TO: UBEE

SPECIFICATION FOR APPROVAL

CUSTOMER DWG. No./PART No. : NA REV. : NA

DESCRIPTION : Ubee _U10C149-WIF4

FOXCONN PART. No. : ANTP2M2-CUB18-EH REV. : X1

ATTACHMENTS:

1. CUSTOMER DRAWING ·····2
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3. SPP ·····21~24

PLEASE RETURN TO FOXCONN ONE COPY OF

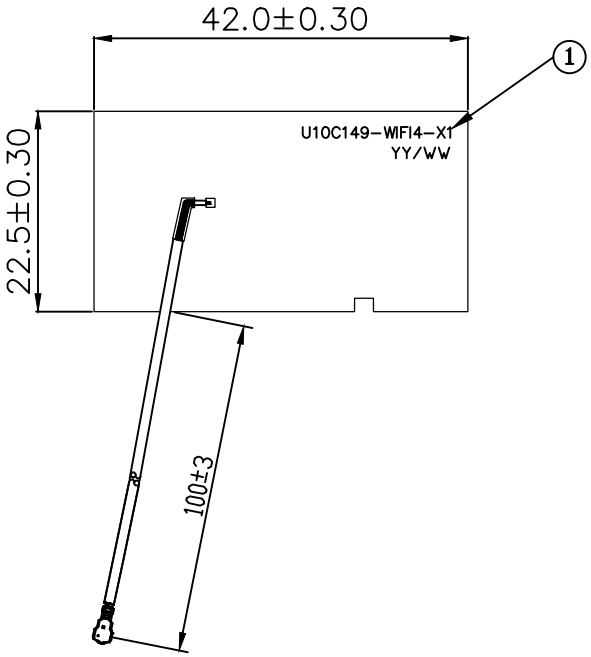
APPROVED SIGNATURES

Approved by : Minda Liu Checked by: Erin Dong Prepared by: Wang Qin

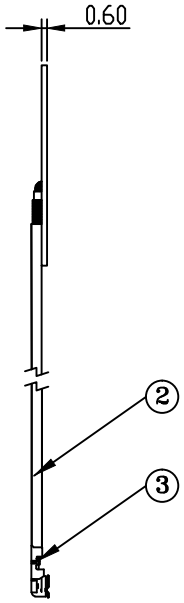
File No.: ANTP2M2-CUB18-EH Revision No.: X1 Date: 2019/12/3

TYPE3

REV.	ECN. NO.	APPD.
X1	BS-20-002828	York.xiong
X2	BS-20-003228	York.xiong



CONN 方向向下



註解：

1. HARMFUL MATERIAL CONTROL PLEASE FOLLOW DOC. NO."EPI12"
有害物質控制請遵循Doc "EPI12"

2.HARMFUL MATERIAL CONTROL PLEASE FOLLOW "ROHS".
(BR<900PPM,CL<900PPM,BR+CL<1500PPM).
鹵素需滿足(BR<900PPM,CL<900PPM,BR+CL<1500PPM).

3.PLEASE CONTACT FIT SALES REPRESENTATIVE TO VERIFY PRODUCT DETAILS&AVAILABILITY
關於產品有效性情況請與FIT業務代表聯繫

NO	ITEM	DESCRIPTION
3	Connector	MHF Plug,Gold Plated,Halogen Free Type,I-PEX1
2	Cable	ø1.13mm Coaxial Cable,FEP Blue Jacket
1	PCB	PCB Size:42*22.5*0.6mm

X.± 1.00	X.*±	UNITS mm	NAME(INTENDED USE) CUSTOMER
.X± 0.30	.X*±	MAT'L	PART NO.(INTENDED USE) ANTP2M2-CUB18-EH
.XX± 0.20	.XX*±		
.XXX±	.XXX*±	FINISH	APPD: York.xiong 02/18'20
		Q'TY	CHKD: Sheng.tai 02/18'20
			DRAW: Irene.su 02/18'20

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CLASS: □CONFIDENTIAL □SECRET ■GENERAL

TITLE: Ubee_U10C149-WIFI4

DWG NO.: 389-0000-874

SCALE	SHEET	REV.
1:1	4/4	X2

FK2B00065D

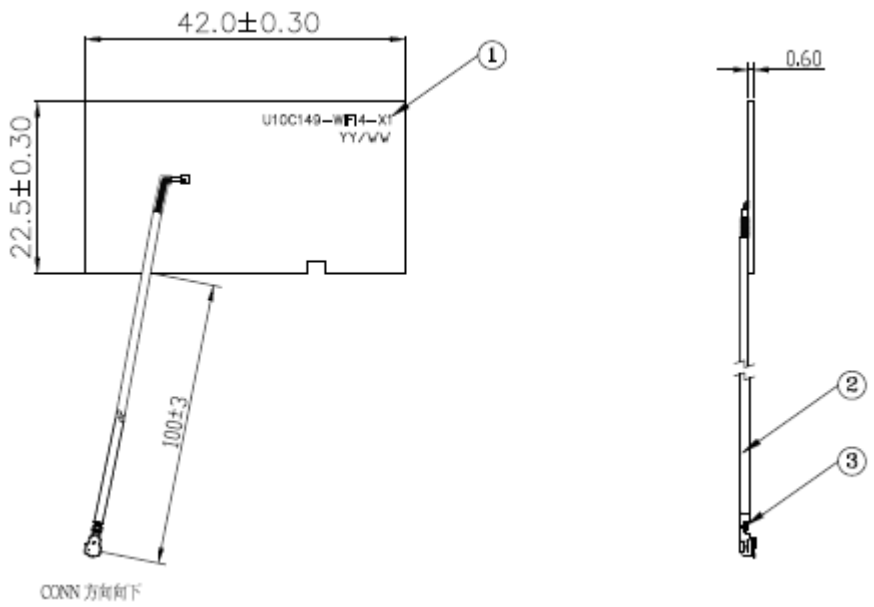
1. Specifications for antennas

FrequencyRange(GHz)	2.4GHz ~ 2.5GHz; 5.05GHz~5.85GHz
VSWR	< 2
Efficiency (%)	≥70%
Peak Gain (dBi)	@2GHz< 4 [dBi] @5GHz< 5 [dBi]
Radio Connector	IPEX MHF I or Compatible
Impedance	50Ω Nominal
Cable Diameter	1.13mm cable
Cable color	Blue
Antenna Type	Dipole
Cable Loss	0.212dB @ 2.4GHz; 0.329dB @ 5GHz
Polarization	Linear

2. Antenna Dimension / Cable length

Product	U10C149
WLAN Antenna	PCB W/100mm Cable,

3. Antenna Pictures



Project Name: **U10C149**

Rev. V1

Test Date: 11-25-2019

Report Date: 11-28-2019

Contact Information:

Charles Lee[charles.ch.lee@fit-foxconn.com]

Confidentiality

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History

Revision	Date	Description
V1	2019/11/28	Initial Release.

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1. Summary

This report summarizes all antennas performance to support U10C149 project.

WIFI X 4

2. General Description

Model: Cable Modem.

Antennas are designed on PCB.

Coaxial cable connected PCB directly, which placed on the side wall.

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2.2. Test Fixture Setup

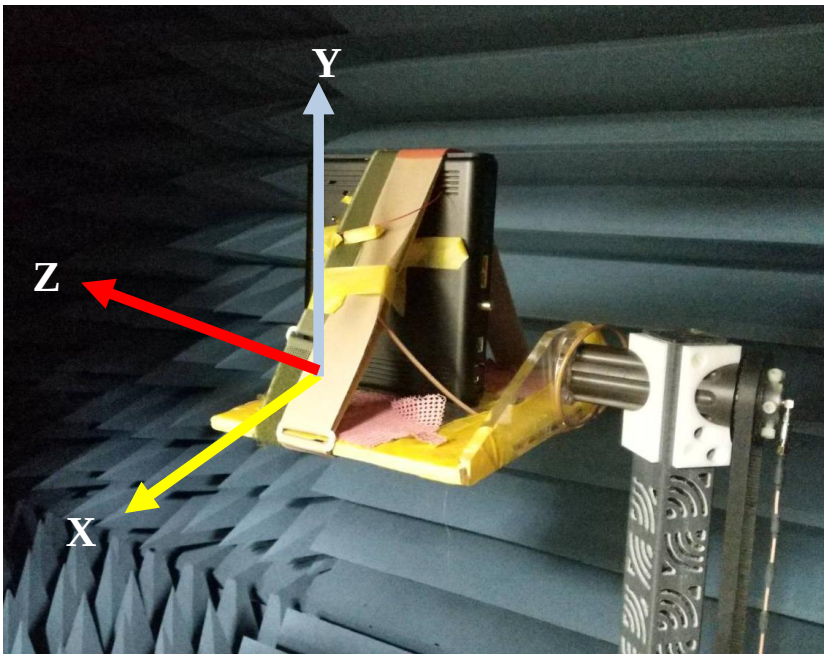
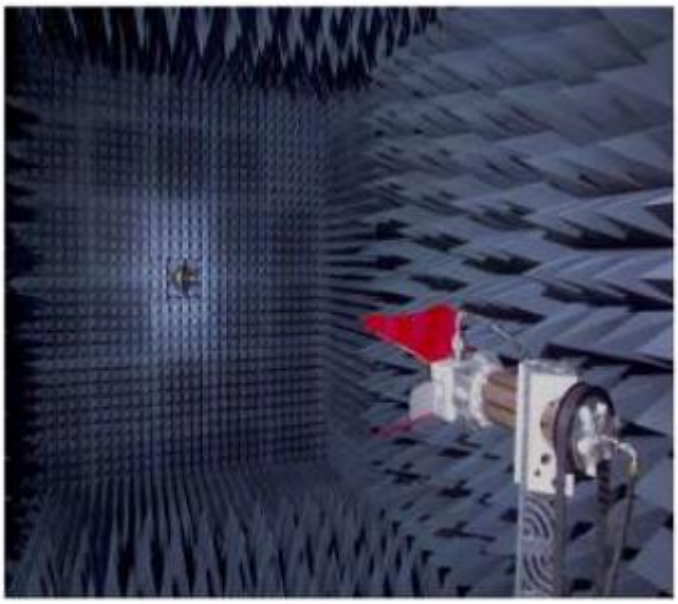


Figure 3 Environment of Setup.

3. Antenna Test Environment



Chamber Dimension: 7.3 * 3.66 * 3.66 m

Frequency Range: 700 MHz~6 GHz

- 3D Antenna Chamber adopted ETS-Lindgren's AMS-8500 system which is authorized by CTIA · and it can satisfy test items of different antenna products, such as NB, cellular phone, AP, GPS…etc.
- It can support passive antenna measurement function for antenna designer to verify antenna characteristics such as 2D/3D radiation pattern measurement, efficiency, VSWR, and Isolation.
- Certification by TAF in 2010
- Add active antenna measurement function for OTA testing items such as TRP, TIS in 2010 4Q.

Figure 4 3D Chamber

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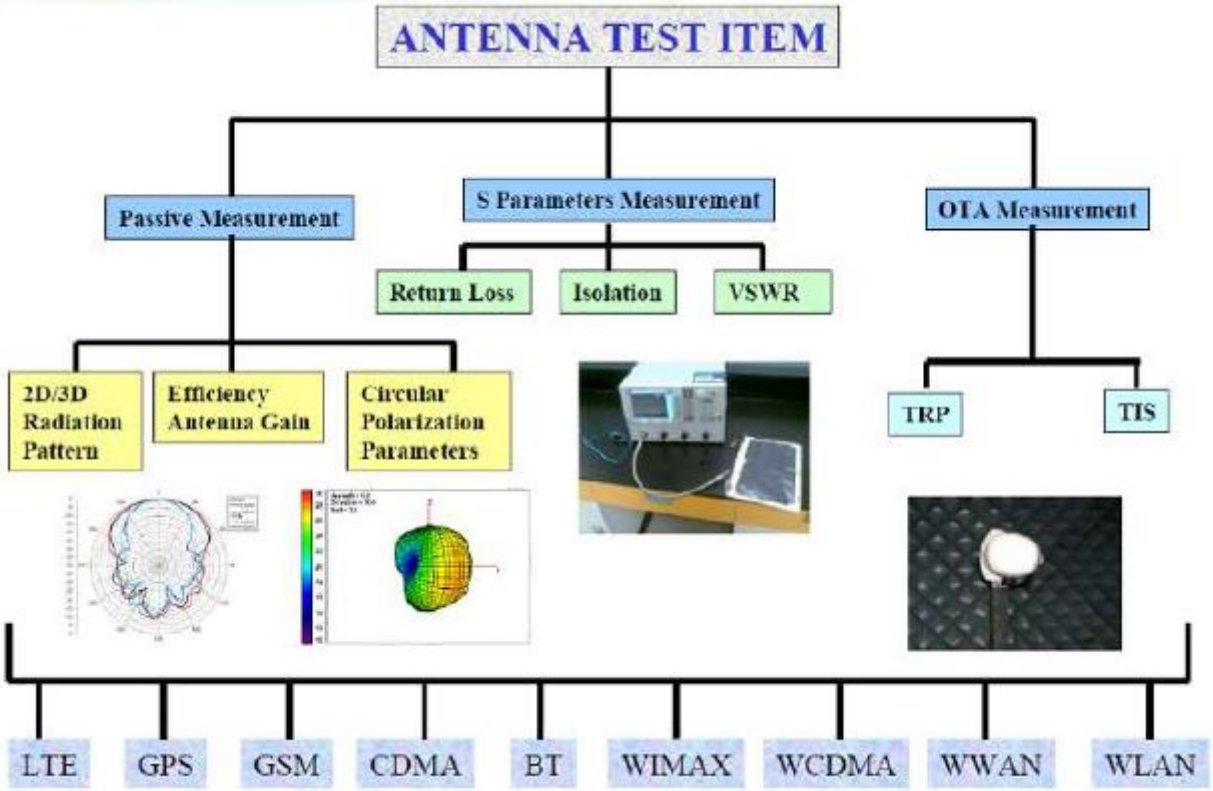

Figure 5 Chamber Compatibility

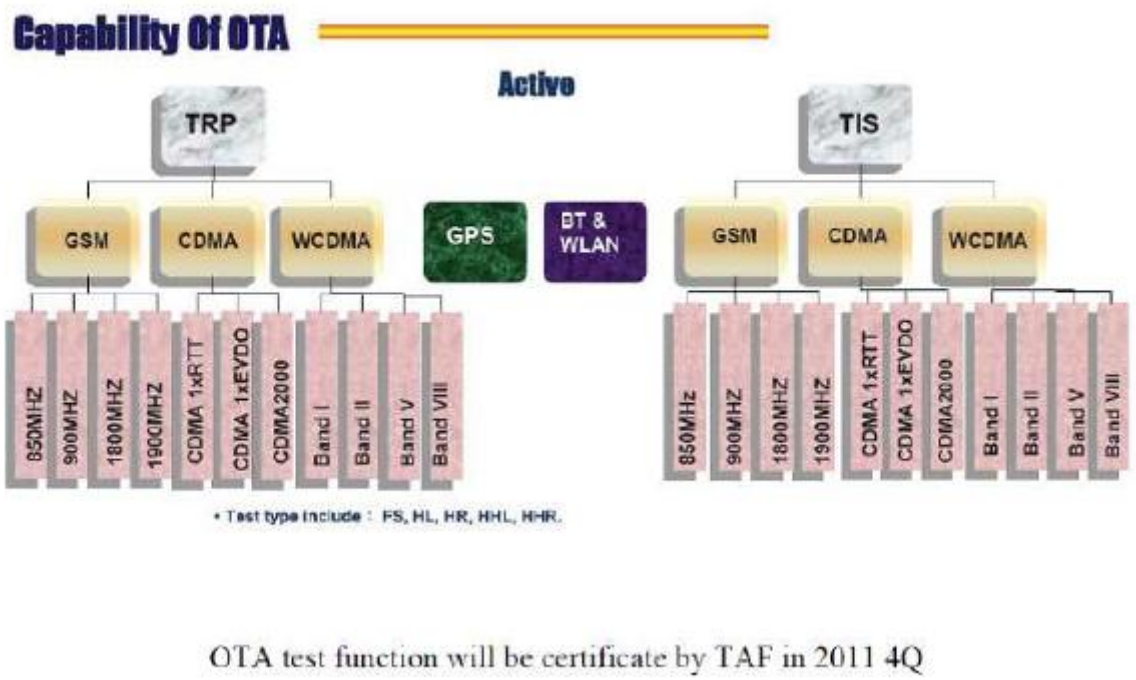

Figure 6 Chamber Capability

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4. Measurement Data

4.1. Antenna Specification

Specifications	
Items	Ant.1 ~ Ant.4 (WIFI)
Antenna Type	Dipole Antenna
Frequency	2.4/5 [GHz]
VSWR	< 2
Efficiency	≥70%
Isolation	> 20 [dB]
Peak Gain	@2GHz< 4 [dBi] @5GHz< 5 [dBi]
Impedances	50 ohms
Cable Length	WIFI#1: 155mm WIFI#2: 87mm WIFI#3: 75mm WIFI#4: 100mm
Antenna Size	WIFI#1: 42X22.5X0.6mm^3 WIF#2: 35X26.5X0.6mm^3 WIF#3: 42X22.5X0.6mm^3 WIF#4: 42X22.5X0.6mm^3

Figure 7Antenna Criteria and measured items

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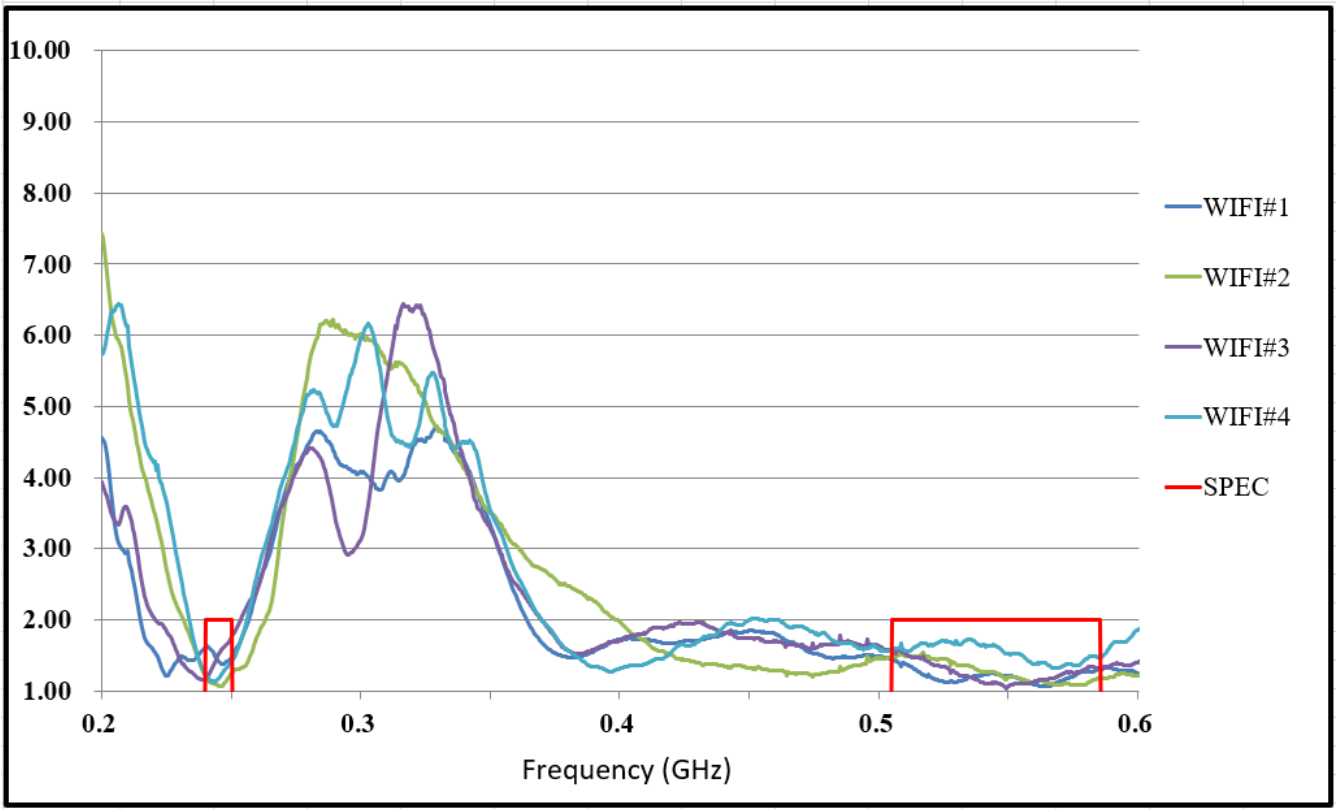
4.2. Antenna VSWR



Freq [MHz]	2400	2450	2500	5050	5150	5350	5725	5825
WIFI#1	1.62	1.42	1.47	1.44	1.28	1.20	1.17	1.28
WIFI#2	1.20	1.07	1.25	1.48	1.50	1.35	1.10	1.15
WIFI#3	1.18	1.52	1.77	1.58	1.47	1.20	1.26	1.34
WIFI#4	1.23	1.18	1.42	1.58	1.64	1.73	1.37	1.49

Figure 8 Chart of VSWR

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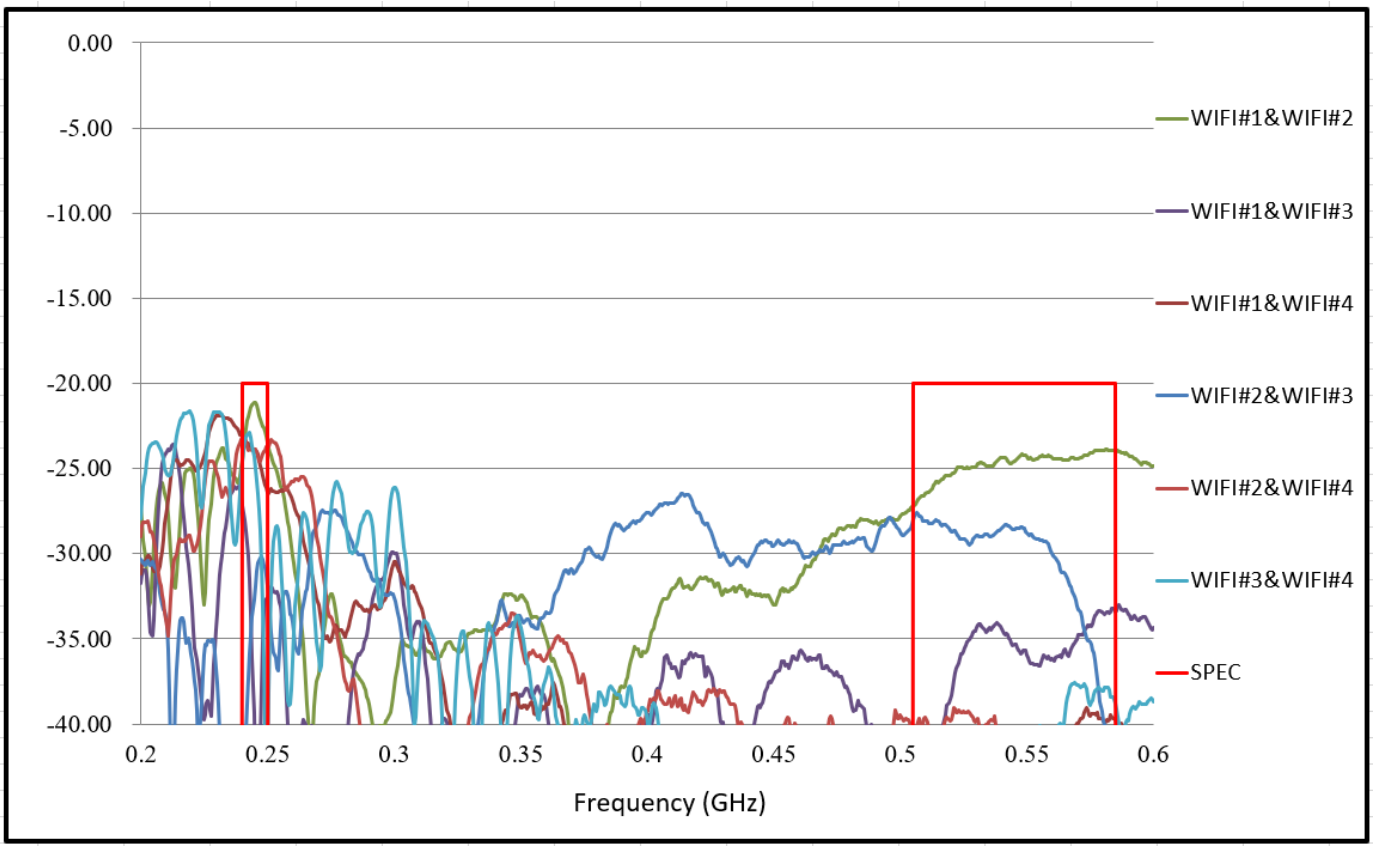
4.3. Antenna Isolations



Freq [MHz]	2400	2450	2500	5050	5150	5350	5725	5825
WIFI#1&WIFI#2	-24.52	-21.13	-23.43	-27.19	-25.82	-24.86	-24.19	-23.95
WIFI#1&WIFI#3	-27.16	-43.07	-32.62	-45.28	-41.17	-34.43	-34.57	-33.46
WIFI#1&WIFI#4	-23.09	-23.96	-26.36	-51.67	-52.40	-49.19	-39.35	-39.72
WIFI#2&WIFI#3	-41.19	-31.94	-31.91	-27.99	-28.08	-28.93	-34.48	-42.30
WIFI#2&WIFI#4	-23.16	-23.90	-23.68	-40.53	-41.58	-39.88	-44.45	-50.64
WIFI#3&WIFI#4	-24.61	-24.98	-43.00	-42.01	-43.06	-44.30	-37.64	-38.00

Figure 9 Chart of Isolation

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4.4. Chart of Antenna Peak Gain

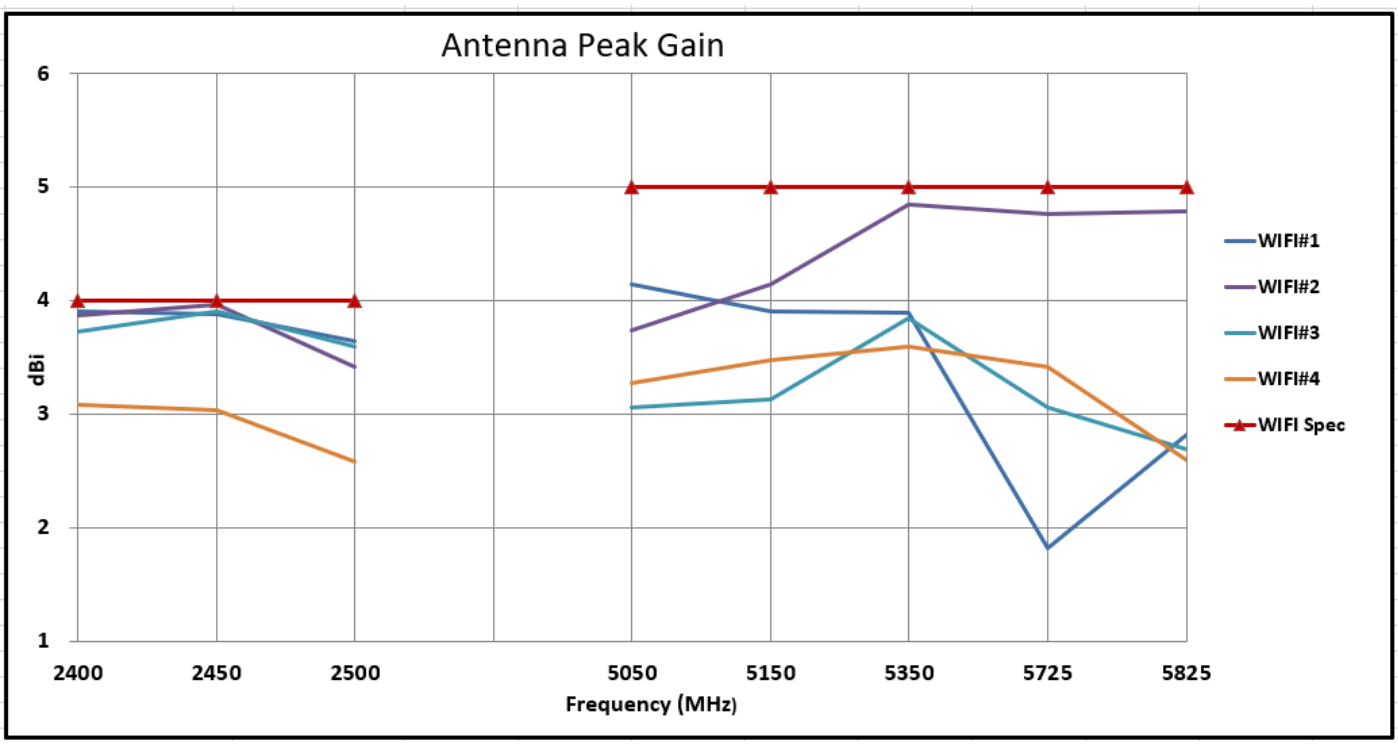

Figure 10 Chart of Peak Gain

4.5. Table of Antenna Performance

Antenna	Frequency(MHz)	2400	2450	2500	5050	5150	5350	5725	5825
WIFI#1	Peak Gain	3.90	3.88	3.64	4.14	3.90	3.90	1.82	2.82
	Avg. Gain	-1.35	-1.11	-1.30	-1.29	-1.32	-1.19	-1.32	-1.49
	Efficiency%	73.34	77.45	74.15	74.27	73.76	76.01	73.74	70.96
WIFI#2	Peak Gain	3.87	3.97	3.41	3.74	4.15	4.84	4.76	4.78
	Avg. Gain	-1.29	-1.30	-1.24	-1.30	-1.11	-1.22	-1.31	-1.35
	Efficiency%	74.26	74.20	75.09	74.18	77.45	75.45	73.94	73.35
WIFI#3	Peak Gain	3.73	3.90	3.59	3.05	3.13	3.85	3.05	2.69
	Avg. Gain	-1.22	-1.30	-1.29	-1.32	-1.37	-1.28	-1.19	-1.14
	Efficiency%	75.58	74.15	74.22	73.77	72.90	74.46	76.11	76.84
WIFI#4	Peak Gain	3.08	3.04	2.58	3.28	3.47	3.59	3.42	2.60
	Avg. Gain	-1.48	-1.21	-1.42	-1.29	-1.26	-1.20	-1.21	-1.44
	Efficiency%	71.18	75.65	72.13	74.26	74.77	75.84	75.65	71.74

Figure 11 Table of Antenna Performance

Antenna	Frequency(MHz)	2400	2450	2500	5050	5150	5350	5725	5825
WIFI Spec	Peak Gain	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0
	Avg. Gain	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6
	Efficiency%	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0

Figure 12 Antenna Criteria

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5. Conclusion

There are 4 dipole WIFI antennas in this project. We suggest that all the cable routings need to separate independently, so as to reduce antenna isolation interference from each other(WIFI#1: 155mm; WIFI#2: 87mm; WIFI#3: 75mm; WIFI#4: 100mm). Thus, the antenna performance can meet the specifications. Next, we will maintain the antenna efficiency to the following up schedule.

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6. Appendices A

6.1. Cable Attenuation

Frequency(GHz)	1GHz	2GHz	3GHz	4GHz	5GHz	6GHz
1.13mm	1.57dB/M	2.26dB/M	2.79dB/M	3.24.dB/M	3.5dB/M	4.05dB/M

1.13mm	Ant#1	2.4G	0.407 dB
coaxial	155mm	5G	0.630 dB
1.13mm	Ant#2	2.4G	0.197 dB
coaxial	87mm	5G	0.305 dB
1.13mm	Ant#3	2.4G	0.165 dB
coaxial	75mm	5G	0.256 dB
1.13mm	Ant#4	2.4G	0.212 dB
coaxial	100mm	5G	0.329 dB

Figure 13Attenuation Table

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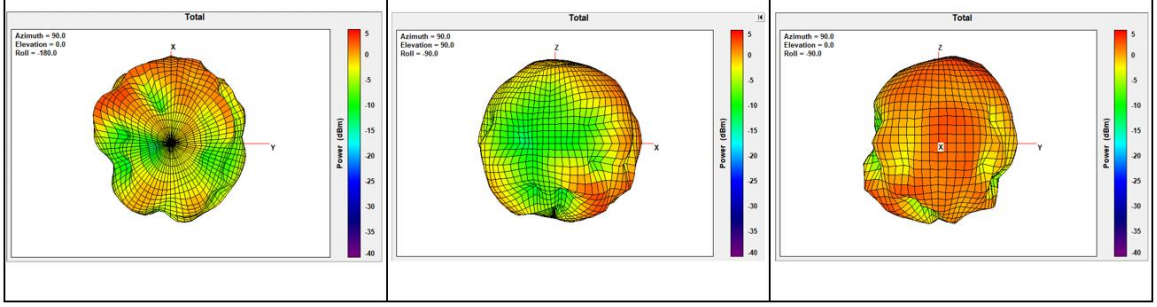
6.2. Antenna 3D graph

6.2.1. WiFi#4

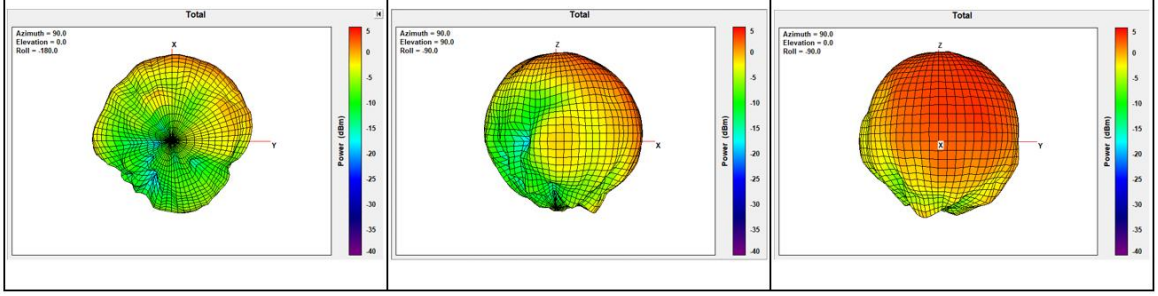
2450MHz

X-Y Plane	Z-X Plane	Z-Y Plane



5350MHz

X-Y Plane	Z-X Plane	Z-Y Plane



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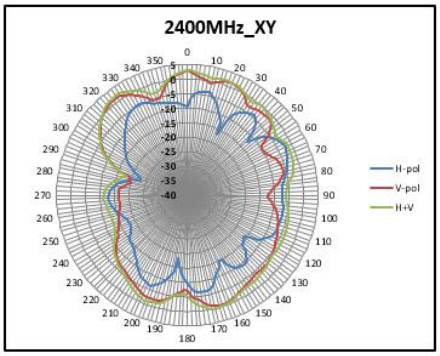
6.3. Antenna 2D graph

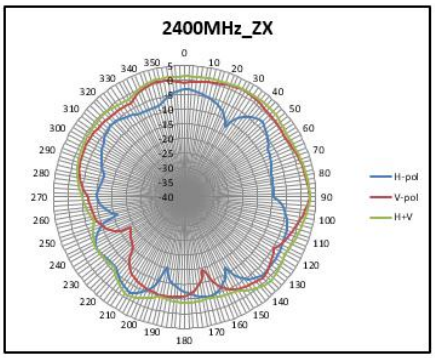
6.3.1. WiFi#4

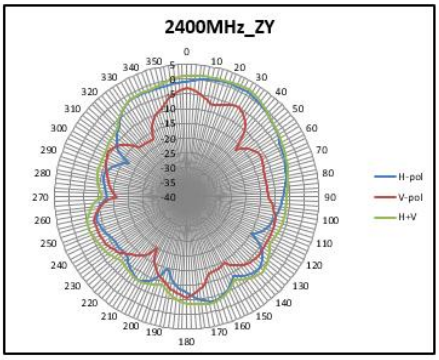
	XY-Plane					
Frequency	H-pol.		V-pol.		Total-pol.	
(MHz)	peak	Avg	peak	Avg	peak	Avg
2400	-2.33	-8.13	2.83	-3.30	3.08	-2.07
2450	-1.16	-6.80	2.69	-3.55	3.04	-1.87
2500	-2.05	-7.11	1.62	-4.11	2.15	-2.34
5050	-9.76	-16.03	2.98	-1.81	3.01	-1.65
5150	-10.05	-16.08	2.92	-1.83	2.94	-1.67
5350	-9.42	-15.15	2.63	-1.92	2.65	-1.71
5725	-7.39	-12.75	2.98	-1.65	3.18	-1.32
5825	-7.88	-13.10	2.44	-1.89	2.51	-1.57

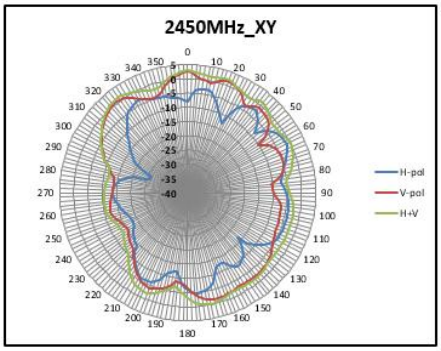
	ZX-Plane					
Frequency	H-pol.		V-pol.		Total-pol.	
(MHz)	peak	Avg	peak	Avg	peak	Avg
2400	-1.87	-5.80	2.83	-1.75	3.08	-0.31
2450	-1.21	-4.92	2.69	-1.93	3.04	-0.17
2500	-1.15	-5.53	2.33	-2.24	2.58	-0.57
5050	-0.80	-10.25	3.16	-0.76	3.28	-0.30
5150	-1.03	-10.06	3.31	-0.71	3.47	-0.23
5350	-0.62	-8.25	3.22	-0.74	3.59	-0.03
5725	-0.92	-7.13	2.54	-1.60	3.42	-0.53
5825	-1.05	-7.31	2.06	-2.18	2.60	-1.02

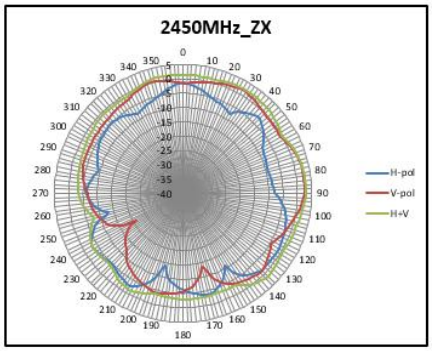
	ZY-Plane					
Frequency	H-pol.		V-pol.		Total-pol.	
(MHz)	peak	Avg	peak	Avg	peak	Avg
2400	1.25	-4.50	-2.94	-9.25	2.24	-3.25
2450	2.70	-3.31	-1.36	-8.49	3.24	-2.16
2500	2.70	-3.49	-1.16	-5.98	3.16	-2.13
5050	3.22	-3.44	-0.80	-5.35	3.83	-1.52
5150	2.64	-3.59	-1.03	-5.35	3.26	-1.37
5350	2.27	-3.48	-0.62	-5.31	2.88	-1.29
5725	2.41	-4.13	0.95	-2.75	3.79	-0.37
5825	2.08	-4.35	0.65	-2.64	3.12	-0.40

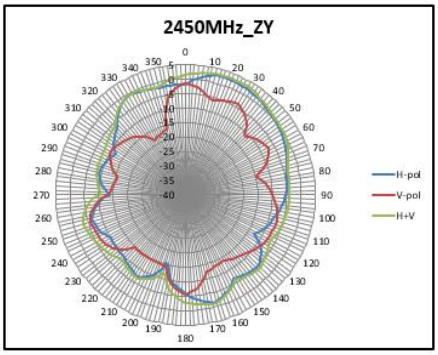


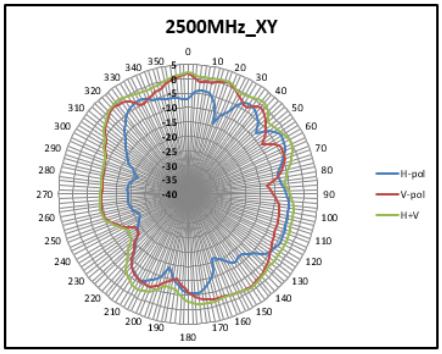


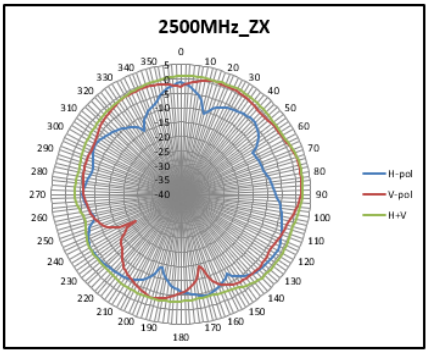


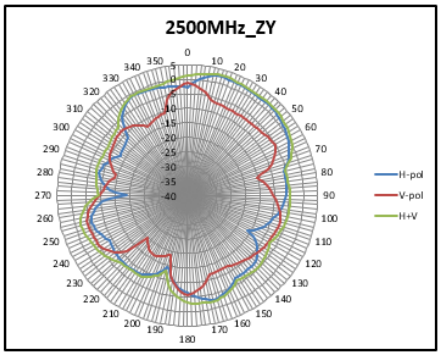












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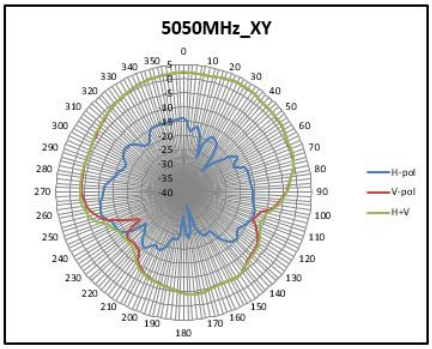

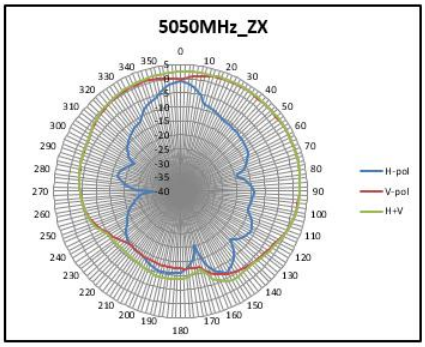

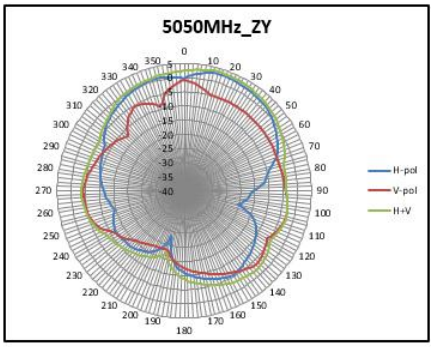

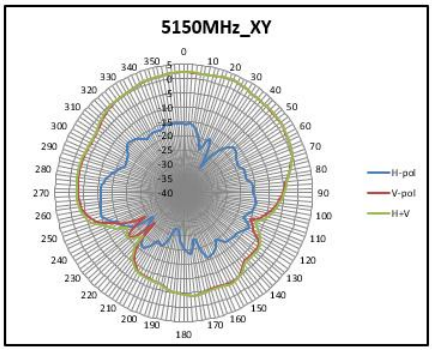

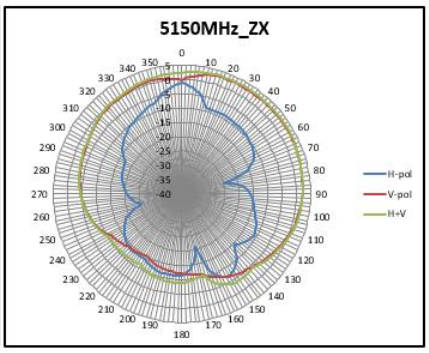

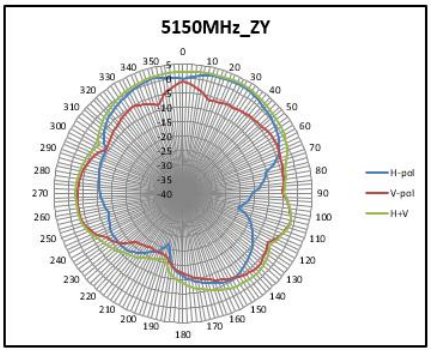

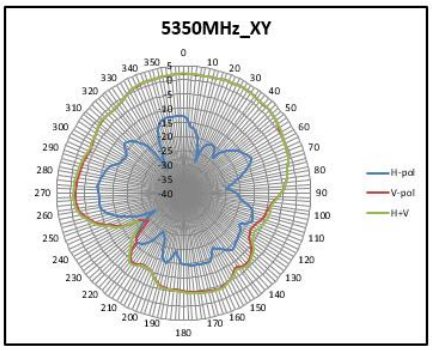

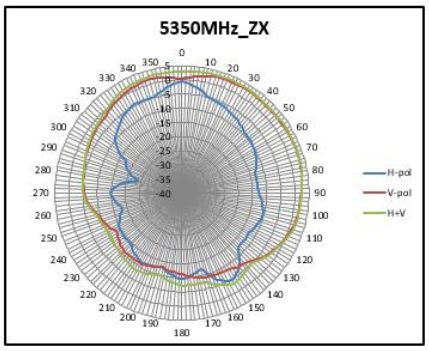

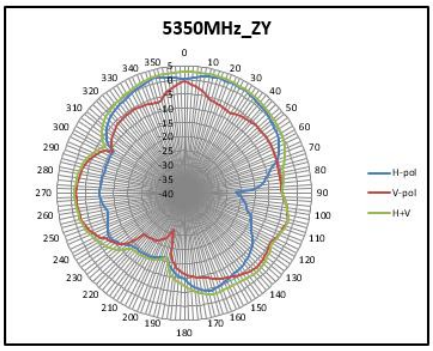

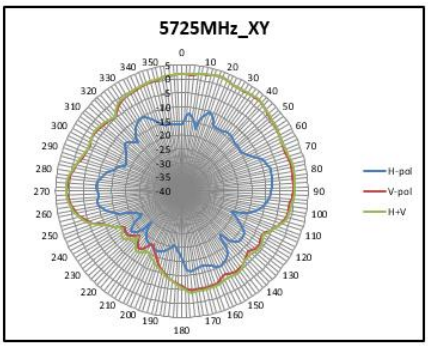

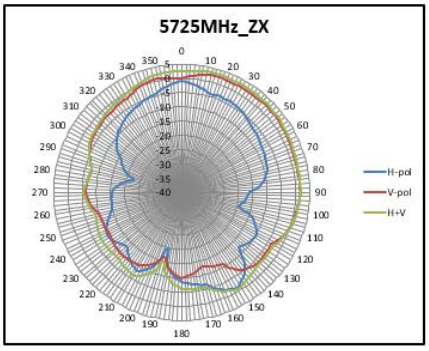

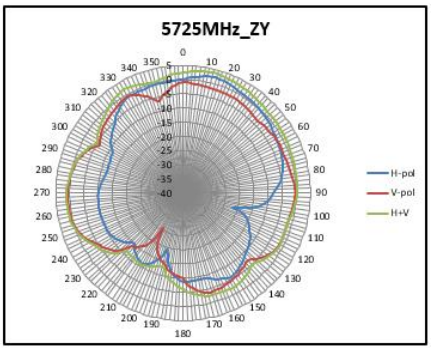

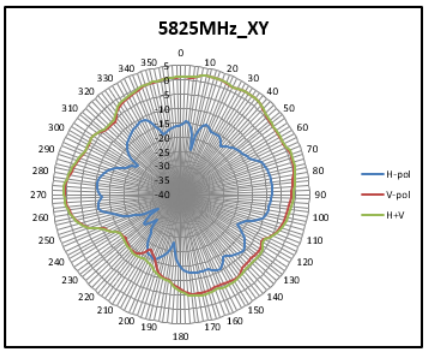

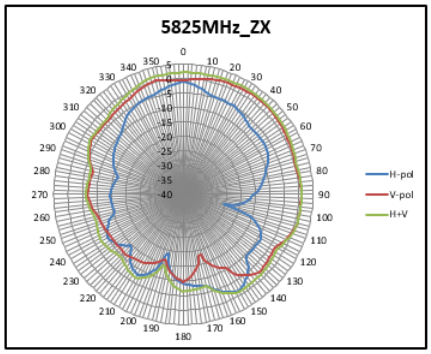

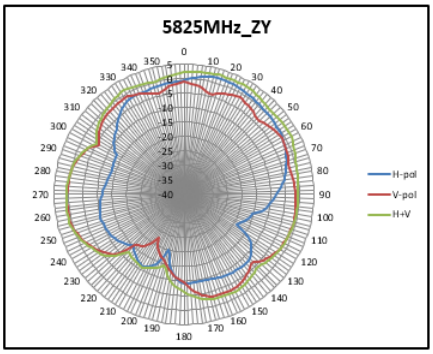

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7. Antenna Total Performance

Antenna	Frequency(MHz)	2400	2450	2500	5050	5150	5350	5725	5825
WIFI#1	Peak Gain	3.90	3.88	3.64	4.14	3.90	3.90	1.82	2.82
	Avg. Gain	-1.35	-1.11	-1.30	-1.29	-1.32	-1.19	-1.32	-1.49
	Efficiency%	73.34	77.45	74.15	74.27	73.76	76.01	73.74	70.96
WIFI#2	Peak Gain	3.87	3.97	3.41	3.74	4.15	4.84	4.76	4.78
	Avg. Gain	-1.29	-1.30	-1.24	-1.30	-1.11	-1.22	-1.31	-1.35
	Efficiency%	74.26	74.20	75.09	74.18	77.45	75.45	73.94	73.35
WIFI#3	Peak Gain	3.73	3.90	3.59	3.05	3.13	3.85	3.05	2.69
	Avg. Gain	-1.22	-1.30	-1.29	-1.32	-1.37	-1.28	-1.19	-1.14
	Efficiency%	75.58	74.15	74.22	73.77	72.90	74.46	76.11	76.84
WIFI#4	Peak Gain	3.08	3.04	2.58	3.28	3.47	3.59	3.42	2.60
	Avg. Gain	-1.48	-1.21	-1.42	-1.29	-1.26	-1.20	-1.21	-1.44
	Efficiency%	71.18	75.65	72.13	74.26	74.77	75.84	75.65	71.74

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FOXCONN INTERCONNECT TECHNOLOGY LIMITED

包　裝　作　業　規　範

環保要求
符合 EPI12 規定

				保密等級	□ 機密　□密　■一般		
規範編號	TBD			PAGE	1 /4	REV.	X1
適用客戶	UBEE	適用產品	ANTP2M2-CUB15-EH ANTP2M2-CUB16-EH ANTP2M2-CUB17-EH ANTP2M2-CUB18-EH	包裝類別	蜂巢隔板		

修訂履歷

ECN No / Rev.	頁　次															
	1		2		3		4		5		6		7		8	
X1	/															

核定	審核	會　簽			制作單位	制作人
			生產單位	品保單位		
李瑞祺 2019/12/03	陳云岐 2019/12/03		姚日紅 2019/12/03	董銀娟 2019/12/03	ACE-FAS-ME	解文斌 2019/12/03

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FOXCONN INTERCONNECT TECHNOLOGY LIMITED

包　裝　作　業　規　範

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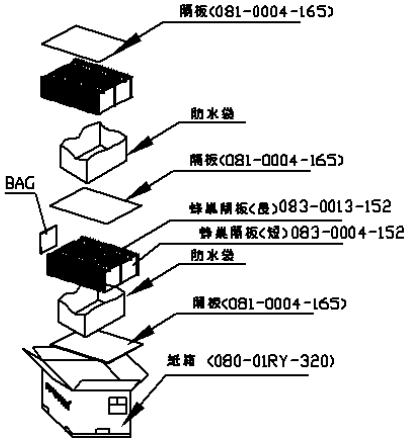
				保密等級	☐ 機密　☐密　■一般		
規範編號	TBD			PAGE	2 /4	REV.	X1
適用客戶	UBEE	適用產品	ANTP2M2-CUB15-EH ANTP2M2-CUB16-EH ANTP2M2-CUB17-EH ANTP2M2-CUB18-EH	包裝類別	蜂巢隔板		

包裝作業圖示及說明

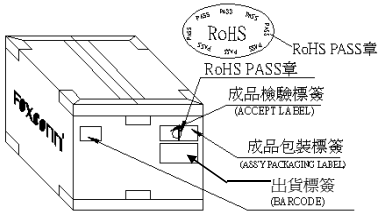
一：1.每20PCS產品用PE BAG 包裝起來，.將100PCS(5個PE BAG)包裝好的產品疊放在一起,放入隔板中.(圖示供參考)

二：
1.在外箱(080-02RZ-320)內放入隔板（081-0004-165）
2.在外箱內放入防水袋（080-0016-038），并敞開袋口.
3.分別放入蜂巢隔板（083-0013-152）3PCS,及蜂巢隔板（083-0004-152）11PCS,成蜂巢狀放入袋中,每1隔間內放入100PCS 產品.
4.包好防水袋,在上面放入隔板（081-0004-165）,再放1PC防水袋(080-0016-038),并敞開袋口.
5.如上重復3.4，上下兩層各2000PCS,共4000PCS.
6.封好防水袋，在頂層放1隔板（081-0004-165），封箱.
7.封箱后,在外箱上貼上標簽.

如圖：



三：外箱標簽粘貼方式，具體的Barcode 要求依據出貨管制.



備　注

1.標簽張貼位置及填寫注意事項,請參照生產管理作業標準:
(THE STICKING POSITION OF LABEL AND THE POINTS FOR ATTENTION, 外裝瓦楞紙箱及標簽應用管理辦法(文件編號:P103-P01). REFER TO FILE: P103-P01.)
2.外箱封箱請依據ESH-KKG-003成品出貨之封箱作業標準文件.
(HOW TO SEAL THE BOX, REFER TO FILE: ESH-KKG-003.)
3.封後之外箱,在棧板上最高堆疊高度 ：5層.
(THERE ARE FIVE STOREYS AT MOST ON THE PALLET AFTER SEALED BOX.)
4.包裝標簽:(PACKAGING LABEL)

FOXCONN

P/N: FOXCONN P/N
C.P/N: CUSTOMER P/N #
DATE: MM/DD/YYYY ☐
Q'TY: ____PCS W'T: _____

1.標簽中"#"表客戶版次，FOXCONN料號,客戶料號及版次依計划表爲准.;如CISCO無鉛料號，版次後加*;
2.標簽中MM/DD/YYYY表示：生產月份/日期/年份（例如：12/13/2009）
3.標簽中"☐"表UL認可制造地代碼.
例如：B：龍華；T:台灣；K:昆山　H:淮安
4.Q'TY:裝箱數量，依包規；零數箱依實際爲准.
5.W'T:產品標重，依系統爲准.
備注：如產品出國外，標簽需帶"Made in china".

*若出貨爲成品時,每箱實重應以實測重量爲準.

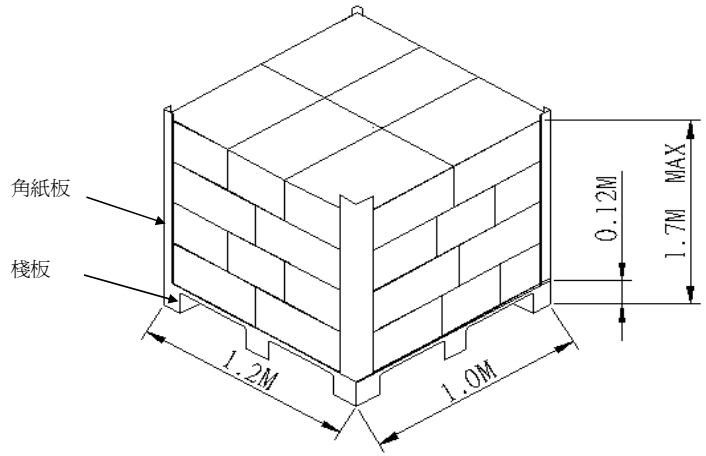
備注:

FOXCONN INTERCONNECT TECHNOLOGY LIMITED

包　裝　作　業　規　範

環保要求
符合 EPI12 規定

				保密等級	☐ 機密 ☐密 ■一般		
規範編號	TBD			PAGE	3/4	REV.	X1
適用客戶	UBEE	適用產品	ANTP2M2-CUB15-EH ANTP2M2-CUB16-EH ANTP2M2-CUB17-EH ANTP2M2-CUB18-EH	包裝類別	蜂巢隔板		

包裝作業圖示及說明	備　　注
	1. 木棧板上放滿後, 在4個角各放1PC角板, 之後於四周纏繞打包膜; 打包膜至少纏繞 3 層.(打包膜一定要從棧板底部一直纏繞到貨物頂部) 2.棧板尺寸爲1.2M×1.0M×0.12M,0.12M爲支承木塊的高度. 3.棧板必須爲木質的,包括原木和膠合木. 4.棧板連同貨物堆積高度不大于1.7M. 5.木棧板上每层最多摆放8箱,每棧板最多放5层，共40箱.（棧板連同貨物堆積高度不大于1.7M）. ***本產品,制程之原物料/零件必須符合EPI12環境管理物質規定.

備注: "包裝作業圖示及說明"欄位內應包括但不限於: 整箱包裝模式設計、 整棧板包裝模式設計、可替代包裝模式設計等.

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FOXCONN INTERCONNECT TECHNOLOGY LIMITED

包　裝　作　業　規　範

環保要求
符合 EPI12 規定

保密等級	□機密　□密　■一般		
PAGE	4/4	REV.	X1

規範編號	TBD
適用料號	ANTP2M2-CUB15-EH ANTP2M2-CUB16-EH ANTP2M2-CUB17-EH ANTP2M2-CUB18-EH

材料名稱 (/替代材料名稱)	料號 (/替代材料料號)	淨重	用量	產品型號	包裝容量 最內層包裝產品數量	每箱最內層包裝數	每箱包裝產品總數量	重量 (Kg) 每PCS淨重	每箱淨重	每箱毛重
外 箱(576*450*360mm)	080-02RZ-320	1.79	1	ANTP2M2-CUB15-EH	20	200	4000	/	/	/
隔板	081-0004-165	0.08	3	ANTP2M2-CUB16-EH	20	200	4000	/	/	/
防水袋	080-0016-038	0.06	2	ANTP2M2-CUB17-EH	20	200	4000	/	/	/
封箱膠帶	090-0060-510	N/A	/	ANTP2M2-CUB18-EH	20	200	4000	/	/	/
蜂巢隔板（長）	083-0013-152	0.05021	6							
蜂巢隔板（短）	083-0004-152	0.039	22							
成品包裝標簽	080-1011-319	0.0006	1							
內箱BARCODE	080-2019-319	N/A	1							
外箱BARCODE	080-2019-319	N/A	1							
PE袋	084-0001-8957	N/A	200							

備注:
1.外箱的長*寬*高是520mm*400mm*300mm
2.本產品,制程之原物料/零件必須符合EPI12環境管理物質規定
3.實際重量以出貨爲准(即以TIPTOP系統中標重爲準)

說明:
1）包裝箱/袋上的安規標示要求需在包裝作業規範上注明，如張貼安規標簽，需注明張貼標簽類型/數量/張貼位置.
2）當存在可用於臨時狀態的替代材料時，應於上表中予以界定.

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