Siretta
Enabling Industrial IoT

Alpha 45

Compact Active Single-Band GPS L1 Adhesive Antenna



General Description

The Alpha 45 is a compact, waterproof, self-adhesive and mag-mount GPS antenna designed for reliable L1-band performance.

Delivering strong top-hemisphere RHCP gain between 26–33 dBiC, the Alpha 45 also maintains excellent top-hemisphere uniformity with consistent performance across 90° and 120° angular sectors from zenith. This gain stability, combined with low VSWR and Axial Ratio, ensures efficient signal transfer, dependable satellite visibility and reduced fix times in outdoor environments. The integrated low-noise amplifier enhances weak signals, providing robust performance for vehicle tracking, fleet management, asset monitoring and GPS timing systems.

Supplied as standard with an SMA Male connector and 1 m, 2 m or 5 m RG174 cable. Alternative cable lengths can be specified for high-volume projects.

Key Features

- Supports GPS L1, Galileo E1, BeiDou B1C, and QZSS L1
- Top hemisphere RHCP gain between 26-33 dBiC
- Return loss of up to -19.46 dB
- Consistent coverage across ±90° and ±120° from zenith
- Compact, rugged water-resistant design with magnetic and adhesive mount

Typical Applications

- Vehicle and fleet tracking
- Asset monitoring and telematics
- Outdoor GNSS positioning and timing
- Smart infrastructure and IoT

GPS L1 Antenna	Water Resistant	RHCP Polarisation	Magnetic Mounting	Low-Profile Design
Active GNSS	Outdoor Radome	GNSS Optimised	Quick Installation	Compact Installation

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Electrical Specifications

Impedance:	50 Ohm
Polarisation:	RHCP
Frequency Range:	1575.42 MHz
Return Loss:	-19.46 dB
VSWR:	1.24
Ground plane:	Tested on 70 x 70 mm ground plane
RHCP Gain at Zenith:	33.18 dBiC
Axial Ratio at Zenith:	5.04 dB
Supply Voltage:	3 - 5 V DC
Current Consumption:	15.5 mA @ 5 V

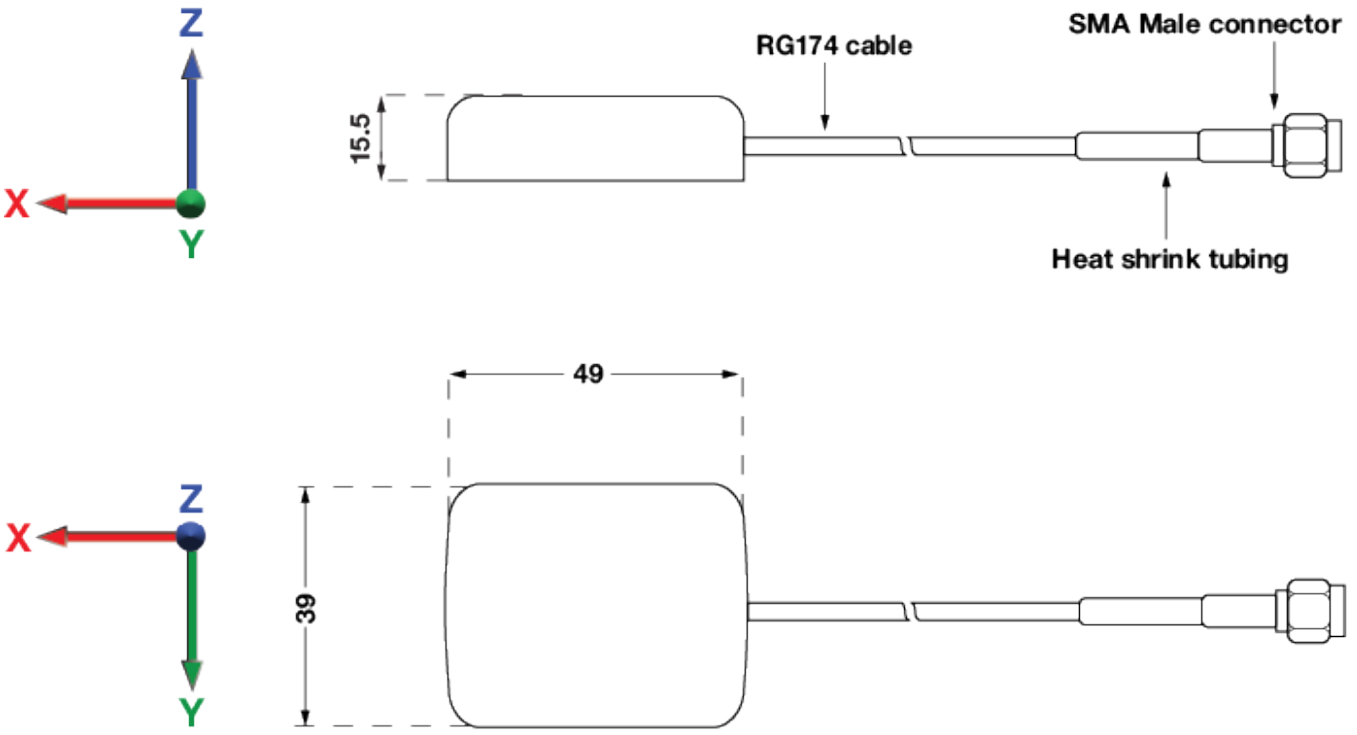
Environmental Specifications

Operating Temperature range:	-40°C to 80 °C
Storage Temperature range:	-40°C to 80 °C

Mechanical Specifications

Dimensions:	L = 49 mm W = 39 mm H = 15.5 mm
Weight:	40 g
Cable Type:	RG174
Cable Length:	1 m, 2.5 m, 5 m or alternative
Connector:	SMA Male
Mounting method:	Magnetic / Adhesive

Housing materials: ABS Radome



Note: Dimensions in mm

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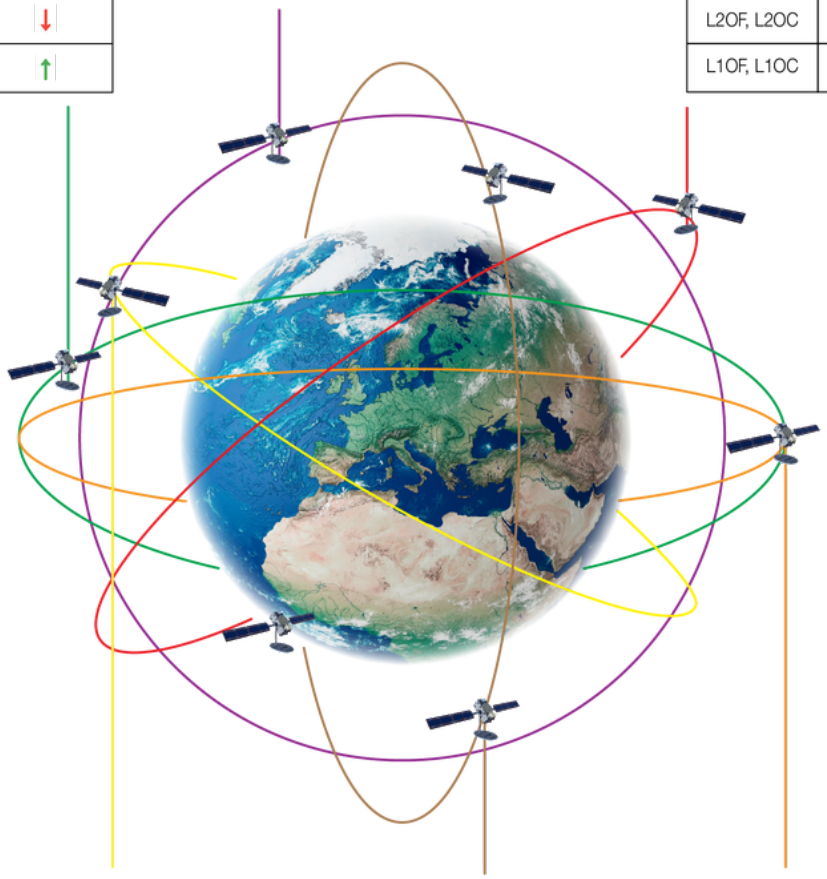
Compact Active Single-Band GPS L1 Adhesive Antenna

Spectrum Coverage*

GPS		
Band	Frequency	Use Indicator
L5	1176.45	↓
L2	1227.6	↓
L1	1575.42	↑

NavIC		
Band	Frequency	Use Indicator
L5	1176.45	↓

GLONASS		
Band	Frequency	Use Indicator
L3OC	1202.025	↓
L2OF, L2OC	1246	↓
L1OF, L1OC	1602	↓



Galileo		
Band	Frequency	Use Indicator
E5a	1176.45	↓
E5b	1207.14	↓
E6-I, E6-Q	1278.75	↓
E1-I, E1-Q	1575.42	↑

BeiDou		
Band	Frequency	Use Indicator
B2a	1176.45	↓
B2I, B2b	1207.14	↓
B3I	1268.52	↓
B1I	1561.098	↓
B1C	1575.42	↑

QZSS		
Band	Frequency	Use Indicator
L5	1176.45	↓
L2	1227.6	↓
L6	1278.75	↓
L1	1575.42	↑

↑ Suitable band □ Adequate band in good signal conditions ↓ Likely to be unsuitable

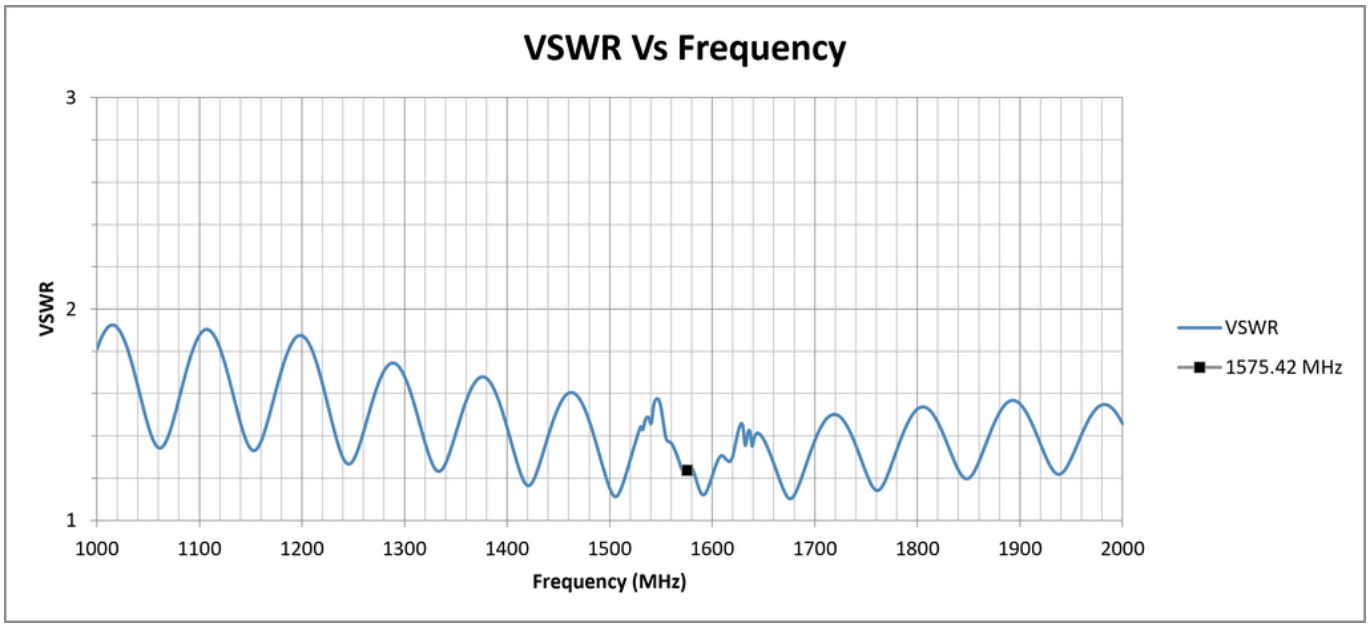
GNSS Standards Band Support

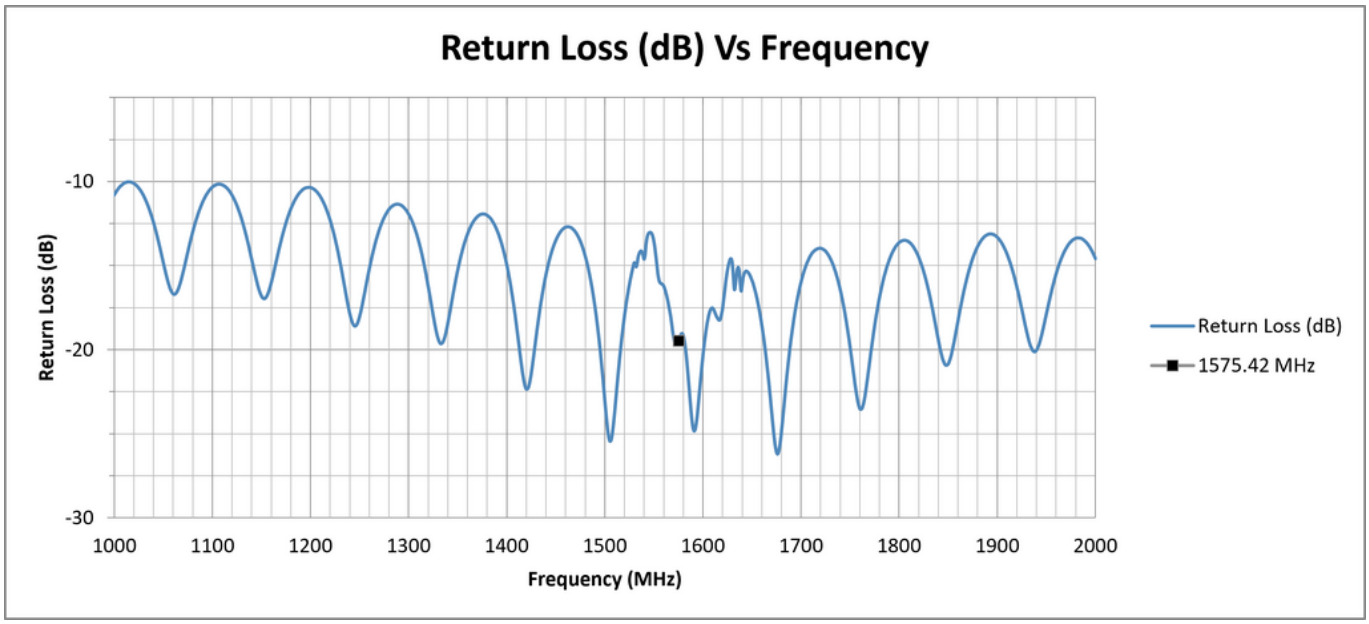
Electrical Interface			Spherical RF Measurements			
Centre Frequency (MHz)	VSWR	Return Loss (dB)	Average RHCP Gain (dBiC)	Peak RHCP Gain (dBiC)	Median Axial Ratio (dB)	Minimum Axial Ratio (dB)
1575.42	1.2383	-19.4560	26.33	33.73	5.41	1.39

Top Hemisphere RF Measurements					Zenith RF Measurements	
Centre Frequency (MHz)	Average RHCP Gain (dBiC)	Peak RHCP Gain (dBiC)	Median Axial Ratio (dB)	Minimum Axial Ratio (dB)	RHCP Gain at Zenith (dBiC)	Axial Ratio at Zenith (dB)
1575.42	30.75	33.73	4.48	2.09	33.18	5.04

RF Matching Performance

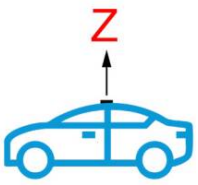
This section illustrates the antenna's impedance matching characteristics across the operating frequency range using VSWR and Return Loss measurements.

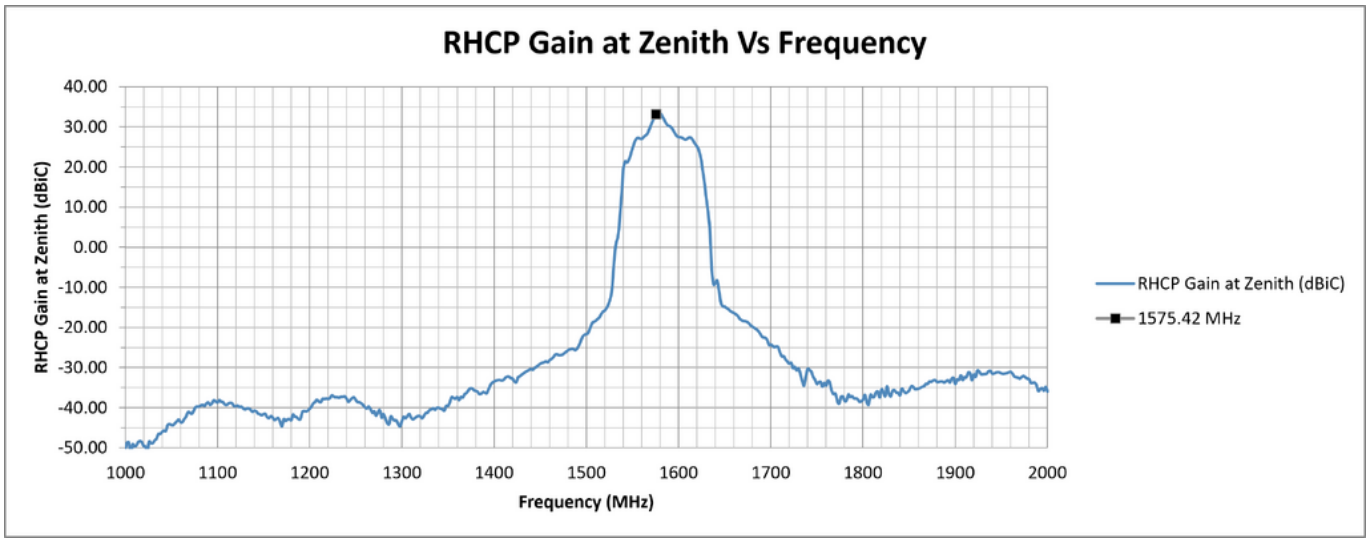


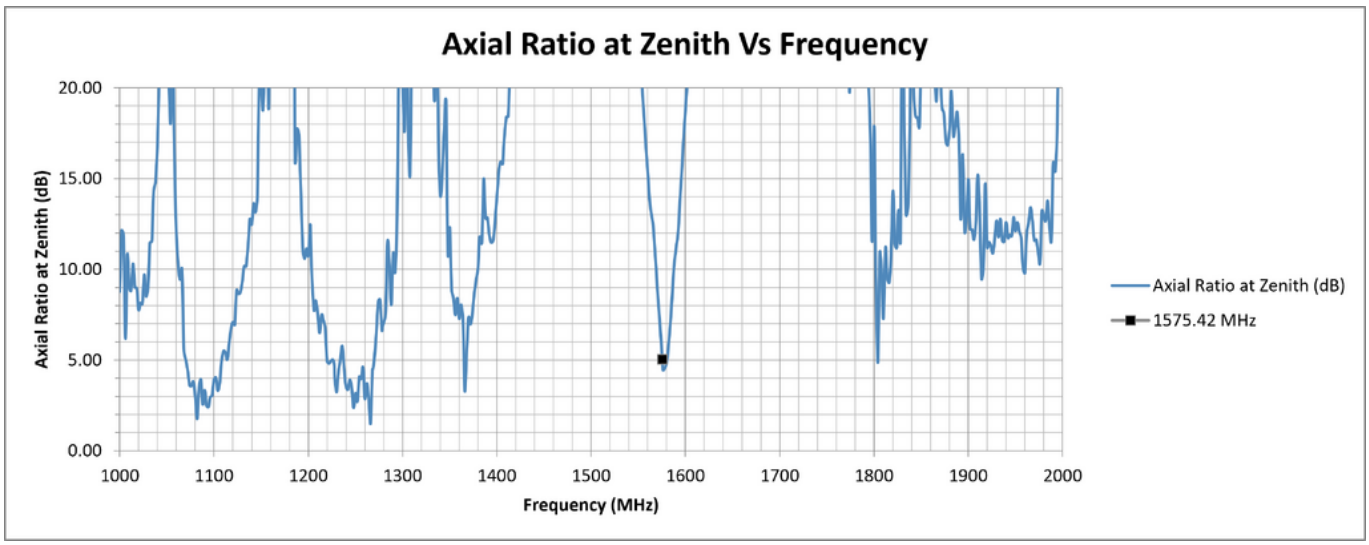


RF Zenith

The following graphs represent the RHCP Gain at Zenith and the Axial Ratio at Zenith as a function of frequency. These measurements indicate how well the antenna performs when receiving signals directly from satellites overhead (zenith direction). A higher RHCP gain ensures strong signal reception, while a lower axial ratio signifies better polarisation purity for optimal GNSS performance.

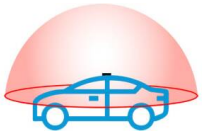


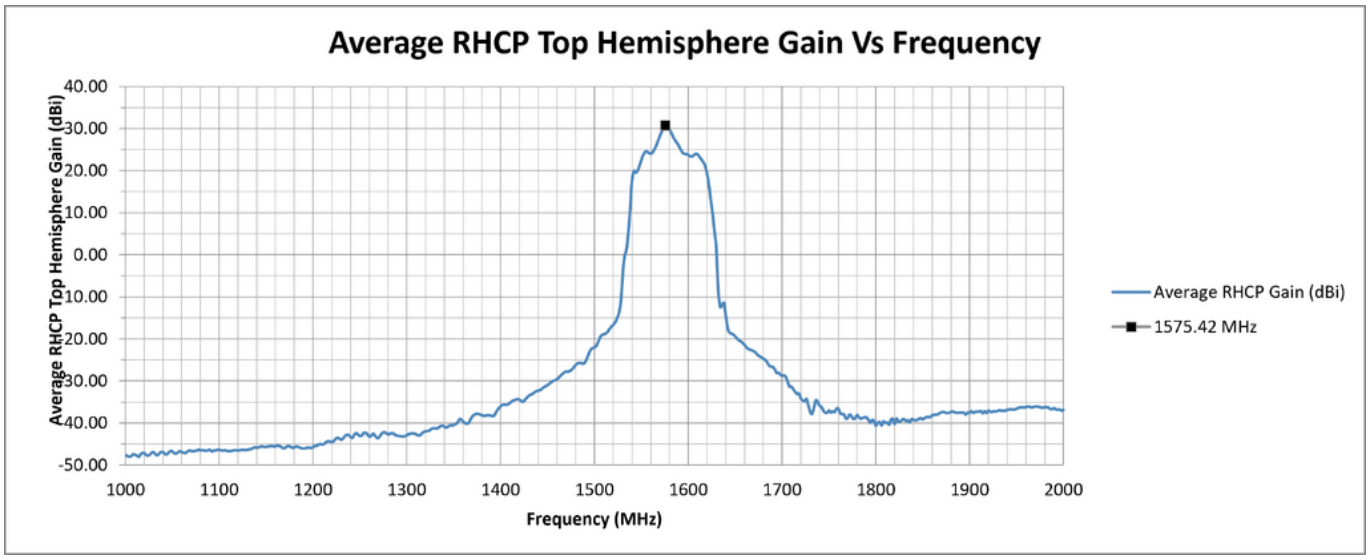


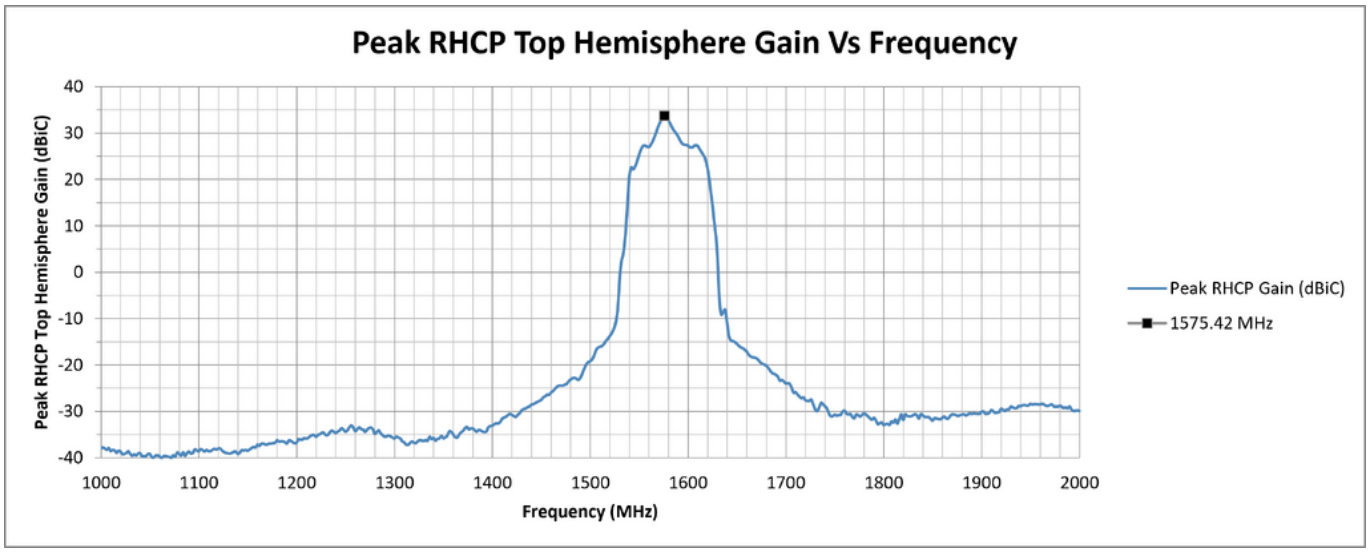


RF Top Hemisphere

The following graphs show the Average and Peak RHCP Gain in the Top Hemisphere. These measurements assess how effectively the antenna receives signals from satellites positioned in the upper half of the sky. Strong RHCP gain in this region is critical for reliable GNSS reception, especially in environments where satellites may not always be directly overhead.

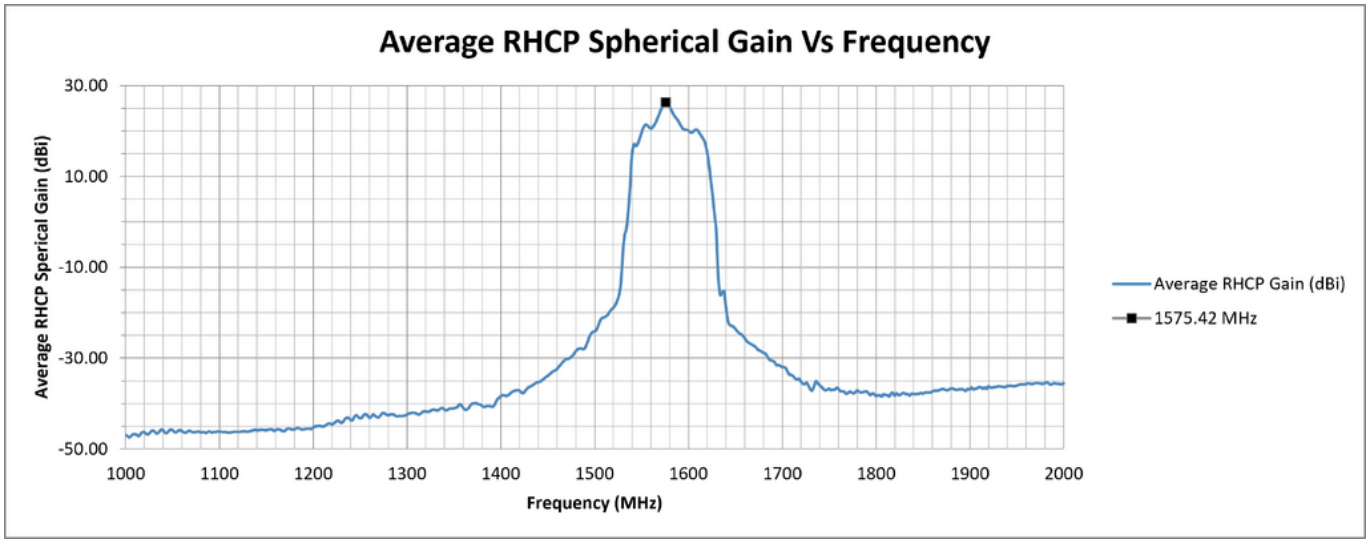


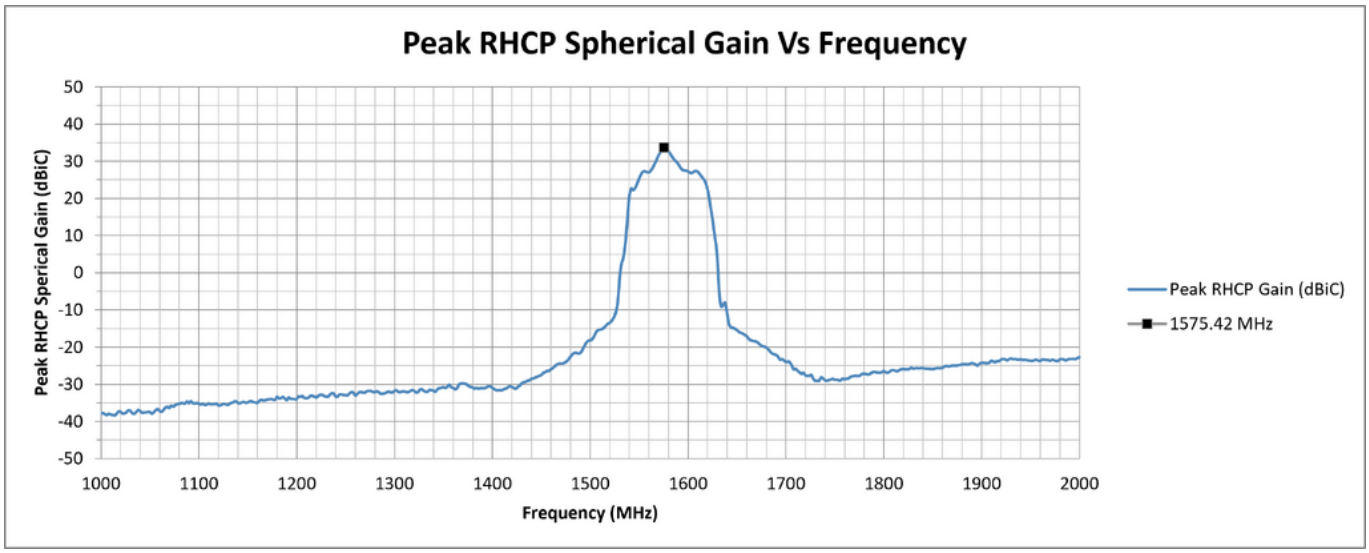




RF Spherical

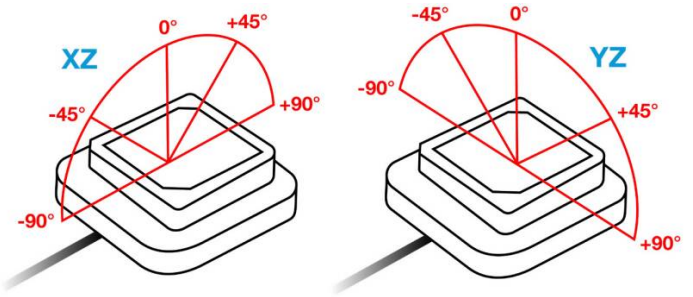
The following graphs display the Average and Peak RHCP Gain across the entire spherical coverage of the antenna. These metrics provide a comprehensive view of the antenna's ability to receive signals from satellites at all elevations and directions.
Consistently high gain across the sphere ensures strong and stable GNSS reception in a variety of operating conditions.

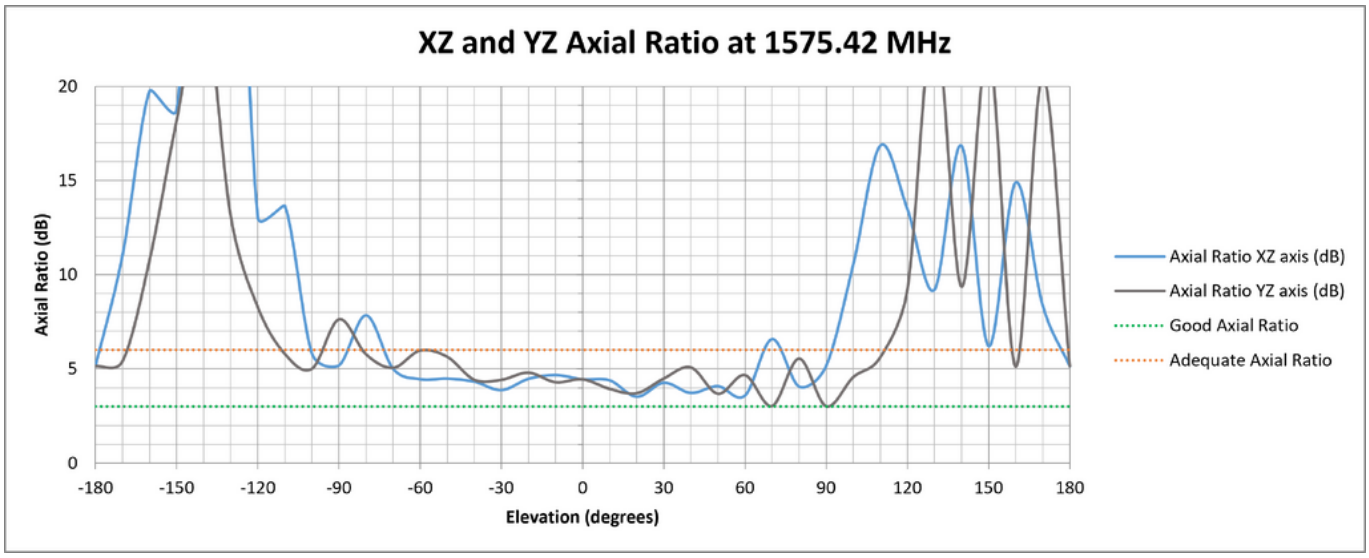




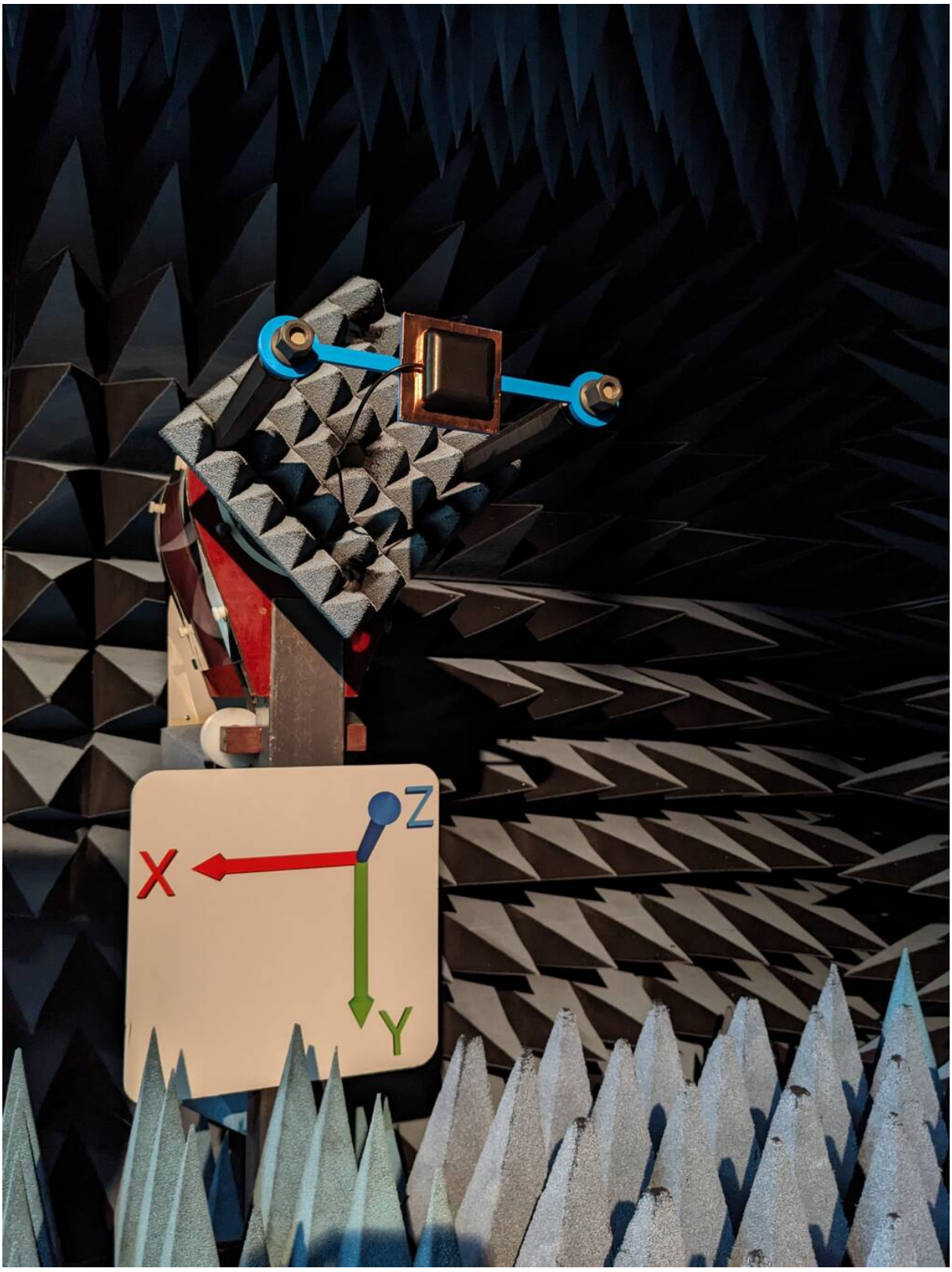
ZX and YZ Plane Axial Ratio Plots (Zenith is at 0 degrees)

The following graph shows how well the antenna maintains circular polarisation at different elevation angles. A lower axial ratio ensures better GNSS signal reception, especially at low elevations, which is crucial for applications requiring strong performance in obstructed environments or wide-angle satellite visibility.

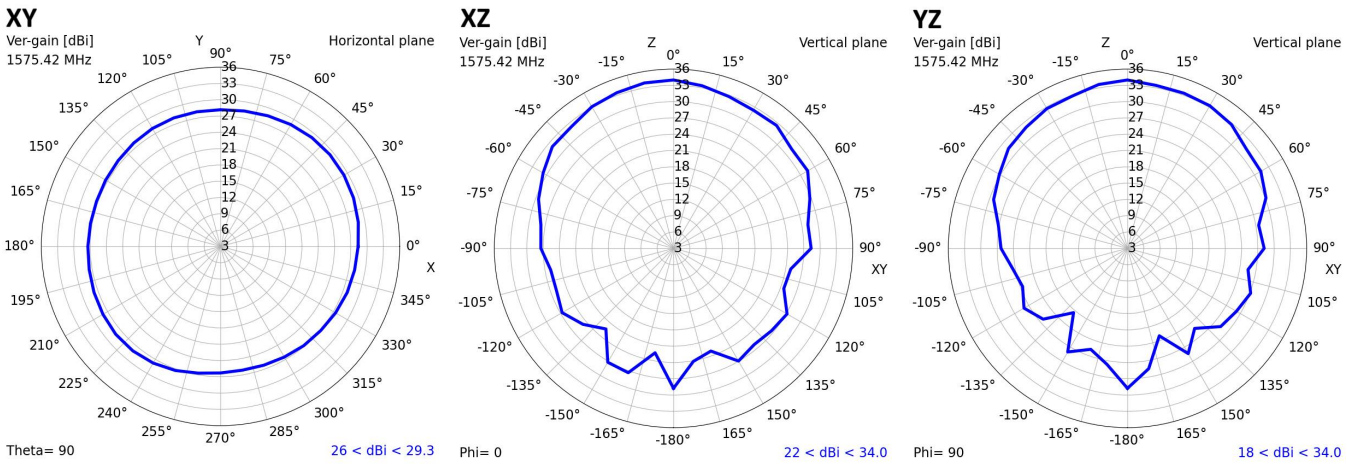




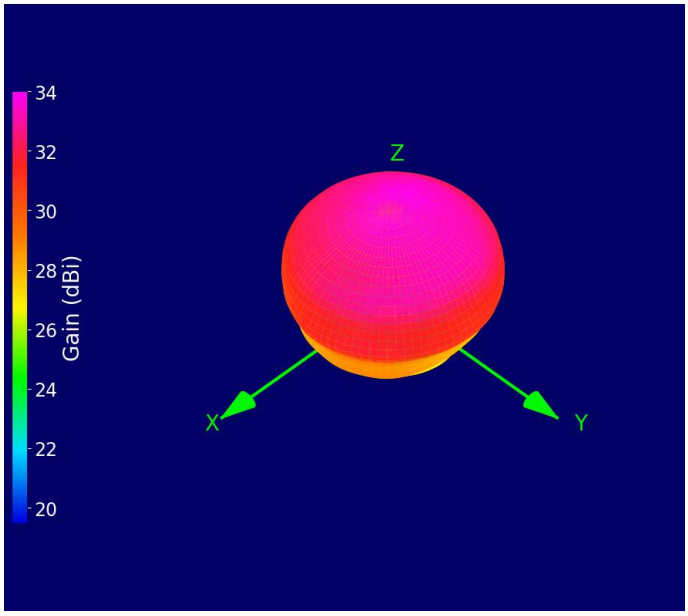
Test Setup (on 70 x 70 mm Ground Plane)



2D Radiation Plots (1575.42 MHz)



3D Radiation Plots (1575.42 MHz)



Ordering Details

Part Number	Description
ALPHA45/1M/SMAM/S/S/48	Compact Active Single-Band GPS L1 Adhesive Antenna 1 Metre Cable RG174 and SMA Male Connector
ALPHA45/2.5M/SMAM/S/48	Compact Active Single-Band GPS L1 Adhesive Antenna 2.5 Metre RG174 Cable and SMA Male Connector
ALPHA45/5M/SMAM/S/S/48	Compact Active Single-Band GPS L1 Adhesive Antenna 5 Metre RG174 Cable and SMA Male Connector

About Siretta

Founded in 1998 and headquartered in Reading, United Kingdom, Siretta is a leading wireless communications company specialising in the design, manufacture, and supply of industrial IoT solutions.

Siretta's product portfolio includes:

- Antennas, plus their associated Cable Assemblies & Adapters
- Cellular Network Analysers
- Industrial Modems
- Industrial Routers
- Associated Cloud Management

Siretta supplies products directly and via a worldwide network of distributors, into numerous markets and applications across the globe.
Siretta’s distribution partners range from industrial IoT specialists through to global catalogue organisations.

Whether “off the shelf” or custom solutions are required, Siretta has a wide portfolio of products to fit many types of application.

Siretta’s extensive knowledge and experience in the wireless market allows support of a wide range of customer applications, focusing on frequencies between 400 MHz to 6 GHz. These encompass modems, routers and antennas for:

- Cellular technologies: GSM / UMTS / LTE / 5G NR (SA & NSA)
- LPWAN technologies: LTE-M / NB-IoT
- Global positioning technologies: GNSS (GPS / GLONASS / Galileo / BeiDou / QZSS / NavIC)
- Short range technologies: Wireless LAN / Bluetooth / Zigbee / ISM band / LoRa / Sigfox
- Satellite technologies: NTN NB-IoT

With a heavy emphasis on design, Siretta has a team of dedicated Engineers and Product Managers, who specialise in wireless applications.
Siretta continually makes significant investment in R&D endeavouring to provide customers with market leading, future-proofed, wireless solutions. Siretta works closely with many technology partners to stay at the forefront of industrial IOT.

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accordance with applicable regulatory, safety, and local compliance requirements within the country of use.

Performance characteristics, coverage, gain, and network operation may vary depending on installation environment, device configuration, network conditions, cable losses, mounting position, and surrounding structures. Any application deployed using Siretta antenna products should be fully evaluated and tested within the intended operating environment prior to deployment.

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Please refer to the Siretta wiki for the latest version of this document.

***IMPORTANT NOTE**
For each frequency band, Siretta provides a traffic light indication to show the suitability of the antenna for use at that frequency band. Determination of exactly what makes an antenna good or bad at any frequency is subjective.

The view presented is that of Siretta's engineering team having taken into account the efficiency and VSWR measurements. The end user is advised to use their own criteria and/or testing to confirm suitability.

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