



昆山华德昌电子科技有限公司

Kun Shan HuaDeChang Electronic Technology CO,ltd

WIFI test report

Project Name:Antenna test report

Test Engineer: Chen Rong

Date:27.5.22

Outline Summary

- **Purpose**

Antenna design and test for HengMao. Result as following.

- **Agenda**

- Test Environment and Equipment

- Antenna Positions

Test Result : VSWR/Return Loss

Test Result : Efficiency

Test Result : 2D Radiation Pattern

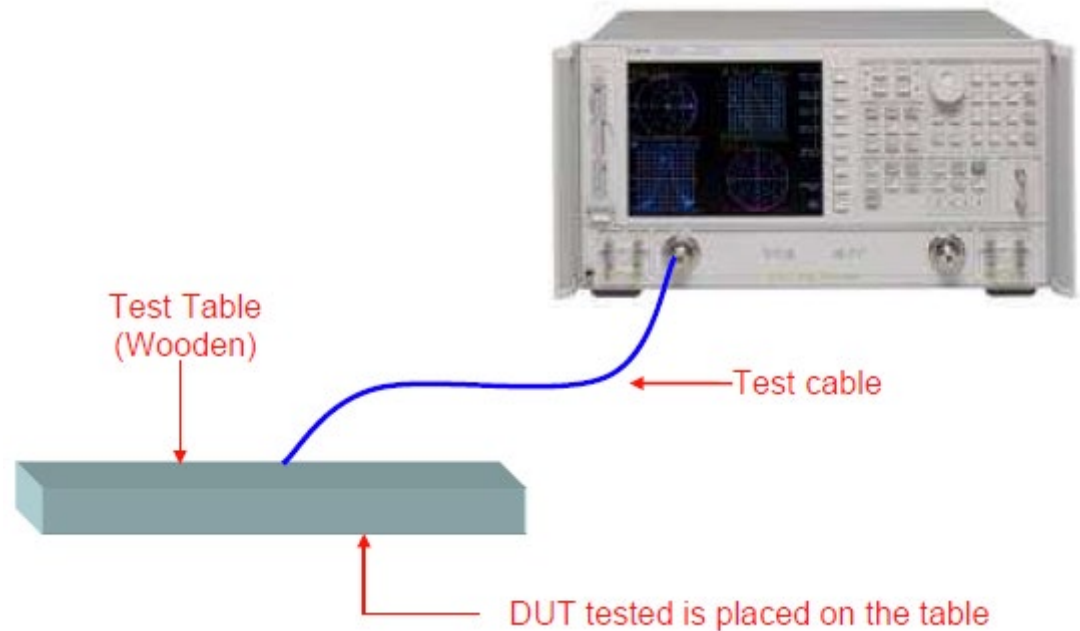
Test Result : 3D Radiation Pattern

- **Result & Suggestions**

Test Environment and Equipments

S-Parameter test

- Testing range from 9KHz to 8.5GHz or 400KHz~6.5GHz
- Network Analyzer(Agilent-E5071C or R&S ZVL)



Test Environment and Equipments

The Gain, Efficiency, Directivity and 2/3D Pattern

- 3D Anechoic Chamber
- Testing range from 400MHz to 6GHz
- Chamber Room Size: $L*W*H=9*4.7*4.7$ M

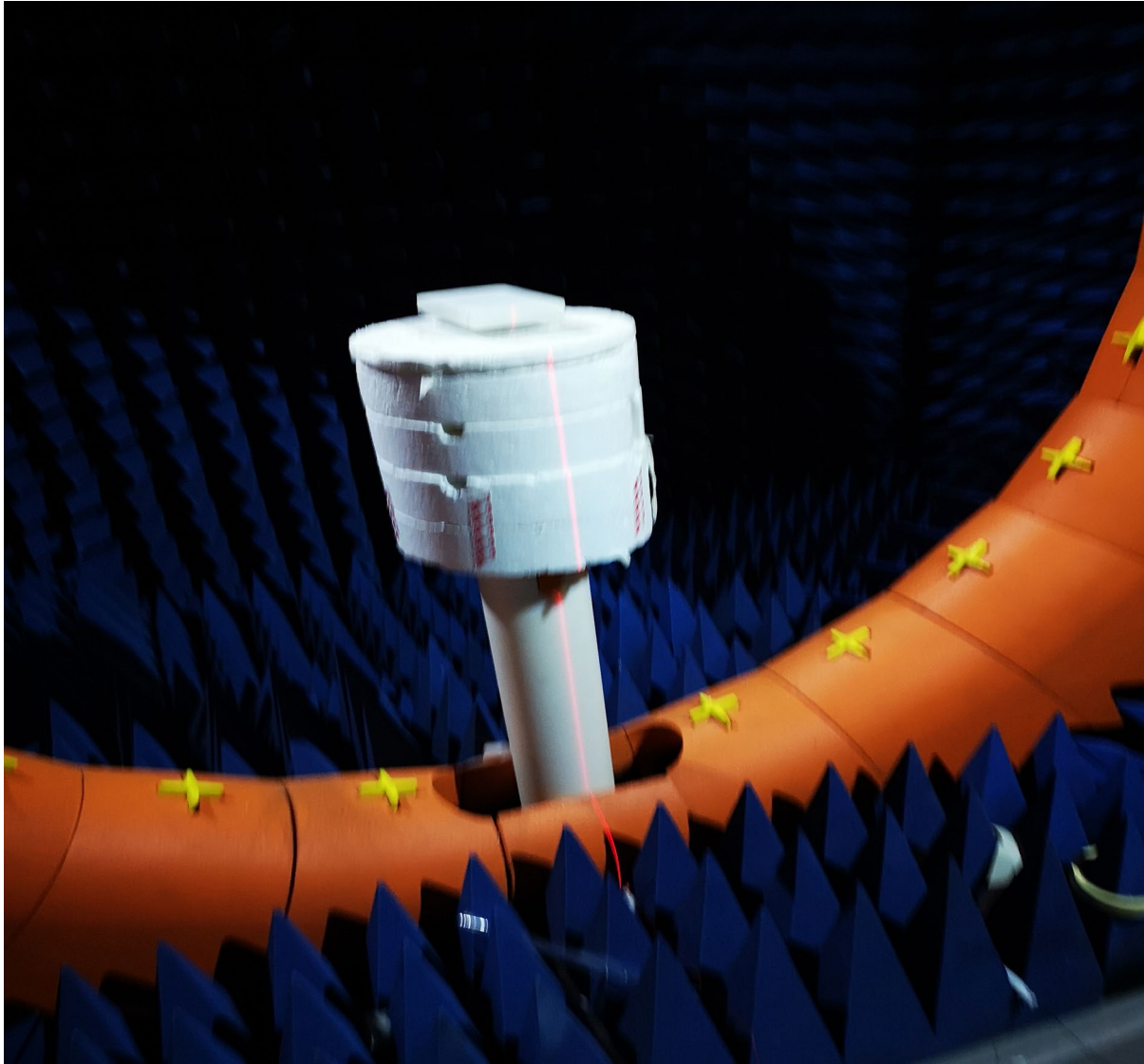


VSWR

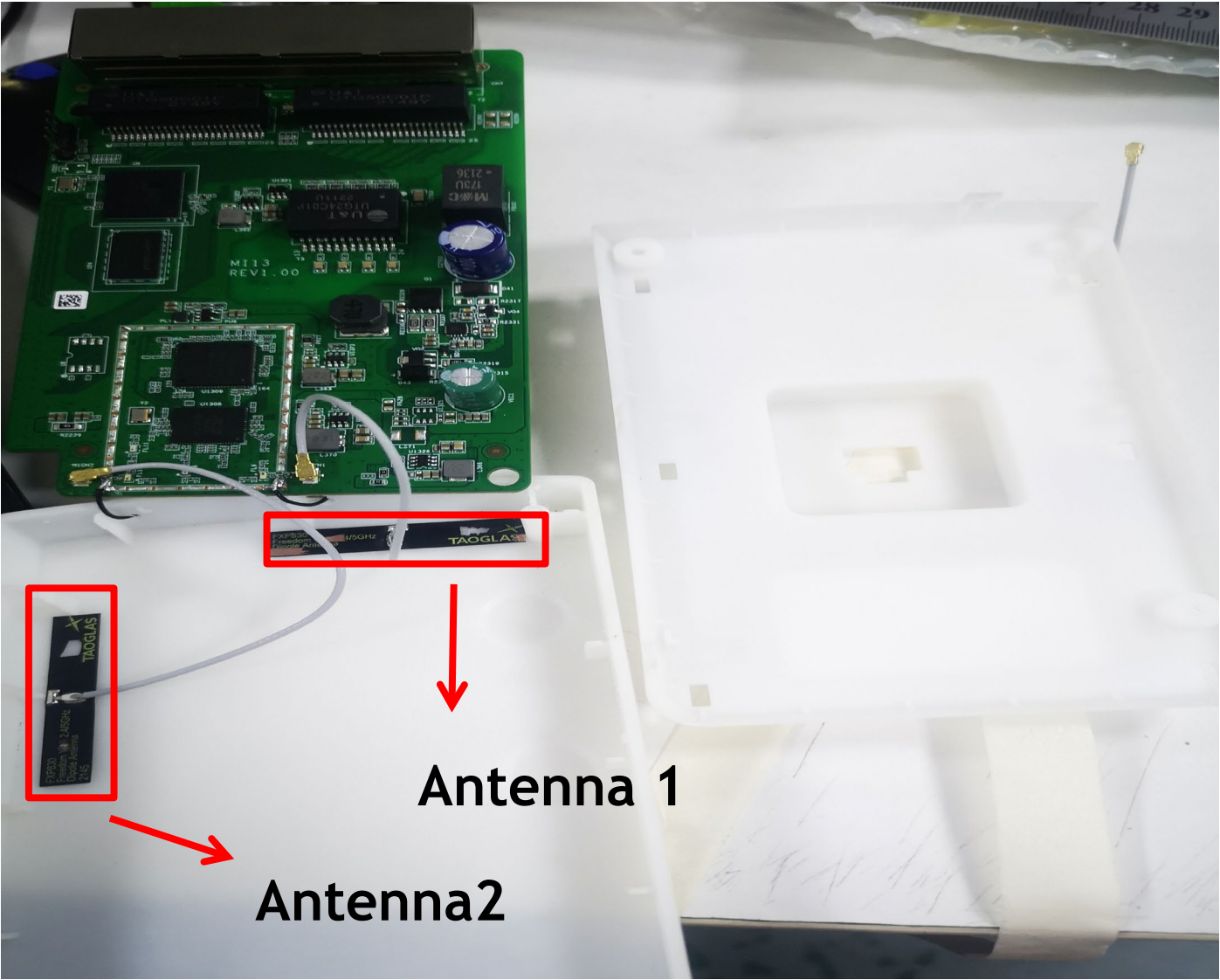
- Testing range from 9KHz to 8.5GHz or 400KHz~6.5GHz
- Network Analyzer(Agilent-E5071C or R&S ZVL)



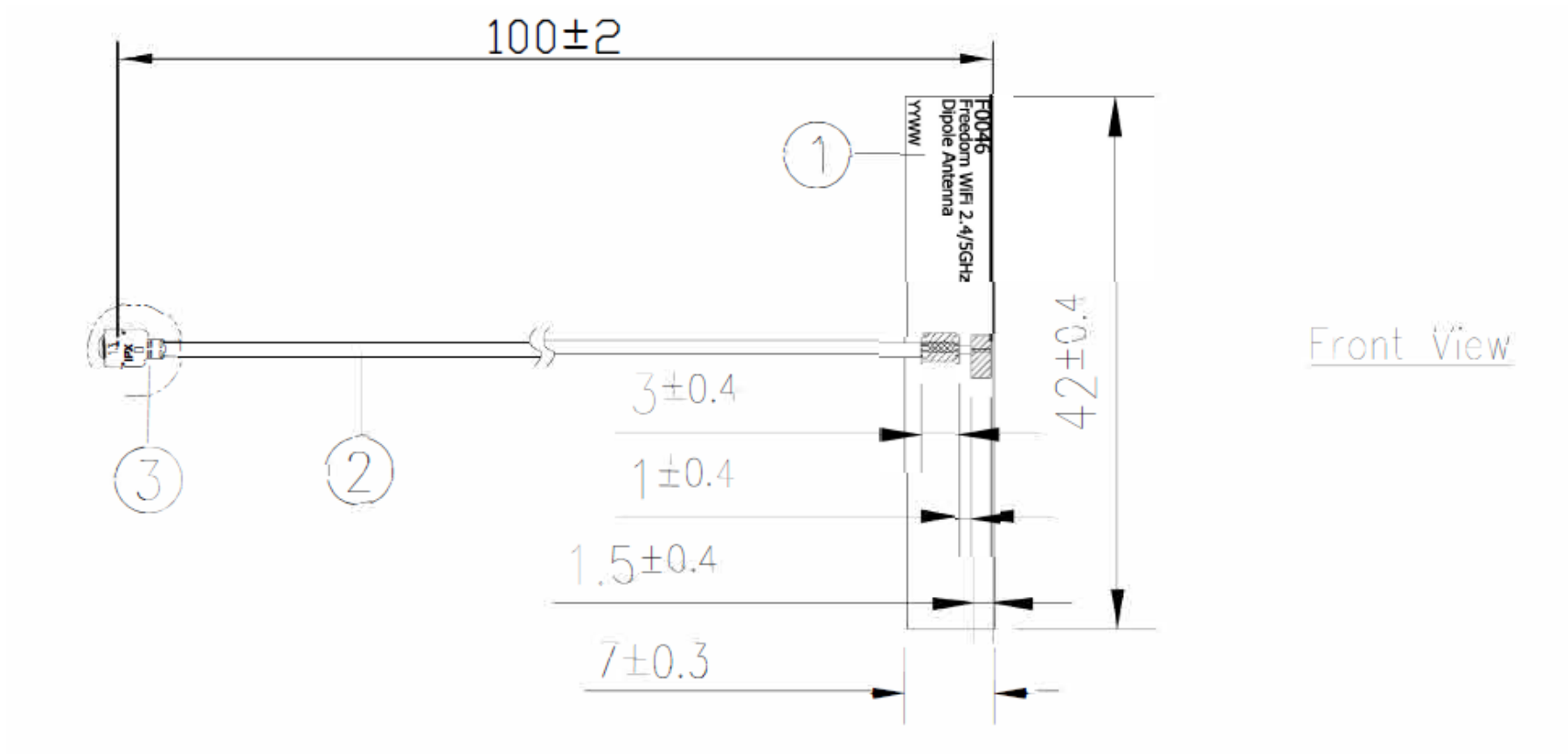
1.0 Darkroom test picture



2.0. Antenna Assembly Location

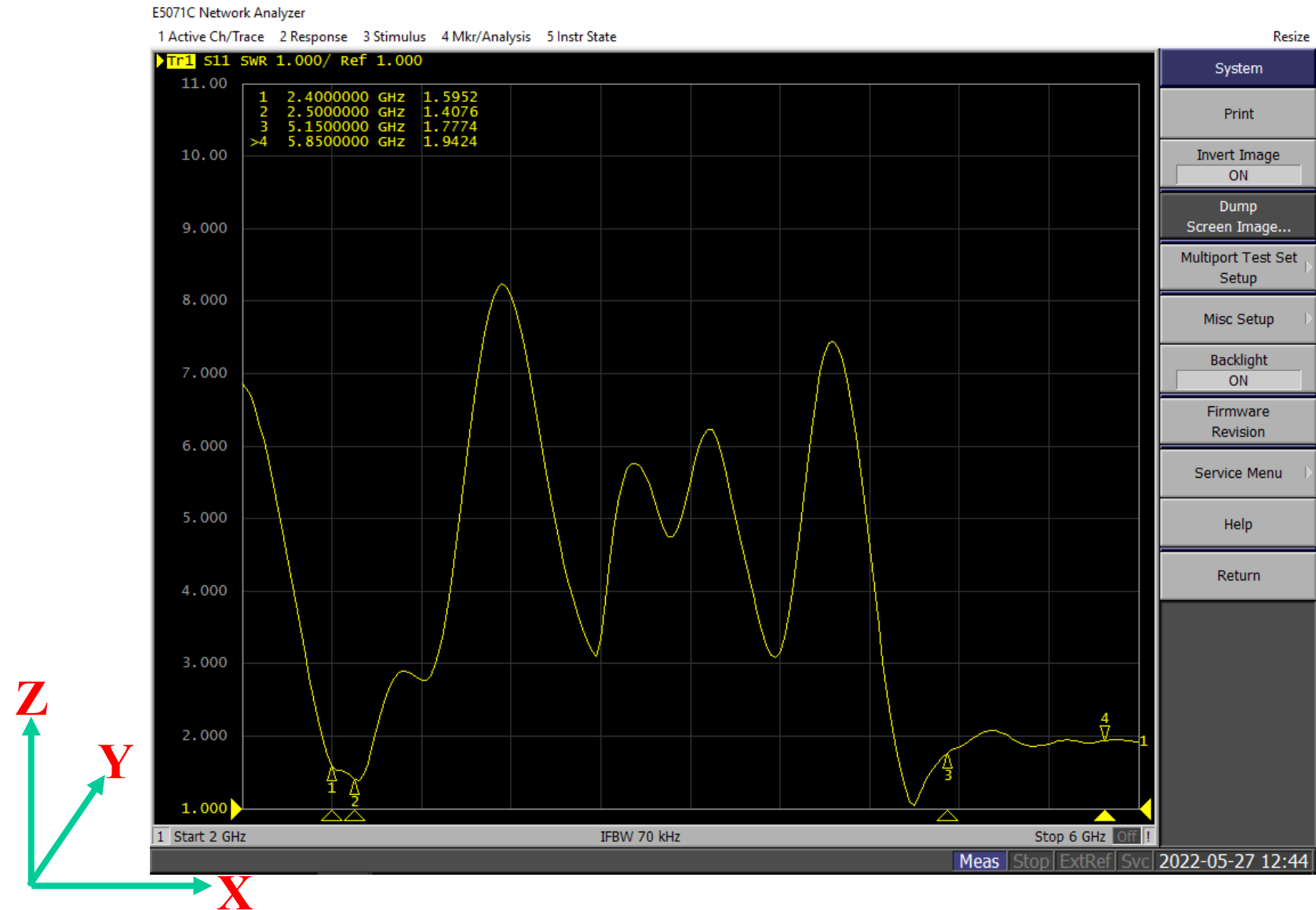


2.0 Antenna-type

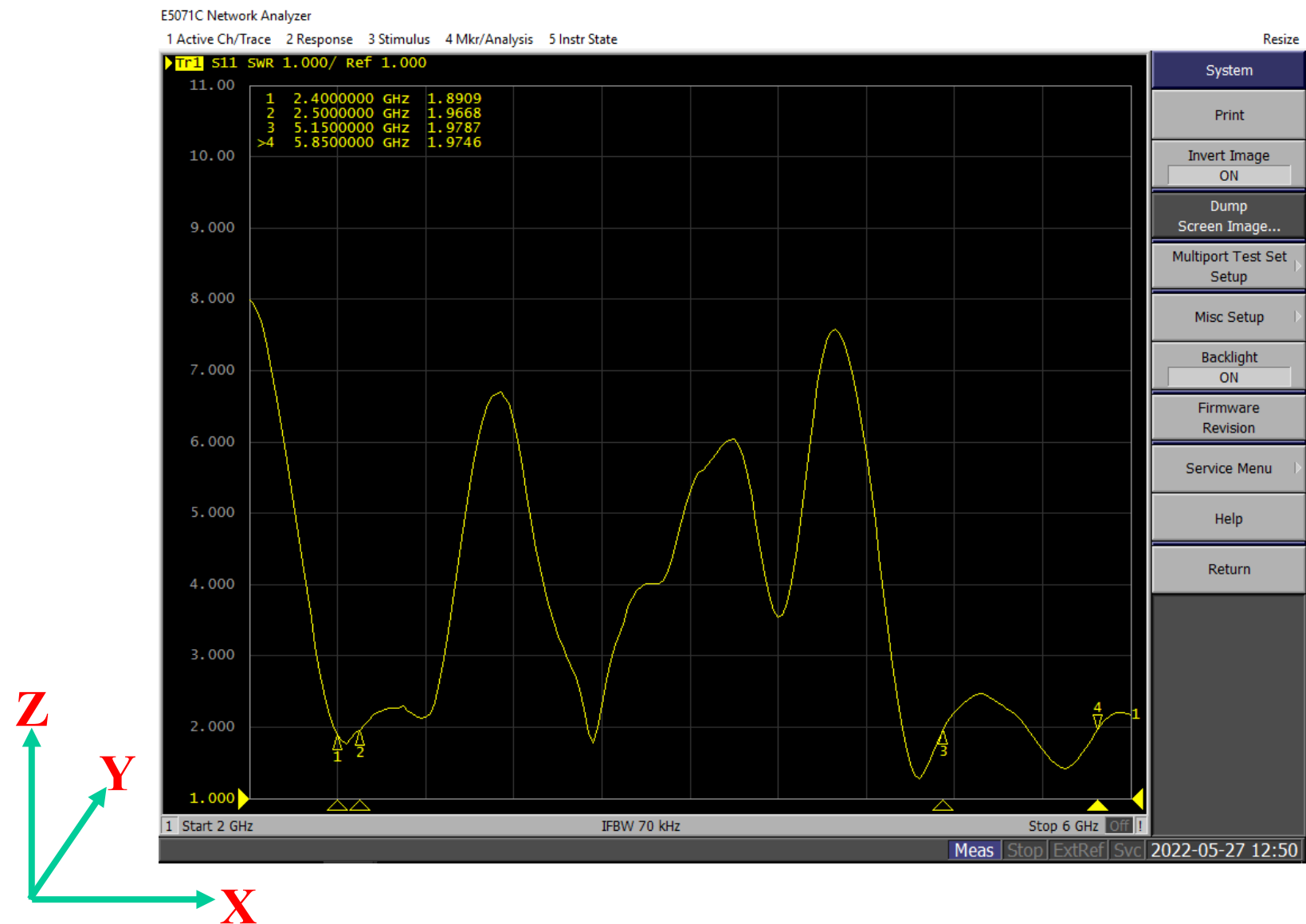


Unit: mm

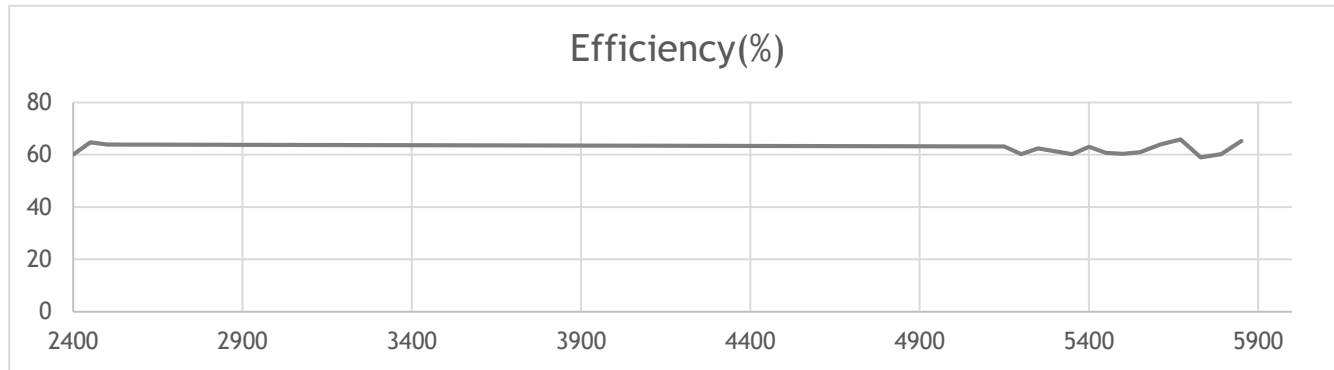
3.0 S-Parameters(Antenna 1 VSWR)



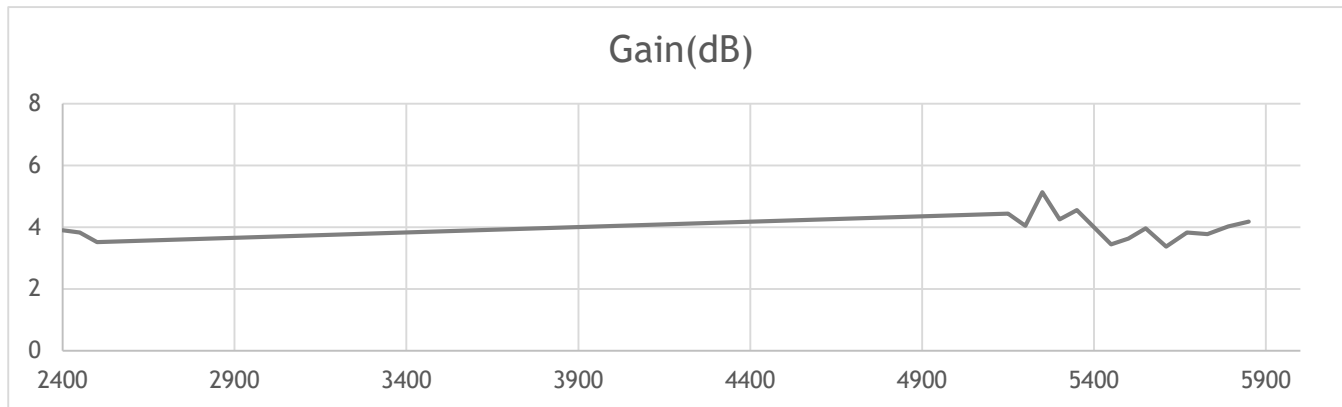
3.1 S-Parameters(Antenna 2 VSWR)



4.0 Antenna Efficiency & Peak Gain (Antenna 1)

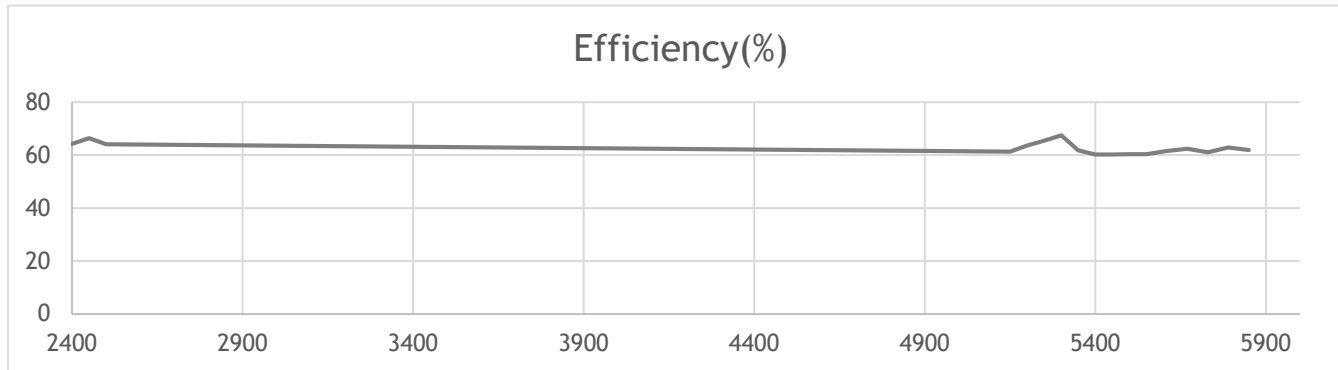


Antenna efficiency

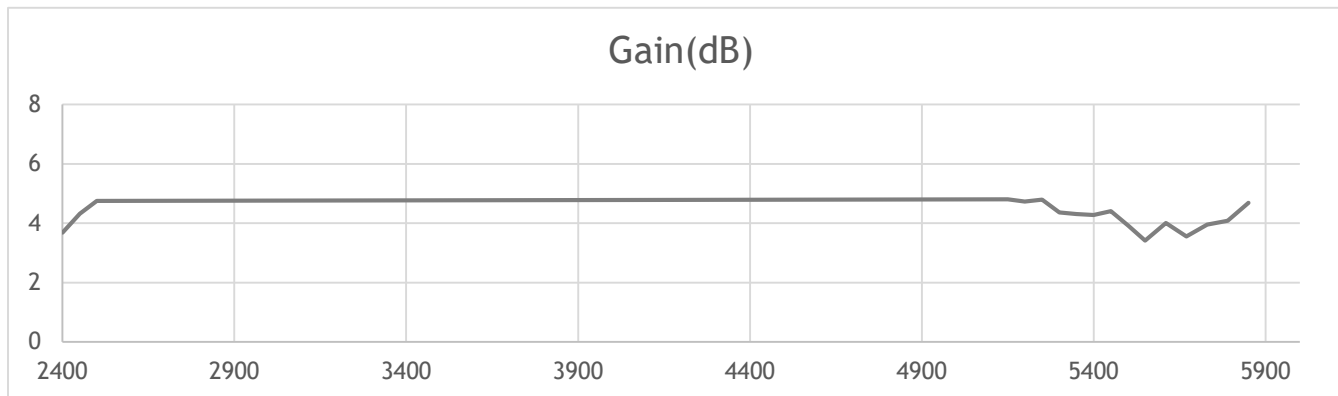


Antenna Gain

4.1 Antenna Efficiency & Peak Gain (Antenna 2)



Antenna efficiency

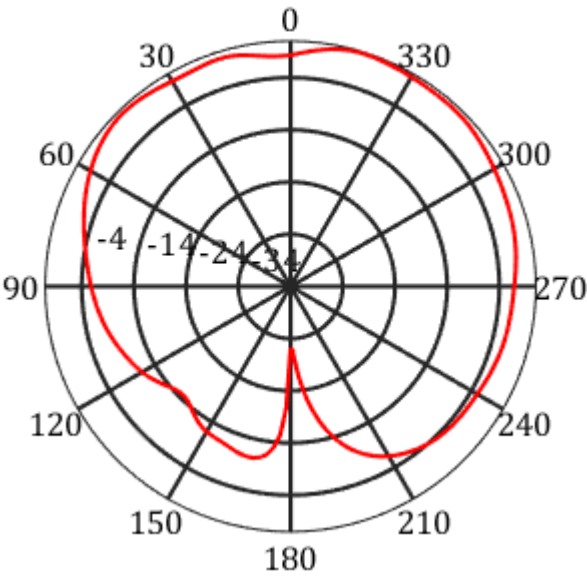


Antenna Gain

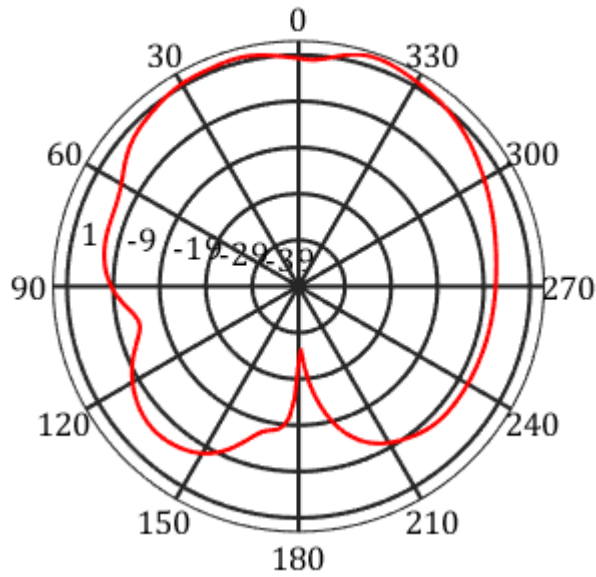
5.0 Radiation patterns—2D (Antenna 1)

2400MHz---2D

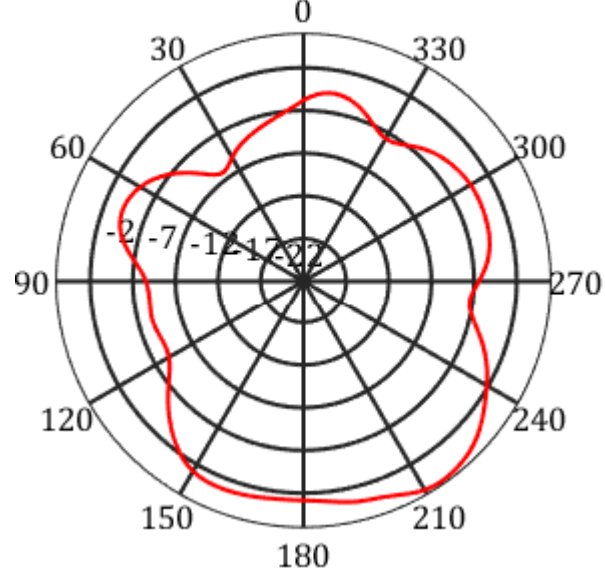
frequency=2400MHz, X-Z Plane



frequency=2400MHz, Y-Z Plane



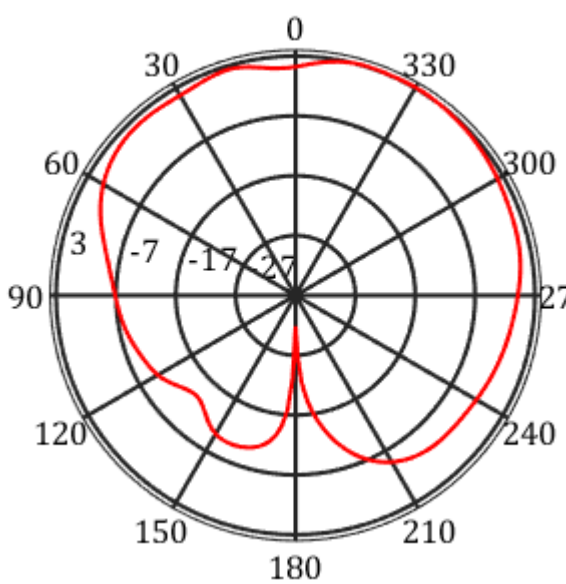
frequency=2400MHz, X-Y Plane



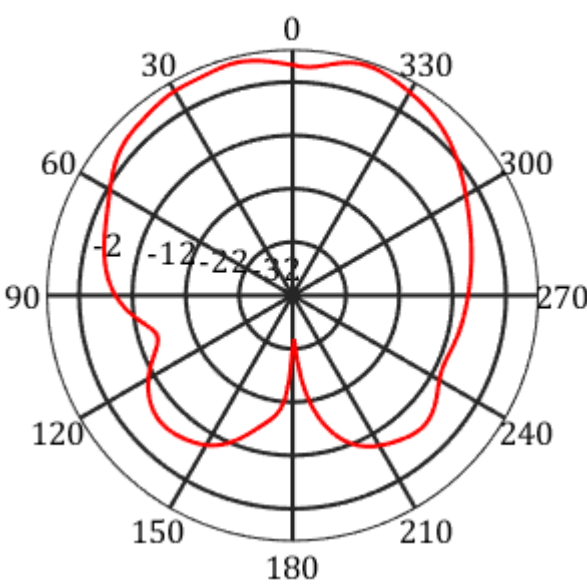
5.1 Radiation patterns—2D(Antenna 1)

2450MHz---2D

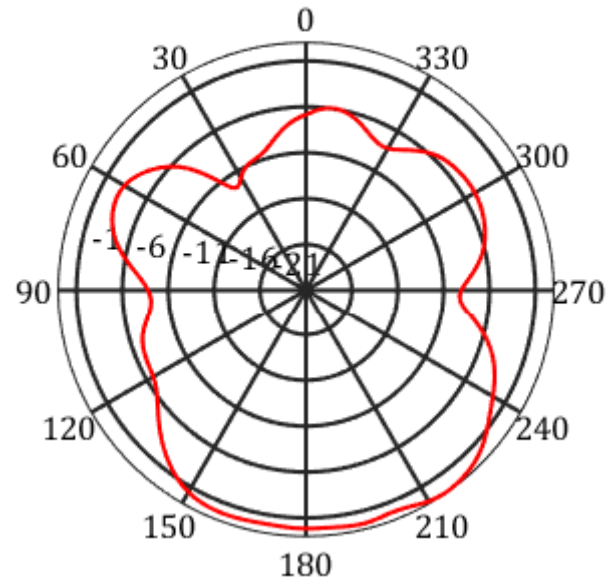
frequency=2450MHz, X-Z Plane



frequency=2450MHz, Y-Z Plane



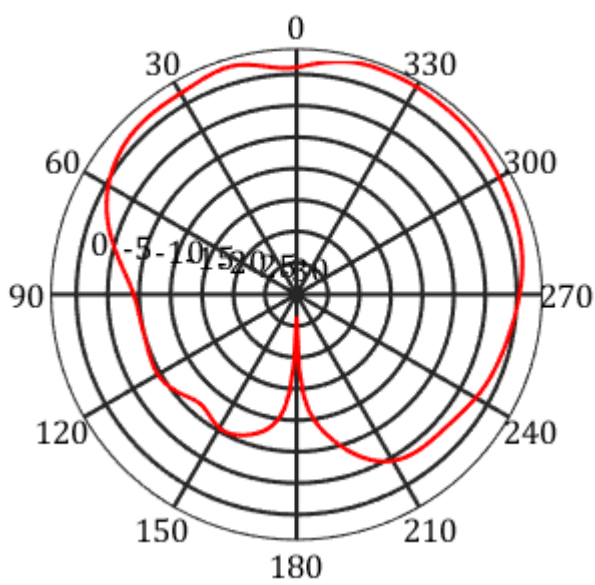
frequency=2450MHz, X-Y Plane



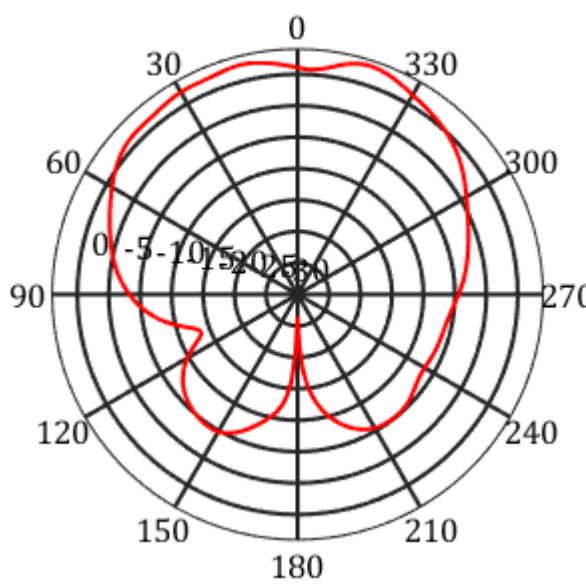
5.2 Radiation patterns—2D (Antenna 1)

2500MHz---2D

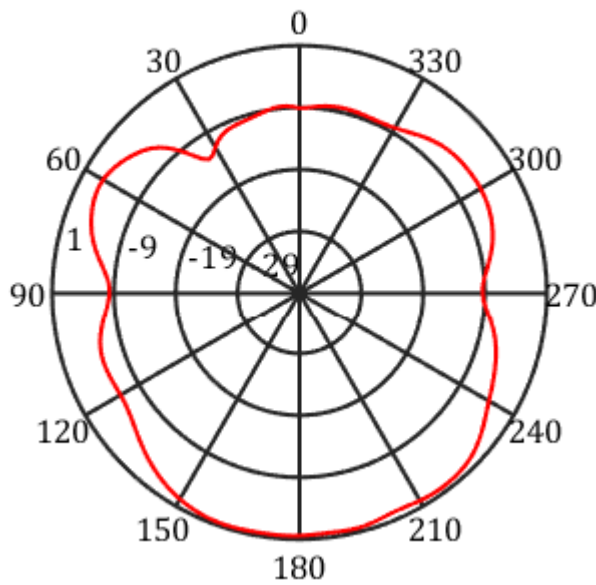
frequency=2500MHz, X-Z Plane



frequency=2500MHz, Y-Z Plane



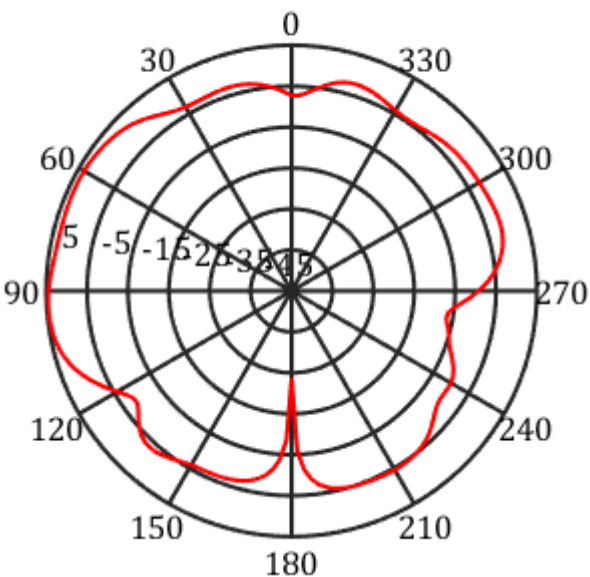
frequency=2500MHz, X-Y Plane



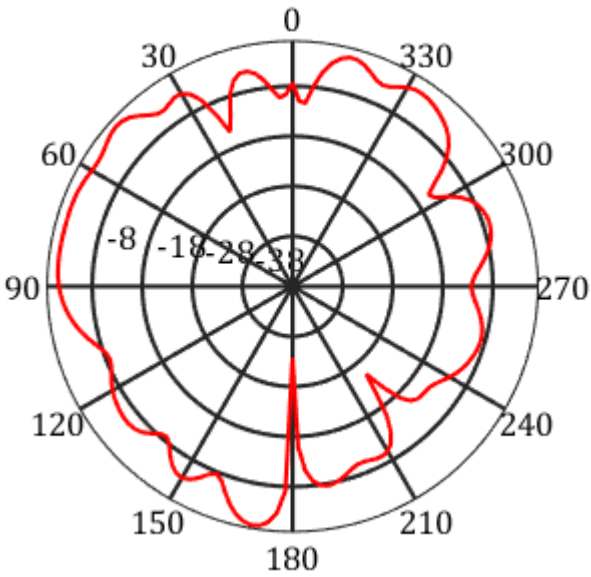
5.3 Radiation patterns—2D (Antenna 1)

5150MHz---2D

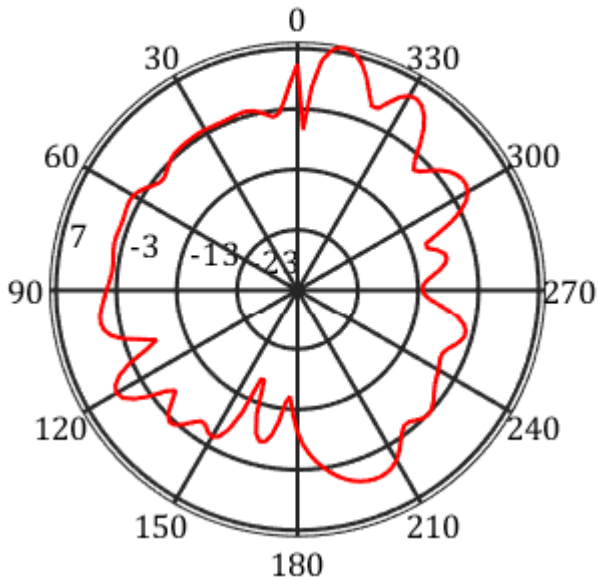
frequency=5150MHz, X-Z Plane



frequency=5150MHz, Y-Z Plane



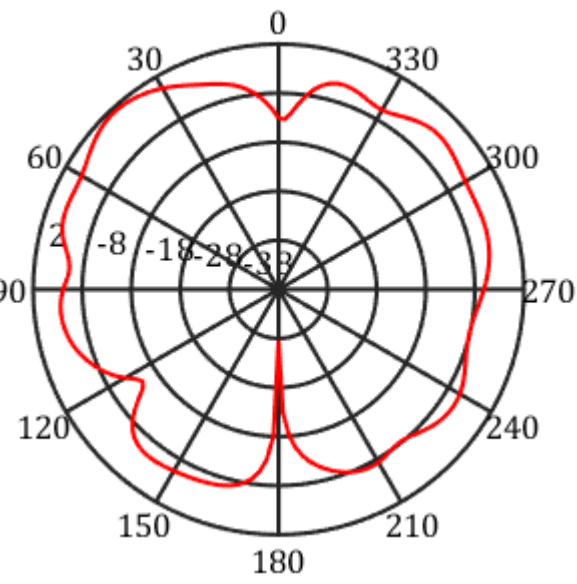
frequency=5150MHz, X-Y Plane



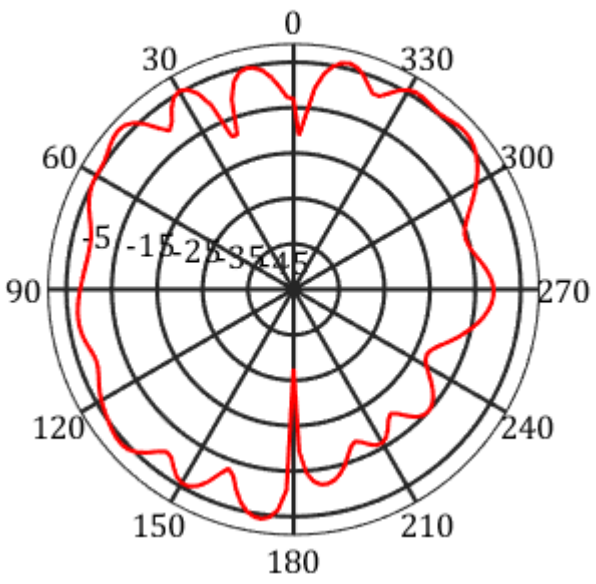
5.4 Radiation patterns—2D (Antenna 1)

5550MHz---2D

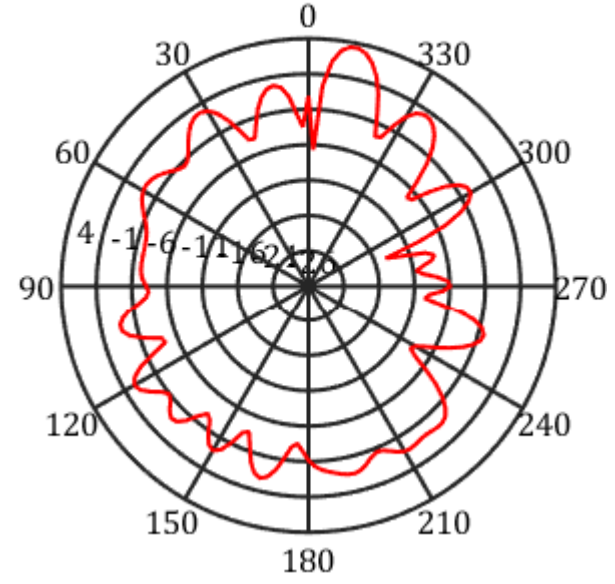
frequency=5550MHz, X-Z Plane



frequency=5550MHz, Y-Z Plane



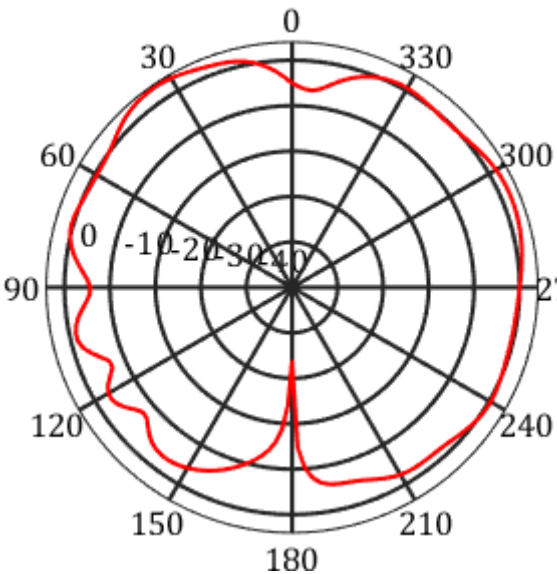
frequency=5550MHz, X-Y Plane



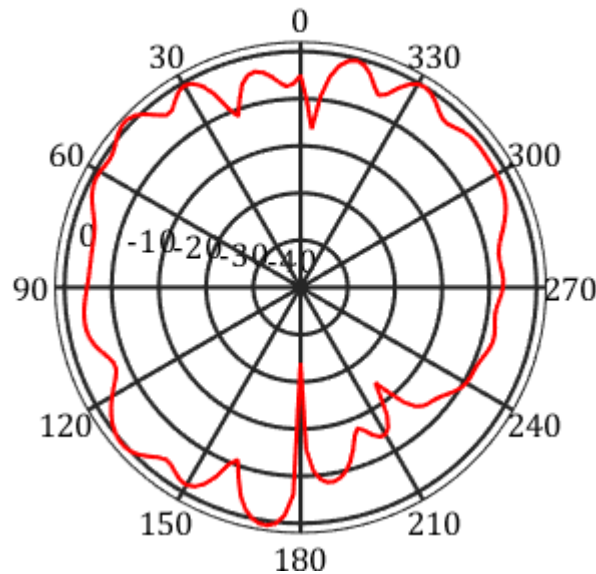
5.5 Radiation patterns—2D (Antenna 1)

5850MHz---2D

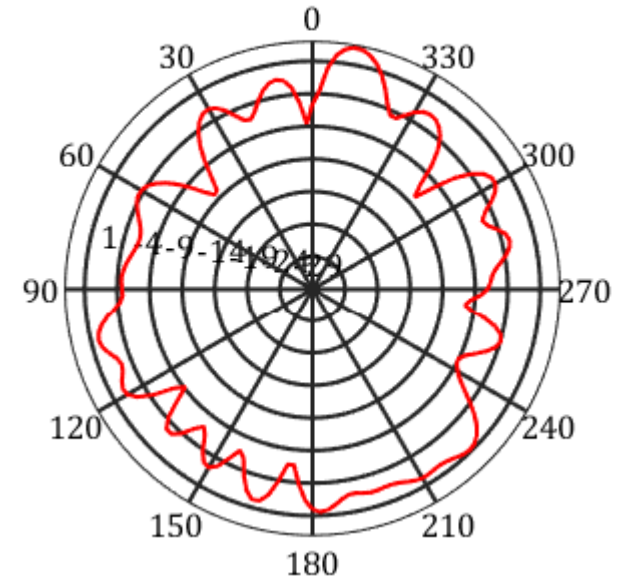
frequency=5850MHz, X-Z Plane



frequency=5850MHz, Y-Z Plane



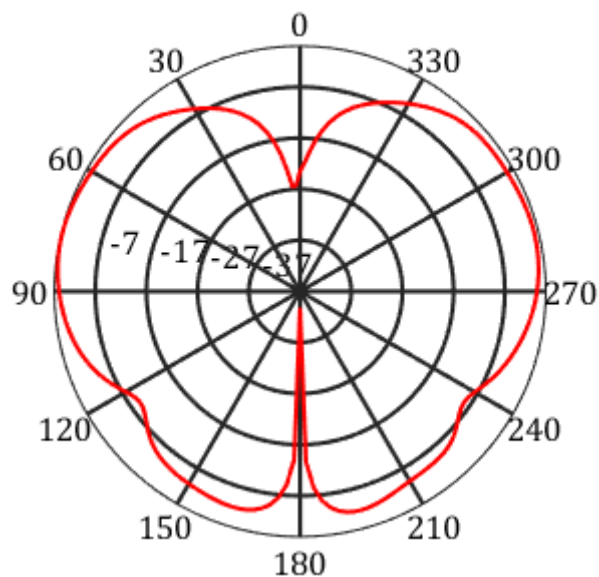
frequency=5850MHz, X-Y Plane



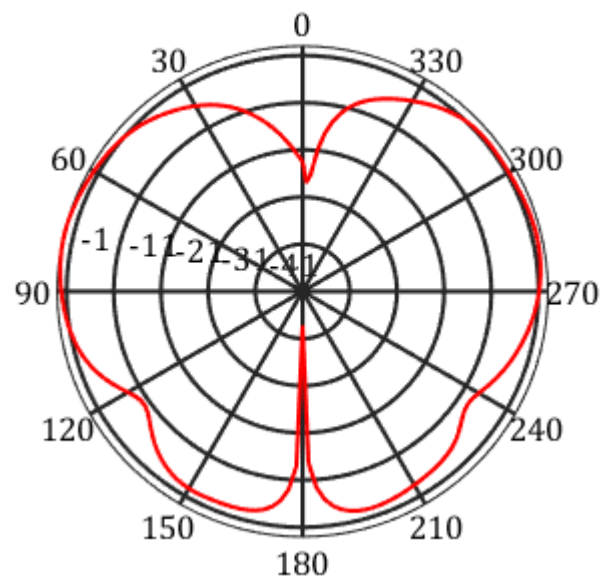
5.6 Radiation patterns—2D (Antenna 2)

2400MHz---2D

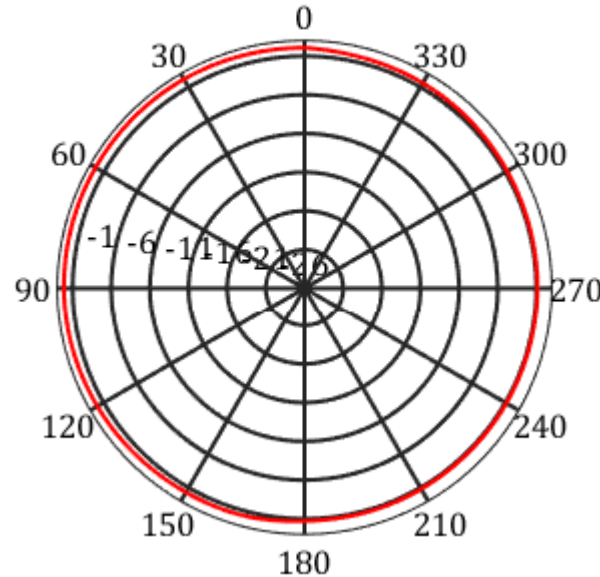
frequency=2400MHz, X-Z Plane



frequency=2400MHz, Y-Z Plane



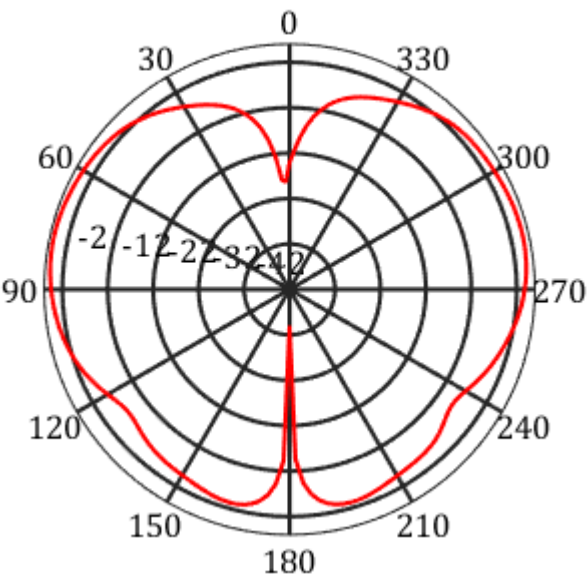
frequency=2400MHz, X-Y Plane



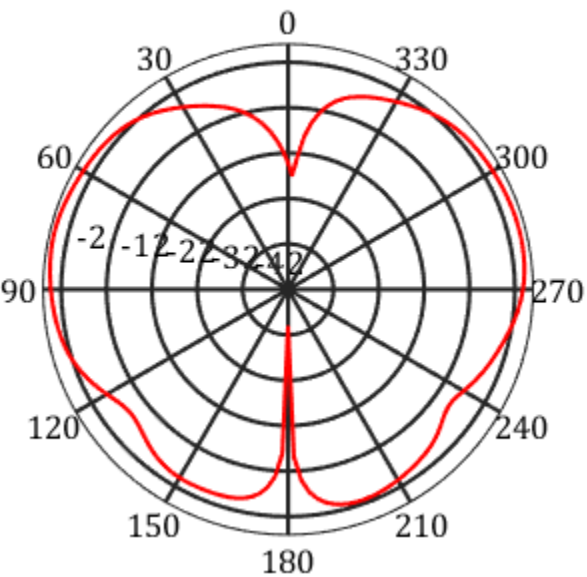
5.7 Radiation patterns—2D (Antenna 2)

2450MHz---2D

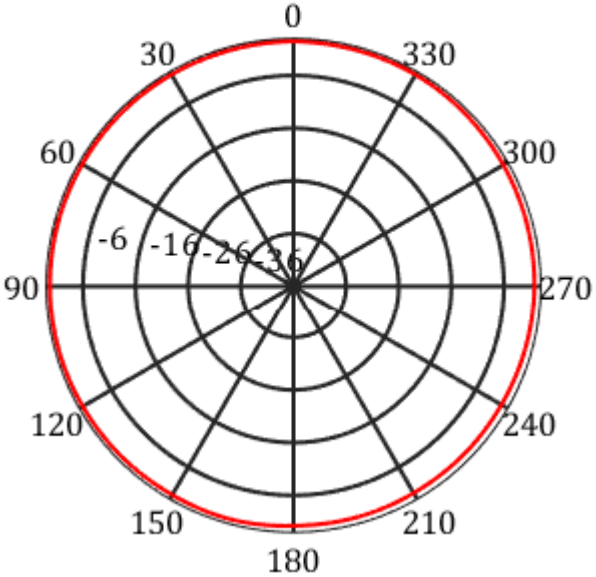
frequency=2450MHz, X-Z Plane



frequency=2450MHz, Y-Z Plane



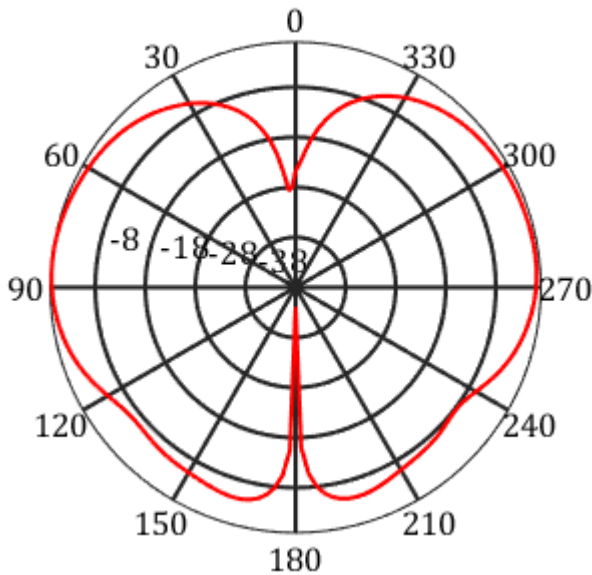
frequency=2450MHz, X-Y Plane



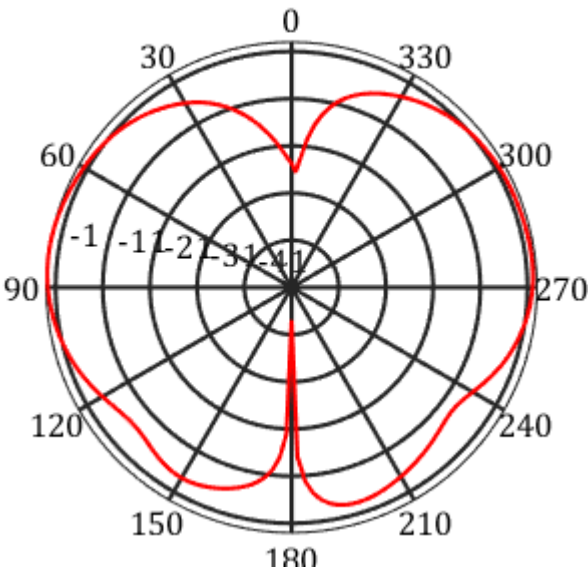
5.8 Radiation patterns—2D (Antenna 2)

2500MHz---2D

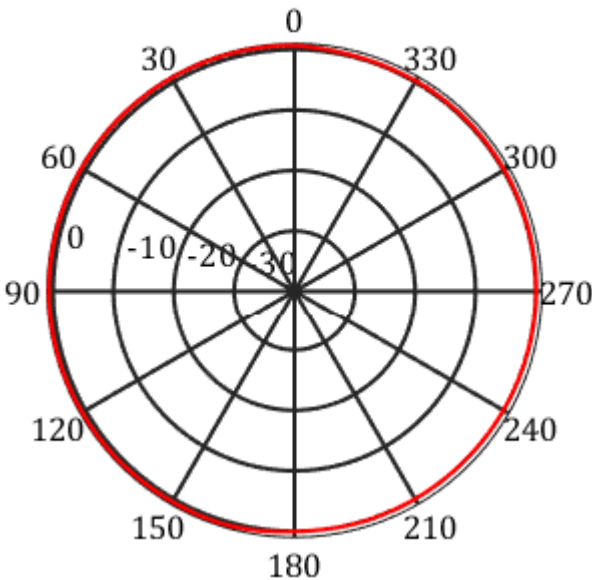
frequency=2500MHz, X-Z Plane



frequency=2500MHz, Y-Z Plane



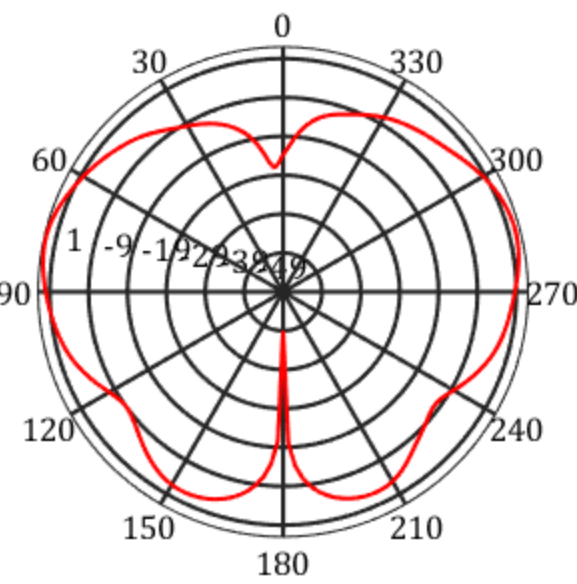
frequency=2500MHz, X-Y Plane



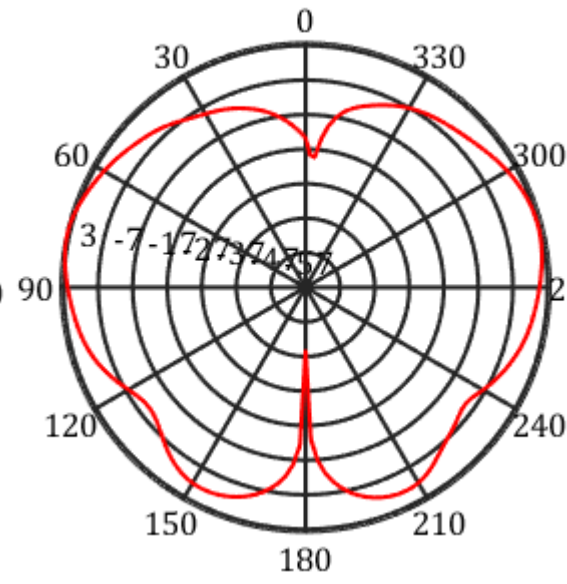
5.9 Radiation patterns—2D (Antenna 2)

5150MHz---2D

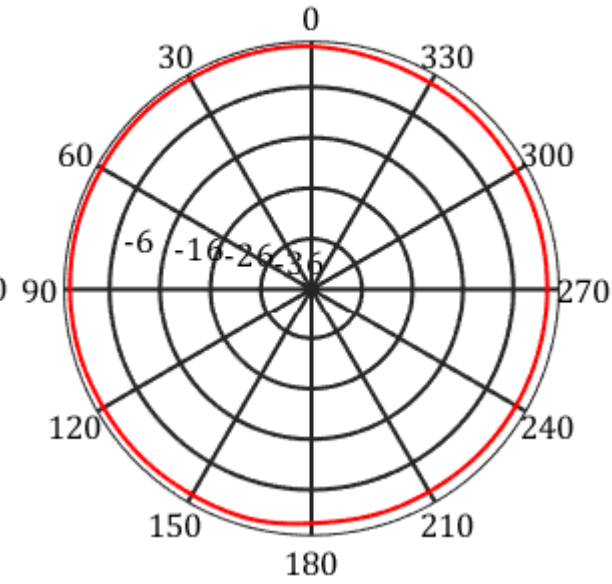
frequency=5150MHz, X-Z Plane



frequency=5150MHz, Y-Z Plane



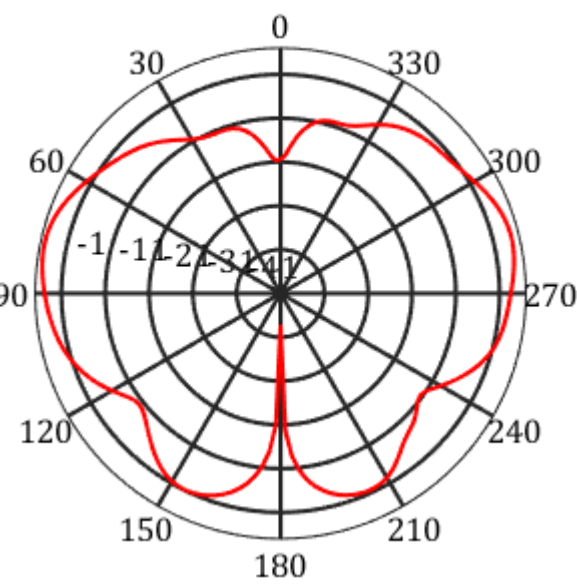
frequency=5150MHz, X-Y Plane



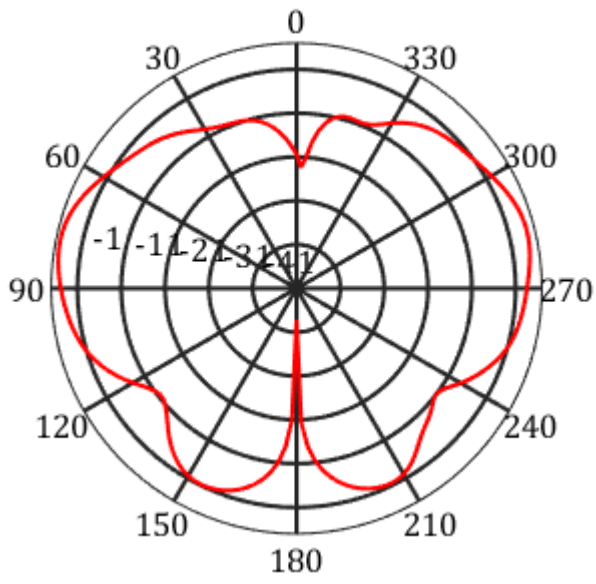
5.10 Radiation patterns—2D (Antenna 2)

5550MHz---2D

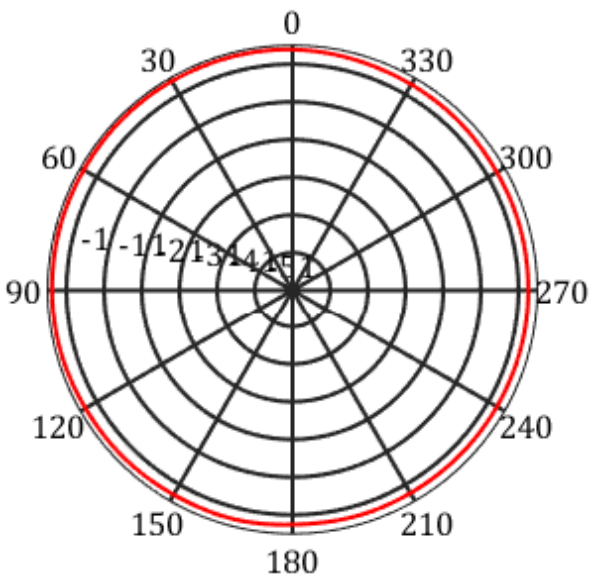
frequency=5550MHz, X-Z Plane



frequency=5550MHz, Y-Z Plane



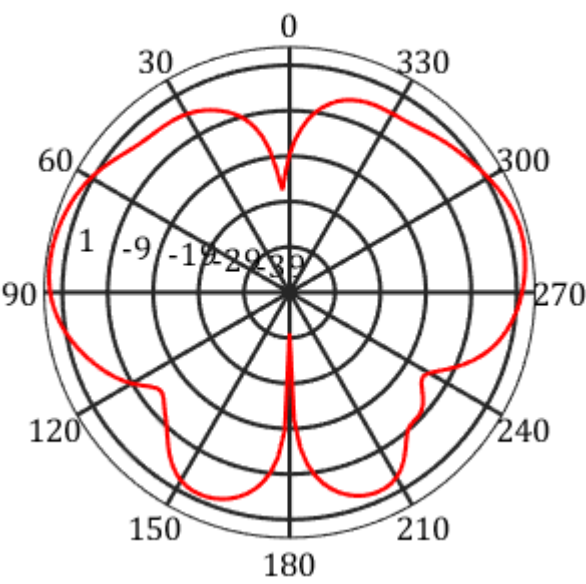
frequency=5550MHz, X-Y Plane



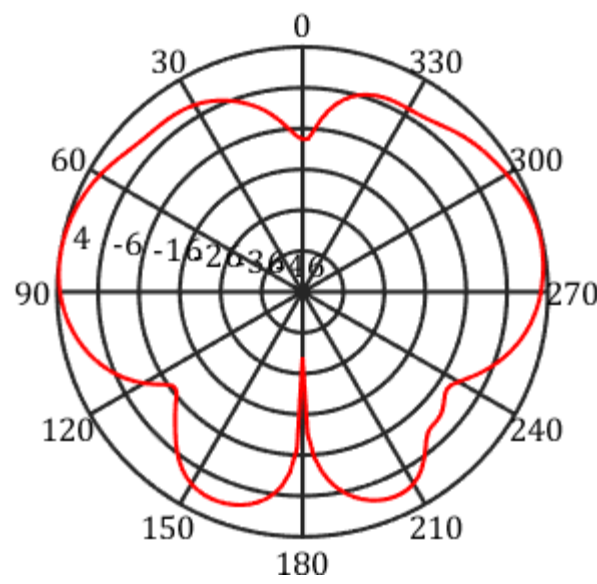
5.11 Radiation patterns—2D (Antenna 2)

5850MHz---2D

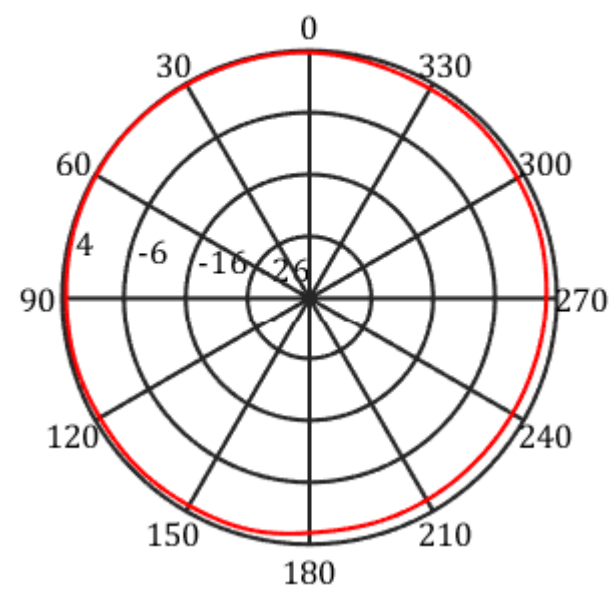
frequency=5850MHz, X-Z Plane



frequency=5850MHz, Y-Z Plane

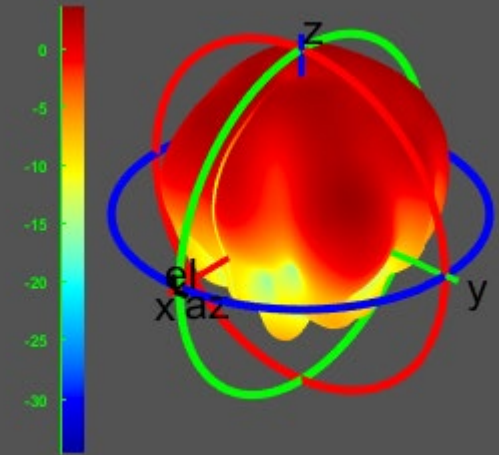
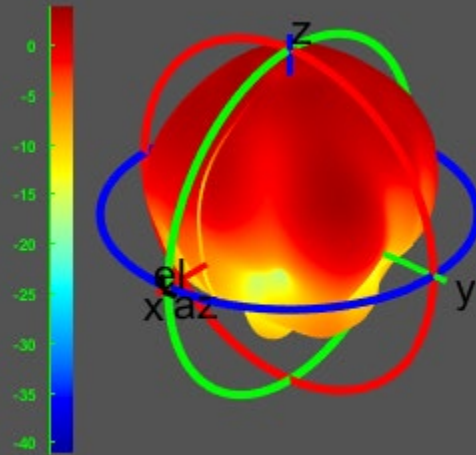
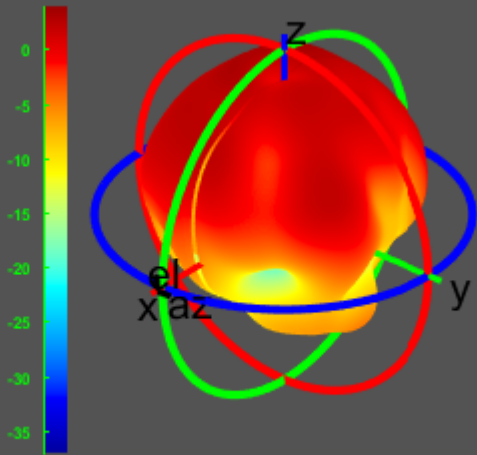


frequency=5850MHz, X-Y Plane



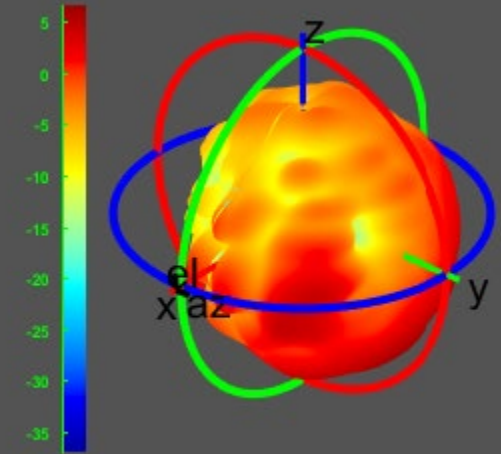
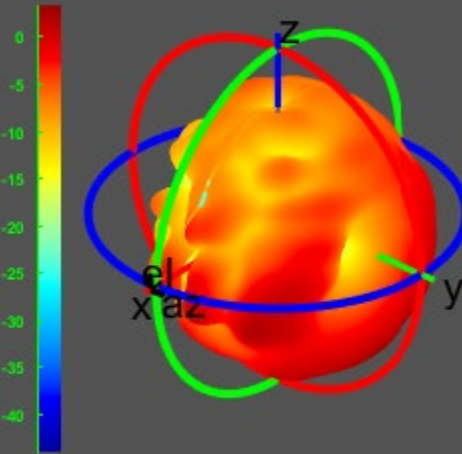
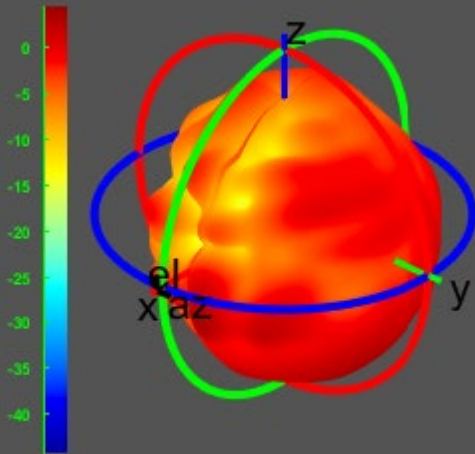
6.0 Radiation patterns—3D (**Antenna 1**)

2.4G---3D



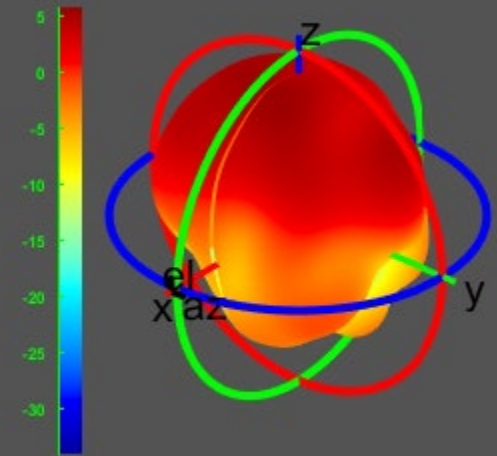
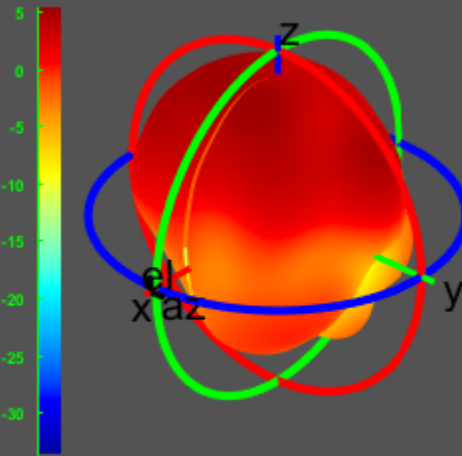
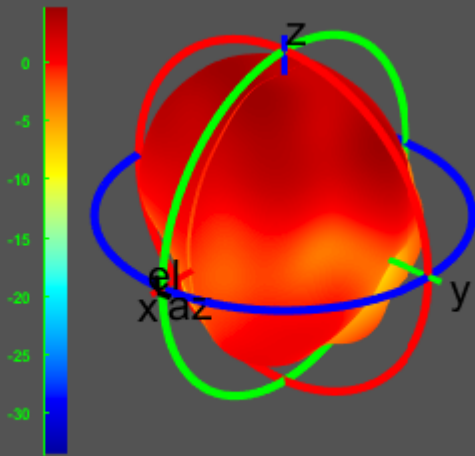
6.1 Radiation patterns—3D (**Antenna 1**)

5G---3D



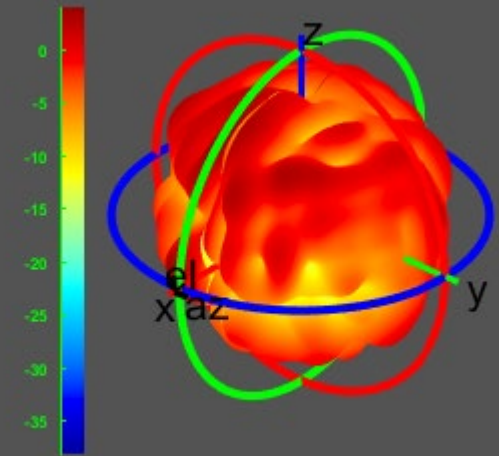
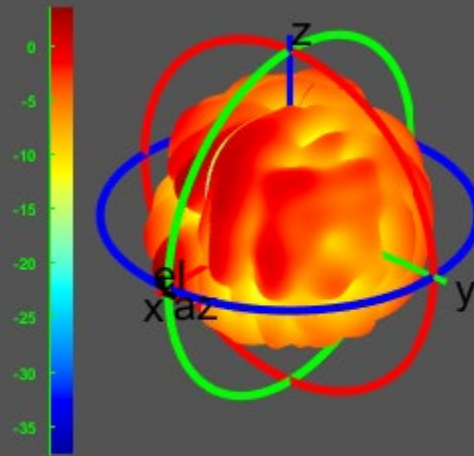
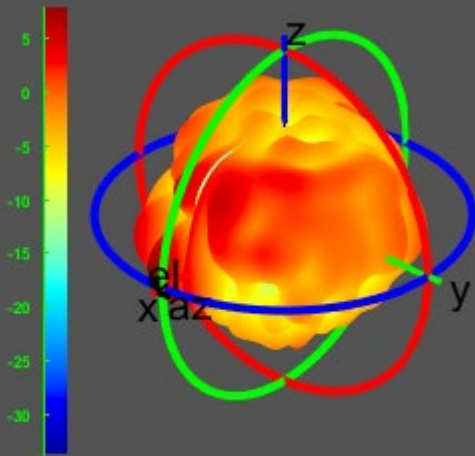
6.2 Radiation patterns—3D (**Antenna 2**)

2.4G---3D



6.3 Radiation patterns—3D (**Antenna 2**)

5G---3D



7.0 Antenna Gain and Efficiency (**Antenna 1**)

Frequency (MHz)	Gain (dB)	Efficiency (%)
2400	3.9025	60.1039
2450	3.8263	64.7221
2500	3.5163	63.9283
5150	4.4398	63.1759
5200	4.0412	60.1958
5250	5.1312	62.4551
5300	4.2535	61.2905
5350	4.5575	60.1913
5400	3.9947	63.02
5450	3.4439	60.6775
5500	3.6349	60.3684
5550	3.967	60.9207
5610	3.369	63.891
5670	3.8332	65.8203
5730	3.7803	59.0272
5790	4.0244	60.2033
5850	4.1829	65.1819

7.1 Antenna Gain and Efficiency (**Antenna 2**)

Frequency (MHz)	Gain (dB)	Efficiency (%)
2400	3.689	64.2081
2450	4.3161	66.4132
2500	4.7514	64.0583
5150	4.8076	61.3149
5200	4.7281	63.5387
5250	4.7922	65.337
5300	4.3596	67.4524
5350	4.3128	61.8258
5400	4.2804	60.1495
5450	4.4053	60.2347
5500	3.9229	60.3595
5550	3.4151	60.3471
5610	4.0104	61.4862
5670	3.5532	62.3311
5730	3.9499	61.0195
5790	4.088	62.9164
5850	4.6852	61.8978