A7672X & A7673X & A7677S TEKIT User Guide

LTE Module

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Date	Version	Description of change	Author
2023-07-04	1.00	Original	Chen Zhongyou Liu Xinao
2023-08-02	1.01	Add Table 3, Table 4, Table 5, Table 6	Liu Xinao Wang Tao

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1 Introduction

This document presents the instructions for using the TE board, which can assist users in performing debugging tasks more effectively. When utilizing the TE board, please ensure it is paired with the EVB board. The content of this document does not include information about the EVB board. For further details, please refer to the SIMCOM_EVB_KIT_User_Guide_V1.01.

2 Detail Description of TE

The TE board offers a variety of functional testing interfaces. The locations of these interfaces can be seen in Figures 1 and 2, while their explanations are provided in Table 1.
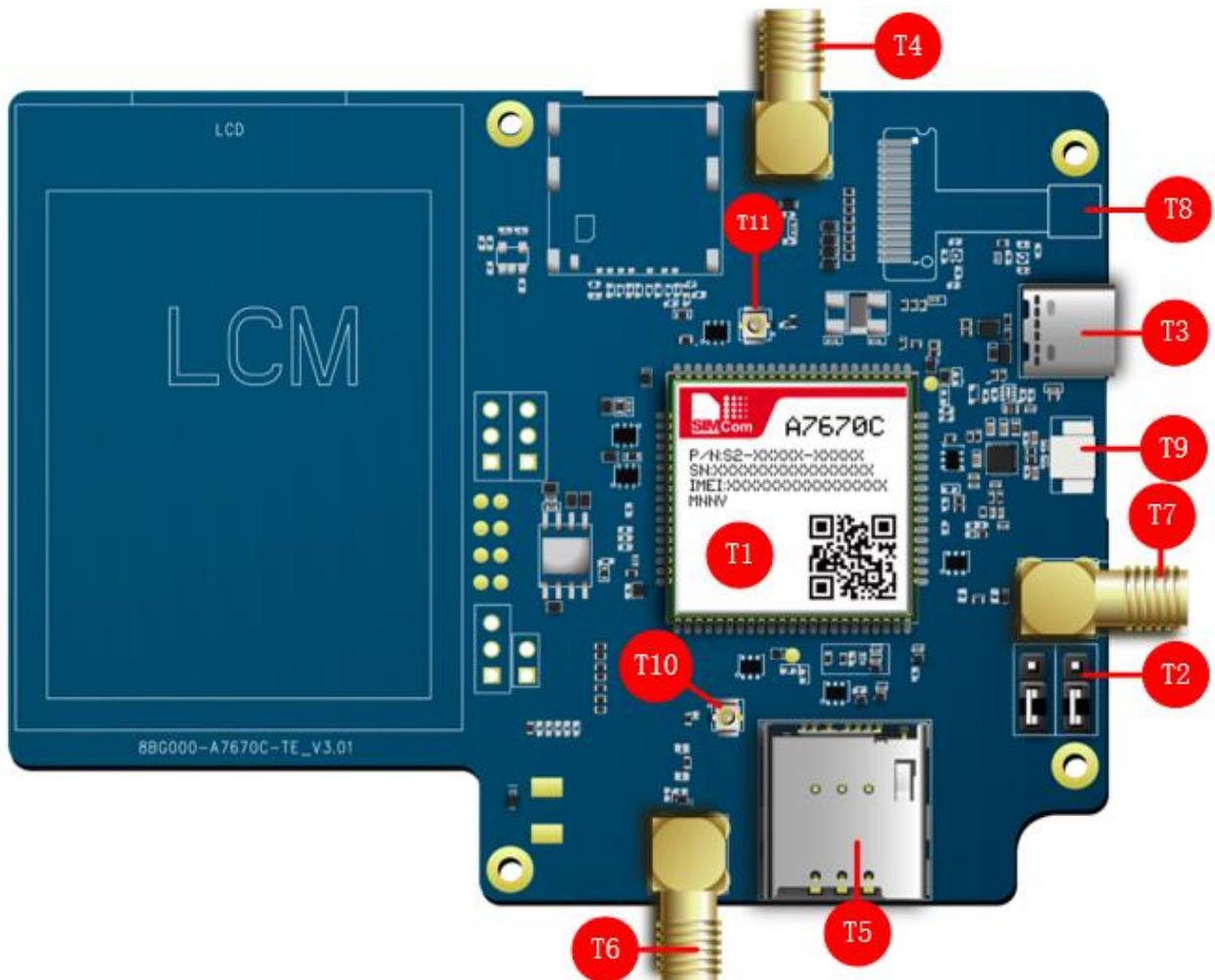
Figure 1: Top view of TE board
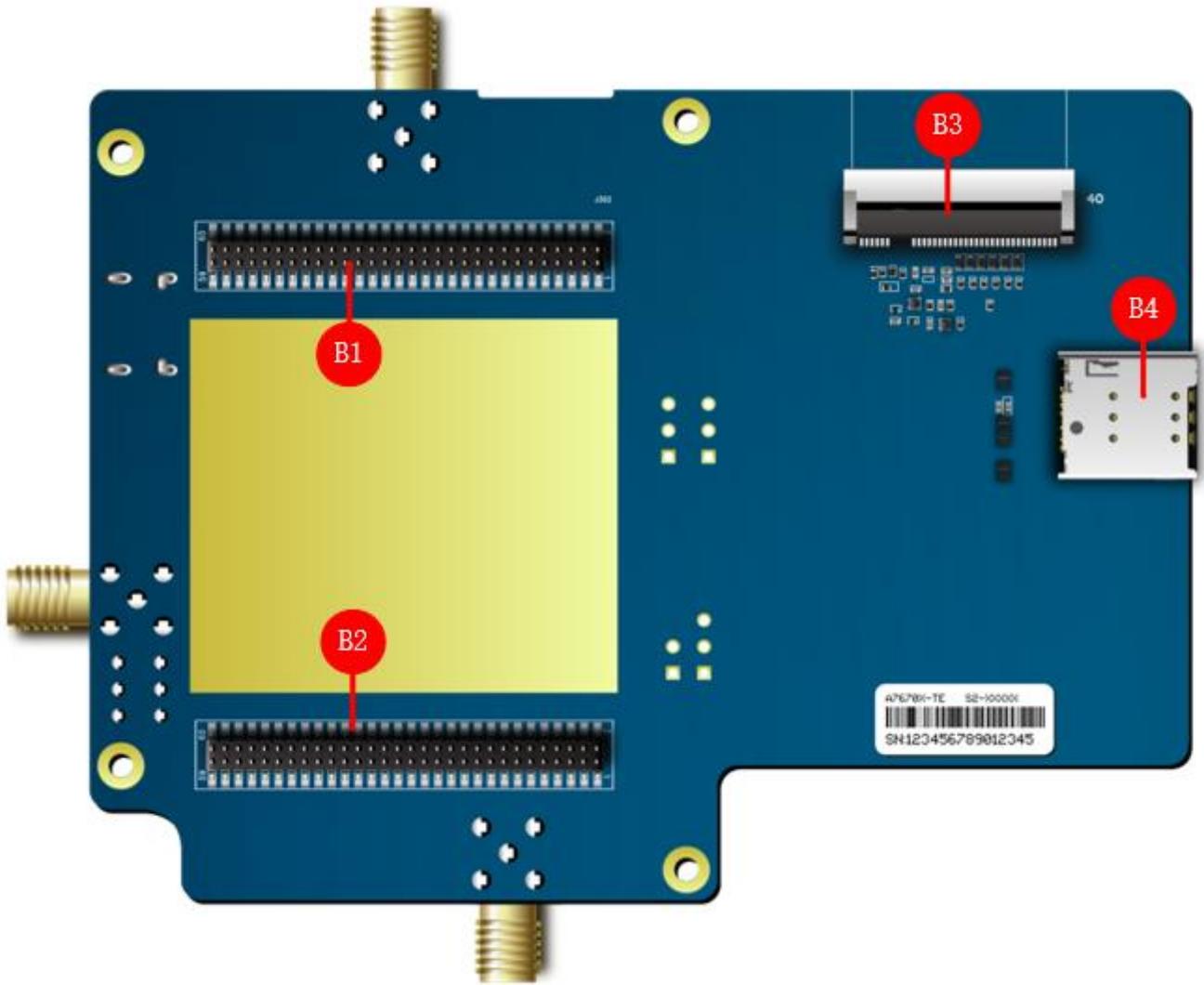
Figure 2: Bottom view of TE board

Table 1: TE board interface

Attachment Label	Description
T1	Module
T2	UART Switch
T3	USB-TYPE-C Connector
T4	Main Antenna Connector
T5	SIM Card Slot
T6	GNSS Antenna Connector
T7	BT Antenna Connector
T8	Camera Connector
T9	Speaker Connector
T10	GNSS Antenna Debugging Connector
T11	Main Antenna Debugging Connector
B1	Connector (Connect to SIMCOM-EVB)
B2	Connector (Connect to SIMCOM-EVB)
B3	LCD Connector
B4	SD Card Slot

NOTE

If UART Switch connected to above two pins by jumper，the debug UART will connect to EVB;
If UART Switch connected to below two pins by jumper，the UART3 will connect to EVB.

3 TE Accessory

The TE kit does not include any accessories. The main antenna is provided by the SIMCom EVB kit.

4 Installing TE on SIMCom EVB Board

TE kits are specifically designed to be compatible with the EVB board, and they are installed as shown in Figure 3.
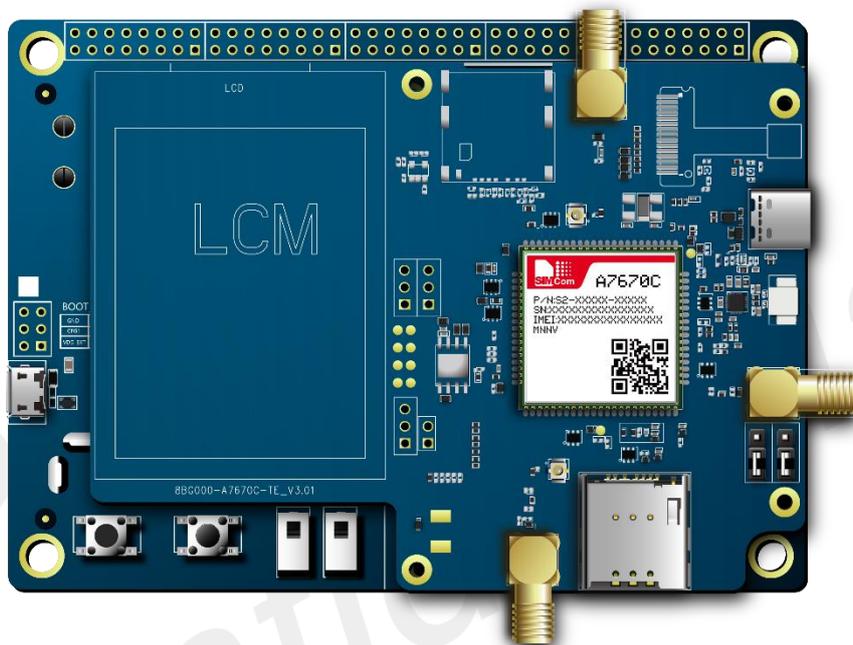
Figure 3: TE and SIMCom-EVB accessory

5 TE KIT USB Driver Installation

Users can manually install USB driver by the following steps:

1. Unzipping software. The installation package is shown in Figure 4.
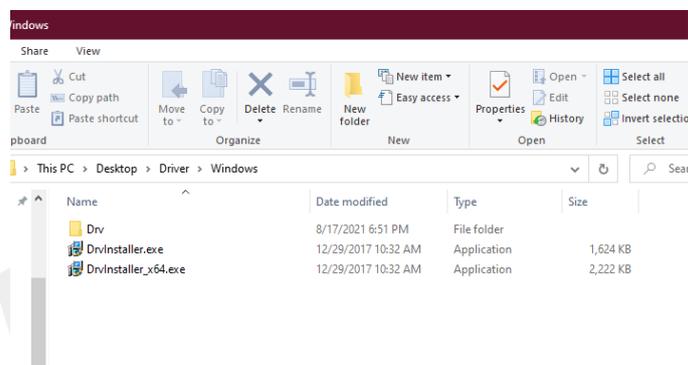
Figure 4: ASR drivers installation package

2. Installing the software. If the installation is successful, it will be depicted in Figure 5.
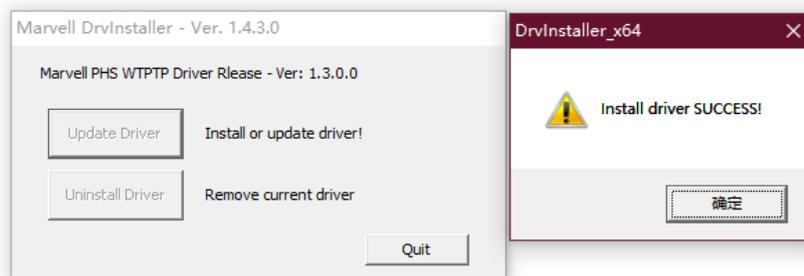
Figure 5: Software installation diagram

3.   Use a USB cable to connect the PC and the Type-C interface on the TE board. Then, several SimTech module devices should appear under "Other devices" in Device Manager, as shown in Figure 6.
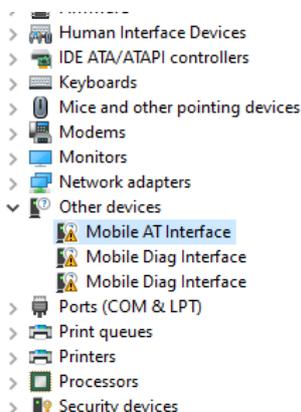
Figure 6: Module devices recognized by the operating system

4.   Right clicking the "Mobile AT Interface" devices and selecting "Update driver".

5.   Selecting "Browse my computer for drivers".

6.   Selecting "Let me pick from a list of available drivers on my computer". You will see the device's type list. Finding "Ports(COM & LPT)" like Figure 7, then clicking "Next".
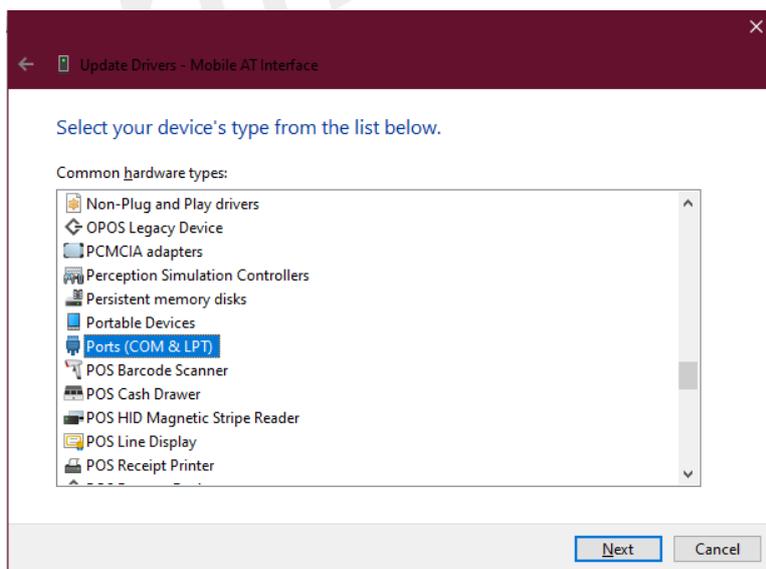
Figure 7: Device type list

7. Finding "ASR Hefei", then clicking "ASR Modem Device" as shown in Figure 8.
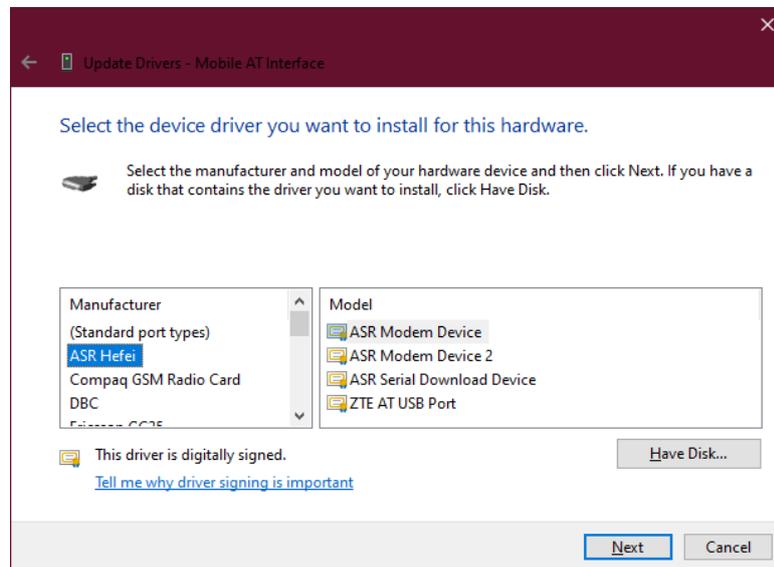
Figure 8: Device driver

8. Clicking "Next", you will see "Update Driver warning". Then click "yes".
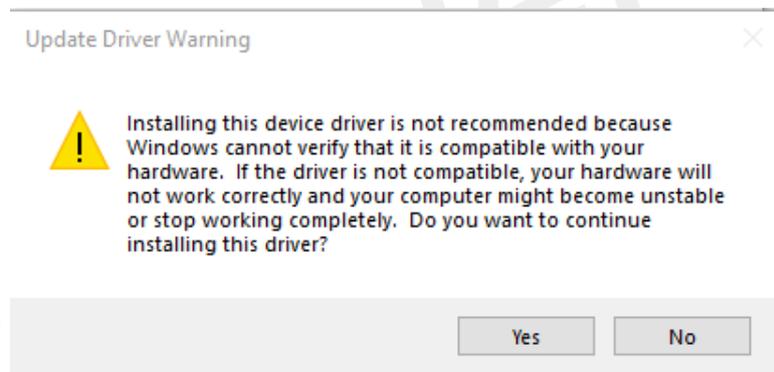
Figure 9: Update driver warning

9. Then you will see "Windows has successfully updated your drivers". Clicking "Close"
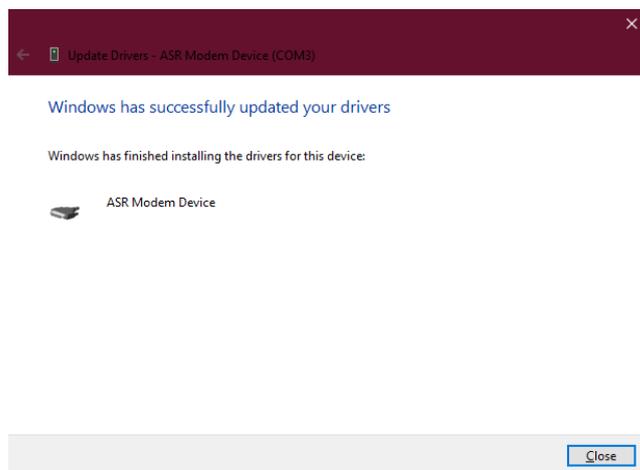
Figure 10: Update drivers

10. You can see "ASR Modem Device (COM3)" in device manager as shown in Figure 11 on the left. Then you need to install the other two drivers in the same way, but you need to choose the other models named "ASR Modem Device 2" and "ASR Serial Download Device" as shown in Figure 11 on the right.
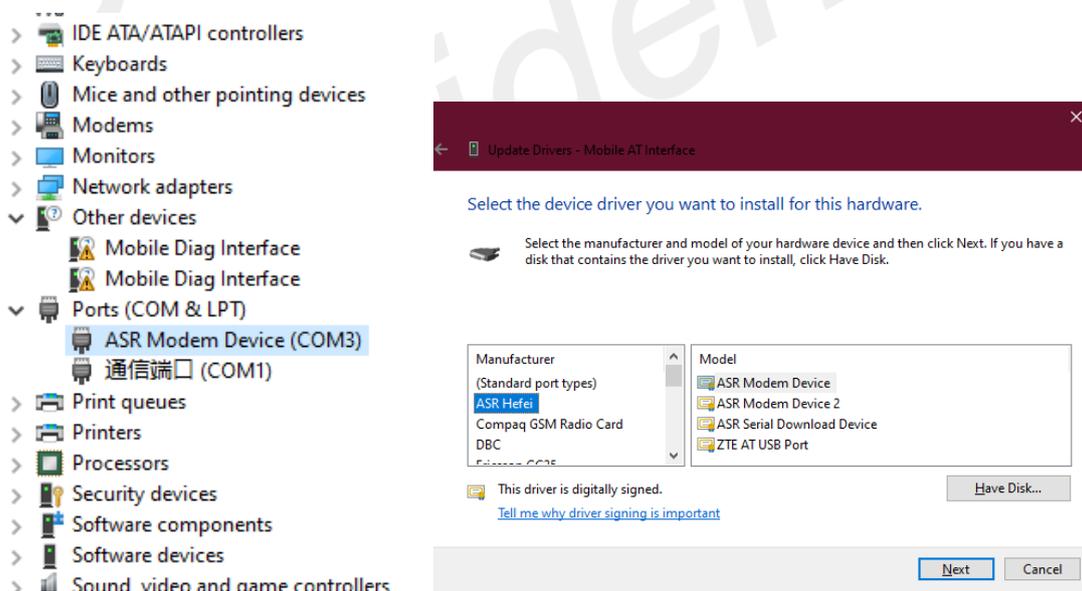
Figure 11: Other drivers installation method

11. Figure 12 shows that three drivers are installed successfully.
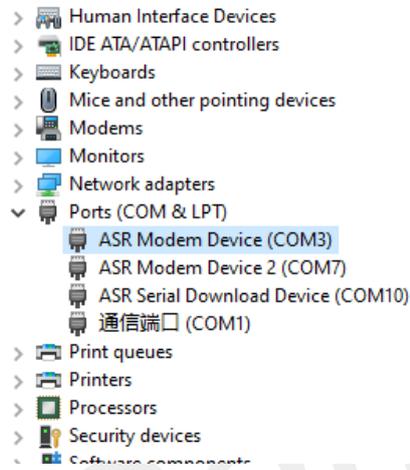
Figure 12: Port list

12. Then you need to install the SIMCom's drivers. Using the same way. Right clicking and selecting "Update driver". Selecting "Browse my computer for drivers". Clicking "Browse" and manually searching the driver folder, then click "Next".
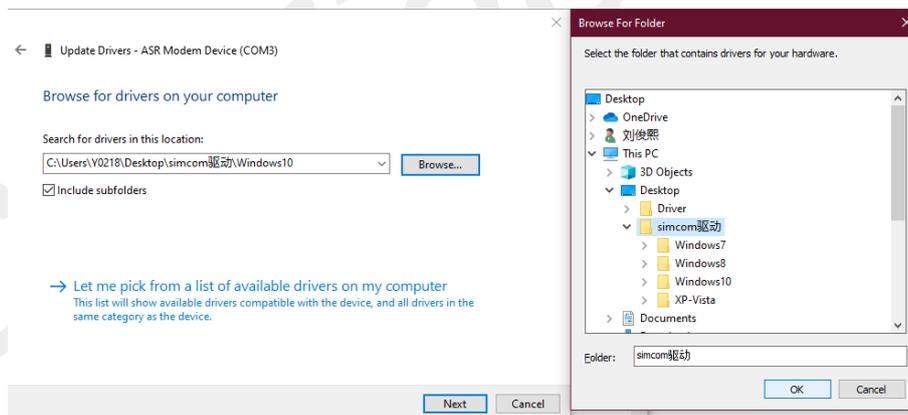
Figure 13: Browse for the drivers

13. Drivers need to be installed in the same way for each device. If you successfully install, you will see one SimTech device under Modems and three SimTech devices under Ports(COM & LPT) as shown in Figure 14.

Figure 14: Schematic diagram of drivers' successful installation

After installing drivers, the ports can be used for following defined functions:

Table 2: USB ports and their description

USB Ports	Description
SimTech HS-USB AT Port 9011	AT Command Communication Port
SimTech HS-USB Diagnostics 9011	Software Debug and FW Update Port
SimTech HS-USB Modem 9011	Modem Port for PPP

6 Using SIMCom Serial Port Tool

SIMCom provides a serial port tool for testing modules using AT Commands. The Serial Port Tool enables communication with modules by opening COM Ports from a list. The following figure displays each section of the SIMCom Serial Port Tool.
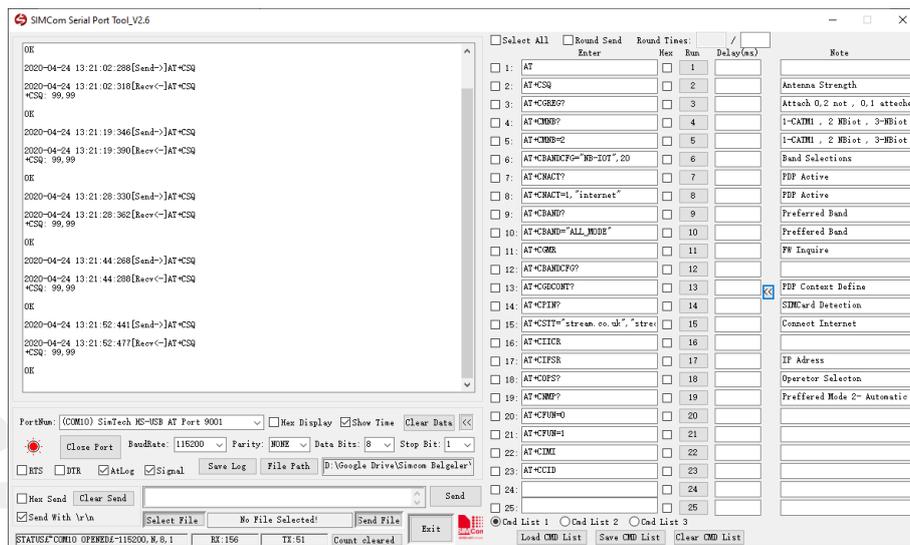
Figure 15: SIMCom Serial Port Tool introduction

NOTE

USB driver and Serial Port Tool can be obtained from local agents or SIMCom FAE.

7 GNSS Antenna

GNSS antennas are classified into active and passive antennas. It is noted that starting from August 1, 2023, the TE board is configured with an active antenna by default. However, in previous versions, without the inductor in the position of L1 and the capacitor in the position of C1, the TE board is configured with a passive antenna by default. The following describes the use of the two antennas.

7.1 Passive Antenna

Passive antennas usually do not require external DC power to work, so when using passive antennas, ensure that the L1 and C1 positions remain NC.

When using passive antennas, if the external DC power supply is provided, it will cause circuit abnormality and heating, in the GNSS part within the module.
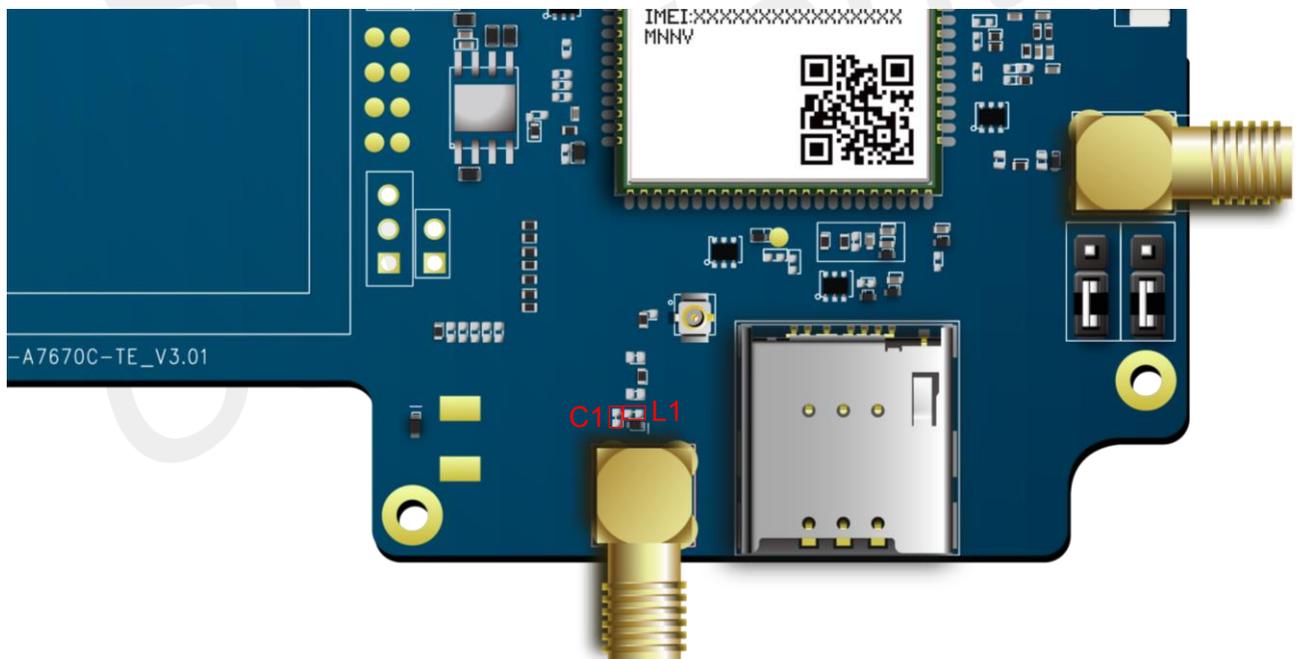
Figure 16: Passive antenna application

7.2 Active Antenna

Active antenna must be powered by external DC power supply to work properly. A7670X & A7672X TE can be used as the power supply of GNSS active antenna through the module PIN99 VDD_AUX. At this time, it is only necessary to weld a 100nF capacitor in the position of C1 and a 47nH inductor in the position of L1.Moreover, 100pF capacitor in the position of R210 must be retained, which serves to isolate the DC signal.
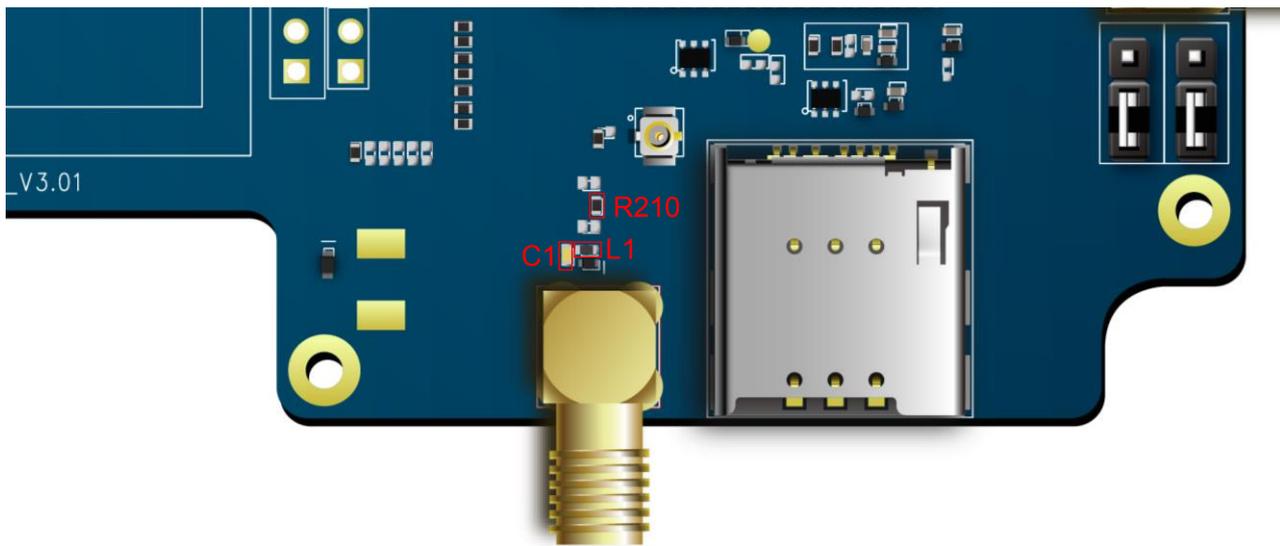
Figure 17: Active antenna application

Table 3: Recommended values

Attachment Label	Values	Description
L1	47nH	Inductor
C1	100nF	Capacitor
R210	100pF	Capacitor

> **NOTE**
>
> 1. For the TE board after August 1, 2023, the active antenna scheme is adopted by default, C1 and L1 are soldered with 100nF capacitor and 47nH inductor by default;
> 2. For the TE board before August 1, 2023, the passive antenna scheme is used by default, C1 and L1 are NC by default. If you need to connect the active antenna, please manually solder the components on C1 and L1 position and make sure that 100pF isolation capacitor is soldered on R210 position.

8 Speaker

The TE board provides a speaker interface for playing audio. The audio amplifier supports a maximum output power of 2W. Therefore, select the speaker with the corresponding power according to the actual situation.
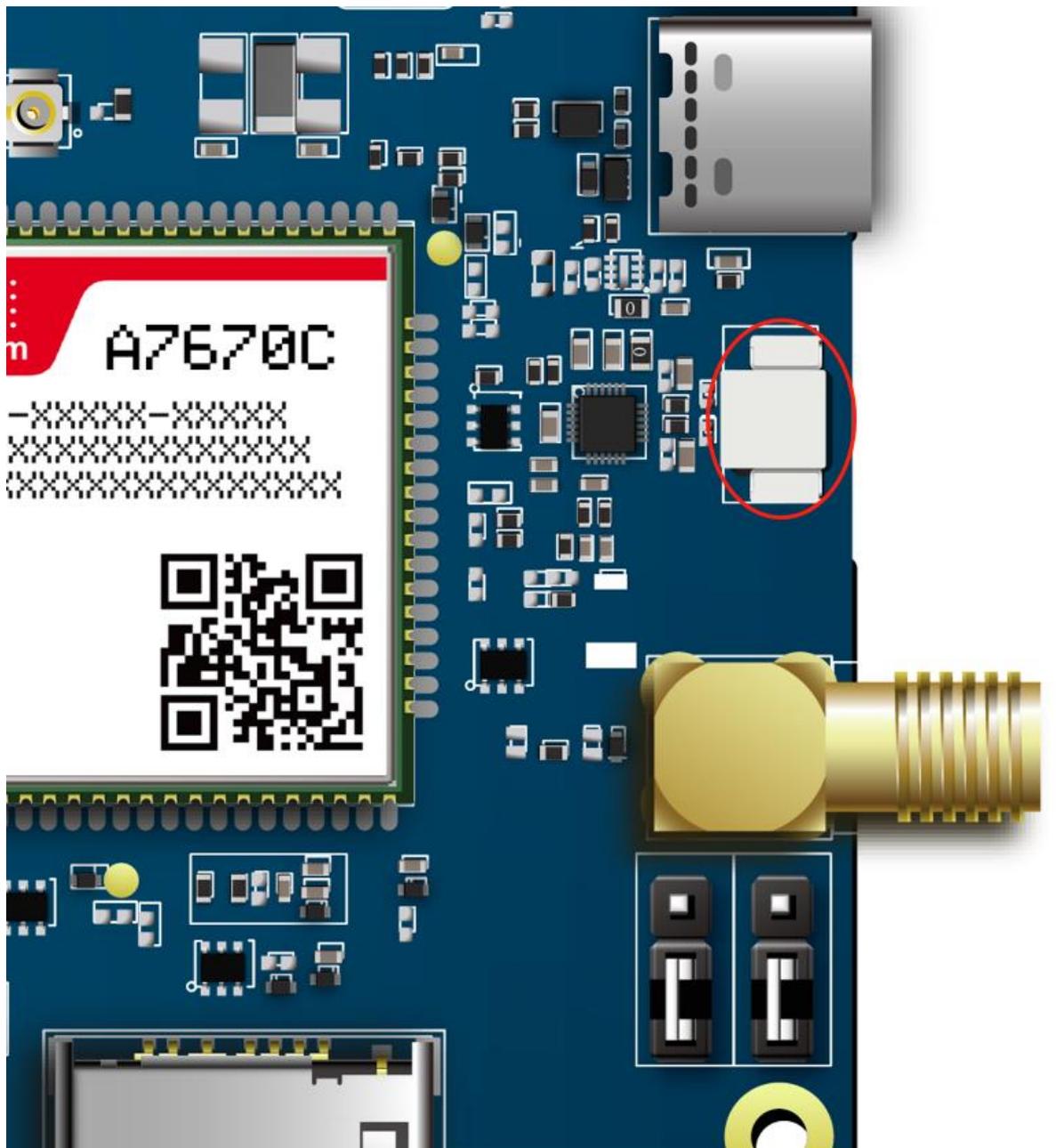
Figure 18: Speaker application

9 Antenna Debugging Connector

The TE board is welded with 0R resistors at R231 and R233 positions by default, so the SMA connector is used as the RF path for the RF antenna and GNSS antenna by default.

The TE board also provides two additional IPEX connectors to debug the RF channel. In this case, you need to remove the 0R resistance on the R231 position to the R232 position and remove the 0R resistance on the R233 position to the R234 position.
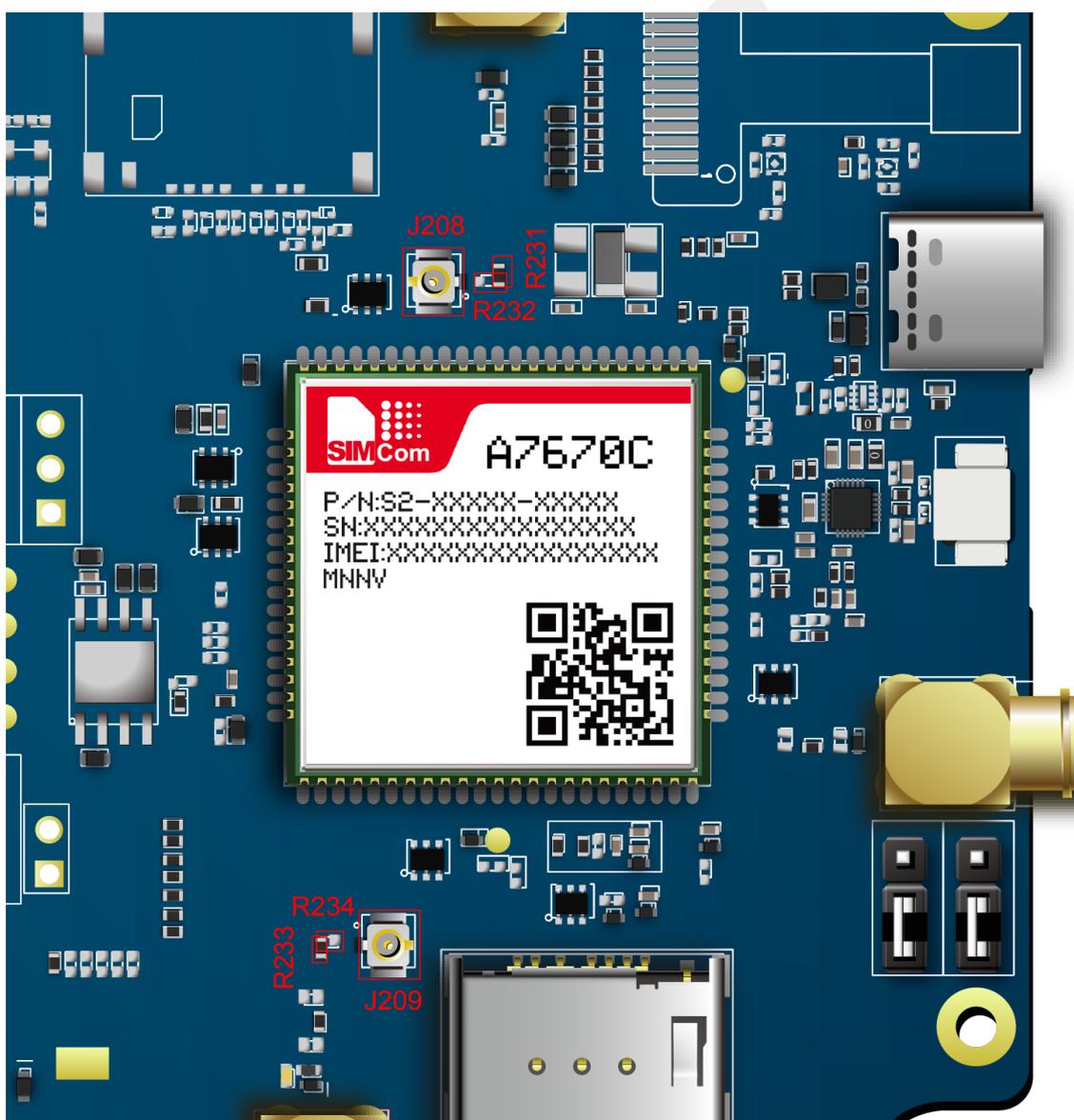
Figure 19: Antenna debugging connector application

10 ADC

There are two ADC test points PT1 and PT2 on the TE board for testing the ADC function as shown in Figure 20.

For R3 and R5 series modules, PT1 and PT2 are used to test the voltage values of ADC1 and ADC2, respectively. For R2 series modules, PT1 and PT2 are used to test the voltage of ADC1 and the battery voltage (CBC), respectively. The voltage measurement ranges of the ADCs for each module are shown in Table 4 and Table 5.

It should be noted that if the customer need to use the battery voltage measurement function of the R2 series modules, the customer need to solder resistors in the position shown in Figure 21, and the resistance value of each resistor is shown in Table 6. In addition, it is recommended that the accuracy of the above resistors is 1%, otherwise the accuracy of reading the battery voltage may be poor.
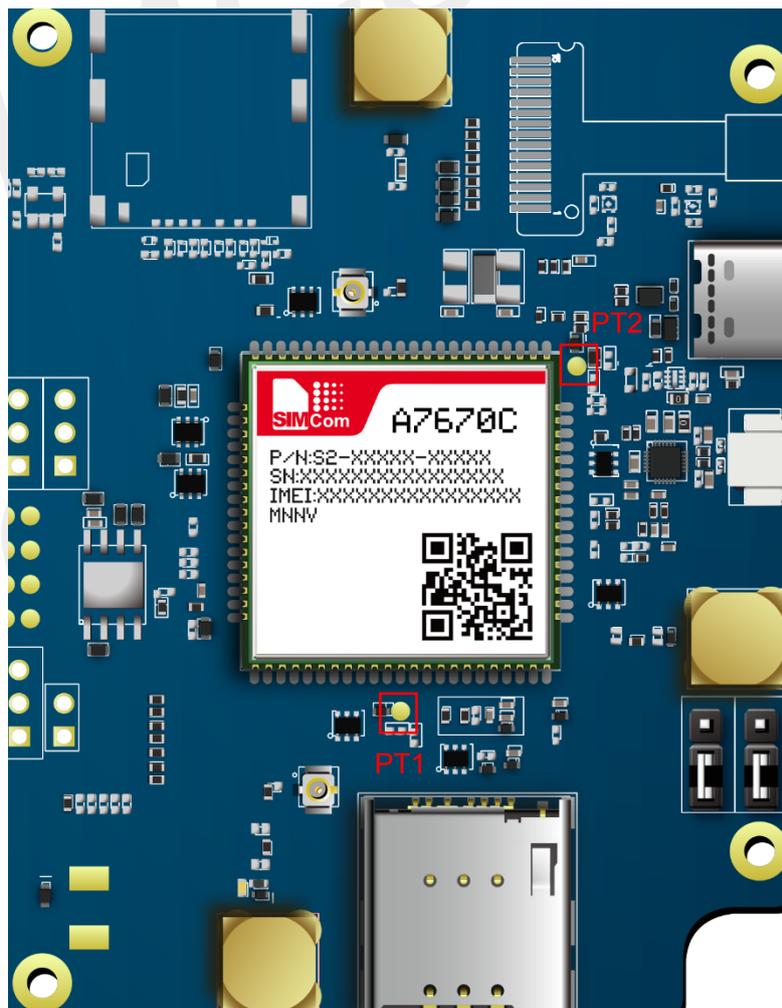
Figure 20: ADC test points PT1 and PT2
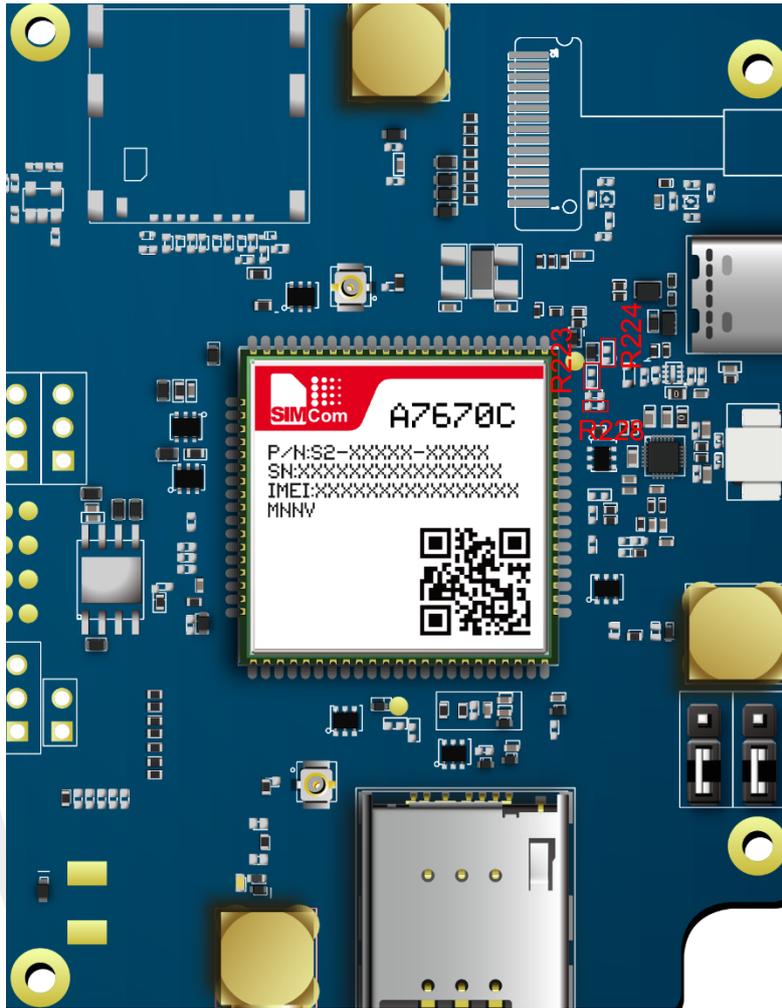
Figure 21: Resistor location of R2 series modules

Table 4: ADC measurement range for R3 and R5 series modules

Attachment Label	ADC	Measurement Range
PT1	ADC1	0-1.2V
PT2	ADC2	0-1.2V

Table 5: ADC measurement range for R2 series modules

Attachment Label	ADC	Measurement Range
PT1	ADC1	0-1.8V
PT2	ADC_VBAT	3.4-4.2V

Table 6: Resistors to be added to PT2 test points for R2 series modules

Attachment Label	Resistance value
R223	680K
R224	470K
R228	0R