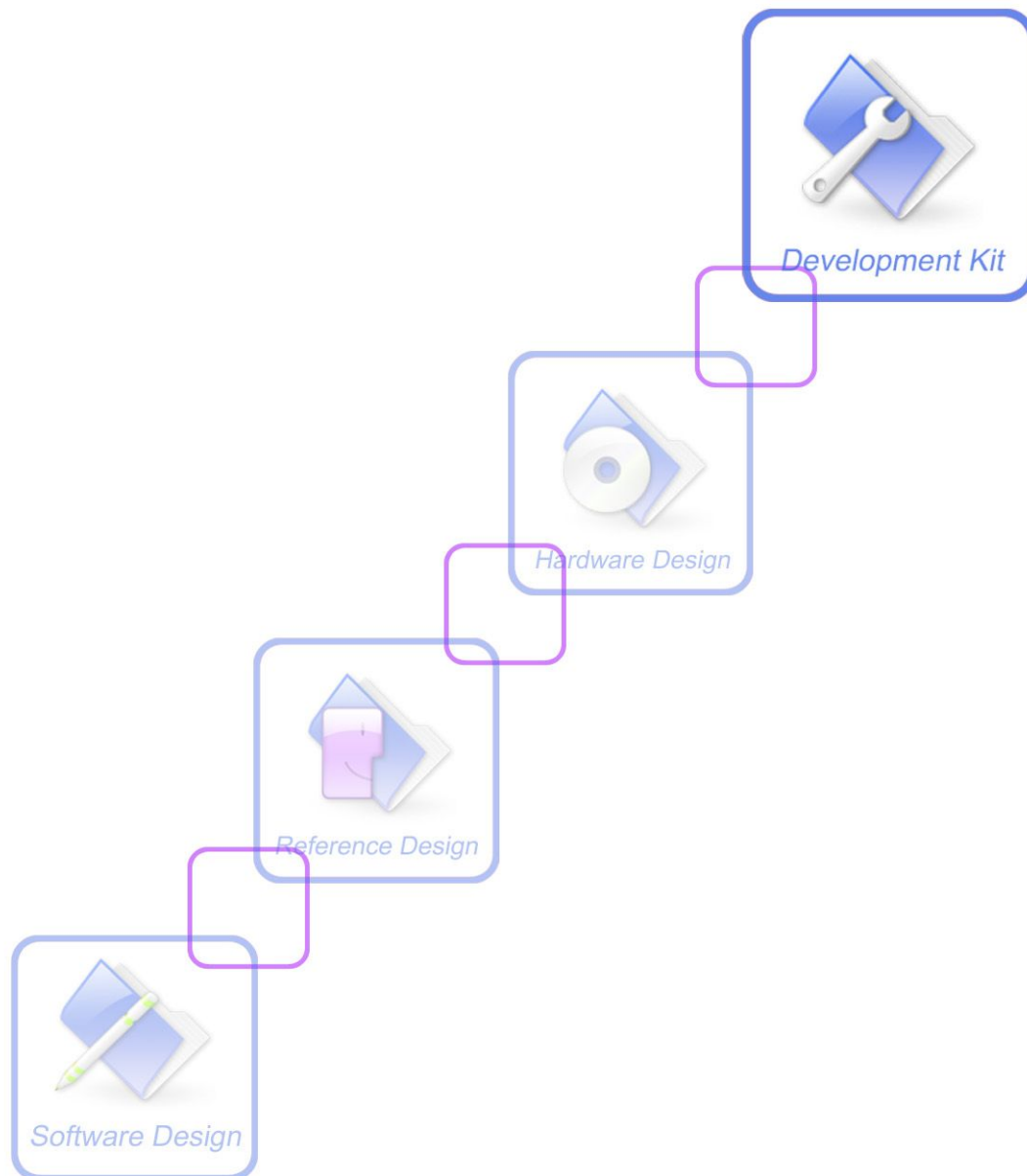




# Development Kit Manual

**SIM5320AL\_EVB\_User Guide\_V1.01**



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## Version History

Data	Version	Description of change	Author
2014-08-20	1.01	Origin	3G Team

## 1 Overview

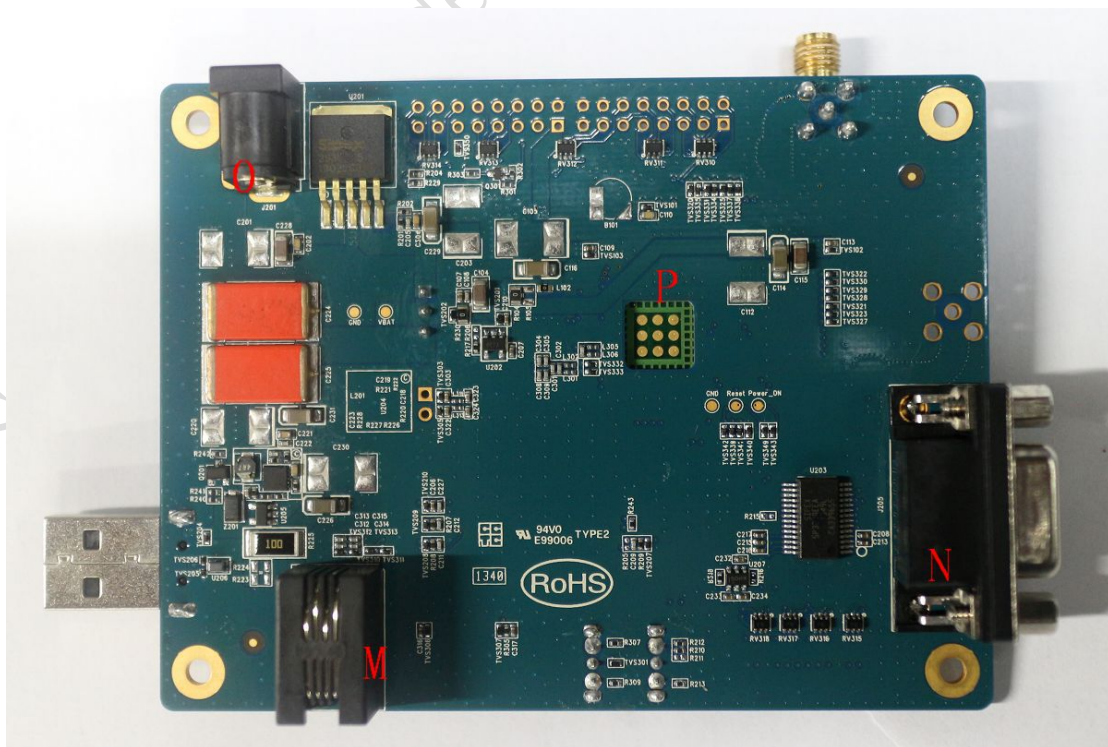
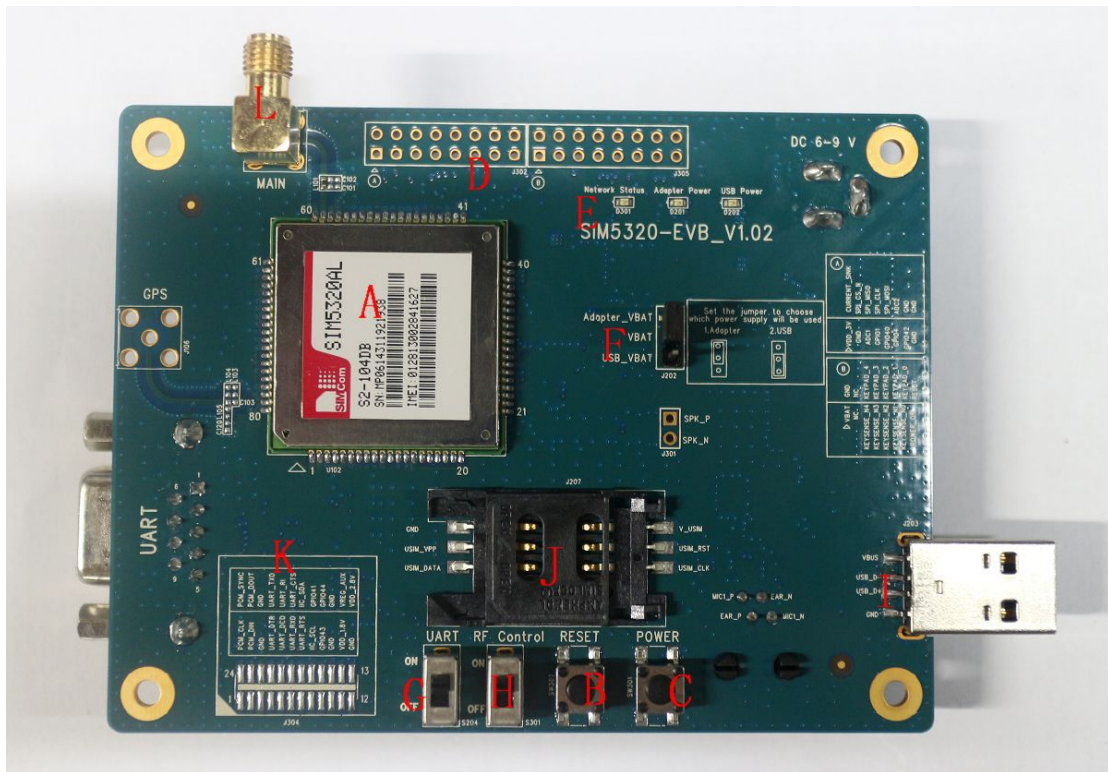
This document gives the usage of SIM5320AL EVB, user can get useful information about the SIM5320AL EVB quickly through this document. All the functions of the SIM5320AL can be used by this board.

**NOTE: This document is subject to change without notice at any time.**

**Table 1:SIM5320AL EVB Key features**

Feature	Implementation
Power supply	1: DC 6.0V~9.0V 2: USB 5.0V power supply
functions	UART interface USB2.0 interface SIMCARD interface I2C interface ADC interface POWER_ON key/Reset key RF enable/disable (flight mode) switch UART Control switch

## 2 SIM5320AL EVB

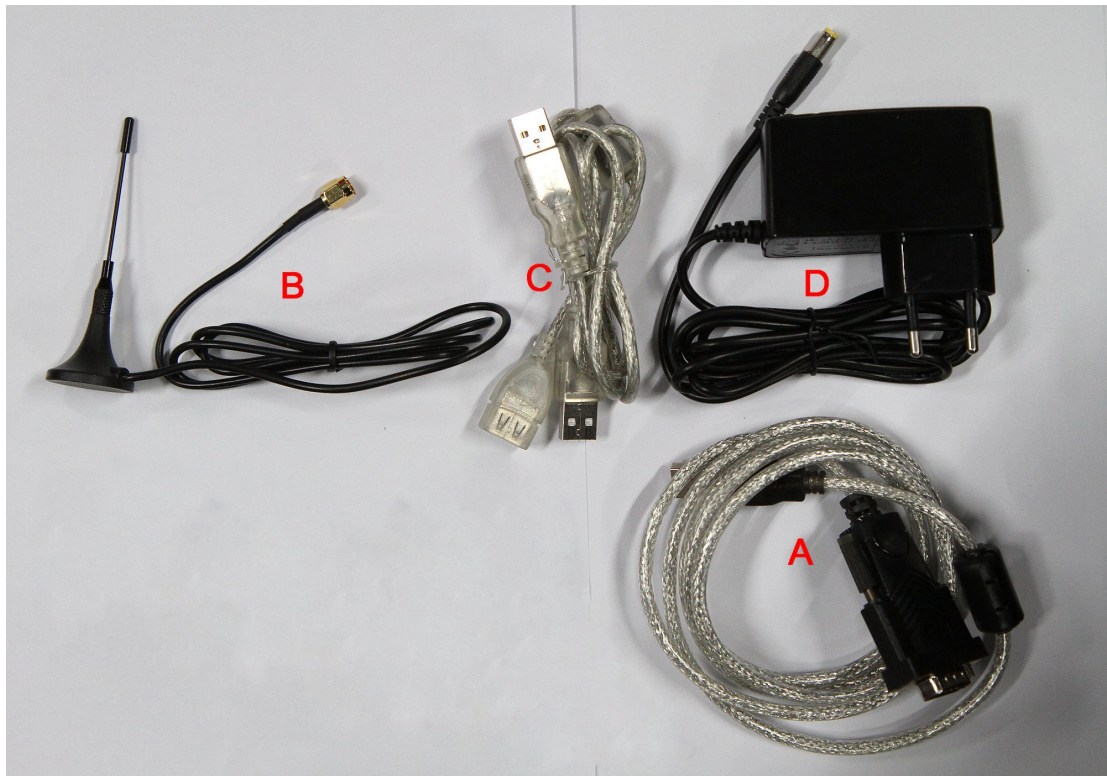


**Figure 1: EVB view**

- A: SIM5320AL module
- B: Reset keypad
- C: Power on/off keypad
- D: IO interface 1 (including GPIO, ADC, SPI, etc)
- E: LED indicator (including network status, operating status)
- F: Power supply selection jumper
- G: UART enable/disable switch
- H: RF enable/disable (flight mode) switch
- I: USB connector
- J: SIM card socket
- K: IO interface 2 (including PCM, GPIO, UART, I2C, etc)
- L: Main antenna SMA
- M: Handset connector
- N: UART connector
- O: Adapter connector
- P: SIM5320AL JTAG test point

All hardware Sub-interfaces included in SIM5320AL EVB are described in detail in following chapters.

### 3 EVB accessories



**Figure 2: EVB accessory**

A: USB to UART cable

B: RF antenna

Antenna Model: WT-C&G-28-90

Frequency Range (MHz) 824 ~ 960 1710 ~ 1990

VSWR  $\leq 1.5$  (900MHz)  $\leq 2$  (1800MHz)

Gain: 1dBi

Input Impedance ( $\Omega$ ): 50

Polarization Type: Vertical

Connector Type: SMA

C: USB cable

D: 6V DC adapter

**NOTE:** The maximum gain of the RF antenna gain should not exceed 1dBi for end-users.



## 4 Accessory Interface

### 4.1 Power Interface

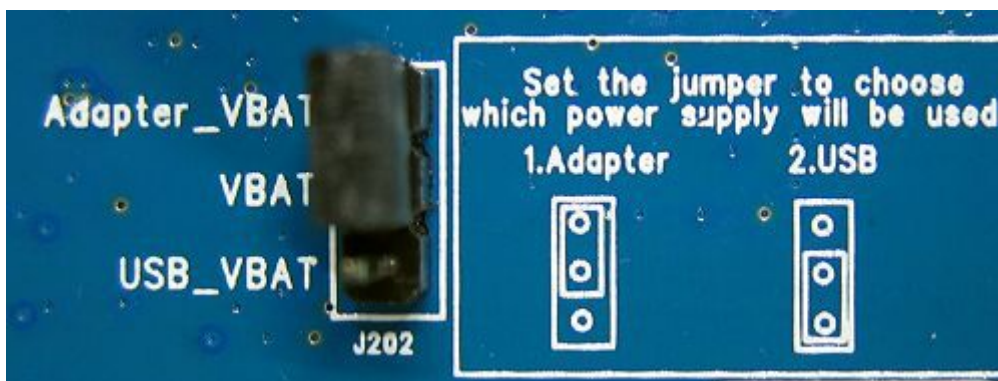


Figure 3: Power selection jumper

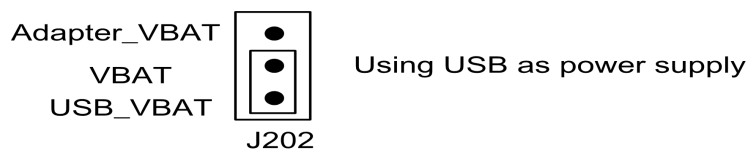
Table 2: Power supply

Signal	Input/Output	Description
Adapter_VBAT	O	3.8V/2A DC source input
USB_VBAT	O	3.8V/0.5A DC source input
VBAT	I	DC source input

If user wants to use DC adapter as power supply, Adapter\_VBAT should be connected to VBAT on J202 through a jumper as following figure shows.



This board could be powered by USB bus. User should connect the USB pin. USB\_VBAT is the USB power out. If user wants to use USB VBUS to power up the module, please connect connector VBAT with connector USB\_VBAT as following figure shows and disconnect Adapter\_VBAT.



## 4.2 SIM card interface



Figure 4: SIM card socket

Table 3: SIM card socket

Pin	Signal	Input/Output	Description
1	V_USIM	O	USIM Card Power output automatic output on USIM mode, one is 3.0V±10%, another is 1.8V±10%. Current is about 10mA.
2	USIM_RESET	O	USIM Card Reset
3	USIM_CLK	O	USIM Card Clock
4	GND		Ground
5	SIM_VPP	O	V_USIM
6	USIM_DATA	I/O	USIM Card data I/O

### 4.3 Antenna Interface

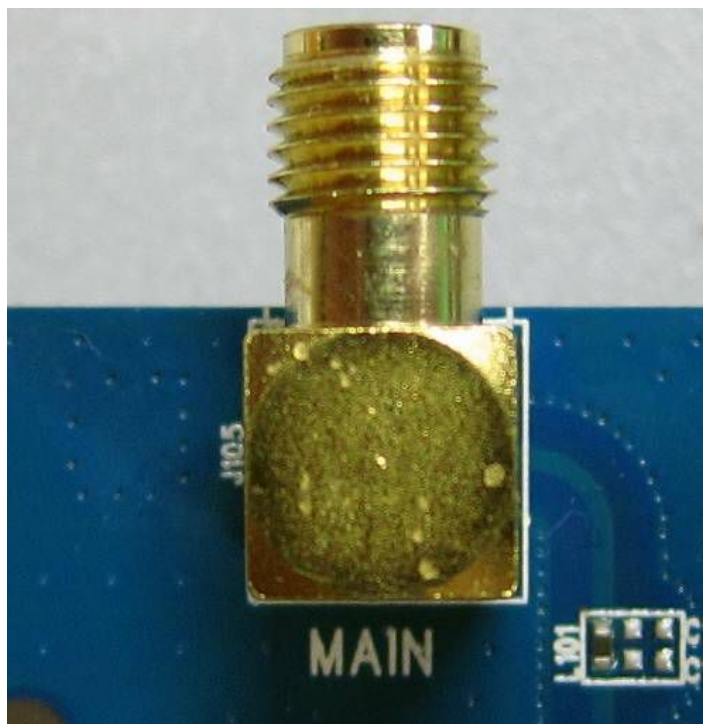


Figure 5: Main Antenna connector

### 4.4 RS232 Interface

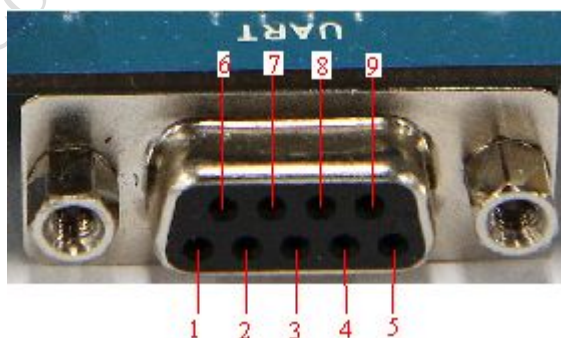


Figure 7: Serial Port

J205 is 9 pins standard RS232 UART interface. It can be connected to a PC directly.

Table 4: Serial Interface

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		Ground
6	NC		NC
7	RTS	I	Request to Send
8	CTS	O	Clear to Send
9	RI	O	Ring Indicator

#### 4.5 Operating Status LED



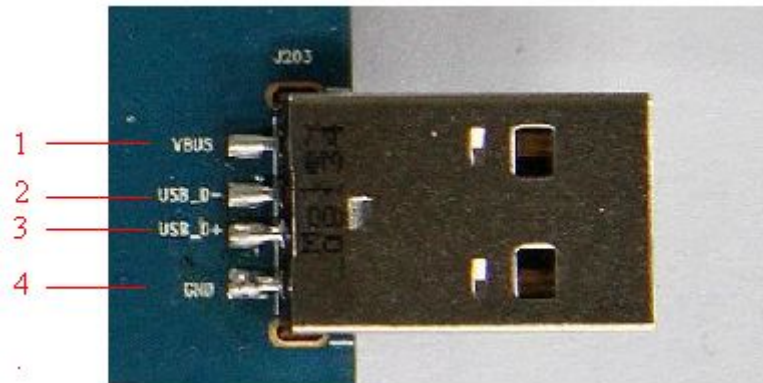
Figure 8: Status LED

Table 5: Network status LED

D301 Status	Module Status
Off	Module is not running
On	Module is running, or voice call is connected
800ms On/ Off	Module find the network and registered
200ms On/ Off	Data communication

LED	I/O	Description
D201	O	ADAPTER power indicator
D202	O	USB power indicator

## 4.6 USB interface



**Figure 9: USB Interface**

It is a normal 4Pin USB connector.

**Table 6: USB interface**

Pin	Signal	I/O	Description
1	USB_VBUS	I	5V
2	USB_DM	I/O	D+ line
3	USB_DP	I/O	D- line
4	GND		Ground

## 4.7 Switch interface

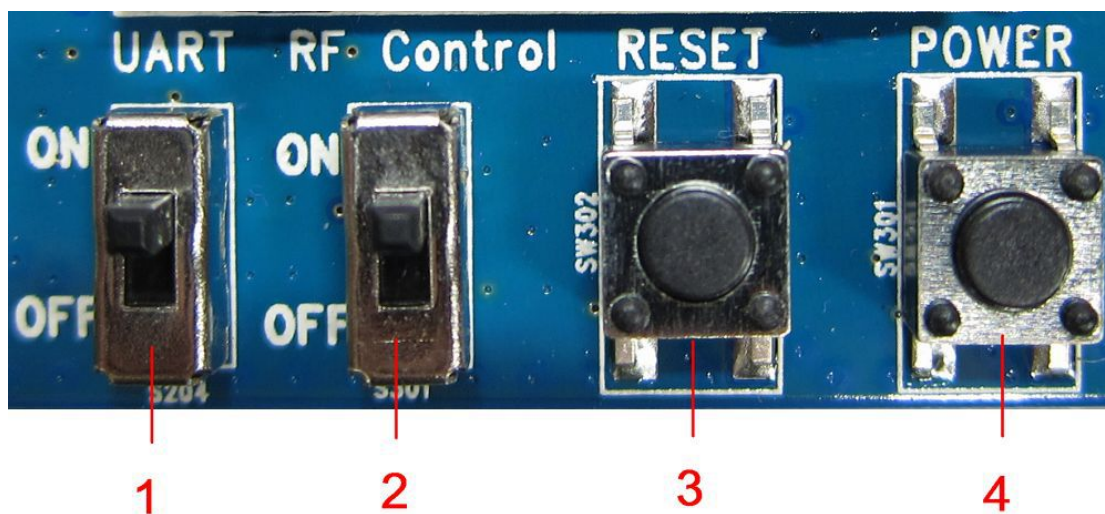


Figure 10: Switch Interface

Table 7: Switch interface

Switch	Signal	I/O	Description
1	RS232 chip SHUTDOWN	I	UART switch
2	GPIO4	I	RF switch (S301) ON : Normal mode OFF : Flight mode
3	RESET	I	Reset the module
4	PWRER_ON	I	Power on the module

### 4.8 IO interface

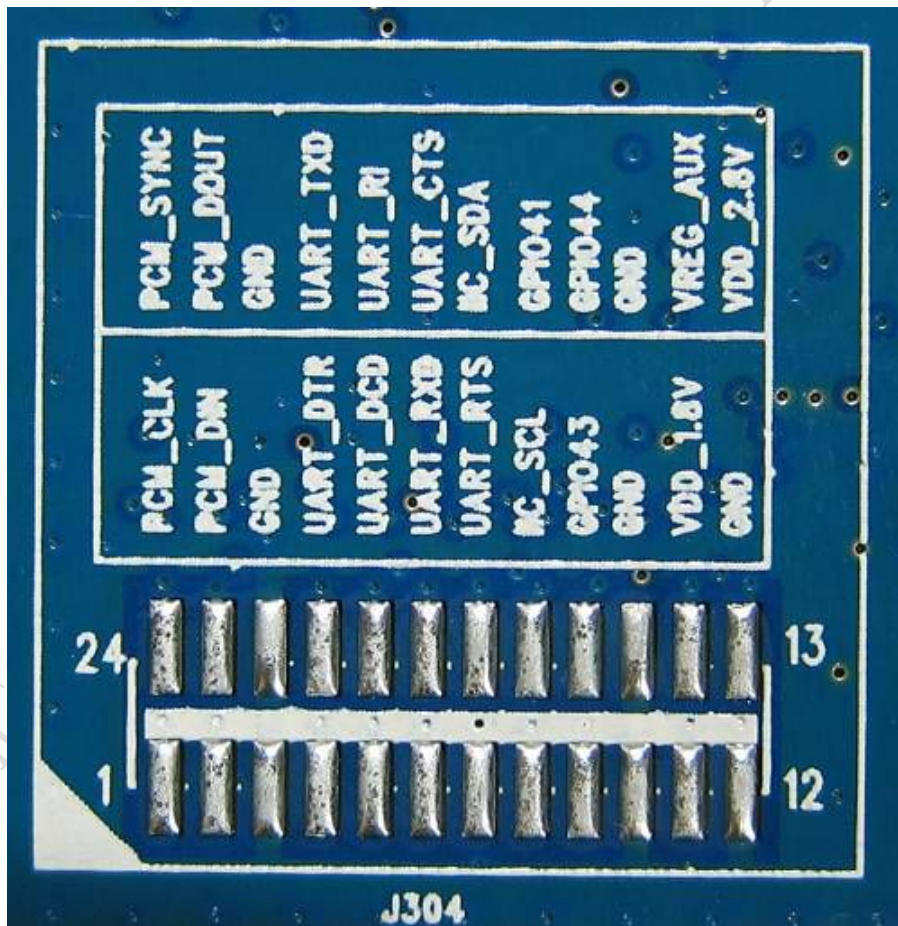
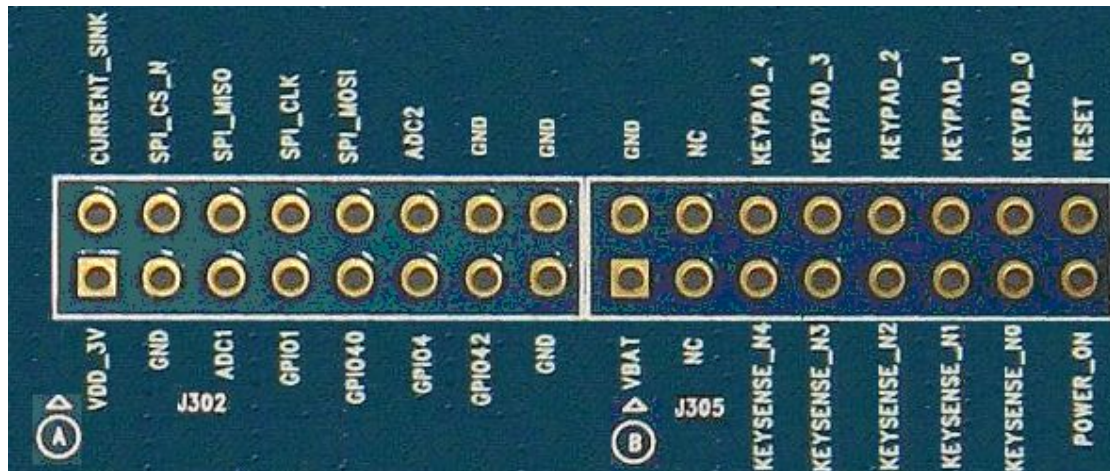


Figure 11: IO Interface

Table 8: IO interface

Signal	I/O	Description
GPIO40	I/O	GPIO
POWER_ON	I	Power on the module
RESET	I	Reset the module
GPIO41	I/O	GPIO
GPIO43	I/O	GPIO
GPIO44	I/O	GPIO
VDD_3V	O	3V power supply
CURRENT_SINK	I	Current sink source
ADC1	I	ADC
GPIO1	O	Network status
GPIO4	I	RF control switch
GPIO42	I/O	GPIO
SPI_CS_N	O	SPI Chip selection
SPI_MISO	I	SPI Master input Slave output
SPI_MOSI	O	SPI Master output Slave input
ADC2	I	ADC
KEYSENSE_N0	I	Bit 0 for sensing key press on pad matrix
KEYSENSE_N1	I	Bit 1 for sensing key press on pad matrix
KEYSENSE_N2	I	Bit 2 for sensing key press on pad matrix
KEYSENSE_N3	I	Bit 3 for sensing key press on pad matrix
KEYSENSE_N4	I	Bit 4 for sensing key press on pad matrix
KEYPAD_0	O	Bit 0 drive to the pad matrix
KEYPAD_1	O	Bit 1 drive to the pad matrix
KEYPAD_2	O	Bit 2 drive to the pad matrix
KEYPAD_3	O	Bit 3 drive to the pad matrix
KEYPAD_4	O	Bit 4 drive to the pad matrix
I2C_SDA	I/O	I2C data
I2C_SCL	O	I2C clock
GPIO0	I	General input pin for module wake up interrupt.
GPIO2	I	General input pin.
GPIO3	O	General output pin.
GPIO5	O	General output pin.



## 5 Quickly start

### 5.1 Running

There are two ways to provide power supply to SIM5320AL module: one is to use the 6V power supply provided in the EVB kit; the other is to use USB port of personal computer.

- (1) When user use the power supply, if user insert 6V DC source adapter, user should connect ADAPTER\_VBAT pin and VBAT pin on the EVB board; then insert a valued SIM card and check if the antenna is connected, and make sure that RF control switch is set to ON; finally press the on/off switch for about 1 second, and then SIM5320AL module will begin running.
- (2) Another option is to use USB port of Computer as power supply. To do so, user need to connect USB\_VBAT pin and VBAT pin on the EVB board, and make sure that RF control switch is set to ON. Firstly insert the sim card and connect the antenna, then connect the PC with USB-to-USB cable and press the Power\_ON button for one second, then SIM5320AL will start running.

User can see the light on the EVB flashing at a certain frequency about 1.25Hz. By the state, user can judge whether the EVB and SIM5320AL is running or not. No function and test can be executed if user has not connected necessary accessories.

**NOTE: This EVB board supports USB power supply when user connects USB\_VBAT and VBAT together.**

### 5.2 Installing Driver

There are 3 ways to connect the module to user's computer and communicate via HyperTerminal:

- (1) Using USB-TO-USB cable;
- (2) Using UART-TO-USB cable;
- (3) Using UART-TO-UART cable.

In the first case, user need install the module USB driver, which can be got from our FAE or sales; For the UART to USB driver, user may get it from the CD in the EVB kit; If user use UART to UART cable, there are certain points to be noticed. One can use UART to UART cable in EVB kit, if the customers want to use their own UART to UART cable, please make sure that the pin sequences of it is same as those of cable in EVB kit, pin sequences of which are shown in Figure 9.

### 5.3 Connecting Net and calling

Once user installs the driver, user can follow steps below to connect to Network.

(1) When user use a UART-UART cable, user need to connect the serial port line to the serial port, open the HyperTerminal (AT command windows) on user's Personal computer. The location of the HyperTerminal in windows2000/XP/Vista can be found from START→accessory→communication→HyperTerminal. Please set the correct Baud Rate and COM port number, the Baud Rate of SIM5320AL is 115200, and the COM port number is based on which UART port user's serial port line is inserted, user should select the port such as COM1 or COM2 etc.

(2) Connect the antenna to the SIM5320AL module using an antenna transmit line, insert SIM card into the SIM card holder, and insert handset into its sockets.

(3) Follow the steps of running which has been mentioned above in Sector 5.1, power on the system, type the AT command from the HyperTerminal, and then the SIM5320AL module will execute its corresponding function. For example, if user type "AT", then it should respond "OK"; if user type "ATI", it should display product identification information.

(4) If user want to use USB to USB cable, user need to connect the cable to USB port of the module and the computer, then follow step 1~3.

(5) If user use UART to USB cable, user need to connect the cable to module serial port and the USB port of the computer, then follow step 1~3.

### 5.4 Downloading

Connect the USB port line to the USB port, connect the direct current source adapter, run the download program, and choose the correct image, please follow the QDL downloading menu for the operation. Update procedure is described in the figure below.

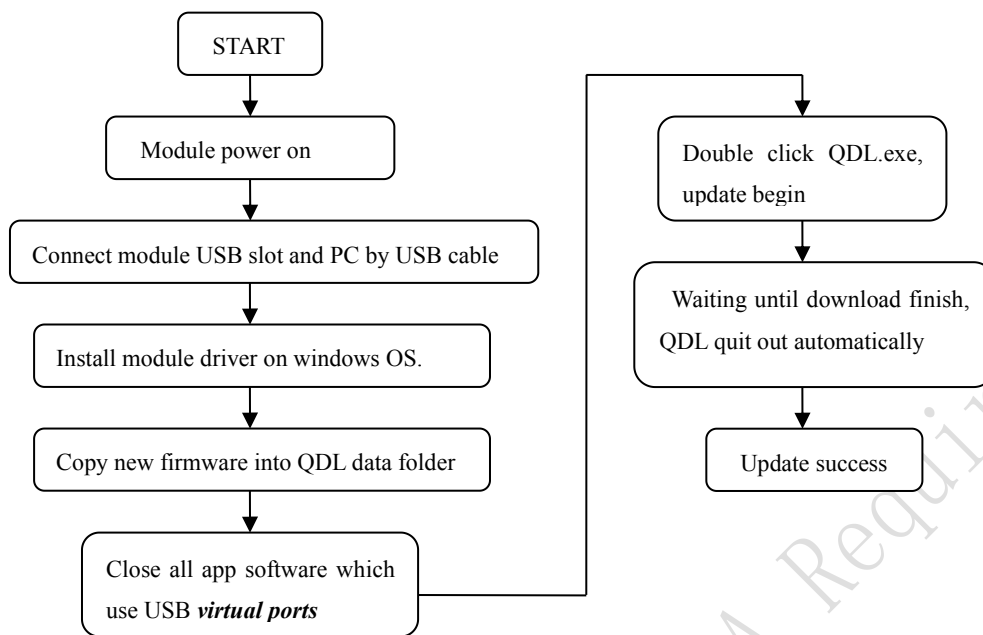


Figure 13: USB interface update procedure

## 5.5 Turning off

Press the POWER\_ON for about 1 second, SIM5320AL module will be turned off.

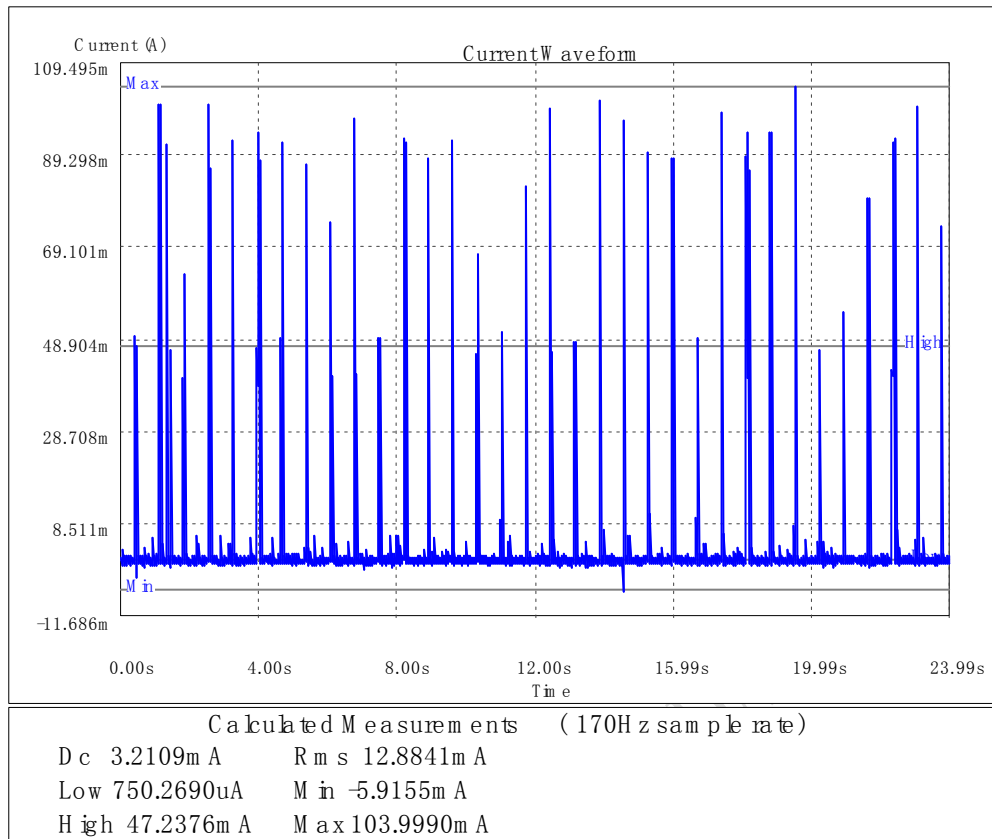
**NOTE:** If user uses USB to power on the module, just disconnect the USB cable to turn off.

## 6.6 Measuring the current consumption

User can measure SIM5320AL current consumption in the sleep mode on our EVB. User need to follow steps.

- (1) Remove the jumper from J202, and provide a 3.8V DC power supply (such as: Agilent 66319B) for VBAT on SIM5320AL EVB;
- (2) Install a SIM card and a RF antenna;
- (3) Shutdown UART by S204;
- (4) Remove the USB cable;
- (5) Power on SIM5320AL;

SIM5320AL will enter sleep mode automatically. User can measure SIM5320AL current consumption. Test report is described in the figure below.



**Figure 14: current consumption in the sleep mode**

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