



# Antenna Datasheet

**Product OC:** YECT103W7AH

**Version:** 1.2

**Date:** 2024-11-05

**Status:** Released

**Product Name:** 5G Terminal Mount External Dipole Antenna

**Key Features:**

Frequency Band: 600–960 MHz, 1710–2690 MHz, 3300–6000 MHz

Dimensions: 233 mm × 54.5 mm × 20 mm

Efficiency: Up to 86 % (FS)

RoHS and REACH Compliant

IP66 (housing)

# Overview

YECT103W7AH is a 5G external antenna measuring 233 mm × 54.5 mm × 20 mm. This ultra-wide-band 5G antenna provides broad coverage from 600–960 MHz, 1710–2690 MHz, 3300–6000 MHz whilst offering backward-compatibility to support 4G/3G and 2G networks as well as LTE Cat-M and narrowband IoT (NB-IoT). The antenna is terminated with N Male connector. Ideal for applications where the antenna is required to be discrete, this low profile, terminal mount omni-directional antenna is easy to install with maximum durability assured thanks to its IP66 rated, PC enclosure. The YECT103W7AH can be used in harsh environments thanks to its robust UV resistant (UL 746c f1) and flame resistant (UL 94 V-0) enclosure.

The antenna is designed as dipole type to work with various GND plane sizes or in free space for ease of integration with a hinged N Male connector to achieve the optimum position. Hinged structure helps to avoid other antennas or objects by rotating to different directions when mounted on terminals. This omni-directional antenna is ideally suited for access points, terminals and routers, high speed video, real-time streaming, public transportation, offering great performance with its high gain and efficiency.

Typical applications include:

- Access points, terminals and routers
- High speed video
- Real-time streaming
- Public transportation

Quectel provides comprehensive antenna design support such as simulation, testing and manufacturing for custom antenna solutions to meet your specific application needs. We have regional R & D centers to offer quick response to meet your requirements. Please contact our sales & FAEs if you have any requests.

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# 1 Specification

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

## 1.1. Electrical

| Electrical        |   |
|-------------------|---|
| Frequency Range   | 600–960 MHz, 1710–2690 MHz, 3300–6000 MHz |
| Impedance         | 50 Ω                                      |
| Polarization      | Linear                                    |
| Radiation Pattern | Omni-directional                          |

| Electrical – Detail   |      |                |             |                     |                   |                     |                  |               |               |               |                     |               |               |
|-----------------------|------|----------------|-------------|---------------------|-------------------|---------------------|------------------|---------------|---------------|---------------|---------------------|---------------|---------------|
| SPEC                  | Band | Band           | B71         | B12<br>/B13<br>/B28 | B5<br>/B8<br>/B26 | n74<br>/n75<br>/n76 | B1<br>/B2<br>/B3 | B40           | Wi-Fi<br>2G   | B38<br>/B41   | B42<br>/B48<br>/n77 | n79           | Wi-Fi<br>5G   |
|                       | Band | Freq.<br>(MHz) | 600–<br>700 | 700–<br>810         | 820–<br>960       | 1420–<br>1520       | 1700–<br>2170    | 2300–<br>2400 | 2400–<br>2500 | 2500–<br>2690 | 3300–<br>4200       | 4400–<br>5000 | 5150–<br>5850 |
| Max. VSWR             | FS   |                | 1.5         | 1.3                 | 1.7               | -                   | 2.5              | 1.3           | 1.2           | 1.5           | 1.9                 | 1.3           | 1.4           |
|                       | EVB  |                | 1.8         | 1.7                 | 2.6               | -                   | 2.5              | 1.6           | 1.3           | 1.2           | 1.9                 | 1.8           | 3.3           |
| Max. Return Loss (dB) | FS   |                | -13.7       | -17.8               | -11.9             | -                   | -7.5             | -18.3         | -21.1         | -13.9         | -10.1               | -17.4         | -14.9         |
|                       | EVB  |                | -10.6       | -11.7               | -7.0              | -                   | -7.3             | -12.5         | -17.1         | -21.0         | -10.1               | -10.7         | -5.4          |
| AVG Eff. (%)          | FS   |                | 66.4        | 70.6                | 56.2              | -                   | 65.5             | 80.4          | 73.3          | 77.6          | 69.4                | 66.3          | 59.5          |
|                       | EVB  |                | 60.8        | 79.0                | 75.2              | -                   | 69.7             | 74.5          | 72.4          | 72.0          | 67.1                | 57.7          | 51.9          |
| AVG AVG Gain (dB)     | FS   |                | -1.8        | -1.5                | -2.5              | -                   | -1.8             | -0.9          | -1.3          | -1.1          | -1.6                | -1.8          | -2.3          |
|                       | EVB  |                | -2.2        | -1.0                | -1.3              | -                   | -1.6             | -1.3          | -1.4          | -1.4          | -1.7                | -2.4          | -2.9          |
| Max. Peak Gain (dBi)  | FS   |                | 1.5         | 1.1                 | 1.7               | -                   | 1.5              | 3.7           | 3.4           | 4.0           | 5.3                 | 5.5           | 4.2           |
|                       | EVB  |                | 0.1         | 1.5                 | 1.4               | -                   | 3.1              | 4.2           | 4.3           | 4.3           | 3.5                 | 4.0           | 4.1           |
| VSWR                  | FS   |                | ≤ 2.5       |                     |                   |                     |                  |               |               |               |                     |               |               |

|                  |            |                |
|------------------|------------|----------------|
|                  | <b>EVB</b> | $\leq 3.3$     |
| <b>Return</b>    | <b>FS</b>  | $\leq -7.5$ dB |
| <b>Loss</b>      | <b>EVB</b> | $\leq -5.4$ dB |
| <b>Peak Gain</b> | <b>FS</b>  | $\leq 5.5$ dBi |
|                  | <b>EVB</b> | $\leq 4.3$ dBi |

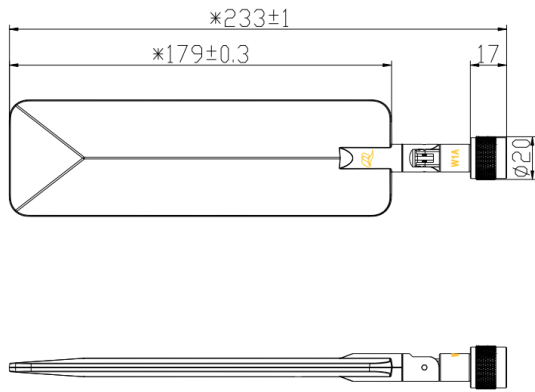
**Note:**

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

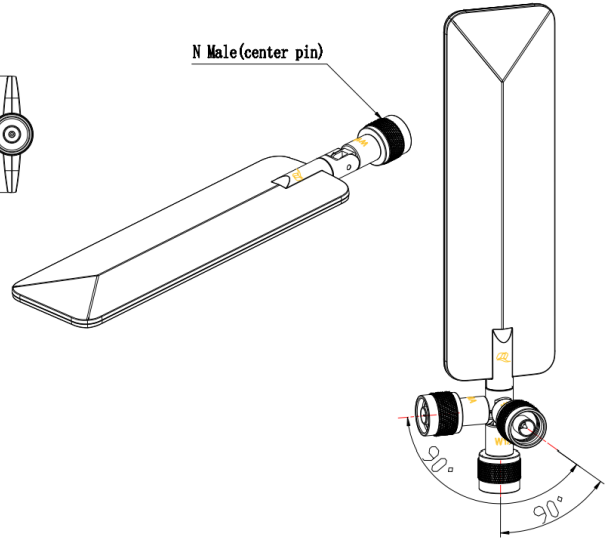
## 1.2. Mechanical & Environmental

| Mechanical                     |   |
|--------------------------------|---|
| Antenna Dimensions             | 233 mm × 54.5 mm × 20 mm                |
| Casing Material & Color        | PC & Black                              |
| Connector Type                 | N Male                                  |
| Mounting Type                  | Terminal                                |
| Weight                         | Typ. 95 g                               |
| Environmental                  |   |
| Operation Temperature          | -40 °C to +85 °C                        |
| Storage Temperature            | -40 °C to +85 °C                        |
| Ingress Protection (IP) Rating | Antenna plastic housing could meet IP66 |
| RoHS & REACH Compliant         | Yes                                     |
| Housing Flame Rating           | UL 94 V-0                               |
| Housing UV Resistant           | UL 746c f1                              |

# 2 Drawing



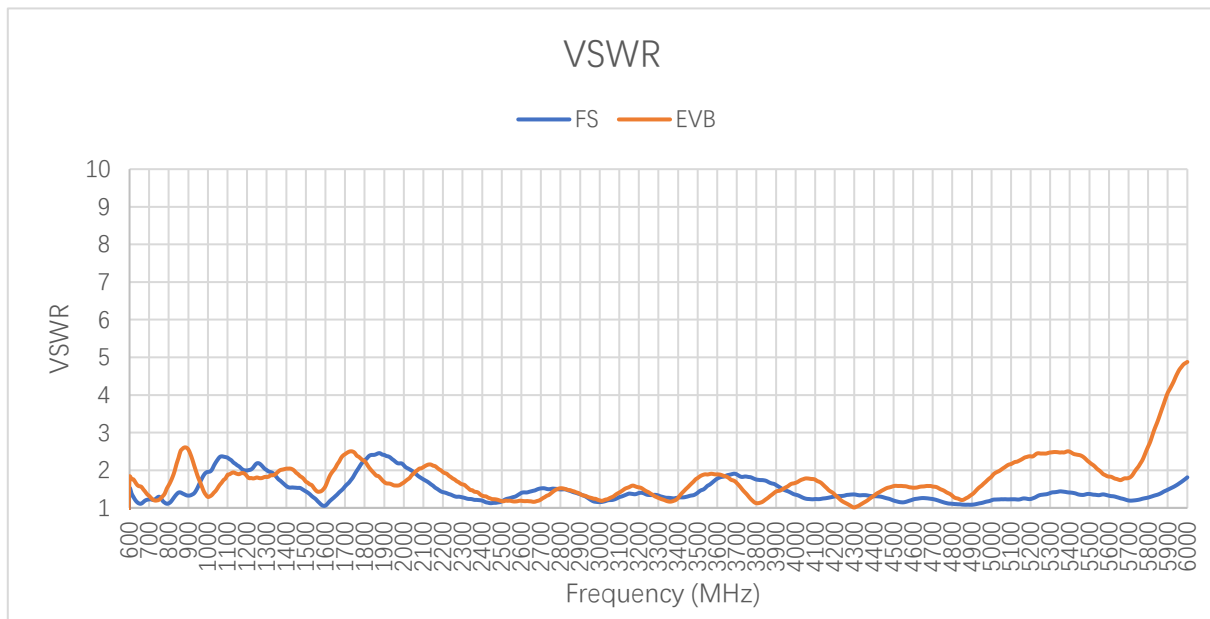
N Male(center pin)



# 3 Detailed Performance

## 3.1. S-Parameter Test

### 3.1.1. VSWR

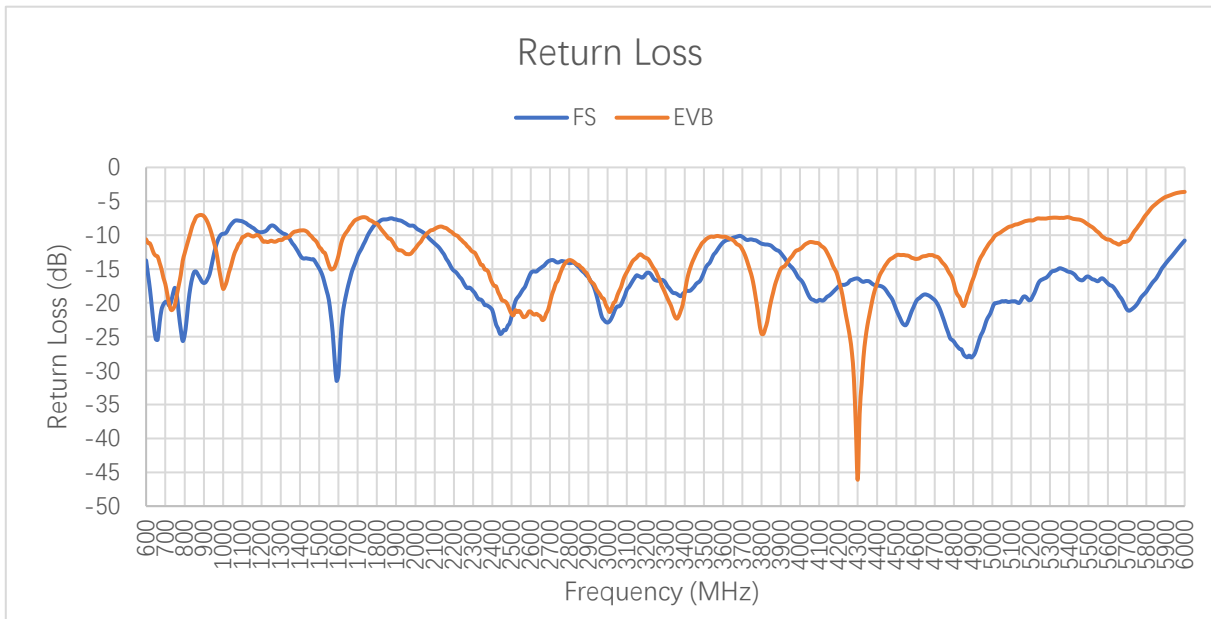


**VSWR**

| Frequency (MHz) | 600  | 630  | 710  | 820  | 900  | 960  | 1440 | 1710 | 1740 | 1880 |
|-----------------|------|------|------|------|------|------|------|------|------|------|
| FS              | 1.5  | 1.2  | 1.2  | 1.3  | 1.3  | 1.7  | -    | 1.6  | 1.8  | 2.4  |
| EVB             | 1.8  | 1.7  | 1.3  | 2.0  | 2.6  | 1.7  | -    | 2.5  | 2.5  | 1.8  |
| Frequency (MHz) | 1950 | 2140 | 2350 | 2450 | 2600 | 3600 | 4700 | 5000 | 5500 | 6000 |
| FS              | 2.3  | 1.6  | 1.2  | 1.1  | 1.4  | 1.8  | 1.2  | 1.2  | 1.4  | 1.8  |
| EVB             | 1.6  | 2.1  | 1.5  | 1.2  | 1.2  | 1.9  | 1.6  | 1.8  | 2.2  | 4.9  |



**3.1.2. Return Loss**

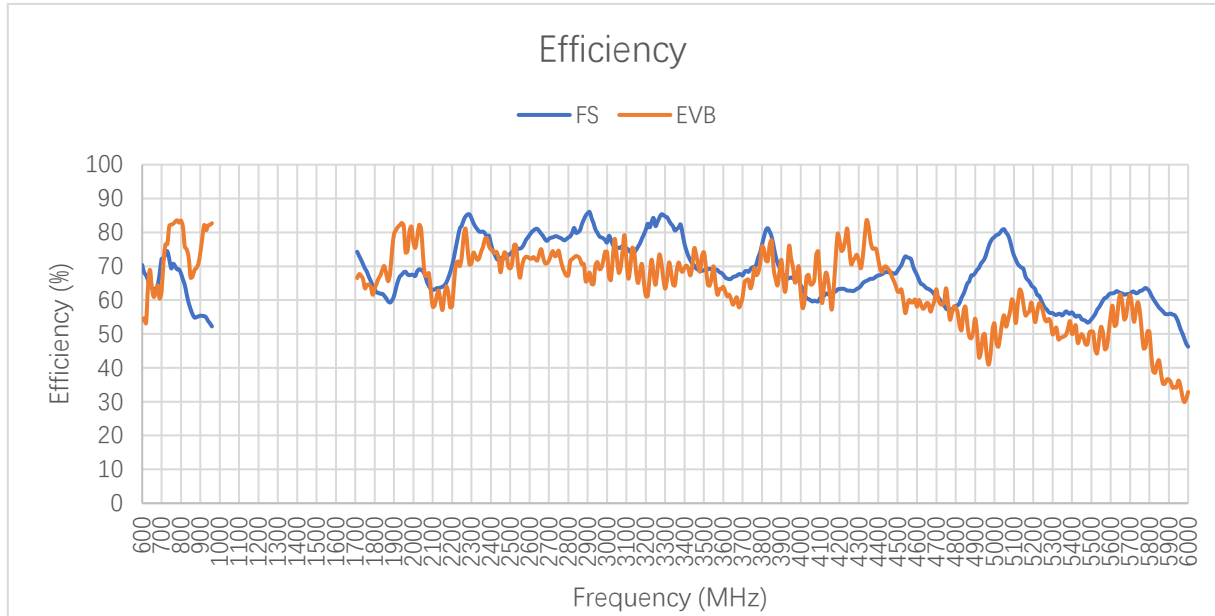


**Return Loss (dB)**

| Frequency (MHz) | 600   | 630   | 710   | 820   | 900   | 960   | 1440  | 1710  | 1740  | 1880  |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| FS              | -13.7 | -20.7 | -19.9 | -17.7 | -17.1 | -11.9 | -     | -12.5 | -10.8 | -7.5  |
| EVB             | -10.6 | -11.9 | -18.7 | -9.7  | -7.2  | -11.9 | -     | -7.5  | -7.4  | -10.9 |
| Frequency (MHz) | 1950  | 2140  | 2350  | 2450  | 2600  | 3600  | 4700  | 5000  | 5500  | 6000  |
| FS              | -8.3  | -12.5 | -19.8 | -24.5 | -15.6 | -11.1 | -19.6 | -20.8 | -16.1 | -10.8 |
| EVB             | -12.8 | -8.8  | -14.4 | -19.6 | -21.3 | -10.2 | -13.1 | -10.7 | -8.5  | -3.6  |

### 3.2. Radiation Performance Test

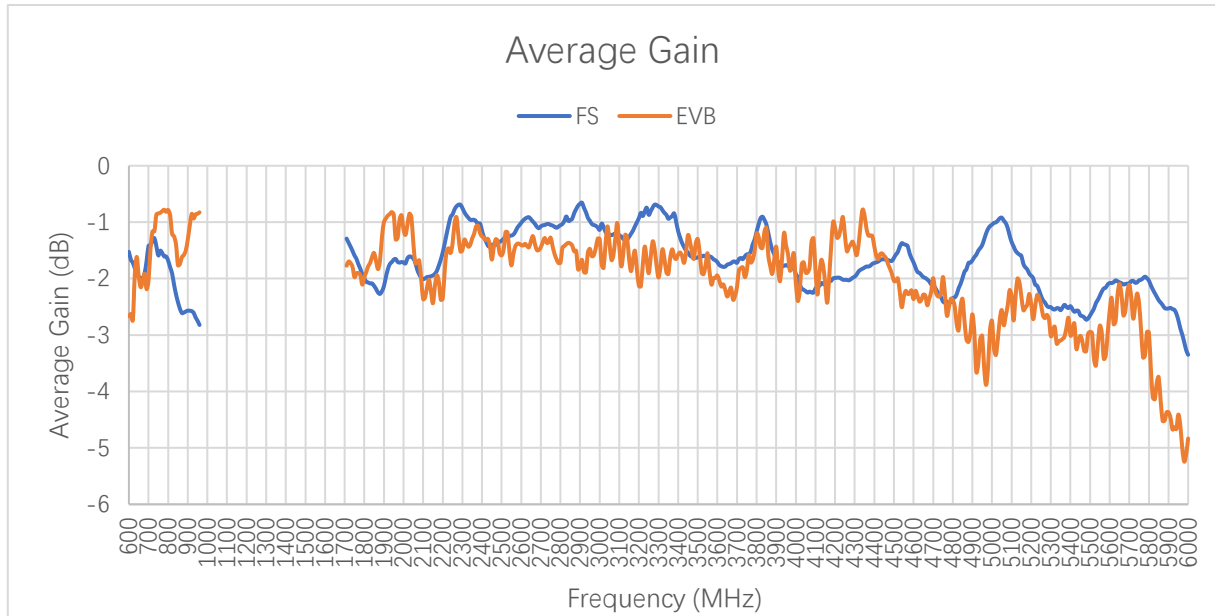
#### 3.2.1. Efficiency



**Efficiency (%)**

| Frequency (MHz) | 600  | 630  | 710  | 820  | 900  | 960  | 1440 | 1710 | 1740 | 1880 |
|-----------------|------|------|------|------|------|------|------|------|------|------|
| <b>FS</b>       | 70.4 | 65.8 | 72.3 | 61.6 | 55.4 | 52.2 | -    | 74.3 | 70.6 | 59.3 |
| <b>EVB</b>      | 54.1 | 64.0 | 71.2 | 75.0 | 73.9 | 82.7 | -    | 66.5 | 66.2 | 67.9 |
| Frequency (MHz) | 1950 | 2140 | 2350 | 2450 | 2600 | 3600 | 4700 | 5000 | 5500 | 6000 |
| <b>FS</b>       | 68.2 | 63.7 | 80.2 | 72.3 | 79.2 | 67.5 | 61.4 | 78.6 | 54.3 | 46.2 |
| <b>EVB</b>      | 82.0 | 59.9 | 74.3 | 68.2 | 72.3 | 63.9 | 63.2 | 53.1 | 50.8 | 32.9 |

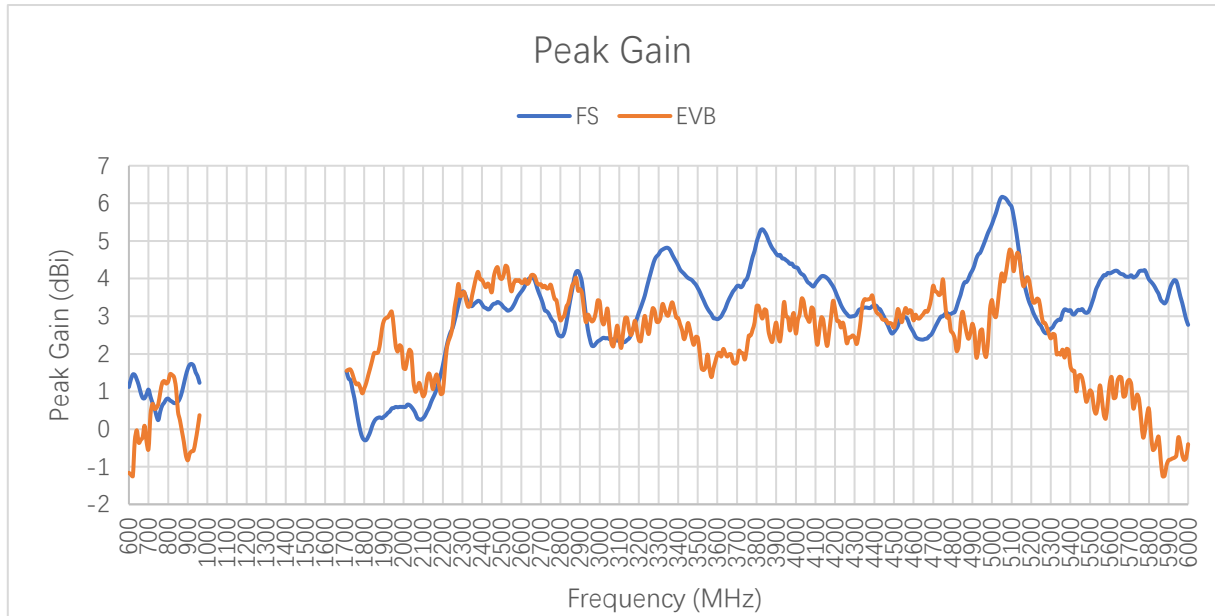
**3.2.2. Average Gain**



**Average Gain (dB)**

| Frequency (MHz) | 600  | 630  | 710  | 820  | 900  | 960  | 1440 | 1710 | 1740 | 1880 |
|-----------------|------|------|------|------|------|------|------|------|------|------|
| <b>FS</b>       | -1.5 | -1.8 | -1.4 | -2.1 | -2.6 | -2.8 | -    | -1.3 | -1.5 | -2.3 |
| <b>EVB</b>      | -2.7 | -1.9 | -1.5 | -1.3 | -1.3 | -0.8 | -    | -1.8 | -1.8 | -1.7 |
| Frequency (MHz) | 1950 | 2140 | 2350 | 2450 | 2600 | 3600 | 4700 | 5000 | 5500 | 6000 |
| <b>FS</b>       | -1.7 | -2.0 | -1.0 | -1.4 | -1.0 | -1.7 | -2.1 | -1.0 | -2.7 | -3.3 |
| <b>EVB</b>      | -0.8 | -2.2 | -1.3 | -1.7 | -1.4 | -1.9 | -2.0 | -2.8 | -2.9 | -4.8 |

**3.2.3. Peak Gain**



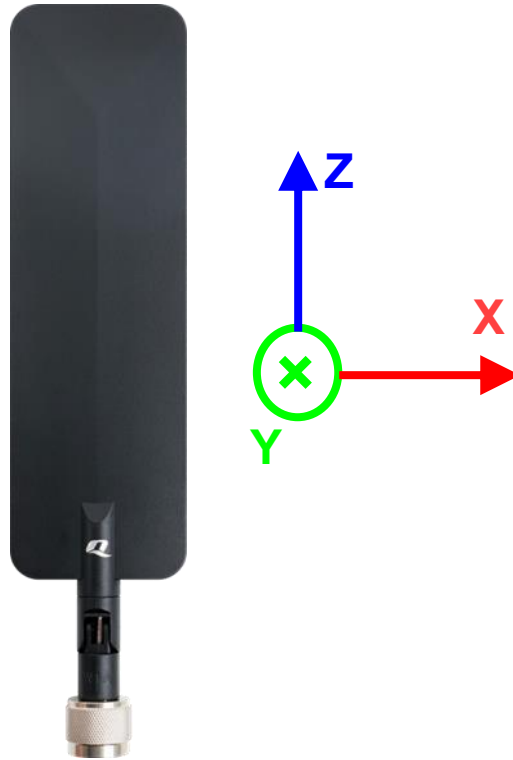
**Peak Gain (dBi)**

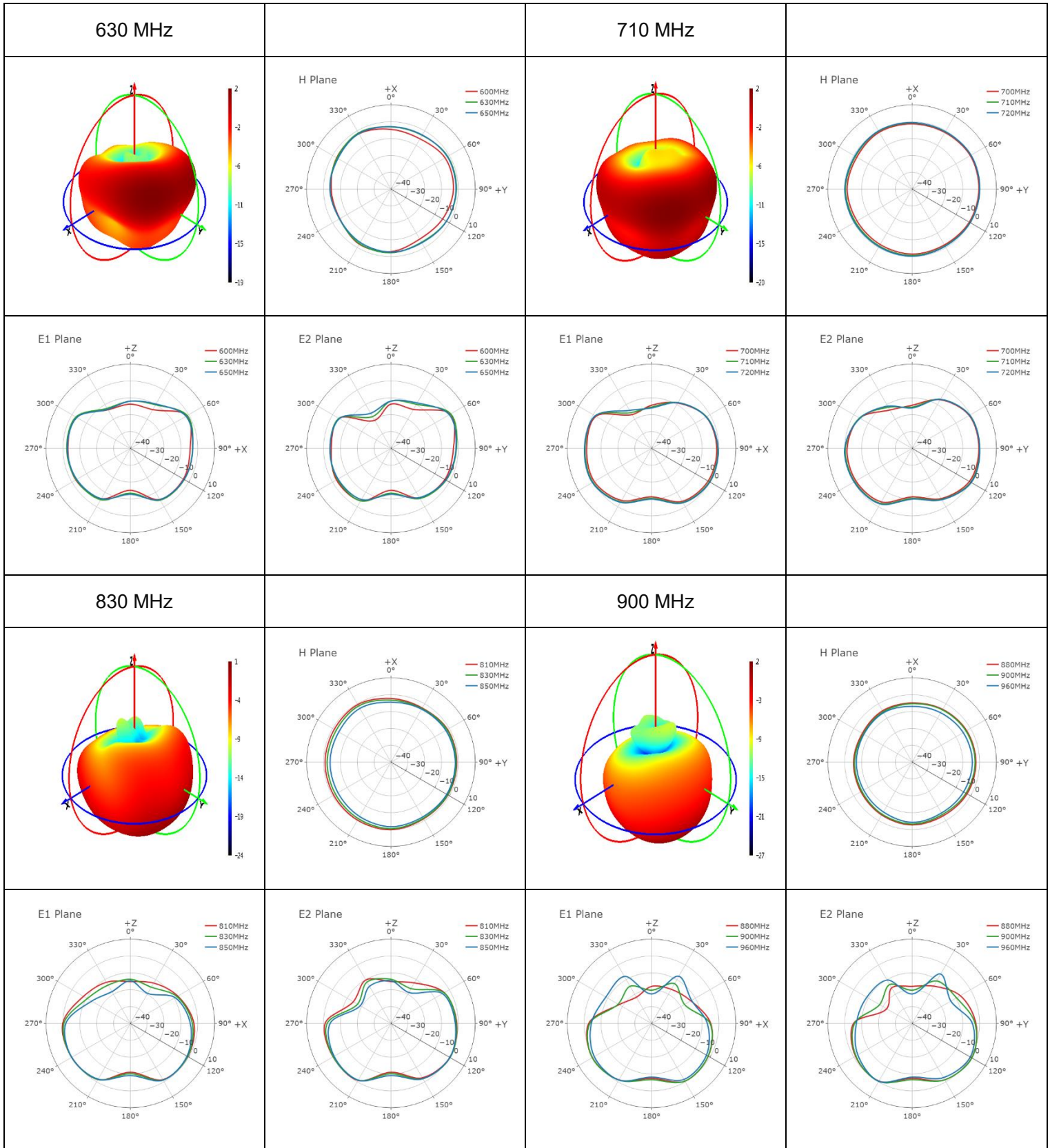
| Frequency (MHz) | 600  | 630  | 710  | 820  | 900  | 960  | 1440 | 1710 | 1740 | 1880 |
|-----------------|------|------|------|------|------|------|------|------|------|------|
| <b>FS</b>       | 1.1  | 1.4  | 0.9  | 0.7  | 1.6  | 1.2  | -    | 1.5  | 1.0  | 0.3  |
| <b>EVB</b>      | -1.2 | -0.3 | 0.4  | 1.4  | -0.8 | 0.4  | -    | 1.6  | 1.5  | 2.3  |
| Frequency (MHz) | 1950 | 2140 | 2350 | 2450 | 2600 | 3600 | 4700 | 5000 | 5500 | 6000 |
| <b>FS</b>       | 0.6  | 0.7  | 3.3  | 3.3  | 3.7  | 2.9  | 2.6  | 5.5  | 3.2  | 2.8  |
| <b>EVB</b>      | 2.7  | 1.3  | 3.6  | 3.6  | 3.9  | 2.0  | 3.8  | 3.4  | 1.0  | -0.4 |

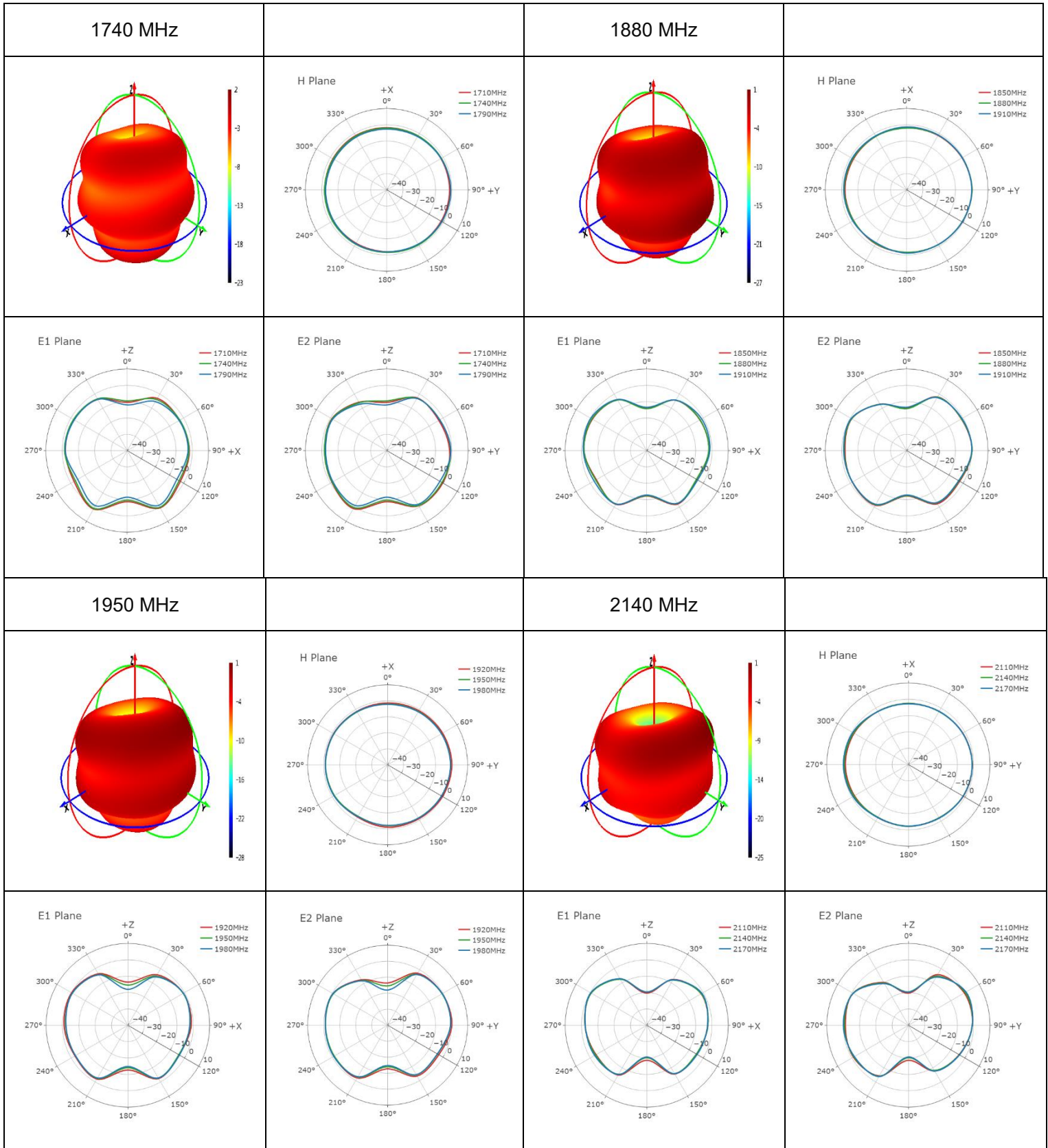
### 3.2.4. 3D & 2D Radiation Pattern

#### 3.2.4.1. Test Condition: In Free Space

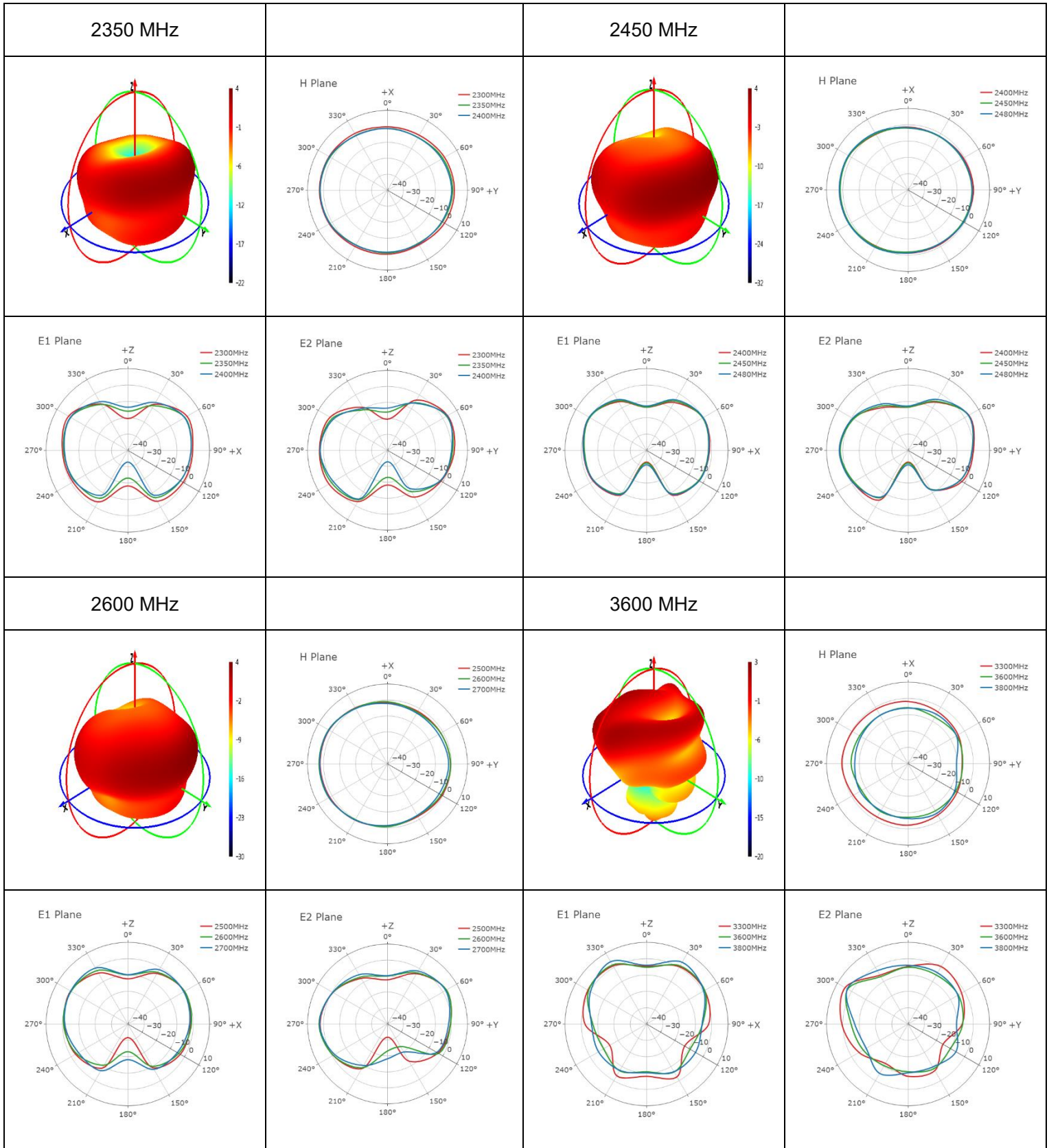
- Test Chamber: GL-S-1



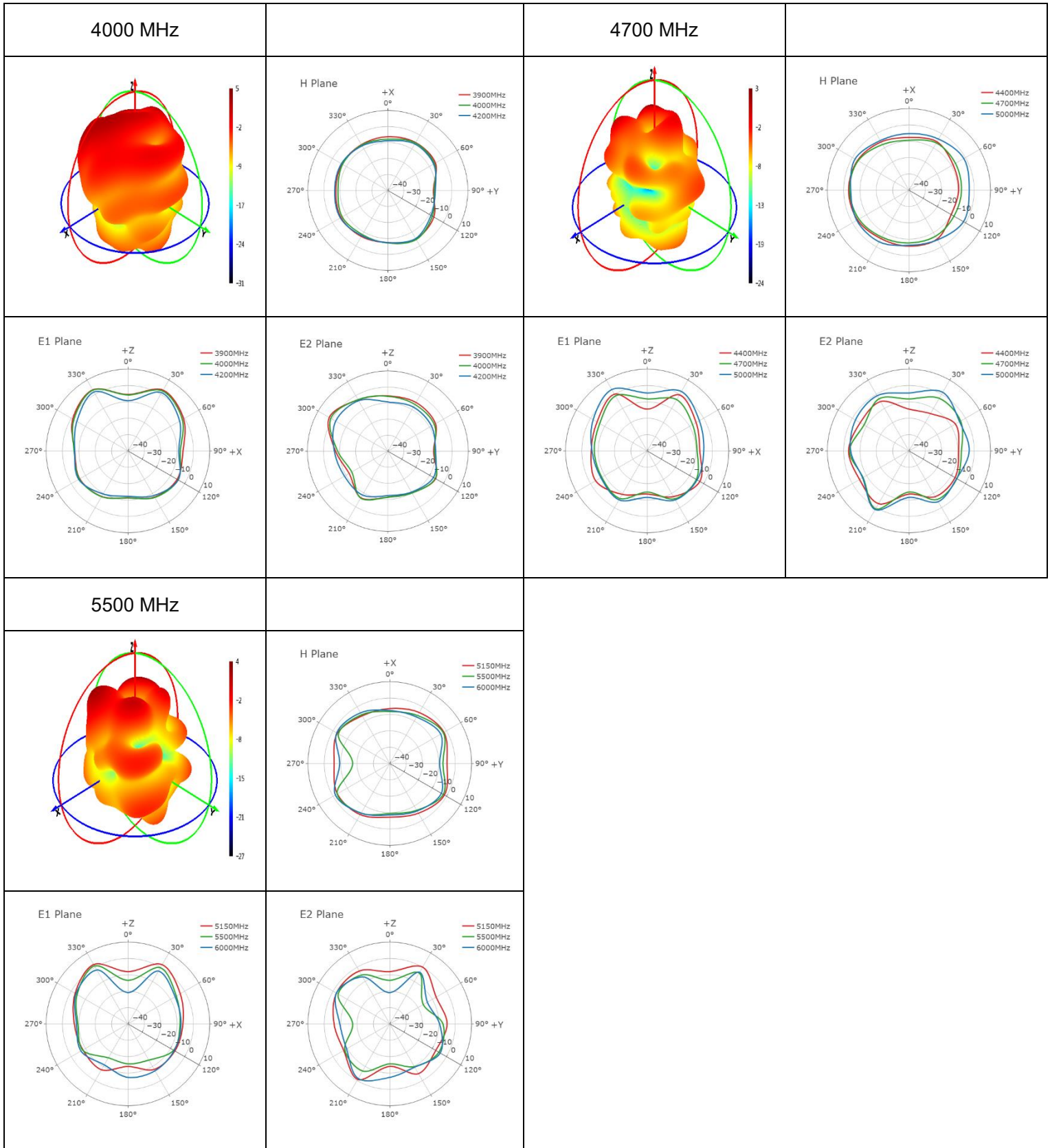






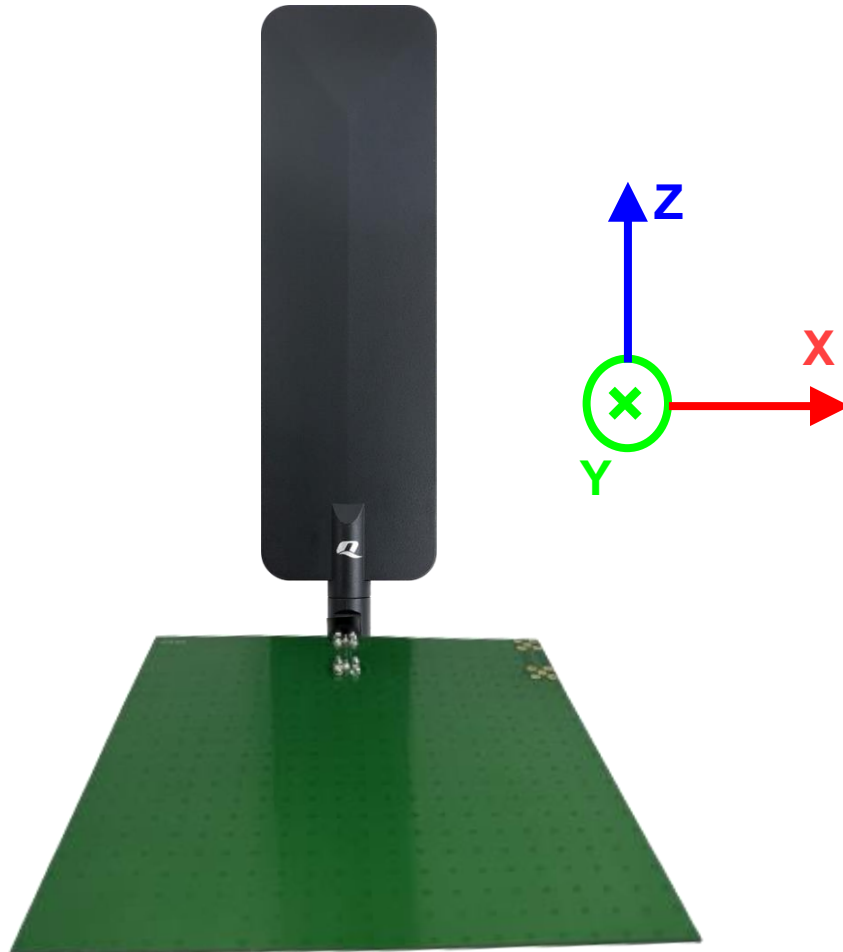


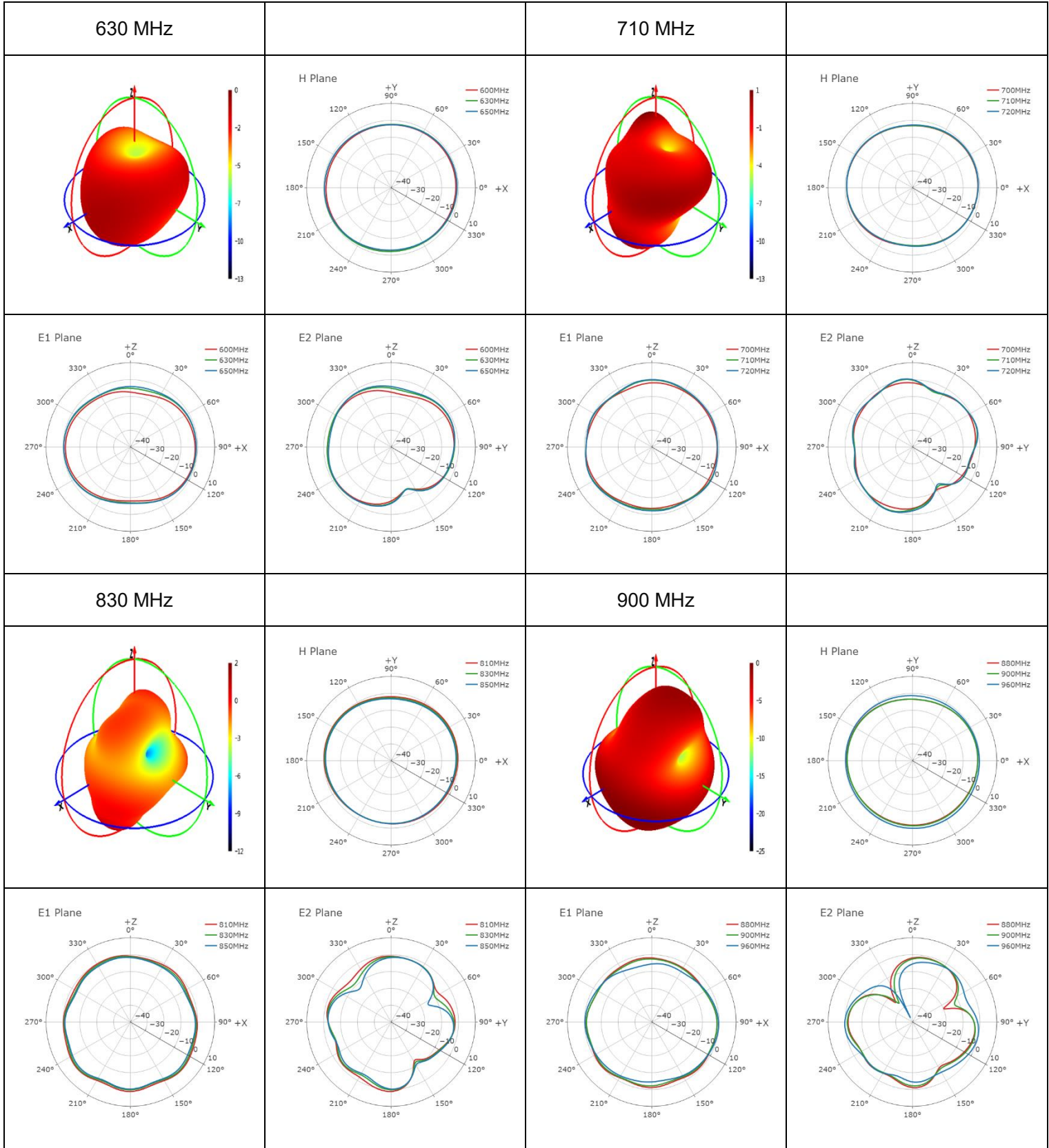


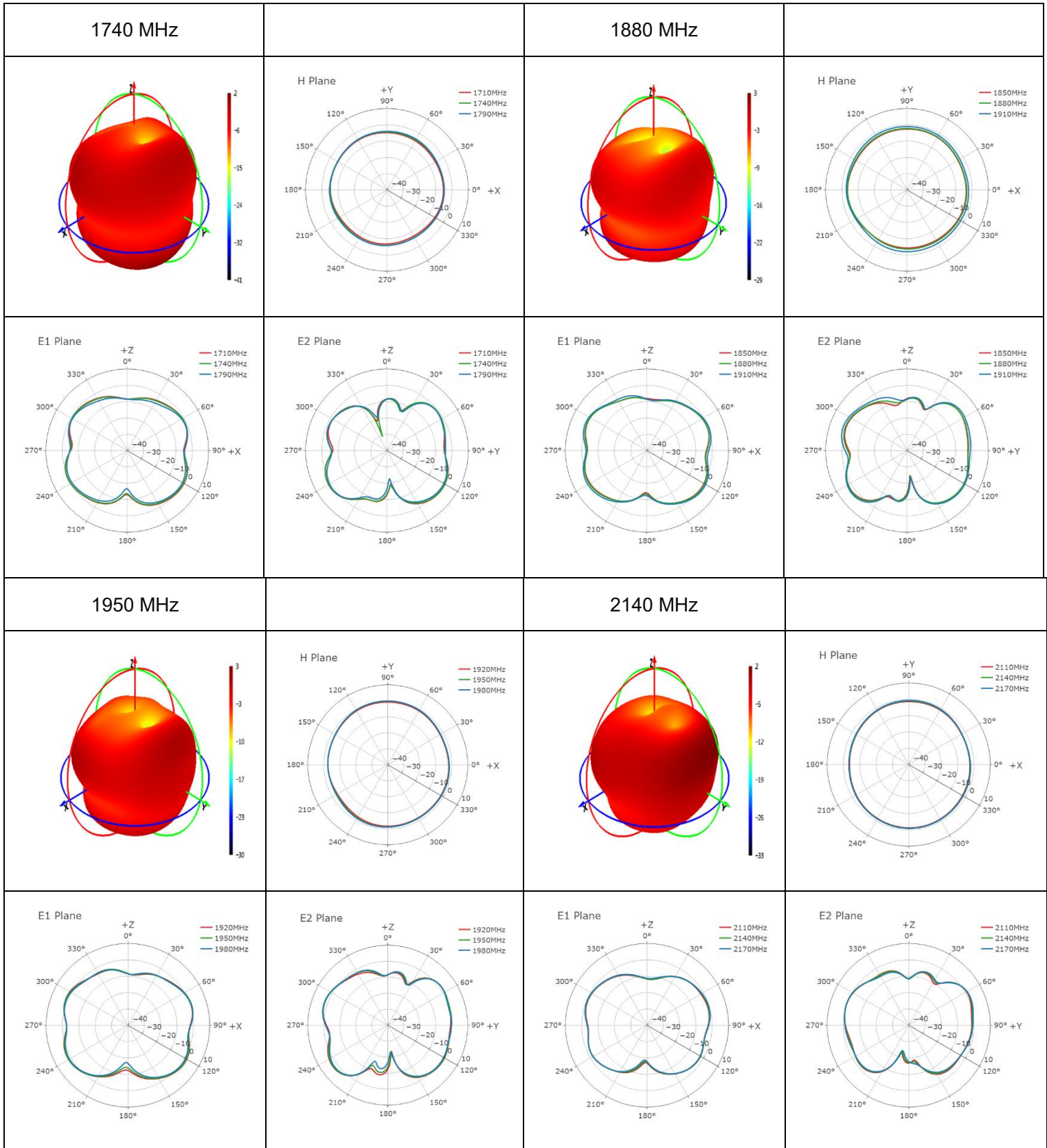


**3.2.4.2. Test Condition: On 130 mm × 130 mm EVB**

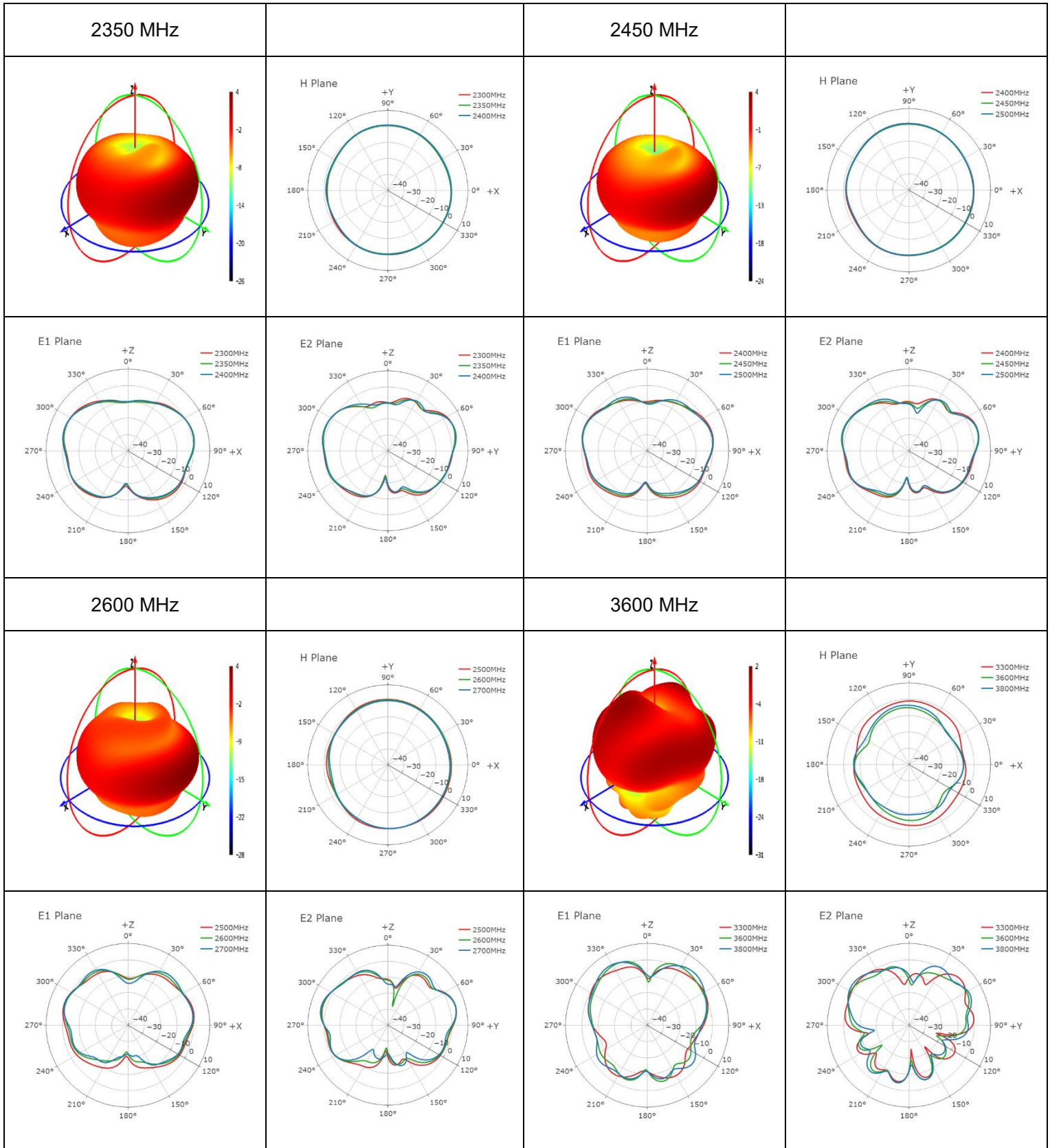
- Test Chamber: GL-S-1

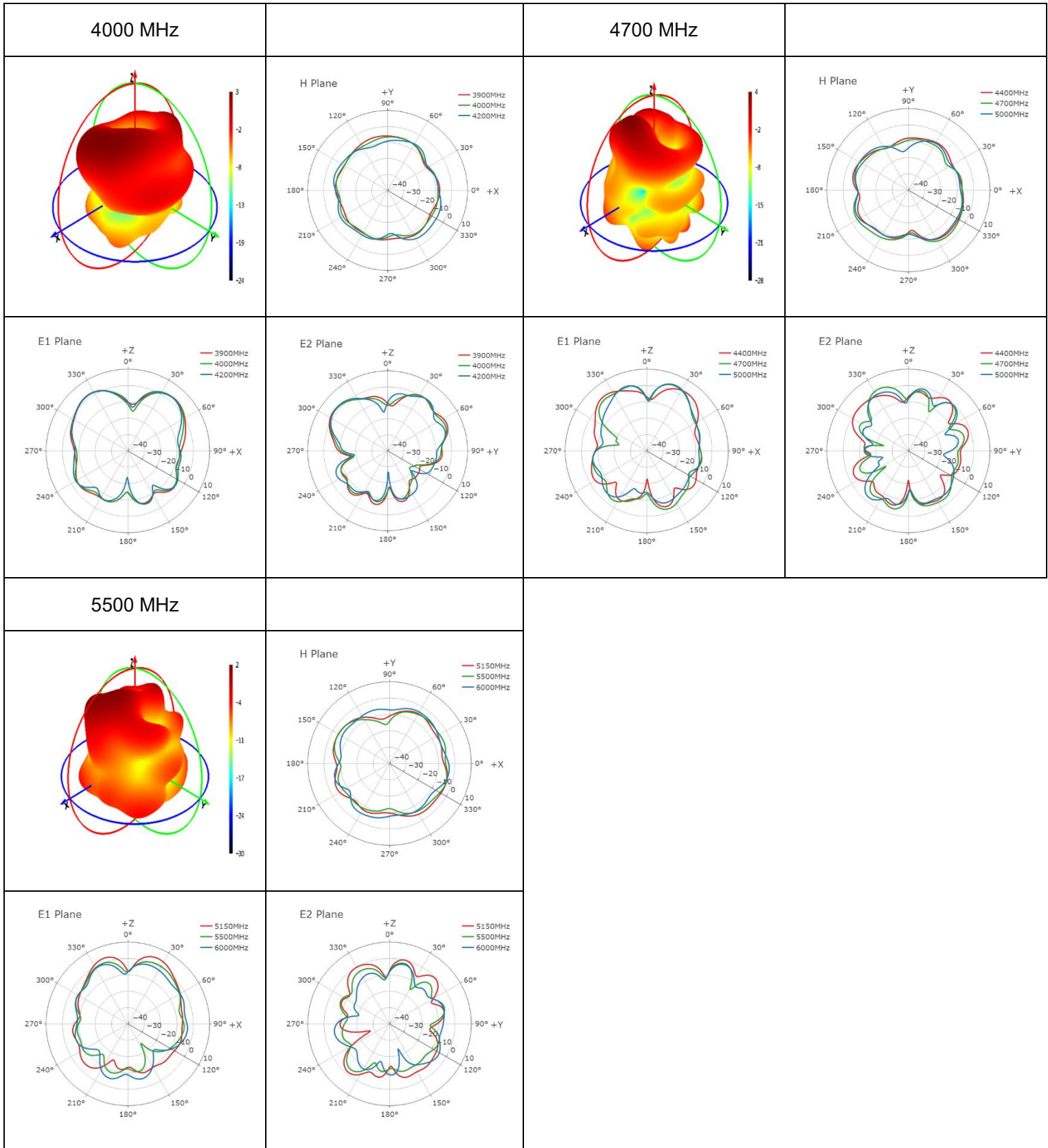






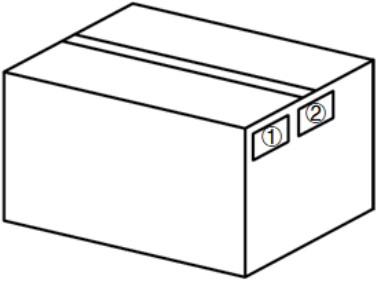
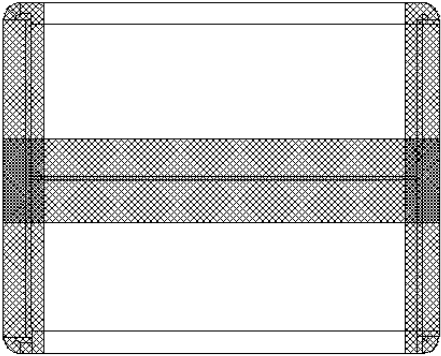






# 4 Packaging

| Step | Packaging Picture / 2D Picture  | Description   |
|------|---|---|
| 1    |    | <p>Put the product in a one-piece bag.<br/>Each one-piece bag contains 10 products.</p>   |
| 2    |  | <p>10 pcs antenna products in a PE bag.<br/>(10 PCS / PE Bag)</p> <p><u>PE Bag Size: L × W = 320 × 220 mm</u></p>                         |
| 3    |  | <p>(10 PE Bags / Carton Box)<br/>(100 PCS Antennas / Carton Box)</p> <p><u>Carton Size:</u><br/><u>L × W × H = 405 × 293 × 185 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><br/>“I” type sealing cartons</p>   |



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# Revision History

| Version | Date       | Author   | Note   |
|---------|------------|--|--|
| -       | 2024-05-11 | Mordecai LIU/<br>Hart HU/<br>David LIU/<br>Rainey LIAO | Creation of the document   |
| 1.0     | 2024-05-11 | Mordecai LIU/<br>Hart HU/<br>David LIU/<br>Rainey LIAO | First official release   |
| 1.1     | 2024-09-25 | Rainey LIAO  | Updated antenna picture (Homepage and Chapter 3.2.4).  |
| 1.2     | 2024-11-05 | Shea LI/<br>Rainey LIAO                                | <ol style="list-style-type: none"><li>1. Updated the overview.</li><li>2. Added housing flame rating and housing UV resistant (Chapter 1.2).</li><li>3. Updated Chapter 2.</li></ol> |

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