# LXE
# VM2 System

# VM2 WIFI EXTERNAL Antenna (WTS 2450) Measurement Report (DVT)

**Revision 03**
**Date: 25 Jan 2013**
**Last updated: NA**

# Signature Sheet

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**Approved by (Venture GES Singapore Pte Ltd):**

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**Review and Approved by (Customer):**

| Name | Title | Date | Signature |
|---|---|---|---|
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**Revision History**

| Item | Description Changes | Latest update date | Prepared By |
|---|---|---|---|
| 1 | Ver01, First Draft Version | 17 Sep 2012 | Tan Huan Fong |
| 2 | Ver02, Modified Table 1 | 19 Nov 2012 | Tan Huan Fong |
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# Table of Content

# 1. INTRODUCTION

The following report describes the results of the External Dual Band WIFI Antenna for the DVT VM2 Terminal. The test is based on the Section 1 of the RF Hardware Validation Test Plan Version 1.0. The Antenna 2D Radiation Plots measurement is being performed in the Full Anechoic Chamber.

# 2. WIFI EXTERNAL DUAL BAND ANTENNA

Figure 1 shows the WIFI External Dual Band Antenna designed for VM2 Terminal.. Figure 2 describes the location of Left Antenna and Middle Antenna. Figure 3 describes the test setup for the Antenna Return Loss measurement. Figure 4 to 7 shows the Return Loss of both Antenna in the 2.4GHz band and 5GHz band.

**Figure 1 WIFI External Dual Band Antenna**


**Figure 2 Antenna Definition**

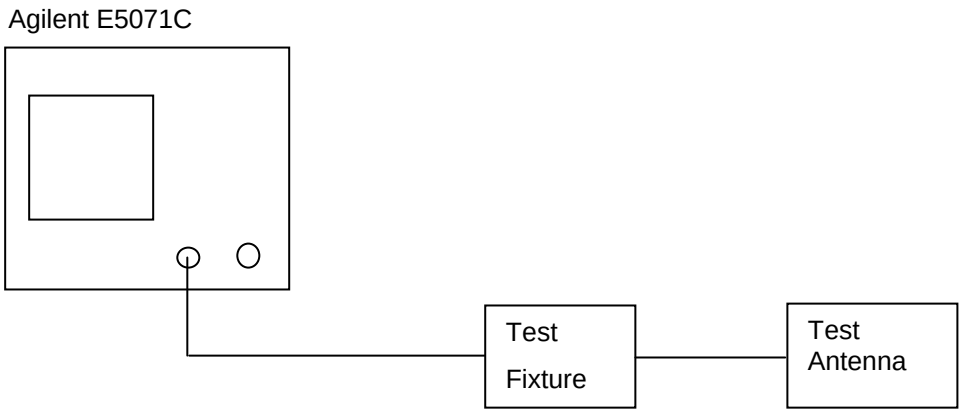


**Figure 3 Return Loss Test Setup**

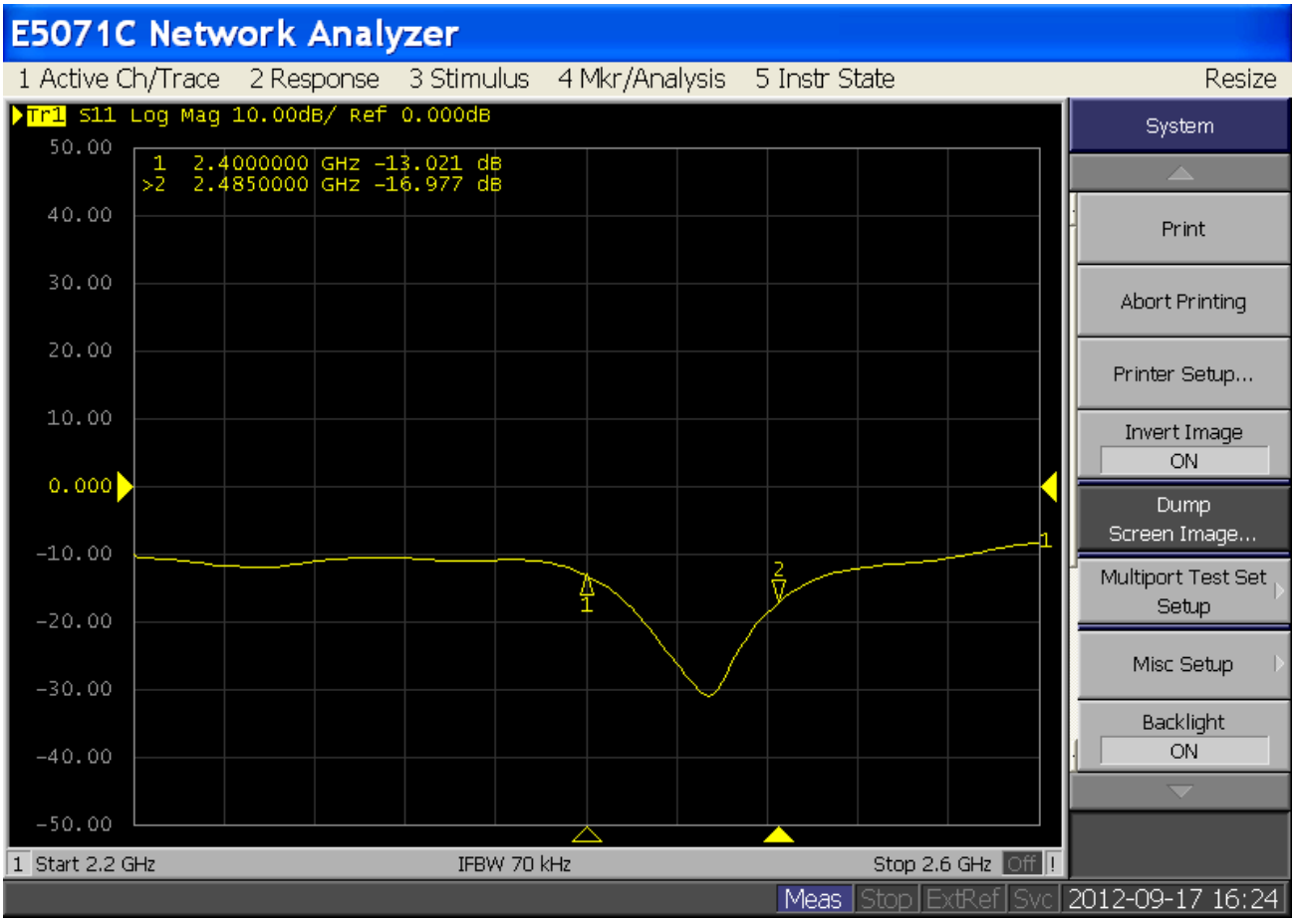


**Figure 4 Left Antenna 2.4GHz Return Loss**

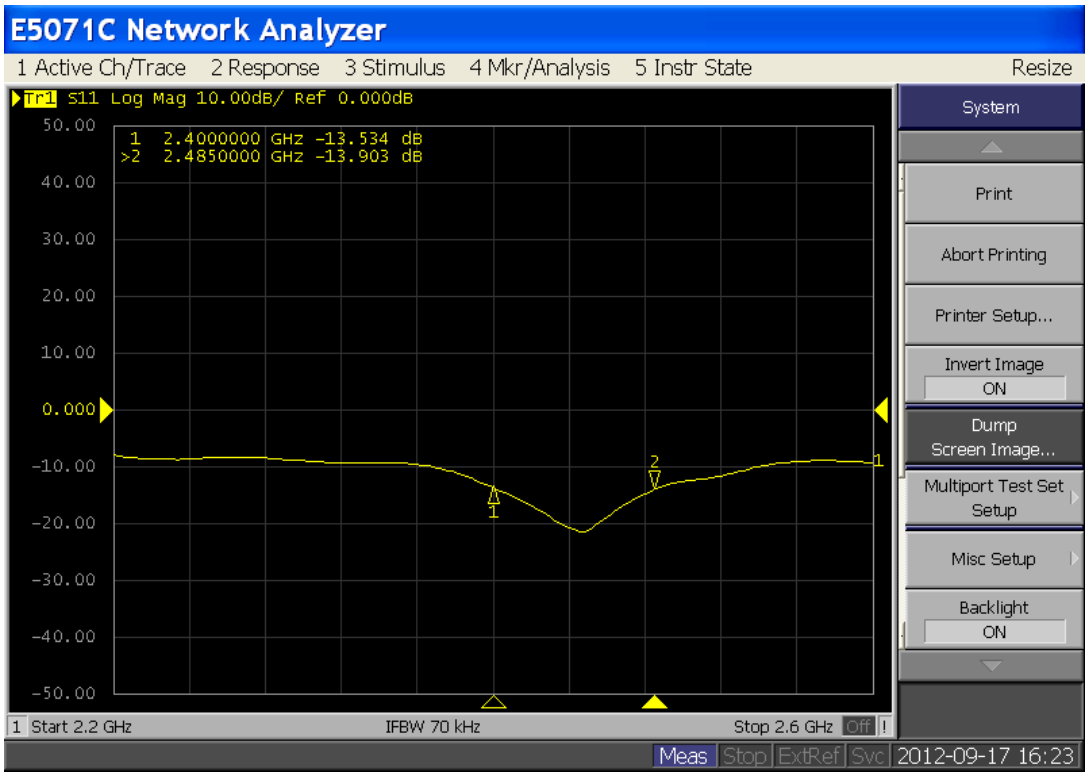


**Figure 5 Right Antenna 2.4GHz Return Loss**

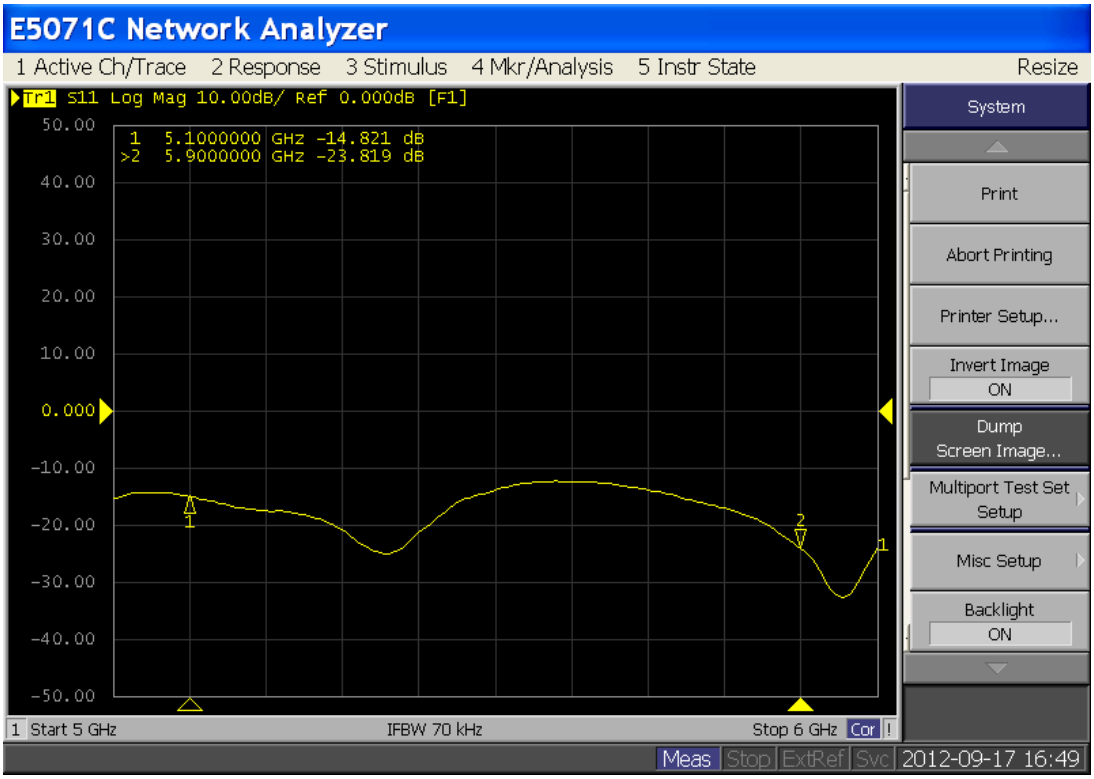


**Figure 6 Left Antenna 5GHz Return Loss**

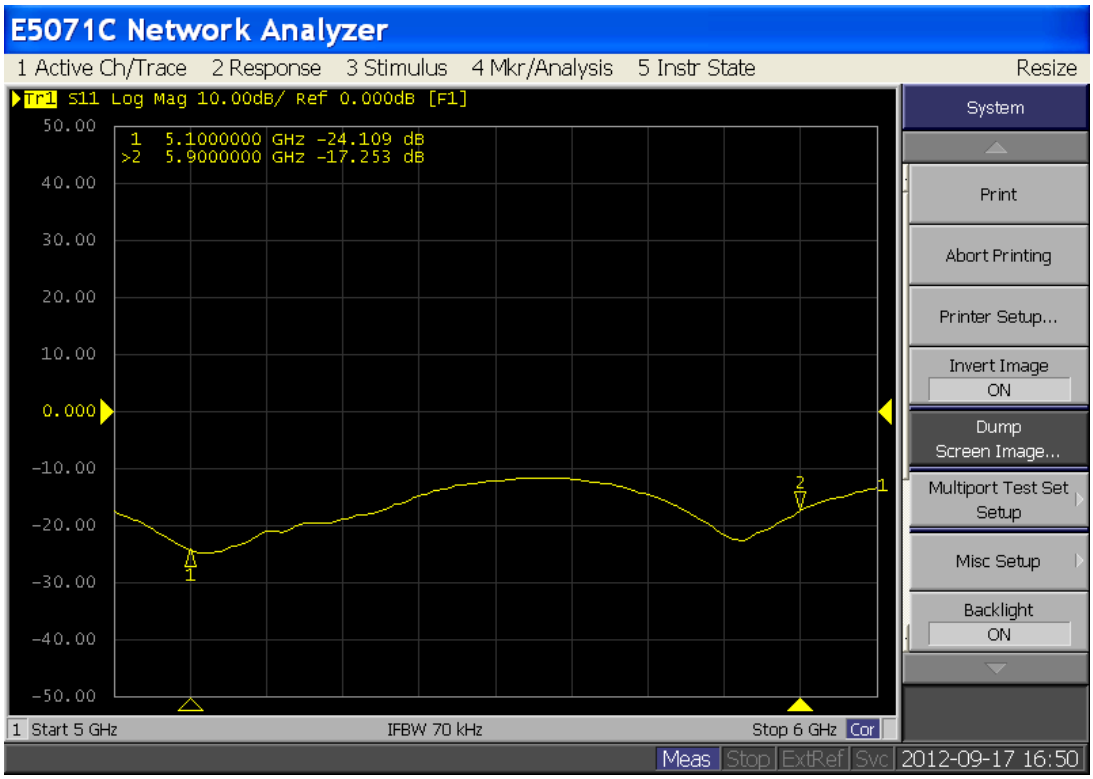


**Figure 7 Right Antenna 5GHz Return Loss**

Figure 8 to 10 describes the definition of the various plane cut for the Antenna measurement.


**Figure 8 Definition of H- Plane Cut**

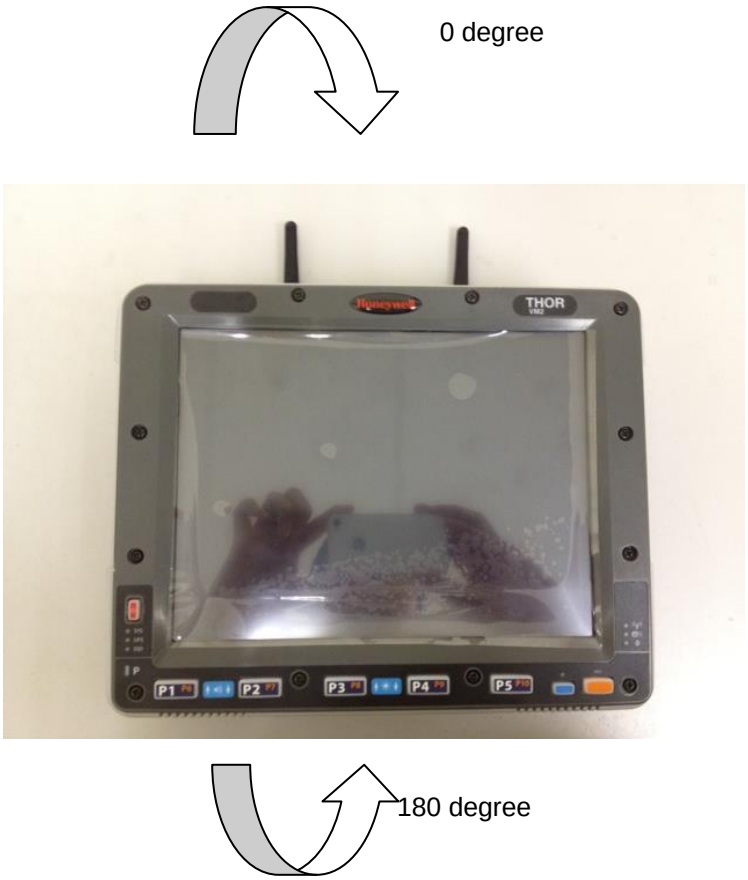


**Figure 9 Definition of E1 Plane Cut**


**Figure 10 Definition of E2 Plane Cut**

Figure 11 shows the setup of the Full Anechoic Chamber used for the Antenna Measurement.

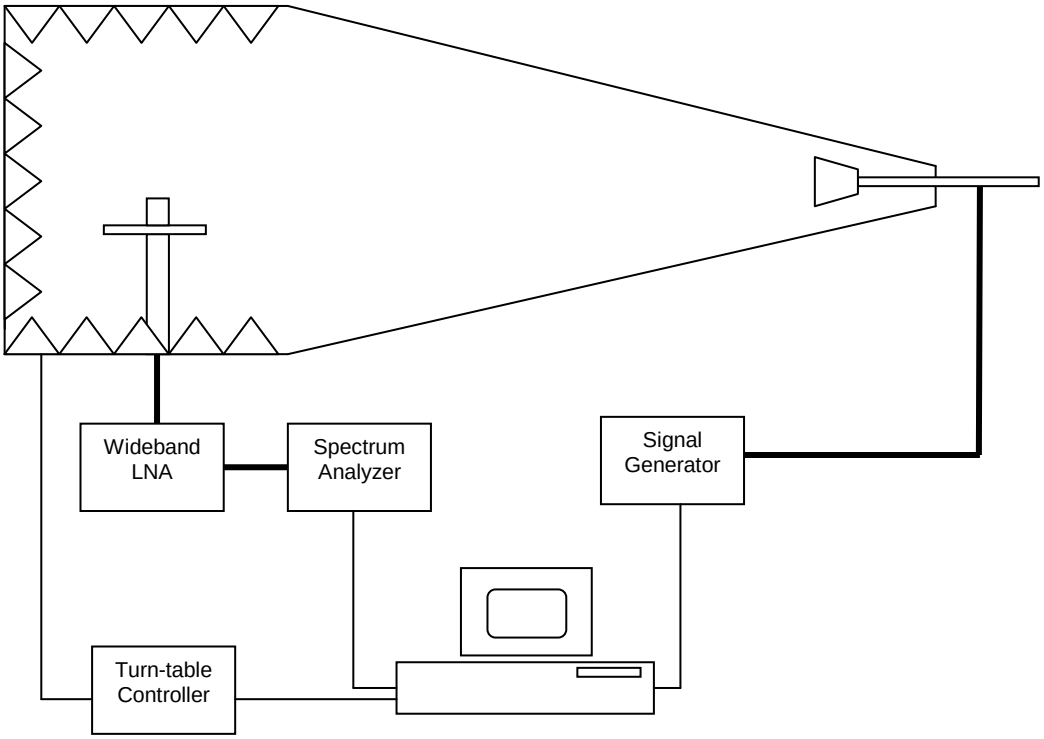


**Figure 11 Anechoic Chamber Setup**

Figure 12 shows the interior view of the Full Anechoic Chamber.

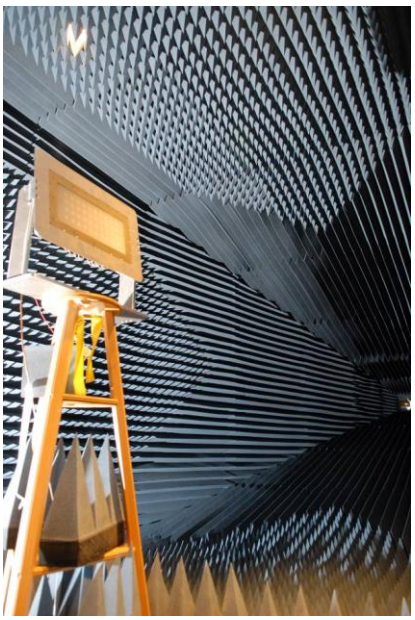

**Figure 12 Interior View of the Full Anechoic Chamber**

# 3. 2.4GHz WIFI ANTENNA RADIATION PLOTS

The following plots describe the 2D Radiation pattern for both the Left and Right WIFI External Antenna in the 2.4GHz Band.

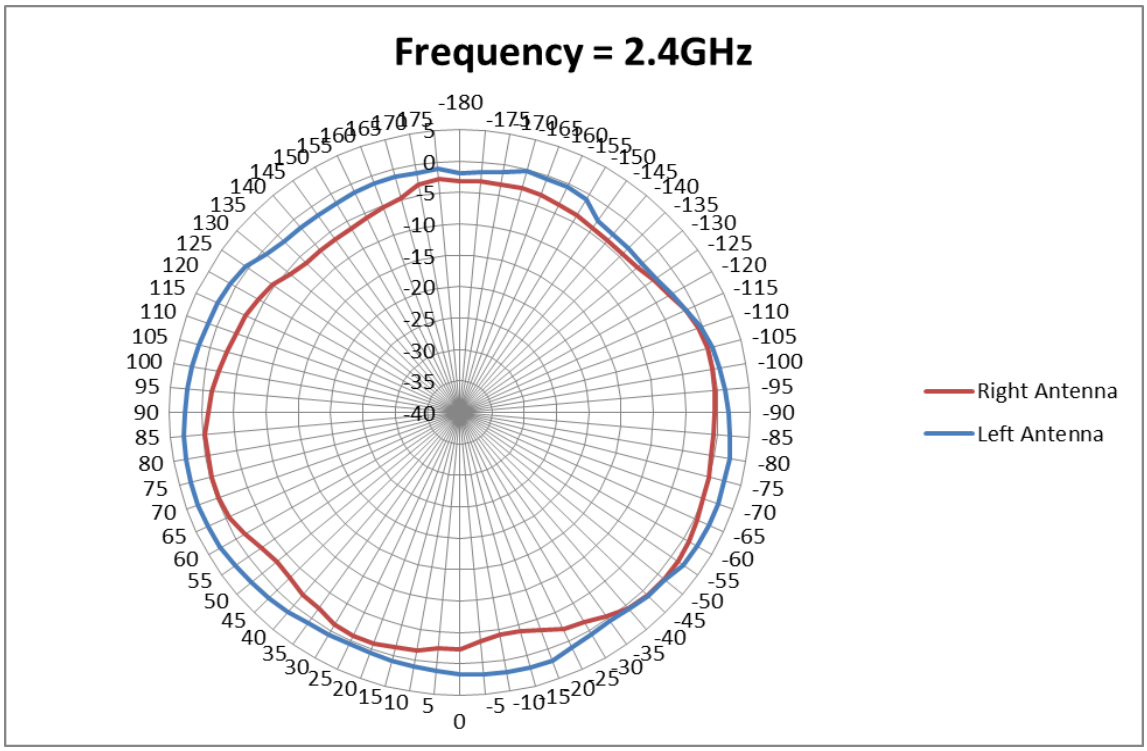


**Figure 13 Radiation Plots for 2.400GHz (H-Plane)**

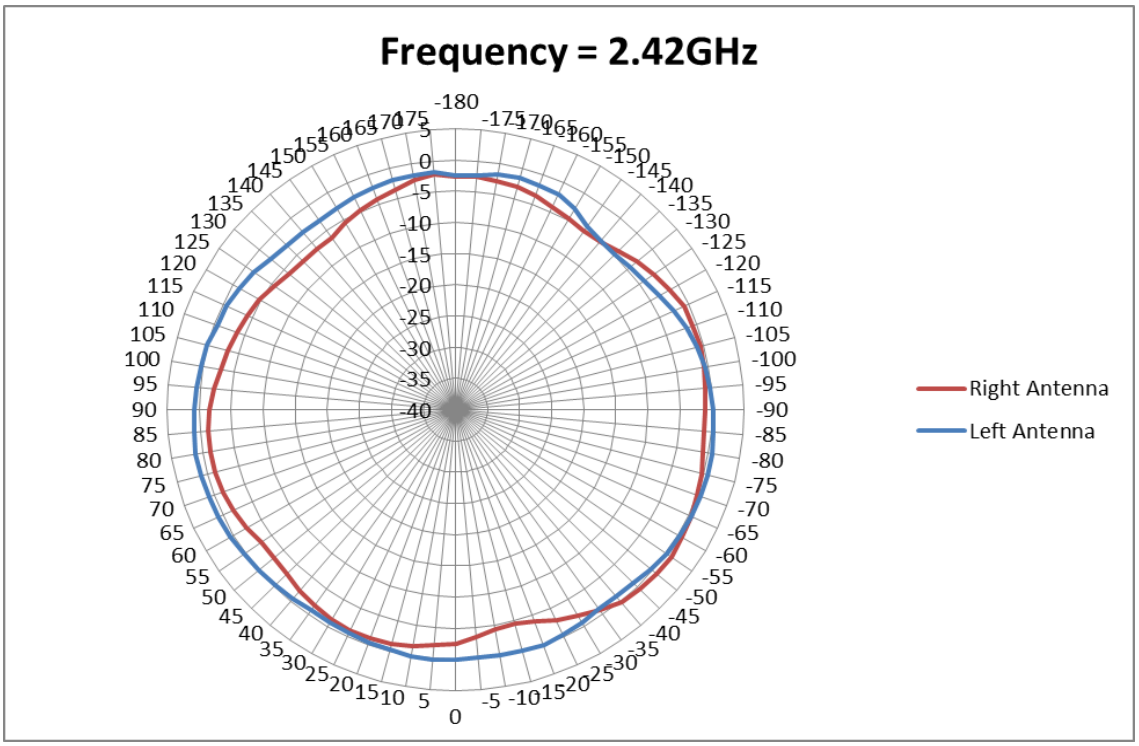


**Figure 14 Radiation Plots for 2.420GHz (H-Plane)**

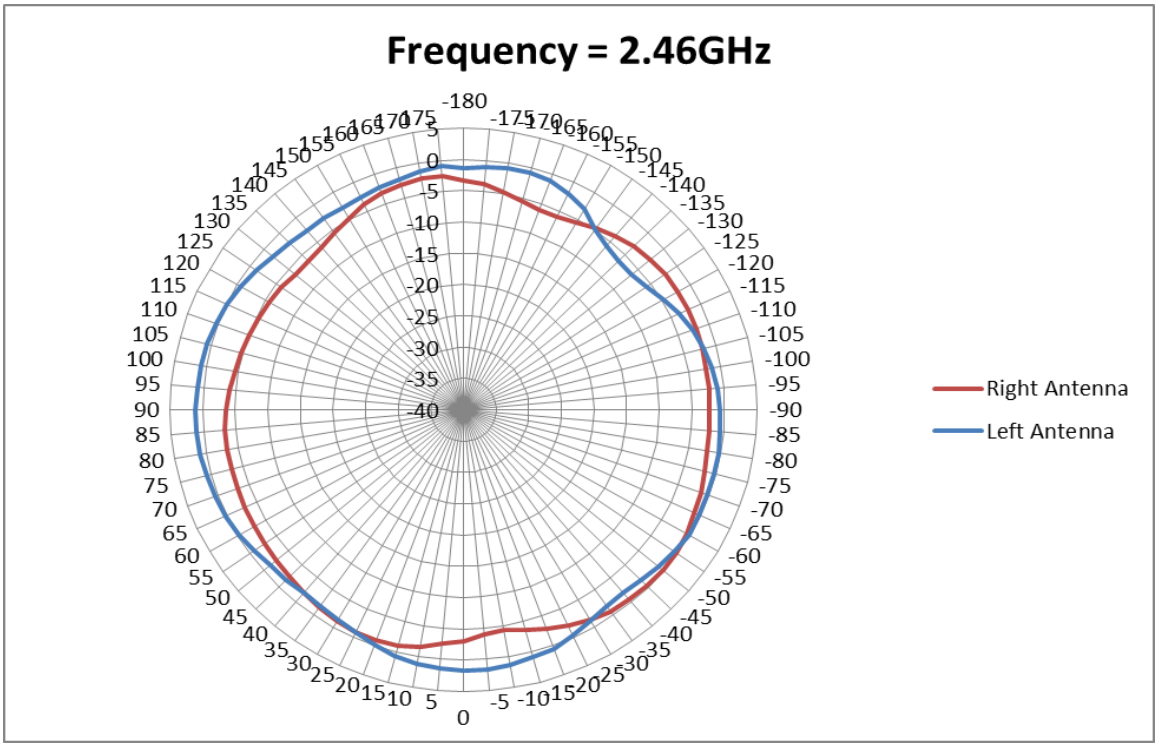


**Figure 15 Radiation Plots for 2.460GHz (H-Plane)**

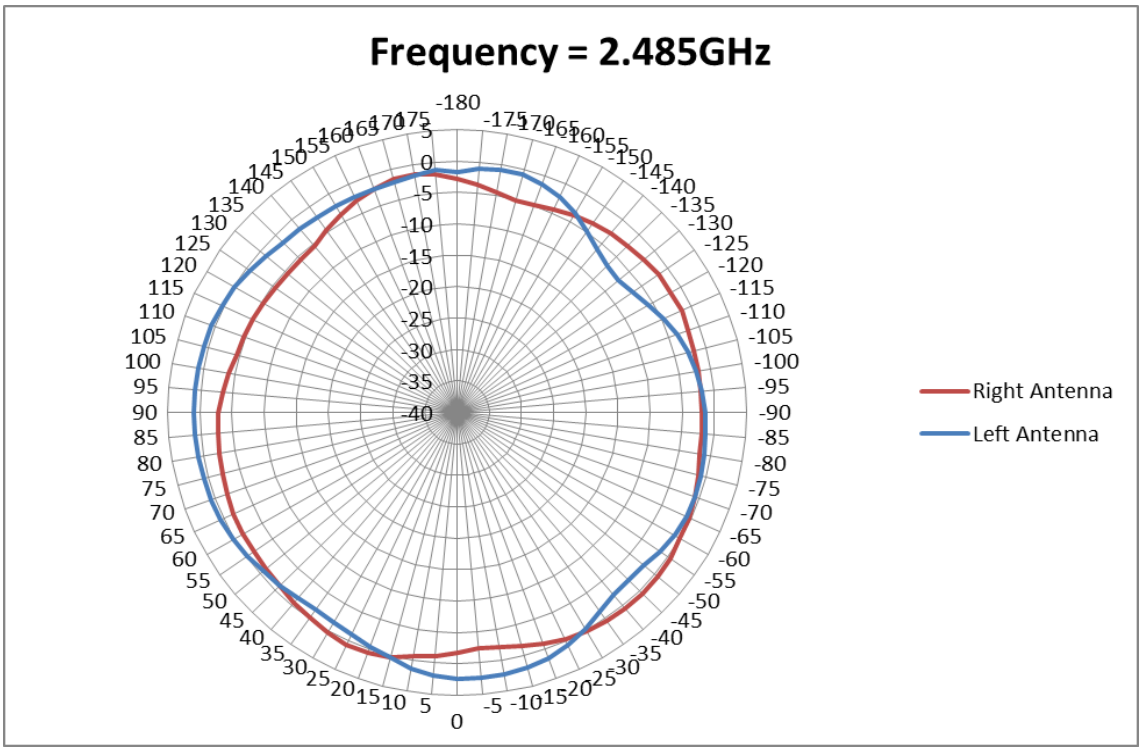


**Figure 16 Radiation Plots for 2.485GHz (H-Plane)**

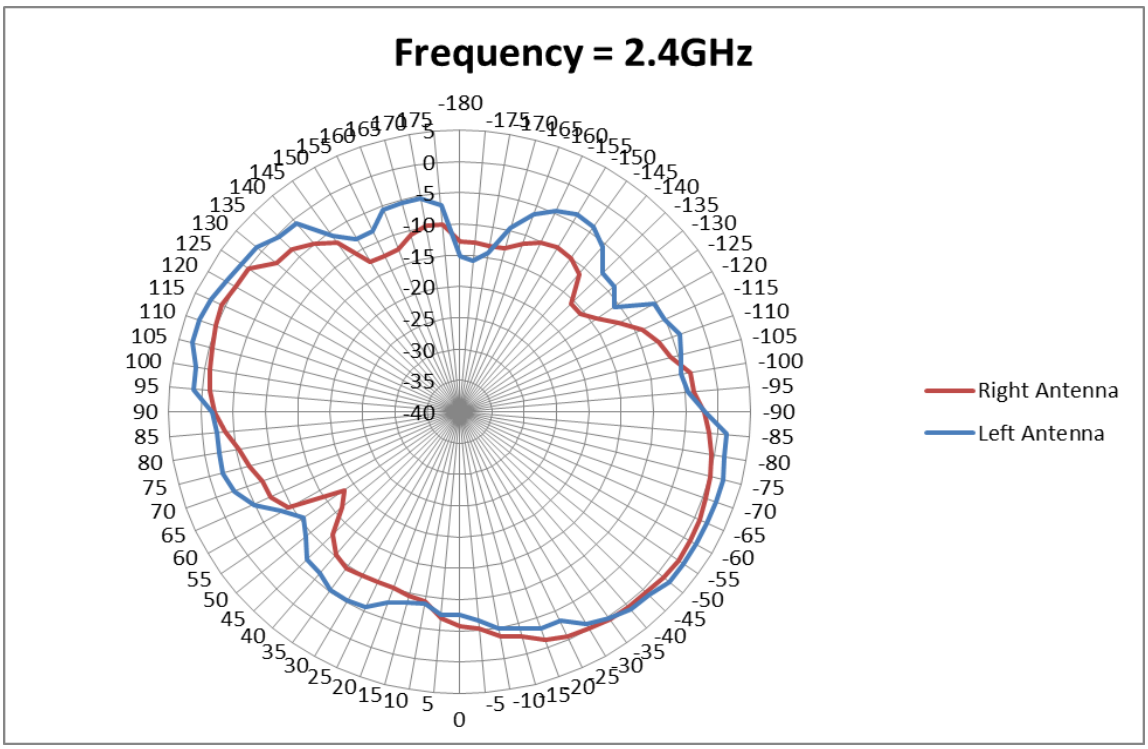


**Figure 17 Radiation Plots for 2.400GHz (E1-Plane)**

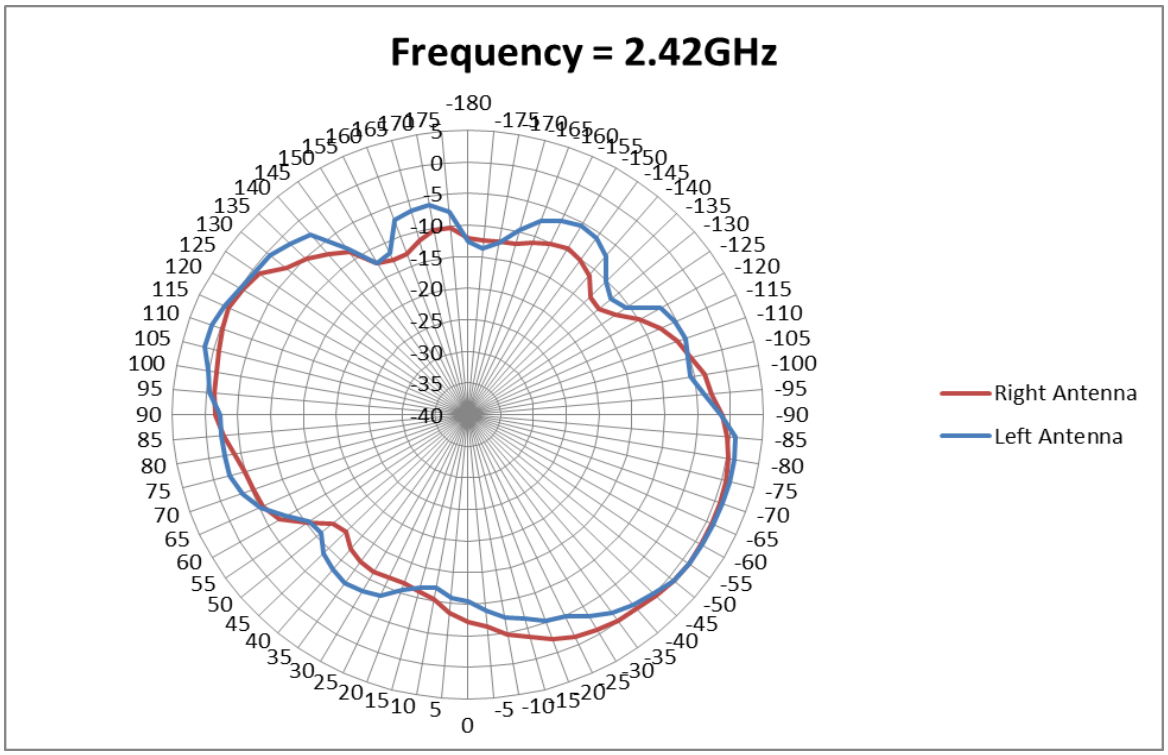


**Figure 18 Radiation Plots for 2.420GHz (E1-Plane)**

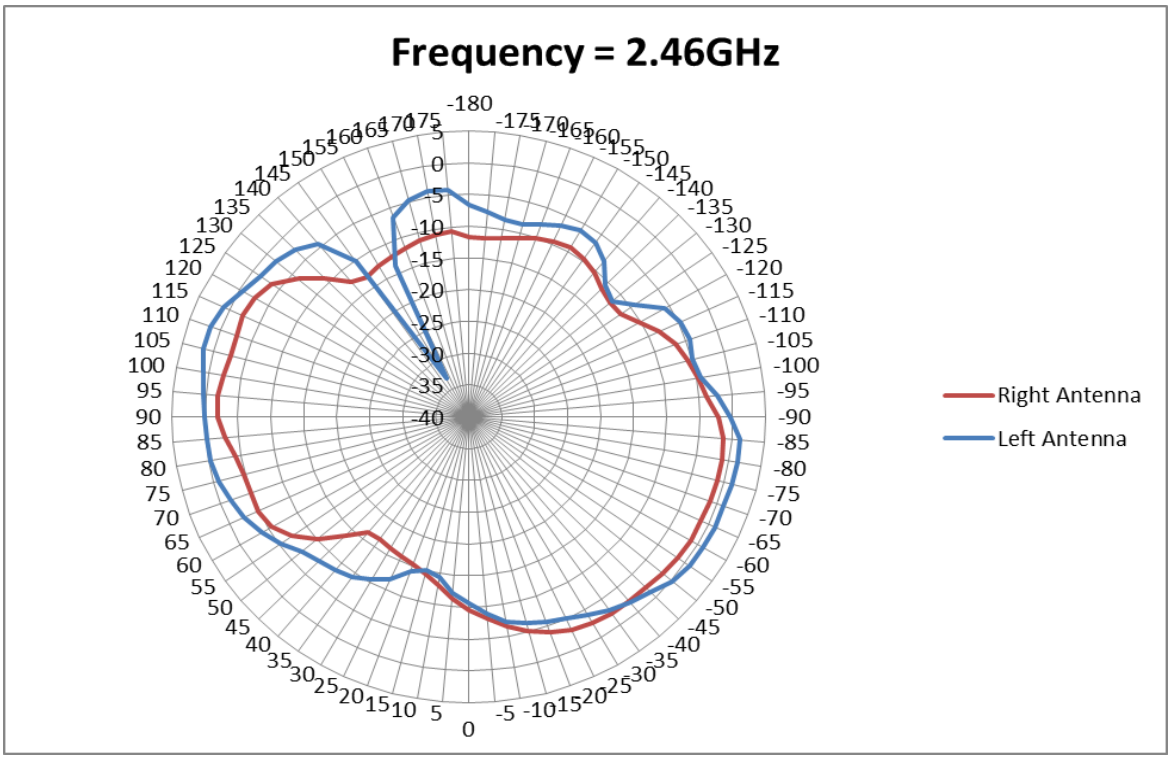


**Figure 19 Radiation Plots for 2.460GHz (E1-Plane)**

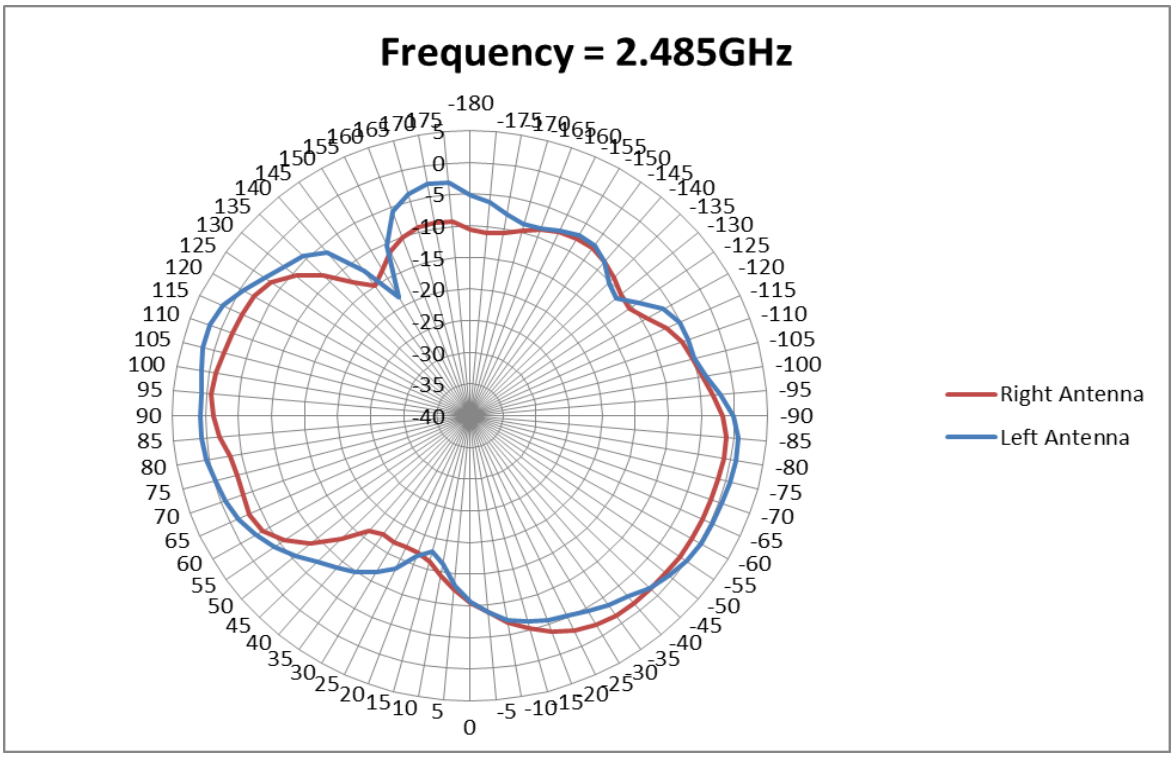


**Figure 20 Radiation Plots for 2.485GHz (E1-Plane)**

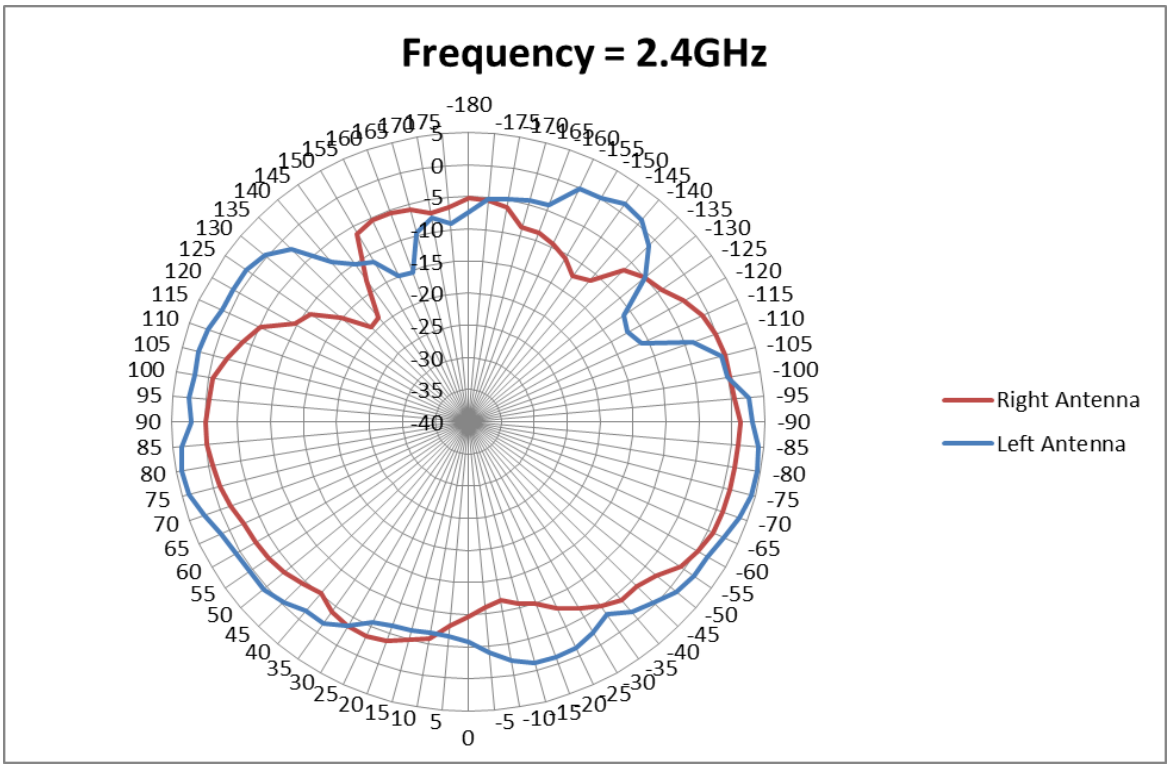


**Figure 21 Radiation Plots for 2.400GHz (E2-Plane)**

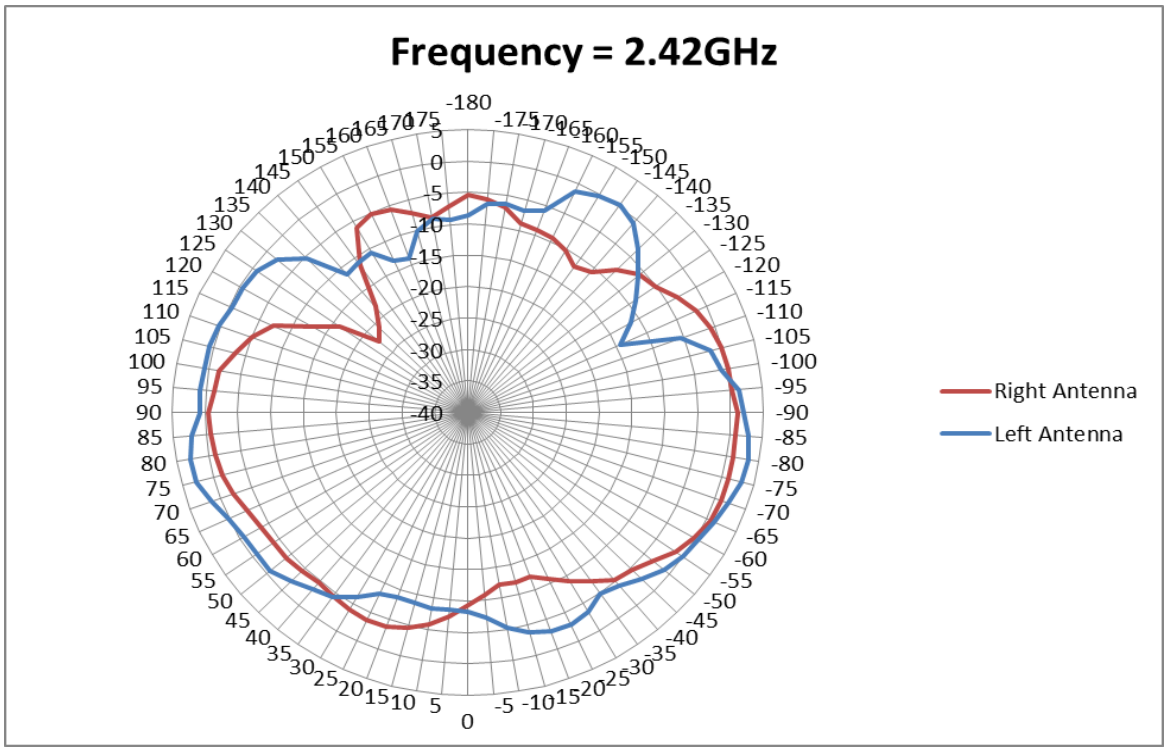


**Figure 22 Radiation Plots for 2.420GHz (E2-Plane)**

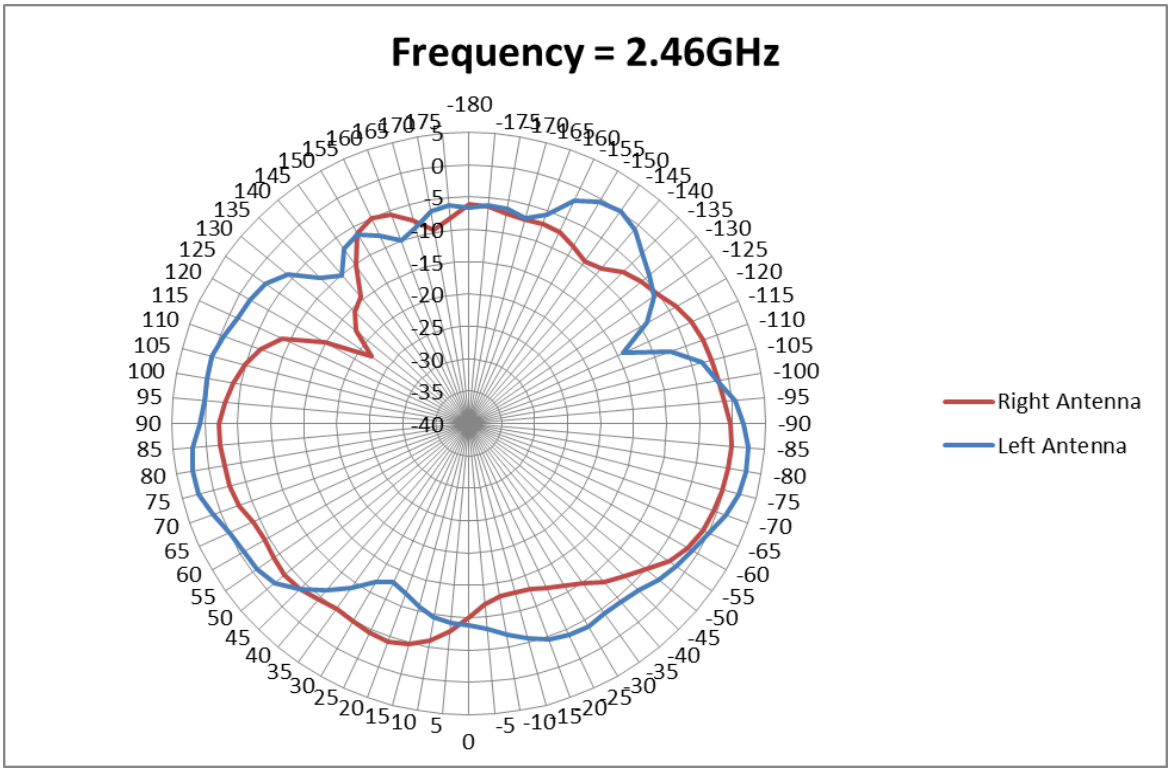


**Figure 23 Radiation Plots for 2.460GHz (E2-Plane)**

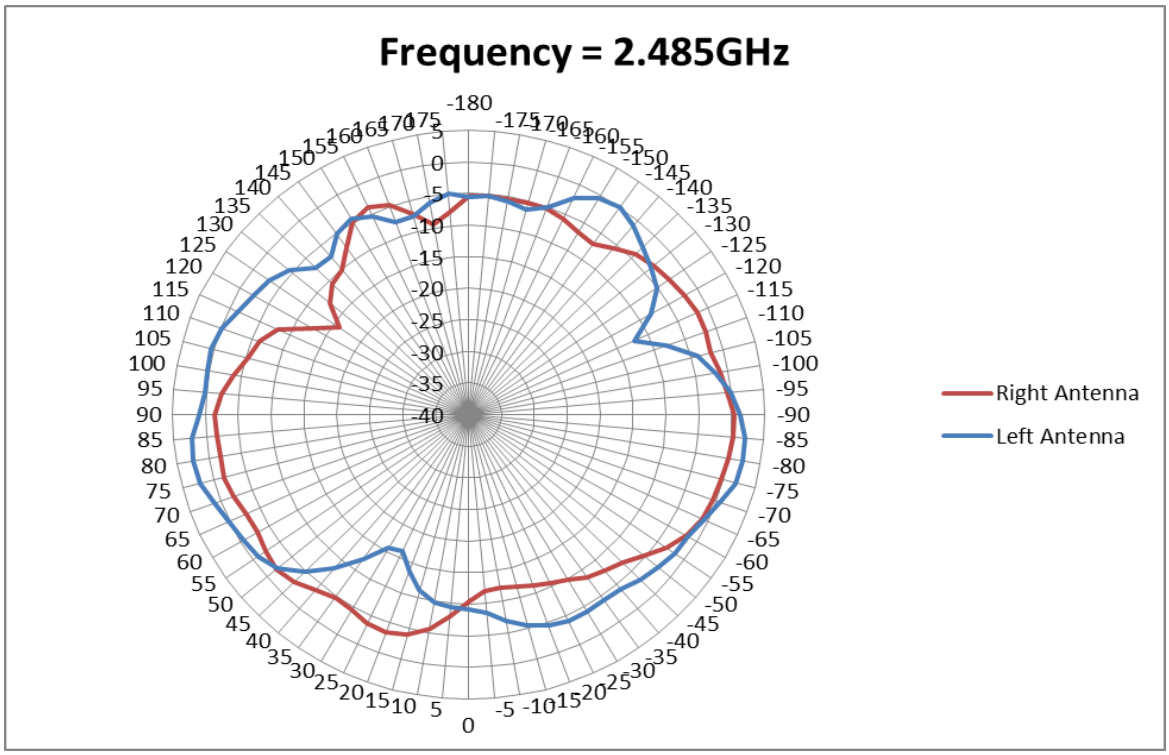


**Figure 24 Radiation Plots for 2.485GHz (E2-Plane)**

The following Plots shall describe the peak gain of the antenna for various planes with respect to frequency.

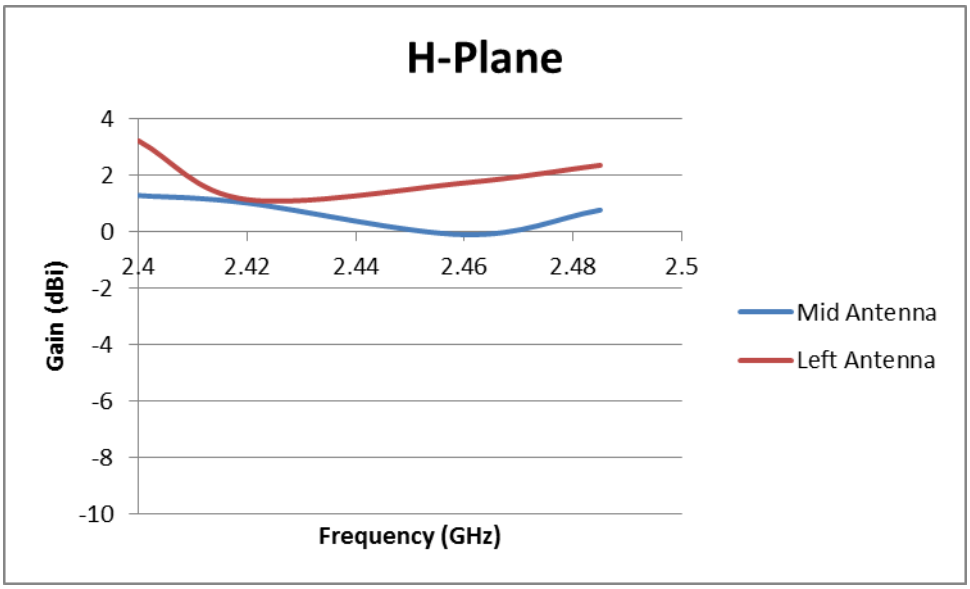


**Figure 25 Peak Gain for Bluetooth Printed Antenna (H-Plane)**

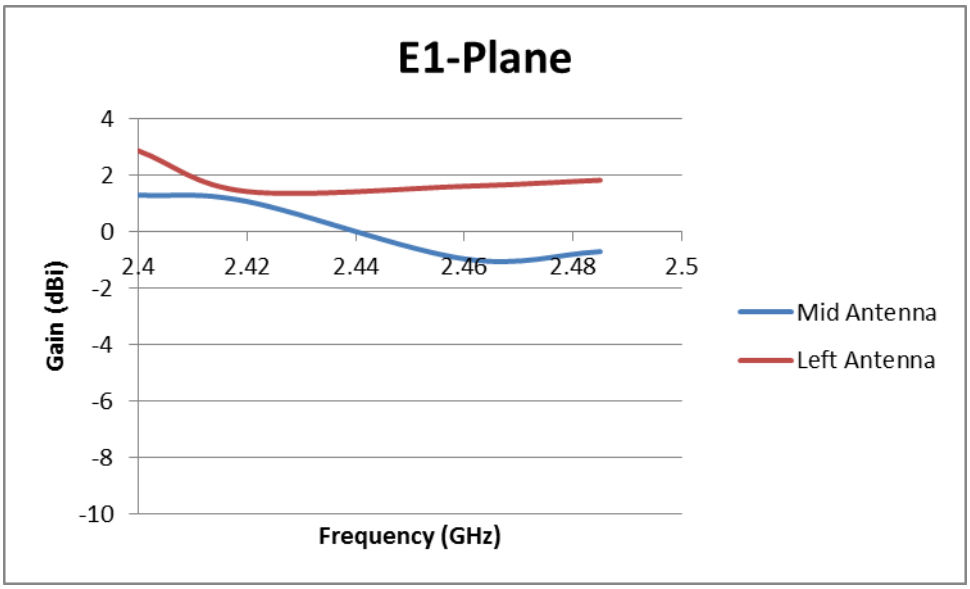


**Figure 26 Peak Gain for Bluetooth Printed Antenna (E1-Plane)**

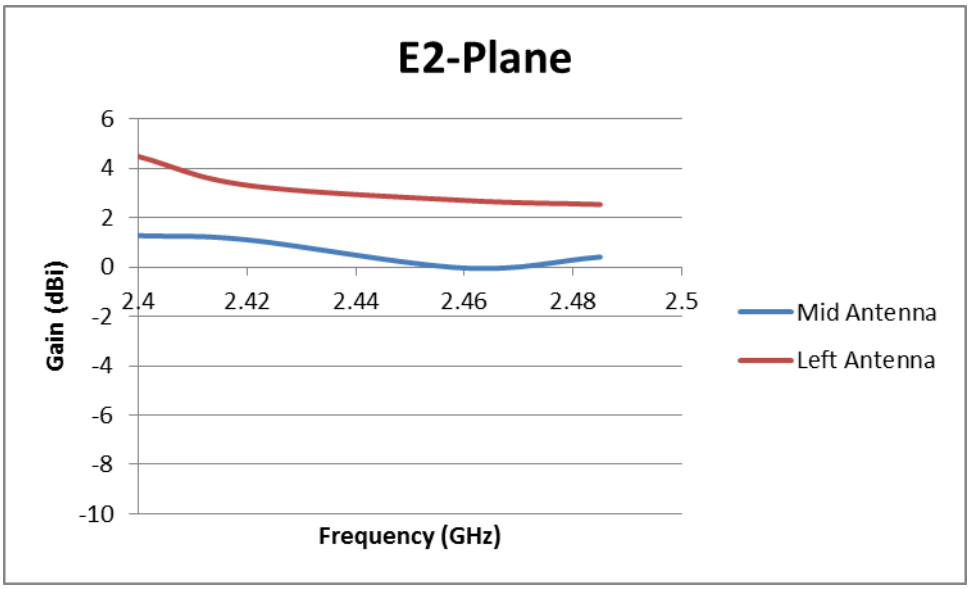


**Figure 27 Peak Gain for Bluetooth Printed Antenna (E2-Plane)**

# 4. 5GHz WIFI ANTENNA RADIATION PLOTS

The following plots describe the 2D Radiation pattern for both the Left and Right WIFI External Antenna in the 5GHz Band.

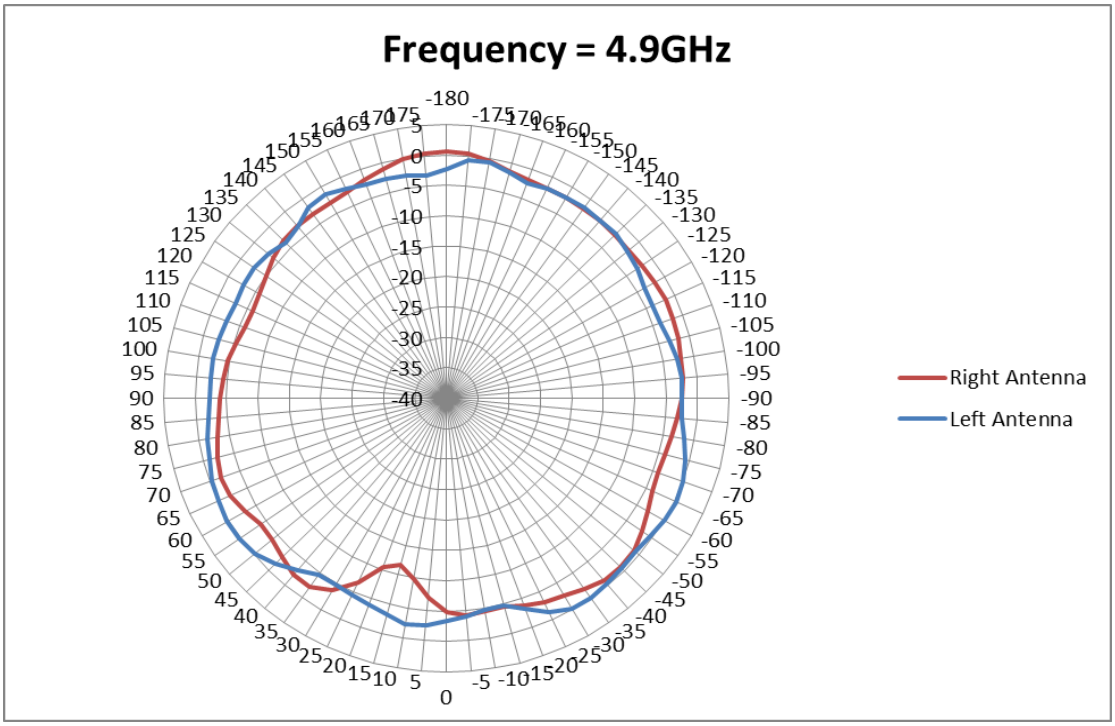


**Figure 28 Radiation Plots for 4.900GHz (H-Plane)**

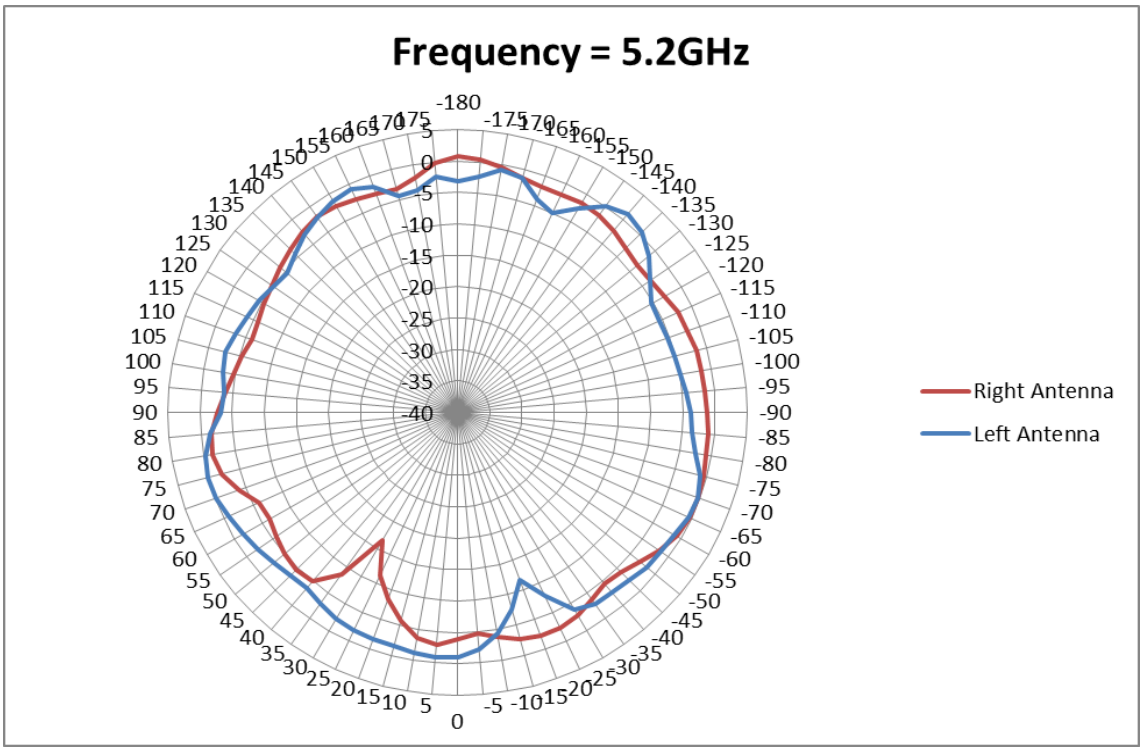


**Figure 29 Radiation Plots for 5.200GHz (H-Plane)**

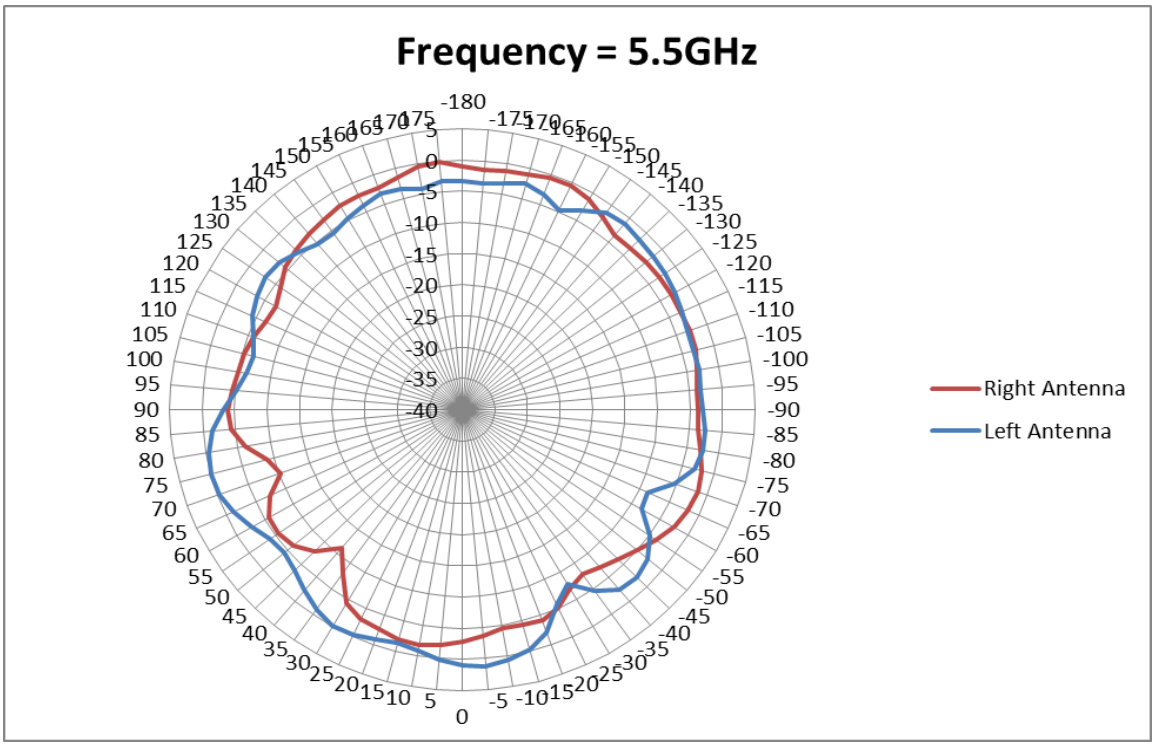


**Figure 30 Radiation Plots for 5.500GHz (H-Plane)**

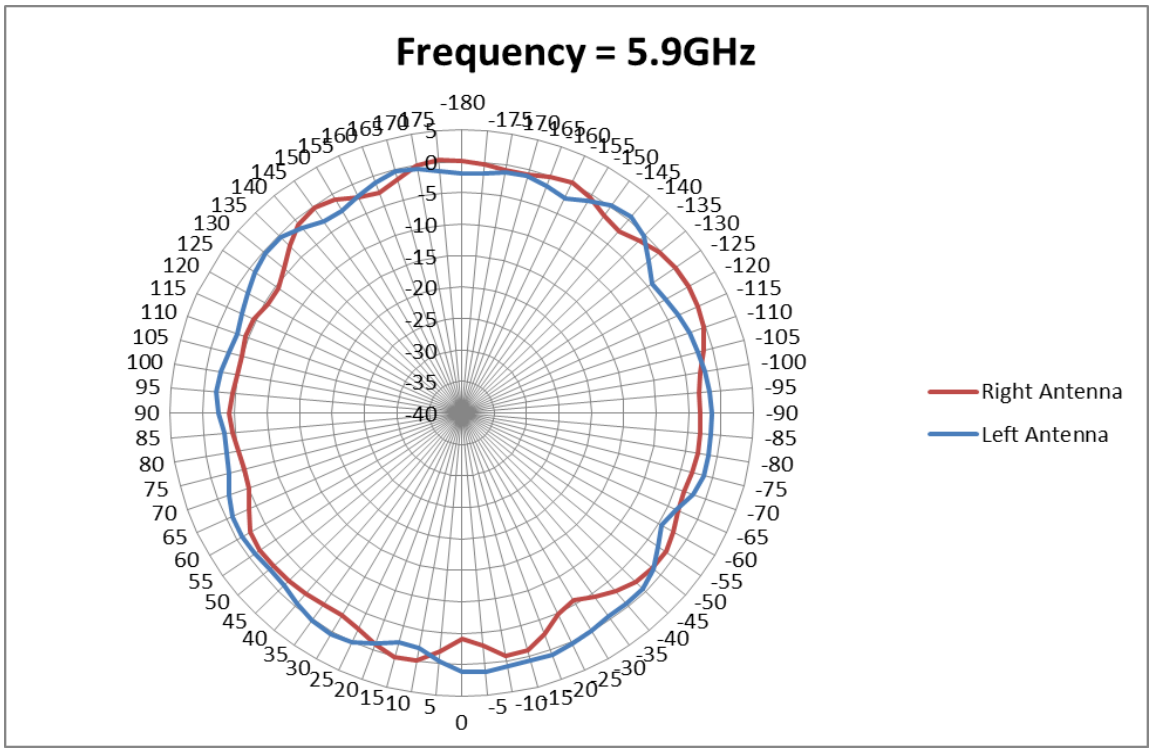


**Figure 31 Radiation Plots for 5.900GHz (H-Plane)**

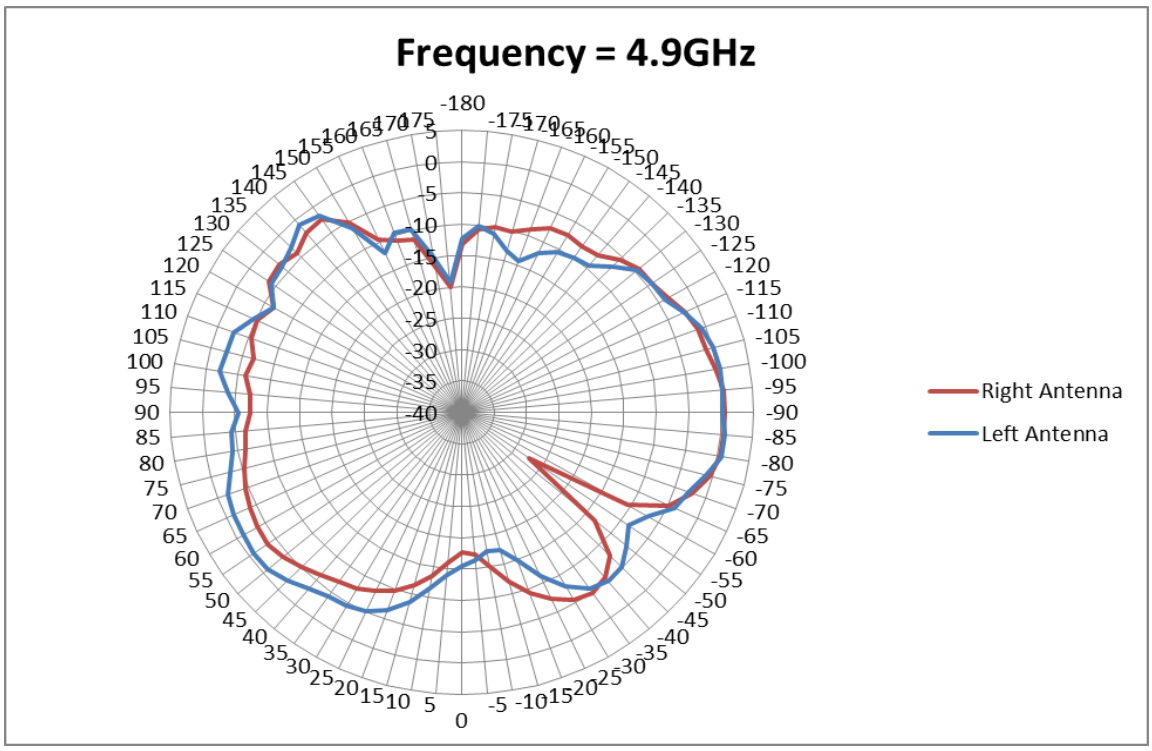


**Figure 32 Radiation Plots for 4.900GHz (E1-Plane)**

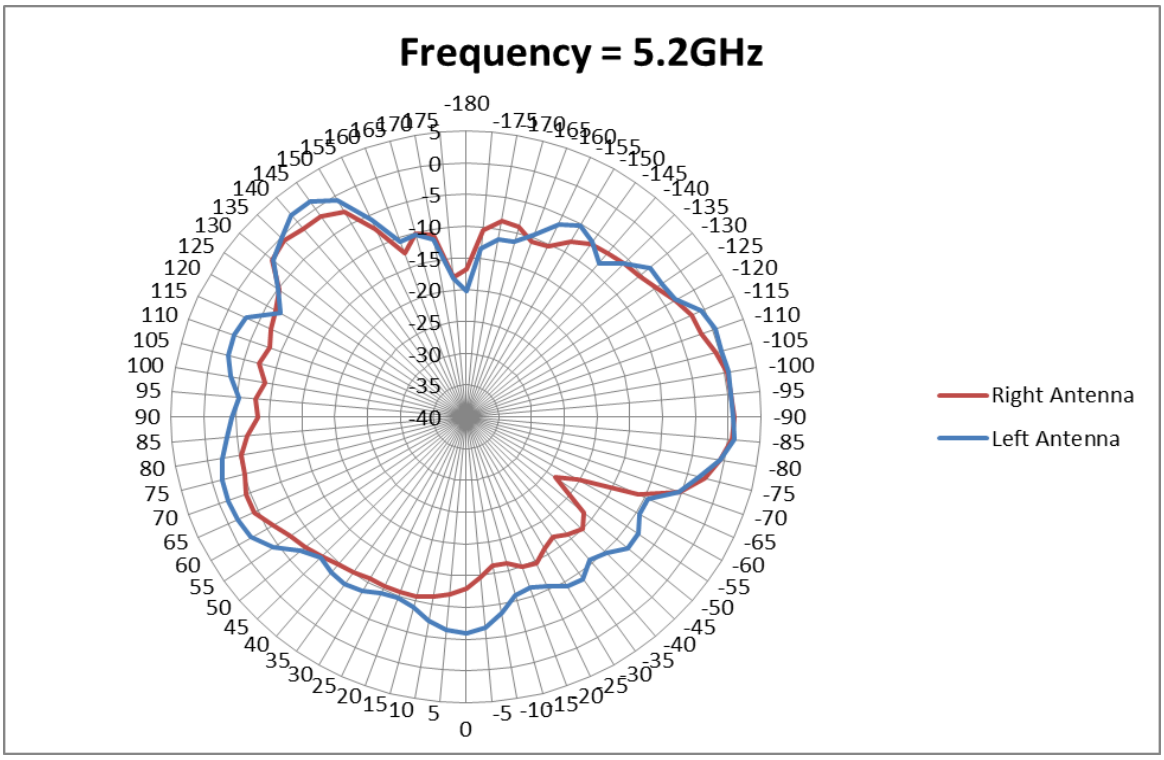


**Figure 33 Radiation Plots for 5.200GHz (E1-Plane)**

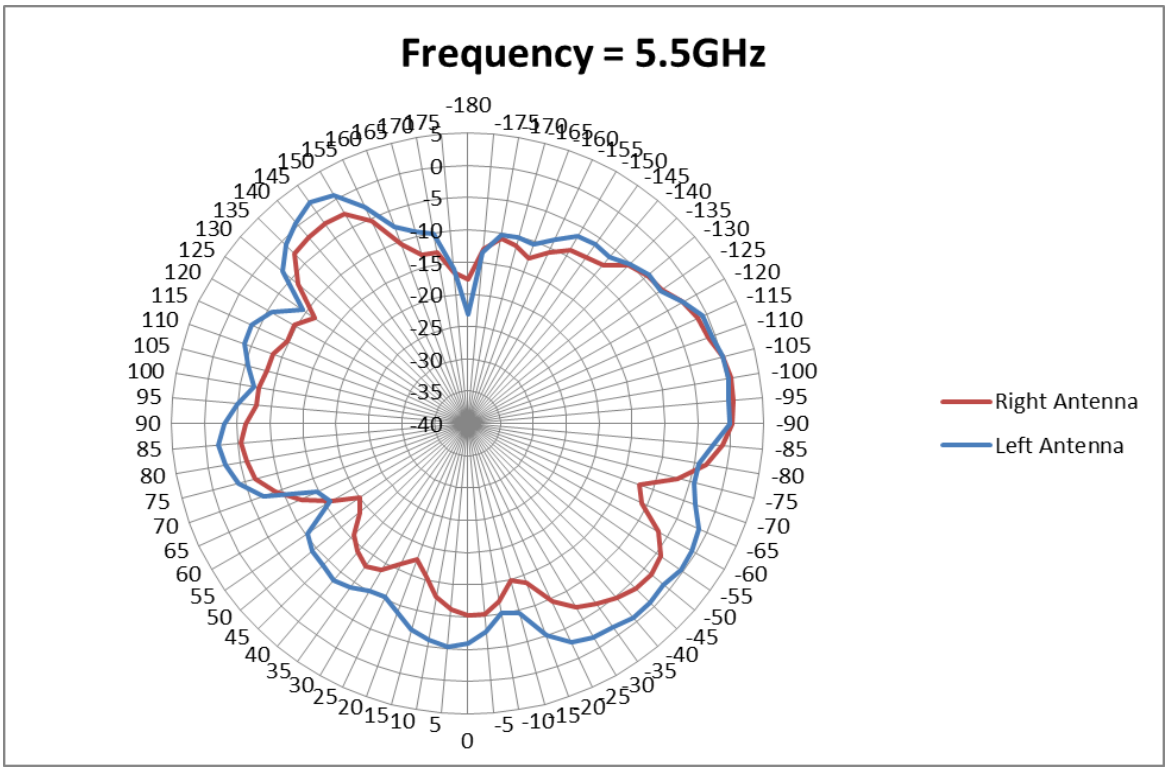


**Figure 34 Radiation Plots for 5.500GHz (E1-Plane)**

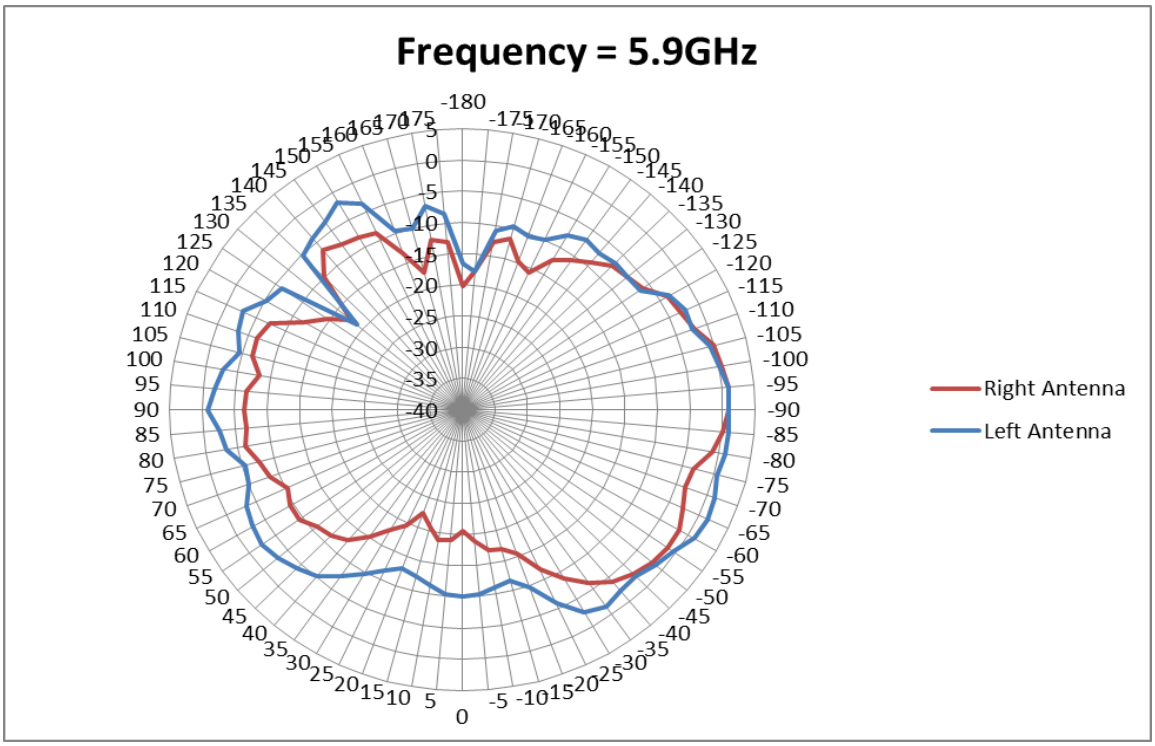


**Figure 35 Radiation Plots for 5.900GHz (E1-Plane)**

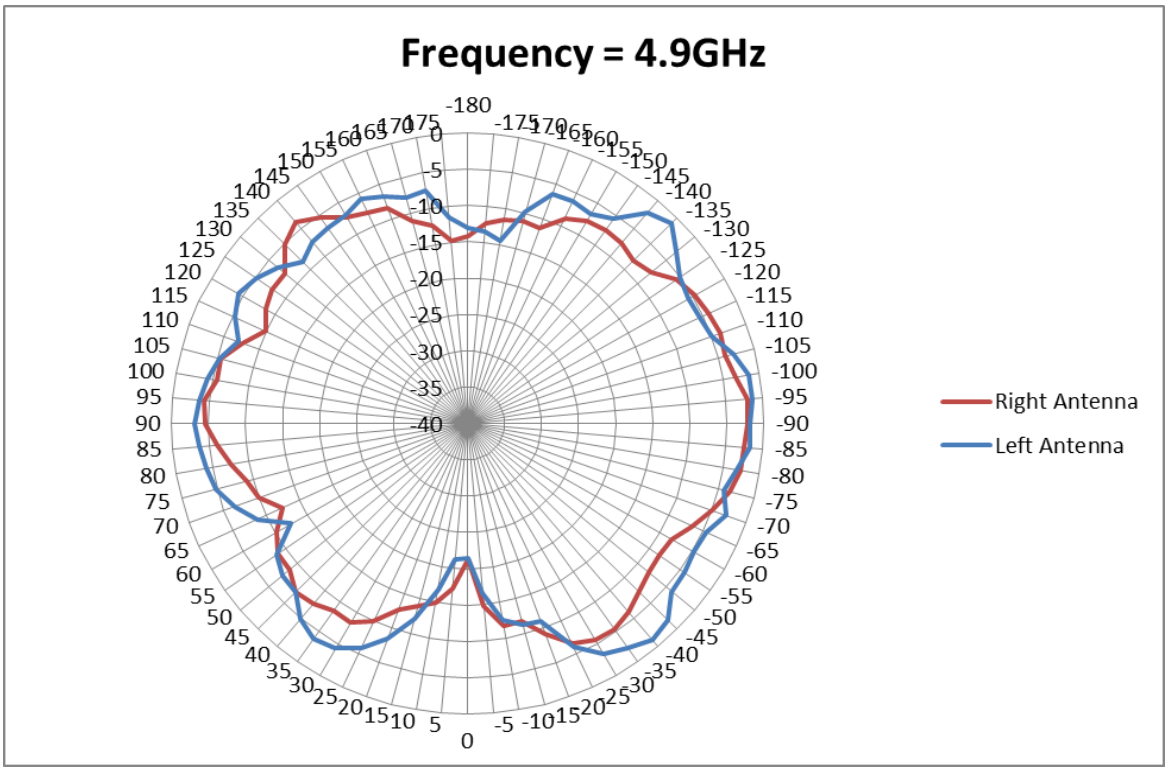


**Figure 36 Radiation Plots for 4.900GHz (E2-Plane)**

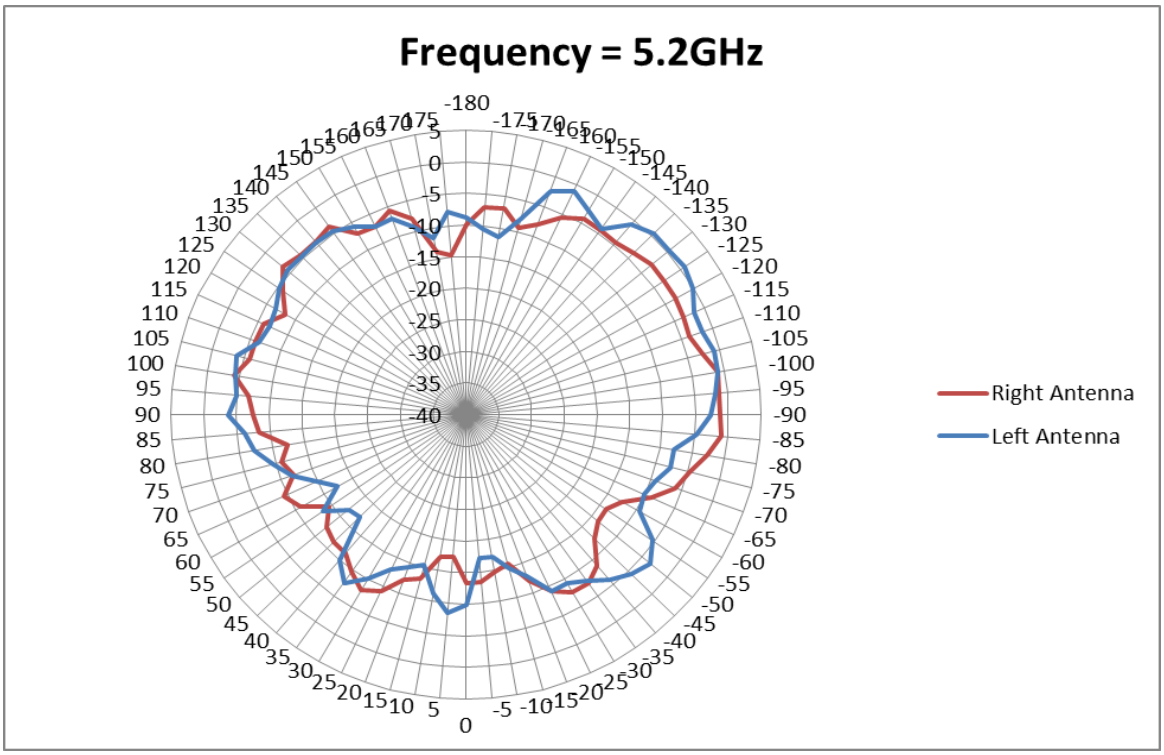


**Figure 37 Radiation Plots for 5.200GHz (E2-Plane)**

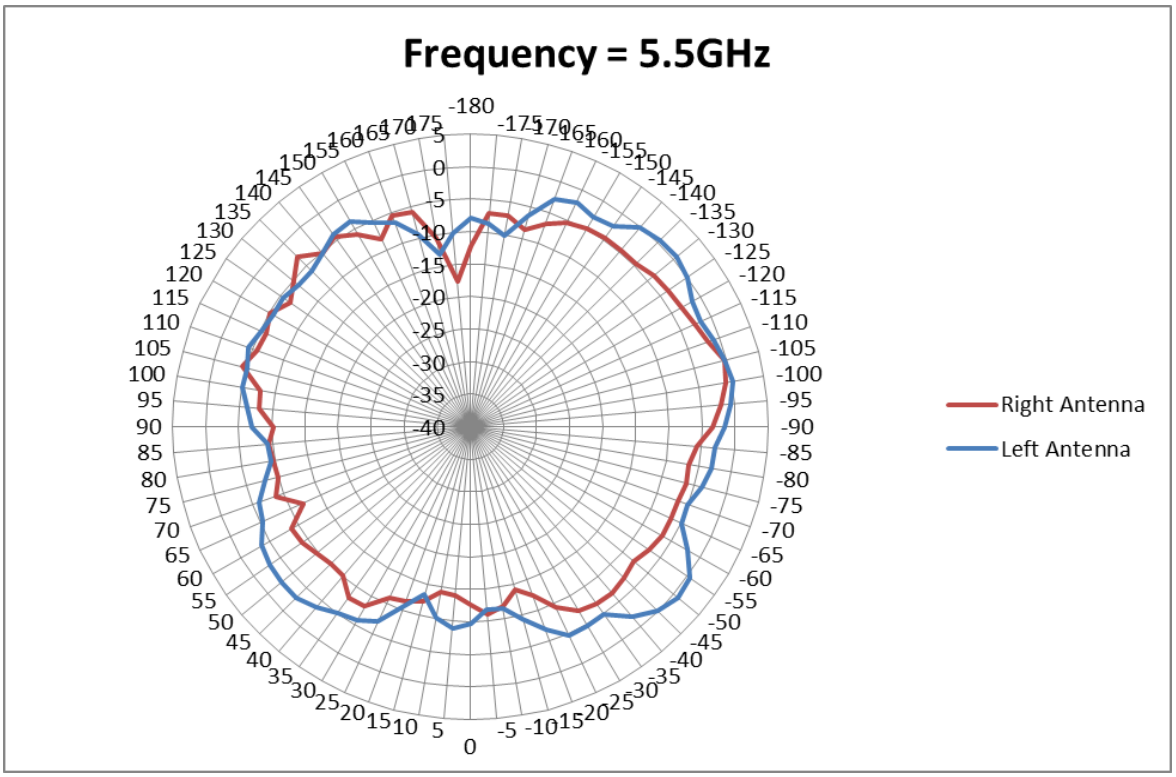


**Figure 38 Radiation Plots for 5.500GHz (E2-Plane)**

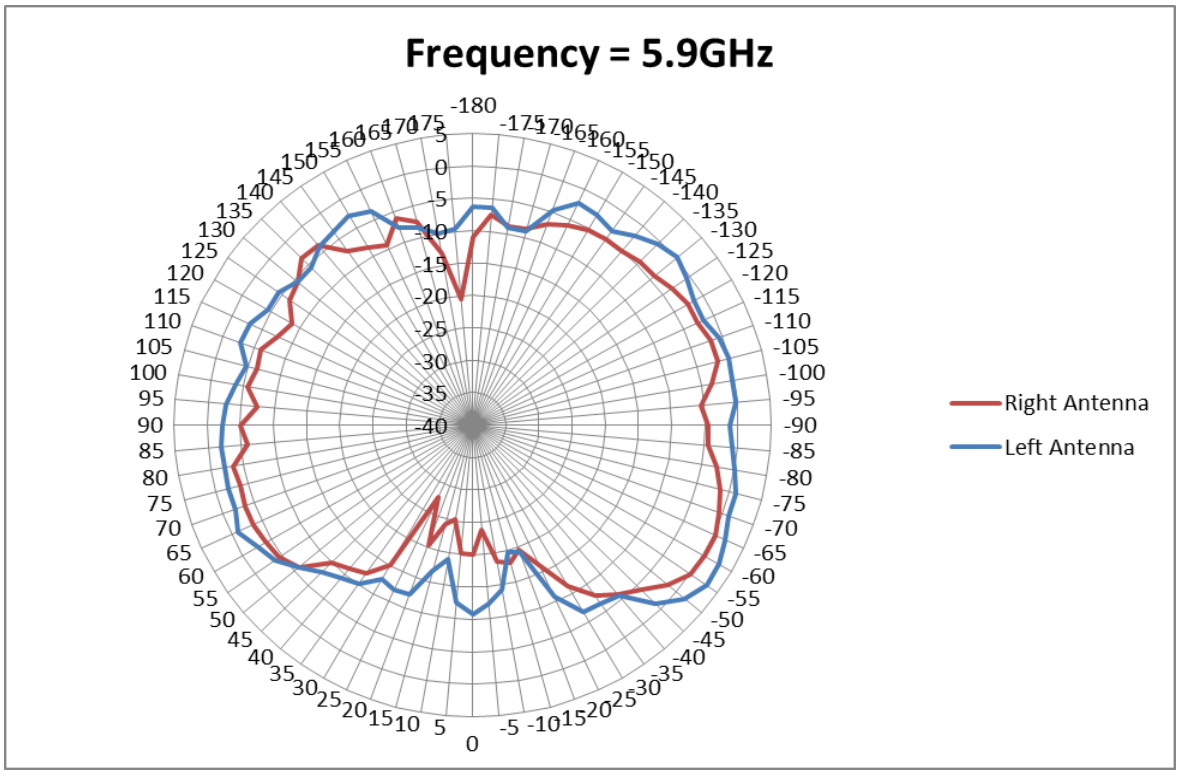


**Figure 39 Radiation Plots for 5.900GHz (E2-Plane)**

The following Plots shall describe the peak gain of the antenna for various planes with respect to frequency.

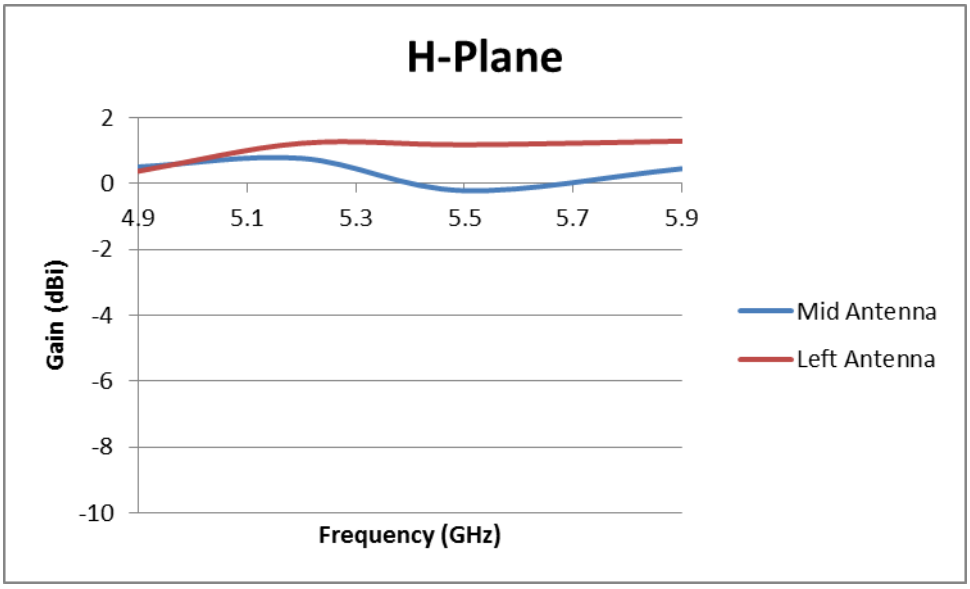


**Figure 40 Peak Gain for Bluetooth Printed Antenna (H-Plane)**

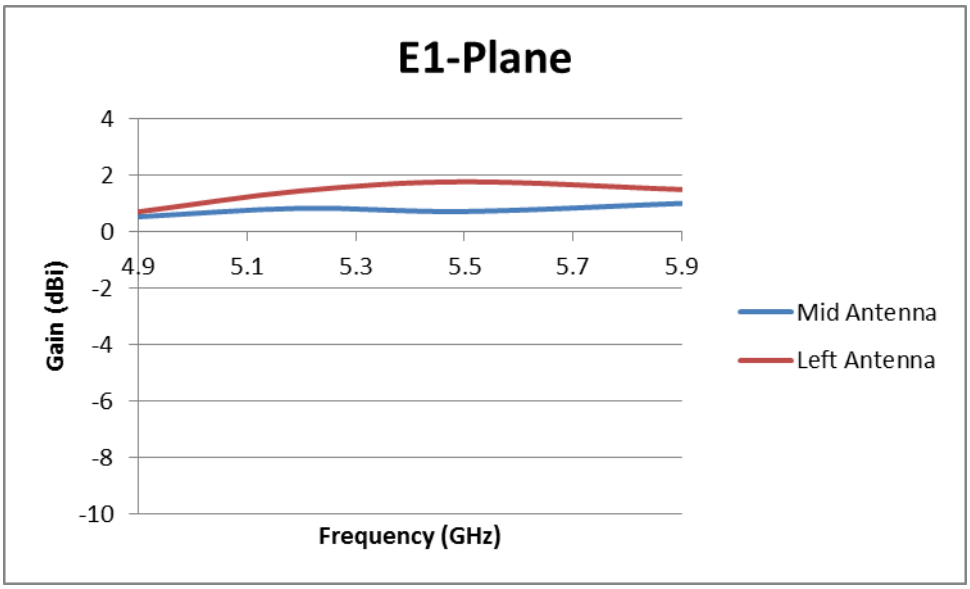


**Figure 41 Peak Gain for Bluetooth Printed Antenna (E1-Plane)**

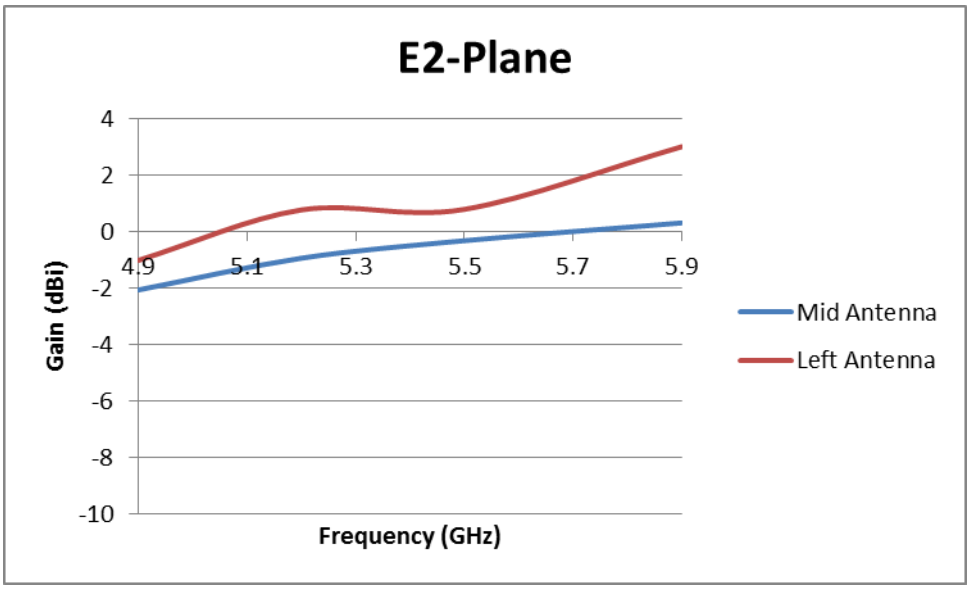


**Figure 42 Peak Gain for Bluetooth Printed Antenna (E2-Plane)**

| | | 2.4GHz | 2.42GHz | 2.46GHz | 2.485GHz | 4.9GHz | 5.2GHz | 5.5GHz | 5.9GHz |
|---|---|---|---|---|---|---|---|---|---|
| Left Antenna | H-Plane | 1.73dBi | -0.36dBi | 0.23dBi | 0.86dBi | -0.62dBi | 0.23dBi | 0.19dBi | 0.29dBi |
| | E1-Plane | 1.37dBi | -0.07dBi | 0.11dBi | 0.33dBi | -0.29dBi | 0.45dBi | 0.77dBi | 0.50dBi |
| | E2-Plane | 2.98dBi | 1.81dBi | 1.20dBi | 1.03dBi | -2.01dBi | -0.22dBi | -0.20dBi | 2.02dBi |
| Right Antenna | H-Plane | 0.79dBi | 0.52dBi | -0.60dBi | 0.27dBi | 0.51dBi | 0.77dBi | -0.21dBi | 0.46dBi |
| | E1-Plane | 0.80dBi | 0.57dBi | -1.46dBi | -1.20dBi | 0.53dBi | 0.83dBi | 0.72dBi | 1.01dBi |
| | E2-Plane | 0.77dBi | 0.60dBi | -0.54dBi | -0.09dBi | -2.06dBi | -0.94dBi | -0.32dBi | 0.32dBi |

**Table 1 Peak Gain for External WIFI Antenna**

## 5. CONCLUSION

The various results above showed that both the WIFI External Antenna is operating within the required Specifications.