



SIM767XX-TE Kit

User Guide Manual

LTE Module

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1 Introduction

This document describes the interface and usage of the SIM767XX-TE kit. With the help of this document, customers can quickly use the SIM767XX-TE Kit.

This document applies to the following product module and TE:

Table 1: Module and TE PN

TE	TE PN	Module
8VC000-SIM7672X-TE_V1.03	S2-10D1K	SIM7672X
8VC000-SIM7672X-TE_V1.03	S2-10D1K	SIM7670X

1.1 Documentation Overview

Table 2: SIM767XX Series Documents Overview

No.	Document	Description
1	SIM7672X_Series_Hardware_Design_V1.01 SIM7670X_Series_Hardware_Design_V1.00	Mainly introducing interface functions, Recommend circuit, PCB layout guideline, packaging and other hardware components, as well as the use of AT commands.
2	SIMCom_SIM767XX Series_Reference_Design_20230814	Reference circuit applications
3	8XS000-SIM767XX-NEWEVB_V1.01_DL&PCB	SIM767XX EVB SCH&PCB PDF Document
4	MOD_SIM767XX_124	Reference Package (Pads)
5	SIM7672X & SIM7652X _Series_ AT_Command _Manual_V1.00 SIM7670X Series_ AT_Command _Manual_V1.00	AT Command Manual
6	SIM767XX_TE kit_User Guide_V1.01 (This document)	The use of TE board, forced download, startup, reset, and the location of other measurement points, as well as the use method in conjunction with EVB

NOTE

This current revision is an early release to support initial product developers. The content is subject to change without advance notice.

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2 Assessment Kit

The Assessment Kit includes EVB Kit and TE Kit. The following chapters describe SIM767XX Assessment Kit.

2.1 SIM767XX Assessment kit

SIMCom EVB Kits are listed as follows. Please confirm all accessories are complete.

- 1) SIMCom EVB board;
- 2) 5V DC power adapter;
- 3) Micro USB cable;
- 4) GSM\WCDMA\LTE Antenna;

Table 3: The SIMCom EVB Kits

Items	Description	Quantity
8PYA00-SIMCOM-EVB_V1.02	EVB	1
Adapter	5V/2A DC power adapter	1
Cable	Micro USB cable	1
Antenna	GSM\WCDMA\LTE Antenna	1

SIM767XX TE Kits are listed as follows. Please confirm all accessories are complete.

- 1) SIM767XX TE board;
- 2) Active Antenna.
- 3) Antenna Cable

Table 4: The TE Kits

Items	Description	Quantity
8XS000-SIM7672-TE_V1.03	TE	1
Active Antenna	GNSS Active Antenna	1
Cable	IPEX TO SMA JACK	1

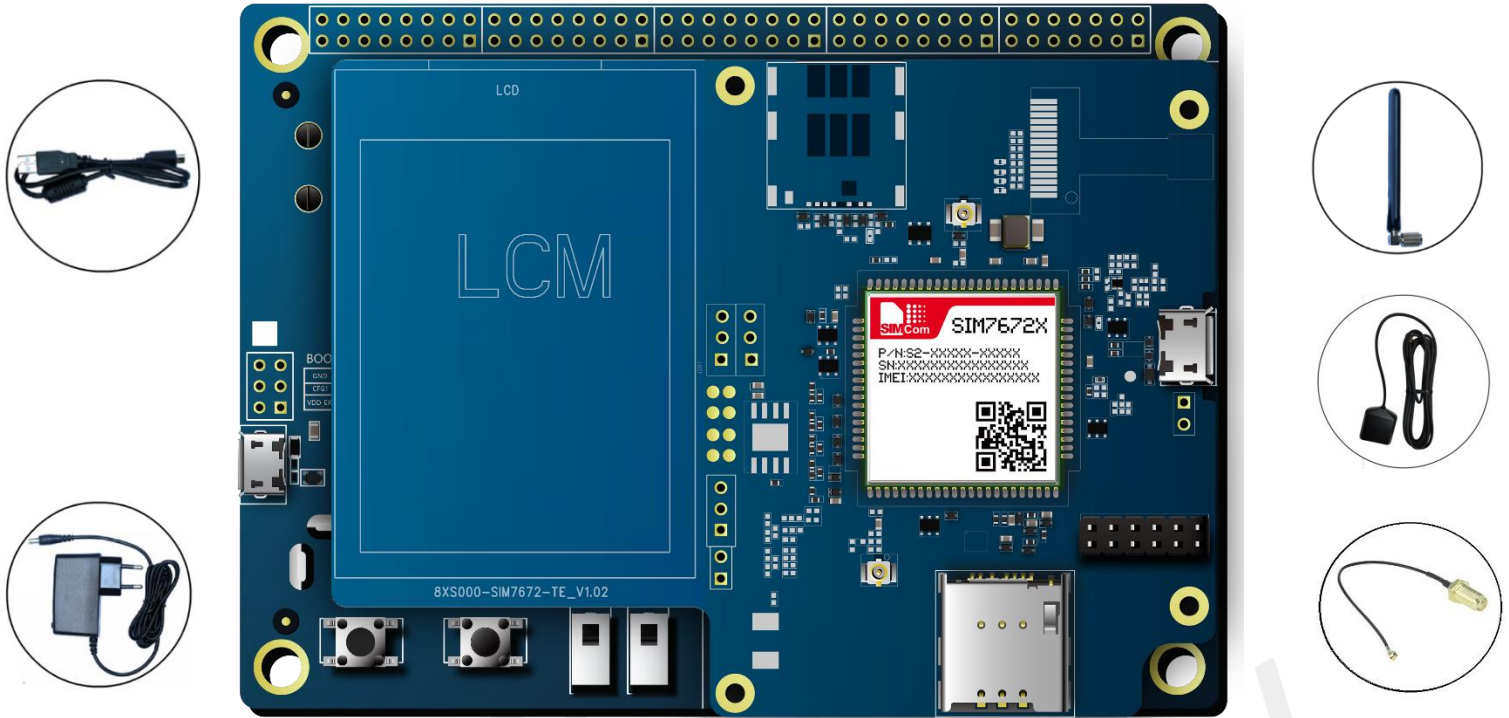


Figure 1: EVB and TE Assessment Kits

The top view and bottom view of the SIMCom EVB board is shown as follows.

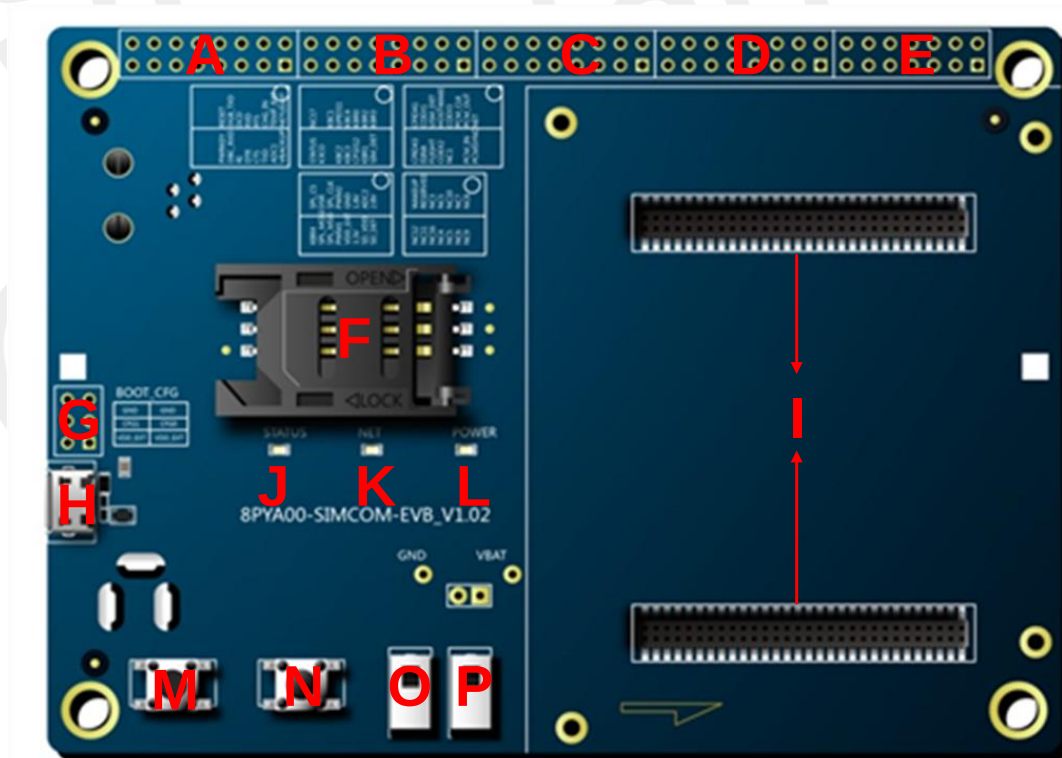


Figure 2: EVB Top View

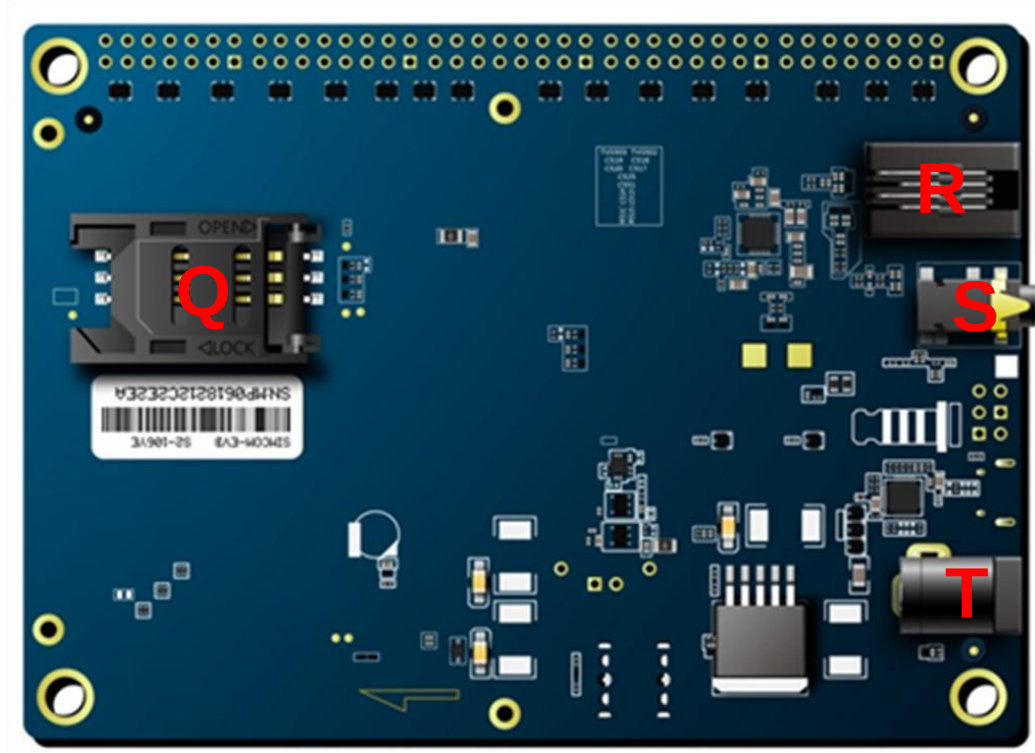


Figure 3: EVB Bottom View

The top view and bottom view of SIM767XX TE board is shown as follows.

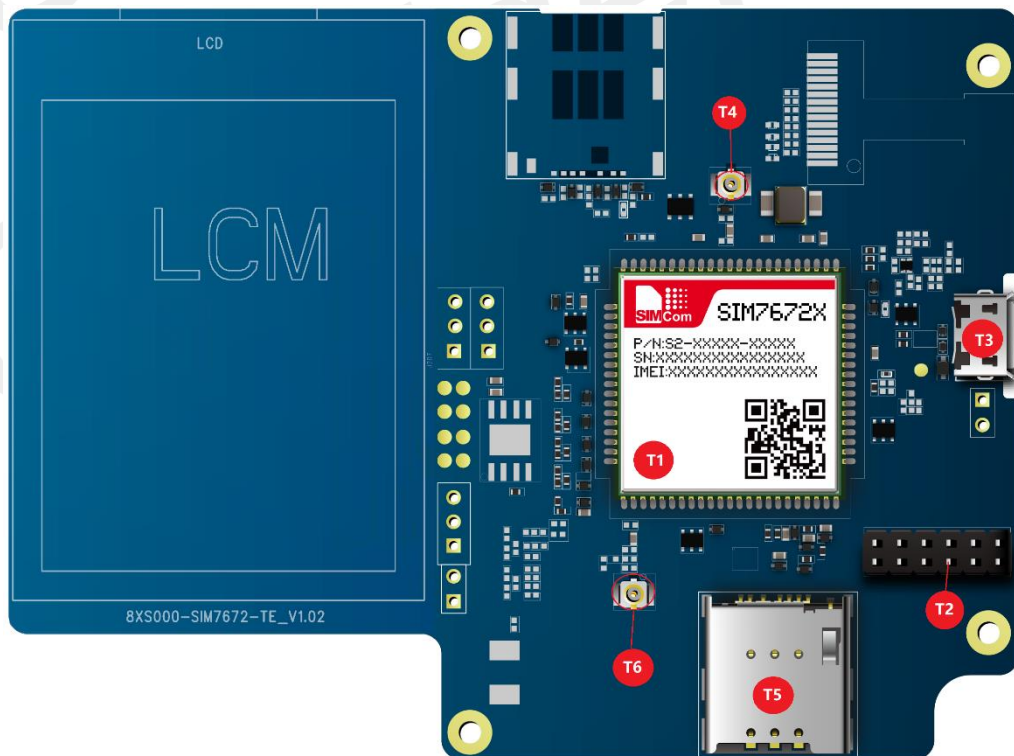


Figure 4: TE Top View

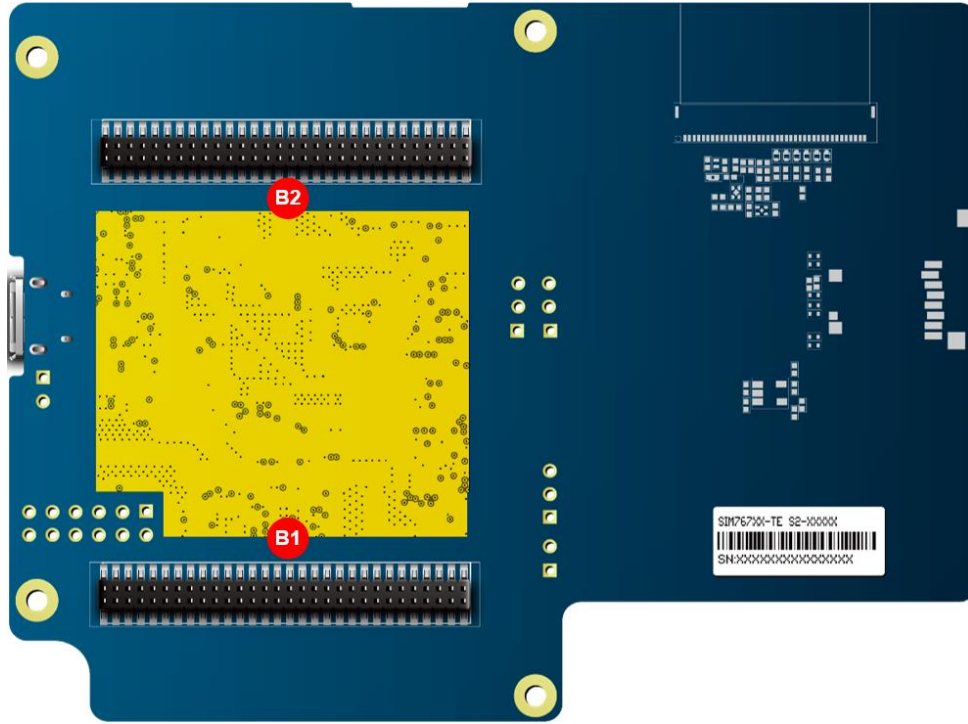


Figure 5: TE Bottom View

Ensure the module normally use, it is recommended to use the correct kit model. The following table shows each kit part number.

Table 5: The Kit part number

Kits	Part Number	Description
SIMCom EVB KIT	S2-106XN	EVb KIT

NOTE

The figures above are the effect diagrams of the module, for reference only. Please refer to the actual product for appearance.

2.2 Interface Description

Through the introduction in the above chapters, we see that there are many signal test points reserved on the EVB and TE board. This chapter mainly introduces the corresponding signals.

The test points on the EVB are listed as follows.

Table 6: The test points on the EVB

Position	Pin	Description	Position	Pin	Description
A	J301_PIN_1	PWRKEY	D	J304_PIN_12	PCM_CLK
	J301_PIN_2	RESET		J304_PIN_13	PCM_IN
	J301_PIN_3	DBG/UART3_RX		J304_PIN_14	PCM_OUT
	J301_PIN_4	DBG/UART3_TX		J304_PIN_15	PCM_SYNC
	J301_PIN_5	UART1_RI		J304_PIN_X	NC
	J301_PIN_6	UART1_DCD	E	J305_PIN_1	GPIO_7
	J301_PIN_7	UART1_DTR		J305_PIN_3	GPIO_6
	J301_PIN_8	UART1_RXD		J305_PIN_5	GPIO_5
	J301_PIN_9	UART1_CTS		J305_PIN_8	GPIO_11
	J301_PIN_10	UART1_RTS		J305_PIN_10	GPIO_10
	J301_PIN_11	UART1_TXD		J305_PIN_11	GPIO_2
	J301_PIN_12	NC		J305_PIN_13	GPIO_1
	J301_PIN_13	ADC1		J305_PIN_14	GPIO_8
	J301_PIN_14	NC		J305_PIN_X	NC
	J301_PIN_15	VRTC	F	J202	Main sim slot
	J301_PIN_16	NETLIGHT	G	J401_PIN_1	VDD_EXT
B	J302_PIN_1	STATUS		J401_PIN_2	
	J302_PIN_15	SIM_DET		J401_PIN_3	USB BOOT
	J302_PIN_X	NC		J401_PIN_4	
C	J303_PIN_2	SPI_CS		J401_PIN_5	GND
	J303_PIN_3	SPI_MOSI		J401_PIN_6	
	J303_PIN_5	SPI_MISO	H	J204	USB-2-UART
	J303_PIN_6	SPI_CLK	I	J101 / J102	To TE board
	J303_PIN_7	PWM1	J	D402	Status LED
	J303_PIN_8	PWM2	K	D401	Network LED
	J303_PIN_9	VDD_EXT	L	D201	Power LED
	J303_PIN_10	GND	M	SW401	PWRKEY
	J303_PIN_12	VCC_1V8	N	SW402	Reset
	J303_PIN_X	NC	O	S201	Power switch
			P	S401	RF switch
			Q	J203	Sim slot (n/a)
			R	J502	Audio jack
			S	X501	Audio jack
			T	J103	+5V DC input

Table 7: The test points on the TE.

Attachment Label	Description
T1	Module
T2	UART Switch*
T3	Micro USB Connector
T4	Main Antenna Connector
T5	SIM Card Holder
T6	GNSS Antenna Connector
B1	Connector (Connect to SIMCOM-EVB)
B2	Connector (Connect to SIMCOM-EVB)

NOTE

1. At the UART switch, the first column is DBG_UART, the second column is DBG/UART3, the third column is UART3, the fourth column is GNSS_UART, the fifth column is EVB_UART, and the sixth column is MAIN_UART. Customers can connect by jumper.
2. By default, DBG_UART and UART1 are connected to EVB.

3 Operation Procedures

3.1 Accessory installation

Install the necessary accessories and perform functional tests.

- 1) Installing the TE to the EVB board, pay attention to the installation direction to prevent short circuit;
- 2) Insert the SIM card to the **T5** position of the main card slot on the front;
- 3) Installing the LTE antenna to the **T4** position and installing the GPS active antenna to the **T6** position;
- 4) For serial AT communication, grab the debug log and upgrade the software, insert the micro USB cable to the interface **T3** position;
- 6) Insert the 5V DC power supply to the **T** position of the EVB board.

The picture of TE board installed on EVB board is shown below.



Figure 6: The picture of TE board installed on EVB board

3.2 Power On/Off the Module

3.2.1 Power on the Module

The module power on procedure is shown in the following:

- (1) Please confirm the EVB board O (S201) is **OFF** status.
- (2) Connect the DC adapter.
- (3) Pull the O (S201) to **ON** state, the L (D201) and the J (STATUS) light will be lighted all time, if the module registered the net, the K (NET) light will be lighted flash, if no registered the net, the J (NET) light will be lighted all the time.

3.2.2 Power off the Module

- (1) Power off the module by pull the O (S201) to off status, after the module save the data and the module will be power off automatic and all lights will be extinguished. This method is not recommended for customers to use directly.
- (2) Power off the module by pressing the POWER_ON (SW401) for 2.5s, after the module save the data and the module will be power off automatic and all lights will be extinguished. Then pull the O (S201) to off state.
- (3) Power off the module by AT command, when the module is in power on status, by sending AT command **"AT+CPOF=1"**, after the module save the data and the module will be powered off automatic and J (STATUS) and K (NET) will be extinguished. Then pull the O (S201) to off state. About the AT command more detail please reference the AT command manual.

3.3 Firmware Update

Customers can update firmware by USB. The firmware update process of the module is as follows.

Before updating the firmware, please contact the SIMCom technical support team and the supplier to obtain the correct firmware upgrade file.

1. Open the SIM767XX download tool, the interface is shown as follows.

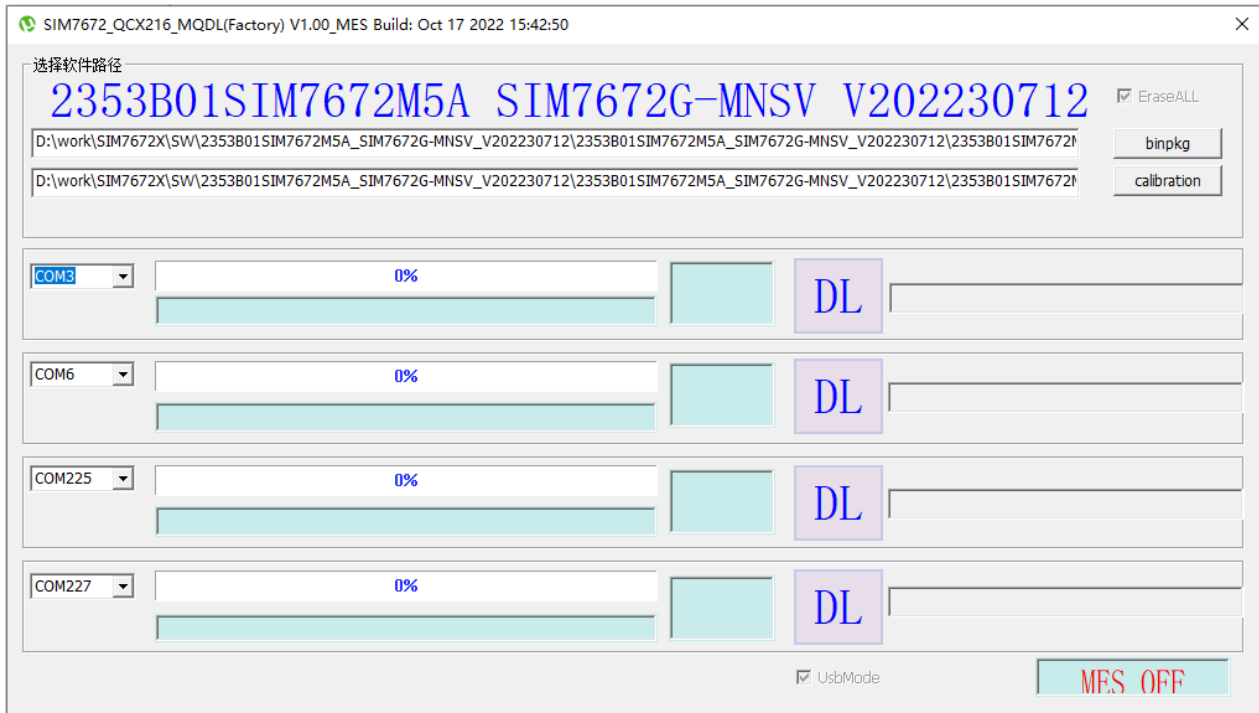


Figure 7: SIM767XX download tool

2. Select the package and RFbin.

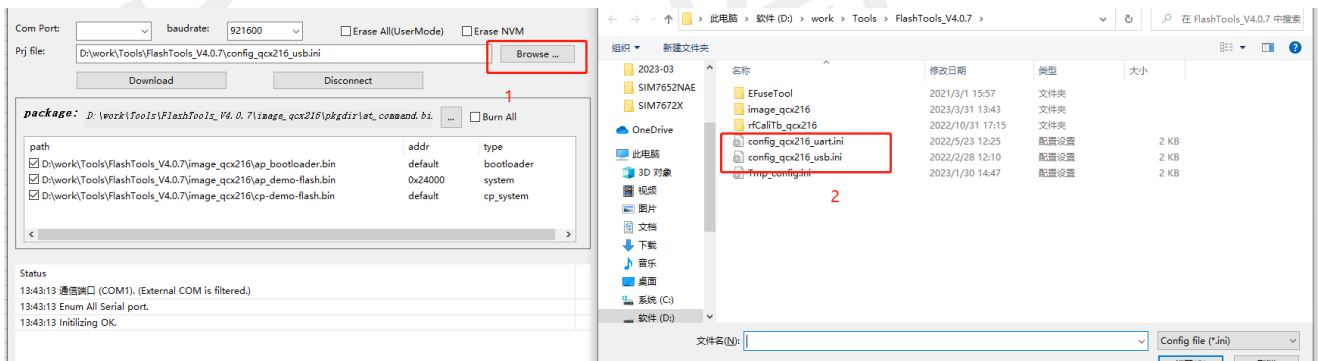


Figure 8: Select the package and RFbin

3. Connect the Micro USB to the TE board, pull down the BOOT test point to the GND test point, then turn on the Power and pressing the POWER_ON button, the module will enter download mode.

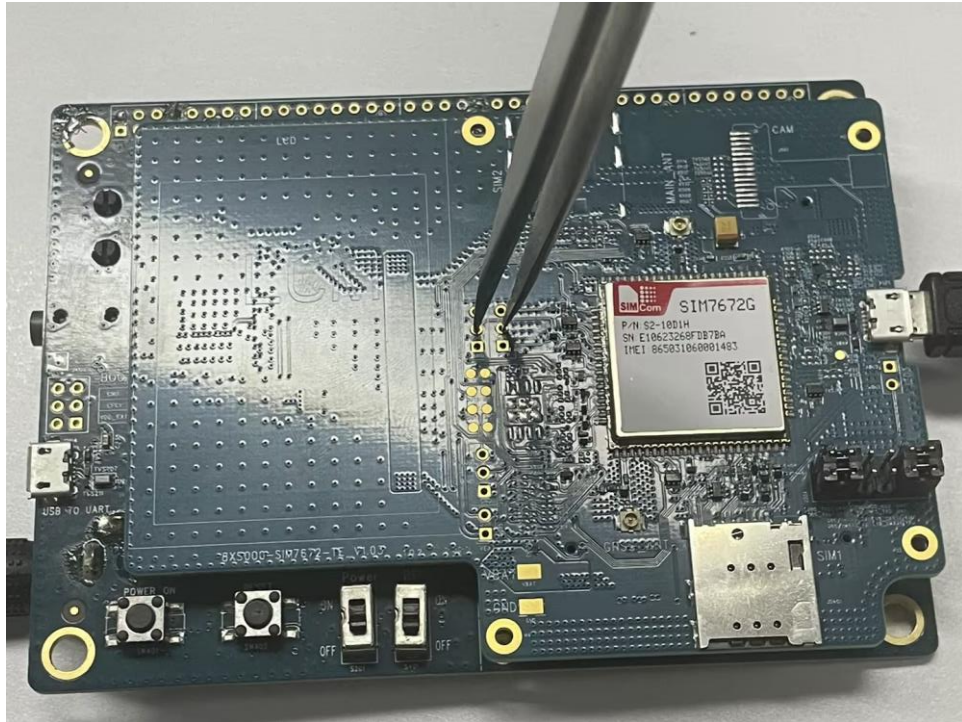


Figure 9: The preparation of Download by USB

4. Select the USB download port, and click the "Download".

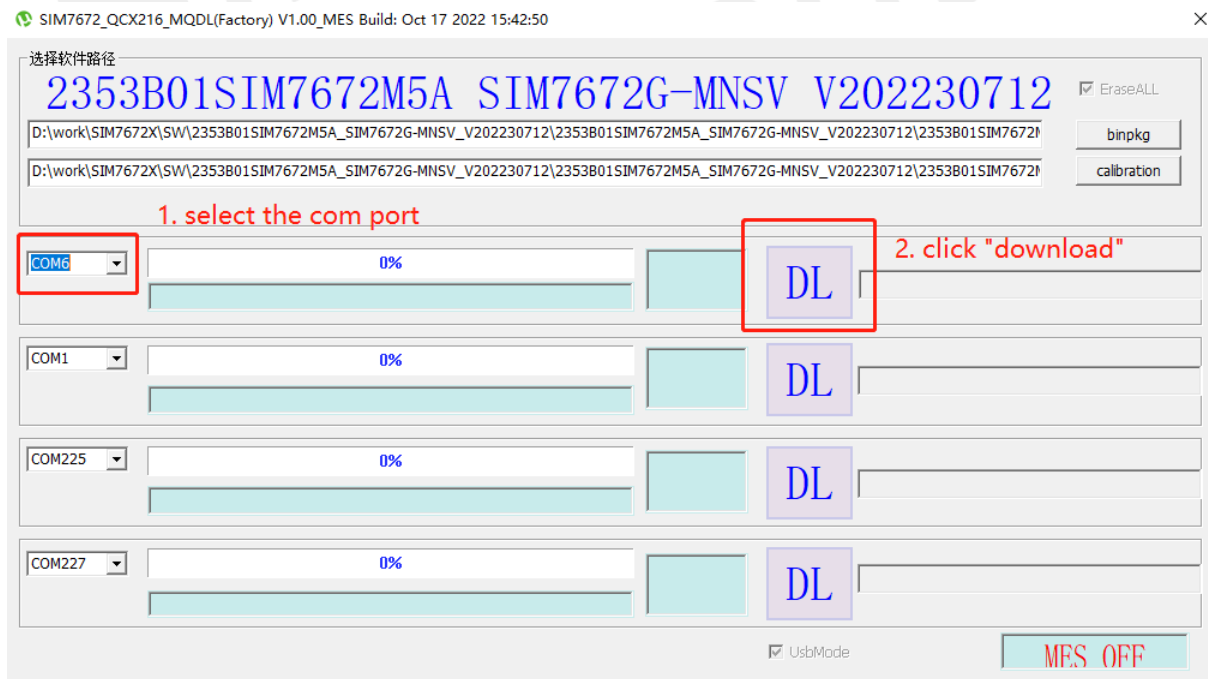


Figure 10: Select the USB com port

5. Download successfully.

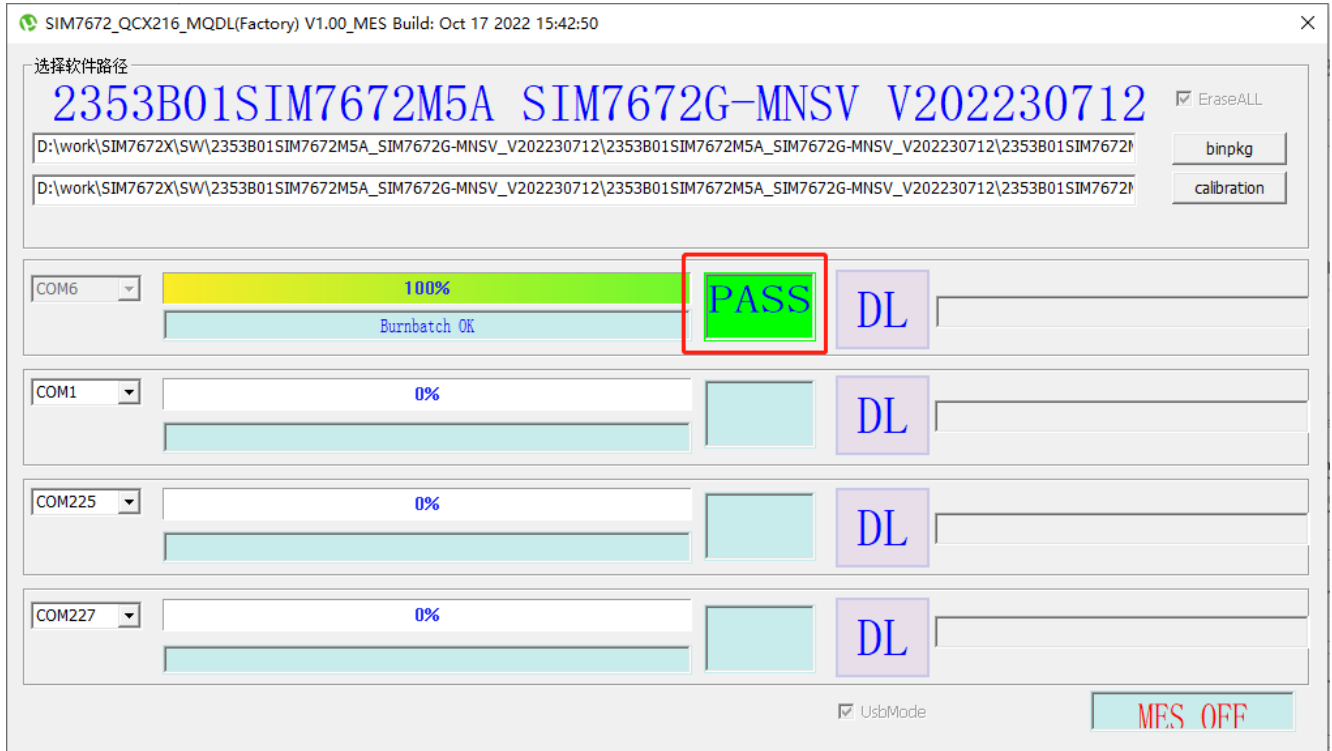


Figure 11: Download successfully

NOTE

The forced download mode lasts for 15s. If the module is not downloaded within 15s, the module will exit the forced download mode.

3.4 Using SIMCom Serial Port Tool

SIMCom has a serial port tool to test modules with AT Commands. Serial Port Tool can communicate with modules after opening COM Ports on list. On the following figure, every section of serial tool can be seen.

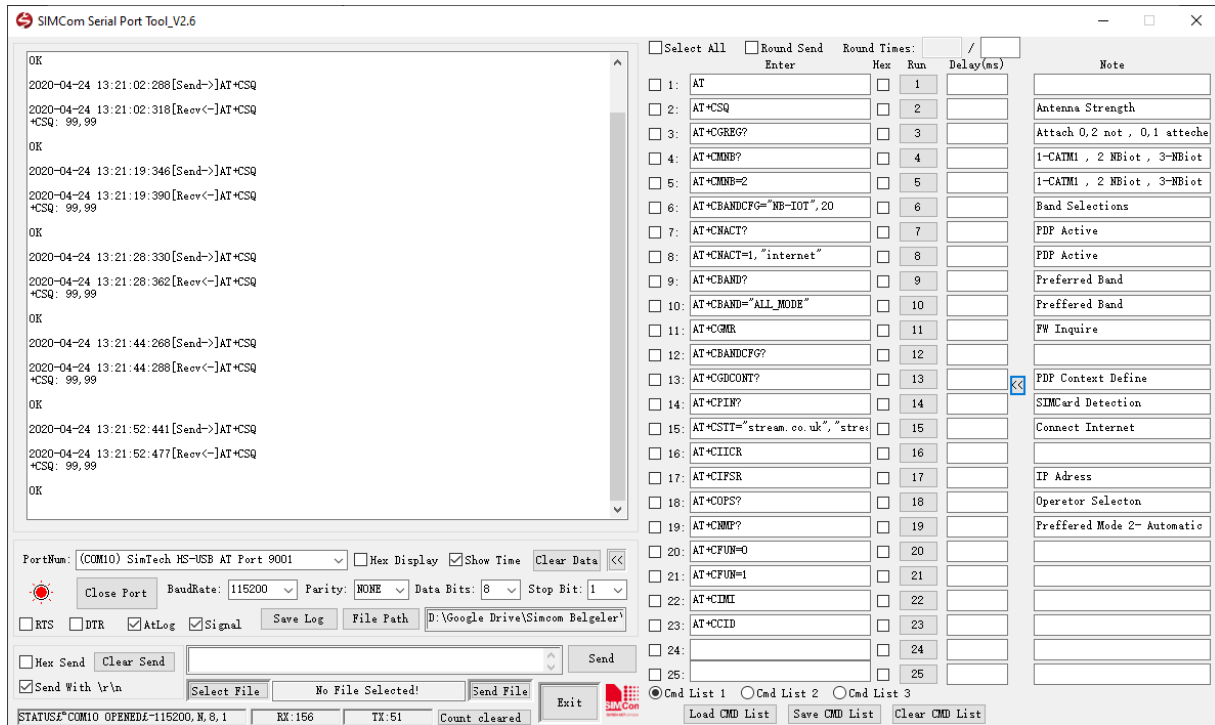


Figure 12: SIMCom Serial Port Tool Introduction

In addition, SIMCom Serial Port Tool may take some log records and save these command lists to use later again. Tool has a 3 CMD List sections and holds AT Commands with their notes and saves under .ini format on PC to import it back.

3.5 AT Command Communication

SIM767XX provides three serial ports. By default, when used as an ordinary serial port, we can set the data frame format of the serial port and set the baud rate.

1) Set the serial port data frame format

SIM767XX supports multiple serial data frame formats. The default data frame format is 8 data bits, 1 stop bit, and no parity bit.

Table 8: The default data frame format

UART frame format	Support format
Data bit	8bits
Stop bit	1bits
Parity bit	None

2) Set the serial port baud rate

SIM767XX supports a variety of common baud rates; the factory default baud rate of the standard module is 115200. For temporary modification of baud rate, please refer to the command "AT+IPR".

Table 9: UART baud rate support

UART baud rate support	Support rate
Serial communication baud rate	600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400 and 460800.

Common methods of using serial port baud rate commands:

Table 10: UART common baud rate operation

UART common baud rate operation	Related command
Query the current baud rate	AT+IPR?
Query module supports baud rate	AT+IPR=?
Set temporary baud rate to 9600	AT+IPR=9600

3.6 GNSS Firmware Update

Customers can read the GNSS NEMA by UART, the process is as follows.

1. Connect the GNSS_UART to the EVB_UART1 by the jumper, and insert the USB and UART cable, then turn on the Power and pressing the POWER_ON button.

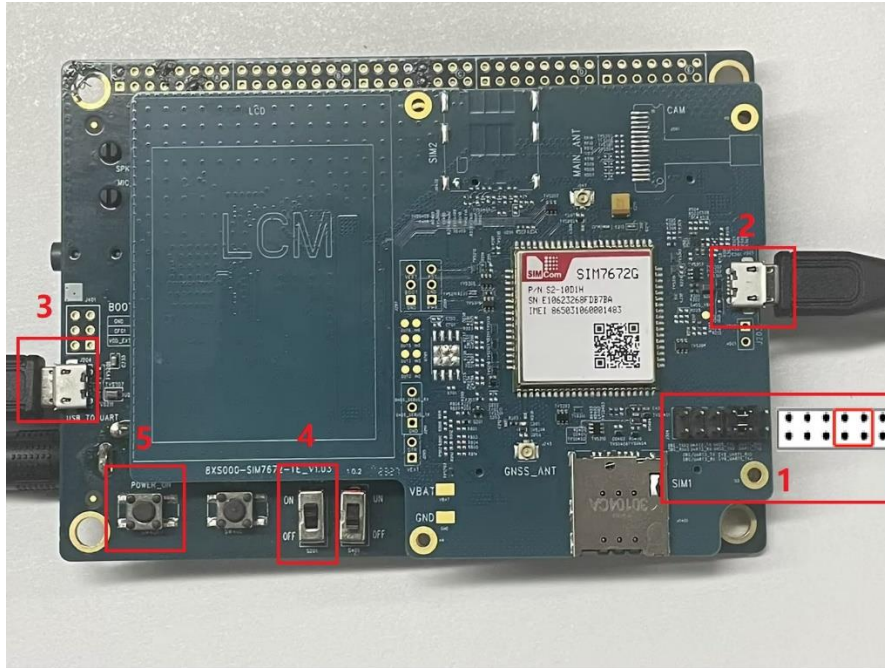


Figure 13: The preparation of GNSS firmware update

- Open the SIM767XX download tool, select the package, GNSS UART com port and USB com port.

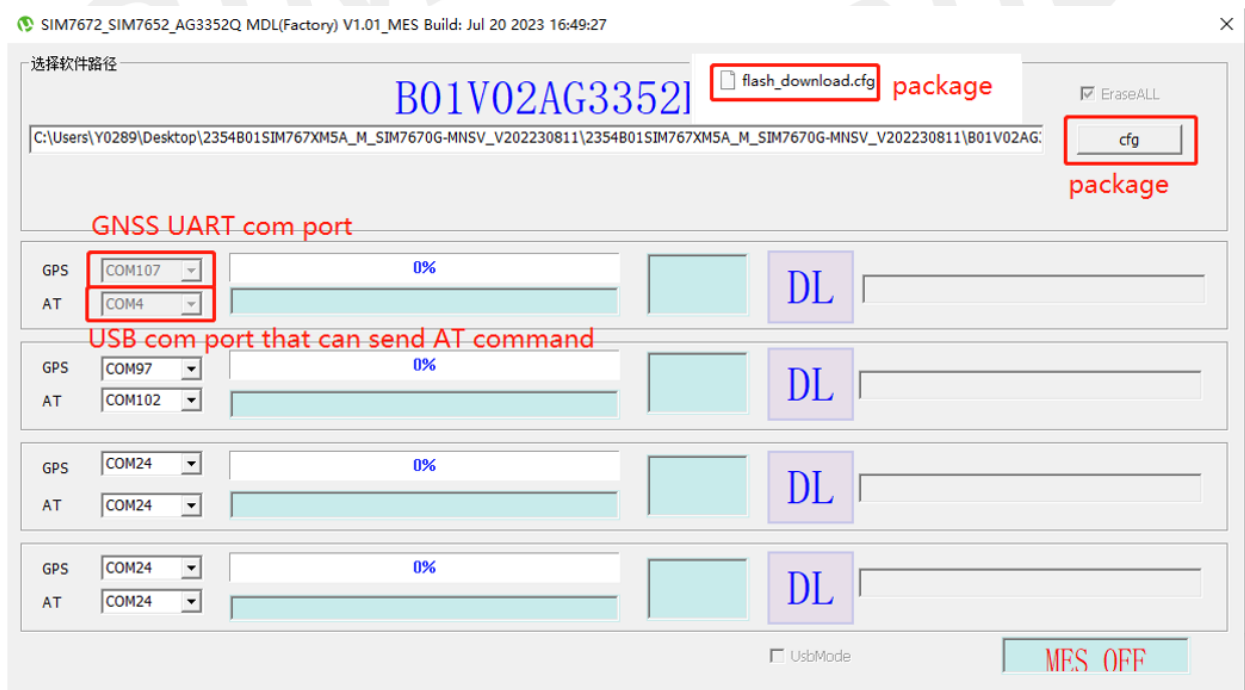


Figure 14: The selection of the package and com port

- Click the “DL” to start download.

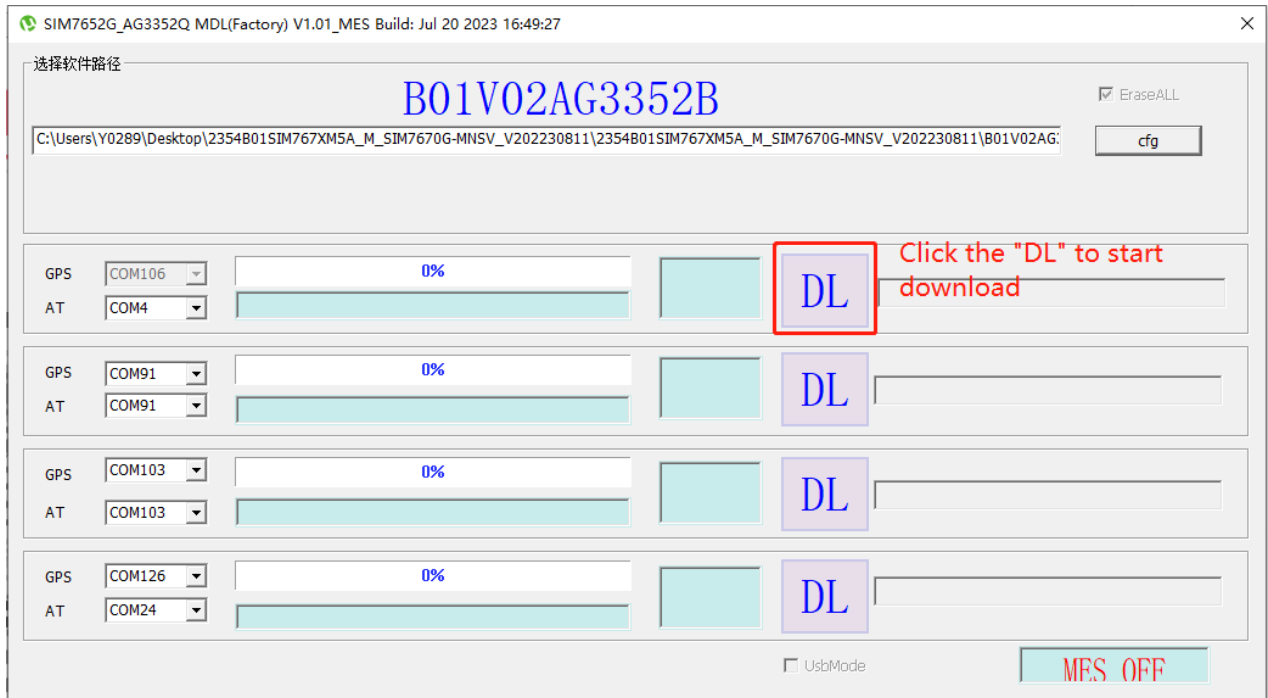


Figure 15: Start the download

2. Download successfully.

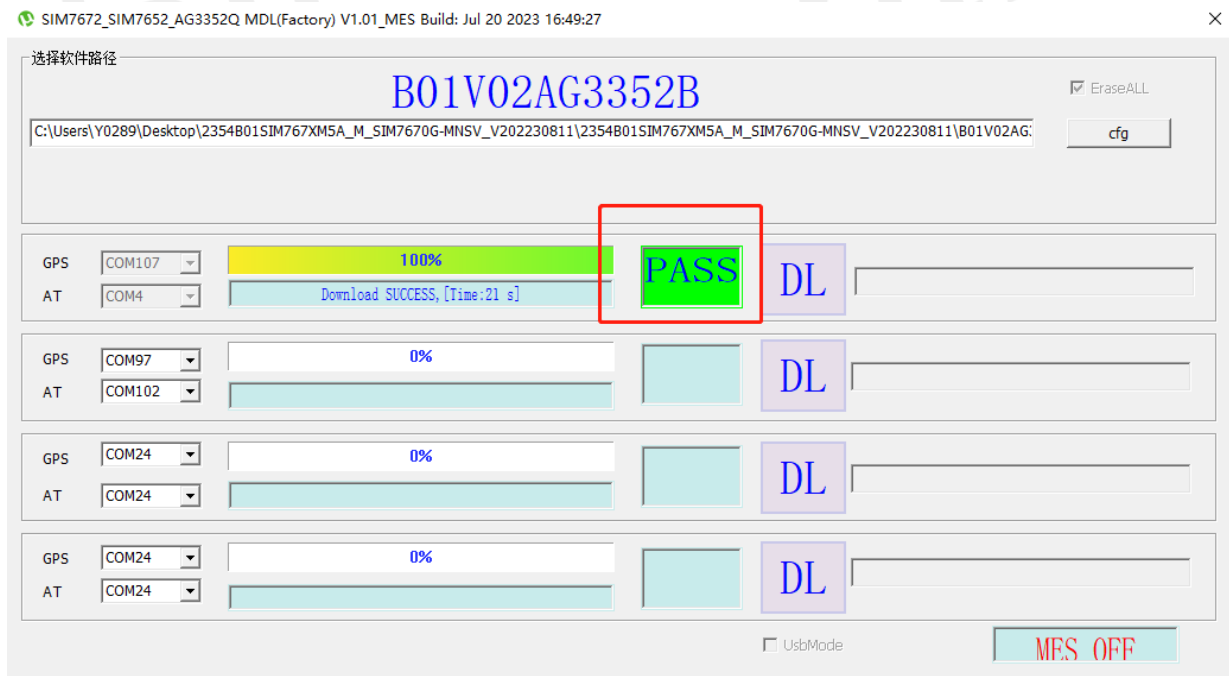


Figure 16: GNSS download successfully

3.7 Reading the GNSS NEMA

Customers can read the GNSS NEMA by USB, the process is as follows.

1. Connect the GNSS_UART to the UART3 by the jumper, and insert the USB cable, then turn on the Power and pressing the POWER_ON button.

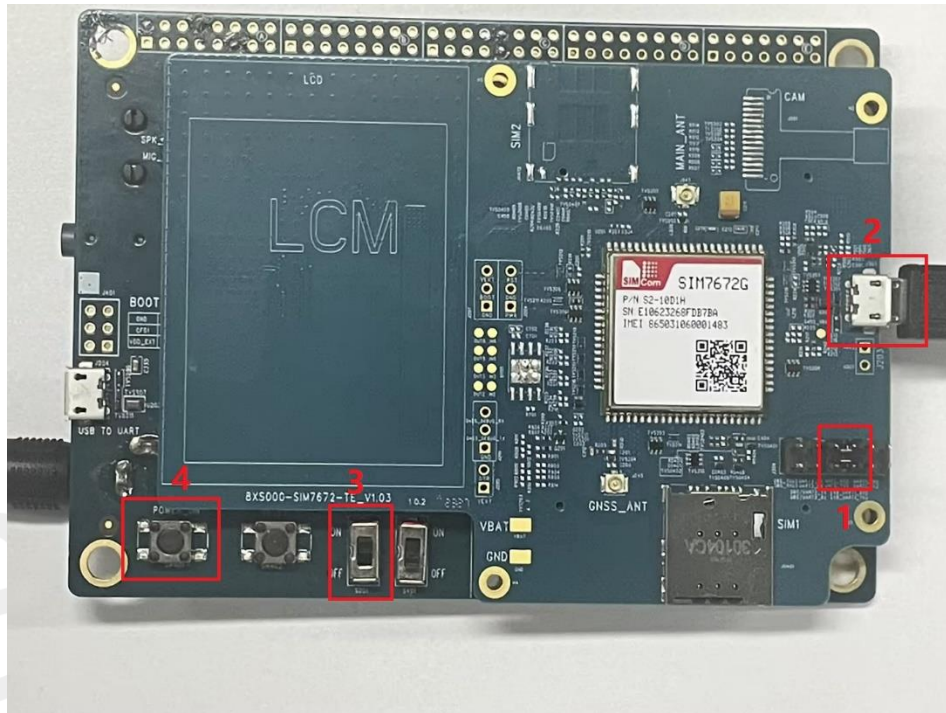


Figure 17: The preparation of reading the GNSS NEMA by USB

2. Open the serial port tool, select the com port and send the AT command “AT+CGNSSPWR=1” and “AT+CGNSSSTST=1”.*

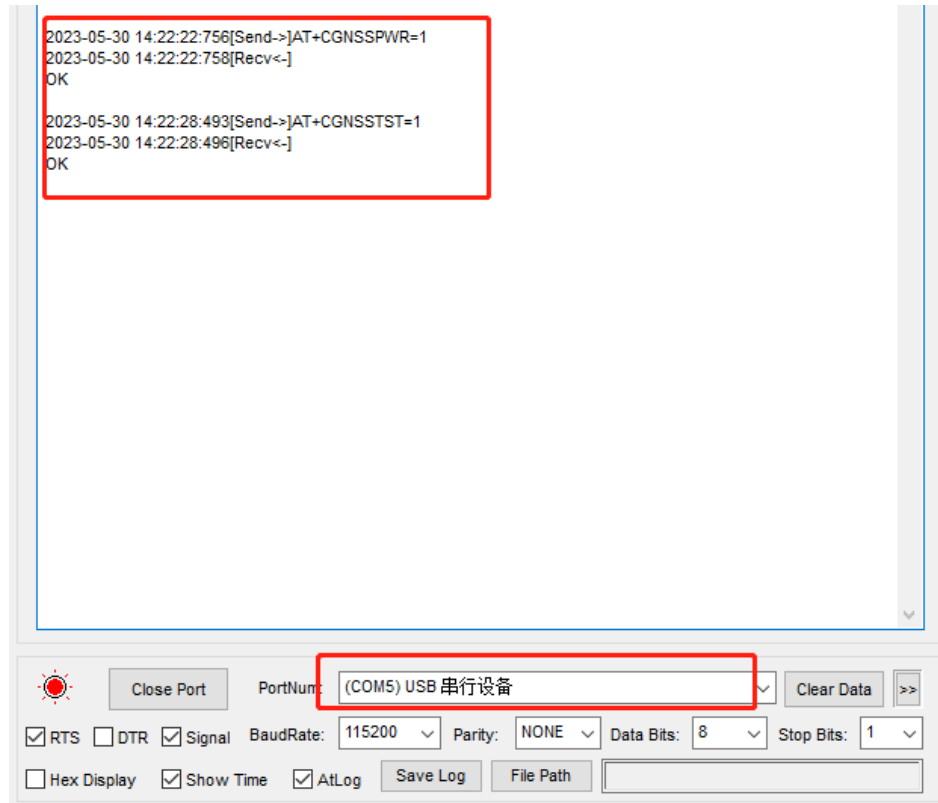


Figure 18: Send the AT command

3. Select the com port of GNSS NEMA.

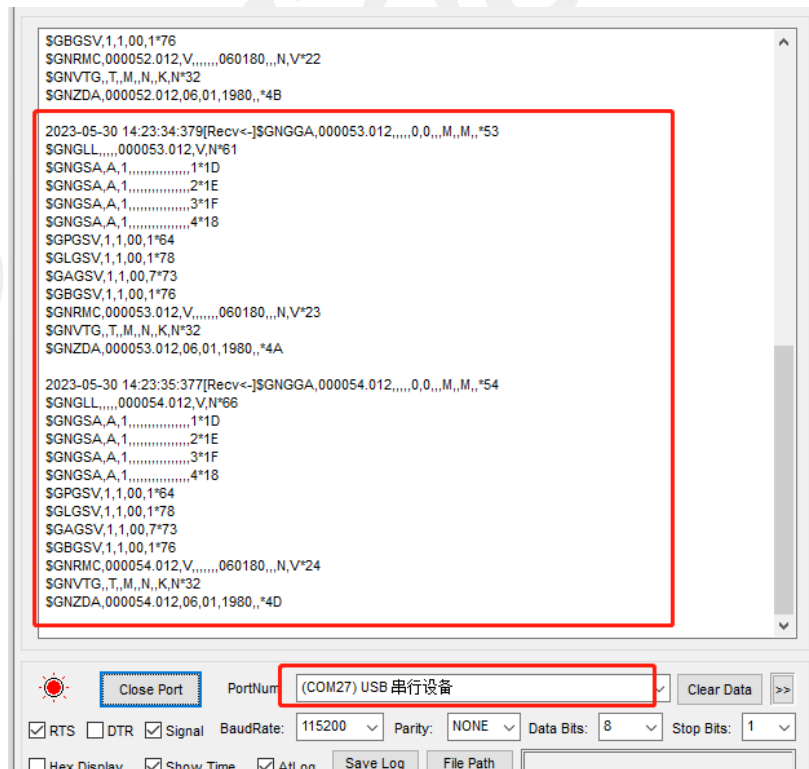


Figure 19: Read the GNSS NEMA

NOTE

About the AT command more detail please refer to the Document [2].

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4 Current Consumption

4.1 Preparation for test

Firstly, connect the power supply to the “VBAT and GND” on the TE board, connected to the USB and power on the module, and then send the command “AT+SIMCOMATI” to query valid information such as module version and software version.

```
[15:19:23.833]发→◇at+simcomati
[15:19:23.847]收←◆at+simcomati
Manufacturer:
Model:
Revision: 2308B01SIM7672M5A
SIM7672M5A_B01V02_230209
IMEI:
OK
```

Figure 20: Query version number

Calibrate the module after check the information of module correctly.

4.2 SLEEP mode current consumption test

1. Insert the SIM card, register the network, and query the network registration status through "AT+CREG?"
2. After the network is successfully registered, turn off functions (such as indicator lights, log, etc.) related to leakage through AT commands.
3. Enable sleep mode by "AT+CSCLK=1", and unplug USB.
4. Measure the current in sleep mode.

NOTE

If the current waveform is abnormal, start again from Step 1.
There is a leakage current of about 25uA on the TE board.

5 Appendix

5.1 Related Documents

Table 11: Related documents

No.	Title	Description
[1]	SIM7672X Hardware Design	SIM7672X Hardware Design document
[1]	SIM7670X Hardware Design	SIM7670X Hardware Design document
[2]	SIM7672X & SIM7652X_Series_AT_Command_Manual_V1.xx	SIM7672X Series AT Command Manual document
[2]	SIM7672X _Series_AT_Command_Manual_V1.xx	SIM7670X Series AT Command Manual document
[3]	SIMCOM_EVB KIT_User Guide	SIMCOM EVB User Guide

5.2 Terms and Abbreviations

Table 12: Terms and abbreviations

Abbreviation	Description
EMC	Electromagnetic Compatibility
ESD	Electrostatic Discharge
GPS	Global Positioning System
I2C	Inter-Integrated Circuit
IMEI	International Mobile Equipment Identity
LTE	Long Term Evolution
MSB	Most Significant Bit
PCB	Printed Circuit Board
RF	Radio Frequency
SIM	Subscriber Identification Module
SMPS	Switched-Mode Power Supply
NC	Not connect

ZIF	Zero Intermediate Frequency
(U)SIM	Universal Subscriber Identity Module
UART	Universal Asynchronous Receiver Transmitter

5.3 Safety Caution

Table 13: Safety caution

Marks	Requirements
	When in a hospital or other health care facility, observe the restrictions about the use of mobiles. Switch the cellular terminal or mobile off, medical equipment may be sensitive and not operate normally due to RF energy interference.
	Switch off the cellular terminal or mobile before boarding an aircraft. Make sure it is switched off. The operation of wireless appliances in an aircraft is forbidden to prevent interference with communication systems. Forgetting to think much of these instructions may impact the flight safety, or offend local legal action, or both.
	Do not operate the cellular terminal or mobile in the presence of flammable gases or fumes. Switch off the cellular terminal when you are near petrol stations, fuel depots, chemical plants or where blasting operations are in progress. Operation of any electrical equipment in potentially explosive atmospheres can constitute a safety hazard.
	Your cellular terminal or mobile receives and transmits radio frequency energy while switched on. RF interference can occur if it is used close to TV sets, radios, computers or other electric equipment.
	Road safety comes first! Do not use a hand-held cellular terminal or mobile when driving a vehicle, unless it is securely mounted in a holder for hands free operation. Before making a call with a hand-held terminal or mobile, park the vehicle.
	GSM cellular terminals or mobiles operate over radio frequency signals and cellular networks and cannot be guaranteed to connect in all conditions, especially with a mobile fee or an invalid SIM card. While you are in this condition and need emergent help, please remember to use emergency calls. In order to make or receive calls, the cellular terminal or mobile must be switched on and in a service area with adequate cellular signal strength. Some networks do not allow for emergency call if certain network services or phone features are in use (e.g. lock functions, fixed dialing etc.). You may have to deactivate those features before you can make an emergency call. Also, some networks require that a valid SIM card be properly inserted in the cellular terminal or mobile.