

Part No. 9001169

GPS FPC Embedded Antenna with LNA

Center Frequency 1575.42 MHz

Supports: GPS L1 band and Galileo E1, Tracking, Smart Home, Agriculture, Smart Metering, Healthcare, M2M, Industrial Devices



Ethertronics' active GPS Antenna delivers high RF performance and functionality in M2M designs where a more standard GPS patch approach is not possible. This innovative antenna provides compelling advantages for GPS enabled M2M / IoT applications such as vehicle tracking or asset tracking. Based on a flexible substrate, this active GPS antenna is able to maintain high efficiency in various device configurations. In addition, the 9001169 antenna embeds a low power consumption LNA that facilitates its integration in the end product.

Electrical Specifications

Typical Characteristics, antenna with 100 mm cable mounted directly on plastic material

Frequency (MHz)	1559 - 1591
Return Loss	> 9 dB
Average Efficiency	55%
Polarization	Linear
Radiation Pattern	Omni-directional
Filter / LNA at DC 3.0 V	
Gain (dB)	16.8
Noise Figure (dB)	< 1*
Current (mA)	3.9
Full System (Antenna + LNA and Filter)	
Average Gain	15.81dB @ 3.30 V 15.72 dB @ 2.70 V 14.84 dB @ 1.80 V
Feed Point Impedance	50 ohms unbalanced
Operation Voltage (V)	+1.5 to +3.5
Current (mA)	3.9
Environmental Specifications/ Conditions	
Operating Temperature Range	-40°C~+85°C
Storage Humidity Range	65±20% RH

Mechanical Specifications & Ordering Part Number

Ordering Part Number	9001169
Dimensions (mm)	41.0 ± 0.2 length 15.5 ± 0.2 width
Connector Type	u.fl
Cable	100 mm

*Value is calculated from the datasheet of the components

Active GPS Antenna

GPS L1 Band : 1563 - 1587 MHz
GALILEO E1 Band: 1559 - 1591 MHz

KEY BENEFITS

Reduced Costs and Time-to-Market

Standard antenna eliminates design fees and cycle time associated with a custom solution; getting products to market faster.

Greater Flexibility with Unique Form Factors

Ethertronics' technology helps you deliver more advanced ergonomic designs without adverse impact on product performance.

RoHS Compliant

Products are the latest RoHS version compliant.

APPLICATIONS

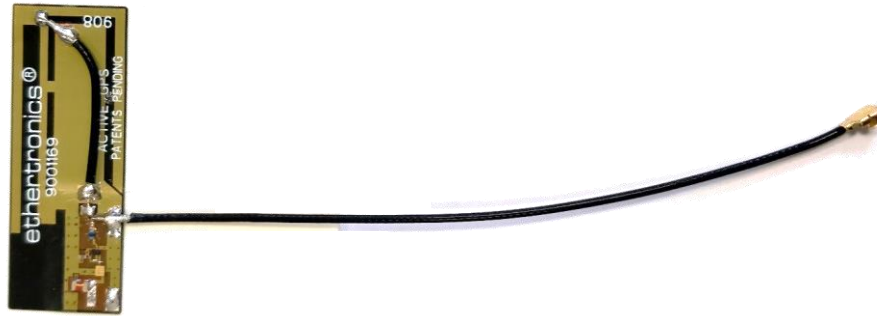
- Smart metering
- M2M
- Industrial devices
- IoT
- Tracking



Ethertronics' External GPS Active Antenna Specifications
Ethertronics produces a wide variety of standard and custom antennas to meet user needs

Test Setup – Passive Antenna Only

Typical performance with 100 mm u.fl cable

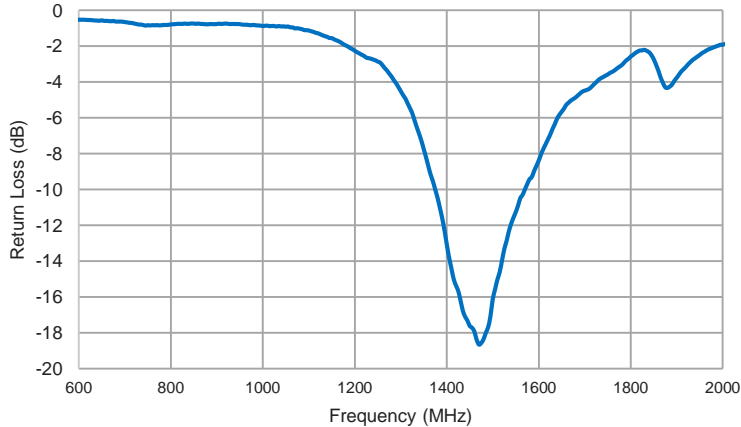


The location of the cable is changed to evaluate only the performance of the passive FPC antenna. Antenna is stuck to a piece of plastic made of ABS.

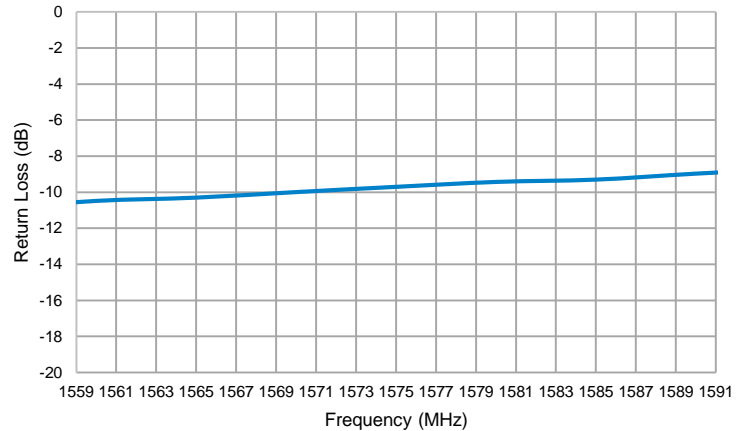
Return Loss, Efficiency and Peak Gain Plots

Typical performance antenna with 100 mm cable mounted directly on plastic material

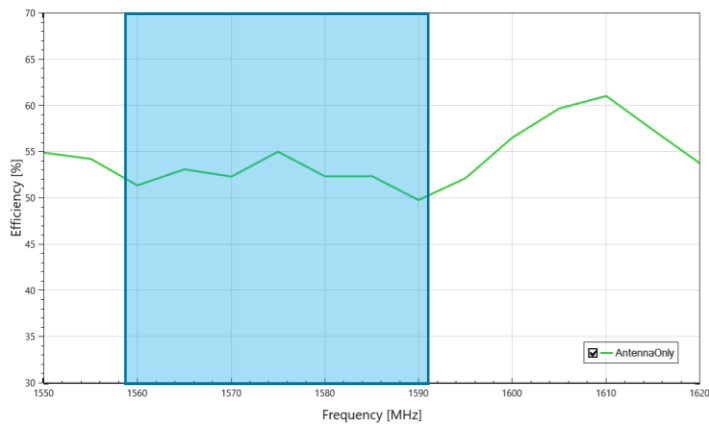
Return Loss wide band



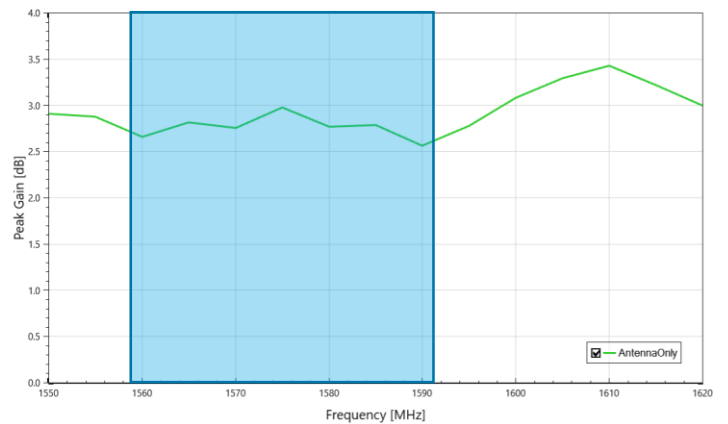
Return Loss narrow band



Efficiency (%)



Peak Gain (dB)

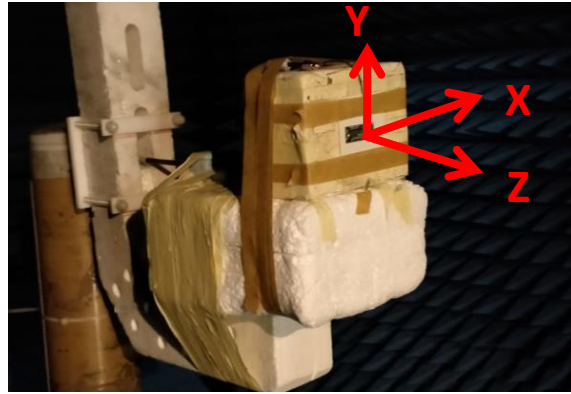




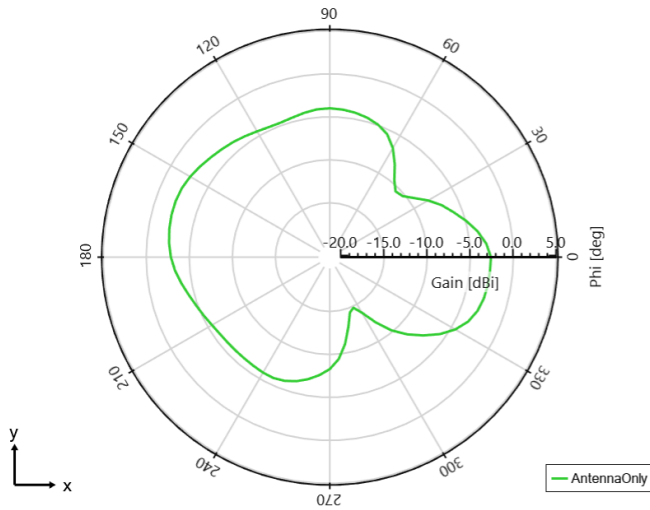
Ethertronics' External GPS Active Antenna Specifications.
Ethertronics produces a wide variety of standard and custom antennas to meet user needs.

Radiation Patterns - Passive Antenna Only

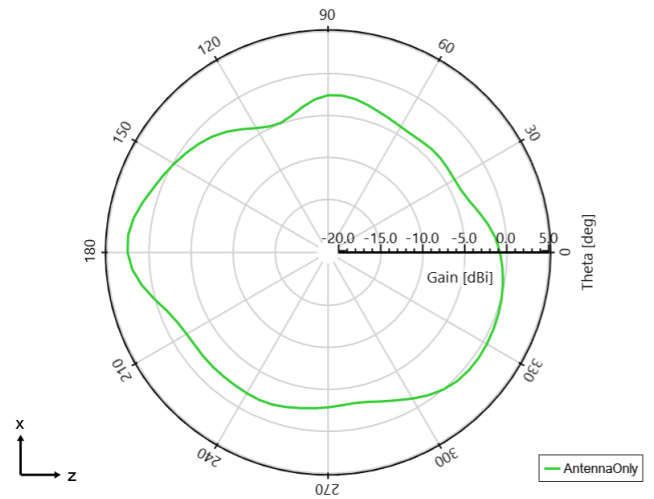
Typical performance with 100 mm u.fl cable



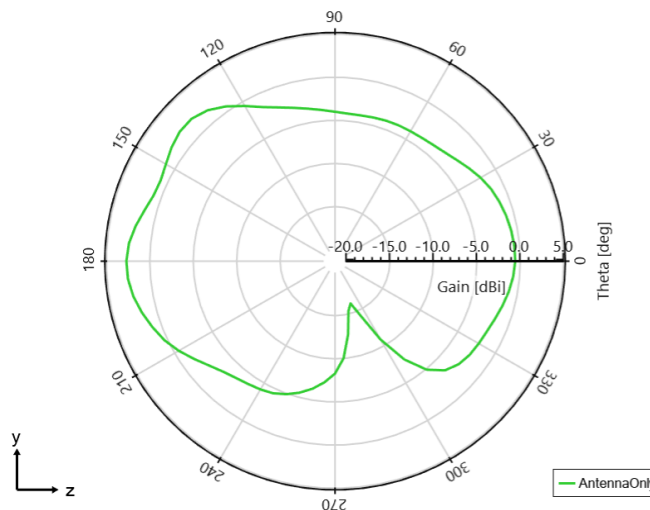
Gain (Total) - $\theta = 90$ deg - 1575 MHz [Plane XY]



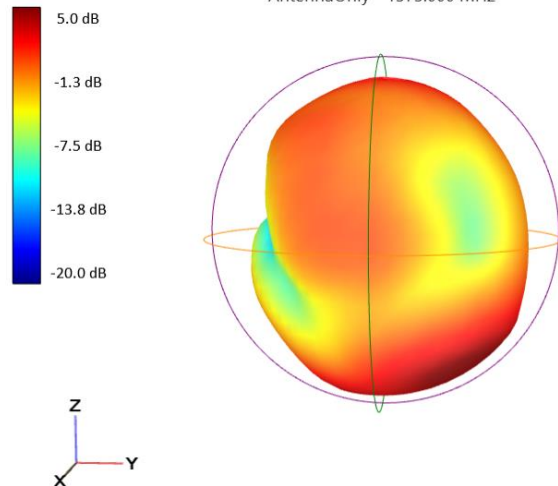
Gain (Total) - $\phi = 0$ deg - 1575 MHz [Plane XZ]



Gain (Total) - $\phi = 90$ deg - 1575 MHz [Plane YZ]



AntennaOnly - 1575.000 MHz

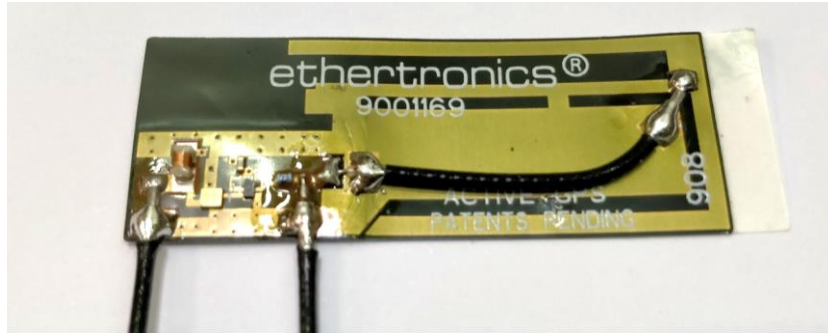




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Test Setup – Filter and LNA Only

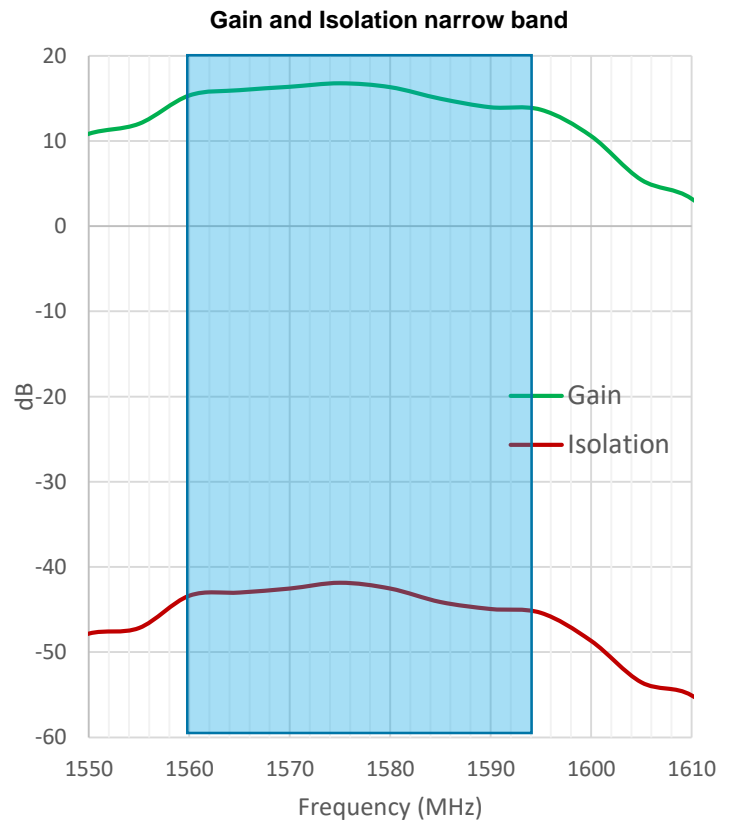
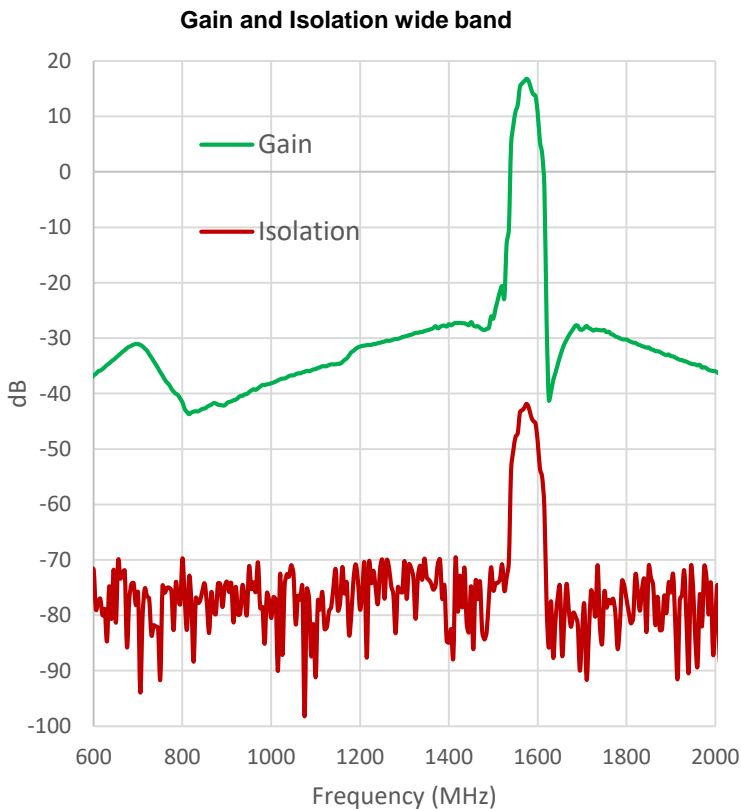
Typical performance – VNA RF power -20dBm, DC Supply 3.0V



Additional 100mm u.fl cable is soldered to evaluate the active circuitry.

Gain, Out of band Rejection and Isolation Plots

Typical performance – VNA RF power -20dBm, DC Supply 3.0V





Ethertronics' External GPS Active Antenna Specifications
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Test Setup – Full System (Antenna + Filter and LNA)

Typical performance with various DC voltage level supplies

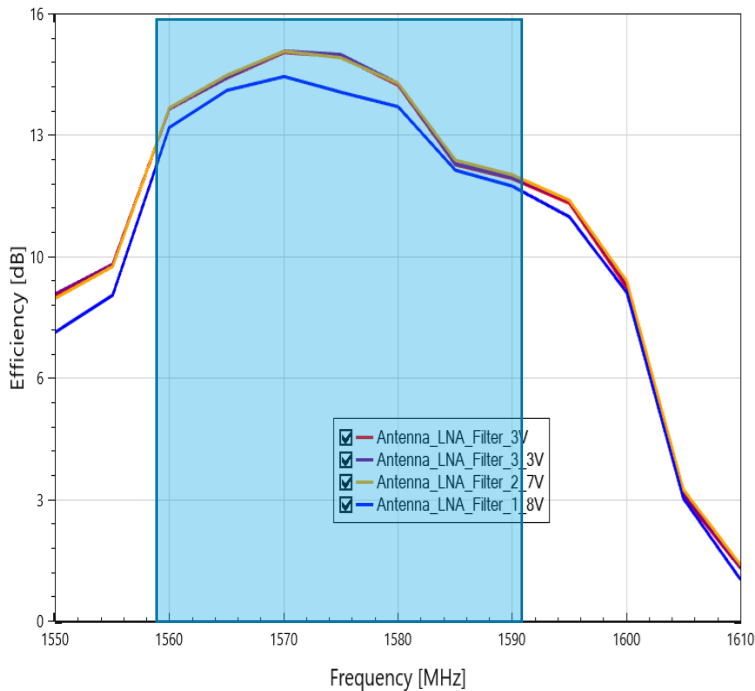


Antenna is stuck to a piece of plastic made of ABS

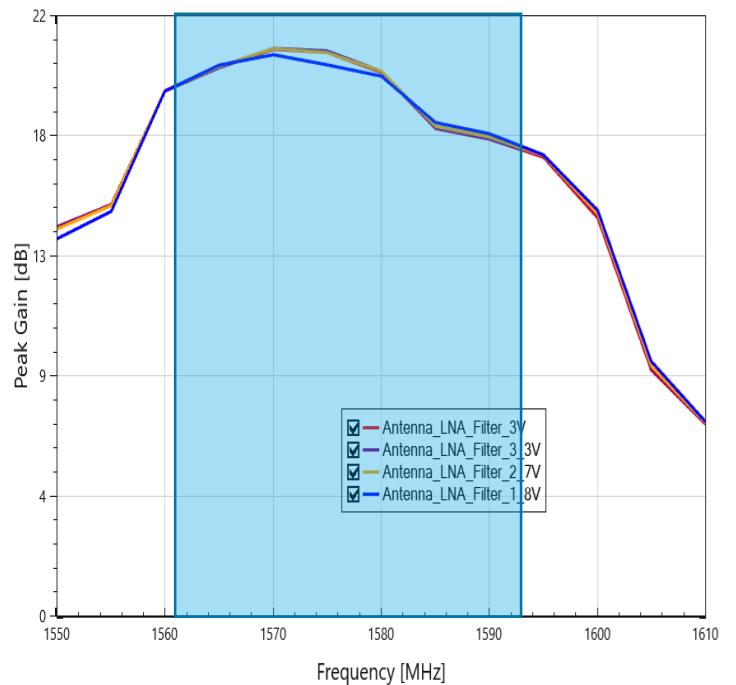
Efficiency and Peak Gain Plots

Typical performance with various DC voltage level supplies

Efficiency (with LNA)



Peak Gain (with LNA)

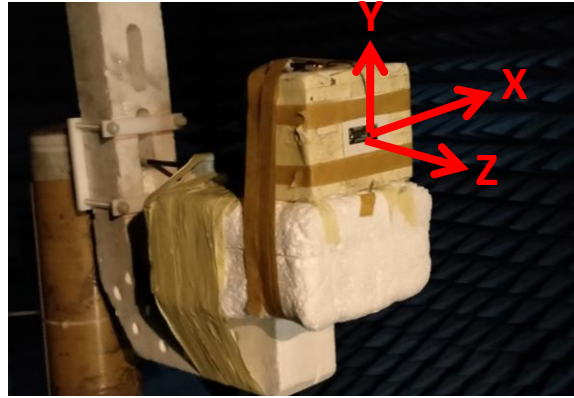




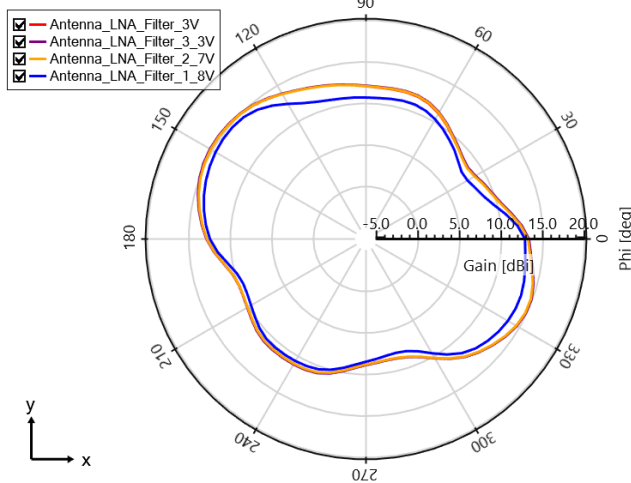
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Radiation Patterns - Full System (Antenna + Filter and LNA)

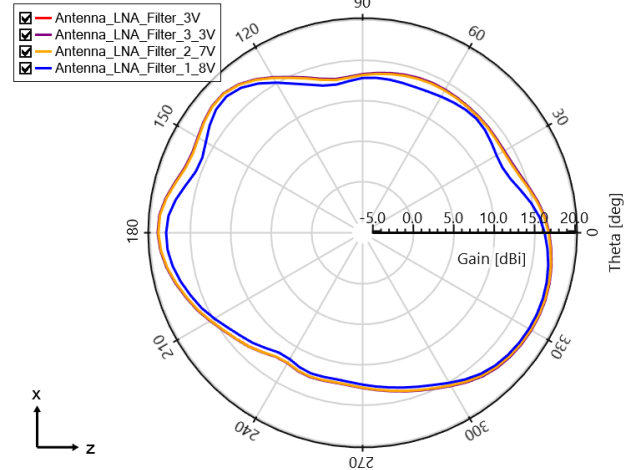
Typical performance with various DC voltage level supplies



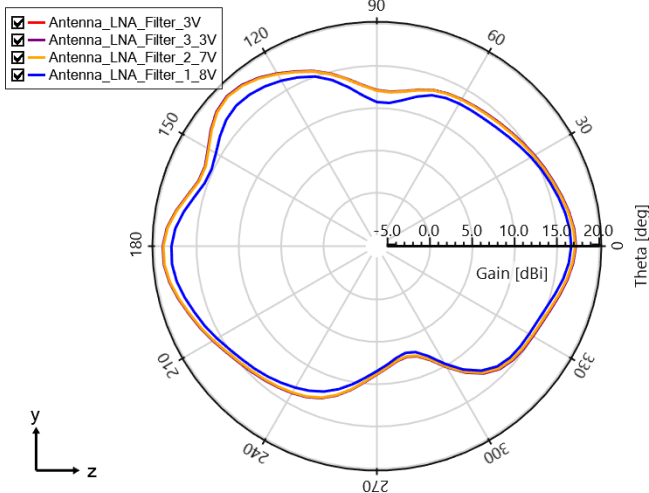
Gain (Total) - $\theta = 90$ deg - 1575 MHz [Plane XY]



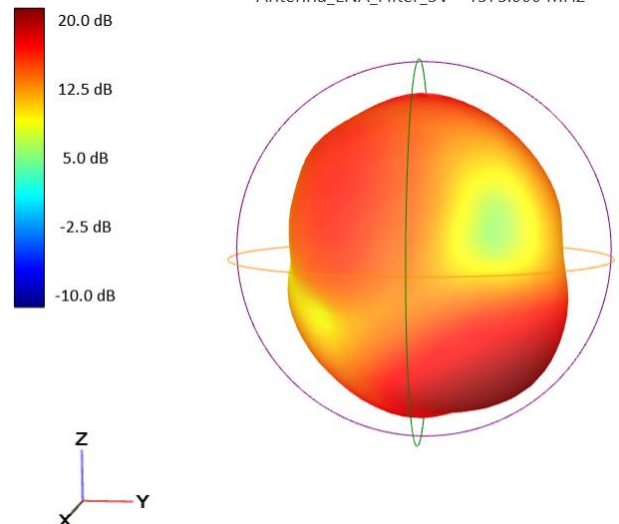
Gain (Total) - $\phi = 0$ deg - 1575 MHz [Plane XZ]



Gain (Total) - $\phi = 90$ deg - 1575 MHz [Plane YZ]



Antenna_LNA_Filter_3V - 1575.000 MHz



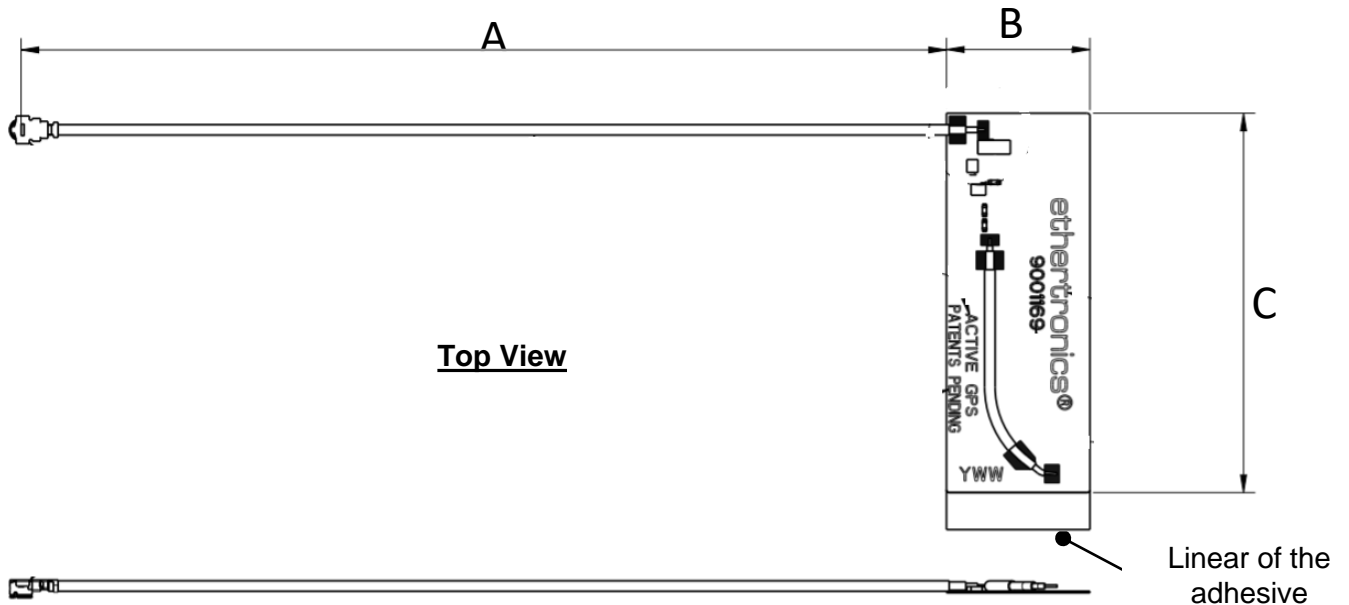


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Mechanical Dimensions

Typical antenna dimensions (mm)

Ordering Part Number	A (mm)	B (mm)	C (mm)	Connector
9001169	100.0 ± 3.0	15.5 ± 0.2	41.0 ± 0.2	u.fl compatible



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