

Antenna Datasheet

Product OC: YPCA006AA

Version: 2.1

Date: 2024-06-07

Status: Released

Product Name: 5G PCB Antenna

Key Features:

Frequency Band: 410–470 MHz; 700–960 MHz; 1400–6000 MHz

Dimensions: 150 × 16.2 × 0.6 mm

Efficiency: Up to 78.1% (EVB)

RoHS and REACH Compliant

Overview

This Quectel embedded 5G FPC/PCB antenna covers 5G NR Sub-6 GHz frequency bands and is compatible with 4G/3G/2G/LPWA bands. Ground plane independent, it's designed to be mounted directly to the underside of either a plastic or non-metallic enclosure. Ease of integration with a cable and connector which can be customized to meet your product design and RF module. Used with other 5G antennas, it can achieve MIMO (multiple input, multiple output) antenna technology for wireless communications in which multiple antennas are used at both the source (transmitter) and the destination (receiver).

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1 Drawing

Condition: Stick to ABS Board on 130 × 130 mm EVB Board & Free Space

1.1. Electrical

Electrical	
Frequency Range	410–470 MHz; 700–960 MHz; 1400–6000 MHz
Impedance	50 Ω
Polarization	Linear
Radiation Pattern	Omni-directional

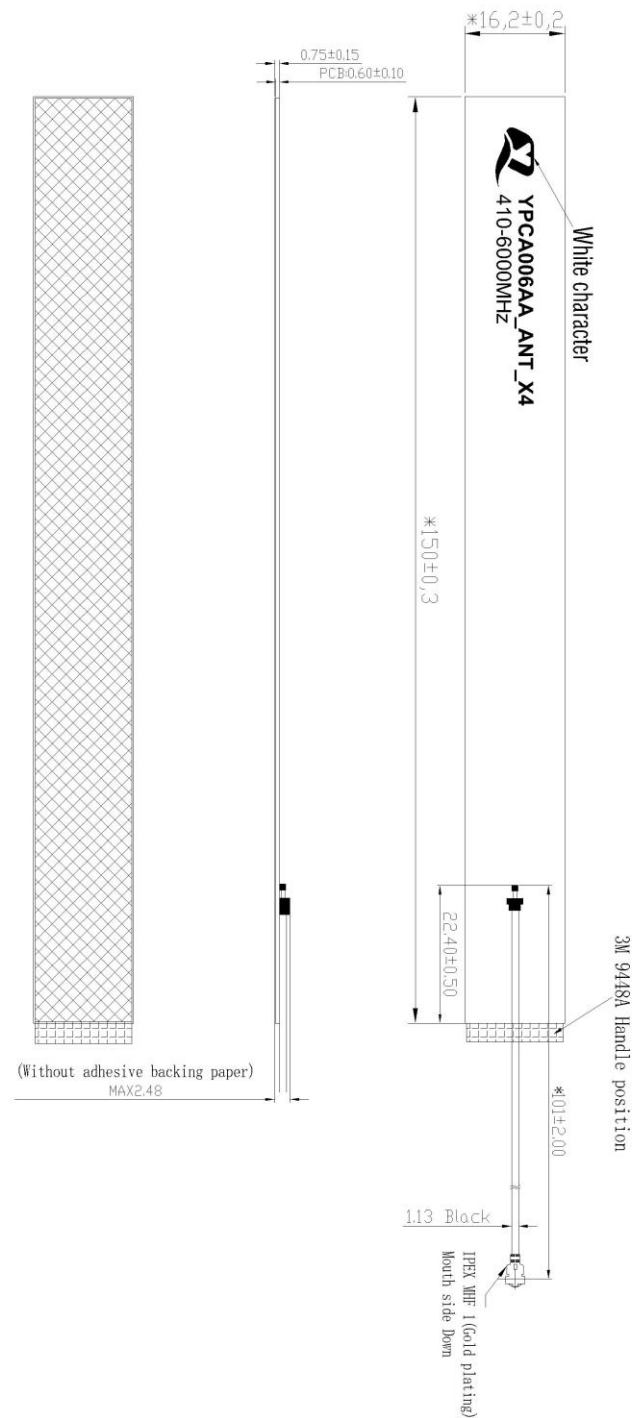
Electrical - Detail													
SPEC	Band	B31/ B87	B71	B12 /B13 /B28	B5 /B8 /B26	B1 /B2 /B3	B40	Wi-Fi 2G	B38 /B41	B48	B42 /N77	N79	Wi-Fi 5G
	Freq. (MHz)	400- 470	600- 700	700- 810	820- 960	1700- 2170	2300- 2400	2400- 2500	2500- 2690	3550- 3700	3300- 4200	4400- 5000	5150- 5850
Max. VSWR	EVB	6.1	7.2	2.8	3.0	2.2	2.9	1.8	1.9	1.6	3.6	2.4	2.9
	FS	11.8	3.0	2.3	2.5	1.6	2.7	2.0	1.3	1.6	2.3	1.8	2.3
Max. Return Loss (dB)	EVB	-2.9	-2.4	-6.4	-6.0	-8.4	-6.3	-10.7	-10.2	-12.5	-5.0	-7.6	-6.3
	FS	-1.5	-6.1	-8.2	-7.3	-12.8	-6.8	-9.3	-17.4	-12.7	-8.0	-10.8	-8.0
AVG Eff. (%)	EVB	42.0	39.8	65.1	59.8	60.9	53.2	56.6	61.1	76.3	58.6	45.0	40.4
	FS	24.0	22.1	46.3	53.5	55.4	51.8	60.1	64.9	60.5	64.7	66.0	48.4
AVG AVG Gain (dB)	EVB	-3.8	-4.2	-1.9	-2.2	-2.2	-2.8	-2.5	-2.2	-1.2	-2.4	-3.5	-4.0
	FS	-7.2	-6.7	-3.4	-2.7	-2.6	-2.9	-2.2	-1.9	-2.2	-1.9	-1.8	-3.2
Max.	EVB	0.6	2.5	2.8	3.3	3.7	4.5	2.3	3.7	3.7	4.2	5.6	5.8

Peak Gain (dBi)	FS	-1.7	-0.8	0.7	0.9	1.8	3.0	2.5	2.9	3.6	2.7	4.1	4.0
VSWR				EVB			≤ 7.2						
				FS			≤ 11.8						
Return Loss				EVB			≤ -2.4 dB						
				FS			≤ -1.5 dB						
Peak Gain				EVB			≤ 5.8 dBi						
				FS			≤ 4.1 dBi						

1.2. Mechanical and Environmental

Mechanical	
Antenna Dimensions	150 × 16.2 × 0.6mm
Antenna Material & Color	PCB & Black
Cable Type & Color & Length	Φ1.13 & Black & 101 mm
Connector Type	IPEX MHF 1
Mounting Type	Adhesive
Weight	Typ. 3.9 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS and REACH Compliant	Yes

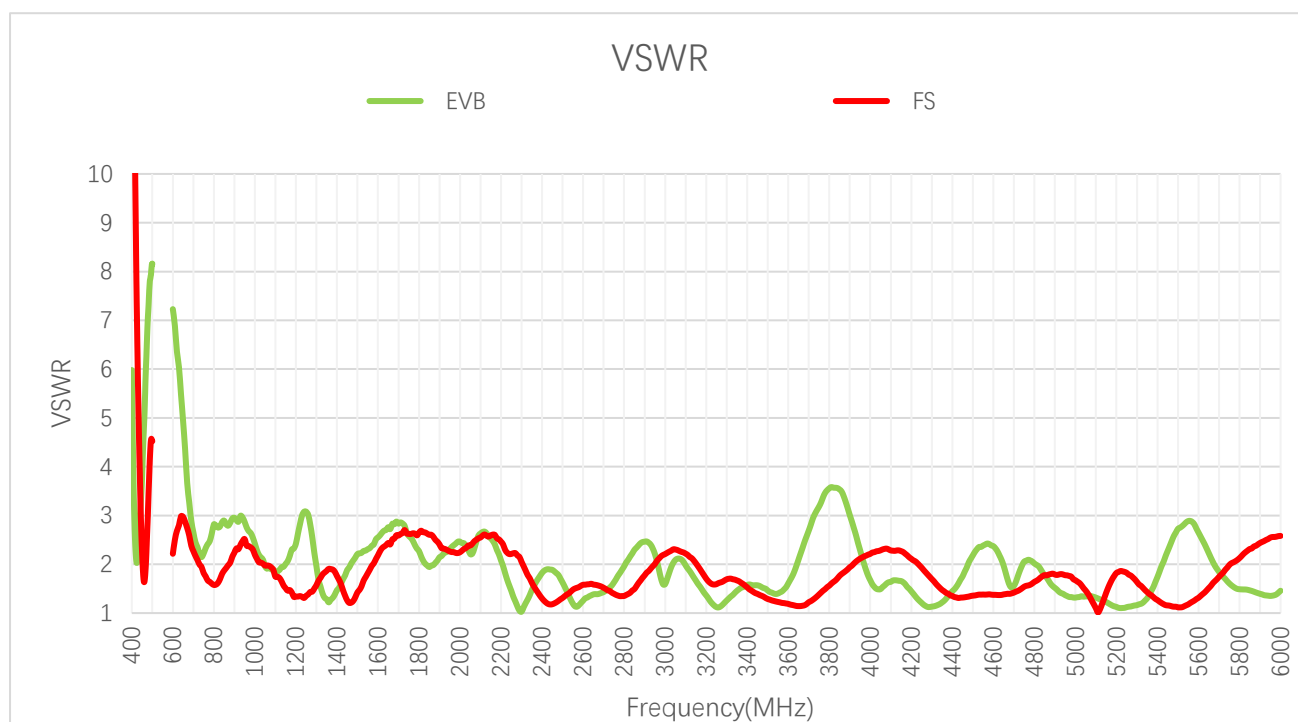
2 Drawing



3 Detailed Performance

3.1. S-Parameter Test

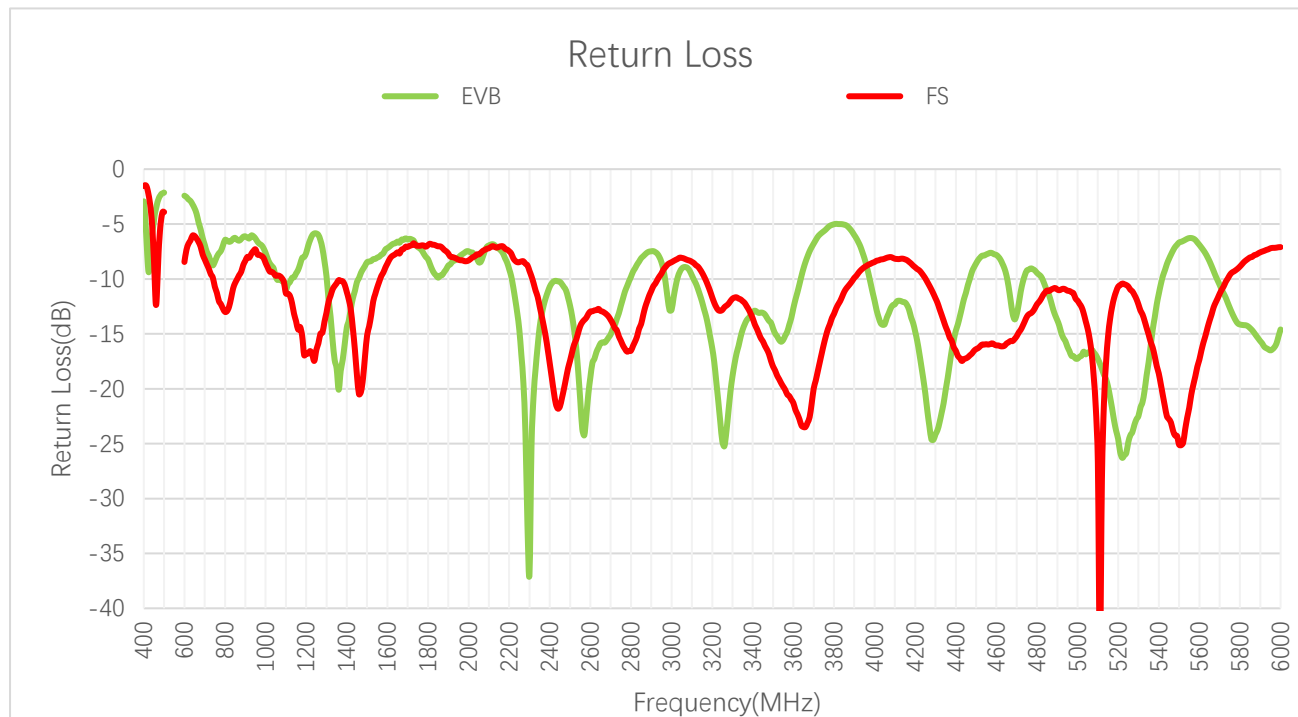
3.1.1. VSWR



VSWR

Frequency (MHz)	410	420	460	470	600	630	710	830	900	960	1440	1710
EVB	3.4	2.2	4.9	6.1	7.2	6.0	2.5	2.8	3.0	2.8	1.8	2.9
FS	11.8	8.7	1.6	2.1	2.2	2.8	2.2	1.7	2.2	2.4	1.4	2.6
Frequency (MHz)	1740	1880	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
EVB	2.6	2.0	2.3	2.6	1.5	1.9	1.3	1.6	1.6	1.3	2.7	1.5
FS	2.6	2.5	2.3	2.6	1.6	1.2	1.6	1.2	1.4	1.7	1.1	2.6

3.1.2. Return Loss

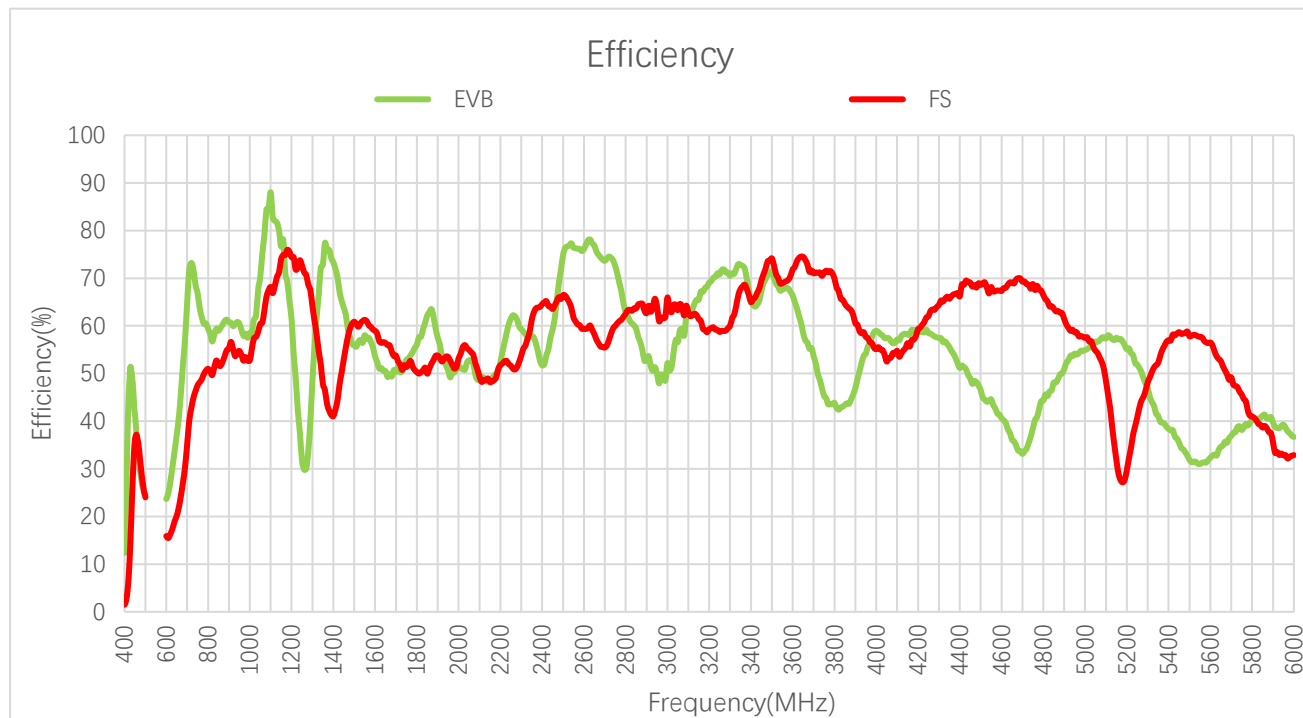


Return Loss (dB)

Frequency (MHz)	410	420	460	470	600	630	710	830	900	960	1440	1710
EVB	-5.3	-8.7	-3.6	-2.9	-2.4	-2.9	-7.5	-6.6	-6.1	-6.6	-11.1	-6.3
FS	-1.5	-2.0	-12.4	-8.8	-8.5	-6.5	-8.6	-11.7	-8.4	-7.8	-16.5	-7.0
Frequency (MHz)	1740	1880	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
EVB	-6.9	-9.4	-8.1	-7.2	-14.4	-10.3	-19.0	-12.7	-13.2	-17.3	-6.7	-14.6
FS	-6.9	-7.4	-8.2	-7.1	-12.5	-21.6	-13.0	-21.3	-15.2	-12.0	-25.1	-7.1

3.2. Radiation Performance Test

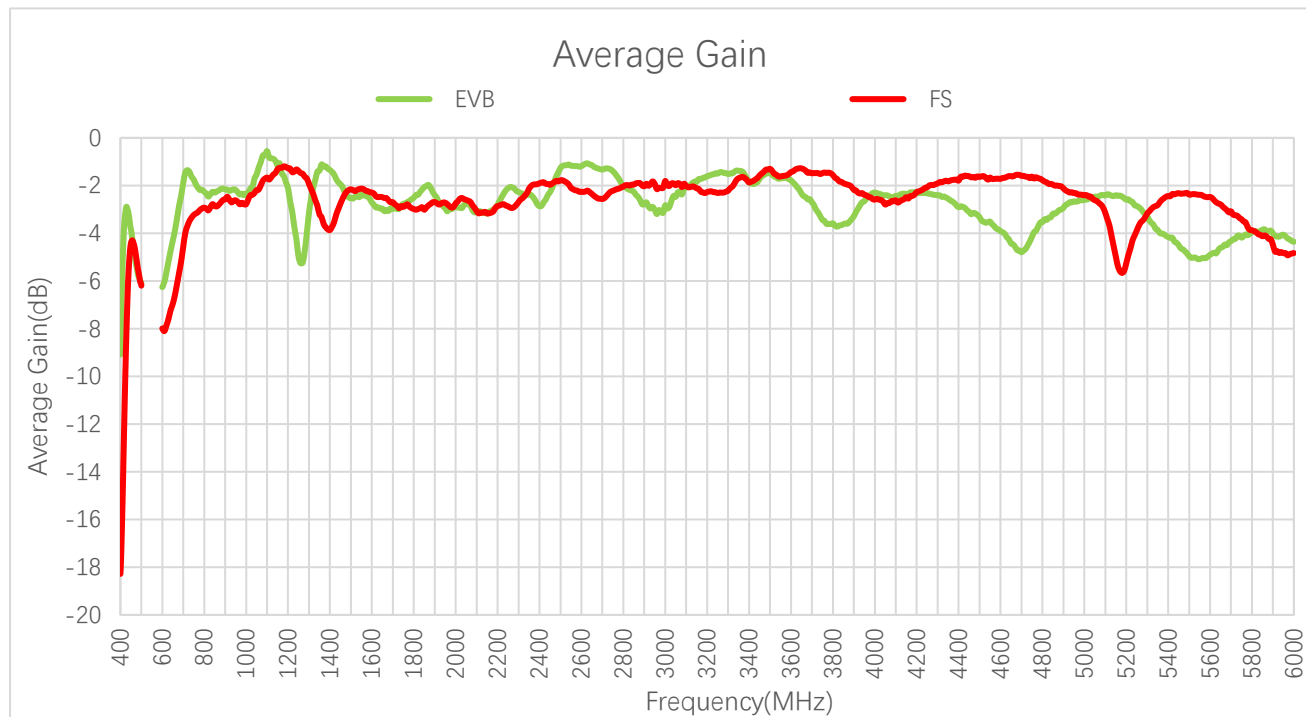
3.2.3. Efficiency



Efficiency (%)

Frequency (MHz)	410	420	460	470	600	630	710	830	900	960	1440	1710
EVB	28.5	45.4	35.5	31.5	23.7	30.5	71.8	58.2	60.8	59.2	65.2	51.4
FS	2.9	7.4	36.8	33.9	15.9	17.5	40.1	51.3	55.3	53.9	50.3	52.6
Frequency (MHz)	1740	1880	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
EVB	52.0	61.9	50.7	49.0	57.9	59.2	76.1	66.3	33.1	54.9	31.9	36.7
FS	51.7	52.8	53.5	49.0	61.2	63.5	59.4	71.9	69.3	57.5	57.8	32.9

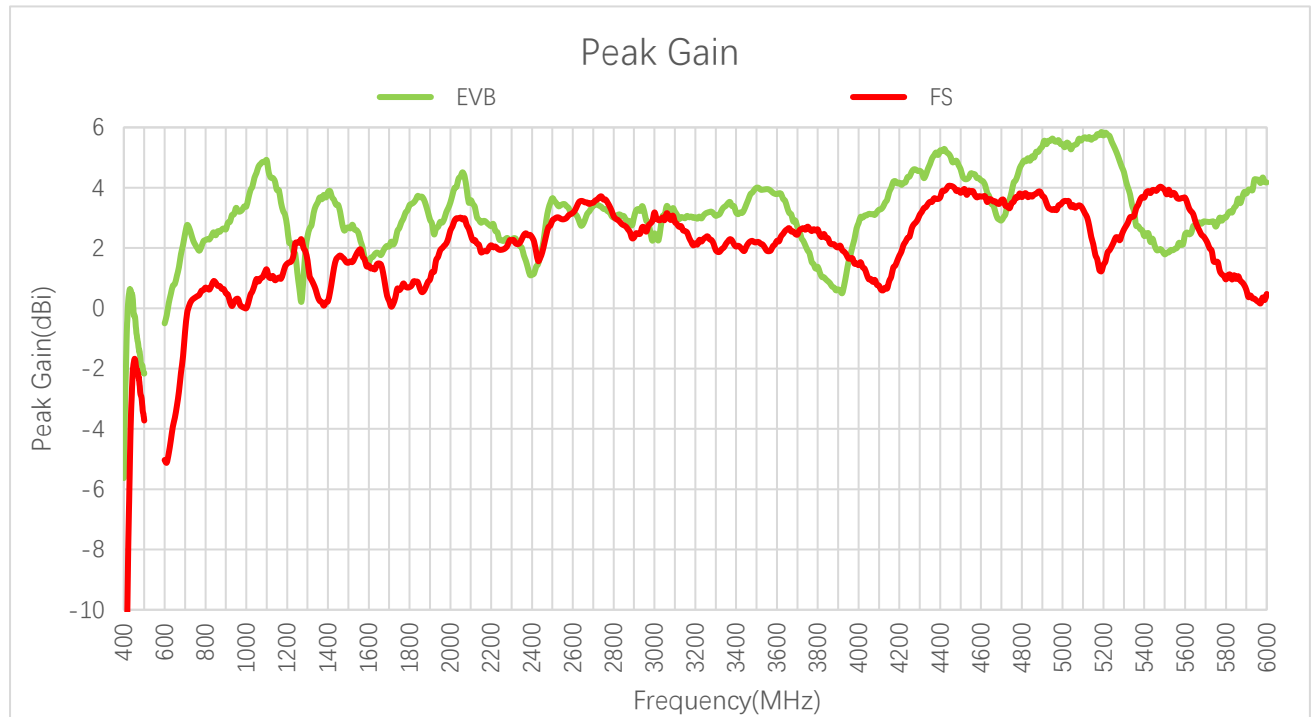
3.2.4. Average Gain



Average Gain (dB)

Frequency (MHz)	410	420	460	470	600	630	710	830	900	960	1440	1710
EVB	-5.5	-3.4	-4.5	-5.0	-6.3	-5.2	-1.4	-2.4	-2.2	-2.3	-1.9	-2.9
FS	-15.3	-11.3	-4.3	-4.7	-8.0	-7.6	-4.0	-2.9	-2.6	-2.7	-3.0	-2.8
Frequency (MHz)	1740	1880	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
EVB	-2.8	-2.1	-3.0	-3.1	-2.4	-2.3	-1.2	-1.8	-4.8	-2.6	-5.0	-4.4
FS	-2.9	-2.8	-2.7	-3.1	-2.1	-2.0	-2.3	-1.4	-1.6	-2.4	-2.4	-4.8

3.2.5. Peak Gain



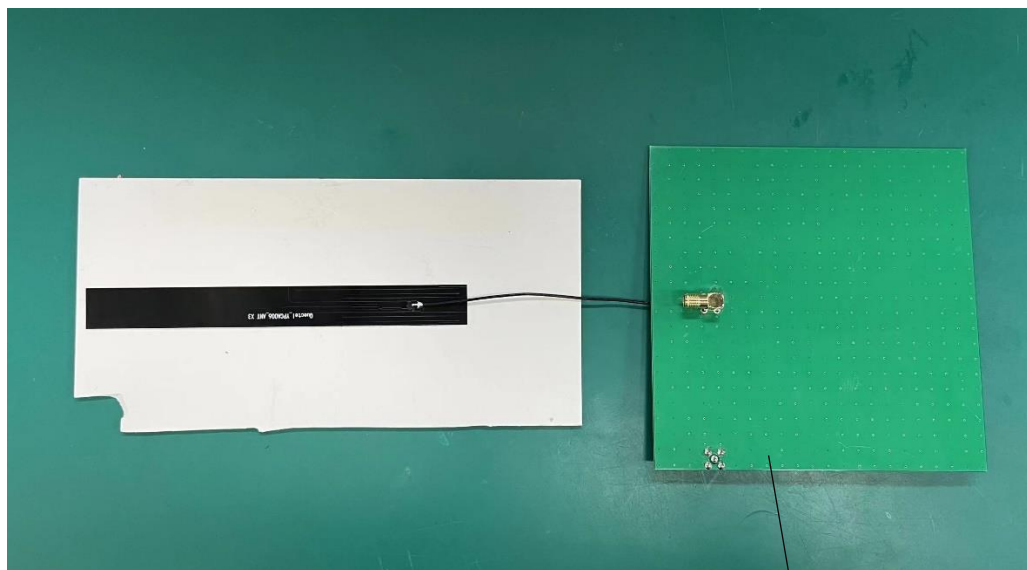
Peak Gain (dBi)

Frequency (MHz)	410	420	460	470	600	630	710	830	900	960	1440	1710
EVB	-2.1	0.1	-0.7	-1.2	-0.5	0.5	2.8	2.4	2.6	3.2	3.4	2.2
FS	-13.1	-8.7	-1.9	-2.2	-5.0	-4.4	-0.2	0.8	0.5	0.3	1.6	0.1
Frequency (MHz)	1740	1880	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
EVB	2.6	3.4	2.9	2.9	2.0	2.0	3.2	3.8	2.9	5.4	1.8	4.2
FS	0.7	0.7	1.9	2.1	2.3	1.9	3.2	2.2	3.6	3.5	3.9	0.5

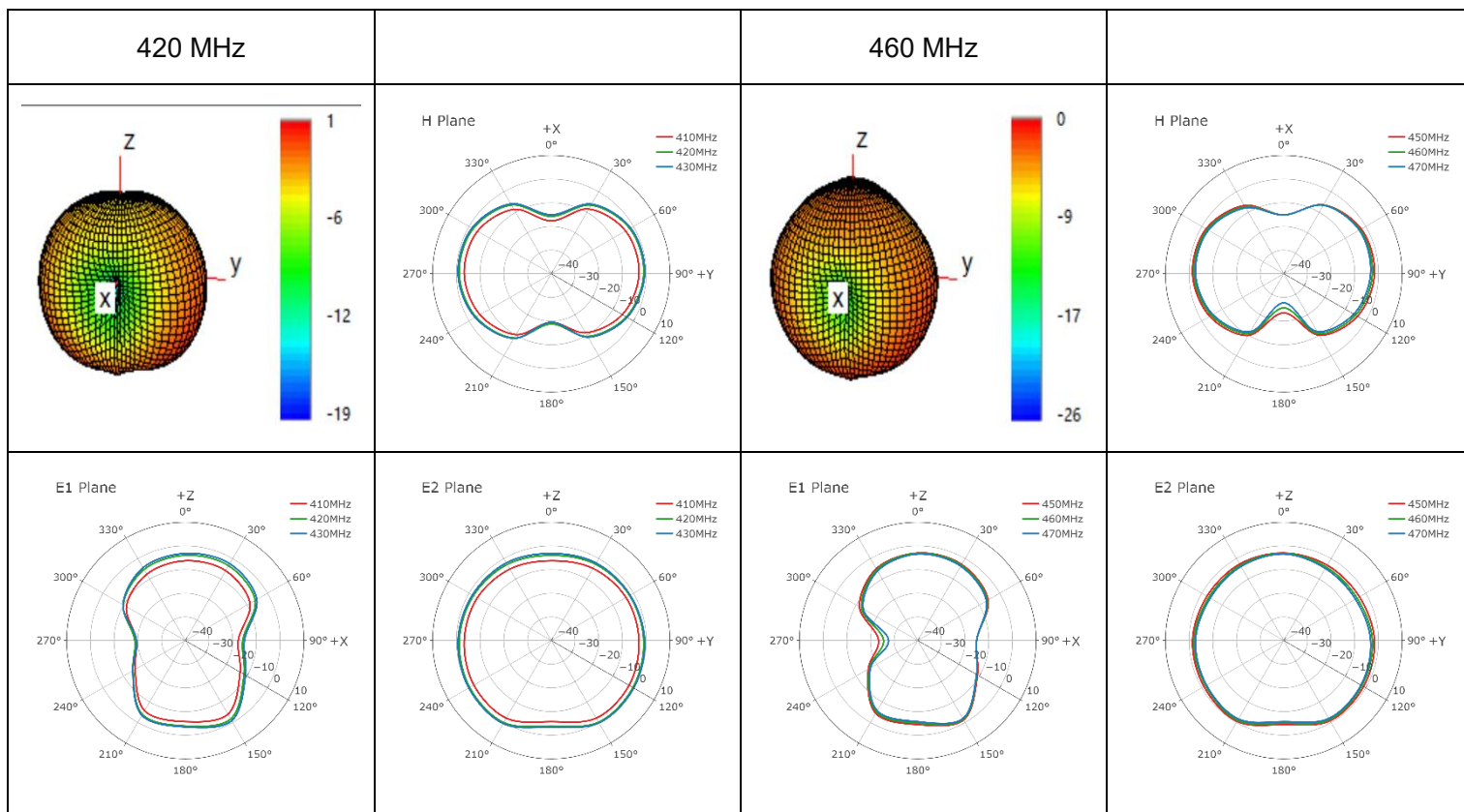
3.2.6. 3D & 2D Radiation Pattern

3.2.6.1. Test Condition: Stick to ABS board on 130 x 130 mm EVB board

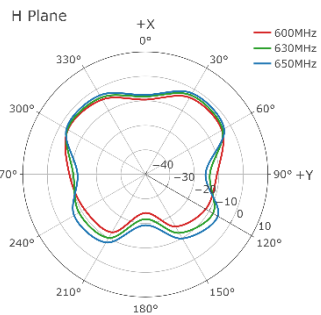
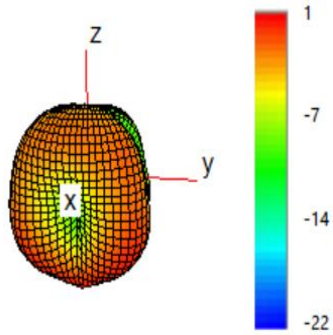
- Test Chamber: HF-G-1



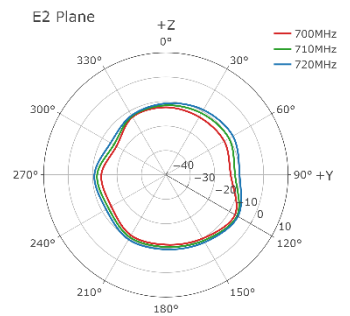
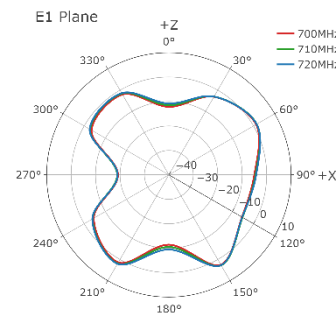
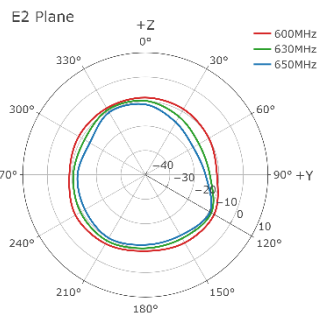
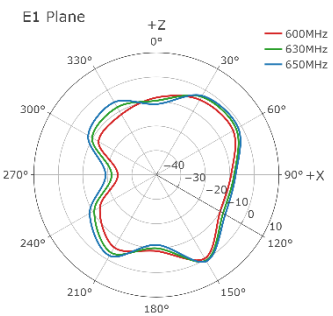
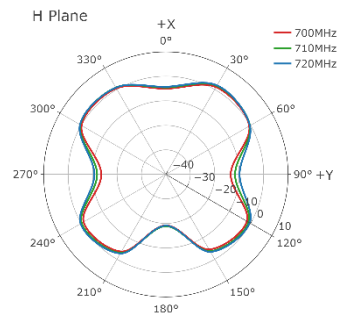
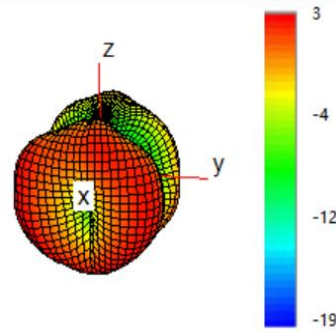
130 × 130 mm EVB



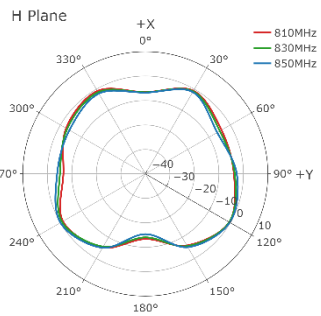
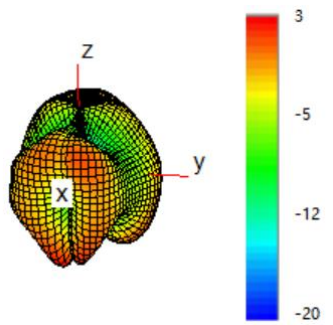
630 MHz



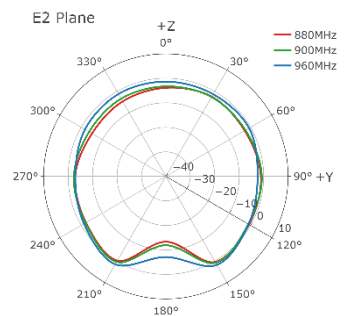
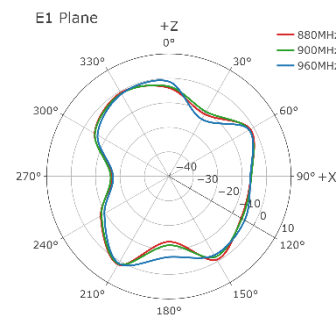
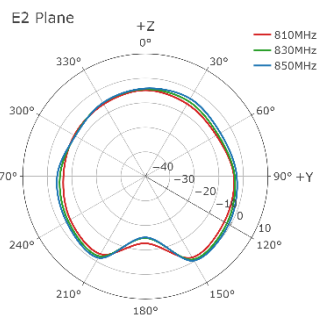
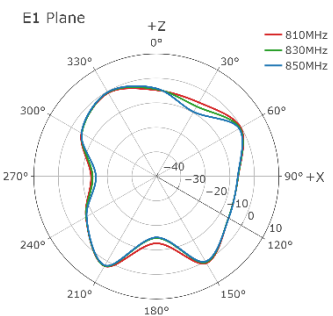
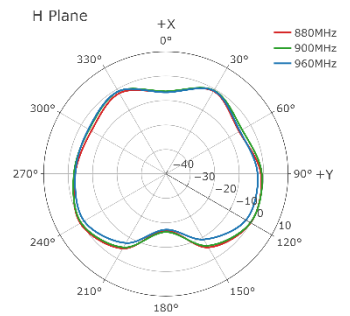
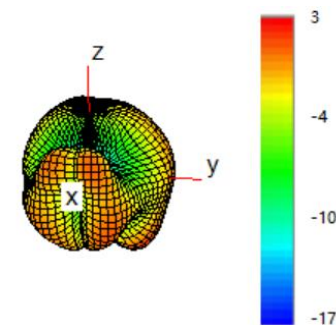
710 MHz



830 MHz

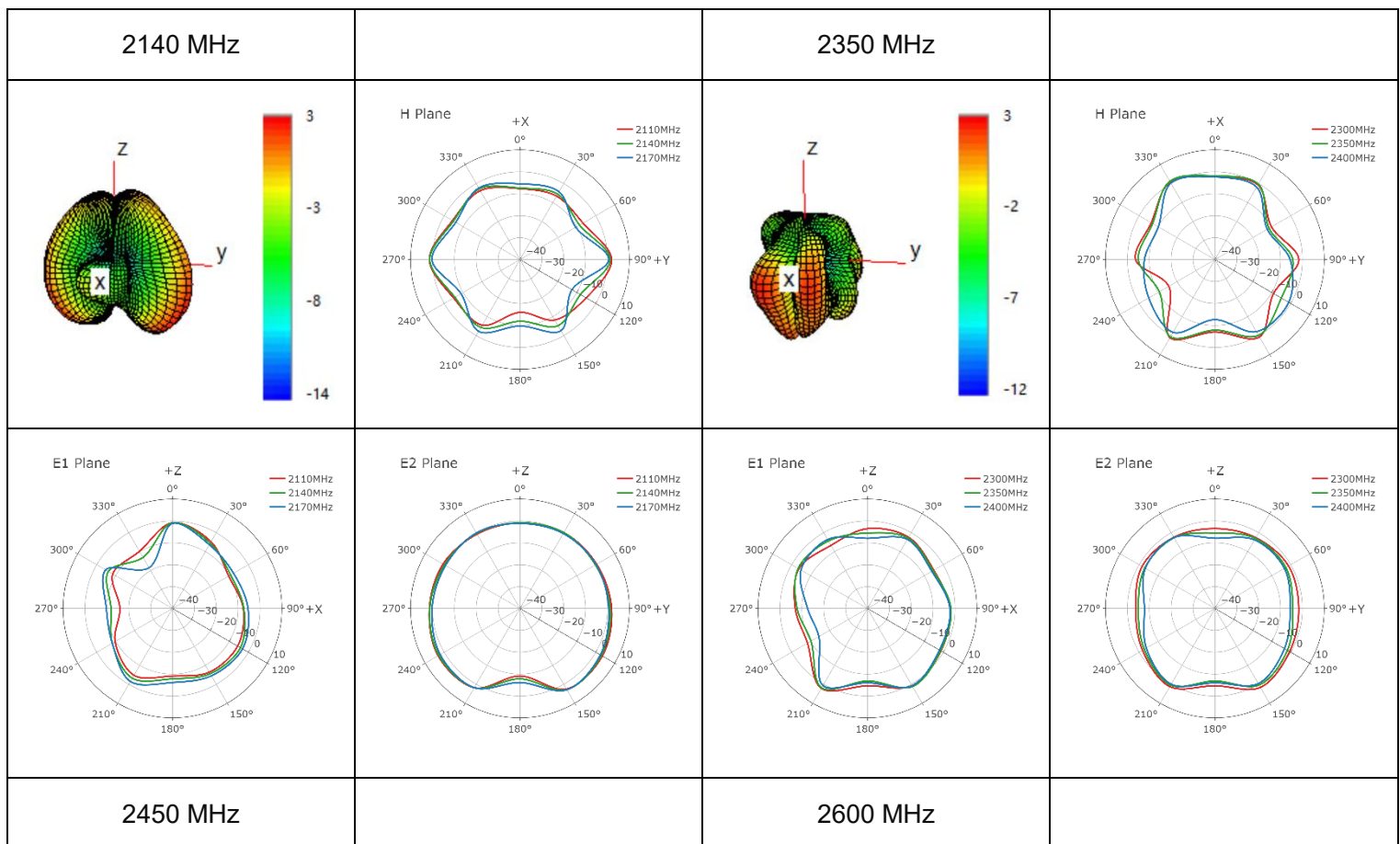
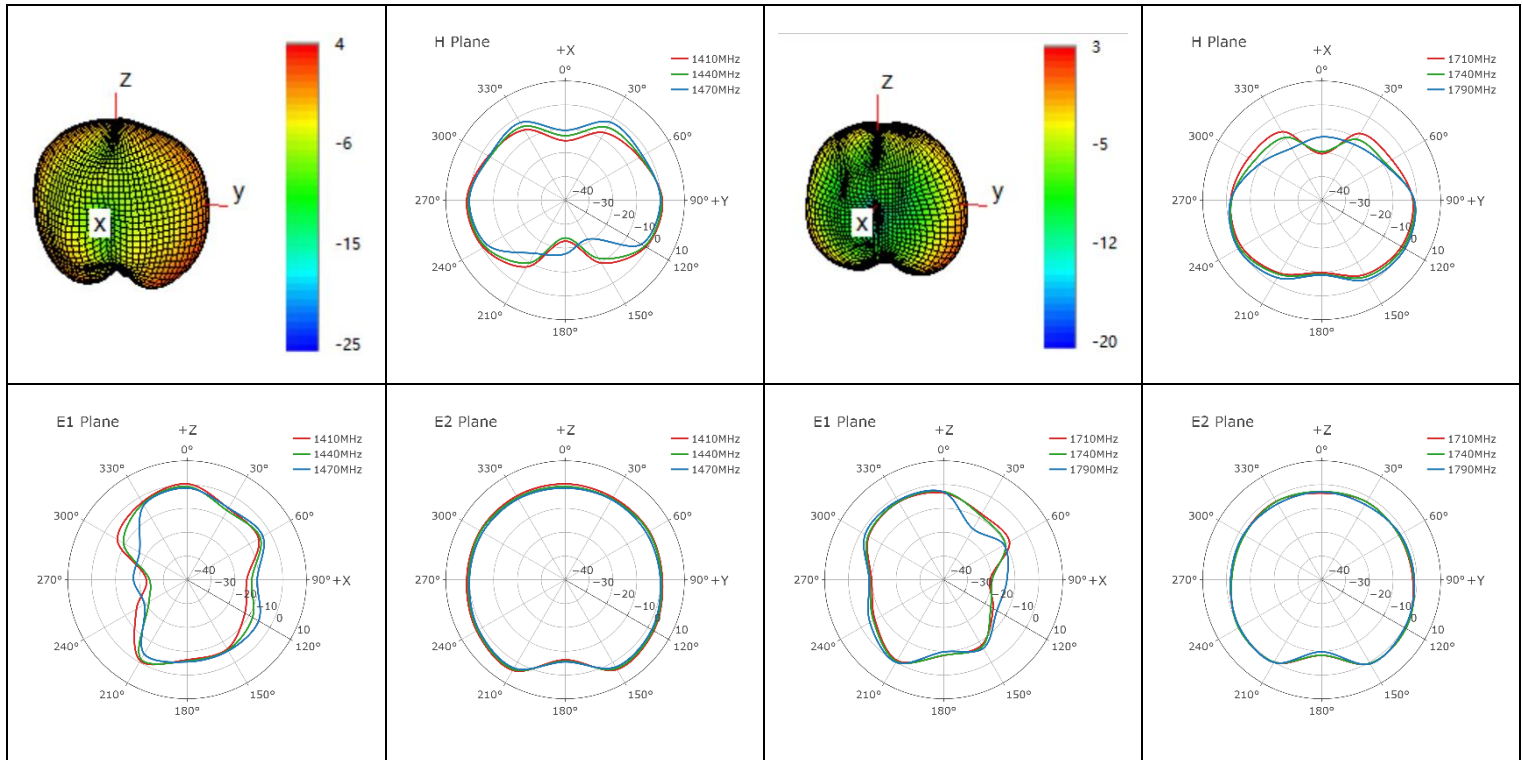


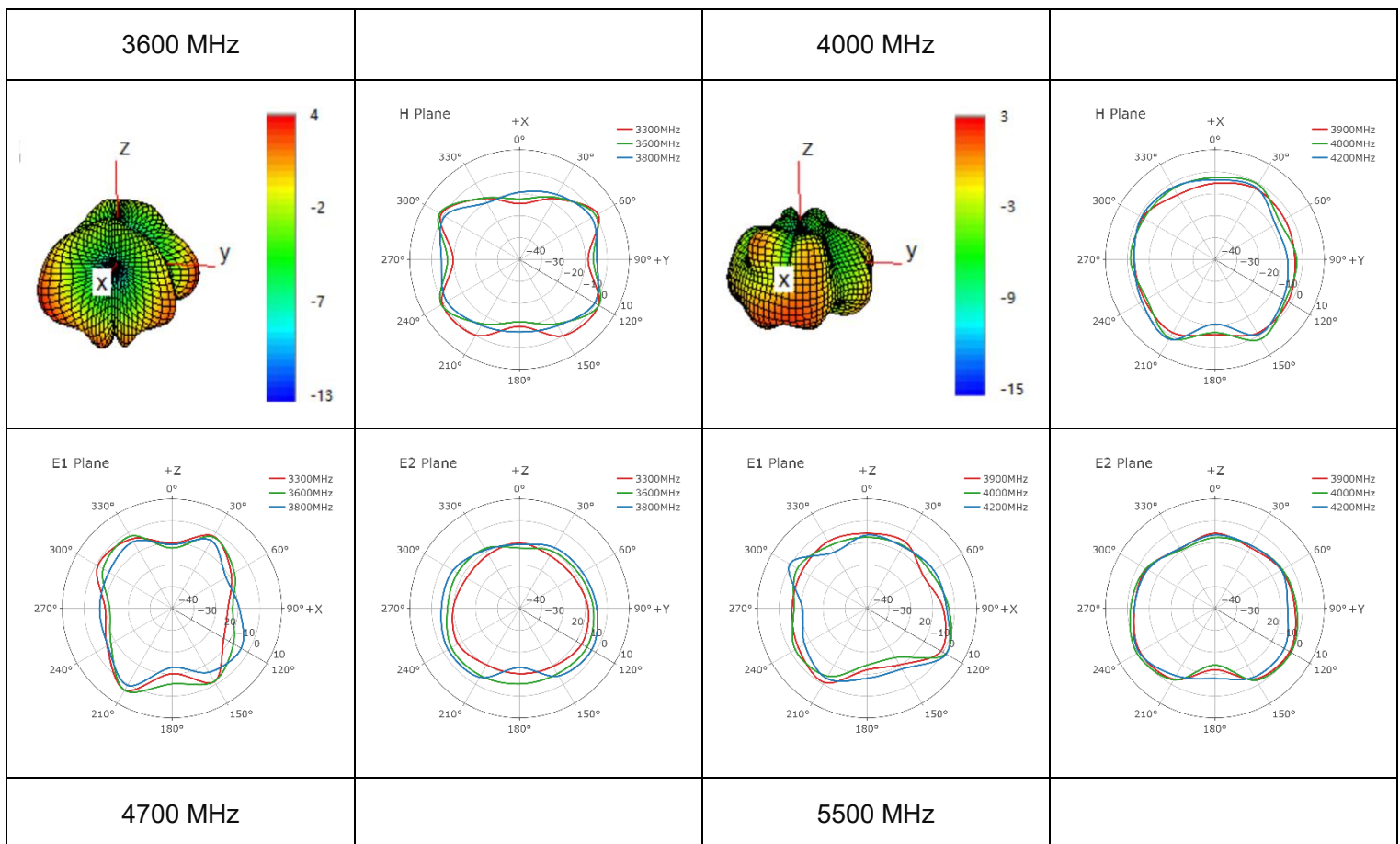
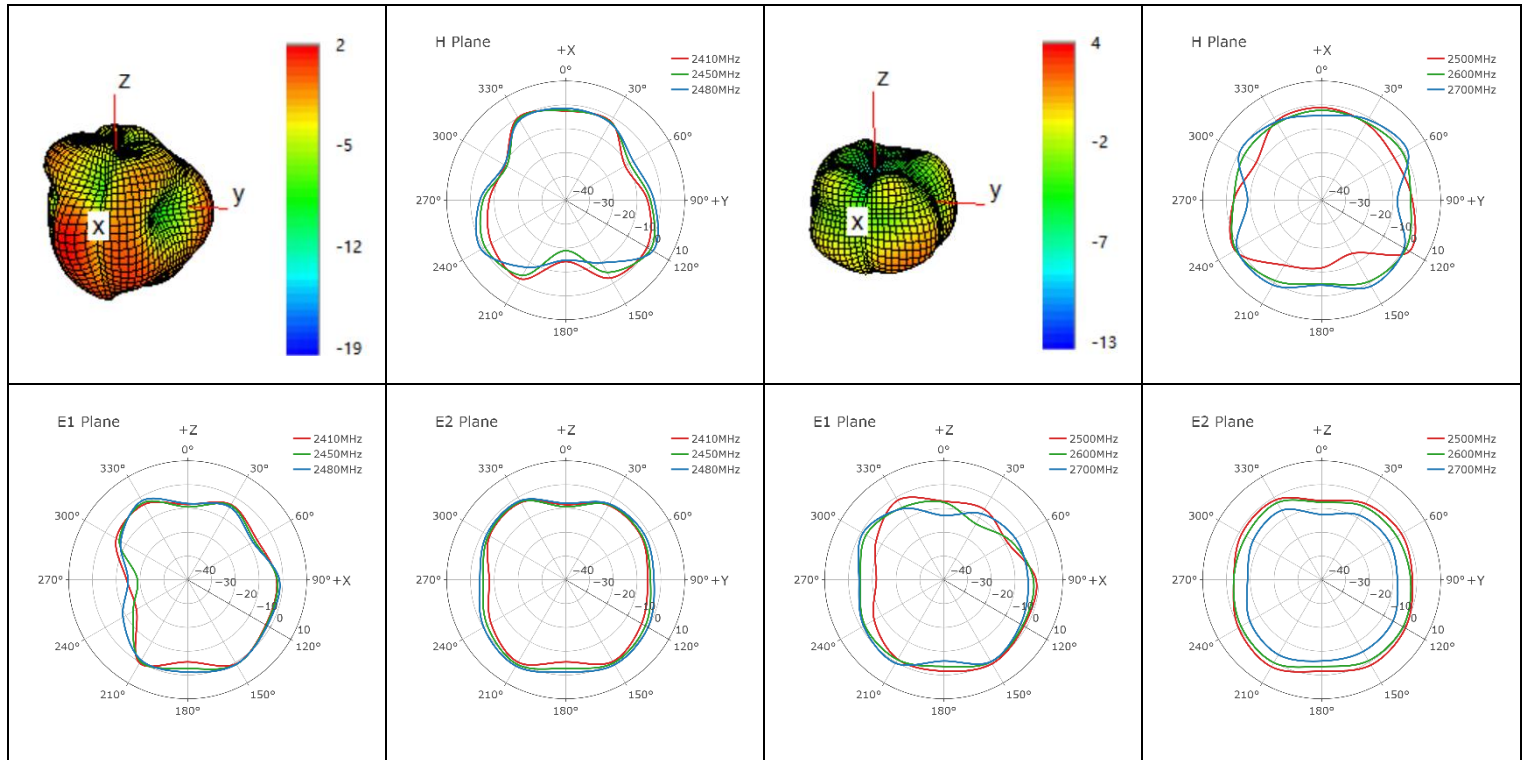
900 MHz

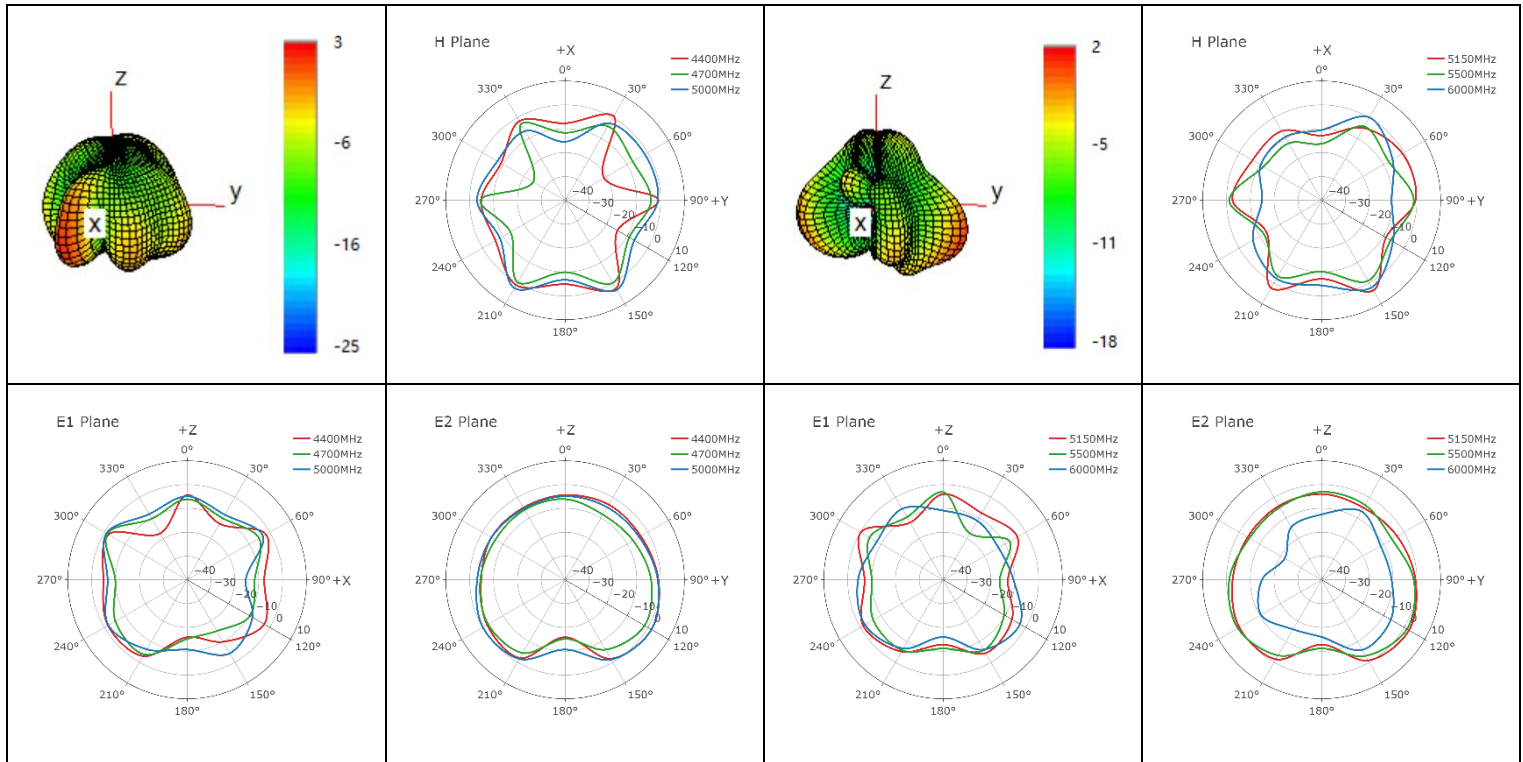


1440 MHz

1740 MHz

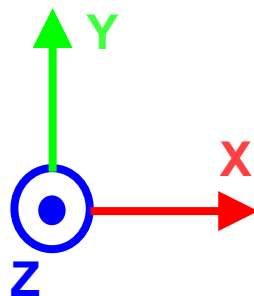




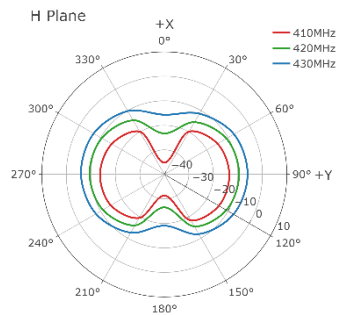
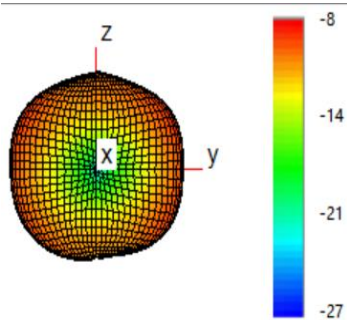


3.2.6.2. Test Condition: Free Space

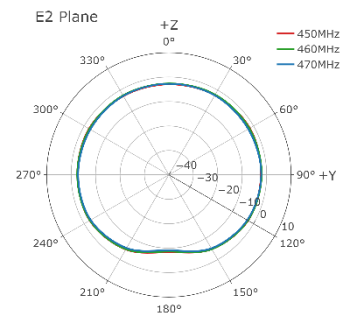
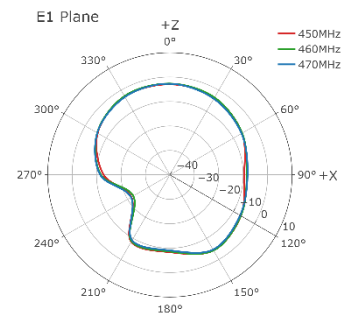
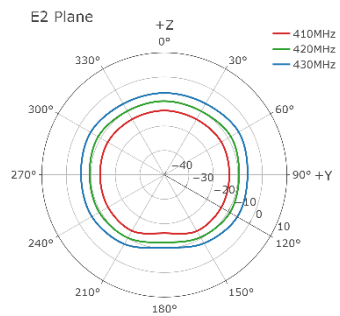
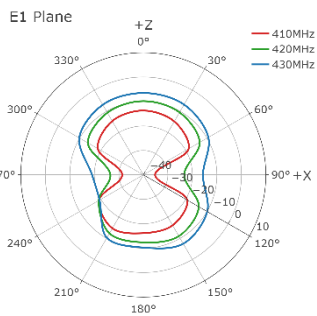
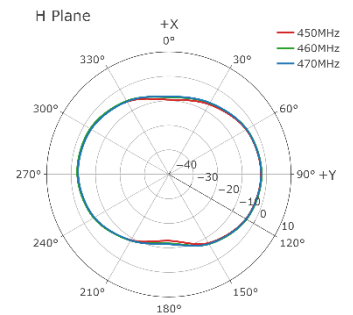
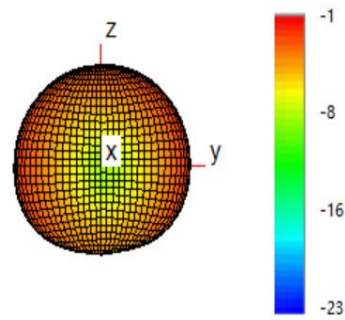
- Test Chamber: HF-G-1



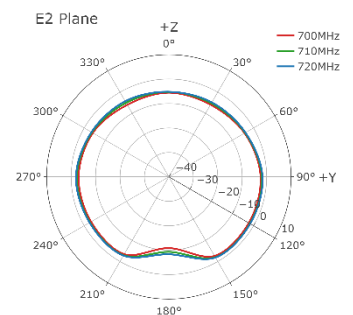
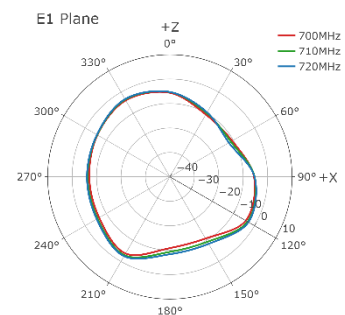
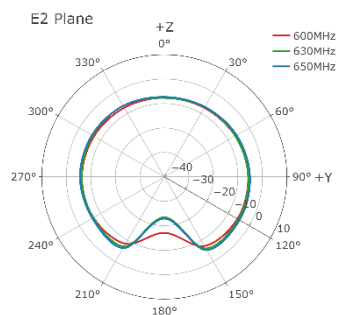
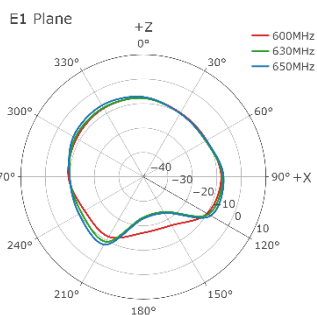
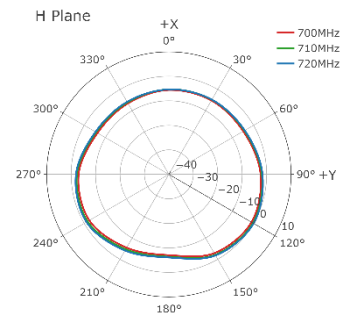
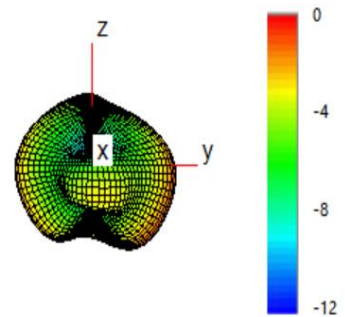
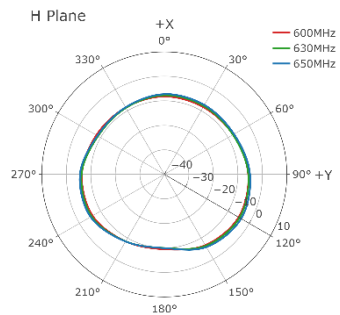
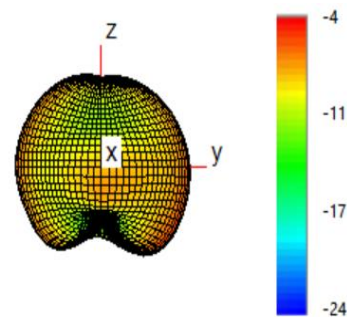
420 MHz



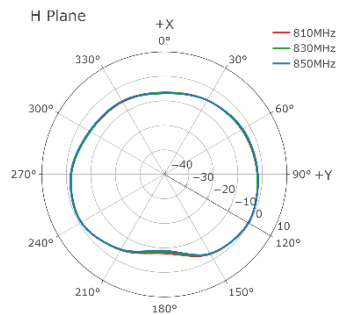
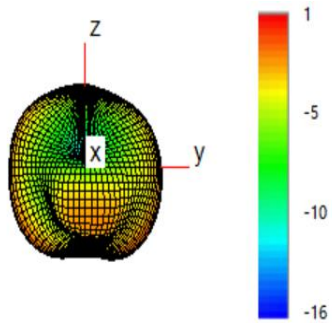
460 MHz



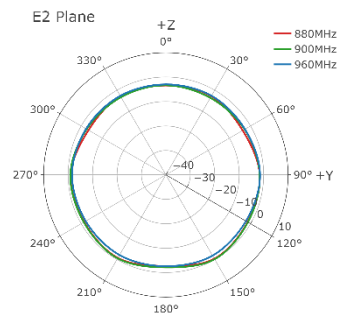
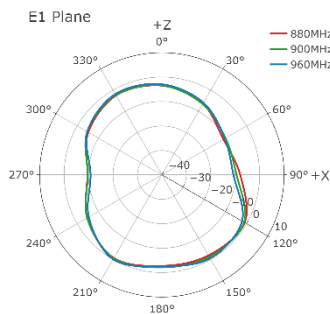
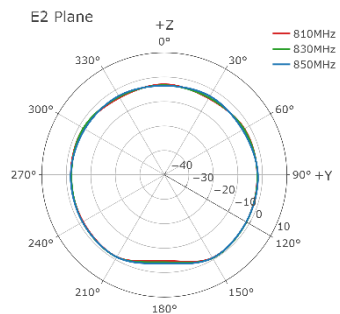
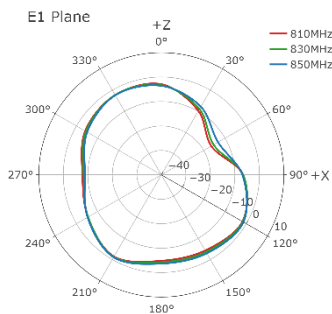
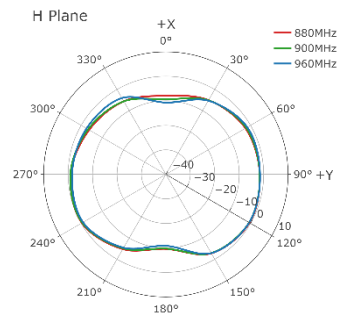
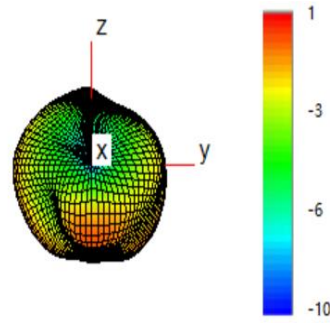
630 MHz



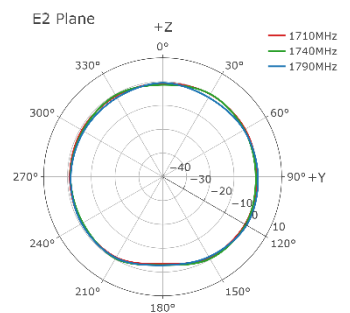
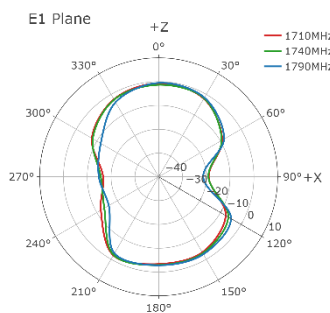
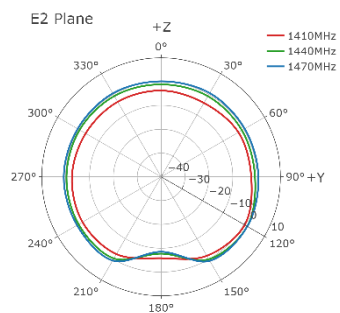
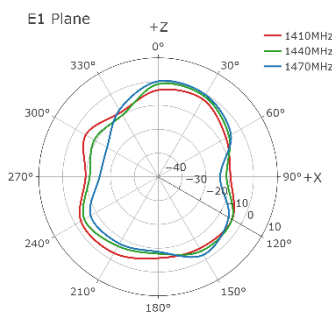
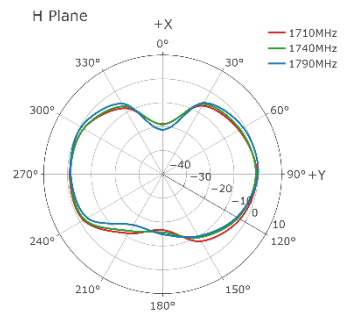
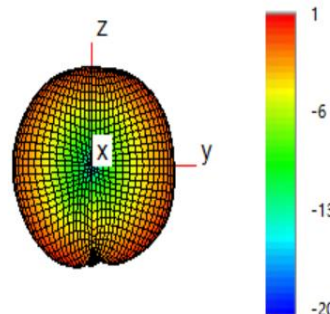
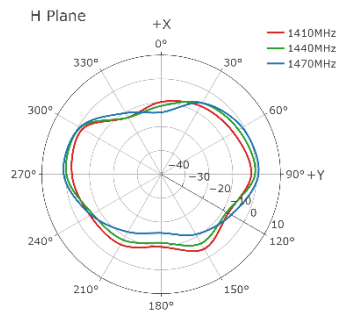
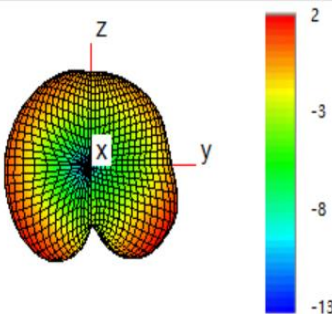
830 MHz

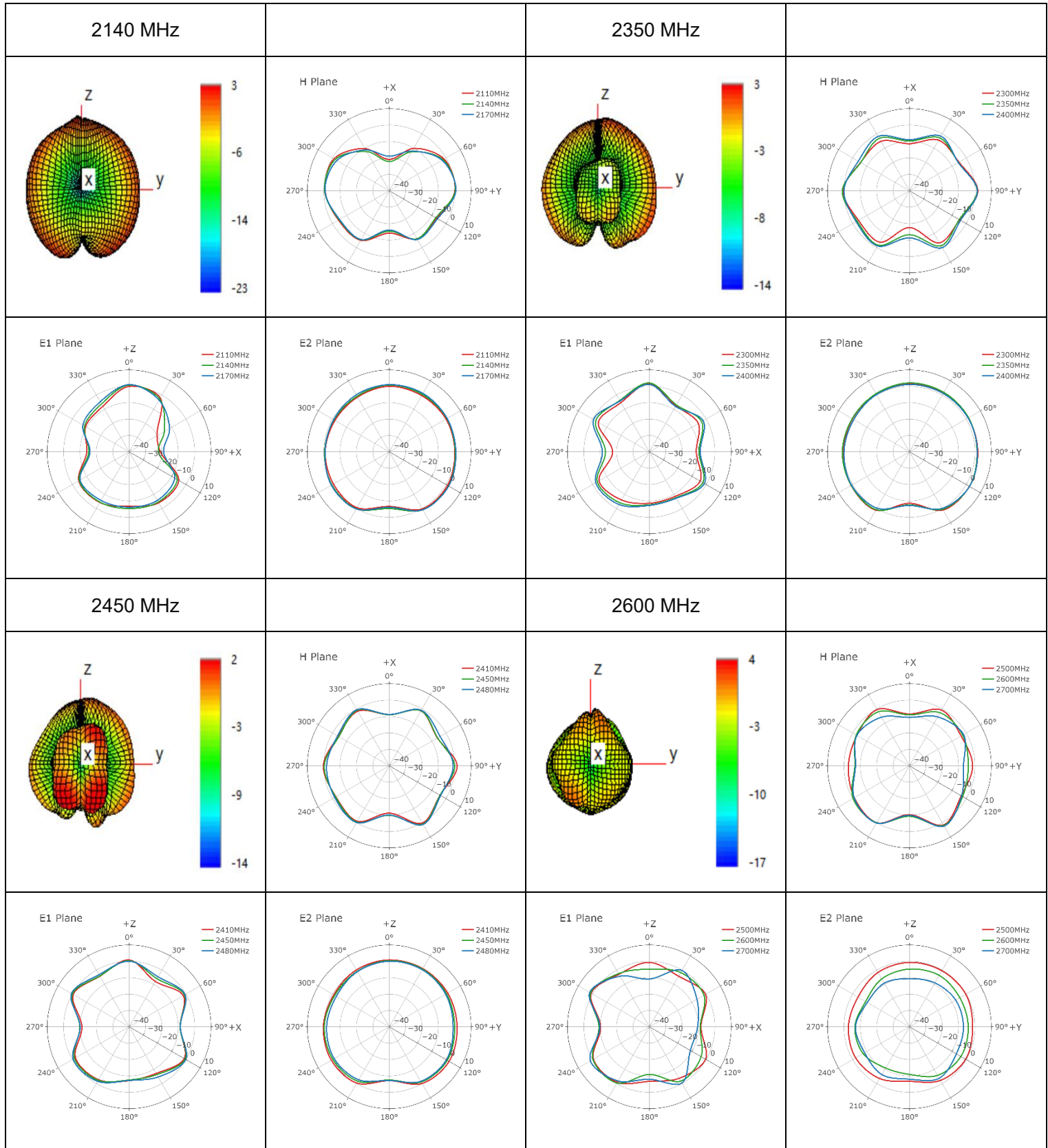


900 MHz

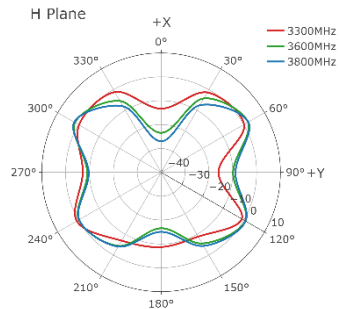
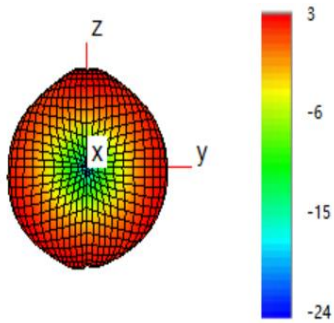


1440 MHz

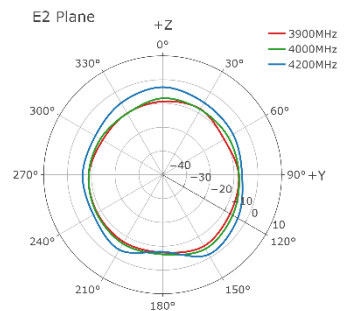
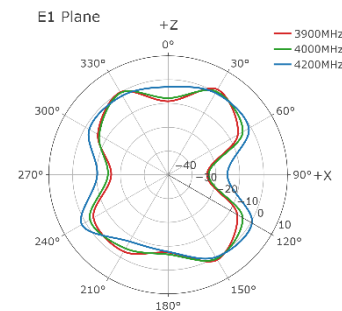
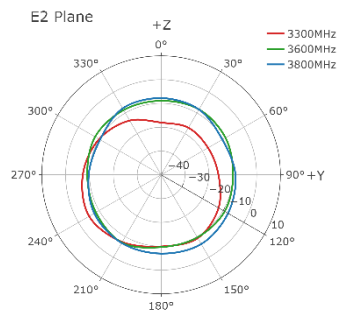
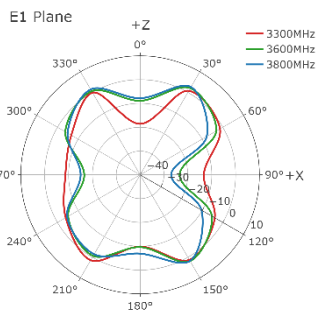
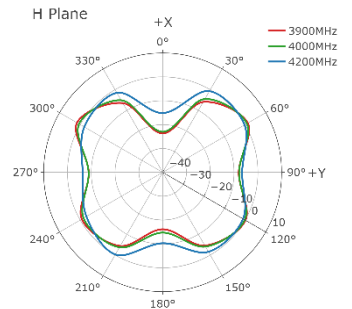
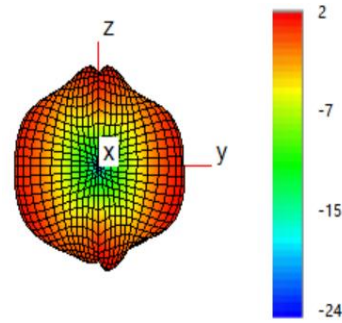




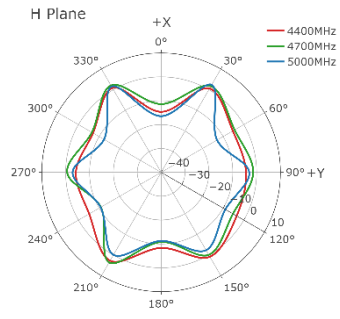
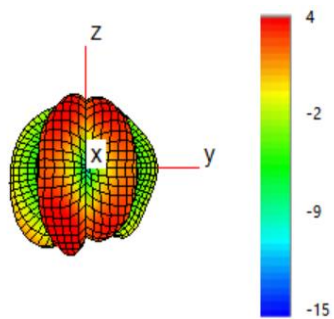
3600 MHz



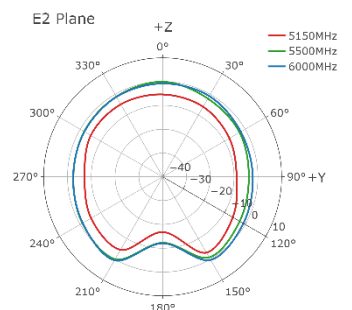
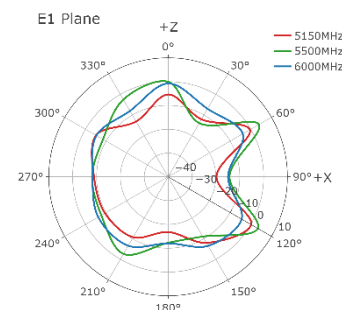
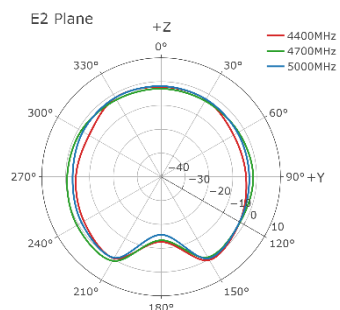
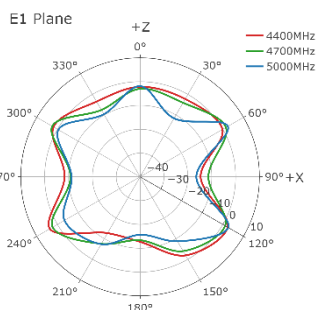
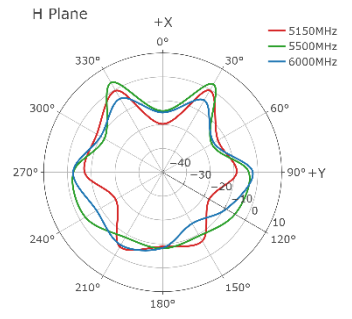
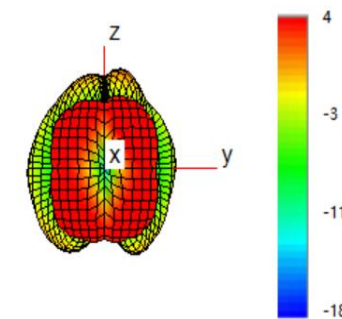
4000 MHz



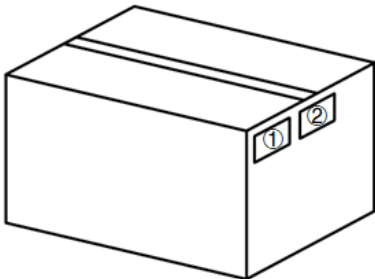
4700 MHz

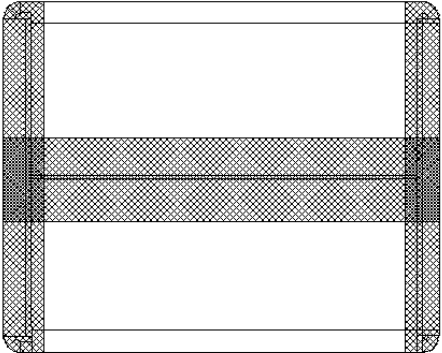


5500 MHz



4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		50 products in a bundle. 100 pcs antenna products in a PE bag. (100 Antennas / PE Bag)
2		The quantity of the full container depends on the actual packing. <u>Carton Size:</u> <u>L × W × H = 405 × 293 × 185 mm</u>
3		Position for Attaching Labels ① Carton Label ② Quality Label

4		Sealing Cartons “I” type sealing cartons
Note	The initial packaging method described above is for reference only, and the final actual packaging method shall be subject to the actual shipping packaging.	

Contact Us

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Revision History

Version	Date	Author	Note
-	2022-10-19	Wilson BAO/ Joye WANG	Creation of the document
1.0	2022-10-19	Wilson BAO/ Joye WANG	First official release
1.1	2023-01-28	Wilson BAO/ Joye WANG	Updated all data in this datasheet.
1.2	2023-06-13	Bunny ZHANG	Updated the packaging information (Chapter 6).
1.3	2023-06-25	Joye WANG	Updated the product drawing (Chapter 5).
2.0	2023-10-19	Jaden FENG/ Lucky FENG/ David LIU/ Aria CHU	Updated all test data in this datasheet.
2.1	2024-06-07	Joye WANG	Updated the drawing (Chapter 2).



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