SG368Z Series EVB User Guide

Smart Module Series

Version: 1.0

Date: 2023-07-28

Status: Released

At Quectel, our aim is to provide timely and comprehensive services to our customers. If you require any assistance, please contact our headquarters:

Quectel Wireless Solutions Co., Ltd.
Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China
Tel: +86 21 5108 6236
Email: info@quectel.com

Or our local offices. For more information, please visit:
http://www.quectel.com/support/sales.htm.

For technical support, or to report documentation errors, please visit:
http://www.quectel.com/support/technical.htm.
Or email us at: support@quectel.com.

Legal Notices

We offer information as a service to you. The provided information is based on your requirements and we make every effort to ensure its quality. You agree that you are responsible for using independent analysis and evaluation in designing intended products, and we provide reference designs for illustrative purposes only. Before using any hardware, software or service guided by this document, please read this notice carefully. Even though we employ commercially reasonable efforts to provide the best possible experience, you hereby acknowledge and agree that this document and related services hereunder are provided to you on an “as available” basis. We may revise or restate this document from time to time at our sole discretion without any prior notice to you.

Use and Disclosure Restrictions

License Agreements

Documents and information provided by us shall be kept confidential, unless specific permission is granted. They shall not be accessed or used for any purpose except as expressly provided herein.

Copyright

Our and third-party products hereunder may contain copyrighted material. Such copyrighted material shall not be copied, reproduced, distributed, merged, published, translated, or modified without prior written consent. We and the third party have exclusive rights over copyrighted material. No license shall be granted or conveyed under any patents, copyrights, trademarks, or service mark rights. To avoid ambiguities, purchasing in any form cannot be deemed as granting a license other than the normal non-exclusive, royalty-free license to use the material. We reserve the right to take legal action for noncompliance with abovementioned requirements, unauthorized use, or other illegal or malicious use of the material.

Trademarks

Except as otherwise set forth herein, nothing in this document shall be construed as conferring any rights to use any trademark, trade name or name, abbreviation, or counterfeit product thereof owned by Quectel or any third party in advertising, publicity, or other aspects.

Third-Party Rights

This document may refer to hardware, software and/or documentation owned by one or more third parties ("third-party materials"). Use of such third-party materials shall be governed by all restrictions and obligations applicable thereto.

We make no warranty or representation, either express or implied, regarding the third-party materials, including but not limited to any implied or statutory, warranties of merchantability or fitness for a particular purpose, quiet enjoyment, system integration, information accuracy, and non-infringement of any third-party intellectual property rights with regard to the licensed technology or use thereof. Nothing herein constitutes a representation or warranty by us to either develop, enhance, modify, distribute, market, sell, offer for sale, or otherwise maintain production of any our products or any other hardware, software, device, tool, information, or product. We moreover disclaim any and all warranties arising from the course of dealing or usage of trade.

Privacy Policy

To implement module functionality, certain device data are uploaded to Quectel's or third-party's servers, including carriers, chipset suppliers or customer-designated servers. Quectel, strictly abiding by the relevant laws and regulations, shall retain, use, disclose or otherwise process relevant data for the purpose of performing the service only or as permitted by applicable laws. Before data interaction with third parties, please be informed of their privacy and data security policy.

Disclaimer

a) We acknowledge no liability for any injury or damage arising from the reliance upon the information.
b) We shall bear no liability resulting from any inaccuracies or omissions, or from the use of the information contained herein.
c) While we have made every effort to ensure that the functions and features under development are free from errors, it is possible that they could contain errors, inaccuracies, and omissions. Unless otherwise provided by valid agreement, we make no warranties of any kind, either implied or express, and exclude all liability for any loss or damage suffered in connection with the use of features and functions under development, to the maximum extent permitted by law, regardless of whether such loss or damage may have been foreseeable.
d) We are not responsible for the accessibility, safety, accuracy, availability, legality, or completeness of information, advertising, commercial offers, products, services, and materials on third-party websites and third-party resources.

Copyright © Quectel Wireless Solutions Co., Ltd. 2023. All rights reserved.

Safety Information

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

	Full attention must be paid to driving at all times in order to reduce the risk of an accident. Using a mobile while driving (even with a handsfree kit) causes distraction and can lead to an accident. Please comply with laws and regulations restricting the use of wireless devices while driving.
	Switch off the 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
-	2023-06-16	Gibert FAN	Creation of the document
1.0	2023-07-28	Gibert FAN	First official release

Contents

Safety Information **3**
About the Document **4**
Contents **5**
Table Index **7**
Figure Index **8**

1 Introduction **9**
1.1. Applicable Module 9
1.2. Special Mark 9

2 Product Overview **10**
2.1. Top and Bottom Views 10
2.2. Component Placement 12

3 Kit Accessories & Assembly **16**
3.1. Accessories Assembly 16
3.2. Accessories List 17

4 Application Interfaces **19**
4.1. Power Supply 19
4.2. Module TE-A Interfaces 20
4.3. USB Interfaces 22
4.4. Camera Interfaces 23
4.5. Video Output Interfaces 24
4.5.1. eDP Interface 24
4.5.2. HDMI Interface 25
4.5.3. LCM and LVDS Interfaces 25
4.6. Audio Interfaces 26
4.7. SD Card Interface 28
4.8. SATA Interfaces 28
4.9. M.2 Interfaces 30
4.10. (U)SIM Card Interfaces 31
4.11. Ethernet Interfaces 31
4.12. 4G Module Interface 32
4.13. Status Indication LED 33
4.14. Push Button and Switches 33
4.15. Test Points 34

5 Operation Procedures **39**
5.1. Turn On the Module 39
5.2. Turn Off and Reset the Module 40
5.3. Communication Via USB 40
5.4. Firmware Upgrade 40

6 Appendix References 41

Table Index

Table 1: Special Mark 9
Table 2: Components & Functions 13
Table 3: Accessories List 18
Table 4: Description of Power Supply 19
Table 5: Description of Module TE-A Interfaces 20
Table 6: Description of USB Interfaces 22
Table 7: Description of Camera Interfaces 23
Table 8: Description of Video Output Interfaces 24
Table 9: Description of Audio Interfaces 27
Table 10: Description of SD Card Interface 28
Table 11: Description of SATA Interfaces 28
Table 12: Description of M.2 Interfaces 30
Table 13: Description of (U)SIM Card Interfaces 31
Table 14: Description of Ethernet Interfaces 31
Table 15: Description of 4G Module Interface 32
Table 16: Description of Status Indication LED 33
Table 17: Description of Button and Switches 34
Table 18: Pin Description of J1601 Test Point 34
Table 19: Pin Description of J1505 Test Point 35
Table 20: Pin Description of TP1503 and TP1504 Test Points 36
Table 21: Pin Description of J1701 Test Point 36
Table 22: Pin Description of J1702 Test Point 37
Table 23: Related Documents 41
Table 24: Terms and Abbreviations 41

Figure Index

Figure 1: Top View 10
Figure 2: Bottom View 11
Figure 3: Top View for Component Placement 12
Figure 4: Bottom View for Component Placement 13
Figure 5: EVB and Accessories Assembly 16
Figure 6: EVB Kit Accessories 17
Figure 7: Block Diagram of EVB Power Supply 20
Figure 8: EVB Power Supply Interface and Switch 20
Figure 9: Connection Between the Module TE-A and EVB 21
Figure 10: Module TE-A Interfaces 21
Figure 11: Block Diagram of USB Interfaces 22
Figure 12: USB Interfaces 23
Figure 13: Camera Interfaces 23
Figure 14: eDP Interface 24
Figure 15: HDMI Interface 25
Figure 16: LCM, LVDS and TP Interfaces 26
Figure 17: Block Diagram of Loudspeaker Application 27
Figure 18: Audio Interfaces 27
Figure 19: SD Card Interface 28
Figure 20: Connection Between SATA Interfaces and the Module 29
Figure 21: SATA interfaces 29
Figure 22: Connection Between M.2 Interfaces and the Modules 30
Figure 23: M.2 Interfaces 30
Figure 24: (U)SIM Card Interfaces 31
Figure 25: RJ45 Ethernet Interfaces 32
Figure 26: Block Diagram of 4G Module Connection 32
Figure 27: 4G Module Interface 33
Figure 28: Power Supply On/Off Indicator 33
Figure 29: Push Button and Switches 34
Figure 30: J1601 Test Point 35
Figure 31: J1505 Test Point 35
Figure 32: TP1503 and TP1504 Test Points 36
Figure 33: J1701 and J1702 Test Points 38
Figure 34: USB Ports 39
Figure 35: COM Port Setting Field on QCOM 40

1 Introduction

This document describes the application details of SG368Z Series EVB (evaluation board), which is an assistant tool for you to develop applications and test basic functionalities of SG368Z series module.

1.1. Applicable Module

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

1.2. 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

2.1. Top and Bottom Views

The EVB size is 110 mm × 160 mm, and the top and bottom views are shown as below:

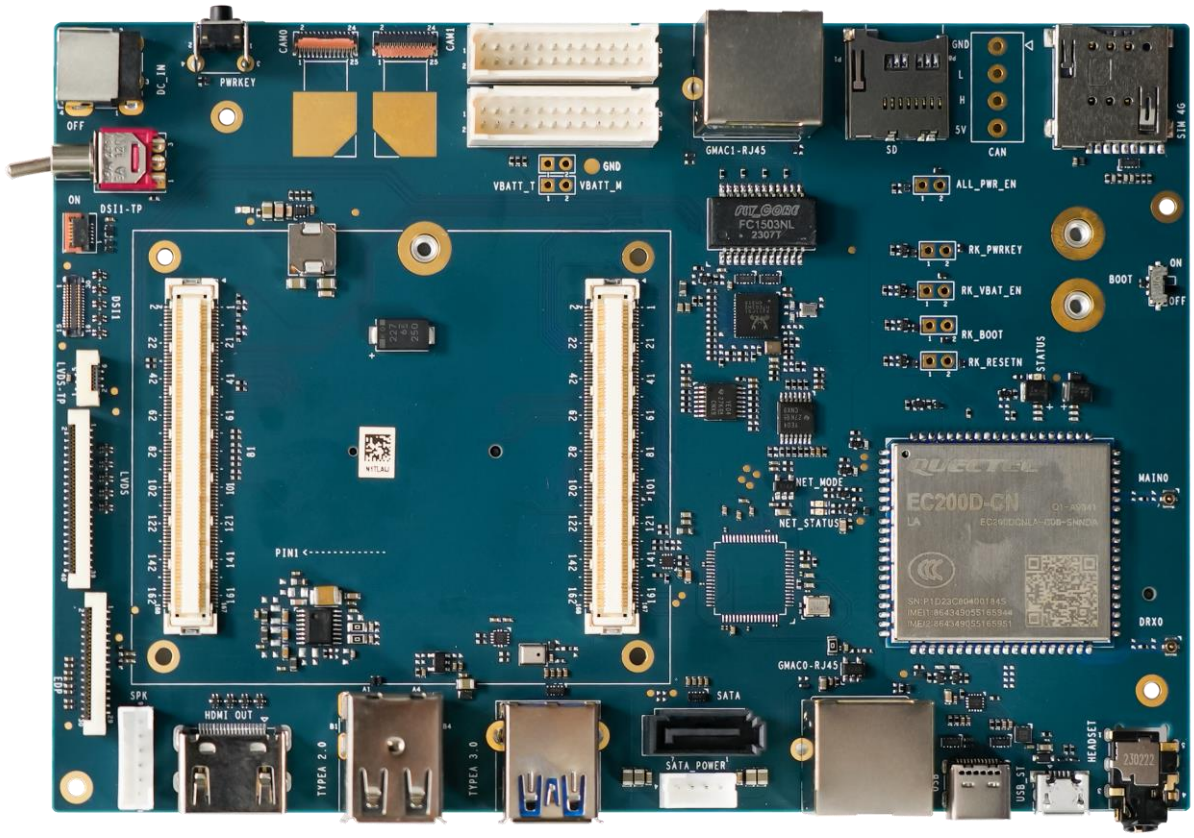

Figure 1: Top View

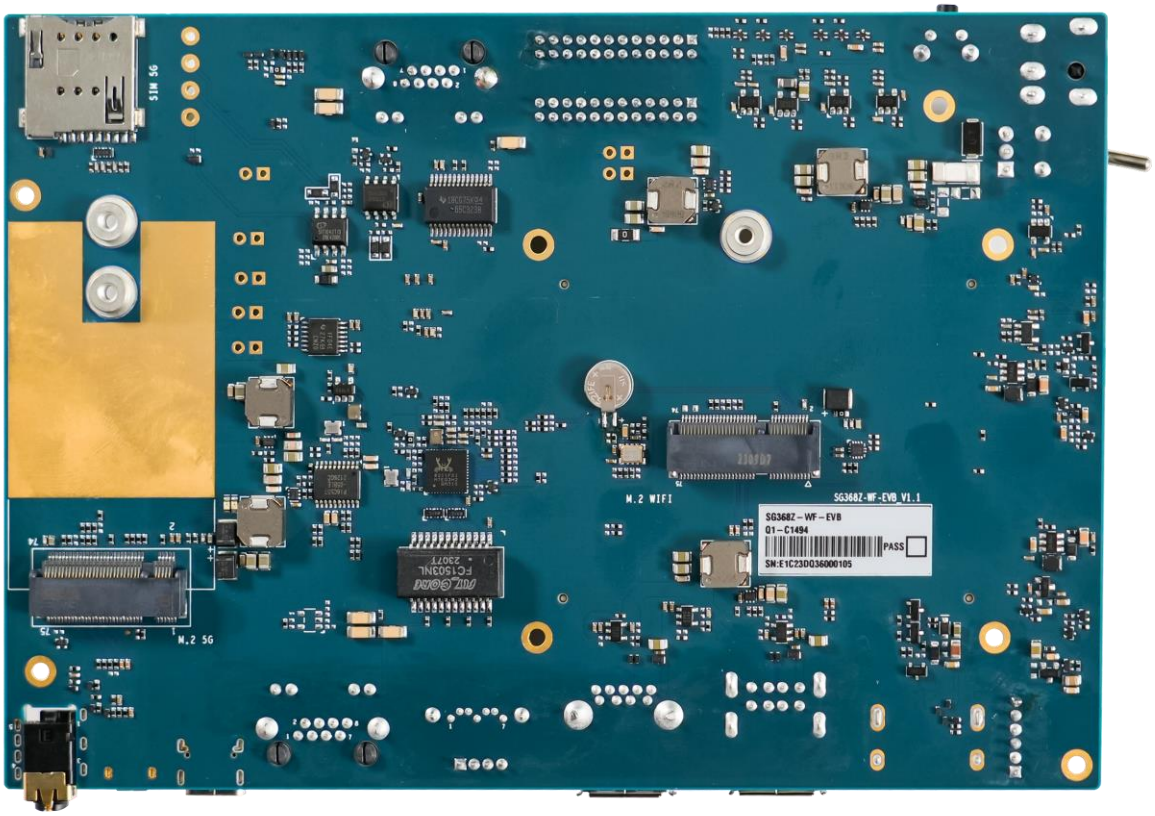

Figure 2: Bottom View

2.2. Component Placement

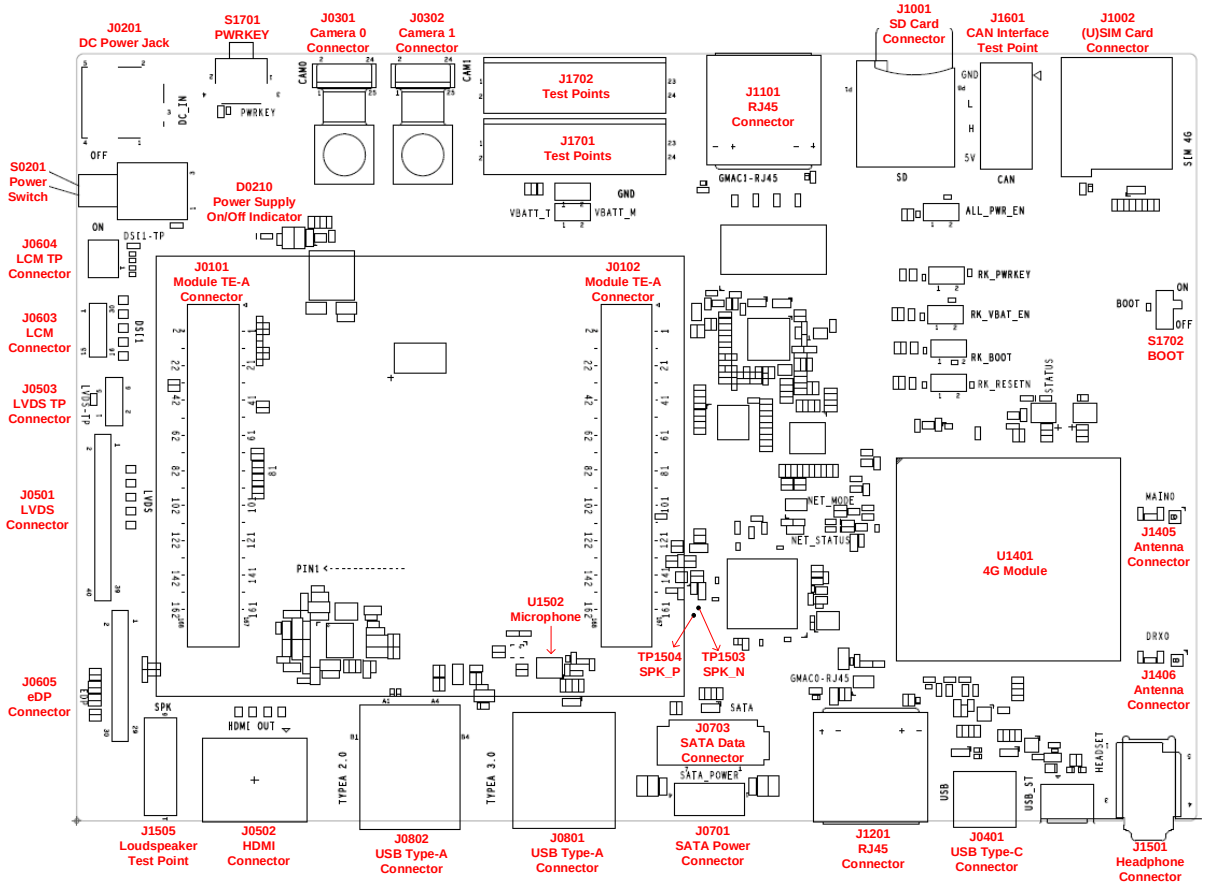

Figure 3: Top View for Component Placement

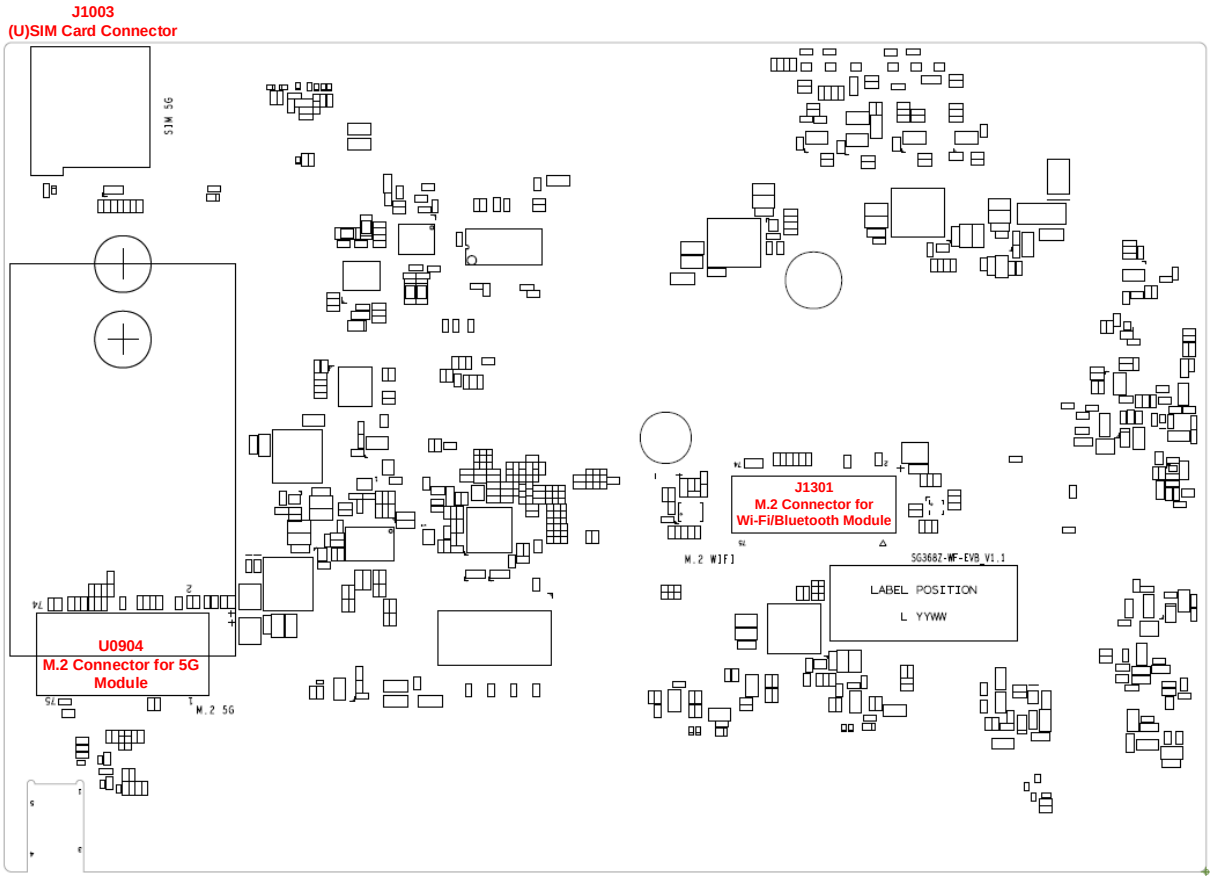

Figure 4: Bottom View for Component Placement

Table 2: Components & Functions

Component	RefDes.	Description	Comment
Module TE-A Interfaces	J0101, J0102	Module TE-A connectors	Connect Module TE-A and EVB
Power Supply	J0201	DC power jack	DC power supply: 12 V/5 A
Power Switch	S0201	Power on/off control	When the switch is turned to "**ON**", the EVB power supply is connected; When the switch is turned to "**OFF**", the EVB power supply is disconnected.
Status Indication LED	D0210	Power supply on/off indicator	12 V power input; Red light
Camera Interfaces	J0301	Camera 0 connector	2-lane CSI, supports 8 MP
	J0302	Camera 1 connector	2-lane CSI, supports 8 MP
LVDS Interface	J0501	LVDS connector	● 4-lane LVDS (MIPI DSI0) ● Supports up to 1280 × 800 @ 60 fps output resolution

LVDS TP Interface	J0503	LVDS TP connector	-
HDMI Interface	J0502	HDMI connector	● HDMI 2.0 ● Supports up to 4096 × 2160 @ 60 fps output resolution
LCM Interface	J0603	LCM connector	● 4-lane MIPI DSI ● Supports up to 1920 × 1080 @ 60 fps output resolution (LCM in EVB kit only supports 1280 × 720 @ 60 fps)
LCM TP Interface	J0604	LCM TP connector	-
eDP Interface	J0605	eDP connector	● Supports eDP V1.3 and 4-lane eDP ● Supports up to 2560 × 1600 @ 60 fps output resolution ● Supports up to 2.7 Gbps/lane data rate ● Supports 1-lane or 2-lane or 4-lane mode ● Supports AUX channel, with up to 1 Mbps rate
SATA Interfaces	J0703	SATA data connector	Supports SATA 3.0
	J0701	SATA power connector	Supply power for SATA
USB Interfaces	J0801	USB Type-A connector	● USB1 ● Supports USB 2.0/3.0 ● Only supports Host mode
	J0802	USB Type-A connector	● Double-layer, the upper layer is USB2 and the lower layer is USB3 ● Only supports USB 2.0 ● Only supports Host mode
	J0401	USB Type-C connector	● USB0 ● Supports USB 2.0/3.0 ● Supports USB OTG, Host and Device modes ● Used for AT command communication, data transmission, software debugging, firmware upgrade (can only be implemented through USB 2.0)
M.2 Interfaces	U0904	M.2 connector for 5G module	Connects 5G module
	J1301	M.2 connector for Wi-Fi/Bluetooth module	Connects Wi-Fi/Bluetooth module (Only SG368Z-AP supports)
(U)SIM Card Interfaces	J1002	(U)SIM card connector	4G module (U)SIM card
	J1003	(U)SIM card connector	5G module (U)SIM card
SD Card Interface	J1001	SD card connector	● Supports SD 3.0 ● Supports 1.8/3.3 V SD card ● Supports SD card hot-plug function
Ethernet Interfaces	J1101	RJ45 connector	Supports 10/100/1000 Mbps data rate

	J1201	RJ45 connector	Supports 10/100/1000 Mbps data rate (Only SG368Z-AP supports)
4G Module Interface	U1401	4G module	Supports EC200D-CN by default
Antenna Interfaces	J1405	Antenna connector	Main antenna of 4G module
	J1406	Antenna connector	Diversity antenna of 4G module
Audio Interfaces	U1502	Microphone	1 single-ended microphone input
	J1501	Headset connector	● Supports 4-pole headset, with detection pin ● Supports hot-plug function ● Supports MIC input
PWRKEY	S1701	● Power key (push button) ● Turns on/off the module	Active low
BOOT	S1702	Module firmware upgrade switch	Before turning on the module, switch it to "**ON**" to enable the firmware upgrade mode
Test points	J1505	Loudspeaker test point	1 differential loudspeaker output
	TP1503, TP1504	Loudspeaker test points	1 differential loudspeaker output
	J1601	CAN interface test point	Supports 3-lane CAN (multiplexed from other function pins)
	J1701	Other test point	-
	J1702	Other test point	-

3 Kit Accessories & Assembly

3.1. Accessories Assembly

Figure 5: EVB and Accessories Assembly

3.2. Accessories List

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

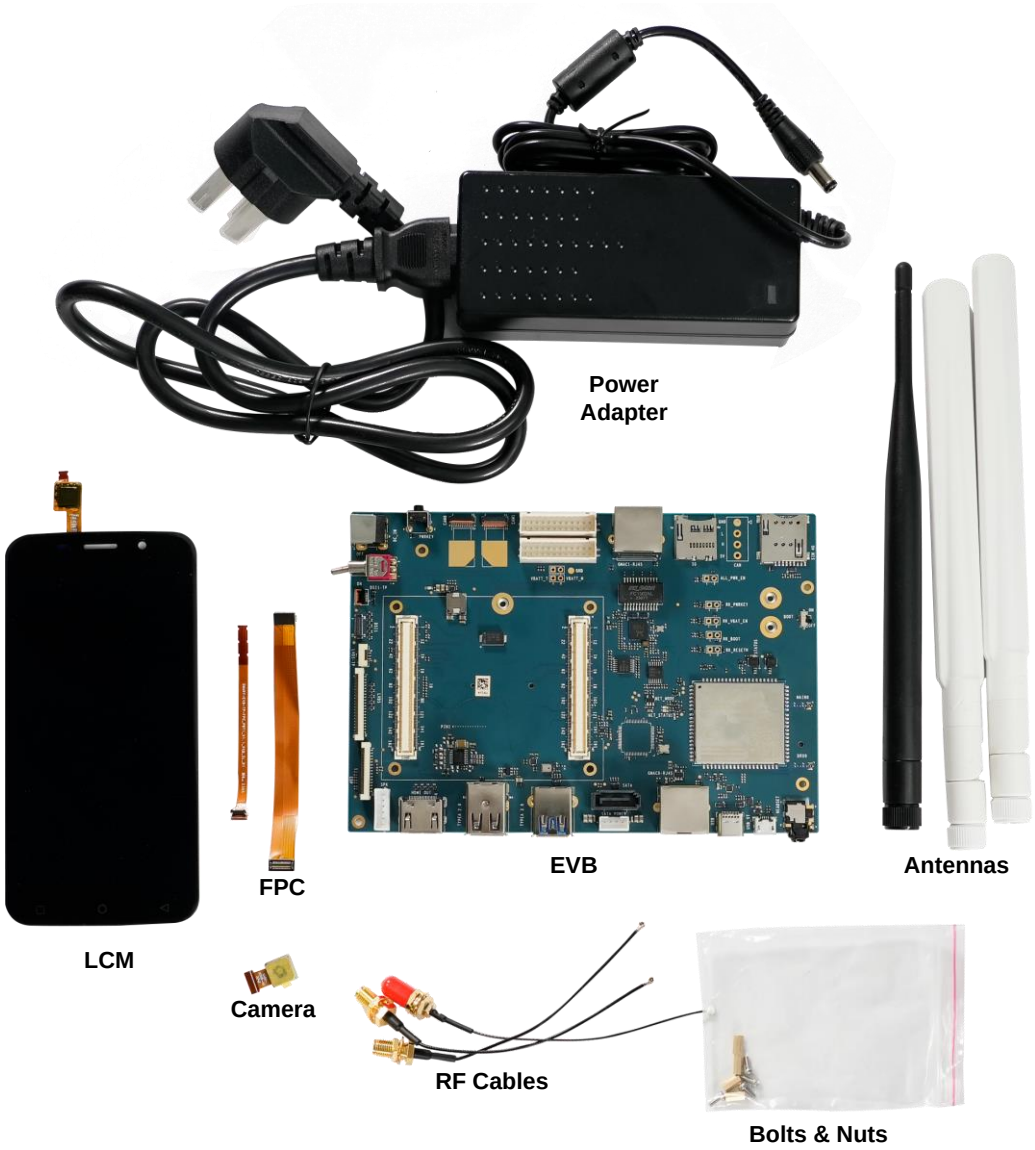

Figure 6: EVB Kit Accessories

Table 3: Accessories List

Item	Description	Quantity (pcs)
EVB	SG368Z series EVB	1
Antennas	Wi-Fi/Bluetooth antenna and 4G antennas	3
Cables	RF cables	3
Power adapter	12 V/ 5 A	1
LCD	LCM	1
Camera	8 MP camera	1
FPC	LCD related FPC	2
Bolts and nuts	Used for assembling the EVB	8

4 Application Interfaces

This chapter describes the hardware interfaces of the EVB, as listed below:

- Power supply
- Module TE-A interfaces
- USB interfaces
- Camera interfaces
- Video output interfaces
  - eDP interface
  - HDMI interface
  - LCM and LVDS interfaces
- Audio interfaces
- SD Card interface
- SATA interfaces
- M.2 interfaces
- (U)SIM card interfaces
- Ethernet interfaces
- 4G module interface
- Status indication LED
- Button and switches
- Test points

4.1. Power Supply

The EVB can be powered by an external 12 V DC power adapter. Insert the power adapter into J0201 DC power jack, and switch S0201 to "**ON**", then reduce the voltage through DC-DC and LDO to supply power for EVB peripherals and modules.

Table 4: Description of Power Supply

RefDes.	Description
J0201	DC power jack
S0201	Power on/off control

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

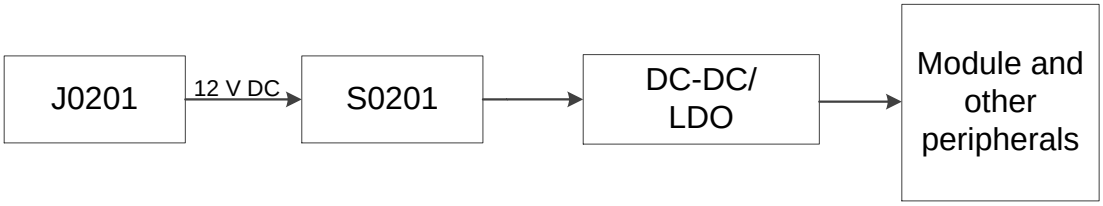

Figure 7: Block Diagram of EVB Power Supply

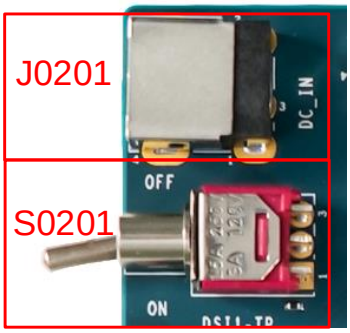

Figure 8: EVB Power Supply Interface and Switch

4.2. Module TE-A Interfaces

Module TE-A interfaces are designed to accommodate the TE-A of SG368Z series module. The TE-A is connected to the EVB via BTB connectors J0101 and J0102. You can test the functionalities of the module easily.

Table 5: Description of Module TE-A Interfaces

RefDes.	Description
J0101, J0102	Module TE-A connectors

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

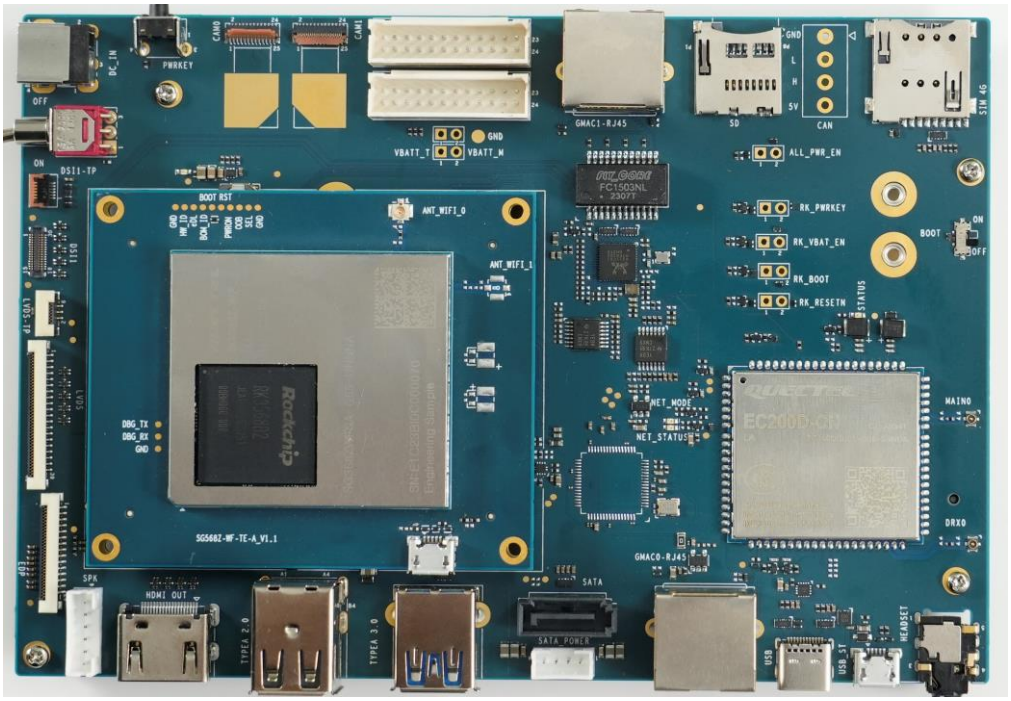

Figure 9: Connection Between the Module TE-A and EVB

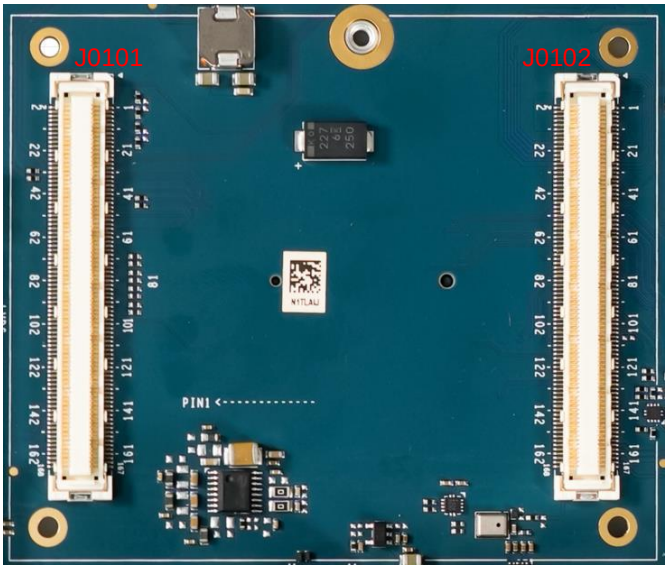

Figure 10: Module TE-A Interfaces

4.3. USB Interfaces

The EVB provides four USB interfaces. One of them is USB Type-C interface and three of them are USB Type-A interfaces.

- USB Type-C interface: USB 3.0 and USB 2.0 interface (USB0); Supports USB OTG, Host and Device modes; Used for AT command communication, data transmission, software debugging, firmware upgrade (can only be implemented through USB 2.0);
- USB Type-A interface: USB 3.0 and USB 2.0 interface (USB1); Only supports Host mode;
- USB Type-A interface: USB 2.0 interface (USB2 and USB3); Only supports Host mode.

USB 3.0 supports SuperSpeed mode and the data rate is up to 5 Gbps; USB 2.0 supports high-speed mode and the data rate is up to 480 Mbps.

Table 6: Description of USB Interfaces

RefDes.	Description
J0401	USB Type-C connector
J0801	USB Type-A connector
J0802	USB Type-A connector

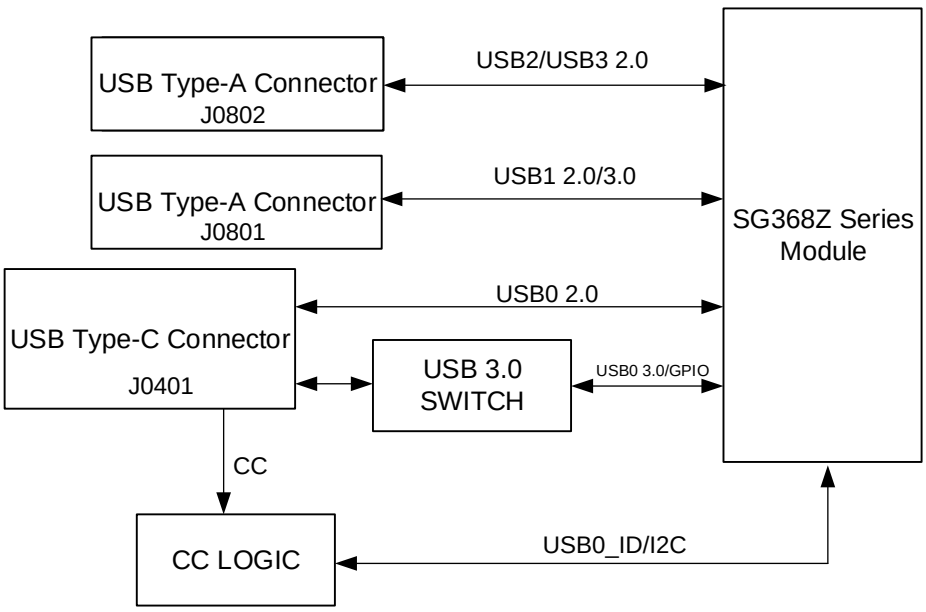

Figure 11: Block Diagram of USB Interfaces

Figure 12: USB Interfaces

4.4. Camera Interfaces

The EVB provides two camera interfaces, both of which are 2-lane CSI with up to 8 MP pixel.

Table 7: Description of Camera Interfaces

RefDes.	Description
J0301	Camera 0 connector
J0302	Camera 1 connector

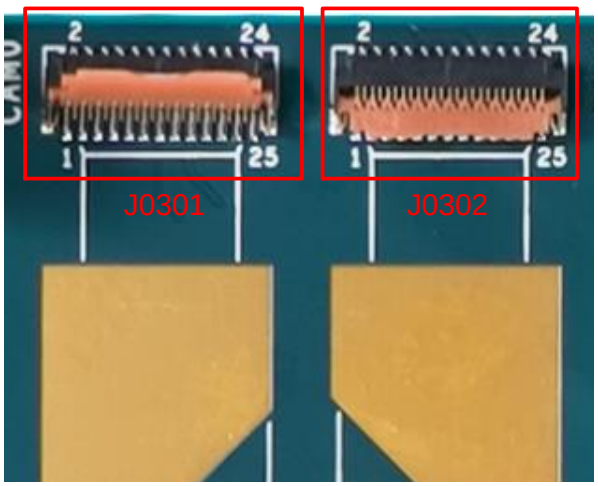

Figure 13: Camera Interfaces

4.5. Video Output Interfaces

The EVB provides four video output interfaces, including LCM, LVDS, eDP and HDMI interfaces. The EVB supports triple-screen display and the three screens can support different video signal.

Table 8: Description of Video Output Interfaces

RefDes.	Description
J0501	LVDS connector
J0502	HDMI connector
J0603	LCM connector
J0605	eDP connector

4.5.1. eDP Interface

The EVB supports eDP V1.3 and 4-lane eDP, with up to 2560 × 1600 @ 60 fps output resolution.

- Supports up to 2.7 Gbps/lane data rate
- Supports 1-lane or 2-lane or 4-lane mode
- Supports AUX channel, with up to 1 Mbps rate

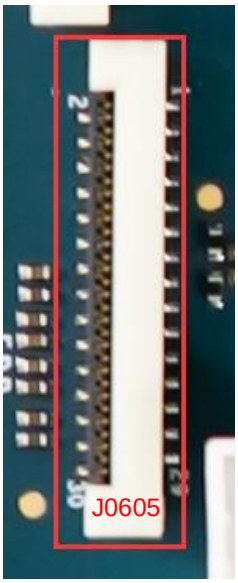

Figure 14: eDP Interface

4.5.2. HDMI Interface

EVB supports HDMI 2.0 and 3-lane HDMI, with up to 4096 × 2160 @ 60 fps output resolution.

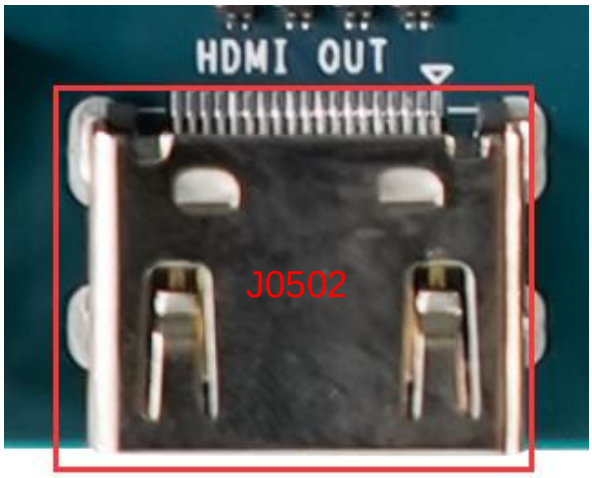

Figure 15: HDMI Interface

4.5.3. LCM and LVDS Interfaces

LCM interface is 4-lane MIPI DSI1 interface, and LVDS interface is multiplexed from 4-lane MIPI DSI0.

On the EVB, both LCM screen and LVDS screen are equipped with TP function. J0503 is LVDS TP connector and J0604 is LCM TP connector.

External backlight drive circuits should be added when using LCM and LVDS screens to adjust brightness.

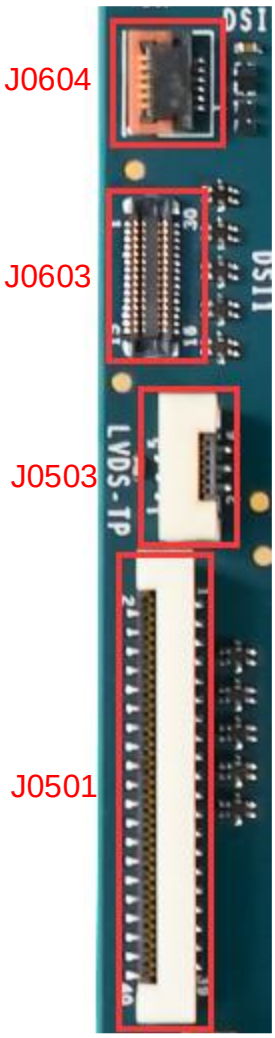

Figure 16: LCM, LVDS and TP Interfaces

4.6. Audio Interfaces

The EVB provides one headset interface, one microphone and two loudspeaker interfaces with Class D amplifiers.

- 1 differential microphone input channel can be divided into 2 single-ended microphone input channels. One is input through microphone U1502 and one is input through headset interface J1501.
- The headset interface J1501 features stereo left and right channel output, and headset insert detection function is supported.
- The loudspeaker interface uses the differential output. The output channel is available with a Class D amplifier whose maximum output power is 1.3 W when the load is 8 Ω. In addition, a Class D amplifier is used on the EVB to output a two-channel stereo loudspeaker signal and the maximum output power is 20 W when the load is 8 Ω.

Table 9: Description of Audio Interfaces

RefDes.	Description
U1502	Microphone
J1501	Headset connector
J1505	Loudspeaker test point
TP1503, TP1504	Loudspeaker test points

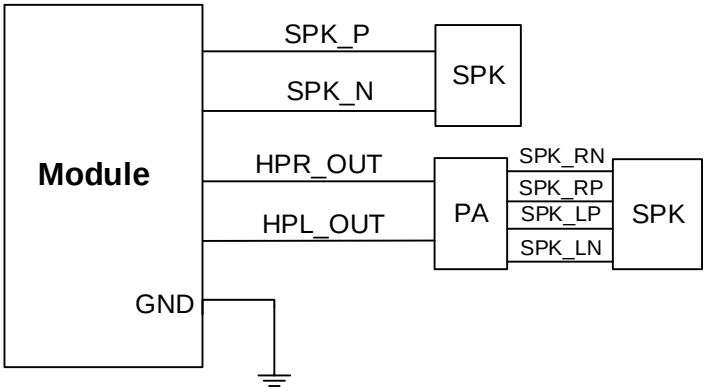

Figure 17: Block Diagram of Loudspeaker Application

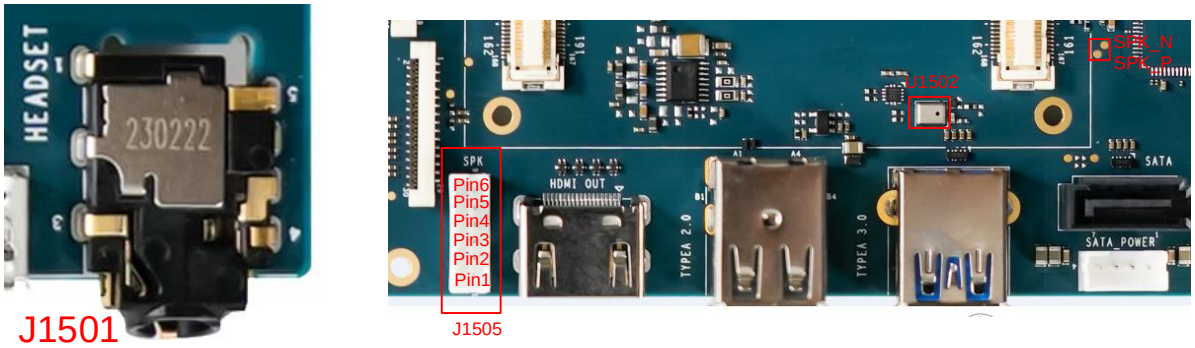

Figure 18: Audio Interfaces

4.7. SD Card Interface

The EVB provides one SD card interface, which complies with SD 3.0 specifications. The interface supports 1.8/3.3 V SD card and SD card hot-plug function.

Table 10: Description of SD Card Interface

RefDes.	Description
J1001	SD card connector

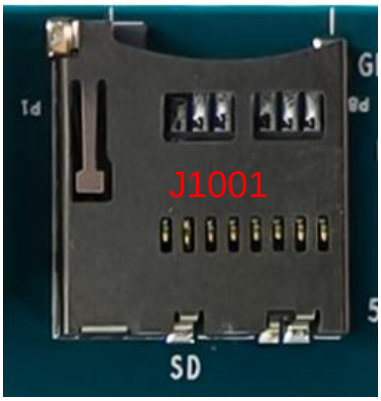

Figure 19: SD Card Interface

4.8. SATA Interfaces

The EVB supports SATA 3.0 and provides one SATA data connector and one SATA power connector.

Table 11: Description of SATA Interfaces

RefDes.	Description
J0703	SATA data connector
J0701	SATA power connector

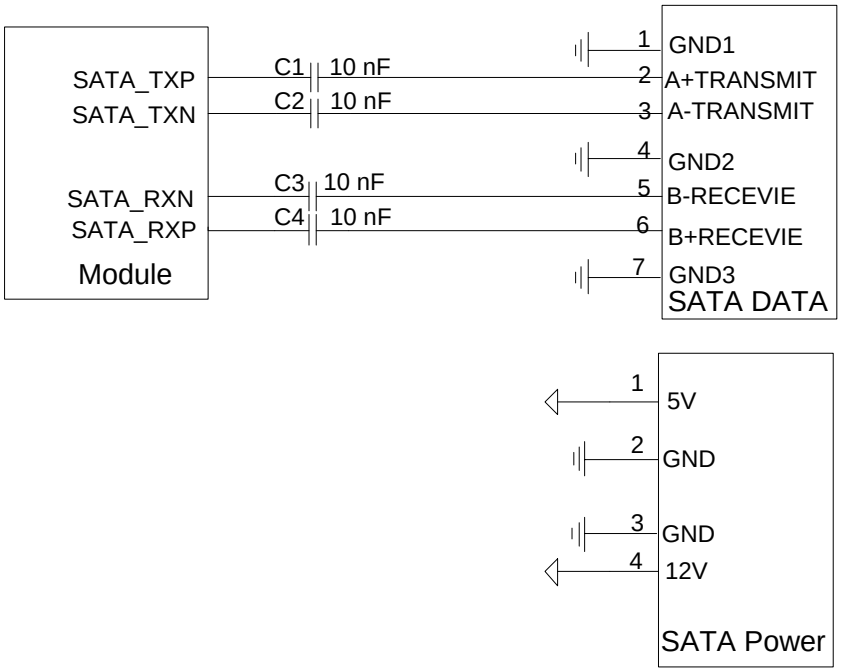

Figure 20: Connection Between SATA Interfaces and the Module

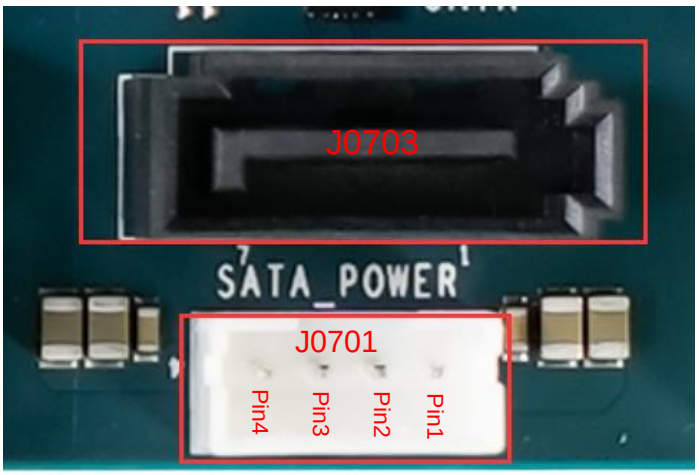

Figure 21: SATA interfaces

4.9. M.2 Interfaces

The EVB provides two M.2 interfaces, which connect 5G module and Wi-Fi/Bluetooth module respectively.

Table 12: Description of M.2 Interfaces

RefDes.	Description
U0904	M.2 connector for 5G module
J1301	M.2 connector for Wi-Fi/Bluetooth module

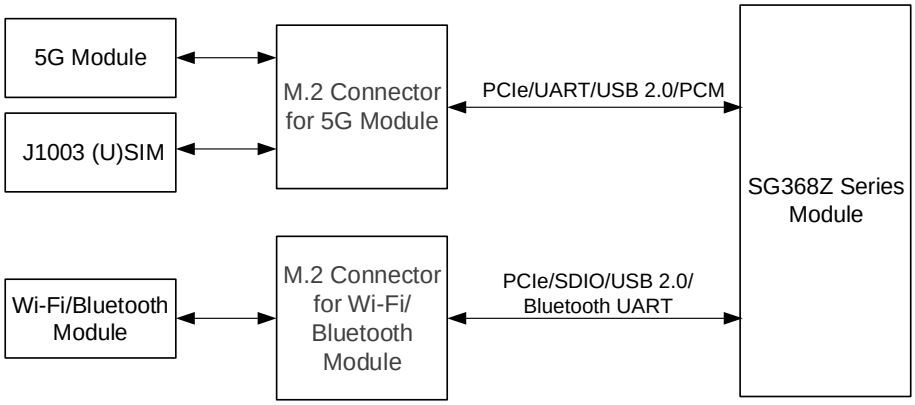

Figure 22: Connection Between M.2 Interfaces and the Modules

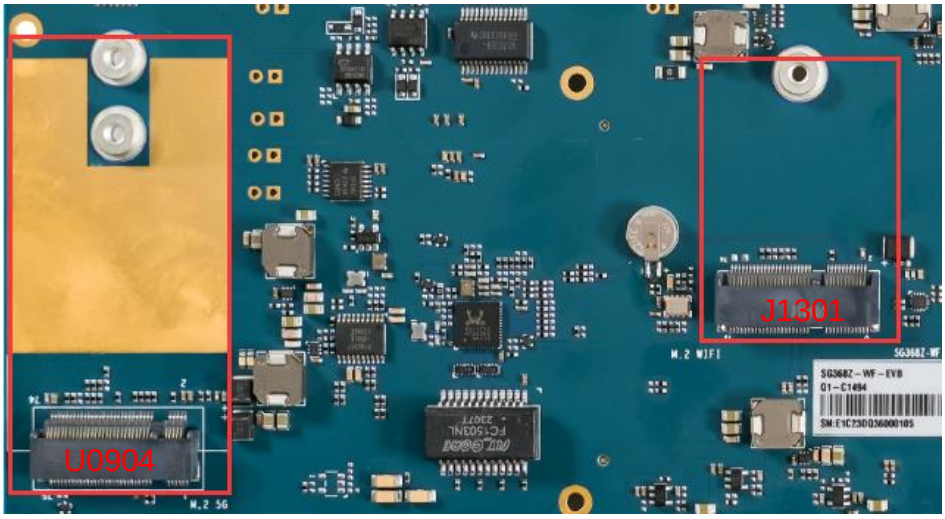

Figure 23: M.2 Interfaces

4.10. (U)SIM Card Interfaces

The EVB provides two (U)SIM card interfaces to respectively connect 4G module (U)SIM card and 5G module (U)SIM card.

Table 13: Description of (U)SIM Card Interfaces

RefDes.	Description
J1002	4G module (U)SIM card connector
J1003	5G module (U)SIM card connector

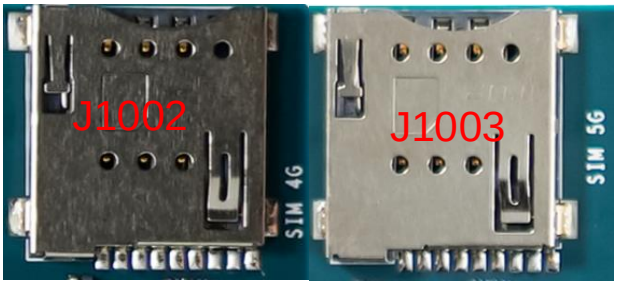

Figure 24: (U)SIM Card Interfaces

4.11. Ethernet Interfaces

The EVB provides two RJ45 Ethernet interfaces, which support dual Gigabit Ethernet connectivity. The module is externally connected to an RTL8211F-CG Ethernet PHY, which supports 10/100/1000 Mbps data rate. The RJ45 Ethernet Interfaces with isolation transformer and indication LED is used.

Table 14: Description of Ethernet Interfaces

RefDes.	Description
J1201	RJ45 connector
J1101	RJ45 connector

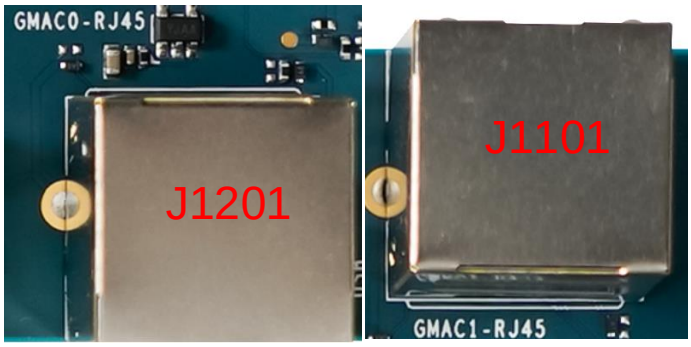

Figure 25: RJ45 Ethernet Interfaces

4.12. 4G Module Interface

The EVB provides one 4G module interface, which supports 4G antennas and (U)SIM card function.

Table 15: Description of 4G Module Interface

RefDes.	Description
U1401	4G module
J1405	Antenna connector (Main antenna of 4G module)
J1406	Antenna connector (Diversity antenna of 4G module)

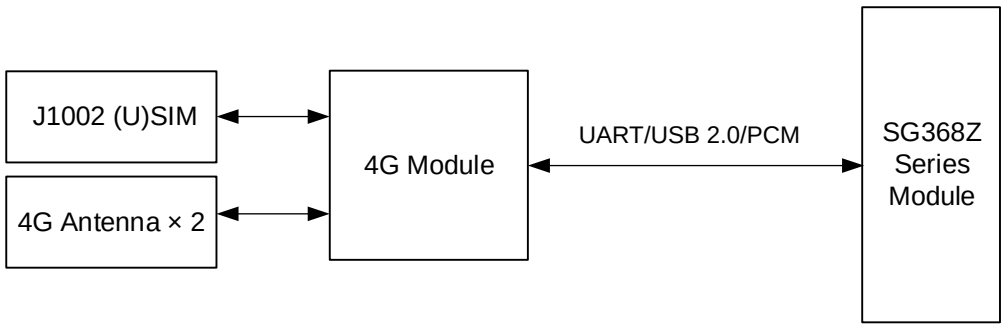

Figure 26: Block Diagram of 4G Module Connection

Figure 27: 4G Module Interface

4.13. Status Indication LED

The EVB provides one power supply on/off indicator D0210. When the indicator lights up with red light, the 12 V power supply is connected.

Table 16: Description of Status Indication LED

RefDes.	Description
D0210	Power supply on/off indicator

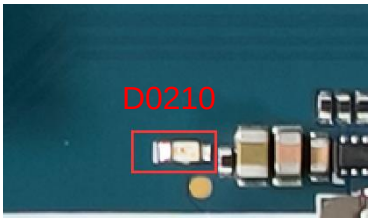

Figure 28: Power Supply On/Off Indicator

4.14. Push Button and Switches

The EVB provides a power key push button S1701 for turning on/off the SG368Z series module. Pressing PWRKEY for at least 200 ms after powering up can turn on the module. After the module is turned on, pressing PWRKEY for at least 6 s can turn off the module.

The EVB provides a power switch and a BOOT switch. The power switch S0201 is used for power on/off control. When the switch is turned to "**ON**", the EVB power supply is connected; When the switch is turned to "**OFF**", the EVB power supply is disconnected. The BOOT switch S1702 is used to make the module enter firmware upgrade mode. Before turning on the module, switch it to the "**ON**" side to enable the firmware upgrade mode.

Table 17: Description of Button and Switches

RefDes.	Description
S0201	Power on/off control
S1701	● Power key (push button) ● Turns on/off the module
S1702	Module firmware upgrade switch

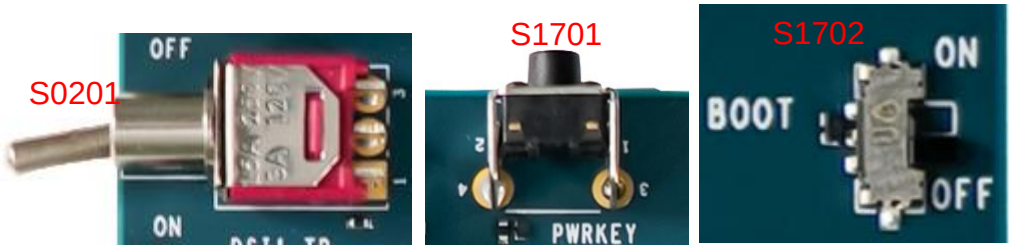

Figure 29: Push Button and Switches

4.15. Test Points

The EVB provides test points for you to test waveforms of some signals, as shown below:

Table 18: Pin Description of J1601 Test Point

Pin No.	Pin Name	Description
1	GND	Ground
2	CANL	Low potential CAN voltage input and output
3	CANH	High potential CAN voltage input and output
4	+5V	5 V power supply

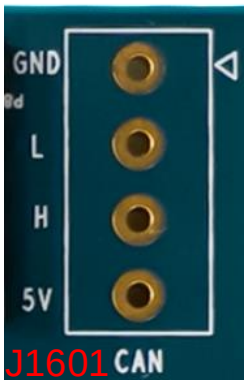

Figure 30: J1601 Test Point

Table 19: Pin Description of J1505 Test Point

Pin No.	Pin Name	Description
1	SPK_OUT_RN	Loudspeaker right channel output (-)
2	SPK_OUT_RP	Loudspeaker right channel output (+)
3	GND	Ground
4	SPK_OUT_LP	Loudspeaker left channel output (+)
5	SPK_OUT_LN	Loudspeaker left channel output (-)
6	GND	Ground

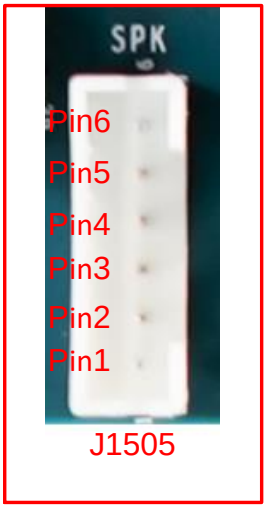

Figure 31: J1505 Test Point

Table 20: Pin Description of TP1503 and TP1504 Test Points

RefDes.	Pin Name	Description
TP1503	SPK_N	Loudspeaker output (-)
TP1504	SPK_P	Loudspeaker output (+)

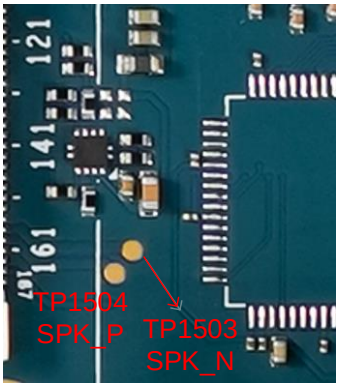

Figure 32: TP1503 and TP1504 Test Points

Table 21: Pin Description of J1701 Test Point

Pin No.	Pin Name	Module Pin No.	Description
1	PDM_SDI3_M0	243	SG368Z series module wakes up 5G module
2	NC	-	Not connected
3	PDM_SDI2_M0	248	LVDS TP reset
4	NC	-	Not connected
5	PDM_SDI1_M0	253	LVDS TP interrupt
6	GND	-	Ground
7	PDM_CLK_M0	258	5G module airplane control
8	RS232_TXD	-	RS232 transmit
9	VCC_3V3	-	3.3 V power supply
10	RS232_RXD	-	RS232 receive

11	GND	-	Ground
12	RS485_B	-	RS485 receiver inverting input and driver inverting output
13	V_DOWN	232	Volume down, active low
14	RS485_A	-	RS485 receiver in-phase input and driver in-phase output
15	ESC	227	Esc, active low
16	MENU	222	Menu, active low
17	GND	-	Ground
18	GND	-	Ground
19	UART2_TX_DEBUG	374	SG368Z series module debug UART transmit
20	RESETn	231	SG368Z series module reset
21	UART2_RX_DEBUG	378	SG368Z series module debug UART receive
22	eDL*	-	Reserved
23	VCC_1V8	-	1.8 V power supply
24	VCC5V0_SYS	-	5 V power supply

Table 22: Pin Description of J1702 Test Point

Pin No.	Pin Name	Module Pin No.	Description
1	GND	-	Ground
2	GND	-	Ground
3	SARADC_VIN4	233	General-purpose ADC interface
4	PON_1*	221	LOW to HIGH indicates SG368Z series module power on
5	SARADC_VIN6	223	General-purpose ADC interface
6	VBATT	-	1.08 V voltage, after divider resistance
7	SARADC_VIN7	213	General-purpose ADC interface
8	GPIO0_C1	50	General-purpose input/output

9	SARADC_VIN5	228	General-purpose ADC interface
10	NC	-	Not connected
11	12C3_SDA	268	12C3 serial data
12	VCCIO4	180	1.8 V output power
13	I2C3_SCL	273	12C3 serial clock
14	NC	-	Not connected
15	GND	-	Ground
16	GND	-	Ground
17	I2C1_SCL_TP	45	I2C1 serial clock
18	UART_TOOL_TX*	-	Reserved
19	I2C1_SDA_TP	40	I2C1 serial data
20	UART_TOOL_RX*	-	Reserved
21	NC	-	Not connected
22	UART8_RX	357	UART8 receive
23	NC	-	Not connected
24	UART8_TX	361	UART8 transmit

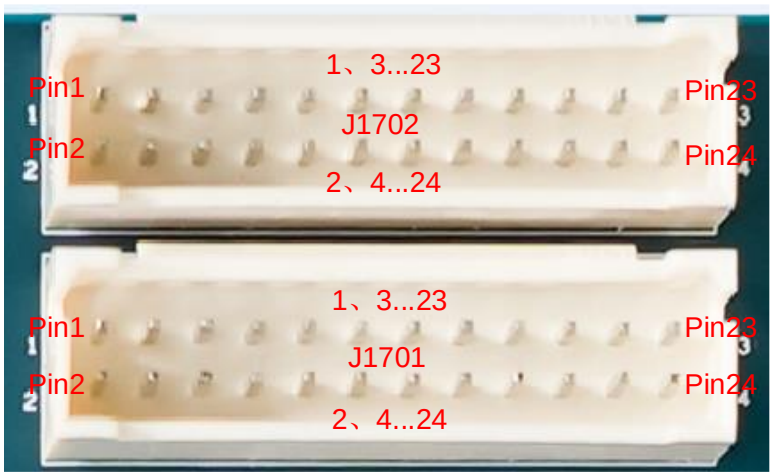

Figure 33: J1701 and J1702 Test Points

5 Operation Procedures

5.1. Turn On the Module

1. Connect the module TE-A to the EVB via BTB connectors.
2. Connect the EVB and a PC with a USB Type-A to Type-C cable.
3. Connect the EVB to a 12 V DC power, then switch S0201 to "**ON**".
4. When D0210 (Power supply on/off indicator) lights up, press PWRKEY for at least 200 ms.
5. Run the driver disk on the PC to install the USB driver provided by Quectel. The USB port numbers can be viewed in Device Manager of the PC when the USB driver is installed, as shown in the following figure, which indicates that the module is turned on.

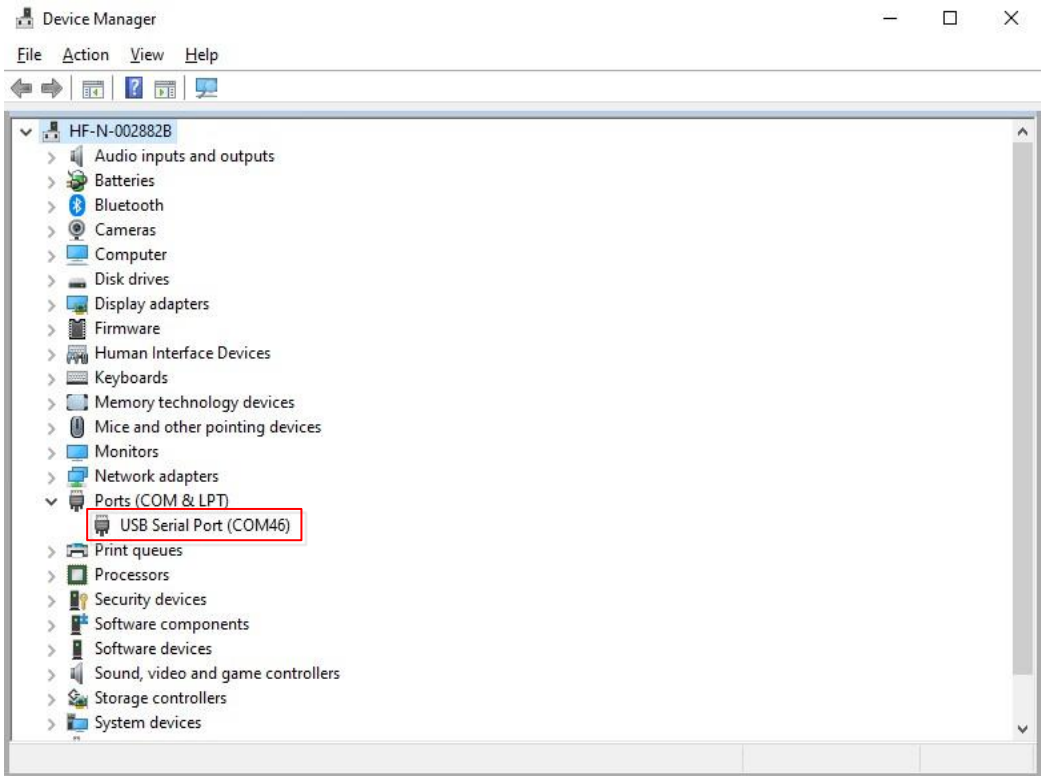

Figure 34: USB Ports

5.2. Turn Off and Reset the Module

After the module is turned on, press PWRKEY for at least 6 s, then the module will be turned off. Pull down RESETn for at least 100 ms, then the module will be reset.

5.3. Communication Via USB

1. Turn on the module according to the procedures in ***Chapter 5.1***.
2. Install and then use QCOM provided by Quectel to achieve the communication between the module and the PC.
3. Select the correct "**COM Port**" (USB Serial Port, which is shown in ***Figure 34***) and set correct "**Baudrate**" (115200 bps by default). For more details about QCOM usage and configuration, see ***document [2]***.

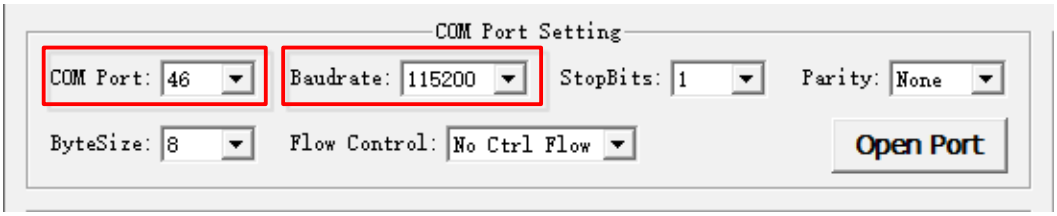

Figure 35: COM Port Setting Field on QCOM

5.4. Firmware Upgrade

Before turning on the module, switch BOOT to "**ON**", then the module will enter firmware upgrade mode.

6 Appendix References

Table 23: Related Documents

Document Name
[1] Quectel_List_of_EVB_Applicable_Modules
[2] Quectel_QCOM_User_Guide

Table 24: Terms and Abbreviations

Abbreviation	Description
BTB	Board to Board
CAN	Controller Area Network
COM	Communication Port
DC	Direct Current
DI	Digital Input
DO	Digital Output
DSI	Display Serial Interface
eDP	Embedded DisplayPort
EVB	Evaluation Board
FPC	Flexible Printed Circuit
GND	Ground
HDMI	High-Definition Multimedia Interface
I/O	Input/Output
LCD	Liquid Crystal Display

LCM	LCD Module
LED	Light Emitting Diode
LVDS	Low-Voltage Differential Signaling
OTG	On-The-Go
PCIe	Peripheral Component Interconnect Express
PCM	Pulse Code Modulation
SATA	Serial Advanced Technology Attachment
SD	Secure Digital
TP	Touch Panel/Test Point
UART	Universal Asynchronous Receiver/Transmitter
USB	Universal Serial Bus
(U)SIM	(Universal) Subscriber Identity Module