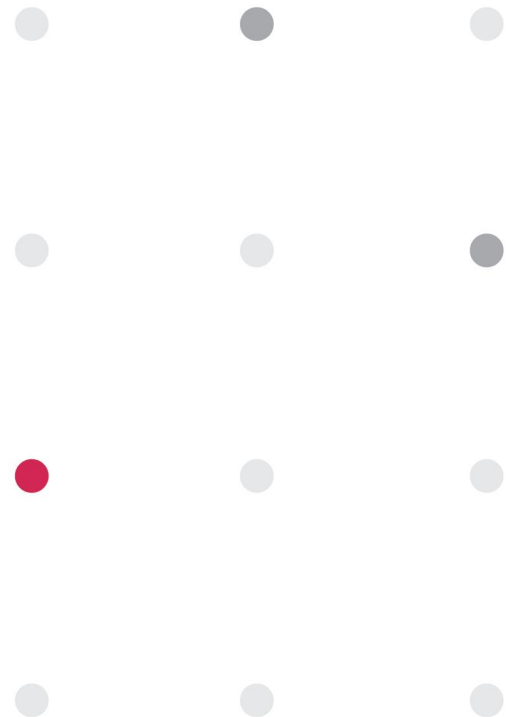


PSA

PASSIVE SYSTEM ALLIANCE
INPAQ TECHNOLOGY CO., LTD.



Lenovo ThinkPad Bluetooth Presenter Mouse (Aura Edition) MOBTQ20

Presented by

Zheng

2025/ 09/ 12

Version	Date	Description	Author
V01	2025/05/16	New Release	Feng
V02	2025/06/04	Optimize antenna	Feng
V03	2025/07/28	EVT machine optimized antenna	Zheng
V04	2025/08/12	Debug chip antenna	Zheng
V05	2025/08/14	Debug chip antenna	Zheng
V06	2025/09/12	Debug chip antenna	Zheng

OUTLINE

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1.1 Experimental Setup

1.2 Antenna Solution Detail

2. Antenna Characteristics

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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

Free space



1. Measurement Information

1.1 Experimental Setup

Hand model

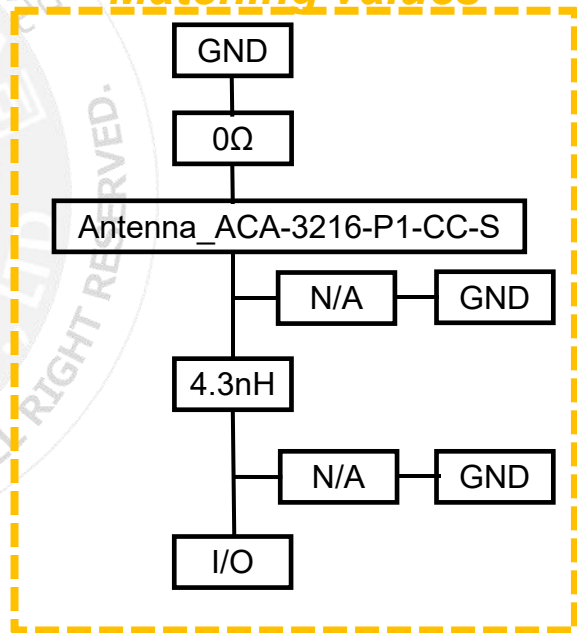


1. Measurement Information

1.2 Antenna Solution Detail

	part number
0Ω	WR04X000 PTL
4.3nH	WLCM1005Z0B4N3TB

Matching values

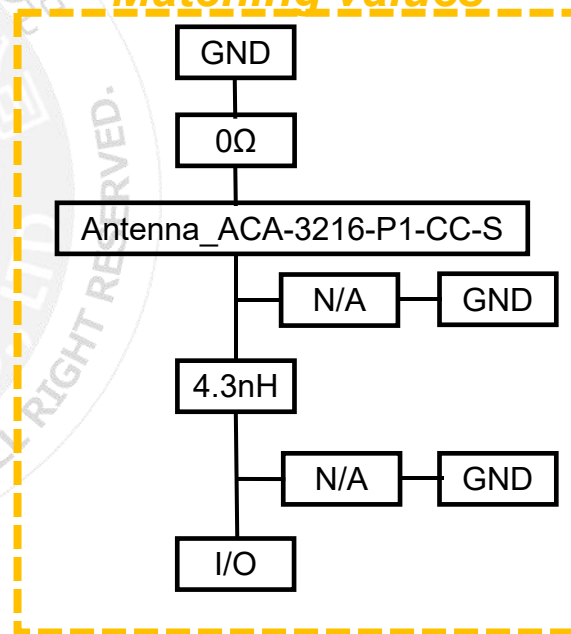


1. Measurement Information

1.2 Antenna Solution Detail

	part number
0Ω	WR04X000 PTL
4.3nH	WLCM1005Z0B4N3TB

Matching values

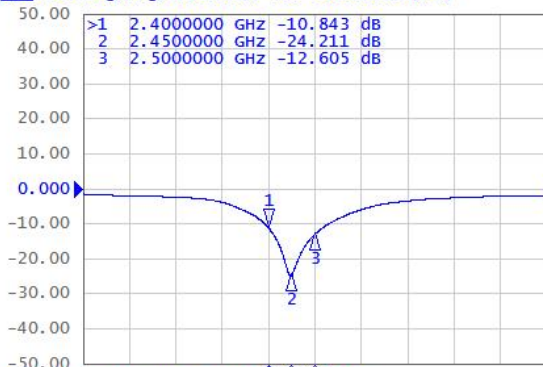


2. Antenna Characteristics

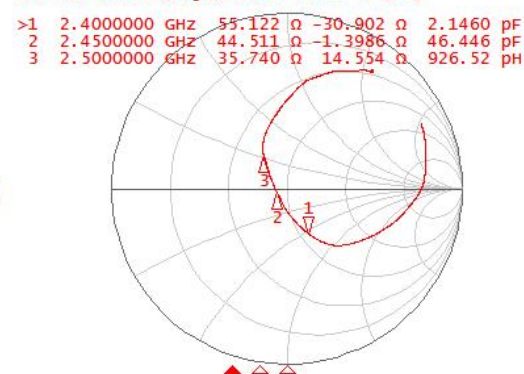
#1-Free space

2.1 S-Parameter

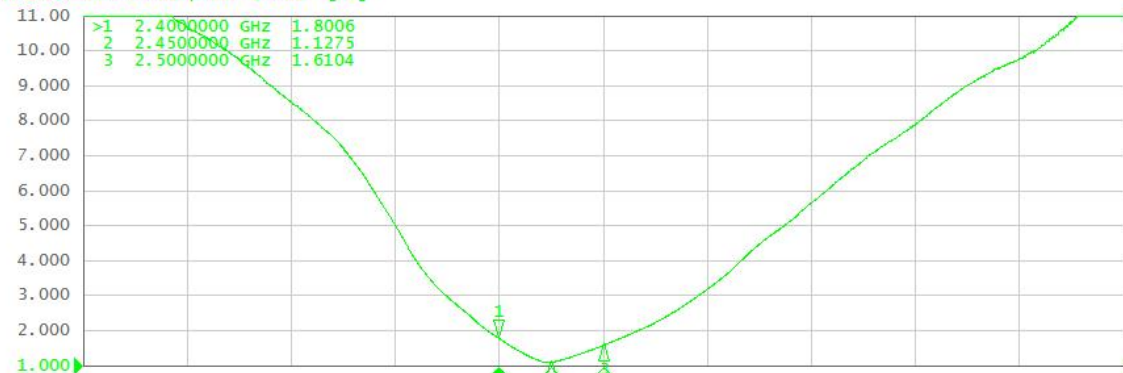
Tr1 S22 Log Mag 10.00 dB/ Ref 0.000 dB [F1]



Tr2 S22 Smith (R+jX) Scale 1.000 U [F1]



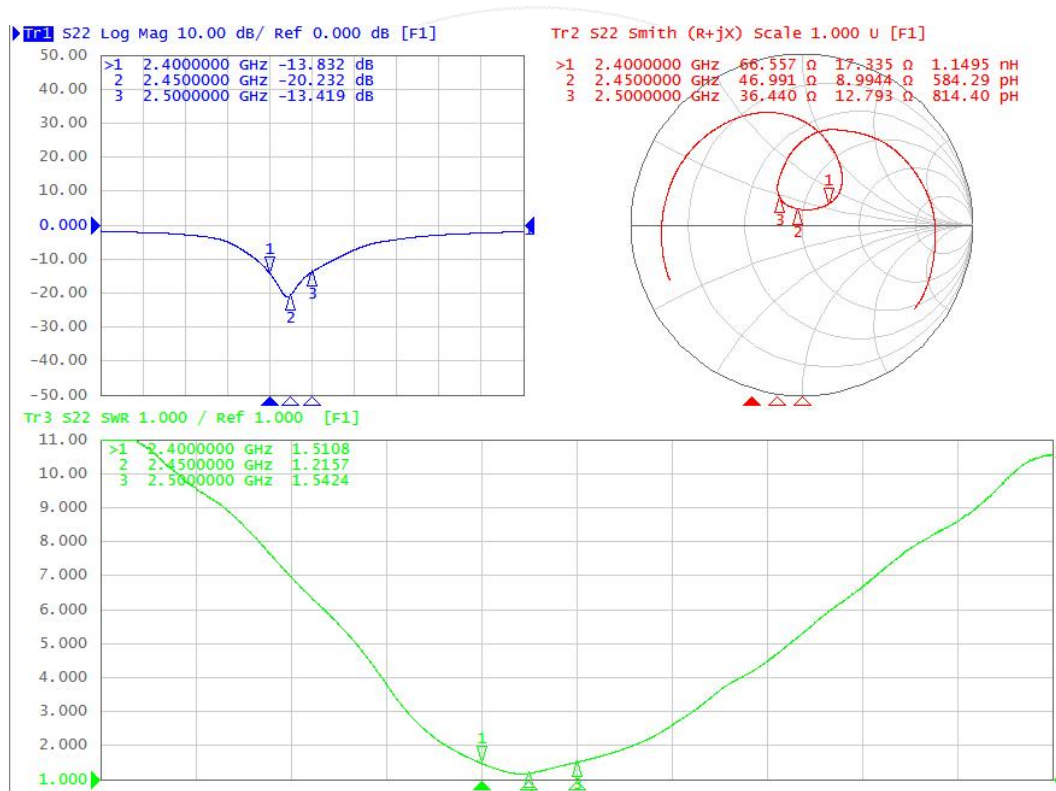
Tr3 S22 SWR 1.000 / Ref 1.000 [F1]



2. Antenna Characteristics

#1-Hand model

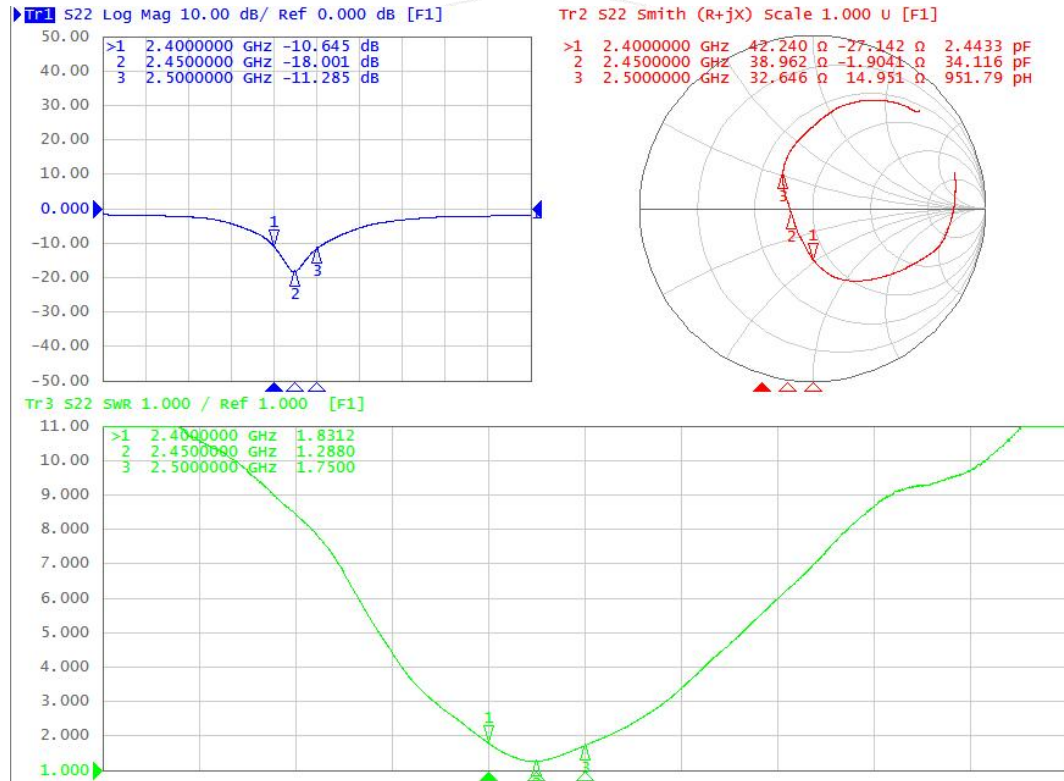
2.1 S-Parameter



2. Antenna Characteristics

#2-Free space

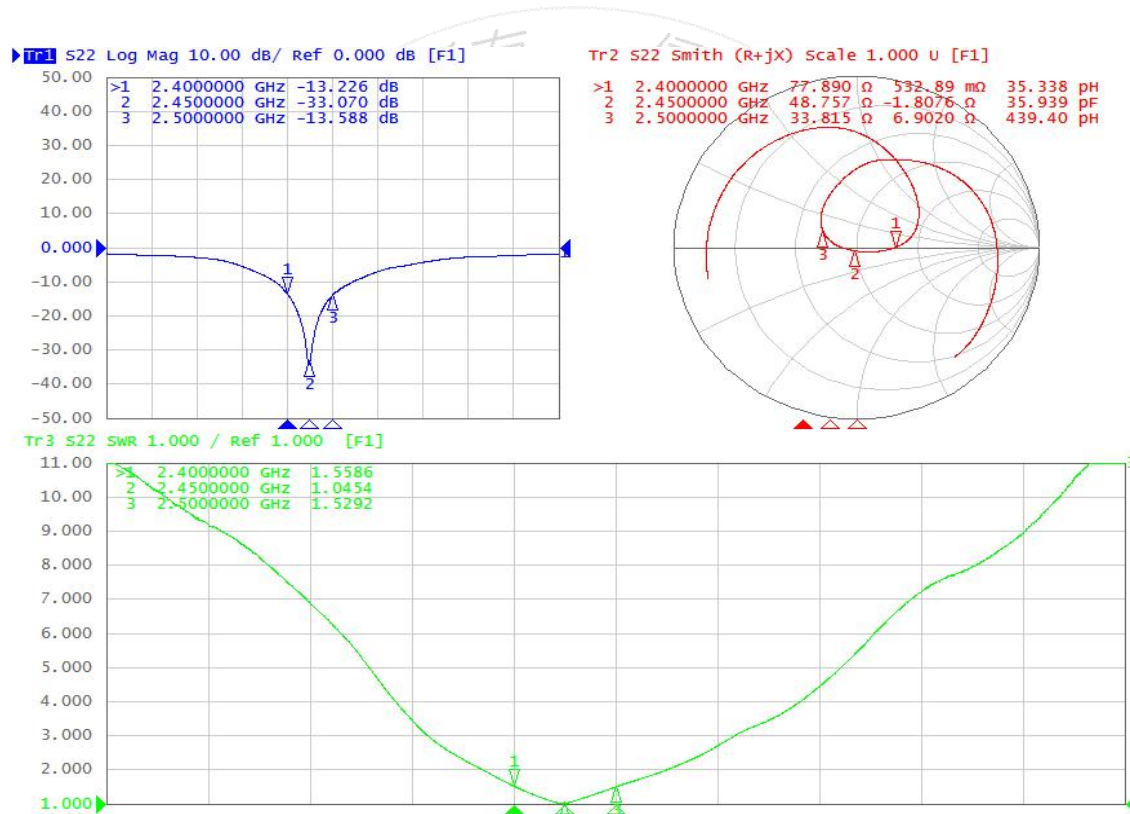
2.1 S-Parameter



2. Antenna Characteristics

#2-Hand model

2.1 S-Parameter



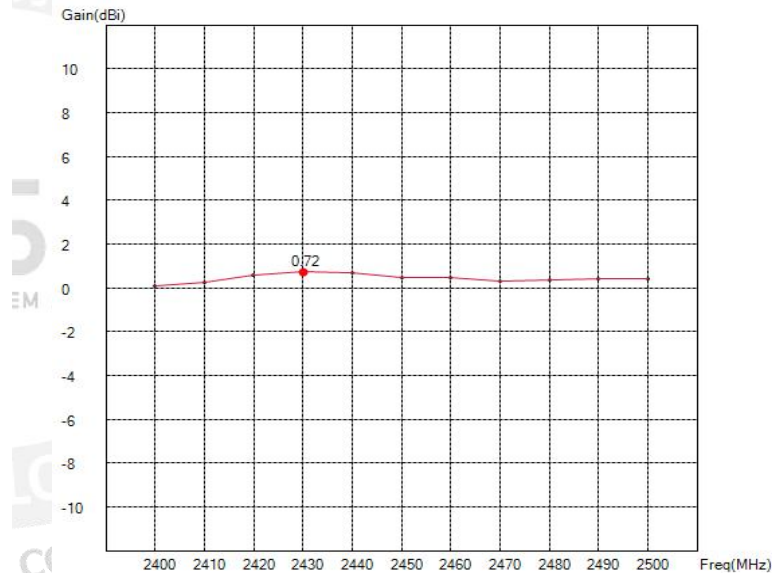
2. Antenna Characteristics

2.2 Antenna Efficiency and Peak Gain

#1-Free space



Maximum Efficiency at 2430MHz : 50.48%

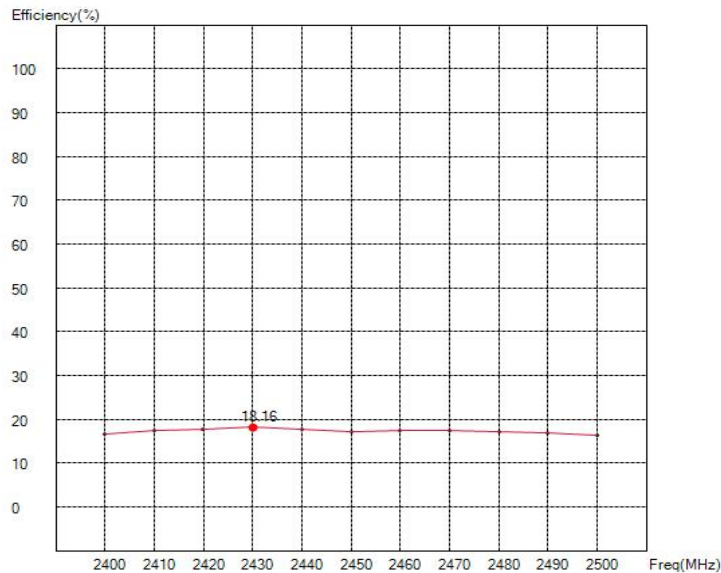


Maximum Peak Gain at 2430MHz : 0.72dBi

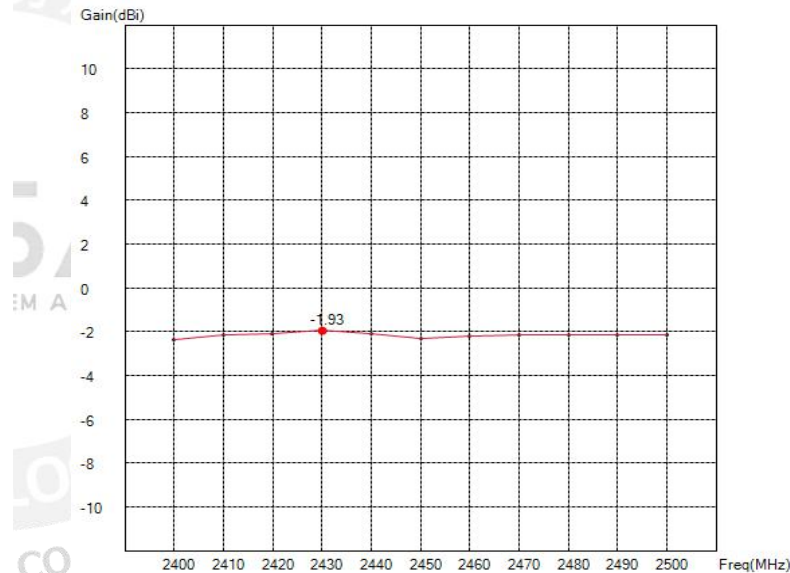
2. Antenna Characteristics

#1-Hand model

2.2 Antenna Efficiency and Peak Gain



Maximum Efficiency at 2430MHz : 18.16%

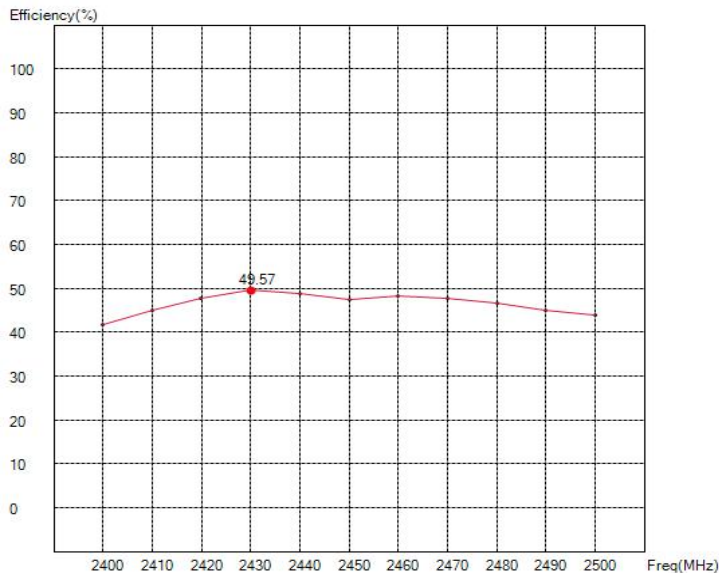


Maximum Peak Gain at 2430MHz : -1.93dBi

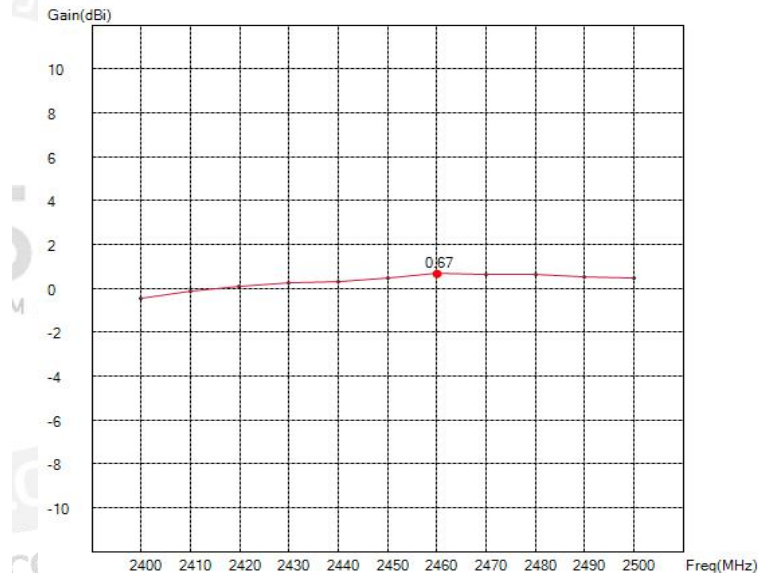
2. Antenna Characteristics

2.2 Antenna Efficiency and Peak Gain

#2-Free space



Maximum Efficiency at 2430MHz : 49.57%

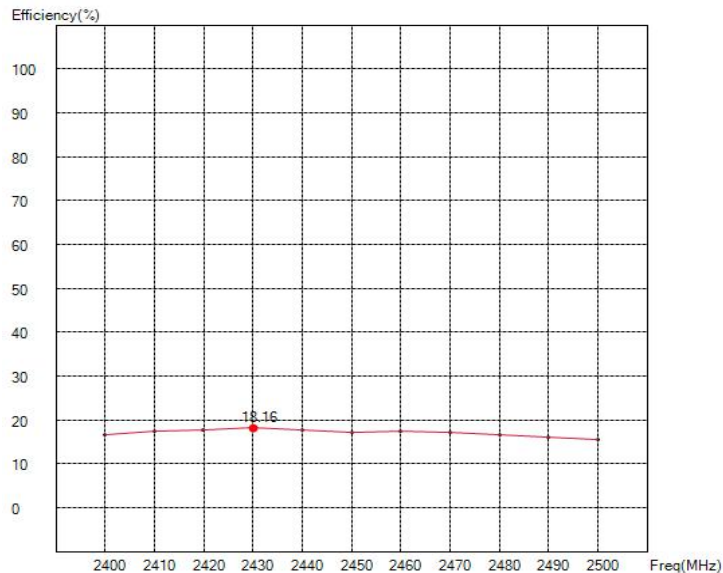


Maximum Peak Gain at 2460MHz : 0.67dBi

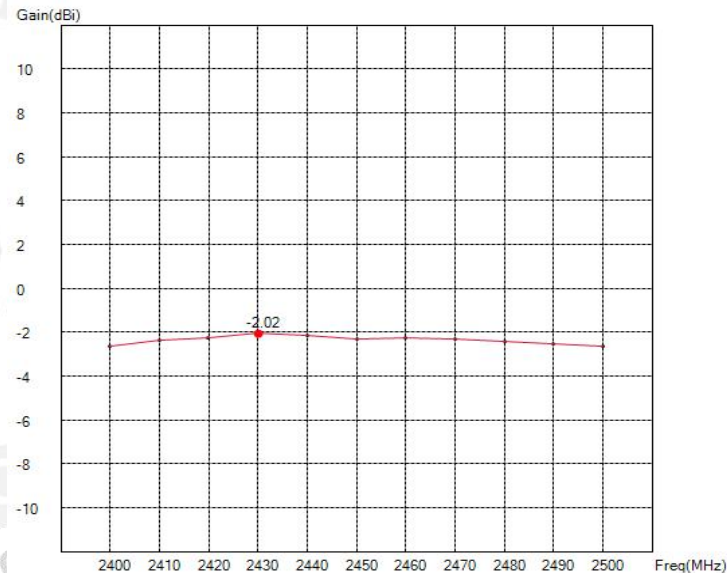
2. Antenna Characteristics

#2-Hand model

2.2 Antenna Efficiency and Peak Gain



Maximum Efficiency at 2430MHz : 18.16%



Maximum Peak Gain at 2430MHz : -2.02dBi

2. Antenna Characteristics

2.2 Antenna Efficiency and Peak Gain

	#1				#2			
	ANT (Free space)		ANT (Hand model)		ANT (Free space)		ANT (Hand model)	
Frequency (MHz)	Efficiency (%)	Peak gain (dBi)	Efficiency (%)	Peak gain (dBi)	Efficiency (%)	Peak gain (dBi)	Efficiency (%)	Peak gain (dBi)
2400	42.93	0.06	16.65	-2.35	41.68	-0.47	16.58	-2.65
2450	48.35	0.46	17.14	-2.33	47.47	0.45	17.18	-2.33
2500	44.99	0.39	16.38	-2.17	43.74	0.45	15.43	-2.64

2. Antenna Characteristics

2.3 3 views of antenna

Free space

X-Z plane

Y-Z plane

X-Y plane

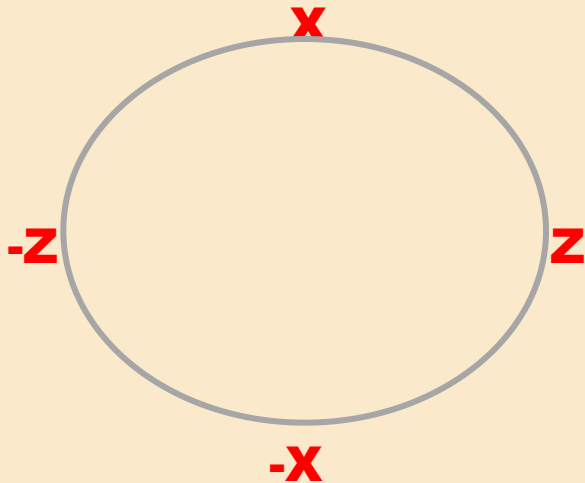


2. Antenna Characteristics

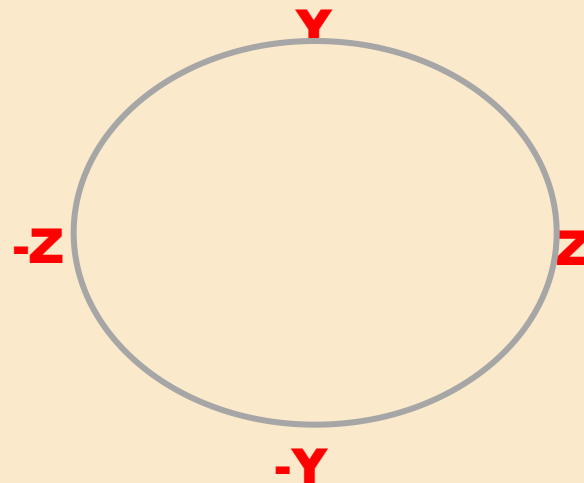
2.3 3 views of antenna

Hand model

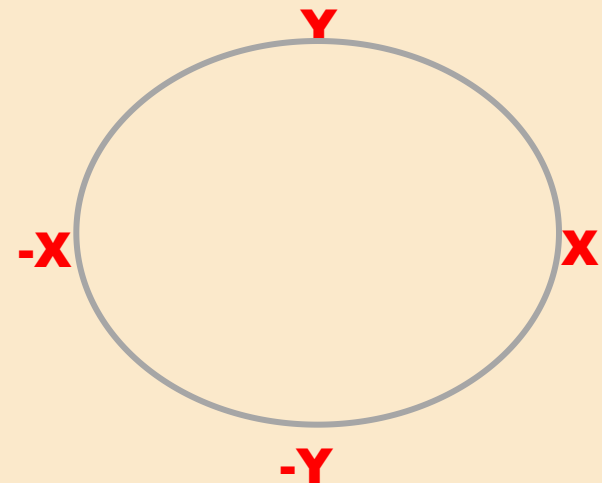
X-Z plane



Y-Z plane

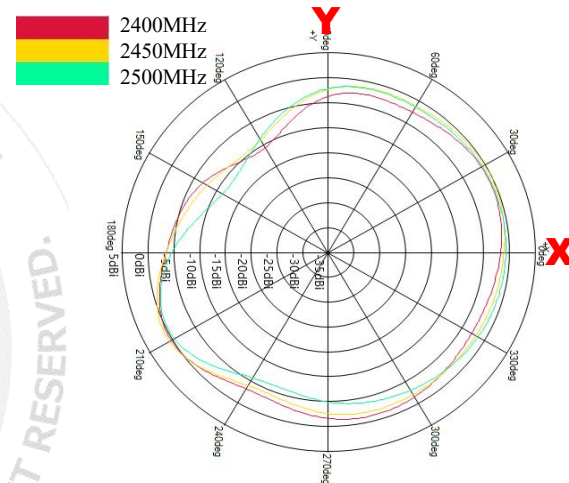
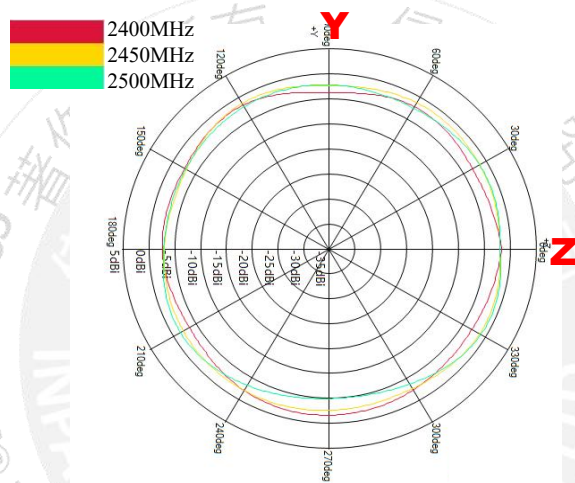
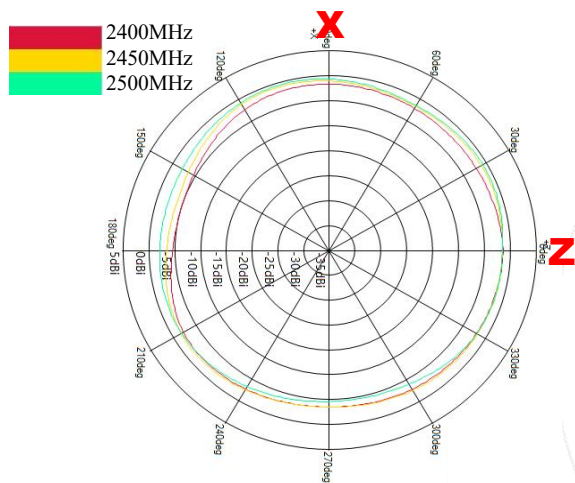


X-Y plane



2. Antenna Characteristics

2.3 2D Radiation Patterns

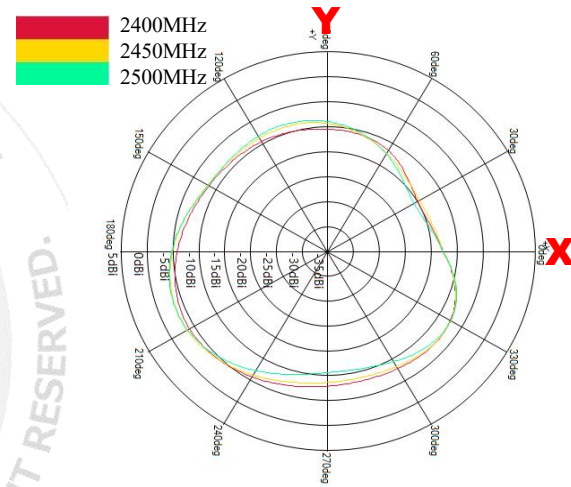
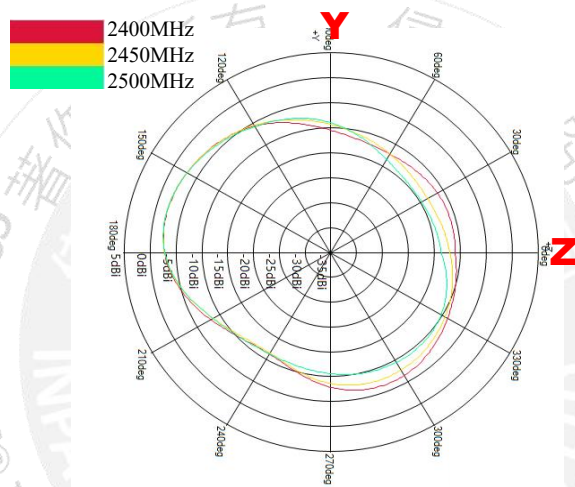
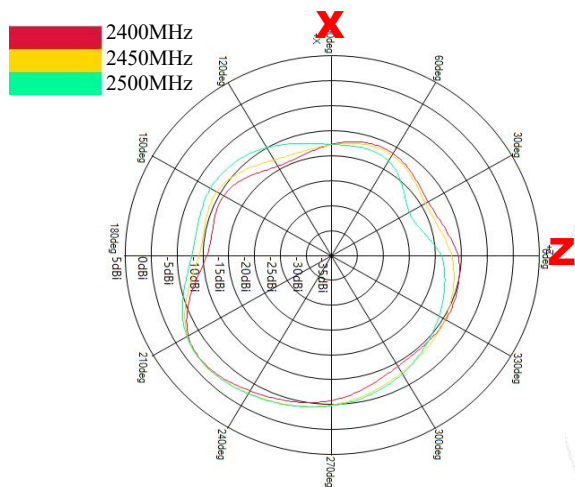


	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]
2400	-1.26	-2.16	-1.59	-2.36	0.06	-2.57
2450	-0.90	-1.75	-1.10	-1.89	0.46	-2.20
2500	-0.53	-1.83	-0.94	-2.30	-0.43	-2.76

#1-Free space

2. Antenna Characteristics

2.3 2D Radiation Patterns



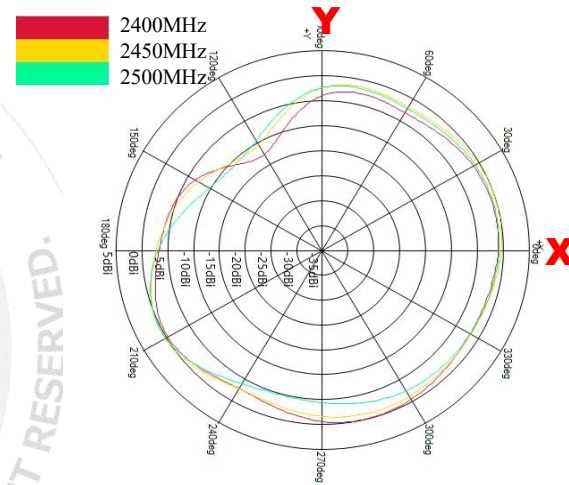
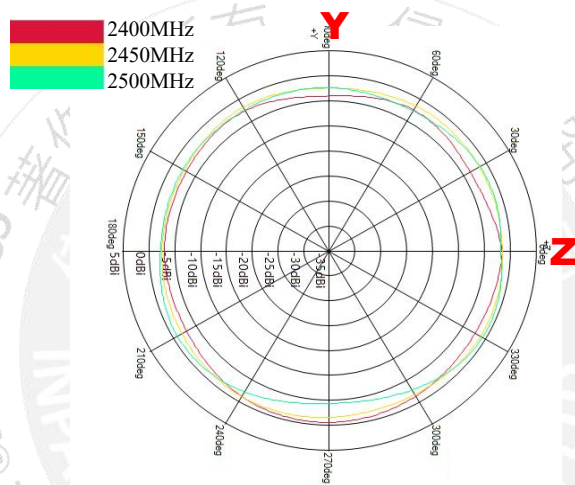
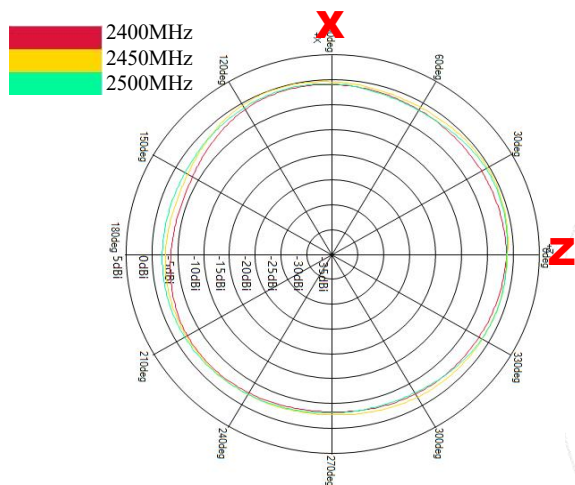
	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]
2400	-3.08	-7.88	-2.99	-8.98	-4.21	-8.06
2450	-2.86	-7.54	-2.98	-9.44	-3.61	-7.82
2500	-2.74	-7.60	-3.04	-10.17	-3.78	-8.09

#1-Hand model

2. Antenna Characteristics

2.3 2D Radiation Patterns

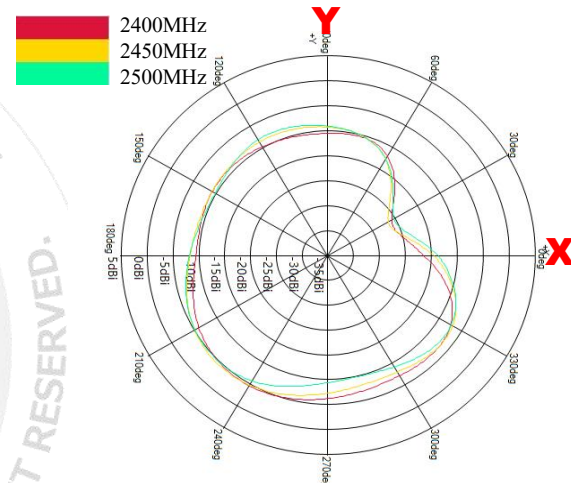
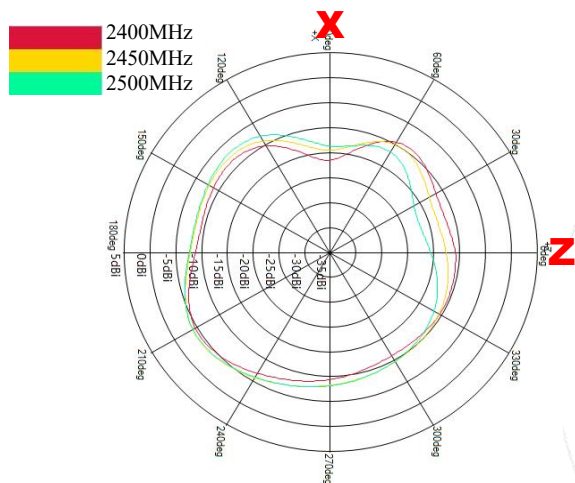
#2-Free space



	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]
2400	-0.83	-1.87	-0.75	-2.08	-0.54	-2.34
2450	-0.18	-1.26	-1.03	-1.61	0.11	-1.97
2500	-0.50	-1.59	-0.59	-2.03	-0.09	-2.63

2. Antenna Characteristics

2.3 2D Radiation Patterns



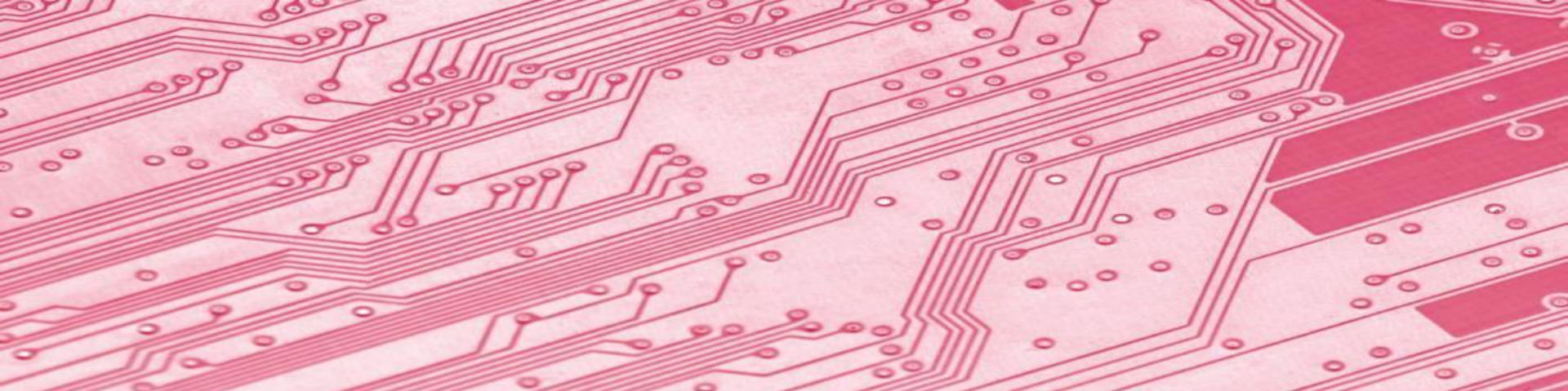
	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]
2400	-4.90	-9.36	-2.65	-8.06	-4.89	-8.54
2450	-4.35	-9.02	-2.33	-8.67	-5.02	-8.34
2500	-4.38	-9.36	-2.64	-9.66	-5.43	-8.78

#2-Hand model

3. Summary

- The performance of antennas is shown in table

	#1		#2	
	ANT (Free space)	ANT (Hand model)	ANT (Free space)	ANT (Hand model)
Maximum Efficiency (%)	50.48	18.16	49.57	18.16
Maximum Gain (dBi)	0.72	-1.93	0.67	-2.02



Title for Image (above image could be replaced)

Content Details

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INPAQ TECHNOLOGY CO., LTD.

Thank you

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