

FC41D-TE-B User Guide

Wi-Fi&Bluetooth 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 cellular terminal or mobile incorporating the module. Manufacturers of the cellular 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 cellular 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.



Cellular 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 cellular terminal or mobile must be switched on in a service area with adequate cellular 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 cellular 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 phone or other cellular terminals. Areas with explosive or potentially explosive atmospheres include fuelling 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
-	2021-04-27	Soni RAO	Creation of the document
1.0.0	2021-04-27	Soni RAO	Preliminary

Contents

Safety Information.....	3
About the Document.....	4
Contents.....	5
Table Index.....	6
Figure Index.....	7
1 Introduction.....	8
2 General Overview.....	9
2.1. Component Placement of FC41D-TE-B.....	9
2.2. Top View of EVB.....	11
2.3. EVB Kit Accessories.....	11
3 Interface Applications.....	12
3.1. Power Interfaces (J201/J202).....	12
3.2. Switch and Button (J104/SW301).....	13
3.3. UART Interfaces (J201/J202).....	14
3.4. RF Interfaces (J301/J303).....	15
3.5. Test Points.....	16
3.6. Status Indication LEDs.....	18
4 Operation Procedures.....	21
4.1. Power on FC41D.....	21
4.2. Communication Via UART (USB Connectors).....	21
4.3. Firmware Upgrade.....	22
4.4. Reset FC41D.....	23
5 Appendix References.....	24

Table Index

Table 1: Interfaces of FC41D-TE-B.....	10
Table 2: Accessories List.....	11
Table 3: Description of Switch and Button	13
Table 4: Pin Definition of J103, J601, J602, J603, J606.....	17
Table 5: Description of Status Indication LEDs.....	19
Table 6: Related Documents	24
Table 7: Terms and Abbreviations	24

Figure Index

Figure 1: Component Placement of FC41D-TE-B	9
Figure 2: FC41D-TE-B Top View.....	11
Figure 3: Power Supply for FC41D-TE-B.....	12
Figure 4: Power Switch	13
Figure 5: Reset Button	13
Figure 6: UART Block Diagram.....	14
Figure 7: USB Connectors	14
Figure 8: RF Block Diagram.....	15
Figure 9: RF Connectors.....	15
Figure 10: Test Points.....	16
Figure 11: Test Points (J103).....	16
Figure 12: Status Indication LEDs	19
Figure 13: USB Serial Port.....	21
Figure 14: Debug UART Setting Field on QCOM.....	22
Figure 15: Configurations for Firmware Upgrade	22

1 Introduction

FC41D-TE-B is designed to help designers develop FC41D applications. It can be used to test basic functionalities of FC41D. This document describes the general features, interface applications and operation procedures of the board.

2 General Overview

2.1. Component Placement of FC41D-TE-B

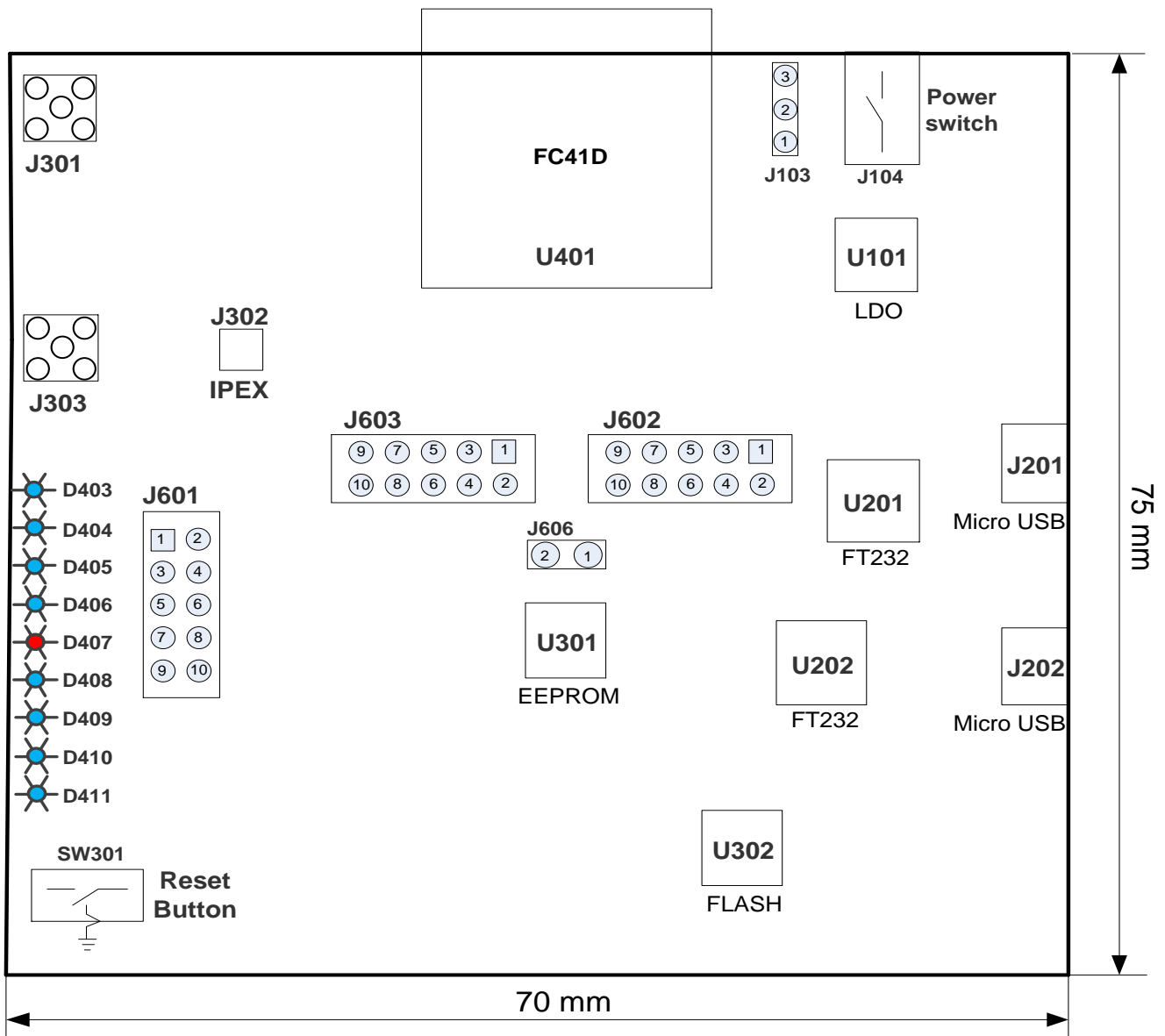


Figure 1: Component Placement of FC41D-TE-B

Table 1: Interfaces of FC41D-TE-B

Interface	Reference No.	Description
Power Supply	J201, J202	USB Micro-B interface Typical supply voltage: +5 V
Power Switch	J104	VBAT ON/OFF control
RESET	SW301	Reset button, used to reset FC41D
USB Connector (UART interface)	J201	Main UART interface, from USB to UART converter chip U201
	J202	Debug UART interface, from USB to UART converter chip U202
RF Connectors	J301	SMA connector of FC41D ANT_RF pin
	J302, J303	SMA connector of FC41D IPEX
Status Indication LEDs	D406 D407	<ul style="list-style-type: none"> ● D406 is Power ON/OFF indicator ● D407 is Wi-Fi status indicator
Test Points	J103, J601, J602, J603, J606	Test pins

2.2. Top View of EVB

The top view of the FC41D-TE-B is shown as following figure.

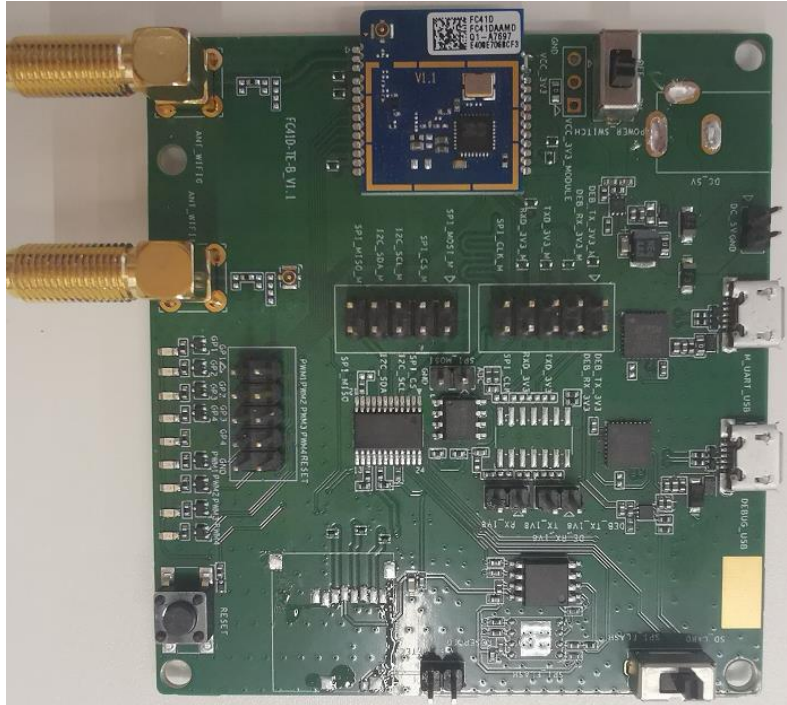


Figure 2: FC41D-TE-B Top View

2.3. EVB Kit Accessories

All accessories of the FC41D-TE-B kit are listed as below.

Table 2: Accessories List

Items	Description	Quantity (pcs)
Cables	USB Micro-B cable	2
	IPEX RF cable	1
Antennas	Wi-Fi antenna	2
Instruction Sheet	A sheet of paper giving instructions for EVB connection, details of EVB accessories, etc.	1

3 Interface Applications

This chapter describes the information and applications of some hardware interfaces of the FC41D-TE-B:

- Power Interfaces
- Switch and Button
- UART Interface
- Test Points
- RF Interface
- Status Indication LEDs

3.1. Power Interfaces (J201/J202)

The FC41D-TE-B can be powered by USB Micro-B Connector (J201, J202).

The following figure shows the simplified power supply schematic of FC41D-TE-B.

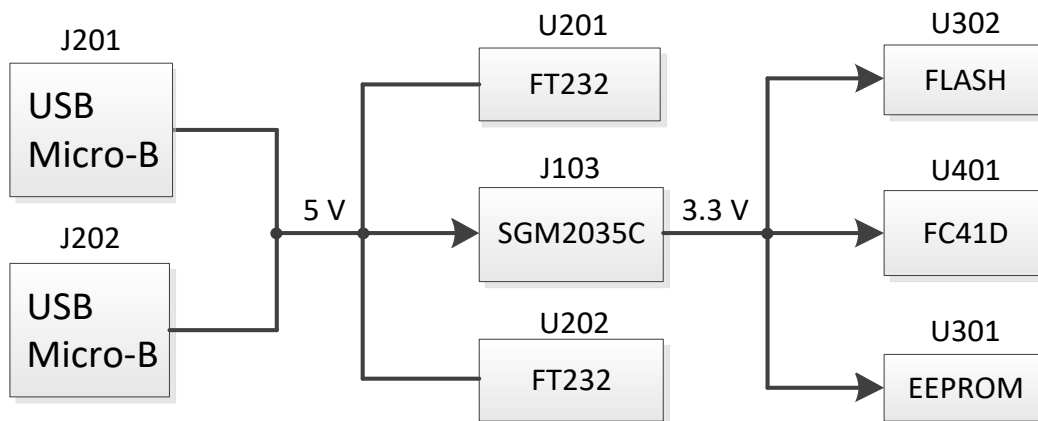


Figure 3: Power Supply for FC41D-TE-B

3.2. Switch and Button (J104/SW301)

FC41D-TE-B includes one power switch (J104) and one reset button (SW301) as shown in the following figure.



Figure 4: Power Switch



Figure 5: Reset Button

Table 3: Description of Switch and Button

Reference No.	Description
J104	VBAT ON/OFF control
SW301	Used to reset FC41D module

3.3. UART Interfaces (J201/J202)

The FC41D-TE-B offers two UART interfaces: J201 (main UART) and J202 (debug UART).

J201 is intended for communication between the module and the host application. It can be used for download and AT command communication.

J202 supports 115200 bps baud rate by default. It can be used for Linux console and log output.

The following figure shows the block diagram of UART on FC41D-TE-B.

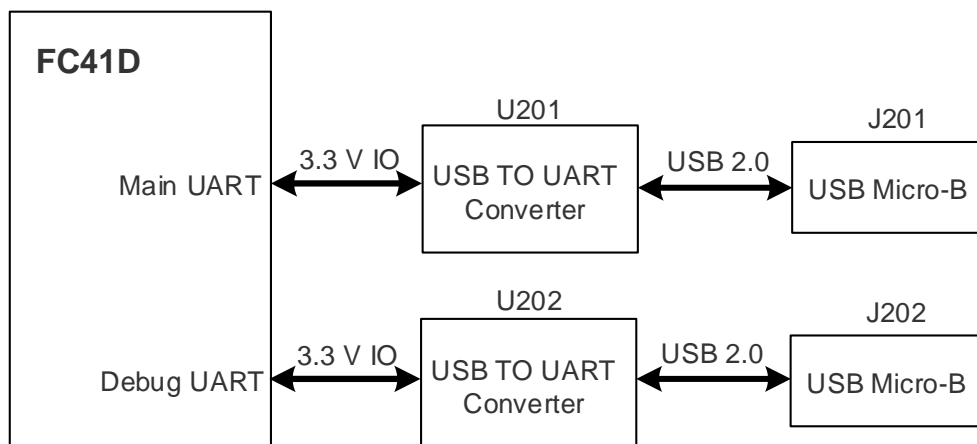


Figure 6: UART Block Diagram

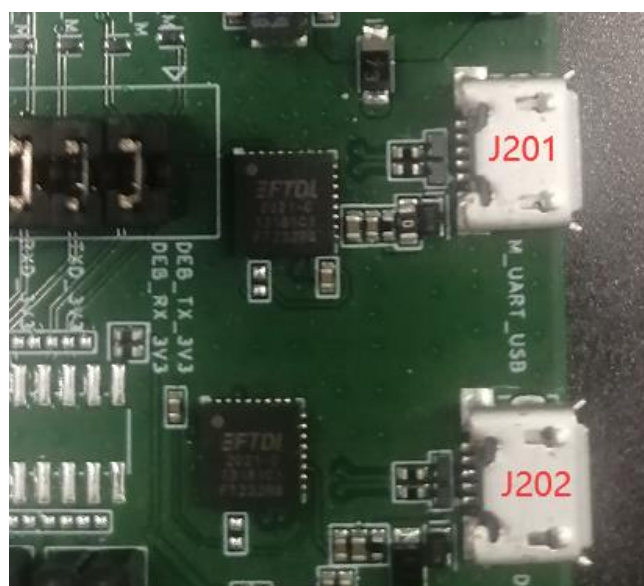


Figure 7: USB Connectors

3.4. RF Interfaces (J301/J303)

FC41D-TE-B offers two RF interfaces (J301, J303).

The following figure shows the block diagram of RF interface.

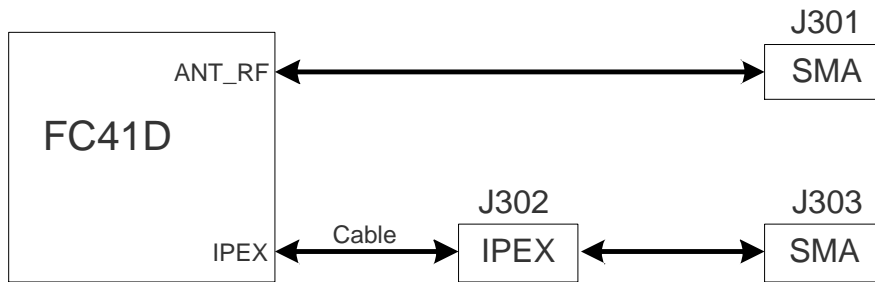


Figure 8: RF Block Diagram

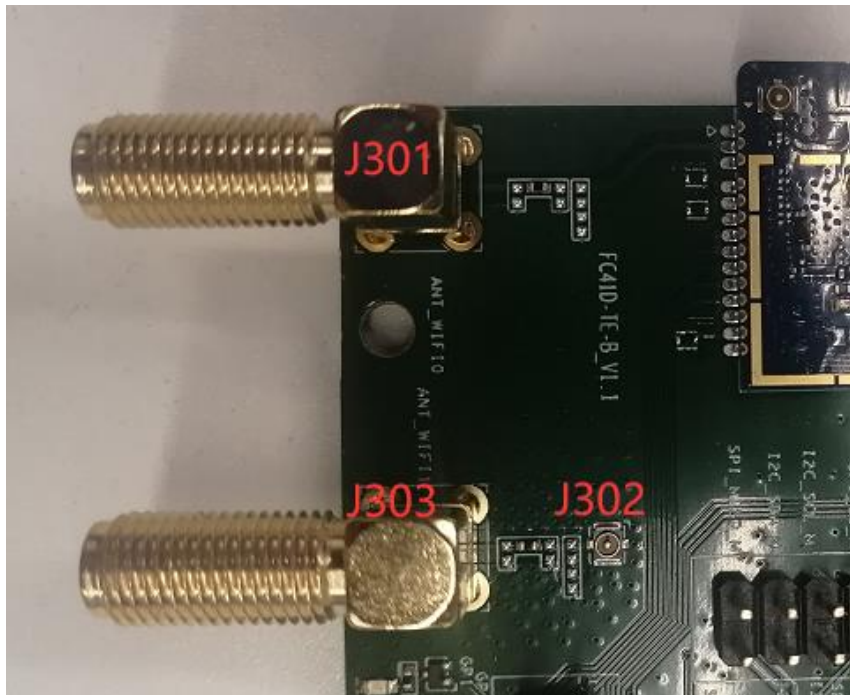


Figure 9: RF Connectors

3.5. Test Points

The FC41D-TE-B provides a series of test points. They can help customers to obtain the corresponding waveform of some signals.

The following figures show the test points of J103, J601, J602, J603, J606.

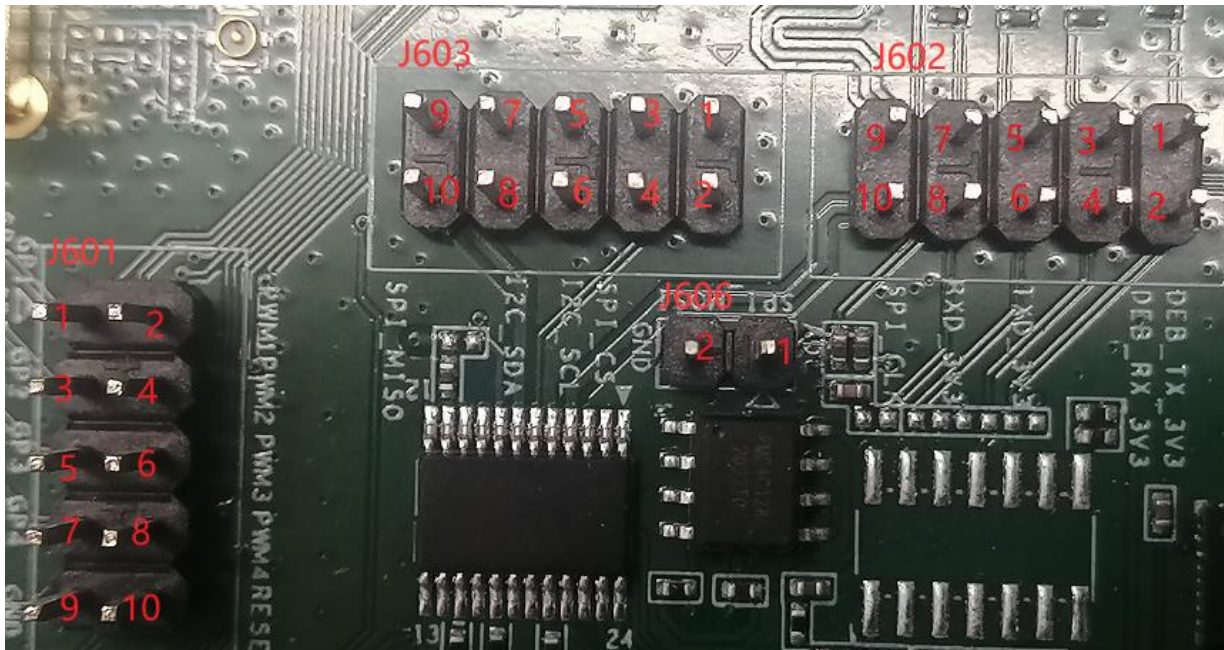


Figure 10: Test Points

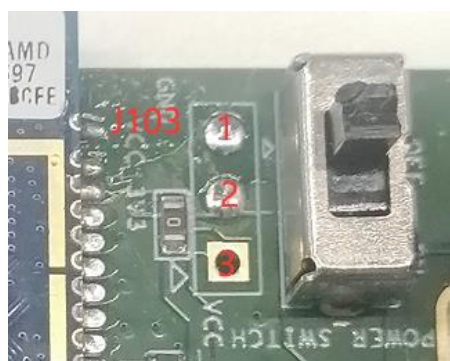


Figure 11: Test Points (J103)

Table 4: Pin Definition of J103, J601, J602, J603, J606

J103		
Pin No.	Pin Name	Description
1	GND	Ground
2	VCC_3V3	3.3 V power supply
3	VBAT	FC41D VBAT power
J601		
Pin No.	Pin Name	Description
1	GPIO1	Connected directly to GPIO1 of FC41D
2	PWM1	Connected directly to PWM1 of FC41D
3	GPIO2	Connected directly to GPIO2 of FC41D
4	PWM2	Connected directly to PWM2 of FC41D
5	GPIO3	Connected directly to GPIO3 of FC41D
6	PWM3	Connected directly to PWM3 of FC41D
7	GPIO4	Connected directly to GPIO4 of FC41D
8	PWM4	Connected directly to PWM4 of FC41D
9	GND	Ground
10	RESET	Connected directly to CEN of FC41D
J602		
Pin No.	Pin Name	Description
1	DEB_TX_M	Connected directly to DBG_TX of FC41D
2	DEB_TX	Connected directly to UART_RX of U202
3	DEB_RX_M	Connected directly to DBG_RX of FC41D
4	DEB_RX	Connected directly to UART_TX of U202
5	TXD_M	Connected directly to MAIN_TX of FC41D

6	TXD	Connected directly to UART_RX of U201
7	RXD_M	Connected directly to MAIN_RX of FC41D
8	RXD	Connected directly to UART_TX of U201
9	SPI_CLK_M	Connected directly to SPI_CLK of FC41D
10	SPI_CLK	Connected directly to SPI_CLK of U302

J603

Pin No.	Pin Name	Description
1	SPI_MOSI_M	Connected directly to SPI_MOSI of FC41D
2	SPI_MOSI	Connected directly to SPI_MOSI of U302
3	SPI_CS_M	Connected directly to DBG_RX of FC41D
4	SPI_CS	Connected directly to UART_TX of U202
5	I2C_SCL_M	Connected directly to I2C_SCL of FC41D
6	I2C_SCL	Connected directly to I2C_SCL of U301
7	I2C_SDA_M	Connected directly to I2C_SDA of FC41D
8	I2C_SDA	Connected directly to I2C_SDA of U301
9	SPI_MISO_M	Connected directly to SPI_MISO of FC41D
10	SPI_MISO	Connected directly to SPI_MISO of U302

3.6. Status Indication LEDs

FC41D-TE-B comprises nine status indication LEDs. The following figure shows the positions of these LED indicators.

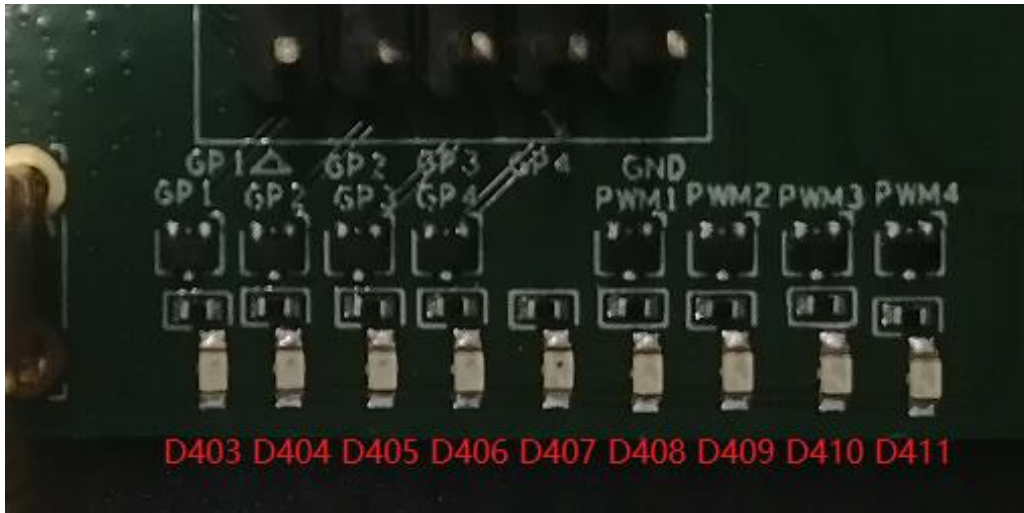


Figure 12: Status Indication LEDs

Table 5: Description of Status Indication LEDs

Reference No.	Description
D407	Power ON/OFF indicator, it can indicate whether the power supply is ready. Light on: VBAT on Light off: VBAT off
D406	Indicates the status of Wi-Fi. Light on: Wi-Fi is connected Light off: Wi-Fi is disconnected
D403	Indicates the status of GPIO1. Light on: high level Light off: low level
D404	Indicates the status of GPIO2. Light on: high level Light off: low level
D405	Indicates the status of GPIO3. Light on: high level Light off: low level
D408	Indicates the status of PWM1. Light on: high level Light off: low level
D409	Indicates the status of PWM2. Light on: high level Light off: low level
D410	Indicates the status of PWM3. Light on: high level

Light off: low level

D410

Indicates the status of PWM4.

Light on: high level

Light off: low level

4 Operation Procedures

This chapter introduces how to use the FC41D-TE-B to test and to evaluate FC41D.

4.1. Power on FC41D

1. Connect the TE-B to PC via USB cable.
2. Switch J104 (Power Switch) to ON state, then D407 (VBAT ON/OFF indicator) will light up.

4.2. Communication Via UART (USB Connectors)

1. Power on FC41D according to the procedures mentioned in **Chapter 4.1**.
2. Connect the USB connectors of FC41D-TE-B to PC with the USB cable, and the USB serial port number can be viewed through the PC Device Manager, as shown below.



Figure 13: USB Serial Port

3. Install and then use the QCOM tool provided by Quectel to achieve the communication between the module and the PC. The following figure shows the COM Port Setting field on QCOM: select correct “**COM port**” (USB Serial Port) and set correct “**Baudrate**” (such as 115200 bps). For more details about QCOM tool usage and configuration, please refer to **document [1]**.

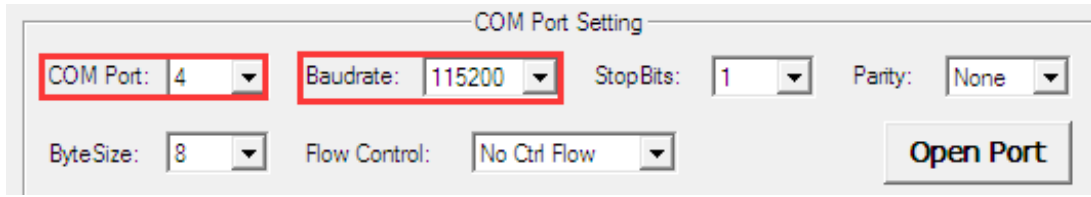


Figure 14: Debug UART Setting Field on QCOM

4.3. Firmware Upgrade

FC41D upgrade firmware via Main UART by default, please follow the procedures below to upgrade firmware.

1. Install and open the firmware upgrade tool Beken Writer on PC and then power on the FC41D module according to the procedures mentioned in **Chapter 4.1**.
2. Click the **“Platform (burning subject)”** dropdown list and select the **“BK7231N”**.
3. Click the **“COM Port”** dropdown list and select the Main UART and choose the 921600 baud rate.
4. Click the **“Load FW Files”** to choose the firmware package.
5. Choose **“Download (burn the main file)”** and click **“Start”** (when the progress bar is not read, the button is displayed as **“Start”**. When the progress bar is read, the button displays **“Stop”**. Click **“Stop”** to interrupt the progress bar reading process)
6. Press the reset button on the TE-B within 15 seconds to upgrade the firmware.



Figure 15: Configurations for Firmware Upgrade

4.4. Reset FC41D

Press the SW301 (reset button) for more than 100 ms then release it to reset FC41D. However, this may cause the loss of information stored in the memory as the module resetting procedure has been initialized.

5 Appendix References

Table 6: Related Documents

SN	Document Name	Description
[1]	Quectel_QCOM_User_Guide	User guide for QCOM tool

Table 7: Terms and Abbreviations

Abbreviation	Description
BT	Bluetooth
COM	Cluster Communication Port
EVB	Evaluation Board
GND	Ground
LED	Light Emitting Diode
NC	Not Connected
PC	Private Computer
RF	Radio Frequency
UART	Universal Asynchronous Receiver & Transmitter
USB	Universal Serial Bus
VBAT	Voltage of Battery
VCC	Volt Current Condenser
Wi-Fi	Wireless Fidelity