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EVK-GT8230-NL

User Guide

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Applicability Type

No.	Product Model	Description
1	NL668-CN	Used together with ADP-NL668-CN/ NL668-CN-MiniPCle
2	NL668-EAU	Used together with ADP-NL668-EAU/ NL668-EAU-MiniPCle
3	NL668-EU	Used together with ADP-NL668-EU/ NL668-EU-MiniPCle
4	NL668-AM	Used together with ADP-NL668-AM/ NL668-AM-MiniPCle
5	NL660	Used together with NL660-752E/753E/754E
6	M910-GL	Used together with ADP-M910-GL
7	NL668-LA	Used together with ADP-NL668-LA/ NL668-LA-MiniPCle
8	NL668-JP	Used together with ADP-NL668-JP/ NL668-JP-MiniPCle
9	MA510-GL	Used together with ADP-MA510-GL
10	FG132 Series	Used together with FG132-XX-MINIPCIE
11	L716 Series	Used together with L716-XX-MINIPCIE
12	MC116	Used together with MC116 -XX-MINIPCIE
13	L610 Series	Used together with L610-XX-MINIPCIE
14	MC660 Series	Used together with MC660-XX-MINIPCIE



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Trademark



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Versions

Version	Author	Assessor	Approver	Update Date	Description
V1.0.0				2018-3-22	Initial version
V1.0.1	Guzhaoqiang	Tumin	Chenguojiang	2019-06-01	Increase the applicable model; schematic and PCB upgrade, update compatible design instructions.
V1.0.2	Wangningning	Liuke	Liuke	2019-08-31	Increase the applicable model MA510-GL
V1.0.3	Wangningning	Liuke	Liuke	2019-10-30	EVK hardware version upgraded to V1.0.3
V1.0.4	Wangningning	Liuke	Liuke	2019-11-14	EVB changed to EVK. Remarks This document applies to EVK-GT8230-MA
V1.0.5	Wangyuanguang	Liuke	Liuke	2019-12-05	Model L610 is added
V1.0.6	Hejiazhao		Wanghailiang	2020-06-16	Normalized format
V1.0.7	Zhishuran	Jinhaibo	Jinhaibo	2024-05-10	Increase the applicable model FG132/L716/MC116/MC660

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1 EVK Introduction

1.1 Product Overview

The GT8230-NL is the development kit for Fibocom 3G/4G/5G modules, consists of a GT8230-NL ("evaluate board" for short), RF cable, an antenna, a Micro USB. This document is the user manual of GT8230-NL, to help users to understand the functions of Fibocom modules.



Note:

This document also applies to EVK-GT8230-MA

1.2 Product appearance

The GT8230-NL evaluate board includes ADP and MiniPCle interface, and its function interface include power input interfaces, power input switch, UART, USB, audio interface, SIM interface and RESET button. The product appearance is shown in Figure 1-1.

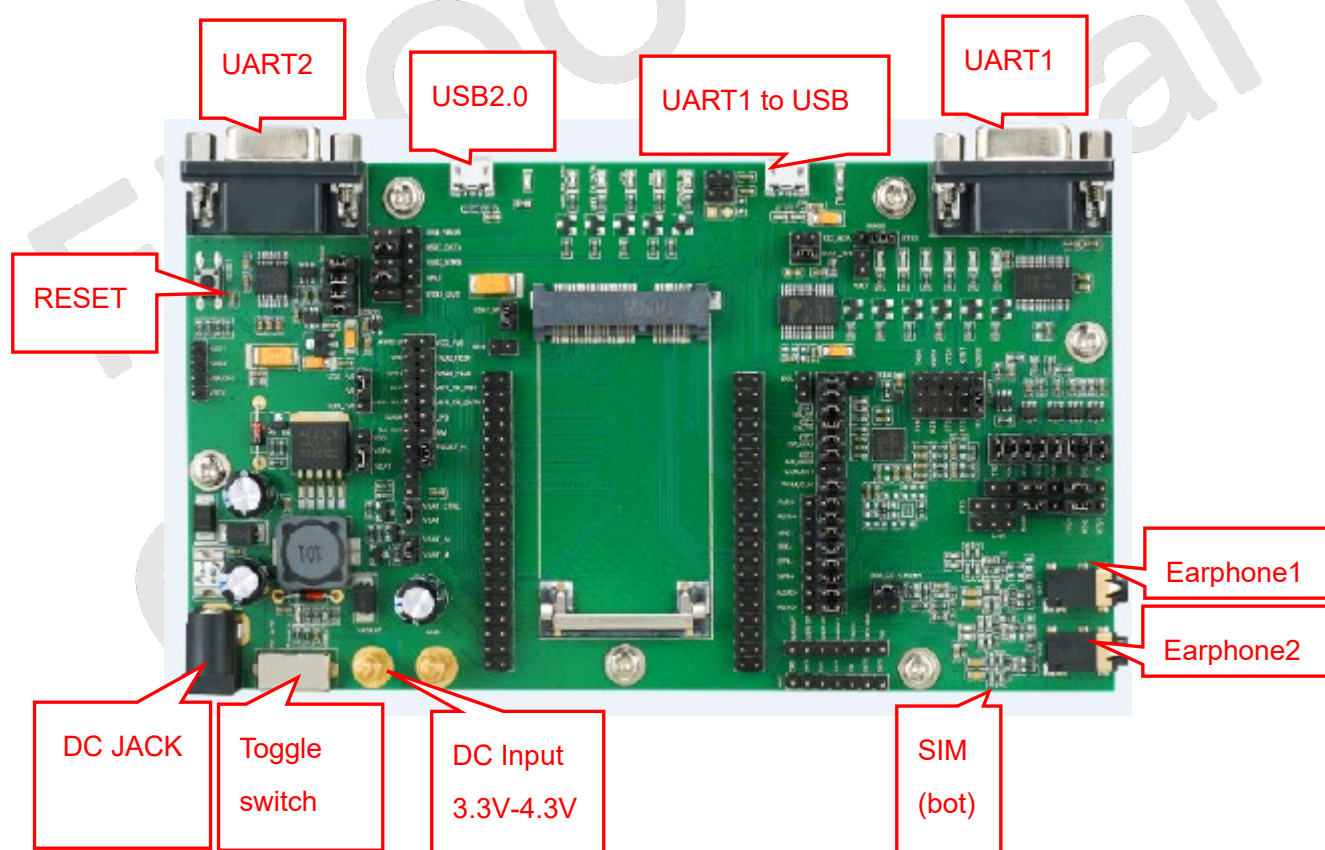


Figure 1-1 GT8230-NL Product appearance

1.3 Application Diagram

The GT8230-NL evaluate board is mainly composed of four parts: power supply, buttons, functional ports, and test points. The function framework is shown in Figure 1-2:

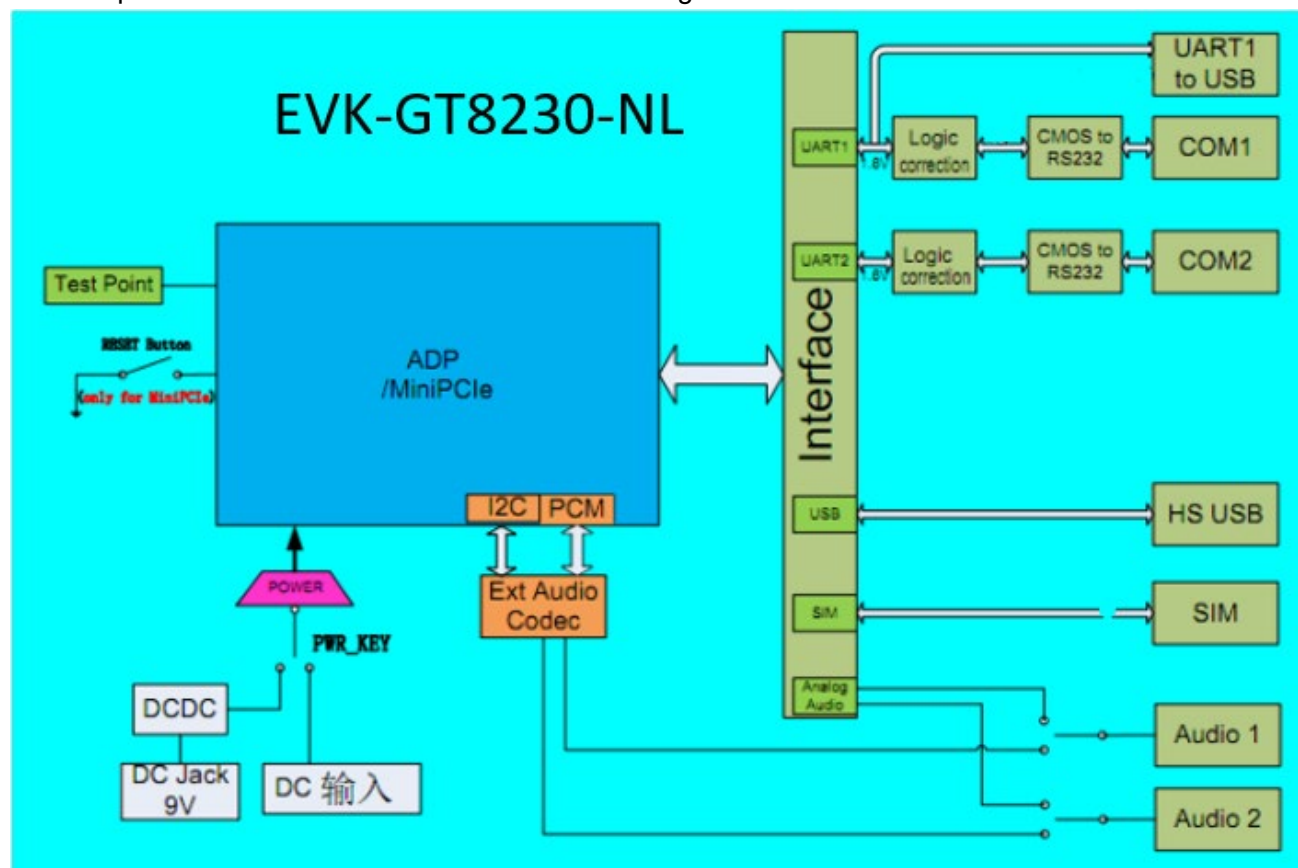


Figure 1-2 GT8230-NL Product Framework

1.4 Components Position Drawing

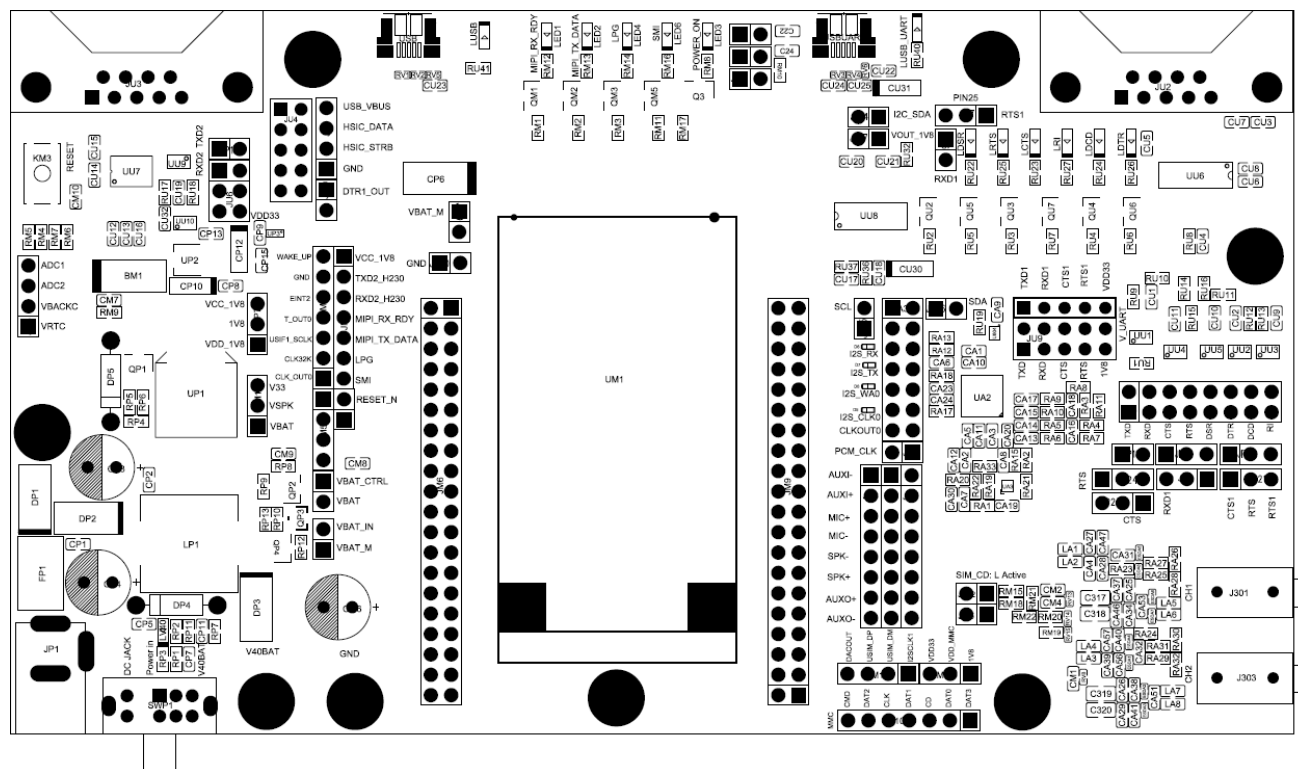


Figure 1-3 GT8230-NL Components Position Drawing

1.5 Default Jumpers

The default positions of the jumpers are shown in Figure 1-4: (Different jumper caps vary slightly)

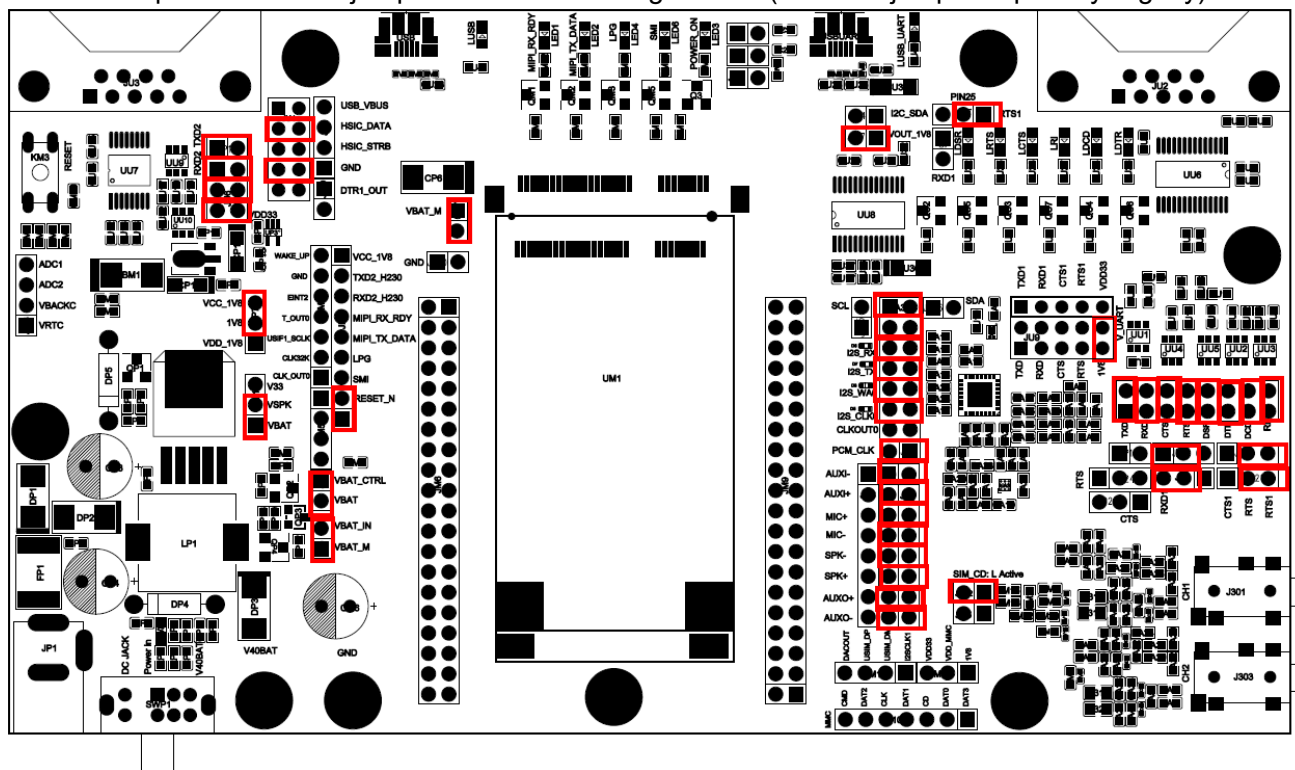


Figure 1-4 Position of Default Jumpers



Note:

FG132-MINIPCIE jumper cap position refer to GT8230-NL_PCB_V1.1_ Description of the default jumper cap.

2 GT8230-NL Functional Description

This chapter provides the detailed description of the functions on the evaluate board by taking ADP-MA510-GL (what follows in the passage called ADP) as example.

2.1 Power Supply

The GT8230-NL evaluate board supports two power supply modes.

The power supply modes choose is shown in Figure 2-1:

- Please slide the power switch (SWP1) to the right when powered by DC power source
- Please slide the power switch (SWP1) to the left when powered by DC adapter.

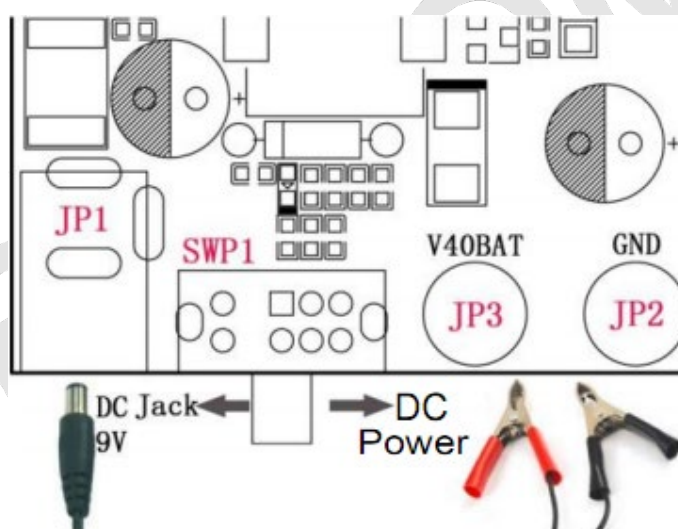


Figure 2-1 Power Supply

2.1.1 DC Power Supply

The output of DC power source directly connected to V40BAT (copper column JP3) and GND (copper column JP2) supply for ADP or MiniPCle module.

DC power input	Description
V40BAT(JP3) GND(JP2)	DC Power Supply Voltage range: 3.3 V ~ 4.3 V Recommended voltage: 3.8V Input current: > 2.0A

Table 2-1 DC Power Supply



Note:

The DC power supply reaches the Goldfinger with 0.2V voltage drop after toggle switch and MOS tube. Power can be supplied according to 2.1.2 without voltage drop. (The internal resistance of the wave switch increases with long-term rust, resulting in a 0.2V pressure drop).

2.1.2 Direct supply of DC power to Goldfinger

As shown in figure 2-2, the power supply has no impact on pressure difference. The positive terminal of the power supply is in the pin position, and GND is in the red box

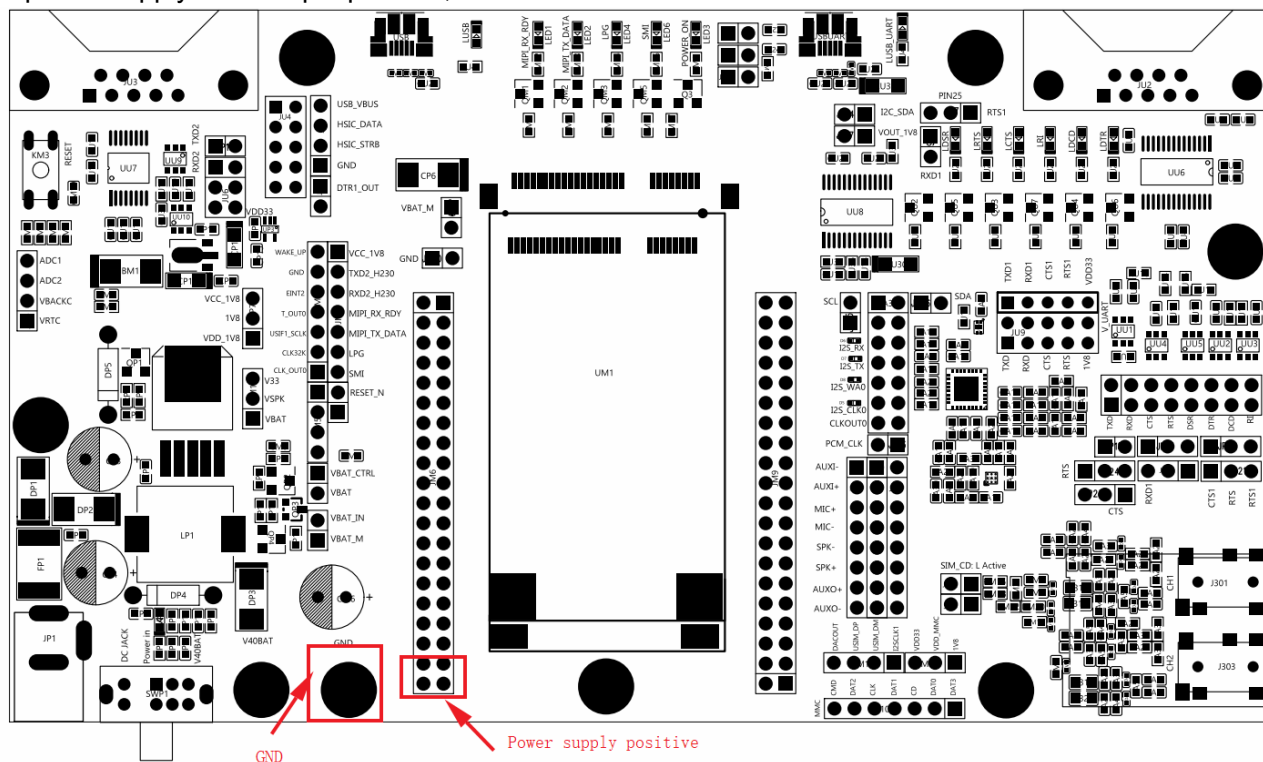


Figure 2-2 GT8230-NL power supply source number diagram



Note:

The MINIPICIE Goldfinger VCC is supplied directly without voltage drop at the shown position.

2.1.3 Power Supply by DC Adapter

After the external power adapter is inserted, it provides DC 3.3V voltage for the module via a DC/DC converter on the evaluate board, then the LV40 indicator LED is lighten.

Adapter Power input	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: $\geq 1A$
--	--

Table 2-2 Power Supply by DC Power Source

2.1.4 Power Supply Jumpers

On the evaluate board there are multiple power supply jumpers, which are used to control supply voltage.

Detailed description of jumpers are as follows:

Jumper	Purpose
JP5(connect by default)	Power supply for ADP/MiniPCle
JP6(connect by default)	Control power supply of ADP/MiniPCle
JP7(connect by default)	Power supply for the UART of GT8230-NL Power supply for ADP:1V8 connect with VDD_1V8 Power supply for GT8230-NL 1V8 connect with VCC_1V8

Table 2-3 Power Supply Jumper

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

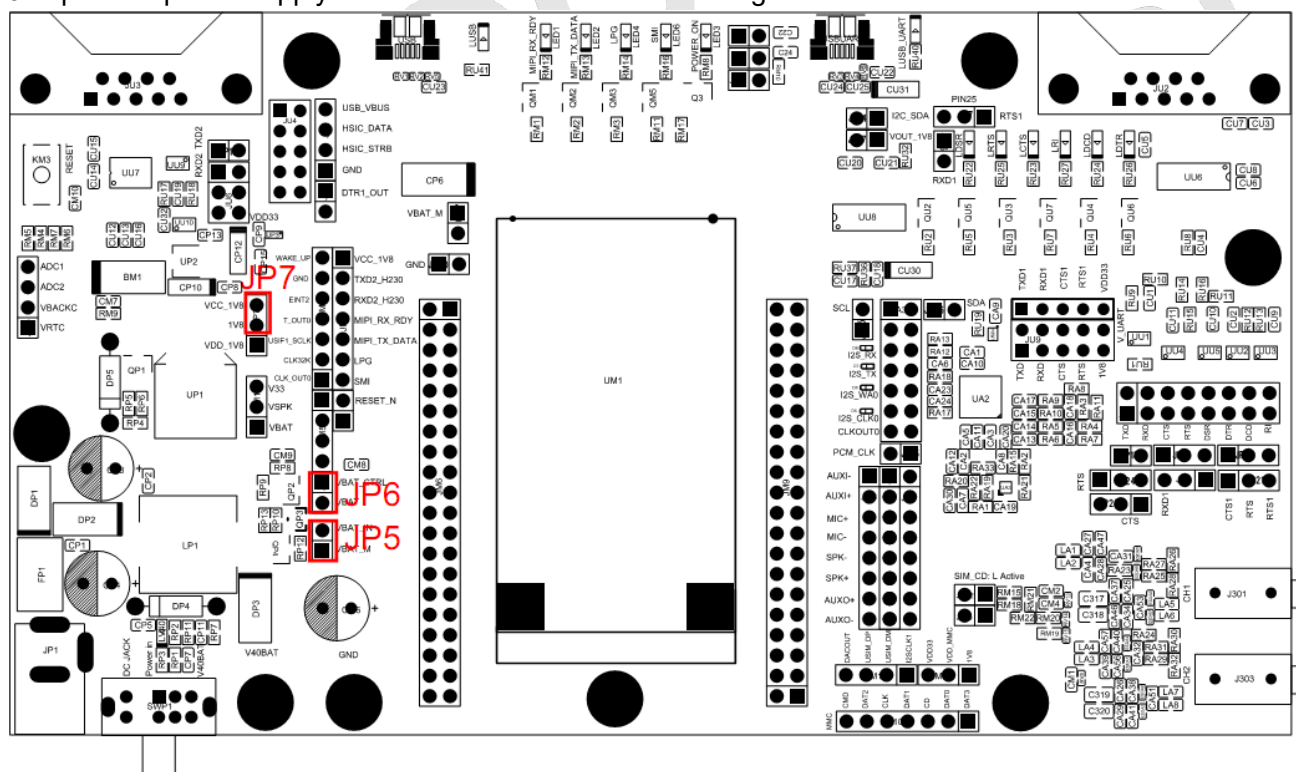


Figure 2-3 Jumpers of Power Supply

2.2 UART

GT8230-NL 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:

Model	UART1	UART2	UART1 to USB
ADP-NL668-XXX	4-line serial port	Support	Support
NL668-XX-MiniPCIe	4-line serial port	Support	Unsupported
ADP-M910-GL	4-line serial port	Support	Support
NL660-XXXE	2-line serial port	Support	Unsupported
MA510-GL	8-line serial port	Support	Support
FG132-XX-MINIPCE	4-line serial port	Support	Support

Table 2-4 UART

2.2.1 UART1

UART1 is an 8-line serial port. The evaluate 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 corresponding pin is low level; when the LED light is off, the corresponding pin is high level).

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



Figure 2-4 Communication of UART1

UART1 signals can be controlled by jumper JU7, JU8, JU9. It supports ADP and MiniPCIe module. The jumper position as Figure 2-4 and function as Table 2-5.

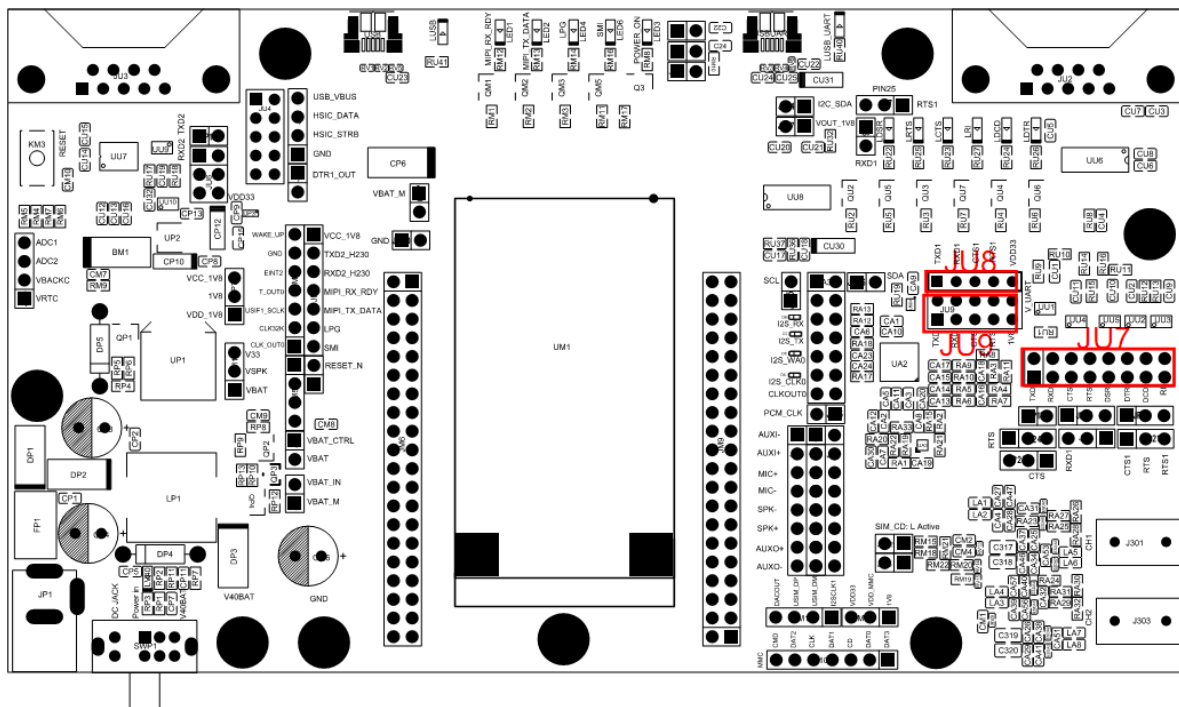


Figure 2-5 Jumper of UART1

Jumper	Purpose
JU7	Turn on/off UART1 signal connection

Table 2-5 UART1 Jumper Function

Figure 2-5 is the jumper connect of JU7 when ADP product use UART1.

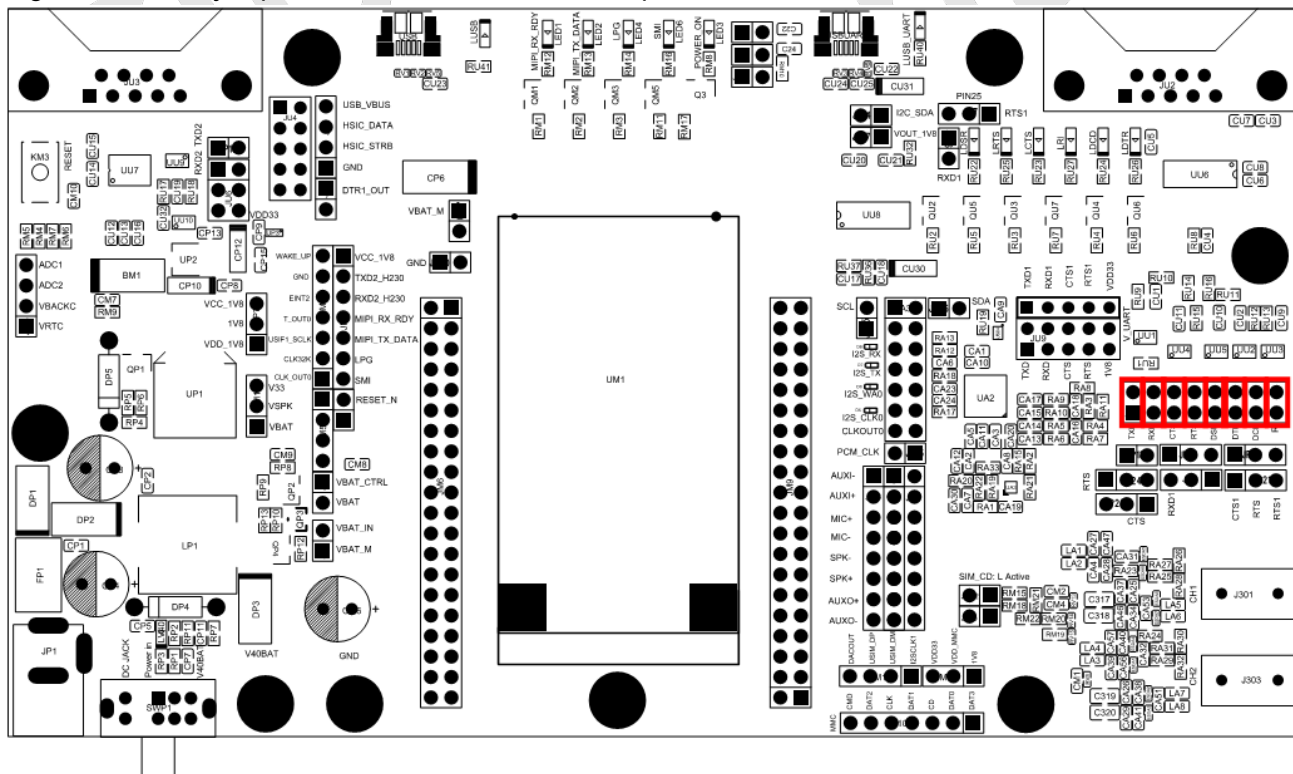


Figure 2-6 Jumper connect when ADP product use UART1

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2.2.2 UART1 Convert to USB

The evaluate board has a built-in 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 Micro 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 follow Figure:

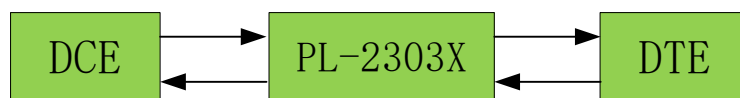


Figure 2-7 UART Communication Diagram

Jumper	Purpose
JU8, JU9	Turn on/off UART1 to USB signal connection

Table 2-6 UART1 to USB Jumper Connect

The jumper connects of evaluate board when ADP product use UART1 to USB show as follow Figure.

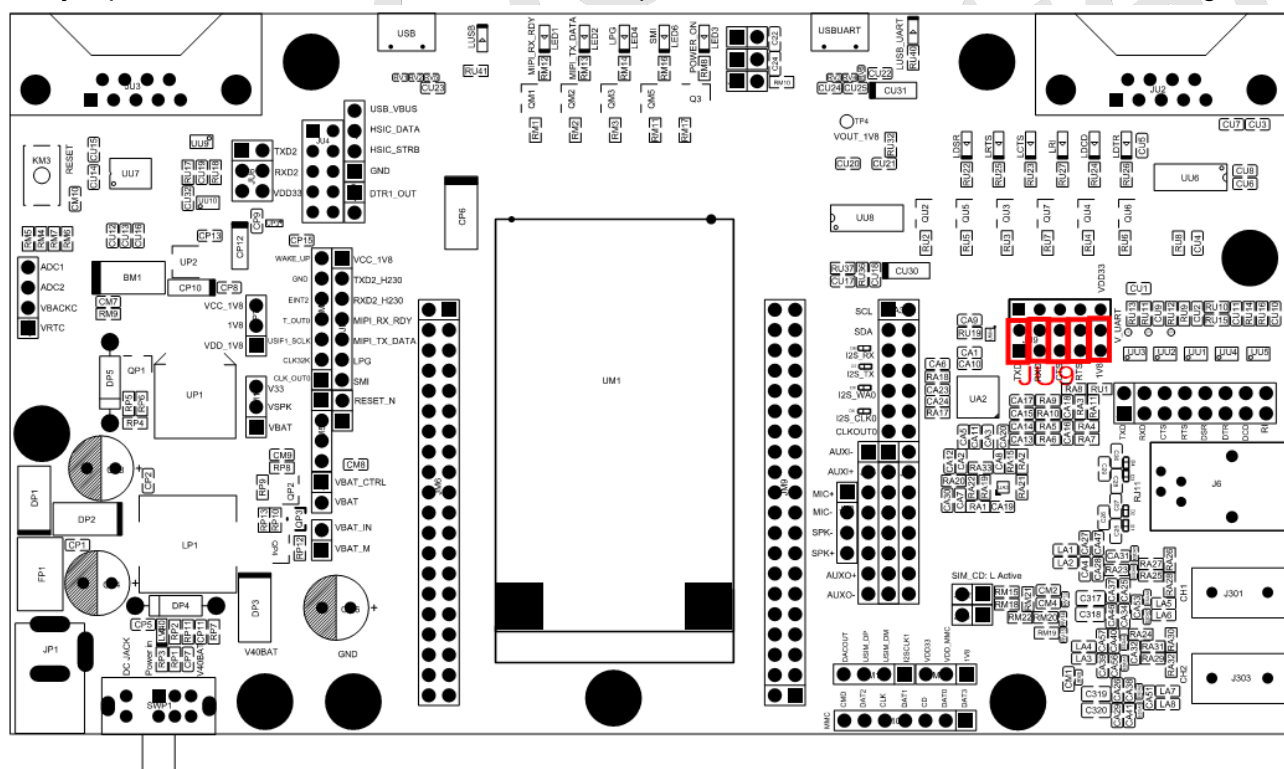


Figure 2-8 Jumper Connect of UART1 to USB of ADP



Note:

- Do not use UART1 and UART1 to USB interface simultaneously.

- The PL2303 driver shall be installed when UART1 to USB interface is used.

The jumper connects of evaluate board when MiniPCle product use UART1 to USB show as follow

2.2.3 UART2

UART2 is a 2-line UART interface (RXD/TXD) and is used to debug by FIBOCOM engineers. The evaluate board can directly connect to the PC or other DTE equipment. The communication process is shown in Figure 2-8:



Figure 2-9 Communication of UART2

Jumper	Purpose
JU6	Turn on/off UART2 signal connection

Table 2-7 UART2 Jumper Connect

The jumper connects of evaluate board when ADP product use UART2 show as follow Figure.

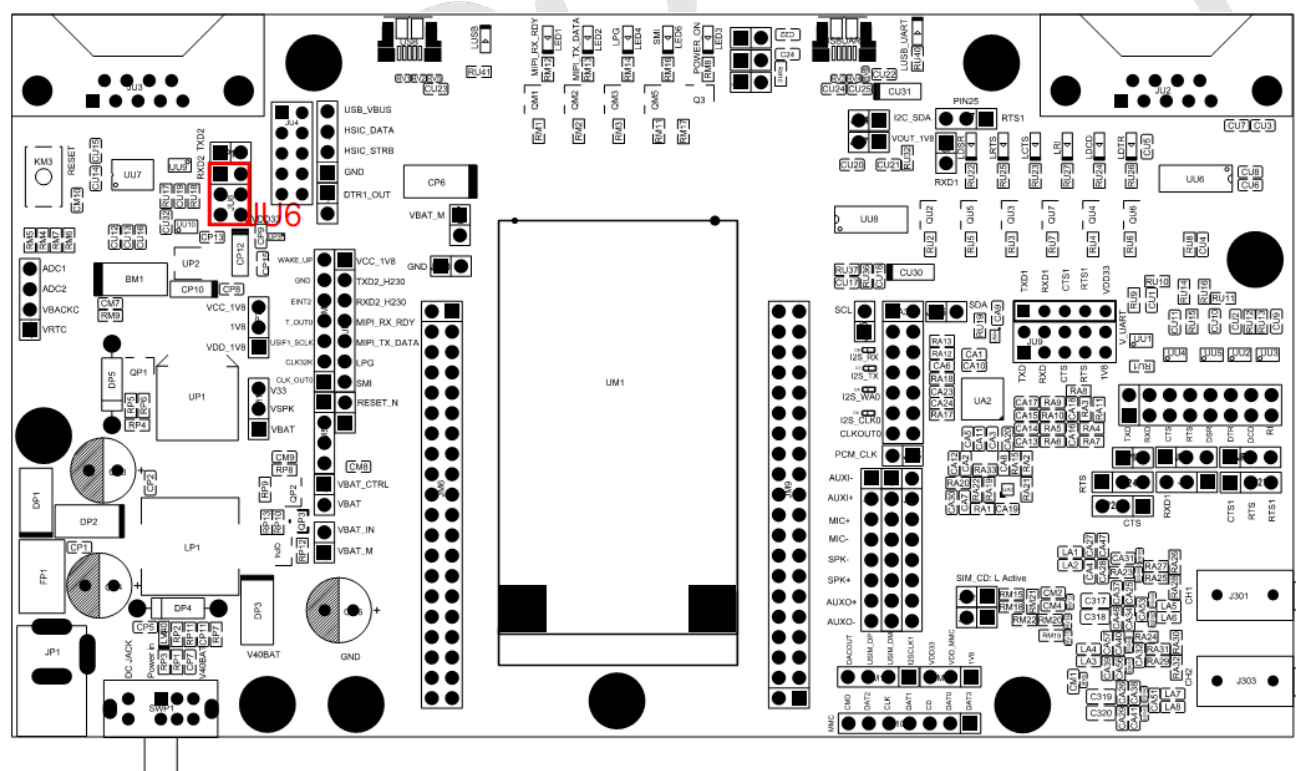


Figure 2-10 Jumper Connect of UART2 of ADP

2.3 USB Interface

The evaluate board provides a micro USB2.0 interface. The USB interface has one indicator LED (LUSB),

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which is used to display the status of connection between the interface and terminals like the PC.



Note:

1. The corresponding driver shall be installed when USB interface is used.
2. The USB interface of NL668 series module and M910-GL-00 and ADP-MA510-GL module just connect to ADP and do not connect to EVK

2.4 SIM Card Interface

On the bottom of evaluate board there is a standard SIM card slot, which supports 1.8V/3V SIM card . Until now, EVK-GT8230-NL does not support the HOT-SWAP SIM function.



Note:

1. SIM card can insert to ADP or EVK, but cannot insert to ADP and EVK at the same time.
2. The SIM interface of NL668 series module and M910-GL-00 and ADP-MA510-GL module just connect to ADP and do not connect to EVK.

2.5 Audio Interface

The evaluate board provides two audio interfaces (Earphone1 and Earphone2), used to connect external earphone.

Earphone1 support analog audio function from both the audio codec on ADP or MiniPCle product and the analog audio by control the audio codec of EVK.

Earphone2 function is in developing.

The evaluate board 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
JA3, JP13, JP25, JP26	I2S/PCM, I2C enable 2S/I2C of MA510 is not connected to EVK

Table 2-8 Analog and Digital Audio Choose Jumper

The jumpers connect when choose ADP or MiniPCle output analog audio are shown in follow Figure:

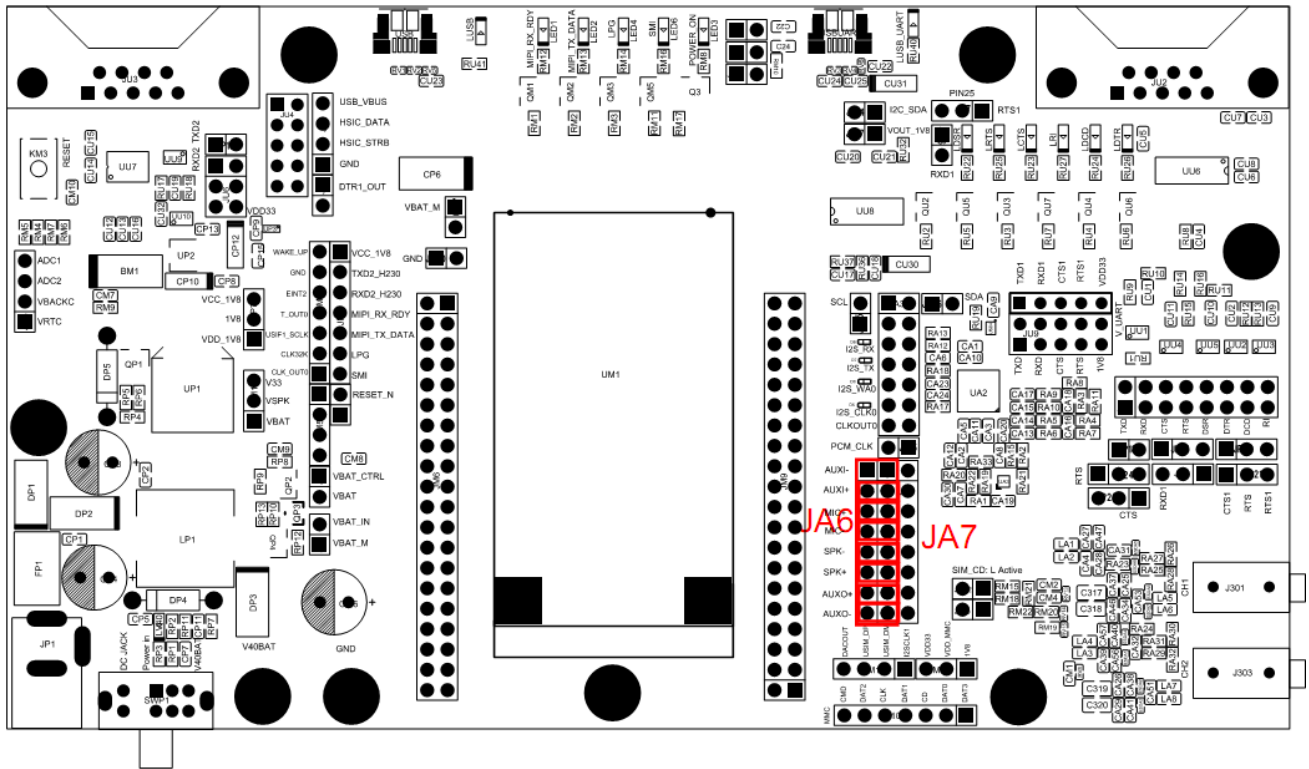


Figure 2-2 ADP/MiniPCle Output Analog Audio Jumper Connect

Two ways earphone on evaluate board support the CTIA standard (3.5mm), 4pin Earphone schematic diagram are shown in follow Figure.

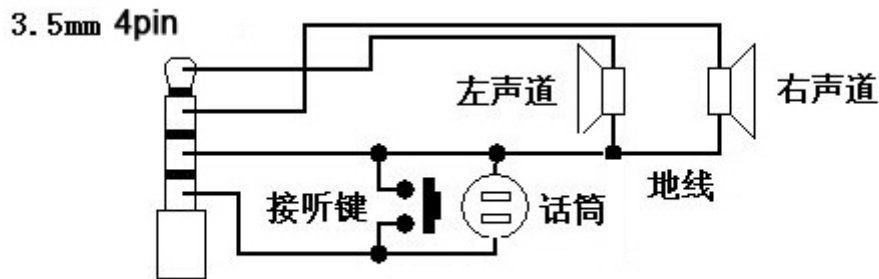


Figure 2-3 3.5mm 4pin earphone

2.6 RESET Button

The evaluate board has a RESET button(KM3), which is used to reset the Mini PCIe and ADP module. Pull down the RESET button (>700ms), then release, MiniPCIe or ADP module are reset. The position of RESET button is shown in Figure 2-12:

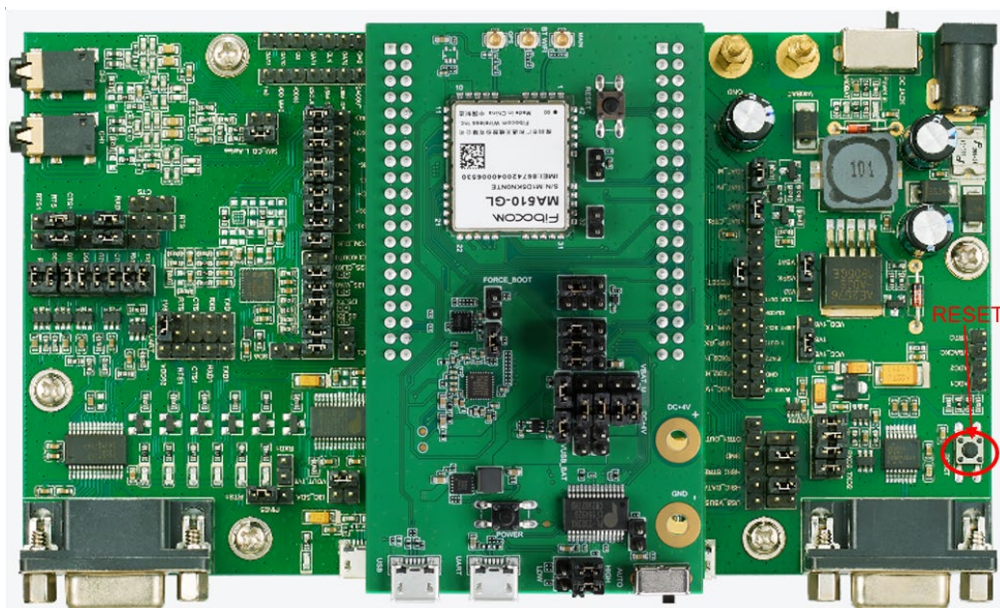


Figure 2-4 Position of Reset Button



Note:

The RESET function of M910-GL-00 and MA510-GL only achieve on ADP, not connect to EVK.

3 Installation of ADP

3.1 ADP Appearance

ADP-MA510-GL board appearance is shown in Figure 3-1:

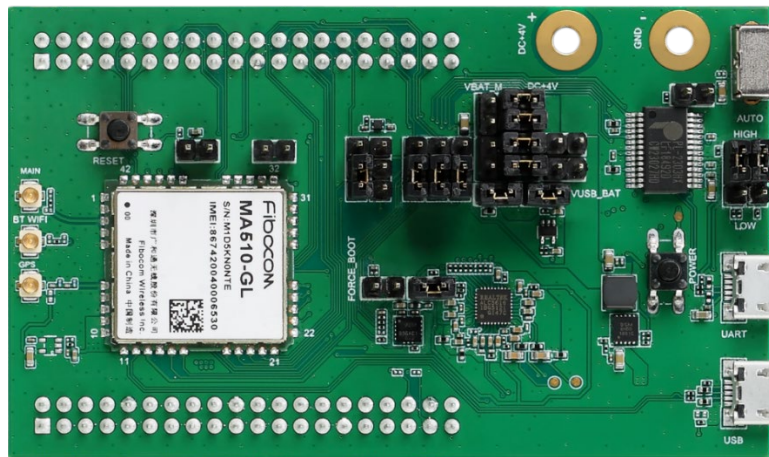


Figure 3-1 Appearance of ADP-MA510-GL

3.2 Installation of ADP

Installation of ADP shown in Figure 3-2:

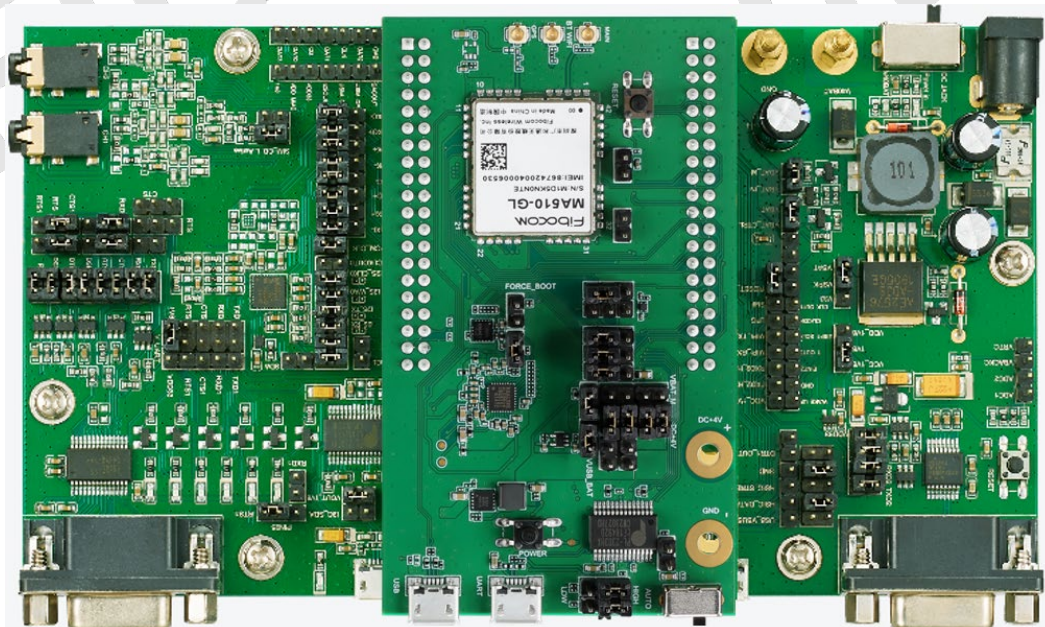


Figure 3-2 Installation of ADP



Note:

Please pay attention to the installation direction of module to avoid damaging the module.