



Antenna Datasheet

Product OC: YFGC010WWA

Version: 1.0

Date: 2024-01-11

Status: Released

Product Name: Passive GNSS L1 Antenna

Key Features:

Frequency Band: 1565–1586 MHz

Dimensions: 10.2 mm × 10.2 mm × 4 mm

Efficiency: Up to 33.3 %

RoHS and REACH Compliant

Overview

This Quectel GNSS antenna adopts a diversity of forms to guarantee the most suitable polarization type. Quectel's positioning products support single-band or multi-band operation modes to meet various high-precision positioning requirements of customers' products. Quectel provides both passive and active antennas to satisfy the customer demand for high gain. Such antenna supports different installation or connection methods such as pin mount, surface mount, magnetic mount, internal cable, and external SMA. Customized connector type and cable length are provided according to requirements.

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1 Specification

Test Condition: on 50 mm × 50 mm PCB

1.1. Electrical

| Electrical | |
|-------------------|---------------|
| Frequency Range | 1565–1586 MHz |
| Impedance | 50 Ω |
| Polarization | RHCP |
| Radiation Pattern | Directional |

| Band Frequency (MHz) | GPS L5 GALILEO E5a BEIDOU B2a-B2I QZSS L5 IRNSS L5 | GALILEO E5b BEIDOU B2b | GPS L2 QZSS L2C | GLONASS G2 | BEIDOU B3 | BEIDOU B1I | GPS L1 GALILEO E1 BEIDOU B1C QZSS L1 | GLONASS G1 |
|----------------------------|---|---------------------------------|-----------------------|---------------|--------------|---------------|---|---------------|
| | 1176 | 1207 | 1227 | 1248 | 1268 | 1561 | 1575 | 1602 |
| VSWR | - | - | - | - | - | - | 1.1 | - |
| Return Loss (dB) | - | - | - | - | - | - | -23.6 | - |
| Efficiency (%) | - | - | - | - | - | - | 33.3 | - |
| Peak Gain (dBi) | - | - | - | - | - | - | 0.11 | - |
| Axial Ratio (dB) | - | - | - | - | - | - | 7.08 | - |

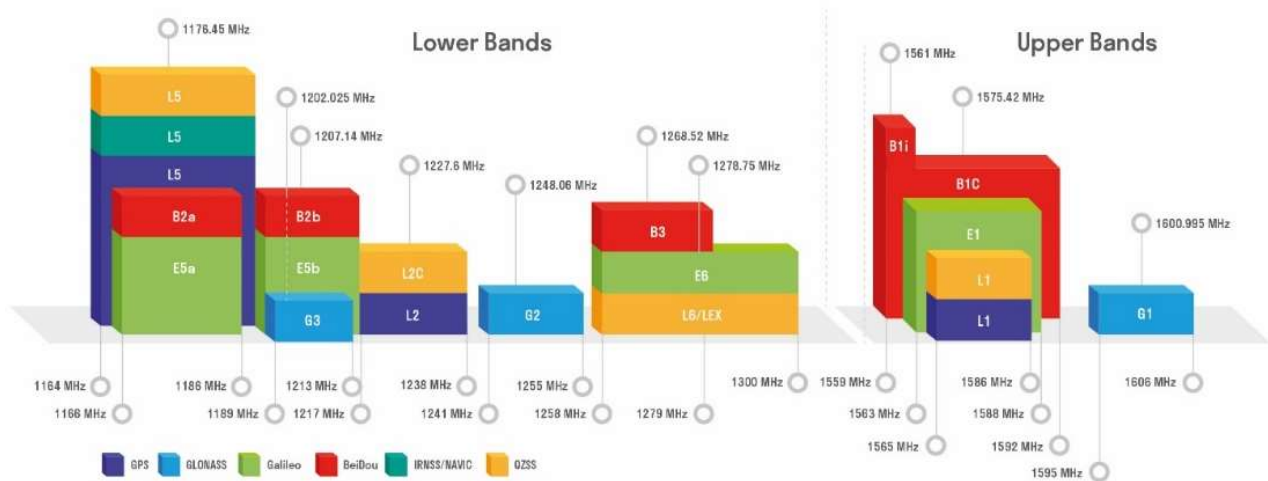
1.2. Mechanical & Environmental

| Mechanical | |
|---|--------------------------|
| Antenna Dimensions | 10.2 mm × 10.2 mm × 4 mm |
| Material | Ceramic |
| Mounting Type | Adhesive & Soldering |
| Weight | Typ. 1.8 g |
| Environmental | |
| Operation Temperature | -40 °C to +85 °C |
| Storage Temperature | -40 °C to +85 °C |
| Recommended reflow temperature and time | 260 °C & 5s |
| RoHS & REACH Compliant | Yes |

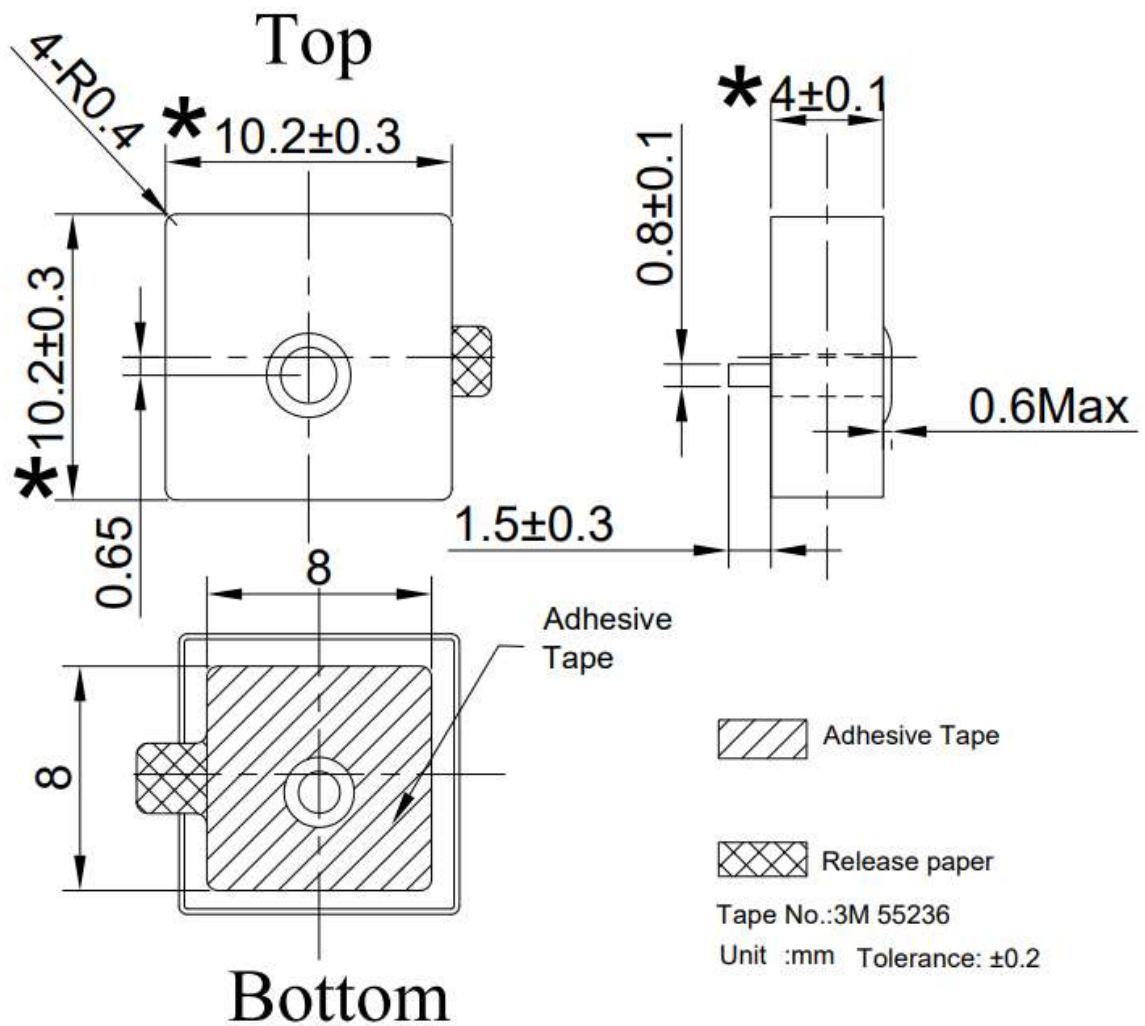
1.3. Supported GNSS Frequency Bands

| GNSS Frequency Bands (MHz) | | | | | |
|----------------------------|---|--|--|---|--|
| GPS | L1 Centre 1575.42 (1565–1586) | L2 Centre 1227.6 (1217–1238) | L5 Centre 1176.45 (1164–1189) | | |
| | √ | - | - | | |
| GLONASS | G1-L1OC-L1OF Centre 1601 (1595–1606) | G2-L2OC-L2OF Centre 1248.06 (1241–1255) | G3-L3OC Centre 1202.025 (1189–1213) | | |
| | - | - | - | | |
| GALILEO | E1 Centre 1575.42 (1563–1588) | E5a Centre 1176.45 (1166–1187) | E5b Centre 1207.14 (1197–1218) | E6 Centre 1278.75 (1258–1300) | |
| | √ | - | - | - | |
| BEIDOU | B1I Centre 1561.098 (1559–1564) | B1C (BeiDou-3) Centre 1575.42 (1559–1592) | B2a-B2I Centre 1176.45 (1166–1187) | B2b Centre 1207.14 (1197–1217) | B3 Centre 1268.52 (1258–1279) |
| | - | √ | - | - | - |
| QZSS | L1 Centre 1575.42 (1573–1578) | L2C Centre 1227.6 (1226–1229) | L5 Centre 1176.45 (1166–1187) | L6 Centre 1278.75 (1257–1300) | |
| | √ | - | - | - | |
| IRNSS | L5 Centre 1176.45 (1164–1189) | | | | |
| | - | | | | |

GNSS Bands and Constellations



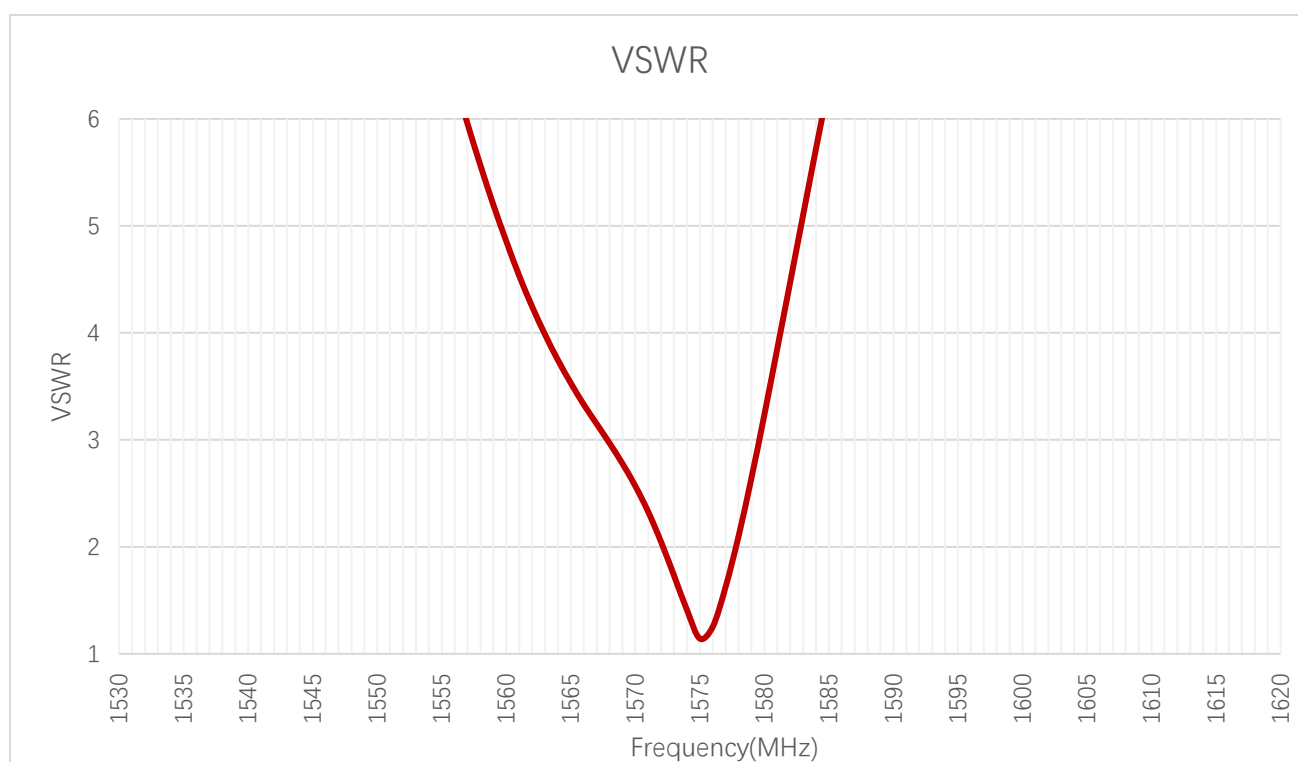
2 Drawing



3 Detailed Performance

3.1. S-Parameter Test

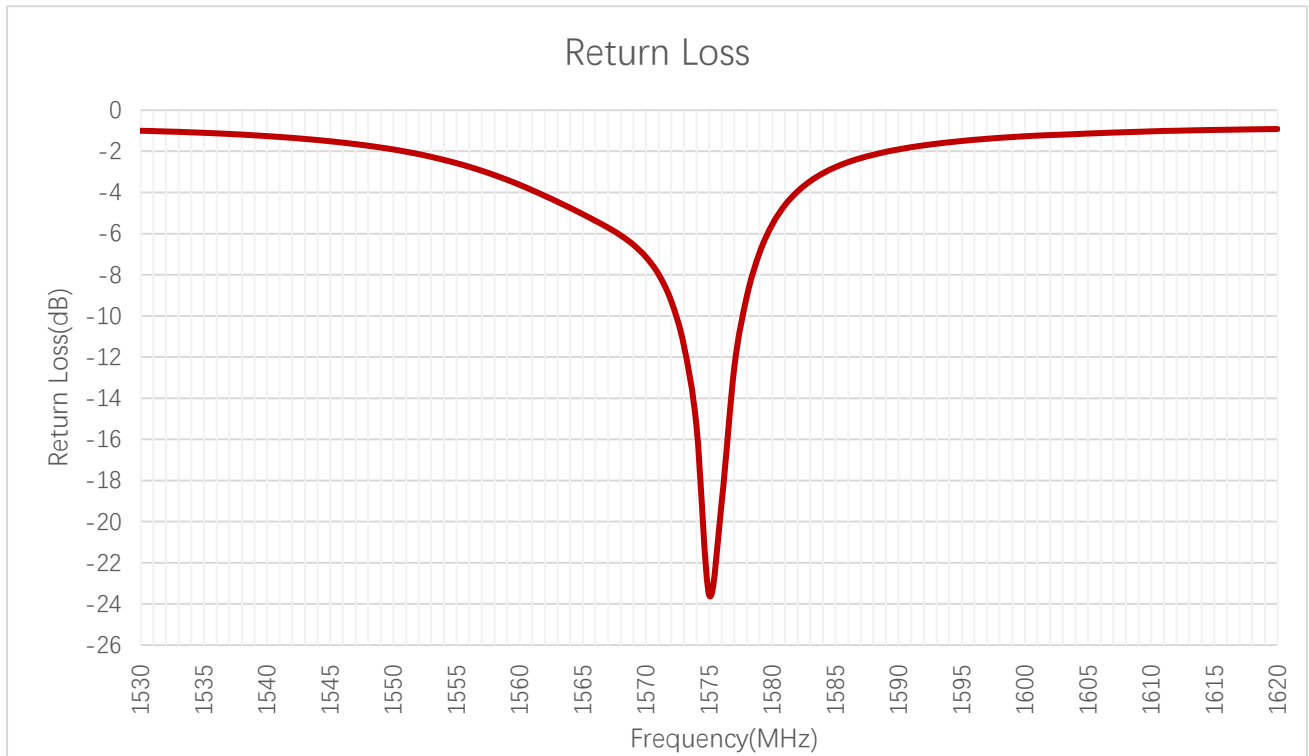
3.1.1. VSWR



VSWR

| Frequency (MHz) | 1176 | 1207 | 1227 | 1248 | 1268 | 1561 | 1575 | 1602 |
|-----------------|------|------|------|------|------|------|------|------|
| VSWR | - | - | - | - | - | - | 1.1 | - |

3.1.2. Return Loss

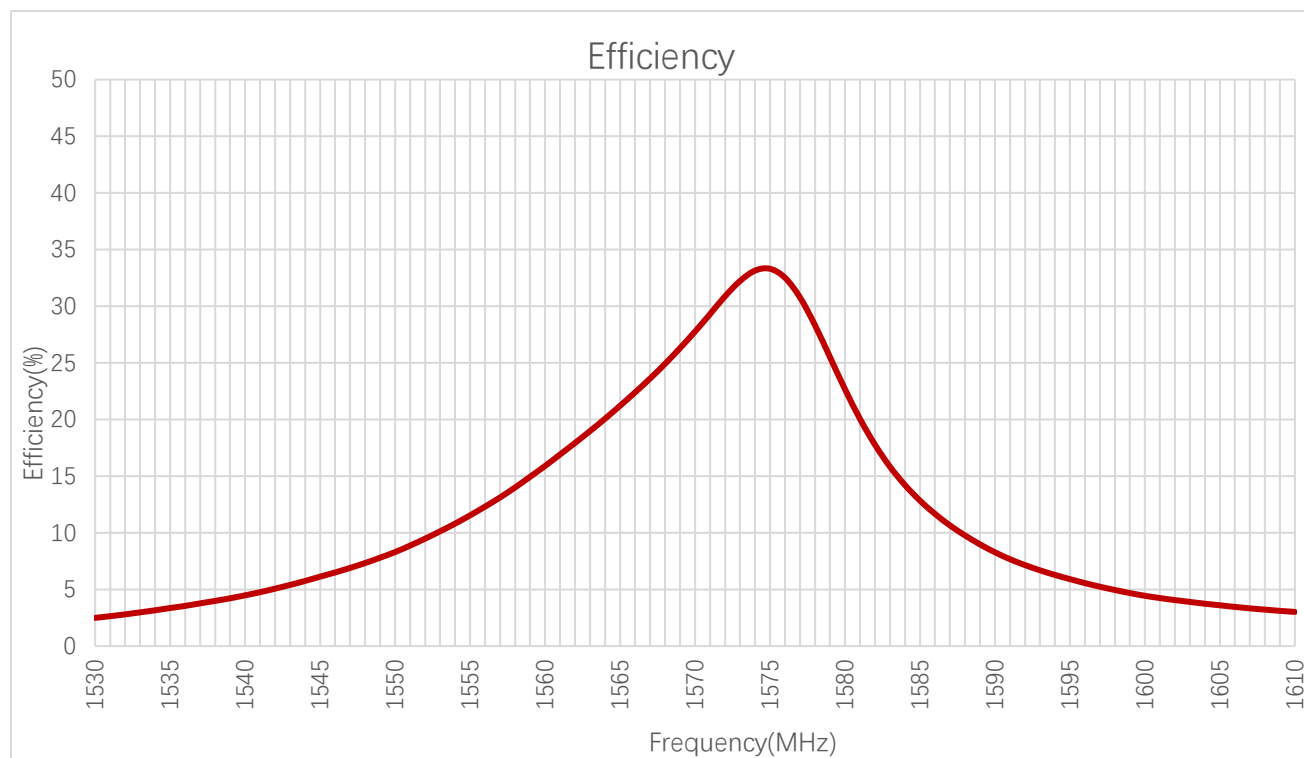


Return Loss (dB)

| Frequency (MHz) | 1176 | 1207 | 1227 | 1248 | 1268 | 1561 | 1575 | 1602 |
|------------------|------|------|------|------|------|------|-------|------|
| Return Loss (dB) | - | - | - | - | - | - | -23.6 | - |

3.2. Radiation Performance Test

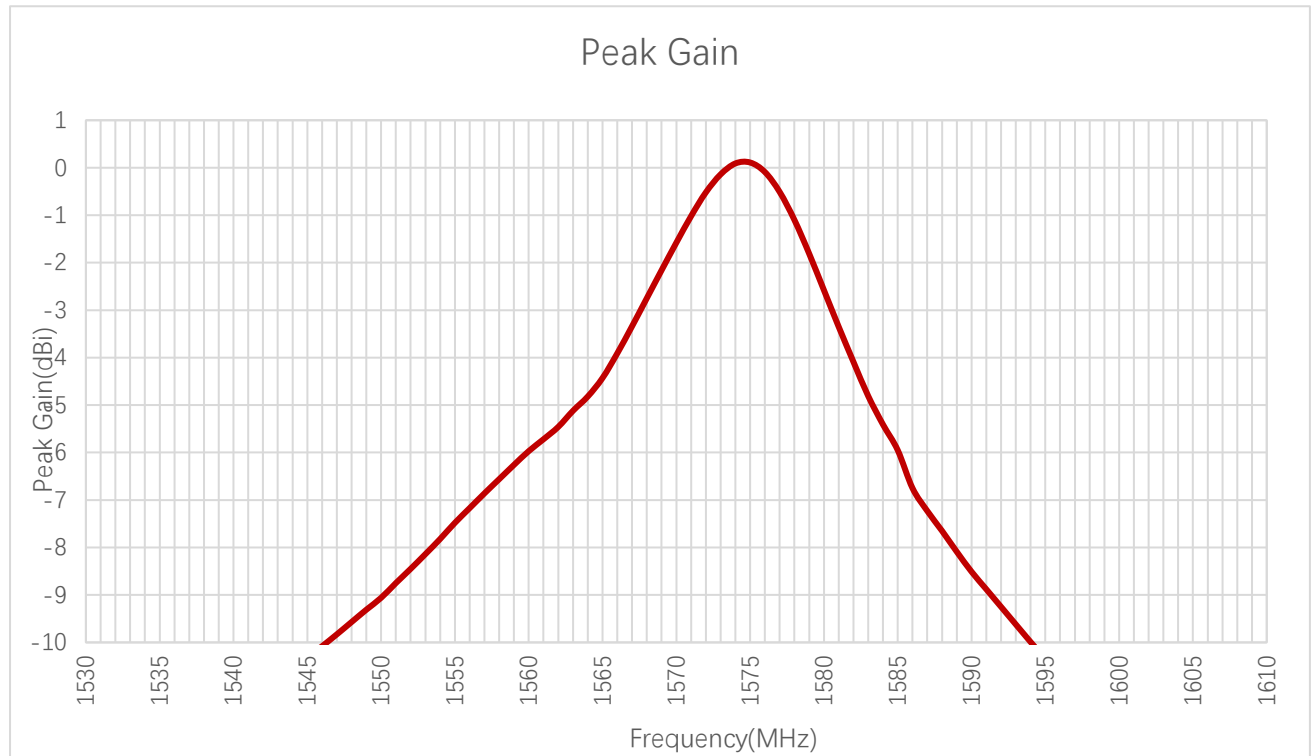
3.2.1. Efficiency



Efficiency (%)

| Frequency (MHz) | 1176 | 1207 | 1227 | 1248 | 1268 | 1561 | 1575 | 1602 |
|-----------------|------|------|------|------|------|------|------|------|
| Efficiency (%) | - | - | - | - | - | - | 33.3 | - |

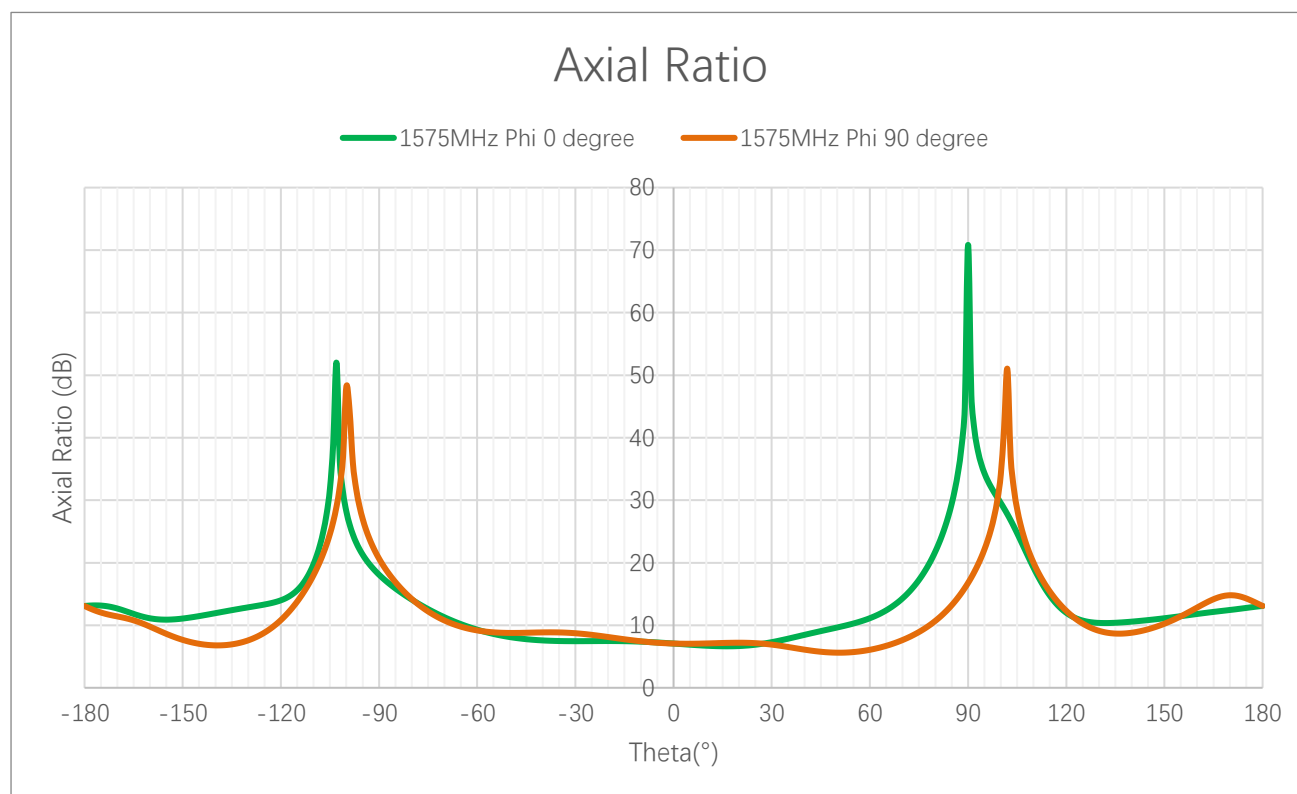
3.2.2. Peak Gain



Peak Gain (dBi)

| Frequency (MHz) | 1176 | 1207 | 1227 | 1248 | 1268 | 1561 | 1575 | 1602 |
|-----------------|------|------|------|------|------|------|------|------|
| Peak Gain (dBi) | - | - | - | - | - | - | 0.11 | - |

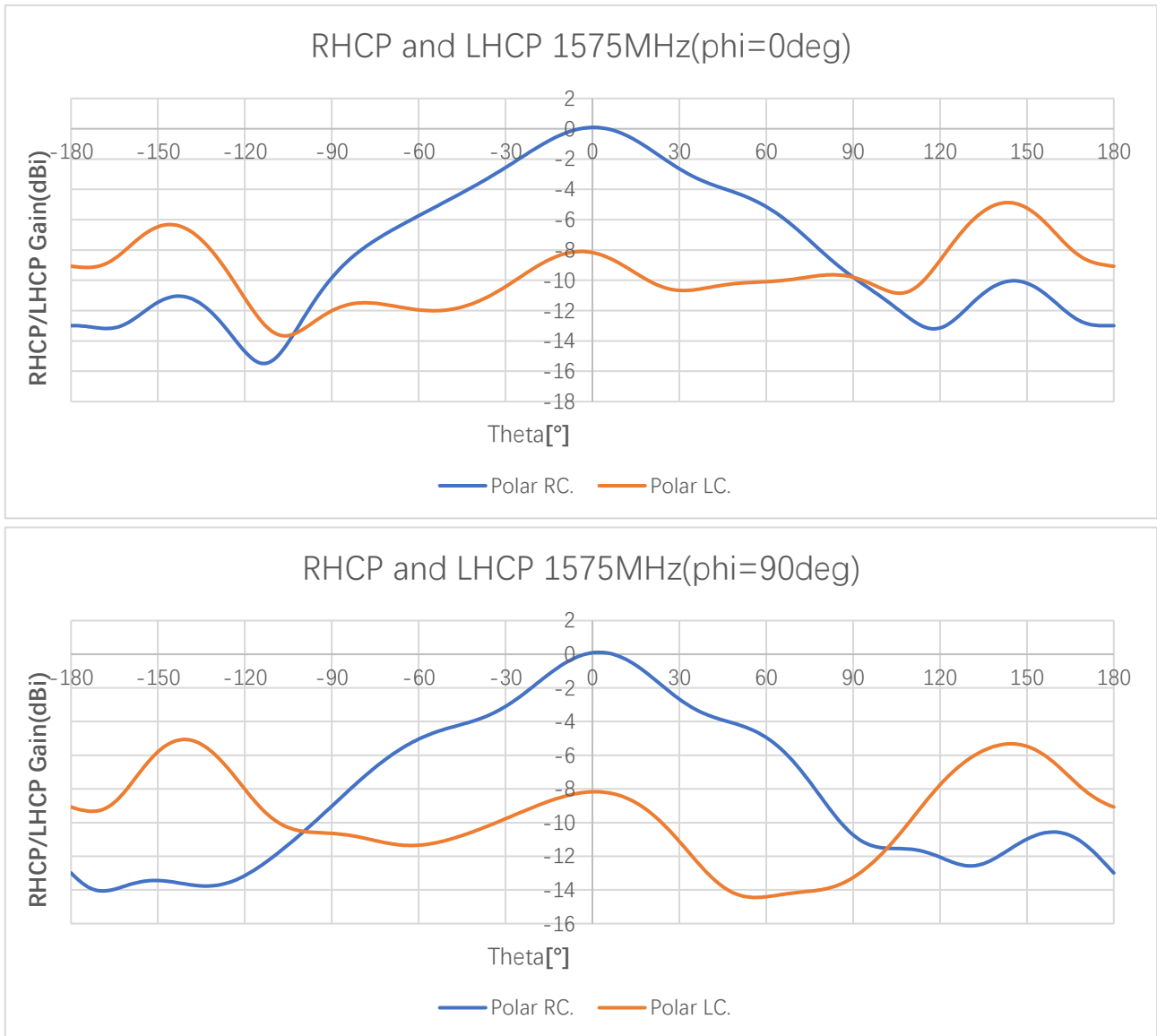
3.2.3. Axial Ratio



Axial Ratio (dB)

| Frequency (MHz) | | 1176 | 1207 | 1227 | 1248 | 1268 | 1561 | 1575 | 1602 |
|------------------|-----------------------------------|------|------|------|------|------|------|------|------|
| Axial Ratio (dB) | Phi = 0 (deg) Theta = 0 (deg) | - | - | - | - | - | - | 7.08 | - |
| | Phi = 90 (deg) Theta = 0 (deg) | - | - | - | - | - | - | 7.08 | - |

3.2.4. 2D RHCP and LHCP Gain

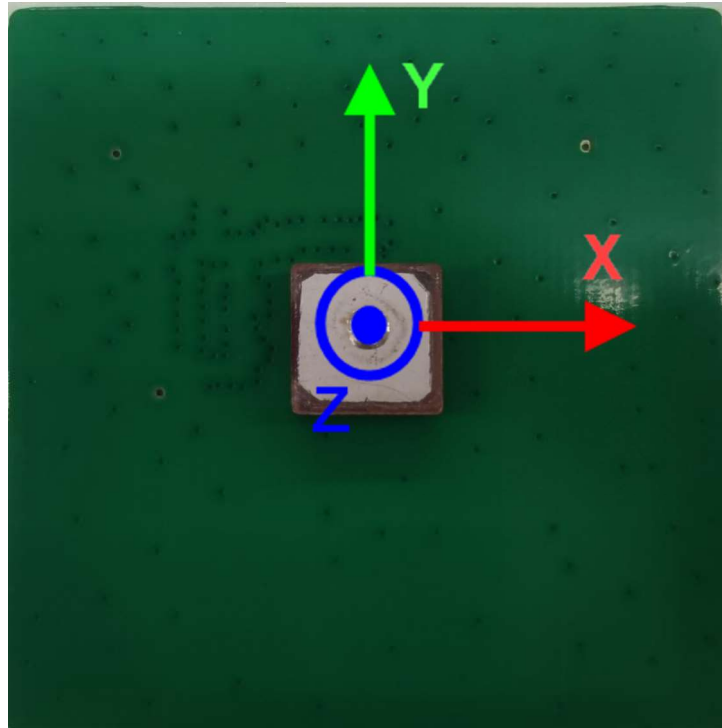


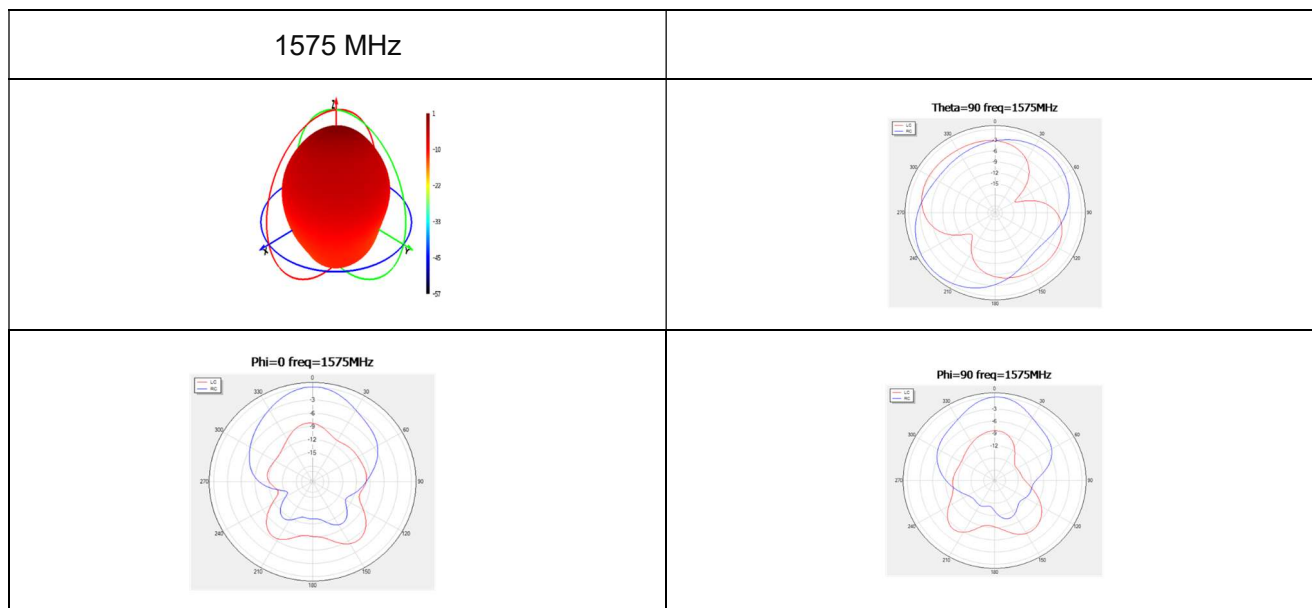
2D RHCP and LHCP Gain (dBi)

| Frequency (MHz) | | 1176 | 1207 | 1227 | 1248 | 1268 | 1561 | 1575 | 1602 |
|--------------------|-----------------------------------|------|------|------|------|------|------|-------|------|
| RHCP Gain (dBi) | Phi = 0 (deg) Theta = 0 (deg) | - | - | - | - | - | - | 0.09 | - |
| | Phi = 90 (deg) Theta = 0 (deg) | - | - | - | - | - | - | 0.09 | - |
| LHCP Gain (dBi) | Phi = 0 (deg) Theta = 0 (deg) | - | - | - | - | - | - | -8.17 | - |
| | Phi = 90 (deg) Theta = 0 (deg) | - | - | - | - | - | - | -8.17 | - |

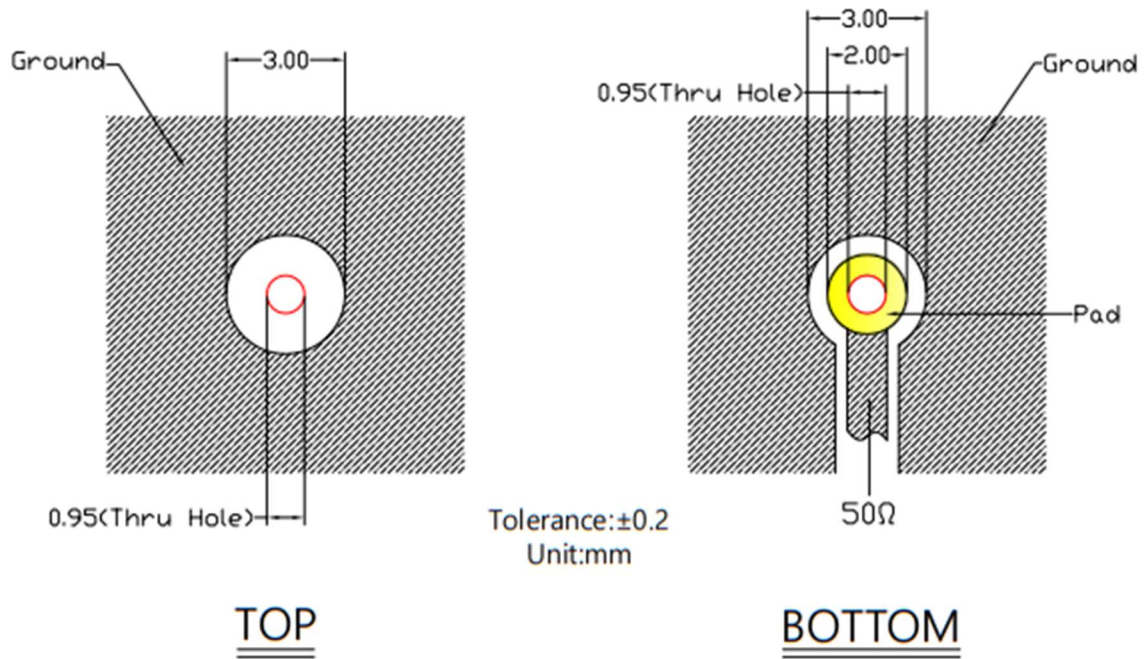
3.2.5. 3D & 2D Radiation Pattern

- Test Condition: on 50 mm × 50 mm PCB
- Test Chamber: HF-S-1



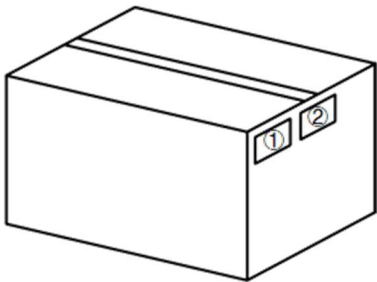
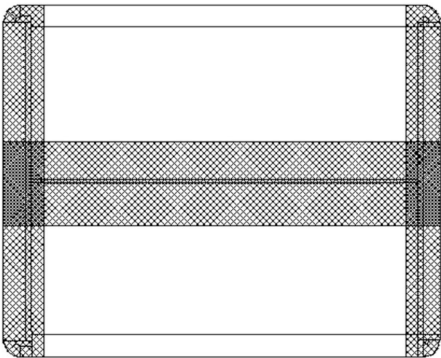


4 PCB Footprint Recommendation



5 Packaging

| Step | Packaging Picture / 2D Picture | Description |
|------|--------------------------------|---|
| 1 | | (100 PCS Antennas / Tray) |
| 2 | | The inner box contains 5 plastic trays. (500 PCS Antennas / Inner Box) |
| 3 | | (4 Inner Boxes / Carton Box) (2000 PCS Antennas / Carton Box) Estimated quantity Products that cannot fill the entire carton box are packed in a suitable size carton box. <u>Carton Size:</u> <u>L × W × H = 405 × 293 × 185 mm</u> |

| | | |
|------|---|---|
| 4 |  | <p>Position for Attaching Labels</p> <p>① Carton Label ② Quality Label</p> |
| 5 |  | <p>Sealing Cartons “I” type sealing cartons</p> |
| Note | <p>The initial packaging method described above is for reference only, and the final actual packaging method shall be subject to the actual shipping packaging.</p> | |

Contact Us

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Revision History

| Version | Date | Author | Note |
|---------|------------|--|--------------------------|
| - | 2024-01-11 | Rhone WEI/ Lucky FENG/ David LIU/ Rainey LIAO | Creation of the document |
| 1.0 | 2024-01-11 | Rhone WEI/ Lucky FENG/ David LIU/ Rainey LIAO | First official release |



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