

# **AW-CU300V2-EVB**

## **AW-CU300 V2 Evaluation Board**

### **User Guide**

**Rev. 02**

**(For Standard)**

## Revision History

Version	Revision Date	Description	Initials	Approved
01	2020/07/23	● Initial Version	Renton Tao	N.C. Chen
02	2021/11/29	● Update to new EVB ● Update to new format	Renton Tao	N.C. Chen

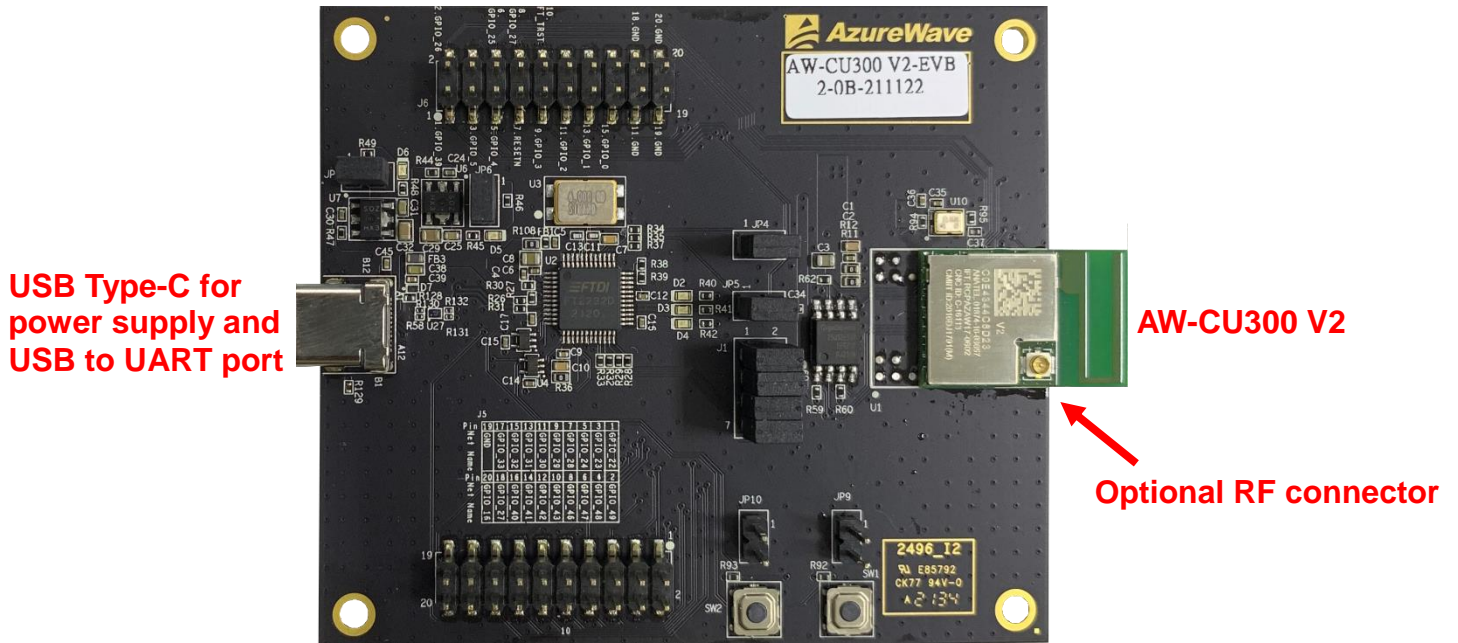
## **Contents**

- 1. System Setup**
- 2. Normal Link Test**
- 3. Re-write Flash for Other Purpose**
- 4. WLAN RF Test (w/ MFG FW)**
- 5. EVB Attachment**

# 1. System Setup

## 1-1. Hardware Requirements

- AW-CU300V2-EVB
- Windows system (OS later than Windows XP) for Labtool.
- Vector Signal Analyzer/WLAN analyzer for transmit measurements.
- WLAN signal generator for receiver measurements.
- RF isolation chamber for receive measurements.
- RF attenuators
- RF cable

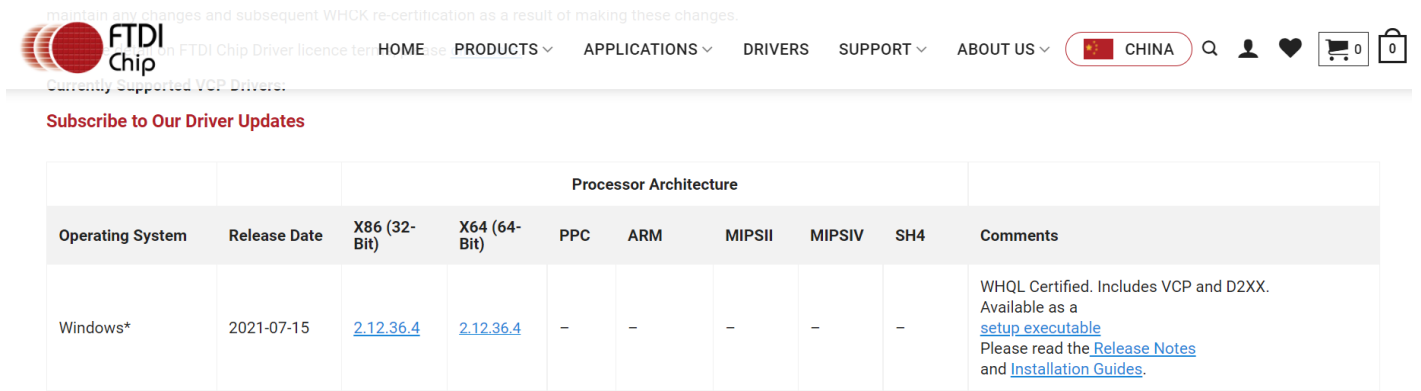


## 1-2. Environment set up

### 1-2-1. Download and Install FTDI VCP Drivers (FT2232D)

Install the driver manually. You can get the driver from FTDI's web site.

<http://www.ftdichip.com/Drivers/VCP.htm>



maintain any changes and subsequent WHCK re-certification as a result of making these changes.

FTDI Chip

HOME PRODUCTS APPLICATIONS DRIVERS SUPPORT ABOUT US CHINA

Currently Supported VCP Drivers:

Subscribe to Our Driver Updates

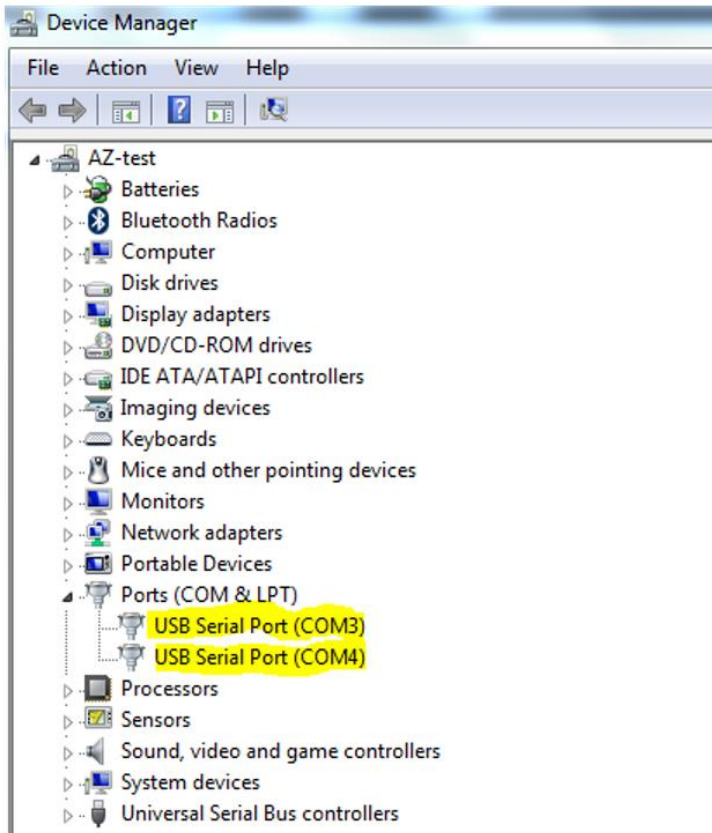
Operating System	Release Date	Processor Architecture							Comments
		X86 (32-Bit)	X64 (64-Bit)	PPC	ARM	MIPSII	MIPSIV	SH4	
Windows*	2021-07-15	<a href="#">2.12.36.4</a>	<a href="#">2.12.36.4</a>	-	-	-	-	-	WHQL Certified. Includes VCP and D2XX. Available as a <a href="#">setup executable</a> . Please read the <a href="#">Release Notes</a> and <a href="#">Installation Guides</a> .

### Verifying Driver Installation:

To verify that driver installation has completed successfully, you can open the "Device Manager" (right-click My Computer, select Properties).

In the System Properties windows, select Hardware, Device Manager.

Two "USB Serial Port" should be listed under MY-PC\Ports (COM & LPT)



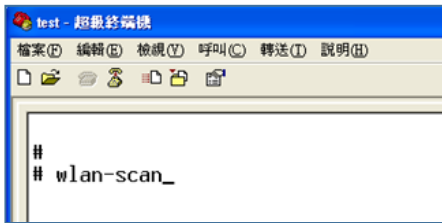
## 2. Normal Link Test

Open OS terminal and set USB comport (reference to the page9), set baud-rate as 115200

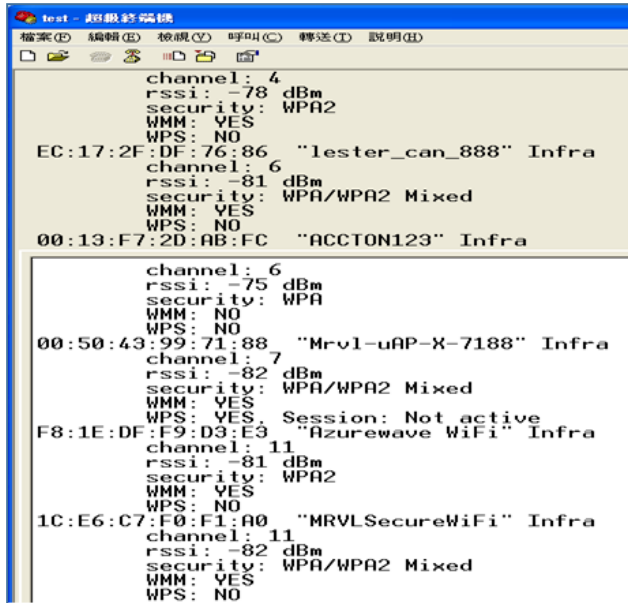
Enter cmd “help” on the screen to see a full list of commands available for use

EX: wlan-scan

That will scan



```
test - 超級終端機
檔案(F) 編輯(E) 檢視(V) 呼叫(C) 轉送(T) 說明(H)
#
# wlan-scan_
```



```
test - 超級終端機
檔案(F) 編輯(E) 檢視(V) 呼叫(C) 轉送(T) 說明(H)
channel: 4
  rssi: -78 dBm
  security: WPA2
  WMM: YES
  WPS: NO
EC:17:2F:DF:76:86 "lester_can_888" Infra
channel: 6
  rssi: -81 dBm
  security: WPA/WPA2 Mixed
  WMM: YES
  WPS: NO
00:13:F7:2D:AB:FC "ACCTON123" Infra
channel: 6
  rssi: -75 dBm
  security: WPA
  WMM: NO
  WPS: NO
00:50:43:99:71:88 "Mrv1-uAP-X-7188" Infra
channel: 7
  rssi: -82 dBm
  security: WPA/WPA2 Mixed
  WMM: YES
  WPS: YES, Session: Not active
F8:1E:DF:F9:D3:E3 "Azurewave WiFi" Infra
channel: 11
  rssi: -81 dBm
  security: WPA2
  WMM: YES
  WPS: NO
1C:E6:C7:F0:F1:A0 "MRVLSecureWiFi" Infra
channel: 11
  rssi: -82 dBm
  security: WPA/WPA2 Mixed
  WMM: YES
  WPS: NO
```

### 3.Re-write Flash for Other Purpose

For other MCU test purpose, user has to re-write the flash to update the MCU function. To re-write flash, programming through MCU JTAG interface is the suggested method.

#### 3-1-1. Download Libusb-win32

To identify the COM port of FT232 for JTAG interface, libusb is needed.

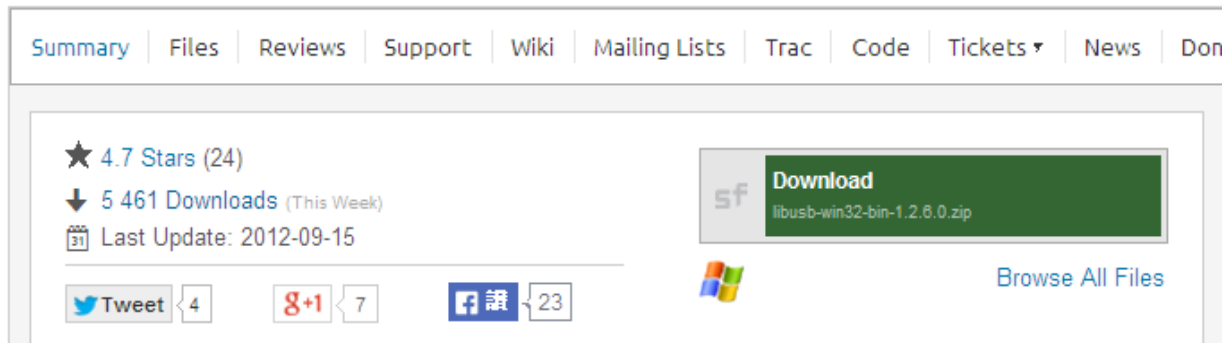
You can get the driver from libusb-win32's web site.

<http://sourceforge.net/projects/libusb-win32>

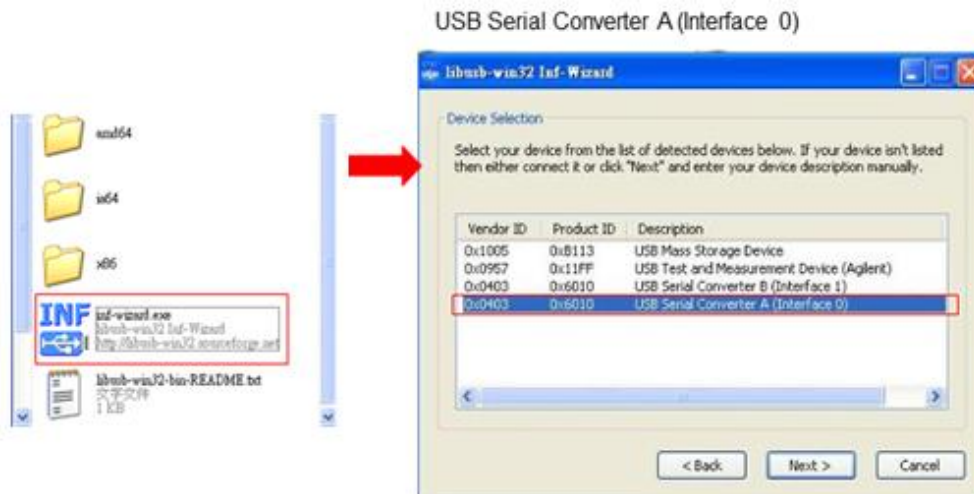
Home / Browse / Software Development / libusb-win32 /

## libusb-win32

Brought to you by: [ste\\_meyer](#), [trobinso](#), [xiaofanc](#)



#### Install Libusb-win32

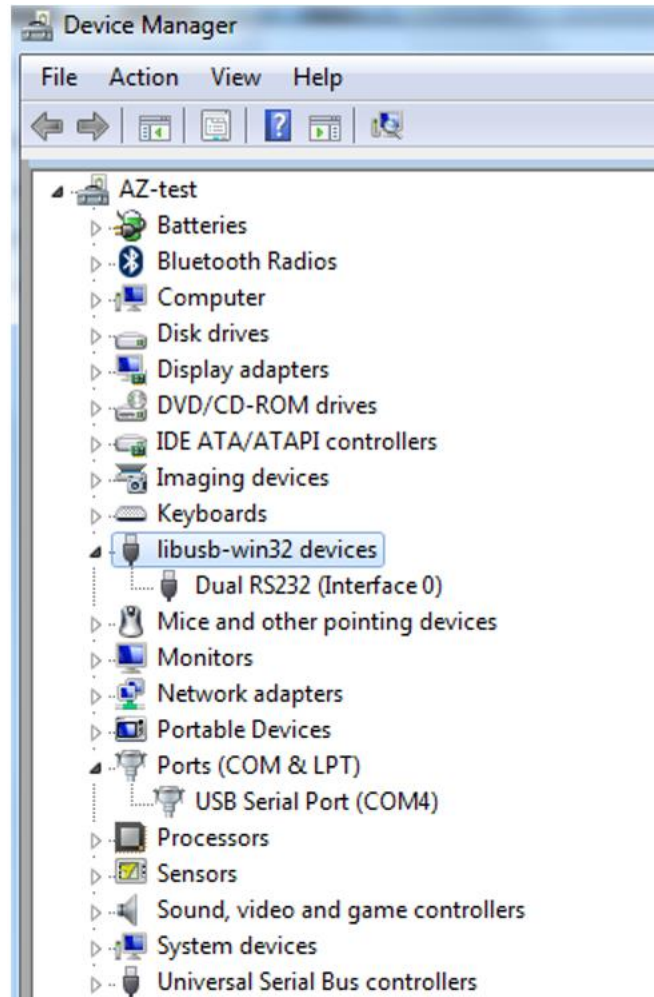


#### Verifying Driver Installation:

To verify that driver installation has completed successfully, you can open the "Device Manager" (right-click My Computer, select Properties).

In the System Properties windows, select Hardware, Device Manager.

One "USB Serial Converter A" should be listed under MY-PC\Ports (lib usb-win32 devices)



### 3-1-2. Download and Install Cygwin

#### Install Cygwin:

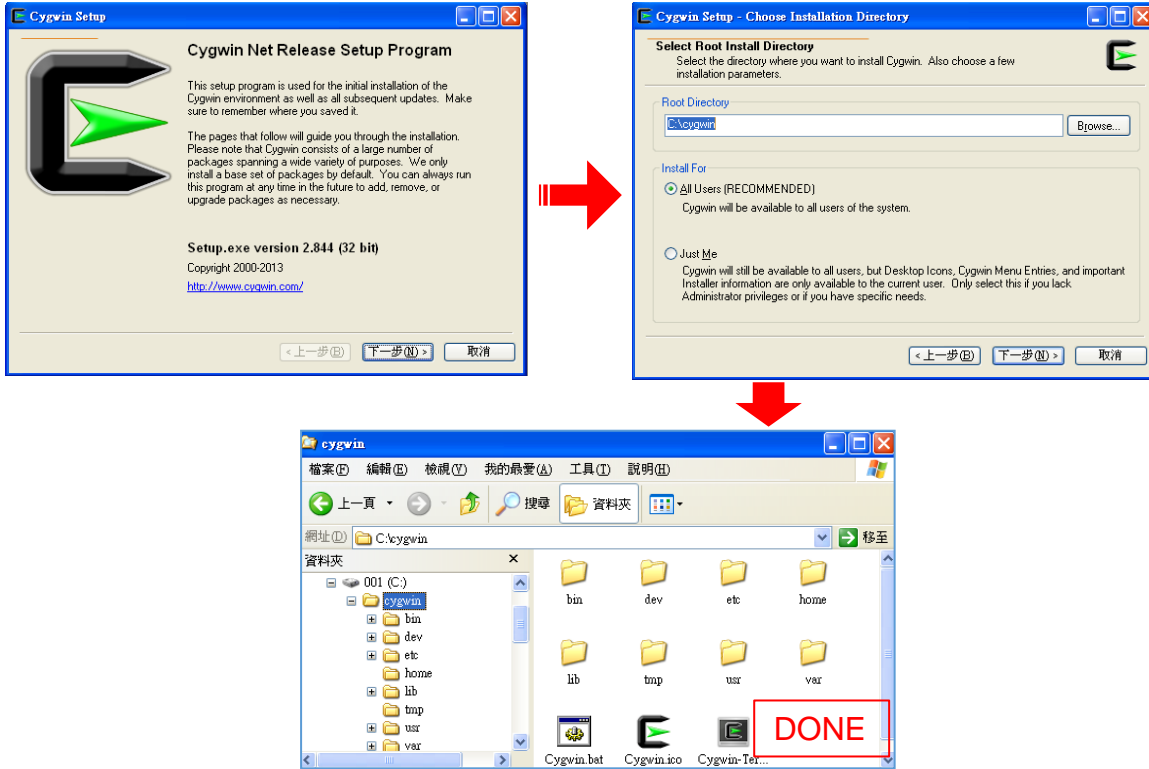
1. Download Cygwin from: <http://www.cygwin.com/setup-x86.exe> (for x86 32-bit systems) or [http://www.cygwin.com/setup-x86\\_64.exe](http://www.cygwin.com/setup-x86_64.exe) (for x86 64-bit systems)
2. Select the option Install from Internet
3. Use default installation path: c:\cygwin. If you chose an alternate installation directory, please make sure that there are no spaces in the path.
4. Pick the Local Package Directory (this is the download cache directory)
5. Select the option Direct Connection
6. Select any mirror you want to use
7. Add additional packages to the default selection:

Click "Next". The Cygwin Setup window will show the progress as each package gets installed.

#### Note:

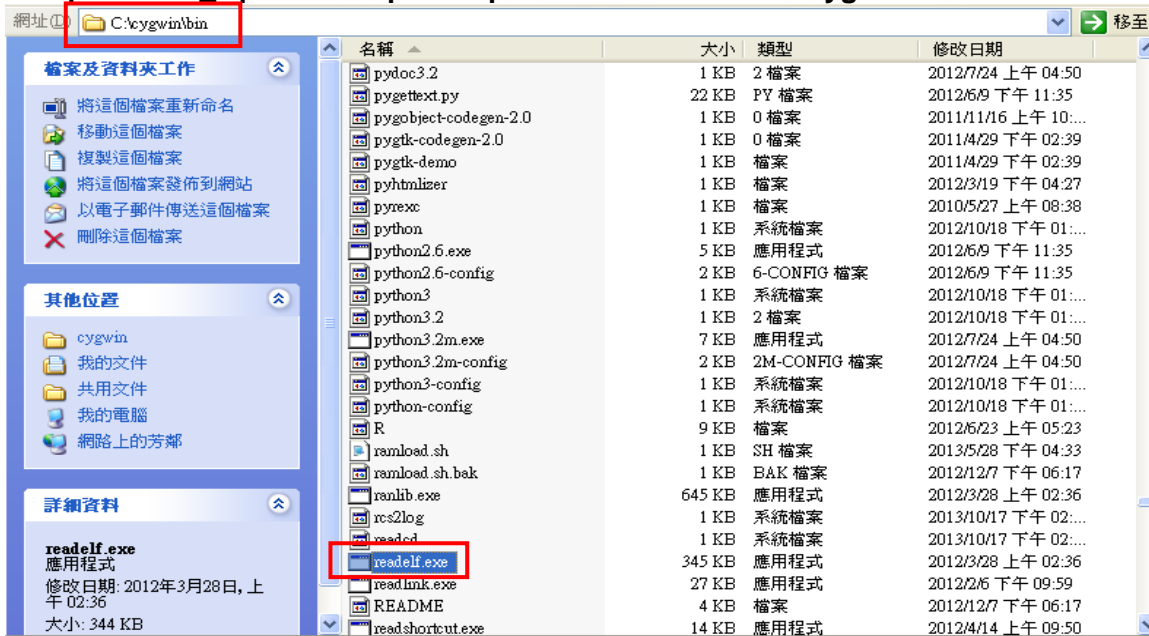
If you are not familiar with cygwin, please visit <http://cygwin.com/> for additional information and details. In particular, the Cygwin User Guide (<http://cygwin.com/cygwin-ug-net/>) is a good resource for new users.



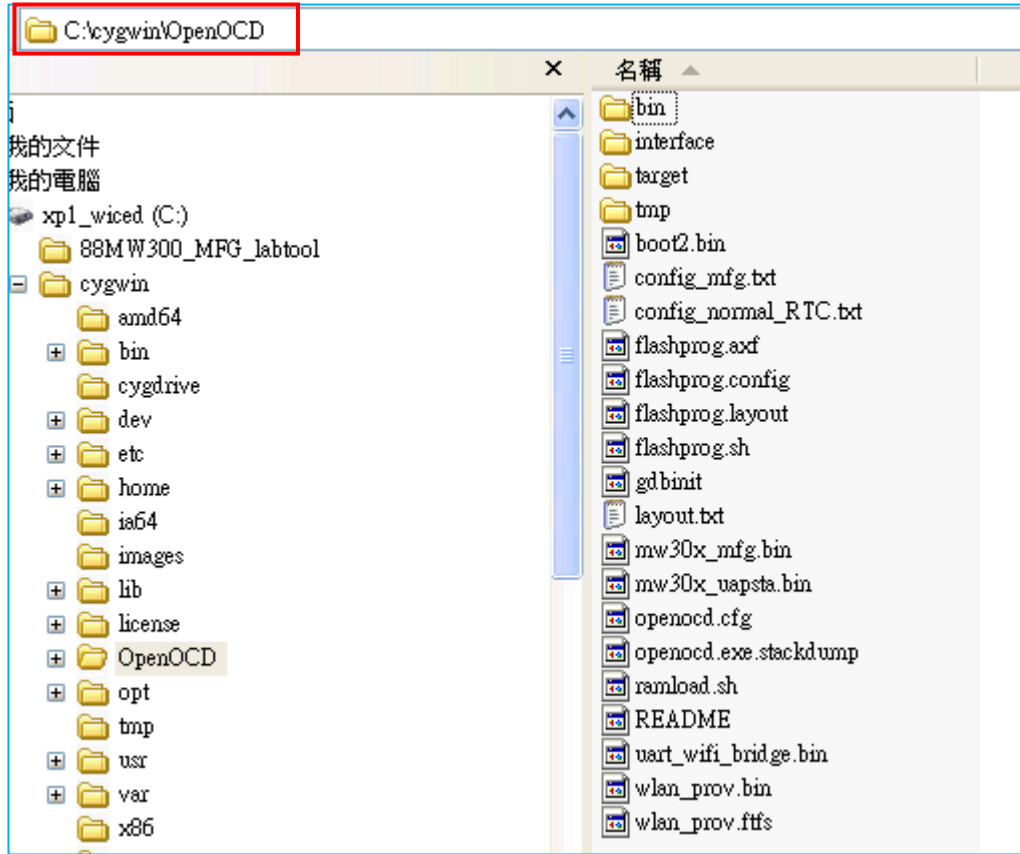


### 3-1-3 Insert file "OpenOCD.zip" for FW burn in.

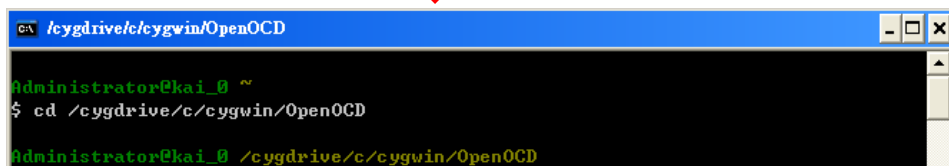
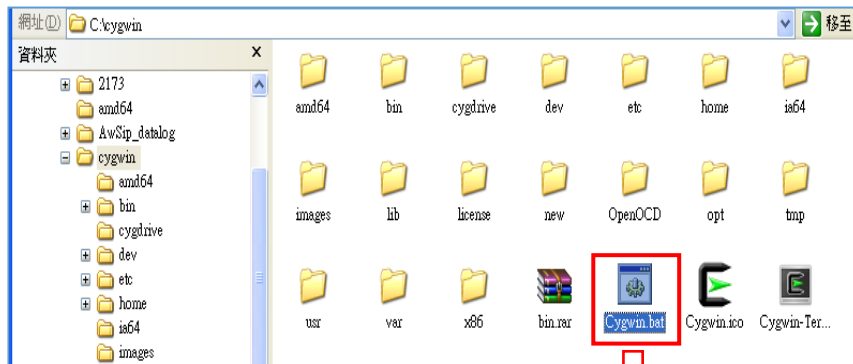
Unzip "CU300\_OpenOCD.zip" and put "readelf.exe" to C:\cygwin\bin



Unzip "CU300\_OpenOCD.zip" and put them to C:\cygwin\



### Execute Cygwin.bat



Move to working folder

```

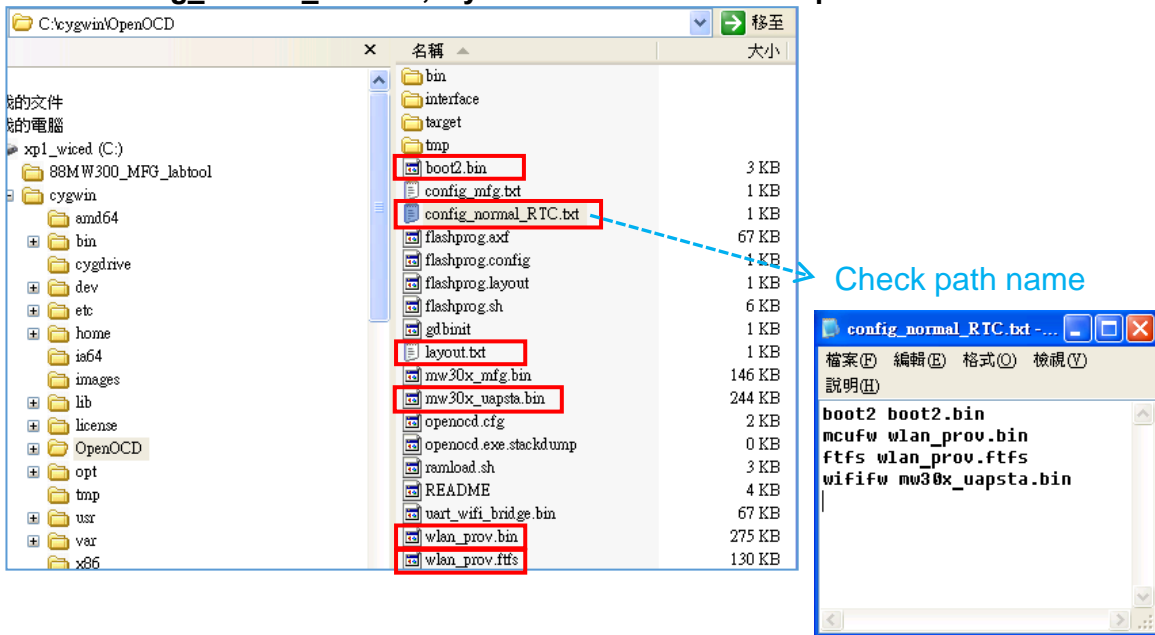
c:\ /cygdrive/c/cygwin/OpenOCD
Administrator@kai_0 ~
$ cd /cygdrive/c/cygwin/OpenOCD
Administrator@kai_0 /cygdrive/c/cygwin/OpenOCD
  
```

### 3-1-4 Burn in FW for RF testing

Example.

A. Link test with RF normal FW(default):

Check config\_normal\_RTC.txt, layout.txt ... 6 files in the OpenOCD folder



Check path name

Key in cmd to burn in normal FW.

```

kai@kai-0 ~
$ cd /cygdrive/c/cygwin/OpenOCD
kai@kai-0 /cygdrive/c/cygwin/OpenOCD
$ ./flashprog.sh -l layout.txt -b config_normal_RTC.txt
  
```

Check if all files are burn in correctly

```
C:\ /cygdrive/c/cygwin/OpenOCD
requesting target halt and executing a soft reset
target state: halted
target halted due to debug-request, current mode: Thread
xPSR: 0x01000000 pc: 0x00007f14 msp: 0x20001000
30848 bytes written at address 0x00100000
downloaded 30848 bytes in 0.250000s (120.500 KiB/s)
verified 30848 bytes in 0.406250s (74.154 KiB/s)
semihosting is enabled

Flashprog version: 2.0.5
Erasing primary flash...done
Writing new flash layout...done
Writing "boot2" @0x0 (primary)...done
Writing "mcufw" @0x7000 (primary).....done
Writing "ftfs" @0xb7000 (primary)....done
Writing "wififw" @0x117000 (primary)....done
Please press CTRL+C to exit.
Exiting.

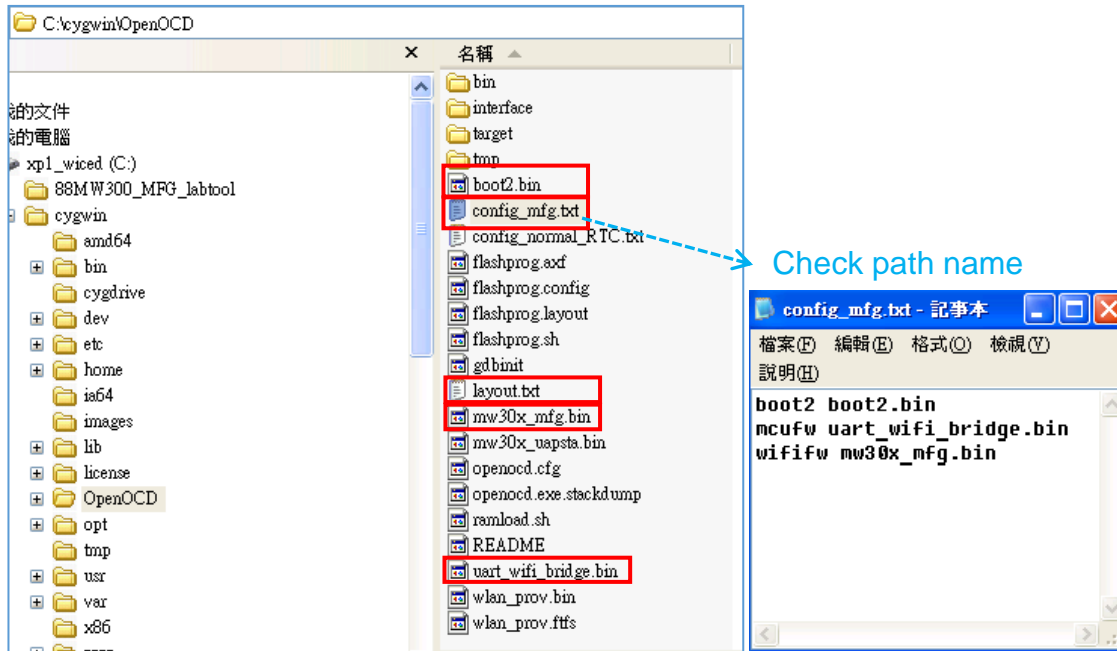
Terminated

kai@kai-0 /cygdrive/c/cygwin/OpenOCD
$ _
```

Now you can perform normal link testing. (Needs to re-boot the EVB after burning in)

## B. RF test with MFG FW:

For RF testing with MFG FW, you need to re-burn in the FW as below.  
**Check config\_mfg.txt, layout.txt ... 5files in OpenOCD folder**



**Key in cmd to burn in MFG FW.**

```
kai@kai-0 ~  
$ cd /cygdrive/c/cygwin/OpenOCD  
kai@kai-0 /cygdrive/c/cygwin/OpenOCD  
$ ./flashprog.sh -l layout.txt -b config_mfg.txt
```

**Check if all files are burn in correctly**

```
C:\ /cygdrive/c/cygwin/OpenOCD
xPSR: 0x01000000 pc: 0x00007f14 msp: 0x20001000
requesting target halt and executing a soft reset
target state: halted
target halted due to debug-request, current mode: Thread
xPSR: 0x01000000 pc: 0x00007f14 msp: 0x20001000
30848 bytes written at address 0x00100000
downloaded 30848 bytes in 0.296875s (101.474 KiB/s)
verified 30848 bytes in 0.531250s (56.706 KiB/s)
semihosting is enabled

Flashprog version: 2.0.5
Erasing primary flash...done
Writing new flash layout...done
Writing "boot2" 0x0 (primary)...done
Writing "mcufw" 0x7000 (primary)...done
Writing "wififw" 0x117000 (primary)...done
Please press CTRL+C to exit.
Exiting.

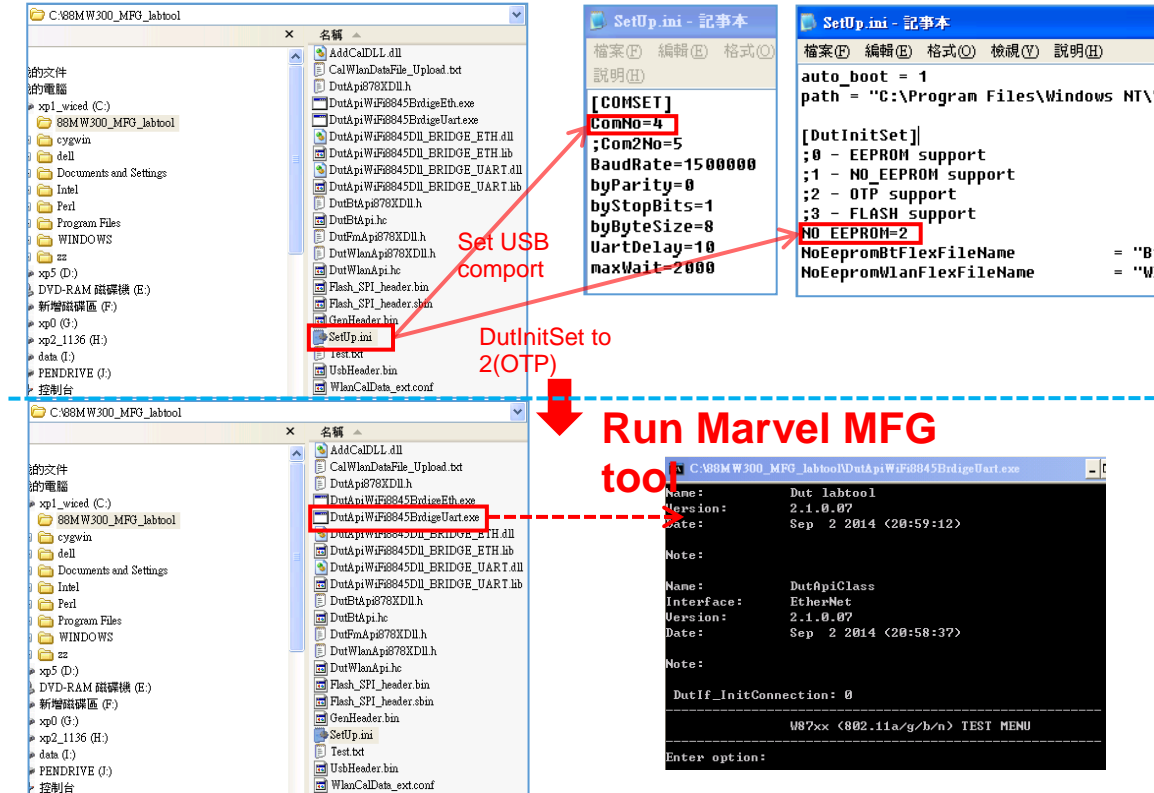
Terminated

kai@kai-0 /cygdrive/c/cygwin/OpenOCD
$
```

Now you can perform MFG RF testing. (Needs to re-boot the EVB after burning in)

# 4. RF Test (w/MFG FW)

## Run Lab tool in Windows OS.



**Set USB comport**

**DutInitSet to 2(OTP)**

**Run Marvel MFG tool**

```

[COMSET]
ComNo=4
;Con2No=5
BaudRate=1500000
byParity=0
byStopBits=1
byByteSize=8
UartDelay=10
maxWait=2000

[auto_boot]
auto_boot = 1
path = "C:\Program Files\Windows NT\

[DutInitSet]
;0 - EEPROM support
;1 - NO EEPROM support
;2 - OTP support
;3 - FLASH support
NO_EEPROM=2
NoEepromBtFlexFileName = "Bt
NoEepromWlanFlexFileName = "Wl
    
```

```

Name:          Dut labtool
Version:       2.1.0.0?
Date:         Sep 2 2014 <20:59:12>

Note:

Name:          DutApiClass
Interface:     EtherNet
Version:       2.1.0.0?
Date:         Sep 2 2014 <20:58:37>

Note:

DutIf_InitConnection: 0

U8?xx <802.11a/g/b/n> TEST MENU

Enter option:
    
```

### 4-1 Generate 802.11b/g/n Packet commands

a. Tx on CH 6 at 10 dBm with a CCK-11Mbps data rate in 20 MHz BW mode on WiFi

```

25          // Stop Tx
112 0      // Set to 20 MHz BW
12 6       // Set to CH 6
22 6 10 0  // Set to CH 6 at 10 dBm Output Power with CCK/BPSK Data Rate on WiFi
25 1 4     // Tx at 11 Mbps
    
```

b. Tx on CH 100 at 8 dBm with a MCS7 Data rate in 20 MHz BW Mode on WiFi

```

25          // Stop Tx
112 0      // Set to 20 MHz BW
12 13      // Set to CH 13
22 13 8 1  // Set to CH 13 at 8 dBm Output Power with OFDM Data Rate on WiFi
25 1 22    // Tx at MCS 7
    
```

## Data rate set up

### B mode & G mode:

1Mbps	5.5Mbps	11Mbps	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps
1	3	4	6	7	8	9	10
36Mbps	48Mbps	54Mbps					
11	12	13					

### N mode:

MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	
15	16	17	18	19	20	21	22	

After you type above command, you can measure the 802.11b/g/n packet by your RF test instrument (exp: Agilent 4010, IQview...).

## 4-2 Generate 802.11 b/g/n continuous symbol Commands

a. Cont. Tx on CH 7 at 8 dBm with a MCS7 Data rate in 20 MHz BW Mode on WiFi

```

17 // Stop Cont. Tx
25 // Stop Tx
112 0 // Set to 20 MHz BW
12 7 // Set to CH 36
22 7 8 1 // Set to CH 36 at 8 dBm Output Power with MCS Data Rate on WiFi
25 1 22 // Tx at MCS 7
25 // Stop Tx
17 1 22 // Cont. Tx at MCS7
17 // Stop Cont. Tx
  
```

## 4-3 Test RX sensitivity Commands

a. Rx on CH 7 in 20 MHz BW Mode on WiFi

```

25 // Stop Tx
112 0 // Set to 20 MHz BW
12 7 // Set to CH 7
31 // Clear all the received packets
32 // Get Rx Packet Count and then clear the Rx packet counter
  
```

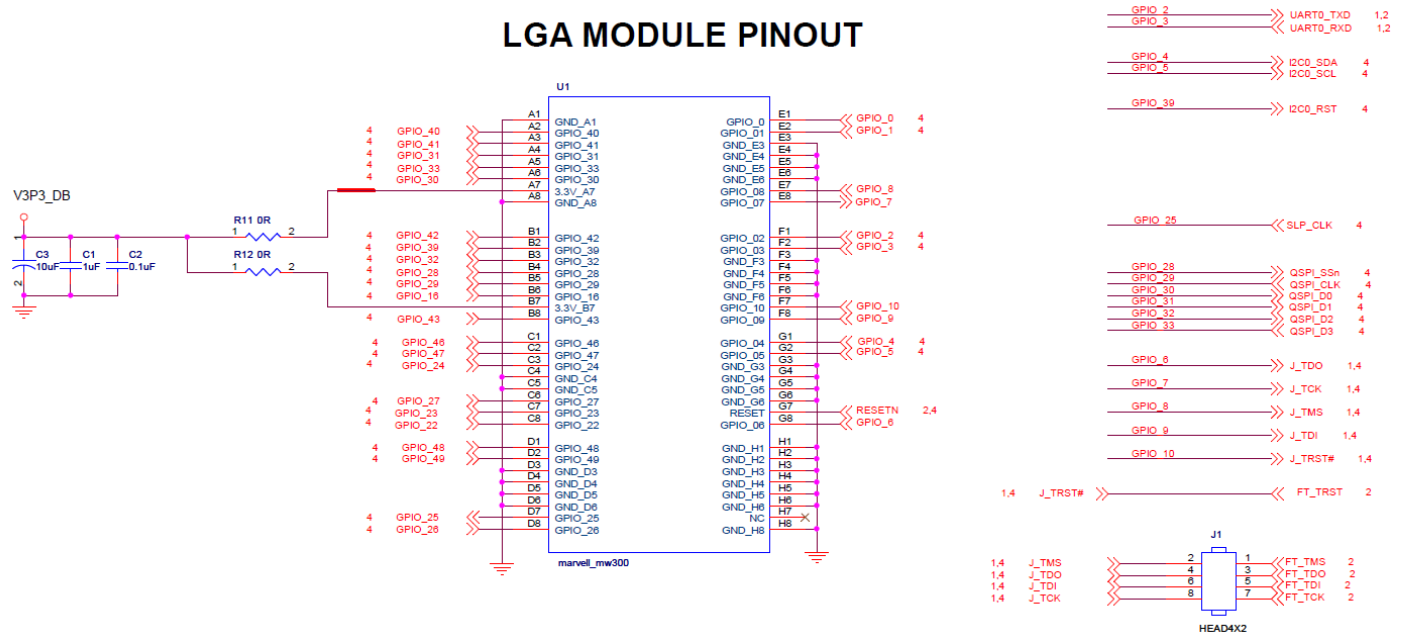
## 4-4 Others Commands

- (1) **Command 45**→ Check the MAC
- (2) **Command 99**→ Quit the test mode/ Quit the MFG tool

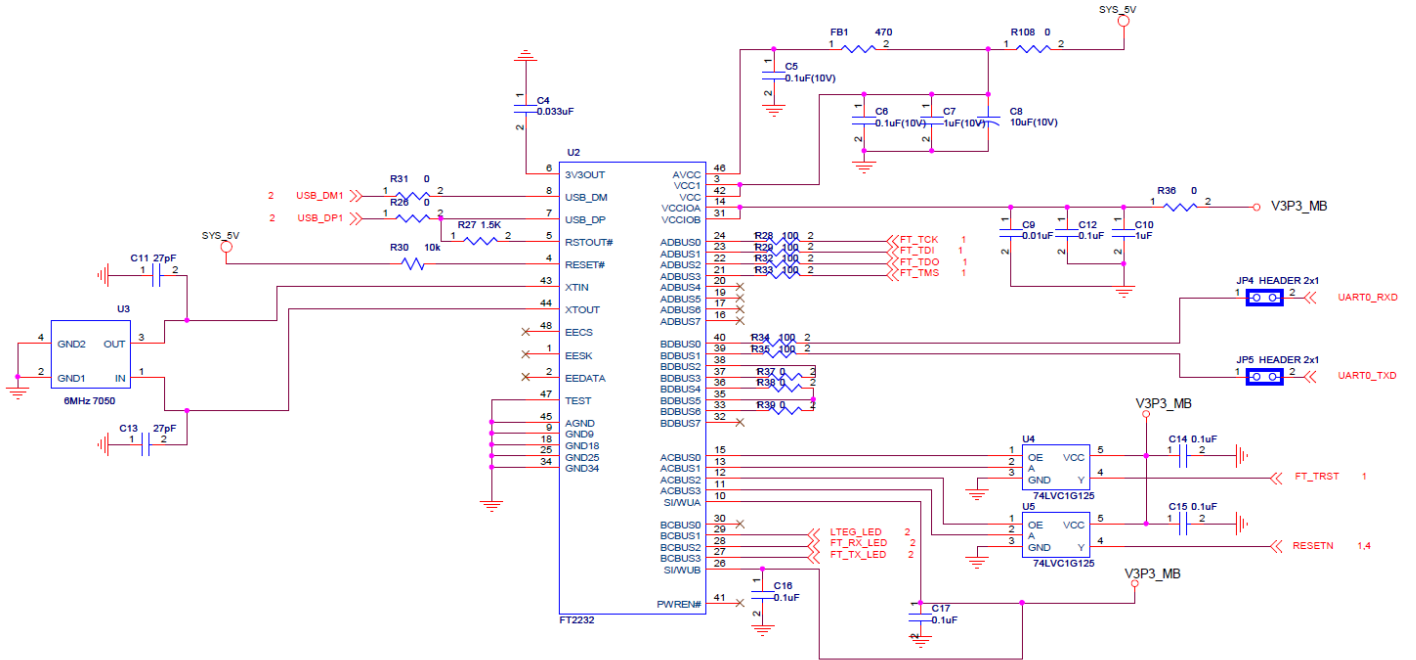


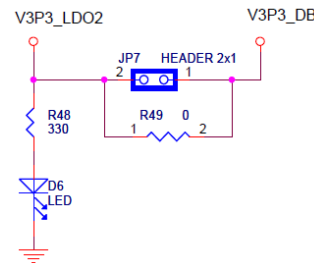
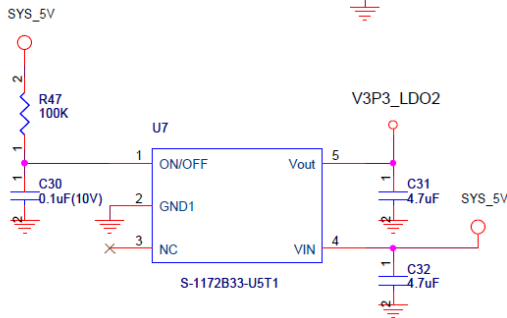
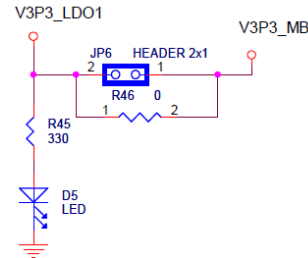
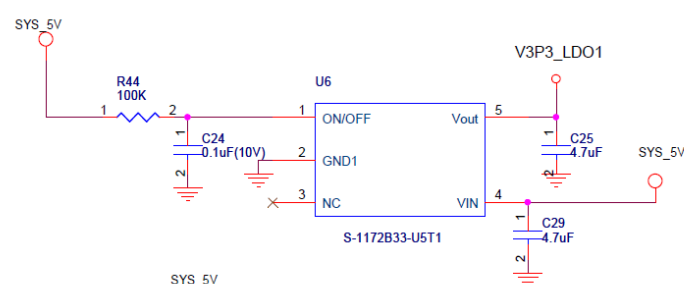
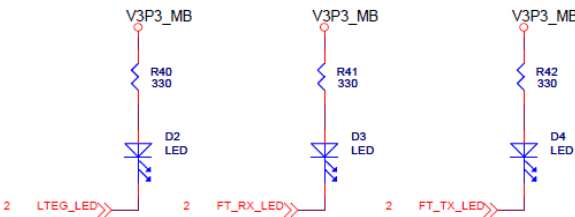
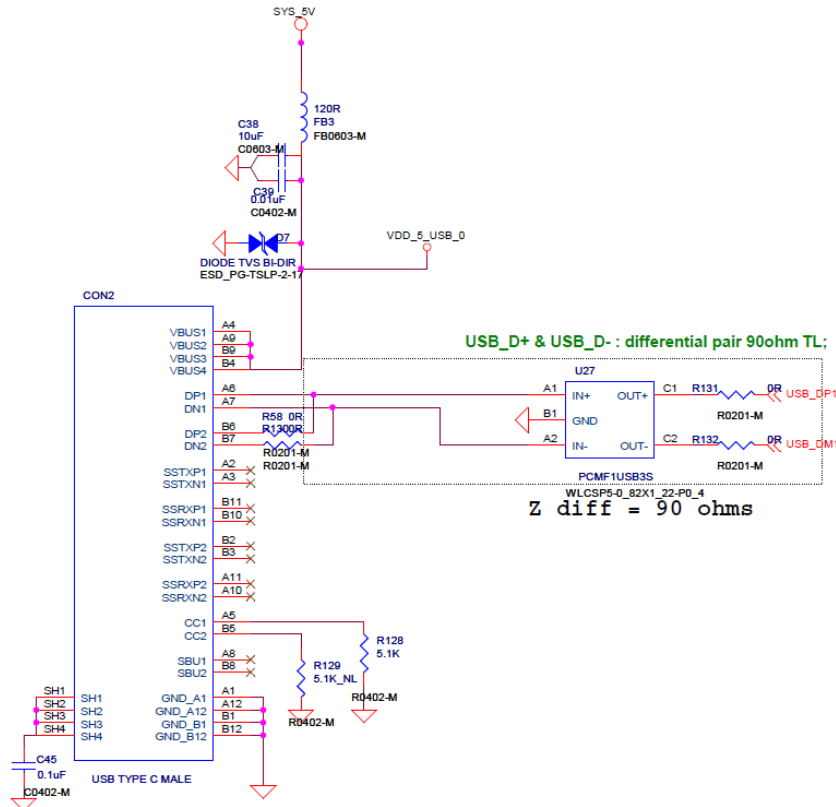
# 5. EVB Attachment

## LGA MODULE PINOUT

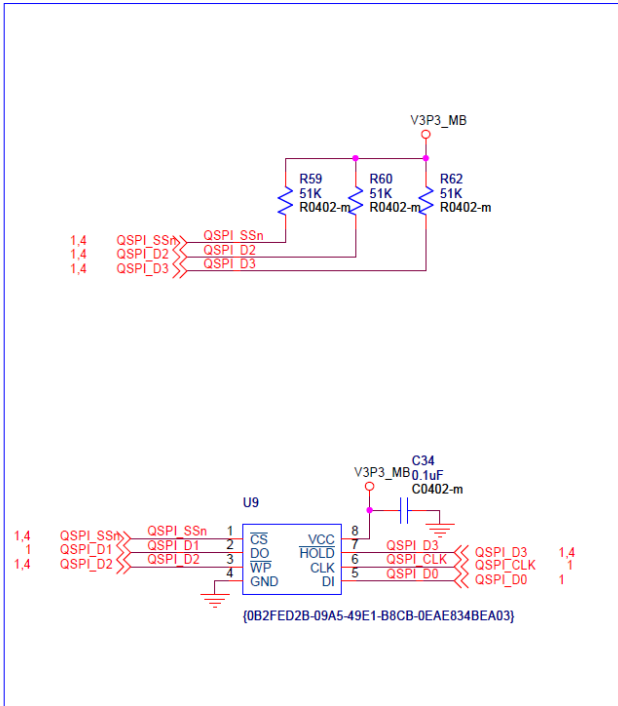


## USB to UART/JTAG interface

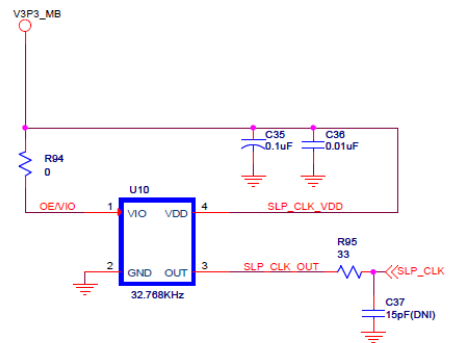




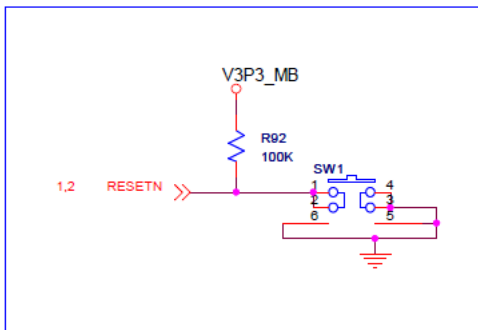
## QSPI FLASH



## Sleeping Clock (Option by software)



## System reset



## Jtag reset

