

## W63RPC1 Series Rigid Embedded Dipole WiFi 6 Antenna

The ANT-W63RPC1 antenna delivers excellent WiFi/WLAN performance in the 2.4 GHz, 5 GHz and 6 GHz bands supporting both WiFi 6 and WiFi 6E.

The rigid W63RPC1 provides a ground plane independent dipole embedded antenna solution comparable in performance to an external antenna. The W63RPC1 antenna's adhesive backing makes it easy to mount in plastic enclosures, while allowing an environmentally sealed enclosure and protection from tampering or accidental antenna damage.

Connection is made to the radio via 1.13 mm coaxial cable terminated in a U.FL-type, MHF4-type or cut-cable, available in several lengths.



### Features

- Rigid internal mounting
- 3M 9888T permanent adhesive backing
- Compact, low-profile
  - 42.0 mm x 11.0 mm x 1.3 mm
- Cable length options
  - 50 mm, 100 mm, 200 mm
- Termination options
  - U.FL-type (MHF1, AMC, UMCC)
  - MHF4-type
  - Cut cable for direct solder

### Applications

- WiFi/WLAN coverage
  - WiFi 6E (802.11ax)
  - WiFi 6 (802.11ax)
  - WiFi 5 (802.11ac)
  - WiFi 4 (802.11n)
  - 802.11b/g
- 2.4 GHz ISM applications
  - Bluetooth®
  - ZigBee®
- U-NII bands 1-8
- Internet of Things (IoT) devices
- Smart Home networking
- Sensing and remote monitoring

### Ordering Information

| Part Number          | Description                                                                                      |
|----------------------|--------------------------------------------------------------------------------------------------|
| ANT-W63RPC1-UFL-50   | WiFi 6 antenna with 50 mm (1.97 in) of 1.13 mm coaxial cable and U.FL-type plug (female socket)  |
| ANT-W63RPC1-UFL-100  | WiFi 6 antenna with 100 mm (3.94 in) of 1.13 mm coaxial cable and U.FL-type plug (female socket) |
| ANT-W63RPC1-UFL-200  | WiFi 6 antenna with 200 mm (7.87 in) of 1.13 mm coaxial cable and U.FL-type plug (female socket) |
| ANT-W63RPC1-MHF4-50  | WiFi 6 antenna with 50 mm (1.97 in) of 1.13 mm coaxial cable and MHF4-type plug (female socket)  |
| ANT-W63RPC1-MHF4-100 | WiFi 6 antenna with 100 mm (3.94 in) of 1.13 mm coaxial cable and MHF4-type plug (female socket) |
| ANT-W63RPC1-MHF4-200 | WiFi 6 antenna with 200 mm (7.87 in) of 1.13 mm coaxial cable and MHF4-type plug (female socket) |
| ANT-W63RPC1-50       | WiFi 6 antenna with 50 mm (1.97 in) of unterminated 1.13 mm coaxial cable                        |
| ANT-W63RPC1-100      | WiFi 6 antenna with 100 mm (3.94 in) of unterminated 1.13 mm coaxial cable                       |
| ANT-W63RPC1-200      | WiFi 6 antenna with 200 mm (7.87 in) of unterminated 1.13 mm coaxial cable                       |

Available from Linx Technologies and select distributors and representatives.

Table 1. Electrical Specifications

| W63RPC1                                                | ISM/WiFi                                                           | WiFi/U-NII 1-4       | WiFi 6E/U-NII 5-8    |
|--------------------------------------------------------|--------------------------------------------------------------------|----------------------|----------------------|
| Frequency Range                                        | 2400 MHz to 2485 MHz                                               | 5150 MHz to 5850 MHz | 5925 MHz to 7125 MHz |
| VSWR (max)                                             | 1.8                                                                | 2.1                  | 1.6                  |
| Peak Gain (dBi)                                        | 3.7                                                                | 6.1                  | 5.9                  |
| Average Gain (dBi)                                     | -1.9                                                               | -1.9                 | -2.1                 |
| Efficiency (%)                                         | 69                                                                 | 69                   | 66                   |
| Cross-Polar Discrimination Limit @ 360° beamwidth (dB) | > 22.5                                                             | > 6.0                | > 6.0                |
| Beamwidth for XPD > 15 dB                              | 360°                                                               | 300°                 | 340°                 |
| Polarization                                           | Linear                                                             | Impedance            | 50 $\Omega$          |
| Radiation                                              | Omnidirectional                                                    | Max Power            | 5 W                  |
| Wavelength                                             | 1/2-wave                                                           | Electrical Type      | Dipole               |
| ESD Sensitivity                                        | NOT ESD sensitive. As a best practice, Linx may use ESD packaging. |                      |                      |

Table 2. Mechanical Specifications

| Part Number           | Cable Length                                                                   | Connection Type | Weight          |
|-----------------------|--------------------------------------------------------------------------------|-----------------|-----------------|
| ANT-W63RPC1-UFL-50    | 50 mm (1.97 in)                                                                | U.FL-type plug  | 1.4 g (0.05 oz) |
| ANT-W63RPC1-UFL-100   | 100 mm (3.94 in)                                                               | U.FL-type plug  | 1.6 g (0.06 oz) |
| ANT-W63RPC1-UFL-200   | 200 mm (7.87 in)                                                               | U.FL-type plug  | 1.9 g (0.07 oz) |
| ANT-W63RPC1-MHF4-50   | 50 mm (1.97 in)                                                                | MHF4-type plug  | 1.4 g (0.05 oz) |
| ANT-W63RPC1-MHF4-100  | 100 mm (3.94 in)                                                               | MHF4-type plug  | 1.5 g (0.05 oz) |
| ANT-W63RPC1-MHF4-200  | 200 mm (7.87 in)                                                               | MHF4-type plug  | 1.9 g (0.07 oz) |
| ANT-W63RPC1-50        | 50 mm (1.97 in)                                                                | cut-cable       | 1.3 g (0.05 oz) |
| ANT-W63RPC1-100       | 100 mm (3.94 in)                                                               | cut-cable       | 1.5 g (0.05 oz) |
| ANT-W63RPC1-200       | 200 mm (7.87 in)                                                               | cut-cable       | 1.8 g (0.06 oz) |
| Dimensions            | Antenna element only, 43.0 mm x 11.0 mm x 1.3 mm (1.69 in x 0.43 in x 0.05 in) |                 |                 |
| Operating Temp. Range | -40 °C to +85 °C                                                               |                 |                 |

## Product Dimensions

Figure 1 shows the product dimensions for the W63RPC1 series antenna, cable and connector options available. The W63RPC1 series antenna is available with a U.FL-type, MHF4-type or cut-cable termination, with each termination option available in 50 mm, 100 mm or 200 mm cable length. The antenna is shown with a U.FL-type connector.

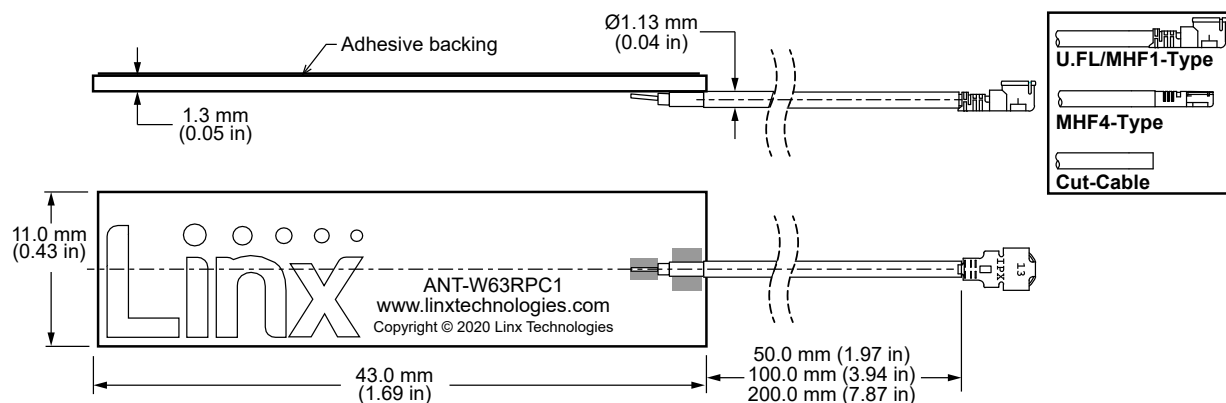


Figure 1. W63RPC1 Series Product Dimensions

## 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.

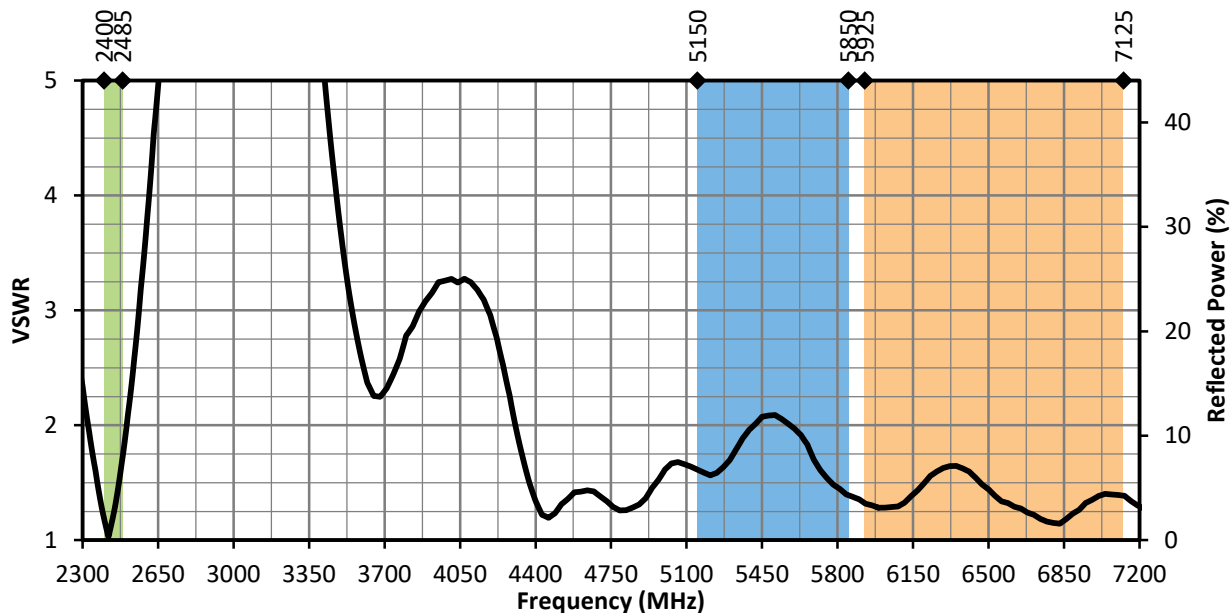


Figure 2. W63RPC1 VSWR with Frequency Band Highlights

## 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.

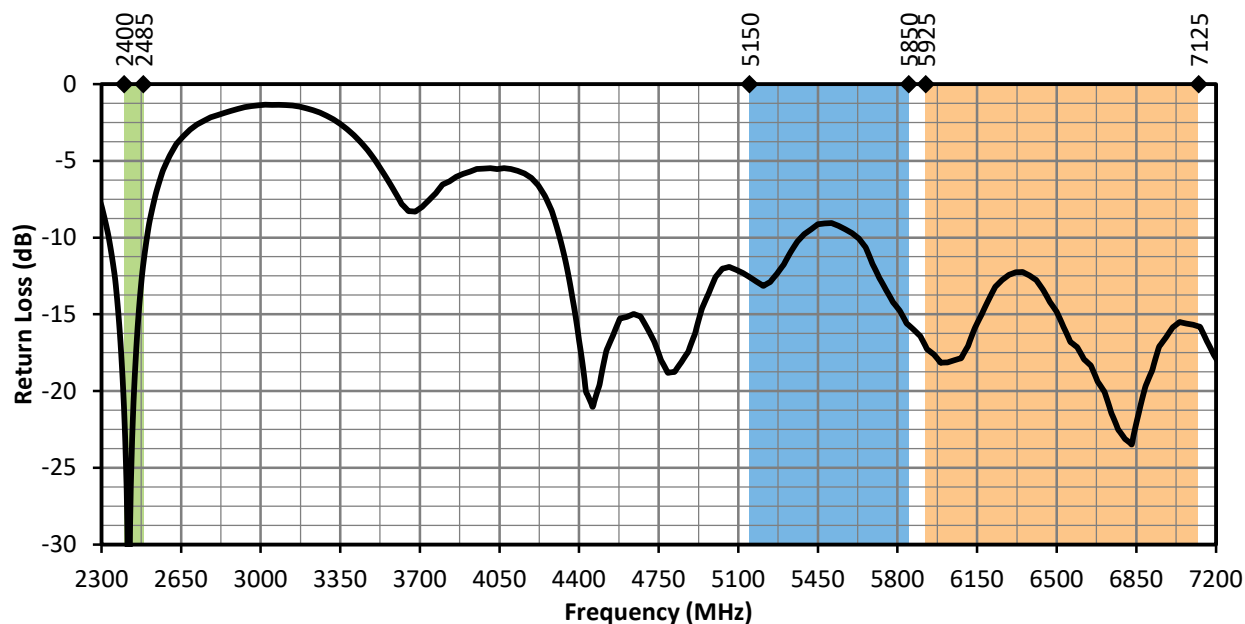


Figure 3. W63RPC1 Return Loss with Frequency Band Highlights

### 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.

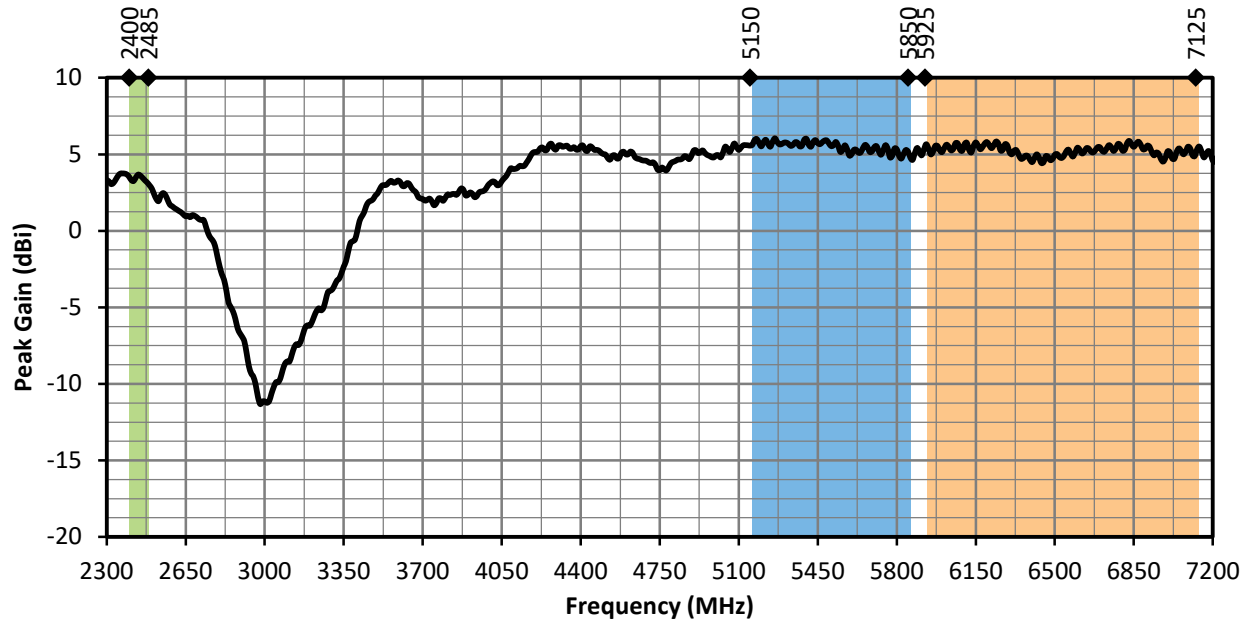


Figure 4. W63RPC1 Peak Gain with Frequency Band Highlights

### Average Gain

Average gain (Figure 5), is the average of all antenna gain in 3-dimensional space at each frequency, providing an indication of overall performance without expressing antenna directionality.

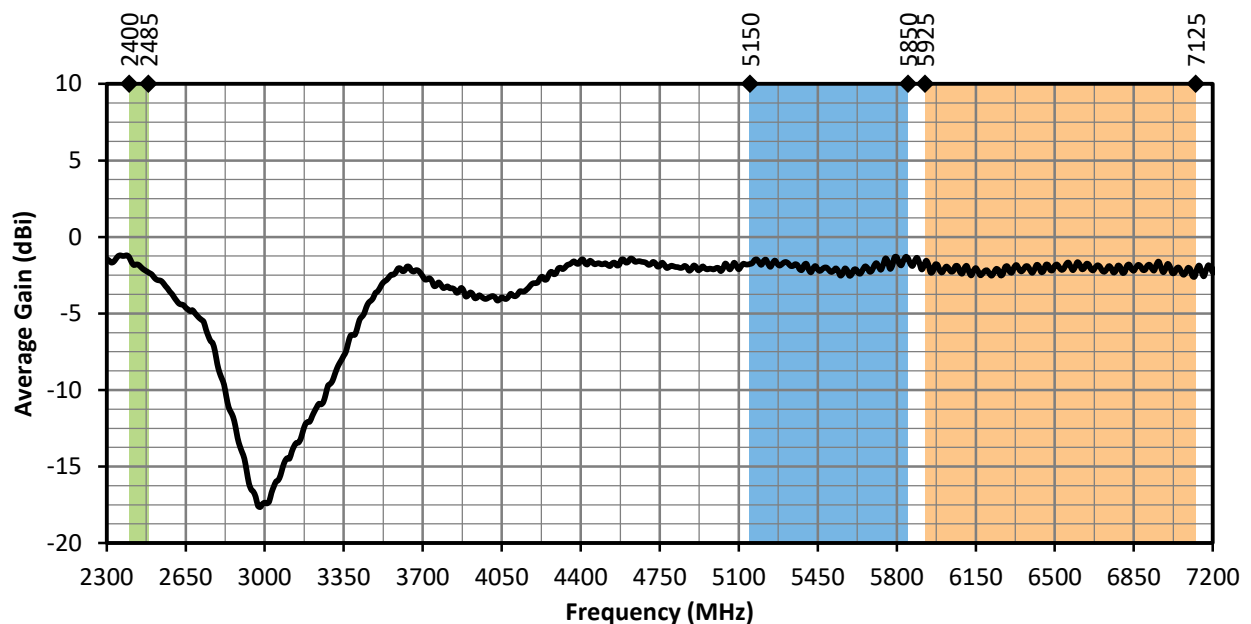


Figure 5. W63RPC1 Antenna Average Gain with Frequency Band Highlights

### Radiation Efficiency

Radiation efficiency (Figure 6), 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.

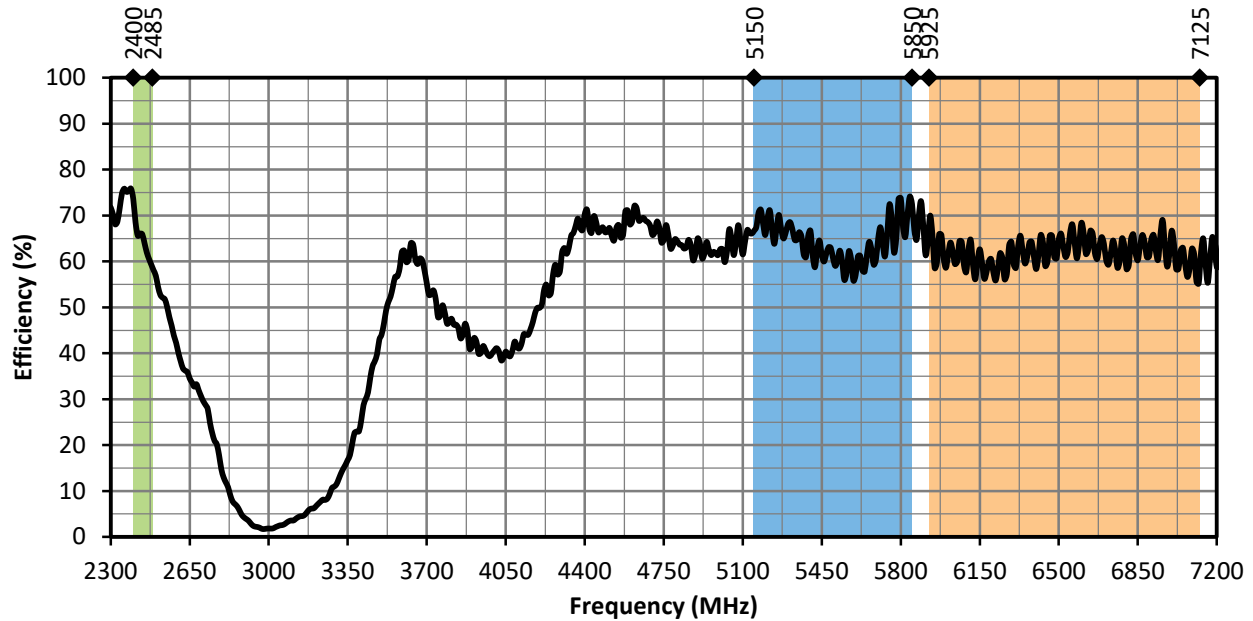


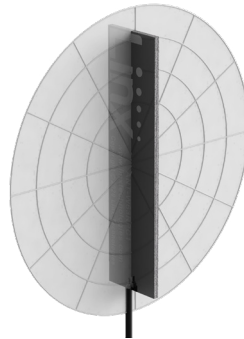
Figure 6. W63RPC1 Antenna Radiation Efficiency with Frequency Band Highlights

## Radiation Patterns

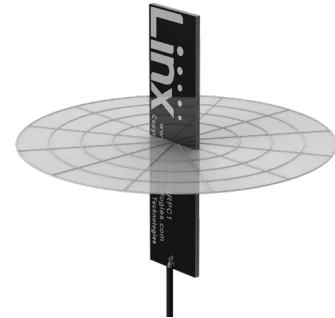
Radiation patterns provide information about the directionality and 3-dimensional gain performance of the antenna by plotting gain at specific frequencies in three orthogonal planes. Antenna radiation patterns are shown in Figure 7 using polar plots covering 360 degrees. The antenna graphic at the top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

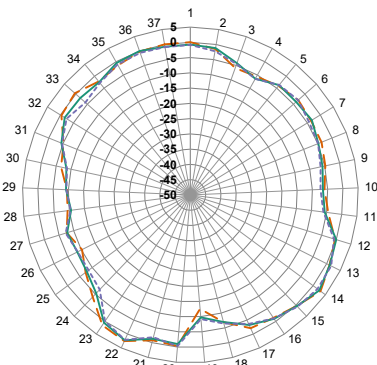


YZ-Plane Gain

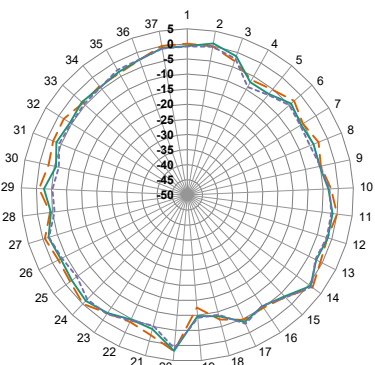


XY-Plane Gain

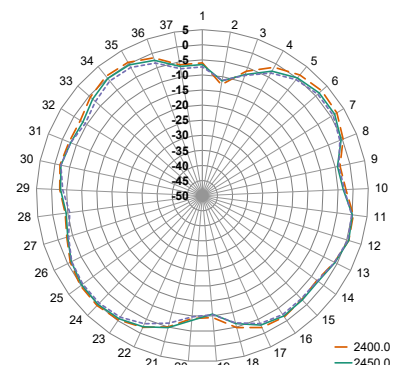
## 2400 MHz to 2485 MHz (2450 MHz)



XZ-Plane Gain

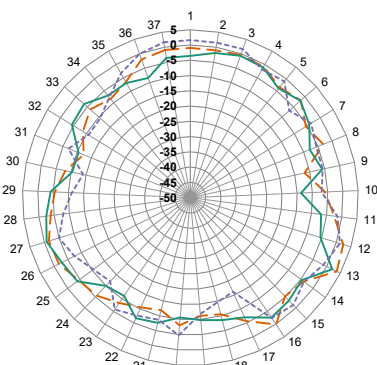


YZ-Plane Gain

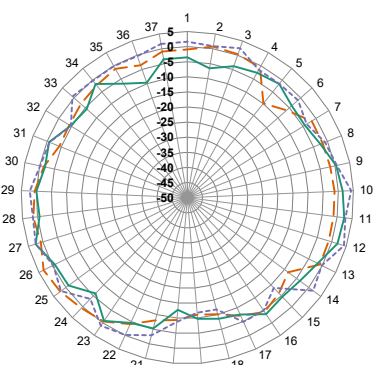


XY-Plane Gain

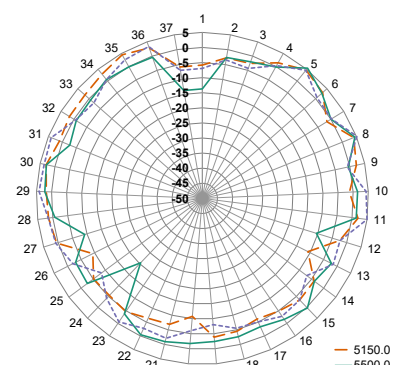
## 5150 MHz to 5850 MHz (5500 MHz)



XZ-Plane Gain



YZ-Plane Gain



XY-Plane Gain

## Radiation Patterns

5925 MHz to 7125 MHz (6530 MHz)

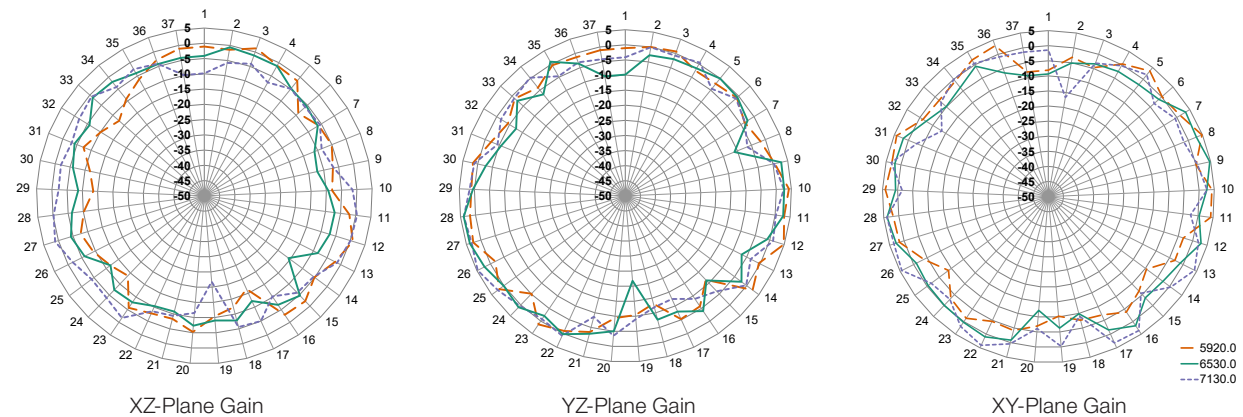


Figure 7. W63RPC1 Radiation Patterns

## Antenna Mounting

The W63RPC1 is an adhesive backed, embedded antenna that allows it to be permanently installed onto a wide variety of materials. The adhesive backing is 3M 9888T, which provides outstanding adhesion to low surface energy plastics.

- 3M 9888T features a medium-soft acrylic pressure sensitive adhesive system. The key characteristics of this adhesive include a combination of high initial adhesion and good shear and bonding power to a wide variety of materials, including many plastics including polyethylene and polypropylene.
- 3M 9888T is UL-recognized (File MH28421). Please see UL listing for details.

## Packaging Information

The W63RPC1 series antenna is individually sealed in a clear plastic bag. Individual packages are sealed in a bag of 100. Distribution channels may offer alternative packaging options.

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