AW-NM230NF

IEEE 802.11 b/g/n Wireless LAN and Bluetooth Combo M.2 1216 Module

User Guide

Document release	Date	Modification	Initials	Approved
Version 0.1	2015/03/10	Initial Version	Chao Lee	Amos Fu
Version 0.2	2015/8/3	Add Pin definition / pin map	Chao Lee	Amos Fu

1. WLAN Basic Test

Driver Installation
Throughput Test
RF Tx/Rx Performance Test

2. Bluetooth Basic Test

Download Mini-driver
Throughput Test
RF Performance Test

3. Statement

4. Pin definition / pin map

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1. WLAN Basic Test

**Must connect USB to PC

Driver Installation

DRIVER INSTALLATION (IN LINUX)

•First prepare the Broadcom's linux package, and put it in the "**home**"folder.

•Open the Terminal, enter the command: **sudo su** and **password**.

•Enter **cd /home/username/drivername/src/dhd/linux**

•Enter **make dhd-cdc-sdmmc-gpl** to generate the **dhd.ko** file in /home/username/ **drivername** /src/dhd/linux/dhd-cdc-sdmmc-gpl-**kernelversion**

•Enter

Insmod /(path of dhd.ko file)

firmware_path=/(path of firmware file) **nvram_path=/(path of nvram file)** to enable.

•Enter **rmmod dhd** to disable

Throughput Test

CONNECTING TO WIRELESS NETWORKS

The examples in the following sections illustrate how to connect to both infrastructure and ad hoc networks, including infrastructure networks that use no security, WEP security, and WPA/PSK and WPS2/PSK security.

SCANNING FOR WIRELESS NETWORKS

To force the dongle to scan

• Run **wl scan**.

To force the dongle to return the results of the scan

• Run **wl scanresults**.

Example results returned when an AP is found:

• SSID: "Eval4325"

• Mode: Managed: RSSI: -48 dBm noise: -105 dBm Channel: 1

• BSSID: 00:10:18:90:2E:C1 Capability: ESS ShortSlot

• Supported Rates: [1(b) 2(b) 5.5(b) 11(b) 18 24 36 54 6 9 12 48]

Example results returned when an ad hoc network is found:

• SSID: "ADHOC#1"

• Mode: Ad Hoc RSSI: -41 dBm noise: -105 dBm Channel: 1

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- BSSID: B2:51:28:6B:3C:A1 Capability: IBSS
- Supported Rates: [1(b) 2(b) 5.5(b) 11(b)]

CONNECTING TO AN INFRASTRUCTURE NETWORK WITH NO SECURITY (AP CONNECTION)

To connect to the network through an AP with SSID = Eval4325

Run **wl join Eval4325**.

CONNECTING TO AN INFRASTRUCTURE NETWORK WITH WEP SECURITY

To connect to the network that uses 12345 as the network key

- Run **wl join Eval4325 key 12345**.

CONNECTING TO AN INFRASTRUCTURE NETWORK WITH WPA-PSK/WPA2-PSK SECURITY

To specify TKIP or AES as the data encryption method

- Run **wl wsec 3/7**.

To enable the supplicant

- Run **wl sup_wpa 1**.

To specify the PSK passphrase (network key) to use

- Run **wl set_psk $passphrase**.

To connect to a network that uses WPA-PSK security

- Run **wl join Eval4325 imode bss amode wpapsk**.

To connect to a network that uses WPA2-PSK security

- Run **wl join Eval4325 imode bss amode wpa2psk**.

CONNECTING TO AN AD HOC NETWORK USING CHANNEL 1

To set the channel to channel 1

- Run **wl channel 1**.

To connect to the ad hoc network with SSID = 4325-ADHOC

- Run **wl join 4325-ADHOC imode ibss**.

MANAGING POWER CONSUMPTION

To disable Power Save (PS) mode (default)

- Run **wl PM 0**.

To enable legacy IEEE 802.11 Power Save (PS) mode

- Run **wl PM 1**.

To enable Fast IEEE 802.11 Power Save mode

- Run **wl PM 2**.

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Note:

- The STA automatically transitions to Legacy PS mode when no data is being sent or received.
- The STA automatically disables PS mode when data is being sent or received.

MEASURING WLAN THROUGHPUT

The throughput measurement shows the performance of the TCP/IP layer over the wireless link. To achieve the best results,

run the measurement test in a clean environment with as little interference as possible . The test can be run with the adapter

connected to either an Infrastructure network (see Fig. 2.2) or an ad hoc network (see Fig. 2.3). An AP that is known to be

in good working order should be used for the infrastructure mode test.

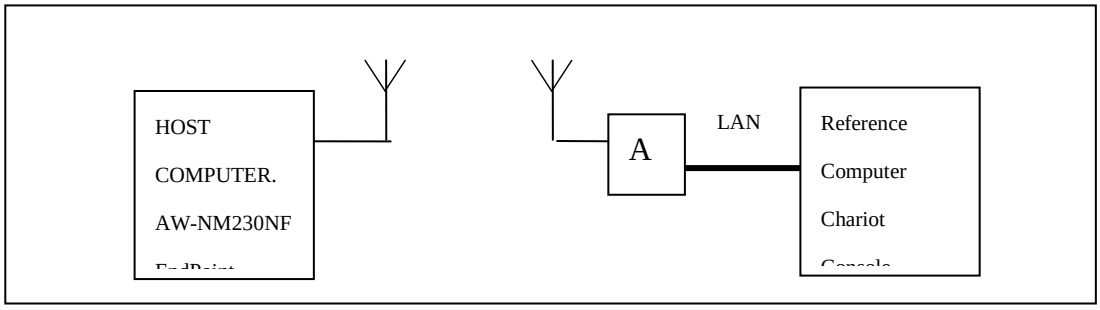

FIG. 2.2

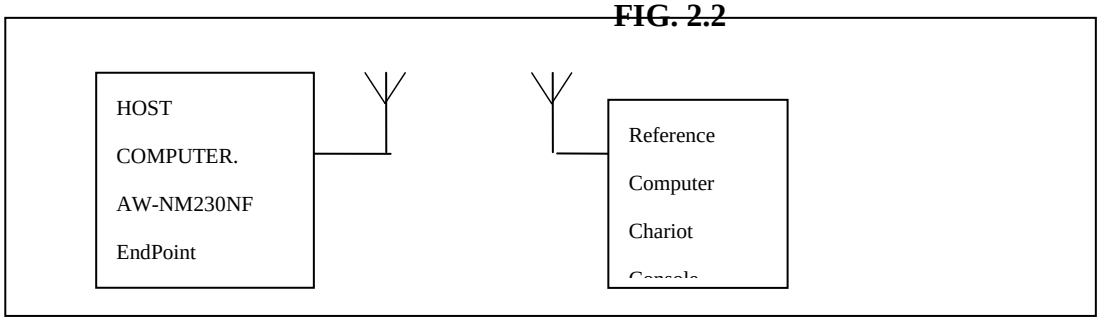

FIG. 2.3

MEASURING THROUGHPUT USING NETIQ CHARIOT

Test Procedure

1. Bring up the AW-NM230NF demo boar with the IP address set as 192.168.1.110.

2. Connect the reference computer with Chariot Console, which is assigned an IP address of 192.168.1.100, to the LAN

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port of the AP

3. Verify that communication exists between the reference computer and the AW-NM230NF demo board by pinging **192.168.1.100**

from the AW-NM230NF host console.

4. Set up Chariot.

a. On the host computer, activate EndPoint:

b. Using Chariot Console on the reference computer, create two pair groups (192.168.1.100 and 192.168.1.110) using the Chariot Throughput.scr script. Run the throughput test for a specified period of time and observe the results.

RF Tx/Rx Performance Test

CREATING A Tx TEST

(In Ubuntu linux 12.04)

1. Open the Terminal, enter the command: **sudo su** and **password**.

2. Enter

Insmod /(path of dhd.ko file)

firmware_path=/(path of firmware file) nvram_path=/(path of nvram file) to enable.

3. Enter the **wl ver** command to check the current WL driver version.

4. Run the following command set **(delay at least 700ms between each command)**:

11b rate:

./wl mpc 0
./wl country ALL
./wl up
./wl scansuppress 1
./wl band b
./wl channel **7**
./wl nrate -r **11**
./wl txpwr1 -o -q **68**
./wl phy_forcecal 1
./wl pkteng_start 00:11:22:33:44:55 tx **300 1500** 0

This will send continuous Tx Packets with 300 us packet interval,1500 byte packet length. Data rate =11Mbps ,Channel=7 and output power =17dBm(68/4=17 q means quarter).

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11g rate:

./wl mpc 0
./wl country ALL
./wl up
./wl scansuppress 1
./wl band b
./wl channel **7**
./wl nrate -r **54**
./wl txpwr1 -o -q **60**
./wl phy_forcecal 1
./wl pkteng_start 00:11:22:33:44:55 tx **300 1500** 0

This will send continuous Tx Packets with 300 us packet interval,1500 byte packet length. Data rate =54Mbps ,Channel=7 and output power =15dBm(60/4=15 q means quarter).

2.4G 11n 20 SISO rate:

./wl mpc 0
./wl country ALL
./wl up
./wl scansuppress 1
./wl band b
./wl channel **7**
./wl nrate -m **7**
./wl chanspec -c **7** -b 2 -w **20** -s 0
./wl txpwr1 -o -q **52**
./wl phy_forcecal 1
./wl pkteng_start 00:11:22:33:44:55 tx **300 1500** 0

This will send continuous Tx Packets with 300 us packet interval,1500 byte packet length. Data rate =MCS7, Bandwidth=20Mhz, Channel=7 and output power =13dBm(52/4=13 q means quarter).

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CREATING A Rx TEST

(In Ubuntu linux 12.04)

1. Open the Terminal, enter the command: **sudo su** and **password**.

2. Enter

Insmod /(path of dhd.ko file) firmware_path=/(path of firmware file) nvram_path=/(path of nvram file)

to enable.

3. Enter the **wl ver** command to check the current WL driver version.

4. Run the following command set

11b/g rate:

./wl mpc 0
./wl phy_watchdog 0
./wl country ALL
./wl band b
./wl channel **7**
./wl up
./wl phy_forcecal 1
./wl scansuppress 1
./wl rxchain 1
./wl reset_cnts
./wl counters

This will enter Channel 7 receive mode.

2.4G 11n 20 SISO rate:

./wl mpc 0
./wl phy_watchdog 0
./wl country ALL
./wl band b
./wl channel **7**
./wl up

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./wl phy_forcecal 1

./wl scansuppress 1

./wl rxchain 1

./wl reset_cnts

./wl counters

This will enter Channel 7 receive mode.

※.The default MAC address is 001122334455. Packets sent from Signal Generator **must** have the same MAC address as the DUT's MAC address (Runtime mac address can be overrode by using wl cur_etheraddr xx:xx:xx:xx:xx:xx .

※. Use "**./wl counters**" and find the received frame numbers in "**rxdfrmocast**".

※. The RX PER = [(Total lost packets at the receiver) / (Total sent packets from the Signal Generator)] x 100%.

Thus, PER =100% - [(**rxdfrmocast** numbers after sequence play) – (**rxdfrmocast** numbers before sequence play)] / (Total sent packets from the signal Generator) x 100%.

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2. Bluetooth Basic Test

*Must connect USB to PC

Download Mini-driver

1. Start Broadcom BlueTool.

2. On the **View** menu, click **Log Windows Details**.

3. On the **Transport** menu, click **HCI Control**.

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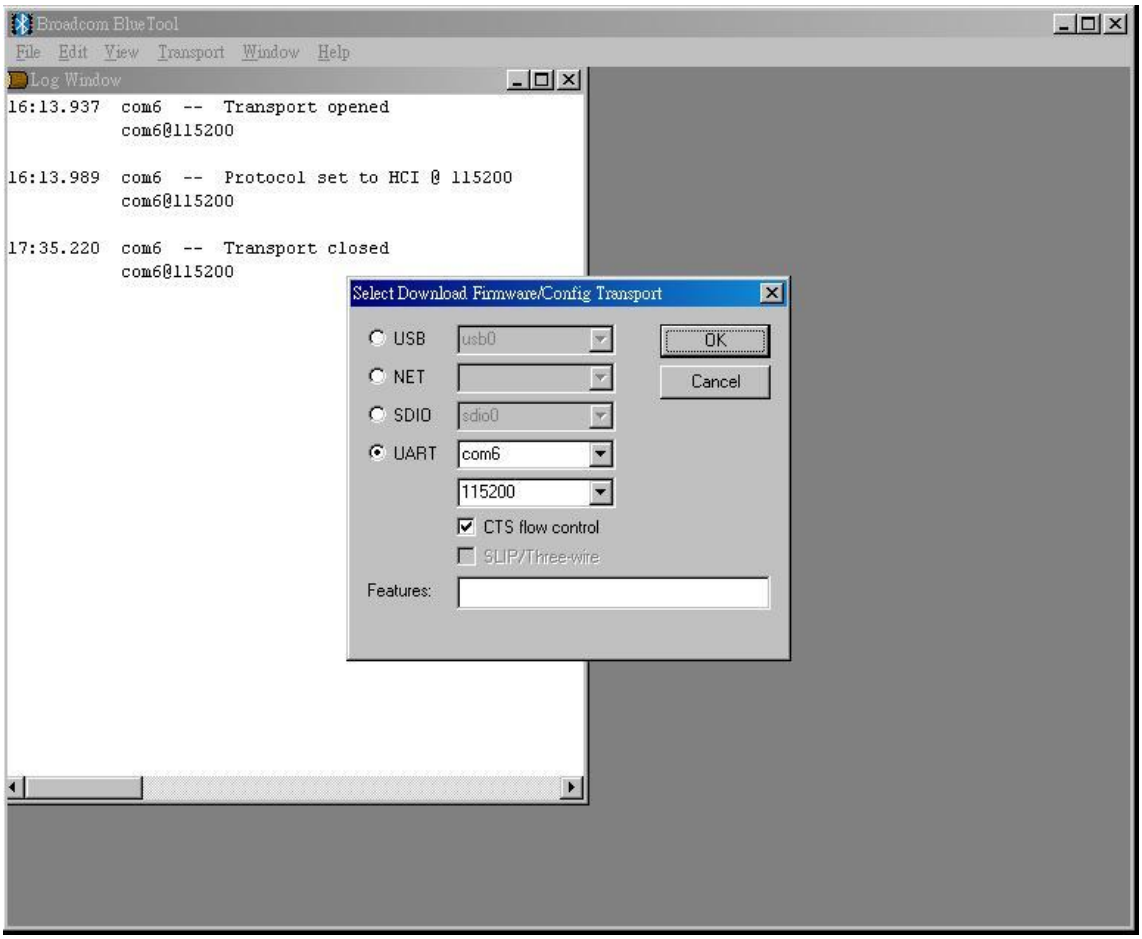

4. In Select HCI Control Window Transport:

a. Select **UART** as the type of transport.

b. In the COM port list, select **com6**.(check the port number in device manager)

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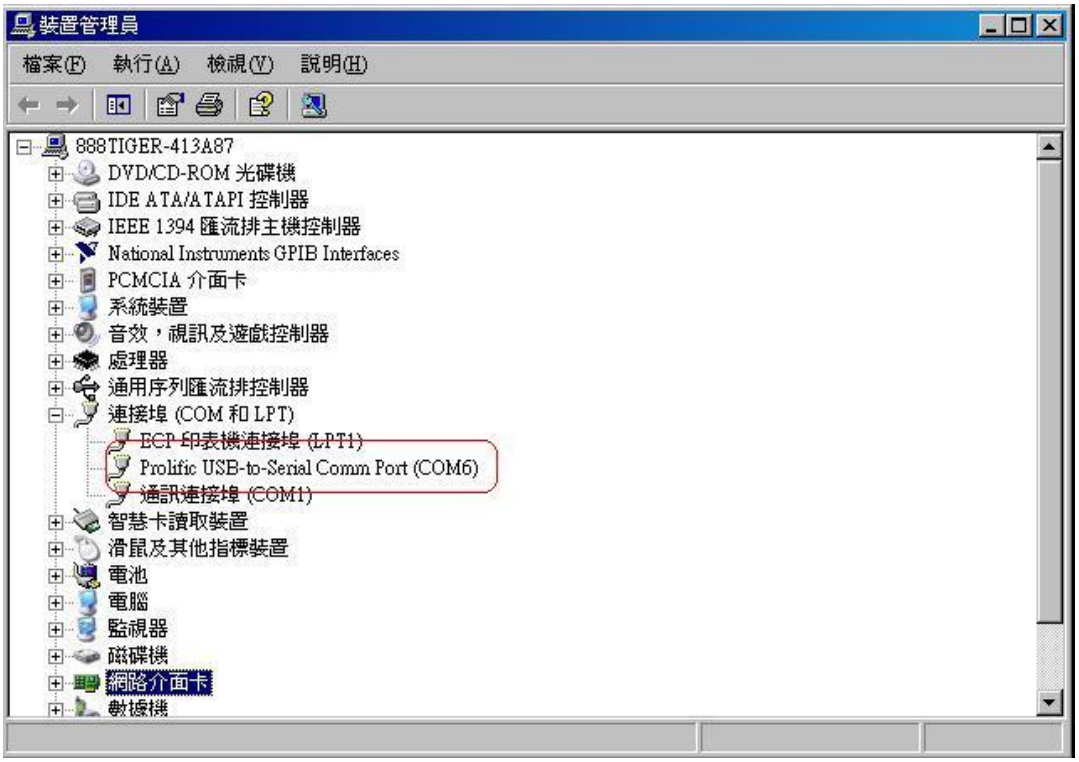
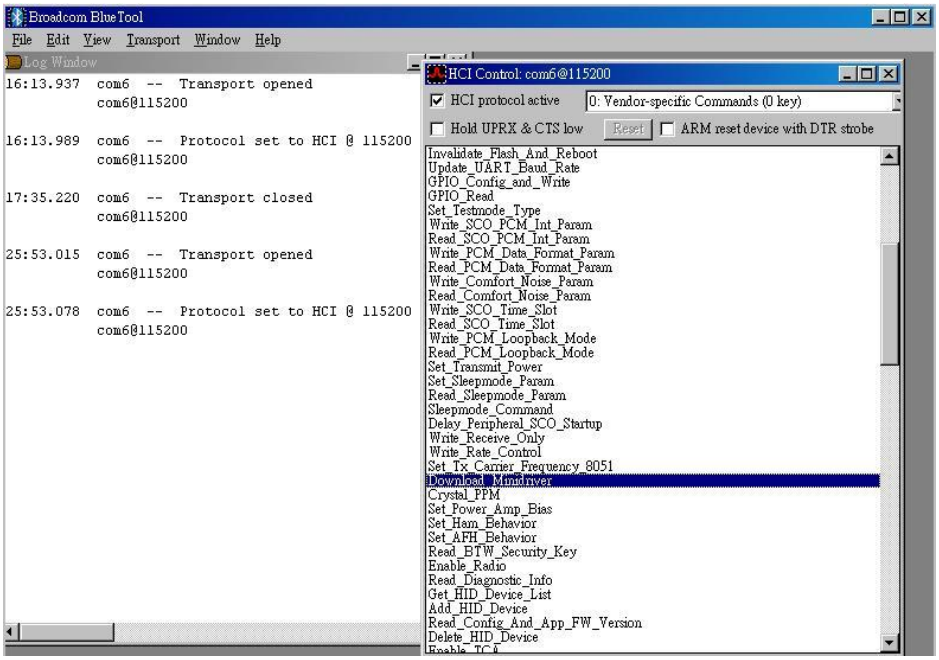


c. In the Baud list, type **115200**.

d. Select the **CTS flow control** check box.

e. Click **OK**.

5. In HCI Control, select the **HCI protocol active** check box



6. In the HCI Control commands list, select **0: Vendor-specific Commands (0 key)**, and then double-click **Download Minidriver**.

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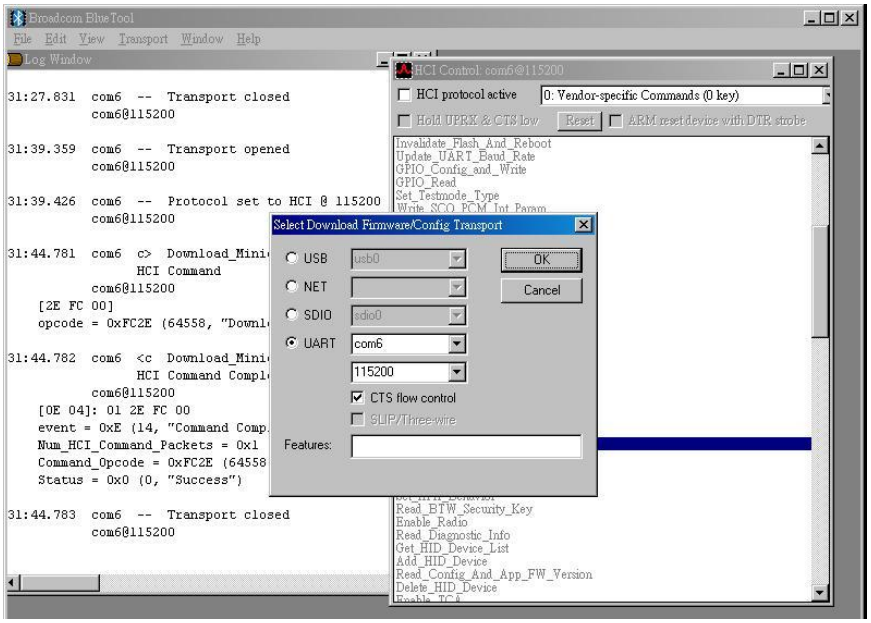
7. On the **Transport** menu, click **Download Firmware/Config**.

8. In **Select Download Firmware/Config Transport**:



a. Select **UART** as the type of transport.

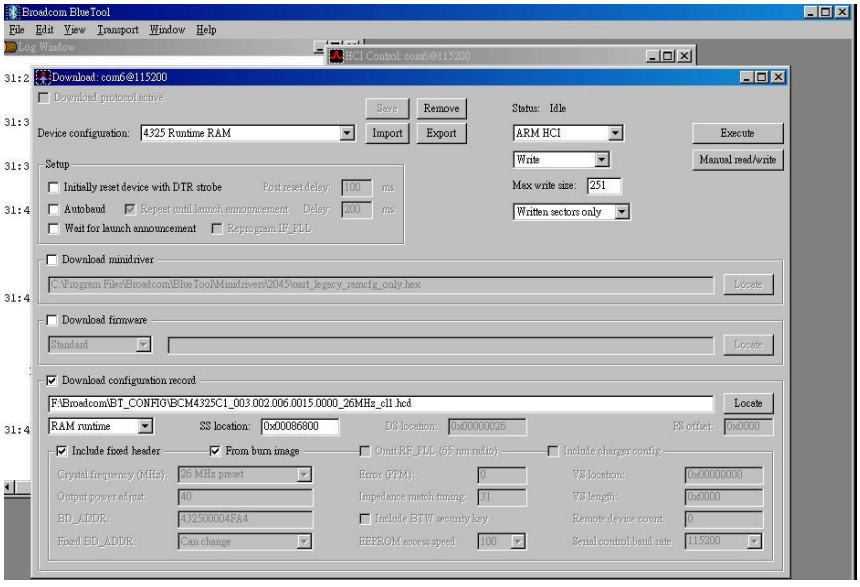
b. In the COM port list, select **com6**.

c. In the Baud list box, type **115200**.

d. Select the **CTS flow control** check box.

e. Click **OK**.

9. In **Download**, configure the settings to match those shown below



10. Click **Execute**.

11. Select the **HCI protocol active** check box

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Throughput Test

Bluetool contains a throughput test feature that can be used with two or more AW-NM230NF devices. Note that each device runs on a separate PC with BlueTool installed. This document will provide basic directions for setting-up and running this test.

The next step in setting-up the test is establishing a connection between the devices.

ESTABLISH A BLUETOOTH CONNECTION BETWEEN TWO USB DEVICES

SET UP THE SLAVE DEVICE FIRST

1. On the **Slave** side, start Bluetool from the Start Menu.
2. If the Log Window is not already open, select “View” and then select “Log Window”.Select “Transport” and then Select “HCI Control.” New window pop-up, select “UART” and enter com port number. Click “OK”.
3. Download mini driver (see 3.1)
4. In the “HCI Control” window, select “7.3 Host Controller & Baseband Commands” (Note: may be 4.3, depending on version)
5. Double Click the “Write Scan Enable” entry
6. Select “Inquiry and Page Scan Enabled” and click “OK”
7. Double Click “Set Event Filter”
8. Select “Connection Setup”
9. Select “Allow Connections from all devices”
10. Select “Do Auto accept the connection with role switch disabled”
11. Click “OK”
12. In the “HCI Control” window, select “0 Vendor-specific commands”.
13. Double Click the “Write_BD_ADDR” command
14. Enter 001122334455
15. In the “HCI Control” window,select”0 Vendor-specific commands”. Double Click ”Update UART Baud Rate”. Select 3000000 then click OK.

SET UP THE MASTER DEVICE, AND CREATE THE CONNECTION

1. On the **Master** side, start Bluetool.
2. Open the log window, if not already open, and open the UART HCI Transport.
3. Download mini driver (see 3.1)
4. In the “HCI Control” window, select “7.1 Link Control Commands” (Note: may be 4.5 depending on version)

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5. Double Click “Create Connection” and put BD address of the slave device into the BDADDR box. Click “OK”
6. In the “HCI Control” window,select”0 Vendor-specific commands”. Double Click ”Update UART Baud Rate”. Select 3000000 then click OK.

A connection should establish now. This can be verified by looking in the log windows for both devices, which should now contain Connection Complete events with “Success” in the status field.

NOTE: once the connection has been established, Inquiry and Page Scan can be disabled. Also, go to: “7.3 Host Controller & Baseband Commands” →→ “Set Event Filter”. Select “Connection Setup”; Select “Allow Connections from all devices”; Select “Do NOT Auto accept the connection” and hit ‘OK’. This will make the slave device non-discoverable and increase throughput by reducing overhead.

SET UP AND EXECUTE THE THROUGHPUT TEST

SET UP THE SLAVE AS THE RECEIVER

1. On the **Slave** side, select “Transport” and then select “Throughput Tests”. Select UART.
2. In the “Receive Test” (Bottom half of the window), fill in a data pattern such as “abcdef”, and fill in a count such as “1000000”
3. Close the “Log Window.” If this window is left open or minimized, then the throughput test will not achieve maximum throughput because of delay that is added by Windows every time the log window is updated.

SET UP THE MASTER AS THE TRANSMITTER AND START THE TEST

1. On the **Master** side, select “Transport” and then select “Throughput Tests”. Select UART.
2. In the “Transmit Test” window (top half of the window), fill in the same data pattern and count that was filled in for the receive test on the **Slave** side.
3. Close the “Log Window.” If this window is left open or minimized, then the throughput test will not achieve maximum throughput because of delay that is added by Windows every time the log window is updated.
4. On the **Slave** side, click “Execute Test” in the “Receive Test” window.
5. On the **Master** side, click “Execute Test” in the “Transmit Test” window.

Bluetooth throughput test is now running.

To stop the test, click “Abort Test” on the Master side first, then on the slave side.

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RF Performance Test

The following procedure explains how to configure the AW-NM230NF for RF testing using Broadcom BlueTool. At the completion of the procedure, connect the Bluetooth test instrument to the AW-NM230NF with RF cable and performs the RF tests.

RESETTING THE USB DEVICE

To reset the USB device

•In **HCI Control**, in the HCI Control commands list, select **7.3: Host Controller & Baseband Commands (3 key)**, and then double-click **Reset**.

READING THE BLUETOOTH DEVICE ADDRESS

To read the Bluetooth Device Address

• In HCI Control, in the HCI Control commands list, select **7.4: Informational Parameters (4 key)**, and then double-click **Read_BD_ADDR**.

The Bluetooth Device Address (BD_ADDR) is displayed in the log window. The Bluetooth Device Address might be needed

by the Bluetooth tester

SETTING THE EVENT FILTER TO AUTOMATICALLY ALLOW CONNECTION

To set the event filter to automatically allow connection

1. In HCI Control, in the HCI Control commands list, select **7.3: Host Controller & Baseband Commands (3 key)**, and then double-click **Set_Event_Filter**.

2. In HCI Command: Set_Event_Filter:

a. In the **Filter_Type** list, select **Connection Setup.**

b. In the **Connection_Setup_Filter_Condition_Type** list, select **Allow Connections from all devices**.

c. In the **Auto_Accept_Flag** list, select **Do Auto accept the connection with role switch disabled**.

ENABLING WRITE SCAN

To enable Write Scan

1. In HCI Control, in the HCI Control commands list, select **7.3: Host Controller & Baseband Commands (3 key)**, and then double-click **Write_Scan_Enable**.

2. In HCI Command: Write_Scan_Enable, in the **Scan_Enable** list, select **Inquiry and Page Scan enabled**.

ENABLING TEST MODE

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To enable Test Mode

• In HCI Control, in the HCI Control commands list, select **7.6: Testing Commands (6 key)**, and then double-click **Enable_Device_Under_Test_Mode**.

The AW-NM230NF is now ready to receive a connection request from the Bluetooth tester and begin testing specified RF parameters.

3.Statement

Federal Communication Commission Interference Statement

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 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.

IMPORTANT NOTE:

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

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

Country Code selection feature to be disabled for products marketed to the US/CANADA

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

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2) The transmitter module may not be co-located with any other transmitter or antenna,
3) For all products market in US, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change.

As long as 3 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

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: “Contains FCC ID: TLZ-NM230NF”.

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.

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Industry Canada statement:

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

(1) This device may not cause interference; and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme aux CNR exemptes de licence d'Industrie Canada. Son fonctionnement est soumis aux deux conditions suivantes:
(1) Ce dispositif ne peut causer d'interférences; et(2) Ce dispositif doit accepter toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement de l'appareil.

Radiation Exposure Statement:
This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Déclaration d'exposition aux radiations:
Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

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

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 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:

1) L'antenne doit être installée de telle sorte qu'une distance de 20 cm est respectée entre l'antenne et les utilisateurs, et
2) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les 2 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

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: “Contains IC: 6100A-NM230NF”.

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Plaque signalétique du produit final

Ce module émetteur est autorisé uniquement pour une utilisation dans un dispositif où l'antenne peut être installée de telle sorte qu'une distance de 20cm peut être maintenue entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 6100A-NM230NF ".

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.

This radio transmitter (IC: 6100A-NM230NF) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device

Cet émetteur radio (IC: 6100A-NM230NF) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous avec le gain maximal admissible indiqué. Types d'antennes ne figurent pas dans cette liste, ayant un gain supérieur au gain maximum indiqué pour ce type, sont strictement interdits pour une utilisation avec cet appareil

Model	Type	Connector	Gain (dBi)
RFMTA340715IMLB301	PIFA	I-PEX	3

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Taiwan 警語：

第十二條→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。

第十四條→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。

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: CC XX xx YY yyy Z z W」字樣

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4. Pin Definition / Pin Map

Pin No	Definition	Basic Description	Type	Voltage
1	NC	No Connect	Floating	
2	NC	No Connect	Floating	
3	NC	No Connect	Floating	
4	3.3V	3.3V power pin	VCC	3.3V
5	3.3V	3.3V power pin	VCC	3.3V
6	GND	Ground.	GND	
7	NC	No Connect	Floating	
8	NC	No Connect	Floating	
9	NC	No Connect	Floating	
10	NC	No Connect	Floating	
11	SECI_TX_GPIO1	GPIO pin	I/O	1.8V
12	SECI_RX_GPIO2	GPIO pin	I/O	1.8V
13	NC	No Connect	Floating	
14	NC	No Connect	Floating	
15	NC	No Connect	Floating	
16	NC	No Connect	Floating	
17	GND	Ground.	GND	
18	NC	No Connect	Floating	
19	NC	No Connect	Floating	
20	GND	Ground.	GND	
21	NC	No Connect	Floating	
22	NC	No Connect	Floating	
23	GND	Ground	GND	
24	BT_DEV_WAKE	BT Device Wake	I	1.8V
25	NC	No Connect	Floating	
26	GND	Ground	GND	
27	CLK_32KHz	External sleep clock input (32.768 kHz).	I	1.8V
28	WL_REG_ON	Used by PMU to power up or power down the internal regulators used by the WLAN section. Also, when deasserted, this pin holds the WLAN section in reset. This pin has an internal 200k	I	1.8V

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		ohm pull down resistor that is enabled by default. It can be disabled through programming.		
29	NC	No Connect	Floating	
30	NC	No Connect	Floating	
31	NC	No Connect	Floating	
32	GND	Ground	GND	
33	NC	No Connect	Floating	
34	NC	No Connect	Floating	
35	GND	Ground	GND	
36	NC	No Connect	Floating	
37	NC	No Connect	Floating	
38	GND	Ground	GND	
39	NC	No Connect	Floating	
40	NC	No Connect	Floating	
41	GND	Ground	GND	
42	NC	No Connect	Floating	
43	NC	No Connect	Floating	
44	NC	No Connect	Floating	
45	WL_REG_ON	Used by PMU to power up or power down the internal regulators used by the WLAN section. Also, when deasserted, this pin holds the WLAN section in reset. This pin has an internal 200k ohm pull down resistor that is enabled by default. It can be disabled through programming.	I	1.8V
46	WL_HOST_WAKE	WL Host Wake	O	1.8V
47	SDIO DATA3	SDIO Data Line 3	I/O	1.8V
48	SDIO DATA2	SDIO Data Line 2	I/O	1.8V
49	SDIO DATA1	SDIO Data Line 1	I/O	1.8V
50	SDIO DATA0	SDIO Data Line 0	I/O	1.8V
51	SDIO CMD	SDIO Command Input	I/O	1.8V
52	SDIO CLK	SDIO Clock Input	I	1.8V
53	BT_HOST_WAKE	BT Host Wake	O	1.8V
54	UART CTS	High-Speed UART CTS	I	1.8V
55	UART Tx	High-Speed UART Data Out	O	1.8V
56	UART Rx	High-Speed UART Data In	I	1.8V

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57	UART RTS	High-Speed UART RTS	O	1.8V
58	PCM_SYNC	PCM Synchronization control	O	1.8V
59	PCM_IN	PCM data Input	I	1.8V
60	PCM_OUT	PCM data Out	O	1.8V
61	PCM_CLK	PCM Clock	I/O	1.8V
62	GND	Ground	GND	
63	BT_REG_ON	Used by PMU to power up or power down the internal regulators used by the Bluetooth section. Also, when deasserted, this pin holds the Bluetooth section in reset. This pin has an internal 200k ohm pull down resistor that is enabled by default. It can be disabled through programming.	I	1.8V
64	NC	No Connect	Floating	
65	NC	No Connect	Floating	
66	NC	No Connect	Floating	
67	NC	No Connect	Floating	
68	GND	Ground	GND	
69	NC	No Connect	Floating	
70	NC	No Connect	Floating	
71	GND	Ground	GND	
72	3.3V	3.3V power pin	VCC	3.3V
73	3.3V	3.3V power pin	VCC	3.3V
74	GND	Ground	GND	
75	GND	Ground	GND	
76	GND	Ground	GND	
77	GND	Ground	GND	
78	GND	Ground	GND	
79	GND	Ground	GND	
80	GND	Ground	GND	
81	GND	Ground	GND	
82	GND	Ground	GND	
83	GND	Ground	GND	
84	GND	Ground	GND	
85	GND	Ground	GND	

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86	GND	Ground	GND	
87	GND	Ground	GND	
88	GND	Ground	GND	
89	GND	Ground	GND	
90	GND	Ground	GND	
91	GND	Ground	GND	
92	GND	Ground	GND	
93	GND	Ground	GND	
94	GND	Ground	GND	
95	GND	Ground	GND	
96	GND	Ground	GND	
G1	GND	Ground	GND	
G2	GND	Ground	GND	
G3	GND	Ground	GND	
G4	GND	Ground	GND	
G5	GND	Ground	GND	
G6	GND	Ground	GND	
G7	GND	Ground	GND	
G8	GND	Ground	GND	
G9	GND	Ground	GND	
G10	GND	Ground	GND	
G11	GND	Ground	GND	
G12	GND	Ground	GND	

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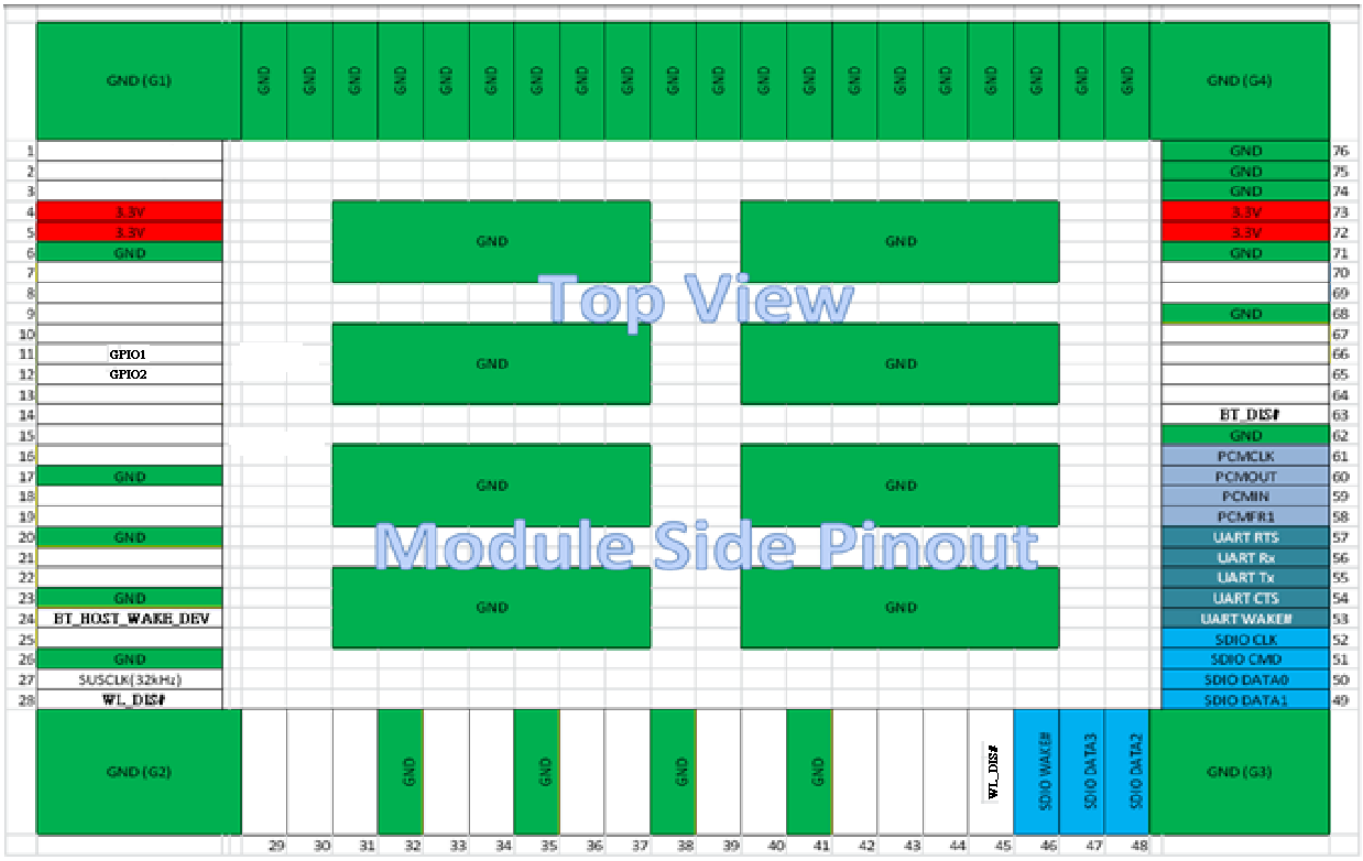
AW-NM230NF Top View Pin Map



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