

AW-CU484

IEEE 802.15.4 and Bluetooth LE 5.0 wireless microcontroller Stamp LGA Module

User Guide

Rev. A

(For Standard)

Revision History

Version	Revision Date	Description	Initials	Approved
A	2020/10/19	● Initial Version	Jeff Kuo	N.C. Chen

1. System Setup

(1) Hardware Requirements

- AW-CU484 Module test board
- Host system need running the Window10 x64 operating system
- Vector Signal Analyzer/WLAN analyzer for transmit measurements.
- WLAN signal generator for receiver measurements.
- RF isolation chamber for receive measurements.
- RF attenuators
- RF cable
- NFC reader

(2) Software Requirements

- PL-2303 GPIO Test (tool)

PL2303HxD_GPIO > PL2303HxD 4 GPIO_bin

名稱	修改日期	類型	大小
 PL-2303 4 GPIOTest.exe	2020/8/11 上午 1...	應用程式	300 KB

- Tera Term (tool)












Note: Tera Term is our suggestion, you can try any terminal tool.

名稱	修改日期	類型	大小
 teraterm-4.63.exe	2009/9/8 下午 04...	應用程式	7,045 KB

- DK6Production flash programmer folder (please contact FAE)

Note: You must have below files

機磁碟 (C:) > nxp > DK6ProductionFlashProgrammer

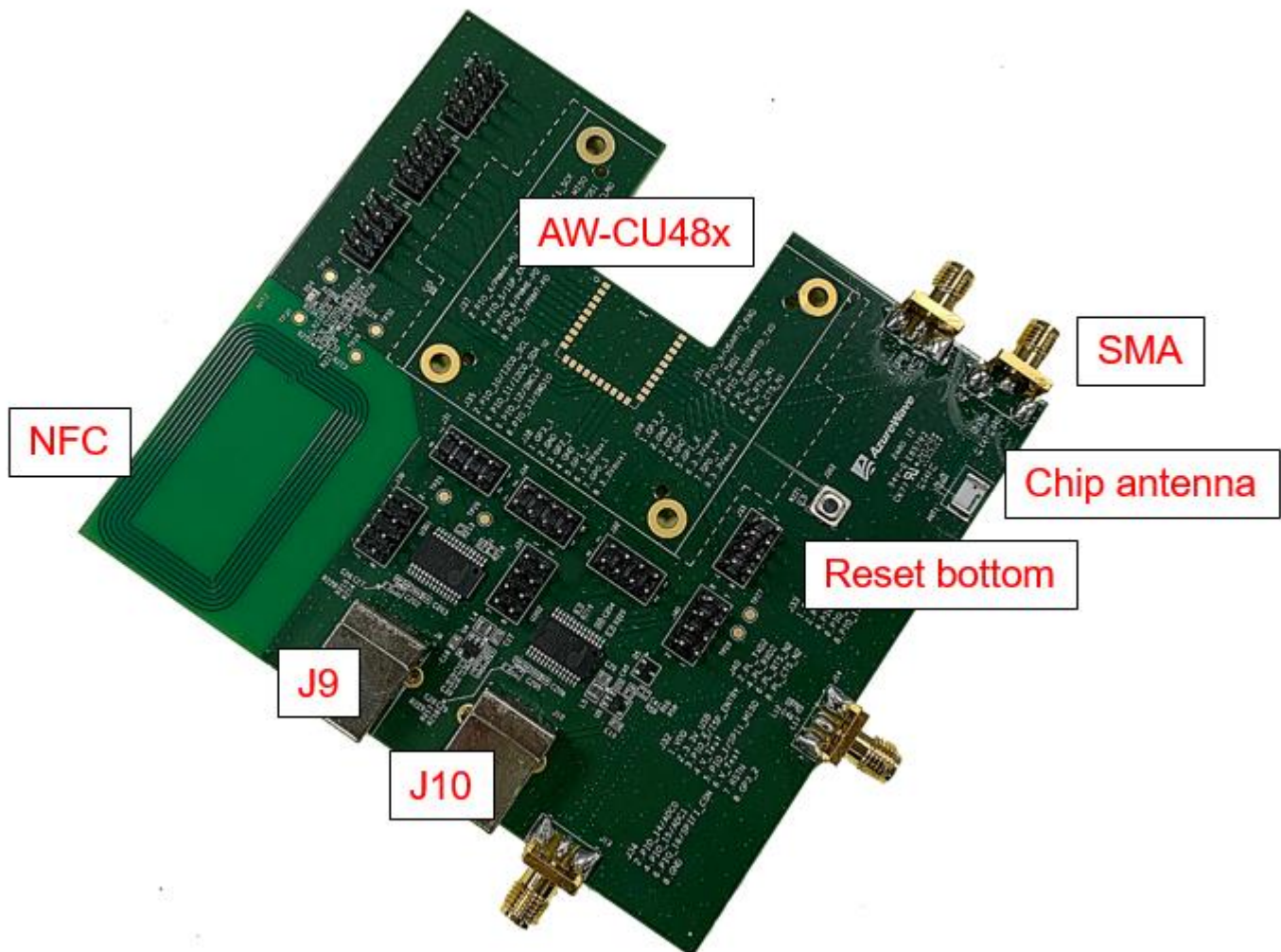
名稱	修改日期	類型	大小
 DK6Programmer.exe	2019/11/16 上午 02:02	應用程式	588 KB
 ftd2xx.dll	2019/5/28 下午 07:15	應用程式擴充	215 KB
 jn5189dk6_hello_world.bin	2020/4/15 上午 10:11	BIN 檔案	17 KB
 JN-AN-1242-JN518x-Customer-Module-Evaluation-Tool.bin	2020/2/28 下午 05:23	BIN 檔案	69 KB
 JN-AN-1242-K32W061-Customer-Module-Evaluation-Tool.bin	2020/5/1 下午 09:52	BIN 檔案	56 KB
 libgcc_s_dw2-1.dll	2019/5/28 下午 07:15	應用程式擴充	110 KB
 pdcurses.dll	2019/5/28 下午 07:15	應用程式擴充	116 KB
 programmer.dll	2019/11/16 上午 02:02	應用程式擴充	972 KB
 qn9090dk6_hci_black_box_bm.bin	2020/3/3 下午 02:03	BIN 檔案	149 KB
 qn9090dk6_hello_world.bin	2020/2/20 上午 10:53	BIN 檔案	21 KB
 uninstall.exe	2020/2/13 下午 02:22	應用程式	323 KB

- Mbt.exe (please contact FAE)

Note: mbt is our suggestion, you can try any hci tool.

名稱	修改日期	類型	大小
 mbt.exe	2020/7/21 上午 1...	應用程式	50 KB
 mbt_setup.ini	2020/7/21 下午 0...	組態設定	1 KB

2. AW-CU484 EVB

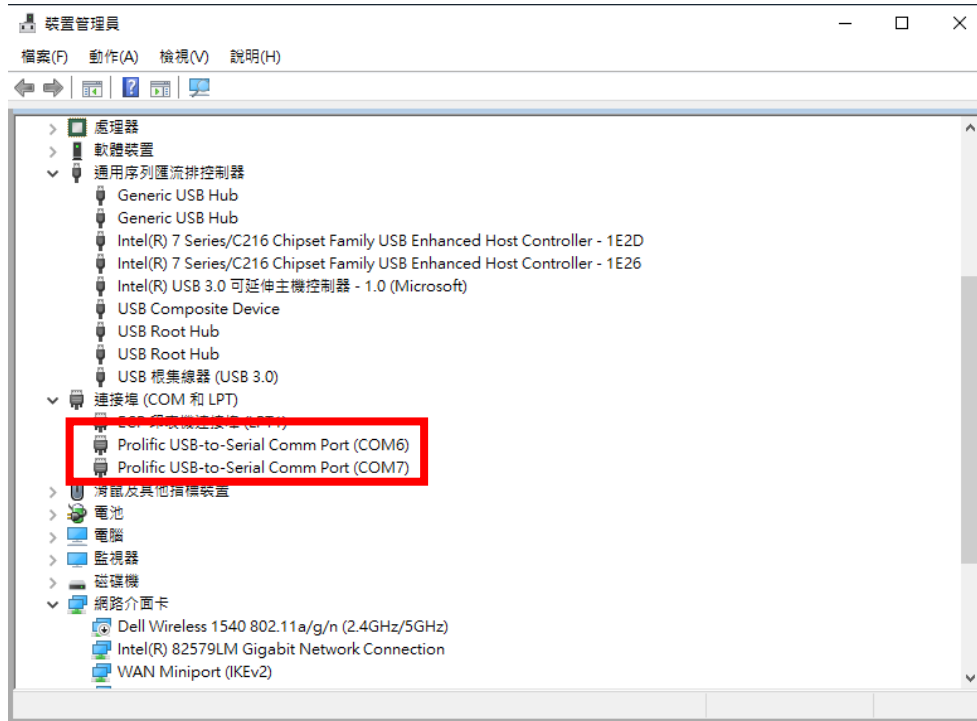


3. How to download the image

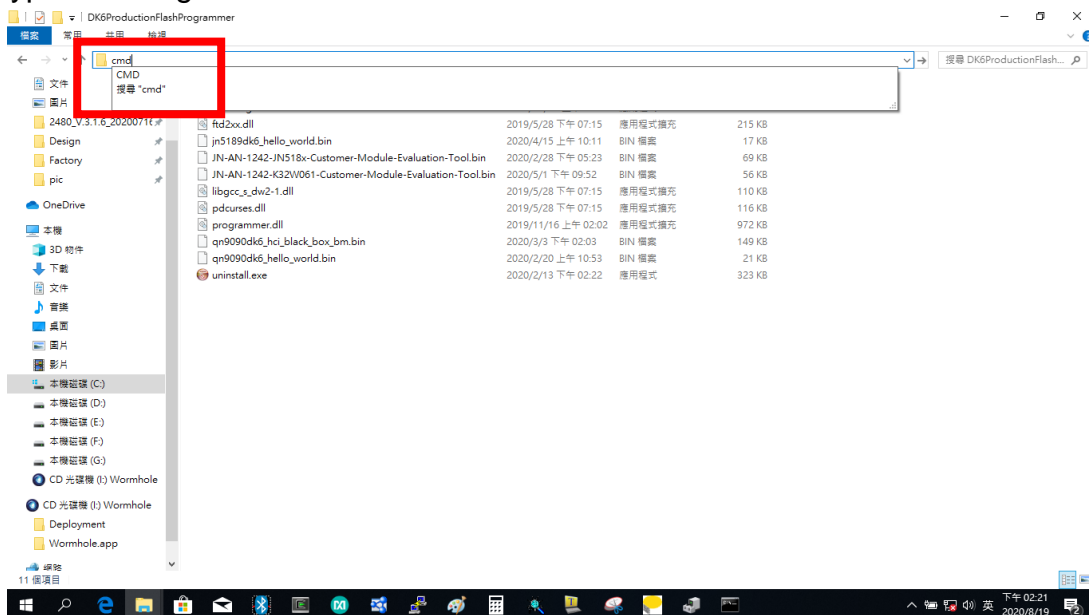
1. You must check the COM number (can check the value by the following picture)

Note: J9 for DUT COM port

J10 for PL2303 control Test/Normal mode.



2. Find the folder of DK6ProductionFlashProgrammer.
And type cmd to get into the Dos window.



3. Key in

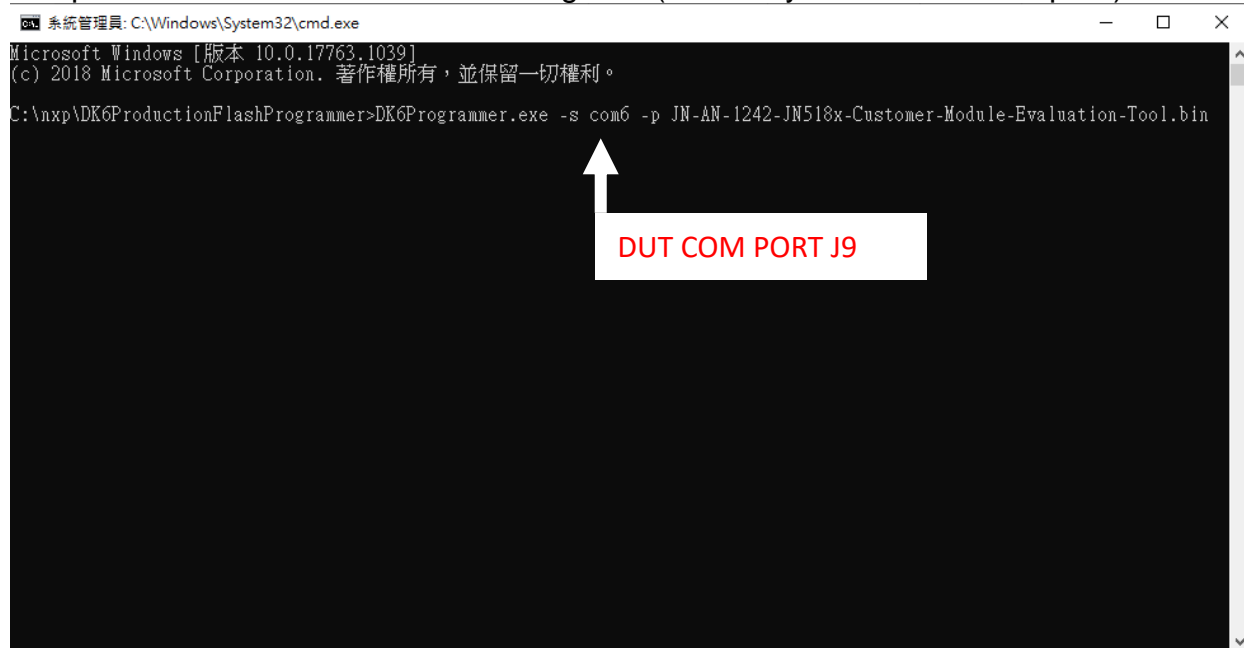
ZIGBEE IMAGE:

DK6Programmer.exe -s com6 -p JN-AN-1242-JN518x-Customer-Module-Evaluation-Tool.bin

BLE IMAGE:

DK6Programmer.exe -s com6 -p qn9090dk6_hci_black_box_bm.bin

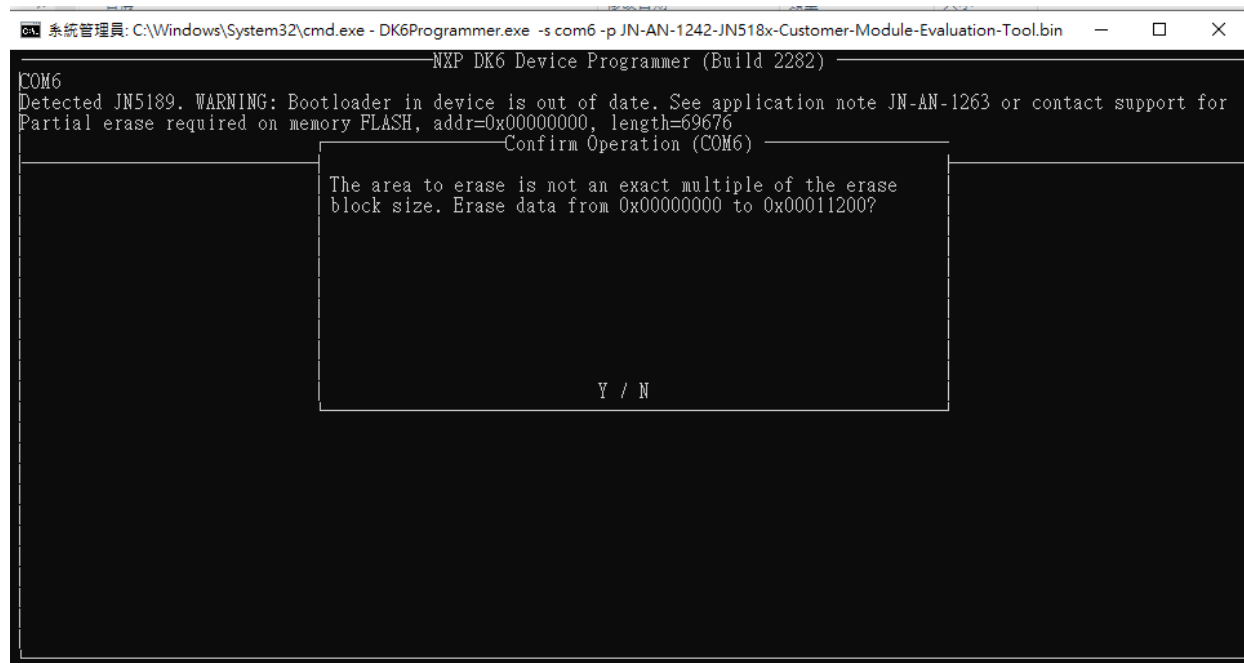
To open the tool and download the image file (com6 is your DUT J9 Com port)



```
系统管理员: C:\Windows\System32\cmd.exe
Microsoft Windows [版本 10.0.17763.1039]
(c) 2018 Microsoft Corporation. 著作權所有，並保留一切權利。
C:\npx\DK6ProductionFlashProgrammer>DK6Programmer.exe -s com6 -p JN-AN-1242-JN518x-Customer-Module-Evaluation-Tool.bin
```

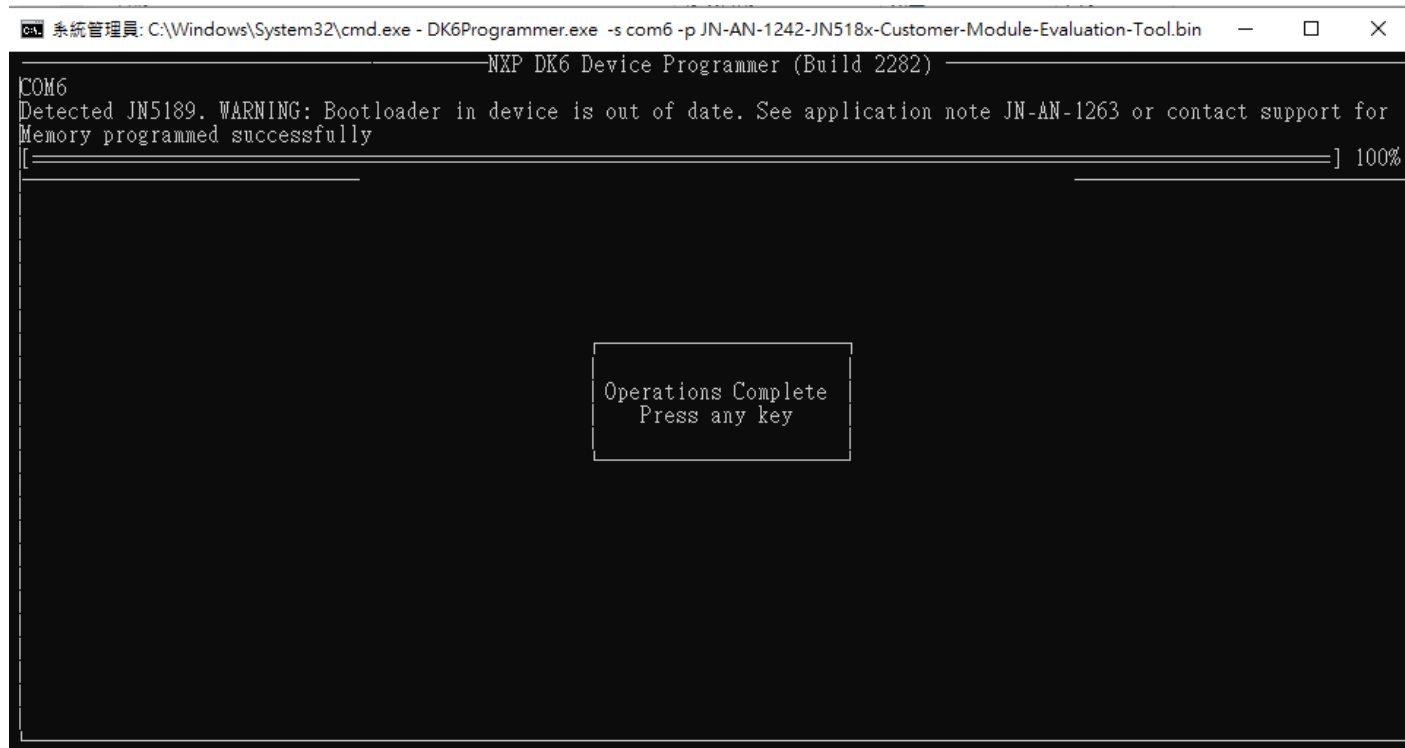
DUT COM PORT J9

4. Select Y



```
系统管理员: C:\Windows\System32\cmd.exe - DK6Programmer.exe -s com6 -p JN-AN-1242-JN518x-Customer-Module-Evaluation-Tool.bin
NXP DK6 Device Programmer (Build 2282)
COM6
Detected JN5189. WARNING: Bootloader in device is out of date. See application note JN-AN-1263 or contact support for
Partial erase required on memory FLASH, addr=0x00000000, length=69676
Confirm Operation (COM6)
The area to erase is not an exact multiple of the erase
block size. Erase data from 0x00000000 to 0x00011200?
Y / N
```

5. Finish



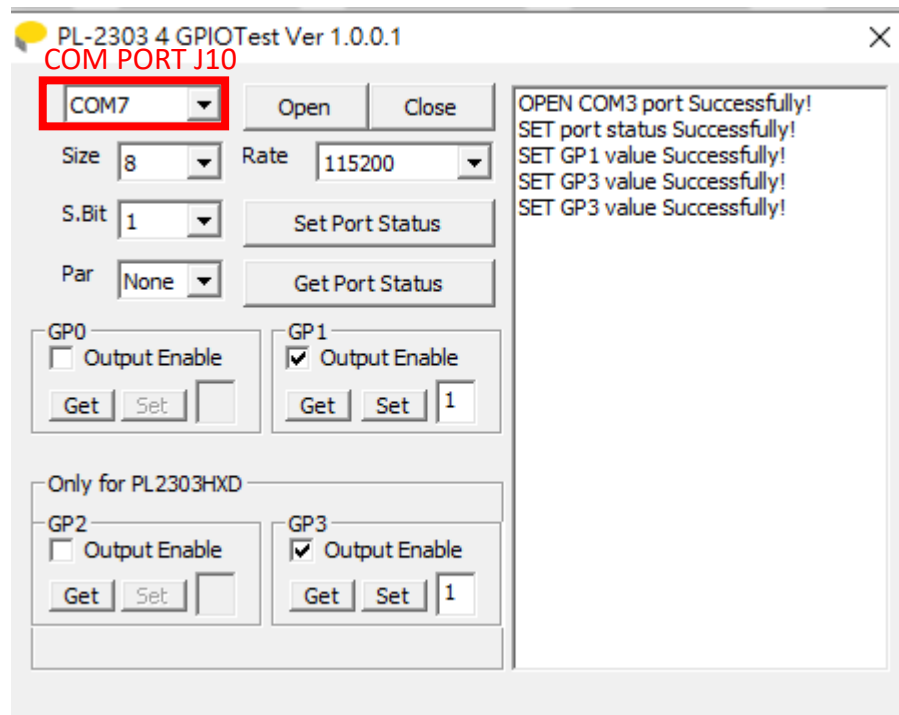
The screenshot shows a Windows command prompt window titled "系統管理員: C:\Windows\System32\cmd.exe - DK6Programmer.exe -s com6 -p JN-AN-1242-JN518x-Customer-Module-Evaluation-Tool.bin". The window displays the output of the NXP DK6 Device Programmer (Build 2282). The text in the window is as follows:

```
COM6
Detected JN5189. WARNING: Bootloader in device is out of date. See application note JN-AN-1263 or contact support for
Memory programmed successfully
[=====] 100%

Operations Complete
Press any key
```

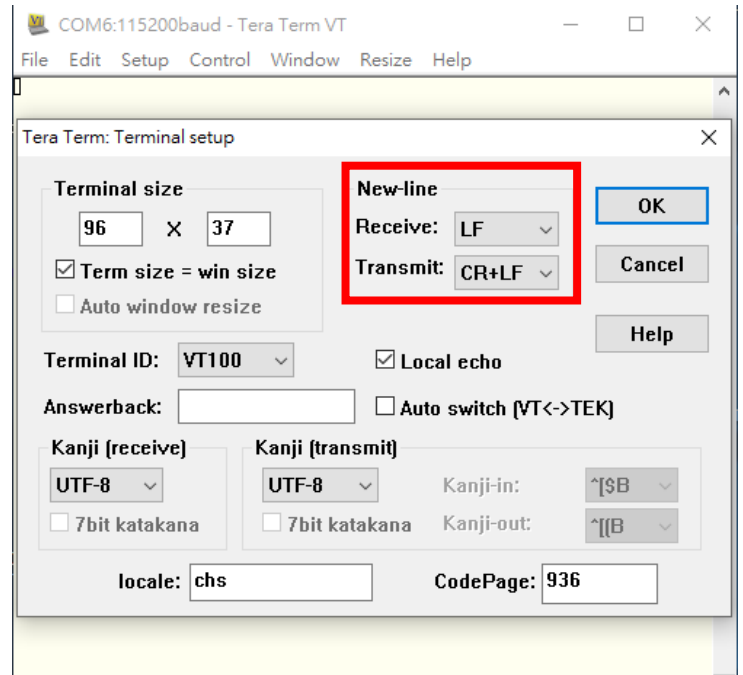
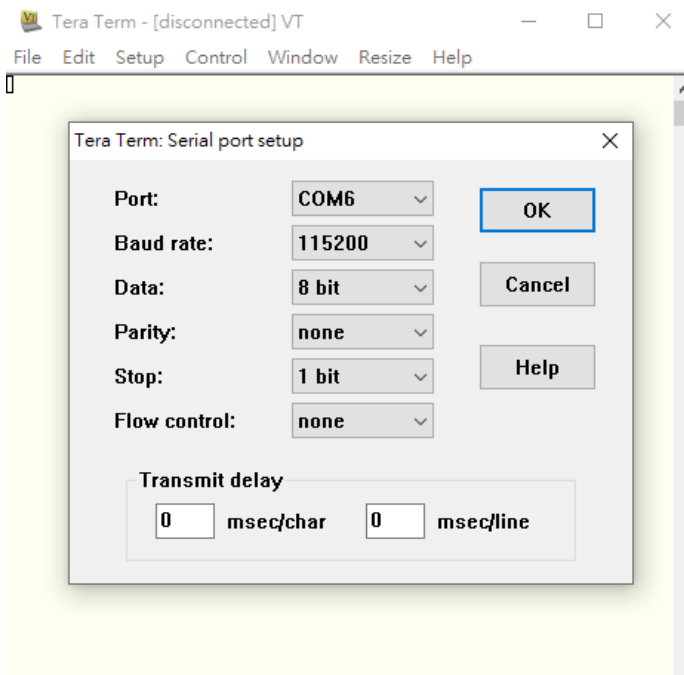

4. How to get into the test mode

1. Open the PL-2303 GPIO Test
2. Setting Com port (J11 com port)
3. Baud rate is 115200
4. Setting the GP1
Key in 1 and Select set button.(open test mode)
5. Setting the GP3
First Key in 0 and Select set button
Then Key in 1 and Select set button. (Reset)



5. Test mode(In Zigbee)

1. Open the Tera Term
2. Select setup → Serial port
 - Setting COM port (J9 com port)
 - Baud rate is 115200
3. Select setup → Terminal
 - Receive select LF
 - Transmit select CR+LF





4. Select a) standard module

```
*****
*      Customer Module Evaluation Tool      *
*      Version 2038                        *
*      Compiled Feb 28 2020 10:23:14       *
*      Radio Test version 2041             *
*      Radio Driver version 2085           *
*      Chip ID 000e2111                    *
*****

a) Standard Module
b) High Power Module (RFTX/RFRX on PI04/5)
c) High Power Module (RFTX/RFRX on PI020/21)
/) Reset CMET

Please choose an option > A
Standard Module Selected

*****
*                      ZigBee Mode          *
*****
```

5. Select a) Regular

```
*****
*                      ZigBee Mode          *
*****

a) Regular
b) Proprietary 1
c) Proprietary 2

Please choose an option > A
ZigBee Regular Mode Selected
```

6. Customer Module Evaluation Tool (main menu)

- Select “g” trigger packet test (Rx test)
- Select “l” transmit packet test (Tx test)

```
*****
*   Customer Module Evaluation Tool   *
*****
a) TX Power Test (CW)
b) TX Power Test (Modulated)
c) Receive Test
d) Oscillator Frequency Test
e) Current Measurement Test
f) RF Power Measurement
g) Trigger Packet Test
h) Receive Packets Test
i) Transmit Packets Test
j) Connectionless Packet Error Rate Test
k) CCA Test
l) LQI Test
m) Turnaround Tests
n) NTAG Tests
/) Return to root menu

Please choose an option >■
```

6. RX test (Select g)

g → Start test (start to receive the package)

+/- → Increment or decrement channel

X → Return to main menu

/→Reset

```
*****
*   Trigger Packet Test               *
*****
* Key      Function                   *
*-----*-----*
* +      Increment Channel           *
* -      Decrement Channel           *
* ]      Increment Repetitions        *
* [      Decrement Repetitions        *
* >      Increase Trigger Delay       *
* <      Decrease Trigger Delay       *
* g      Go                          *
* x      Return to main menu          *
* /      Return to root menu          *
*-----*-----*
* Note:                               *
* Connect pin DI02 to the trigger     *
* !!!!! Trig on RAISING edge !!!!!   *
* input on the signal generator       *
*****
Channel      11      (2.405 GHz)
Repetitions  100
Trigger delay 1 mS
■
```

7. TX test (Select i)

+/- → Can control the channel

F → Fast transmit rate (fast transmit can help modulation to catch signal)

X → Return to main menu

/→Reset

```

*****
* Transmit Packet Test In Progress *
* Slow Rate (~1 Pkt/sec) *
*****
* Key          Function *
* * * * *
* f  Faster transmit rate *
* l  Lower transmit rate  *
* +  Increment Channel    *
* -  Decrement Channel    *
* <  Reduce output power by 0.25 dBm *
* >  Increase output power by 0.25 dBm *
* p  Reduce power step    *
* P  Increase power step   *
* x  Return to main menu  *
* /  Return to root menu  *
* * * * *
*****
Channel      11      (2.405 GHz)
Power Level  10.00 dBm
MAC Address  00:15:8D:00:04:A5:A8:3F
Packets Sent 9
  
```

8. NTAG tests(Select n)

Select Internal or External NTAG

- Select a) internal NTAG

NTAG Tests (Internal)

- Select a) read contents of EEPROM
- Select b) write data to EEPROM

```
*****
* Select Internal or External NTAG *
*****

a) Internal NTAG
b) External NTAG on DK6 (FD to PI01)

Please choose an option >A
*****
* NTAG Tests (Internal) *
*****

a) Read contents of EEPROM
b) Write data to EEPROM
c) Reset NTAG address to 0x55
d) Monitor FD pin
e) Test FD pin Wake up
x) Return to main menu
/) Return to root menu

Please choose an option >■
```

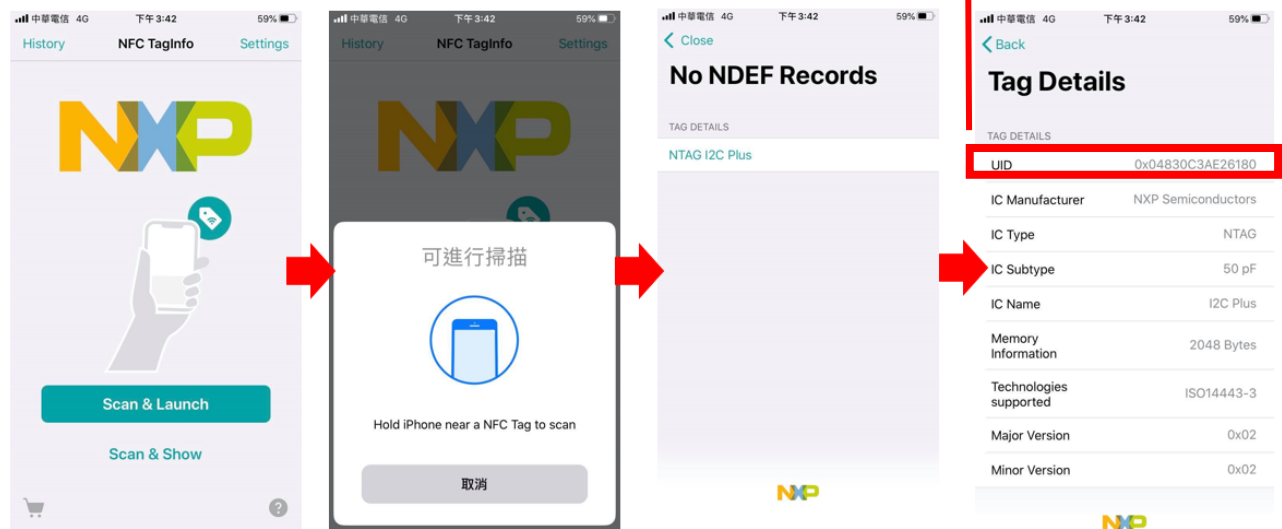
9. Read contents of EEPROM

Can read the NFC MAC in Block 0: 04830C3AE26180

```
COM6:115200baud - Tera Term VT
File Edit Setup Control Window Resize Help
* NTAG Tests (Internal) *
*****
a) Read contents of EEPROM
b) Write data to EEPROM
c) Reset NTAG address to 0x55
d) Monitor FD pin
e) Test FD pin Wake up
x) Return to main menu
/) Return to root menu

Please choose an option >A
Found 0: 04 83 0c 3a e2 61 80 00 44 00 00 00 00 00 00 00
1: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
2: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
3: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
4: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
5: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
6: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
7: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
8: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
9: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
11: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
12: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
13: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
14: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
15: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
16: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
17: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
18: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
19: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
20: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
21: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

Open the NFC Taginfo in you smart phone, and scan the NFC
Then you will get the information from NFC



10. Write data to EEPROM

Use this test to write data to EEPROM, Format is:

1:0 1 2 3 4 5 6 7 8 9 A B C D E F

Programs 0 to F in block 1

```
*****
* NTAG Tests (Internal) *
*****
a) Read contents of EEPROM
b) Write data to EEPROM
c) Reset NTAG address to 0x55
d) Monitor FD pin
e) Test FD pin Wake up
x) Return to main menu
/) Return to root menu

Please choose an option >
Using Address: 0x55
Enter Data to Program:1:0 1 2 3 4 5 6 7 8 9 0 A B C D E F
```

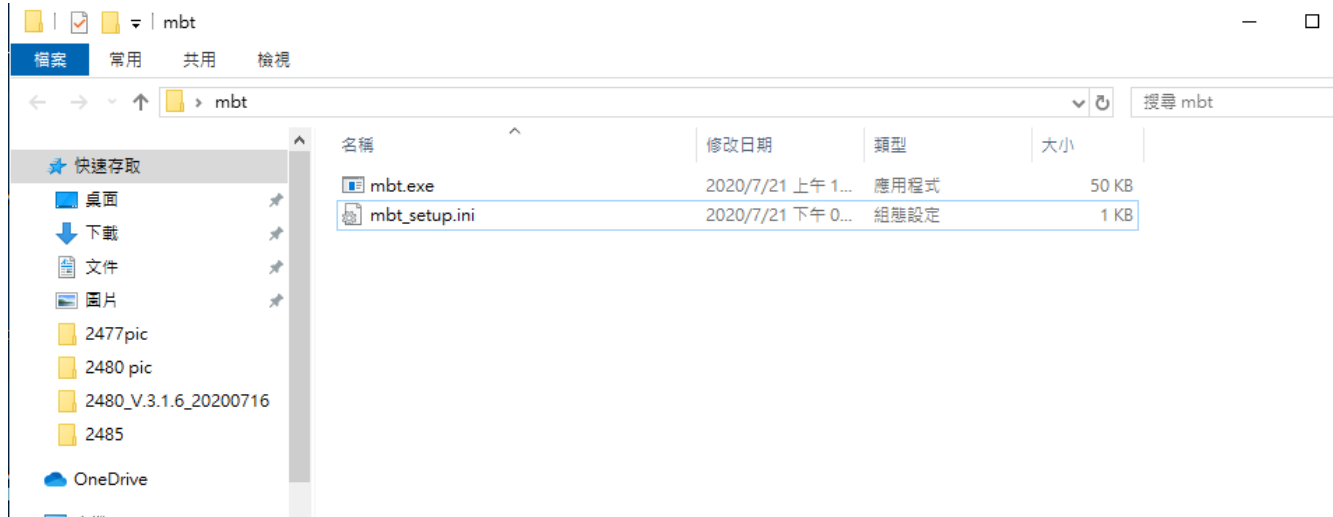
Check the Format again.

```
*****
* NTAG Tests (Internal) *
*****
a) Read contents of EEPROM
b) Write data to EEPROM
c) Reset NTAG address to 0x55
d) Monitor FD pin
e) Test FD pin Wake up
x) Return to main menu
/) Return to root menu

Please choose an option >
Found NTAG I2C address: 0x55
Block 0: 04 83 0c 3a e2 61 80 00 44 00 00 00 00 00 00 00
Block 1: 00 01 02 03 04 05 06 07 08 09 0a 0b 0c 0d 0e 0f
Block 2: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Block 3: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Block 4: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Block 5: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```


6. Test mode(In BLE)

1. Open the folder of mbt



2. Open the mbt_setup.ini
Setting MBT_TRANSPORT=COM3 (your DUT COM port J9)
DOWNLOAD_BAUDRATE=115200
APPLICATION_BAUDRATE=115200
Enable_Debug_Message=1

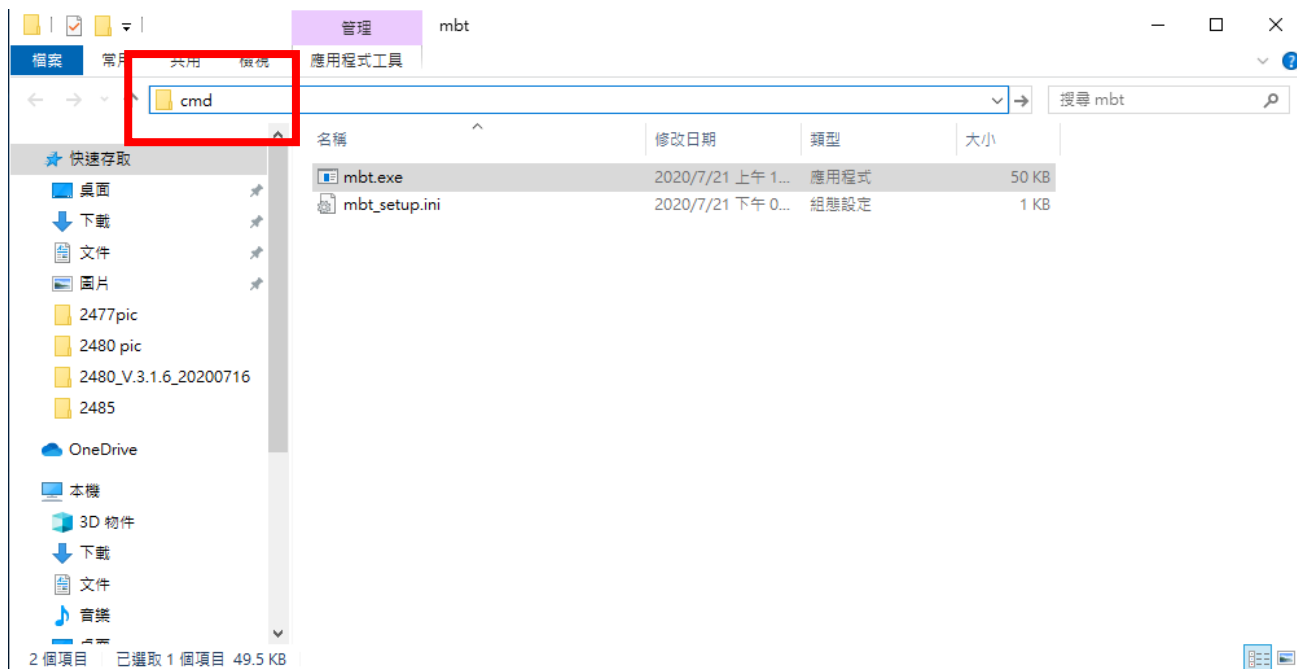
DOWNLOAD_DELAY = 50

[Solution]

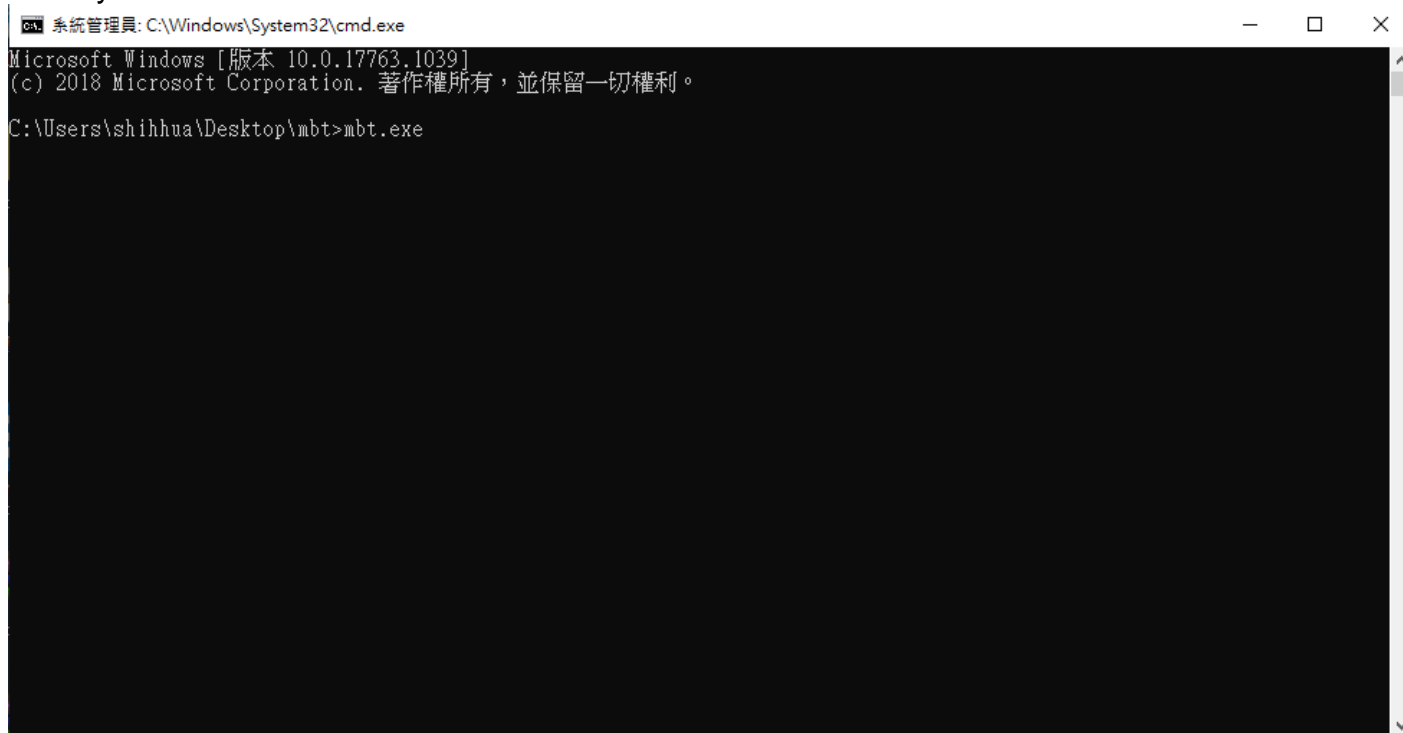
Type=2



3. And type cmd to get into the Dos window.



4. Key in mbt.exe



5. Main menu

If you need to more information, please key in mbt help.

```
系统管理员: C:\Windows\System32\cmd.exe
Send HCI Success
Success
** mbt command finish **

C:\Users\shihhua\Desktop\mbt>mbt help
MBT_TRANSPORT: COM3
DOWNLOAD_BAUDRATE: 115200
APPLICATION_BAUDRATE: 115200
Usage: mbt help
Usage: mbt reset
Usage: mbt le_receiver_test <rx_channel>
Usage: mbt le_transmitter_test <tx_channel> <data_length> <packet_payload>
Usage: mbt le_test_end
Usage: mbt set_tx_frequency_arm <carrier on/off> <tx_frequency> <tx_mode> <tx_modulation_type> <tx_power>
Usage: mbt receive_only <rx_frequency>
Usage: mbt read_bd_addr
Usage: mbt write_bd_addr <bd_addr>
Usage: mbt radio_tx_test <bd_addr> <frequency> <modulation_type> <logical_channel> <bb_packet_type> <packet_length> <tx_
power>
Usage: mbt radio_rx_test <bd_addr> <frequency> <modulation_type> <logical_channel> <bb_packet_type> <packet_length>
Usage: mbt connectionless_dut_loopback_mode
Usage: mbt download <hcd_pathname>

Check Bluetooth Core 4.1 spec vol. 2 Sections 7.8.28-7.2.30
for details of LE Transmitter and Receiver tests
** mbt command finish **

C:\Users\shihhua\Desktop\mbt>
```

6. Key in mbt reset

Make sure the DUT have been reset.

```
C:\Users\shihhua\Desktop\mbt>mbt reset
MBT_TRANSPORT: COM3
DOWNLOAD_BAUDRATE: 115200
APPLICATION_BAUDRATE: 115200
Sending HCI Command:
0000 < 03 0C 00 >
Received HCI Event:
0000 < 0E 04 05 03 0C 00 >
Send HCI Success
Success
** mbt command finish **

C:\Users\shihhua\Desktop\mbt>
```