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EVK-GT8230 User Manual

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Applicability Table

No.	Product model	Description
1	H330S	Used together with ADP-H330S-XXX-YY/H330S-MiniPCIe
2	H350	Used together with ADP-H350-XXX-YY
3	L810	Used together with ADP-L810-XX-YY/L810-MiniPCIe
4	L811	Used together with ADP-L811-XX-YY

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Version Record

Version	Update Date	Description
V1.0.0	2012-05-29	Initial version
V1.0.1	2013-01-04	Update the document name
V1.0.2	2013-01-30	Update the picture of development kits; Add notes for the use of mini PCIe; Add the definition of handle socket wiring; Delete POWER_ON and POWER_OFF switches
V1.0.3	2013-09-13	Update the document name; Add introduction to the adapter
V1.0.4	2014-12-26	Change company name to “Fibocom Wireless Inc.”
V1.0.5	2015-03-12	Add applicable model L810
V1.0.6	2015-08-24	Update the company logo
V2.0.0	2015-10-23	Improve the manual content, add description of some chapters, and add LTE module support

Contents

1 EVK Introduction

1.1 Product Overview

The EVK-GT8230, the development kit for Fibocom 3G/4G modules, consists of an EVB-GT8230 ("development board" for short), an adapter (“ADP”) or a Mini PCIe module, an antenna, a Mini/Micro USB, and a serial cable. This document is the user manual of EVK-GT8230, to help users to understand the functions of Fibocom modules.

1.2 Product Appearance

The EVB-GT8230 development board includes power input interfaces, power input switch, UART, USB, audio interface and RESET button. The product appearance is shown in Figure 1-1.

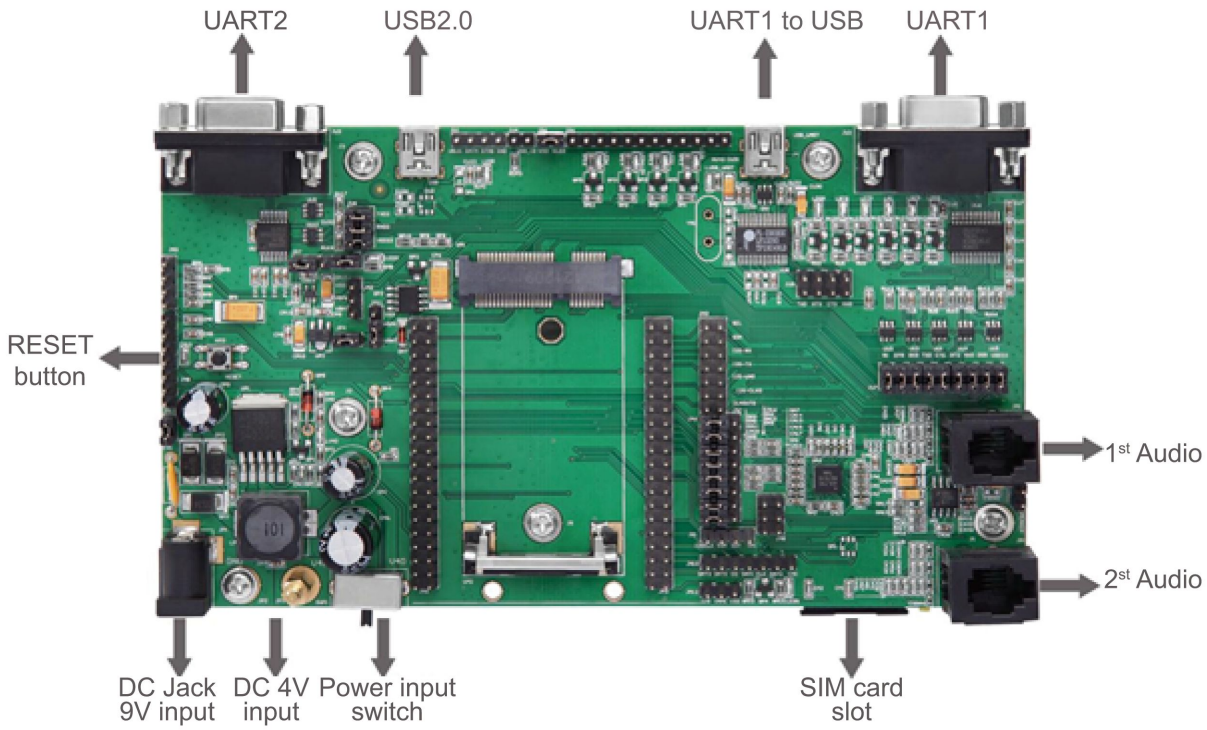

Figure 1-1 EVB-GT8230 Product Appearance

1.3 Application Diagram

The EVB-GT8230 development board is mainly composed of four parts: power supply, buttons, functional ports, and test points.

The function framework is shown in Figure 1-2：

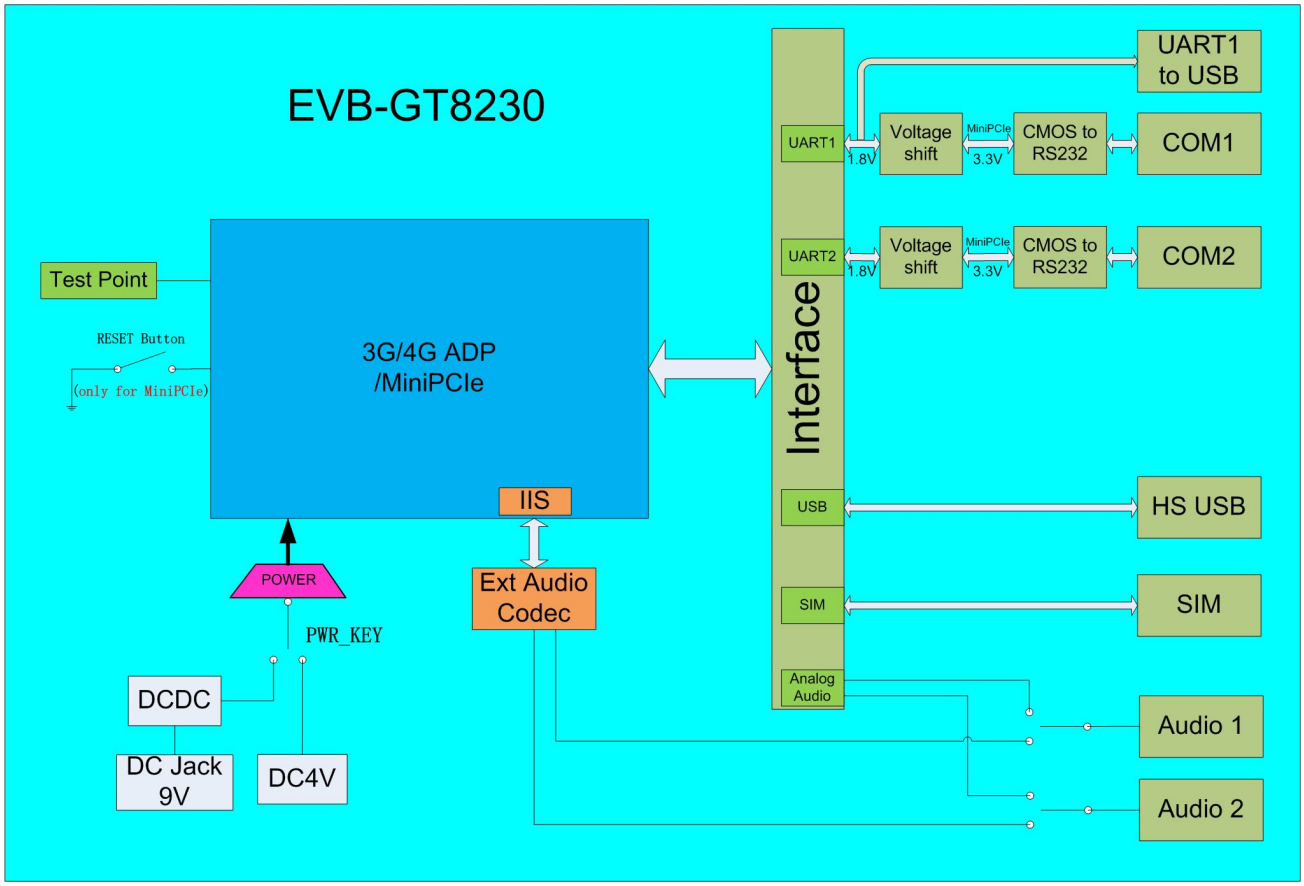

Figure 1-2 Product Framework

Note:

The RESET button only applies to Mini PCIe module reset, and does not apply to ADP reset.

2 EVB-GT8230 Functional Description

This chapter provides the detailed description of the functions on the development board by taking ADP-H330S (H330S Adapter) as an example.

2.1 Power Supply

The EVB-GT8230 development board supports two power supply modes.

1. DC Power Supply

DC power supply provides DC 4V voltage to ADP-H330S through power clipsby connecting V40BAT (copper cylinder JP3) and GND (copper cylinder JP2).

Note:

The voltage of the power supply should be adjusted to 3.3V for Mini PCIe module.

2. External Power Adapter

The adapter provides 9V input power to DC Jacket (JP1), and powers up ADP-H330S by converting the voltage to 4V through DC/DC conversion circuit on the development board.

The power supply is shown in Figure 2-1:

- Please slide the power switch (SWP1) to the left in case of DC power supply.
- Please slide the power switch (SWP1) to the right in case of power supply by adapter.

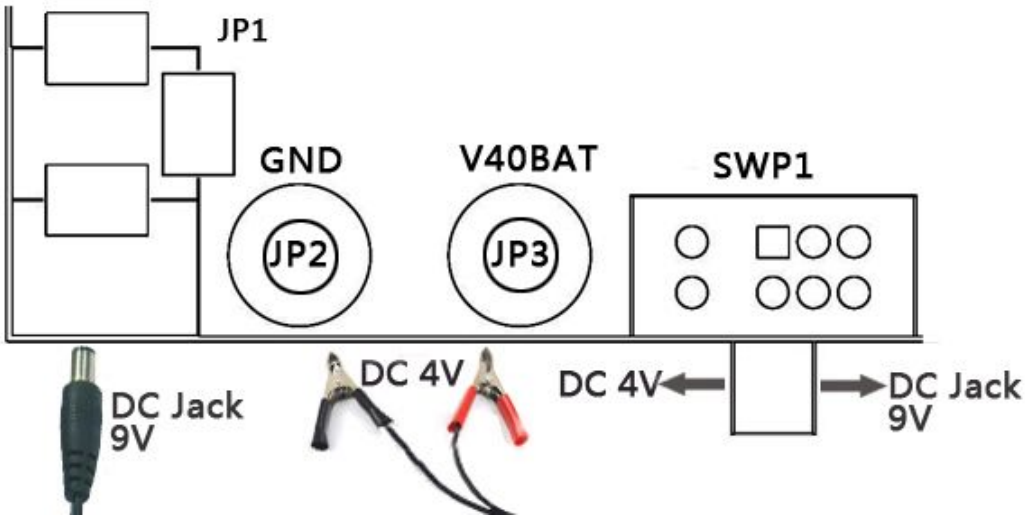

Figure 2-1 Power Supply

2.1.1 DC Power Supply

DC power supply: The voltage is directly applied to the module, and the input voltage should be in the range of the requirements of H330S.

Power input end	Description
V40BAT (JP3) GND (JP2)	DC Power Supply Voltage range: 3.3 V ~ 4.5 V Recommended voltage: 4.0V Input current: > 2.0A

Note:

Please output the correct supply voltage to avoid damaging the module.

For the voltage range of other modules, please refer to the corresponding Hardware User Manuals.

2.1.2 Power Supply by Adapter

After the external power adapter is inserted, it provides DC 4V voltage for the module via a DC/DC converter on the development board, then the LV40 indicator LED is lit.

Power input end	Description
JP1	Directly connected to the power adapter. DC jack diameter: 2.5mm (positive inside, negative outside) Input voltage: 8V~15V, typical value: 9V Input current: ≥1A

2.1.3 Power Supply Jumpers

On the development board there are multiple power supply jumpers, which are used to control supply voltage. Moreover, there are two LDOs (UP2 and UP3) on the development board. After passing UP2, DC 4V generates 3.3V voltage; and after passing UP3, 3.3V generates 1.8V voltage. The two sets of voltage are used for UART level shifter, audio codec and indicator LED on the development board. Detailed description of jumpers is as follows:

Jumper	Purpose
JP4	Turn on/off 3.3V voltage output
JP6	Turn on/off power supply for indicator LED
JM5	Turn on/off power supply for module system indicator LED
JM11	Power supply for audio codec inside the module DC 4V power supply: VSPK connected to VBAT 3.3V power supply: VSPK connected to V33
JA2	Power supply for audio codec of the development board DC 4V power supply: VSPK connected to VBAT 3.3V power supply: VSPK connected to V33
JM12	Power supply for VDD_MMC inside the module 1.8V power supply: VMMC connected to 1V8 3.3V power supply: VMMC connected to V33

Note:

To measure the current in sleep mode via the DC power, the caps of above six jumpers should be removed, then the measured current is the current consumed by the module.

Jumpers for power supply of development board are shown in Figure 2-2:

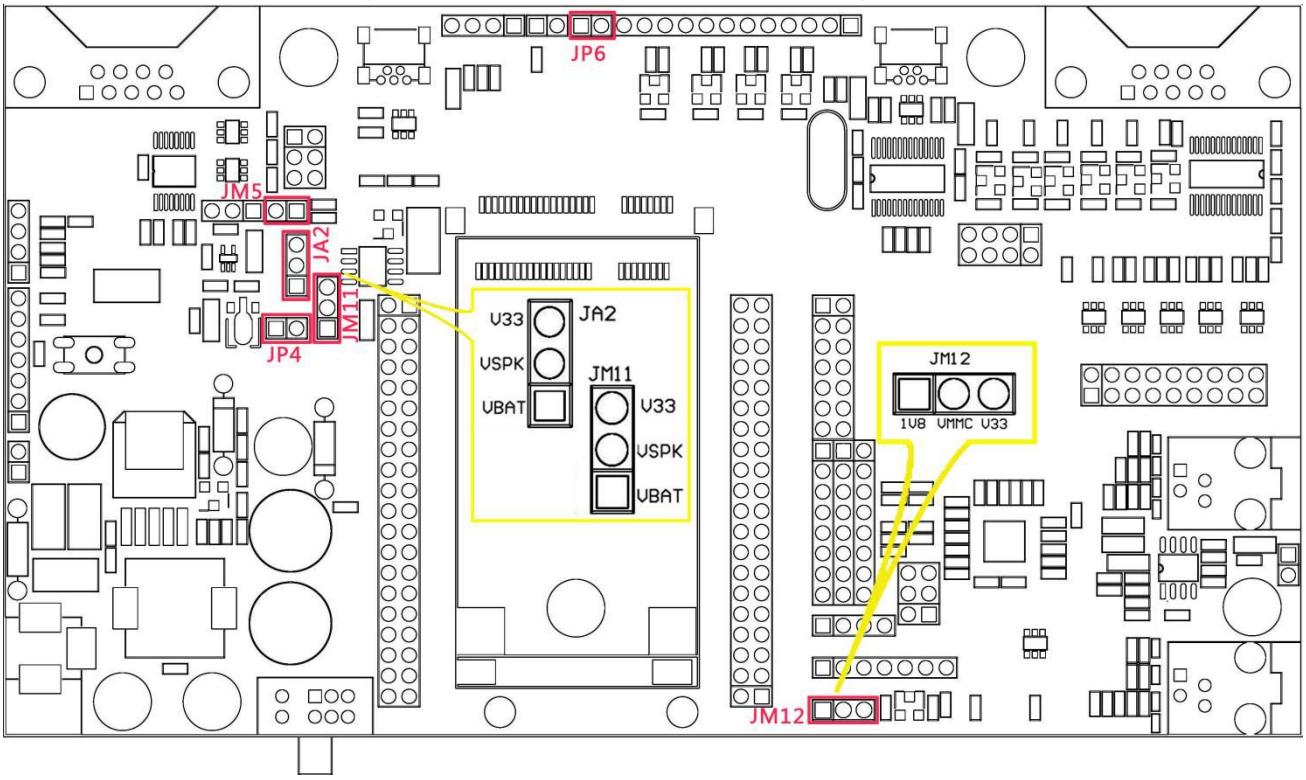

Figure 2-2 Jumpers of Power Supply

2.2 UART

EVB-GT8230 contains two serial ports. UART1 is an 8-line serial port, and UART2 is a 2-line serial port. Moreover, UART1 can be converted into USB port. UART support for different ADP/Mini PCIe modules as shown in the following tables:

	UART1	UART2	UART1to USB
ADP-H330S-XXX-YY	8-line serial port	Supported	Supported
H330S-MiniPCIe	8-line serial port	Supported	Supported
ADP-H350-XXX-00	8-line serial port	Supported	Supported
ADP-H350-XXX-10	2-line serial port	Supported	Supported
ADP-L810-XX-YY	4-line serial port	Not supported	Supported
L810-MiniPCIe	4-line serial port	Not supported	Supported
ADP-L811-XX-YY	4-line serial port	Not supported	Supported

2.2.1 UART1 (COM)

UART1 is an 8-line serial port. The development board can be connected directly to a PC or other RS232 DTE equipment. UART1 has 6 indicator LEDs (LDSR/LRTS/LCTS/LRI/LDCD/LDTR), which are used to indicate the pins' logic level of the module (when the LED light is on, the module pin is low level; when the LED light is off, the module pin is high level).

PC or other DTE equipment can send AT commands through UART1 to test all functions of the module. Communication process of the serial port is shown in Figure 2-3:

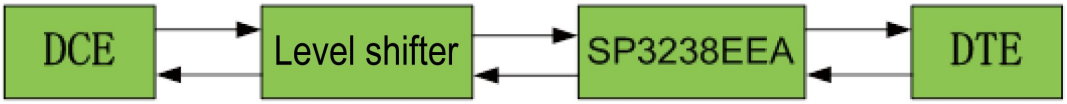

Figure 2-3 Communication of UART1

UART1 signals can be controlled by jumper JU7. The function of JU7 is shown below:

Jumper	Purpose
JU7	Turn on/off UART1 signal connection

The position of UART1 jumper JU7 on the development board is shown in Figure 2-4:

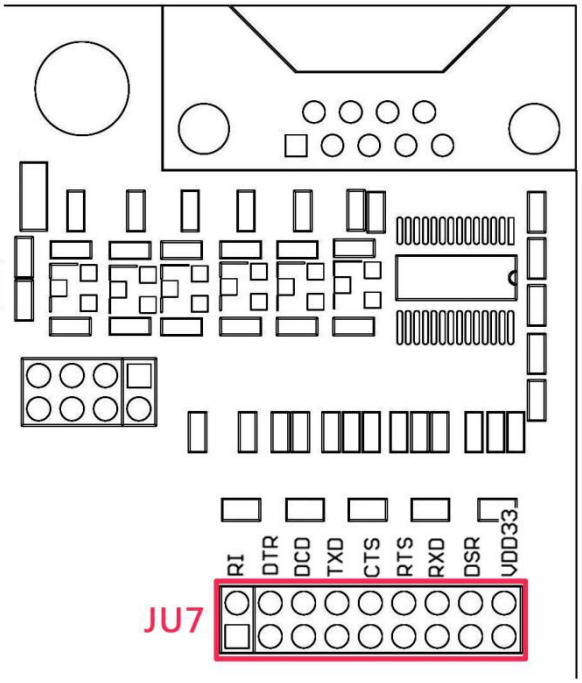

Figure 2-4 Jumper of UART1

Note:

USB 2.0 interface of the development board controls the power supply capability of the Mini PCIe module, and a mini USB line shall be inserted for connecting to the PC in case of Mini PCIe module powered by DC Jack 9V.

2.2.2 UART1 Convert to USB

The development board has built-in a UART to USB converter (PL2303) which is connected to the module's 4-line UART interface (TXD/RXD/CTS/RTS). The 4-line UART interface and UART1 share one UART interface of the module and have the same functions. The type of USB interface is mini USB, through which users can achieve connection to the PC.

USB interface has an indicator LED (LUSB-UART), which is used to display the status of connection between the USB interface and terminals like the PC. If the connection is completed, the LED light is on. The communication process is shown in Figure 2-5:

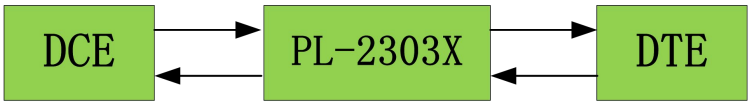

Figure 2-5 Communication of UART2

Jumper	Purpose
JU9	Turn on/off UART1 to USB signal connection

The jumper position of UART to USB on the development board is shown in Figure 2-6:

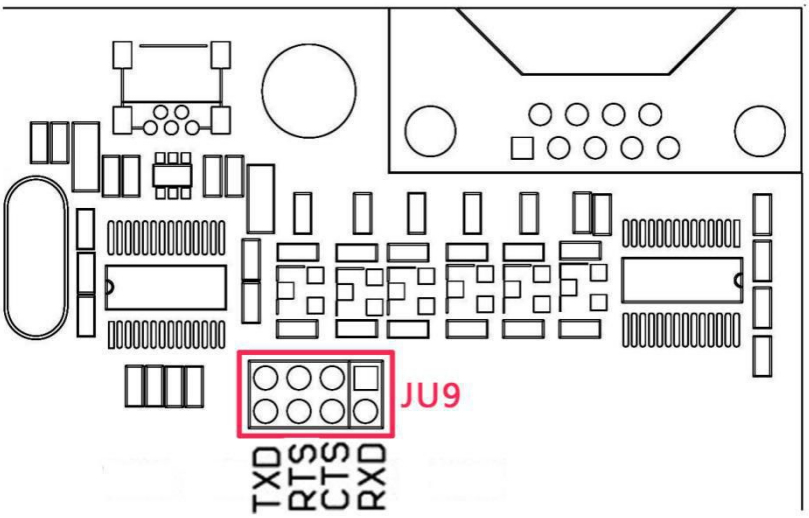

Figure 2-6 Jumper of UART to USB

Note:

- Do not use UART1 and UART1 to USB interface simultaneously. Please select between JU9 and JU7.
- The PL2303 driver shall be installed when USB interface is used.
- The Mini PCIe module does not support UART to USB function.

2.2.3 UART2 (COM)

UART2 is a 2-line UART interface (RXD/TXD) and is used to debug/test the UART2 interface of ADP-H330S. The development board can directly connect to the PC or other DTE equipment. The communication process is shown in Figure 2-7:

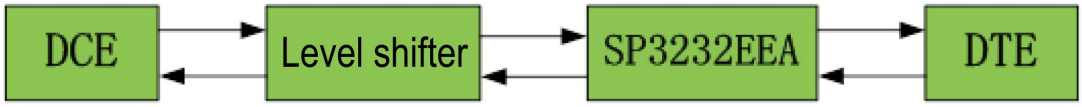

Figure 2-7 Communication of UART2

Jumper	Purpose
JU6	Turn on/off UART2 signal connection

The jumper position of UART2 on the development board is shown in Figure 2-8:

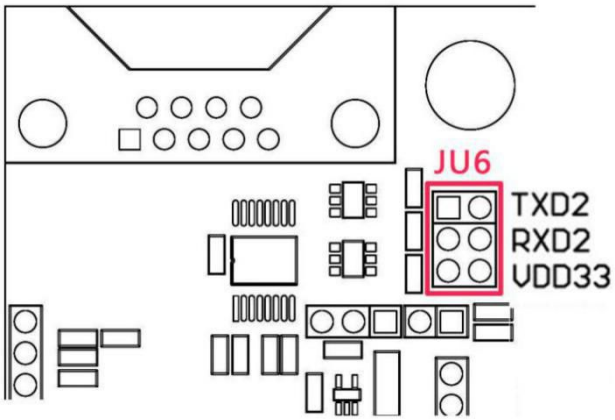

Figure 2-8 Jumper of UART2

Note:

USB 2.0 interface of the development board controls the power supply capability of the Mini PCIe module, and a mini USB cable shall be inserted for connecting to the PC in case of the Mini PCIe module powered by DC Jack 9V.

2.3 USB Interface

The development board provides a USB2.0 interface, which is a mini USB interface. The USB interface has one indicator LED (LUSB), which is used to display the status of connection between the interface and terminals like the PC.

Besides high-speed connection, USB is used to enable DC Jack 9V power supply of the Mini PCIe module. When USB is inserted, 3.3V power supply of the Mini PCIe module is on. The function of USB is

shown in Figure 2-9:

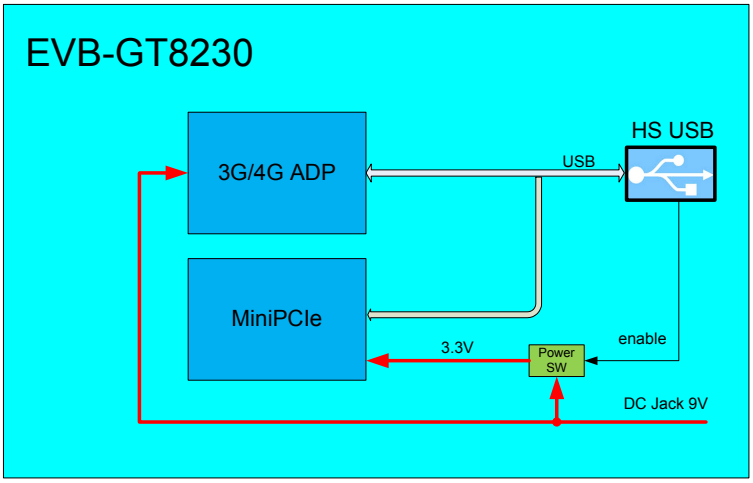

Figure 2-9 Functions of USB

Note:

The PL2303 driver shall be installed when USB interface is used.

2.4 SIM Card Interface

On the development board there is a standard Mini SIM card slot, which supports 1.8V/3V SIM card and SIM card detection function (via SIM_CD signals). The use of SIM card is explained below:

	ADP SIM card slot	Development board SIM card slot	Hot plug of SIM card
ADP-H330S-XXX-YY	Supported	Not supported	OFF by default, can be turned on with AT commands
H330S-MiniPCIe	Not supported	Supported	Not supported
ADP-H350-XXX-00	Supported	Not supported	OFF by default, can be turned on with AT commands
ADP-H350-XXX-10	Supported	Not supported	ON by default, SIM_CD high enabled. SIM_CD is not detected during the first start-up.
ADP-L810-XX-YY	Supported	Not supported	ON by default. High enabled
L810-MiniPCIe	Not supported	Supported	Not supported
ADP-L811-XX-YY	Supported	Not supported	ON by default, SIM_CD high enabled. SIM_CD is not detected during the first start-up.

Note:

The card tray shall be taken out if the development board's SIM card slot is not supported.

2.5 Audio Interface

The development board provides two audio interfaces (Audio 1 and Audio 2) and one speaker interface. Audio 2 interface and speaker interface are connected to the same audio output network of the module, so they cannot be used simultaneously.

In addition, the development board provides two audio modulation schemes:

- Scheme 1: analog audio output of the module

  Generate analog audio with the module's built-in audio codec.
- Scheme 2: digital audio output of the module

  Generate analog audio with the audio codec on the development board.

The support of audio by ADP and Mini PCIe is shown below:

	Analog audio	Digital audio
ADP-H330S-XXX-00	Supported	Supported
ADP-H330S-XXX-20	Not supported	Not supported
H330S-XXX-00-MiniPCIe	Supported	Not supported
H330S-XXX-20-MiniPCIe	Not supported	Not supported
ADP-H350-XXX-00	Not supported	Supported
ADP-H350-XXX-10	Not supported	Supported
ADP-L810-XX-YY	Not supported	Supported
L810-MiniPCIe	Not supported	Not supported
ADP-L811-XX-YY	Not supported	Supported

The development board's support for analog audio and digital audio contains the following jumpers:

Jumper	Purpose
JA6	For analog audio, select audio output from the built-in codec
JA7	For digital audio, select audio output from the codec on the development board
JA3	

Audio jumpers are shown in Figure 2-10:

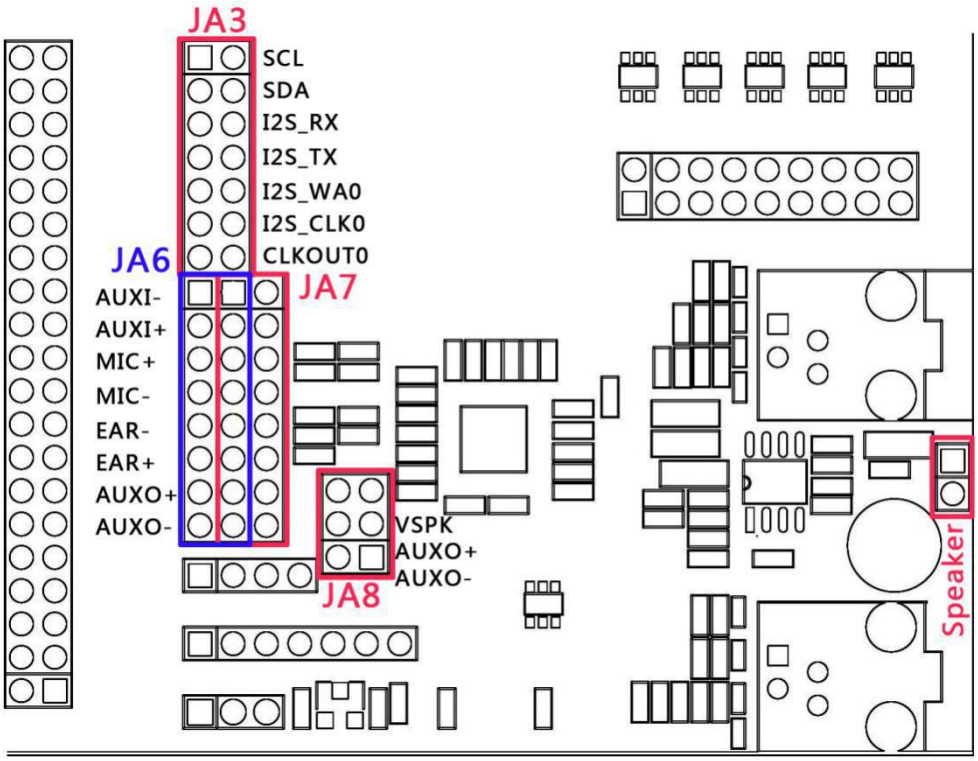

Figure 2-10 Audio Jumpers

2.5.1 Audio1

JA1 handset socket on the development board is for Audio 1, which controls audio input/output by JA6/JA7 jumpers.

Jumper	Pin	Purpose	Type
JA6	PIN 5-6	On/off, connecting to earphone MIC+	Analog audio from the built-in codec
	PIN 7-8	On/off, connecting to earphone MIC-	
	PIN 9-10	On/off, connecting to earphone EAR-	
	PIN 11-12	On/off, connecting toearphone EAR+	
JA7	PIN 5-6	On/off, connecting to earphone MIC+	Digital audio from the codec on the development board
	PIN 7-8	On/off, connecting toearphone MIC-	
	PIN 9-10	On/off, connecting to earphone EAR-	
	PIN 11-12	On/off, connecting to earphone EAR+	

Definition of JA1 handset socket signal is shown in Figure 2-11:

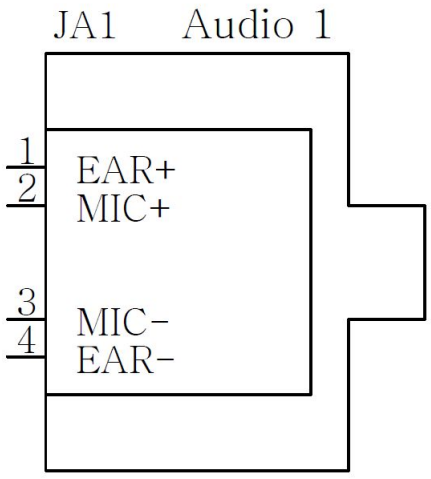

Figure 2-11 Definition of JA1 Handset Socket Signal

2.5.2 Audio2

JA4 handle socket on the development board is Audio 2. It also controls audio input/output with JA6/JA7 jumper.

Jumper	Pin	Purpose	Type
JA6	PIN 1-2	On/off, connecting to handset AUXI-	Analog audio from built-in codec
	PIN 3-4	On/off, connecting to handset AUXI+	
	PIN 13-14	On/off, connecting to handset AUXO+	
	PIN 15-16	On/off, connecting to handset AUXO-	
JA7	PIN 1-2	On/off, connecting to handset AUXI-	Digital audio from external codec
	PIN 3-4	On/off, connecting to handset AUXI+	
	PIN 13-14	On/off, connecting to handset AUXO+	
	PIN 15-16	On/off, connecting to handset AUXO-	

Definition of JA4 handset socket signal is shown in Figure 2-12:

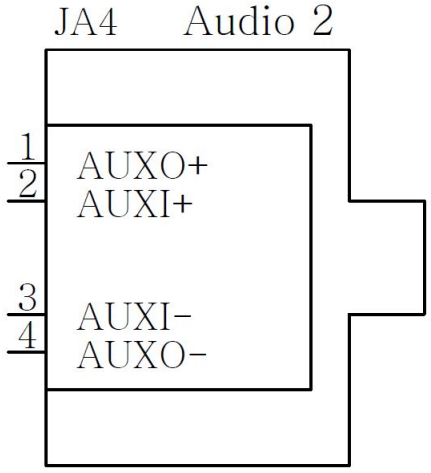

Figure 2-12 Definition of JA4 Handset Socket Signal

2.5.3 Speaker

Jumpers for speak interface are shown below:

Jumper	Purpose	
JA8	PIN 1-2	On/off, connecting to speaker AUXO-
	PIN 3-4	On/off, connecting to speaker AUXO+
	PIN 5-6	On/off, power supply of speaker amplifier

2.6 RESET Button

The development board is designed with a RESET button, which is used only to reset the Mini PCIe module. When the RESET button is pressed down, Mini PCIe module's PERST# signal is lowered to realize the restart function.

The RESET button is controlled by jumperJM14, which is used to enable/disable the RESET button function.

Jumper	Purpose
JM14	Enable/disable, RESET button switch

RESET button and jumper are shown in Figure 2-13:

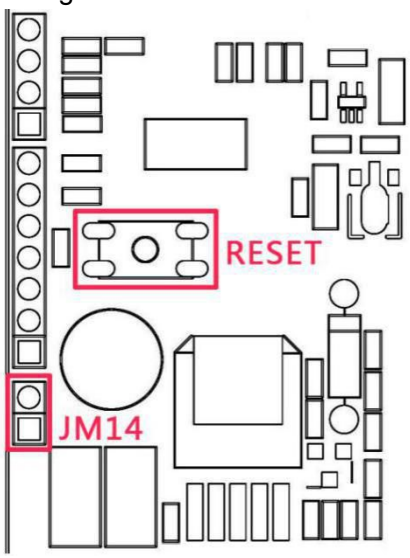

Figure 2-13 RESET Button and Jumper

2.7 Pin Headers

For testing and debugging, several pin headers are placed on the development board. The detailed functions are shown below:

Pin header	Pin	Signal	Pin description
VRTC&ADC			
JM3	1	VRTC_1V8	RTC power supply 1.8V
	2	VBACKC	RTC external backup battery capacitor
	3	ADC2	ADC2
	4	ADC1	ADC1
CLOCK & EINT			
JM8	1	CLKOUT0	26MHz clock output
	2	CLK32K	32.768KHz clock output
	3	USIF1_SCLK	USIF1 serial clock
	4	T_OUT0	T_OUT0 output
	5	EINT2	Interrupt 2 input
	6	GND	Ground
	7	EINT1	Interrupt 1 input
MMC			
JM10	1	MMC_DAT3	MMC card DATA3
	2	MMC_DAT0	MMC card DATA0
	3	MMC_CD	MMC card detection
	4	MMC_DAT1	MMC card DATA1
	5	MMC_CLK	MMC card Clock
	6	MMC_DAT2	MMC card DATA2
	7	MMC_CMD	MMC card Command
HSIC			
JU1	1	USB_VBUS	USB power supply
	2	HSIC_USB_DATA	DATA signal of HSIC

Pin header	Pin	Signal	Pin description
VRTC&ADC			
JM3	1	VRTC_1V8	RTC power supply 1.8V
	2	VBACKC	RTC external backup battery capacitor
	3	ADC2	ADC2
	4	ADC1	ADC1
CLOCK & EINT			
	3	HSIC_USB_STRB	STROBE signal of HSIC
	4	GND	Ground
MIPI/UART/Indicator			
JM4	1	1V8	1.8V
	2	NC	Floating
	3	UART2_TX	Serial port UART2_TX
	4	UART2_RX	Serial port UART2_RX
	5	MIPI_RX_RDY	MIPI signal RX_RDY
	6	UART1_DSR	Serial port UART1_DSR
	7	MIPI_TX_DATA	MIPI signal TX_DATA
	8	MIPI_TX_FLG	LPG status indicator
	9	UART1_DTR	Serial port UART1_DTR
	10	UART1_DCD	Serial port UART1_DCD
	11	SMI	SMI status indicator
	12	GND	Ground
Misc			
JM1	1	I2SCLK1	I2S Clock1
	2	USIM_DM	High-speed SIM card D-
	3	USIM_DP	High-speed SIM card D+
	4	DACOUT	DAC output

2.8 Default Jumper

By default, the development board provides 26 jumpers. The functions of the jumper are shown below:

Jumper	Quantity	Purpose
JP4	1	4V to 3.3V connection
JP7 (PIN 2-3)	1	LDO power supply 1.8V
JM5	1	Module 1.8V indicator LED
JP6	1	Power supply for indicator LEDs
JM14	1	RESET enable
JU7	9	UART1 connection
JU6	3	UART2 connection
JM11 (PIN 2-3)	1	Power supply for module internal codec
JA6	8	Analog audio output from internal codec

The default positions of the jumpers are shown in Figure 2-14:

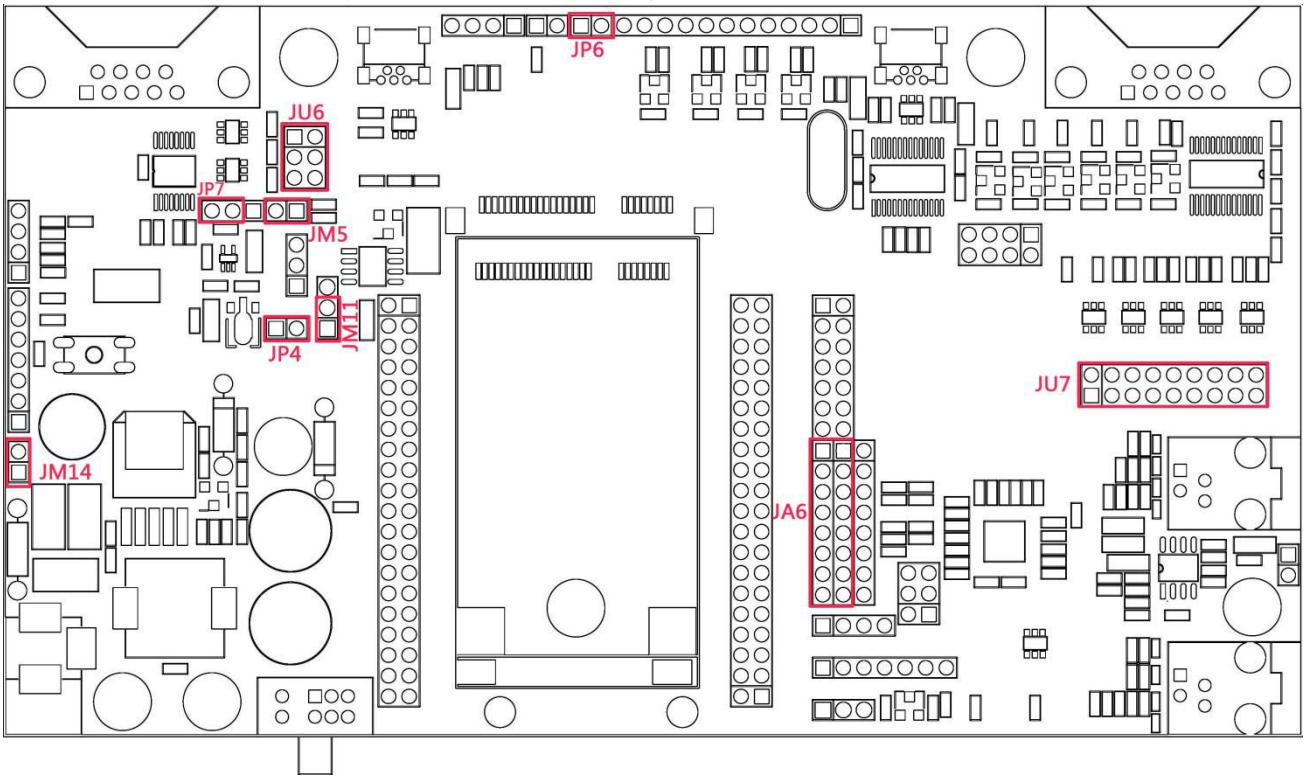

Figure 2-14 Position of Default Jumpers

3 ADP Introduction

3.1 Overview

ADP is an adapter for the connection between the module and the development board.

3.2 Appearance

ADP-H330S board appearance is shown in Figure 3-1:

Figure 3-1 Appearance of ADP-H330S

ADP-L810 board appearance is shown in Figure 3-2:

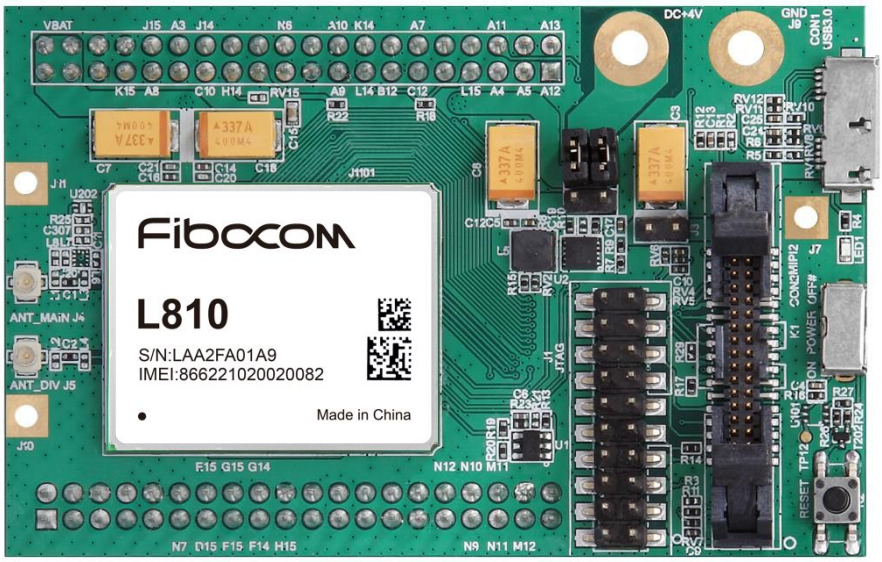

Figure 3-2 Appearance of ADP-L810

3.3 Functions

In this section, the functions of ADP are illustrated with ADP-H330S.

The functions of the ADP-H330S module are shown in Figure 3-3:

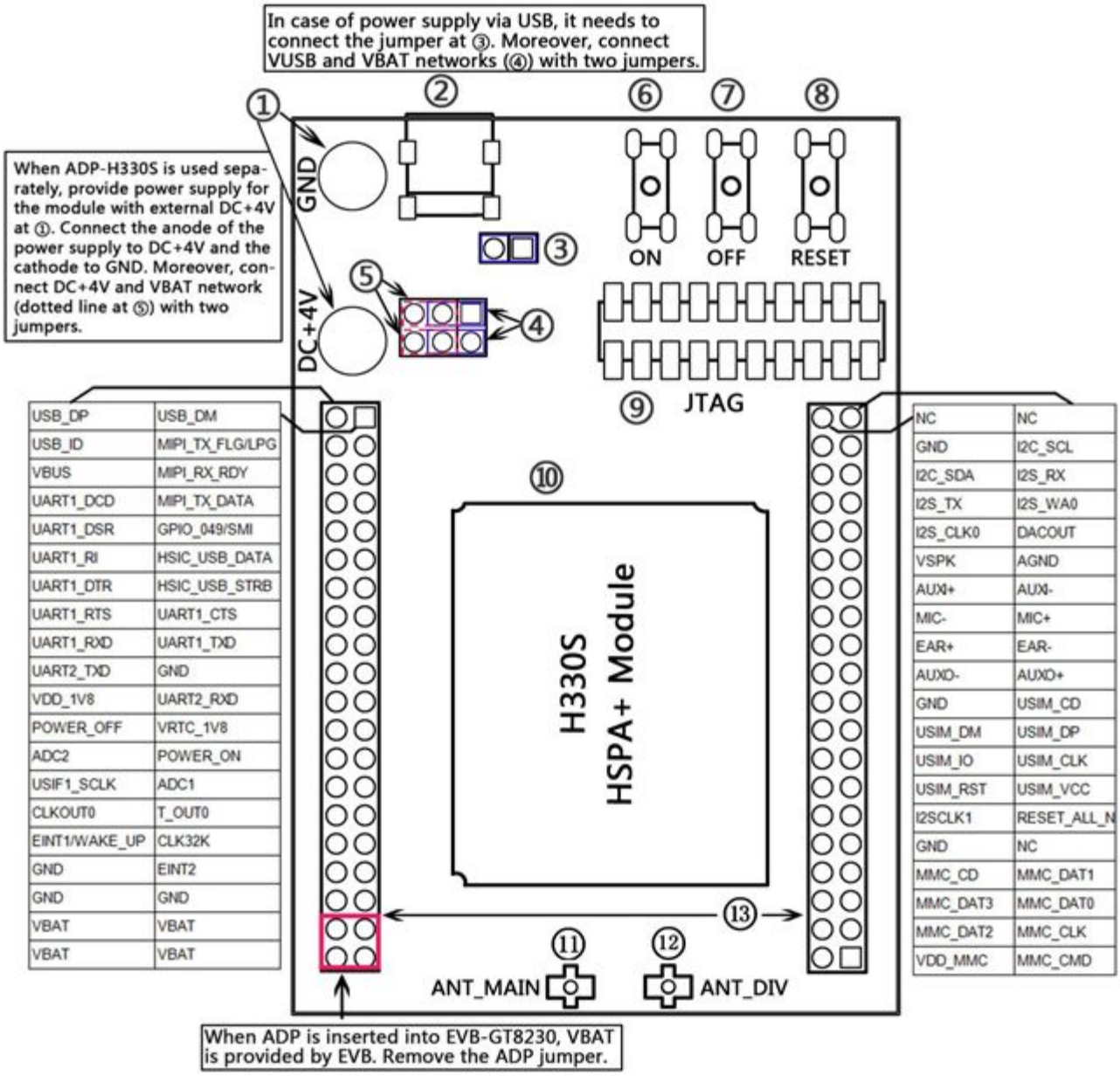

Figure 3-3 Overall Diagram of ADP-H330S

No.	Category	Functional description
①	Test point	DC+4V (DC power supply) interface
②	USB interface	USB communication connection interface
③	Jumper	USB power supply switch control

No.	Category	Functional description
④	Jumper	Power selection: connecting VUSB and VBAT, to achieve VUSB power supply
⑤		Power selection: connecting DC+4V and VBAT, to achieve DC+4V power supply
⑥	Button	ON button, to turn on the module
⑦	Button	OFF button, to turn off the module
⑧	Button	RESET button, to reset the module
⑨	Test point	JTAG test point, used for debugging
⑩	Module	H330S communication module
!	Antenna interface	Main antenna interface (Main), U.FL connector
@	Antenna interface	Diversity antenna interface (Div), U.FL connector
#	Connectors	Row connectors for ADP and EVB-GT8230; 80PIN

Note:

When ADP is connected to the development board, jumpers at ③ and ④ must be removed.

3.4 Installation of ADP and Mini PCIe

ADP installation is shown in Figure 3-4:

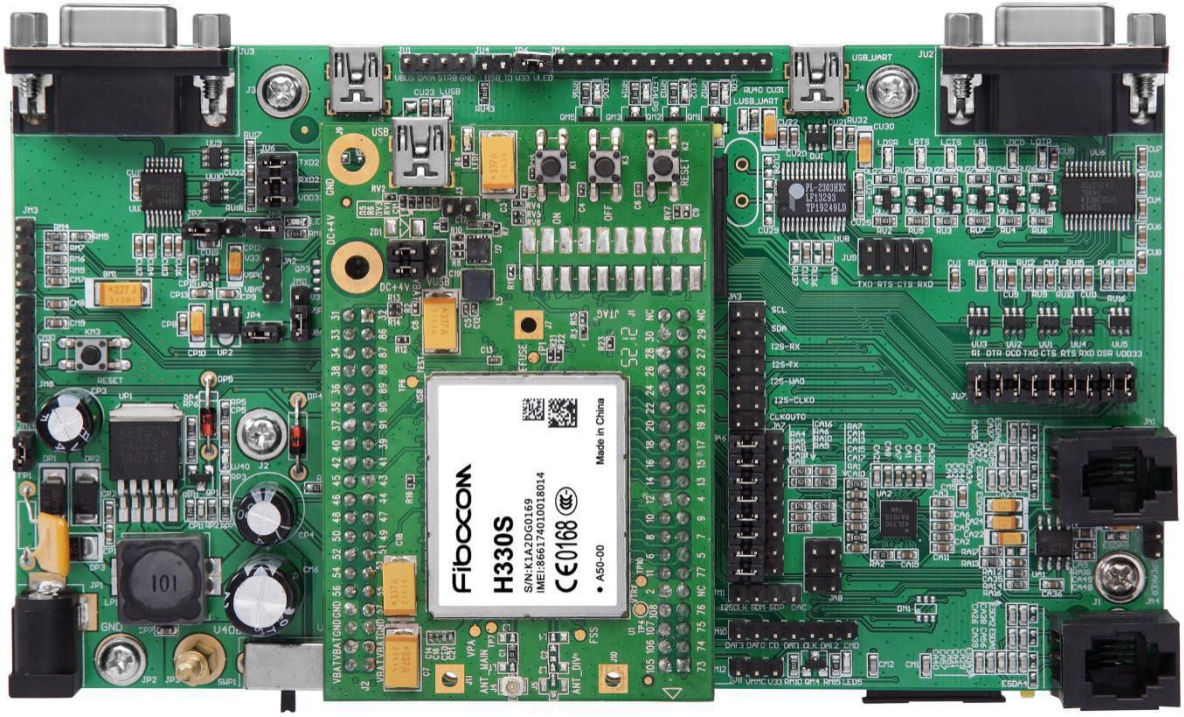

Figure 3-4 Installation of ADP-H330S

Note:

Please note the installation direction of ADP, to avoid damaging the module.

Mini PCIe installation is shown in Figure 3-5:

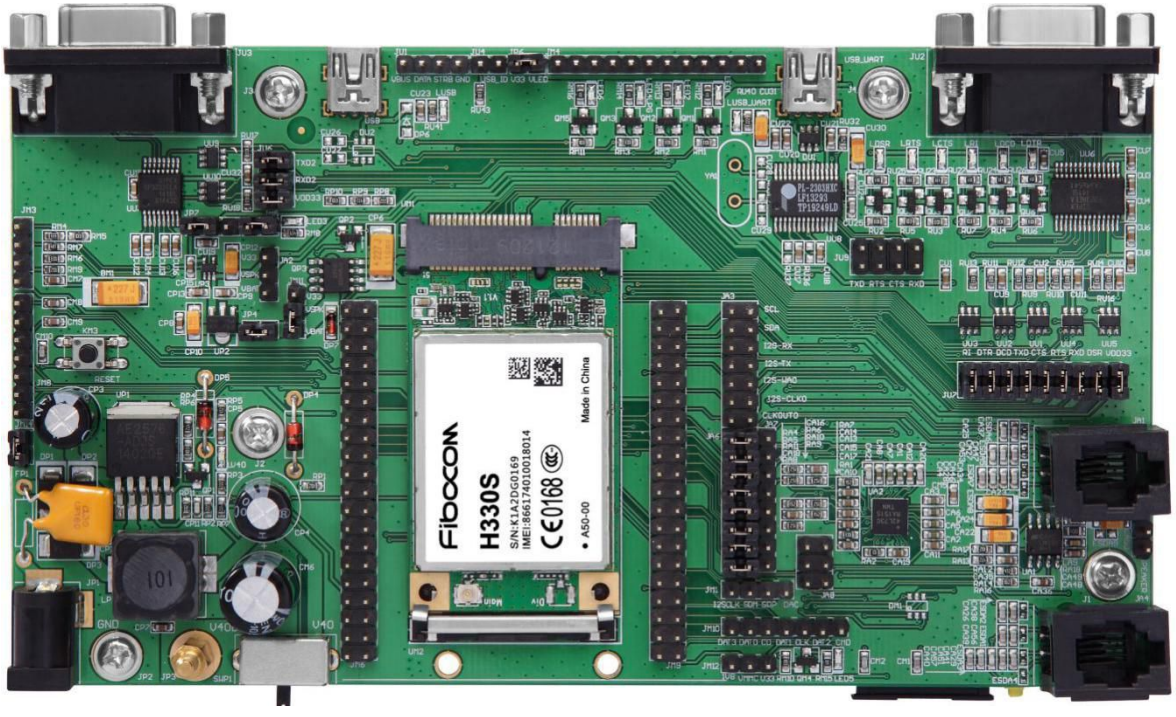

Figure 3-5 Installation of H330S-MiniPCIe

Note:

When installing Mini PCIe, please first remove the screw at the position of the Mini PCIe slot on the development board; otherwise the Mini PCIe module cannot be installed.

3.5 The Use of ADP

3.5.1 Together with EVB-GT8230

- The separate power supply is not required for ADP. All jumpers of ADP plates can be pulled out.
- The position of 80-pin header connector of ADP should be connected to the corresponding 80-pin headers on the development board. It should be noted that the direction should not be reversed, or it will cause damage on modules.
- USIM card can only be installed on ADP board, not on the development board.

3.5.2 Stand-alone

- Please give priority to external DC+4V power supply, and use a jumper to connect the contact pins in position ⑤ shown in the diagram, and press ON to boot the module.
- If USB power is used for power supply, it needs to connect jumpers at ③ and ④ shown in the diagram.

Note:

Make sure the load capacity of USB port is over 5V/700mA in case of using USB power; otherwise, the module may operate abnormally.