

ANT-LPX-FPC-100

LTE/LPWA/WiFi Flexible Embedded Dipole Antenna

The ANT-LPX-FPC-100 (LPX) antenna is a flexible embedded multiband cellular and cellular IoT antenna (LTE-M and NB-IoT) ideal for use in LTE bands 5, 8, 12, 13, 14, 17, 20, 28, while also supporting low-power, wide-area (LPWA) networking at 868 MHz and 915 MHz and WiFi/WLAN applications.

The LPX provides a ground plane independent dipole embedded antenna solution comparable in performance to an external antenna. The LPX's flexibility and adhesive backing makes it easy to mount in unique and custom enclosures, while enabling an environmentally sealed enclosure and protection from tampering or accidental antenna damage.

Connection is made to the radio via a 100 mm long, 1.13 mm coaxial cable terminated in an MHF1/U.FL compatible plug connector.



Features

- Excellent low-band LTE coverage, 698 MHz to 960 MHz, including LTE 5, 8, 12, 13, 14, 17, 20, 26, 28 and 29
 - VSWR: ≤ 3.9
 - Peak Gain: 4.4 dBi
 - Efficiency: 67%
- Compact, low-profile
 - 120.0 mm x 50.0 mm x 0.2 mm
- MHF1/U.FL compatible plug (female socket) on 100 mm of 1.13 mm coaxial cable
- Flexible to fit in challenging enclosures
- Adhesive backing permanently adheres to non-metal enclosures using 3M 467MP™/200MP adhesive

Applications

- Worldwide LTE, UMTS and GSM
- Cellular IoT: LTE-M (Cat-M1) and NB-IoT
 - AT&T: bands 12, 17
 - Verizon: band 13
 - Europe: bands 8, 20
 - Latin America: bands 5, 28
 - Asia Pacific: bands 5, 8, 20, 28
- Single- and dual-band WiFi/WLAN/802.11
- Low-power, wide-area (LPWA) applications
 - LoRaWAN®
 - Sigfox®
- ISM: Bluetooth® and ZigBee®
- Citizens Broadband Radio Service (CBRS)
- UHF RFID readers
- Internet of Things (IoT) devices

Ordering Information

Part Number	Description
ANT-LPX-FPC-100	Antenna with 100 mm of 1.13 mm coaxial cable and MHF1/U.FL compatible plug (female socket)

Available from Linx Technologies and select distributors and representatives.

Electrical Specifications

Select Bands	Frequency Range	VSWR (max.)	Peak Gain (dBi)	Avg. Gain (dBi)	Efficiency (%)
LTE 12, 13, 14, 17, 26, 28, 29	698 MHz to 803 MHz	3.9	3.6	-2.3	63
LTE 5, 8, 20	791 MHz to 960 MHz	2.0	4.4	-1.7	71
LTE 1, 2, 3, 4, 10, 25, 66	1710 MHz to 2200 MHz	3.3	4.9	-2.2	66
LTE 30, 40	2300 MHz to 2400 MHz	2.8	3.1	-2.4	58
LTE 7, 41	2496 MHz to 2690 MHz	2.5	3.4	-2.0	67
LTE 22, 42, 43, 48, 49, 52	3300 MHz to 3800 MHz	3.1	4.4	-2.5	59
GNSS/GPS	1553 MHz to 1609 MHz	2.8	5.3	-1.8	69
ISM	2400 MHz to 2485 MHz	2.5	3.1	-2.4	59
U-NII/ISM	5150 MHz to 5850 MHz	3.6	6.7	-2.6	59

Polarization	Linear
Radiation	Omnidirectional
Max Power	2 W
Wavelength	1/2-wave
Electrical Type	Dipole
Impedance	50 Ω
Connection	MHF1/U.FL compatible plug (female socket) on 100 mm of 1.13 mm coaxial cable.
Weight	3.5 g (0.12 oz)
Dimensions	120.0 mm x 50.0 mm x 0.2 mm (4.72 in x 1.97 in x 0.01 in)
Operating Temperature Range	-40 °C to +85 °C
ESD Sensitivity	NOT ESD sensitive. As a best practice, Linx may use ESD packaging.

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.

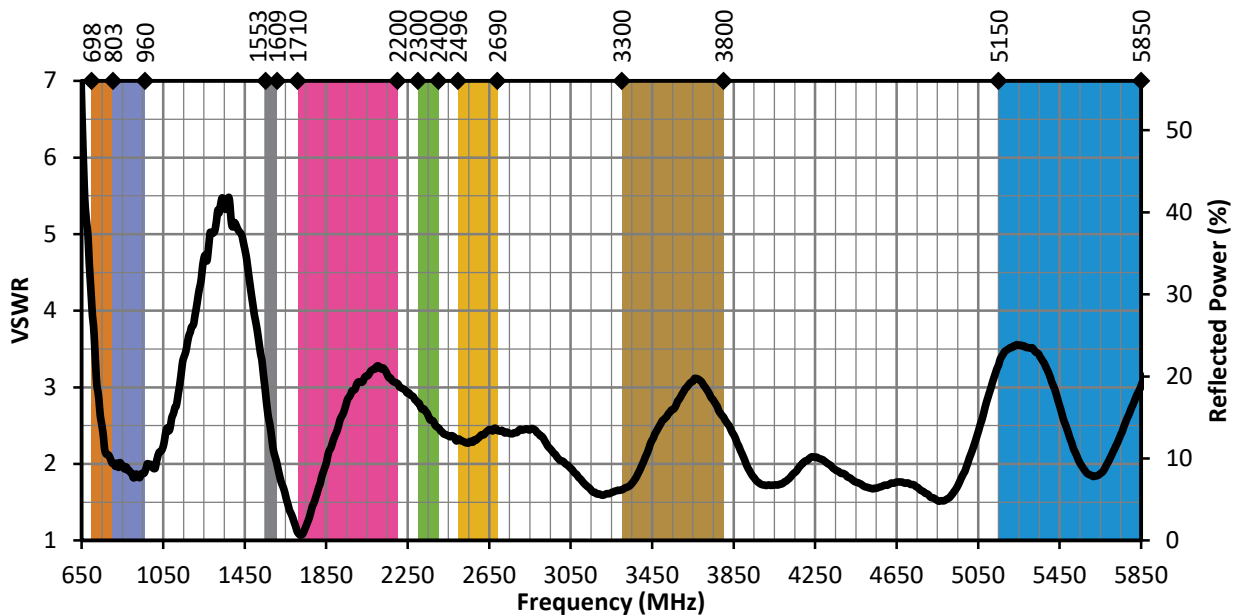


Figure 1. LPX Antenna VSWR with Frequency Band Highlights

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.

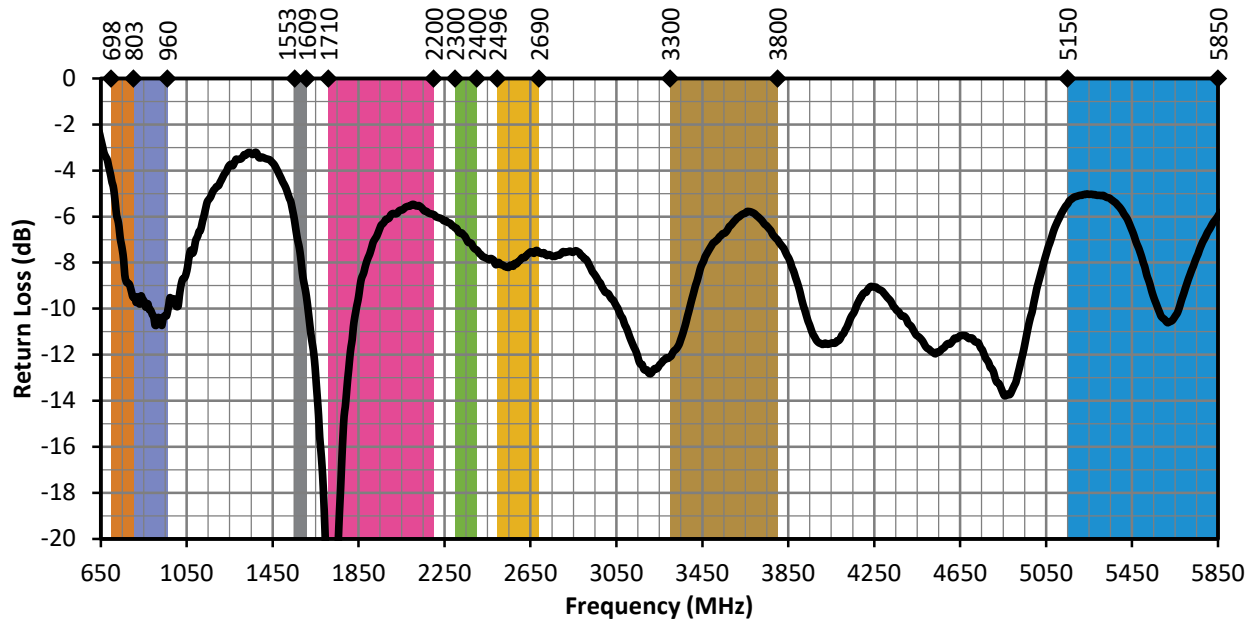


Figure 2. LPX Antenna Return Loss with Frequency Band Highlights

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.

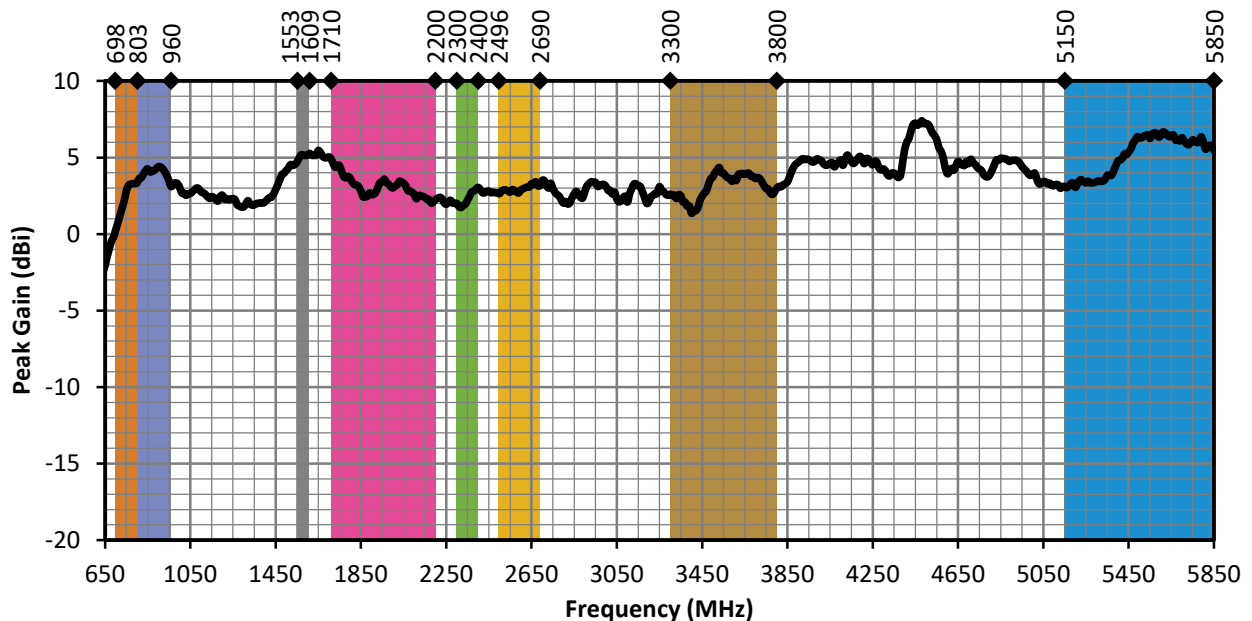


Figure 3. LPX Antenna Peak Gain with Frequency Band Highlights

Average Gain

Average gain (Figure 4), is the average of all antenna gain in 3-dimensional space at each frequency, providing an indication of overall performance without expressing antenna directionality.

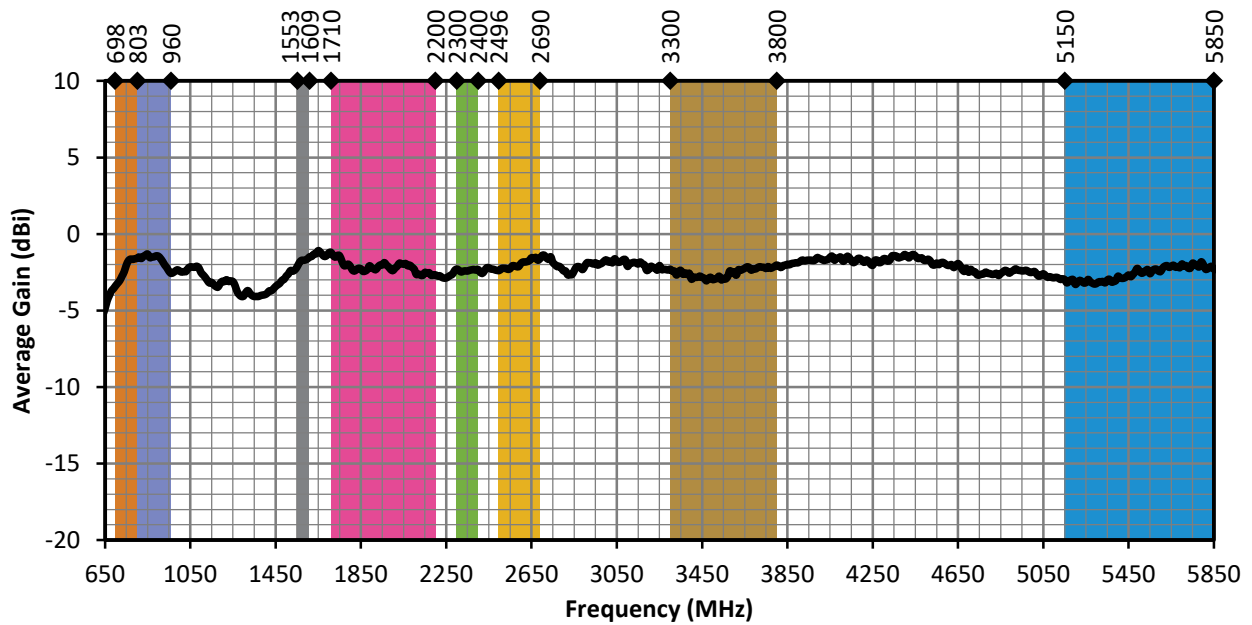


Figure 4. LPX Antenna Average Gain with Frequency Band Highlights

Radiation Efficiency

Radiation efficiency (Figure 5), shows the ratio of power delivered to the antenna relative to the power radiated at the antenna, expressed as a percentage, where a higher percentage indicates better performance at a given frequency.

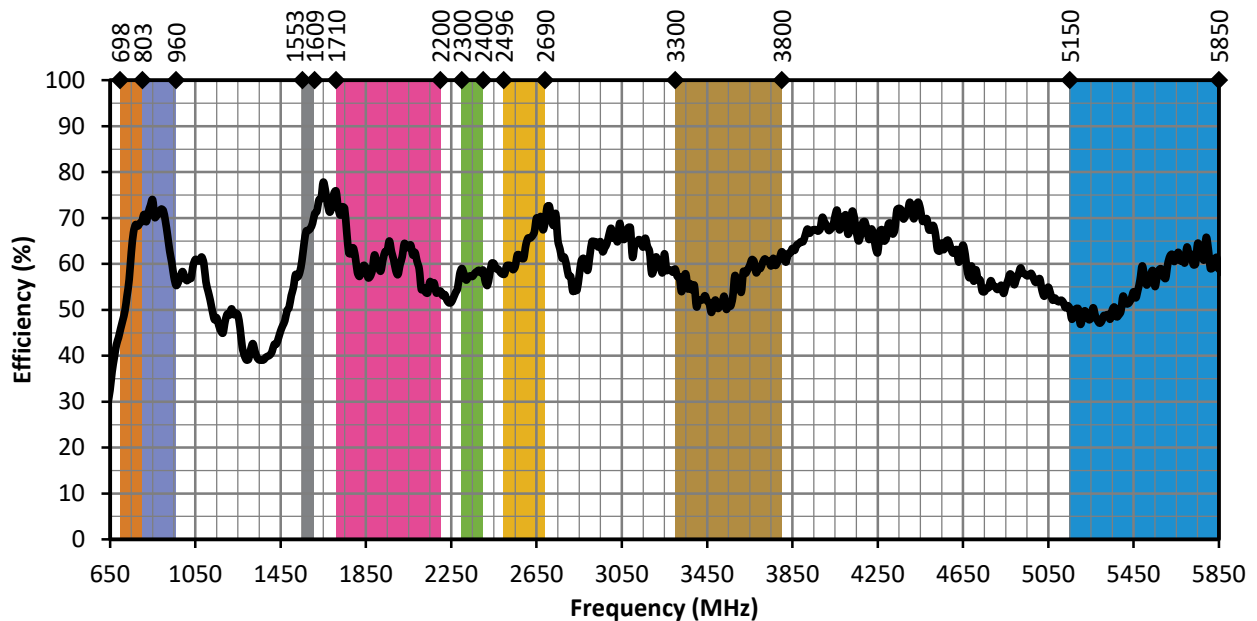


Figure 5. LPX Antenna Radiation Efficiency with Frequency Band Highlights

Product Dimensions

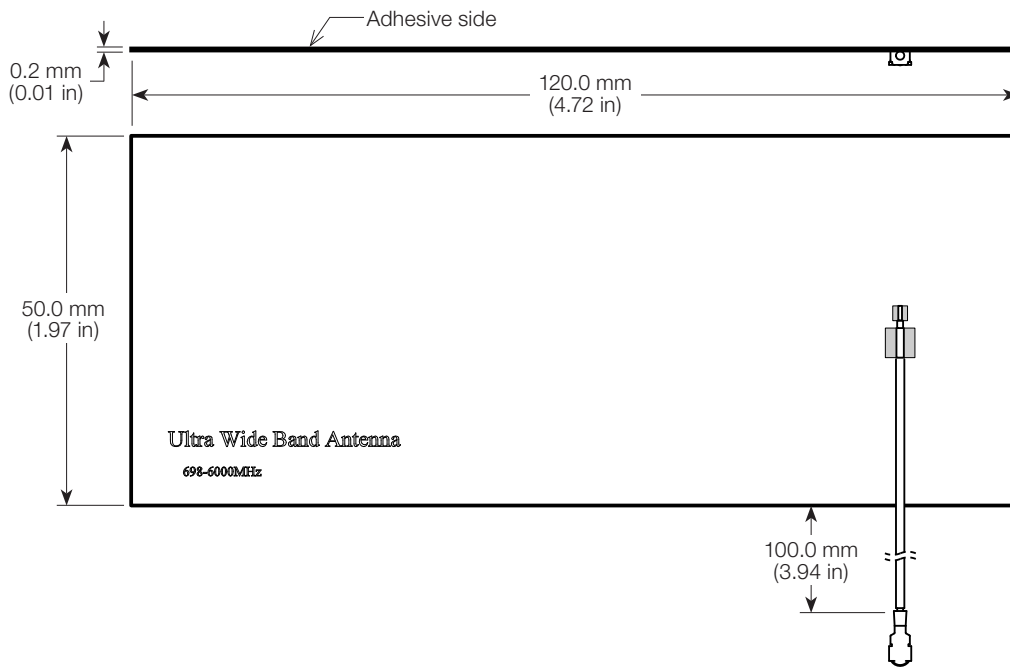


Figure 6. ANT-LPX-FPC-100 Antenna Dimensions

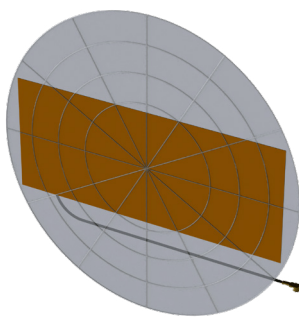
Antenna Mounting

The ANT-LPX-FPC-100 is a flexible, adhesive backed antenna that allows it to be permanently installed onto non-metallic surfaces. The adhesive backing is 3M 467MP™/200MP, which provides outstanding adhesion to high surface energy plastics. The adhesive delivers excellent shear strength to resist slippage and edge lifting, but can be repositioned temporarily to allow for repositioning. This adhesive is highly resistant to solvents, humidity and moisture, as well as heat up to 204 °C (400 °F) for short periods.

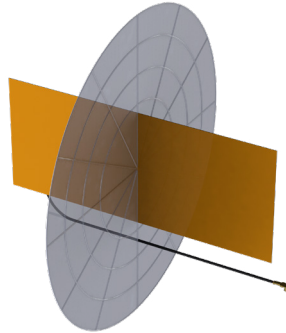
The antenna should never be bent to the point of creating a crease or allowing the angle of the bend to fall below 90 degrees (i.e. become acute) as this will impair function and may cause permanent damage.

Radiation Patterns

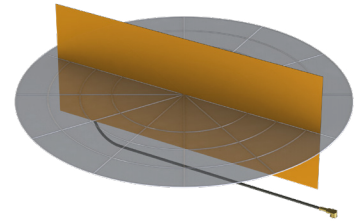
Radiation patterns provide information about the directionality and 3-dimensional gain performance of the antenna by plotting gain at specific frequencies in three orthogonal planes. Antenna radiation patterns (Figure 7), are shown using polar plots covering 360 degrees. The antenna graphic above the plots 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

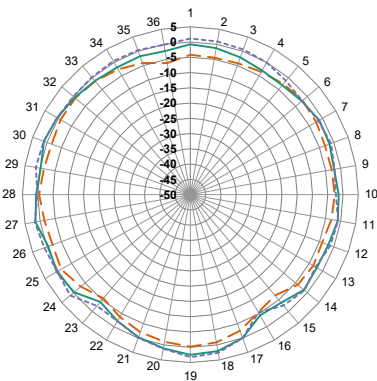


YZ-Plane Gain

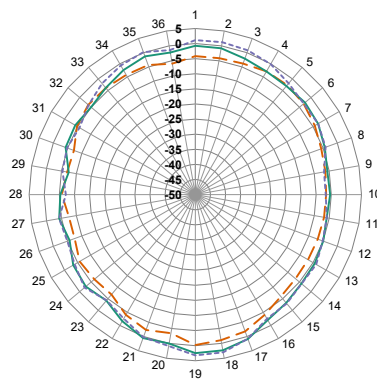


XY-Plane Gain

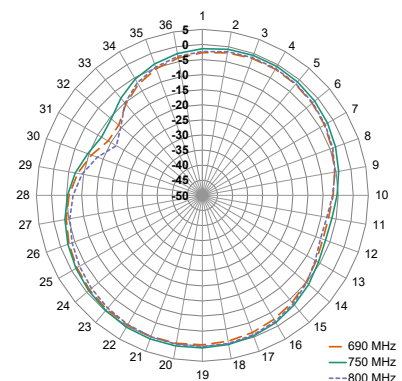
690 MHz to 800 MHz (750 MHz)



XZ-Plane Gain

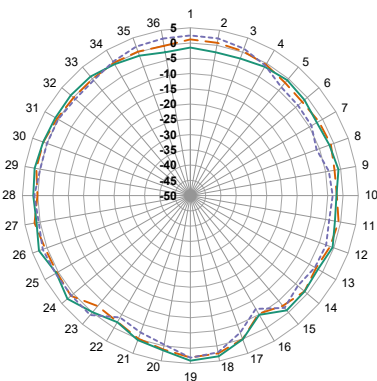


YZ-Plane Gain

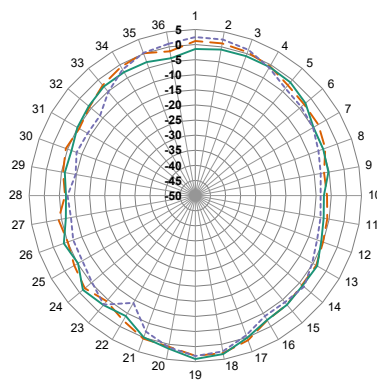


XY-Plane Gain

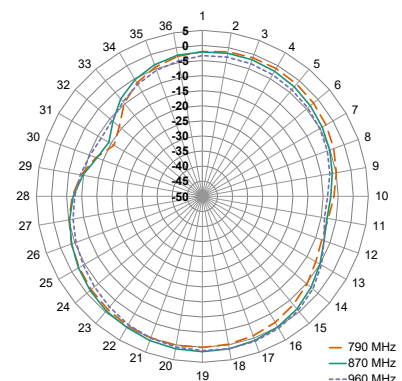
790 MHz to 960 MHz (870 MHz)



XZ-Plane Gain



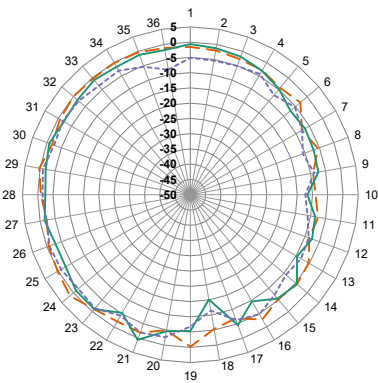
YZ-Plane Gain



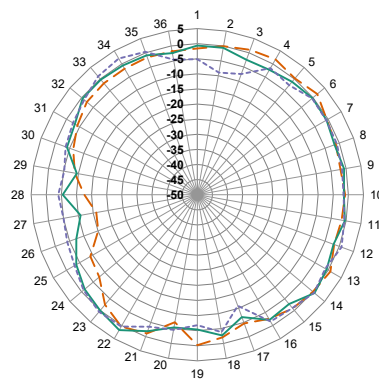
XY-Plane Gain

Radiation Patterns

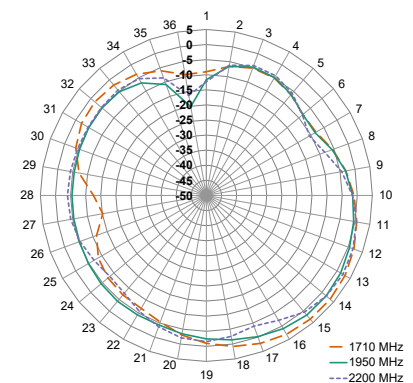
1710 MHz to 2200 MHz (1950 MHz)



XZ-Plane Gain

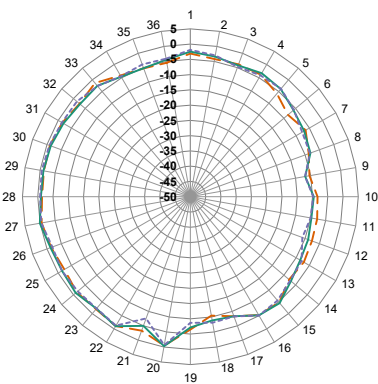


YZ-Plane Gain

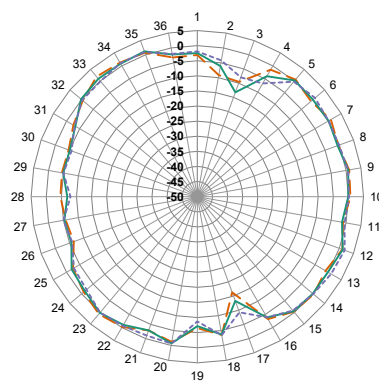


XY-Plane Gain

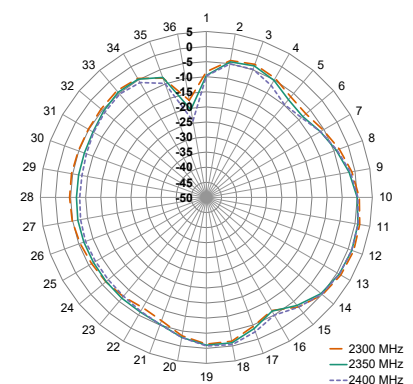
2300 MHz to 2400 MHz (2350 MHz)



XZ-Plane Gain

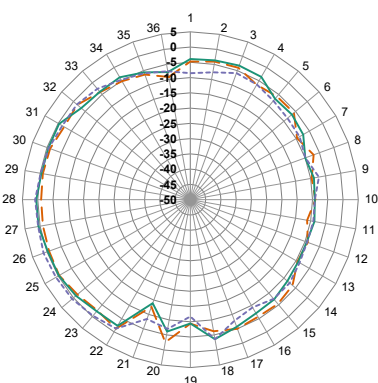


YZ-Plane Gain

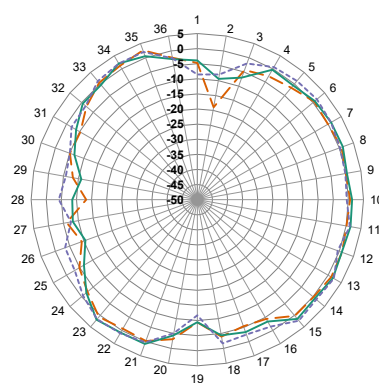


XY-Plane Gain

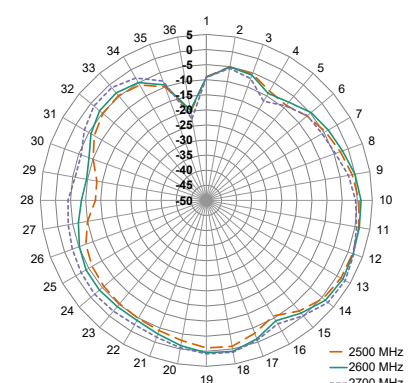
2500 MHz to 2700 MHz (2600 MHz)



XZ-Plane Gain



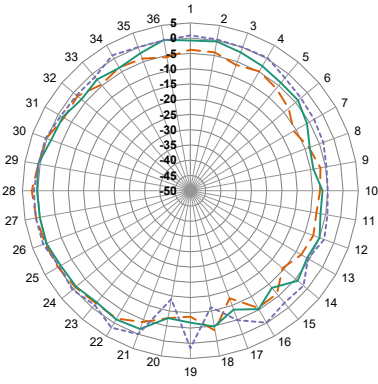
YZ-Plane Gain



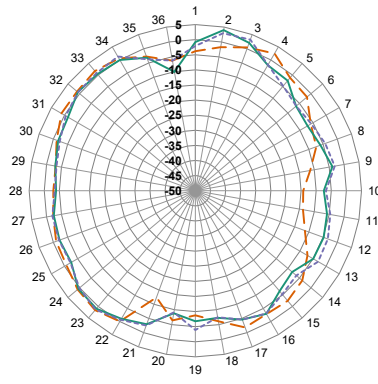
XY-Plane Gain

Radiation Patterns

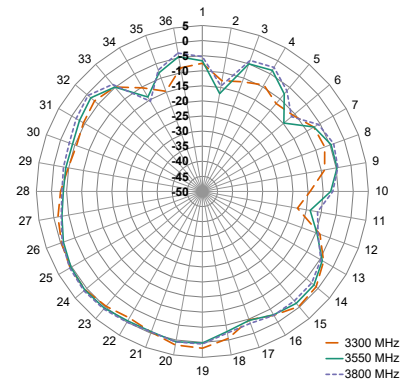
3300 MHz to 3800 MHz (3550 MHz)



XZ-Plane Gain

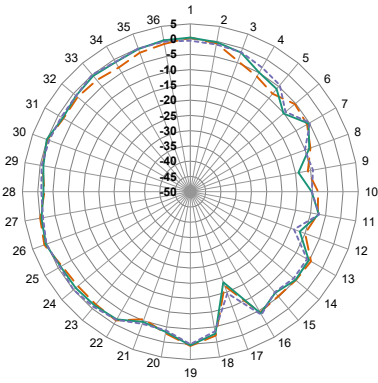


YZ-Plane Gain

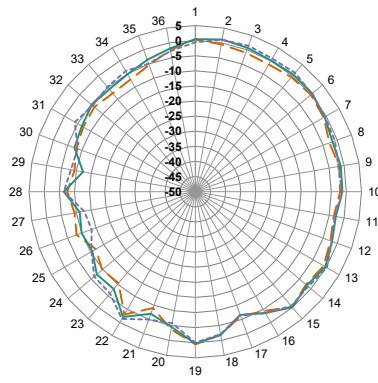


XY-Plane Gain

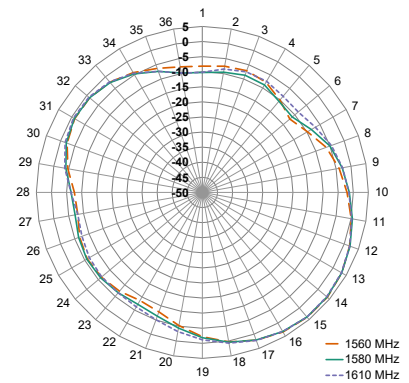
1560 MHz to 1610 MHz (1580 MHz)



XZ-Plane Gain

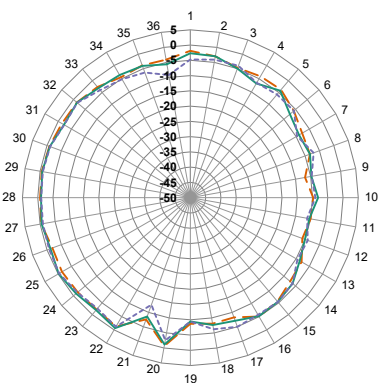


YZ-Plane Gain

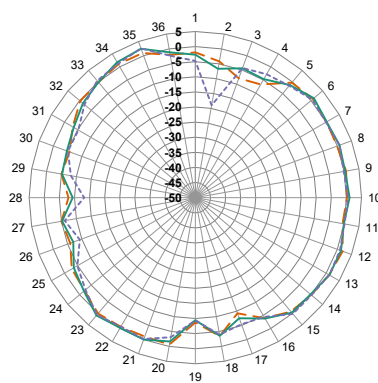


XY-Plane Gain

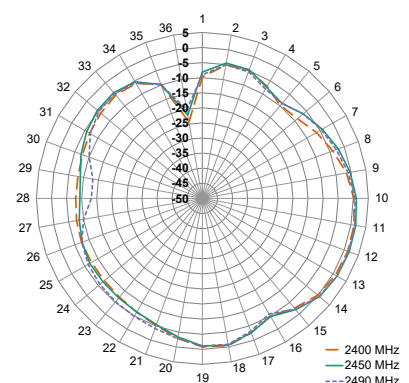
2400 MHz to 2490 MHz (2450 MHz)



XZ-Plane Gain



YZ-Plane Gain



XY-Plane Gain

Radiation Patterns

5150 MHz to 5850 MHz (5500 MHz)

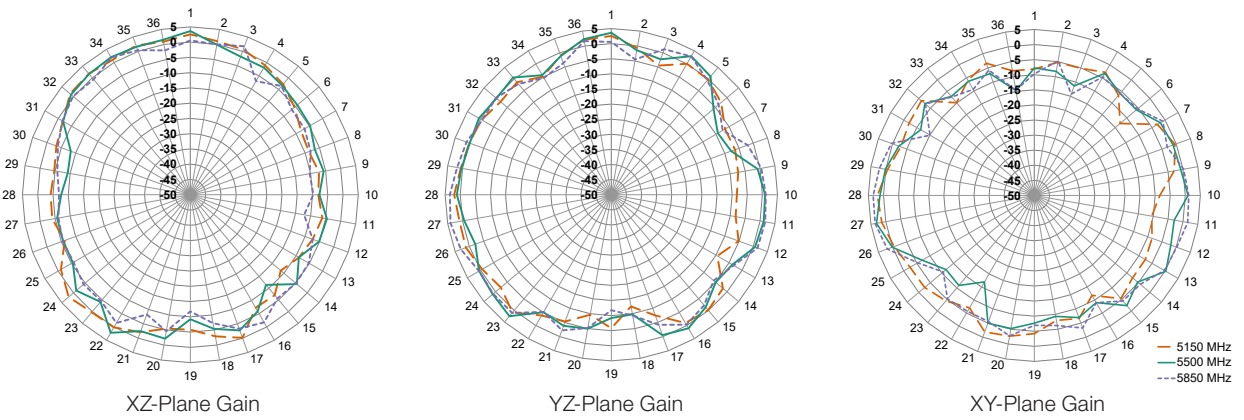


Figure 7. Radiation Patterns for the ANT-LPX-FPC-100 Antenna

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