Tektronix AH Module Development Board User's Manual

Zhuhai TaiXin Semiconductor Co.

TaiXin Semiconductor Co., Limited

3/F, Building 11, Port No. 1, Hi-Tech Zone, Zhuhai, China

Revision Record

Date	Version	Description Description	Revised by
2023-6-21	V1.4	Add a description of the V1.6 version of the development board;	WY
2023-2-7	V1.3	Add the description of firmware and print port;	WY
2022-2-18	V1.2.1	Modify the logo;	XYJ
2021-10-20	V1.2	Modify the description of sdio/usb interface switching;	WY
2021-6-7	V1.1	Add description of SVCC;	WY
2021-5-24	V1.0	Initial version;	WY

Catalog

1. OVERVIEW

     As an optimized Wi-Fi solution for IoT devices, the TX-AH-R900Pxx series modules designed by TaiXin Semiconductor are the industry's leading IEEE 802.11ah compliant Wi-Fi modules.

     The TX-AH-R900Pxx series modules integrate the 802.11ah SOC TXW83xx, which operates in the 730M~950M frequency band, providing a longer transmission range than 2.4GHz and 5GHz Wi-Fi with the same transmit power. The module can operate in channel widths of 1/2/4/8MHz and can provide physical throughput from 150 Kbps to 32.5Mbps, thus supporting applications ranging from low rate sensors to multiple high rate surveillance cameras.

     The TX-AH-R900P series modules can be interfaced with application processors via USB, SDIO, SPI, UART and other interfaces, and can be used in a variety of applications such as wireless security, drone mapping, smart home and smart grid. In addition, TX-AH-R900P series modules also provide RMII interface to realize the low-cost solution of single-module wireless bridge. The modules can work in AP/STA mode and support 1-to-many networking.

     The internal architecture and external connection diagram of the chip/module are shown in Figure 1-1.
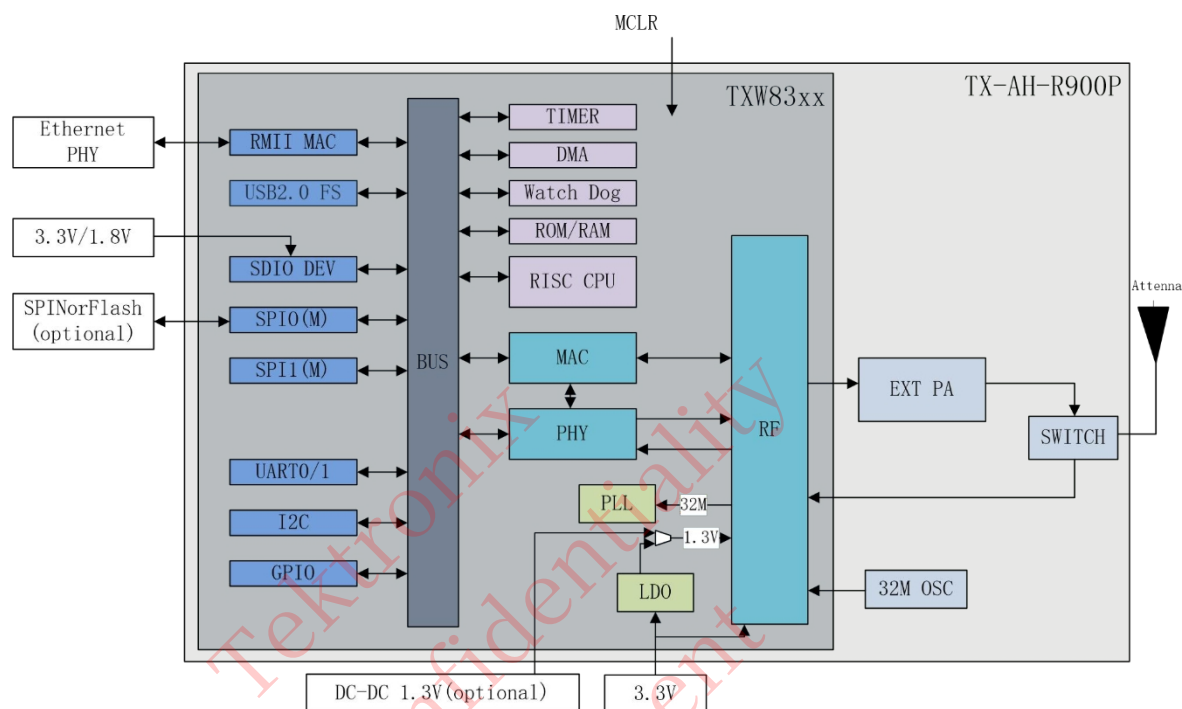

Figure 1-1. Chip/Module Internal Architecture and External Connection Diagrams

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2. Development Board Introduction

TX-AH-MODULE development board, the board supports SDIO interface development by default, the main control side of the TF card interface can be d i r e c t l y   using the on-board PCB-TF-CARD directly into the main control side of the card holder, through the development of the board through the MICRO-USB (5V@500ma) power supply, you can easily complete the construction of the development environment.

If you need to develop other interfaces, you can solder different jumper resistors to switch to the hardware development interfaces that customers need, such as USB/UART/SPI.
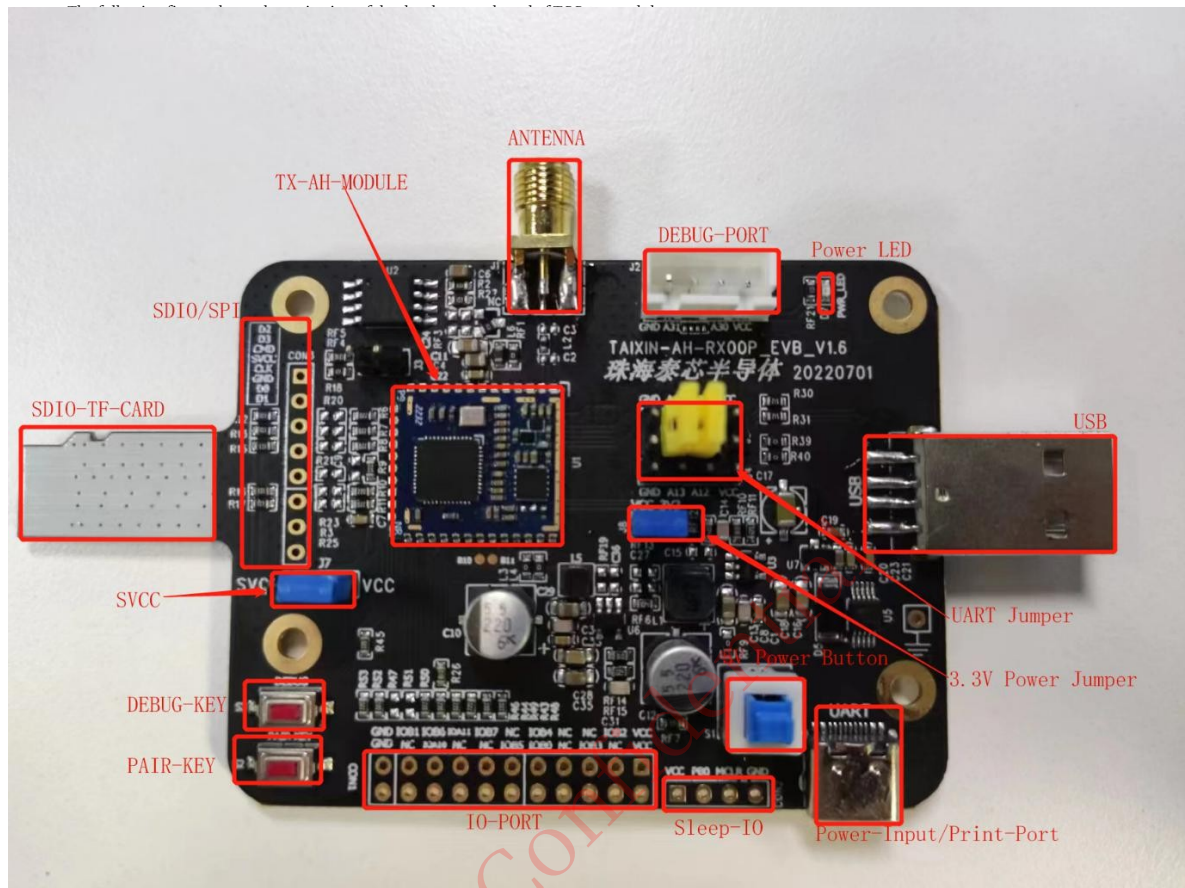
The following figure shows the main view of the development board of TX module.

Figure 2-1 Main view of TX-AH module development board (V1.6 version)

➢ **TX-AH-MODULE:** TX-AH module;

➢ **ANTENNA:** SMA antenna interface of AH module;

➢ **DEBUG-PORT:** CDK debug port of AH module, please refer to the "TXW830x AH-SDK Development Guide";

➢ **Power-Input/Print-Port:** the power supply port and print port of USB Micro; make sure the USB port has 500ma power supply capacity; the board contains USB-UART chip, connect the USB port with PC and set proper UART jumper, then the debugging information of AH module can be output (baud rate 115200);

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➤ 5V Power Button: 5V power switch for the board;

➤ Power LED: 3.3V power indicator;

➤ 3.3V Power Jumper: used to evaluate the power consumption of the AH system, generally shorted with a jumper cap, remove the jumper cap when testing the power consumption, string into the ammeter;

➤ UART Jumper：在用不同的接口通讯方式时，选择不同的跳线方式，将 USB Micro 打印口切换到不同的 UART 端口；选择 USB 口时，将 A10/A11 与中间一排短接；选择 SDIO/SPI 等接口时，将A12/A13 与中间一排短接；如果是用UART 口 与 MCU 进行 If you want to use UART port to communicate with MCU and also have one more UART for printing and debugging, the default is A11/A10 for communication and A13/A12 for printing, at this time, the USB Micro can only select one serial port, and the other serial port is directly connected from the jumper;

➤ USB: Communicate with the master control through USB interface, pay attention to the instructions of UART Jumper to lead to printing;

➤ AH-TF_CARD: onboard TF-CARD interface, used to communicate with the master control through the SDIO interface, see the description of the UART Jumper to lead to print;

➤ SDIO: Mainly used for the SDIO flywire of the master control without TF card holder or for connecting to the logic analyzer DEBUG (R3, R18, R21, R23, R20, R21, R23, R21, R21, R23),

  SDIO: Mainly used for the SDIO flywire of the master without TF card holder or for connecting to the DEBUG of logic analyzer (R3, R18, R20, R21, R23, R25 need to be soldered with 22R resistor);

➤ SVCC (V1.6): Select SVCC power supply when there is main control power supply (jump cap flies to SVCC), select VCC power supply when there is no main control power supply (jump cap flies to VCC);

➤ SPI: multiplex w i t h SDIO pin, the corresponding relations are: SD_CLK/SPI_CLK1, SD_CMD/SPI_MOSI1, SD_D0/SPI_MISO1, SD_D1/SPI_INTIO1, SD_D2/NC, SD_D3/CS1; if you need to use the COM3 flywire, you need to set R18/R20/R21/R23/R3/R25 to R21/R23/R3/R25. R21/R23/R3/R25 to 0R resistor; see the description of UART Jumper to lead the printing;

➤ PAIR KEY: Support hardware pairing function by default, connect to IOB1 through resistor R45;

➤ DEBUG KEY: AH module will get the firmware from flash by default, press and hold this key to power on the module before powering on, it can let the module enter into debugging mode without reading the firmware from flash, you can use DEBUG PORT to debug it, or you can debug it to download the firmware through the master control;

➤ IO PORT: some IO pins of AH module lead to 2.54MM double rows of pins;

➤ Sleep-IO: IO of AH waking up MCU (IOB0), or IO of MCU waking up AH module (MCLR), which is needed for low-power program; IO PORT: some IO pins of AH module lead to 2.54MM double row pins.

  Sleep-IO: IO of AH waking up MCU (IOB0) or IO of AH module waking up MCU (MCLR);

The following figure is the main view of the 1.5 version development board:

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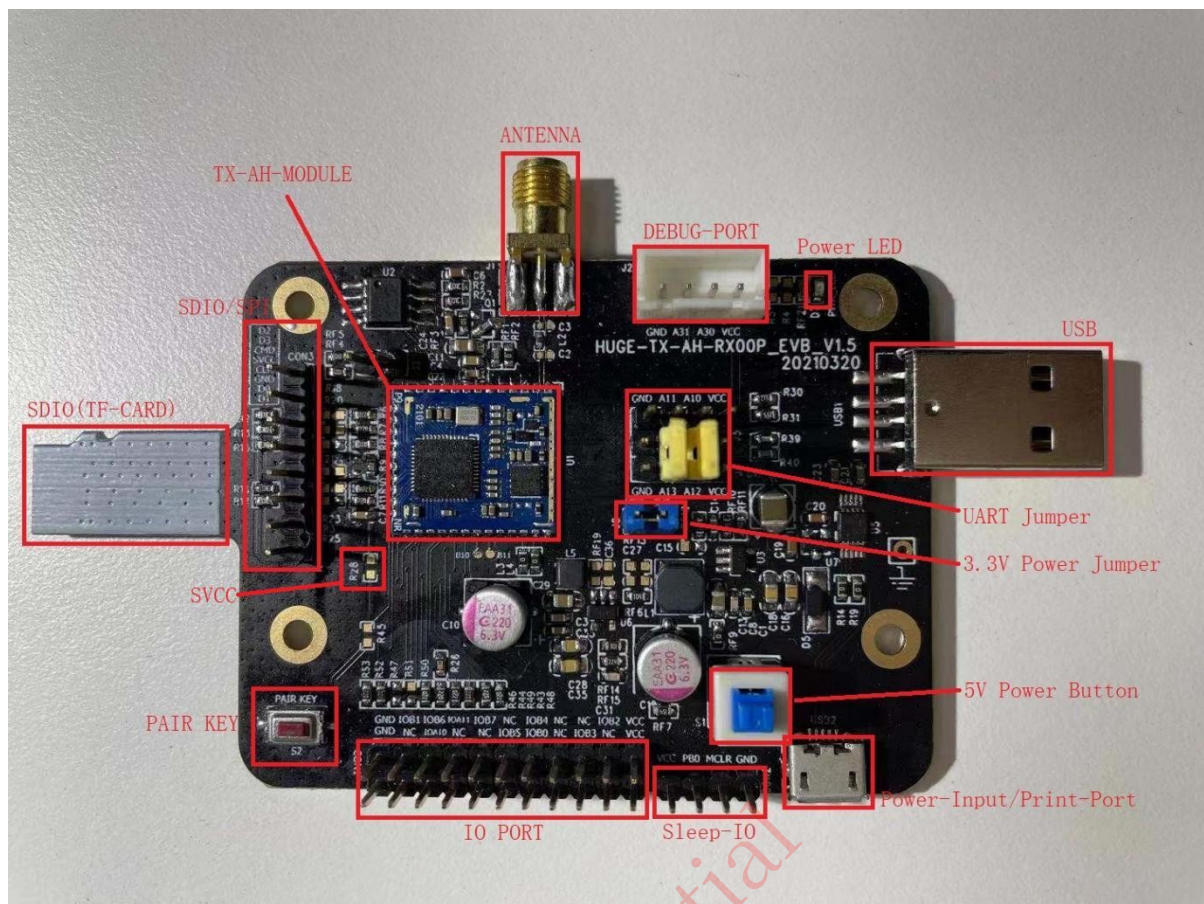
Figure 2-2 Main View of Taixin AH Module Development Board (V 1 .5)

Compared with the new version V1.6, there are three differences (TypeC port, DEBUG KEY, SVCC).

➢ SVCC: R28 is the power supply selection resistor of SVCC, when selecting USB/UART/SPI interface, short R28 with 0R, otherwise IOA6~11 will have no power supply.
When selecting USB/UART/SPI interface, R28 should be shorted with 0R, otherwise there is no power for IOA6~11; when selecting SDIO interface, R28 NC, SVCC is powered by SDIO host (power is given by AH-TF CARD);

➢ DEBUG KEY: There is no DEBUG KEY in V1.5 version of the module.

Note, SDIO interface and SPI interface are one firmware, SDIO interface/USB interface/serial port do communication port, development board need to use different firmware; USB firmware corresponding to the print serial port is A10/A11, other interface print serial port is A12/A13, the jumper cap is connected differently, please refer to the description of the UART Jumper.

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