



User Manual
Bluetooth Module

Part Name	Bluetooth Module
Doc. Rev.	0.0
Foxconn P/N.	J20H077

Prepared by	Reviewed by	Approved by
Kevin Tao	Eddie Huang	

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Section1 Introduction

1. Product Overview

The J20H077 Bluetooth module provides Bluetooth 3.0 compliant wireless modem function. This module is based on BCM20705 solution which is integrated 2.4GHz transceiver and manufactured using the industry's most advanced 65nm CMOS low-power process.

1.1 Application scope

The BT Module is compliant to Bluetooth 3.0 and EDR standard:

Carrier Frequency: 2402MHz ~ 2480 MHz

Carrier Spacing: 1.0MHz

Duplexing: TDD

Modulation: FHSS

GFSK, pi/4-DQPSK, 8DPSK

Symbol Rate: 1Mbps (GFSK), 2Mbps (pi/4-DQPSK), 3Mbps (8DPSK)

This module is designed with BTB connector and UART Interface, and it is installed as a client device in TV platform.

1.2 Block Diagram

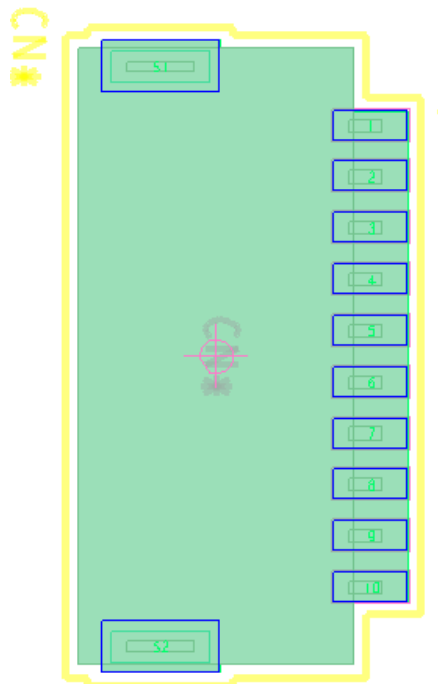
The general HW architecture is shown below Figure:

1.3 Features

- ◆ Bluetooth 3.0 Compliant
- ◆ UART Interface.
- ◆ Module is powered by the host with a 3.3V +/- 10% supply.
- ◆ One PCB printed antenna.
- ◆ 4 layers through hole PCB design with halogen free FR4 material

1.4 Interface and Connector

- ◆ Pin definition:



Pin Number	Symbol Name	Status	Pin definition
1	GND	P	Ground
2	UARTTXD	O	UART Transmit
3	UARTRXD	I	UART Receive
4	GND	P	Ground
5	BT_RST	I	BT Reset
6	BT_DEVICE_WAKE	I	BT wake up Signal
7	BT_HOST_WAKE	O	Host wake up Signal
8	EMT_SYNC	I	-
9	GND	P	Ground
10	VDD_3P3	P	Power
S1	GND	P	Ground
S2	GND	P	Ground

2. Electrical Specification

2.1 Recommended operating rating

Element	Symbol	Min	Typ	Max	Unit
DC supply voltage	UV+	3.0	3.3	3.6	(V)

2.2 DC Characteristics

Symbol	Parameter	Min	Typ	Max	Unit
STBY3.3V	Supply voltage	3.0	3.3	3.6	(V)
	Tx Current	-	40	50	(mA)
	Rx Current	-	26	32	(mA)
	Standby Current		5	7	(mA)

2.3 ESD Information

Mode	Level	Unit
HBM	+/-1500	V
MM	+/-200	V

2.4 Environment Storage Condition

Environment condition	
Temperature	Operating Temperature: -10 deg.C ~70 deg.C
	Storage Temperature: -40 deg.C ~80 deg.C
Humidity	Operating Humidity: 5% ~95% (Non-condensing)
	Storage Humidity: 5% ~95% (Non-condensing)

3. RF Specification

3.1 Bluetooth 3.0

Items	Contents			
	Min.	Typ.	Max.	Unit
- TX Characteristics -				
1. Power Levels				
BT Output Power (Basic Data Rate)	-1	1	3	dBm
2. Initial Carrier Frequency Tolerance				
Average Offset	-75	6	75	kHz
3. Carrier Drift				
Drift Rate				
DH1	-20	-4	20	kHz/50us
DH3	-20	-4	20	kHz/50us
DH5	-20	-5	20	kHz/50us
Average Drift				
DH1	-25	-1	25	kHz
DH3	-40	0	40	kHz
DH5	-40	0	40	kHz
4. Modulation Characteristic				
F1avg	140	150	175	kHz
F2max	115	140		kHz
F1/F2 Ratio	0.8	0.96		
5. EDR Relative Transmit Power				
2Mbps: P[DQPSK]-P[GFSK]	-4	0.25	1	dB
3Mbps: P[8DPSK]-P[GFSK]	-4	0.25	1	dB
6. EDR Carrier Frequency Stability and Modulation Accuracy				
2Mbps: $\pi/4$ DQPSK				
Initial Frequency Error: ω_i	-75	-3	75	kHz
Frequency Error: ω_0	-10	-2	10	kHz
Block Frequency Error: $\omega_i + \omega_0$	-75	-5	75	kHz
RMS DEVM	-	0.05	0.2	
Peak DEVM	-	0.12	0.35	
99% DEVM (% Symbols ≤ 0.3)	99%	100%		
3Mbps: 8DPSK				
Initial Frequency Error: ω_i	-75	-9	75	kHz
Frequency Error: ω_0	-10	-1.5	10	kHz
Block Frequency Error: $\omega_i + \omega_0$	-75	-10	75	kHz
RMS DEVM	-	0.05	0.13	
Peak DEVM	-	0.13	0.25	
99% DEVM (% Symbols ≤ 0.13)	99%	100%		

Items	Contents			
Specification	BT3.0			
Frequency range	2.4GHz~2.4835GHz			
Data rate	1Mbps, 2Mbps, 3Mbps			
- RX Characteristics -	Min.	Typ.	Max.	Unit
1. Minimum Input Level Sensitivity				
GFSK (1Mbps)	-	-90	-83	dBm
$\pi/4$ DQPSK (2Mbps)	-	-90	-83	dBm
8DPSK (3Mbps)	-	-85	-77	dBm
2. Maximum Input Level				
GFSK (1Mbps)	-20	0		dBm
$\pi/4$ DQPSK (2Mbps)	-20	-14		dBm
8DPSK (3Mbps)	-20	-14		dBm

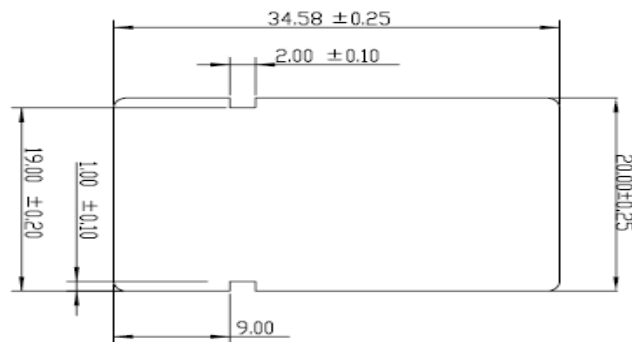
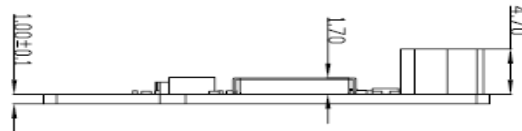
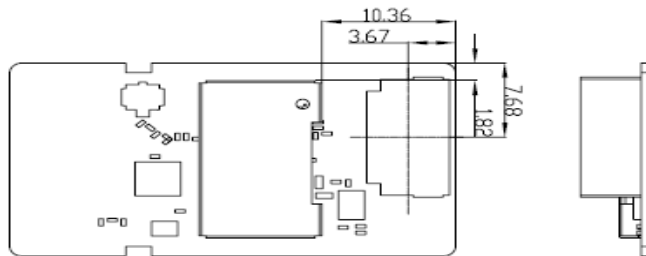
3.2 Antenna Characteristic

Parameter	Value	Units
Operating frequency range	2402~2483.5	MHz
Antenna gain (max)	0.13	dBi
VSWR	<2.1	/
Efficiency	43% @2402MHz	/
	44% @2441MHz	/
	40% @2480MHz	/

4. Mechanical Specifications

4.1 PCB Assembly Dimension

Dimension (W x L): 34.58mmx20mm PCB: 4 layer HF-FR4 design



Section2 WinXP utility and install

5. Overview

This document is intended to provide a brief introduction to the Mckinley test for users. It includes the initial setup instruction on how to configure the device and test the transmitter.

6. Requirements

Hardware

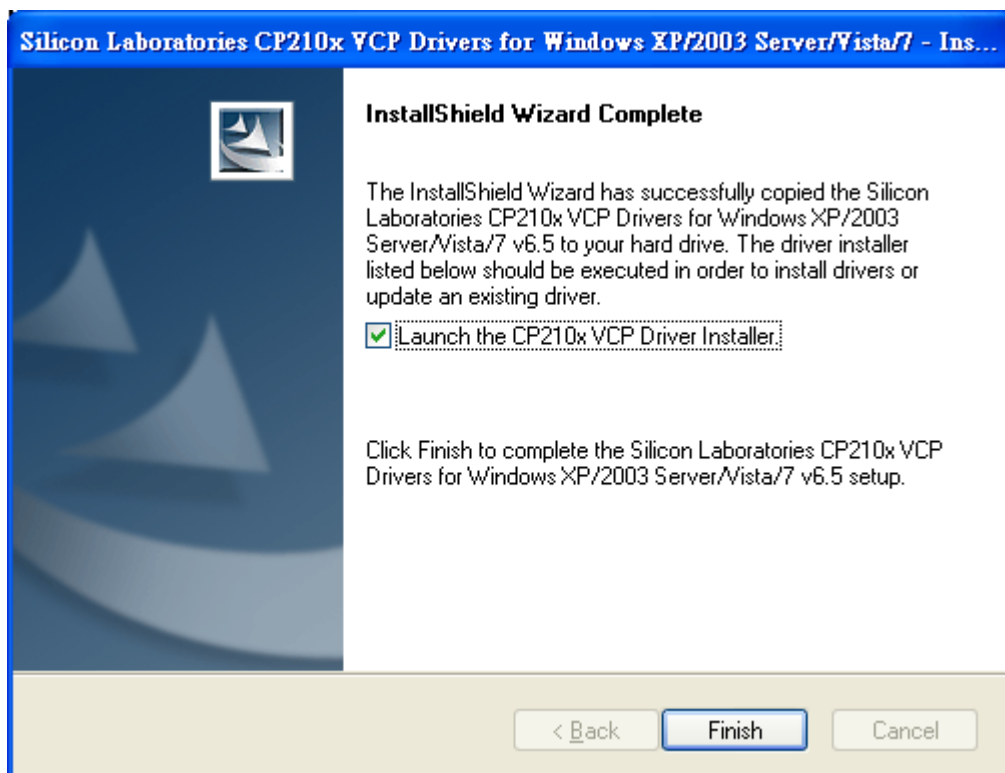
- Desktop PC with USB interface

Software

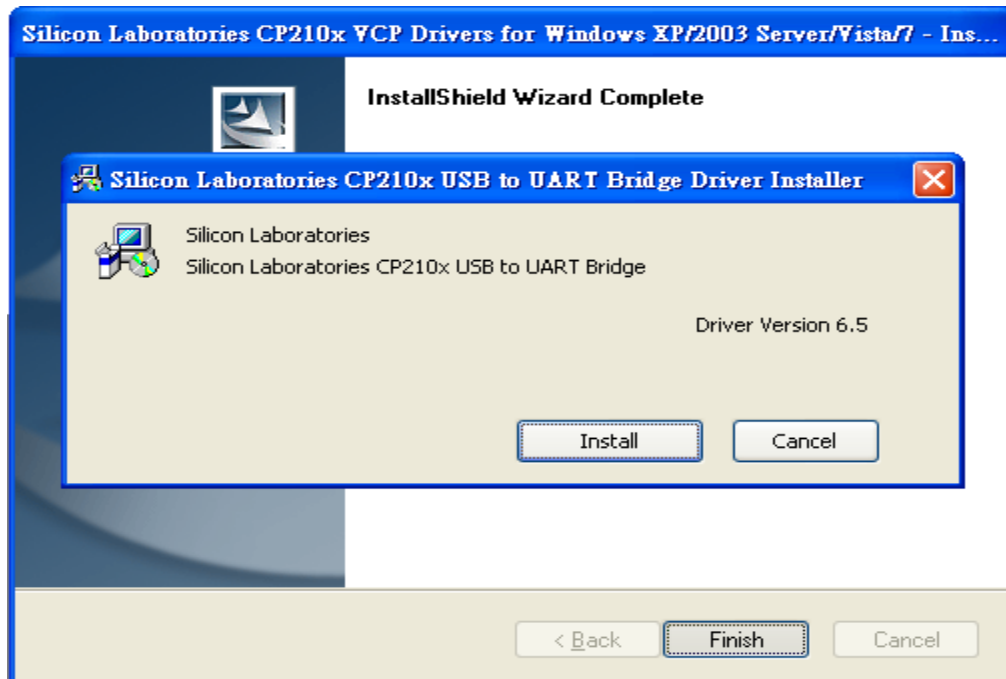
- Windows XP Professional (SP3 or above)
- USB to UART DRIVER
- Bluetooth Test Tool

7. USB to UART Interface Driver Install

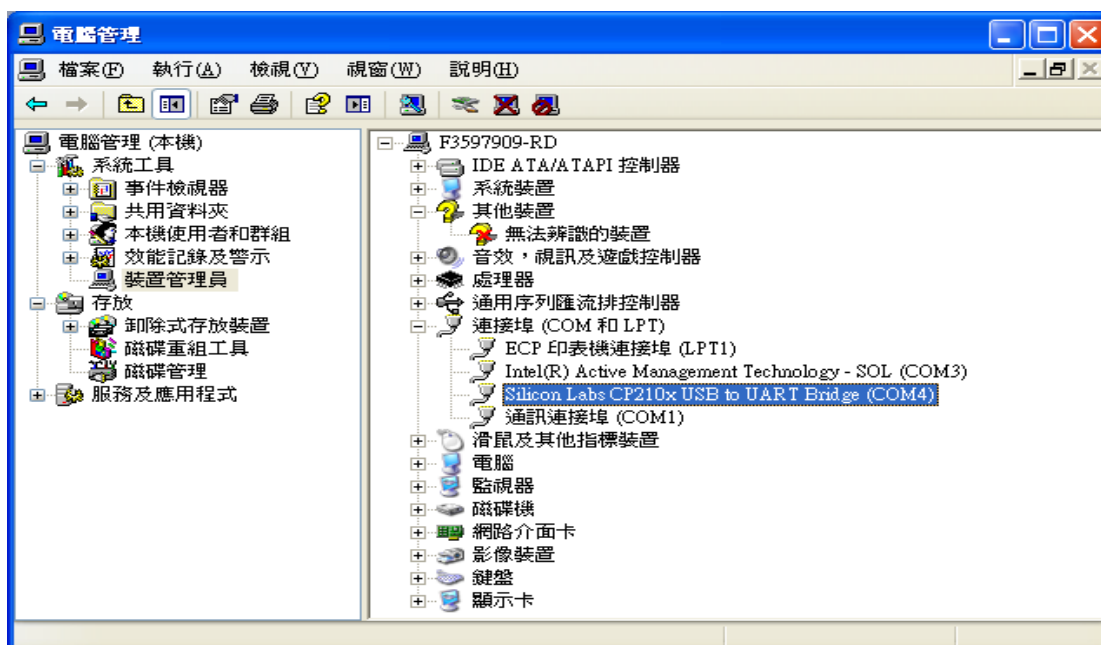
Step1: Go to “* \BT\Test Tool\uart driver\V6.5” and double click “CP210x_VCP_Win_XP_S2K3_Vista_7.exe” to install USB to UART Interface driver.



Step2: Select “Launch the CP210x VCP Driver Installer”, and click the “Finish” button to start the install.



Step3: Finish installation and Insert the Conversion Board with Module, you will get a card named”Silicon Labs CP210x USB to UART Bridge” in computer management..

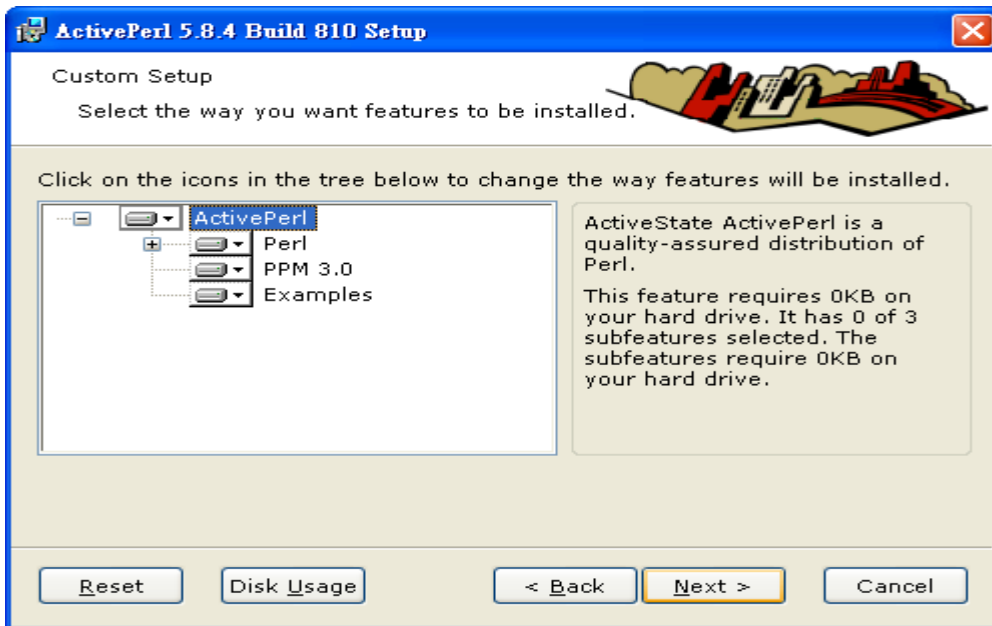


8. Test Tool Install

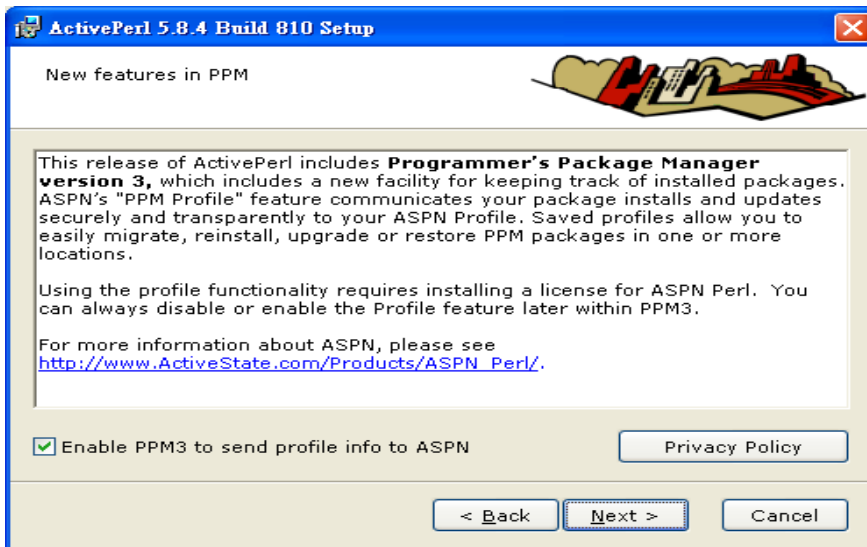
8.1 ActivePerl-5[1].8.4.810-MSWin32-x86.msi install

Step1: Go to “* \BT\Test Tool” and double click “ActivePerl-5[1].8.4.810-MSWin32-x86.msi” to install

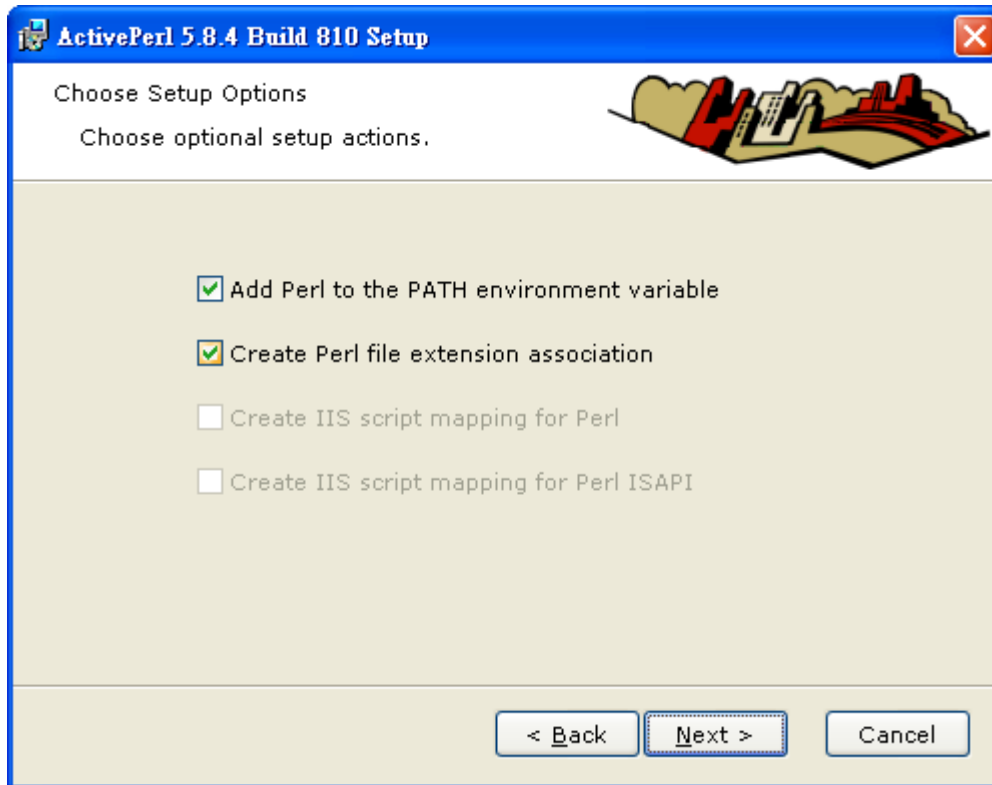
Step2: Select the default setting, and then click the “Next>” button to show the next page.



Step3: Select "Enable PPM3 to send profile info to ASPN ", and then click the “Next>” button to show the next page.

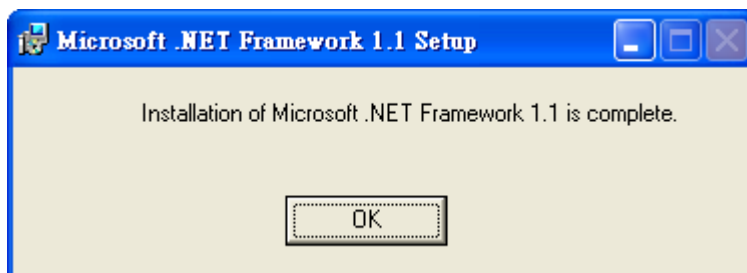


Step4: Select the default setting, and then click the “Next>” button to continue the installation.



8.2 dotnetfx.exe install

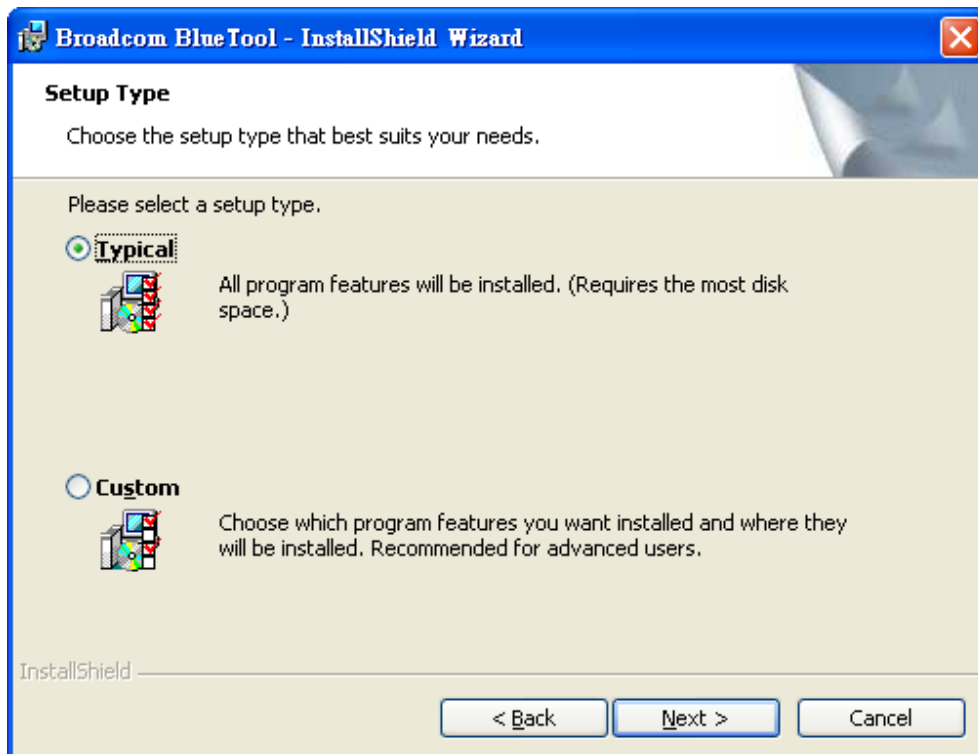
Step1: Go to “* \BT\Test Tool” and double click “dotnetfx.exe” to install Microsoft.net Framework 1.1



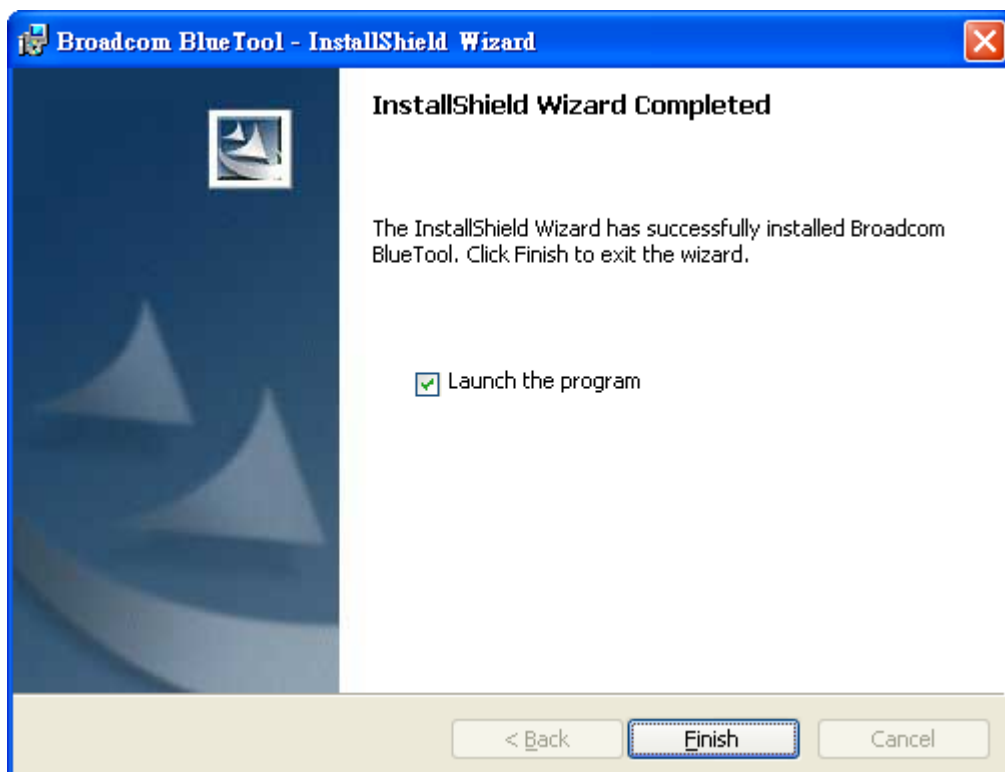
8.3 setup_for 20702A1.exe

Step1: Go to “* \BT\Test Tool” and double click “setup_for 20702A1.exe” to install BlueTool

Step2: Select the “Typical”, and then click the “Next>” button to continue the installation.



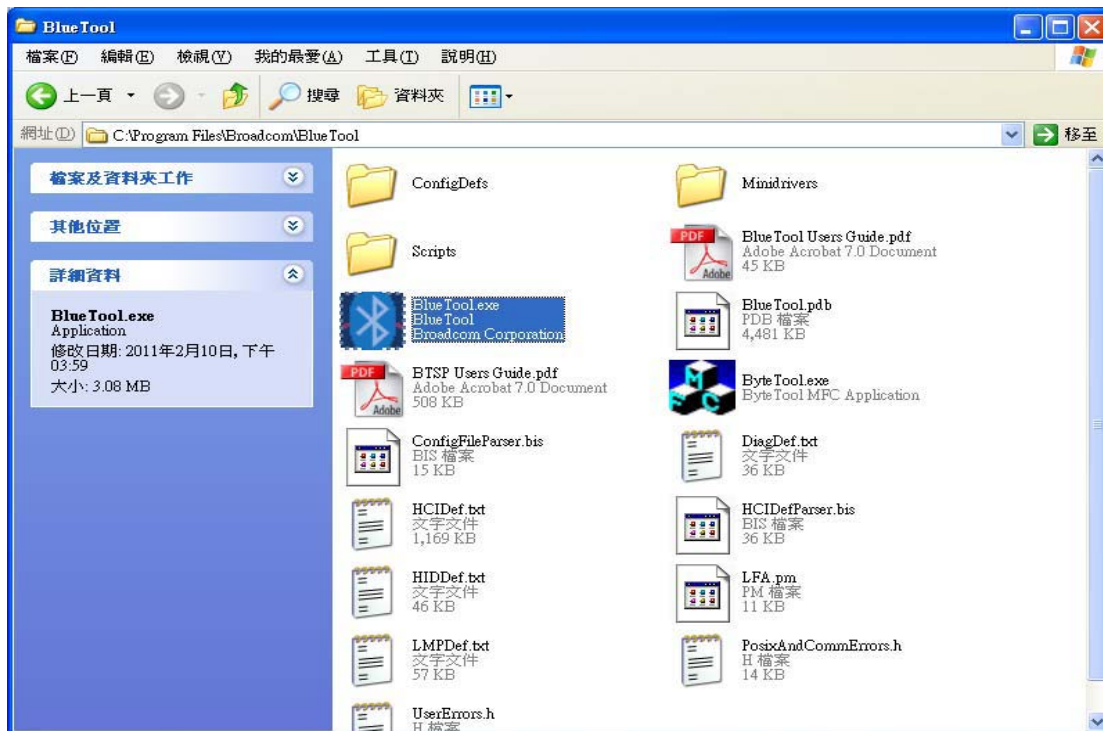
Step3: Click the “Finish” button to finish the installation.



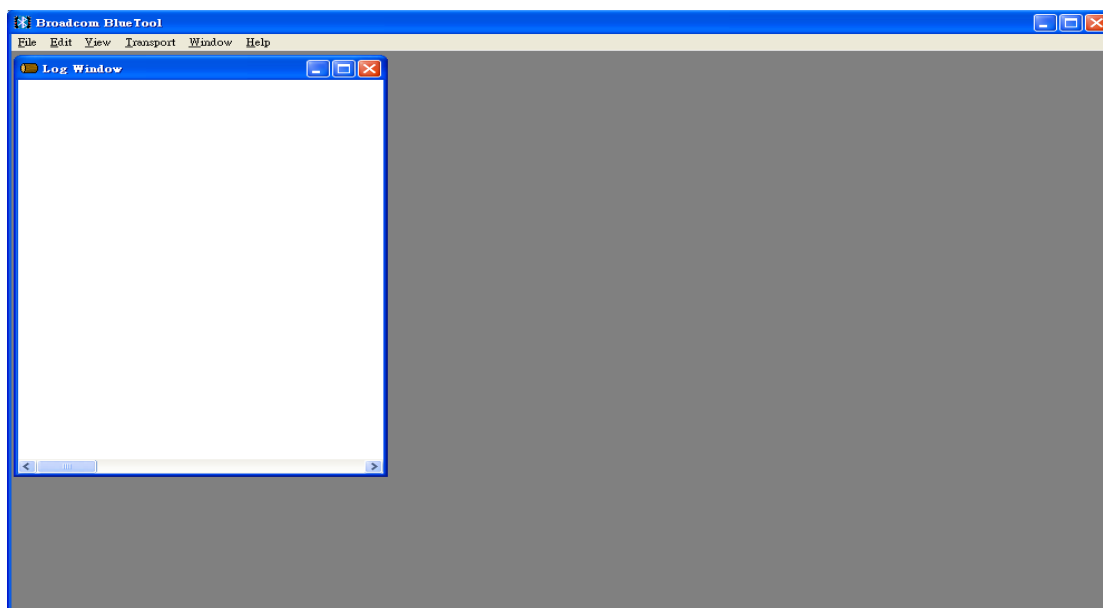
9. Blue Tool Test Setting

9.1 Tx Mode

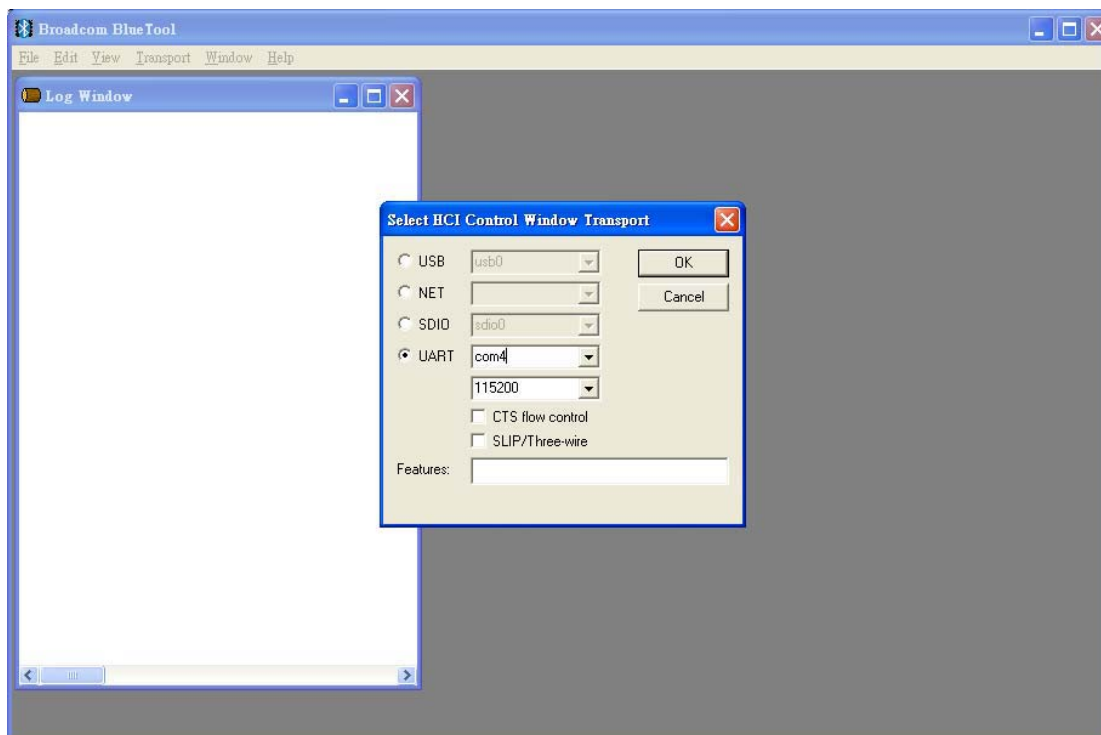
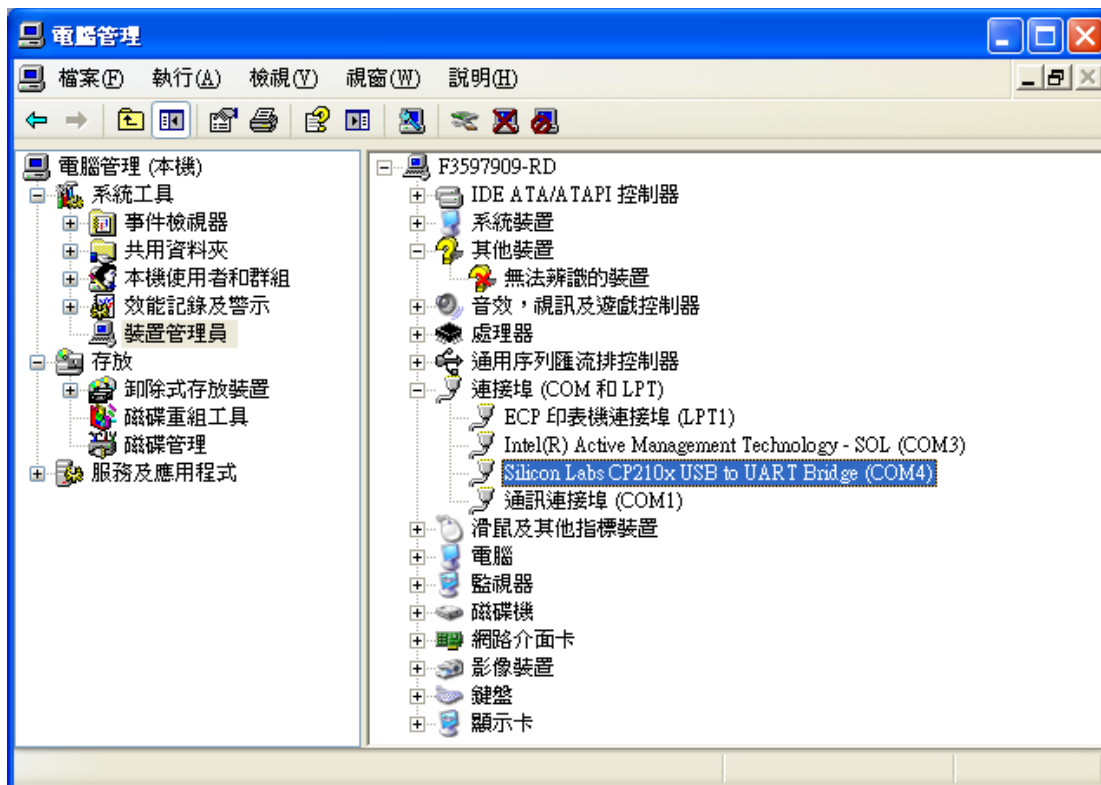
Step1: Go to “C:\Program Files\Broadcom\BlueTool” to double click the “BlueTool.exe” to run Blue Tool



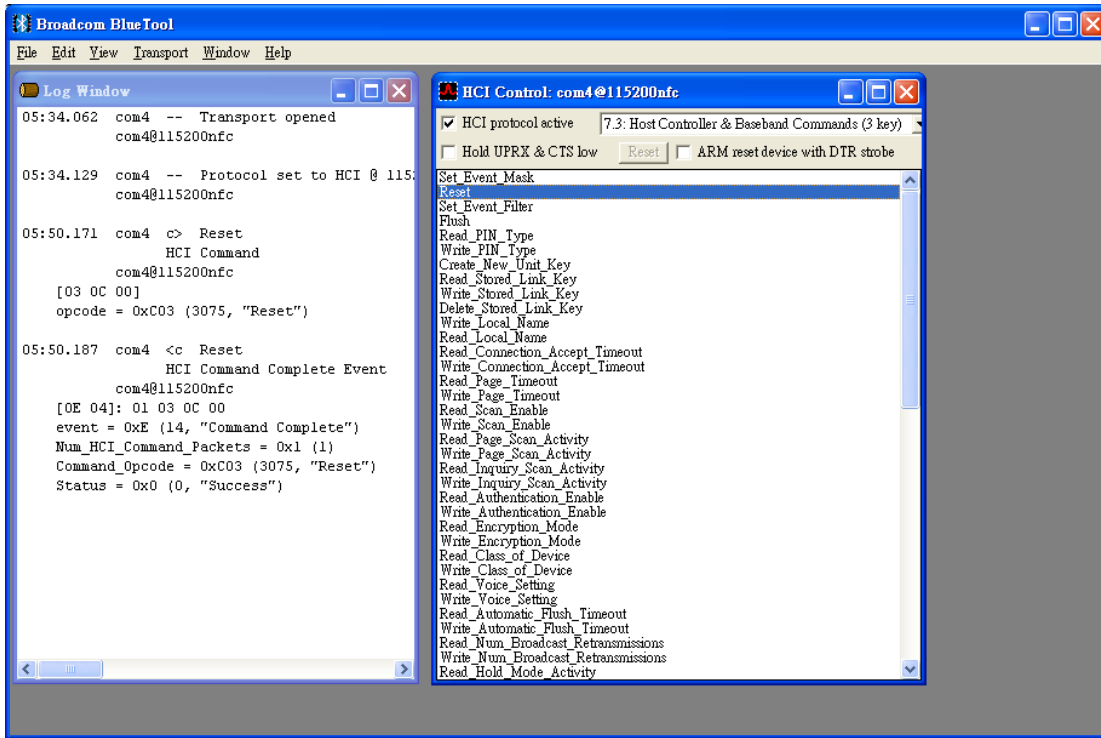
Step2: Select “View ->Log Window” to show the log window



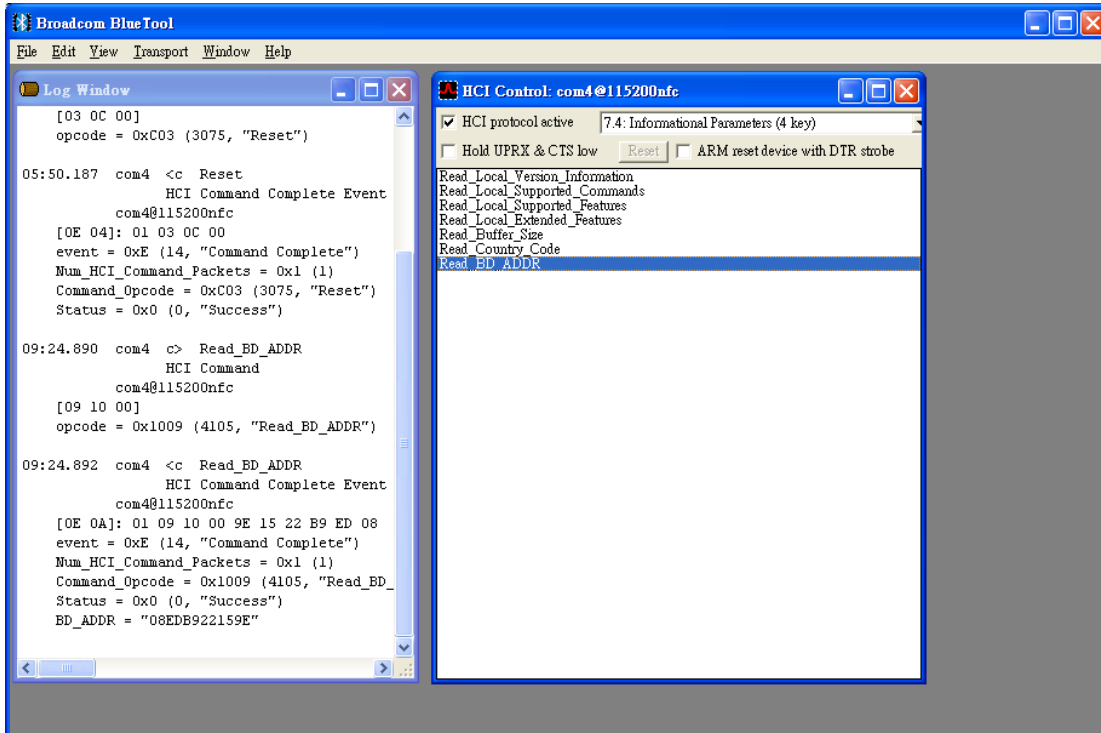
Step3: Select "Transport ->HCI Control.." to select the interface based on the computer management.



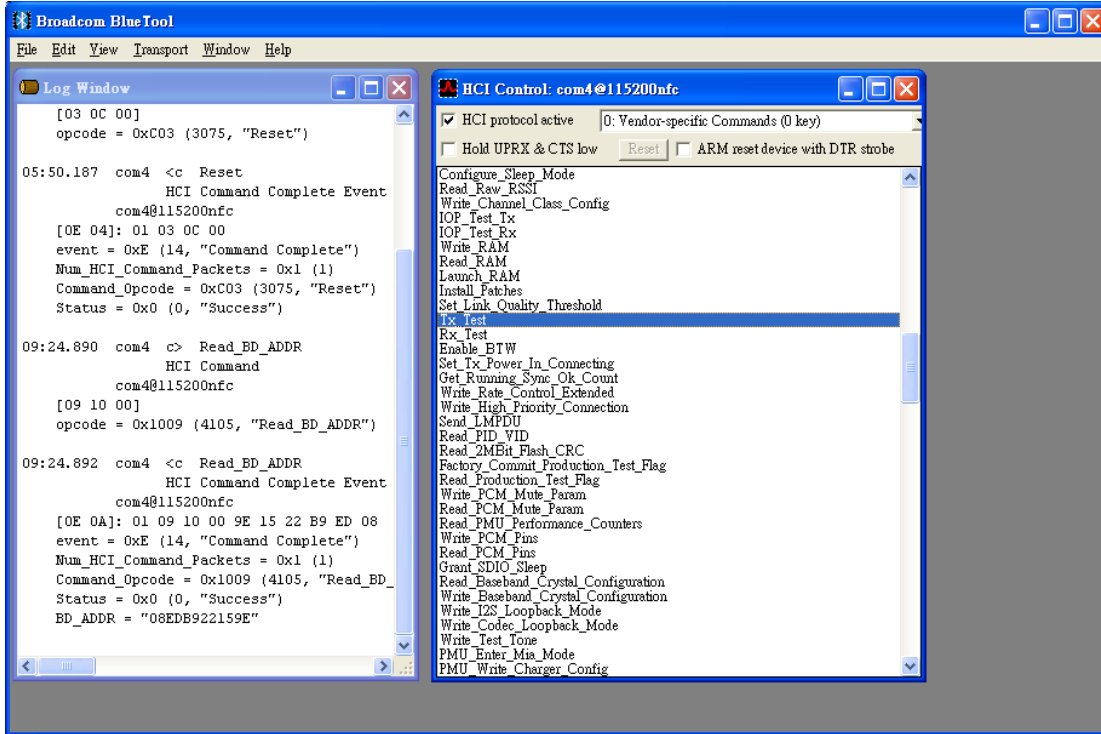
Step4: Select “7.3: Host controller & Baseband Commands(3 Key) “ and do “Reset” .



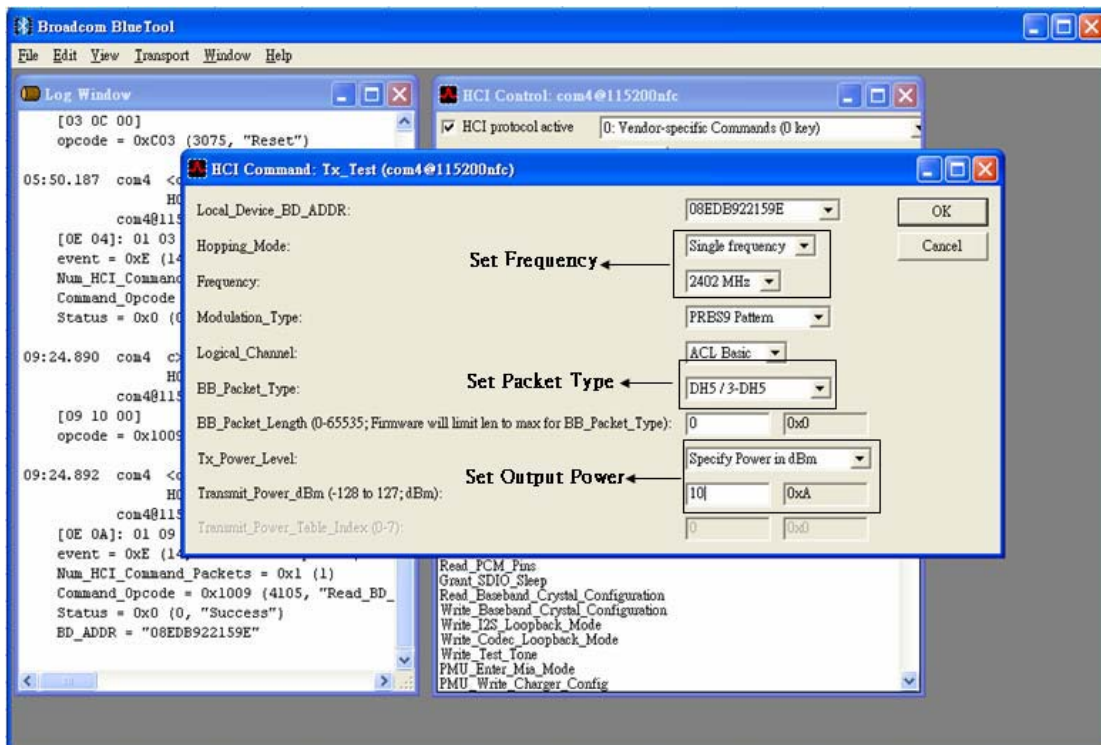
Step5: Select “7.4: Informational Parameters(4 Key) “ and do “Read_BD_ADDR” to read the MAC ID



Step6: Select “0: Verdor-specific Commands(0 Key) “ and do “Tx Test” to set Tx Mode

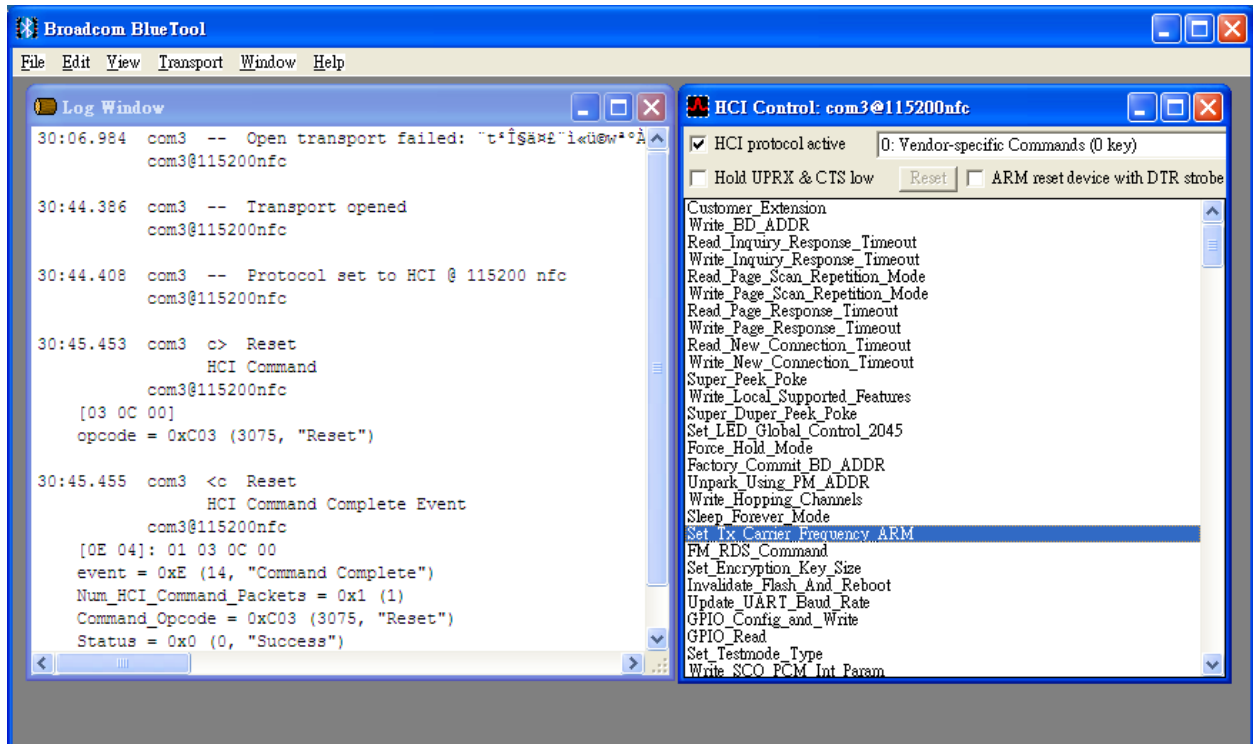


Step7: Select “0: Verdor-specific Commands(0 Key) “ and do “Tx Test” to set Tx Mode, set packet type DH5,output power 10dBm , then click “OK”

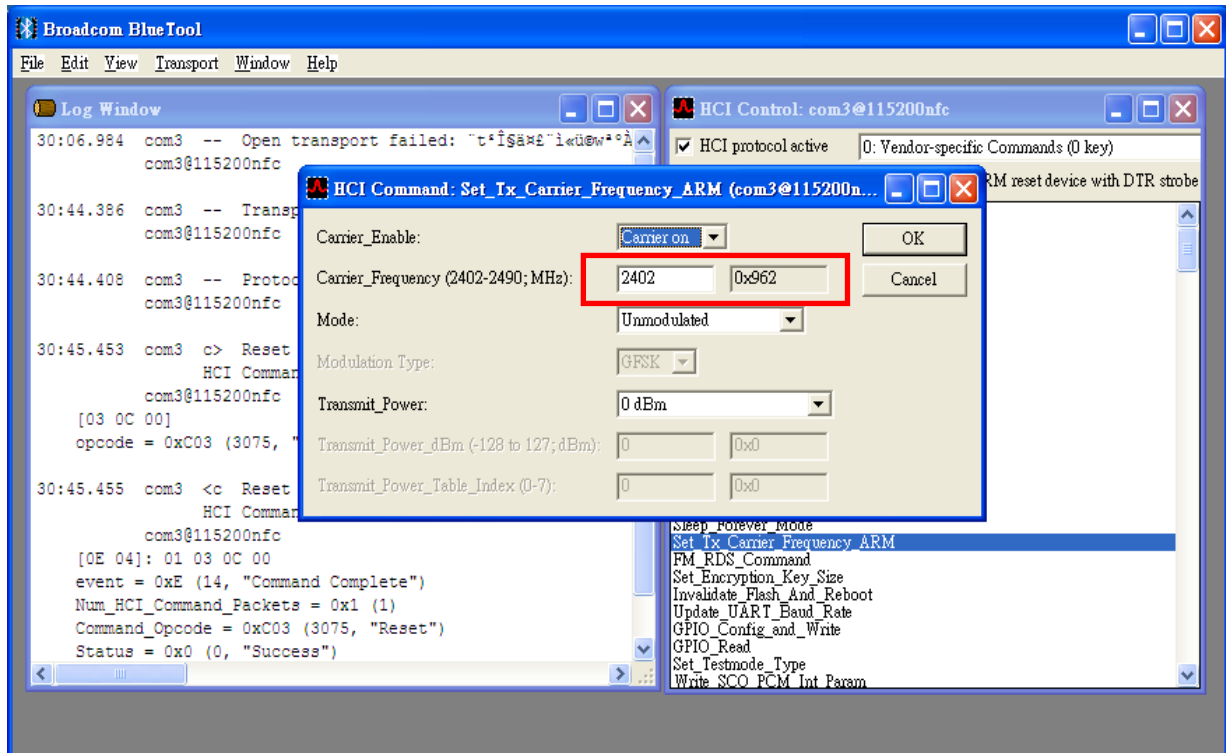


9.2 Frequency Deviation Test

Step1: Based on Section 9.1 Step5 , Select "0: Vendor-specific Commands(0 Key)" and do "Set Tx Carrier Frequency ARM" to set Frequency Deviation Test .

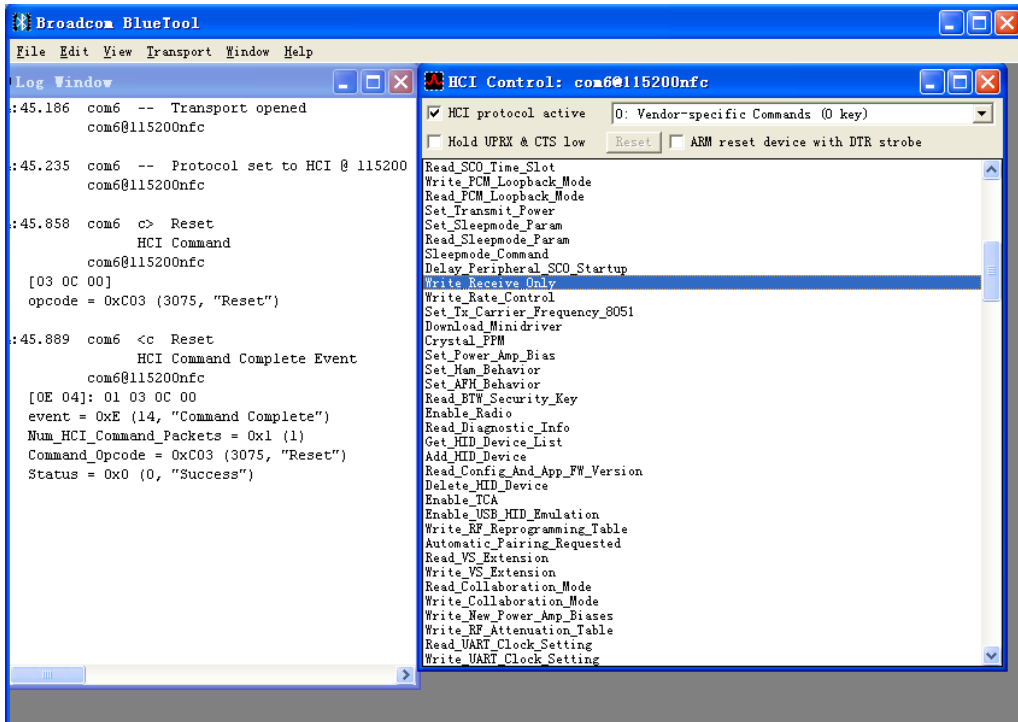


Step2: Select frequency for Frequency Deviation Test .

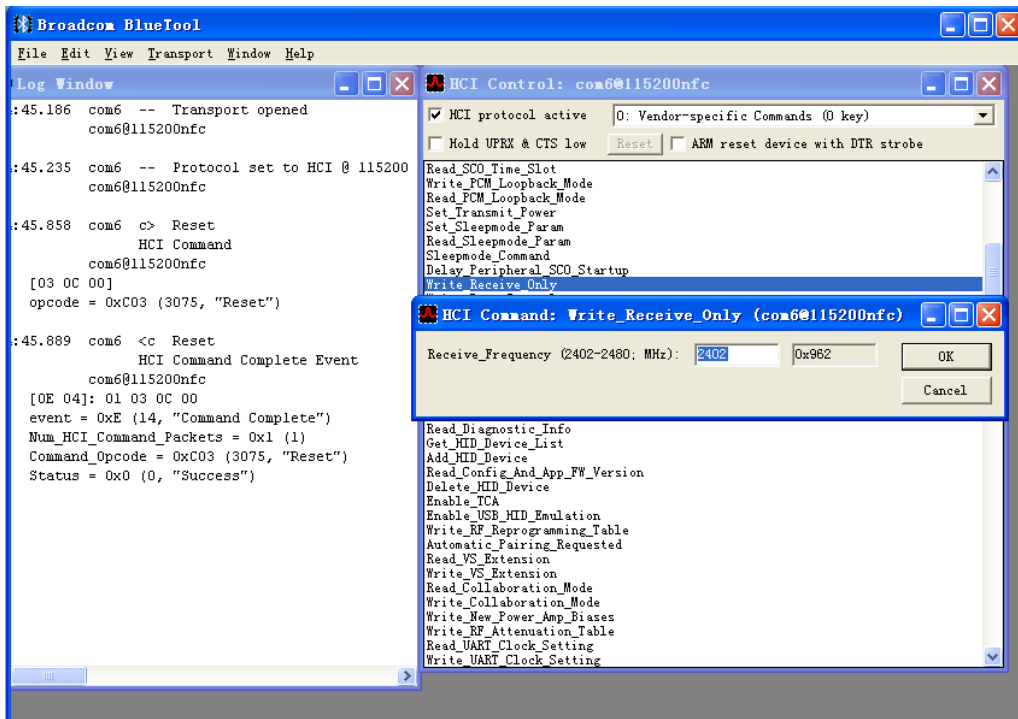


9.3 Rx Mode

Step1: Based on Section 4.1 Step5 , Select “0: Vendor-specific Commands(0 Key)” and do “write receive only” to set Rx Mode .



Step2: Set frequency , then click “OK”



Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Radiation Exposure Statement:

The product comply with the FCC portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

This device is intended only for OEM integrators under the following conditions:

The transmitter module may not be co-located with any other transmitter or antenna.

As long as the conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

The final end product must be labeled in a visible area with the following: “Contains FCC ID:MCLJ20H077”. The grantee's FCC ID can be used only when all FCC compliance requirements are met.

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user’s manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

Industry Canada statement:

This device complies with RSS-210 of the Industry Canada Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Radiation Exposure Statement:

The product comply with the Canada portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

Déclaration d'exposition aux radiations:

Le produit est conforme aux limites d'exposition pour les appareils portables RF pour les Etats-Unis et le Canada établies pour un environnement non contrôlé.

Le produit est sûr pour un fonctionnement tel que décrit dans ce manuel. La réduction aux expositions RF peut être augmentée si l'appareil peut être conservé aussi loin que possible du corps de l'utilisateur ou que le dispositif est réglé sur la puissance de sortie la plus faible si une telle fonction est disponible.

This device is intended only for OEM integrators under the following conditions: (For module device use)

The transmitter module may not be co-located with any other transmitter or antenna. As long as the conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes: (Pour utilisation de dispositif module)

Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les conditions ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.

NOTE IMPORTANTE:

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

End Product Labeling

The final end product must be labeled in a visible area with the following: "Contains IC: 2878D-J20H077".

Plaque signalétique du produit final

Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 2878D-J20H077".

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.

Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

For Taiwan 警語：

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

Note: 1. 本模組於取得認證後將依規定於模組本體標示審驗合格標籤 2. 系統廠商應於平台上標示「本產品內含射頻模組:  XXXyyyLPDzzzz-x (NCC ID) 」字樣.