

# Wi-Fi-M.2 EVB

# 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
-	2021-06-01	Elinor WANG	Creation of the document
1.0	2021-07-16	Elinor WANG	First official release

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# 1 Introduction

Wi-Fi-M.2 EVB is designed to help designers develop Wi-Fi module applications. It can be used to test basic functionalities of Wi-Fi module.

This document describes the general features, application interfaces and operation procedures of the EVB.

## 1.1. Applicable Modules

Quectel Wi-Fi-M.2 EVB is applicable to the following modules:

**Table 1: Applicable Modules**

Modules
FC62E M.2
FC64E M.2
FC65E M.2
FC66E M.2

# 2 General Overview

## 2.1. Component Placement of Wi-Fi-M.2 EVB

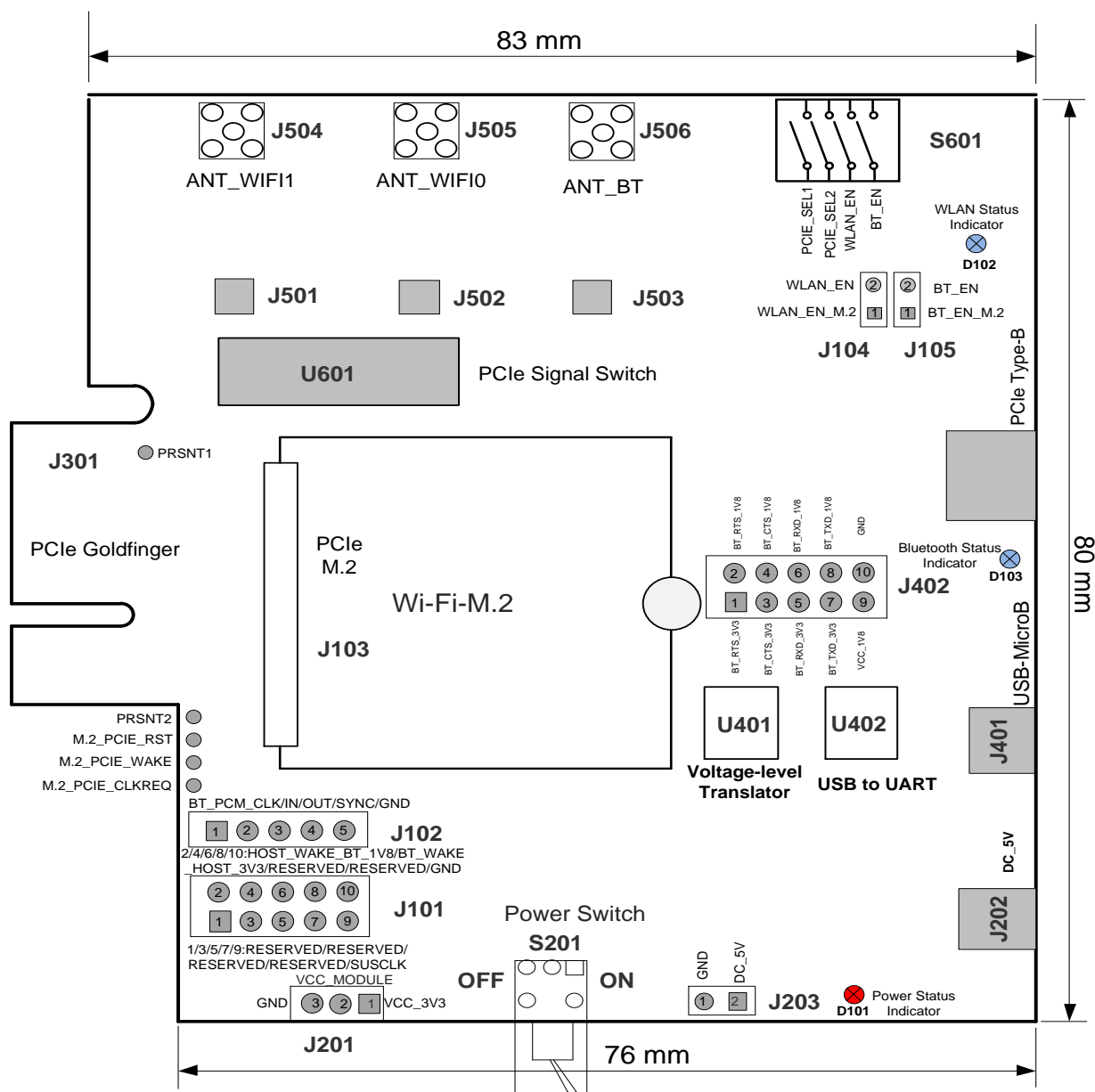


Figure 1: Component Placement of Wi-Fi-M.2 EVB

Table 2: Interfaces of Wi-Fi-M.2 EVB

Interfaces	Reference No.	Description
Power Supply	J202	DC power supply interface Typical supply voltage: +5 V
	J301	PCIe Goldfinger Typical supply voltage: +3.3 V
	J401	USB Micro-B connector Typical supply voltage: +5 V
Power Switch	S201	VCC ON/OFF control
PCIe Connectors	J103	M.2 slot for Wi-Fi module daughter board
	J301	PCIe X1 Goldfinger, used to plug into PC etc.
USB Connector	J401	Wi-Fi module UART interface, from USB to UART converter chip (U402)
RF Connectors	J501, J504	SMA connector of Wi-Fi-M.2 WiFi1, 2.4 GHz & 5 GHz WLAN antenna interface
	J502, J505	SMA connector of Wi-Fi-M.2 WiFi0, Bluetooth and 2.4 GHz & 5 GHz WLAN antenna interface
	J503, J506	SMA connector of Wi-Fi-M.2 Bluetooth, reserved for dedicated Bluetooth antenna interface
Status Indication LEDs	D101 D102 D103	<ul style="list-style-type: none"> <li>● D101 is power status indicator</li> <li>● D102 is Wi-Fi status indicator</li> <li>● D103 is Bluetooth status indicator</li> </ul>
Test Points	J101/J102/J104/J105/J201/J203/J402, etc.	See <b>Chapter 3.5</b>

## 2.2. Top View of EVB

The top view of the Wi-Fi-M.2 EVB is shown as the following figure:

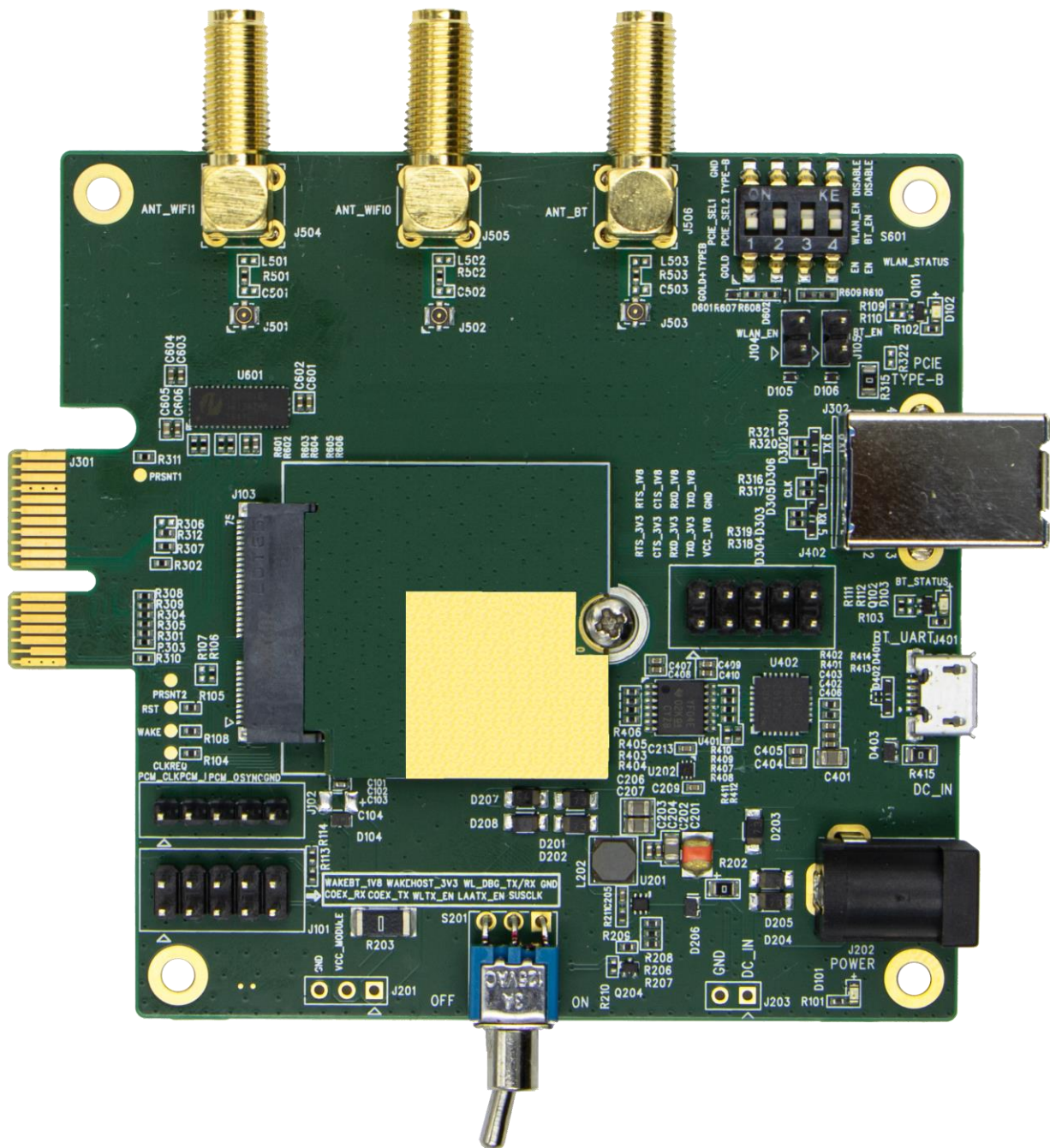


Figure 2: Wi-Fi-M.2 EVB Top View

## 2.3. EVB Kit Accessories

All accessories of the Wi-Fi-M.2 EVB kit are listed as below.

**Table 3: Accessories List**

Items	Description	Quantity (pcs)
Cables	USB Micro-B cable	1
	IPEX RF cable	3
Antennas	Wi-Fi/Bluetooth antenna	3
Instruction Sheet	A sheet of paper giving instructions for EVB connection, details of EVB accessories, etc.	1

# 3 Interface Applications

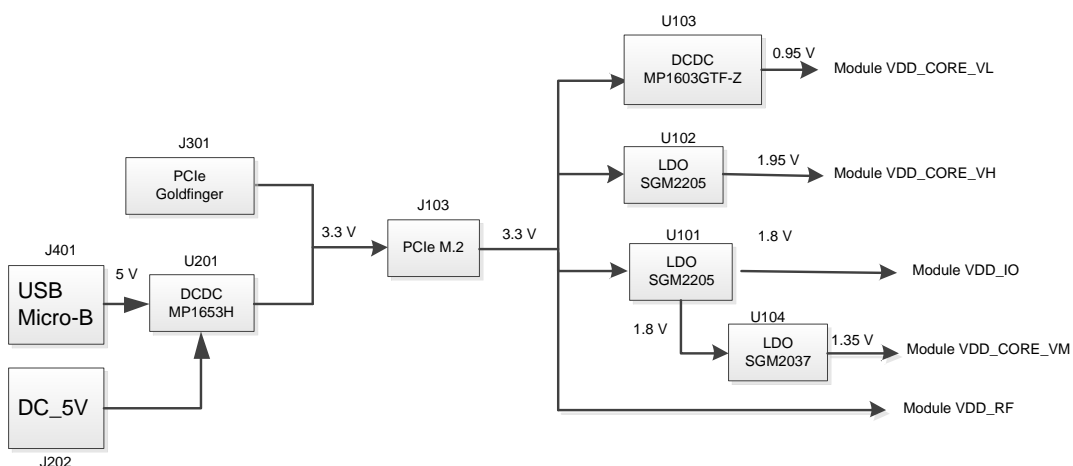
This chapter describes the hardware interfaces of Wi-Fi-M.2 EVB as follows:

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

## 3.1. Power Interfaces (J202/J301/J401)

The Wi-Fi-M.2 EVB can be powered by PCIe Goldfinger (J301), USB Micro-B connector (J401) or DC power supply interface (J202).

The following figure show the simplified power supply schematic of Wi-Fi-M.2 EVB.



**Figure 3: Power Supply for Wi-Fi-M.2 EVB**

### 3.2. Power Switch (S201)

Wi-Fi-M.2 EVB includes one power switch (S201) as shown in the following figure.



Figure 4: S201 Power Switch

Table 4: Description of S201

Reference No.	Description
S201	VCC ON/OFF control

### 3.3. PCIe Interfaces (J103/J301)

Wi-Fi-M.2 EVB provides two PCIe interfaces including one PCIe X1 Goldfinger (J301) and one PCIe M.2 slot (J103). Through these two PCIe connectors, PCIe lines PCIETX, PCIERX and REFCLK, and other signals are connected from Wi-Fi module to host.

- J103 is used to connect Wi-Fi module's daughter board.
- J301 is used to plug into the PCIe standard X1 slot of corresponding host such as PC. The **Figure 5** shows the connection between Wi-Fi-M.2 and PC:

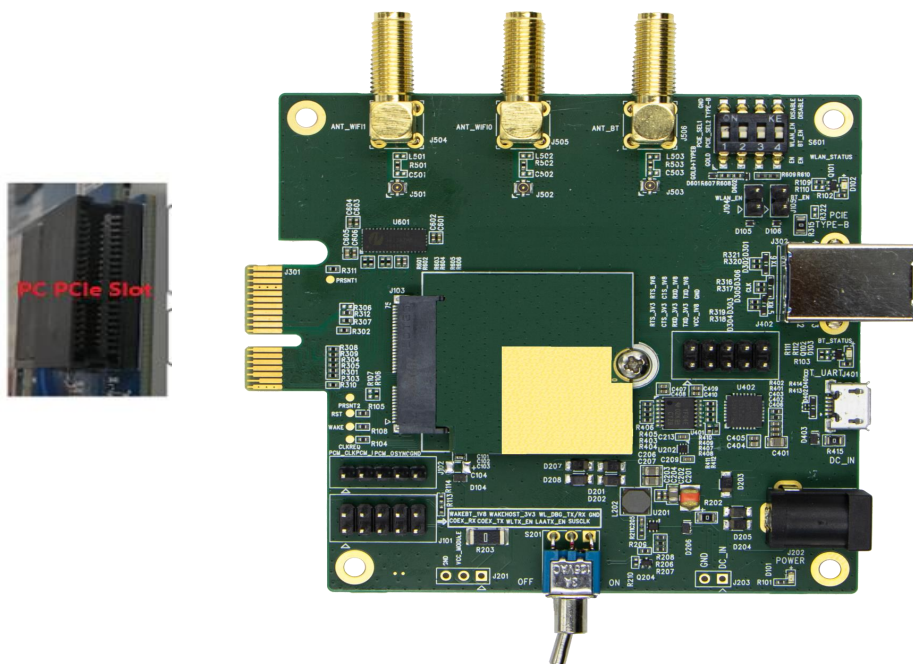


Figure 5: The Connection Between J301 and PC

### 3.4. UART Interface (J401)

Wi-Fi-M.2 EVB offers one UART interface J401 (debug UART) for Linux console and log output.

The block diagram of UART on Wi-Fi-M.2 EVB is shown as below.

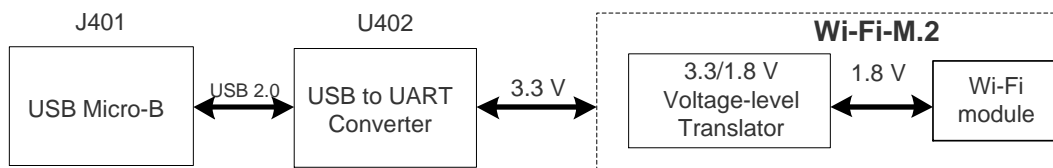


Figure 6: UART Block Diagram



### 3.5. Test Points

Wi-Fi-M.2 EVB provides test points which help obtain corresponding waveforms of some signals.

The following figures show the test points of J101, J102, J104, J105, J201, J203, J402 and PCIe test points.

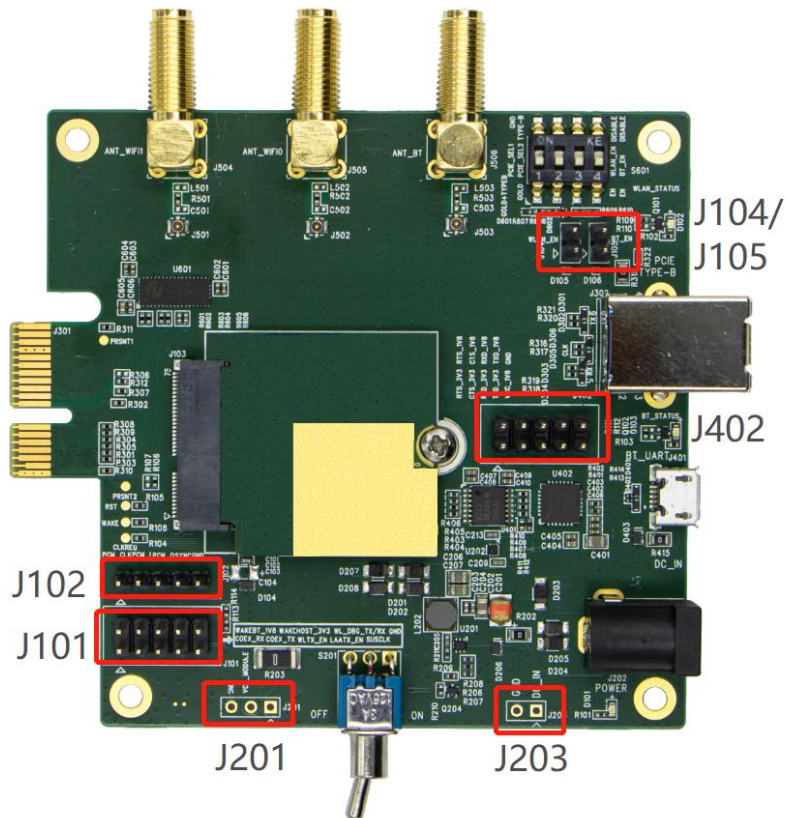


Figure 7: Test Points

Table 5: Pin Definition of WLAN and Bluetooth Application Interface Test Points

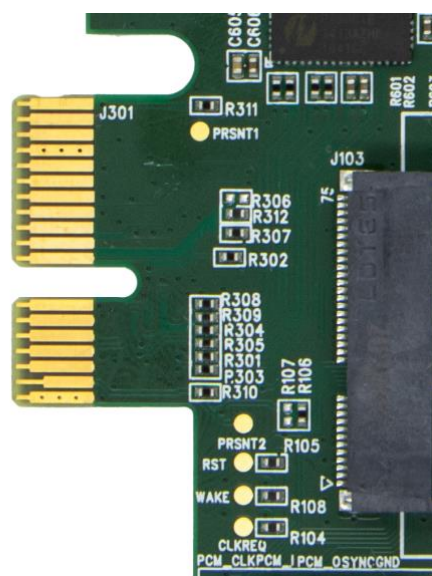
J101		
Pin No.	Pin Name	Description
2	HOST_WAKE_BT_1V8	Connected directly to HOST_WAKE_BT of the module.
4	BT_WAKE_HOST_3V3	Through voltage-level translator connected to BT_WAKE_HOST of the module.
9	SUSCLK	Connected to WLAN_SLP_CLK of the module through a 3.3/1.8 V voltage-level translator.

10	GND	Ground
<b>J102</b>		
Pin No.	Pin Name	Description
1	BT_PCM_CLK	Connected directly to the module's PCM_CLK.
2	BT_PCM_IN	Connected directly to the module's PCM_DIN.
3	BT_PCM_OUT	Connected directly to the module's PCM_DOUT.
4	BT_PCM_SYNC	Connected directly to the module's PCM_SYNC.
5	GND	Ground
<b>J104</b>		
Pin No.	Pin Name	Description
1	WLAN_EN_M.2	Connected to the module's WLAN_EN through a 3.3/1.8 V voltage-level translator.
2	WLAN_EN	Through its connection with the module's WLAN_EN to achieve the hardware mode to control the WLAN enablement.
<b>J105</b>		
Pin No.	Pin Name	Description
1	BT_EN_M.2	Connected to BT_EN through a 3.3/1.8 V voltage-level translator.
2	BT_EN	Through its connection with the module's BT_EN, to achieve the hardware mode to control the Bluetooth enablement.
<b>J402</b>		
Pin No.	Pin Name	Description
1	BT_RTS_3V3	Connected to module's BT_RTS through a 3.3/1.8 V voltage-level translator.
2	BT_RTS_1V8	Connected directly to module's BT_RTS.
3	BT_CTS_3V3	Connected to module's BT_CTS through a 3.3/1.8 V voltage-level translator.
4	BT_CTS_1V8	Connected directly to module's BT_CTS.
5	BT_RXD_3V3	Connected to module's BT_RXD through a 3.3/1.8 V voltage-level translator.

6	BT_RXD_1V8	Connected directly to module's BT_RXD.
7	BT_TXD_3V3	Connected to the module's BT_TXD through a 3.3/1.8 V voltage-level translator.
8	BT_TXD_1V8	Connected directly to the module's BT_TXD.
9	VCC_1V8	1.8 V
10	GND	Ground

**Table 6: Pin Definition of Power Test Points**

J201		
Pin No.	Pin Name	Description
1	VCC_3V3	Wi-Fi-M.2 EVB's 3.3 V power test point.
2	VCC_MODULE	3.3 V power supply near the module.
3	GND	Ground
J203		
Pin No.	Pin Name	Description
1	DC_5V	Connected to J202.
2	GND	Ground



**Figure 8: PCIe Test Points**

**Table 7: Pin Definition of PCIe Test Points**

Pin No.	Pin Name	Description
R303	REFCLK -	PCIe reference clock (-)
R301	REFCLK +	PCIe reference clock (+)
R305	TX -	PCIe transmit (-)
R304	TX +	PCIe transmit (+)
R309	RX -	PCIe receive (-)
R308	RX +	PCIe receive (+)
-	M.2_PCIE_RST	Connected to the module's PCIE_RST_N through a 3.3/1.8 V voltage-level translator.
-	M.2_PCIE_WAKE	Connected to the module's PCIE_WAKE_N through a 3.3/1.8 V voltage-level translator.
-	M.2_PCIE_CLKREQ	Connected to the module's PCIE_CLKREQ_N through a 3.3/1.8 V voltage-level translator.
-	PRSNT1	Hot plug detection of PCIe X1 Goldfinger
-	PRSNT2	

**NOTE**

Undescribed test points are reserved pins and have no actual function.

### 3.6. RF Interfaces (J504/J505/J506)

Wi-Fi-M.2 EVB offers three RF interfaces for Wi-Fi and Bluetooth function (J504, J505, J506).

The following figure shows the block diagram of RF interface.

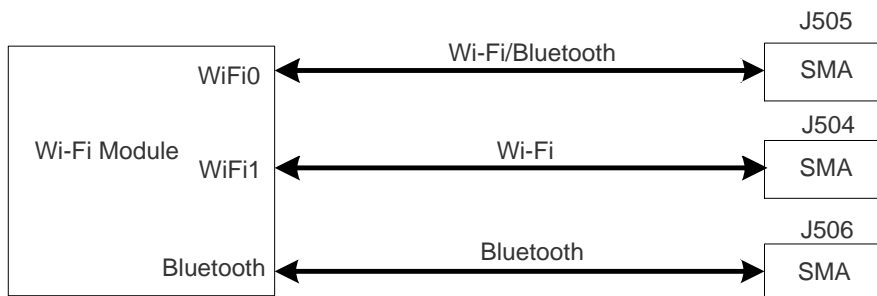


Figure 9: RF Block Diagram

### 3.7. Status Indication LEDs (D101/D102/D103)

Wi-Fi-M.2 EVB comprises three status indication LEDs (D101, D102, D103). The following figure shows the positions of these LED indicators.

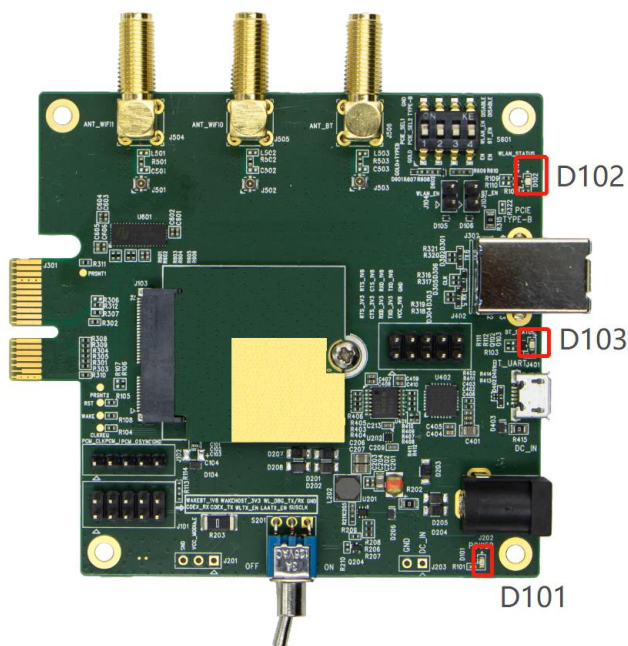


Figure 10: Status Indication LEDs

**Table 8: Description of Status Indication LEDs**

Reference No.	Description
D101	Power ON/OFF indicator. Indicates whether the power supply is ready. Light on: Power on Light off: Power off
D102	Indicates the status of Wi-Fi. Light on: Wi-Fi is turned on. Light off: Wi-Fi is turned off.
D103	Indicates the status of Bluetooth. Light on: Bluetooth is turned on. Light off: Bluetooth is turned off.

# 4 Appendix References

**Table 9: Terms and Abbreviations**

Abbreviation	Description
BT	Bluetooth
DC	Direct Current
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
VCC	Volt Current Condenser
Wi-Fi	Wireless Fidelity