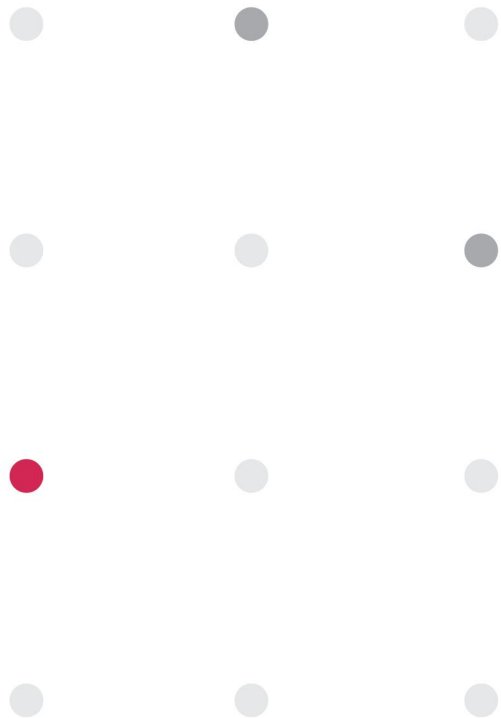


PSA

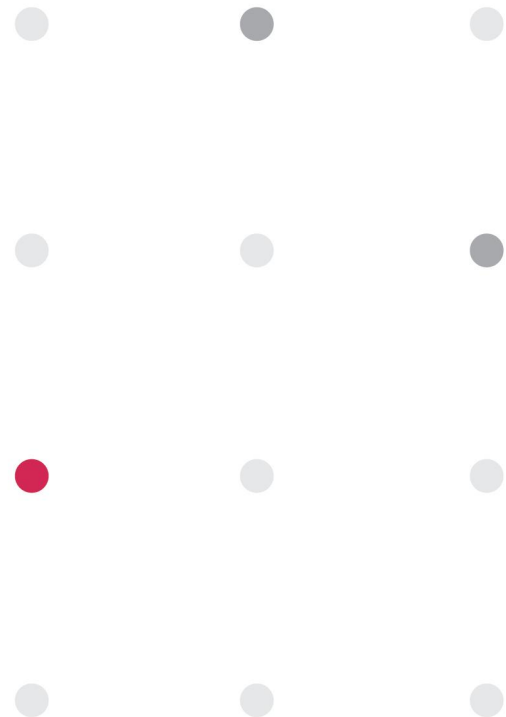
佳邦科技股份有限公司

INPAQ TECHNOLOGY CO., LTD.



PSA

PASSIVE SYSTEM ALLIANCE
INPAQ TECHNOLOGY CO., LTD.



春风动力-SE02-MB01-HW.0.03.00

Presented by

FangTan Jin

2023/07/24

ZHEJIANG CFMOTO POWER CO., LTD.

NO.116,Wuzhou Road, Yuhang Economic Development Zone,
Hangzhou 311100,Zhejiang Province,China

Version	Date	Description	Author
V01	2023/07/24	New Release	FangTan Jin

OUTLINE

1. Measurement Information

- 1.1 Experimental Setup
- 1.2 Antenna Solution Detail

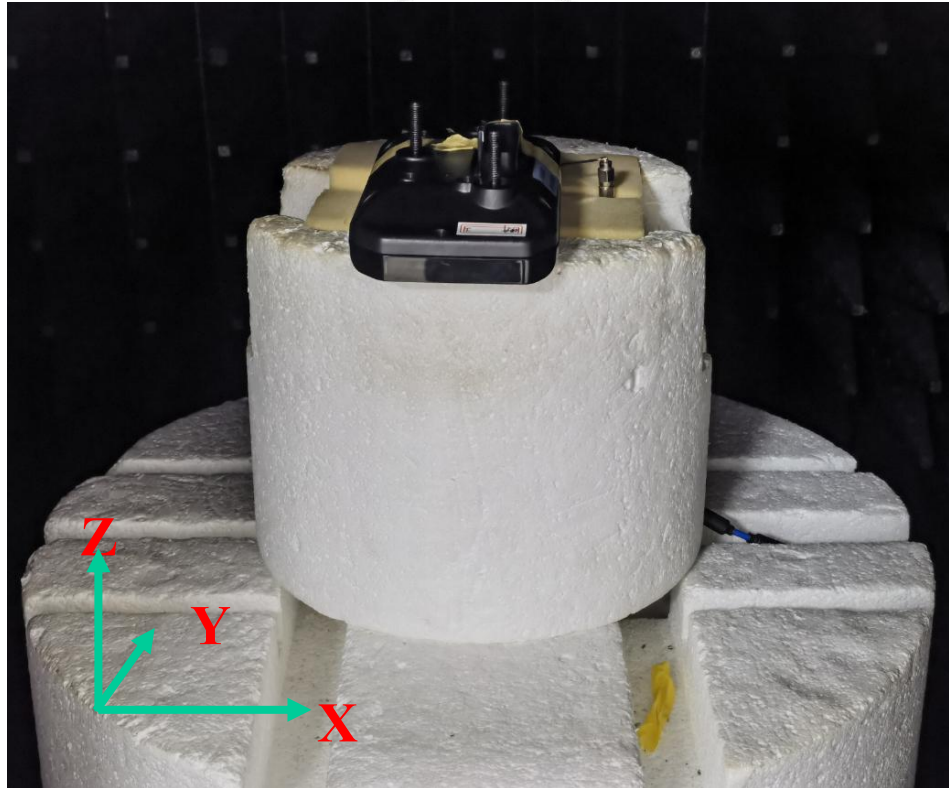
2. Antenna Characteristics

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

3. Summary

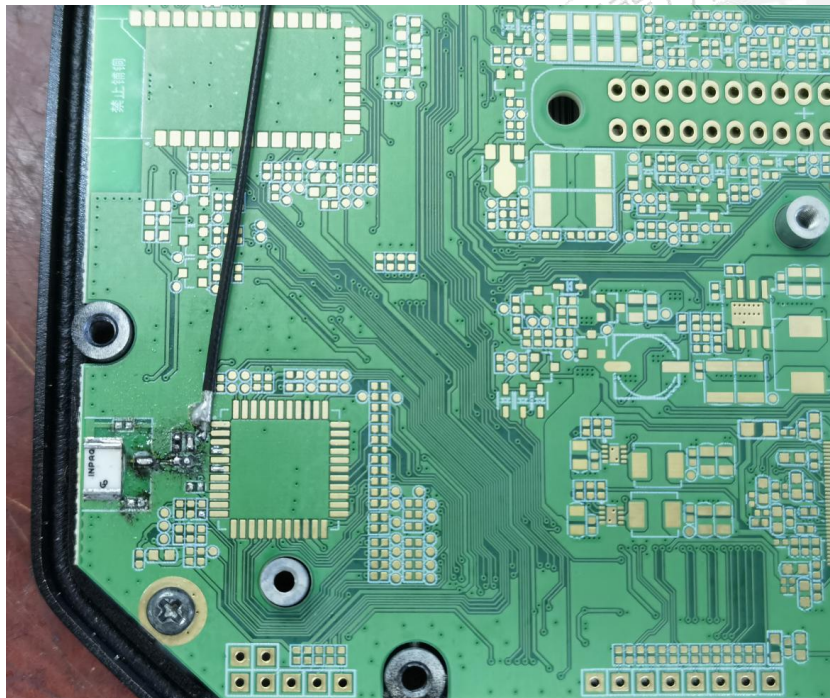
1. Measurement Information

1.1 Experimental Setup



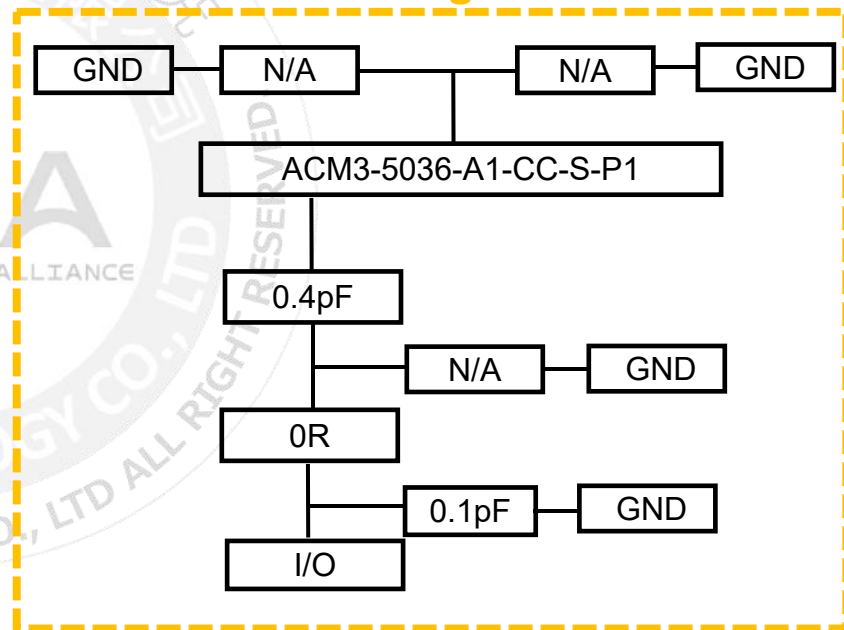
1. Measurement Information

1.2 Antenna Solution Detail



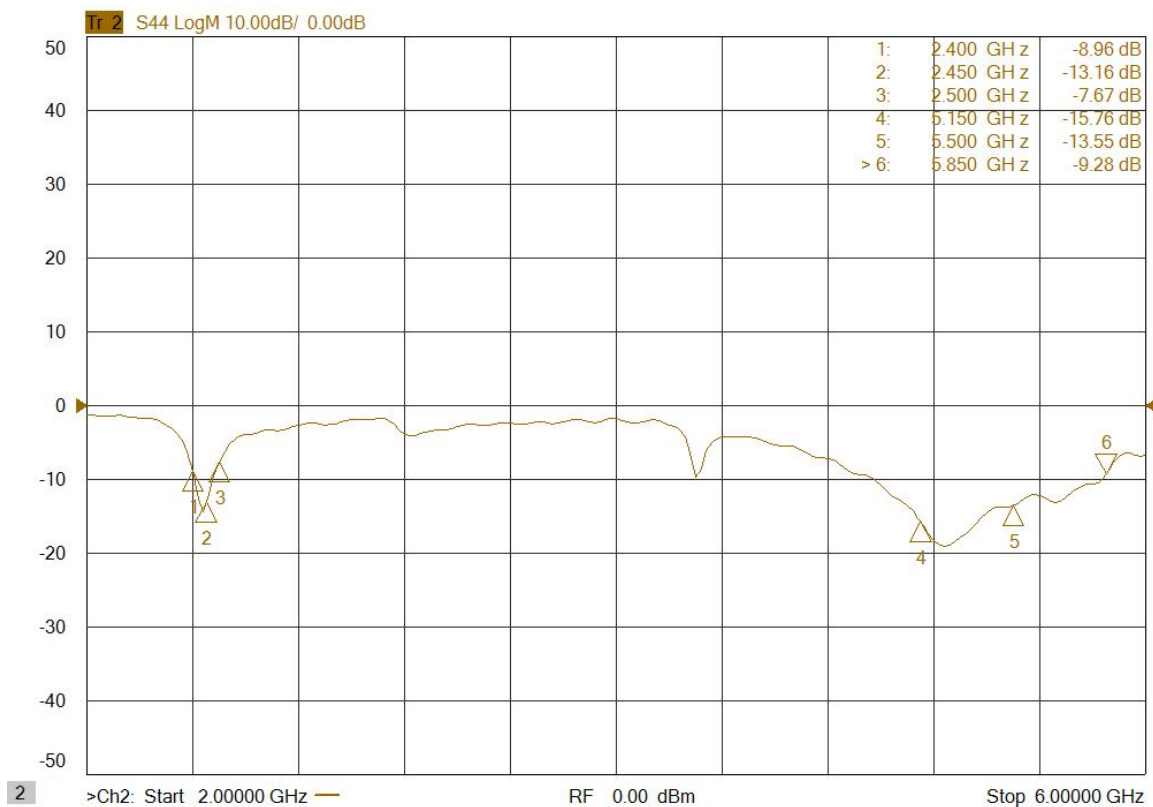
	對應料號
0.1pF	RF15NOR1A500CTNA
0.4pF	RF15NOR4A500CTNA
0 ohm	WR04X000PTL

Matching values



2. Antenna Characteristics

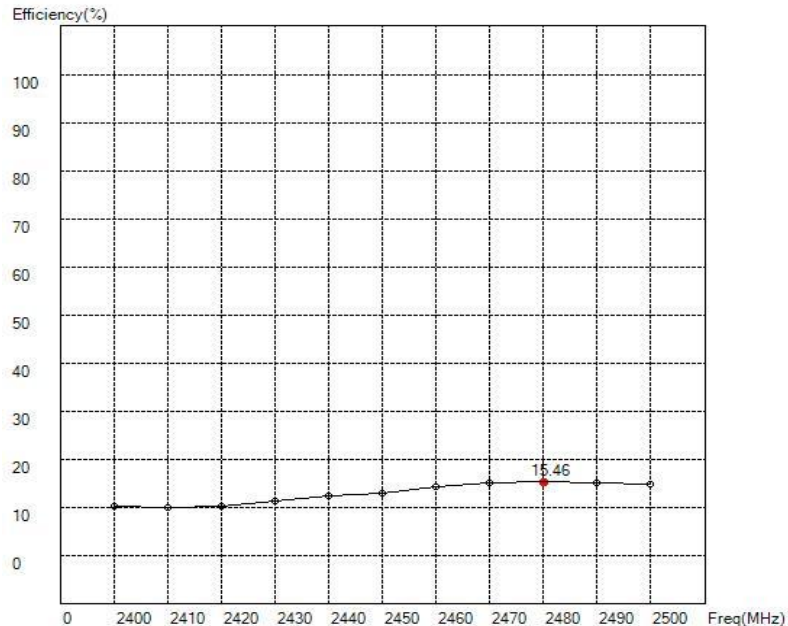
2.1 S-Parameter



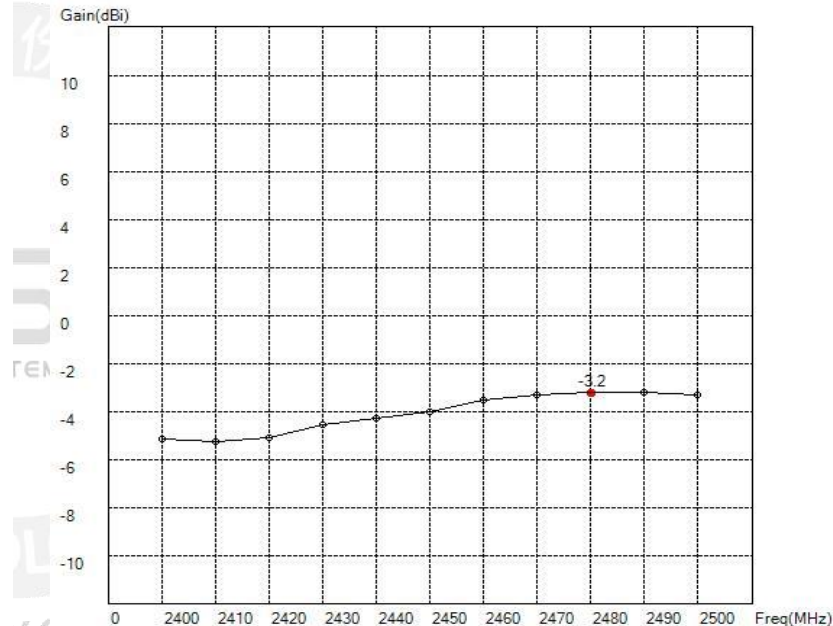
2. Antenna Characteristics

2.2 Antenna Efficiency and Peak Gain

2G



Maximum Efficiency at 2480 MHz : 15.46 %

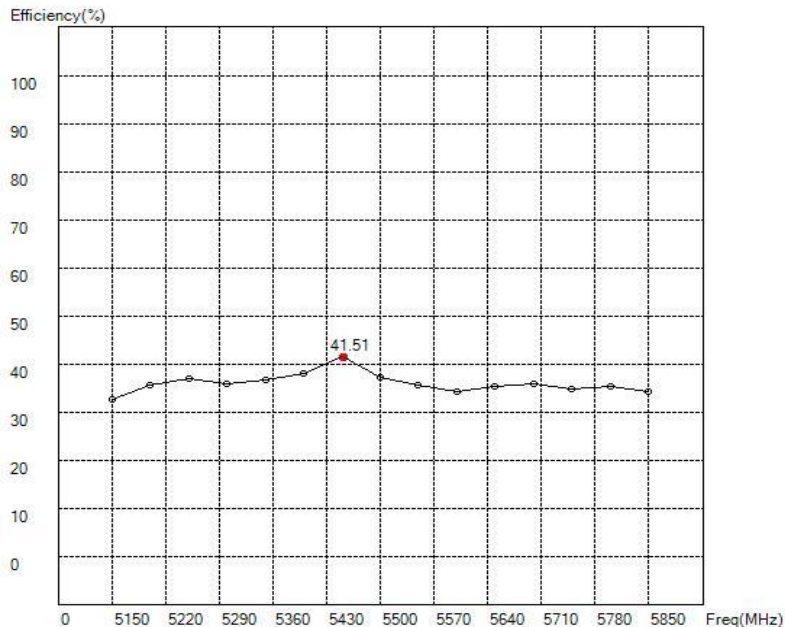


Maximum Peak Gain at 2480 MHz : -3.2 dBi

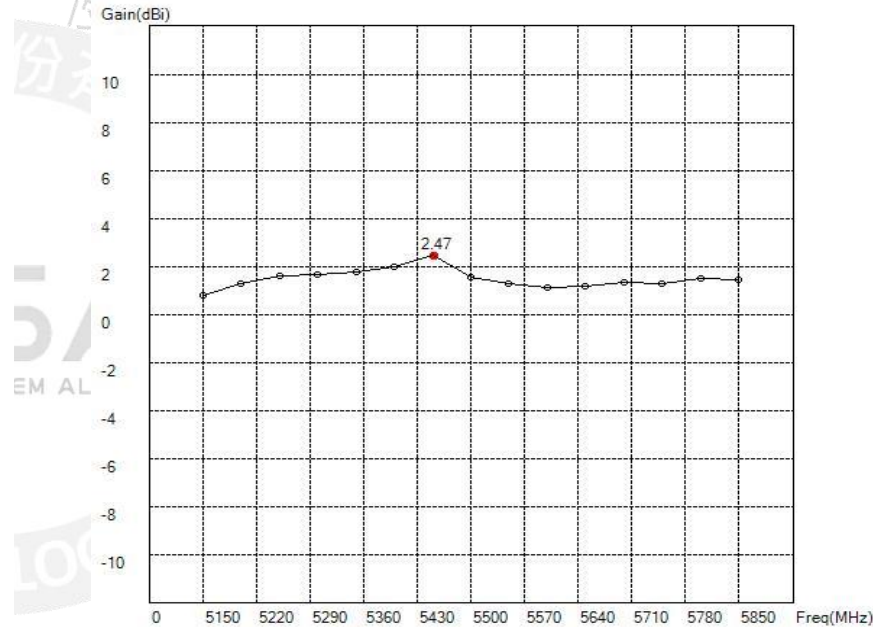
2. Antenna Characteristics

2.2 Antenna Efficiency and Peak Gain

5G



Maximum Efficiency at 5450 MHz : 41.51 %



Maximum Peak Gain at 5450 MHz : 2.47 dBi

2. Antenna Characteristics

2.2 Antenna Efficiency and Peak Gain

ANT (2G)			
Frequency (MHz)	2400	2450	2500
Efficiency (%)	10.38	13.04	14.82
Peak gain (dBi)	-5.15	-4.01	-3.28

ANT (5G)			
Frequency (MHz)	5150	5500	5850
Efficiency (%)	32.83	37.36	34.26
Peak gain (dBi)	0.82	1.57	1.45

2. Antenna Characteristics

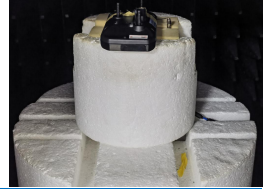
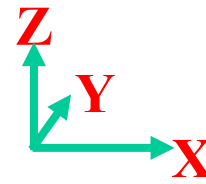
2.2 Antenna Efficiency and Peak Gain

Freq (MHz)	Gain (dBi)	Efficiency (%)
2400	-5.25	10.14
2410	-5.12	10.33
2420	-5.08	10.27
2430	-4.54	11.48
2440	-4.28	12.31
2450	-4.01	13.04
2460	-3.53	14.29
2470	-3.27	15.05
2480	-3.20	15.46
2490	-3.21	15.26
2500	-3.28	14.82

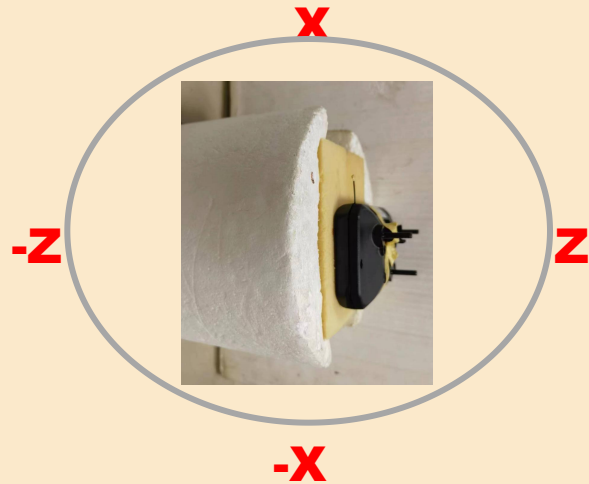
Freq (MHz)	Gain (dBi)	Efficiency (%)
5150	0.82	32.83
5200	1.29	35.68
5250	1.60	37.05
5300	1.66	36.03
5350	1.76	36.68
5400	2.00	38.00
5450	2.47	41.51
5500	1.57	37.36
5550	1.31	35.73
5600	1.15	34.41
5650	1.20	35.47
5700	1.33	36.05
5750	1.30	34.81
5800	1.54	35.30
5850	1.45	34.26

2. Antenna Characteristics

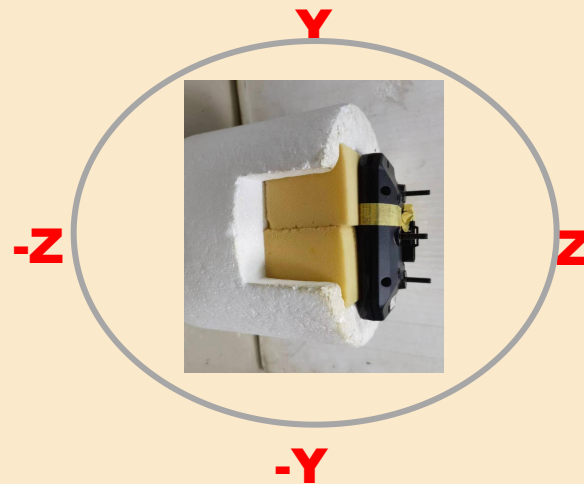
2.3 3 views of antenna



X-Z plane



Y-Z plane



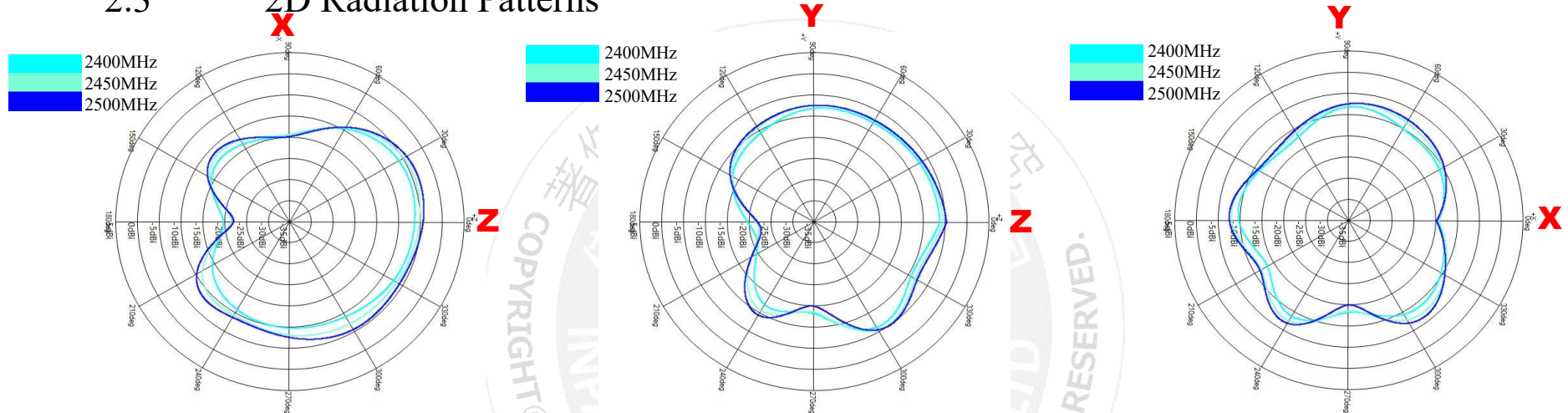
X-Y plane



2. Antenna Characteristics

2G

2.3 2D Radiation Patterns

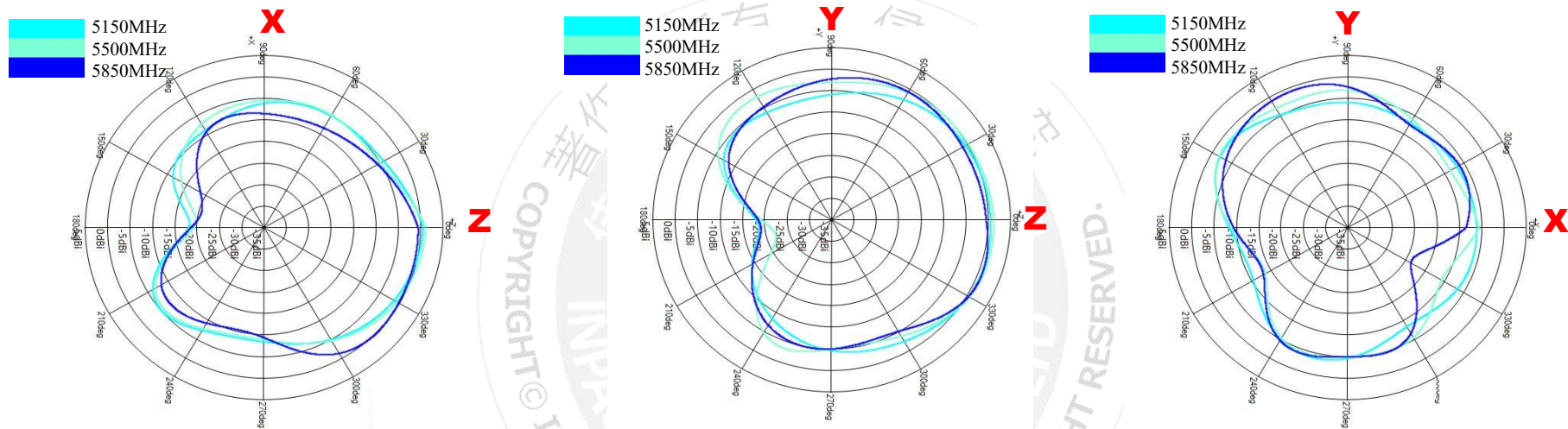


	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]	Max Value [dB]	Average [dB]
2400	-5.86	-8.76	-6.07	-8.42	-8.03	-10.59
2450	-4.56	-7.54	-5.28	-7.60	-7.36	-9.51
2500	-3.81	-6.74	-4.52	-7.26	-7.02	-9.12

2. Antenna Characteristics

5G

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]
5150	0.73	-3.36	0.62	-2.30	-2.02	-5.82
5500	1.33	-2.97	1.34	-1.37	-1.81	-5.36
5850	-0.13	-3.82	0.46	-2.35	-0.97	-5.40

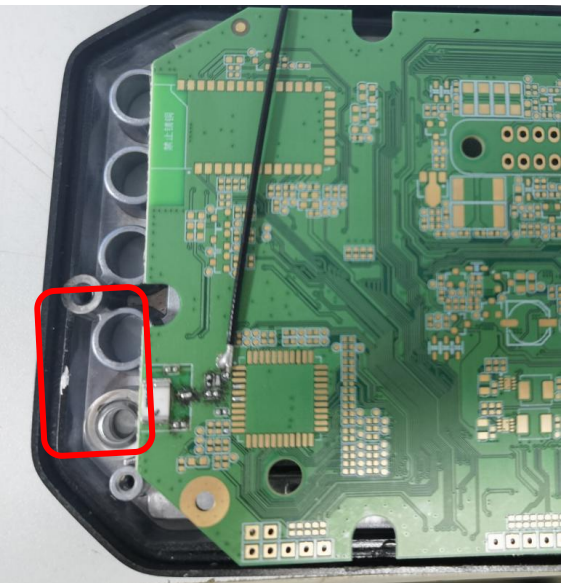
3. Summary

- The performance of antennas is shown in table

	2G	5G
Maximum Efficiency (%)	15.46	41.51
Maximum Gain (dBi)	-3.2	2.47

3. Summary

天线2.4G效率低原因分析：



图一

如图一红框中的所示，
这两颗螺丝以及金属边
框侵入了天线的净空区，
导致2.4G效率偏低

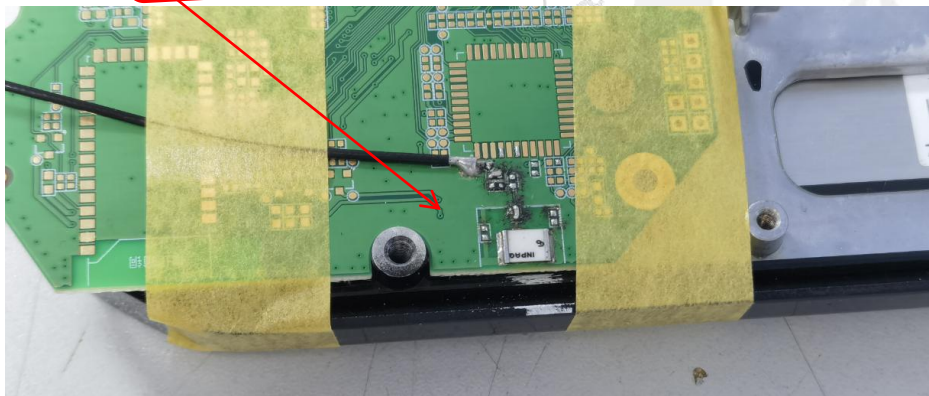
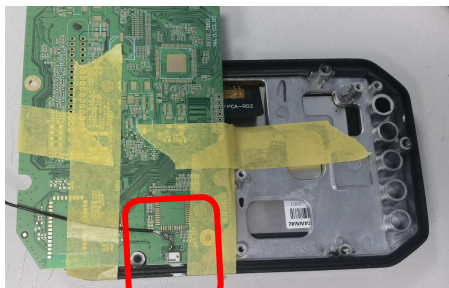
将主板拿出，测试结果如
表一所示。

Freq(MHz)	Gain(dBi)	Efficiency(%)
2400	-0.95	30.24
2410	-0.78	31.12
2420	-0.57	32.40
2430	-0.18	35.64
2440	0.10	37.88
2450	0.25	39.28
2460	0.50	42.04
2470	0.60	43.53
2480	0.56	43.64
2490	0.48	42.85
2500	0.23	41.32

表一

3. Summary

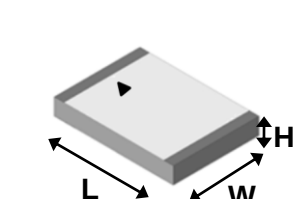
如上午沟通，将天线移到长边,测试结果如表二，效率有10%左右提升



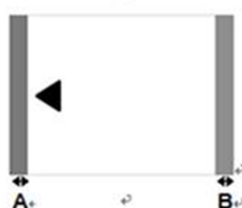
Freq (MHz)	Gain (dBi)	Efficiency (%)
2400	-1.21	21.95
2410	-0.86	23.77
2420	-0.61	24.92
2430	-0.28	26.16
2440	-0.20	26.59
2450	-0.13	26.81
2460	0.15	27.94
2470	0.20	28.17
2480	0.23	27.80
2490	0.08	26.72
2500	-0.12	25.27

表二

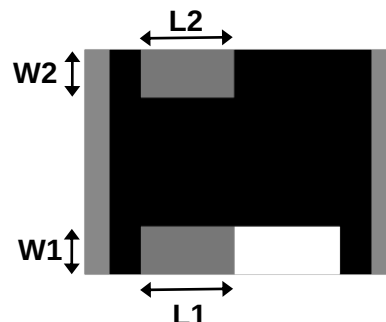
4. Physical Dimension :



Top view



Bottom view



Marking is Black

L	5.20 ± 0.30
W	3.70 ± 0.30
H	0.70 ± 0.15
A	0.45 ± 0.25
B	0.45 ± 0.25
L1	1.60 ± 0.20
W1	0.62 ± 0.20
L2	1.50 ± 0.20
W2	0.62 ± 0.20

(Unit : mm)

Pin Configuration

Top View



Pin Assignments

Layout	
Pin	Function
1	GND
2	GND
3	Feed
4	No connect

Mirror Layout	
Pin	Function
1	GND
2	GND
3	No connect
4	Feed

UNLESS OTHER SPECIFIED TOLERANCES ON :

X=± X.X=± X.XX=

ANGLES=± HOLEDIA=±

SCALE : -----

UNIT : mm

DRAWN BY : 黃健育

CHECKED BY : 鄭榮謀

DESIGNED BY : 黃健育

APPROVED BY : 謝立庭

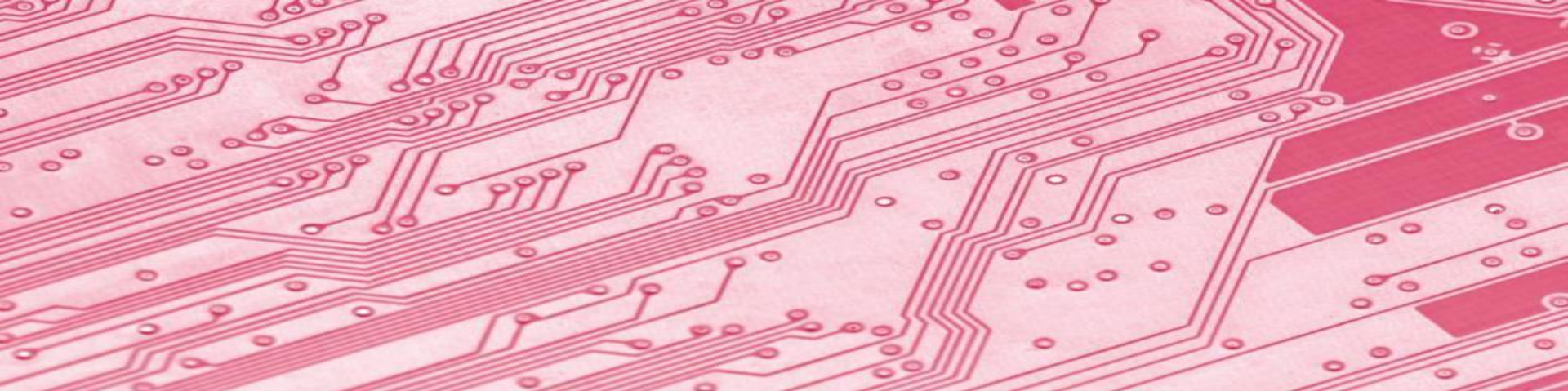
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TITLE : ACM3-5036-A1-CC-S-P1 Specification

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NO.

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SPEC REV.
A0



Title for Image (above image could be replaced)

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INPAQ TECHNOLOGY CO., LTD.

WE CONNECT WE PROTECT **PSA**

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