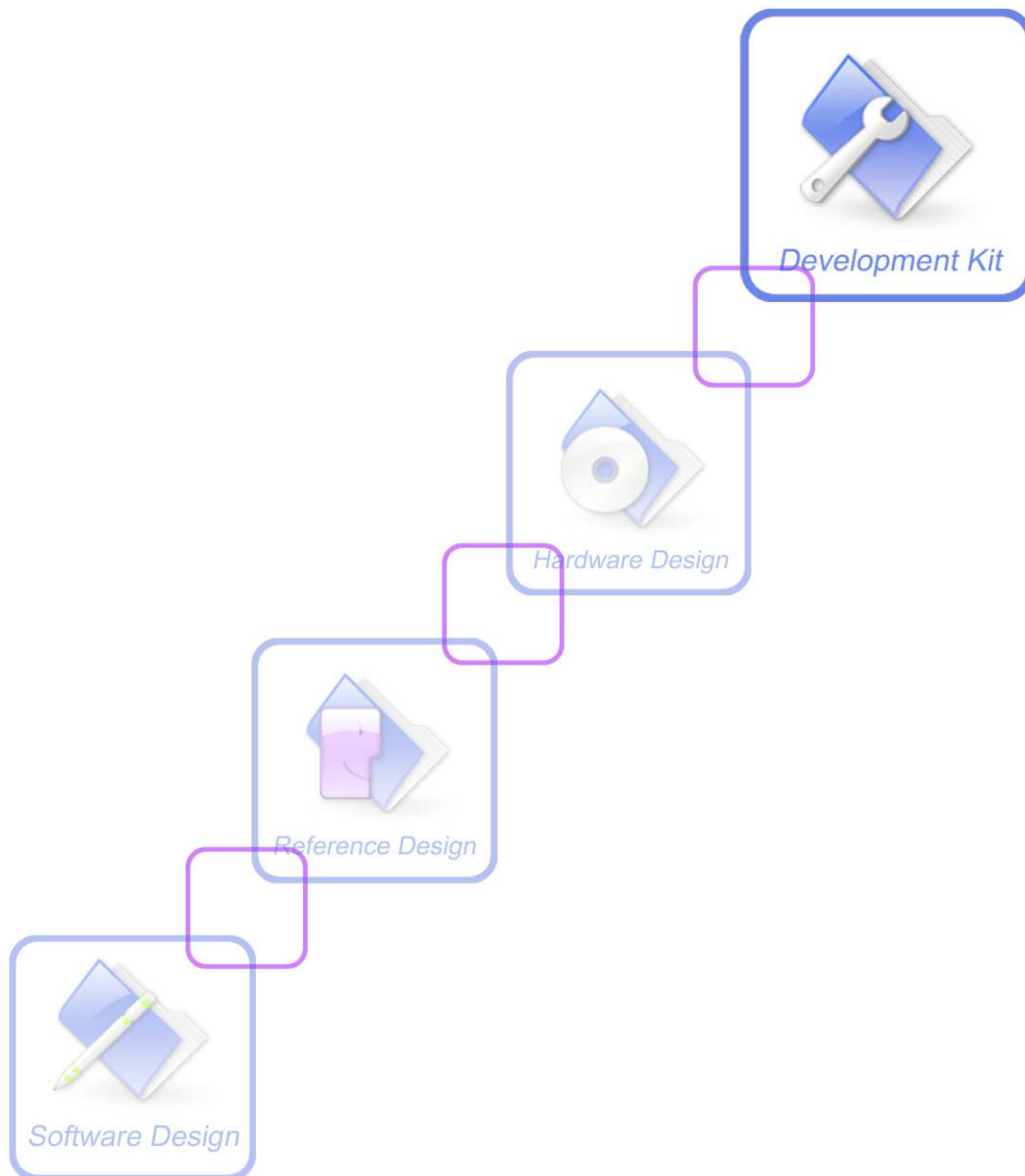




Development Kit Manual

SIM5360_EVB_User Guide_V1.02



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Version History

Data	Version	Description of change	Author
2014-01-22	1.01	Origin	Libing
2014-03-18	1.02	Update to using SIM5360-EVB V1.03 for description Add UART2 to USB circuit	Libing

1 Overview

This document gives the usage of SIM5360 EVB, user can get useful information about the SIM5360 EVB quickly through this document.

The Debug board is designed for customer to design their own applications by using the 3G module SIM5360 easily.

All the functions of the SIM5360 can be used by this board. One can use UART, USB interface to communicate with the SIM5360. There is one UART interface, one USB 2.0 interface, one SIM card interface, one T-FLASH card interface, three audio interfaces on the board.

One can connect the UART and/or the USB interface to a computer directly.

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

Table 1:SIM5360 EVB Key features

Feature	Implementation
Power supply	1: DC 5.0V ~9.0V 2: USB 5.0V power supply
functions	<input type="checkbox"/> UART interface <input type="checkbox"/> USB2.0 interface <input type="checkbox"/> SIMCARD interface <input type="checkbox"/> IIC interface <input type="checkbox"/> Audio interface <input type="checkbox"/> ADC interface <input type="checkbox"/> POWER_ON key/Reset key <input type="checkbox"/> Flight mode switch <input type="checkbox"/> UART Control switch <input type="checkbox"/> TFLASH interface <input type="checkbox"/> UART to USB interface

2 SIM5360 EVB

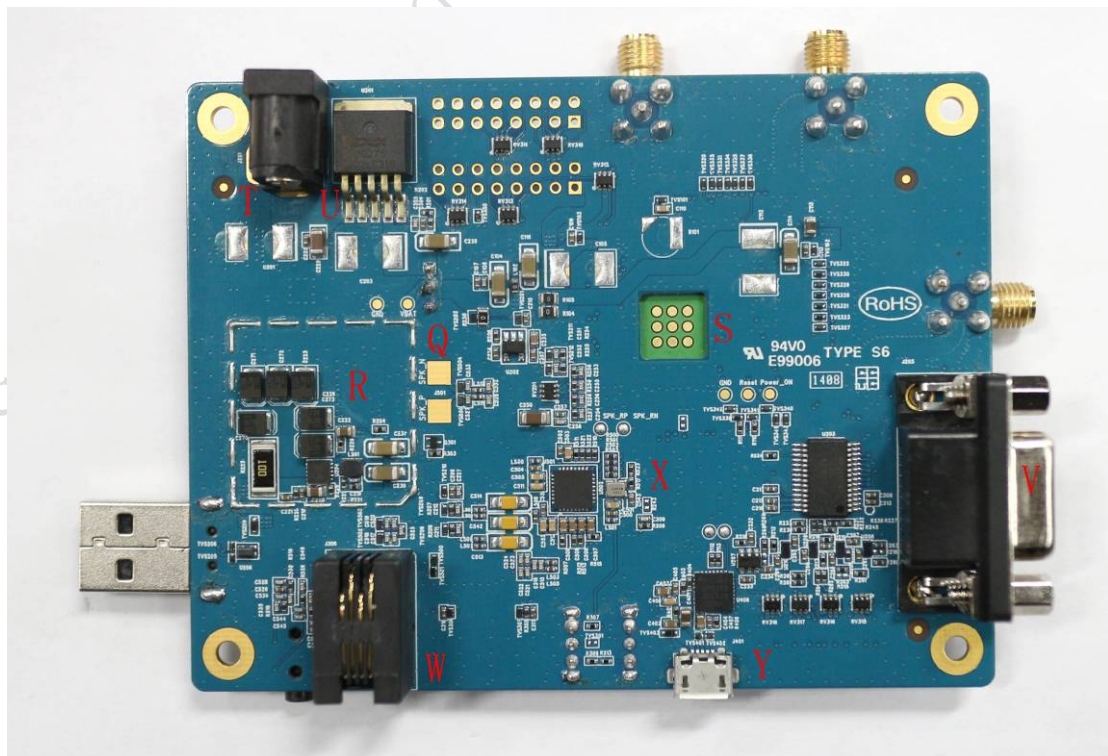
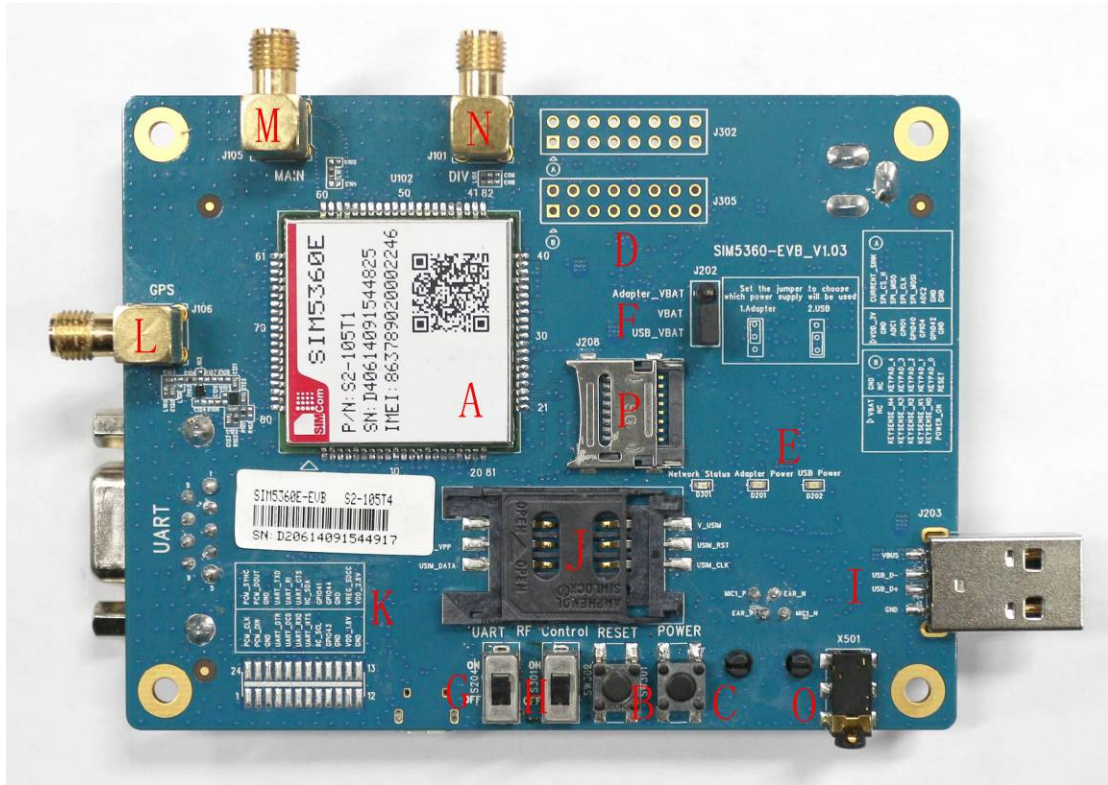
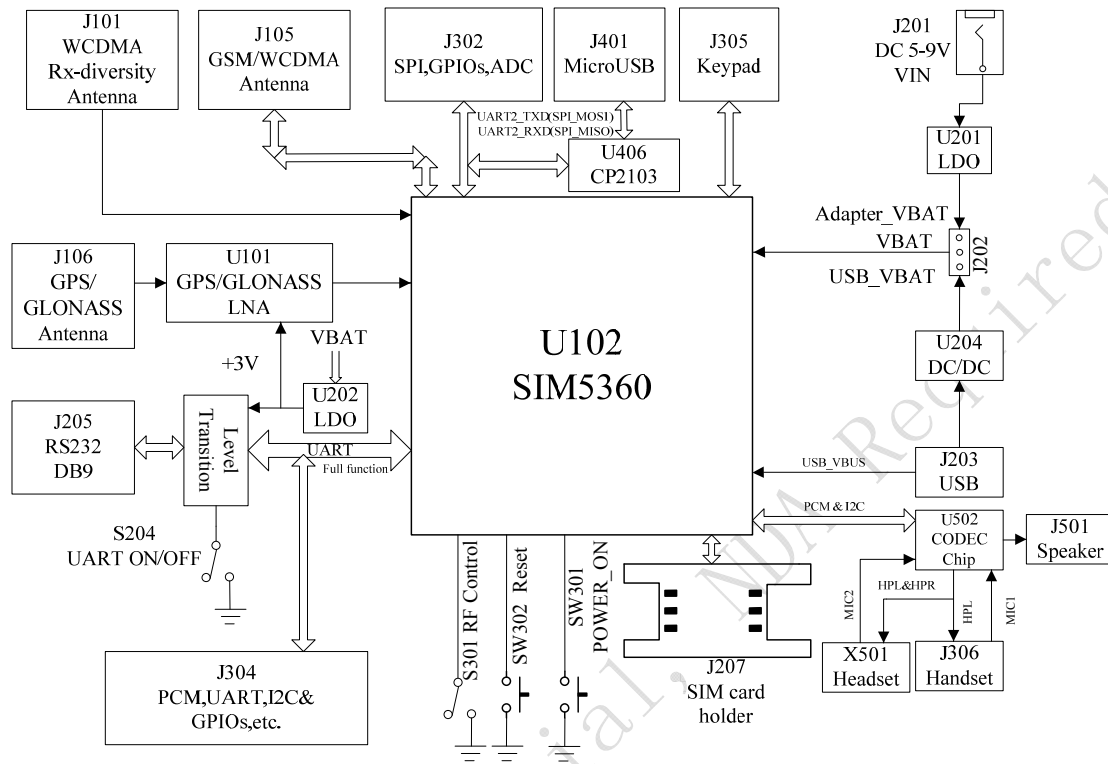


Figure 1: EVB view

-
- A: SIM5360 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(If user wants to use UART, please switch it to ON at first.)
 - H: RF enable/disable (flight mode) switch (Before the SIM5360 is powered on, please make sure that RF control switch is ON)
 - I: USB connector
 - J: SIM card socket
 - K: IO interface 2 (including PCM, GPIO, UART, I2C, etc)
 - L: GPS/GLONASS antenna SMA
 - M: Main antenna SMA
 - N: Rx-diversity antenna SMA
 - O: Headset interface
 - P: SD card interface
 - Q: Speaker interface

 - R: USB DC-DC
 - S: SIM5360 JTAG test point
 - T: Adapter connector
 - U: DC LDO
 - V: UART interface for AT command transmitting, data exchanging
 - W: Handset interface (RJ-11)
 - X: Audio codec (WM8960)
 - Y: MicroUSB interface for SIM5360 (UART2 to USB, IC is Silabs Cp2103)

The following figure shows block diagram of SIM5360 EVB.



All hardware Sub-interfaces included in SIM5360 EVB are described in detail in following chapters.

3 EVB accessories



Figure 2: EVB accessory

- A: USB to UART cable
- B: RF antenna
- C: USB cable
- D: 5V DC adapter
- E: GPS/GLONASS antenna
- F: RF antenna

4 Accessory Interface

4.1 Power Interface



Figure 3: Power selection jumper

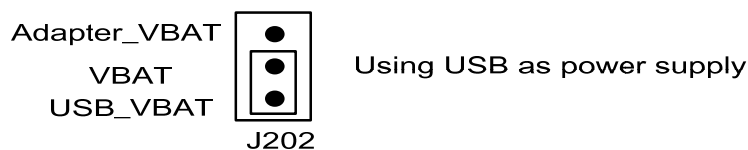
Table 2: Power supply

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	SIM5360 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 Audio Interface

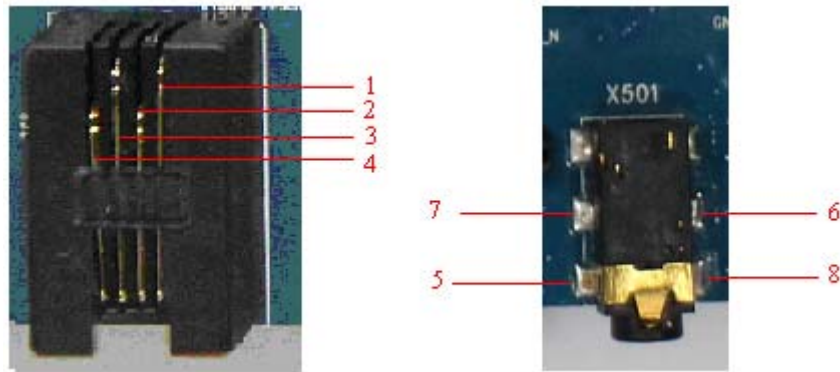


Figure 4: Audio Interface

J306 is the handset interface. X501 is the headset interface.

NOTE: The MIC's polarity must be correct.

Table 3: Earphone interface

Pin	Signal	Input/Output	Description
1	MIC1P	I	Positive microphone input
2	EAR_P	O	Positive receiver output
3	EAR_N	O	Negative receiver output
4	MIC1N	I	Negative microphone input

Table 4: Headset interface

Pin	Signal	I/O	Description
5	GND		Ground
6	HEADSET_MIC+	I	Headset microphone input
7	HPH_L	O	Positive microphone output
8	HPH_R	O	Negative microphone output

Speaker interface:

Please refer Figure 1. Pin 1 and Pin 2 is the SPK_M and SPK_P on J501.

NOTE: Audio cable must be away from the RF antenna, otherwise TDD noise may be occurred.

4.3 SIM card interface



Figure 5: SIM card socket

Table 5: 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		Not connect
6	USIM_DATA	I/O	USIM Card data I/O

4.4 Antenna Interface



Figure 6: Main and diversity Antenna connector

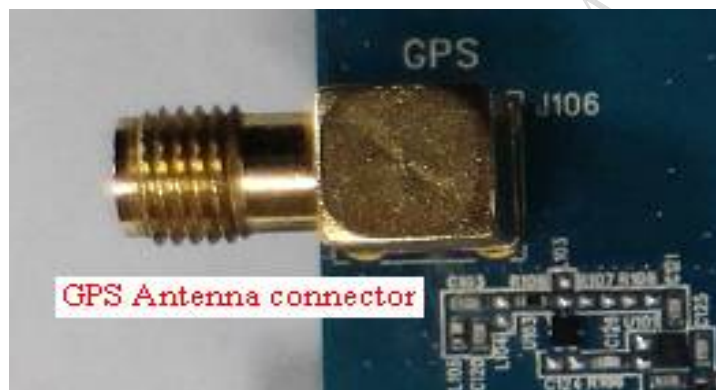


Figure 7:GPS Antenna connector

SIMCom strongly recommends additional matching components between the antenna and the RF output of SIM5360 RF PAD (Main: pin 59; Diversity: PIN 82; GPS: pin 79;) for the application including an antenna.

Topology is a PI structure plus a serial element; components assume to be capacitors or inductors depending on the antenna matching. But if the pad is 50 Ohms and is connected to 50 Ohms load, the matching circuitry is not needed.

The RF connection should be short enough to minimize losses and must have a characteristic impedance of 50 Ohms until $F \geq 2$ GHz.

SIMCom strongly recommends the micro strip line can be used.

4.5 RS232 Interface

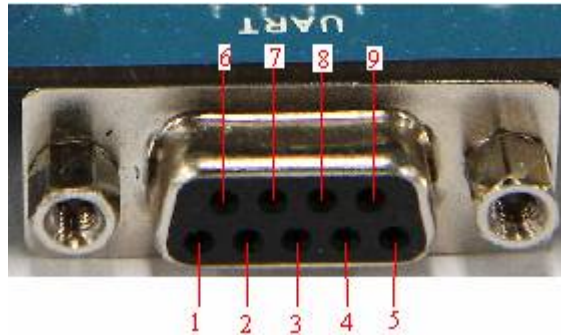


Figure 8: Serial Port

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

Table 6: 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

4.6 Operating Status LED



Figure 9: Status LED

Table 7: 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

4.7 USB interface



Figure 10: USB Interface

It is a normal 4Pin USB connector.

Table 8: 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

4.8 Switch interface

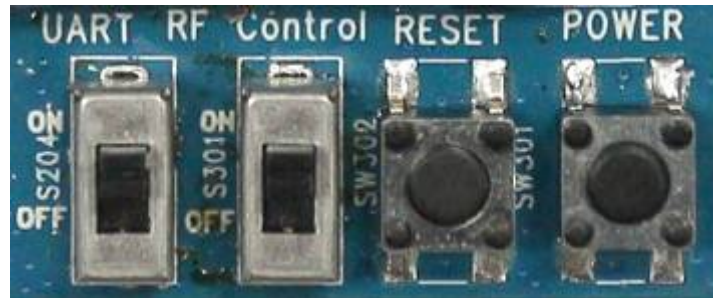


Figure 11: Switch Interface

Table 9: 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

4.9 IO interface

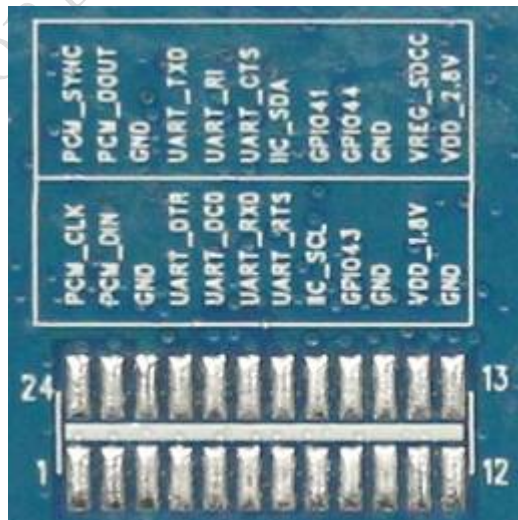
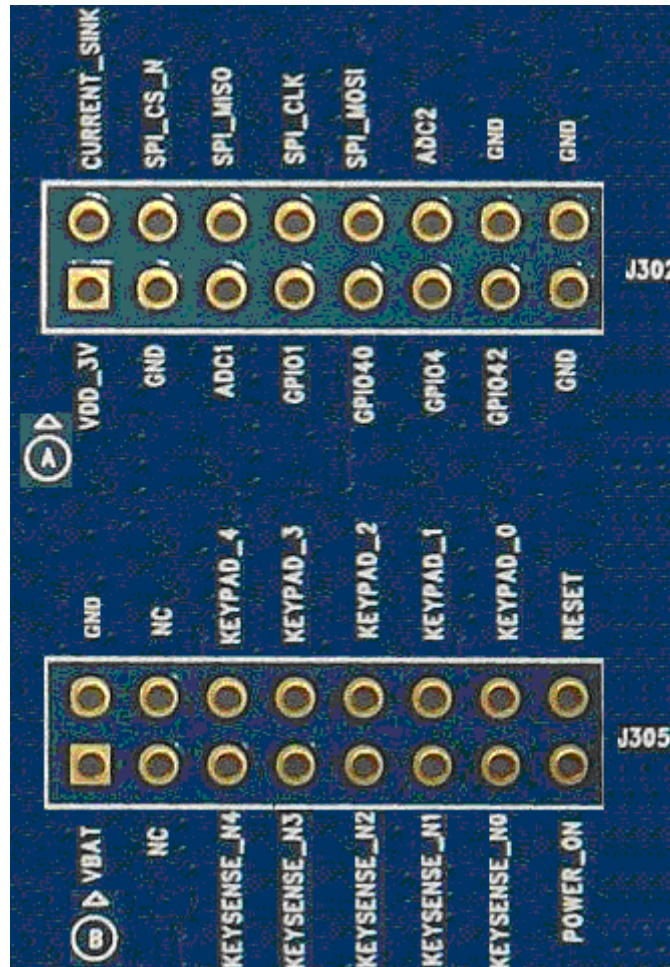


Figure 12: IO Interface

Table 10: 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 (UART_RXD)	I	SPI Master input Slave output / Receive data of UART2
SPI_MOSI (UART_TXD)	O	SPI Master output Slave input / Transmit data of UART2
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
PCM_DIN/GPIO0	I	General input pin for module wake up interrupt. It also can be multiplexed as the PCM_DIN pin.
PCM_SYNC/GPIO2	I	General input pin. It also can be multiplexed as the PCM_SYNC pin.

PCM_CLK/GPIO3	O	General output pin. It also can be multiplexed as the PCM_CLK pin.
PCM_DOUT/GPIO5	O	General output pin. It also can be multiplexed as the PCM_DOUT pin.

4.10 SD card interface

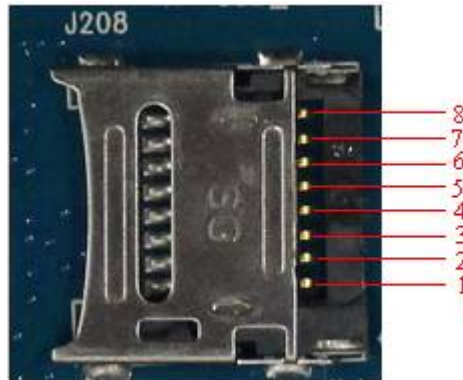


Figure 13: SD card socket

J208 is the SD card interface.

Table 11: SD card socket

Pin	Signal	Input/Output	Description
1	SD_D2	I/O	Data line 2
2	SD_D3	I/O	Data line 3
3	SD_CMD	O	Command line
4	VREG_SDCC	O	Power supply for SD card
5	SD_CLK	O	Clock line
6	GND		Ground
7	SD_D0	I/O	Data line 0
8	SD_D1	I/O	Data line 1

4.10 UART2 to MicroUSB interface

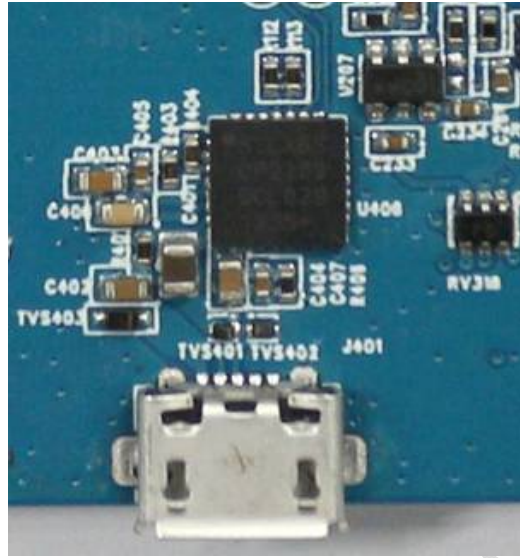


Figure 14: MicroUSB interface

J401 is 5 pins standard MicroUSB interface. It can be connected to a PC directly. The following figure is the uart to USB circuit of SIM5360-EVB.

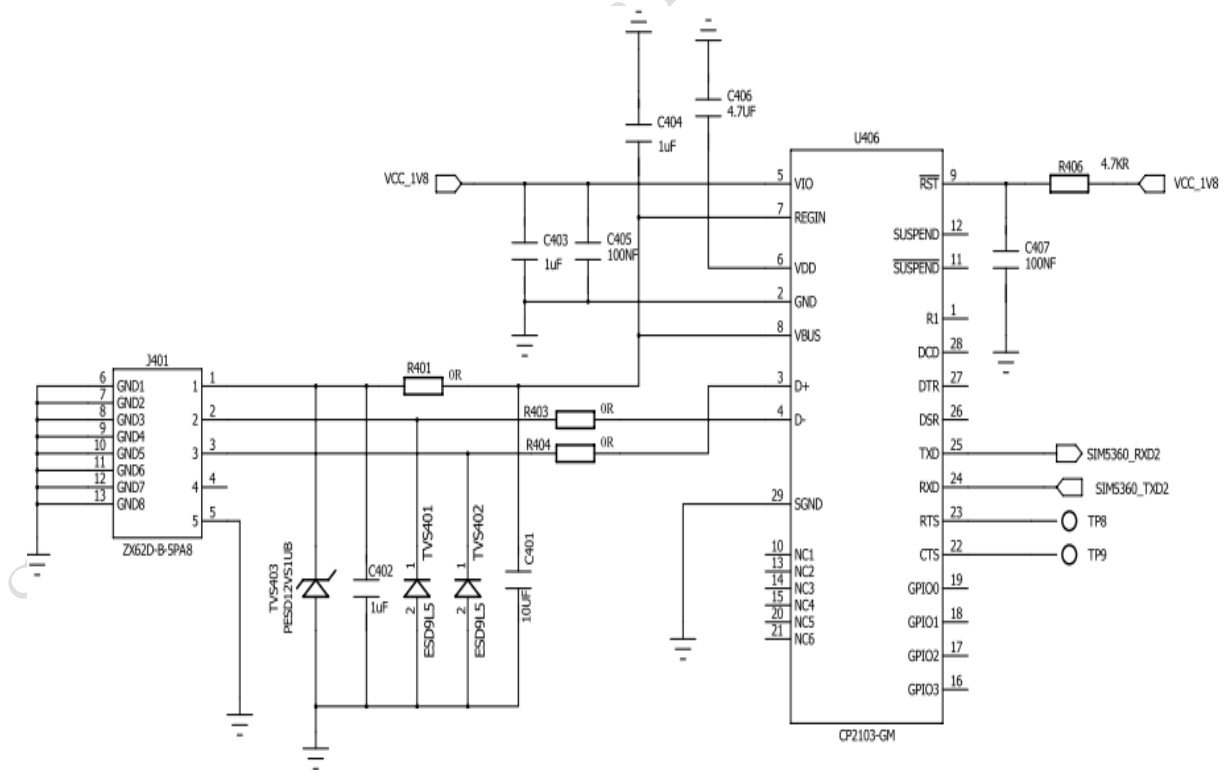


Figure 15: Uart to USB circuit

5 EVB and accessory equipment

At normal circumstance, the EVB and its accessories are equipped as the Figure below.

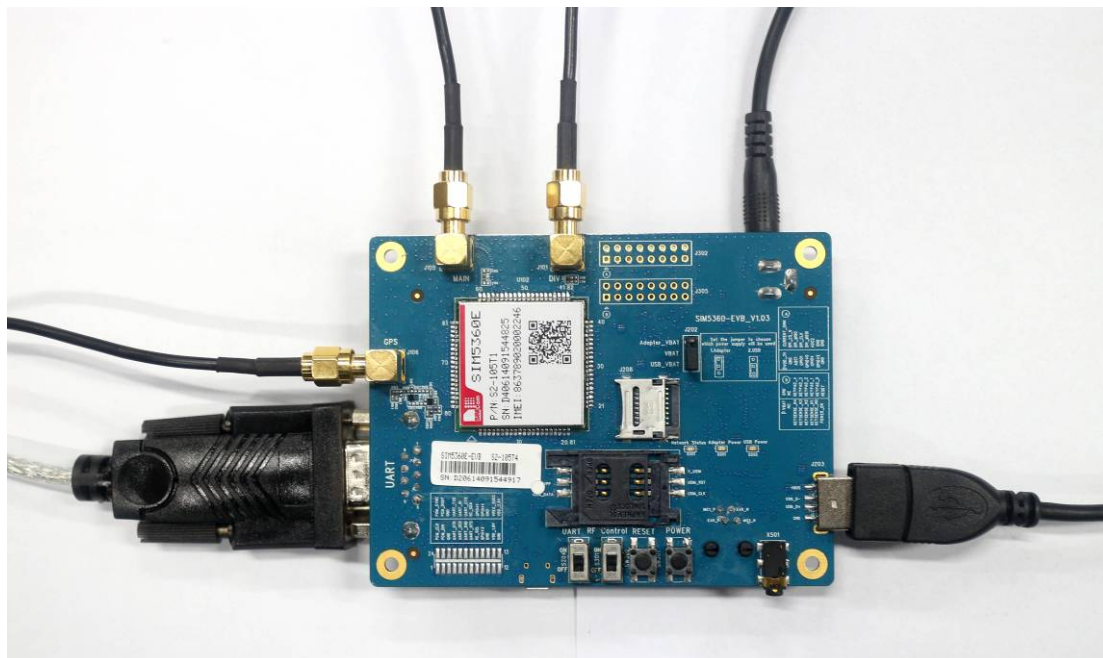


Figure 16: EVB and accessory equipment

6 Quickly start

6.1 Running

There are two ways to provide power supply to SIM5360 module: one is to use the 5V 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 5V 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 SIM5360 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 SIM5360 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 SIM5360 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.

6.2 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.

6.3 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 SIM5360 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 SIM5360 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 SIM5360 module will execute its corresponding function. For example, if user type "AT", then it should respond "OK"; if user type "ATP", 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.

6.4 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.

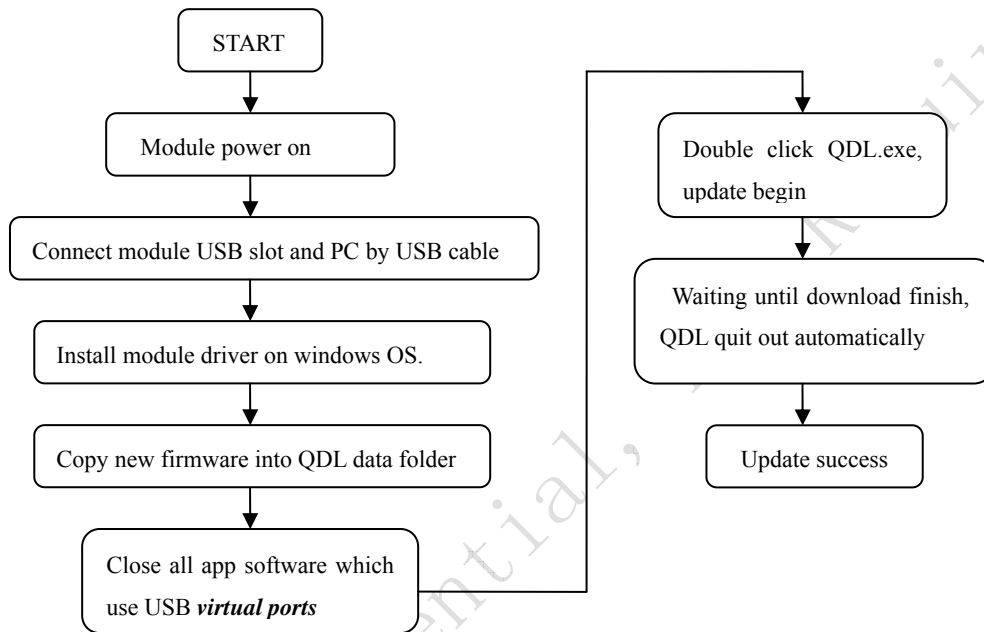


Figure 17: USB interface update procedure

6.5 Turning off

Press the POWER_ON for about 1 second, SIM5360 module will be turned off.

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



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