

Part No. 9001169F0

GPS FPC Embedded Antenna with LNA (Active)

1575.42 MHz

Supports: GPS L1, Galileo E1



KYOCERA AVX's 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 9001169F0 antenna embeds a low power consumption LNA that facilitates its integration in the end product.

GPS FPC Embedded Antenna with LNA

GPS L1: 1563 - 1587 MHz

GALILEO E1: 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

KYOCERA AVX's 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
- IoT, Industrial devices
- Tracking
- Telematics
- Smart Home

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	-30°C to +85°C
Storage Humidity Range	40 - 60% RH
Storage Temperature	16°C to +27°C

GPS FPC Active KYOCERA AVX Embedded Antenna Specifications
KYOCERA AVX produces a wide variety of standard and custom antennas to meet user needs

Mechanical Specifications & Ordering Part Number

Ordering Part Number	9001169F0-AA10L0100
Dimensions (mm)	41.0 x 15.5 x 0.17
Mounting Type	Adhesive 3M 9077
Connector Type	MHF I (U.FL Compatible)
Cable length (mm)	100
Weight (g)	0.9
Packaging	PE Bag

GPS FPC Active KYOCERA AVX Embedded Antenna Specifications
 KYOCERA AVX produces a wide variety of standard and custom antennas to meet user needs

Test Setup – Passive Antenna Only

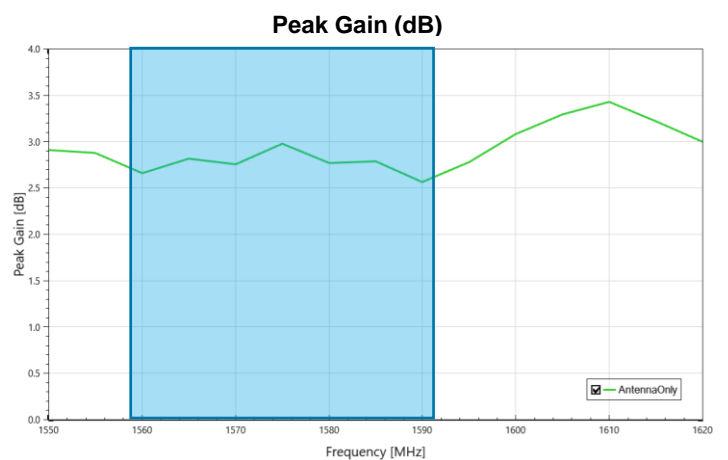
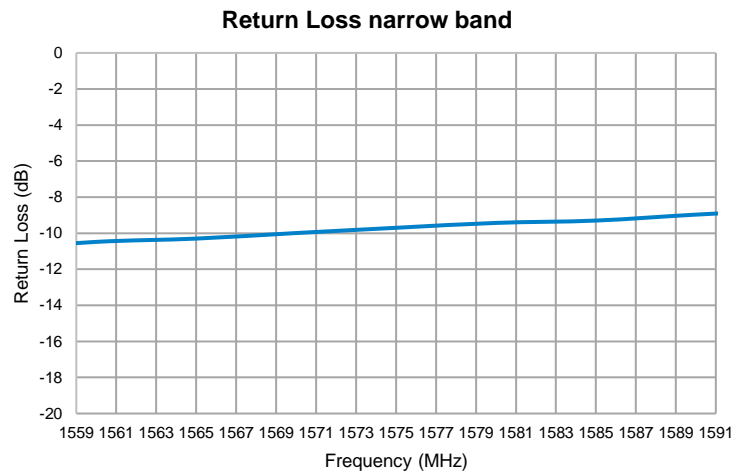
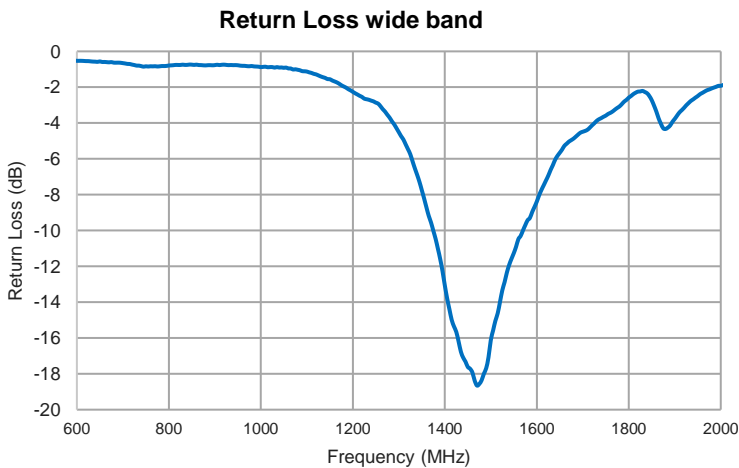
Typical performance with 100 mm U.FL cable



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

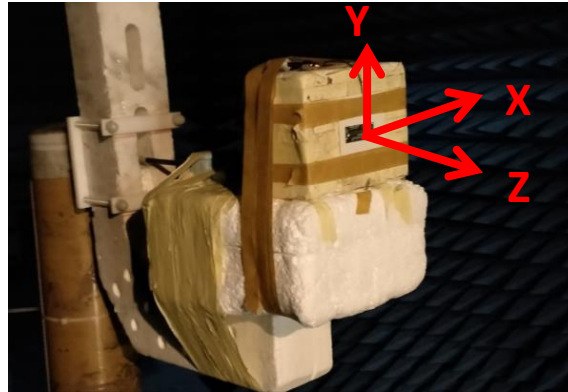
Typical performance antenna with 100 mm cable mounted directly on plastic material



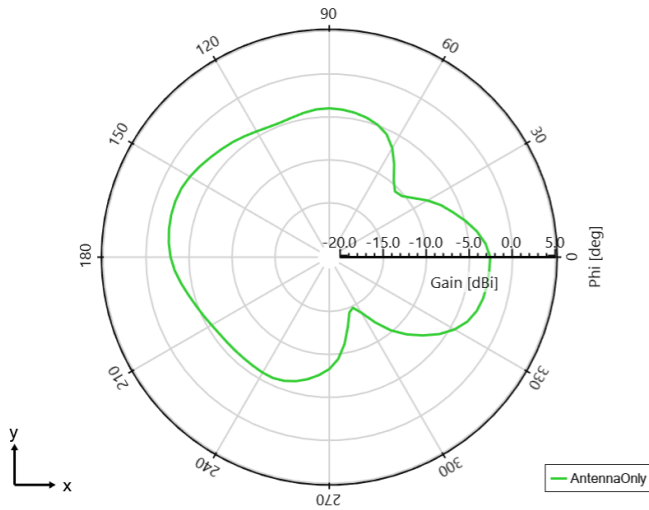
GPS FPC Active KYOCERA AVX Embedded Antenna Specifications.
 KYOCERA AVX produces a wide variety of standard and custom antennas to meet user needs.

Radiation Patterns - Passive Antenna Only

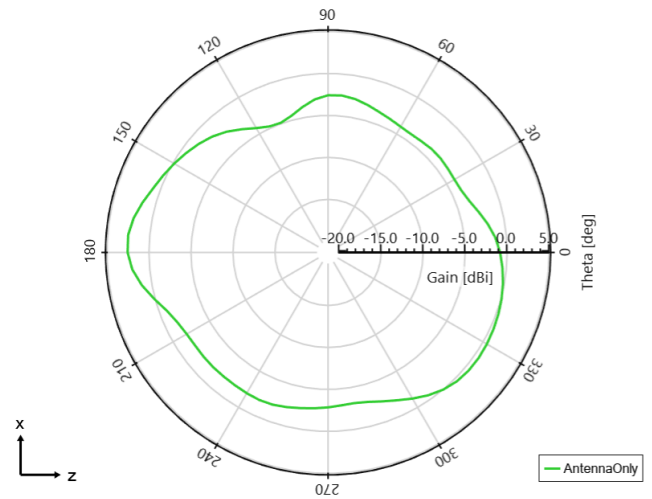
Typical performance with 100 mm u.fl cable



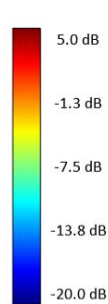
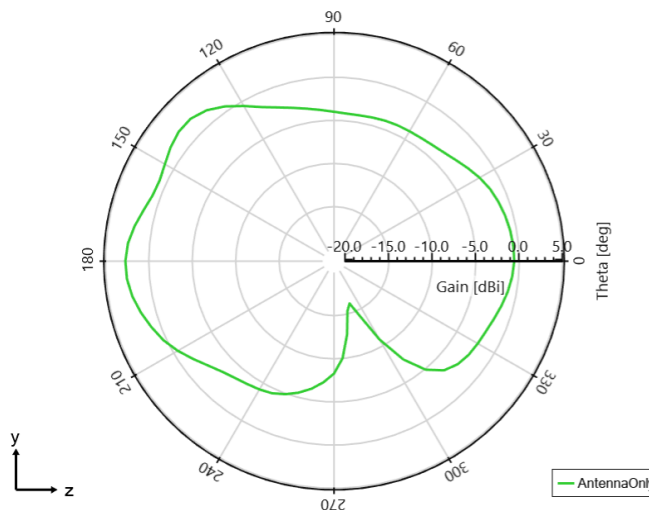
Gain (Total) - $\theta = 90$ deg - 1575 MHz [Plane XY]



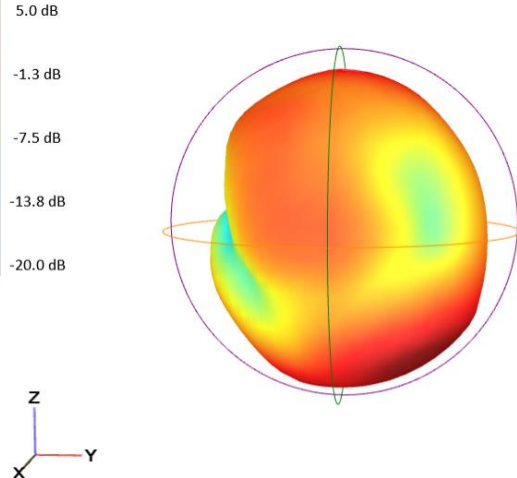
Gain (Total) - $\phi = 0$ deg - 1575 MHz [Plane XZ]



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



AntennaOnly - 1575.000 MHz



GPS FPC Active KYOCERA AVX Embedded Antenna Specifications
 KYOCERA AVX produces a wide variety of standard and custom antennas to meet user needs

Test Setup – Filter and LNA Only

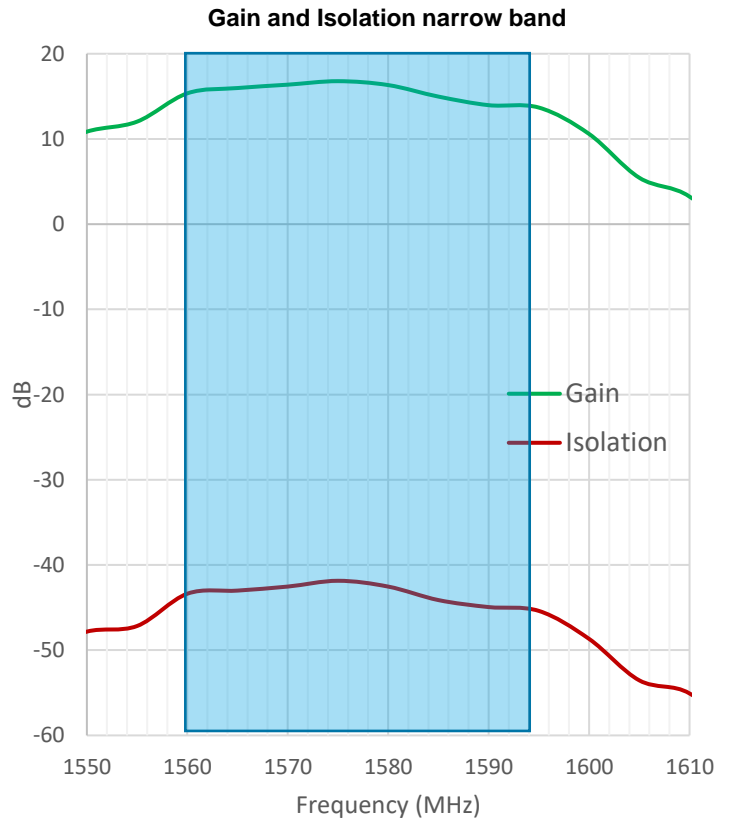
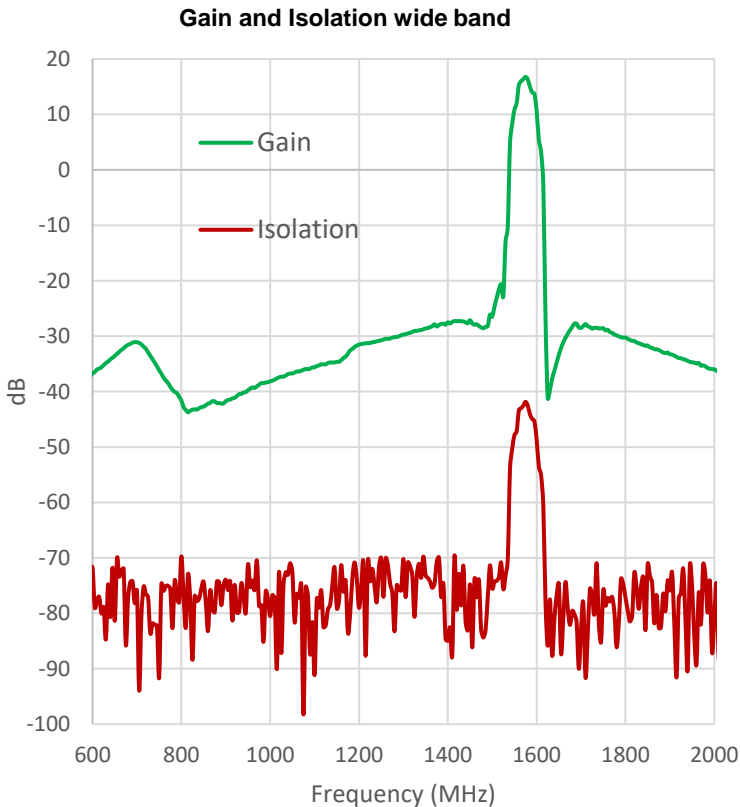
Typical performance – VNA RF power -20dBm, DC Supply 3.0V



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



GPS FPC Active KYOCERA AVX Embedded Antenna Specifications
 KYOCERA AVX produces a wide variety of standard and custom antennas to meet user needs

Test Setup – Full System (Antenna + Filter and LNA)

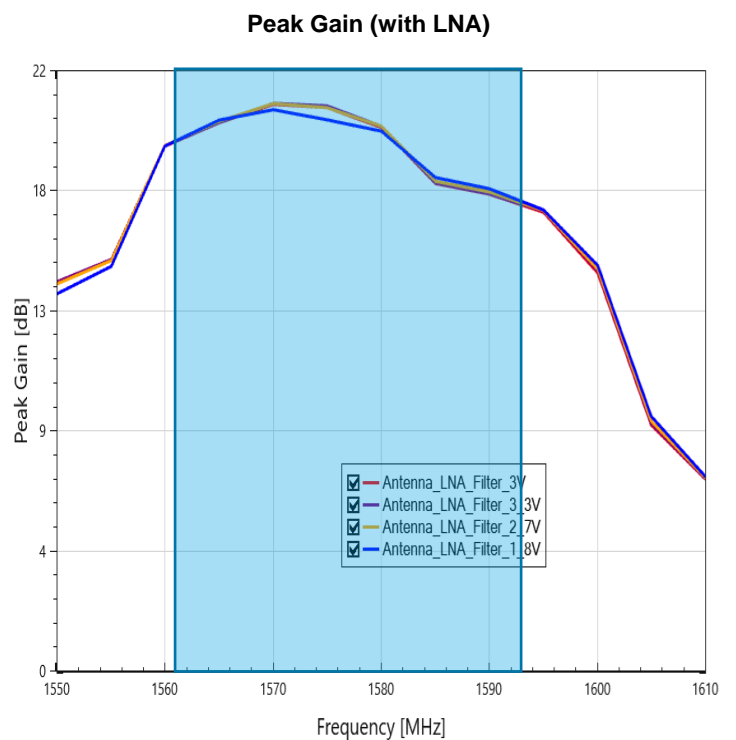
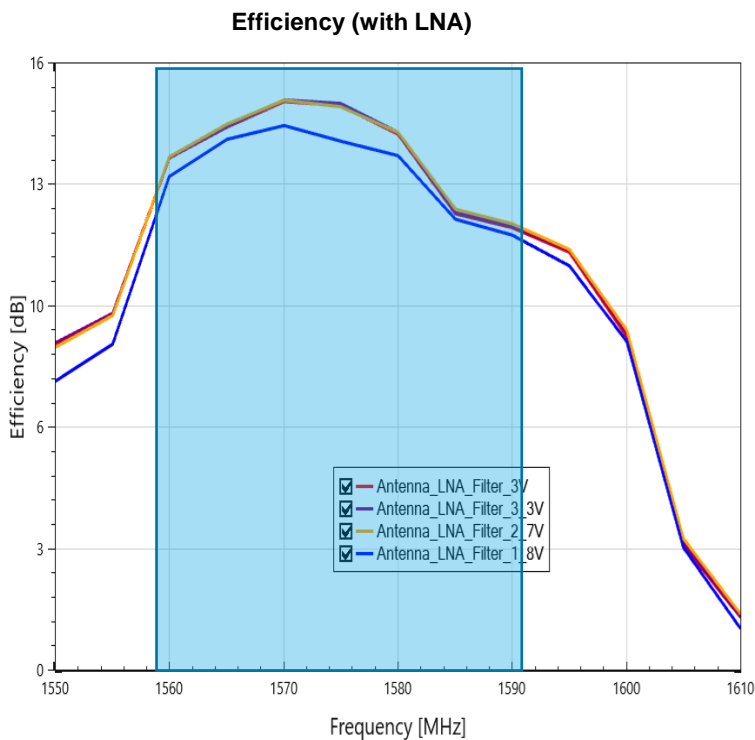
Typical performance with various DC voltage level supplies



Antenna is stuck to a piece of plastic made of ABS

Efficiency and Peak Gain Plots

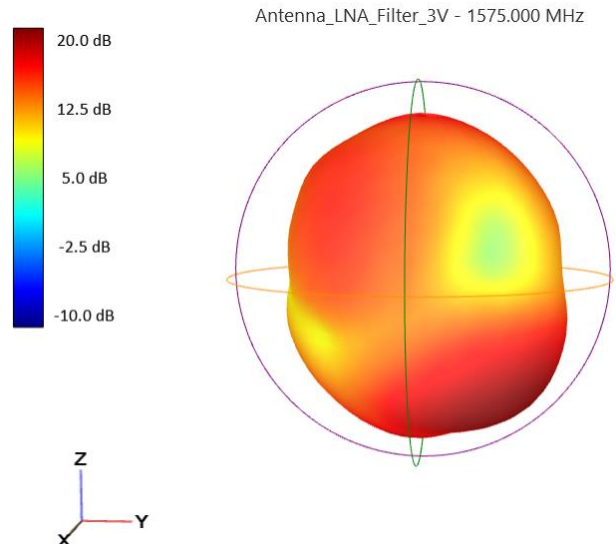
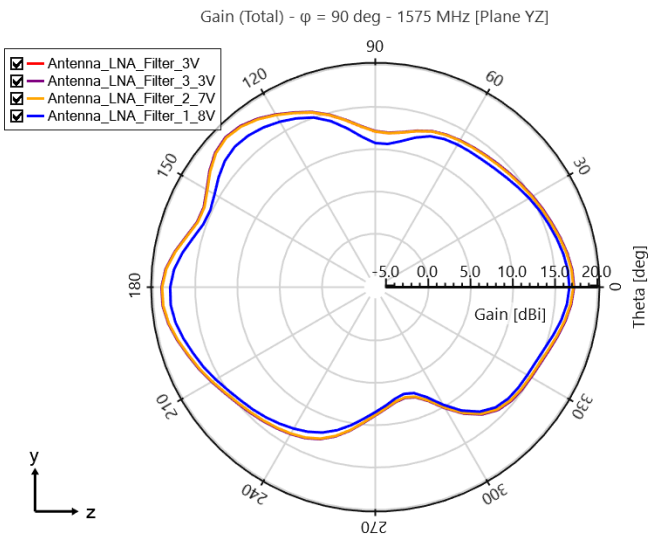
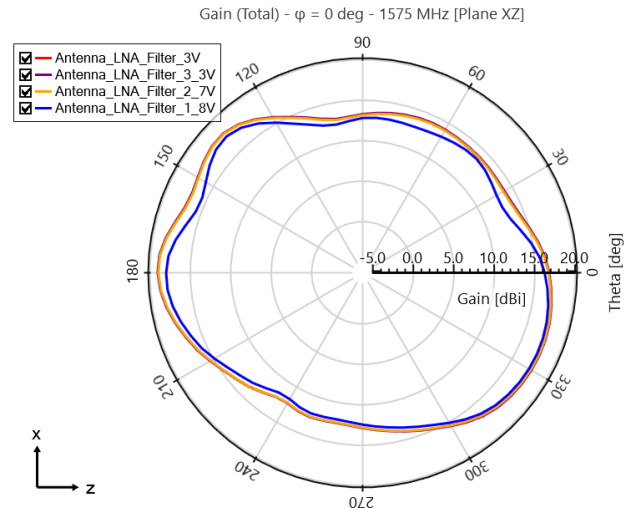
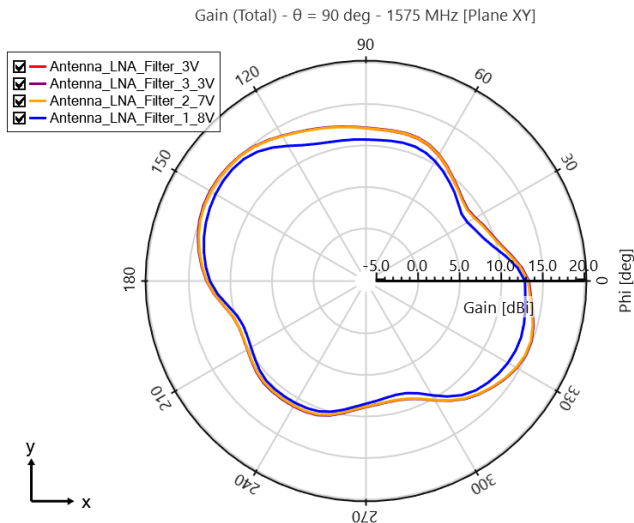
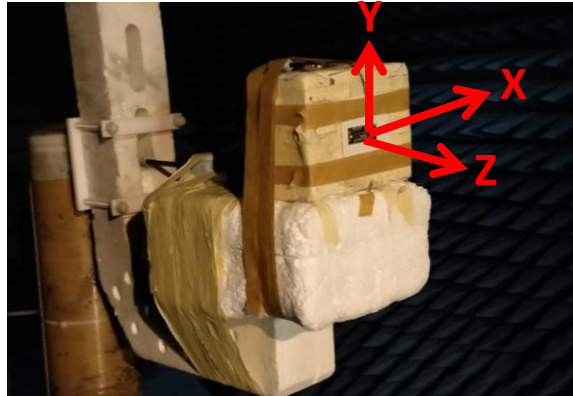
Typical performance with various DC voltage level supplies



GPS FPC Active KYOCERA AVX Embedded Antenna Specifications
 KYOCERA AVX produces a wide variety of standard and custom antennas to meet user needs

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

Typical performance with various DC voltage level supplies



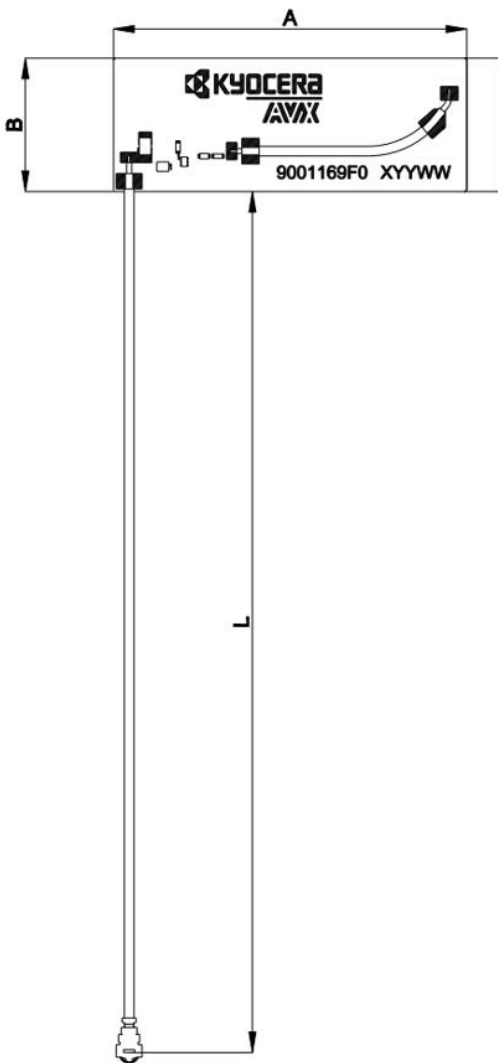
GPS FPC Active KYOCERA AVX Embedded Antenna Specifications
 KYOCERA AVX produces a wide variety of standard and custom antennas to meet user needs

Mechanical Dimensions

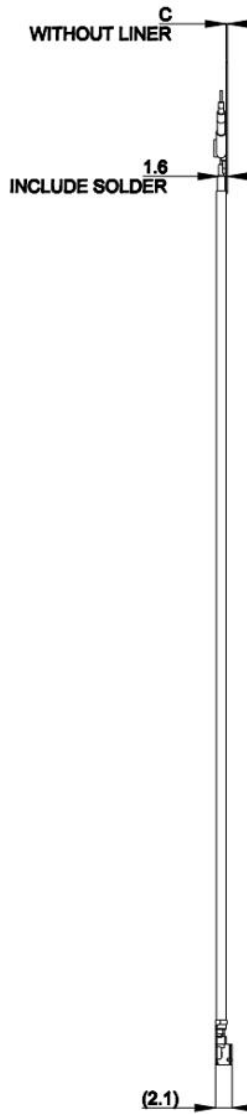
Typical antenna dimensions (mm)

Ordering Part Number	A (mm)	B (mm)	L (mm)	Connector
9001169F0-AA10LXXXX	41.0 ± 0.2	15.5 ± 0.2	XXXX	MHF I (U.FL compatible)

XXX → Cable length on customer request



Top View



Side View

XXX (mm)	Condition	Tolerance Z
050	XXX < 150	± 3.0
100	XXX < 150	± 3.0
150	$150 \leq \text{XXX} < 300$	± 4.0
200	$150 \leq \text{XXX} < 300$	± 4.0
250	$150 \leq \text{XXX} < 300$	± 4.0
300	$300 \leq \text{XXX} \leq 500$	± 5.0
400	$300 \leq \text{XXX} \leq 500$	± 5.0
500	$500 \leq \text{XXX} \leq 1000$	± 7.0
600	$500 \leq \text{XXX} \leq 1000$	± 7.0

*All dimensions provided in this document are for informational purposes only