

HCM010S TE-B

User Guide

Short-Range Module Series

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Safety Information

The following safety precautions must be observed during all phases of operation, such as usage, service or repair of any terminal or mobile incorporating the module. Manufacturers of the terminal should notify users and operating personnel of the following safety information by incorporating these guidelines into all manuals of the product. Otherwise, Quectel assumes no liability for customers' failure to comply with these precautions.



Full attention must be paid to driving at all times in order to reduce the risk of an accident. Using a mobile while driving (even with a handsfree kit) causes distraction and can lead to an accident. Please comply with laws and regulations restricting the use of wireless devices while driving.



Switch off the terminal or mobile before boarding an aircraft. The operation of wireless appliances in an aircraft is forbidden to prevent interference with communication systems. If there is an Airplane Mode, it should be enabled prior to boarding an aircraft. Please consult the airline staff for more restrictions on the use of wireless devices on an aircraft.



Wireless devices may cause interference on sensitive medical equipment, so please be aware of the restrictions on the use of wireless devices when in hospitals, clinics or other healthcare facilities.



Terminals or mobiles operating over radio signal and cellular network cannot be guaranteed to connect in certain conditions, such as when the mobile bill is unpaid or the (U)SIM card is invalid. When emergency help is needed in such conditions, use emergency call if the device supports it. In order to make or receive a call, the terminal or mobile must be switched on in a service area with adequate signal strength. In an emergency, the device with emergency call function cannot be used as the only contact method considering network connection cannot be guaranteed under all circumstances.



The terminal or mobile contains a transceiver. When it is ON, it receives and transmits radio frequency signals. RF interference can occur if it is used close to TV sets, radios, computers or other electric equipment.



In locations with explosive or potentially explosive atmospheres, obey all posted signs and turn off wireless devices such as mobile phones or other terminals. Areas with explosive or potentially explosive atmospheres include fueling areas, below decks on boats, fuel or chemical transfer or storage facilities, and areas where the air contains chemicals or particles such as grain, dust or metal powders.

About the Document

Revision History

| Version | Date | Author | Description |
|---------|------------|---------|--------------------------|
| - | 2024-01-16 | Luke FU | Creation of the document |
| 1.0 | 2024-01-30 | Luke FU | First official release |

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1 Introduction

For convenient development of applications with Quectel HCM010S, Quectel supplies the corresponding development board (HCM010S-TE-B) for module testing. This document can help you quickly understand HCM010S-TE-B interface specifications, RF characteristics, electrical and mechanical details and how to effectively use it.

2 Product Overview

HCM010S-TE-B is a Bluetooth development board that supports a series of interfaces. It can be used for testing basic functionalities and developing HCM010S.

2.1. Top and Bottom Views

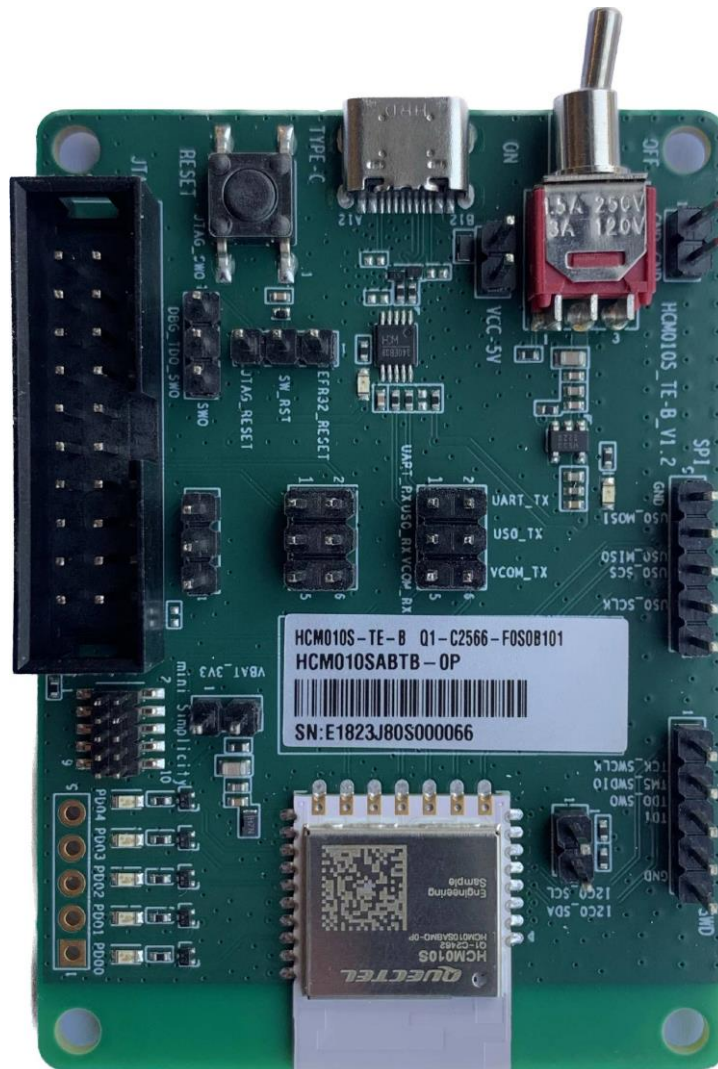


Figure 1: Top View

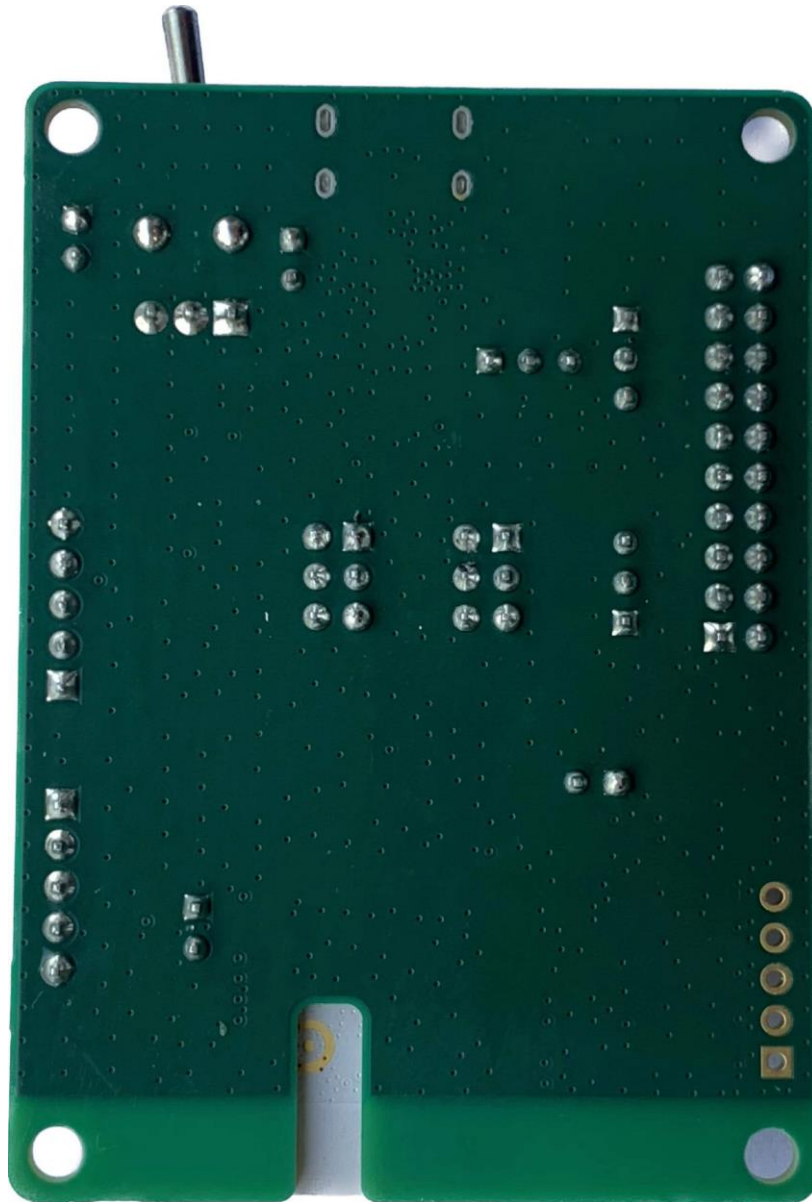


Figure 2: Bottom View

2.2. Component Placement

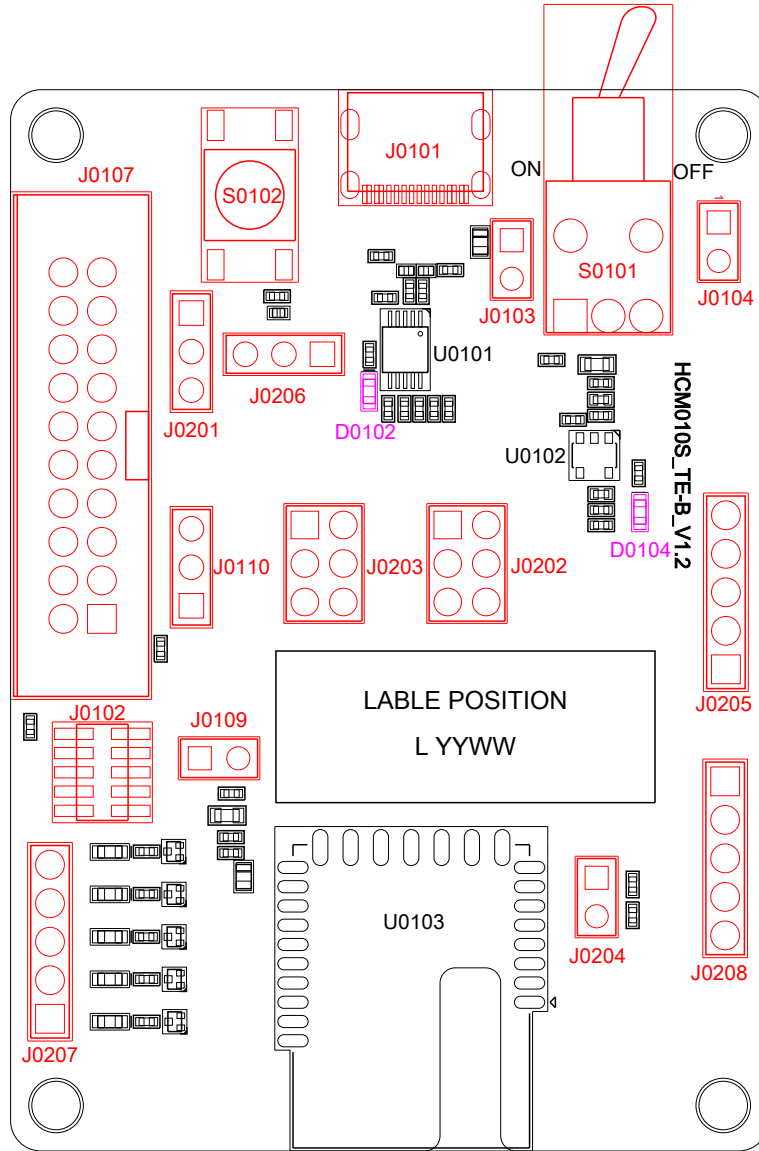


Figure 3: Component Placement

Table 1: Component Information

| Component | RefDes. | Description |
|--------------------|---------|--------------------|
| Module | U0103 | HCM010S module |
| LDO | U0102 | 5 V to 3.3 V |
| USB-to-UART Bridge | U0101 | USB-to-UART bridge |

| | | |
|-------------------------|---------------------|--|
| Power Supply Interfaces | J0101 | USB Type-C power supply interface |
| | J0103 | Positive electrode of external power supply interface (+5 V) |
| | J0104 | Negative electrode of external power supply interface (GND) |
| | J0110 | VBAT jumper interface |
| Power Switch | S0101 | VBAT ON/OFF control |
| Reset Button | S0102 | Resets the module via J0206 |
| USB Interface | J0101 | Connects to USART interface of the module via U0101 and J0202 |
| Debug Interfaces | J0208 | 5-pin SWD interface |
| | J0107 | 20-pin JTAG interface |
| | J0102 | 10-pin header of mini simplicity connector |
| Status LEDs | D0104 | Indicates VBAT ON/OFF status |
| | D0102 | Indicates USART status |
| SWO Jumper Interface | J0201 | Connections between different jumper pins for JTAG interface or 10-pin header of mini simplicity connector |
| USART Jumper Interface | J0202 | Connections between different jumper pins for U0101 or 10-pin header of mini simplicity connector |
| SWD Jumper Interface | J0203 | Connections between different jumper pins for JTAG interface or 10-pin header of mini simplicity connector |
| Reset Jumper Interface | J0206 | Connections between different jumper pins for S0102 or JTAG interface |
| Test Points | J0109 | Tests the module power consumption |
| | J0204, J0205, J0207 | Tests the basic functions of the module |

NOTE

See **Chapter 4** for details of pins connection of jumper interfaces in the table above.

3 Kit Accessory & Assembly

3.1. Kit Accessory

Table 2: Accessory List

| Items | Description | Quantity (pcs) |
|-------|------------------|----------------|
| Cable | USB Type-C cable | 1 |

3.2. Kit Assembly



Figure 4: TE-B Kit Assembly

4 Interface Applications

This chapter outlines the information and applications of some hardware interfaces of HCM010S-TE-B.

4.1. Power Supply Interfaces

The simplified schematic of power supply for HCM010S-TE-B is shown in the following figure.

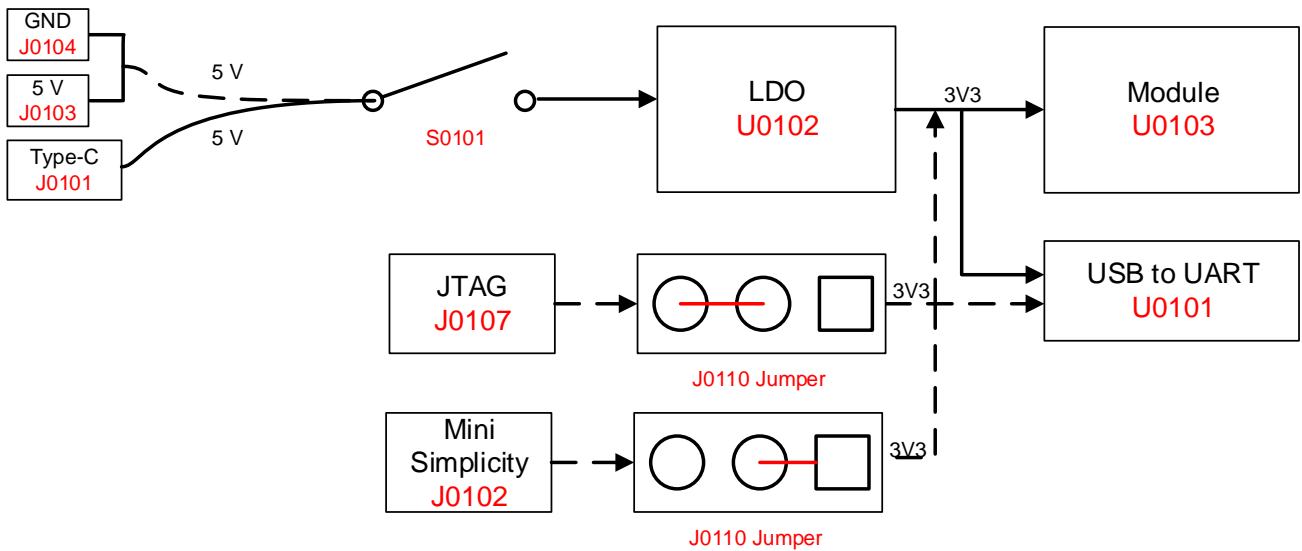


Figure 5: Power Supply for HCM010S-TE-B

4.2. Power Switch and Reset Button

HCM010S-TE-B includes one power switch (S0101) and one reset button (S0102) as shown in the following figure.

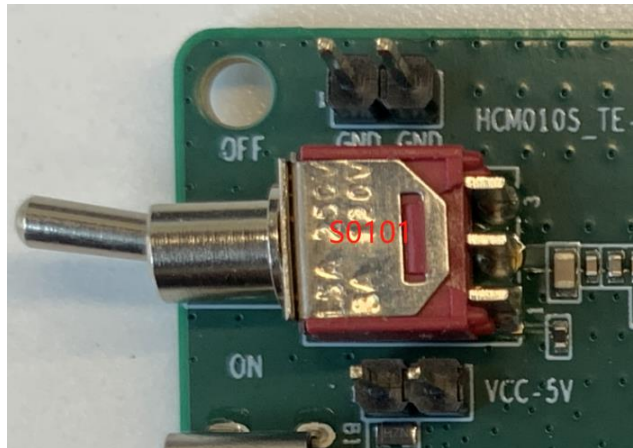


Figure 6: Power Switch

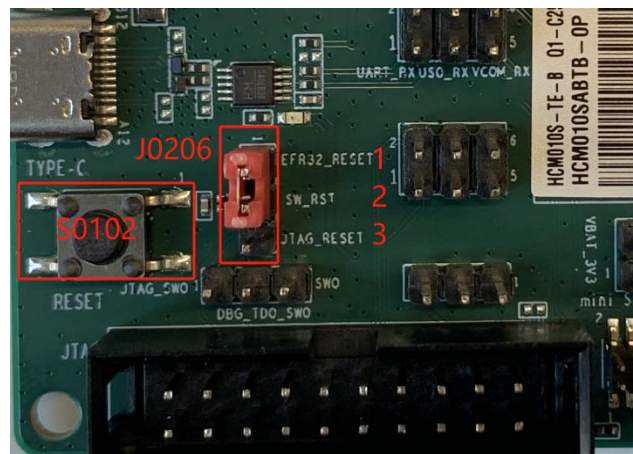


Figure 7: Reset Button

Table 3: Description of Power Switch and Reset Button

| RefDes. | Description |
|---------|--------------------------------|
| S0101 | VBAT ON/OFF control |
| S0102 | Resets the module via J0206 |
| J0206 | Connects EFR32_RESET to SW_RST |

4.3. USB Interface

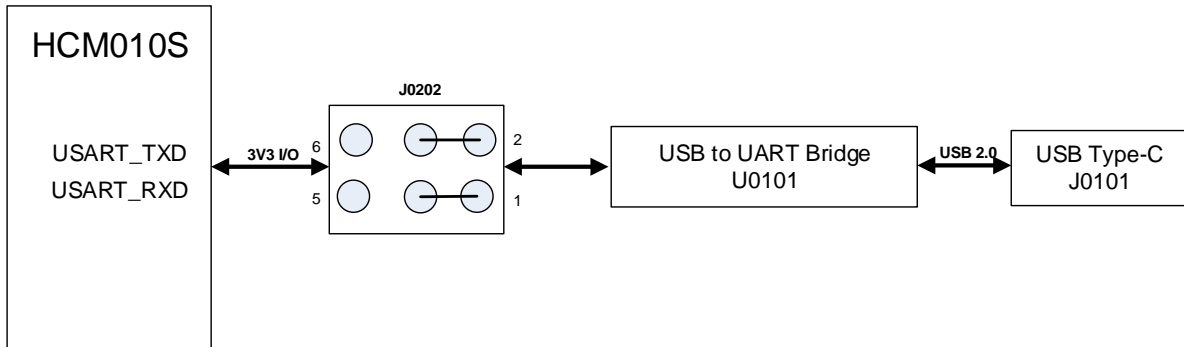


Figure 8: USB-to-UART Connection

Table 4: Description of USB-to-UART Connection

| RefDes. | Description |
|---------|----------------------------|
| U0101 | USB-to-UART bridge |
| J0101 | USB interface |
| J0202 | Connects US0_TX to UART_TX |
| | Connects US0_RX to UART_RX |

HCM010S-TE-B offers J0101 (USB interface) connecting to the module’s USART interface via U0101 and J0202 for USB-to-UART connection, with the jumpers on J0202 as shown in **Figure 11**.

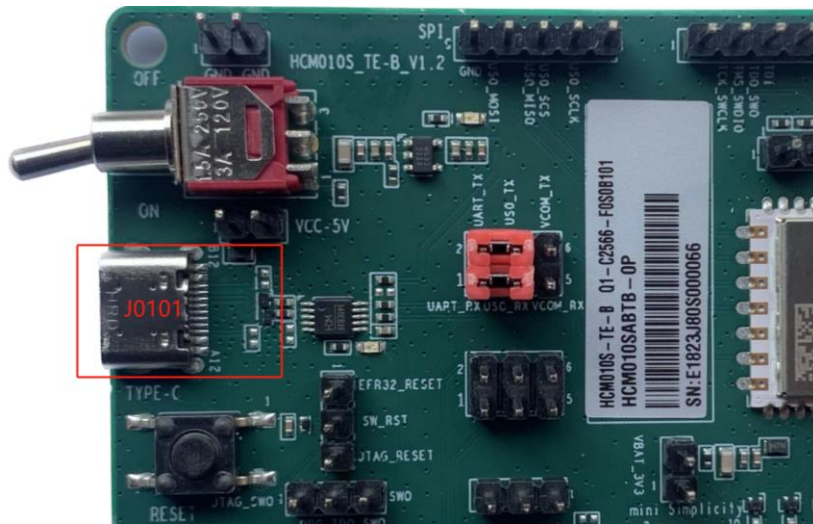


Figure 9: USB Interface

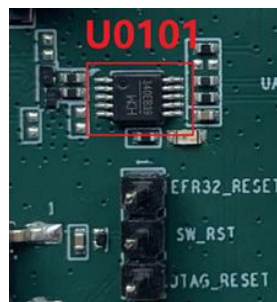


Figure 10: USB-to-UART Bridge

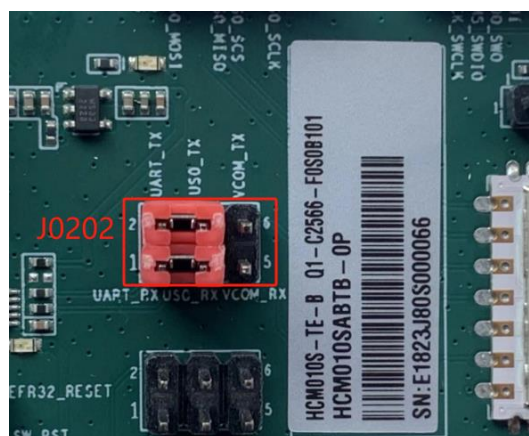


Figure 11: Jumper

J0101 supports 115200 bps baud rate by default. It is intended for data transmission between the module and the host. It can also be used for AT command communication and debugging.

4.4. Debug Interfaces

HCM010S-TE-B offers J0208 (SWD interface), J0107 (JTAG interface) and J0102 (10-pin header of mini simplicity connector) for real-time data and instruction tracing through the Embedded Trace Module(ETM) as illustrated in the following figure. J0208/J0107/J0102 can also be used for firmware download and upgrade.

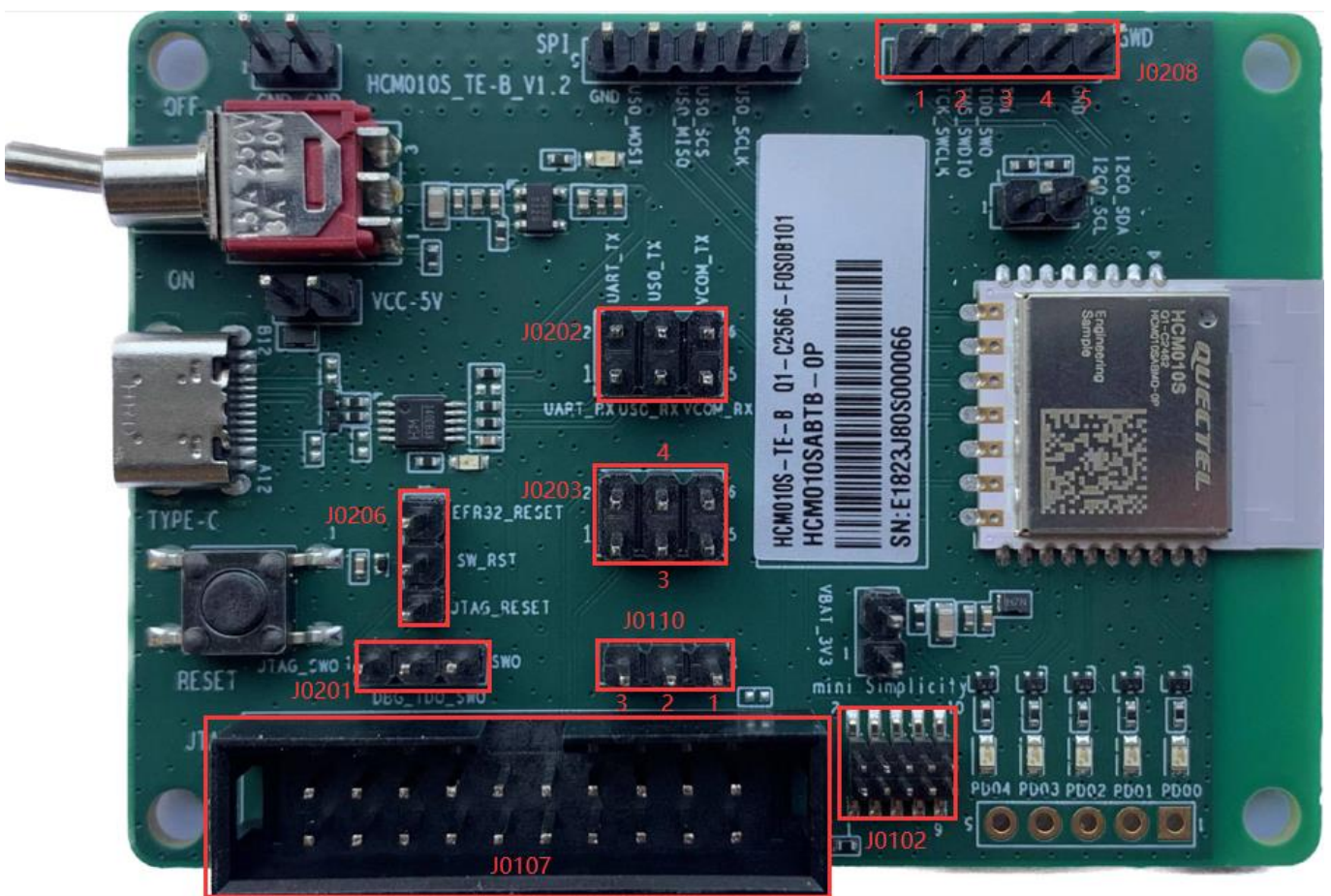


Figure 12: Debug Interfaces

Table 5: Description of Debug Interfaces

| RefDes. | Description |
|---------|--|
| J0107 | 20-pin JTAG interface |
| J0102 | 10-pin header of mini simplicity connector |
| J0202 | Connects US0_TX to VCOM_TX and US0_RX to VCOM_RX |
| J0203 | Connects pin 2 to pin 4 and pin 1 to pin 3 for JTAG interface connection Connects pin 4 to pin 6 and pin 3 to pin 5 for the connection of mini simplicity connector |
| J0206 | Connects SW_RST to EFR32_RESET |
| J0201 | Connects DBG_TDO_SWO to SWO for the connection of mini simplicity connector Connects DBG_TDO_SWO to JTAG_SWO for JTAG interface connection |
| J0110 | Connects pin 1 to pin 2 for the connection of mini simplicity connector Connects pin 2 to pin 3 for JTAG interface connection |

When you use the SWD interface, connect pin 1 (TCK_SWCLK), pin 2 (TMS_SWDIO) and pin 5 (GND) of J0208 to JTAG downloader as below:

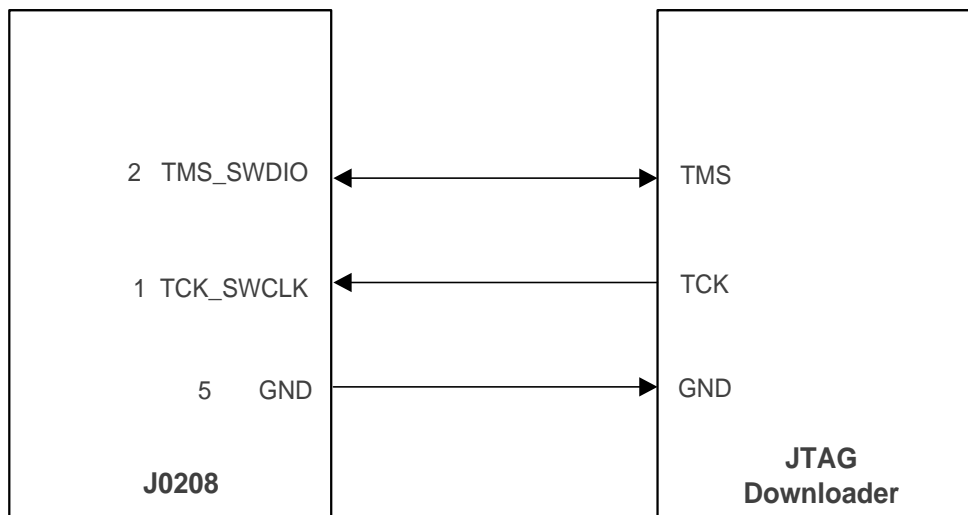


Figure 13: SWD Connection

When you use J0107 (JTAG interface), place the jumper as shown below, and connect the JTAG downloader to PC through a USB type-C cable.

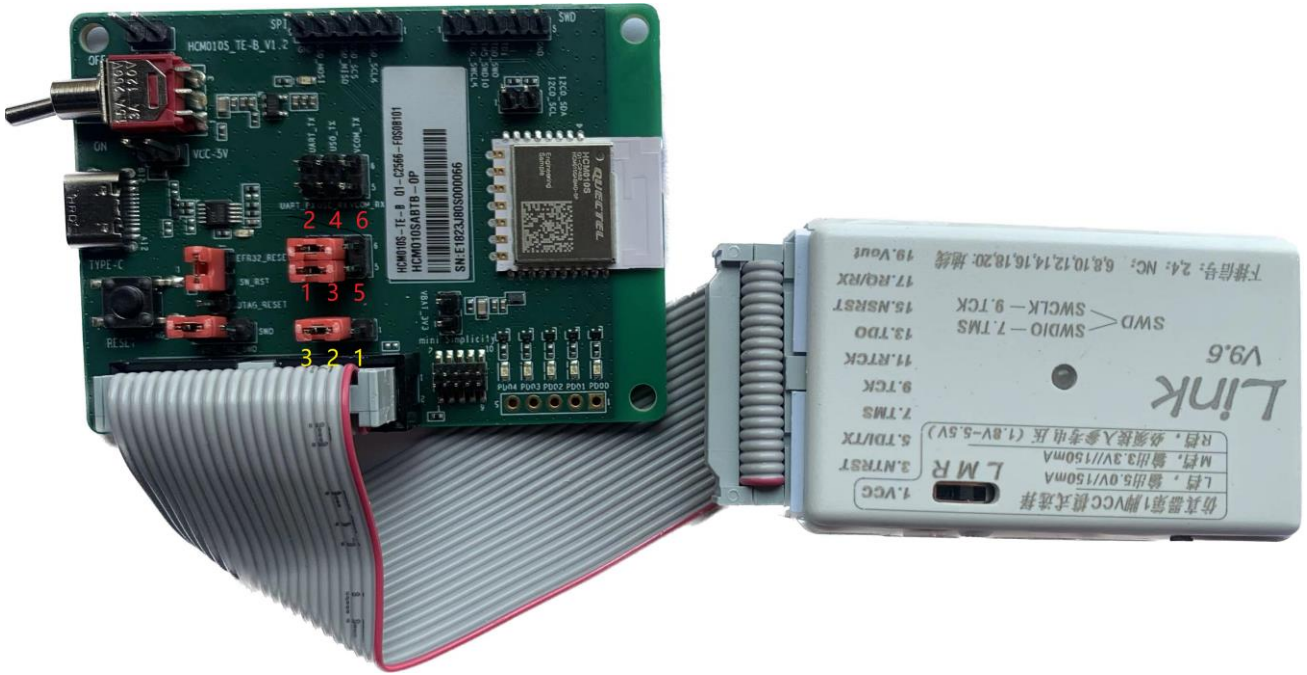
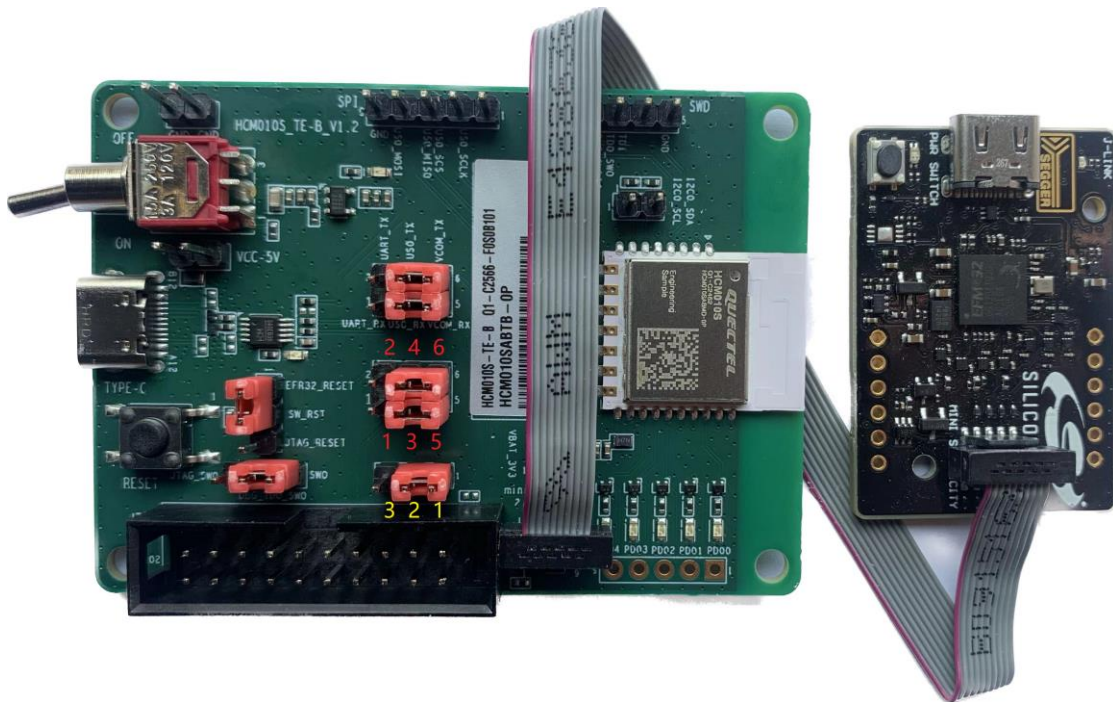


Figure 14: JTAG Connection

When you use J0102 (10-pin header of mini simplicity connector), place the jumper as shown below, and connect the J-Link debugger (SI-DBG1015A) to PC through a USB type-C cable.



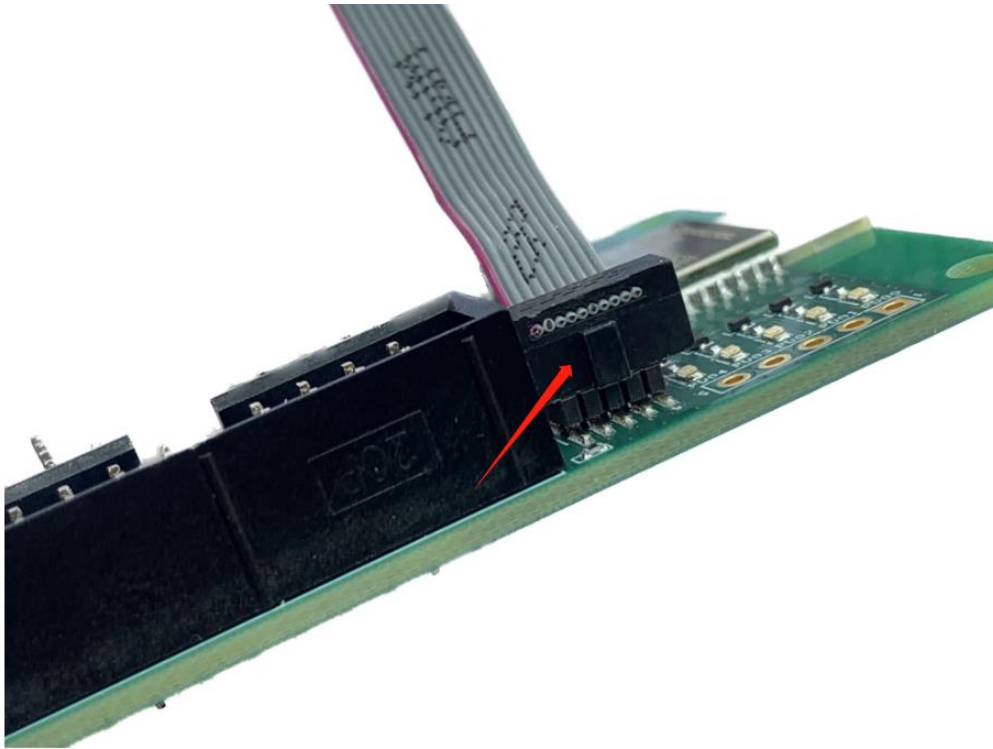


Figure 15: Mini Simplicity Connection

4.5. RF Interface

Test the conductivity through the concentric circle on the bottom side. Weld the RF coaxial cable as shown below.

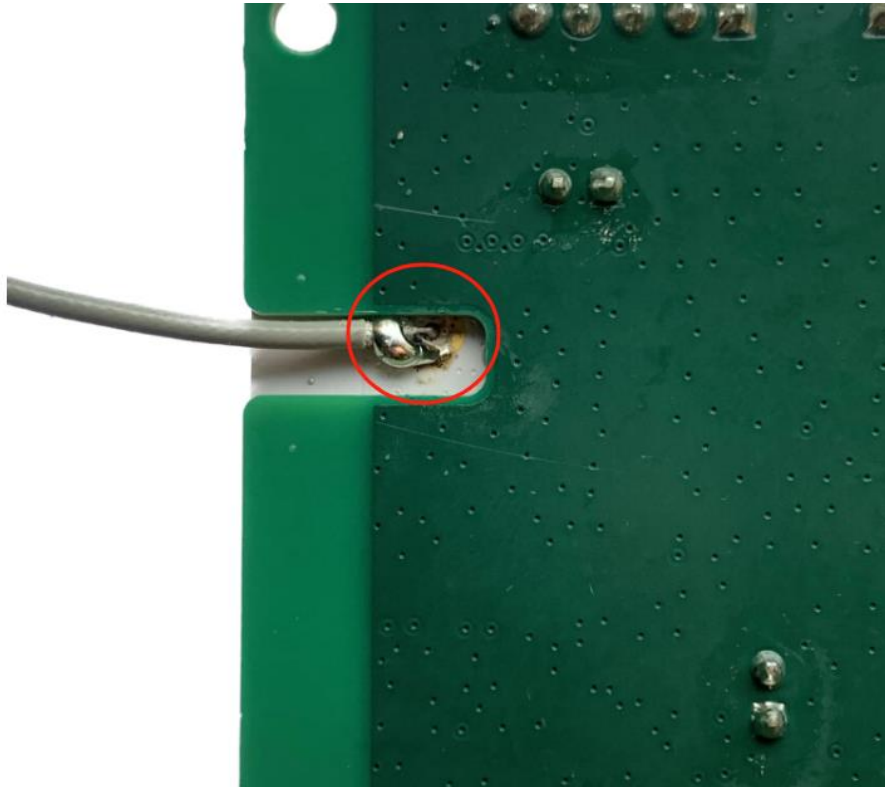


Figure 16: Concentric Circle Welding

Before testing the conductivity, you must remove the shielding cover of the module and matched resistors to disconnect the matching circuit of the PCB antenna. The matched resistors are shown as below.

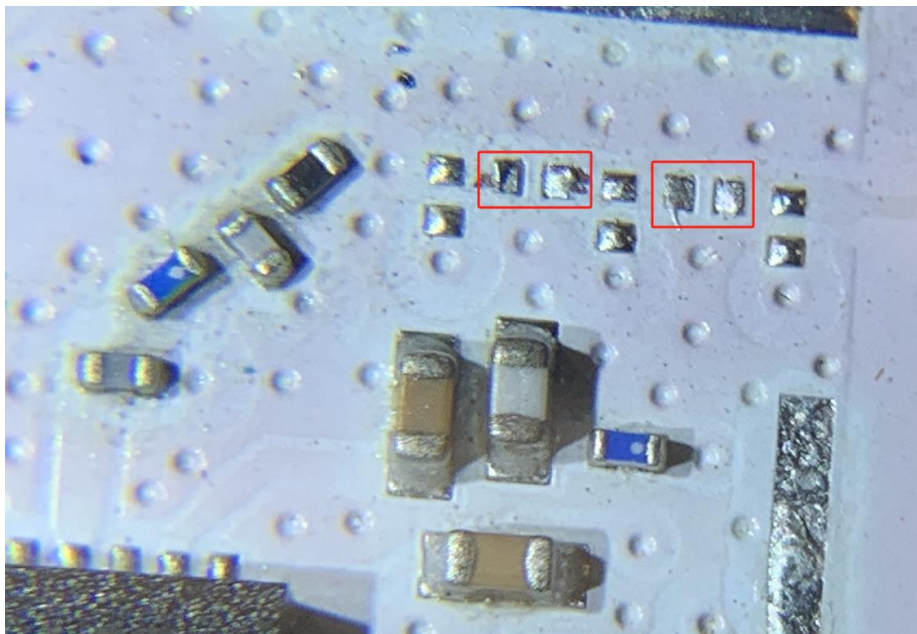


Figure 17: Matched Resistors

4.6. Test Points

HCM010S-TE-B features a series of test points (J0205, J0204, J0109 and J0207) which are illustrated in the following figure, and these test points can help you to obtain the corresponding waveform of some signals.

To test the module's power consumption, disconnect the resistor at the red arrow's location and connect pin 1 of J0109 to the negative pole and pin 2 of J0109 to the positive pole for the programmable power supply.

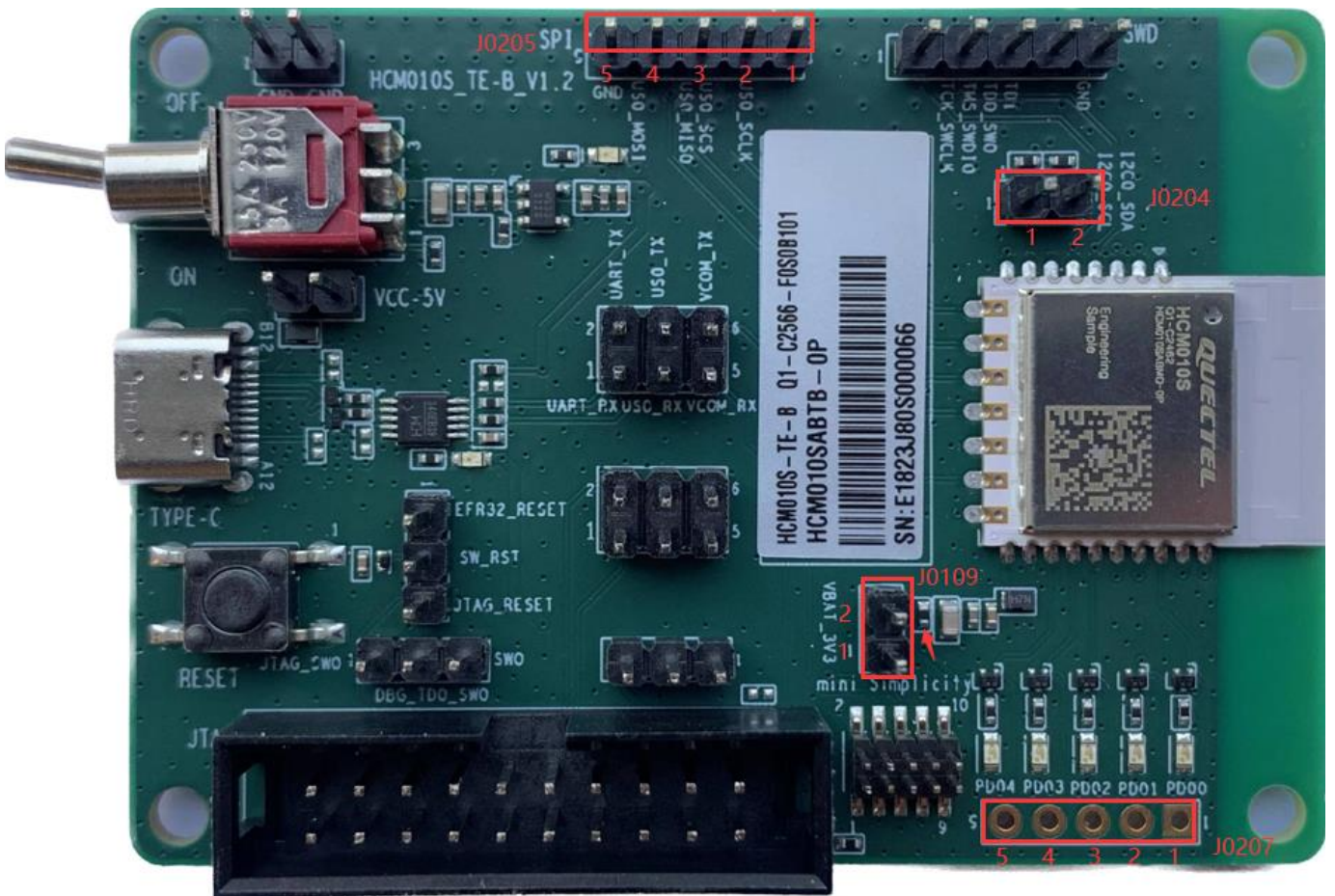


Figure 18: Test Points

Table 6: Pin Description of Test Points

| J0109 | | |
|---------|----------|---|
| Pin No. | Pin Name | Description |
| 1 | GND | Ground |
| 2 | VBAT_3V3 | Tests the module power consumption |
| J0204 | | |
| Pin No. | Pin Name | Description |
| 1 | I2C0_SCL | Connected directly to the module's GPIO5 |
| 2 | I2C0_SDA | Connected directly to the module's GPIO4 |
| J0205 | | |
| Pin No. | Pin Name | Description |
| 1 | US0_SCLK | Connected directly to the module's GPIO6 |
| 2 | US0_SCS | Connected directly to the module's GPIO9 |
| 3 | US0_MISO | Connected directly to the module's GPIO7 |
| 4 | US0_MOSI | Connected directly to the module's GPIO8 |
| 5 | GND | Ground |
| J0207 | | |
| Pin No. | Pin Name | Description |
| 1 | PD00 | Connected directly to the module's GPIO16 |
| 2 | PD01 | Connected directly to the module's GPIO12 |
| 3 | PD02 | Connected directly to the module's GPIO15 |
| 4 | PD03 | Connected directly to the module's GPIO14 |
| 5 | PD04 | Connected directly to the module's GPIO13 |

NOTE

See *document [1]* for details of module pin names and definitions in the above table.

4.7. Status LEDs

HCM010S-TE-B comprises 2 status LEDs, which are presented in the following figure.

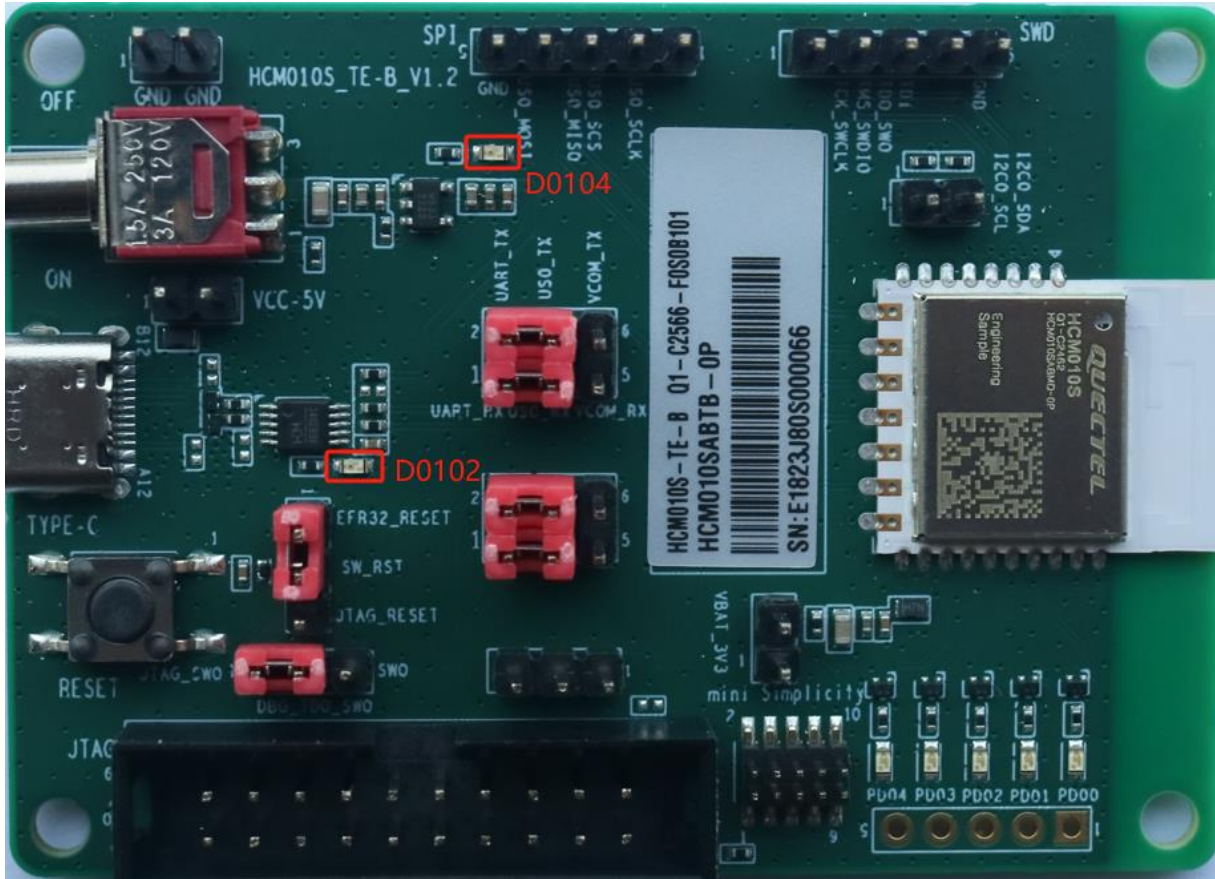


Figure 19: Status LEDs

Table 7: Description of Status LEDs

| RefDes. | Description | Comment |
|---------|------------------------|--|
| D0102 | Indicates USART status | Light on: power on Flicker: data transmission |
| D0104 | VBAT ON/OFF indicator | Light on: power on Light off: power off |

5 Operating Procedures

This chapter outlines how to use the HCM010S-TE-B for testing and evaluating the module.

5.1. Power Up

1. Connect J0101 (USB interface) of HCM010S-TE-B to PC through the USB Type-C cable.
2. Switch S0101 (Power Switch) to ON state, and then D0104 (VBAT ON/OFF indicator) will light up.

5.2. Communication via USB Interface

1. Turn on the module according to the procedures referred to in **Chapter 5.1**.
2. The USB serial port number can be viewed through the PC Device Manager, as shown below.

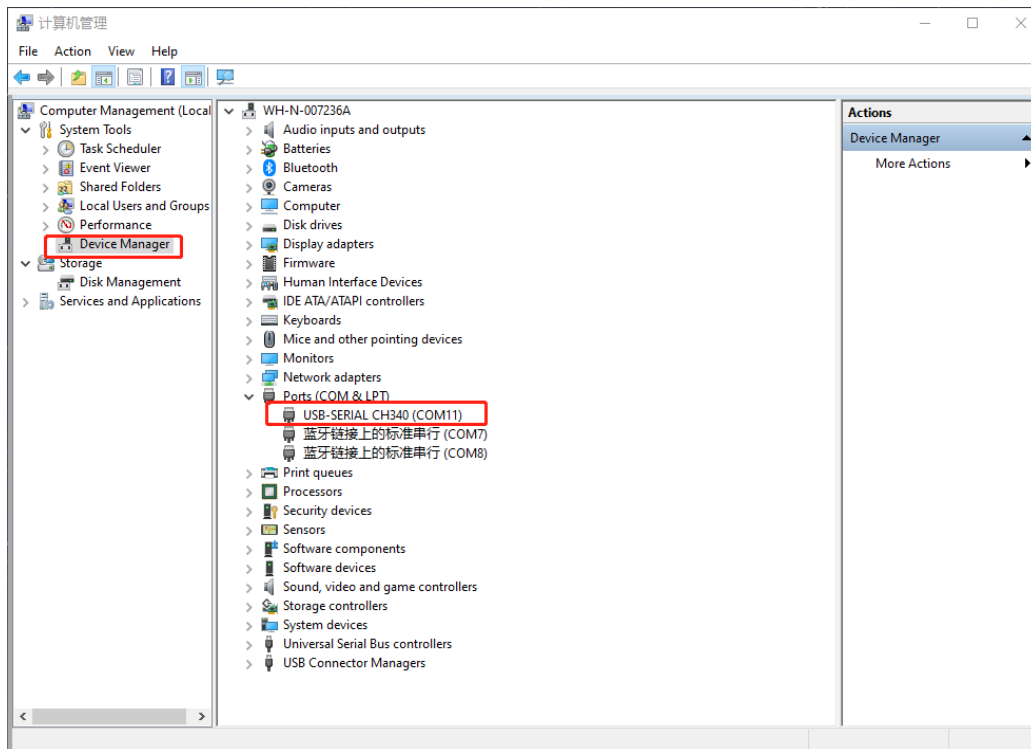


Figure 20: USB Serial Port

- Use the QCOM tool provided by Quectel to establish communication between the module and the PC via the USB interface (J0101). The following figure shows the field for setting the COM port on QCOM. Select the “**COM port**” (USB serial port) and set the correct “**Baudrate**”. For more details about QCOM tool usage and configuration, see *document [2]*.

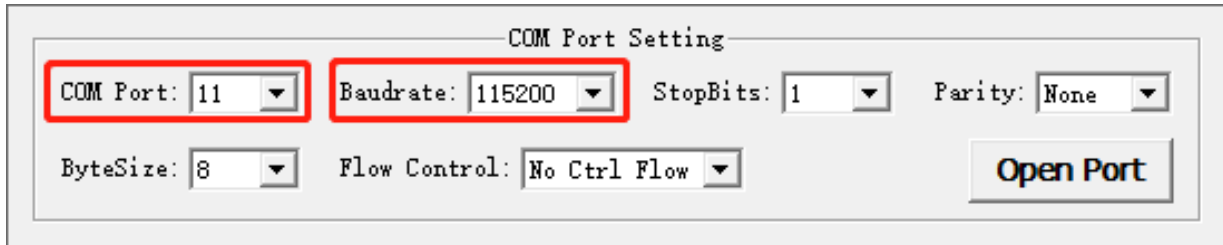


Figure 21: COM Port Setting Field on QCOM

5.3. Firmware Upgrade

You can use the JFlash tool provided by Quectel to establish the communication between the module and the PC via J0208 (SWD interface) or J0107 (JTAG interface).

NOTE

Contact Quectel Technical Support for the JFlash tool. For more details about JFlash tool usage and configuration, see *document [3]*.

5.4. Reset

To reset the module, first connect EFR32_RESET to SW_RST of J0206 (reset jumper interface), and then push and hold the S0102 (reset button) for more than 100 ms before releasing it.

6 Appendix References

Table 8: Related Documents

| Document Name |
|-------------------------------------|
| [1] Quectel_HCM010S_Hardware_Design |
| [2] Quectel_QCOM_User_Guide |
| [3] Quectel_HCM010S_Test_Guide |

Table 9: Terms and Abbreviations

| Abbreviation | Description |
|--------------|-----------------------------------|
| COM | Communication |
| ETM | Embedded Trace Module (Macrocell) |
| GND | Ground |
| GPIO | General Purpose Input/Output |
| IC | Integrated Circuit |
| JTAG | Joint Test Action Group |
| LDO | Low-dropout Regulator |
| LED | Light Emitting Diode |
| PC | Personal Computer |
| RF | Radio Frequency |
| RXD | Receive Data (Pin) |
| SWD | Serial Wire Debug |
| SWO | Serial Wire Output |

| | |
|------|---|
| TXD | Transmit Data (Pin) |
| UART | Universal Asynchronous Receiver & Transmitter |
| USB | Universal Serial Bus |
| VBAT | Voltage at Battery (Pin) |
