Datasheet

ANT-GNCP-CA188L165
Active Ceramic Patch GNSS Antenna

The GNCP-CA188L165 is a global navigation satellite system (GNSS) ceramic patch antenna with integrated low noise amplifier (LNA), supporting GPS, Galileo, GLONASS, Beidou, IRNSS and QZSS systems in the L1/E1/B1 bands. The 15 dB LNA provides high gain with low noise figure of 2.6 dB (typ.). The antenna has a 65 mm cable terminated in a U.FL-type plug (female socket) connector.

Features

- Performance at 1575.42 MHz
  - VSWR: ≤ 1.1
  - Peak Gain: 13.7 dBi
  - Axial Ratio: 9.7 dB
- Directional radiation pattern orthogonal to antenna surface
- Right-hand circularly polarized (RHCP)
- Omnidirectional radiation pattern
- 15 dB (Typ.) LNA
- U.FL-type plug (female socket) compatible with MHF1, AMC, UMCC

Applications

- Global navigation
  - GPS L1
  - Galileo E1
  - GLONASS II L1
  - Beidou B1-BOC
  - IRNSS
  - QZSS L1
- Timing solutions

Ordering Information

Part Number	Description
ANT-GNCP-CA188L165	GNSS ceramic patch antenna with U.FL-type plug (female socket) on 65 mm of 1.13 mm coaxial cable

Available from Linx Technologies and select distributors and representatives.

Table 1. Electrical Specifications, LNA plus Antenna Data

GNCP-CA188L165	Beidou B1	GPS L1, GALILEO E1, GLONASS II L1, Beidou B1-BOC, QZSS L1	Beidou B1-2	GLONASS I L1, GLONASS II L1
Center Frequency	1561.098 MHz	1575.42 MHz	1589.74 MHz	1602 MHz
Frequency Range	1559.05 MHz to 1563.14 MHz	1567.24 MHz to 1583.60 MHz	1587.69 MHz to 1591.79 MHz	1593.31 MHz to 1608.68 MHz
VSWR (max)	1.1	1.1	1.1	1.1
Peak Gain* (dBi)	10.6	13.7	14.1	14.1
Axial Ratio (dBi)	8.1	9.7	13.3	3.2
Noise Figure (dB)	2.7	2.2	2.9	2.9

Polarization	RHCP	Impedance	50 Ω
Radiation	Vertical	Electrical Type	Radiating Patch plus LNA
Input Voltage	Min. 1.8 V, Typ. 3.0 V, Max. 5.5 V	Current Consumption @3.0V	Typ. 10.0 mA, Max. 15.0 mA

*Applies to antenna, LNA, cable and connector combined.

Table 2. Mechanical Specifications, LNA plus Antenna

Operating Temp. Range	-40 °C to +85 °C	Weight	7.4 g (0.26 oz)
Connection	U.FL-type plug (female socket) on 65 mm (2.56 in) of 1.13 mm coaxial cable		
Dimensions	18.0 mm x 18.0 mm x 7.1 mm (0.71 in x 0.71 in x 0.28 in)		

VSWR

Figure 1 provides the voltage standing wave ratio (VSWR) across the antenna bandwidth. VSWR describes the power reflected from the antenna back to the radio. A lower VSWR value indicates better antenna performance at a given frequency. Reflected power is also shown on the right-side vertical axis as a gauge of the percentage of transmitter power reflected back from the antenna.

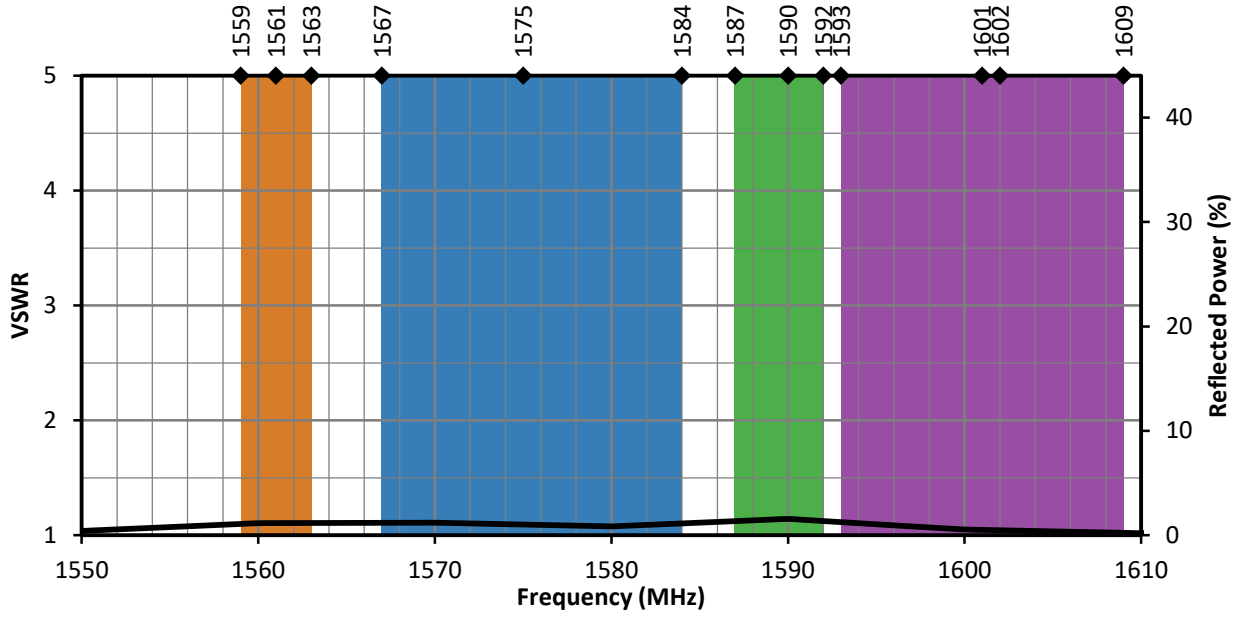


Figure 1. ANT-GNCP-CA188L165 VSWR with Frequency Band Highlights

Return Loss

Return loss (Figure 2), represents the loss in power at the antenna due to reflected signals. Like VSWR, a lower return loss value indicates better antenna performance at a given frequency.

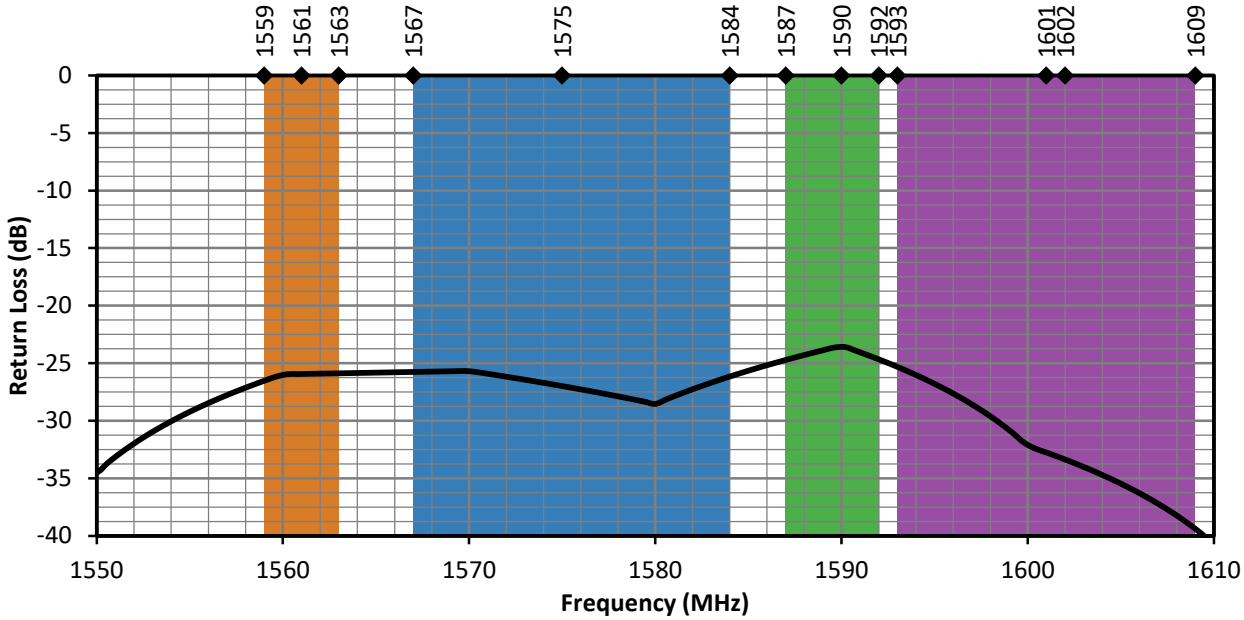


Figure 2. ANT-GNCP-CA188L165 Return Loss with Frequency Band Highlights

Peak Gain

The peak gain across the antenna bandwidth is shown in Figure 3. Peak gain represents the maximum antenna input power concentration across 3-dimensional space, and therefore peak performance at a given frequency, but does not consider any directionality in the gain pattern.

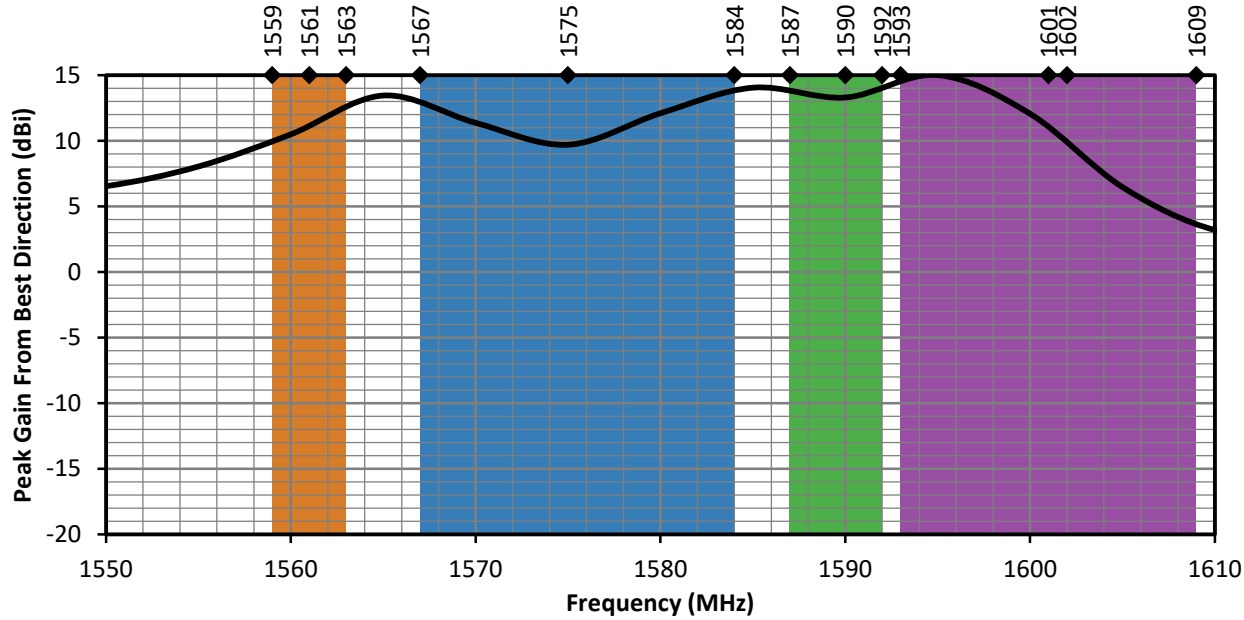


Figure 3. ANT-GNCP-CA188L165 Peak Gain with Frequency Band Highlights

Axial Ratio

Axial ratio provides a measure of the quality of circular polarization of an antenna, the lower the value (in dB), the better the circular polarization. A circularly polarized antenna field comprises two orthogonal E-field components. These fields are ideally of equal amplitude, resulting in an axial ratio equal to unity (0 dB). In practice, no antenna is perfectly circular in polarization, the polarization is elliptical as one field has larger magnitude. As the axial ratio increases the antenna gain degrades away from the main beam orthogonal to the antenna surface. The axial ratio for the ANT-GNCP-CA188L165 antenna is shown in Figure 4.

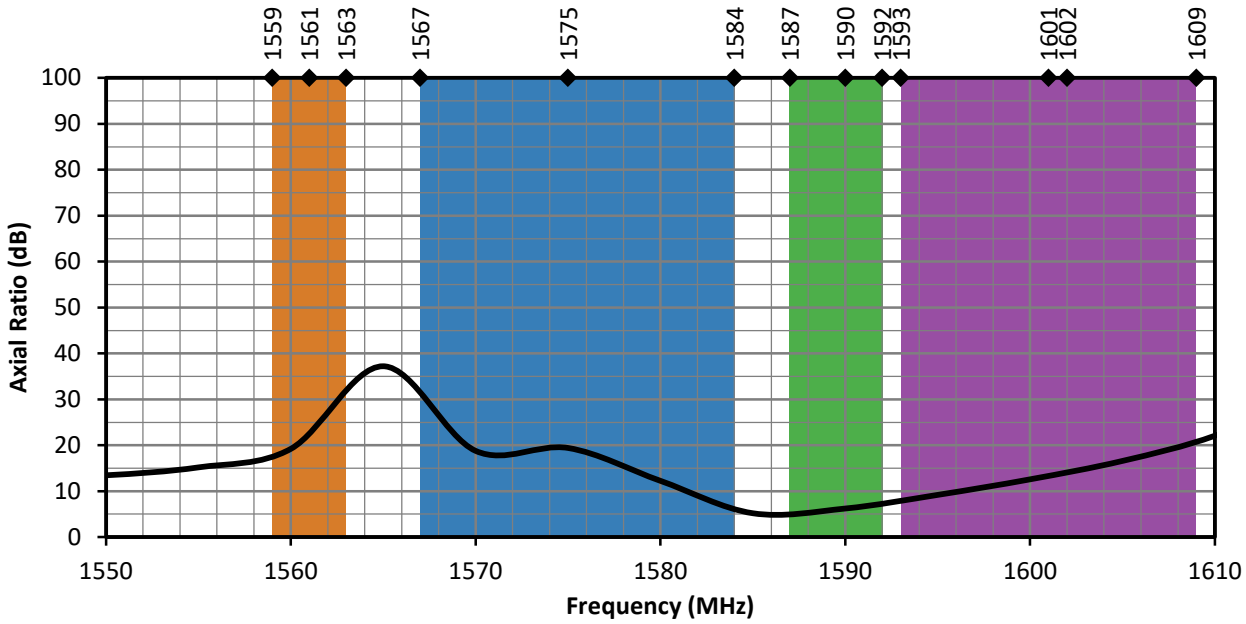
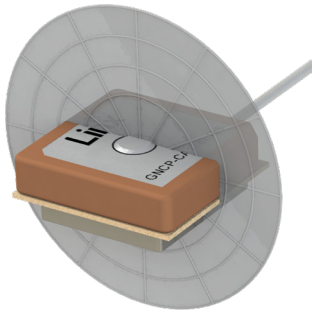


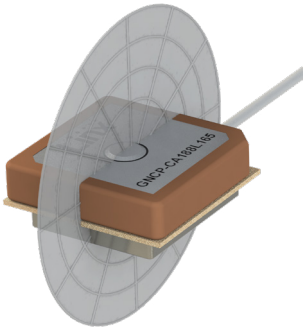
Figure 4. ANT-GNCP-CA188L165 Antenna Axial Ratio

Radiation Patterns

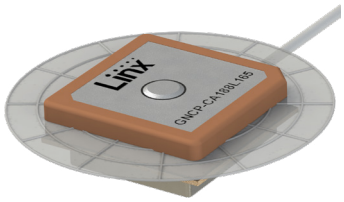
Radiation patterns provide information about the directionality and 3-dimensional gain performance of the antenna by plotting gain at specific frequencies in three orthogonal planes. Antenna radiation patterns are shown in Figure 5 using polar plots covering 360 degrees. The antenna graphic at the top of the page provides reference to the plane of the column of plots below it. Note: when viewed with typical PDF viewing software, zooming into radiation patterns is possible to reveal fine detail.



XZ-Plane Gain

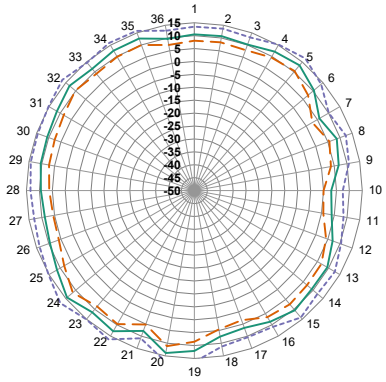


YZ-Plane Gain

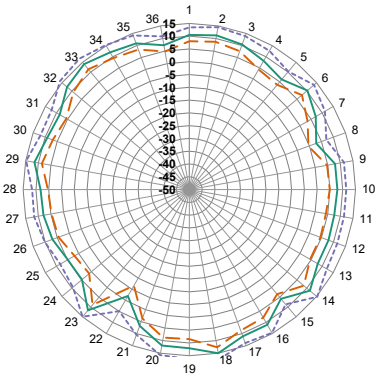


XY-Plane Gain

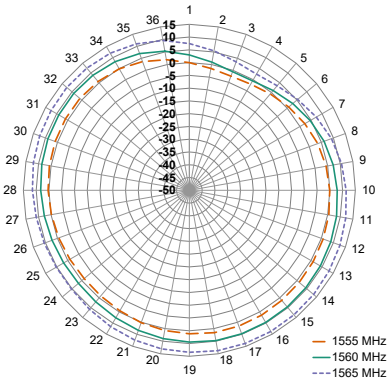
1559.05 MHz to 1563.14 MHz (1561 MHz)



XZ-Plane Gain

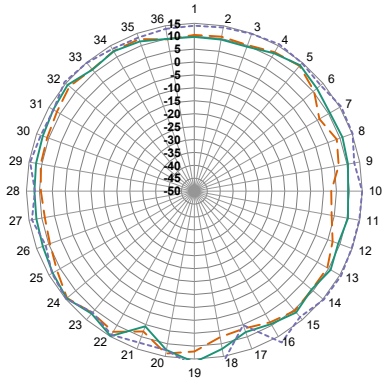


YZ-Plane Gain

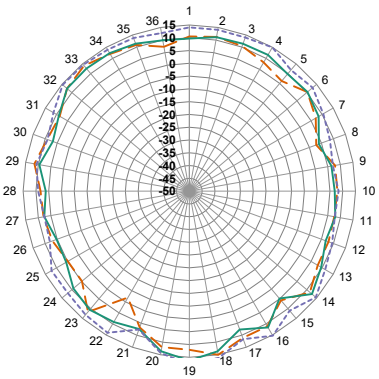


XY-Plane Gain

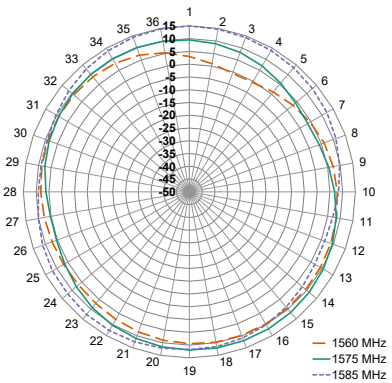
1567.24 MHz to 1583.60 MHz (1576 MHz)



XZ-Plane Gain

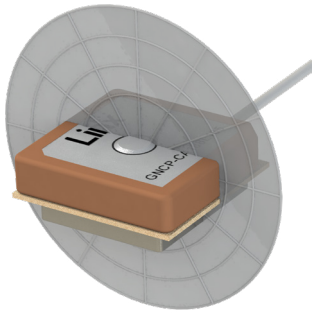


YZ-Plane Gain

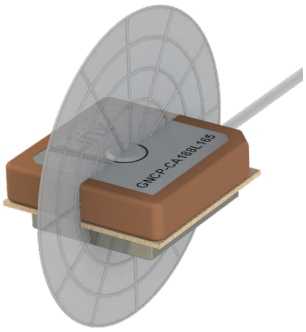


XY-Plane Gain

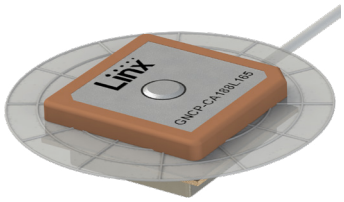
Radiation Patterns



XZ-Plane Gain

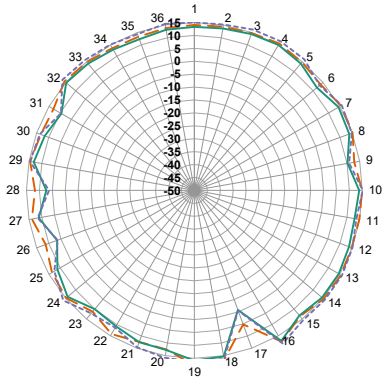


YZ-Plane Gain

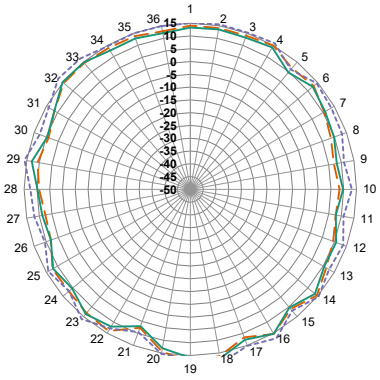


XY-Plane Gain

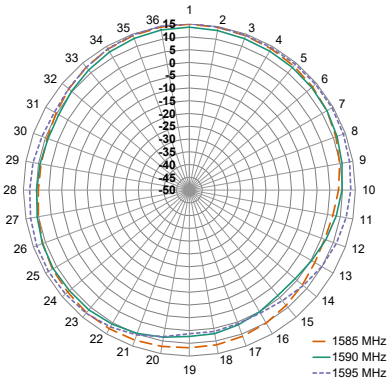
1587.69 MHz to 1591.79 MHz (1590 MHz)



XZ-Plane Gain

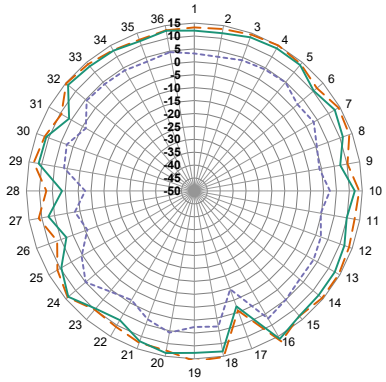


YZ-Plane Gain

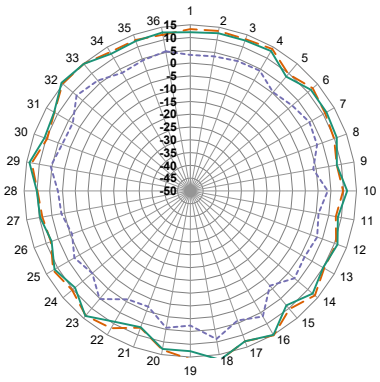


XY-Plane Gain

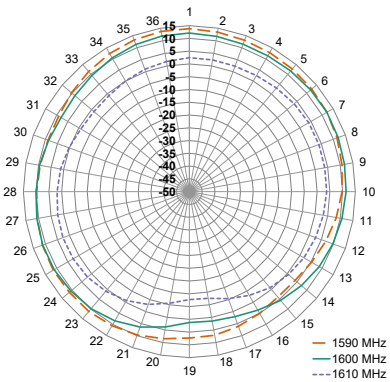
1593.31 MHz to 1608.68 MHz (1601 MHz)



XZ-Plane Gain



YZ-Plane Gain



XY-Plane Gain

Figure 5. ANT-GNCP-CA188L165 Radiation Patterns

Product Dimensions

Figure 6 provides dimensions of the ANT-GNCP-CA188L165.

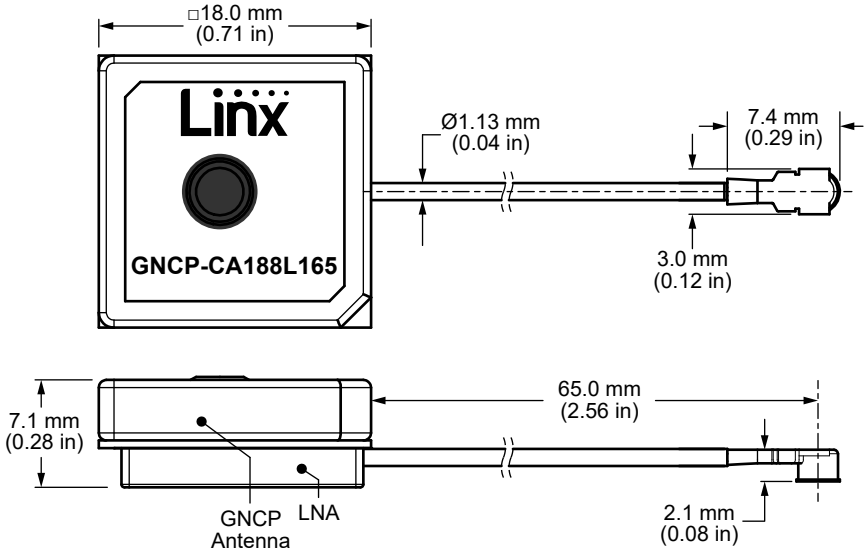


Figure 6. ANT-GNCP-CA188L165 Antenna Dimensions

Mounting

The GNCP-CA188L165 may be mounted by soldering the LNA base to a printed circuit board (PCB) - see application note, AN-00504 on the Linx website for more information. Alternatively, the antenna may be mounted by mechanical means (e.g. bracket, not included) or using an adhesive patch (not included).

Packaging Information

The ANT-GNCP-CA188L165 antenna is packaged in a protective plastic tray in quantities of 30. Antenna trays are bundled and packaged in a carton of 540 antennas. Distribution channels may offer alternative packaging options..

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