

A large, thick, dark blue circular graphic is positioned on the left side of the slide, partially cut off by the edge. It has a white center.

do the **MAGIC+**

# 2.4GHz antenna report

## QX-008-1018 rev. A

Prepared by SINBON Engineering team

Date: 23 Feb-2022

# Revision History

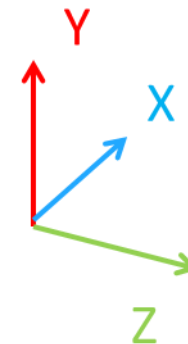
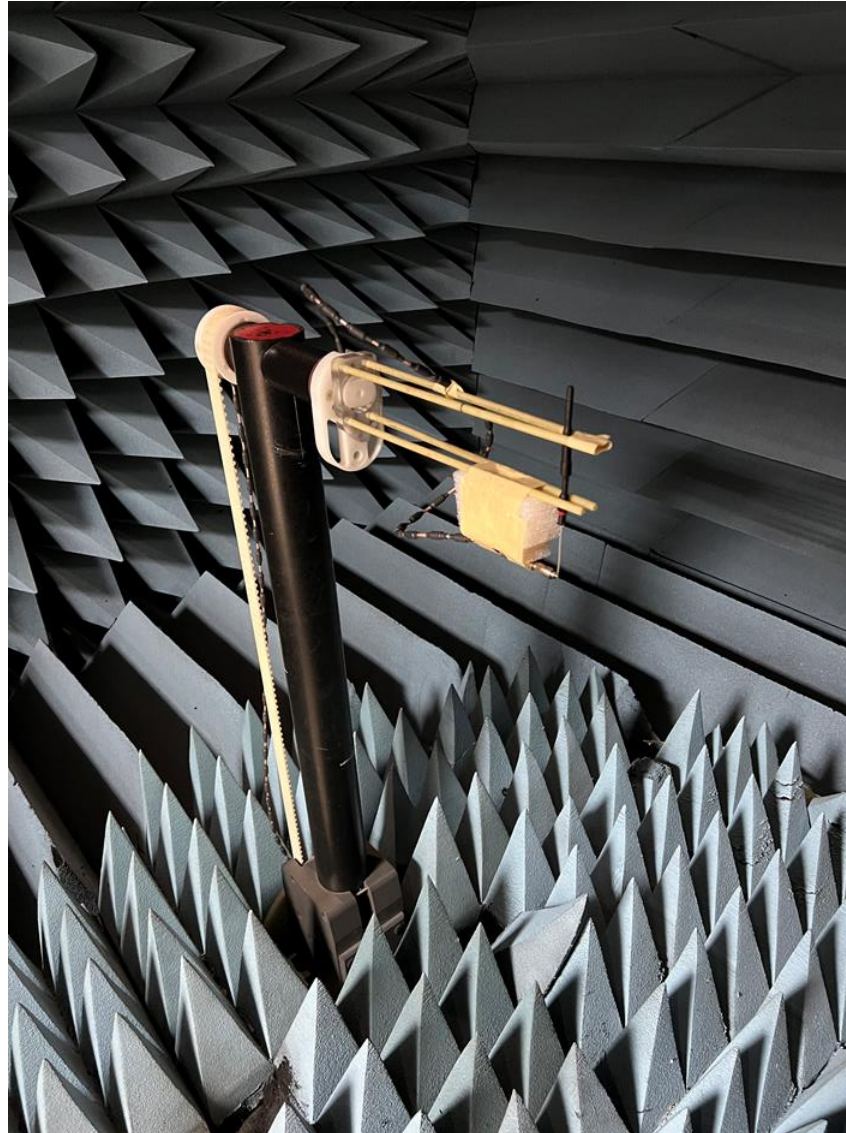
Revision	Date	Description of changes
A	23 Feb-2022	Measure the performance of the sample antenna.

1.0		Test fixture
2.0		Test setup (Network Analyzer)
3.0		Laboratory Equipment
	3.1	ETS Chamber - AMS-8500
4.0		Return Loss
5.0		Efficiency
	5.1	2D&3D Radiation Pattern
6.0		Conclusion

# 1.0 Test fixtures pictures

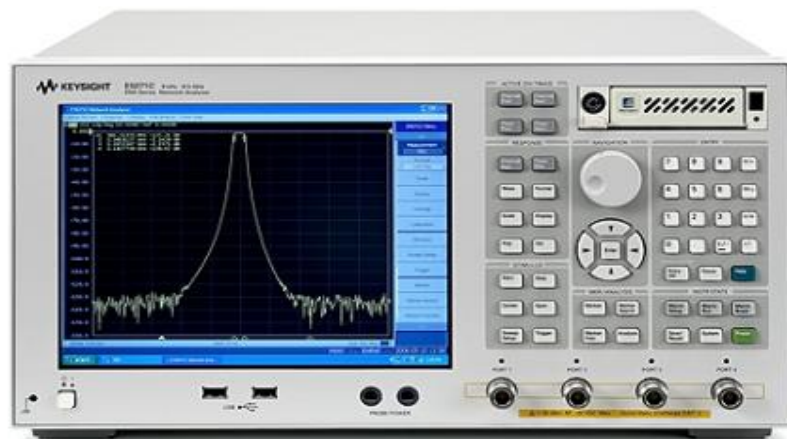


# 1.0 Test fixtures pictures





## 2.0 Test setup (Network Analyzer)

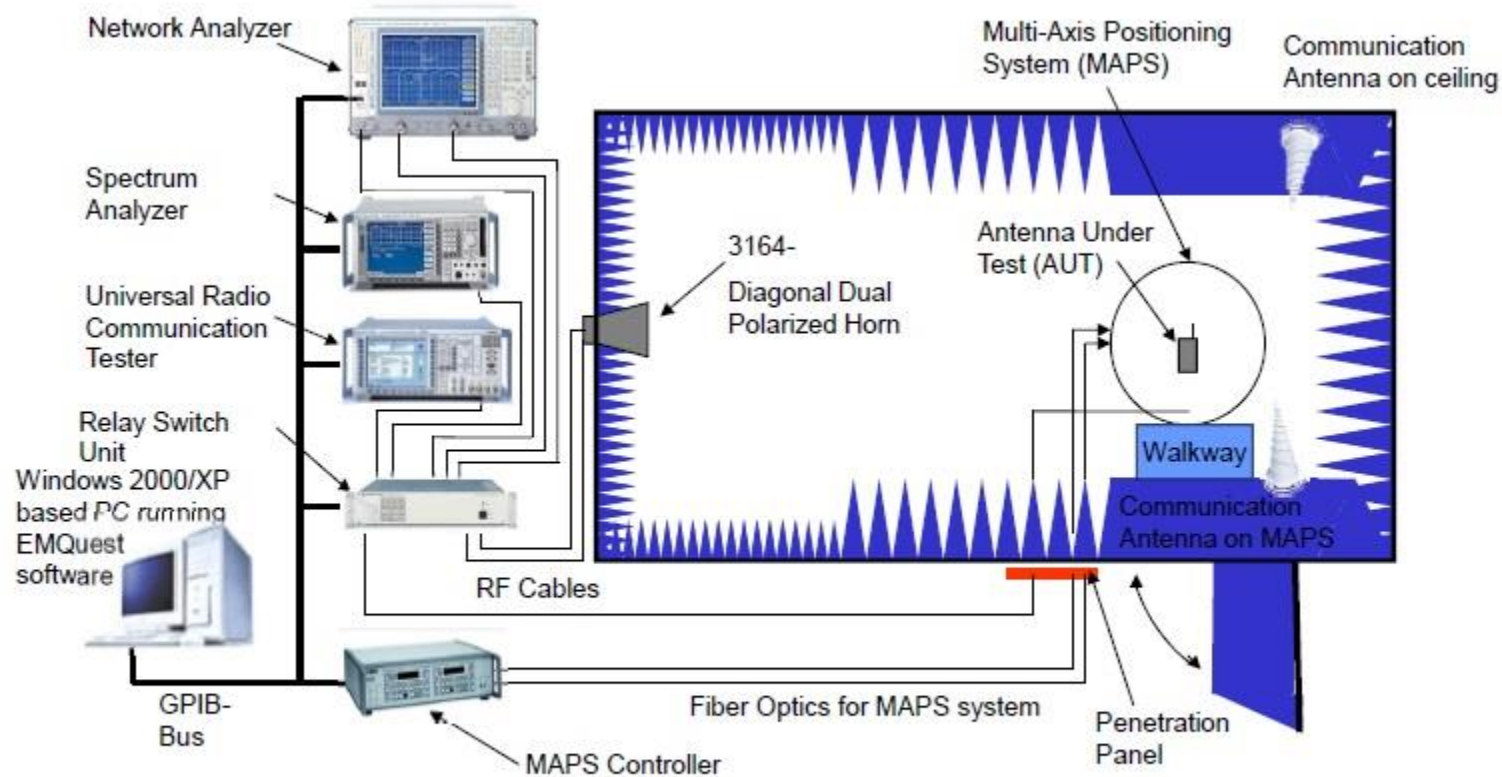


VSWR / S11 measurements were performed using an Agilent E5071C Network Analyzer and the test fixture shown in section 2. The testing was performed in free space. The complete VSWR and return loss plots are provided in section 4.0.

## 3.0 Laboratory Equipment

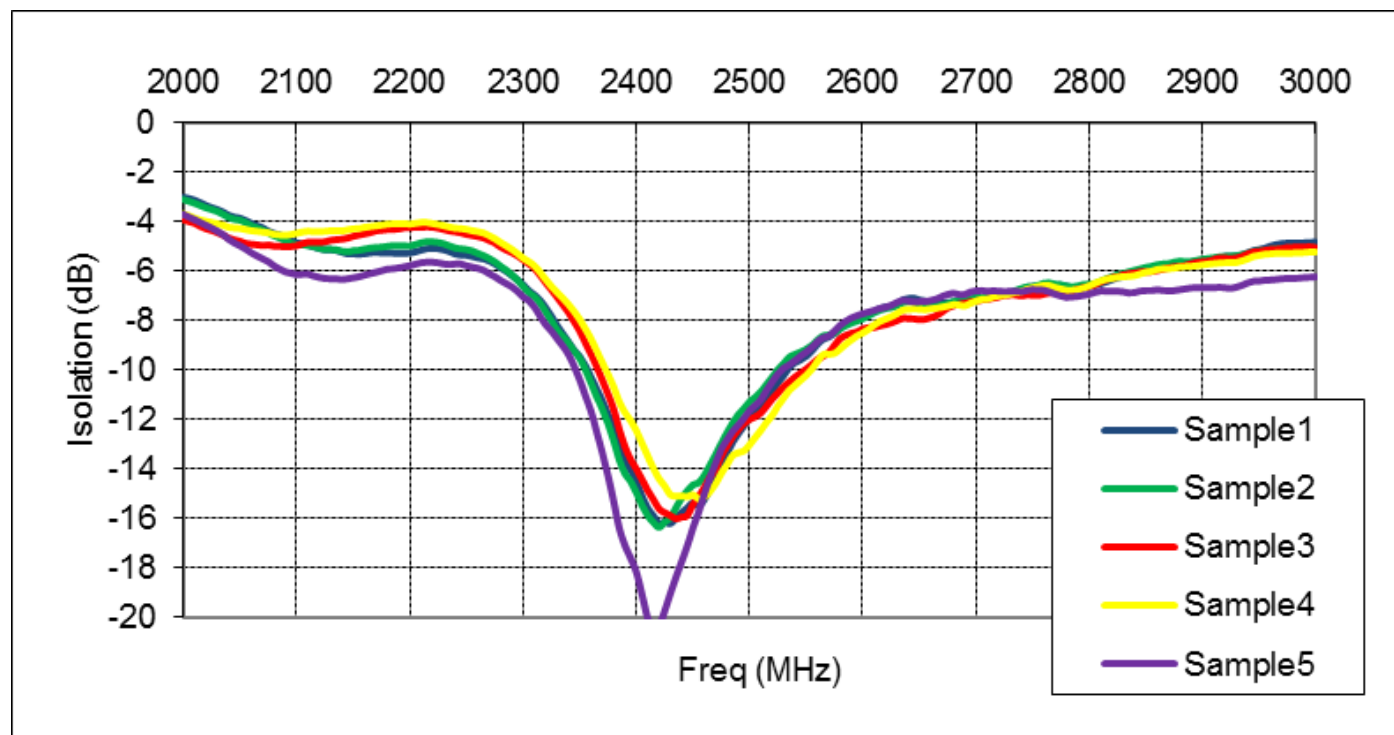


## 3.1 ETS Chamber - AMS-8500





## 4.0 Return Loss



## 5.0 Antenna Efficiency

	Sample 1			Sample 2		
	23-Feb-22			23-Feb-22		
	Free Space			Free Space		
MHz	Efficiency (%)	Efficiency (dB)	Peak Gain (dBi)	Efficiency (%)	Efficiency (dB)	Peak Gain (dBi)
2400	61.6	-2.1	3.4	61.0	-2.1	3.2
2410	62.7	-2.0	3.4	62.2	-2.1	3.1
2420	64.8	-1.9	3.4	64.3	-1.9	3.1
2430	66.1	-1.8	3.3	65.9	-1.8	3.1
2440	67.6	-1.7	3.3	67.3	-1.7	3.1
2450	68.7	-1.6	3.2	68.6	-1.6	3.0
2460	69.9	-1.6	3.0	70.2	-1.5	2.9
2470	70.3	-1.5	3.0	70.3	-1.5	2.8
2480	70.1	-1.5	2.8	70.4	-1.5	2.7
2490	70.2	-1.5	2.7	70.4	-1.5	2.5
2500	69.4	-1.6	2.5	69.4	-1.6	2.4

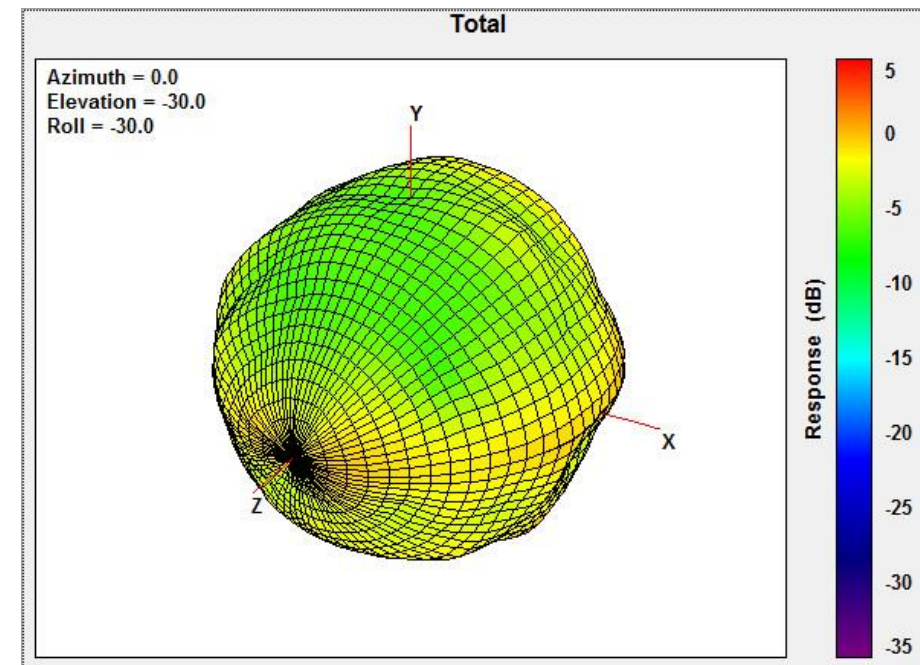
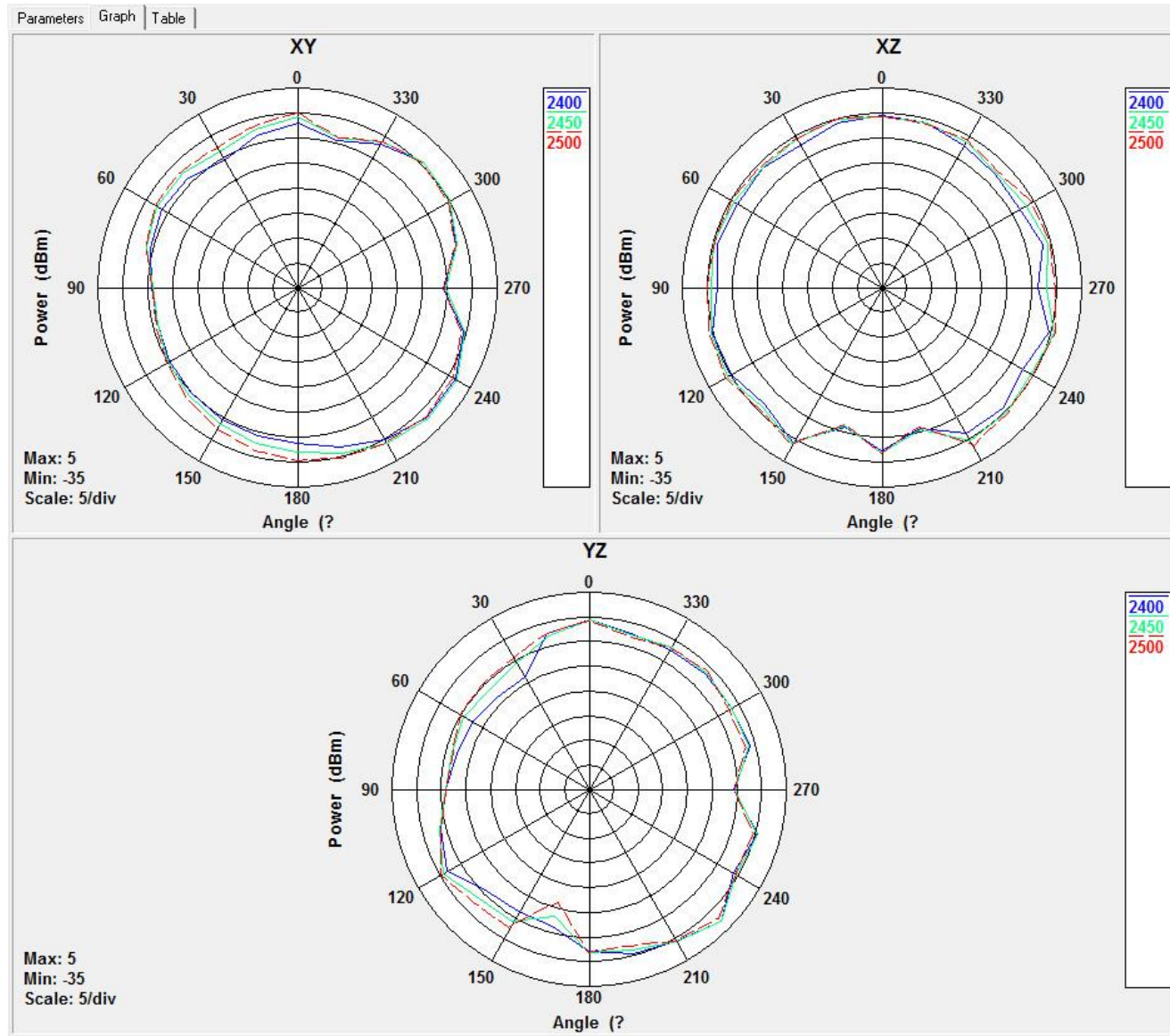
## 5.0 Antenna Efficiency

	Sample 3			Sample 4		
	23-Feb-22			23-Feb-22		
	Free Space			Free Space		
MHz	Efficiency (%)	Efficiency (dB)	Peak Gain (dBi)	Efficiency (%)	Efficiency (dB)	Peak Gain (dBi)
2400	61.0	-2.1	2.6	63.7	-2.0	2.9
2410	61.0	-2.1	2.6	64.6	-1.9	2.8
2420	63.2	-2.0	2.5	66.4	-1.8	2.8
2430	64.9	-1.9	2.4	67.6	-1.7	2.7
2440	66.7	-1.8	2.5	68.7	-1.6	2.7
2450	68.4	-1.6	2.4	69.7	-1.6	2.5
2460	70.2	-1.5	2.4	71.0	-1.5	2.4
2470	70.3	-1.5	2.3	70.9	-1.5	2.3
2480	70.5	-1.5	2.3	70.4	-1.5	2.2
2490	70.7	-1.5	2.1	70.0	-1.5	2.0
2500	69.9	-1.6	1.9	68.6	-1.6	1.9

## 5.0 Antenna Efficiency

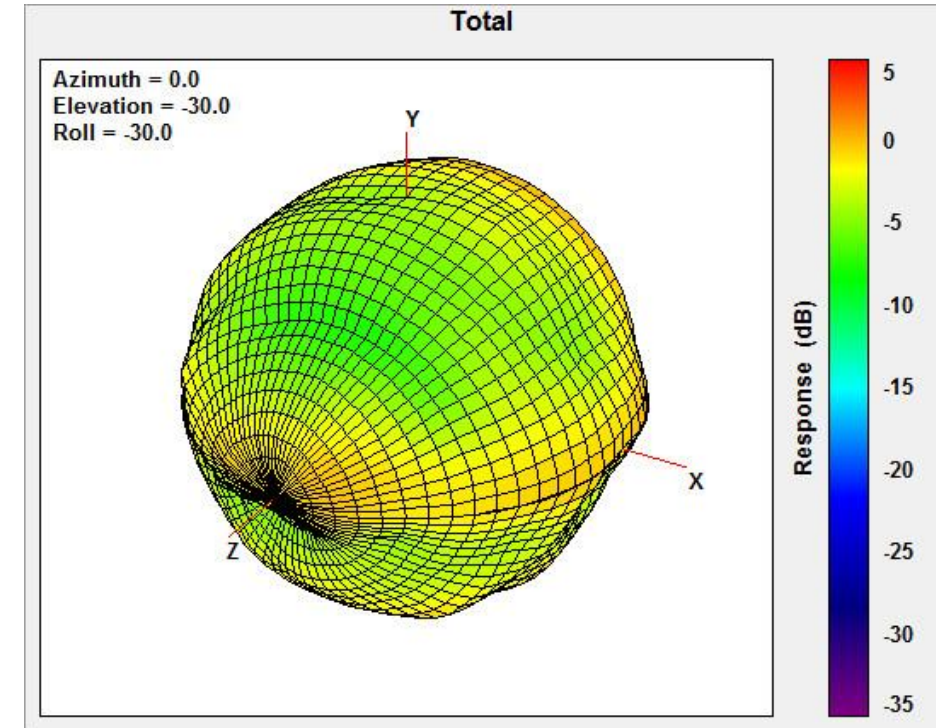
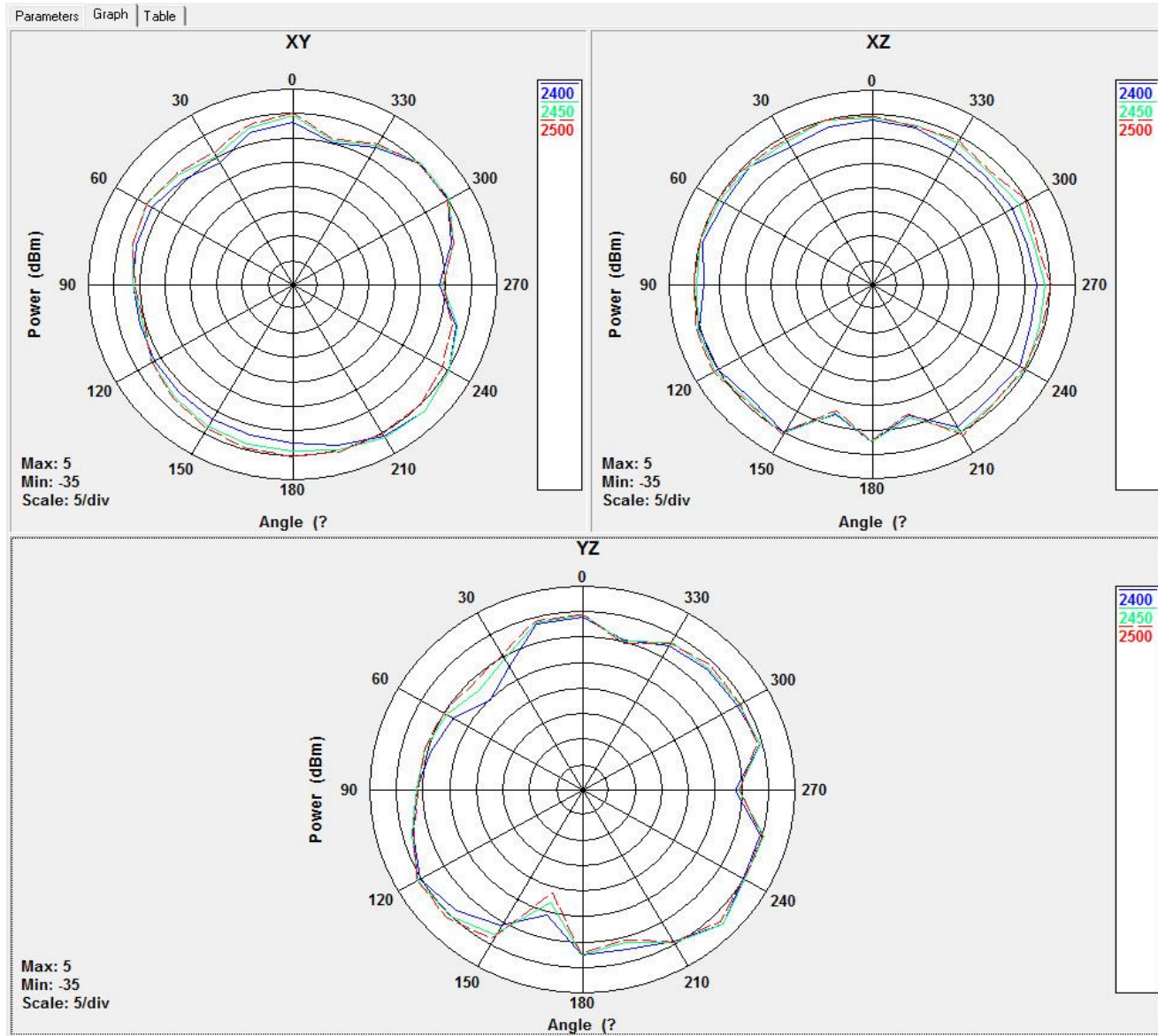
	Sample 5		
	23-Feb-22		
	Free Space		
MHz	Efficiency (%)	Efficiency (dB)	Peak Gain (dBi)
2400	63.1	-2.0	3.4
2410	63.8	-2.0	3.4
2420	65.7	-1.8	3.3
2430	66.8	-1.7	3.3
2440	67.7	-1.7	3.2
2450	68.8	-1.6	3.1
2460	69.9	-1.6	3.1
2470	69.9	-1.6	3.0
2480	69.5	-1.6	2.9
2490	69.0	-1.6	2.8
2500	67.7	-1.7	2.7

# 5.1 2D&3D Radiation Pattern(Sample1)

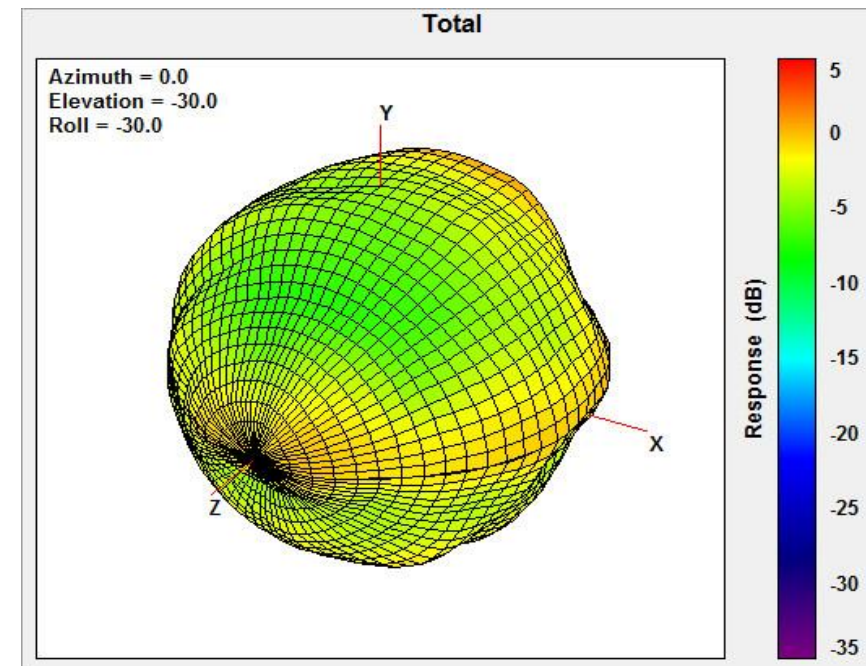
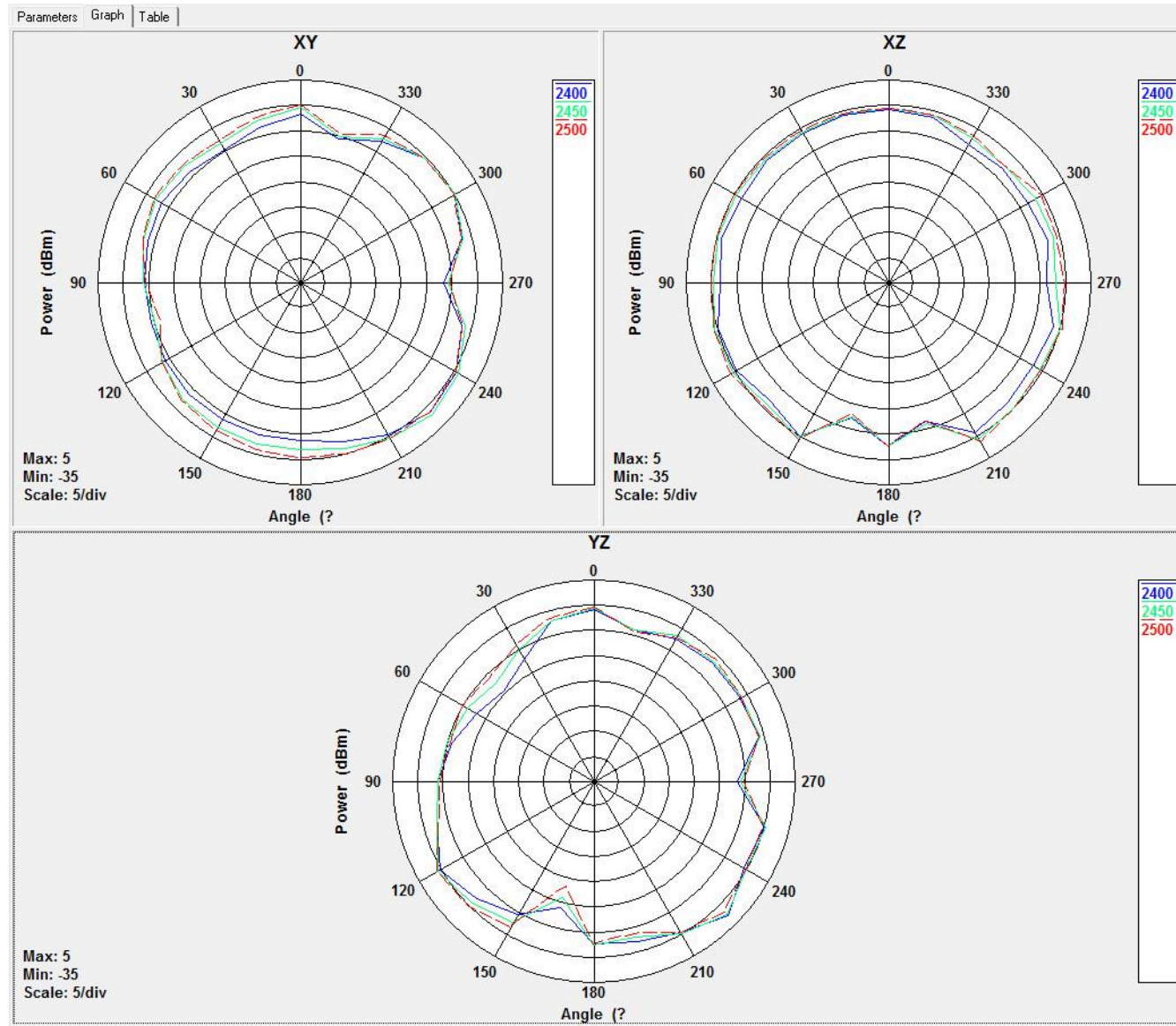




# 5.1 2D&3D Radiation Pattern(Sample2)

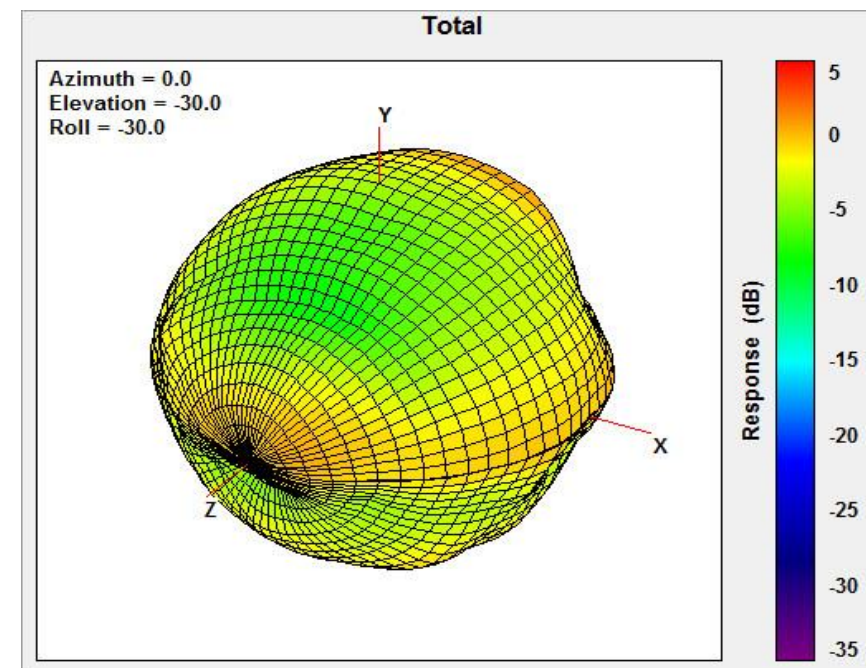
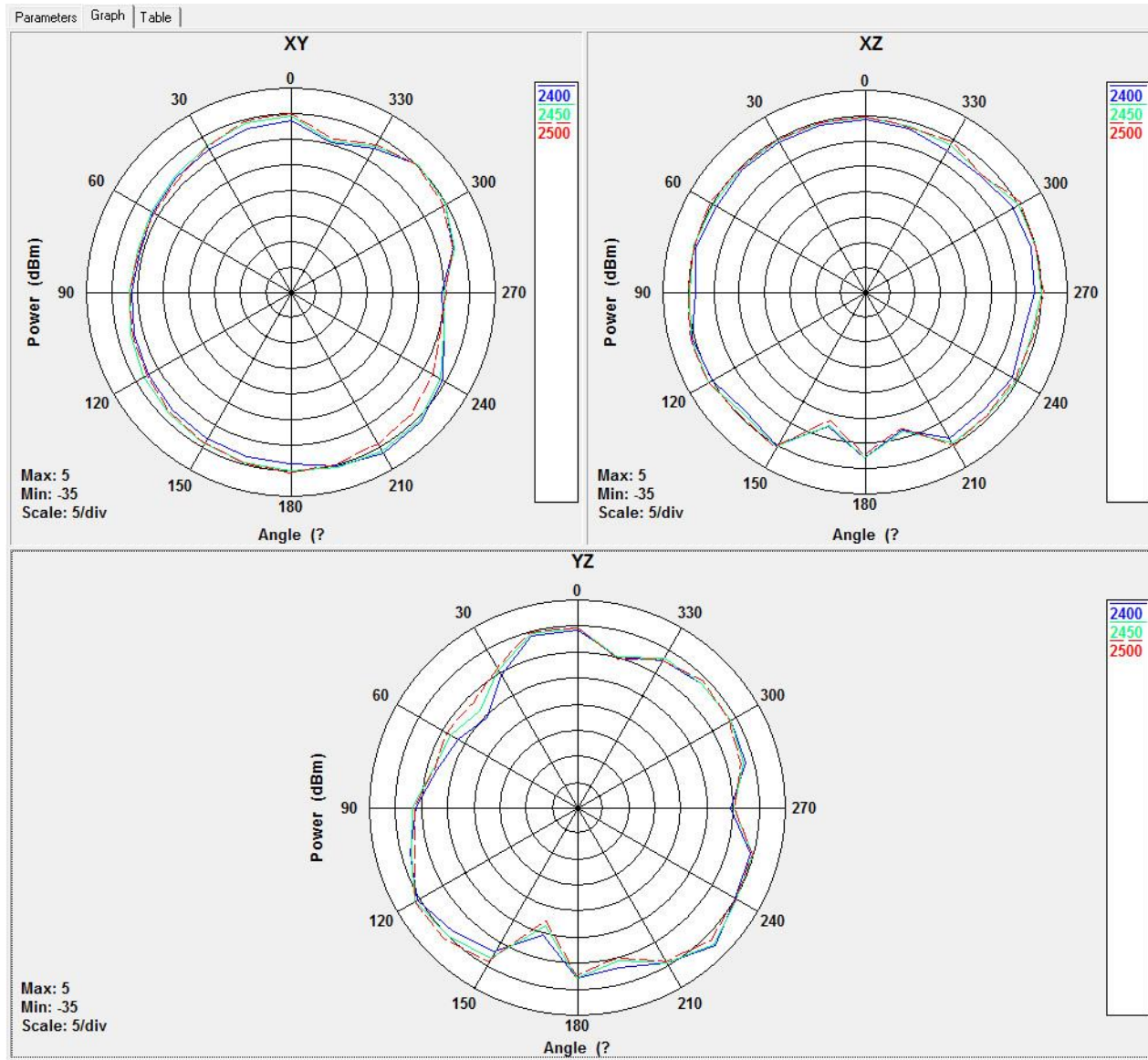


## 5.1 2D&3D Radiation Pattern(Sample3)

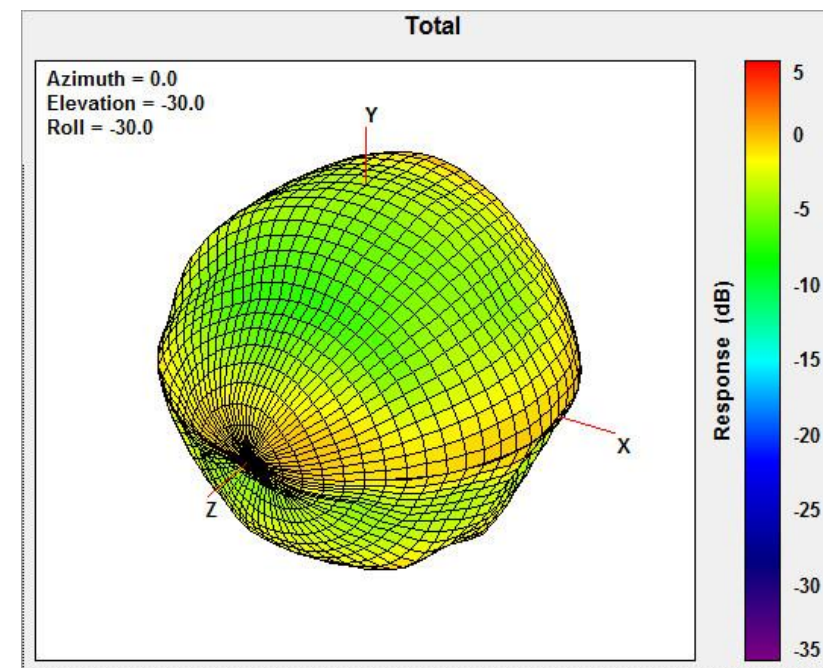
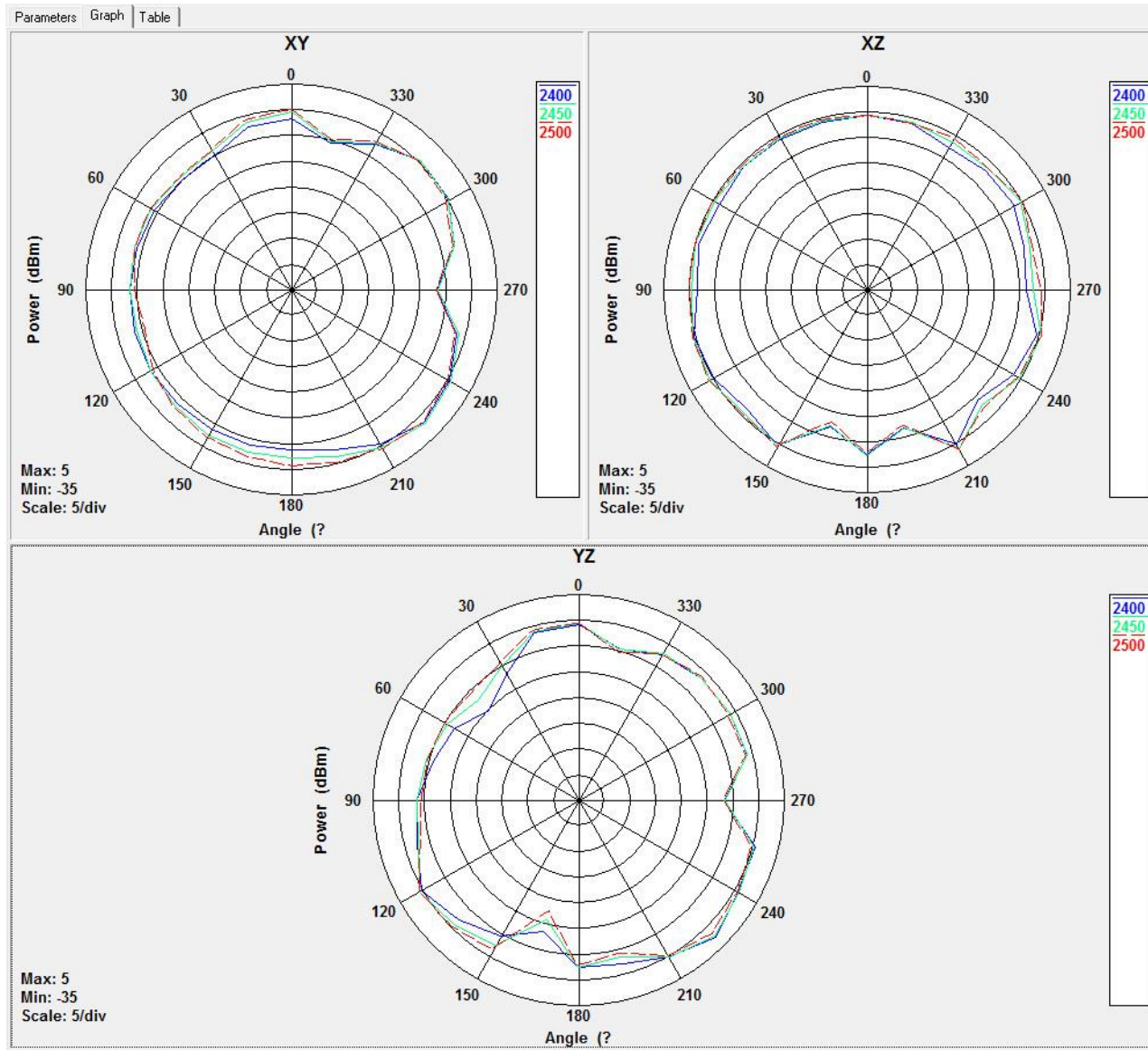




## 5.1 2D&3D Radiation Pattern(Sample4)



## 5.1 2D&3D Radiation Pattern(Sample5)



## 6.0 Conclusion

- ◆ The average efficiency of antenna:
  - Sample 1 : 2.4GHz antenna is 67% on average.
  - Sample 2 : 2.4GHz antenna is 67% on average.
  - Sample 3 : 2.4GHz antenna is 67% on average.
  - Sample 4 : 2.4GHz antenna is 68% on average.
  - Sample 5 : 2.4GHz antenna is 67% on average.
  
- ◆ If you have any question, please feel free to contact us.





**thank you**

*danke děkuji ありがとう merci gracias  
grazie kiitos הודות köszöni tak tack*