RTL87x2x Quick Start User Guide

V1.6

2022/07/18

Revision History

Date	Version	Comments	Author	Reviewer
2018/12/29	V1.0	First draft	nimi_gao	qq_wang
2021/09/01	V1.1	Translate into EN	Jarvis_gu	
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1 Overview

This document is designed to help beginners who use the RTL87x2 series for the first time to quickly use the EVB development board, which can compile and generate images, burn to EVB, observe BLE broadcasts and view logs. In addition, it also guides beginners to check the steps of other documents.

What needs special introduction is that RTL8762 (RTL8762C/D/E) and RTL8752 (RTL8752C) belong to the same series, Bee2 (RTL8762C), Sbee2 (RTL8762D), Bee3 (RTL8762E), is another name for this series of ICs. SDK, HDK, TOOL corresponding to the chip name.

This article takes RTL8762C (Bee2) as an example to illustrate.

2 Startup Procedure

2.1.1 EVB Wire Map

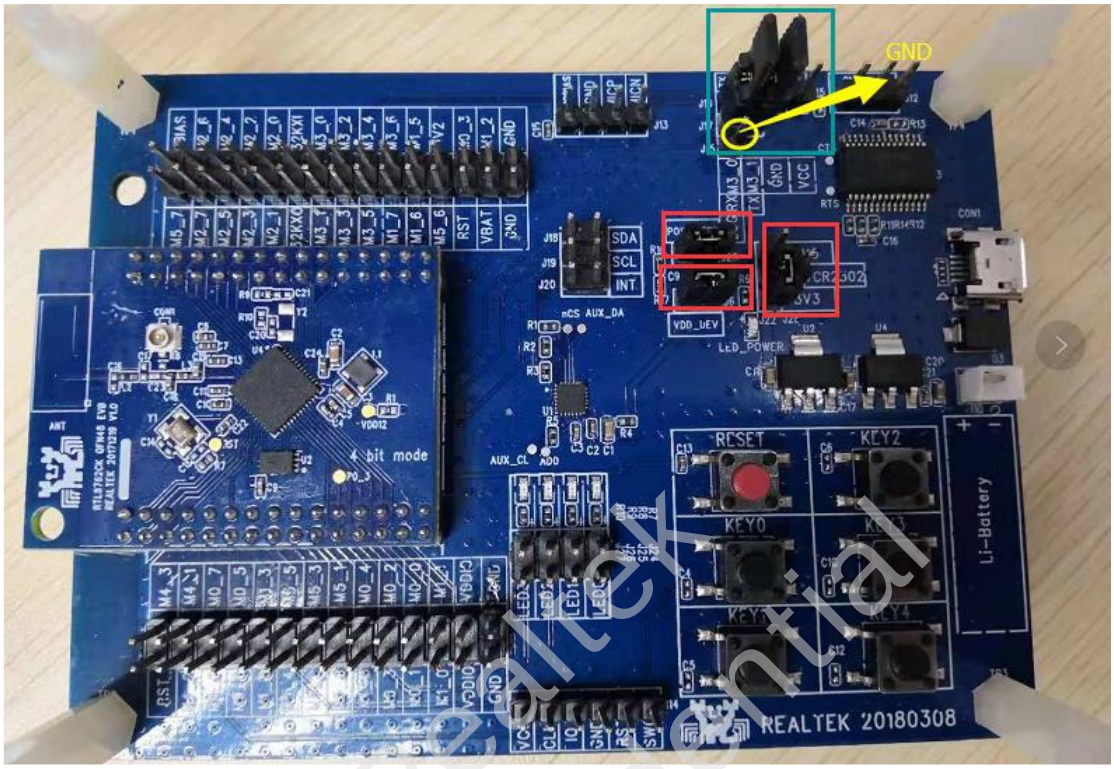

Figure 2-1 EVB Wire Map

As shown above:

1. Three pins framed by red squares must be connected. It's order to power up the sub-board.
2. The pins framed by blue squares must be connected. So the sub-board can be programmed. (This connection represents a connection between UART port of RTL8762E and FT232, so that the PC can communicate with RTL8762E successfully. FT232 is a USB to UART chip.)
3. Connect P0_3 with GND(The yellow circle PIN is P0_3). Then power on or press the red button (Reset) , and remove the cable.

For more details about the EVB board, please refer to *RTL8762E Evaluation Board User Manual*.

NOTE:

In order to reduce the programming time, the baud rate of the serial port will be increased from 115200bps to about 1M baud rate during the programming process. If users use your own USB to serial port board, please make sure to use the authentic FT232 conversion board.

2.2 Download files

The SDK, Tool and other materials must be placed in a non-Chinese path. The five files that must be downloaded are shown below:

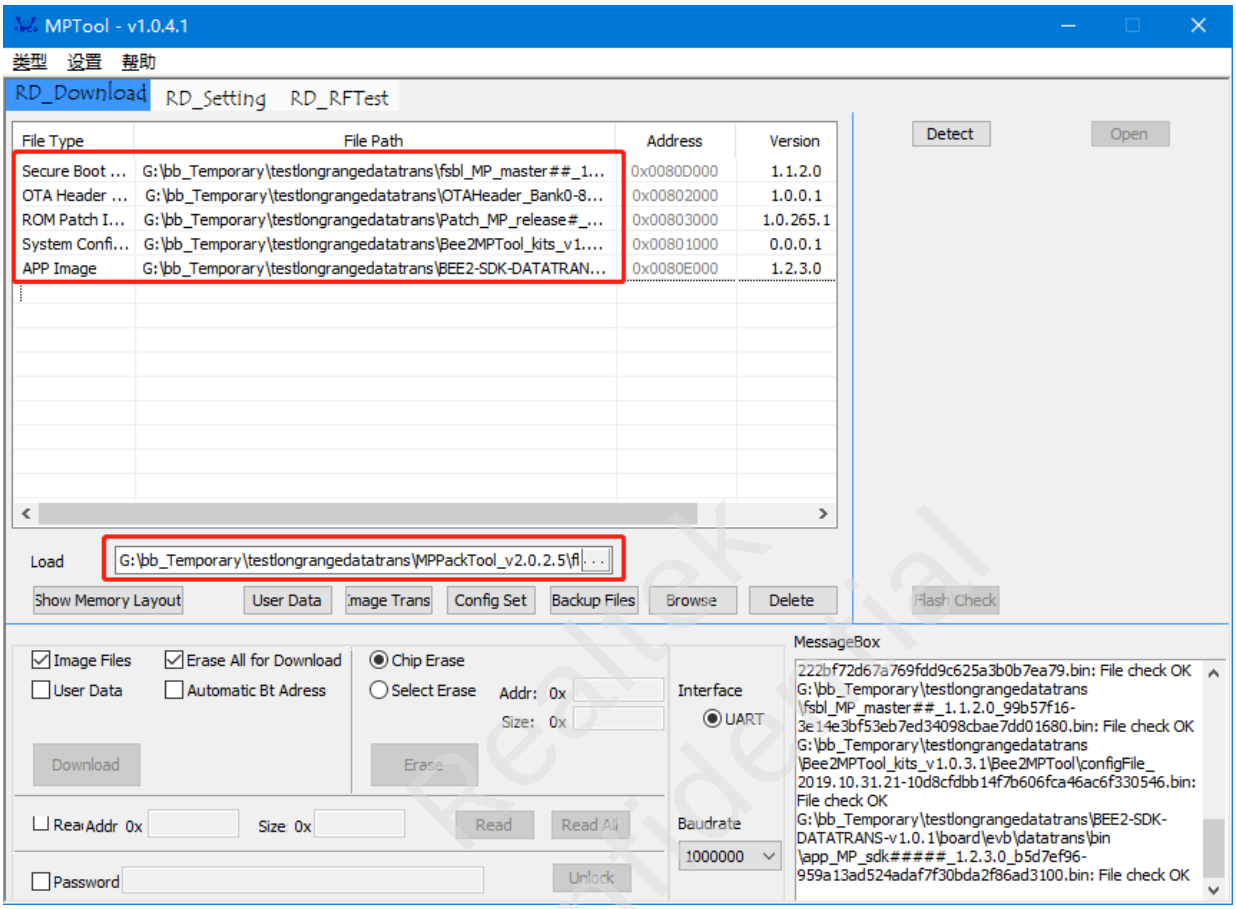

Figure 2-2 Files to be downloaded

2.2.1 Brief instruction of Patch and FSBL

Provided by Realtek directly.

2.2.2 Generate Flash map

To generate the flash map, flashMapGenerateTool.exe should be used, which is contained in MPPackTool file.

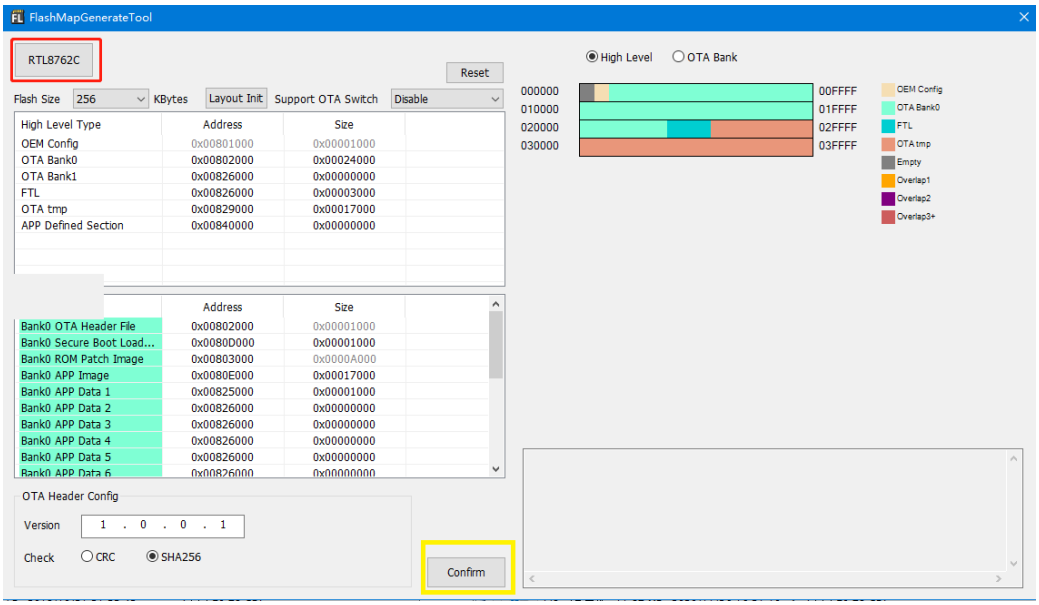

Figure 2-3 Generate Flash map

1. Select the flash type in the red box and click Confirm in the yellow box to generate a Flash map.ini directly：bee3MPPackTool\MPPackTool_v2.0.1.9\MPPackTool_v2.0.1.9\flash map.ini
2. Copy the flash_map.h file which is generated in the same directory to the corresponding project directory. Taking peripheral engineering as an example, the path is as follows:BEE3-SDK-v1.0.1\board\evb\ble_peripheral\flash_map.h

NOTE：

1) The maximum flash size is 8M bytes:

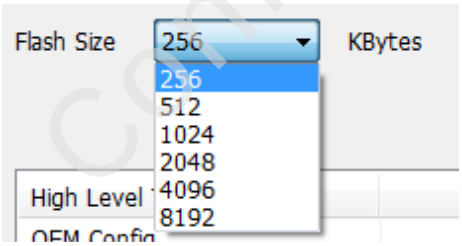

Figure 2-4 flash size

2) OTA Bank switch Enable/Disable is supported:

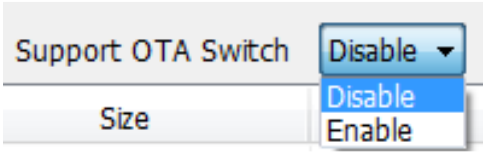

Figure 2-5 OTA bank switch

For details, please refer to chapter 4 of *RTL8762E OTA User Manual* which is contained in folder BEE3-SDK-v1.0.1\doc.

2.2.3 Generate OTA header File

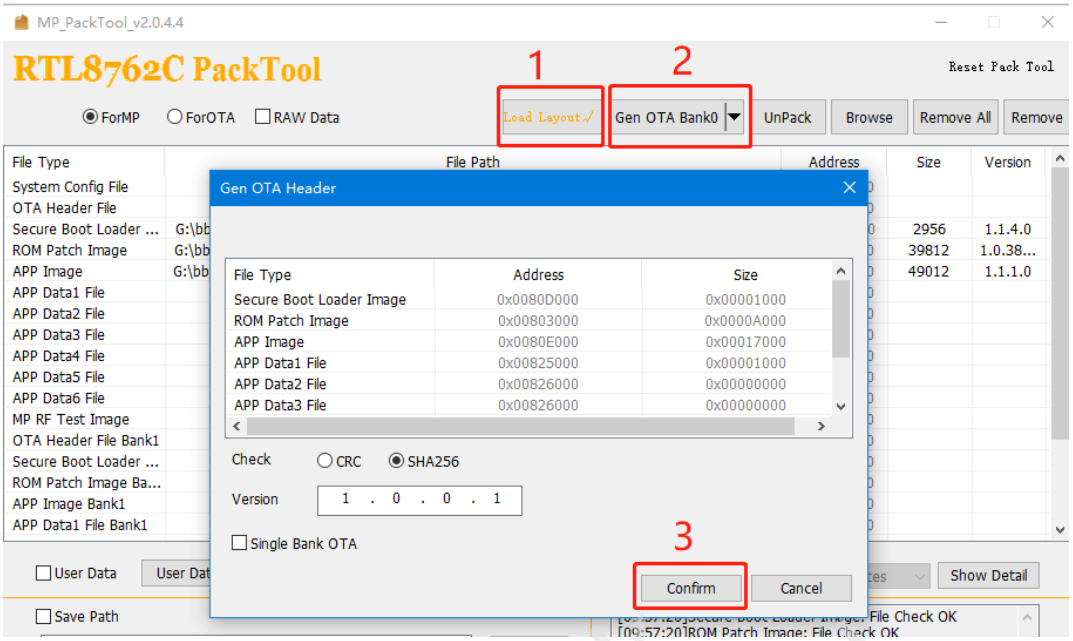

Figure 2-6 Generate OTA header File

As shown above:

1. import flash map.ini which is generated just now.
2. click the button Gen OTA Bank0.
3. click the button Confirm.
4. Generate OTA header file as follows.

Path: bee3MPPackTool\MPPackTool_v2.0.1.9\MPPackTool_v2.0.1.9\OTAHeaderxxxxxxxxx.bin

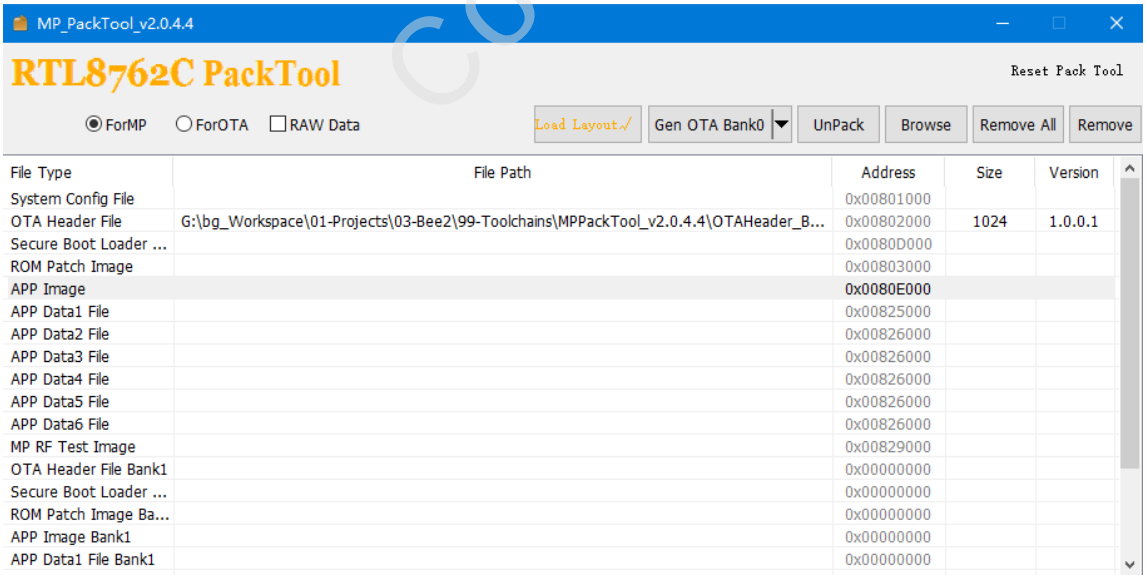

Figure 2-7 OTA header Path

2.2.4 Generate App image

Take peripheral project as an example, path as follows: BEE3-SDK-v1.0.1\board\EVb\ble_peripheral\peripheral. Keil must be configured before use. Please refer to section 2.4 of BEE3-SDK-v1.0.1\doc\ *RTL8762E SDK User Guide*.

App image is generated after compiling the project in Keil, as shown in the figure below. The file to be downloaded is the corresponding bin with MD5 verification.

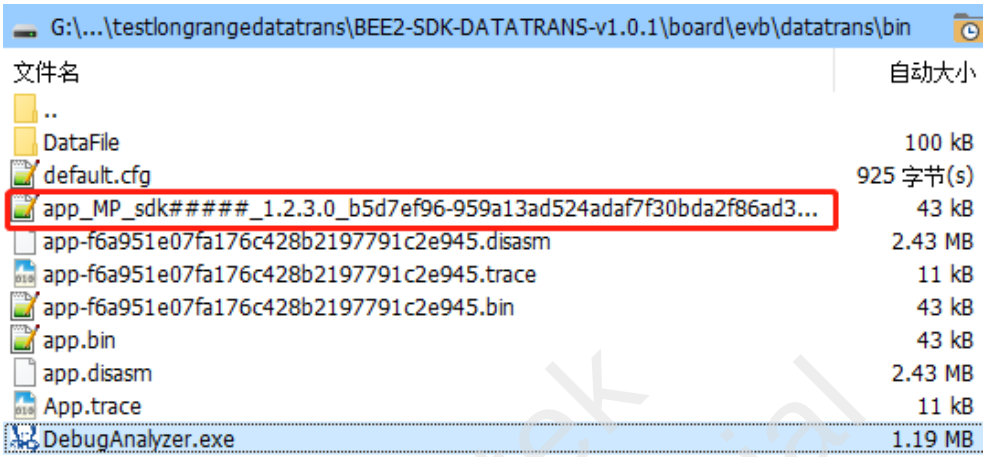

Figure 2-8 APP image

2.2.5 Generate Config

Using MPTool, path: Bee3MPTool_kits_v1.0.1.3\Bee3MPTool\MPTool.

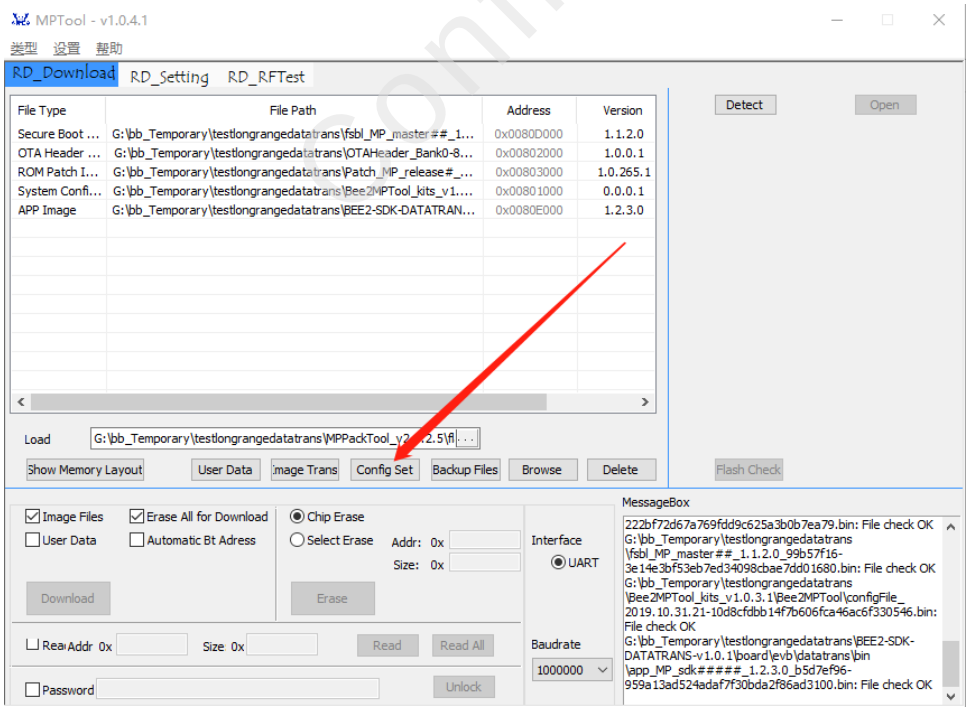

Figure 2-9 MP Tool Path

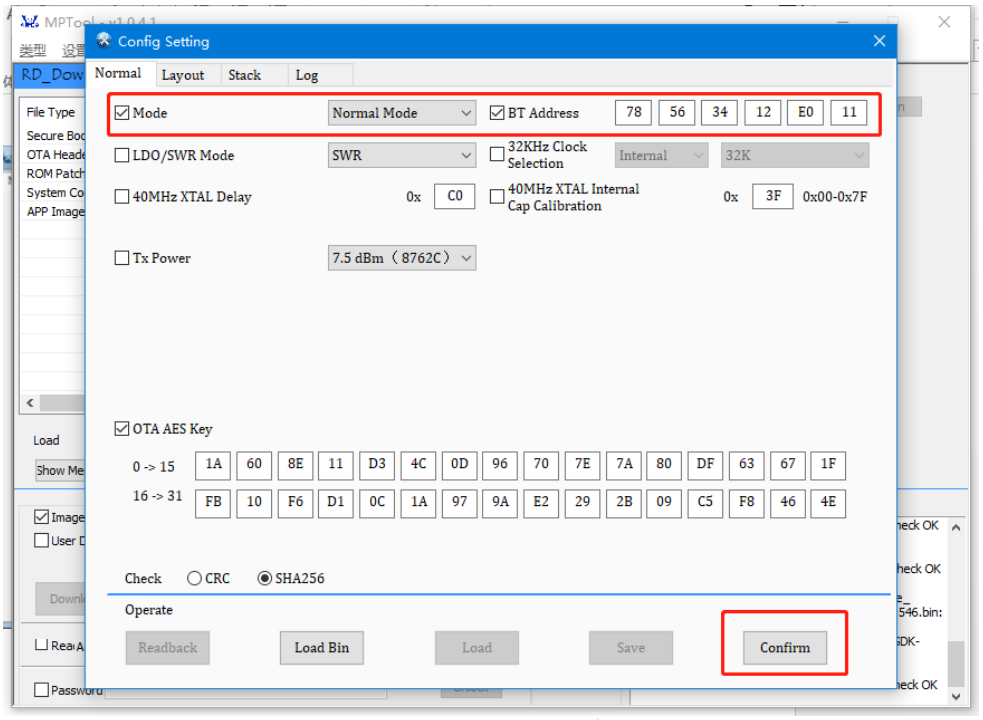

Figure 2-10 Generate Config

Please select Normal mode and write bluetooth address. Click Confirm to generate bluetooth address automatically.

2.2.6 Start to download

When the images are prepared, the downloading process can be started.

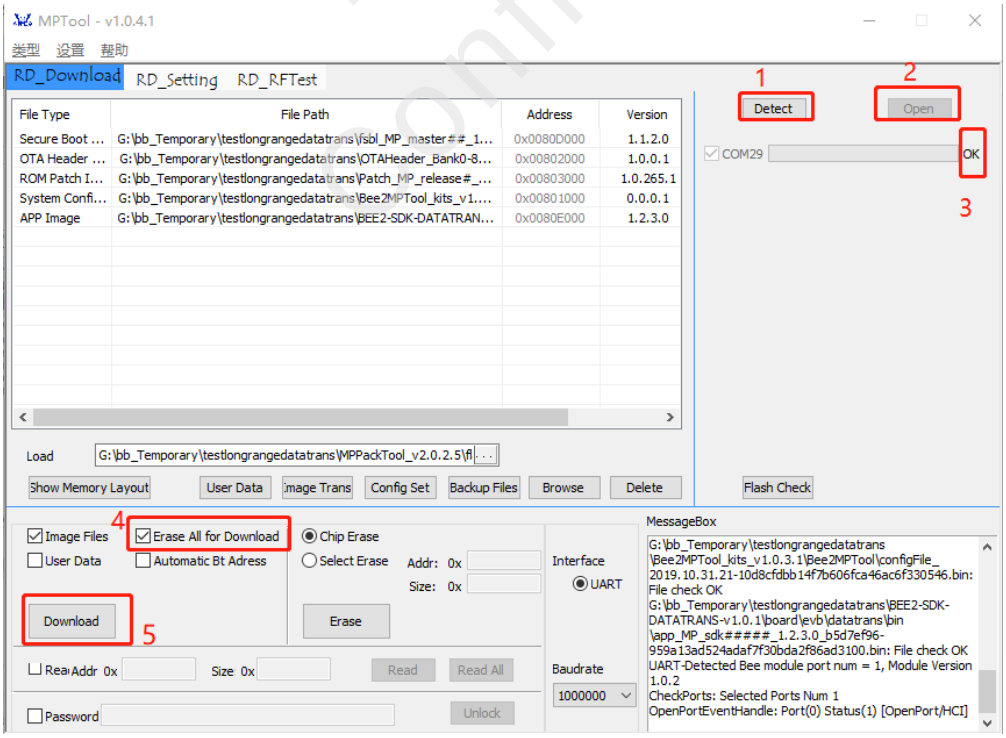

Figure 2-11 Download steps

1. Click Detect button to find devices which will be programming. If the device is available, Ready will be displayed. If PC does not detect devices, it will not display any informations.
2. Click Open button to activate devices. If device is RTL8762E, OK will be displayed. If it displayed Fail, please try again, referred section 1. (Connect P0_3 with GND(The yellow circle PIN is P0_3). Then power on or press the red button (Reset) , and remove the cable.)
3. Check image Files and click Download. The correct programming is completed as shown below.

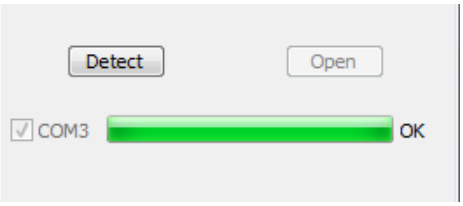

Figure 2-12 correct programming

4. NOTE: If the test board is not EVB board, and you meet the programming fails during the process, such as the port can be successfully opened, and sometimes opened fails, please refer those solutions:
   1) Pay attention to the connection of UART TX and RX. (Dupont wire should not be too long)
   2) Do not use low-quality wire for USB cable. If it is connected to USB HUB, the HUB should have independent power supply.
   3) Use genuine FT232 serial chip. CP2102 must not work.

If it still doesn't work, please check whether the crystal oscillator of the test plate starts up, whether 1.2V is normal, and whether the power consumption of the whole plate is abnormal.

2.3 Print Logs

Logs can be used to determine whether the operation is normal after downloading. Please unplug the cable between P0_3 and GND, and change the position of jumper according to the picture below (connecting J17 with J15), then press the red Reset button.

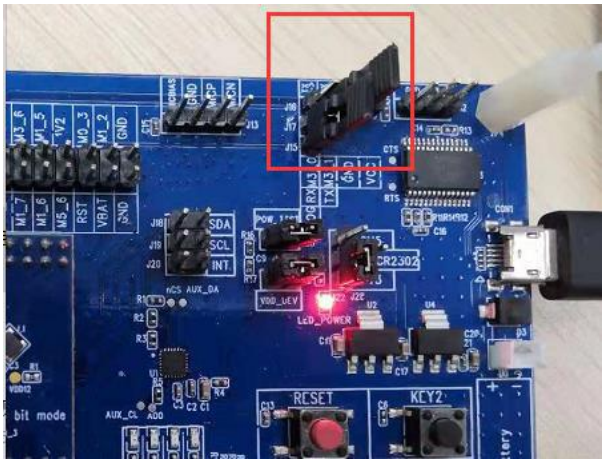

Figure 2-13 EVB connection

The tool used to print the logs is DebugAnalyzer.

Path: BEE3-SDK-v1.0.1\tool\DebugAnalyzer-v2.1.8.1\DebugAnalyzer_app\DebugAnalyzer.

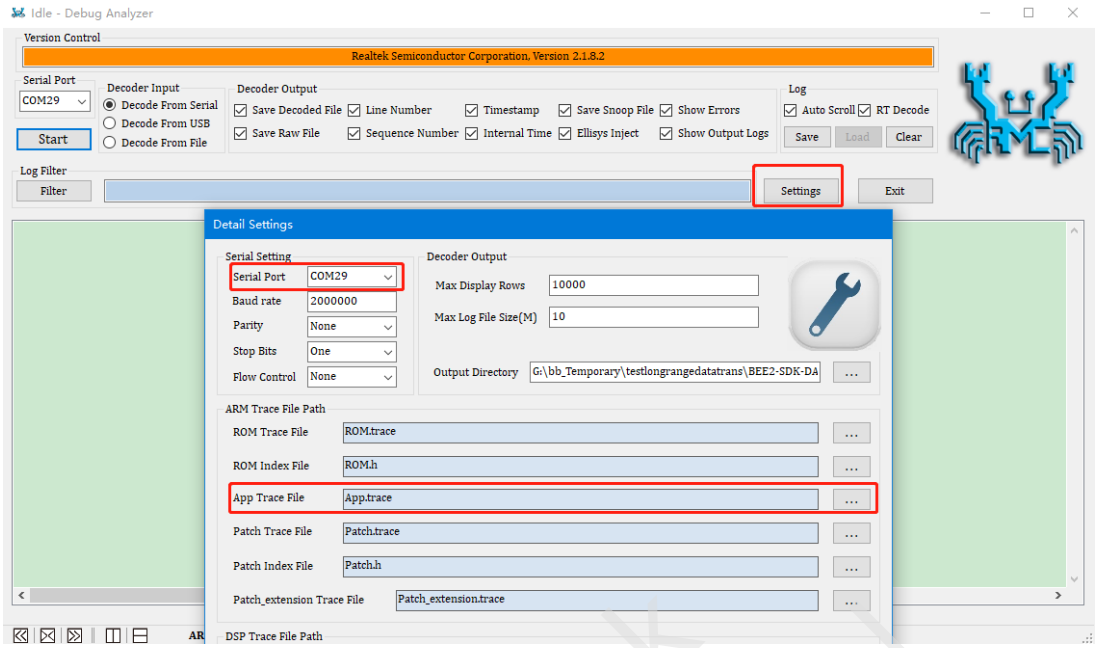

Figure 2-14 Print Logs steps

1. Click Setting button to go to detail Settings;
2. Verify that port is correct;
3. Modify the trace path to the project path: BEE3-SDK-v1.0.1\board\evb\ ble_Peripheral\bin\app.trace.
4. Click Start button to print the log, as shown below:

For details, please refer to section 10.1 of BEE3-SDK-v1.0.1\doc\ *RTL8762E SDK User Guide*.

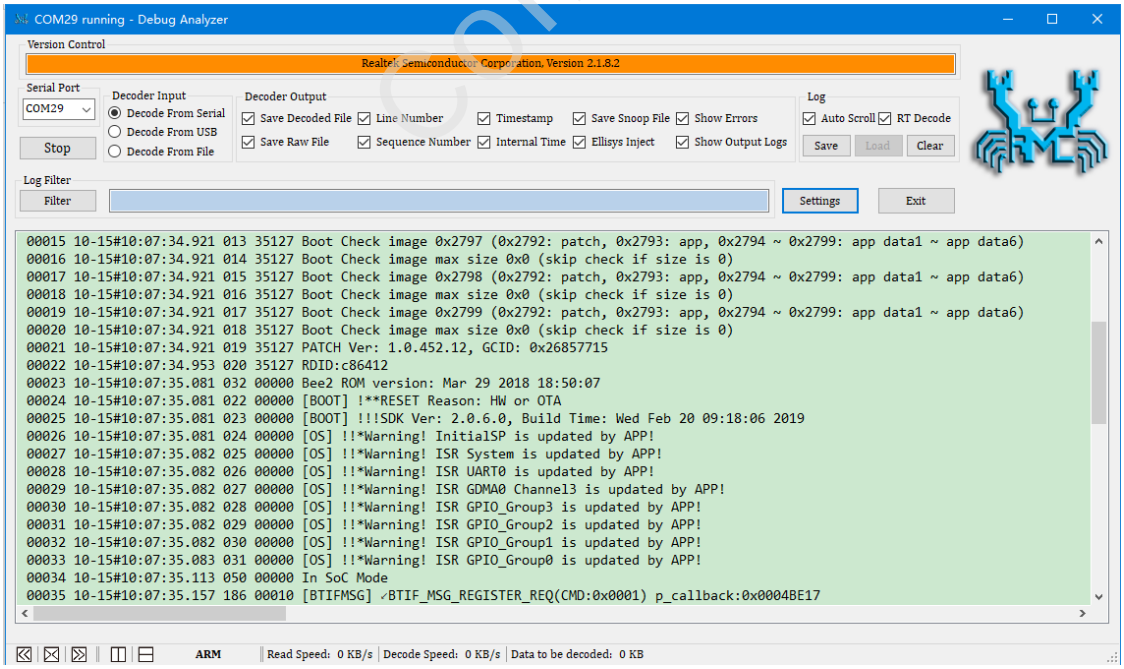

Figure 2-15 Print Logs successfully

2.4 Verification Test

After downloading, you can also check the broadcast to confirm whether it is normal.

1. **Using Peripheral Project to test**

   After programming, unplug the cable between P0_3 and GND before powering on. EVB will directly send BLE broadcast, which can be checked by mobile phone. For ios devices, please use Lightblue. For Android devices, you can use many BLE apps, such as nFR Connect. Because in general, BLE signals cannot be found in system settings of mobile phones. The broadcast name for Peripheral project is BLE_PERIPHERAL.

2. **Using PXP Project to test**

   Different from the Peripheral Project, you need to press the KEY2 button on the EVB board to broadcast. For details, see *RTL8762E Proximity Application Design spec*. The broadcast name of the PXP project is BLB_PROX.

3 Document Descriptions

3.1 Primary Stage

1. ***RTL8762E Evaluation Board User Manual***

   Make sure to learn this document. This is a basic introduction.

2. ***RTL8762E SDK User Guide***

   Using RTL8762E software development kit(SDK) to develop bluetooth low power applications, including software ,hardware architecture, application introduction, storage, interrupt, programming, debugging and so on.

3. ***RTL8762E OTA User Manual***

   You need to read this document to generate the OTA_header file which is required for downloading.

3.2 Functional requirements

1. **Understand Flash and storage space**

   1) RTL8762E Flash User Guide

   2) RTL8762E Memory User Guide

   3) *RTL8762E OTA User Manual*

   This section describes the current allocation and margin of memory space, and how to allocate FlashLayout and storage space during OTA.

2. **Bluetooth communication correlation: *RTL8762E BLE Stack User Manual***

   Describing Bluetooth broadcast, connection, pairing, service reading and writing, data processing and so on.

3. **Peripheral related Settings: *RTL8762E Peripheral Manual***

   Related all peripheral register settings and the function will be used.

4. **OTA in-flight upgrade function: *RTL8762E OTA User Manual***

   This section describes how to allocate flash during OTA, which OTA mode to select, such as Normal mode or silent mode, and whether to enable bank switch.

5. **Deep low power: *RTL8762E Deep Low Power State***

   This paper introduces the trigger conditions of entering DLPS mode and get out from DLPS, and the corresponding settings. Please learning carefully, and refer to the PXP project.

6. **Flash/Image security:*RTL8762E Security Mechanism User Guide***

   Describing how to encrypt images, and download the key into EFUSE.