



TAOGLAS®



Datasheet

Levity Series

Part No:
AHP24510.07.0100C

Description

Active L1/L2/L-Band GNSS Antenna
45x45x10mm Dual Feed Stacked Patch

Features:

L1, L2, L-Band GNSS Bands Covered
Ceramic Patch Element
Cable: 100mm \varnothing 1.37
Connector: IPEX MHFI (U.FL)
Patch Dimensions: 45x45x10mm
Overall Dimensions: 60x60x15mm
RoHS & Reach Compliant



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A STELIAU TECHNOLOGY COMPANY

| | | |
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1. Introduction



The Taoglas Levity Series AHP24510, is a multi-band GNSS, high-performance directional antenna for high precision GPS and BeiDou accuracy and fast positioning. It utilizes a 45*45*10mm advanced wide-band dual stacked ceramic patch antenna with optimized gain for GPS L1/L2, Galileo, GLONASS, BeiDou, and L-Band bands.

Typical Applications Include:

- Wearables
- Transportation
- Precision Agriculture
- Navigation
- Robotics
- Autonomous Vehicles

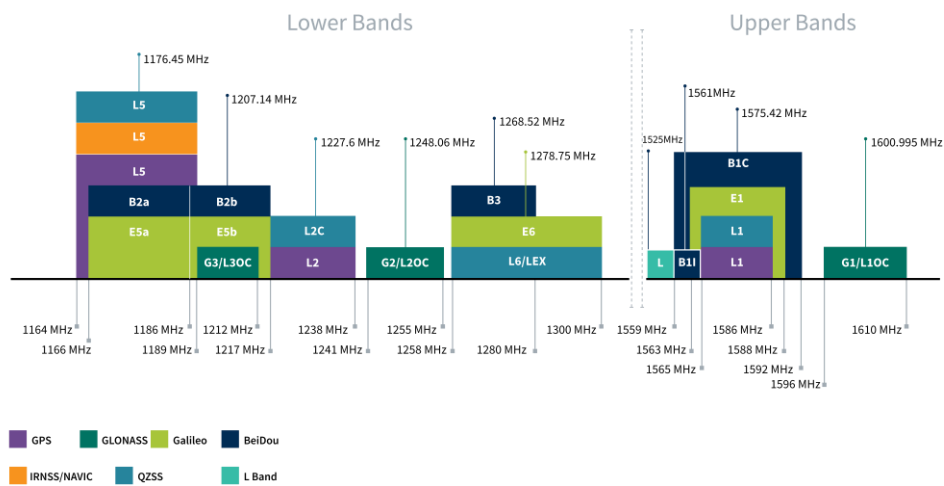
The AHP24510 has been tuned and tested on a 60 x 60 mm ground plane and exhibits excellent radiation patterns. The AHP24510 has been optimized to cover the bands required for the next generation of L1/L2 GNSS receivers that are currently on the market. It is supplied with 4 corner screw holes for easy installation in customer devices.

The AHP24510 has been designed to be a premium solution for high precision GNSS systems, by including the L-Band for High Precision GNSS correction services. The L-Band correction service is utilized in High Precision GNSS systems to decode the satellite transmission and outputs a correction stream, enabling a high precision system to reach genuine centimeter level accuracy.

The cable and connector is fully customizable, for further information please contact your regional Taoglas customer support team to request these services or additional support to integrate and test this antenna's performance in your device.

2. Specification

| GNSS Frequency Bands | | | | | |
|----------------------|-------------------------|---------------------------|--------------------|--------------------|-------------------|
| GPS | L1 1575.42 MHz | L2 1227.6 MHz | L5 1176.45 MHz | | |
| | ■ | ■ | □ | | |
| GLONASS | G1 1602 MHz | G2 1248 MHz | G3 1207 MHz | | |
| | ■ | ■ | ■ | | |
| Galileo | E1 1575.24 MHz | E5a 1176.45 MHz | E5b 1201.5 MHz | E6 1278.75 MHz | |
| | ■ | □ | ■ | □ | |
| BeiDou | B1C 1575.42 MHz | B1I 1561 MHz | B2a 1176.45 MHz | B2b 1207.14 MHz | B3 1268.52 MHz |
| | ■ | ■ | □ | ■ | □ |
| L-Band | L-Band 1542 MHz | | | | |
| | ■ | | | | |
| QZSS (Regional) | L1 1575.42 MHz | L2C 1227.6 MHz | L5 1176.45 MHz | L6 1278.75e6 | |
| | ■ | ■ | □ | □ | |
| IRNSS (Regional) | L5 1176.45 MHz | | | | |
| | □ | | | | |
| SBAS | L1/E1/B1 1575.42 MHz | L5/B2a/E5a 1176.45 MHz | G1 1602 MHz | G2 1248 MHz | G3 1207 MHz |
| | ■ | □ | ■ | ■ | ■ |



GNSS Bands and Constellations

| GNSS Electrical | | | | | | | |
|---------------------------------------|-------------|--------|-------|-----------|-------|---------|-------|
| Frequency (MHz) | 1207 | 1227.6 | 1248 | 1525-1559 | 1561 | 1575.42 | 1603 |
| VSWR (max.) | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 |
| Passive Antenna Efficiency (%) | 39.93 | 61.54 | 45.47 | 55.72 | 68.52 | 69.41 | 61.1 |
| Passive Antenna Gain at Zenith (dBic) | 1.23 | 3.48 | 2.95 | 4.01 | 4.21 | 4.43 | 4.27 |
| Axial Ratio (dB) | 1.84 | 0.54 | 1.31 | 0.5 | 0.7 | 0.84 | 0.95 |
| PCO (cm) | 3.4 | 3.4 | 3.0 | 1.9 | 1.9 | 2.0 | 2.2 |
| PCV (cm) | 0.6 | 0.6 | 0.6 | 0.3 | 0.2 | 0.2 | 0.2 |
| Group Delay Mean (ns) | 11.58 | 12.94 | 13.58 | 10.29 | 10.98 | 11.01 | 11.11 |
| Group Delay Variation (ns) | 3 | 6 | 3 | 0 | 1 | 2 | 0 |
| Polarization | RHCP | | | | | | |
| Radiation Pattern | Directional | | | | | | |
| Impedance | 50 Ω | | | | | | |

*Tested on a 60x60mm Ground plane

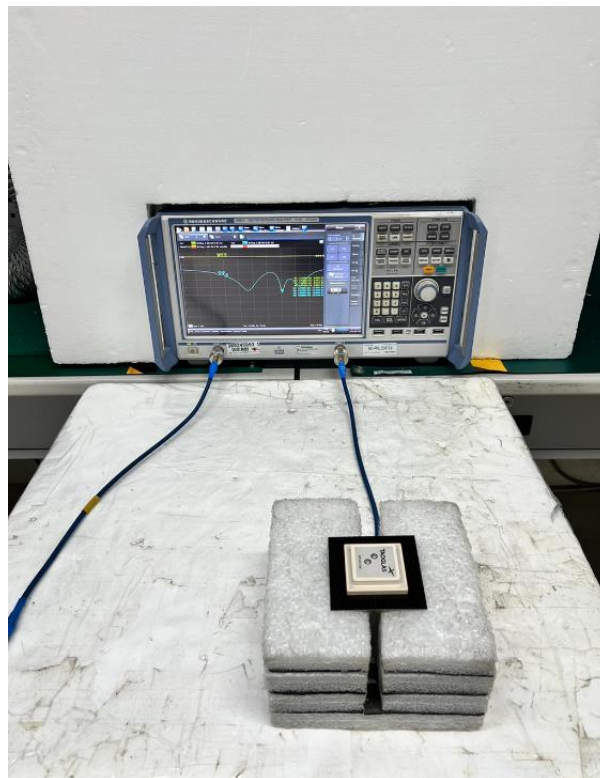
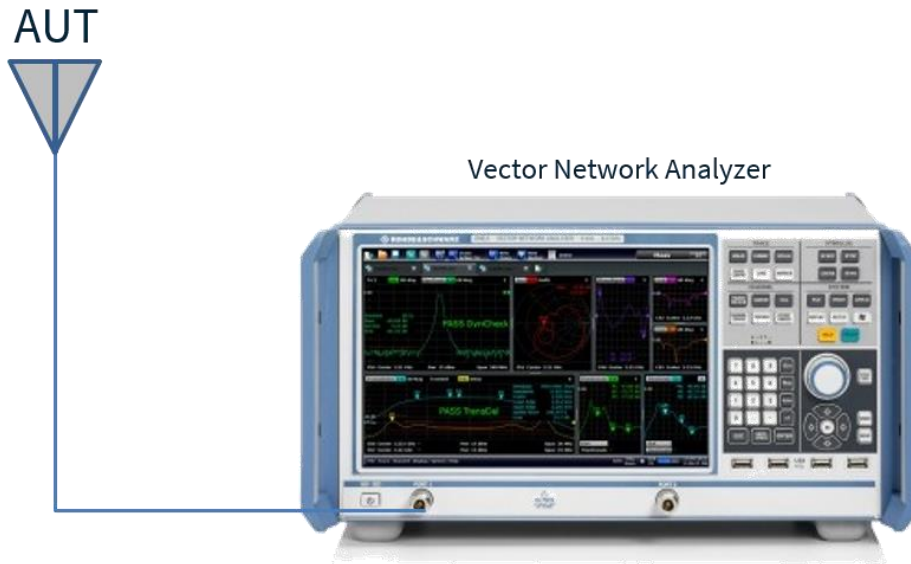
| LNA and Filter Electrical Properties | | | | | | | |
|--------------------------------------|-------------------|--------|------|-----------|------|---------|------|
| Frequency (MHz) | 1207 | 1227.6 | 1248 | 1525-1559 | 1561 | 1575.42 | 1603 |
| Noise Figure (dB) | 2.0 | 2.3 | 2.4 | 2.4 | 2.1 | 1.8 | 2.3 |
| Gain (dB) | 29.2 | 29.4 | 28.6 | 28.8 | 28.5 | 28.3 | 26.9 |
| Input Voltage (V) | + 1.8 to 5.5 | | | | | | |
| Current consumption (mA) | 18 \pm 3 | | | | | | |
| Outer Band Attenuation (dB) | > 65dB @ LTE Band | | | | | | |

| Mechanical | |
|--|----------------------|
| Dimensions | 45x45x10mm |
| Total Dimension (Including Shielding Case) | 60x60x15mm |
| Connector | IPEX MHFI (U.FL) |
| Cable | 1.37mm Coaxial Cable |
| Material | Ceramic |
| Weight | 70g |

| Environmental | |
|---------------------|----------------------------|
| Temperature Range | -40°C to 85°C |
| Storage Temperature | -40°C to 85°C |
| Humidity | Non-condensing 65°C 95% RH |

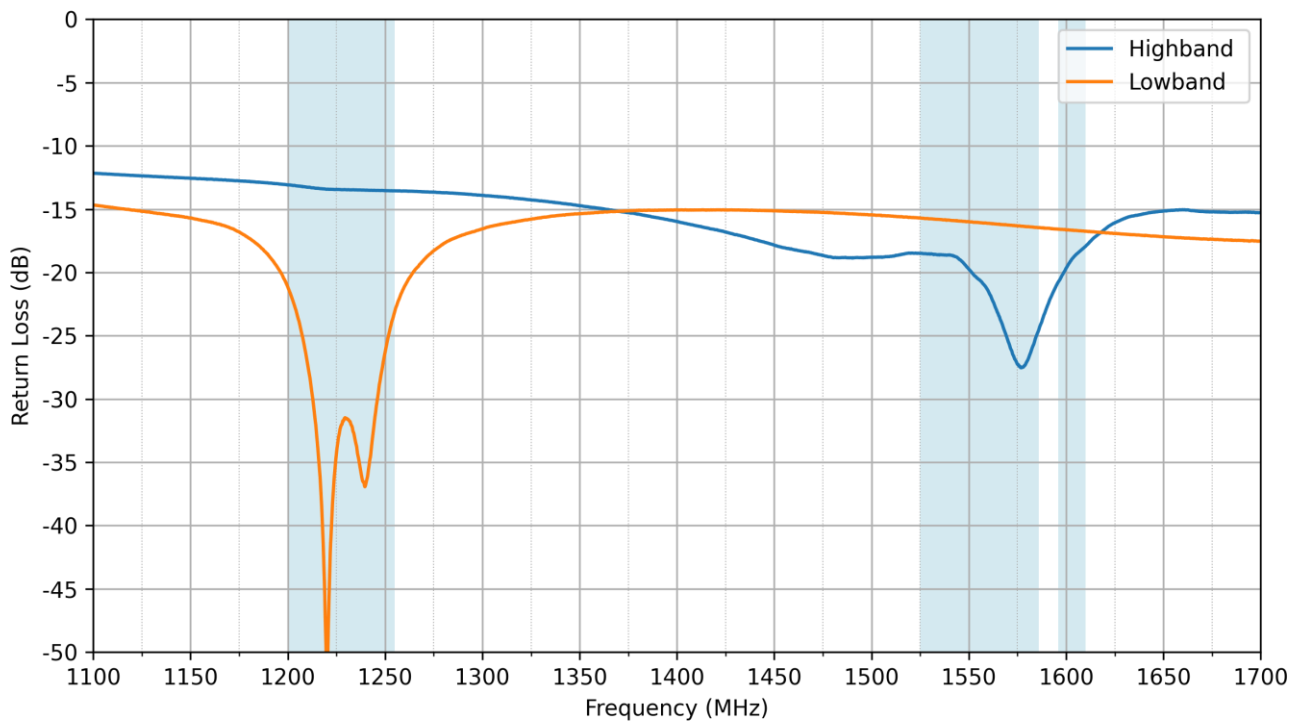
3. Antenna Characteristics

3.1 Test Setup

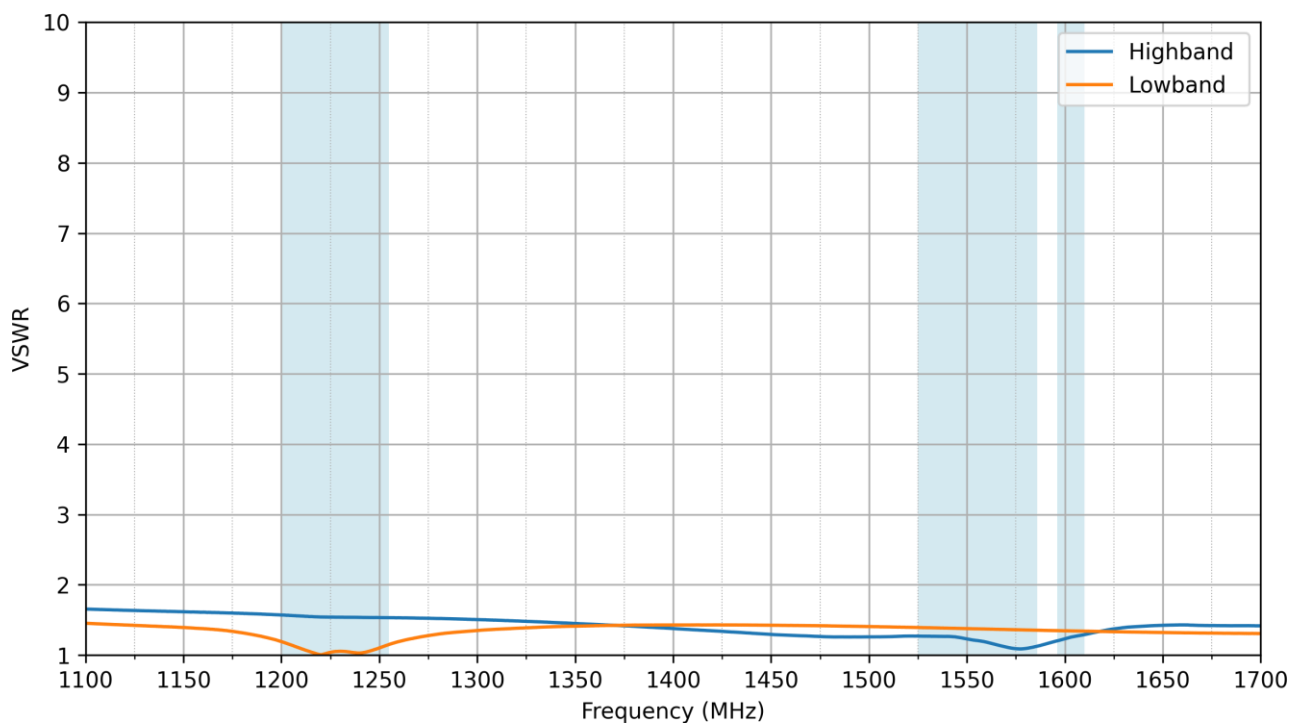


VNA Test Setup – Tested on 60x60mm Evaluation Board.

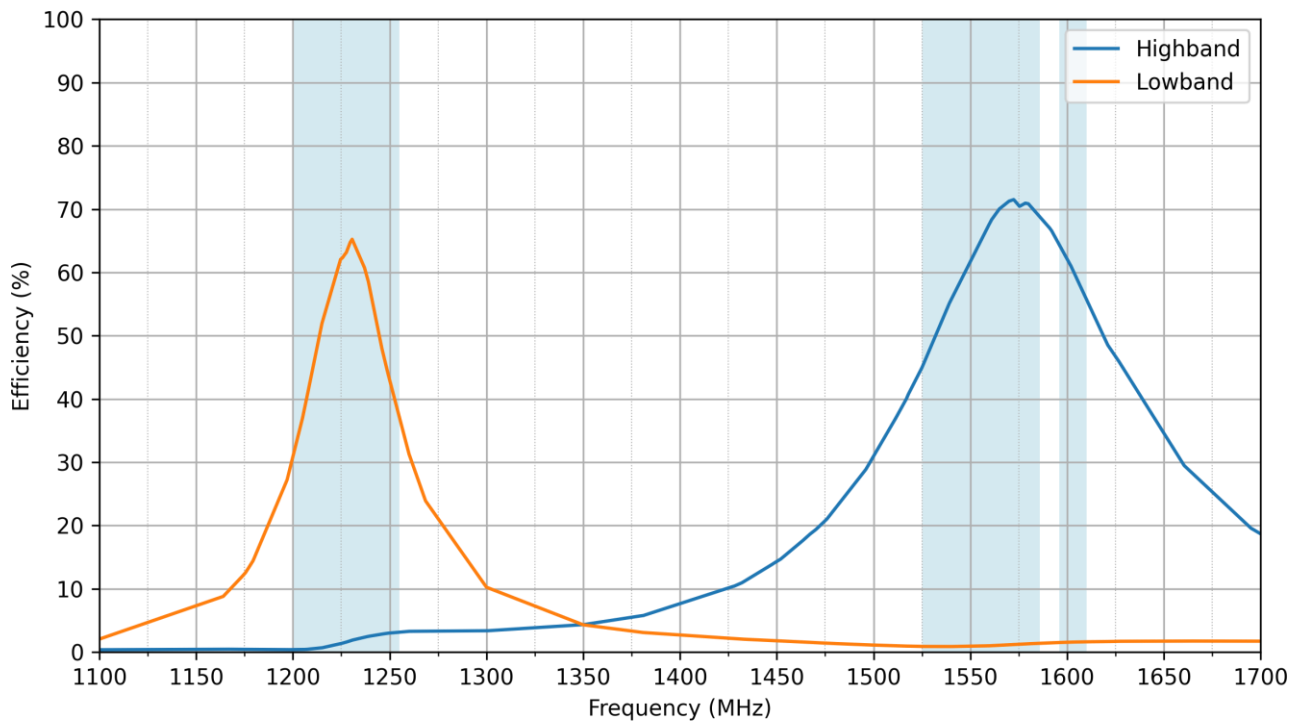
3.2 Return Loss



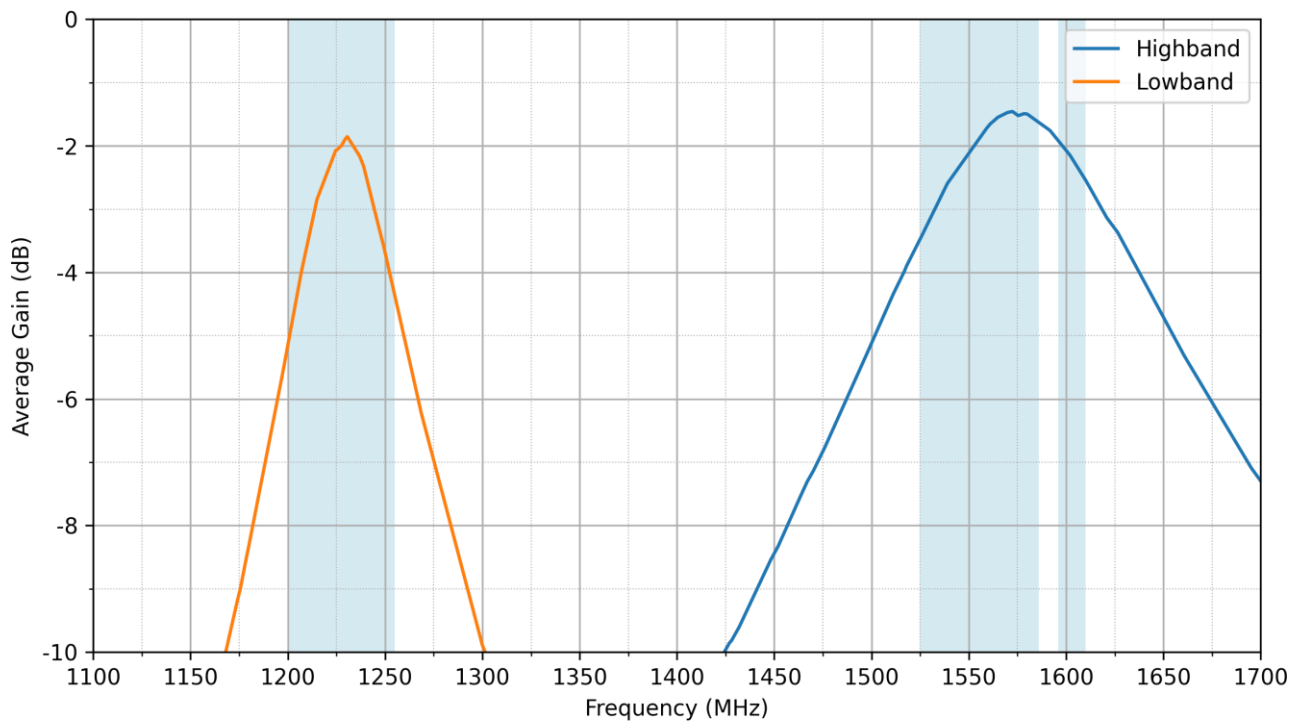
3.3 VSWR



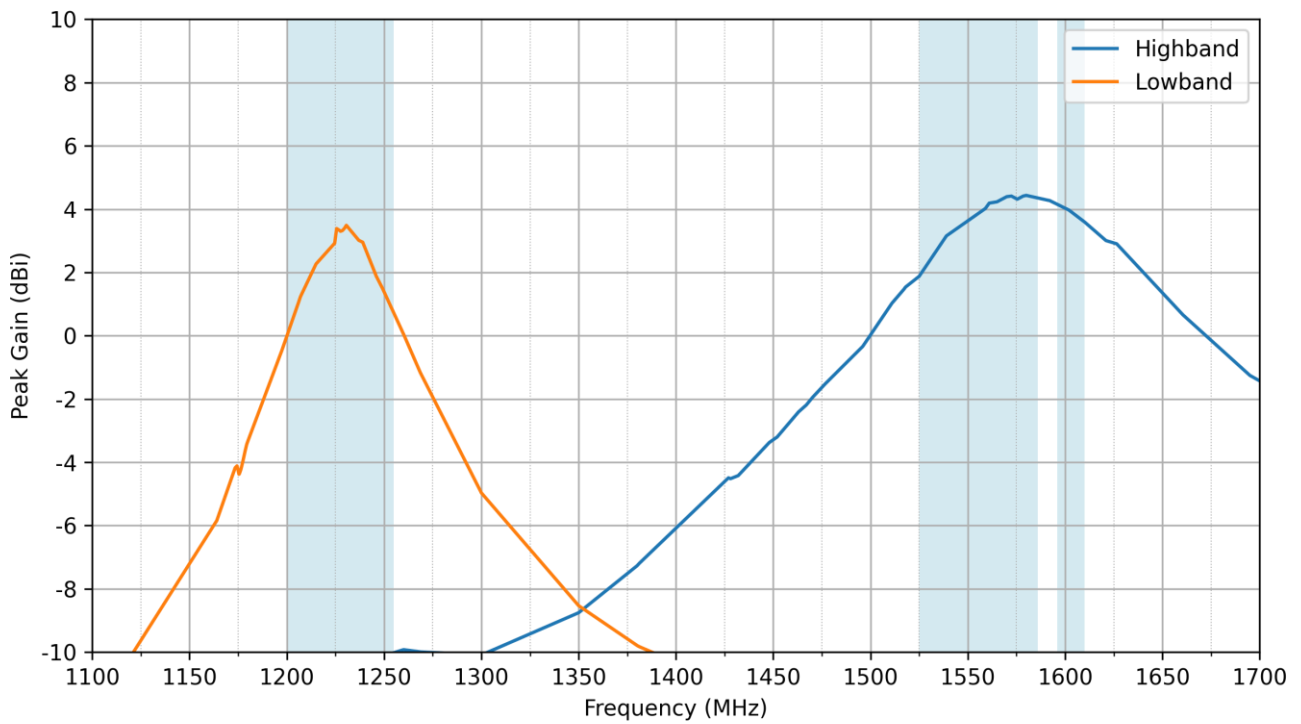
3.4 Efficiency



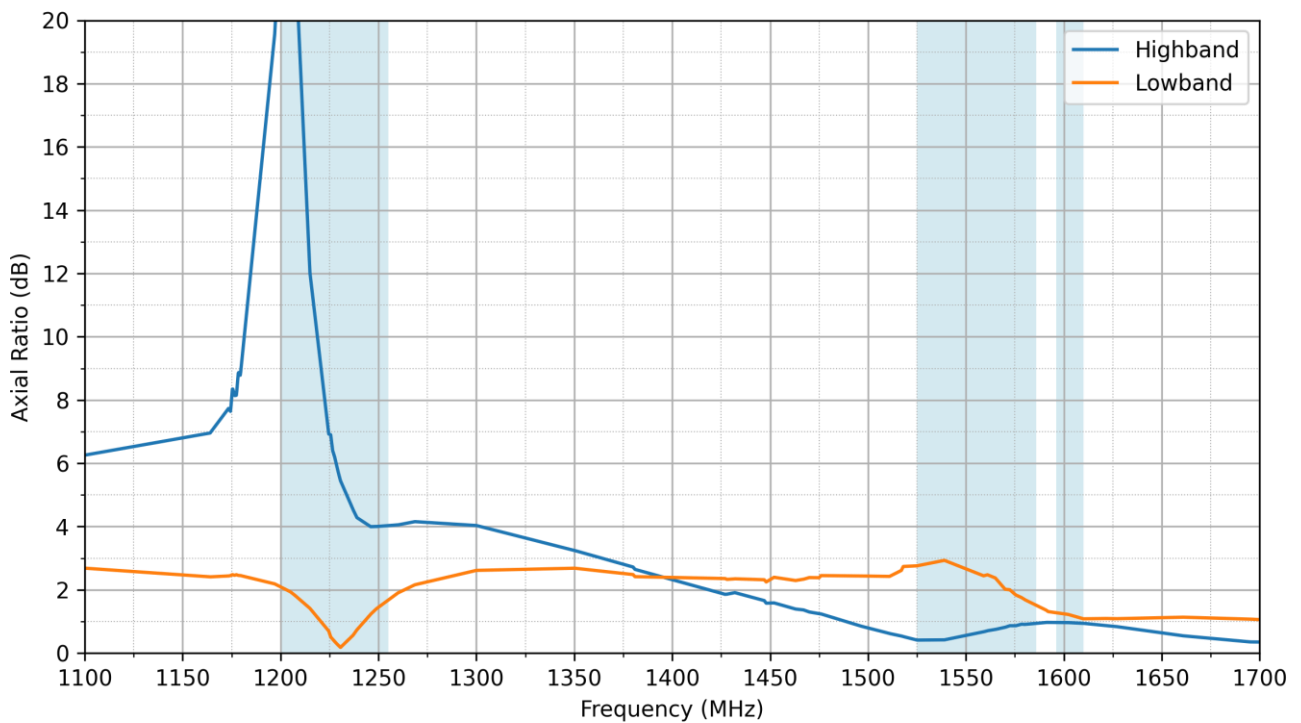
3.5 Average Gain



3.6 Peak Gain

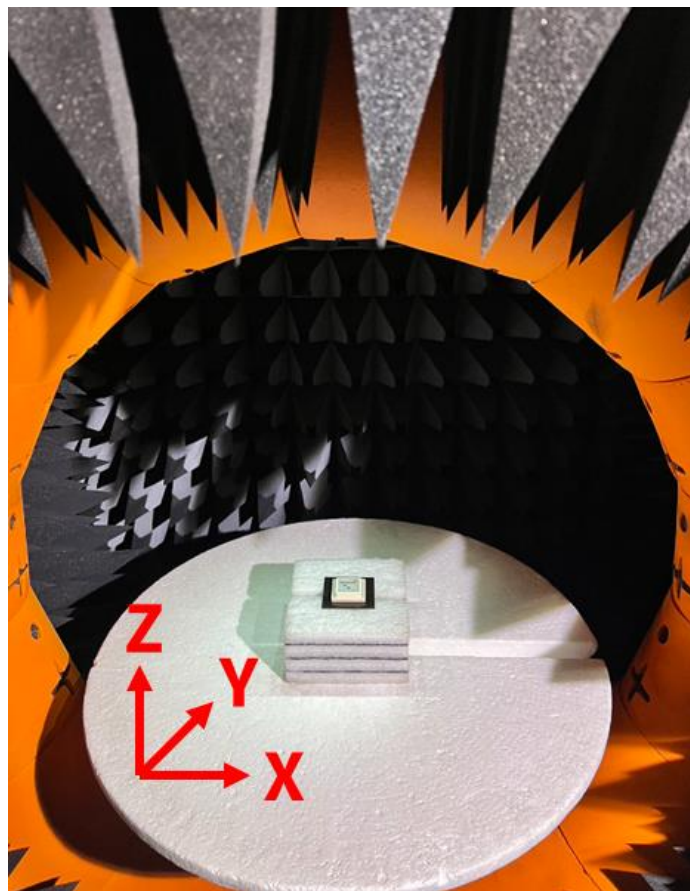
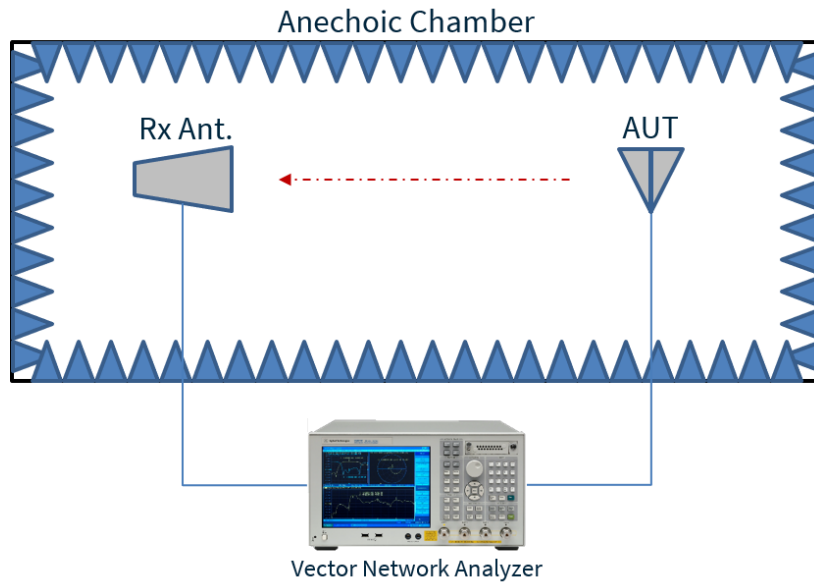


3.7 Axial Ratio



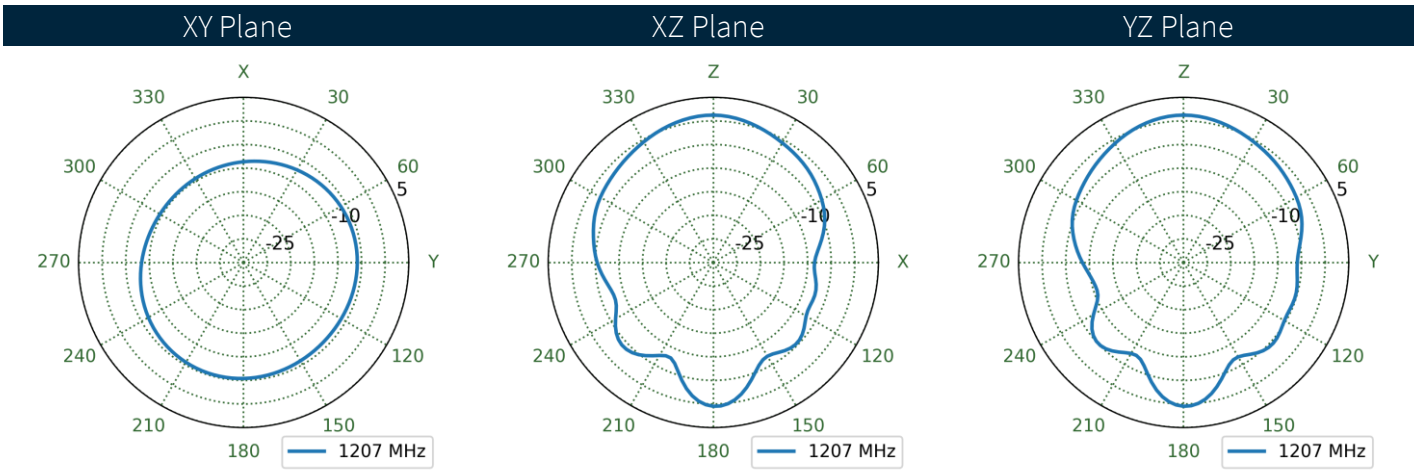
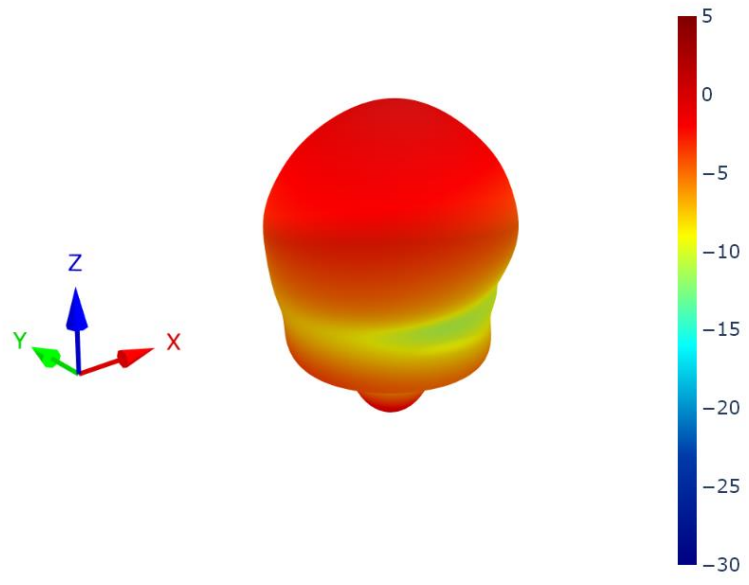
4. Radiation Patterns

4.1 Test Setup

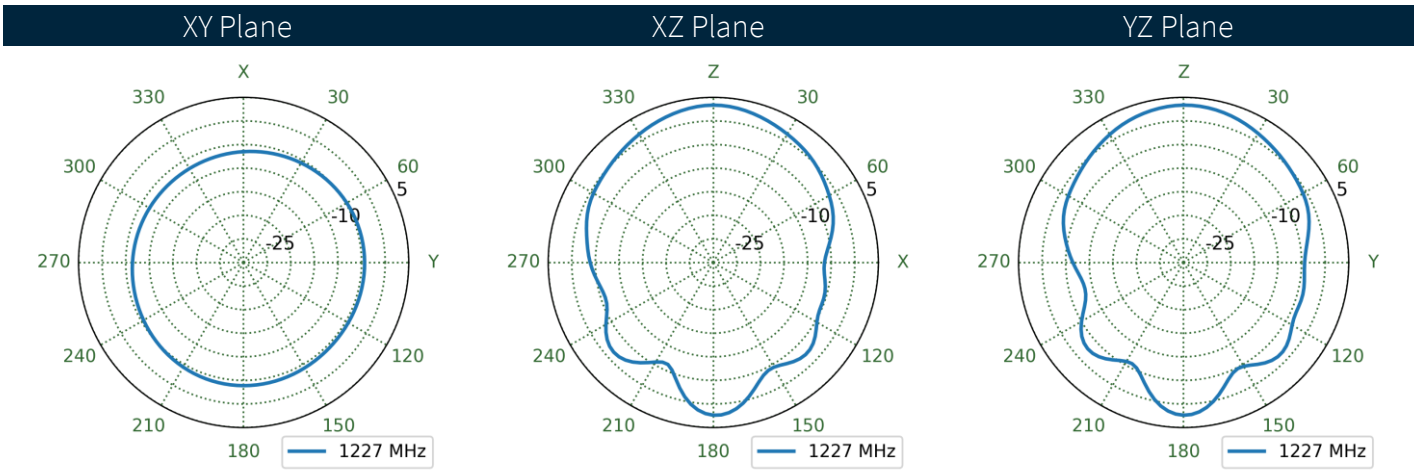
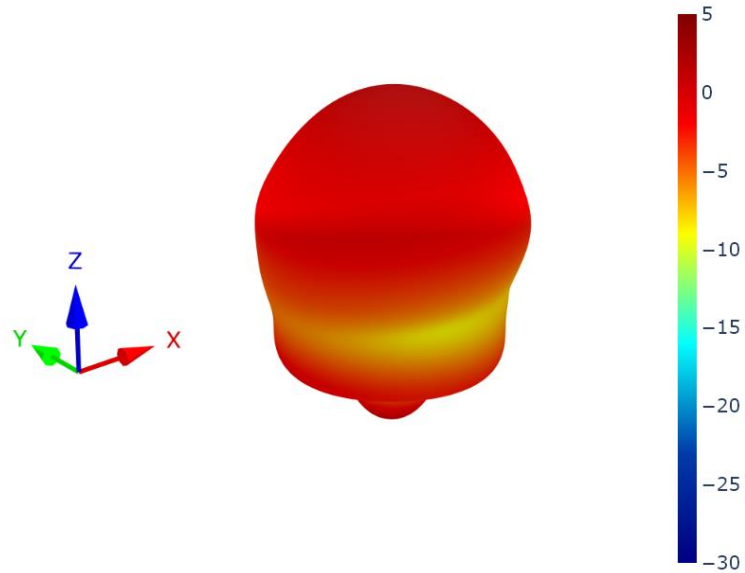


Chamber Test Setup – Tested on 70x70mm Evaluation Board.

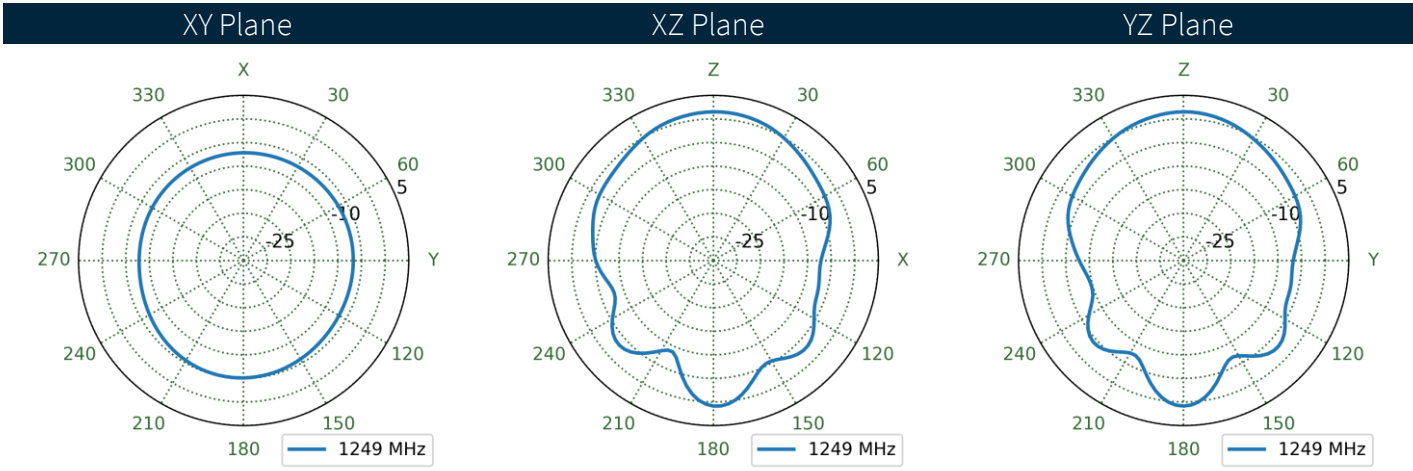
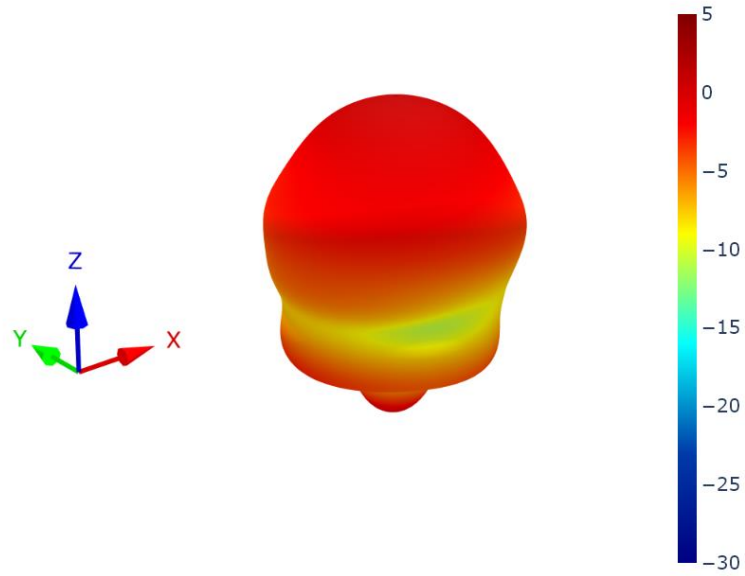
4.2 Patterns at 1207 MHz



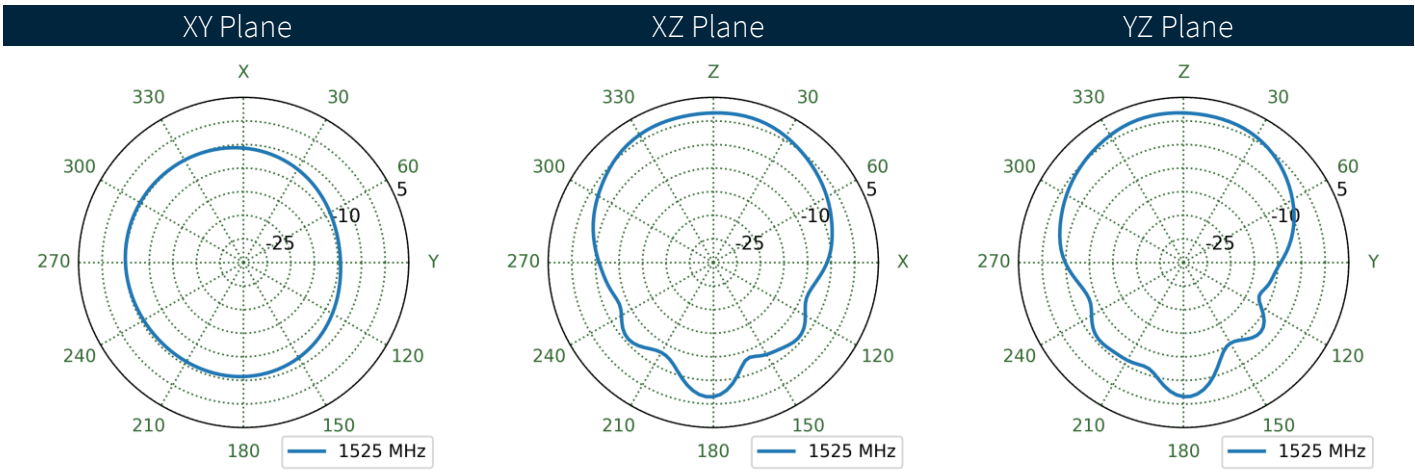
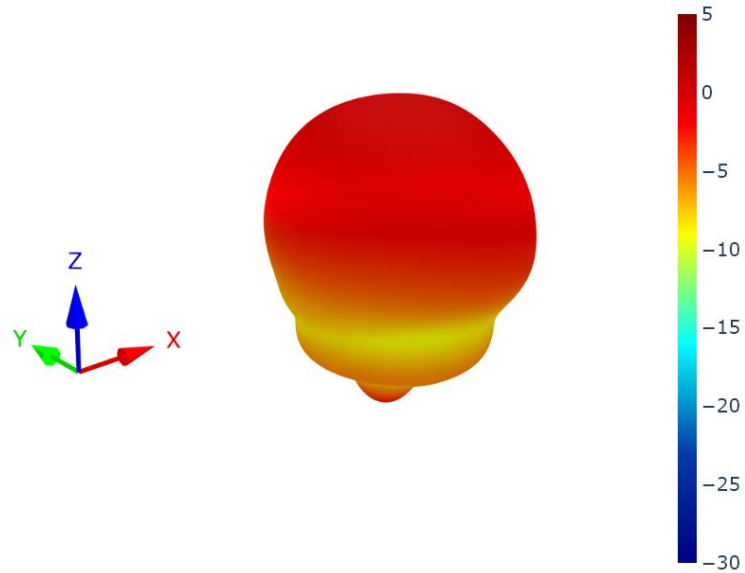
4.3 Patterns at 1227 MHz



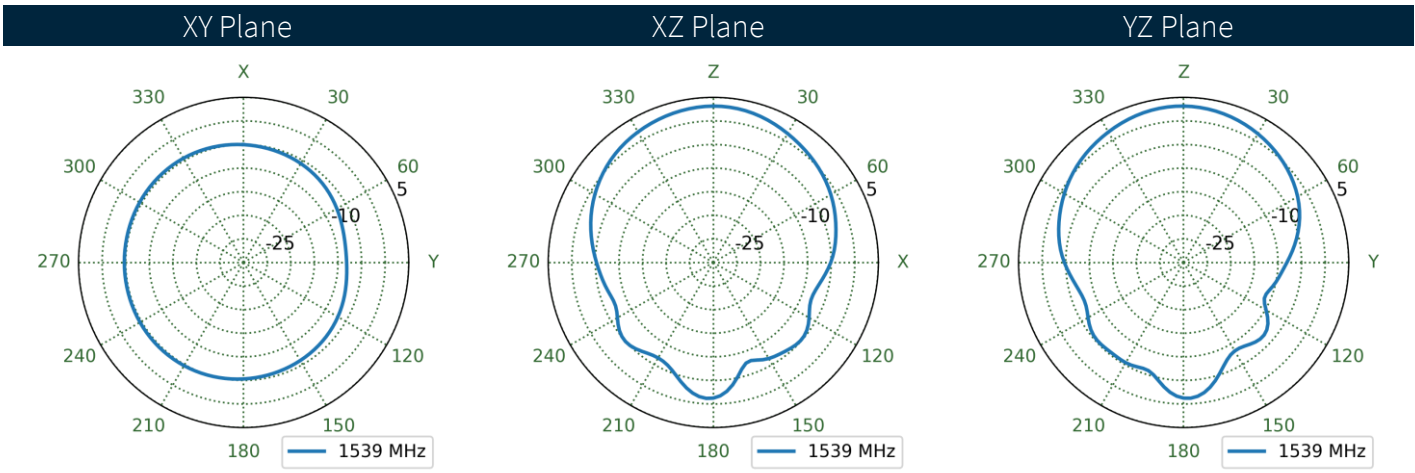
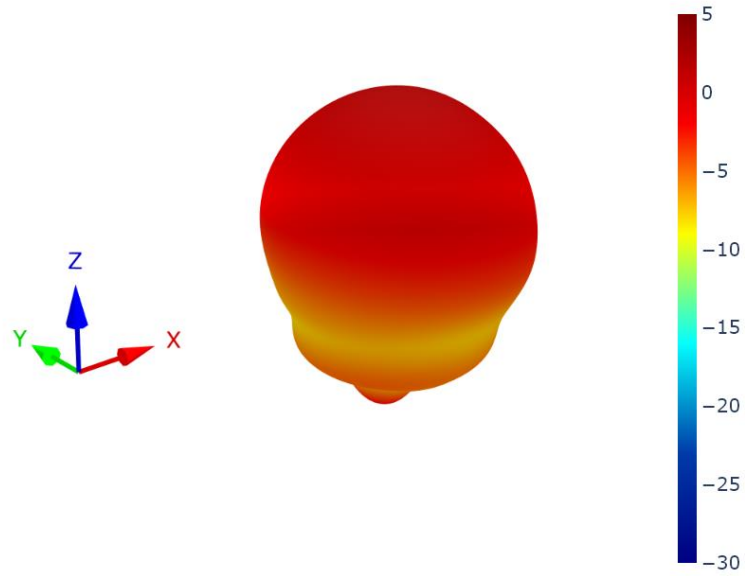
4.4 Patterns at 1249 MHz



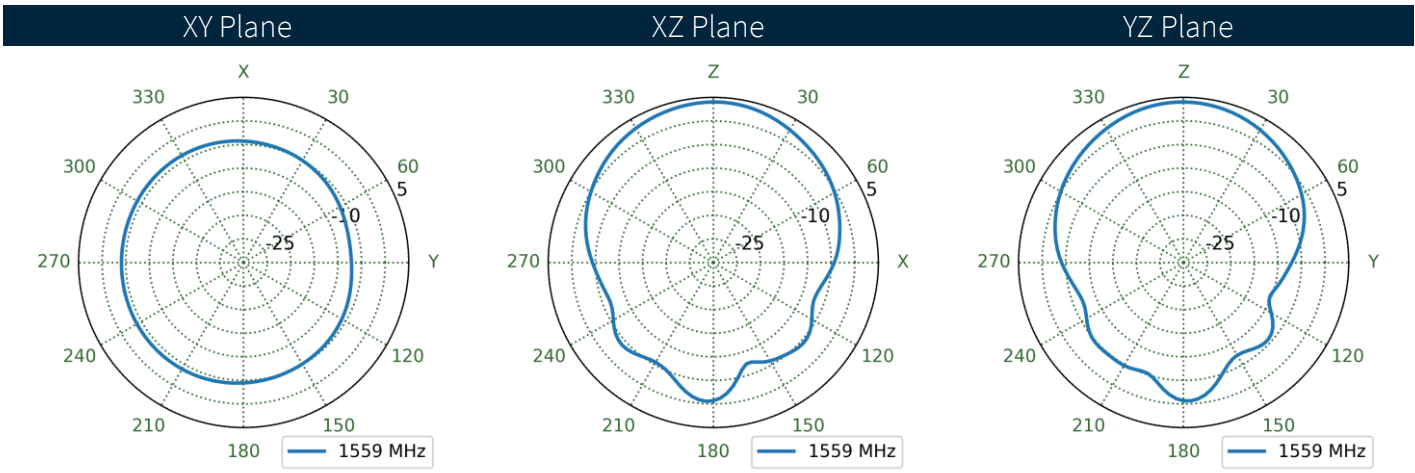
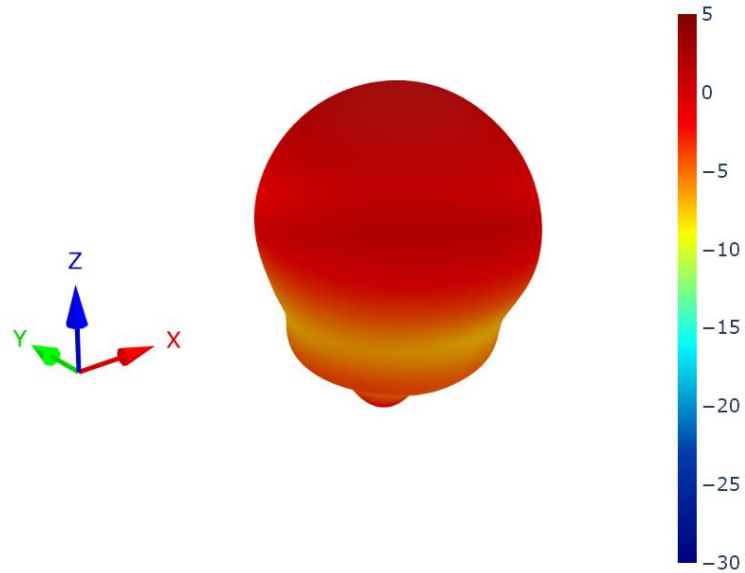
4.5 Patterns at 1525 MHz



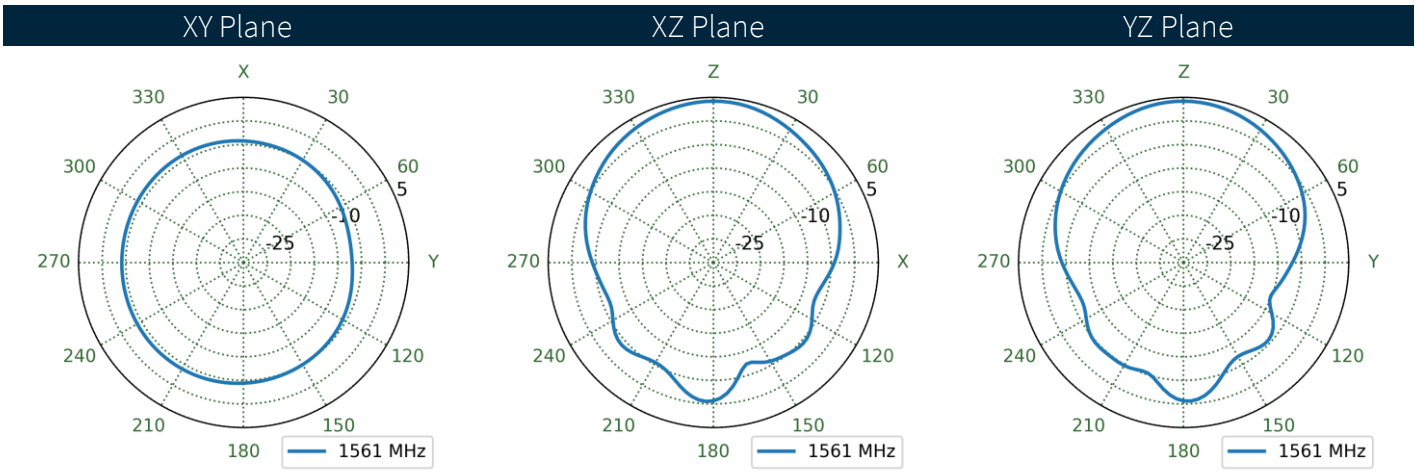
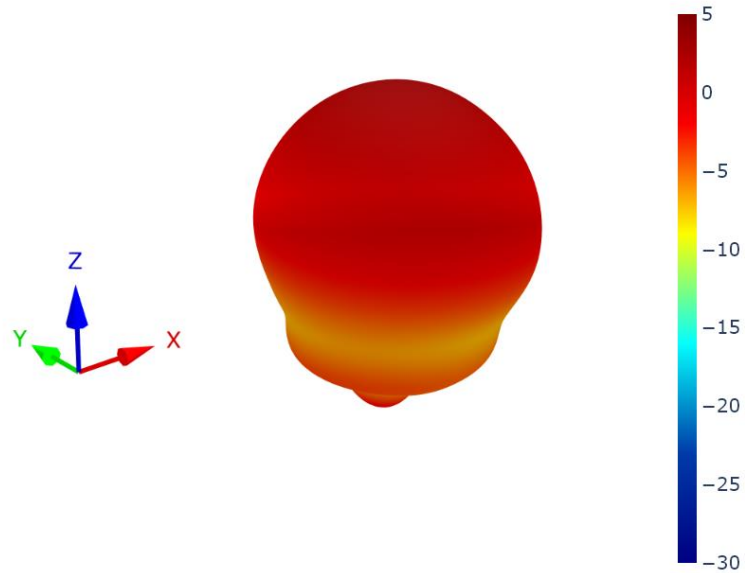
4.6 Patterns at 1539 MHz



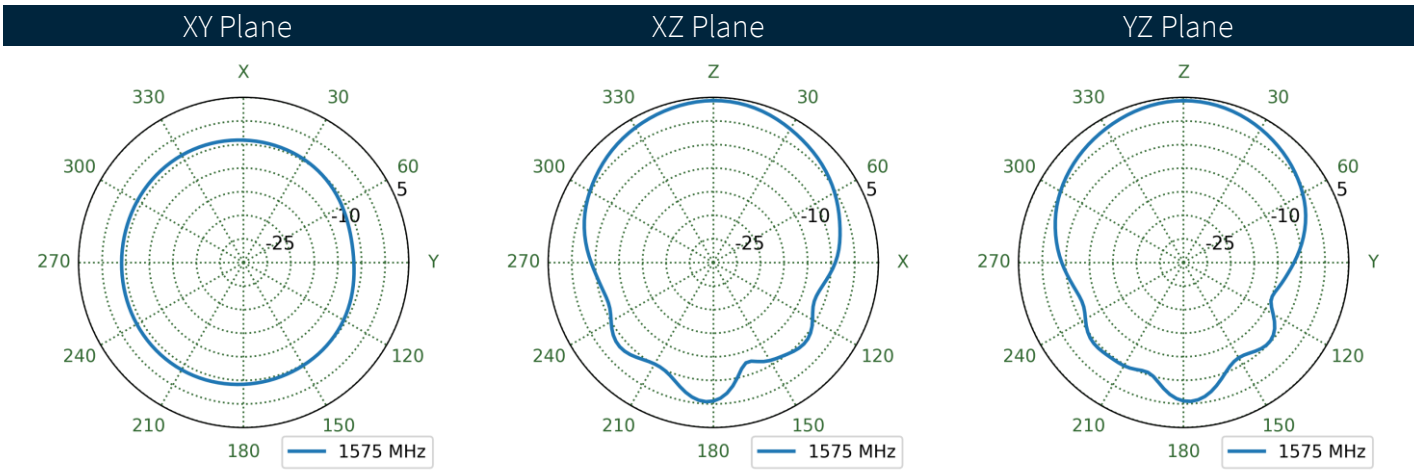
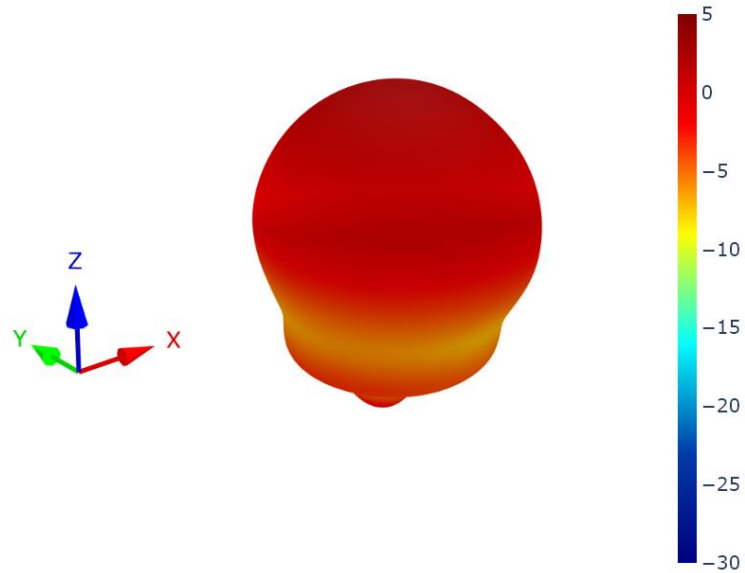
4.7 Patterns at 1559 MHz



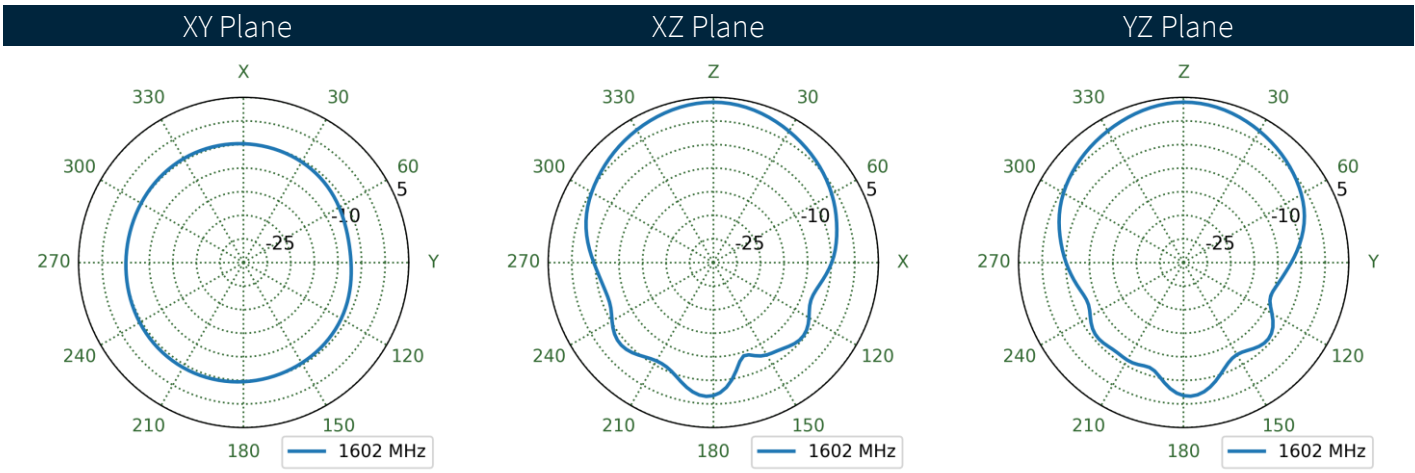
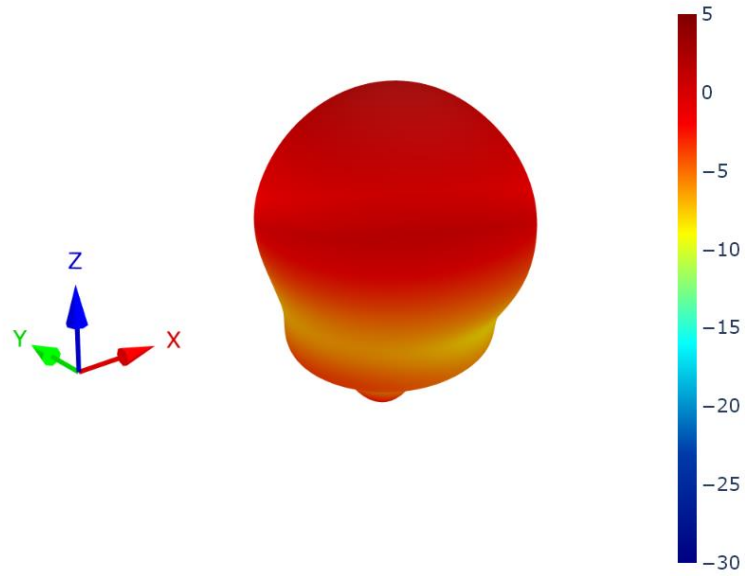
4.8 Patterns at 1561 MHz



4.9 Patterns at 1575 MHz

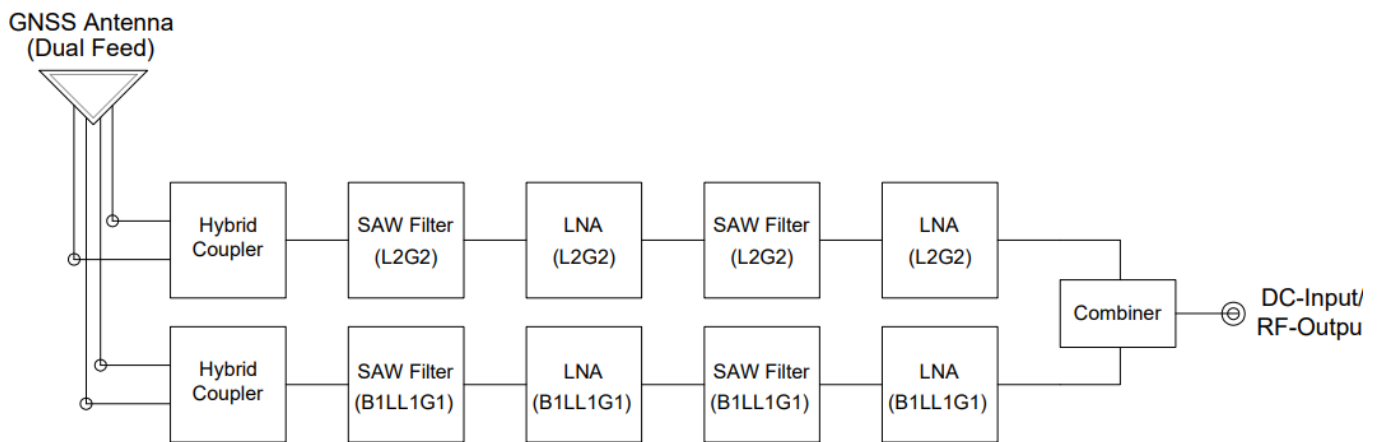


4.10 Patterns at 1602 MHz

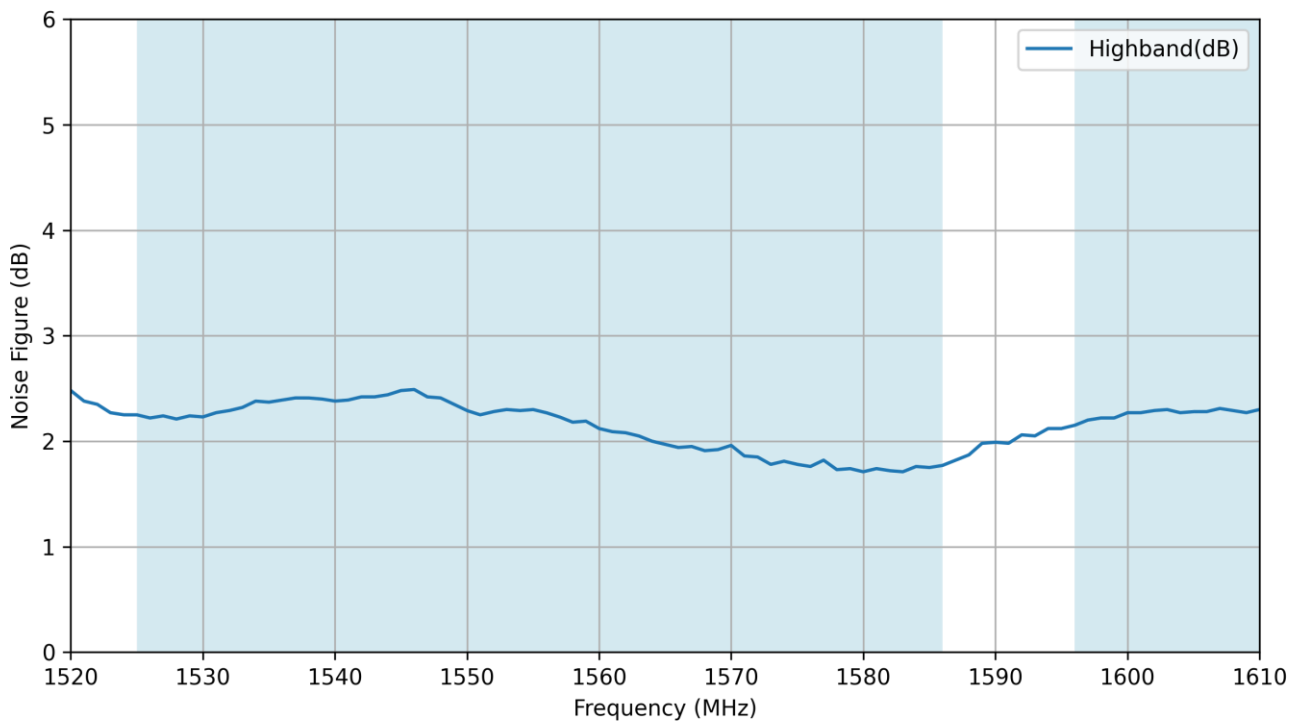
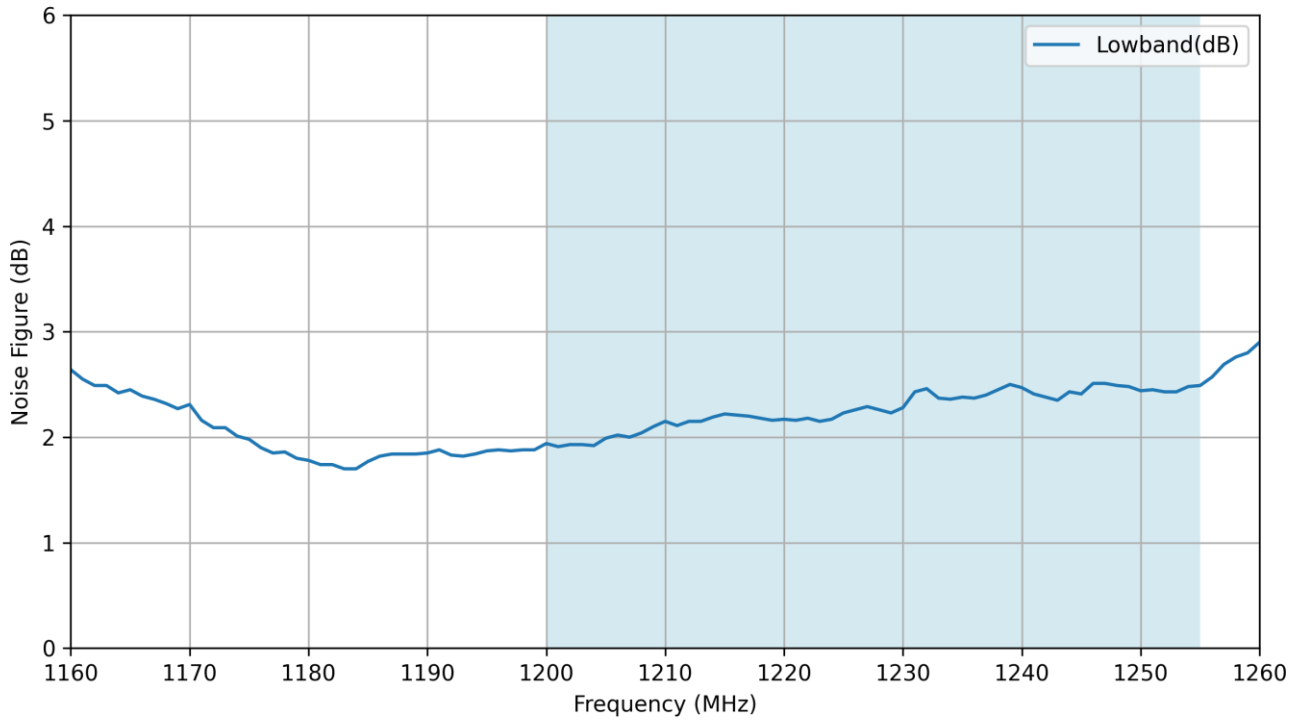


5. LNA Characteristics

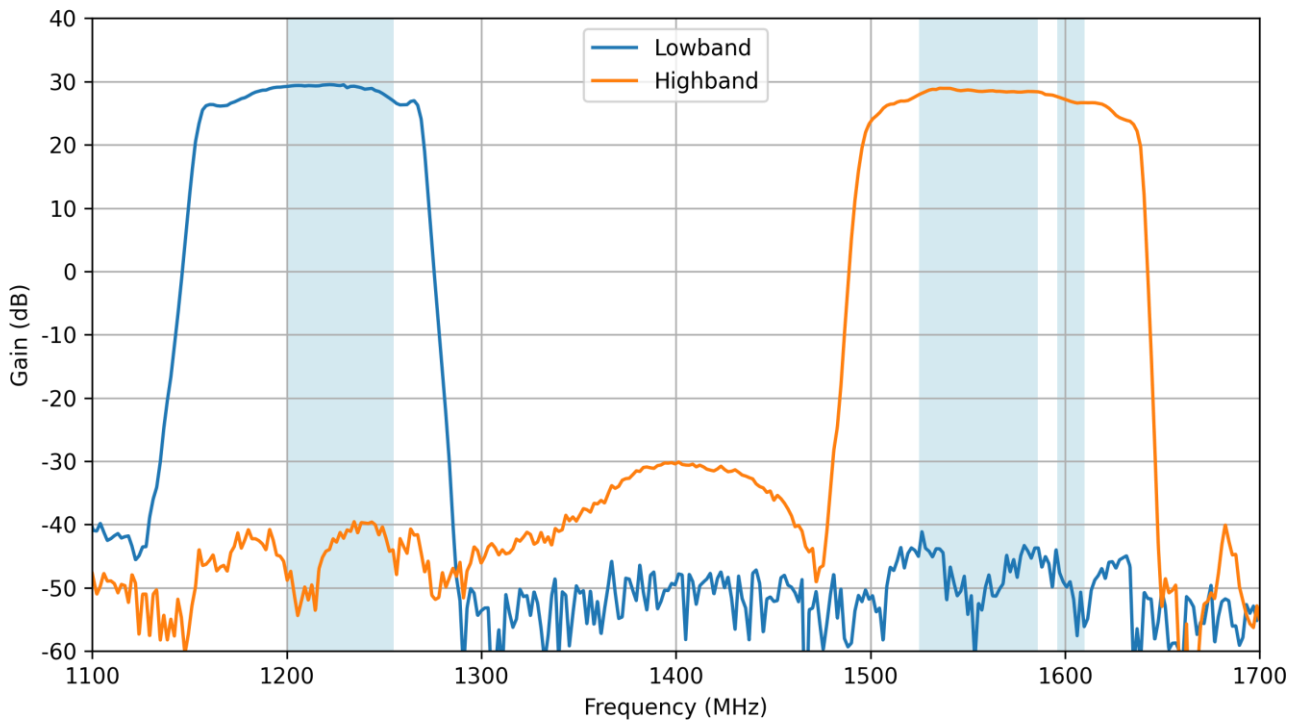
5.1 Block Diagram



5.2 Noise Figure

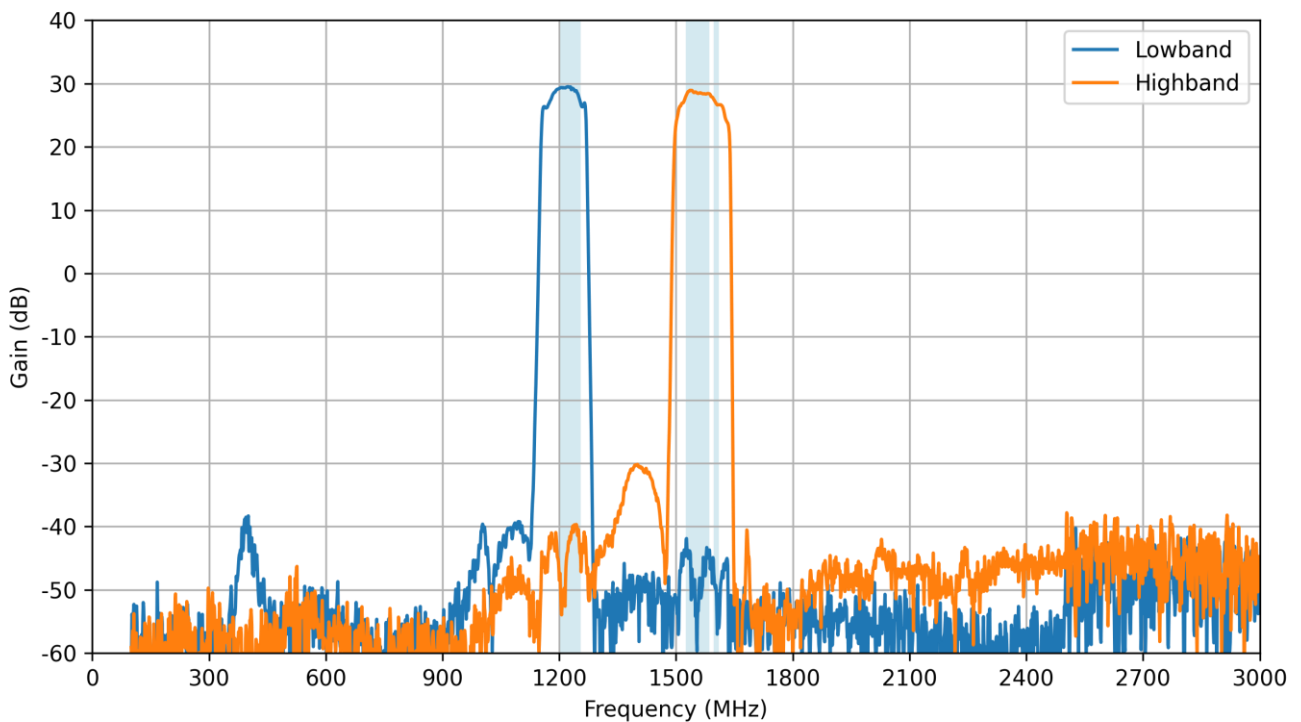


5.3 LNA Gain

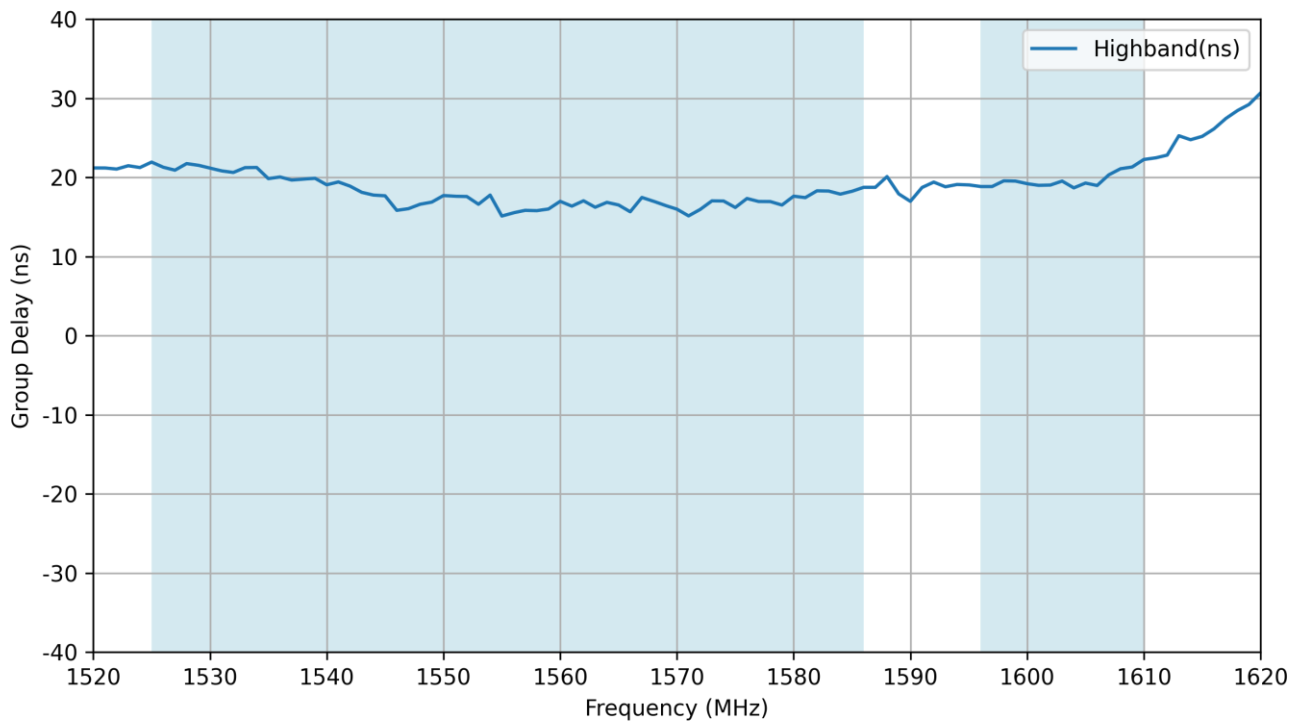
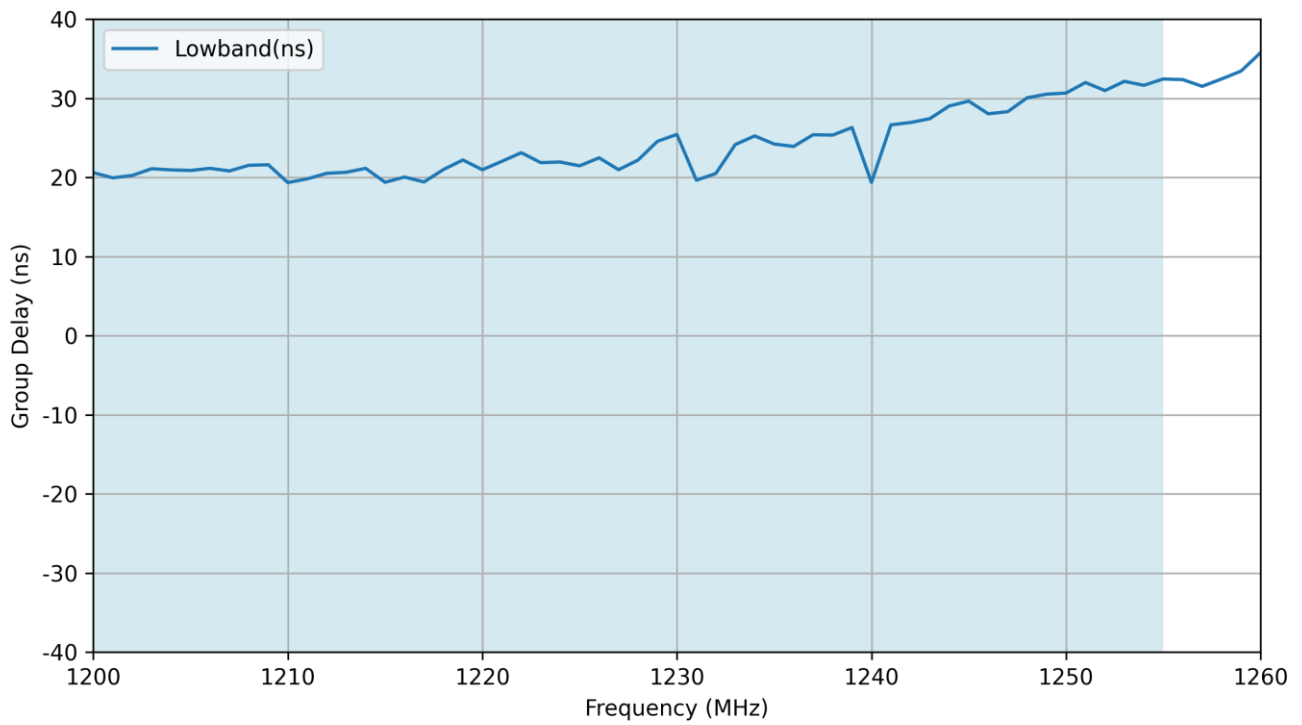


100

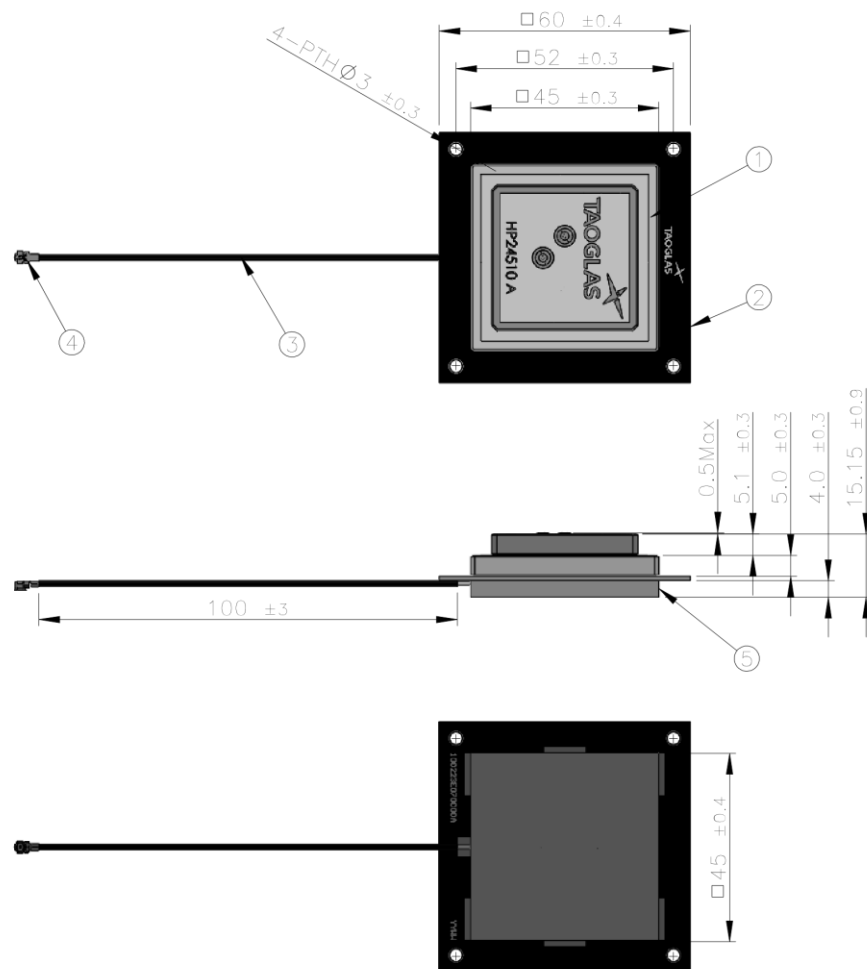
5.4 Out-band rejection



5.5 Group Delay



6. Mechanical Drawing



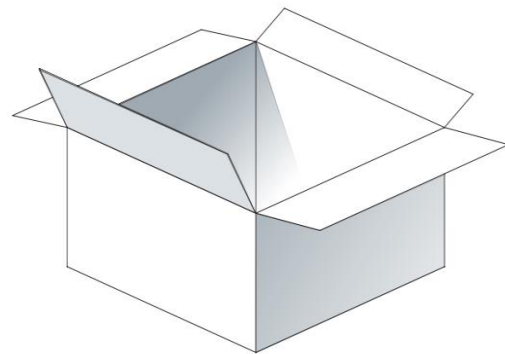
| | Name | Material | Finish | QTY |
|---|--------------------|--------------|---------------|-----|
| 1 | Patch | Ceramic | Reddish Brown | 1 |
| 2 | PCB | Composite 1t | Black | 1 |
| 3 | 1.37 Coaxial Cable | FBP | Black | 1 |
| 4 | IPEX MHHT | Brass | Au Plated | 1 |
| 5 | Shielding Case | SPTe | Sn Plated | 1 |

7. Packaging

1 PCS AHP24510 per PE Bag



60pcs AHP24510 per Carton
Dimensions: 390x320x290 mm



Changelog for the datasheet

SPE-23-8-279– AHP24510.07.0100C

Revision: D (Current Version)

| | |
|------------------|---|
| Date: | 2024-12-11 |
| Changes: | Added Levity Series to datasheet description. |
| Changes Made by: | Conor McGrath |

Previous Revisions

Revision: C

| | |
|------------------|--|
| Date: | 2024-05-16 |
| Changes: | Updated dimensions on test set up diagram on datasheet |
| Changes Made by: | Conor McGrath |

Revision: B

| | |
|------------------|---|
| Date: | 2023-12-20 |
| Changes: | Updated datasheet to include 1207-1248MHz |
| Changes Made by: | Gary West |

Revision: A (Original First Release)

| | |
|---------|-----------------|
| Date: | 2023-09-28 |
| Notes: | Initial Release |
| Author: | Cesar Sousa |



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