COMPANY CONFIDENTIAL

HON HAI PRECISION IND. CO., LTD.
No.2, 2nd Dong Huan Road, 10th
YouSong Industrial District, Longhua
Town, Baoan, ShenZhen
Tel: +86-755-28128988#80633
Fax:+86-755-28129800#64886

Product Specification

IEEE 802.11b/g/n WLAN and Bluetooth Combo Card

Project Name	Marvell 88W8797 WLAN/BT Combo Card
Customer	Hisense
Foxconn Part No.	M26H003.00
Customer Part No.	TBD

CONTENTS

0. Revision History

Date	Document revision	Product revision	Change Description
2012/11/20	00		1. Initial release
2013/06/06	01		1. add label and package information
2013-10-17	02		Update PCB bottom view picture (add FCC label)

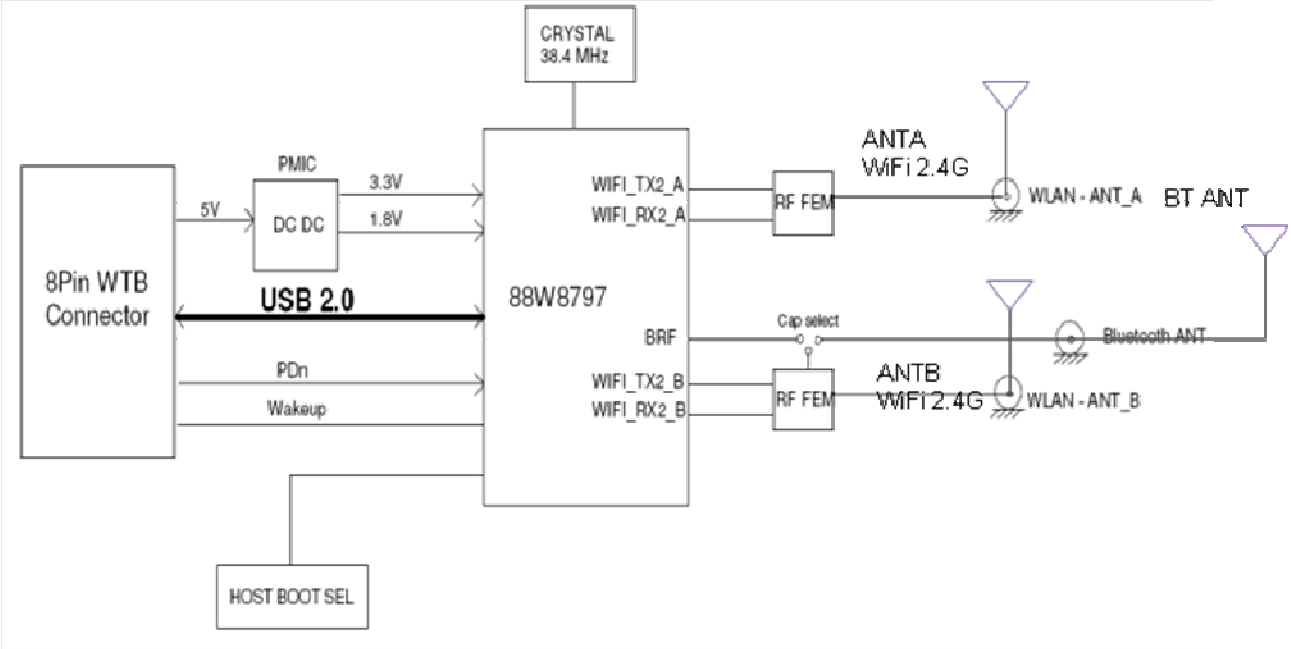
1. Introduction

Project Name: Marvell 88W8797 WLAN/BT Combo Card
Project Number: M26H003.00

This documentation describes the engineering requirements specification of 88W8797 (WLAN+BT) combo Card. It is a confidential document of Foxconn.

1.1 Scope

This combo design is based on the Marvell 8797 single-chip solution. It's operating in 2.4GHz, compatible with the IEEE 802.11b/g/n standard and Bluetooth BT4.0 standard. The 802.11n data rate provides for MCS0 to MCS7 (HT20,HT40). The 802.11g data rate provides for 54, 48, 36, 24, 18, 12, 9, 6Mbps, and 802.11b data rate provides for 11, 5.5, 2, 1Mbps. In addition, it's also compatible with BT4.0. This combo card has implemented some efficient mechanisms in its software and hardware to maximize the performance of WLAN and BT.



1.2 Feature

- Compatible with IEEE 802.11b/g/n standard
- Compatible with BT4.0 + HS (supports Low Energy (LE)
- Support external or on-board antenna for both WiFi and BT
- Support two Antennas (WiFi*2 and BT shared one ANT）
  or three antennas for WiFi *2 and BT*1 (preferred)
- 2x2 MIMO spatial streams supporting data rates up to MCS15(300Mbps)
- Better WiFi and BT Coexistence performance

1.3 Application

- WLAN/Bluetooth/FM enabled cellular handsets
- Portable audio/video devices and accessories
- Personal computing systems including pads, tablets and slates
- Wireless home audio and video entertainment systems including TV, set-top boxes, media servers and gaming platforms

Sample picture as bellow

TOP VIEW

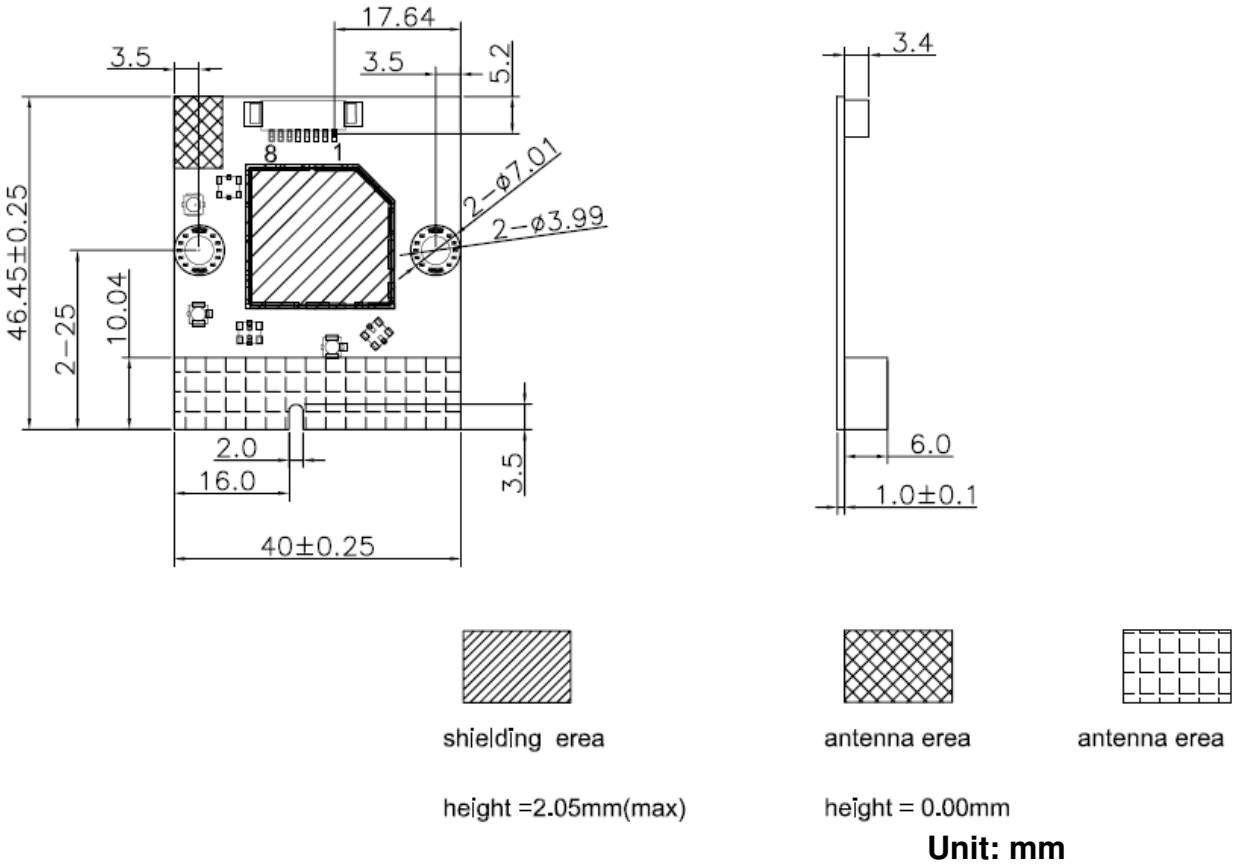
BOTTOM VIEW

* note1, the sample picture is just for reference only.

2. Mechanical Specification

2.1 Module Dimension

PCB: FR4, 4layers, one side design
Typical PCB size (W×L): 40mm ×46.45mm

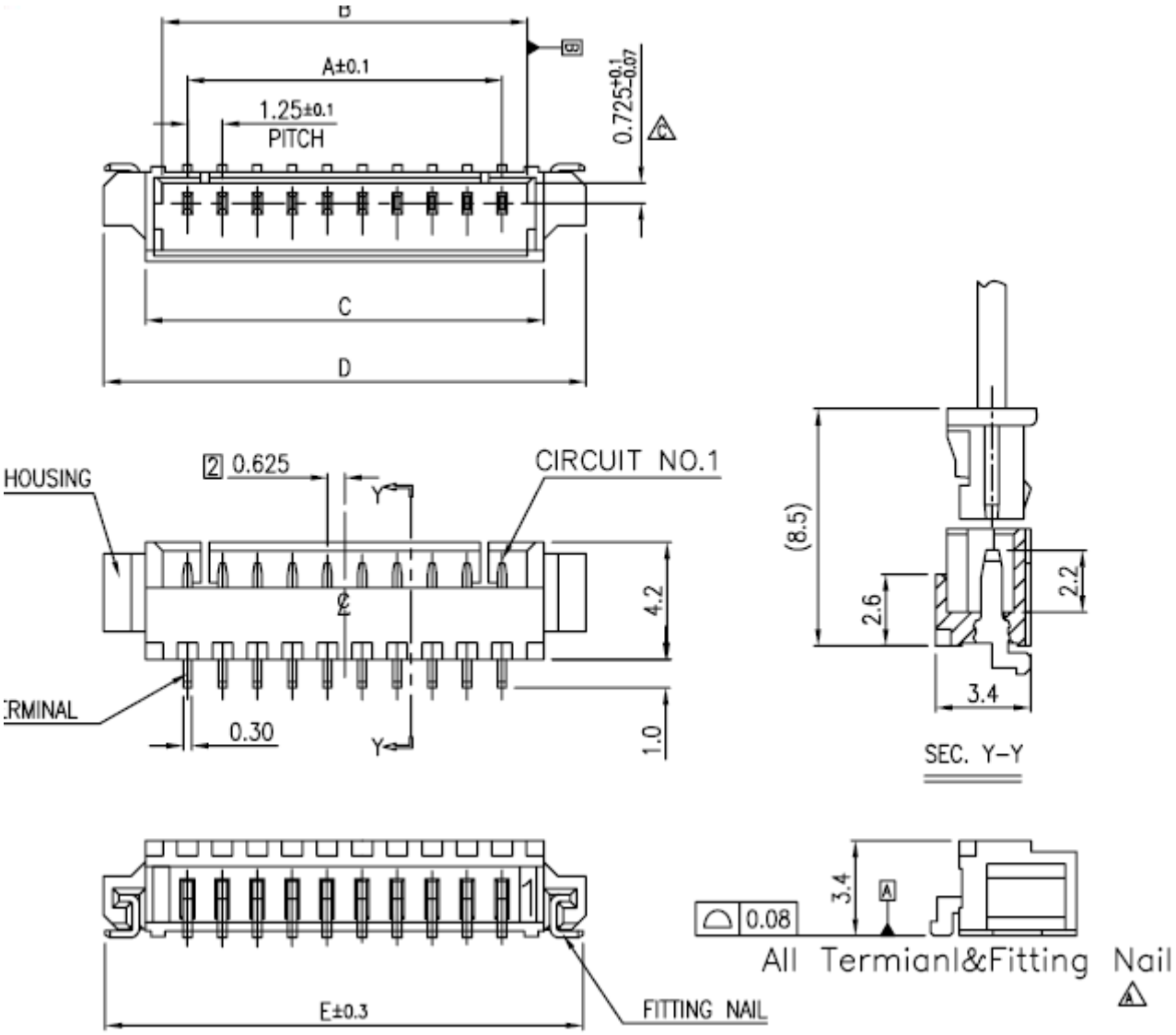


Unit: mm

2.2 Host Interface Connector

This module use 8pins BTW connector for the Host-Module interface.

- WTB 8Pin 1.25mm pin pitch SMD MALE



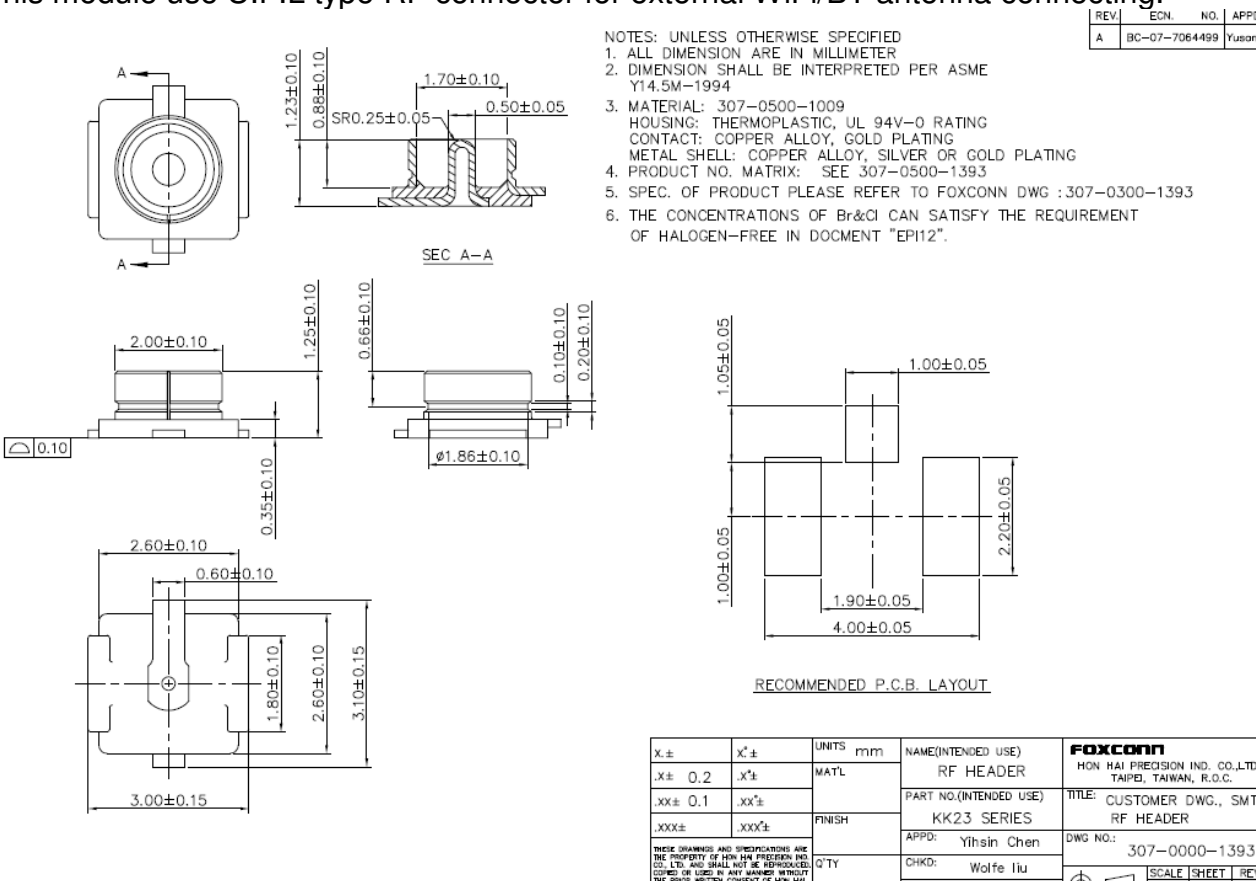
- Here is the pin-out signals of module's connector. The pin number is refer to "Item2.2.1 module dimension".

Table 1: Host-Module Connector Pin-out Signals

No.	Pin-Out	Description
1	VCC	VCC 5V
2	GND	GND
3	DN	USB Data DN
4	DP	USB Data DP
5	GND	GND
6	Reset	Reset (active low, input) Once asserts low, all digital logic in the chip is reset to default power up states. This pin has internal pull-up resistor on module.
7	Wakeup	GPIO interrupt (host-to-chip wakeup interrupt) (input) (default) Host Wakeup: chip-to-host wakeup interrupt (output)
8	PDn	Full Power Down (active low, input) This pin has internal pull-up resistor on module.

2.3 RF Connector (Option)

This module use U.F.L type RF connector for external WiFi/BT antenna connecting.



3. Electrical Specification

3.1 Operating Condition

Parameter	Condition	Min.	Typ.	Max.	Unit
DC Input	5V	4.5	5	5.5	V
Module Current (DC input nominal)	WiFi TX only and BT sleep		200		mA
	WiFi RX only and BT sleep		176		
	BT TX only		172		
	BT RX only		181		
	WiFi/BT co-existence		220		
	Standby with connection AP		180		
Operating Temperature	--	0		+60	℃
Storage Temperature	--	-30		+85	℃

3.2 WiFi RF Specification

3.2.1 802.11b Mode

Items	Contents				
Standard	IEEE802.11b				
Modulation Type	DSSS / CCK				
Frequency range	2412MHz~2472MHz				
Channel	CH1 to CH13				
Data rate	1, 2, 5.5, 11Mbps				
TX Characteristics(per chain)	Min.	Typ.	Max.	Unit	
1. Transmitter Output Power					
1) 11b Target Power	15	17	19	dBm	
2. Spectrum Mask @ target power					
1) fc +/-11MHz to +/-22MHz			-30	dBr	
2) fc > +/-22MHz			-50	dBr	
3. Frequency Error	-25	-1	25	ppm	
4 Constellation Error(peak EVM)@ target power					
1) 1~11Mbps		-31		dB	
RX Characteristics(per chain)	Min.	Typ.	Max.	Unit	
5 Minimum Input Level Sensitivity					
1) 1Mbps (FER≦8%)		-97.6	-83	dBm	
2) 2Mbps (FER≦8%)		-94.4	-80	dBm	
3) 5.5Mbps (FER≦8%)		-92.6	-79	dBm	
4) 11Mbps (FER≦8%)		-89.0	-76	dBm	
6 Maximum Input Level (FER≦8%)	-10			dBm	

3.2.2 802.11g Mode

Items	Contents				
Standard	IEEE802.11g				
Modulation Type	OFDM				
Frequency range	2412MHz~2472MHz				
Channel	CH1 to CH13				
Data rate	6, 9, 12, 18, 24, 36, 48, 54Mbps				
TX Characteristics (per chain)	Min.	Typ.	Max.	Unit	
1. Transmitter Output Power					
1) 11g Target Power	13	15	17	dBm	
2. Spectrum Mask @ target power					
1) at fc +/- 11MHz			-20	dBr	
2) at fc +/- 20MHz			-28	dBr	
3) at fc > +/-30MHz			-40	dBr	
3 Constellation Error(EVM)@ target power					
1) 6Mbps			-5	dB	
2) 9Mbps			-8	dB	
3) 12Mbps			-10	dB	
4) 18Mbps			-13	dB	
5) 24Mbps			-16	dB	
6) 36Mbps			-19	dB	
7) 48Mbps			-22	dB	
8) 54Mbps		-33	-25	dB	
4 Frequency Error	-25	-1.1	+25	ppm	
RX Characteristics (per chain)	Min.	Typ.	Max.	Unit	
5 Minimum Input Level Sensitivity					
1) 6Mbps (PER ≦ 10%)		-90.8	-85	dBm	
2) 9Mbps (PER ≦ 10%)		-90.3	-84	dBm	
3) 12Mbps (PER ≦ 10%)		-88.1	-82	dBm	
4) 18Mbps (PER ≦ 10%)		-86.2	-80	dBm	
5) 24Mbps (PER ≦ 10%)		-83.3	-77	dBm	
6) 36Mbps (PER ≦ 10%)		-80.0	-73	dBm	
7) 48Mbps (PER ≦ 10%)		-75.4	-69	dBm	
8) 54Mbps (PER ≦ 10%)		-73.5	-68	dBm	
6 Maximum Input Level (PER ≦ 10%)	-20			dBm	

3.2.3 802.11n HT20 Mode

Items	Contents				
Standard	IEEE802.11n HT20 @ 2.4GHz				
Modulation type	MIMO-OFDM				
Channel	CH1 to CH13				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7				
TX Characteristics(per chain)	Min.	Typ.	Max.	Unit	
1. Transmitter Output Power					
1) 11n HT20 Target Power	13	15	17	dBm	
2. Spectrum Mask @ target power					
1) at fc +/- 11MHz			-20	dBr	
2) at fc +/- 20MHz			-28	dBr	
3) at fc > +/-30MHz			-45	dBr	
3. Constellation Error(EVM)@ target power					
1) MCS0			-5	dB	
2) MCS1			-10	dB	
3) MCS2			-13	dB	
4) MCS3			-16	dB	
5) MCS4			-19	dB	
6) MCS5			-22	dB	
7) MCS6			-25	dB	
8) MCS7		-32	-28	dB	
4. Frequency Error	-25	-1.2	+25	ppm	
RX Characteristics (per chain)	Min.	Typ.	Max.	Unit	
5. Minimum Input Level Sensitivity					
1) MCS0 (PER ≦ 10%)		-91.0	-82	dBm	
2) MCS1 (PER ≦ 10%)		-88.3	-79	dBm	
3) MCS2 (PER ≦ 10%)		-85.9	-77	dBm	
4) MCS3 (PER ≦ 10%)		-83.5	-74	dBm	
5) MCS4 (PER ≦ 10%)		-80.2	-70	dBm	
6) MCS5 (PER ≦ 10%)		-75.5	-66	dBm	
7) MCS6 (PER ≦ 10%)		-74.1	-65	dBm	
8) MCS7 (PER ≦ 10%)		-71.9	-64	dBm	
6. Maximum Input Level (PER ≦ 10%)	-20			dBm	

3.2.4 802.11n HT40 Mode

Items	Contents				
Standard	IEEE802.11n HT40 @ 2.4GHz				
Modulation type	MIMO-OFDM				
Channel	CH3 to CH11				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7				
TX Characteristics(per chain)	Min.	Typ.	Max.	Unit	
1. Transmitter Output Power					
1) 11n HT40 Target power	12	14	16	dBm	
2. Spectrum Mask @ target power					
1) at fc +/- 22MHz			-20	dBr	
2) at fc +/- 40MHz			-28	dBr	
3) at fc > +/-60MHz			-45	dBr	
3. Constellation Error(EVM)@target power					
1) MCS0			-5	dB	
2) MCS1			-10	dB	
3) MCS2			-13	dB	
4) MCS3			-16	dB	
5) MCS4			-19	dB	
6) MCS5			-22	dB	
7) MCS6			-25	dB	
8) MCS7		-32	-28	dB	
4. Frequency Error	-25	-1.1	+25	ppm	
RX Characteristics (per chain)	Min.	Typ.	Max.	Unit	
5. Minimum Input Level Sensitivity					
1) MCS0 (PER ≦ 10%)		-87.2	-79	dBm	
2) MCS1 (PER ≦ 10%)		-84.1	-76	dBm	
3) MCS2 (PER ≦ 10%)		-81.3	-74	dBm	
4) MCS3 (PER ≦ 10%)		-79.7	-71	dBm	
5) MCS4 (PER ≦ 10%)		-74.5	-67	dBm	
6) MCS5 (PER ≦ 10%)		-73.0	-63	dBm	
7) MCS6 (PER ≦ 10%)		71.2	-62	dBm	
8) MCS7 (PER ≦ 10%)		-68.8	-61	dBm	
6. Maximum Input Level (PER ≦ 10%)	-20			dBm	

3.3 On-board Antenna Specification

Operating Frequency	2.412~2.472GHz
VSWR(ANT1and ANT2)	<=2.0:1
Isolation(ANT1& ANT2)	>=15dB
Antenna Type	Metal ANT

3.3 BT RF Specification

Items		Contents				
Standard		BTv4.0				
Modulation technology		HFSS				
Modulation type		GFSK, π/4-DQPSK, 8DPSK				
Frequency range		2402MHz ~ 2480MHz				
Numbers of Channel		79 channels with 1MHz Bandwidth				
Data rate (MCS index)		1Mbps/2Mbps/3Mbps				
TX Characteristics		Min.	Typ.	Max.	Unit	
1. BDR Transmitter Output Power						
1) Target power (class2)		-6	2.0	+4	dBm	
2. BDR Initial Carrier Freq. Tolerance		-75	-1.3	+75	KHz	
3. BDR Carrier Drift						
1) Drift Rate/50us		-20	4.7	+20	KHz	
2) Average Drift	-25	-1	+25	dB	dB	
	-40	+2	+40	KHz	KHz	
	-40	0	+40	KHz	KHz	
4. BDR Modulation Characteristic						
1) F1avg(kHz)		140	162.1	175	KHz	
2) F2avg(kHz)		115	146.5	-	KHz	
3) F1/F2 Ratio		0.8	0.9	-	-	
5 EDR Carrier Frequency Stability and Modulation Accuracy						
1) Initial Frequency Error		-75	-1.3	+75	KHz	
2) Frequency Error		-10	0.6	+10	KHz	
3) Block Frequency Error		-75	-1.2	+75	KHz	
4) RMS DEVM @2Mbps		0.2	0.045		-	
5) Peak DEVM @2Mbps		0.35	0.1		-	
6) 99% DEVM @% Symbols <= 0.3 (2Mbps)		99%	100%		-	
7) RMS DEVM @3Mbps		0.13	0.037		-	
8) Peak DEVM @3Mbps		0.25	0.08		-	
9) 99% DEVM @% Symbols <= 0.2(3Mbps)		99%	100%		-	
RX Characteristics					Unit	
6. Minimum Input Level Sensitivity						
1) BDR Single slot sensitivity (BER ≦ 0.1%)				-70	dBm	
2) BDR Multi slot sensitivity (BER ≦ 0.1%)				-70	dBm	
3) EDR sensitivity@2Mbps (BER ≦ 0.01%)				-70	dBm	
4) EDR sensitivity@3Mbps (BER ≦ 0.01%)				-70	dBm	
7. Maximum Input Level (BER ≦ 0.1%)		-20			dBm	

4. Compatibility and Certification Information

The 8797 combo module shall pass the standard test plan, which includes hardware compatibility and reliability, and software compatibility test.

5. Quality

The product quality must be followed-up by Foxconn factory quality control system.

6. Appendix

Appendix A - Label Information

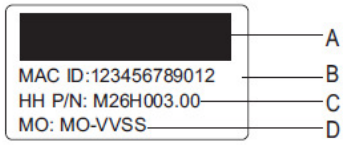
REV.	MARK	ECR/ECN NO.	DATE	UPDATE DESCRIPTION	SIGNATURE
0	N/A	N/A	11/08/08	First Release	Sunny

Human readable(可讀部分)：
B.MAC ID:123456789012
MAC ID：12 digital，區間由PM或HW RD提供，一個產品兩個MAC,跳號列印.
C.HH P/N: M26H003.00
D.MO:MO-VVSS
a.第一個MO:爲文字
b.第二個MO is Foxconn MO,follow Foxconn standard(爲工單號，參考Foxconn標準)
c.VV:the engineering version
(refer to Foxconn label Rev column in the cover of the MFG document)
VV爲工程版本（參考製造文件封面Foxconn Label Rev.欄位）
d.SS:the version of A300/A400 product
(refer to Doc Rev.in the cover of MFG document)
SS爲A300/A400產品之版本（參考製造文件封面Doc Rev.之主版本）

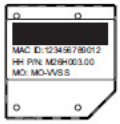
All of the font:Arial,4pt

Scannable(掃描部分)：
A.XXXXXXXXXXXX：MAC ID Barcode
Barcode type: code 39
Barcode height:3.5mm

size:18mm*10mm



Scale:3:1



label stick position

標籤製作黏貼方式/M26H003.00/00/1 of 4

Notes:
1.Surface Material: 50# Mylar
2.Color: White
3.Adhesiive thickness: 0.024+/-0.003mm
4.Package Style: Reel

MATERIAL (SPEC.)	SCALE
50# mylar	
FINISH	SHEET 1/1

Select Dim. \ Tol.	A	B	C	EPS	EPE	BAG	CTN	V Label	USR
0~6	0.05	0.05	0.10					0.20	
6~30	0.10	0.15	0.20	0.50	0.50	3.00		0.20	
30~120	0.15	0.20	0.30	0.50	0.50	5.00	2.00	0.25	
120~300	0.20	0.30	0.40	1.00	1.00	10.00	3.00	0.30	
300~450	0.25	0.40	0.50	2.00	2.00	15.00	5.00	0.50	
450~600	0.30	0.50	0.60	3.00	3.00	20.00	5.00	0.80	

DRAFT TOLERANCE ±0.2" CRITICAL DIM. MARK *

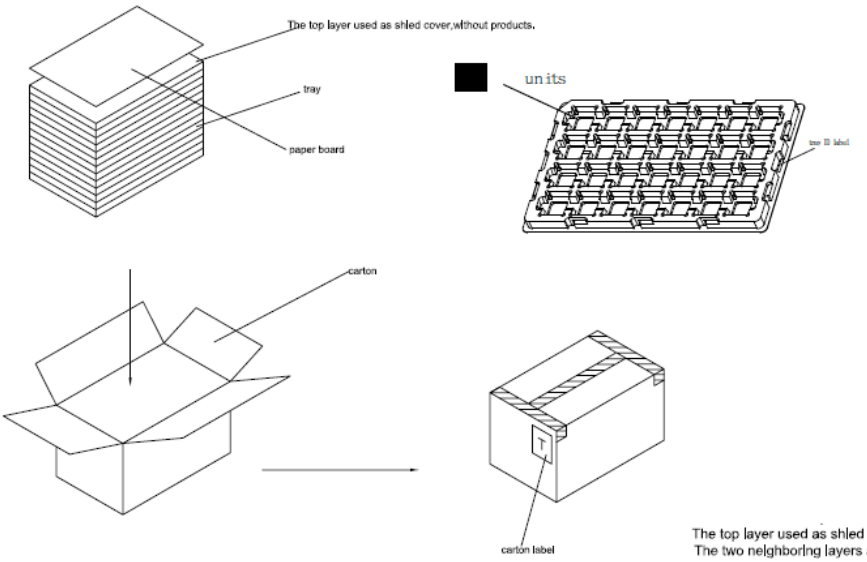
UNIT	MM
SIZE	A4

FOXCONN
HON HAI PRECISION IND. CO., LTD.
CNSBG

PART NAME		
MAC ID label		
MODEL: M26H003.00	PART NO.: 503.00828.005	DESIGNED: Sunny Wu
CUSTOMER MODEL	CUSTOMER PART NO.	APPROVED: George Yeh

Appendix B - Package Information

REV.	MARK	ECR/ECN NO.	DATE	UPDATE DESCRIPTION	SIGNATURE
0	N/A	N/A	12.07.19	First Release	Sunny Wu



組立圖及包裝出貨方式/M26H003.00/00/1 OF 3

ITEM	DESCRIPTION	FOXCONN P/N	QUA
5	tray ID label	503.00090.005	9/252
4	carton label	503.00098.005	1/252
3	carton	520.00794.005	1/252
2	paper board	522.00976.005	1/252
1	tray	513.00266.005	10/252

MATERIAL (SPEC.) | SCALE
FINISH | SHEET 1/1
UNIT MM | SIZE A4
DRAFT TOLERANCE ±0.2" CRITICAL DIM. MARK *

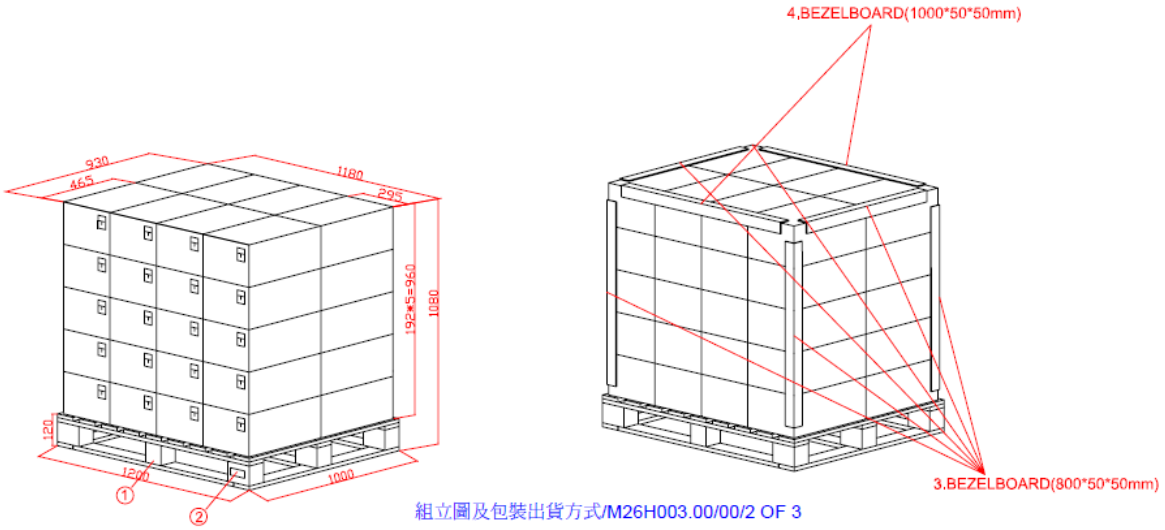
Dim. Tol.	A	B	C	EPS	EPE	BAG	CTN	Label	USR
0~6	0.05	0.05	0.10						0.20
6~30	0.10	0.15	0.20	0.50	0.50	3.00			0.20
30~120	0.15	0.20	0.30	0.50	0.50	5.00	2.00		0.25
120~300	0.20	0.30	0.40	1.00	1.00	10.00	3.00		0.30
300~450	0.25	0.40	0.50	2.00	2.00	15.00	5.00		0.50
450~600	0.30	0.50	0.60	3.00	3.00	20.00	5.00		0.80

FOXCONN
HON HAI PRECISION IND. CO., LTD.
CNSBG

PART NAME: PALLET ASSY
MODEL: M26H003.00 | PART NO. | DESIGNED: Sunny wu
CUSTOMER MODEL | CUSTOMER PART NO. | APPROVED: George Yeh

REV.	MARK	ECR/ECN NO.	DATE	UPDATE DESCRIPTION	SIGNATURE
0	N/A	N/A	12.07.19	First Release	Sunny Wu

ITEM	DESCRIPTION	FOXCONN P/N	QUA
1	PALLET(1200*1000*120mm)	527.00019.005	1/10080
2	PALLET LABEL(110*35mm)	503.00089.005	1/10080
3	BEZELBOARD(800*50*50mm)	522.00216.005	6/10080
4	BEZELBOARD(1000*50*50mm)	522.00215.005	2/10080



組立圖及包裝出貨方式/M26H003.00/00/2 OF 3

NOTES:
1 carton=252 pcs
1 layer= 40 carton
1 pallet=10080pcs

MATERIAL (SPEC.) | SCALE
FINISH | SHEET 1/1
UNIT MM | SIZE A4
DRAFT TOLERANCE ±0.2" CRITICAL DIM. MARK *

Dim. Tol.	A	B	C	EPS	EPE	BAG	CTN	Label	USR
0~6	0.05	0.05	0.10						0.20
6~30	0.10	0.15	0.20	0.50	0.50	3.00			0.20
30~120	0.15	0.20	0.30	0.50	0.50	5.00	2.00		0.25
120~300	0.20	0.30	0.40	1.00	1.00	10.00	3.00		0.30
300~450	0.25	0.40	0.50	2.00	2.00	15.00	5.00		0.50
450~600	0.30	0.50	0.60	3.00	3.00	20.00	5.00		0.80

FOXCONN
HON HAI PRECISION IND. CO., LTD.
CNSBG

PART NAME: PALLET ASSY
MODEL: M26H003.00 | PART NO. | DESIGNED: Sunny wu
CUSTOMER MODEL | CUSTOMER PART NO. | APPROVED: George Yeh

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.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter.

This End equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

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: N89-NU260HS”.

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.