CH572 Evaluation Board Reference

Version: 1B

https://wch-ic.com

1. Overview

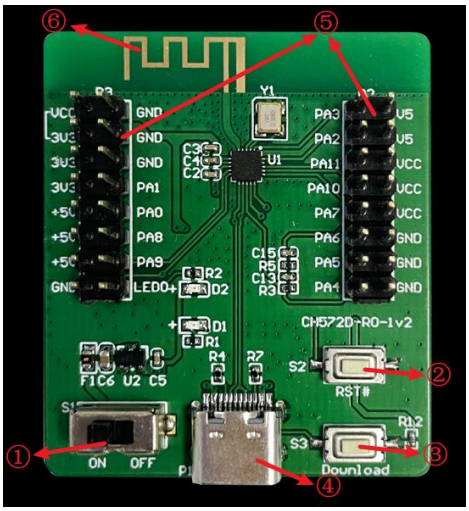
This evaluation board is applied to the test and development of CH572 chip, supporting MounRiver compiler and host computer ISP tools, and provides application reference examples and demonstrations related to chip resources.

2. Evaluation Board Hardware

Please refer to the CH3572SCH.pdf document for the schematic of the evaluation board.

CH572D evaluation board, with Bluetooth antenna, indicator light, USB interface socket and chip universal interface pins, is suitable for testing and verifying customers' basic functions.

Figure 2-1 CH572D-R0-1v2 evaluation board



2.1 Functional description of Each Part

CH572 is a RISC-V MCU with integrated 2.4G wireless communication. On-chip integration of 2Mbps BLE communication module, USB full-speed controller and transceiver, CMP, key detection module, SPI, UART, I2C and other rich peripheral resources.

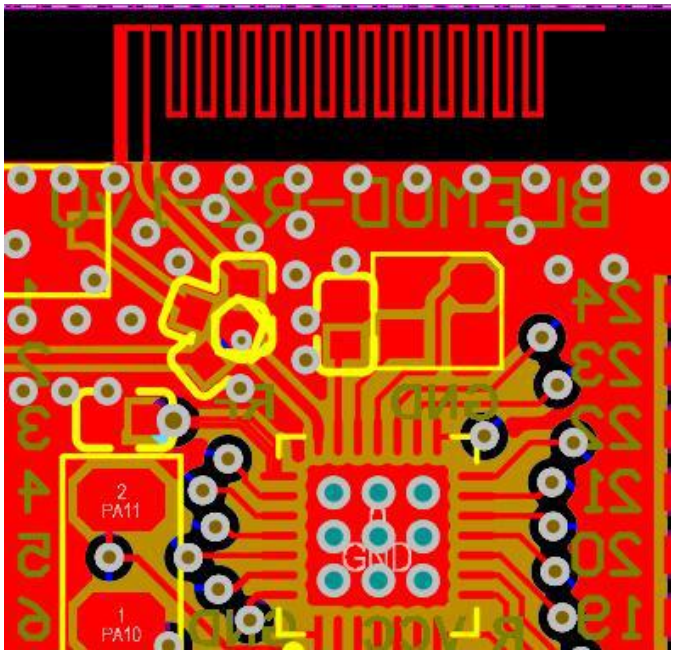
CH572 evaluation board is equipped with the following resources:

1. Switch S1: Power switch, used to disconnect or connect external 5V power supply or USB power supply
2. Button RESET: Used for external manual reset (Note that the chip manual reset function needs to be enabled).
3. Button DOWNLOAD: Used in ISP download.
4. A USB interface: The chip's USB communication interface, with Host and Device functions.
5. Plug P2/P3: Including chip function, power supply, LED load operation pins.
6. BLE antenna: Responsible for wireless signal transmission.

2.2 CH572 Antenna Description

The following provides a design example of a 2.4GHz small PCB antenna matched with CH572 chip. The specific parameters of antenna drawing can refer to the PCB drawing design given by our company.

Figure 2-2 Antenna drawing



1. 50Ω impedance matching is required for the alignment from the chip pins to the antenna feed point (A area in the above figure). The counting factor will involve the width of the alignment in the A area, the spacing between A and B, the thickness of the board, the dielectric constant of the board, the thickness of the copper, the thickness of the green oil and other parameters.
2. The area at B in the above figure is a coplanar reference ground, this area should try to ensure sufficient area and the number of ground holes.
3. The bottom of the chip ground pad (C area), in the manufacturing process allows to ensure good grounding and heat dissipation (more ground holes).
4. RF part needs to be far away from interference sources, such as crystals, power devices, switching power supply.

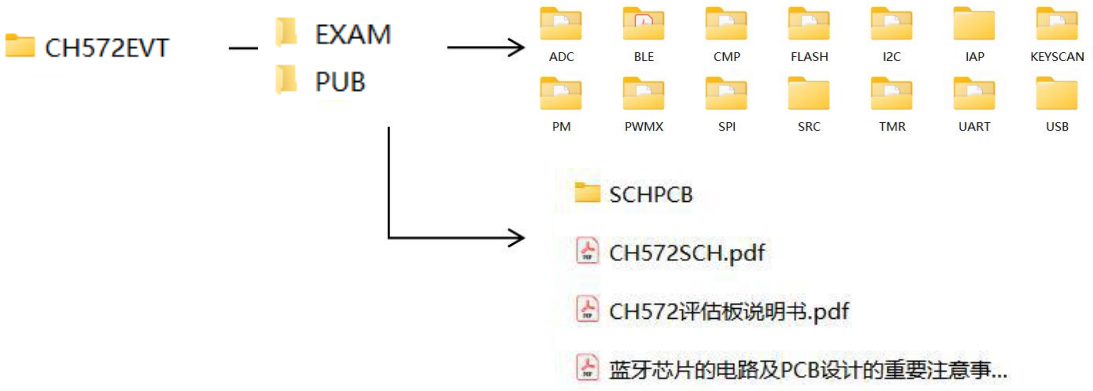
Figure 2-1 for our evaluation board antenna style, PCB board thickness 0.8mm, antenna size details, please contact our technology to provide.

3. Software Development

Please search and download the CH572EVT.ZIP development kit on the company homepage.

3.1 EVT Package Directory Structure

Figure 3-1 EVT package directory structure



Description:

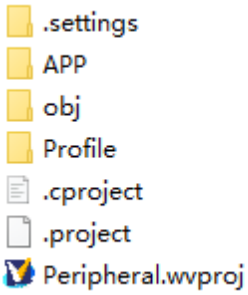
PUB folder: Provides evaluation board manuals, evaluation board schematics.

EXAM folder: Provides software development drivers and corresponding examples for the CH572 controller, grouped by peripheral. Each type of peripheral folder contains one or more functional application routines folders.

3.2 Open Project

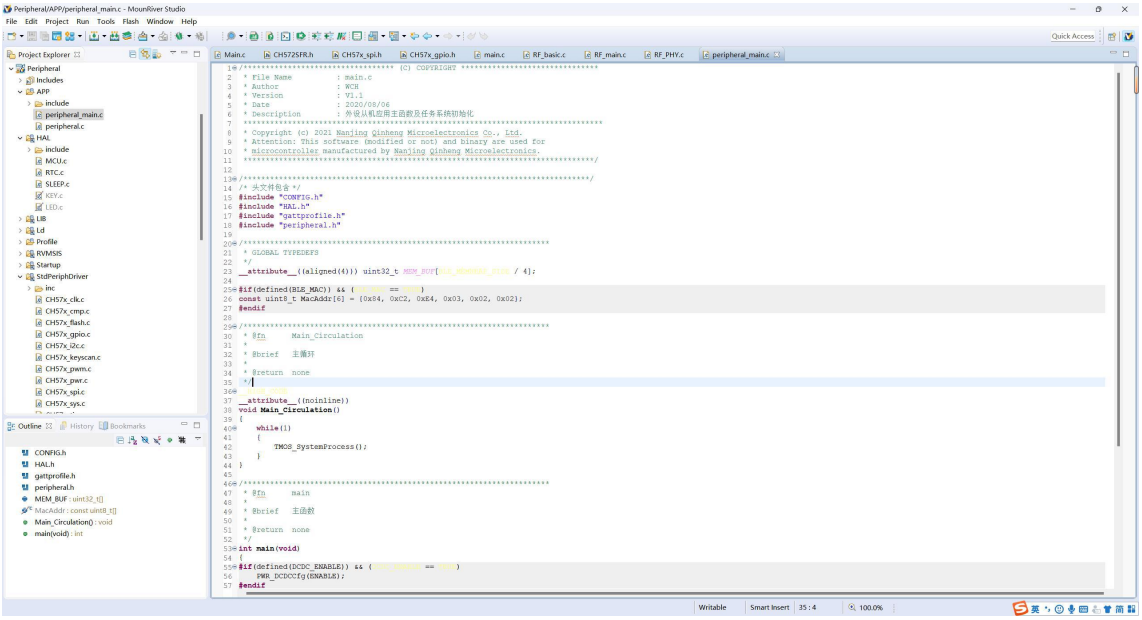
The project that the user switches on any Peripheral, such as switching on the Bluetooth slave routine 'peripheral'.

Figure 3-2 File layout under peripheral folder



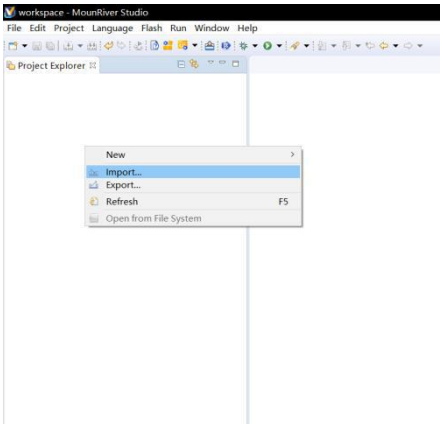
Click the Peripheral.wvproj file to arouse MounRiver Studio to open the corresponding project.

Figure 3-3 mounriver interface aroused after opening Peripheral.wvproj



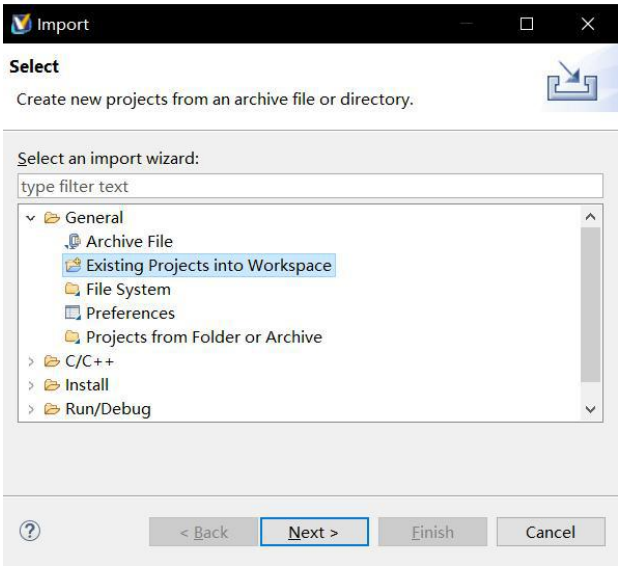
In addition, you can open existing projects by importing. Open the mounriver, right-click in the blank space of the projectexplorer interface on the left, and select import from the pop-up menu, as shown in Figure 3-4.

Figure 3-4 Open the import menu



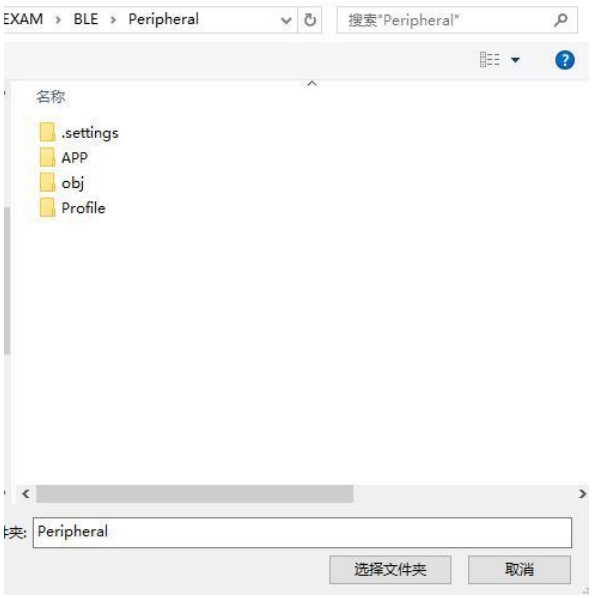
Select an existing project in the pop-up menu.

Figure 3-5 Choose to open an existing project



Select the directory containing the project files.

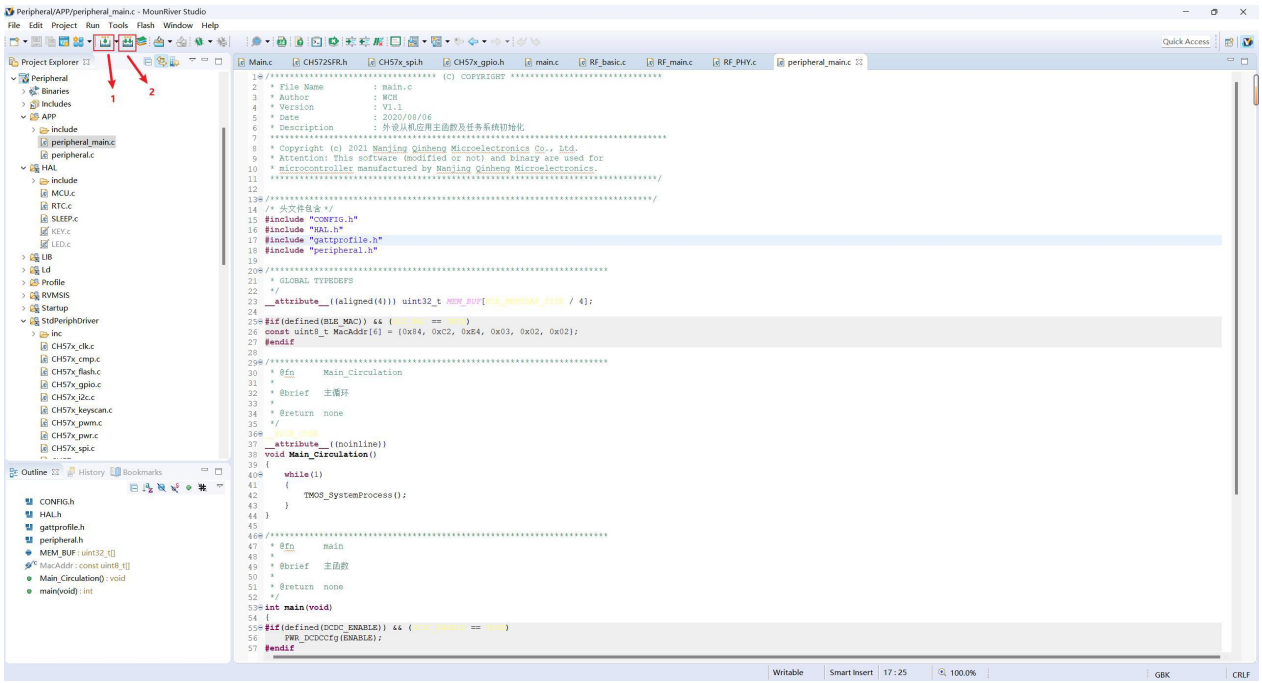
Figure 3-6 Select project directory



This operation can also open the project.

3.3 Compilation

Figure 3-7 Engineering display



In the figure, 1 is incremental compilation, which only compiles the modified part, which is fast, and 2 is rebuild, which compiles the selected project globally, which is slow. Select rebuild here, and the compilation result is shown in the figure.

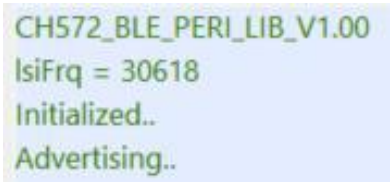
The default compilation will generate an executable. hex file, and we need to download the hex file to the evaluation version to run. Note that the compilation settings of mounriver, such as project file directory, linker and optimization level, are described in the *MounRiverStudio Help Manual*.

3.4 Sample Program Demonstration

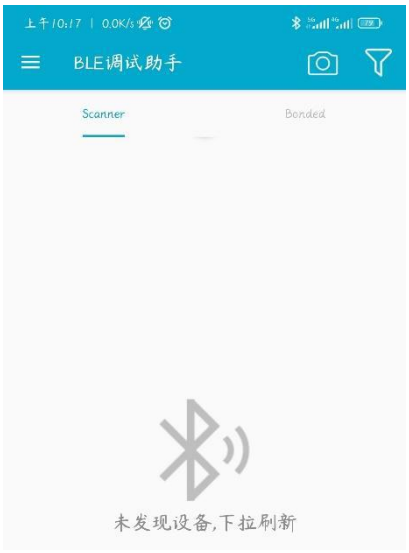
3.4.1 Bluetooth Peripheral Routine Demonstration

1. Open the routine: 'CH572EVT\EXAM\BLE\Peripheral\Peripheral.wvproj', click on the compiler and then use ISP tools to open the generated 'Peripheral.hex' file. The board will hold down the download button to power up, and connect the serial port to facilitate viewing the routine serial output, hardware connected to the serial port 1 (program default), open the serial port tool, set the serial port parameters baud rate 115200, data bit 8, stop bit 1, no parity, and download the program.

2. The serial port tool will display:
'CH572_BLE_PERI_LIB_V1.00
lsiFrq = xxxxx
Initialized..
Advertising.. '
At this time, the board Bluetooth has started broadcasting, as shown below:

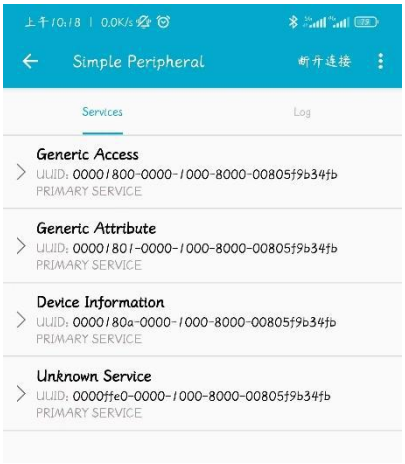


3. Open the mobile APP. (If it is not installed, please download and install it from our website) After opening the software, you will see the following interface:

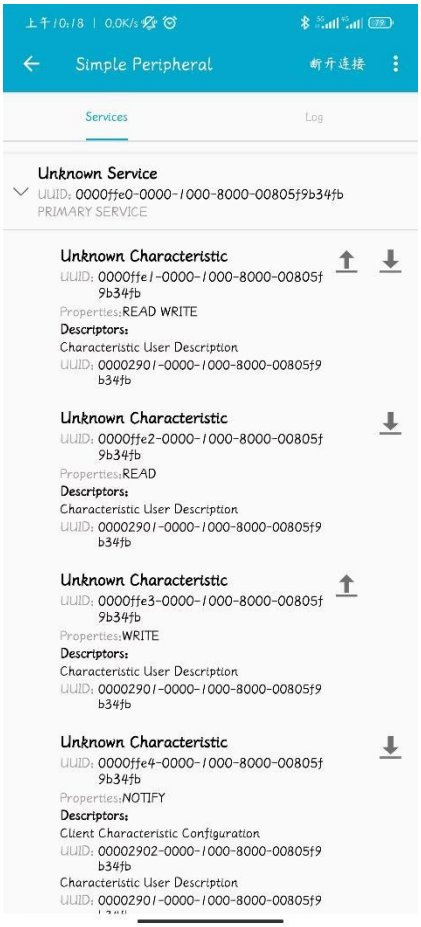


4. Pull down to scan Bluetooth devices, and a 'Simple Peripheral' device will be displayed in the interface, which is the Bluetooth device simulated by the routine, as shown in the following figure:

5. Click the 'Simple Peripheral' device entry to connect. After the connection is successful, the serial port will output 'Connected ... ', and the software will switch to the connection completion interface to display all services included in the device, including 'Generic Access', 'Generic Attribute', 'device information' and 'Unknown Service', as shown below:



6. The Unknown Service is a communication service defined by the program, and the UUID is 0xFFE0. Click this item, and all the characteristic under the 0xFFE0 service will be displayed in the interface, including '0xFFE1', '0xFFE2', '0xFFE3', '0xFFE4' and '0xFFE5', and the Properties of the service will be displayed, as shown below:



7. Click the send and read buttons on the right of the first characteristic (namely '0xFFE1' service), which has read and write properties. Enter a byte in the send input box, click Send, and the transmission will output 'profile ChangeCB CHAR1 .. ', and click the 'Read' button to get a byte just sent, as shown below:

8. Click the Close button to return to the previous level, which '0xFFE2', '0xFFE3' have read attributes, write attributes, respectively, can be read and write operations.

9. Click the read button on the right side of the '0xFFE4' service, the service has a notification service (NOTIFY), that is, to actively send data to the host computer, open the 'Receive Notification Data' option button in the operation interface, the receive box will receive every second The device sends the byte '0x88', when you return, you need to turn off the notification (NOTIFY), cancel the 'Receive Notification Data' button option, click on the close button to return to the previous level, the following figure:

10. Click '0xFFE5' service, the service has authentication read attribute, you need to enter the pairing key to read, in the send and receive interface click the read button will appear Bluetooth pairing interface (different cell phone pairing timing is not the same, some are in the connection is successful after the pairing, there is in

the operation of the need for pairing services only), enter the pairing code default is '000000', select the PIN code, click OK button, the host and the device for pairing, pairing success can operate the service, otherwise cannot be operated or the device is disconnected, the following chart:

4. Program Download (Take CH572D chip as an example)

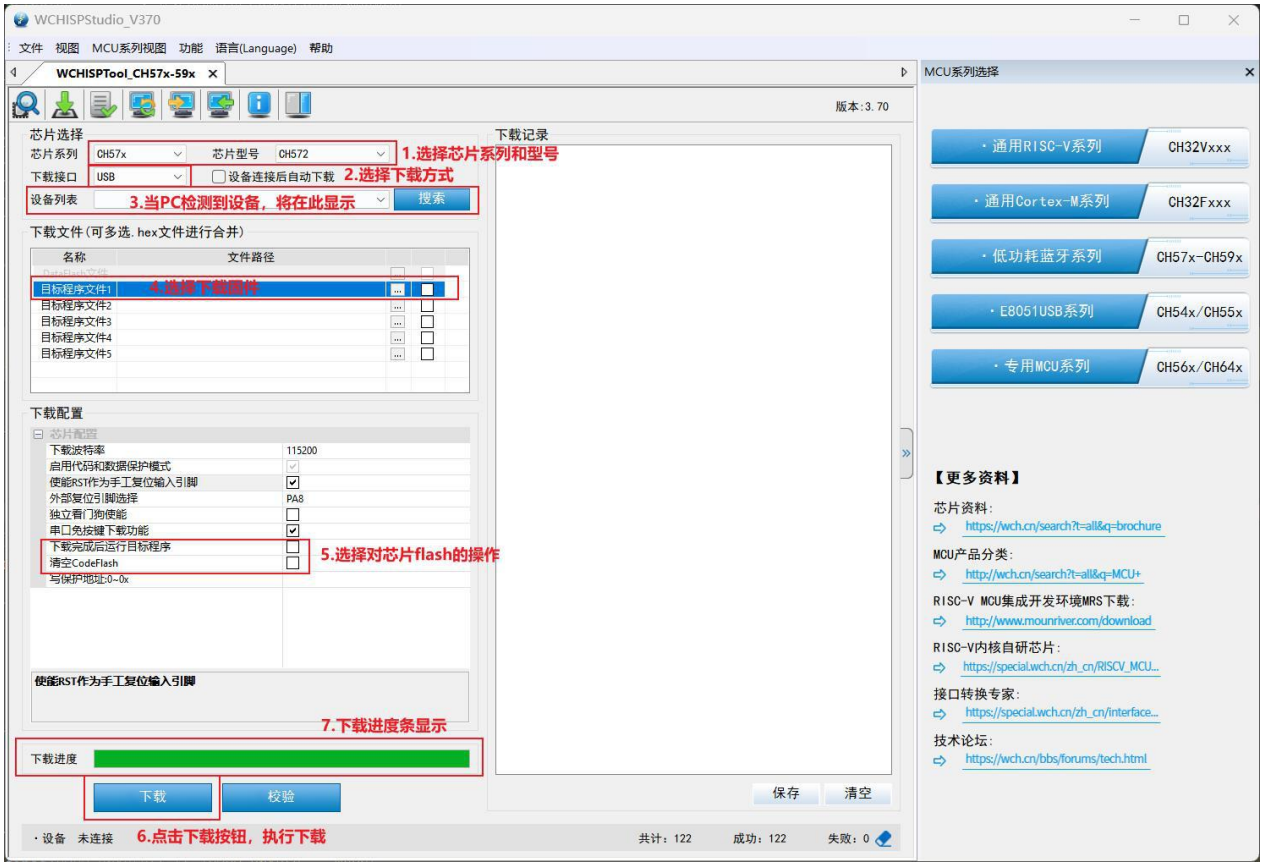
CH57x chip ISP download methods include serial port download and USB download.

Default download boot pin: PA1;
USB download channel: USB full-speed port (FS);
Serial download channel: UART (PA0/PA1), support keyless download;

4.1 Download Tools

Please open the http://www.wch.cn/downloads/WCHISPTool_Setup_exe.html, download our MCU programming software tool. Follow the installation wizard to complete the software installation.

Figure 4-1 Download tool display



4.2 Serial Download

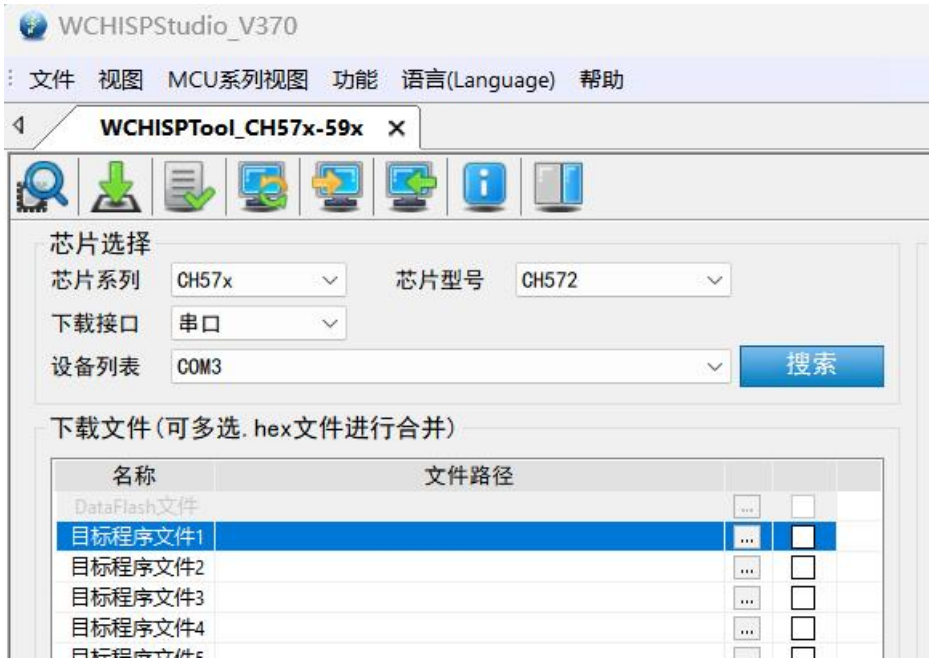
Keyless download method:
Step 1: Open the 'WCHISPTool.exe' tool software, select the chip model: CH572 (specifically matching the current program chip model), download mode: serial port download, serial port device list: select the use of COMx.
Step 2: Connect the serial port (PA0/PA1) of the download board to the serial device correctly, select the required download baud rate and other configurations and click Download, the ISP tool prompts to wait for the device to be accessed (The MCU should not be powered on during this process).

Step 3: Power is supplied to the download board and the program is automatically downloaded.

Step 4: View the program result in the 'Download Record'. When prompted to complete, it will run the user program directly, or you can re-power on or hardware reset to run the user program just programmed in the download board. If the prompt fails, please repeat the above steps 2-3. If you select 1M/3M baud rate download, please make sure the serial device supports 1M/3M baud rate.

Note: Serial port download itself is slow, some larger target code will take tens of seconds, it is recommended to use USB download method.

Figure 4-2 Serial Download



4.3 USB Download

Step 1: Open the 'WCHISPTool.exe' tool software, select the chip model: CH572 (specifically match the current chip model if programmed), download mode: USB download.

Step 2: Hold down the Download button or connect the PA1 pin of MCU to the VCC pull-up (The MCU should not be powered on during this process).

Step 3: Connect the download board to the computer via USB cable, and supply power to the download board.

Step 4: The programming tool software on the computer detects the 'USB device' (if not, please repeat steps 1-3 above), click on the 'Download' control, and perform programming.

Step 5: View the programming results in the 'Download Record'. When prompted to complete, the user program will be run directly, or you can re-power on or hardware reset to run the user program just programmed in the download board. If the prompt fails, please repeat steps 4-5 above.

Figure 4-3 USB Download