AW-NB097H

IEEE 802.11b/g/n Wi-Fi with Bluetooth 3.0HS &4.0 class II Combo half Size Mini Card

Datasheet

Version 1.4

Document Release	Date	Modification	Initials	Approved
Version 0.1	2011/02/14	1. First release	Andy	Antonio
Version 0.2	2011/03/18	1. Update the Mechanical drawing	Kevin	Raylee
Version 0.3	2011/05/12	1. update pin define /power /sensitivity	Andy	Antonio
Version 0.4	2011/06/07	1. update pin define/ output power tolerance/ weight / BT PID/VID	Andy	Antonio
Version 0.5	2011/06/24	1. update power voltage	Andy	Antonio
Version 0.6	2011/07/26	1. Update power Sequencing	Andy	Antonio
Version 0.7	2011/09/26	1. Update power consumption / FCC label / temp.	Andy / Stephanie	Antonio /Ray
Version 0.8	2011/10/11	1. Update pin define for pin 5/51 of BT radio on/off	Andy	Antonio
Version 0.9	2011/10/26	1. Update antenna connector spec	Kevin	Ray
Version 1.0	2012/01/03	1. Update Pin define 2. Update Antenna Main/ Aux SN Label	Carla	Ray
Version 1.1	2012/02/09	1. Update Power sequencing and Power Consumption for NB097 with new resisster	Andy	Antonio
Version 1.2	2012/02/15	1. Amend Module SN Pic.	Carla	Ray
Version 1.3	2012/02/21	1. Amend Module SN three in one Label	Carla	Ray
Version 1.4	2012/02/23	1. Update Power consumption test device	Andy	Antonio

1. Introduction

AzureWave Technologies, Inc. introduces the pioneer of the IEEE 802.11b/g/n WiFi with Bluetooth 3.0HS& 4.0 class II combo half size mini card module ---**AW-NB097H.** The AW-NB097H IEEE 802.11 b/g/n PCIE WIFI with Bluetooth 3.0HS& 4.0 class II combo module is a highly integrated wireless local area network (WLAN) solution to let users enjoy the digital content through the latest wireless technology without using the extra cables and cords. And it combines with Bluetooth 3.0HS& 4.0 class II and provides a complete 2.4GHz Bluetooth system and is fully compliant to Bluetooth 3.0HS& 4.0 and v2.1 that supports EDR of 2Mbps and 3Mbps for data and audio communications. It enables a **high performance, cost effective, low power, compact solution** that easily fits onto two sides of the PCI Express and USB Combo Half Mini Card.

Compliant with the IEEE 802.11b/g/n standard, the AW-NB097H uses Direct Sequence Spread Spectrum (DSSS), Orthogonal Frequency Division Multiplexing (OFDM), BPSK, QPSK, CCK and QAM baseband modulation technologies.

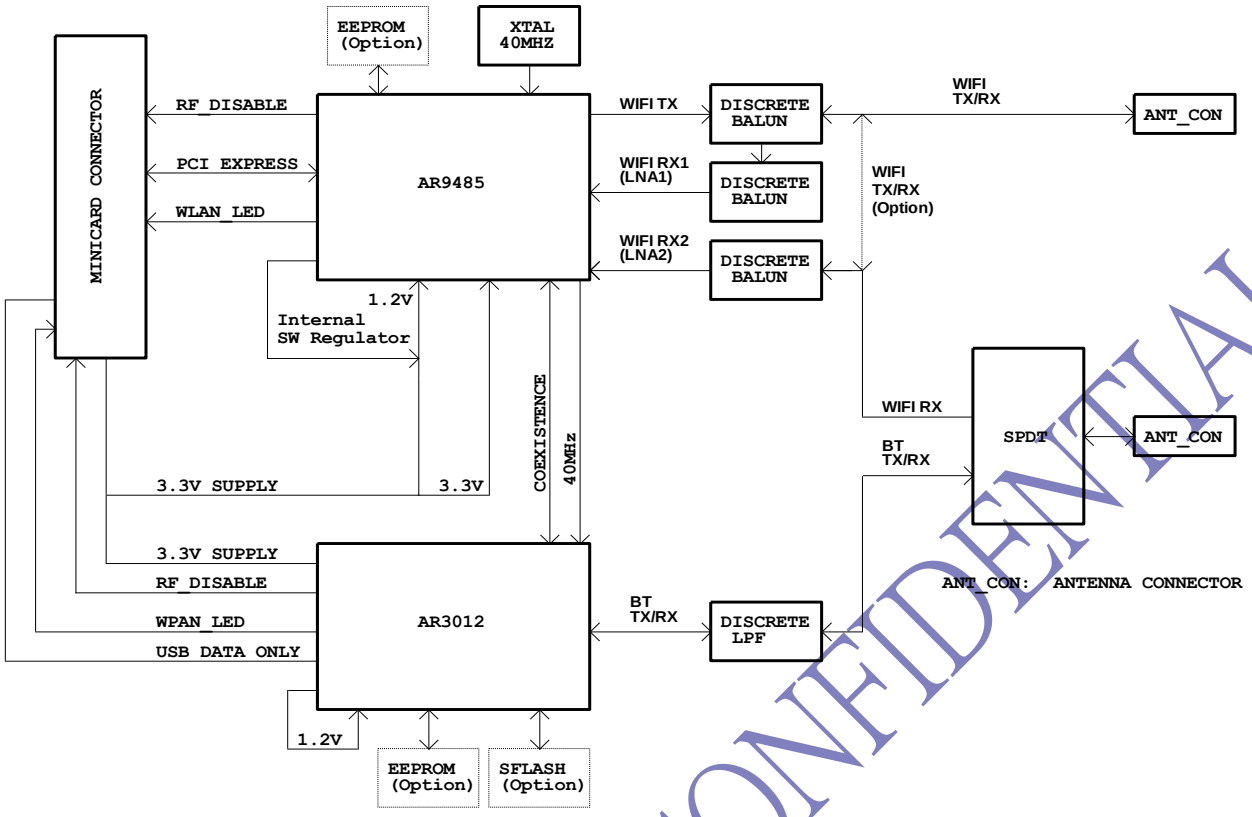
A high level of integration and full implementation of the power management functions specified in the IEEE 802.11 standard minimize system power requirements by using AW-NB097H.

AW-NB097H module adopts Atheros **AR9485 with AR3012**solution. The module design is based on the AR9485 with AR3012 solution.

2. Features

- **PCIE half size Mini-Card**
- **Compliant with IEEE802.11 b/g/n standard**
- **2 Antenna to support 1(Transmit) × 1 (Receive) technology and Bluetooth**
- **Antenna WLAN RX diversity**
- **High speed wireless connection up to 150 Mbps**
- **Low power consumption and high performance**
- **Enhanced wireless security**
- **Fully qualified Bluetooth 4.0 & 3.0HS**
- **Enhanced Data Rate(EDR) compliant for both 2Mbps and 3Mbps supported**
- **Fully speed operation with Piconet and Scatternet support**

3. Block Diagram



4. General Specifications

Model Name	AW-NB097H
Product Description	IEEE 802.11 b/g/n Wi-Fi with Bluetooth 4.0 class II Combo half size mini card
BlueTooth Standard	IEEE 802.11b/g/n, Wi-Fi compliant / Bluetooth v4.0 Standard
Host Interface	PCIE / USB
Major Chipset	Atheros AR9485 (MAC/Baseband/RF) with AR3012
Wi-Fi PID	2C97
Wi-Fi VID	1A3B
BT PID	3362
BT VID	13D3
Dimension	29.85mm x 26.65mm x 4.25 mm
Weight	3.1 g
Antenna	Hirose* U.FL-R-SMT 1: WiFi → TX/RX 2: Wi-Fi RX diversity ; Bluetooth → TX/RX
Operating Conditions	
Voltage	3.3V +/- 9%
Temperature	Operating: 0~80 °C

Storage temperature	**-40 °C~ 85 °C**
Electrical Specifications	
Frequency Range	**Wi-Fi: 2.4 GHz ISM Bands 2.412-2.472 GHz, 2.484 GHz /** **BT: 2402MHz~2483MHz**
Modulation	**Wi-Fi:** **802.11 g/n: OFDM** **802.11b: CCK(11, 5.5Mbps), QPSK(2Mbps), BPSK(1Mbps)** **BT:** **Header GFSK** **Payload 2M: 4-DQPSK** **Payload 3M: 8DPSK**
Output Power	**Wi-Fi: 802.11b: Typical 17 dBm at 11Mbps +/- 2.5dBm** **802.11g: Typical 13 dBm at 54Mbps +/- 2.5dBm** **802.11n 2.4G HT20 : 11 dBm at MCS7 +/-2.5dBm** **802.11n 2.4G HT40 : 11 dBm at MCS7 +/- 2.5dBm** **BT: -6 ≤ Output Power ≤ +4 dBm (Conductive)**
Receive Sensitivity	**802.11b: less than -76 dBm (11Mbps)** **802.11g: less than -65 dBm (54Mbps)** **802.11n: less than -64 dBm at HT20 MCS7** **less than -61 dBm at HT40 MCS7** **BT: BER < 0.1% (Anritsu 8852B Tx -70dBm)**
Power Consumption	**Refer following item 4-7**
Operating Range	**Wi-Fi:** **Open Space:300m** **(The transmission speed may vary according to the environment)** **BT: 10m (depending on environment and NB model)**
Regulatory	**FCC, CE… Refer to Atheros WB225 regulatory list**

4-1. Absolute Maximum Ratings

Symbol	Parameter	Max. Rating	Unit
V_{dd33}	Maximum I/O supply voltage	-0.3~4.0	V
RF_{in}	Maximum RF input (reference to 50 Ω)	+10	dBm

4-2. PCI Express Bus Interface Characteristics

Signal Name	Mini PCI-E PIN	Type	Driver	PU/DP Resistance
PCIE_RST_L	22	IL	---	---
PCIE_CLKREQ_L	7	OD	24mA	---

IL : Input signals with weak internal pull-down, to prevent signals from floating when left open

OD: A digital output signal with open drain

PD: Pull down

4-3. GPIO Interface Characteristics

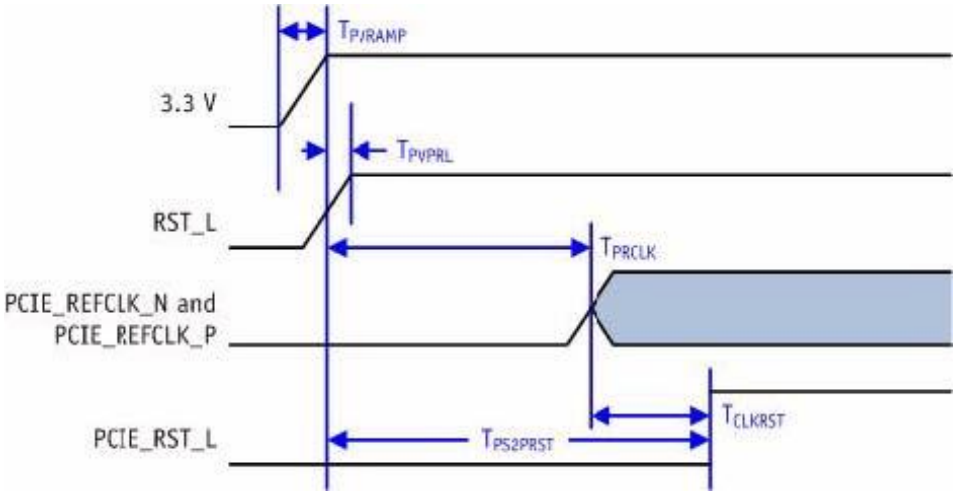
Signal Name(To chip GPIO PIN)	Mini PCI-E PIN	Type	Driver	PU/DP Resistance
MPCIE_WLAN_LED(GPIO1)	44	O		10 KΩ PU (Internal Pull-high)
WLAN_DISABLE(GPIO0)	20	I	Up to 22mA	100 KΩ PU (Internal Pull-high)

PU: Pull Up

4-4 LED mode behavior

State	Definition	Interpretation
OFF	**The LED is emitting no light.**	**Radio is incapable of transmitting.** This state is indicated when the card is not powered, the W_Disable# signal is asserted to disable the radio, or when the radio is disabled by software.
ON	**The LED is emitting light.**	**Radio is capable of transmitting.** The LED should remain ON even if the radio is bit actually transmitting. For example, the LED remains ON during temporary radio disablements performed by the Mini Card of its own volition to do scanning, switching radios/bands, power-management, etc. If the card is in a state wherein it is possible that radio can begin transmitting without the system user performing any action, this LED should remain ON.

4-5 Power UP Sequencing



Signal Name	Description	Min	Max
TPVRAMP	Power Supply Ramp on 3.3V	--	1 ms
TPVPRL	Power valid to RST_L asserted (Power on Reset)	0 μ s	--
TPRCLK	RST_L deasserted to PCIE_REFCLK_N and PCIE_REFCLK_P stable	100 μ s	--
TCLKRST	PCIE_REFCLK_N and PCIE_REFCLK_P stable to PCIE_RST_L de-asserted	100 μ s	--
TPS2PRST	Power supply stable to PCIE_RST_L de-assert	10 ms	--

[1]It is recommended to leave the RST_L pin floating. At power up, internal power-on reset signal derived from 1.2 V and 3.3 V supply will ensure correct functionality.

[2]This timing depends on hardware interface designs, such as Express Card, PCIE Mini Card, or PCIE desktop applications. The system must follow PCI Express specification, as well as TCLKRST.

4-6 Power Consumption

WLAN

Test Bed	Dell Vostro 3450	
Test OS	Windows 7 Ultimate SP1 x64	
Test AP	D-Link DIR-855	
Driver Version	AZ_AR9485_AR3012_Win7_9.2.0.402_BT_7.3.0.95_20110427	
Test Voltage	3.3V	
Item	**L0 Mode**	**NOTE**
Transmit Packet Test HT 40*	273.16 mA	N/A
Receiver Packet Test HT 40*	188.47 mA	N/A

Note. 1. Bluetooth function is disable.

2. The power consumption data were measured when NB operated in DC (battery) mode.

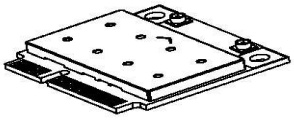
Bluetooth

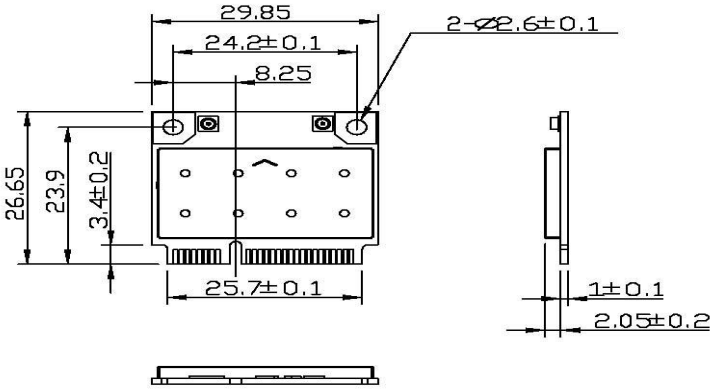
Test Bed	Dell Vostro 3450	
Test OS	Windows 7 Ultimate SP1 x64	
Driver Version	AZ_AR9485_AR3012_Win7_9.2.0.402_BT_7.3.0.95_20110427	
Test Voltage	3.3V	
Item	UNIT	Note
Transmit Packet	47.271 mA	N/A
Receiver Packet	41.521 mA	N/A

Note. 1.Wifi function is disable.

2.The power consumption data were measured when NB operated in DC (battery) mode.

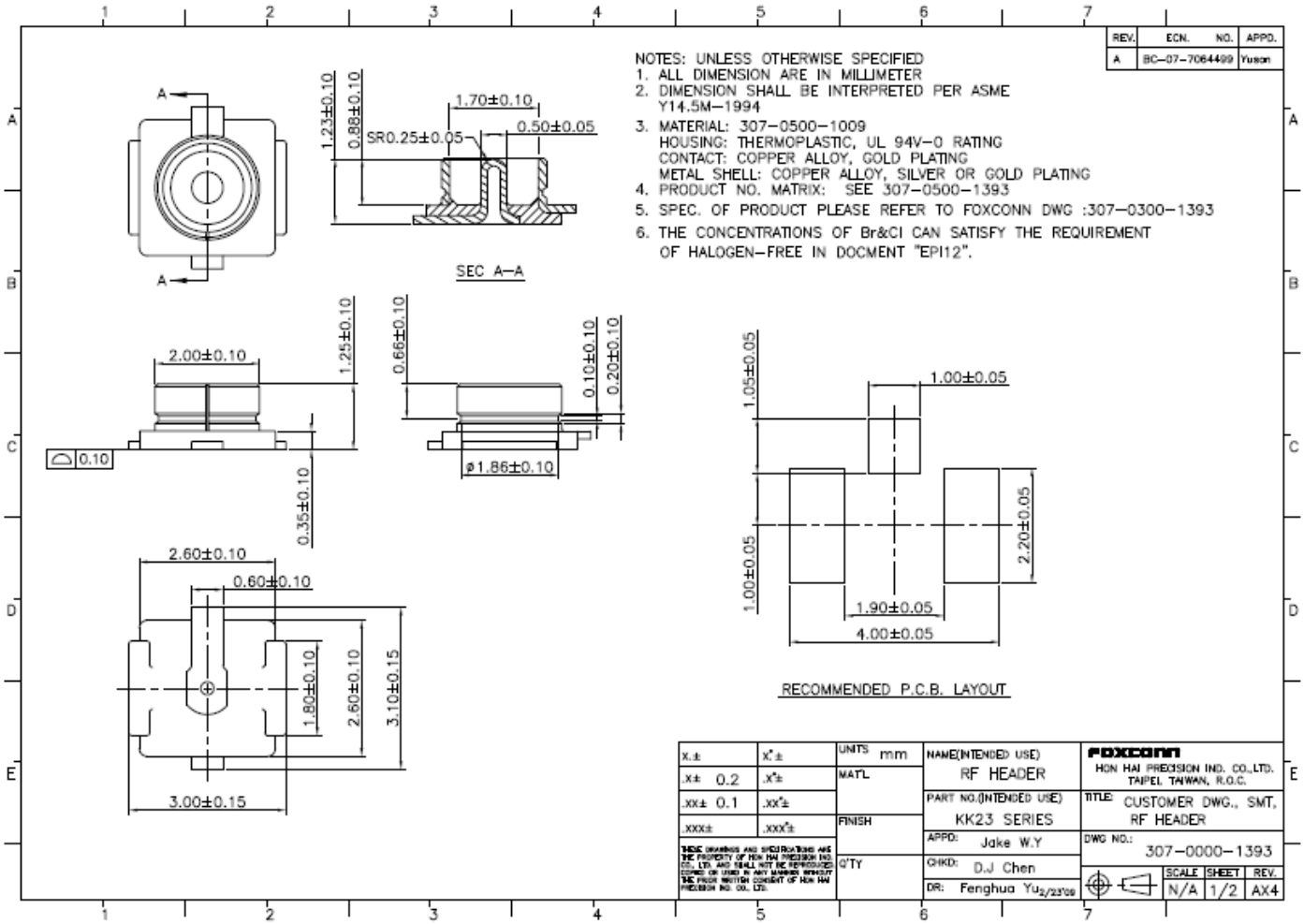
5. Mechanical Dimensions





Tolerances unless otherwise specified : ±0.15mm

RF Connector mechanical drawing

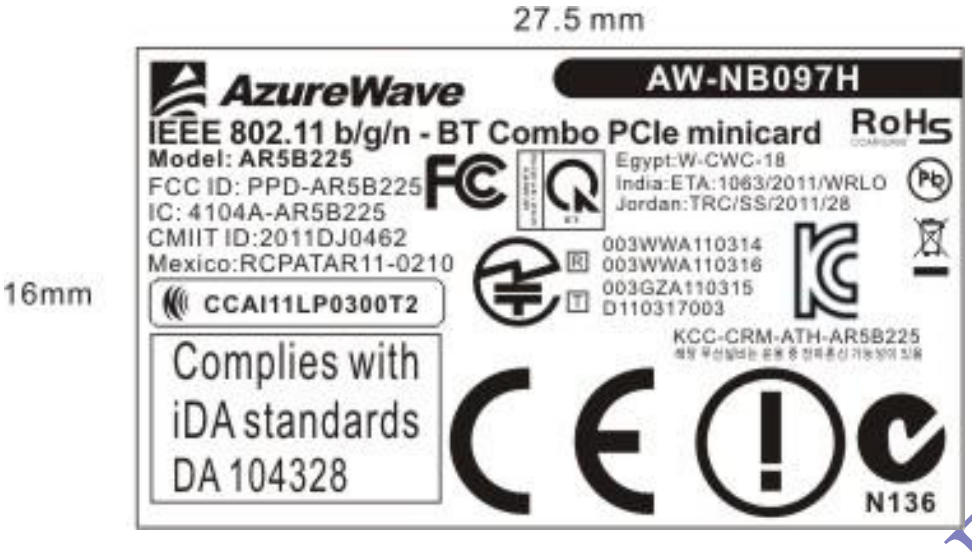


6. Connector Pin-out Definitions

Pin No.	Definition	Basic Description	Type
1	NC	No connect. Should be left open.	
2	3.3V	3.3V power supply.	VCC
3	NC	No connect. Should be left open.	
4	GND	Ground.	GND
5	BT_Disable	BT disable control(Active low).	Input
6	NC	No connect. Should be left open.	
7	CLKREQ_L	Reference clock request	Output
8	NC	No connect. Should be left open.	
9	GND	Ground.	GND
10	NC	No connect. Should be left open.	
11	REFCLK-	Differential reference clock.	Input
12	NC	No connect. Should be left open.	
13	REFCLK+	Differential reference clock.	Input
14	NC	No connect. Should be left open.	
15	GND	Ground.	GND
16	NC	No connect. Should be left open.	
17	NC	No connect. Should be left open.	
18	GND	Ground.	GND
19	NC	No connect. Should be left open.	
20	W_DISABLE_L	WLAN disable control(Active low).	Input
21	GND	Ground.	GND
22	PERST_L	PCI express fundamental reset.	Input
23	PERN0	Differential transmit.	Output
24	NC	No connect. Should be left open.	
25	PERP0	Differential transmit.	Output
26	GND	Ground.	GND
27	GND	Ground.	GND
28	NC	No connect. Should be left open.	
29	GND	Ground.	GND
30	NC	No connect. Should be left open.	
31	PETN0	Differential receive.	Input
32	NC	No connect. Should be left open.	

33	PETP0	Differential receive.	Input
34	GND	Ground.	GND
35	GND	Ground.	GND
36	USB_D-	USB Differential signal.	Input/Output
37	GND	Ground.	GND
38	USB_D+	USB Differential signal.	Input/Output
39	NC	No connect. Should be left open.	
40	NC	No connect. Should be left open.	
41	NC	No connect. Should be left open.	
42	NC	No connect. Should be left open.	
43	GND	Ground.	GND
44	LED_WLAN_L	Active low signal. The signal is used to provide status indicators via LED.	Output
45	NC	No connect. Should be left open.	
46	LED_WPAN_L	Active low signal. The signal is used to provide status indicators via LED.	Output
47	NC	No connect. Should be left open.	
48	NC	No connect. Should be left open.	
49	NC	No connect. Should be left open.	
50	GND	Ground.	GND
51	BT_Disable	BT disable control(Active low).	Input
52	3.3V	3.3V power supply.	VCC

7. (1) FCC Label



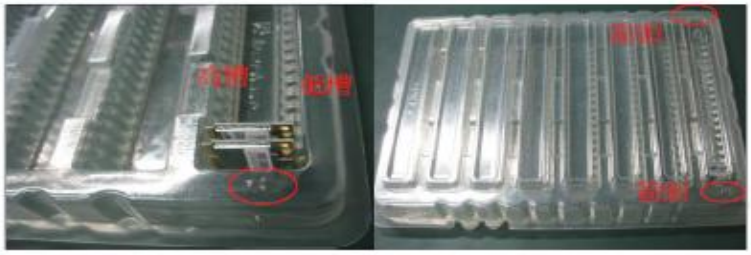
(2) Antenna Main/ Aux Label

Main: 黑色三角形 意指主天線

Aux: 白色三角形 意指副天線

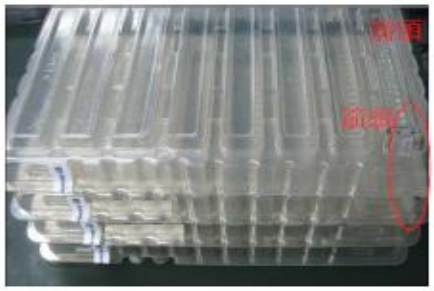
8. Packing method

1. 將無線網卡插入 Tray 盤內,金手指端在高槽處,天線端在低槽處,屏蔽蓋面向 Tray 盤上面右下角的箭頭.按照順序(1~150)將網卡放入 Tray 盤內,整盤 Tray 可放 150 片網卡.(正常情況下應該放滿產品,因爲缺少樣品所以暫時沒有放滿產品,以下相同)



2. 將 Tray 盤的上蓋蓋上,注意 Cover 的箭頭要與 Tray 盤的箭頭對應.另外,在盒子長邊的對角方向上分別貼易撕膜一張.

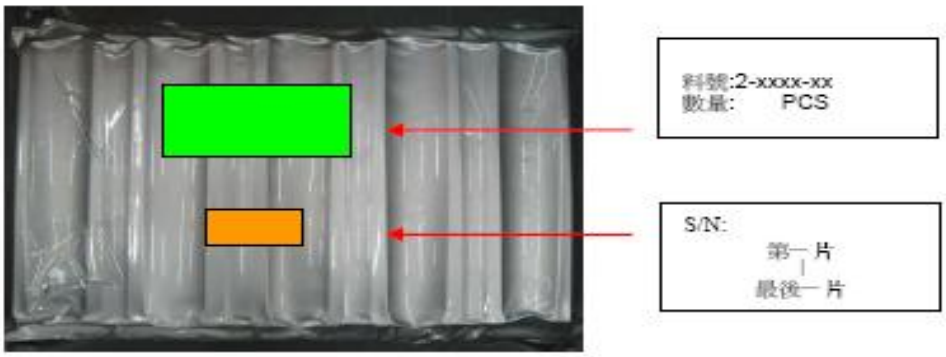
3. 重複步驟 1 和步驟 2,將 4 盤產品疊加起來,注意四盤產品的 Tray 及 Cover 的箭頭對應在同一個位置.



4. 四盤爲一疊,用兩條橡皮筋束緊,並在產品屏蔽蓋所對箭頭方向的盒子側面的橡皮筋處放乾燥劑一包.

5. 乾燥劑在內側,將產品裝入抗靜電鋁箔袋中.

6 將鋁箔袋抽成 60%真空,然後熱壓封袋(Tray 盤缺角在左上角).貼出貨標籤,用透明膠帶包覆,然後再貼 S/N 標籤.



7.貼有標籤,且真空包裝好的產品放入內箱中,注意乾燥劑所處位置爲內箱的右下角.

8. 合上內箱.

9. 將兩個內箱裝入外箱.

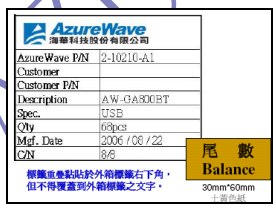
Shipping Mark / information

外箱上側標或麥頭請註明 Asus 料號／訂單號碼及數量 * 訂單號碼 ： 由業務提供

a. 外箱封箱膠帶規定

b. 標示產品, 料號 等資訊: 統一使用 PEGATRON 外箱標籤,為白色 Barcode 紙（7cm×8.8cm）,不分顏色, 黏貼位置統一為左上角,若左上角已有其他標籤可貼於右上角

c. 尾數箱標示標籤位置



d. 出貨標籤 （請依照下列出貨標籤格式製作） **依照業務訂單不同，分別有不同出貨標籤.

外箱標籤下方加貼 S/N label(S/N label 大小無特殊定義,請工廠自訂)

S/N:

xxxxxxxxxxxxx0000001

xxxxxxxxxxxxx0001200

Ex.<<華碩>>出貨標籤