

# FCC Composite Gain Test Report

---

***TP-Link Systems Inc.***  
10 Mauchly, Irvine, CA 926187



Copyright © 2024 By TP-Link Systems Inc. All rights reserved.

The drawings, specifications and the data contained in this document are exclusively the property of TP-Link Systems Inc. The information is intended for internal use only and is subject to change without any notice.

With no written permission from TP-Link Systems Inc. this document, in parts or as a whole, shall not be reproduced, copied, or used in any form or by any means to make any derivatives such as translation, transformation, or adaptation, for any purpose whatever.



is a registered trademark of TP-Link Systems Inc. Other brands and product names mentioned herein are trademarks or registered trademarks of their respective holders.

### Warning

This document is intended for internal use only. A Non-Disclosure Agreement (NDA) approved by Chief Technology Officer (CTO) is required to release this document under any circumstances.

### Basic Information

|                  |                                          |       |            |
|------------------|------------------------------------------|-------|------------|
| EUT Description: | AX3000 High Power Gigabit Wi-Fi 6 Router |       |            |
| Brand Name:      | tp-link                                  |       |            |
| Model Name:      | Archer AX53HP                            |       |            |
| Tested By:       | Yu Sunli                                 | Date: | 2025/03/18 |

## CONTENTS

|          |                                                       |           |
|----------|-------------------------------------------------------|-----------|
| <b>1</b> | <b>Operation Mode and Antenna Information .....</b>   | <b>4</b>  |
| 1.1      | EUT Operation Mode .....                              | 4         |
| 1.2      | Antenna Information .....                             | 4         |
| 1.3      | Test Frequency .....                                  | 4         |
| <b>2</b> | <b>Test System.....</b>                               | <b>5</b>  |
| 2.1      | Test Equipment.....                                   | 5         |
| 2.2      | Test Software.....                                    | 5         |
| <b>3</b> | <b>Test Summary.....</b>                              | <b>5</b>  |
| 3.1      | Measurement Environment .....                         | 5         |
| 3.2      | Measurement Quantity .....                            | 8         |
| 3.3      | Test Method.....                                      | 8         |
| 3.4      | Directional Gain Calculations .....                   | 8         |
| 3.5      | Test Procedure .....                                  | 9         |
| <b>4</b> | <b>Measured Value and Maximum Gain Positions.....</b> | <b>10</b> |
| 4.1      | Antenna Number .....                                  | 10        |
| 4.2      | 2G .....                                              | 10        |
| 4.2.1    | DG_1SS Max Value Position .....                       | 10        |
| 4.2.2    | DG_1SS Max Value Position Calculation .....           | 10        |
| 4.3      | 5G .....                                              | 11        |
| 4.3.1    | DG_1SS Max Value Position .....                       | 11        |
| 4.3.2    | DG_1SS Max Value Position Calculation .....           | 11        |
| <b>5</b> | <b>Test and Calculate Result .....</b>                | <b>11</b> |
| 5.1      | Peak Antenna Gain (Single) .....                      | 11        |
| 5.2      | Directional Gain Calculate Result .....               | 12        |
| <b>6</b> | <b>Test Pattern.....</b>                              | <b>13</b> |
| 6.1      | Antenna Pattern.....                                  | 13        |
| 6.2      | Test Data.....                                        | 16        |

# 1 Operation Mode and Antenna Information

## 1.1 EUT Operation Mode

The Archer AX58HP is the AX3000 High Power Gigabit Wi-Fi 6 Router of 4 external antennas.

## 1.2 Antenna Information

The Antennas are external , the Locations of Antennas are shown below:



Figure 1-1 Locations of Antennas

The Antenna Information was shown below:

Table 1-1 Antenna Information

| Antenna Position | Antenna Type | Connector | Mode of operation |
|------------------|--------------|-----------|-------------------|
| Ant1             | Dipole       | Weld      | 2.4G              |
| Ant2             | Dipole       | Weld      | 2.4G              |
| Ant3             | Dipole       | Weld      | 5G                |
| Ant4             | Dipole       | Weld      | 5G                |

## 1.3 Test Frequency

The Listed frequency of each bands are selected to represent each frequency bands.

Table 1-2 Test Frequency

| Frequency Band(MHz) | Test Frequency(MHz) |
|---------------------|---------------------|
| 2400-2500           | 2450                |
| 5150-5250           | 5200                |
| 5250-5350           | 5300                |
| 5470-5725           | 5600                |
| 5725-5950           | 5800                |

## 2 Test System

### 2.1 Test Equipment

Table 2-1 Test System

| Equipment                  | Model       | Manufacturer | S/N        | Cali. Interval | Cali. Due Date |
|----------------------------|-------------|--------------|------------|----------------|----------------|
| Chamber                    | Rayzone2800 | GTS          | MY53470435 | 12months       | 2025/04/15     |
| Vector<br>Network Analyzer | E5071C      | Keysight     | MY46315238 | 24months       | 2025/05/27     |

### 2.2 Test Software

Table 2-2 Test Software

| Software       | Version | Function                     |
|----------------|---------|------------------------------|
| GTS MaxSign100 | V2.1    | Passive Antenna Measurements |

## 3 Test Summary

### 3.1 Measurement Environment

This measurement experiment adopted an antenna near-field measurement system, and the diagram of the measurement system was shown in Figure 3-1. The excitation signal was generated by the Keysight E5071C (300kHz-20GHz). Under the control of the central computer, the probe rotated in the  $\theta$  direction, and the EUT rotated in the  $\phi$  direction with the turntable. The probe sampling frame received and collected signals in the near-field range of the EUT. The software system which was controlled by the central computer completed the processing, output and display of the test data.

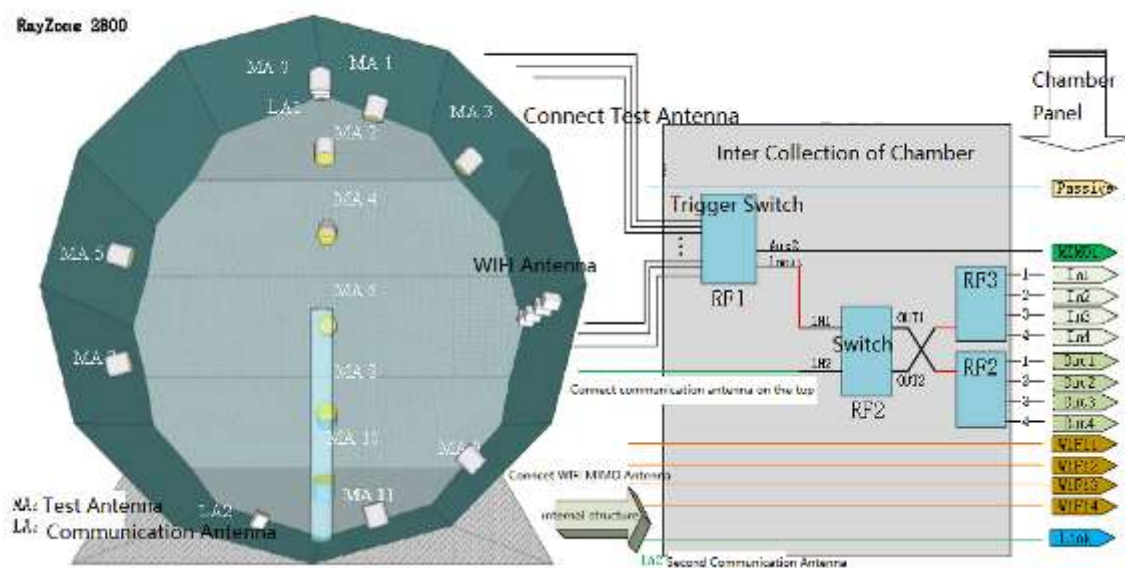


Figure 3-1 Schematic diagram of antenna near-field measurement system

The test site was a full anechoic chamber with a size of 3.0m×3.1m×2.97m, which was built by GTS Rayzone2800. All six surfaces of the anechoic chamber were pasted with absorbing materials. And the chamber was calibrated by the authoritative third-party lab every year. The antenna anechoic chamber measurement system adopted a 13-probe multi-probe system. The probe antennas were evenly distributed on the spherical surface surrounding the EUT, and their operating frequency was 600MHz~8.5GHz.

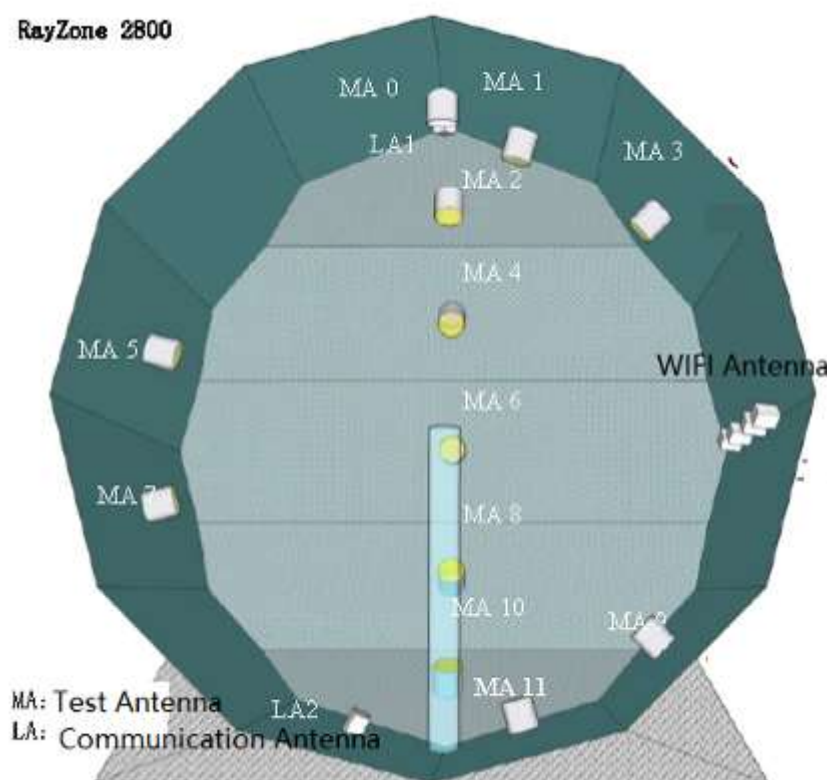


Figure 3-2 Antenna anechoic chamber for near-field measurement

During the measurement, the probe antennas were rotated in the  $\theta$  direction under the control of the probe holder to sample the near-field data at the  $\theta$  angle. At the same time, the EUT rotated with the turntable in the  $\phi$  direction to sample the near field data at the  $\phi$  angle. The system diagram was shown in Figure 3-3. From the sampling results, the EUT's near-field test data of  $\theta$  component,  $\phi$  component and total component could be obtained.

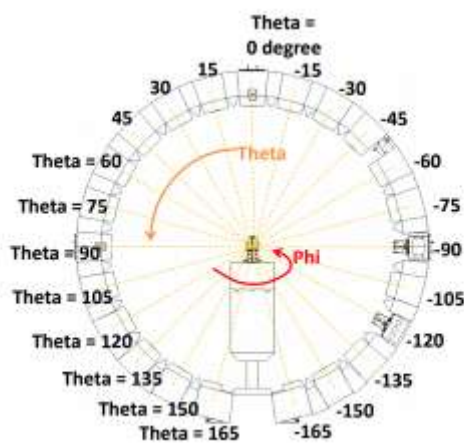


Figure 3-3 System diagram

Before the measurement, calibrated the vector network analyzer, and then connected the input end of each antenna to the output end of the vector network analyzer, and evenly the antennas to be measured. The Calibration information was shown in table 2-1.



Figure 3-4 Antennas measurement diagram

Table 3-1 Calibration information

| Measurement Class | Standard |
|-------------------|----------|
| Cal Type          | 2p/1-2   |
| Cal Kit           | N4691B   |

## 3.2 Measurement Quantity

In this measurement experiment, the Directional Gain was measured at a certain frequency interval within the whole frequency range. The measurement frequency interval of the 2.4G antennas was 10MHz, while the 5GL and 5GU and 6G antennas was 50MHz.

## 3.3 Test Method

During the measurement, the probe antennas were rotated in the  $\theta$  direction under the control of the probe holder to sample the near-field data at the  $\theta$  angle. At the same time, the EUT rotated with the turntable in the  $\phi$  direction to sample the near field data at the  $\phi$  angle. The sampling accuracy was  $15^\circ$ . The system diagram was shown in Figure 2-6. From the sampling results, the EUT's near-field test data of  $\theta$  component,  $\phi$  component and total component could be obtained.

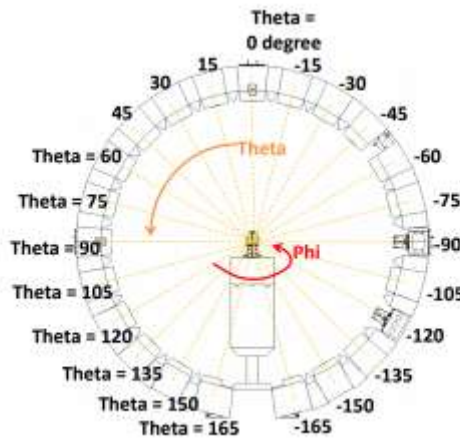


Figure 3-5 Test angle

## 3.4 Directional Gain Calculations

Multiple antennas system, each of which has one of two (or three) polarizations that are orthogonal to one another (i.e., cross polarized), The total gain—including array gain—is computed separately for each of the two (or three) polarizations using the procedures presented in this document. The highest of the total gains shall apply.

Theoretical Directional Gain represented the theoretical value calculated by formula 2-1. As we all know, the effect of array gain must be included in the calculation of overall directional antenna gain for devices that transmit on multiple outputs simultaneously in the same band, in the same or in overlapping frequency ranges. Therefore, in formula 2-1, the directional gain calculation needs to include all directions and all Frequencies and all Polarizations, and then take the maximum value as the final directional gain value. Therefore, the calculation formula of theoretical directional gain value can be modified as formula 2-2

$$\text{Directional Gain} = 10\log \left[ \frac{\sum_{j=1}^{N_{SS}} \left( \sum_{k=1}^{N_{ANT}} g_{j,k} \right)^2}{N_{ANT}} \right] \quad (2-1)$$

Where

$N_{SS}$  = the number of independent spatial streams of data;  $N_{SS} = 1$ .

$N_{ANT}$  = the total number of antennas:  $N_{ANT} = 4$  for 2.4G & 5G antennas



$g_{j,k} = 10^{G_k/20}$  if the kth antenna is being fed by spatial stream j, or zero if it is not;

$G_k$  is the gain in dBi of the kth antenna .

$$\text{Directional Gain} = \text{Maximum} \left[ 10 \log \left[ \frac{\sum_{j=1}^{N_{SS}} \left( \sum_{k=1}^{N_{ANT}} g_{j,k} \right)^2}{N_{ANT}} \right] \right] \quad (2-2)$$

**Maximum** function is the max directional gain overall directions and all frequency all polarizations.

### 3.5 Test Procedure

The calculation method of DG (Directional Gain) in this scheme is summarized as follows:

- 1) The antenna anechoic chamber is used to measure the gain of each antenna, the gain of each antenna at this angle is taken every 15° to calculate the Directional Gain;
- 2) Use formula below to calculate and the Directional Gain of the system at this angle is obtained

$$\text{Directional Gain} = 10 \log \left[ \frac{\sum_{j=1}^{N_{SS}} \left( \sum_{k=1}^{N_{ANT}} g_{j,k} \right)^2}{N_{ANT}} \right] \quad (2-3)$$

- 3) For each frequency point, the Directional Gain value under 24 different angles can be obtained, and finally the maximum value is taken as the system Directional Gain value.

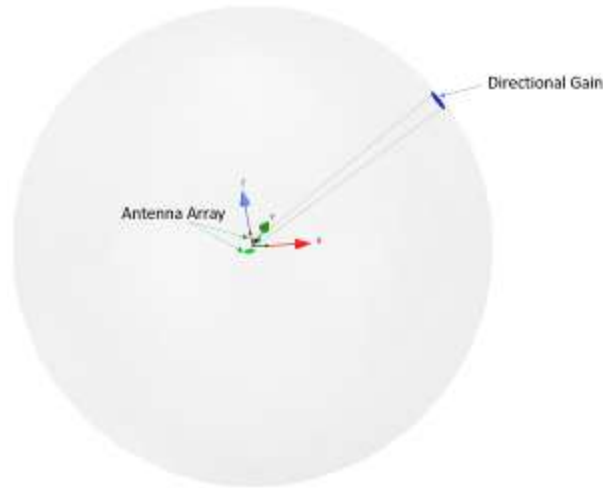


Figure 3-6 Directional Gain Calculation Sketch Map

## 4 Measured Value and Maximum Gain Positions

### 4.1 Antenna Number

The Antennas number for measured in the following section was shown below:

Table 4-1 Antennas number

| Antenna Number | Antenna Position |      |
|----------------|------------------|------|
|                | 2G               | 5G   |
| Ant1           | Ant1             | Ant3 |
| Ant2           | Ant2             | Ant4 |

### 4.2 2G

#### 4.2.1 DG\_1SS Max Value Position

Table 4-2 DG\_1SS Max Value Position

|                |       |
|----------------|-------|
| Frequency(GHz) | 2.45  |
| Ant1(dBi)      | 5.24  |
| Ant2(dBi)      | 4.89  |
| Polarization   | Theta |
| $\Phi$ (°)     | 315   |
| $\theta$ (°)   | 90    |

#### 4.2.2 DG\_1SS Max Value Position Calculation

Table 4-3 DG\_1SS Max Value Position Calculation

|                                                               |                  |
|---------------------------------------------------------------|------------------|
| Frequency(GHz)                                                | 2.45             |
| Ant1[ $10^{(G/20)}$ ]                                         | $10^{(5.24/20)}$ |
| Ant2[ $10^{(G/20)}$ ]                                         | $10^{(4.89/20)}$ |
| Ant1[ $10^{(G/20)}$ ] value                                   | 1.83             |
| Ant2[ $10^{(G/20)}$ ] value                                   | 1.75             |
| Sum of Ants Value(Antmax)                                     | 3.58             |
| DG[ $10 \cdot \log(\text{Antmax}^2 / N_{\text{ant}})$ ] (dBi) | 8.08             |

## 4.3 5G

### 4.3.1 DG\_1SS Max Value Position

Table 4-4 DG\_1SS Max Value Position

| Frequency(GHz) | 5.20  | 5.30  | 5.60  | 5.80  |
|----------------|-------|-------|-------|-------|
| Ant1(dBi)      | 4.60  | 5.41  | 5.12  | 6.71  |
| Ant2(dBi)      | 8.15  | 7.06  | 6.22  | 5.06  |
| Polarization   | Theta | Theta | Theta | Theta |
| $\Phi$ (°)     | 315   | 30    | 330   | 210   |
| $\theta$ (°)   | 90    | 90    | 75    | 75    |

### 4.3.2 DG\_1SS Max Value Position Calculation

Table 4-5 DG\_1SS Max Value Position Calculation

| Frequency(GHz)                              | 5.20             | 5.30             | 5.60             | 5.80             |
|---------------------------------------------|------------------|------------------|------------------|------------------|
| Ant1[10 <sup>^(G/20)</sup> ]                | $10^{(4.60/20)}$ | $10^{(5.41/20)}$ | $10^{(5.12/20)}$ | $10^{(6.71/20)}$ |
| Ant2[10 <sup>^(G/20)</sup> ]                | $10^{(8.15/20)}$ | $10^{(7.06/20)}$ | $10^{(6.22/20)}$ | $10^{(5.06/20)}$ |
| Ant1[10 <sup>^(G/20)</sup> ] value          | 1.70             | 1.87             | 1.80             | 2.17             |
| Ant2[10 <sup>^(G/20)</sup> ] value          | 2.55             | 2.25             | 2.05             | 1.79             |
| Sum of Ants Value(Antmax)                   | 4.25             | 4.12             | 3.85             | 3.96             |
| DG[10*Log(Antmax <sup>2</sup> /Nant)] (dBi) | 9.57             | 9.28             | 8.70             | 8.93             |

## 5 Test and Calculate Result

### 5.1 Peak Antenna Gain (Single)

Table 5-1 Antenna Test Result

| Frequency Band(MHz) | Ant1 | Ant2 |
|---------------------|------|------|
| 2400-2500           | 6.17 | 5.22 |
| 5150-5250           | 8.08 | 8.15 |
| 5250-5350           | 7.34 | 7.13 |
| 5470-5725           | 6.38 | 6.54 |
| 5725-5950           | 6.84 | 6.66 |

## 5.2 Directional Gain Calculate Result

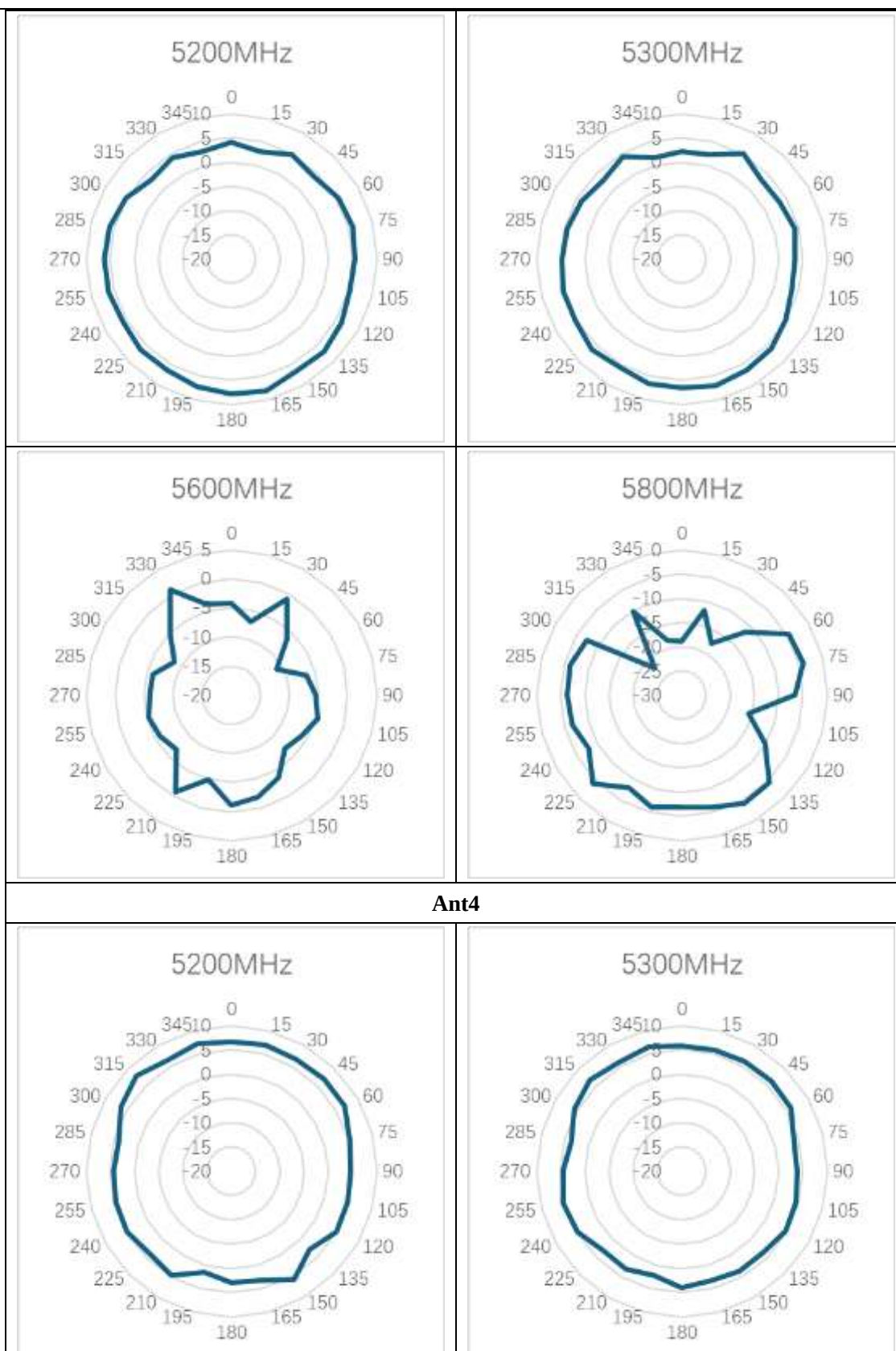
Table 5-2Test & Calculate Result

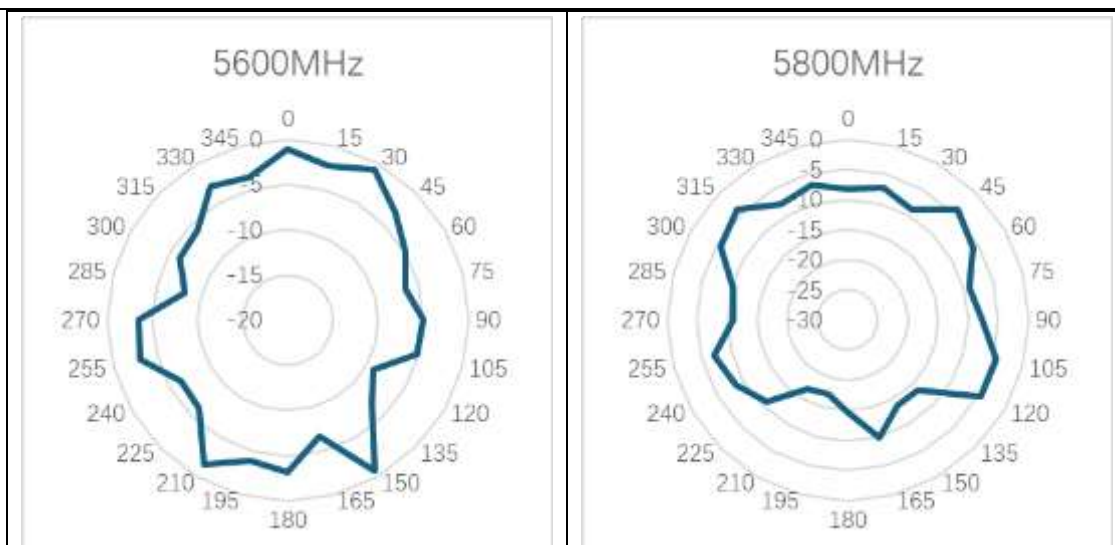
| Frequency Band(MHz) | Max Composite Gain | Polarization/ $\Phi$ (°) / $\theta$ (°) |
|---------------------|--------------------|-----------------------------------------|
| 2400-2500           | 8.08dBi            | Theta/315/90                            |
| 5150-5250           | 9.57dBi            | Theta/315/90                            |
| 5250-5350           | 9.28dBi            | Theta/30/90                             |
| 5470-5725           | 8.70dBi            | Theta/330/75                            |
| 5725-5950           | 8.93dBi            | Theta/210/75                            |

## 6 Test Pattern

### 6.1 Antenna Pattern







## 6.2 Test Data

| Ant1      |        |        |        |        |        |       |      |       |        |        |        |       |       |
|-----------|--------|--------|--------|--------|--------|-------|------|-------|--------|--------|--------|-------|-------|
| Freq      | 2450   |        |        |        |        |       |      |       |        |        |        |       |       |
| Phi\Theta | 0      | 15     | 30     | 45     | 60     | 75    | 90   | 105   | 120    | 135    | 150    | 165   | 180   |
| 0         | -11.05 | -13.8  | -15.37 | -12.78 | -14.31 | -3.47 | 1.65 | -3.94 | -4.86  | -8     | -5.4   | -4.85 | -9.79 |
| 15        | -11.45 | -13.6  | -15.56 | -9.34  | -18.74 | -0.95 | 1.44 | -5.73 | -6.22  | -7.19  | -5.31  | -6.07 | -9.79 |
| 30        | -11.62 | -12.89 | -15.76 | -4.3   | -12.15 | 0.72  | 1.96 | -4.28 | -5.12  | -3.83  | -4.79  | -6.04 | -9.79 |
| 45        | -11.75 | -11.14 | -13.63 | -3.28  | -9.93  | 2.91  | 4.35 | -3.98 | -3.9   | -3.24  | -4.32  | -5.08 | -9.79 |
| 60        | -12.02 | -9.05  | -9.46  | -2.59  | -9.14  | 3.64  | 5.21 | -1.77 | -2.84  | -3.44  | -4.92  | -5.03 | -9.79 |
| 75        | -11.6  | -8.04  | -6.59  | -3.22  | -7.42  | 3.41  | 5.06 | -2.64 | -3.57  | -5.65  | -6.16  | -5.7  | -9.79 |
| 90        | -11.04 | -8.37  | -6.23  | -6.93  | -7.03  | 1.96  | 4.83 | -1.13 | -3.45  | -7.1   | -7.42  | -7.08 | -9.79 |
| 105       | -11.05 | -9.62  | -6.72  | -9.15  | -7.71  | 0.54  | 5.4  | -0.59 | -2.03  | -5.23  | -8.93  | -8.41 | -9.79 |
| 120       | -11.33 | -11.33 | -7.52  | -8.29  | -9.58  | 1.87  | 5.27 | -1.67 | -1.94  | -4     | -8.9   | -7.88 | -9.79 |
| 135       | -11.68 | -12.6  | -9.89  | -6.13  | -8.78  | 2.29  | 4.12 | -2.31 | -2.84  | -4.25  | -8.48  | -7.16 | -9.79 |
| 150       | -11.96 | -13.38 | -12.19 | -6.62  | -7.53  | 0.55  | 3.28 | -4.8  | -4.44  | -6.71  | -10.33 | -7.44 | -9.79 |
| 165       | -11.49 | -14.06 | -11.39 | -7.7   | -5.37  | 0.33  | 2.9  | -4.64 | -2.15  | -7.65  | -10.45 | -8.41 | -9.79 |
| 180       | -10.98 | -14.48 | -10.54 | -7.49  | -10.28 | -2.27 | 3.66 | -3.04 | -1.43  | -5.96  | -9.1   | -9.79 | -9.79 |
| 195       | -11.05 | -13.93 | -11.85 | -9.02  | -9.51  | -1.7  | 3.79 | -2.76 | -2.95  | -5.11  | -11.14 | -9.51 | -9.79 |
| 210       | -11.56 | -12.34 | -15.33 | -9.91  | -7.93  | -1.05 | 3.93 | -1.47 | -3.61  | -6.8   | -16.68 | -7.29 | -9.79 |
| 225       | -11.69 | -11.17 | -15.63 | -16.73 | -4.02  | 0.43  | 5.55 | -1.09 | -6.95  | -17.33 | -12.07 | -6.51 | -9.79 |
| 240       | -11.16 | -10.29 | -14.86 | -14.5  | -3.53  | 0.82  | 6.17 | -0.21 | -5.81  | -14.12 | -8.86  | -7.31 | -9.79 |
| 255       | -10.87 | -9.99  | -22.87 | -16.09 | -3.36  | -0.56 | 4.92 | -2.65 | -13.31 | -8.75  | -8.95  | -8.17 | -9.79 |
| 270       | -10.99 | -10.04 | -13.33 | -10.35 | -4.68  | 0.95  | 3.98 | -2.93 | -8.25  | -3.44  | -8.06  | -7.73 | -9.79 |
| 285       | -11.44 | -10.34 | -10.62 | -9.94  | -8.78  | 0.35  | 4.16 | -2.01 | -6.83  | -4.56  | -11.19 | -7.39 | -9.79 |
| 300       | -11.87 | -11.01 | -10.3  | -14.17 | -5.6   | -3.52 | 5.4  | -1.07 | -9     | -10.66 | -13.15 | -7.34 | -9.79 |
| 315       | -11.75 | -12.19 | -9.31  | -15.82 | -2.82  | -1.69 | 5.24 | -0.22 | -8.46  | -12.36 | -7     | -6.53 | -9.79 |
| 330       | -11.21 | -13.25 | -10.05 | -14.81 | -2.94  | -1.57 | 3.84 | -0.94 | -7.73  | -4.78  | -4.24  | -5.19 | -9.79 |
| 345       | -10.97 | -13.59 | -12.89 | -13.25 | -6     | -3.92 | 2.7  | -3.74 | -8.02  | -4.36  | -4.37  | -4.63 | -9.79 |

| Ant2      |        |       |        |       |        |       |      |       |       |        |        |       |       |
|-----------|--------|-------|--------|-------|--------|-------|------|-------|-------|--------|--------|-------|-------|
| Freq      | 2450   |       |        |       |        |       |      |       |       |        |        |       |       |
| Phi\Theta | 0      | 15    | 30     | 45    | 60     | 75    | 90   | 105   | 120   | 135    | 150    | 165   | 180   |
| 0         | -9.89  | -9.99 | -11.1  | -8.96 | -10.63 | -2.12 | 1.7  | -5.64 | -6.81 | -4.84  | -8.49  | -8.08 | -8.75 |
| 15        | -9.83  | -9.99 | -12.51 | -9.61 | -12.96 | -1.55 | 1.24 | -3.71 | -3.51 | -3.98  | -11.37 | -8.75 | -8.75 |
| 30        | -9.8   | -9.8  | -12.3  | -9.21 | -16.43 | -0.42 | 2.08 | -1.78 | -1.33 | -2.96  | -10.69 | -7.23 | -8.75 |
| 45        | -9.83  | -9.4  | -11.37 | -9.28 | -17.64 | 1.5   | 3.95 | -0.85 | -0.6  | -2.43  | -6.03  | -4.94 | -8.75 |
| 60        | -9.91  | -9    | -9.99  | -8.14 | -10.46 | 2.1   | 4.37 | -1.93 | -3.31 | -3.8   | -3.82  | -3.72 | -8.75 |
| 75        | -10.01 | -8.36 | -8.38  | -7.56 | -8.41  | 2.05  | 3.57 | -4.92 | -6.02 | -7.53  | -4.33  | -3.77 | -8.75 |
| 90        | -10.04 | -7.4  | -6.88  | -7.9  | -9.48  | 2.1   | 4.11 | -4.8  | -5.84 | -13.3  | -6.9   | -3.82 | -8.75 |
| 105       | -10.17 | -6.67 | -5.22  | -4.64 | -6.2   | 0.71  | 3.71 | -5.93 | -6.66 | -13.36 | -9.88  | -3.57 | -8.75 |



|     |        |        |        |       |        |       |      |       |        |        |        |       |       |
|-----|--------|--------|--------|-------|--------|-------|------|-------|--------|--------|--------|-------|-------|
| 120 | -10.25 | -6.2   | -4.32  | -1.69 | -3.9   | 0.28  | 3.49 | -3.78 | -9.1   | -9.38  | -11.04 | -3.86 | -8.75 |
| 135 | -10.29 | -6.27  | -4.66  | -1.05 | -5.27  | -0.04 | 2.79 | -2.85 | -8.8   | -9.31  | -10.88 | -4.31 | -8.75 |
| 150 | -10.42 | -6.84  | -5.83  | -1.83 | -7.94  | -1.45 | 1.47 | -3.14 | -7.63  | -9.05  | -11.09 | -4.67 | -8.75 |
| 165 | -10.25 | -7.6   | -7.28  | -4.44 | -9.73  | -2.52 | 1.37 | -2.36 | -7.07  | -8.58  | -8.76  | -5.18 | -8.75 |
| 180 | -10    | -8.52  | -8.73  | -7.54 | -11.93 | -4.41 | 2.45 | -1.32 | -4.42  | -7.43  | -5.82  | -5.4  | -8.75 |
| 195 | -10.03 | -9.44  | -9.3   | -8.32 | -6.74  | -5.65 | 3.51 | -0.87 | -4.56  | -5.85  | -3.92  | -4.95 | -8.75 |
| 210 | -10.06 | -10.53 | -10.23 | -7.63 | -5.13  | -4.07 | 4.13 | 0.83  | -3.16  | -2.65  | -1.86  | -3.92 | -8.75 |
| 225 | -10.13 | -11.66 | -12.5  | -7.65 | -9.42  | -4.84 | 3.95 | 1.46  | -2.26  | -2.19  | -1.55  | -3.23 | -8.75 |
| 240 | -10.33 | -12.69 | -13.03 | -6.98 | -9.68  | -3.34 | 3.1  | -1.54 | -4.26  | -4.24  | -3.89  | -3.37 | -8.75 |
| 255 | -10.2  | -13.24 | -11.44 | -7.93 | -5.25  | 1.17  | 4.26 | -2.26 | -6.46  | -5.59  | -8.23  | -4.71 | -8.75 |
| 270 | -9.85  | -13.56 | -9.75  | -9.79 | -5.59  | 2.28  | 3.68 | -5.44 | -12.85 | -6.56  | -13.06 | -6.37 | -8.75 |
| 285 | -9.71  | -13.21 | -8.32  | -7.59 | -5.15  | 2.59  | 3.63 | -4.67 | -9.56  | -5.07  | -10.96 | -7.14 | -8.75 |
| 300 | -9.63  | -12.41 | -7.51  | -7.06 | -4.53  | 2.96  | 4.69 | -4.63 | -12.51 | -5.15  | -8.45  | -7.61 | -8.75 |
| 315 | -9.68  | -11.34 | -7.42  | -7.88 | -5.63  | 2.18  | 4.89 | -2.51 | -10.31 | -7.13  | -7.9   | -7.8  | -8.75 |
| 330 | -9.84  | -10.31 | -8.06  | -8.24 | -7.02  | 0.75  | 4.19 | -1.84 | -7.12  | -11.37 | -8.64  | -7.32 | -8.75 |
| 345 | -9.97  | -9.93  | -9.43  | -8.35 | -8.82  | -1.45 | 2.93 | -4.2  | -8.01  | -8.46  | -8.37  | -7.17 | -8.75 |

| 2450MHz Composite Gain (1SS) |       |       |        |       |        |       |      |       |       |       |       |       |       |
|------------------------------|-------|-------|--------|-------|--------|-------|------|-------|-------|-------|-------|-------|-------|
| Freq                         | 2450  |       |        |       |        |       |      |       |       |       |       |       |       |
| Phi\Theta                    | 0     | 15    | 30     | 45    | 60     | 75    | 90   | 105   | 120   | 135   | 150   | 165   | 180   |
| 0                            | -7.44 | -8.68 | -9.96  | -7.65 | -9.27  | 0.24  | 4.69 | -1.74 | -2.77 | -3.27 | -3.80 | -3.31 | -6.24 |
| 15                           | -7.59 | -8.60 | -10.89 | -6.46 | -12.37 | 1.77  | 4.35 | -1.65 | -1.75 | -2.43 | -4.81 | -4.30 | -6.24 |
| 30                           | -7.65 | -8.20 | -10.85 | -3.40 | -11.02 | 3.18  | 5.03 | 0.07  | -0.01 | -0.37 | -4.24 | -3.60 | -6.24 |
| 45                           | -7.73 | -7.22 | -9.42  | -2.76 | -9.95  | 5.24  | 7.16 | 0.74  | 0.92  | 0.18  | -2.12 | -2.00 | -6.24 |
| 60                           | -7.89 | -6.01 | -6.71  | -1.92 | -6.76  | 5.91  | 7.81 | 1.16  | -0.06 | -0.61 | -1.34 | -1.34 | -6.24 |
| 75                           | -7.76 | -5.19 | -4.43  | -2.11 | -4.89  | 5.77  | 7.36 | -0.70 | -1.70 | -3.53 | -2.19 | -1.67 | -6.24 |
| 90                           | -7.52 | -4.86 | -3.54  | -4.39 | -5.16  | 5.04  | 7.49 | 0.24  | -1.55 | -6.65 | -4.15 | -2.29 | -6.24 |
| 105                          | -7.59 | -5.01 | -2.93  | -3.60 | -3.91  | 3.64  | 7.61 | 0.15  | -1.03 | -5.37 | -6.38 | -2.65 | -6.24 |
| 120                          | -7.76 | -5.38 | -2.76  | -1.37 | -3.27  | 4.12  | 7.44 | 0.35  | -1.79 | -3.27 | -6.89 | -2.63 | -6.24 |
| 135                          | -7.95 | -5.86 | -3.88  | -0.21 | -3.84  | 4.21  | 6.49 | 0.43  | -2.31 | -3.41 | -6.59 | -2.61 | -6.24 |
| 150                          | -8.15 | -6.50 | -5.43  | -0.89 | -4.72  | 2.62  | 5.43 | -0.92 | -2.88 | -4.79 | -7.69 | -2.93 | -6.24 |
| 165                          | -7.84 | -7.23 | -6.08  | -2.91 | -4.27  | 2.03  | 5.18 | -0.42 | -1.26 | -5.09 | -6.55 | -3.64 | -6.24 |
| 180                          | -7.47 | -7.99 | -6.58  | -4.50 | -8.06  | -0.26 | 6.09 | 0.87  | 0.21  | -3.65 | -4.30 | -4.31 | -6.24 |
| 195                          | -7.51 | -8.39 | -7.47  | -5.65 | -5.00  | -0.44 | 6.66 | 1.25  | -0.71 | -2.46 | -3.79 | -3.92 | -6.24 |
| 210                          | -7.77 | -8.38 | -9.40  | -5.69 | -3.41  | 0.58  | 7.04 | 2.77  | -0.37 | -1.47 | -3.42 | -2.43 | -6.24 |
| 225                          | -7.86 | -8.40 | -10.91 | -8.04 | -3.30  | 1.20  | 7.80 | 3.29  | -1.28 | -3.80 | -2.30 | -1.71 | -6.24 |
| 240                          | -7.72 | -8.40 | -10.89 | -6.94 | -3.06  | 2.00  | 7.78 | 2.16  | -1.99 | -4.83 | -3.01 | -2.11 | -6.24 |
| 255                          | -7.52 | -8.45 | -12.39 | -8.07 | -1.24  | 3.36  | 7.61 | 0.56  | -6.22 | -4.02 | -5.57 | -3.26 | -6.24 |
| 270                          | -7.39 | -8.61 | -8.35  | -7.06 | -2.11  | 4.65  | 6.84 | -1.08 | -7.24 | -1.85 | -7.19 | -4.01 | -6.24 |
| 285                          | -7.52 | -8.65 | -6.38  | -5.68 | -3.77  | 4.55  | 6.91 | -0.23 | -5.08 | -1.80 | -8.06 | -4.25 | -6.24 |
| 300                          | -7.67 | -8.67 | -5.78  | -6.90 | -2.04  | 3.32  | 8.06 | 0.34  | -7.57 | -4.46 | -7.48 | -4.46 | -6.24 |
| 315                          | -7.64 | -8.74 | -5.30  | -7.96 | -1.10  | 3.47  | 8.08 | 1.72  | -6.33 | -6.35 | -4.43 | -4.13 | -6.24 |
| 330                          | -7.49 | -8.65 | -5.99  | -7.91 | -1.73  | 2.68  | 7.03 | 1.63  | -4.41 | -4.45 | -3.15 | -3.18 | -6.24 |

|     |       |       |       |       |       |      |      |       |       |       |       |       |       |
|-----|-------|-------|-------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|
| 345 | -7.45 | -8.56 | -7.98 | -7.45 | -4.29 | 0.41 | 5.83 | -0.96 | -5.00 | -3.16 | -3.13 | -2.80 | -6.24 |
|-----|-------|-------|-------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|

| Ant1      |        |        |        |        |        |       |      |       |        |        |        |        |        |
|-----------|--------|--------|--------|--------|--------|-------|------|-------|--------|--------|--------|--------|--------|
| Freq      | 5200   |        |        |        |        |       |      |       |        |        |        |        |        |
| Phi\Theta | 0      | 15     | 30     | 45     | 60     | 75    | 90   | 105   | 120    | 135    | 150    | 165    | 180    |
| 0         | -13.25 | -9.93  | -8.78  | -19.92 | -8.04  | -1.43 | 3.79 | -4.35 | -16.82 | -12.79 | -13.96 | -30.17 | -31.51 |
| 15        | -13.28 | -9.22  | -7.25  | -15.99 | -7.01  | -1.2  | 4.01 | -4.15 | -16.79 | -14.57 | -13.13 | -29.63 | -31.51 |
| 30        | -13.44 | -8.45  | -4.87  | -11.14 | -5.42  | -0.44 | 5.29 | -3.1  | -15.8  | -13.28 | -17.11 | -23.26 | -31.51 |
| 45        | -13.33 | -8.09  | -6.69  | -13.47 | -6.57  | -2.11 | 4.16 | -6.8  | -17.47 | -11.25 | -18.86 | -20.2  | -31.51 |
| 60        | -13.31 | -8.42  | -6.66  | -8.88  | -6.92  | -0.06 | 5.3  | -7.98 | -12.21 | -15.7  | -16.92 | -18.58 | -31.51 |
| 75        | -13.26 | -10.23 | -7.68  | -15.14 | -4.89  | 0.99  | 5.47 | -5.71 | -7.8   | -7.67  | -17.29 | -20.13 | -31.51 |
| 90        | -13.23 | -12.42 | -7.81  | -12.54 | -5.16  | -4.09 | 5.22 | -4.43 | -11.42 | -9.96  | -20.47 | -21.74 | -31.51 |
| 105       | -13.18 | -13.98 | -7.73  | -13.89 | -4.44  | -4.67 | 5.59 | -5.9  | -15.33 | -15.69 | -15.79 | -21.68 | -31.51 |
| 120       | -12.86 | -18.1  | -7.6   | -12.17 | -6.7   | -1.77 | 6.39 | -7.62 | -19.61 | -13.62 | -13.03 | -18.78 | -31.51 |
| 135       | -12.6  | -21.08 | -11.48 | -7.95  | -5.57  | -3.41 | 6.87 | -9.79 | -13.91 | -8.83  | -11.98 | -16.21 | -31.51 |
| 150       | -12.48 | -20.1  | -8.4   | -6.17  | -3.72  | -2.17 | 7.11 | -7.93 | -10.06 | -9.53  | -12.74 | -14.67 | -31.51 |
| 165       | -12.65 | -18.14 | -8.15  | -7.92  | -2.89  | -3.07 | 7.64 | -7.64 | -9.86  | -12.19 | -14.04 | -14.36 | -31.51 |
| 180       | -12.87 | -16.19 | -9.69  | -8.13  | -3.99  | -1.17 | 7.74 | -8.01 | -11.28 | -12.75 | -12.24 | -15.13 | -31.51 |
| 195       | -12.57 | -15.15 | -11.06 | -8.57  | -4.15  | -1.19 | 7.21 | -6.47 | -9.57  | -12.53 | -10.92 | -16.76 | -31.51 |
| 210       | -12.41 | -15.14 | -12.72 | -8.04  | -9.26  | -0.23 | 7.08 | -6.93 | -9.5   | -11.76 | -11.23 | -18.38 | -31.51 |
| 225       | -12.38 | -16.7  | -7.48  | -14.65 | -5.76  | -2.41 | 5.47 | -9.64 | -15.47 | -12.24 | -16.58 | -17.41 | -31.51 |
| 240       | -12.4  | -17.54 | -5.3   | -14.44 | -12.13 | -1.96 | 5.68 | -6.07 | -14.49 | -17.13 | -19.4  | -17.89 | -31.51 |
| 255       | -12.68 | -12.64 | -8.73  | -10.8  | -8.02  | -3.29 | 6.22 | -7.03 | -14.35 | -13.66 | -20.92 | -22.6  | -31.51 |
| 270       | -12.89 | -10.17 | -9.27  | -7.45  | -6.21  | -0.49 | 5.81 | -4.14 | -15.35 | -11.78 | -13.92 | -17.95 | -31.51 |
| 285       | -12.65 | -9.78  | -7.59  | -13.64 | -9.07  | 0.02  | 5.49 | -5.18 | -16.14 | -17.9  | -17.21 | -17.53 | -31.51 |
| 300       | -12.92 | -10.17 | -9.83  | -12.24 | -7.07  | -0.07 | 5.28 | -4.56 | -14.33 | -17.79 | -18.94 | -19.58 | -31.51 |
| 315       | -13.08 | -10.48 | -8.75  | -9.39  | -12.79 | -3.11 | 4.6  | -5.25 | -16.34 | -11.72 | -12.83 | -20.42 | -31.51 |
| 330       | -13.23 | -10.64 | -6.28  | -10.62 | -5.43  | 0.19  | 4.34 | -2.64 | -14.54 | -11.32 | -13.65 | -23.17 | -31.51 |
| 345       | -13.29 | -10.43 | -7.31  | -17.15 | -5.52  | -0.47 | 3.03 | -2.91 | -16.52 | -14.67 | -13.81 | -31.51 | -31.51 |

| Ant2      |        |        |       |        |       |       |      |        |        |        |        |        |        |
|-----------|--------|--------|-------|--------|-------|-------|------|--------|--------|--------|--------|--------|--------|
| Freq      | 5200   |        |       |        |       |       |      |        |        |        |        |        |        |
| Phi\Theta | 0      | 15     | 30    | 45     | 60    | 75    | 90   | 105    | 120    | 135    | 150    | 165    | 180    |
| 0         | -12.42 | -15.32 | -7.37 | -11.23 | -3.12 | -1.32 | 7.83 | -2.85  | -10.88 | -13.78 | -11.82 | -11.6  | -24.89 |
| 15        | -12.31 | -14.36 | -5.63 | -8.37  | -2.22 | -1.83 | 7.44 | -6.35  | -16.26 | -19.33 | -8.52  | -9.74  | -24.89 |
| 30        | -12.06 | -13.59 | -5.22 | -8.73  | -2.18 | -1.44 | 6.6  | -12.46 | -17.12 | -18.71 | -6.64  | -10.72 | -24.89 |
| 45        | -11.96 | -14.57 | -7.27 | -9.99  | -2.67 | -0.87 | 7.71 | -5.68  | -15.43 | -9.33  | -6.45  | -13.45 | -24.89 |
| 60        | -11.55 | -17.3  | -5.29 | -12.37 | -3.95 | 1.21  | 7.65 | -10.67 | -17.42 | -8.81  | -11.53 | -16.42 | -24.89 |
| 75        | -11.12 | -17.94 | -5.4  | -11.37 | -5.61 | -1.43 | 5.43 | -3.99  | -14.44 | -17.27 | -11.12 | -16.48 | -24.89 |
| 90        | -11.43 | -14.53 | -6.89 | -17.24 | -4.77 | -3.5  | 5.09 | -3.3   | -9.97  | -14.92 | -11.74 | -15.87 | -24.89 |
| 105       | -11.53 | -11.69 | -6.32 | -11.88 | -5.55 | -1.37 | 5.43 | -5.84  | -19.16 | -16.93 | -13.02 | -13.13 | -24.89 |
| 120       | -11.74 | -9.82  | -7.74 | -16.75 | -7.84 | -1.09 | 5.55 | -6.77  | -11.67 | -16.42 | -13.98 | -10.78 | -24.89 |
| 135       | -11.87 | -8.88  | -9.54 | -14.92 | -5.43 | -2.3  | 3.82 | -3.78  | -16.07 | -13.86 | -14.31 | -11.49 | -24.89 |

|     |        |        |        |        |        |       |      |       |        |        |        |        |        |
|-----|--------|--------|--------|--------|--------|-------|------|-------|--------|--------|--------|--------|--------|
| 150 | -11.5  | -8.69  | -7.62  | -22.16 | -6.8   | -0.96 | 5.48 | -3.26 | -12.3  | -19.29 | -9.89  | -13.31 | -24.89 |
| 165 | -11.43 | -8.61  | -7.67  | -13.54 | -10.38 | -1.99 | 2.59 | -4.56 | -13.07 | -29.85 | -10.22 | -15.03 | -24.89 |
| 180 | -11.78 | -8.48  | -9.43  | -11.82 | -7.24  | 0.52  | 3.69 | -2.6  | -15.63 | -17.19 | -10.02 | -15.71 | -24.89 |
| 195 | -11.77 | -8.72  | -10.42 | -13.77 | -9.59  | 0.23  | 1.61 | -2.8  | -14.72 | -13.47 | -10.59 | -14.76 | -24.89 |
| 210 | -12.01 | -9.43  | -12.3  | -14.71 | -10.25 | 1.11  | 4.49 | -2.9  | -23.39 | -9.41  | -12.11 | -18.01 | -24.89 |
| 225 | -12.28 | -10.21 | -12.68 | -12.47 | -10.66 | -0.79 | 3.59 | -3.39 | -16.93 | -12.29 | -10.41 | -19.18 | -24.89 |
| 240 | -12.27 | -10.99 | -9.63  | -16.45 | -7.3   | 1.07  | 5.61 | -5.68 | -11.35 | -20.63 | -14.04 | -14.43 | -24.89 |
| 255 | -12.79 | -10.48 | -8.49  | -13.15 | -7.95  | -0.87 | 5.92 | -2.96 | -17.62 | -20.53 | -16.15 | -14.67 | -24.89 |
| 270 | -12.87 | -10.86 | -7.6   | -9.16  | -5.4   | -1.36 | 4.84 | -5.71 | -20.54 | -10.71 | -15.25 | -18.74 | -24.89 |
| 285 | -12.59 | -13.28 | -6.03  | -9.66  | -6.92  | 0.02  | 4.46 | -8.04 | -23.79 | -15.76 | -17.09 | -24.89 | -24.89 |
| 300 | -12.36 | -14    | -6.05  | -13.18 | -5.96  | 0.69  | 6.75 | -5.27 | -11.63 | -13.91 | -16.13 | -15.46 | -24.89 |
| 315 | -12.38 | -14.24 | -9.82  | -11.57 | -3.79  | -0.56 | 8.15 | -4.99 | -13.41 | -17.61 | -15.11 | -14.21 | -24.89 |
| 330 | -12.33 | -14.9  | -7.72  | -9.05  | -4.57  | -1.08 | 6.51 | -5.55 | -12.77 | -16.79 | -15.26 | -15.5  | -24.89 |
| 345 | -12.38 | -14.92 | -7.49  | -10.54 | -4.84  | -2.1  | 7.38 | -5.58 | -10.69 | -13.95 | -12.02 | -14.71 | -24.89 |

| 5200MHz Composite Gain (1SS) |       |        |       |        |       |       |      |       |        |        |        |        |        |
|------------------------------|-------|--------|-------|--------|-------|-------|------|-------|--------|--------|--------|--------|--------|
| Freq                         | 5200  |        |       |        |       |       |      |       |        |        |        |        |        |
| Phi\Theta                    | 0     | 15     | 30    | 45     | 60    | 75    | 90   | 105   | 120    | 135    | 150    | 165    | 180    |
| 0                            | -9.81 | -9.20  | -5.04 | -11.52 | -2.23 | 1.64  | 9.05 | -0.56 | -10.34 | -10.26 | -9.81  | -13.64 | -24.57 |
| 15                           | -9.77 | -8.40  | -3.39 | -8.36  | -1.28 | 1.50  | 8.90 | -2.17 | -13.51 | -13.62 | -7.51  | -11.91 | -24.57 |
| 30                           | -9.71 | -7.63  | -2.03 | -6.84  | -0.64 | 2.08  | 8.98 | -3.57 | -13.42 | -12.57 | -7.37  | -11.89 | -24.57 |
| 45                           | -9.61 | -7.73  | -3.96 | -8.55  | -1.39 | 1.54  | 9.13 | -3.21 | -13.38 | -7.23  | -7.59  | -13.17 | -24.57 |
| 60                           | -9.38 | -8.76  | -2.94 | -7.44  | -2.30 | 3.61  | 9.56 | -6.21 | -11.42 | -8.58  | -10.80 | -14.42 | -24.57 |
| 75                           | -9.11 | -10.25 | -3.46 | -10.04 | -2.23 | 2.87  | 8.46 | -1.80 | -7.49  | -8.20  | -10.66 | -15.10 | -24.57 |
| 90                           | -9.27 | -10.40 | -4.33 | -11.57 | -1.95 | -0.78 | 8.17 | -0.84 | -7.65  | -9.08  | -12.04 | -15.31 | -24.57 |
| 105                          | -9.31 | -9.75  | -3.99 | -9.82  | -1.97 | 0.15  | 8.52 | -2.86 | -14.03 | -13.28 | -11.28 | -13.38 | -24.57 |
| 120                          | -9.27 | -10.00 | -4.66 | -11.15 | -4.24 | 1.59  | 8.99 | -4.17 | -11.75 | -11.90 | -10.48 | -10.88 | -24.57 |
| 135                          | -9.22 | -9.98  | -7.45 | -7.74  | -2.49 | 0.17  | 8.49 | -3.26 | -11.91 | -7.98  | -10.06 | -10.52 | -24.57 |
| 150                          | -8.97 | -9.63  | -4.99 | -7.90  | -2.11 | 1.47  | 9.34 | -2.27 | -8.10  | -10.10 | -8.19  | -10.95 | -24.57 |
| 165                          | -9.01 | -9.12  | -4.90 | -7.27  | -2.84 | 0.50  | 8.49 | -2.95 | -8.31  | -14.13 | -8.91  | -11.68 | -24.57 |
| 180                          | -9.30 | -8.50  | -6.55 | -6.77  | -2.45 | 2.73  | 8.96 | -1.88 | -10.18 | -11.68 | -8.05  | -12.40 | -24.57 |
| 195                          | -9.15 | -8.34  | -7.72 | -7.78  | -3.44 | 2.56  | 7.86 | -1.43 | -8.76  | -9.98  | -7.74  | -12.69 | -24.57 |
| 210                          | -9.20 | -8.81  | -9.50 | -7.74  | -6.73 | 3.48  | 8.89 | -1.67 | -10.91 | -7.50  | -8.65  | -15.18 | -24.57 |
| 225                          | -9.32 | -9.85  | -6.69 | -10.48 | -4.86 | 1.45  | 7.59 | -2.95 | -13.16 | -9.25  | -9.95  | -15.24 | -24.57 |
| 240                          | -9.32 | -10.65 | -4.19 | -12.38 | -6.37 | 2.70  | 8.66 | -2.86 | -9.77  | -15.69 | -13.30 | -12.98 | -24.57 |
| 255                          | -9.72 | -8.48  | -5.60 | -8.89  | -4.97 | 1.01  | 9.08 | -1.75 | -12.82 | -13.42 | -15.20 | -14.75 | -24.57 |
| 270                          | -9.87 | -7.50  | -5.38 | -5.25  | -2.79 | 2.10  | 8.35 | -1.88 | -14.55 | -8.22  | -11.55 | -15.33 | -24.57 |
| 285                          | -9.61 | -8.34  | -3.76 | -8.41  | -4.92 | 3.03  | 8.00 | -3.48 | -16.14 | -13.75 | -14.14 | -17.44 | -24.57 |
| 300                          | -9.63 | -8.87  | -4.73 | -9.69  | -3.49 | 3.33  | 9.06 | -1.90 | -9.87  | -12.62 | -14.41 | -14.27 | -24.57 |
| 315                          | -9.71 | -9.15  | -6.26 | -7.40  | -4.16 | 1.27  | 9.57 | -2.11 | -11.74 | -11.16 | -10.89 | -13.76 | -24.57 |
| 330                          | -9.76 | -9.50  | -3.96 | -6.79  | -1.98 | 2.59  | 8.50 | -0.96 | -10.60 | -10.62 | -11.41 | -15.50 | -24.57 |
| 345                          | -9.81 | -9.38  | -4.39 | -10.22 | -2.16 | 1.76  | 8.48 | -1.13 | -10.11 | -11.29 | -9.86  | -16.55 | -24.57 |

| Ant1      |        |        |        |        |        |       |      |        |        |        |        |        |        |
|-----------|--------|--------|--------|--------|--------|-------|------|--------|--------|--------|--------|--------|--------|
| Freq      | 5300   |        |        |        |        |       |      |        |        |        |        |        |        |
| Phi\Theta | 0      | 15     | 30     | 45     | 60     | 75    | 90   | 105    | 120    | 135    | 150    | 165    | 180    |
| 0         | -14.01 | -10.88 | -10.45 | -13.95 | -11.91 | -0.79 | 2.76 | -6.56  | -21.58 | -14.25 | -13.77 | -24.12 | -27.92 |
| 15        | -14.1  | -9.65  | -9.53  | -12.41 | -7.59  | 0.03  | 1.8  | -7.9   | -20    | -15.25 | -14.09 | -24.47 | -27.92 |
| 30        | -14.15 | -8.42  | -8.25  | -10.4  | -8.11  | 1.57  | 5.41 | -7.03  | -18.14 | -14.62 | -20.29 | -23.73 | -27.92 |
| 45        | -14.22 | -8.21  | -7.97  | -20.32 | -8.79  | -1.39 | 2.78 | -10.33 | -19.13 | -13.12 | -18.15 | -19.81 | -27.92 |
| 60        | -14.11 | -9.45  | -8.77  | -9.99  | -8.93  | 0.84  | 4.15 | -12.87 | -11.51 | -16.5  | -12.74 | -20.05 | -27.92 |
| 75        | -14.24 | -11.31 | -7.23  | -15.59 | -5.16  | 2     | 4.61 | -9.85  | -7.19  | -9.97  | -15.63 | -26.3  | -27.92 |
| 90        | -14.02 | -13.17 | -8.8   | -17.21 | -6.15  | -1.94 | 3.72 | -8.18  | -10.2  | -11.59 | -17.79 | -27.92 | -27.92 |
| 105       | -13.73 | -16.03 | -5.98  | -12.13 | -4.67  | -2.97 | 3.83 | -12.63 | -19.77 | -14.37 | -11.38 | -20.74 | -27.92 |
| 120       | -13.82 | -17.18 | -7.51  | -11.59 | -6.4   | 0.48  | 5.29 | -15.25 | -20.13 | -9.08  | -13.31 | -17.13 | -27.92 |
| 135       | -13.54 | -19.61 | -8.67  | -7.62  | -6.14  | 0.46  | 6.91 | -14.8  | -14    | -8.97  | -11.94 | -15.09 | -27.92 |
| 150       | -13.13 | -21.38 | -6.77  | -9.26  | -3.34  | -1.79 | 6.6  | -12.43 | -11.24 | -11.62 | -13.46 | -15.55 | -27.92 |
| 165       | -13.02 | -19.43 | -7.87  | -12.54 | -3.11  | -0.2  | 7.34 | -10.25 | -10.63 | -11.04 | -15.16 | -16.17 | -27.92 |
| 180       | -12.93 | -17.21 | -8.76  | -12.9  | -3.65  | 0.71  | 7.22 | -15.93 | -12.24 | -10.97 | -12.35 | -16.09 | -27.92 |
| 195       | -12.77 | -15.5  | -9.52  | -13.83 | -4.09  | 1.63  | 7.25 | -12.55 | -11.73 | -11.16 | -10.85 | -16.05 | -27.92 |
| 210       | -12.82 | -14.74 | -9.97  | -8.87  | -8.25  | 0.11  | 5.97 | -11.83 | -10.51 | -13.43 | -10.97 | -16.01 | -27.92 |
| 225       | -12.87 | -14.35 | -8.19  | -14.07 | -5.89  | 0.83  | 6.01 | -13.33 | -15.2  | -10.97 | -16.18 | -13.9  | -27.92 |
| 240       | -12.79 | -15.68 | -4.28  | -12.56 | -11.97 | 1.35  | 5.38 | -9.67  | -11.43 | -12.11 | -17.71 | -14.76 | -27.92 |
| 255       | -12.88 | -15.43 | -6.57  | -12.94 | -7.21  | -1.54 | 5.66 | -12.74 | -15.16 | -14.3  | -13.95 | -20.13 | -27.92 |
| 270       | -12.92 | -12.42 | -7.57  | -9.11  | -5.43  | 0.45  | 5.33 | -7.79  | -16.34 | -14.56 | -13.2  | -18.1  | -27.92 |
| 285       | -13.06 | -11.56 | -8.82  | -13.13 | -10.45 | 1.1   | 4.96 | -9.16  | -17.22 | -20.44 | -13.7  | -14.67 | -27.92 |
| 300       | -13.08 | -11.95 | -11.15 | -11.7  | -9.12  | 1.25  | 4.04 | -7.52  | -15.5  | -16.09 | -19.07 | -16.21 | -27.92 |
| 315       | -13.44 | -11.96 | -11.24 | -11.24 | -15.08 | -1.41 | 2.91 | -8.49  | -21.08 | -12.78 | -12.56 | -18.34 | -27.92 |
| 330       | -13.69 | -11.83 | -9.53  | -10.34 | -6.85  | 2.56  | 4.57 | -5.12  | -16.07 | -10.21 | -14.58 | -26.66 | -27.92 |
| 345       | -14.05 | -11.72 | -9.08  | -11.34 | -7.18  | 0.54  | 1.61 | -5     | -19.56 | -13.16 | -13.11 | -27.68 | -27.92 |

| Ant2      |        |        |       |        |       |       |      |        |        |        |        |        |        |
|-----------|--------|--------|-------|--------|-------|-------|------|--------|--------|--------|--------|--------|--------|
| Freq      | 5300   |        |       |        |       |       |      |        |        |        |        |        |        |
| Phi\Theta | 0      | 15     | 30    | 45     | 60    | 75    | 90   | 105    | 120    | 135    | 150    | 165    | 180    |
| 0         | -14.67 | -14.94 | -7.29 | -10.9  | -3.44 | 0.01  | 6.78 | -8.13  | -11.55 | -14.36 | -14.72 | -11.28 | -22.41 |
| 15        | -14.6  | -14.17 | -6.12 | -8.78  | -2.95 | 0.58  | 6.88 | -11.14 | -13.12 | -15.2  | -12.98 | -10.45 | -22.41 |
| 30        | -14.21 | -13.64 | -5.74 | -9.23  | -3.3  | 0.64  | 7.06 | -15.37 | -12.99 | -14.17 | -10.9  | -11.67 | -22.41 |
| 45        | -13.79 | -13.46 | -6.72 | -8.13  | -3.7  | 1.53  | 6.49 | -14.16 | -16.04 | -12.78 | -8.76  | -14.54 | -22.41 |
| 60        | -13.48 | -14.18 | -6.54 | -10.39 | -4.9  | 1.3   | 6.53 | -13.12 | -15.59 | -8.88  | -12.25 | -17.53 | -22.41 |
| 75        | -13.54 | -15.08 | -6.14 | -17.9  | -4.45 | -1.73 | 4.22 | -6.08  | -12.18 | -18.36 | -11.8  | -19.36 | -22.41 |
| 90        | -13.46 | -13.84 | -7.25 | -21.46 | -4.89 | -1.7  | 3.82 | -8.61  | -10.47 | -13.96 | -10.16 | -17.85 | -22.41 |
| 105       | -13.25 | -11.4  | -7.31 | -13.99 | -6.72 | 0.26  | 4.06 | -14.85 | -12.37 | -22.89 | -11.78 | -14.18 | -22.41 |
| 120       | -13.47 | -10.1  | -7.15 | -14.63 | -9.81 | 0.11  | 3.96 | -11.11 | -10.82 | -24.97 | -12.12 | -11.73 | -22.41 |
| 135       | -13.67 | -9.62  | -8.19 | -16.53 | -6.66 | -0.52 | 3.38 | -5.96  | -16.86 | -14.06 | -13.87 | -11.41 | -22.41 |
| 150       | -13.89 | -9.06  | -8.55 | -21.39 | -8.54 | 0.24  | 5.39 | -4.92  | -12.83 | -16.34 | -9.68  | -13.76 | -22.41 |
| 165       | -13.92 | -8.59  | -8.58 | -17.18 | -9.72 | 0.47  | 3.47 | -5.83  | -13.13 | -17.15 | -10.72 | -16.28 | -22.41 |

|     |        |        |        |        |        |      |      |        |        |        |        |        |        |
|-----|--------|--------|--------|--------|--------|------|------|--------|--------|--------|--------|--------|--------|
| 180 | -13.78 | -8.33  | -9.45  | -13.03 | -7.11  | 1.44 | 4.16 | -4.7   | -16.37 | -16.11 | -11.47 | -19.68 | -22.41 |
| 195 | -13.77 | -8.34  | -11.48 | -12.44 | -8.39  | 1.83 | 3.23 | -4.43  | -18.85 | -11.48 | -11.03 | -20.18 | -22.41 |
| 210 | -14.12 | -8.94  | -11.96 | -12.74 | -10.64 | 1.67 | 4.12 | -6.41  | -20.45 | -9.83  | -11.21 | -21.28 | -22.41 |
| 225 | -14.59 | -9.54  | -11.39 | -12.67 | -12.57 | 1.16 | 3.64 | -6.07  | -17.26 | -17.03 | -11.18 | -17.76 | -22.41 |
| 240 | -15.16 | -10.04 | -10.3  | -14.13 | -8.8   | 2    | 5.3  | -9.58  | -11.56 | -21.23 | -13.65 | -16.09 | -22.41 |
| 255 | -14.94 | -10.2  | -8.29  | -18.27 | -8.28  | 1.25 | 5.34 | -6.23  | -14.34 | -19.41 | -13.77 | -18.4  | -22.41 |
| 270 | -15.1  | -10.36 | -7.36  | -11.77 | -5.94  | 0.21 | 4.15 | -8.05  | -18    | -11.93 | -13.5  | -22.41 | -22.41 |
| 285 | -15.32 | -11.16 | -7.18  | -12.94 | -5.72  | 0.61 | 3.07 | -10.77 | -21.27 | -14.38 | -12.92 | -16.95 | -22.41 |
| 300 | -14.98 | -11.67 | -6.42  | -11.8  | -8.37  | 1.11 | 5.27 | -10.27 | -13.08 | -11.41 | -12.84 | -14.13 | -22.41 |
| 315 | -14.73 | -11.24 | -10.31 | -11.71 | -4.38  | 1.71 | 7.13 | -11.65 | -20.11 | -16.38 | -12.17 | -15.56 | -22.41 |
| 330 | -14.61 | -11.85 | -9.33  | -8.66  | -4.66  | 1.62 | 6.83 | -8.96  | -12.25 | -13.51 | -15.48 | -15.61 | -22.41 |
| 345 | -14.47 | -14.27 | -8.41  | -10.07 | -4.21  | 0.04 | 6.91 | -9.41  | -9     | -12.09 | -14.01 | -13.13 | -22.41 |

| 5300MHz Composite Gain (1SS) |        |        |       |        |       |      |      |        |        |        |        |        |        |
|------------------------------|--------|--------|-------|--------|-------|------|------|--------|--------|--------|--------|--------|--------|
| Freq                         | 5300   |        |       |        |       |      |      |        |        |        |        |        |        |
| Phi\Theta                    | 0      | 15     | 30    | 45     | 60    | 75   | 90   | 105    | 120    | 135    | 150    | 165    | 180    |
| 0                            | -11.32 | -9.66  | -5.72 | -9.28  | -3.67 | 2.63 | 8.01 | -4.30  | -12.18 | -11.29 | -11.22 | -12.51 | -21.72 |
| 15                           | -11.34 | -8.61  | -4.65 | -7.40  | -1.95 | 3.32 | 7.72 | -6.36  | -12.89 | -12.21 | -10.51 | -11.88 | -21.72 |
| 30                           | -11.17 | -7.63  | -3.89 | -6.79  | -2.37 | 4.13 | 9.28 | -7.22  | -12.18 | -11.38 | -11.37 | -12.75 | -21.72 |
| 45                           | -10.99 | -7.43  | -4.31 | -9.23  | -2.87 | 3.20 | 7.84 | -9.03  | -14.44 | -9.94  | -9.23  | -13.77 | -21.72 |
| 60                           | -10.78 | -8.49  | -4.57 | -7.18  | -3.67 | 4.08 | 8.43 | -9.98  | -10.30 | -8.87  | -9.48  | -15.69 | -21.72 |
| 75                           | -10.87 | -9.98  | -3.66 | -13.66 | -1.79 | 3.34 | 7.43 | -4.75  | -6.32  | -10.18 | -10.50 | -19.14 | -21.72 |
| 90                           | -10.73 | -10.49 | -4.98 | -16.07 | -2.49 | 1.19 | 6.78 | -5.38  | -7.32  | -9.68  | -10.15 | -18.49 | -21.72 |
| 105                          | -10.48 | -10.40 | -3.61 | -10.00 | -2.62 | 1.80 | 6.96 | -10.66 | -12.29 | -14.61 | -8.57  | -13.84 | -21.72 |
| 120                          | -10.63 | -9.93  | -4.32 | -9.97  | -4.93 | 3.31 | 7.66 | -9.93  | -11.27 | -10.80 | -9.68  | -11.01 | -21.72 |
| 135                          | -10.59 | -10.24 | -5.42 | -7.97  | -3.39 | 2.99 | 8.33 | -6.29  | -12.30 | -8.14  | -9.84  | -10.05 | -21.72 |
| 150                          | -10.49 | -10.19 | -4.60 | -10.35 | -2.55 | 2.29 | 9.03 | -4.88  | -8.99  | -10.65 | -8.36  | -11.60 | -21.72 |
| 165                          | -10.45 | -9.41  | -5.21 | -11.54 | -2.79 | 3.15 | 8.63 | -4.75  | -8.78  | -10.56 | -9.65  | -13.21 | -21.72 |
| 180                          | -10.33 | -8.67  | -6.09 | -9.95  | -2.20 | 4.09 | 8.83 | -5.60  | -11.05 | -10.15 | -8.89  | -14.69 | -21.72 |
| 195                          | -10.25 | -8.19  | -7.43 | -10.10 | -2.97 | 4.74 | 8.48 | -4.56  | -11.57 | -8.31  | -7.93  | -14.86 | -21.72 |
| 210                          | -10.44 | -8.35  | -7.90 | -7.58  | -6.35 | 3.94 | 8.10 | -5.69  | -11.12 | -8.43  | -8.08  | -15.24 | -21.72 |
| 225                          | -10.68 | -8.61  | -6.63 | -10.33 | -5.59 | 4.01 | 7.92 | -5.95  | -13.16 | -10.47 | -10.31 | -12.61 | -21.72 |
| 240                          | -10.88 | -9.40  | -3.77 | -10.30 | -7.23 | 4.69 | 8.35 | -6.61  | -8.48  | -12.51 | -12.43 | -12.39 | -21.72 |
| 255                          | -10.84 | -9.42  | -4.38 | -12.19 | -4.72 | 2.98 | 8.51 | -5.88  | -11.73 | -13.47 | -10.85 | -16.21 | -21.72 |
| 270                          | -10.93 | -8.32  | -4.45 | -7.33  | -2.67 | 3.34 | 7.77 | -4.91  | -14.12 | -10.14 | -10.34 | -16.98 | -21.72 |
| 285                          | -11.11 | -8.35  | -4.95 | -10.02 | -4.76 | 3.87 | 7.08 | -6.92  | -16.00 | -13.88 | -10.29 | -12.73 | -21.72 |
| 300                          | -10.97 | -8.80  | -5.46 | -8.74  | -5.73 | 4.19 | 7.69 | -5.78  | -11.20 | -10.43 | -12.40 | -12.10 | -21.72 |
| 315                          | -11.05 | -8.58  | -7.75 | -8.46  | -5.17 | 3.30 | 8.28 | -6.92  | -17.57 | -11.38 | -9.35  | -13.83 | -21.72 |
| 330                          | -11.13 | -8.83  | -6.42 | -6.45  | -2.68 | 5.11 | 8.78 | -3.82  | -10.94 | -8.69  | -12.01 | -16.47 | -21.72 |
| 345                          | -11.25 | -9.89  | -5.73 | -7.67  | -2.56 | 3.30 | 7.67 | -3.92  | -9.75  | -9.60  | -10.54 | -14.65 | -21.72 |

| Ant1 |      |  |  |  |  |  |  |  |  |  |  |  |  |
|------|------|--|--|--|--|--|--|--|--|--|--|--|--|
| Freq | 5600 |  |  |  |  |  |  |  |  |  |  |  |  |

| Phi\Theta | 0     | 15     | 30     | 45     | 60     | 75   | 90    | 105   | 120    | 135    | 150    | 165    | 180    |
|-----------|-------|--------|--------|--------|--------|------|-------|-------|--------|--------|--------|--------|--------|
| 0         | -8.21 | -4.44  | -13.96 | -7.13  | -11.2  | 3.82 | -4.19 | -8.59 | -16.26 | -13.32 | -16.78 | -17.82 | -25.53 |
| 15        | -8.58 | -3.62  | -9.55  | -6.26  | -13.74 | 4.02 | -6.91 | -6.38 | -16.32 | -12.92 | -20.48 | -18.87 | -25.53 |
| 30        | -8.14 | -3.31  | -7.31  | -5.09  | -11.77 | 5.26 | -0.92 | -5.28 | -12.53 | -12.51 | -14.59 | -19.1  | -25.53 |
| 45        | -8.09 | -4.16  | -7.36  | -8.55  | -10.33 | 3.23 | -6.49 | -5.72 | -9.44  | -10.43 | -17.51 | -18.47 | -25.53 |
| 60        | -7.81 | -5.55  | -5.73  | -4.16  | -14.24 | 4.23 | -11.1 | -3.47 | -12.86 | -7.21  | -17.21 | -14.38 | -25.53 |
| 75        | -7.69 | -7.64  | -5.9   | -8.11  | -7.59  | 5.33 | -6.58 | -3.19 | -19.48 | -11.14 | -19.22 | -12.79 | -25.53 |
| 90        | -7.97 | -9.96  | -6.86  | -10.41 | -8.32  | 3.64 | -5.47 | -5.82 | -9.2   | -16.79 | -14.45 | -10.23 | -25.53 |
| 105       | -7.95 | -10.88 | -6.22  | -12.57 | -8.21  | 2.67 | -4.69 | -5.43 | -10.69 | -13.5  | -16.78 | -10.16 | -25.53 |
| 120       | -7.58 | -13.25 | -6.79  | -11.51 | -8.4   | 4.01 | -6.02 | -3.83 | -8.33  | -15.37 | -13.76 | -11.92 | -25.53 |
| 135       | -7.52 | -15.42 | -5.74  | -10.42 | -8.19  | 5.07 | -6.99 | -2.71 | -8.96  | -15.26 | -14.37 | -12.55 | -25.53 |
| 150       | -7.19 | -16.25 | -7.57  | -13.91 | -5.5   | 6.38 | -3.61 | -1.99 | -12.35 | -12.5  | -11.04 | -11.89 | -25.53 |
| 165       | -6.98 | -16.65 | -8.68  | -13.34 | -5.13  | 4.79 | -1.96 | -1.46 | -10.4  | -17.2  | -11.53 | -12.44 | -25.53 |
| 180       | -6.92 | -17.81 | -9.53  | -12.55 | -4.07  | 5.14 | -1.15 | -3.56 | -11.47 | -16.01 | -13.96 | -13.94 | -25.53 |
| 195       | -6.74 | -15.27 | -12.35 | -11.55 | -8.24  | 5.61 | -5.02 | -3.77 | -12.55 | -15.36 | -12.55 | -13.89 | -25.53 |
| 210       | -6.67 | -13.85 | -9.44  | -11.52 | -6.67  | 5.92 | -0.84 | -2.2  | -7.83  | -13.13 | -12.78 | -13.68 | -25.53 |
| 225       | -6.68 | -12.56 | -5.66  | -10.41 | -10.18 | 5.23 | -6.69 | -1.63 | -6.63  | -12.43 | -12.92 | -16.77 | -25.53 |
| 240       | -6.74 | -9.56  | -5.12  | -8.32  | -12    | 2.46 | -5.76 | -2.84 | -8.95  | -10.63 | -15.2  | -20.55 | -25.53 |
| 255       | -6.94 | -7.73  | -4.78  | -6.06  | -7.61  | 2.35 | -5.37 | -3.62 | -12.81 | -13.91 | -20.29 | -19.13 | -25.53 |
| 270       | -7.1  | -6.72  | -8.74  | -4.64  | -10.63 | 3.93 | -5.91 | -2.85 | -13.06 | -16.41 | -18.2  | -20.91 | -25.53 |
| 285       | -7.22 | -5.83  | -6.75  | -6.1   | -13.24 | 4.41 | -6.03 | -4.71 | -14.93 | -13.02 | -15.76 | -25.53 | -25.53 |
| 300       | -7.12 | -5.36  | -8.66  | -4.37  | -9.6   | 3.84 | -8.68 | -6.19 | -17.47 | -14.5  | -12.11 | -19.24 | -25.53 |
| 315       | -7.15 | -5.49  | -12.14 | -3.56  | -6.77  | 3.35 | -5.27 | -4.35 | -16.55 | -13.06 | -15.96 | -17.02 | -25.53 |
| 330       | -7.29 | -5.48  | -12.62 | -4.78  | -8.98  | 5.12 | 0.95  | -4.54 | -16.91 | -12.08 | -14.18 | -17.04 | -25.53 |
| 345       | -7.64 | -5.06  | -13.82 | -5.62  | -9.16  | 4.08 | -3.73 | -9.39 | -17.08 | -9.89  | -14.34 | -16.52 | -25.53 |

| Ant2      |        |        |        |        |        |      |       |       |        |        |        |        |        |
|-----------|--------|--------|--------|--------|--------|------|-------|-------|--------|--------|--------|--------|--------|
| Freq      | 5600   |        |        |        |        |      |       |       |        |        |        |        |        |
| Phi\Theta | 0      | 15     | 30     | 45     | 60     | 75   | 90    | 105   | 120    | 135    | 150    | 165    | 180    |
| 0         | -13.46 | -8.91  | -4.05  | -11.01 | -6.07  | 4.98 | -1.14 | -4.19 | -10.96 | -18.29 | -13.7  | -13.28 | -21.13 |
| 15        | -13.11 | -8.42  | -3.41  | -11.02 | -5.4   | 5.42 | -2.29 | -3.36 | -9.59  | -21.76 | -15.87 | -10.49 | -21.13 |
| 30        | -12.98 | -7.92  | -2.9   | -12.52 | -4.95  | 5.97 | -0.76 | -3.19 | -10.46 | -30.45 | -16.55 | -8.23  | -21.13 |
| 45        | -12.46 | -7.56  | -3.18  | -19.91 | -6.79  | 5.17 | -3.15 | -1.8  | -8.22  | -23.38 | -14.96 | -8.1   | -21.13 |
| 60        | -12.16 | -7.78  | -4.87  | -17.6  | -6.28  | 4.65 | -4.99 | -2.09 | -7.35  | -19.34 | -11.06 | -9.89  | -21.13 |
| 75        | -11.79 | -9.06  | -5.64  | -9.55  | -7.52  | 4.3  | -6.54 | -6.89 | -7.33  | -20.1  | -18.51 | -11.95 | -21.13 |
| 90        | -11.67 | -10.73 | -8.14  | -7.09  | -9.61  | 4.01 | -4.96 | -6.77 | -15.29 | -11.2  | -14.53 | -10.14 | -21.13 |
| 105       | -11.27 | -11.04 | -8.33  | -6.99  | -12.32 | 4.15 | -5.21 | -3.08 | -11.62 | -8.76  | -19.82 | -10.34 | -21.13 |
| 120       | -11.43 | -8.34  | -6.53  | -8.75  | -12.87 | 4.03 | -9.02 | -5.31 | -13.81 | -12.4  | -16.83 | -12.22 | -21.13 |
| 135       | -11.71 | -6.52  | -7.45  | -8.92  | -15.17 | 3.18 | -6.78 | -8.71 | -19.66 | -15.27 | -19.04 | -9.75  | -21.13 |
| 150       | -11.88 | -6.28  | -7.48  | -8.73  | -14.06 | 4.24 | -0.75 | -4.43 | -37.53 | -7.8   | -16.79 | -10.09 | -21.13 |
| 165       | -11.82 | -6.2   | -9.06  | -7.34  | -13.68 | 4.31 | -6.64 | -6.72 | -18.54 | -10.49 | -14.48 | -11.28 | -21.13 |
| 180       | -11.85 | -6.06  | -10.76 | -7.2   | -14.11 | 4.24 | -3.12 | -4.99 | -18.22 | -10.47 | -12.65 | -11.77 | -21.13 |
| 195       | -11.7  | -5.88  | -12.06 | -6.01  | -9.49  | 3    | -3.89 | -6.24 | -18.66 | -11.48 | -10.68 | -12.94 | -21.13 |

|     |        |       |        |        |        |      |       |       |        |        |        |        |        |
|-----|--------|-------|--------|--------|--------|------|-------|-------|--------|--------|--------|--------|--------|
| 210 | -12.13 | -5.49 | -14.96 | -5.44  | -10.18 | 4.8  | -1.48 | -3.53 | -18.39 | -13.43 | -11.5  | -13.71 | -21.13 |
| 225 | -12.91 | -5.18 | -15.21 | -6.45  | -8.12  | 4.12 | -6.13 | -5.94 | -19.5  | -15.77 | -13.79 | -13.43 | -21.13 |
| 240 | -13.29 | -5.33 | -10.55 | -8.63  | -14.2  | 4.43 | -6.36 | -3.45 | -13.39 | -16.64 | -15.22 | -13.22 | -21.13 |
| 255 | -13.58 | -6.23 | -8.98  | -11.48 | -14.59 | 3.88 | -3.1  | -4.26 | -19.95 | -23.36 | -18.87 | -16.38 | -21.13 |
| 270 | -13.74 | -7.55 | -10.43 | -8.43  | -14.83 | 3.05 | -3.49 | -5.23 | -16.01 | -10.92 | -25.44 | -19.14 | -21.13 |
| 285 | -13.78 | -7.76 | -8.44  | -7.14  | -8.99  | 3.81 | -8.21 | -6.78 | -11.47 | -10.79 | -20.58 | -21.13 | -21.13 |
| 300 | -14.03 | -7.97 | -9.44  | -9.9   | -9.67  | 4.64 | -6.19 | -2.99 | -9.64  | -15.48 | -22.93 | -18.61 | -21.13 |
| 315 | -13.93 | -9.12 | -7.32  | -9.66  | -8.56  | 5.63 | -5.99 | -1.15 | -10.19 | -15.5  | -15.54 | -17.1  | -21.13 |
| 330 | -13.68 | -9.59 | -6.16  | -10.53 | -6.11  | 6.22 | -2.85 | -2.48 | -13.96 | -15.39 | -11.9  | -15.23 | -21.13 |
| 345 | -13.53 | -9.59 | -4.81  | -11.93 | -6.23  | 5.72 | -3.71 | -4.21 | -12.73 | -21.35 | -11.47 | -14.28 | -21.13 |

| 5600MHz Composite Gain (1SS) |       |       |       |       |        |      |       |       |        |        |        |        |        |
|------------------------------|-------|-------|-------|-------|--------|------|-------|-------|--------|--------|--------|--------|--------|
| Freq                         | 5600  |       |       |       |        |      |       |       |        |        |        |        |        |
| Phi\Theta                    | 0     | 15    | 30    | 45    | 60     | 75   | 90    | 105   | 120    | 135    | 150    | 165    | 180    |
| 0                            | -7.43 | -3.38 | -4.65 | -5.84 | -5.25  | 7.43 | 0.48  | -3.10 | -10.20 | -12.44 | -12.09 | -12.25 | -20.04 |
| 15                           | -7.54 | -2.68 | -2.94 | -5.31 | -5.59  | 7.76 | -1.29 | -1.73 | -9.31  | -13.25 | -14.86 | -10.70 | -20.04 |
| 30                           | -7.22 | -2.30 | -1.82 | -5.02 | -4.70  | 8.63 | 2.17  | -1.16 | -8.42  | -14.48 | -12.50 | -9.05  | -20.04 |
| 45                           | -6.99 | -2.68 | -2.01 | -9.48 | -5.37  | 7.26 | -1.65 | -0.53 | -5.80  | -11.68 | -13.13 | -8.81  | -20.04 |
| 60                           | -6.71 | -3.58 | -2.28 | -5.49 | -6.37  | 7.45 | -4.51 | 0.26  | -6.66  | -8.30  | -10.59 | -8.84  | -20.04 |
| 75                           | -6.49 | -5.31 | -2.76 | -5.79 | -4.54  | 7.84 | -3.55 | -1.83 | -8.42  | -11.50 | -15.85 | -9.35  | -20.04 |
| 90                           | -6.61 | -7.33 | -4.47 | -5.58 | -5.93  | 6.84 | -2.20 | -3.27 | -8.71  | -10.54 | -11.48 | -7.17  | -20.04 |
| 105                          | -6.44 | -7.95 | -4.20 | -6.33 | -7.01  | 6.45 | -1.94 | -1.17 | -8.13  | -7.80  | -15.16 | -7.24  | -20.04 |
| 120                          | -6.28 | -7.44 | -3.65 | -7.01 | -7.34  | 7.03 | -4.38 | -1.53 | -7.63  | -10.75 | -12.15 | -9.06  | -20.04 |
| 135                          | -6.35 | -6.87 | -3.54 | -6.63 | -7.99  | 7.19 | -3.87 | -2.19 | -9.75  | -12.25 | -13.38 | -8.03  | -20.04 |
| 150                          | -6.21 | -6.90 | -4.51 | -7.93 | -5.76  | 8.39 | 0.95  | -0.11 | -14.89 | -6.83  | -10.44 | -7.93  | -20.04 |
| 165                          | -6.06 | -6.93 | -5.86 | -6.82 | -5.38  | 7.56 | -0.98 | -0.69 | -10.54 | -10.20 | -9.87  | -8.83  | -20.04 |
| 180                          | -6.03 | -7.07 | -7.11 | -6.46 | -4.70  | 7.71 | 0.93  | -1.24 | -11.19 | -9.80  | -10.27 | -9.78  | -20.04 |
| 195                          | -5.86 | -6.35 | -9.19 | -5.34 | -5.83  | 7.41 | -1.43 | -1.91 | -12.07 | -10.19 | -8.55  | -10.39 | -20.04 |
| 210                          | -5.97 | -5.69 | -8.76 | -4.95 | -5.24  | 8.39 | 1.86  | 0.17  | -8.58  | -10.27 | -9.11  | -10.68 | -20.04 |
| 225                          | -6.24 | -5.10 | -6.17 | -5.20 | -6.08  | 7.70 | -3.40 | -0.51 | -7.86  | -10.93 | -10.33 | -11.93 | -20.04 |
| 240                          | -6.40 | -4.18 | -4.41 | -5.46 | -10.02 | 6.51 | -3.04 | -0.13 | -7.88  | -10.11 | -12.20 | -13.12 | -20.04 |
| 255                          | -6.63 | -3.94 | -3.62 | -5.34 | -7.41  | 6.16 | -1.15 | -0.92 | -12.66 | -14.40 | -16.54 | -14.64 | -20.04 |
| 270                          | -6.79 | -4.11 | -6.53 | -3.32 | -9.47  | 6.51 | -1.61 | -0.95 | -11.40 | -10.23 | -18.08 | -16.97 | -20.04 |
| 285                          | -6.88 | -3.73 | -4.54 | -3.59 | -7.85  | 7.13 | -4.04 | -2.67 | -10.02 | -8.82  | -14.83 | -20.04 | -20.04 |
| 300                          | -6.89 | -3.56 | -6.03 | -3.69 | -6.62  | 7.26 | -4.34 | -1.43 | -9.69  | -11.97 | -12.92 | -15.91 | -20.04 |
| 315                          | -6.88 | -4.11 | -6.39 | -3.07 | -4.61  | 7.57 | -2.61 | 0.41  | -9.79  | -11.18 | -12.74 | -14.05 | -20.04 |
| 330                          | -6.90 | -4.28 | -5.79 | -4.18 | -4.42  | 8.70 | 2.27  | -0.44 | -12.30 | -10.57 | -9.96  | -13.08 | -20.04 |
| 345                          | -7.08 | -4.02 | -5.19 | -5.20 | -4.56  | 7.95 | -0.71 | -3.41 | -11.63 | -10.84 | -9.78  | -12.32 | -20.04 |

| Ant1      |       |       |        |       |       |      |        |       |        |        |        |        |        |
|-----------|-------|-------|--------|-------|-------|------|--------|-------|--------|--------|--------|--------|--------|
| Freq      | 5800  |       |        |       |       |      |        |       |        |        |        |        |        |
| Phi\Theta | 0     | 15    | 30     | 45    | 60    | 75   | 90     | 105   | 120    | 135    | 150    | 165    | 180    |
| 0         | -8.68 | -3.35 | -12.35 | -4.65 | -5.62 | 3.35 | -12.44 | -5.63 | -13.43 | -19.27 | -10.84 | -12.01 | -20.38 |

|     |       |        |        |        |        |      |        |       |        |        |        |        |        |
|-----|-------|--------|--------|--------|--------|------|--------|-------|--------|--------|--------|--------|--------|
| 15  | -8.71 | -3.05  | -9.7   | -3.13  | -6.12  | 2.49 | -9.02  | -5.31 | -16.19 | -21.33 | -17.01 | -12.81 | -20.38 |
| 30  | -8.71 | -3.44  | -8.01  | -3.64  | -5.52  | 4.42 | -14.3  | -2.84 | -13.35 | -16.58 | -20.57 | -15.89 | -20.38 |
| 45  | -8.55 | -4.32  | -8.66  | -5.85  | -7.34  | 2.74 | -9.13  | -6    | -10.34 | -9.73  | -13.9  | -15.26 | -20.38 |
| 60  | -8.51 | -5.52  | -7.57  | -3.81  | -8.43  | 3.82 | -3.61  | -3.06 | -8.97  | -10.29 | -18.12 | -13.48 | -20.38 |
| 75  | -8.39 | -7.49  | -8.5   | -5.57  | -13.84 | 4.63 | -3.36  | -2.89 | -14.16 | -10.53 | -15.26 | -12.76 | -20.38 |
| 90  | -8.13 | -11.52 | -6.04  | -8.04  | -9.14  | 3.76 | -5.68  | -6.71 | -10.76 | -18.27 | -11.53 | -13.19 | -20.38 |
| 105 | -8.11 | -12.26 | -5.46  | -10.08 | -9.67  | 3.83 | -9.12  | -6.16 | -8.99  | -14.11 | -12.17 | -14.42 | -20.38 |
| 120 | -7.86 | -11.54 | -4.61  | -8.25  | -11.12 | 5.28 | -5.33  | -3.99 | -5.2   | -11.44 | -9.2   | -13.67 | -20.38 |
| 135 | -7.86 | -11.13 | -4.62  | -10.8  | -9.86  | 6.43 | -2.9   | -3.81 | -7.26  | -9.86  | -9.59  | -12.65 | -20.38 |
| 150 | -7.97 | -12.18 | -5.98  | -10.43 | -11.72 | 6.4  | -2.24  | -1.81 | -11.62 | -15.88 | -7.26  | -10.89 | -20.38 |
| 165 | -7.87 | -14.3  | -7.09  | -11.12 | -9.87  | 6.29 | -5.09  | -2.8  | -8.69  | -15.49 | -7.09  | -11.19 | -20.38 |
| 180 | -7.69 | -17.22 | -8.33  | -13.34 | -6.55  | 6.84 | -5.77  | -3.13 | -10.44 | -13.93 | -7.99  | -12.09 | -20.38 |
| 195 | -7.61 | -16.97 | -9.31  | -7.93  | -10.54 | 6.59 | -5.48  | -4.74 | -10.48 | -14.6  | -8.04  | -12.42 | -20.38 |
| 210 | -7.33 | -13.31 | -8.68  | -12.45 | -7.99  | 6.71 | -4.55  | -0.77 | -8.91  | -11.52 | -7.33  | -13.2  | -20.38 |
| 225 | -7.38 | -10.36 | -6.29  | -8.95  | -10.29 | 5.65 | -2.59  | -2.56 | -5.32  | -12.55 | -6.59  | -15.54 | -20.38 |
| 240 | -7.71 | -10.13 | -5.87  | -7.05  | -8.91  | 3.82 | -5.57  | -4.47 | -10.7  | -15.01 | -8.87  | -18.51 | -20.38 |
| 255 | -8.03 | -8.52  | -5.35  | -4.76  | -7.6   | 2.76 | -6.46  | -5.18 | -9.13  | -14.83 | -20.18 | -13.92 | -20.38 |
| 270 | -8.18 | -6.26  | -7     | -5.15  | -9.45  | 3.49 | -6.08  | -4.32 | -16.79 | -18.7  | -16.58 | -11.28 | -20.38 |
| 285 | -8.15 | -5.31  | -7.47  | -6.01  | -12.5  | 4.51 | -5.33  | -3.49 | -10.72 | -10.07 | -12.87 | -14.99 | -20.38 |
| 300 | -8.06 | -5.23  | -10.2  | -4.99  | -5.56  | 3.64 | -5.95  | -5.92 | -16.84 | -15.66 | -16.33 | -20.38 | -20.38 |
| 315 | -7.99 | -5.38  | -15.99 | -5.17  | -3.4   | 2.46 | -13.82 | -3.87 | -13.21 | -18.23 | -15.83 | -19.38 | -20.38 |
| 330 | -8.21 | -5.05  | -14.22 | -4.44  | -4.97  | 4.68 | -13.66 | -1.45 | -25.83 | -12.69 | -13.36 | -19.57 | -20.38 |
| 345 | -8.57 | -4.34  | -12.46 | -4.86  | -7.81  | 2.88 | -17.54 | -4.88 | -13.2  | -13.16 | -12.49 | -16.15 | -20.38 |

| Ant2      |        |       |        |        |        |      |        |       |        |        |        |        |        |
|-----------|--------|-------|--------|--------|--------|------|--------|-------|--------|--------|--------|--------|--------|
| Freq      | 5800   |       |        |        |        |      |        |       |        |        |        |        |        |
| Phi\Theta | 0      | 15    | 30     | 45     | 60     | 75   | 90     | 105   | 120    | 135    | 150    | 165    | 180    |
| 0         | -11.78 | -9.54 | -4.37  | -8.15  | -9.21  | 6.66 | -8.52  | -2.42 | -11.46 | -18.2  | -12.31 | -10.05 | -18.66 |
| 15        | -11.88 | -8.69 | -3.83  | -8.77  | -9.2   | 5.83 | -7.29  | -2.17 | -10.2  | -19.31 | -12.74 | -9.29  | -18.66 |
| 30        | -11.75 | -8.61 | -4.32  | -8.22  | -9.94  | 5.71 | -6.21  | -1.2  | -11.21 | -16.16 | -11.93 | -7.32  | -18.66 |
| 45        | -11.52 | -8.42 | -3.76  | -10.37 | -15.58 | 5.62 | -4.11  | -0.8  | -6.74  | -13.56 | -12.35 | -6.53  | -18.66 |
| 60        | -11.4  | -7.6  | -5.14  | -8.71  | -13.36 | 5.87 | -5.19  | -1.48 | -5.33  | -13.4  | -7.83  | -8.35  | -18.66 |
| 75        | -11.33 | -7.33 | -6.38  | -9.01  | -10.2  | 5.38 | -8.71  | -4.62 | -4.74  | -10.3  | -9.52  | -11.49 | -18.66 |
| 90        | -11.52 | -7.98 | -7.49  | -8.2   | -12.58 | 4.36 | -7.64  | -3.25 | -15.92 | -17.02 | -10.6  | -11.5  | -18.66 |
| 105       | -11.92 | -8.48 | -9.02  | -4.39  | -12.75 | 4.65 | -3.09  | -0.22 | -8.95  | -13.73 | -10.8  | -10.78 | -18.66 |
| 120       | -12.03 | -8.11 | -9.97  | -5.68  | -9.97  | 4.31 | -3.5   | -1.97 | -9.46  | -14.6  | -11.49 | -10.31 | -18.66 |
| 135       | -11.88 | -7.23 | -9.94  | -7.16  | -7.43  | 3.45 | -10.21 | -4.66 | -15.86 | -12.66 | -10.48 | -8.53  | -18.66 |
| 150       | -11.67 | -6.58 | -10.68 | -6.75  | -7.18  | 4.43 | -13.42 | -0.16 | -15.59 | -8.85  | -10.63 | -8.78  | -18.66 |
| 165       | -11.91 | -6.48 | -11.52 | -7.22  | -6.54  | 3.14 | -7.35  | -3.36 | -12.78 | -16.17 | -10.53 | -10.8  | -18.66 |
| 180       | -12.16 | -6.63 | -14.86 | -6.39  | -8.16  | 4.15 | -11.14 | -3.09 | -13.56 | -13.61 | -9.18  | -11.36 | -18.66 |
| 195       | -12.27 | -6.82 | -17.23 | -7.12  | -5.69  | 1.82 | -18.22 | -2.89 | -16.65 | -12.44 | -9.66  | -9.82  | -18.66 |
| 210       | -12.44 | -6.7  | -15.95 | -5.52  | -3.52  | 5.06 | -17.88 | -0.91 | -16.3  | -10.5  | -9.3   | -9.41  | -18.66 |
| 225       | -12.35 | -6.38 | -14.97 | -6.24  | -3.34  | 3.69 | -8.12  | -2.23 | -16.93 | -15.08 | -7.96  | -9.59  | -18.66 |



|     |        |        |        |       |        |      |        |       |        |        |        |        |        |
|-----|--------|--------|--------|-------|--------|------|--------|-------|--------|--------|--------|--------|--------|
| 240 | -12.38 | -6.16  | -11.27 | -9.19 | -6.88  | 4.43 | -6.42  | -0.99 | -10.71 | -14.75 | -8.8   | -12.57 | -18.66 |
| 255 | -12.63 | -7.17  | -7.12  | -8.71 | -9.7   | 4.06 | -6.39  | -1.99 | -21.09 | -20.43 | -15.83 | -18.66 | -18.66 |
| 270 | -12.47 | -9.75  | -7.71  | -8.92 | -13.42 | 3.86 | -11.31 | -3.64 | -11.64 | -11.07 | -14.01 | -13.41 | -18.66 |
| 285 | -12.23 | -9.76  | -5.11  | -9.24 | -9.08  | 5.14 | -6.1   | -4.75 | -8.84  | -9.54  | -15.73 | -12.39 | -18.66 |
| 300 | -12.13 | -8.36  | -8.72  | -8.73 | -9.51  | 5.53 | -3.88  | -2.48 | -9.78  | -15.37 | -9.74  | -11.86 | -18.66 |
| 315 | -11.95 | -10.73 | -7.59  | -7.28 | -14.35 | 5.54 | -4.04  | -1.29 | -9.06  | -15.41 | -16.01 | -11.95 | -18.66 |
| 330 | -12.07 | -12.44 | -7.08  | -7.2  | -12.12 | 6.25 | -5.03  | -1.77 | -13.16 | -16.22 | -15.54 | -11.13 | -18.66 |
| 345 | -11.95 | -10.9  | -5.66  | -8.81 | -9.43  | 6.18 | -6.12  | -3.63 | -12.35 | -19.07 | -12.2  | -10.19 | -18.66 |

| 5800MHz Composite Gain (1SS) |       |       |       |       |       |      |       |       |        |        |        |        |        |
|------------------------------|-------|-------|-------|-------|-------|------|-------|-------|--------|--------|--------|--------|--------|
| Freq                         | 5800  |       |       |       |       |      |       |       |        |        |        |        |        |
| Phi\Theta                    | 0     | 15    | 30    | 45    | 60    | 75   | 90    | 105   | 120    | 135    | 150    | 165    | 180    |
| 0                            | -7.08 | -2.89 | -4.46 | -3.21 | -4.22 | 8.17 | -7.25 | -0.87 | -9.38  | -15.71 | -8.53  | -7.96  | -16.47 |
| 15                           | -7.14 | -2.41 | -3.27 | -2.49 | -4.51 | 7.33 | -5.10 | -0.59 | -9.68  | -17.25 | -11.60 | -7.86  | -16.47 |
| 30                           | -7.09 | -2.64 | -2.96 | -2.62 | -4.44 | 8.10 | -6.34 | 1.03  | -9.20  | -13.36 | -12.21 | -7.58  | -16.47 |
| 45                           | -6.90 | -3.12 | -2.86 | -4.81 | -7.51 | 7.31 | -3.25 | -0.01 | -5.34  | -8.43  | -10.08 | -6.83  | -16.47 |
| 60                           | -6.83 | -3.49 | -3.26 | -2.91 | -7.54 | 7.92 | -1.35 | 0.78  | -3.95  | -8.70  | -8.52  | -7.53  | -16.47 |
| 75                           | -6.73 | -4.40 | -4.37 | -4.11 | -8.82 | 8.02 | -2.62 | -0.70 | -5.22  | -7.40  | -8.91  | -9.09  | -16.47 |
| 90                           | -6.65 | -6.56 | -3.72 | -5.11 | -7.68 | 7.08 | -3.59 | -1.80 | -9.95  | -14.61 | -8.04  | -9.29  | -16.47 |
| 105                          | -6.80 | -7.16 | -4.05 | -3.77 | -8.06 | 7.26 | -2.58 | 0.32  | -5.96  | -10.91 | -8.45  | -9.40  | -16.47 |
| 120                          | -6.69 | -6.65 | -3.87 | -3.86 | -7.52 | 7.82 | -1.36 | 0.09  | -4.06  | -9.87  | -7.26  | -8.82  | -16.47 |
| 135                          | -6.63 | -5.95 | -3.87 | -5.78 | -5.55 | 8.08 | -2.80 | -1.21 | -7.53  | -8.14  | -7.01  | -7.34  | -16.47 |
| 150                          | -6.61 | -5.93 | -5.01 | -5.39 | -6.15 | 8.48 | -3.13 | 2.06  | -10.37 | -8.66  | -5.77  | -6.76  | -16.47 |
| 165                          | -6.65 | -6.53 | -6.02 | -5.94 | -5.04 | 7.87 | -3.14 | -0.07 | -7.49  | -12.81 | -5.63  | -7.98  | -16.47 |
| 180                          | -6.63 | -7.39 | -7.98 | -6.18 | -4.31 | 8.61 | -5.04 | -0.10 | -8.85  | -10.76 | -5.55  | -8.71  | -16.47 |
| 195                          | -6.62 | -7.48 | -9.39 | -4.51 | -4.77 | 7.54 | -6.69 | -0.76 | -10.02 | -10.44 | -5.80  | -8.01  | -16.47 |
| 210                          | -6.50 | -6.38 | -8.57 | -5.30 | -2.46 | 8.93 | -5.87 | 2.17  | -8.83  | -7.98  | -5.25  | -8.09  | -16.47 |
| 225                          | -6.50 | -5.13 | -6.58 | -4.48 | -3.13 | 7.74 | -1.91 | 0.62  | -6.30  | -10.71 | -4.24  | -9.05  | -16.47 |
| 240                          | -6.72 | -4.91 | -5.15 | -5.04 | -4.83 | 7.14 | -2.97 | 0.45  | -7.69  | -11.87 | -5.82  | -12.03 | -16.47 |
| 255                          | -7.02 | -4.81 | -3.18 | -3.50 | -5.58 | 6.44 | -3.41 | -0.43 | -10.19 | -14.18 | -14.73 | -12.96 | -16.47 |
| 270                          | -7.05 | -4.82 | -4.34 | -3.82 | -8.20 | 6.69 | -5.30 | -0.96 | -10.83 | -11.06 | -12.19 | -9.27  | -16.47 |
| 285                          | -6.94 | -4.24 | -3.20 | -4.47 | -7.61 | 7.84 | -2.70 | -1.09 | -6.72  | -6.79  | -11.17 | -10.58 | -16.47 |
| 300                          | -6.85 | -3.64 | -6.42 | -3.65 | -4.30 | 7.65 | -1.84 | -1.02 | -9.60  | -12.50 | -9.41  | -12.10 | -16.47 |
| 315                          | -6.74 | -4.64 | -7.80 | -3.15 | -4.24 | 7.15 | -4.61 | 0.53  | -7.88  | -13.70 | -12.91 | -11.88 | -16.47 |
| 330                          | -6.92 | -4.97 | -6.93 | -2.70 | -4.82 | 8.51 | -5.30 | 1.40  | -14.35 | -11.27 | -11.37 | -11.35 | -16.47 |
| 345                          | -7.09 | -4.00 | -5.40 | -3.60 | -5.57 | 7.70 | -7.06 | -1.22 | -9.75  | -12.61 | -9.33  | -9.66  | -16.47 |