



Antenna Datasheet

Product OC: YEMX425J1A

Version: 1.1

Date: 2024-01-30

Status: Released

Product Name: 5G × 4 Combo Antenna

Key Features:

Frequency Band: 410–470 MHz, 617–2690 MHz, 3300–6000 MHz

Dimensions: 186 × 176 × 150 mm

Efficiency: Up to 76.2 % (4G/5G-1)

RoHS and REACH Compliant

IP67

Overview

This ultra-wide-band 5G/4G antenna box provides broad coverage from 410–6000 MHz whilst backward-compatible to support 3G/2G networks as well as Cat-M and NB-IoT. The antenna is designed for ease of integration with connection via 4 various cable lengths from 50–5000 mm, terminated with SMA connectors. This pole/wall/suction mount omni-directional antenna is easy to install with maximum durability with its IP67 & IP69K ASA enclosure. It is compatible with Quectel's RM520x Series modules. Quectel provides comprehensive antenna design support such as simulation, testing and manufacturing for custom antenna solutions to meet your specific application needs.

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1 Specification

Test Condition: Free Space

1.1. Electrical

Electrical	
Frequency Range	410–470 MHz, 617–2690 MHz, 3300–6000 MHz
Radiation Pattern	Omni-directional
Polarization	Linear
Impedance	50 Ω
Isolation	≤ -8.8 dB

1.1.1. 4G/5G-1

Electrical - Detail													
SPEC	Band	B31/ B88	B71	B12 /B13 /B28	B5 /B8 /B26	N74 /N75 /N76	B1 /B2 /B3	B40	Wi-Fi 2G	B38 /B41	B42 /B48 /N77	N79	Wi-Fi 5G
	Band	Freq. (MHz)	410- 470	610– 700	700– 810	820– 960	1420– 1520	1700– 2170	2300– 2400	2400– 2500	2500– 2690	3300– 4200	4400– 5000
Max. VSWR		3.5	4.6	3.9	3.0	2.8	2.1	1.6	1.7	1.8	2.1	1.6	2.0
Max. Return Loss (dB)		-5.2	-3.8	-4.6	-6.1	-6.4	-9.2	-12.8	-12.0	-10.6	-9.0	-12.9	-9.8
AVG Eff. (%)		23.1	33.7	52.7	57.5	43.0	58.4	66.6	56.5	59.1	66.7	69.9	62.3
AVG AVG Gain (dB)		-6.4	-4.7	-2.8	-2.4	-3.7	-2.3	-1.8	-2.5	-2.3	-1.8	-1.6	-2.1
Max. Peak Gain (dBi)		-0.5	1.2	5.6	5.6	4.8	3.5	3.9	3.5	4.2	3.6	4.9	3.0
VSWR		≤ 4.6											

Return Loss	≤ -3.8 dB
Peak Gain	≤ 5.6 dBi

1.1.2. 4G/5G-2

Electrical - Detail													
Band	Band	B31/ B88	B71	B12 /B13 /B28	B5 /B8 /B26	N74 /N75 /N76	B1 /B2 /B3	B40	Wi-Fi 2G	B38 /B41	B42 /B48 /N77	N79	Wi-Fi 5G
	SPEC	Freq. (MHz)	410- 470	610- 700	700- 810	820- 960	1420- 1520	1700- 2170	2300- 2400	2400- 2500	2500- 2690	3300- 4200	4400- 5000
Max. VSWR		6.2	4.1	2.6	2.2	3.0	2.6	1.4	1.4	2.1	2.2	1.7	1.9
Max. Return Loss (dB)		-2.8	-4.4	-7.0	-8.6	-6.1	-7.2	-14.9	-16.5	-9.0	-8.7	-11.7	-10.3
AVG Eff. (%)		26.0	27.7	41.7	48.6	38.2	53.3	66.4	56.0	56.6	64.1	64.6	62.6
AVG AVG Gain (dB)		-5.8	-5.6	-3.8	-3.1	-4.2	-2.7	-1.8	-2.5	-2.5	-1.9	-1.9	-2.0
Max. Peak Gain (dBi)		-0.3	2.2	4.9	4.4	4.0	4.8	2.5	4.7	4.7	5.3	4.4	4.0
VSWR							≤ 6.2						
Return Loss							≤ -2.8 dB						
Peak Gain							≤ 5.3 dBi						

1.1.3. 4G/5G-3

Electrical - Detail													
Band	Band	B31/ B88	B71	B12 /B13 /B28	B5 /B8 /B26	N74 /N75 /N76	B1 /B2 /B3	B40	Wi-Fi 2G	B38 /B41	B42 /B48 /N77	N79	Wi-Fi 5G
	SPEC	Freq. (MHz)	410- 470	610- 700	700- 810	820- 960	1420- 1520	1700- 2170	2300- 2400	2400- 2500	2500- 2690	3300- 4200	4400- 5000
Max. VSWR		5.1	4.6	3.1	2.6	2.6	2.3	1.5	1.5	2.2	2.2	1.7	1.9
Max. Return Loss (dB)		-3.4	-3.9	-5.8	-7.1	-6.9	-8.1	-13.7	-14.6	-8.3	-8.4	-11.4	-10.0

AVG Eff. (%)	27.3	30.8	48.7	54.6	52.2	54.6	67.1	64.4	54.5	66.9	63.5	62.6
AVG AVG Gain (dB)	-5.6	-5.1	-3.1	-2.6	-2.8	-2.6	-1.7	-1.9	-2.6	-1.7	-2.0	-2.0
Max. Peak Gain (dBi)	-0.5	0.2	1.8	3.1	3.1	4.8	2.7	4.6	5.1	6.2	5.0	3.7
VSWR	≤ 5.1											
Return Loss	≤ -3.4 dB											
Peak Gain	≤ 6.2 dBi											

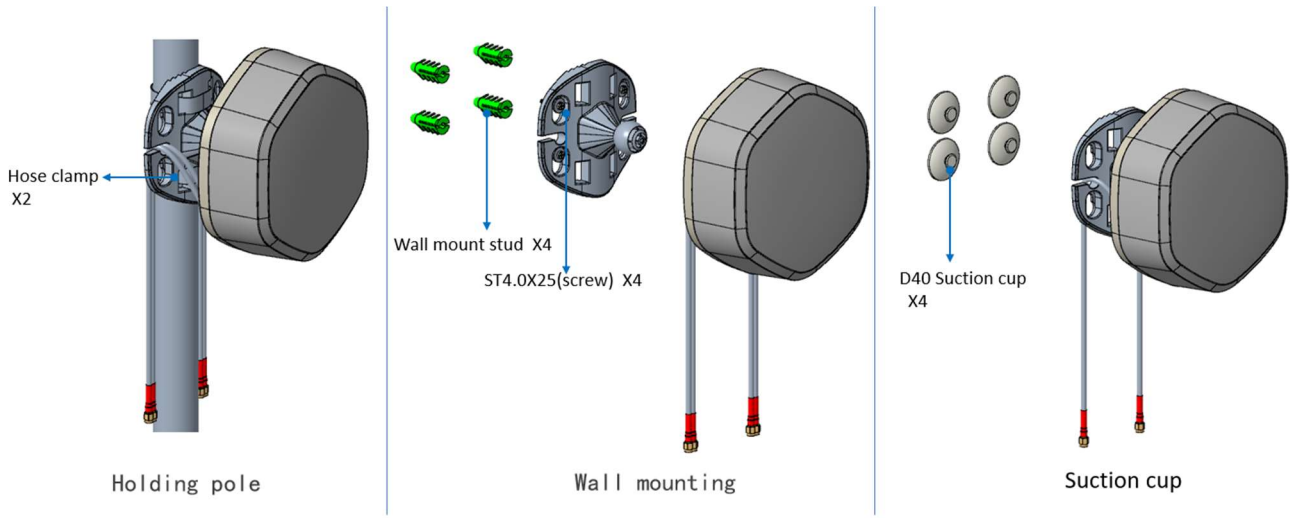
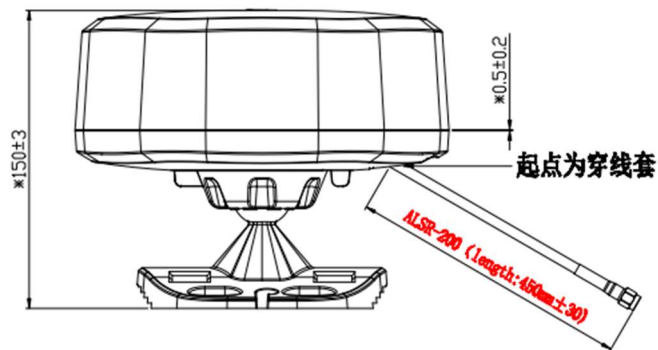
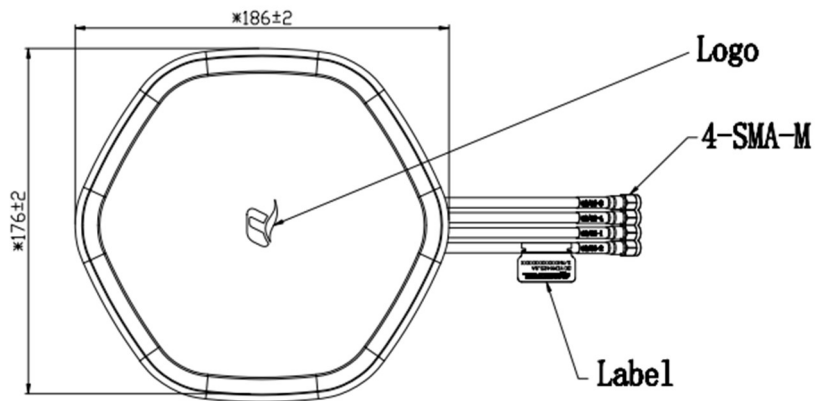
1.1.4. 4G/5G-4

Electrical - Detail													
Band	Band	B31/ B88	B71	B12 /B13 /B28	B5 /B8 /B26	N74 /N75 /N76	B1 /B2 /B3	B40	Wi-Fi 2G	B38 /B41	B42 /B48 /N77	N79	Wi-Fi 5G
	SPEC	Freq. (MHz)	410- 470	610- 700	700- 810	820- 960	1420- 1520	1700- 2170	2300- 2400	2400- 2500	2500- 2690	3300- 4200	4400- 5000
Max. VSWR		5.4	5.3	3.7	3.2	3.2	2.0	1.6	1.7	2.3	2.1	1.7	1.8
Max. Return Loss (dB)		-3.2	-3.3	-4.8	-5.7	-5.7	-9.4	-12.3	-11.8	-8.2	-9.1	-11.9	-10.7
AVG Eff. (%)		23.3	33.4	62.4	60.9	44.8	59.7	66.9	55.3	53.9	65.9	63.9	59.1
AVG AVG Gain (dB)		-6.3	-4.8	-2.0	-2.2	-3.5	-2.2	-1.7	-2.6	-2.7	-1.8	-1.9	-2.3
Max. Peak Gain (dBi)		0.4	1.4	3.1	3.5	2.8	5.3	4.3	4.4	4.2	5.1	3.2	3.7
VSWR		≤ 5.4											
Return Loss		≤ -3.2 dB											
Peak Gain		≤ 5.3 dBi											

1.2. Mechanical & Environmental

Mechanical	
Antenna Dimensions	186 × 176 × 150 mm
Antenna Material & Color	ASA
Cable Type & Color & Length	ALSR200 & Black & 450 mm
Connector Type	SMA Male
Weight	Typ. 650 g
Mounting Type	pole /wall /suction cup
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
Ingress Protection (IP) Rating	IP67
RoHS & REACH Compliant	Yes
Housing UV Resistant	UL 746c f1

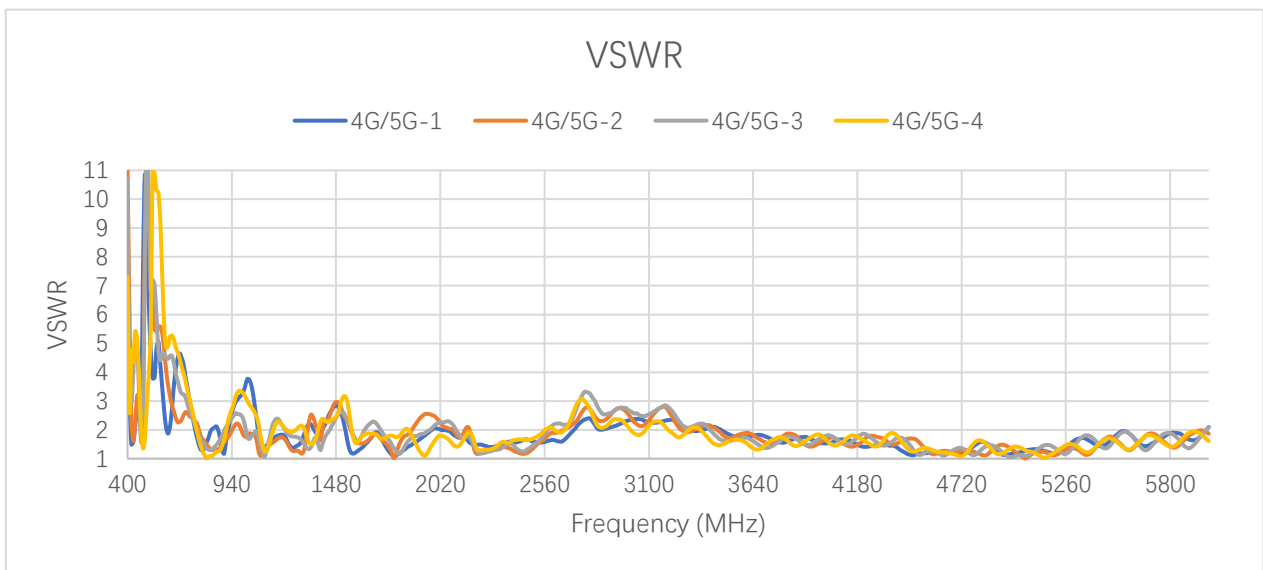
2 Drawing



3 Detailed Performance

3.1. S-Parameter Test

3.1.1. VSWR



VSWR

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
4G/5G-1	2.1	2.7	3.5	2.0	1.2	3.0	2.5	1.8	1.4	1.5
4G/5G-2	4.1	2.8	2.6	1.3	1.6	2.2	2.4	1.7	1.5	2.1
4G/5G-3	4.5	4.6	2.9	1.3	2.0	2.6	1.9	2.0	1.7	1.8
4G/5G-4	4.8	5.3	3.4	1.1	1.7	3.2	2.3	1.7	1.7	1.7
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
4G/5G-1	1.9	1.8	1.5	1.6	1.7	1.7	1.2	1.2	1.7	2.1
4G/5G-2	2.6	1.9	1.4	1.2	1.9	1.9	1.2	1.2	1.7	1.9
4G/5G-3	1.9	1.7	1.4	1.2	2.1	1.7	1.4	1.1	1.5	2.1
4G/5G-4	1.2	1.7	1.6	1.7	2.1	1.6	1.1	1.4	1.7	1.6

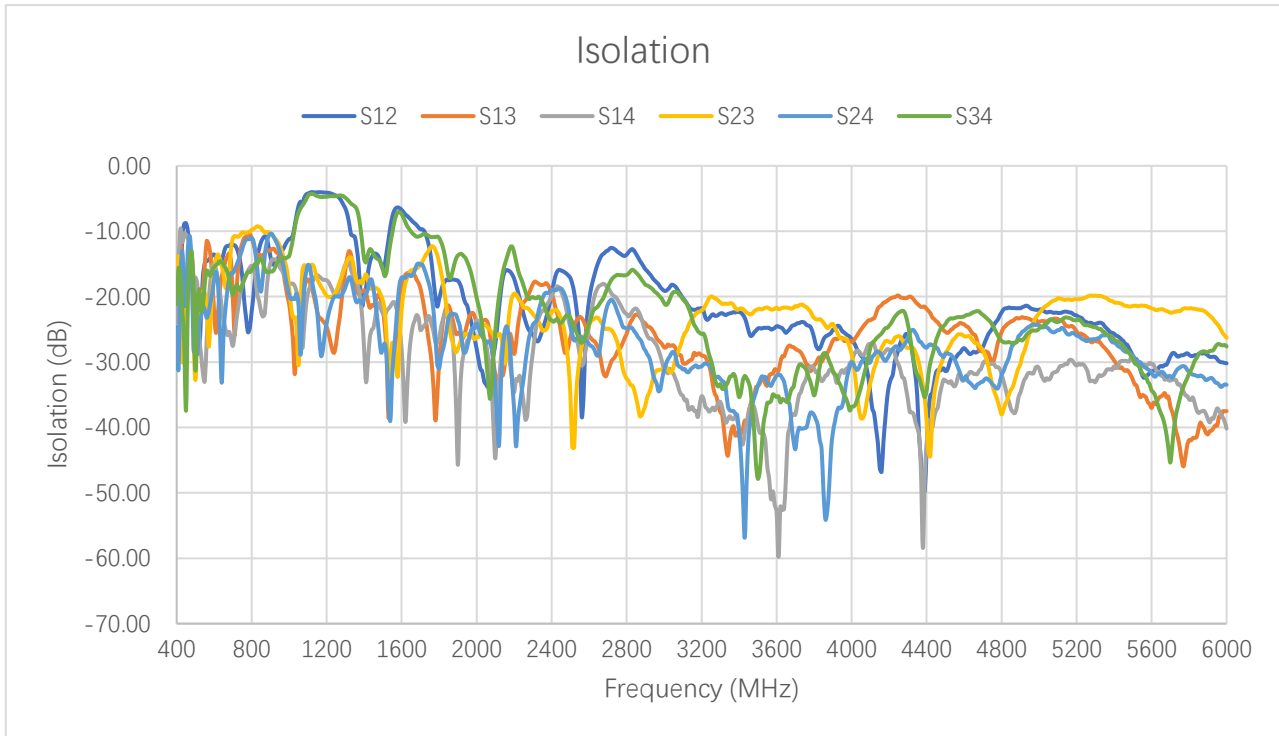
3.1.2. Return Loss



Return Loss (dB)

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
4G/5G-1	-9.2	-6.7	-5.1	-9.8	-21.9	-6.1	-7.5	-11.3	-15.8	-13.6
4G/5G-2	-4.4	-6.4	-7.1	-16.9	-13.1	-8.6	-7.8	-11.7	-13.7	-9.1
4G/5G-3	-3.9	-3.9	-6.3	-17.9	-9.8	-7.1	-10.0	-9.5	-11.5	-11.1
4G/5G-4	-3.6	-3.3	-5.3	-26.6	-12.1	-5.7	-8.2	-11.7	-11.4	-11.9
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
4G/5G-1	-10.4	-10.8	-13.6	-12.2	-12.2	-11.3	-21.5	-21.2	-11.8	-9.0
4G/5G-2	-7.2	-10.2	-15.5	-22.3	-10.2	-10.2	-19.5	-19.9	-11.3	-10.4
4G/5G-3	-9.9	-11.5	-15.0	-19.3	-8.8	-11.5	-16.2	-26.8	-13.5	-9.1
4G/5G-4	-22.7	-12.1	-13.0	-12.1	-9.2	-13.2	-25.4	-15.2	-11.9	-12.6

3.1.3. Isolation

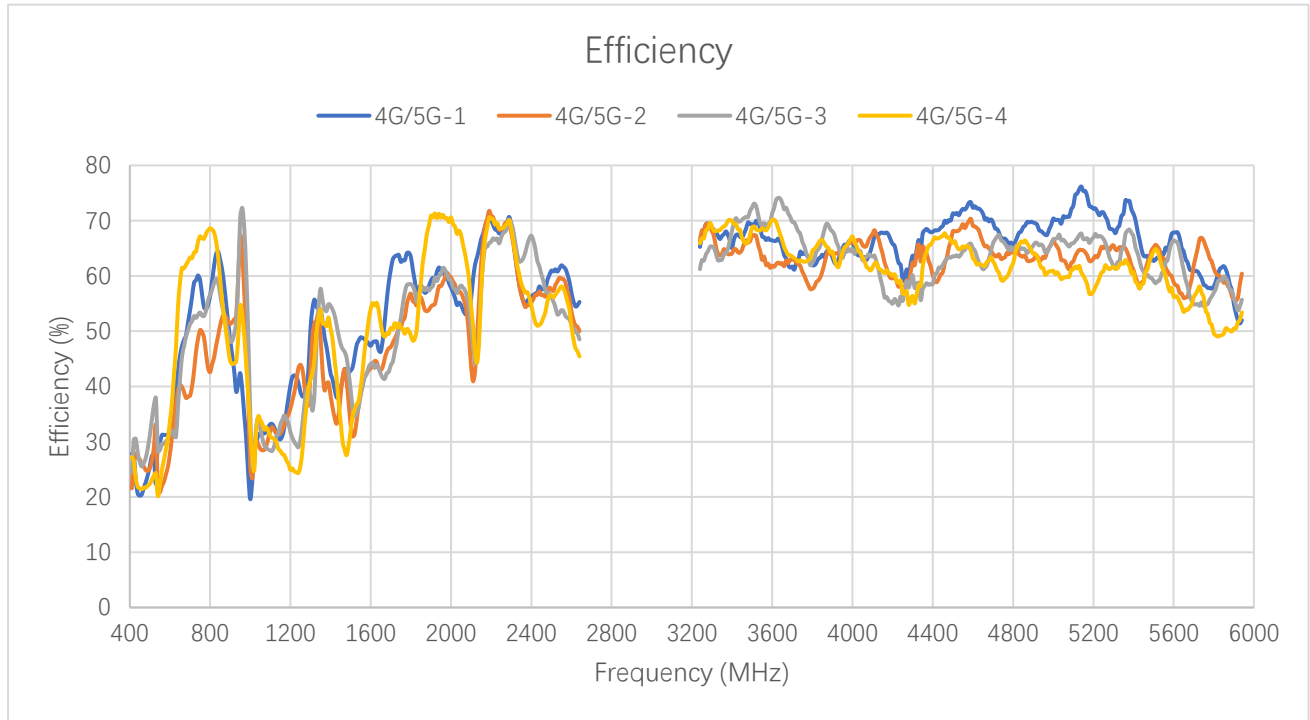


Max Isolation (dB)

Band	B31/ B88	B71	B12/ B13/ B28	B5/ B8/ B26	N74/ N75/ N76	B1/ B2/ B3	B40	Wi-Fi 2G	B38/ B41	B42/ B48/ N77	N79	Wi-Fi 5G
Freq. (MHz)	410- 470	600- 700	700- 810	820- 960	1420- 1520	1700- 2170	2300- 2400	2400- 2500	2500- 2690	3300- 4200	4400- 5000	5150- 5850
S12	-8.8	-12.0	-12.1	-10.8	-13.2	-9.7	-19.5	-15.9	-13.1	-22.3	-21.4	-22.3
S13	-12.0	-13.4	-10.4	-12.7	-19.7	-20.1	-17.7	-19.4	-23.1	-20.4	-21.9	-24.5
S14	-9.6	-14.9	-15.3	-14.3	-21.0	-22.1	-19.9	-18.4	-18.1	-27.2	-29.9	-29.4
S23	-13.1	-11.1	-9.6	-9.2	-17.5	-12.3	-22.2	-22.0	-23.2	-20.9	-22.5	-19.8
S24	-10.7	-16.2	-11.0	-10.4	-17.4	-15.1	-19.1	-18.7	-22.1	-28.4	-24.2	-25.5
S34	-13.7	-14.6	-15.4	-14.0	-12.8	-10.4	-20.0	-22.9	-19.2	-24.4	-22.2	-23.2

3.2. Radiation Performance Test

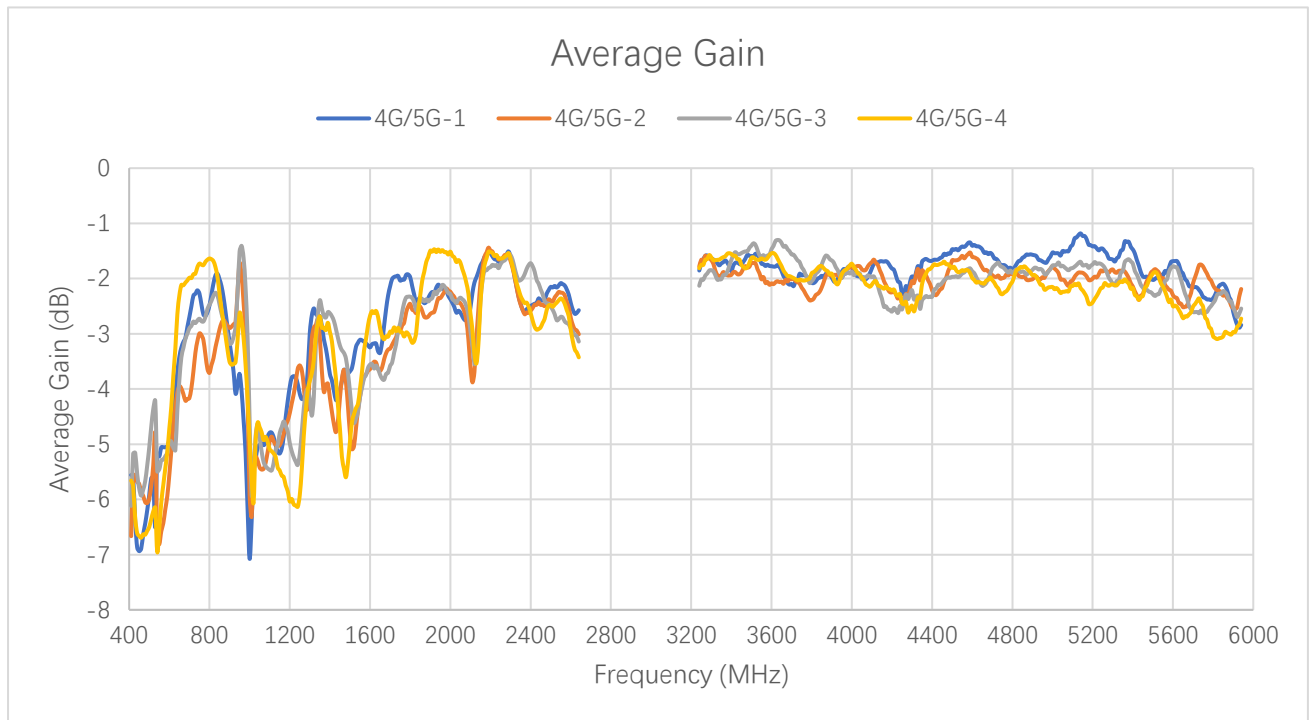
3.2.1. Efficiency



Efficiency (%)

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
4G/5G-1	30.4	31.2	45.5	54.3	64.4	48.4	44.8	46.3	55.6	59.0
4G/5G-2	21.3	22.7	40.3	48.8	49.1	51.3	40.7	42.9	46.2	55.2
4G/5G-3	28.2	29.7	41.3	52.8	58.8	48.1	54.9	42.3	42.4	57.1
4G/5G-4	20.2	26.7	58.8	66.7	63.5	44.6	52.5	51.4	49.6	48.7
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
4G/5G-1	58.2	53.0	70.7	55.8	61.3	68.6	71.9	68.1	64.8	52.0
4G/5G-2	53.9	52.9	69.6	54.7	59.7	64.5	67.1	62.9	58.8	60.4
4G/5G-3	57.4	56.2	70.1	66.7	53.3	69.5	61.8	65.7	61.4	55.7
4G/5G-4	69.0	61.9	70.2	56.1	57.6	68.2	62.1	61.5	58.4	53.4

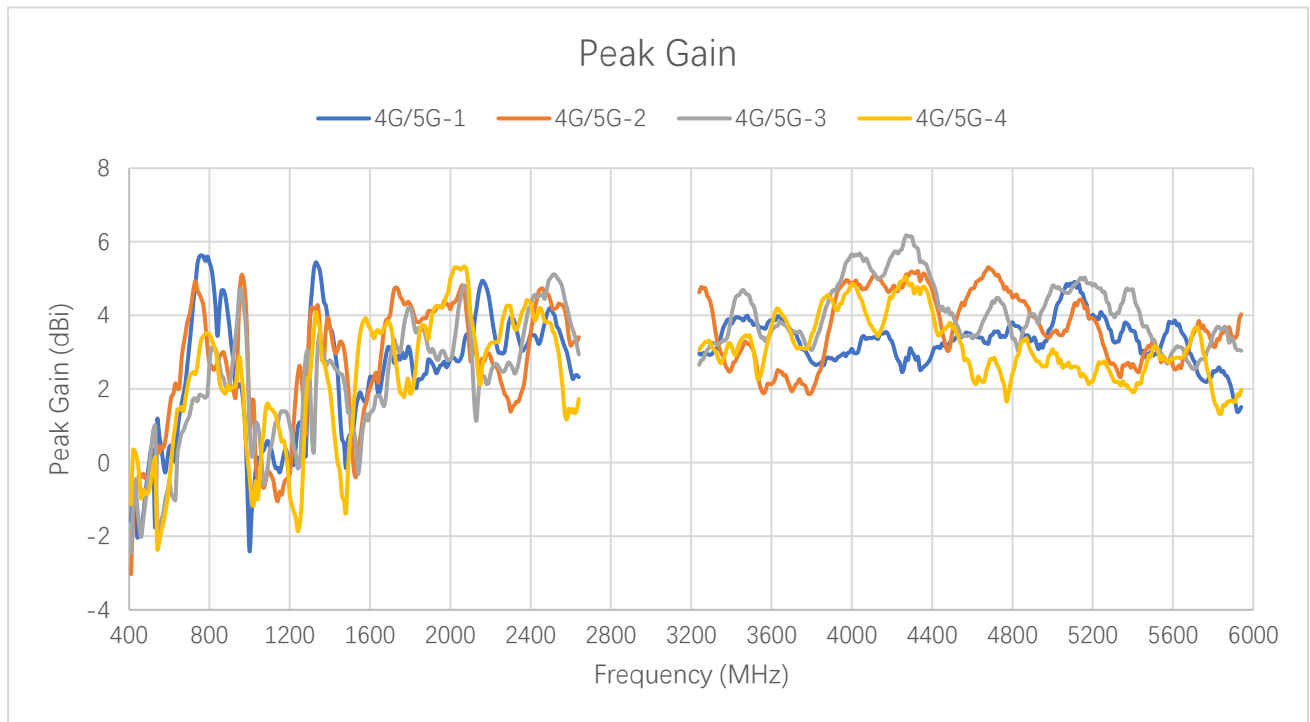
3.2.2. Average Gain



Average Gain (dB)

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
4G/5G-1	-5.2	-5.1	-3.4	-2.7	-1.9	-3.1	-3.5	-3.3	-2.6	-2.3
4G/5G-2	-6.7	-6.4	-3.9	-3.1	-3.1	-2.9	-3.9	-3.7	-3.4	-2.6
4G/5G-3	-5.5	-5.3	-3.8	-2.8	-2.3	-3.2	-2.6	-3.7	-3.7	-2.4
4G/5G-4	-7.0	-5.7	-2.3	-1.8	-2.0	-3.5	-2.8	-2.9	-3.0	-3.1
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
4G/5G-1	-2.4	-2.8	-1.5	-2.5	-2.1	-1.6	-1.4	-1.7	-1.9	-2.8
4G/5G-2	-2.7	-2.8	-1.6	-2.6	-2.2	-1.9	-1.7	-2.0	-2.3	-2.2
4G/5G-3	-2.4	-2.5	-1.5	-1.8	-2.7	-1.6	-2.1	-1.8	-2.1	-2.5
4G/5G-4	-1.6	-2.1	-1.5	-2.5	-2.4	-1.7	-2.1	-2.1	-2.3	-2.7

3.2.3. Peak Gain

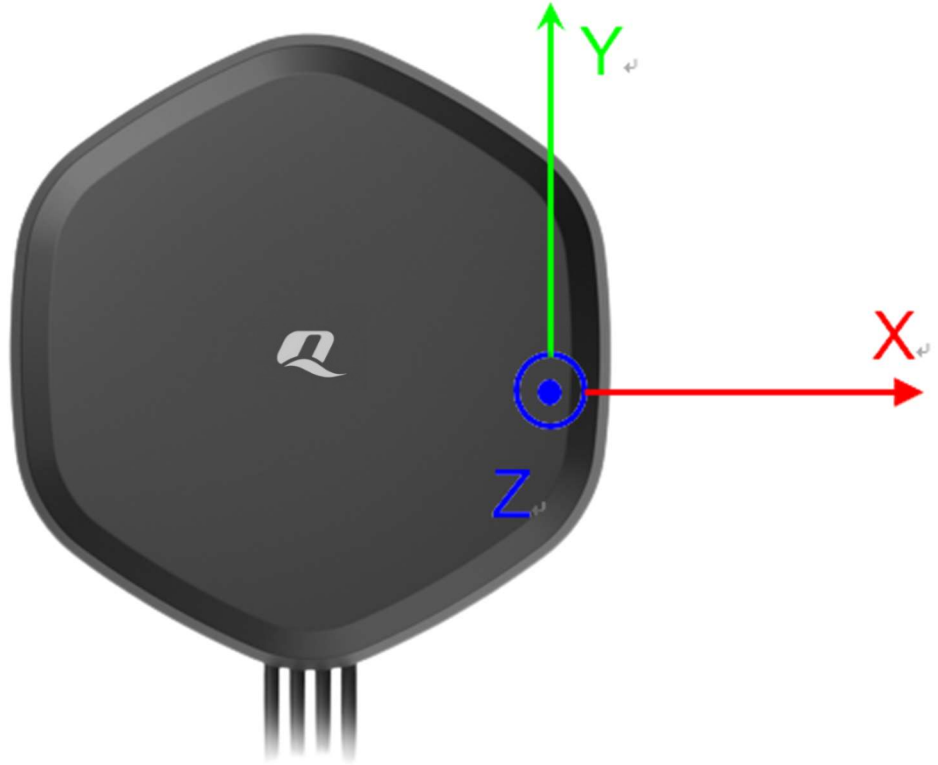


Peak Gain (dBi)

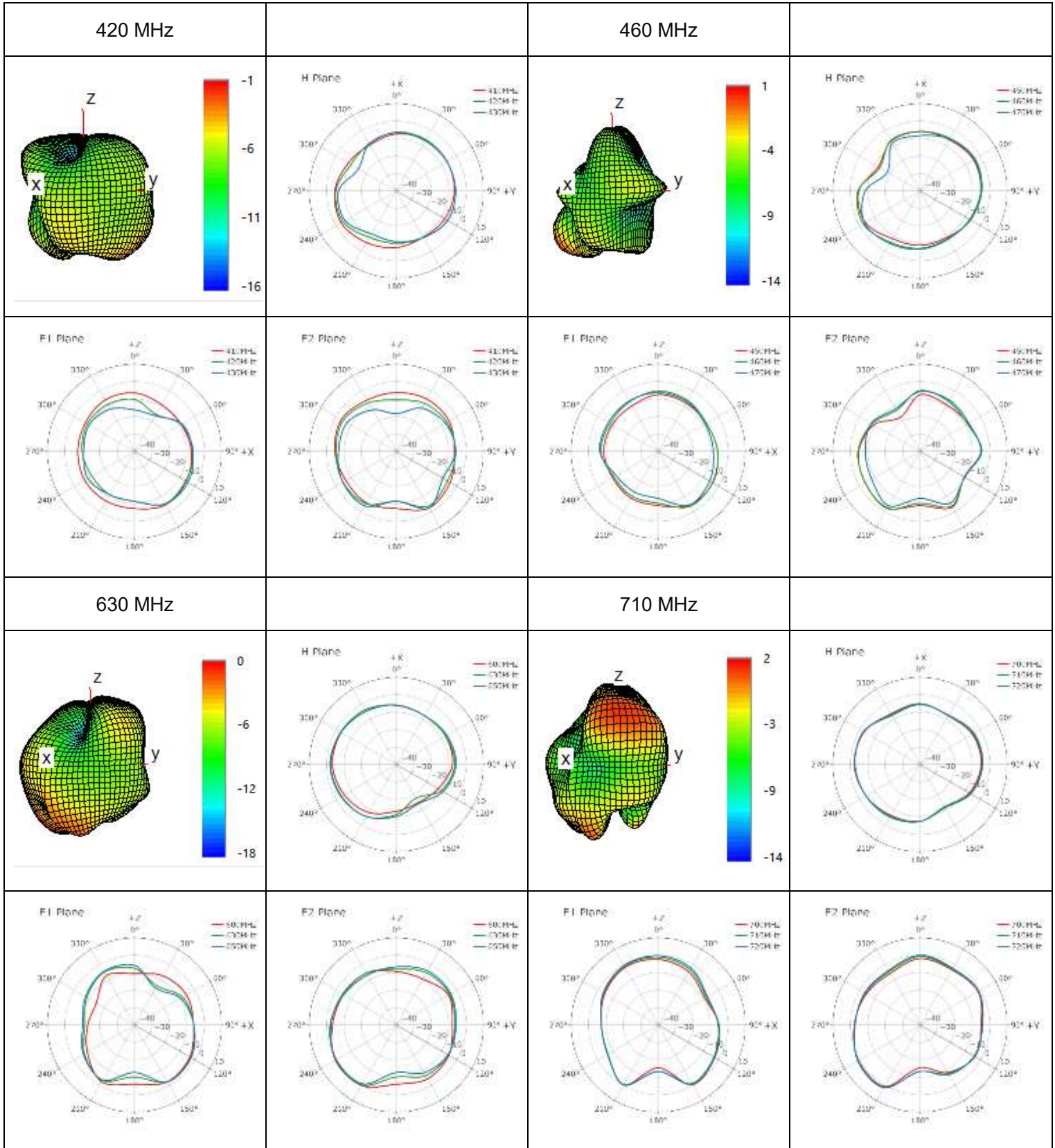
Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
4G/5G-1	1.2	0.0	1.3	5.6	3.4	3.7	3.9	2.0	2.9	2.2
4G/5G-2	0.5	0.4	2.0	4.3	2.7	2.2	4.0	2.7	3.9	4.0
4G/5G-3	-2.0	-1.4	0.5	1.8	2.9	2.1	2.7	1.8	1.8	3.7
4G/5G-4	-2.4	-1.7	1.5	3.4	2.7	2.0	2.2	3.5	3.7	2.2
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
4G/5G-1	2.8	3.5	3.8	3.3	3.6	3.7	3.4	3.2	3.0	1.5
4G/5G-2	4.1	4.1	1.7	3.1	4.3	2.1	5.0	3.7	2.7	4.0
4G/5G-3	3.1	4.8	2.7	4.2	5.0	3.5	3.6	4.0	3.9	3.0
4G/5G-4	3.4	5.3	4.3	4.4	3.0	2.3	2.2	2.7	2.2	2.0

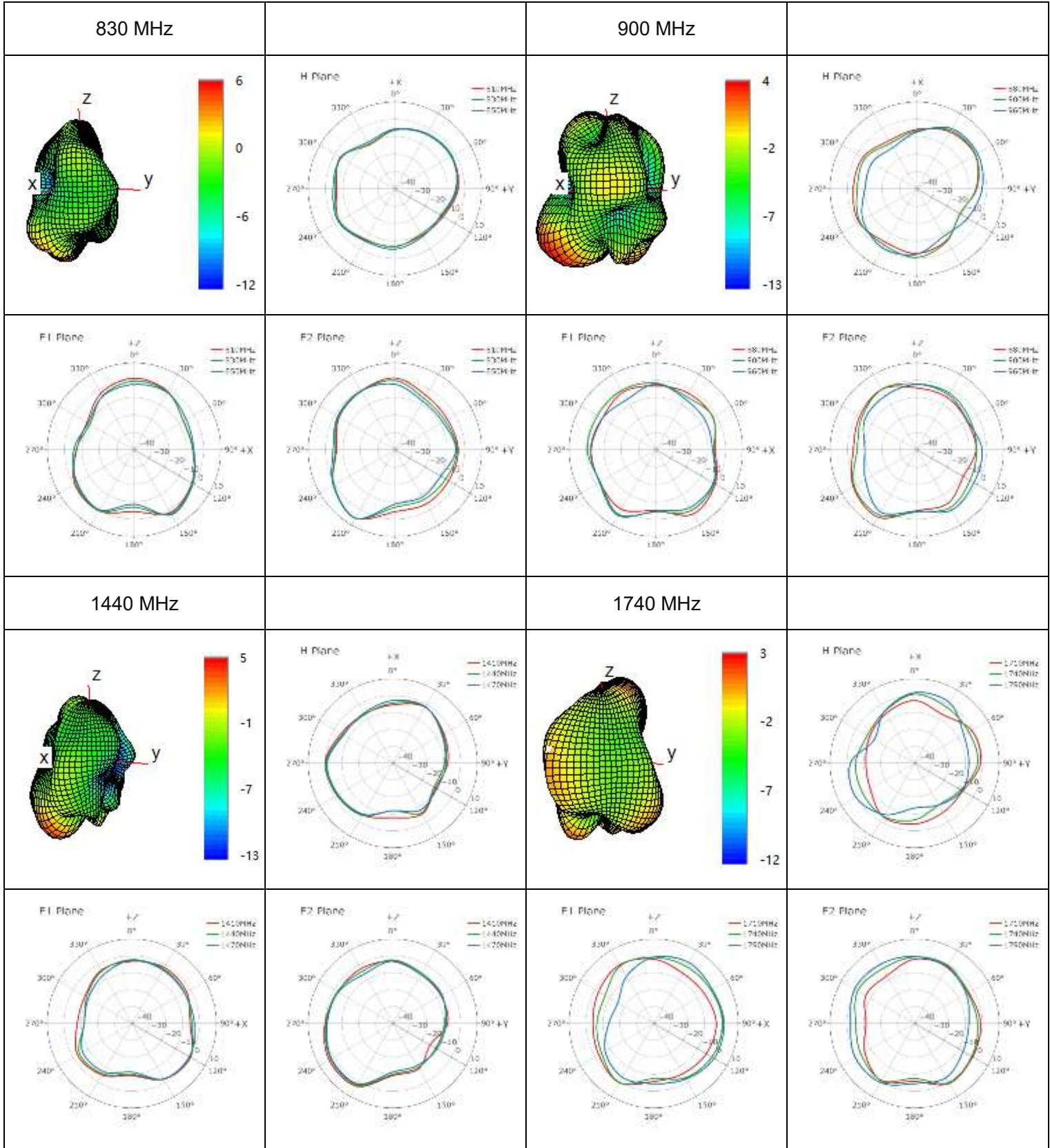
3.2.4. 3D & 2D Radiation Pattern

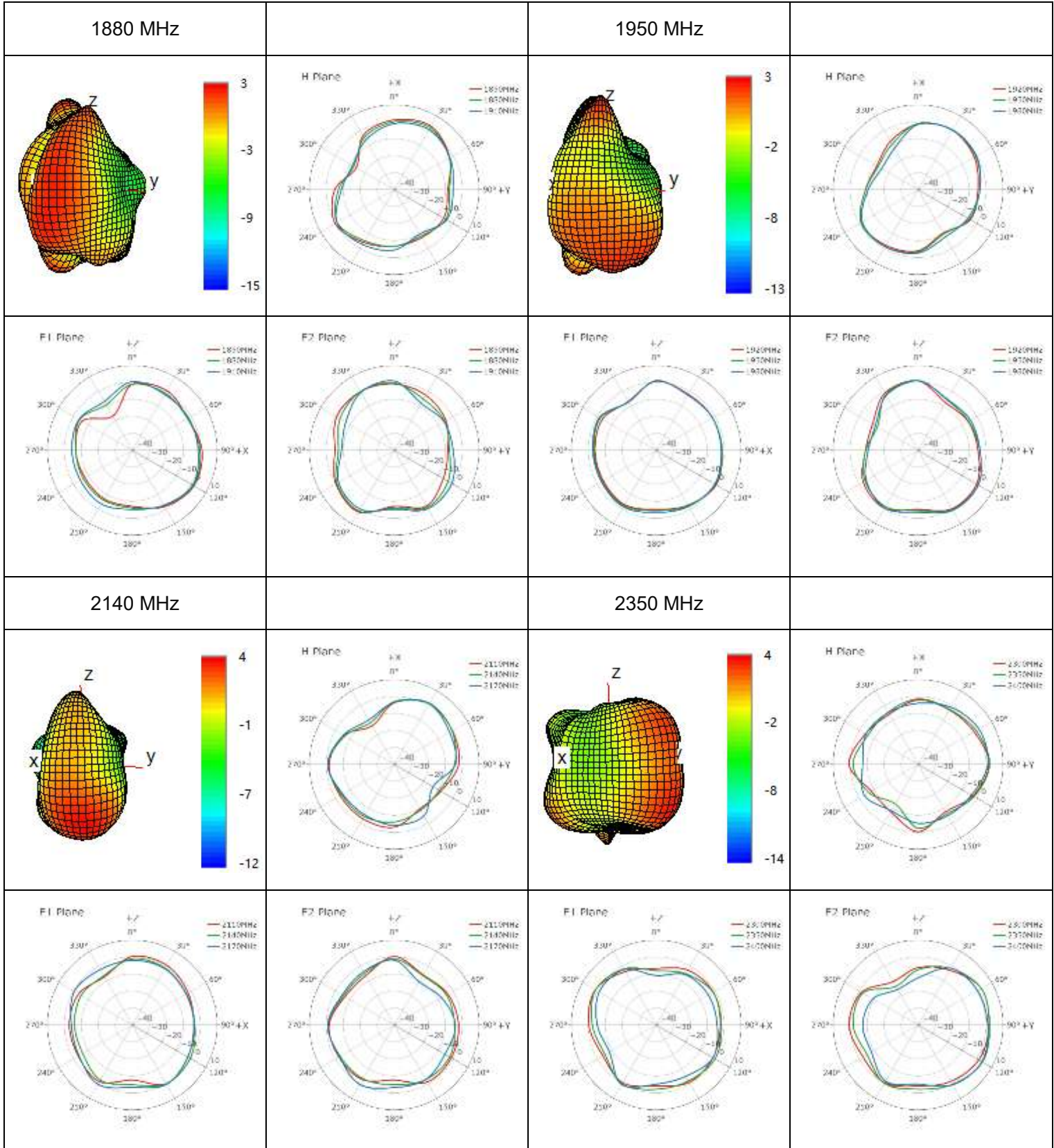
- Test Status: Free space
- Test Chamber: FS-G-1

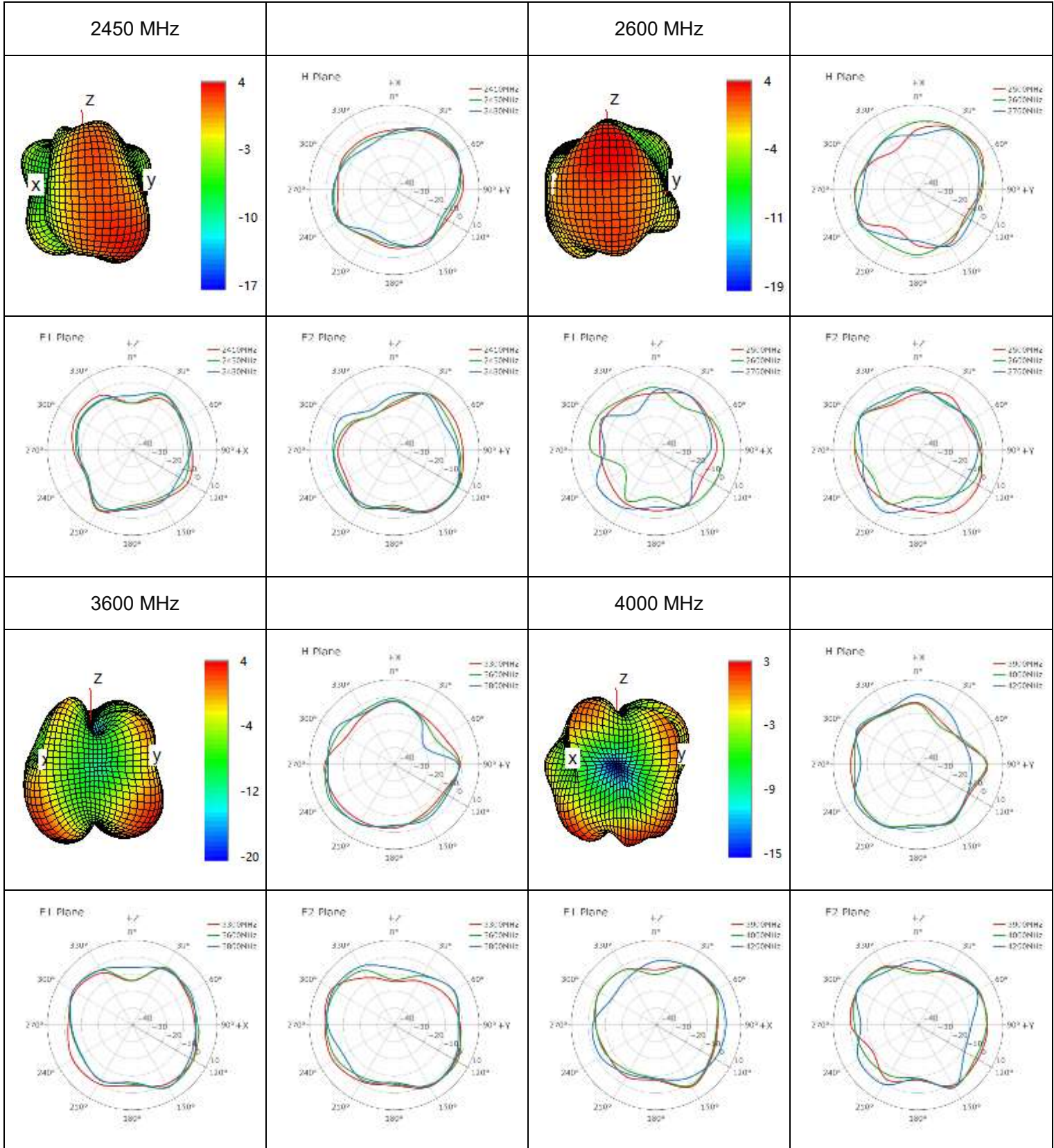


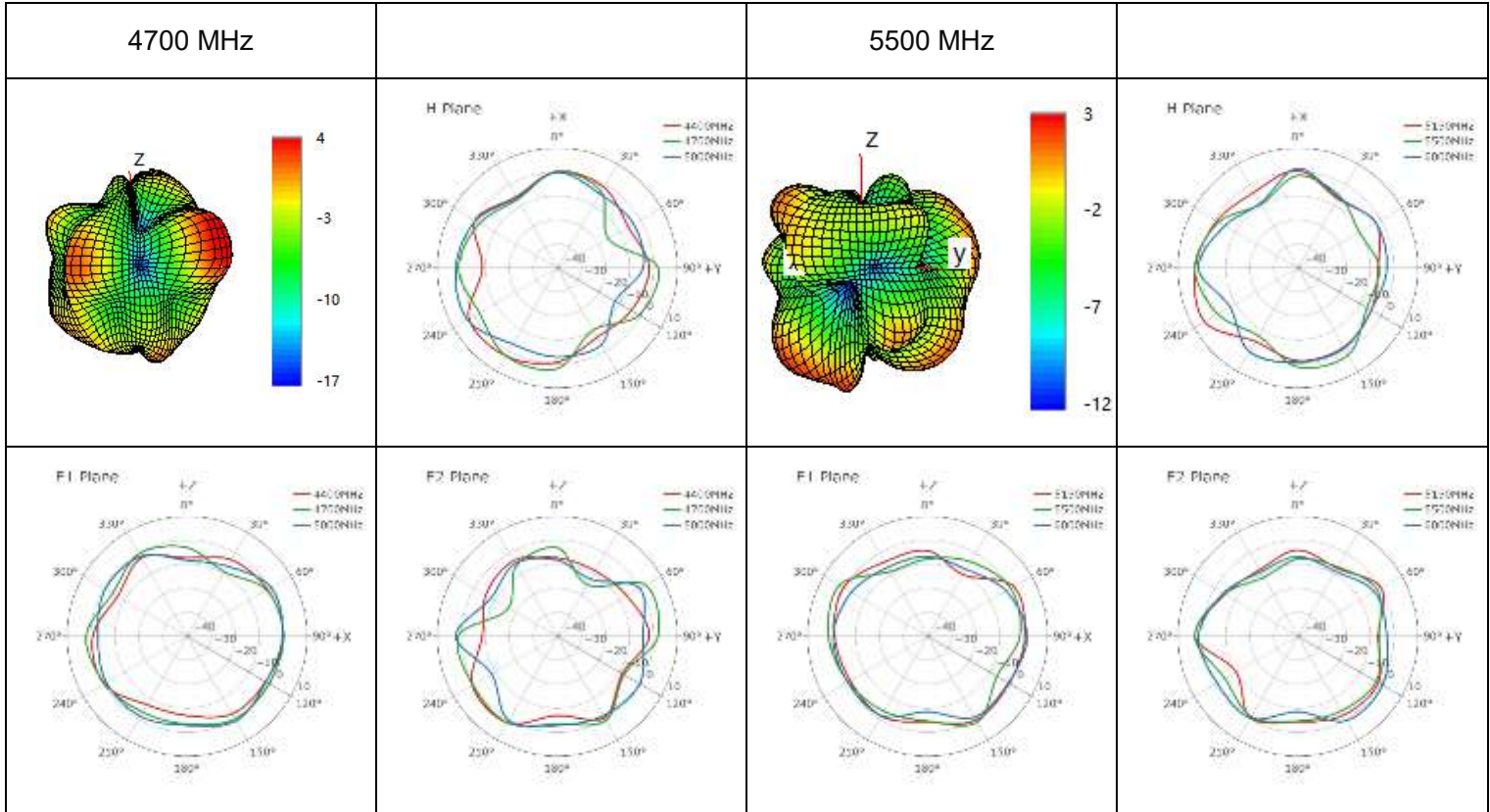
● **4G/5G-1**



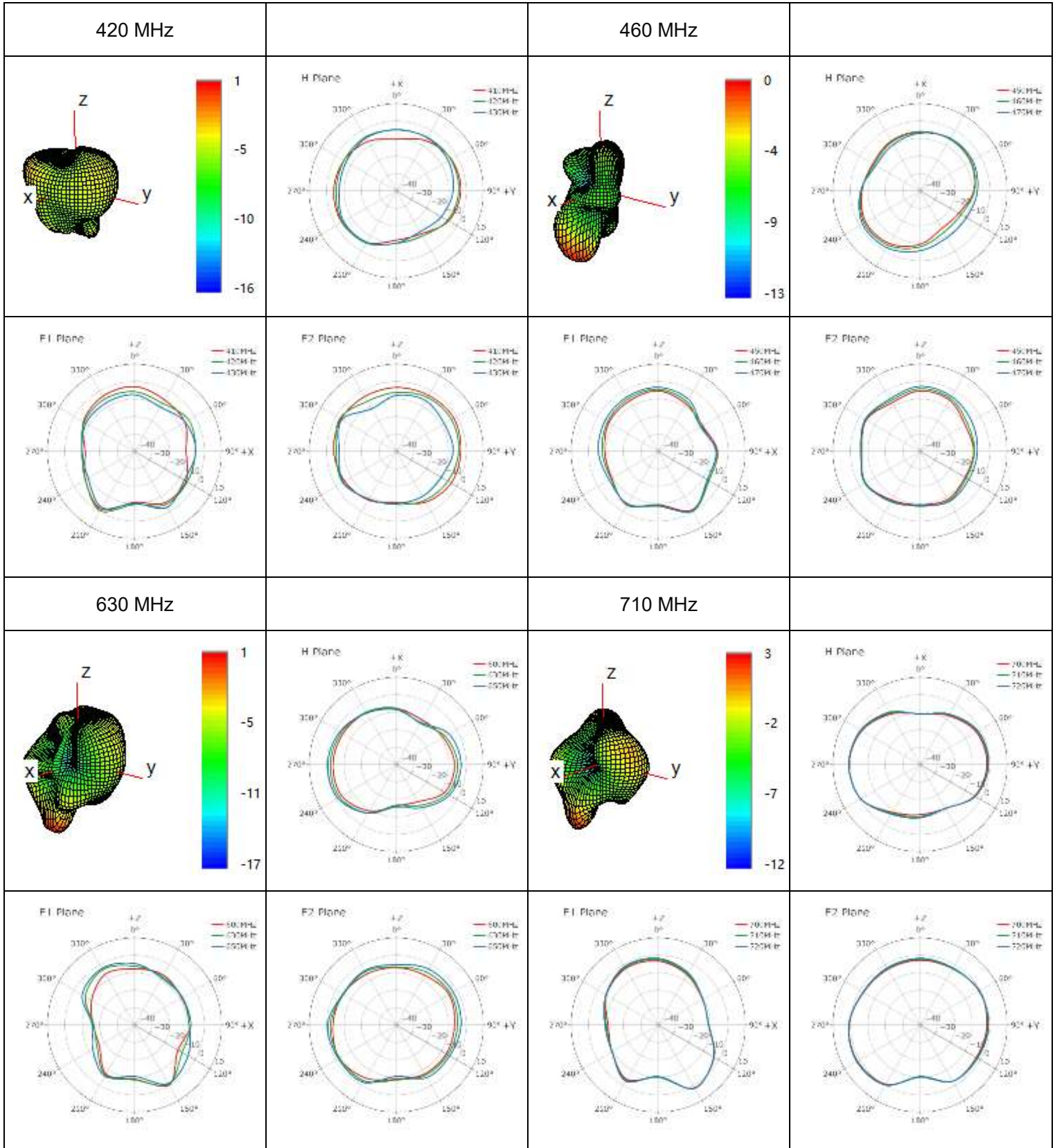


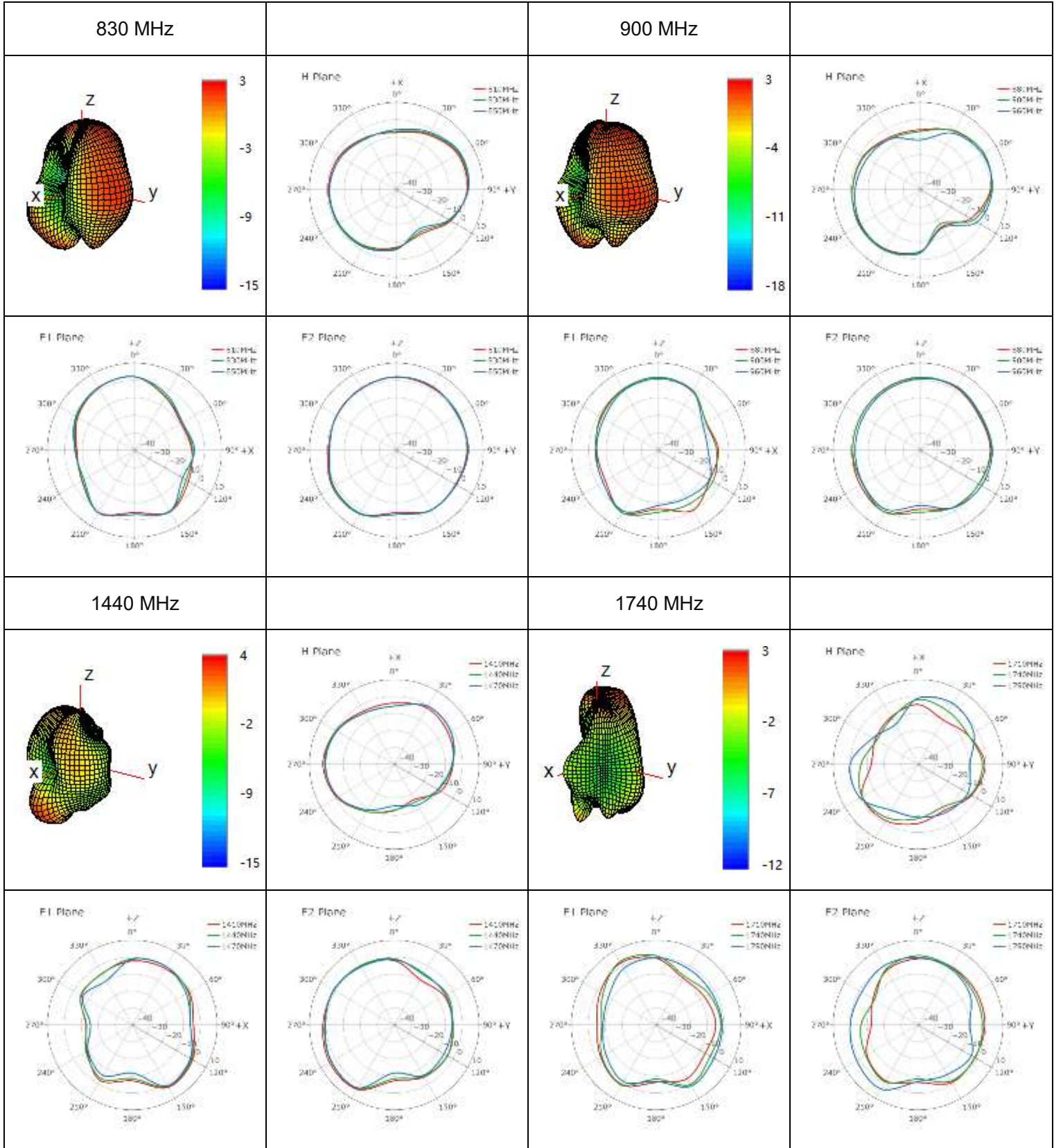


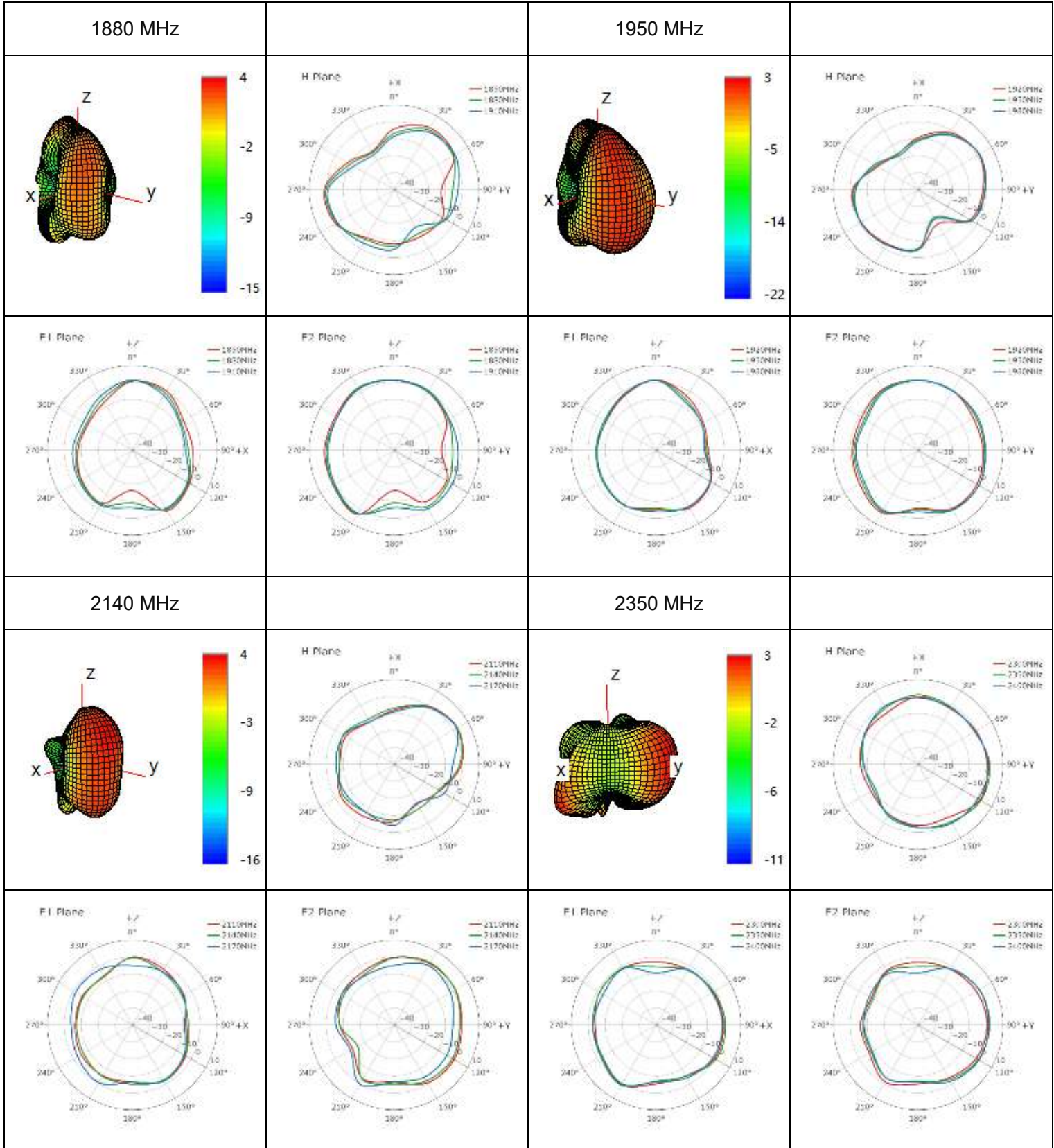


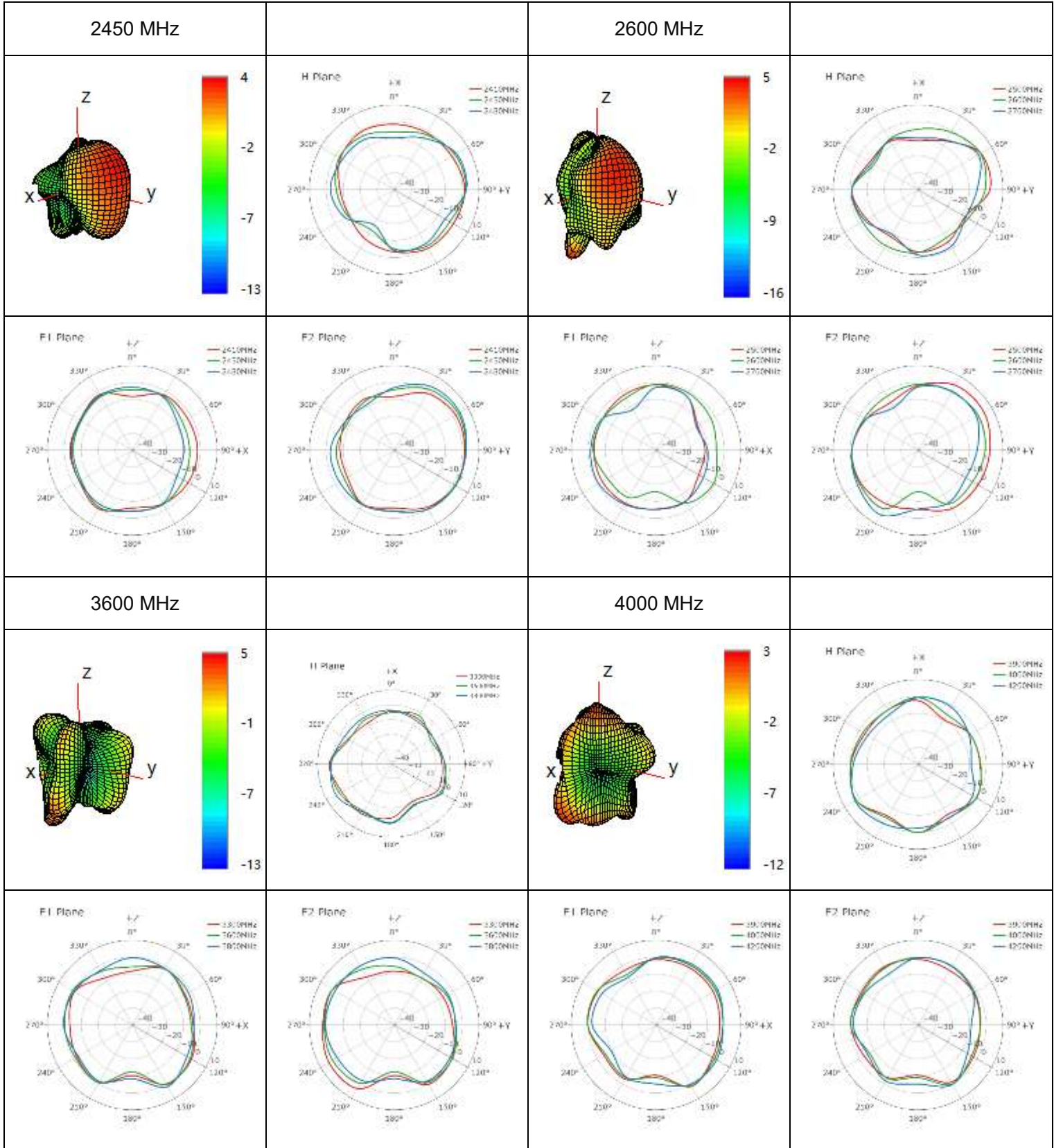


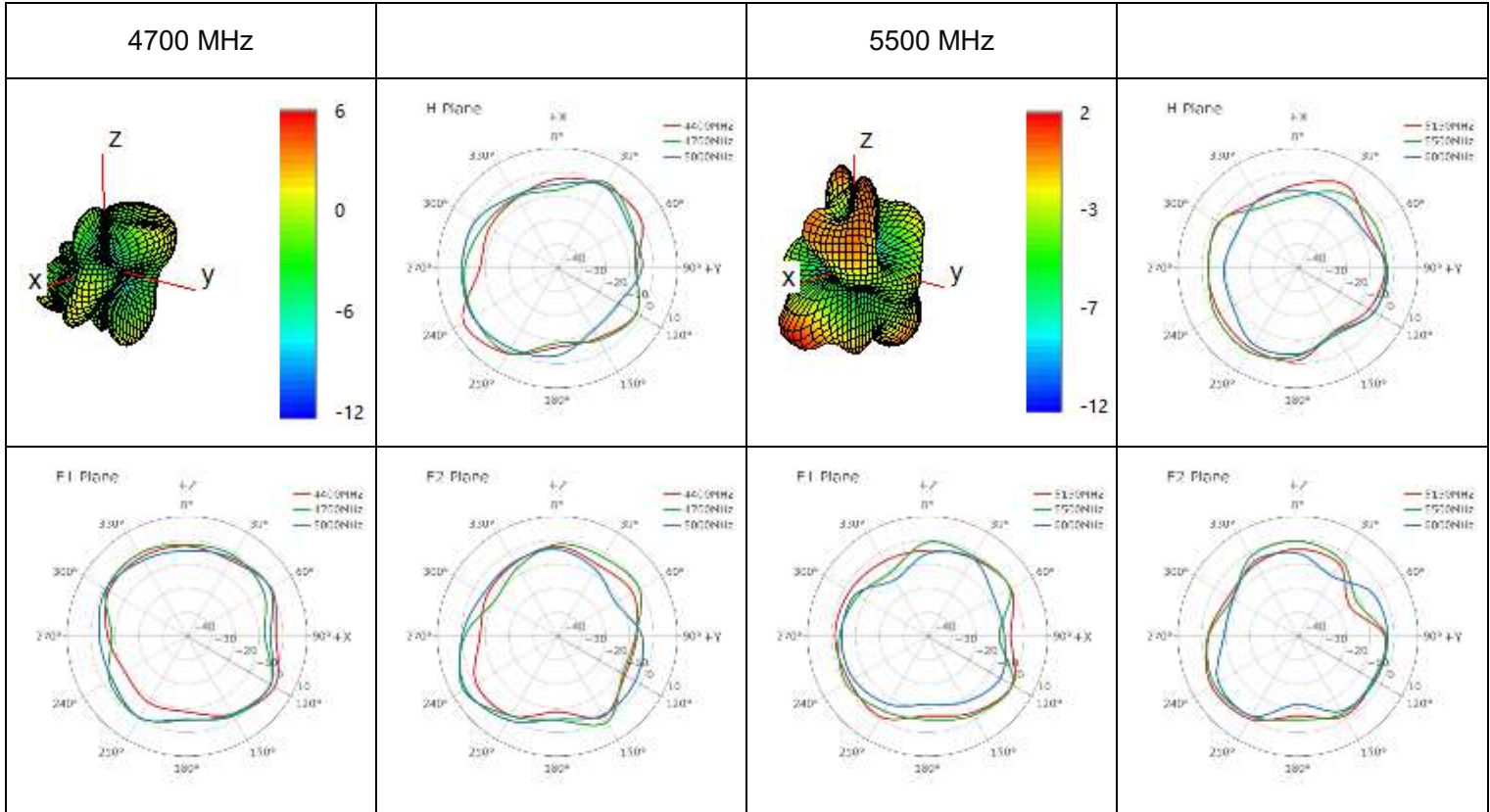
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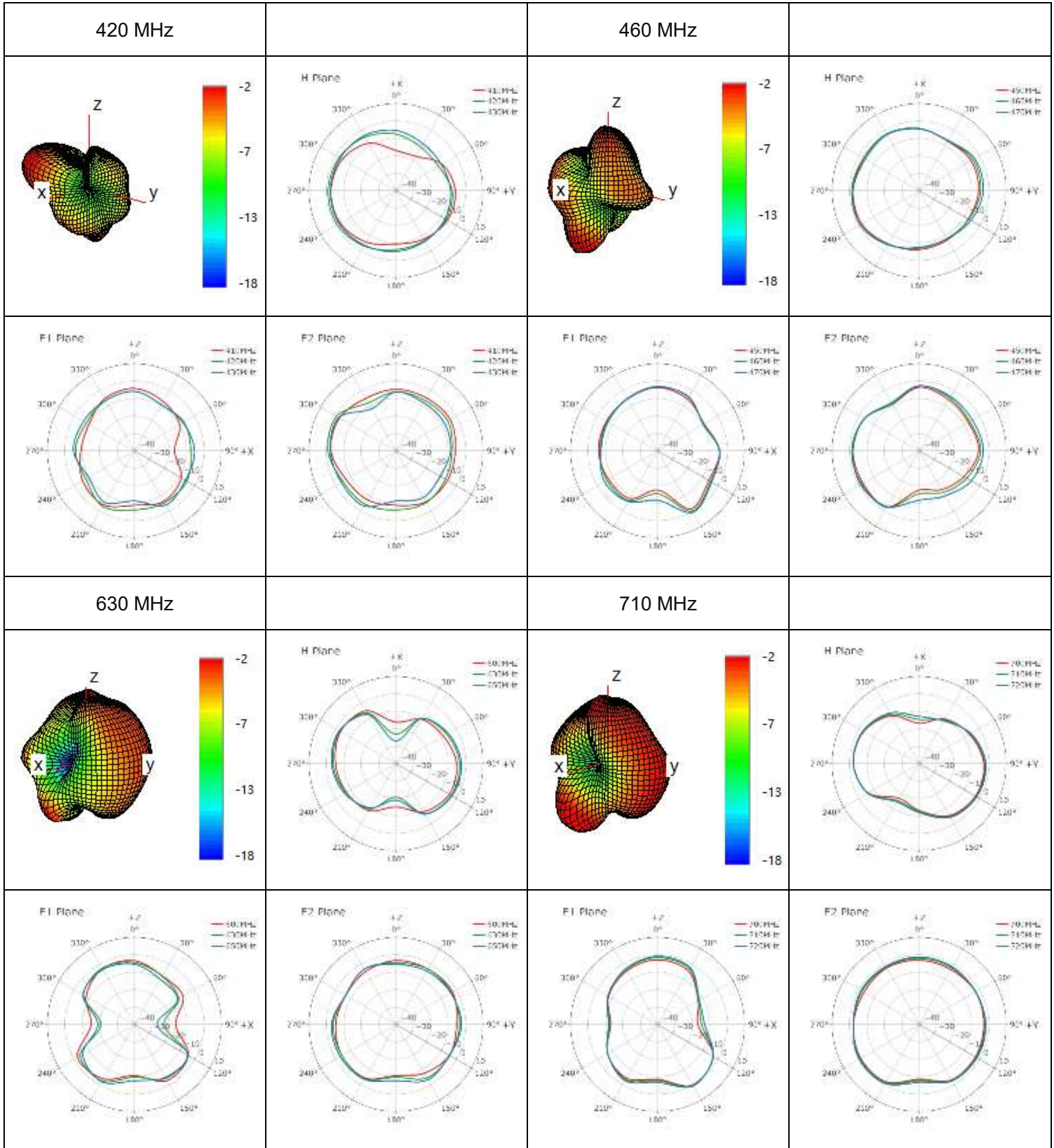


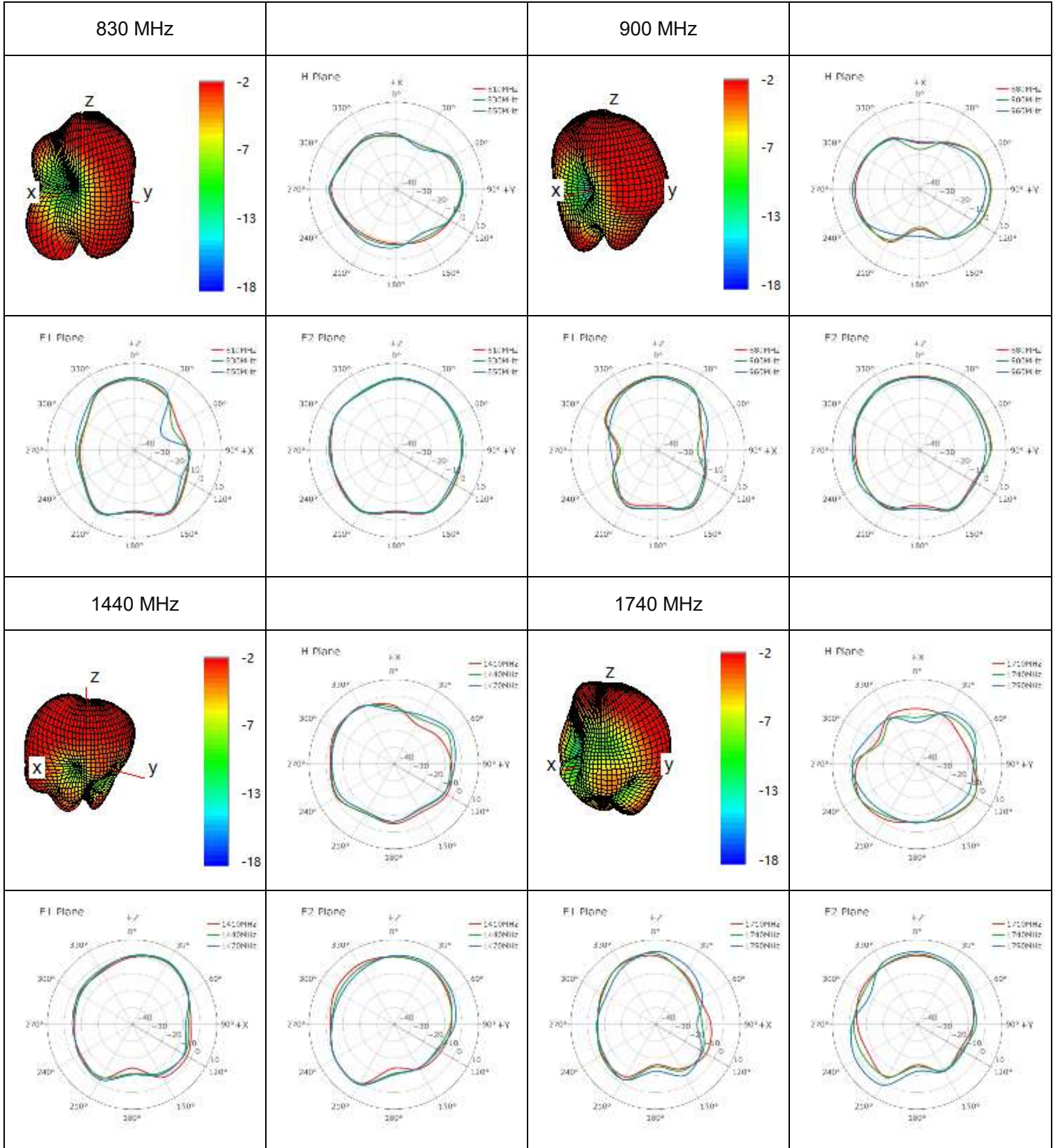


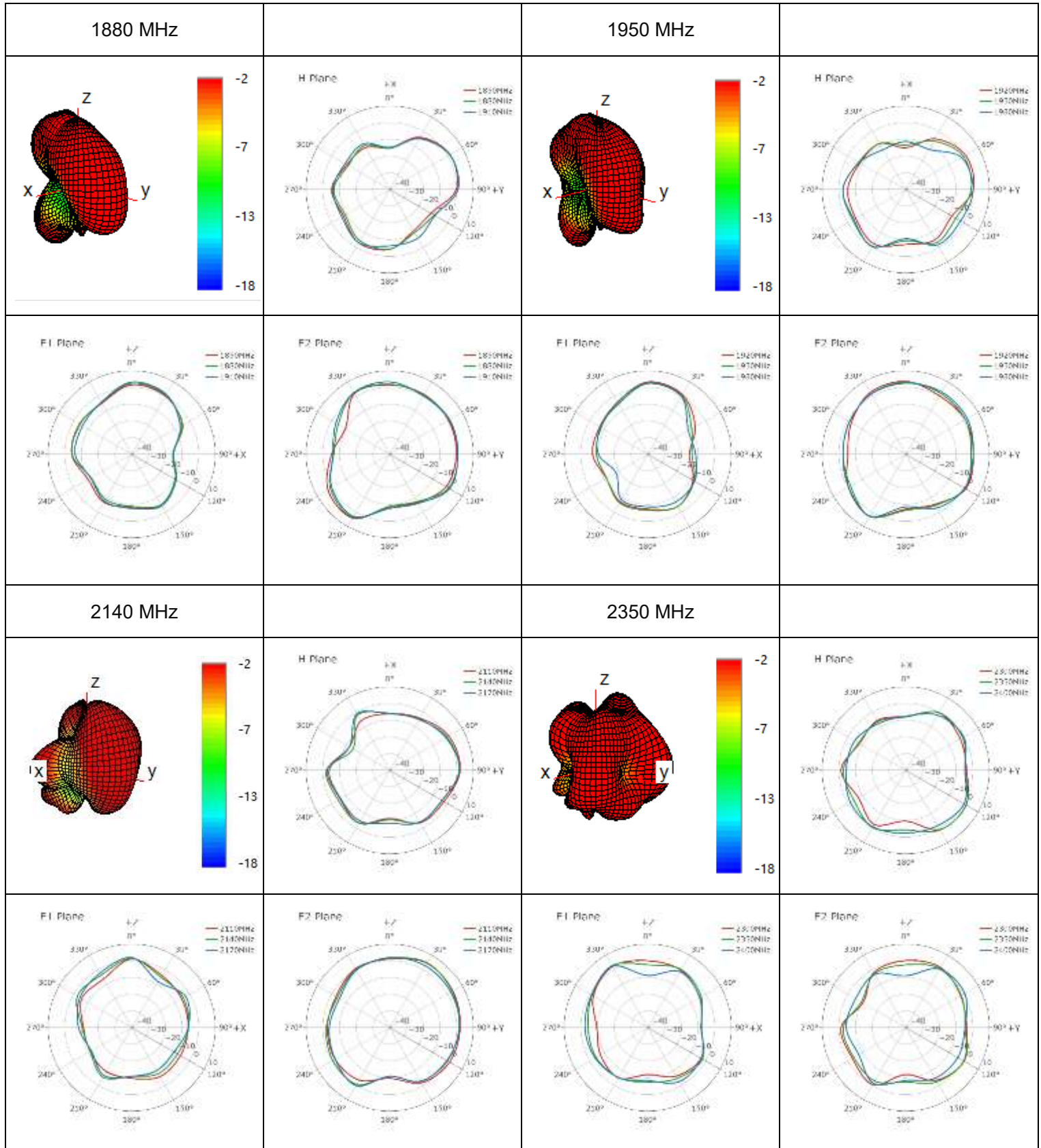


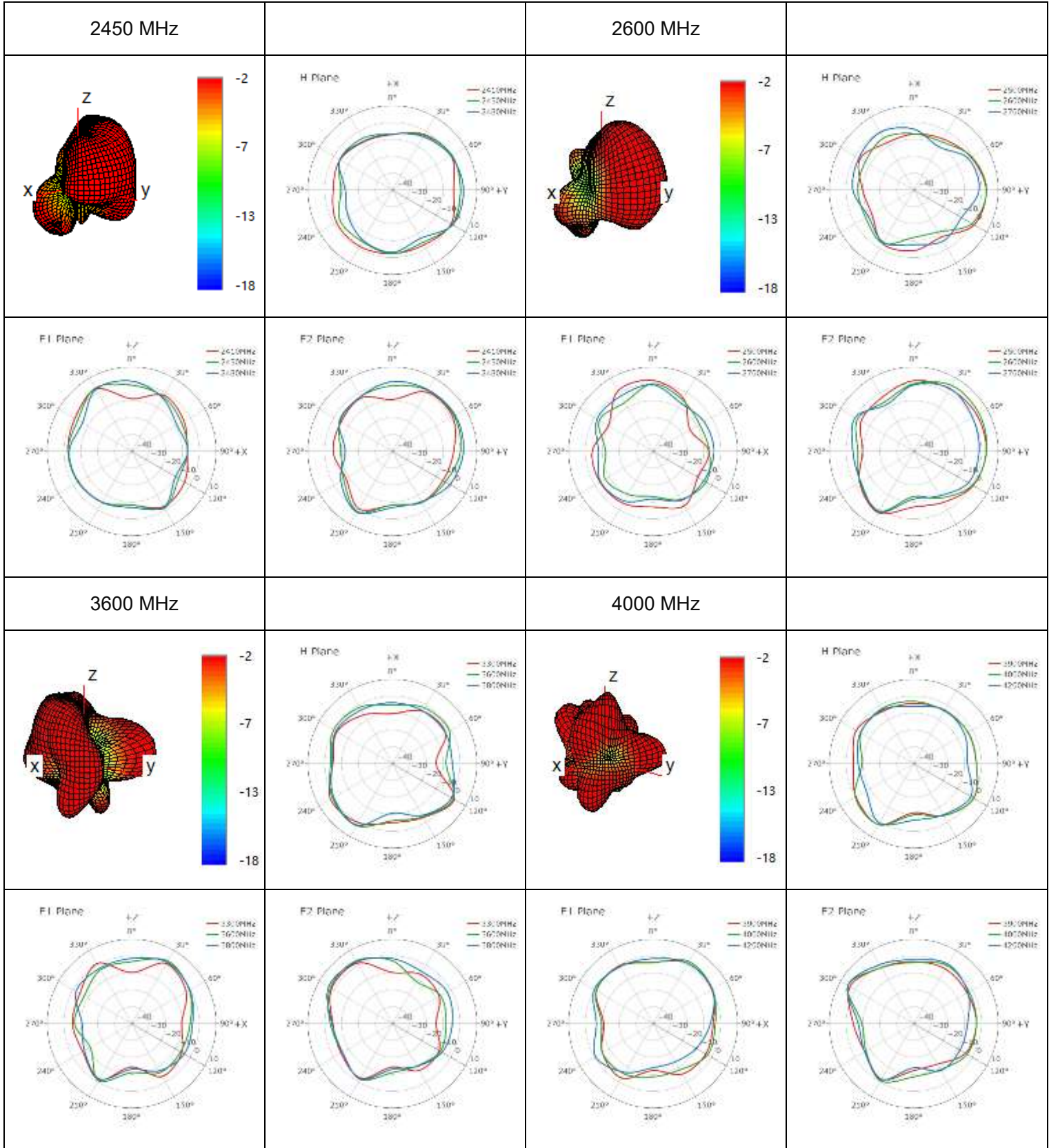


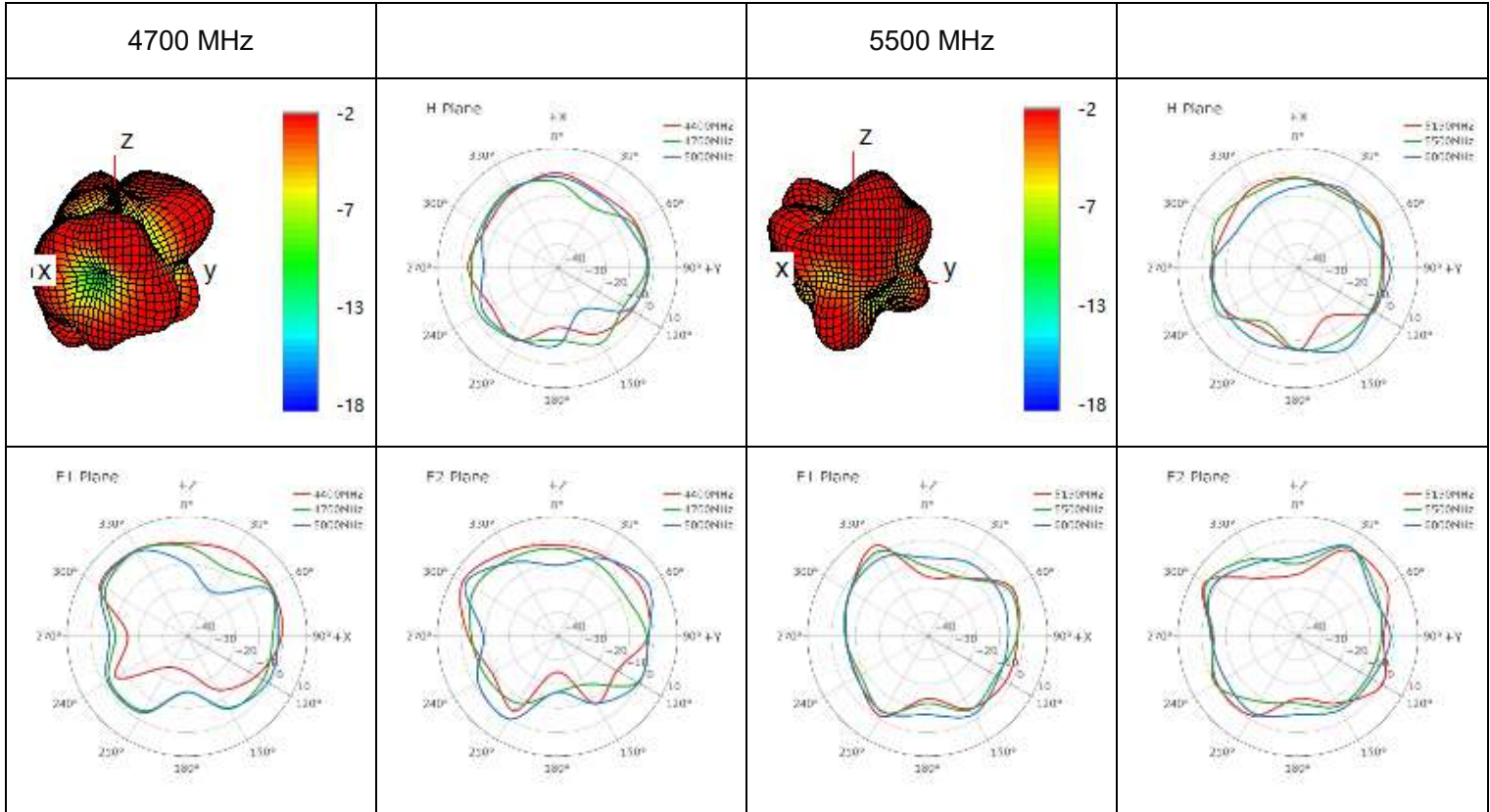
● **4G/5G-3**



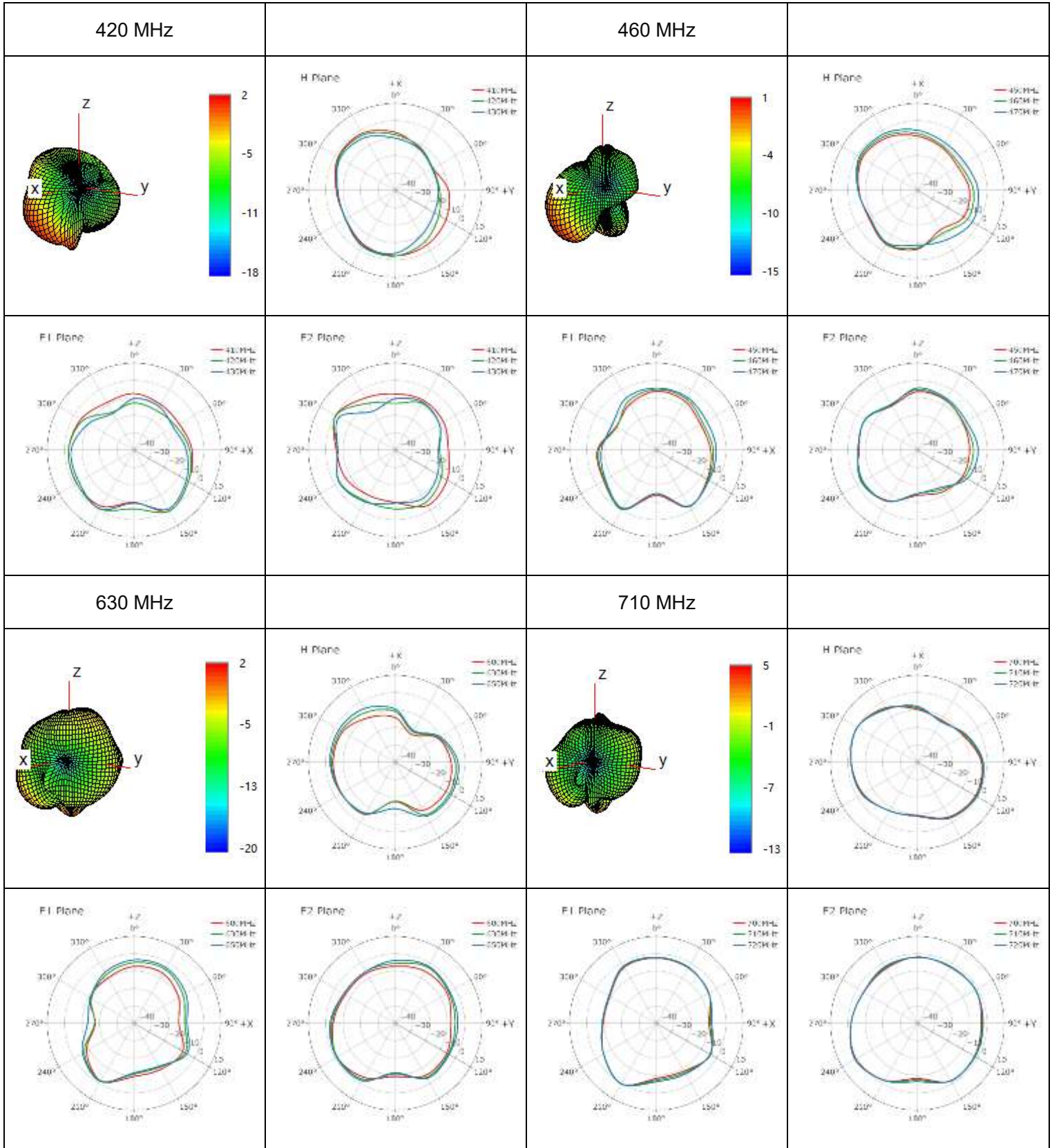


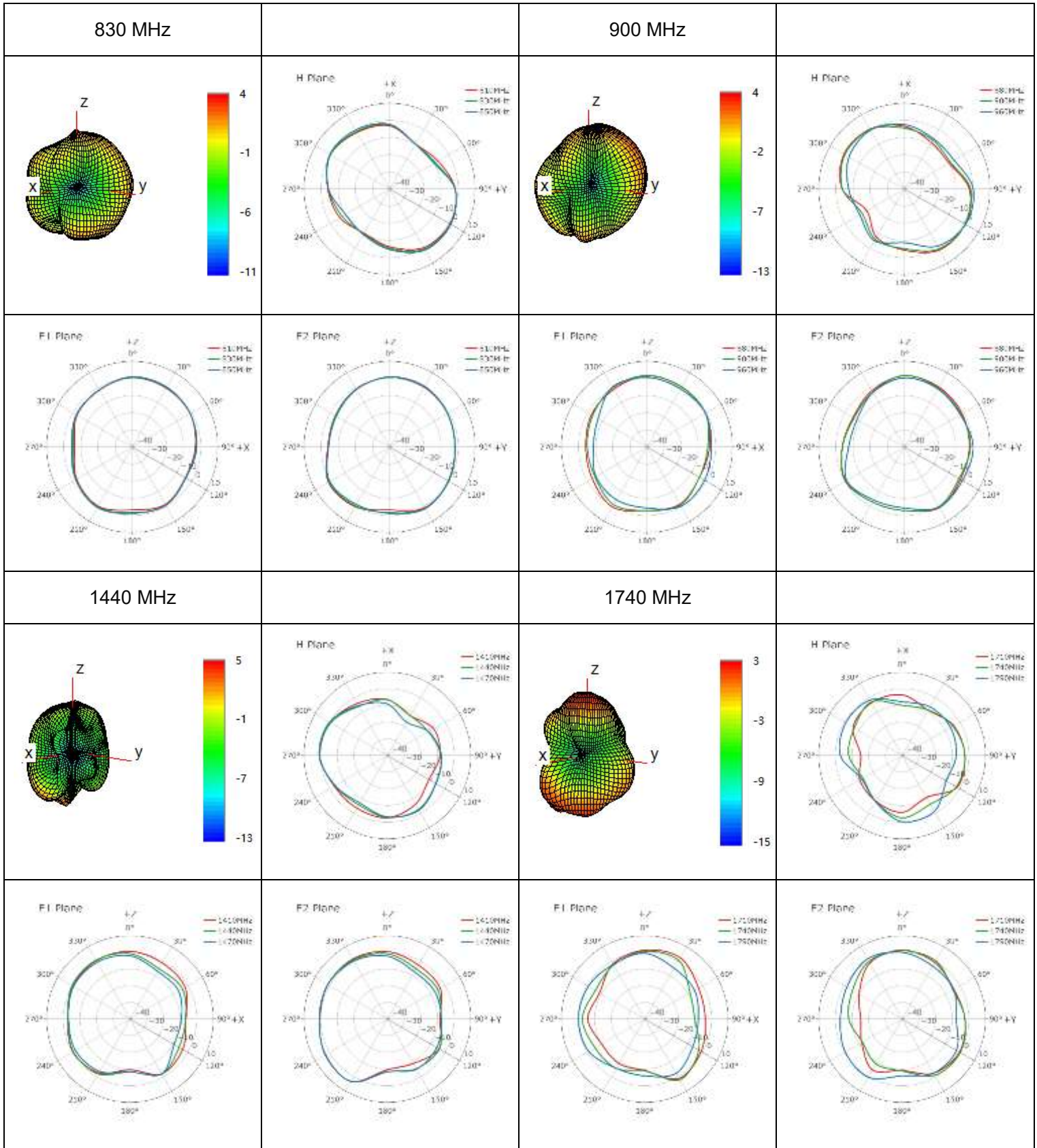


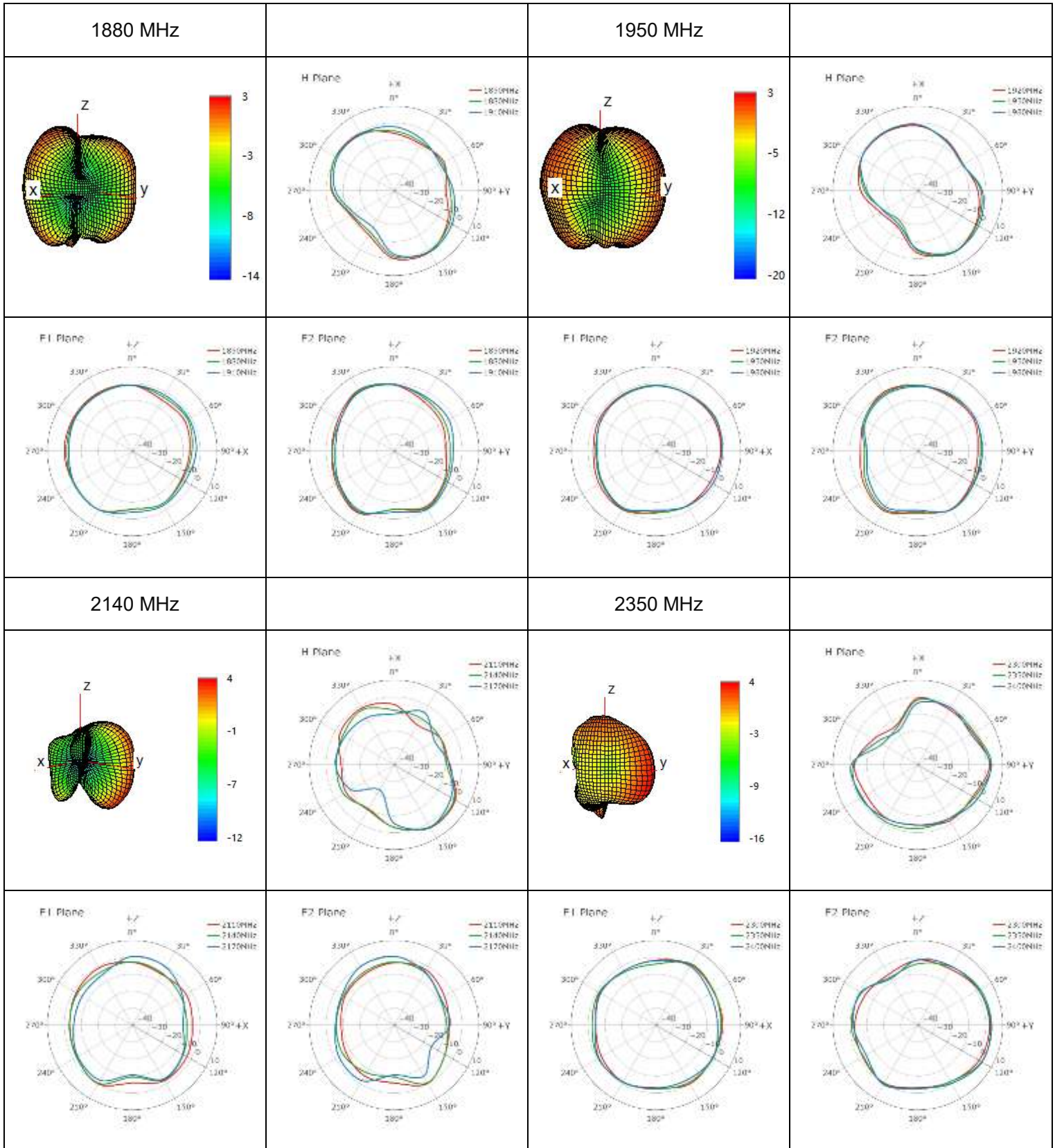


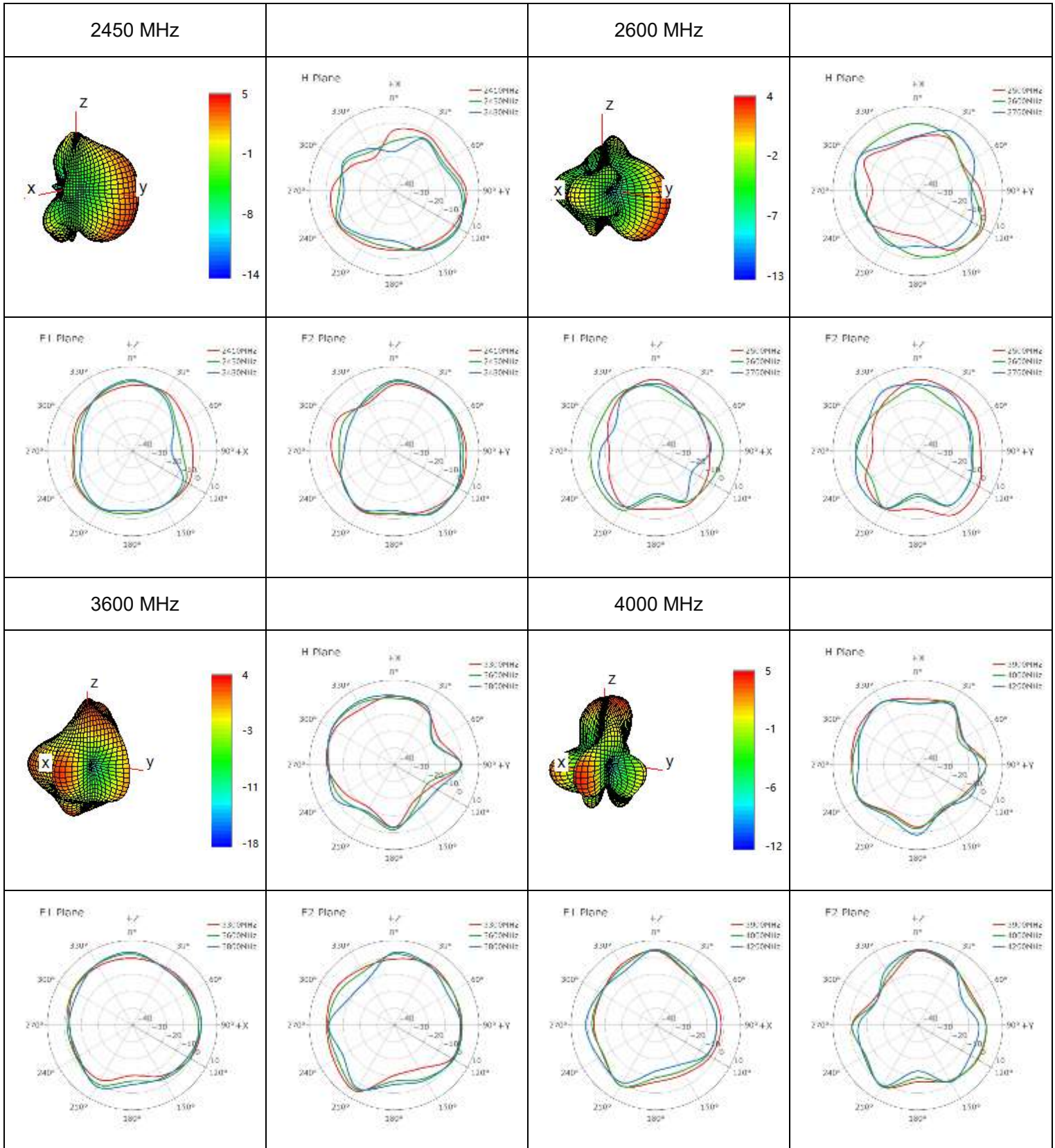


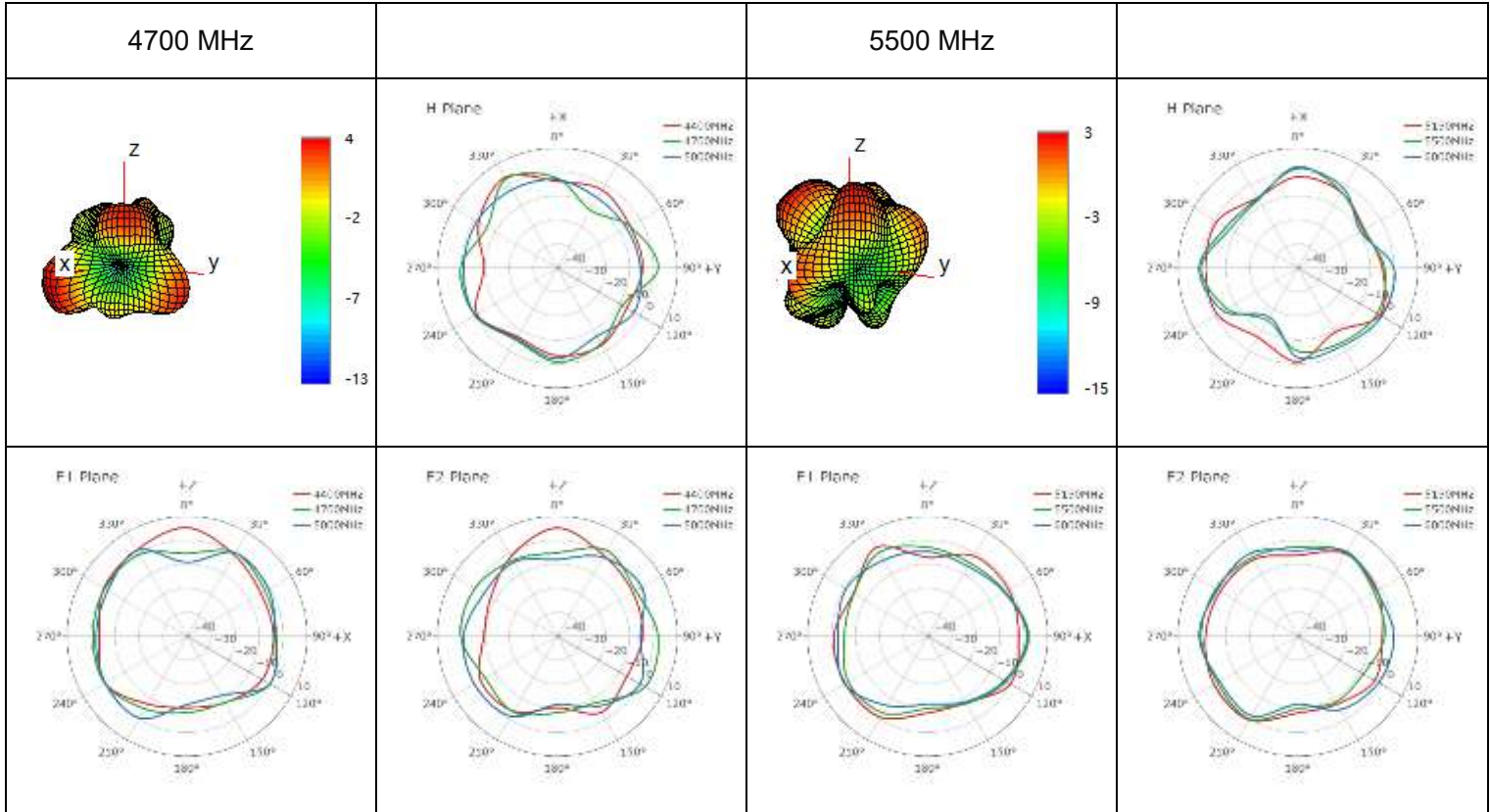
● **4G/5G-4**



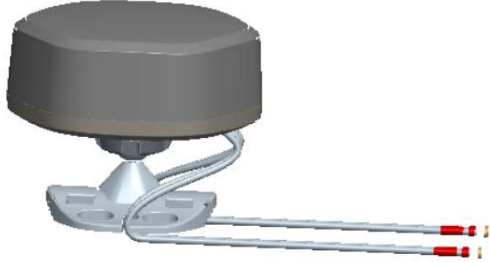



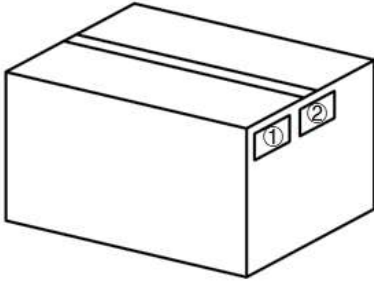
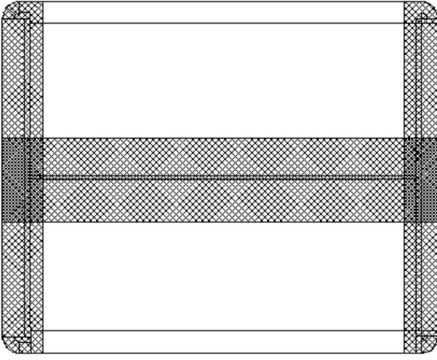






4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		Product drawing
2		1 pc antenna product in an inner box. (1 PC / Inner Box)
3		(4 Inner Boxes / Carton Box) (4 PCS Antennas / Carton Box) <u>Carton Inside Dimension:</u> <u>L × W × H = 460 × 440 × 225 mm</u>

4		<p>Position for Attaching Labels</p> <ul style="list-style-type: none">① Carton Label② Quality Label
5		<p>Sealing Cartons “I” type sealing cartons</p>

Contact Us

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Email: info@quectel.com

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Revision History

Version	Date	Author	Note
-	2023-06-19	Mordecai LIU/ Hart HU/ David LIU/ Bunny ZHANG	Creation of the document
1.0	2023-06-19	Mordecai LIU/ Hart HU/ David LIU/ Bunny ZHANG	First official release
1.1	2024-01-30	Hart HU/ Vinnie LIU	1. Added Housing UV Resistant (Chapter 1.2). 2. Updated the drawing (Chapter 2).

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