

SA800U-WF EVB

User Guide

Smart Module Series

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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 shall 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 given 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 shall 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

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-	2022-05-16	Mary SHEN	Creation of the document
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1 Introduction

This user guide describes the application details of the SA800U-WF EVB (evaluation board), which is an assistant tool for developers to develop applications and test basic functionalities of applicable modules as follows:

- SA800U-WF
- SG865W-WF

1.1. Special Mark

Table 1: Special Mark

Mark	Definition
*	Unless otherwise specified, when an asterisk (*) is used after a function, feature, interface, pin name, AT command, or argument, it indicates that the function, feature, interface, pin, AT command, or argument is under development and currently not supported; and the asterisk (*) after a model indicates that the sample of the model is currently unavailable.

2 Product Overview

Quectel provides designers with SA800U-WF EVB with a size of 288 mm × 170 mm for developing applications based on applicable modules and basic functions of test modules.

2.1. Top and Bottom Views

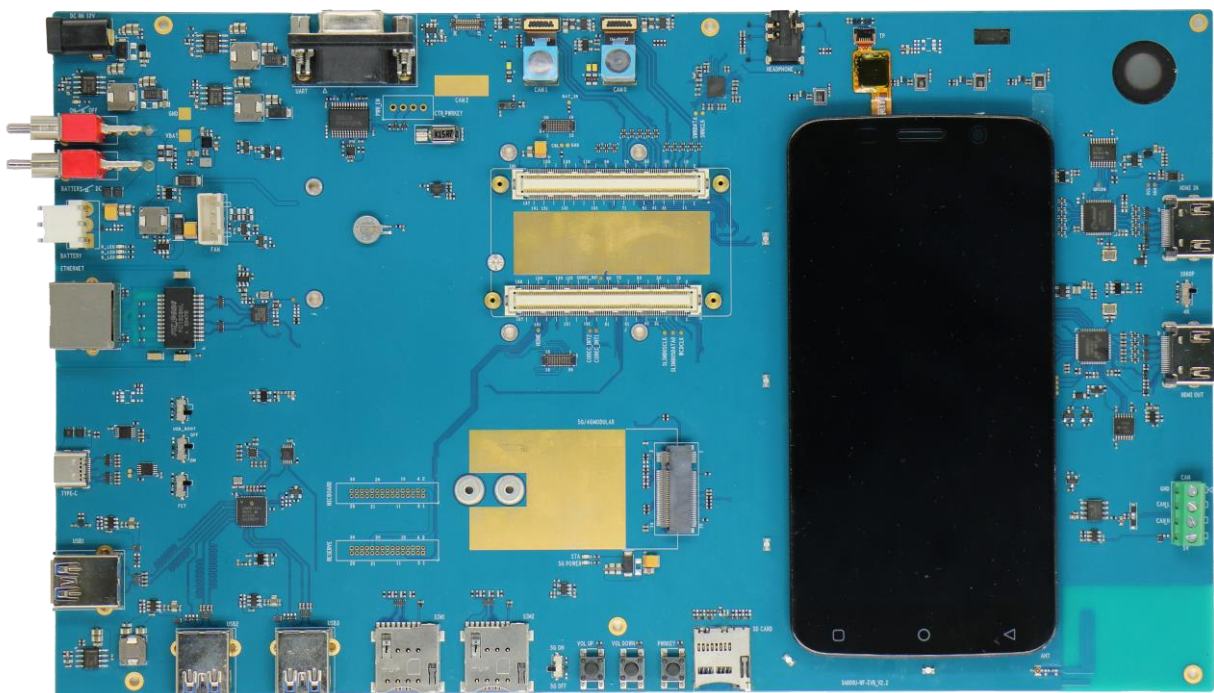


Figure 1: Top View



Figure 2: Bottom View

2.2. Component Placement

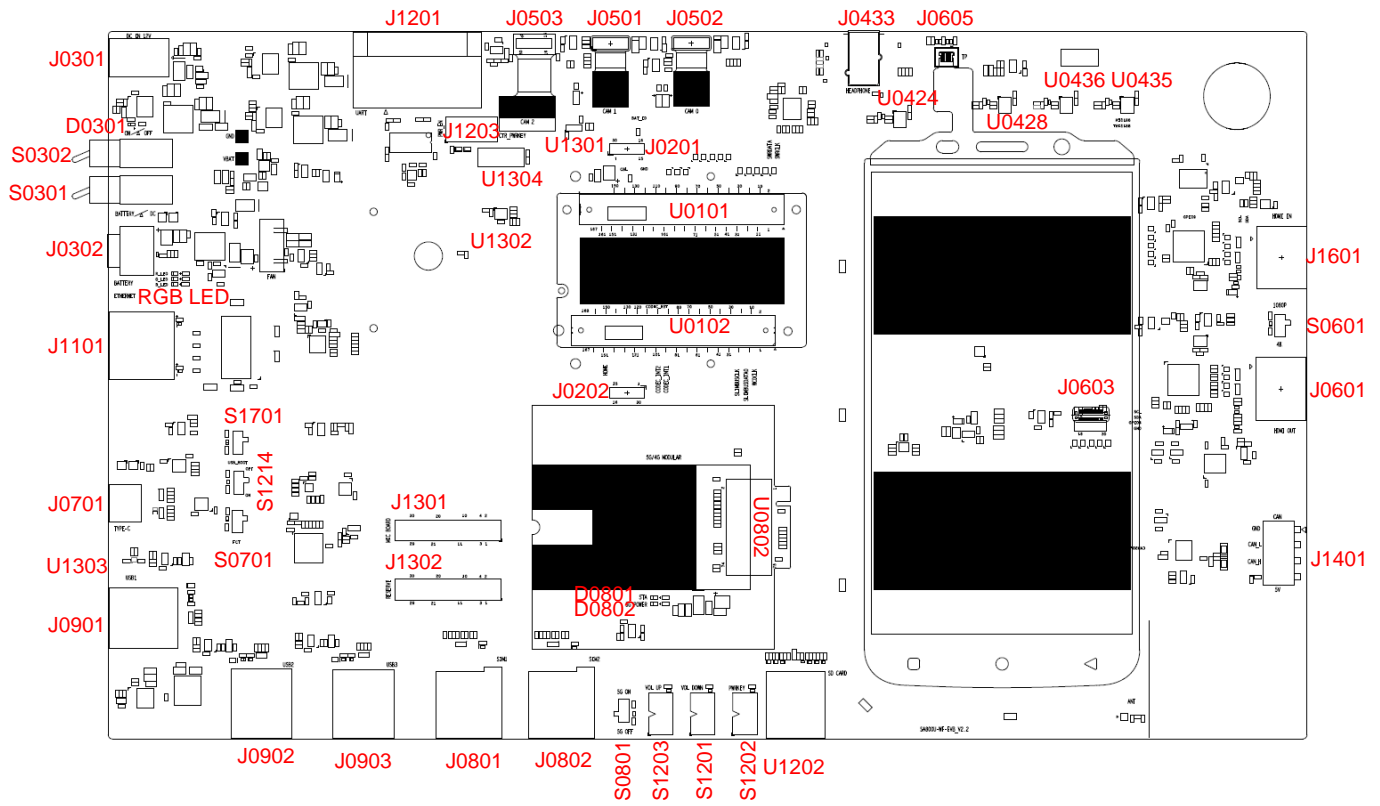


Figure 3: Top View for Component Placement

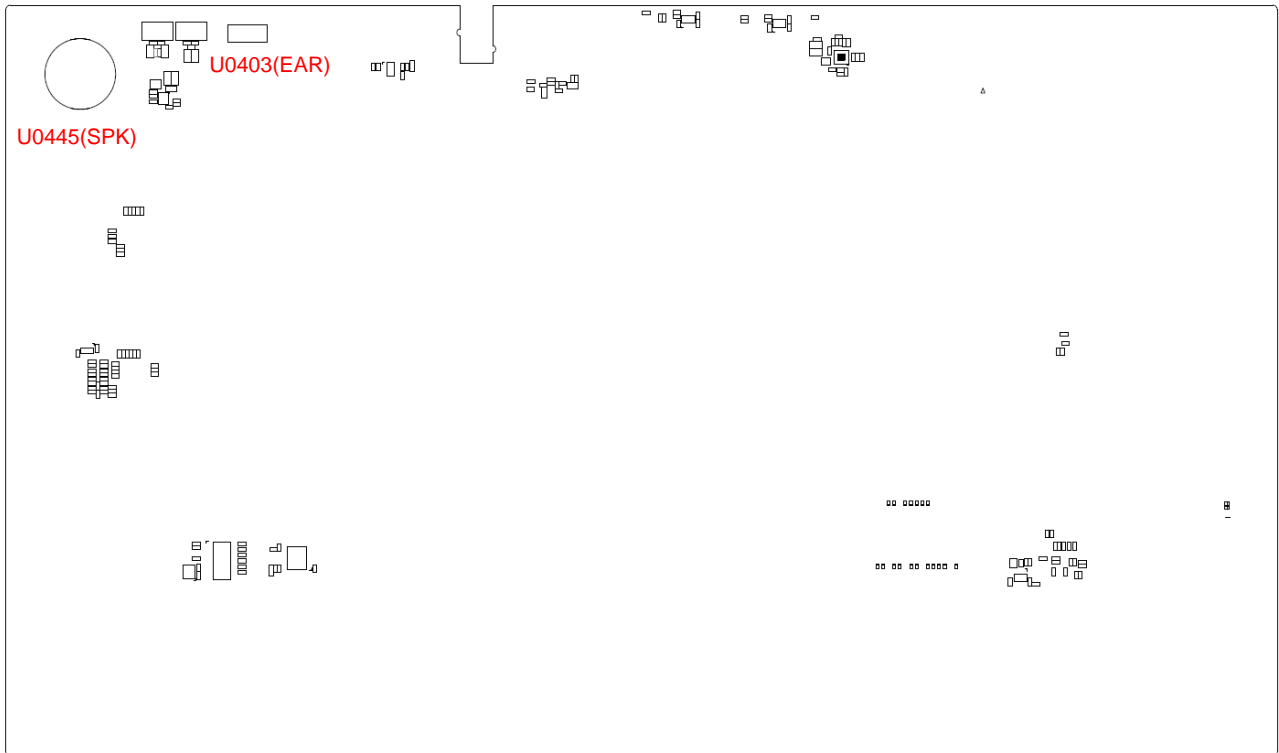


Figure 4: Bottom View for Component Placement

Table 2: Components & Functions

Components	RefDes.	Description	Implementation
Power Supply	J0301	Power jack on the EVB	<ul style="list-style-type: none"> DC power supply: 4.5–18 V Typical supply voltage: 12 V/5 A
	J0302	Li-polymer battery connector	Typical supply voltage: 3.8 V
Power Switch	S0301	Select DC power supply or battery power supply	Switch
	S0302	VBAT ON/OFF control	Switch
	S0801	Turn ON/OFF 5G communication module	Switch
PWRKEY	S1202	Power key (push button) Turn ON/OFF the module	Button
VOL_UP	S1203	Turn up the volume	Button
VOL_DOWN	S1201	Turn down the volume	Button
M.2 Interface	U0802	M.2 connector for RM500Q-AE	Standard PCI Express M.2 interface for SA800U-WF

USB Interface	J0701	USB Type-C connector	<ul style="list-style-type: none"> ● Support USB type-C mode, DisplayPort mode and USB OTG ● Used for at command transmission, data transmission, software debugging and firmware upgrade
	J0901		
	J0902	USB Type-A connectors	3 type-A interfaces, only support host mode
	J0903		
USB_BOOT	S1214	Emergency download	Switch
5G/HUB Switch	S1701	5G or HUB switch	Switch
FCT	S0701	Factory test ON/OFF control	Switch
Audio Interfaces	U0445	Loudspeaker	<ul style="list-style-type: none"> ● Rated resistance: 8 Ω ● Rated power: 1.5 W
	U0403	Earphone	<ul style="list-style-type: none"> ● Rated resistance: 32 Ω ● Rated power: 30 mW
	J0433	Audio jack for headset	
	U0424		
	U0428	MEMS-type microphones	
	U0435		
	U0436		
(U)SIM Card Interfaces	J0801	(U)SIM1 card connector	<ul style="list-style-type: none"> ● Support (U)SIM card insertion detection.
	J0802	(U)SIM2 card connector	<ul style="list-style-type: none"> ● Dual (U)SIM card supported: 1.8 V and 2.95 V
SD Card Interface	U1202	SD card connector	
CAN Interface	J1401	Support CAN bus	
Debug UART	J1201	DBG_UART for debugging	<ul style="list-style-type: none"> ● For debugging ● Default baud rate: 115200 bps
Ethernet Interface	J1101	RJ45 connector	
Status Indicators	D0301	Power supply of the modules ON/OFF indicator	9 LEDs available for signal indication

	D0801	RM500Q-AE operation status indicator	
	D0802	Power supply of RM500Q-AE ON/OFF indicator	
	D1201	Red LED	
	D1202	Green LED	
	D1203	Blue LED	
	D1301		
	D1302	Flashlights	
	D1303		
Module TE-A	U0101, U0102	Connect to modules TE-A	B2B
	J0201, J0202		FPC
HDMI	J0601	HDMI OUT connector	
	J1601	HDMI IN connector	
Resolution Switch	S0601	Select 1080P or 4K	Switch
Cameras	J0501	Camera connectors	
	J0502		
	J0503	TOF camera connector	
LCM	J0603	LCD connector	
TP	J0605	Touch panel connector	
Sensors	U1301	Ambient light sensor and proximity sensor	
	U1302	Accelerometer and gyroscope sensor	
	U1303	Geomagnetic sensor	
Vibrator	U1304	ERM-type vibrator	
Fan	J1202*	Fan connector	
Coin Cell	U0311	Coin cell battery for RTC power supply	

	J1301	MIC Board connector	
Reserved pin	J1302	PWM/ADC/SPI interfaces	
	J1203	Reserve for testing control interfaces	
Test Points	TP0103、TP0104、TP0105、TP0201、TP0402、TP0404、TP0405、TP0412、TP0413、TP0415、TP0422、TP0423、TP0425、TP0426、TP0601、TP0602、TP0603、TP0604、TP0701、TP0702、TP0803、TP0805、TP0806、TP1101、TP1402、TP1403、TP1606、TP1607、TP1608		29 test points

3 Kit Accessories

3.1. Accessories Assembly

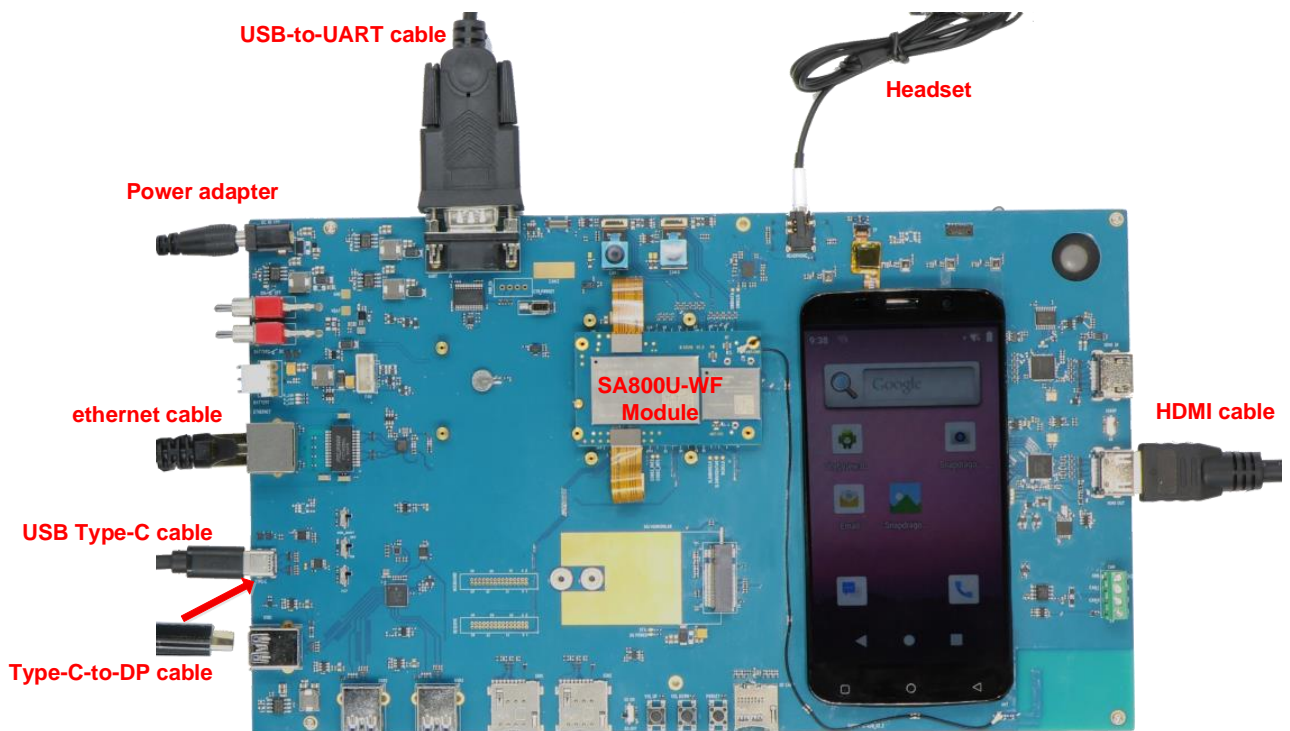


Figure 5: SA800U-WF EVB and Accessories Equipment

3.2. Accessories List

All accessories of the SA800U-WF EVB kit are listed as below. Please contact the supplier if there is something missing.



Figure 6: SA800U-WF EVB Kit Accessories

Table 3: Accessories List

Items	Description	Quantity (pcs)
Power Adapter	12 V/ 5 A power adapter	1
Cables	1 Gb Ethernet cable	1

	USB-to-UART cable	1
	USB Type-C cable	1
	HDMI cable	1
	Type-C-to-DP cable	1
	RF cables	2
Antennas	Wi-Fi/Bluetooth antennas	2
Audio	Headset	1
Driver Disc	<ul style="list-style-type: none">● USB-to-RS232 driver● USB driver● Related tools for modules	1
FPC	Used for FPC connector	2
Bolts and Nuts	Bolts and nuts for assembling the EVB	12

4 Application Interfaces

This chapter describes the hardware interfaces of SA800U-WF EVB, shown as follows:

- Power supply interfaces
- B2B and FPC connectors
- LCM interface
- Touch panel interface
- Camera interfaces
- HDMI interfaces
- USB interfaces
- Audio interfaces
- (U)SIM interfaces
- UART interface
- CAN interface
- Ethernet interface
- M.2 interface
- SD card interface
- Emergency download interface

It also provides information about flashlights, sensors, vibrator, buttons and switches, status indicators and test points to help users use the SA800U-WF EVB.

4.1. Power Supply

The SA800U-WF EVB can be powered by an external 12 V DC power adapter. Connect the DC power adapter to the power jack and then the step-down converter (DC-DC converter), which is used to regulate the 12 V DC power supply voltage to 4.2 V for powering up the module. SA800U-WF EVB can also be powered by a Li-polymer battery through the battery connector (J0302) on the board.

Table 4: Description of Power Supply

RefDes.	Description
J0301	Power jack on the EVB
J0302	Li-polymer battery connector
S0301	Select DC power supply or battery power supply
S0302	VBAT ON/OFF control

The following figure shows the simplified power supply block diagram of SA800U-WF EVB.

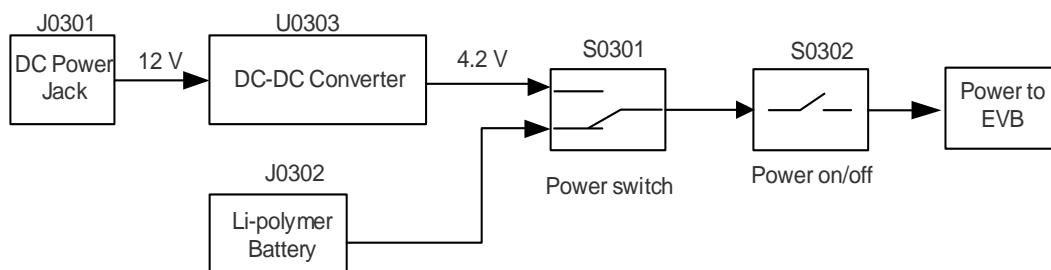


Figure 7: Simplified Power Supply Block Diagram of SA800U-WF EVB

4.1.1. Adapter Interface

The following figure shows the DC power jack of the SA800U-WF EVB.

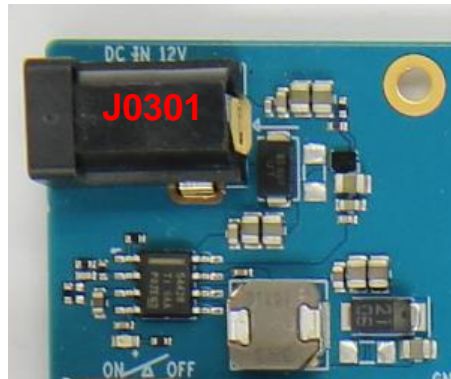


Figure 8: DC Power Supply Interface

Before connecting the power supply, developers have to select a proper 12 V DC power adapter to supply power for the SA800U-WF EVB, and the power plug design of the adapter is shown as below.

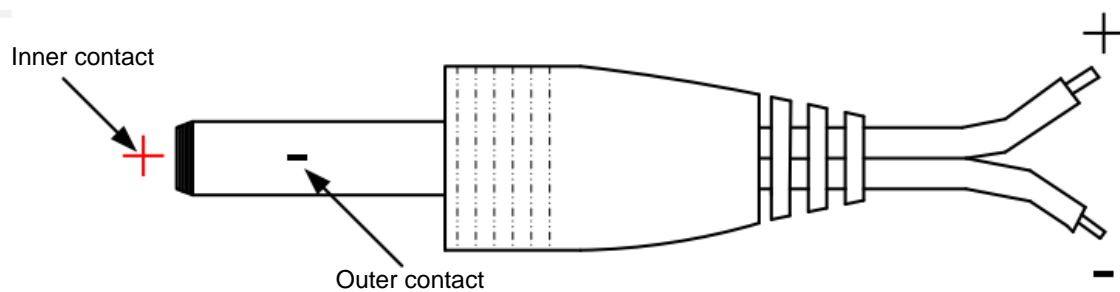


Figure 9: Power Plug Design

4.1.2. Battery Interface

The following figure shows a reference circuit design for battery interface.

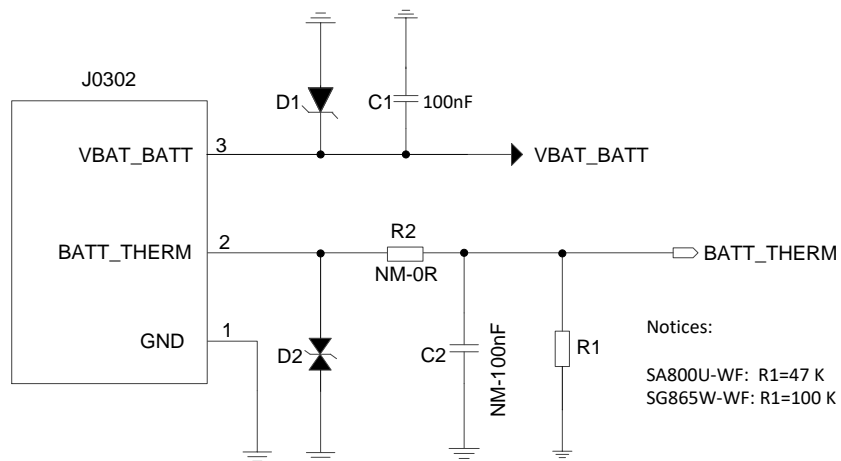


Figure 10: Reference Design for Battery Interface

The following figure shows the pin assignment of battery interface.

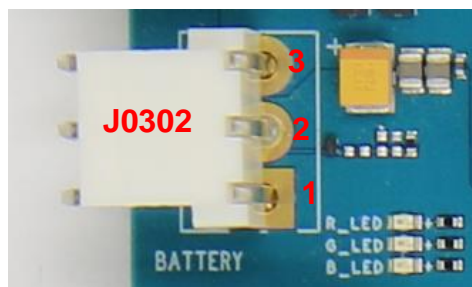


Figure 11: Pin Assignment of Battery Interface

4.2. B2B and FPC Connectors

SA800U-WF EVB is connected to the module with two B2B connectors and two FPC connectors:

Table 5: B2B and FPC Connectors

RefDes.	Description
U0101	B2B connectors
U0102	
J0201	FPC connectors
J0202	

The following two figures show the B2B and FPC connectors and the diagram after assembly of the SA800U-WF:

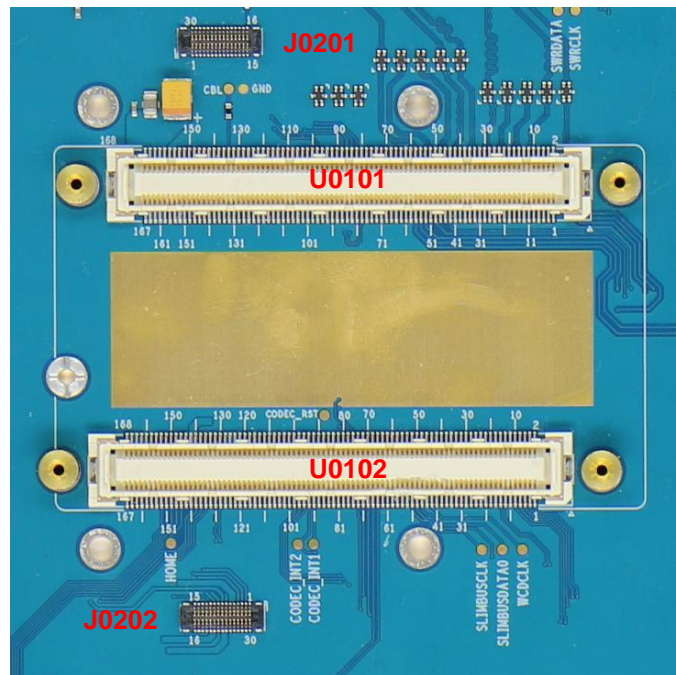


Figure 12: B2B and FPC Connectors

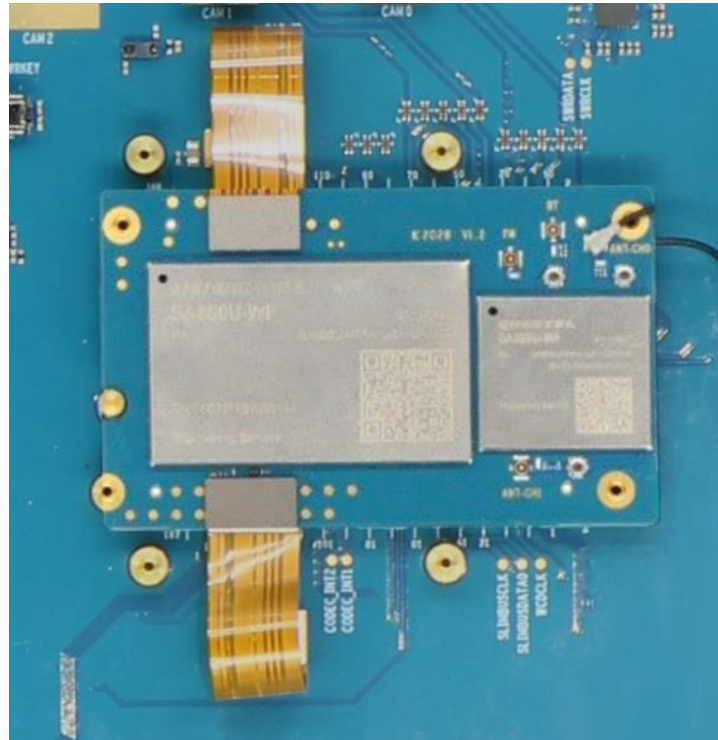


Figure 13: Diagram after assembly of SA800U-WF (Top View)

See **document [1]** for detailed information about pin definition corresponding to B2B and FPC connectors on SA800U-WF EVB.

4.3. LCM Interface

SA800U-WF EVB video output interface (LCM interface) is based on MIPI_DSI standard and supports 4 groups of high-speed differential data transmission.

Table 6: LCM Interface

RefDes.	Description
J0603	LCD connector

The following figure shows a reference circuit design for LCM interface of the SA800U-WF EVB.

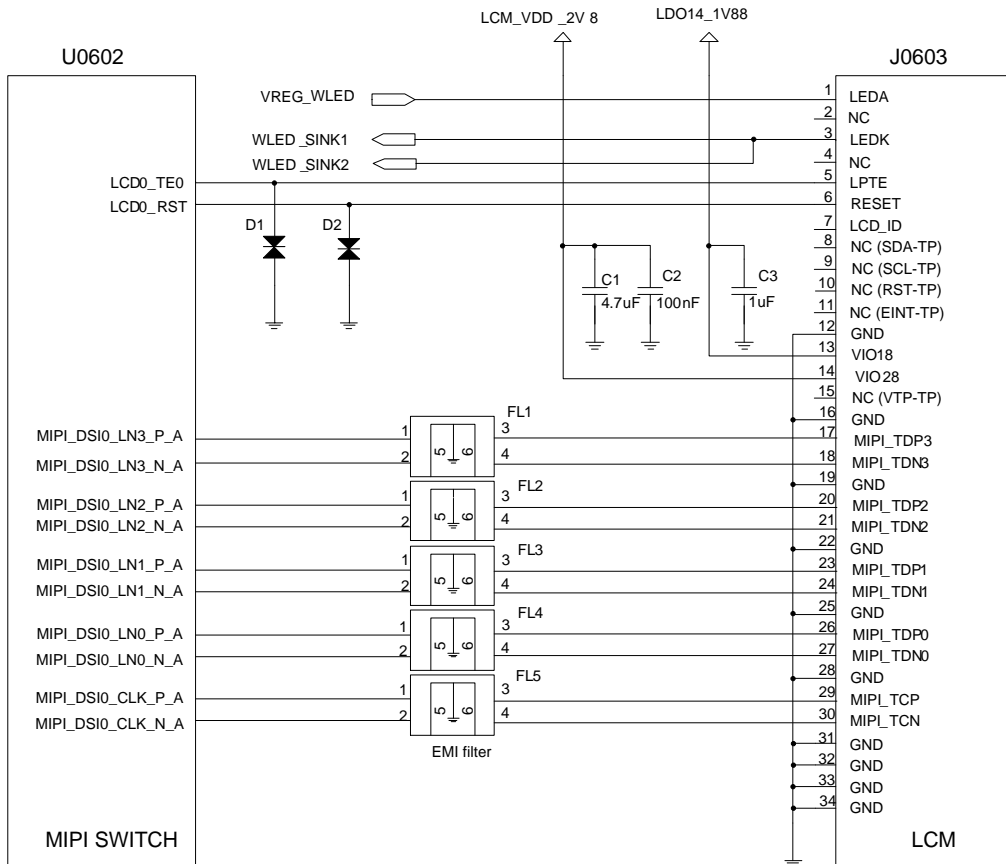


Figure 14: Reference Design for LCM Interface

The following figure shows the pin assignments of LCM interface.

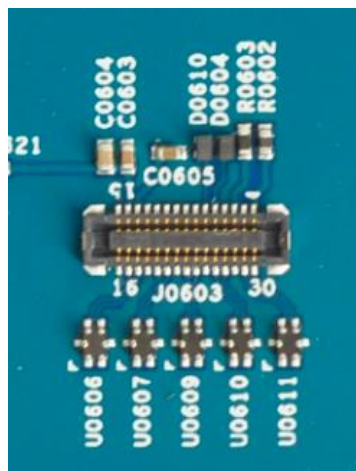


Figure 15: Pin Assignments of LCM Interface

4.4. Touch Panel Interface

The SA800U-WF EVB provides a touch panel interface J0605. J0605 is used to realize LCD touch function. The following figure shows a reference design for touch panel interface.

Table 7: Touch Panel Interface

RefDes.	Description
J0605	Touch panel connector

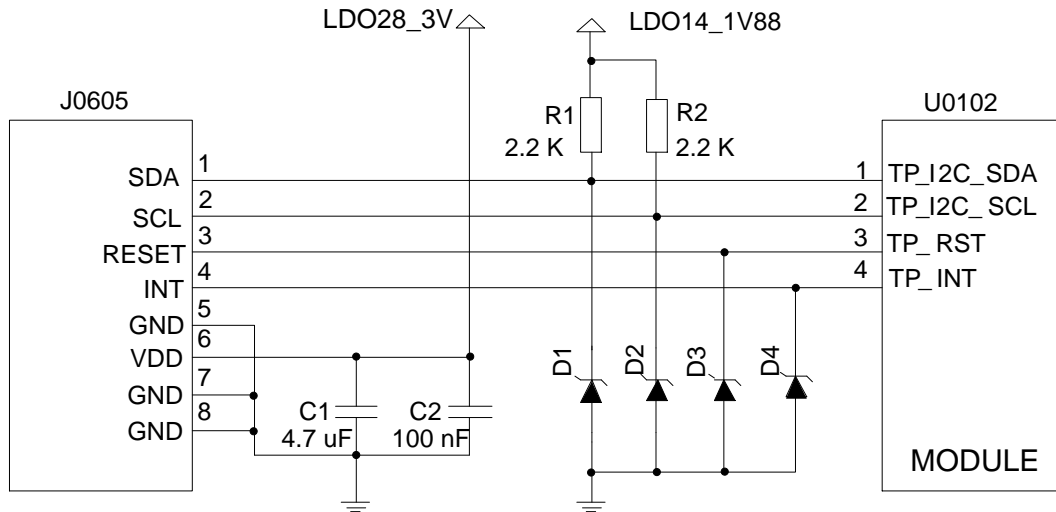


Figure 16: Reference Design for Touch Panel Interface

The following figure shows the pin assignments of touch panel interface.

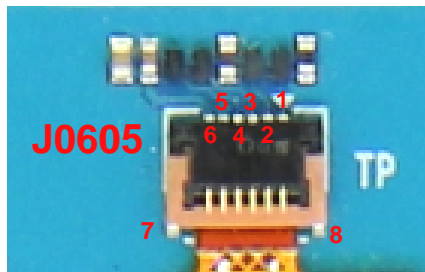


Figure 17: Touch Panel Interface

4.5. Camera Interfaces

Based on standard MIPI_CSI input interface, SA800U-WF EVB supports two cameras and one TOF camera (4-lane + 4-lane + 2-lane). J0501 supports 1-channel 4-lane MIPI_CSI1, J0502 supports 1-channel 4-lane MIPI_CSI0, the pixels of both cameras are 16 MP. TOF camera interface J0503 supports 1-channel 2-lane MIPI_CSI3, which only supports raw format and does not support Preview. The video and photo quality are determined by various factors such as camera sensor, camera lens quality, etc.

Table 8: Camera Interfaces

RefDes.	Description
J0501	Camera connectors
J0502	
J0503	TOF camera connector

The following figures are reference designs for camera interfaces:

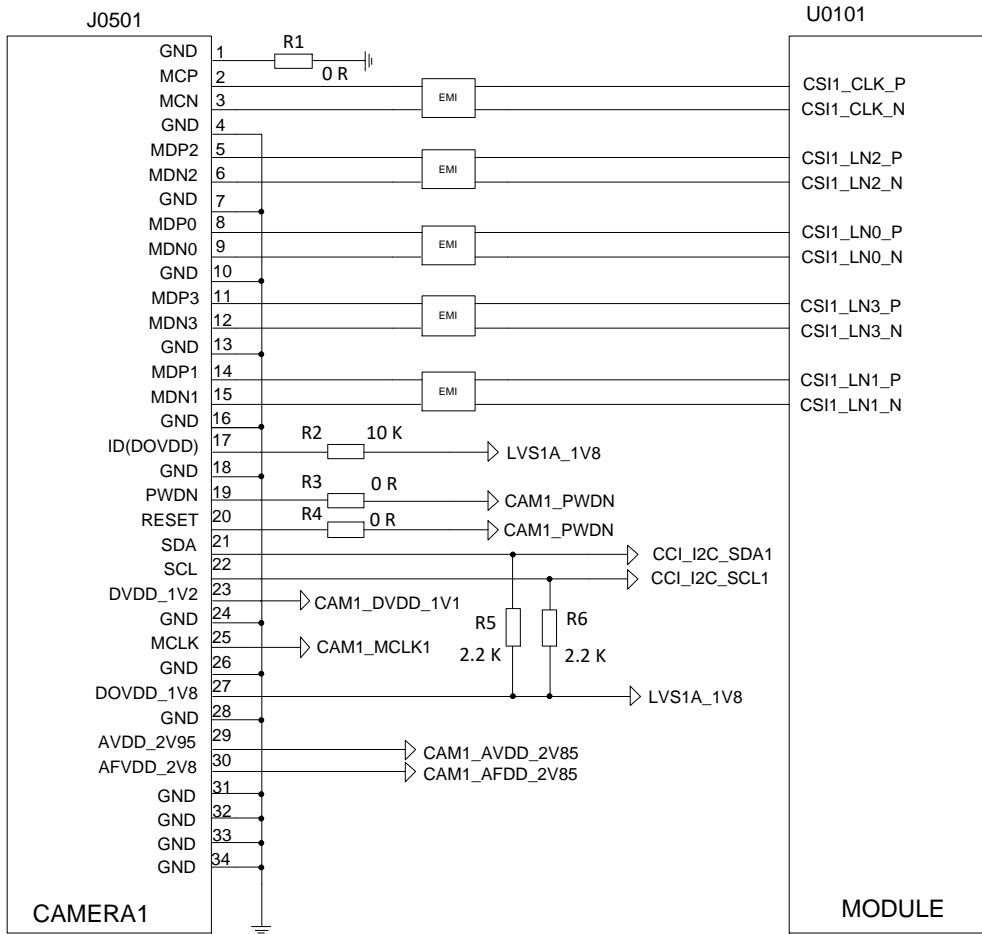


Figure 18: Reference Design for Camera Interface J0501

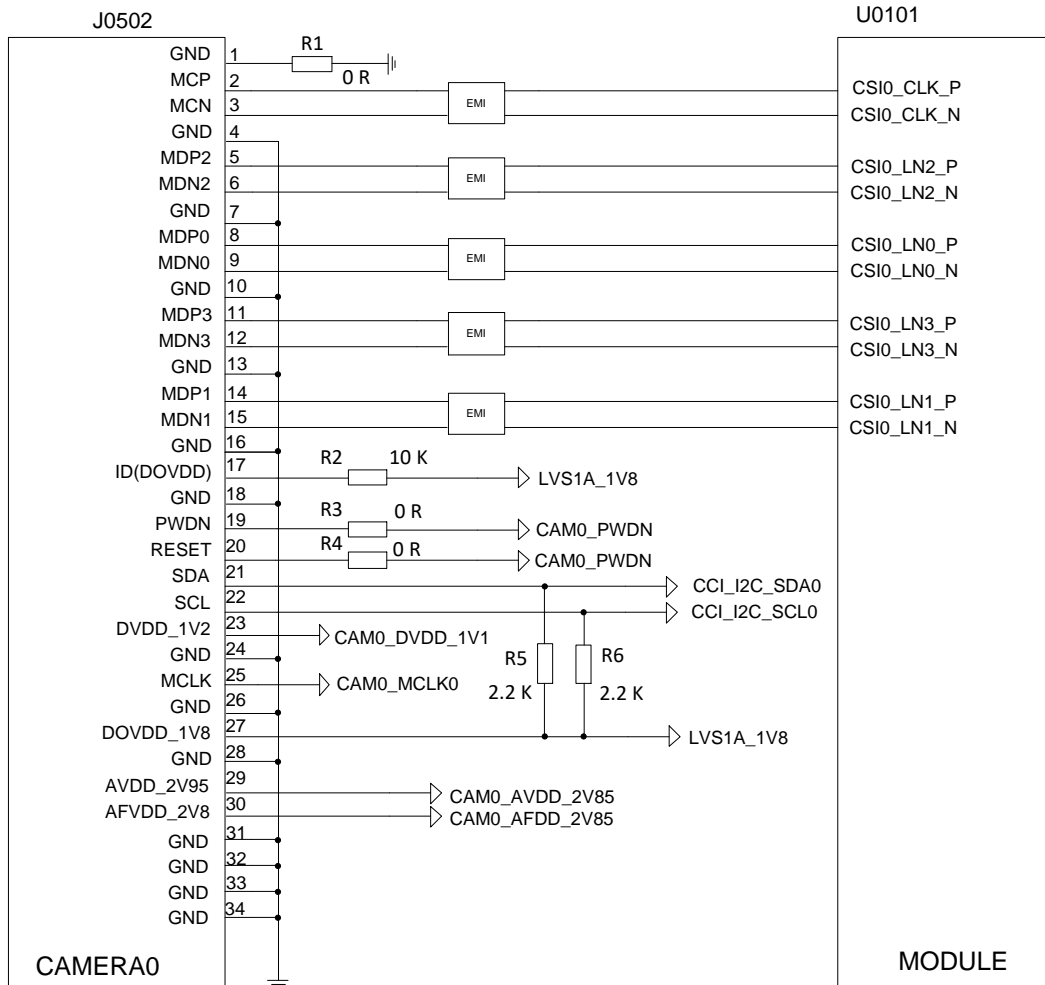


Figure 19: Reference Design for Camera Interface J0502

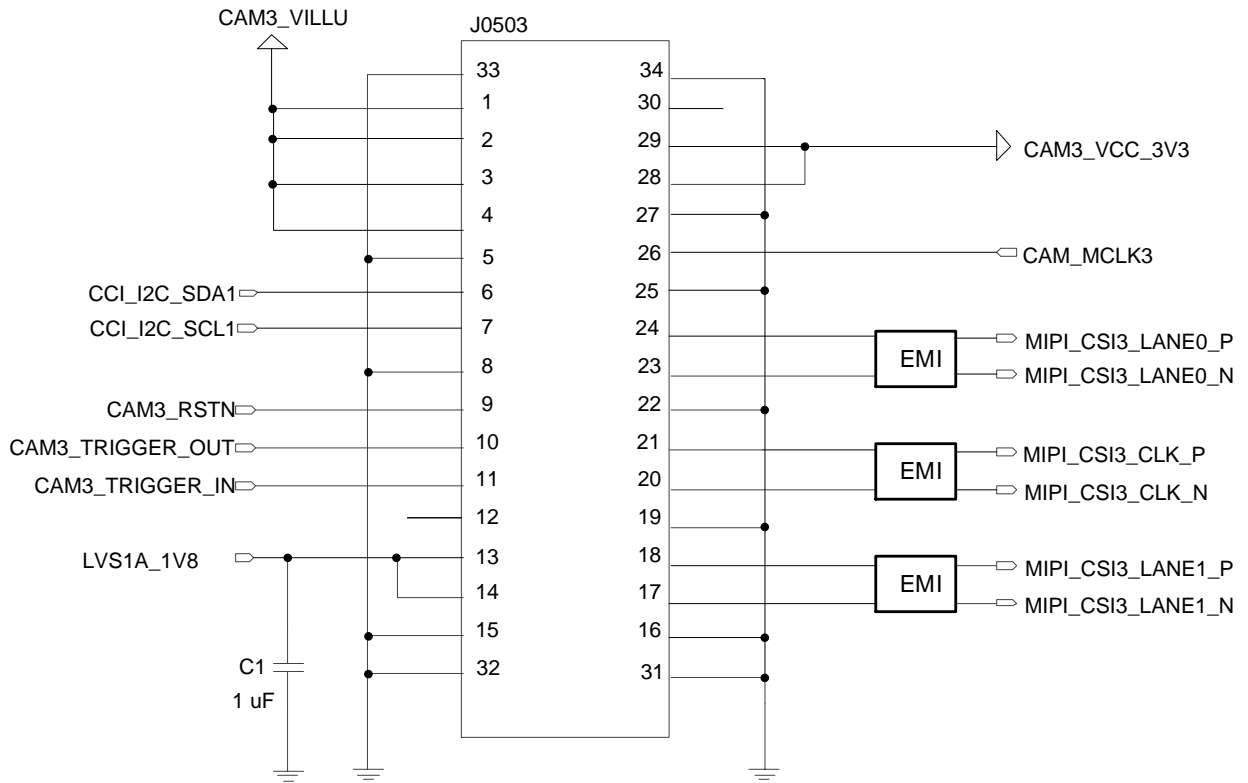


Figure 20: Reference Design for TOF Camera Interface



Figure 21: Camera Interfaces with Cameras Assembled

4.6. HDMI Interfaces

SA800U-WF EVB provides one HDMI IN and one HDMI OUT interfaces.

Table 9: HDMI Interfaces

RefDes.	Description
J0601	HDMI OUT connector
J1601	HDMI IN connector

The following figure shows a reference circuit design for HDMI IN interface:

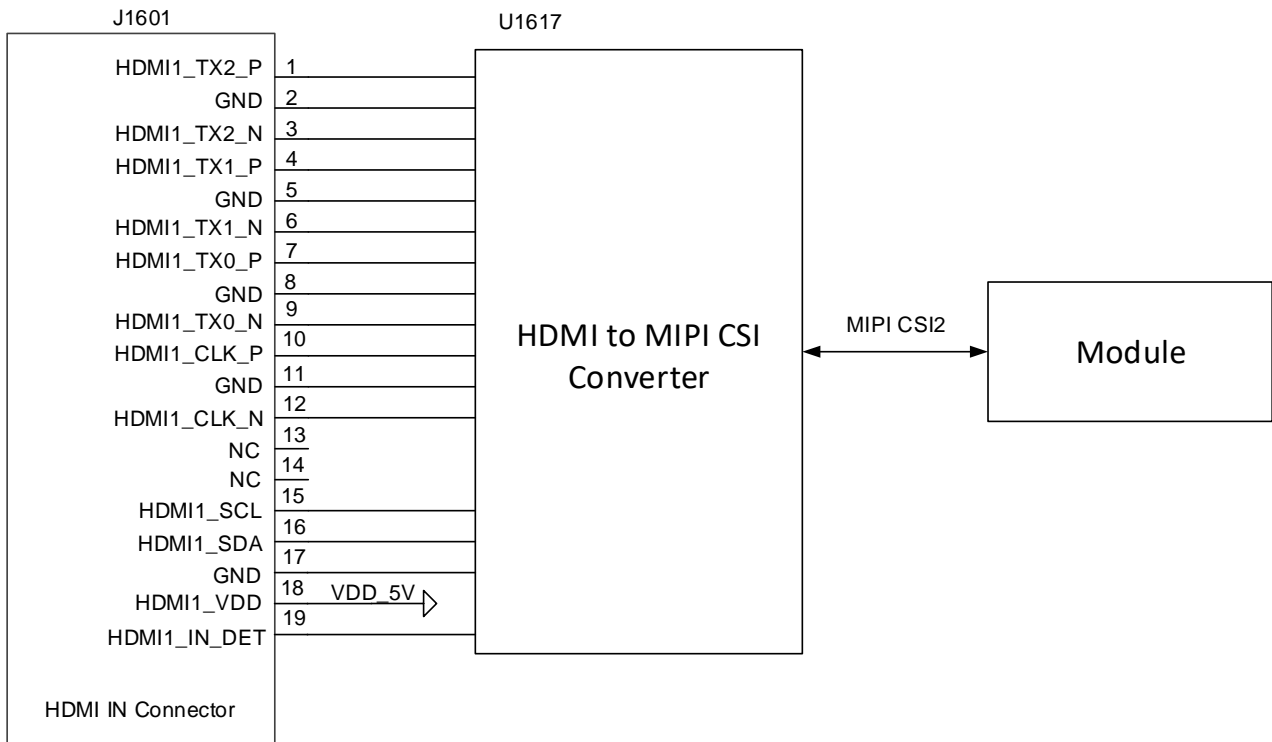
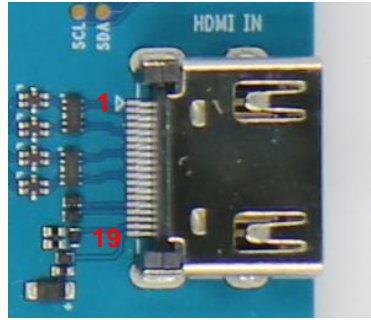


Figure 22: Simplified Interface Schematic for HDMI IN



J1601

Figure 23: HDMI IN Interface

The following figure shows a reference circuit design for HDMI OUT interface:

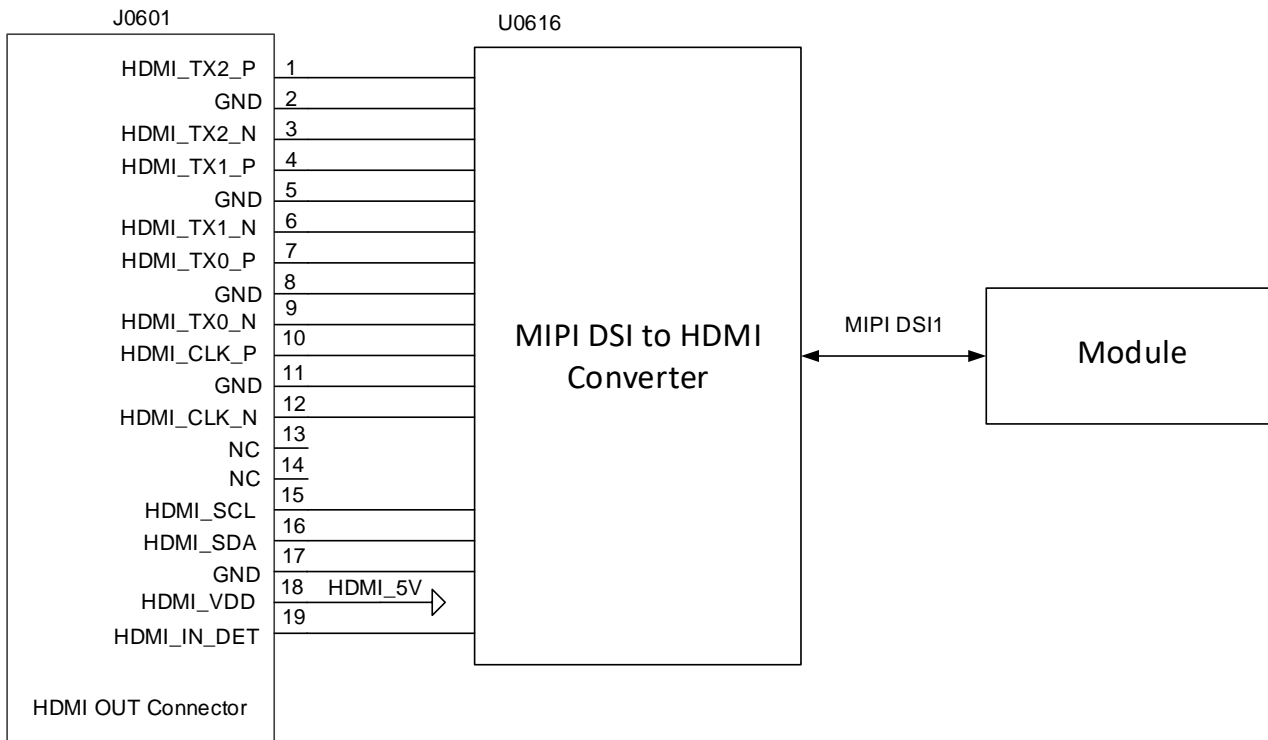
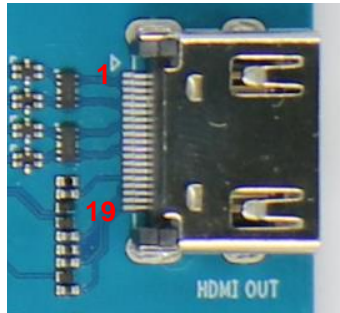


Figure 24: Simplified Interface Schematic for HDMI OUT



J0601

Figure 25: HDMI OUT Interface

4.7. USB Interfaces

SA800U-WF EVB provides one USB Type-C interface and three USB Type-A interfaces, which comply with the USB 3.1/2.0 specifications. USB Type-C interface supports the DisplayPort mode and OTG function, which can be used for AT command transmission, data transmission, software debugging and software upgrading. USB Type-A interfaces only supports host mode.

Table 10: USB Interfaces

RefDes.	Description
J0701	USB Type-C connector
J0901	
J0902	USB Type-A connectors
J0903	

4.7.1. USB Type-C Interface

USB type-C interface has a set of HS interfaces compatible with USB 2.0, namely USB_DP、USB_DM, and two sets of SS interfaces supporting USB 3.1, namely USB_SS1 and USB_SS2.

When Type-C is plugged in right-side up, USB_CC1 will detect the external device, and the data will be transmitted through USB_SS1; when it is plugged in upside down, USB_CC2 will detect the external device, and the data will be transmitted through USB_SS2.

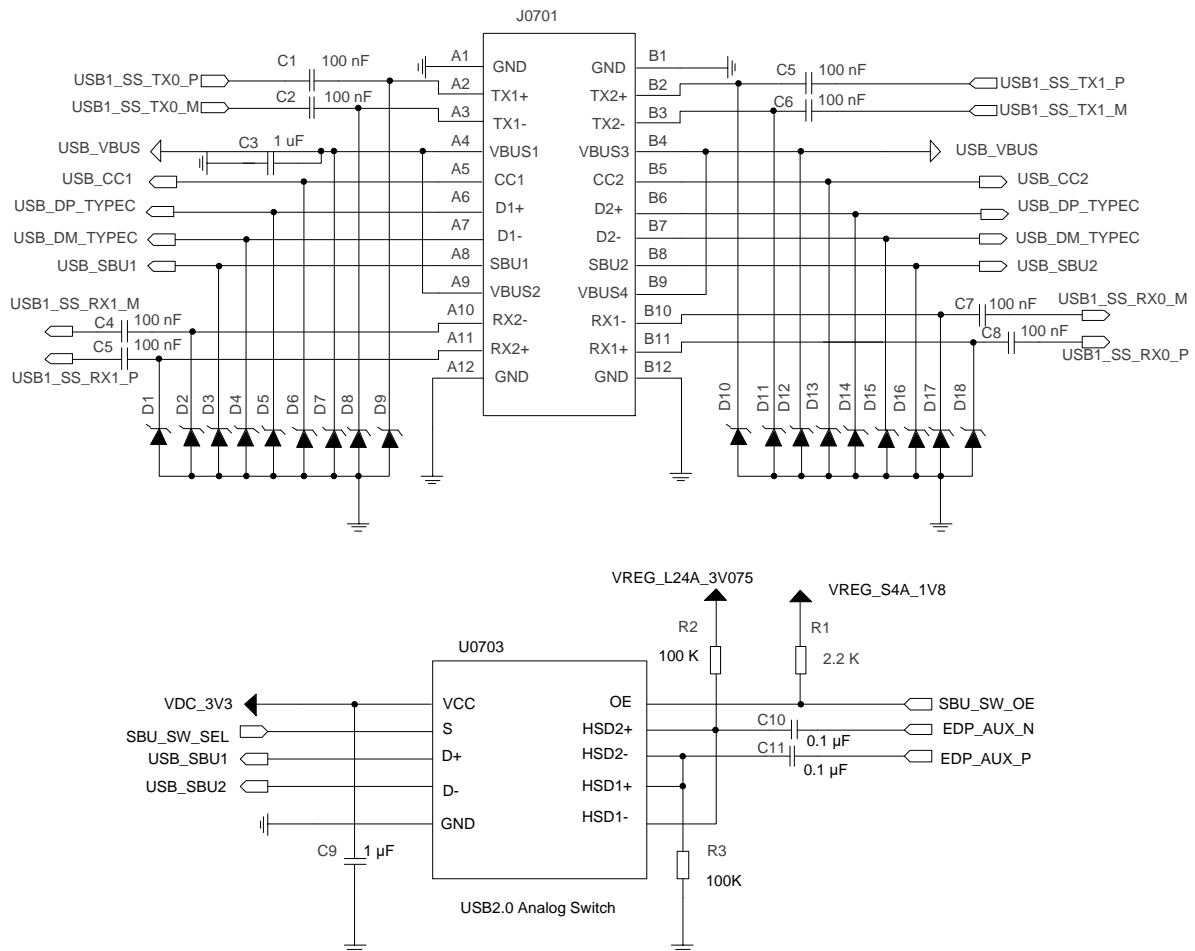


Figure 26: Reference Design for USB Type-C Interface

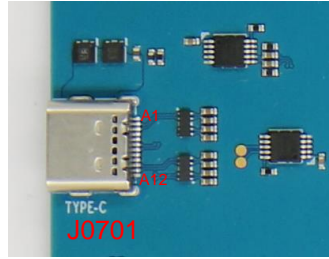


Figure 27: Type-C Interface

SA800U-WF EVB supports DisplayPort (DP) mode with 4 lanes up to 4K @ 60 fps over USB Type-C. The default version of DP function software is not supported. If the DP function is needed, please contact Quectel to update the software. Pin descriptions in USB Type-C/DisplayPort mode is listed below:

Table 11: Pin Descriptions in USB Type-C and DisplayPort Mode

Pin NO.	USB Type-C Mode	DisplayPort Mode
A2, A3	USB1_SS0_TX_P/M	DP_LANE2_P/M
B11, B10	USB1_SS0_RX_P/M	DP_LANE3_P/M
B2, B3	USB1_SS1_TX_P/M	DP_LANE1_P/M
A11, A10	USB1_SS1_RX_P/M	DP_LANE0_P/M
A5, B8	SBU1/2	DP_AUX_P/N
A7, A6, B6, B7	USB1_DP/DM	USB1_DP/DM
A8, B5	USB_CC1/CC2	HOTPLUG_DET/VCONN
A4, A9, B4, B9	USB_VBUS	USB_VBUS
A1, A12, B1, B12	GND	GND

4.7.2. USB Type-A Interfaces

USB Type-A interfaces are extended by a set of USB ports and a HUB chip (U0901). The diagram below is the block diagram of Type-A interface design.

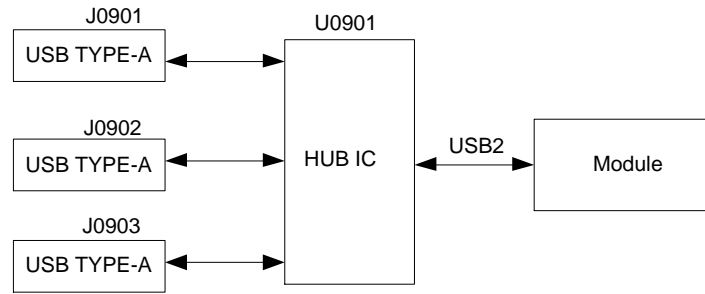


Figure 28: Type-A Interface Block Diagram (USB2 for Host Mode)

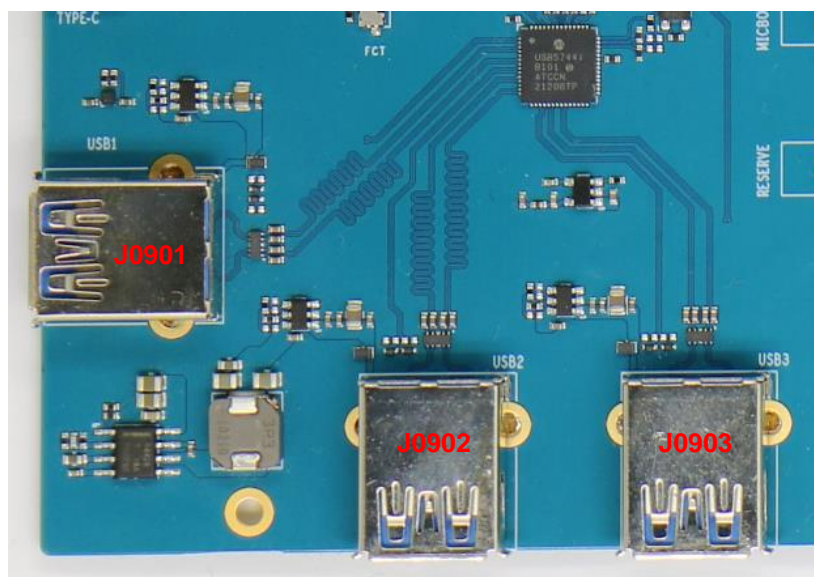


Figure 29: Type-A Interfaces

4.8. Audio Interfaces

SA800U-WF EVB provides three analog audio outputs including one mono loudspeaker, one mono earphone, and one stereo headset. SA800U-WF EVB also provides five analog audio inputs including five differential microphone inputs.

Table 12: Audio Interfaces

RefDes.	Description
U0445	Loudspeaker

U0403	Earphone
J0433	Audio jack for headset
U0424	
U0428	
U0435	MEMS-type microphone
U0436	

4.8.1. Loudspeaker Interface

SA800U-WF EVB provides one loudspeaker interface U0445. The following figure shows a reference circuit design for loudspeaker interface.

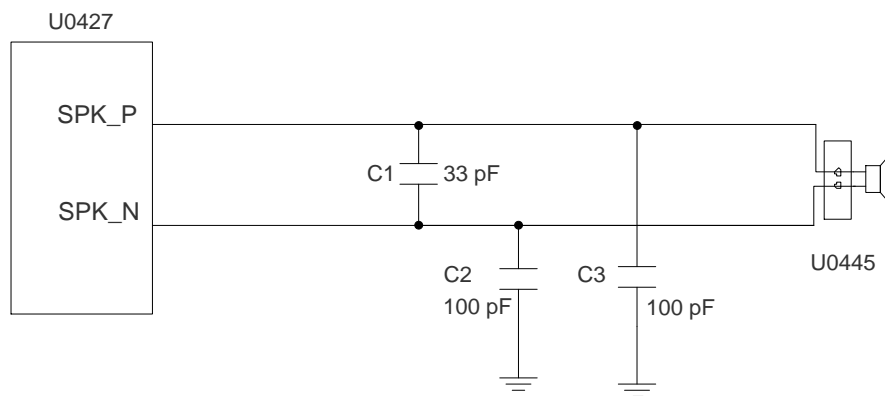


Figure 30: Reference Design for Loudspeaker Interface

U0445

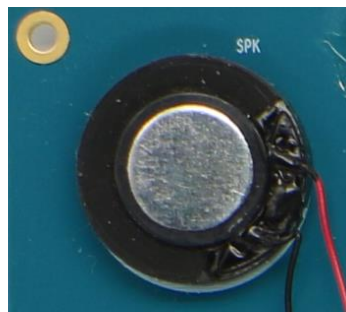


Figure 31: SPK

4.8.2. Headset Interface

SA800U-WF EVB provides one headset interface. The following figure shows a reference circuit design for headset interface.

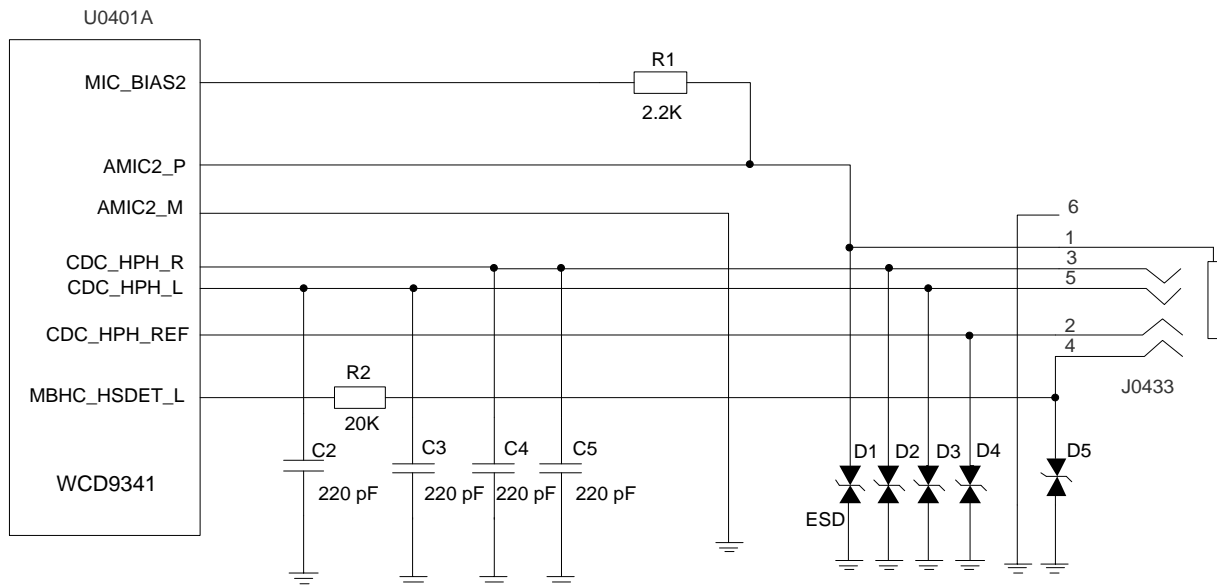


Figure 32: Reference Design for Headset Interface

The following figure shows the pin assignment of headset interface.

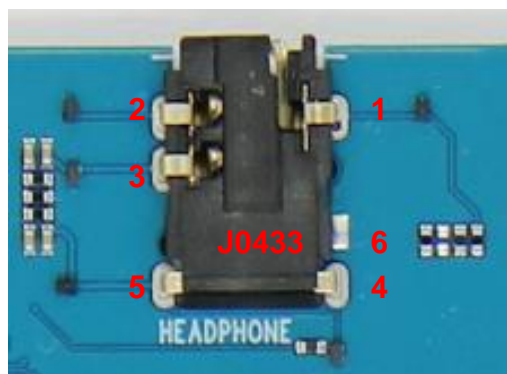


Figure 33: Pin Assignment of Headset Interface

4.8.3. Earphone Interface

SA800U-WF EVB provides one earphone interface and the earphone is soldered onto the SA800U-WF EVB via test point U0403. The following figure shows a reference circuit design for earphone interface.

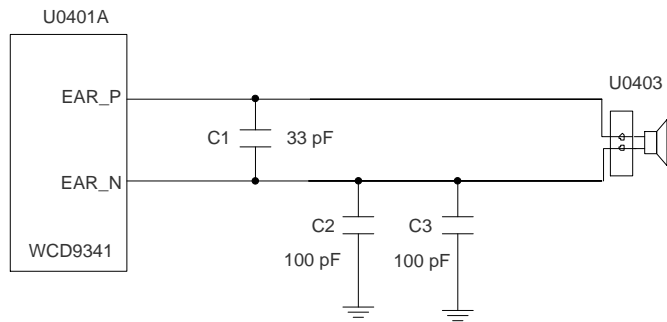


Figure 34: Reference Design for Earphone Interface



Figure 35: Earphone

4.8.4. Microphone Interfaces

SA800U-WF EVB provides four differential microphone inputs for microphone interfaces. The following figures show a reference circuit design for microphone interfaces.

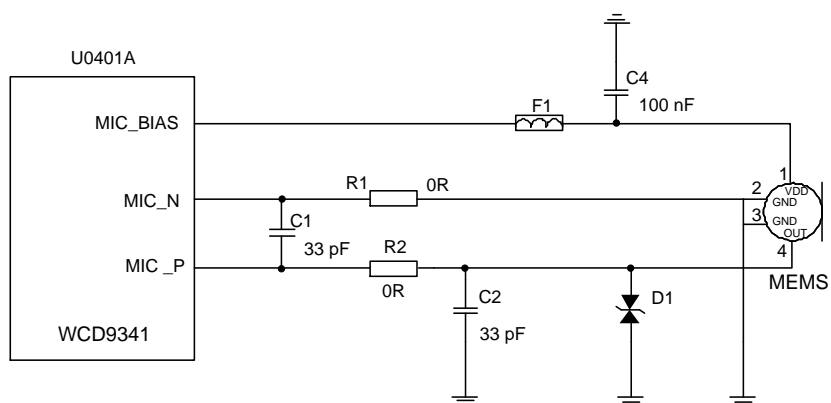


Figure 36: Reference Design for Microphone Interfaces

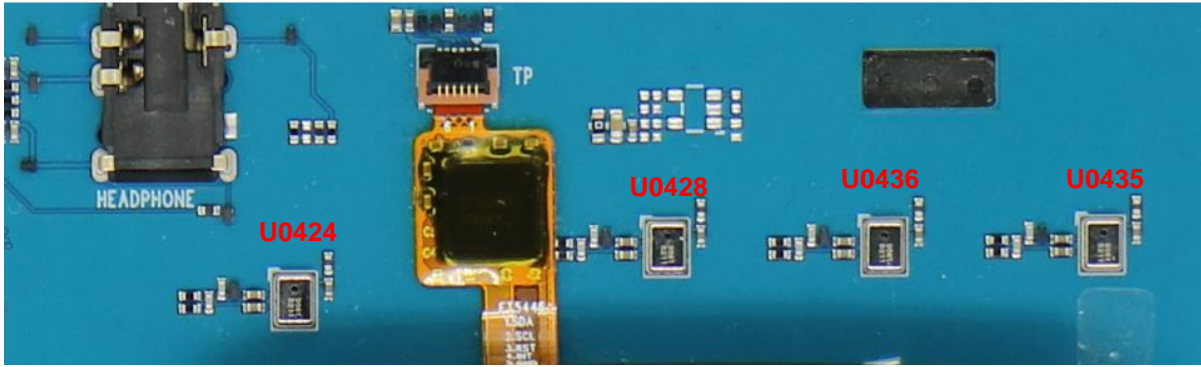


Figure 37: MEMS-Type Microphones

4.9. (U)SIM Interfaces

The SA800U-WF EVB provides two 6-pin push-in type (U)SIM card (1.8/3 V) connectors: (U)SIM1 card connector and (U)SIM2 card connector.

Table 13: (U)SIM Card Interfaces

RefDes.	Description
J0801	(U)SIM1 card connector
J0802	(U)SIM2 card connector

The following figure shows the simplified interface schematic for J0801:

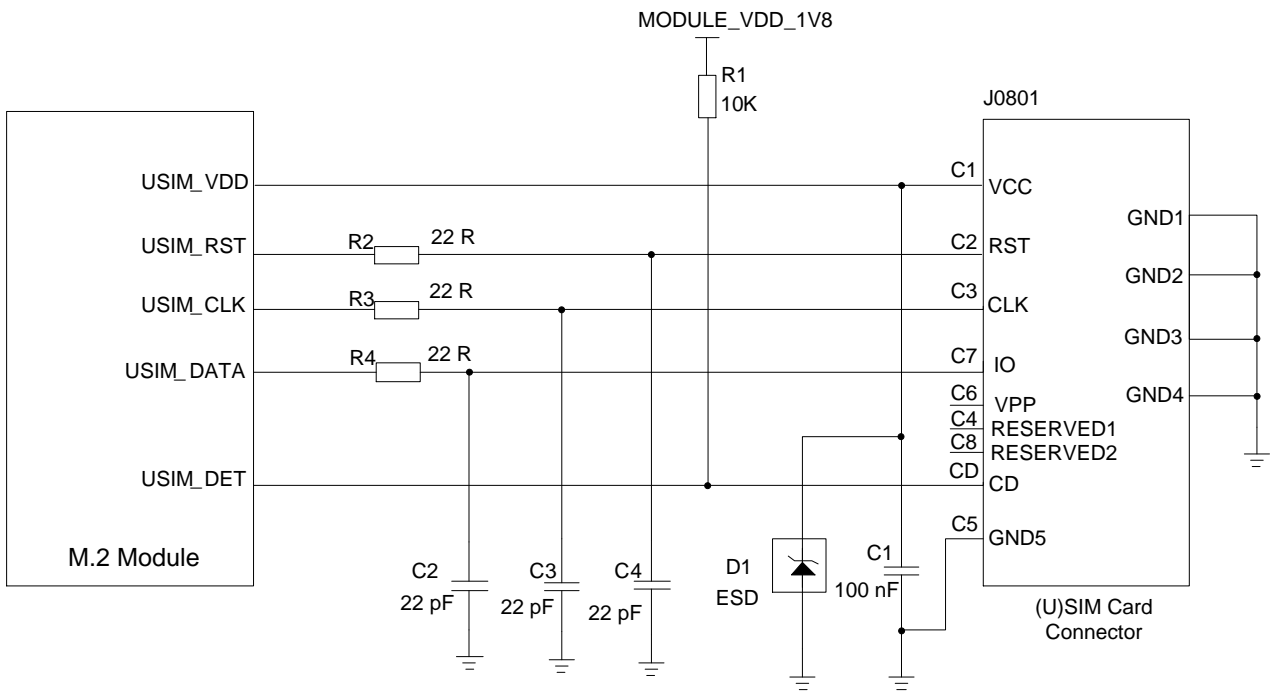


Figure 38: Simplified Interface Schematic for (U)SIM Card Connector J0801

The following figure shows the pin assignment of (U)SIM card connectors (J0801, J0802):

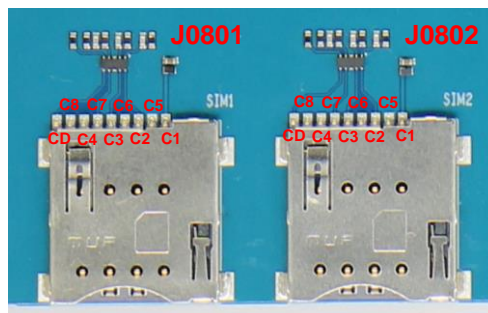


Figure 39: (U)SIM Card Connectors

4.10. UART Interfaces

SA800U-WF EVB provides one Debug UART. Support RS-232 interface standard, can be used for data transmission, AT command sending, software debugging and firmware upgrade.

Table 14: UART Interface

RefDes.	Description
J1201	DBG_UART for debugging

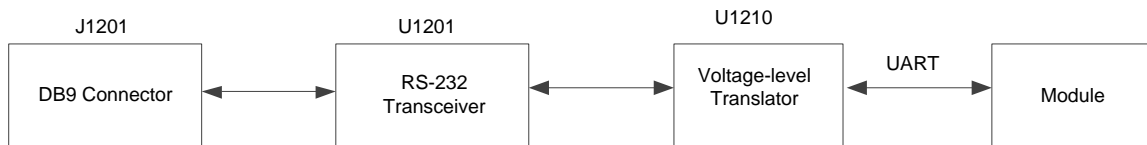


Figure 40: Simplified UART interface Block Diagram

The following figure shows the pin assignment of Debug UART (J1201):

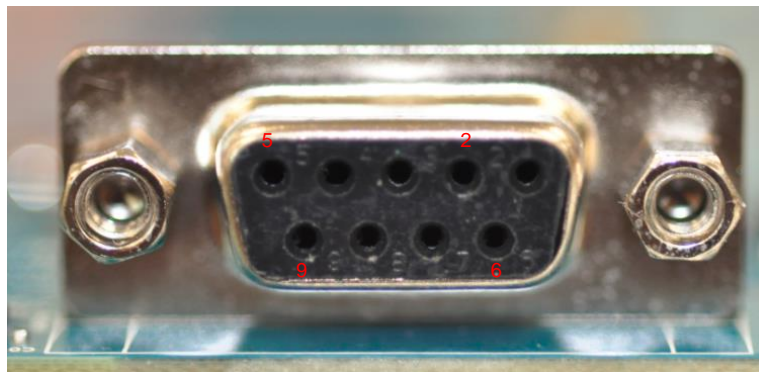


Figure 41: Pin Assignment of Debug UART

4.11. CAN Interface

SA800U-WF EVB provides a CAN interface, which supports SPI to CAN interface.

Table 15: CAN Interface

RefDes.	Description
J1401	Support CAN bus

The following figure shows the simplified interface schematic for SPI to CAN.

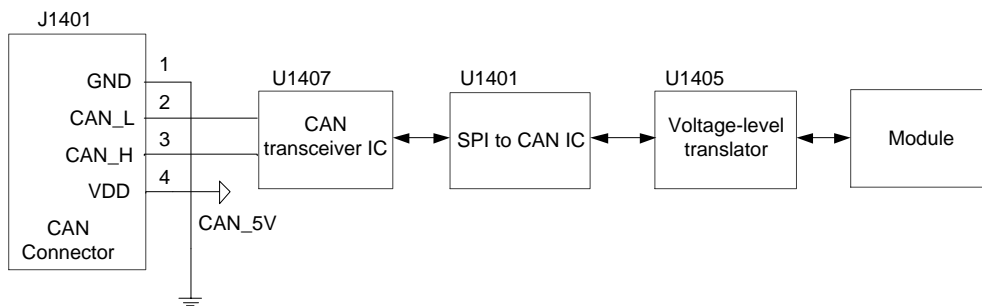


Figure 42: Simplified Interface Schematic for SPI to CAN Interface

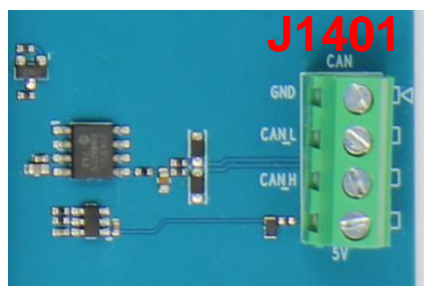


Figure 43: CAN Connector

4.12. Ethernet Interface

SA800U-WF EVB provides an Ethernet interface that supports LAN.

Table 16: Ethernet Interface

RefDes.	Description
J1101	RJ45 connector connecting to PC with LAN cable

The following figure shows the simplified interface schematic for Ethernet interface:

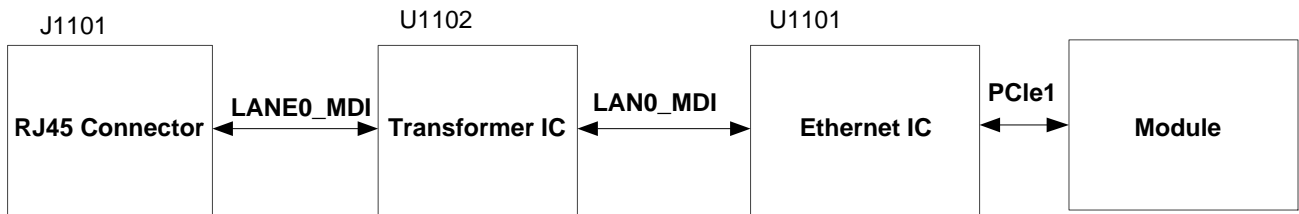


Figure 44: Simplified Interface Schematic for Ethernet Interface

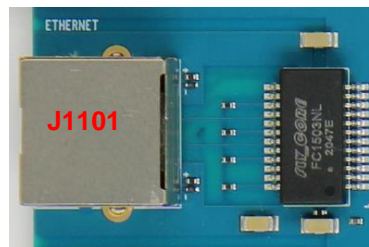


Figure 45: RJ45 Connector

4.13. M.2 Interface

SA800U-WF EVB provides a M.2 interface that supports 5G communication function.

Table 17: M.2 Interface

RefDes.	Description
U0802	M.2 connector for RM500Q-AE

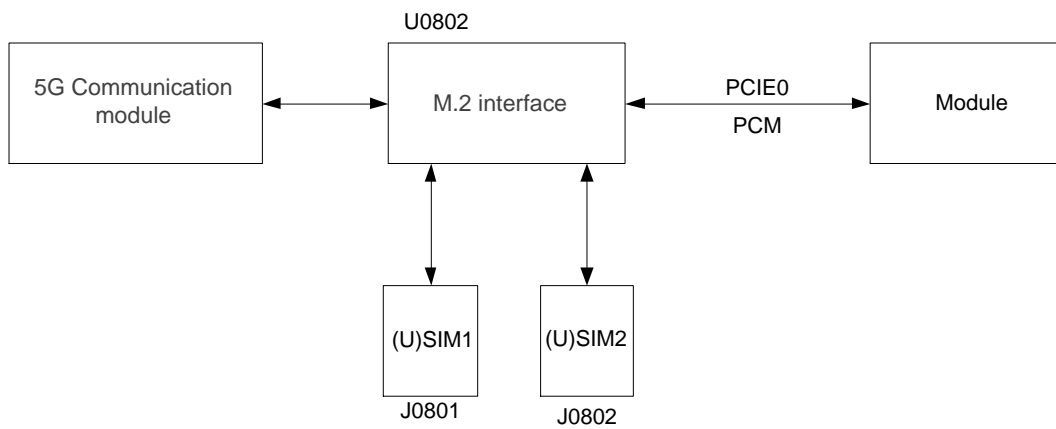


Figure 46: Simplified Interface Schematic for M.2 Interface

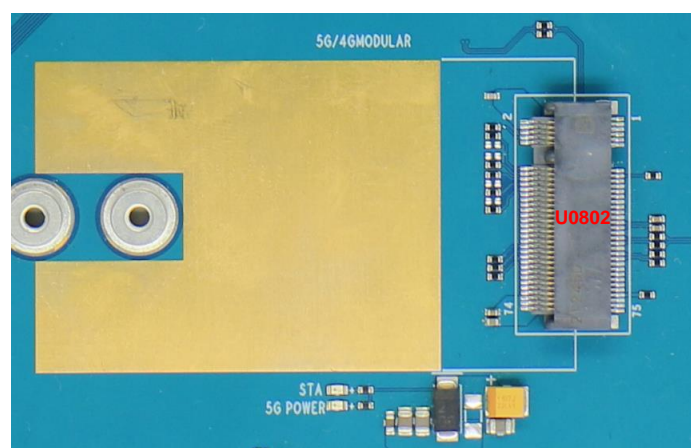


Figure 47: M.2 interface

4.14. SD Card Interface

The following figure shows the simplified interface schematic for SD card interface on SA800U-WF EVB.

Table 18: SD Card Interface

RefDes.	Description
U1202	SD card connector

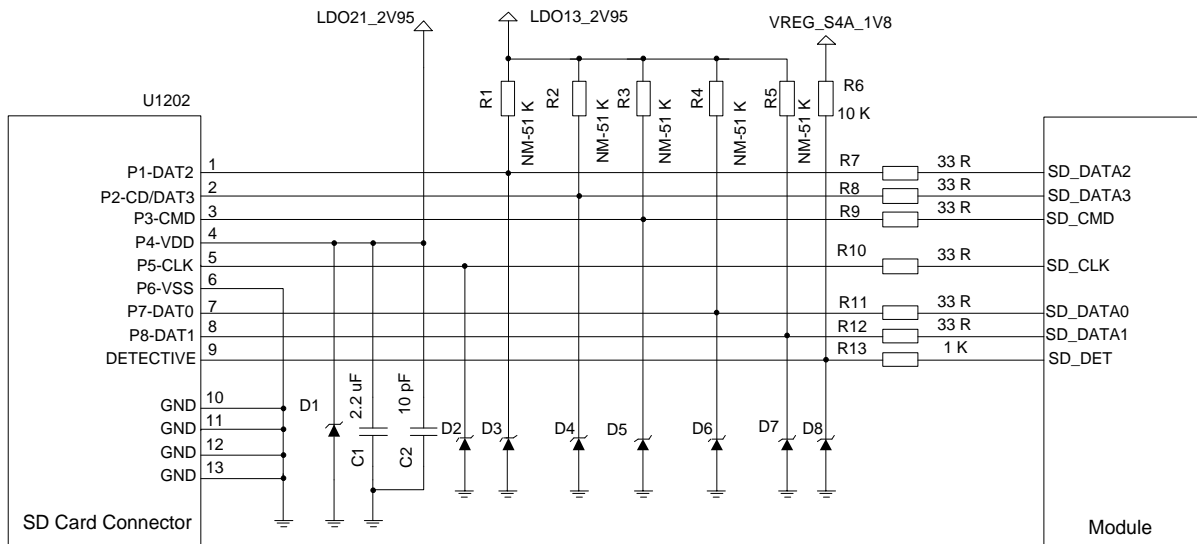


Figure 48: Reference Design for SD Card Interface

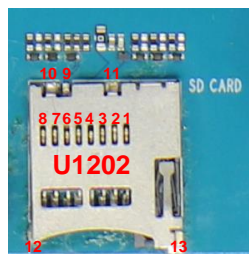


Figure 49: Pin Assignment of SD Card Interface

4.15. Flashlights

SA800U-WF EVB supports 3 flash LED drivers.

Table 19: Flashlights

RefDes.	Description
D1301	Flashlights
D1302	
D1303	

The following figures show a reference circuit design for flashlights and their locations on SA800U-WF EVB.

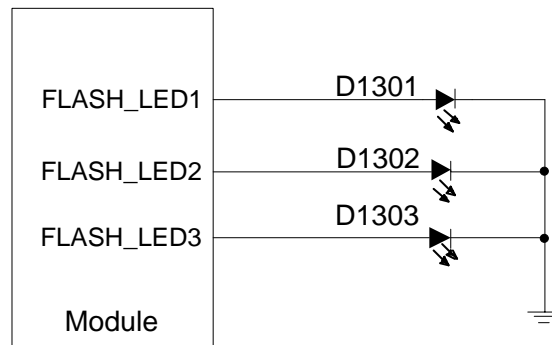


Figure 50: Reference Circuit Design for Flashlight Interfaces



Figure 51: Flashlights

4.16. Sensors

SA800U-WF EVB provides three sensors for testing purpose, as shown in the figure below:

Table 20: Sensors

RefDes.	Description
U1301	Ambient light sensor and proximity sensor
U1302	Accelerometer and gyroscope sensor
U1303	Geomagnetic sensor



Figure 52: Sensors

4.17. Emergency Download Interface

SA800U-WF EVB provides one emergency download switch USB_BOOT to force the module enter download mode. Turn on S1214(Pull up USB_BOOT to 1.8 V) before turning on the module to use this function.

The following figure shows a reference circuit design for the emergency download interface:

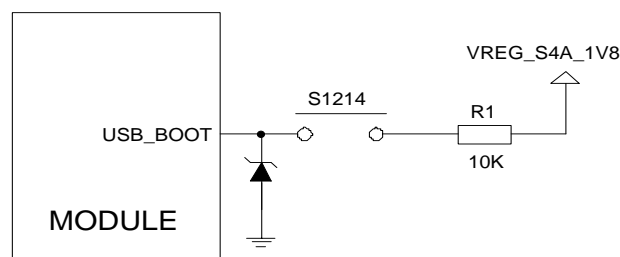


Figure 53: Reference Design for Emergency Download Interface

4.18. Vibrator

SA800U-WF EVB provides an ERM-type vibrator for developers to test the vibrator driver interface of smart modules.

Table 21: Vibrator

RefDes.	Description
U1304	ERM-type vibrator

The following figures show the reference circuit design and the vibrator on the board.

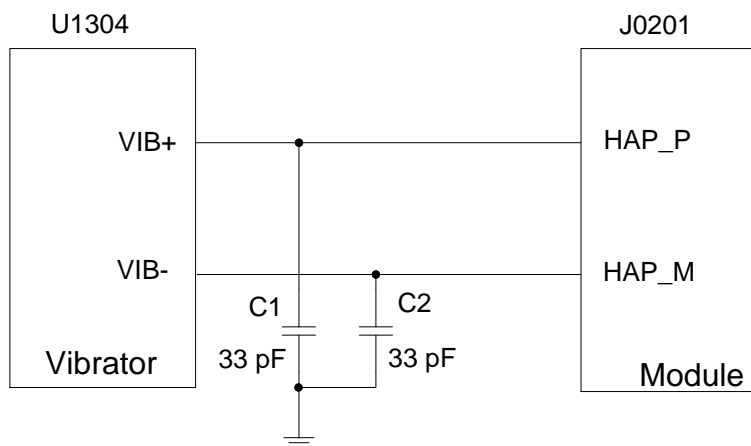


Figure 54: Reference Design for Vibrator



Figure 55: ERM-Type Vibrator

4.19. Buttons and Switches

SA800U-WF EVB provides three buttons and seven switches:

Table 22: Buttons

RefDes.	Description
S1202	Power key (push button) Turn ON/OFF the module
S1203	Turn the volume up
S1201	Turn the volume down

Table 23: Switches

RefDes.	Description
S0301	Select DC power supply or battery power supply
S0302	VBAT ON/OFF control
S0801	Turn ON/OFF 5G communication module
S1214	Emergency download switch
S1701	5G or HUB switch
S0701	Factory test ON/OFF control
S0601	Select 1080P or 4K

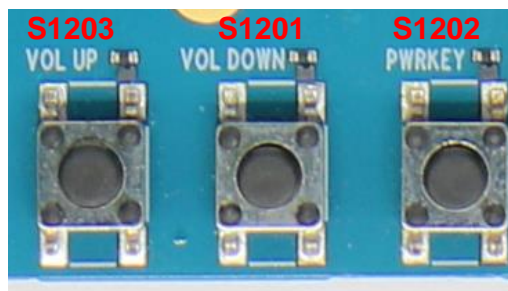


Figure 56: Buttons

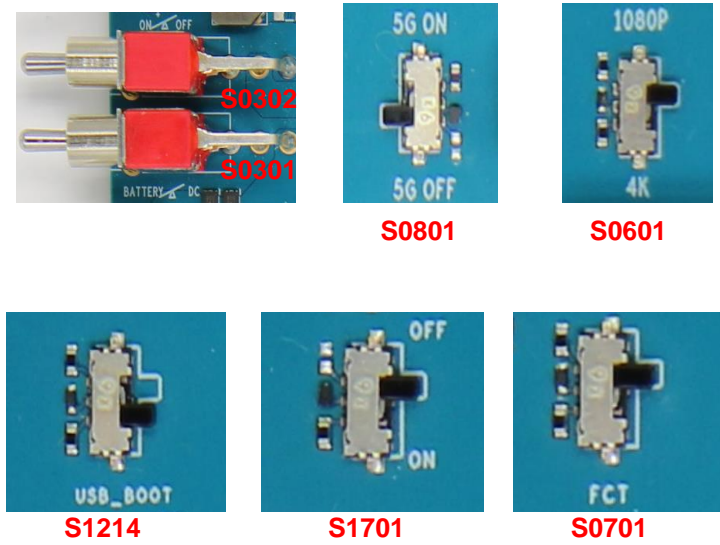


Figure 57: Switches

4.20. Status Indicators

There are six status indicators for signal indication on SA800U-WF EVB, shown as below:

Table 24: Status Indicators

RefDes.	Description
D0301	Power supply of the modules ON/OFF indicator <ul style="list-style-type: none"> ● Light ON: VBAT ON ● Light OFF: VBAT OFF
D0801	RM500Q-AE operation status indicator
D0802	Power supply of RM500Q-AE ON/OFF indicator
D1201	Red LED
D1202	Green LED
D1203	Blue LED



Figure 58: Status Indicators

4.21. Test Points

SA800U-WF EVB provides test points which help customers obtain the corresponding waveforms of some signals. The following figures show the details of all test points.

Table 25: Pin Definition

Pin No.	Pin Name	Description
1	TP0103	GND
2	TP0104	CBL
3	TP0105	HOME_KEY
4	TP0201	BATT_ID
5	TP0402	CODEC_RST_N
6	TP0404	CODEC_SLIMBUS_DATA0
7	TP0405	CODEC_SLIMBUS_CLK
8	TP0412	CODEC_INT1_N
9	TP0413	CODEC_INT2_N
10	TP0415	LN_BB_CLK2_WCD
11	TP0422	WSA8815_EN
12	TP0423	WSA8815_INTR
13	TP0425	SWR_CLK
14	TP0426	SWR_DATA

15	TP0601	GPIO_4
16	TP0602	HDMIOUT_SCL
17	TP0603	HDMIOUT_SDA
18	TP0604	GND
19	TP0701	USB_DP
20	TP0702	USB_DM
21	TP0803	DPR
22	TP0805	COEX_UART_RX
23	TP0806	COEX_UART_TX
24	TP1101	LED1/GPO
25	TP1402	CLKO/SOF
26	TP1403	INT1/GPIO1
27	TP1606	I2S_MCLK_GPIO9
28	TP1607	CSCL_GPIO10
29	TP1608	CSDA_GPIO11

5 Operation Procedures

This chapter introduces how to use the SA800U-WF EVB for testing and evaluation of applicable modules. Before the procedures below, please ensure modules and the EVB are correctly assembled.

5.1. Turn On the Module

1. Connect the SA800U-WF to the connectors (U0101, U0102, J0201, J0202) on SA800U-WF EVB.
2. If battery power supply mode is selected, install a Li-polymer battery on J0302 and then switch S0301 to “**BATTERY**” state. If 12 V DC power supply mode is selected, switch S0301 to “**DC POWER**” state.
3. Switch S0302 to “**ON**” state, and then D0301 will light on.
4. Press S1202 (PWRKEY) for at least 2 s to turn on the module. When the following interface is displayed on the utilized LCD(s), it means the booting has been completed.

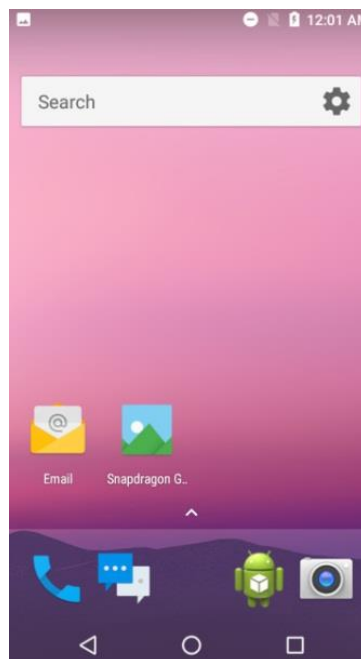


Figure 59: LCD Display Indicating Module’s Power-on

NOTE

After the module is powered on, you can connect the USB Type-C interface of the EVB to the PC through the USB Type-C adapter cable to turn on the module.

5.2. Turn Off the Module

There are two methods to turn off the module. The steps for the first method are as follows:

1. Press S1202 (PWRKEY) for at least 1 s under the power-on state, and then LCD will display a menu for selection shown as the following figure:

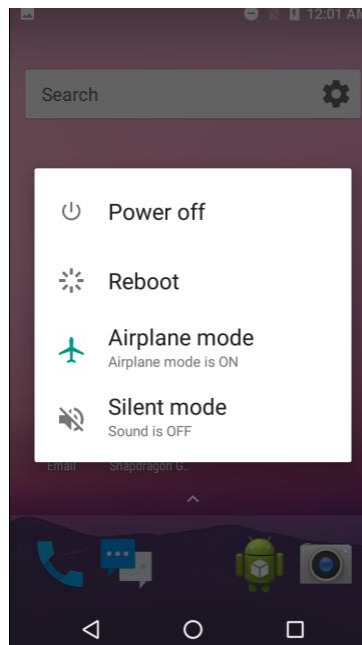


Figure 60: LCD Menu Display for Powering Off the Module

2. Choose “**Power off**” option.
3. The module will be powered off.

The other method is to press PWRKEY for at least 8 s until the module is shut down completely.

5.3. Communication via USB

1. Turn on the module according to the procedures mentioned in **Chapter 5.1**.
2. Connect SA800U-WF EVB and the PC with USB cable through USB Type-C interface and then run the driver disk on PC to install the USB driver and ADB driver. The USB port numbers can be viewed in Device Manager of the PC when the USB driver is installed, as shown below.

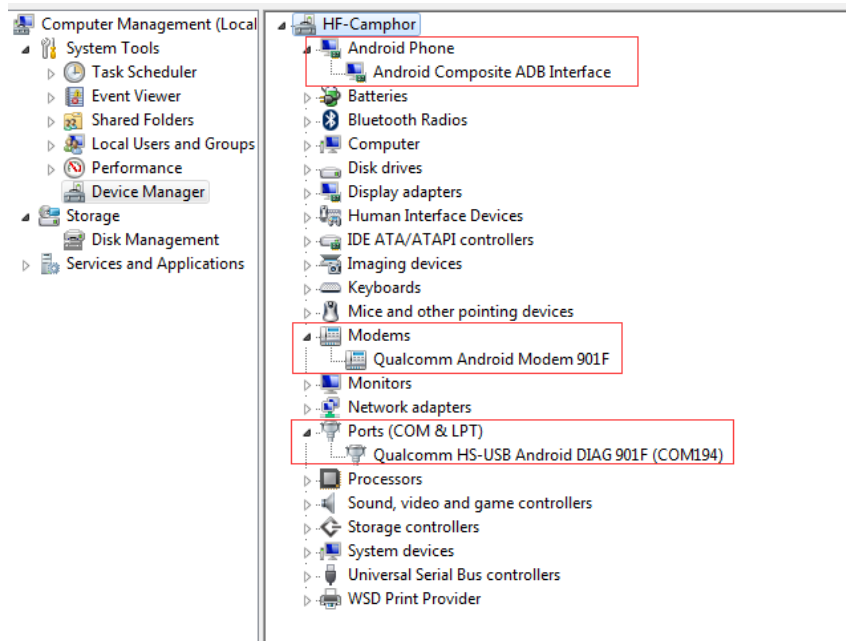


Figure 61: USB COM Ports

3. Open CMD tool

For Windows 7: click **"Start"** → **"All Programs"** → **"Accessory"** → **"Command Prompt"**.

For Windows 10: (option 1) click **"Start"** → **"Operate"** → input **"cmd"**, then click **"Enter"**;
 (option 2) click **"Start"** and input **"cmd"** in the searching box, then click **"cmd.exe"**.

4. Execute the command **"adb shell"** to enable the module enter into ADB mode. Then developers can use USB ADB interface for testing.

```
C:\Users\lenovo>adb shell
sdm845:/ $
```

Figure 62: "adb shell" Command

NOTE

1. If developers want to use HyperTerminal for testing, then Qualcomm HS-USB Modem 901F can be used.
2. Please note that the USB port numbers may be different among different modules.

5.4. Communication via UART Interface

1. Run the driver disk on PC to install the USB-TO-RS232 driver.
2. Connect the UART interface to the PC with USB-TO-RS232 converter cable and then turn on the module according to the procedures mentioned in **Chapter 5.1**. After that, serial port number can be viewed through the PC Device Manager, such as below:

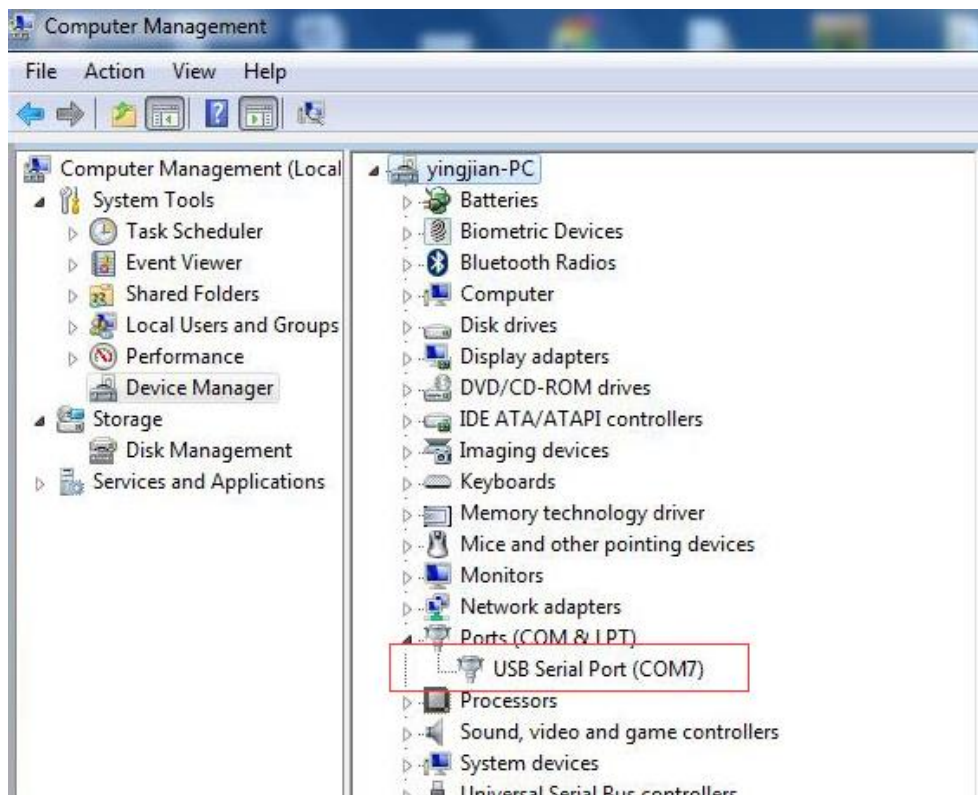


Figure 63: USB Serial Port

3. Install and then use the QCOM tool provided by Quectel to realize the communication between the smart module and the PC. The following figure shows the QCOM configuration: select correct “**COM port**” (USB Serial Port) and set correct “**Baudrate**” (such as 115200 bps). see **document [2]** for detailed information about QCOM tool usage and configuration,

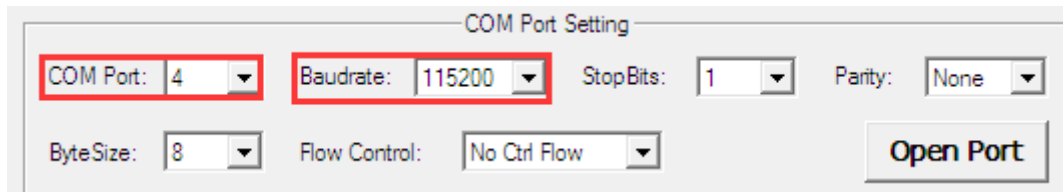


Figure 64: QCOM Configuration When Connecting USB Serial Port

5.5. Firmware Upgrade

Quectel Smart modules upgrade firmware via USB port by default. Please follow the procedures below to upgrade firmware.

1. Install and open the firmware upgrade tool QFIL on PC and then turn on the smart module according to the procedures mentioned in **Chapter 5.1**.
2. Click the “**Select Port**” and select the USB port “**Qualcomm HS-USB Android DIAG 901F (COM194)**”.
3. Select “**Flat Build**” in “Select Build Type” option.
4. Click “**Browse**” to select the firmware which needs to be upgraded in “**Select Programmer**” option.
5. Click “**Load XML**” to select the XML which needs to be upgraded in “**Select Build**” option.
6. Click “**Download**” to upgrade the firmware.
7. Select “**UFS**” for ‘Storage Type’.

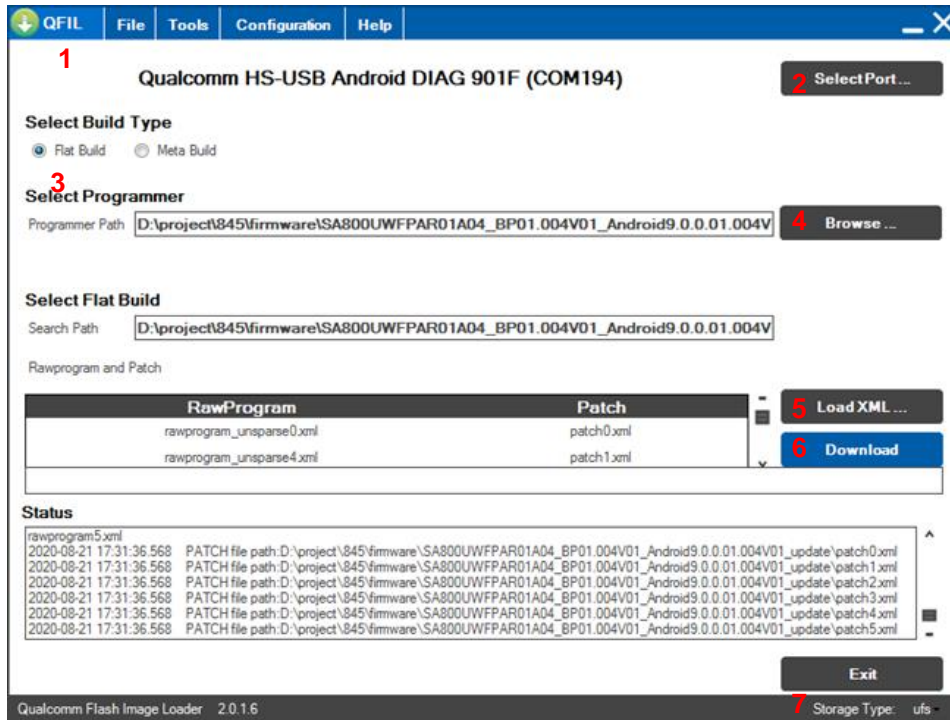


Figure 65: Firmware Upgrade Steps

6 Appendix References

Table 26: Related Documents

Document Name
[1] Quectel_SA800U-WF_Hardware_Design
[2] Quectel_QCOM_User_Guide

Table 27: Terms and Abbreviations

Abbreviation	Description
ADC	Analog-to-Digital Converter
B2B	Board to Board
CAN	Controller Area Network
DP	DisplayPort
EVB	Evaluation Board
FCT	Facility Control Terminal
FPC	Flexible Printed Circuit
HD	High Definition
HDMI	High Definition Multimedia Interface
LCD	Liquid Crystal Display
LCM	LCD Module
LED	Light Emitting Diode
M.2	Next Generation Form Factor
MEMS	Micro-Electro-Mechanical System

MIC	Microphone
MIPI	Mobile Industry Processor Interface
OTG	On-The-Go
PC	Personal Computer
PWM	Pulse Width Modulation
RF	Radio Frequency
RTC	Real-time clock
SD	Secure Digital Memory Card
SPI	Serial Peripheral Interface
TOF	Time of Flight
TP	Touch Panel
UFS	Universal Flash Storage
USB	Universal Serial Bus
(U)SIM	(Universal) Subscriber Identity Module
