

LTE Antenna - 900MHz ISM band report

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(Digitally signed)

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(Digitally signed)

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Antenna Specifications

| | |
|-----------------------|-------------------------|
| Frequency | 902 – 928 MHz |
| Polarization | Linear, omnidirectional |
| Nominal impedance | 50 Ω |
| VSWR | 3:1 |
| Peak Gain | 6 dBi |
| Weight | 0.38 kg |
| Operating temperature | -25°C to +65°C |
| Storage temperature | -40°C to +70°C |

Test Equipments

MVG StarLab 6 GHz serial number 1102283-0038

Test software: MVG WaveStudio 23.2.0

Test Personnel: James Bryant

Test date: September 26, 2023

The antennas were tested with MVG StarLab 6 GHz turn-key antenna measurement system. A system diagram is shown Figure 1. Figure 2 shows the antenna under test in the StarLab system.

The system is capable of the following measurements:

- Gain
- Directivity
- Beamwidth
- Cross polar discrimination
- Sidelobe levels
- 3D radiation pattern
- Radiation pattern in any polarization (linear or circular)
- Antenna efficiency
- TRP, TIS, EIRP and EIS

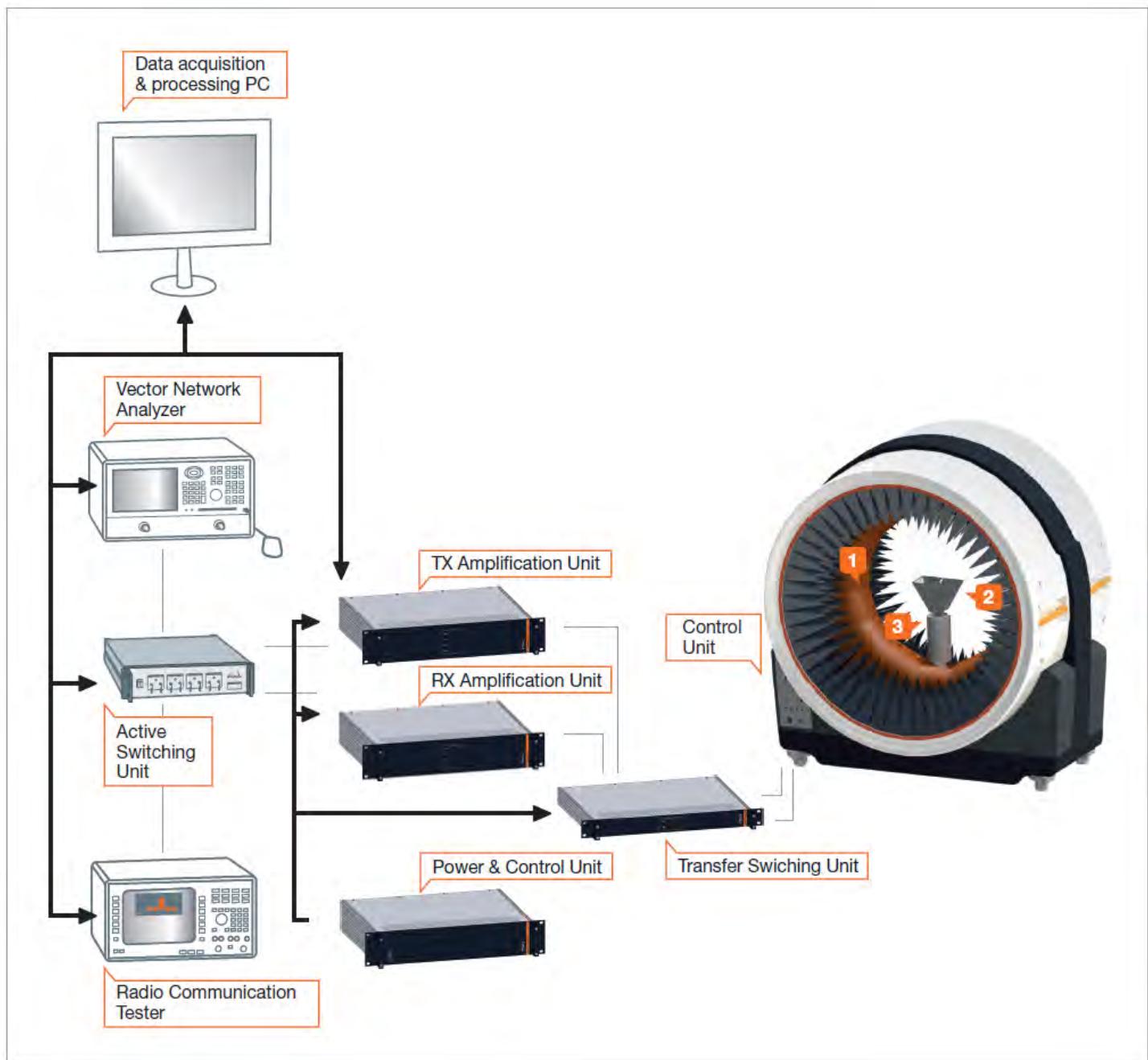


Figure 1 - MVG StarLab 6 GHz system diagram



Figure 2 - Antenna Under Test in StarLab system

Test Results

Test results of three units with gain were measured at 902 – 928 MHz. Azimuth, elevation plots of each max gain plane are shown at 902, 908, 915, 921, 928 MHz.

Unit 1 data

Figure 3 shows the gain of unit 1, figures 4 – 13 show the azimuth, elevation gain plots at each max gain plane.

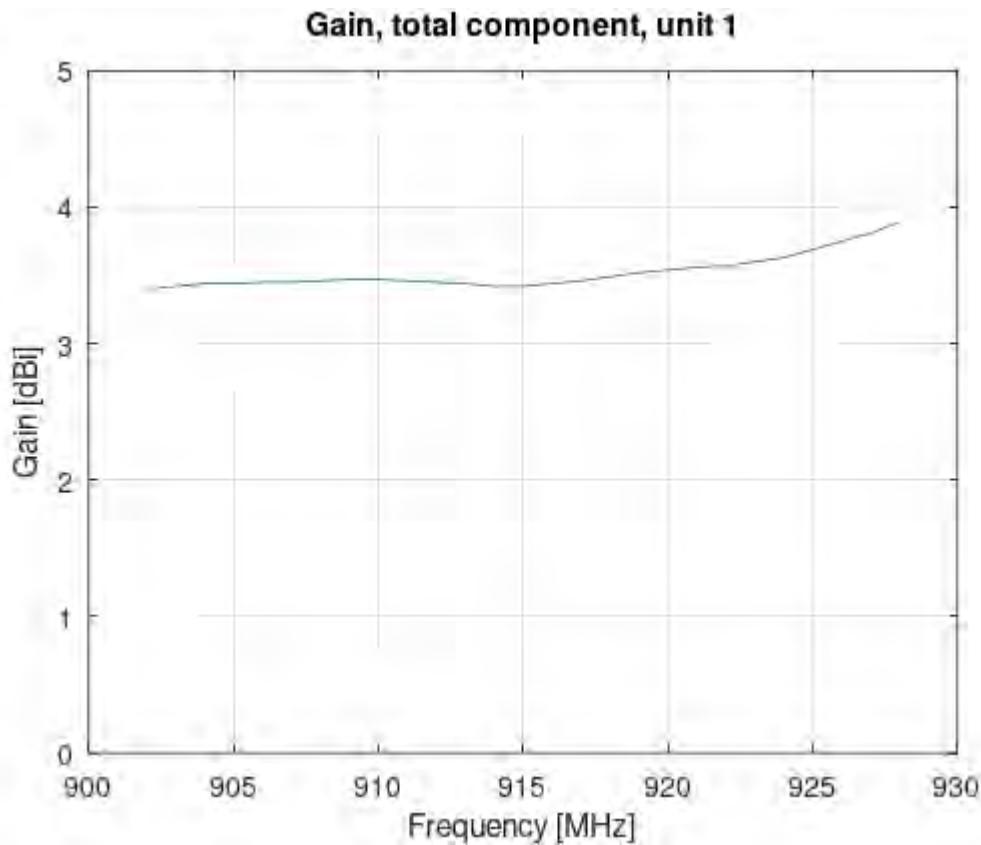


Figure 3 - Unit 1, 900 MHz band gain

— 120° 902.00 MHz Elevation

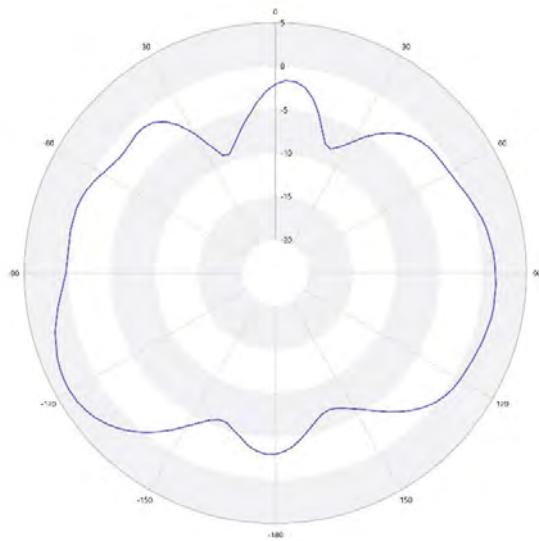


Figure 4 - Elevation cut, unit 1, 902 MHz

— 120° 902.00 MHz Azimuth

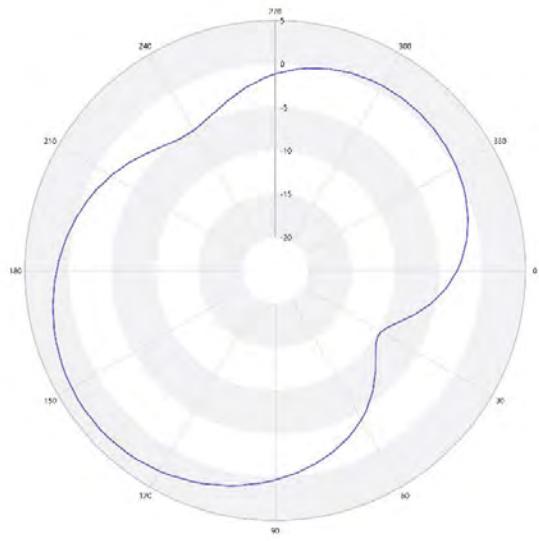


Figure 5 - Azimuth cut, unit 1, 902 MHz

—111° 908.00 MHz Elevation

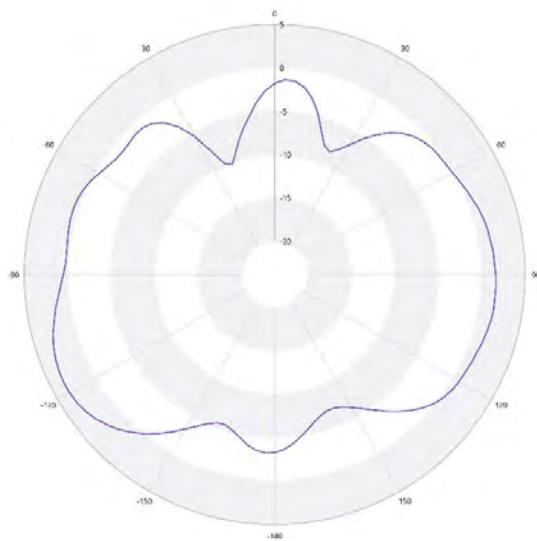


Figure 6 - Elevation cut, unit 1, 908 MHz

—117° 908.00 MHz Azimuth

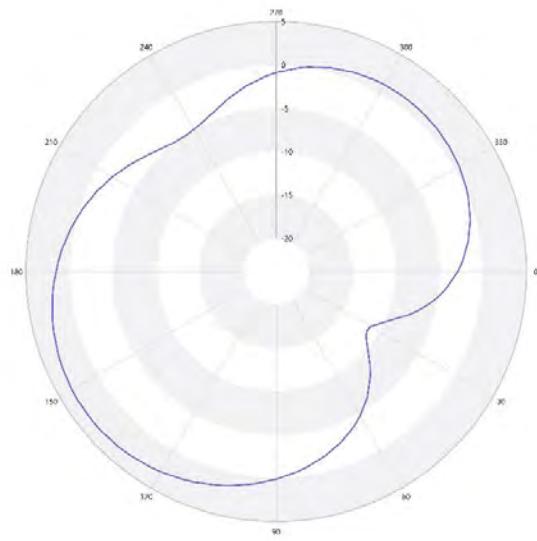


Figure 7 - Azimuth cut, unit 1, 908 MHz

—111° 915.00 MHz Elevation

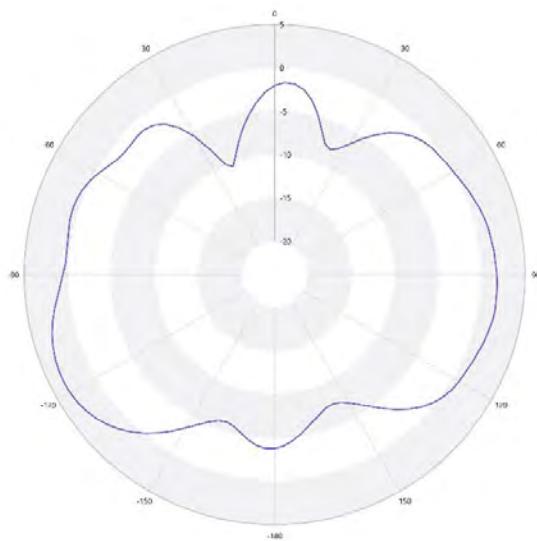


Figure 8 - Elevation cut, unit 1, 915 MHz

—117° 915.00 MHz Azimuth

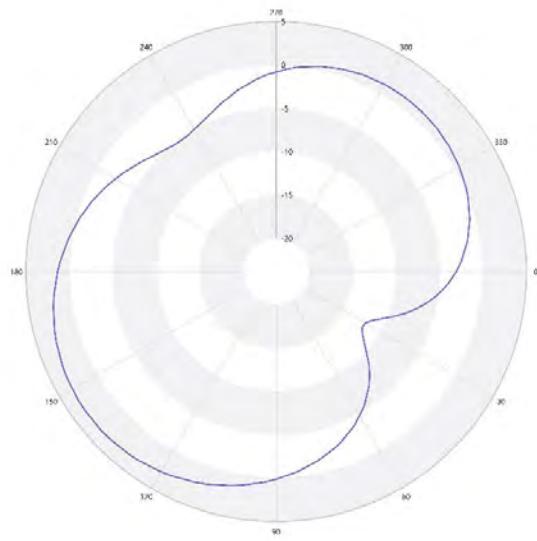


Figure 9 - Azimuth cut, unit 1, 915 MHz

—111° 921.00 MHz E70d

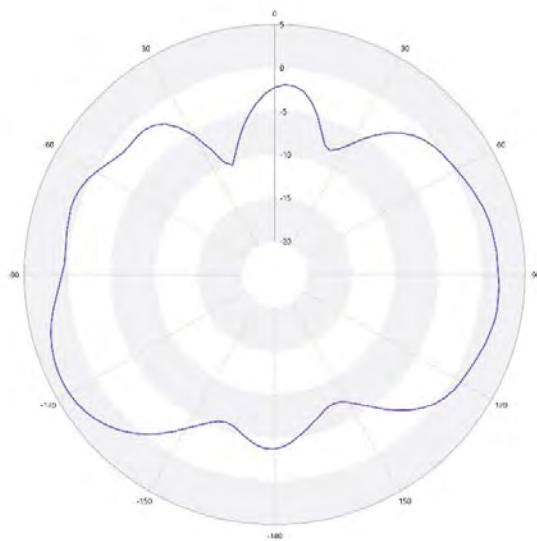


Figure 10 - Elevation cut, unit 1, 921 MHz

—117° 921.00 MHz E70d

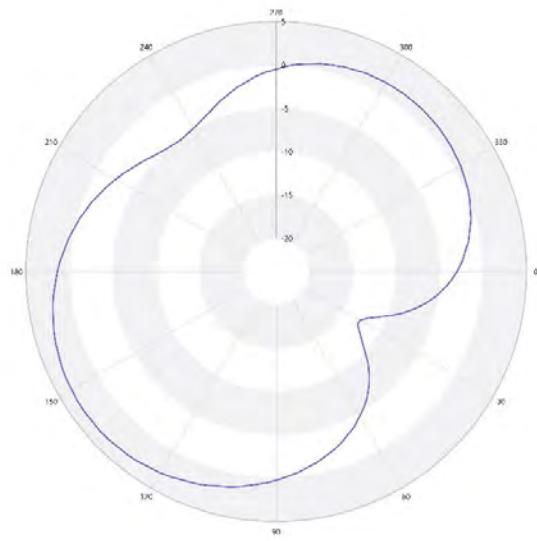


Figure 11 - Azimuth cut, unit 1, 921 MHz

—111° 928.00 MHz E70d

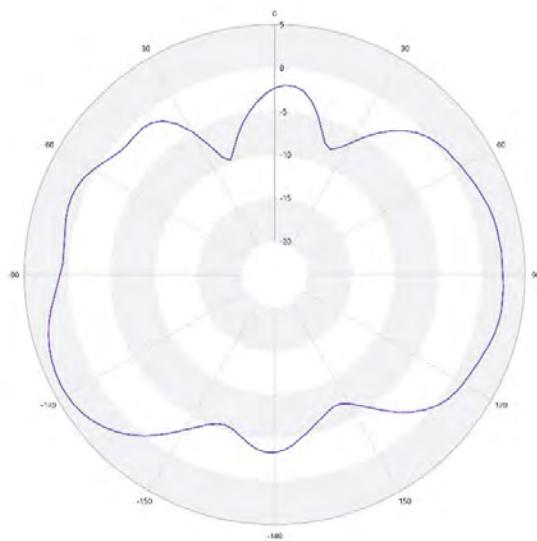


Figure 12 - Elevation cut, unit 1, 928 MHz

—117° 928.00 MHz E70d

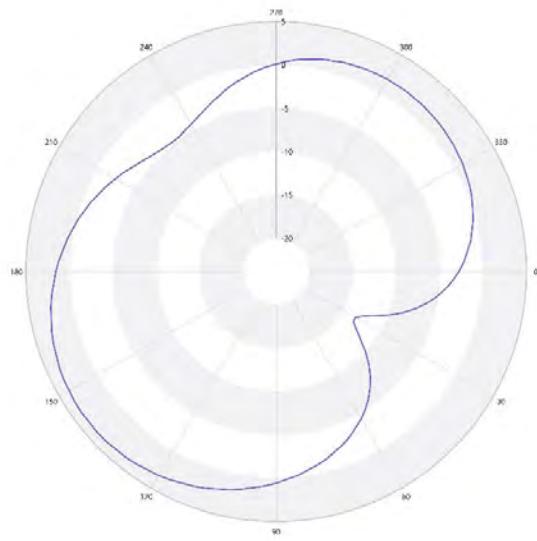


Figure 13 - Azimuth cut, unit 1, 928 MHz

Unit 2 data

Figure 14 shows the gain of unit 2, figures 15 – 24 show the azimuth, elevation gain plots at each max gain plane.

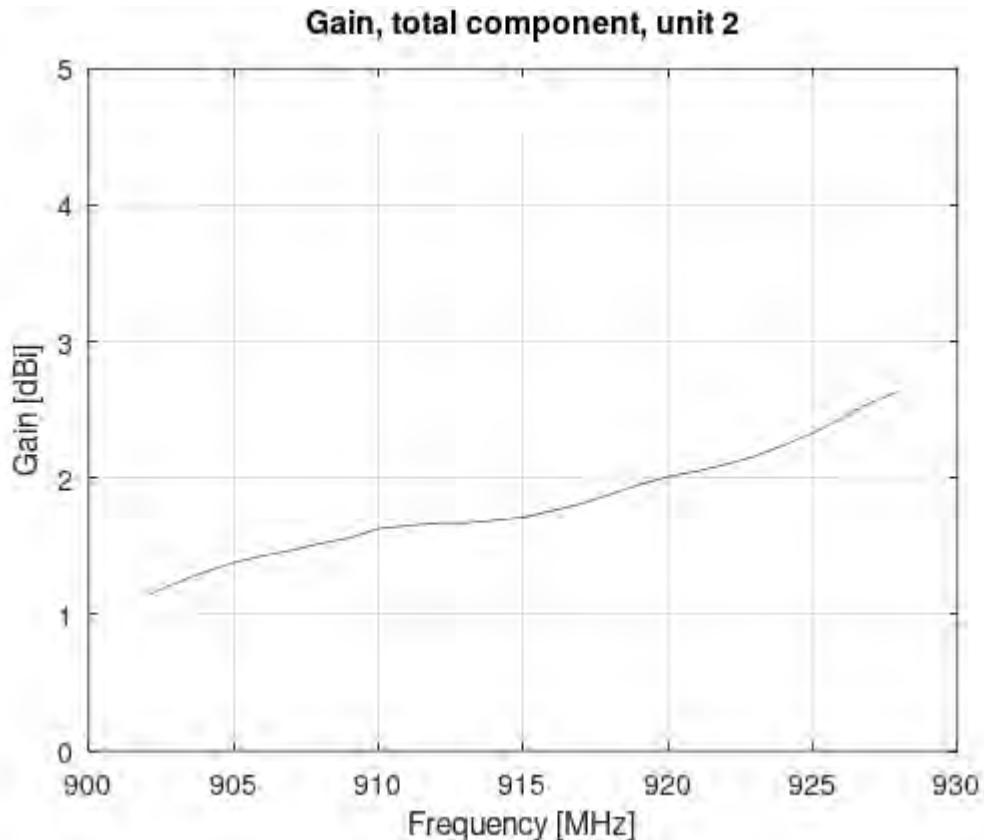


Figure 14 - Unit 2, 900 MHz band gain

— 5.5° (902.00 MHz ETO/air)

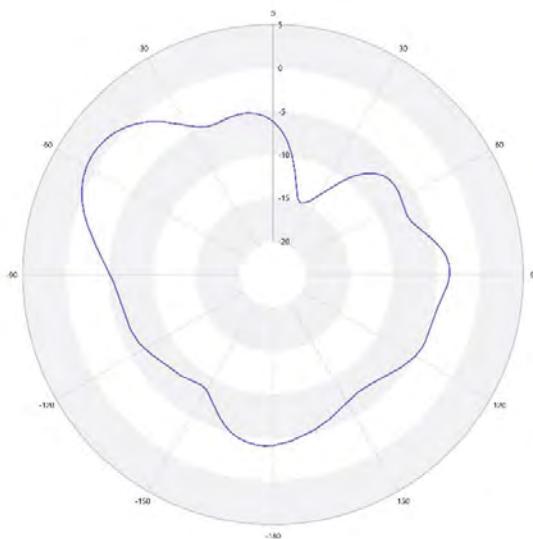


Figure 15 - Elevation cut, unit 2, 902 MHz

— 1.7° (902.00 MHz ETO/air)

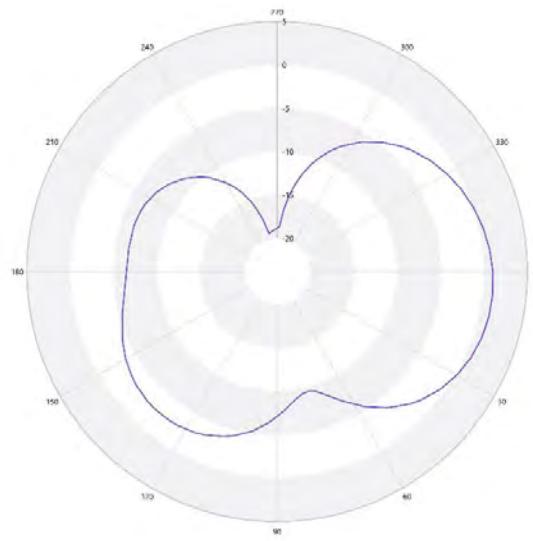


Figure 16 - Azimuth cut, unit 2, 902 MHz

— 9° 908.00 MHz ETOA

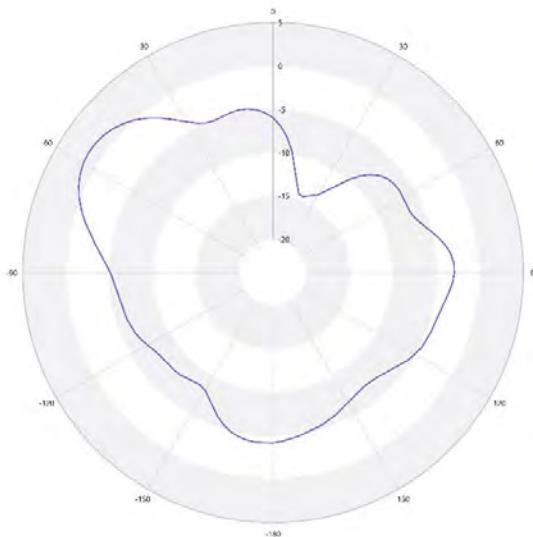


Figure 17 - Elevation cut, unit 2, 908 MHz

— 1.7° 908.00 MHz ETOA

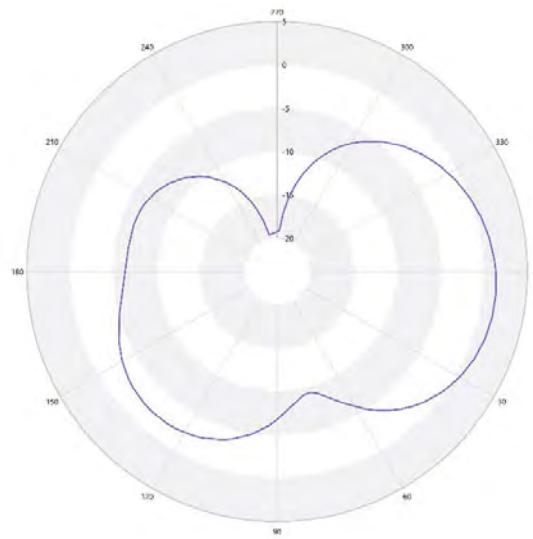


Figure 18 - Azimuth cut, unit 2, 908 MHz

— 915.00 MHz ETOA

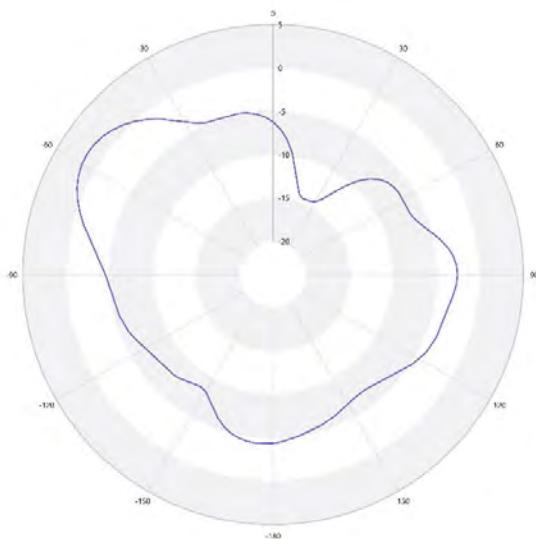


Figure 19 - Elevation cut, unit 2, 915 MHz

— 915.00 MHz ETOA

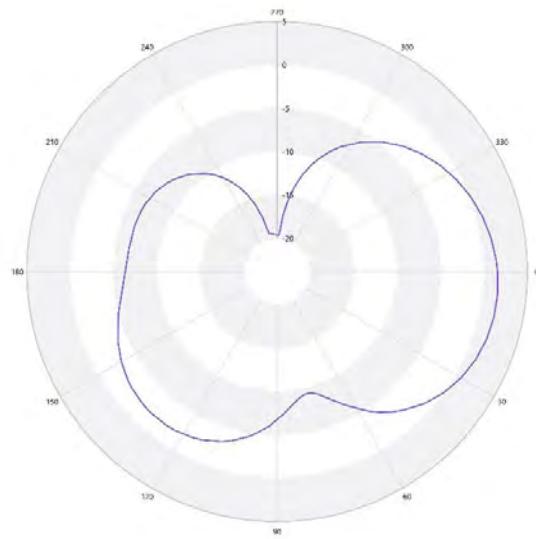


Figure 20 - Azimuth cut, unit 2, 915 MHz

— 9° 921.00 MHz ETO/air

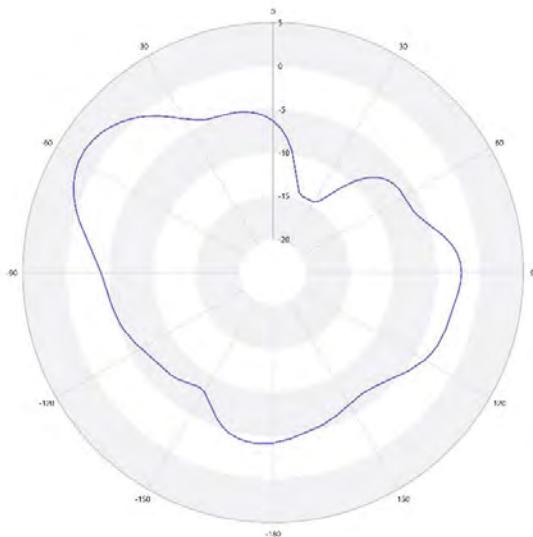


Figure 21 - Elevation cut, unit 2, 921 MHz

— 13° 921.00 MHz ETO/air

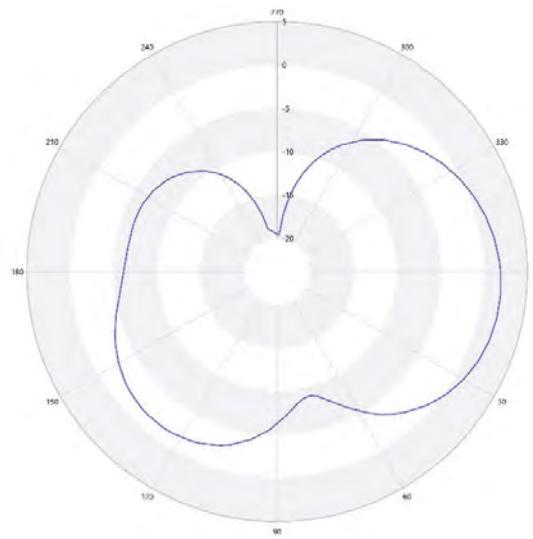


Figure 22 - Azimuth cut, unit 2, 921 MHz

— 9° 928.00 MHz ETOA

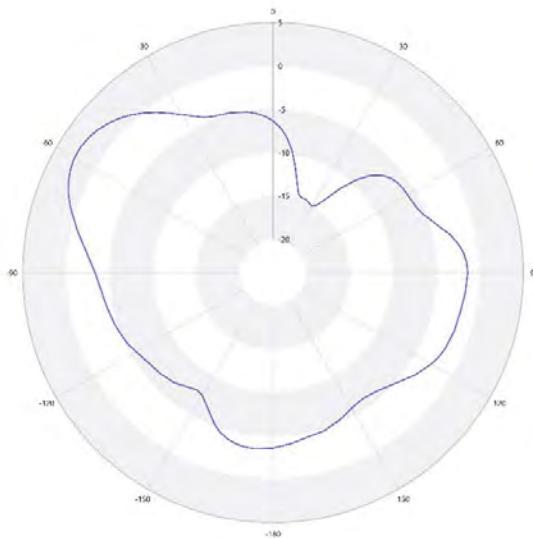


Figure 23 - Elevation cut, unit 2, 928 MHz

— 13° 928.00 MHz ETOA

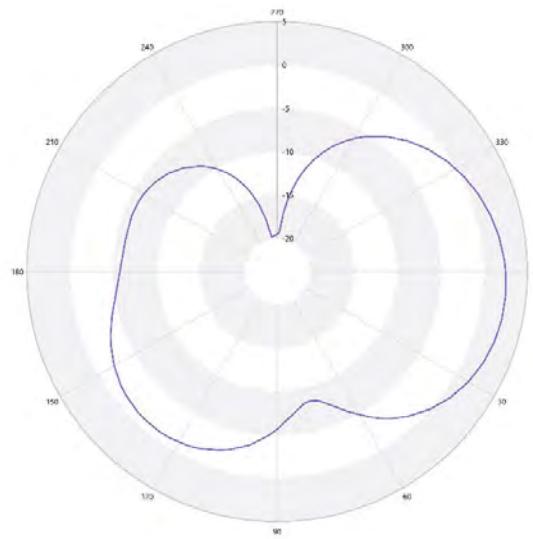


Figure 24 - Azimuth cut, unit 2, 928 MHz

Unit 3 data

Figure 25 shows the gain of unit 3, figures 26 – 35 show the azimuth, elevation gain plots at each max gain plane.

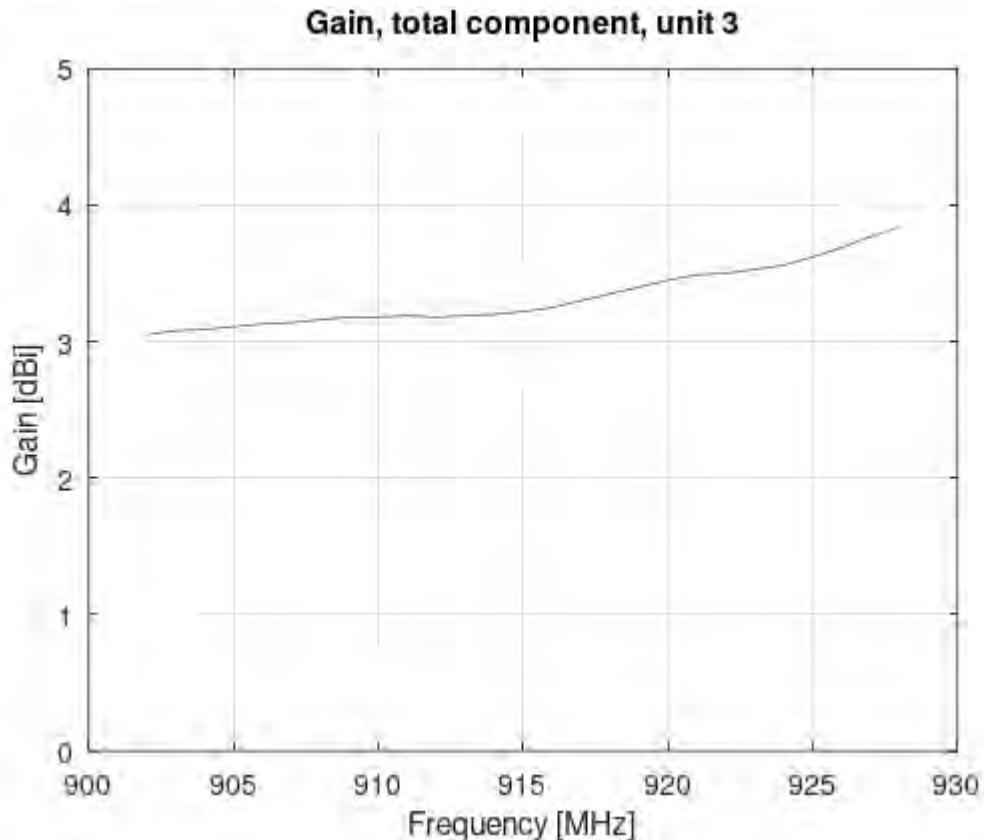


Figure 25 - Unit 3, 900 MHz band gain

— 27° 902.00 MHz Elevation

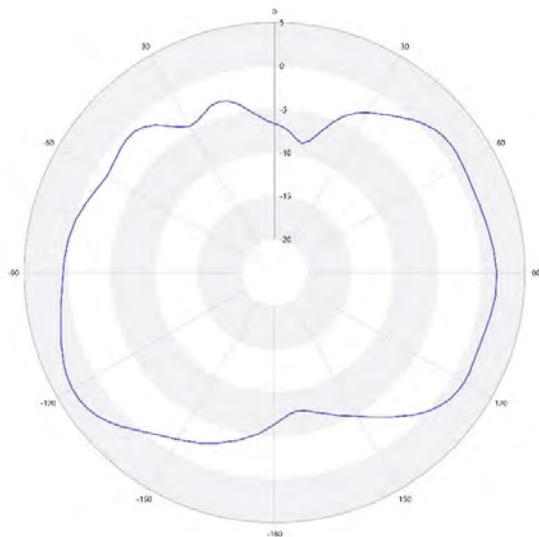


Figure 26 - Elevation cut, unit 3, 902 MHz

— 120° 902.00 MHz Azimuth

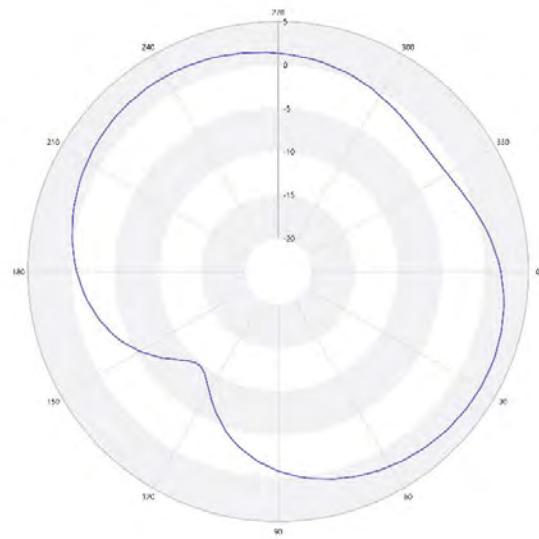


Figure 27 - Azimuth cut, unit 3, 902 MHz

— 27° 908.00 MHz ETotal

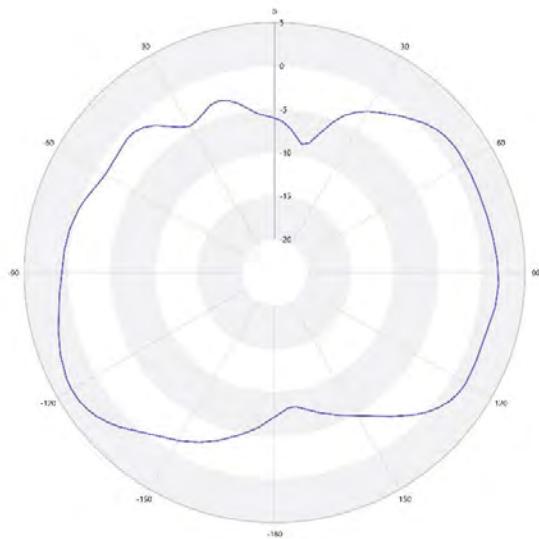


Figure 28 - Elevation cut, unit 3, 908 MHz

— 120° 908.00 MHz ETotal

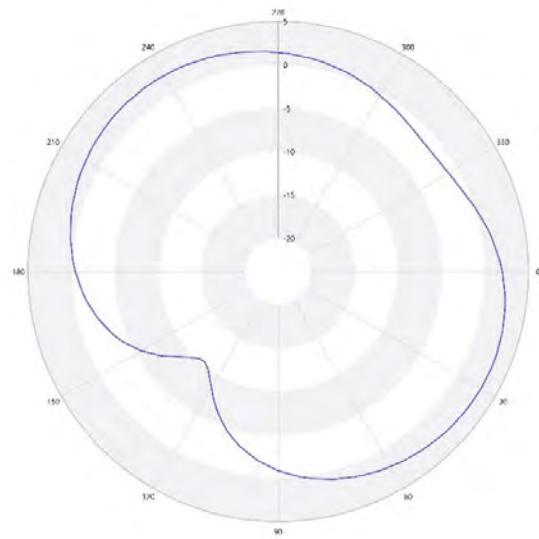


Figure 29 - Azimuth cut, unit 3, 908 MHz

— 27° 915.0 MHz ETotal

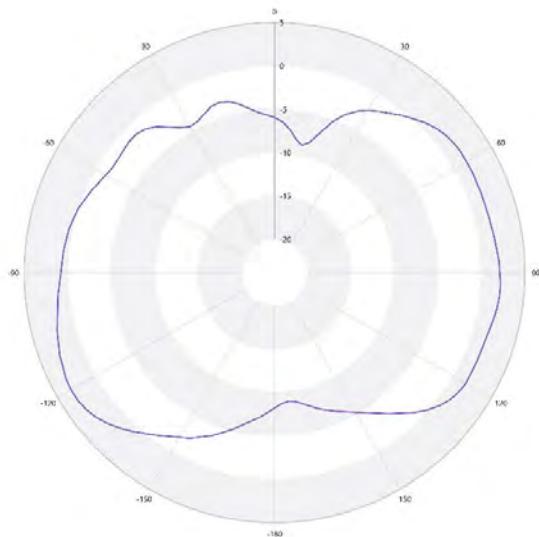


Figure 30 - Elevation cut, unit 3, 915 MHz

— 120° 915.0 MHz ETotal

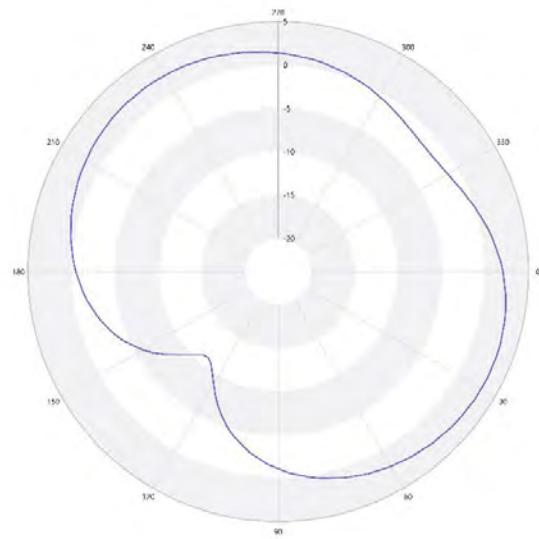


Figure 31 - Azimuth cut, unit 3, 915 MHz

— 27° 921.00 MHz Elevation

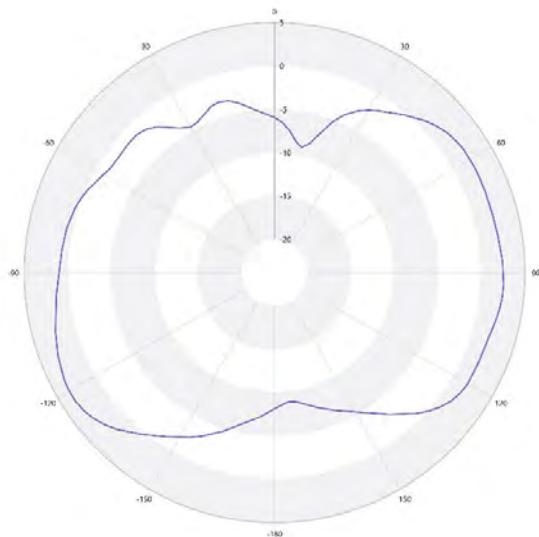


Figure 32 - Elevation cut, unit 3, 921 MHz

— 120° 921.00 MHz Azimuth

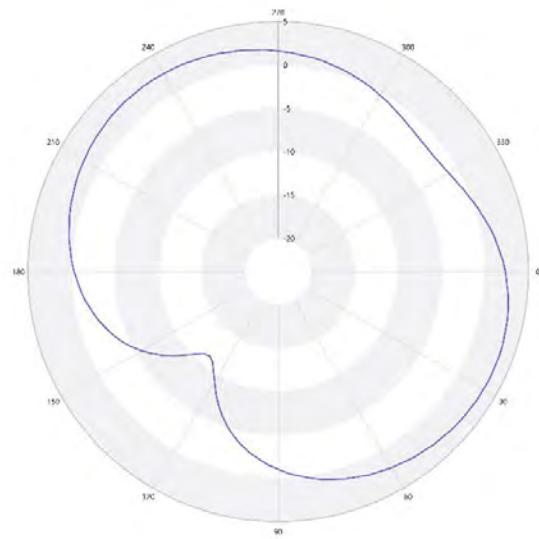


Figure 33 - Azimuth cut, unit 3, 921 MHz

— 241° 928.00 MHz Elevation

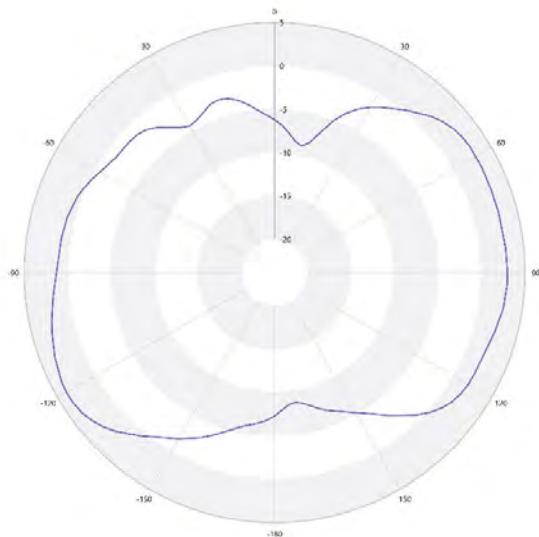


Figure 34 - Elevation cut, unit 3, 928 MHz

— 120° 928.00 MHz Azimuth

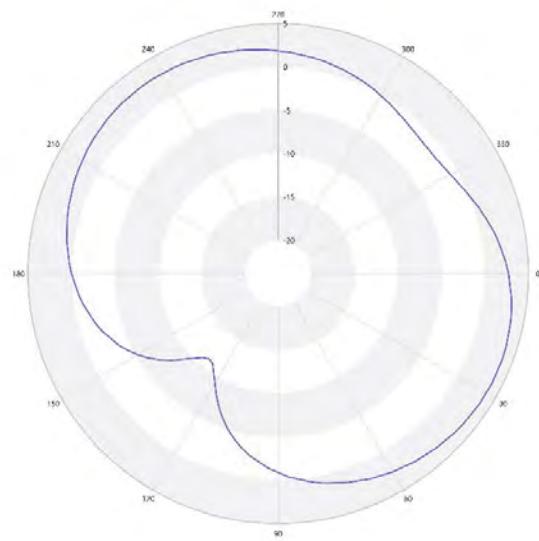


Figure 35 - Azimuth cut, unit 3, 928 MHz

REVISION HISTORY

| Revision | Revision Date | Description |
|----------|---------------|-----------------|
| A | 10/20/2023 | Initial Release |
| B | | |
| C | | |
| D | | |