidelines.*

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1 Introduction

Infineon AIROC™ CYW55913 Evaluation Kit (CYW955913EVK-01) enables the evaluation, prototyping, and development of a wide array of Internet of Things (IoT) applications using the AIROC™ CYW55913, ultra-low-power, single-chip, and connected MCU.

The Infineon CYW55913/55912/55911/55903/55902/55901 are a family of ultra-low-power, single-chip, connected MCUs that support 1x1 Wi-Fi 6/6E, Bluetooth® Low Energy 5.4, Matter, IP networking, with integrated PMU, targeted at IoT applications for standalone operation or to offload a host-processor. An integrated 192 MHz Arm® Cortex®-CM33 runs the Wi-Fi and Networking Stacks, Bluetooth® LE 5.4 and supports a wide array of peripherals.

CYW955913EVK-01, ModusToolbox™ software, and tools form a powerful but easy-to-use toolset that helps the users to create Wi-Fi and Bluetooth® enabled IoT solutions. The CYW955913EVK-01 offers footprint compatibility with Arduino shields. The development environment is compatible with Windows, macOS, and Linux operating systems. In addition, the kit features an onboard programmer/debugger (KitProg3).

***Note**: This kit supports ModusToolbox™ software 3.2 or later.*

To order the Evaluation Kit (EVK), reach out to Infineon's sales team.

1.1 Kit contents

This evaluation kit box includes the following:

- CYW55913 Evaluation Board (CYW9CPM2BASE1 + CYW955913SDCM2WLIPA)
- 30-pin FFC cable with M.2 Adapter Card
- USB Type-C to Type-C cable
- Six jumper wires, each five inches in length
- Two Laird Triband PCB Antenna
- Quick start guide

Figure 1 CYW955913EVK-01 kit contents

Figure 1 shows CYW955913EVK-01 kit contents. Inspect the kit contents. If you find any part missing, contact your nearest Infineon sales office for assistance: www.infineon.com/support.

1.2 Kit details

Figure 1 shows CYW955913EVK-01 with the following features:

- CYW55913 M.2 carrier module with antenna connectors
- Expansion headers compatible with Arduino shields
- Supports 1.8 V, 3.3 V, and 5 V operation of Arduino shields
- Reset button (black) and User button (white)
- Onboard USB Type-C connector (J6) for powering, programming, and debugging purposes

Follow these steps before connecting the board and verifying the driver installation:

1. Verify that all the jumpers are in the default configuration, as shown in Table 3 to Table 6, so that the peripheral UART is selected and can display embedded application trace messages. Figure 2 shows the default jumper locations.
2. Connect the USB connector (J6) of the EVK to the development PC with the provided Type-C USB cable. The USB UART driver loads automatically. If the EVK is not detected as a USB device, reinstall the USB UART driver in the following ModusToolbox™ installation directory:
   - Windows and macOS: *<install>\tools_3.2\driver_media\dpinst*
   - Linux: *<install>\tools_3.2 \driver_media\install_driver\dpinst*

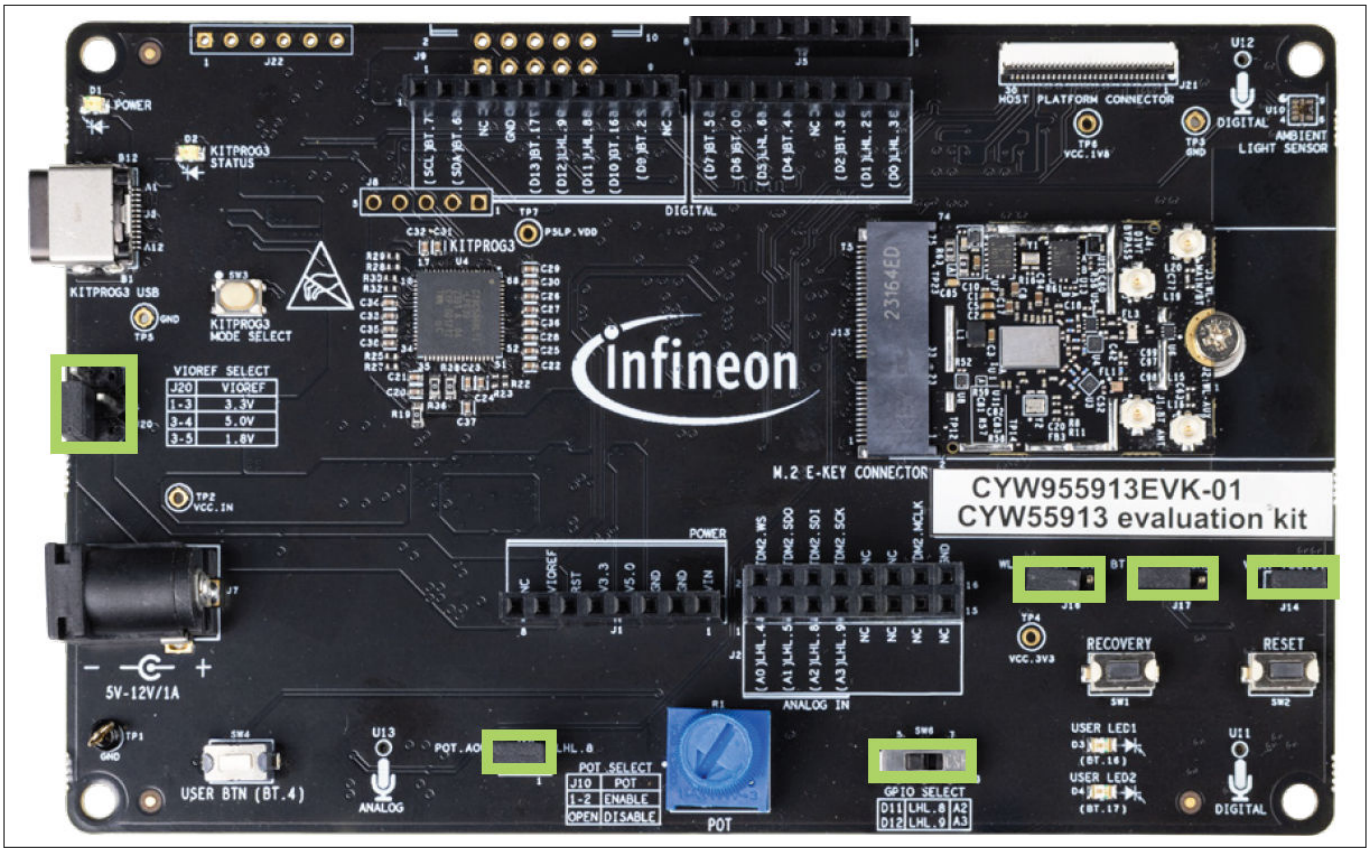

Figure 2 CYW955913EVK-01 default jumper settings

Figure 3 highlights the LEDs provided on CYW955913EVK-01:

- LED D1 (Yellow) indicates that input power is ON.
- LED D2 (Yellow) indicates KitProg3 status.
- LED D3 (Red) and LED D4 (Orange) are generic user LEDs controlled by GPIOs. A label on the back of the kit provides the pin mapping.

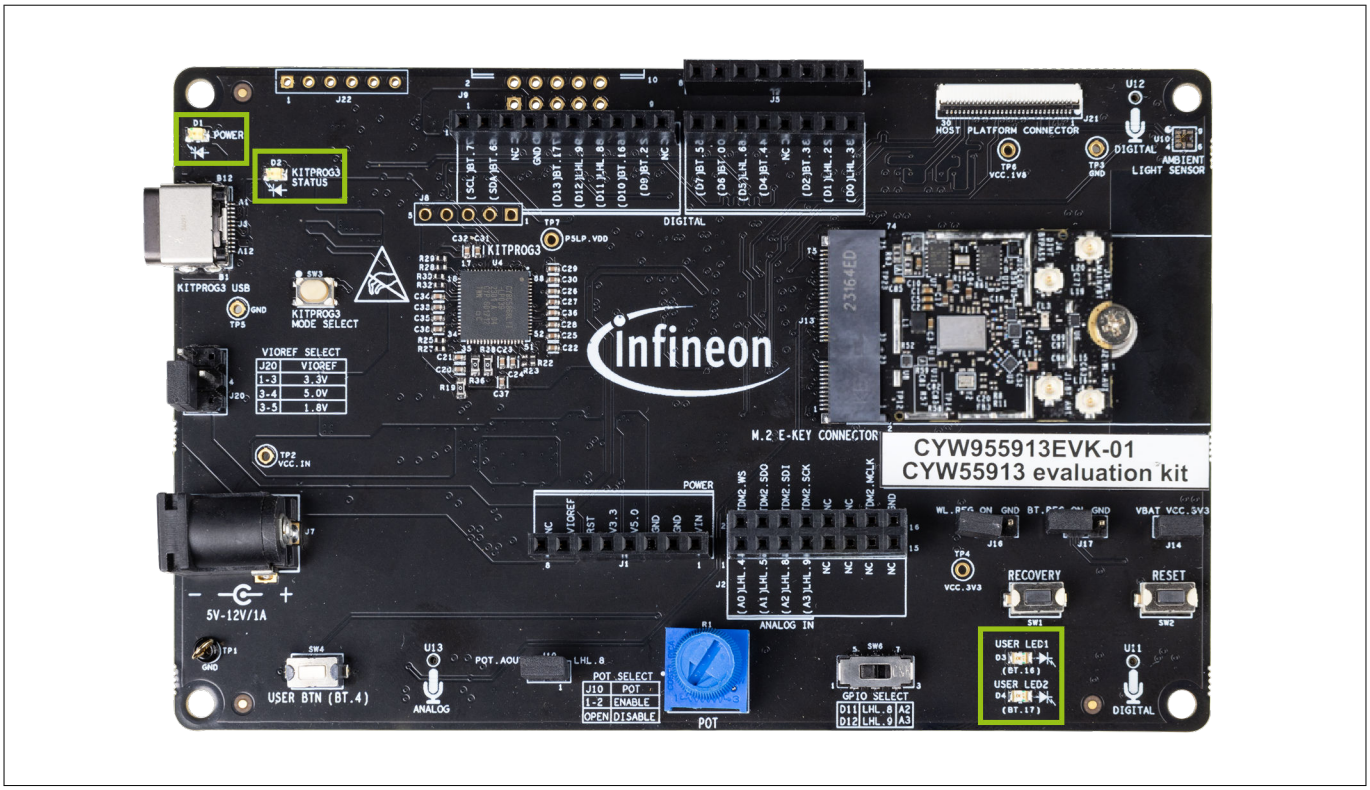

Figure 3 CYW955913EVK-01 LEDs

1.3 Getting started

This user guide helps you find the details of the CYW955913EVK-01 kit:

- The Kit operation chapter describes the operation of the kit and the utility of its various features.
- The Hardware chapter describes the design details of the CYW955913EVK-01 hardware blocks.

Perform the following steps to get started with the out of the box experience of the CYW955913EVK-01 Kit.

1. Before you start, ensure that you have the following:
   - PC with Type-C USB port
   - UART terminal soft¬ware such as TeraTerm or Minicom
2. Connect the Triband PCB antenna to the UFL connectors J3 (WL Main) and J2 (WL AUX) on the M.2 radio card
3. Ensure that the jumper and switch settings on the board are configured as shown in Table 2 to Table 7
4. Connect the KitProg3 USB Type-C connector (J6) to your PC
5. Wait for the driver installation to complete

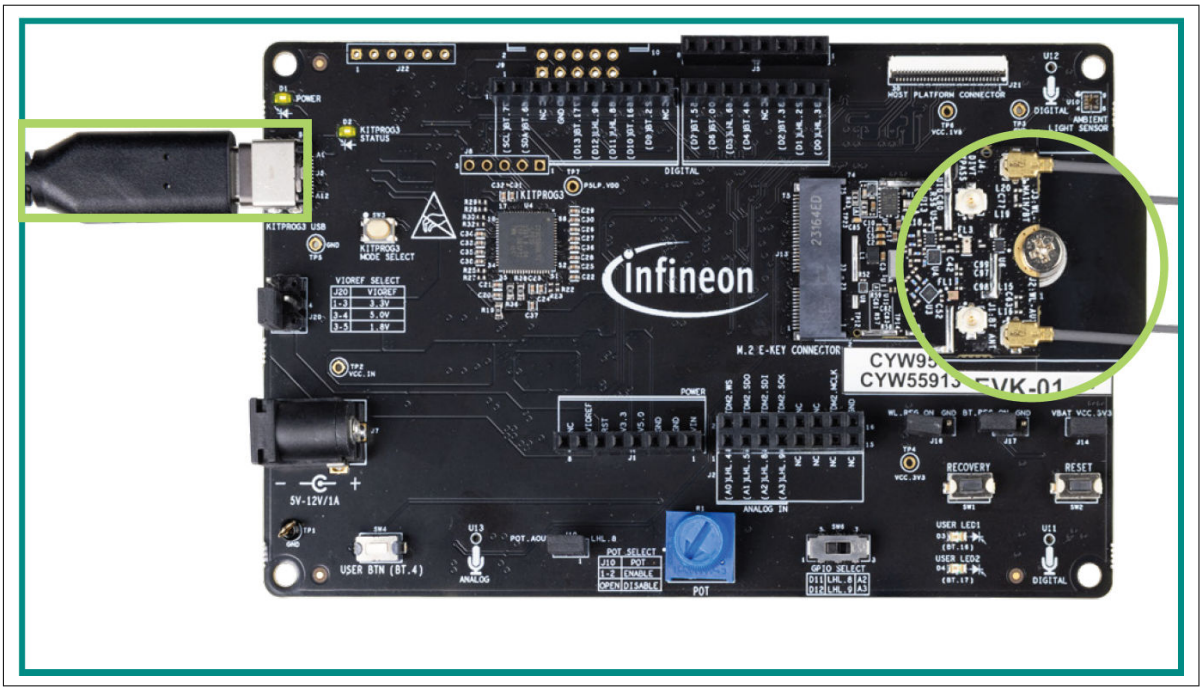

Figure 4 CYW955913EVK-01 Antenna connection

6. Open the UART terminal software and connect to the kit's Peripheral UART COM port with the following settings:
   - **Baud rate:** 115200
   - **Data:** 8 bit
   - **Parity:** None
   - **Stop bit**: 1 bit
   - **Flow control:** None
7. Press the Reset button (SW2) and follow the instructions displayed on the UART terminal to use the pre-programmed code example

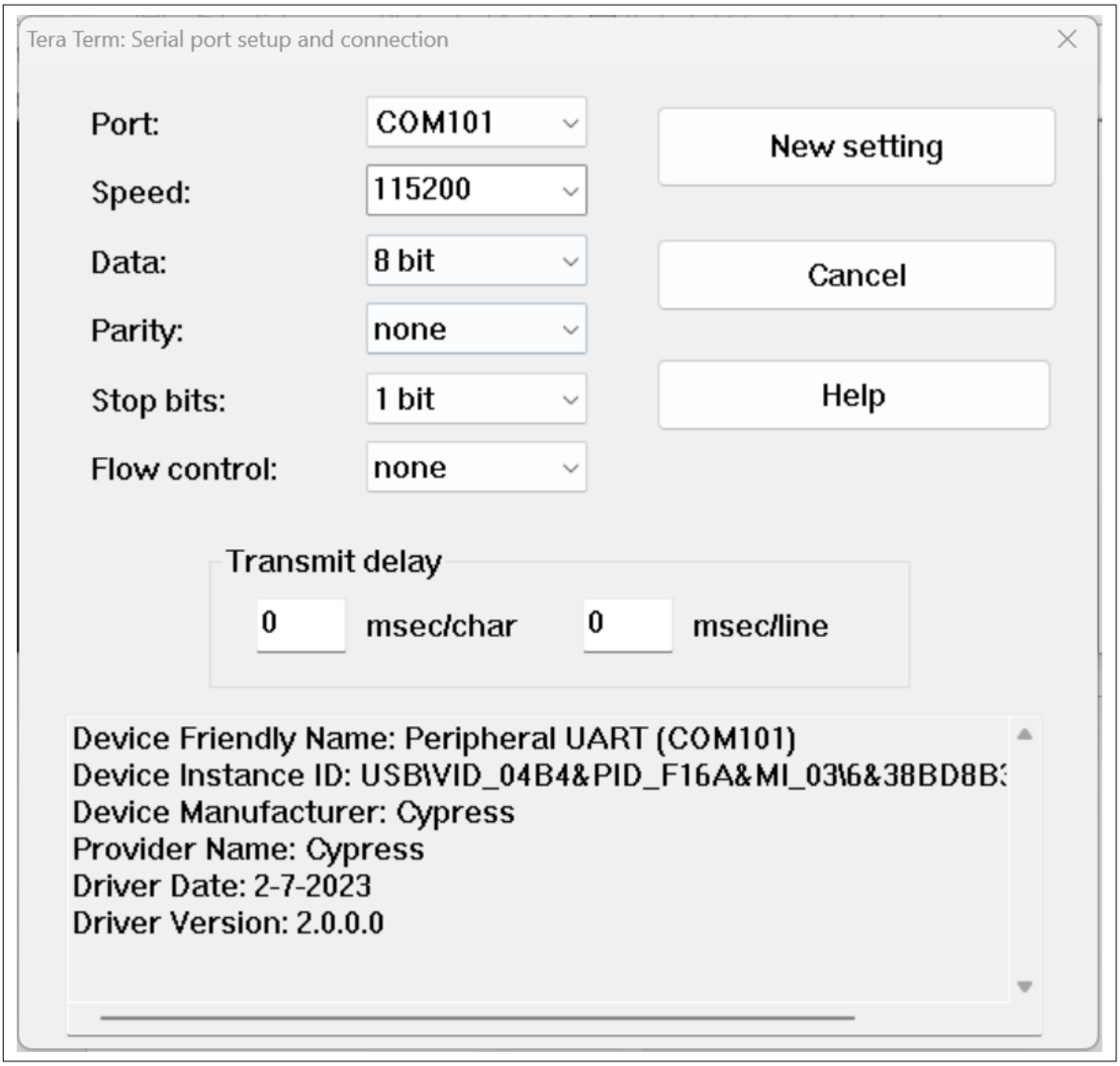

Figure 5 USB-UART COM port setup

1.4 ModusToolbox™ software

ModusToolbox™ is a free software development ecosystem that includes the Eclipse IDE for ModusToolbox™, AIROC™ BTSTACK, Bluetooth® SDK, and Wi-Fi SDK to develop applications for Infineon IoT products. Eclipse IDE for ModusToolbox™ is a multi-platform, integrated development environment (IDE) used to create new applications, update application code, change middleware settings, and program or debug applications.

Using ModusToolbox™, you can enable and configure device resources and middleware libraries, write C source code, and program and debug the device. The build system infrastructure includes the new project creation wizard that can run independently of the Eclipse IDE, the make infrastructure, and other tools. This means you can choose your compiler, RTOS, and ecosystem without compromising usability or access to our industry-leading AIROC™ Wi-Fi and Bluetooth®, CAPSENSE™ Human Machine Interface (HMI), security, and various other features.

For more details on ModusToolbox™ installation and usage, see the Eclipse IDE for ModusToolbox™ user guide.

1.4.1 ModusToolbox™ code examples

This section provides information about the code examples available for the CYW55913 devices.

The code examples are part of ModusToolbox™ 3.2 version (or later) and are located under the BSP CYW955913EVK-01.

To create a project using ModusToolbox™, see Getting Started with Bluetooth® LE on AIROC™ CYW55913 and Getting Started with Wi-Fi on AIROC™ CYW55913 application notes for Bluetooth® and Wi-Fi applications development, respectively.

1.4.2 ModusToolbox™ help

Launch ModusToolbox™ and navigate to the following items for help documentation:

- **Quick Start Guide**: Choose **Help** > **Eclipse IDE for ModusToolbox™ Documentation** > **Quick Start Guide**. This guide gives you the basics of using ModusToolbox™.
- **ModusToolbox™ General Documentation**: Choose **Help** > **ModusToolbox™ General Documentation** > **ModusToolbox™ Documentation Index**. This page provides links to various ModusToolbox™ documents.
- **ModusToolbox™ User Guide**: Choose **Help** > **Eclipse IDE for ModusToolbox™ Documentation** > **User Guide**. This is a comprehensive guide for creating, building, and programming ModusToolbox™ applications.

1.4.3 Update programmer serial number for CYW55913

Programming an application onto a CYW55913 device is done through the UART interface. If there are two or more serial ports connected to your computer, add "UART=COMXX" (or "UART=/dev/ttyXX" for Linux or macOS) to the application Makefile. Replace XX with the appropriate UART number that is attached to the kit. For example:

UART=COM16

1.5 IoT resources and technical support

Infineon provides a wealth of product documentation at the Wireless Connectivity webpage to help you select the right IoT device for your design. Additionally, Infineon Developer Community offers a platform for developers to access the latest software and tools, solving common evaluation and integration problems while directly interacting with both Infineon engineers and experienced peers.

2 Kit operation

This section provides detailed instructions to setup the Infineon CYW955913EVK-01 with Infineon ModusToolbox™ for Wi-Fi and Bluetooth® LE combo applications with a connected MCU. It introduces CYW955913EVK-01 and the features that are used as part of the kit's operation. Also, discusses the features such as Wi-Fi and Bluetooth® connectivity, MCU capabilities, programming/debugging, and a USB-UART bridge device that can be used to communicate with the CYW55913 device on this EVK.

2.1 Theory of operation

CYW955913EVK-01 is built around the CYW55913 device. Figure 6 shows the block diagram of the CYW55913 device. See the device datasheet for more details on device features.

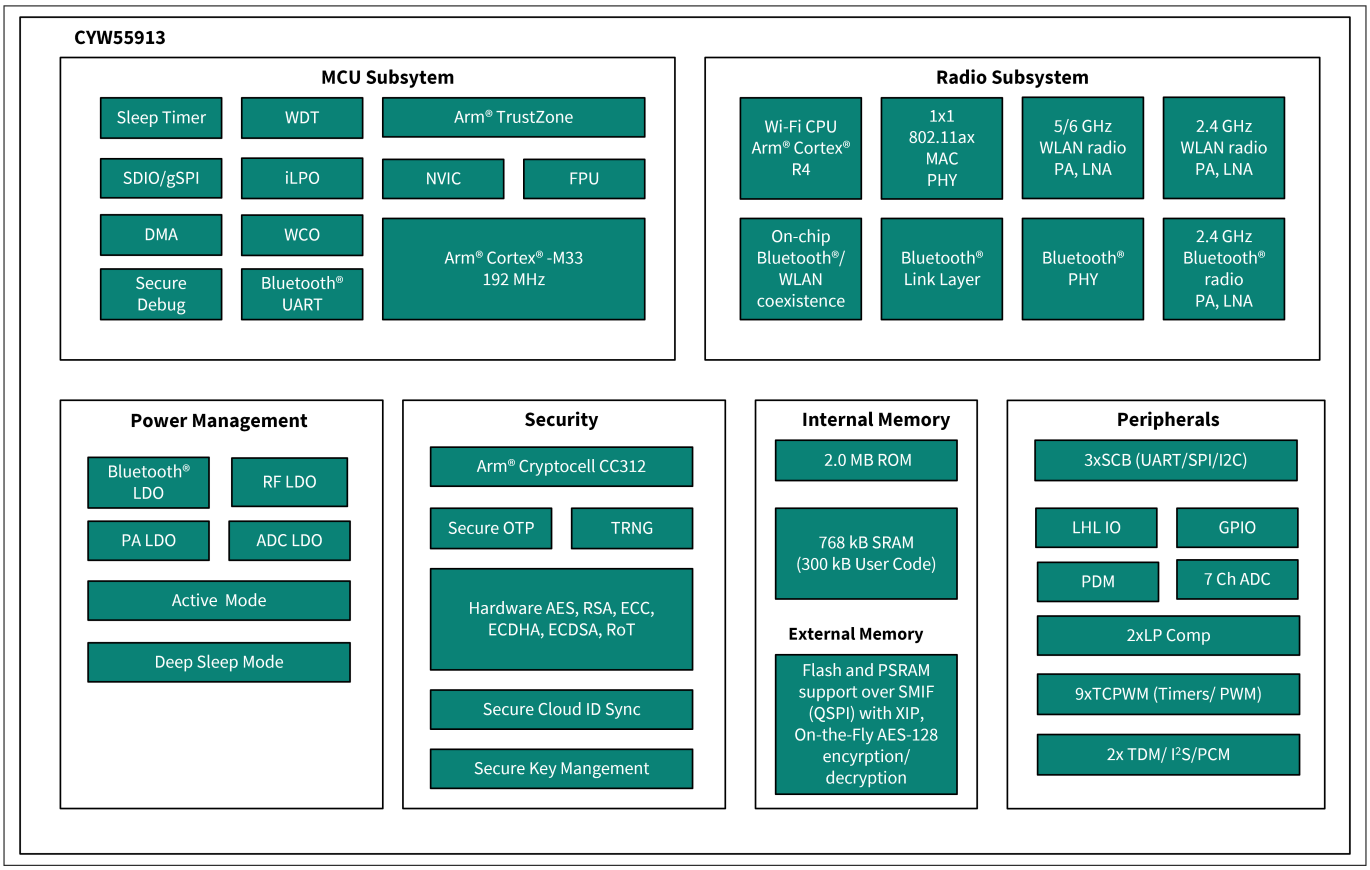

Figure 6 CYW55913 block diagram

Figure 7 illustrates the block diagram of CYW955913EVK-01. This board contains a CYW55913 Wi-Fi and Bluetooth® LE-connected MCU and a USB-to-serial interface/programmer. The kit features Arduino form-factor-compatible headers, which enable Arduino shields to be plugged in, extending the EVK's capabilities. It also features one user button, a recovery button, a reset button, two user LEDs, a potentiometer, an ambient light sensor, an AMIC, and two DMICs.

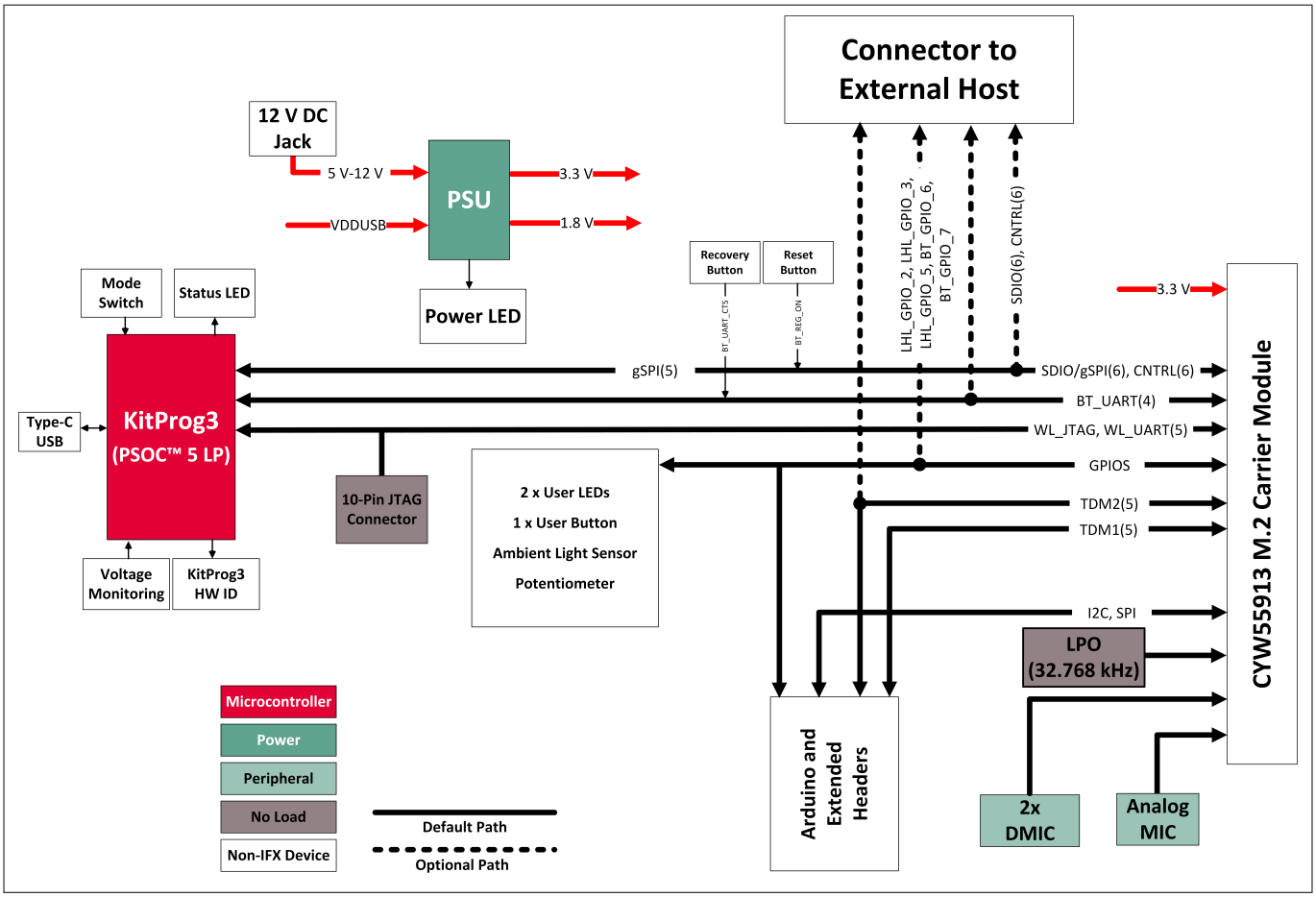

Figure 7 CYW955913EVK-01 block diagram

Figure 8 and Figure 9 show the markup of the CYW955913EVK-01.

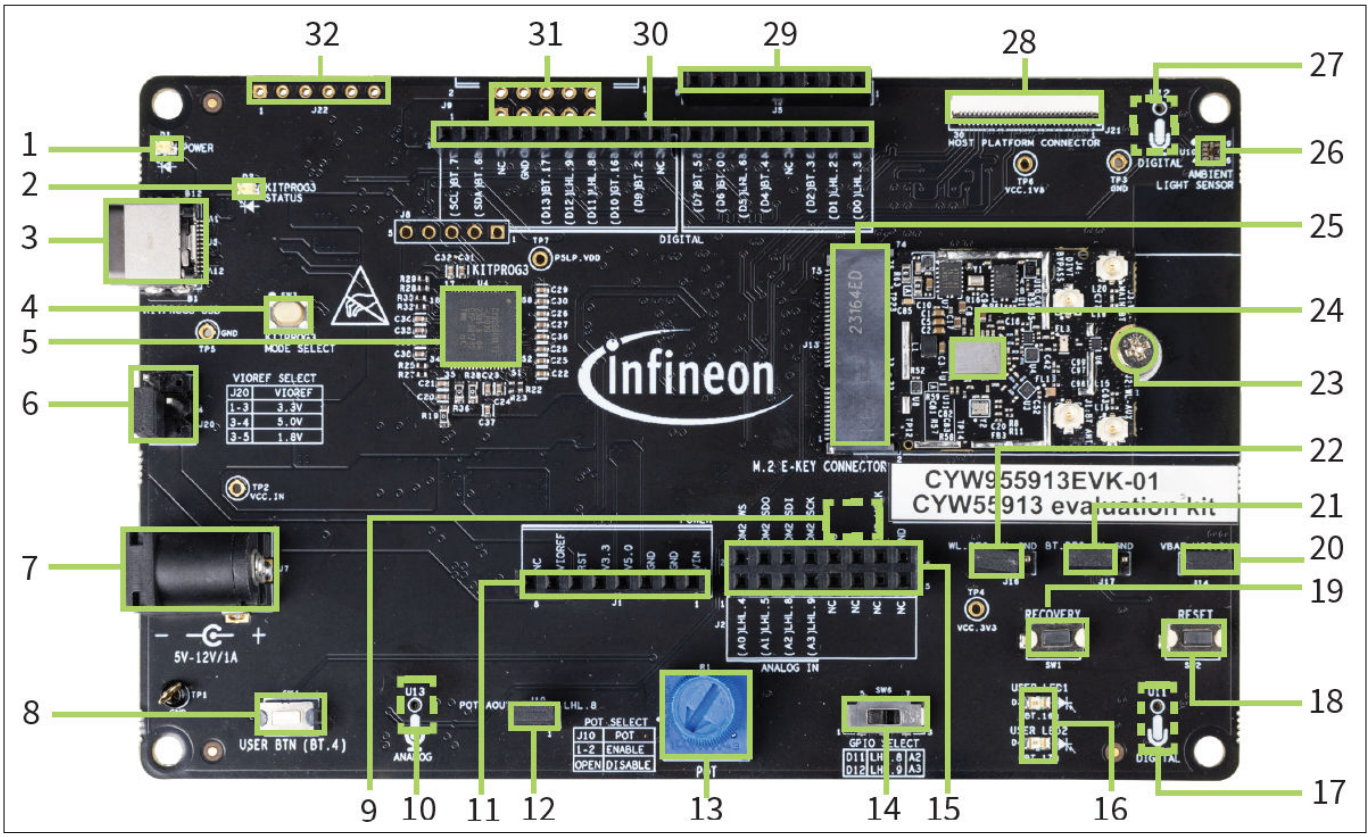

Figure 8 **CYW955913EVK-01 (top view)**

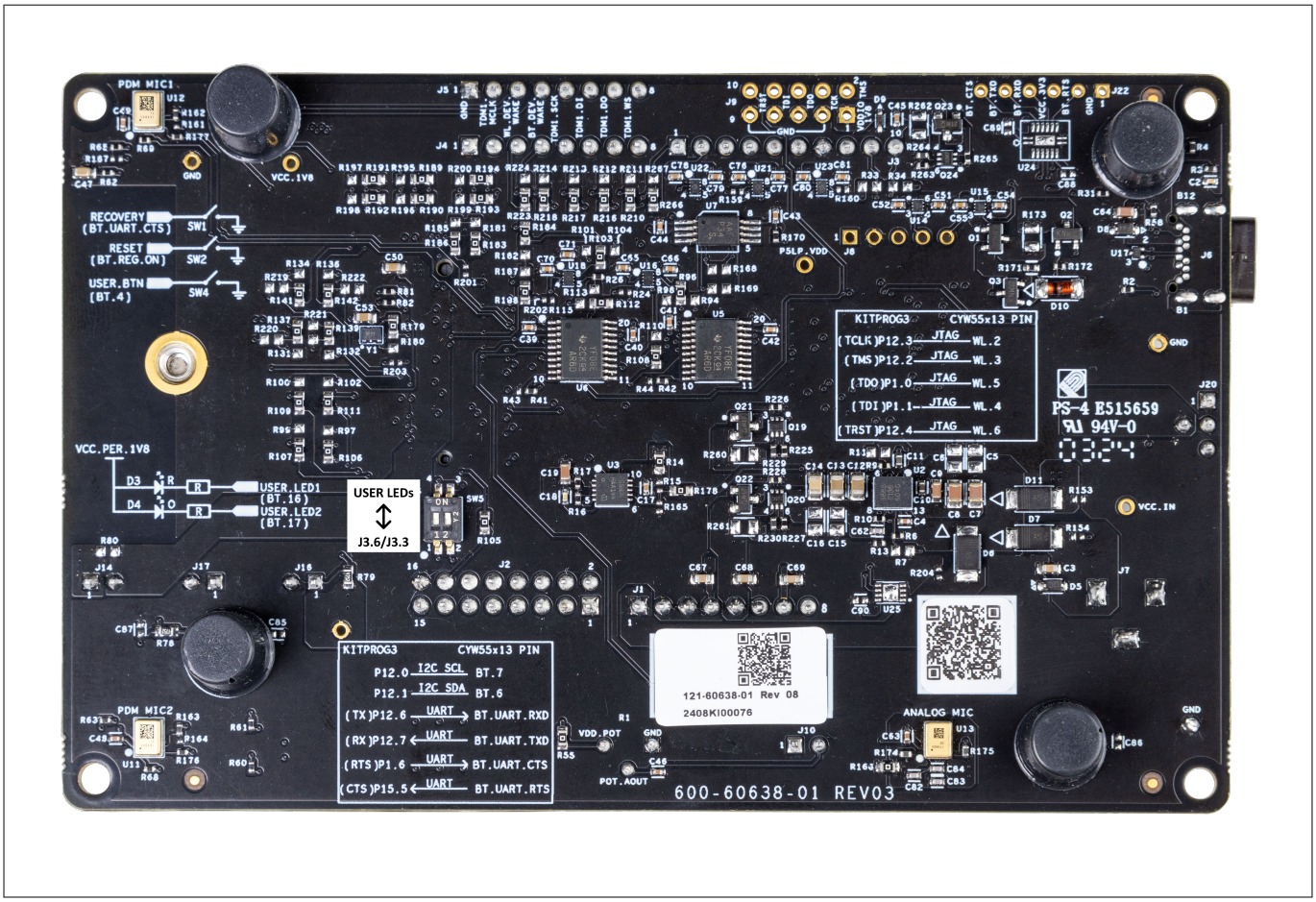

Figure 9 CYW955913EVK-01 (bottom view)

The following are the descriptions of the numbered items in Figure 8:

1. **Power indicator LED (D1)**: This LED is used to indicate the status of power supplied to the board.
2. **KitProg3 status LED (D2)**: This yellow LED indicates the status of KitProg3.
3. **KitProg3 USB Type-C connector (J6)**: J6 is a Type-C USB female connector for connecting the kit to the PC using the provided USB Type-C cable. It is used for powering the board, programming, and USB-UART communication.
4. **KitProg3 programming mode selection button (SW3)**: In this kit, by default, it supports Dual-UART mode. The button connects the PSOC™ 5LP Mode select pin to the ground when pressed. To interchange between Single-UART and Dual-UART mode, press and hold SW3 for 2 seconds. For more details, refer to the KitProg3 user guide.
5. **KitProg3 (PSOC™ 5LP) programmer and debugger (CY8C5868LTI-LP039, U4)**: The PSOC™ 5LP (CY8C5868LTI-LP039) serving as KitProg3, is a multi-functional system that includes a JTAG debugger, a USB-I2C bridge, and a Dual USB-to-UART bridge. For more details, see the KitProg3 user guide.
6. **VIOREF voltage selection jumper (J20)**: This jumper is used to select the VIOREF (Arduino shield IO supply) power source. The possible selections are 1.8 V, 3.3 V, or 5.0 V.
7. **External power supply VIN connector (J7)**: This is an optional power supply DC jack that support 12 V and 1 A to power the board.
8. **CYW55913 user button (SW4)**: This button can be used to provide input to the CYW55913 device. Note that the button connects the CYW55913 pin to the ground when pressed; therefore, the CYW55913 pin must be configured as a digital input with a resistive pull-up for detecting the button press.
9. **LED enable/disable switch (SW5)**: This switch is used to enable or disable the user LEDs by connecting or disconnecting GPIOs from CYW55913.
10. **Analog mic (U13)**: It can be used to configure the kit as a voice remote.

11. **Power header compatible with Arduino Uno R3 (J1)**: The Arduino-compatible I/O header brings out power and reference voltage pins from the base board to interface with Arduino shields.
12. **Potentiometer connection jumper (J10)**: This jumper can be used to connect or disconnect the on-board potentiometer from the CYW55913 device.
13. **Potentiometer (R1)**: This enables the kit to demonstrate the analog input capability of the CYW55913 chip.
14. **Arduino ADC/SPI selection switch**: This DPDT switch is used to select between the connection of GPIO from CYW55913 to Arduino headers.
15. **Analog-IN header compatible with Arduino Uno R3 with Extended TDM2 interface (J2)**: The Arduino-compatible I/O header brings out analog-capable pins and Audio TDM2 interface from CYW55913 to interface with Arduino shields.
16. **CYW55913 user LEDs (D3, D4)**: These onboard LEDs can be controlled by the CYW55913 device. The LEDs are ACTIVE LOW; therefore, these pins must be driven low to turn ON the LEDs.
17. **Digital mic 1 (U11)**: The digital microphone ASIC contains an extremely low-noise preamplifier and a high-performance sigma-delta ADC. It can be used to configure the kit as a voice remote.
18. **CYW55913 reset button (SW2)**: This button can be used to reset the device.
19. **CYW55913 recovery button (SW1)**: This button can be used to force the device to recovery mode.
20. **VBAT current measurement jumper (J14)**: This jumper is used to power the M.2 carrier module. Remove this jumper and connect an ammeter across the two pins of J14 to measure the current consumption by the M.2 carrier module.
21. **Bluetooth® section disable jumper (J17)**: This jumper is used to enable/disable BT subsystem of the device.
22. **WLAN section disable jumper (J16)**: This jumper is used to enable/disable WLAN subsystem of the device.
23. **M.2 stand-off (MT1)**: Stand-off to connect the M.2 carrier module.
24. **CYW55913 (U1)**: AIROC™ Wi-Fi and Bluetooth® LE connected MCU with Wi-Fi 6 and Bluetooth® LE 5.4 support is the heart of the kit.
25. **M.2 E-key interface connector (J13)**: This is used to interface Infineon custom Wi-Fi and Bluetooth® LE connected MCU M.2 carrier boards to this kit.
26. **Ambient light sensor (U10)**: On-board digital ambient light sensor can be used to sense the ambient light intensity and provide the data to the CYW55913 device via I2C.
27. **Digital mic 2 (U12)**: Second digital PDM mic on board enables the stereo audio input functionality.
28. **External host platform interface connector (J21)**: This 30-pin connector enables the CYW55913 device to connect to other host platforms.
29. **TDM1 interface connector (J5)**: This connector exposes the audio TDM1 interface of the CYW55913 device.
30. **Digital I/O headers compatible with Arduino Uno R3 (J3, J4)**: The Arduino-compatible I/O header brings out pins from CYW55913 to interface with Arduino shields.
31. **10-pin JTAG/COEX header (J9)**: Optional (not mounted) header to access the JTAG/COEX interface of the device.
32. **6-pin Bluetooth® UART header (J22)**: Optional (not mounted) header to access BT UART interface of the device.

2.2 Jumpers

Table 2 to Table 6 list the jumper settings on the CYW955913EVK-01.

Table 2 Baseboard jumper J14 pin configuration

Baseboard Jumper J14 (VBAT current measurement)	Default state	Connection on CYW55913	Description
1 and 2	Shorted	VBAT	Short this jumper to supply power to the VBAT of CYW55913. In addition, use this jumper to measure the current consumption of the VBAT domain.

Table 3 Baseboard jumper J16 pin configuration

Baseboard jumper J16 (WLAN Disable)	Default state	Connection on CYW55913	Description
1 and 2	Open	NA	Short this jumper to disable the WLAN section of the radio module on the M.2 carrier board. ***Note***: *This jumper can be used for radio modules other than CYW55913 as WL_REG_ON is not exposed on this device.*

Table 4 Baseboard jumper J17 pin configuration

Baseboard jumper J17 (BT Disable)	Default state	Connection on CYW55913	Description
1 and 2	Open	REG_ON	Short this jumper to disable the BT subsystem of the CYW55913 device. ***Note***: *Shorting this jumper disables both the BT and WL subsystem on the CYW55913 device, as both Reg_ON pins are tied together.*

Table 5 Baseboard jumper J10 pin configuration

Baseboard jumper J10 (Potentiometer enable)	Default state	Connection on CYW55913	Description
1 and 2	1-2	LHL_GPIO_8	Short this jumper to connect the onboard potentiometer to CYW55913.

Table 6 Baseboard jumper J20 pin configuration

Baseboard jumper J20 (Arduino header VIOREF select)	Default state	Connection on CYW55913	Description
1 and 3	Open	NA	Short these pins to supply 3.3 V to the VIOREF of the Arduino header.
3 and 4	Open		Short these pins to supply 5.0 V to the VIOREF of the Arduino header.
3 and 5	Shorted		Short these pins to supply 1.8 V to the VIOREF of the Arduino header.

2.3 Buttons and switches

Table 7 lists the buttons and switches on the CYW955913EVK-01.

Table 7 Baseboard button/switch functionality

Baseboard buttons/switch	Pressed state	Connection on CYW55913	Description
SW1	GND	BT_UART_CTS	Active low recovery button (black)
SW2	GND	BT_REG_ON	Active low reset button (black)
SW3	GND	NA	Switch to change the KP3 mode
SW4	GND	BT_GPIO_4	User application button (white)
SW5	NA	BT_GPIO_16 BT_GPIO_17	User LED1 and User LED2 enable/disable switch
SW6	NA	LHL_GPIO_8 LHL_GPIO_9	Arduino GPIO ADC/SPI selection switch

2.4 Arduino-compatible headers

J1, J2, J3, J4, and J5 are Arduino shield-compatible headers.

Table 8 Header J1 pin configuration

Header J1	Arduino compatible pin	Connection on CYW55913	Description
1	VIN	NA	Input supply (5 V - 12 V) option to the kit from the Arduino shield
2	GND	GND	Ground
3	GND	GND	Ground
4	5V0	NA	5 V supply output to the Arduino shield
5	3V3	NA	3.3 V supply output to the Arduino shield
6	RESET	NA	Arduino shield reset from KP3
7	VIOREF	NA	I/O reference pin used by shields to determine the I/O voltage. It can be changed to 1.8 V, 3.3 V, and 5 V with J20 configuration.
8	NC	NC	No connect

Table 9 Header J2 pin configuration

Header J2	Arduino compatible pin	Connection on CYW55913	Description
1	A0	LHL_GPIO_4	LHL GPIO
2	NA	TDM2_WS	TDM2 interface word select
3	A1	LHL_GPIO_5	LHL GPIO
4	NA	TDM2_SDO	TDM2 interface data out
5	A2	LHL_GPIO_8	LHL GPIO
6	NA	TDM2_SDI	TDM2 interface data in
7	A3	LHL_GPIO_9	LHL GPIO
8	NA	TDM2_SCK	TDM2 interface slave clock
9	NC	NA	No connect
10	NC	NA	No connect
11	NC	NA	No connect
12	NC	NA	No connect
13	NC	NA	No connect
14	NA	TDM2_MCK	TDM2 interface master clock
15	NC	NA	No connect
16	GND	GND	Ground

Table 10 Header J3 pin configuration

Header J3	Arduino compatible pin	Connection on CYW55913	Description
1	D8	NC	No Connect
2	D9	BT_GPIO_2	BT GPIO
3	D10	BT_GPIO_16	BT_GPIO
4	D11	LHL_GPIO_8	LHL GPIO
5	D12	LHL_GPIO_9	LHL GPIO
6	D13	BT_GPIO_17	BT GPIO
7	GND	GND	Ground
8	NC	NC	No connect
9	SDA	BT_GPIO_6	BT GPIO
10	SCL	BT_GPIO_7	BT GPIO

Table 11 Header J4 pin configuration

Header J4	Arduino compatible pin	Connection on CYW55913	Description
1	D0	LHL_GPIO_3	LHL GPIO
2	D1	LHL_GPIO_2	LHL GPIO
3	D2	BT_GPIO_3	BT GPIO
4	D3	NC	No connect
5	D4	BT_GPIO_4	BT GPIO
6	D5	LHL_GPIO_6	LHL_GPIO
7	D6	BT_GPIO_0	BT GPIO
8	D7	BT_GPIO_5	BT GPIO

Table 12 Header J5 pin configuration

Header J5	Arduino compatible pin	Connection on CYW55913	Description
1	NA	GND	Ground
2	NA	TDM1_MCK	TDM1 interface master clock
3	NA	WL_DEV_WAKE	WLAN device wake
4	NA	BT_DEV_WAKE	Bluetooth® device wake
5	NA	TDM1_SCK	TDM1 interface slave clock
6	NA	TDM1_DI	TDM1 interface data in
7	NA	TDM1_DO	TDM1 interface data out
8	NA	TDM1_WS	TDM1 interface word select

***Note**: The J5 header and even pins of the J2 header are not compatible with standard Arduino pinout and are compatible with the custom audio codec shield from Infineon for the BT audio support.*

2.5 Other headers

J9 is the JTAG/COEX header, which brings out the WL GPIOs of the CYW55913 device (not mounted by default; see the Kit reworks chapter for use).

Table 13 Header J9 pin configuration

Header J9	Pin name	Connection on CYW55913	Description
1	VDDIO_1V8	NA	1.8 V supply to the external debugger
2	TMS	GPIO_3	WL GPIO
3	GND	GND	Ground
4	TCK	GPIO_2	WL GPIO
5	GND	GND	Ground
6	TDO	GPIO_5	WL GPIO
7	GND	GND	Ground
8	TDI	GPIO_4	WL GPIO
9	GND	GND	Ground
10	TRST	GPIO_6	WL GPIO

J22 is a UART programming header using an external device that brings out the HCI UART pins of the CYW55913 device (not mounted by default; see the Kit reworks chapter for use).

Table 14 Header J22 pin configuration

Header J22	Pin name	Connection on CYW55913	Description
1	GND	GND	Ground
2	UART_RTS	BT_UART_RTS_N	UART request-to-send. Active-low request-to-send signal for the HCI UART interface.
3	VCC_3V3	NA	3.3 V supply
4	UART_RXD	BT_UART_RXD	UART serial input. Serial data input for the HCI UART interface.
5	UART_TXD	BT_UART_TXD	UART serial output. Serial data output for the HCI UART interface.
6	UART_CTS	BT_UART_CTS_N	UART clear-to-send. Active-low clear-to-send signal for the HCI UART interface.

J21 is the 30-pin external host interface connector that enables the kit to connect the CYW55913 device to other host platforms via the FFC-M.2 adapter card. See the Kit reworks chapter to use this connector.

Table 15 Header J21 pin configuration

Header J21	Pin name	Connection on CYW55913	Description
1	EX_LHL_GPIO_3/ UART_RXD	LHL_GPIO_3	LHL GPIO
2	EX_LHL_GPIO_2/ UART_TXD	LHL_GPIO_2	LHL_GPIO
3	WL_DEV_WAKE_M2	WL_DEV_WAKE	WLAN device wake
4	EX_LHL_GPIO_5/ UART_RTS	LHL_GPIO_5	LHL GPIO
5	BT_GPIO_7	BT_GPIO_7	BT GPIO
6	BT_GPIO_6	BT_GPIO_6	BT GPIO
7	WL_REG_ON_M2	WL_REG_ON	Enable it for WLAN section power supply. Not used in the CYW55913 device, connected to GND on the device side.
8	BT_REG_ON_M2	BT_REG_ON	Used by the PMU to power on or power off the internal CYW55913 regulators used by the Bluetooth® section.
9	EX_LPO_IN_3V3	LPO_IN_OUT	LPO clock input from external host board
10	BT_DEV_WAKE_M2	BT_DEV_WAKE	Bluetooth® device wake
11	GND	GND	Ground
12	EX_BT_UART_CTS	BT_UART_CTS_N	UART clear-to-send. Active-low clear-to-send signal for the HCI UART interface.
13	EX_BT_UART_RTS	BT_UART_RTS_N	UART request-to-send. Active-low request-to-send signal for the HCI UART interface.
14	EX_BT_UART_RXD	BT_UART_RXD	UART serial input. Serial data input for the HCI UART interface.
15	EX_BT_UART_TXD	BT_UART_TXD	UART serial output. Serial data output for the HCI UART interface.
16	GND	GND	Ground
17	BT_HOST_WAKE_M2	BT_HOST_WAKE	Bluetooth® host wake
18	GPIO0_WL_HOST_WAKE_M2	GPIO_0	WLAN host wake
19	GND	GND	Ground
20	EX_TDM2_DI	TDM2_DI	TDM2 interface data in
21	EX_TDM2_DO	TDM2_DO	TDM2 interface data out
22	EX_TDM2_WS	TDM2_WS	TDM2 interface word select
23	EX_TDM2_SCK	TDM2_SCK	TDM2 interface slave clock
24	GND	GND	Ground

(table continues...)

Table 15 (continued) Header J21 pin configuration

Header J21	Pin name	Connection on CYW55913	Description
25	EXT_SDIO_DATA3	SDIO_DATA_3	SDIO data line 3
26	EXT_SDIO_DATA2	SDIO_DATA_2	SDIO data line 2
27	EXT_SDIO_DATA1	SDIO_DATA_1	SDIO data line 1
28	EXT_SDIO_DATA0	SDIO_DATA_0	SDIO data line 0
29	EXT_SDIO_CMD	SDIO_CMD	SDIO command line
30	EXT_SDIO_CLK	SDIO_CLK	SDIO clock input

2.6 USB serial interface chip

A CY8C5868LTI-LP039 PSOC™ 5LP chip is used for onboard programming and USB-serial functionality. It connects the kit to the PC over a USB interface and to the CYW55913 device through the HCI, peripheral UARTs, and I2C pins. Optional SPI and JTAG connectivity are also supported by this chip.

2.7 Kit power supply

The CYW955913EVK-01 kit can be powered with the following power inputs:

- USB Type-C connector (J6)
- 5 V - 12 V, 1 A DC jack (J7)
- VIN pin of the J1 header (J1.1)

The input supply is provided to the buck regulator to generate 3.3 V for the VBAT supply of the device, and from the same 3.3 V; for the peripherals, 1.8 V is generated using an LDO. For more details about the power regulators, see the Hardware section.

2.8 Test points

There are three ground test points for easy connection of probes. Table 16 lists voltage at various domains that can be measured from their respective test points on the baseboard.

Table 16 Test points in CYW955913EVK-01

Label	Description
TP1, TP3, TP5	Ground
TP2	Input supply test point, VCC_IN
TP4	3.3 V rail test point, VCC_3V3
TP6	1.8 V rail test point, VCC_1V8
TP7	P5LP supply test point, P5LP_VDD

2.9 Current measurement

CYW955913EVK-01 has a VBAT (3.3 V) power domain to power the CYW55913 device. Current consumption of the M.2 carrier module with the CYW55913 device can be found out from the current consumed by the VBAT domain.

***Note**: To measure the current consumed by the VBAT domain, connect an ammeter across pin 1 and pin 2 of the jumper J14 on the baseboard.*

2.10 Pin configuration

GPIOs on the CYW55913 device can be multiplexed to various peripherals. For more information on the peripherals that can be routed to the various GPIOs; see the device datasheet.

For this board, the ModusToolbox™ initializes GPIOs to the platform's default configuration.

3 Hardware

This section describes the CYW955913EVK-01 kit hardware and its different blocks, such as the power supply, reset control, Arduino-compatible headers, other connectors, and peripherals. This kit consists of two boards: a baseboard with all peripherals and interconnect options and an M.2 carrier module with the CYW55913 device .

See the CYW955913EVK-01 kit webpage for schematics and design files of the baseboard, and M.2 carrier module.

3.1 M.2 carrier module

The baseboard design of the CYW955913EVK-01 board is designed to be modular so that different carrier modules can be used with the same baseboard. In this kit, the CYW955913SCM2WLIPA M.2 carrier radio module, which employs the CYW55913 device, is connected to the baseboard through the M.2 interface.

The carrier module interface is a generic interface used across many devices. See device I/O mapping for a detailed interface description. SDIO, UART signals, and GPIOs are moved out from module pins to interface with the baseboard.

3.1.1 CYW55913 device

CYW55913 is the heart of the kit, which is an ultra-low-power, single-chip, connected MCU that supports 1x1 Wi-Fi 6/6E, Bluetooth® LE 5.4, Matter, IP networking, with integrated PMU, targeted at Internet of Things (IoT) applications for standalone operation or to offload a host-processor.

An integrated 192 MHz Arm® Cortex®-CM33 runs the Wi-Fi and Networking Stacks, Bluetooth® LE 5.4, and supports a wide array of peripherals. The CYW55913/55912/55911/55903/55902/55901 operates over the -40°C to +85°C temperature range and is available in a 0.35 mm pitch WLBGA package.

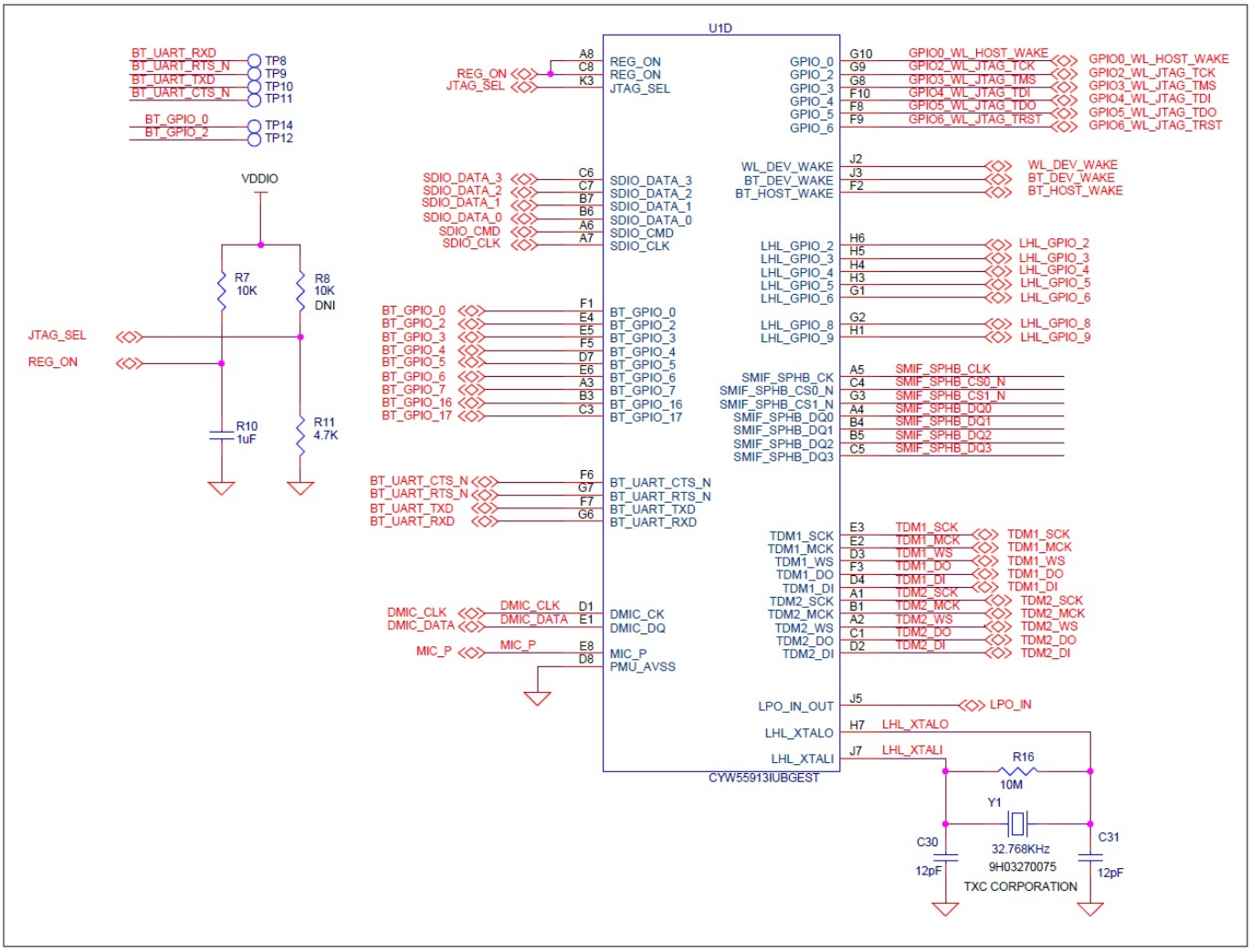

Figure 10 CYW55913 system

CYW55913 device powered from VBAT 3.3 V and VDDIO 1.8 V. All sections are powered from the internally generated power outputs.

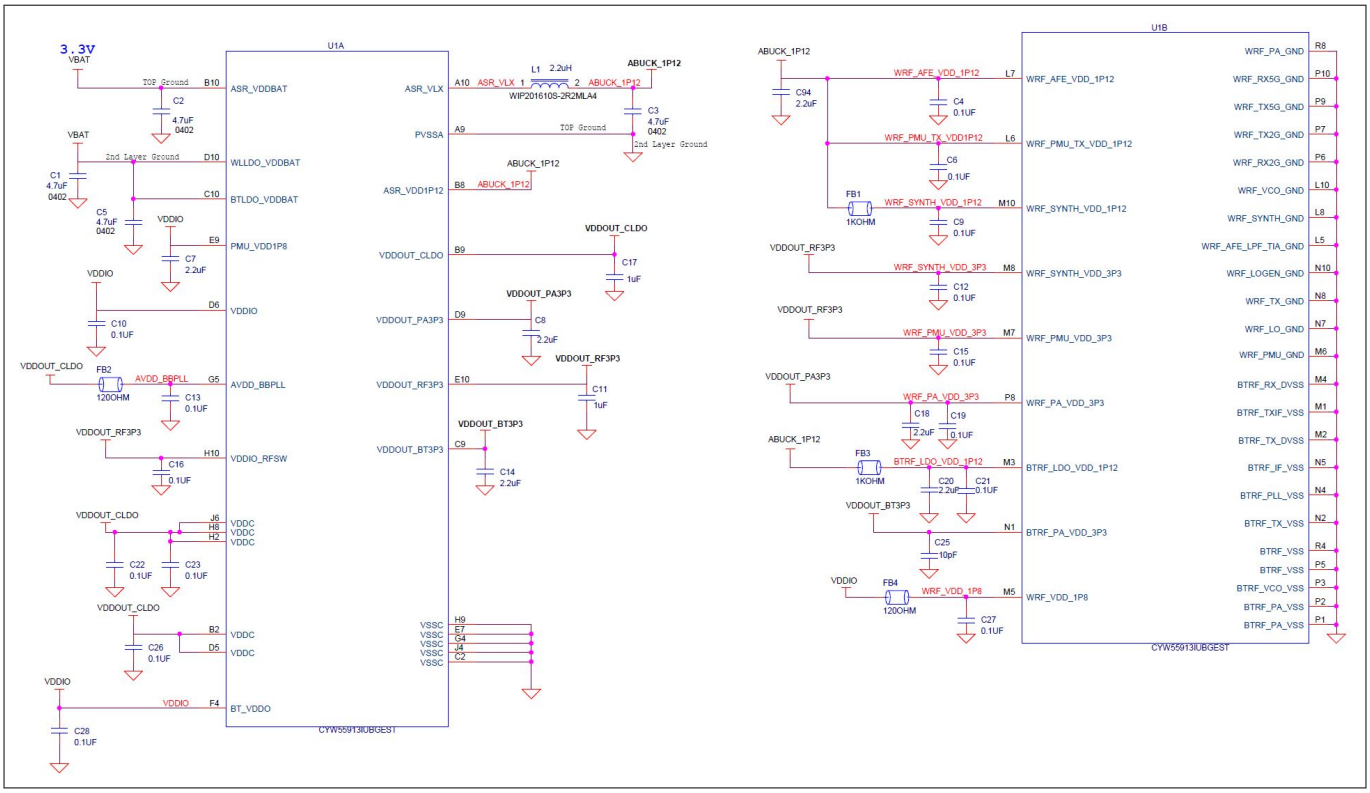

Figure 11 CYW55913 PMU Topology

CYW55913 Carrier M.2 card also includes the RF front end for the Triband WiFi and BT. This section consists of RF switches, BPF and Matching networks that terminates to the UFL antenna connectors.

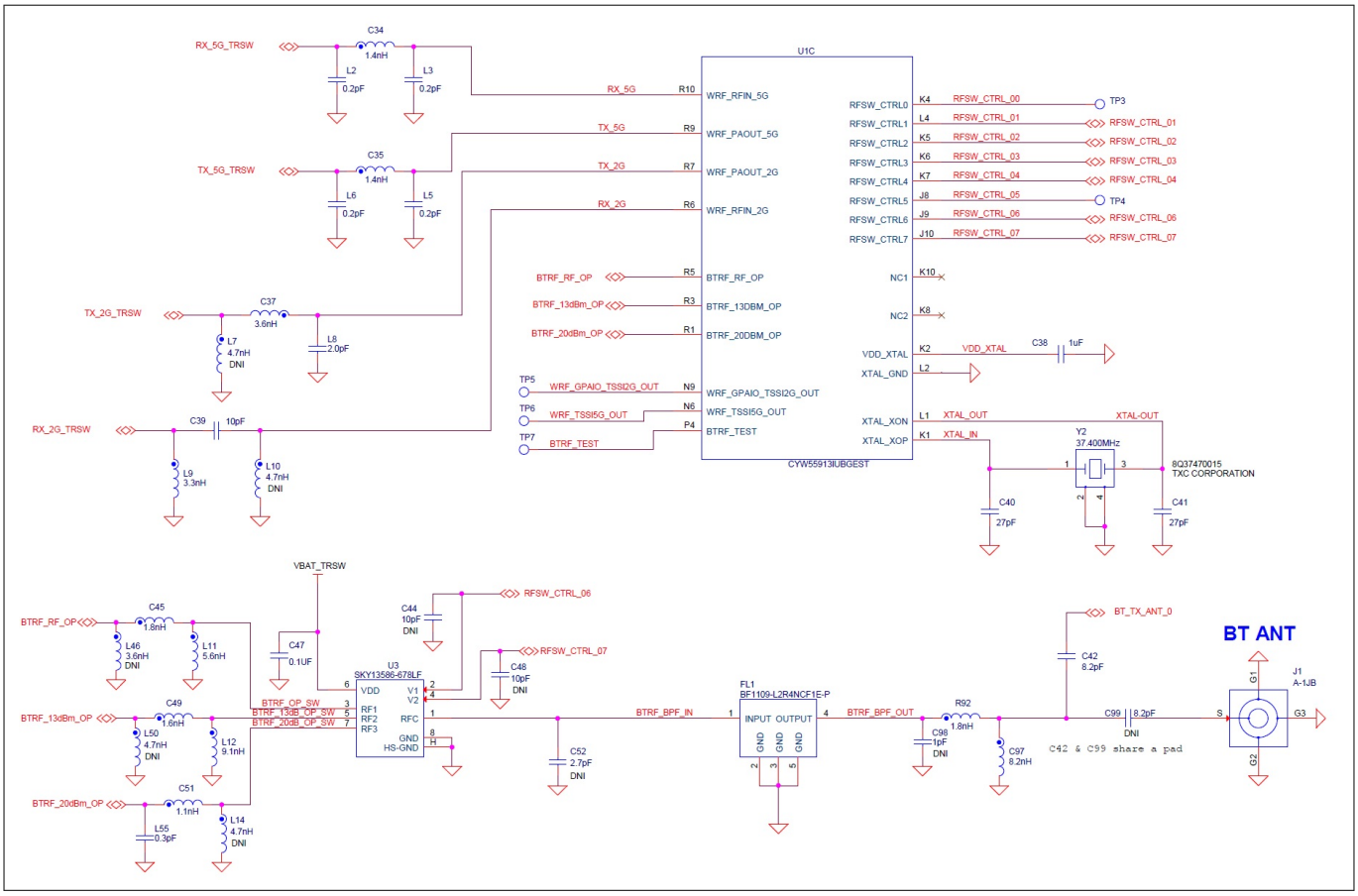

Figure 12 CYW55913 RF Section and BT Front end

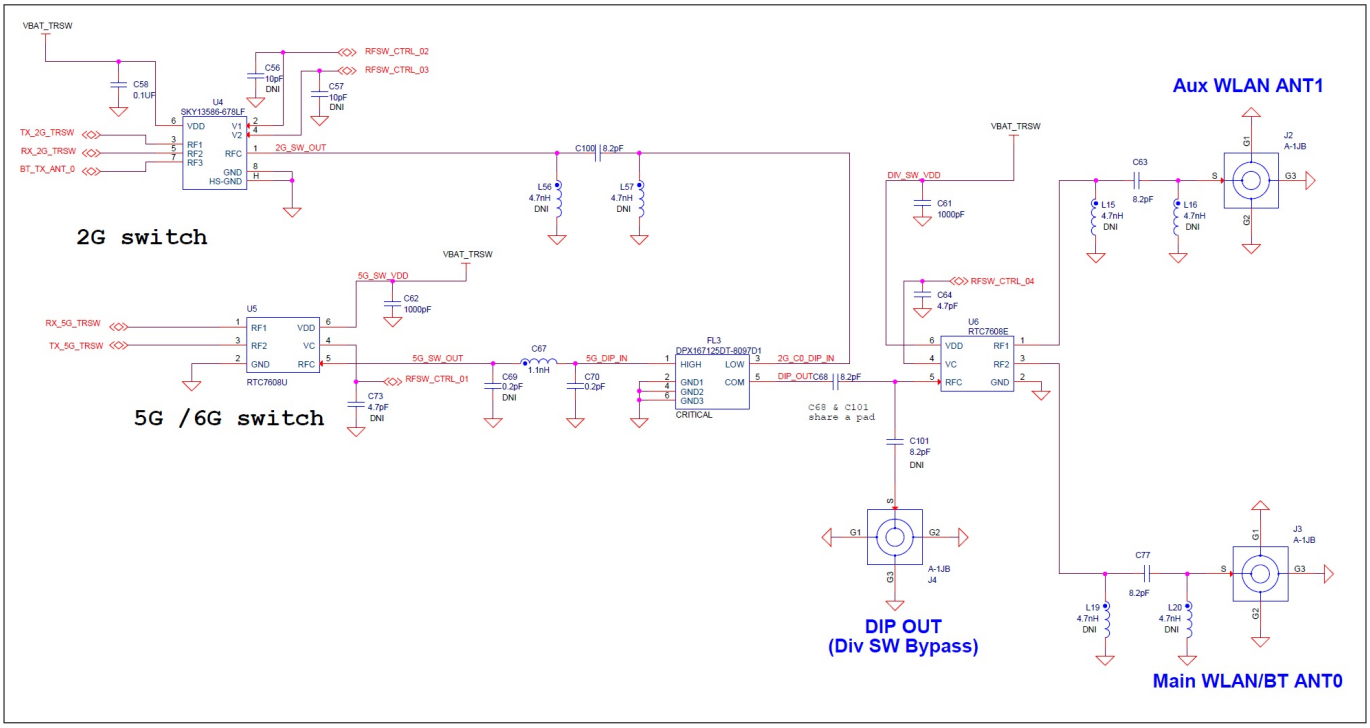

Figure 13 CYW55913 RF Front end

The M.2 Carrier Board is interfaced with the Baseboard via the M.2 E-Key standard edge finger connector.

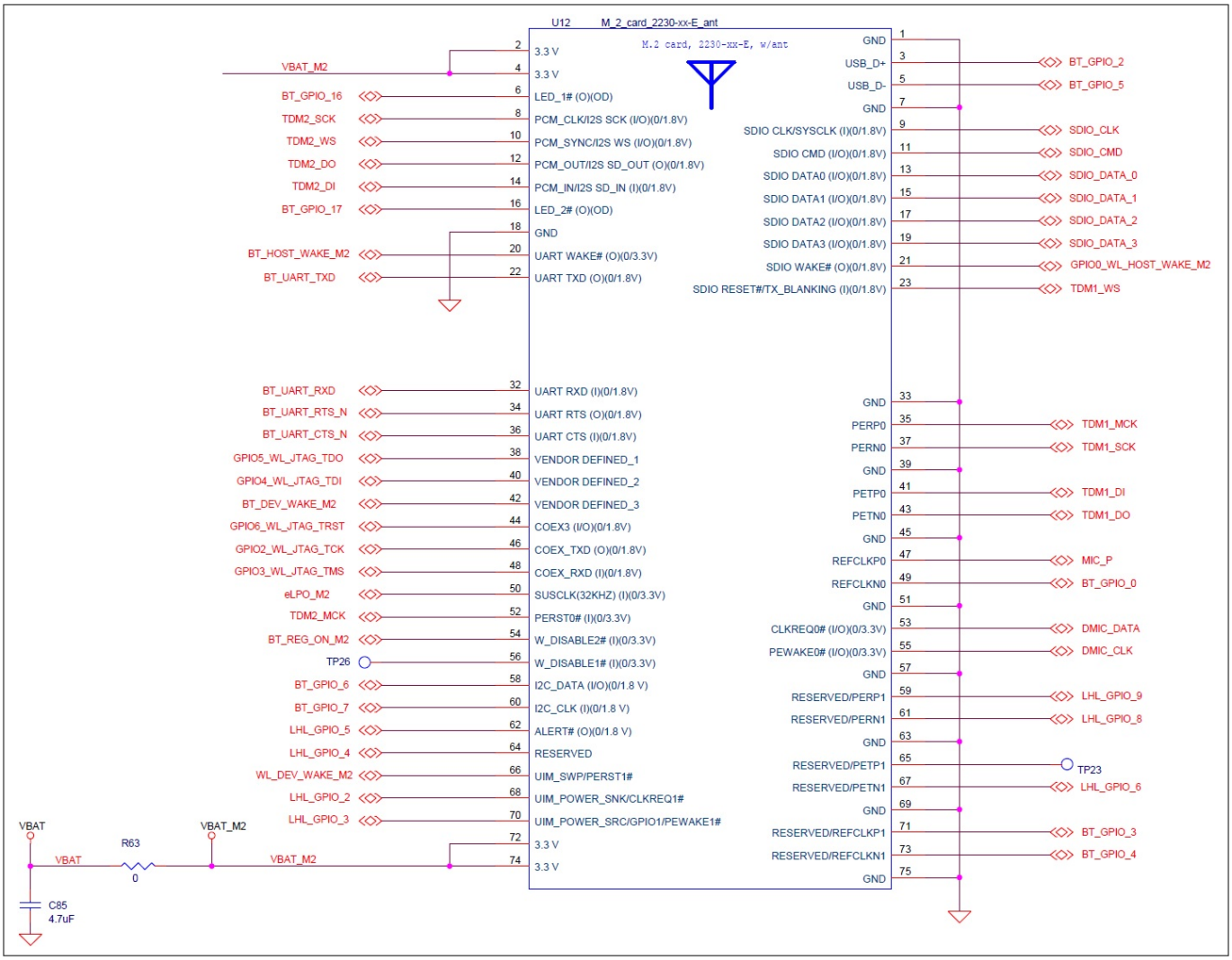

Figure 14 CYW55913 M2 Interface

3.1.2 Crystals

The CYW55913 M.2 carrier module has two crystals onboard, a 37.4 MHz crystal which provides the system reference clock and can operate from an internal high-accuracy (~1%) and a 32.768 kHz low-power oscillator (iLPO) or external 32.76 kHz crystal (eLPO) for higher accuracy or from an external reference clock.

3.1.3 Memory

CYW955913SCM2WLIPA M.2 carrier module also includes external memory connected to the CYW55913 device via the SMIF interface. One QSPI flash is provided on the M.2 carrier board, which is interfaced with CYW55913 device through an SMIF interface with separate chip select.

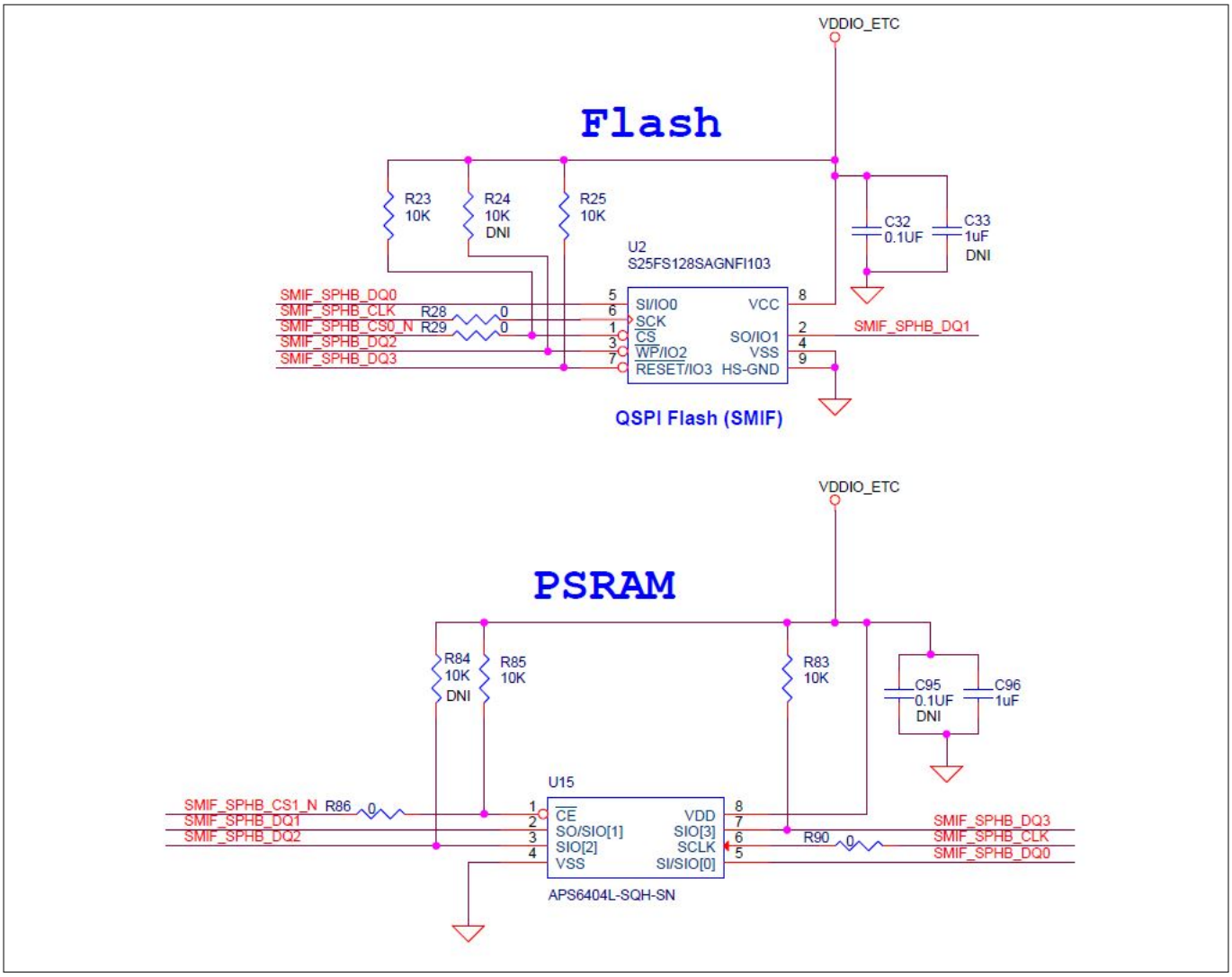

Figure 15 Memory

3.2 Baseboard

CYW9CPM2BASE1 is the baseboard on which the CYW55913 M.2 carrier module (CYW955913SCM2WLIPA) is mounted. The baseboard is interfaced with the M.2 carrier module through the M.2 E-Key connector, and it provides different peripherals and extended connectors to demonstrate the capabilities of the CYW55913 device.

3.2.1 Serial communication between CYW55913 and PSOC™ 5LP KitProg3

The onboard CY8C5868LTI-LP039 PSOC™ 5LP device is a true programmable embedded system-on-chip responsible for two-channel USB-serial conversion on this baseboard. The USB-serial pins of the PSOC™ 5LP device are hard-wired to the HCI UART pins of the CYW55913 device. Also, one peripheral UART from the device also connected to the P5LP device, which can also be accessed via USB.

Mode switch SW3 can be used to switch between single and dual UART modes of operation of KitProg3. The status LED (LED2) indicates the current mode of KitProg3.

This kit supports a special operating mode that allows for two UART connections rather than a single UART plus bridging (USB-I2C or USB-SPI). To enter UARTx2 when the kit is in CMSIS-DAP Bulk or HID mode, press and hold the mode switch for at least two seconds. In UARTx2 mode, the KP3 status LED (LED2) blinks for 1 second at 2

Hz, then stays on for another second. To exit, press and hold the mode switch for at least two seconds. You can return to CMSIS-DAP Bulk mode.

***Note**: In single UART mode, only HCI UART will be connected to the USB, and for the debug logs, peripheral UART need to be enabled, and KP3 mode needs to be changed to dual-UART mode.*

KP3 supports other serial bridges like USB-I2C and USB-SPI, as well as USB-JTAG for debugging. All serial interfaces are connected through Level translators, as the P5LP device supports 5 V and the CYW55913 device supports 1.8 V.

***Note**: In KitProg3, 3[5] pin can be used for GPIO bridging. This pin is unidirectional (available signal transmittance only from CYW55913 to KitProg3) and the state of 3[5] pin can only read by kitprog3.*

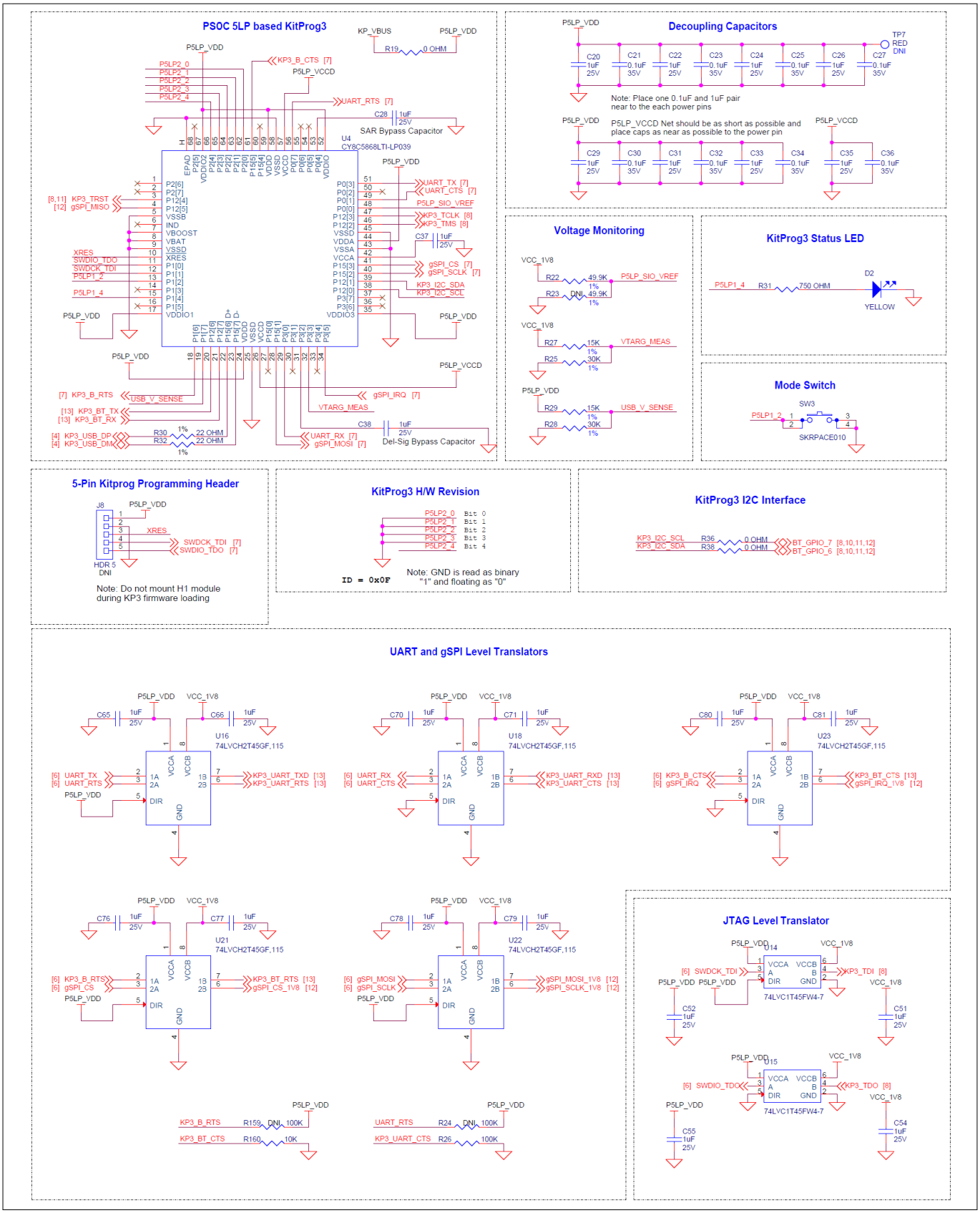

Figure 16 **Serial communication between CYW55913 and PSOC™ 5LP KitProg3 with level translators**

3.2.2 Baseboard power

The major power supply source to this kit is the USB Type-C connector (J6) with a 20 V overvoltage protection circuit. The kit also has one optional power supply option, 5 V - 12 V DC Jack (J7). These input source sections have transient voltage suppression (TVS-diode) to provide ESD protection for the power source at the connector. The amber power LED is connected to the VCC_3V3 rail through a current-limiting resistor to indicate the board power is ON.

The PSOC™ 5LP (KitProg3) is powered from the KP_VBUS rail with a 0 Ω resistor/jumper in series so that PSOC™ 5LP can be disconnected from the supply rail or used as a current measurement jumper. On the other hand, KP_VBUS also goes to the Arduino header (J1) as VCC_ARD_5V0 through a reverse voltage protection circuit.

The kit has a buck regulator that generates 3.3 V from the input sources, which are combined through ORing diodes. Generated 3.3 V will be used for VBAT supply to the CYW55913 device through a current measurement jumper (J14). This 3.3 V supply is also fed to one LDO to generate 1.8 V for other peripherals on the baseboard.

5 V and 3.3 V are going to the Arduino headers via reverse voltage protection circuits, and VIOREF voltage going to the Arduino header (J1) can be selected with the jumper configuration on the J20 header.

Figure 17 shows the power architecture of the CYW955913EVK-01.

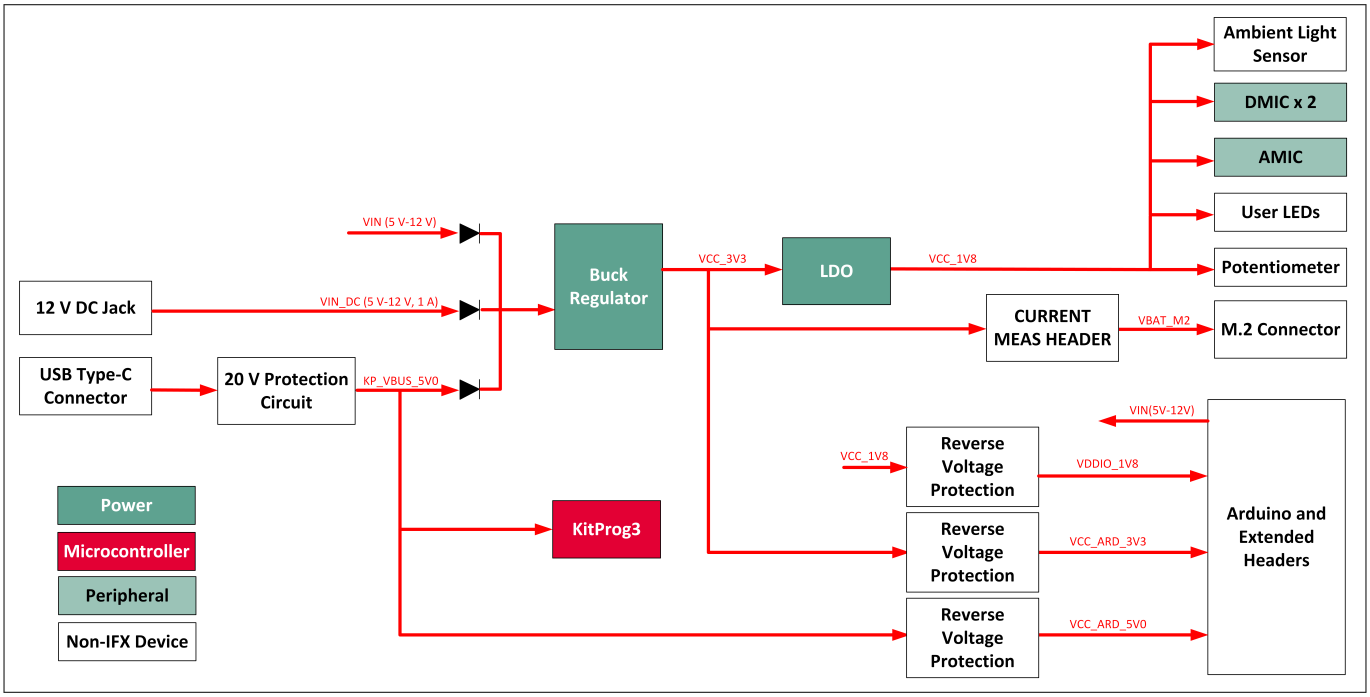

Figure 17 Power architecture of CYW955913EVK-01

The schematics of the power supply sections of the kit are provided below.

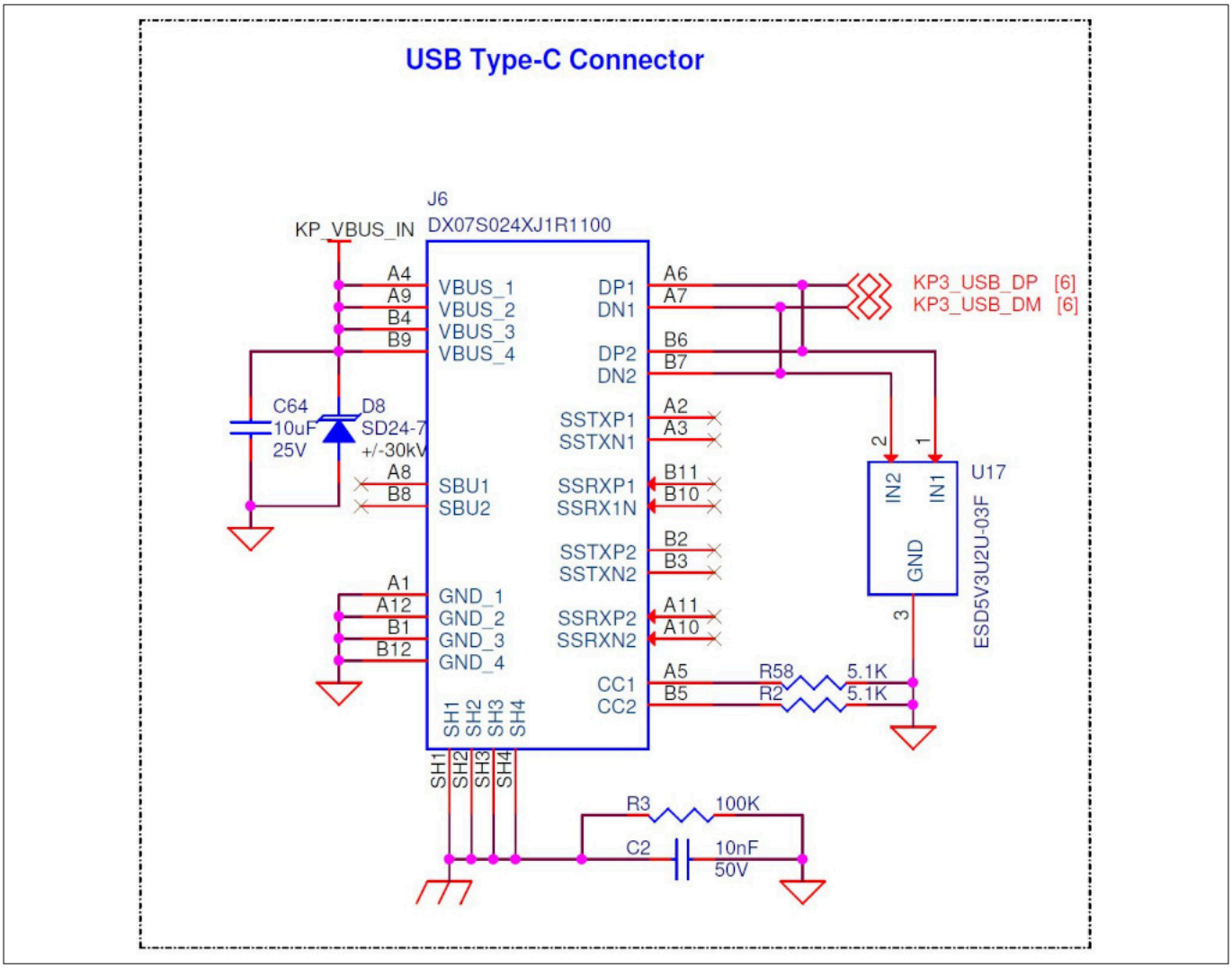

Figure 18 USB Type-C connector for power and KitProg3

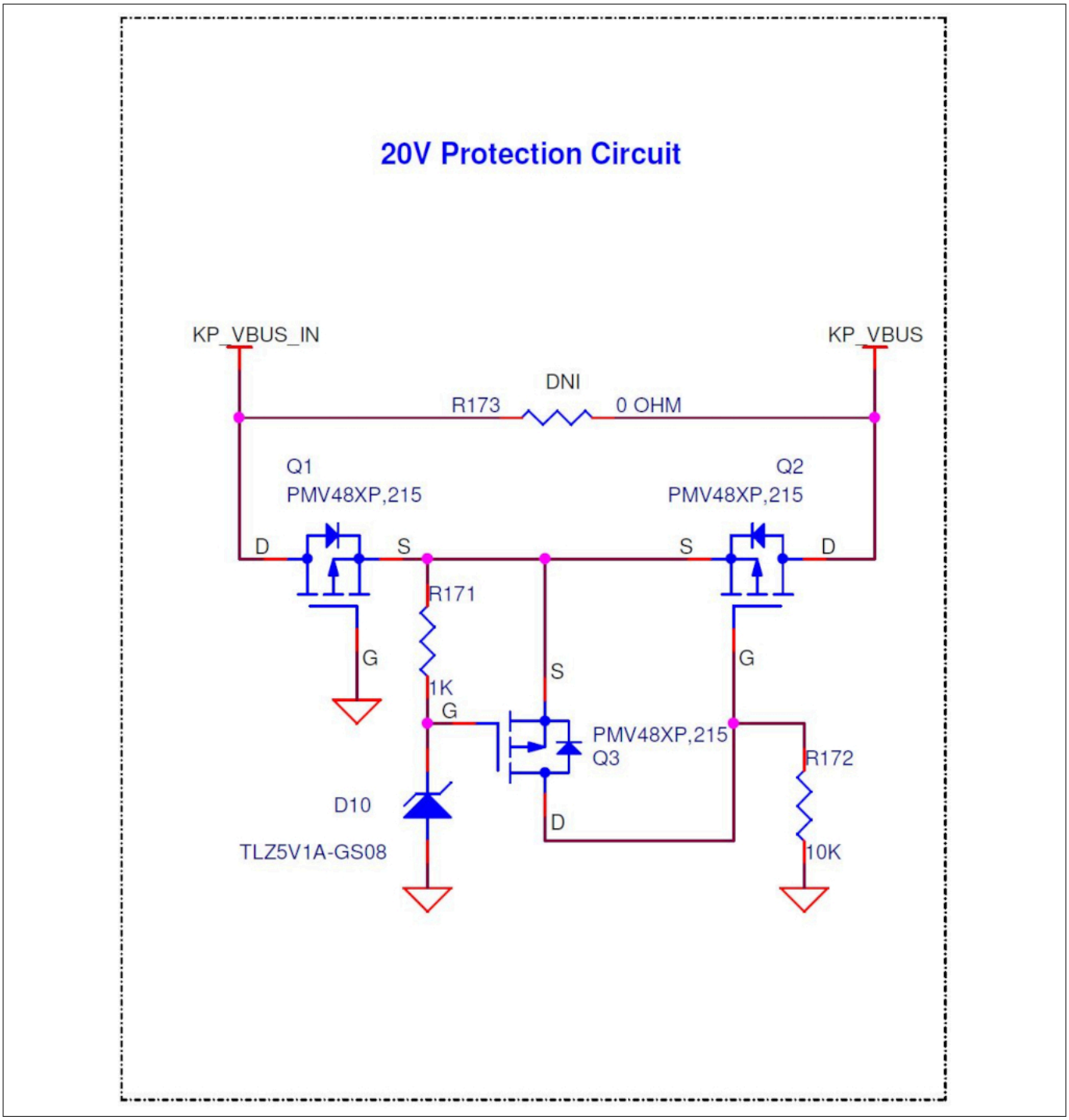

Figure 19 20 V protection circuit for USB

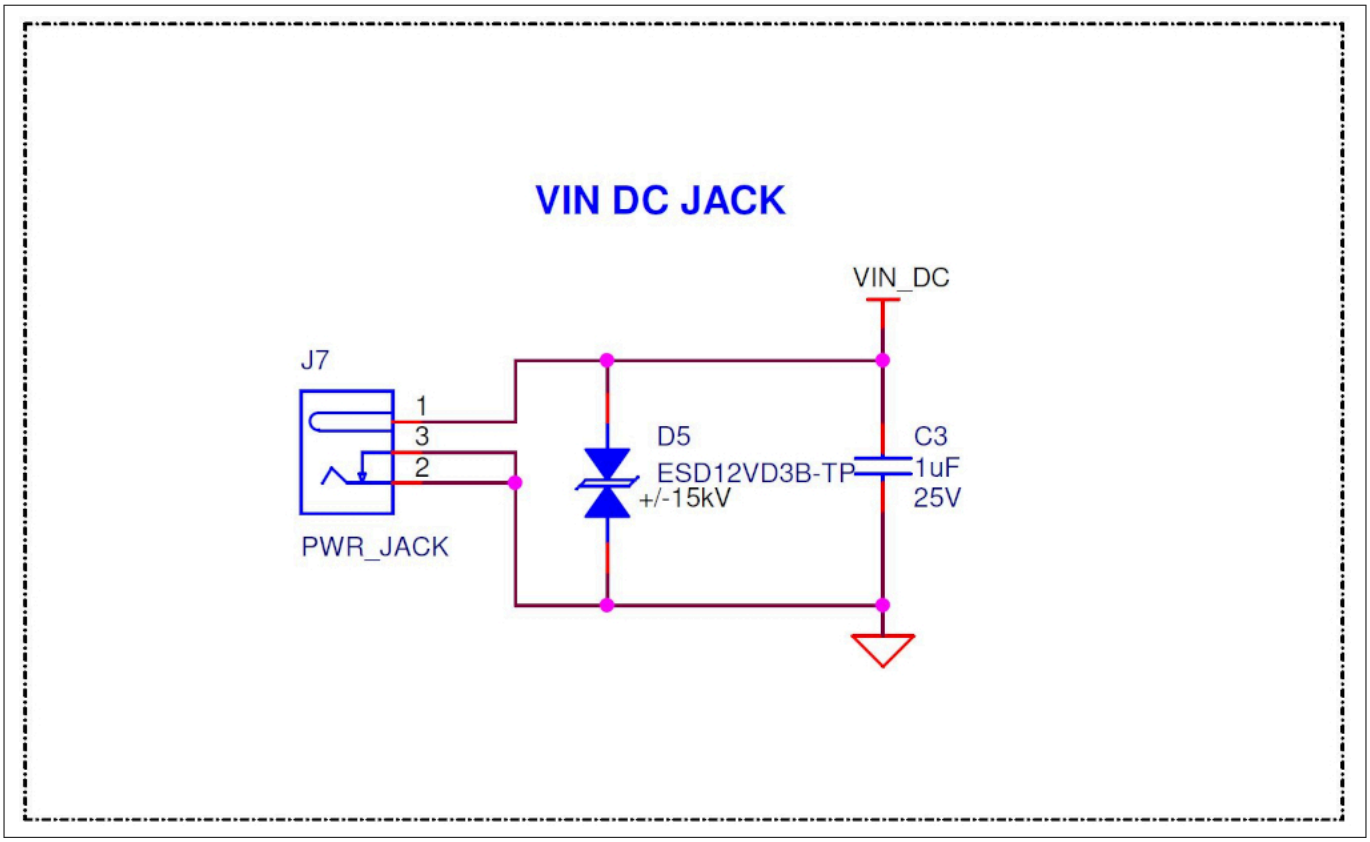

Figure 20 5 V - 12 V DC jack

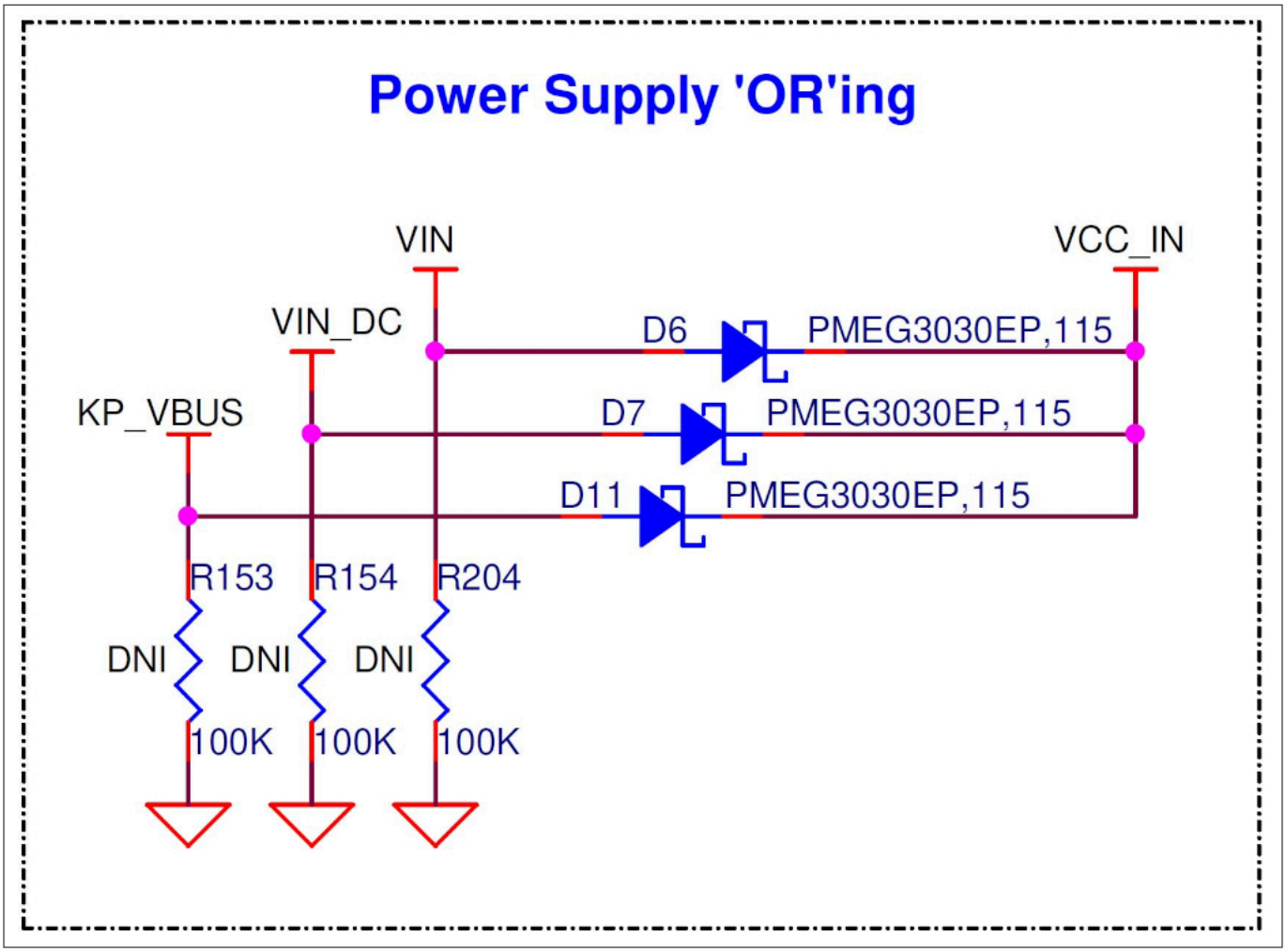

Figure 21 Power supply ORing circuit

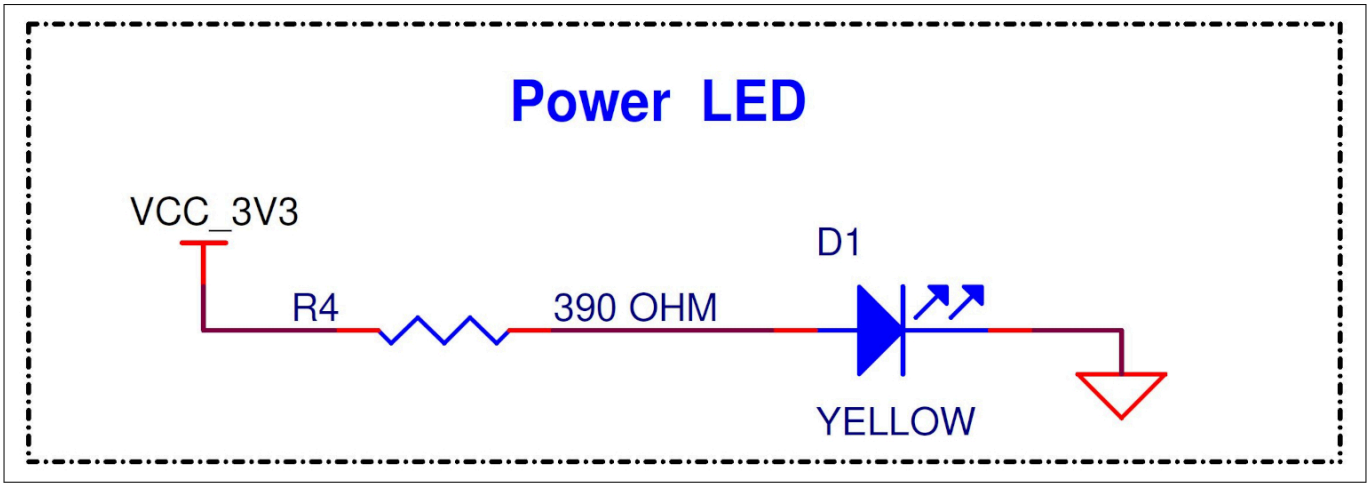

Figure 22 Power LED

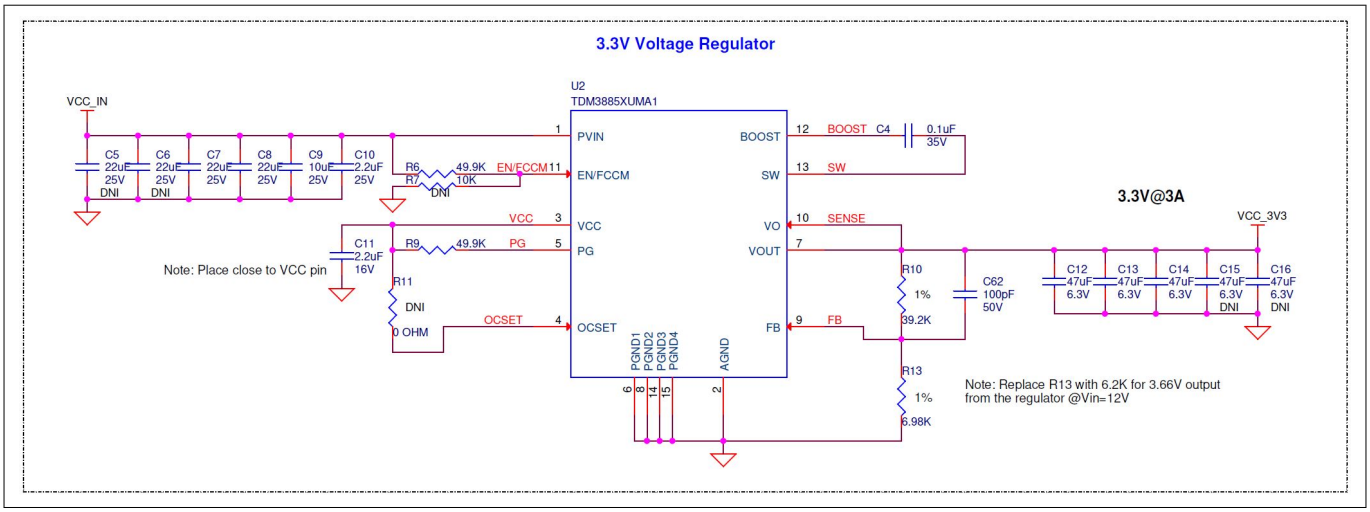

Figure 23 3.3 V Buck regulator

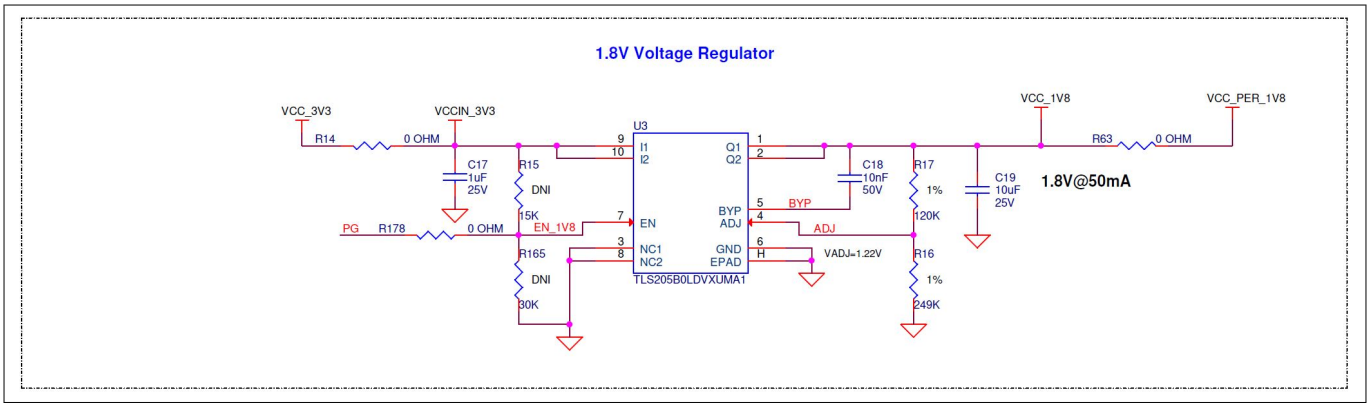

Figure 24 1.8 V LDO

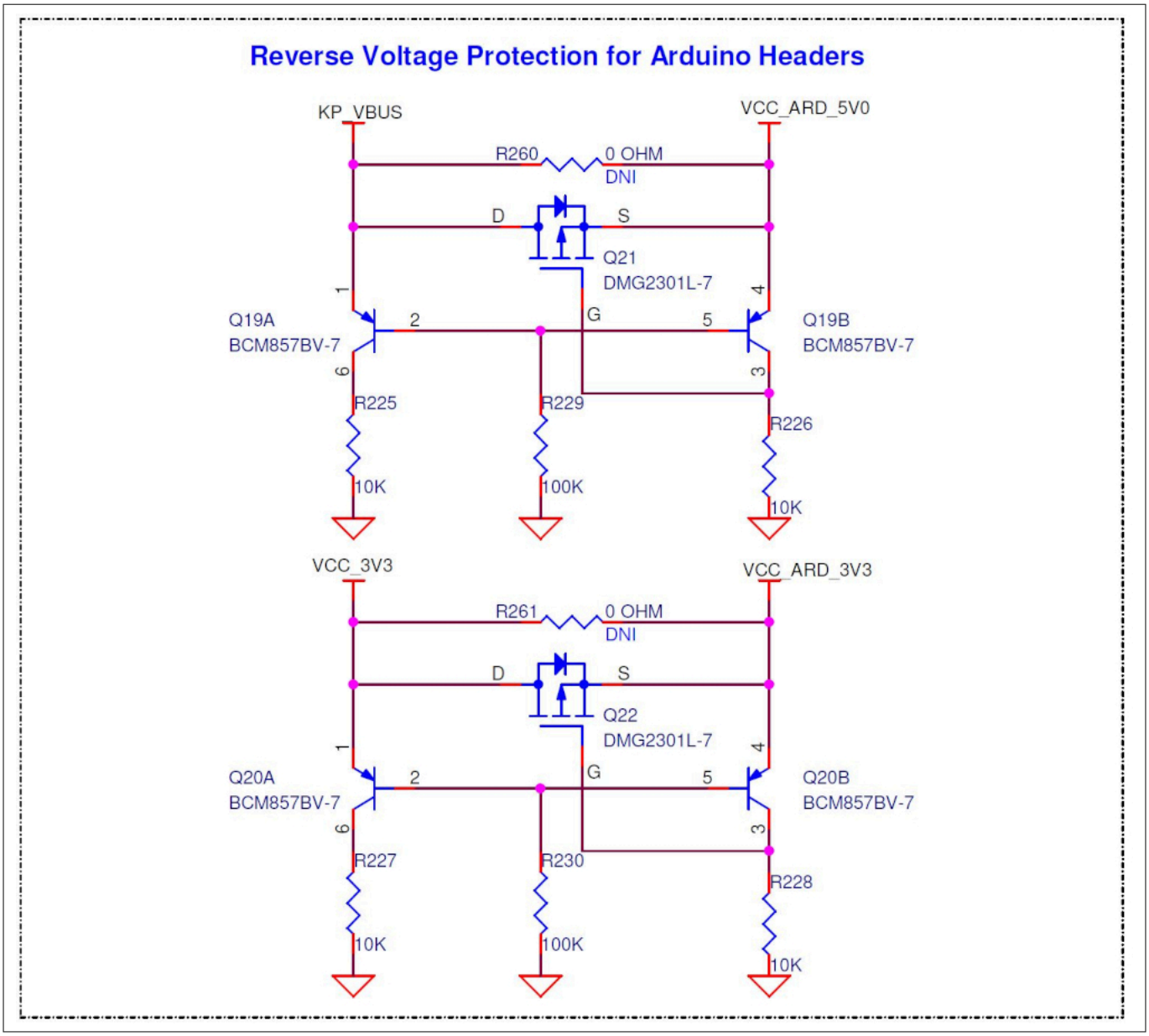

Figure 25 Reverse voltage protection circuit for Arduino headers

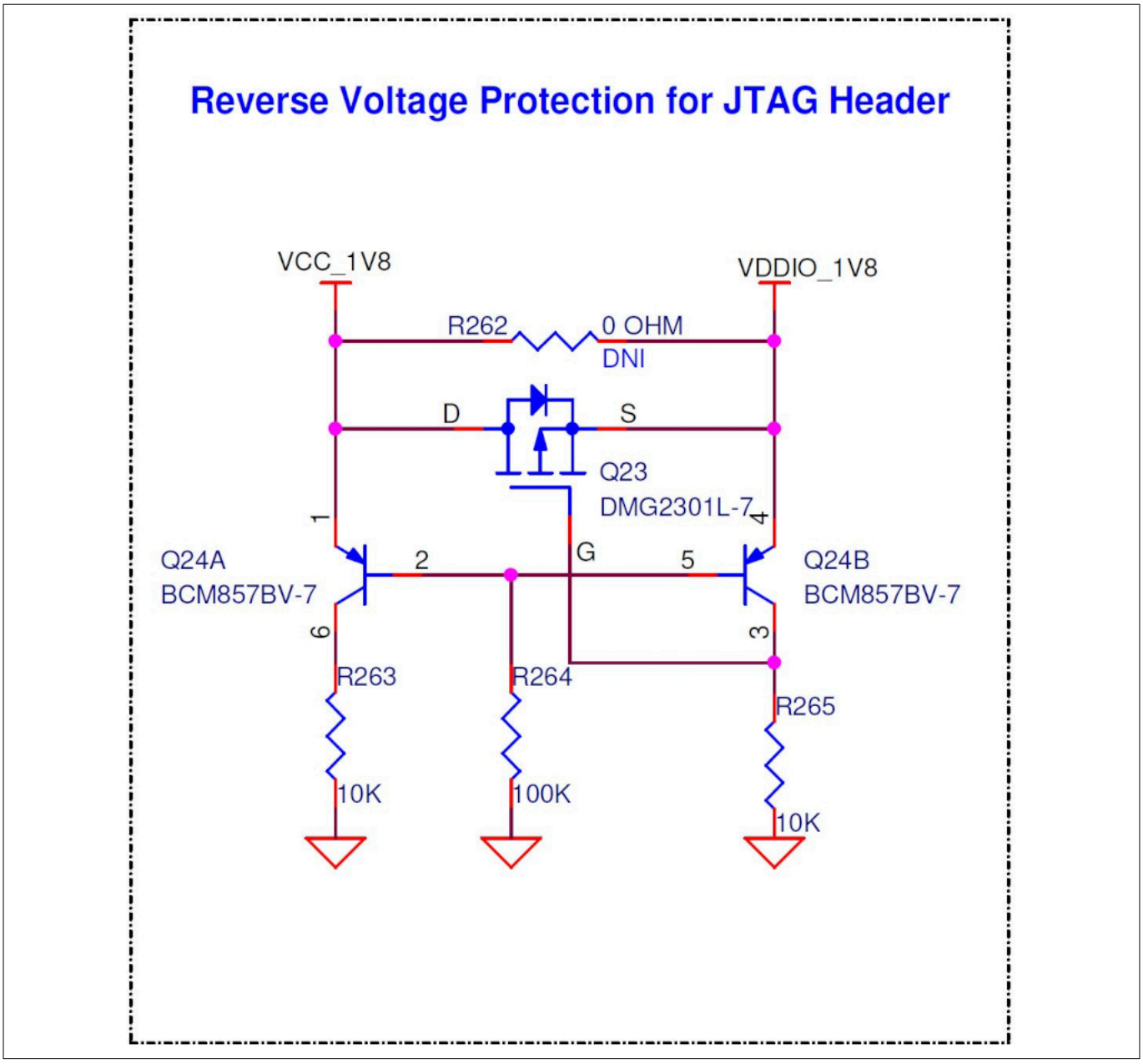

Figure 26 Reverse protection circuit for connector J9

3.2.3 Device recovery and reset

CYW955913EVK-01 has one recovery button and a reset button. The recovery button (SW1) connects to the BT_UART_CTS_N pin on the CYW55913 device, and while pressing the button, this pin is connected to ground and push the device into recovery mode.

SW2 on the kit is the reset button, which is connected to the BT_REG_ON pin of the CYW55913 device, and once button is pressed, it connects this pin to ground, disables the BT subsystem power supply, and makes the system reset. The BT_REG_ON pin of the device is also connected to the J17 header, and by placing jumper on the same, the BT subsystem can be permanently disabled.

Also, J16 connected to the WL_REG_ON pin of the CYW55913, should be mounted with the jumper to connect the pin always to ground.

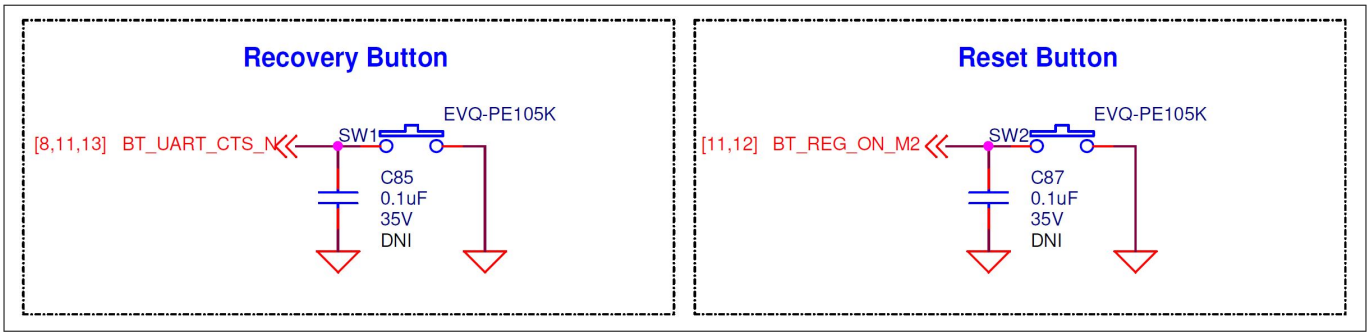

Figure 27 Reset and recovery buttons

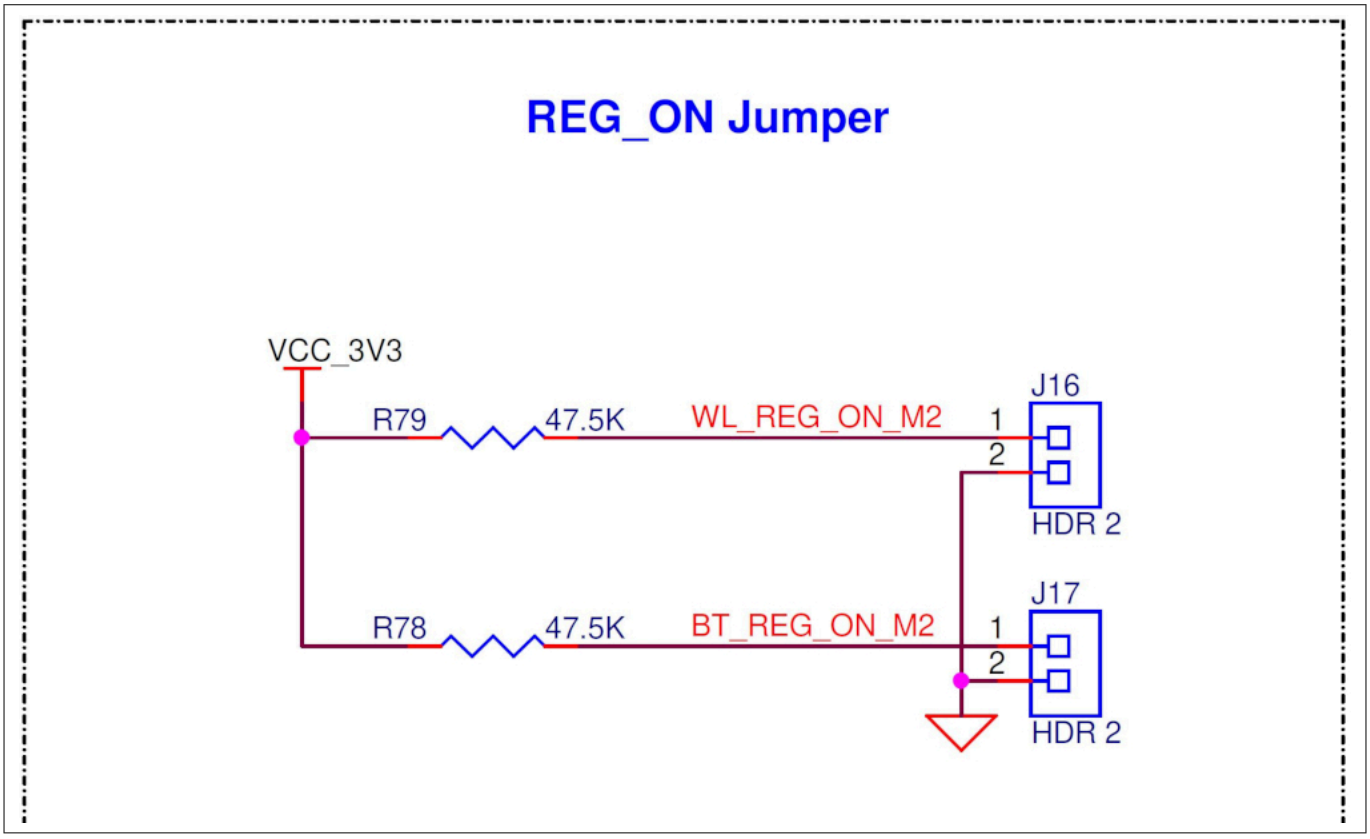

Figure 28 WL_REG_ON and BT_REG_ON jumpers

3.2.4 Digital (PDM) microphones

This kit has two digital mics that are connected to the CYW55913 device through the PDM interface and can be used for audio record functionalities in stereo mode. The select pin on each microphone is biased such that data is either on a HIGH or LOW of the clock signal. This digital mic is powered from the VCC_PER_1V8 power rail of the kit.

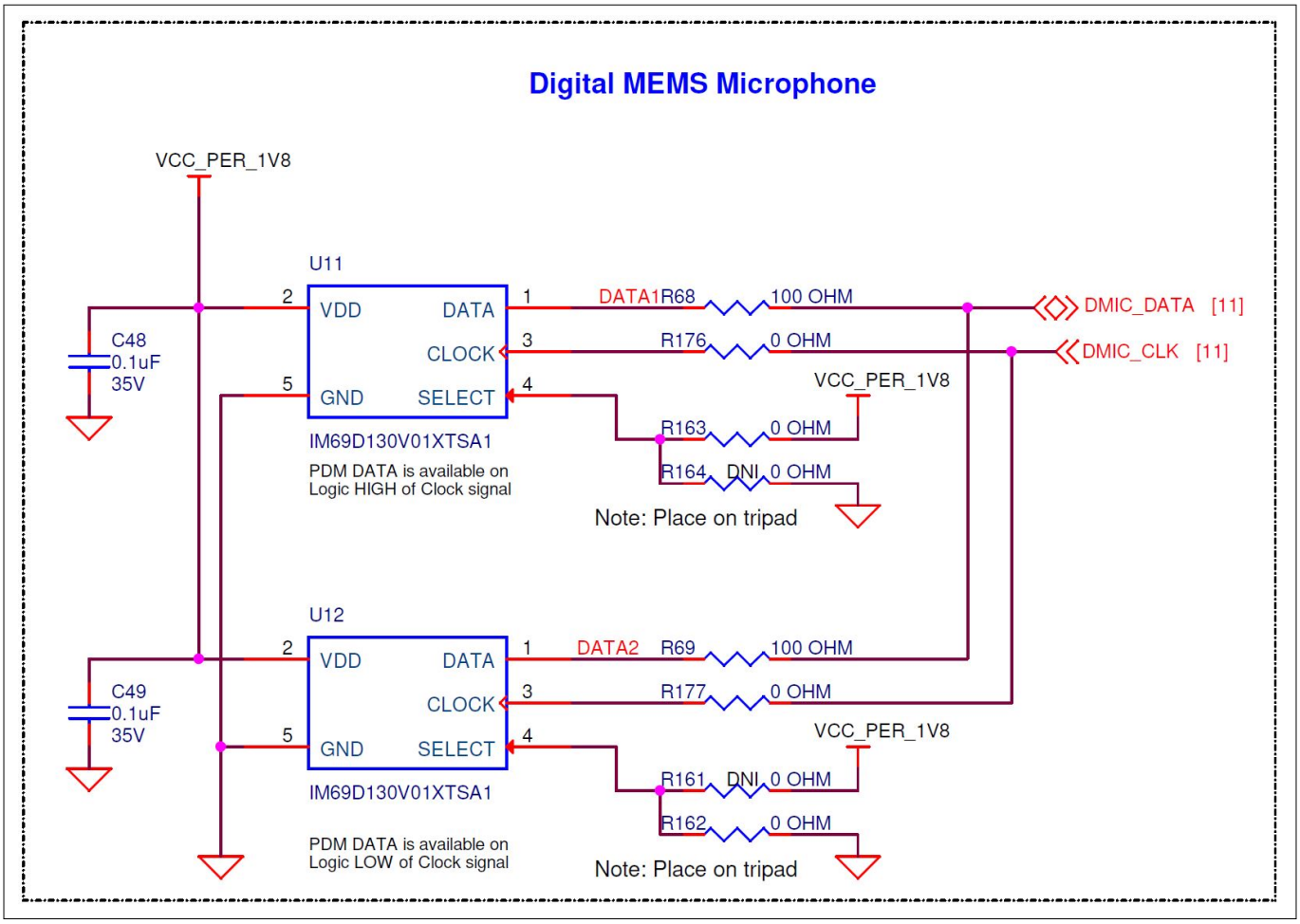

Figure 29 Digital microphone

3.2.5 Analog microphone

One analog microphone is also included in this kit to demonstrate the analog audio capability of the CYW55913 device. Differential output AMIC is interfaced with the CYW55913 device through the dedicated analog microphone input pin and AGND pin. This AMIC is powered by the VCC_PER_1V8 rail on the kit.

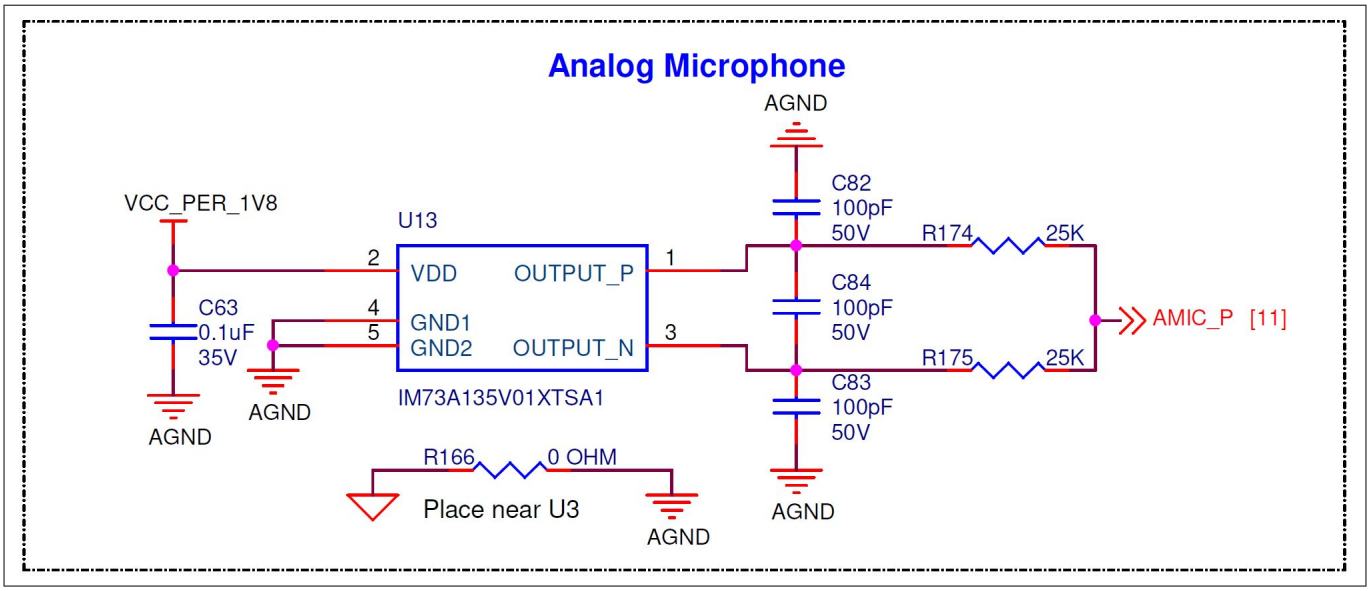

Figure 30 Analog microphone

3.2.6 Ambient light sensor

Kit is having a digital ambient light sensor on the baseboard, which is connected to the CYW55913 device via an I2C interface. The ambient light sensor is powered by the VCC_PER_1V8 power rail on the baseboard, sense the ambient light intensity, and provides data to the CYW55913 device via an I2C interface.

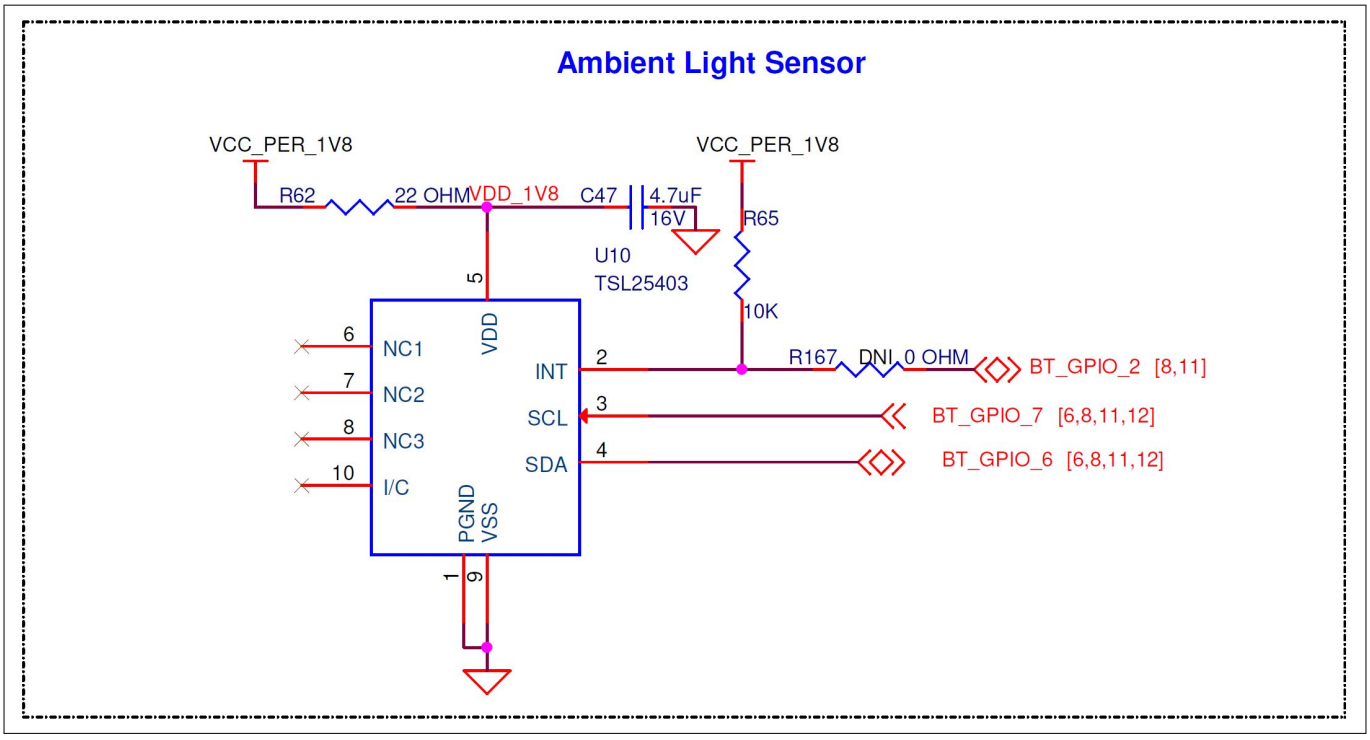

Figure 31 Ambient light sensor

3.2.7 User LEDs

There are two user LEDs on the baseboard that are connected to the GPIOs of the CYW55913 device. User LED1 is connected to the BT_GPIO_16, and user LED2 is connected to the BT_GPIO_17, and these connections to the LEDs can be isolated using the SW5 switch when the GPIOs are accessed on the Arduino connectors.

LEDs are connected to the device GPIOs, so the GPIOs need to be configured as low for glowing the LEDs.

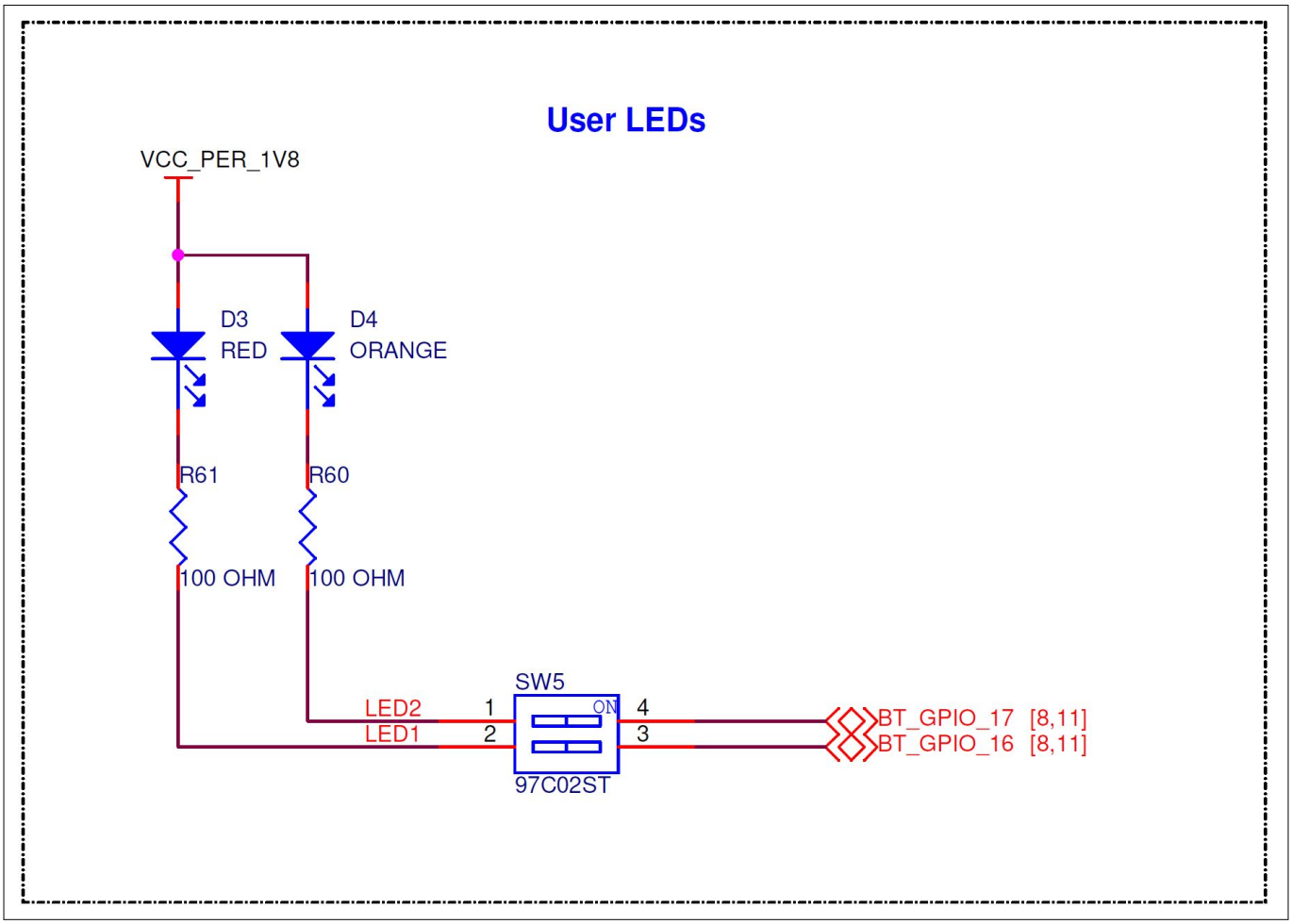

Figure 32 User LEDs and isolation switch

3.2.8 User button

One user-controlled button is available on the kit to provide user-specified inputs. This user button is connected to BT_GPIO_4 of the CYW55913 device as an active low input.

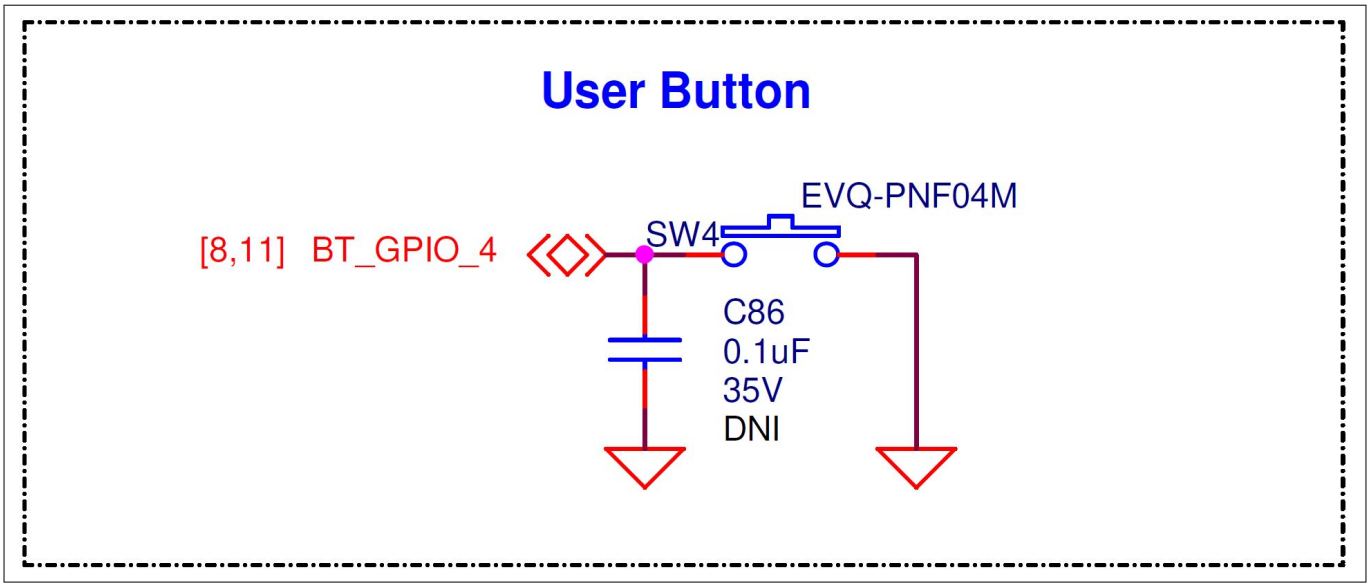

Figure 33 User button

3.2.9 Potentiometer

One Potentiometer is present on the kit and is connected to the ADC-capable pin (LHL_GPIO_8) of the CYW55913 device that enables the kit to demonstrate the analog capability of the device.

If this GPIO is used for other functionalities on the Arduino header, the potentiometer can be disconnected from the GPIO by removing the jumper from the J10 header.

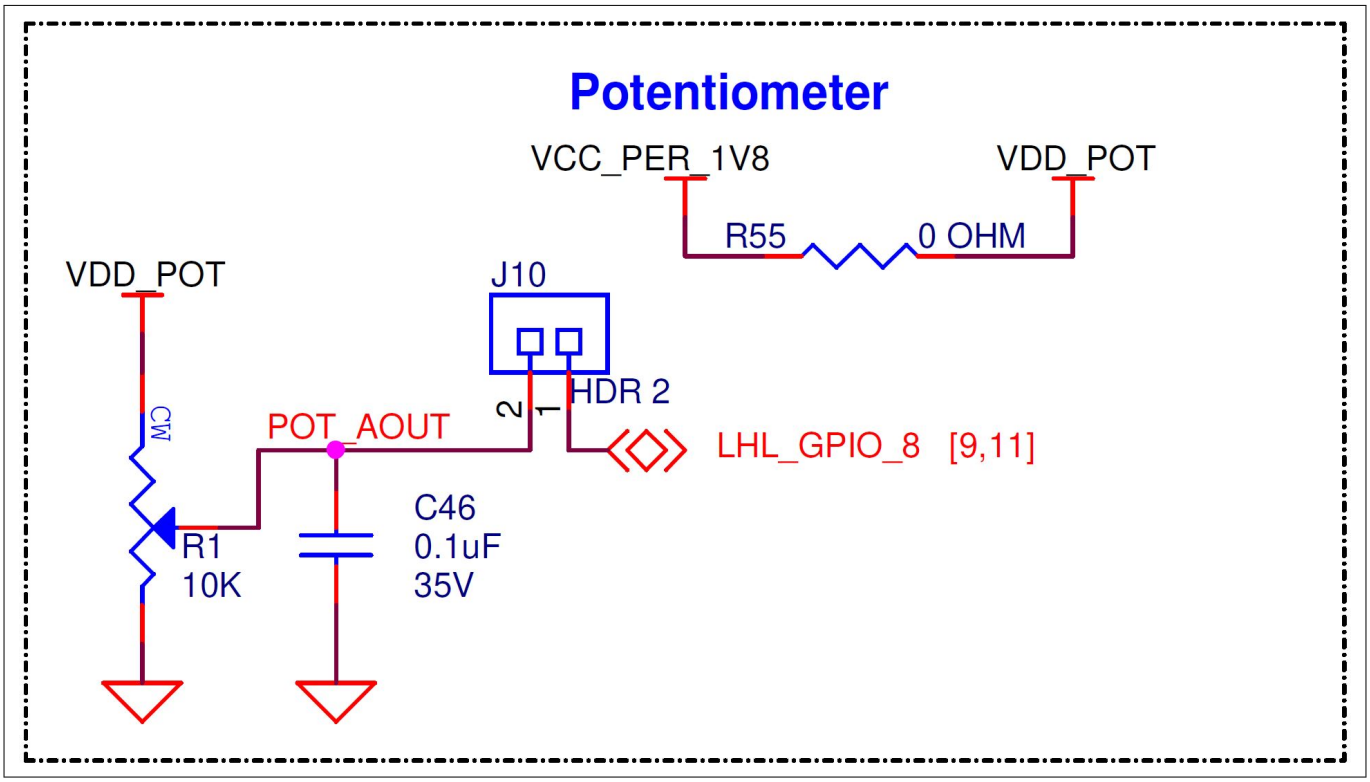

Figure 34 Potentiometer

3.2.10 Arduino compatible headers and extended headers

The baseboard supports generic Arduino-compatible Uno shields and selected Infineon custom-defined Arduino-compatible shields. All CYW55913 GPIO pins are moved out to Arduino-compatible headers. Some pins with fixed functions are also multiplexed through 0 Ω and connected to headers. The I/O headers J1-J4 whose position and pin map comply with the Arduino-compatible UNO R3 kit to support Arduino-compatible shields.

The system power signals are moved to the pins of J1. The power supply pins for Arduino-compatible VCC_ARD_3V3 and VCC_ARD_5V0 connect to VCC_3V3 and KP_VBUS through reverse voltage protection circuits. All GPIOs of the CYW55913 device are at 1.8 V, and level translators are used to level shift them to 3.3 V, 5 V to support those voltage levels, and VIOREF voltage can be selected with the jumper position in the J20 header.

Extended headers are also available on the kit and mapped to the TDM interfaces from the CYW55913 device to support the BT audio functionality.

The SW6 slide switch is used to switch the functionalities of the multiplexed GPIOs LHL_GPIO_8 and LHL_GPIO_9.

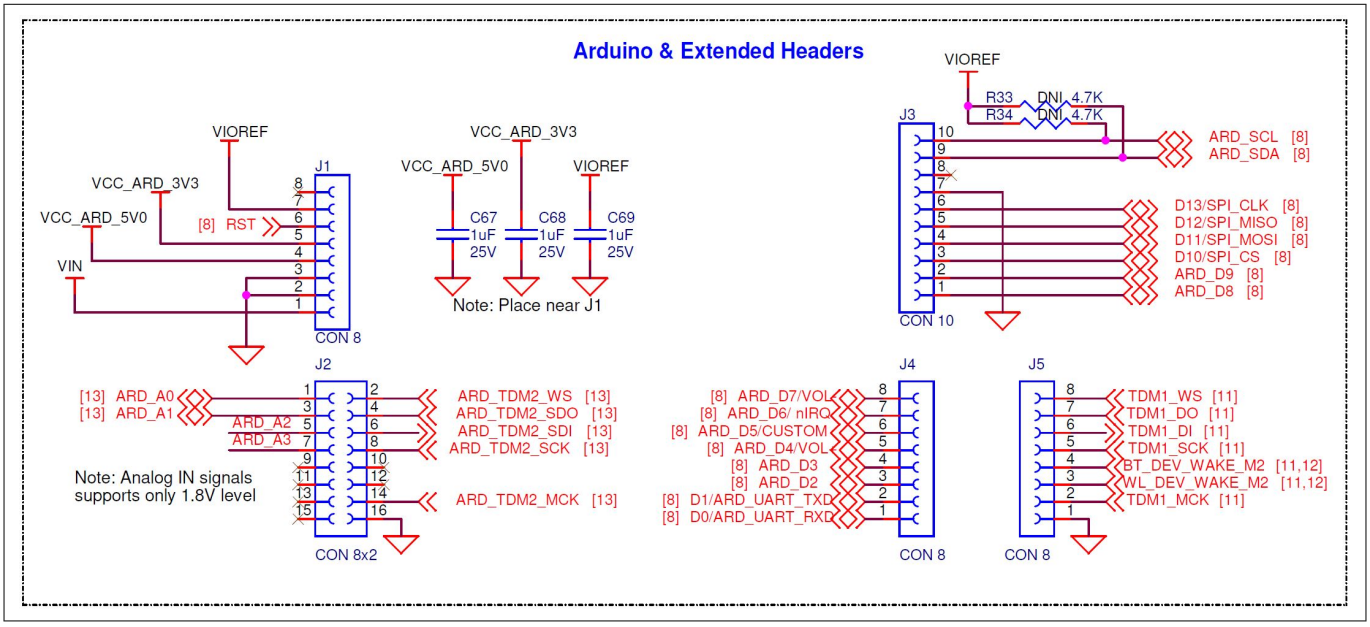

Figure 35 Arduino and extended headers

CYW55913 device have three Serial Communication Blocks (SCBs) supports three serial communication protocols: SPI, UART, and I2C. Only one of the protocols is supported by an SCB at any given time.

In CYW955913EVK-01, SPI interface to the Arduino header J3 and the Peripheral UART available on the USB connector(J6) uses the same SCB block (SCB1). So only one of them can be accessed at any given time.

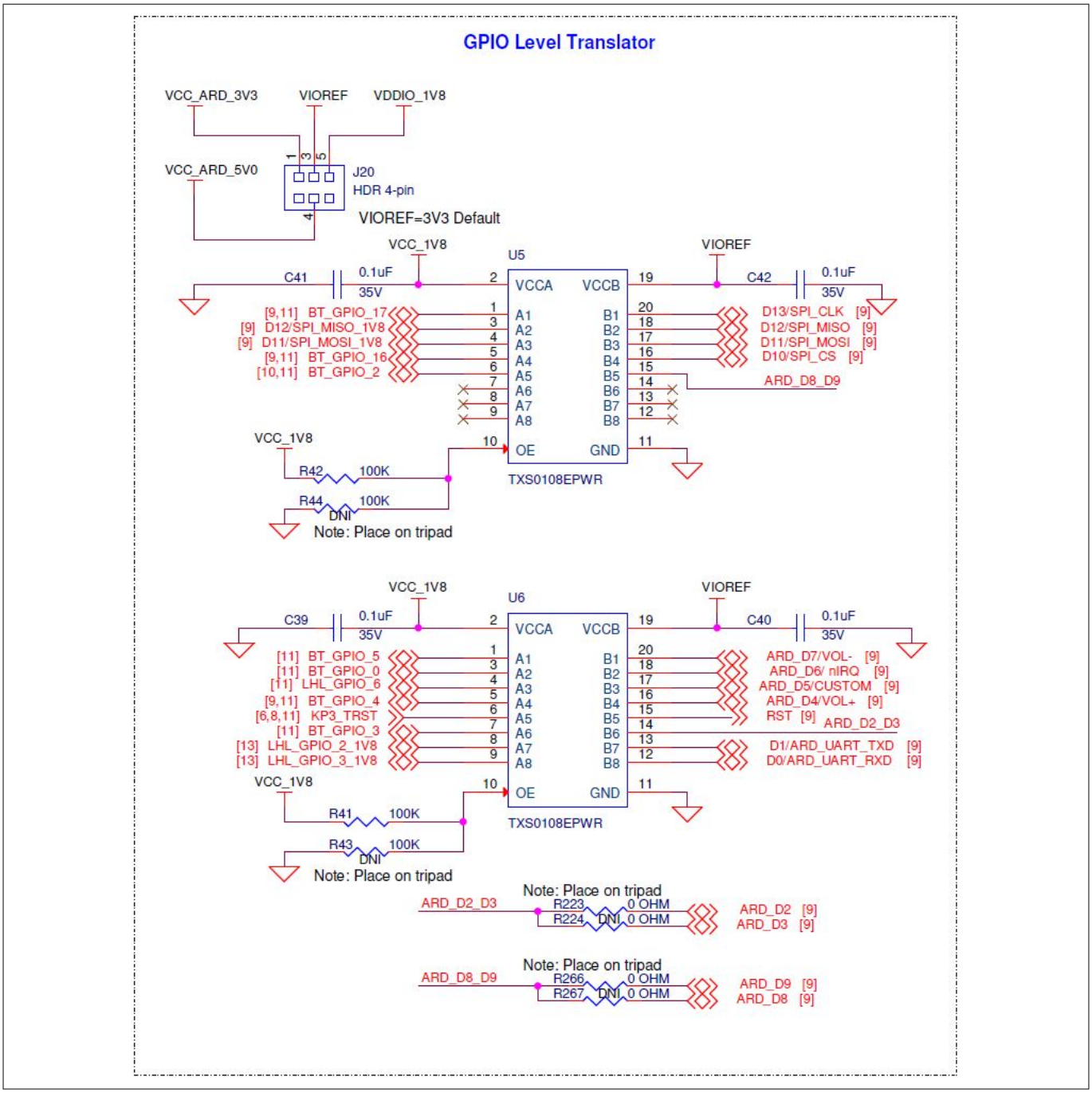

Figure 36 GPIO level translators for Arduino headers

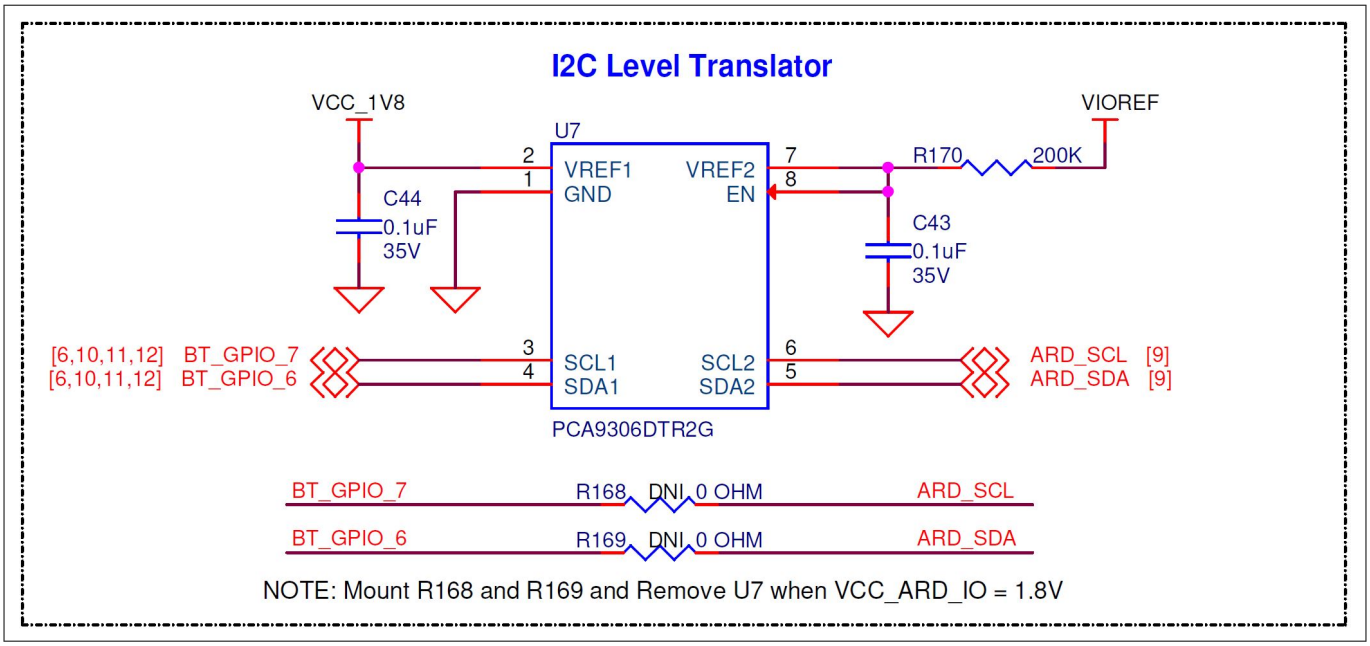

Figure 37 I2C level translator

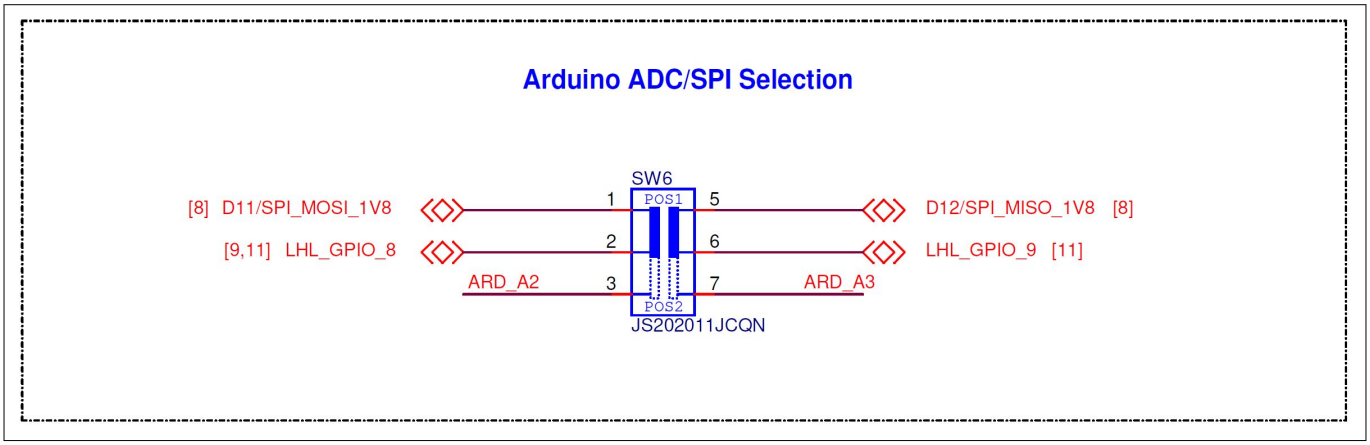

Figure 38 Multiplex switch for LHL_GPIO

3.2.11 M.2 connector for CYW55913 carrier module

The M.2 E-Key standard connector (J13) is used to interface the CYW55913 M.2 carrier module to the baseboard. This connector brings out all major interfaces like HCI UART, SDIO, TDM, and GPIOs from the device.

One external LPO option is provided on the baseboard, which is connected to the pin-50 of M.2 connector to provide 32.768 kHz clock to the M.2 carrier module.

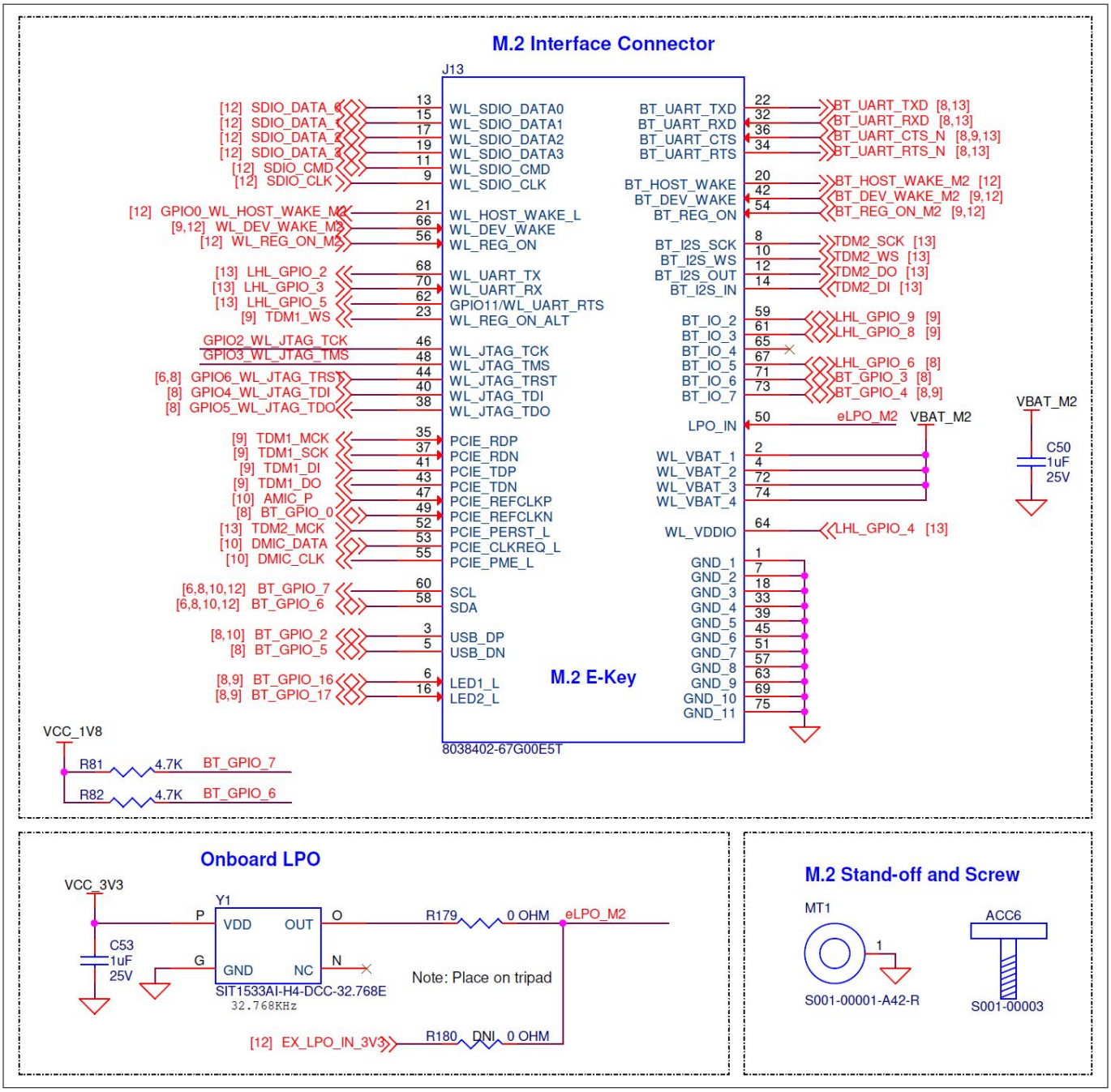

Figure 39 M.2 E-Key connector

3.2.12 External host interface connector

To interface the CYW55913 device to other external host platforms, one external host interface is added on the kit, which maps all the major interfaces from the device. One 30-pin FFC cable with FFC to M.2 adapter card enables the user to interface the CYW55913 carrier module to external host platforms.

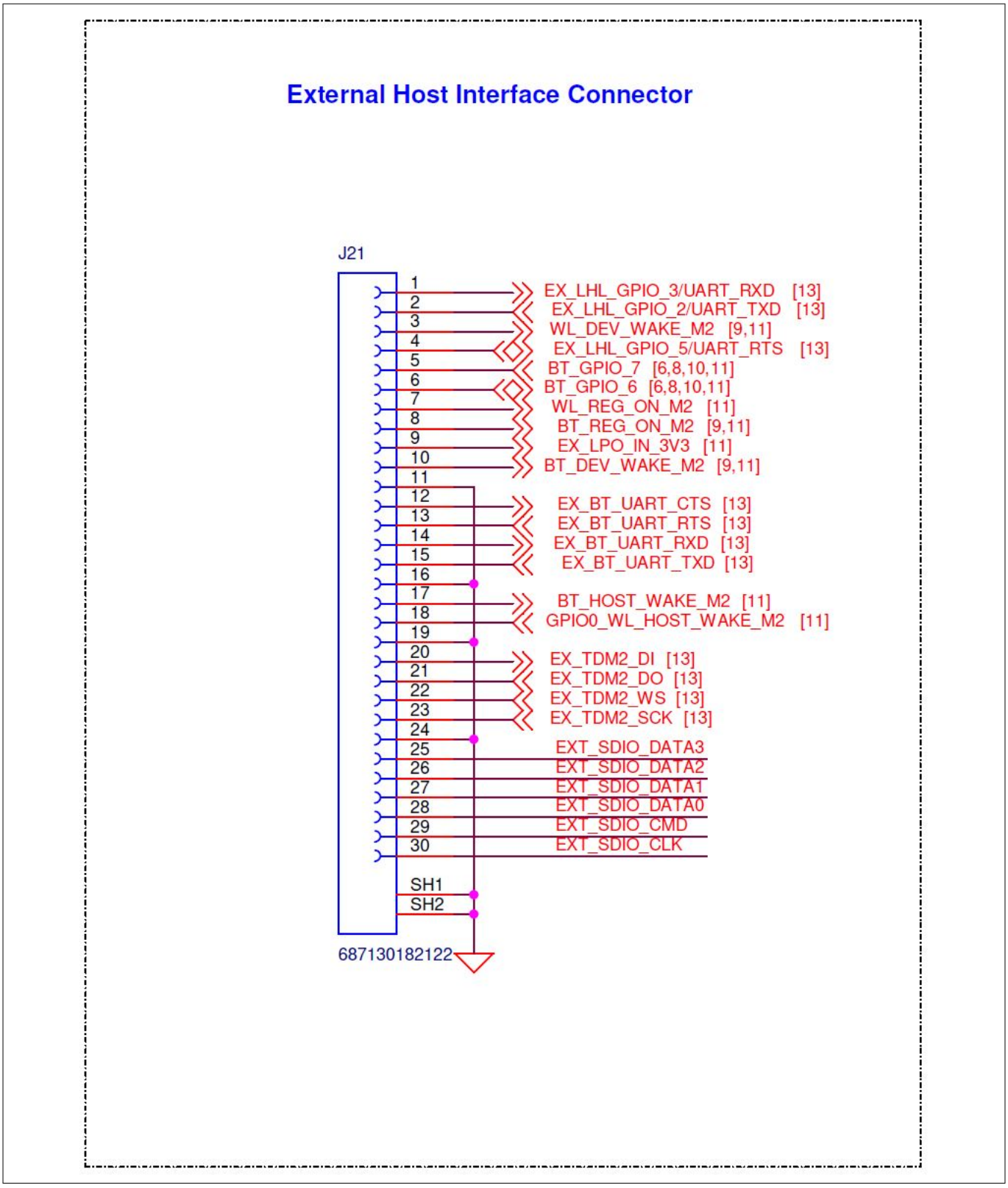

Figure 40 External host interface connector

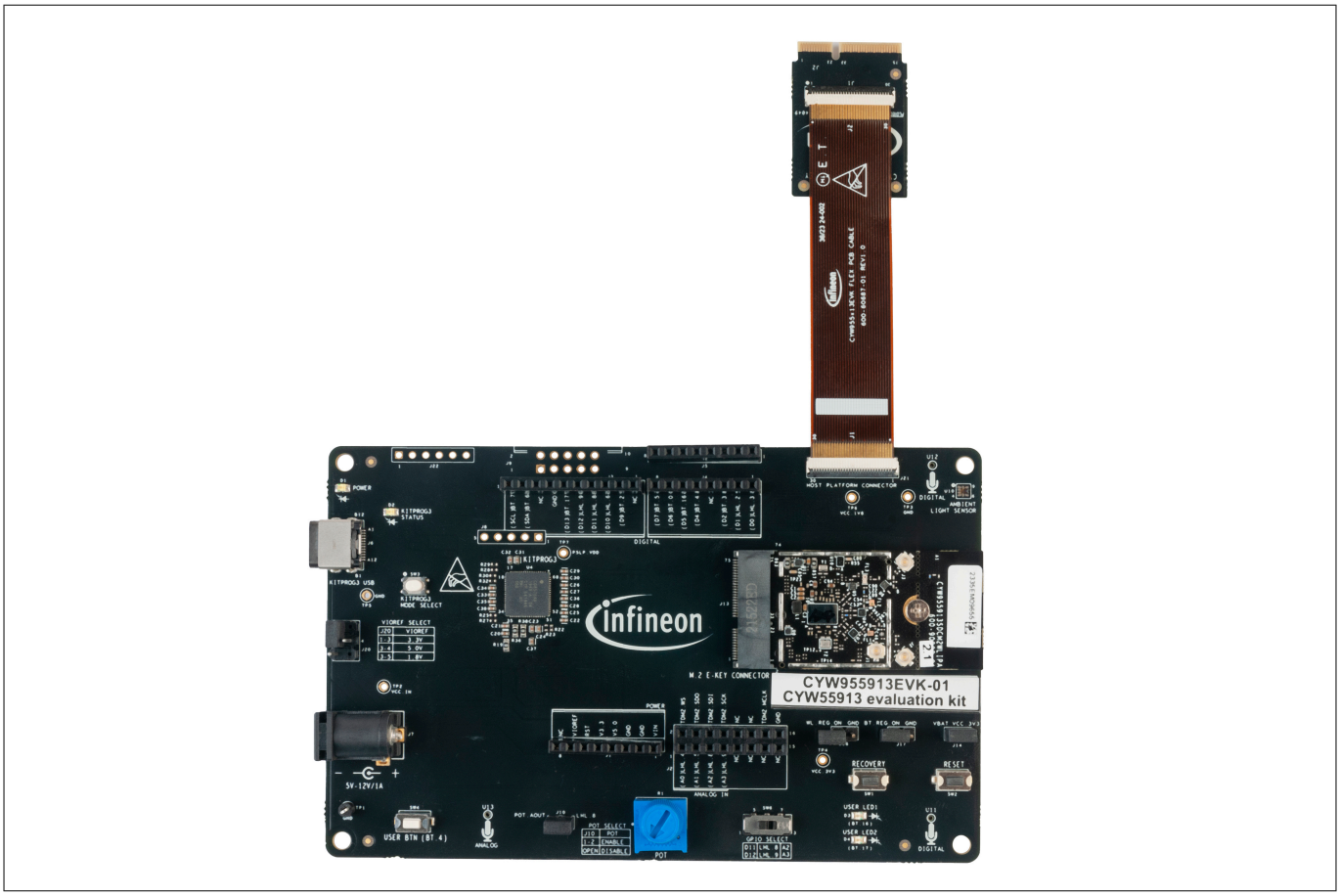

Figure 41 Host interface connection to external host platform

3.2.13 JTAG connector

Connector J9 on the baseboard maps the WL GPIOs from the CYW55913 device, which functions as the JTAG/ COEX pins from the device. By default, this connector path is not mounted. See the Kit reworks chapter for the rework required to enable this path.

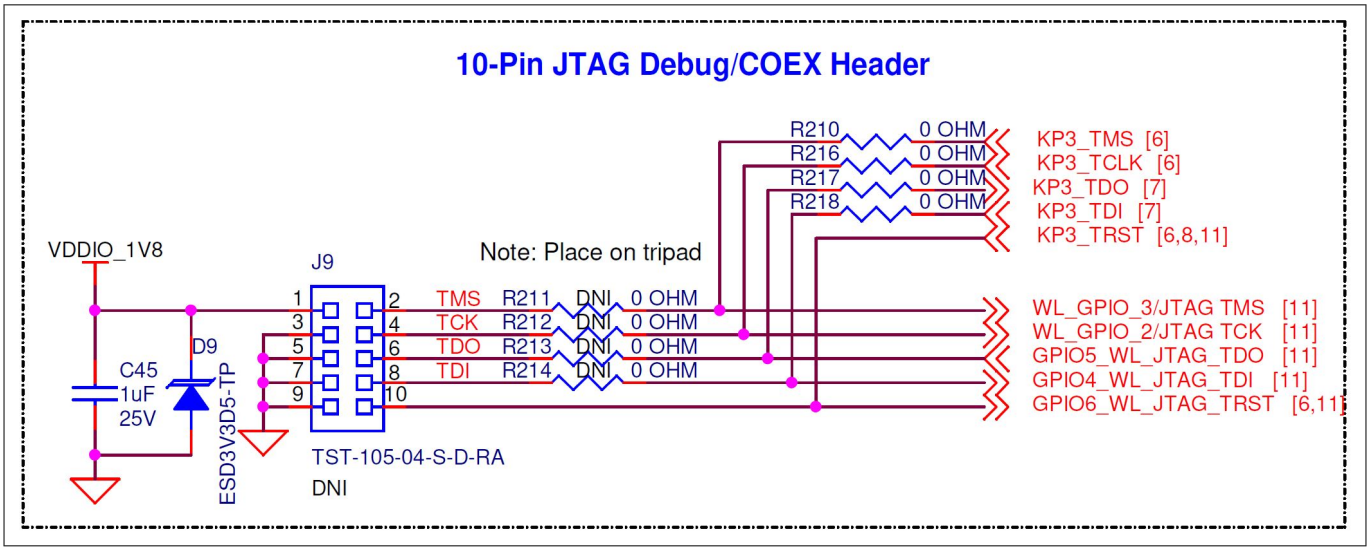

Figure 42 JTAG connector

3.2.14 UART connector

To enable UART programming from an external source, the baseboard has one 6-pin header (J22), which is not mount by default. It maps the HCI UART pins from the CYW55913 device with level translated to 3.3 V.

For details of the rework required to enable this path, see the Kit reworks chapter.

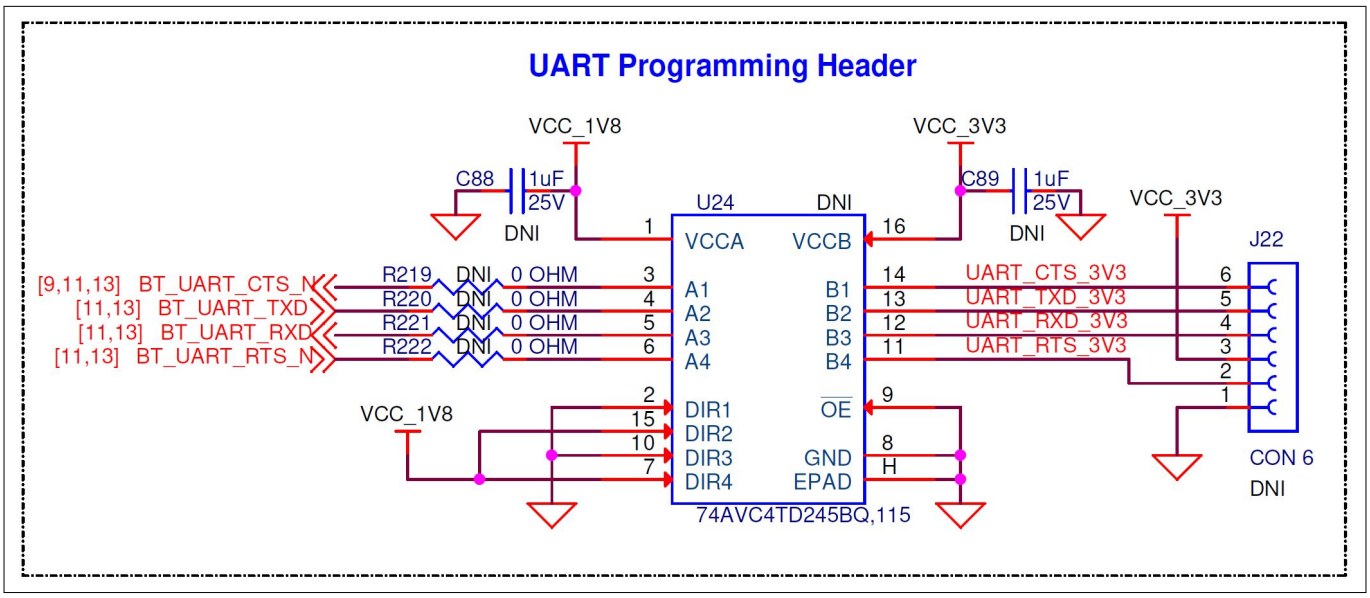

Figure 43 UART programming header

4 CYW55913 device I/O mapping

Table 17 gives the detailed I/O mapping of CYW55913 device and how it is connected to the peripherals and connectors on the baseboard. Baseboard connection 1 in the table defines the default configuration, and for other connection to enable, reworks may be required. See the Kit reworks chapter for more details.

Table 17 CYW55913 device I/O mapping

M.2 carrier module pin	M.2 carrier module pin name	CYW55913 pin	Baseboard connection 1 (Default)	Baseboard connection 2	Baseboard connection 3
1	GND	GND	GND	–	–
2	VBAT_M2	ASR_VDDBAT WLLDO_VDDBAT BTLDO_VDDBAT	VCC_3V3	–	–
3	BT_GPIO_2	BT_GPIO_2	ARD_D9	ARD_D8	ALS_INT
4	VBAT_M2	ASR_VDDBAT WLLDO_VDDBAT BTLDO_VDDBAT	VCC_3V3	–	–
5	BT_GPIO_5	BT_GPIO_5	ARD_D7/VOL	-	–
6	BT_GPIO_16	BT_GPIO_16	USER_LED1	D10/SPI_CS	–
7	GND	GND	GND	–	–
8	TDM2_SCK	TDM2_SCK	ARD_TDM2_SCK	EX_TDM2_SCK	–
9	SDIO_CLK	SDIO_CLK	gSPI_SCLK	EXT_SDIO_CLK	–
10	TDM2_WS	TDM2_WS	ARD_TDM2_WS	EX_TDM2_WS	–
11	SDIO_CMD	SDIO_CMD	gSPI_MOSI	EXT_SDIO_CMD	–
12	TDM2_DO	TDM2_DO	ARD_TDM2_DO	EX_TDM2_DO	–
13	SDIO_DATA_0	SDIO_DATA_0	gSPI_MISO	EXT_SDIO_DATA0	–
14	TDM2_DI	TDM2_DI	ARD_TDM2_DI	EX_TDM2_DI	–
15	SDIO_DATA_1	SDIO_DATA_1	gSPI_IRQ	EXT_SDIO_DATA1	–
16	BT_GPIO_17	BT_GPIO_17	USER_LED2	D13/SPI_CLK	–
17	SDIO_DATA_2	SDIO_DATA_2	GND	EXT_SDIO_DATA2	–
18	GND	GND	GND	–	–
19	SDIO_DATA_3	SDIO_DATA_3	gSPI_CS	EXT_SDIO_DATA3	–

(table continues...)

Table 17 (continued) CYW55913 device I/O mapping

M.2 carrier module pin	M.2 carrier module pin name	CYW55913 pin	Baseboard connection 1 (Default)	Baseboard connection 2	Baseboard connection 3
20	BT_HOST_WAKE_M2	BT_HOST_WAKE	J21.17	–	–
21	GPIO0_WL_HOST_WAKE_M2	GPIO0_WL_HOST_WAKE	J21.18	–	–
22	BT_UART_TXD	BT_UART_TXD	KP3_BT_RX	EX_BT_UART_TXD	J22.5
23	TDM1_WS	TDM1_WS	J5.8	–	–
32	BT_UART_RXD	BT_UART_RXD	KP3_BT_TX	EX_BT_UART_RXD	J22.4
33	GND	GND	GND	–	–
34	BT_UART_RTS_N	BT_UART_RTS_N	KP3_BT_CTS	EX_BT_UART_RTS	J22.2
35	TDM1_MCK	TDM1_MCK	J5.2	–	–
36	BT_UART_CTS_N	BT_UART_CTS_N	SW1	KP3_BT_RTS	EX_BT_UART_CTS, J22.6
37	TDM1_SCK	TDM1_SCK	J5.5	–	–
38	GPIO5_WL_JTAG_TDO	GPIO5_WL_JTAG_TDO	KP3_TDO	J9.6	–
39	GND	GND	GND	–	–
40	GPIO4_WL_JTAG_TDI	GPIO4_WL_JTAG_TDI	KP3_TDI	J9.8	–
41	TDM1_DI	TDM1_DI	J5.6	-	–
42	BT_DEV_WAKE_M2	BT_DEV_WAKE_M2	J5.4	J21.10	-
43	TDM1_DO	TDM1_DO	J5.7	-	–
44	GPIO6_WL_JTAG_TRST	GPIO6_WL_JTAG_TRST	KP3_TRST	J9.10	–
45	GND	GND	GND	–	–
46	GPIO2_WL_JTAG_TCK	GPIO2_WL_JTAG_TCK	KP3_TCLK	J9.4	–
47	AMIC_P	MIC_P	AMIC_P	–	–
48	GPIO3_WL_JTAG_TMS	GPIO3_WL_JTAG_TMS	KP3_TMS	J9.2	–
49	BT_GPIO_0	BT_GPIO_0	ARD_D6/ nIRQ	–	–
50	eLPO_M2	LPO_IN_OUT	eLPO_M2	–	–
51	GND	GND	GND	–	–

(table continues...)

Table 17 (continued) CYW55913 device I/O mapping

M.2 carrier module pin	M.2 carrier module pin name	CYW55913 pin	Baseboard connection 1 (Default)	Baseboard connection 2	Baseboard connection 3
52	TDM2_MCK	TDM2_MCK	ARD_TDM2_MCK	–	–
53	DMIC_DATA	DMIC_DQ	DMIC_DATA	–	–
54	BT_REG_ON_M2	BT_REG_ON	SW2	J17.1	J21.8
55	DMIC_CLK	DMIC_CK	DMIC_CLK	–	–
56	WL_REG_ON_M2	NC	J16.1	J21.7	–
57	GND	GND	GND	–	–
58	BT_GPIO_6	BT_GPIO_6	KP3_SDA	ARD_SDA	J21.6
59	LHL_GPIO_9	LHL_GPIO_9	D12/ SPI_MISO	ARD_A3	–
60	BT_GPIO_7	BT_GPIO_7	KP3_SCL	ARD_SCL	J21.5
61	LHL_GPIO_8	LHL_GPIO_8	Potentiometer	D11/SPI_MOSI	ARD_A2
62	LHL_GPIO_5	LHL_GPIO_5	ARD_A1	KP3_UART_CTS	EX_LHL_GPIO_5/ UART_RTS
63	GND	GND	GND	–	–
64	LHL_GPIO_4	LHL_GPIO_4	ARD_A0	KP3_UART_RTS	–
65	NC	NA	-	-	-
66	WL_DEV_WAKE_M2	WL_DEV_WAKE	J5.3	J21.3	–
67	LHL_GPIO_6	LHL_GPIO_6	ARD_D5/ CUSTOM	–	–
68	LHL_GPIO_2	LHL_GPIO_2	KP3_UART_RXD	D1/ ARD_UART_TXD	EX_LHL_GPIO_2/ UART_TXD
69	GND	GND	GND	–	–
70	LHL_GPIO_3	LHL_GPIO_3	KP3_UART_TXD	D1/ ARD_UART_RXD	EX_LHL_GPIO_3/ UART_RXD
71	BT_GPIO_3	BT_GPIO_3	ARD_D2	ARD_D3	–
72	VBAT_M2	ASR_VDDBAT WLLDO_VDDBAT BTLDO_VDDBAT	VCC_3V3	–	–
73	BT_GPIO_4	BT_GPIO_4	USER_BUTTON	ARD_D4/VOL+	–

(table continues...)

Table 17 (continued) CYW55913 device I/O mapping

M.2 carrier module pin	M.2 carrier module pin name	CYW55913 pin	Baseboard connection 1 (Default)	Baseboard connection 2	Baseboard connection 3
74	VBAT_M2	ASR_VDDBAT WLLDO_VDDBAT BTLDO_VDDBAT	VCC_3V3	–	–
75	GND	GND	GND	–	–

5 Kit reworks

This section provides details about the reworks required to enable the sections in the kit hardware that are not available by default.

5.1 JTAG connector mounting

To enable the JTAG/COEX access from the kit, you need to mount the J9 connector and resistors R211, R212, R213, and R214 to connect the CYW55913 device GPIOs to J9 and need to isolate the connection to the KP3 by removing resistors R210, R216, R217, and R218.

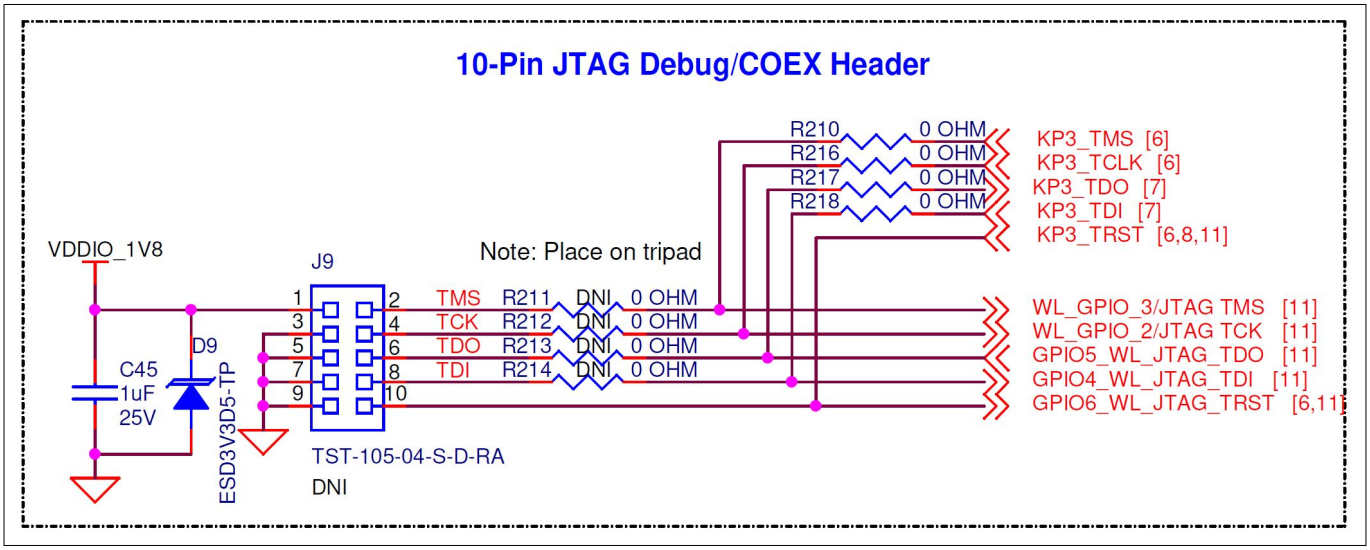

Figure 44 JTAG connector rework

5.2 UART connector mounting

To enable the external UART programming, you need to mount the J22 connector and level translator (U24), which is not mounted by default. The path to the connector from CYW55913 can be enabled by mounting R219, R220, R221, and R222 resistors and removing the connections R137, R139, R141, and R142 resistors.

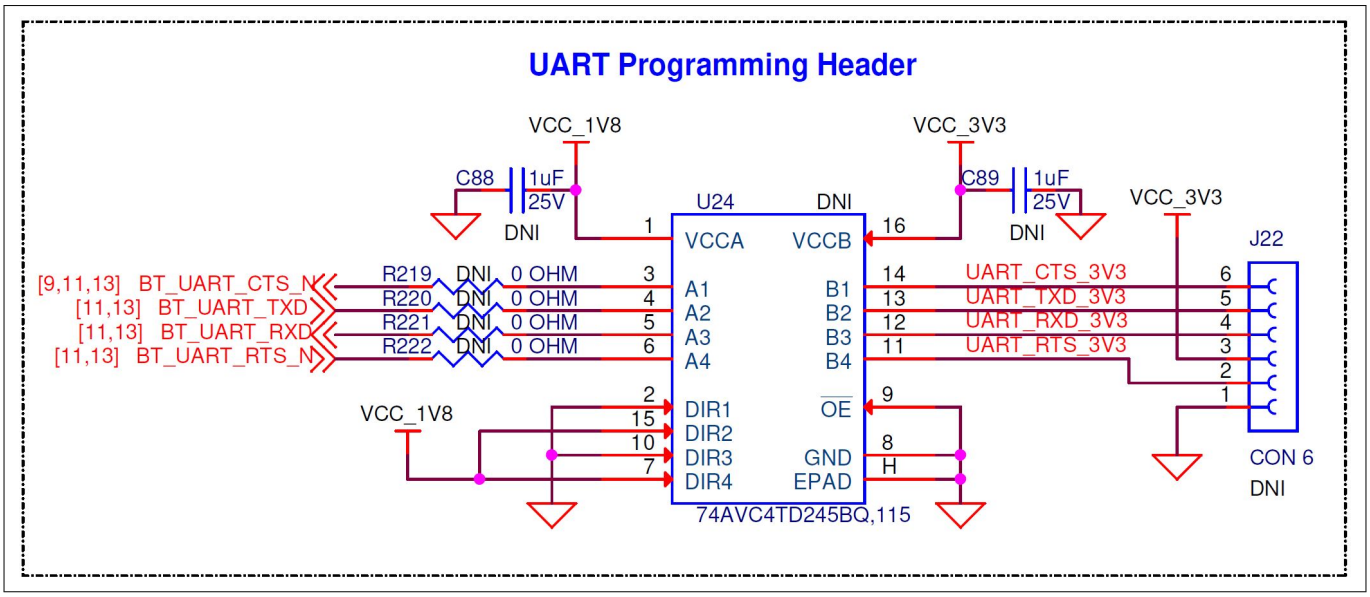

Figure 45 UART connector rework

5.3 CYW55913 device pin multiplex options

CYW55913 device major interfaces can be switched to the external host interface or Arduino header by mounting the series resistor in the path between the device and the external connector or to the Arduino header in the multiplex options.

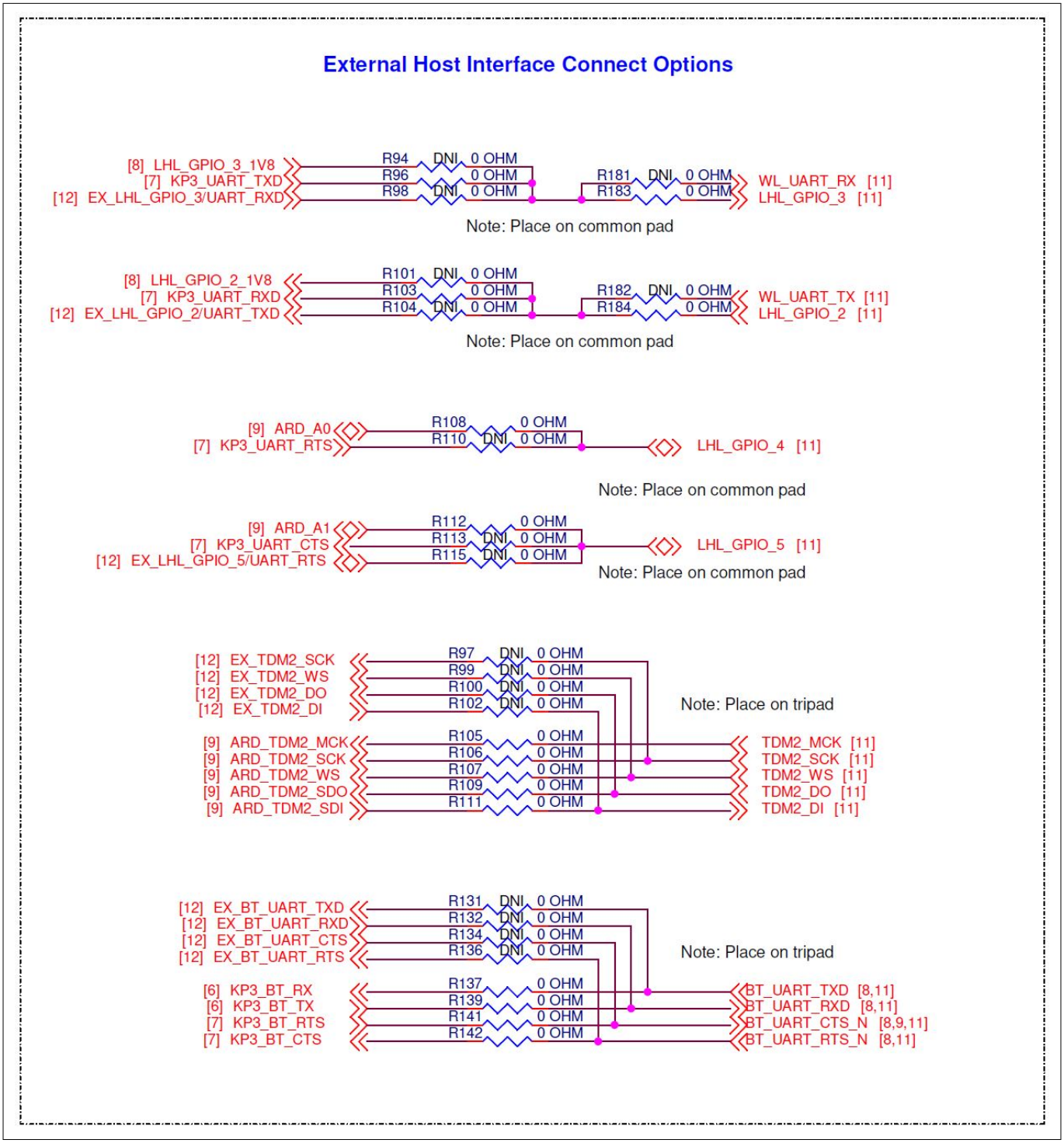

Figure 46 External host interface resistor mount options

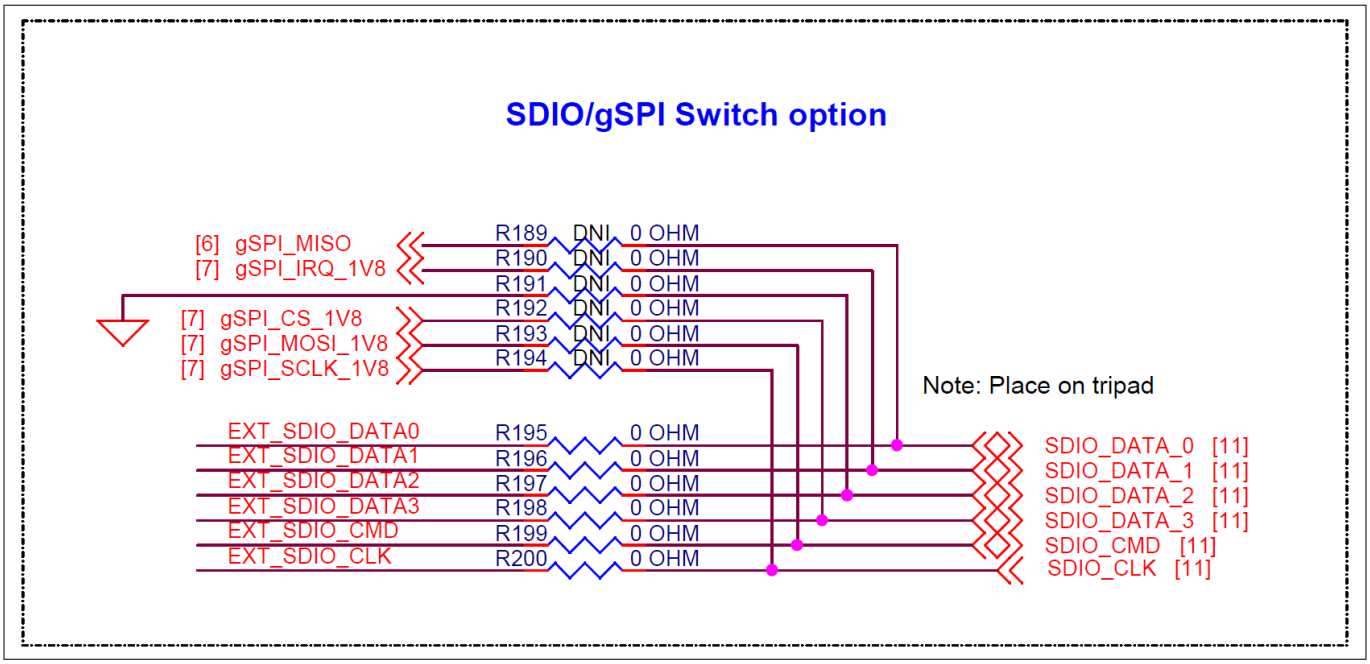

Figure 47 SDIO interface external host interface connect option

Revision history

Document version	Date of release	Description of changes
**	2023-09-29	• Initial release
*A	2024-03-21	• Updated kit name to CYW955913EVK-01 • Updated Figure 2, Figure 3, Figure 7, Figure 8, Figure 9, Figure 36 • Updated Table 3, Table 4, Table 5, Table 6, Table 10, Table 11, Table 17 • Updated these sections: - M.2 carrier module - CYW55913 device • Deleted the Antenna section • Added Figure 15
*B	2024-09-12	• Updated BLE version from 5.3 to 5.4 in the document • Updated ModusToolbox™ version from 3.1 to 3.2 in the document • Updated sections Kit contents, Getting started, ModusToolbox™ code examples • Updated Figure 1 to Table 7 with latest version board images • Updated Table 5, Table 7, Table 17 • Added new section Update programmer serial number for CYW55913

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