

5G Antenna Box

YB0007xx Datasheet

Antenna Services

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About the Document

Revision History

Version	Date	Author	Note
-	2020-05-20	Kenny YIN	Creation of the document
1.0	2020-05-20	Kenny YIN	First official release
2.0	2020-05-25	Kenny YIN	Updated the efficiency specifications.
3.0	2020-07-17	Kenny YIN	Updated the product pictures.
4.0	2020-10-26	Kenny YIN	Added the frequency band and cable information.
4.1	2020-11-18	Kenny YIN	Added the interface information.
4.2	2020-12-20	Kenny YIN	Updated the cover.
5.0	2021-01-06	Kenny YIN	Added the performance under 600 MHz and the OTA&GNSS data.
5.1	2021-01-14	Kenny YIN	Updated the drawing of product dimensions in Chapter 5.
6.0	2021-04-28	Aria CHU	Updated all test data in the datasheets.
6.1	2021-06-10	Kenny YIN	Added the IP rating in Chapter 3.
6.2	2021-07-09	Aria CHU	Updated the value of gain in Chapter 3.

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1 Product Description

The antenna box is designed for superior performance, and can be widely used for wireless applications.

We provide comprehensive antenna design support such as simulation, testing and manufacturing for custom antenna solutions to meet your specific application needs.

- YB0007AA
- YB0007BA
- YB0007CA
- YB0007DA
- YB0007EA

2 Product Features

- 5G antenna box
- High efficiency
- Excellent performance



3 Product Specifications

Passive Electrical Specifications

Frequency Range	700–960 MHz, 1100–2690 MHz, 3300–5000 MHz
Input Impedence	50 Ω
VSWR	≤ 4.0
Gain	≤ 8.0 dBi
Polarization Type	Linear

Mechanical Specifications

Antenna Box Size	Φ 120 mm \times 43 mm
Cable Length	YB0007AA: 500 mm YB0007BA: 1000 mm YB0007CA: 2000 mm YB0007DA: 3000 mm YB0007EA: 5000 mm
Connector Type	SMA Male (Center Pin)
Shell Material	KIBILAC [®] ASA
Working Temperature	-20 °C to +80 °C
Radome Color	Black
IP Rating	IP67 (IP rating of the antenna box after installation)
Installation Method	Screw

4 Overall Performance

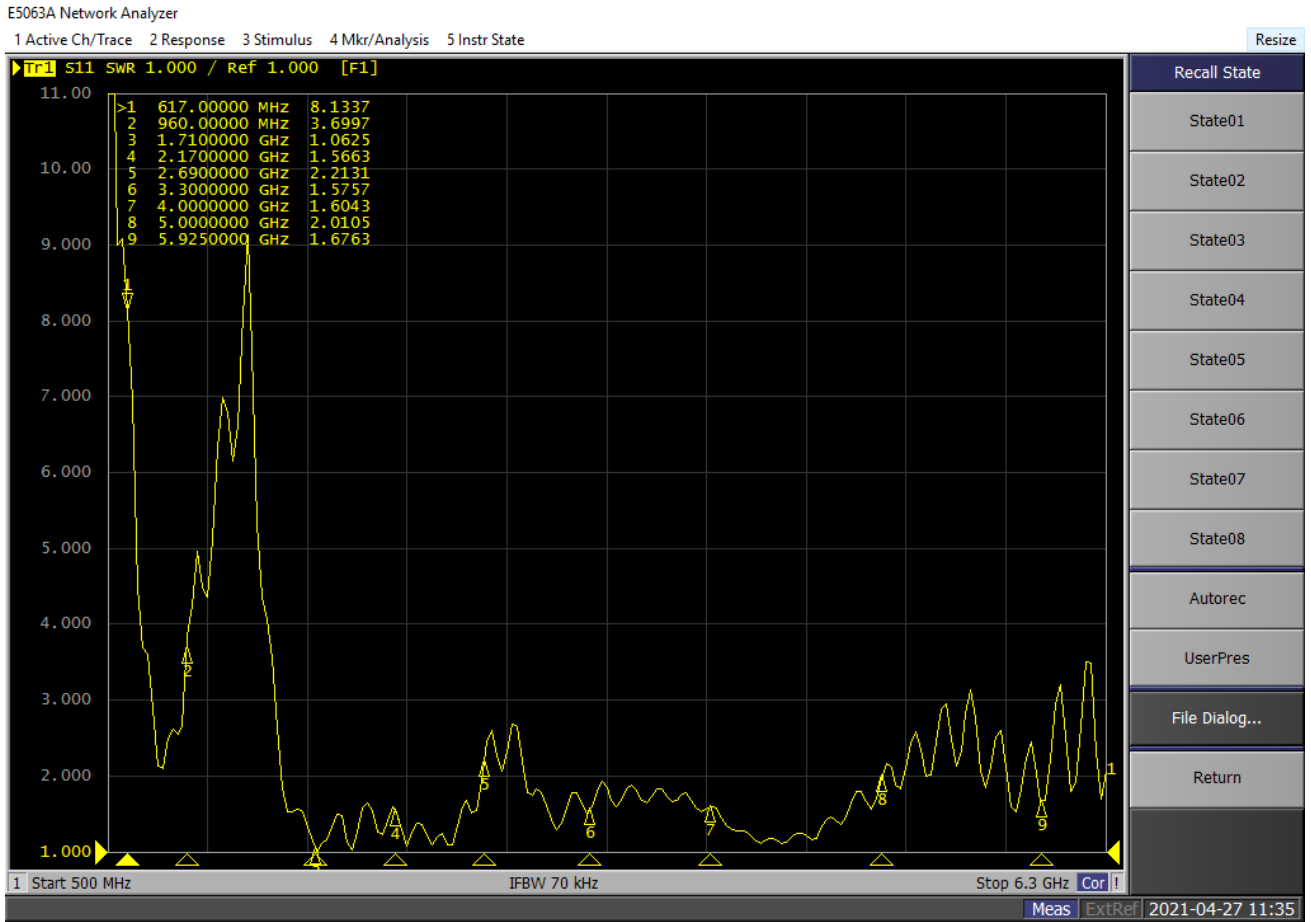
4.1. Test Environment

- KEYSIGHT VNA Network Analyzer E5063A 100 kHz – 8.5 GHz
- RayZone®2800 Chamber 5G (FR1) SISO/MIMO, 400 MHz – 8.0 GHz



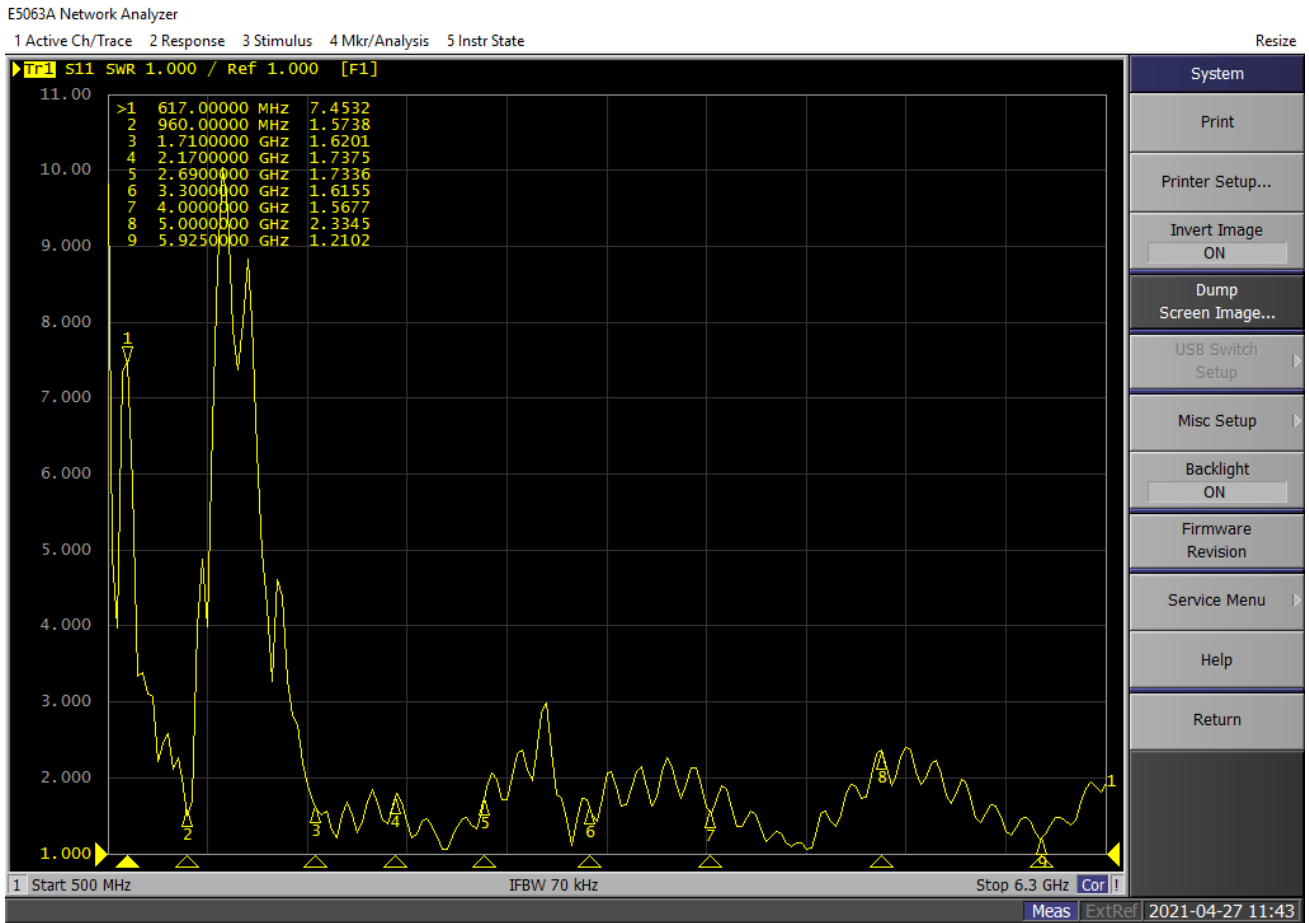
4.2. VSWR (500 mm Cable Length)

4.2.1. 4G&5G Main Antenna (LMH#)



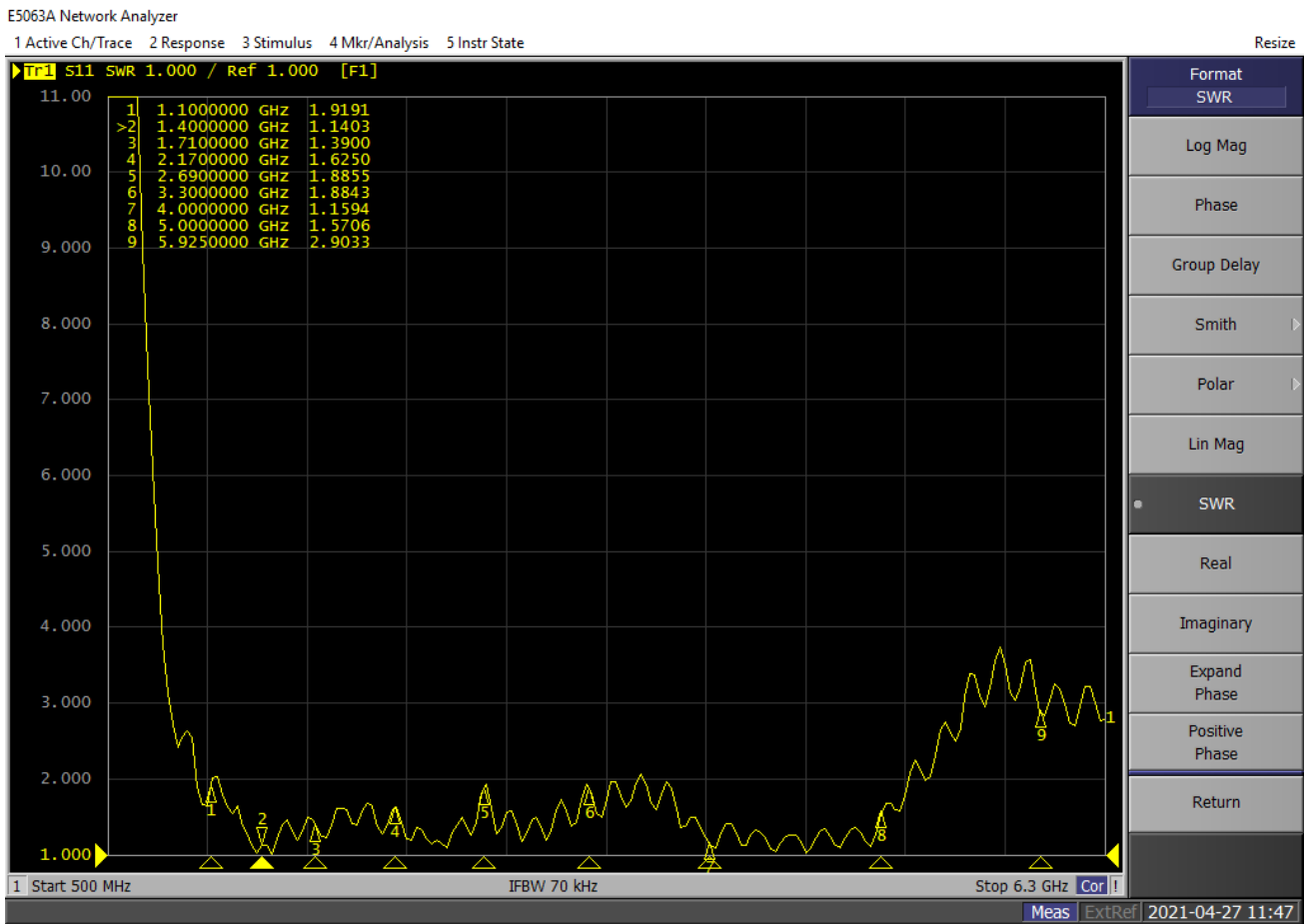
Frequency (MHz)	617	960	1710	2170	2690	3300	4000	5000	5925
VSWR	8.13	3.69	1.64	1.06	2.21	1.57	1.60	2.01	1.67

4.2.2. 4G&5G Diversity Antenna (LMH)



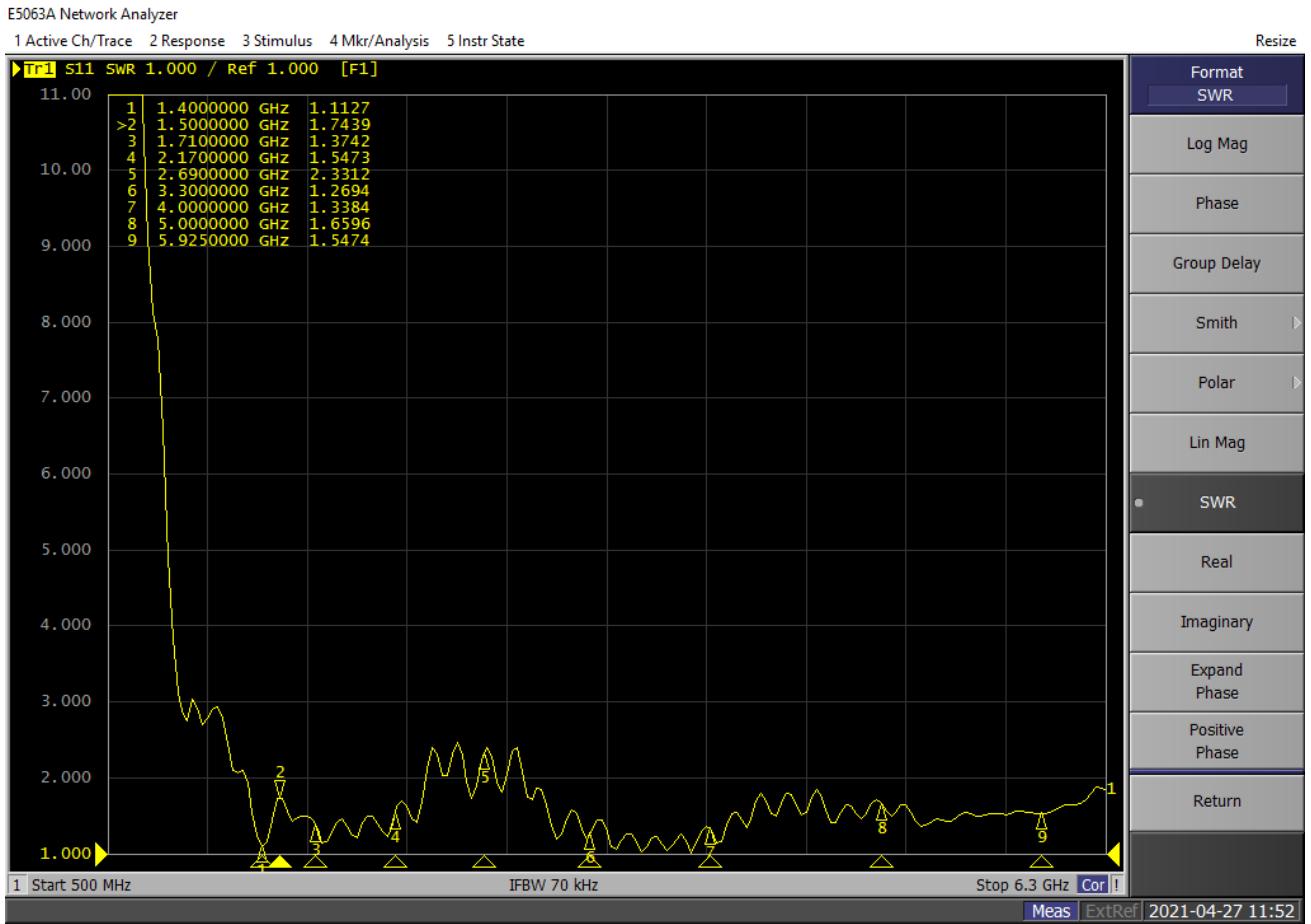
Frequency (MHz)	617	960	1710	2170	2690	3300	4000	5000	5925
VSWR	7.45	1.57	1.62	1.73	1.73	1.61	1.56	2.33	1.21

4.2.3. 5G-MIMO1 Antenna (*MH)



Frequency (MHz)	1100	1400	1710	2170	2690	3300	4000	5000	5925
VSWR	1.91	1.14	1.39	1.62	1.88	1.88	1.15	1.57	2.90

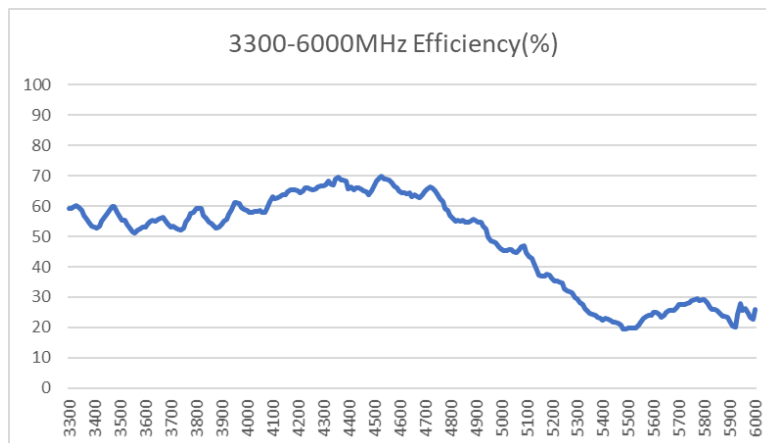
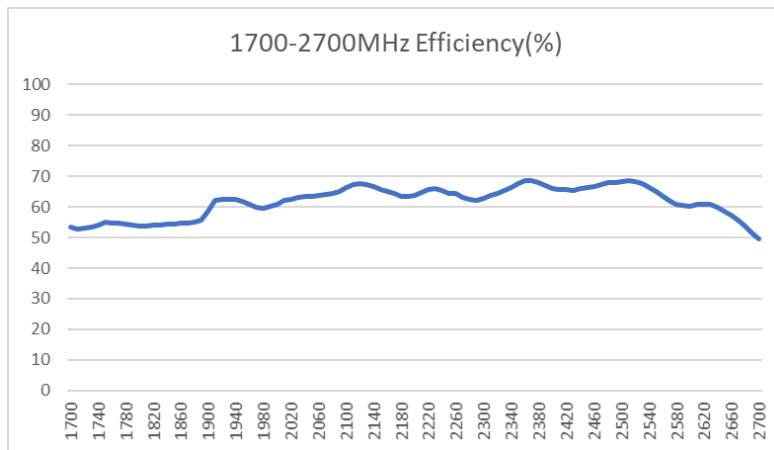
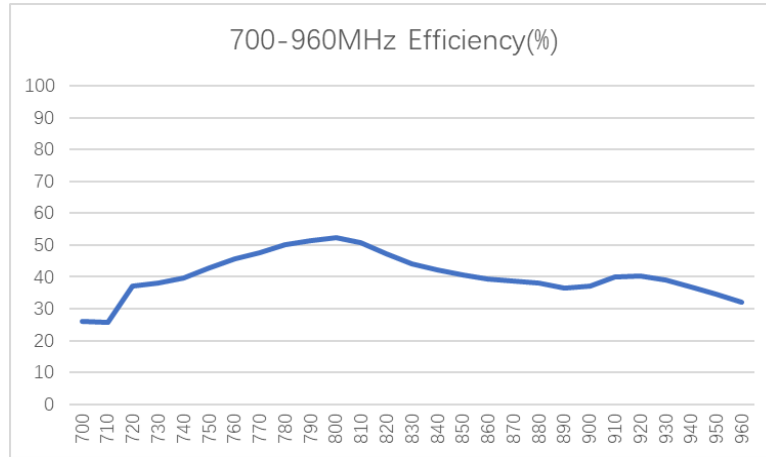
4.2.4. 5G-MIMO2 Main Antenna (MH)



Frequency (MHz)	1400	1500	1710	2170	2690	3300	4000	5000	5925
VSWR	1.11	1.74	1.37	1.54	2.33	1.26	1.33	1.65	1.54

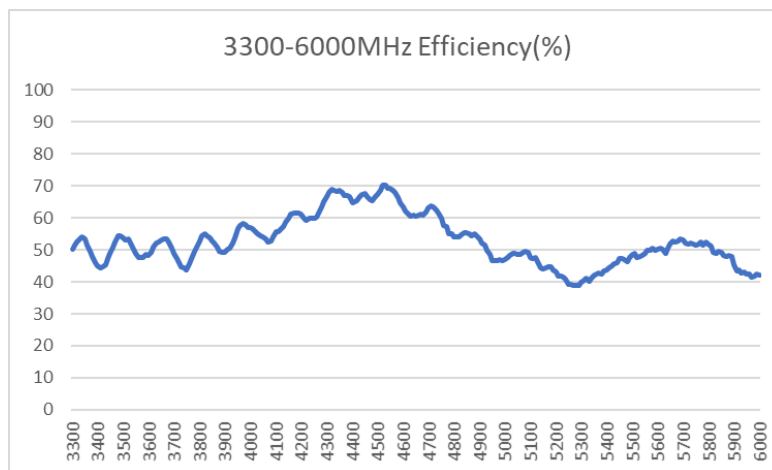
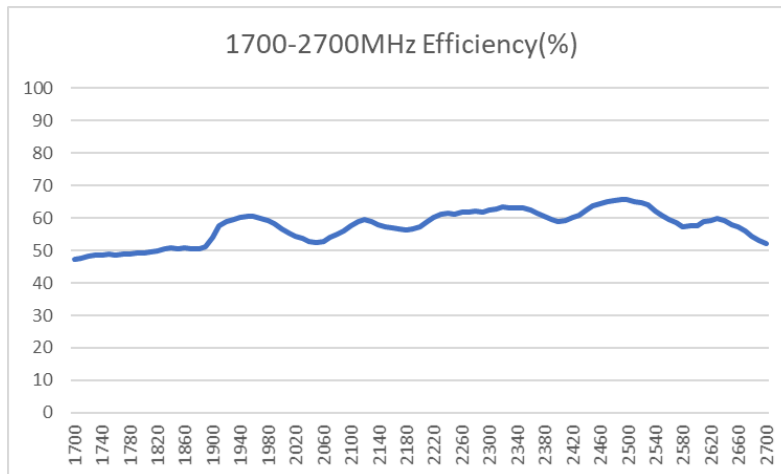
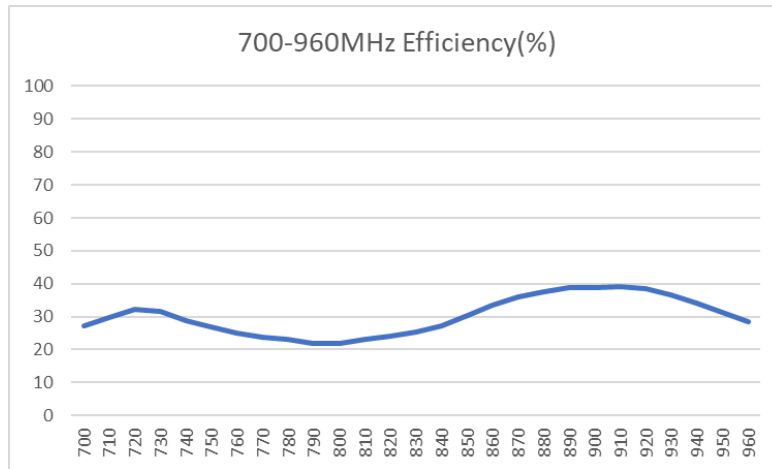
4.3. Efficiency (500 mm Cable Length)

4.3.1. 4G&5G Main Antenna (LMH#)



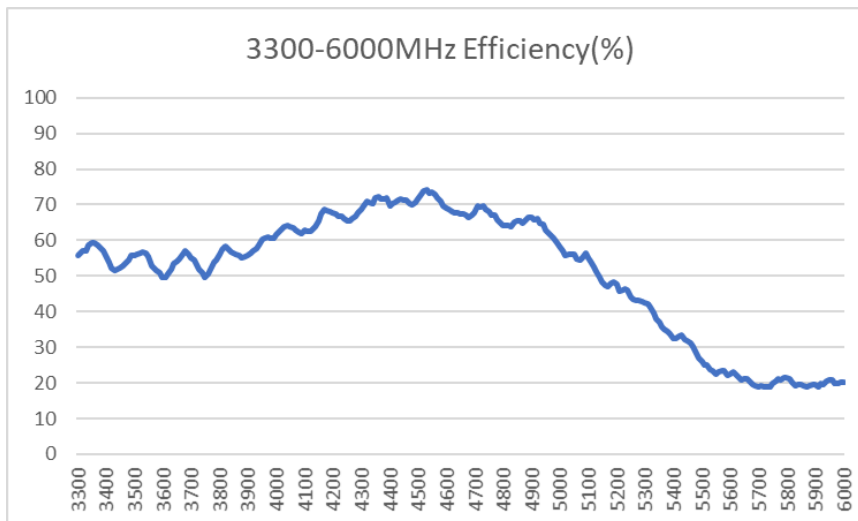
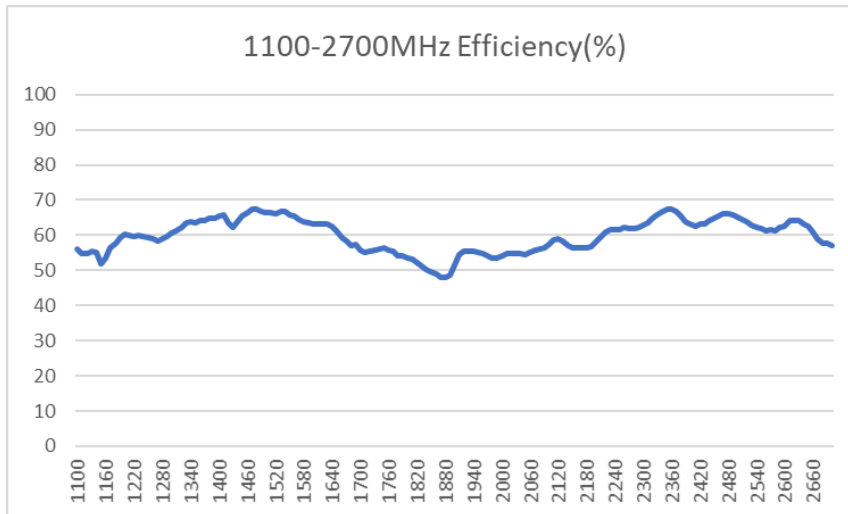
Frequency (MHz)	700	820	960	1710	2170	2690	3300	4000	5000	6000
Efficiency (%)	26	47	32	52	64	51	59	58	46	25

4.3.2. 4G&5G Diversity Antenna (LMH)



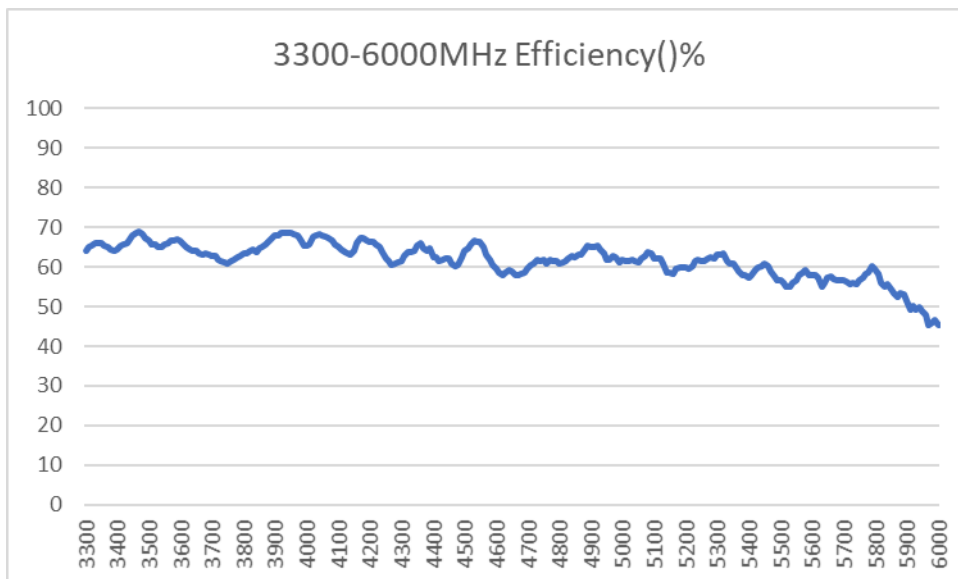
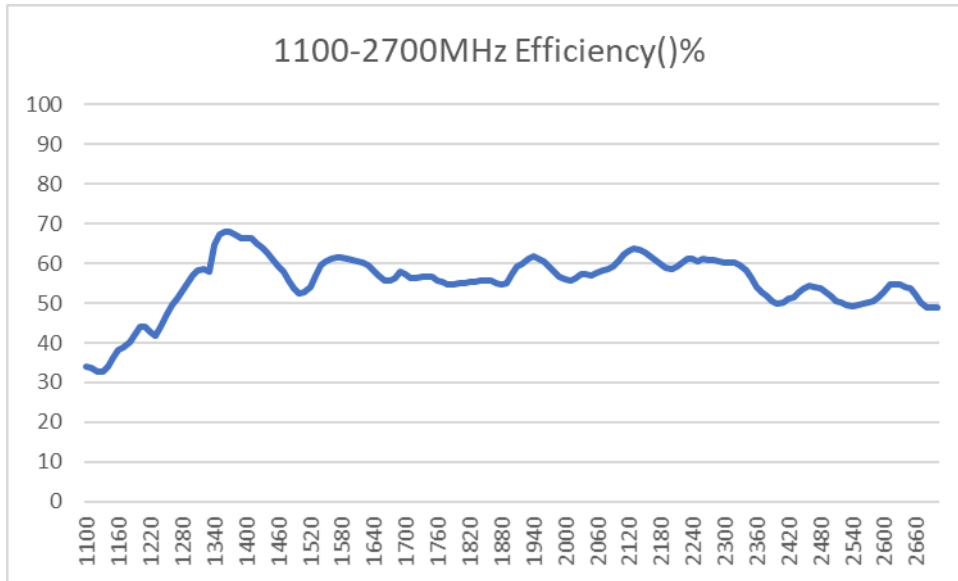
Frequency (MHz)	700	820	960	1710	2170	2690	3300	4000	5000	6000
Efficiency (%)	27	24	28	47	56	53	50	57	46	42

4.3.3. 5G-MIMO1 Antenna (*MH)



Frequency (MHz)	1100	1400	1710	2170	2690	3300	4000	5000	6000
Efficiency (%)	59	65	55	56	57	55	61	58	20

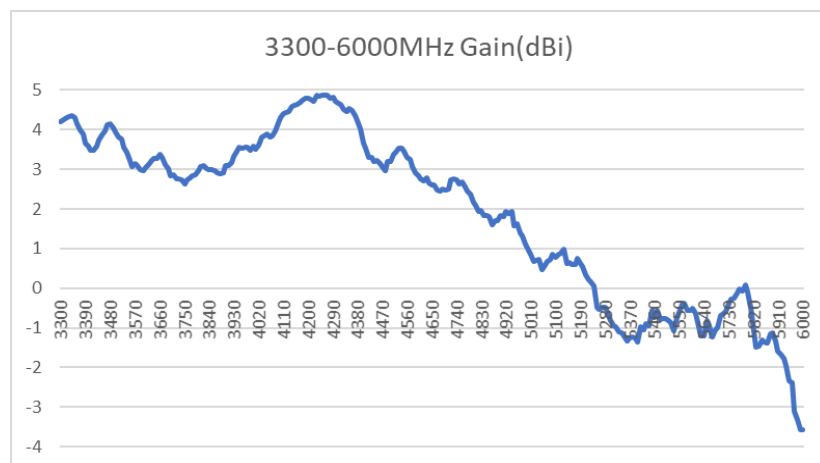
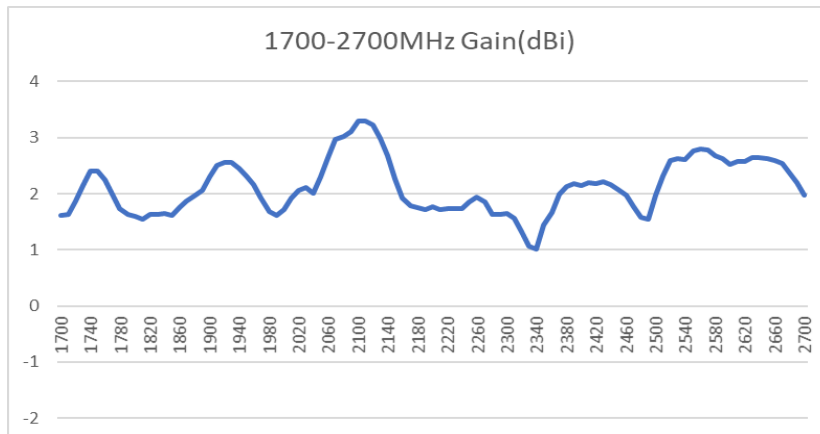
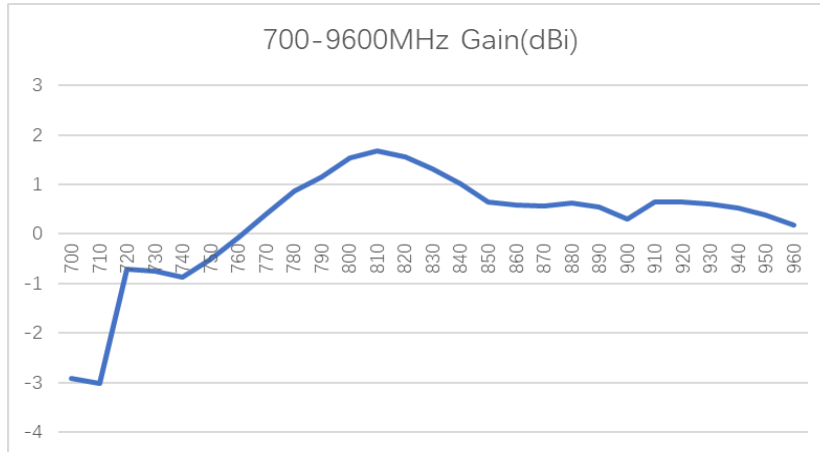
4.3.4. 5G-MIMO2 Antenna (MH)



Frequency (MHz)	1100	1400	1710	2170	2690	3300	4000	5000	6000
Efficiency (%)	34	69	56	60	48	64	65	61	45

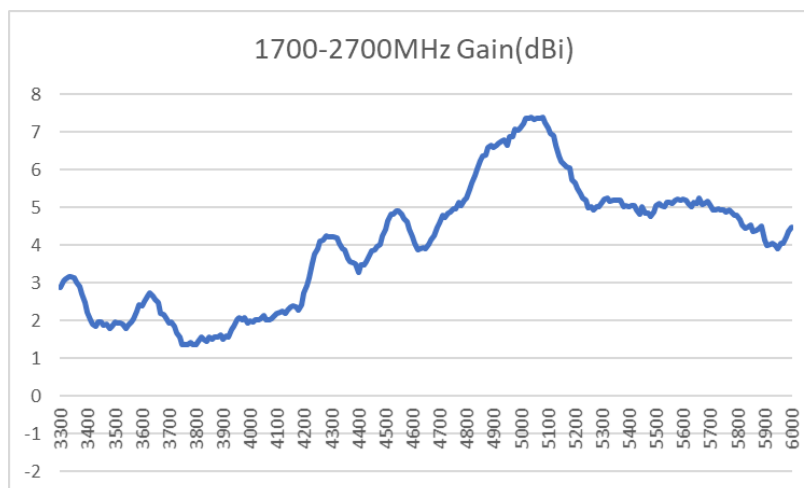
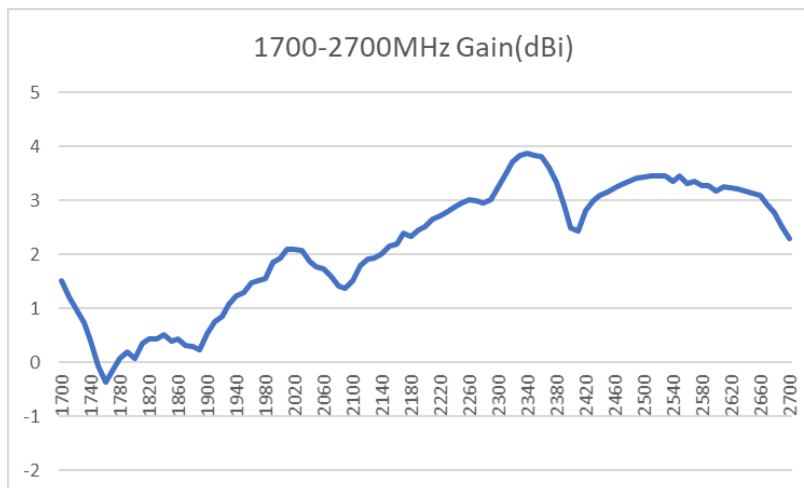
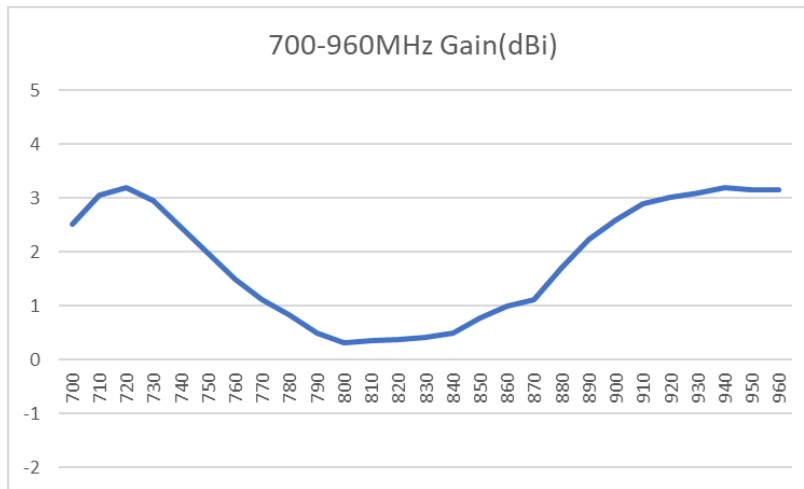
4.4. Gain (500 mm Cable Length)

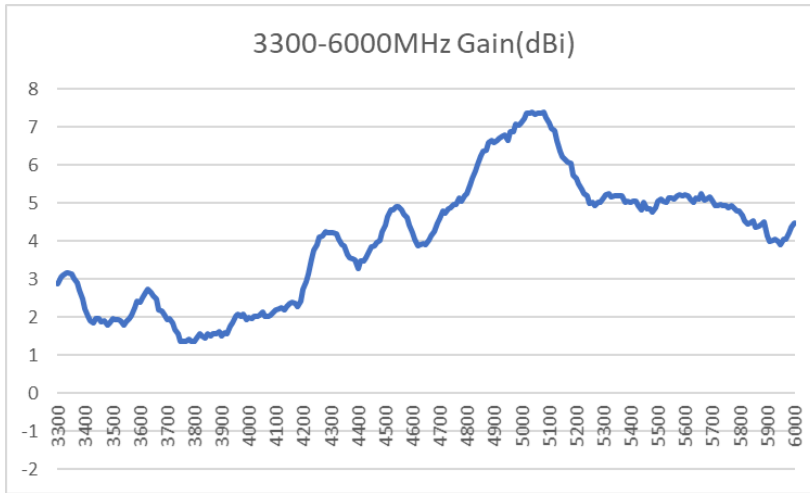
4.4.1. 4G&5G Main Antenna (LMH#)



Frequency (MHz)	700	820	960	1710	2170	2690	3300	4000	5000	6000
Gain (dBi)	-2.92	1.55	0.17	1.63	1.78	2.20	4.21	3.57	0.94	-3.57

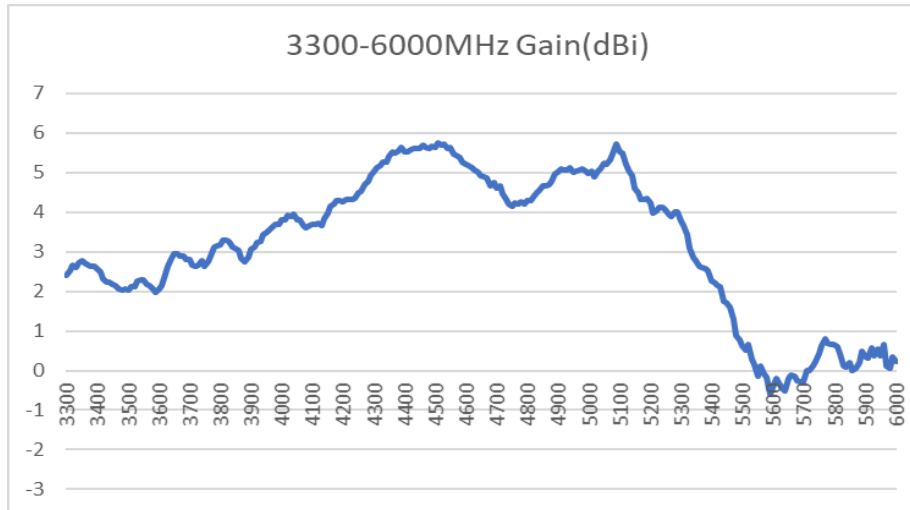
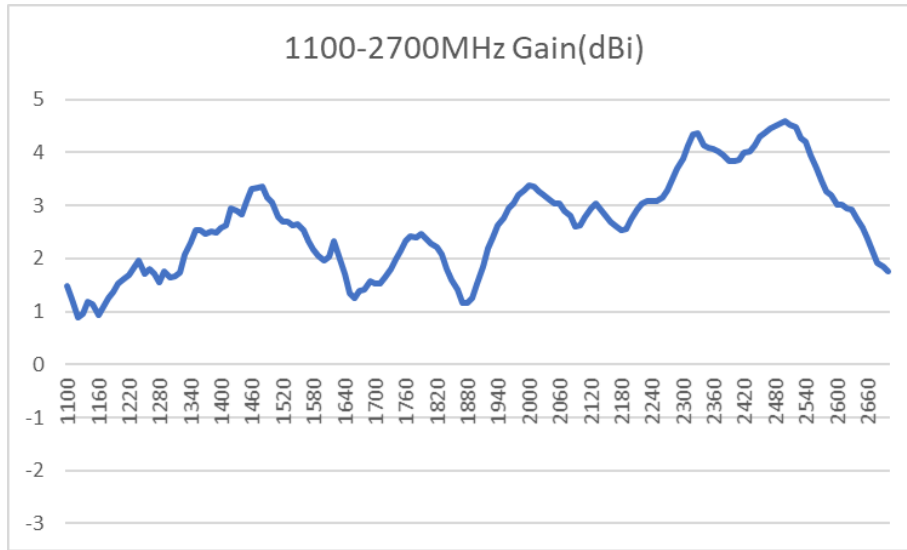
4.4.2. 4G&5G Diversity Antenna (LMH)





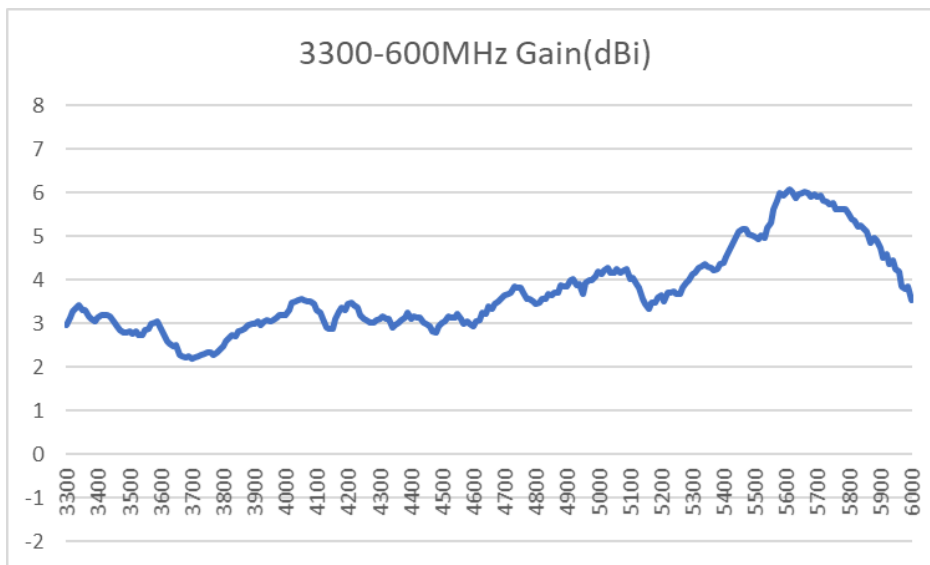
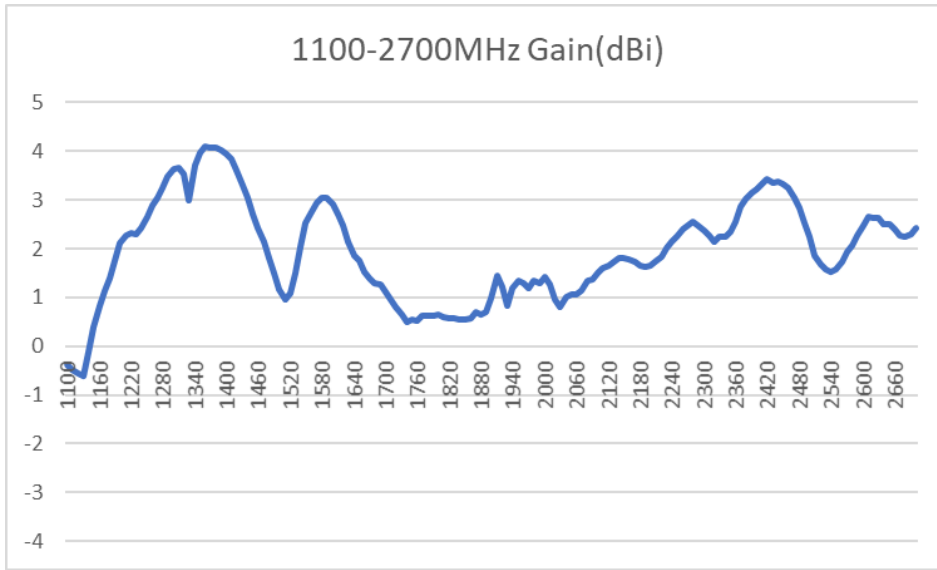
Frequency (MHz)	700	820	960	1710	2170	2690	3300	4000	5000	6000
Gain (dBi)	2.51	0.37	3.15	1.21	2.46	2.51	2.88	1.98	7.10	4.49

4.4.3. 5G-MIMO1 Antenna (*MH)



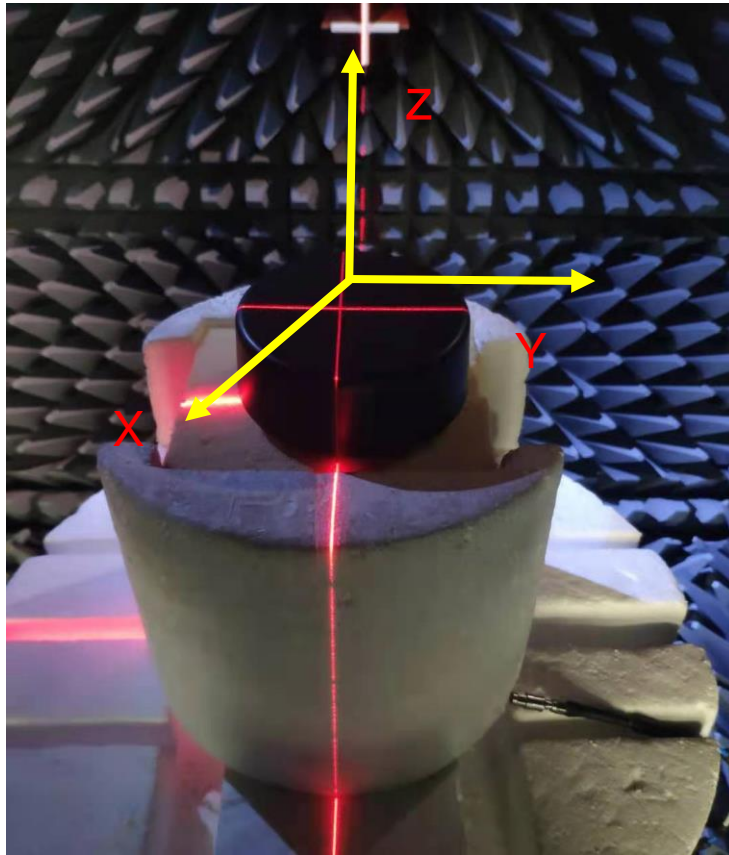
Frequency (MHz)	1100	1400	1710	2170	2690	3300	4000	5000	6000
Gain (dBi)	1.48	2.57	1.51	2.59	1.83	2.39	3.80	4.97	0.24

4.4.4. 5G-MIMO2 Antenna (MH)



Frequency (MHz)	1100	1400	1710	2170	2690	3300	4000	5000	6000
Gain (dBi)	-0.38	3.94	0.95	1.72	2.29	2.97	3.19	4.18	3.52

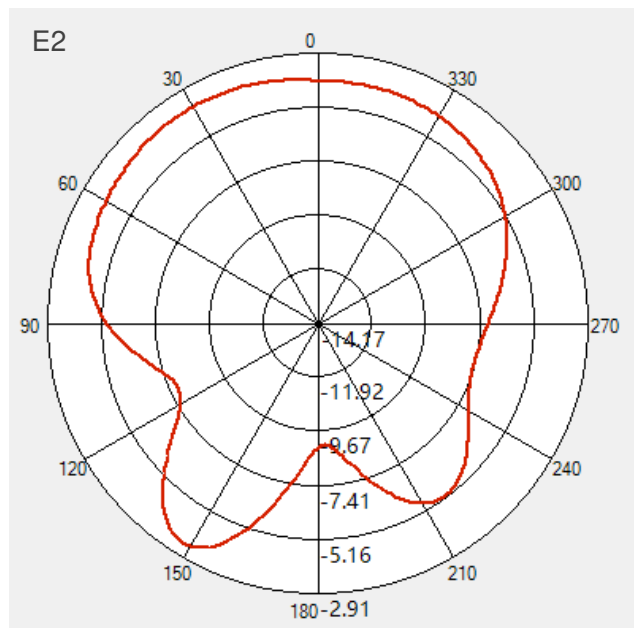
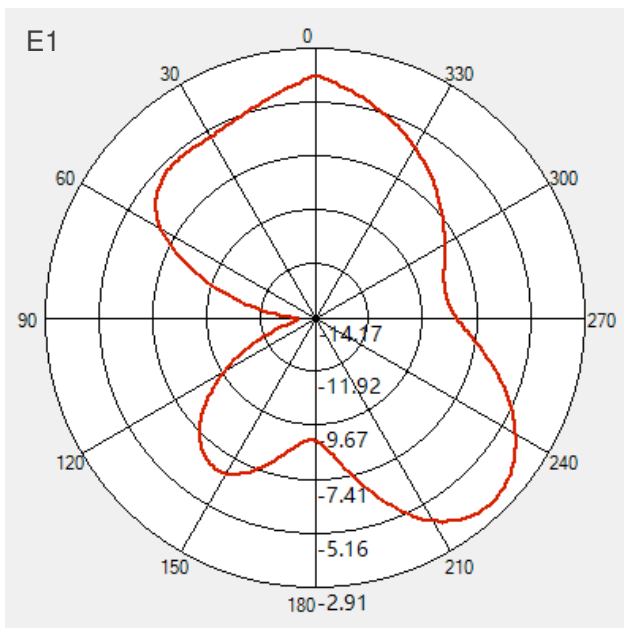
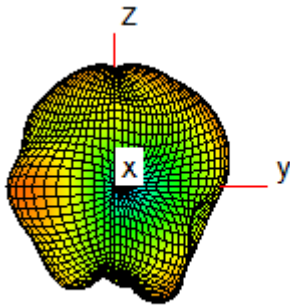
4.5. Radiation Pattern (500 mm Cable Length)



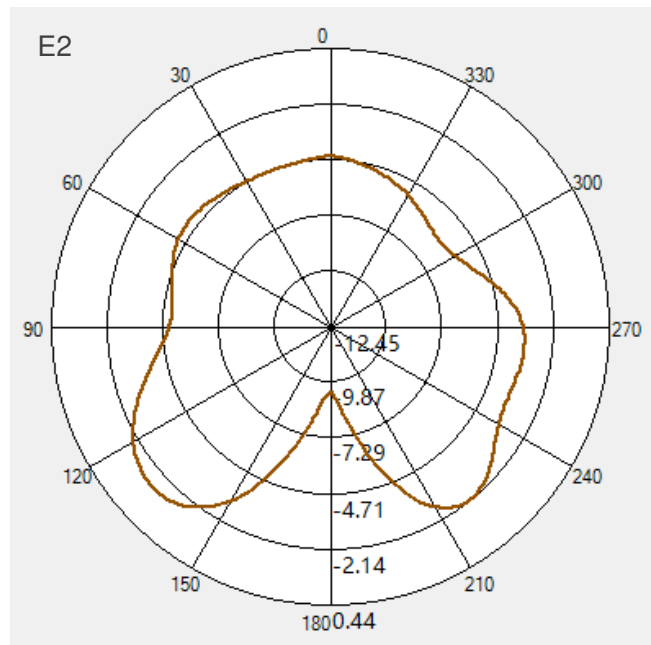
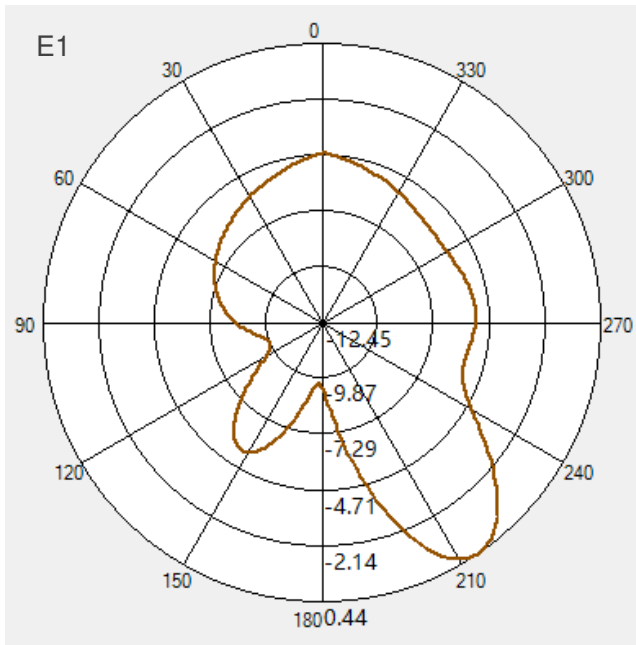
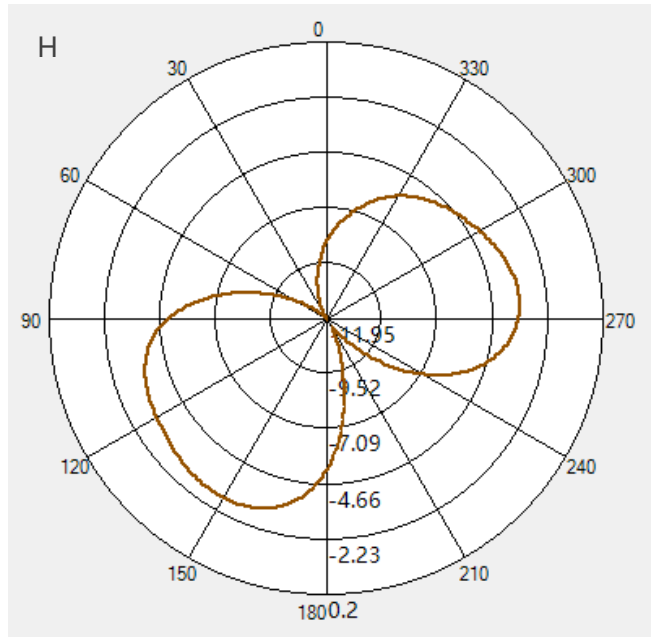
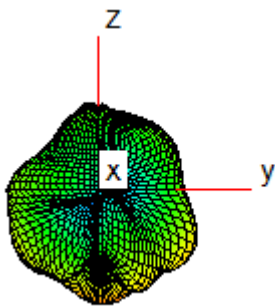
H plane: the tangent of XY
E1 plane: the tangent of XZ
E2 plane: the tangent of YZ

4.5.1. 4G&5G Main Antenna (LMH#)

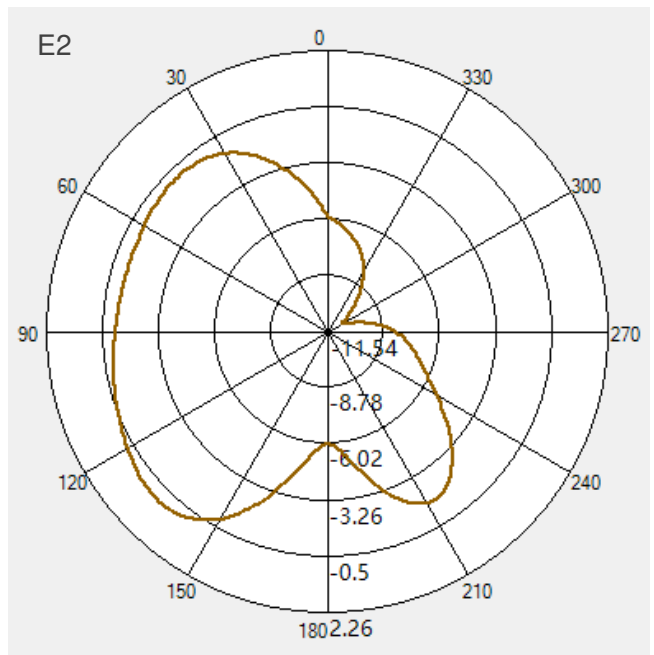
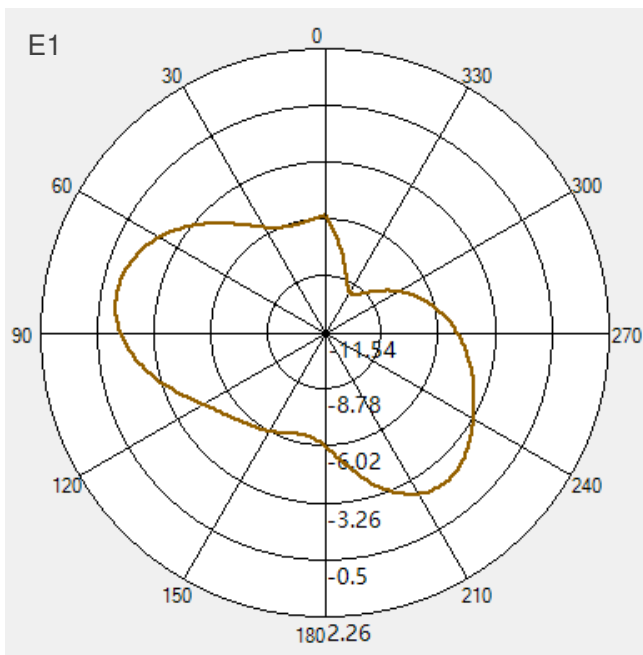
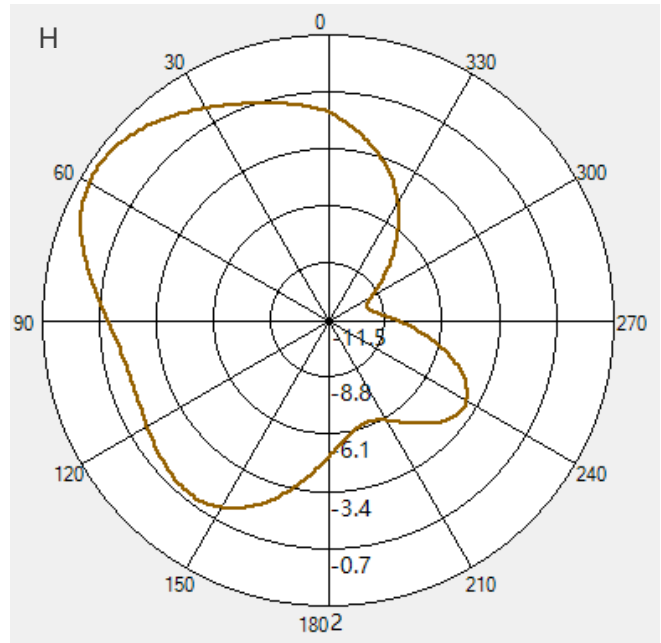
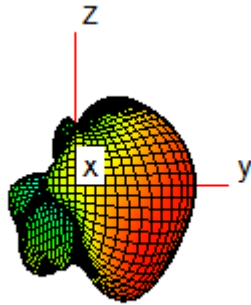
4.5.1.1. 700 MHz



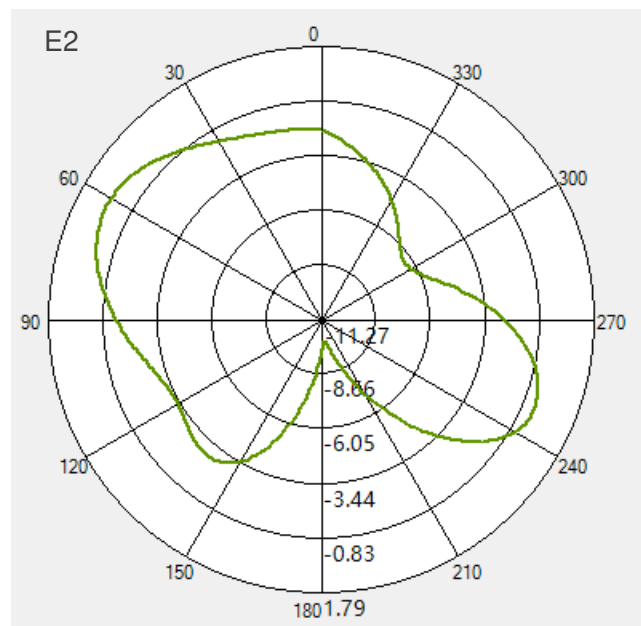
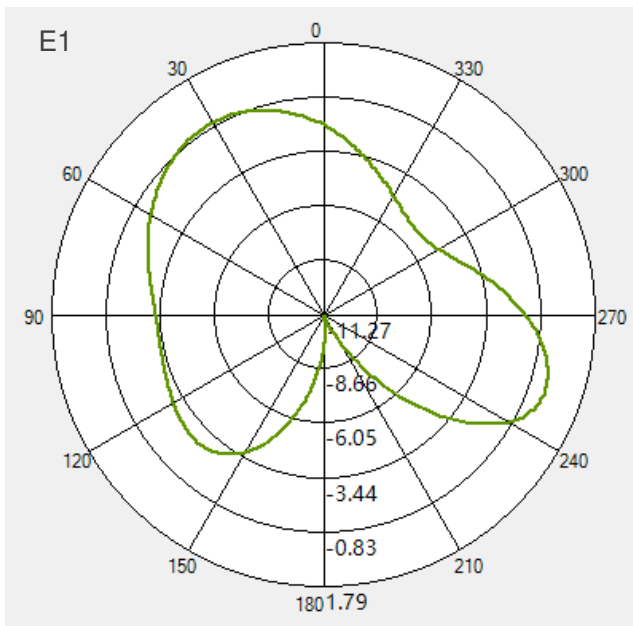
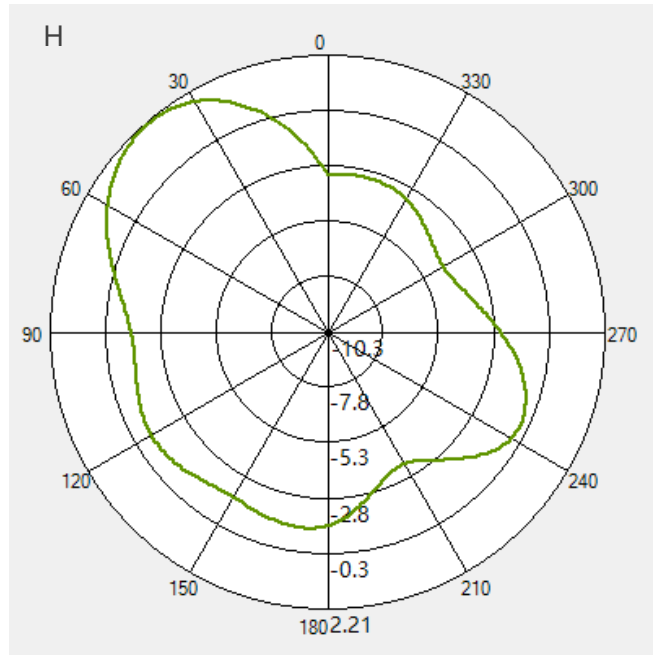
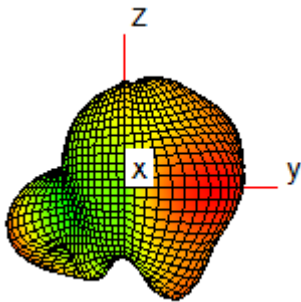
4.5.1.2. 960 MHz



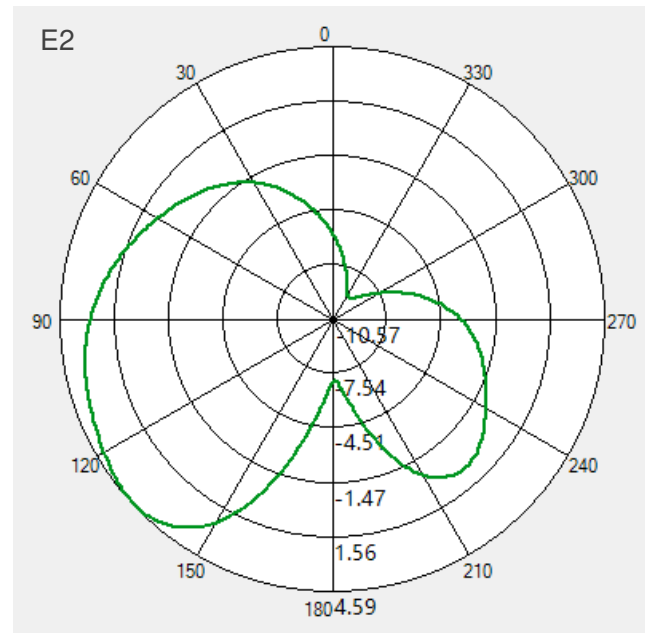
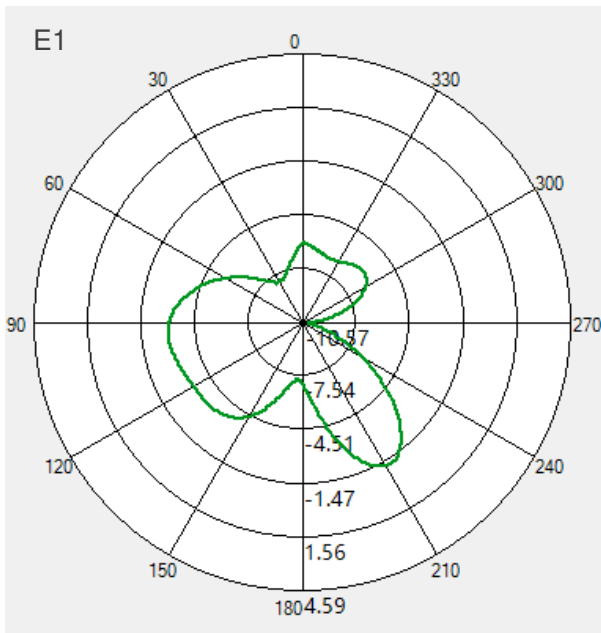
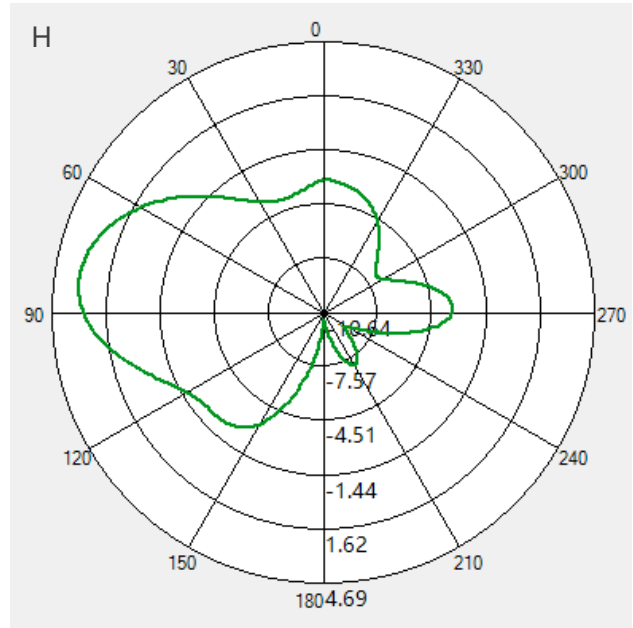
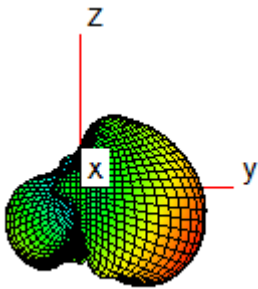
4.5.1.3. 1710 MHz



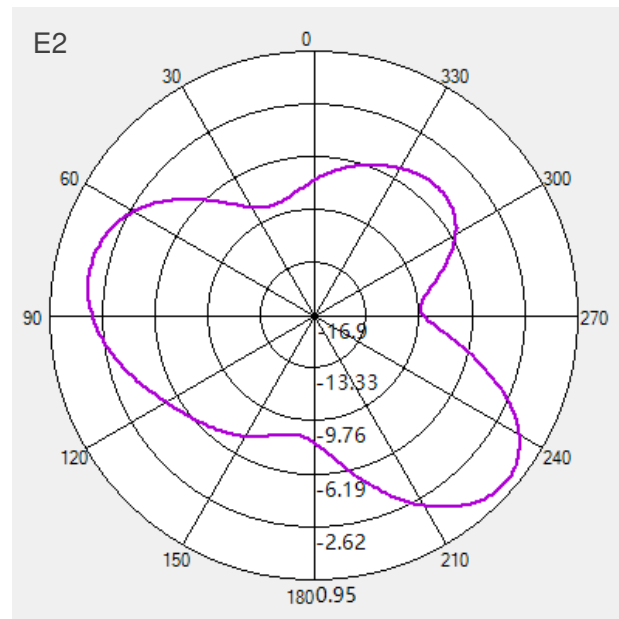
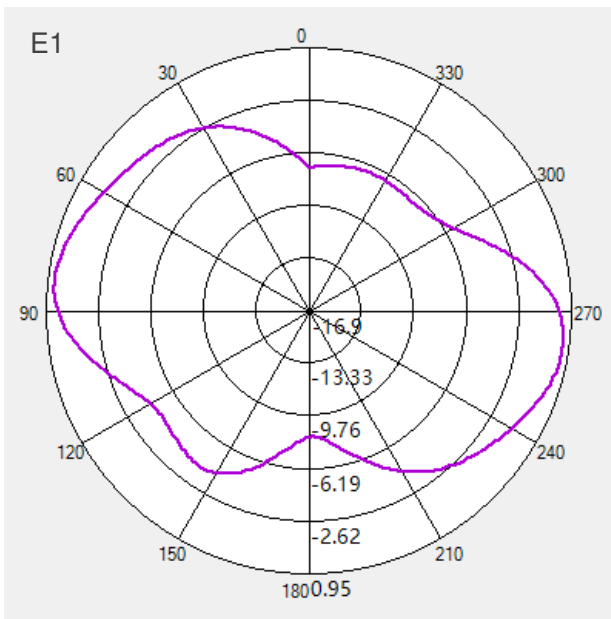
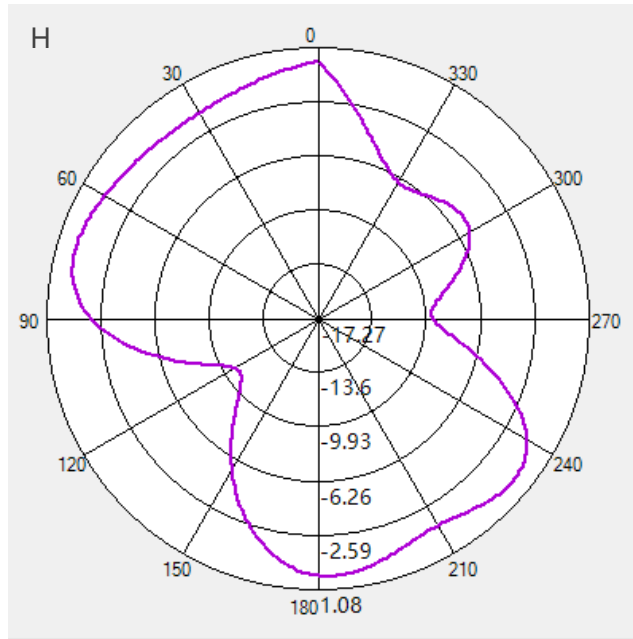
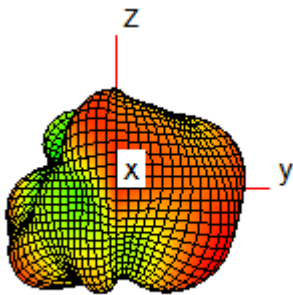
4.5.1.4. 2170 MHz



4.5.1.5. 3300 MHz

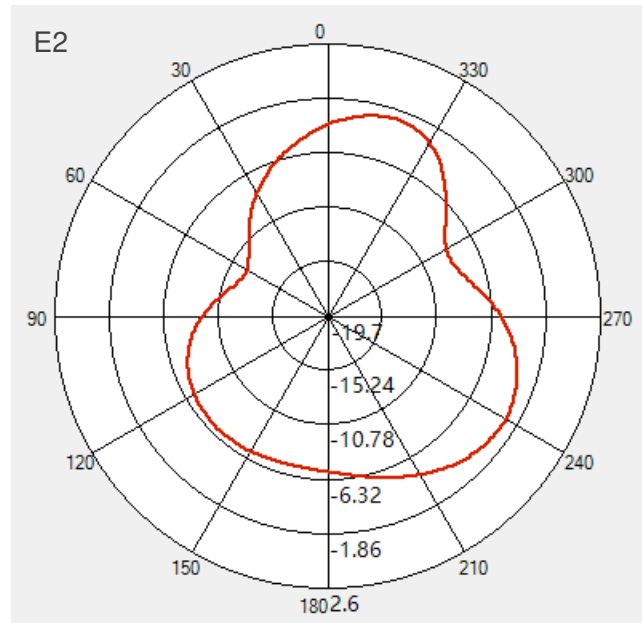
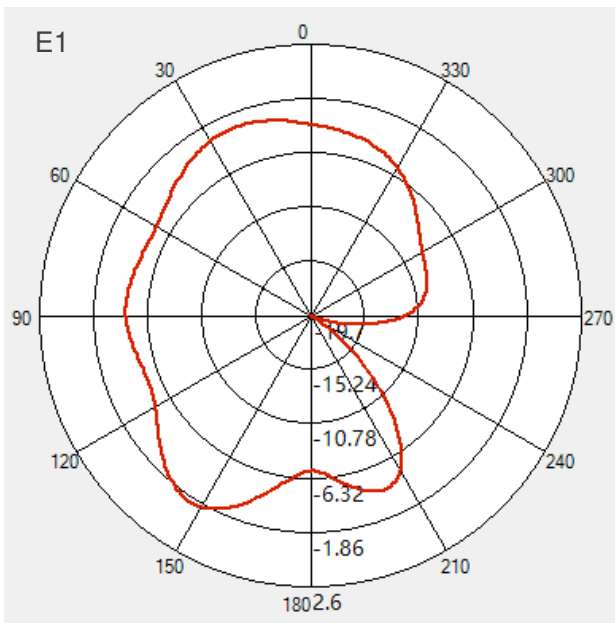
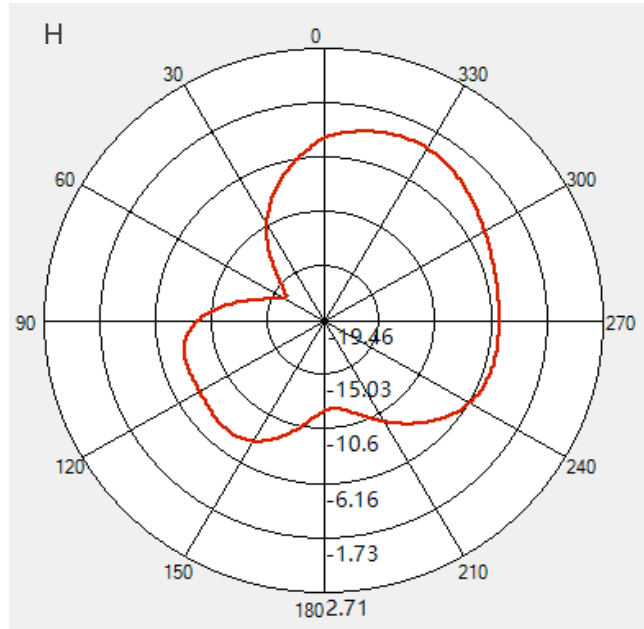
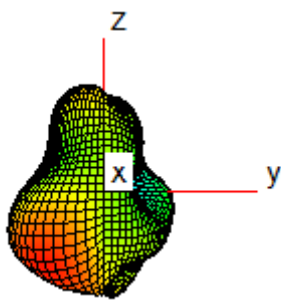


4.5.1.6. 5000 MHz

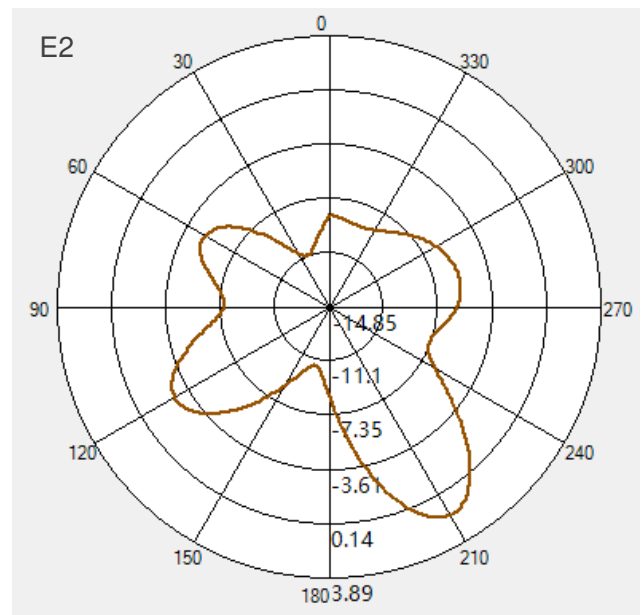
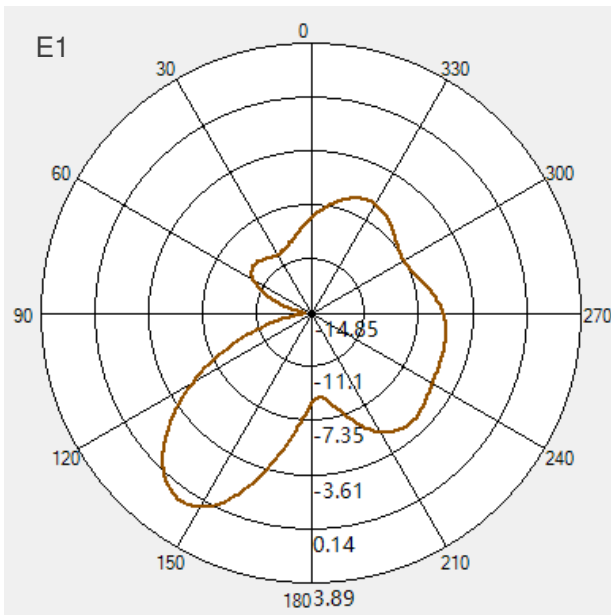
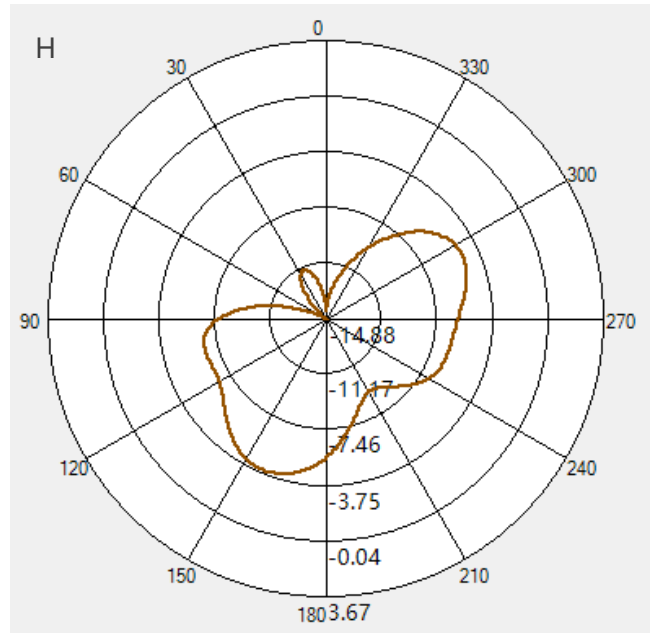
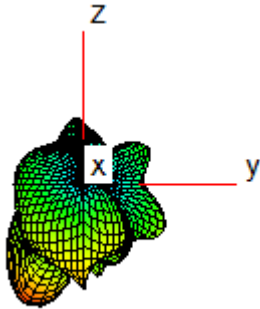


4.5.2. 4G&5G Diversity Antenna (LMH)

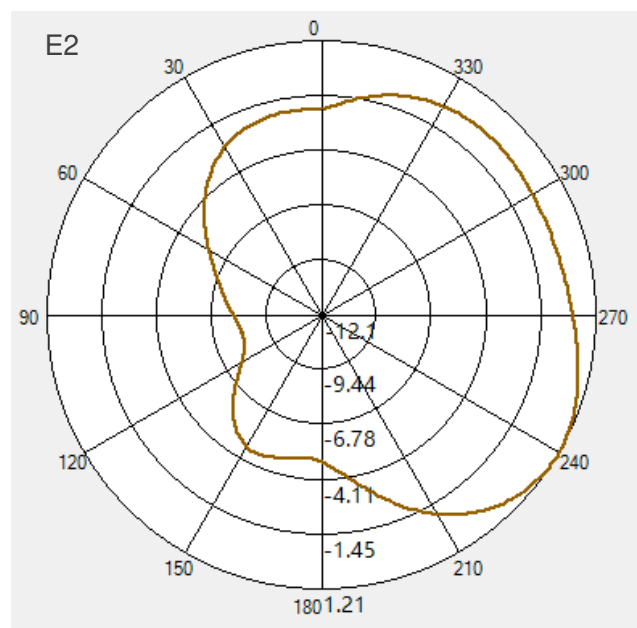
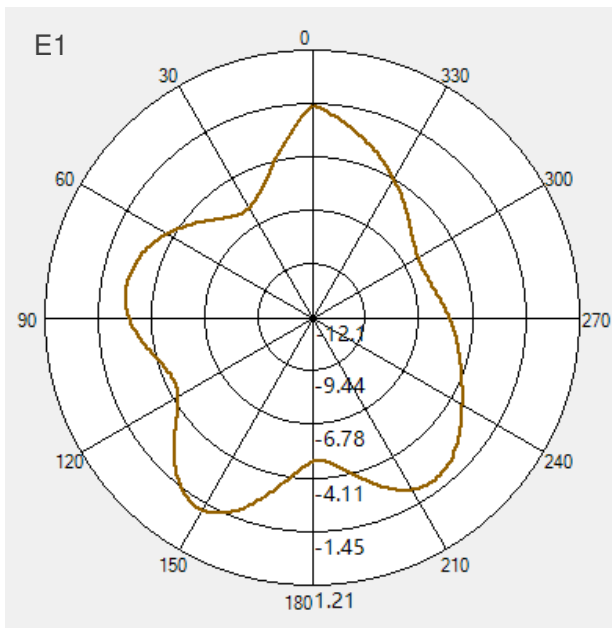
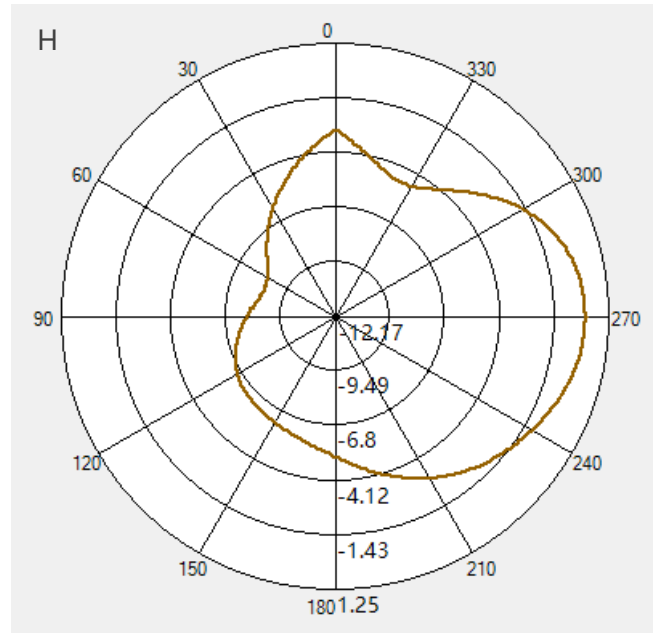
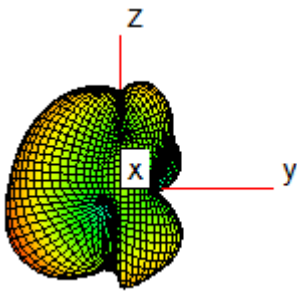
4.5.2.1. 700 MHz



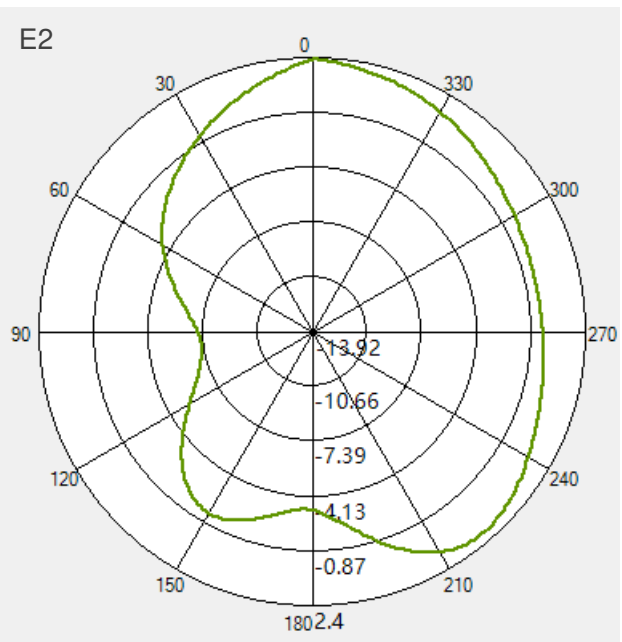
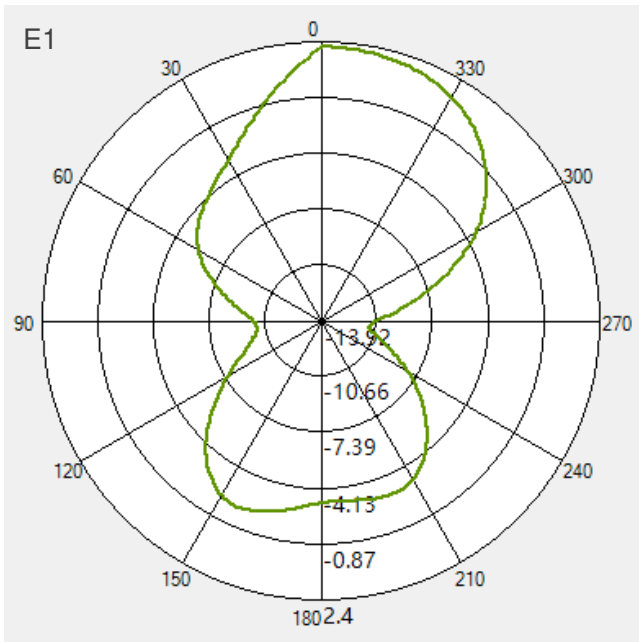
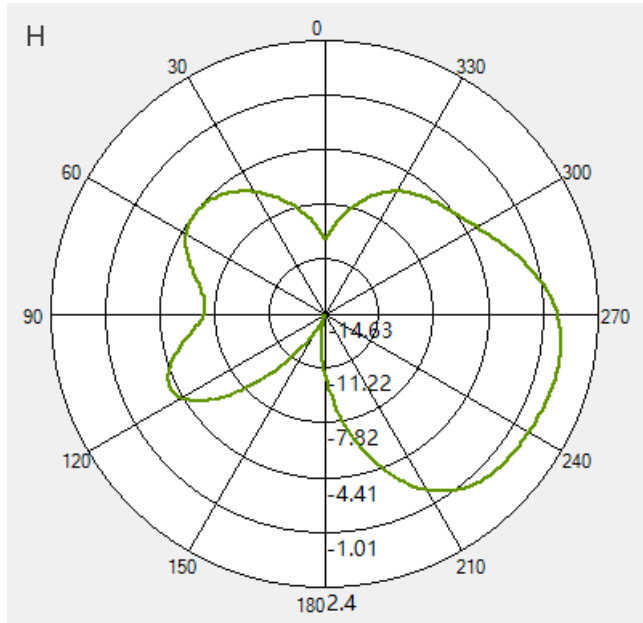
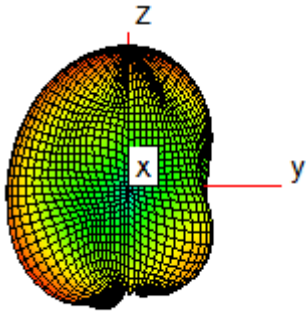
4.5.2.2. 960 MHz



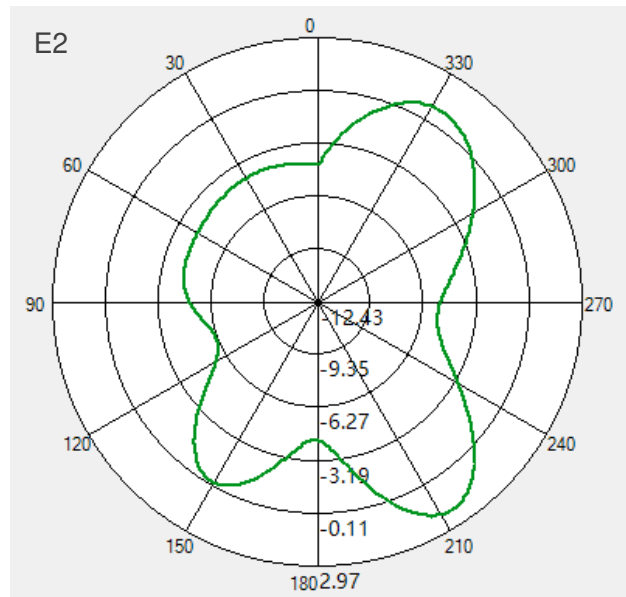
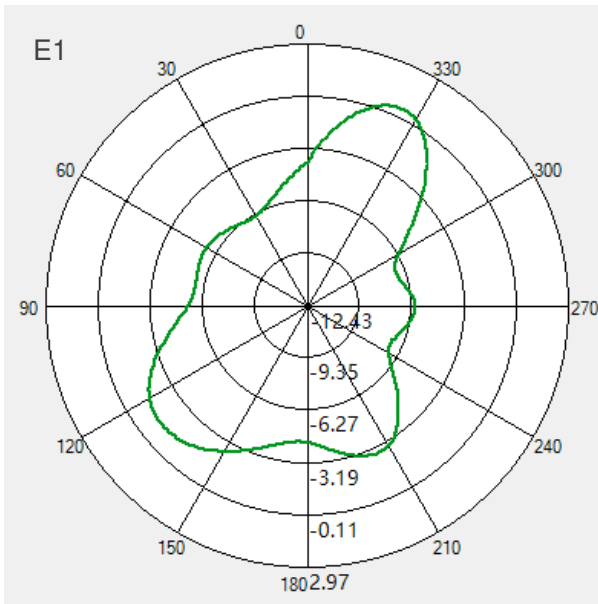
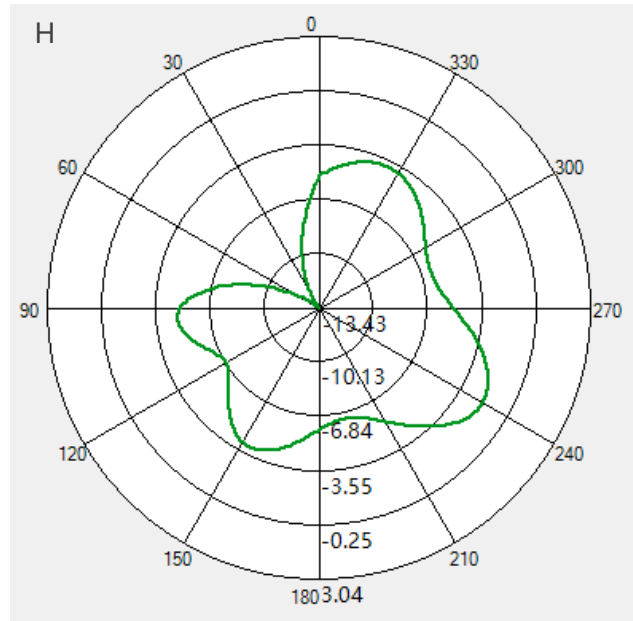
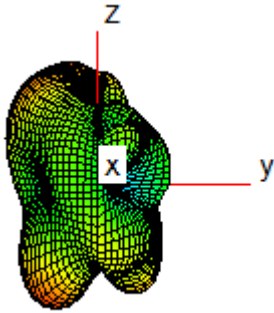
4.5.2.3. 1710 MHz



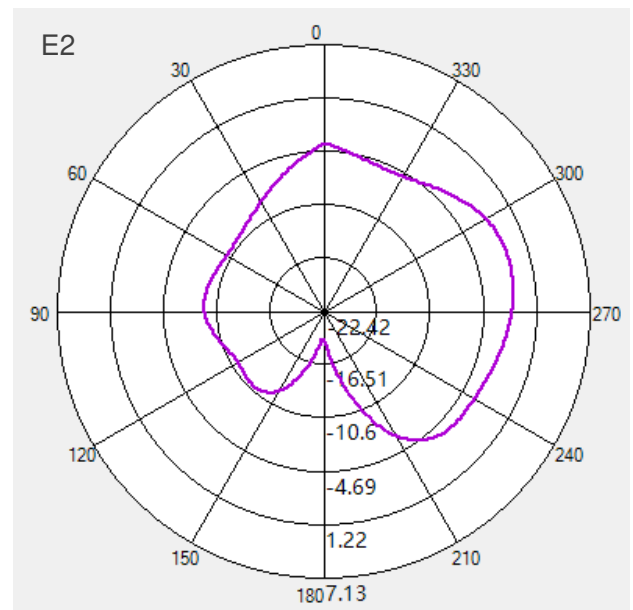
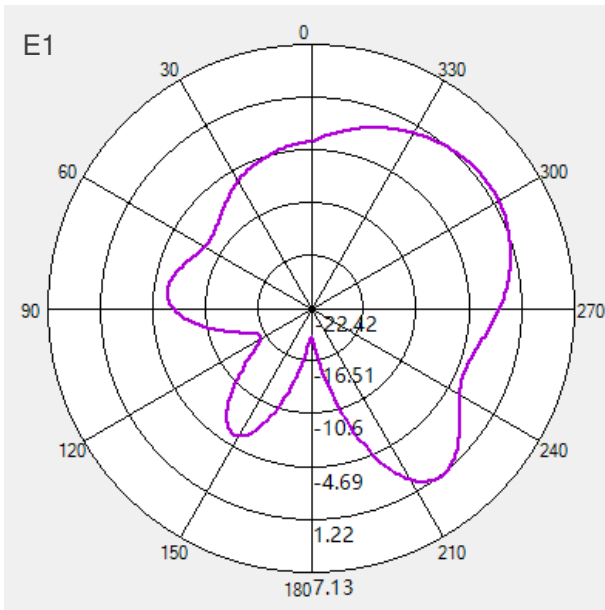
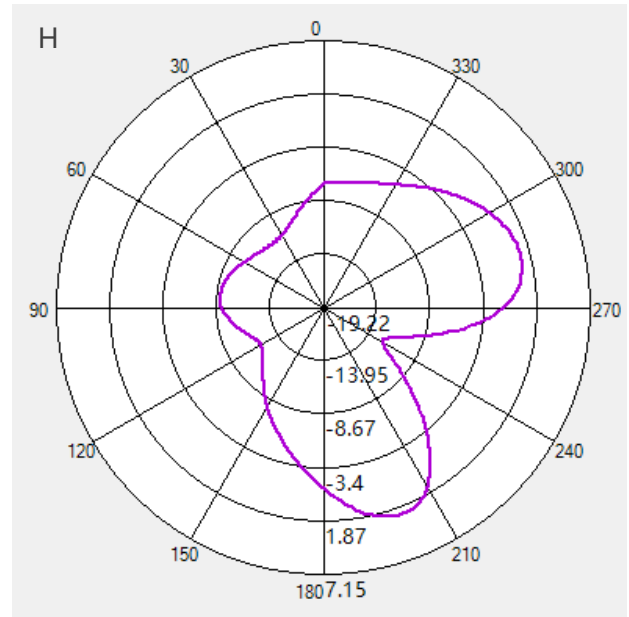
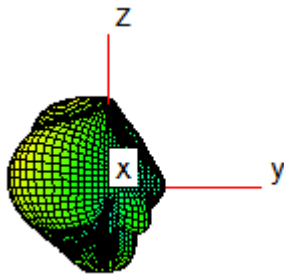
4.5.2.4. 2170 MHz



4.5.2.5. 3300 MHz

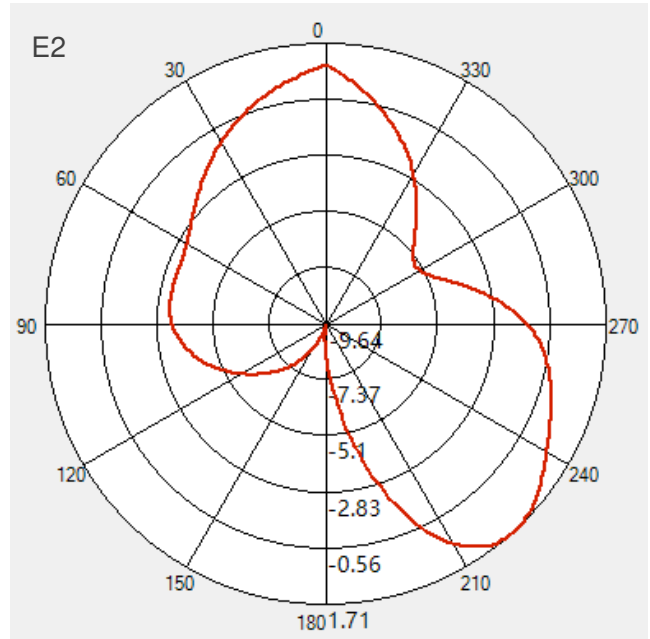
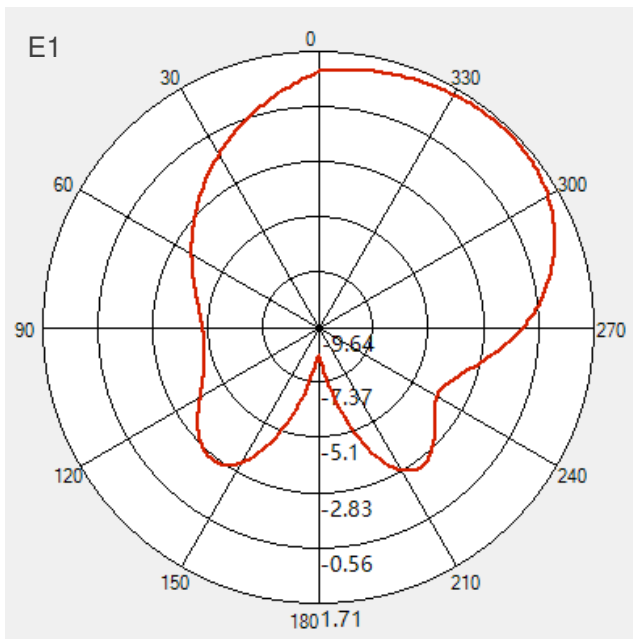
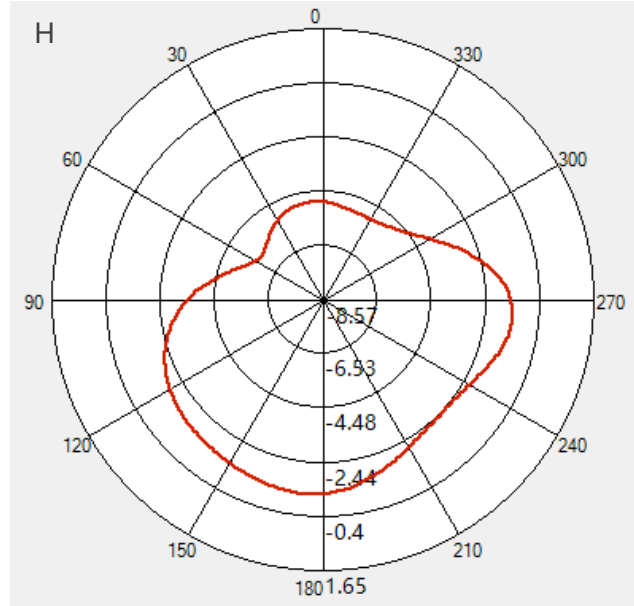
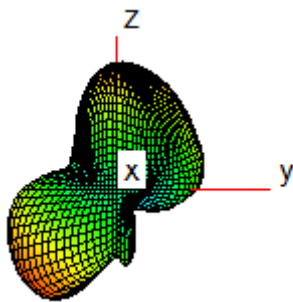


4.5.2.6. 5000 MHz

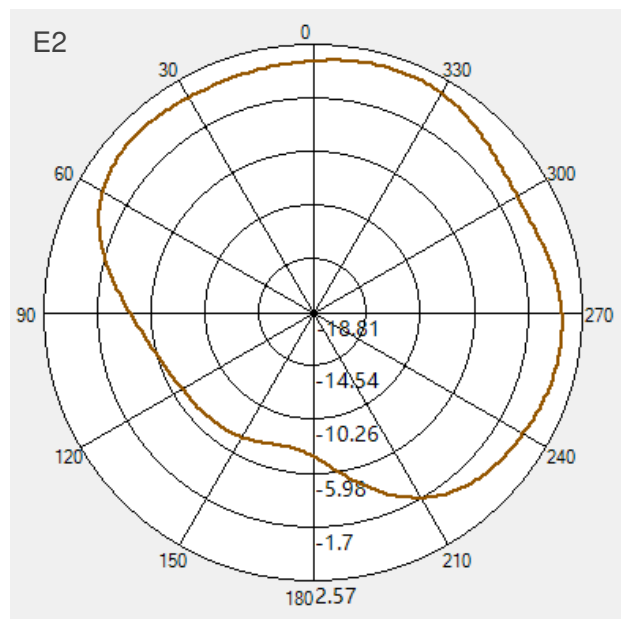
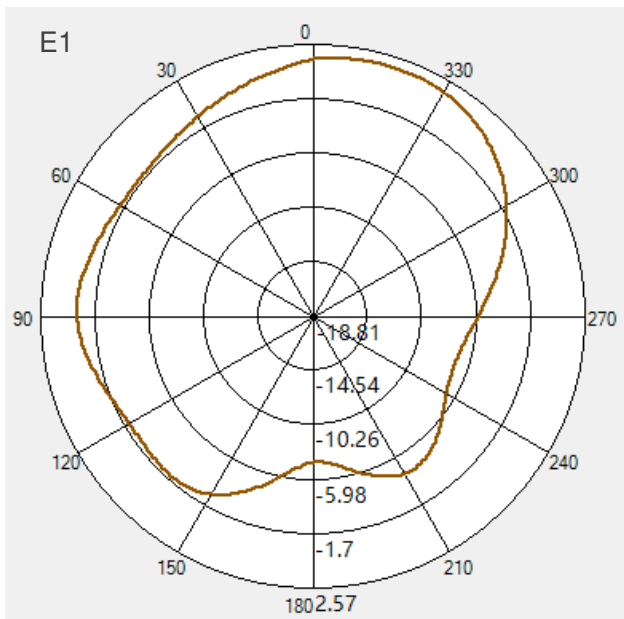
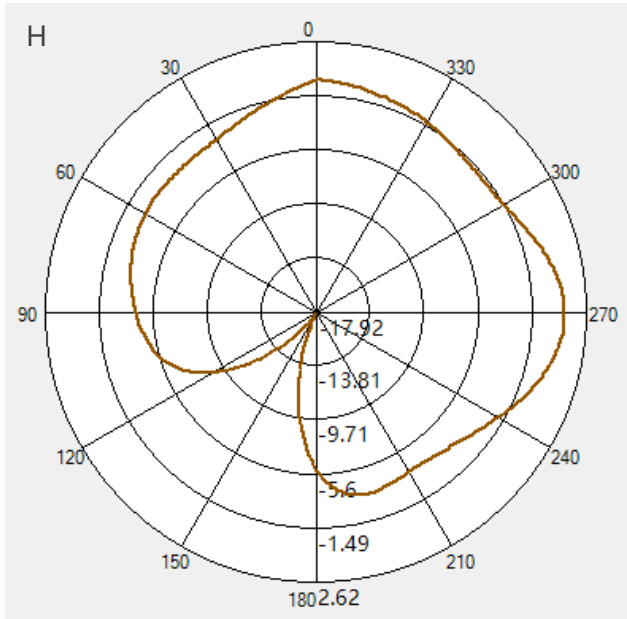
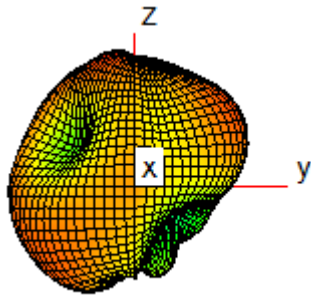


4.5.3. 5G-MIMO1 Antenna (*MH)

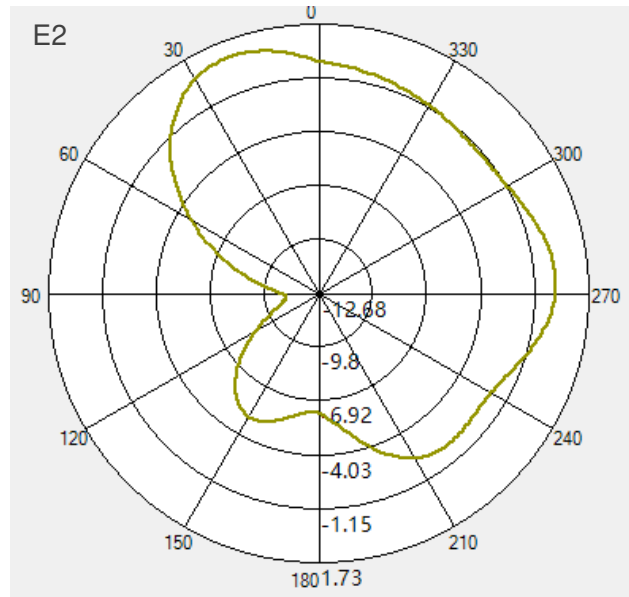
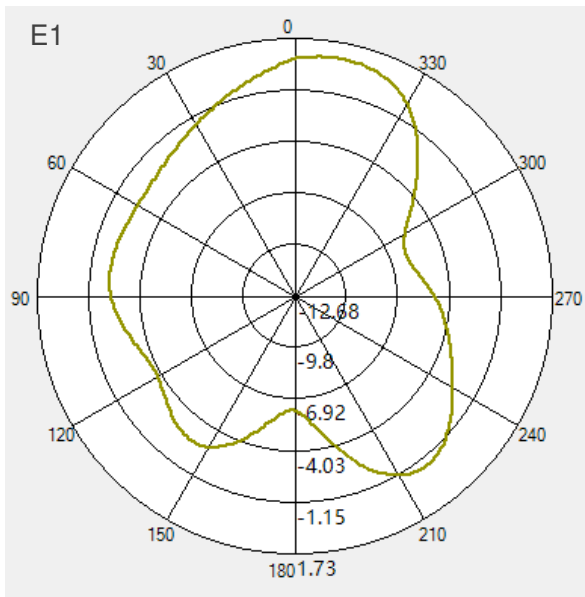
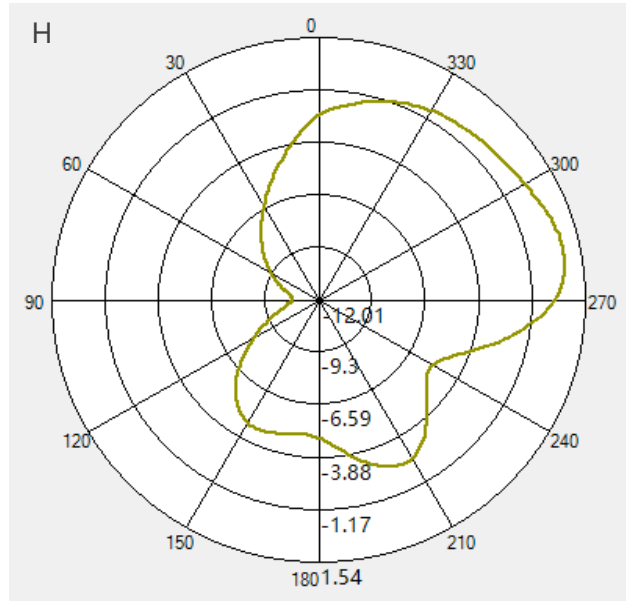
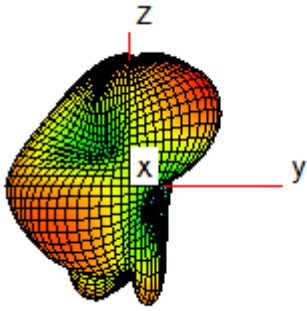
4.5.3.1. 1100 MHz



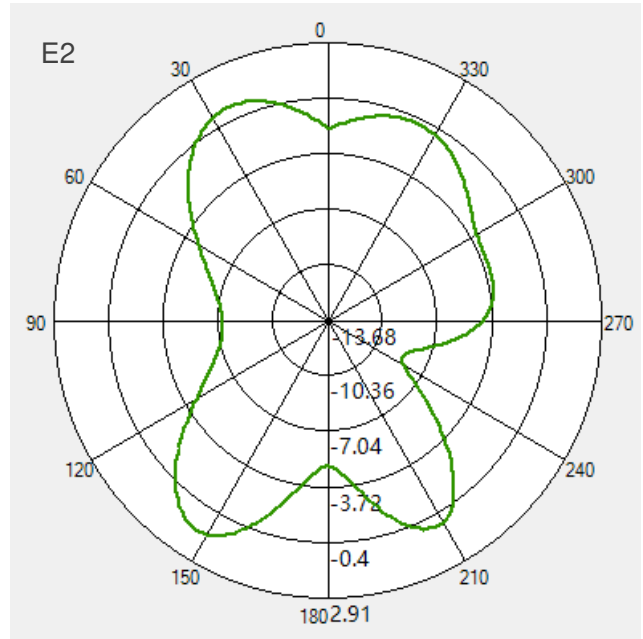
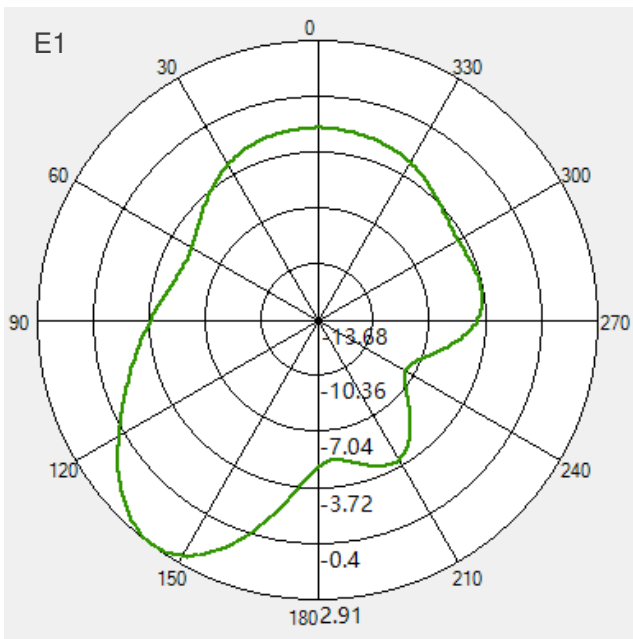
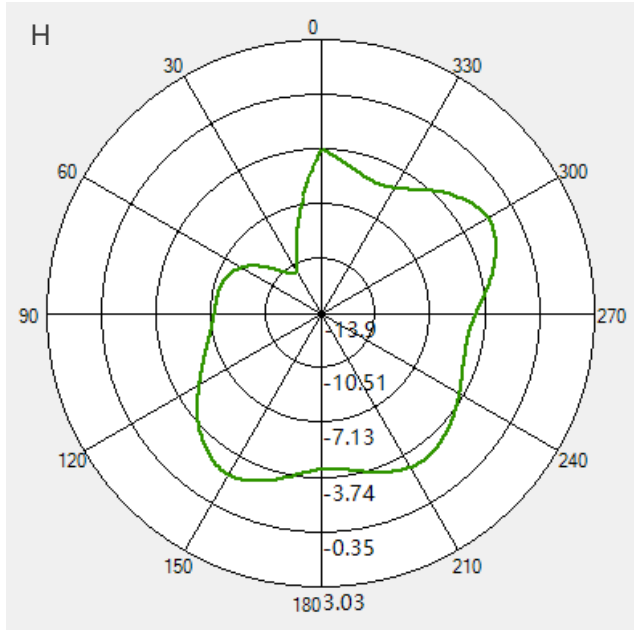
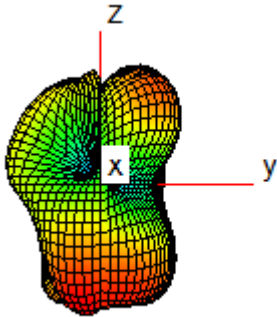
4.5.3.2. 1400 MHz



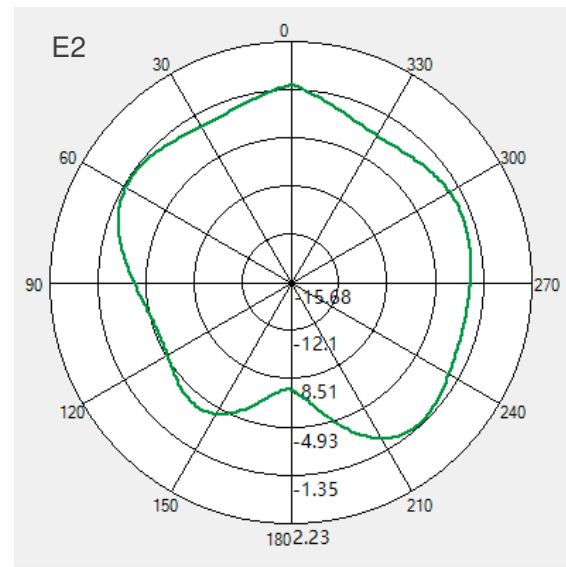
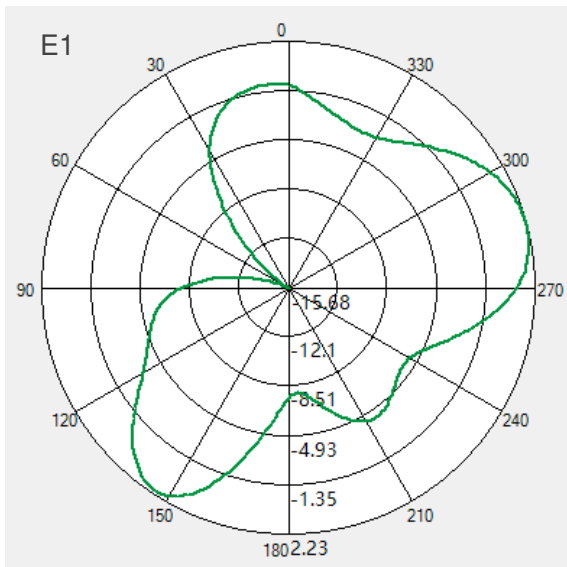
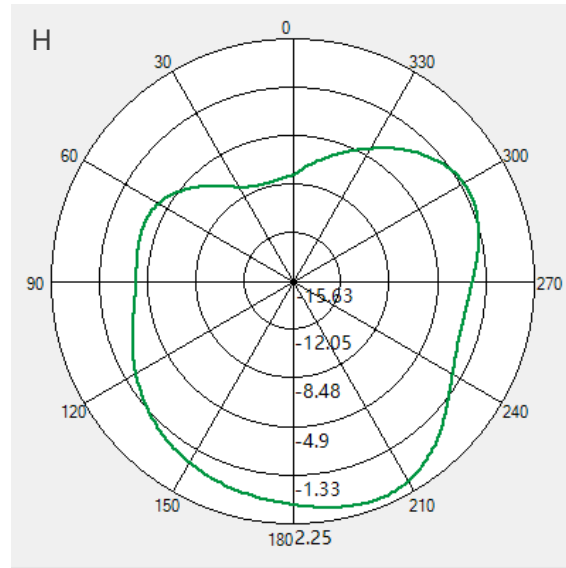
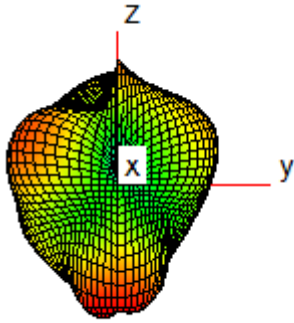
4.5.3.3. 1710 MHz



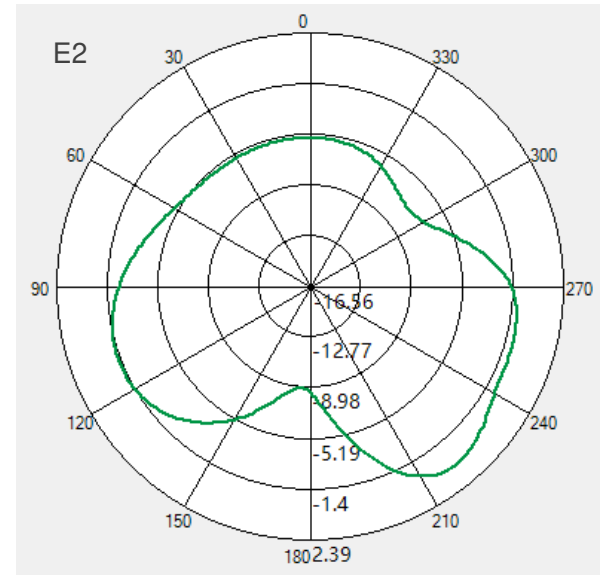
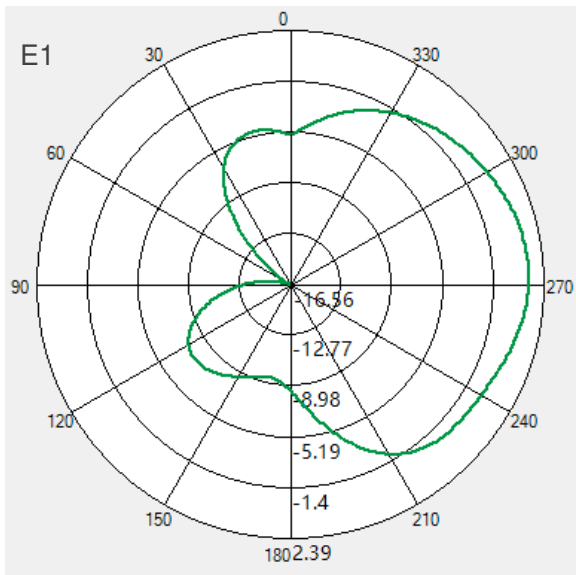
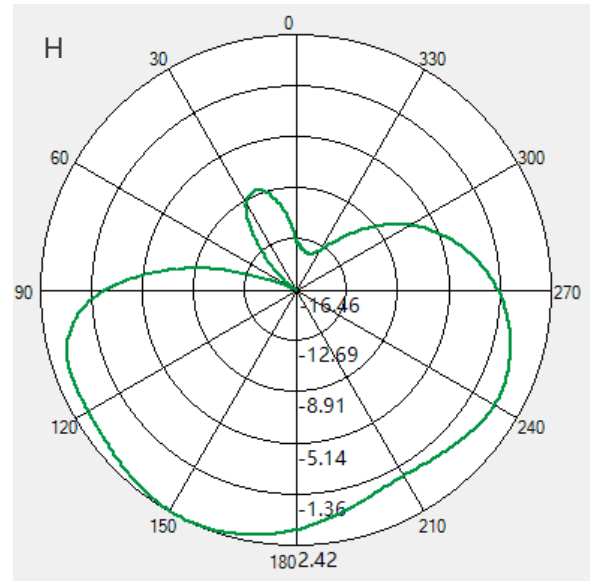
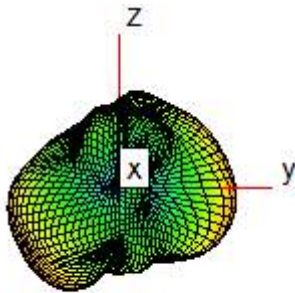
4.5.3.4. 2170 MHz



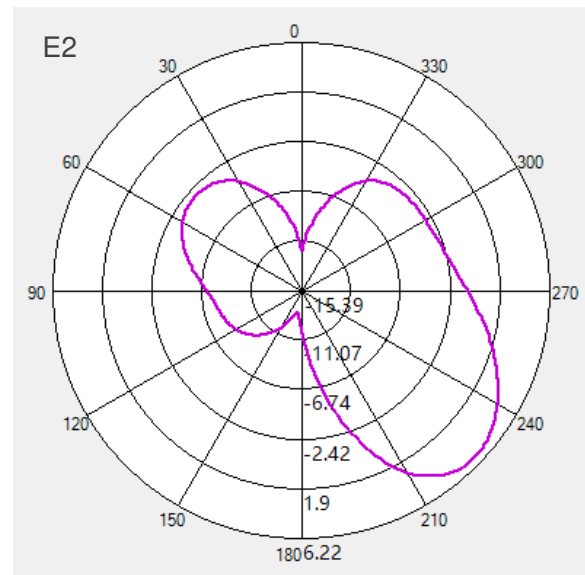
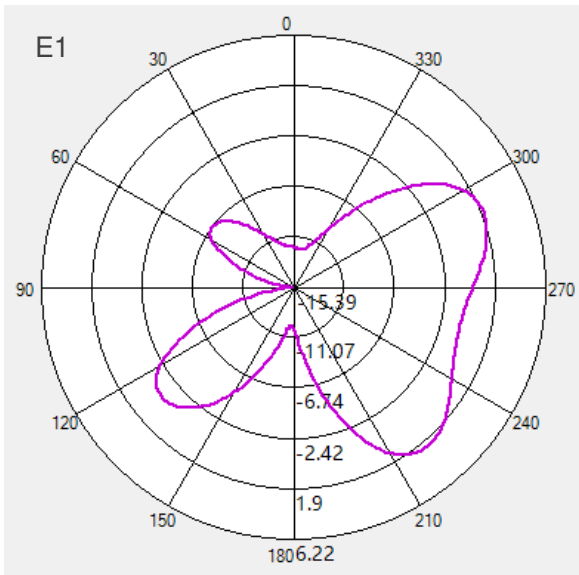
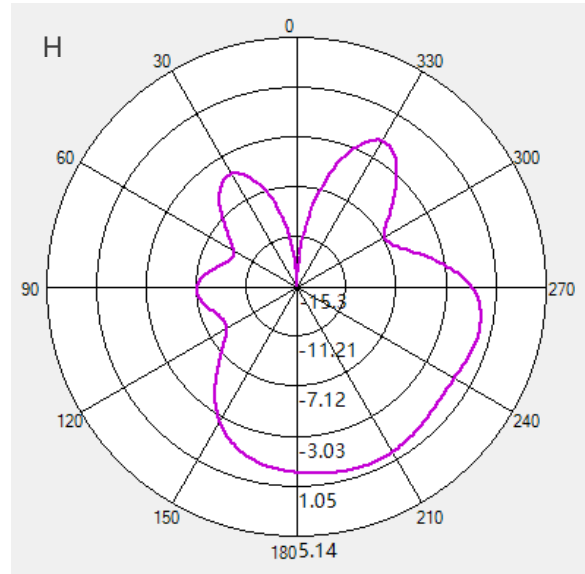
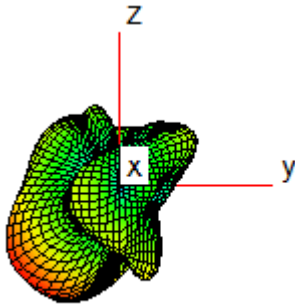
4.5.3.5. 2690 MHz



4.5.3.6. 3300 MHz

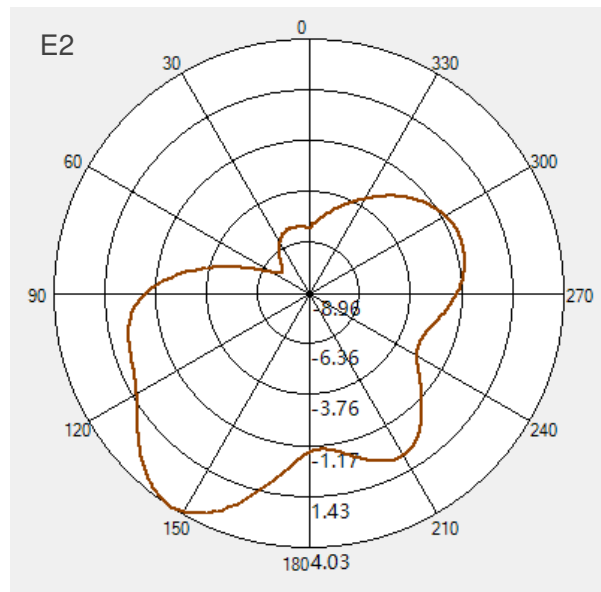
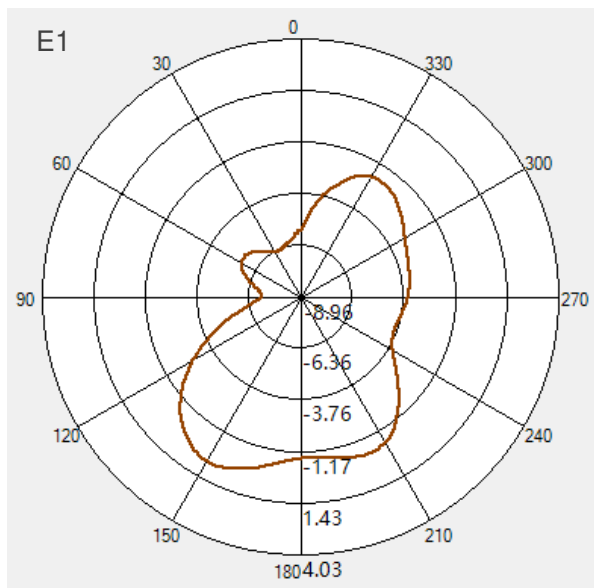
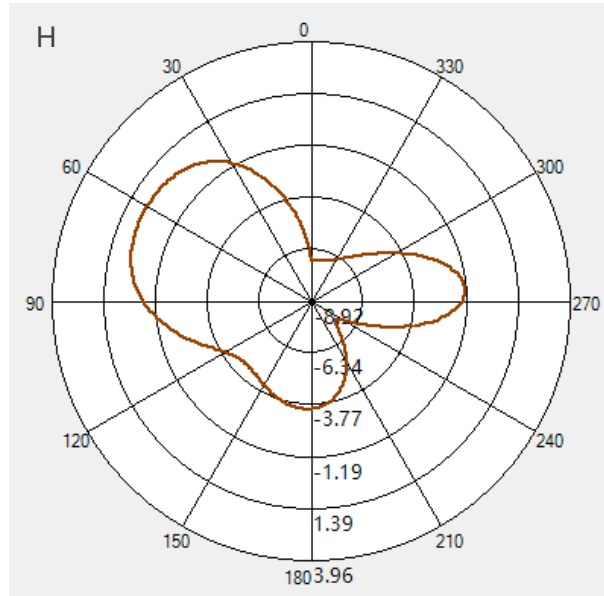
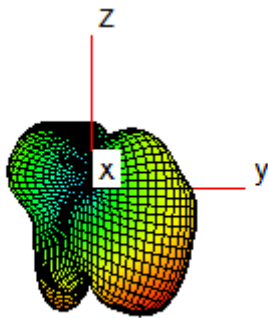


4.5.3.7. 5000 MHz

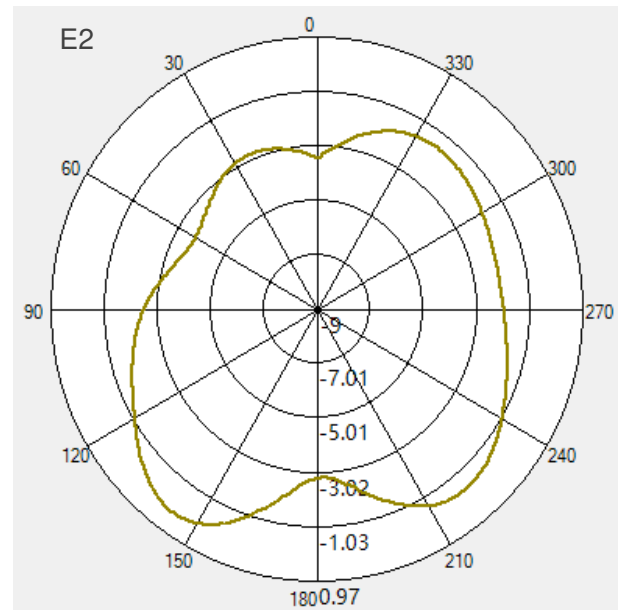
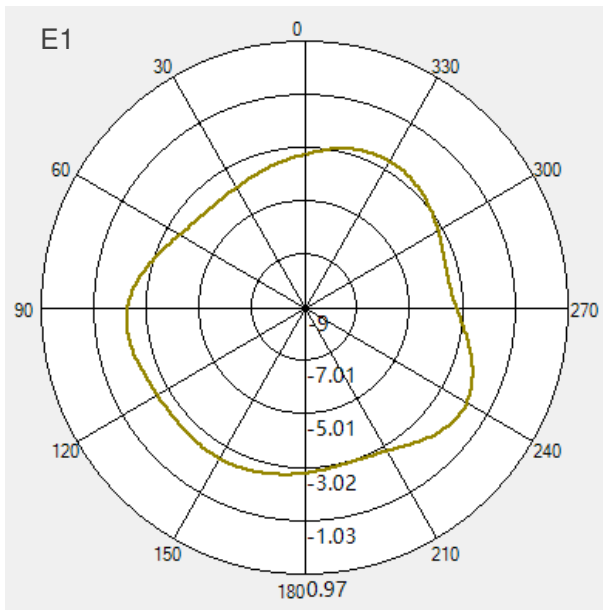
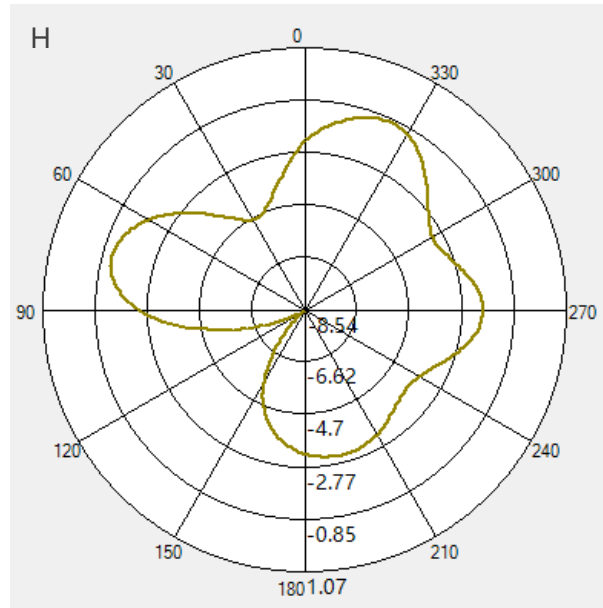
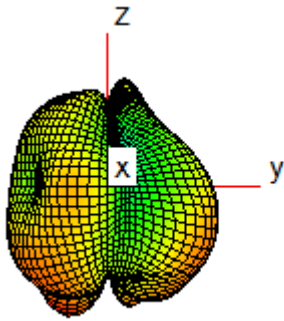


4.5.4. 5G-MIMO2 Antenna (MH)

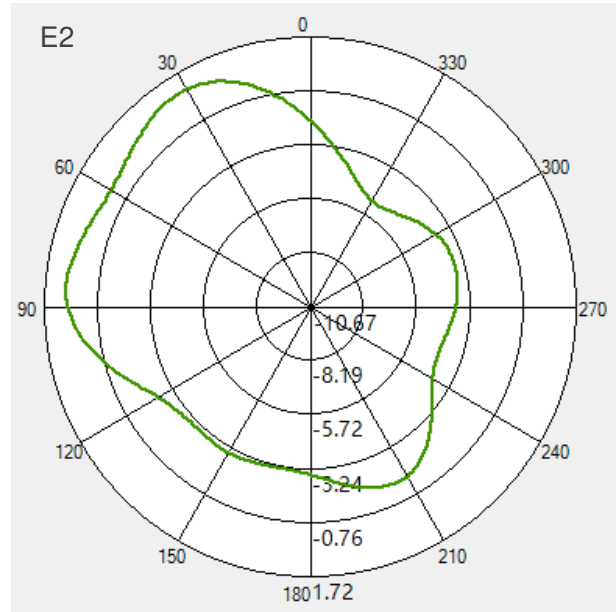
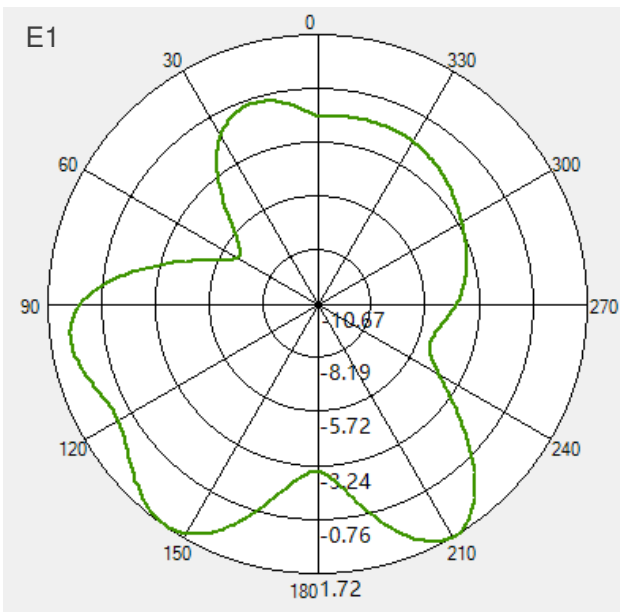
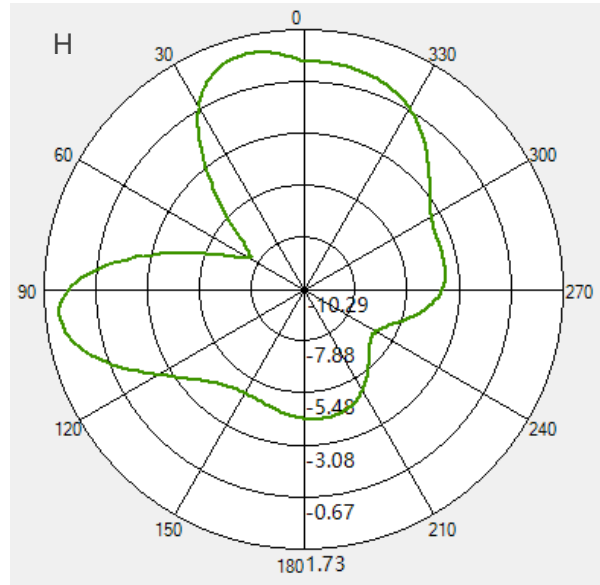
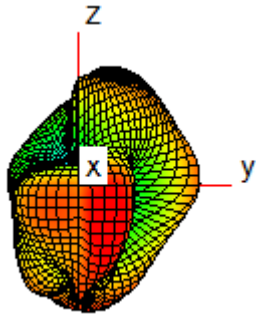
4.5.4.1. 1400 MHz



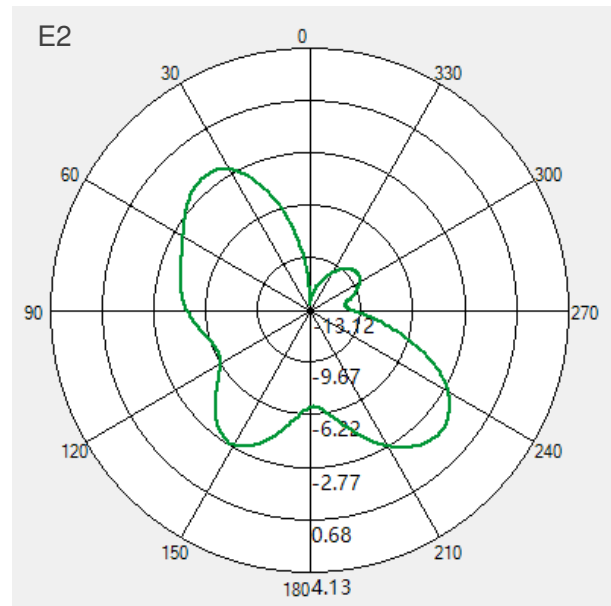
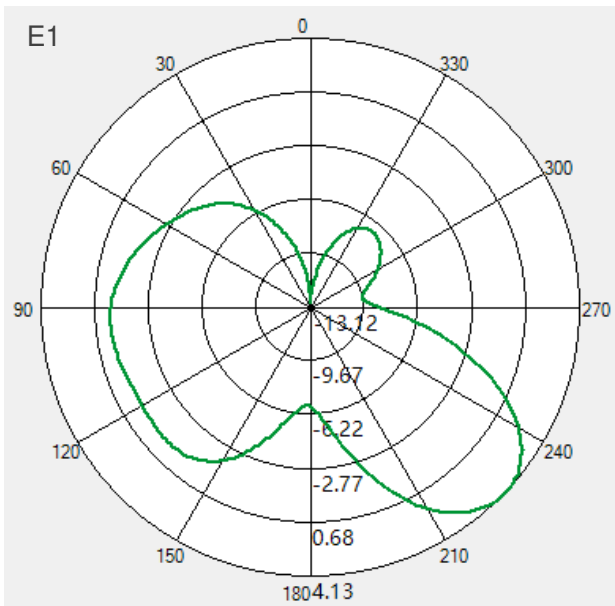
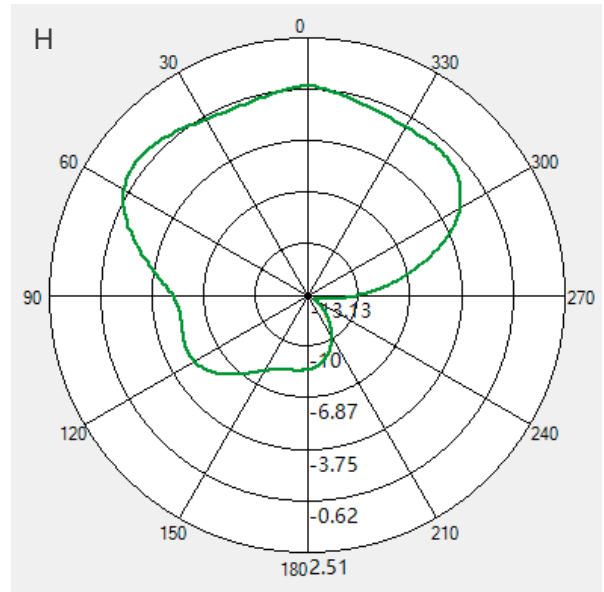
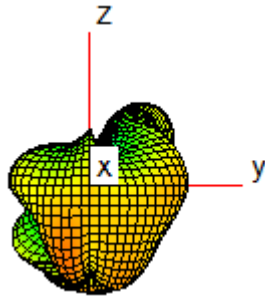
4.5.4.2. 1710 MHz



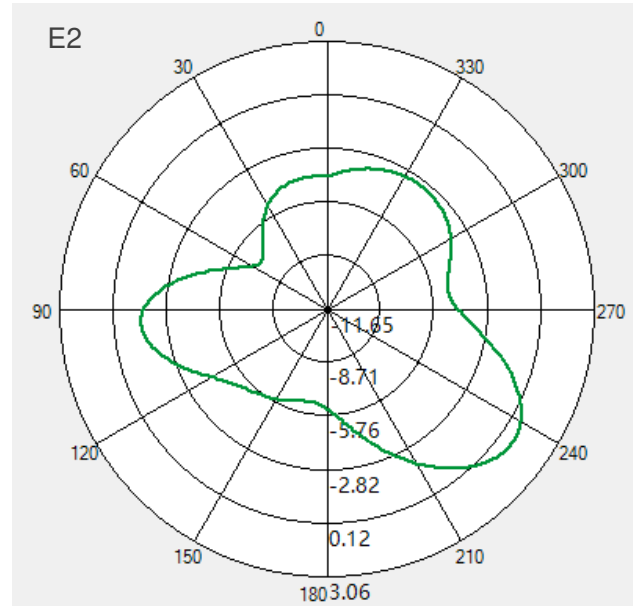
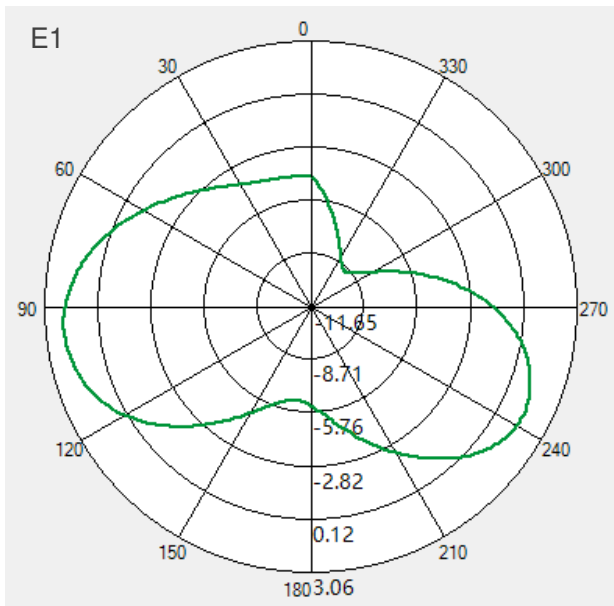
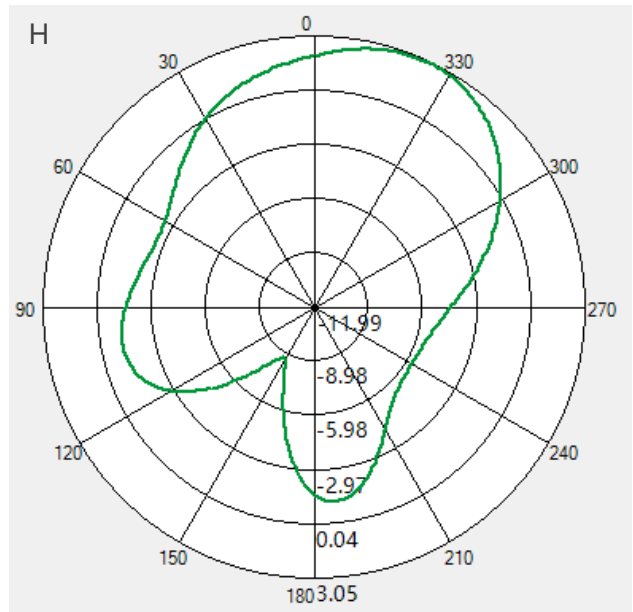
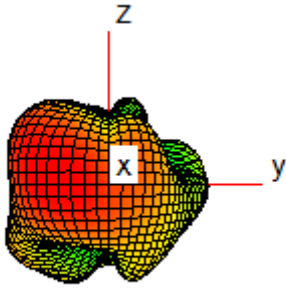
4.5.4.3. 2170 MHz



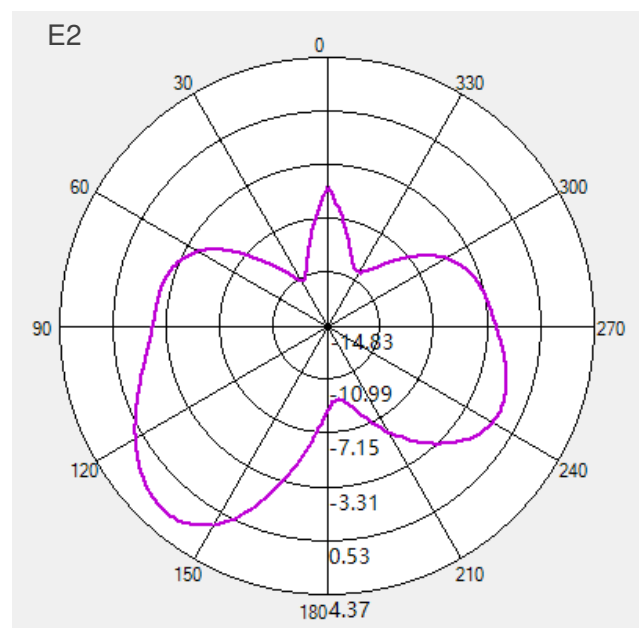
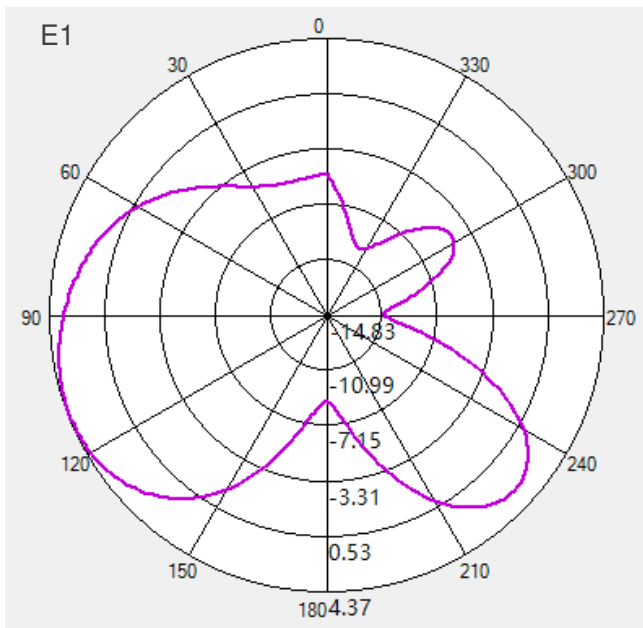
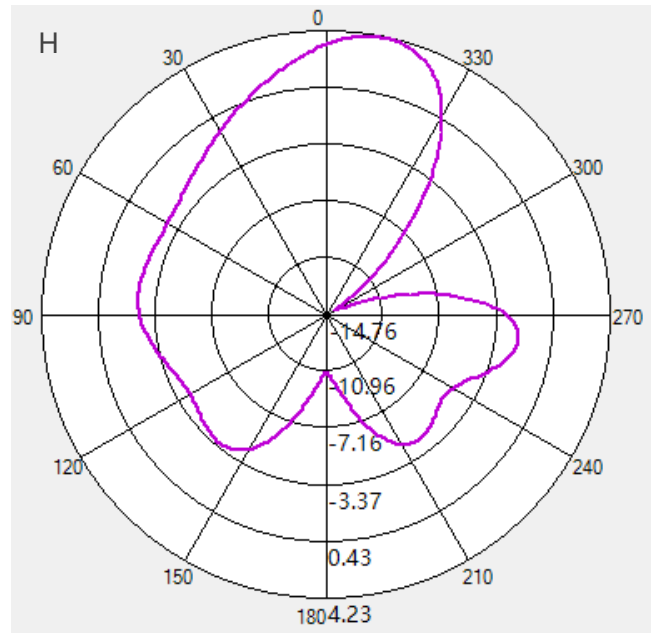
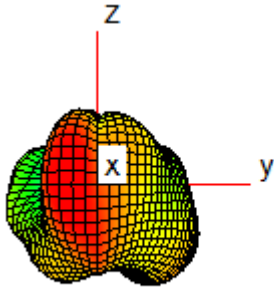
4.5.4.4. 2690 MHz



4.5.4.5. 3300 MHz



4.5.4.6. 5000 MHz



4.6. OTA Data

- Base Module: RM500Q-GL
- Cable Length: 500 mm

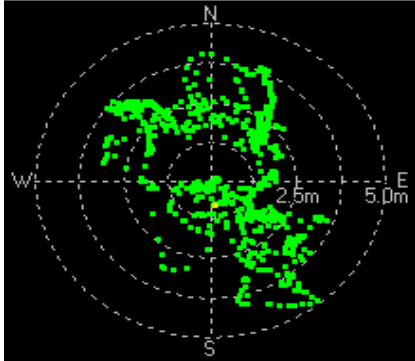
Test Condition		Free Space		
Band		Channel	TIS	TRP
LTE	1 (10 MHz)	18050	-100.6	20.2
		18300	-100.5	20.6
		18550	-100.3	20.5
	2 (10 MHz)	18650	-99.8	20.2
		18900	-100.1	19.6
		19150	-99.7	19.8
	3 (10 MHz)	19250	-100.4	20.2
		19575	-100.5	20.2
		19900	-100.8	20.1
	4 (10 MHz)	20000	-98.2	19.8
		20176	-98.1	20
		20350	-98	19.6
		20450	-97.3	20.1
	5 (10 MHz)	20525	-96.9	19.6
		20600	-96.8	19.3
		20850	-99.9	20.5
	7 (10 MHz)	21100	-99.7	20.7
		21350	-99.6	20.9
		21500	-97.9	20.5
	8 (10 MHz)	21625	-97.8	19.7
21750		-97.5	19.3	

	-	-	-
14 (10 MHz)	23330	-89.1	21.1
	-	-	-
	23780	-93.1	19.3
17 (10 MHz)	23790	-93.2	19.4
	23800	-93.1	19.1
	-	-	-
18 (10 MHz)	23925	-97.6	19.4
	-	-	-
	-	-	-
19 (10 MHz)	24075	-97.1	19.5
	-	-	-
	24200	-97.8	19.5
20 (10 MHz)	24300	-97.9	19.3
	24400	-97.6	19.5
	-	-	-
25 (10 MHz)	26365	-99.7	18.9
	-	-	-
	-	-	-
26 (10 MHz)	26865	-97.8	19.5
	-	-	-
	27260	-97.3	18.1
28 (10 MHz)	27435	-97.6	17.2
	27610	-97.4	18.5
	-	-	-
29 (10 MHz)	26865	-95.5	17

Band	Channel	TIS	TRP
66 (10 MHz)	132022	-99.5	21.3
	132322	-99.9	20.8
	132622	-99.7	20.4
	133175	-89.5	16.1
	133297	-91.2	15.6
	133405	-92.8	17.9
5G	499200	-86.7	21.3
	518600	-86.4	21.1
	537999	-86.2	20
	620000	-85.6	20.7
	650000	-85.9	21.5
	680000	-85.7	20.9
	620000	-86.9	21.1
	636667	-86.7	21.6
	653333	-86.4	21.7
	693334	-85.2	19.7
	713334	-85.3	20.2
	733333	-85.1	20.1

4.7. GNSS Test Data (Open Sky)

- Static drifting test at normal temperature

Test Module	CEP	Drifting (m)	Static Drifting figure
RM500Q-GL#GNSS	1.78	5	

- GPS navigation performance

Name	GPS SV	GL SV	GA SV	BE SV
	L1	L1	L1	L1
RM500Q-GL#GNSS	9	6	8	17

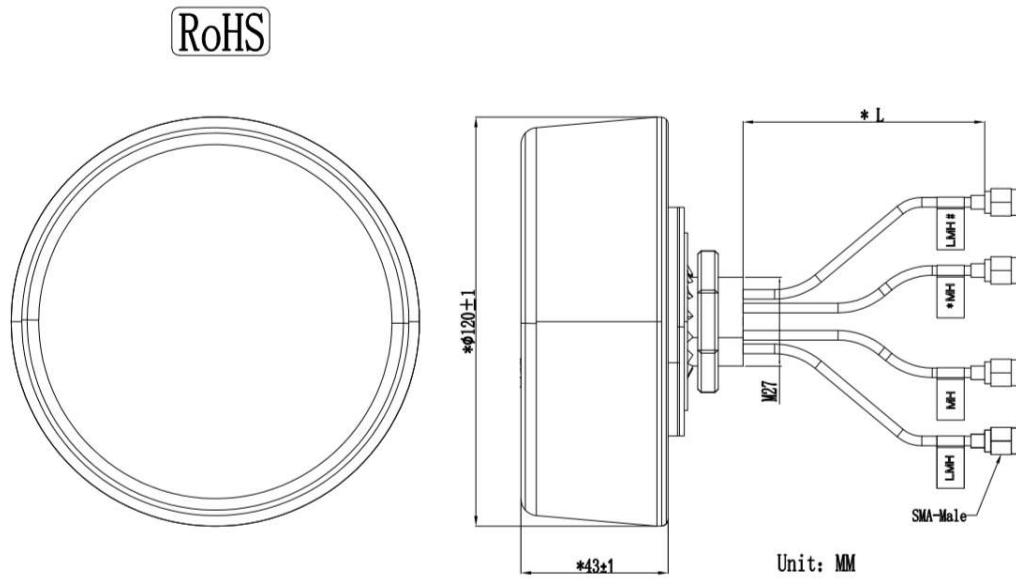
- Average CN0

Name	GPS Cno	GL Cno	GA Cno	BE Cno
	Median (dBHz)	Median (dBHz)	Median (dBHz)	Median (dBHz)
RM500Q-GL#GNSS	36.1	30.7	29.4	27.4

- TTFF Test
(Turn off XTAR assisted TTFF pressure test – normal temperature)

Test Module	Test Mode	Times	Time (s)
RM500Q-GL#GNSS	Cold Start	100	33.53
	Warm Start	100	23.65
	Hot Start	100	1.05

5 Product Size



OC	L
YB0007AA	500 ±30 mm
YB0007BA	1000 ±30 mm
YB0007CA	2000 ±30 mm
YB0007DA	3000 ±40 mm
YB0007EA	5000 ±50 mm

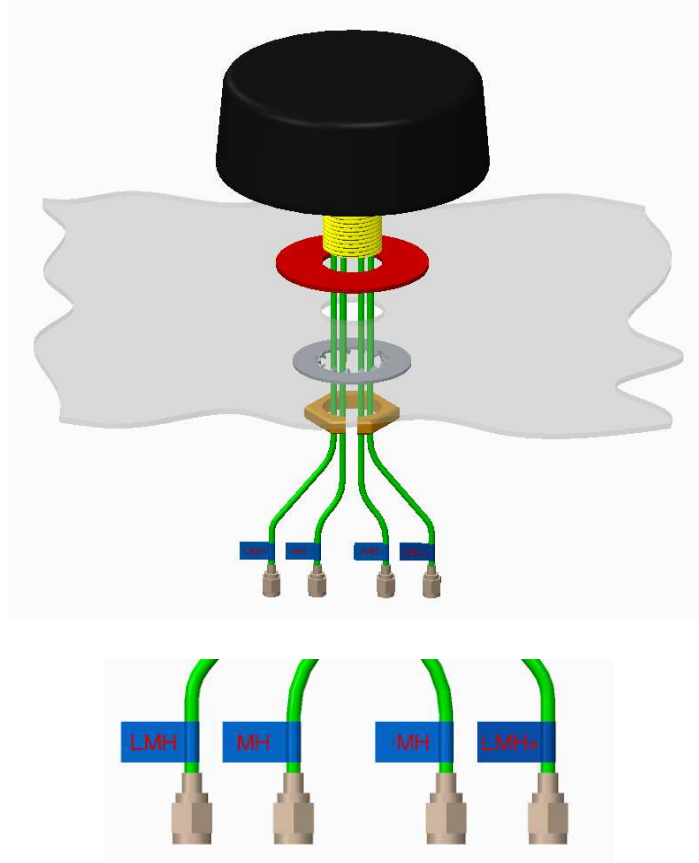
6 Connect Description

As follows, the default SMA male (center pin) is usually the setting that most users probably choose.



7 Installation

- Recommended hole size: $\Phi 28.0 \pm 0.5$ mm
- Recommended wall thickness size: 3.0 ± 1.0 mm



- Antenna labels are as follows:

Connector	Frequency
LMH#	600–5000 MHz
LMH	600–5000 MHz
*MH	1100–6000 MHz
MH	1400–6000 MHz