



# Antenna Datasheet

**Product OC:** YP00090A

**Version:** 2.0

**Date:** 2023-10-20

**Status:** Released

**Product Name:** 5G PCB Antenna

**Key Features:**

Frequency Band: 600–6000 MHz

Dimensions: 78.6 mm × 14.2 mm × 0.8 mm

Efficiency: Up to 79.2 % (FS)

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 Specification

Test Condition: Stick to ABS board on 130 × 130 mm EVB board & Free space

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

Electrical - Detail												
SPEC	Band	B71	B12 /B13 /B28	B5 /B8 /B26	B1 /B2 /B3	B40	Wi-Fi 2G	B38 /B41	B48	B42 /N77	N79	Wi-Fi 5G
	Band	Freq. (MHz)	600– 700	700– 810	820– 960	1700– 2170	2300– 2400	2400– 2500	2500– 2690	3550– 3700	3300– 4200	4400– 5000
Max. VSWR	EVB	4.0	2.8	3.8	5.3	2.2	1.6	1.5	2.8	2.8	2.3	2.8
	FS	3.7	3.7	2.4	3.7	3.3	1.6	1.4	2.1	2.3	2.0	2.5
Max. Return Loss (dB)	EVB	-4.4	-6.4	-4.6	-3.3	-8.3	-13.3	-13.8	-6.5	-6.4	-7.9	-6.4
	FS	-4.8	-4.8	-7.8	-4.8	-5.5	-13.0	-15.5	-9.3	-8.1	-9.7	-7.5
AVG Eff. (%)	EVB	45.0	71.4	57.0	36.5	60.2	68.4	66.2	47.9	55.8	52.7	43.5
	FS	30.0	42.6	35.1	41.2	59.9	63.3	63.2	51.5	56.5	63.7	41.5
AVG AVG Gain (dB)	EVB	-3.5	-1.5	-2.5	-4.5	-2.2	-1.6	-1.8	-3.2	-2.6	-2.8	-3.7
	FS	-5.3	-3.7	-4.6	-3.9	-2.3	-2.0	-2.0	-2.9	-2.5	-2.0	-3.9
Max. Peak Gain (dBi)	EVB	0.7	2.2	2.2	2.2	3.2	5.2	5.1	4.8	4.1	5.3	2.6
	FS	0.2	0.5	-0.5	2.4	3.3	5.2	5.5	5.3	5.1	4.4	1.6

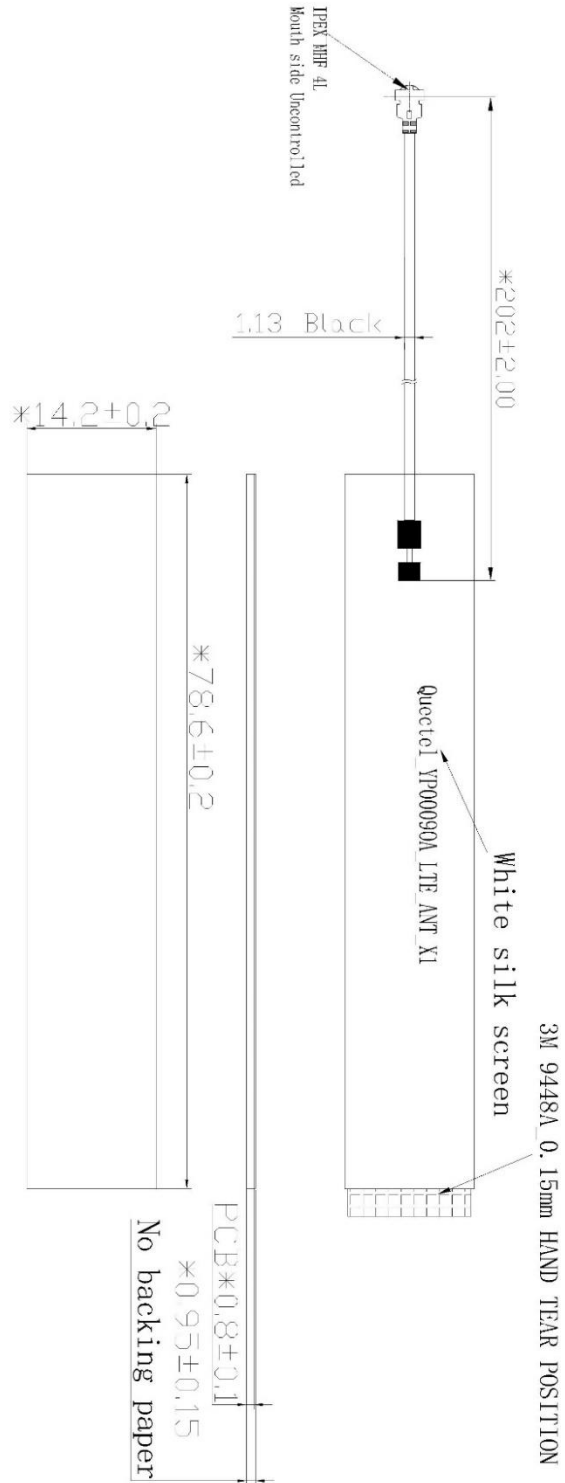
VSWR	EVB	$\leq 5.3$
	FS	$\leq 3.7$
Return Loss	EVB	$\leq -3.3$ dB
	FS	$\leq -4.8$ dB
Peak Gain	EVB	$\leq 5.3$ dBi
	FS	$\leq 5.5$ dBi

- EVB: Stick to ABS board on 130 × 130 mm EVB board
- FS: Free Space

## 1.1. Mechanical & Environmental

Mechanical	
Antenna Dimensions	78.6 mm × 14.2 mm × 0.8 mm
Material & Color	PCB & Black
Cable Type & Color & Length	Φ 1.13 & Black & 202 mm
Connector Type	IPEX MHF 4L
Mounting Type	Adhesive
Weight	Typ. 2.8 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS and REACH Compliant	Yes

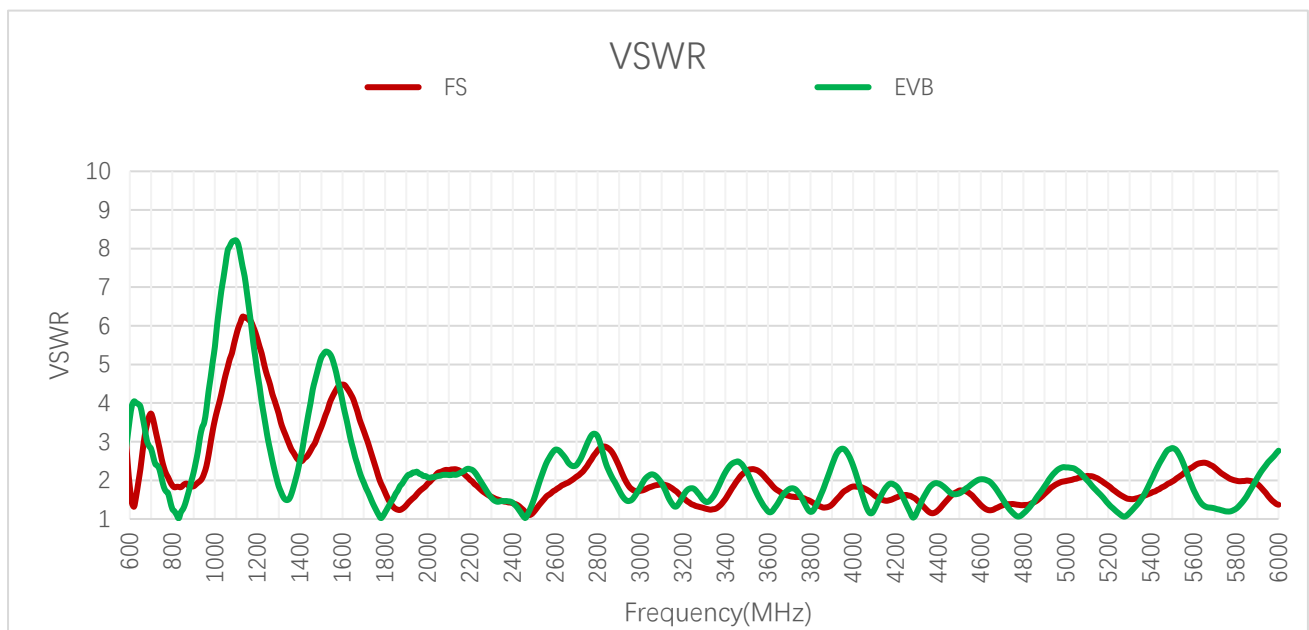
# 2 Drawing



# 3 Detailed Performance

## 3.1. S-Parameter Test

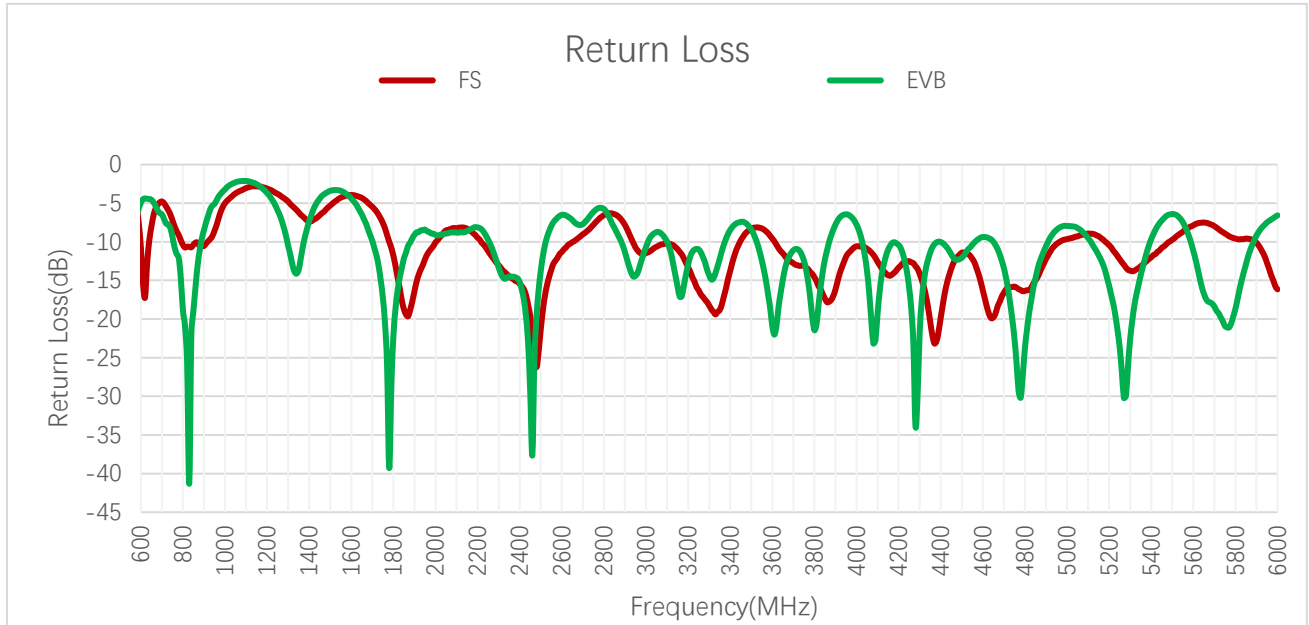
### 3.1.1. VSWR



**VSWR**

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
VSWR	EVB	3.6	4.0	2.6	1.0	2.2	3.8	3.7	1.8	1.4	1.9
	FS	1.8	1.6	3.6	1.8	1.8	2.4	2.7	3.1	2.6	1.3
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
VSWR	EVB	2.2	2.2	1.5	1.1	2.8	1.2	1.5	2.3	2.8	2.8
	FS	1.6	2.3	1.5	1.2	1.7	2.0	1.3	2.0	2.0	1.4

**3.1.2. Return Loss**



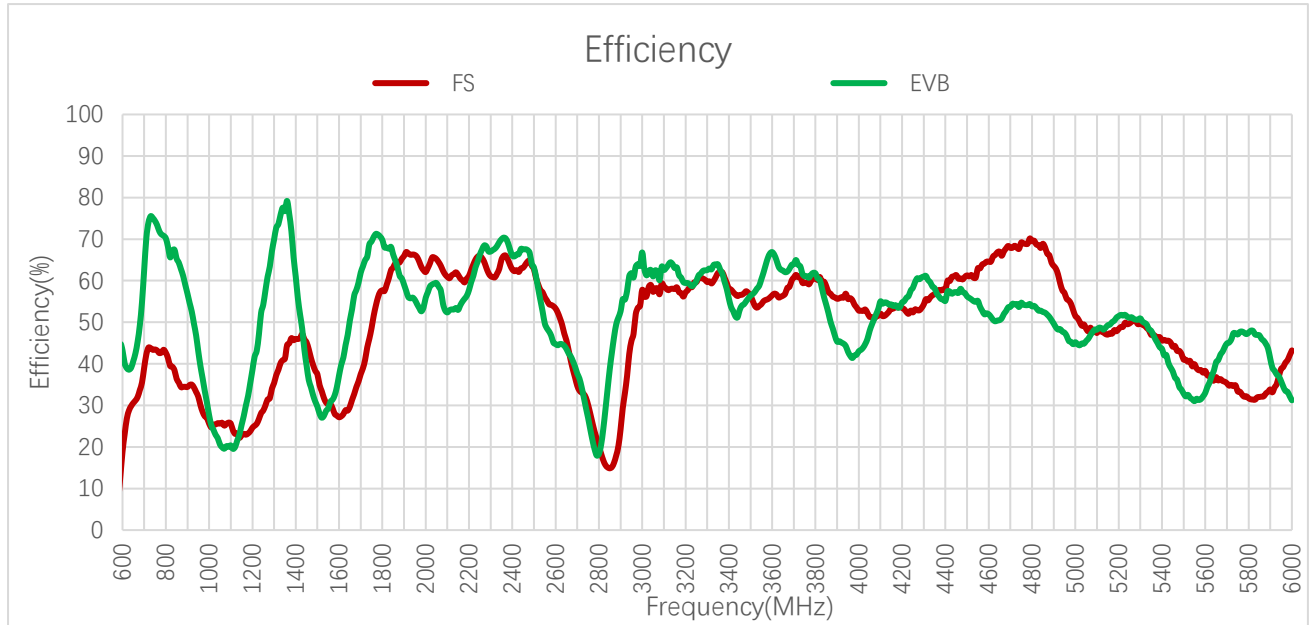
**Return Loss (dB)**

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Return Loss (dB)	EVB	-5.0	-4.4	-7.0	-41.3	-8.5	-4.6	-4.8	-10.9	-15.0	-10.1
	FS	-10.6	-12.8	-5.0	-10.6	-10.5	-7.8	-6.8	-5.8	-7.0	-18.8
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Return Loss (dB)	EVB	-8.4	-8.7	-14.5	-29.5	-6.5	-20.9	-13.4	-8.0	-6.4	-6.6
	FS	-12.2	-8.2	-14.5	-19.6	-11.3	-9.6	-16.6	-9.7	-9.7	-16.2



### 3.2. Radiation Performance Test

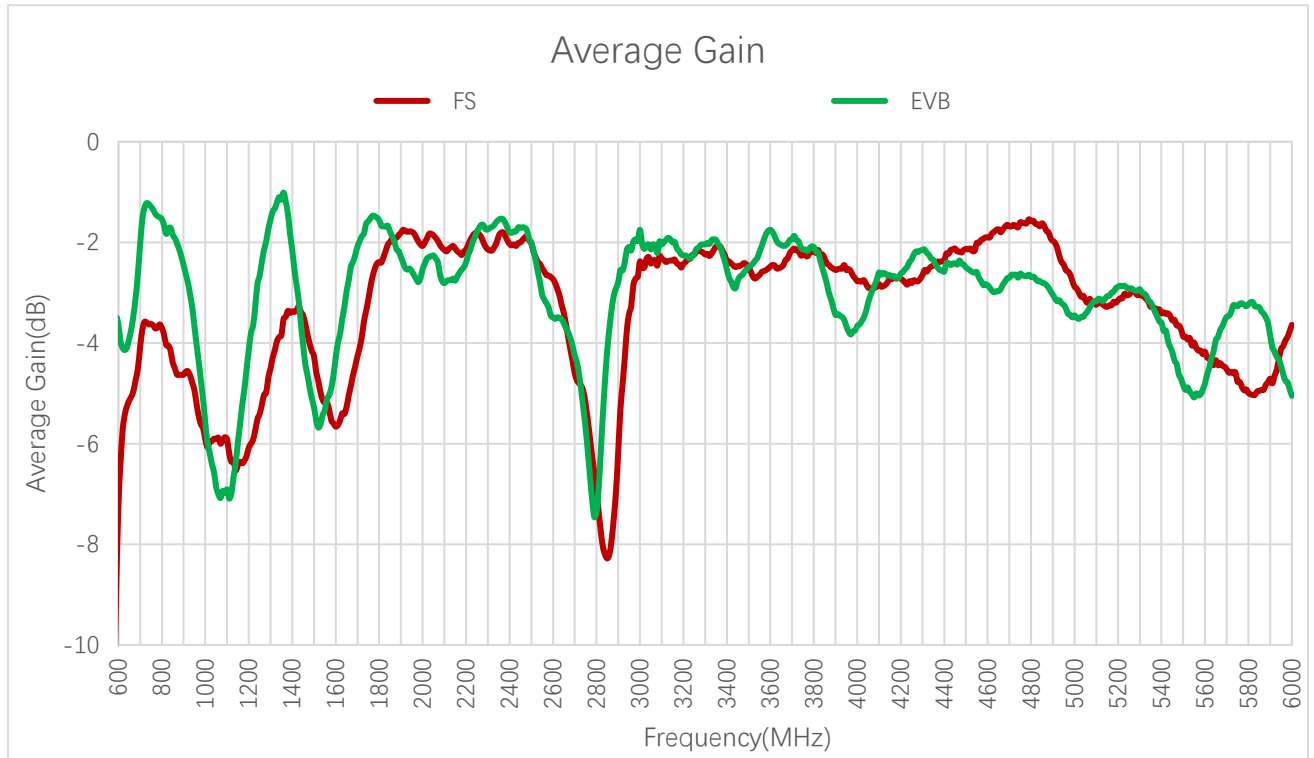
#### 3.2.1. Efficiency



**Efficiency (%)**

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Efficiency (%)	<b>EVB</b>	43.2	38.6	70.2	67.2	56.9	39.4	43.3	63.4	68.8	61.1
	<b>FS</b>	18.9	28.8	42.3	39.3	34.4	30.0	45.9	38.9	46.1	64.4
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Efficiency (%)	<b>EVB</b>	55.4	53.4	70.0	67.5	44.8	66.9	53.7	45.2	32.8	31.2
	<b>FS</b>	66.2	62.0	65.1	63.1	53.3	56.5	67.9	51.5	41.0	43.2

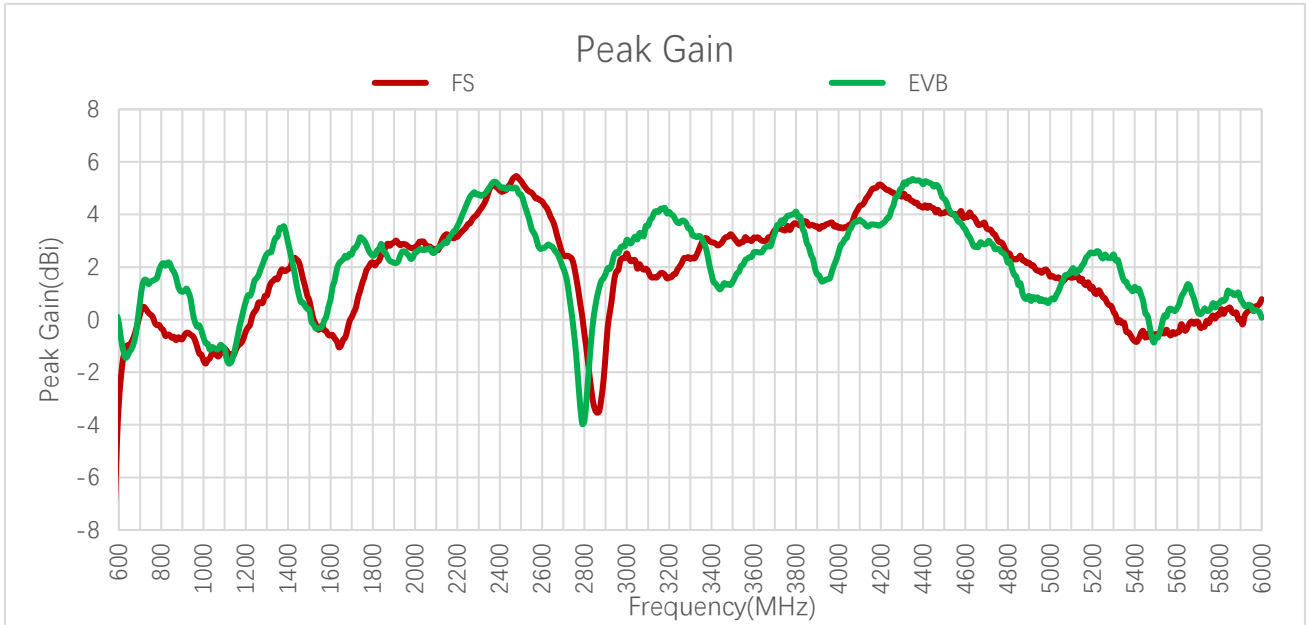
**3.2.2. Average Gain**



**Average Gain (dB)**

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880	
Average Gain (dB)	EVB	-3.6	-4.1	-1.5	-1.7	-2.5	-4.0	-3.6	-2.0	-1.6	-2.1
	FS	-7.3	-5.4	-3.7	-4.1	-4.6	-5.2	-3.4	-4.1	-3.4	-1.9
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000	
Average Gain (dB)	EVB	-2.6	-2.7	-1.6	-1.7	-3.5	-1.8	-2.7	-3.5	-4.8	-5.1
	FS	-1.8	-2.1	-1.9	-2.0	-2.7	-2.5	-1.7	-2.9	-3.9	-3.6

**3.2.3. Peak Gain**



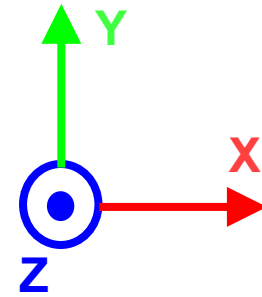
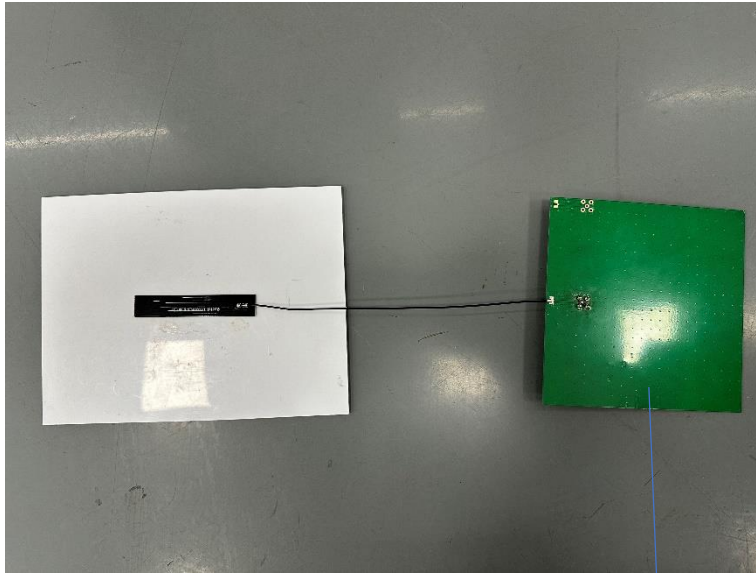
**Peak Gain (dBi)**

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Peak Gain (dBi)	EVB	-0.1	-1.4	1.3	2.2	1.1	-0.1	1.3	2.7	3.1	2.2
	FS	-3.2	-1.2	0.5	-0.6	-0.7	-0.8	2.3	0.3	1.1	2.8
Frequency (MHz)		1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Peak Gain (dBi)	EVB	2.6	3.0	5.0	5.0	2.7	2.6	2.9	0.8	-0.7	0.1
	FS	2.9	3.2	4.9	5.2	4.5	3.1	3.5	1.6	-0.6	0.8

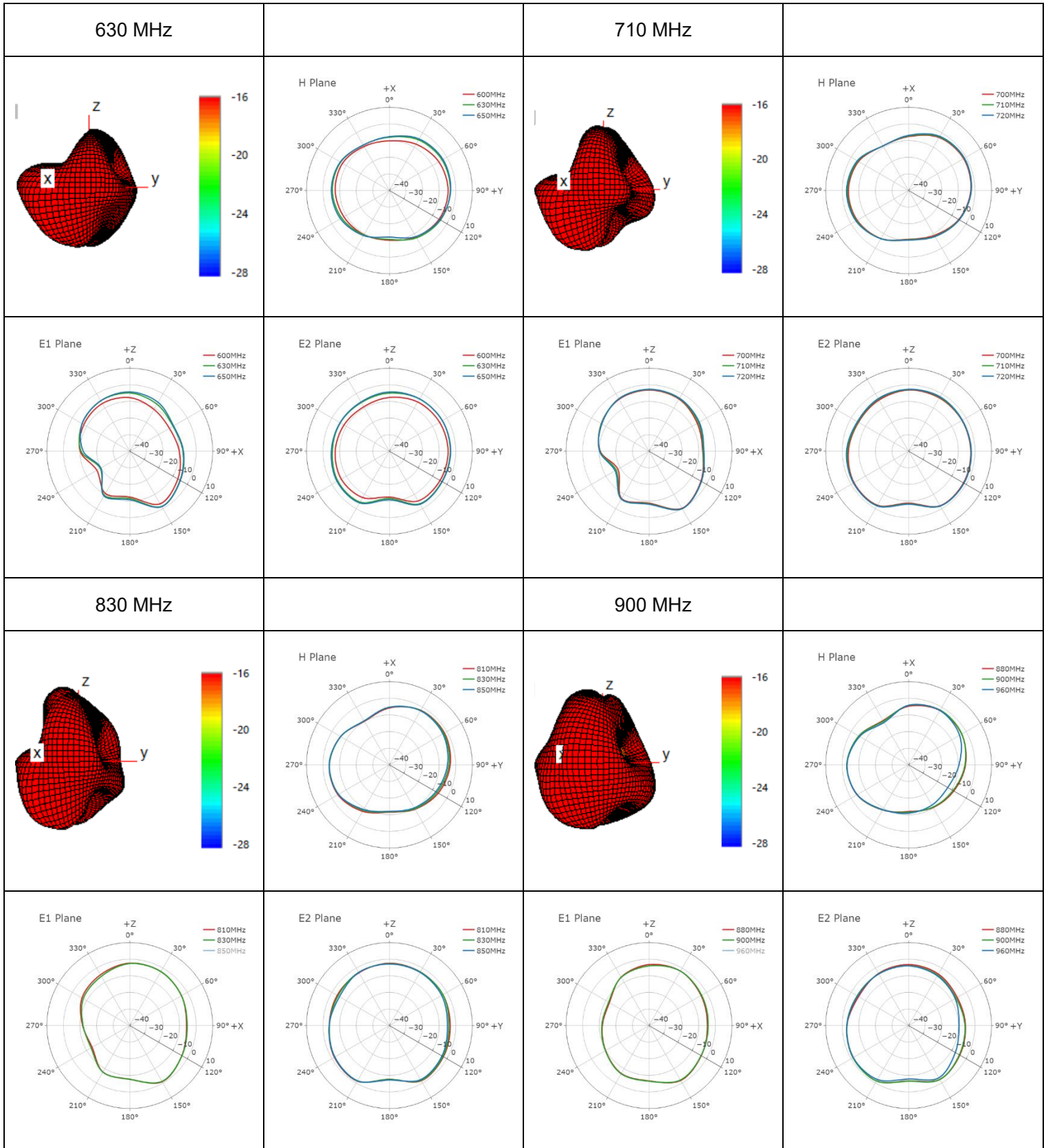
### 3.2.4. 3D & 2D Radiation Pattern

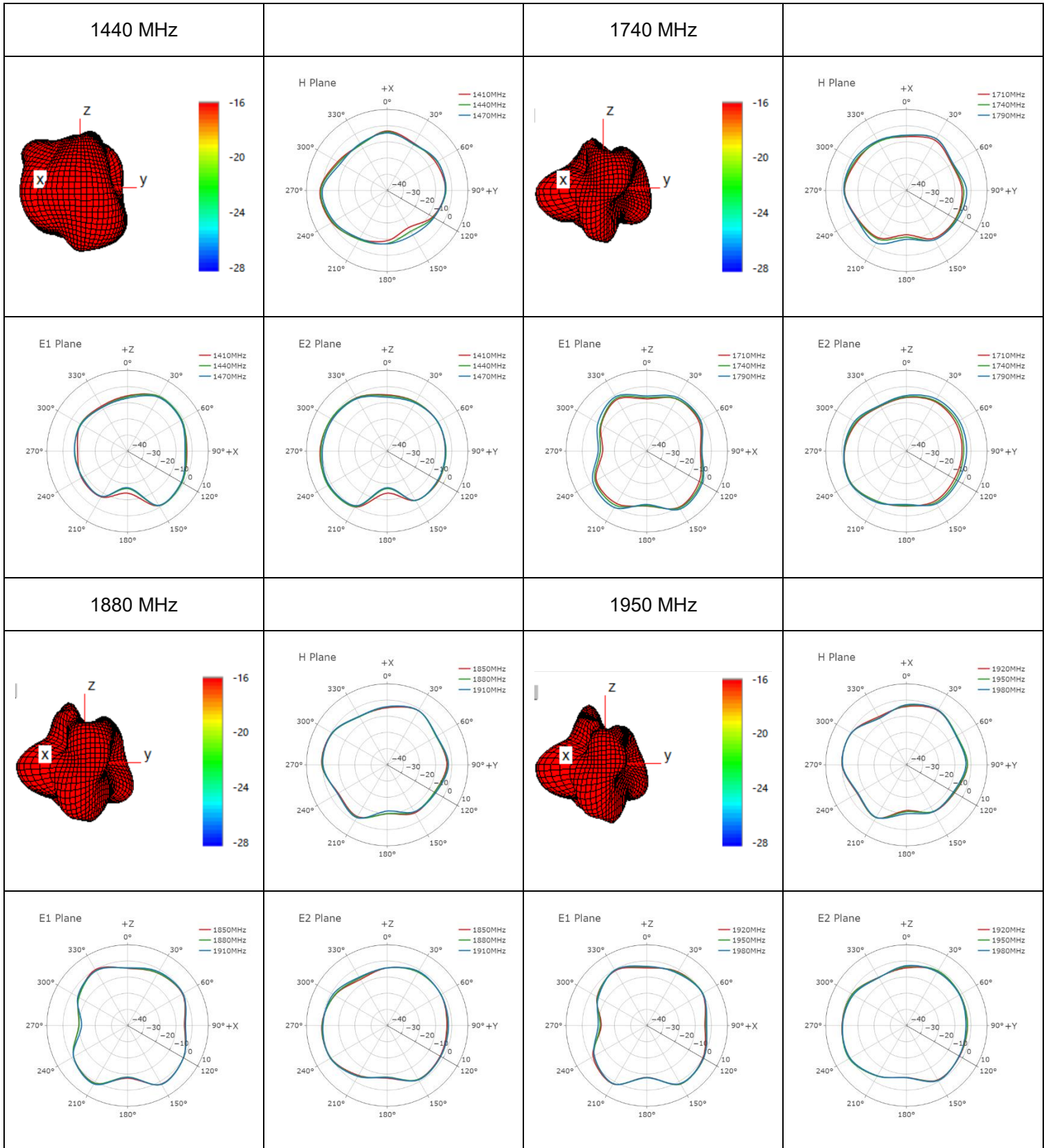
#### 3.2.4.1. Test Condition: Stick to ABS board on 130 mm × 130 mm EVB board

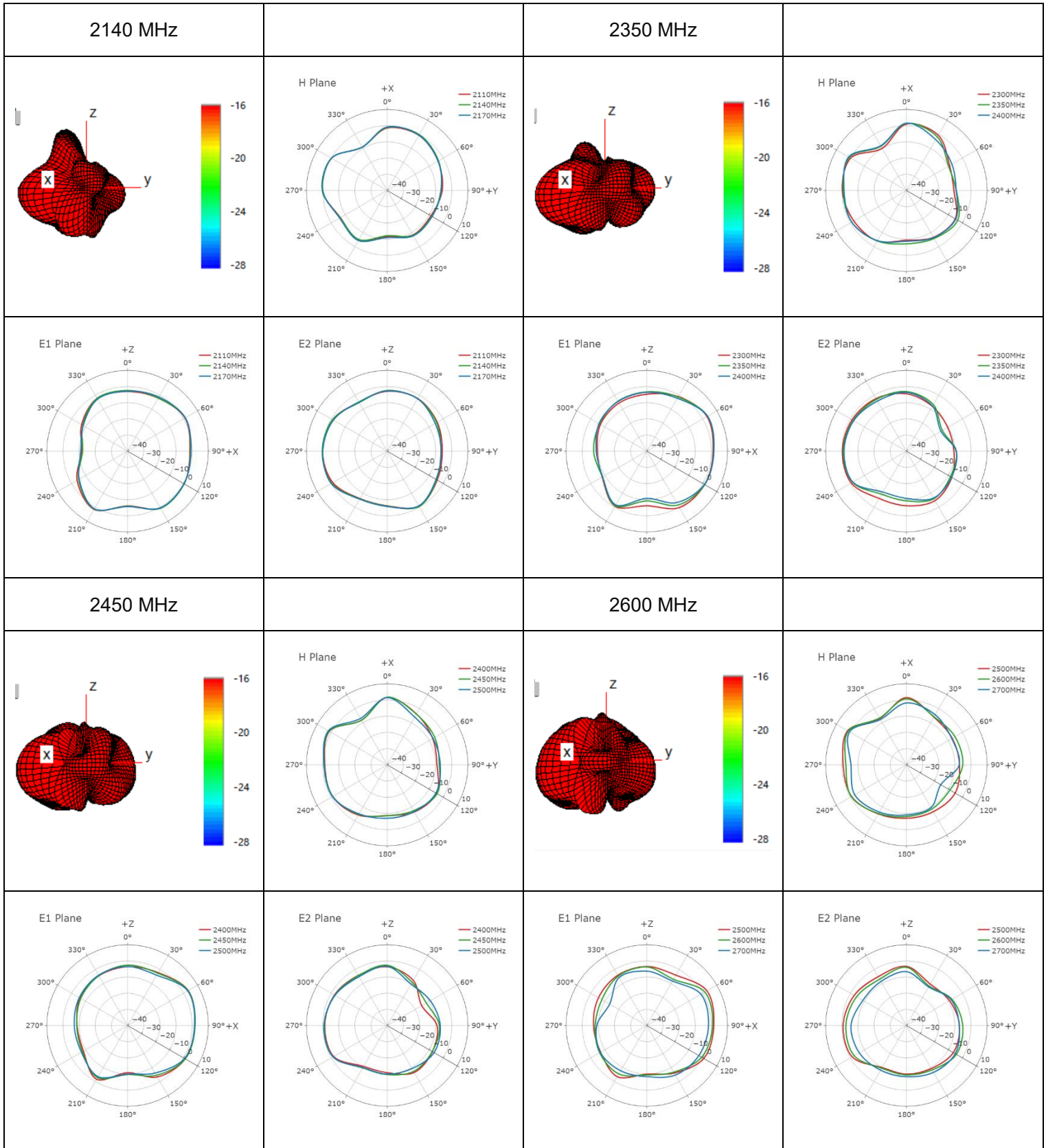
- Test Chamber: HF-G-1



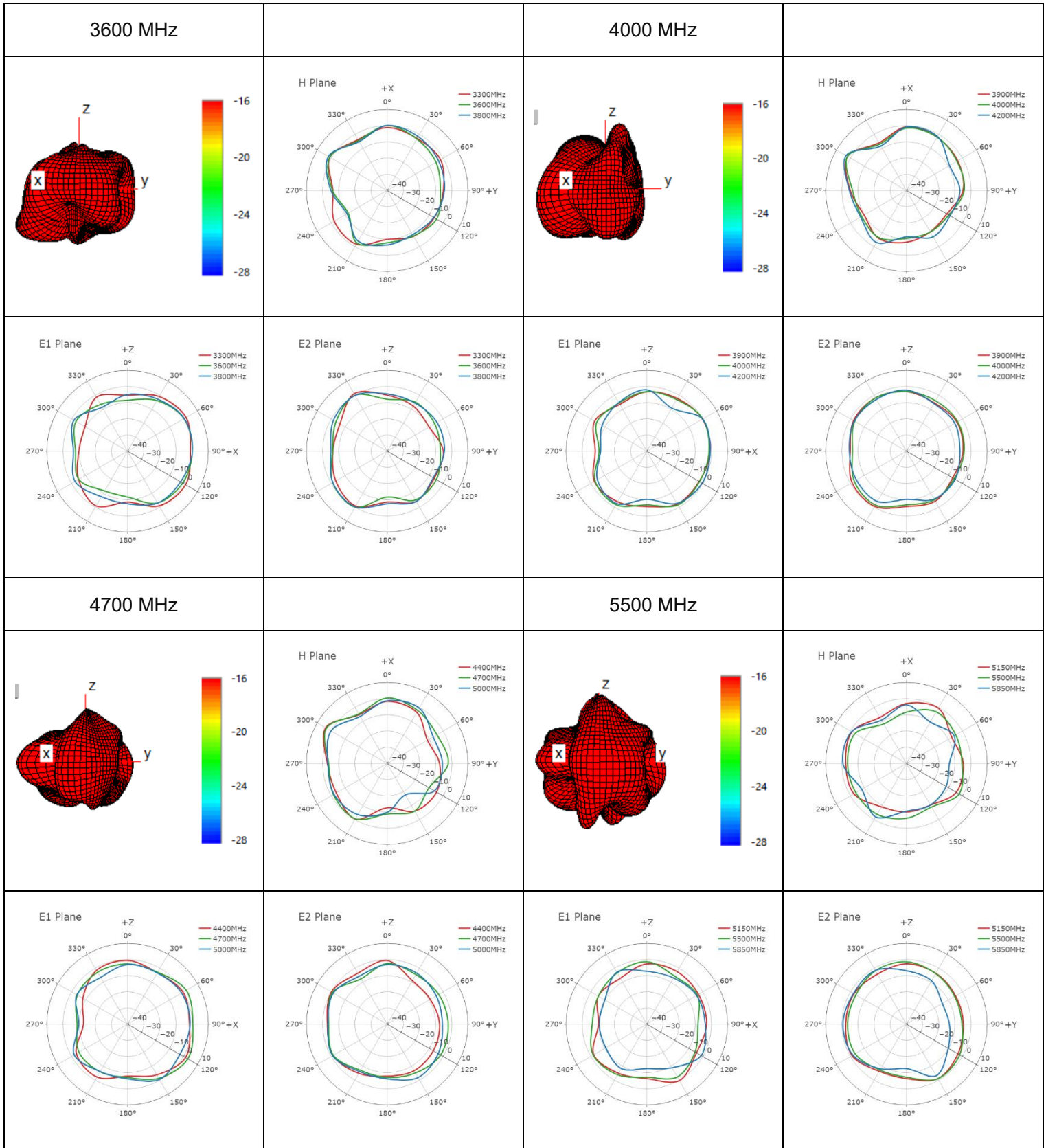
130 × 130 mm EVB







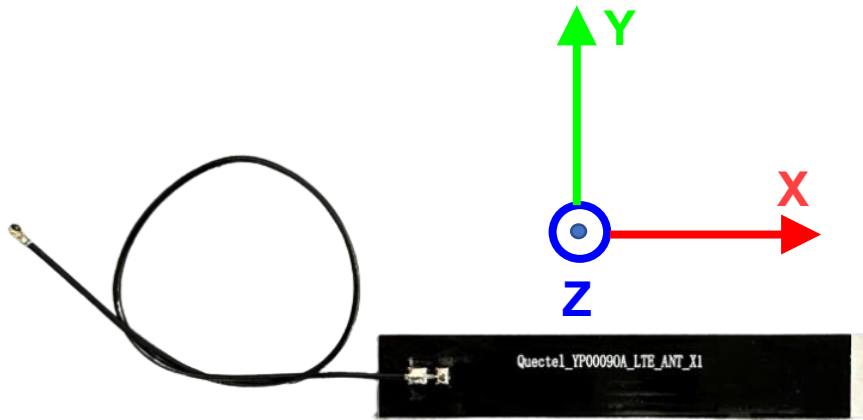


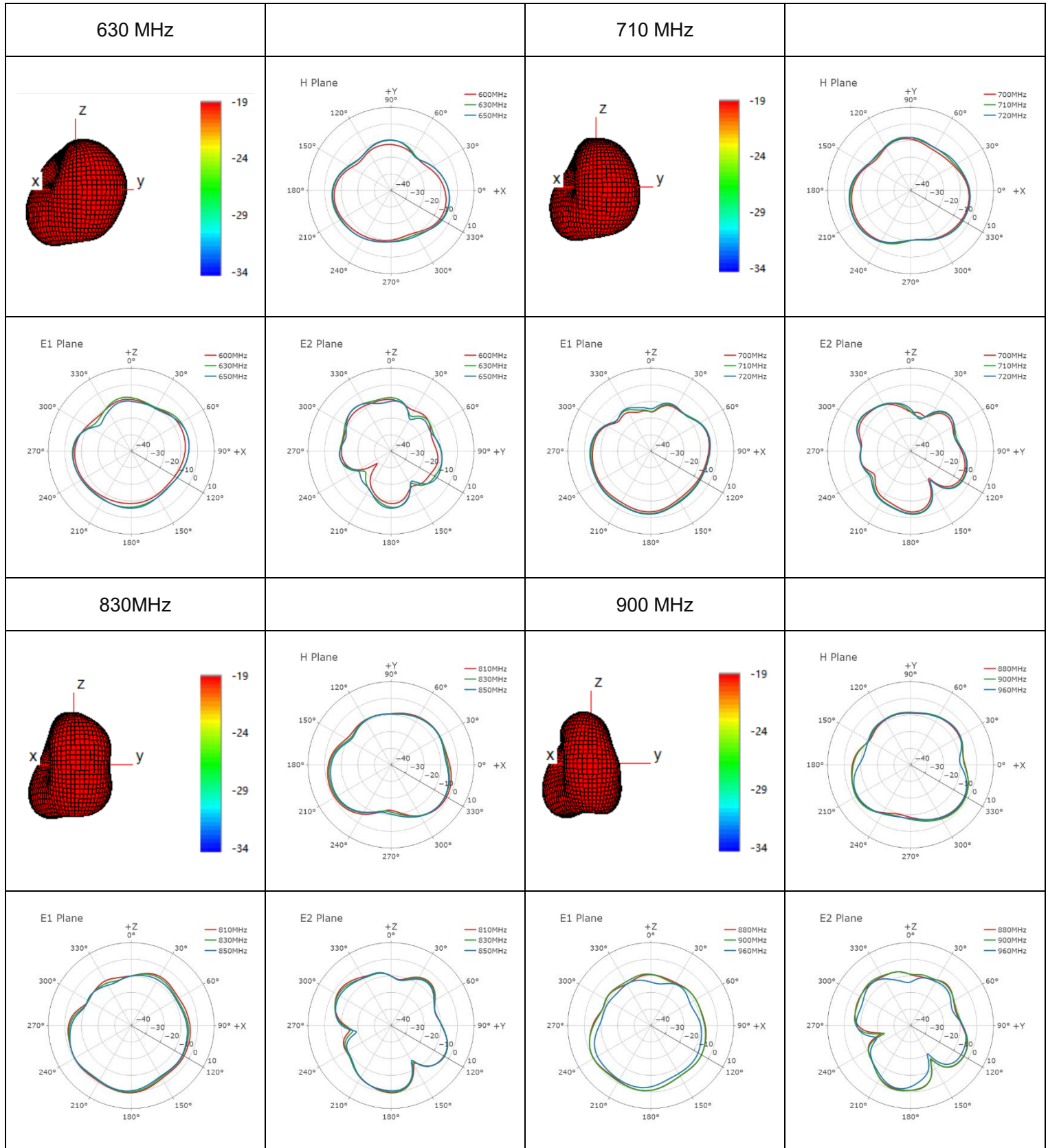


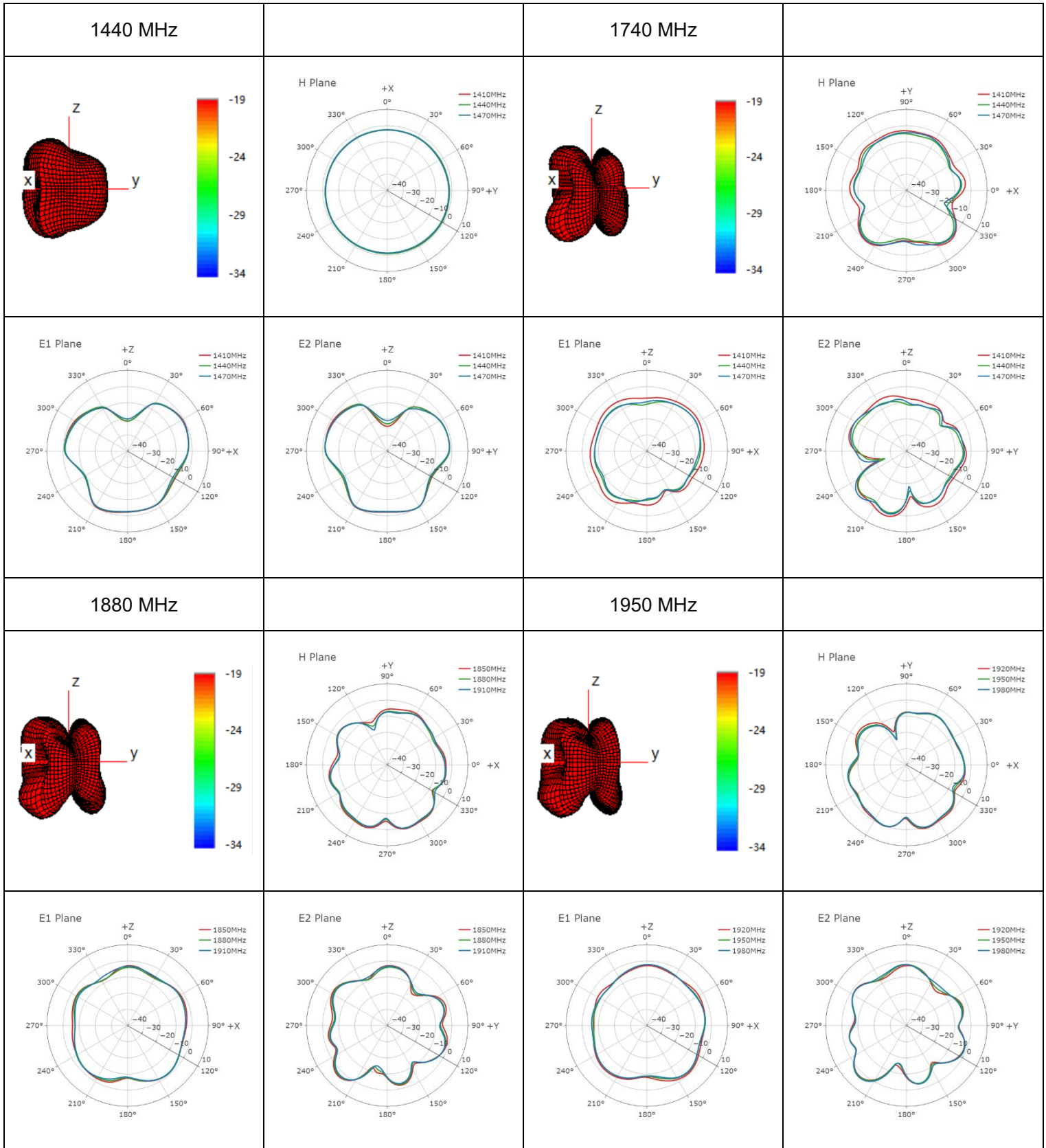


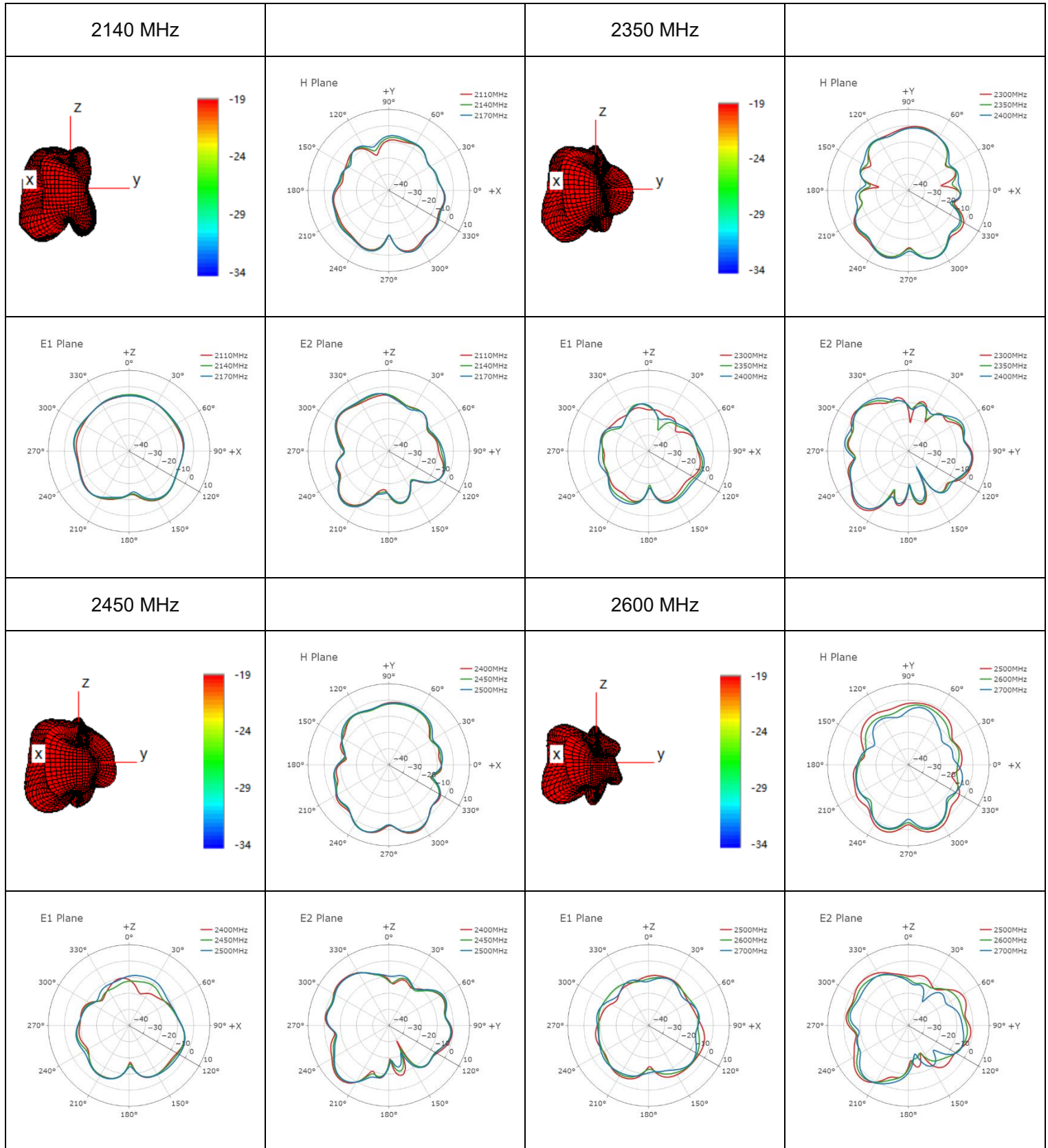
**3.2.4.2. Test Condition: Free Space**

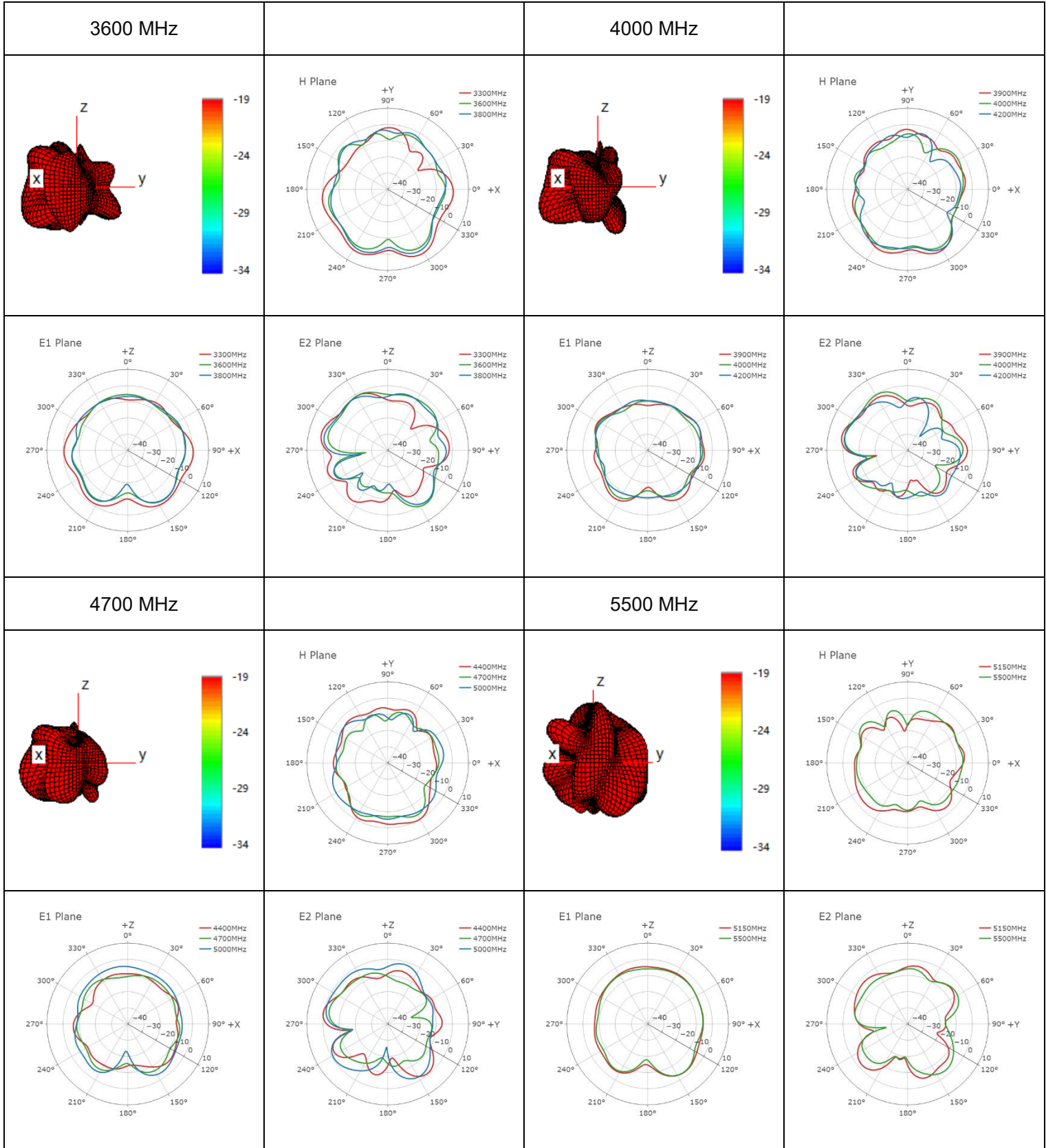
- Test Chamber: HF-G-1




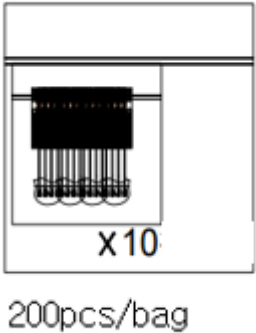
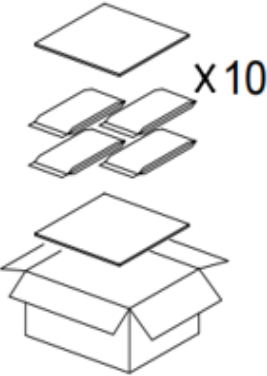


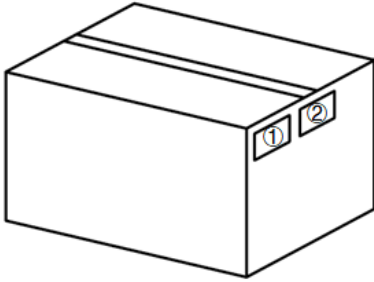
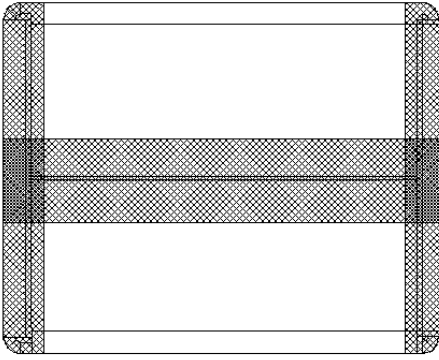






# 4 Packaging

Step	Packaging Picture / 2D Picture	Description
1	 <p>20pcs/tie</p>	<p>The terminals of the product are wrapped with EPE foam; (20 pcs per tie)</p>
2	 <p>x10 200pcs/bag</p>	<p>200 pcs antenna products in a PE bag; (200 pcs antennas per PE bag)</p>
3	 <p>x10</p>	<p>(10 PE bags per carton box) (2000 pcs antennas per carton box) Estimated quantity Unsatisfactory cases will be shipped in suitable cartons.</p> <p><u>Carton Size:</u> <u>L × W × H = 340 × 260 × 140 mm</u></p>

4		<p><b>Position for Attaching Labels</b></p> <ul style="list-style-type: none"><li>① Carton Label</li><li>② Quality Label</li></ul>
5		<p><b>Sealing Cartons</b> “I” type sealing cartons</p>
6	Initial packaging plan and the final packaging method are subject to the physical supply.	



# 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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# Revision History

Version	Date	Author	Note
-	2022-08-02	Jason LI/ Joye WANG	Creation of the document
1.0	2022-08-02	Jason LI/ Joye WANG	First official release
2.0	2023-10-20	Zeline LIANG/ Joye WANG/ David LIU/ Aria CHU	Updated all test data in this datasheet.

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