

# Antenna Datasheet

**Product OC:** YECT002W1A

**Version:** 1.1

**Date:** 2024-09-05

**Status:** Released

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

**Key Features:**

Frequency Band: 600–5000 MHz

Dimensions: 209 mm × 42 mm × 6 mm

Efficiency: Up to 81.2 %

RoHS and REACH Compliant

# Overview

YECT002W1A is a 5G external antenna measuring 209 mm × 42 mm × 6 mm. This ultra-wide-band 5G antenna provides broad coverage from 600–5000 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 type Male connectors. Ideal for applications where the antenna is required to be discrete, this low profile, terminal mount omni-directional antenna, is easy to install.

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 type 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: Free Space

## 1.1. Electrical

| Electrical        |                  |
|-------------------|------------------|
| Frequency Range   | 600–5000 MHz     |
| Impedance         | 50 Ω             |
| Polarization      | Linear           |
| Radiation Pattern | Omni-directional |

| Electrical – Detail |                      |                |                     |                   |                     |                  |               |               |               |                     |               |
|---------------------|----------------------|----------------|---------------------|-------------------|---------------------|------------------|---------------|---------------|---------------|---------------------|---------------|
| 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           |
|                     | SPEC                 | 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 |
|                     | Max. VSWR            | 11.2           | 4.5                 | 1.9               | 3.6                 | 1.6              | 3.7           | 6.2           | 7.7           | 2.6                 | 2.6           |
|                     | Max. Return Loss(dB) | -1.5           | -4.0                | -9.9              | -4.9                | -12.8            | -4.8          | -2.8          | -2.3          | -7.0                | -6.9          |
|                     | AVG Eff. (%)         | 20.9           | 66.4                | 65.2              | 47.3                | 58.2             | 43.4          | 23.8          | 5.3           | 42.4                | 35.6          |
|                     | AVG AVG Gain (dB)    | -7.4           | -1.9                | -1.9              | -3.3                | -2.4             | -3.7          | -6.4          | -13.9         | -3.7                | -4.5          |
|                     | Max. Peak Gain(dBi)  | 0.4            | 2.0                 | 1.7               | 0.8                 | 2.3              | 0.1           | -1.5          | -4.6          | 2.8                 | 2.8           |
|                     | Frequency (MHz)      | (700)          | (790)               | (820)             | (1520)              | (1700)           | (2310)        | (2400)        | (2500)        | (3840)              | (4730)        |
|                     | VSWR                 | ≤ 11.2         |                     |                   |                     |                  |               |               |               |                     |               |
|                     | Return Loss          | ≤ -1.5 dB      |                     |                   |                     |                  |               |               |               |                     |               |
|                     | Peak Gain            | ≤ 2.8 dBi      |                     |                   |                     |                  |               |               |               |                     |               |

| Gain – Detail |                           |                |                     |
|---------------|---------------------------|----------------|---------------------|
|               | Band                      | Freq.<br>(MHz) | Max peak Gain (dBi) |
| FDD < 3 dBi   | B1                        | 1920-1980      | 2.2                 |
|               | B3/n3                     | 1710-1785      | 1.8                 |
|               | B8                        | 880-915        | 0.9                 |
|               | B18                       | 815-830        | 1.7                 |
|               | B19                       | 830-845        | 1.5                 |
|               | B26                       | 814-849        | 1.7                 |
|               | B28/n28                   | 703-748        | 1.1                 |
|               | n77/n78                   | 3400-4100      | 2.8                 |
|               | n79                       | 4500-4900      | 2.8                 |
| TDD < 4 dBi   | B39                       | 1888-1920      | 2.1                 |
|               | B41/n41<br>(Disable HPUE) | 2496-2690      | -4.6                |
|               | B42                       | 3400-3600      | 1.8                 |

## 1.2. Supported Bands

| 5G NR / LTE / LTE-Advanced / WCDMA / HSPA / HSPA+ / GPRS / GSM / NB-IoT |                 |               |                |         |
|-------------------------------------------------------------------------|-----------------|---------------|----------------|---------|
| Band                                                                    | Frequency (MHz) | Uplink (MHz)  | Downlink (MHz) | Covered |
| 1                                                                       | 2100            | 1920–1980     | 2110–2170      | √       |
| 2                                                                       | 1900            | 1850–1910     | 1930–1990      | √       |
| 3                                                                       | 1800            | 1710–1785     | 1805–1880      | √       |
| 4                                                                       | 1700            | 1710–1755     | 2110–2155      | √       |
| 5                                                                       | 850             | 824–849       | 869–894        | √       |
| 7                                                                       | 2600            | 2500–2570     | 2620–2690      | √       |
| 8                                                                       | 900             | 880–915       | 925–960        | √       |
| 9                                                                       | 1800            | 1749.9–1784.9 | 1844.9–1879.9  | √       |
| 11                                                                      | 1500            | 1427.9–1447.9 | 1475.9–1495.9  | -       |
| 12                                                                      | 700             | 699–716       | 729–746        | √       |
| 13                                                                      | 700             | 777–787       | 746–756        | √       |
| 14                                                                      | 700             | 788–798       | 758–768        | √       |
| 17                                                                      | 700             | 704–716       | 734–746        | √       |
| 18                                                                      | 850             | 815–830       | 860–875        | √       |
| 19                                                                      | 850             | 830–845       | 875–890        | √       |
| 20                                                                      | 800             | 832–862       | 791–821        | √       |
| 21                                                                      | 1500            | 1447.9–1462.9 | 1495.9–1510.9  | -       |
| 22                                                                      | 3500            | 3410–3490     | 3510–3590      | -       |
| 23                                                                      | 2100            | 2000–2020     | 2180–2200      | √       |
| 24                                                                      | 1600            | 1626.5–1660.5 | 1525–1559      | -       |
| 25                                                                      | 1900            | 1850–1915     | 1930–1995      | √       |
| 26                                                                      | 850             | 814–849       | 859–894        | √       |

|    |      |             |             |   |
|----|------|-------------|-------------|---|
| 28 | 700  | 703–748     | 758–803     | √ |
| 31 | 450  | 452.5–457.5 | 462.5–467.5 | - |
| 34 | 2100 | 2010–2025   |             | √ |
| 38 | 2600 | 2570–2620   |             | √ |
| 39 | 1900 | 1880–1920   |             | √ |
| 40 | 2300 | 2300–2400   |             | √ |
| 41 | 2500 | 2496–2690   |             | √ |
| 42 | 3500 | 3400–3600   |             | √ |
| 48 | 3500 | 3550–3700   |             | √ |
| 66 | 1700 | 1710–1780   | 2110–2200   | √ |
| 71 | 600  | 663–698     | 617–652     | - |
| 74 | 1500 | 1427–1470   | 1475–1518   | - |
| 77 | 3500 | 3300–4200   |             | √ |
| 78 | 3500 | 3300–3800   |             | √ |
| 79 | 4500 | 4400–5000   |             | √ |

**Note:**

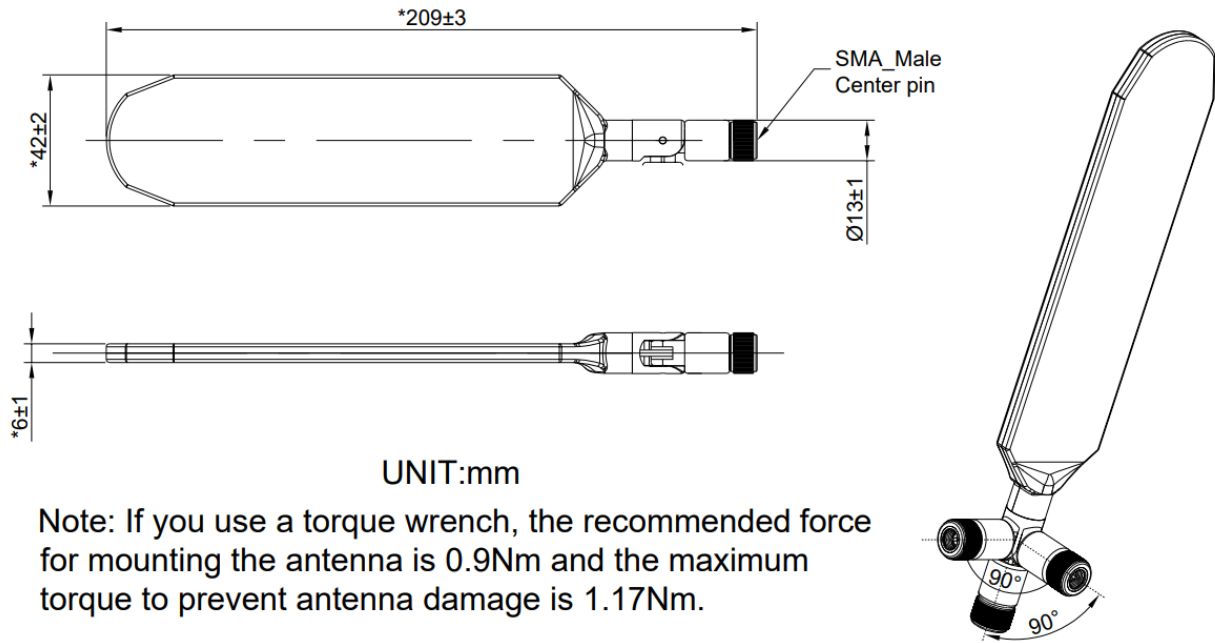
Covered √ means efficiency > 20 %.

### 1.3. Mechanical & Environmental

| Mechanical               |                       |
|--------------------------|-----------------------|
| Antenna Dimensions       | 209 mm × 42 mm × 6 mm |
| Antenna Material & Color | ABS & Black           |
| Connector Type           | SMA Male              |
| Mounting Type            | Terminal              |
| Weight                   | Typ. 33.9 g           |
| Environmental            |                       |
| Operation Temperature    | -20 °C to +60 °C      |
| Storage Temperature      | -20 °C to +60 °C      |
| RoHS and REACH Compliant | Yes                   |



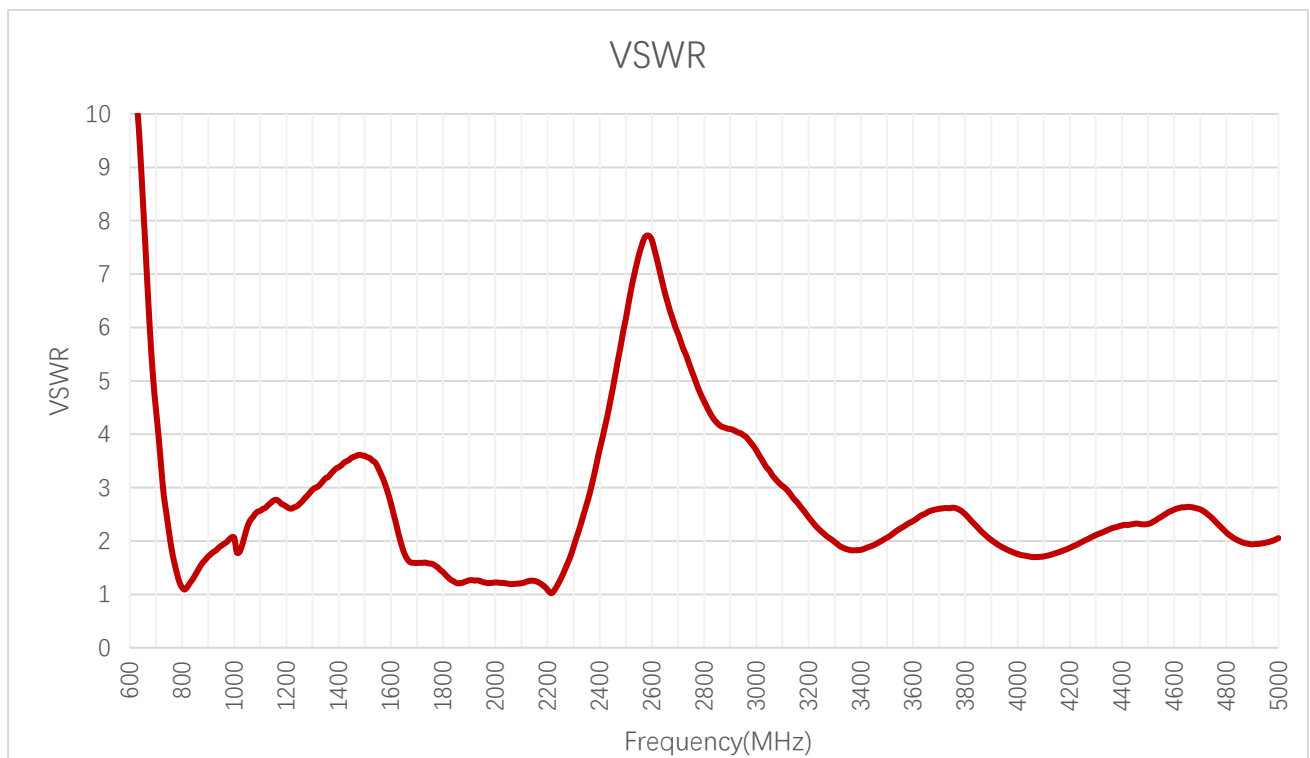
## 2 Drawing



# 3 Detailed Performance

## 3.1. S-Parameter Test

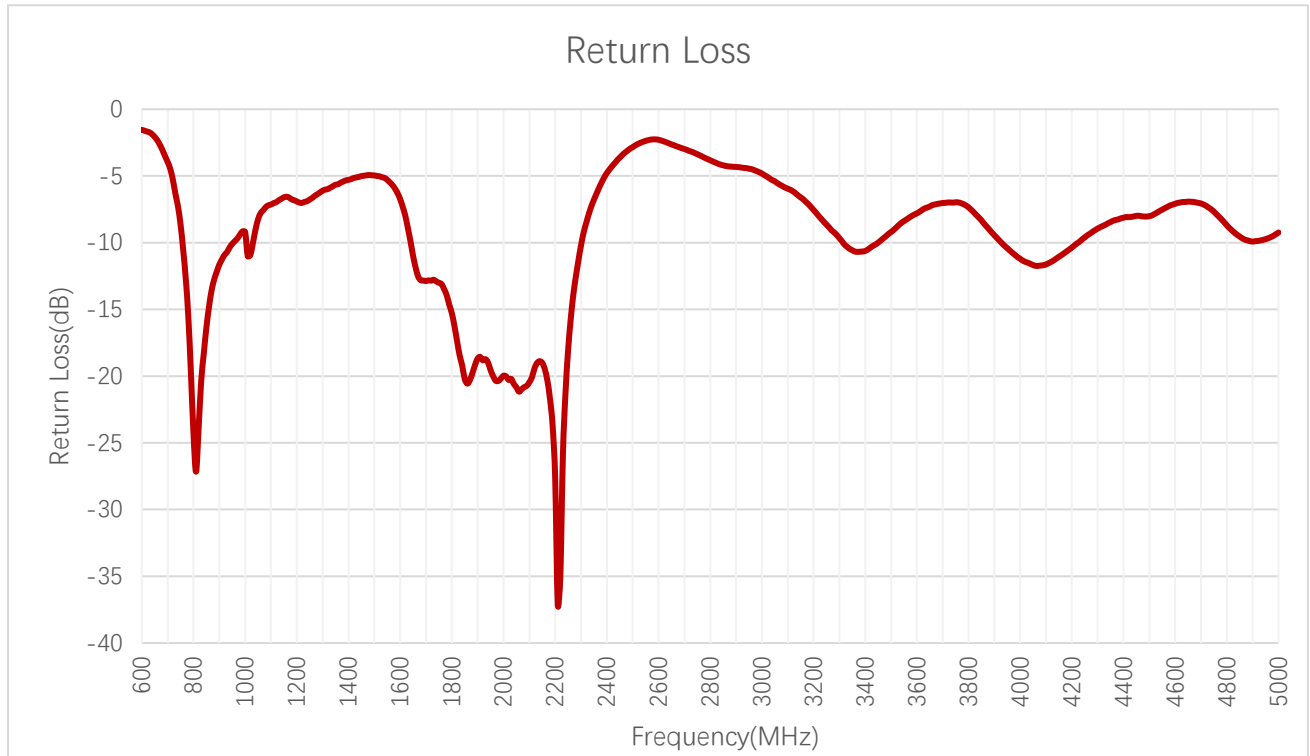
### 3.1.1. VSWR



**VSWR**

|                        |             |             |             |             |             |             |             |             |             |             |
|------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Frequency (MHz)</b> | <b>600</b>  | <b>630</b>  | <b>710</b>  | <b>830</b>  | <b>900</b>  | <b>960</b>  | <b>1440</b> | <b>1710</b> | <b>1740</b> | <b>1880</b> |
| <b>VSWR</b>            | 11.2        | 10.0        | 4.0         | 1.2         | 1.7         | 1.9         | 3.5         | 1.6         | 1.6         | 1.2         |
| <b>Frequency (MHz)</b> | <b>1950</b> | <b>2140</b> | <b>2350</b> | <b>2450</b> | <b>2600</b> | <b>2690</b> | <b>4700</b> | <b>5000</b> | <b>5500</b> | <b>6000</b> |
| <b>VSWR</b>            | 1.2         | 1.3         | 2.7         | 4.9         | 7.6         | 6.0         | 2.6         | 2.1         | -           | -           |

**3.1.2. Return Loss**

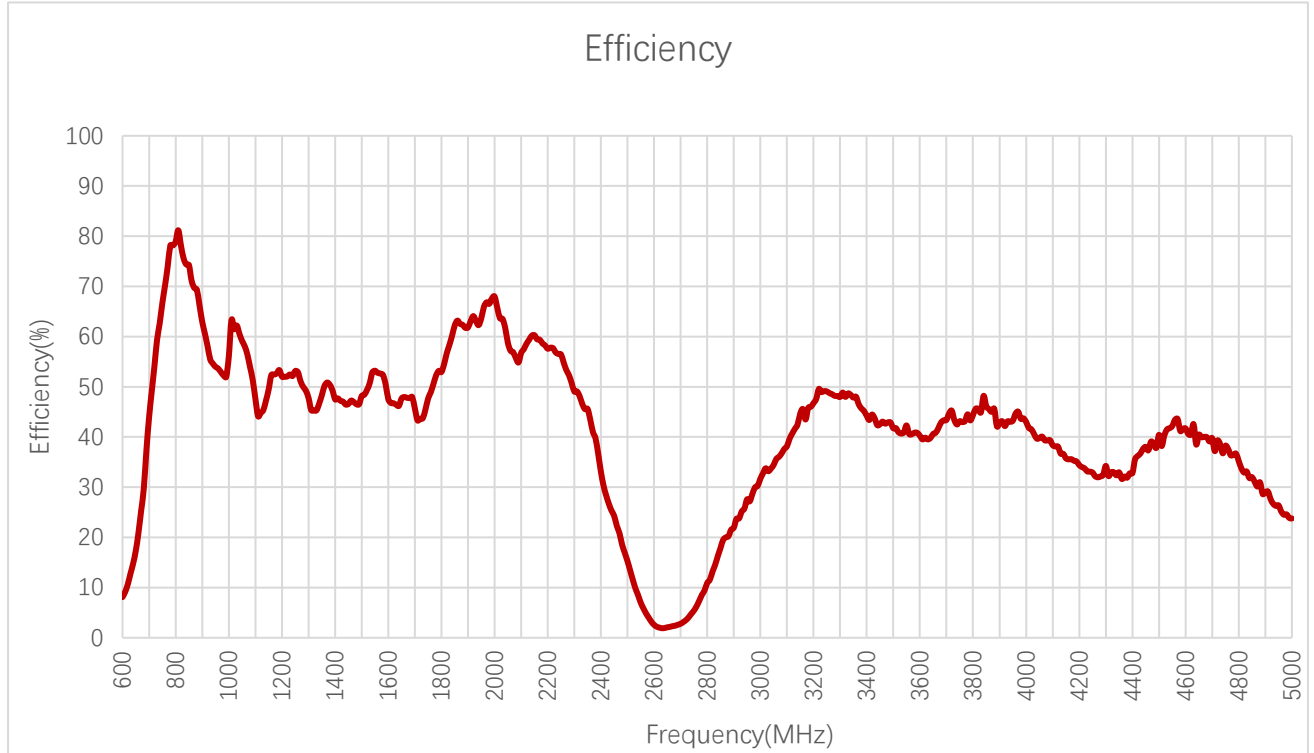


**Return Loss (dB)**

|                         |             |             |             |             |             |             |             |             |             |             |
|-------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Frequency (MHz)</b>  | <b>600</b>  | <b>630</b>  | <b>710</b>  | <b>830</b>  | <b>900</b>  | <b>960</b>  | <b>1440</b> | <b>1710</b> | <b>1740</b> | <b>1880</b> |
| <b>Return Loss (dB)</b> | -1.5        | -1.7        | -4.5        | -20.4       | -11.6       | -9.9        | -5.1        | -12.8       | -12.9       | -19.8       |
| <b>Frequency (MHz)</b>  | <b>1950</b> | <b>2140</b> | <b>2350</b> | <b>2450</b> | <b>2600</b> | <b>2690</b> | <b>4700</b> | <b>5000</b> | <b>5500</b> | <b>6000</b> |
| <b>Return Loss (dB)</b> | -19.6       | -18.9       | -6.8        | -3.6        | -2.3        | -2.9        | -7.1        | -9.2        | -           | -           |

### 3.2. Radiation Performance Test

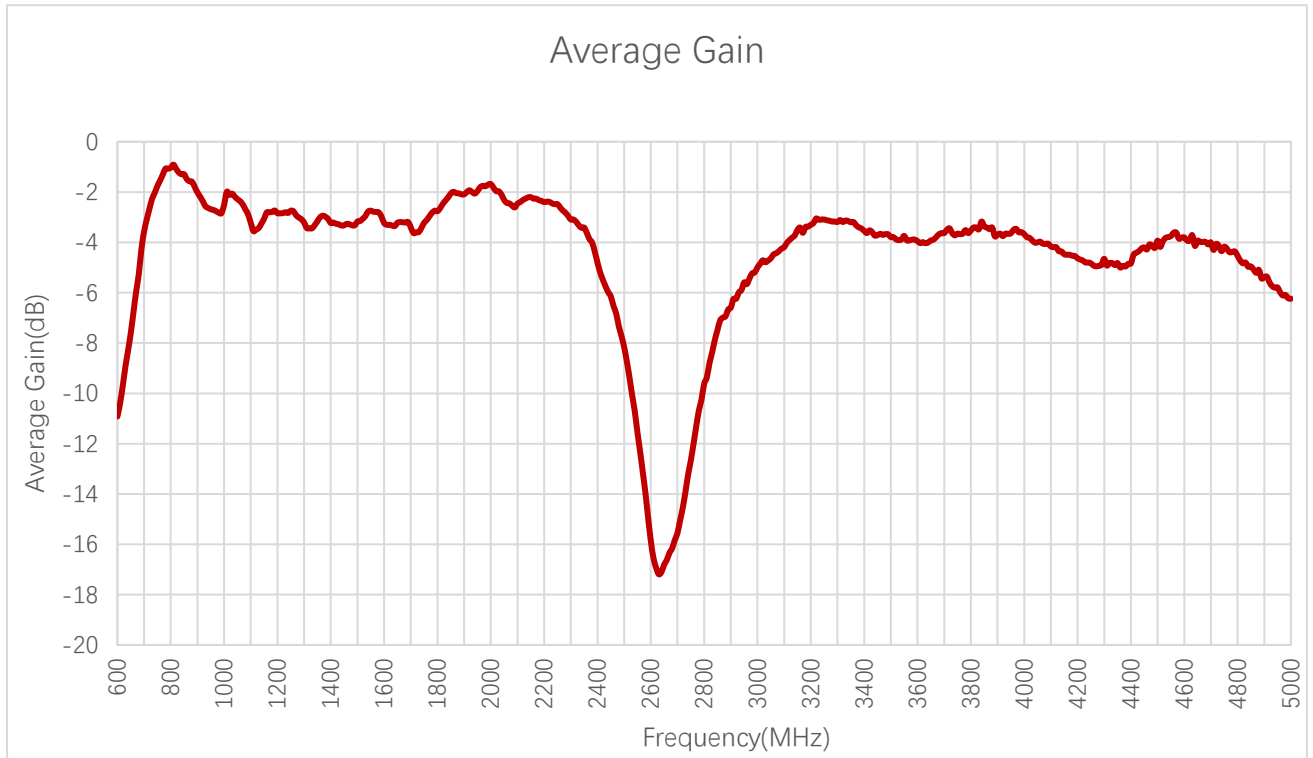
#### 3.2.1. Efficiency



**Efficiency (%)**

|                        |             |             |             |             |             |             |             |             |             |             |
|------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Frequency (MHz)</b> | <b>600</b>  | <b>630</b>  | <b>710</b>  | <b>830</b>  | <b>900</b>  | <b>960</b>  | <b>1440</b> | <b>1710</b> | <b>1740</b> | <b>1880</b> |
| <b>Efficiency (%)</b>  | 8.1         | 12.8        | 49.1        | 75.6        | 62.9        | 53.6        | 46.5        | 43.3        | 45.5        | 62.3        |
| <b>Frequency (MHz)</b> | <b>1950</b> | <b>2140</b> | <b>2350</b> | <b>2450</b> | <b>2600</b> | <b>2690</b> | <b>4700</b> | <b>5000</b> | <b>5500</b> | <b>6000</b> |
| <b>Efficiency (%)</b>  | 63.7        | 60.2        | 45.6        | 24.3        | 2.6         | 2.6         | 39.8        | 23.8        | -           | -           |

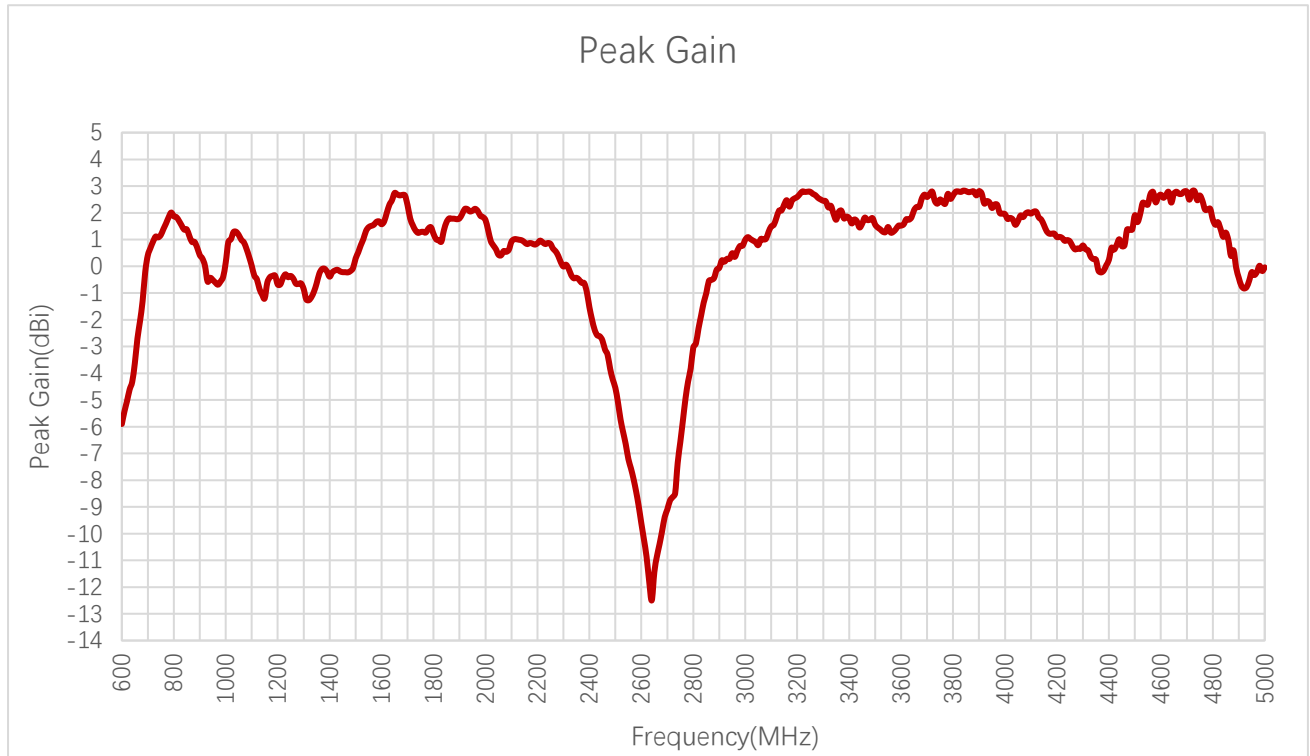
**3.2.2. Average Gain**



**Average Gain (dB)**

|                          |             |             |             |             |             |             |             |             |             |             |
|--------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Frequency (MHz)</b>   | <b>600</b>  | <b>630</b>  | <b>710</b>  | <b>830</b>  | <b>900</b>  | <b>960</b>  | <b>1440</b> | <b>1710</b> | <b>1740</b> | <b>1880</b> |
| <b>Average Gain (dB)</b> | -10.9       | -8.9        | -3.1        | -1.2        | -2.0        | -2.7        | -3.3        | -3.6        | -3.4        | -2.1        |
| <b>Frequency (MHz)</b>   | <b>1950</b> | <b>2140</b> | <b>2350</b> | <b>2450</b> | <b>2600</b> | <b>2690</b> | <b>4700</b> | <b>5000</b> | <b>5500</b> | <b>6000</b> |
| <b>Average Gain (dB)</b> | -2.0        | -2.2        | -3.4        | -6.2        | -15.9       | -15.8       | -4.0        | -6.2        | -           | -           |

**3.2.3. Peak Gain**



**Peak Gain (dBi)**

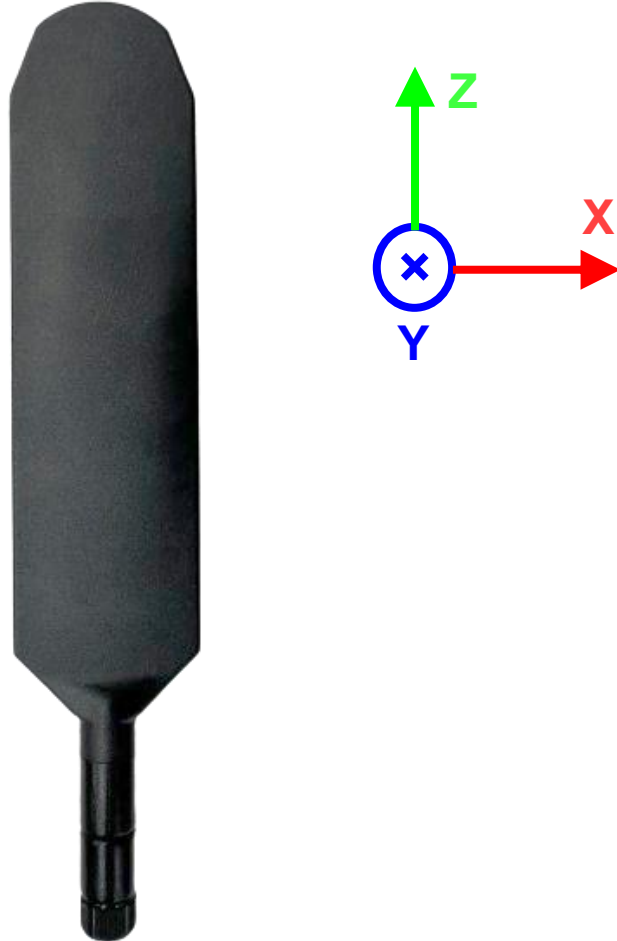
|                        |             |             |             |             |             |             |             |             |             |             |
|------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Frequency (MHz)</b> | <b>600</b>  | <b>630</b>  | <b>710</b>  | <b>830</b>  | <b>900</b>  | <b>960</b>  | <b>1440</b> | <b>1710</b> | <b>1740</b> | <b>1880</b> |
| <b>Peak Gain (dBi)</b> | -5.9        | -4.6        | 0.7         | 1.5         | 0.4         | -0.6        | -0.2        | 1.8         | 1.3         | 1.8         |
| <b>Frequency (MHz)</b> | <b>1950</b> | <b>2140</b> | <b>2350</b> | <b>2450</b> | <b>2600</b> | <b>2690</b> | <b>4700</b> | <b>5000</b> | <b>5500</b> | <b>6000</b> |
| <b>Peak Gain (dBi)</b> | 2.1         | 1.0         | -0.4        | -2.8        | -9.6        | -9.4        | 2.8         | 0.0         | -           | -           |

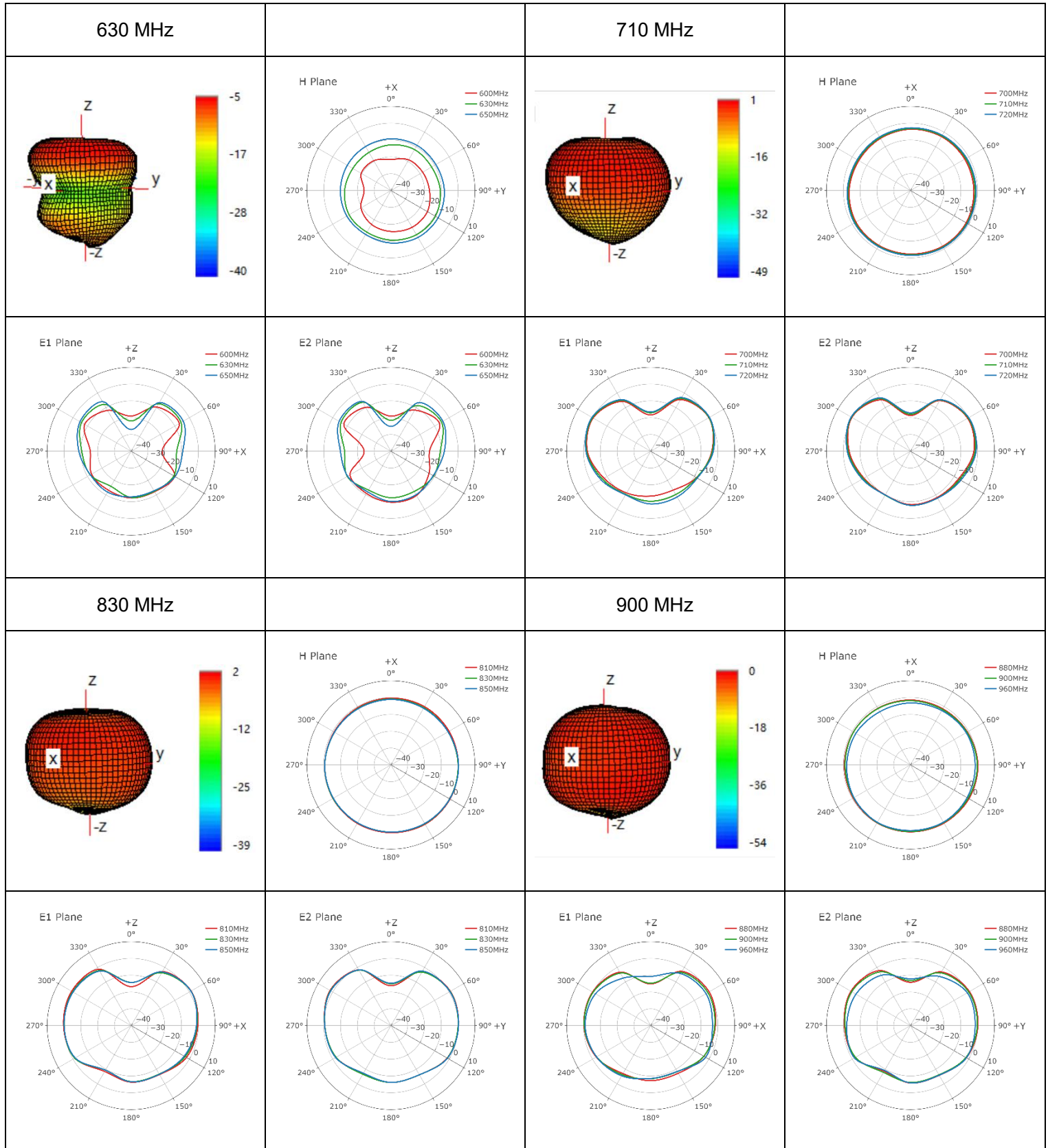
**Max Peak Gain (dBi)**

|                        |            |                      |                    |                      |                   |             |                 |                 |                      |             |
|------------------------|------------|----------------------|--------------------|----------------------|-------------------|-------------|-----------------|-----------------|----------------------|-------------|
| <b>Band</b>            | <b>B71</b> | <b>B12 /B13 /B28</b> | <b>B5 /B8 /B26</b> | <b>n74 /n75 /n76</b> | <b>B1 /B2 /B3</b> | <b>B40</b>  | <b>Wi-Fi 2G</b> | <b>B38 /B41</b> | <b>B42 /B48 /n77</b> | <b>n79</b>  |
| <b>Frequency (MHz)</b> | <b>700</b> | <b>790</b>           | <b>820</b>         | <b>1520</b>          | <b>1700</b>       | <b>2310</b> | <b>2400</b>     | <b>2500</b>     | <b>3840</b>          | <b>4730</b> |
| <b>Peak Gain (dBi)</b> | 0.4        | 2.0                  | 1.7                | 0.8                  | 2.3               | 0.1         | -1.5            | -4.6            | 2.8                  | 2.8         |

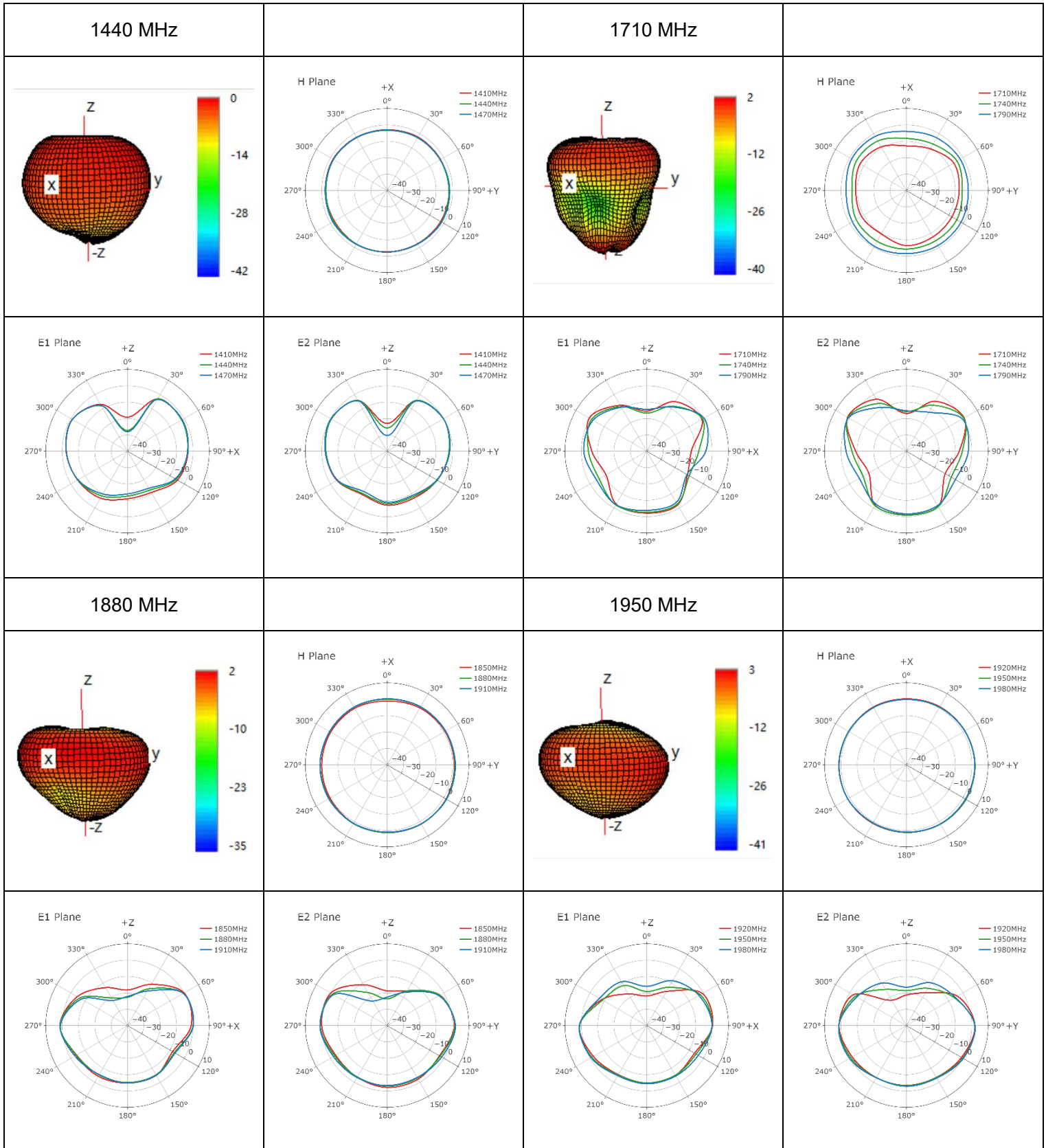
### 3.2.4. 3D & 2D Radiation Pattern

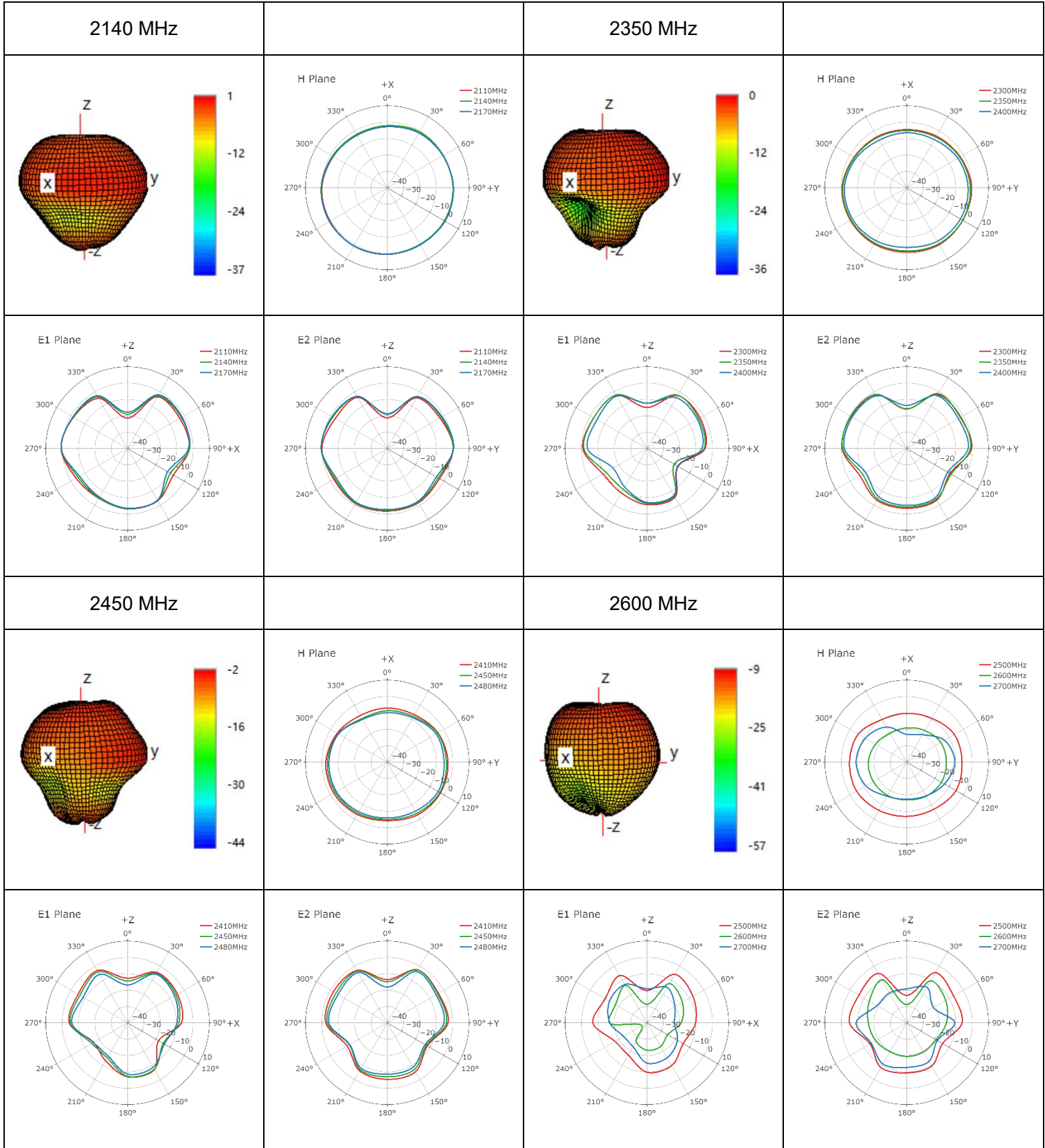
- Test Condition: Free Space
- Test Chamber: GL-G-1

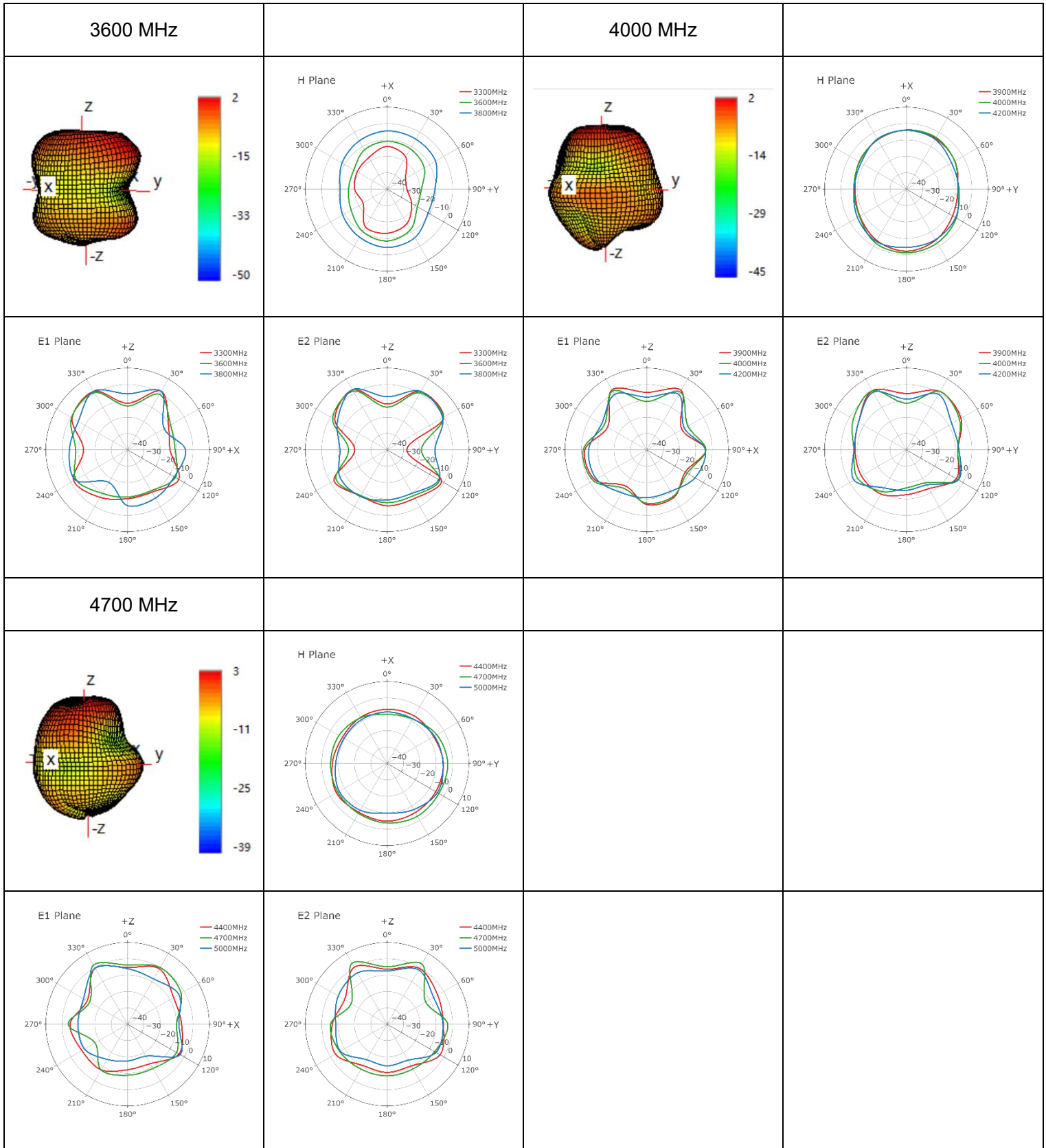




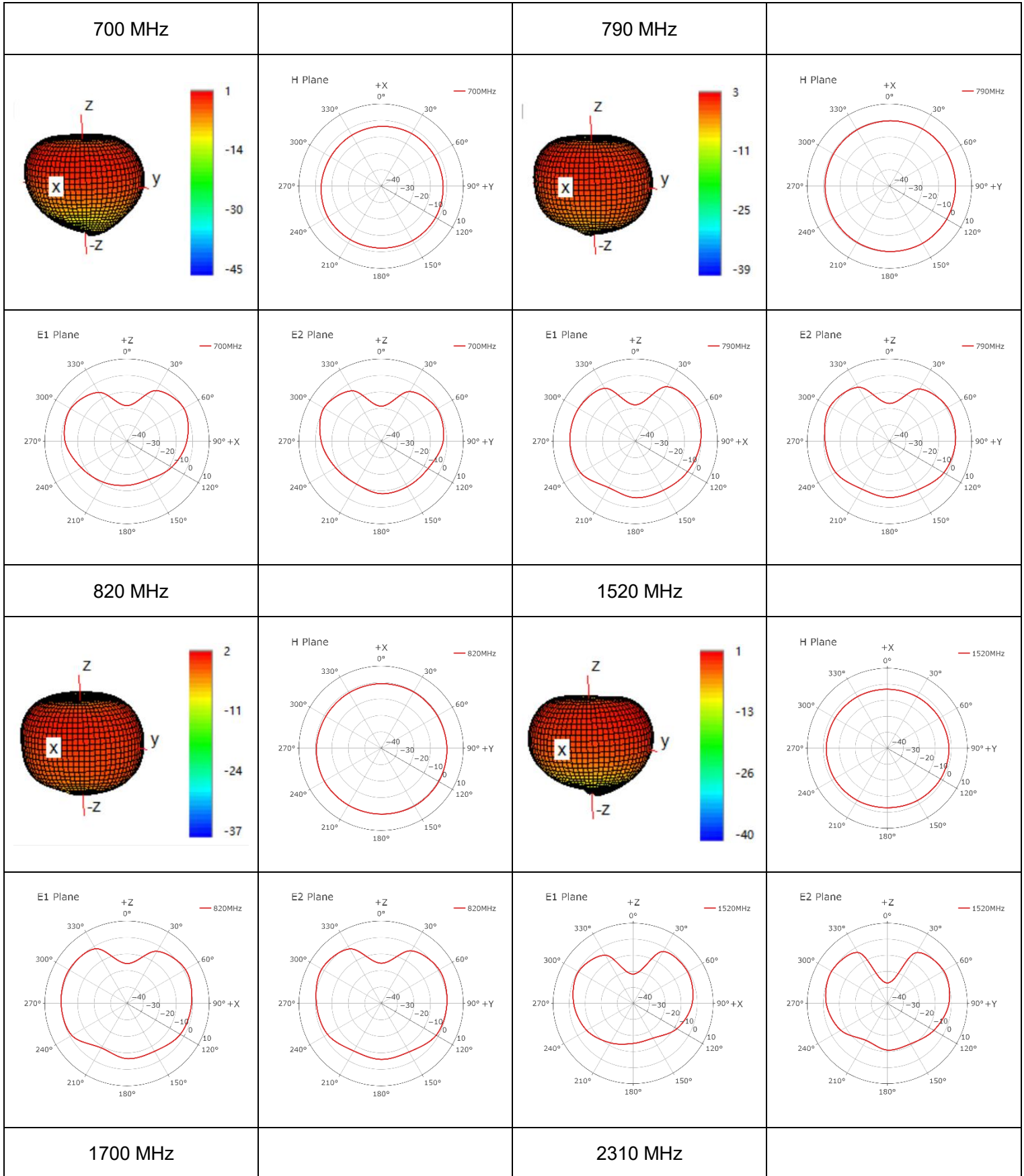


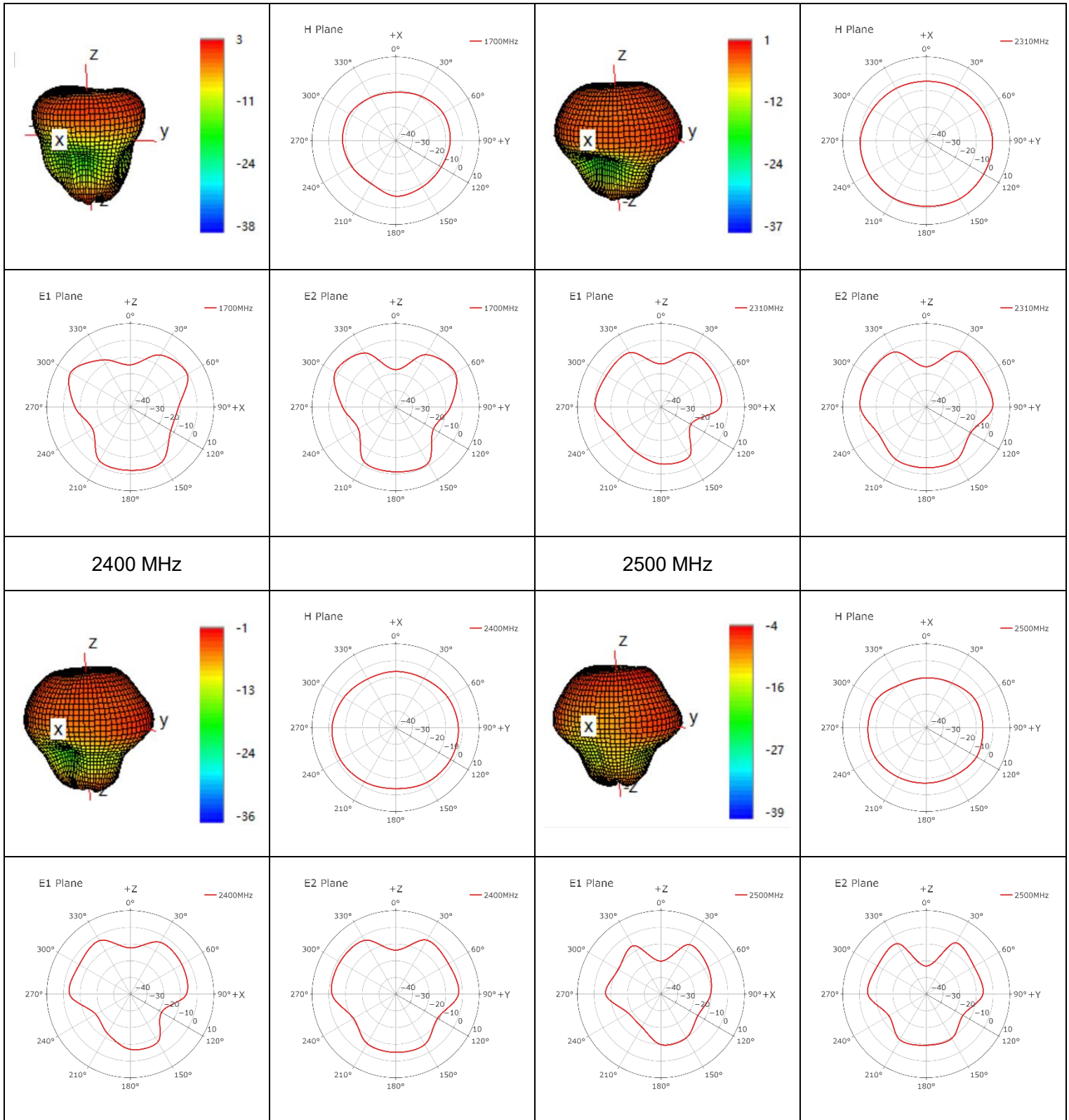


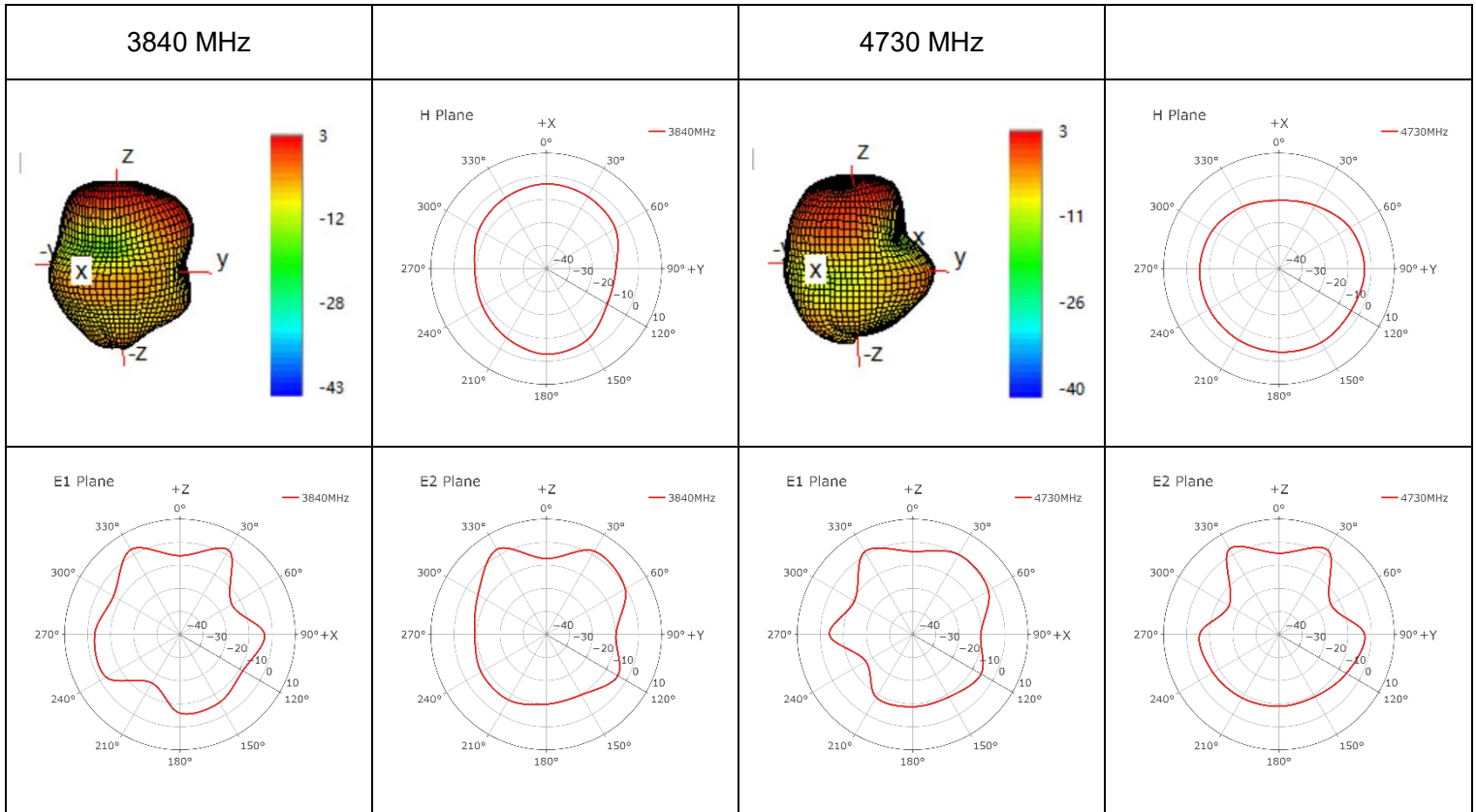







● **Max Peak Gain**

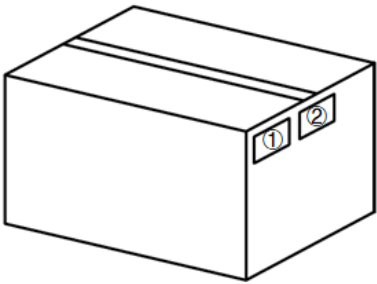
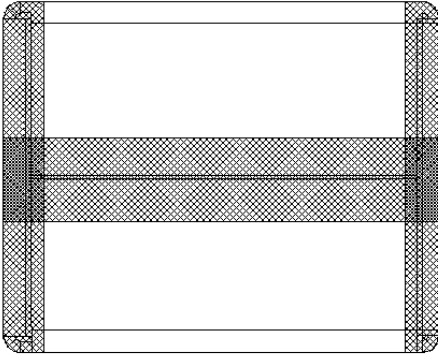






# 4 Packaging

| Step | Packaging Picture / 2D Picture                                                      | Description                                                                                                                                                                                  |
|------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    |    | <p>(10 PCS Antennas / Conjoined Plastic Bag)</p>                                                                                                                                             |
| 2    |   | <p>Put the products with conjoined plastic bags into a PE bag.<br/>(10 PCS Antennas / PE Bag)</p> <p><u>PE Bag Size: L × W = 320 × 220 mm</u></p>                                            |
| 3    |  | <p>Put 2 PE bags in one layer and stack 5 layers.<br/>(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></p> <p>H-shaped sealing cartons</p> <p>Wrap the outer box with the wrapping film.</p>                    |



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**Quectel Wireless Solutions Co., Ltd.**

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](mailto:info@quectel.com)

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# Revision History

| Version | Date       | Author                                                 | Note                               |
|---------|------------|--------------------------------------------------------|------------------------------------|
| -       | 2024-04-30 | Jaden FENG/<br>Lance SUN/<br>David LIU/<br>Rainey LIAO | Creation of the document           |
| 1.0     | 2024-04-30 | Jaden FENG/<br>Lance SUN/<br>David LIU/<br>Rainey LIAO | First official release             |
| 1.1     | 2024-09-05 | David LIU                                              | Updated the packaging (Chapter 4). |

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