RG200U&RG500U Series 5G EVB

User Guide

5G Module Series

Version: 1.0.

Date: 2023-05-30

Status: Released

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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
-	2022-07-21	Neeson ZHANG	Creation of the document
1.0	2023-05-30	Anthony LIU/ Cavan ZHU	First Official Release

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1 Introduction

This user guide describes the application details of RG200U & RG500U Series 5G EVB (evaluation board), which is an assistant tool for developers to develop applications and test basic functionalities of applicable modules.

1.1. Applicable Modules

For details about the applicable modules of this EVB, see ***document [1]***.

2 Product Overview

2.1. Top and Bottom Views

The size of RG200U & RG500U Series 5G EVB is 235 mm × 190 mm, and the top and bottom views are shown as below:

Figure 1: Top View

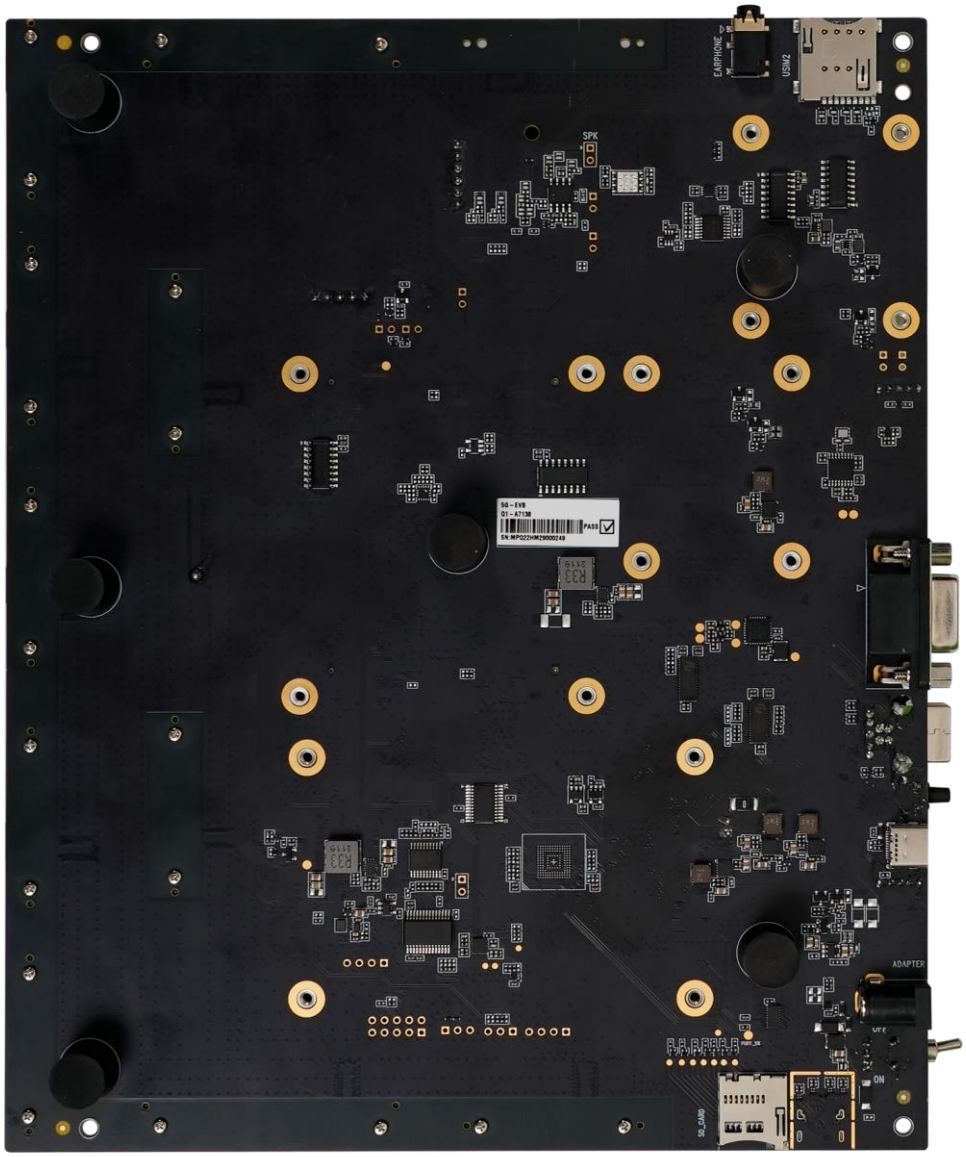


Figure 2: Bottom View

2.2. Component Placement

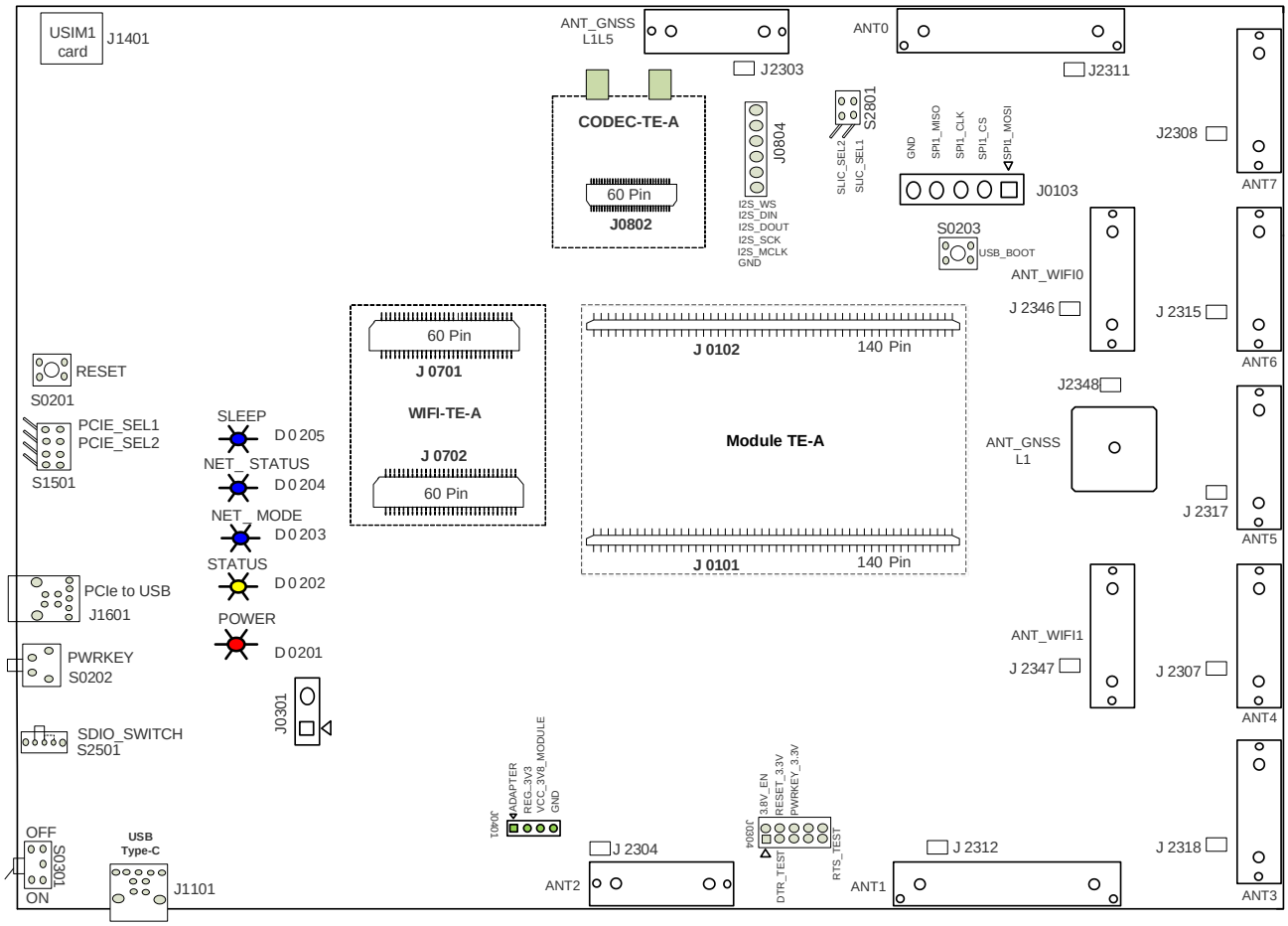


Figure 3: Top View for Component Placement

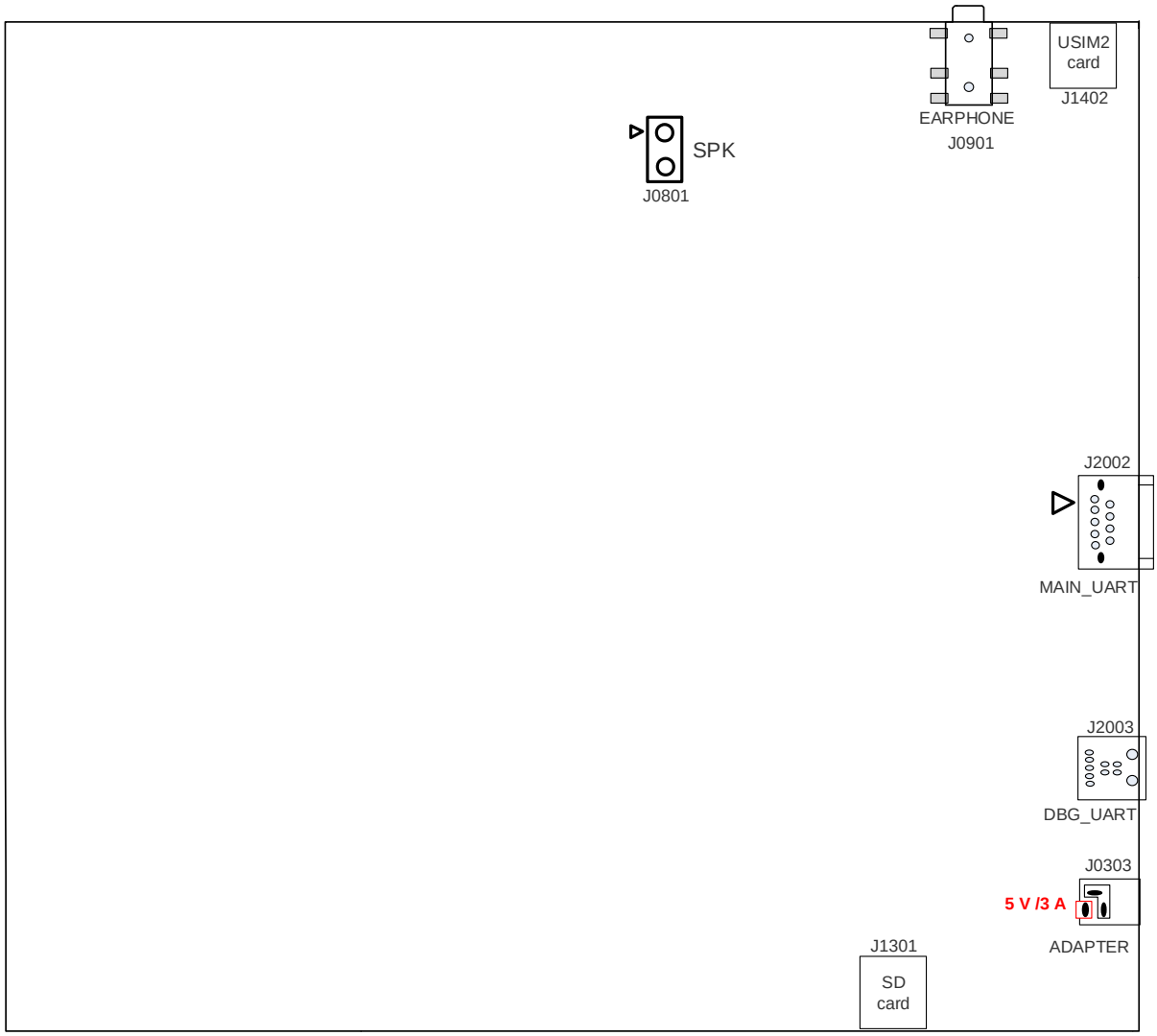


Figure 4: Bottom View for Component Placement

Table 1: Components & Functions

Component	RefDes.	Description	Implementation
Power Supply	J0303	Power jack on the EVB	● DC power supply: 4.5–5.5 V ● Typical supply voltage: +5 V/ 3 A
Power Switch	S0301	VBAT ON/OFF control	Switch
PWRKEY	S0202	● Power key (push button) ● Used to turn ON/OFF the module	Button
USB_BOOT	S0203	Emergency download	Button

RESET	S0201	• Reset button (push button) • Used to reset the module	Button
USB Interface	J1101	USB Type-C interface	Used for USB 3.0 and USB 2.0 communication
PCIe-to-USB Interface	J1601	PCIe-to-USB interface, not supported by default	Reserved
PCIe Configuration Switch	S1501	Used to configure the module communication with different devices via PCIe signals	Switch
SDIO Configuration Switch	S2501	Used to switch between SD card and eMMC	Switch
Codec Configuration Switch	S2801	Used for codec configuration	Switch
Audio Interfaces	J0802	Codec board TE-A connector	• 1 digital audio codec board interface: Supports ALC5616-TE-A and TLV320AIC3104-TE-A codec boards • 2 analog audio interfaces: Used for loudspeaker and earphone
	J0801	Test points for loudspeaker	
	J0901	Audio jack for earphone	
(U)SIM Card Interfaces	J1401	(U)SIM1 card connector	Dual (U)SIM card supported: 1.8 V and 3.0 V
	J1402	(U)SIM2 card connector	
SD Card Interface	J1301	SD card connector	
Main UART	J2002	MAIN_UART for data communication	**COM1 (J2002):** Default baud rate: 115200 bps
Debug UART	J2003	DBG_UART for debugging	**COM2 (J2003):** Default baud rate: 115200 bps
Status Indicators	D0201	Power supply ON/OFF indicator	5 LEDs are available for signal indication
	D0202	Module operation status indicator, indicating whether the module is turned on.	
	D0203	Network mode indicator, indicating NET_MODE status of the module	
	D0204	Network status indicator, indicating NET_STATUS status	

		of the module	
	D0205	Sleep status indicator, indicating SLEEP status of the module	
Module TE-A Interfaces	J0101, J0102	Connect module TE-A	Support the applicable modules
Wi-Fi TE-A Interfaces	J0701, J0702	Connect Wi-Fi TE-A	Reserved
Antenna Interfaces	J2303, J2304, J2307, J2308, J2311, J2312, J2315, J2317, J2318, J2346, J2347, J2348	Antenna connectors	12 antenna connectors
Test Points	J0103, J0301, J0304, J0401, J0804		Five test points

3 Kit Accessories & Assembly

3.1. Accessories Assembly

Figure 5: RG200U & RG500U Series 5G EVB and Accessories Assembly

3.2. Accessories List

All accessories of the RG200U & RG500U Series 5G EVB kit are listed as below. Please contact the supplier if there is something missing.

Figure 6: RG200U & RG500U Series 5G EVB Kit Accessories

Table 2: Accessories List

Items	Description	Quantity (pcs)
Cables	USB-to-RS232 converter cable	1
	USB Type-A to Type-B cable	1
	USB Type-C cable	1
	RF cables	9
Antennas	Wi-Fi antennas	2

	RF antennas	8
	GNSS antennas (passive)	2
Audio	Earphone	1
USB Driver	Including module's related documents, tools & drivers, etc.	1
Codec TE-A	ALC5616, TLV320AIC3104	2
Instruction Sheet	A sheet of paper giving instructions for EVB connection, details of EVB accessories, etc.	1
PCIe-to-USB adapter	PCIe signal is transferred through USB 3.0 connector, not used by default.	1
Heatsink	Used to dissipate heat from the modules	1
Bolts and Nuts	Bolts and nuts for assembling the EVB	16 pairs
Adapter Plug	Adapter plug type: BS	1
	Adapter plug type: EU	1
	Adapter plug type: US	1
	Adapter plug type: CN	1
Power Adapter	+5 V/ 3 A power adapter	1

4 Application Interfaces

This chapter describes the hardware interfaces of the RG200U & RG500U Series 5G EVB, as listed below:

- Power supply
- Module TE-A interfaces
- USB interface
- Audio interfaces
  - Digital Audio Codec Board Interface
  - Analog Audio Interfaces
    - Loudspeaker Application
    - Earphone Application
- (U)SIM card interfaces
- SD card interface
- UART interfaces
- PCIe-to-USB interface
- Status indicators
- Wi-Fi TE-A interfaces
- Antenna Interfaces
- Switches and buttons
- Test points

4.1. Power Supply

The EVB can be powered by an external power adapter through the power jack on the EVB.

Table 3: Description of Power Supply

RefDes.	Description
J0303	Power jack on the EVB

The following figures show the simplified power supply block diagram of the EVB.

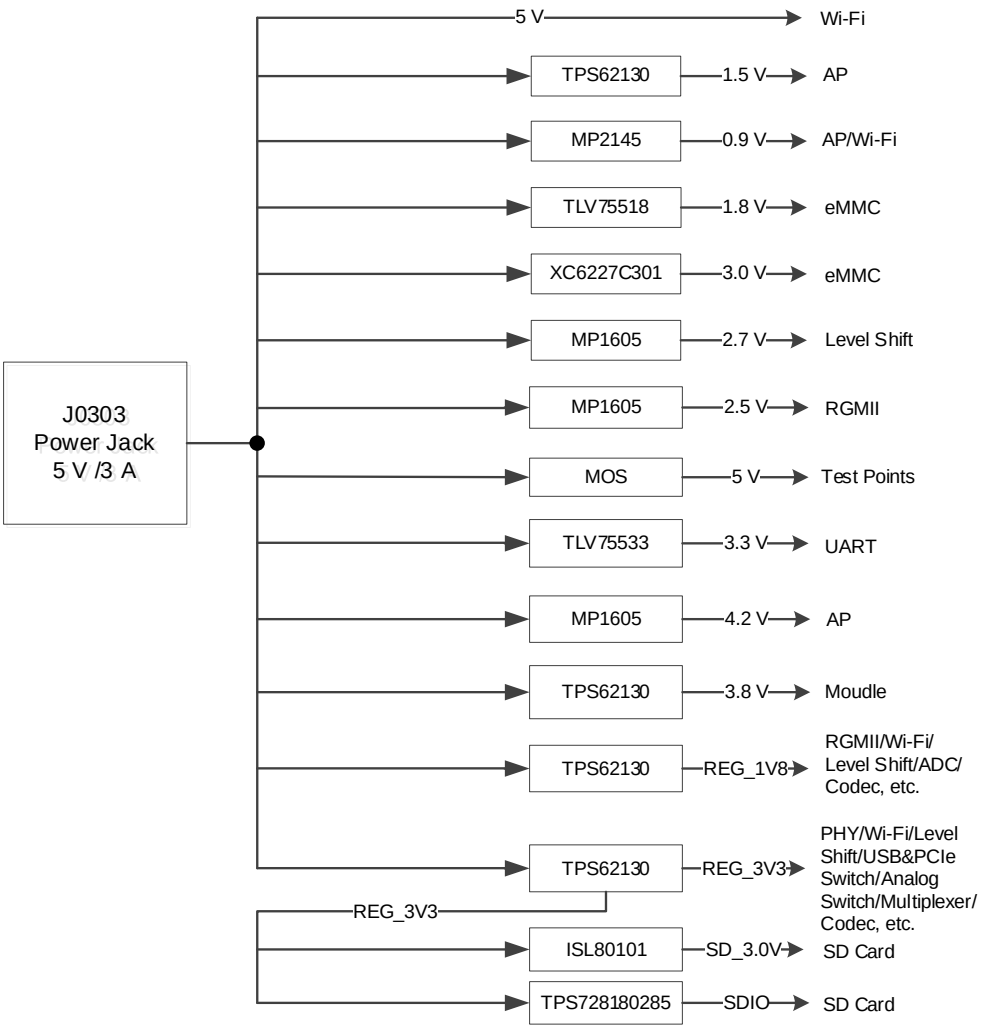


Figure 7: Block Diagram of the EVB Power Supply

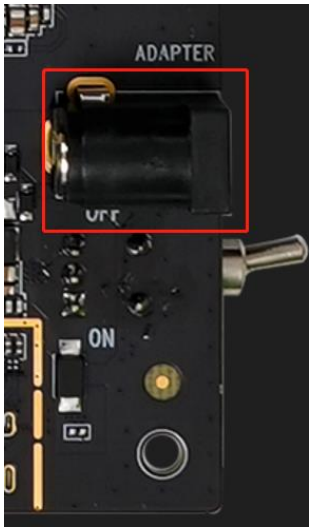


Figure 8: EVB Power Supply Interface

If the power jack is used for power supply, the power plug design of the adapter is shown as below.

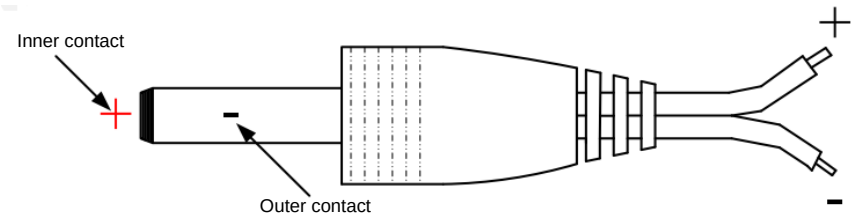


Figure 9: Power Plug Design

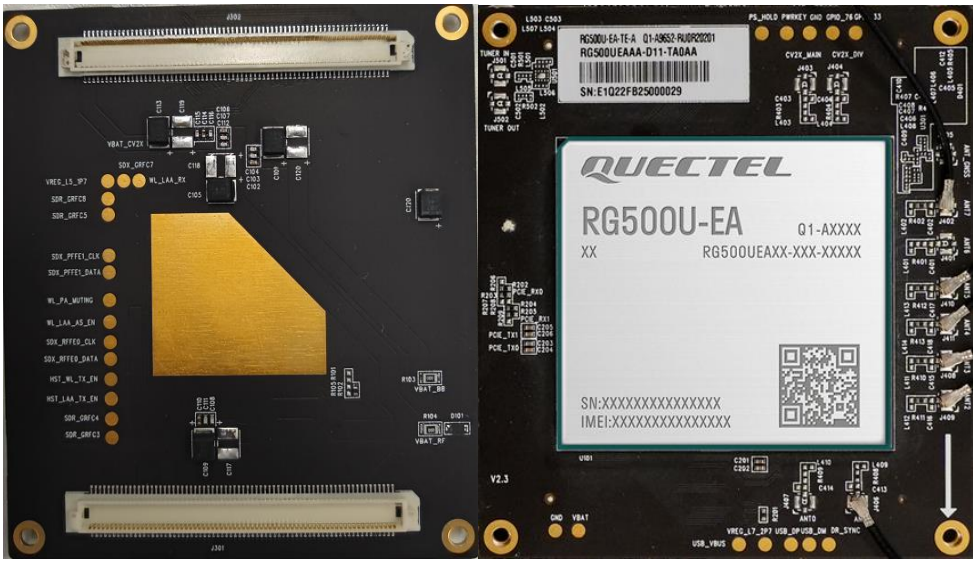
4.2. Module TE-A Interfaces

Module TE-A interfaces are designed to accommodate the TE-A of applicable modules. The TE-A is connected to the EVB via BTB connector. The developer will be able to test the functionalities of the modules easily (insert as indicated by the arrow to prevent reverse insertion).

Table 4: Description of Module TE-A Interfaces

RefDes.	Description
J0101	Connect module TE-A
J0102	

The following figure shows the connection between the module TE-A and the EVB.



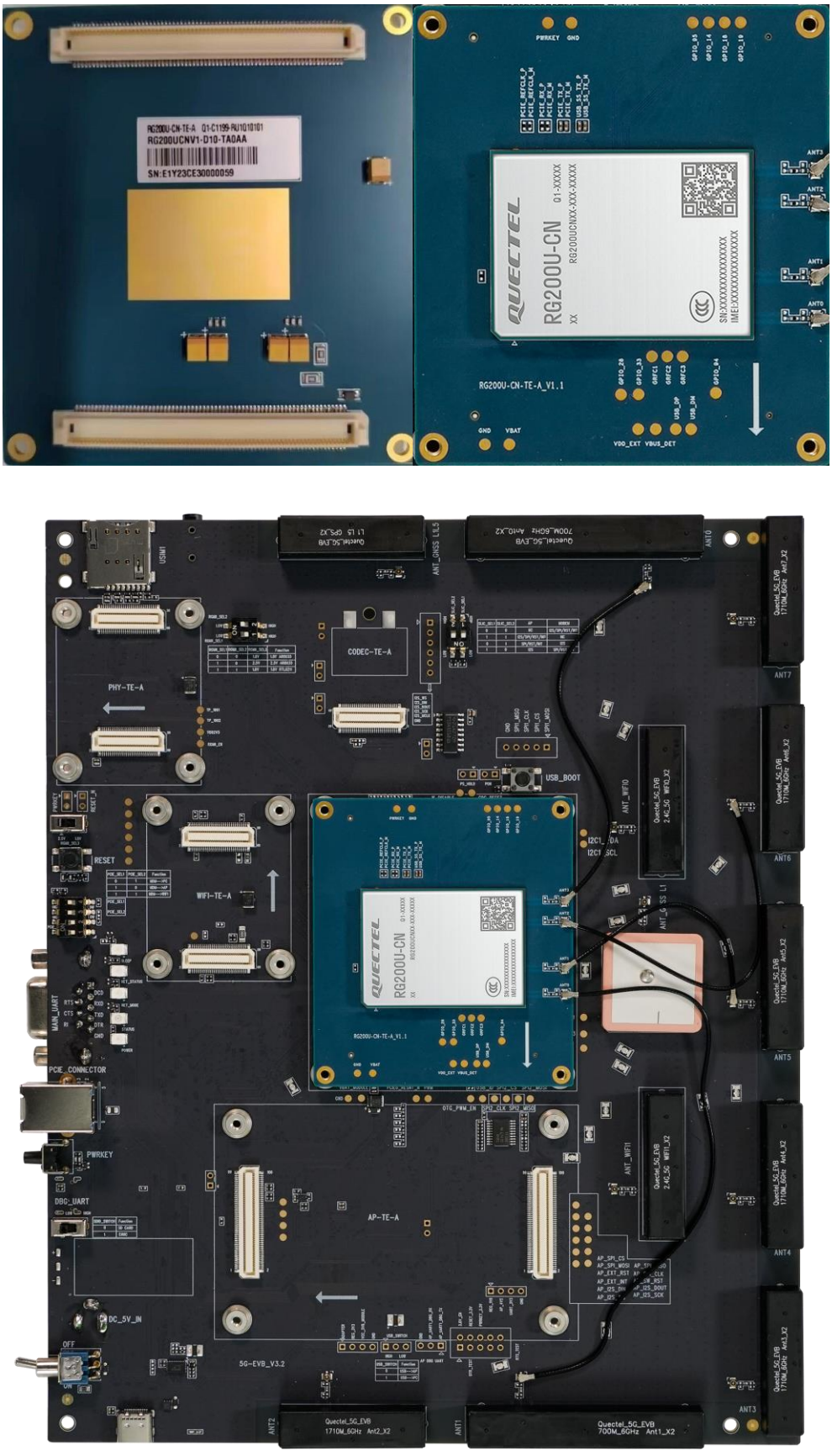


Figure 10: Connection Between the Module TE-A and the EVB

4.3. USB Interface

The EVB provides a USB Type-C interface, which complies with USB 3.0 and USB 2.0 standard. This USB interface is used for AT command communication, data transmission and firmware upgrade.

Table 5: Description of USB Interface

RefDes.	Description
J1101	USB Type-C interface, used for USB 3.0 and USB 2.0 communication

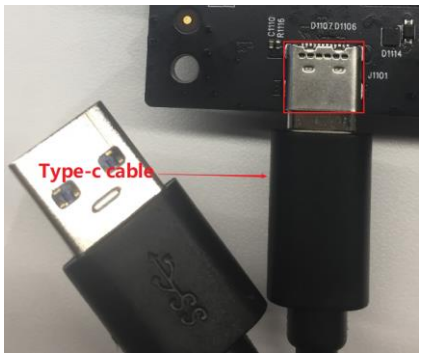


Figure 11: USB Interface Connection

4.4. Audio Interfaces

The EVB provides one digital audio codec board interface (I2S) and two analog audio interfaces.

Table 6: Description of Audio Interfaces

RefDes.	Description
J0802	Codec board TE-A connector
J0801	Test point for loudspeaker
J0901	Audio jack for earphone

4.4.1. Digital Audio Codec Board Interface

The EVB supports two different kinds of external digital audio codec TE-As, i.e. ALC5616 and TLV320AIC3104. The codec circuit is assembled on an independent small board which can be interconnected with the EVB by the BTB connector J0802.

Codecs can be selected according to specific application demands, the following figures show the connection between digital audio codec TE-A and the EVB.

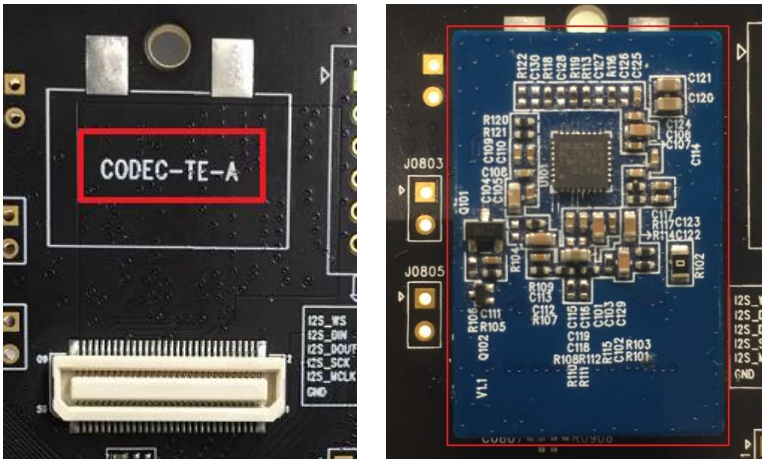


Figure 12: Connection Between Codec TE-A and EVB

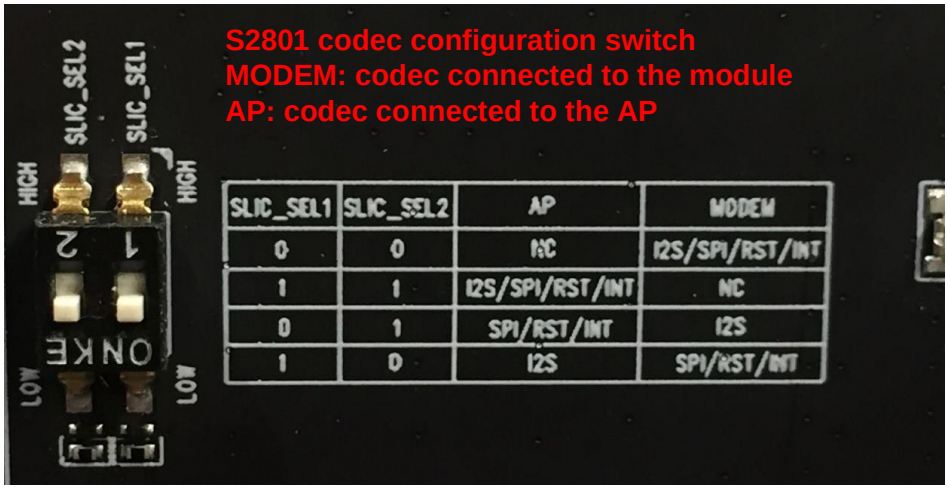


Figure 13: Codec Configuration Switch S2801

Table 7: Codec TE-A Configuration Switch

SLIC_SEL1	SLIC_SEL2	AP	MODEM
Low	Low	NC	I2S/SPI/RST/INT
High	High	I2S/SPI/RST/INT	NC
Low	High	SPI/RST/INT	I2S
High	Low	I2S	SPI/RST/INT

4.4.2. Analog Audio Interfaces

4.4.2.1. Loudspeaker Application

Audio interface J0801 is designed for loudspeaker and the following figure shows a reference design of loudspeaker with an external audio amplifier.

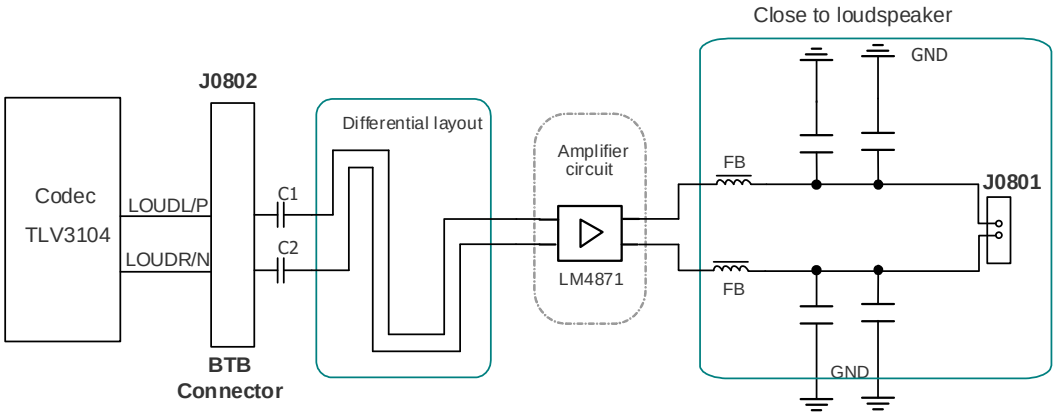


Figure 14: Reference Circuit Design for Loudspeaker Application

4.4.2.2. Earphone Application

Audio interface J0901 is designed for earphone. A reference circuit design is shown by the following figure.

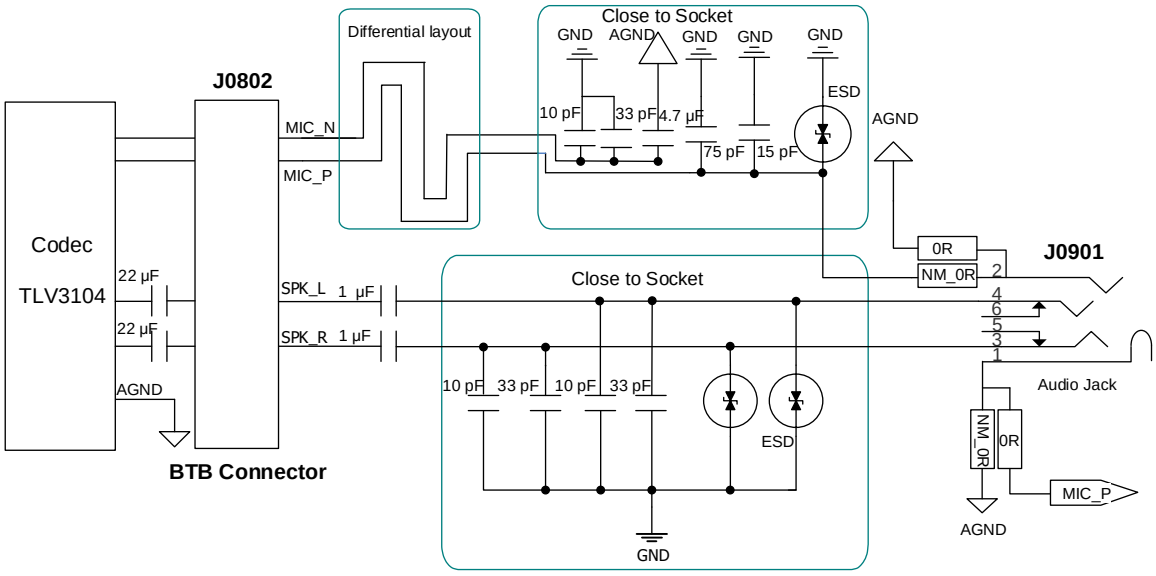


Figure 15: Reference Circuit Design for Earphone Application

The figure and table below illustrate the pin assignment and pin definition of earphone connector.

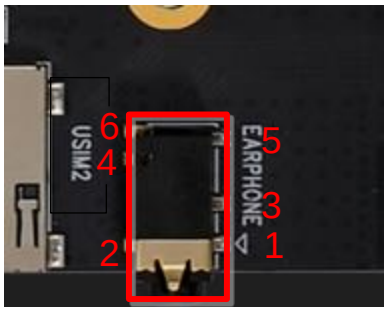


Figure 16: Pin Assignment of J0901

Table 8: Pin Definition of J0901

Pin No.	Pin Name	Description
1	MIC	Microphone input
2	AGND	Dedicated GND for audio
3	SPK_R	Right channel of stereo audio output
4	SPK_L	Left channel of stereo audio output
5, 6	NC	NC

The following figure shows a schematic of audio plug which suits the audio jack on the EVB.

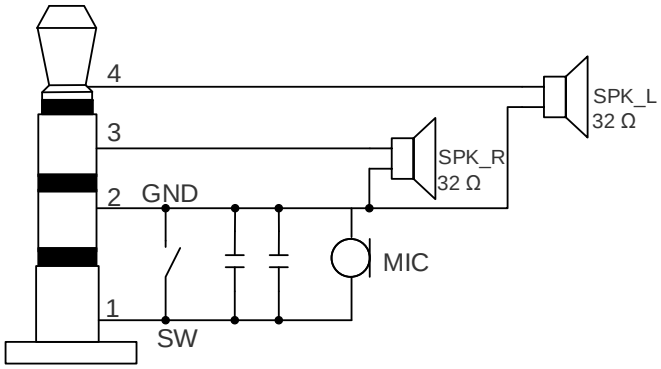


Figure 17: Schematic of Audio Plug

4.5. (U)SIM Card Interfaces

The EVB has two 8-pin push-push type (U)SIM card interfaces which support 1.8/3.0 V (U)SIM card.

Table 9: Description of (U)SIM Card Interfaces

RefDes.	Description
J1401	(U)SIM1 card connector
J1402	(U)SIM2 card connector

The following figure shows a simplified connector schematic for these connectors.

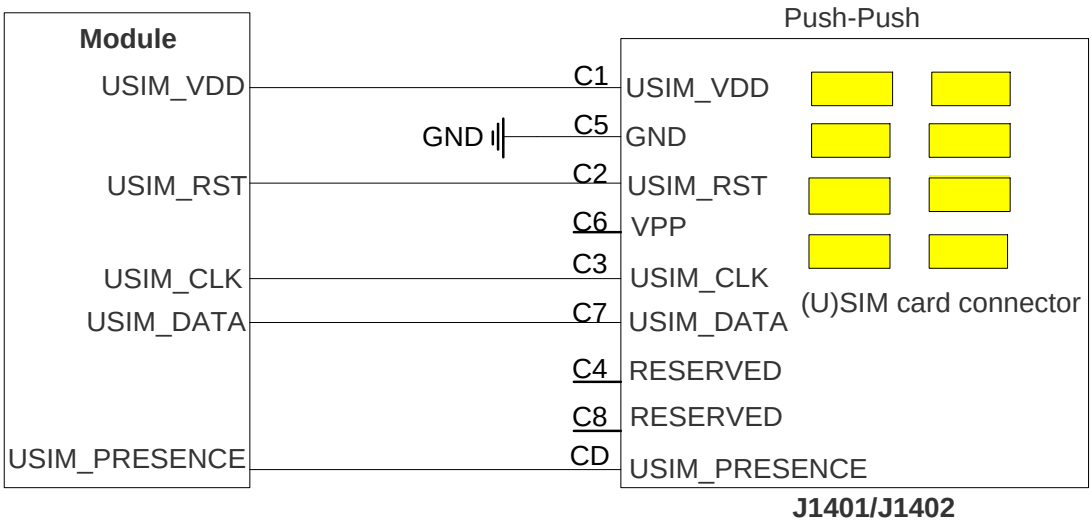


Figure 18: Simplified Connector Schematic for (U)SIM Card Connectors

The figure and table below illustrate the pin assignment and definition of (U)SIM card connector J1401. J1402 is similar to J1401.

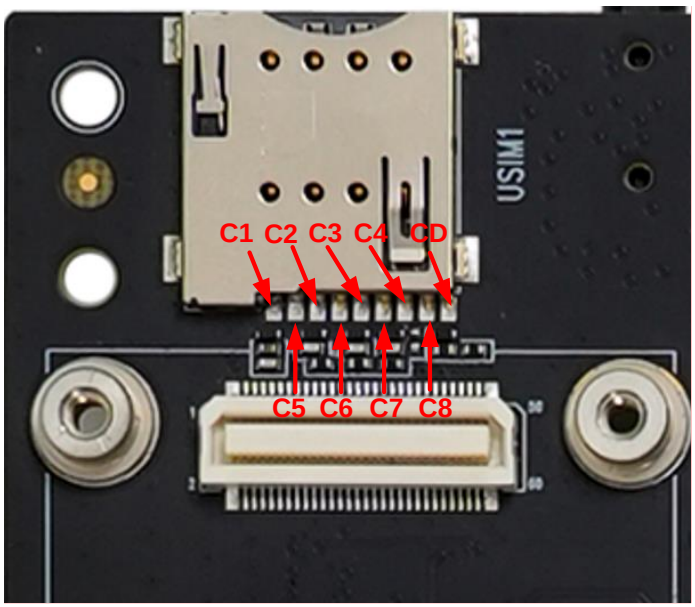


Figure 19: Pin Assignment of (U)SIM Card Connector J1401

Table 10: Pin Definition of J1401

Pin No.	Pin Name	I/O	Function
C1	USIM_VDD	PO	(U)SIM card power supply, provided by module

C2	USIM_RST	DO	(U)SIM card reset
C3	USIM_CLK	DO	(U)SIM card clock
C4	RESERVED	-	NC
C5	GND	-	Ground
C6	VPP	-	NC
C7	USIM_DATA	DIO	(U)SIM card data
C8	RESERVED	-	NC
CD	USIM_PRESENCE	DI	(U)SIM card insertion detection

4.6. SD Card Interface

The EVB provides an SD card interface, which can be used for connecting SD card or eMMC.

Table 11: Description of SD card Interface

RefDes.	Description
J1301	SD card connector

If eMMC function is intended to be used, switch the SDIO Configuration Switch (S2501) to low level as illustrated in the figure below:

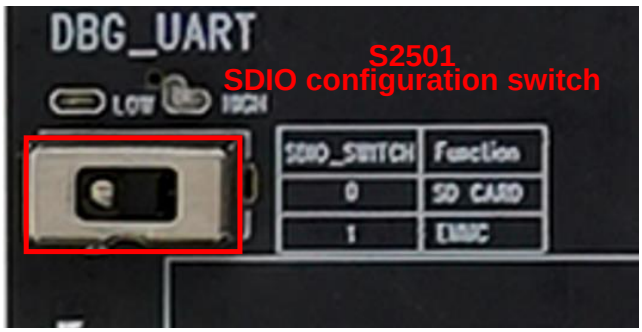


Figure 20: SDIO Configuration Switch S2501

Table 12: SDIO Switch Function

SDIO Switch	Function
Low	Enable SD card function
High	Enable eMMC function

NOTE

SD card function is not supported for the applicable modules.

4.7. UART Interfaces

The EVB supports two UART interfaces: main UART and debug UART, supporting baud rate of 115200 bps by default. The main UART interface is used for communication between the module and the host application. The debug UART interface is used for Linux console and log output.

Table 13: Description of UART Interfaces

RefDes.	Description
J2002	MAIN_UART for data communication
J2003	DBG_UART for debugging

The following figure shows a block diagram of UART interfaces of the EVB.

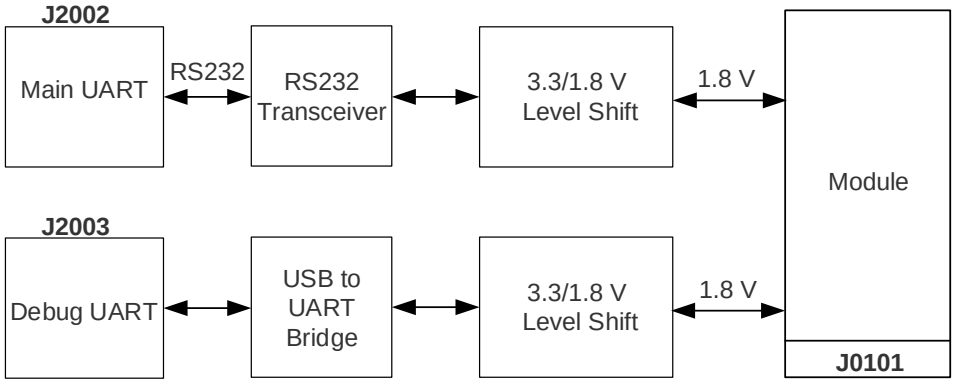


Figure 21: UART Block Diagram

4.8. PCIe-to-USB Interface

The EVB reserves a PCIe 2.0 signal over USB interface for developers' testing, and this function is not enabled by default.

Table 14: Description of PCIe-to-USB Interface

RefDes.	Description
J1601	PCIe-to-USB interface, not supported by default

Please refer to the following block diagram:

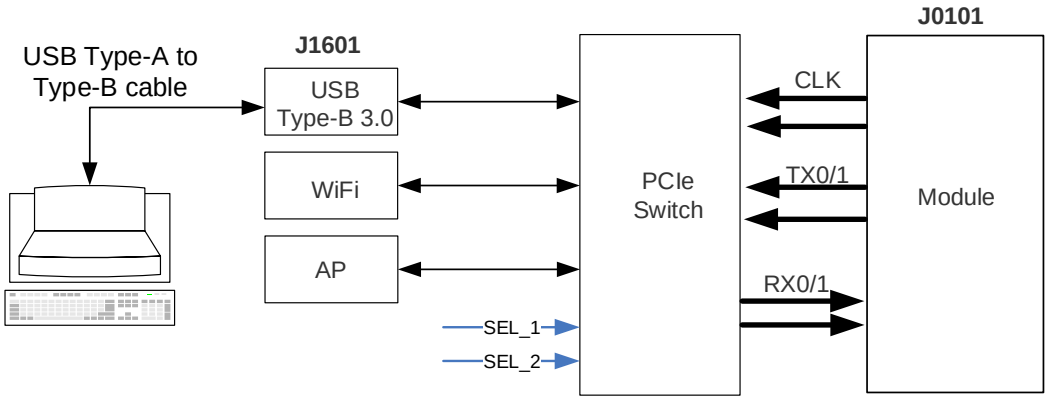


Figure 22: PCIe Block Diagram

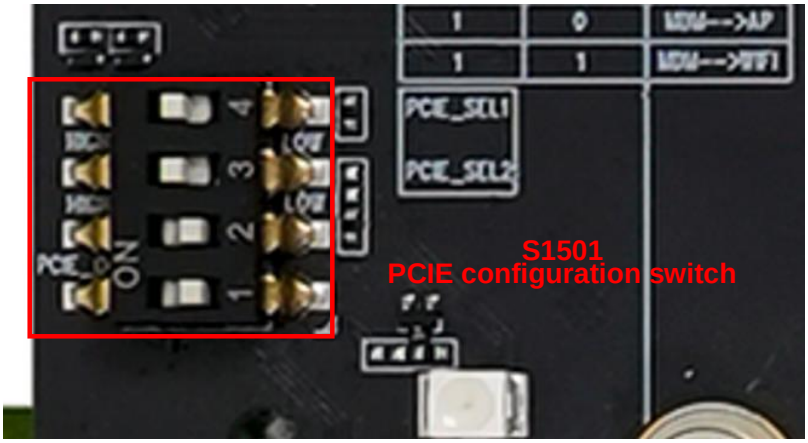


Figure 23: PCIe Configuration Switch S1501

Table 15: PCIe Connection Truth Table

PCIE_SEL1	PCIE_SEL2	Function
0	1	Module → PC
1	0	Module → AP
1	1	Module → Wi-Fi

4.9. Status Indicators

There are five status indication LEDs on the EVB.

Table 16: Description of Status Indication LEDs

RefDes.	Description
D0201	Indicates whether the power supply for module is ready ● ON: VBAT ON ● OFF: VBAT OFF
D0202	Indicates the operation status of the module ● ON: the module is turned ON ● OFF: the module is turned OFF
D0203	Indicates NET_MODE status of the module
D0204	Indicates NET_STATUS status of the module
D0205	Indicates the module's SLEEP status

The following figure manifests the positions of these LED indicators:

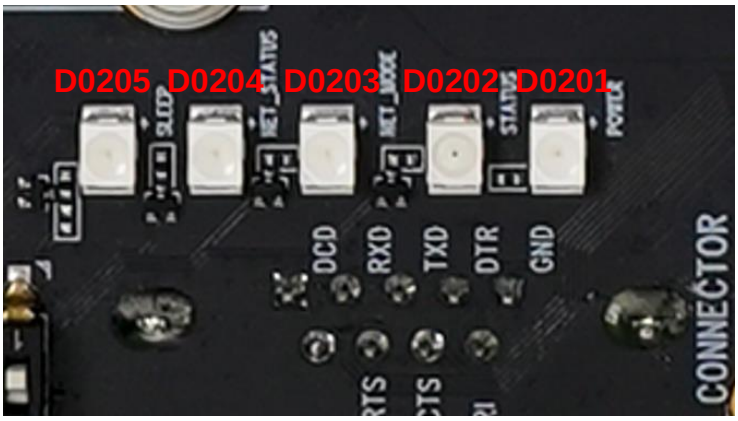


Figure 24: Status Indicators

4.10. Wi-Fi TE-A Interfaces

The Wi-Fi TE-A interface is designed to accommodate the FG50V/FC64E/FC06E TE-A and Ethernet TE-A (RTL8111H/RTL8125B). The TE-A is connected to the EVB via BTB connector. The interfaces allow developers to test the Wi-Fi function or the Ethernet function of the module.

Table 17: Description of Wi-Fi TE-A Interfaces

RefDes.	Description
J0701	Connect Wi-Fi TE-A
J0702	

The following two figures show the connection between TE-A (take RTL8111H TE-A and FC06E TE-A as examples) and EVB.

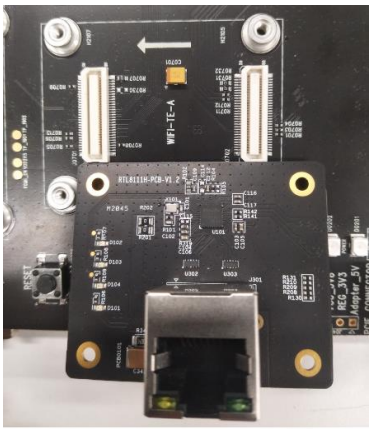


Figure 25: Connection Between RTL8111H TE-A and EVB

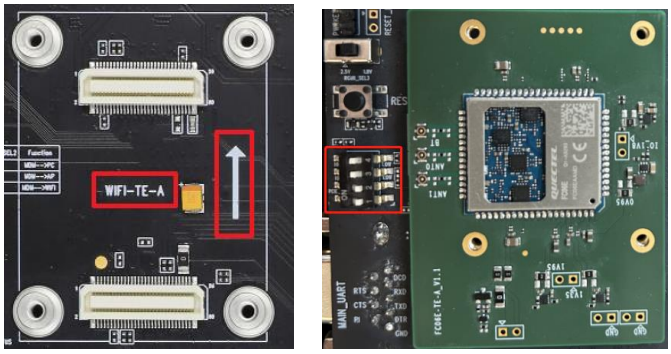


Figure 26: Connection Between FC06E TE-A and EVB

4.11. Antenna Interfaces

The EVB includes twelve antenna interfaces.

Table 18: Description of Antenna Interfaces

RefDes.	Description
J2303, J2304, J2307, J2308, J2311, J2312, J2315, J2317, J2318, J2346, J2347, J2348	Antenna connectors

The following figure shows the assembly of these antenna interfaces:

Figure 27: RG500U-EA Antenna Interfaces

Table 19: RG500U-EA Antenna Interfaces description

Module Pin No.	TE-A	EVB	Band
130	Ant1	Ant1	• WCDMA: LMB TRX • LTE: LMB & B40 TRX • 5G NR: n1/n3 PRX1 & n8/n20/n28 TRX & n40 TRX1
139	Ant2	Ant4	• LTE: B7/B38/B41 TRX • 5G NR: n7/n77/n78/n79 PRX1 &

			n38/n41 TRX1
148	Ant3	Ant0	• WCDMA: LMB DRX • LTE: LMB & B40 DRX • 5G NR: n1/n3/n40 DRX1 & n8/n20/n28 DRX
157	Ant4	Ant5	• LTE: B7/B38/B41 DRX • 5G NR: n7/n38/n41 DRX1 & n77/n78/n79 TX1 & DRX0
166	Ant5	Ant6	5G NR: LMHB DRX0 & n77/n78/n79 DRX1
184	Ant7	Ant7	5G NR: LMHB & n77/n78/n79 TRX0

Figure 28: RG500U-CN Antenna Interfaces

Table 20: RG500U-CN Antenna Interfaces description

Module Pin No.	TE-A	EVB	Band
130	Ant1	Ant1	● WCDMA: LMB TRX ● LTE: LMHB TRX ● 5G NR: n1/n28 TRX & n41 TRX1 & n77/n78/n79 DRX1
157	Ant4	Ant0	● WCDMA: LMB DRX ● LTE: LMHB DRX ● 5G NR: n1 DRX0 & n28 DRX & n77/n78/n79 TRX1 & n41 DRX1
166	Ant5	Ant5	5G NR: n41/n77/n78/n79 DRX0 & n1 DRX1
184	Ant7	Ant6	5G NR: n41/n77/n78/n79 TRX0 & n1 PRX1

Figure 29: RG200U-CN Antenna Interfaces

Table 21: RG200U-CN Antenna Interfaces description

Module Pin No.	TE-A	EVB	Band
54	Ant0	Ant1	• WCDMA: B1/B5/B8 TRX • LTE: LMHB TRX • 5G NR: n1/n3/n5/n8/n28/n41 TRX & n77/n78/n79 TRX1

64	Ant1	Ant5	5G NR: n77/n78/n79 DRX1 & n1/n41 DRX MIMO
82	Ant2	Ant6	5G NR: n77/n78/n79 TRX0 & n1/n41 PRX MIMO
90	Ant3	Ant0	● WCDMA: B1/B5/B8 DRX ● LTE: LMHB DRX ● 5G NR: n1/n3/n5/n8/n28/n41 DRX & n77/n78/n79 DRX0

4.12. Switches and Buttons

The EVB includes four switches and three buttons, as shown in the following table and figures:

Table 22: Description of Switches and Buttons

RefDes.	Description
S0301	VBAT ON/OFF control
S0202	● Power key (push button) ● Used to turn ON/OFF the module
S0201	● Reset button (push button) ● Used to reset the module
S0203	Emergency download
S1501	Used to configure the module communication with different devices via PCIe signals
S2501	Used to switch between SD card and eMMC
S2801	Used for codec configuration

Figure 30: Switches S0301 and S2501

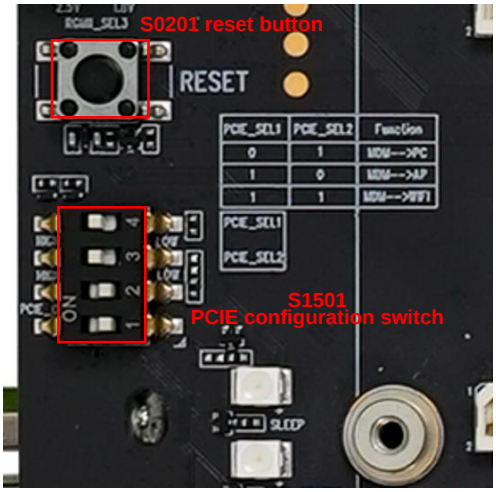


Figure 31: Switch S1501 and Button S0201

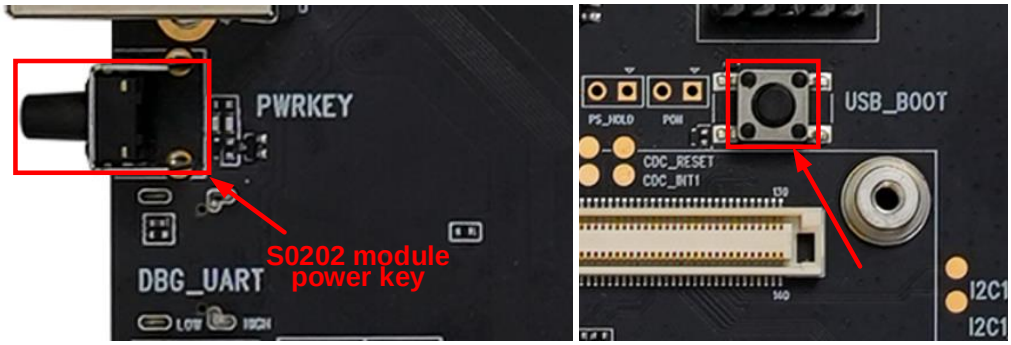


Figure 32: Buttons S0202 and S0203

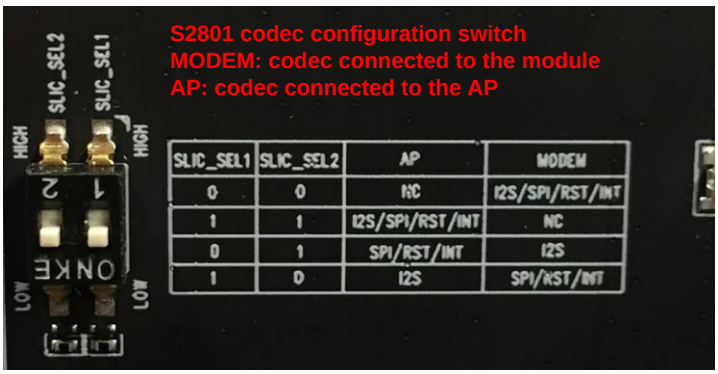


Figure 33: Switch S2801

4.13. Test points

The EVB provides test points which help you obtain the corresponding waveforms of some signals. The following figures show the details of all test points.

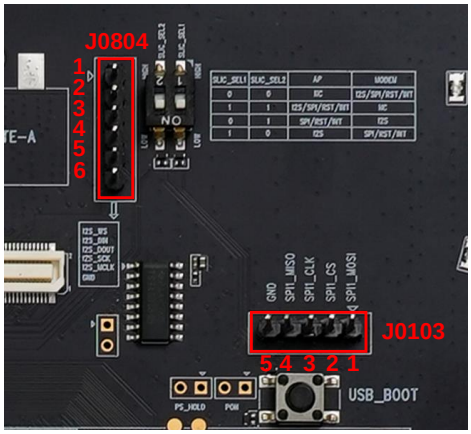


Figure 34: Test Points of J0103 and J0804

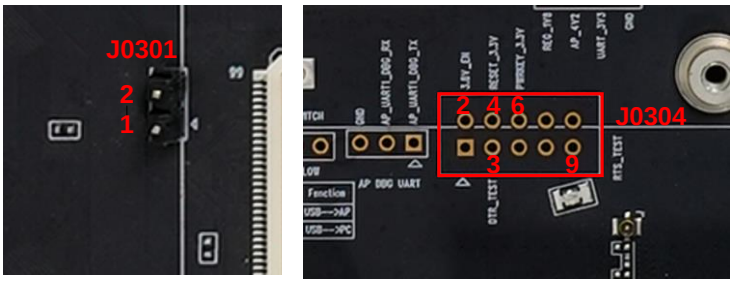


Figure 35: Test Points of J0301 and J0304

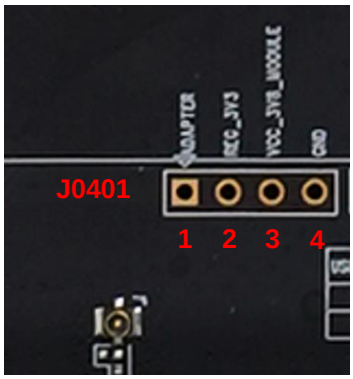


Figure 36: Test Points of J0401

Table 23: Pin Definition of Test Points

J0804			
Pin No.	**Pin Name**	**Module Pin No.**	**Description**
1	I2S_WS	RG200U-CN: 20 RG500U series: 259	I2S word select
2	I2S_DIN	RG200U-CN: 18 RG500U series: 257	I2S data in
3	I2S_DOUT	RG200U-CN: 17 RG500U series: 255	I2S data out
4	I2S_SCK	RG200U-CN: 19 RG500U series: 256	I2S clock
5	I2S_MCLK	-	I2S main clock
6	GND	-	Ground
J0103			
Pin No.	**Pin Name**	**Module Pin No.**	**Description**
1	SPI1_MOSI	RG200U-CN: 171 RG500U series: 204	SPI master-out slave-in
2	SPI1_CS	RG200U-CN: 170 RG500U series: 207	SPI chip select
3	SPI1_CLK	RG200U-CN: 169 RG500U series: 210	SPI clock
4	SPI1_MISO	RG200U-CN: 172 RG500U series: 213	SPI master-in slave-out
5	GND	-	Ground

J0301			
Pin No.	**Pin Name**	**Module Pin No.**	**Description**
1	VCC_3V8_ MODULE	-	3.8 V module power supply test pin
2	VBAT_MODULE	RG200U-CN: 6, 7, 8, 9, 23, 24, 25, 26 RG500U series: 107, 109, 110, 112, 229, 230, 232, 233, 235, 236, 238	Module power supply test pin
J0304			
Pin No.	**Pin Name**	**Module Pin No.**	**Description**
2	3.8V_EN	-	3.8 V enable test pin
3	DTR_TEST	-	DTR test pin
4	RESET_3.3V	-	3.3 V RESET test pin
6	PWRKEY_3.3V	-	3.3 V PWRKEY test pin
9	RTS_TEST	-	RTS test pin
J0401			
Pin No.	**Pin Name**	**Module Pin No.**	**Description**
1	ADAPTER	-	Adapter test pin
2	REG_3V3	-	3.3 V power supply test pin
3	VCC_3V8_ MODULE	-	3.8 V module power supply test pin
4	GND	-	Ground

5 Operation Procedures

This chapter introduces how to use the RG200U & RG500U Series 5G EVB for testing and evaluating applicable modules. Before starting the procedures below, please ensure modules and the EVB are correctly assembled.

5.1. Turn on the Module

1. Connect the module TE-A to the EVB via connectors J0101 and J0102.
2. Insert a (U)SIM card into the USIM1 card connector J1401 on EVB.
3. Use RF cables to connect the module TE-A to the EVB, and connect antennas to the EVB.
4. Connect the EVB to a 5 V/ 3 A power, then switch S0301 to the "**ON**" side. Then D0201 (power supply ON/OFF indicator) will light up, which indicates that the power supply for the whole EVB is ready.
5. Press the PWRKEY S0202 for at least 1200 ms, then the module will be turned on and D0202 (module operation status indicator) will light up.

NOTE

Turning on the module should be performed only after the EVB assembling is completed to avoid any possible damage.

5.2. Turn off the Module

There are two methods to turn off the module.

- Turn off the module with AT command **AT+QPOWD=1**. This is a safer method. The module will log off from the network and save data before shutdown.
- Turn off the module with PWRKEY button (S0202). Long press PWRKEY for at least 800 ms and then release, the module will be turned off.

5.3. Communication via USB

1. Turn on the module according to the procedure in ***Chapter 5.1***.
2. Connect the EVB and a PC with USB cable through USB Type-C interface, and then run the driver disk on the PC to install the USB driver. For details about USB driver installation, please refer to ***document [2]***. The USB port numbers can be viewed in Device Manager of the PC when the USB driver is installed, as shown below.

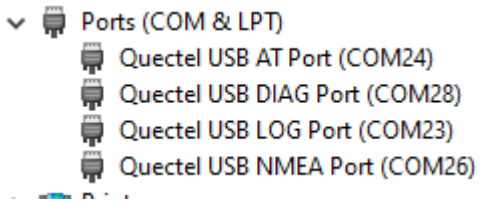


Figure 37: USB Ports

3. Install and then use QCOM provided by Quectel to realize the communication between the module and the PC.

The following figure shows the COM Port Setting of QCOM: select the correct "**COM Port**" (USB AT Port, which is shown in figure above) and set correct "**Baudrate**" (e.g. 115200 bps). For more details about QCOM usage and configuration, please refer to ***document [3]***.

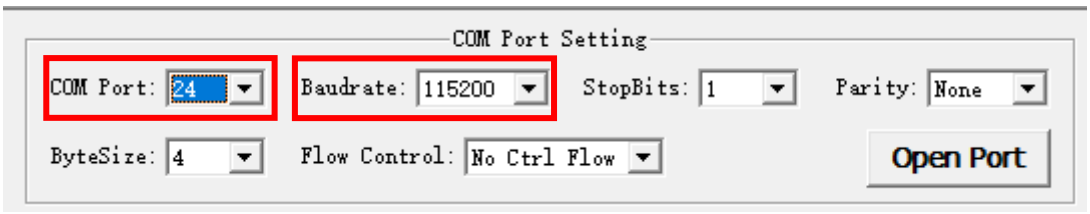


Figure 38: COM Port Setting Field on QCOM (USB AT Port Connection)

5.4. Firmware Upgrade

Firmware of the module is upgraded via USB port by default, and there are two methods for the upgrade: emergency download and normal download. Please refer to the following procedures to upgrade firmware through the EVB.

5.4.1. Emergency Download

1. Install the firmware upgrade tool QFlash on PC.
2. Connect the EVB and the PC through USB Type-C cable.
3. Press the USB_BOOT button (S0203).
4. Insert the DC power adapter and turn on the module.
5. Upgrade the firmware with QFlash. Please refer to ***document [4]*** for details about the use of QFlash.

5.4.2. Normal Download

1. Turn on the module according to the procedure in ***Chapter 5.1***.
2. Wait for the USB port to be found in Device Manage of the PC.
3. Send **AT+QDOWNLOAD=1** through the AT port. Then, the SPRD U2S Diag port will come out as below.

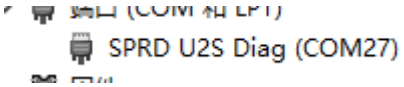


Figure 39: SPRD U2S Diag Port

4. Open QFlash and upgrade the firmware. Please refer to ***document [4]*** for the detailed procedures.

5.5. Reset the Module

Reset is only used in case of emergency or abnormality. For example, the software fails to respond for more than 5 seconds due to some serious problems.

Long pressing the RESET button S0201 for more than 8 seconds, and then releasing it will reset the module. Note that this operation may cause loss of information in the memory as the module will be initialized after the resetting.

6 Appendix References

Table 24: Related Documents

Document Name
[1] Quectel_List_of_EVB_Applicable_Modules
[2] Quectel_LTE&5G_Windows_USB_Driver_Installation_Guide
[3] Quectel_QCOM_User_Guide
[4] Quectel_QFlash_User_Guide

Table 25: Terms and Abbreviations

Abbreviation	Description
AGND	Analog Ground
AP	Application Processor
BTB	Board to Board
COM	Cluster Communication Port
DC	Direct Current
DI	Digital Input
DO	Digital Output
DRX	Discontinuous Reception
DTX	Discontinuous Transmission
eMMC	embedded Multi-Media Card
EVB	Evaluation Board

GND	Ground
GNSS	Global Navigation Satellite System
I2S	Inter-IC Sound
I/O	Input/Output
LED	Light Emitting Diode
MIC	Microphone
NC	Not Connected
PC	Private Computer
PCB	Printed Circuit Board
PCIe	Peripheral Component Interconnect Express
PCM	Pulse Code Modulation
PHY	Physical Layer
PO	Power Output
PRX	Primary Receive
RF	Radio Frequency
RTS	Request to Send
SD	Secure Digital
SIM	Subscriber Identity Module
SPI	Serial Peripheral Interface
UART	Universal Asynchronous Receiver & Transmitter
USB	Universal Serial Bus
(U)SIM	(Universal) Subscriber Identity Module