ANT-GNCP-C257L160

L1 Active Ceramic Patch GNSS Antenna

The GNCP-C257L160 is a global navigation satellite system (GNSS) ceramic patch antenna with integrated low noise amplifier (LNA), supporting GPS, Galileo, Beidou, and QZSS systems in the L1/E1/B1 bands. The LNA provides high gain with a low noise figure. The antenna is 25 mm x 25 mm and has a 60 mm cable terminated in an MHF1/U.FL-type plug (female socket) connector.

FEATURES

- Performance at 1575.4 MHz
  - VSWR: ≤ 1.7
  - Peak Gain: 34.5 dBi
  - Axial Ratio: 10.14 dB
- Performance at 1561 MHz
  - VSWR: ≤ 1.6
  - Peak Gain: 30.7 dBi
  - Axial Ratio: 8.2 dB
- 28 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
  - Galileo E1
  - L1
  - Beidou B1I, B1C
  - QZSS L1
- Timing solutions

ORDERING INFORMATION

Part Number	Description
ANT-GNCP-C257L160	GNSS L1 band active ceramic patch antenna with MHF1/U.FL-type plug (female socket) on 60 mm of 1.13 mm coaxial cable

Available from Linx Technologies and select distributors and representatives.

TABLE 1. ELECTRICAL SPECIFICATIONS, ANTENNA PLUS LNA

Frequency Band	GPS Bands	VSWR (max.)	Return Loss (dB)	Peak Gain (dBi)	Axial Ratio (dB)
1561 MHz	Beidou B1I	1.5	-13.9	27.8	8.3
1575 MHz	GPS L1C, L1C/A, Galileo E1, Beidou B1C, QZSS L1	1.7	-11.5	34.5	10.1
1601/1602 MHz	L1	2.1	-8.8	36.1	18.2

Output Impedance	50 Ω
Polarization	RHCP
Radiation	Directional radiation pattern orthogonal to antenna surface
Electrical Type	Radiating Patch plus LNA
Input Voltage	Min. 1.8 V, Typ. 3.0 V, Max. 5.5 V
Current Consumption @3.3V	Min. 5.0 mA, Typ. 10.0 mA, Max. 23.0 mA
Noise Figure (dB)	Min. 3.0, Typ. 2.8, Max. 3.0
ESD Sensitivity	ESD sensitive device. As a best practice, Linx uses ESD packaging.

TABLE 2. MECHANICAL SPECIFICATIONS, ANTENNA PLUS LNA

Parameter	Value
Operating Temp. Range	-40 °C to +85 °C
Connection	MHF1/U.FL-type plug (female socket) on 60 mm (2.36 in) of 1.13 mm coaxial cable
Weight	11.6 g (0.41 oz)
Dimensions	25.1 mm x 25.1 mm x 7.4 mm (0.99 in x 0.99 in x 0.29 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 ANT-GNCP-C257L160 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-C257L160 antenna is packaged in a protective plastic tray in quantities of 30 wrapped in anti-static ESD Polyethylene. Antenna trays are bundled and packaged in cartons of 150 antennas. Cartons are packaged in larger boxes in quantities of 450 antennas. Distribution channels may offer alternative packaging options.

PRODUCT DIMENSIONS

Figure 1 provides dimensions of the ANT-GNCP-C257L160.

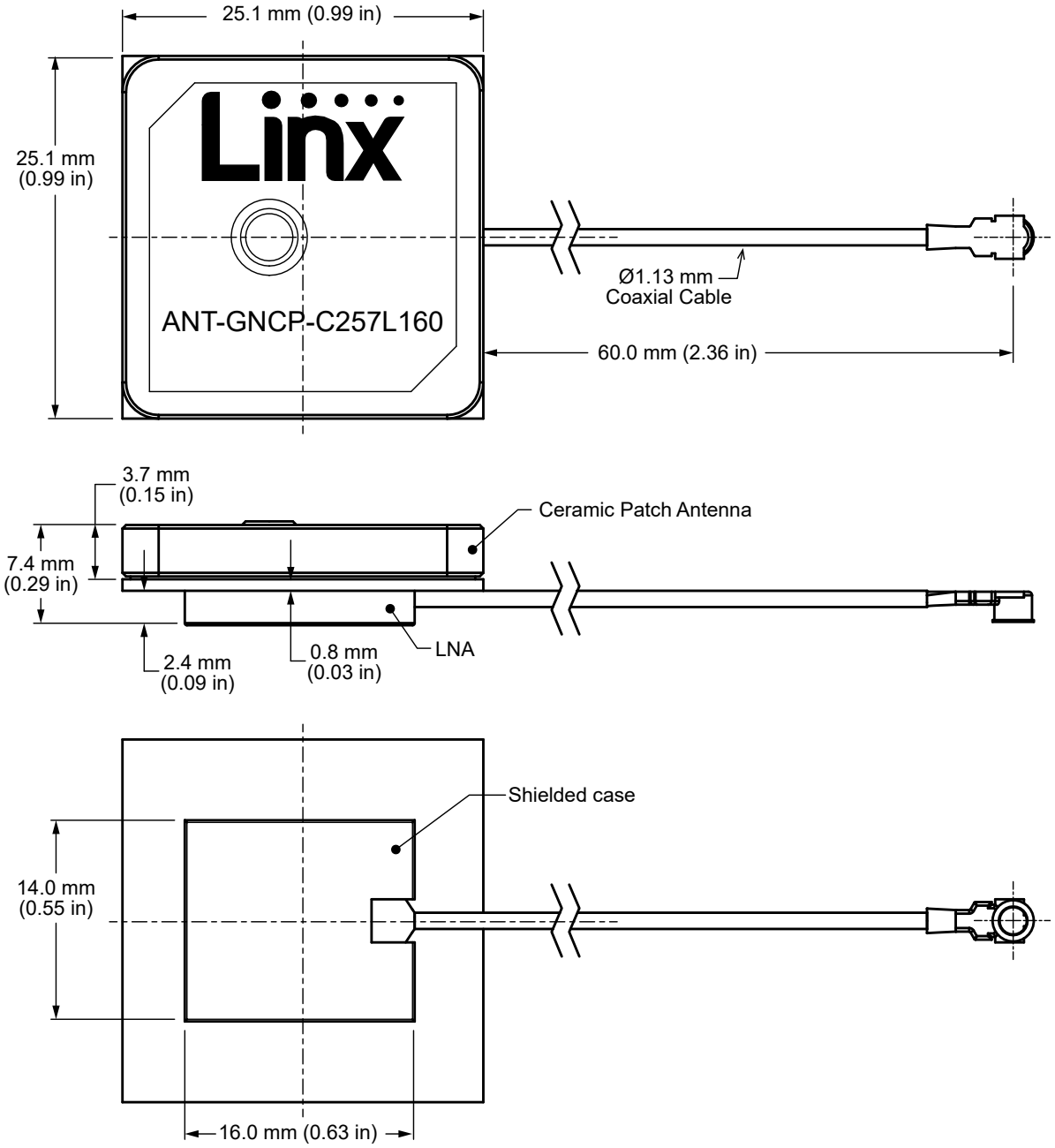


Figure 1. ANT-GNCP-C257L160 Antenna Dimensions

VSWR

Figure 2 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.

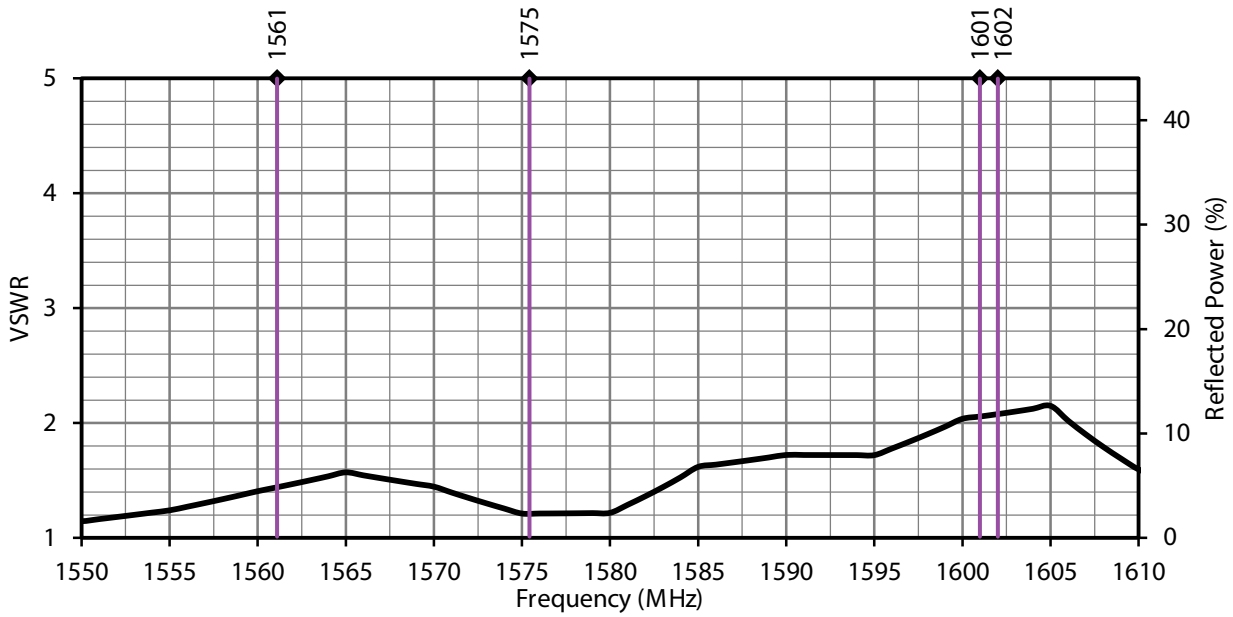


Figure 2. ANT-GNCP-C257L160 VSWR

RETURN LOSS

Return loss (Figure 3), 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.

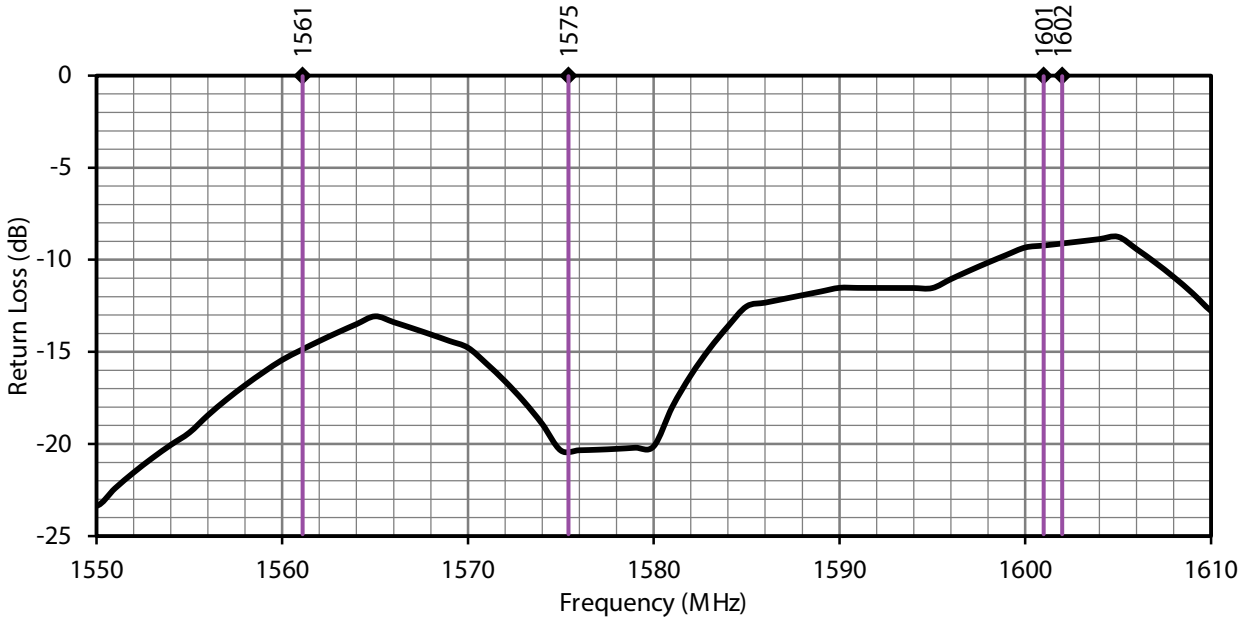


Figure 3. ANT-GNCP-C257L160 Return Loss

PEAK GAIN

The peak gain across the antenna bandwidth is shown in Figure 4. 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.

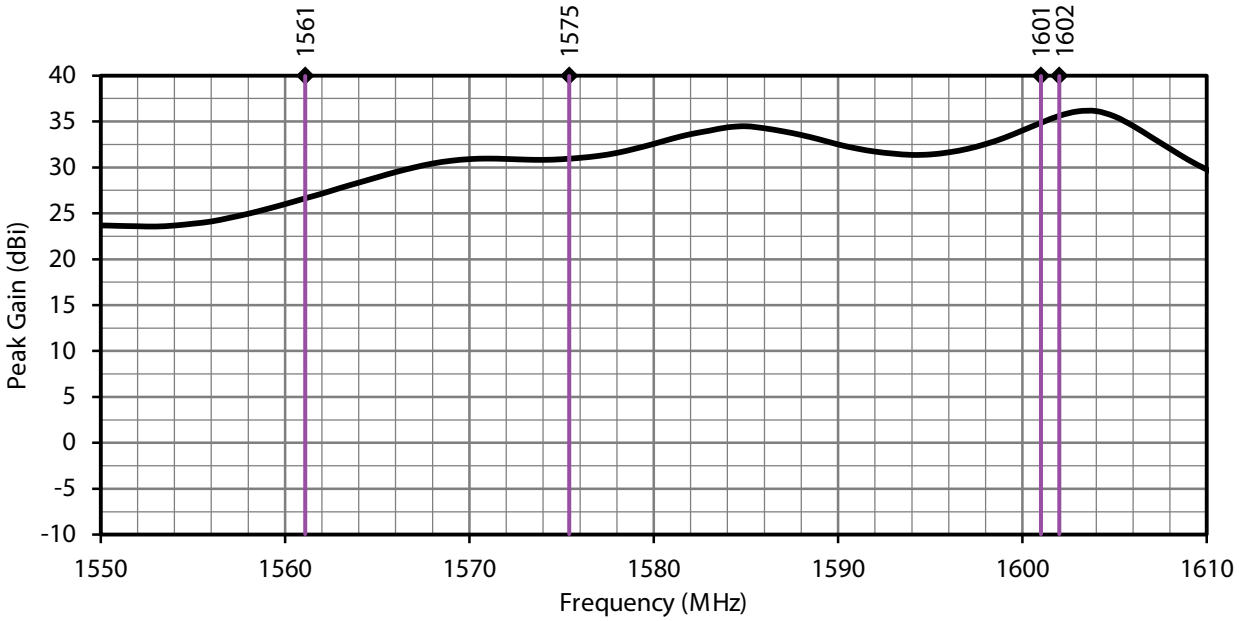


Figure 4. ANT-GNCP-C257L160 Peak Gain

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-C257L160 antenna is shown in Figure 5.

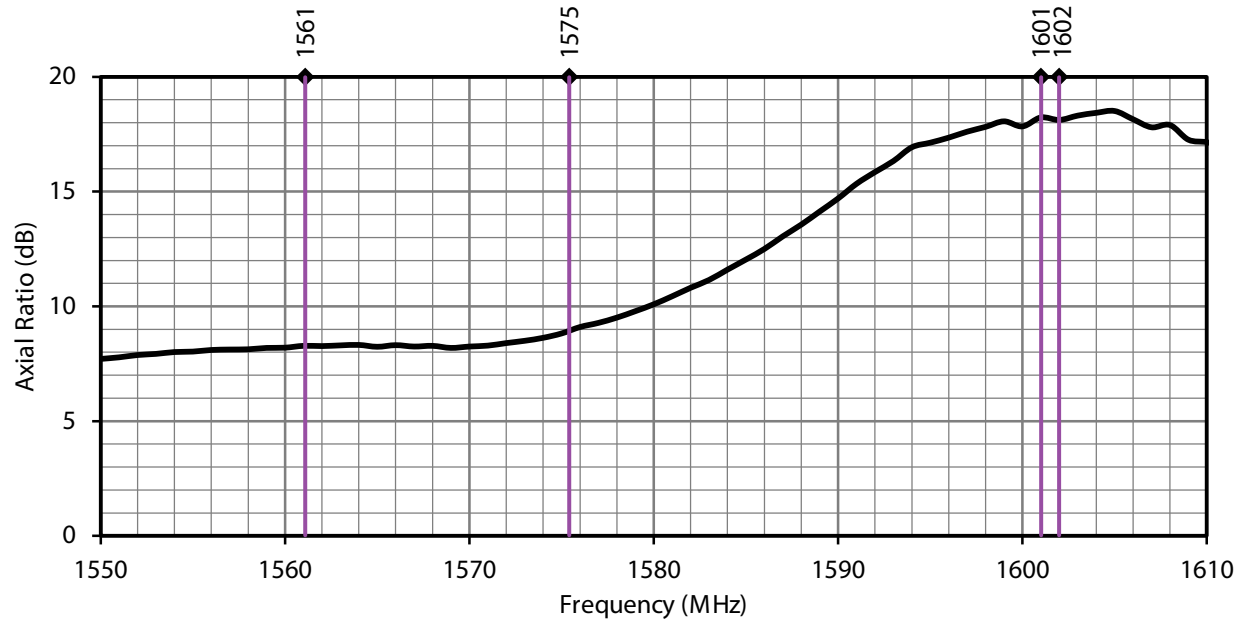
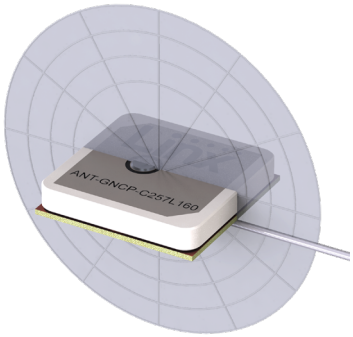


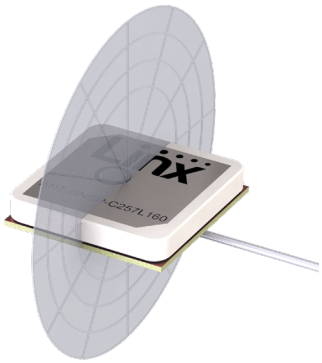
Figure 5. ANT-GNCP-C257L160 Antenna Axial Ratio

RADIATION PATTERNS

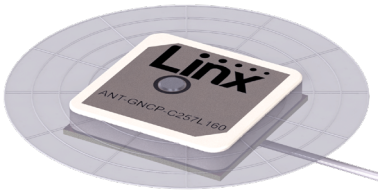
Radiation patterns provide information about the directionality and 3-dimensional gain performance of the antenna by plotting gain at specific frequencies in three orthogonal planes. Antenna radiation patterns are shown in Figure 6 using polar plots covering 360 degrees. The antenna graphic at the top 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

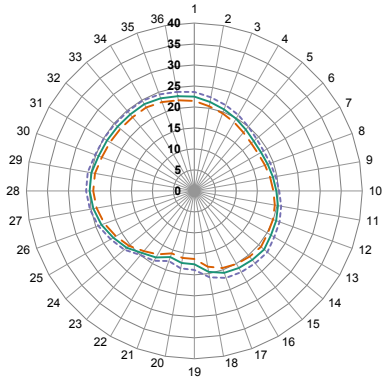


YZ-Plane Gain

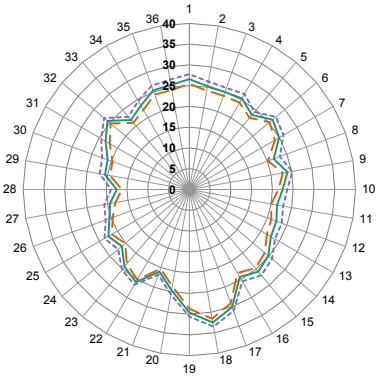


XY-Plane Gain

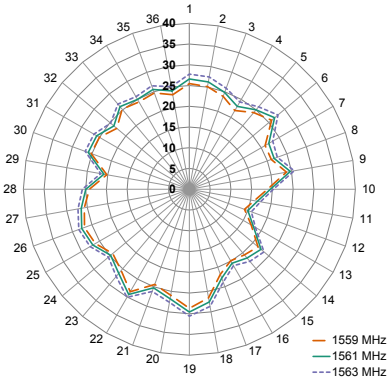
1559 MHz to 1563 MHz (1561 MHz)



XZ-Plane Gain

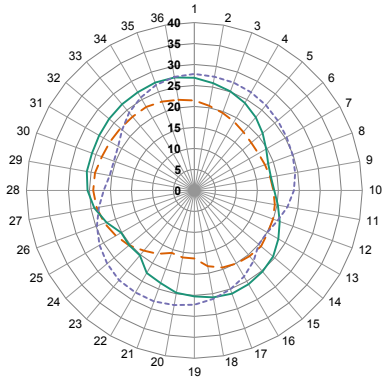


YZ-Plane Gain

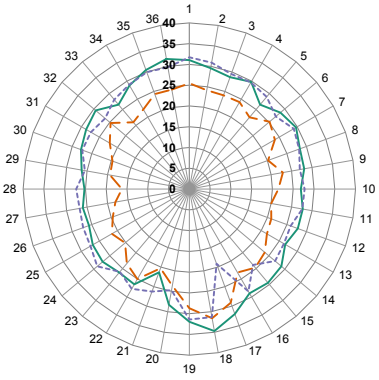


XY-Plane Gain

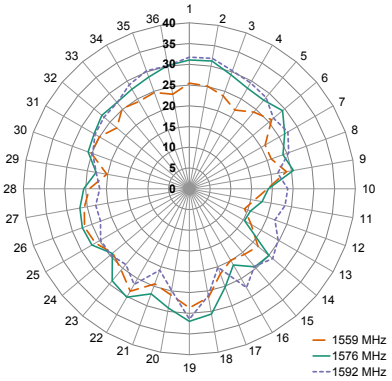
1559 MHz to 1592 MHz (1575 MHz)



XZ-Plane Gain

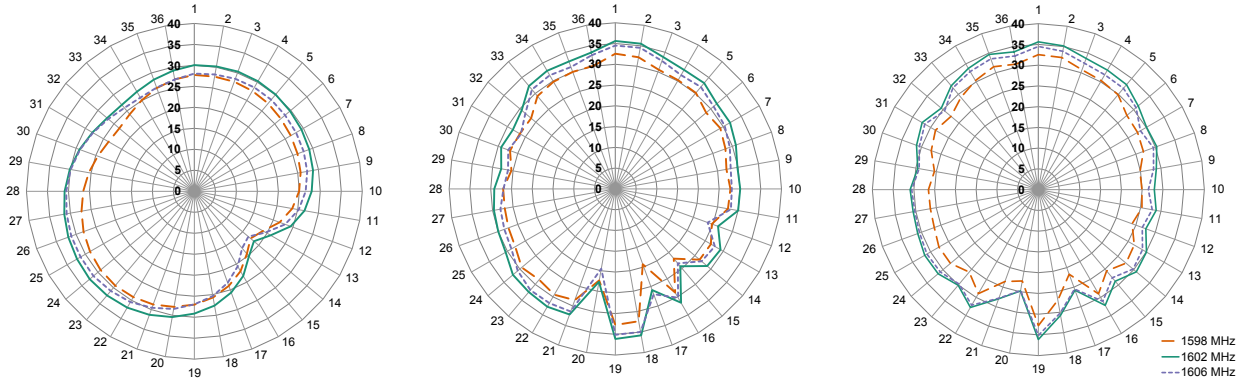


YZ-Plane Gain



XY-Plane Gain

1598 MHz to 1606 MHz (1601 MHz)



XZ-Plane Gain YZ-Plane Gain XY-Plane Gain

Figure 6. ANT-GNCP-C257L160 Radiation Patterns

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10/22 Original