# SIMCOM-PCIE-EVB Kit
# User Guide

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**SIMCom Wireless Solutions Limited**
Building B, SIM Technology Building, No.633 Jinzhong Road, Changning District, Shanghai P.R.China
Tel: +86 21 31575100
Email: simcom@simcom.com

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# Version History

| Date | Version | Description of change | Author |
|------|---------|----------------------|--------|
| 2018.12.05 | 1.00 | Origin | Xutao.Jiang |
| 2020.04.22 | 1.01 | Modify the Format | Xutao.Jiang |

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# 1  SIMCOM-PCIE-EVB Overview



Figure1: SIMCOM-PCIE-EVB TOP view
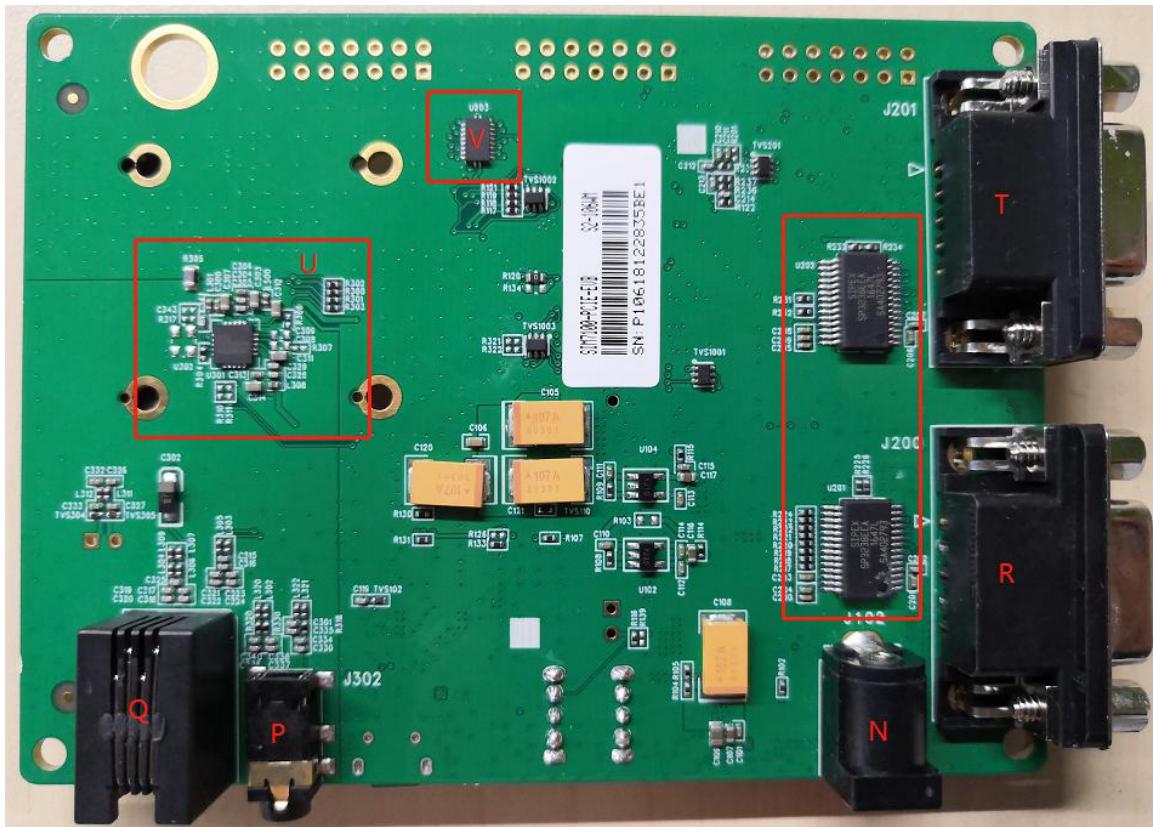
Figure2: SIMCOM-PCIE-EVB BOTTOM view

A:    Test point
B:    SIM card socket
C:    Mini PCIe card holder
D:    Indicator LED
E:    System power (3.3V)
F:    System reset key
G:    Power switch
H:    RF control switch
J:    Micro USB connector
N:    5V DC jack
P:    Audio jack
Q:    Handset jack
R:    Main UART
S:    UART to RS232 IC
T:    DBG UART (reserved)
U:    NAU8810 codec
V:    Level shifter IC

## 2 EVB Accessory
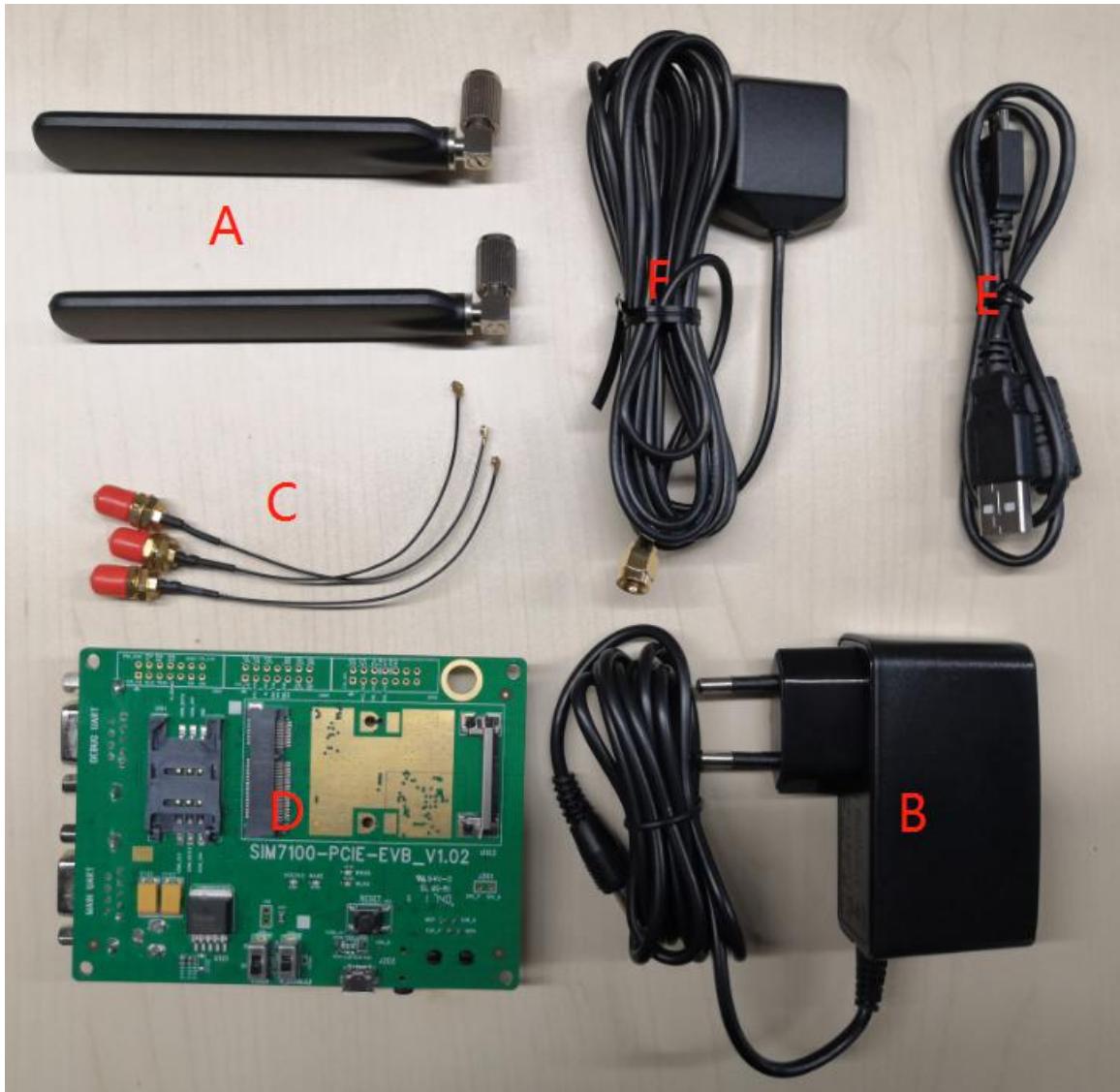


Figure3: EVB Accessory

A: GSM/WCDMA/LTE Antenna
B: 5V DC adapter
C: Antenna cable
D: SIMCom-PCIE-EVB
E: Micro USB cable
F: GNSS Antenna

# 3 Accessory Interface

## 3.1 Adapter Interface

**Table 1: 5V adapter interface**

| Pin | Signal | I/O | Description |
|-----|--------|-----|-------------|
| 1 | Adapter input | I | 5V/2.0A DC source input |
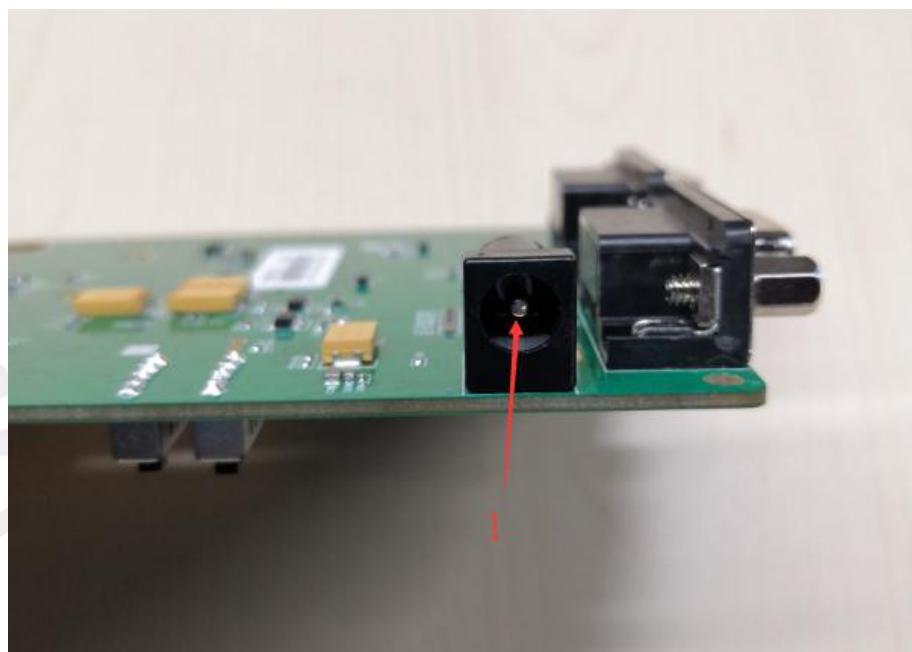


Figure 4: Adapter interface

## 3.2 **Audio Interface**
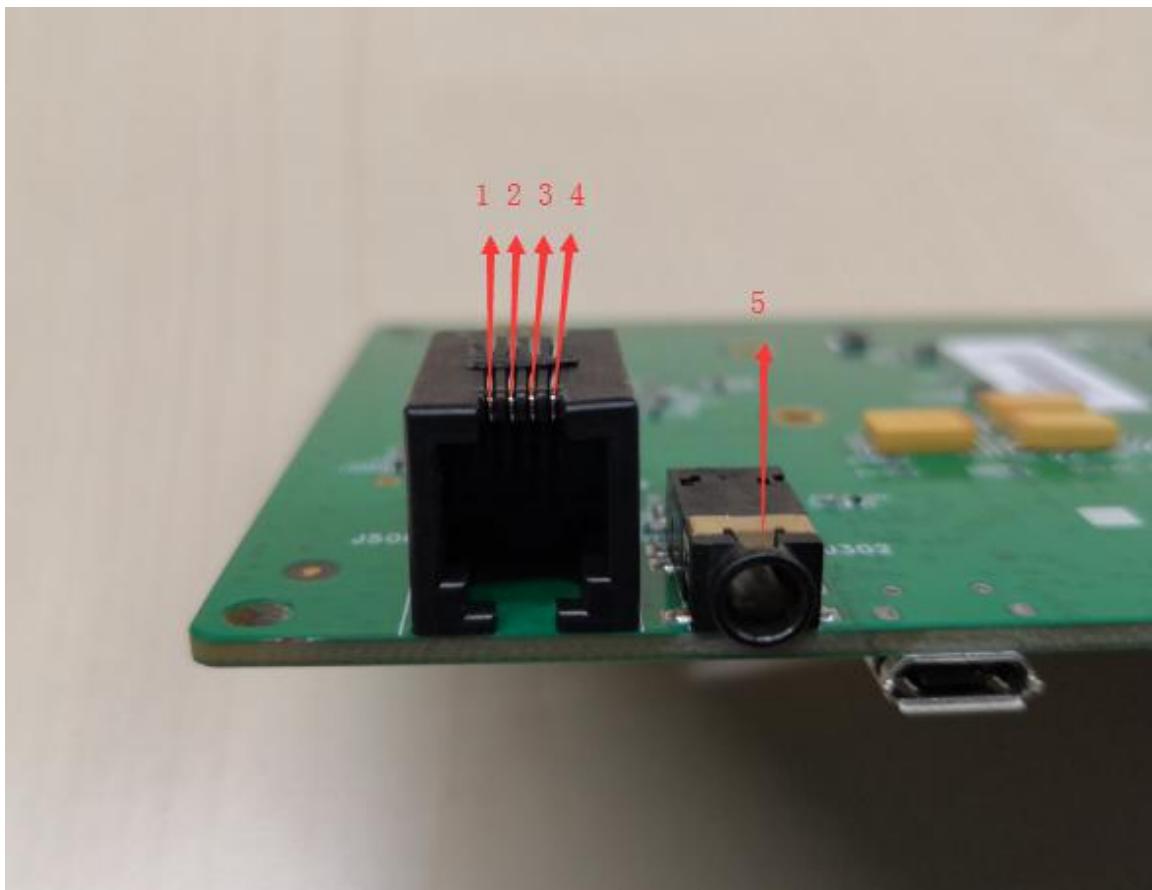


Figure4: Audio Interface

**Table 2: Headset interface**

| Pin | Signal | I/O | Description |
|-----|--------|-----|-------------|
| 1 | MICN | I | Negative microphone input |
| 2 | SPKN | O | Negative receiver output |
| 3 | SPKP | I | Positive receiver output |
| 4 | MICP | O | Positive microphone input |

**Table 3: Earphone interface**

| Pin | Signal | I/O | Description |
|-----|--------|-----|-------------|
| 5 | MIC2& Headphone | I/O | Auxiliary audio input/output |

| NOTE |
|------|

The default audio channel is headset interface (MIC1 and EAR1), customer should connect the headset to the headset interface, and the sequence of the signal should match with table 2.

## 3.3 SIM Card Interface
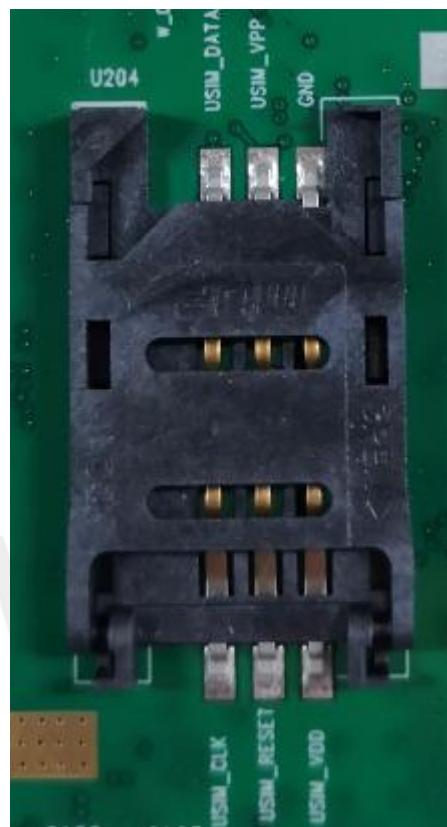


Figure 6: SIM card interface

**Table 4: UIM card socket**

| Signal | I/O | Description |
| --- | --- | --- |
| GND | - | Ground |
| USIM_VPP | - | NC |
| USIM_DATA | I/O | External USIM card data signal |
| USIM_CLK | O | External USIM card clock signal |
| USIM_RST | O | External USIM card reset signal |
| USIM_VDD | O | Power source for the external USIM card |

## 3.4 Antenna Interface



Figure 7: Antenna interface

| NOTE |
| --- |

This chapter takes SIM7600E as an example, the sequence of antennas maybe different, customer should refer to the relevant Hardware Design document.

## 3.5 UART port interface
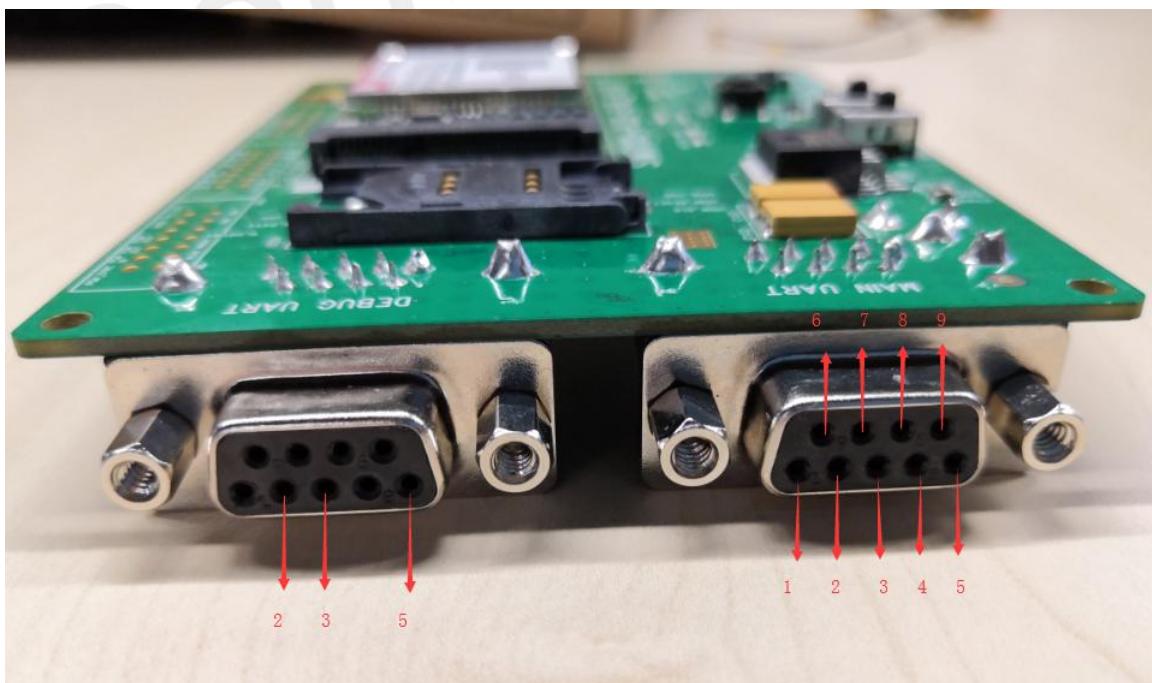
Figure 8: UART ports

Main UART
AUX UART (Reserved)

**Table 5: Main UART port**

| Pin | Signal | I/O | Description |
|---|---|---|---|
| 1 | DCD | O | Data carrier detection |
| 2 | TXD | O | Transmit data |
| 3 | RXD | I | Receive data |
| 4 | DTR | I | Data Terminal Ready |
| 5 | GND | | GND |
| 6 | - | - | - |
| 7 | CTS | I | Clear to Send |
| 8 | RTS | O | Request to Send |
| 9 | RI | O | Ring Indicator |

**Table 6: Debug UART Port:**

| Pin | Signal | I/O | Description |
|---|---|---|---|
| 2 | DEBUG_TX | O | Transmit data |
| 3 | DEBUG_RX | I | Receive data |
| 5 | GND | | GND |

## 3.6 LED Indicator and Switch
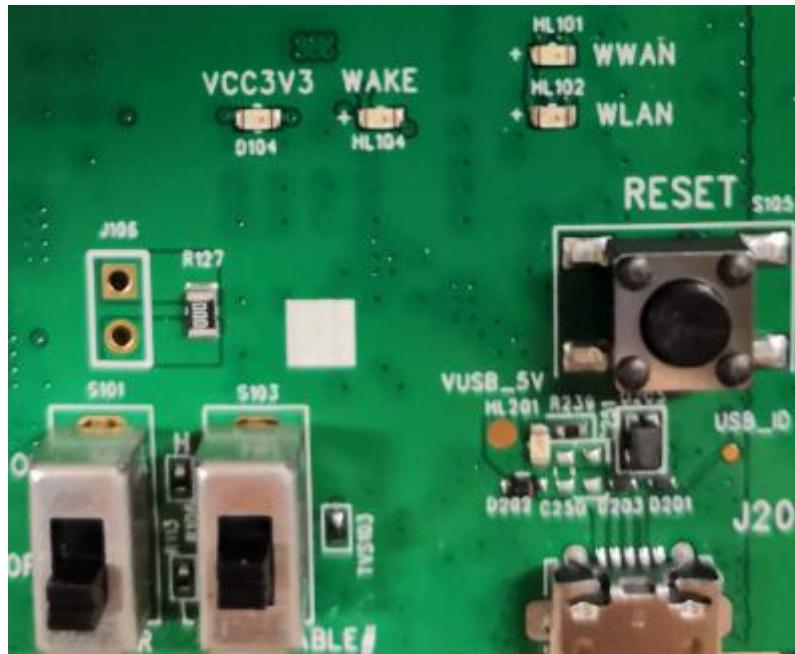
Figure 9: LED indicator and Switch

Figure 9 shows the indicator LED and function switch, the detail function please refer to table 7 and table 8.

**Table 7: Working state of LED as list**

| Ref No. | Name | Function description |
|---------|------|----------------------|
| D104 | VCC3V3 indicator | Bright：system has the 3.3V power<br>Extinct: system does not have the 3.3V power |
| HL104 | WAKE indicator | Blinking one time when module wake up host |
| HL101 | WWAN indicator | Refer to the HD document Netlight chapter; |
| HL102 | WLAN indicator | Reserved |
| HL201 | USB indicator | Bright：USB cable inserted<br>Extinct: USB cable does not insert |
| USIM_VDD | O | Power source for the external USIM card |

**Table 8: Function of switch**

| Ref No. | Name | Function description |
|---------|------|----------------------|
| S101 | VCC3V3 indicator | Bright：system has the 3.3V power<br>Extinct: system does not have the 3.3V power |
| S103 | RF Control switch | Switch down: module goes into Flight mode<br>Switch up: module controlled by software |

# 4 Test Interface


Figure10: Test interface overview

## 4.1 J2001
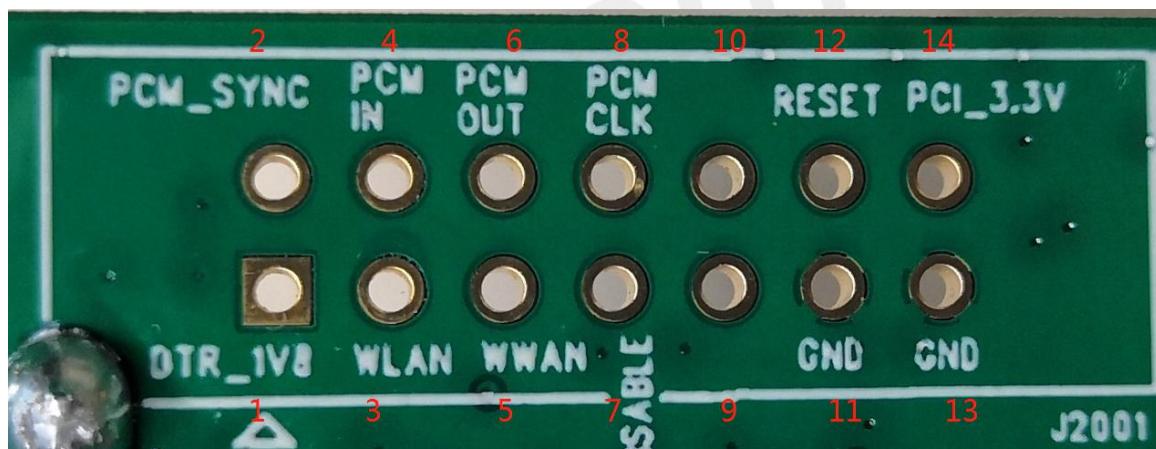

Figure11: J2001 interface

**Table 9: J2001 Interface Pin List**

| Pin | Signal | I/O | Description |
|-----|--------|-----|-------------|
| 1 | DTR_1V8 | I | (1.8V voltage domain) |
| 2 | PCM_SYNC | O | PCM frame synchronization |
| 3 | WLAN | O | Connected with RI_1V8 |
| 4 | PCM_IN | I | PCM data input |
| 5 | WWAN | I | Network status indicator |
| 6 | PCM_OUT | O | PCM data output |
| 7 | W_DISABLE | I | Active low signal for wireless disabling (Flight mode) |
| 8 | PCM_CLK | O | PCM clock |
| 9 | NC | - | NC |
| 10 | NC | - | NC |
| 11 | GND | - | Ground |
| 12 | RESET | I | Active low functional reset to the card |

| 13 | GND | - | Ground |
|----|-----|---|--------|
| 14 | PCI_3.3V | I | 3.3V supply |

## 4.2  J2002
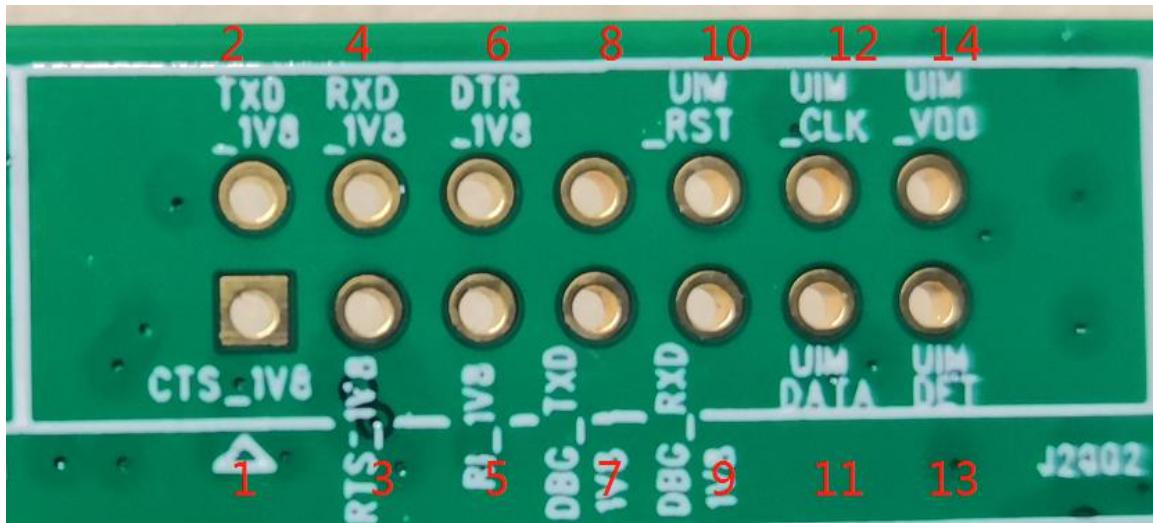


Figure12: J2002 interface

**Table 10: J2002 Interface Pin List**

| Pin | Signal | I/O | Description |
|-----|--------|-----|-------------|
| 1 | CTS_1V8 | I | Reserved for future use. (1.8V voltage domain) |
| 2 | TXD_1V8 | O | |
| 3 | RTS_1V8 | O | |
| 4 | RXD_1V8 | I | |
| 5 | RI_1V8 | O | |
| 6 | DTR_1V8 | I | |
| 8 | NC | - | NC |
| 7 | DBG_TXD_1V8 | O | Reserved for DEBUG (1.8V voltage domain) |
| 9 | DBG_RXD_1V8 | I | |
| 10 | USIM_RST | O | USIM card reset signal |
| 11 | USIM_DATA | I/O | USIM card data signal |
| 12 | USIM_CLK | O | USIM card clock signal |
| 13 | USIM_DET | I | External USIM card presence detect signal, hot swap |
| 14 | USIM_VDD | O | Power source for the external USIM card |

## 4.3 J2003
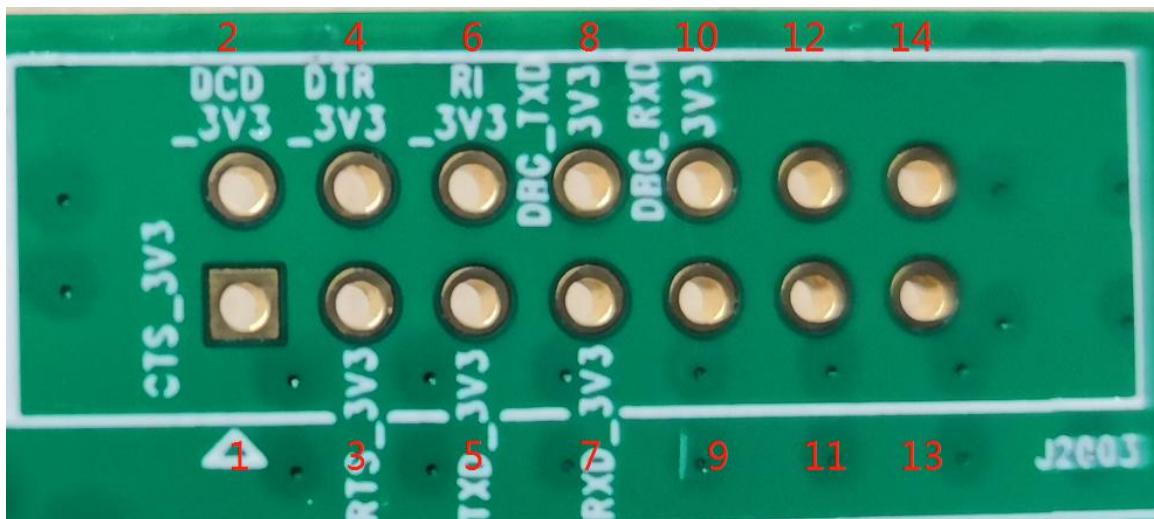

Figure13: J2003 interface

**Table 11: J2003 Interface Pin List**

| Pin | Signal | I/O | Description |
|-----|--------|-----|-------------|
| 1 | CTS_3V3 | O | The UART port is a full function serial port, reserved for debug and future use. (3.3V voltage domain)

The DBG port is a 3-wire serial port, reserved for debug and future use. (3.3V voltage domain) |
| 2 | DCD_3V3 | I | |
| 3 | RTS_3V3 | I | |
| 4 | DTR_3V3 | O | |
| 5 | TXD_3V3 | I | |
| 6 | RI_3V3 | I | |
| 7 | RXD_3V3 | O | |
| 8 | DBG_TXD_3V3 | I | |
| 9 | NC | | |
| 10 | DBG_RXD_3V3 | O | |
| 11 | NC | | |
| 12 | NC | | |
| 13 | NC | | |
| 14 | NC | | |

# 5 EVB and Accessory

The EVB and its accessory are equipped as the Figure 14



Figure 14: EVB and accessory

> **NOTE**
>
> The headset and Uart cable is not included in the EVB Kit. S101 and S103 switch up.

# 6 Illustration

## 6.1 Power on module

The Mini PCIe module is designed with auto power on with power appears.

The procedure of power on the module described as the following steps:

1. Insert the module to the SIMCom-PCIE-EVB;
2. Equip the accessory as figure 14 shows; make sure the SIM card has equipped;
2. Plug in 5V DC adapter, and push S101 to "ON" state, then D104 will lighten;

The module would be power on, HL101 would flash at a certain frequency, and user can judge registering status of the module by the HL101. For detailed description, please refer to document [1] [2].

## 6.2 Registering Network and Making a Call

User should setup the driver on the PC for the proper operation, The procedure of making a call described as the following steps:

1) User should power on the module as chapter 6.1 described.
2) Connect the micro USB cable to the USB connector;
3) Open the SSCOM32(Serial Debug Port) on your computer.
4) Check the serial port number: My computer (right click) →Manage → Device Manager → Ports (COM&LPT)



Figure 15: COM ports

5) Use the SSCOM32 to call the module as following steps:
   ● OPEN SSCOM32
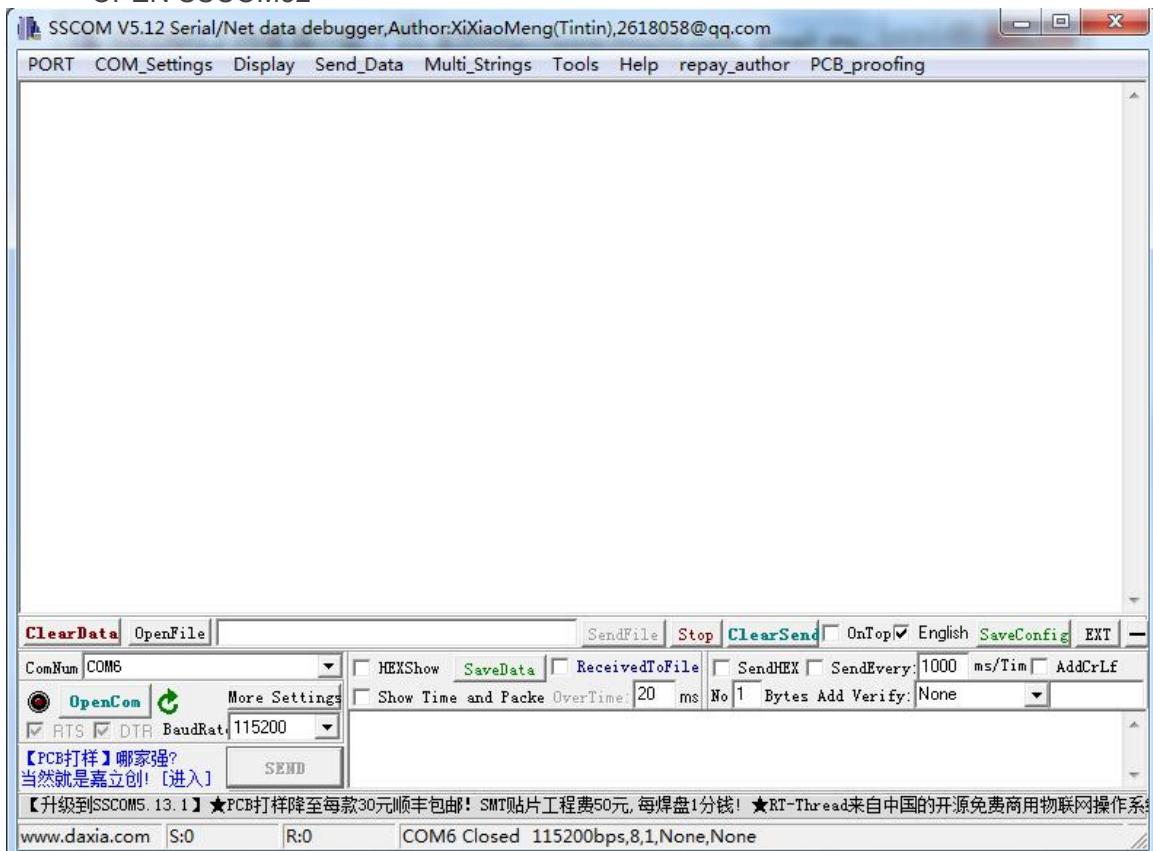


Figure 16: Run the SSCOM32

● Configure the serial port number
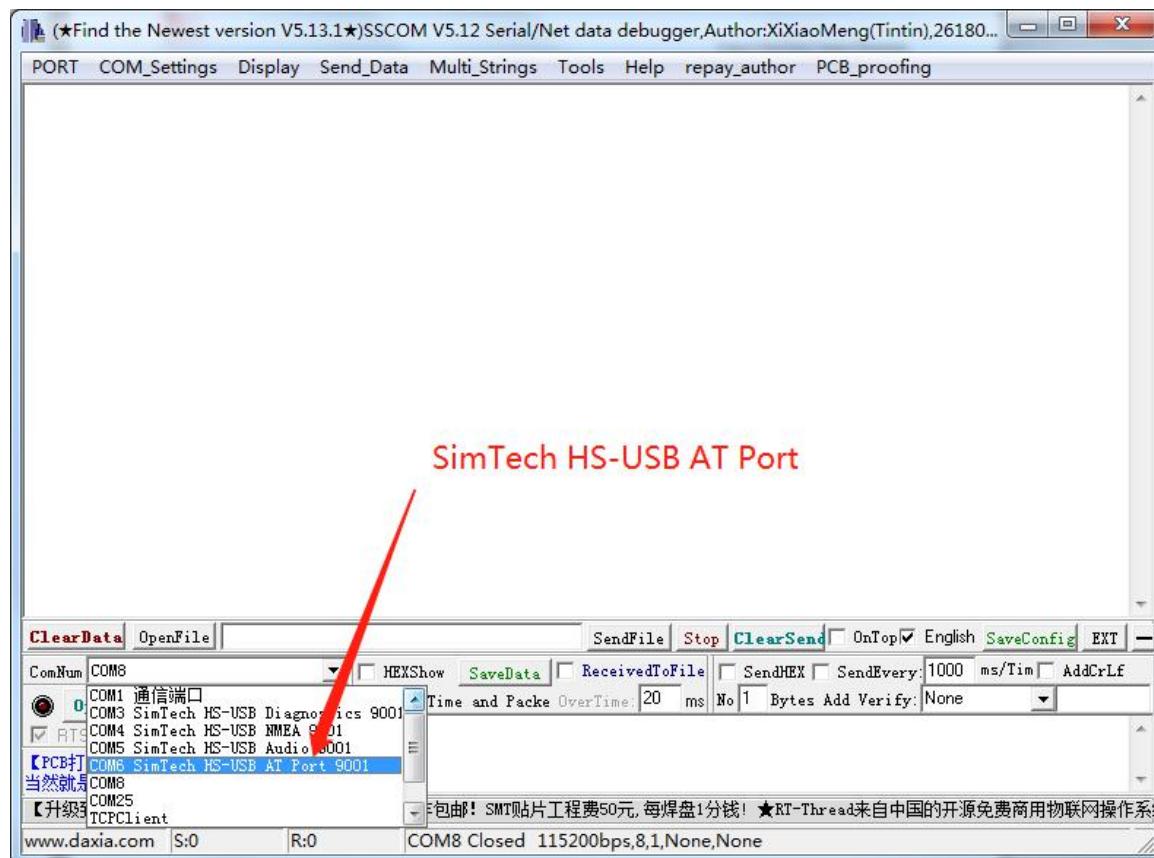
Figure 17: Choose the right COM port

● Set the baud rate, User can set the baud rate from 1200bps to 115200bps
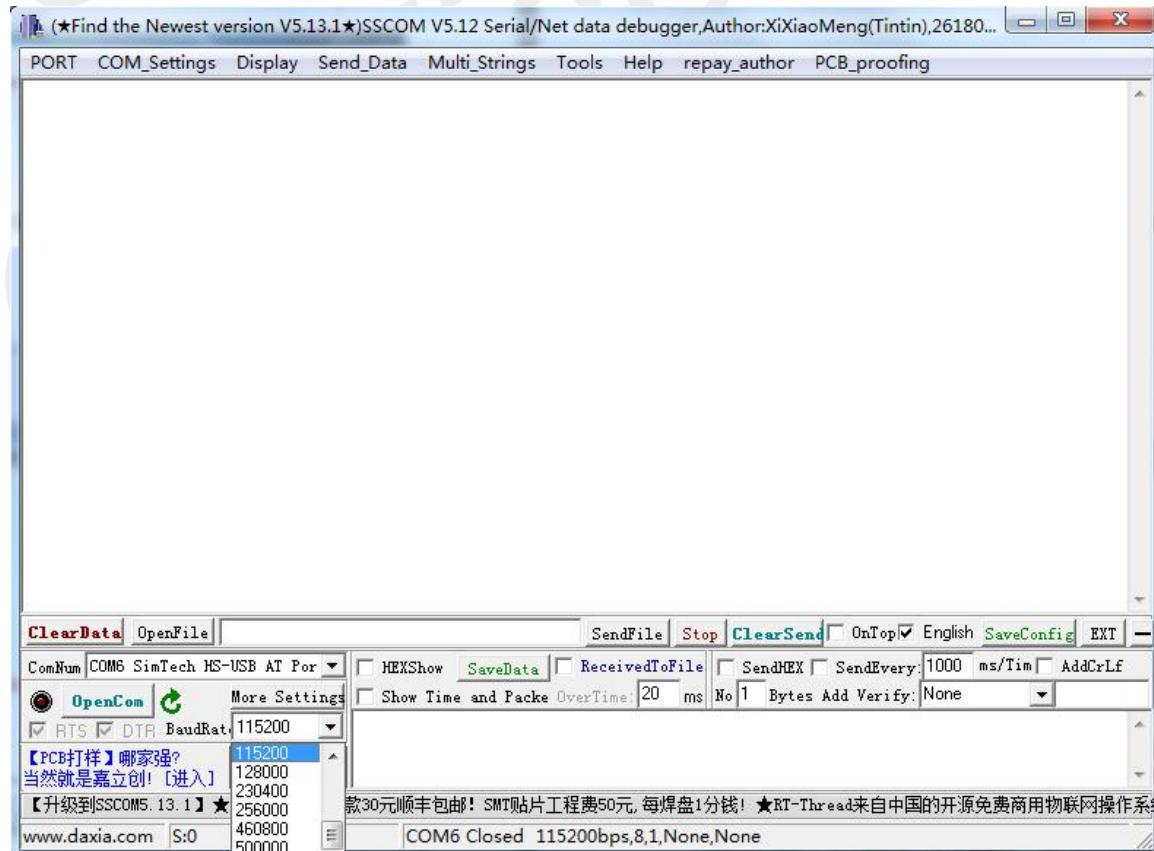
Figure 18: Set up the COM property

● Open the serial port
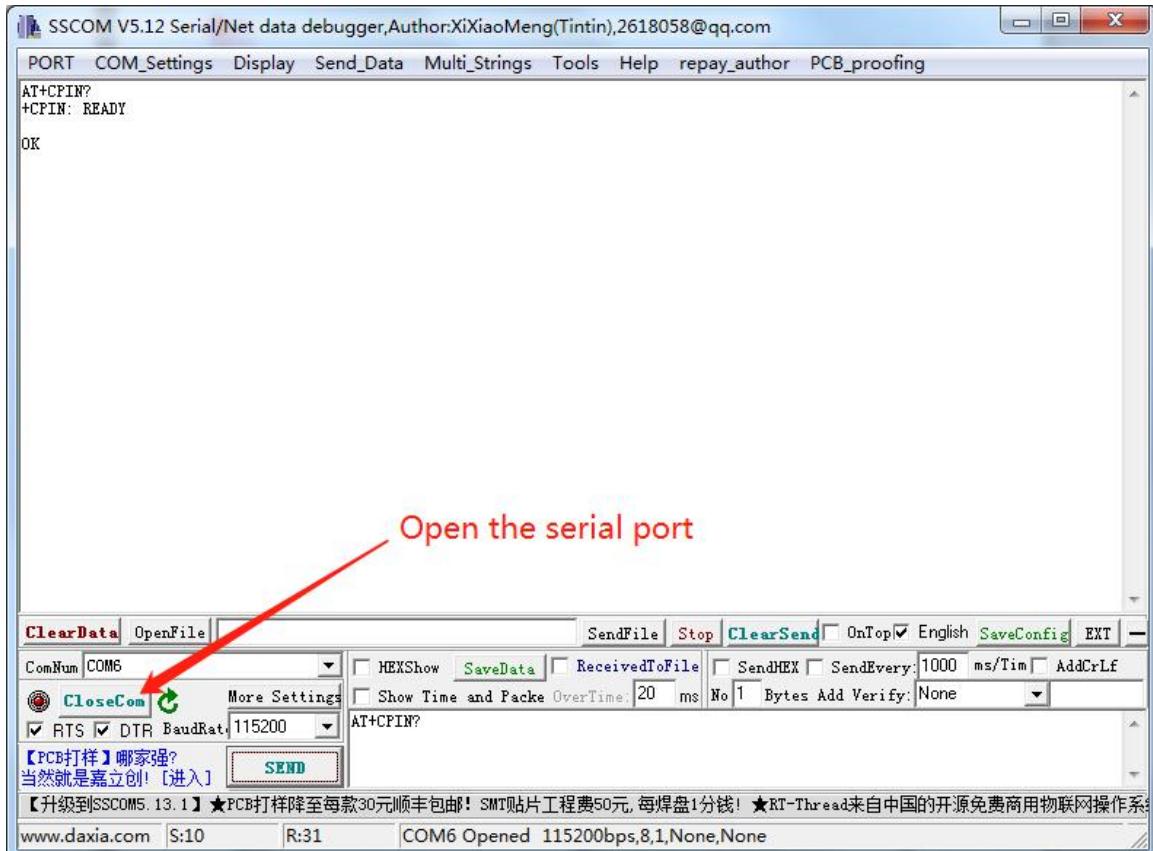


Figure 19: Connect the module

6) Make a call
   ● Typing the AT command. When module is power on, user must firstly send "AT+CPIN?" to check SIM card and send "AT+CREG?" to check Network registration.
   ● Use AT command ATD to make a call.
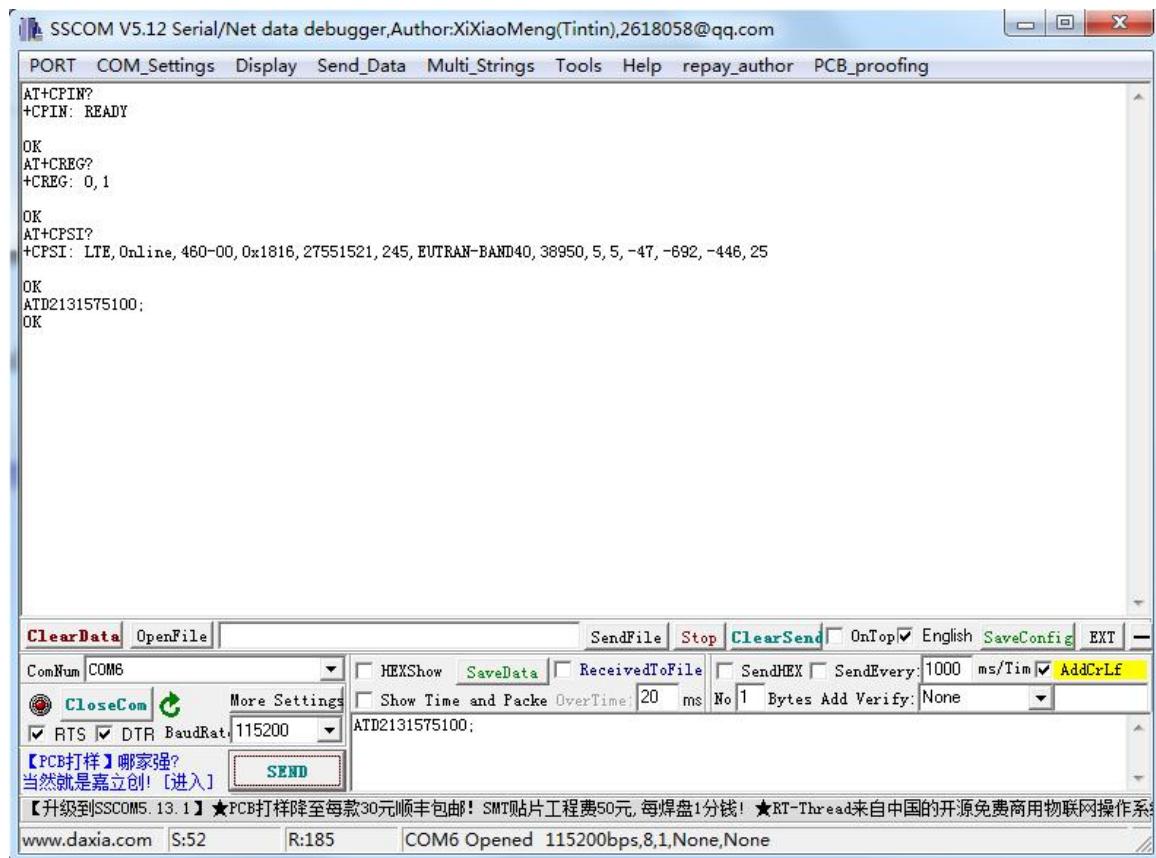
Figure 20: Make a call

## 6.3 Get NMEA information

User can also operate the GPS with the AT+CGPS command, then user can see the NMEA information from the SimTech HS-USB NMEA Port. Refer to the AT Command document to get more operation guide.
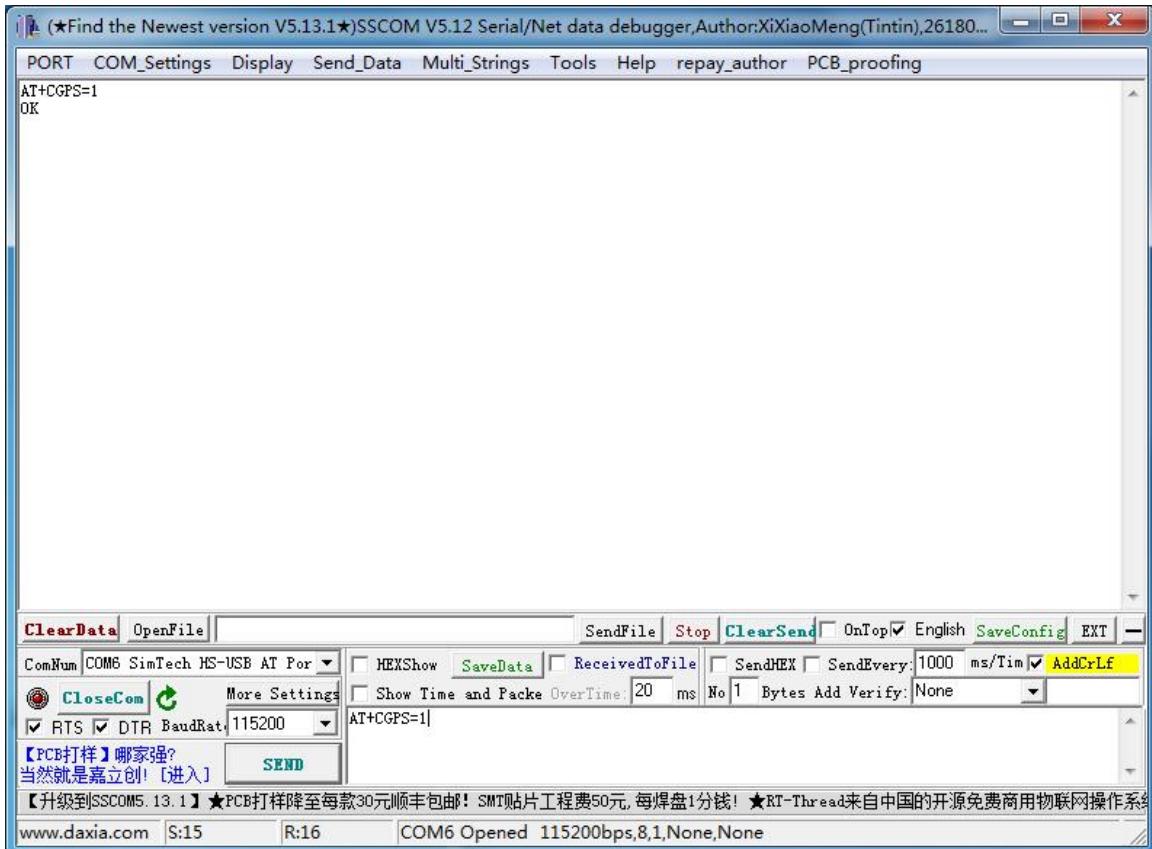
Figure 21: Open GNSS
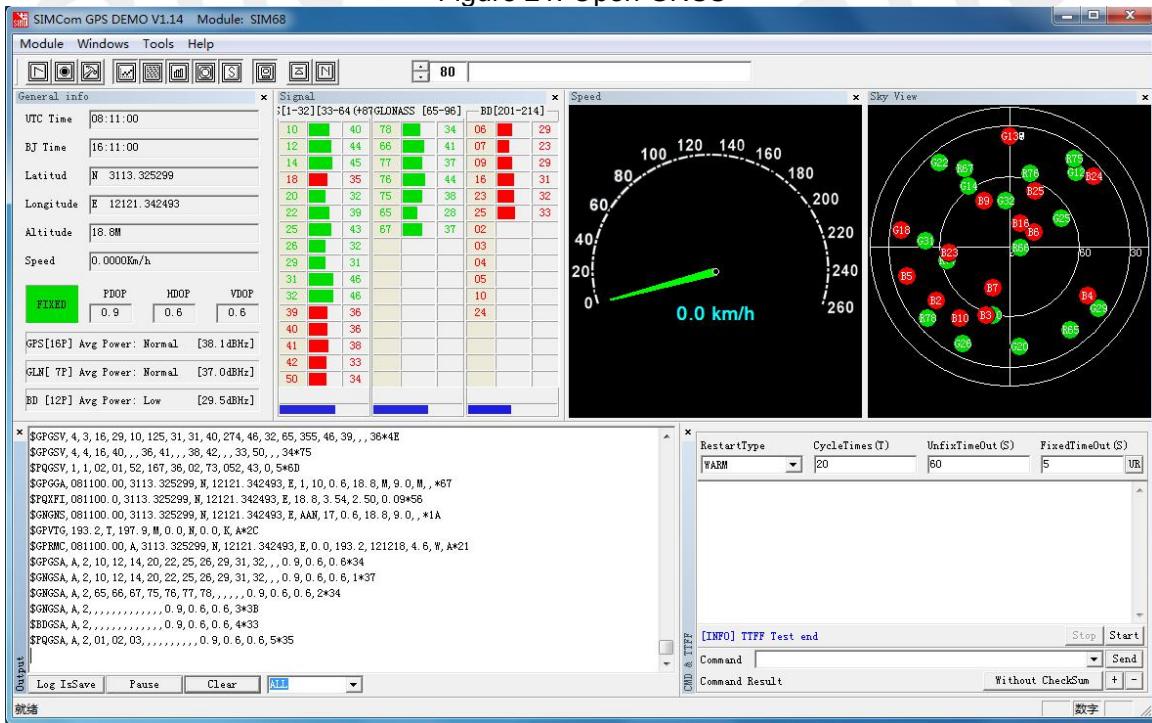


Figure 22: Open GNSS

## 6.4 Downloading

This chapter introduces software upgrade process of SIM7600 series modules. The update tool is "sim7500_sim7600_qdl v1.45 only for update .exe". The following pictures show the upgrade process and

other functional processes.

### 6.4.1 USB Port Specification

First user should connect the micro USB cable to module, and power on the module.
Then user could run the tool, after the tool is opened, it will scan the device.
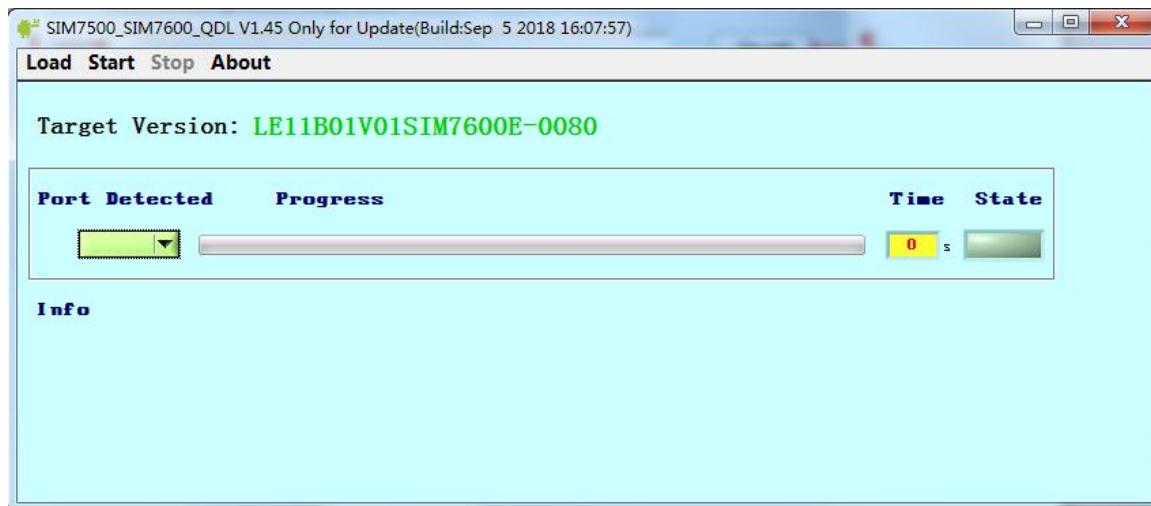


Figure 23: Run the download tool

### 6.4.2 Firmware Update

I. Select module platform and firmware path
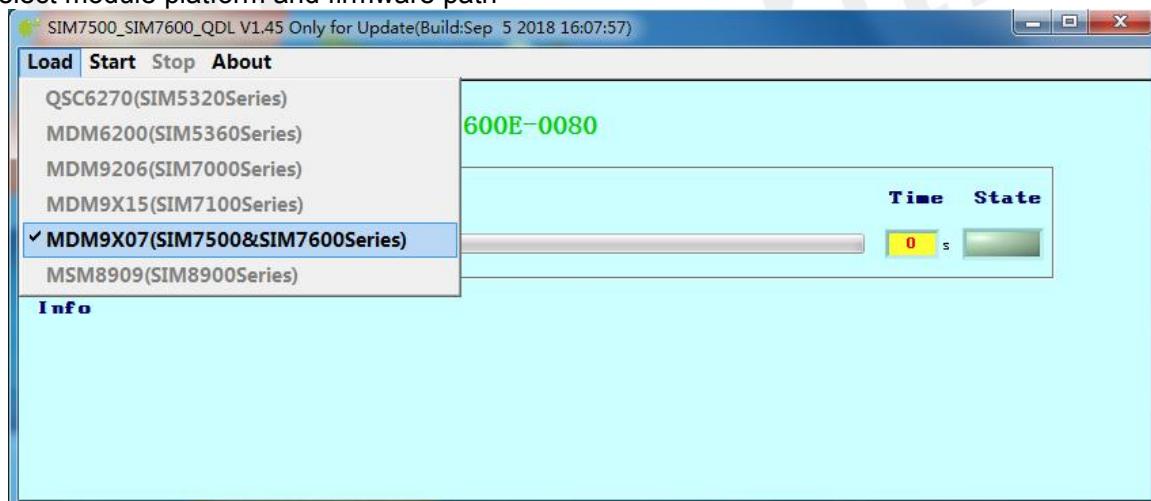


Figure 24: Browse the software package

**[File path]**
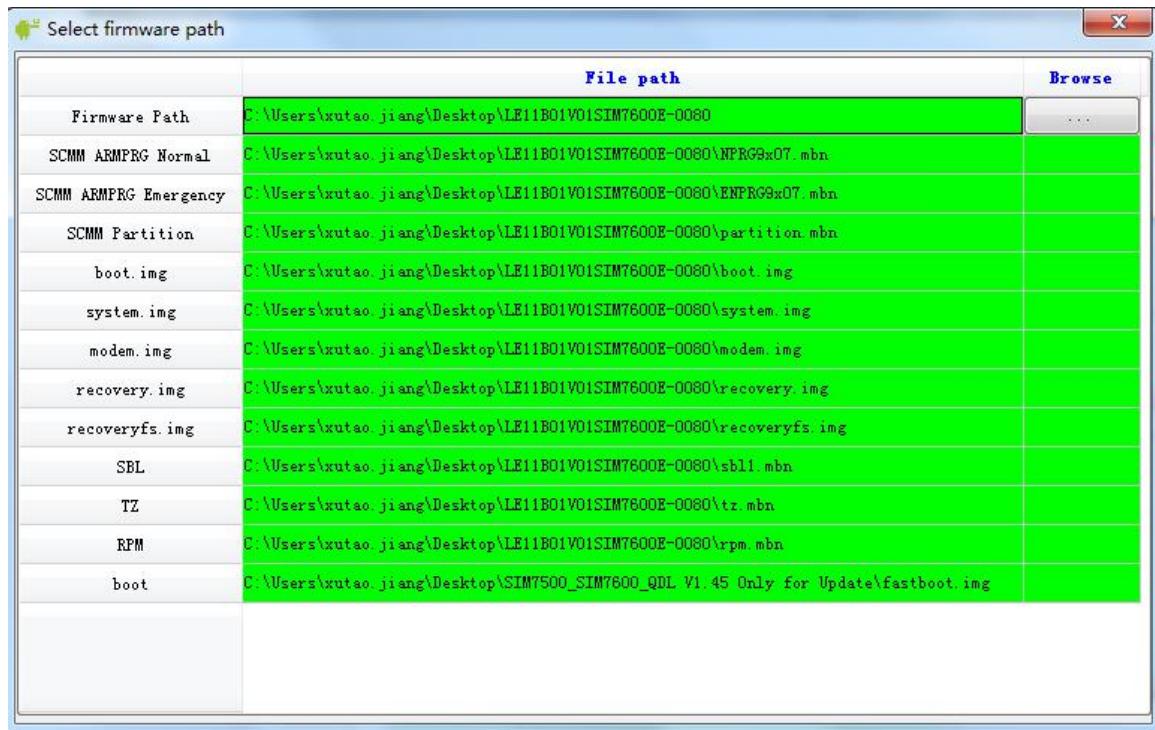
Figure 25: Browse the software package

II. Click start button, the tool will automatically detect the module port and start to download
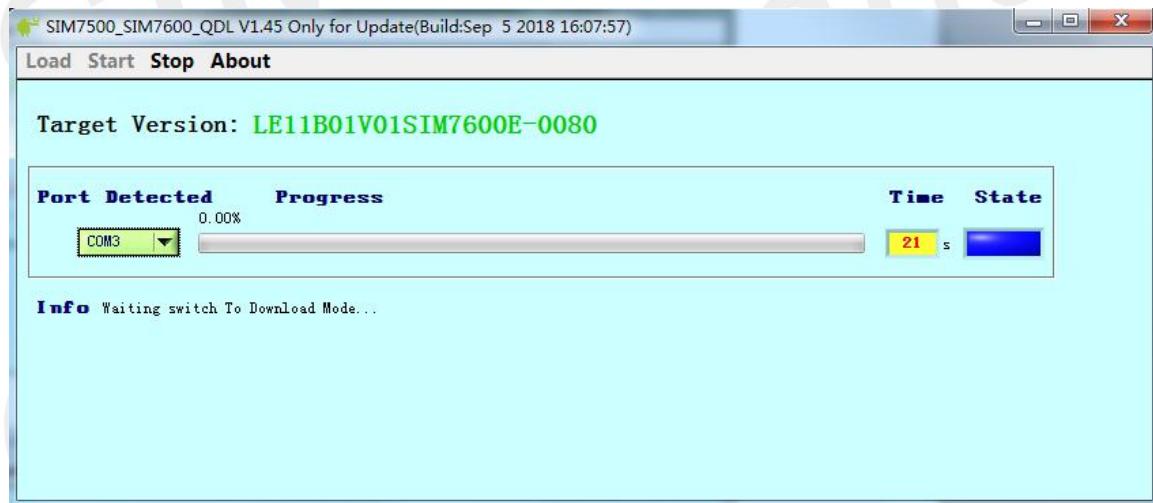


Figure 26: Down software
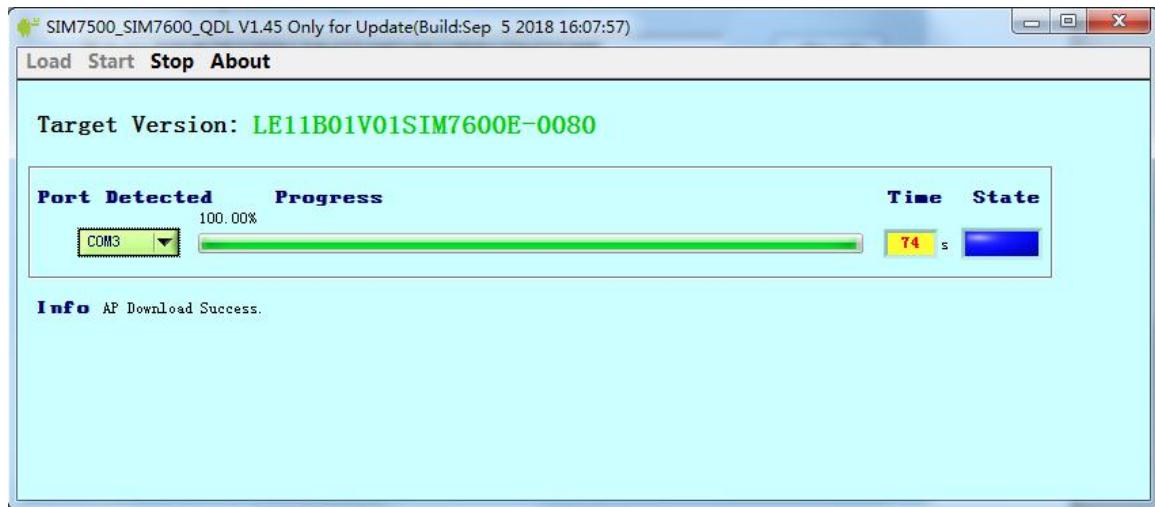
Figure 27: Download finished

**Attention:**

1) In upgrade process, please do not power down module or unplug USB port in updating to avoid module damage.

2) Any update fail, you also can send back us the dut1.log for analyzing.

3) Firmware path must be ASCII string.

# 7 Illustration

## 7.1 Related Documents

**Table 12: Related Documents**

| NO. | Title | Description |
|-----|-------|-------------|
| [1] | SIM7500_SIM7600 Series_AT Command Manual _V1.10 | |
| [2] | SIMXXX-PCIE_Hardware_Design_VX.XX | |

## 7.2 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. |
| SOS | 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.<br>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.<br>Also, some networks require that a valid SIM card be properly inserted in the cellular terminal or mobile. |