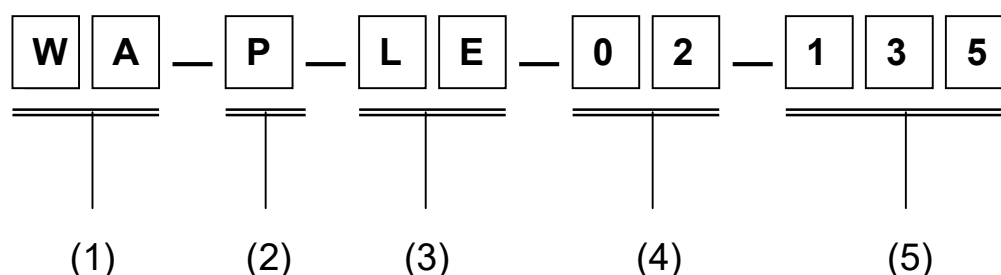


Embedded Multi-Band Antenna for WA-P-LE-02-135

1. Explanation of part number :



1. Product Type : Wireless Antenna
2. Material : PCB
3. Frequency/Band code : 2400~2500 & 5150~7125MHz
4. Coaxial Cable Type : Black Coaxial Cable
5. Suffix : 135

2. Electrical Specification :

Ant. Part Number (main & aux parts)	Type	Highest Peak Gain with Cable Loss (dBi)	Cable loss (dB)	Connector Type	Cable length	Laptop/ Host Model
		2400~7125MHz	2400~7125MHz			
Main: INPAQ P/N: WA-P-LE-02-135 ASUS P/N: 14008-05430200	PIFA	3@2400~2500MHz 4.7@5150~7125MHz	0.4@2400~2500MHz 0.63@5150~7125MHz	I-PEX MHF4-L	145mm	B9403

Antenna Type	PIFA Antenna For WIFI 802.11a/b/g/n/ac/ax	
Connector Type	I-PEX MHF4-L Connector 20565-001R-13	
Cable Type	OD 1.13 LLS RF Cable	
Impedance	50Ω	
Polarization	Linear	
Radiation Pattern	Omni-directional	
Frequency Range	WLAN 802.11a/b/g/n/ac/ax	2.4~2.5GHz & 5.15~7.125 GHz
VSWR	WLAN 802.11a/b/g/n/ac/ax	≤ 3.5
Operation Temperature	-10℃~+55℃	
Storage Temperature	-30℃~+75℃	
Return Loss	≤ -6 dB	
Max Power	1W	

UNLESS OTHER SPECIFIED TOLERANCES ON :

X=± X.X=± X.XX=±
 ANGLES=± HOLEDIA=±



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SCALE : N/A

UNIT : mm

DRAWN BY: 廖偉廷

CHECKED BY: 鄭榮謀

DESIGNED BY: 林易暄

APPROVED BY: 張建焜

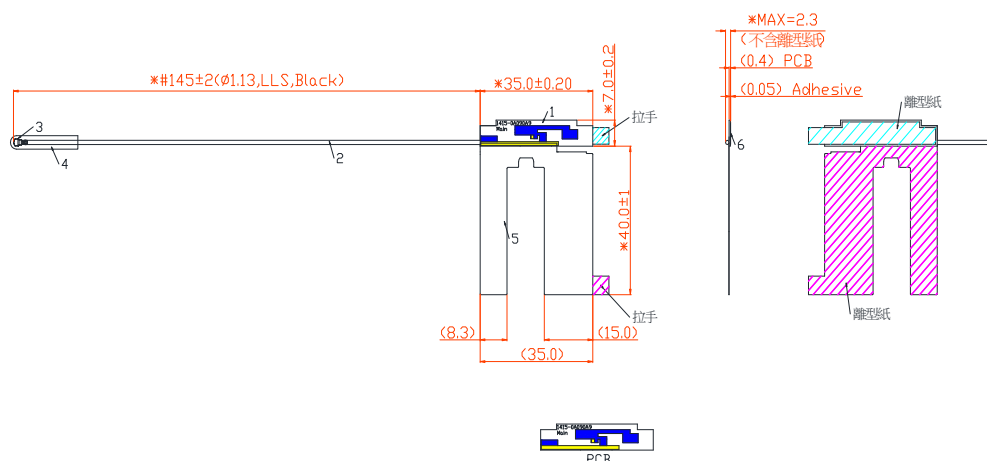
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WA-P-LE-02-135

DOCUMENT
NO.

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4. Antenna Drawing:



NOTE:

1. 工程圖上“*”號為重要尺寸標註指示。
Mark “*” are the key dimensions.
2. 工程圖上“#”號為Cpk 量測尺寸標註指示。
Mark “#” are CPK dimensions.

Drawing Rev. P5

ITEM	DESCRIPTION	MATERIAL SPECIFICATION	QUANTITY	UNIT	SUPPLIER	UL File NO
1	PCB	35x7x0.4mm	1	PCS	HA1041	E529263
2	CABLE	OD 1.13, Low Loss, Black	1	PCS	HA0008	E318898
3	Connector	I-PEX MHF4-L I-PEX Equivalent(compatible)	1	PCS	HA0063	E213445
4	Tube	ID1.9x20mm	1	PCS	HA0059	N/A
5	Cu foil	40.8x35x0.08mm	1	PCS	HA0026	N/A
6	Adhesive	34x6x0.05mm	1	PCS	HA0026	N/A

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ANGLES=± HOLEDIA=±



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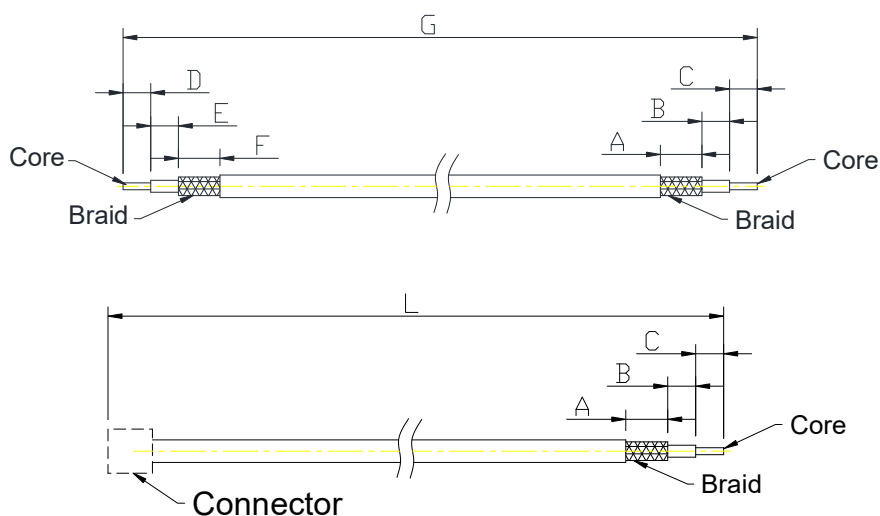
TITLE : Embedded Multi-Band Antenna for
WA-P-LE-02-135

DOCUMENT
NO.

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5. RF Connector :

5-1 Cable Dimension :



Connector : I-PEX MHF-4L ; Cable : RF Cable ϕ 1.13 Low Loss (Black)

L : 164.0 $\pm$ 2.0

D : 1.20 $\pm$ 0.15

A : 3.0 $\pm$ 0.5(沾錫)

E : 0.72 $\pm$ 0.15

B : 2.0 $\pm$ 0.5

F : 1.00 $\pm$ 0.15

C : 1.0 $\pm$ 0.5(沾錫)

G : 163.0 $\pm$ 2.0

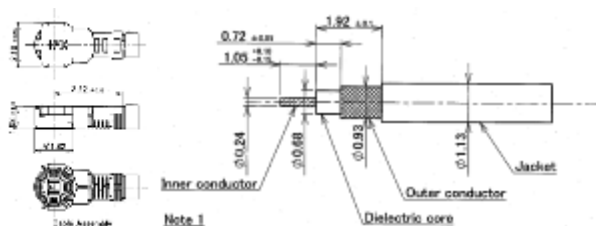
unit : mm

5-1.1 Electric SPEC :

短路/斷路測試：(使用三用電表量測)

- 心線與 Braid wires 間不可短路。
- Connector 之 Ground 與線路另一端之 Braid wires 間不可斷路。
- Connector 之心線與線路另一端之心線間不可斷路。

5-1.2 Connector Appearance : I-PEX MHF-4L (此為示意圖)



UNLESS OTHER SPECIFIED TOLERANCES ON :

X=±

X.X=±

X.XX=±

ANGLES=±

HOLEDIA=±



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6. Electrical Specification :

Those specifications were specially defined for B9403 model, and all characteristics were measured under the model's handset testing jig.

6-1. Frequency Band :

Frequency Band	MHz	MHz
Wi-Fi 6e	2400~2500	5150~7125

6-2. Impedance :

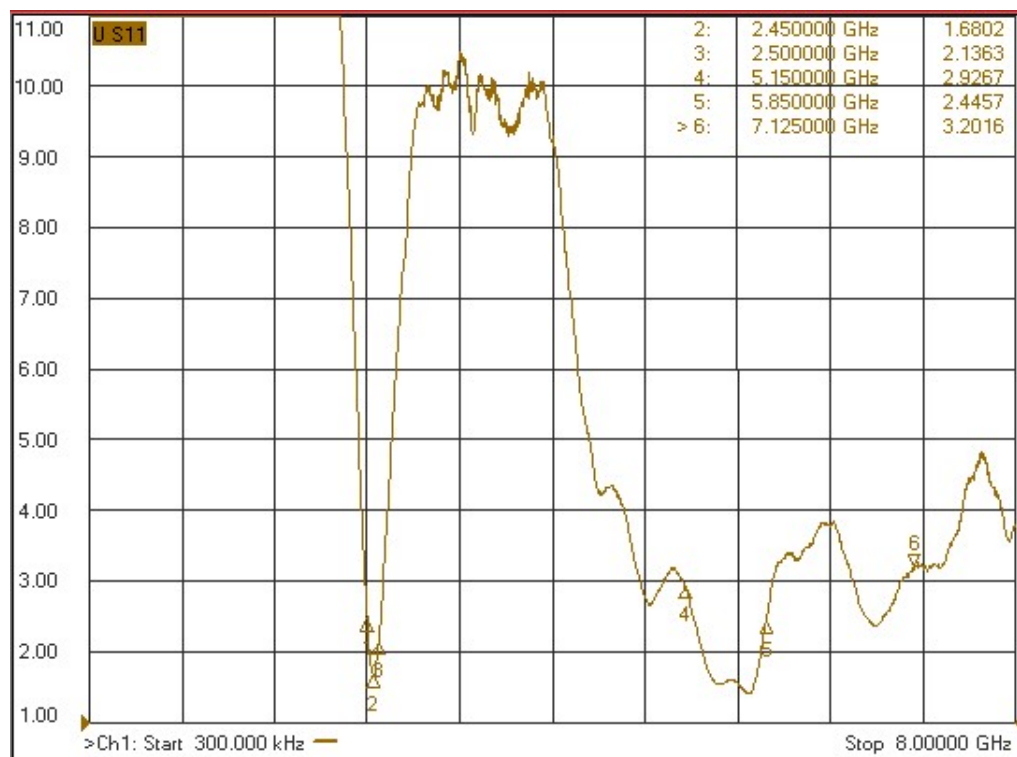
50 ohm nominal

6-3. Matching circuit :

None

6-4. Return loss/VSWR :

Frequency(MHz)	2400	2500	5150	5850	7125
Main VSWR(dB)	2.31	2.13	2.92	2.44	3.20



UNLESS OTHER SPECIFIED TOLERANCES ON :

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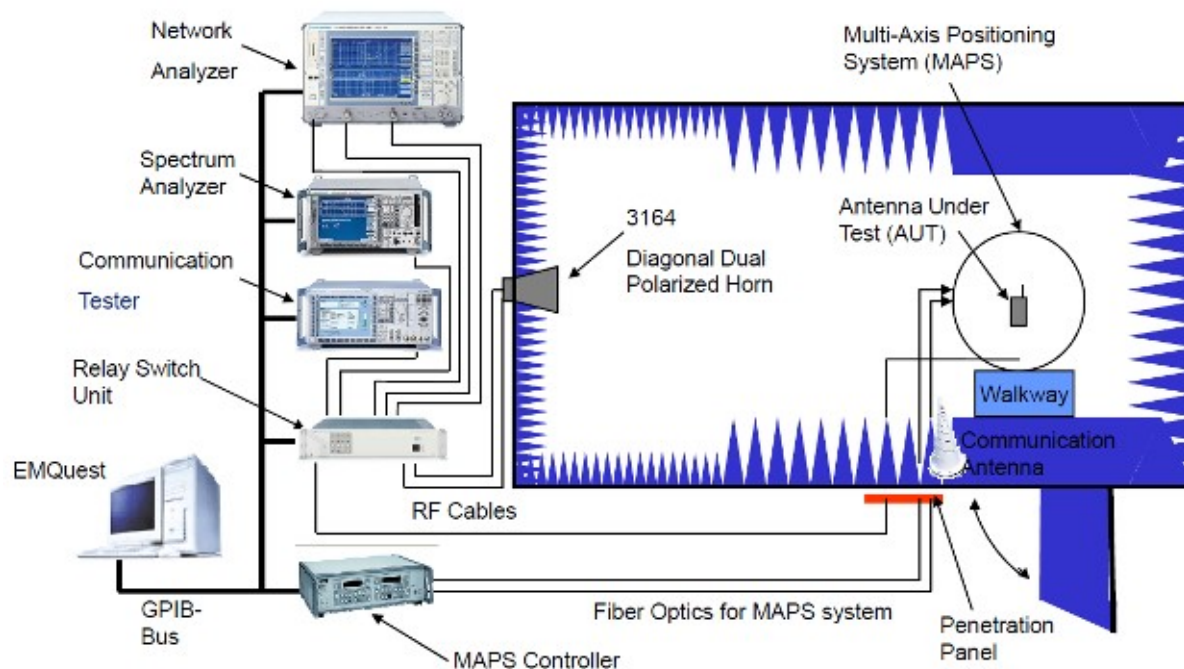
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6-5 Gain and Radiation Pattern

6-5.1 Measure method

1. Using a low loss coaxial cable to link a standard handset jig
2. Fixed this handset jig on chamber's rotator plane
3. Linking jig into network analyzer port and using a probing horn antenna to collect data.
4. Using another standard gain horn antenna to calibrated those data

6-5.2 Chamber definition



1. An anechoic chamber (10mx3mx3m) which satisfied far-field condition was applied to avoid multi-path effect
2. The quiet room region is 50cmx50cmx50cm at the center of rotator
3. The distance between DUT and standard antenna is 9.14m
4. Two measurement antennas is 3164-06 (300MHz - 6GHz) and 3164-05 (2 - 18GHz)

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6-5.3 Gain data and radiation pattern

Antenna gain is marked (dBi) and is based on **STANDARD HORN** antenna. The data shows Peak-Gain and Average-Gain.

Frequency (MHz)	Main	
	Efficiency (dB)	3D Peak gain (dBi)
2400	-5.13	2.61
2412	-4.62	2.95
2437	-4.25	3
2462	-5.05	2.97
2500	-5.04	2.92
5150	-4.25	3.56
5250	-4.65	3.52
5350	-3.96	3.49
5470	-3.64	4.31
5600	-3.39	4.3
5725	-3.13	4.7
5785	-3.52	4.23
5850	-3.9	4.6
5895	-3.94	4.27
5925	-4.25	4.23
6125	-5.71	4.4
6425	-5.93	4.05
6525	-5.49	4.27
6725	-3.97	4.16
6875	-3.84	4.03
6925	-4.16	3.75
7125	-4.88	3.78

UNLESS OTHER SPECIFIED TOLERANCES ON :

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 ANGLES=± HOLEDIA=±



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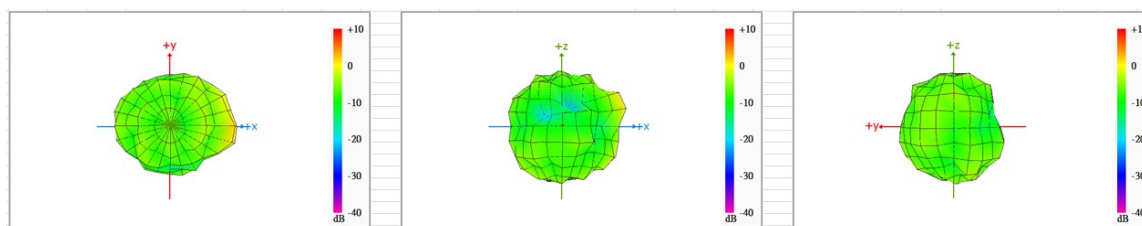
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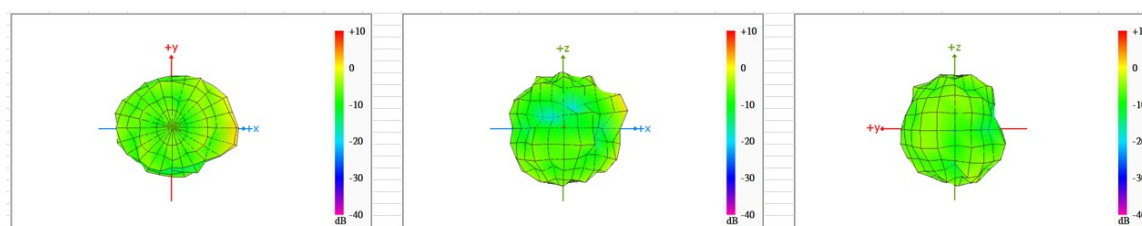
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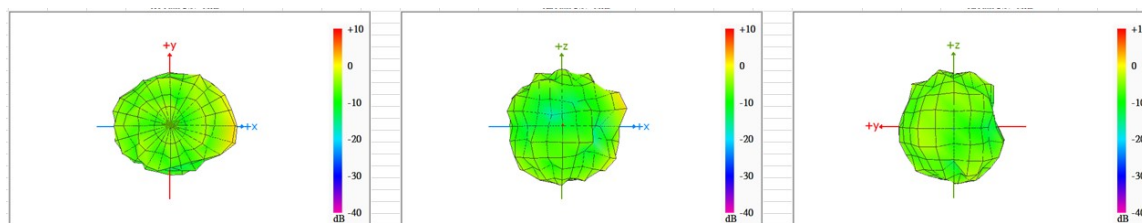
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2400-2500MHz radiation characteristic**Main antenna: 2400 MHz**

Center Frequency	2400 MHz
Three-dimensional (dBi) peak	2.61

Main antenna: 2412 MHz

Center Frequency	2412 MHz
Three-dimensional (dBi) peak	2.95

Main antenna: 2437 MHz

Center Frequency	2437 MHz
Three-dimensional (dBi) peak	3

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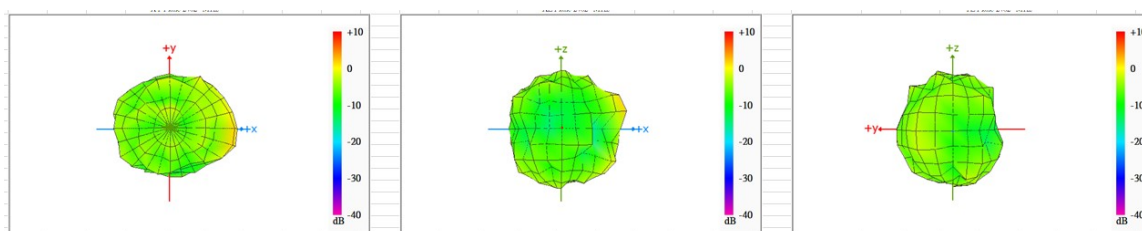
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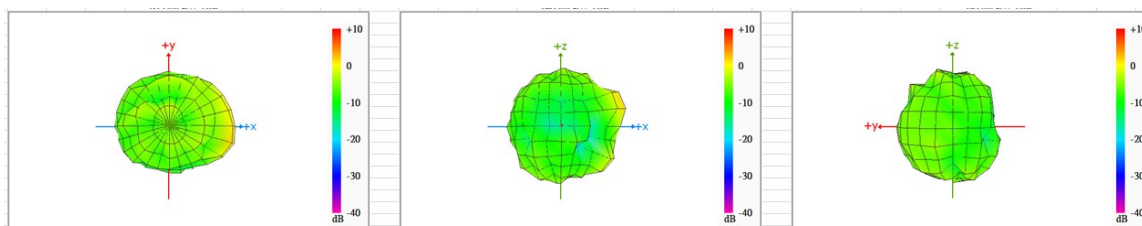
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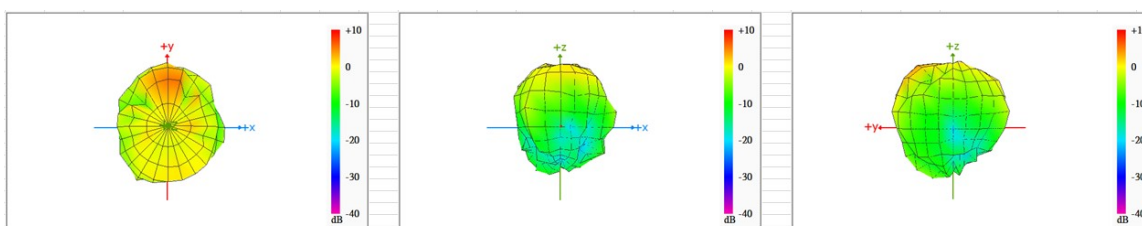
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Main antenna: 2462 MHz

Center Frequency	2462 MHz
Three-dimensional (dBi) peak	2.97

Main antenna: 2500 MHz

Center Frequency	2500 MHz
Three-dimensional (dBi) peak	2.92

5150-5350MHz radiation characteristic**Main antenna: 5150 MHz**

Center Frequency	5150 MHz
Three-dimensional (dBi) peak	3.56

UNLESS OTHER SPECIFIED TOLERANCES ON :

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UNIT : mm

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CHECKED BY:鄭榮謀

DESIGNED BY:林易暄

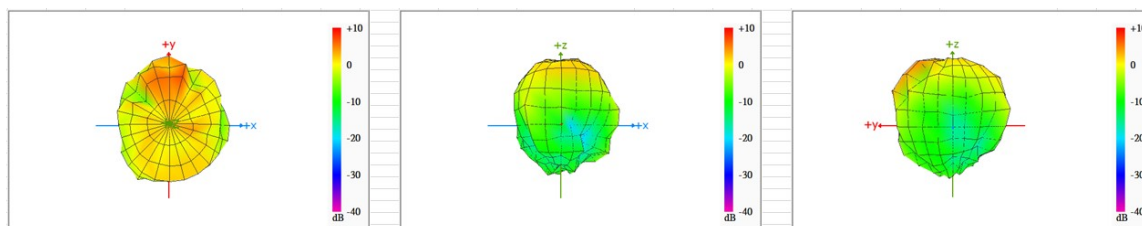
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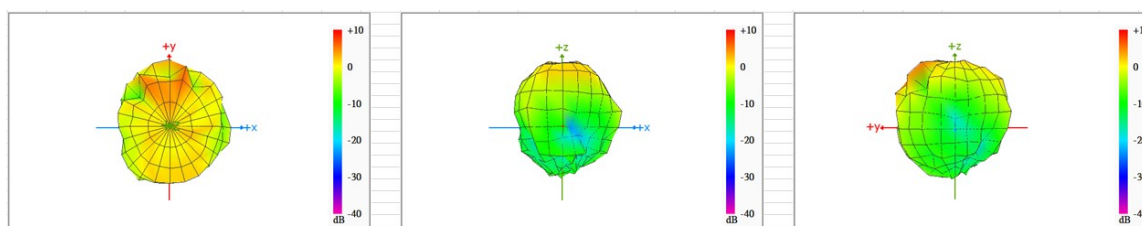
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 WA-P-LE-02-135

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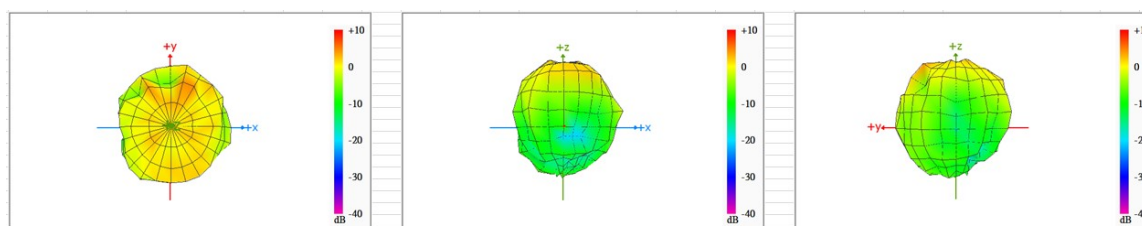
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Main antenna: 5250 MHz

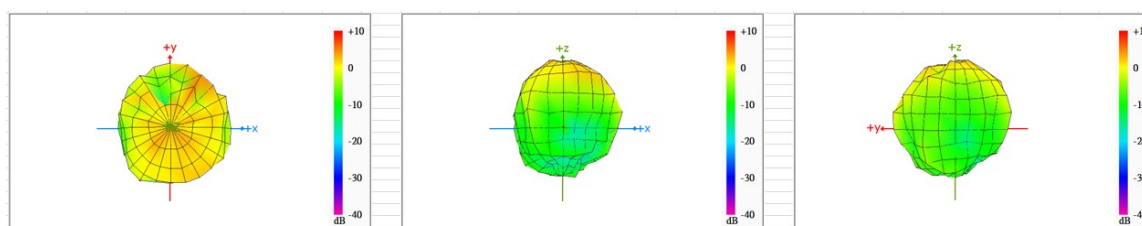
Center Frequency	5250 MHz
Three-dimensional (dBi) peak	3.52

Main antenna: 5350 MHz

Center Frequency	5350 MHz
Three-dimensional (dBi) peak	3.49

5470-5725MHz radiation characteristic**Main antenna: 5470 MHz**

Center Frequency	5470 MHz
Three-dimensional (dBi) peak	4.31

Main antenna: 5600 MHz

Center Frequency	5600 MHz
Three-dimensional (dBi) peak	4.3

UNLESS OTHER SPECIFIED TOLERANCES ON :

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ANGLES=± HOLEDIA=±

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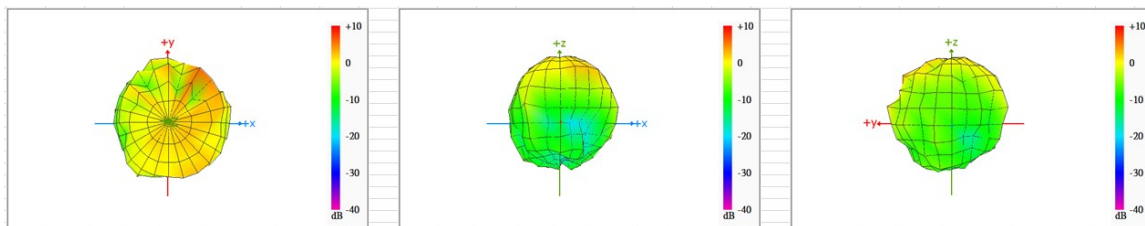
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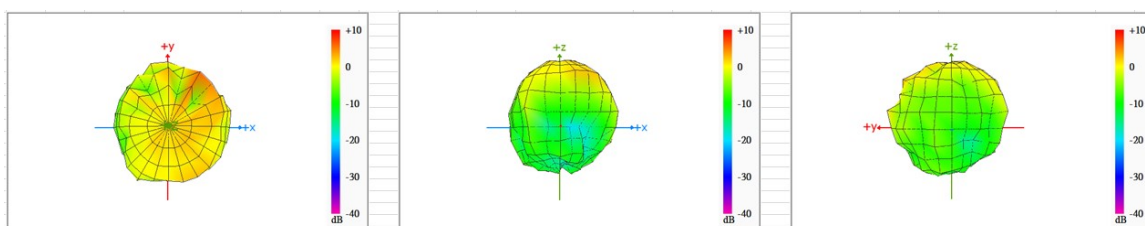
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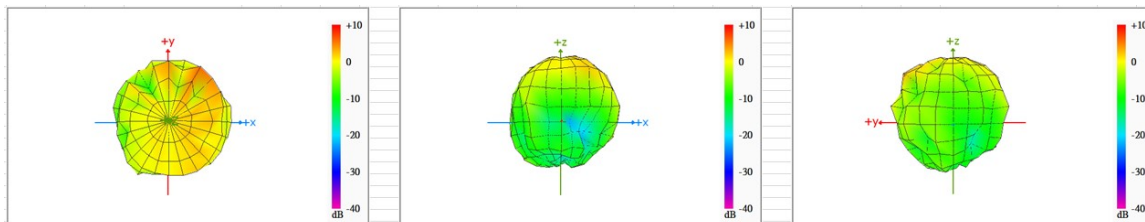
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WA-P-LE-02-135DOCUMENT
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Main antenna: 5725 MHz

Center Frequency	5725 MHz
Three-dimensional (dBi) peak	4.7

5725-5895MHz radiation characteristic**Main antenna: 5725 MHz**

Center Frequency	5725 MHz
Three-dimensional (dBi) peak	4.7

Main antenna: 5785 MHz

Center Frequency	5785 MHz
Three-dimensional (dBi) peak	4.23

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 ANGLES=± HOLEDIA=±

**INPAQ TECHNOLOGY CO., LTD.**

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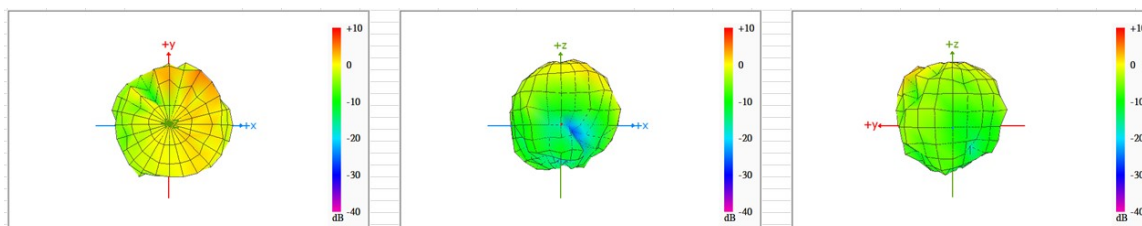
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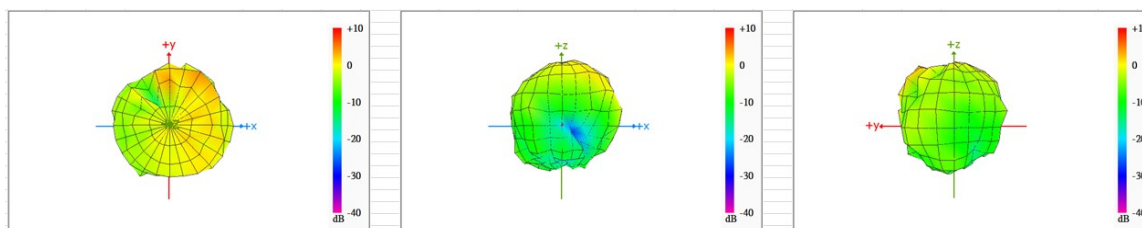
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 WA-P-LE-02-135

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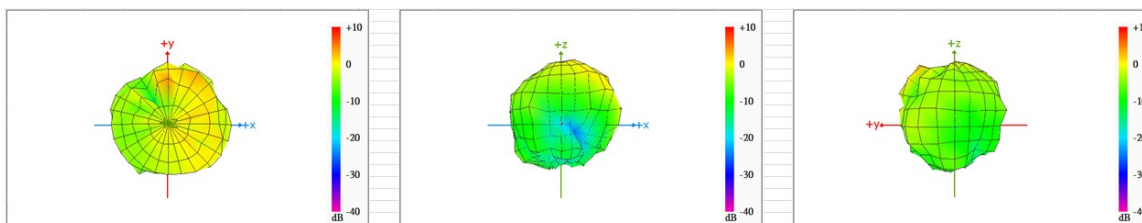
SPEC REV.
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Main antenna: 5850 MHz

Center Frequency	5850 MHz
Three-dimensional (dBi) peak	4.6

Main antenna: 5895 MHz

Center Frequency	5895 MHz
Three-dimensional (dBi) peak	4.27

5925-6425MHz radiation characteristic**Main antenna: 5925 MHz**

Center Frequency	5925 MHz
Three-dimensional (dBi) peak	4.23

UNLESS OTHER SPECIFIED TOLERANCES ON :

X=± X.X=± X.XX=±
 ANGLES=± HOLEDIA=±

**INPAQ TECHNOLOGY CO., LTD.**

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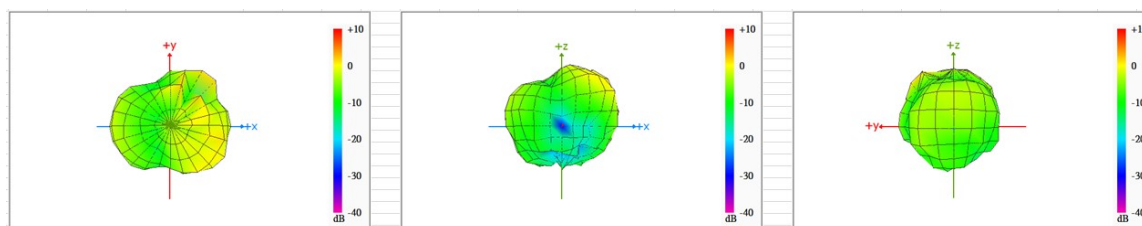
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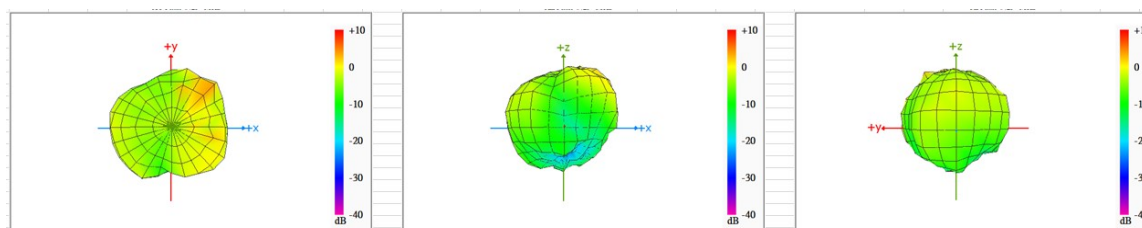
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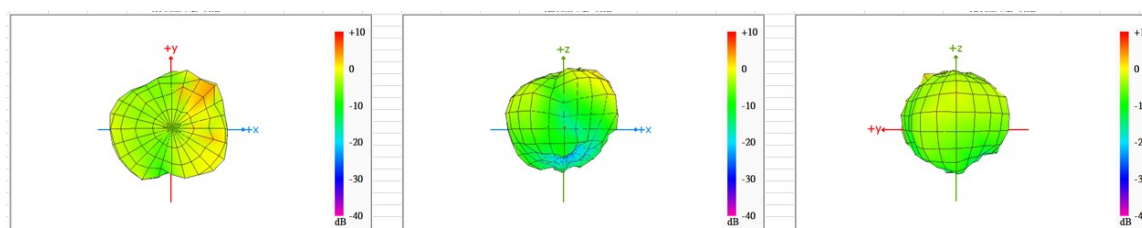
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Main antenna: 6125 MHz

Center Frequency	6125 MHz
Three-dimensional (dBi) peak	4.4

Main antenna: 6425 MHz

Center Frequency	6425 MHz
Three-dimensional (dBi) peak	4.05

6425-6525MHz radiation characteristic**Main antenna: 6425 MHz**

Center Frequency	6425 MHz
Three-dimensional (dBi) peak	4.05

UNLESS OTHER SPECIFIED TOLERANCES ON :

X=± X.X=± X.XX=±

ANGLES=± HOLEDIA=±

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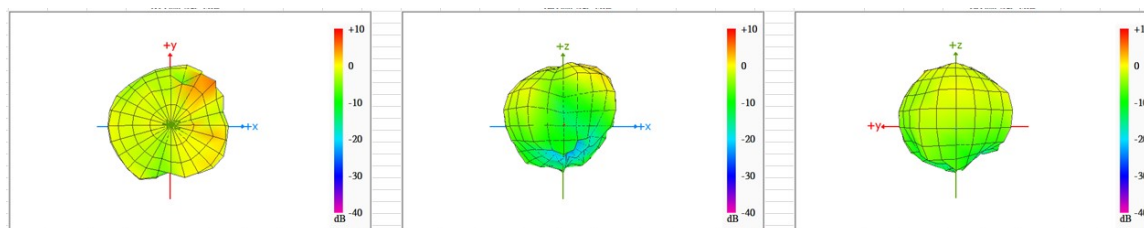
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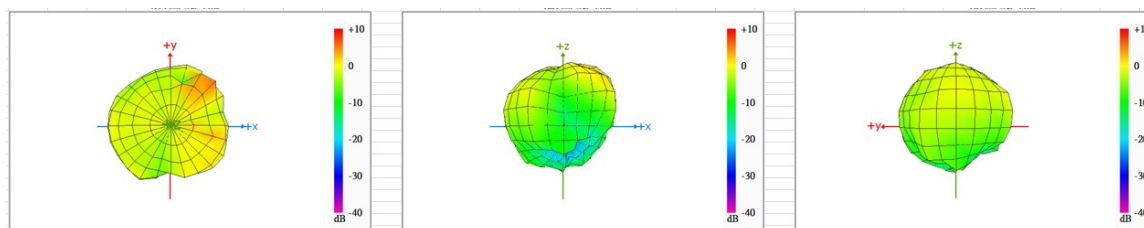
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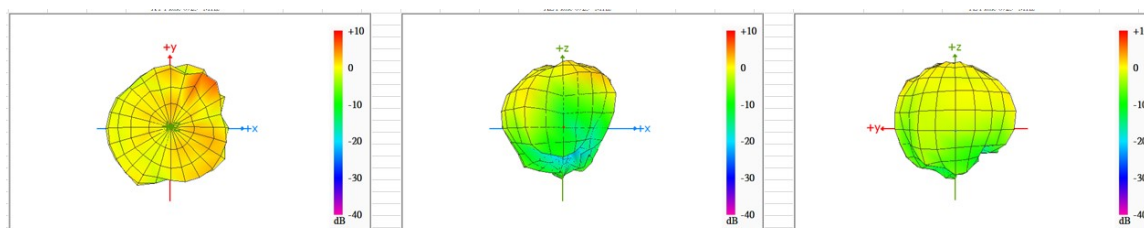
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WA-P-LE-02-135**
**DOCUMENT
NO.**
**SPEC REV.
P0**

Main antenna: 6525 MHz

Center Frequency	6525 MHz
Three-dimensional (dBi) peak	4.27

6525-6875MHz radiation characteristic**Main antenna: 6525 MHz**

Center Frequency	6525 MHz
Three-dimensional (dBi) peak	4.27

Main antenna: 6725 MHz

Center Frequency	6725 MHz
Three-dimensional (dBi) peak	4.16

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ANGLES=± HOLEDIA=±

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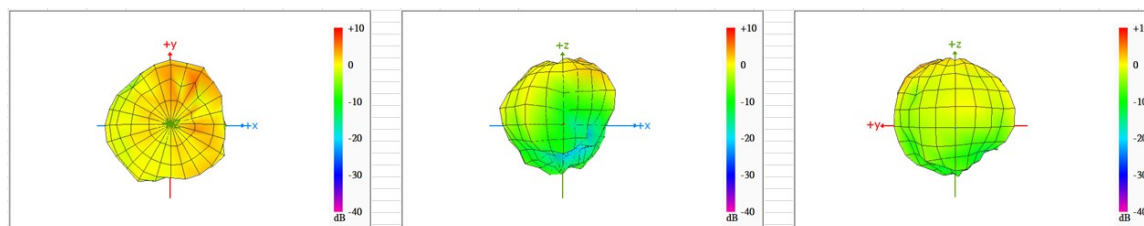
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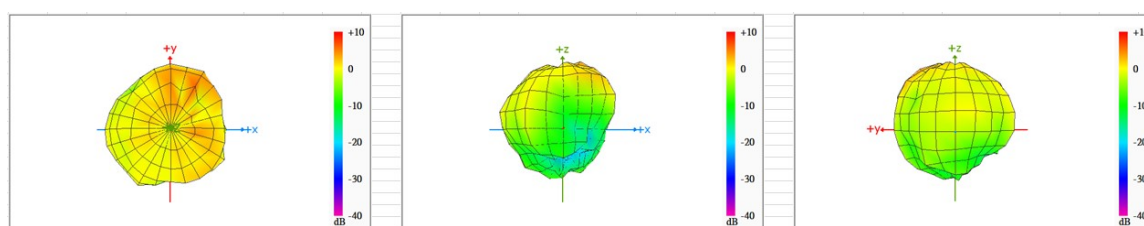
APPROVED BY:張建焜

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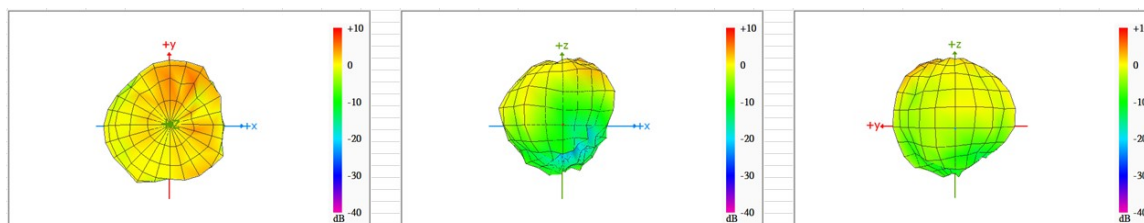
**TITLE : Embedded Multi-Band Antenna for
WA-P-LE-02-135**
**DOCUMENT
NO.**
**SPEC REV.
P0**

Main antenna: 6875 MHz

Center Frequency	6875 MHz
Three-dimensional (dBi) peak	4.03

6875-7125MHz radiation characteristic**Main antenna: 6875 MHz**

Center Frequency	6875 MHz
Three-dimensional (dBi) peak	4.03

Main antenna: 6925 MHz

Center Frequency	6925 MHz
Three-dimensional (dBi) peak	3.75

UNLESS OTHER SPECIFIED TOLERANCES ON :

$X=\pm$ $X.X=\pm$ $X.XX=\pm$
 $ANGLES=\pm$ $HOLEDIA=\pm$

**INPAQ TECHNOLOGY CO., LTD.**

SCALE : N/A

UNIT : mm

DRAWN BY:廖偉廷

CHECKED BY:鄭榮謀

DESIGNED BY:林易暄

APPROVED BY:張建焜

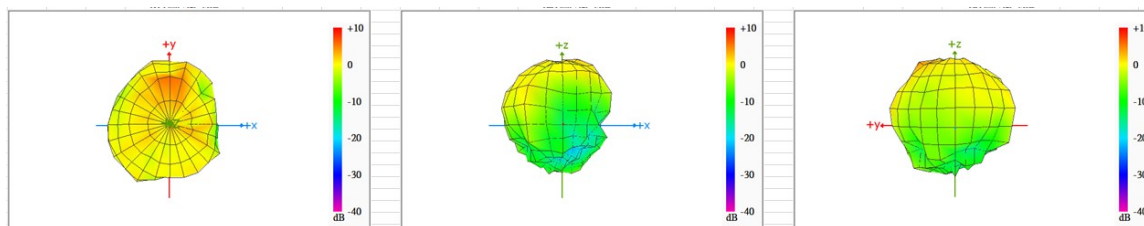
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TITLE : Embedded Multi-Band Antenna for
WA-P-LE-02-135

DOCUMENT
NO.

SPEC REV.
P0

Main antenna: 7125 MHz



Center Frequency	7125 MHz
Three-dimensional (dBi) peak	3.78

UNLESS OTHER SPECIFIED TOLERANCES ON :

X=± X.X=± X.XX=±

ANGLES=± HOLEDIA=±



INPAQ TECHNOLOGY CO., LTD.

SCALE : N/A

UNIT : mm

DRAWN BY:廖偉廷

CHECKED BY:鄭榮謀

DESIGNED BY:林易暄

APPROVED BY:張建焜

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APPARATUS OR DEVICES WITHOUT PERMISSION

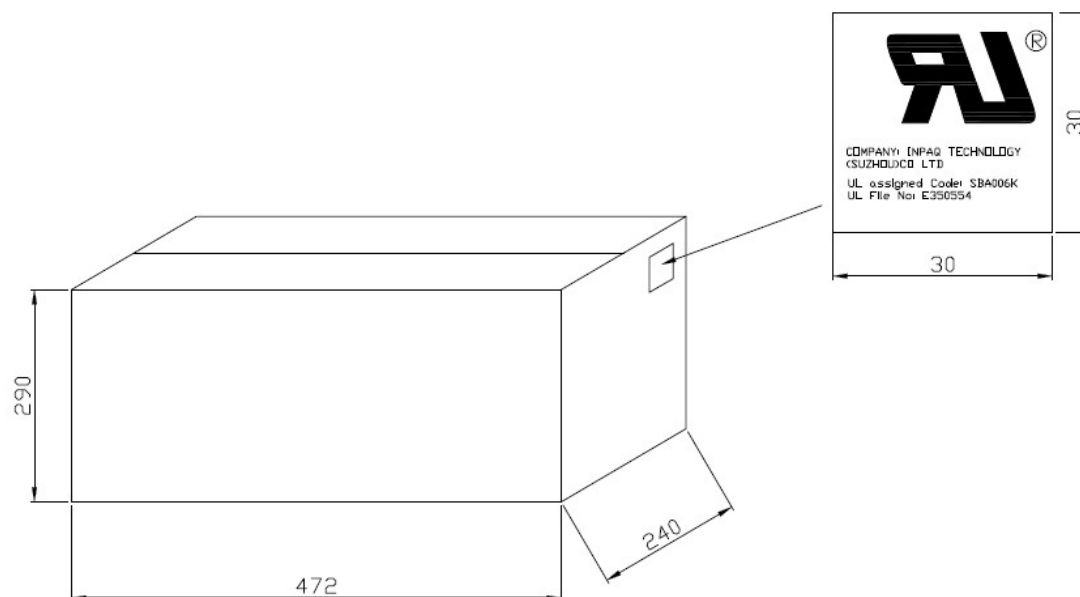
TITLE : Embedded Multi-Band Antenna for
WA-P-LE-02-135

DOCUMENT
NO.

SPEC REV.
P0

6. 外箱貼附 Cable 的 UL 標籤：

The appearance of cable UL label is according to drawing Figure 7-1-1



帶線材的產品出貨時皆需貼附此標籤

UNLESS OTHER SPECIFIED TOLERANCES ON :

X=± X.X=± X.XX=±
 ANGLES=± HOLEDIA=±



INPAQ TECHNOLOGY CO., LTD.

SCALE : N/A

UNIT : mm

DRAWN BY: 廖偉廷

CHECKED BY: 鄭榮謀

DESIGNED BY: 林易暄

APPROVED BY: 張建焜

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TITLE : Embedded Multi-Band Antenna for
 WA-P-LE-02-135

DOCUMENT
 NO.

SPEC REV.
 P0