



**AANE-AH-0161**

Request Samples



Check Inventory



Ø33 x 45.8 mm

RoHS Compliant

MSL Level = 1

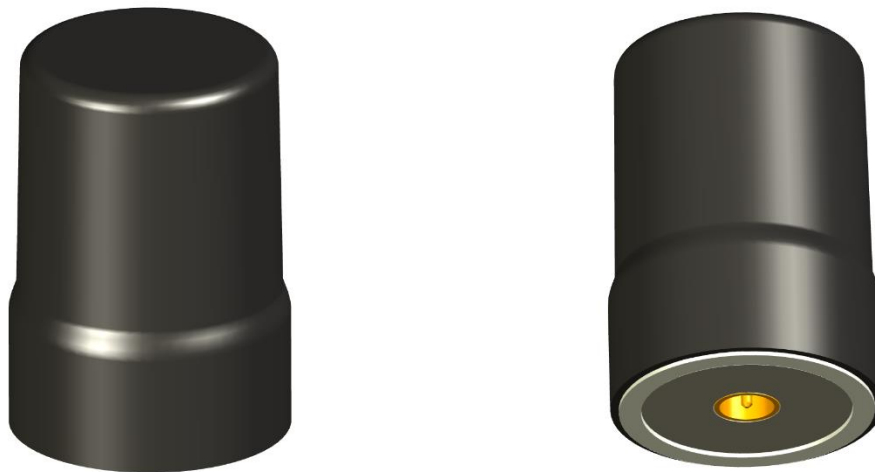
## Features

- Multiband Multi-Constellation Active GNSS Antenna
  - GPS: L1/L2/L5
  - GLONASS: G1/G2/G3
  - GALILEO: E1/E5a/E5b
  - BEIDOU: B1I/B2I/B3I/B1C/B2a/B2b
  - IRNSS: L5
  - SBAS: L1/L5
  - L-Band
- High LNA Gain of 33±2 dB with Low Noise Figure
- Centimeter Phase Center Repeatability
- Invariant Performance from 3.3 to 12 VDC
- Extremely Light (≤20g) with IP65 Housing

## Applications

- Precision Land Survey Positioning
- Surveying and Mapping Systems
- Precision GNSS Positioning
- Autonomous Driving and UAVs
- Mission-Critical GNSS Timing
- Geofencing

## Product Image



# Full-Band (L1/L2/L5 + L-band) Full-Constellation GNSS Helix Antenna



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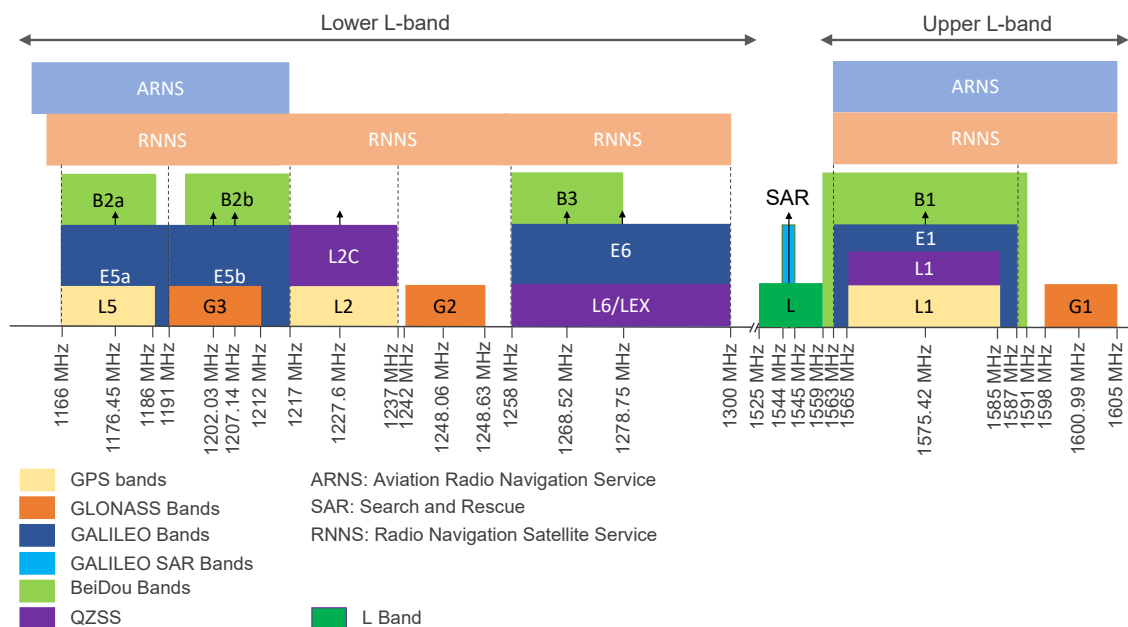
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## GNSS Frequency Bands Covered

|             |                          |                          |                          |                  |                |
|-------------|--------------------------|--------------------------|--------------------------|------------------|----------------|
| GPS         | L1<br>1575.42MHz         | L2<br>1227.6MHz          | L5<br>1176.45MHz         |                  |                |
|             | ■                        | ■                        | ■                        |                  |                |
| GLONASS     | G1<br>1598.06-1609.31MHz | G2<br>1242.93-1251.68MHz | G3<br>1202.025MHz        |                  |                |
|             | ■                        | ■                        | ■                        |                  |                |
| GALILEO     | E1<br>1575.42MHz         | E5a<br>1176.45MHz        | E5b<br>1201.5MHz         | E6<br>1278.75MHz |                |
|             | ■                        | ■                        | ■                        | □                |                |
| BEIDOU      | B1C<br>1575.42MHz        | B2b<br>1207.14MHz        | B2a<br>1176.45MHz        | B3<br>1268.52MHz | B1I<br>1561MHz |
|             | ■                        | ■                        | ■                        | ■                | ■              |
| L-Band      | L-Band<br>1542MHz        |                          |                          |                  |                |
|             | ■                        |                          |                          |                  |                |
| QZSS        | L1<br>1575.42MHz         | L2<br>1227.6MHz          | L5<br>1176.45MHz         | L6<br>1278.75MHz |                |
|             | ■                        | ■                        | ■                        | □                |                |
| IRNSS/NAVIC |                          |                          | L5<br>1176.45MHz         |                  |                |
|             |                          |                          | ■                        |                  |                |
| SBAS        | L1/E1/B1<br>1575.42MHz   |                          | L5/B2a/E5a<br>1176.45MHz |                  |                |
|             | ■                        |                          | ■                        |                  |                |



Frequency allocation: GNSS systems, upper L bands and lower L bands



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## Electrical Specification

| Parameters                     |                 | Typ.                                                                                                                                          |    |    | Units | Note                               |
|--------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----|----|-------|------------------------------------|
| Antenna                        |                 |                                                                                                                                               |    |    |       |                                    |
| Frequency                      |                 | GPS: L1/L2/L5GLONASS: G1/G2/G3<br>GALILEO: E1/E5a/E5b<br>BEIDOU: B1I/B2I/B3I/B1C/B2a/B2b<br>QZSS: L1/L2/L5/L6 IRNSS: L5 SBAS:<br>L1/L5 L-Band |    |    |       |                                    |
| VSWR                           |                 | ≤ 2                                                                                                                                           |    |    | -     |                                    |
| Polarization                   |                 | RHCP                                                                                                                                          |    |    | -     | (Right Hand Circular Polarization) |
| Nominal Impedance              |                 | 50                                                                                                                                            |    |    | Ω     |                                    |
| Gain RHCP<br>(maximum)         | 1575.42MHz (L1) | 2.6                                                                                                                                           |    |    | dBic  |                                    |
|                                | 1227.60MHz (L2) | 2.5                                                                                                                                           |    |    |       |                                    |
|                                | 1176.45MHz (L5) | -4.2                                                                                                                                          |    |    |       |                                    |
|                                | L-Band          | -0.8                                                                                                                                          |    |    |       |                                    |
| Axial Ratio                    | 1575.42MHz (L1) | 0.6                                                                                                                                           |    |    | dB    |                                    |
|                                | 1227.60MHz (L2) | 0.5                                                                                                                                           |    |    |       |                                    |
|                                | 1176.45MHz (L5) | 0.1                                                                                                                                           |    |    |       |                                    |
|                                | L-Band          | 0.6                                                                                                                                           |    |    |       |                                    |
| PCO                            | L1              | 26.8                                                                                                                                          |    |    | mm    |                                    |
|                                | L2              | 26.8                                                                                                                                          |    |    |       |                                    |
| PCV                            |                 | < 1.5                                                                                                                                         |    |    | mm    |                                    |
| LNA                            |                 |                                                                                                                                               |    |    |       |                                    |
| Noise Figure                   |                 | ≤ 1.2                                                                                                                                         |    |    | dB    |                                    |
| Gain                           |                 | 33±2                                                                                                                                          |    |    | dB    |                                    |
| Passband Ripple                |                 | ±2                                                                                                                                            |    |    | dB    |                                    |
| VSWR                           |                 | ≤ 2.0                                                                                                                                         |    |    | -     |                                    |
| Operating Voltage              |                 | 3.3                                                                                                                                           | 5  | 12 | V     |                                    |
| Current Consumption            |                 | 29                                                                                                                                            | 29 | 29 | mA    |                                    |
| Differential Propagation Delay |                 | ≤ 5                                                                                                                                           |    |    | ns    |                                    |
| Out-Of-Band Rejection          |                 |                                                                                                                                               |    |    |       |                                    |
| < 1400MHz                      |                 | > 33                                                                                                                                          |    |    | dB    | Upper band                         |
| > 1700MHz                      |                 | >30                                                                                                                                           |    |    |       |                                    |
| < 1000MHz                      |                 | >41                                                                                                                                           |    |    |       |                                    |
| < 1130MHz                      |                 | >28                                                                                                                                           |    |    |       | Lower band                         |

Please note: All measurement data is based on the standard configuration (conducted in free space unless otherwise specified).

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Ø33 x 45.8 mm

RoHS Compliant

MSL Level = 1

### Mechanical Specifications

| Parameter         | Specification   |
|-------------------|-----------------|
| Antenna Dimension | Ø33 x 45.8 mm   |
| Weight            | ≤20g            |
| Mounting Type     | Connector Mount |
| RF Connector      | SMA (M)         |

(1): UV Resistant optional

### Environmental Specification

| Parameter              | Specification       |
|------------------------|---------------------|
| Operating Temperature  | -40°C to +85°C      |
| Storage Temperature    | -55°C to +85°C      |
| RoHS Compliance        | Yes                 |
| ESD Circuit Protection | 15kV Air Discharge  |
| Relative Humidity      | Up to 95%           |
| Ingress Protection     | IP65 (when mounted) |

Full-Band (L1/L2/L5 + L-band) Full-Constellation GNSS Helix Antenna



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Ø33 x 45.8 mm  
RoHS Compliant  
MSL Level = 1

Ordering Information

| Part Number    | Description                                                                                                     | Connector Option |
|----------------|-----------------------------------------------------------------------------------------------------------------|------------------|
| AANE-AH-0161-1 | Full-Band (L1/L2/L5 + L-band) Full-Constellation GNSS Helix Antenna Black with UV coating and SMA (M) connector | SMA (M)          |

Note: Different cable and connector configurations that are not listed may be available upon request via [Abracon online support](#)



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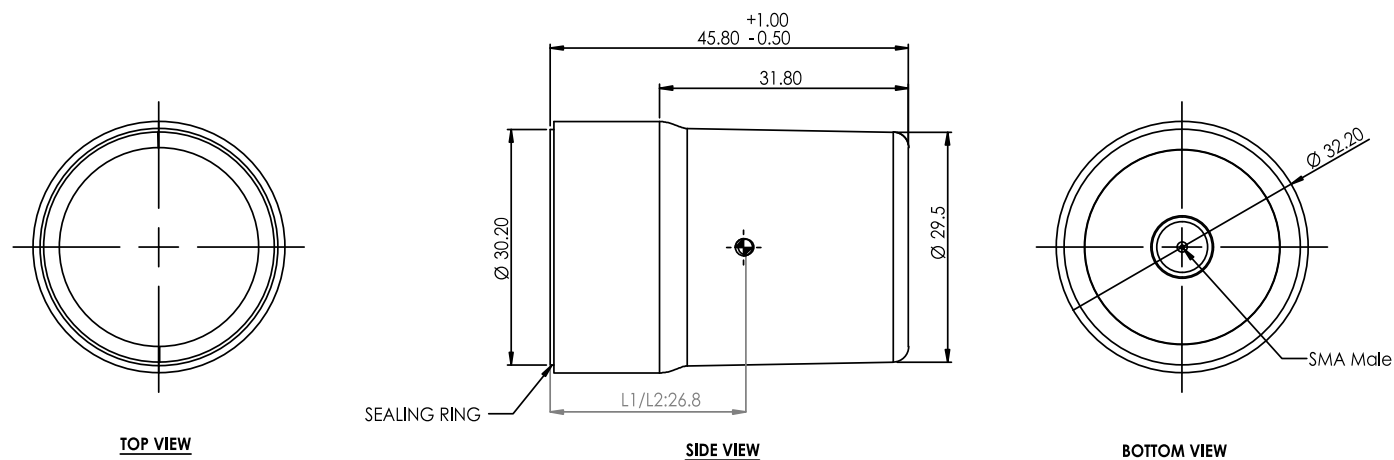


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Ø33 x 45.8 mm  
RoHS Compliant  
MSL Level = 1

## Product Dimension



Antenna phase center offset: L1/L2:26.8mm

Unit: mm

# Full-Band (L1/L2/L5 + L-band) Full-Constellation GNSS Helix Antenna



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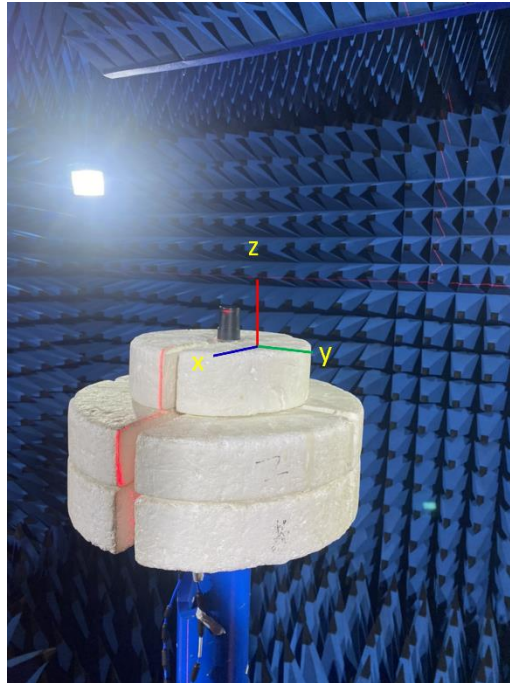


Ø33 x 45.8 mm

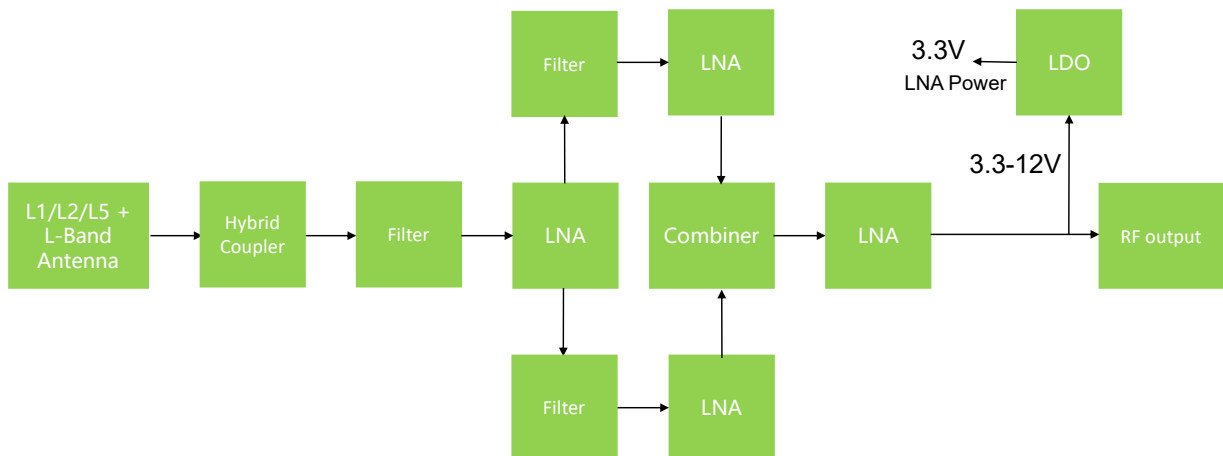
RoHS Compliant

MSL Level = 1

## Measurement Setup



## GNSS Block Diagram





**AANE-AH-0161**

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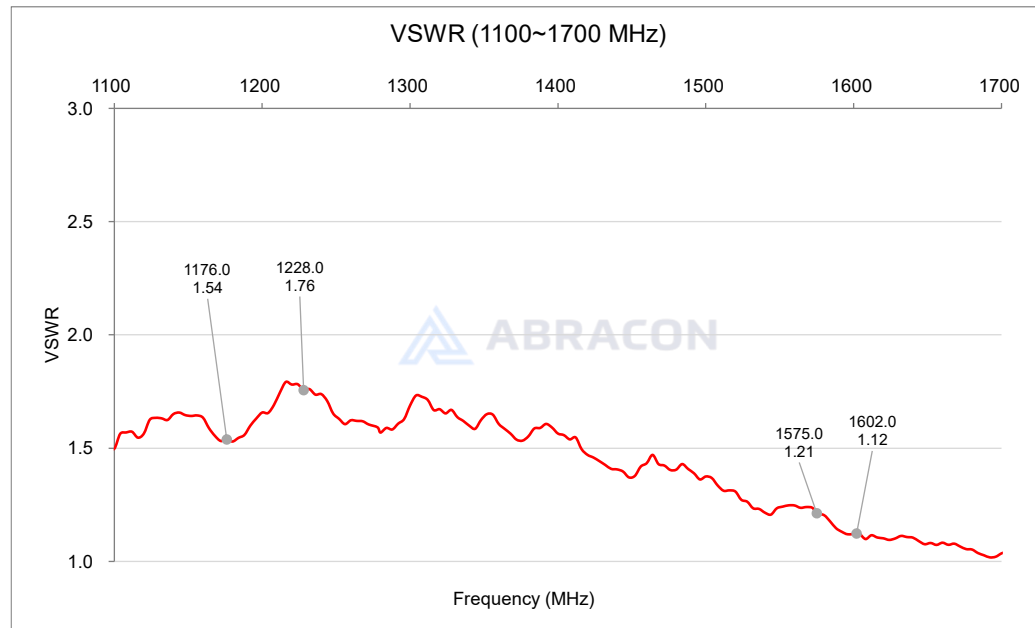
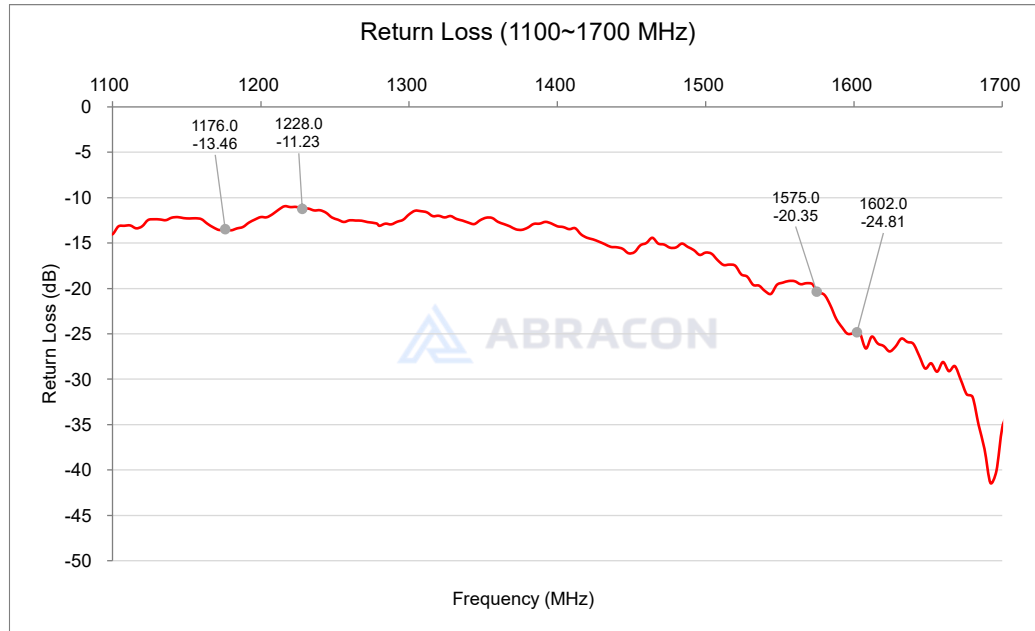


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Ø33 x 45.8 mm  
RoHS Compliant  
MSL Level = 1

## Reflection Characteristics – Return Loss & VSWR







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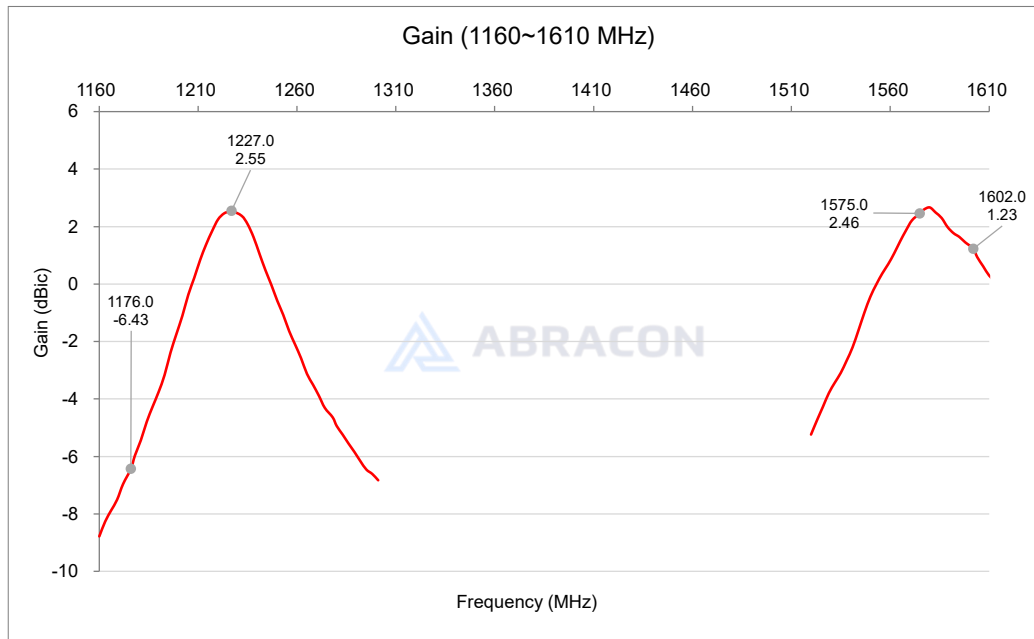


Check Inventory



Ø33 x 45.8 mm  
RoHS Compliant  
MSL Level = 1

## Radiation Characteristics –Passive Peak Gain





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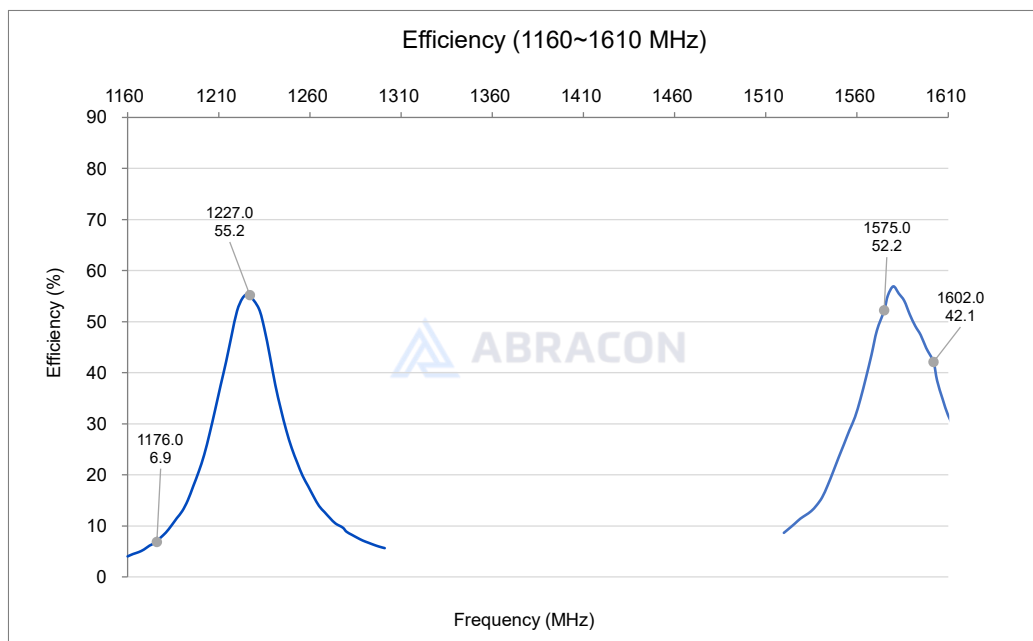


Ø33 x 45.8 mm

**RoHS Compliant**

MSL Level = 1

## Radiation Characteristics –Passive Efficiency





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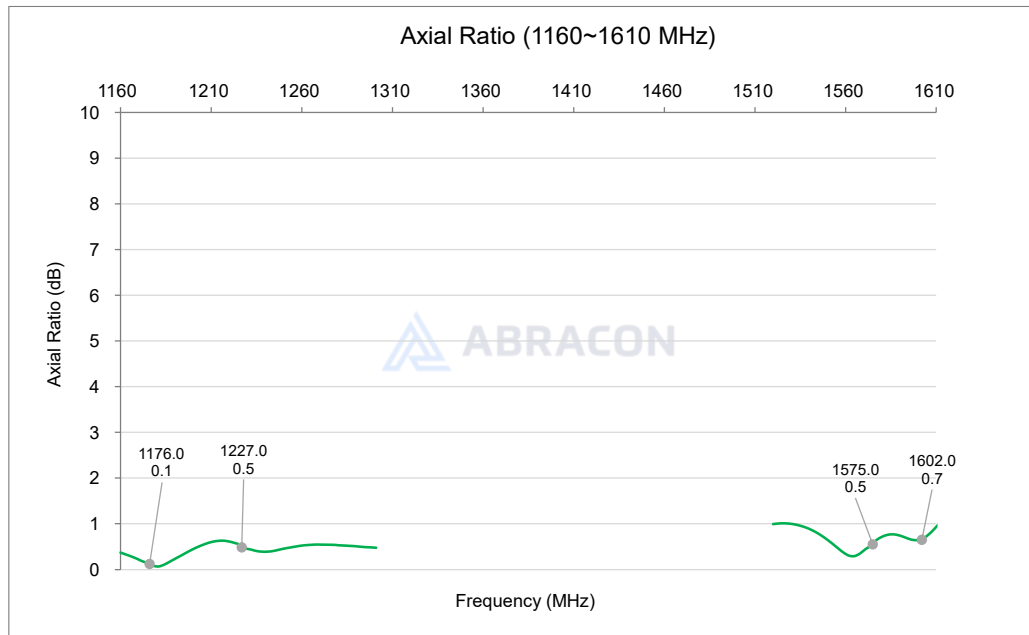


Check Inventory



Ø33 x 45.8 mm  
**RoHS Compliant**  
MSL Level = 1

## Radiation Characteristics –Axial Ratio





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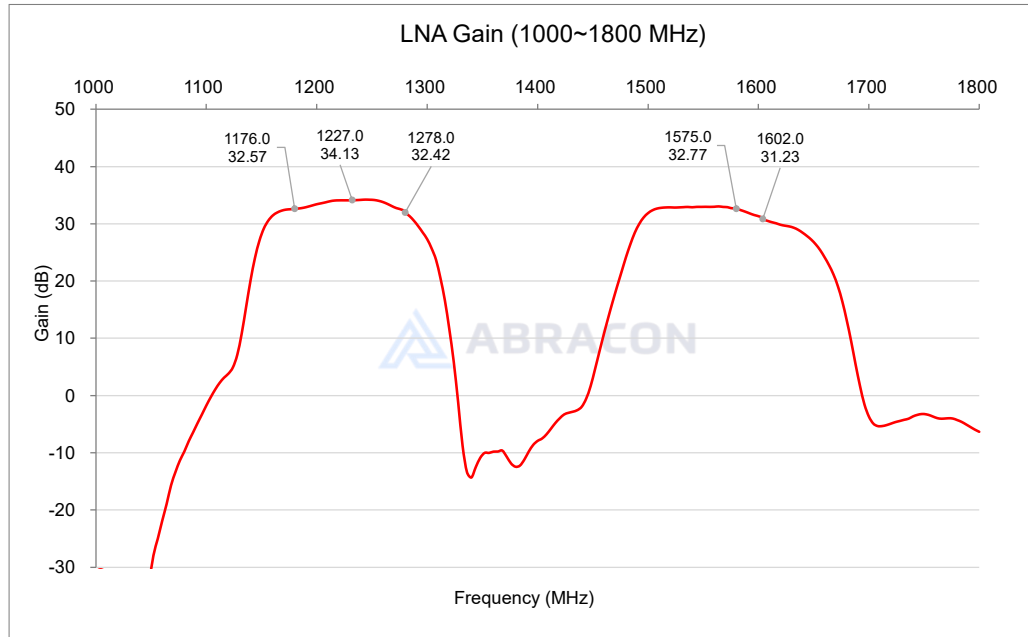


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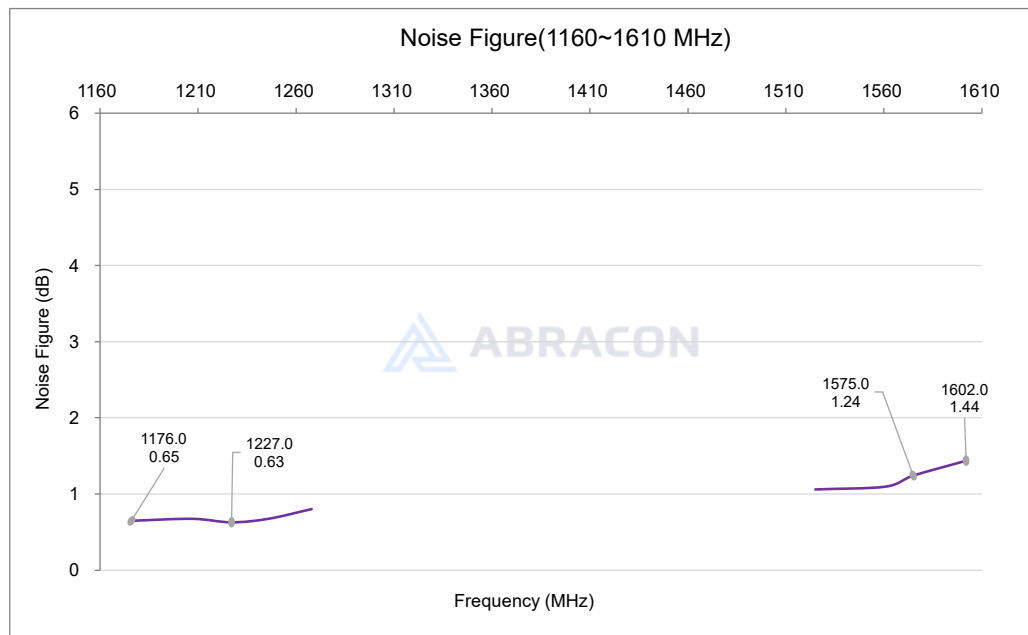


Ø33 x 45.8 mm  
RoHS Compliant  
MSL Level = 1

## LNA Characteristics –LNA Gain



## LNA Characteristics –Noise Figure





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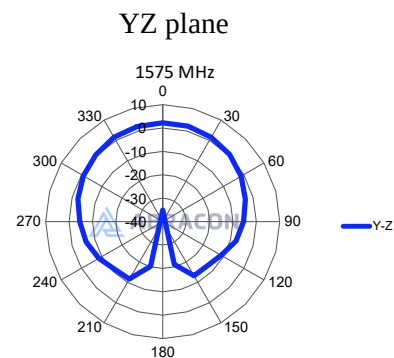
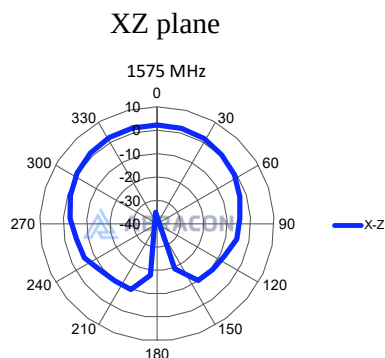
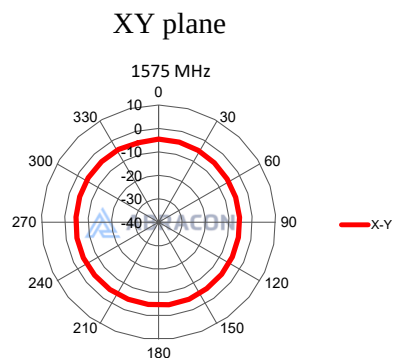
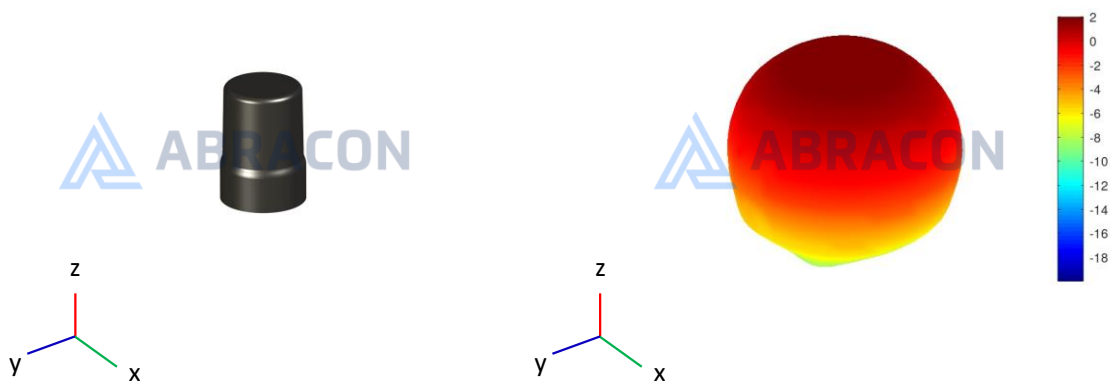
Ø33 x 45.8 mm

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## Radiation Characteristics – 3D & 2D Pattern

1575MHz (L1 Band)



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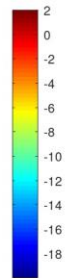
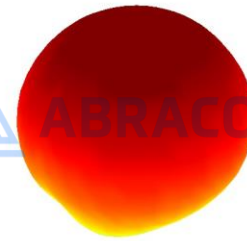
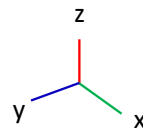
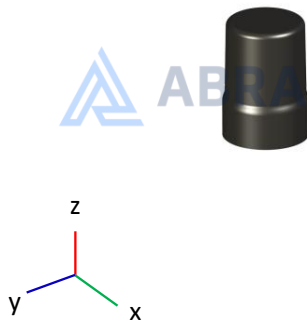


Check Inventory

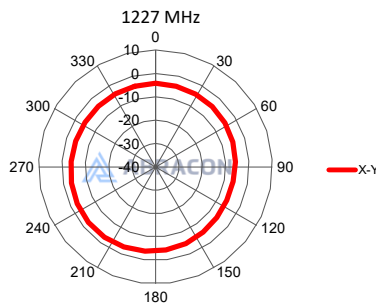


Ø33 x 45.8 mm  
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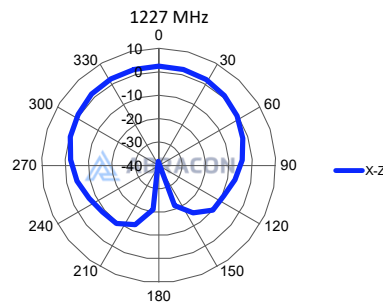
1227MHz (L2 Band)



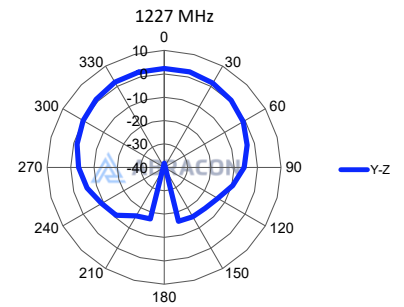
XY plane



XZ plane



YZ plane



# Full-Band (L1/L2/L5 + L-band) Full-Constellation GNSS Helix Antenna



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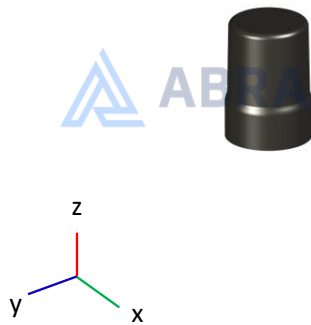


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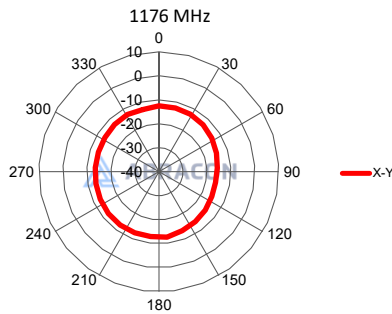


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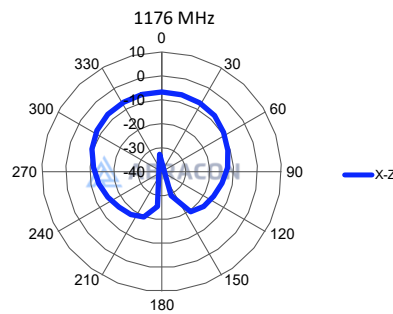
1176MHz (L5 Band)



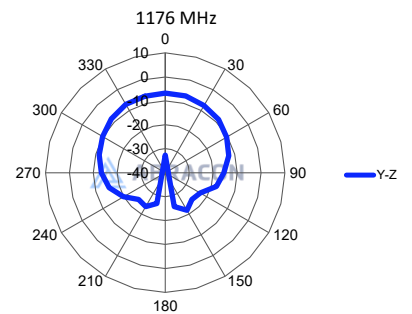
XY plane



XZ plane



YZ plane



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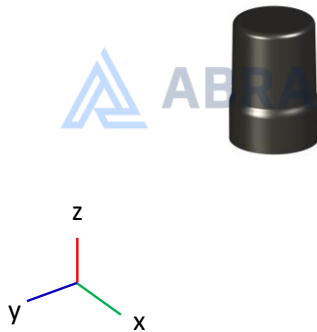


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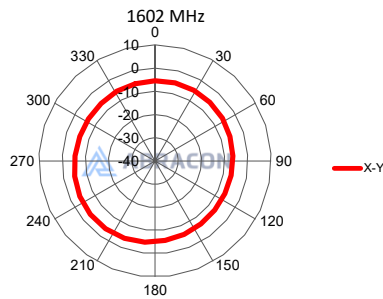


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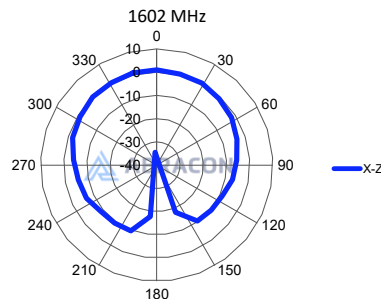
1602MHz (G1 Band)



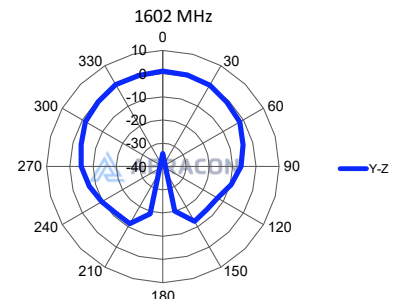
XY plane



XZ plane



YZ plane



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### Packaging Information

---

Number of Antennas/ Carton: 50 pcs

Dimension of the Carton: 450 x 330 x 220 mm

**ATTENTION:** Abracon LLC's products are Commercial-Off-The-Shelf ('COTS'), which are designed, intended, and validated for use in commercial, industrial, and automotive applications. The customer is responsible for testing and verifying the performance of an Abracon solution to meet their system-level requirements.



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