

T2 Unlicensed Transmitters: Approved Antennas List V3								
<i>Manufacturer</i>	<i>Antenna</i>	<i>Description</i>	<i>Type</i>	<i>Peak Gain (dBi)</i>	<i>Min Cable loss (dB)</i>	Ω	<i>Connector Type</i>	<i>Notes</i>
Inpaq	RFDPA161300SBLB807	Dual Band	Dipole	3.76-2.4GHz Band/ 4.66-5GHz Band	1.5	50	RPSMA	
Inpaq	RFPCA501024IMAB401	Single Band	Dipole PCB	3.67	0.3	50	Solder/U.FL	
Inpaq	RFPCA301059IMAB901	Single Band	Dipole PCB	4.83	1.8	50	Solder/U.FL	

APPROVAL SHEET

Dipole ANTENNA

2.4/5.x GHz Working Frequency

Halogens Free Product

P/N: RFDPA161300SBLB807

Customer : _____
Customer 's Part No. : _____
Approval No. : _____
Issue Date : _____

*Contents in this sheet are subject to change without prior notice.

Version	Date	Description	Author
V01	2018 Mar	New Release	SHLEE

Approval sheet

ELECTRICAL CHARACTERISTICS

Item	Specification
Working Frequency Range	2.4~2.5/5.15~5.85 GHz (Note-1)
Gain	3.76 dBi@2.4~2.5 GHz 4.66 dBi@5.15~5.85 GHz
Return Loss	-10dB(Max)
VSWR	2 max.
Polarization	Linear
Radiation Pattern	Omni-directional
Impedance	50Ω

*Note 1. Central Frequency should be defined after customers' application approval.

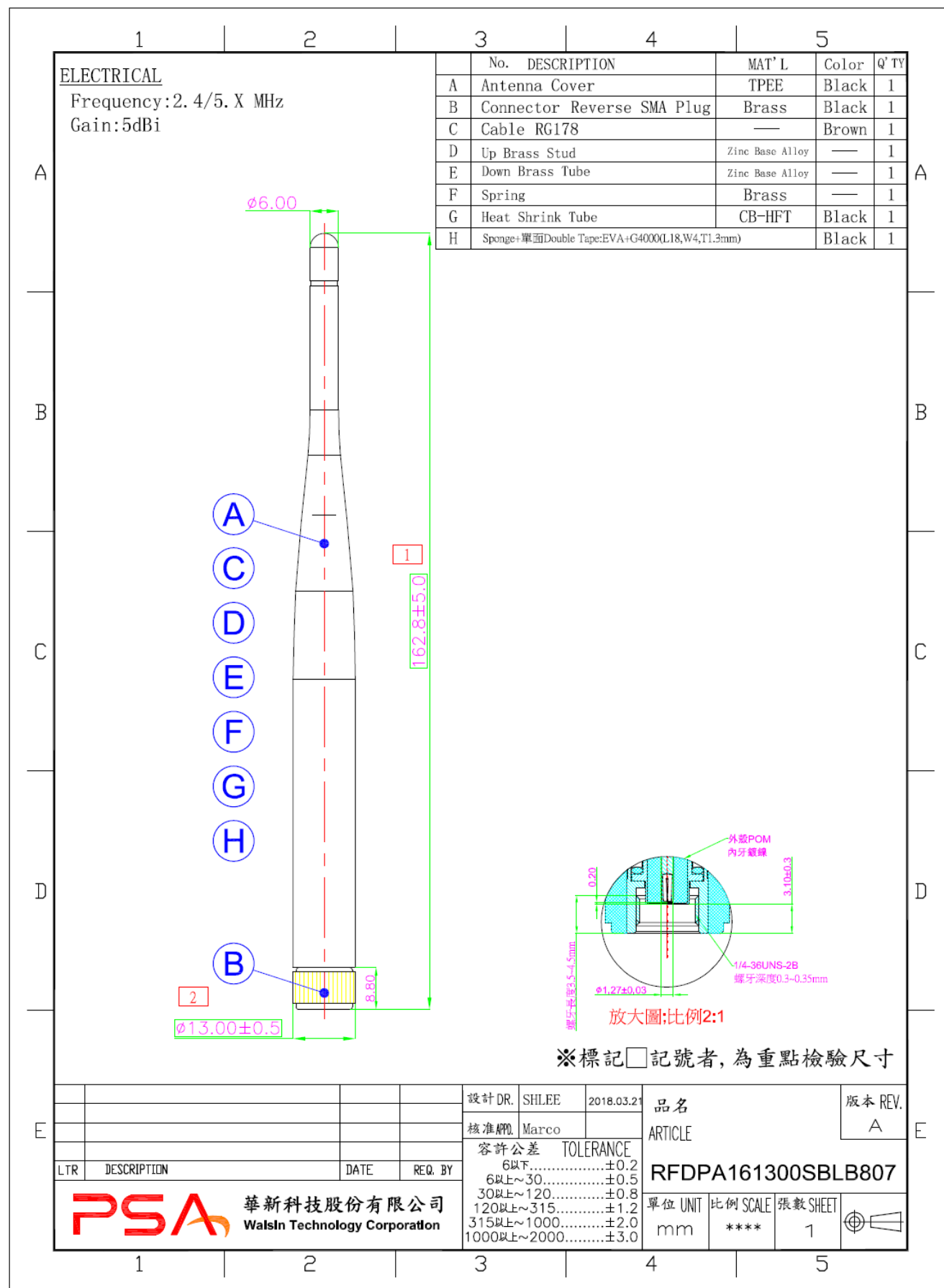
MATERIAL TABLE

Items	Description
Cable	RG178(Brown)
Antenna Cover	TPEE(Black)
UP Brass Stud	Zinc Base Alloy
Down Brass Tube	Zinc Base Alloy
Spring	Brass
Heat Shrink Tube	CB-HFT(Black)
Reverse SMA Plug	Brass(Black)
Sponge+單面Double Tape	EVA+G4000(L18,W4,T1.3mm)

ORDERING RULE

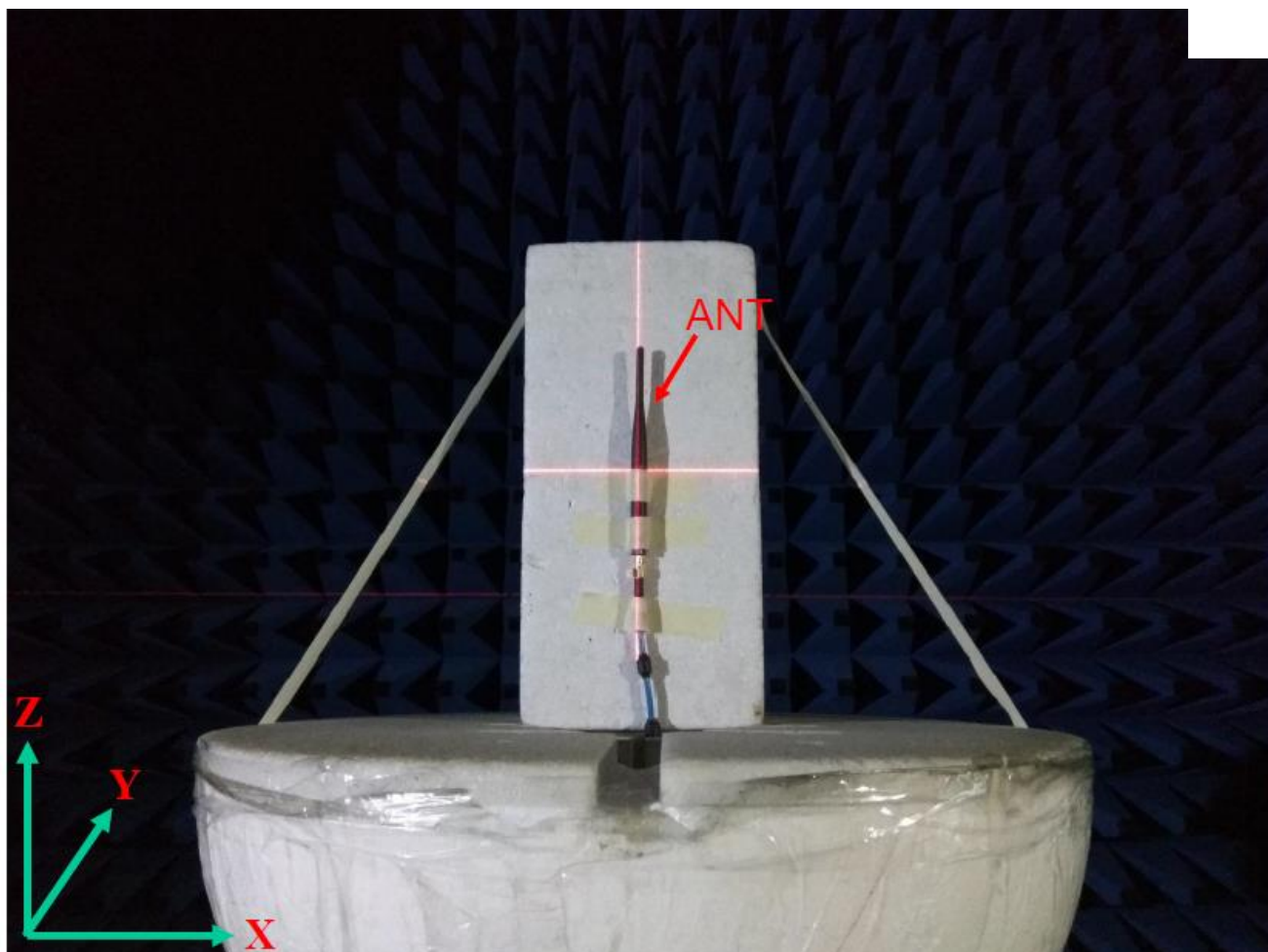
RF	DPA	1613	00	S	B	L	B	8	07
Type Code	Product Code	Dipole Dimension (Unit: mm)	Cable Length (unit: cm)	Connector Brand	Type of Connector	Application	Project status	Wire Diameter	Project
Walsin RF Device	DPA: Dipole Antenna	Per 2 digits of length, width e.g.: 1613 Length 162.8mm Width 13mm	2 digits for cable length e.g.: 00 None Cable	A: N C: MCX D: IPEX III E: IPEX IV F: IPEX A13 H: Hirose I: IPEX M: MMCX S: SMA T: TNC U: MURATA N: None	A: Reverse Female B: Reverse Male F: Female M: Male N: None	0: 0GHz 3: 3GHz 5: 5 GHz 6: 6GHz A: 2.4GHz ISM band B: GSM 900/1800 dual band G: GPS band L: 2.4/5.2/5.8 GHz tri-band N: NFC band T: LTE band W: WCDMA band	B: MP T: During Test X: Pile Run	0: None 1: ∅0.81 3: ∅1.13 6: RG316 7: ∅1.37 8: RG178	01~99 series number

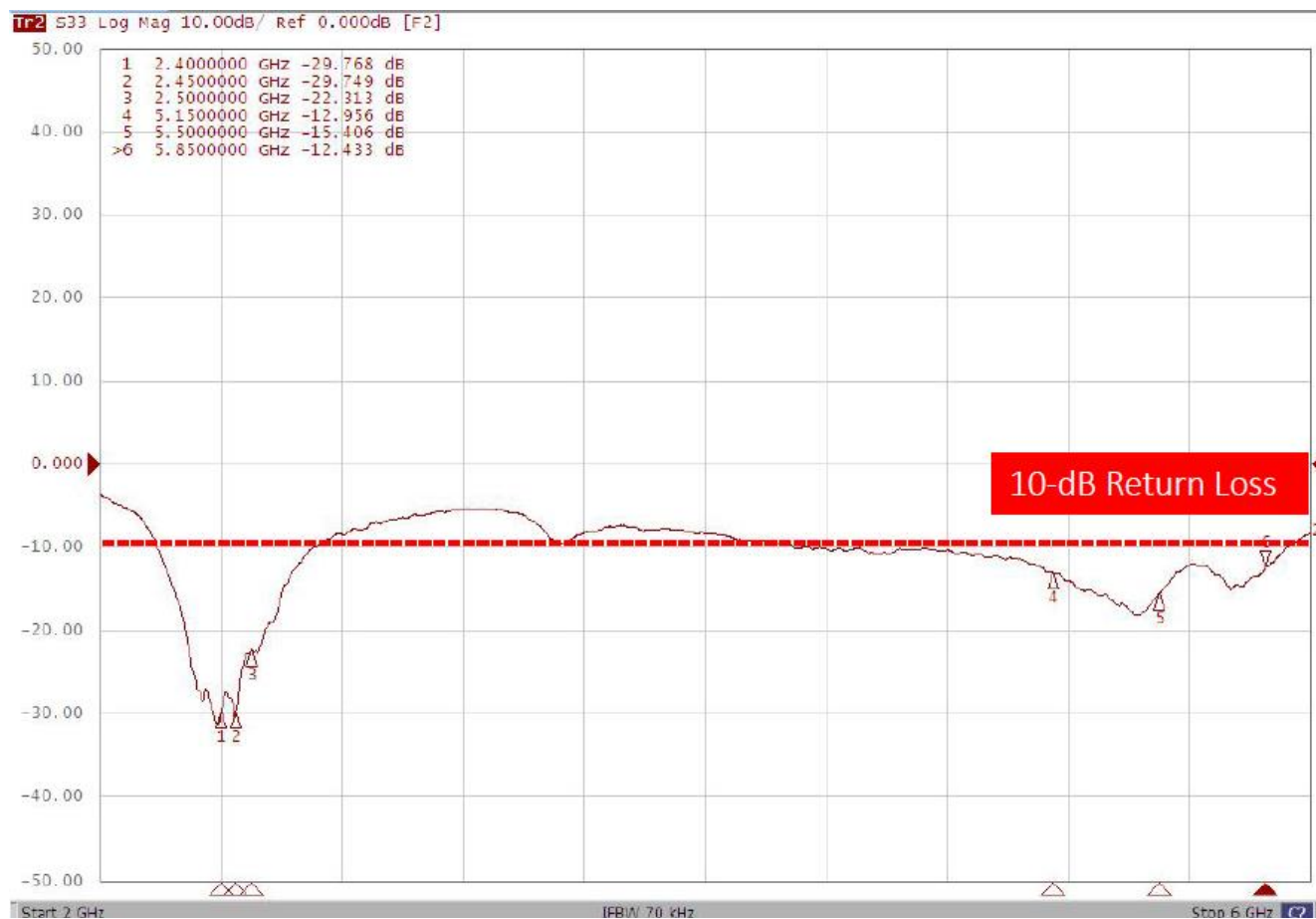
DIMENSIONS

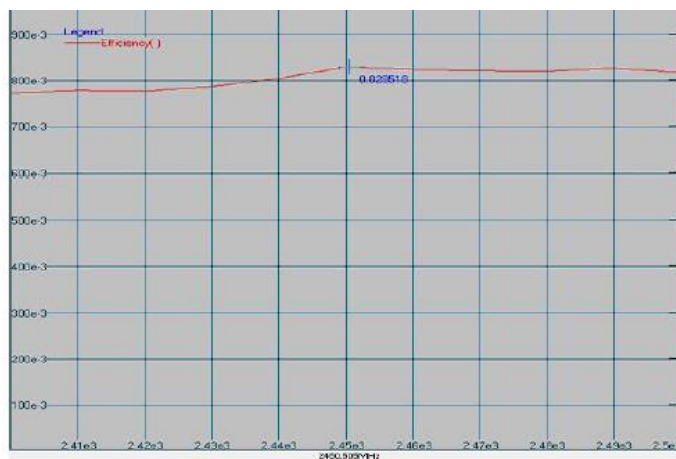
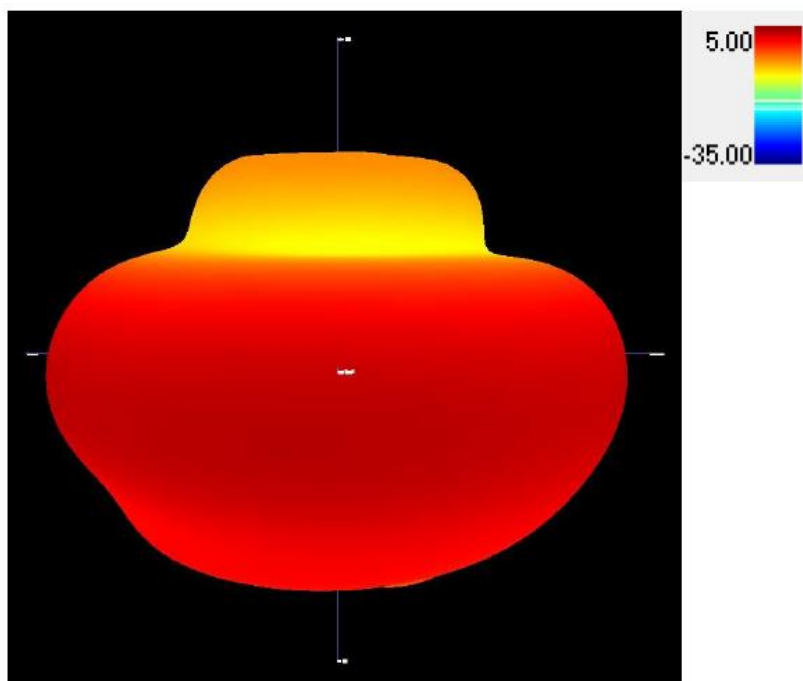
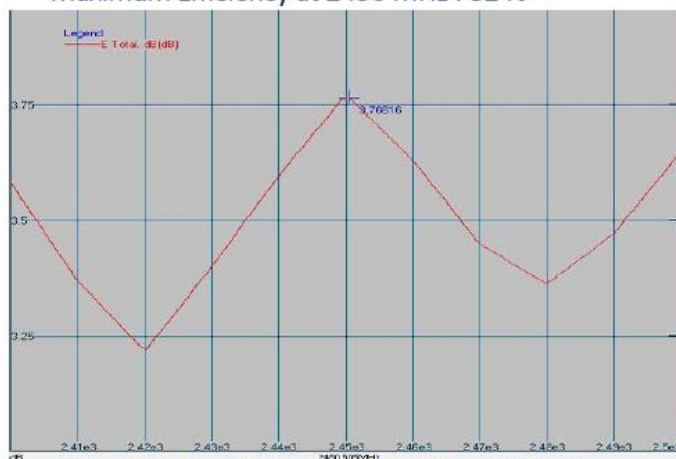


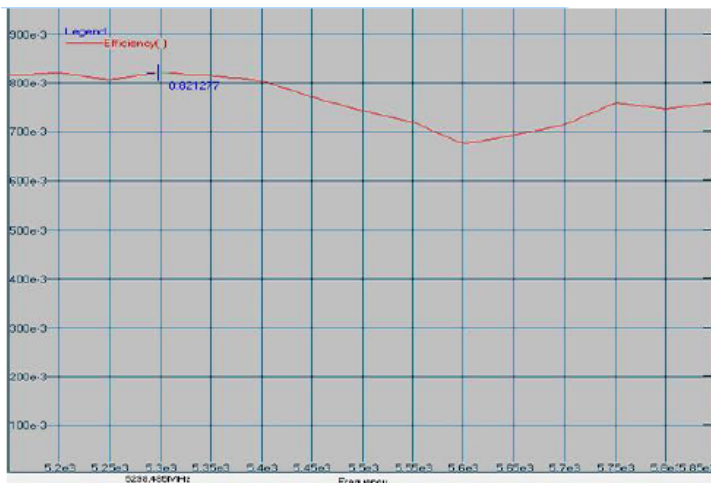
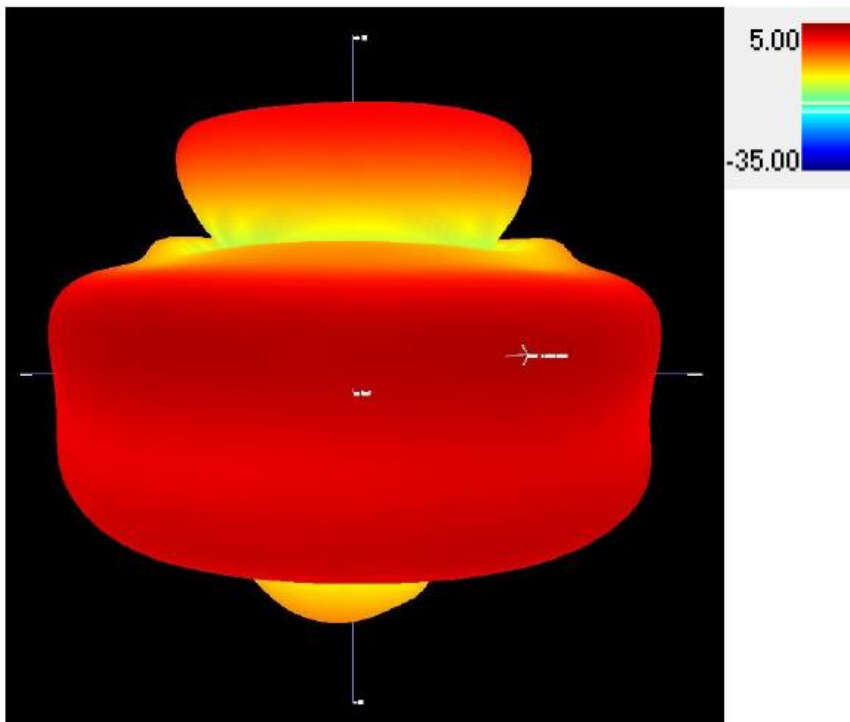
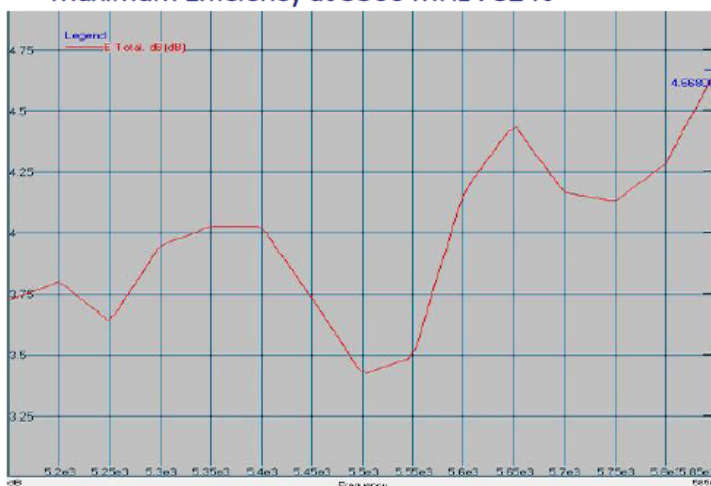
Test Report

■ Experimental Setup



ELECTRICAL CHARACTERISTICS**Return Loss**

Antenna Efficiency & Peak Gain**2450 MHz****Maximum Efficiency at 2450 MHz : 82 %****Maximum Peak Gain at 2450 MHz : 3.76 dBi**

5500 MHz**Maximum Efficiency at 5300 MHz : 82 %****Maximum Peak Gain at 5850 MHz : 4.66 dBi**

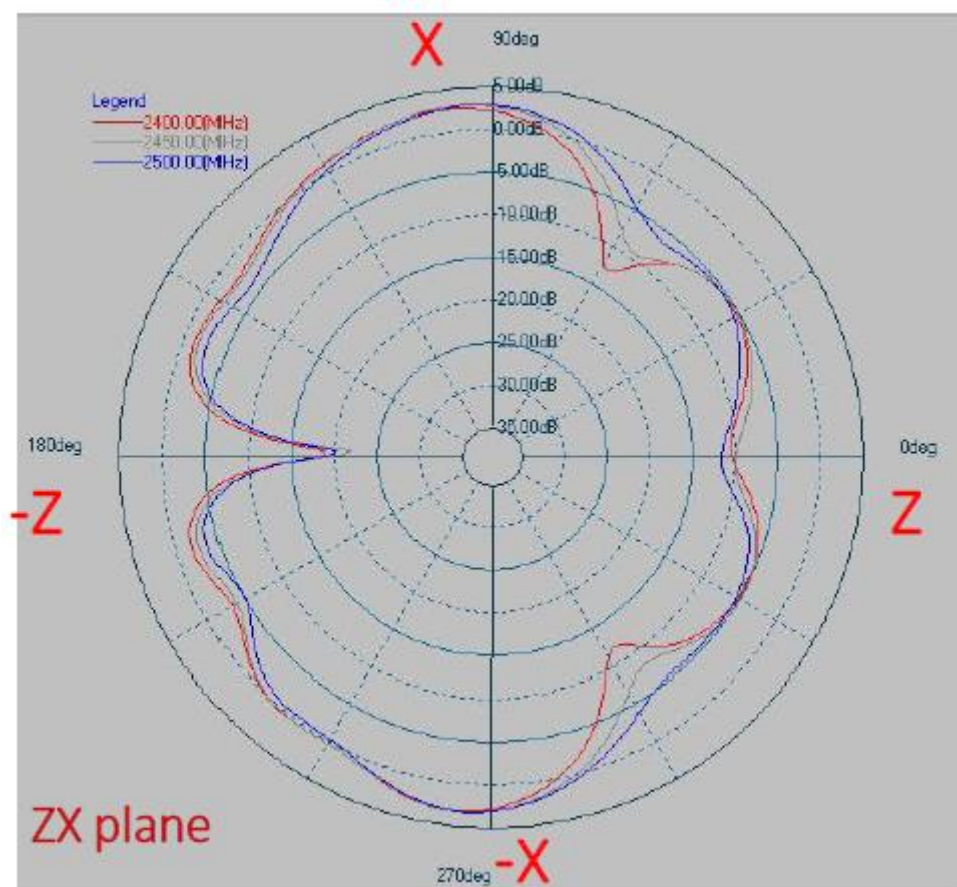
RADIATION PATTERN

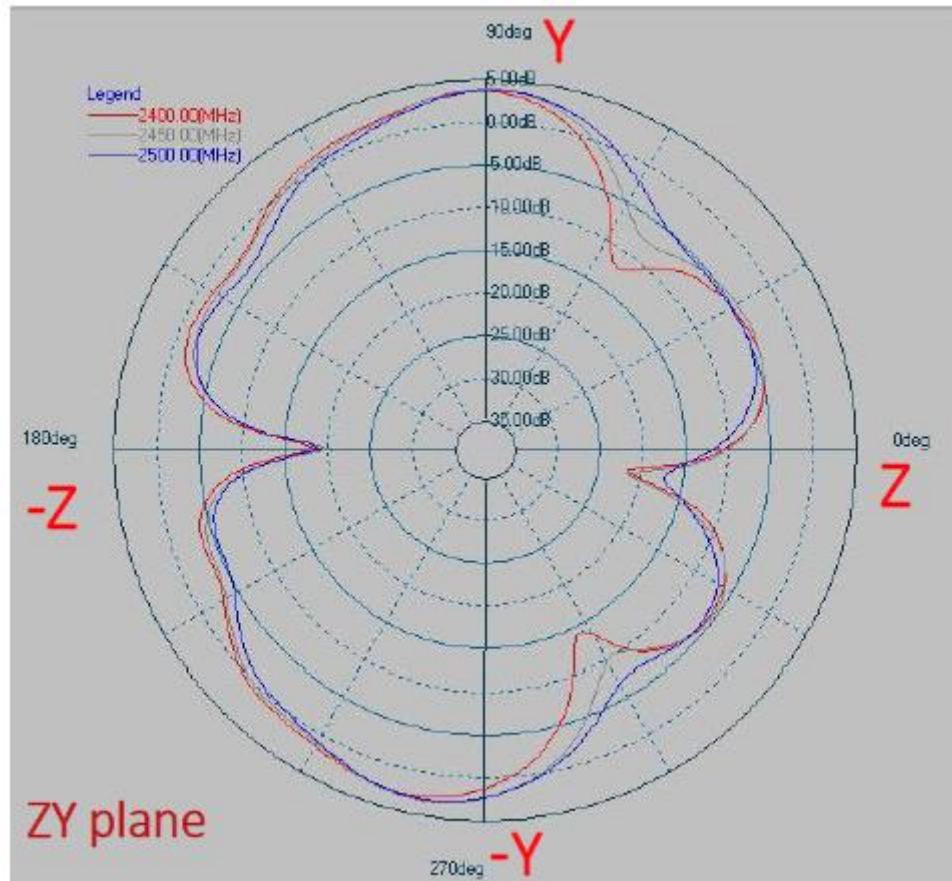
2400~2500 MHz

X-Z Plane

Phi=0.00deg

Gain . dB

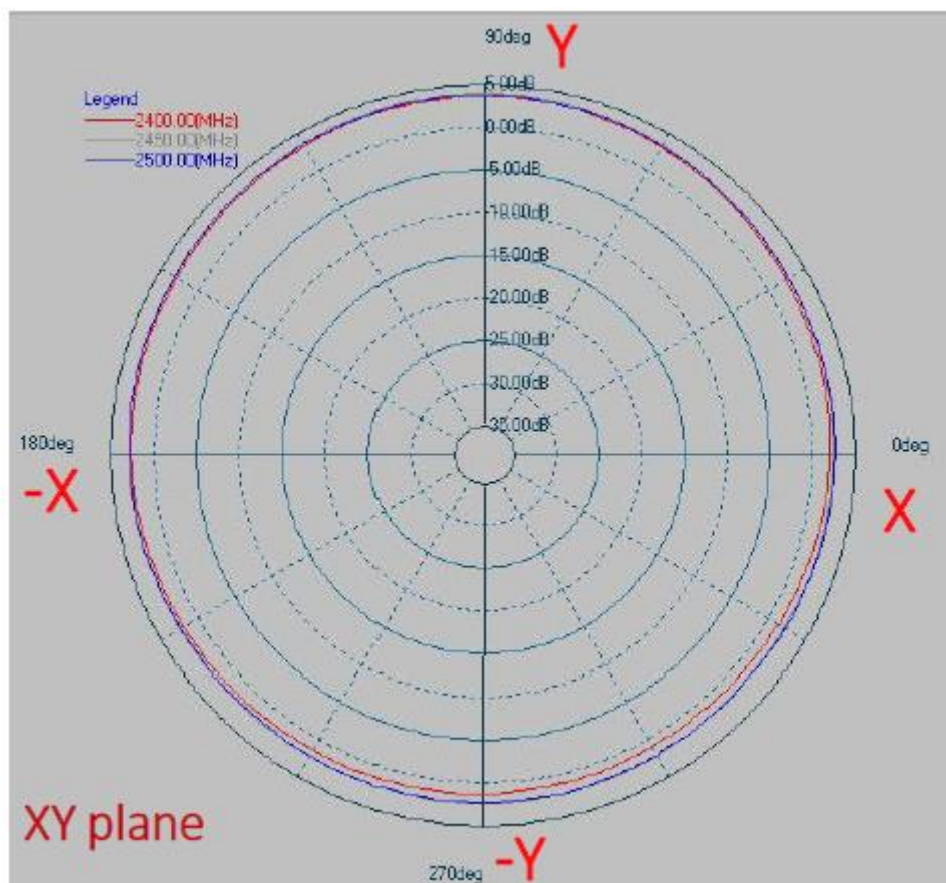


Y-Z Plane**Phi=90.00deg****Gain . dB**

X-Y Plane

Theta=90.00deg

Gain . dB



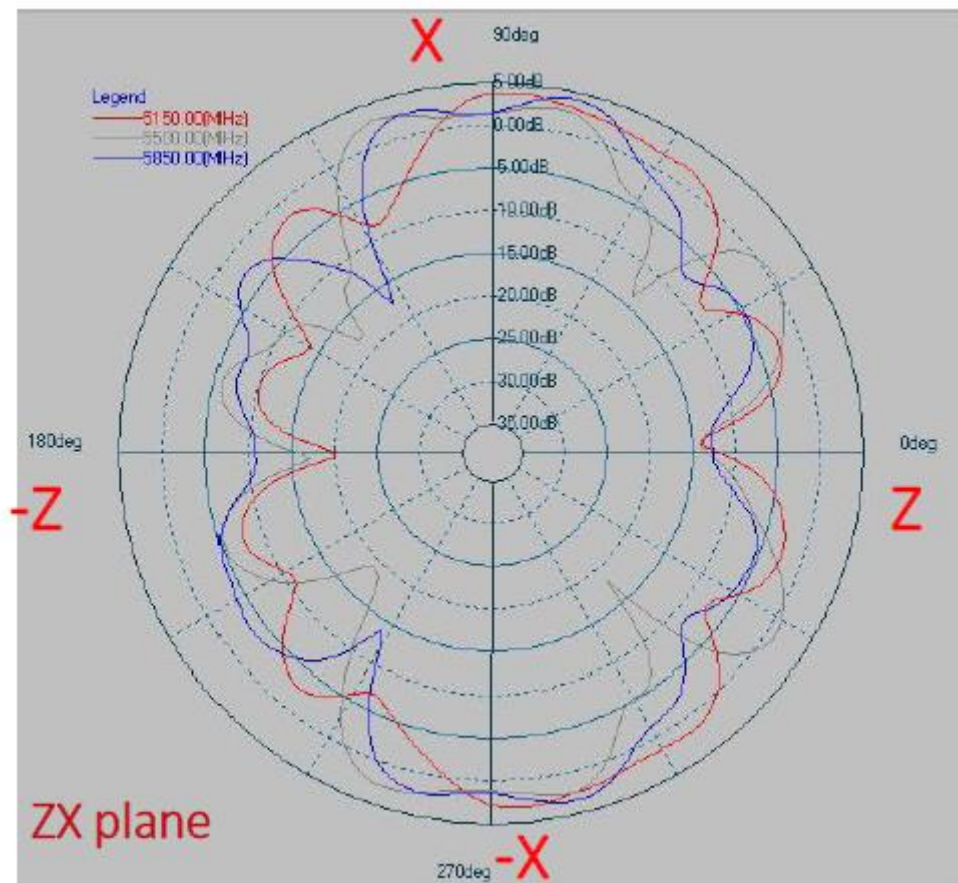
	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
2400	3.05	-1.72	3.58	-1.52	3.56	2.30
2450	3.17	-1.54	3.77	-1.33	3.77	2.79
2500	3.11	-1.69	3.64	-1.48	3.63	2.76

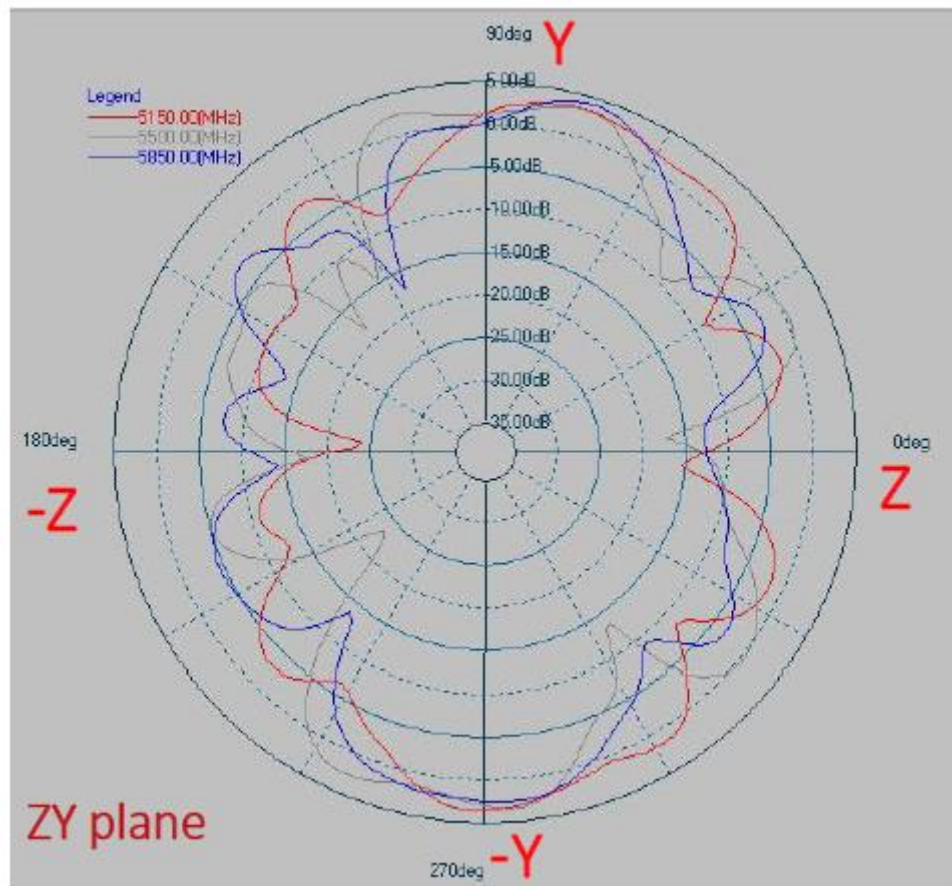
5150~5850 MHz

X-Z Plane

Phi=0.00deg

Gain . dB

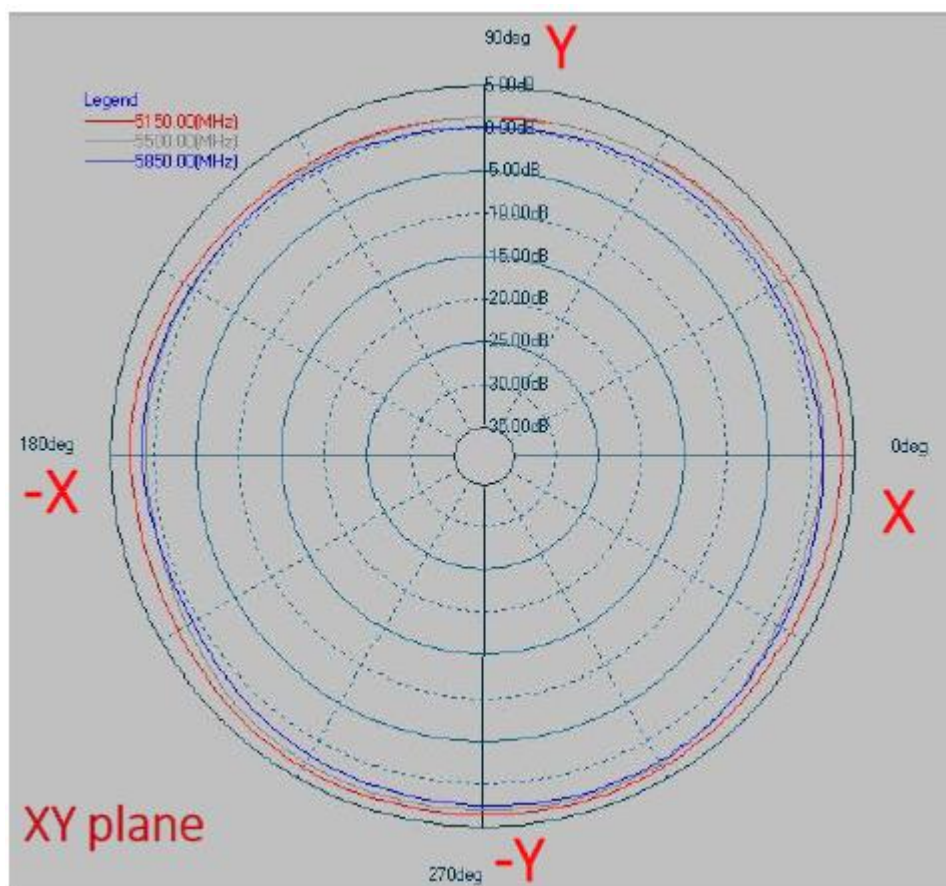


Y-Z Plane**Phi=90.00deg****Gain . dB**

X-Y Plane

Theta=90.00deg

Gain . dB



	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
5150	3.73	-1.61	3.49	-1.70	3.61	2.69
5500	2.83	-2.01	3.28	-1.85	3.11	1.72
5850	4.00	-1.90	4.07	-2.35	2.78	1.30

APPROVAL SHEET

PCB ANTENNA

2.4 GHz Working Frequency

Halogens Free Product

P/N: RFPCA501024IMAB401

Customer : _____
Customer 's Part No. : _____
Approval No. : _____
Issue Date : _____

*Contents in this sheet are subject to change without prior notice.

Version	Date	Description	Author
V01	2018 Mar.	New Release	SHLEE

ELECTRICAL CHARACTERISTICS

Item	Specification
Working Frequency Range	2.4 ~ 2.5GHz (Note-1)
Impedance	50 Ohm Nominal
VSWR	2.0 (Max)
Radiation	Omni-directional
Gain(peak)	3.67 dBi
Polarization	Linear Vertical
Admitted Power	1W

*Note 1. Central Frequency should be defined after customers' application approval.

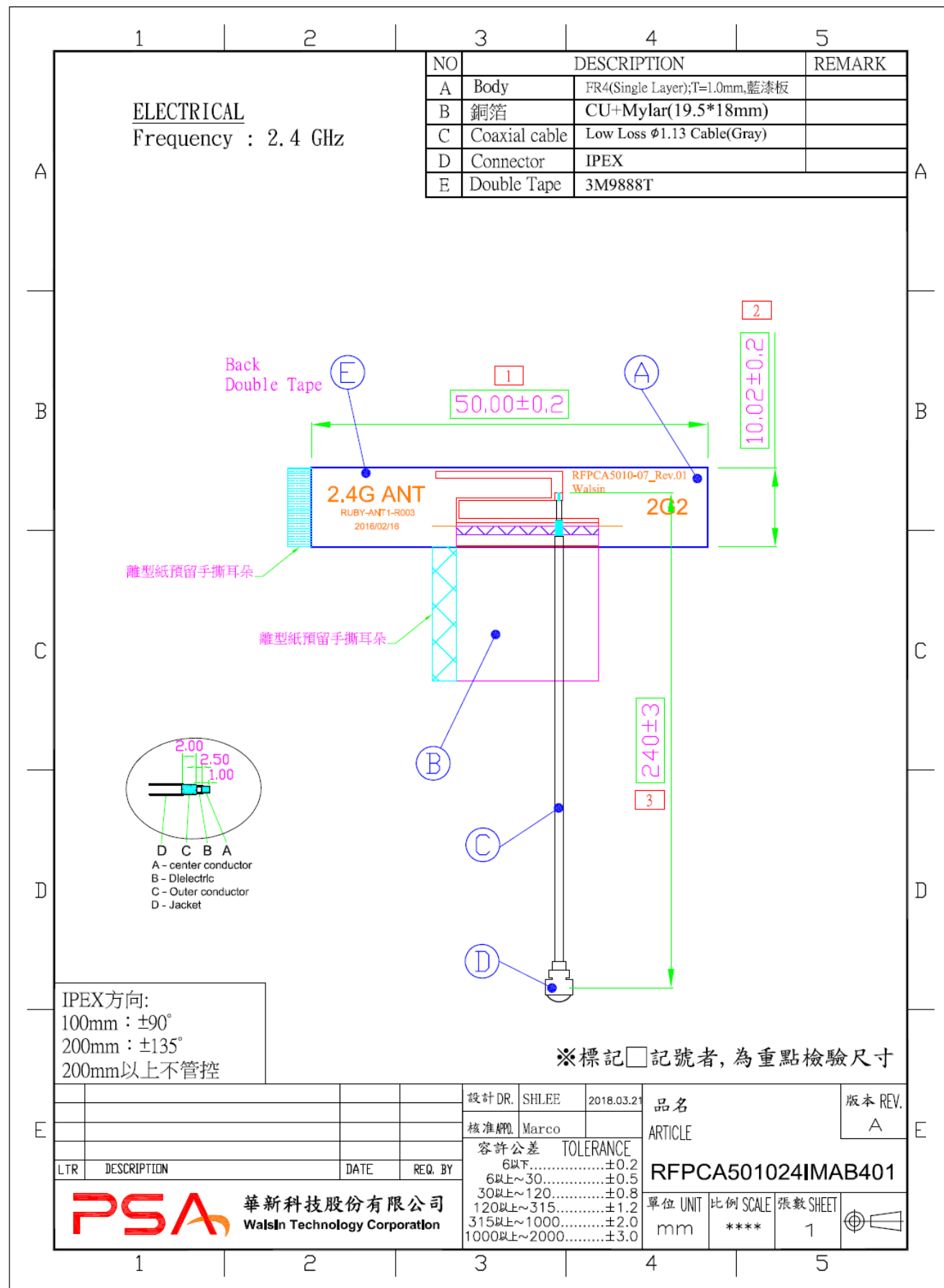
MATERIAL TABLE

Items	Description
PCB	FR4 T=1.0mm(藍漆)
Cable	Low Loss Ø1.13 (Gray)
Double Tape	3M9888T
Connector	IPEX (Gold)
銅箔	CU+Mylar(19.5*18mm)

ORDERING RULE

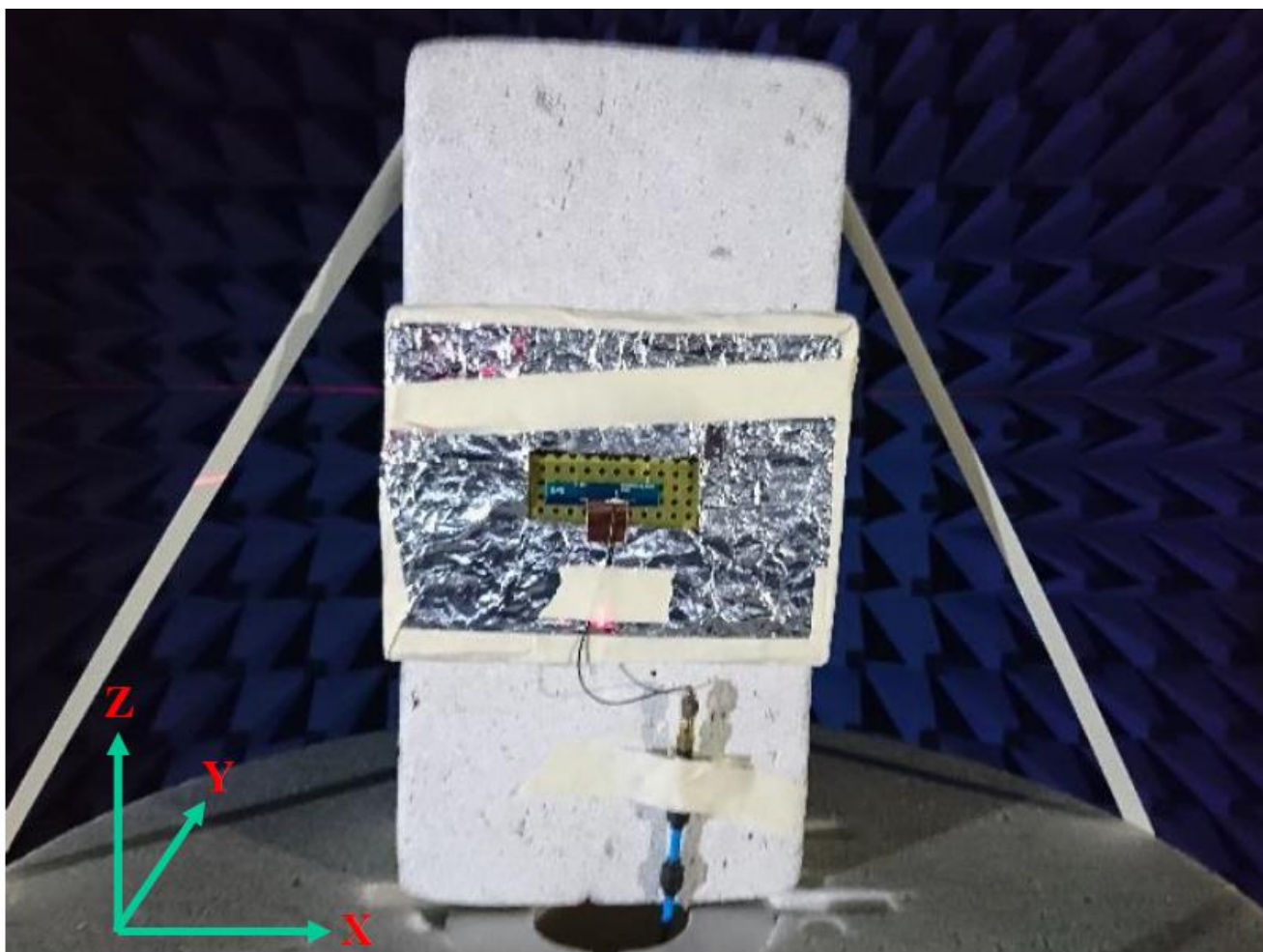
RF	PCA	5010	24	I	M	A	B	4	01
Type Code	Product Code	PCB Dimension (Unit: mm)	Cable Length (unit: cm)	Connector Brand	Type of Connector	Application	Project status	Wire Diameter	Project
Walsin RF Device	PCB Antenna	Per 2 digits of length, width e.g.: 5010 Length 50mm, Width 10.02mm	2 digits for cable length e.g.: 24 Cable Length: 24 cm	A: N C: MCX D: IPEX III E: IPEX IV F: IPEX A13 H: Hirose I: IPEX M: MMCX S: SMA T: TNC U: MURATA N: None	A: Reverse Female B: Reverse Male F: Female M: Male N: None	0: 0GHz 3: 3GHz 6: 6GHz A: 2.4GHz ISM band B: GSM 900/1800 dual band G: GPS band L: 2.4/5.2/5.8 GHz tri-band N: NFC T: LTE band W: WCDMA band	B: MP T: During Test X: Pile Run	0: None 1: Ø 0.81 2: Ø 1.32 3: Ø 1.13 4: Low Loss Ø 1.13 5: Ø 0.5 6: RG316 7: Ø 1.37 8: RG178 9: Low Loss Ø 1.37	01~99 series number

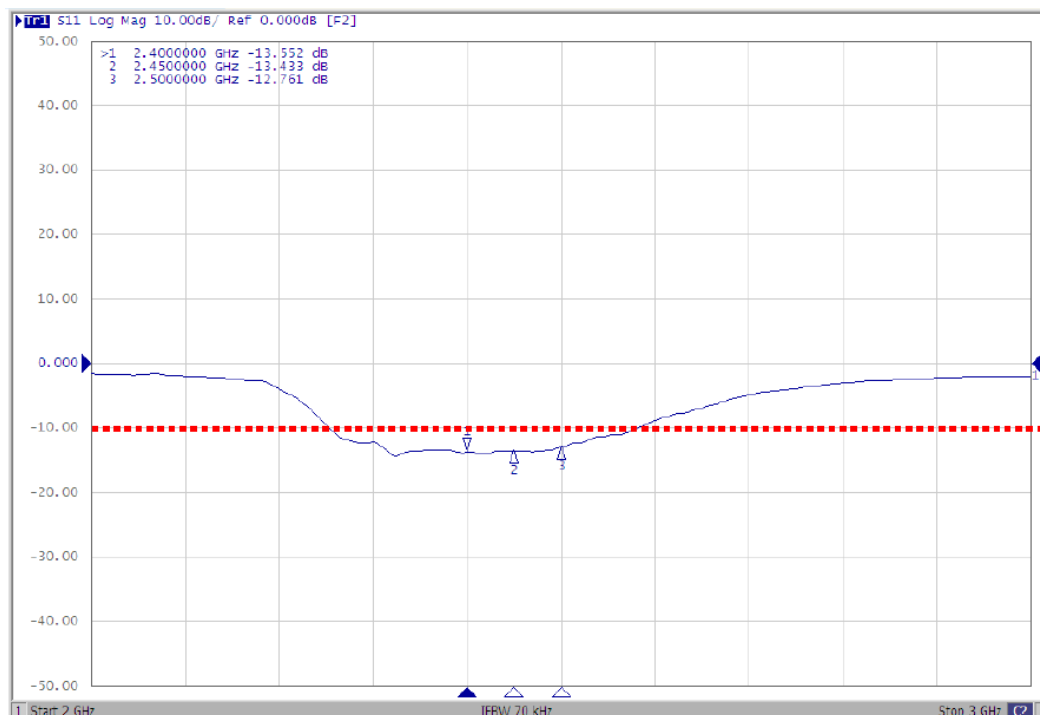
DIMENSIONS



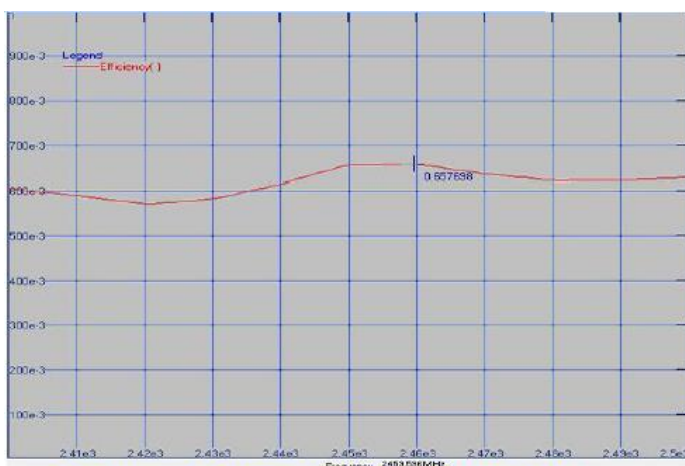
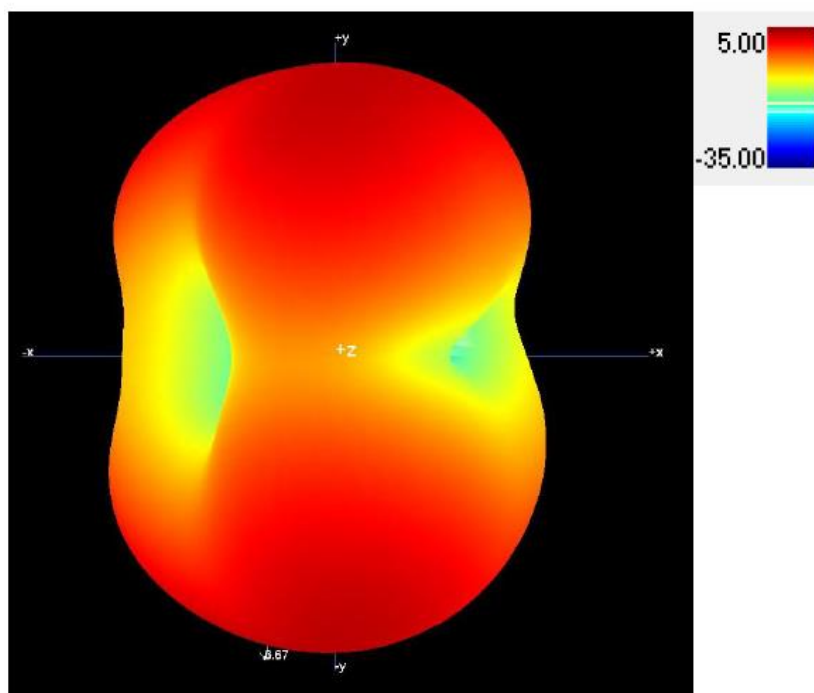
Test Report

■ Experimental Setup



ELECTRICAL CHARACTERISTICS**Return Loss**

10 dB- Return Loss

Antenna Efficiency and Peak Gain**2450 MHz****Maximum Efficiency at 2459 MHz : 65%****Maximum Peak Gain at 2459 MHz : 3.67 dBi**

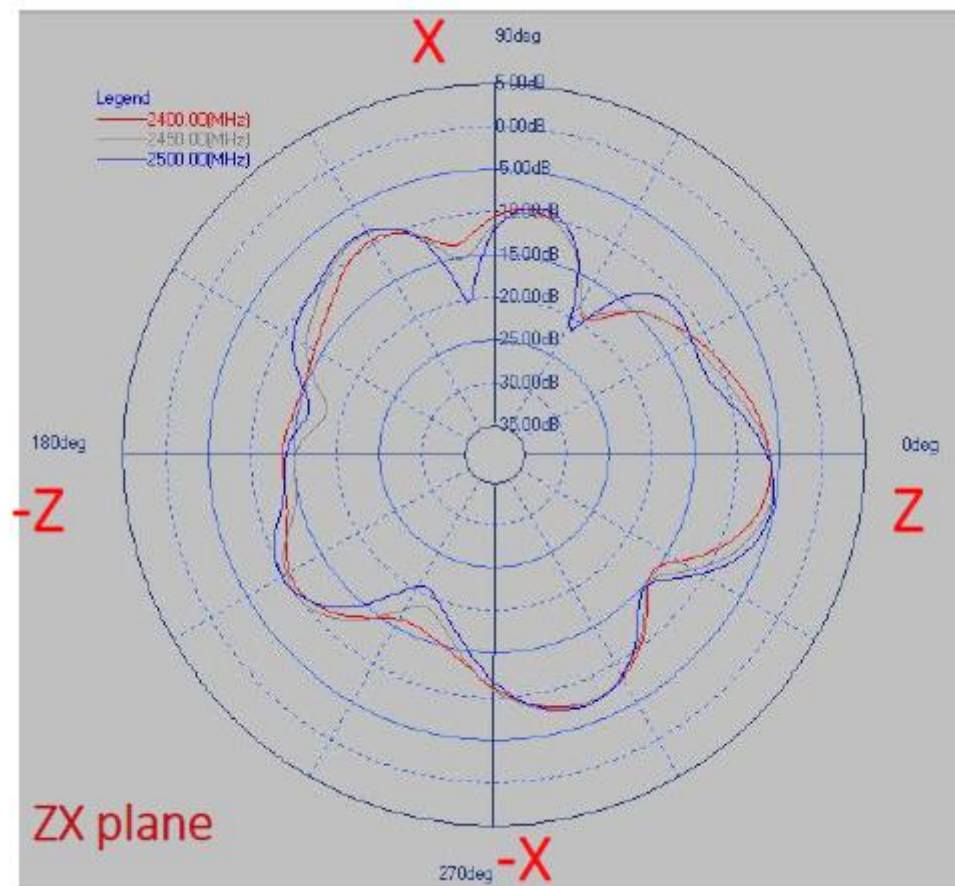
RADIATION PATTERN

2400~2500 MHz

X-Z Plane

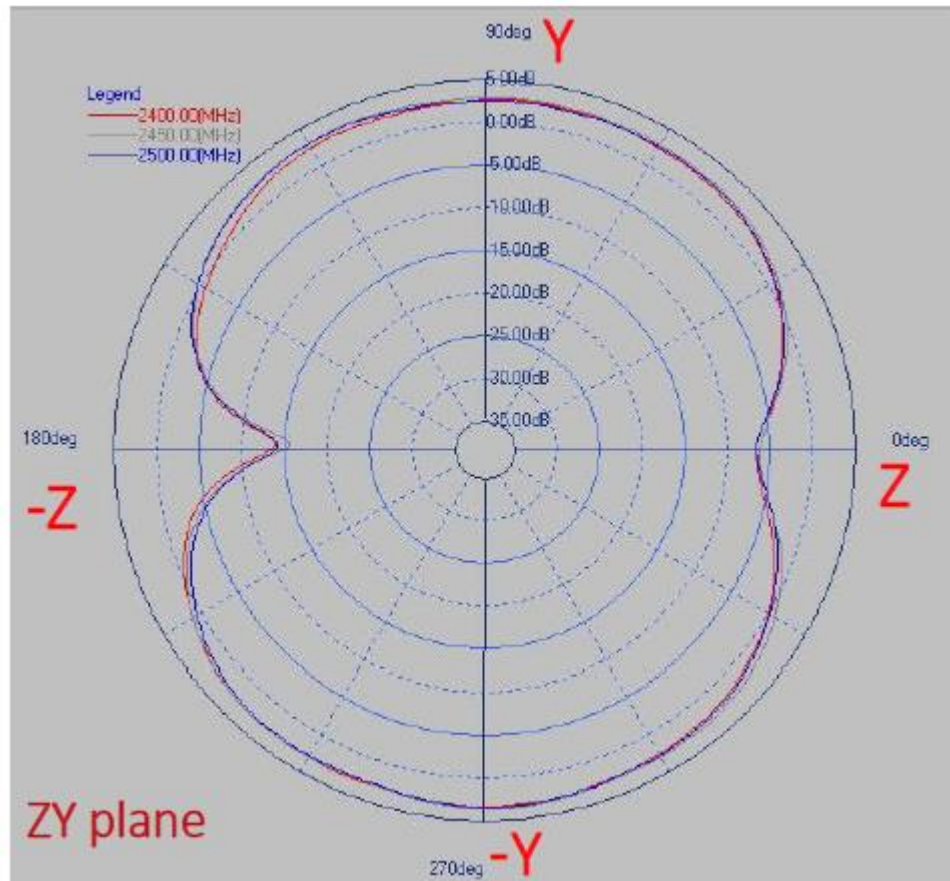
Phi=0.00deg

Gain . dB



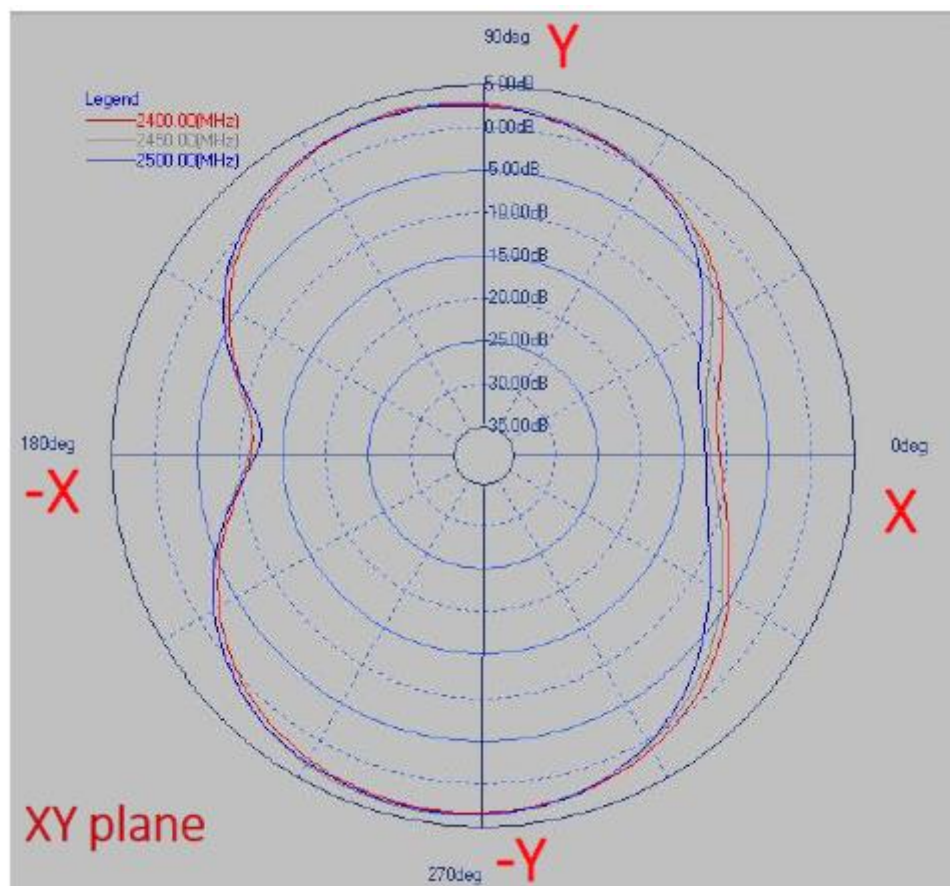
Y-Z Plane
Phi=90.00deg

Gain . dB



X-Y Plane

Theta=90.00deg

Gain . dB

	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
2400	-6.05	-10.99	3.25	1.14	3.30	-0.34
2450	-5.59	-10.89	3.50	1.49	3.67	-0.14
2500	-5.24	-10.73	3.42	1.25	3.48	-0.36

PSA

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PASSIVE SYSTEM ALLIANCE

Tonal_T3.0 BT antenna for bobble

PN: RFPCA301059IMAB901

Presented by

Ken Cheng

2024/07/22

OUTLINE

1. Measurement Information

- 1.1 Experimental Setup
- 1.2 Antenna Solution Detail

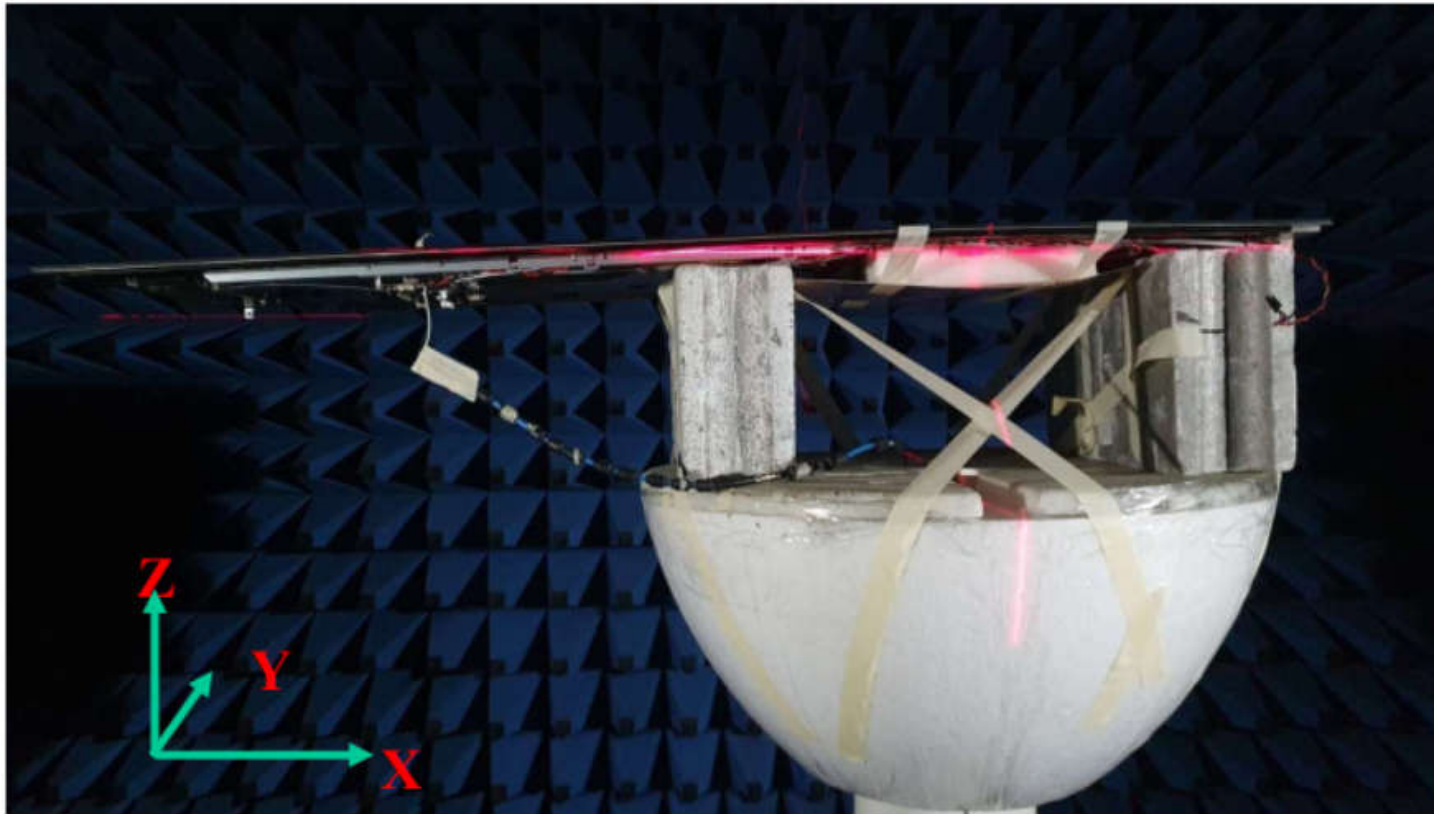
2. Antenna Characteristics

- 2.1 S-Parameter
- 2.2 Antenna Efficiency and Peak Gain
- 2.3 3 views of antenna & 2D Radiation Patterns

3. Summary

1. Measurement Information

1.1 Experimental Setup



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1. Measurement Information

1.2 Antenna Solution Detail

Factory sample



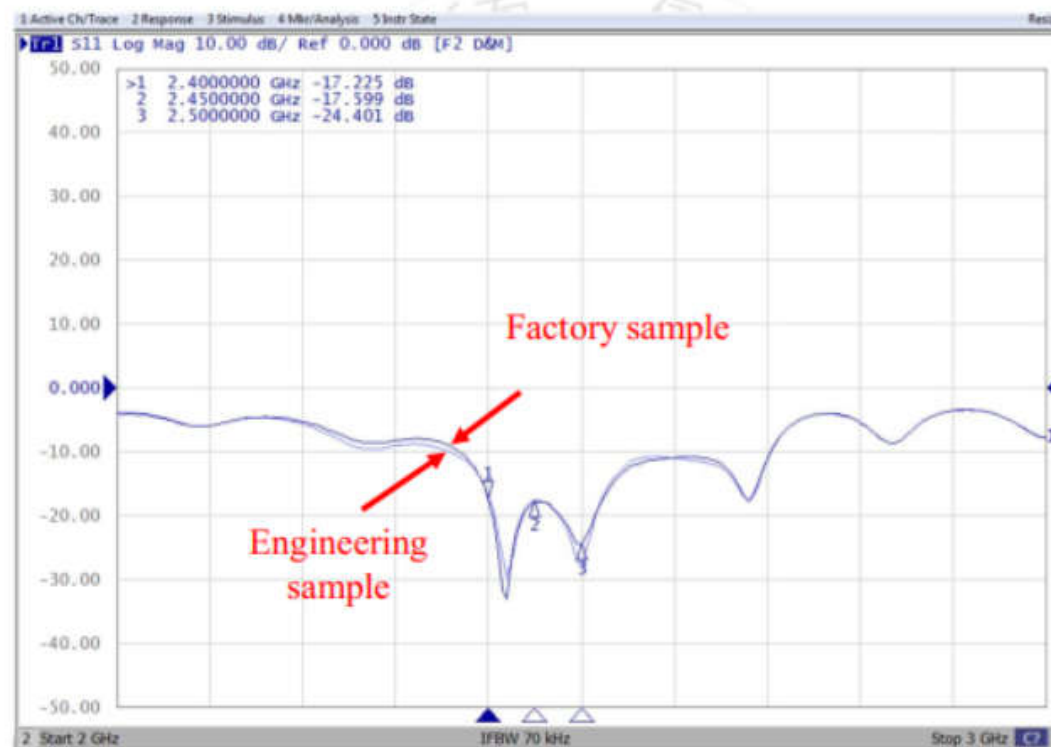
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2. Antenna Characteristics

2.1 S-Parameter

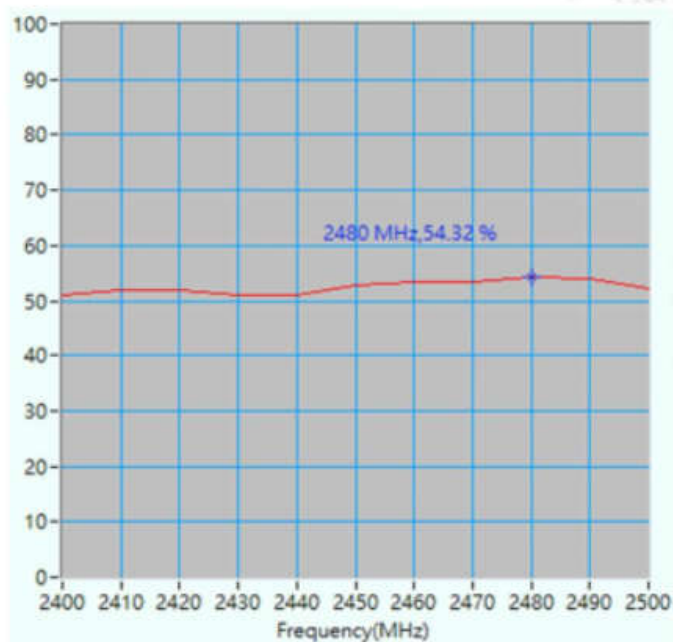
Factory sample S11 compare to engineering sample



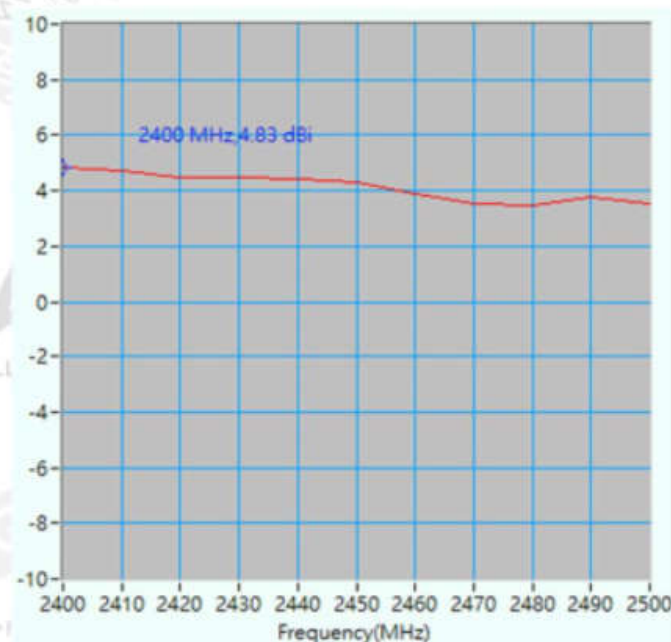
2. Antenna Characteristics

BT

2.2 Antenna Efficiency and Peak Gain



Maximum Efficiency at 2480 MHz : 54.32 %



Maximum Peak Gain at 2400 MHz : 4.83 dBi

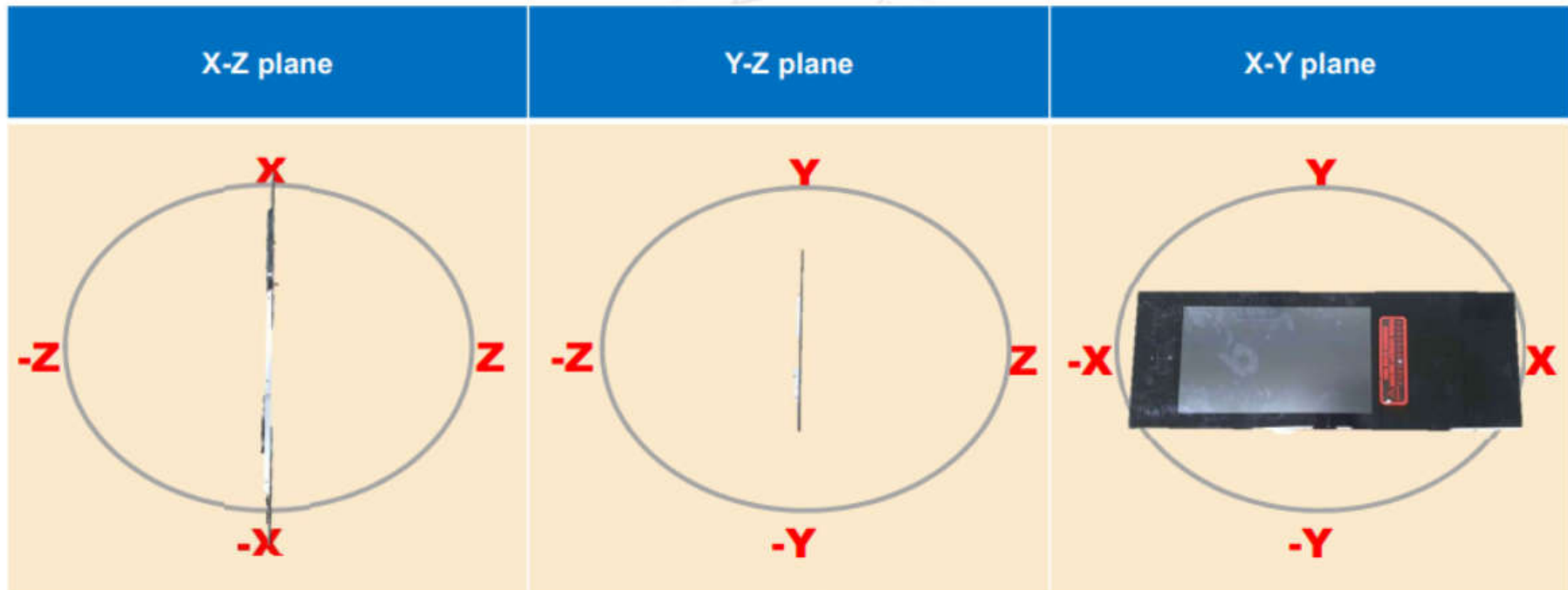
2. Antenna Characteristics

2.2 Antenna Efficiency and Peak Gain

Frequency (MHz)	Efficiency (%)	Peak gain (dBi)
2400	50.96	4.83
2450	52.75	4.29
2500	52.30	3.54

2. Antenna Characteristics

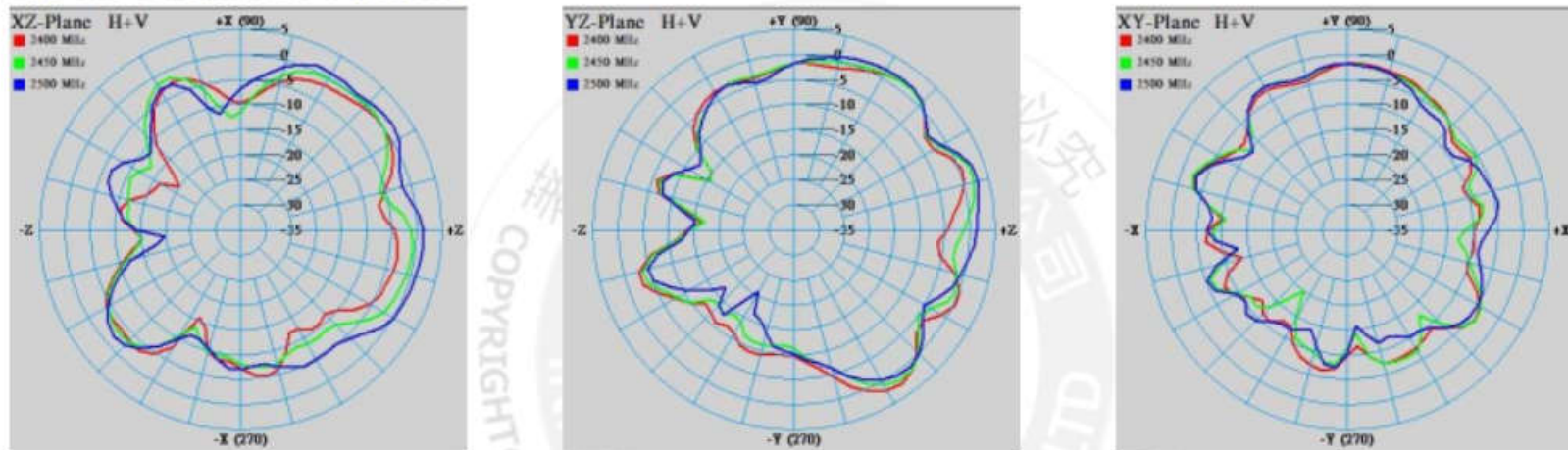
2.3 3 views of antenna



2. Antenna Characteristics

BT

2.3 2D Radiation Patterns



	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]
2400	-0.08	-5.36	2.47	-2.91	-1.74	-6.09
2450	0.36	-4.42	2.18	-2.74	-1.73	-6.05
2500	1.65	-2.86	2.87	-2.43	-1.77	-6.13

3. Summary

- The performance of antennas are shown in table

Due to our OTA chamber space limitation , antenna test result is the measurement panel of the mainboard with the antenna attached.

At the back side of the antenna and inside panel (-Z axis) place a metal plate in order to simulate mainboard circuit environment.

At the front side of the panel (+Z axis) already improved previous patten depression.

	BT
Maximum Efficiency (%)	54.32
Maximum Gain (dBi)	4.83

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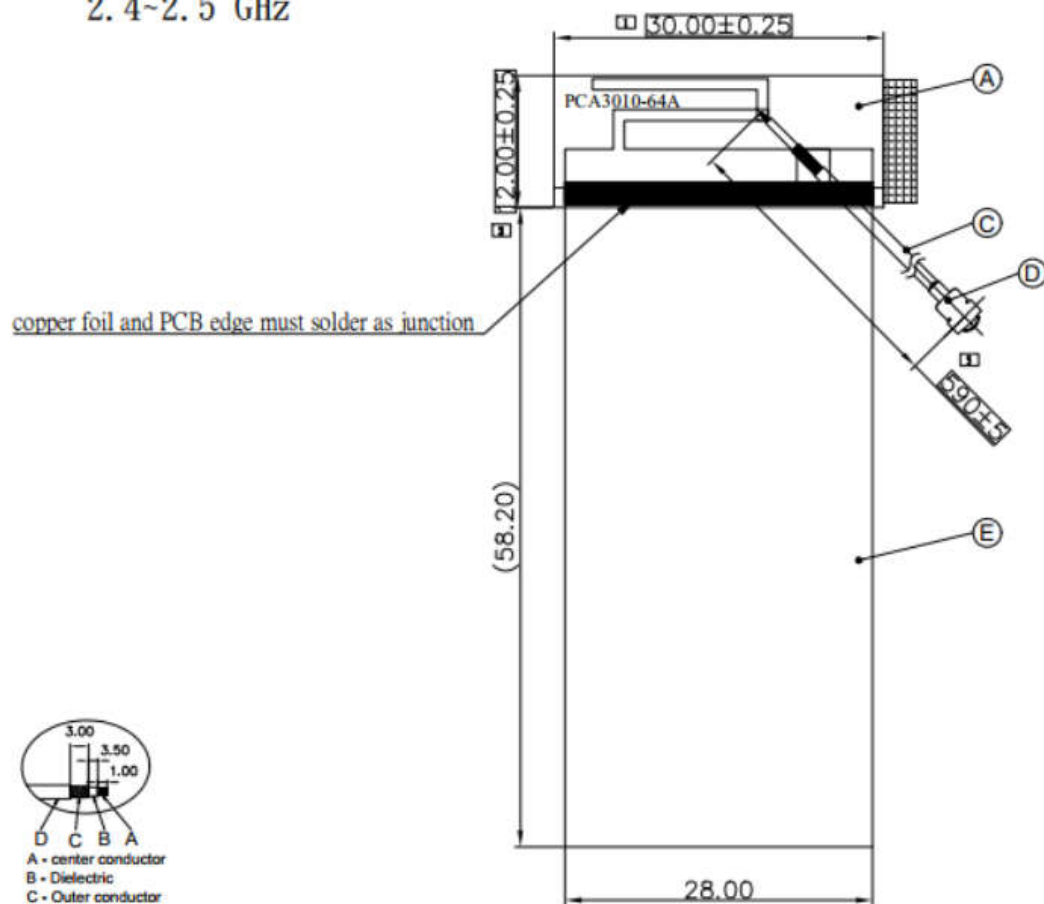
Revision	Engineering Change Description	Date	Owner
1	New drawing release	2024/04/10	PIPI

ELECTRICAL

Frequency:
2.4~2.5 GHz

Front View

Back View



RF Coaxial Connector direction:
100mm±90°
200mm±135°
200mm above dose
not control

※Mark□Bymark, Focused inspection dimensions

※標記□記號者, 為重點檢驗尺寸

INDEX	PART NO.	DESCRIPTION	MATERIAL	Q/TY
E	CU+Mylar	-		1
D	Connector	IPEX : Gold	20351-112R-37 / 721215007739	1
C	Coaxial Cable	Coaxial Cable Ø1.37 Low Loss : White		1
B	Double Tape	3M9888T		1
A	Body	FR4(Single Layer)T=1.0mm : Black		1

PARTS LIST

SELECT				V	
SPEC. CLASS	A	B	C	D	
< 8mm	0.05	0.1	0.2	0.5	
8~30mm	0.08	0.2	0.5	1.5	
30~120mm	0.12	0.3	0.8	2.0	
120~315mm	0.25	0.5	1.2	3.0	
315~1000mm	0.3	0.8	2.0	5.0	
1000~2000mm	0.5	1.2	3.0	8.0	
ANGLE	0.5				
MATERIAL	SEE NOTE				
FINISH					

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DO NOT MANUALLY UPDATE

DRAWN 邱國輝

CHECKED 詹建輝

APPROVED 詹建輝

3RD ANGLE



禾邦电子(苏州)有限公司
INPAQ Technology Co., Ltd.

SIZE
A4

RFPCA301059IMAB901

PART No.:

UNIT MM

SCALE : NA

SHEET 1 OF 1

Thank you

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