

ANT-GNCP-C25L15100

L1/L5 Active Ceramic Patch GNSS Antenna

The GNCP-C25L15100 is a global navigation satellite system (GNSS) ceramic patch antenna with integrated low noise amplifier (LNA), supporting GPS, Galileo, GLONASS, Beidou, NavIC and QZSS systems in the L1/E1/B1 and L5/ E5/ B2A bands. The LNA provides high gain with a low noise figure. The antenna has a 100 mm cable terminated in an MHF1/U.FL-type plug (female socket) connector.

FEATURES

- Performance at 1575.42 MHz
 - VSWR: ≤ 1.3
 - Peak Gain: 31.7 dBi
 - Axial Ratio: 10.1 dB
- Performance at 1176.45 MHz
 - VSWR: ≤ 1.8
 - Peak Gain: 27.3 dBi
 - Axial Ratio: 6.2 dB
- 29 dB (Typ.) LNA
- Ground plane independent
- Directional radiation pattern orthogonal to antenna surface
- Right-hand circularly polarized (RHCP)
- U.FL-type plug (female socket) compatible with MHF1, AMC, UMCC

APPLICATIONS

- Global navigation
 - GPS L1C, L1C/A, L5
 - Galileo E1, E5A
 - GLONASS L1
 - Beidou B2A, B1C
 - NavIC
 - QZSS L1, L5
- Timing solutions

ORDERING INFORMATION

Part Number	Description
ANT-GNCP-C25L15100	GNSS L1/L5 band ceramic patch antenna with MHF1/U.FL-type plug (female socket) on 100 mm of 1.13 mm coaxial cable

Available from Linx Technologies and select distributors and representatives.

TABLE 1. ELECTRICAL SPECIFICATIONS, ANTENNA PLUS LNA

Frequency	GPS Bands	VSWR (max.)	Return Loss (dB)	Peak Gain (dBi)	Axial Ratio (dB)
1176 MHz	GPS L5, Galileo E5A, Beidou B2A, NavIC L5, QZSS L5	1.8	-11.2	27.3	6.2
1561 MHz	Beidou B1I	1.3	-17.3	31.5	14.3
1575 MHz	GPS L1C, GPS L1C/A, Galileo E1, Beidou B1C, QZSS L1	1.3	-18.1	31.7	10.1
1601/1602 MHz	GLONASS L1	1.2	-20.5	29.4	12.3
Output Impedance	50 Ω				
Polarization	RHCP				
Radiation	Directional radiation pattern orthogonal to antenna surface				
Electrical Type	Radiating Patch plus LNA				
Input Voltage	Min. 3.0 V, Typ. 3.3 V, Max. 5.0 V				
Current Consumption @3.3V	Typ. 10.0 mA, Max. 15.0 mA				
Noise Figure (dB)	0.9 (1176 MHz), 0.9 (1575 MHz)				
ESD Sensitivity	ESD sensitive device. As a best practice, Linx uses ESD packaging.				

TABLE 2. MECHANICAL SPECIFICATIONS, ANTENNA PLUS LNA

Parameter	
Operating Temp. Range	-40 °C to +85 °C
Connection	MHF1/U.FL-type plug (female socket) on 100 mm (3.94 in) of 1.13 mm coaxial cable
Weight	19.8 g (0.70 oz)
Dimensions	25.1 mm x 25.1 mm x 12.0 mm (0.99 in x 0.99 in x 0.47 in)

GROUND PLANE INDEPENDENT

Because of the significant signal gain provided by the antenna's LNA, the ground plane typically required for passive GNSS antenna gain performance is not required for active GNSS antennas.

MOUNTING

The GNCP-C25L15100 may be mounted by mechanical means (e.g. bracket, not included) or using an adhesive patch (not included). Alternatively, the antenna 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.

PACKAGING INFORMATION

The ANT-GNCP-C25L15100 antenna is packaged in a protective plastic tray in quantities of 30. Antenna trays are bundled and packaged in a carton of 120 antennas. Distribution channels may offer alternative packaging options.

PRODUCT DIMENSIONS

Figure 1 provides dimensions of the ANT-GNCP-C25L15100.

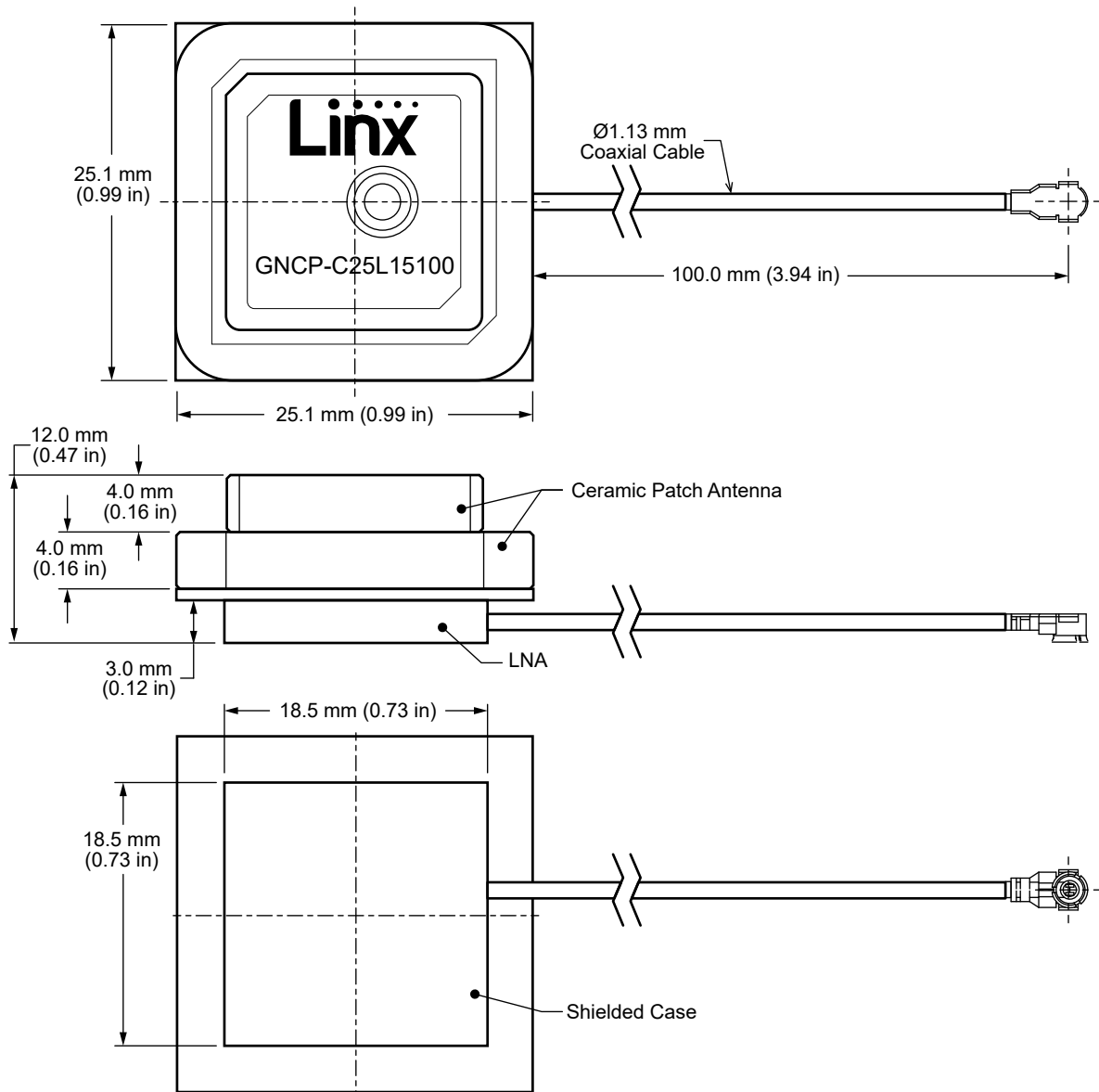


Figure 1. ANT-GNCP-C25L15100 Antenna Dimensions

VSWR

Figure 2 provides the voltage standing wave ratio (VSWR) across the L1 band, and Figure 3 provides VSWR across the L5 band.

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.

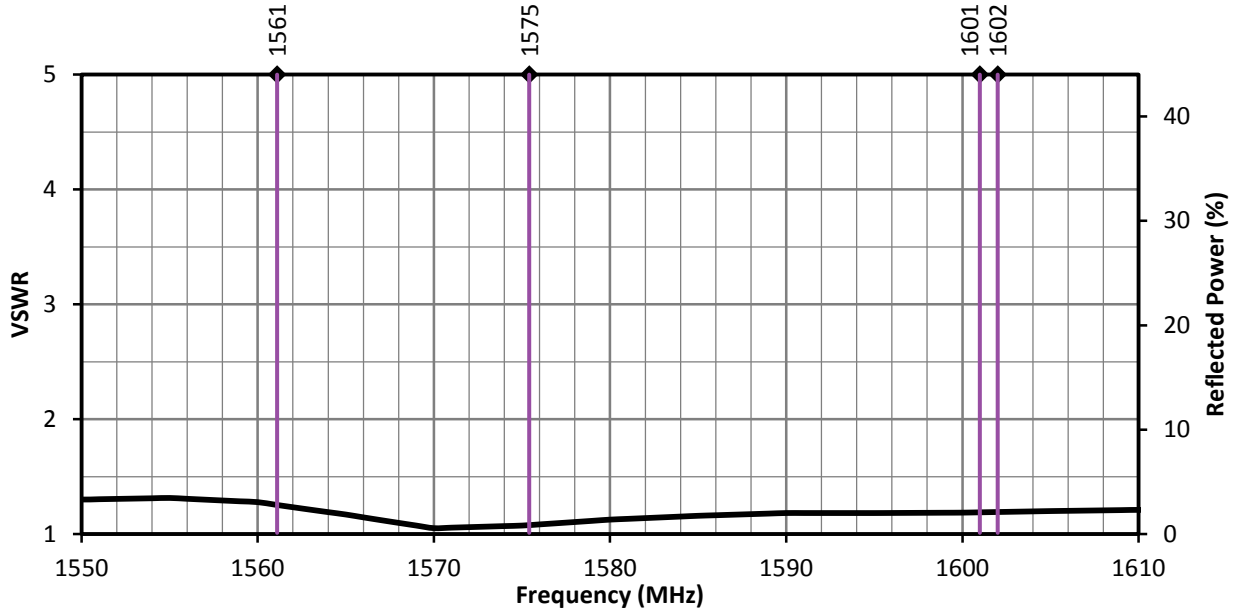


Figure 2. ANT-GNCP-C25L15100 VSWR, L1 Band

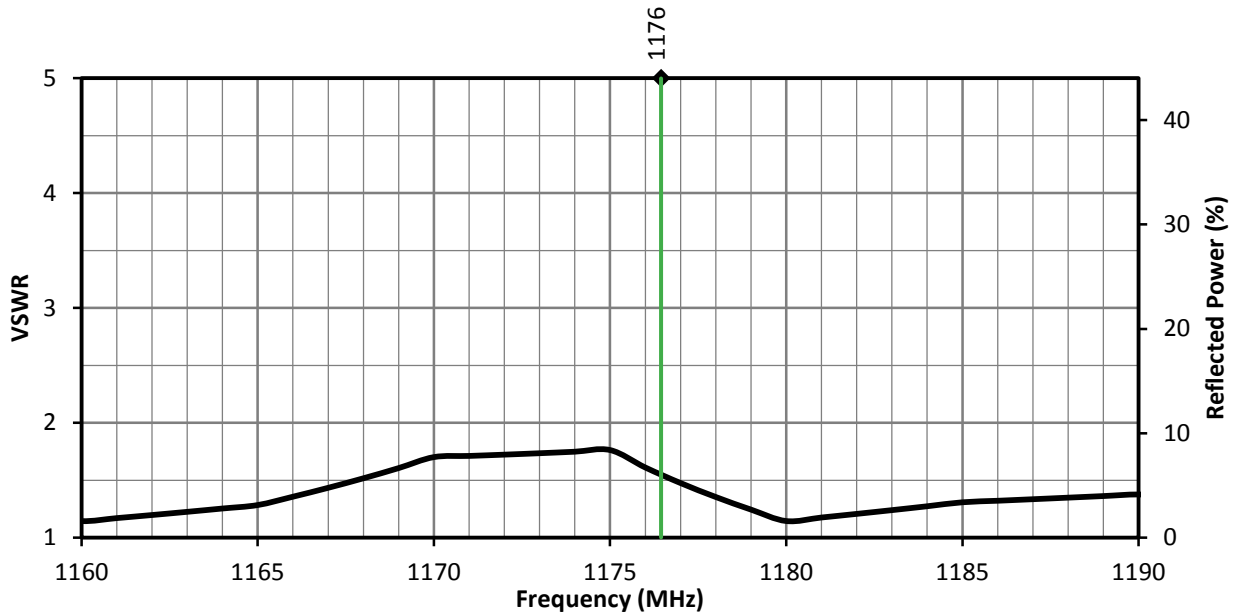


Figure 3. ANT-GNCP-C25L15100 VSWR, L5 Band

RETURN LOSS

Return loss, shown in Figure 4 (L1 band) and Figure 5 (L5 band) 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.

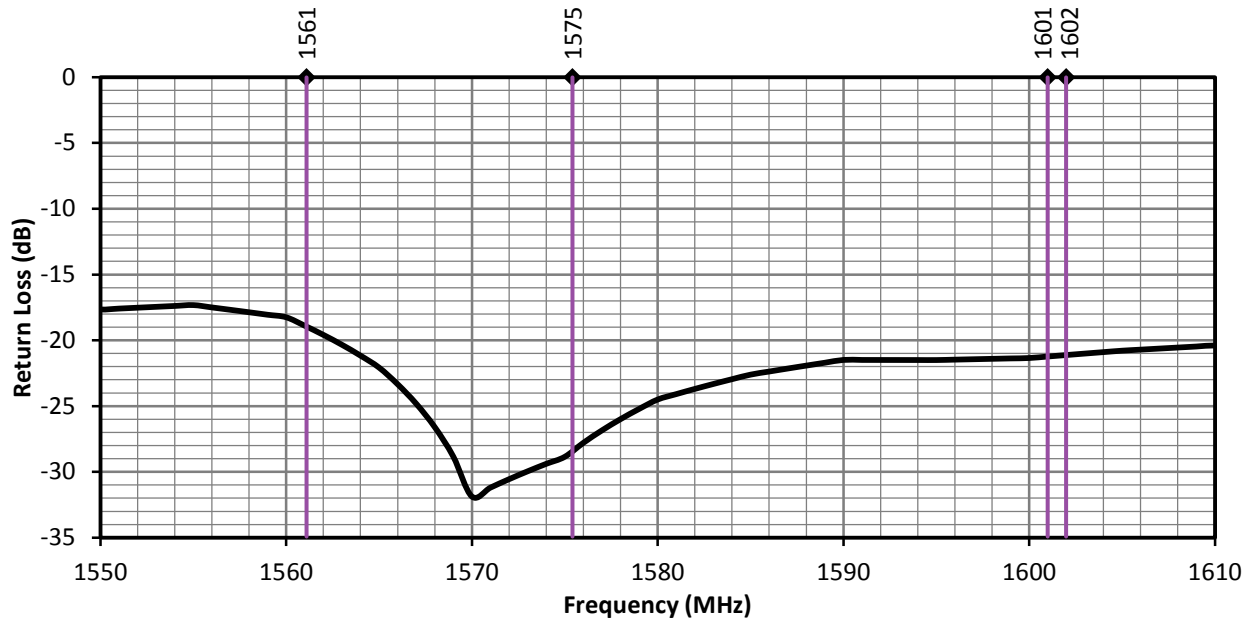


Figure 4. ANT-GNCP-C25L15100 Return Loss, L1 Band

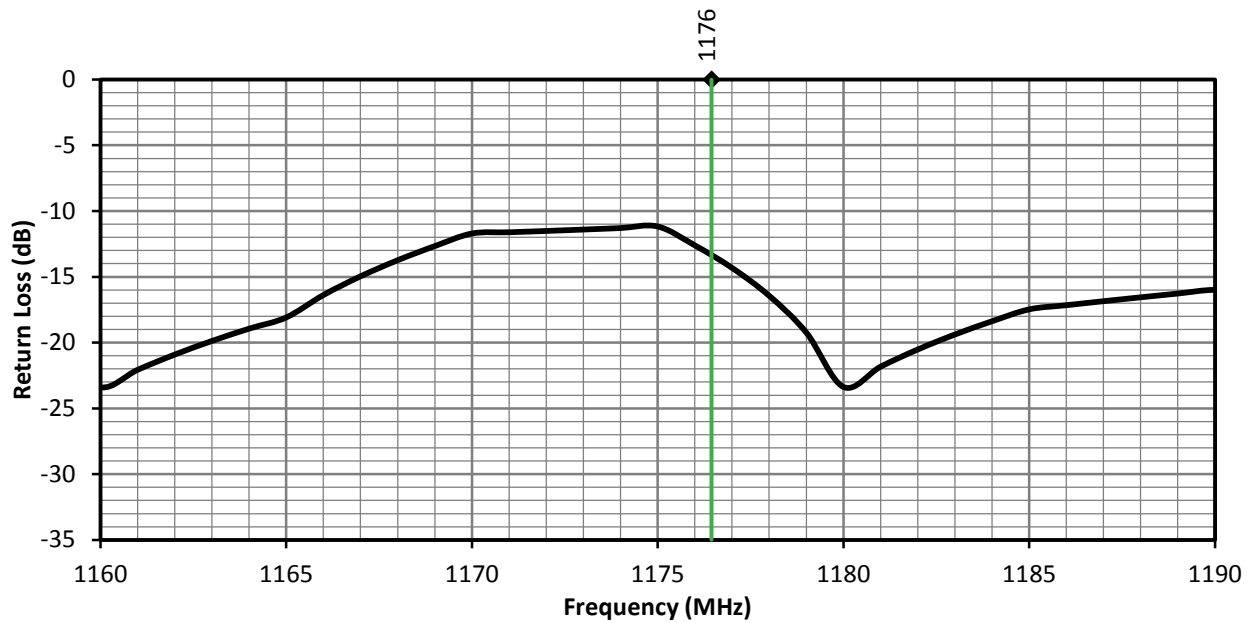


Figure 5. ANT-GNCP-C25L15100 Return Loss, L5 Band

PEAK GAIN

The peak gain across the antenna bandwidth is shown in Figure 6 (L1 band) and Figure 7 (L5 band). 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.

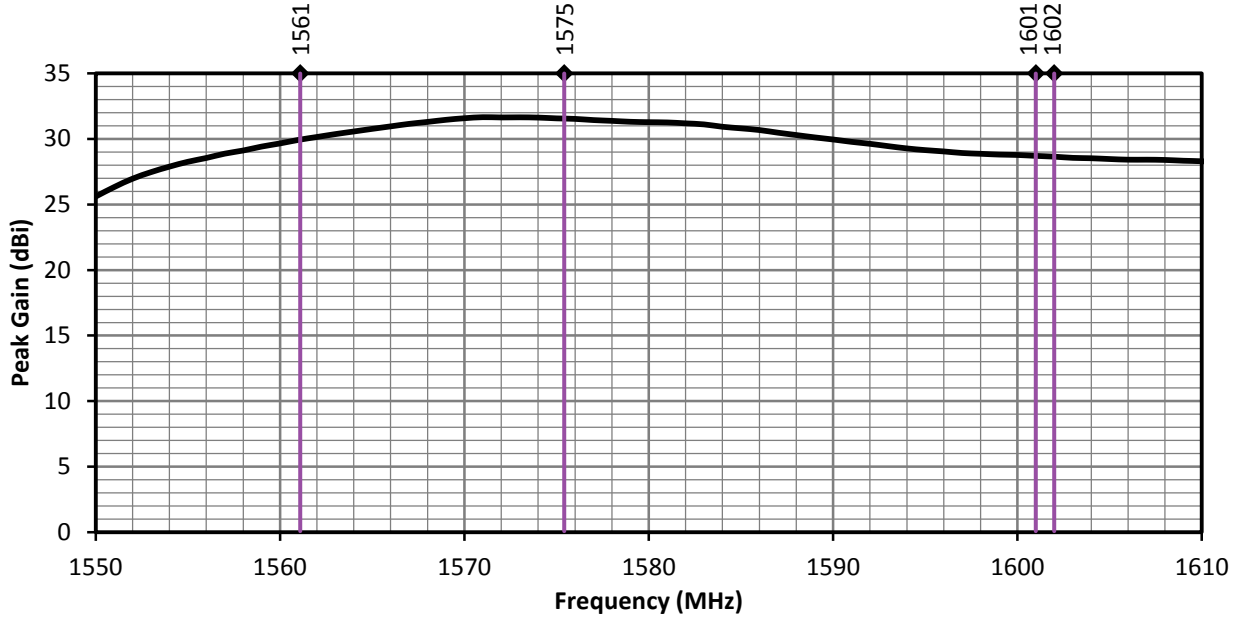


Figure 6. ANT-GNCP-C25L15100 Peak Gain, L1 Band

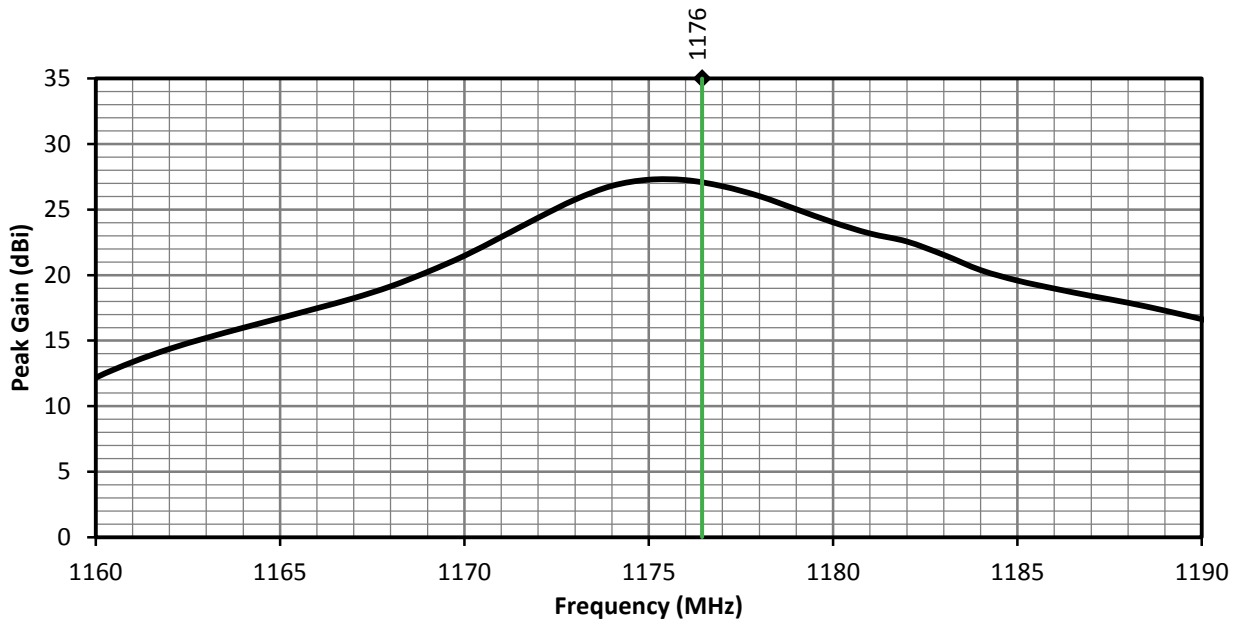


Figure 7. ANT-GNCP-C25L15100 Peak Gain, L5 Band

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-C25L15100 antenna is shown in Figure 8 (L5 band) and Figure 9 (L5 band).

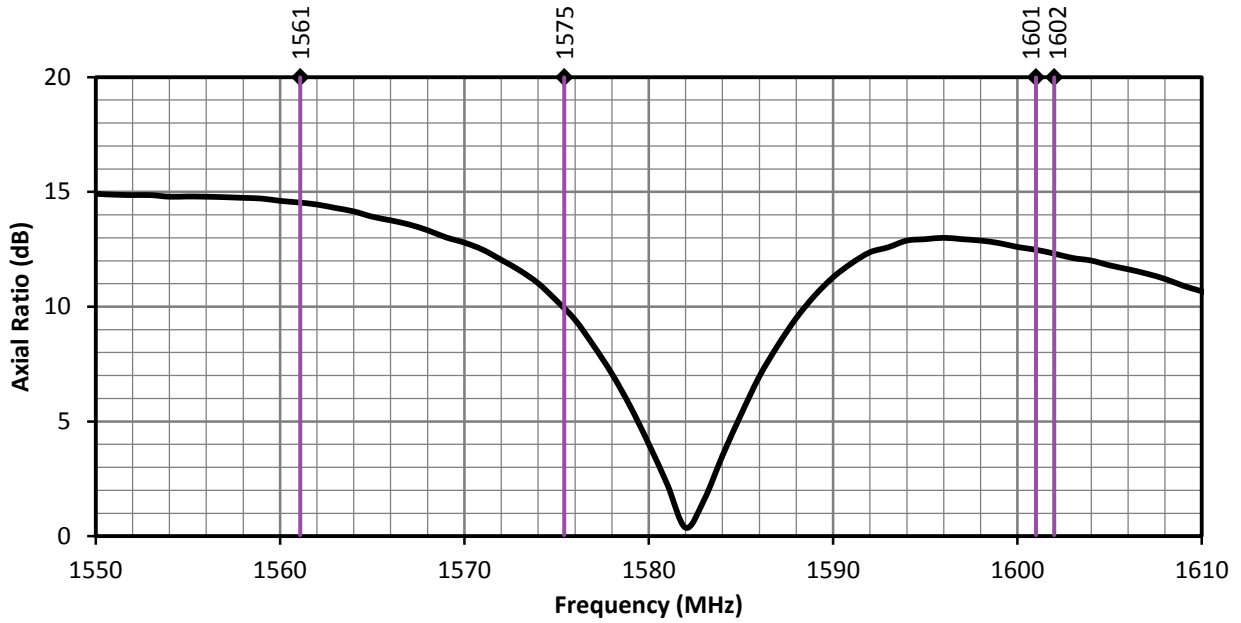


Figure 8. ANT-GNCP-C25L15100 Antenna Axial Ratio, L1 Band

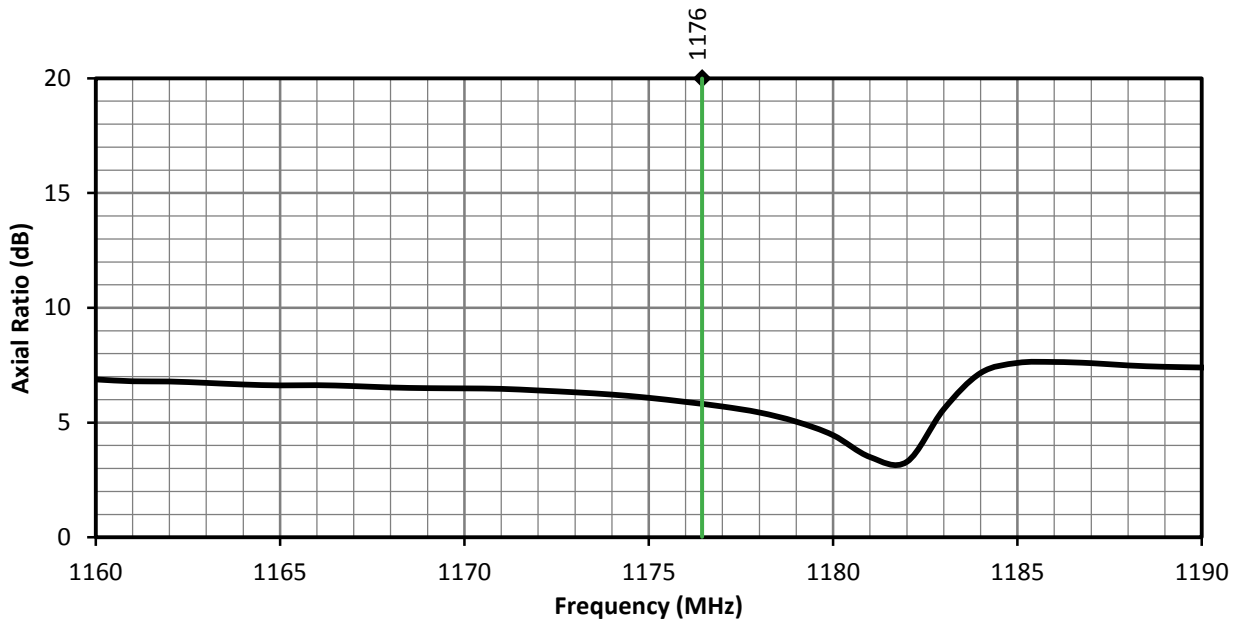
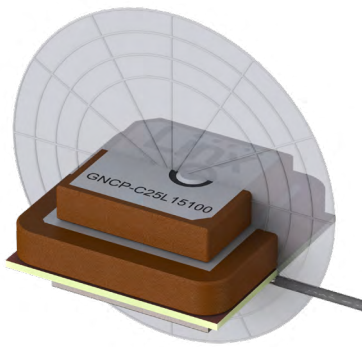


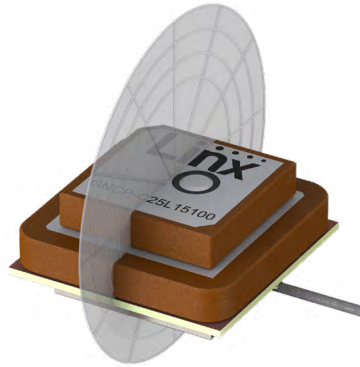
Figure 9. ANT-GNCP-C25L15100 Antenna Axial Ratio, L5 Band

RADIATION PATTERNS

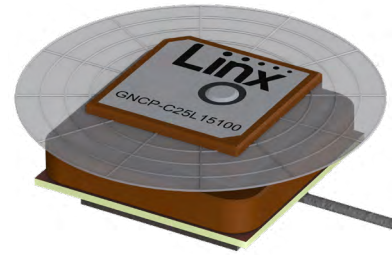
Radiation patterns provide information about the directionality and 3-dimensional gain performance of the antenna by plotting gain at specific frequencies in three orthogonal planes. Antenna radiation patterns are shown in Figure 10 using polar plots covering 360 degrees. The antenna graphic at the top 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

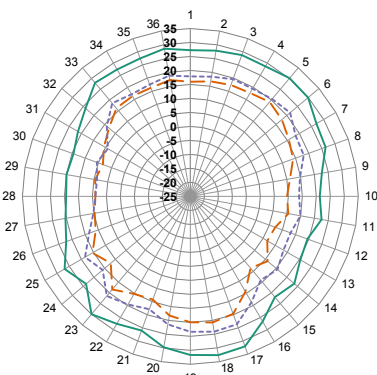


YZ-Plane Gain

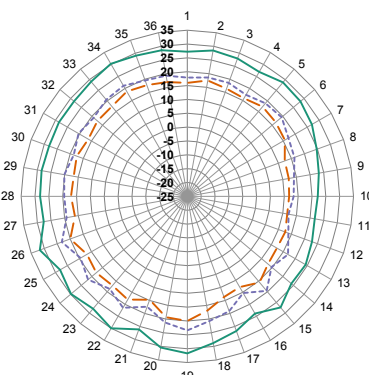


XY-Plane Gain

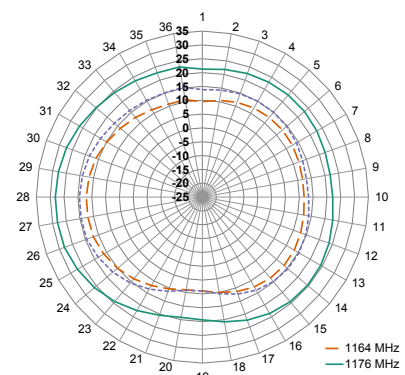
1164 MHz to 1189 MHz (1176 MHz)



XZ-Plane Gain



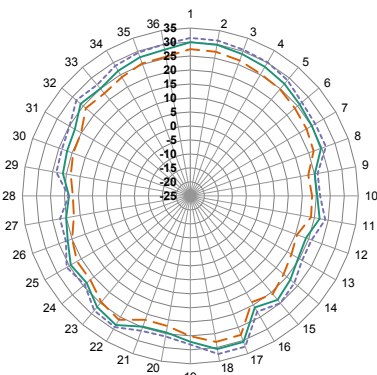
YZ-Plane Gain



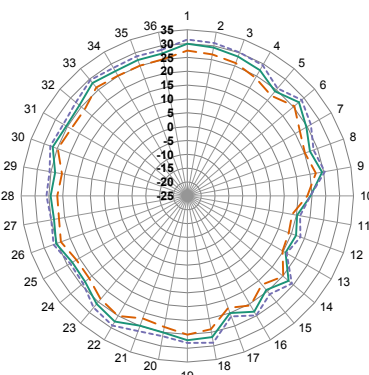
XY-Plane Gain

— 1164 MHz
— 1176 MHz
- - 1188 MHz

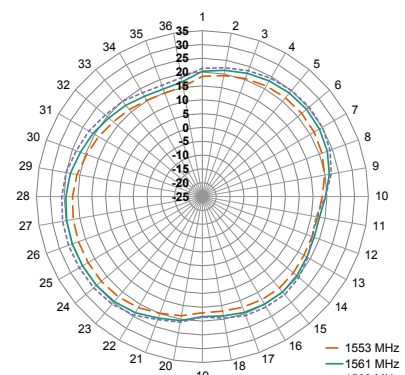
1559 MHz to 1563 MHz (1561 MHz)



XZ-Plane Gain



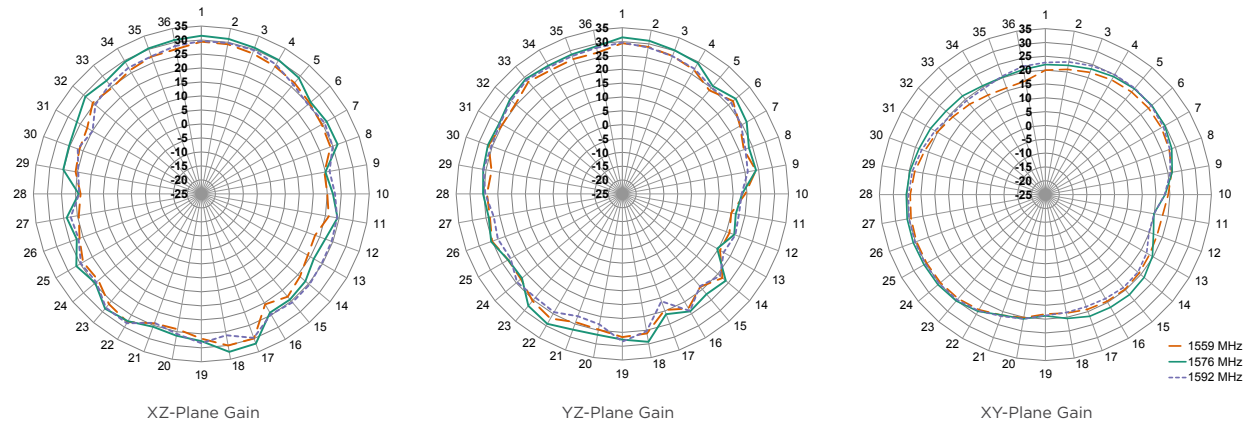
YZ-Plane Gain



XY-Plane Gain

— 1553 MHz
— 1561 MHz
- - 1569 MHz

1559 MHz to 1592 MHz (1575 MHz)



1598 MHz to 1606 MHz (1601 MHz)

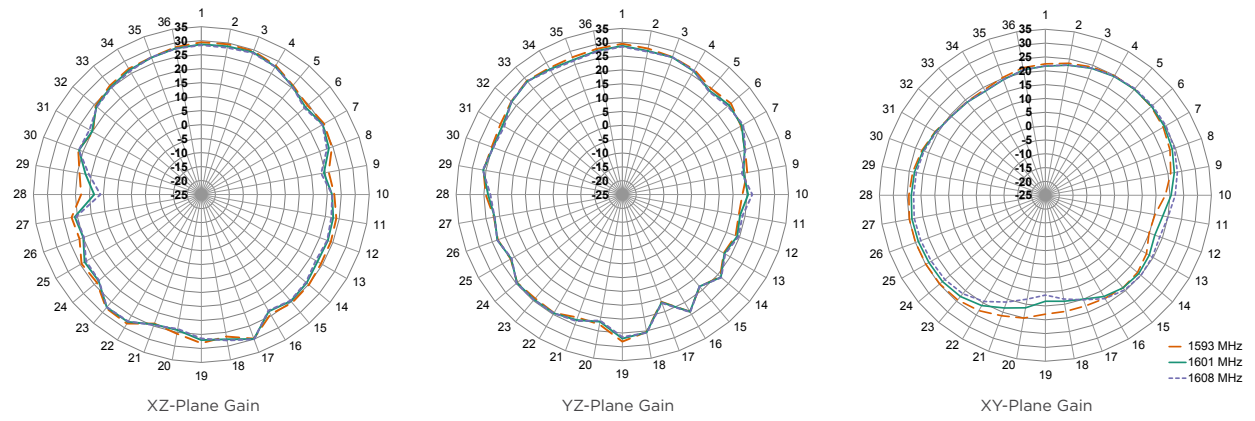


Figure 10. ANT-GNCP-C25L15100 Radiation Patterns

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