ESP Series of Products

CE Certification Guide

Related products

ESP32 series
ESP32-S2 series
ESP32-S3 series
ESP32-C3 series
ESP32-C6 series
ESP32-H2 series
ESP8266 series
ESP8285 series

Version 1.0
Espressif Systems

About This Document

This Guide focuses on CE certification tests for the ESP series of products.

Release Notes

Date	Version	Release Notes
2021.08	v1.0	Initial release.

Documentation Change Notification

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Certification

Download certificates for Espressif products from *https://www.espressif.com/en/certificates*.

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1. Test Preparation

1.1. Hardware Preparation

Three hardware devices are needed for CE certification tests: the DUT (device under test), serial port board, and USB cable as shown in Table 1-1.

Table 1-1. Hardware Description

Item	Picture	Quantity	Description
DUT	N/A	6	Products designed based on ESP chips or modules
Serial port board		1	Connect the PC with the Dupont cables from the DUT. It serves as the USB-UART converter that allows the PC to communicate with the DUT.
USB cable		1	Connect PC with the serial port board.

> **Note:**
>
> *1. Only Bluetooth Blocking tests need two serial port boards and two USB cables. The DUT without Bluetooth functionality only needs one serial port board and one USB cable.*
>
> *2. It is recommended to buy Espressif's serial port board via this link to reduce testing interference and to your convenience.*

1.2. Software Preparation

Download the software required for CE certification. Table 1-2 is the software description.

Table 1-2. Software Description

Item	Description
ft232r-usb-uart.zip	The driver application for Espressif's serial port board.
ESP_RF_test_tool.zip	It contains the test bin files and tools for downloading and running the bin.
BQB	For Bluetooth Blocking tests.

1.3. Download the Test Bin

Before you conduct any test, please set up the download environment and then download the test bin according to this section.

1.3.1. Setup Download Environment

Table 1-3. Setup Download Environment

Chip	Description
ESP8266 ESP8285	• Connect 3V3/CH_EN pins to the 3.3 V power supply • Connect RXD/TXD/GND pins to corresponding pins of a serial converter so that PC can communicate with DUT • Pull MTDO (GPIO15) low • Pull GPIO0 (Boot) low to make DUT enter the downloading mode
ESP32 ESP32-S2 ESP32-S3	• Connect 3V3/CH_EN pins to the 3.3 V power supply • Connect RXD/TXD/GND pins to corresponding pins of a serial converter so that PC can communicate with DUT • Pull GPIO0 (Boot) low to make DUT enter the downloading mode
ESP32-C3 ESP32-C6 ESP32-H2	• Connect 3V3/CH_EN pins to the 3.3 V power supply • Connect RXD/TXD/GND pins to corresponding pins of a serial converter so that PC can communicate with DUT • Pull GPIO9 (Boot) low and GPIO8 high to make DUT enter the downloading mode

1.3.2. Download Test Bin

After building the hardware environment, please download the test bin as follows:

1. Switch on the serial port board, and the indicator LED will light up as shown in Figure 1-1.

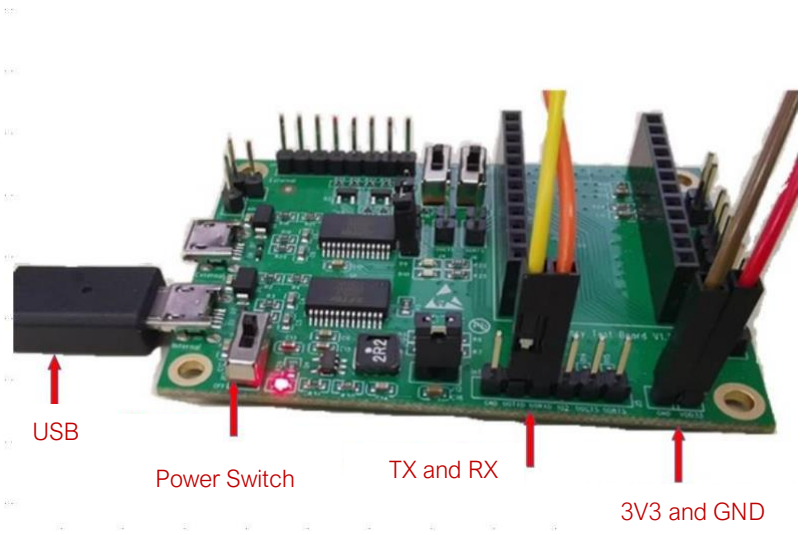


Figure 1-1. Connection with Serial Port Board

2. Unzip and open EspRFTestTool.

- Select the ChipType, COM, BaudRate, and click on **Open** to open the serial port.
- Select Flash as the download address.
- Select the test bin for your chip.

- See Table 1-4 for the non-signaling RF test bin.

See

- Table 1-5 for the Adaptivity and Blocking test bin.
- See Table 1-6 for the BQB test bin.

See

- Table 1-7 for the signaling test bin.

- Click on the **Load bin** button and **SUCC** will show once the download succeeds. Figure 1-2 shows the interface of downloading test bin for ESP32

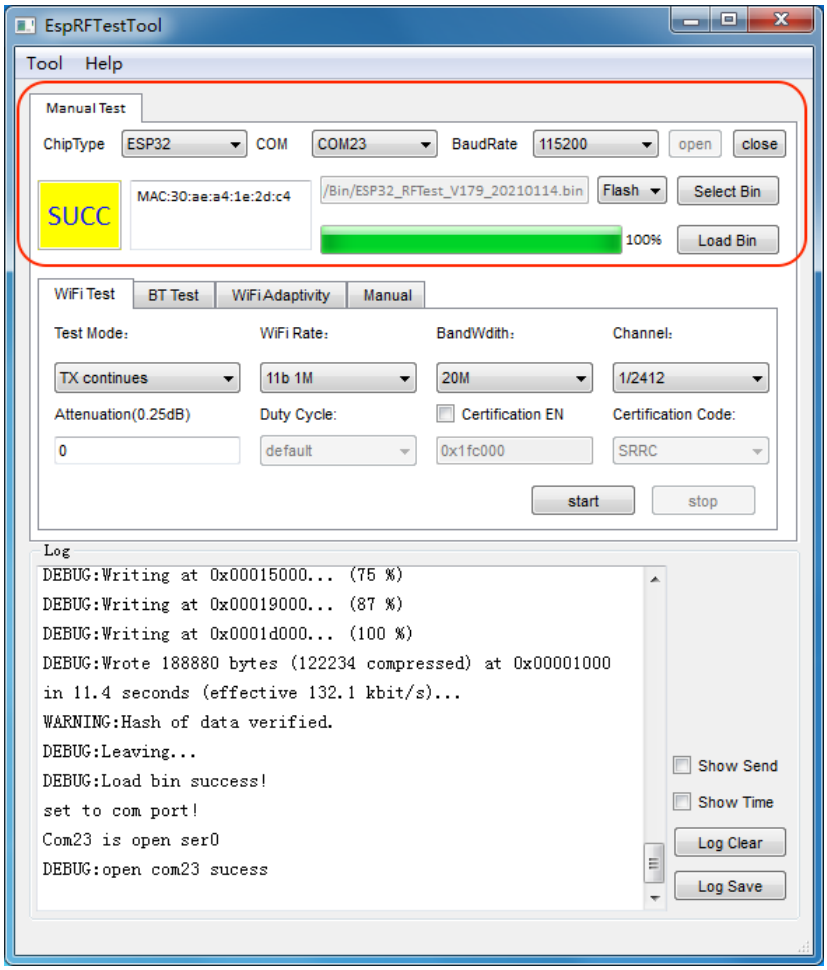


Figure 1-2. Download Test Bin for ESP32

The default download address of EspRFTestTool is 0x1000. If you need to download a bin file somewhere else or download multiple bin files at the same time, it is recommended to use DownloadTool. For example, three bin files are required for ESP32 Blocking tests: bootloader, partitions, and SSC. Unzip and open EspRFTestTool on the PC. Click on Tool on the upper left corner to open DownloadTool, and set up the download configuration. Figure 1-3 displays the interface of downloading three bin files at the same time. **SUCC** will show up once the download succeeds. For more details on how to use DownloadTool, please refer to *DownloadTool Instructions* under the help folder.

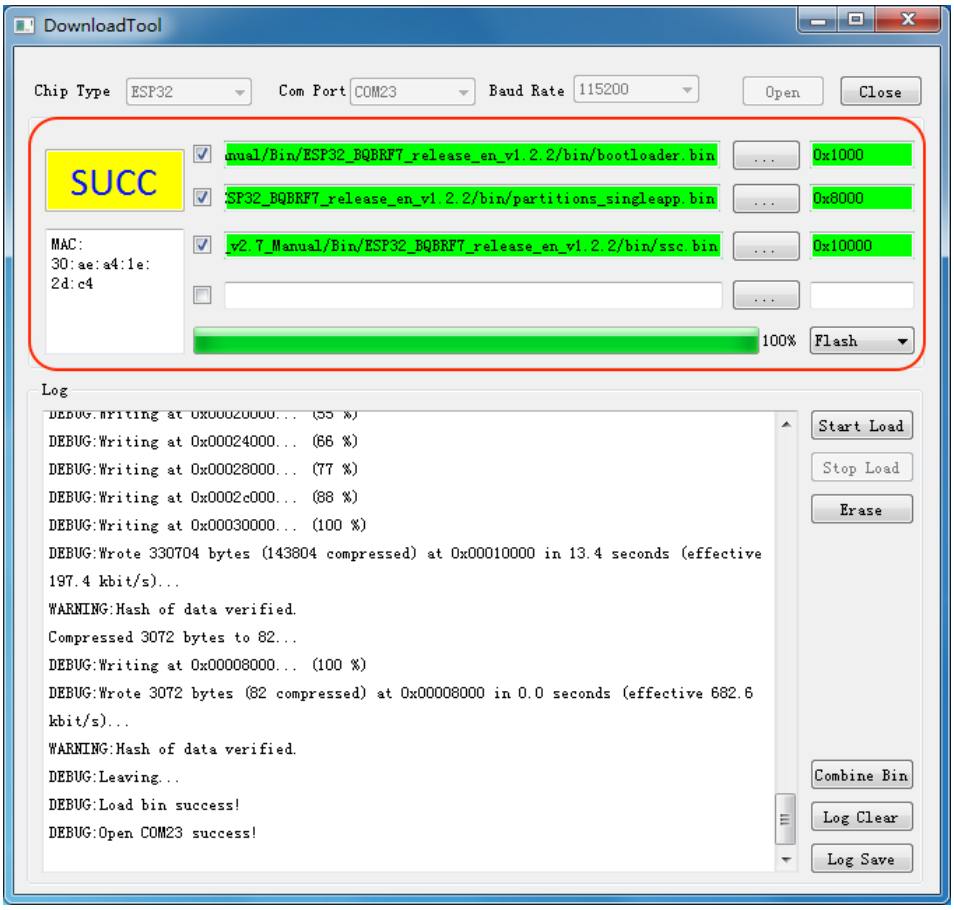


Figure 1-3. Download Bluetooth Test Bins with DownloadTool

Table 1-4. Non-signaling RF Test Bin and the Download Address

Chip	Non-signaling RF Test Bin		Chip Feature	
	Bin	Download Address	Wi-Fi	Bluetooth
ESP32	ESP32_RFTest_Bin	0x1000	11b, 11g, 11n-HT20, 11n-HT40	Bluetooth & Bluetooth LE 4.2
ESP32-S2	ESP32-S2_RFTest_Bin	0x1000	11b, 11g, 11n-HT20, 11n-HT40	—
ESP32-S3	ESP32-S3_RFTest_Bin	0x0	11b, 11g, 11n-HT20, 11n-HT40	BLE 5.0
ESP32-C3	ESP32-C3_RFTest_Bin	0x0	11b, 11g, 11n-HT20, 11n-HT40	BLE 5.0
ESP32-C6	ESP32-C6_RFTest_Bin	0x0	11b, 11g, 11n-HT20, 11n-HT40	BLE 5.0
ESP32-H2	ESP32-H2_RFTest_Bin	0x0	—	BLE 5.2 & Zigbee & Thread
ESP8266 ESP8285	ESP8266_RFTest_Bin	0x0	11b, 11g, 11n-HT20	—

Table 1-5. Adaptivity and Blocking Test Bin and the Download Address

Chip	Bin	Download Address
ESP32	ESP32_Adaptivity&Blocking_Bin	0x1000
ESP32-S2	ESP32-S2_Adaptivity&Blocking_Bin	0x1000
ESP32-S3	ESP32-S3_Adaptivity&Blocking_Bin	0x0
ESP32-C3	ESP32-C3_Adaptivity&Blocking_Bin	0x0
ESP32-C6	ESP32-C6_Adaptivity&Blocking_Bin	0x0
ESP8266 ESP8285	ESP8266&ESP8285_Adaptivity&Blocking_Bin	0x0

Table 1-6. BQB Test Bin and the Download Address

Chip	Bin	Download Address	Bluetooth
ESP32	bootloader.bin	0x1000	Classic Bluetooth & Bluetooth LE 4.2
	partitions_singleapp.bin	0x8000	
	ssc.bin	0x10000	
ESP32-C3	bootloader.bin	0x0	Bluetooth LE 5.0
	partitions_singleapp.bin	0x8000	
	ssc.bin	0x10000	
ESP32-C6	bootloader.bin	0x0	Bluetooth LE 5.0
	partitions_singleapp.bin	0x8000	
	ssc.bin	0x10000	
ESP32-S3	bootloader.bin	0x0	Bluetooth LE 5.0
	partitions_singleapp.bin	0x8000	
	ssc.bin	0x10000	
ESP32-H2	bootloader.bin	0x0	Bluetooth LE 5.2
	partitions_singleapp.bin	0x8000	
	ssc.bin	0x10000	
ESP32-S2	—		Not supported
ESP8266 ESP8285	—		Not supported

Table 1-7. Wi-Fi Signaling Test Bin and the Download Address

Chip	Bin	Download Address
ESP32	(phy int bin)	0xF000

Chip	Bin	Download Address
	bootloader.bin	0x1000
	partitions_singleapp.bin	0x8000
	ssc.bin	0x10000
ESP32-S2	(phy int bin)	0xF000
	bootloader.bin	0x1000
	partitions_singleapp.bin	0x8000
	ssc.bin	0x10000
ESP32-S3	(phy int bin)	0xF000
	bootloader.bin	0x0
	partitions_singleapp.bin	0x8000
	ssc.bin	0x10000
ESP32-C3	(phy int bin)	0xF000
	bootloader.bin	0x0
	partitions_singleapp.bin	0x8000
	ssc.bin	0x10000
ESP32-C6	(phy int bin)	0xF000
	bootloader.bin	0x0
	partitions_singleapp.bin	0x8000
	ssc.bin	0x10000
ESP8266 ESP8285	bootloader.bin	0x0
	partitions_singleapp.bin	0x8000
	ssc.bin	0x10000

2. Fixed Frequency Test

This chapter describes how to run the fixed frequency test bin on the products that are based on ESP chips or modules.

2.1. Environment Setup

In hardware, the EN pin of ESP chips is usually designed to connect to the 3V3 power line via an RC delay circuit. Solder Dupont wires to the TXD0, RXD0, Boot, 3V3, and GND of the ESP module (DUT) and connect them to the corresponding pins of the serial port board. Connect the serial port board to the PC with a USB cable so that the PC can communicate with the DUT and power up the serial port board. Figure 2-1 shows a block diagram that illustrates the test environment setup for the DUT.

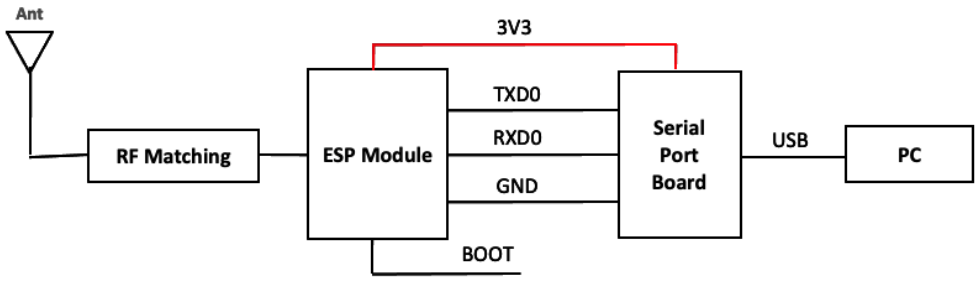


Figure 2-1. Environment Setup Block Diagram

When testing conduction, RF cable is attached to the back of the ESP RF matching, and if an antenna is also attached to the back of the Π match, it should be disconnected. When RF matching is included within a module shield, the RF cable should be soldered to the outside the shield, as shown in Figure 2-2.

When testing radiation, connect the antenna directly to the back of the RF matching and ensure that it has no obstruction around.

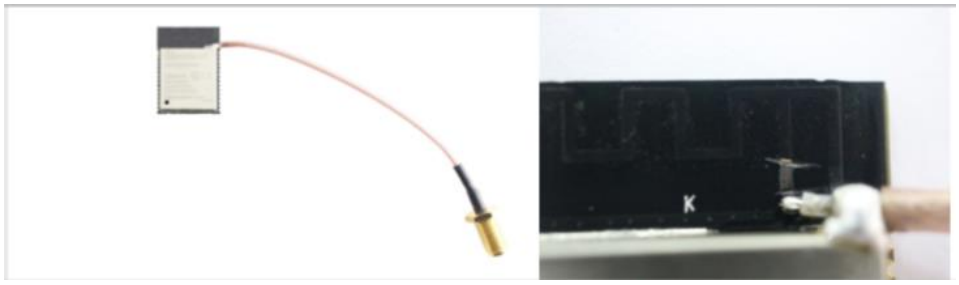


Figure 2-2. RF Cable Connection for Module Conduction Test

Table 2-1 lists the hardware environment for each chip to run the test bin, which is slightly different from the environment to download the bin (differences marked in boldface).

Table 2-1. Hardware Setup for Running the Test Bin

Chip	Description
ESP8266 ESP8285	• Connect 3V3/CH_EN pins to the 3.3 V power supply • Connect RXD/TXD/GND pins to corresponding pins of a serial converter so that PC can communicate with DUT • Pull MTDO (GPIO15) low • **Pull GPIO0 high**
ESP32 ESP32-S2 ESP32-S3	• Connect 3V3/CH_EN pins to the 3.3 V power supply • Connect RXD/TXD/GND pins to corresponding pins of a serial converter so that PC can communicate with DUT • **Pull GPIO0 high**
ESP32-C3 ESP32-C6 ESP32-H2	• Connect 3V3/CH_EN pins to the 3.3 V power supply • Connect RXD/TXD/GND pins to corresponding pins of a serial converter so that PC can communicate with DUT • **Pull both GPIO9 and GPIO8 high**

2.2. Run the Test Bin

2.2.1. Wi-Fi Fixed Frequency Test

- Disconnect IO0 of the DUT, and then toggle the power switch of the serial port board to power it up.
- In EspRFTestTool, click on **WiFi Test**, and select **TX continues** as the **Test Mode**.
- You can decrease power by setting values in the field of **Attenuation(0.25dB)**. The unit is 0.25 dB, which means the value 20 represents a decrease of the maximum power by 20x0.25=5dB. The field defaults to 0, meaning no attenuation.
- Select other options according to the laboratory test needs. Then click on **start** to start the fixed frequency test. The log is displayed in the tool. Figure 2-3 shows the test interface of ESP32.

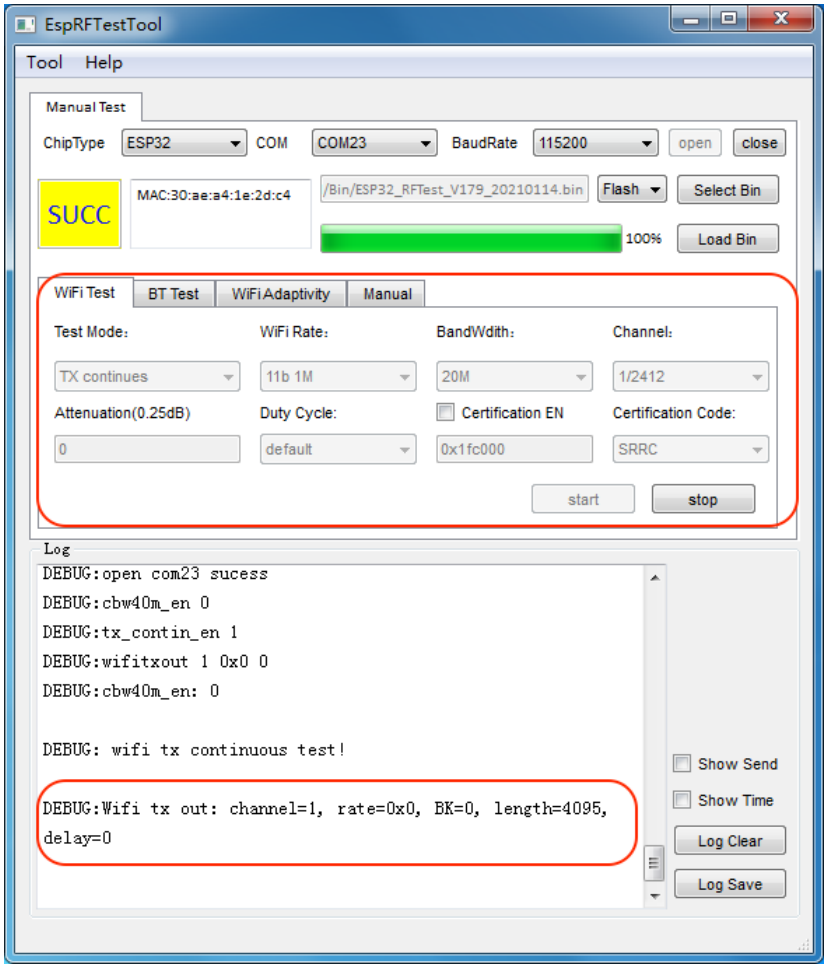


Figure 2-3. ESP32 Wi-Fi Fixed Frequency Test

- If testing receiving, select **RX packet** as the **Test Mode** and other options as needed. Figure 2-4 shows the ESP32 Wi-Fi Receiving Test interface.

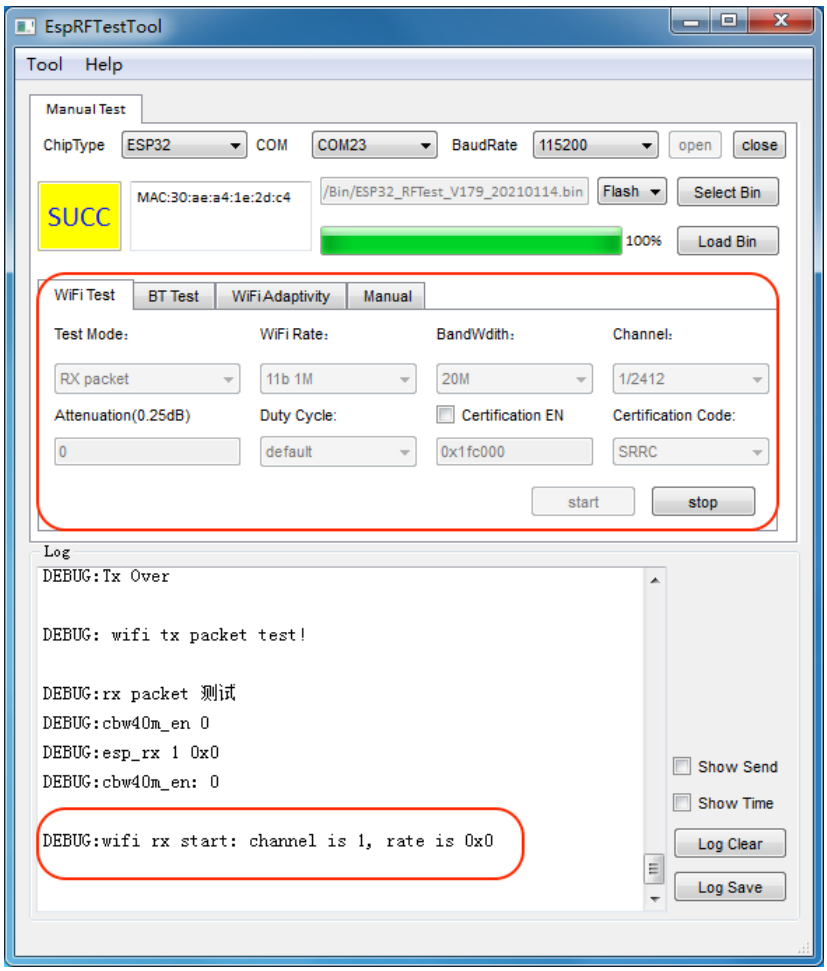


Figure 2-4. ESP32 Wi-Fi Receiving Test Interface

2.2.2. Bluetooth Fixed Frequency Test

The bin for the Bluetooth Fixed Frequency test is the same as that for Wi-Fi.

- Open EspRFTestTool, and select the ChipType of the DUT. The ESP8266, ESP32-S2 series of chips do not have Bluetooth functionality, so there is no Bluetooth test for them. ESP32-C3 series of chips only support Bluetooth LE.
- Switch to the **BT Test** tab and configure the parameters: In general, set **Power Level** to 4 and other parameters according to the actual needs. Figure 2-5 shows the ESP32 Bluetooth Fixed Frequency Test interface.

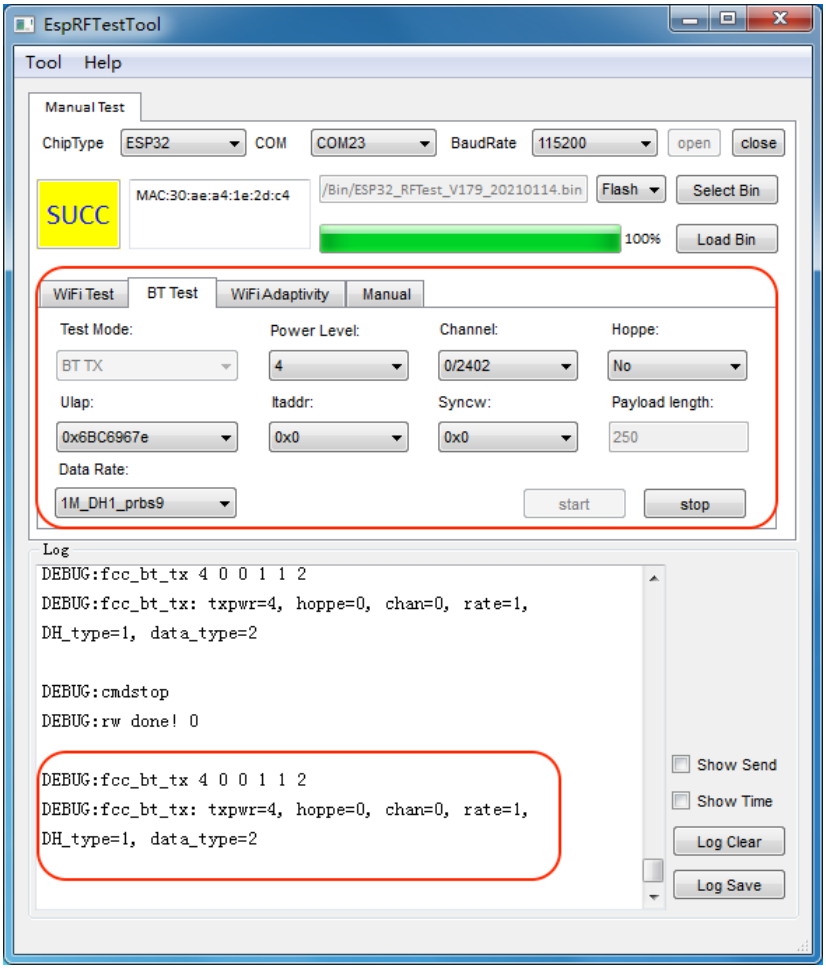


Figure 2-5. Bluetooth Test Interface

3. Adaptivity Test

This chapter describes how to perform adaptivity tests required by CE certification on the products that are based on ESP chips or modules.

3.1. Environment Setup

The hardware environment for this test is the same as that for the Fixed Frequency Tests, so please refer to 2.1 Environment Setup.

3.2. Run the Test Bin

- After downloading the bin, connect the RF cable from the DUT to the coaxial line of the test equipment.
- In EspRFTestTool, set BaudRate to 115200.
- Disconnect IO0 of the DUT, and then toggle the power switch of the serial port board to power it up.
- For the DUT working in the Wi-Fi Station Mode, switch to the **WiFi Adaptivity** tab in EspRFTestTool, click on the **STA** on the left, enter the AP ssid and password, click on **Connect AP**, and the connection log will be displayed in the Log Information panel in EspRFTestTool. Note that the AP ssid and name should be as simple as possible. Upon a successful connection, change **packet num** to 900000 for a long time running, set **packet delay** to 1, select **socket ID** of your chip, and then click on **Send Data** to start the adaptivity test. Figure 3-1 is the ESP32 test interface and Figure 3-2 the ESP32-C3 test interface.
  - Socket ID for ESP32, ESP32-S2, ESP32-C3: 54
  - Socket ID for ESP8266 and ESP8285: 0
- For the DUT working in the Wi-Fi AP Mode, switch to the **WiFi Adaptivity** tab in EspRFTestTool, click on the AP on the left, enter the AP ssid, password, channel, and mode, click on **create**, and then the laboratory's STA will connect to the newly created AP. Upon a successful connection, configure the running as that in the Wi-Fi Station Mode above.

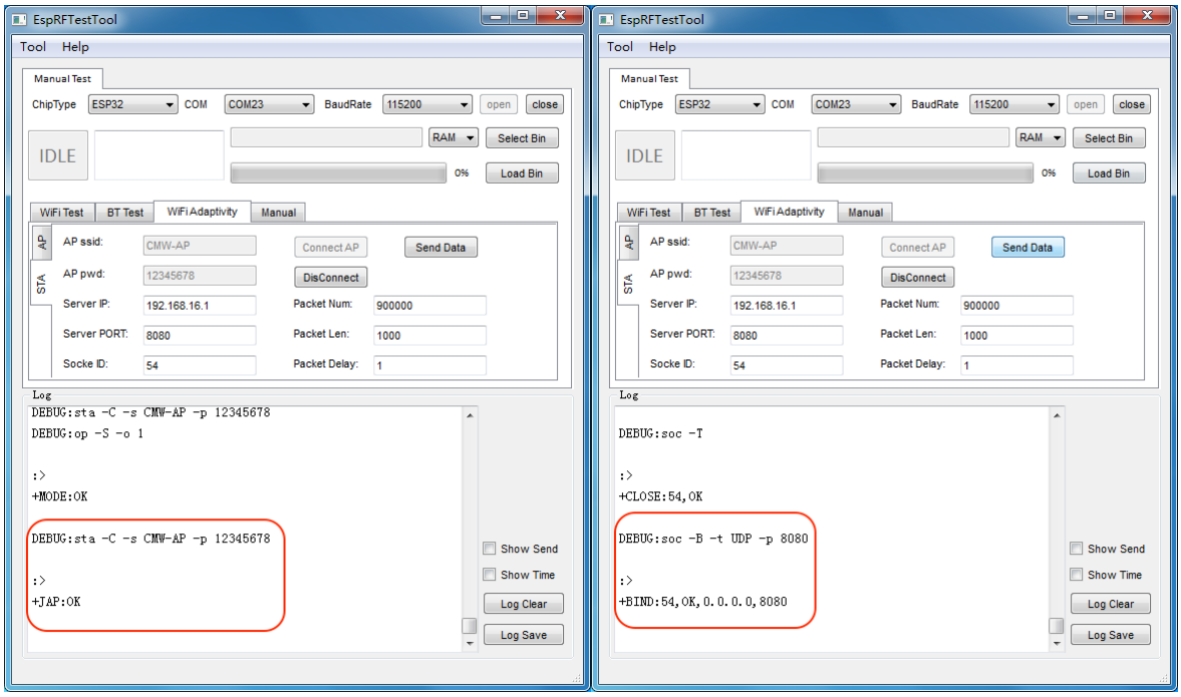


Figure 3-1. ESP32 Adaptivity Test Interface

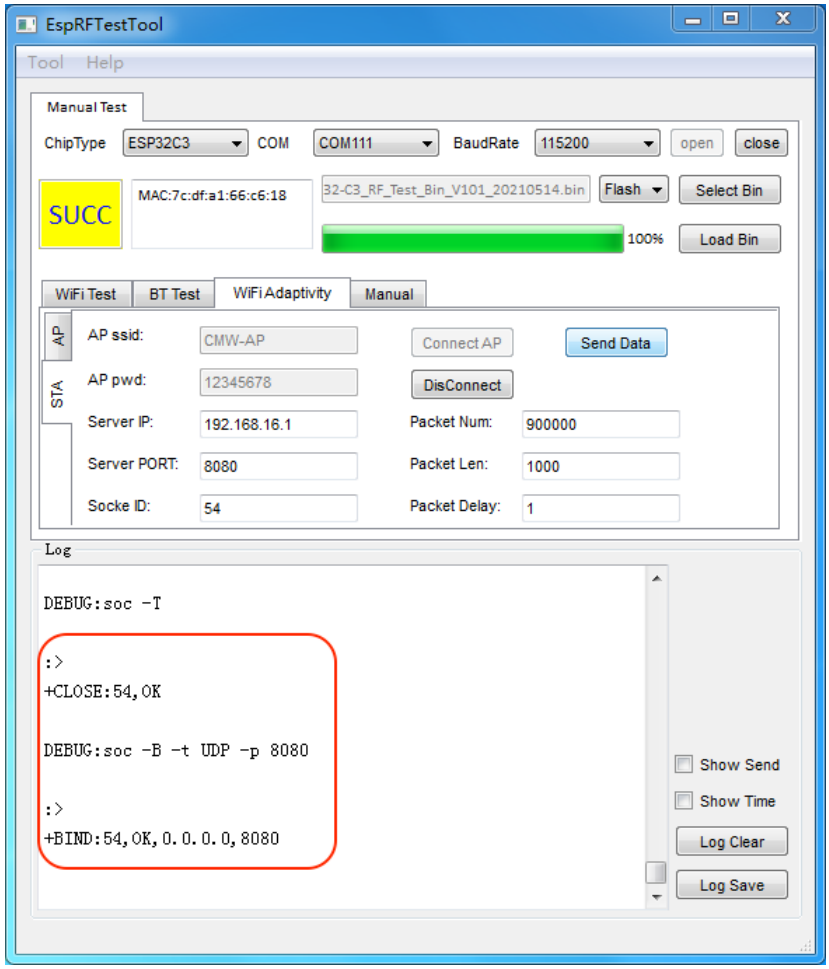


Figure 3-2. ESP32-C3 Adaptivity Test Interface

4. Blocking Test

This chapter describes how to perform Blocking Tests required by CE certification on the products that are based on ESP chips or modules. The Blocking Test is divided into two parts: Wi-Fi Blocking Test and Bluetooth Blocking Test, which uses BQB test bin. The ESP32-S2 and ESP8266 series of chips do not have Bluetooth functionality, so there is no need to perform Bluetooth Blocking Tests on them.

4.1. Wi-Fi Blocking Tests

4.1.1. Environment Setup

The hardware environment for this test is the same as that for the Fixed Frequency Tests, so please refer to 2.1 Environment Setup.

Blocking tests are usually conduction signaling tests. The RF cable of the DUT needs to be connected to the test equipment in a certification laboratory, such as CMW500.

4.1.2. Run the Test Bin

- After downloading the bin, connect the RF cable from the DUT to the coaxial line of the test equipment.
- Open EspRFTestTool and select BaudRate:
  - ESP32, ESP32-S2, ESP32-C3: 115200;
  - ESP8266 and ESP8285: 74880.
- Disconnect IO0 of the DUT, and then toggle the power switch of the serial port board to power it up.
- For the DUT working in the Wi-Fi Station Mode, switch to the **WiFi Adaptivity** tab in EspRFTestTool, click on the **STA** on the left, enter the AP ssid and password of the laboratory's test equipment, click on **Connect AP**, and the connection log will be displayed in the Log Information panel in EspRFTestTool. Note that the AP ssid and name should be as simple as possible. Once connected successfully, the test equipment can control the DUT to perform receiving tests.
- For the DUT working in the Wi-Fi AP Mode, switch to the **WiFi Adaptivity** tab in EspRFTestTool, click on the AP on the left, enter the AP ssid, password, channel, and mode, click on **create**, then the laboratory's STA will connect to the AP, and you can start testing.

4.2. Bluetooth Blocking Test

This section describes how to test Bluetooth Blocking with BQB test bin files.

4.2.1. Environment Setup

Bluetooth Blocking tests require two serial port boards. See Figure 4-1 for the hardware connection environment for the DUT. Connect TXD0 and RXD0 to TXD0 and RXD0 pins of the ESP module, and TXD1 and RXD1 to IO5 and IO18 pins of the ESP module.

Attach the RF cable to the back of the RF matching of the ESP module. If a PCB antenna is also attached to the back, please disconnect it.

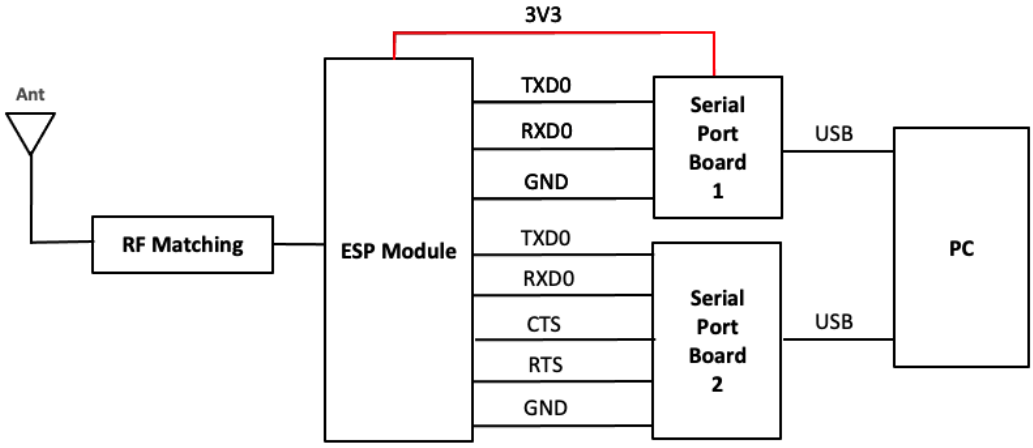


Figure 4-1. Bluetooth Blocking Test Environment

Note on setting up UART1:

You can assign the pins for UART1 yourself and do not use the default pins(i.e. IO5, IO18, IO19, IO23). You need to configure the pins used via UART0 commands.

For example, if you want to use IO21, IO22, IO19 and IO5 for UART1 TXD, RXD, RTS, CTS pins, You need to do the following settings:

connect IO21 to the USB serial port RXD

connect IO22 to the USB serial port TXD

connect IO19 to the USB serial port CTS

connect IO5 to the USB serial port RTS

After power up, type the following command via UART0:

bqb -z set_uart_pin -t 21 -r 22 -q 19 -c 5

See BQB_test_tool_user_guide.pdf in the BQB folder for details.

4.2.2. Run the Test Bin

4.2.2.1. Run Classic Bluetooth Blocking Test Bin

- After downloading the bin, connect the RF cable from the DUT to the coaxial line of the test equipment.
- Disconnect IO0 of the ESP module.
- Open a serial port tool on the PC, select the COM of ESP's serial port board 1, and set BaudRate to 115200.
- Re-power up the ESP module.
- Enter the following commands in the serial tool. Figure 4-2 shows the log.

```
bqb -z set_ble_tx_power -i 4    // Set BLE TX power; range of i is [0~7].
```

```
bqb -z set_power_class -i 3 -a 4    // Set Classic Power Class; i is Min_powe_level_index, range is [0~7]; a is [Max_power_level_index], range is [0-7].

bqb -z set_pll_track -e 0    // Turn off the PLL track function.

bqb -z init    // Initialize Bluetooth controller dual mode.
```

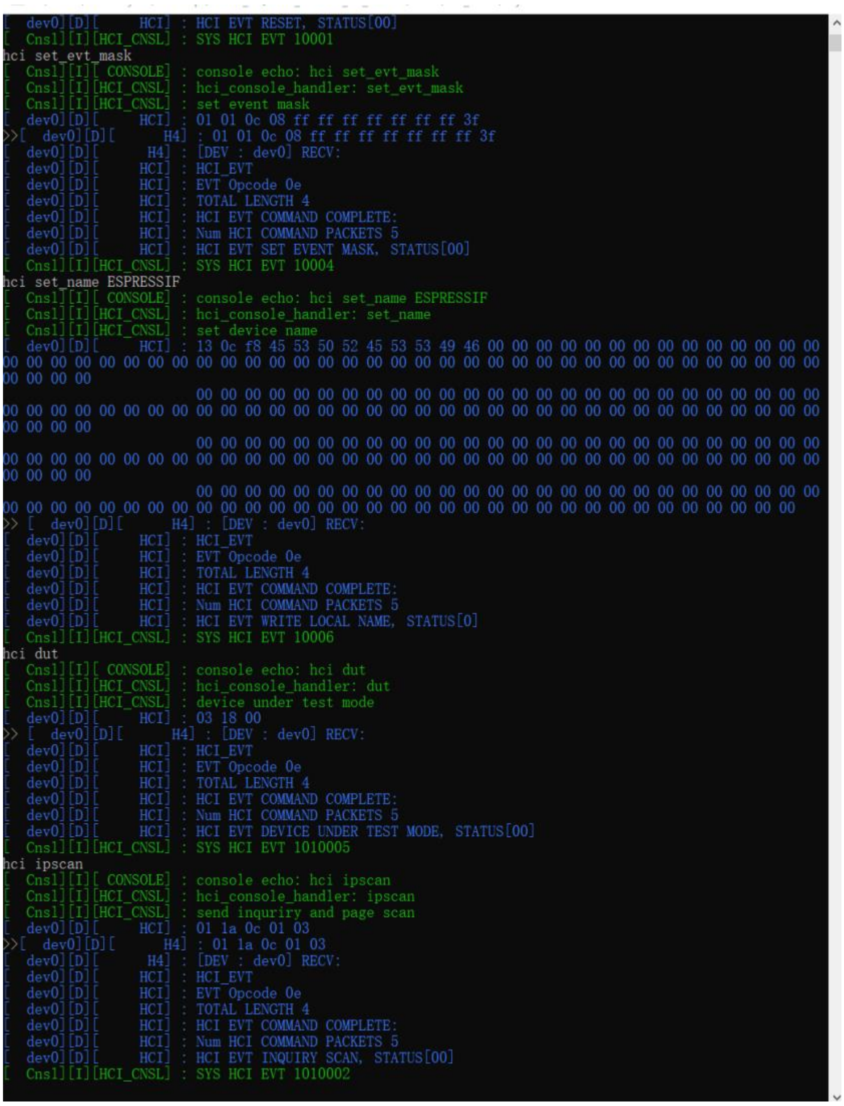
```
!!!ready!!!
bqb -z set_ble_tx_power -i 4

SSC: bqb

ssc_bt, got op i

SSC: set ble tx power, idx 4

+BT:OK

:>bqb -z set_power_class -i 3 -a 4

SSC: bqb

ssc_bt, got op i

ssc_bt, got op a

+BT:OK

:>bqb -z set_pll_track -e 0

SSC: bqb

ssc_bt, got op e

SSC: set pll track 0

+BT:OK

:>bqb -z init

SSC: bqb

SSC: bluetooth init

BTDM CONTROLLER VERSION: 010101
btip start
copy .data from 4000d890 to 3ffae6e0, len 00001830
set .bss 0x0 from 3ffb8000 to 3ffbff70, len 00007f70
BTDM ROM VERSION 0101
I (75614) system_api: Base MAC address is not set, read default base MAC address from BLK0 of EFUSE
BD_ADDR: 30:AE:A4:1E:2D:C6
reset feature
NVDS MAGIC FAILED
RF Init OK with coex
W (76294) phy_init: failed to load RF calibration data (0x1102), falling back to full calibration
I (76294) phy_init: BQB version, always full calibration!!
I (76554) phy: phy_version: 362.0, 61e8d92, Sep  8 2017, 18:48:11, 0, 2
PLL track disable
Enable Classic BT
Enable Low Energy

+BT:OK
```

Figure 4-2. UART0 Serial Port Configuration

- Set UART1. In /tools/HCI_host/config/dev0.conf, change the UART_PORT to the com value of the serial port board 2.
- Open tinyBH.exe in /tools/HCI_host/, and enter the following instructions. The log should be as Figure 4-3 shows.

```
hci reset    // Initialize all Bluetooth controllers.
hci set_evt_mask    // Set the legacy event mask.
hci set_name ESPRESSIF // Set the name of the subject to be tested.
hci dut// Set Bluetooth into Under test mode.
hci dut// Set Bluetooth into scan status.
```

- At this time, you can find the Bluetooth ESPRESSIF and connect to the signaling test equipment to perform Classic Bluetooth Blocking tests.



```
[  dev0][D][      HCI] : HCI EVT RESET, STATUS[00]
[  Cnsl][I][HCI_CNSL] : SYS HCI EVT 10001
hci set_evt_mask
[  Cnsl][I][ CONSOLE] : console echo: hci set_evt_mask
[  Cnsl][I][HCI_CNSL] : hci_console_handler: set_evt_mask
[  Cnsl][I][HCI_CNSL] : set event mask
[  dev0][D][      HCI] : 01 01 0c 08 ff ff ff ff ff ff ff 3f
>>[  dev0][D][       H4] : 01 01 0c 08 ff ff ff ff ff ff ff 3f
[  dev0][D][       H4] : [DEV : dev0] RECV:
[  dev0][D][      HCI] : HCI_EVT
[  dev0][D][      HCI] : EVT Opcode 0e
[  dev0][D][      HCI] : TOTAL LENGTH 4
[  dev0][D][      HCI] : HCI EVT COMMAND COMPLETE:
[  dev0][D][      HCI] : Num HCI COMMAND PACKETS 5
[  dev0][D][      HCI] : HCI EVT SET EVENT MASK, STATUS[00]
[  Cnsl][I][HCI_CNSL] : SYS HCI EVT 10004
hci set_name ESPRESSIF
[  Cnsl][I][ CONSOLE] : console echo: hci set_name ESPRESSIF
[  Cnsl][I][HCI_CNSL] : hci_console_handler: set_name
[  Cnsl][I][HCI_CNSL] : set device name
[  dev0][D][      HCI] : 13 0c f8 45 53 50 52 45 53 53 49 46 00 00 00 00 00 00 00 00 00 00 00 00 00 00
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>> [  dev0][D][       H4] : [DEV : dev0] RECV:
[  dev0][D][      HCI] : HCI_EVT
[  dev0][D][      HCI] : EVT Opcode 0e
[  dev0][D][      HCI] : TOTAL LENGTH 4
[  dev0][D][      HCI] : HCI EVT COMMAND COMPLETE:
[  dev0][D][      HCI] : Num HCI COMMAND PACKETS 5
[  dev0][D][      HCI] : HCI EVT WRITE LOCAL NAME, STATUS[0]
[  Cnsl][I][HCI_CNSL] : SYS HCI EVT 10006
hci dut
[  Cnsl][I][ CONSOLE] : console echo: hci dut
[  Cnsl][I][HCI_CNSL] : hci_console_handler: dut
[  Cnsl][I][HCI_CNSL] : device under test mode
[  dev0][D][      HCI] : 03 18 00
>> [  dev0][D][       H4] : [DEV : dev0] RECV:
[  dev0][D][      HCI] : HCI_EVT
[  dev0][D][      HCI] : EVT Opcode 0e
[  dev0][D][      HCI] : TOTAL LENGTH 4
[  dev0][D][      HCI] : HCI EVT COMMAND COMPLETE:
[  dev0][D][      HCI] : Num HCI COMMAND PACKETS 5
[  dev0][D][      HCI] : HCI EVT DEVICE UNDER TEST MODE, STATUS[00]
[  Cnsl][I][HCI_CNSL] : SYS HCI EVT 1010005
hci ipscan
[  Cnsl][I][ CONSOLE] : console echo: hci ipscan
[  Cnsl][I][HCI_CNSL] : hci_console_handler: ipscan
[  Cnsl][I][HCI_CNSL] : send inquriry and page scan
[  dev0][D][      HCI] : 01 1a 0c 01 03
>>[  dev0][D][       H4] : 01 1a 0c 01 03
[  dev0][D][       H4] : [DEV : dev0] RECV:
[  dev0][D][      HCI] : HCI_EVT
[  dev0][D][      HCI] : EVT Opcode 0e
[  dev0][D][      HCI] : TOTAL LENGTH 4
[  dev0][D][      HCI] : HCI EVT COMMAND COMPLETE:
[  dev0][D][      HCI] : Num HCI COMMAND PACKETS 5
[  dev0][D][      HCI] : HCI EVT INQUIRY SCAN, STATUS[00]
[  Cnsl][I][HCI_CNSL] : SYS HCI EVT 1010002
```

Figure 4-3. UART1 Configuration Log

4.2.2.2. Run Bluetooth LE Blocking Test Bin

As for the Bluetooth LE Blocking Test instructions, please refer to the first five steps of the Classic Bluetooth Blocking Test, then connect the USB cable from the serial port board 2 to the test equipment, such as CMW500, and set the equipment to Bluetooth LE mode. After the connection is established, you can start a signaling test.

5. FAQ

Q: How do I update the power parameters of a certification test to the application firmware?

A: Please refer to the ESP32-Series_PowerLimitTool_Instructions_EN documentation.

Q: The second, third, and fourth harmonics of fixed frequency test radiation exceed the standard.

A: 1. For ESP chip-based products, please check the RF layout, matching, and PA power supply. You can suppress harmonics by adjusting the RF matching and PA power line filtering network.

2. For ESP module-based products, place the backplane under the module, which is usually the PCB board of the product.

3. Enter a value in the attenuation field of the fixed frequency test tool to reduce the power.

Q: PSD and power exceed the standard.

A: 1. Make sure the RF matching is tuned correctly.

2. Enter a value in the attenuation field of the fixed frequency test tool to reduce the power.

Q: Adaptivity Tests failed.

A: 1. Confirm the test method is correct. Set up according to the Adaptivity Test chapter, and then the spectrum meter should display the normal flow.

2. Repeat testing to check laboratory environmental stability.

Q: The radiation spurious emissions exceed the standard below 1 GHz.

A: 1. Check peripheral communication, UART, SPI, IIC, etc.

2. Check the serial port board, UART cable, and USB cable.

Q: The UART1 log is abnormal during the Bluetooth Blocking Test.

A: 1. Check whether the hardware is set up correctly.

2. Swap TX and RX of UART1.

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