Siretta
Enabling Industrial IoT

Echo 63

12 x 12 mm Active Ceramic Patch GPS L1 Embedded Antenna



UAV Optimised
Ideal for Aerial Platforms

Embedded
Installation

GPS
L1 Antenna

General Description

The Echo 63 is a compact active GPS L1 antenna engineered for high-quality reception of satellite signals at 1575.42 MHz. Developed for positioning and navigation applications, it combines a small footprint with straightforward integration into embedded products.

Optimised for the primary GNSS L1 band, the Echo 63 incorporates an integrated low-noise amplifier (LNA) to amplify weak satellite signals at the antenna, helping preserve signal quality before transmission to the GNSS receiver. Delivering up to 14.09 dBiC top-hemisphere RHCP gain, together with good impedance matching, it supports stable satellite tracking and accurate position updates.

Weighing less than 4 grams, the Echo 63 is ideal for UAVs and portable equipment where minimising weight helps maximise flight time, payload capacity and overall efficiency.

Its omnidirectional radiation pattern and lightweight form factor make it well suited to handheld surveying equipment, compact IoT sensors, drones and portable GPS terminals.

Typical Applications

- Asset tracking and logistics
- Industrial IoT and remote monitoring
- UAV navigation and control
- Smart agriculture and precision farming
- Timing and synchronisation systems

Key Features

- Supports GPS L1, Galileo E1, BeiDou B1C, and QZSS L1
- Lightweight construction (under 4 g)
- RHCP top hemisphere gain up to 14.09 dBiC
- Omnidirectional radiation pattern for consistent sky coverage
- Compact design for easy integration

Additional Considerations

- Gain pecifications based on 70 x 70 mm ground plane
- 100 mm mini coax cable and U.FL connector as standard (customisation available)
- RoHS and REACH compliant
- TSCA assessed and CMRT aligned

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Electrical Specifications

Impedance:	50 Ohm
Polarisation:	RHCP
Frequency Range:	1575.42 MHz
Return Loss:	-17.21 dB
VSWR:	1.32
Ground plane:	No (tested on 70 x 70 mm ground plane)
RHCP Gain at Zenith:	13.19 dBiC
Axial Ratio at Zenith:	28.29 dB
Supply Voltage:	3 - 5 V DC
Current Consumption:	5.3 ± 2 mA

Environmental Specifications

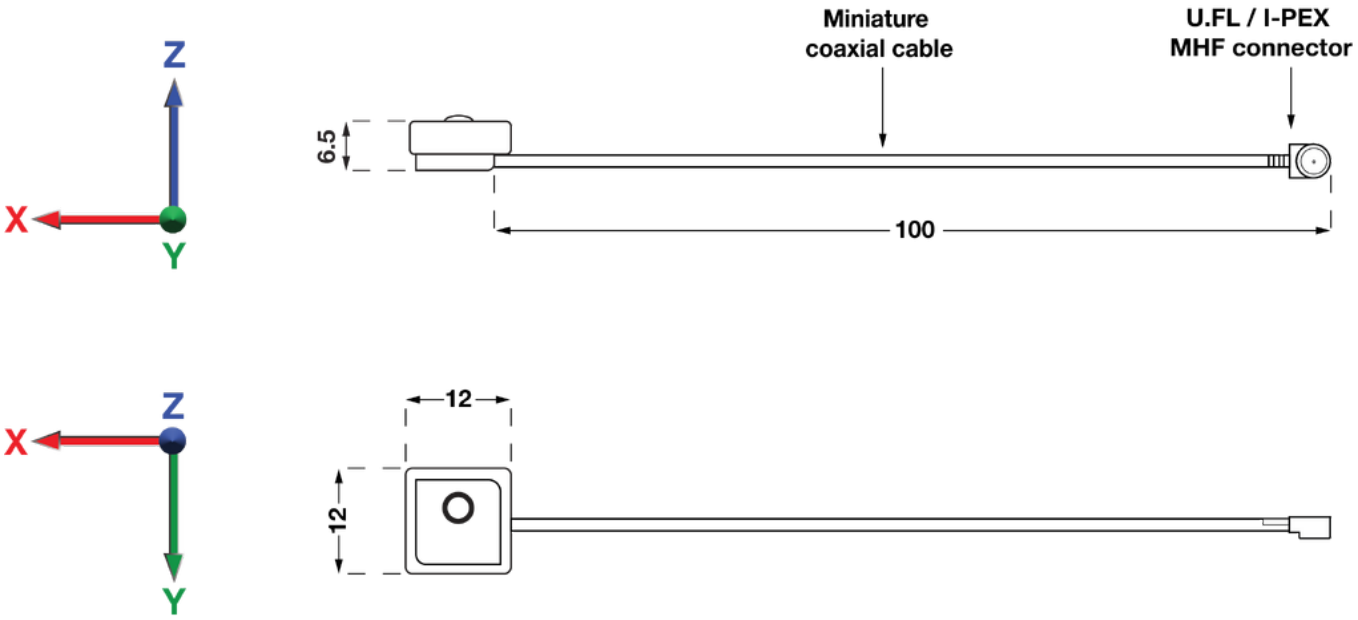
Operating Temperature range:	-40°C to 80 °C
Storage Temperature range:	-40°C to 80°C

Mechanical Specifications

Dimensions:	L = 12 mm W = 12 mm H = 6.5 mm
Weight:	3.81 g
Cable Type:	Miniature Coaxial
Cable Length:	100 mm
Connector:	U.FL / I-PEX MHF
Mounting method:	Embedded

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Note: Dimensions in mm

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Echo 63

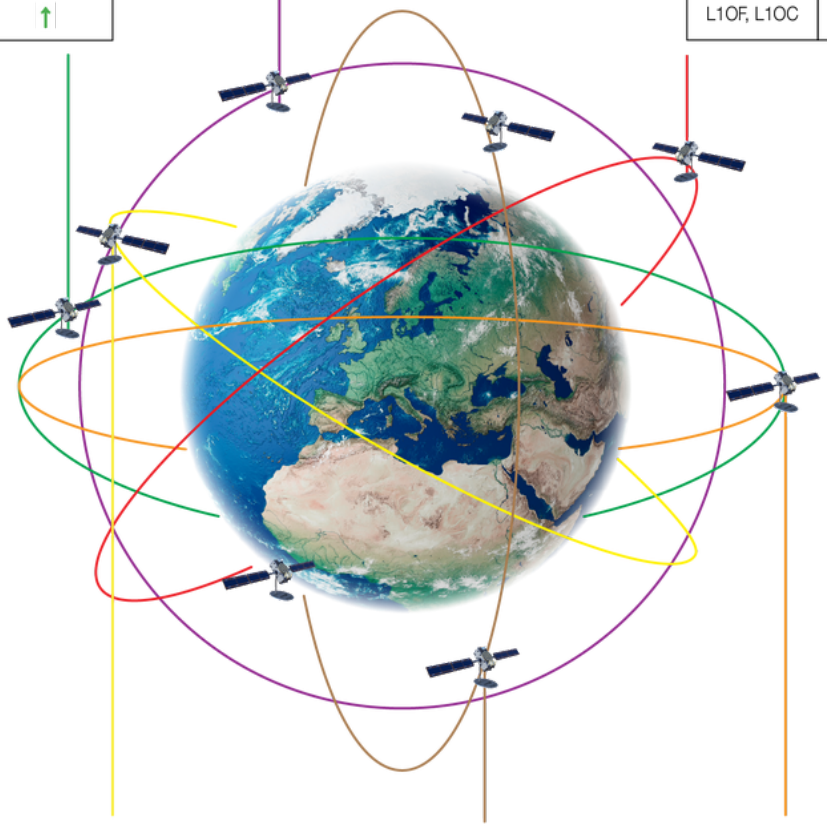
12 x 12 mm Active Ceramic Patch GPS L1 Embedded Antenna

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

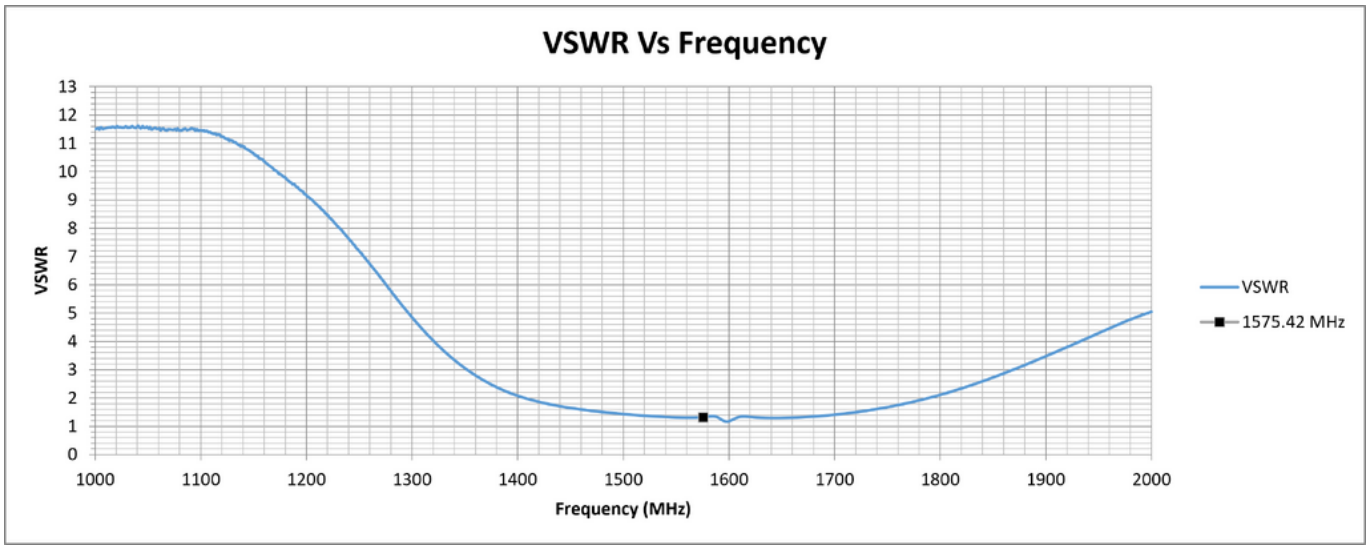
GNSS Standards Band Support

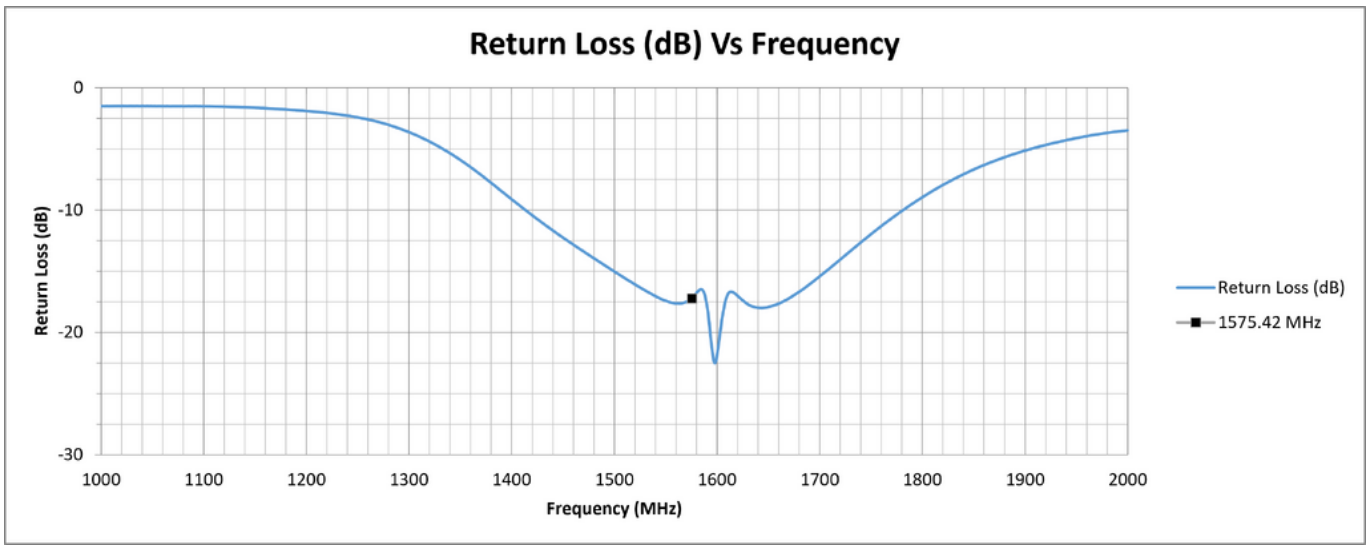
Electrical Interface			Spherical RF Measurements			
Centre Frequency (MHz)	VSWR	Return Loss (dB)	Average RHCP Gain (dBiC)	Peak RHCP Gain (dBiC)	Median Axial Ratio (dB)	Minimum Axial Ratio (dB)
1575.42	1.3198	-17.2118	6.66	14.09	19.31	1.17

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	10.38	14.09	22.87	9.95	13.19	28.29

RF Matching Performance

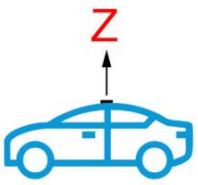
This section illustrates the antenna's impedance matching characteristics across the operating frequency range using VSWR and Return Loss measurements.

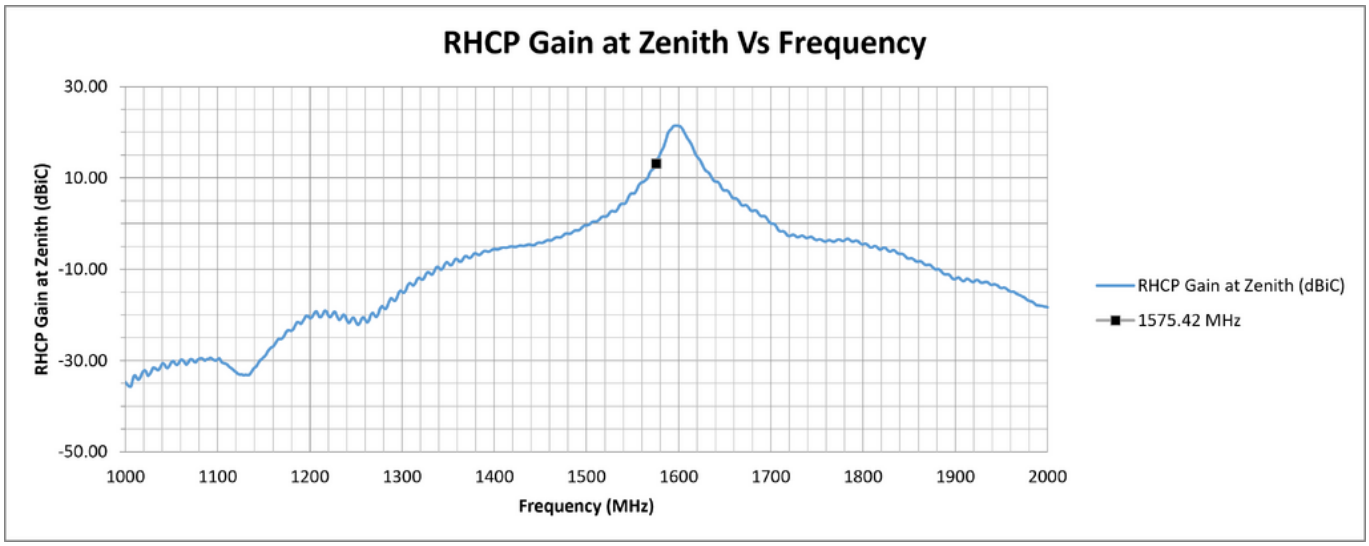




RF Zenith

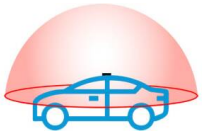
The following graph represents the RHCP Gain at Zenith as a function of frequency. These measurements indicate how well the antenna performs when receiving signals directly from satellites overhead (zenith direction). A higher RHCP gain ensures strong signal reception.

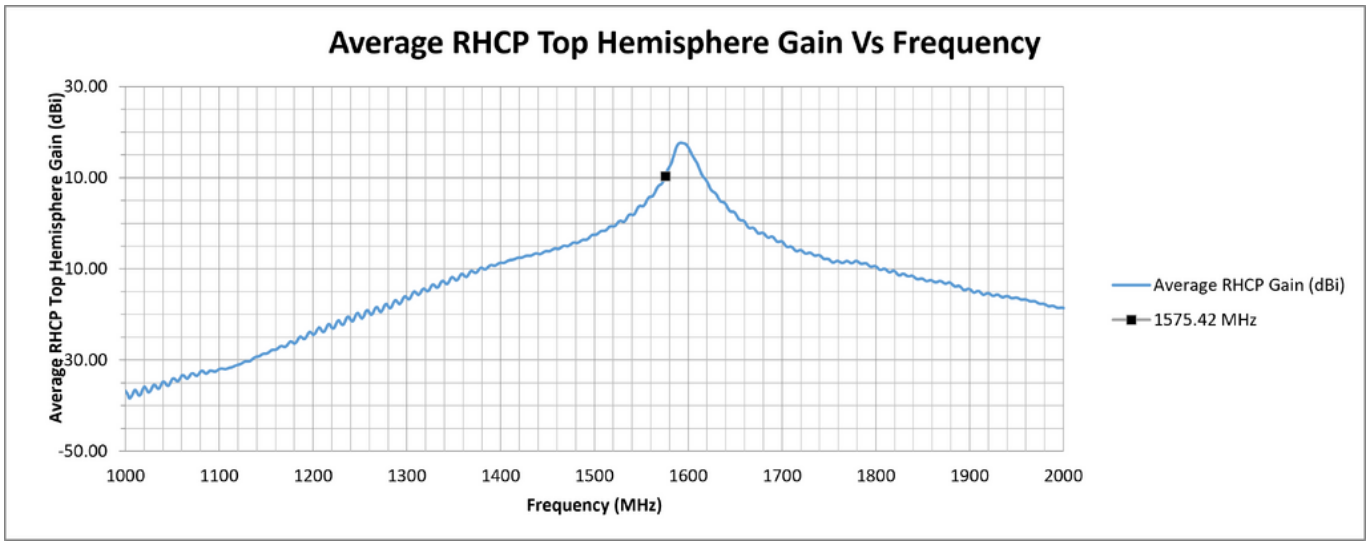


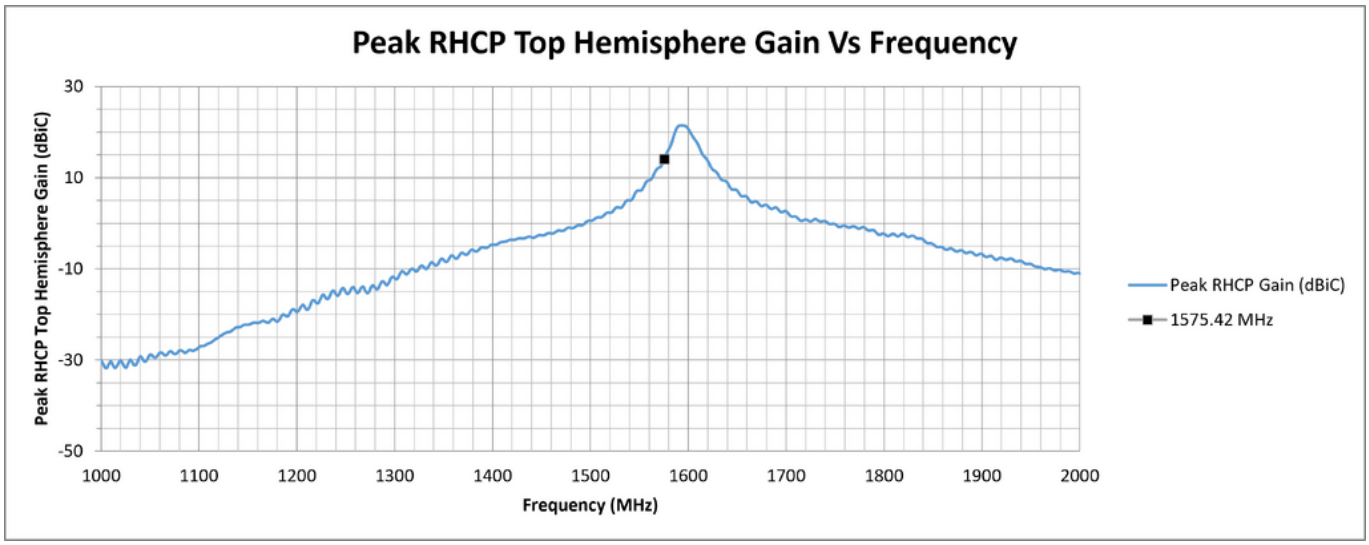


RF Top Hemisphere

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.

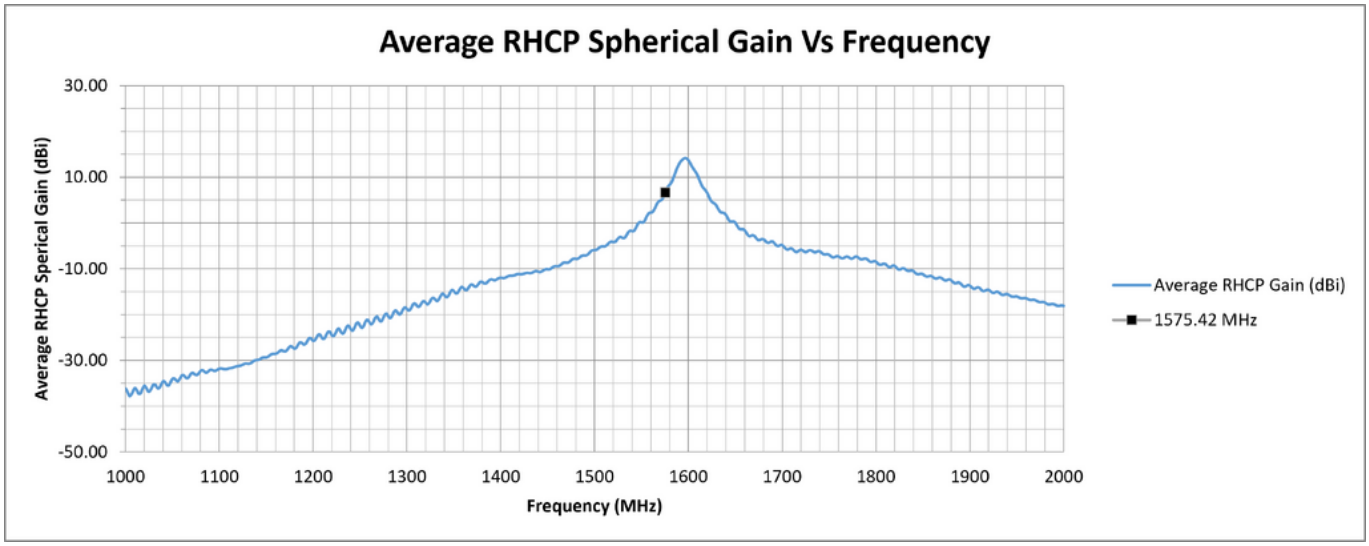


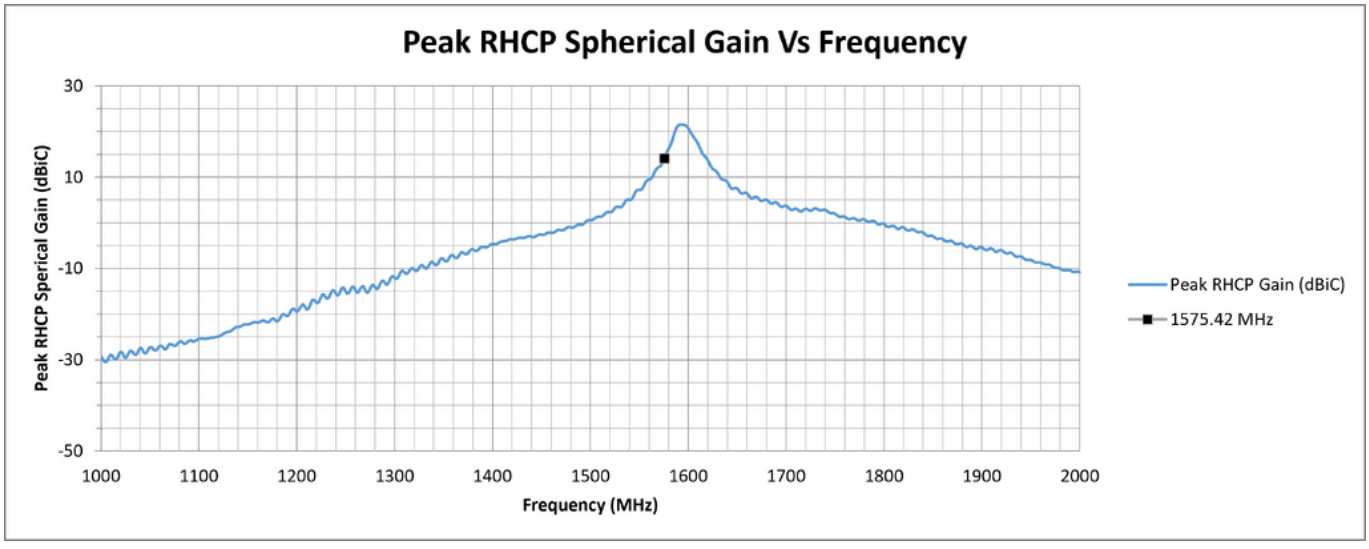




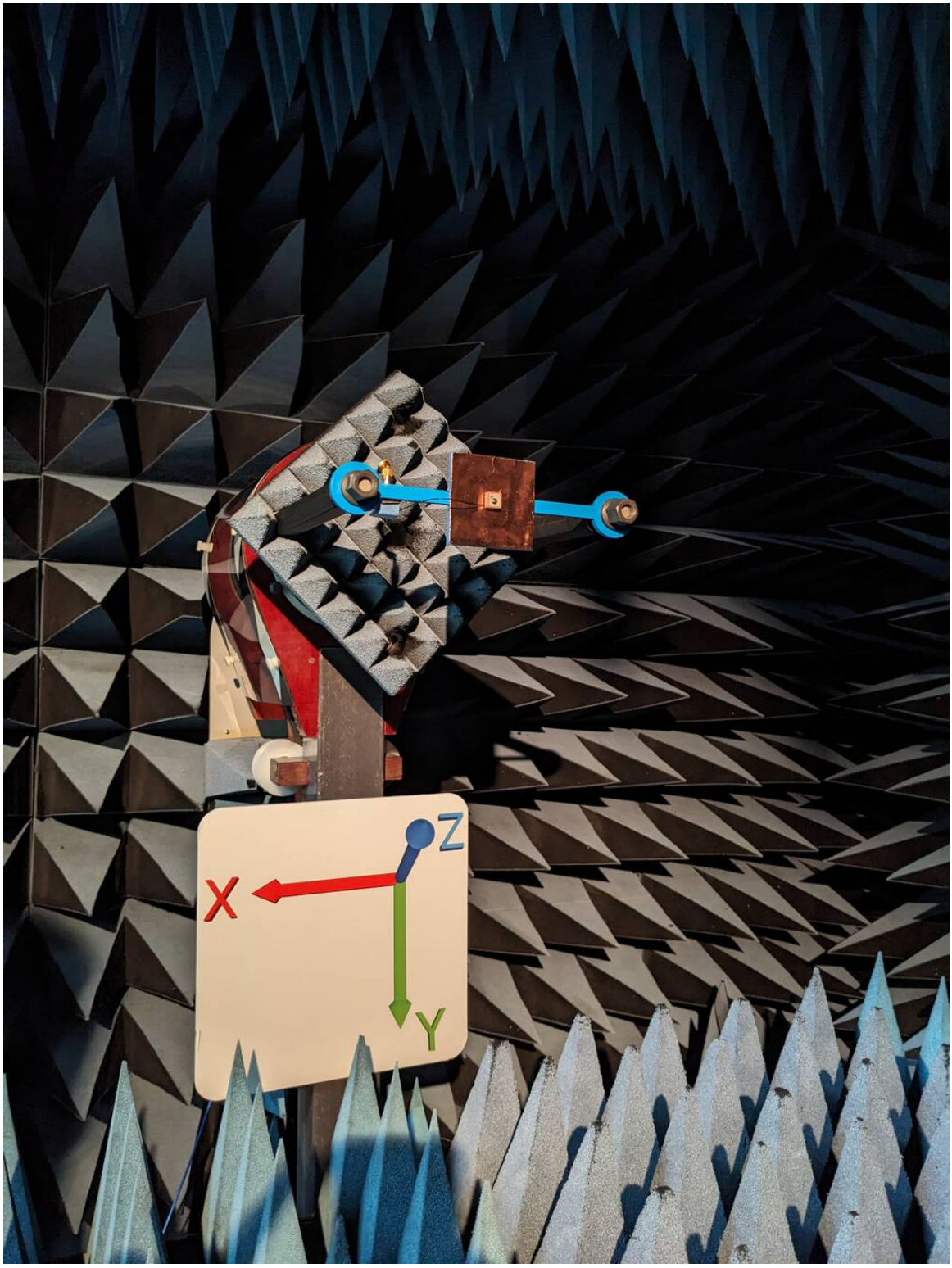
RF Spherical

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.

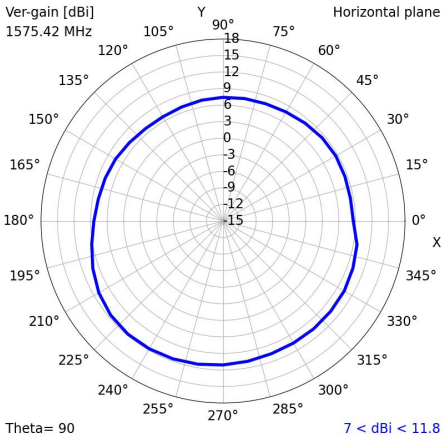


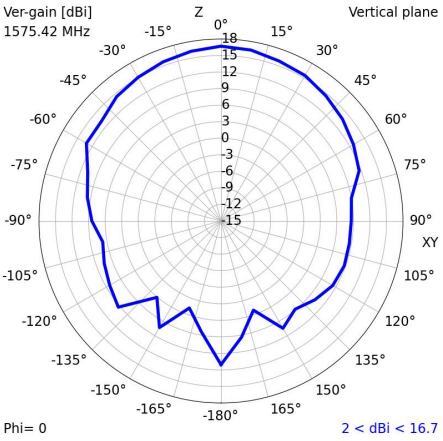


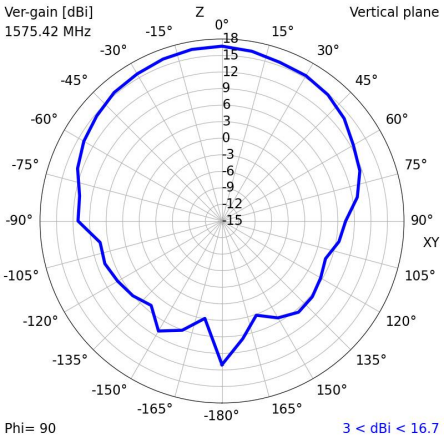
Test Setup (on 70 x 70 mm Ground Plane)



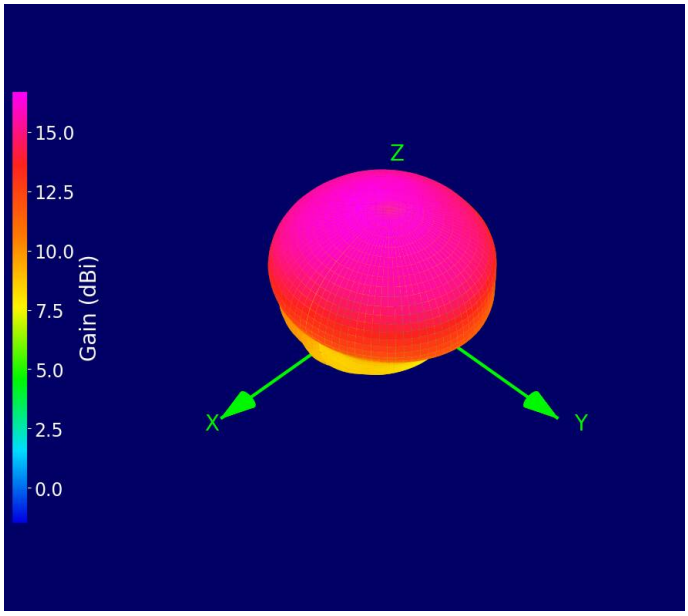
2D Radiation Plots (1575.42 MHz)







3D Radiation Plots (1575.42 MHz)



Ordering Details

Part Number	Description
ECHO63/0.1M/UFL/S/S/48	12 x 12 mm Active Ceramic Patch GPS L1 Embedded Antenna 0.1 Metre Miniature Coaxial Cable and U.FL / I-PEX MHF 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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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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