



Antenna Datasheet

Product OC: YE0001BA

Version: 3.1

Date: 2024-01-10

Status: Released

Product Name: External 5G Antenna

Key Features:

Frequency Band: 600–6000 MHz

Dimensions: 221 mm × 27.30 mm × 13.45 mm

Efficiency: Up to 78.3 % (EVB)

RoHS and REACH Compliant

Overview

This Quectel external 5G antenna covers 5G NR Sub-6 GHz frequency bands and is compatible with 4G/3G/2G/LPWA bands. Featuring high efficiency and gain, it is an ideal omni-directional antenna solution to ensure high-speed data transmission, which can be widely used in a diversity of wireless communication devices such as AP, routers, outdoor equipment, real-time monitoring equipment, and many more. The antenna is designed to work with any ground plane size or in free space for ease of integration. Quectel also offers flexible installation with custom cable length and connector options.

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1 Specification

Test Condition: On 130 mm × 130 mm EVB & Free Space

1.1. Electrical

Electrical	
Frequency Range	600–6000 MHz
Impedance	50 Ω
Polarization	Linear
Radiation Pattern	Omni-directional

Electrical - Detail													
SPEC	Band	Band	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)	600– 700	700– 810	820– 960	1420– 1520	1700– 2170	2300– 2400	2400– 2500	2500– 2690	3300– 4200	4400– 5000	5150– 5850	
Max. VSWR	EVB	3.2	3.2	3.1	-	2.3	1.8	2.6	2.7	3.6	3.1	2.6	
	FS	1.7	2.2	2.4	-	2.3	1.7	1.7	2.4	2.2	2.2	1.7	
Max. Return Loss (dB)	EVB	-5.7	-5.6	-5.8	-	-8.0	-10.6	-7.1	-6.9	-4.9	-5.9	-6.9	
	FS	-11.3	-8.7	-7.7	-	-8.2	-11.9	-12.0	-7.5	-8.4	-8.5	-12.2	
AVG Eff. (%)	EVB	50.2	54.3	50.5	-	70.4	77.0	71.7	68.8	61.7	57.6	53.6	
	FS	36.6	37.1	37.3	-	67.3	74.1	66.9	58.7	59.5	51.9	63.1	
AVG AVG Gain (dB)	EVB	-3.0	-2.7	-3.0	-	-1.5	-1.1	-1.4	-1.6	-2.1	-2.4	-2.7	
	FS	-4.4	-4.3	-4.3	-	-1.7	-1.3	-1.8	-2.3	-2.3	-2.9	-2.0	

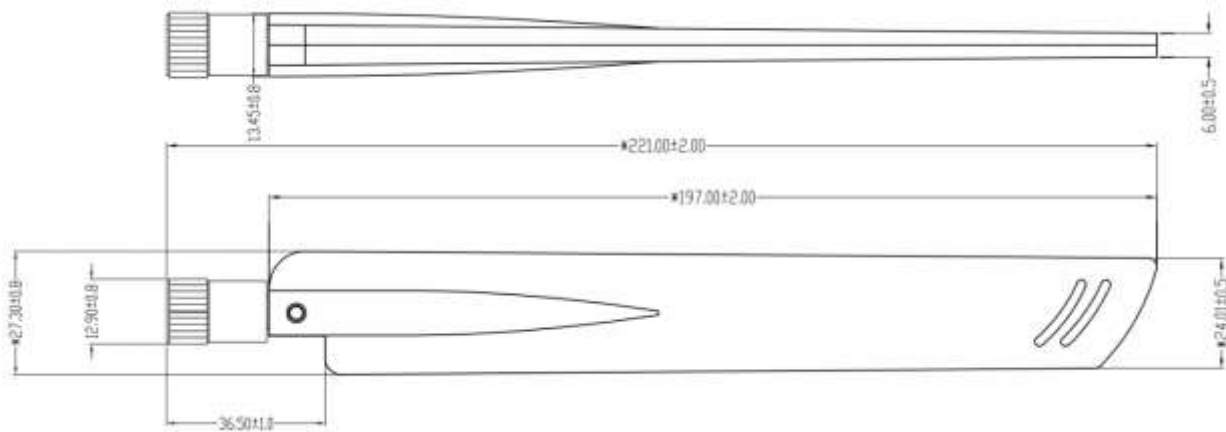
Max. Peak Gain (dBi)	EVB	0.4	1.3	2.0	-	4.3	3.7	3.0	2.7	3.5	2.6	2.7
	FS	-1.2	-1.1	-1.2	-	3.4	2.6	2.8	2.8	3.3	3.3	5.0
VSWR		EVB				≤ 3.6						
		FS				≤ 2.4						
Return Loss		EVB				≤ -4.9 dB						
		FS				≤ -7.5 dB						
Peak Gain		EVB				≤ 4.3 dBi						
		FS				≤ 5.0 dBi						

- FS: Free Space
- EVB: On 130 mm × 130 mm EVB

1.2. Mechanical & Environmental

Mechanical	
Antenna Dimensions	221 mm × 27.30 mm × 13.45 mm
Material & Color	ABS & Black
Connector Type	SMA Male
Mounting Type	Terminal
Weight	Typ. 29 g
Environmental	
Operation Temperature	-40 °C to +80 °C
Storage Temperature	-40 °C to +80 °C
RoHS and REACH Compliant	Yes

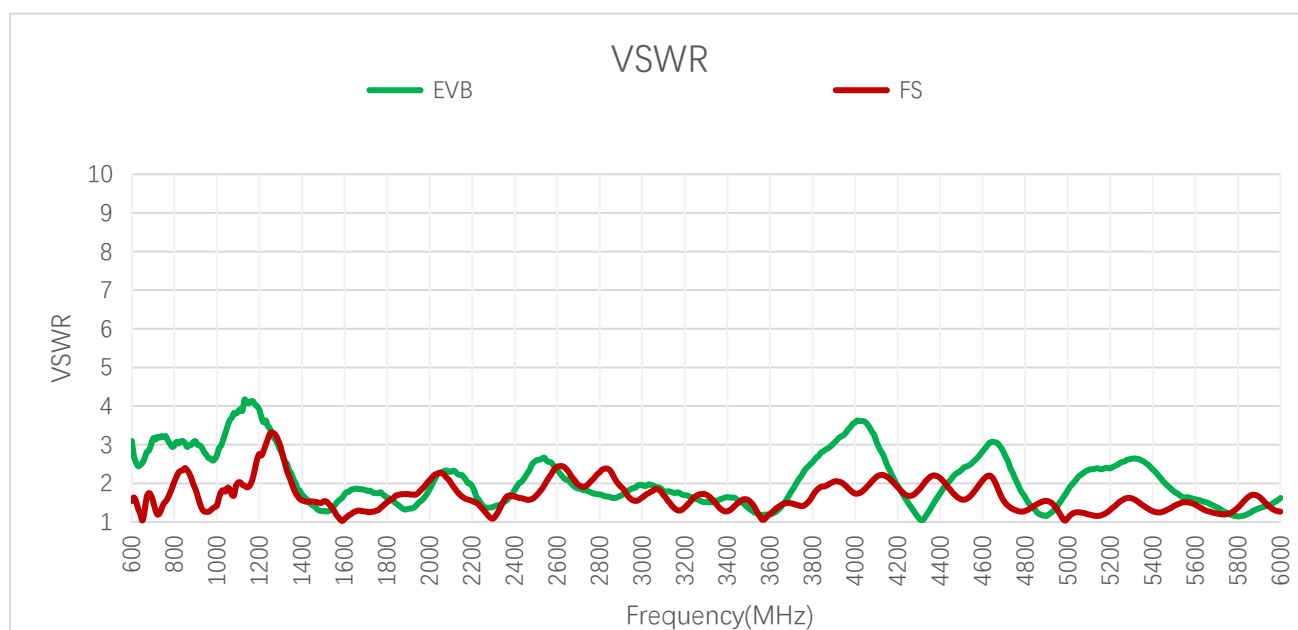
2 Drawing



3 Detailed Performance

3.1. S-Parameter Test

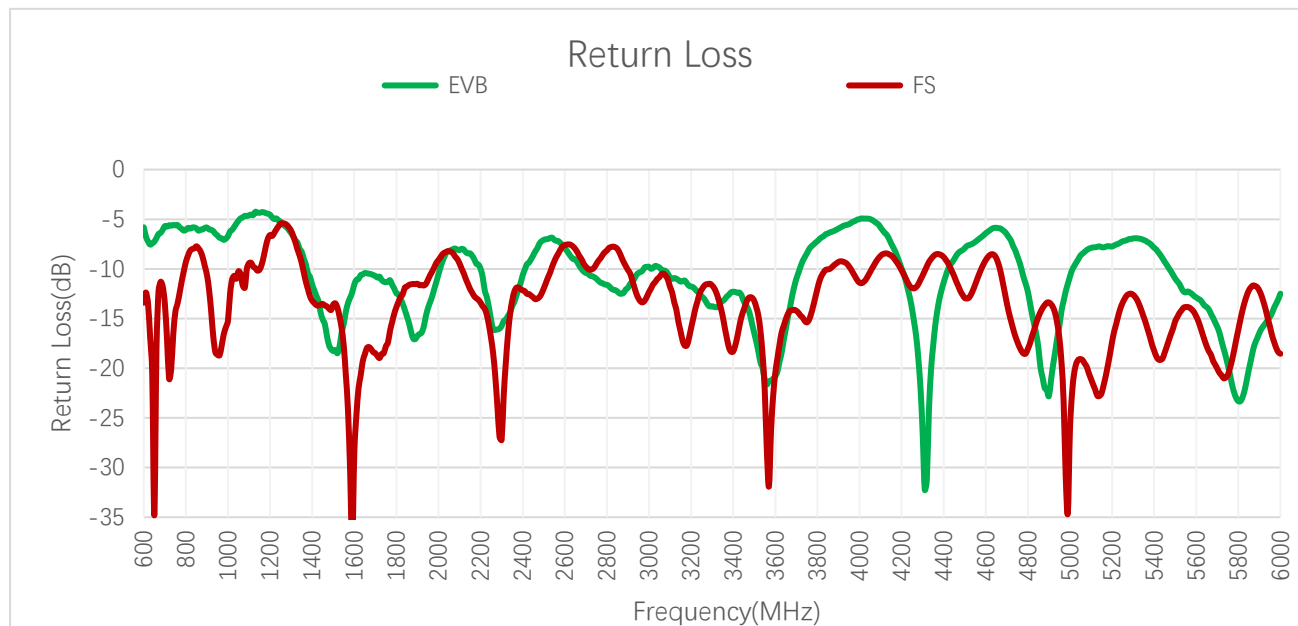
3.1.1. VSWR



VSWR

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
VSWR	EVB	3.1	2.4	3.1	3.1	3.1	2.7	-	1.8	1.7	1.3
	FS	1.5	1.3	1.3	2.3	1.8	1.3	-	1.3	1.3	1.7
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
VSWR	EVB	1.5	2.2	1.5	2.2	2.3	1.2	2.8	1.8	1.8	1.6
	FS	1.8	1.7	1.6	1.6	2.4	1.2	1.5	1.1	1.4	1.3

3.1.2. Return Loss

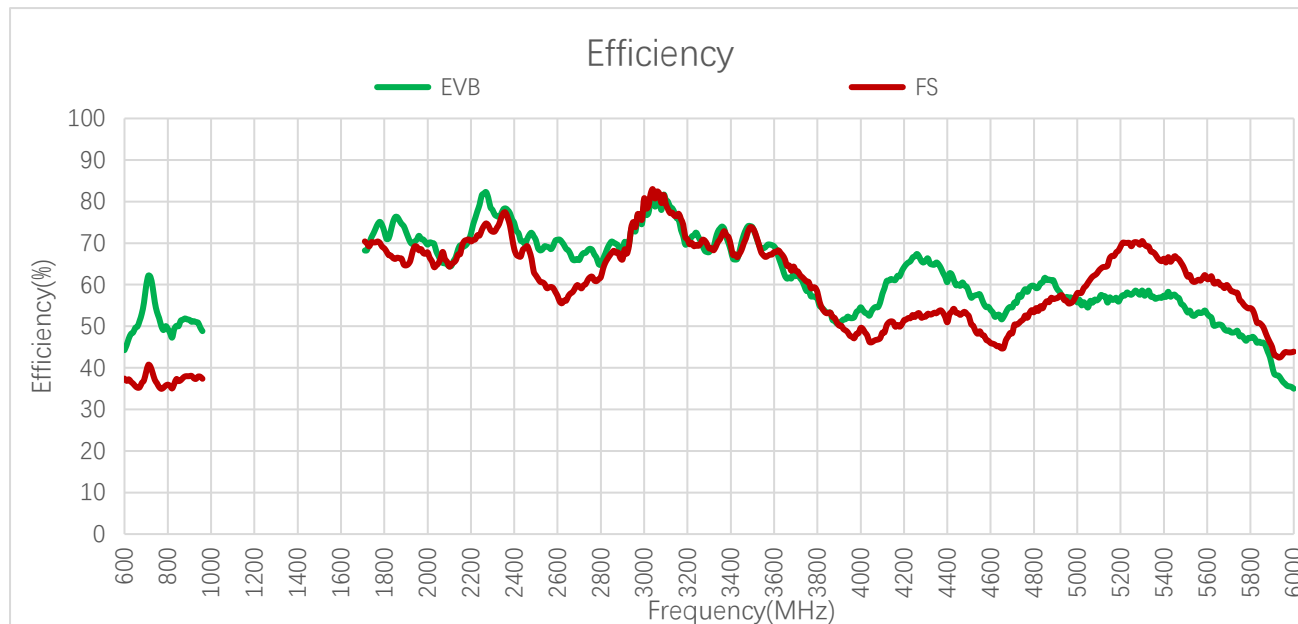


Return Loss (dB)

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Return Loss (dB)	EVB	-5.8	-7.6	-5.7	-5.8	-5.8	-6.9	-	-10.9	-11.3	-17.0
	FS	-13.4	-16.8	-16.9	-8.0	-10.6	-18.7	-	-18.8	-18.5	-11.5
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Return Loss (dB)	EVB	-14.0	-8.4	-13.8	-8.6	-7.9	-20.8	-6.5	-10.8	-11.0	-12.5
	FS	-11.1	-11.5	-13.2	-12.9	-7.6	-20.5	-13.4	-26.2	-15.3	-18.5

3.2. Radiation Performance Test

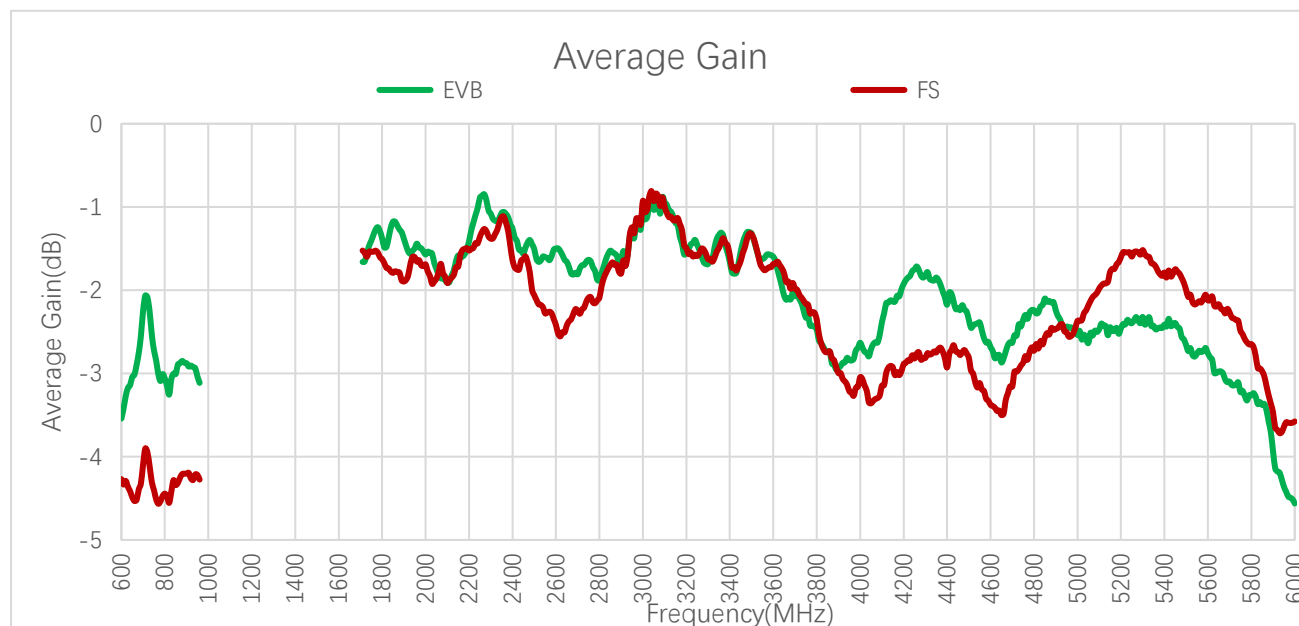
3.2.1. Efficiency



Efficiency (%)

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Efficiency (%)	EVB	44.2	48.2	62.2	49.4	51.6	48.8	-	68.2	71.4	74.6
	FS	37.4	36.6	40.7	36.2	38.0	37.4	-	70.4	70.2	66.2
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Efficiency (%)	EVB	70.8	68.4	78.2	69.8	70.8	69.2	54.6	55.7	54.2	35.0
	FS	69.1	67.2	77.2	68.8	57.3	67.8	48.3	58.0	63.1	43.9

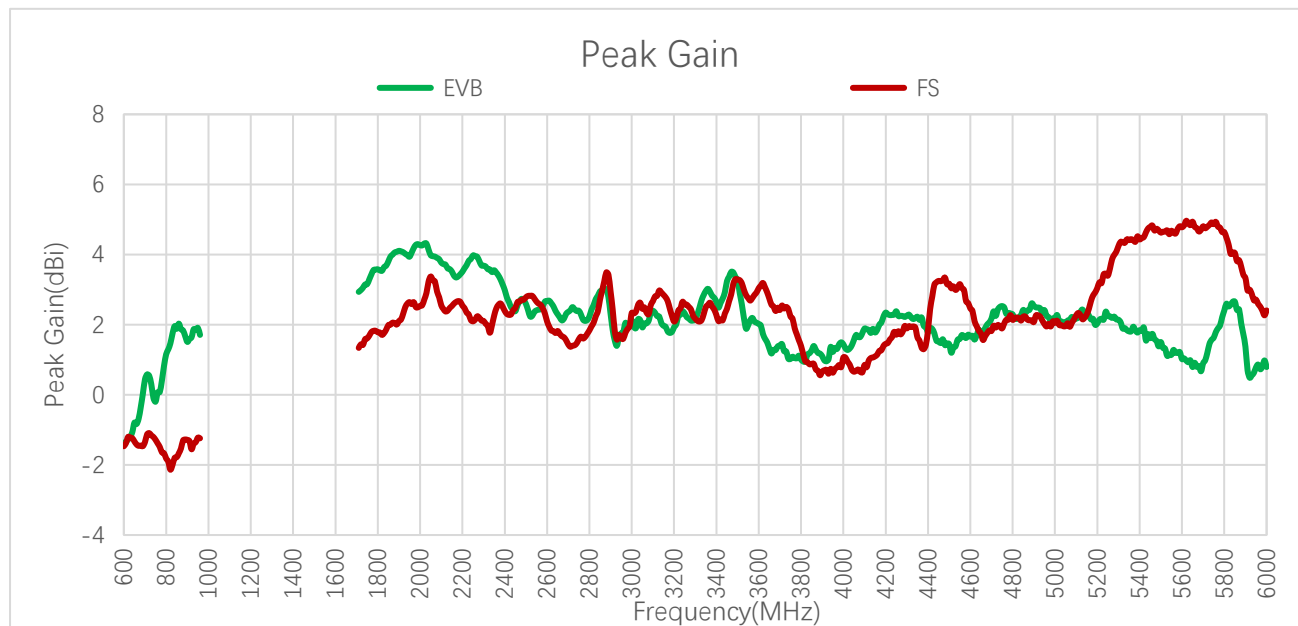
3.2.2. Average Gain



Average Gain (dB)

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Average Gain (dB)	EVB	-3.5	-3.2	-2.1	-3.1	-2.9	-3.1	-	-1.7	-1.5	-1.3
	FS	-4.3	-4.4	-3.9	-4.4	-4.2	-4.3	-	-1.5	-1.5	-1.8
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Average Gain (dB)	EVB	-1.5	-1.6	-1.1	-1.6	-1.5	-1.6	-2.6	-2.5	-2.7	-4.6
	FS	-1.6	-1.7	-1.1	-1.6	-2.4	-1.7	-3.2	-2.4	-2.0	-3.6

3.2.3. Peak Gain



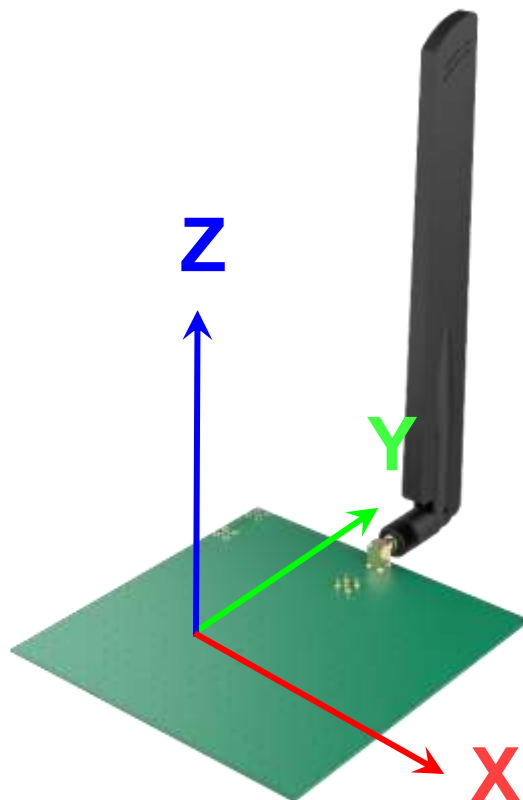
Peak Gain (dBi)

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Peak Gain (dBi)	EVB	-1.4	-1.2	0.6	1.7	1.5	1.7	-	2.9	3.1	4.1
	FS	-1.5	-1.2	-1.1	-2.0	-1.3	-1.2	-	1.3	1.6	2.0
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Peak Gain (dBi)	EVB	3.9	3.6	3.6	2.4	2.7	2.0	2.2	2.2	1.5	0.8
	FS	2.6	2.5	2.3	2.5	2.1	3.0	1.8	2.1	4.6	2.4

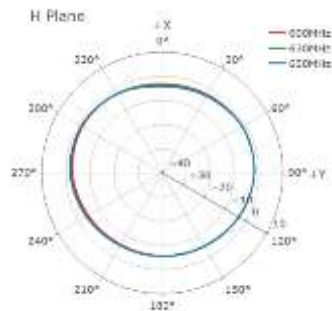
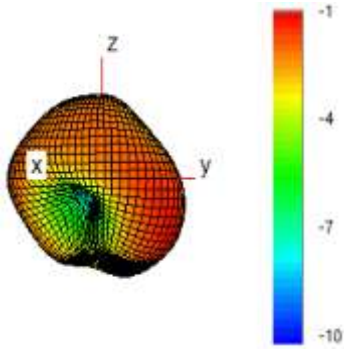
3.2.4. 3D & 2D Radiation Pattern

3.2.4.1. Test Condition: On 130 mm × 130 mm EVB

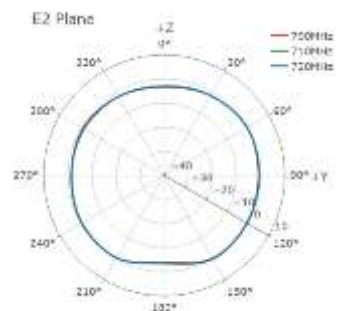
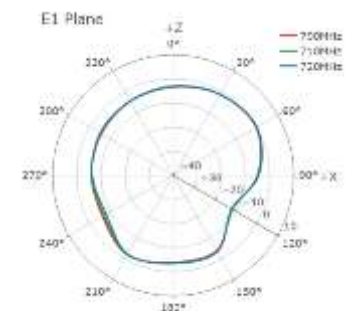
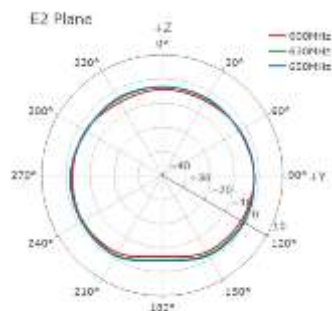
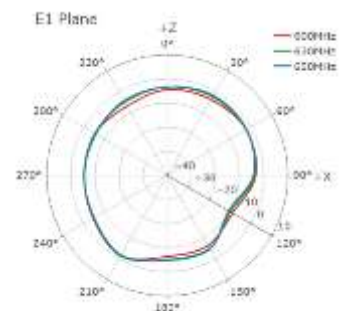
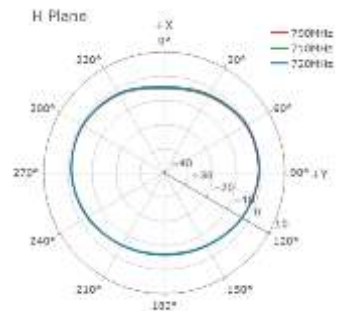
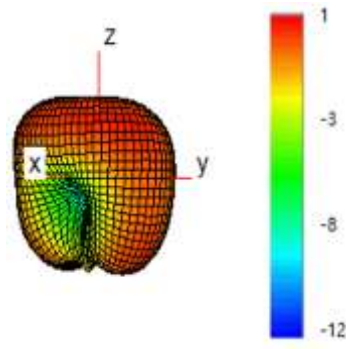
- Test Chamber: HF-G-1



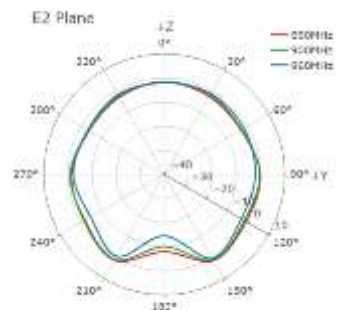
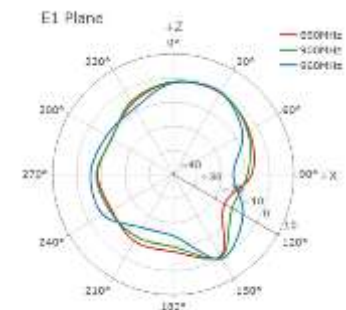
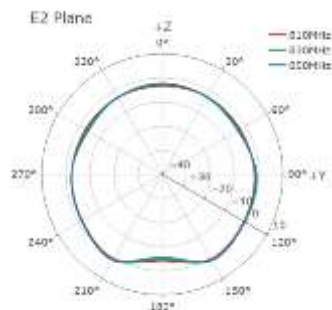
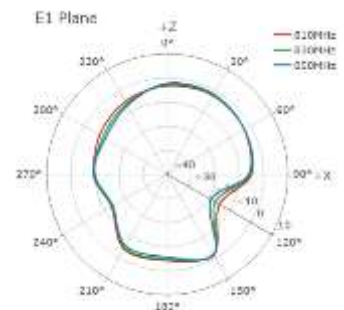
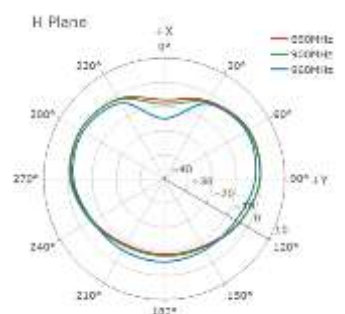
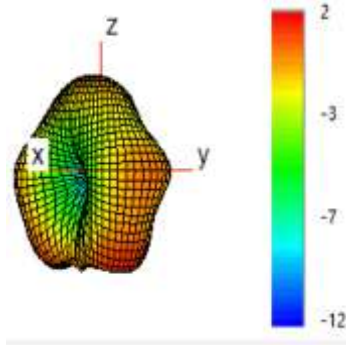
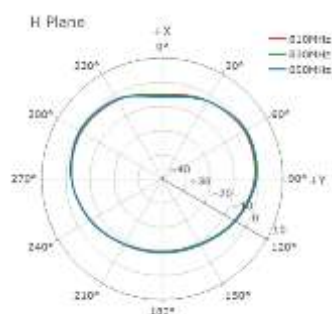
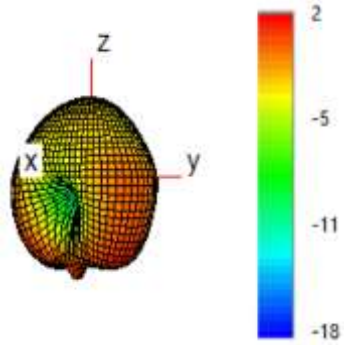
630 MHz

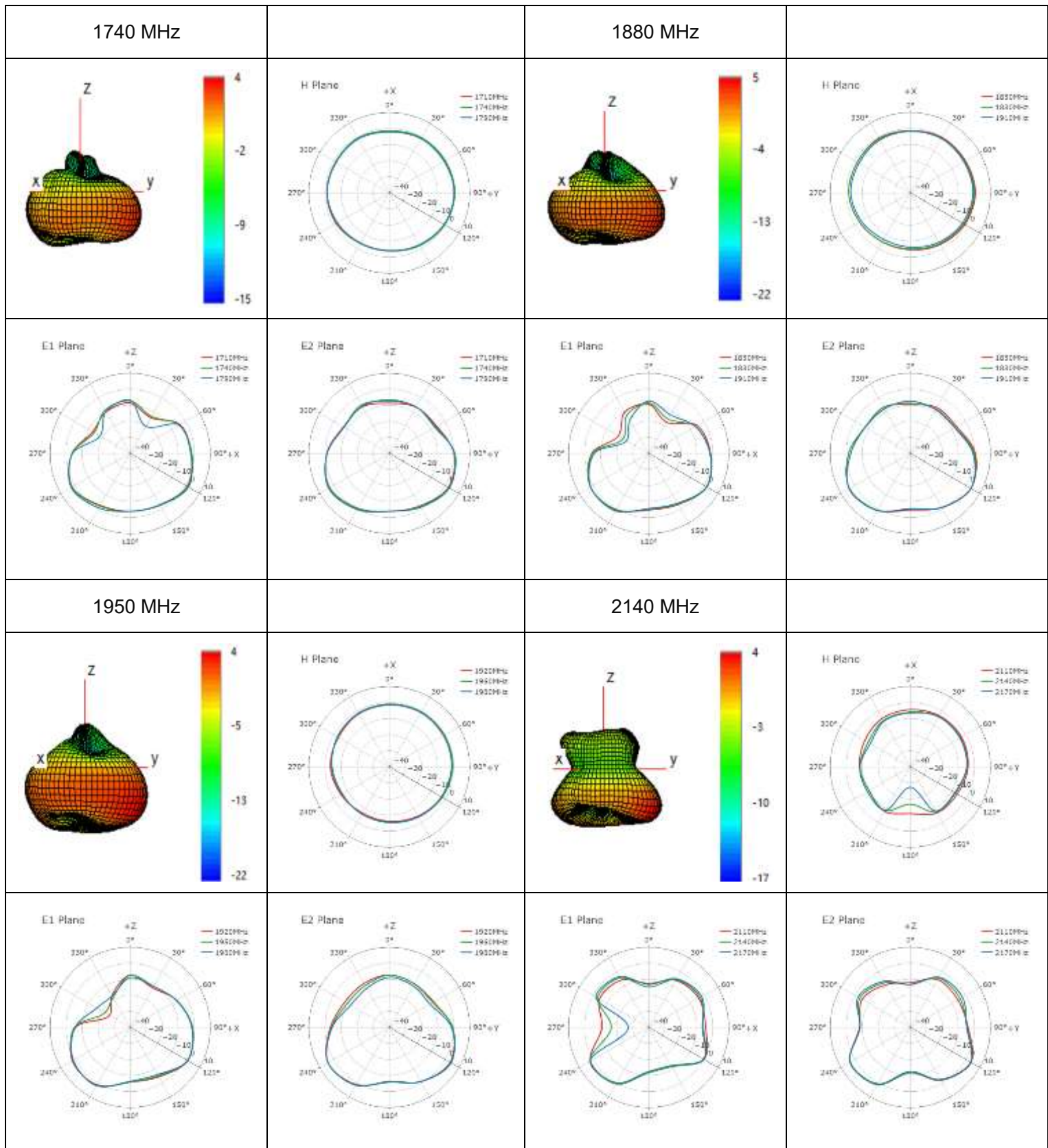


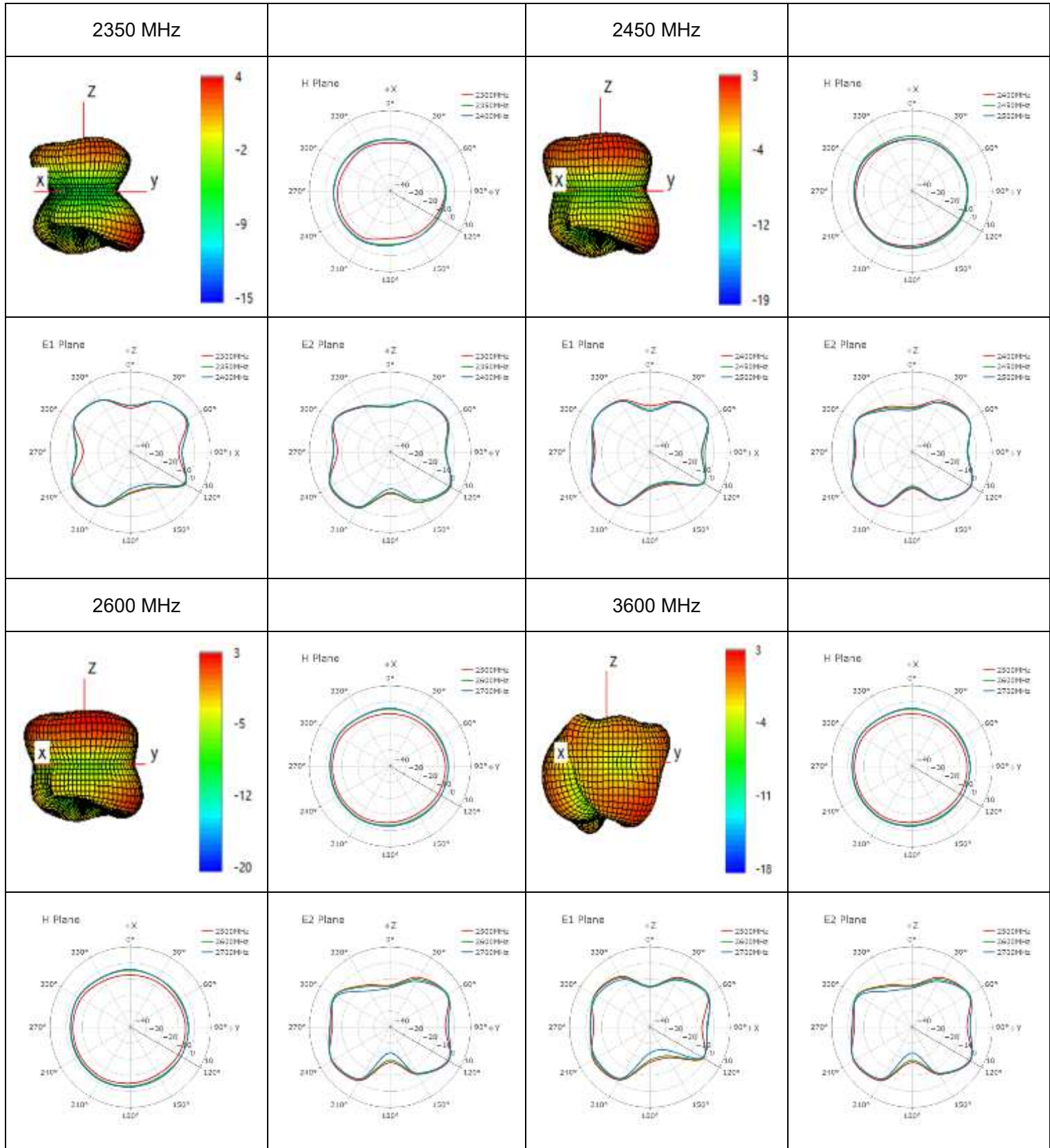
710 MHz

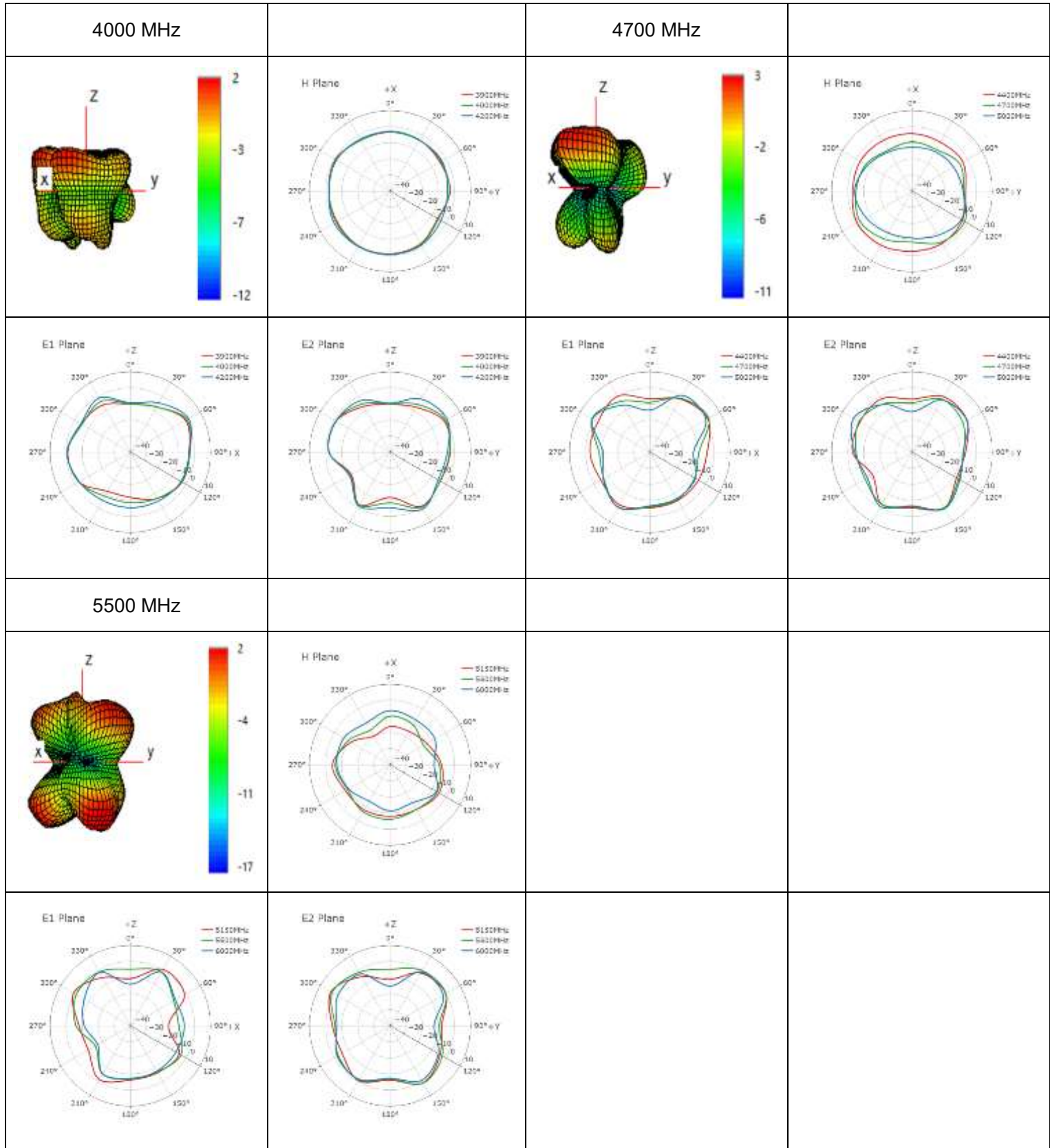


830 MHz



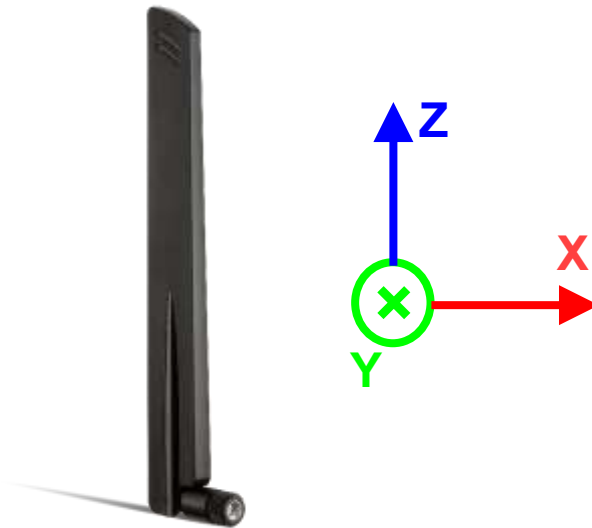




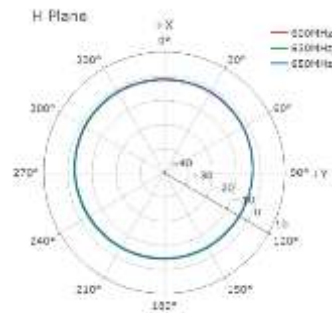
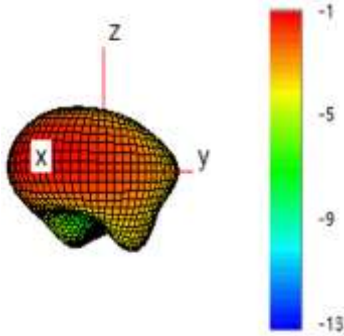


3.2.4.2. Test Condition: Free Space

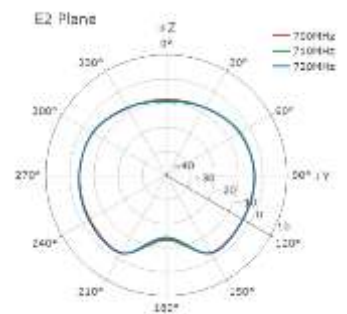
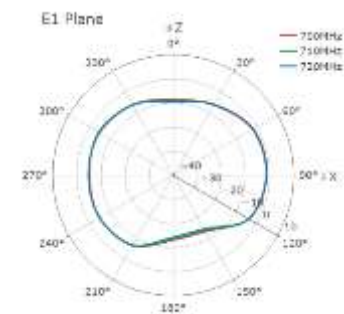
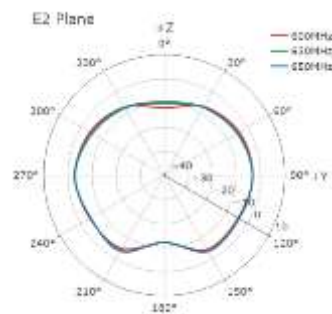
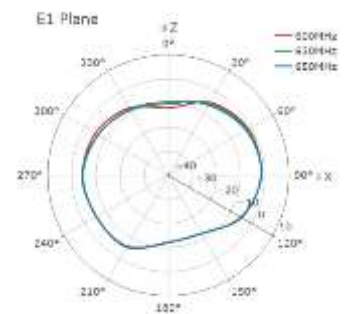
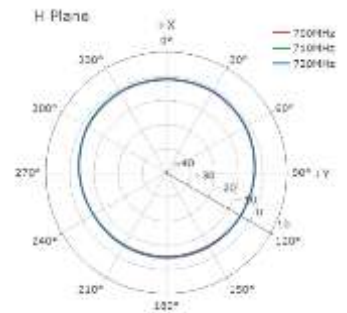
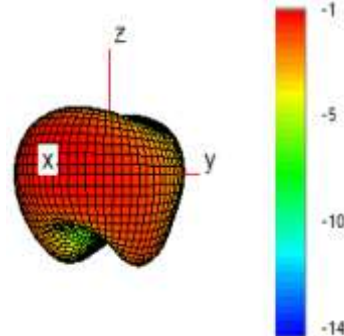
- Test Chamber: HF-G-1



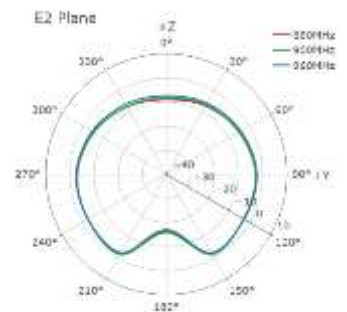
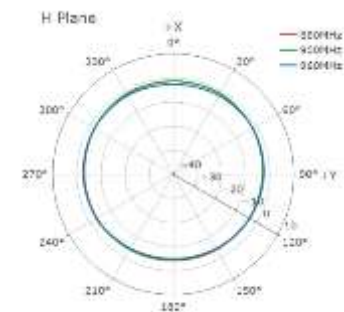
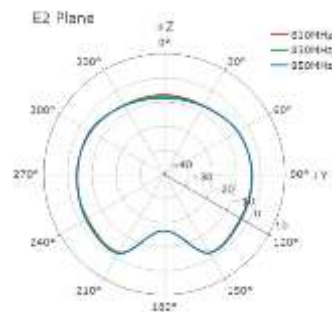
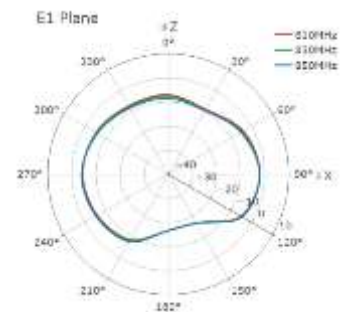
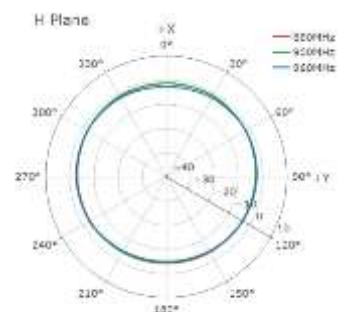
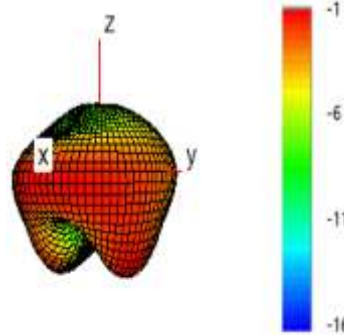
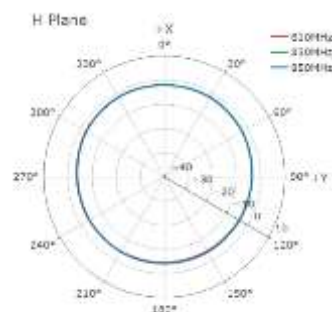
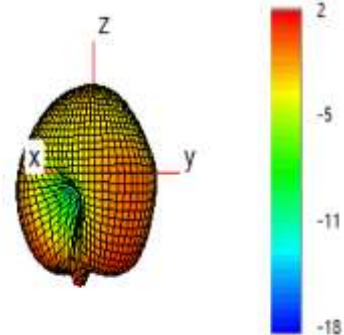
630 MHz

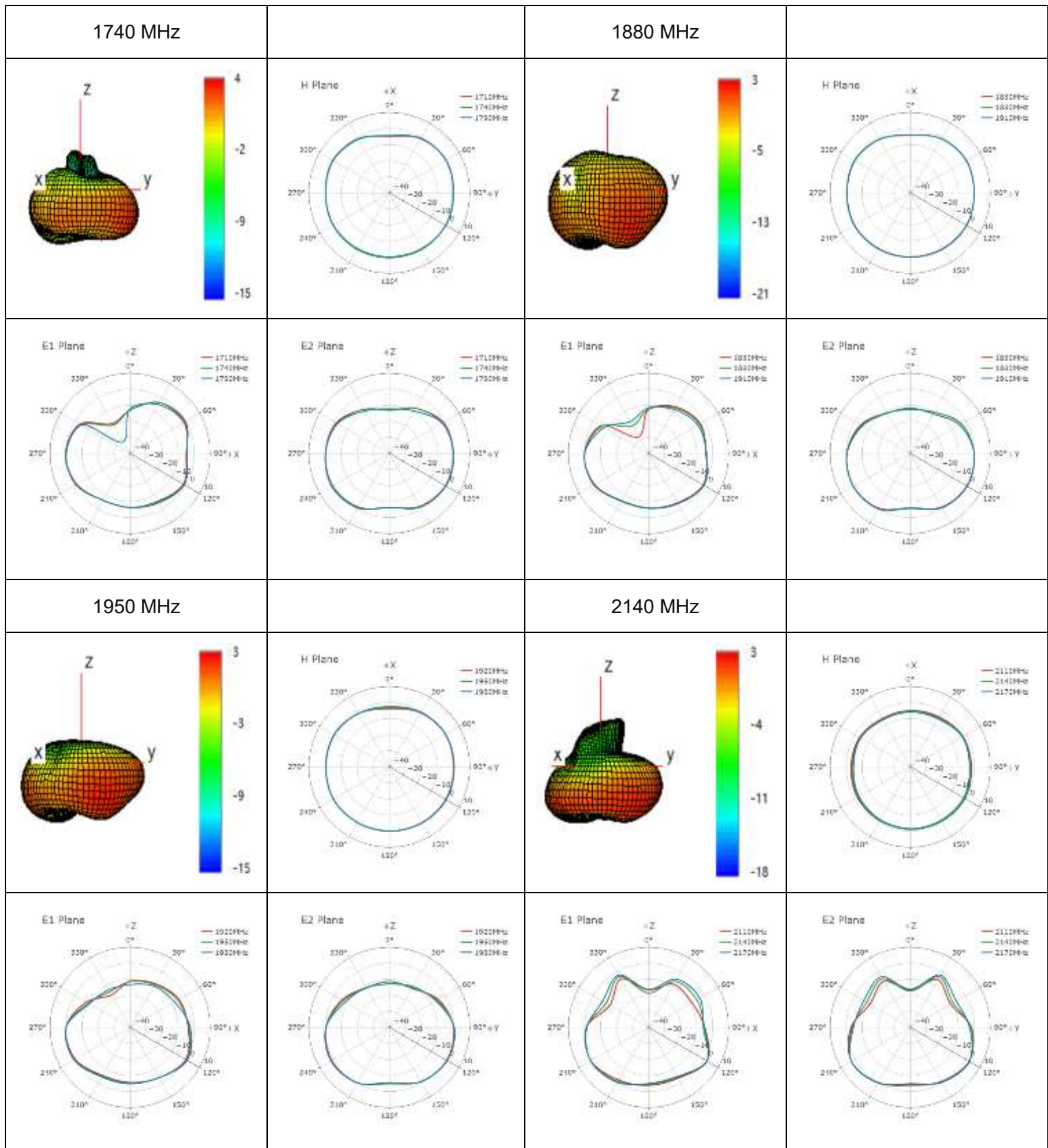


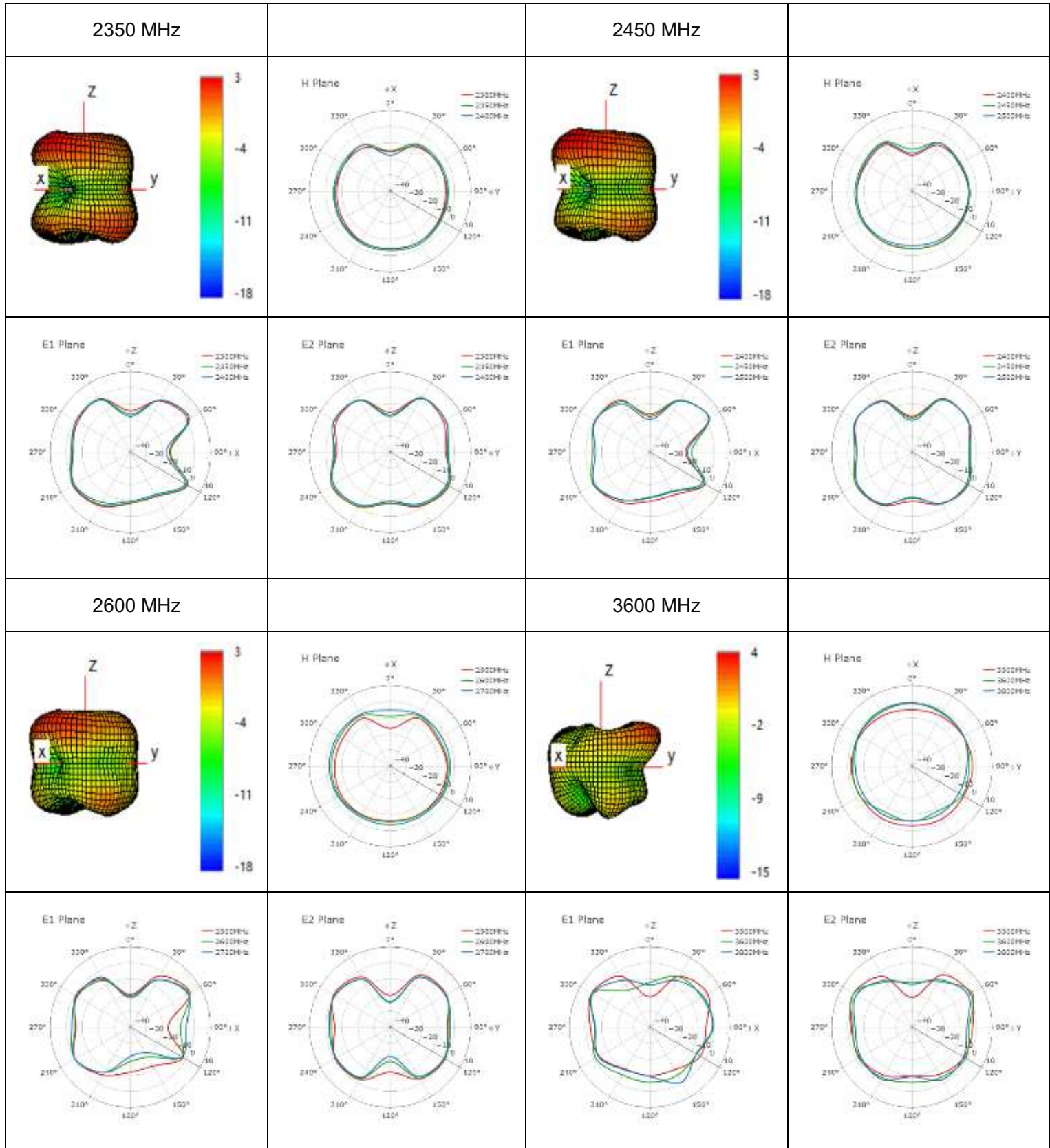
710 MHz

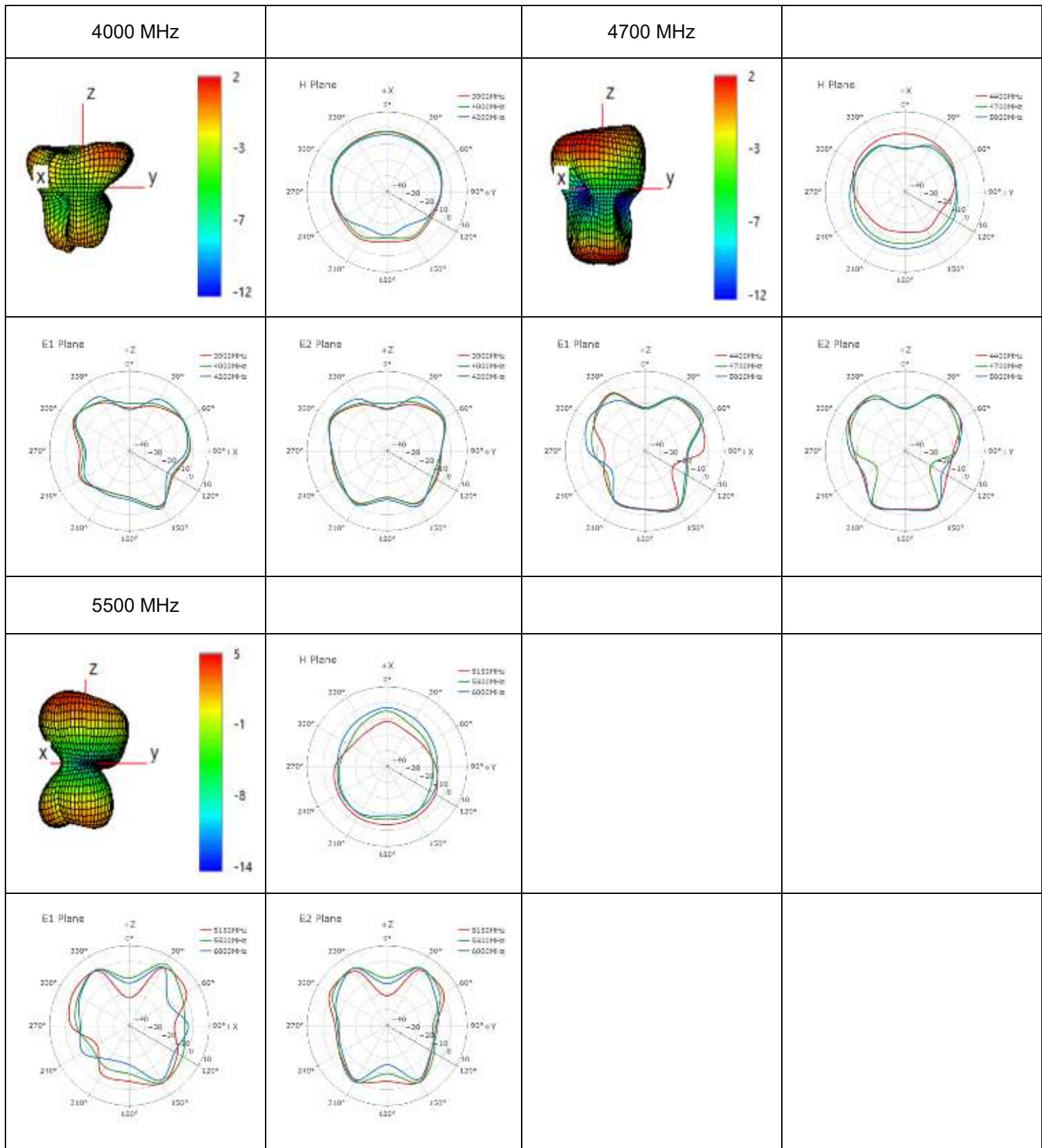


830 MHz

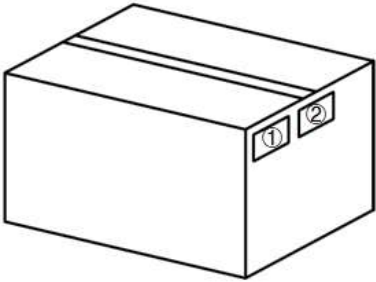


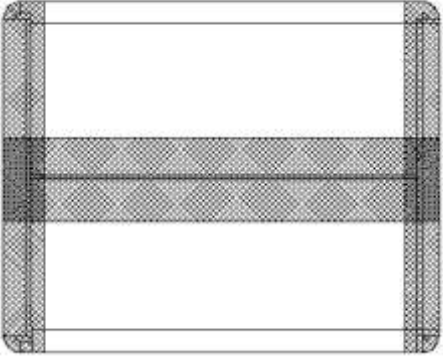






4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		20 pcs antenna products in a PE bag; (20 PCS/ Per PE Bag)
2		(18 PE Bags / Carton Box) (360 PCS Antennas / Carton Box) <u>Carton Size:</u> <u>L × W × H = 450 × 240 × 290 mm</u>
3		Position for Attaching Labels ① Carton Label ② Quality Label

4		Sealing Cartons “工” type sealing cartons
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Contact Us

At Quectel, our aim is to provide timely and comprehensive services to our customers. If you require any assistance, please contact our headquarters:

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Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China

Tel: +86 21 5108 6236

Email: info@quectel.com

Or our local offices. For more information, please visit:

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Revision History

Version	Date	Author	Note
-	2020-08-27	Kenny YIN	Creation of the document
1.0	2020-08-27	Kenny YIN	First official release
1.1	2020-12-16	Kenny YIN	Updated the antenna image (Chapter 2).
1.2	2021-01-27	Kenny YIN	Added IP rating description.
1.3	2021-07-25	Kenny YIN	1. Updated working temperature. (Chapter 3). 2. Added detailed passive electrical specifications. (Chapter 3).
1.4	2021-11-30	Kenny YIN	Updated the product description (Chapter 1).
1.5	2022-01-14	Kenny YIN	Updated the drawing (Chapter 5).
1.6	2022-10-17	Aria CHU	Deleted the IP rating.
2.0	2023-04-26	Tina GAN/ Lucky FENG/ David LIU/ Aria CHU	Updated all data and datasheet template.
2.1	2023-10-10	Lucky FENG	Updated the temperature and materials (Chapter 1.1).
3.0	2023-10-30	Nico PAN	Numerous changes were made to this document. It should be read in its entirety.
3.1	2024-01-10	Lucky FENG	Updated antenna material (Chapter 1.2).



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