

Specification

Part No. : WA.500w.301151

Product Name : Stingray Adhesive Mount
Wi-Fi/Zigbee Antenna

Features : Dual Band 2.4-2.5 GHz, 4.9-6.0 GHz
IP-65 Water Resistance
RG-174 – 3M, RP-SMA(M)
RoHS Compliant



1. Introduction

The WA.500w Stingray is a high efficiency, high gain adhesive mount dual band wireless antenna. Its high quality low profile covert housing can be attached onto the glass or plastic. The WA.500w is designed for applications that require omni-directional gain across both bands to ensure wide coverage area and constant reception and transmission for Wi-Fi and ZigBee applications.

Many module manufacturers specify peak gain limits for any antennas that are to be connected to that module. Those peak gain limits are based on free-space conditions. In practice, the peak gain of an antenna tested in free-space can degrade by at least 1 or 2dBi when put inside a device. So ideally you should go for a slightly higher peak gain antenna than mentioned on the module specification to compensate for this effect, giving you better performance.

Upon testing of any of our antennas with your device and a selection of appropriate layout, integration technique, or cable, Taoglas can make sure any of our antennas' peak gain will be below the peak gain limits. Taoglas can then issue a specification and/or report for the selected antenna in your device that will clearly show it complying with the peak gain limits, so you can be assured you are meeting regulatory requirements for that module.

For example, a module manufacturer may state that the antenna must have less than 2dBi peak gain, but you don't need to select an embedded antenna that has a peak gain of less than 2dBi in free-space. This will give you a less optimized solution. It is better to go for a slightly higher free-space peak gain of 3dBi or more if available. Once that antenna gets integrated into your device, performance will degrade below this 2dBi peak gain due to the effects of GND plane, surrounding components, and device housing. If you want to be absolutely sure, contact Taoglas and we will test. Choosing a Taoglas antenna with a higher peak gain than what is specified by the module manufacturer and enlisting our help will ensure you are getting the best performance possible without exceeding the peak gain limits.

Cables and Connectors are customizable.

2. Specifications

2.1 Dimensions

| Parameter | Specification |
|---------------|---------------|
| Base Diameter | 55mm |
| Base Height | 10.8mm |

2.2 Electrical Characteristics

| Parameter | Specification |
|--------------|---------------|
| Frequency | 2.4/5.8GHz |
| Polarization | Linear |
| Impedance | 50Ω |
| VSWR | 1.92 Max |

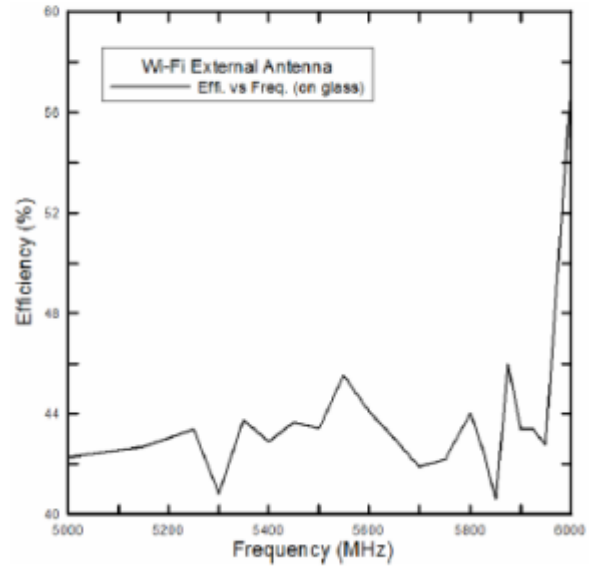
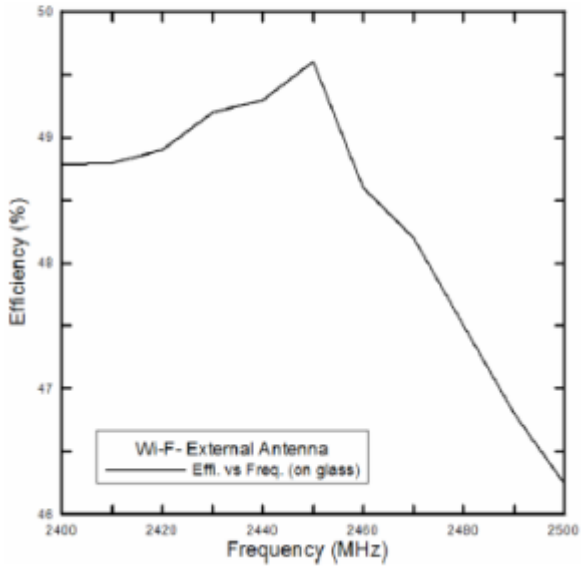
2.3 Mechanical

| Parameter | Specification |
|------------|---|
| Dimensions | Diameter 55mm Height 10.80mm |
| Colour | Black |
| Connector | RP-SMA(M) Fully Customizable |
| Cable | RG174 Length = 3M Fully Customizable |
| Weight | 62g |

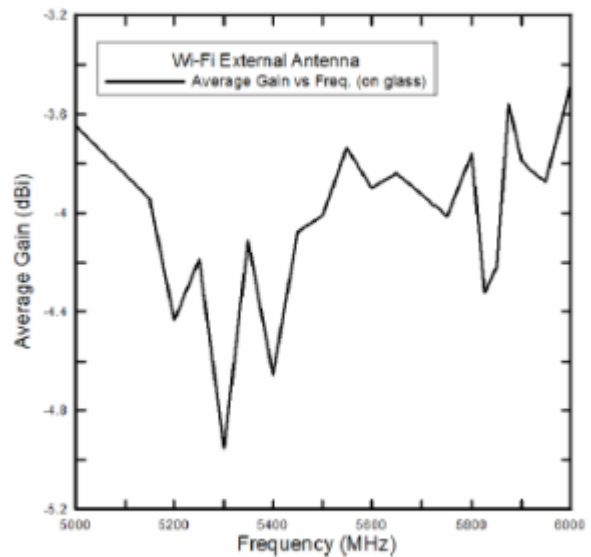
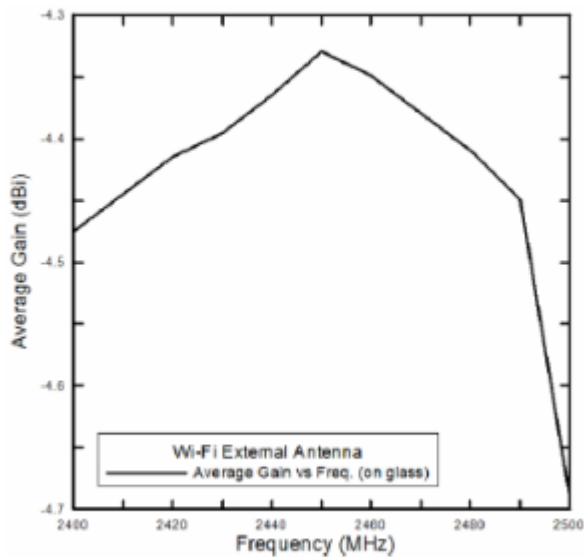
2.4 Efficiency, Average Gain, & Peak Gain without cable

| Frequency | Efficiency (%) | | Average Gain dBi | | Peak Gain dBi | |
|-------------------|----------------|----------|--------------------------------------|----------|---------------|----------|
| | On Plastic | On Glass | On Plastic | On Glass | On Plastic | On Glass |
| 2400 | 30.421 | 48.78 | -6.957 | -4.475 | 2.452 | 5.382 |
| 2450 | 48.09 | 49.605 | -4.217 | -4.329 | 4.2 | 6.886 |
| 2500 | 57 | 46.247 | -3.473 | -4.687 | 4.933 | 5.844 |
| 5000 | 67.232 | 42.28 | -2.45967 | -3.64833 | 8.991 | 3.736 |
| 5150 | 71 | 42.7 | -2.11333 | -3.94167 | 9.161 | 4.532 |
| 5200 | 65.933 | 43.03 | -2.448 | -4.434 | 8.901 | 4.481 |
| 5250 | 72 | 43.398 | -1.852 | -4.18833 | 9.154 | 5.129 |
| 5300 | 63.761 | 40.8 | -2.279 | -4.954 | 8.502 | 4.369 |
| 5350 | 72.267 | 43.751 | -1.65933 | -4.11033 | 8.906 | 5.757 |
| 5400 | 61.363 | 42.88 | -2.311 | -4.658 | 7.905 | 5.056 |
| 5450 | 68.398 | 43.649 | -1.74467 | -4.076 | 8.135 | 4.739 |
| 5500 | 68.624 | 43.413 | -1.69933 | -4.00933 | 7.985 | 4.564 |
| 5550 | 70.21 | 45.55 | -1.51533 | -3.73533 | 7.907 | 5.094 |
| 5600 | 66.97 | 44.11 | -1.72333 | -3.898 | 7.656 | 4.863 |
| 5650 | 66.678 | 43.04 | -1.78233 | -3.841 | 7.635 | 4.205 |
| 5700 | 62.174 | 41.88 | -2.12867 | -3.92433 | 7.394 | 4.062 |
| 5750 | 68.187 | 42.21 | 0.311333 | -4.013 | 7.859 | 4.917 |
| 5800 | 70.44 | 44.052 | -1.505 | -3.76133 | 7.901 | 4.308 |
| 5825 | 67.31 | 42.43 | -2.113 | -4.32467 | 7.769 | 3.615 |
| 5850 | 69.353 | 40.583 | -1.62233 | -4.21933 | 7.899 | 3.487 |
| 5875 | 76.068 | 45.984 | -1.22067 | -3.56 | 8.091 | 3.856 |
| 5900 | 69.981 | 43.385 | -2.24767 | -3.78733 | 7.611 | 3.990 |
| 5925 | 70.424 | 43.379 | -1.581 | -3.83533 | 7.701 | 4.262 |
| 5950 | 70.742 | 42.749 | -1.59033 | -3.876 | 7.755 | 3.899 |
| 6000 | 72.374 | 56.95 | -1.51533 | -3.48933 | 7.701 | 3.239 |
| Plastic Dimension | | | 520*520*13.8mm ³ , PC+ABS | | | |
| Glass Dimension | | | 500*500*3mm ³ | | | |

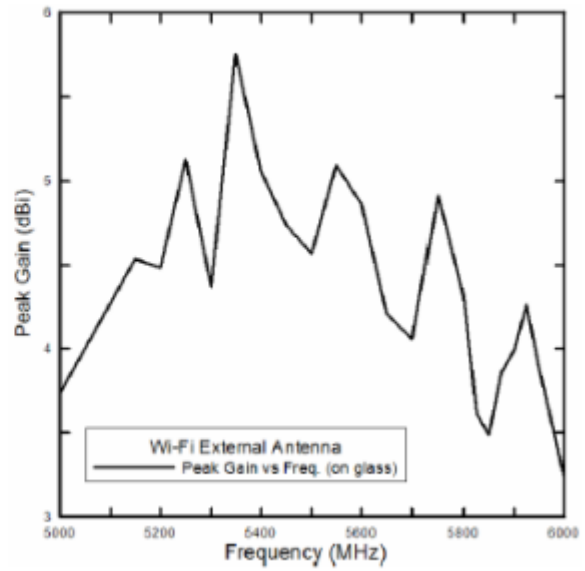
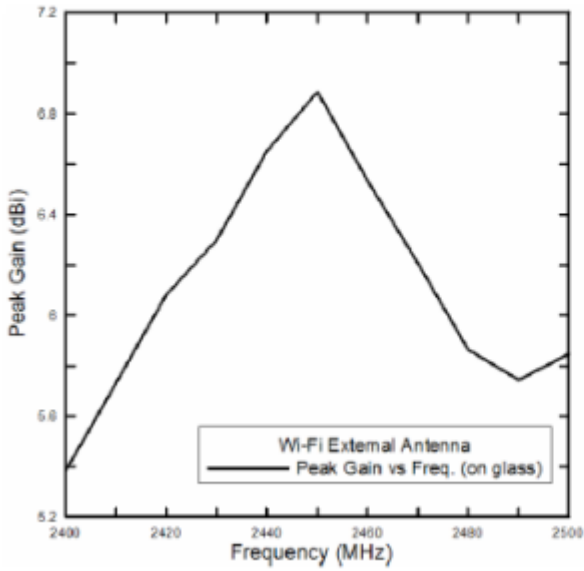
Efficiency vs. Frequency (Measured with glass)



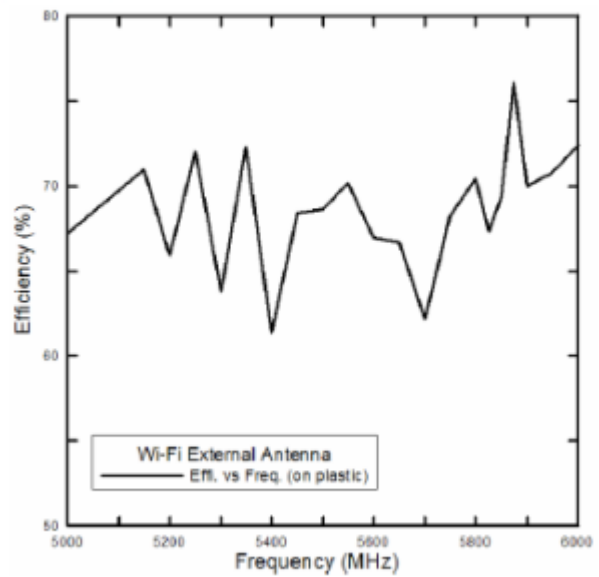
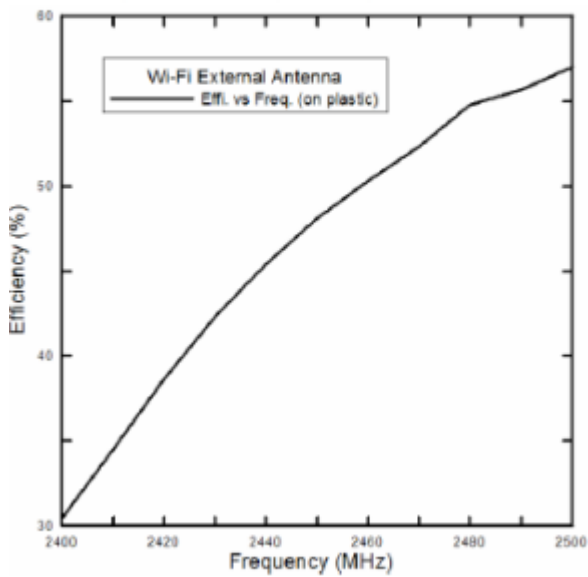
Average Gain vs. Frequency (Measured with glass)



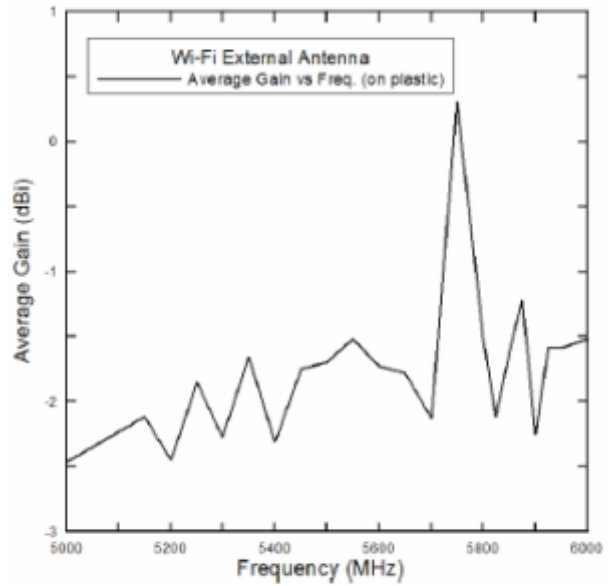
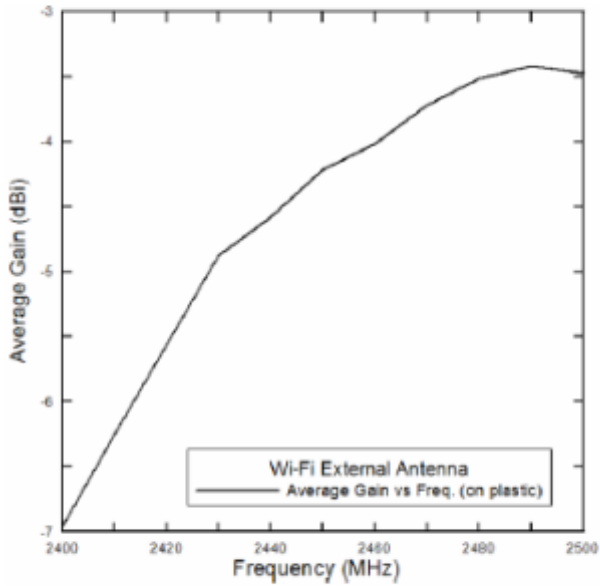
Peak Gain vs. Frequency (Measured with glass)



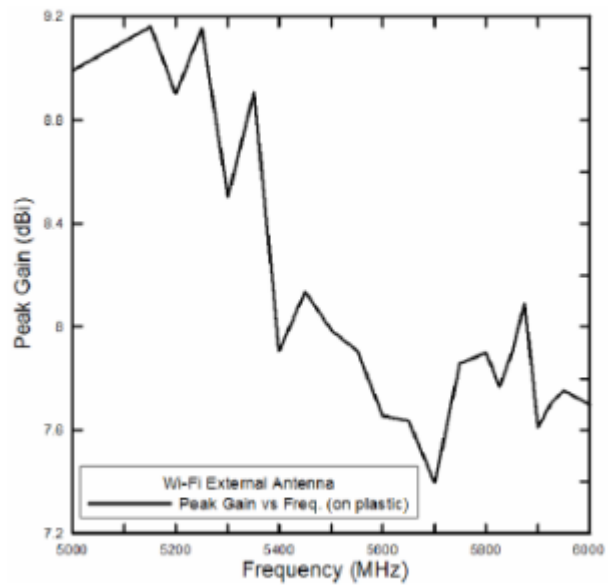
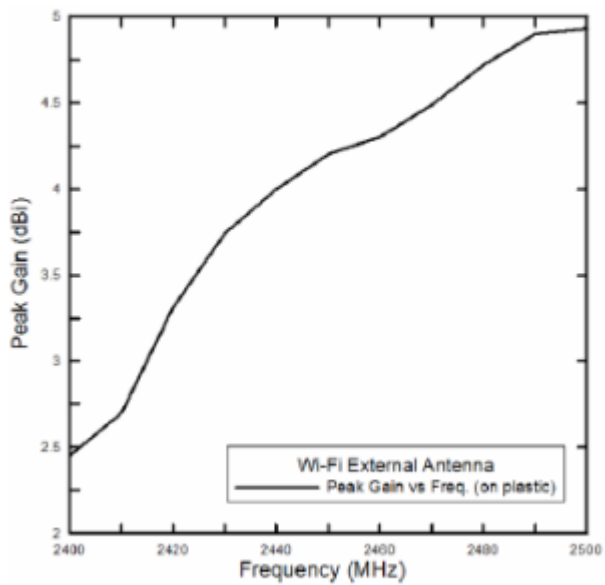
Efficiency vs. Frequency (Measured with plastic)



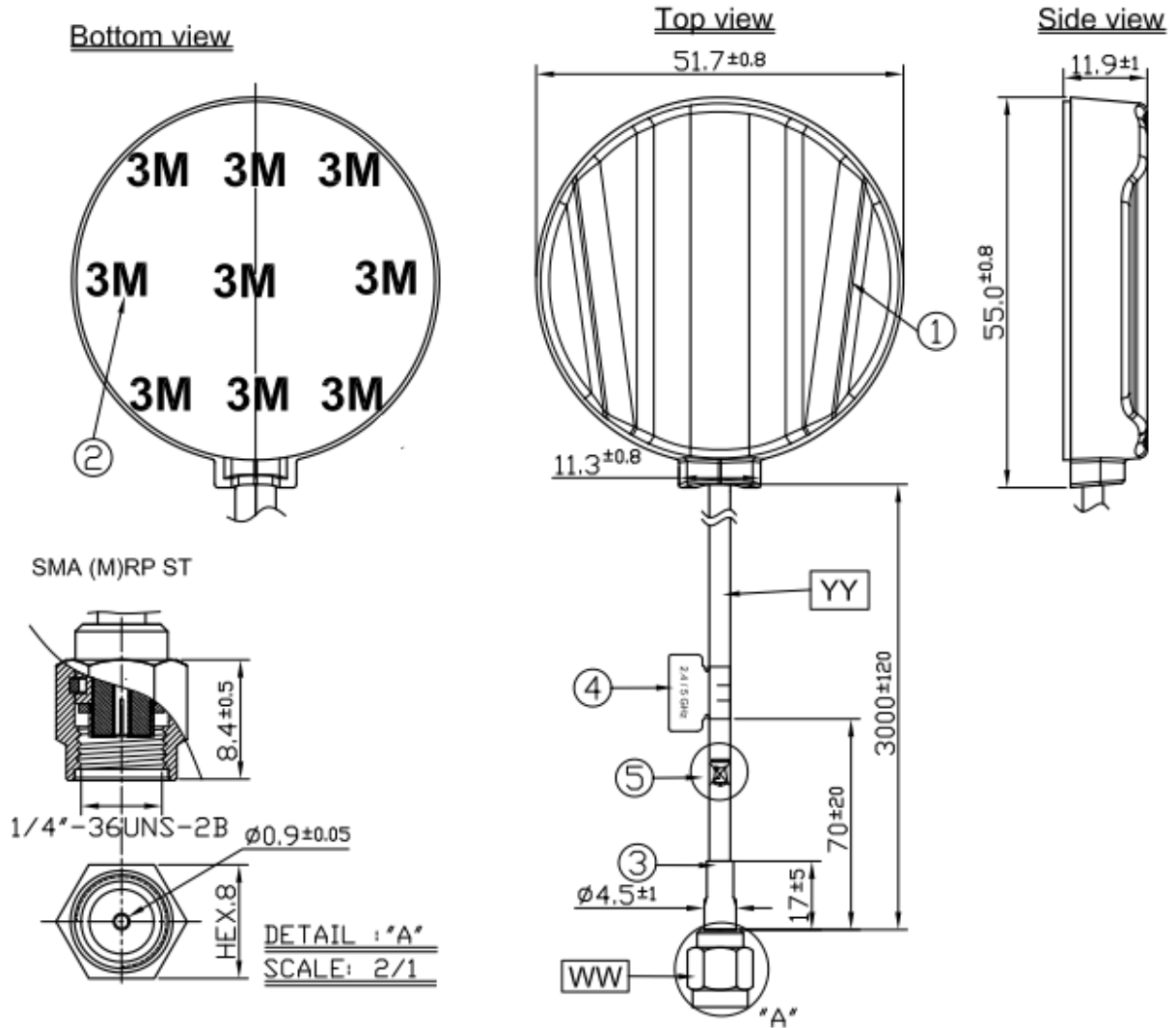
Average Gain vs. Frequency (Measured with plastic)



Peak Gain vs. Frequency (Measured with plastic)



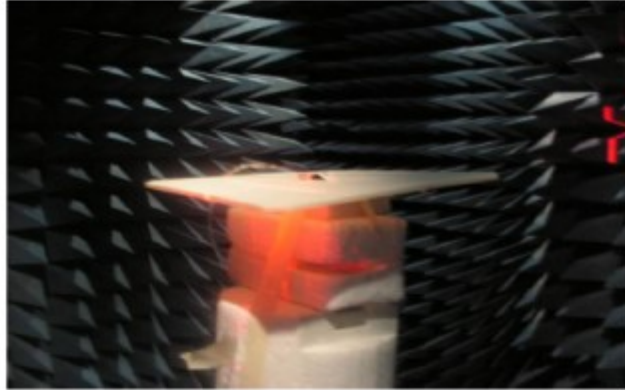
3.Drawing



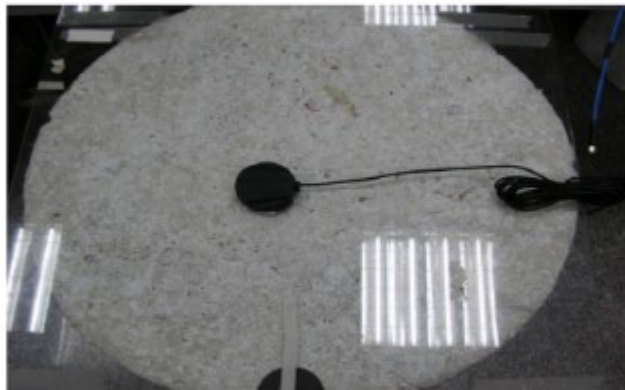
| | Name | Material | Finish | QTY |
|---|-------------------|--------------|-------------|-----|
| 1 | Housing | ABS | Black | 1 |
| 2 | Acrylic Foam Tape | 3M 4612 | White Liner | 1 |
| 3 | Heat Shrink tube | PE | Black | 1 |
| 4 | 2.4/5GHz Label | Coated Paper | Green | 1 |
| 5 | WEEE Label | Coated Paper | White | 1 |

| | Name | Spec | Finish | QTY |
|----|----------------|--------------------|--------|-----|
| WW | Connector Type | SMA(M) RP ST RG174 | Gold | 1 |
| YY | Cable Type | RG174 Cable | Black | 1 |

4. Testing



Testing Wi-Fi Antenna in 3D Chamber



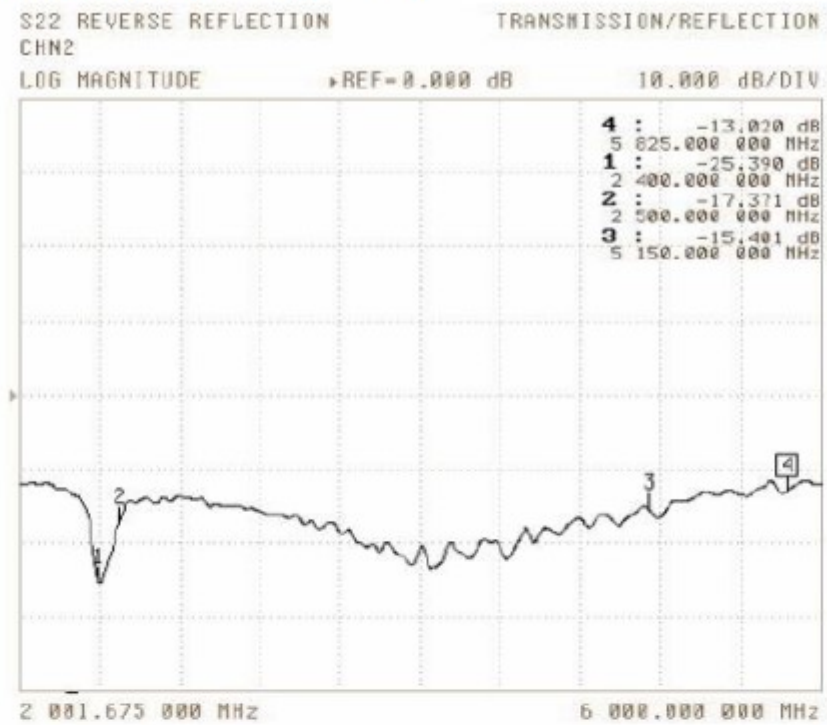
Wi-Fi Antenna test with glass



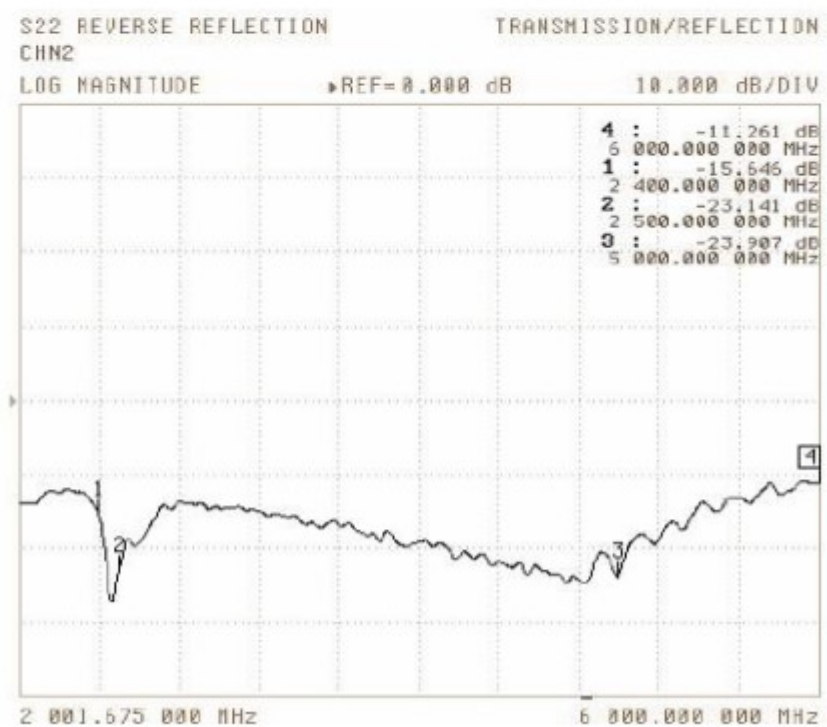
Wi-Fi antenna test with plastic

Wi-Fi Antenna Return Loss

(Measured with RG-174 cable, length=3 M)



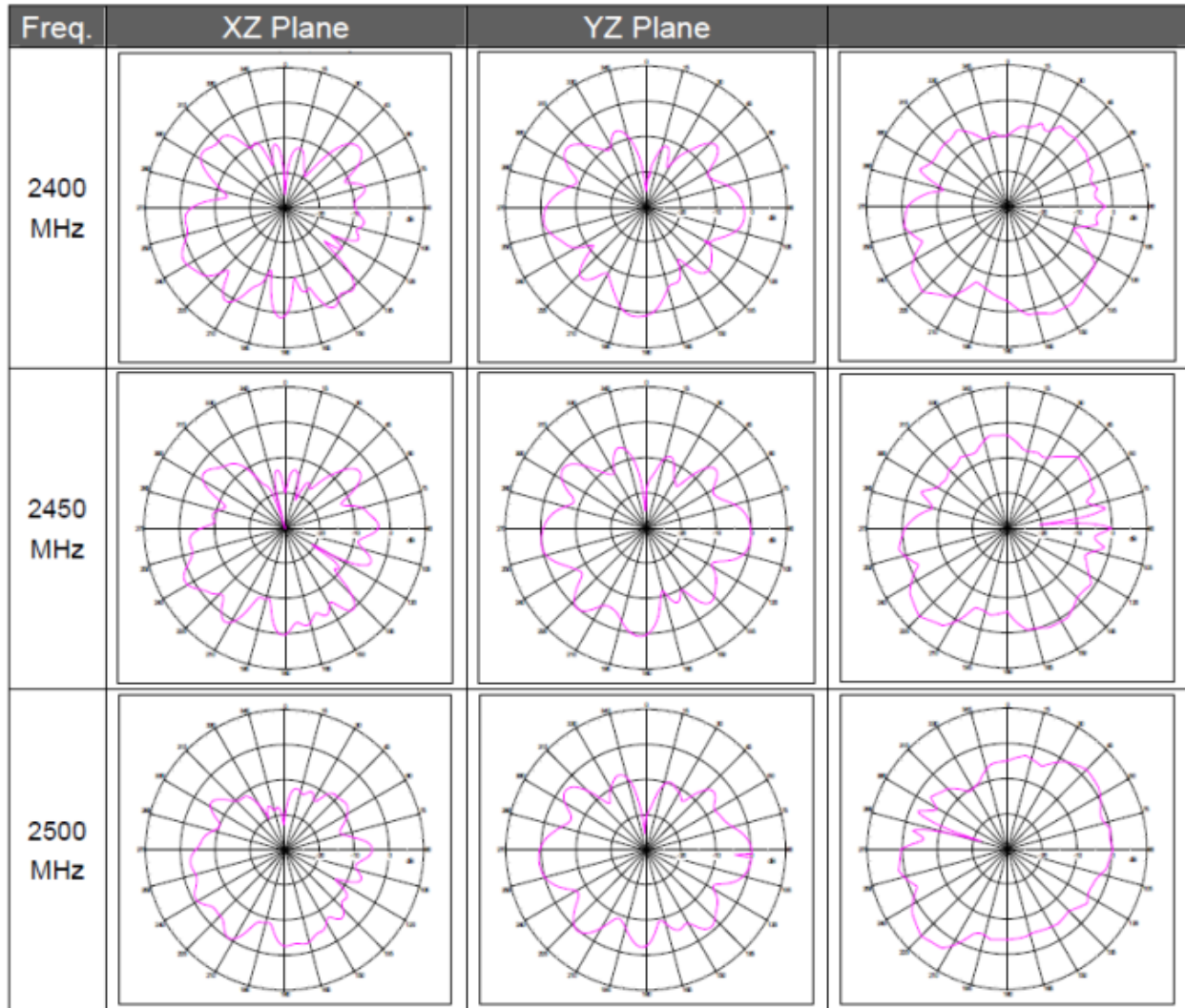
Measured with glass (500*500*3mm³)



Measured with glass (520*520*13.8mm³)

Wi-Fi Antenna Radiation Patterns

Measured with glass

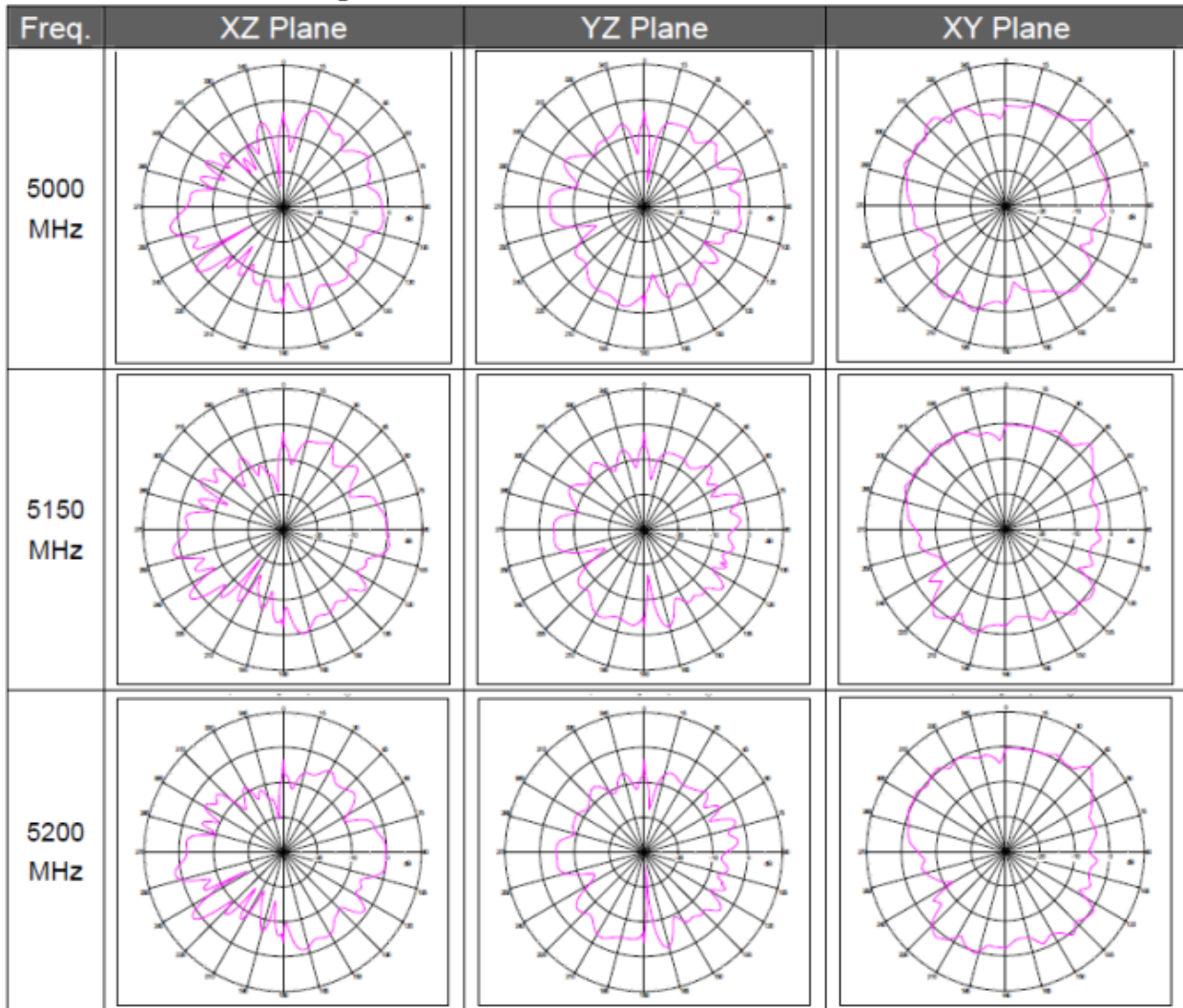


RG-174 cable attenuation (dB/100m)

| GHz | 0.5 | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | 5.5 | 6 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| RG-174 | 67 | 110 | 127 | 153 | 168 | 183 | 207 | 229 | 252 | 272 | 291 | 311 |

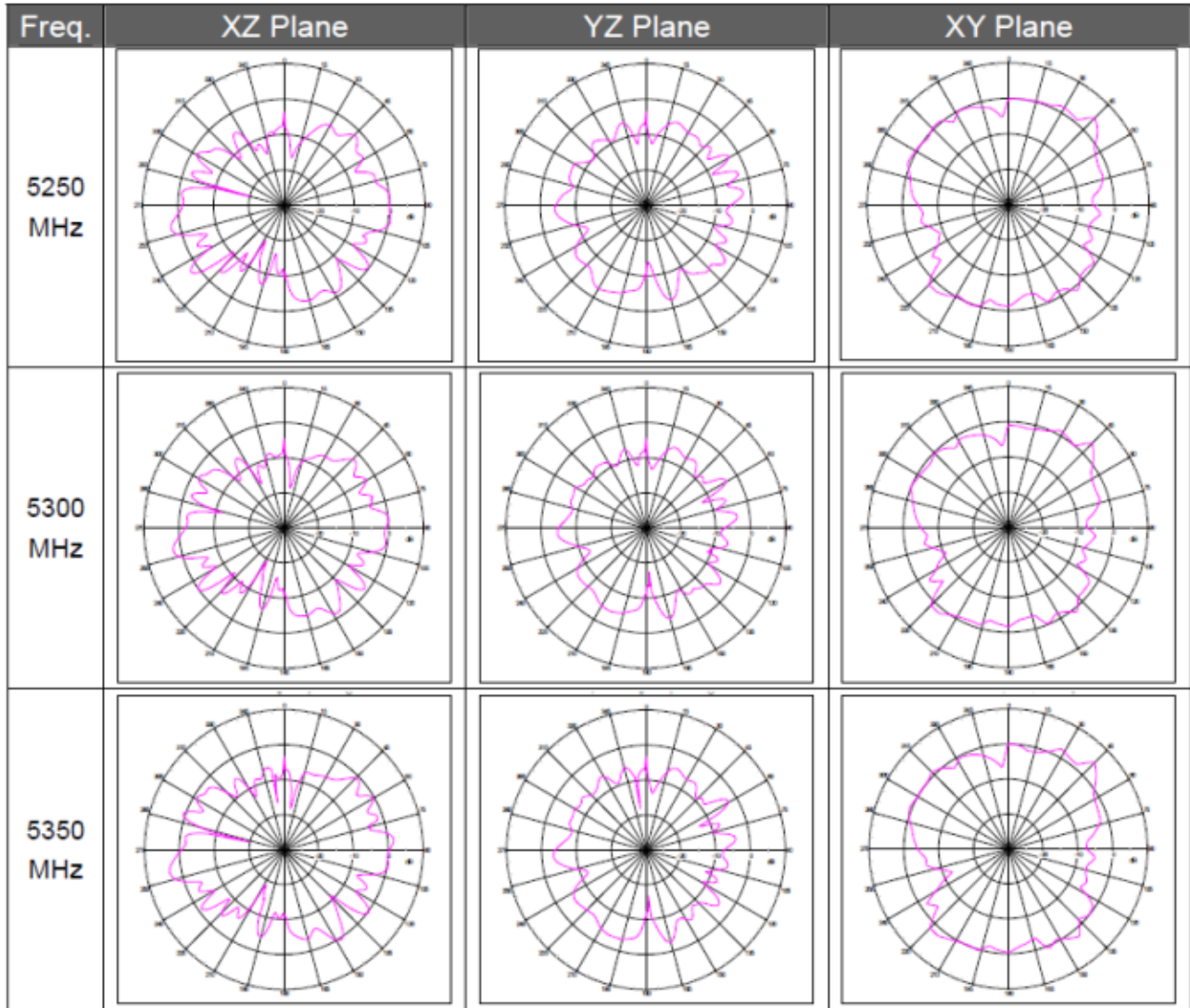
Wi-Fi Antenna Radiation Patterns (con.)

Measured with glass



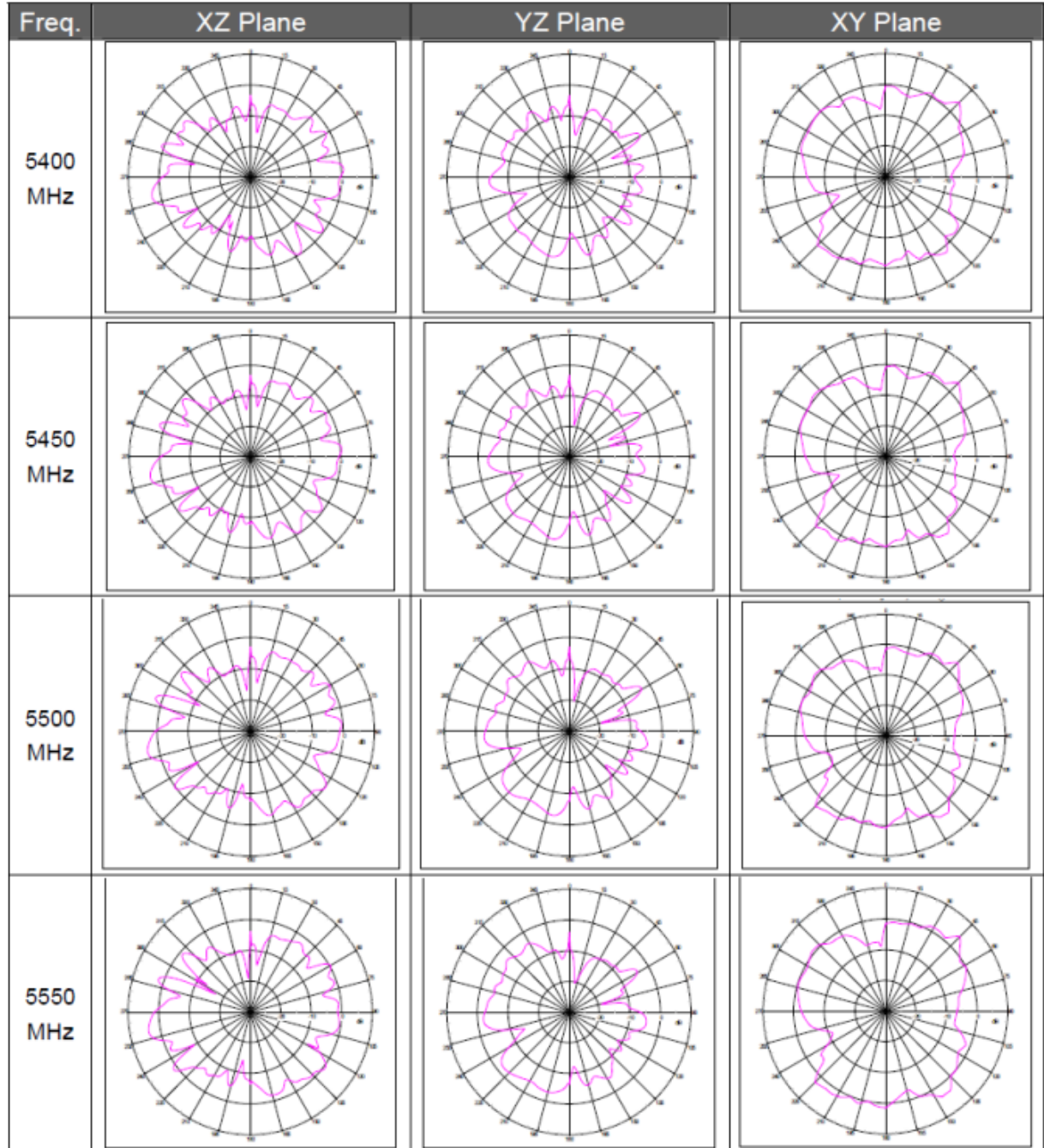
Wi-Fi Antenna Radiation Patterns (con.)

Measured with glass

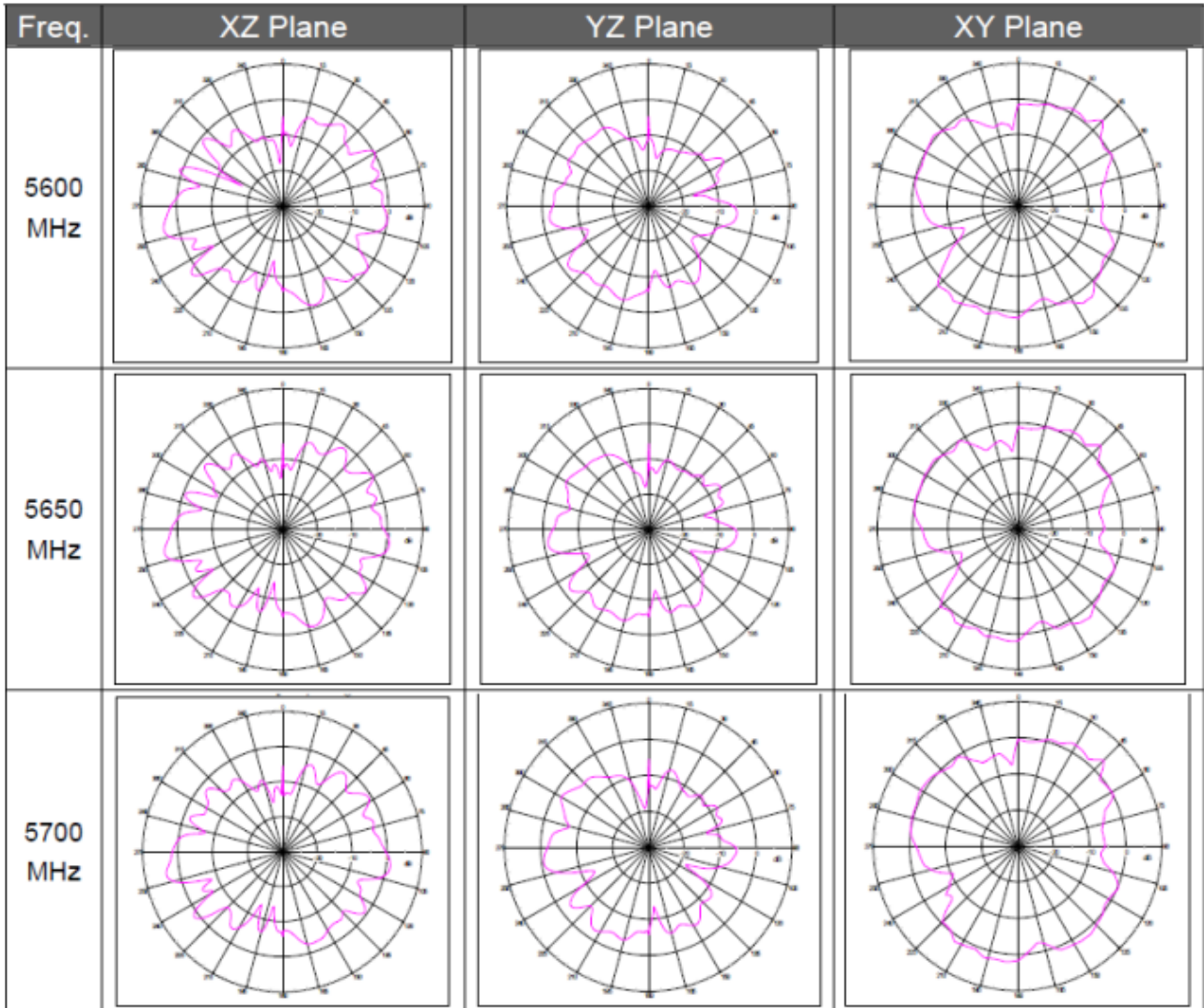


Wi-Fi Antenna Radiation Patterns (con.)

Measured with glass

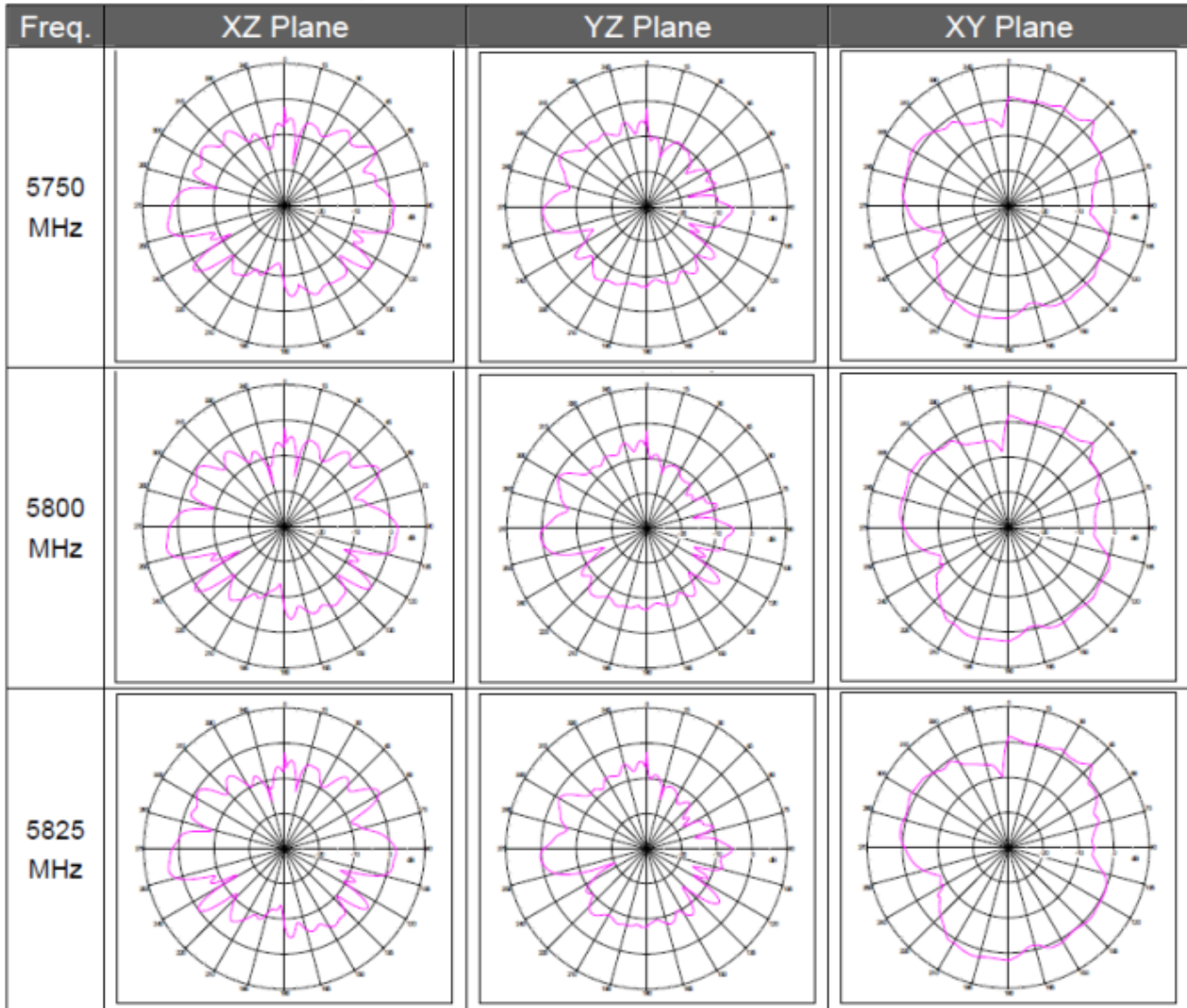


Wi-Fi Antenna Radiation Patterns (con.)
 Measured with glass

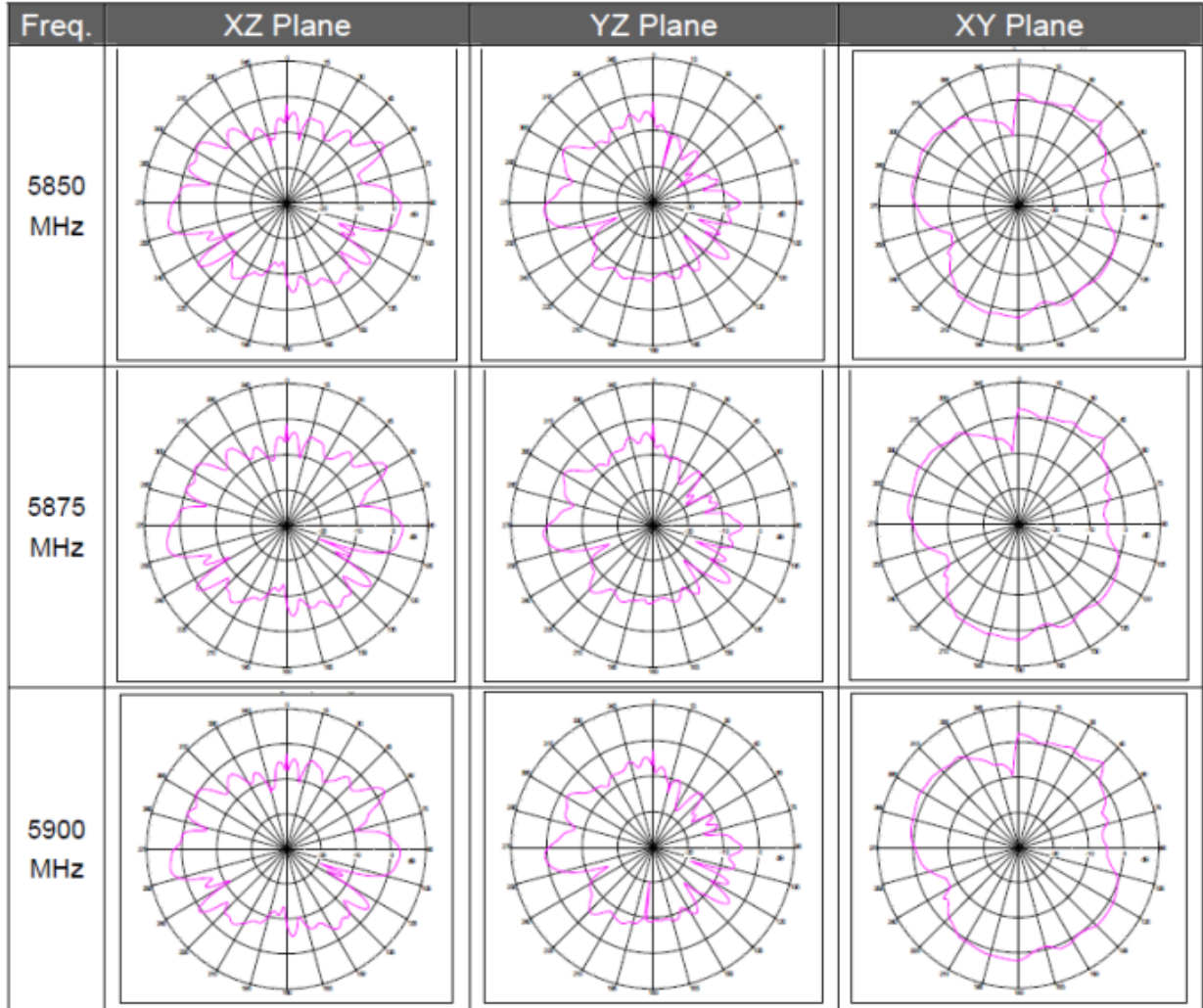


Wi-Fi Antenna Radiation Patterns (con.)

Measured with glass

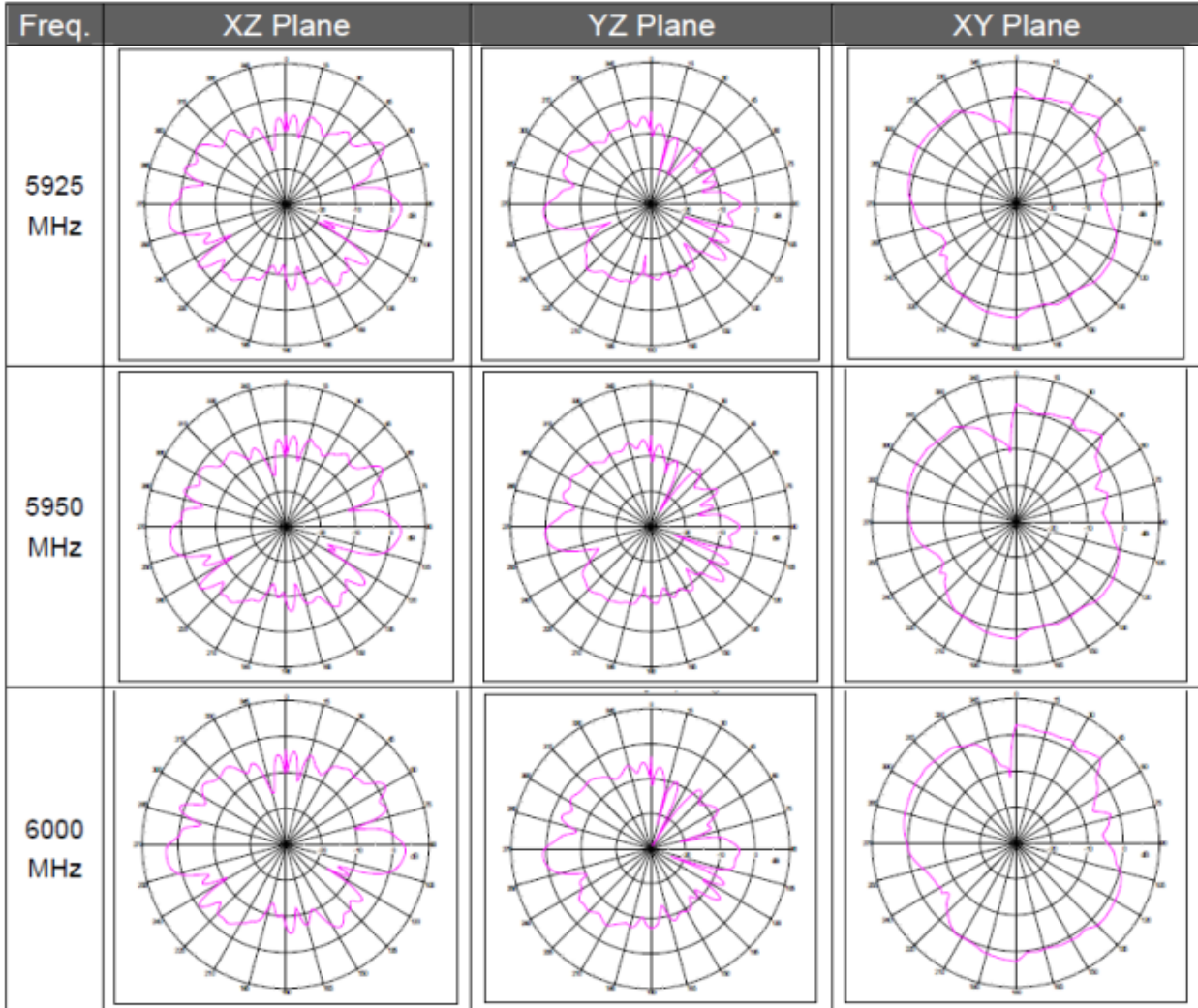


Wi-Fi Antenna Radiation Patterns (con.)
 Measured with glass

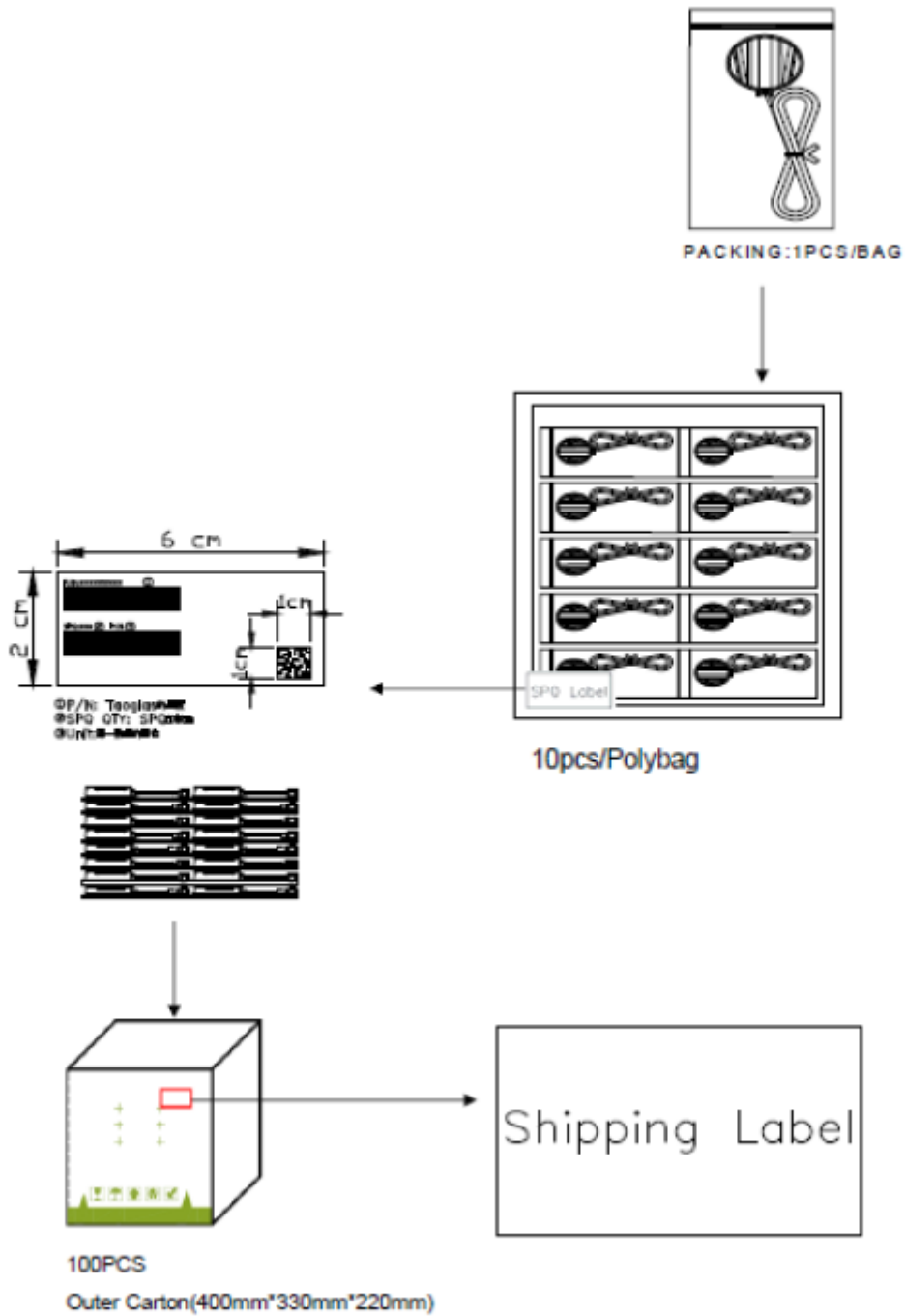


Wi-Fi Antenna Radiation Patterns (con.)

(Measured with glass)



5. Packaging





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