Product Portfolio

- TT&C
- DATA DOWNLINK
- NAVIGATION
- LAUNCHER
- PAYLOAD

01 Designed by experts	02 Best in class performance	03 Lean manufacturing process	04 Made in France, delivered worldwide	**anywaves.com** +

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SPACE ANTENNA MAKERS

Anywaves

Space Antenna Makers

At Anywaves, we design and manufacture high-performance space antennas to power the success of your missions — from satellites to launchers, rovers, and planetary landers.

Based in Toulouse, Europe's space capital, we bring together advanced Radio Frequency and Mechanical-Thermal expertise to deliver compact, reliable, and efficient antennas adapted to your operational environment.

Our products are built on strong flight heritage and a rigorous qualification process, ensuring performance and resilience throughout the entire mission lifetime.

From Earth observation and navigation to spectrum monitoring, telecommunications, and deep-space exploration, our antennas are tailored to support the most demanding space applications worldwide.

- EN 9100 Certified
- Short Lead Time
- ITAR Free
- High Volume Capability

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SPACE ANTENNA MAKERS

Why Anywaves

Designed by experts

Our R&D team develops and designs antennas with state-of-the-art concepts, utilizing cutting-edge components and technologies. From PCBs to 3D printed materials, our expertise and flight heritage experience ensure the creation of reliable antennas tailored to your needs.

Best in class performance

Anywaves antennas are optimized to deliver top-notch performance in space missions. Through rigorous testing and qualification processes, we ensure their resilience to harsh space conditions, including radiation, extreme temperatures, and vibrations.

Lean manufacturing process

We have implemented a lean manufacturing process and a continuous improvement method called FMEA. This approach emphasizes continuous improvement, waste reduction, and standardized processes. It allows us to deliver high-quality products with fast lead times and optimal production volumes.

Made in France, delivered worldwide

Anywaves antennas are proudly manufactured in France and delivered worldwide. Our products meet the highest quality standards with EN 9100 certification. All of our antennas are also ITAR-FREE so we can easily export them globally with more flexibility.

Let's fly with our antennas

- TT&C
- DATA DOWNLINK
- NAVIGATION
- PAYLOAD

Anywaves develops a new generation of compact, high-performance antennas to meet the needs of the most demanding space missions. Our portfolio covers the full range of key applications for satellites and space vehicles — from TT&C for robust telemetry, tracking and command links, to Data Downlink for secure and efficient payload transmission, Navigation for precise and reliable GNSS reception, and advanced Payload solutions for telecommunications, inter-satellite links and mission-specific requirements. With a steadfast commitment to performance, reliability and adaptability, our antennas are engineered to meet the operational requirements of your mission—wherever space takes you.

GET THE BEST QUOTE FOR YOUR MISSIONS

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01

TT&C Antennas

Anywaves S-Band TT&C Antennas are used in the subsystem that provides the telemetry, tracking and command links between the satellite and the ground station.

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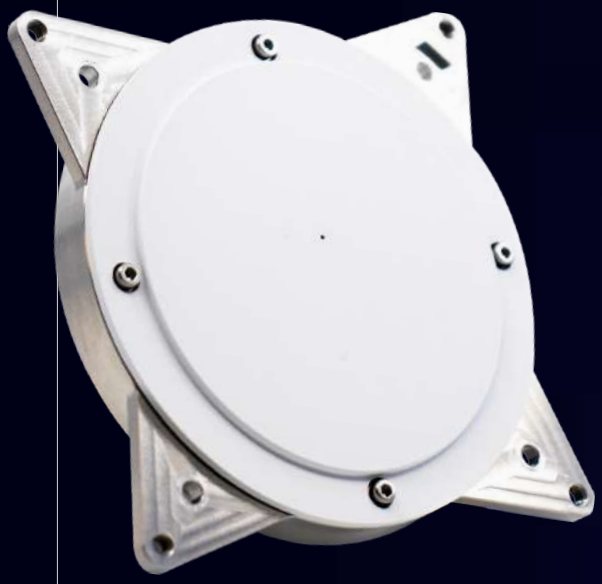
QUALITY SYSTEM CERTIFICATION DNV ISO 9001 AS/EN/JISQ 9100



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TT&C ANTENNAS

S-Band TT&C Antenna

Anywaves S-Band antenna is our flagship antenna with a strong flight heritage (TRL 9).
Perfectly suited to LEO platforms, this antenna operates both in transmission for telemetry and in reception for telecommand.

Its wide beam coverage enables the best satellite availability for TT&C link. In pair work, Anywaves S-band TT&C antenna provides an omni-directional coverage to enhance the satellite availability.
This antenna is provided with right or left-hand circular polarization with a SMA (SubMiniature version A) connector.

NB : compatible with Anywaves Test Hat for S-Band TT&C Antennas.

Tx and Rx | Hemispherical Coverage | HPBW > 90° | Size < 1U

Benefits

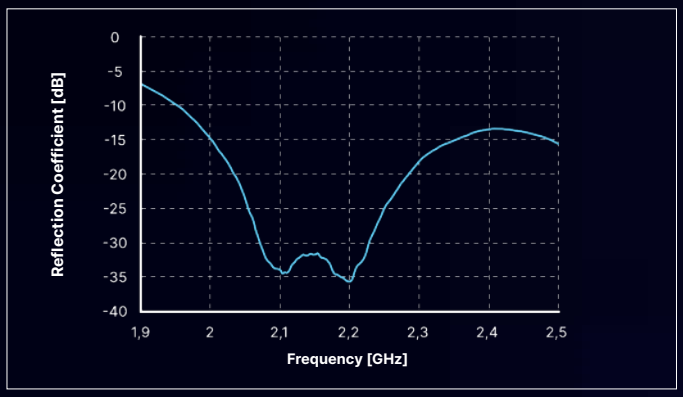
- Full Duplex Telemetry & Telecommand
- ITAR Free
- Acceptance Tests (RF, Mechanical, Thermal) included:
  - Return loss
  - Z-axis random vibration
  - Thermal cycling
- Radome protection against harsh environment: temperature & ESD
- In orbit since 2019

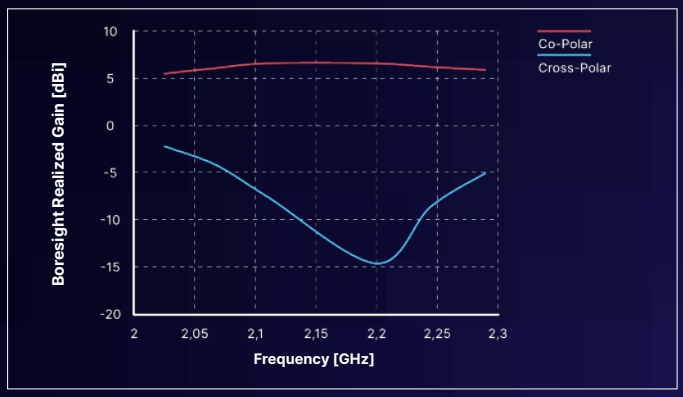
  CNESAdvance Label

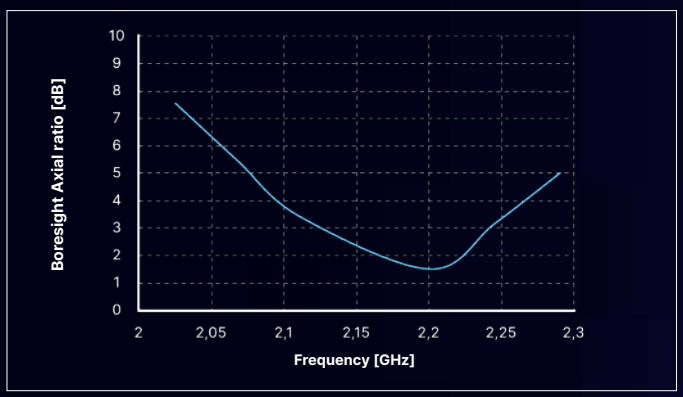
S-BAND TT&C ANTENNA

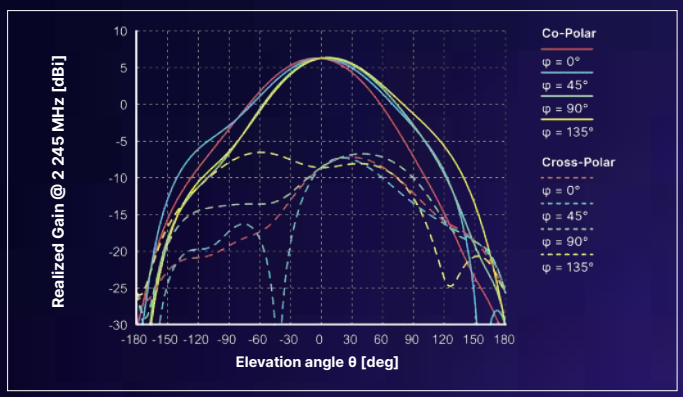
Typical Measured Performance

Tx and Rx | Hemispherical Coverage | HPBW > 90° | Size < 1U









Typical Performance

Frequency Bands	**From 2.025 GHz to 2.29 GHz**
Bandwidth	> 265 MHz
Polarization	Left or Right Hand Circular Polarization
Reflection Coefficient	< -15 dB (all frequency band)
Half Power Beam Width	> 90° (± 45° in all planes)
Power Handling	Transmit and Receive
Efficiency	> 92%
Gain @ 2 150 MHz	Gain @ boresight > 6.5 dBi Gain @ ± 30° > 4.5 dBi Gain @ ± 60° > 0 dBi
Axial Ratio @ 2 150 MHz	< 3 dB from 0° to ± 30° < 5 dB from 0° to ± 60° < 8 dB from 0° to ± 90°

Physical Characteristics

Envelope Size Without Connector	L 84.3 x W 84.3 x H 12.1 mm³ Protruding height: 6.3 mm
Mass With Connector	136 ± 3g
Connector	Coaxial SMA female (50 Ω)
Mechanical Interface	4 x M3 (unthreaded hole)
Qualification Temperature	-120°C / +120°C
Protective Radome	VESPEL coated with SG121FD white paint (on Flight Models only) resistant to thermal and radiation environments and preventing electrostatic discharges.
Acceptance Tests on Flight Models	- Radio Frequency - Mechanical - Thermal
Acceptance Tests on Engineering Models	Radio Frequency Only

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QUALITY SYSTEM CERTIFICATION DNV ISO 9001 AS/EN/JISQ 9100

TT&C ANTENNAS

Compact S-Band TT&C Antenna

Anywaves Compact S-band TT&C antenna is an ultra compact antenna featuring excellent radiation characteristics over a wide frequency band, especially at high elevation angles. It can withstand harsh thermal environment thanks to a protective radome. Furthermore, both polarization (Right Handed and Left Handed Circular Polarization) can be used simultaneously.

NB : compatible with Anywaves Test Hat for S-Band TT&C Antennas.

Single or Dual-Polarization | Tx and Rx | Hemispherical Coverage | Wideband | Size < 1U

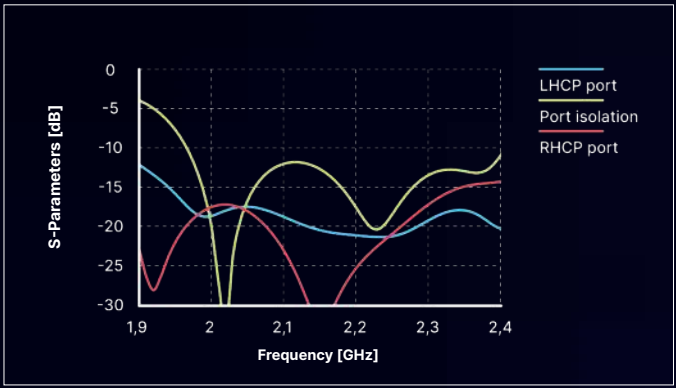
Benefits

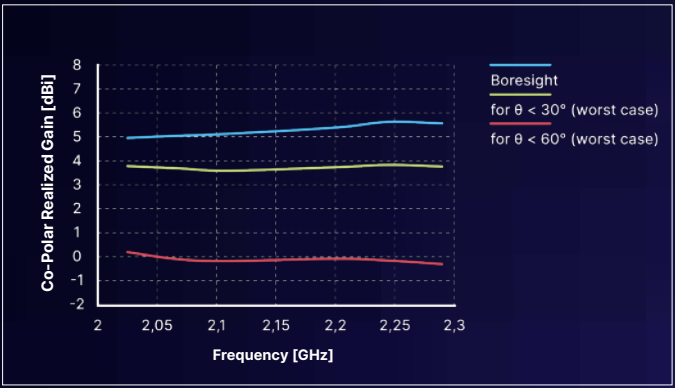
- Full Duplex Telemetry & Telecommand
- Wide frequency band
- Acceptance Tests (RF, Mechanical, Thermal) included:
  - Return loss
  - Z-axis random vibration
  - Thermal cycling
- Dual-Polarization capable
- ITAR Free

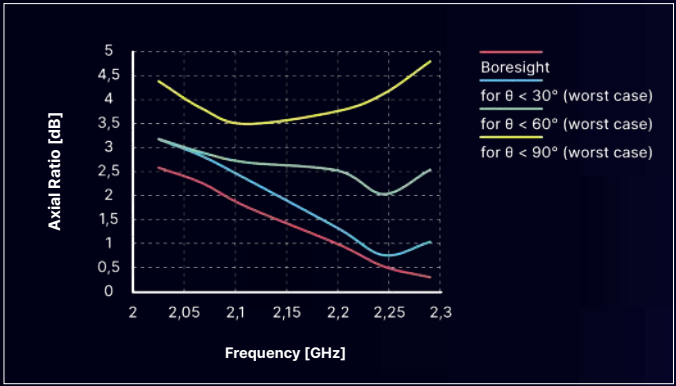
COMPACT S-BAND TT&C ANTENNA

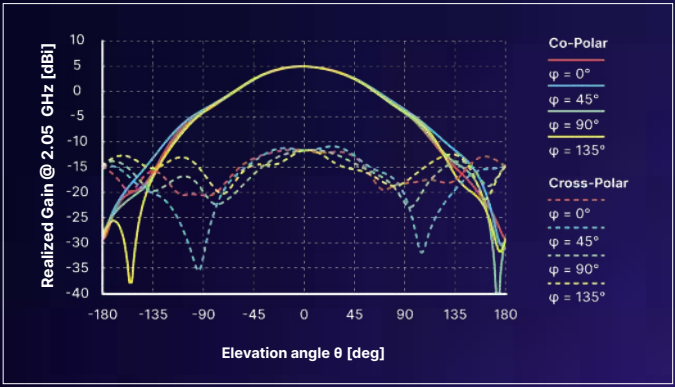
Typical Measured Performance

Single or Dual-Polarization | Tx and Rx | Hemispherical Coverage | Wideband | Size < 1U









Typical performance

Frequency Bands	**From 1.98 GHz to 2.29 GHz**
Bandwidth	> 310 MHz
Polarization	Left and/or Right Hand Circular Polarization
Reflection Coefficient	RHCP port < -16 dB LHCP port < -16 dB Isolation < -12 dB
Power Handling	20 W Transmit and Receive
Half Power Beam Width	> 88° (± 44° in all planes)
Realized Gain	Gain @ boresight > 5.4 dBi Gain @ ± 30° > 4.2 dBi Gain @ ± 60° > 0.5 dBi
Axial Ratio	< 3 dB from 0° to ± 30° < 3.5 dB from 0° to ± 60° < 4 dB from 0° to ± 90°

Physical characteristics

Envelope Size	L 70.9 x W 70.9 x H 10.3 mm^3 Protruding Height: 3.62 mm (connectors excluded)
Mass With Connector (RF load included)	**SMA**: < 106g
Connector	2 x SMA female (50Ω)
Mechanical Interface	4 x M3 (unthreaded hole)
Qualification Temperature	-120°C / +120°C
Protective Radome	PEEK coated with SG121FD white paint (on Flight Models only) resistant to thermal and radiation environments and preventing electrostatic discharges.
Acceptance Tests on Flight Models	- Radio Frequency - Mechanical - Thermal
Acceptance Tests on Engineering Models	Radio Frequency Only

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QUALITY SYSTEM CERTIFICATION DNV ISO 9001 AS/EN/JISQ 9100

TT&C ANTENNA

Ka-Band TT&C Antenna

The Ka-Band TT&C Antenna offers a compact and reliable solution for telemetry, tracking, and command operations in the Ka-band. Available in two models (Rx and Tx), it is designed for demanding space missions with scalable frequency to suit various operational needs. The choke ring design reduces multipath interference, ensuring accurate signal transmission and reception. Supporting single- or dual-circular polarization (RHCP/LHCP), it operates across the 19.7–20.2 GHz (Tx) and 29.5–30 GHz (Rx) bands with excellent axial ratio stability and low reflection coefficient. Lightweight, durable, and engineered for extreme environments, this antenna ensures optimal performance.

Rx or TX | Hemispherical Coverage | HPBW > 90° | Size < 1U

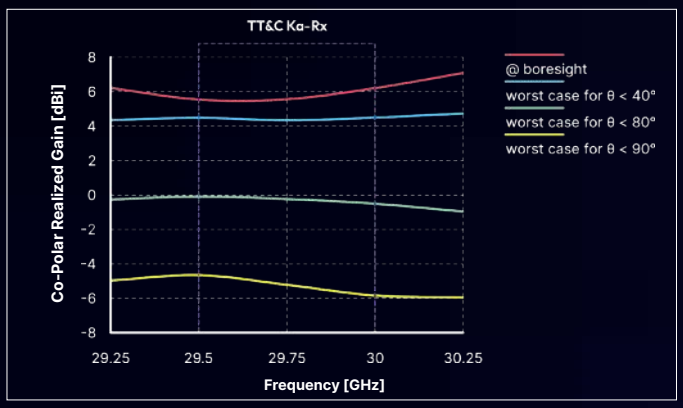
Benefits

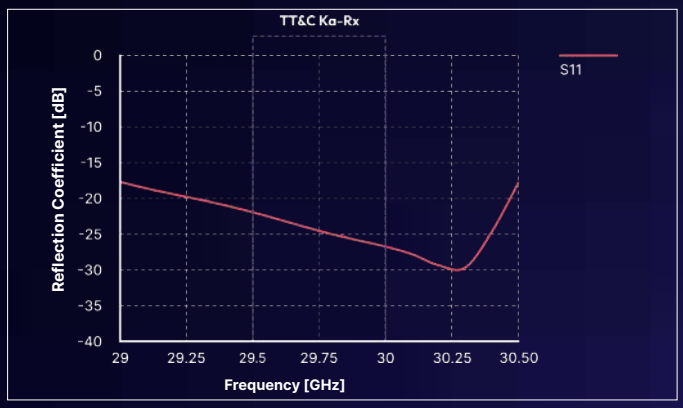
- High Performance on TT&C Ka Bands
- Ultra High Beamwidth
- Acceptance Tests (RF, Mechanical, Thermal) included:
  - Return loss
  - Z-axis random vibration
  - Thermal cycling
- Full Metal Design: Resistant against harsh environment
- ITAR Free

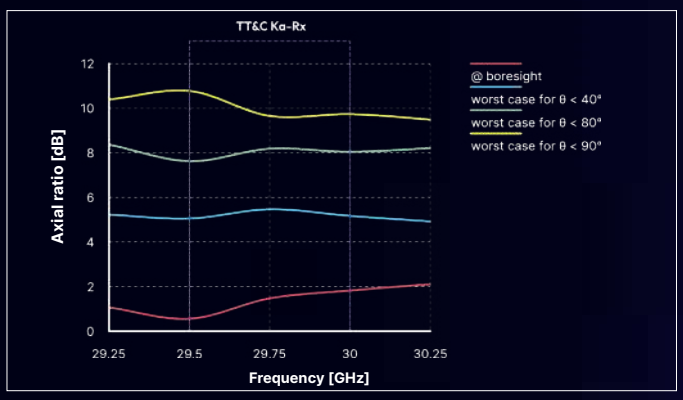
KA-BAND TT&C ANTENNA

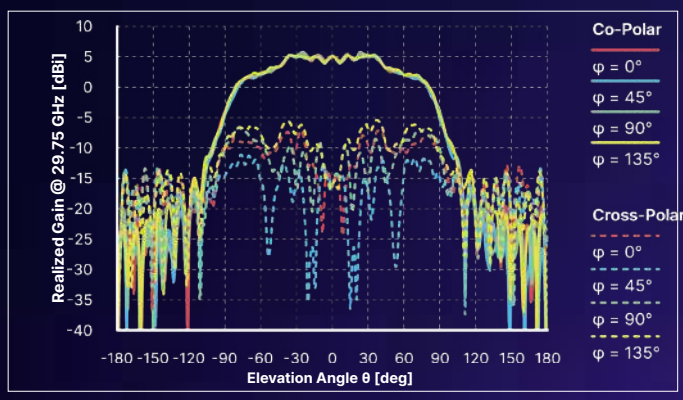
Typical Measured Performance

Rx | Hemispherical Coverage | HPBW > 90° | Size < 1U









Typical Measured Performances

Frequency Band	**From 29.5 GHz to 30 GHz**
Polarization	Left or Right Hand Circular Polarization
Reflection Coefficient	< -18 dB
Realized Gain	> 5 dBi @boresight > 4 dBi @ ±40° > -0.5 dBi @ ± 80°
Axial Ratio	< 5.5 dB from 0° to ± 40° < 8.5 dB from 0° to ± 80° < 11 dB from 0° to ± 90°

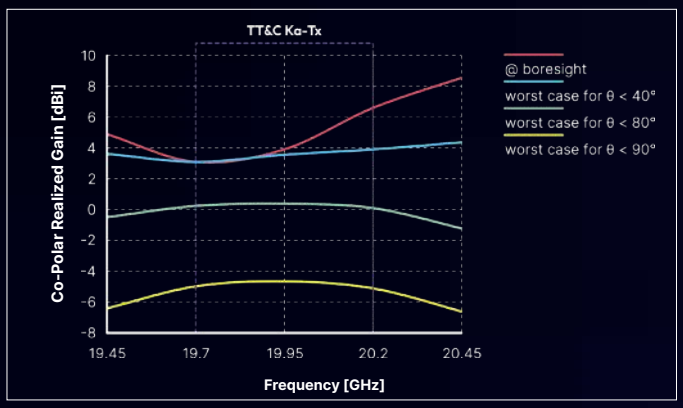
Physical Characteristics

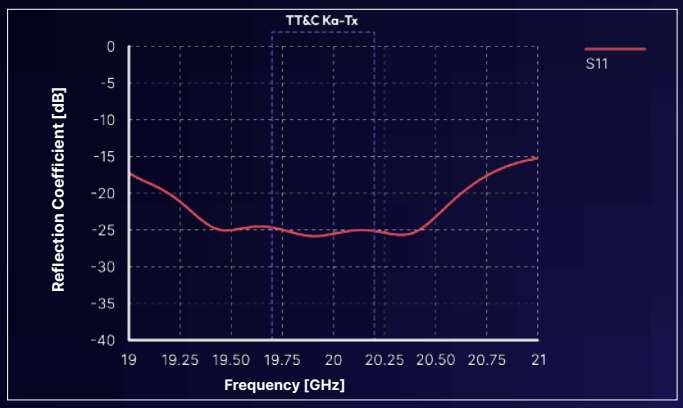
Envelope Size	L 108 x W 108 x H 44 mm^3 Protruding Height: 15.2 mm
Test-Cap compatibility	Yes
Mass	< 75 g
Connector	SMA 2.9 female 50 (No floating potentials within the antenna structure. Coax core electrically connected with antenna full-metal structure.)
Mechanical Interface	4 x M3 (unthreaded hole)
Qualification Temperature	-120°C / +120°C
Acceptance Tests on Flight Models	- Radio Frequency - Mechanical - Thermal
Acceptance Tests on Engineering Models	Radio Frequency Only

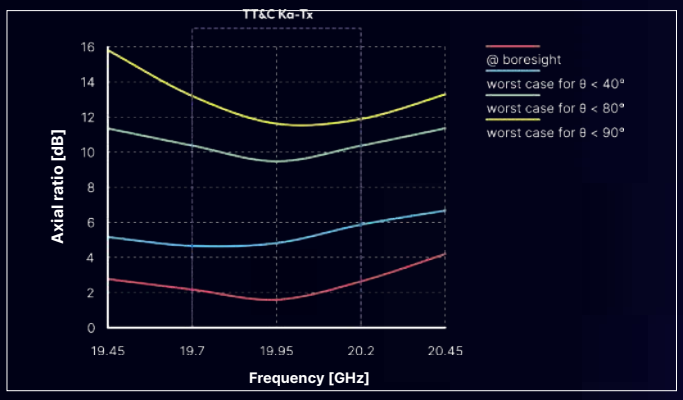
KA-BAND TT&C ANTENNA

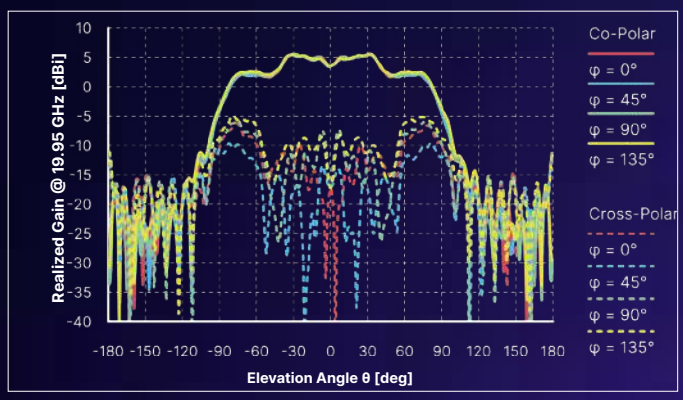
Typical Measured Performance

Tx | Hemispherical Coverage | HPBW > 90° | Size < 1U









Typical Measured Performances

Frequency Band	**From 19.7 GHz to 20.2 GHz**
Polarization	Left or Right Hand Circular Polarization
Reflection Coefficient	<-18dB
Realized Gain	> 3 dBi @boresight > 3 dBi @ ±40° > 0 dBi @ ± 80°
Axial Ratio	< 6 dB from 0° to ± 40° < 10.5 dB from 0° to ± 80° < 13.5 dB from 0° to ± 90°

Physical Characteristics

Envelope Size	L 50 x W 50 x H 60 mm^3 Protruding Height: 19.69 mm
Test-Cap compatibility	Yes
Mass	<140 g
Connector	SMA 2.9 female 50 (No floating potentials within the antenna structure. Coax core electrically connected with antenna full-metal structure.)
Mechanical Interface	4 x M3 (unthreaded hole)
Qualification Temperature	-120°C / +120°C
Acceptance Tests on Flight Models	- Radio Frequency - Mechanical - Thermal
Acceptance Tests on Engineering Models	Radio Frequency Only

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QUALITY SYSTEM CERTIFICATION DNV ISO 9001 AS/EN/JISQ 9100

TT&C ANTENNAS

Test Hat for S-Band TT&C Antennas

Anywaves Test Hat for S-Band TT&C Antennas is essential to carry out end to end testing (parallelism, assembly chain, thermal vacuum...). It features a simple and robust design consisting in a cylindrical aluminum cavity, covered with absorber material and terminated by a RF probe.

It operates over the frequency band of the S-Band TT&C antenna. It is delivered in a single part that can be directly screwed on top of the antenna, minimizing both the risk to damage the antenna and the manipulation steps.

NB : a Test Hat compatible version of the Anywaves S-Band TT&C antenna is required.

RF Chain Measurement | TVAC Compatibility | Plug & Play | On-platform Test

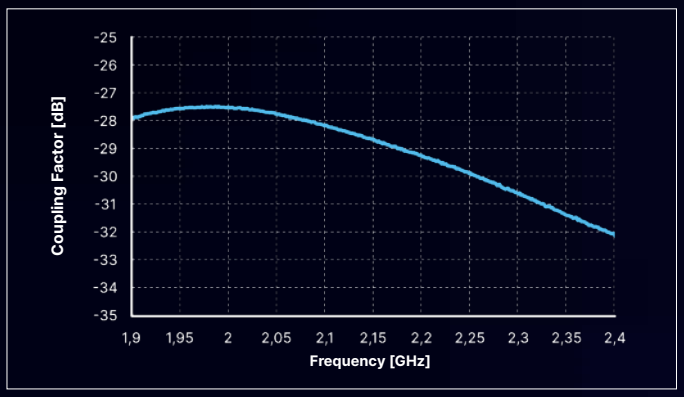
Benefits

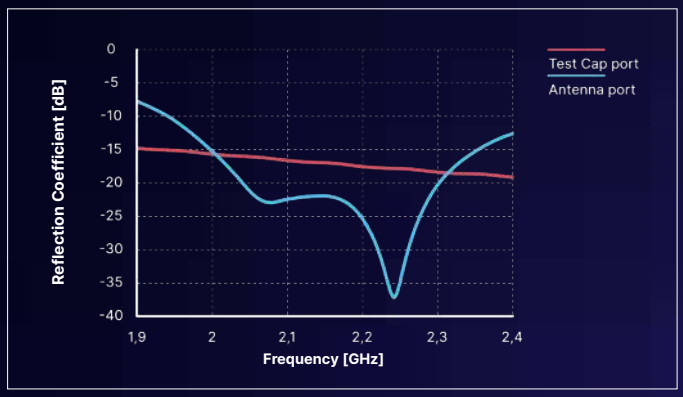
- Enables reproductible measurements of antenna & transceiver on the platform
- Very low impact on the antenna matching (reflection coefficient)
- No mounting bracket required on the platform (screwed on the antenna itself)
- ITAR Free
- Compatible with thermal vacuum environment with low outgassing properties
- Safe & easy to mount & dismount thanks to an oriented slot ensuring the correct positioning
- Low RF leakage to protect users from radiation during the test

TEST-HAT FOR S-BAND TT&C ANTENNAS

Typical Measured Performance

RF Chain Measurement | TVAC Compatibility | Plug & Play | On-platform Test



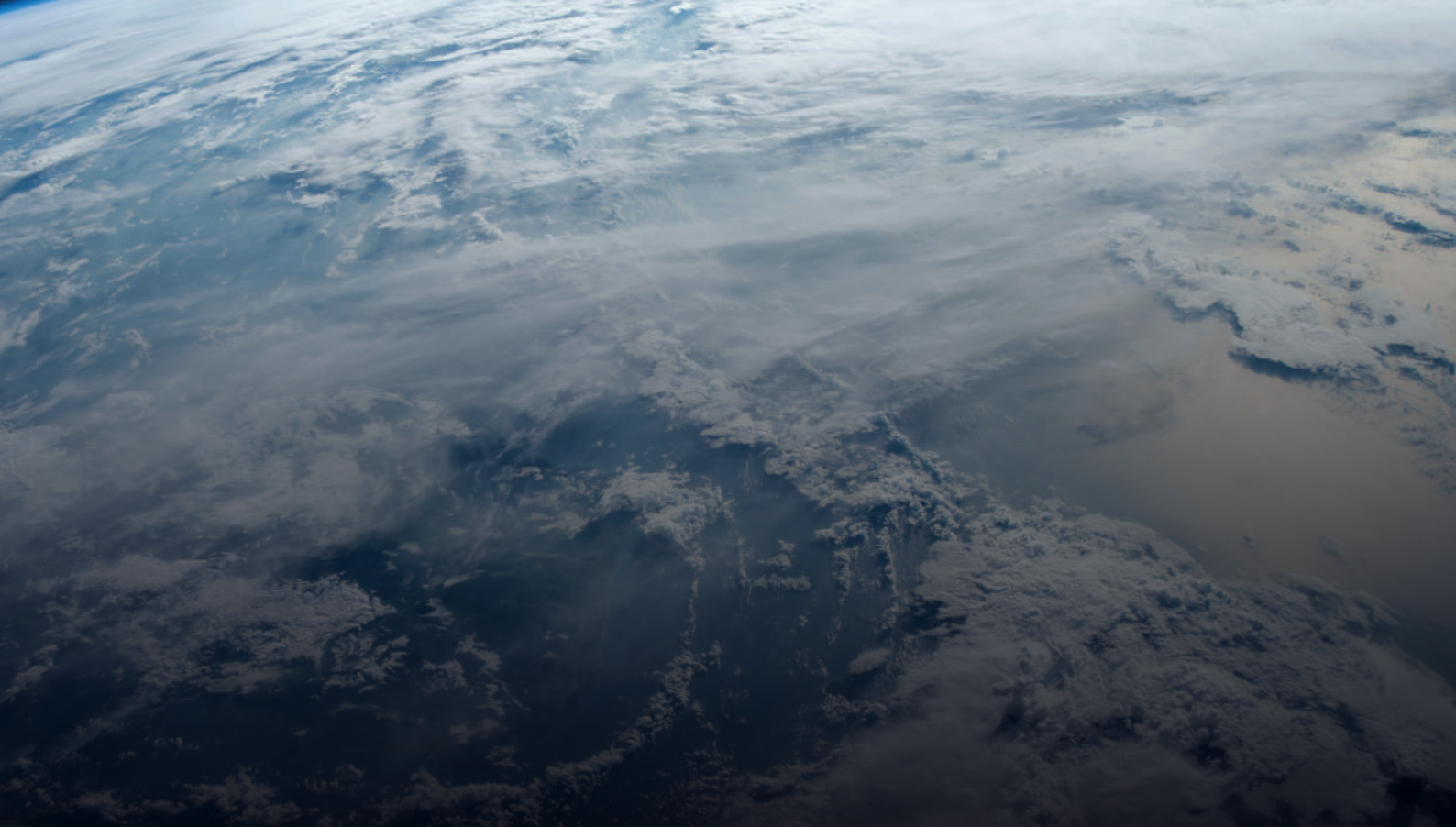


Typical Performance

Frequency Bands	**From 1.98 GHz to 2.29 GHz**
Bandwidth	> 310 MHz
Polarization	Left or Right Hand Circular Polarization
Reflection Coefficient at Antenna Port	< -15 dB
Reflection Coefficient at Test Hat Port	< -15 dB
Coupling Factor	~ -29 dB
Coupling Factor Variation	< 1 dB within telecommand band < 2dB within telemetry band

Physical Characteristics

Envelope Size Without Connector	Ø 117 mm x 98 mm
Mass With Connector	910 ± 10 g
Connector	Coaxial SMA female (50 Ω)
Mechanical Interface	4 x M3 (unthreaded hole)
Qualification Temperature	-40°C / +70°C



02

Data Downlink

Antennas

Anywaves X-Band Antennas are designed for data downlink and payload telemetry in space missions.

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DATA DOWNLINK ANTENNAS

Wide Beam X-Band Antenna

Anywaves' Wide Beam X-Band antenna is a compact, ultra-thin solution for payload telemetry, offering reliable hemispherical coverage for robust mission data downlink.

Designed for LEO satellites with broad visibility needs, it fits easily into nanosat platforms thanks to its sub-1U form factor. Its circular polarization ensures stable performance across a wide angular range. A protective radome enhances resilience to harsh thermal and ESD conditions.

NB: Fully compatible with Anywaves' X-Band Test Hat.

Tx | HPBW > 85° | Ultra Low Profile | RHCP or LHCP | Size < 1U

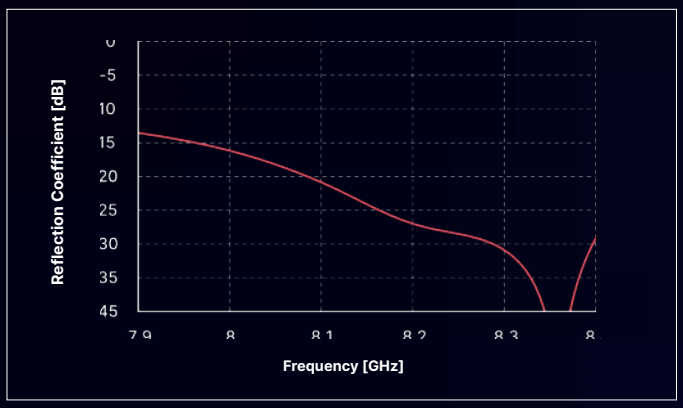
Benefits

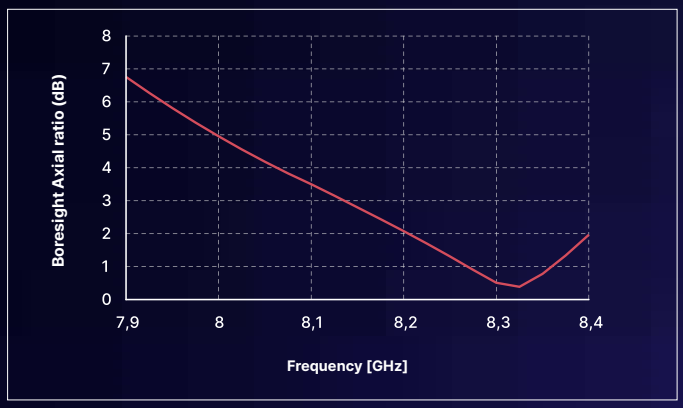
- Wide coverage payload telemetry
- High cross-polarization discrimination
- Acceptance Tests (RF, Mechanical, Thermal) included:
  - Return loss
  - Z-axis random vibration
  - Thermal cycling
- Radome protection against harsh environment: temperature & ESD
- ITAR Free
- Test cap compatible

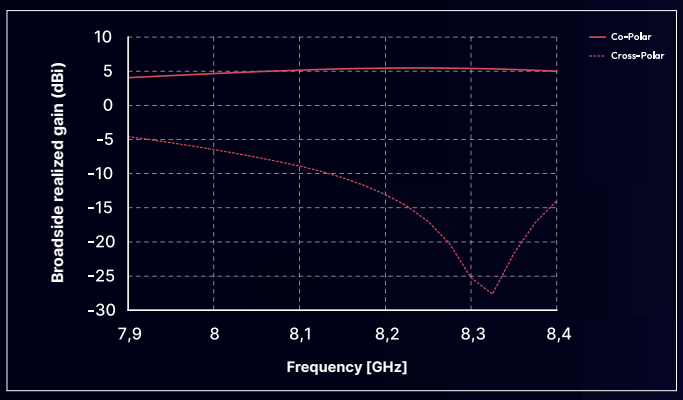
WIDE BEAM X-BAND ANTENNA

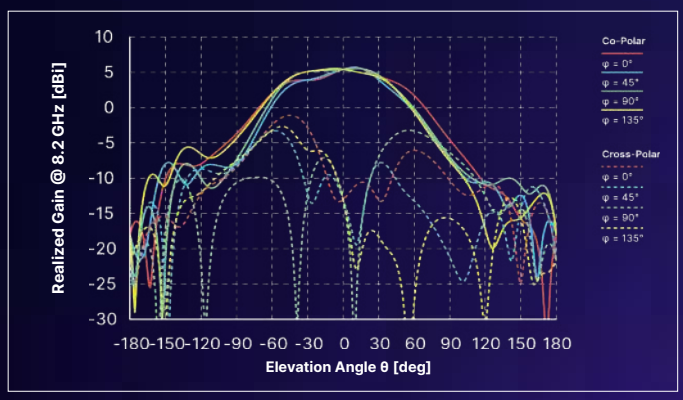
Typical Measured Performance

Tx | HPBW > 85° | Ultra Low Profile | RHCP or LHCP | Size < 1U









Typical Measured Performances

Frequency Band	**From 8.025 GHz to 8.4 GHz**
Polarization	Right or Left Hand Circular Polarization
Reflection Coefficient	< -15 dB
Realized Gain @8.2 GHz	Gain @ boresight > 5.0 dBi Gain @ ± 30° > 4.0 dBi Gain @ ± 60° > -1.0 dBi
Bandwidth	375 MHz
Half Power Beam Width	~86° (-47°/+39° in all planes) @ 8.2 GHz

Physical Characteristics

Envelope size without connectors	L 100 x W 100 x H 6.5 mm3 Height with connector: 16 mm
Mass With Connector	70 g ± 7 g
Connector	Coaxial SMA female (50Ω)
Mechanical Interface	4 x M3 (unthreaded hole)
Qualification Temperature	-120°C / +120°C
Protective Radome	PEEK coated with SG121FD white paint (on Flight Models only) resistant to thermal and preventing electrostatic discharges.
Acceptance Tests on Flight Models	- Radio Frequency - Mechanical - Thermal
Acceptance Tests on Engineering Models	Radio Frequency Only

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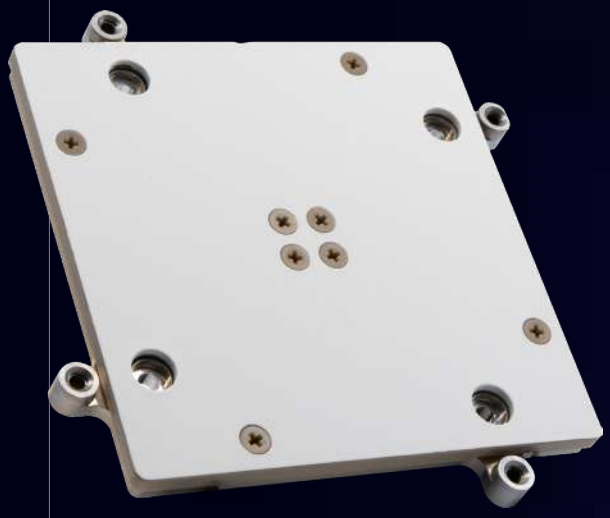


DATA DOWNLINK ANTENNAS

Compact X-Band Antenna

Anywaves' Compact X-Band Antenna is an ultra-low-profile antenna designed for payload telemetry from the satellite to the ground station.

This antenna features a broadside directive beam, with high-quality circular polarization, to enable higher data rates for the payload telemetry downlink. Due to its very compact design, it is perfectly suitable for nanosatellites and LEO platforms.

NB : compatible with Anywaves Test Hat for High-Gain X-Bands Antennas.

Tx | G > 15 dBi | Ultra Low Profile | RHCP or LHCP | Size < 1U

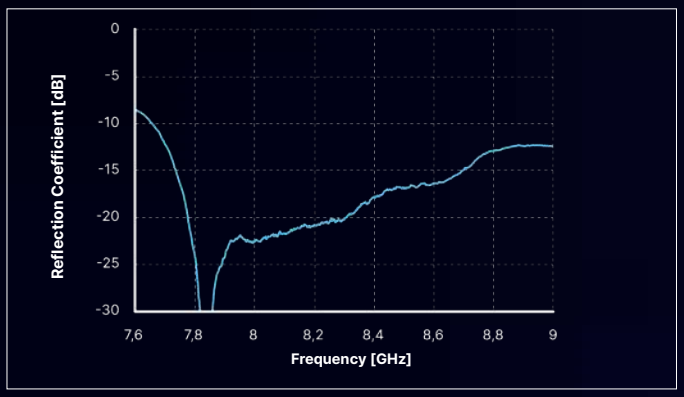
Benefits

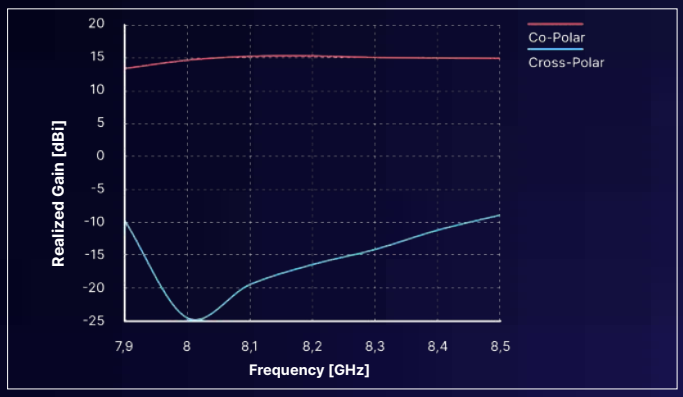
- High data-rate payload telemetry
- High cross-polarization discrimination
- Acceptance Tests (RF, Mechanical, Thermal) included:
  - Return loss
  - Z-axis random vibration
  - Thermal cycling
- Radome protection against harsh environment: temperature & ESD
- ITAR Free

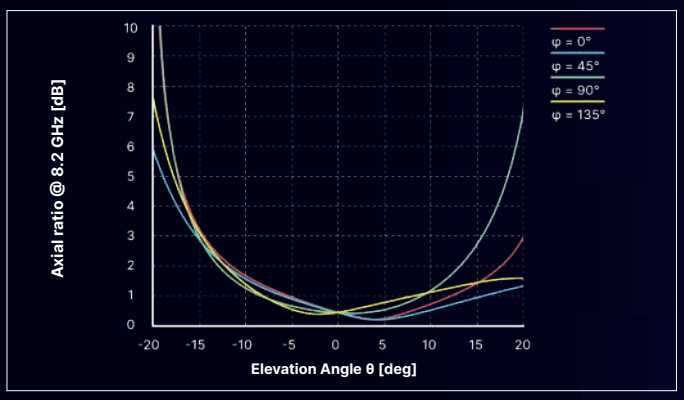
COMPACT X-BAND ANTENNA

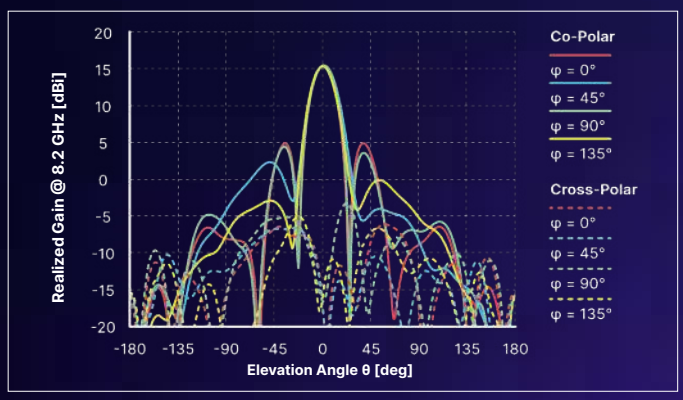
Typical Measured Performance

Tx | G > 15 dBi | Ultra Low Profile | RHCP or LHCP | Size < 1U









Typical Performance

Frequency Band	**From 7.9 GHz to 8.5 GHz**
Bandwidth	600 MHz
Polarization	Left or Right Hand Circular Polarization
Reflection Coefficient	< -15 dB
Half Power Beam Width	~ 20° (± 10°)
Radiation Efficiency	> 70%
Power Handling	20 W
Realized Gain @ 8.2 GHz	15.5 dBi
Axial Ratio @ 8.2 GHz	< 1 dB from 0° to ± 5° (all planes) < 2 dB from 0° to ± 10° (all planes)

Physical Characteristics

Envelope Size	L 100 x W 100 x H 16 mm^3 Protruding Height: 6.5 mm (connectors excluded)
Mass With Connector	70 g ± 7 g
Connector	Coaxial SMA female (50Ω)
Mechanical Interface	4 x M3 (unthreaded hole)
Qualification Temperature	-120°C / +120°C
Protective Radome	PEEK coated with SG121FD white paint (on Flight Models only) resistant to thermal and preventing electrostatic discharges.
Acceptance Tests on Flight Models	- Radio Frequency - Mechanical - Thermal
Acceptance Tests on Engineering Models	Radio Frequency Only

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SPACE ANTENNA MAKERS

QUALITY SYSTEM CERTIFICATION DNV ISO 9001 AS/EN/JISQ 9100

DATA DOWNLINK ANTENNAS

Compact Dual-Polarized X-Band Antenna

This compact 1U X-band antenna offers simultaneous dual circular polarization (LHCP & RHCP), enabling increased data rates or polarization diversity. It is ideal on small satellite platforms, particularly those requiring high-data-rate payload telemetry such as Earth Observation missions.

Despite its compact form factor, the antenna delivers a boresight gain exceeding 16.5 dBi, making it a robust choice for demanding applications where size, weight, and performance must be carefully balanced.

NB: compatible with Anywaves Test Hat for High-Gain X-Bands Antennas.

Dual-Polarization | Tx | G > 15.5 dBi | Ultra Low Profile | Size < 1U

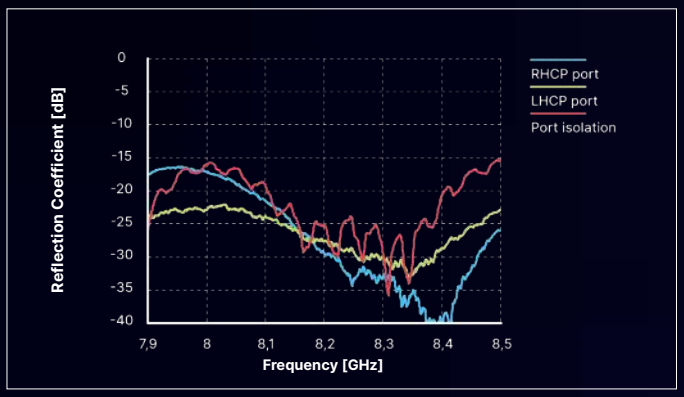
Benefits

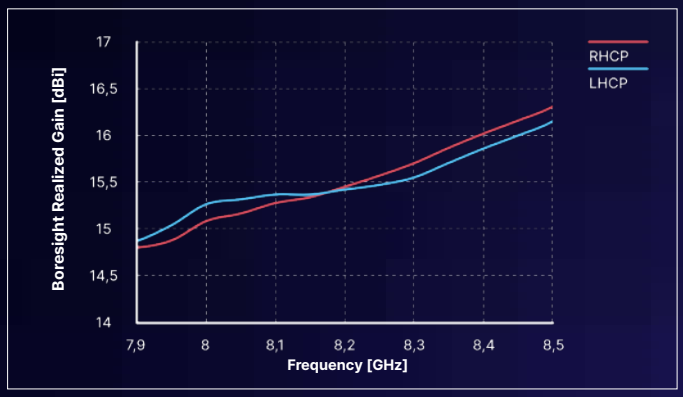
- High data-rate payload telemetry
- High cross polar discrimination
- Acceptance Tests (RF, Mechanical, Thermal) included:
  - Return loss
  - Z-axis random vibration
  - Thermal cycling
- Simultaneous dual circular polarization to double data throughput
- ITAR Free
- Rugged for harsh space environments
- ESD Free

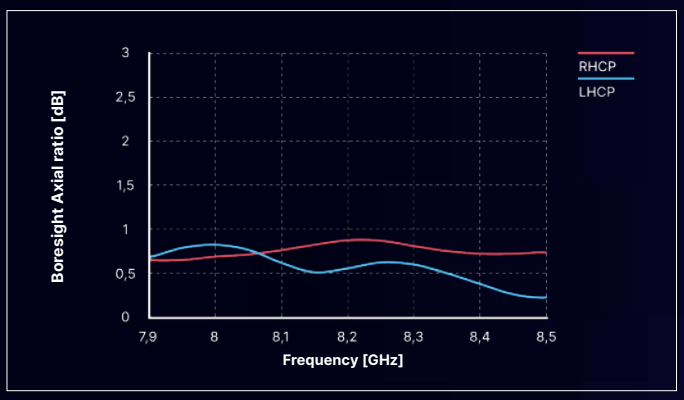
COMPACT DUAL-POLARIZED X-BAND ANTENNA

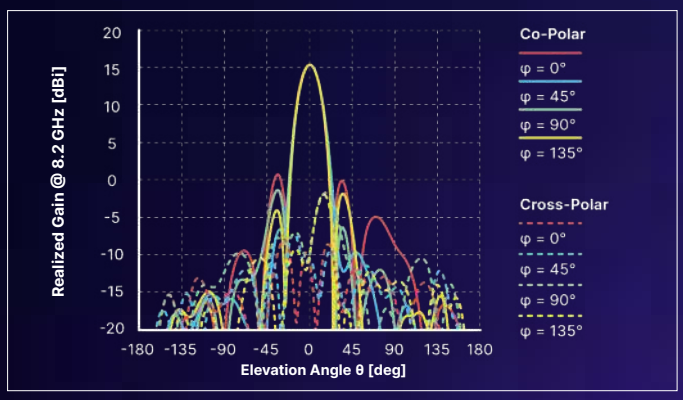
Typical Measured Performance

Dual-Polarization | Tx | G > 15.5 dBi | Ultra Low Profile | Size < 1U









Typical Performance

Frequency Bands	**8.025 GHz to 8.4 GHz**
Bandwidth	375 MHz
Polarization	Right and/or Left Hand Circular Polarization
Reflection Coefficient	RHCP port < -15 dB LHCP port < -15 dB Port to port isolation < -15 dB
Half Power Beam Width	~20° (±10°)
Power Handling	20 W (Either 1×20 W or 2×10 W Continuous Wave)
Realized Gain @8.2 GHz	> 15.5 dBi @boresight
Axial Ratio @8.2 GHz	< 1 dB from 0° to ± 5° (all Planes) < 2 dB from 0° to ± 10° (all Planes)

Physical Characteristics

Envelope Size	L 100 x W 100 x H 26.1 mm³ Protruding Height: 8.7mm (connectors excluded)
Mass	140g ± 7g
Qualification Temperature	-120°C / +120°C
Protective Radome	PEEK coated with SG121FD white paint (on Flight Models only) resistant to thermal and radiation environments and preventing electrostatic discharges
Connectors	Coaxial SMA female (50Ω)
Mechanical Interface	4 x M3 (unthreaded hole)
Acceptance Tests on Flight Models	- Radio Frequency - Mechanical - Thermal
Acceptance Tests on Engineering Models	Radio Frequency Only

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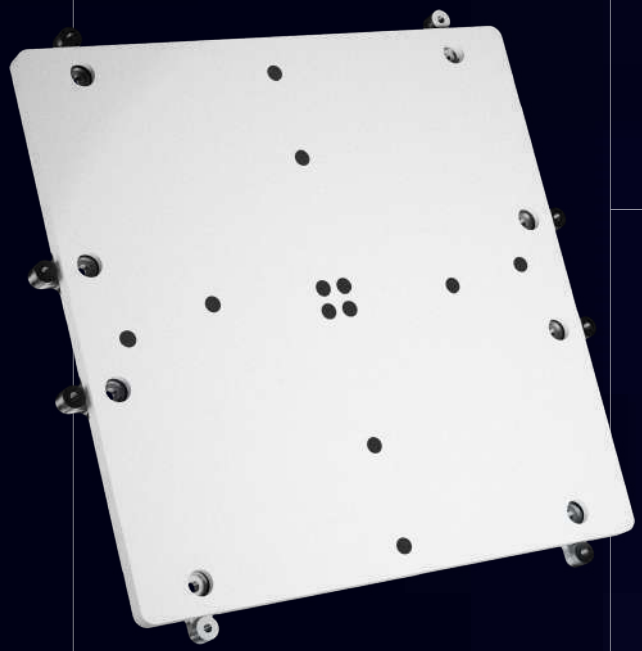
SPACE ANTENNA MAKERS

QUALITY SYSTEM CERTIFICATION DNV ISO 9001 AS/EN/JISQ 9100



DATA DOWNLINK ANTENNAS

High-Gain X-Band Antenna

Anywaves' High-Gain X-Band Antenna is optimized for payload telemetry requiring high data rates. With >20 dBi boresight gain over 7.9–8.5 GHz and circular polarization (RHCP or LHCP), it ensures excellent signal integrity.

Compact, lightweight, and reliable, it is built for harsh space environments with a PEEK-coated radome designed to withstand extreme temperatures. This antenna is ideal for demanding satellite missions needing robust and efficient data downlink.

NB: compatible with Anywaves Test Hat for High-Gain X-Bands Antennas.

Tx | High Gain | > 20 dBi

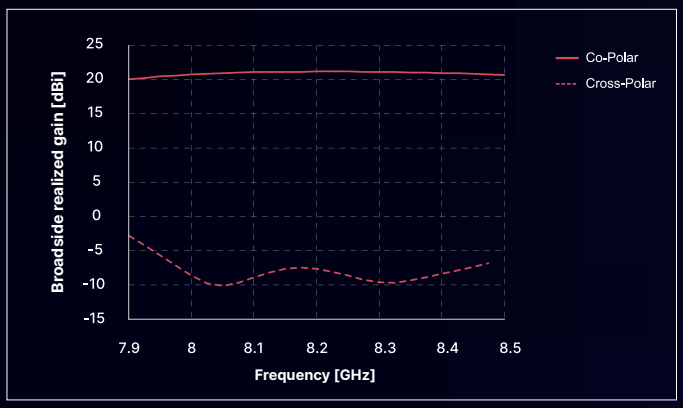
Benefits

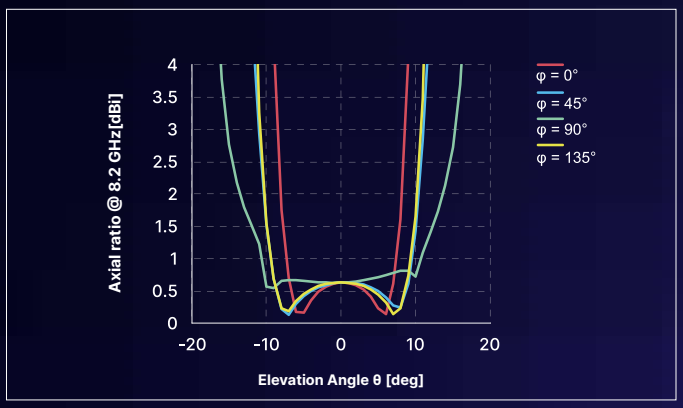
- High data-rate payload telemetry
- High gain broadside beam (>20dBi)
- Acceptance Tests (RF, Mechanical, Thermal) included:
  - Return loss
  - Z-axis random vibration
  - Thermal cycling
- Radome protection against harsh environment: temperature & ESD
- ITAR Free
- Test cap compatible

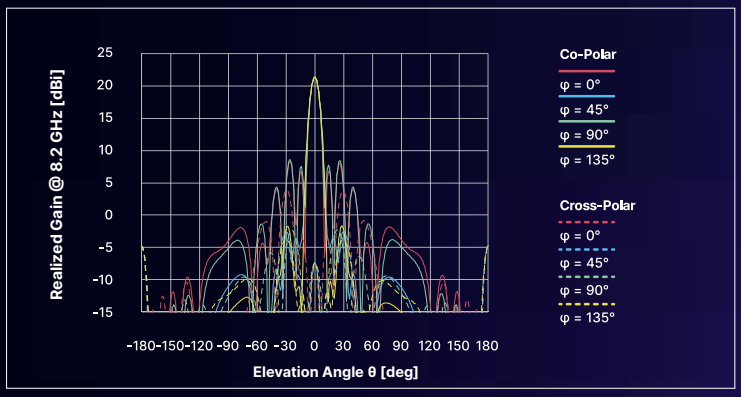
HIGH GAIN X-BAND ANTENNA

Typical Measured Performance

Tx | High Gain | > 20 dBi







Typical Measured Performances

Frequency Band	From 7.9 GHz to 8.5 GHz
Polarization	Right or Left Hand Circular Polarization
Reflection Coefficient	< -18 dB
Realized Gain @8.2 MHz	>20 dBi @boresight
Axial Ratio @8.2 MHz	< 1 dB from 0° to ± 7.5° (all planes) < 2 dB from 0° to ± 8° (all planes)
Bandwidth	600 MHz
Half Power Beam Width	~9° (±4.5° in all planes)

Physical Characteristics

Envelope Size without connectors	L 200 x W 200 x H 16 mm³ Protruding Height: <8 mm
Connectors	Coaxial SMA female (50 Ω)
Test-Cap Compatibility	Yes
Mechanical interface	4 x M3 (unthreaded hole)
Qualifiifaction temperature	-120°C / +120°C
Protective Radome	PEEK coated with SG121FD white paint (on Flight Models only) resistant to thermal and radiation environment and preventing from electrostatic discharges
Acceptance Tests on Flight Models	- Radio Frequency - Mechanical - Thermal
Acceptance Tests on Engineering Models	Radio Frequency Only

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SPACE ANTENNA MAKERS

QUALITY SYSTEM CERTIFICATION DNV ISO 9001 AS/EN/JISQ 9100

DATA DOWNLINK ANTENNAS

Test Hat for X-Band Antennas

Anywaves' Test Hat for X-Band Antennas is essential for satellite-level testing. Its single-part design ensures ease of use and minimal impact on the antenna. It allows reproducible measurements of the antenna and transceiver, enhancing end-to-end tests and saving time and money by avoiding complex anechoic chamber tests.

This Ground Segment Equipment, made from cylindrical aluminum with an RF probe, screws directly onto the antenna. It is compatible with thermal vacuum environments and ensures low RF leakage. The plug-and-play design offers reliable RF system measurements, demonstrating complete performance for better satellite reliability and increased customer satisfaction.

RF Chain Measurement | TVAC Compatibility | Plug & Play | On-platform Test

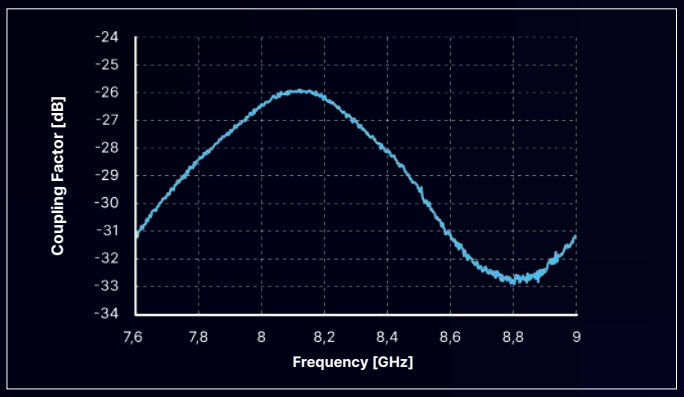
Benefits

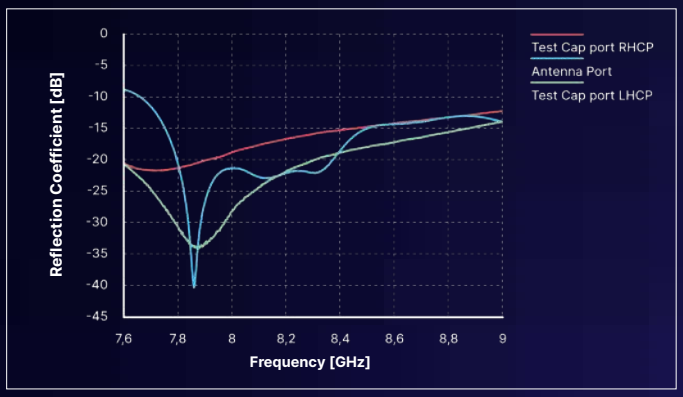
- Enables reproductible measurements of antenna & transceiver on the platform
- Very low impact on the antenna matching (reflection coefficient)
- No mounting bracket required on the platform (screwed on the antenna itself)
- ITAR Free
- Compatible with thermal vacuum environment with low outgassing properties
- Safe & easy to mount & dismount thanks to an oriented slot ensuring the correct positioning
- Low RF leakage to protect users from radiation during the test

TEST-HAT FOR X-BAND ANTENNAS

Typical Measured Performance

RF Chain Measurement | TVAC Compatibility | Plug & Play | On-platform Test



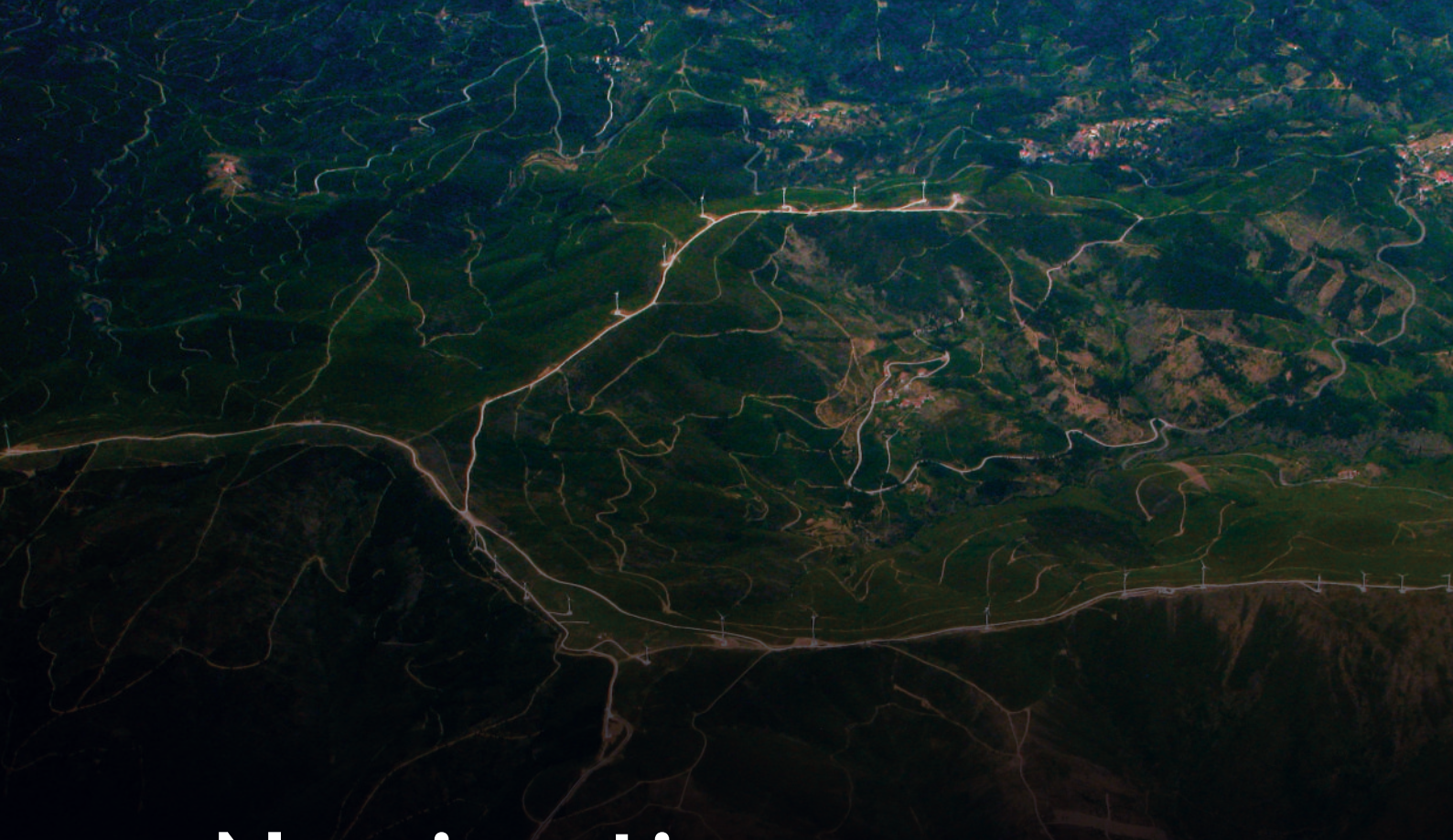


Typical Performance

Frequency Bands	**From 8 GHz to 8.4 GHz**
Bandwidth	400 MHz
Polarization	Right and/or Left Hand Circular Polarization
Reflection Coefficient at Antenna Port	< -15 dB
Reflection Coefficient at Test Hat Port	< -12 dB
Coupling Factor	~ -27 dB
Coupling Factor Variation	< 2.5 dB

Physical Characteristics

Envelope Size Without Connector	100.2 × 100.2 × 106.2 mm^3
Mass With Connector	615 g ± 5 %
Connector	Coaxial SMA female (50 Ω)
Mechanical Interface	4 x M3 captive screws (provided)
Qualification Temperature	-40°C / +85°C



03

Navigation

Antennas

Anywaves GNSS Antennas are essential for accurate positioning and timing in space missions.

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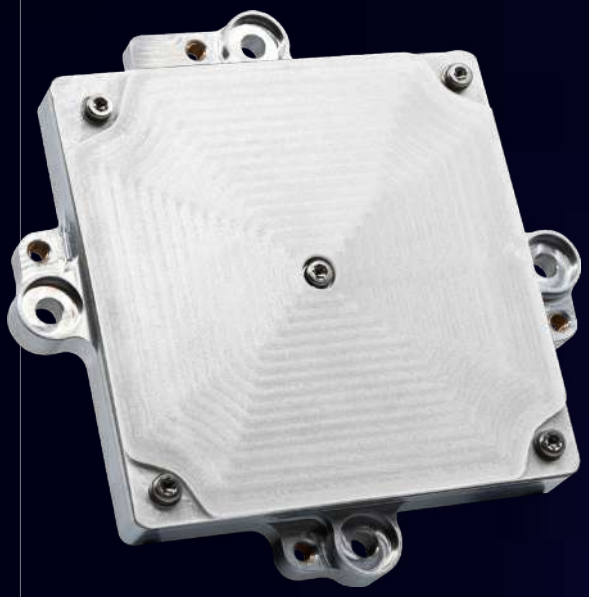
SPACE ANTENNA MAKERS

QUALITY SYSTEM CERTIFICATION DNV ISO 9001 AS/EN/JISQ 9100



NAVIGATION ANTENNAS

GNSS L1/E1 Bands Antenna

Anywaves' GNSS L1/E1 Bands antenna is our latest navigation antenna designed for LEO platforms, ensuring precise positioning and timing in harsh space environments. Operating in the GPS L1 and Galileo E1 frequency bands, this antenna guarantees exceptional performance. It offers a superior gain (> 6 dBi) and low reflection (< -18dB), and the Right Hand Circular polarization improves signal stability and reliability to avoid any blackouts risks.

This antenna is equipped with a robust PEEK radome for protection against extreme conditions. Its compact size, light weight and SMA connector facilitate easy integration with your platform without compromising on performance.

NB : compatible with Anywaves Test Hat for GNSS Antennas.

Rx | Hemispherical Coverage | HPBW > 90° | Size < 1U

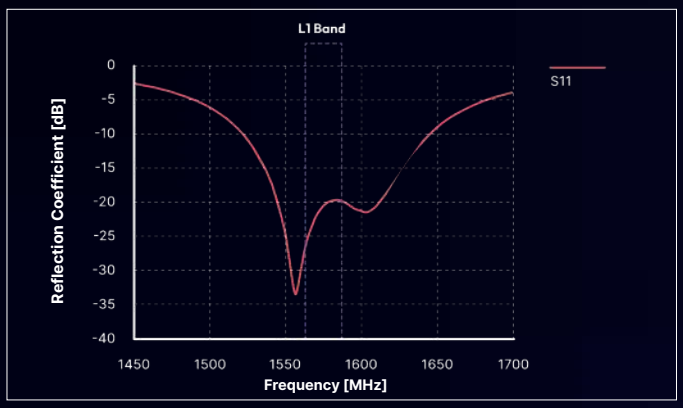
Benefits

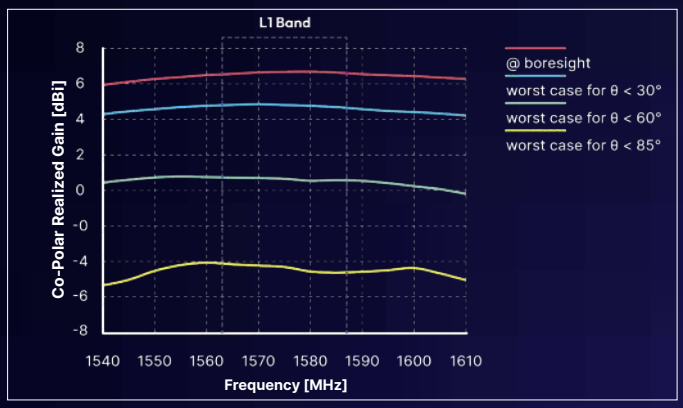
- High Performance on L1 Band (GPS) & E1 Band (Galileo)
- High cross-polarization discrimination
- Acceptance Tests (RF, Mechanical, Thermal) included:
  - Return loss
  - Z-axis random vibration
  - Thermal cycling
- Radome protection against harsh environment: temperature & ESD
- ITAR Free

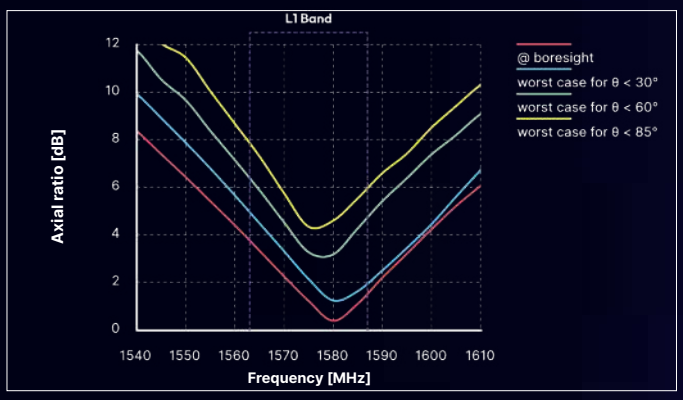
GNSS L1/E1 BANDS ANTENNA

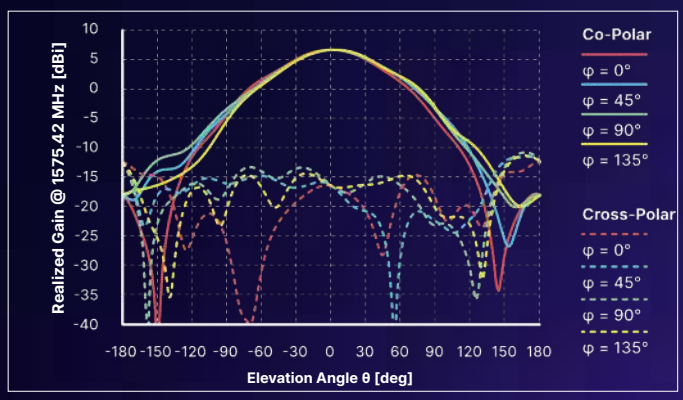
Typical Measured Performance

Rx | Hemispherical Coverage | HPBW > 90° | Size < 1U









Typical Measured Performances

Frequency Band	**GPS L1: 1563 MHz to 1587 MHz**
Polarization	Right Hand Circular Polarization
Reflection Coefficient	< -18 dB
Realized Gain @1575.42 MHz	> 6.5 dBi @boresight > 0.5 dBi @ ± 60° > -4.5 dBi @ ± 85°
Axial Ratio @1575.42 MHz	< 1.5 dB @boresight < 3.5 dB @ ± 60° < 4.5 dB @ ± 85°
Phase Center Position (PCO) Variation Maximum Variation vs Frequency	Variation within a sphere of radius < 1 mm
Phase Center Variation (PCV) Maximum Variation vs Elevation	< 0.4 mm (± 60° FoV)
Group Delay Variation	< 0.8 ns

Physical Characteristics

Envelope Size	L 96.6 x W 96.6 x H 23.26 mm^3 Protruding Height: <8 mm
Test-Cap Compatibility	Yes
Mass	119 g
Connector	Coaxial SMA female (50Ω)
Mechanical Interface	4 x M3 (unthreaded hole)
Qualification Temperature	-120°C / +120°C
Protective Radome	PEEK coated with SG121FD white paint (on Flight Models only) resistant to thermal and preventing electrostatic discharges.
Acceptance Tests on Flight Models	- Radio Frequency - Mechanical - Thermal
Acceptance Tests on Engineering Models	Radio Frequency Only

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SPACE ANTENNA MAKERS

QUALITY SYSTEM CERTIFICATION DNV ISO 9001 AS/EN/JISQ 9100

NAVIGATION ANTENNAS

GNSS All-Bands Antenna

Anywaves GNSS all-bands antenna is perfectly suited for LEO platforms. Operating in the frequency band from 1.16 GHz to 1.61 GHz, our antenna covers all GNSS constellations simultaneously with its very stable phase center and circular polarization. This offers excellent signal stability, ensuring no signal blackouts occur even if one GNSS constellation breaks down.

This antenna has a TRL 8 and has successfully passed qualification tests. Developed under the European Space Agency Navisp contract, this antenna is reliable and efficient, giving you the accuracy and precision you need to ensure your satellite is always in the right position.

NB : compatible with Anywaves Test Hat for GNSS All-Bands Antenna.

Rx | Hemispherical Coverage | Very High Accuracy | Size < 1U

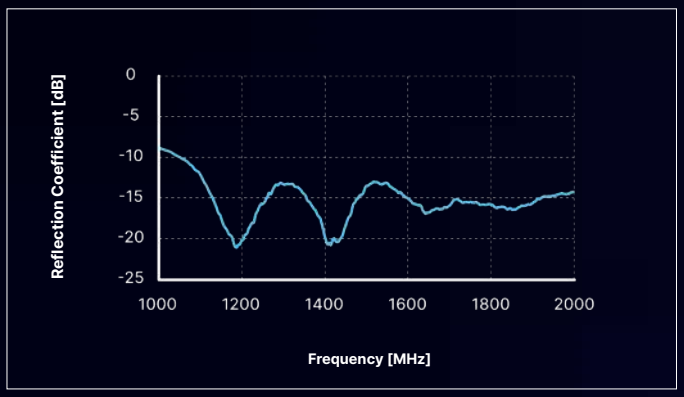
Benefits

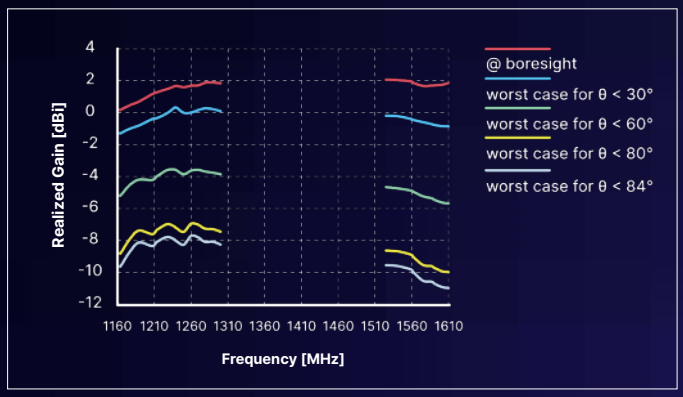
- All GNSS bands : GPS, Galileo, Glonass, Beidou, IRNSS L5, QZSS L6, INMARSAT in L-band for precise point positioning (PPP).
- Unique GNSS All-Bands antenna on the market
- Acceptance Tests (RF, Mechanical, Thermal) included:
  - Return loss
  - Z-axis random vibration
  - Thermal cycling
- Radome protection against harsh environment: temperature & ESD
- ITAR Free

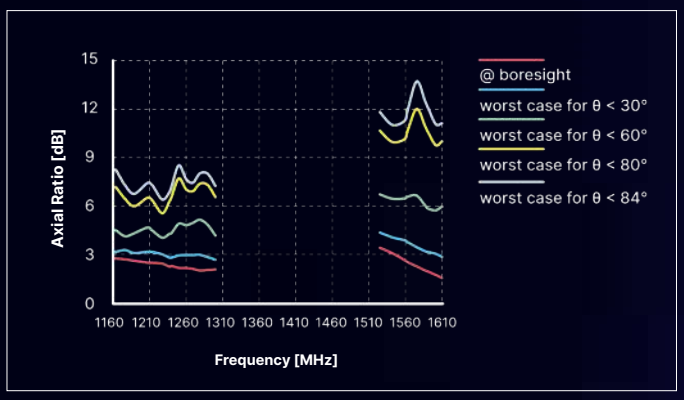
GNSS ALL-BANDS ANTENNA

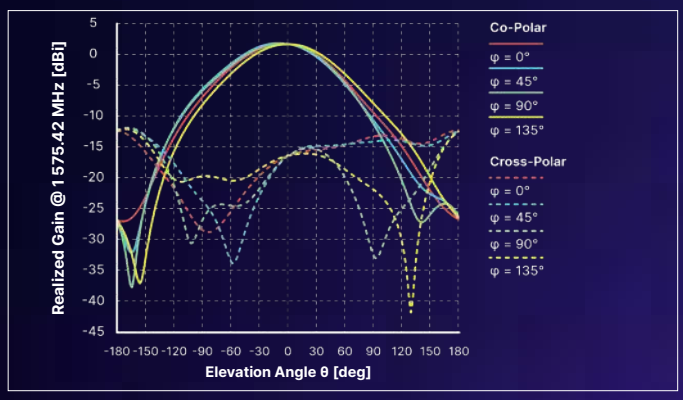
Typical Measured Performance

Rx | Hemispherical Coverage | Very High Accuracy | Size < 1U









Typical Performance

Frequency Bands	**1 160 MHz to 1 610 MHz:** GPS L1/L2/L5, Galileo E1/E5a/E5b/E6 Glonass G1/G2/G3, Beidou B1/B2a/B2/B3 **Inmarsat L-band:** 1 525 – 1 559 MHz
Polarization	Right Hand Circular Polarization
Reflection Coefficient	≤ -10 dB
Realized Gain	@ boresight > 0 dBi
Gain Variation	In all individual sub-bands: < 0.6 dBi
Axial Ratio	@ boresight < 3 dB
Phase Center Offset (± 30° FoV) Maximum Variation vs Frequency	Variation within a sphere of radius < 4.7 mm for all bands Variation within a sphere of radius < 1.8 mm for individual sub-bands
Phase Center Variation (± 30° FoV) Maximum Variation vs Elevation	Variation < 0.4 mm within ± 30° Variation < 2.6 mm within ± 60°
Group Delay Variation	< 1.2 ns

Physical Characteristics

Envelope Size	99.4 mm x 99.4 mm x 15.2 mm Protruding height: 8.7 mm
Mass With Connector	130 g
Connector	Coaxial SMA female 50 Ω
Mechanical Interface	4 x M3 (unthreaded hole)
Qualification Temperature	-120°C / +120°C
Protective Radome	PEEK coated with SG- 121FD white paint (on Flight Models only) resistant to thermal and radiation environments and preventing electrostatic discharges.
Acceptance Tests on Flight Models	- Radio Frequency - Mechanical - Thermal
Acceptance Tests on Engineering Models	Radio Frequency Only

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SPACE ANTENNA MAKERS

QUALITY SYSTEM CERTIFICATION
DNV
ISO 9001
AS/EN/JISQ 9100

GNSS All-Bands Antenna with Integrated LNA

- Integrated active electronic board with amplification and filtering
- Very stable phase center
- Thermal shield against harsh environment
- Acceptance tests included
- ITAR Free
- Test Hat compatible

Frequency Bands	**From 1.16 GHz to 1.61 GHz** **GPS L1/L2/L5, Galileo E1/E5a/E5b/E6** **Glonass G1/G2/G3, Beidou B1/B2a/B2/B3** **Inmarsat L-band: 1.525 – 1.559 GHz**
Polarization	Right Hand Circular Polarization
Realized Gain	> 0 dBi @ boresight > -5 dBi @ ± 30° > -11 dBi @ ± 60°
TRL	5
Size	99.4×99.4×35 mm^3
Return Loss	< -15dB

RF Interface	**SMA Female**
DC Interface	Micro-D 9 Socket Female
DC Input Voltage	5.5 - 6.5 V
Consumption	< 500 mW
LNA Block Gain	Typical: 22 dB Worst Case: 20 dB
Noise Figure	Typical: 1.5 dB

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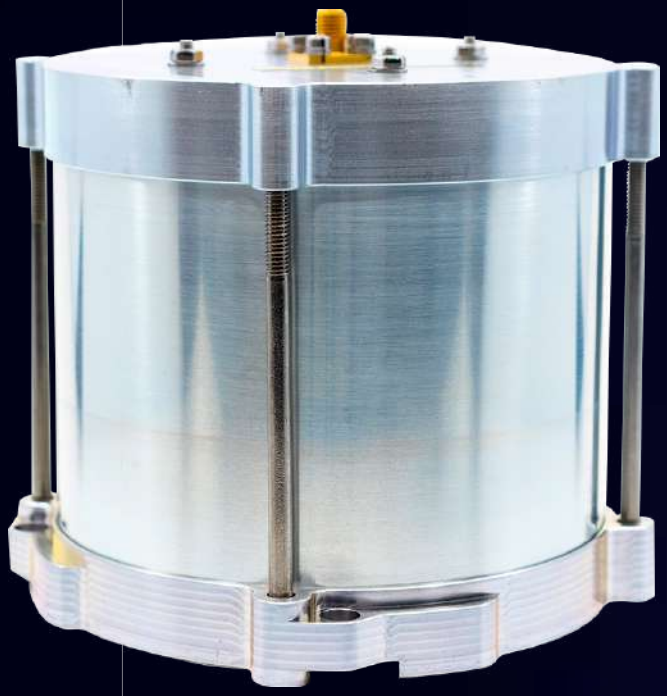
SPACE ANTENNA MAKERS

QUALITY SYSTEM CERTIFICATION DNV ISO 9001 AS/EN/JISQ 9100



NAVIGATION ANTENNAS

Test Hat for GNSS All-Bands Antennas

Anywaves Test Hat for GNSS All-Bands Antennas is essential to carry out end to end testing (parallelism, assembly chain, thermal vacuum...). It features a simple and robust design consisting in a cylindrical aluminum cavity, covered with absorber material and terminated by a RF probe.

It operates over the frequency bands of the GNSS All-Bands antenna. It is delivered in a single part that can be directly screwed on top of the antenna, minimizing both the risk to damage the antenna and the manipulation steps.

NB : a Test Hat compatible version of the Anywaves GNSS All-Bands antenna is required.

RF Chain Measurement | TVAC Compatibility | Plug & Play | On-platform Test

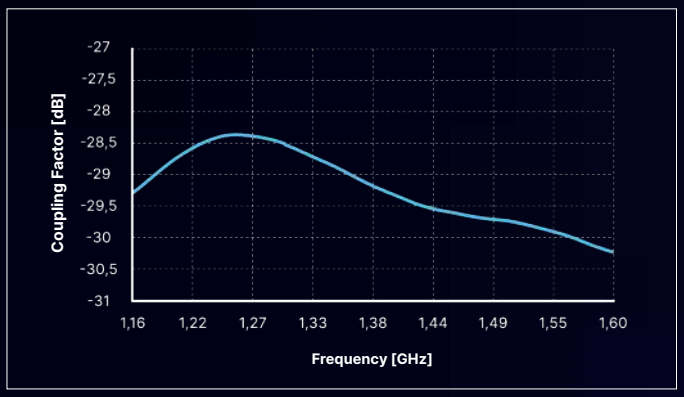
Benefits

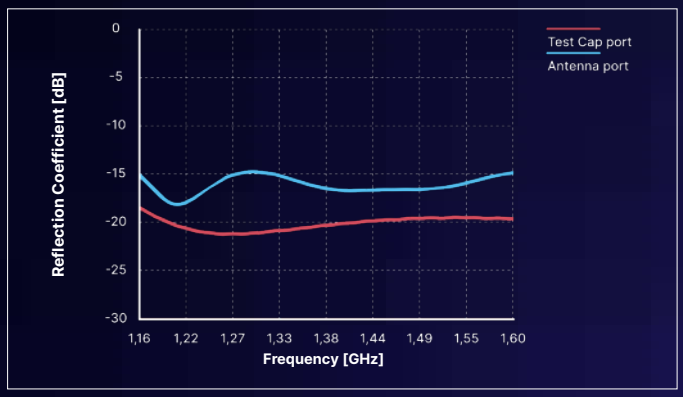
- Enables reproducible measurements of antenna & transceiver on the platform
- Very low impact on the antenna matching (reflection coefficient)
- No mounting bracket required on the platform (screwed on the antenna itself)
- ITAR Free
- Compatible with thermal vacuum environment with low outgassing properties
- Safe & easy to mount & dismount thanks to an oriented slot ensuring the correct positioning
- Low RF leakage to protect users from radiation during the test

TEST HAT FOR GNSS ALL-BANDS ANTENNAS

Typical Measured Performance

RF Chain Measurement | TVAC Compatibility | Plug & Play | On-platform Test





Typical Performance

Frequency Bands	**From 1 160 MHz to 1 610 MHz**
Bandwidth	> 450 MHz
Polarization	Right Hand Circular Polarization
Reflection Coefficient at Antenna Port	< -10 dB
Reflection Coefficient at Test Hat Port	< -17 dB
Coupling Factor	~ -29 dB
Coupling Factor Variation	< 1 dB everywhere within the frequency bands: - GPS: L2/L5 - Galileo: E5a/E5b/E6 - Glonass: G2/G3 - Beidou: B2/B3 < 0.5 dB everywhere within the frequency bands: - GPS: L1 - Galileo: E1 - Glonass: G1 - Beidou: B1

Physical Characteristics

Envelope Size Without Connector	Ø 118.8 mm x 96.3 mm
Mass With Connector	915 ± 5 g
Connector	Coaxial SMA female (50 Ω)
Mechanical Interface	4 x M3 mm (unthreaded hole)
Qualification Temperature	-40°C / +70°C

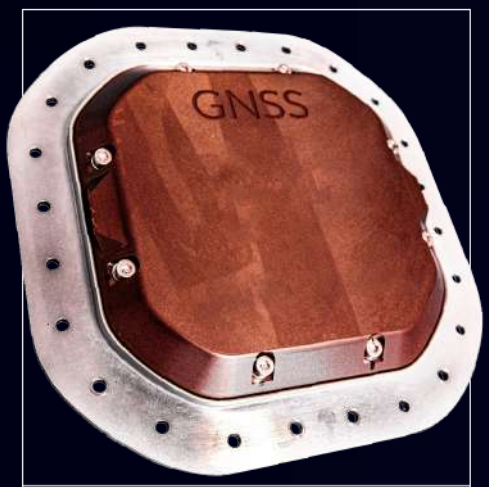
04

Launcher
Antennas

With the advent of reusable launchers, the design of antennas faces new challenges.

Launcher Antennas

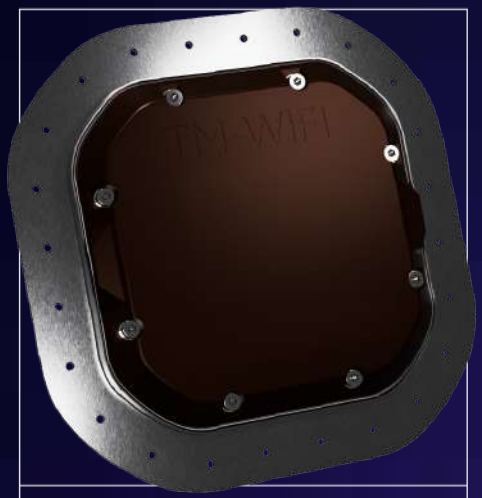
Anywaves provides reliable antennas specifically designed and manufactured for launchers. Our antennas are constructed with durable materials, featuring a thermal shield for resilience in harsh launch conditions. This design ensures accurate and precise communication between the launcher and ground during the mission.



GNSS All-Bands Launcher Antenna

- Unique GNSS All-Bands Antenna for launcher platform
- Very stable phase center
- Thermal shield against harsh environment
- Acceptance tests included
- ITAR Free
- Test Hat compatible

Frequency Bands	**From 1.16 GHz to 1.61 GHz** **GPS L1/L2/L5, Galileo E1/E5a/E5b/E6** **Glonass G1/G2/G3, Beidou B1/B2a/B2/B3** **Inmarsat L-band: 1.525 – 1.559 GHz**
Polarization	Right Hand Circular Polarization
Realized Gain	> 0 dBi @ boresight > -2 dBi @ ± 30° > -6 dBi @ ± 60°
TRL	8
Size	150×150×30 mm³
Materials	Antenna protected with high-quality thermal shield



S-Band Launcher Antenna

- Unique S-Band Antenna for launcher platform
- Full Duplex Telemetry & Telecommand
- Thermal shield against harsh environment
- Acceptance tests included
- ITAR Free
- Test Hat compatible

Frequency Bands	**From 2.025 GHz to 2.29 GHz**
Polarization	Left or Right Hand Circular Polarization
Realized Gain	> 6.0 dBi @ boresight > 2.0 dBi @ ± 30° > -4.0 dBi @ ± 60°
TRL	8
Size	145×145×30 mm³
Materials	Antenna protected with high-quality thermal shield

05

Payload

Antennas

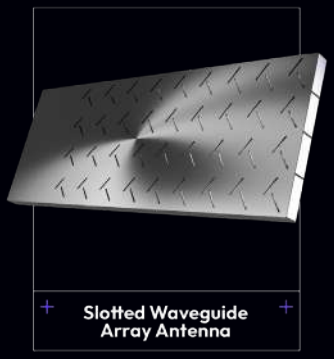
Designed to serve mission payloads, these antennas enable signal transmission, reception, and measurement across a wide range of frequencies, coverage patterns, and polarizations—supporting applications such as scientific instruments, radar, spectrum monitoring, and communications.

Payload Antennas

High-Gain Antennas

High-gain antennas allow for more power to be transmitted to the receiver for high precision targeting of radio signals. These properties are crucial when it comes to X-, Ku- and Ka-band applications to cope with strong atmospheric attenuation.

Reflectarray Antenna



Slotted Waveguide Array Antenna

EXPLORE

Spectrum Monitoring Antennas

These antennas are engineered for payloads requiring wideband signal detection and analysis. Covering broad frequency ranges with tailored radiation patterns, they support missions involving spectrum intelligence.

Compact Wideband Antenna

Quad Ridged Horn Antenna

EXPLORE

LEO-PNT Antennas

Paired with GNSS All-Bands Antennas for reception, these payload antennas are designed to re-radiate GNSS signals from LEO, contributing to next-generation multi-layer PNT architectures. They enhance service robustness, improve signal availability and accuracy, and enable innovative PNT applications beyond traditional GNSS performance.

Quadrifilar Helix Antenna

GNSS All-Bands Antenna

EXPLORE

Didn't find what you were looking for?

If you need a higher gain or a specific solution, let's review your specifications! Anywaves can assist you in designing the ideal antenna, including customizable array solutions tailored to your projects. We guide you from system requirements to antenna features for optimal performance - reach out to discuss your needs!

They fly with us!

AIRBUS DEFENCE & SPACE

ThalesAlenia Space
a Thales / Leonardo company

ST Engineering

E-SPACE

LOCKHEED MARTIN

AERO SPACE LAB

LOFT ORBITAL

MAXAR

OHB SWEDEN

unseenlabs
— THE BRIGHT SIGHT

cnes

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GHALAM

esa

D-ORBIT

SI 쎄트렉아이 SATREC INITIATIVE

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