SC36XZ EVB

User Guide

Smart Module Series

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Safety Information

The following safety precautions must be observed during all phases of operation, such as usage, service or repair of any 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 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.
	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 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 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 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
-	2024-11-04	Bayes YANG	Creation of the document
1.0	2024-11-06	Bayes YANG	First official release

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1 Introduction

This document is a user guide that details the basic information of SC36XZ EVB (Evaluation Board), which is an assistant tool for you to develop applications and test basic functionalities on SC362Z-AP module.

1.1. Applicable Module

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

1.2. Special Mark

Table 1: Special Mark

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

2 Product Overview

2.1. Top and Bottom Views

The EVB dimensions are 200 mm × 150 mm, and the EVB's top and bottom views are as follows:

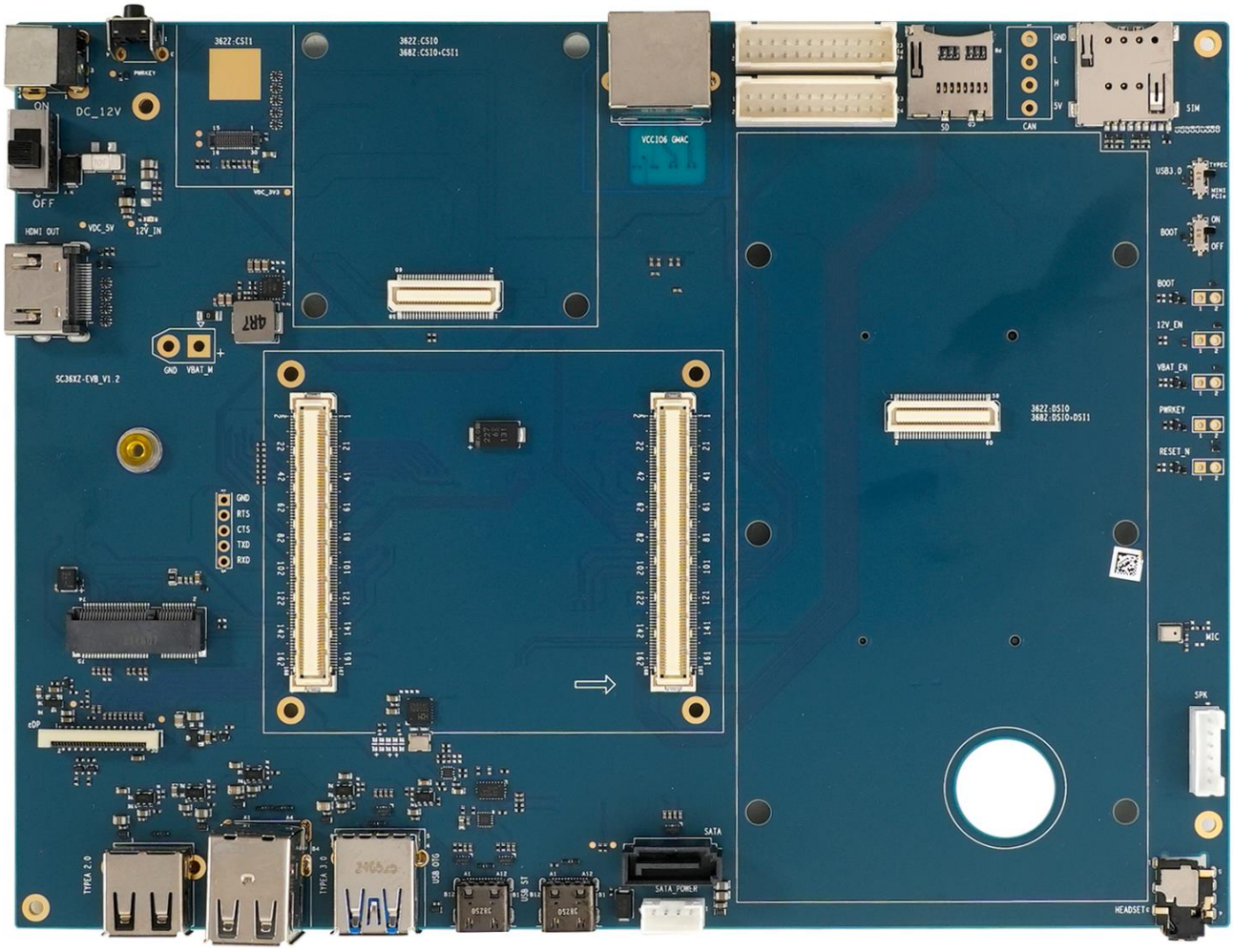

Figure 1: Top View

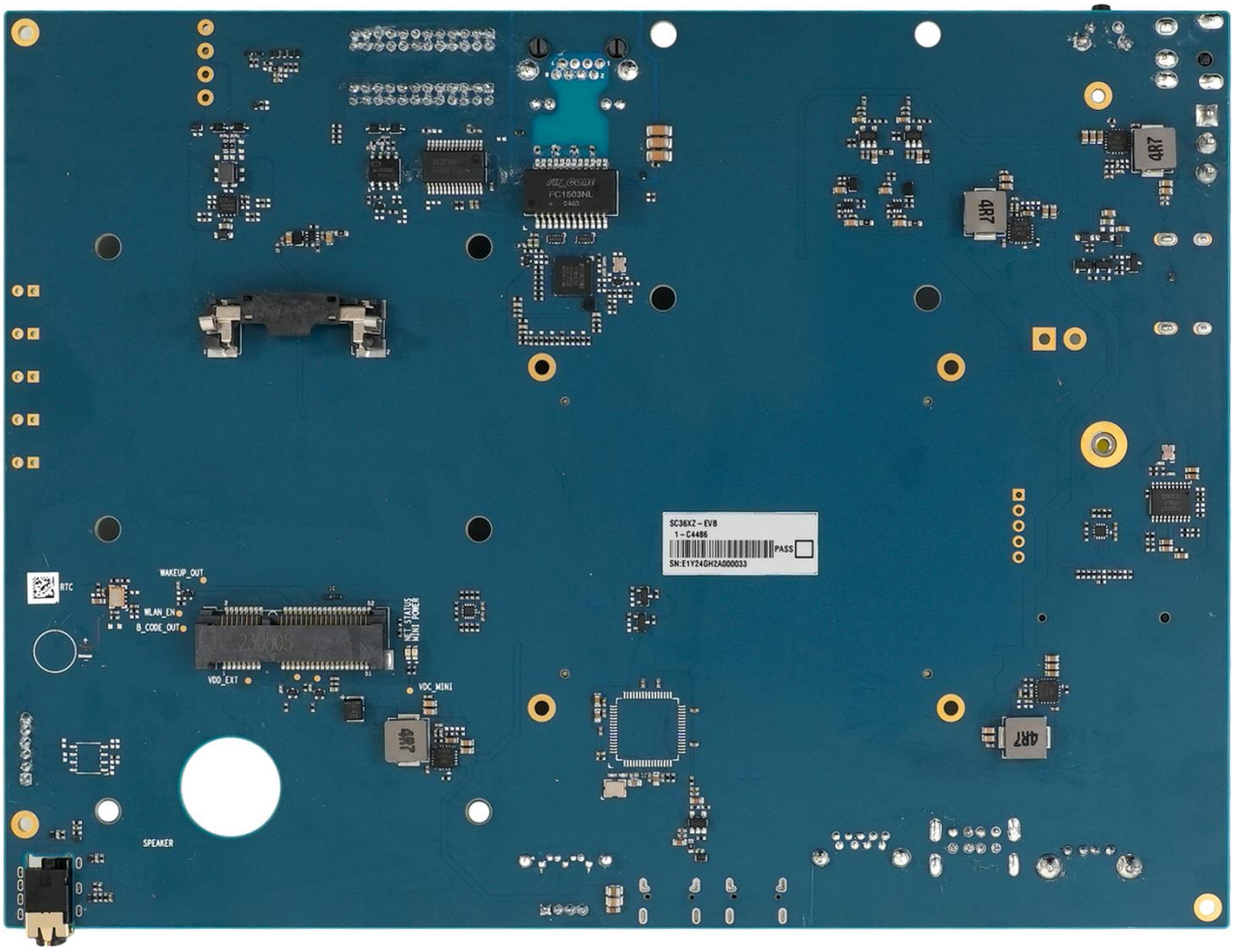

Figure 2: Bottom View

2.2. Component Placement

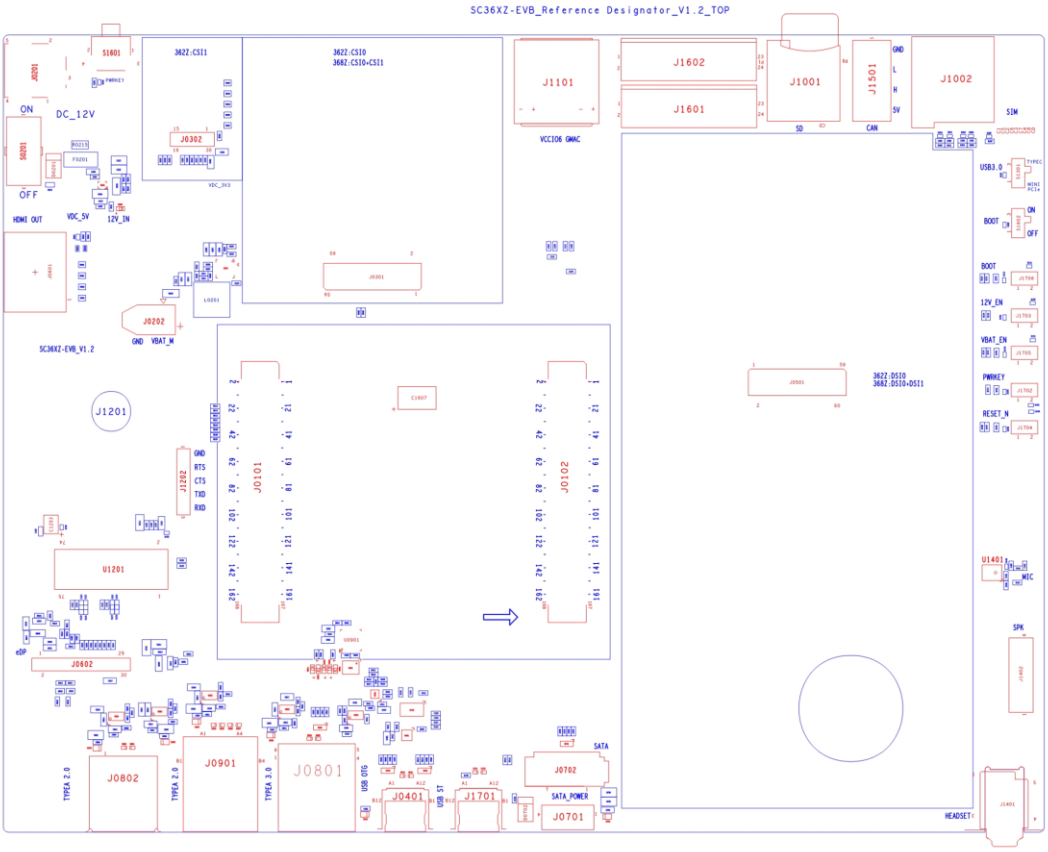

Figure 3: Top View for Component Placement

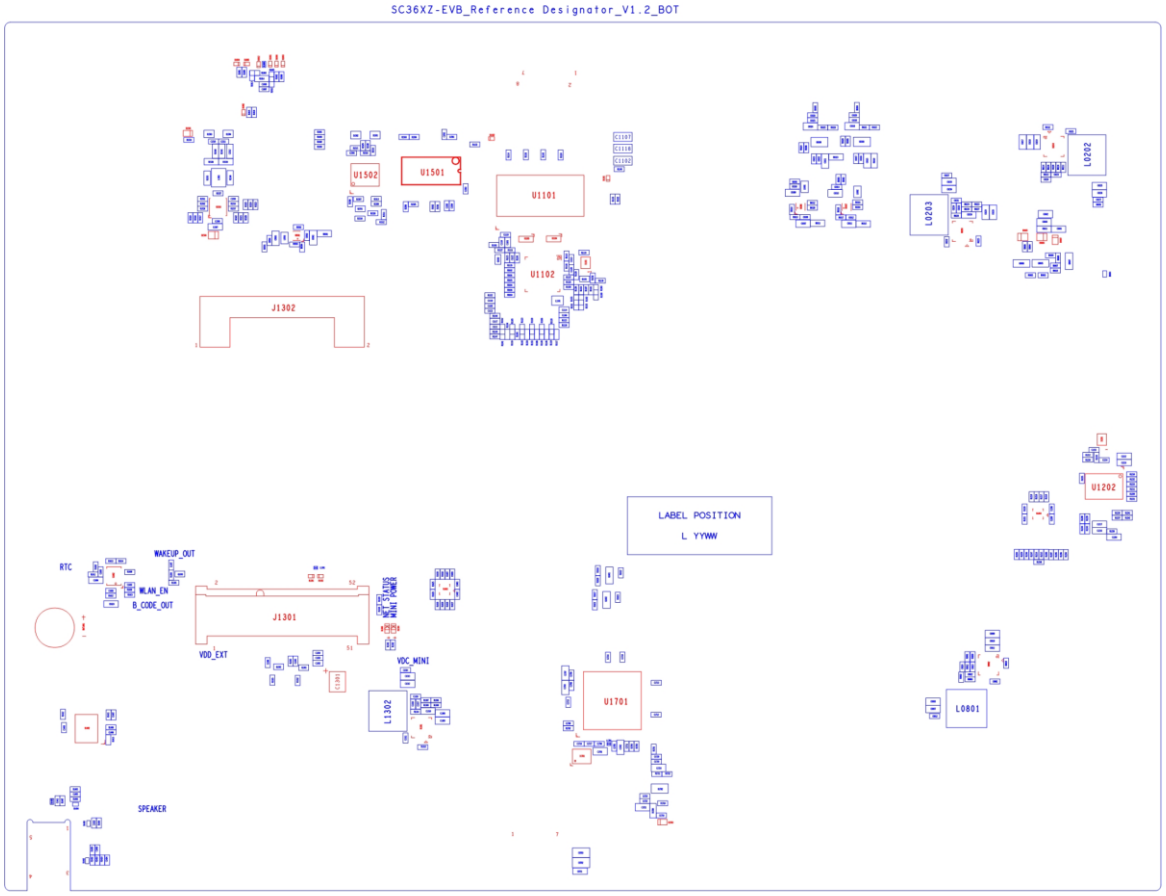

Figure 4: Bottom View for Component Placement

Table 2: Components and Functions

Component	RefDes.	Description	Comment
Module's TE-A interface	J0101, J0102	Module's TE-A connectors	Used to connect module's TE-A and EVB
Power supply	J0201	DC power jack	DC typical power supply: 12 V/ 5 A
Power switch	S0201	EVB 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 indicator	D0202	Power supply indicator	When the red power supply indicator lights up, the 12 V power supply is connected
Camera interface	J0302	Camera connector	4-lane CSI, supporting up to 13 MP pixel camera
LCM interface	J0501	LCM connector	● 4-lane MIPI DSI

			● Up to 2048 × 1080 @ 60 Hz output resolution (LCM in EVB kit only supports 1280 × 720 @ 60 Hz)
USB interfaces	J0901	USB Type-A connector	● Dual-layer interface, expanded by USB1 via HUB ● Supports USB 2.0 only ● Supports master mode only
	J0401	USB Type-C connector	● USB0 ● Supports USB 2.0/3.0 ● Supports USB OTG, master and slave modes ● Used for AT command communication, data transmission, software debugging, firmware upgrade (USB 2.0 only)
M.2 interface	U1201	M.2 connector for Wi-Fi/Bluetooth module	Used to connect Wi-Fi/Bluetooth module
(U)SIM card interface	J1002	(U)SIM card connector	Used to connect (U)SIM card of 4G/5G modules
Mini PCIe interface	J1301	Mini PCIe connector	Used to connect 4G/5G modules
SD card interface	J1001	SD card connector	● Supports SD 3.0 protocol ● Supports 1.8/3.3 V SD card ● Supports SD card hot-plug function
Ethernet interface	J1101	RJ45 connector	Supports 10/100/1000 Mbps data transmission rate
Audio interfaces	U1401	Microphone	1 single-ended microphone input
	J1401	Headset connector	● Supports 4-pole headset ● With detection pins ● Supports hot-plug function ● Supports Microphone input
PWRKEY	S1601	Button to turn on/off the module	Active low
BOOT	S1602	Module's switch for firmware upgrade	Before turning on the module, switch BOOT to "**ON**", and then the module will enter firmware upgrade mode
Test points	J1402	Loudspeaker test points	1 differential loudspeaker output
	TP0301, TP0302	I2C4 test points	TP0301 is the test point for I2C4_SDA TP0302 is the test point for I2C4_SCL

	J1501	CAN interface test point	Supports 2 CAN interfaces
	J1601	Another test point	-
	J1602	Another test point	-

3 Kit Accessories and Assembly

3.1. Accessories Assembly

Figure 5: EVB and Accessories Assembly

3.2. Accessories List

All accessories of the EVB kit are as follows. Contact the supplier if there is something missing.

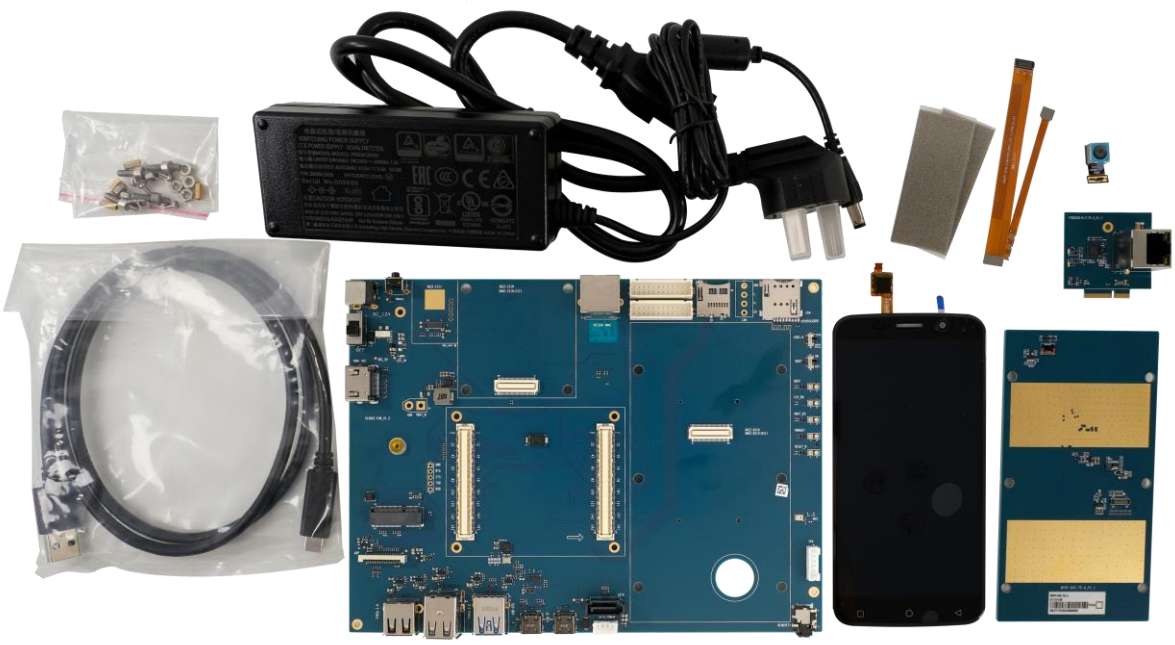

Figure 6: EVB Kit Accessories

Table 3: Accessories List

Accessories	Description	Quantity (pcs)
EVB	SC36XZ EVB	1
Screen adapter board	MIPI-DSI-TE-A	1
RMII adapter board	YT8522H-M.2-TE-A	1
Power supply adapter	12 V/ 5 A	1
LCD	LCM screen	1
Camera	13 MP pixel camera	1
FPC	LCD related FPC	2
USB cable	USB Type-A to Type-C converter cable	1

Foam	Used to fix LCM screen	2
Bolts and nuts	Used to assemble the EVB	20

4 Application Interfaces

This chapter details the hardware interfaces of the EVB as follows:

- Power supply interface
- Module's TE-A interface
- USB interfaces
- Camera interface
- Video output interface
- Audio interfaces
- SD card interface
- M.2 interface
- (U)SIM card interface
- Ethernet interface
- Mini PCIe interface
- Status indicator
- Button and switch
- Test points

4.1. Power Supply Interface

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

Table 4: Description of Power Supply Interface

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

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

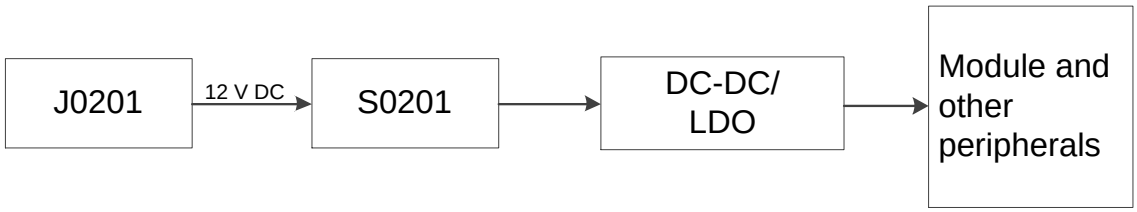

Figure 7: Block Diagram of EVB Power Supply

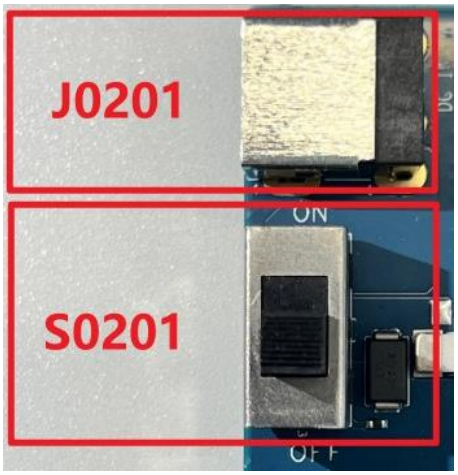

Figure 8: EVB Power Supply Interface and Switch

4.2. Module's TE-A Interface

Module's TE-A interface is designed to accommodate the TE-A of SC362Z-AP 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's TE-A Interface

RefDes.	Description
J0101, J0102	Module's TE-A connectors

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

Figure 9: Connection Between Module's TE-A and EVB

Figure 10: Module's TE-A Interface

4.3. USB Interfaces

The EVB provides three USB interfaces, one USB Type-C interface and two USB Type-A interfaces.

- USB Type-C interface: USB 3.0 and USB 2.0 interfaces (USB0); supports USB OTG, and master and slave modes; used for AT command communication, data transmission, software debugging, firmware upgrade (can only be implemented through USB 2.0 channel);
- USB Type-A interfaces: USB 2.0 interface (USB1); supports master mode only.

USB 3.0 supports SuperSpeed mode, with up to 5 Gbps data rate; USB 2.0 supports high-speed mode, with up to 480 Mbps data rate.

Table 6: Description of USB Interfaces

RefDes.	Description
J0401	USB Type-C connector
J0901	USB Type-A connector

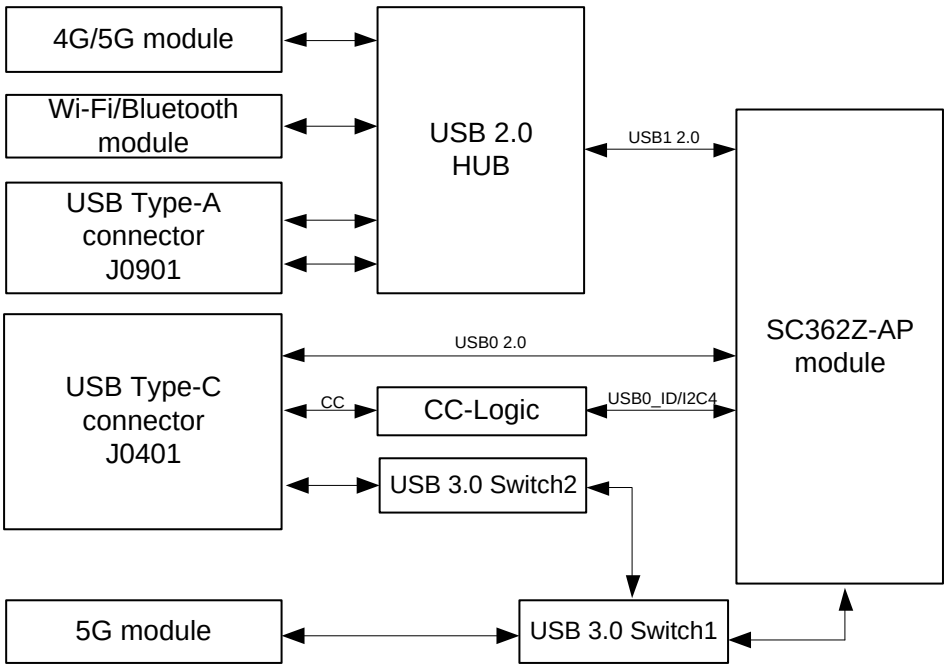

Figure 11: Block Diagram of USB Interfaces

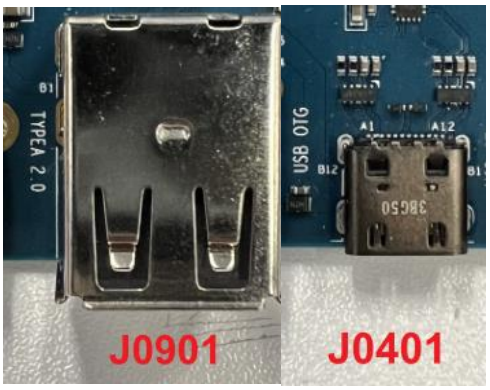

Figure 12: USB Interfaces

4.4. Camera Interface

The EVB provides one camera interface, J0302, which corresponds to CSI1 of the module and supports up to 13 MP pixel camera. J0301 corresponds to the CSI0 of the module, which can provide an additional 4-lane AHD analog camera interface with the XS9922B-AHD TE-A. Both CSI0 and CSI1 support 4-lane CSI signal transmission.

Table 7: Description of Camera Interface

RefDes.	Description
J0302	Camera connector, 4-lane CSI, supporting up to 13 MP pixel camera

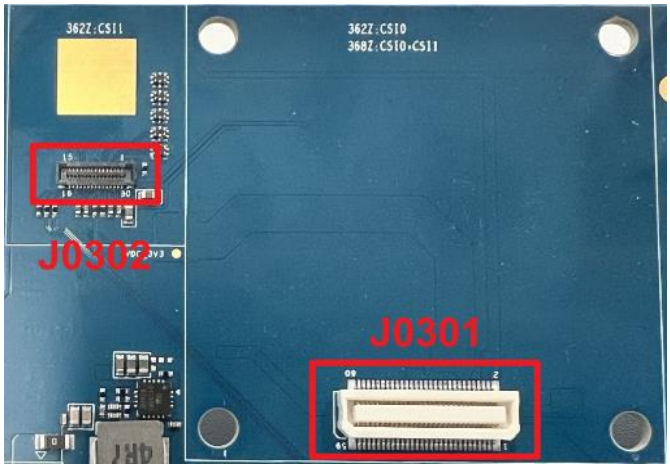

Figure 13: Camera Interface

4.5. Video Output Interface

The EVB provides one video output interface, J0501, to connect to the LCM screen of the EVB kit via MIPI-DSI TE-A.

Table 8: Description of Video Output Interface

RefDes.	Description
J0501	Video output interface

J0501 contains the module 4-lane DSI signal and TP I2C signal, as well as PWM, reset and interrupt signals, and it can be connected to MIPI-DSI TE-A. MIPI-DSI TE-A is equipped with an LCM connector and an LCM TP connector, which can be connected to the LCM screen and TP of the EVB kit, and a backlight driver circuit is provided for screen backlight adjustment.

Figure 14: Video Output Interface

4.6. Audio Interfaces

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

- One differential microphone input channel can be divided into two single-ended microphone input channels. One is input through microphone, U1401, and one is input through headset interface, J1401.
- The headset interface, J1401, features stereo left and right channel output, and supports headset insert detection function.
- The loudspeaker interface, J1402, 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.

Table 9: Description of Audio Interfaces

RefDes.	Description
U1401	Microphone
J1401	Headset connector
J1402	Loudspeaker test points

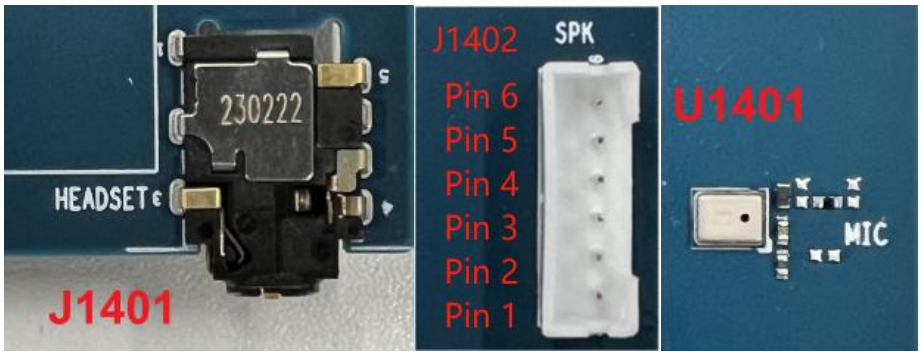

Figure 15: Audio Interfaces

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

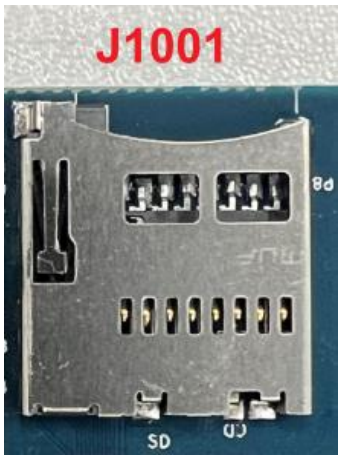

Figure 16: SD Card Interface

4.8. M.2 Interface

The EVB provides one M.2 interface to support the communication of the external Wi-Fi/Bluetooth module (Quectel Wi-Fi/Bluetooth module is recommended). It can also be used with the YT8522H-M.2 TE-A to provide 100 MHz Ethernet connectivity.

Table 11: Description of M.2 Interface

RefDes.	Description
U1201	M.2 connector for Wi-Fi/Bluetooth module

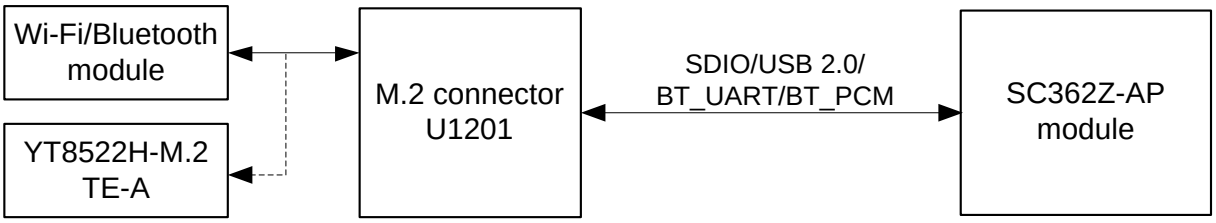

Figure 17: Connection Diagram of M.2 Interface

Figure 18: M.2 Interface

4.9. (U)SIM Card Interface

The EVB provides one (U)SIM card interface to connect the (U)SIM card of 4G/5G modules.

Table 12: Description of (U)SIM Card Interface

RefDes.	Description
J1002	(U)SIM card connector

Figure 19: (U)SIM Card Interface

4.10. Ethernet Interface

The EVB provides one RJ45 connector, which can provide Gigabit Ethernet connectivity. The module is externally connected to an YT8531SC-CA/YT8521SH-CA Ethernet PHY, which supports 10/100/1000 Mbps data rate. The interface uses the combined RJ45 connector with the indicator and the isolation transformer.

The EVB can be used with the YT8522H-M.2 TE-A to provide additional 100 MHz Ethernet connectivity.

Table 13: Description of Ethernet Interface

RefDes.	Description
J1101	RJ45 connector

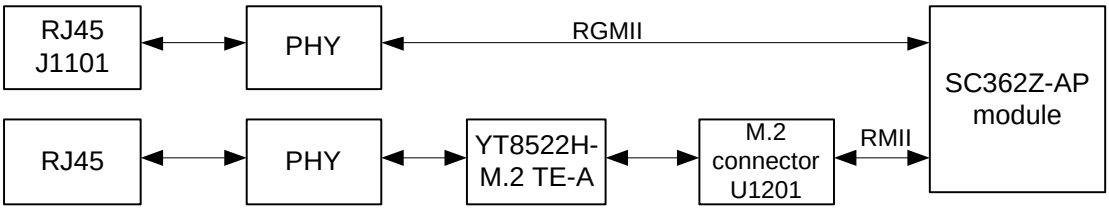

Figure 20: Connection Diagram of RJ45

Figure 21: RJ45 Connector

4.11. Mini PCIe Interface

The EVB provides one Mini PCIe interface to support the communication of external 4G/5G modules (Quectel 4G/5G modules are recommended).

Table 14: Description of Mini PCIe Interface

RefDes.	Description
J1301	Mini PCIe connector

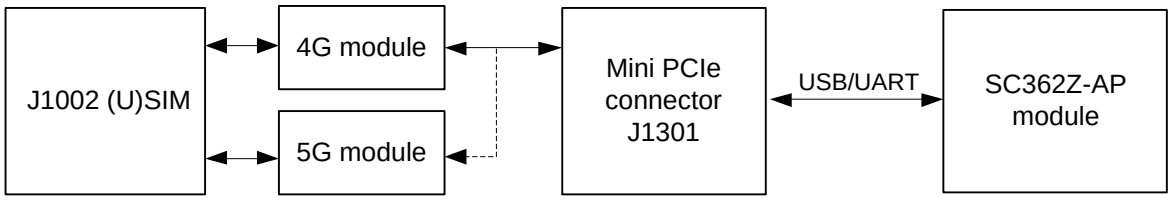

Figure 22: Connection Diagram of 4G/5G Modules

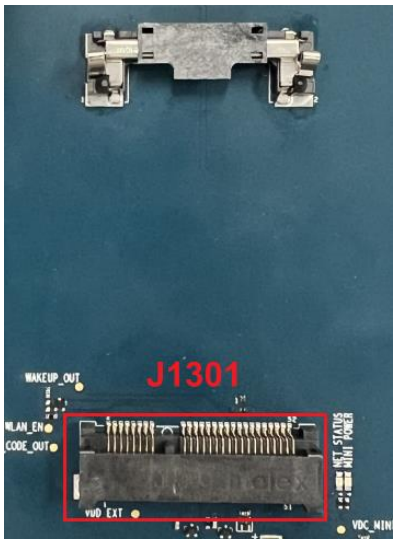

Figure 23: Mini PCIe Interface

4.12. Status Indicator

The EVB provides one power supply on/off indicator, D0202. When the red power supply indicator lights up, the 12 V power supply is connected.

Table 15: Description of Status Indicator

RefDes.	Description
D0202	Power supply indicator

Figure 24: Power Supply Indicator

4.13. Button and Switch

The EVB provides an on/off button, S1601, for turning on/off the SC362Z-AP module. Pressing PWRKEY for more than 200 ms after powering up the module can turn on the module. After the module is turned on, press PWRKEY for more than 6 s can turn off the module.

The EVB provides one power switch and one BOOT switch. The power switch, S0201, is used for power on/off control of the EVB. 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, S1602, is used for the firmware upgrade of SC362Z-AP module. Before turning on the module, switch BOOT to "**ON**", and then the module will enter firmware upgrade mode.

Table 16: Description of Button and Switch

RefDes.	Description
S0201	EVB power on/off control
S1601	Button to turn on/off the module
S1602	Module's switch for firmware upgrade

Figure 25: Button and Switch

4.14. Test Points

The EVB provides test points to connect to other devices to test the signal waveforms, as follows:

Table 17: J1501 Test Points

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	+5 V	5 V power supply

Figure 26: J1501 Test Points

Table 18: J1402 Test Points

Pin No.	Pin Name	Description
1	GND	Ground
2	SPK_OUT_N*	Loudspeaker output (-)
3	SPK_OUT_P*	Loudspeaker output (+)
4	GND	Ground
5	SPKN_OUT	Loudspeaker output (-)
6	SPKP_OUT	Loudspeaker output (+)

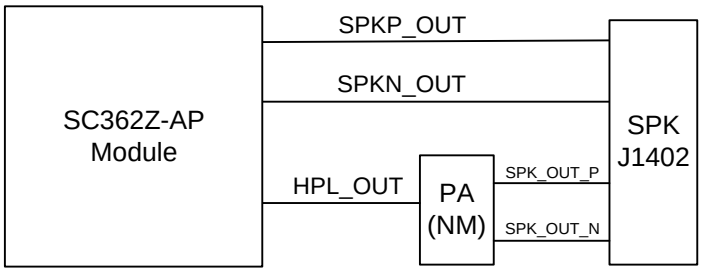

Figure 27: Block Diagram of Loudspeaker Interface

Figure 28: J1402 Test Points

Table 19: J1601 Test Points

Pin No.	Pin Name	Module Pin No.	Description
1	RS232_TXD	-	RS232 data transmit
2	GND	-	Ground
3	RS232_RXD	-	RS232 data receive
4	VOL_DOWN	141	Volume down, active low
5	RS485_A	-	RS485 receiver in-phase input and driver in-phase output
6	SNS_P*	362	Current detection of charging and discharging circuit (+)
7	RS485_B	-	RS485 receiver inverting input and driver inverting output
8	SNS_N*	361	Current detection of charging and discharging circuit (-)
9	NC	-	Not connected
10	BAT_DIV*	360	Battery divided voltage detect
11	PDM_DIN2	151	PDM data input 2
12	ADC0_4*	136	General-purpose ADC interface/headset HOOK
13	PDM_DIN1	150	PDM data input 1
14	ADC0_3	138	General-purpose ADC interface

15	PDM_CLK1	152	PDM clock 1
16	ADC0_5	135	General-purpose ADC interface
17	PON_1	121	Rising edge triggers module power on
18	ADC0_6	134	General-purpose ADC interface
19	VBATT	-	VBAT is divided into 1.13 V via a voltage-divider resistor and connected to PON_1 for automatic turn-on when it is powered up
20	ADC0_7	139	General-purpose ADC interface
21	VBUSS	-	VBUS is divided into 1.18 V via a voltage-divider resistor and connected to PON_1 for automatic turn-on when USB is inserted
22	EDL	137	Forced download mode. Active low
23	GND	-	Ground
24	GND	-	Ground

Table 20: J1602 Test Points

Pin No.	Pin Name	Module Pin No.	Description
1	GND	-	Ground
2	LDO1_0V9	363	0.9 V output power supply
3	NC	-	Not connected
4	VCCIO1	95	3.3 V output power supply; Reference voltage for VCCIO1 power domain
5	NC	-	Not connected
6	VCC_PMUIO0	96	3.3 V output power supply; Reference voltage for PMUIO0 power domain
7	NC	-	Not connected
8	VCC_SWOUT1	97	VBAT output power supply 1
9	NC	-	Not connected
10	LDO9_1V8	99	1.8 V output power supply

11	NC	-	Not connected
12	BUCK5_1V8	8	1.8 V output power supply
13	EXT_EN	120	External device enable. It will output high level after the module is turned on
14	VCC_PMUIO1	364	1.8 V output power supply; Reference voltage for PMUIO1 power domain
15	MIC_P_EC200A	-	Pin 1 of Mini PCIe module
16	NC	-	Not connected
17	MIC_N_EC200A	-	Pin 3 of Mini PCIe module
18	NC	-	Not connected
19	SPK_P_EC200A	-	Pin 5 of Mini PCIe module
20	DBG_TXD_3V3	-	Debug UART transmit
21	SPK_N_EC200A	-	Pin 7 of Mini PCIe module
22	DBG_RXD_3V3	-	Debug UART receive
23	GND	-	Ground
24	GND	-	Ground

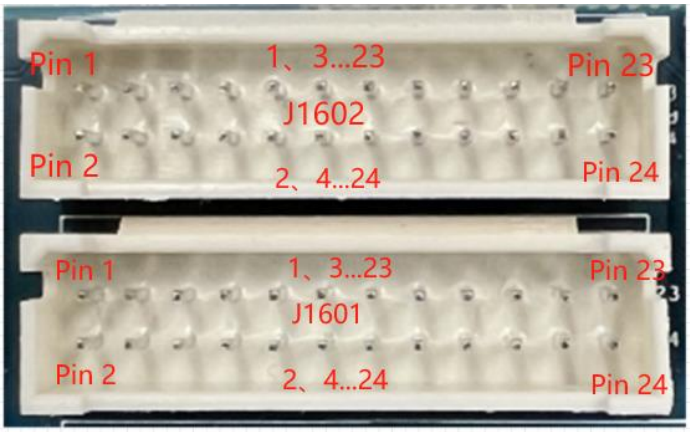

Figure 29: J1601 and J1602 Test Points

NOTE

In ***Figure 29***, the ellipsis "…" between pin 3 and pin 23 indicates to omit the odd-numbered pins between pin 3 and pin 23, and the ellipsis "..." between pin 4 and pin 24 indicates to omit the even-numbered pins between pin 4 and pin 24.

5 Operating Instructions

5.1. Turn On the Module

- Connect the module's TE-A to the EVB via BTB connectors.
- Connect the EVB to a PC with a USB Type-A to Type-C cable.
- Connect the EVB to a 12 V DC power adapter, and then switch S0201 to "**ON**".
- When the red power supply indicator D0210 lights up, press PWRKEY for more than 200 ms.
- Run the driver disk provided by Quectel on the PC to install the USB driver. 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 30: USB Ports

5.2. Turn Off and Reset the Module

After the module is turned on, press PWRKEY for more than 6 s, and then the module will be turned off. Pull down RESET_N for more than 100 ms, and then the module will be reset.

5.3. Communication Via USB

- Turn on the module according to the procedures in ***Chapter 5.1***.
- Install and use QCOM tool provided by Quectel to achieve the communication between the module and the PC.
- Select the correct "**COM Port**" (USB serial port, which is shown in ***Figure 30***) and set the correct "**Baudrate**" (115200 bps by default). For more details about QCOM usage and configuration, see ***document [2]***.

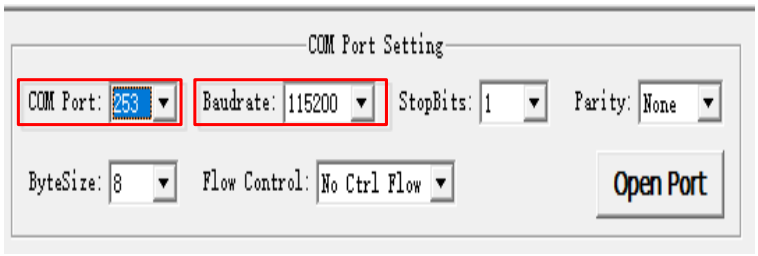

Figure 31: COM Port Setting Field on QCOM

5.4. Firmware Upgrade

- **Upgrade mode of Loader**:

  Before powering up the module, turn the BOOT switch, S1602, to "**ON**". After turning on the module, the module will enter the Loader mode. Turn the BOOT switch to "**OFF**" when the Loader device is recognized by the PC, and then upgrade the firmware of the module.

- **MaskRom upgrade method**:

  When the module cannot be turned on normally and the Loader mode cannot be entered via the BOOT switch due to a firmware burning error during the development process, the pin 22 EDL of J1601 can be short-circuited to the ground before the module is powered up, and then the module will enter the MasRrom mode after it is turned on. When the PC recognizes the MaskRom device, release the EDL pin, so the firmware of the module can be upgraded again.

6 Appendix References

Table 21: Related Documents

Document Name
[1] Quectel_List_of_EVB_Applicable_Modules
[2] Quectel_QCOM_User_Guide

Table 22: 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