Application Note:
OTP.BIN Firmware Burning User Guide

AN-FBD-EVK-UG-E1

Ver 1.0

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Brief:

This application note mainly introduces firmware burning into OTP method and steps for using EVK board.

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Revision History

Version	Major Changes	Date	Author
1.0	Initial release	2014/11	Y.H., Cynthia

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1 Overview

This application mainly introduces method and steps about how to use the EVK board to load firmware for target program or bin file, as well as firmware debugging. In this document, EVK board is the bin file loader and 2 platforms: EVK_LZjiqi_17H25_ and EVK_LZjiqi_17H26_ are used as the target BIN file generator .

1.1 naming rules

Eg:17H26_Lenze_ARGun_3432_171206.bin

The file name should contain Chip Version ,company name, project name ,CRC

and date of the generating the file.

1.2 choose the right platform:

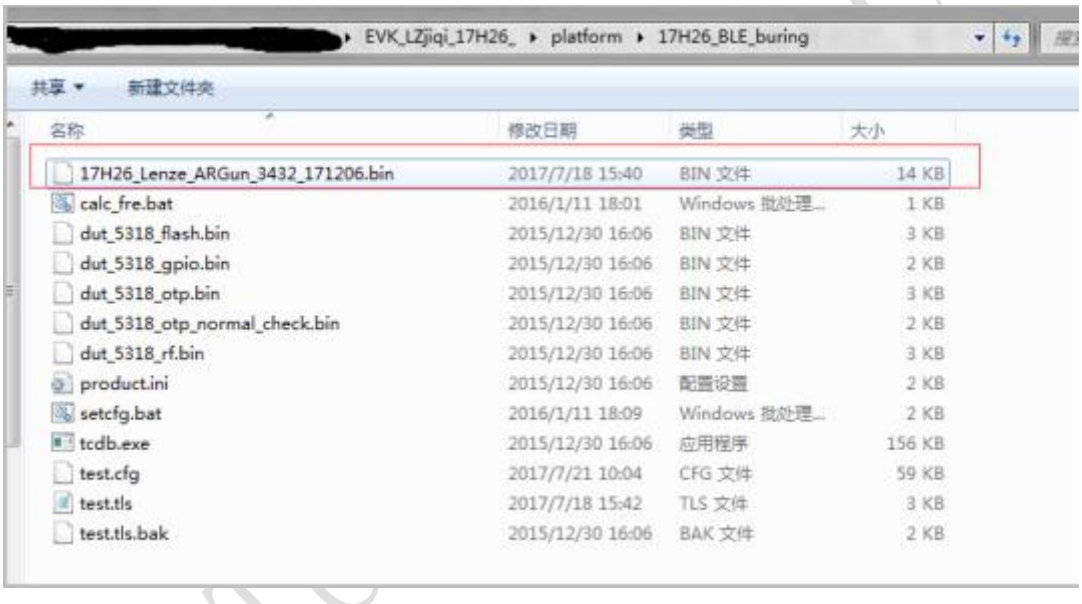
If you want to load a BIN file into 17H25, then you need to select “EVK_LZjiqi_17H25_” platform;
If you want to load a BIN file into 17H26, then you need to select “EVK_LZjiqi_17H26_” platform;

1.3 start making a bin file loading packet .

copy the target file we want to load ,in the path like below:

EVK_LZjiqi_17H2x_\platform\17H2x_BLE_buring

Here ,we use “EVK_LZjiqi_17H26_” as an example to show the basic procedure.



2 EVK Loading Tool

The EVK board acts as the adapter board used for firmware download by lenze.

2.1 Check EVK board

Before burning firmware into target board, user should check whether the EVK board is OK according to steps below:

1) Connect the EVK board with PC via a USB cable.

Figure 1 Connect EVK with PC

2) Observe the indicating LED light shown as **Figure 1**:

- ✧ If the indicating light is off, it indicates that the EVK board and its connection with PC is OK, so user can skip steps in **Section 2.2** and burn firmware into target board directly.

3 Burn firmware into target board

3.1 Connect target with EVK

For the target board with USB interface, such as a dongle board shown in **Figure 4**, connect the target board with the EVK board via USB interface directly.

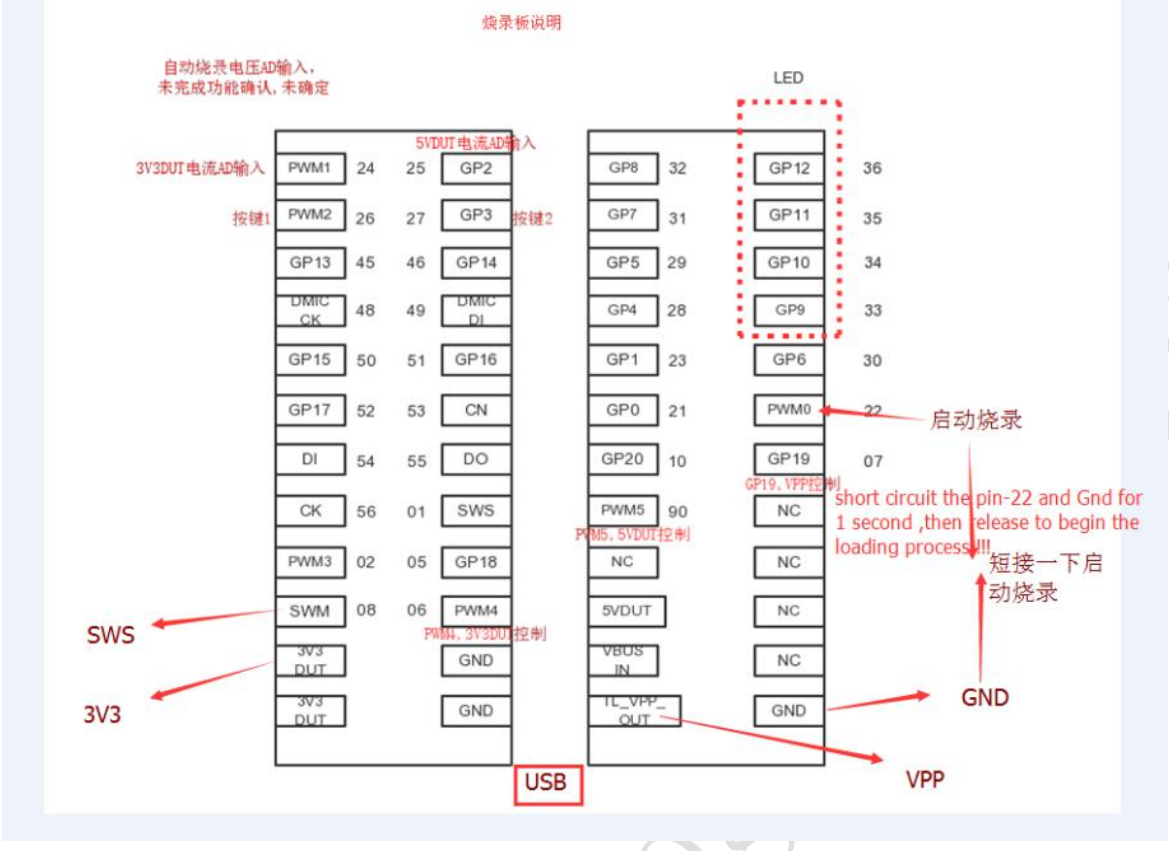
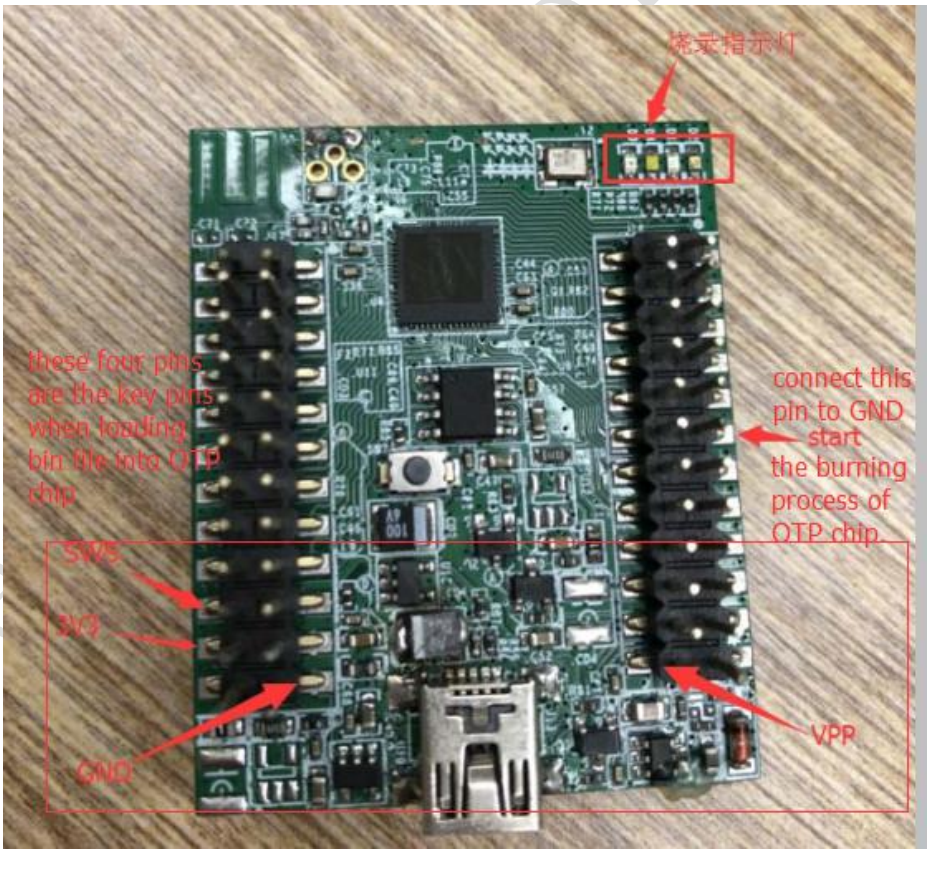


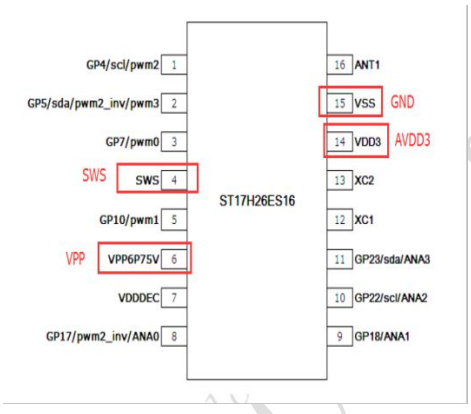
Figure 2 Connect each pin of empty otp board to the EVK via SW



When loading the bin file into The 17H25 or 17H26,the IC **must connect to a 12MHZ crystal ,**otherwise it may work abnormally.

These are **some key pins** need to connect when loading the bin file into the OTP chip .

For 17H25 connect (AVDD3/SWS/GND)3pins For 17H26 connect(VDD3/SWS/VPP/GND)



3.2 Burn firmware into target

It's **noted** that the firmware could be downloaded into the target board via Single Wire only. In this section an example introducing how to download "lenze_searching_mode.bin" file into the chip is given.

1)Firstly ,you have to unzip the content like below : EVK_LZjiqi_17H26_Finder_M_v7_5625_170207

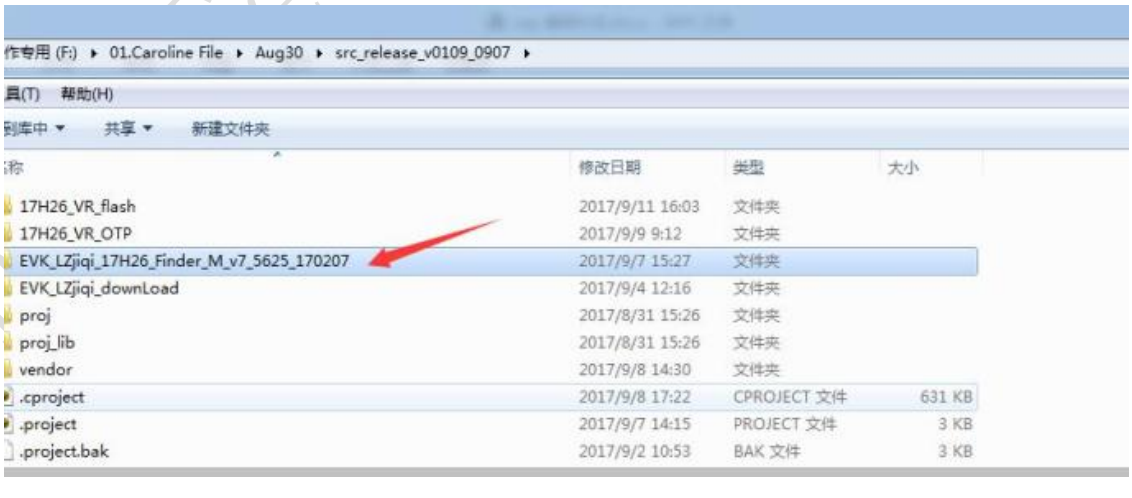
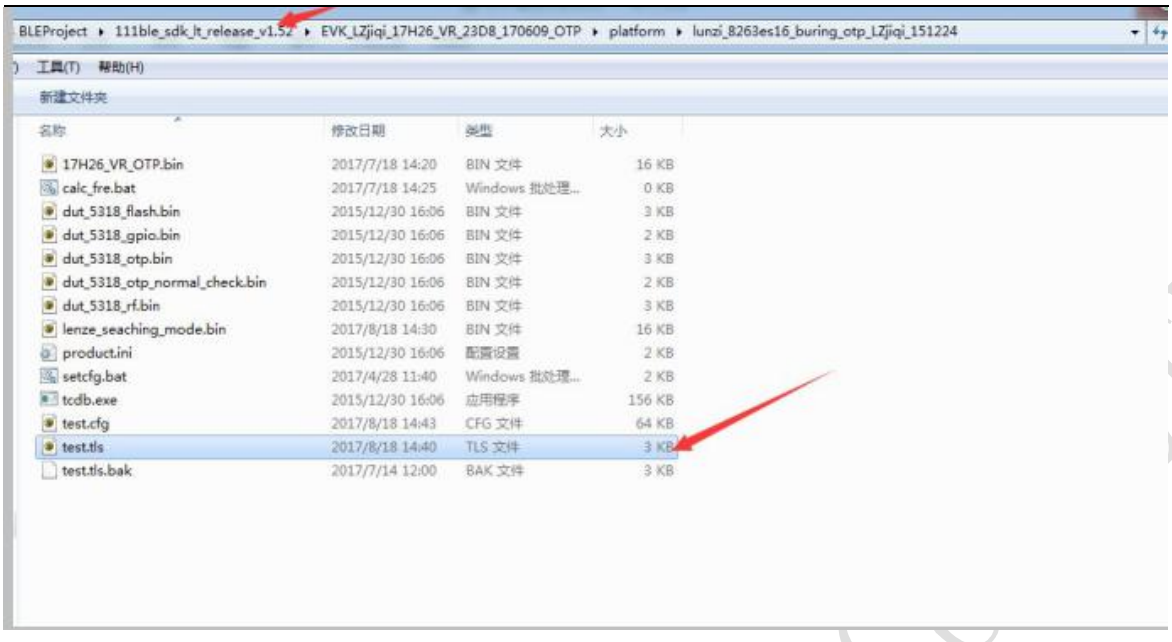
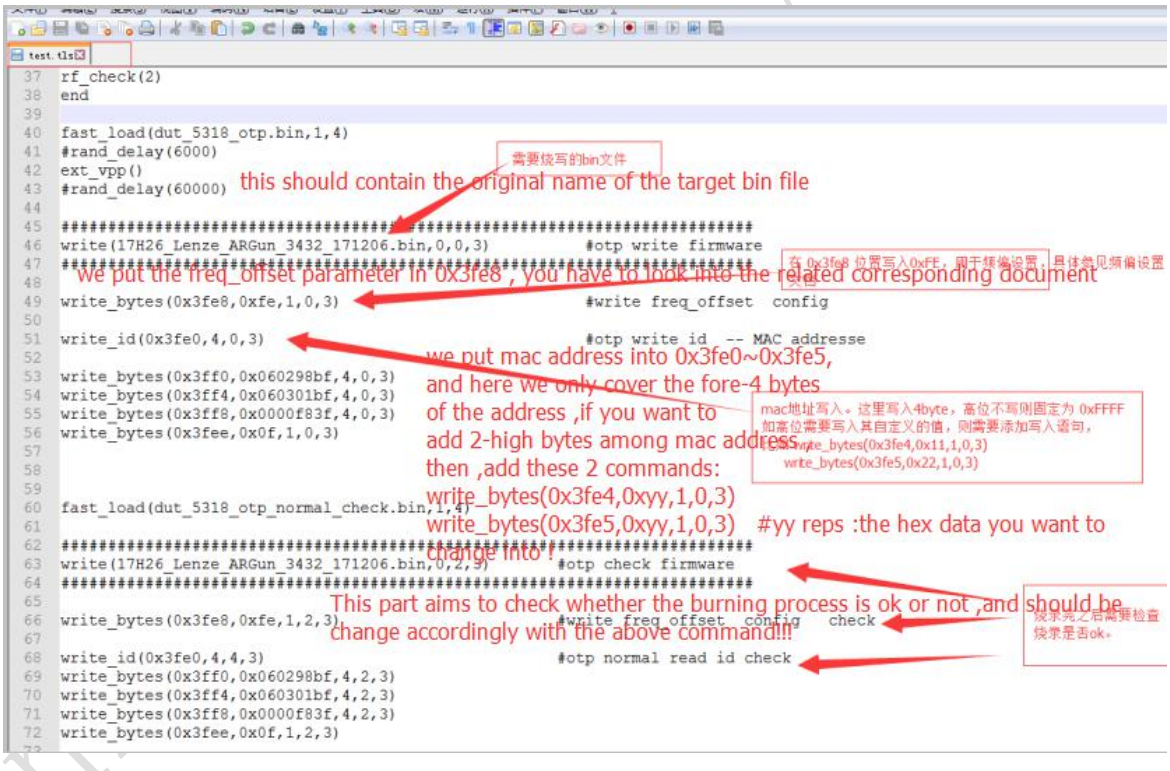


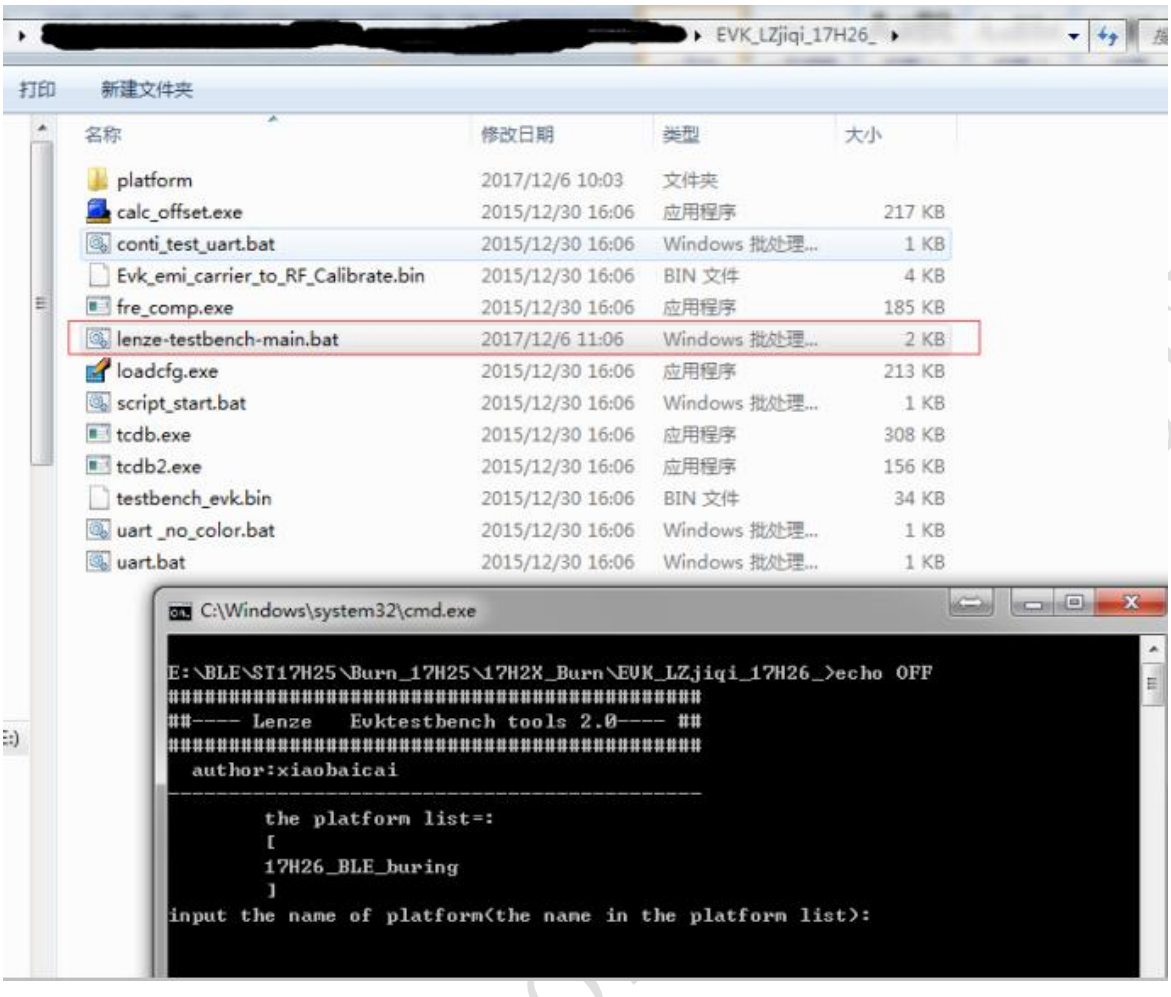
Figure 3 "lenze_searching_mode.bin" file burning process

2)Reassure the name of the target ,in the following file ,which will help assigning a increasing step of 1 for each Mac address.

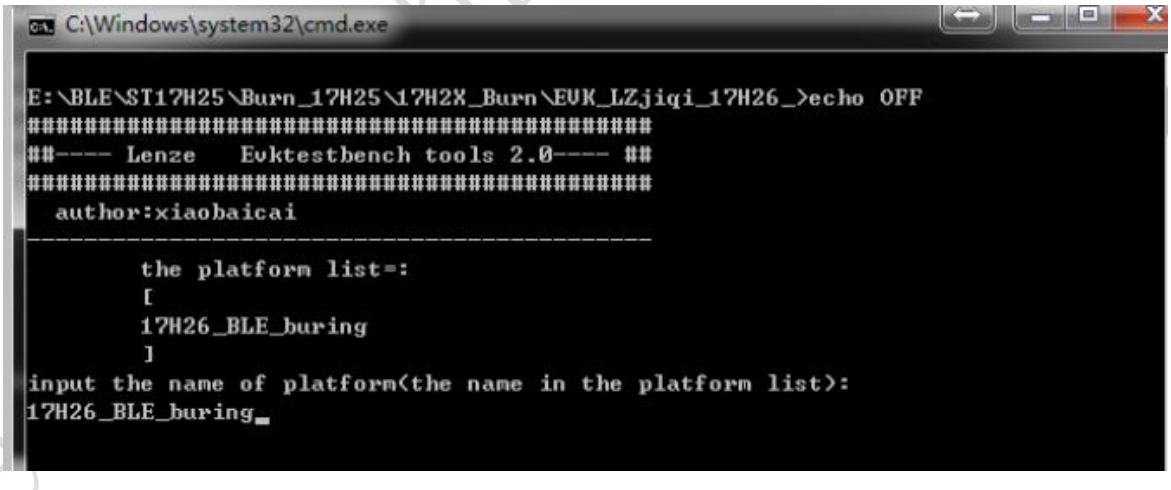




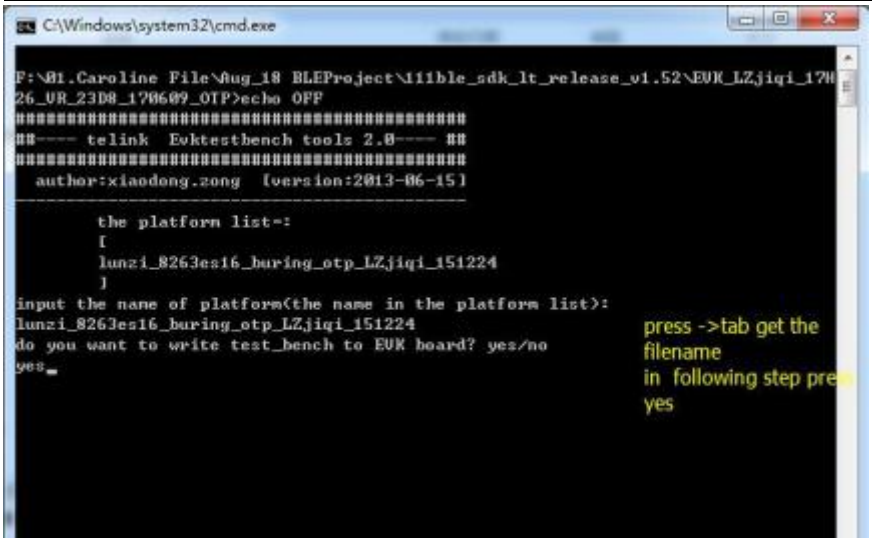
3) Go back to the interface like below where we double click the lenzetestbench_evk.bat file.



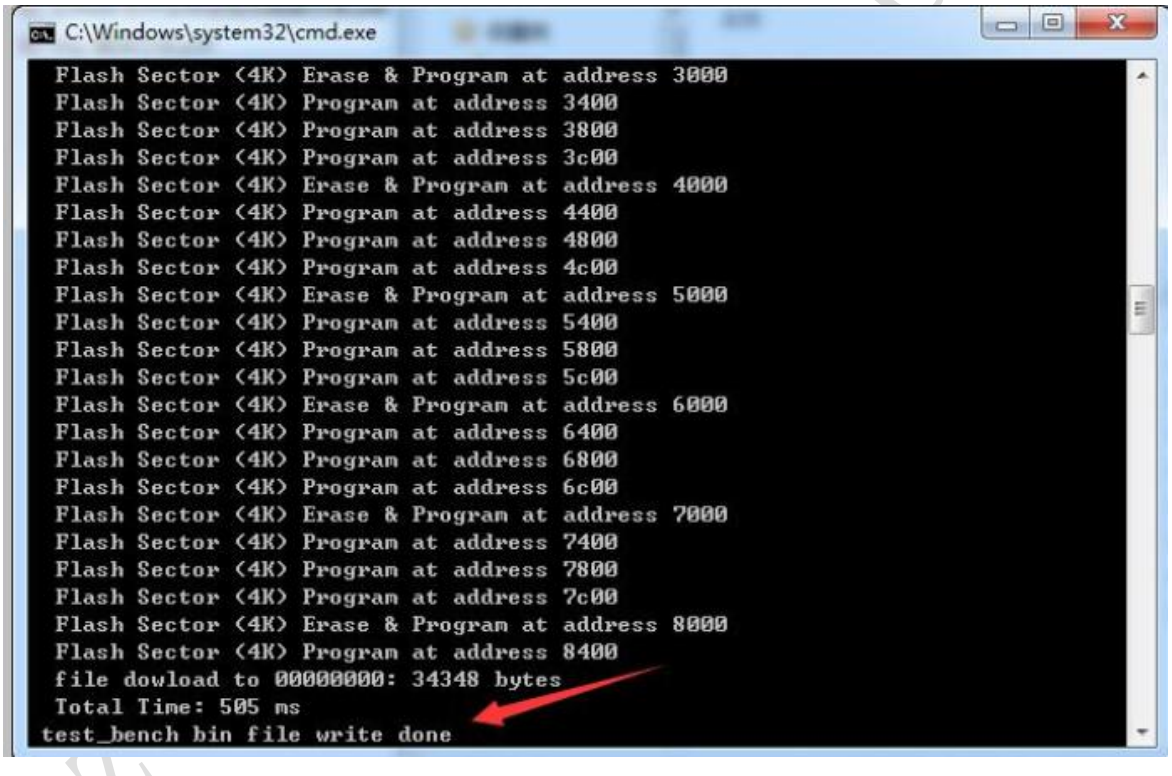
In the cmd window above ,we press the ‘tab’ on the keyboard ,then it will show the sub-folder in the platform folder:



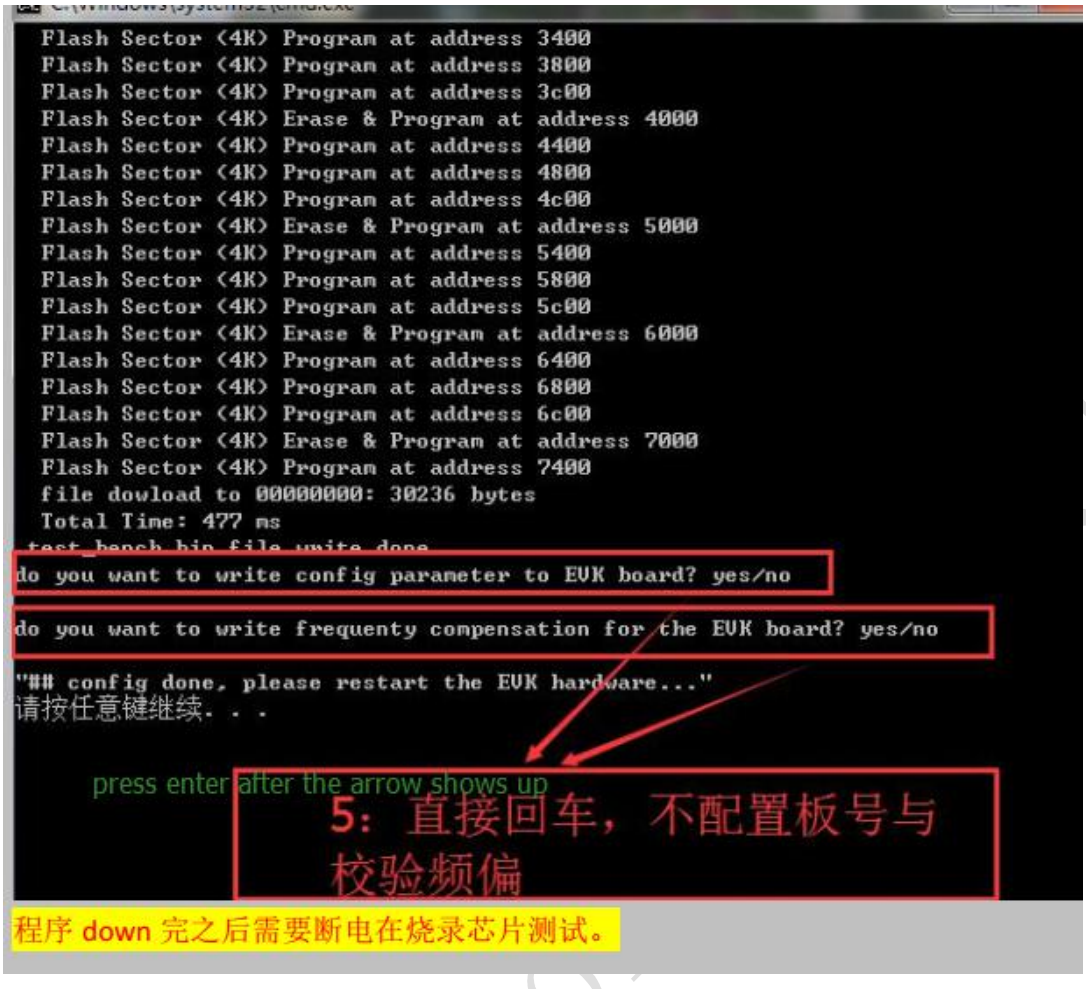
4) To continue the dialog in the cmd window , press ‘enter’ on the keyboard ,then in the following step ,input ‘yes’,and press ‘enter’ to continue.



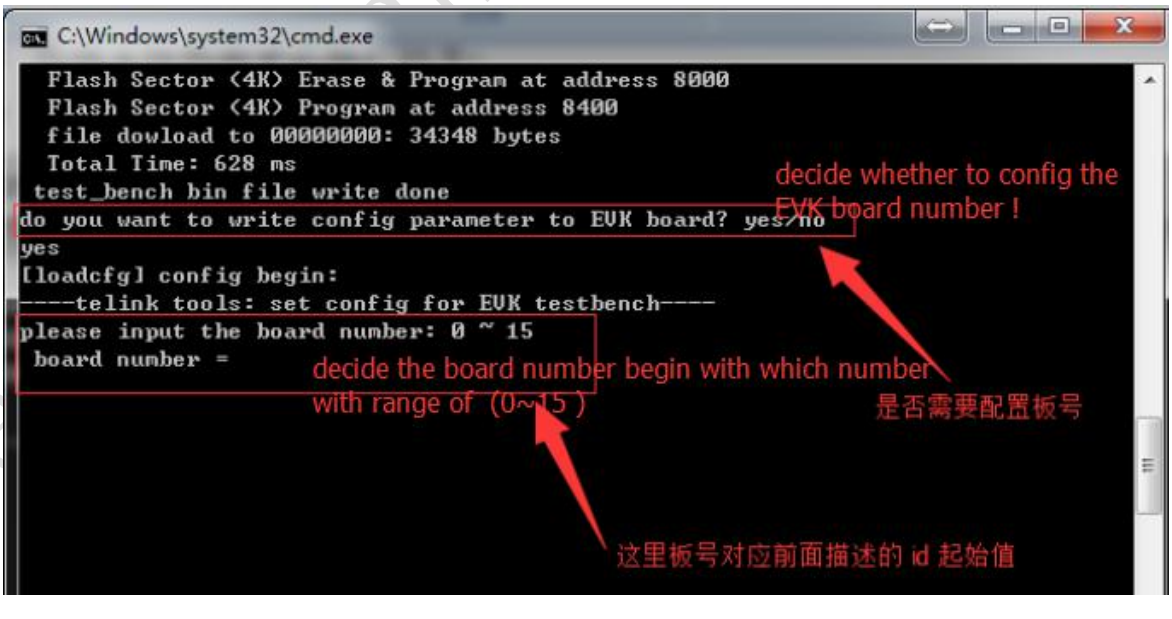
5) This step will take 30 secs to 1 min ,and after showing the ‘test_bench bin file write done’ ,means everything about loading otp.bin into the EVK board is done.



6) At the following steps ,if you want to use the default configuration you can just press ‘enter’ on your keyboard.



7) Otherwise , if you want to configure the Board Number for your OTP chip, you can just input 'yes'on your keyboard.



The default configuration of board number contains in 'EVK_LZjiqi_17H2x_\platform\17H2x_BLE_buring\product.ini '

```
41  board_rf_chn[8] =  8
42  board_rf_chn[9] =  9
43  board_rf_chn[10] = 10
44  board_rf_chn[11] = 11
45  board_rf_chn[12] = 12
46  board_rf_chn[13] = 13
47  board_rf_chn[14] = 14
48  board_rf_chn[15] = 15
49  id_initial_value[0] = 0x10000001
50  id_initial_value[1] = 0x20000001
51  id_initial_value[2] = 0x30000001
52  id_initial_value[3] = 0x40000001
53  id_initial_value[4] = 0x50000001
54  id_initial_value[5] = 0x60000001
55  id_initial_value[6] = 0x70000001
56  id_initial_value[7] = 0x80000001
57  id_initial_value[8] = 0x90000001
58  id_initial_value[9] = 0xa0000001
59  id_initial_value[10] = 0xb0000001
60  id_initial_value[11] = 0xc0000001
61  id_initial_value[12] = 0xd0000001
62  id_initial_value[13] = 0xe0000001
63  id_initial_value[14] = 0xf0000001
64  id_initial_value[15] = 0x18000001
```

不同的板号对应不同的id起始值。
不配置板号就在原来的值上累加。如果重新配置了一次板号，起始值就会被初始化为这里的值

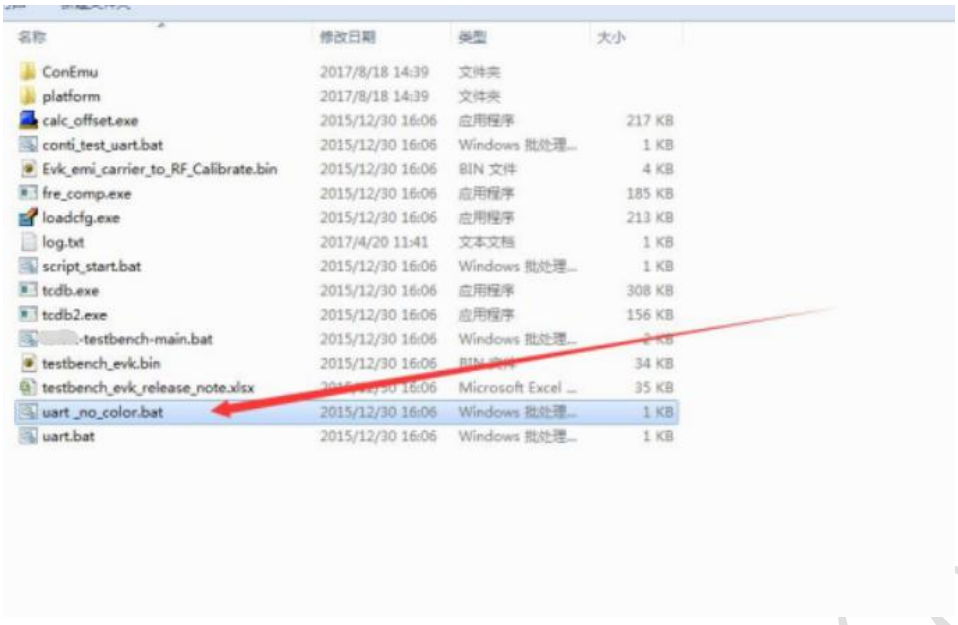
board number will begin with the address in id_initial_value[x] ,then will increase 1 everytime after burning a new chip .

For every chip there is a unique number on the back of it ,which indicates the freq_offset .And you should be very careful with the positive or negetive of the value is ,and **only press the number without KHZ behind it !!! for example , on the chip it's -17khz freq_offset ,then you have to configure it as : -17 ,and press enter after that .**

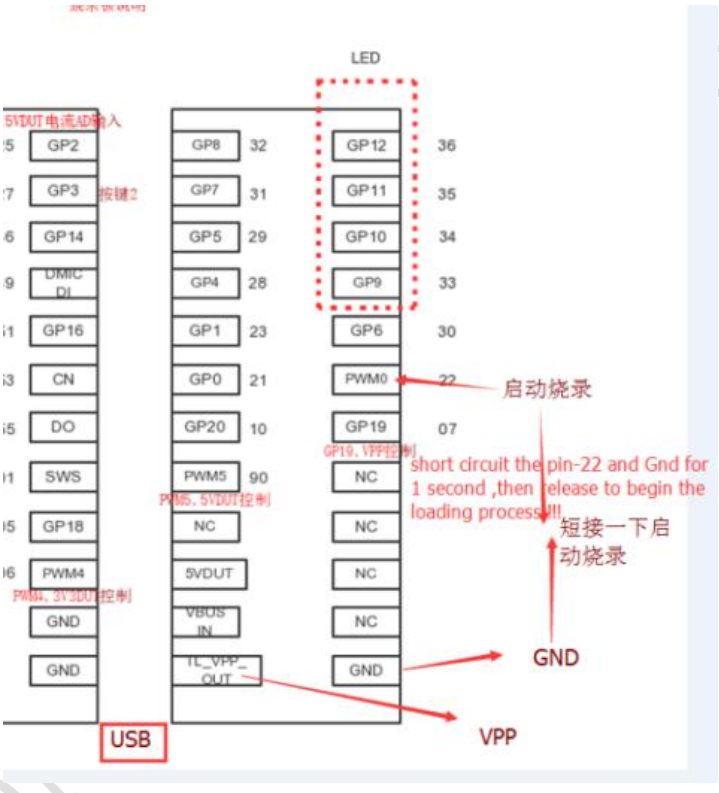
```
C:\Windows\system32\cmd.exe
  Flash Sector (4K) Program at address 3e80f
  Total Time: 0 ms
  Flash Sector (4K) Program at address 3e810
  Total Time: 0 ms
  Flash Sector (4K) Program at address 3e814
  Total Time: 0 ms
 config parameter write done
do you want to write frequenty compensation for the EVK board? yes/no
yes

Delta_f/kHz = frequency_from_spectrum_analyzer - frequency_want = 41
frequent compensation done!
  Flash Sector (4K) Erase at address 3f000
  Total Time: 28 ms
  Flash Sector (4K) Program at address 3f000
  Total Time: 0 ms
 frequent compensation done
"## config done, please restart the EVK hardware..."
请按任意键继续. . .
```

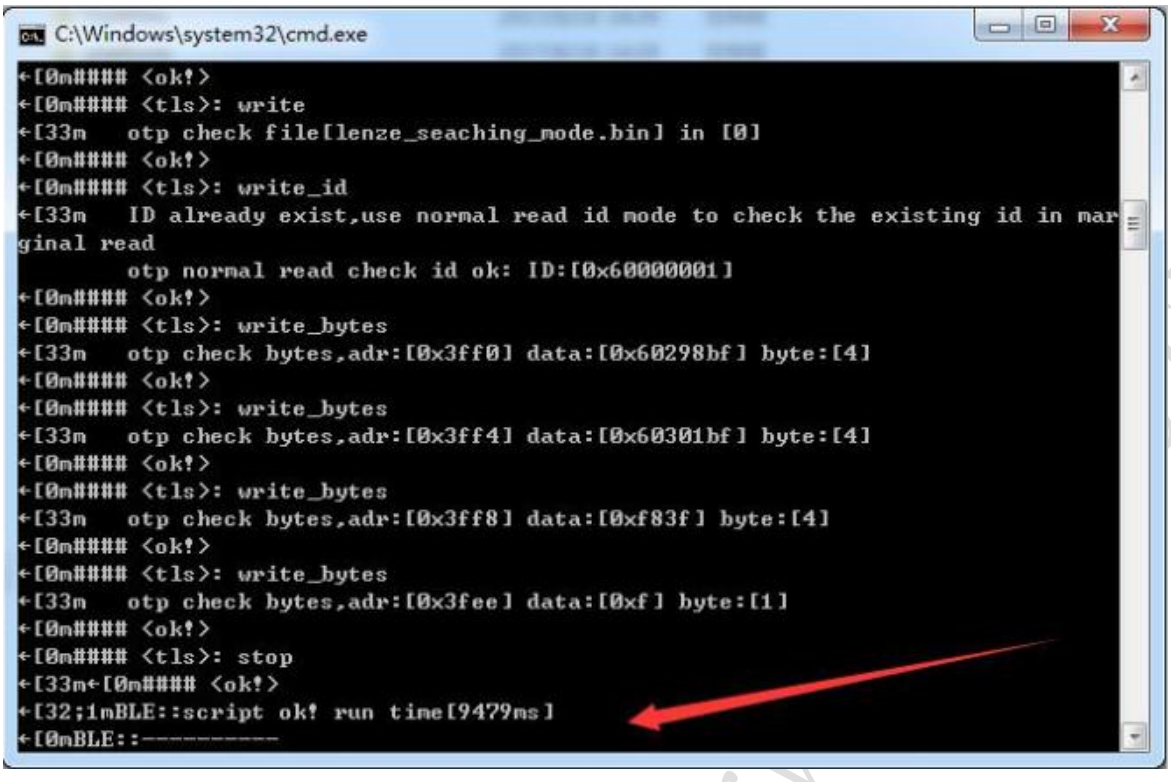
8) final step , here we are ,before this step ,**I suggest you to disconnect the EVK to computer to reset the EVK ,then reconnect to the pc :**



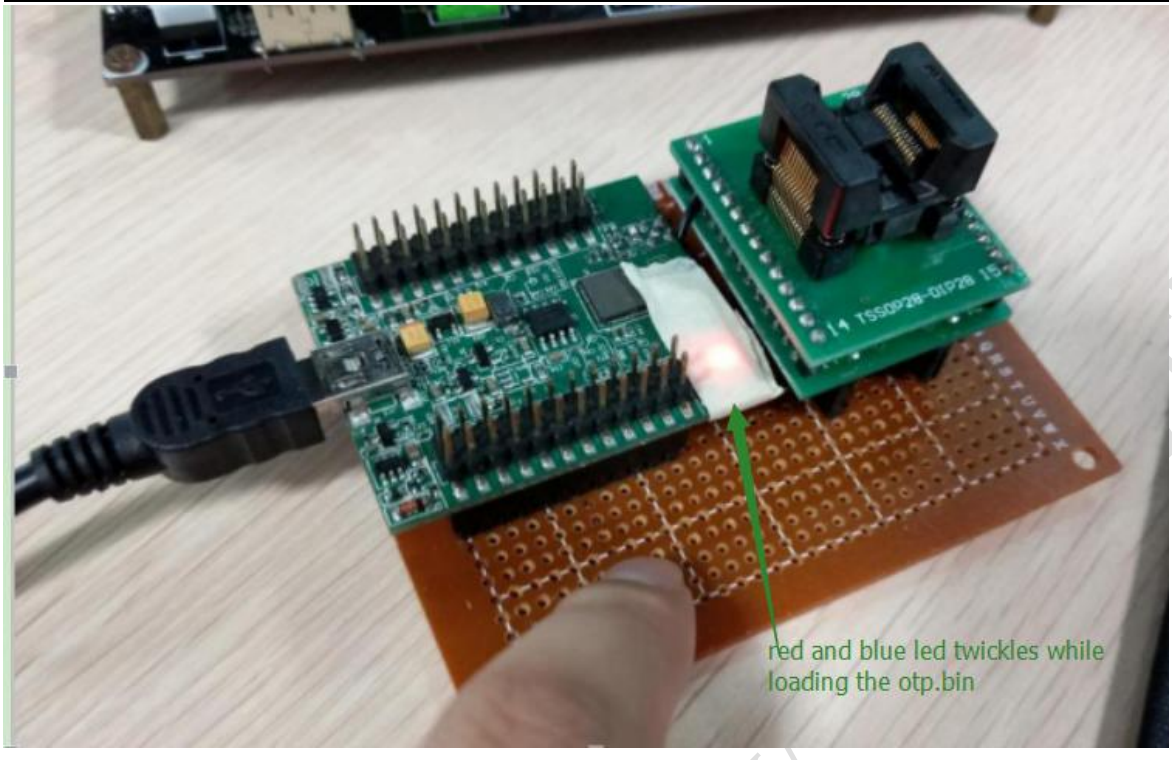
Now ,click the 'uart_no_color.bat' where the arrow targeted ,and then **short circuit the pin22 and GND for 1 time and release them ,this will start the otp loading process.**

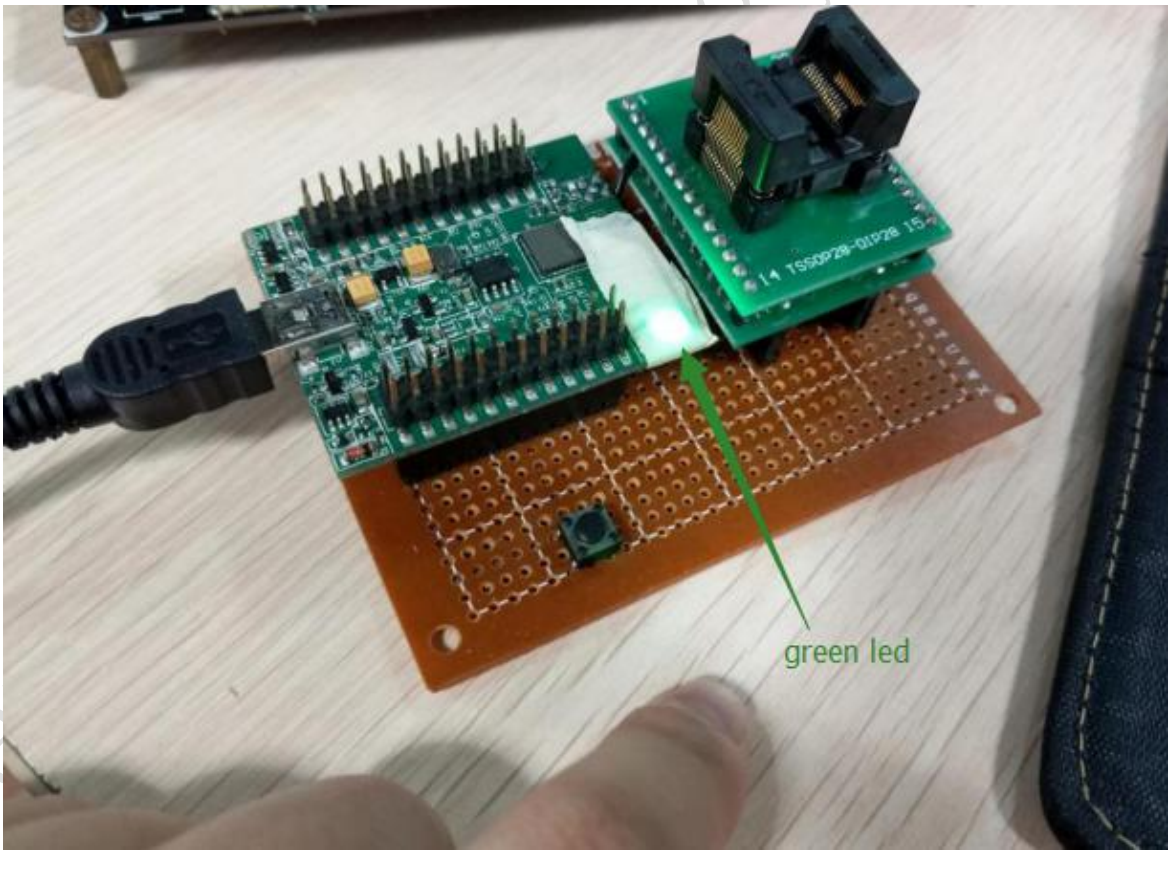


Almost at the same time , in the cmd.exe window ,you can see the status of loading the OTP.bin .



And during **the otp loading process**,the led on the EVK board will turning from off to red and blue,and finally ,green or white(where green means otp loading success ,and white means failure) .





Please refer to the document "***Application Note: lenze Tcdb User Guide***" to learn about memory access command format. For example, "rf 12345 -s 4" indicates reading 4-byte data from Flash address starting from 0x12345, which is equivalent to operation of example a).

And after you finish these steps ,Go ahead and test whether the function and the power consumption is normal ,and don’t forget to save it with a name and date ,as below .