AW-NE186H

IEEE 802.11b/g/n
PCIE half size Mini-Card
Wireless Module

B1

Datasheet

Version 1.5

Este equipamento opera em caráter secundário, isto é, não tem direito à proteção contra interferência prejudicial, mesmo de estações do mesmo tipo e não pode causar interferência a sistemas operando em caráter primário.

Revision History

Document release	Date	Modification	initials	Approved
Version 0.1	2011 /03/28	Initial release	Andy	Antonio
Version 0.2	2011/04/11	Update Mechanical drawing	Stephanie	Ray
Version 0.3	2011/05/13	Update power & sensitivity	Stephanie	Ray
Version 0.4	2011/06/07	Update power tolerance and PID/VID /Weight	Stephanie	Ray
Version 0.5	2011/06/24	Update voltage range	Andy	Antonio
Version 0.6	2011/07/26	Update power sequencing	Andy	Antonio
Version 0.7	2011 / 08/23	Update Mechanical drawing	Kevin	Ray
Version 0.8	2011/09/28	Update Temperature / power consumption / FCC label	Andy	Antonio
Version 0.9	2011/10/7	Update Pull-high resistor value	Andy	Antonio
Version 1.0	2011/10/26	Update antenna connector spec	Kevin	Ray
Version 1.1	2012/01/03	Update antenna Main/Aux Label	Carla	Ray
Version1.2	2012/02/15	Amend Module SN Pic.	Carla	Ray
Version1.3	2012/02/21	Amend Module SN Pic.	Carla	Ray
Version 1.4	2012/04/16	Update Power Sequencing And Power Consumption data	Andy	Antonio
Version 1.5	2012/06/05	Update RX Sensitivity of 11g 54M	Andy	Antonio

1. Introduction

AzureWave Technologies, Inc. introduces the pioneer of the IEEE 802.11b/g/n PCIE half size Mini-Card wireless module ---AW-NE186H. The AW-NE186H PCIE half size Mini-Card wireless 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. It enables a high performance, cost effective, low power, compact solution that easily fits onto one side of a PCIE half size Mini-Card.

Compliant with the IEEE 802.11b/g/n standard, the AW-NE186H 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-NE186H.

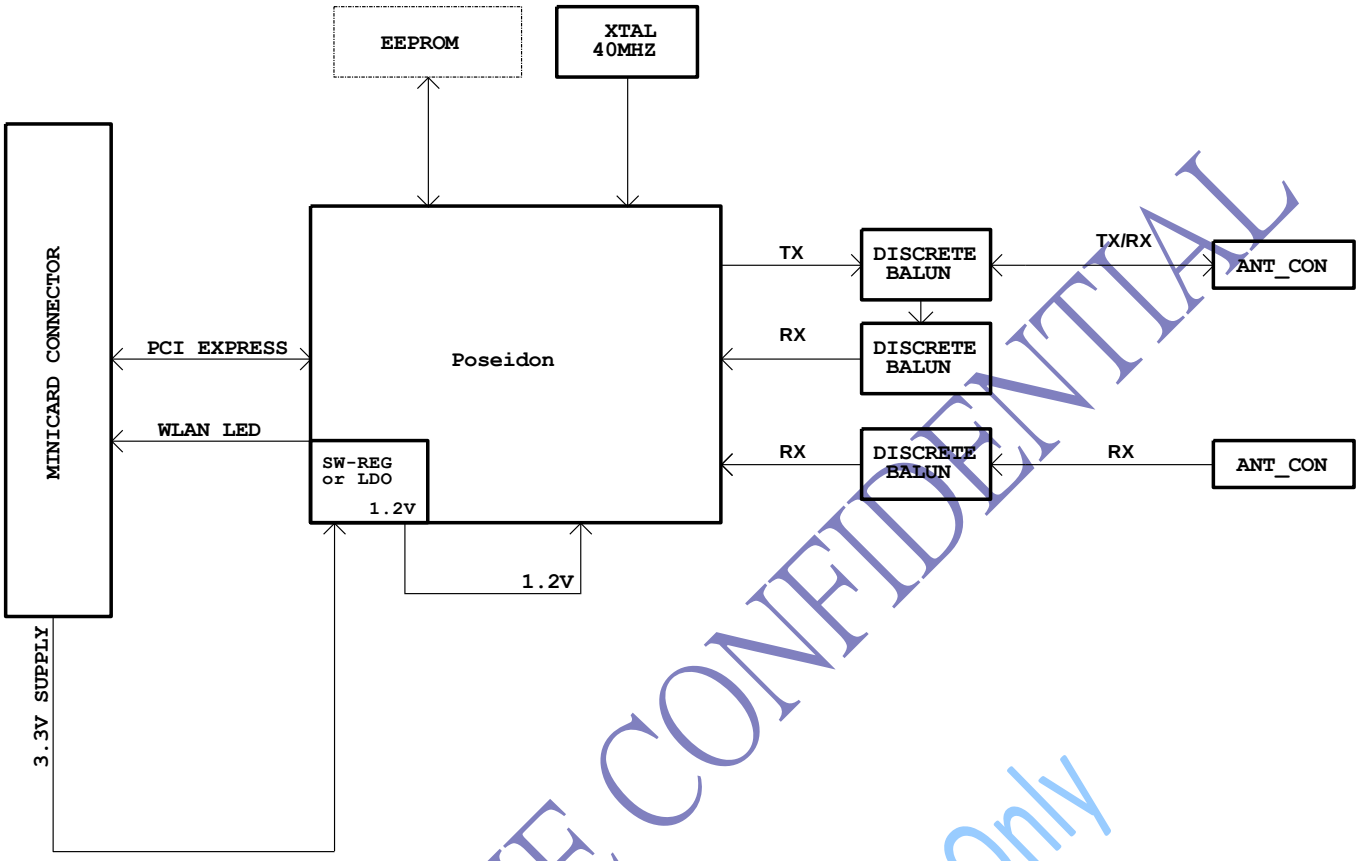
Longer Range and Faster Speed

Comparing to 802.11g technology, 802.11n standard make big improvement on speed and range. It Increases wireless range by up to 2 times and reduces dead spots in coverage area. The robust signal travels farther, maintaining wireless connections more farther than standard 802.11g. The data rate can up to 150Mbps data rate.

2. Features

- **PCIE half size Mini-Card**
- **Compliant with IEEE802.11n standard**
- **Antenna to support 1(Transmit) × 1 (Receive) technology**
- **Antenna RX diversity**
- **High speed wireless connection up to 150Mbps**
- **Low power consumption and high performance**
- **Enhanced wireless security**

3. Block Diagram



4. General Specifications

Model Name	AW-NE186H
Product Description	**PCIE half size Mini-Card wireless module**
WLAN Standard	IEEE 802.11 b/g/n, Wi-Fi compliant
Host Interface	PCIE half size Mini-Card
Major Chipset	Atheros AR9485 (MAC/Baseband/RF) Single chip
PID(Product ID)-Atheros	0032
VID (Vendor ID)-Atheros	168C
SSID (Sub product ID) AZW	1186
SVID (Sub vendor ID)AZW	1A3B
Weight	3.1g
Antenna Connector	Hirose U.FL-R-SMT 1:TX / RX 2:RX
Operating Conditions	
Voltage	3.3V+-9%
Temperature	Operating: 0~80 °C
Storage temperature	-40 °C ~ 85 °C
Humidity Non-Operating	60%
Electrical Specifications	
Frequency Range	2.4 GHz ISM Bands 2.412-2.472 GHz, 2.484 GHz
Modulation	802.11 g/n: OFDM 802.11b: CCK(11, 5.5Mbps), QPSK(2Mbps), BPSK(1Mbps)
Output Power	802.11b: 17 dBm +/-2.5dBm (11Mbps) 802.11g: 13 dBm +/-2.5dBm (54Mbps) 802.11n(HT20): 11 dBm +/-2.5dBm (HT20 MCS7) 802.11n(HT40): 11 dBm +/-2.5dBm (HT40 MCS7)
Receive Sensitivity	802.11b: less than -76 dBm (11Mbps) 802.11g: less than -68 dBm (54Mbps) 802.11n: less than -64 dBm at HT20 MCS7 less than -61 dBm at HT40 MCS7
Data Rates	802.11b: 11,5.5,2,1 Mbps 802.11g: 54,48,36,24,18,12,9,6 Mbps 802011n: up to 150Mbps
Operating Range	Open Space: 300m Indoor:100m (The transmission speed may vary according to the environment)
Security	◆ WEP 64-bit and 128-bit encryption ◆ WPA(Wi-Fi Protected Access)

	◆ WPA2(Wi-Fi Protected Access)
Operating System Compatibility	**Windows XP/Vista/ win 7**
Regulatory	**FCC / CE / NCC / Japan …etc** **Details refer to QCA/Atheros HB125 Regulatory documentation**

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	---	15 KΩ PU (Internal Pull-high)
PCIE_CLKREQ_L	7	OD	24mA	---

I : Input signals with internal pull-high ,active low

OD: A digital output signal with open drain, active low

PU: Pull Up

PD: Pull down

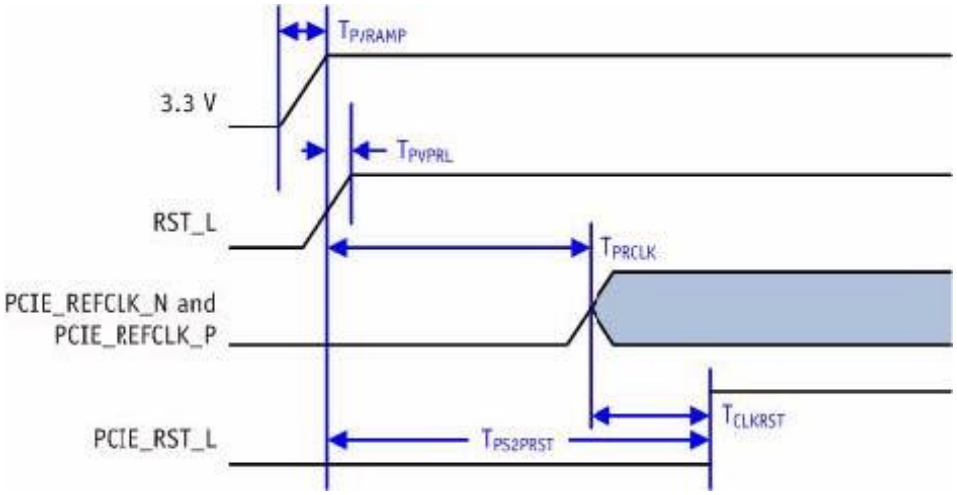
4-3. GPIO Interface Characteristics

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

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



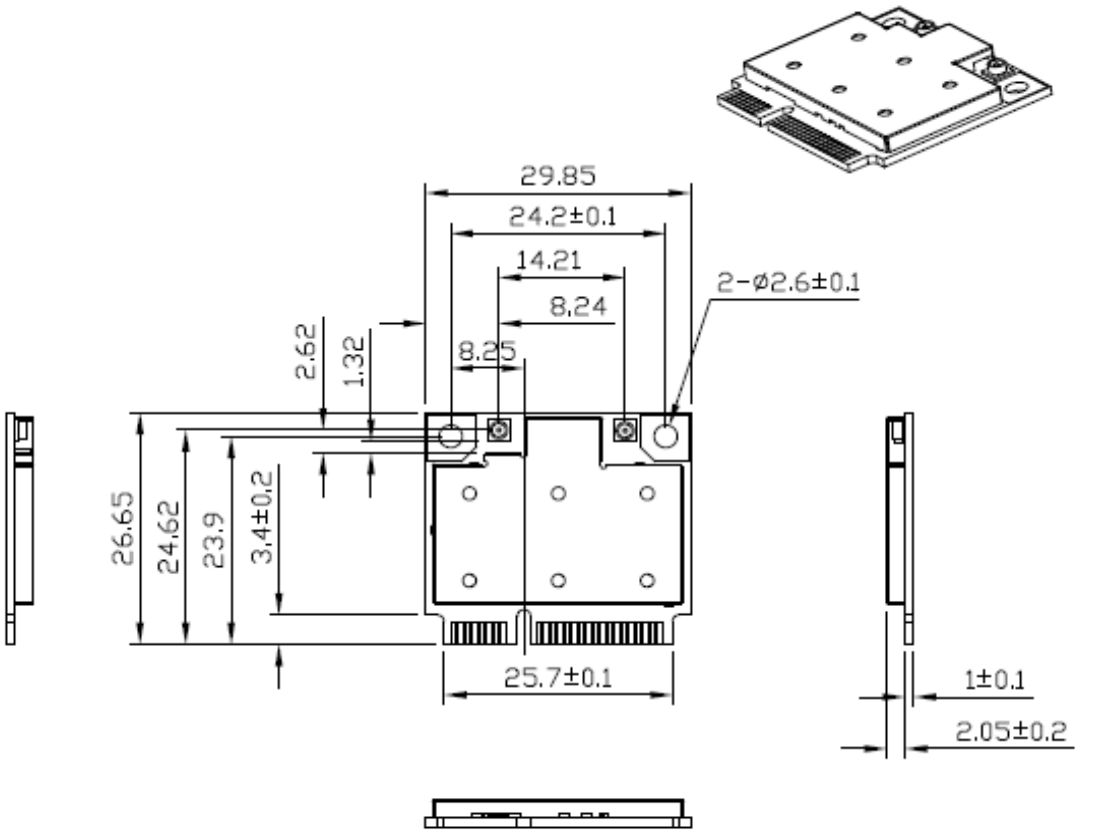
Signal Name	Description	Min	Max
TPVRAMP	Power Supply Ramp on 3.3V	--	25 ms
TPVPRL	Power valid to RST_L asserted (Power on Reset)	0 μ s	--
TPRCLK	RST_L deasserted to PCIE_REFCLK_N and PCIE_REFCLK_P stable	100 μ s	--
TCLKRST	PCIE_REFCLK_N and PCIE_REFCLK_P stable to PCIE_RST_L de-asserted	100 μ s	--
TPS2PRST	Power supply stable to PCIE_RST_L de-assert	10 ms	--

4-6. Power Consumption

Test Bed	**IBM T60**		
Test OS	**Windows 7 Ultimate x64 SP1**		
Driver Version	**Win7_9.2.0.402**		
Test Voltage	**3.3V**		
Item	**L0 Mode**	**L1 Mode**	**NOTE**
Transmit Packet Test HT 40*	223.8 mA	237.6 mA	
Receiver Packet Test HT 40*	184.5 mA	186.6 mA	

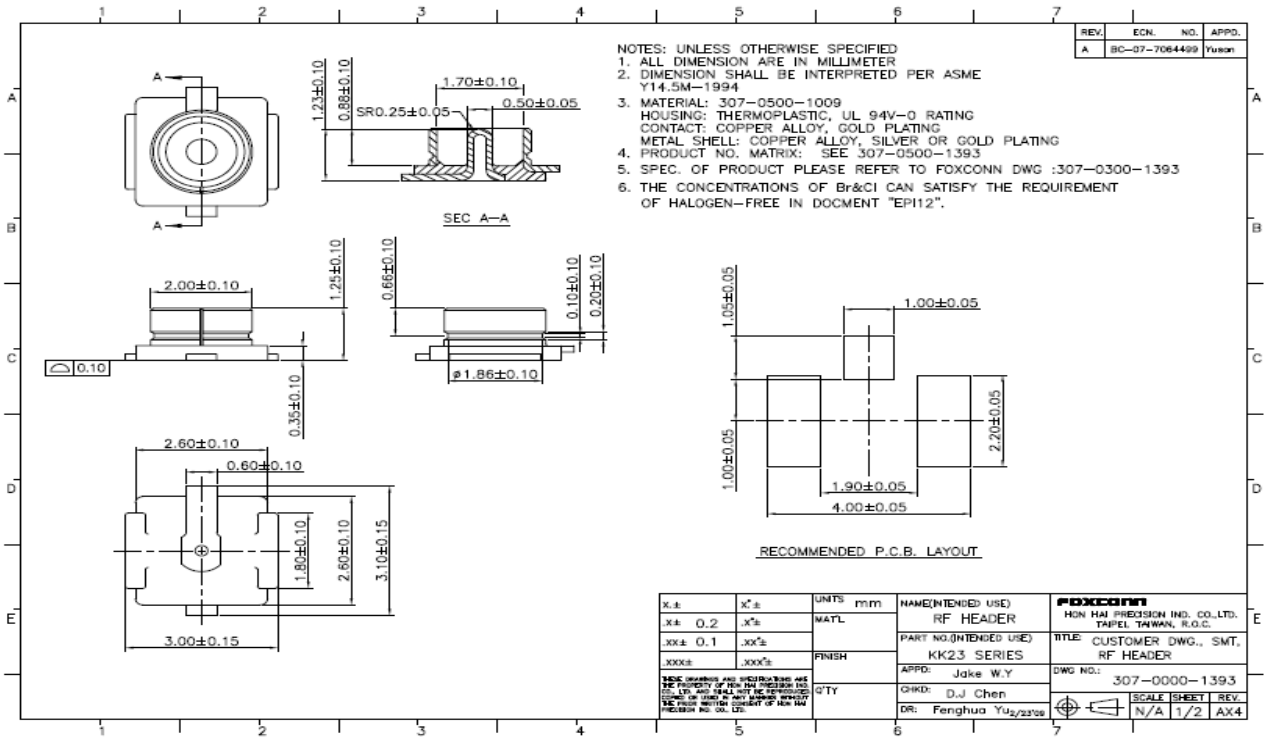
Note. The power consumption data were measured when NB operated in DC (battery) mode.

5. Mechanical Dimensions

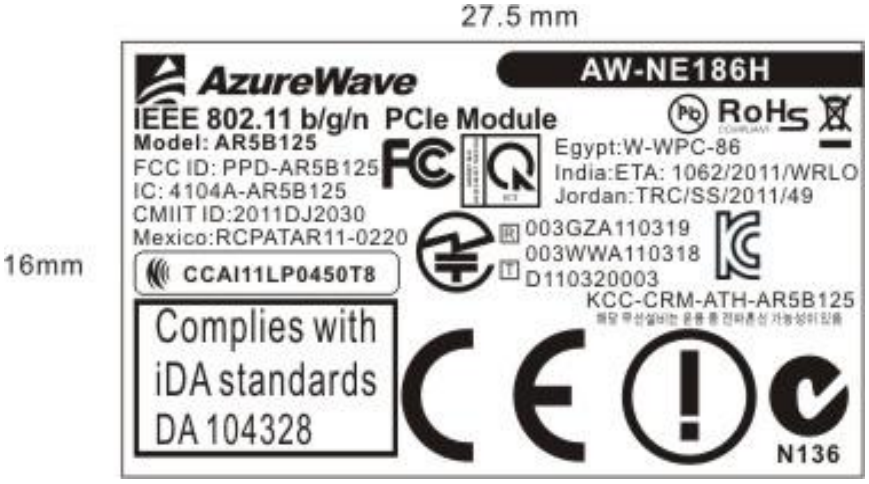


Tolerances unless otherwise specified : ±0.15mm

RF Connector mechanical drawing



6. (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

7. Connector Pin-out Definitions

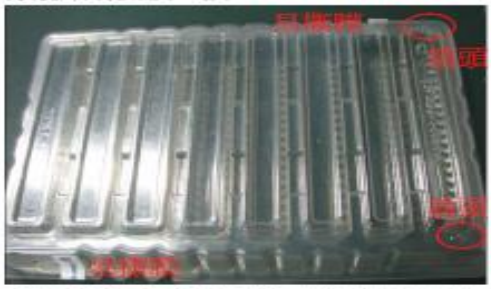
Pin No.	Definition	Basic Description	Type
1	NC	No connect. Should be left open.	
2	3.3V	3.3V power supply.	VCC
3	NC	No connect. Should be left open.	
4	GND	Ground.	GND
5	NC	No connect. Should be left open.	
6	NC	No connect. Should be left open.	
7	CLKREQ_L	Reference clock request	Output
8	NC	No connect. 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.	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	NC	No connect. Should be left open.	
37	NC	No connect. Should be left open.	
38	NC	No connect. Should be left open.	

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	NC	No connect. Should be left open.	
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	NC	No connect. Should be left open.	
52	3.3V	3.3V power supply.	VCC

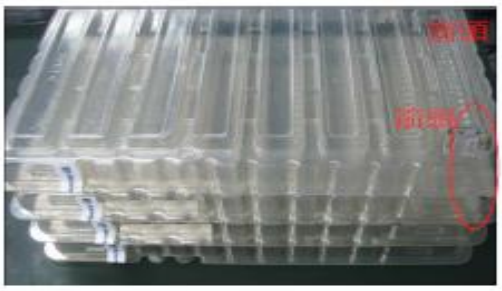
8. Packing method

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.



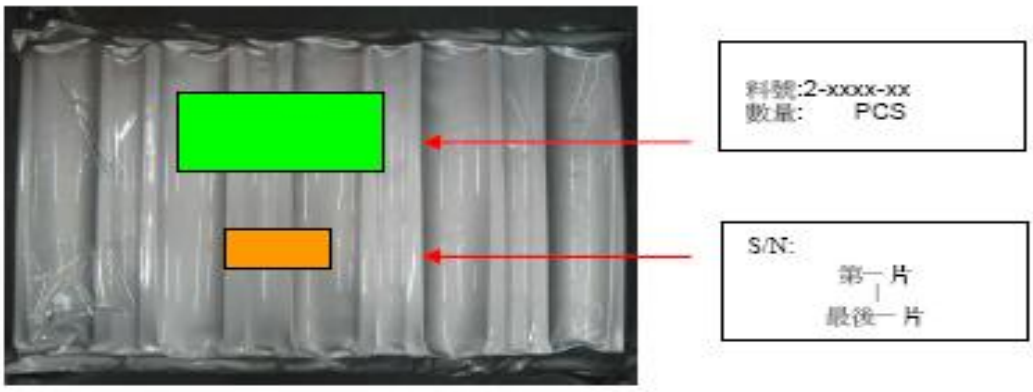
3. 重複步驟 1 和步驟 2,將 4 盤產品疊加起來,注意四盤產品的 Tray 及 Cover 的箭頭對應在同一個位置.



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.

10. 使用海華 Logo 膠帶(有特殊規定之產品依特殊產品之規定)單層封口，若因重工或者其它原因需貼第二層膠帶的，需與外箱上表示原因，但最多不得多於兩層，外箱膠帶密封嚴實，上下介以工字型黏貼。