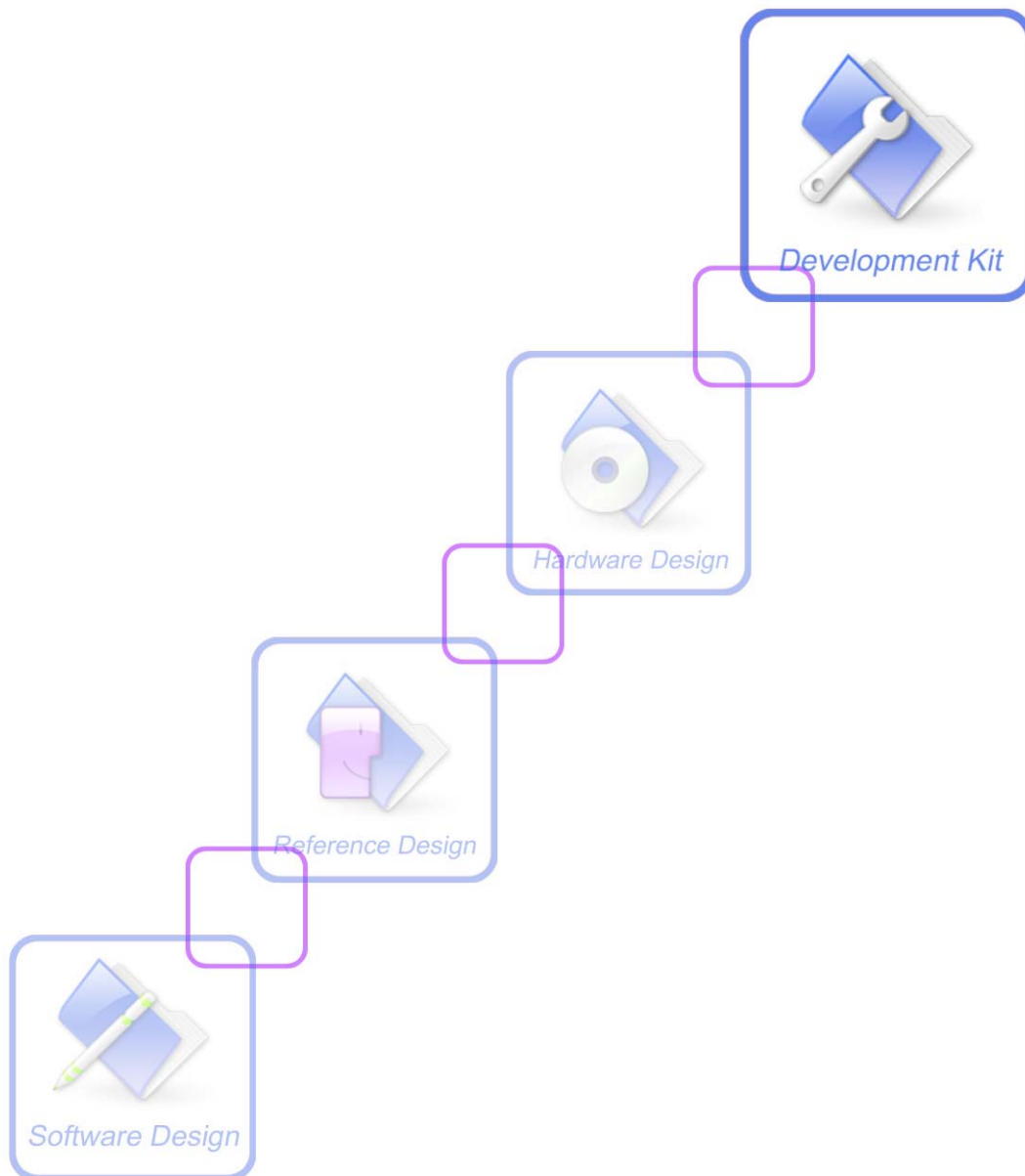




# Development Kit Manual

**SIM5218\_EVB\_UGD\_V1.01**

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## SCOPE

This document give the usage of SIM5218 EVB, user can get useful information about the SIM5218 EVB quickly through this document.

The Debug board is designed for custom to design their applications by using the 3G module SIM5218 easily.

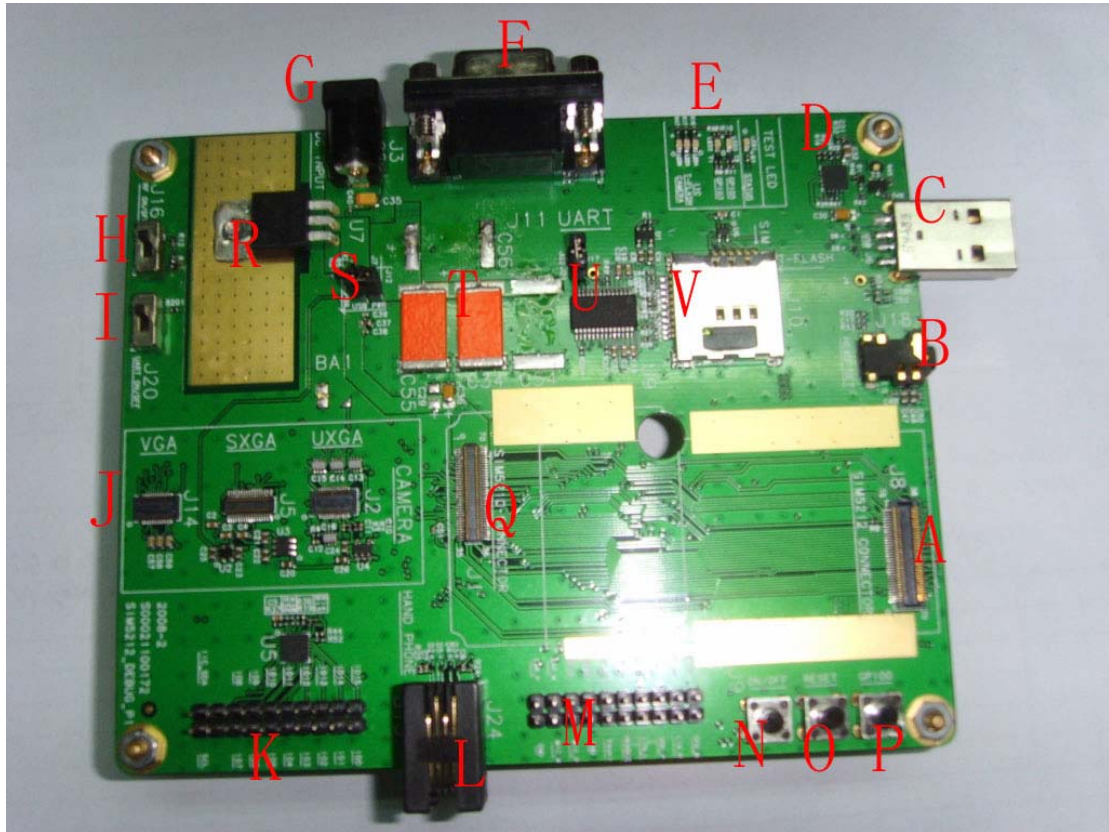
All the functions of the SIM5218 can be used by this board. One can use UART, USB interface to communicate with the SIM5218, and can design their camera phone by SIM5218. There is one UART interface, one USB 2.0 interface, one SIM card interface, one T-FLASH card interface, three camera interfaces, and four audio interfaces on the board and expand I/O interfaces. One can connect the UART and the USB interface to a computer directly.

### Key features

Feature	Implementation
Power supply	1: DC 6.0V~9.0V 2: 3.6V~4.2V at J19 3: 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"/> TFLASH interface <input type="checkbox"/> Three sensor interface <input type="checkbox"/> IIC interface <input type="checkbox"/> Audio/ADC interface <input type="checkbox"/> Onkey/Resetkey/Intkey <input type="checkbox"/> RF Control switch/UART Control switch <input type="checkbox"/> Expanded I/O interface

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## 1 SIM5218 EVB



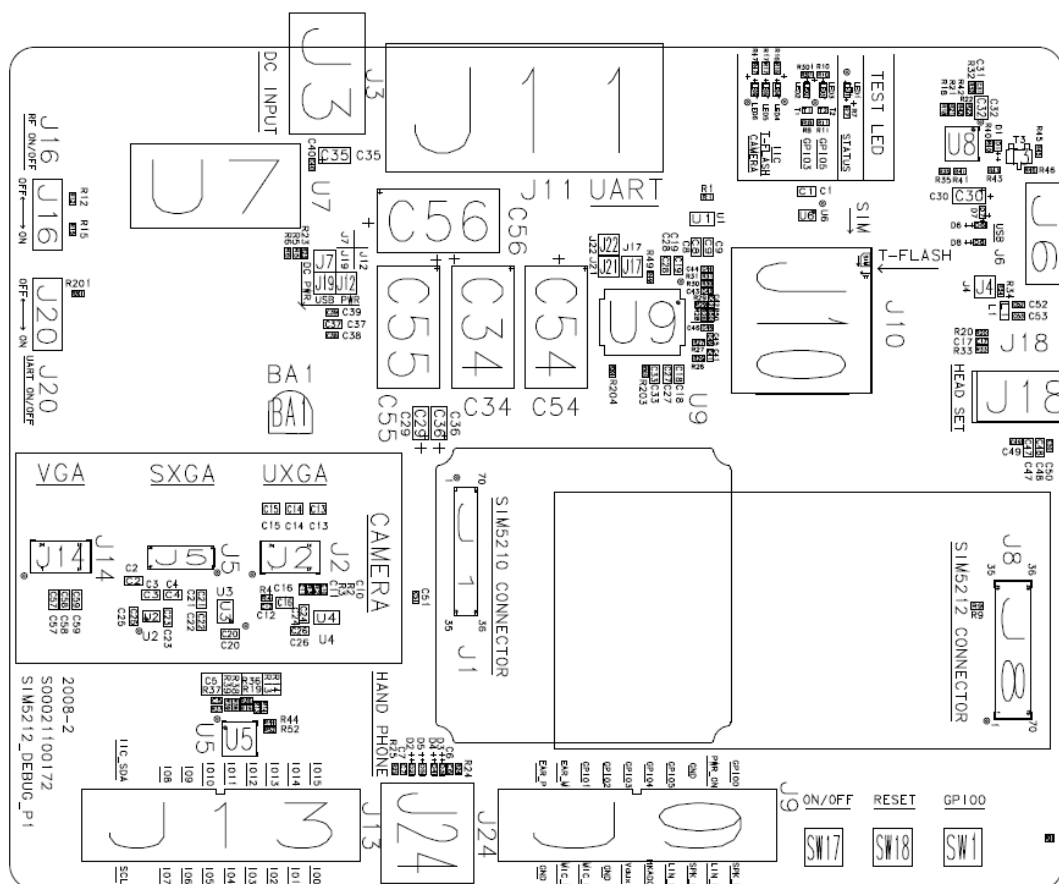
**Figure 1: EVB view**

- A: SIM5218 module interface
- B: headset interface
- C: USB interface
- D: USB power DC-DC
- E: GPIO led
- F: UART interface for AT command transmitting, data exchanging
- G: DC power in
- H: RF control switch
- I: Serial port shutdown switch
- J: Camera interface
- K: IIC expand IO interface
- L: headset interface
- M: Audio & GPIO test interface
- N: Power on/off of SIM5218
- O: RESET key

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- P: GPIO0 key
- Q: Sim5210 module interface
- R: DC-DC LM317
- S: Power select jumper
- T: Capacity
- U: RS232 chip
- V: SD & SIM card interface

All hardware interfaces that connect SIM5218 to the customers' cellular application platform are through a 70-pin 0.5mm pitch board-to-board connector. Sub-interfaces included in this board-to-board connector are described in detail in following chapters.



**Figure 2: EVB Mark view**

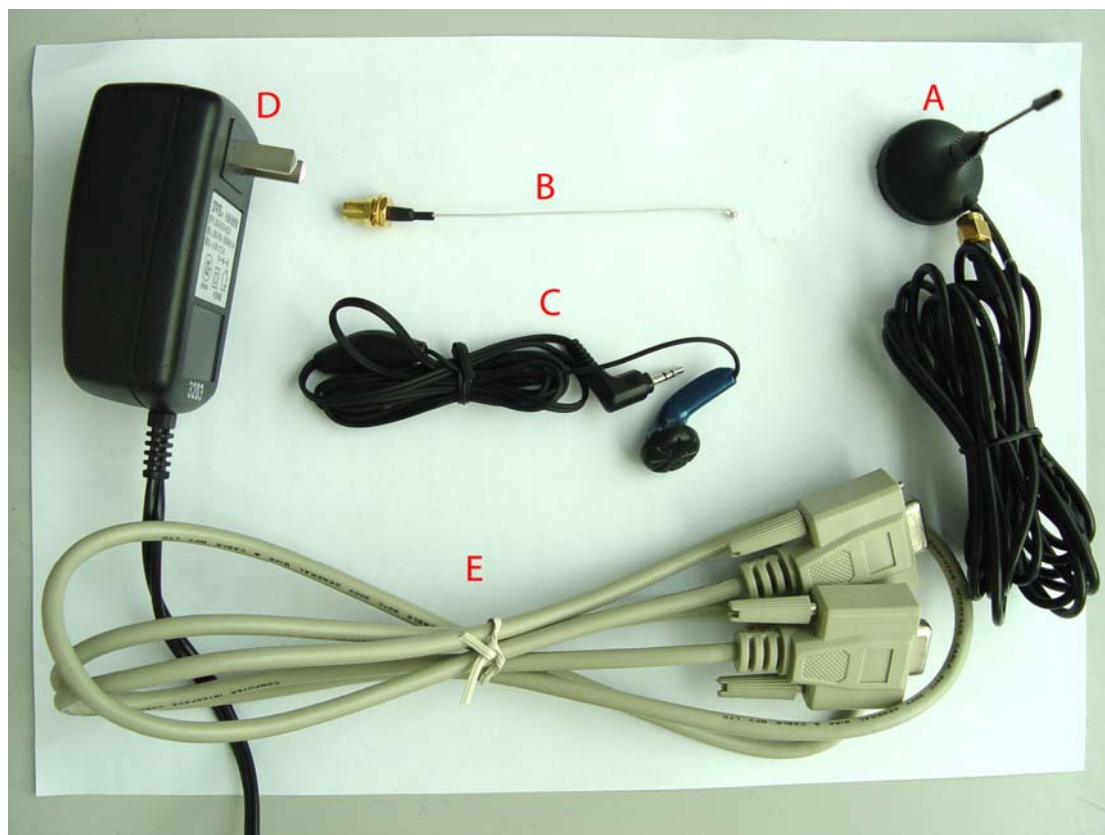
No	Name	Description
1	J1	70PIN B to B connector, connect to SIM5210 module
2	J2	RGB sensor connector(24pin), An OV2640 2.0M sensor can be used
3	J3	Extern DC input connector
4	J4	No use
5	J5	YUV sensor connector(34pin)
6	J6	USB connector

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7	J7	DC-DC out test point, connect this pin to J19 when use a external DC power supply, you can use a 3.6V~4.2V DC supply to J19 when you not use a external DC supply
8	J8	70PIN B to B connector, connect to SIM5218 module
9	J9	Audio interface connector, MIC, receiver, speaker and line in are in this connector, also the Phone on and a GPIO pin are in this connector.
10	J10	USIM and T-FLASH card holder.
11	J11	DB9 UART interface. This can be connect to a PC directly
12	J12	LDO out test point, USB power source, connect to USB with the J19 together.
13	J13	IIC extend IO connector
14	J14	RGB sensor connector(24pin), An OV7670 0.3M sensor can be used
15	J15	no use
16	J16	RF control : Flight Mode switch
17	J17	Connect to DB9 connector DSR of J11
18	J18	Audio jack, for headset use.
19	J19	VABT input, if you don't use the DC-DC circuit, you can supply a 3.5V~4.3V DC supply to this pin directly
20	J20	UART on/off switch
21	J21	RS232 Level shift IC test point
22	J22	no use
23	J23	no use
24	J24	Headphone interface



## 2 EVB accessory



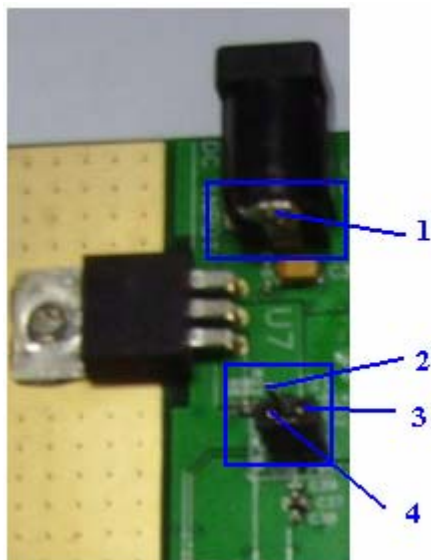
**Figure 3: EVB accessory**

- A: antenna
- B: antenna transmit line
- C: headset
- D: 6V DC source adapter
- E: serial port line



## 3 Accessory Interface

### 3.1 Power Interface



**Figure 4: Power Interface**

If using connector 1 to power on, the connector 2 should be connected.

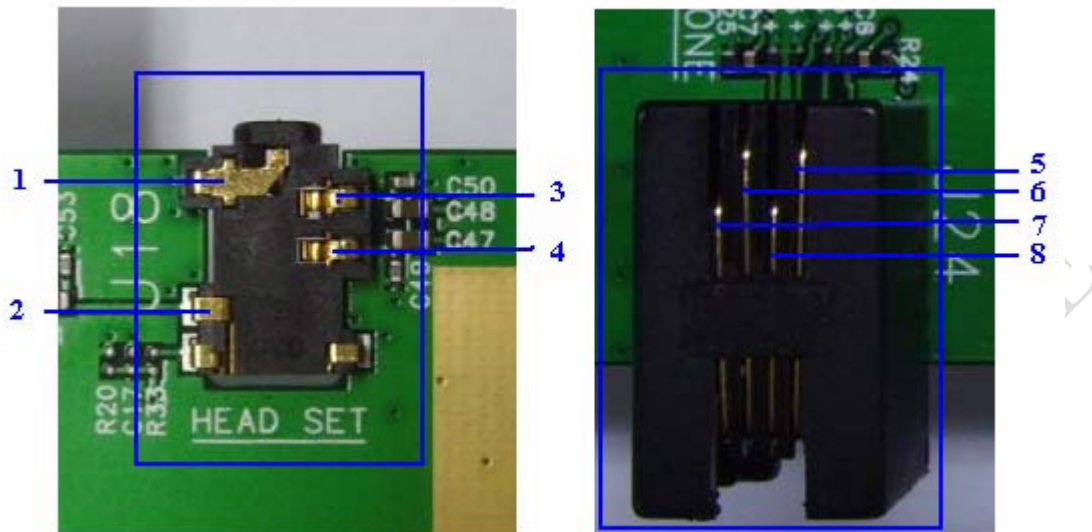
J7 is the DC-DC out, J19 (3.8V) is connected to J7 through a jump, if one want to use a battery to supply the circuit, the jump can be removed and connect the battery + to J19.

This board could be powered by USB bus. You should connect the USB pin. J12 is the USB power out, if you want to use USB VBUS to power up the module, please connect J12 with J19 and disconnect J7.

Pin	Signal	I/O	Description
1	Adapter input	I	6 V/2A DC source input
2	Adapter input	I	3.8V/2A DC source input
3	USB power input	I	3.8V/0.5A DC source input
4	VBat	I	DC source input

**NOTE:** when you use USB power, be sure that the resistant of the USB cable line **MUST** not be too big, otherwise the voltage on J19 will be pulled down and the module may be shutdown automatically.

### 3.2 Audio Interface



**Figure 5: Audio Interface**

J18 is the headset interface. J24 is the handset interface.

**NOTE:** The MIC's polarity must be correct.

#### Headset interface:

Pin	Signal	I/O	Description
1	GND		Ground
2	HEADSET_MIC+	I	Headset microphone input
3	HPH_L	O	Negative microphone output
4	HPH_R	O	Positive microphone output

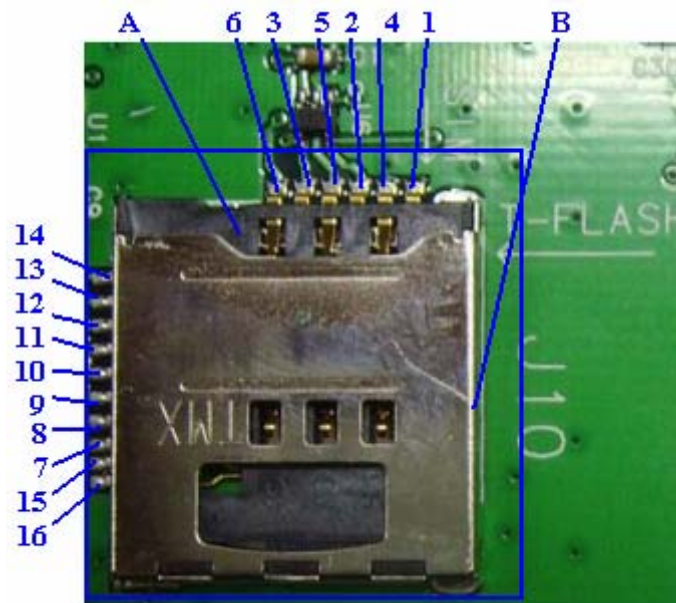
#### Earphone interface:

Pin	Signal	Input/Output	Description
5	MIC1P	I	Positive microphone input
6	EAR1Q_P	O	Positive receiver output
7	EAR1Q_N	O	Negative receiver output
8	MIC1N	I	Negative microphone input

#### Speaker interface:

Please refer Figure 14. Pin 1 and Pin 5 is the SPK\_M and SPK\_P.

### 3.3 SIM card and SD card interface



**Figure 6: SIM/SD card interface**

J3 is a two connector in one package. The upstairs is SIMCARD holder, and the downstairs is T-FLASH card holder.

**NOTE:** the Pin No isn't in sequence, detail description is in follow table.

A---SD card socket

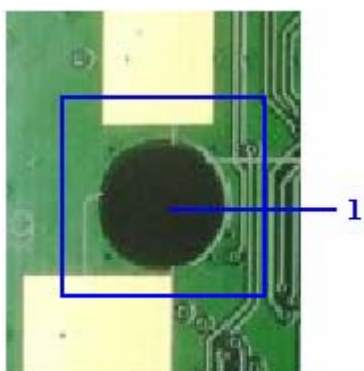
Pin	Signal	Input/Output	Description
1	V_USIM	O	USIM Card Power output automatic output on USIM mode, one is 3.0V±10%, another is 1.8V±10%. Current is about 10mA.
2	USIM_RESET	O	USIM Card Reset
3	USIM_CLK	O	USIM Card Clock
4	GND		Ground
5	SIM_VPP	O	VREG_USIM
6	USIM_DATA	I/O	USIM Card data I/O

B---SIM card socket

Pin	Signal	Input/Output	Description
7	SD-DATA2	I/O	Data line 2
8	SD-DATA3	I/O	Data line 3
9	SD-CMD	O	Command line

10	SD-VDD	O	VDD
11	SD-CLK	O	Clock line
12	GND		Ground
13	SD-DATA0	I/O	Data line 0
14	SD-DATA1	I/O	Data line 1
15	SW1		NC
16	SW2		NC

### 3.4 Antenna Interface

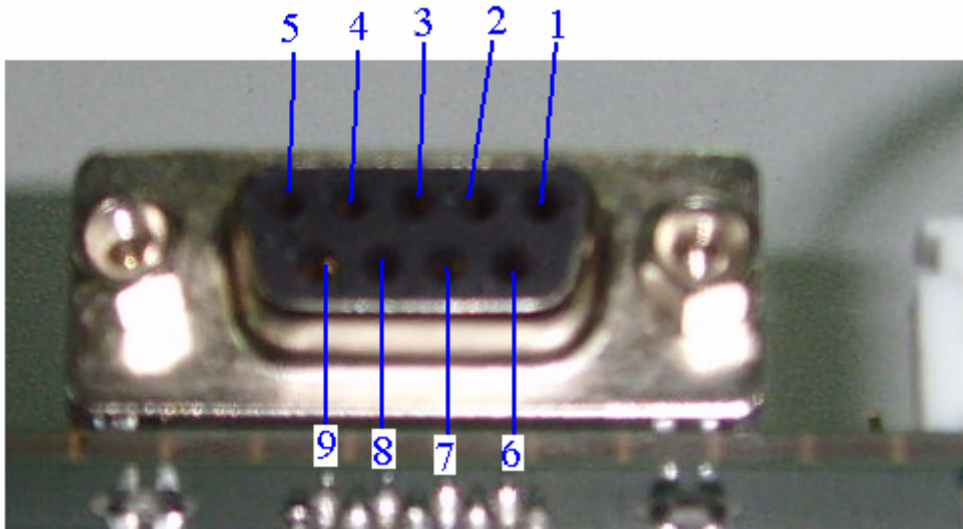


**Figure 7: Antenna Hole**

1---this is an antenna hole on the EVB board, the antenna connector is on the main board – SIM5218 module.

This is mainly used for SIM5210.

### 3.5 RS232 Interface



**Figure 8: Serial Port**

J11 is 9 PINs standard RS232 UART interface. It can be connected to a PC directly

**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
7	RTS	I	Request to Send
8	CTS	O	Clear to Send
9	RI	O	Ring Indicator

### 3.6 Operating Status LED

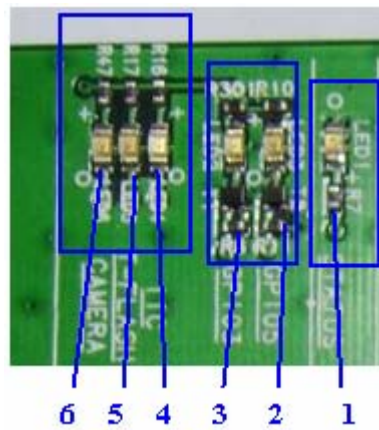


Figure 9: StatusLED

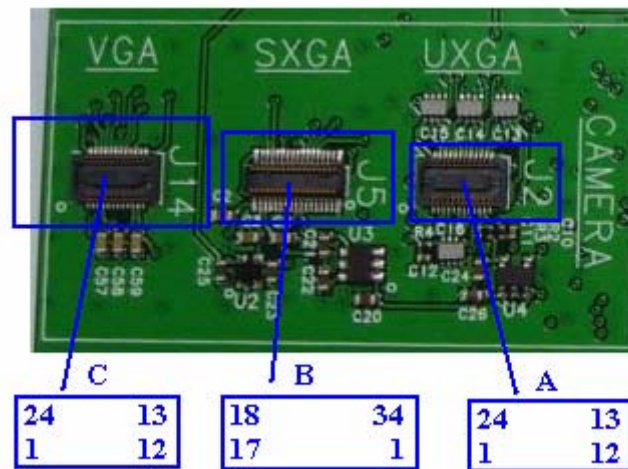
Pin	Signal	I/O	Description
1	ACC_DETECT/GPIO0	O	LED indicator

Working state of status LED as list:

State	Module function
Off	Module is not running
On	Module is running, or call is connected
800ms On/ Off	Module find the network and registered
200ms On/ Off	GPRS/WCDMA communication

Pin	Signal	I/O	Description
2	GPIO5	O	LED indicator
3	GPIO3	O	LED indicator
4	IIC_LED/IIC_IO0	O	LED indicator
5	T-FLASH_LED/IIC_IO1	O	LED indicator
6	CAMERA_LED/IIC_IO4	O	LED indicator

### 3.7 Camera interface



**Figure 10: Camera Interface**

Camera interface A: J14 socket has 24 Pin, this 24PIN B to B socket is used to connect a RGB sensor, the socket is made by HRS.

Pin	Signal	I/O	Description
1			NC
2	GND		Ground/DGND
3	IIC_SDA	I/O	IIC data line
4	VDD2.5V		VDD/ AVDD
5	IIC_SCL	I	IIC clock line
6	CAMIF_RESET	O	Reset signal
7	CAMIF_VSYNC	O	Vertical synchronize
8	CAMIF_STDBY	O	Standby signal
9	CAMIF_HSYNC	O	Horizon synchronize
10	VDD1.3V		VDD/DVDD
11	VDD2.8V		VDD/ IOVDD
12	CAMIF_D9	I/O	Camera data line 9
13	CAMIF_P0	O	Main clock
14	CAMIF_D8	I/O	Camera data line 8
15	GND		Ground
16	CAMIF_D7	I/O	Camera data line 7
17	CAMIF_PCLK	I	Pixel clock
18	CAMIF_D6	I/O	Camera data line 6
19	CAMIF_D2	I/O	Camera data line 2
20	CAMIF_D5	I/O	Camera data line 5



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21	CAMIF_D3	I/O	Camera data line 3
22	CAMIF_D4	I/O	Camera data line 4
23	CAMIF_D1	I/O	Camera data line 1
24	CAMIF_D0	I/O	Camera data line 0

Camera interface B: J5 socket has 34 Pins, J5 is a 34pin B to B connector which produced by NAIS, the PART NO is AXK834145WG.

Pin	Signal	I/O	Description
1	GND		Ground/ DGND
2	CAMIF_PCLK	I	Pixel clock
3-4,6-7			NC
5	CAMIF_RESET	O	Reset signal
8	IIC_SDA	I/O	IIC data line
9	IIC_SCL	I	IIC clock line
10-12			NC
13	CAMIF_STDBY	O	Standby signal
14			NC
15	VDD2.8V		VDD/ IOVDD
16	VDD2.5V		VDD/ AVDD
17	VDD1.8V		VDD/ DVDD
18	CAMIF_VSYNC	O	Vertical synchronize
19	CAMIF_HSYNC	O	Horizon synchronize
20	GND		Ground/ AGND
21	CAMIF_P0	O	Main clock
22			NC
23	CAMIF_D2	I/O	Camera data line 2
24	CAMIF_D3	I/O	Camera data line 3
25	CAMIF_D4	I/O	Camera data line 4
26	CAMIF_D5	I/O	Camera data line 5
27	CAMIF_D6	I/O	Camera data line 6
28	CAMIF_D7	I/O	Camera data line 7
29	CAMIF_D8	I/O	Camera data line 8
30	CAMIF_D9	I/O	Camera data line 9
31-34			NC

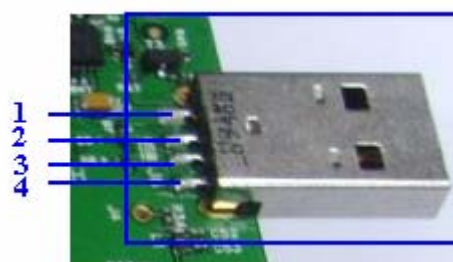
Camera interface C: J2 socket has 24 Pin, this 24PIN B to B socket is used to connect a YUV sensor, and the socket is made by HRS. This is designed to connect a sensor with 0.3M resolution for our platform using the high 8 data lines for 0.3M sensor only.

Pin	Signal	I/O	Description
1			NC

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2	GND		Ground
3	IIC_SDA	I/O	IIC data line
4	VDD2.5V		VDD/AVDD
5	IIC_SCL	I	IIC clock line
6	CAMIF_RESET	O	Reset signal
7	CAMIF_VSYNC	O	Vertical synchronize
8	CAMIF_STDBY	O	Standby signal
9	CAMIF_HSYNC	O	Horizon synchronize
10	VDD1.3V		VDD/DVDD
11	VDD2.8V		VDD/IOVDD
12	CAMIF_D9	I/O	Camera data line 9
13	CAMIF_P0	O	Main clock
14	CAMIF_D8	I/O	Camera data line 8
15	GND		Ground/AGND
16	CAMIF_D7	I/O	Camera data line 7
17	CAMIF_PCLK	I	Pixel clock
18	CAMIF_D6	I/O	Camera data line 6
19	CAMIF_D2	I/O	Camera data line 2
20	CAMIF_D5	I/O	Camera data line 5
21	CAMIF_D3	I/O	Camera data line 3
22	CAMIF_D4	I/O	Camera data line 4
23	CAMIF_D1	I/O	NC
24	CAMIF_D0	I/O	NC

### 3.8 USB interface



**Figure 11: USB Interface**

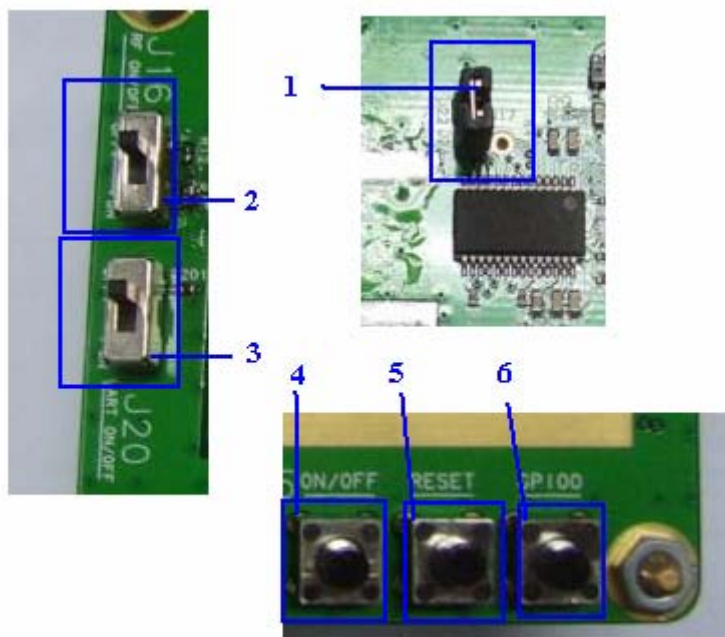
USB interface: It is a normal 4Pin USB connector.

Pin	Signal	I/O	Description
1	USB_VBUS	I	5V
2	USB_DM	I/O	D+ line

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3	USB_ DP	I/O	D- line
4	GND		Ground

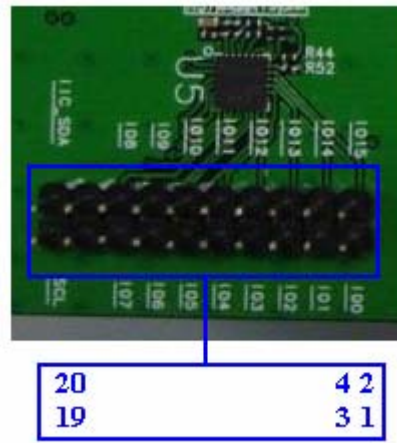
**3.9 Switch interface**



**Figure 12: Switch Interface**

Pin	Signal	I/O	Description
1	ONLINE	I	3V UART
2	GPIO4	I	2.5V RF switch
3	SHUTDOWN	I	3V UART
4	PWR_ON	I	Power on the module
5	RESET	I	Reset the module
6	GPIO0	I	A key for interrupt

### 3.10 IIC expand IO interface



**Figure 13: IIC expand IO Interface**

Pin	Signal	I/O	Description
1	IO_0	O	IIC expand IO
3	IO_1	O	IIC expand IO
5	IO_2	O	IIC expand IO
7	IO_3	O	IIC expand IO
9	IO_4	O	IIC expand IO
11	IO_5	O	IIC expand IO
13	IO_6	O	IIC expand IO
15	IO_7	O	IIC expand IO
19	SCL	I	IIC clock line
2	IO_15	O	IIC expand IO
4	IO_14	O	IIC expand IO
6	IO_13	O	IIC expand IO
14	IO_12	O	IIC expand IO
12	IO_11	O	IIC expand IO
10	IO_10	O	IIC expand IO
8	IO_9	O	IIC expand IO
16	IO_8	O	IIC expand IO
20	SDA	I/O	IIC data line
Others			NC

### 3.11 Audio & GPIO interface

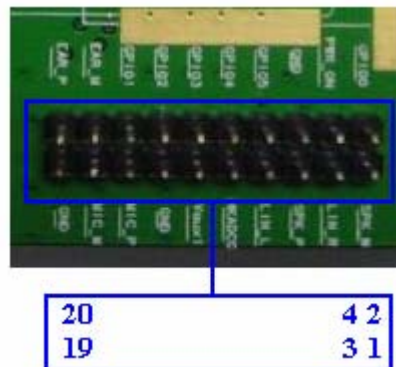


Figure 14: Audio and GPIO Interface

#### Audio & GPIO interface--- J9 Pin List

Pin	Signal	I/O	Description
1	SPK_M	O	Speaker minus
3	LIN_R		Ground
5	SPK_P	O	Speaker plus
7	LIN_L		Ground
9	HKADC0	I	ADC interface
11	VAux1	O	LDO
13	GND		Ground
15	MIC1_P	I	MIC plus
17	MIC1_M	I	MIC minus
19	GND		Ground
2	GPIO0	Input, interrupt	Input Port with interrupt, Use AT Command to set interrupt triggering mechanism & polarity .
4	PWR_ON	I	Power On/off
6	GND		Ground
14	GPIO5	O	General Purpose Output Port (default value: Low Level)
12	GPIO4	I	RF Control Interrupt : Flight Mode Switch
10	GPIO3	O	General Purpose Output Port (default value: Low Level)
8	GPIO2	I	General Purpose Input Port without interrupt.
16	GPIO1	O	General Purpose Output Port without interrupt. Status Led indication.
18	EAR1Q_N	O	Negative receiver output
20	EAR1Q_P	O	Positive receiver output

## 4 EVB and accessory equipment

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



Figure 15: EVB and accessory equipment

## 5 Illustration

### 5.1 Running

- (1) Connect the SIM5218 module to the 70pins connector on SIM5218 EVB, inserting 6V direct current source adapter, you should connect J7 and J19 pin on the board;
- (2) Insert a valued SIM card and check the antenna is connected;
- (3) Press the on/off switch for about 1 second, and then SIM5218 module begins running.

You can see the light on the EVB flashing at a certain frequency. By the state, you can judge whether the EVB and SIM5218 can run or not. No function and test can be executed when we have not connected necessary accessories.

**NOTE:** This EVB board supports USB power on when you connect J12 and J19 together.

## 5.2 Connecting Net and calling

(1) Connect the serial port line to the serial port, open the HyperTerminal (AT command windows) on your Personal computer, the location of the HyperTerminal in windows2000 is START→accessory→communication→HyperTerminal. Set correct Baud Rate and COM number. The Baud Rate of SIM5218 is 115200, and the COM number based on which USB port your serial port line insert in, you should select such as COM1 or COM2 etc.

(2) Connect the antenna to the SIM5218 module using an antenna transmit line, insert SIM card into the SIM card interface, and insert headphones or headset into its interface.

(3) Act on the step of running which mentioned above, power on the system, typing the AT command in the HyperTerminal, and then the SIM5218 module will execute its corresponding function.

(4) If you want to use USB port, you should setup the drivers for the USB modem, after that, you will see 3 virtual serial ports in device list in windows system. Now you can connect the device following step 1~3. The performance of the virtual serial port is as same as the serial port.

## 5.3 Downloading

Connect the USB port line to the **USB** port, connect the direct current source adapter, run the download program, select the Diag port on USB interface (such as COM3,COM4,etc), and choose the correct image, press the start button on the program to enter downloading mode.

**NOTE:** You should enter download mode using AT command *AT+CSWITCHTEST=1*. Please refer ATC specification for more information.

## 5.4 Turns off

Press the PWRKEY for about 1 second, SIM5218 module will be turned off.

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



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