



# Antenna Composite Gain Test Report

|                 |                                                                                                                                |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------|
| Equipment       | WiFi 7 Tri-radio concurrent indoor ceiling mount AP<br>Cloud Lite 802.11be 2x3x3 Tri-Band Managed Indoor Wireless Access Point |
| Brand Name      | Senao, EnGenius                                                                                                                |
| Model Name      | IAP3701M-C, ECW516L                                                                                                            |
| Applicant       | Senao Networks, Inc.<br>3F., No.529, Zhongzheng Rd., Xindian Dist., New Taipei City, Taiwan                                    |
| Manufacturer    | Senao Networks, Inc.<br>3F., No.529, Zhongzheng Rd., Xindian Dist., New Taipei City, Taiwan                                    |
| Standard        | KDB 662911 D03 v01                                                                                                             |
| Sample Received | Jul. 18, 2024                                                                                                                  |
| Start Test Date | Jul. 23, 2024                                                                                                                  |
| Final Test Date | Jul. 23, 2024                                                                                                                  |

  
Approved by: Jackson Tsai

**SPORTON INTERNATIONAL INC. Hsinhua Laboratory**

No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)



## **Table of Contents**

|                                                                   |    |
|-------------------------------------------------------------------|----|
| History of this test report.....                                  | 3  |
| 1. Operation Mode and Antenna Information .....                   | 4  |
| 2. Test Frequency .....                                           | 4  |
| 3. Testing Location.....                                          | 4  |
| 4. Test Facility and Configuration.....                           | 5  |
| 5. Reference Calibration .....                                    | 6  |
| 6. Test Method .....                                              | 7  |
| 7. Measured Values and Calculation of Maximum Gain Positions..... | 8  |
| 8. Summary of Test Result .....                                   | 9  |
| 9. Test Setup .....                                               | 10 |
| 10. Test Equipment and Calibration Data .....                     | 11 |
| 11. Test Results .....                                            | 12 |

## History of this test report

[illegible]



## 1. Operation Mode and Antenna Information

| Antenna Position | RF Port | Brand Name | Model Name   | Ant. Type | Connector | Modes of Operation |
|------------------|---------|------------|--------------|-----------|-----------|--------------------|
| 2G 5GAnt1        | 1       | Enrack     | 7102A1311000 | PIFA      | I-Pex     | 2.4GHz, 5GHz       |
| 2G 5GAnt2        | 2       | Enrack     | 7102A1312000 | PIFA      | I-Pex     | 2.4GHz, 5GHz       |
| 5GAnt3           | 3       | Enrack     | 7102A1313000 | PIFA      | I-Pex     | 5GHz               |

Note:

### 2.4GHz Operation Mode (2TX/2RX)

2G 5GAnt1, 2G 5GAnt2 can be used as transmitting/receiving antenna.

### 5GHz Operation Mode (3TX/3RX)

2G 5GAnt1, 2G 5GAnt2, 5GAnt3 can be used as transmitting/receiving antenna.

## 2. Test Frequency

The listed frequency of each bands are selected to represent each frequency bands

| Band [MHz]  | Test Frequency [MHz] |
|-------------|----------------------|
| 2400-2483.5 | 2450                 |
| 5150-5250   | 5200                 |
| 5250-5350   | 5300                 |
| 5470-5725   | 5600                 |
| 5725-5850   | 5785                 |

## 3. Testing Location

| Test Lab. : Sporton International Inc. Hsinhua Laboratory |               |                                                                                    |                           |                |
|-----------------------------------------------------------|---------------|------------------------------------------------------------------------------------|---------------------------|----------------|
| <input checked="" type="checkbox"/> Wen 33rd.St.          | ADD:          | No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) |                           |                |
|                                                           | TEL:          | 886-3-318-0787                                                                     | FAX:                      | 886-3-318-0287 |
| Test Condition                                            | Test Site No. | Test Engineer                                                                      | Test Environment (°C / %) | Test Date      |
| Radiated                                                  | 05CH03-HY     | Rofy Chen                                                                          | 23.5~24.5°C / 45~55%      | 23/Jul/2024    |

Note:

Testing Site Information

Brand Name: TDK

Dimension: 11m\*6m\*6m

Characteristic: Fully Anechoic Chamber

## 4. Test Facility and Configuration

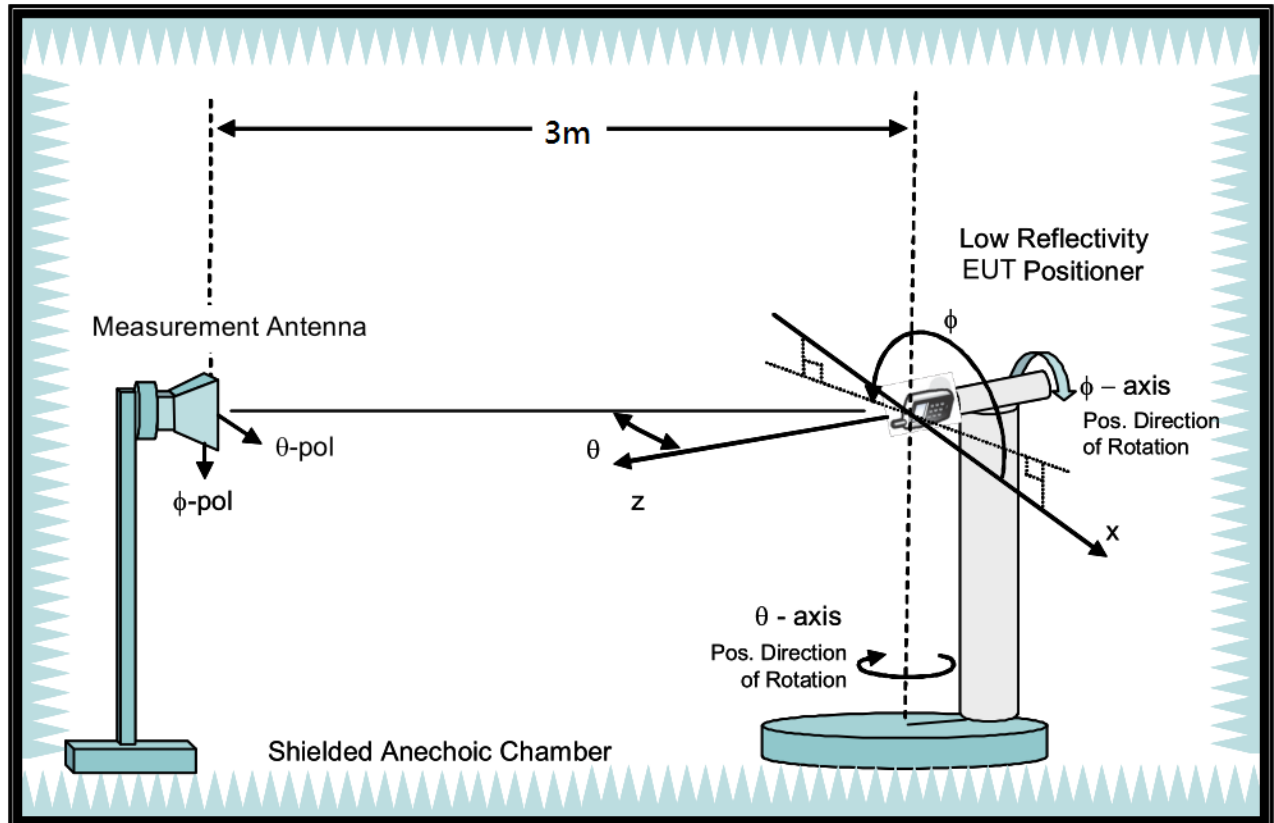
Test configuration: Reference to CITA OTA distributed-axes system configuration.

Chamber: Fully Anechoic Chamber.

Measurement antenna: Dual Polarization Horn antenna

Turntable: Multi-axis positioner (Theta and Phi angle).

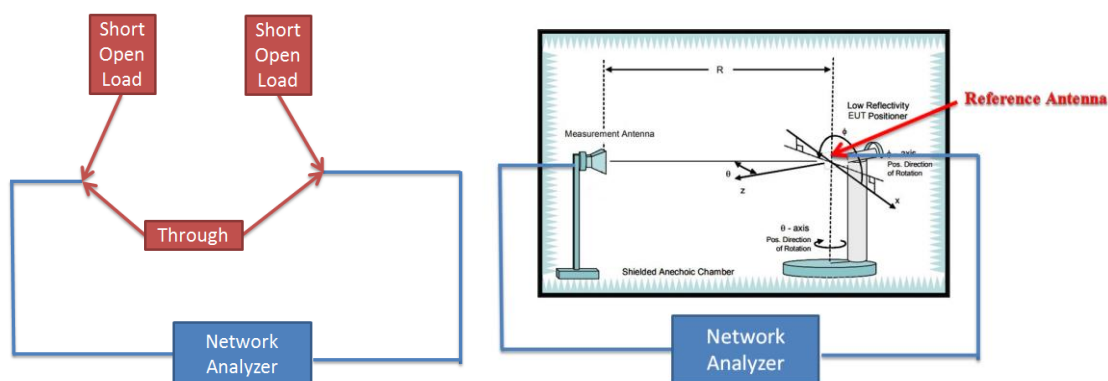
#Reference to CTIA "ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1"



## 5. Reference Calibration

Connected cables to VNA calibration kit and use network analyzer internal function to do calibration. Do short, open and load to each side. Then connect through to both side and calibrate G values. The cable loss is calibrated and set inside the network analyzer.

Measurement Antenna is connected to port1 of Network analyzer and reference antenna connected to port 2 of Network Analyzer. Record G values and used with reference antenna gain to calculate gain factor.



| Frequency (MHz)       | 2400   | 2450   | 2500   | 5150   | 5200   | 5300   | 5600   | 5750   | 5800   | 5900   | 6000   | 6500   | 7000   | 7200   |
|-----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| G(theta) reading (dB) | -33.55 | -33.38 | -32.91 | -32.29 | -32.48 | -32.25 | -32.33 | -32.85 | -32.67 | -33.37 | -32.53 | -33.75 | -34.72 | -35.33 |
| G(phi) reading (dB)   | -33.11 | -32.68 | -32.48 | -32.45 | -32.85 | -31.35 | -32.76 | -32.68 | -32.57 | -32.81 | -32.85 | -33.62 | -34.33 | -35.29 |
| Reference gain (dBi)  | 10.3   | 10.3   | 10.1   | 11.1   | 11.3   | 11.7   | 12.1   | 11.5   | 11.2   | 11.1   | 11.3   | 11     | 11.1   | 10.5   |
| Factor(theta) (dB)    | 43.85  | 43.68  | 43.01  | 43.39  | 43.78  | 43.95  | 44.43  | 44.35  | 43.87  | 44.47  | 43.83  | 44.75  | 45.82  | 45.83  |
| Factor(phi) (dB)      | 43.41  | 42.98  | 42.58  | 43.55  | 44.15  | 43.05  | 44.86  | 44.18  | 43.77  | 43.91  | 44.15  | 44.62  | 45.43  | 45.79  |

Note:

$$G \text{ reading (dB)} = 20 \cdot \log(V_2/V_1) = 10 \cdot \log(P_2/P_1)$$

V2 is the voltage of VNA port2 is measured, V1 is the voltage of VNA port1 is the reference source.

P2 is the power of VNA port2 is measured, P1 is the power of VNA port1 is the reference source.

$$\text{Factor} = \text{gain factor} + \text{power gain conversion} = (\text{Reference antenna gain}) - (G \text{ reading})$$

## 6. Test Method

EUT set on multi-axis positioner and adjust EUT's physical center to measurement reference center. Measurement antenna set at phi polarization and 1.5 meter height. Port 1 of Network analyzer connect to antenna 1 of EUT. Record G value every 7.5 degree from 0 to 352.5 degree on Phi angle and 0 to 180 on theta angle of multi-axis positioner. Then set measurement antenna to theta polarization and repeat process. Repeat process to each antenna of EUT.

DG steps:

1. Each Phi and Theta polarization antenna gain are measured for all test angles.
2. Composite Phi and Theta antenna gain are computed, using formula in KDB662911 D01 d) (i) and e) (ii), for all angles.
3. Composite antenna gain are examined for all angles to determine max gain and Phi/Theta position. Max gain and phi/theta position are listed in section 7 tables.

Note: Antenna gain = G reading + factor, The factor of chapter five includes reference antenna gain factor and power gain conversion.

## 7. Measured Values and Calculation of Maximum Gain Positions

### DG\_1SS max value position

| Frequency (Hz)     | 2.45G | 5.2G  | 5.3G  | 5.6G  | 5.785G |
|--------------------|-------|-------|-------|-------|--------|
| Ant. 1 (dBi)       | 0.56  | 2.76  | -0.09 | 0.73  | 2.64   |
| Ant. 2 (dBi)       | 0.39  | 4.82  | 3.33  | 3.06  | -4.27  |
| Ant. 3 (dBi)       | -     | -9.1  | -2.39 | -0.13 | 1.97   |
| DG [1SS] (dBi)     | 3.49  | 6.03  | 5.38  | 6.1   | 5.39   |
| Polarization       | Theta | Phi   | Phi   | Theta | Theta  |
| $\Theta(^{\circ})$ | 60    | 22.5  | 15    | 82.5  | 67.5   |
| $\Phi(^{\circ})$   | 322.5 | 352.5 | 195   | 277.5 | 165    |

Note: The DG 1SS max value position is the maximum value of section 11 table DG 1SS Result.

### DG\_1SS max value position calculation

| Frequency (Hz)                            | 2.45G            | 5.2G             | 5.3G              | 5.6G              | 5.785G            |
|-------------------------------------------|------------------|------------------|-------------------|-------------------|-------------------|
| Ant. 1 [ $10^{(G/20)}$ ]                  | $10^{(0.56/20)}$ | $10^{(2.76/20)}$ | $10^{(-0.09/20)}$ | $10^{(0.73/20)}$  | $10^{(2.64/20)}$  |
| Ant. 2 [ $10^{(G/20)}$ ]                  | $10^{(0.39/20)}$ | $10^{(4.82/20)}$ | $10^{(3.33/20)}$  | $10^{(3.06/20)}$  | $10^{(-4.27/20)}$ |
| Ant. 3 [ $10^{(G/20)}$ ]                  | -                | $10^{(-9.1/20)}$ | $10^{(-2.39/20)}$ | $10^{(-0.13/20)}$ | $10^{(1.97/20)}$  |
| Ant. 1 [ $10^{(G/20)}$ ] value            | 1.067            | 1.374            | 0.99              | 1.088             | 1.355             |
| Ant. 2 [ $10^{(G/20)}$ ] value            | 1.046            | 1.742            | 1.467             | 1.422             | 0.612             |
| Ant. 3 [ $10^{(G/20)}$ ] value            | -                | 0.351            | 0.759             | 0.985             | 1.255             |
| Sum All Antenna [Amax]                    | 2.113            | 3.467            | 3.216             | 3.495             | 3.221             |
| DG [ $10 \cdot \log(A_{max}^2/N_{ant})$ ] | 3.49             | 6.03             | 5.38              | 6.1               | 5.39              |

Note:

Directional Gain (1SS) is the max value of every look angle. Each position value is calculated by KDB662911 D01 d) (i).

Directional gain (1SS) =  $10 \cdot \log(10^{(G_{ant1}/20)} + 10^{(G_{ant2}/20)} + 10^{(G_{ant3}/20)} + 10^{(G_{ant4}/20)} + \dots)^{2/N_{ant}}$

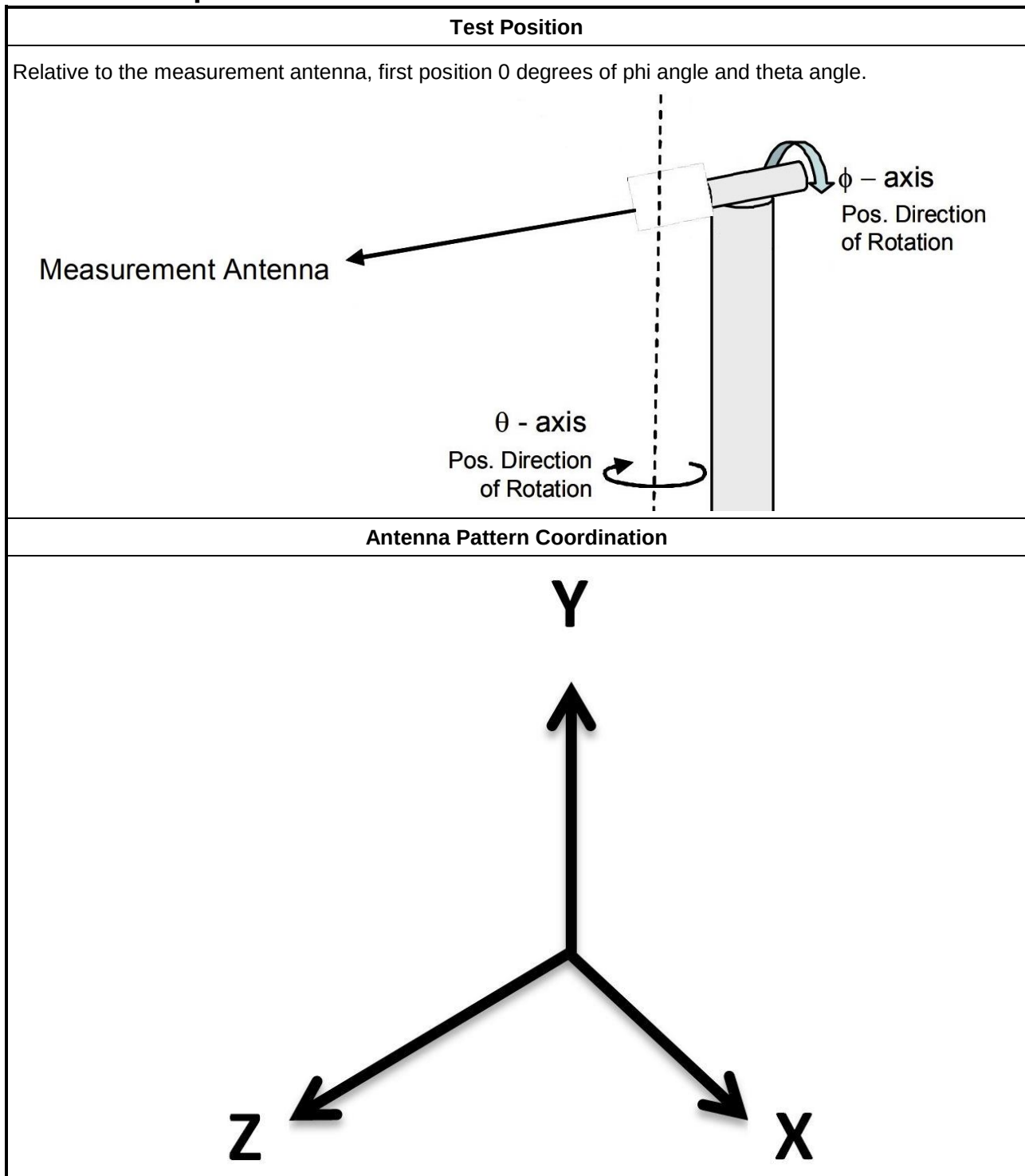
## 8. Summary of Test Result

| Freq(Hz)                                               | 2.45G          | 5.2G           | 5.3G             | 5.6G             | 5.785G           |
|--------------------------------------------------------|----------------|----------------|------------------|------------------|------------------|
| Ant. 1 Max Gain (dBi)                                  | 2.04           | 3.22           | 2.6              | 2.92             | 2.64             |
| Ant. 2 Max Gain (dBi)                                  | 3.05           | 4.82           | 4.77             | 4.93             | 4.8              |
| Ant. 3 Max Gain (dBi)                                  | -              | 3.89           | 3.94             | 3.85             | 3.63             |
| Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$ | Theta/45/112.5 | Phi/15/172.5   | Phi/30/172.5     | Theta/67.5/165   | Theta/67.5/165   |
| Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$ | Theta/60/292.5 | Phi/22.5/352.5 | Phi/0/187.5      | Phi/7.5/352.5    | Phi/0/180        |
| Ant. 3 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$ | -              | Theta/67.5/180 | Theta/67.5/187.5 | Theta/67.5/187.5 | Theta/67.5/187.5 |
| Max Gain (dBi)                                         | 3.05           | 4.82           | 4.77             | 4.93             | 4.8              |
| DG [1SS] (dBi)                                         | 3.49           | 6.03           | 5.38             | 6.1              | 5.39             |
| DG [2SS] (dBi)                                         | 3.05           | 4.82           | 4.77             | 4.93             | 4.8              |
| DG [3SS] (dBi)                                         | -              | 4.82           | 4.77             | 4.93             | 4.8              |

Note:

1. Antenna max gain is the max value of each individual antenna through all measurement angles.
2. The max gain is the max value of all antennas.
3. Directional Gain (2SS) = Directional Gain (1SS) – 3dB. If directional gain is less than max gain, use max gain as directional gain. Refer to KDB662911D01 (F) (2) (e) (ii)
4. Directional Gain (3SS) = Directional Gain (1SS) – 4.77dB. If directional gain is less than max gain, use max gain as directional gain. Refer to KDB662911D01 (F) (2) (e) (ii)

## 9. Test Setup



Note:

Photos of Test Position: Please refer to the test photos in the appendix.

**10. Test Equipment and Calibration Data**

| Instrument                     | Brand       | Model No.  | Serial No.      | Characteristics  | Calibration Date | Calibration Due Date |
|--------------------------------|-------------|------------|-----------------|------------------|------------------|----------------------|
| Horn Antenna                   | SCHWARZBECK | BBHA9120D  | BBHA 9120D-1531 | 1GHz~18GHz       | Dec. 20, 2023    | Dec. 19, 2024        |
| Dual Polarization Horn Antenna | Sporton     | S0209DP    | S0209DP-001     | 2GHz~9GHz        | N.C.R.           | N.C.R.               |
| ENA Series Network Analyzer    | AGILENT     | E5071C     | MY46419477      | 100kHz~8.5GHz    | Jul. 28, 2023    | Jul. 27, 2024        |
| VNA Calibration Kit            | TS RF       | TS85033E-F | -               | DC~9GHz          | N.C.R.           | N.C.R.               |
| Multi-axis positioner          | Sporton     | MAPS01     | MAPS01-001      | Theta / Phi axis | N.C.R.           | N.C.R.               |
| Test Software                  | SPORTON     | SENSE-RDG  | V1.0.8          | -                | N.C.R.           | N.C.R.               |

Note: Calibration Interval of instruments listed above is one year.

NCR means Non-Calibration required.



## **11. Test Results**

Please refer to the appendix.

|                                           |         |
|-------------------------------------------|---------|
| Appendix A – Radiated Composite Gain..... | Page 13 |
| Appendix B – Antenna Pattern.....         | Page 25 |
| Appendix C – Test Photos.....             | Page 31 |

————THE END————



-

| Freq(Hz)                      | 2.45G          | 5.2G           | 5.3G             | 5.6G             | 5.785G           |
|-------------------------------|----------------|----------------|------------------|------------------|------------------|
| Ant. 1 Max Gain (dBi)         | 2.04           | 3.22           | 2.6              | 2.92             | 2.64             |
| Ant. 2 Max Gain (dBi)         | 3.05           | 4.82           | 4.77             | 4.93             | 4.8              |
| Ant. 3 Max Gain (dBi)         |                | 3.89           | 3.94             | 3.85             | 3.63             |
| Ant. 1 Polarization/Θ(°)/Φ(°) | Theta/45/112.5 | Phi/15/172.5   | Phi/30/172.5     | Theta/67.5/165   | Theta/67.5/165   |
| Ant. 2 Polarization/Θ(°)/Φ(°) | Theta/60/292.5 | Phi/22.5/352.5 | Phi/0/187.5      | Phi/7.5/352.5    | Phi/0/180        |
| Ant. 3 Polarization/Θ(°)/Φ(°) |                | Theta/67.5/180 | Theta/67.5/187.5 | Theta/67.5/187.5 | Theta/67.5/187.5 |
| Max Gain (dBi)                | 3.05           | 4.82           | 4.77             | 4.93             | 4.8              |
| DG [1SS] (dBi)                | 3.49           | 6.03           | 5.38             | 6.1              | 5.39             |
| DG [2SS] (dBi)                | 3.05           | 4.82           | 4.77             | 4.93             | 4.8              |



# Radiated Composite Gain Data

# Appendix A

## DG 1SS Result

| Freq(Hz)  | 2.45G/Pol.    | Phi-            | +               | +               | +               | +               | +               | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 |                   |                   |
|-----------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| DG(dB)    | Φ(0°)/Φ(7.5°) | Φ(15°)/Φ(22.5°) | Φ(30°)/Φ(37.5°) | Φ(45°)/Φ(52.5°) | Φ(60°)/Φ(67.5°) | Φ(75°)/Φ(82.5°) | Φ(90°)/Φ(97.5°) | Φ(105°)/Φ(112.5°) | Φ(120°)/Φ(127.5°) | Φ(135°)/Φ(142.5°) | Φ(150°)/Φ(157.5°) | Φ(165°)/Φ(172.5°) | Φ(180°)/Φ(187.5°) | Φ(195°)/Φ(202.5°) | Φ(210°)/Φ(217.5°) | Φ(225°)/Φ(232.5°) | Φ(240°)/Φ(247.5°) | Φ(255°)/Φ(262.5°) | Φ(270°)/Φ(277.5°) | Φ(285°)/Φ(292.5°) | Φ(300°)/Φ(307.5°) | Φ(315°)/Φ(322.5°) | Φ(330°)/Φ(337.5°) | Φ(345°)/Φ(352.5°) |
| Θ(0°)     | -8.55/-8.63   | -7.61/-6.98     | -6.47/-6.28     | -6.48/-6.77     | -7.35/-7.63     | -7.63/-7.33     | -6.91/-6.62     | -6.48/-6.41       | -6.76/-6.78       | -6.75/-6.73       | -7.48/-8.32       | -8.07/-7.77       | -8.02/-8.15       | -8.21/-7.87       | -7.15/-6.42       | -5.94/-5.68       | -5.45/-5.3        | -5.2/-5.2         | -5.25/-5.35       | -5.6/-5.97        | -6.6/-7.48        | -8.21/-8.33       | -8.11/-7.88       | -7.85/-7.13       |
| Θ(7.5°)   | -8.61/-8.81   | -7.69/-6.16     | -4.89/-4.04     | -3.51/-3.27     | -3.2/-3.14      | -3.43/-3.18     | -4.54/-4.54     | -6.52/-7.29       | -7.83/-8.6        | -9.05/-9.4        | -9.36/-8.27       | -7.62/-7.41       | -7.7/-8.21        | -8.6/-8.88        | -9.25/-9.54       | -9.43/-9.27       | -8.89/-8.15       | -7.3/-6.68        | -6.14/-5.71       | -5.85/-5.62       | -6.21/-6.47       | -6.21/-6.47       | -6.21/-6.47       | -6.21/-6.47       |
| Θ(15°)    | -9.77/-10.23  | -8.86/-6.73     | -4.79/-3.33     | -2.33/-1.77     | -1.57/-1.5      | -1.42/-1.35     | -1.49/-1.76     | -2.28/-3.19       | -4.4/-5.58        | -6.92/-8.5        | -10/-9.44         | -9.24/-8.39       | -7.35/-7.03       | -7.51/-8.67       | -9.77/-8.86       | -7.42/-5.83       | -4.94/-4.53       | -4.37/-4.39       | -4.59/-4.99       | -5.3/-5.1         | -4.79/-4.64       | -4.67/-4.89       | -5.34/-6.12       | -7.25/-8.63       |
| Θ(22.5°)  | -11.63/-12.3  | -10.88/-9.09    | -6.19/-3.76     | -2.05/-1.03     | -0.75/-0.9      | -1.14/-1.23     | -1.22/-1.28     | -1.55/-2.18       | -3.25/-4.68       | -6.54/-8.73       | -10.38/-9.67      | -8.26/-7.22       | -6.61/-6.8        | -7.83/-8.93       | -7.73/-4.94       | -6.02/-1.21       | -4.0/-0.3         | -0.52/-1.06       | -1.87/-3.02       | -4.32/-5.26       | -5.33/-4.92       | -4.77/-5.13       | -5.95/-7.16       | -8.65/-10.21      |
| Θ(30°)    | -12.35/-12.84 | -12.32/-10.48   | -7.28/-4.22     | -1.96/-0.52     | 0.03/-0.2       | -1/-1.67        | -1.74/-1.56     | -1.48/-1.81       | -2.81/-4.34       | -6.27/-8.44       | -9.52/-8.28       | -6.74/-5.81       | -5.49/-5.87       | -6.66/-7.42       | -5.3/-3.21        | -1.41/-0.04       | 0.76/1.02         | 0.85/0.34         | -0.54/-1.89       | -3.82/-5.81       | -5.41/-6.1        | -7.42/-8.56       | -9.6/-11.1        |                   |
| Θ(37.5°)  | -11.23/-11    | -9.82/-8.16     | -6.19/-3.91     | -1.97/-0.58     | 0.11/-0.11      | -1.13/-2.01     | -2.05/-1.72     | -1.49/-2.01       | -2.83/-4.7        | -6.39/-7.58       | -6.84/-5.56       | -4.64/-4.17       | -4.14/-4.76       | -5.88/-6.05       | -4.18/-2.73       | -1.51/-0.5        | 0.22/0.47         | 0.33/-0.15        | -1.03/-2.47       | -4.69/-7.05       | -6.64/-5.39       | -5.28/-5.98       | -6.09/-6.49       | -7.85/-9.99       |
| Θ(45°)    | -8.39/-7.09   | -5.93/-5.53     | -4.83/-3.33     | -1.85/-0.81     | -0.08/-0.06     | -0.99/-2.06     | -2.47/-2.33     | -2.22/-2.28       | -3.45/-4.11       | -4.79/-4.89       | -4.45/-4.46       | -4.55/-4.12       | -3.44/-3.32       | -4.42/-5.72       | -3.9/-2.69        | -1.86/-1.02       | -0.37/-0.39       | -0.94/-1.67       | -2.66/-4.3        | -6.86/-8.5        | -6.85/-5.32       | -5.06/-5.47       | -4.62/-4.47       | -5.48/-7.14       |
| Θ(52.5°)  | -6.92/-4      | -3/-3.37        | -3.82/-3.19     | -2.07/-1.29     | -0.5/-0.23      | -1.06/-2.56     | -3.72/-4.05     | -4.05/-4.01       | -3.45/-2.8        | -2.73/-2.86       | -3.56/-5.42       | -6.35/-4.94       | -2.57/-2.38       | -4.03/-5.49       | -3.67/-2.81       | -2.11/-1.01       | -0.36/-0.99       | -2.41/-3.41       | -4.17/-5.15       | -6.45/-6.82       | -5.65/-4.82       | -5.2/-6.39        | -4.6/-3.77        | -4.2/-6.14        |
| Θ(60°)    | -6.5/-3.98    | -2.92/-3.25     | -3.65/-3.43     | -2.82/-2.1      | -1.5/-1.22      | -2.17/-3.89     | -5.02/-5.35     | -5.64/-5.02       | -3.48/-2.33       | -2.23/-2.55       | -3.38/-5.9        | -7.12/-3.96       | -1.95/-1.89       | -4.02/-5.35       | -2.38/-2.14       | -2.57/-1.55       | -0.81/-2.09       | -4.9/-5.24        | -4.71/-6          | -6.96/-6.43       | -4.29/-3.08       | -3.51/-5.21       | -3.43/-2.41       | -2.75/-4.74       |
| Θ(67.5°)  | -4.26/-2.91   | -3.17/-4.51     | -4.52/-3.78     | -3.49/-2.65     | -2.34/-2.45     | -3.72/-5.15     | -5.02/-5.11     | -6.24/-6.12       | -4.29/-3.07       | -2.77/-2.23       | -2.63/-5.26       | -6.65/-3.28       | -1.66/-2.18       | -5.1/-3.25        | -0.69/-1.23       | -2.87/-1.87       | -0.82/-2.47       | -6.07/-4.47       | -2.97/-4.27       | -5.19/-4.03       | -2.14/-2.07       | -2.85/-4.97       | -3.38/-1.73       | -1.85/-3.63       |
| Θ(75°)    | -3.91/-2.47   | -2.86/-4.81     | -5.26/-3.73     | -3.24/-2.38     | -3.32/-3.93     | -5.46/-6.12     | -4.48/-4.07     | -5.41/-5.54       | -3.77/-3          | -3.26/-2.53       | -2.14/-4.25       | -7.69/-4.03       | -1.76/-1.84       | -4.48/-3.6        | -0.66/-1.5        | -5.56/-4.04       | -1.12/-1.64       | -3.62/-2.75       | -2.3/-3.61        | -3.53/-1.71       | -0.19/-0.58       | -2.31/-5.89       | -5.1/-2.88        | -2.59/-4.48       |
| Θ(82.5°)  | -4.87/-3.73   | -4.19/-5.77     | -5.4/-3.46      | -3.32/-4.98     | -5.37/-6.07     | -7.18/-6        | -3.84/-3.67     | -5.24/-8.3        | -3.18/-3.53       | -4.97/-2.79       | -1.79/-3.77       | -7.88/-4.1        | -2.59/-3.78       | -7.62/-2.83       | -0.18/-1.31       | -5.38/-4.15       | -2.01/-3.52       | -3.63/-2.16       | -1.98/-3.25       | -2.9/-1.68        | -0.7/-1.36        | -3.14/-6.57       | -5.31/-3.57       | -3.37/-5.14       |
| Θ(90°)    | -3.95/-3.2    | -4.24/-5.92     | -4.83/-3.24     | -4.17/-6.16     | -6.28/-5.59     | -6.04/-6.1      | -4.02/-3.54     | -5.13/-5.14       | -3.36/-3.94       | -5.33/-2.74       | -1.38/-2.75       | -8.45/-4.91       | -3.17/-4.07       | -8.31/-4.79       | -0.44/-0.79       | -4.77/-3.81       | -1.36/-2.8        | -5.05/-2.37       | -1.57/-3.6        | -3.19/-0.72       | 0.79/0.19         | -1.87/-5.46       | -5.49/-4.52       | -4.24/-5.17       |
| Θ(97.5°)  | -4.92/-4.55   | -5.91/-7.47     | -5.69/-3.49     | -4.05/-5.45     | -6.07/-5.42     | -5.62/-5.83     | -3.43/-2.56     | -3.88/-4.96       | -3.73/-4.33       | -4.69/-2.73       | -1.85/-3.49       | -9.86/-8.3        | -2.94/-4.42       | -8.66/-3.63       | 0.03/-0.99        | -6.11/-3.6        | -0.37/-1.62       | -4.51/-1.93       | -0.66/-2.58       | -3.26/-0.73       | 0.64/0.03         | -1.46/-3.96       | -4.4/-4.11        | -5.11/-6.27       |
| Θ(105°)   | -5.13/-5      | -6.11/-8.85     | -7.25/-3.34     | -3.05/-4.65     | -6.32/-6.78     | -6.14/-5.41     | -3.83/-3.28     | -4.78/-5.93       | -3.66/-3.52       | -4.58/-4.16       | -2.48/-3.32       | -8.24/-4.15       | -2.52/-3.91       | -8.05/-4.73       | -5.97/-3.27       | 0.02/-0.19        | -2.84/-1.57       | -3.62/-2.16       | -1.98/-3.25       | -2.9/-1.68        | -0.7/-1.36        | -3.14/-6.57       | -5.31/-3.57       | -3.37/-5.14       |
| Θ(112.5°) | -5.52/-5.29   | -6.73/-9.16     | -7.98/-4.23     | -4.06/-5.75     | -6.55/-6.72     | -6.35/-5.92     | -4.98/-4.47     | -4.59/-3.73       | -2.54/-2.96       | -5.57/-5.21       | -3.17/-4.32       | -7.32/-3.71       | -3.21/-5.43       | -10.55/-3.71      | -0.03/-0.95       | -5.88/-4.58       | -1.24/-0.92       | -0.61/0.8         | <b>1.28/-0.69</b> | -3.79/-2.13       | 0.31/0.36         | -2.36/-4.12       | -5.71/-6.52       | -8.64/-8.23       |
| Θ(120°)   | -7.28/-6.49   | -7.23/-9.16     | -10.09/-5.86    | -4.15/-4.44     | -4.57/-4.36     | -4.29/-3.74     | -2.94/-2.73     | -3.17/-3.83       | -3.43/-6.28       | -3.41/-2.78       | -1.74/-2.49       | -5.25/-4.27       | -2.33/-3.56       | -8.35/-7.27       | -2.6/-3.17        | -4.67/-1.97       | 0.22/-0.66        | -3.83/-2.41       | -0.28/-0.11       | -1.19/-1.82       | -0.93/-1.56       | -3.96/-6.1        | -7.5/-8.51        | -10.95/-9.55      |
| Θ(127.5°) | -11.51/-9.88  | -9.94/-9.36     | -8.66/-5.36     | -2.82/-2.1      | -4.36/-3.31     | -2.77/-3.81     | -1.86/-2.39     | -4.98/-2.31       | -0.18/-2.61       | -2.43/-2.75       | -3.74/-2.97       | -2.6/-4.36        | -7.94/-6.23       | -4.27/-5.54       | -2.7/-5.54        | -3.71/-4.46       | 0.31/-0.16        | -2.21/-2.75       | -0.64/-0.11       | -0.92/-2.58       | -4.27/-4.76       | -5.92/-6.97       | -6.89/-7.58       | -10.98/-12.36     |
| Θ(135°)   | -11.56/-11.44 | -12.12/-11.09   | -8.32/-5.34     | -3.57/-3.26     | -3.38/-2.63     | -2.45/-3        | -3.68/-3.66     | -2.21/-0.29       | 0.87/0.54         | -1.26/-2.91       | -2.8/-2.44        | -2.35/-2.44       | -3.08/-5.55       | -8.63/-6.02       | -3.83/-4.37       | -6.46/-3.74       | -1.32/-1.01       | -2.07/-2.04       | -0.87/-0.55       | -1.48/-3.37       | -4.84/-8.6        | -6.28/-7.25       | -7.21/-8.02       | -10/-11.91        |
| Θ(142.5°) | -11.27/-12.46 | -14.81/-12.16   | -8.18/-5.44     | -3.85/-3.26     | -2.99/-2.59     | -2.62/-6.29     | -2.43/-1.85     | -1.01/-0.29       | -0.07/-0.68       | -2.01/-3.01       | -3.05/-2.71       | -2.45/-2.59       | -3.76/-6.9        | -9.22/-5.86       | -8.8/-7.27        | -6.48/-3.54       | -1.8/-2.25        | -4.8/-5.89        | -4.04/-2.89       | -3.14/-4.16       | -3.37/-2.93       | -3.86/-5.92       | -7.92/-9          | -9.51/-10.42      |
| Θ(150°)   | -9.31/-11.65  | -15.49/-11.93   | -8.68/-6.5      | -5.05/-4.02     | -3.08/-2.37     | -2/-1.87        | -1.78/-1.68     | -1.36/-1.12       | -1.23/-1.77       | -2.68/-3.67       | -4.75/-6.64       | -6.43/-7.59       | -8.96/-11.54      | -13.45/-11.26     | -8.56/-6.68       | -4.86/-3.15       | -2.16/-2.68       | -5.21/-3.68       | -6.89/-5.92       | -5.04/-4.15       | -4.13/-4.83       | -5.81/-6.38       | -6.67/-7.24       |                   |
| Θ(157.5°) | -11.96/-14.04 | -13.54/-9.82    | -7.39/-5.72     | -4.88/-3.59     | -2.74/-2.11     | -1.92/-2.24     | -2.98/-3.75     | -4.06/-3.66       | -2.97/-2.58       | -2.82/-3.8        | -5.53/-8.02       | -9.46/-10.77      | -12.39/-14.04     | -12.97/-11.1      | -8.89/-6.25       | -4.57/-3.73       | -3.82/-5          | -7.52/-11.76      | -14.24/-11.2      | -8.96/-7.84       | -7.61/-7.19       | -6.46/-6.03       | -5.96/-6.3        | -7.16/-8.79       |
| Θ(165°)   | -15.29/-14.71 | -13.91/-10.81   | -8.43/-7.24     | -6.07/-5.03     | -4.58/-5.47     | -4.96/-5.9      | -7.19/-7.68     | -6.29/-4.75       | -3.6/-3.11        | -3.31/-4.16       | -5.61/-5.77       | -8.67/-8.91       | -8.95/-9.71       | -11.21/-12.1      | -10.68/-8.68      | -7.33/-7.1        | -8.01/-10.3       | -13.09/-14.08     | -14.38/-11.69     | -10.18/-9.77      | -9.63/-9.86       | -9.83/-9.96       | -10.41/-10.79     | -12.71/-15.09     |
| Θ(172.5°) | -15.95/-15.69 | -15.69/-14.49   | -12.47/-11.22   | -10.53/-10.24   | -10.33/-11.01   | -10.78/-11.81   | -10.97/-15.83   | -6.75/-5.52       | -4.84/-4.64       | -4.92/-5.59       | -6.8/-6.76        | -9.62/-11.38      | -12.98/-12.82     | -12.92/-12.79     | -12.95/-13.8      | -13.38/-13.77     | -14.82/-14.73     | -14.18/-13.17     | -11.77/-10.19     | -9.67/-9.97       | -12.59/-12.1      | -14/-14.58        | -12.73/-15.14     |                   |
| Θ(180°)   | -14.72/-15.41 | -15.79/-15.15   | -15.63/-15.42   | -15.32/-14.29   | -12.82/-11.15   | -9.62/-8.49     | -7.63/-6.92     | -6.52/-6.26       | -6.15/-6.4        | -7.02/-7.97       | -9.44/-11.18      | -12.37/-13.56     | -15/-15.14        | -15.39/-14.95     | -14.94/-15.01     | -15.4/-15.48      | -15.15/-15.01     | -13.61/-11.85     | -10.76/-10.2      | -10.35/-11.2      | -12.26/-12.99     | -12.93/-12.56     | -12.49/-13.06     | -14.14/-14.91     |
| Freq(Hz)  | 2.45G/Pol.    | Theta-          | +               | +               | +               | +               | +               | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 | +                 |
| DG(dB)    | Φ(0°)/Φ(7.5°) | Φ(15°)/Φ(22.5°) | Φ(30°)/Φ(37.5°) | Φ(45°)/Φ(52.5°) | Φ(60°)/Φ(67.5°) | Φ(75°)/Φ(82.5°) | Φ(90°)/Φ(97.5°) | Φ(105°)/Φ(112.5°) | Φ(120°)/Φ(127.5°) | Φ(135°)/Φ(142.5°) | Φ(150°)/Φ(157.5°) | Φ(165°)/Φ(172.5°) | Φ(180°)/Φ(187.5°) | Φ(195°)/Φ(202.5°) | Φ(210°)/Φ(217.5°) | Φ(225°)/Φ(232.5°) | Φ(240°)/Φ(247.5°) | Φ(255°)/Φ(262.5°) | Φ(270°)/Φ(277.5°) | Φ(285°)/Φ(292.5°) | Φ(300°)/Φ(307.5°) | Φ(315°)/Φ(322.5°) | Φ(330°)/Φ(337.5°) | Φ(345°)/Φ(352.5°) |
| Θ(0°)     | -6.84/-6.72   | -6.91/-7.29     | -7.97/-8.49     | -8.74/-8.86     | -8.83/-8.95     | -8.88/-8.84     | -8.87/-8.83     | -8.26/-7.94       | -7.28/-7.17       | -7.02/-7.16       | -6.82/-6.41       | -6.23/-6.47       | -6.87/-7.3        | -7.39/-7.57       | -7.49/-7.49       | -7.78/-7.97       | -8.34/-84         | -8.57/-8.77       | -8.71/-839        | -8.05/-7.54       | -6.89/-6.25       | -6.02/-6.26       | -5.66/-6.99       | -7.05/-6.91       |
| Θ(7.5°)   | -5.33/-5.06   | -5.15/-5.7      | -6.28/-6.8      | -7.01/-7.1      | -7.23/-7.84     | -8.12/-8.19     | -7.97/-7.43     | -6.57/-5.84       | -5.43/-5.48       | -5.79/-6.04       | -6.25/-6.78       | -7.85/-9.33       | -10.35/-10.35     | -9.42/-9.19       | -9.67/-9.32       | -8.54/-7.62       | -6.58/-5.9        | -5.6/-5.8         | -6.2/-6.65        | -6.95/-6.86       | -6.46/-6.16       | -6.32/-6.74       | -6.96/-6.69       | -6.21/-5.72       |
| Θ(15°)    | -5.09/-4.87   | -4.87/-5.51     | -6.13/-6.61     | -7.06/-6.59     | -5.82/-5.27     | -5.02/-4.99     | -5.09/-5.12     | -4.54/-4.8        | -3.66/-3.78       | -4.25/-4.8        | -5.38/-6.35       | -8.1/-10.61       | -7.15/-9.2        | -7.95/-6.93       | -6.93/-6.9        | -6.5/-5.79        | -4.71/-3.72       | -3.22/-3.27       | -3.61/-3.87       | -3.89/-3.68       | -3.37/-3.42       | -4.04/-5          | -5.86/-6.18       | -6.02/-5.68       |
| Θ(22.5°)  | -5.87/-5.73   | -5.73/-5.62     | -5.76/-6.69     | -7.18/-6.7      | -5.68/-4.57     | -3.8/-3.48      | -3.56/-3.67     | -3.21/-2.53       | -2.14/-2.19       | -2.6/-3.32        | -4.26/-5.44       | -7.55/-8.63       | -7.15/-5.81       | -5.06/-4.53       | -4.36/-4.62       | -5.13/-5.14       | -4.41/-3.4        | -2.67/-2.24       | -1.96/-1.64       | -1.32/-1.07       | -1.07/-1.45       | -2.34/-3.43       | -4.36/-5.17       | -5.63/-5.6        |
| Θ(30°)    | -6.89/-6.5    | -5.63/-4.74     | -4.5/-4.78      | -5.41/-5.65     | -5.23/-4.21     | -3.18/-2.54     | -2.33/-2.26     | -1.74/-1.03       | -0.53/-0.34       | -0.57/-1.29       | -2.56/-4.22       | -5.99/-6.85       | -6.2/-5.08        | -4.26/-3.91       | -4.1/-4.6         | -5.3/-5.77        | -5.21/-4.11       | -2.81/-1.71       | -0.98/-0.5        | -0.19/-0.9        | -0.27/-0.77       | -1.47/-2.09       | -2.71/-3.73       | -5.53/-5.4        |
| Θ(37.5°)  | -6.49/-5.67   | -4.54/-3.43     | -2.71/-3.33     | -4.71/-5.05     | -4.69/-3.77     | -2.58/-1.62     | -1.2/-1.03      | -0.56/0.03        | 0.5/0.69          | 0.48/0.4          | -1.9/-3.51        | -5.04/-6.57       | -7.5/-6.98        | -5.61/-5.34       | -5.65/-6.33       | -7.1/-1.15        | -6.24/-4.56       | -2.76/-1.42       | -0.75/-0.48       | -0.36/-0.38       | -0.46/-0.56       | -0.53/-0.56       | -0.97/-2.15       | -4.16/-6.28       |
| Θ(45°)    | -4.05/-4.52   | -3.92/-2.65     | -2.13/-3.19     | -4.88/-5.03     | -4.54/-3.56     | -2.22/-1.23     | -0.87/-0.95     | -0.51/-43         | 0.72/0.88         | 0.65/-0.32        | -1.7/-2.83        |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |



# Radiated Composite Gain Data

# Appendix A

|           |               |                 |                 |                 |                 |                 |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
|-----------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Θ(22.5°)  | 4.56/4.95     | 4.95/9.79       | 1.1/-2.42       | -7.17/-6.9      | -3.69/-1.02     | 0.58/1.47       | 1.65/1.77       | 2.12/3.1          | 3.88/3.83         | 3.33/3.14         | 3.09/2.7          | 2.09/1.87         | 1.28/1.76         | 2.97/3.6          | 3.41/2.97         | 1.97/0.84         | -0.65/-2.47       | -3.87/-2.26       | -1.6/-2.15        | -1.74/-0.4        | 0.57/1.6          | 2.17/2.66         | 3.29/3.81         | 4.41/4.65         |
| Θ(30°)    | 2.54/2.44     | 2.06/1.69       | 0.59/-2.91      | -8.53/-4.96     | -1.1/2.3        | 0.04/-1.53      | -2.7/-2.09      | -0.27/1.51        | 3.14/3.81         | 3.69/3.23         | 3.75/4.13         | 4.31/4.38         | 3.56/1.92         | 1.31/1.93         | 2.69/2.56         | 0.22/-3.16        | -3.57/-4.01       | -3.88/-3.26       | -2.47/-2          | -2.01/-1.24       | -1.0/-0.81        | 1.13/1.75         | 2.97/3.88         | 3.56/2.99         |
| Θ(142.5°) | 4.83/4.39     | 2.42/-0.57      | -2.7/-6.75      | -6.61/-2.03     | 0.32/1.56       | 2.1/0.7         | -1.91/-1.89     | -0.8/-1.09        | -0.54/0.11        | 0.78/2.3          | 3.69/4.36         | 2.07/1.58         | 1.38/1.27         | 1.54/1.21         | -1.92/-3.28       | -4.69/-4.32       | -1.61/-0.68       | -1.72/-0.21       | -2.24/-2.49       | -1.72/-1.09       | 0.23/3.81         | 2.27/1.98         | 1.59/3.46         |                   |
| Θ(45°)    | 4.43/3.85     | 3.19/1.48       | -2.7/-4.05      | -1.72/0.74      | 0.12/1.6        | 2.79/0.67       | -3.6/-2.28      | -0.3/-1.83        | -2.09/-2.59       | -1.68/1.1         | 3.06/4.14         | 4.24/1.8          | -0.66/-0.69       | 1.43/2.17         | 0.72/-1.2         | -0.09/1.76        | -0.28/-4.97       | -4.56/-3.86       | -3.38/-2.63       | -4.74/-7.42       | -6.53/-4.72       | -3.7/0.09         | 1.44/1.32         | 1.08/2.97         |
| Θ(52.5°)  | 2.12/31       | 1.75/0.83       | -3.06/-1.44     | -1.21/0.7       | -2.25/-0.2      | 0.41/-1.71      | -1.25/-1.37     | 1.62/-0.39        | -0.04/-0.31       | -1.63/0.95        | 3.01/4.93         | 4.74/2.82         | 0.72/-0.5         | -0.56/0.24        | -0.08/-3.25       | -2.12/-1.11       | 0.18/-1.77        | -2.61/-1.95       | -2.04/-3.48       | -4.93/-7.55       | -8.88/-4.7        | -2.12/-1.37       | -1.09/0.33        | 1.34/1.42         |
| Θ(60°)    | 1.76/2.36     | 0.33/0.14       | -2.34/-3.01     | -2.18/0.29      | -4.29/-2.16     | -2.95/-1.24     | 0.38/1.61       | 2.31/0.68         | -0.05/-3.31       | 0.66/1.75         | 0.96/3.94         | 4.61/3.12         | -1.4/-5.61        | -3.46/1.01        | 0.84/0.28         | -1.4/-4.55        | -3.84/-1.7        | -2.76/-3.84       | -12.14/-5.91      | -4.38/-1.65       | -0.93/0.55        | 1.25/0.38         |                   |                   |
| Θ(67.5°)  | 3.13/3.21     | -0.3/-0.7       | -2.68/-1.6      | -4/-1.02        | -5.2/-2.24      | -2.89/-1.49     | 0.16/2.15       | 3.72/1.87         | 0.54/-0.97        | 2.41/2.95         | 0.59/2.36         | 1.86/0.08         | -1.92/0.74        | 1.54/-2.35        | -2.25/-1.75       | -1.53/0.4         | -0.18/0.53        | -1.63/-1.51       | -2.31/0.45        | -0.98/-2.26       | -10.53/-4.04      | -5.09/-1.79       | 0.25/0.4          | -1.83/-0.26       |
| Θ(75°)    | 2.93/1.96     | -0.04/-0.32     | -0.81/-2.3      | -5.34/-1.83     | -5.73/-1.73     | 0.31/-1.1       | -0.03/1.64      | 4.14/1.68         | 0.73/0.03         | 2.48/3.29         | 1.53/1.47         | 0.14/0.25         | -2.31/0.46        | 2.61/-0.2         | -1.97/-3.23       | -1.02/-0.38       | 0.51/1.65         | -1.37/-0.27       | -0.83/2.54        | -0.26/-1.23       | -7.74/-2.8        | -4.48/-1.26       | 1.43/1.9          | 0.86/-0.12        |
| Θ(82.5°)  | 2.19/0.49     | 0.85/-0.35      | -0.31/-1.53     | -5.62/-1.61     | -4.34/-1.65     | 1.45/-1.57      | 1.24/0.28       | 4.22/0.4          | 1.88/1.54         | 2.25/3.43         | 0.53/0.07         | 0.04/-1.02        | 0.13/1.9          | 3.09/0.14         | -0.57/-3.44       | -1.36/-0.51       | -1.21/0.67        | -0.68/1.15        | -1.49/3.07        | 0.33/-0.23        | -5.12/-0.68       | -4.81/-0.57       | 2.12/1.82         | 1.44/-0.97        |
| Θ(90°)    | 1.56/-0.46    | 1.01/0.32       | -0.9/-1.04      | -5.09/-2.73     | -3.02/-2.14     | 0.66/-2.38      | 2.65/0.43       | 3.01/1.13         | 1.82/1.37         | 1.99/2.24         | 0.81/1.07         | -0.86/-0.74       | -0.58/2.65        | 2.34/0.56         | -1.12/-3.88       | -1.41/-4.44       | -0.57/-0.42       | -2.25/0.24        | -1.91/1.29        | -2.46/-2.26       | -3.94/-0.54       | -5.58/-1.31       | 1.83/1.82         | 2.37/-0.59        |
| Θ(97.5°)  | 1.31/-1.38    | -0.31/-0.85     | -1.25/-2.72     | -5.78/-0.8      | -2.72/-1.84     | 1.28/-3.01      | 1.99/0.61       | 1.75/1.54         | -0.41/1.87        | 0.99/-0.58        | -0.77/-0.86       | 1.15/2.54         | -0.88/-0.28       | -2.65/-3.78       | -2.63/-4.73       | -3.55/-2.87       | -4.65/-1.84       | -2.63/-1.31       | -4.23/-4.49       | -4.59/-0.68       | -4.72/-1.98       | 0.66/1.43         | 1.74/-1.49        |                   |
| Θ(105°)   | -1.12/-0.32   | 0.36/-2.58      | -2.46/-2.76     | -7.15/-1.55     | -3.18/-2.24     | -4.9/-1.44      | -1.26/-1.99     | 1.47/1.12         | 1.13/-0.34        | -2.02/0.5         | -1.93/-0.45       | -1.82/7           | -0.16/-0.52       | -1.15/-3.56       | -2.45/-5.65       | -4.19/-3.86       | -3.93/-1.97       | -3.51/-0.31       | -4.17/-5.83       | -6.03/-1.13       | -4.55/-1.78       | 0.59/-0.39        | -0.07/-2.83       |                   |
| Θ(112.5°) | -3.16/-1.91   | -0.64/-2.39     | -4.25/-2.38     | -4.13/-1.85     | -6.24/-3.6      | -0.19/-1.22     | 1.68/-1.81      | -0.5/-1.84        | -0.75/-0.46       | -5.37/-0.14       | -0.13/-2.39       | -2.14/-3.14       | -1.35/-0.39       | -0.12/-3.99       | -2.91/-1.56       | -2.68/-5.29       | -5.28/-6.48       | -8.64/-0.13       | -1.28/-0.2        | -5.78/-6.47       | -6.25/-2.14       | -3.83/-2.55       | -0.64/-2.02       | -0.23/-3.66       |
| Θ(120°)   | -4.52/-2.78   | -3.07/-2.72     | -4.83/-4.11     | -4.6/-1.2       | -5.84/-3.4      | -0.77/-2.84     | -2.48/-3.23     | -1.63/-3.21       | -3.25/-1.35       | -5.05/-2.13       | -1.54/-2.41       | -3.75/-1.32       | -4.36/-3.17       | -3.41/-4.5        | -3.19/-4.28       | -0.98/4           | -4.69/-7.46       | -3.88/-2.03       | -1.43/-0.95       | -7.13/-7.62       | -3/-6.49          | -4.08/-1.97       | -2.9/-5.3         | -5.58/-5.96       |
| Θ(127.5°) | -5.46/-3.84   | -2.92/-1.62     | -5.66/-5.49     | -6.47/-2.87     | -2.81/-2.1      | -1.25/-3.37     | -4.02/-3.41     | -5.58/-4.49       | -5.11/-3.46       | -6.46/-4.9        | -2.26/-1.4        | -2.95/-3.52       | -4.35/-4.09       | -6.66/-5.43       | -3.31/-3.37       | -1.85/-2.79       | -4.09/-8.81       | -6.30/46          | -0.38/-1.61       | -8.44/-8.98       | -5.03/-6.14       | -3.29/5           | -7.04/-9.35       |                   |
| Θ(135°)   | -5.12/-5.66   | -3.61/-2.58     | -2.08/-2.74     | -6.84/-9.44     | -3.71/-0.19     | -1.75/-6        | -8.61/-3.17     | -3.47/-4.4        | -5.58/-6.47       | -7.22/-5.82       | -6.97/-4.04       | -2.65/-1.85       | -4.9/-3.96        | -4.98/-6.23       | -1.9/-2.97        | -0.09/-2.08       | -3.75/-4.44       | -6.48/-2.98       | -4.22/-4.5        | -9.02/-8.01       | -4.54/-4.15       | -7.76/-6.52       | -6.84/-3.35       | -8.59/-12.96      |
| Θ(142.5°) | -9.31/-7.71   | -4.69/-2.58     | -1.66/-0.91     | -1.06/-2.55     | -2.49/-2.18     | -4.75/-10.28    | -6.49/-3.77     | -3.51/-6.6        | -7.01/-6.53       | -5.08/-3.92       | -4.11/-4.23       | -6.33/-8.52       | -7.26/-5.52       | -8.15/-4.66       | -4.8/-4.24        | -4.08/-9.2        | -5.85/-3.95       | -6.73/-5.06       | -4.47/-5.03       | -7.39/-7.28       | -4.02/-4.19       | -2.87/-7.33       | -8.67/-12.61      | -11.29/-10.82     |
| Θ(150°)   | -10.17/-9.84  | -5.64/-1.91     | -0.67/-2.01     | -4.54/-6.11     | -4.35/-3.66     | -5.98/-7.74     | -4.96/-2.76     | -2.45/-4.1        | -5.81/-7.04       | -7.27/-5.82       | -6.96/-10.99      | -9.58/-8.91       | -8.76/-8.27       | -5.26/-4.7        | -4.9/-4.48        | -9.88/-8.39       | -8.29/-6.01       | -4.9/-5.07        | -4.4/-3.65        | -4.7/-6.43        | -4.97/-2.28       | -3.6/-6.65        | -8.2/-10.31       | -10.68/-10.81     |
| Θ(157.5°) | -7.79/-8.35   | -6.73/-4.98     | -3.43/-3.02     | -2.45/-2.32     | -2.11/-1.99     | -2.38/-3.21     | -3.53/-3.31     | -3.91/-4.86       | -5.81/-6.87       | -9.65/-11.71      | -12.48/-11.6      | -9.03/-5.82       | -3.47/-2.38       | -2.48/-4.07       | -6.77/-9.67       | -8.83/-6.57       | -3.42/-2.11       | -2.69/-3.63       | -3.06/-2.15       | -2.43/-2.96       | -2.01/-1.37       | -1.4/-2.01        | -3.05/-4.41       | -4.68/-5.82       |
| Θ(165°)   | -8.86/-9.2    | -8.29/-6.76     | -5.42/-5.02     | -4.14/-4.28     | -4.21/-4.15     | -4.32/-4.94     | -5.1/-5.65      | -6.05/-6.57       | -7.07/-8.09       | -8.97/-11.28      | -11.92/-10.98     | -8.31/-6.31       | -4.87/-3.65       | -3.58/-4.92       | -5.63/-5.97       | -5.15/-4.74       | -3.91/-4.07       | -5.62/-6.45       | -6.63/-5.24       | -3.86/-3.46       | -3.68/-3.76       | -4.28/-4.29       | -5.09/-6.09       | -6.97/-8.2        |
| Θ(172.5°) | -9.85/-9.94   | -8.46/-7.84     | -7.45/-6.67     | -5.48/-4.74     | -3.82/-3.12     | -2.97/-3.29     | -3.76/-4.42     | -5.09/-5.41       | -5.69/-5.99       | -6.85/-8.78       | -10.69/-10.05     | -9.36/-9.2        | -9.34/-8.09       | -6.24/-5.39       | -4.67/-4.1        | -4.16/-5.05       | -6.24/-6.98       | -7.48/-7.61       | -8.19/-7.69       | -6.87/-6.88       | -7.48/-7.74       | -8.11/-8.35       | -8.72/-9.54       | -11.61/-11.25     |
| Θ(180°)   | -6.37/-7.25   | -7.48/-6.53     | -6.28/-5.88     | -5.43/-4.59     | -3.89/-3.75     | -4.63/-5.28     | -6.44/-7.41     | -8.16/-8.92       | -9.43/-8.85       | -9.43/-11.06      | -11.73/-11.11     | -10.84/-11.71     | -9.98/-11.34      | -12.05/-12.12     | -11.61/-11.26     | -11.55/-11.76     | -12.28/-11.99     | -11.25/-11.17     | -11.69/-10.86     | -10.11/-11.57     | -11.98/-11.34     | -10.66/-8.14      |                   |                   |
| Freq(Hz)  | 5.3GPol       | Theta-          | -               | -               | -               | -               | -               | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 |                   |
| DG(dB)    | Φ(0°)/Φ(7.5°) | Φ(15°)/Φ(22.5°) | Φ(30°)/Φ(37.5°) | Φ(45°)/Φ(52.5°) | Φ(60°)/Φ(67.5°) | Φ(75°)/Φ(82.5°) | Φ(90°)/Φ(97.5°) | Φ(105°)/Φ(112.5°) | Φ(120°)/Φ(127.5°) | Φ(135°)/Φ(142.5°) | Φ(150°)/Φ(157.5°) | Φ(165°)/Φ(172.5°) | Φ(180°)/Φ(187.5°) | Φ(195°)/Φ(202.5°) | Φ(210°)/Φ(217.5°) | Φ(225°)/Φ(232.5°) | Φ(240°)/Φ(247.5°) | Φ(255°)/Φ(262.5°) | Φ(270°)/Φ(277.5°) | Φ(285°)/Φ(292.5°) | Φ(300°)/Φ(307.5°) | Φ(315°)/Φ(322.5°) | Φ(330°)/Φ(337.5°) | Φ(345°)/Φ(352.5°) |
| Θ(0°)     | -2.1/-2.03    | -1.95/-1.51     | -0.98/-0.51     | 0.37/0.96       | 1.63/2.27       | 2.67/3.13       | 3.98/3.44       | 3.73/3.81         | 3.34/3.04         | 2.38/1.97         | 1.11/0.08         | -0.67/-1.07       | -1.67/-1.174      | -0.81/-0.49       | -0.44/0.3         | 2.96/2.2          | 2.86/3.22         | 3.33/3.27         | 3.05/2.93         | 2.56/2.09         | 1.52/0.52         | -0.71/-1.44       | -1.97/-2.05       |                   |
| Θ(7.5°)   | -0.88/-1.18   | -1.2/-0.84      | -0.2/0.05       | 0.22/0.55       | 1.09/1.39       | 1.32/1.31       | 3.63/4.07       | 0.21/0.17         | -0.12/-0.61       | -1.07/-1.63       | -2.41/-2.77       | -3.03/-2.63       | -2.92/-2.39       | 1.38/1.57         | 3.06/2.8          | 0.93/1.2          | 3.72/3.62         | 3.59/3.81         | 4.154/16          | 3.8/3.31          | 3.06/2.8          | 0.71/-0.44        | -0.89/-0.53       |                   |
| Θ(15°)    | 0.07/-0.88    | -1.48/-1.04     | -0.4/-0.11      | 0.36/0.58       | 0.47/0.31       | 0.16/-0.22      | -0.83/-1.26     | -1.74/-1.96       | -2.24/-2.36       | -2.77/3.19        | -2.71/-1.54       | -1.34/-1.45       | -1.61/-1.76       | -1.97/-0.66       | 1.14/1.8          | 2.45/2.97         | 2.89/2.53         | 1.93/1.44         | 1.65/2.02         | 2.45/2.64         | 2.21/1.58         | 1.21/0.97         | 0.45/-0.26        | -0.16/-0.46       |
| Θ(22.5°)  | 0.42/-0.05    | -0.55/-0.84     | -0.45/0.35      | 0.18/-1.26      | -1.46/-0.11     | 0.16/-0.28      | -0.6/-1.07      | -1.12/-1.44       | -2.44/-4.39       | -3.53/-3.05       | -2.03/-1.23       | -0.62/-0.28       | -0.4/-1.13        | -1.99/-2.66       | -2.2/-0.72        | 0.63/1.21         | 1.03/0.59         | -0.08/0.02        | 0.38/-0.07        | -0.39/-0.83       | -1.57/-1.86       | -0.83/0.31        | 0.56/0.32         | 0.73/0.8          |
| Θ(30°)    | 0.63/-0.3     | -1.09/-2.47     | -1.49/-0.22     | -0.43/-2.13     | -1.78/-0.26     | 0.09/-0.56      | -1.74/-2.88     | -3.17/-2.65       | -2.28/-2.52       | -3.23/-3.99       | -2.85/-1.62       | -1.04/-1.67       | -2.15/-2.61       | -3.27/-3.5        | -3.65/-2.14       | 0.29/1.56         | 1.41/0.24         | -0.91/2.15        | -3.75/-3.56       | -1.61/-0.96       | -2.34/-5.02       | -4.63/-3.07       | -1.6/-0.9         | 0.27/0.96         |
| Θ(37.5°)  | -0.39/-1.2    | -1.59/-1.18     | -0.71/-1.02     | -1.07/-1.57     | -0.86/-0.85     | -1.47/-1.07     | -0.75/-0.47     | -0.89/-1.46       | -0.85/-0.67       | -1.68/-1.4        | 0.35/0.5          | -0.9/-4.06        | -3.67/-1.19       | -1.85/-2.75       | -3.13/-3.06       | 0.04/0.99         | -0.03/-1.86       | -2.99/-3.45       | -3.08/-2.06       | -0.99/-0.53       | -0.53/-1.59       | -4.46/-9.16       | -6.7/-1.53        | 0.65/0.52         |
| Θ(45°)    | 0.89/-1.16    | -2.03/-1.92     | -2.17/-1.25     | -0.67/-0.24     | 1.17/0.62       | 0.94/1.94       | 0.15/-0.82      | -0.5/-0.93        | -0.98/-0.76       | -2.06/-4.57       | -2.63/0.96        | 2.3/3.84          | -2.95/-0.69       | 0.95/-0.52        | -0.63/-2.12       | -1.45/-0.68       | -1.05/-4.07       | -3.46/-2.99       | -2.95/-1.4        | -0.13/-1.95       | -2.83/-2.34       | -3.79/-6.14       | -8.06/-3.47       | -0.17/1.1         |
| Θ(52.5°)  | 2.08/-1.42    | -2.68/-2.43     | -1.88/-2.09     | -2.42/-0.37     | 2.57/2.59       | 2.71/1.99       | 0.16/-1.69      | -1.56/0.32        | 1.56/1.87         | 0.36/-2.76        | -4.81/-1.31       | 1.61/8.8          | 0.03/0.84         | 1.83/0.07         | -2.66/-0.09       | -1.91/-1.15       | -2.74/-3.79       | -1.05/-0.31       | -3.05/-2.06       | -2.08/-2.61       | -4.21/-2.96       | 0.59/0.05         |                   |                   |
| Θ(60°)    | 1.8/-0.67     | -1.1/0.31       | -0.91/-1.63     | -3.89/-0.46     | 3.96/4          | 2.51/0.6        | 1.62/0.7        | 2.03/1.87         | 2.12/1.68         | 0.65/-1.25        | -4.81/-2.08       | -0.01/0.72        | 1/2.26            | 2.6/0.4           | 0.75/0.25         | -1.61/-1.7        | -1.7/-2.51        | 0.41/2.3          | 1.71/1.19         | 2.29/0.64         | -2.65/-1.52       | -0.98/-0.78       | -3.91/-4.51       | 1.07/3.43         |
| Θ(67.5°)  | 0.02/0.77     | 1.74/1.89       | -0.91/0.25      | -0.75/0.97      | 4.17/3.49       | 0.64/3.19       | 4.08/3.95       | 3.07/2.51         | 2.23/1.28         | -0.21/-2.65       | -4.67/0.85        | 2.11/3.58         | 2.54/2.98         | 2.15/0.65         | 0.64/-0.4         | -1.79/-2.52       | 1.78/1.96         | 3.08/2.98         | 3.06/0.97         | -1.28/-1.41       | -1.2/-0.67        | -4.08/-1.53       | 2.22/7.1          |                   |
| Θ(75°)    | -0.91/-1.18   | 1.61/3.2        | -1.45/-1.1      | 0.82/1.49       | 4.17/2.61       | 1.32/4.13       | 3.92/3.1        | 3.09/2.31         | 1.08/0.71         | -0.22/-3.61       | -3.91/2.09        | 2.96/3.96         | 3.92/2.01         | 1.58/-0.75        | -1.48/-2.82       | -1.68/-1.87       | 0.61/0.29         | 3.22/2.82         | 3.84/19           | <b>4.26/0.77</b>  | -0.77/0.4         | 0.44/0.65         | -2.35/-1.6        | 1.89/1.74         |
| Θ(82.5°)  | -1.05/0.96    | 0.64/0.33       | -3.15/0.33      | 0.82/1.53       | 3.25/1.2        | 0.92/7.9        | 2.82/0.2        | 2.11/2.33         | 0.43/-0.24        | -0.36/-2.64       | -2.27/2.03        | 2.54/4.08         | 3.67/0.29         | -0.11/1.09        | 1/0.11            | -1.01/-1.2        | 1.24/-0.07        | 2.77/2.73         | 3.03/4.06         | 3.72/-0.05        | -1.26/0.23        | 0.03/-0.28        | -3.57/-1.85       | 1.17/1.4          |



Radiated Composite Gain Data

Appendix A

|           |               |                 |                 |                 |                 |                 |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
|-----------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Θ(67.5°)  | -0.39/-0.12   | 1.96/0.13       | 1.44/0.73       | -1.69/-0.08     | -1.49/-0.59     | 0.43/1.46       | 0.79/2.9        | 3.21/4.1          | 0.9/-1.14         | 2.07/3.67         | 3.77/3.99         | 2.76/0.41         | 0.59/-1.06        | -0.4/-2.77        | -0.85/-0.23       | -3.67/-0.36       | -0.19/-0.4        | 0.77/0.81         | -1.2/-1.32        | -1.36/-3.6        | -4.15/-2.71       | -5.38/-0.05       | -0.52/2.22        | -0.68/-0.63       |
| Θ(75°)    | 1.03/-0.61    | 1.29/-0.68      | 1.09/-0.8       | -1.46/-2.6      | -2.46/-0.29     | 0.63/0.9        | 0.03/2.23       | 3.28/2.72         | 0.54/-0.63        | 0.86/3.65         | 3.48/2.81         | 0.66/0.42         | 1.21/-0.09        | 0.56/-2.84        | -1.32/-0.73       | -1.99/0.62        | -0/0.59           | 2.86/2.64         | 1.96/-1.26        | 0.34/-2.11        | -2.66/-2.04       | -5.54/-0.39       | 1.24/3.05         | -0.74/-1.68       |
| Θ(82.5°)  | 1.87/-1.27    | 0.24/-0.31      | 0.31/-2.73      | -1.7/-3.49      | -3.09/-2.26     | -0.01/-0.3      | -3.38/0.85      | 2.46/1.63         | -2/0.12           | 1.5/3.06          | 1.93/1.93         | 0.39/1.73         | 1.42/-0.96        | 1.49/-3.23        | -0.5/0.06         | -1.79/0.74        | 0.64/-0.46        | 2.13/2.77         | 2.26/-2.27        | -2.15/-3.06       | -3.77/-0.49       | -6.81/-1.18       | 0.6/2.64          | 0.36/-0.83        |
| Θ(90°)    | 2.11/-2.79    | 0.25/-0.19      | 1.08/-2.67      | -2.81/-3.94     | -4.44/-2.24     | -0.34/-2.02     | -1.45/0.16      | 1.99/0.18         | -1.06/0.92        | 0.83/2.08         | 1.75/0.71         | -0.29/2.05        | -0.43/1.54        | 0.31/-2.48        | -1.37/-1.03       | -1.29/0.11        | -1.17/-0.62       | 1.46/2.56         | 1.55/-1.32        | -0/-4.59          | -3.37/-0.28       | -4.84/-2.28       | 0.21/0.99         | 0.57/-0.67        |
| Θ(97.5°)  | 1.26/-3.11    | 0.25/-0.63      | 0.18/-2.74      | -3.6/-6.24      | -3.94/-4.47     | -1.19/-3.79     | -0.34/-0.48     | 0.1/-0.25         | -0.64/0.64        | 0.07/0.09         | -0.78/1.22        | -0.49/1.26        | 0.72/1.16         | 0.81/-4.75        | -1.03/-1.3        | -1.02/-0.08       | -2.52/-3.33       | -1.61/1.06        | -0.49/-1.3        | -1.88/-7.32       | -3.68/-0.03       | -7.67/-3.19       | -0.32/1.16        | 0.33/-0.54        |
| Θ(105°)   | -0.33/-3.98   | 0.14/-1.28      | -0.59/-4.31     | -3.71/-5.23     | -5.51/-2.86     | -1.01/-3.73     | -0.95/-1.49     | 0.76/-0.83        | -0.83/0.57        | -1.89/-1.46       | -0.9/-0.9         | -2.15/0.33        | -1.45/1.43        | -0.18/-5.37       | -1.92/-2.41       | -1.61/-1.88       | -4.51/-3.57       | -3.32/0.16        | 2.29/0            | -1.44/-7.37       | -4.03/-2.85       | -7.63/-3.54       | -2.38/-0.71       | -1.03/-2.56       |
| Θ(112.5°) | -1.4/-3.36    | -1.53/-4.48     | -1.52/-4.82     | -6.92/-5.47     | -4.42/-4.04     | -2.28/-2.9      | -0.89/-1.71     | -1.27/-1.15       | -2.25/-1.21       | -4.37/-4.25       | -0.97/-1.68       | -3.43/-1.77       | -1.17/-1.21       | -2/-4.74          | -1.18/-3.49       | 0.09/-0.57        | -4.23/-5.27       | -3.96/-0.25       | 1.84/-0.22        | -1.61/-8.17       | -3.16/-0.23       | -4.88/-3.67       | -1.32/-1.85       | -2.08/-2.03       |
| Θ(120°)   | -3.93/-3.68   | -3.49/-3.4      | -1.96/-3.51     | -4.82/-8.82     | -4.35/-3.34     | -4.22/-2.42     | -1.07/-3.78     | -2.15/-2.09       | -4.45/-2.81       | -6.89/-4.88       | -1.41/-2.94       | -1.87/-5.82       | -4.24/-2.72       | -4.24/-6.47       | -1.04/-2.67       | -0.7/-3.08        | -1.86/-9.22       | -6.54/-3.12       | -0.52/-1.26       | -4.49/-6.22       | -3.45/-1.79       | -2.4/-0.45        | -4.34/-6.91       | -6.44/-3.53       |
| Θ(127.5°) | -5.86/-4.06   | -3.2/-1.94      | -2.36/-2.9      | -4.97/-8.15     | -2.11/-0.31     | -2.7/-2.76      | -1.31/-1.09     | -2.18/-2.37       | -6.55/-4.42       | -10.24/-8.85      | -3.24/-4.2        | -3.34/-3.84       | -3.29/-3.7        | -10.79/-5.27      | -6.48/-3.6        | -2.66/-3.3        | -2.27/-5.74       | -11.7/-1.94       | -1.57/-1.39       | -4.67/-2.82       | -5.96/-5.39       | -2.85/-2.68       | -7.5/-4.48        | -7.98/-7.22       |
| Θ(135°)   | -5.92/-6.19   | -7.1/-4.55      | -4.04/-2.47     | -3.87/-7.24     | -4.43/-1.28     | -1.95/-5.38     | -5.32/-4.23     | -3.11/-3.5        | -7.33/-9.14       | -11.34/-11.91     | -4.03/-3.04       | -3.15/-2.86       | -6.48/-4.07       | -9.6/-5.9         | -2.1/-3.08        | -2.48/-1.84       | -2.49/-4.8        | -2.78/-4.28       | -2.34/-1          | -3.16/-0.82       | -2.98/-3.88       | -3.73/-2.58       | -7.2/-7.84        | -10.49/-6.51      |
| Θ(142.5°) | -11.4/-7.98   | -5.29/-5.15     | -3.07/-1.86     | -3.55/-7.01     | -5.85/-5.51     | -8.77/-6.62     | -5.34/-7.5      | -10.95/-9.13      | -6.87/-5.76       | -8.72/-10.46      | -9.38/-7.36       | -4.1/-5.4         | -7.62/-8.96       | -8.16/-6.03       | -6.29/-4.59       | -7.75/-2.23       | -4.15/-8.06       | -4.76/-2.62       | -2.07/-0.44       | -1.47/-2.8        | -6.94/-5.49       | -7.6/-6.94        | -5.81/-8.98       | -8.36/-10.97      |
| Θ(150°)   | -8.82/-8.2    | -4.96/-3.81     | -3.05/-2.6      | -2.14/-2.71     | -3.83/-5.05     | -7.65/-10.03    | -7.89/-6.85     | -7.97/-9.09       | -8.72/-7.76       | -8.05/-10.31      | -9.56/-7.98       | -7.79/-7.91       | -10.12/-12.58     | -9.89/-9.83       | -5.09/-4.64       | -3.99/-4.63       | -7.61/-9.99       | -7.78/-3.89       | -4.09/-3.88       | -4.36/-5.93       | -9.21/-6.25       | -6.54/-8.11       | -6.05/-6.02       | -7.95/-8.63       |
| Θ(157.5°) | -6.72/-7.74   | -7.7/-6.23      | -7.14/-7.04     | -4.71/-4.22     | -4.89/-7.47     | -7.42/-5.27     | -5.3/-6.22      | -6.96/-7.25       | -7.04/-6.57       | -6.93/-7.11       | -7.29/-7.63       | -7.17/-6.68       | -6.36/-5.38       | -5.25/-6.66       | -7.46/-7.98       | -10.75/-9.54      | -5.27/-4.51       | -4.34/-3.97       | -4.88/-6.53       | -5.28/-4.78       | -3.97/-3.93       | -6.72/-7.97       | -6.38/-4.89       | -6.09/-6.87       |
| Θ(165°)   | -6.11/-5.5    | -4.46/-4.23     | -4.39/-3.06     | -2.73/-2.86     | -2.74/-2.99     | -3.7/-4.53      | -5.79/-6.26     | -6.55/-6.46       | -6.29/-6.12       | -6.54/-6.51       | -6.84/-7.59       | -8.19/-9.19       | -10.51/-9.09      | -9.45/-9.32       | -7.48/-7          | -7.53/-7.07       | -6.38/-6.41       | -6.53/-7          | -7.57/-8.07       | -8.36/-8.47       | -7.42/-8.51       | -9.14/-7.99       | -6.13/-6.59       | -6.61/-6.7        |
| Θ(172.5°) | -11.65/-12.02 | -9.39/-9.11     | -9.28/-6.88     | -5.11/-4.45     | -3.75/-3.23     | -3.64/-4.13     | -4.73/-5.24     | -5.73/-6.67       | -7.18/-7.11       | -7/-6.64          | -6.2/-6.73        | -7.84/-8.62       | -9.57/-9.54       | -9.45/-10.75      | -9.67/-8.14       | -8.95/-9.48       | -11.25/-11.79     | -11.18/-9.17      | -7.42/-6.75       | -5.01/-3.41       | -3.5/-4.51        | -6.35/-7.86       | -7.94/-9.7        |                   |
| Θ(180°)   | -11.82/-10.73 | -9.25/-8.83     | -7/-5.44        | -4.45/-3.6      | -3.4/-3.88      | -4.14/-4.56     | -4.72/-5.03     | -5.55/-6.2        | -6.43/-6.49       | -6.88/-6.44       | -6.51/-7.83       | -7.71/-7.29       | -7.83/-6.43       | -5.14/-5.25       | -6.02/-5.7        | -5.51/-5.82       | -6/-5.71          | -5.62/-5.97       | -5.26/-4.5        | -3.63/-3.19       | -3.58/-3.62       | -3.99/-5.11       | -6.33/-7.67       | -9.52/-11.56      |
| Freq(Hz)  | 5.785/Pol     | Theta/-         | -/-             | -/-             | -/-             | -/-             | -/-             | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               |
| DG(dB)    | Φ(0°)/Φ(7.5°) | Φ(15°)/Φ(22.5°) | Φ(30°)/Φ(37.5°) | Φ(45°)/Φ(52.5°) | Φ(60°)/Φ(67.5°) | Φ(75°)/Φ(82.5°) | Φ(90°)/Φ(97.5°) | Φ(105°)/Φ(112.5°) | Φ(120°)/Φ(127.5°) | Φ(135°)/Φ(142.5°) | Φ(150°)/Φ(157.5°) | Φ(165°)/Φ(172.5°) | Φ(180°)/Φ(187.5°) | Φ(195°)/Φ(202.5°) | Φ(210°)/Φ(217.5°) | Φ(225°)/Φ(232.5°) | Φ(240°)/Φ(247.5°) | Φ(255°)/Φ(262.5°) | Φ(270°)/Φ(277.5°) | Φ(285°)/Φ(292.5°) | Φ(300°)/Φ(307.5°) | Φ(315°)/Φ(322.5°) | Φ(330°)/Φ(337.5°) | Φ(345°)/Φ(352.5°) |
| Θ(0°)     | -2.57/-3.9    | -3.06/-1.84     | -1.08/-0.52     | -0.18/0.62      | 2.04/2.46       | 3.04/3.5        | 3.91/4.2        | 4.55/4.65         | 4.57/4.16         | 3.64/3.25         | 2.51/1.2          | 0.17/-1.22        | -2.86/-3.77       | -2.56/-1.97       | -0.91/0.34        | 0.81/4.3          | 2.09/2.55         | 3.29/3.48         | 3.66/3.91         | 4.04/3.74         | 3.65/3.6          | 3.45/3.2          | 2.33/1.23         | 0.5/-0.42         |
| Θ(7.5°)   | -2.28/-3.63   | -3.75/-2.39     | -1.6/-0.25      | 0.64/0.81       | 1.15/-1.42      | 1.69/1.63       | 1.66/2.04       | 2.73/0.5          | 3.24/3.36         | 3.15/3.14         | 2.95/2.24         | 1.59/0.87         | -0.38/-1.39       | -1.37/-0.98       | -0.59/0.15        | 0.64/-1.1         | 1.82/6.3          | 3.33/4.05         | 4.24/4.27         | 4.74/4.7          | 4.31/3.88         | 3.29/2.92         | 2.25/0.99         | -0.16/-1.13       |
| Θ(15°)    | -1.41/-1.26   | -0.37/0.27      | 0.04/-0.19      | -0.88/-1.09     | -0.98/-1.31     | -1.41/-1.68     | -1.99/-1.57     | -0.36/0.8         | 1.43/1.37         | 1.24/1.68         | 2.24/2.32         | 2.19/1.36         | 0.28/-0.3         | -0.61/-0.84       | -1.31/-1.82       | -2.18/-2.28       | -1.21/-0.3        | 0.73/1.67         | 2.04/2.24         | 2.29/2.3          | 2.24/2.26         | 2.37/2.1          | 1.46/0.27         | -0.74/-1.38       |
| Θ(22.5°)  | -2.26/-1.93   | -0.78/-0.16     | 0.02/0.26       | 0.53/0.19       | -0.18/-0.44     | -0.91/-2.62     | -4.21/-1.78     | 1.42/4.5          | 1.96/0.67         | 0.49/1.75         | 3.16/3.72         | 3.75/2.51         | 0.16/-1.27        | -1.37/0.14        | 0.53/-0.38        | -0.89/-0.71       | -0.09/-1.03       | -2.32/-1.66       | 0.28/1.86         | 2.24/2.59         | 3.32/3.94         | 4.19/3.93         | 2.76/0.37         | -1.64/-2.02       |
| Θ(30°)    | -3.06/-1.58   | 0.31/0.83       | -0.62/-1.78     | -2.27/-1.87     | -2.42/-3.81     | -3.73/-3.64     | -2.08/-0.1      | 1.21/36           | -0.16/-0.2        | 1.46/2.68         | 2.39/2.19         | 2.61/2.2          | 1.29/0.58         | 0.11/0.81         | 0.24/-0.41        | -0.94/-2.55       | -1.96/-1.68       | -2.29/-4          | -4.07/-1.32       | 0.76/1.54         | 1.77/2.25         | 2.25/2.2          | 2.59/2.28         | 0.15/-2.93        |
| Θ(37.5°)  | -7.21/-2.55   | 0.36/0.59       | -0.82/-3.65     | -2.35/-1.15     | -0.63/-0.5      | -1.48/-2.25     | -0.38/0.59      | -0.12/-0.67       | -0.13/0.19        | 0.61/1.9          | 1.98/2.89         | 2.82/1.56         | -0.21/-1.19       | -0.94/0.81        | -1.02/-1.06       | -1.13/-3.92       | -6.03/-4.37       | -3.28/-2.64       | -2.8/-2.93        | -2.16/-2.85       | -4.09/-3.37       | -2.96/-0.22       | 1.52/1.19         | -1.17/-4.25       |
| Θ(45°)    | -5.88/-1.54   | -0.47/-1.38     | -3.35/-3.22     | -2.52/-1.8      | 0.21/4.7        | -0.37/-1.72     | 0.33/1.34       | 0.82/1.52         | 2.02/0.9          | -1.25/-0.58       | 2.14/3.42         | 3.2/1.72          | -0.16/-0.75       | -0.54/0.19        | -0.75/-5.06       | -5.69/-5.18       | -4.34/-4.01       | -3.2/-1.58        | -1.18/-1.33       | -0.72/-2.12       | -3.91/-6.32       | -8.74/-6.54       | -1.43/-1.85       | 0.48/-2.04        |
| Θ(52.5°)  | 0.06/0.55     | -1.65/-4.46     | -6.76/-3.89     | -3.23/0.71      | 2.44/2.06       | 1.92/5.7        | 2.1/0.62        | 0.62/-1.45        | 0.44/-1.18        | -2.87/-2.05       | 0.36/2.73         | 2.49/2.41         | 2.37/0.86         | 1.35/0.4          | -0.96/-2.66       | -5.92/-9.3        | -4.58/-2.38       | -1.84/-1.23       | 0.19/-0.64        | -3.24/-3.98       | -5.46/-6.37       | -10.75/-9.59      | -2.71/-0.49       | 2.1/0.32          |
| Θ(60°)    | 1.11/-0.34    | -0.91/-3.56     | -4.86/-3.1      | -0.62/2.92      | 4.59/3.64       | 3.47/2.7        | 1.92/2.49       | 1.78/-1.38        | -0.76/-2.38       | -2.63/-4.25       | -2.02/1.85        | 3.93/3.66         | 3.04/1.33         | 0.88/-0.22        | 1.78/1.18         | -2.25/-4.77       | -2.31/0.75        | 0.58/-0.04        | -0.27/0.72        | 0.3/-2.71         | -3.38/-4.39       | -8.36/-7.83       | -1.67/0.98        | 2.14/2.16         |
| Θ(67.5°)  | 0.75/0.73     | 1.53/-2.4       | -2.33/-0.15     | 1.15/2.94       | 4.82/3.74       | 2.96/1.92       | 3.17/4.74       | 3.34/2.1          | 2.16/-0.55        | -2.98/-4.9        | -1.29/2.58        | 5.39/3.59         | 2.16/2.76         | 0.62/0.24         | 1.97/1.38         | -0.31/-2.39       | -0.2/2.98         | 1.82/0.96         | 2.4/2.64          | 2.12/-1.15        | -1.17/-2.06       | -6.59/-5.66       | -0.52/1.27        | 1.36/2.78         |
| Θ(75°)    | 0.26/-0.05    | 2.08/-0.38      | -0.43/0.88      | 2.04/2.75       | 4.12/2.88       | 1.74/1.6        | 3.47/4.93       | 3.78/3.08         | 2.67/-0.08        | -4.15/-6.42       | -1.79/1.36        | 3.92/2.71         | 2.74/3.19         | 1.30/27           | 2.16/2.05         | 0.36/-1.15        | 0.57/3.83         | 2.23/1.67         | 3.84/4.18         | 3.7/0.94          | 1.21/-1.61        | -3.67/-2.25       | 0.05/0.87         | 1.51/2.23         |
| Θ(82.5°)  | -0.02/-1.56   | 0.89/-0.78      | -0.95/0.34      | 1.74/1.94       | 2.91/5.3        | 1.07/0.43       | 2.38/3.67       | 2.51/2.99         | 2.26/0.69         | -4.29/-5.38       | -2.56/-1.52       | 3.07/1.97         | 1.13/2.17         | -0.67/-1.02       | 1.94/1.4          | -2.08/-0.54       | 1.14/2.66         | 1.73/2.26         | 4.46/3.89         | 3.68/1.05         | 0.66/-1.32        | -2.16/-0.87       | 0.46/-0.43        | 0.75/1.36         |
| Θ(90°)    | -0.15/-2.6    | -0.53/-2.67     | -2.89/0.09      | 0.52/0.4        | 2.11/0.58       | 0.37/-0.76      | 1.18/1.61       | 1.13/1.85         | 1.76/0.86         | -2.48/-5.86       | -5.6/-0.61        | 2.69/1.04         | 0.09/1.54         | -1.51/-1.79       | 0.88/0.25         | -4.24/-0.79       | 1.51/1.84         | -0/0.84           | 3.7/3.1           | 3.57/1.29         | 0.66/-2.45        | -2.88/-0.91       | 0.49/-1.24        | -0.07/-0.53       |
| Θ(97.5°)  | -0.25/-1.42   | -2.32/-6.58     | -5.1/-2.86      | -1.93/-1.37     | 0.27/-1.7       | -0.85/-2.18     | -1.04/0.11      | -0.71/-0.06       | -0.35/0.57        | -1.4/-3.74        | -6.8/-1.12        | 1.44/-0.7         | -0.89/0.48        | -3.4/-3.09        | -1.17/-3.16       | -5.12/-0.3        | 0.37/0.19         | -0.91/-2.14       | 1.2/0.58          | 0.73/-4.39        | -0.98/-2.26       | -3.86/-4          | -1.44/-2.37       | -1.51/-1.73       |
| Θ(105°)   | -0.06/0.87    | -2.54/-8.33     | -7.47/-4.94     | -3.02/-3.57     | -2.2/-3.32      | -2.28/-3.75     | -4.26/-1.58     | -1.97/-2.67       | -2.5/-0.67        | -1.15/-2.37       | -5.15/-3.9        | 0.59/0.64         | 0.24/-0.09        | -1.6/-3.98        | -2.02/-2.2        | -5.5/-1.27        | -0.25/-0.37       | -0.56/-4.28       | -1.34/-2.97       | -1.69/-4.66       | -3.63/-2.94       | -4.97/-3.95       | -4.11/-1.6        | -3.24/-3.37       |
| Θ(112.5°) | -0.25/-0.25   | -5.14/-9.43     | -5.33/-3.61     | -2.66/-2.77     | -3.78/-5.89     | -3.47/-3.68     | -6.59/-5.56     | -3.78/-6.27       | -4.36/-0.71       | -1.4/-0.87        | -2.93/-3.94       | -0.75/1.47        | -1.13/-3.69       | -4.06/-3.04       | -3.63/-2.49       | -2.86/0.68        | -0.73/-0.03       | -1.29/-3.66       | -0.54/-5.72       | -6.37/-4.46       | -3.22/-2.8        | -6.05/-3.93       | -3.73/-2.11       | -4.82/-2.46       |
| Θ(120°)   | -3.67/-2.68   | -9.19/-6.57     | -4.7/-3.1       | -3.93/-2.75     | -1.34/-3.61     | -4/-3.8         | -3.77/-8.31     | -5.72/-5.89       | -2.25/-1.6        | -2.31/-3.11       | -2.02/-1.53       | -0.82/0.72        | -0.29/-4.34       | -1.85/-3.45       | -6.94/-4.72       | -0.4/0.35         | 0.87/0.82         | 0.16/-1.1         | 1.13/-3.73        | -4.87/-2.16       | -4.22/-5.19       | -4.91/-6.03       | -3.91/-1.98       | -4.01/-2.83       |
| Θ(127.5°) | -3.22/-4.68   | -4.93/-6.51     | -5.63/-4.36     | -4.29/-3.37     | -3.3/-4.7       | -6.22/-6.39     | -5.08/-9.14     | -7.12/-5.58       | -2.76/-1.99       | -2.78/-2.41       | -0.08/0.61        | 0.39/-0.02        | -3.15/-2.6        |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |



# Radiated Composite Gain Data

# Appendix A

## Gain Result

| Freq(Hz)  | 2.45GPol.    | PhiAnt.1       | +              | -              | +              | -              | +              | -                | +                | -                | +                | -                | +                | -                | +                | -                | +                | -                | +                | -                | +                | -                | +                | -                | + | - |
|-----------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|---|---|
| Gain      | Φ(0°)Φ(7.5°) | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°) | Φ(90°)Φ(97.5°) | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°) | Φ(165°)Φ(172.5°) | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°) | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°) | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |   |   |
| Θ(0°)     | -14.12-13.95 | -12.49-12.07   | -11.46-11.19   | -11.42-11.59   | -12.38-12.57   | -12.53-12.21   | -12.15-12.37   | -13.55-14.54     | -16.91-17.15     | -16.56-15.34     | -16.43-17.18     | -14.44-13.12     | -13.05-13.54     | -14.17-13.9      | -12.91-12.11     | -11.82-11.84     | -11.92-12.03     | -11.89-11.73     | -11.76-12.17     | -13.05-14.27     | -15.73-17.34     | -17.26-16.69     | -15.94-15.84     |                  |   |   |
| Θ(7.5°)   | -14.61-13.1  | -11.04-9.35    | -8.16-7.45     | -7.09-7.07     | -7.15-7.04     | -6.94-7.25     | -7.98-9.17     | -10.97-13.61     | -16.84-18.31     | -18.21-19.01     | -18.43-18.44     | -18.08-14.86     | -13.26-12.53     | -12.49-12.53     | -12.18-11.69     | -11.63-11.96     | -12.56-13.82     | -15.01-15.56     | -15.28-14.98     | -14.49-13.82     | -13.12-12.76     | -12.43-12.2      | -12.37-12.98     | -14.02-14.73     |   |   |
| Θ(15°)    | -14.78-12.43 | -9.9-7.93      | -6.36-5.16     | -4.36-3.93     | -3.68-3.47     | -3.47-7.88     | -4.88-6.16     | -7.98-10.52      | -13.44-15.22     | -15.92-17.04     | -19.11-17.26     | -19.05-17.52     | -13.88-11.72     | -10.54-9.99      | -9.33-8.33       | -7.33-6.65       | -6.44-6.84       | -7.84-9.26       | -10.79-12.54     | -14-13.68        | -12.39-11.15     | -10.25-10.05     | -10.68-12.15     | -14.31-15.77     |   |   |
| Θ(22.5°)  | -14.71-12.84 | -10.72-8.69    | -6.79-5.09     | -3.75-2.77     | -2.22-1.99     | -2.08-2.81     | -4.18-5.99     | -8.2-10.73       | -13.77-15.17     | -15.86-16.45     | -18.17-18.85     | -18.48-16.29     | -13-10.52        | -9.02-8.32       | -7.8-6.84        | -5.53-4.35       | -3.58-3.46       | -3.77-4.56       | -5.76-7.72       | -10.46-13        | -10.44-10.68     | -11.97-13.89     | -15.61-15.84     |                  |   |   |
| Θ(30°)    | -16.37-16.4  | -13.85-10.94   | -8.39-6.11     | -4.3-2.94      | -2.23-2.07     | -2.5-3.72      | -5.79-8.37     | -11.13-13.81     | -16.92-18.49     | -16.79-14.85     | -14.07-14.48     | -14.94-14.56     | -12.66-10.23     | -8.04-6.73       | -6.1-5.78        | -5.19-4.15       | -3.16-2.44       | -2.16-2.39       | -3.25-5.05       | -8.26-12.72      | -14.28-12.61     | -12.5-14.16      | -16.52-16.37     | -15.11-15.21     |   |   |
| Θ(37.5°)  | -18.98-18.76 | -14.32-10.25   | -7.69-5.98     | -4.8-3.85      | -3.05-2.92     | -3.73-5.63     | -8.62-11.98    | -14.66-18.63     | -18.59-19.42     | -14.3-11.54      | -10.56-10.93     | -12.09-12.66     | -11.11-8.72      | -6.62-5.14       | -4.53-4.66       | -4.82-4.42       | -3.52-2.59       | -2.08-2.16       | -3.05-5.15       | -9.28-15.52      | -14.84-12.9      | -14.64-17.71     | -14.21-11.25     | -11.2-14.29      |   |   |
| Θ(45°)    | -17.94-13.74 | -9.71-7.79     | -6.19-4.77     | -4.32-4.4      | -3.87-3.4      | -4.12-6.36     | -9.66-12.3     | -13.52-16.94     | -17.77-14.13     | -10.76-9.26      | -8.96-9.73       | -11.46-12.68     | -10.6-7.69       | -5.43-4.22       | -3.97-4.45       | -5.08-5.05       | -4.22-3.46       | -3.07-3.07       | -3.8-5.98        | -10.52-14.14     | -10.79-9.89      | -12.55-16.01     | -10.8-7.94       | -8.59-13.93      |   |   |
| Θ(52.5°)  | -18.95-8.79  | -5.6-5.03      | -4.7-3.63      | -3.47-4.54     | -4.46-3.65     | -4.2-6.7       | -10.17-11.49   | -11.53-12.83     | -12.55-9.8       | -8-7.74          | -8.74-10.62      | -13.22-13.53     | -10.24-7.01      | -5-4.1           | -4.19-4.89       | -5.41-5.01       | -4.39-4.57       | -5.12-4.98       | -4.87-5.96       | -9.06-10.31      | -7.74-7.14       | -10.34-16.54     | -8.61-6.39       | -7.11-13.19      |   |   |
| Θ(60°)    | -18.45-8.27  | -4.62-4.1      | -3.92-2.71     | -2.51-4.1      | -5-4.31        | -4.75-1.7      | -9.8-10.17     | -10.23-11.1      | -10.21-7.74      | -6.28-6.35       | -8-10.78         | -13.41-13.74     | -11.1-7.95       | -5.51-4.26       | -4.07-4.77       | -5.41-5.11       | -4.72-5.6        | -7.52-6.73       | -4.64-4.64       | -7.6-9.71        | -5.97-4.66       | -7.5-13.91       | -7.57-4.42       | -5.17-10.82      |   |   |
| Θ(67.5°)  | -12.96-6.33  | -4.17-4.56     | -4.33-2.47     | -2.1-3.76      | -5.2-5.17      | -5.77-7.5      | -7.96-7.86     | -9.06-10.6       | -9.22-6.76       | -5.49-5.86       | -7.75-10.44      | -12.25-11.95     | -9.87-7.12       | -5.01-3.81       | -3.67-4.81       | -6.48-6.65       | -5.7-6.29        | -8.05-6.21       | -3.88-4.43       | -4.84-8.86       | -3.88-2.4        | -4.78-11.67      | -7.52-4.04       | -5.25-11.46      |   |   |
| Θ(75°)    | -10.9-4.79   | -3.13-4.39     | -5.07-2.66     | -1.86-3.3      | -5.12-5.59     | -6.05-6.75     | -5.91-5.44     | -6.48-7.92       | -7.32-5.9        | -5.19-5.64       | -7.15-9.3        | -10.82-10.93     | -9.69-7.63       | -5.72-4.42       | -4.19-5.64       | -8.87-8.61       | -5.36-4.7        | -6.4-6.35        | -4.63-5.24       | -8.08-8.32       | -3.64-2.29       | -4.54-13.27      | -9.32-4.88       | -6.19-14.06      |   |   |
| Θ(82.5°)  | -11.34-5.52  | -3.66-5.09     | -6.26-3.78     | -2.71-3.65     | -5.36-5.95     | -6.26-6.05     | -4.84-4.85     | -5.92-6.22       | -5.52-6.1        | -5.17-5.71       | -6.71-8.05       | -9.18-9.97       | -10.27-9.32      | -7.66-6.08       | -5.56-6.71       | -9.28-7.48       | -4.57-4.24       | -6.57-8.45       | -6.34-6.23       | -9.95-9.96       | -5.06-3.68       | -6.29-1.6        | -9.27-5.37       | -7-14            |   |   |
| Θ(90°)    | -10.25-5.6   | -3.88-5.51     | -6.81-4.58     | -4.06-5        | -6.32-6.01     | -5.84-5.58     | -4.21-4.17     | -5.54-5.69       | -4.71-4.56       | -5.08-5.64       | -5.93-6.52       | -7.97-10.61      | -13.26-13.12     | -10.34-7.06      | -4.89-4.76       | -7.31-9.05       | -6.44-5.11       | -7.01-9.2        | -6.52-6.5        | -12.21-10.16     | -4.88-11.95      | -4.48-11.95      | -6.83-5.36       | -7.65-14.42      |   |   |
| Θ(97.5°)  | -10.31-6.6   | -4.78-6.54     | -7.25-4.27     | -4.11-5.68     | -7.66-6.96     | -5.73-5.14     | -3.99-3.8      | -4.64-4.54       | -3.84-4.04       | -4.98-5.74       | -6.1-7.13        | -9.62-11.61      | -11.43-11.67     | -9.95-6.4        | -4.18-4.52       | -8.13-9.76       | -5.52-4.1        | -6.25-9.67       | -6.73-6.27       | -10.33-8.19      | -3.32-1.98       | -3.93-10.19      | -9.01-5.68       | -8.42-14.5       |   |   |
| Θ(105°)   | -9.19-7.22   | -6.09-8.14     | -9.47-5.09     | -4.37-5.77     | -8-8.93        | -7.18-9.33     | -4.99-4.67     | -4.89-4.55       | -5.65-6.6        | -6.75-7.15       | -7.61-7.07       | -7.35-9.37       | -10.27-9.32      | -7.66-6.08       | -5.56-6.71       | -6.11-7.78       | -5.47-4.04       | -5.85-7.84       | -4.28-5.37       | -7.91-15.03      | -5.89-3.55       | -10.74-7.6       | -10.74-7.6       | -7-14            |   |   |
| Θ(112.5°) | -9.27-6.85   | -6.2-8.51      | -11.51-6.21    | -4.92-5.98     | -7.28-8.33     | -7.66-6.56     | -5.59-5.74     | -5.21-4.16       | -3.31-5.53       | -4.88-6.71       | -7.66-7.5        | -7.61-9.58       | -7.49-10.85      | -11.28-6.57      | -3.47-3.28       | -5.62-7.42       | -4.44-2.66       | -7.55-5.97       | -5.04-5.38       | -11.93-13.44     | -4.95-13.3       | -4.95-9.62       | -13.52-10.55     | -13.99-17.1      |   |   |
| Θ(120°)   | -11.72-8.08  | -6.9-8.7       | -12.2-7.92     | -6.29-7.51     | -7.85-6.85     | -6.05-5.45     | -5.26-5.32     | -4.5-3.04        | -1.94-1.87       | -3.03-4.95       | -6.16-5.62       | -4.16-3.69       | -4.98-7.95       | -11.08-7.31      | -3.98-3.61       | -5.16-5.4        | -3.26-2.44       | -4.45-8.99       | -7.17-4.99       | -6.81-11.57      | -8.25-6.18       | -7.54-12.15      | -17.65-14.97     | -17.05-17.88     |   |   |
| Θ(127.5°) | -16.08-11.44 | -9.54-10.25    | -11.84-9.02    | -7.92-10.31    | -11.12-7.59    | -5.5-4.82      | -4.88-4.93     | -3.68-1.92       | -1.06-1.45       | -3.08-5.12       | -5.82-5.46       | -3.2-3.1         | -4.42-7.4        | -11.19-8.3       | -5.07-4.37       | -5.03-5.08       | -4.14-4.03       | -5.92-6.93       | -3.97-4.58       | -4.03-6.97       | -17.65-13.83     | -12.96-16.48     | -18.46-16.53     | -18.94-18.06     |   |   |
| Θ(135°)   | -15.85-15.14 | -14.86-13.39   | -11.91-9.86    | -9.47-12.28    | -14.82-9.89    | -6.6-5.34      | -5.38-5.75     | -4.84-3.05       | -1.86-1.83       | -2.73-3.81       | -4.2-3.51        | -2.5-2.2         | -2.97-5.09       | -8.84-9.15       | -6.46-5.41       | -5.56-5.27       | -4.13-3.66       | -4.66-5.93       | -5.14-4.49       | -6.07-11.28      | -15.15-9.96      | -8.93-9.89       | -12.71-16.41     | -18.86-17.84     |   |   |
| Θ(142.5°) | -11.5-13.51  | -19.41-18.79   | -13.97-11.88   | -11.98-14.31   | -14.91-11.31   | -8.65-7.31     | -7.02-6.97     | -6.21-5.02       | -4.03-3.61       | -3.67-3.9        | -3.89-3.36       | -17.22-2.74      | -3.79-6.25       | -8.88-8.43       | -6.57-6.02       | -5.86-5.26       | -4.41-4.48       | -5.87-8.01       | -8.74-9.6        | -11.51-17.64     | -12.56-6.18      | -6.96-8.02       | -10.75-13.8      | -13.81-11.9      |   |   |
| Θ(150°)   | -10.05-12.49 | -18.01-19.29   | -18.04-17.36   | -16.94-15.76   | -12.78-10.1    | -8.64-8.17     | -8.08-7.67     | -6.37-5.04       | -4.17-3.96       | -4.28-4.98       | -5.74-6.17       | -6.26-6.86       | -8.7-12.05       | -14.58-12.38     | -10.01-6.55      | -7.37-6.31       | -5.64-6.02       | -7.6-10.44       | -13.54-16.05     | -18.89-18.67     | -15.61-11.04     | -9.37-9.25       | -7.89-9.82       | -9.36-9.15       |   |   |
| Θ(157.5°) | -12.87-16.03 | -18.34-18.96   | -18.29-18.02   | -19.36-15.07   | -12.29-10      | -8.71-8.27     | -8.27-7.96     | -7.06-5.92       | -4.94-4.48       | -4.61-5.26       | -6.26-7.5        | -8.97-11.01      | -14.07-18.83     | -18.5-14.72      | -15.6-11.37      | -18.77-6.5       | -7.52-8.37       | -10.29-13.45     | -17.47-18.18     | -18.06-17.94     | -18.56-16.48     | -13.51-11.74     | -10.66-10.06     | -10.1-10.9       |   |   |
| Θ(165°)   | -17.82-17.64 | -18.77-18.42   | -17.47-19.09   | -18.44-15.62   | -14.48-12.82   | -11.27-10.27   | -9.55-8.81     | -7.95-7.2        | -6.4-5.84        | -5.69-5.89       | -6.3-6.79        | -7.77-9.04       | -10.71-13.16     | -17.32-18.18     | -16.39-14.16     | -11.77-15.1      | -11.4-11.26      | -14.3-15.96      | -16.41-16.02     | -16.23-17.45     | -17.91-18.27     | -17.35-17.3      | -17.96-17.18     | -17.64-19.42     |   |   |
| Θ(172.5°) | -19.33-18.31 | -18.84-19.02   | -18.64-18.59   | -18.47-18.14   | -16.62-14.93   | -13.41-12.24   | -11.17-10.17   | -9.33-8.61       | -8.05-7.6        | -7.42-7.38       | -7.64-8.33       | -9.59-11.46      | -13.93-17.35     | -19.03-18.81     | -18.06-19.21     | -17.17-16.79     | -17.21-17.05     | -15.87-14.37     | -13.1-12.34      | -12.32-13.08     | -14.43-15.99     | -17.55-18.95     | -17.77-18.79     | -17.35-18.07     |   |   |
| Θ(180°)   | -17.45-19.13 | -18.68-18.18   | -18.29-18.3    | -18.43-16.33   | -14.22-12.91   | -12.18-11.68   | -11.21-10.67   | -10.36-10.01     | -9.65-9.39       | -9.33-9.55       | -10.17-11.31     | -13.03-15.3      | -18.08-17.67     | -18.93-17.74     | -18.16-18.33     | -18.04-18.96     | -18.46-18.36     | -15.22-13.42     | -12.49-12.31     | -12.82-14.12     | -15.78-17.1      | -17.12-16.04     | -15.23-15.46     | -16.52-17.64     |   |   |
| Freq(Hz)  | 2.45GPol.    | ThetaAnt.1     | +              | -              | +              | -              | +              | -                | +                | -                | +                | -                | +                | -                | +                | -                | +                | -                | +                | -                | +                | -                | +                | -                |   |   |
| Gain      | Φ(0°)Φ(7.5°) | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°) | Φ(90°)Φ(97.5°) | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°) | Φ(165°)Φ(172.5°) | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°) | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°) | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |   |   |
| Θ(0°)     | -14.36-14.45 | -14.63-14.4    | -15.85-16.59   | -16.71-16.68   | -16.25-16.11   | -15.21-14.66   | -14.56-13.44   | -12.95-12.1      | -11.66-12.26     | -12.62-13.87     | -13.96-13.79     | -13.88-14.85     | -16.21-17.86     | -18.19-19.12     | -18.82-18.39     | -18.43-17.16     | -16.38-15.82     | -15.46-15.23     | -14.91-14.34     | -13.33-12.13     | -11.25-10.81     | -10.83-11.36     | -12.18-13.09     | -13.85-14.18     |   |   |
| Θ(7.5°)   | -16.23-16.18 | -16.17-17.05   | -18.56-19.34   | -19.23-18.65   | -17.88-18.3    | -16.39-13.99   | -11.91-10.5    | -9.48-9.05       | -9.38-10.51      | -11.82-12.46     | -12.42-12.54     | -13.36-14.94     | -16.69-18.21     | -17.2-17.31      | -18.19-17.47     | -15.25-13.24     | -9.4-9           | -8.93-9.01       | -9.1-9.24        | -9.58-10.42      | -11.94-13.87     | -15.36-15.67     | -16.71-15.91     |                  |   |   |
| Θ(15°)    | -18.42-18.36 | -17.46-18.79   | -18.89-18      | -18.31-16.02   | -13.68-11.94   | -10.33-8.72    | -7.31-6.39     | -5.81-5.77       | -6.52-8.09       | -10.08-11.54     | -11.87-11.74     | -11.84-12.75     | -14.35-16.55     | -18.63-17.56     | -18.73-18.51     | -16.3-13.09      | -9.98-7.46       | -5.71-6.68       | -4.25-4.15       | -4.32-4.79       | -5.52-6.85       | -9.07-12.21      | -15.84-18.1      | -18.89-17.85     |   |   |
| Θ(22.5°)  | -18.65-18.35 | -18.9-18.26    | -17.28-18.54   | -16.71-13.33   | -11.06-9.32    | -7.87-6.48     | -5.26-4.35     | -3.77-3.77       | -4.48-5.77       | -7.36-8.86       | -9.6-9.47        | -9.48-10.26      | -11.72-13.75     | -15.73-16.18     | -15.96-16.13     | -16.18-13.72     | -9.86-6.67       | -4.47-3.15       | -2.5-2.25        | -2.29-2.7        | -3.62-5.1        | -7.41-10.28      | -13.24-16.17     | -17.52-17.29     |   |   |
| Θ(30°)    | -18.62-18.29 | -18.47-17.59   | -17.57-17.13   | -16.12-12.9    | -10.2-8.19     | -6.65-6.4      | -3.65-2.61     | -1.95-1.81       | -2.1-2.56        | -3.34-4.1        | -5.93-7.54       | -8.95-10.24      | -11.33-11.99     | -12.78-13.65     | -14.3-14.47      | -14.59-13.02     | -9.77-8.85       | -4.58-3.12       | -2.36-2.02       | -2.05-2.48       | -3.42-4.76       | -6.21-7.41       | -8.8-11.25       | -16.45-18.72     |   |   |



# Radiated Composite Gain Data

# Appendix A

|           |               |                 |                 |                 |                 |                 |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |               |
|-----------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|---------------|
| Θ(22.5°)  | 0.640/0.3     | -1.85/-5.89     | -14.53/-19.16   | -18.19/-18.27   | -12.62/8.88     | -6.59/-5.3      | -5.9/-9.01      | -6.76/-3.49       | -9.920/6.4        | 1.69/1.89         | 1.33/0.93         | 0.74/0.25         | -1.82/-1.93       | -1.54/-1.47       | -1.73/-2.61       | -4.5/-6.75        | -10.58/-14.65     | -18.81/-17.36     | -18.81/-18.51     | -13.66/-10        | -7.07/-5.18       | -3.88/-2.8        | -1.67/-0.38       | 0.84/1.05         |               |
| Θ(30°)    | -0.51/-2.11   | 4.06/-7.75      | -11.83/-12.87   | -16.99/-18.15   | -9.81/-7.37     | -9.36/-16.64    | -19.13/-17.61   | -17.28/-11.49     | -5.63/-2.26       | -0.47/0.4         | 1.35/-1.96        | <b>2.422/6</b>    | 1.49/-0.37        | -1.25/-2.33       | -3.49/-3.69       | -5.93/-10.51      | -13.47/-11.97     | -12.95/-15.94     | -14.09/-11.44     | -10.3/-6.79       | -3.54/-2.76       | -3.46/-4.13       | -3.3/-1.56        | -0.49/-0.03       |               |
| Θ(35°)    | -0.59/-2.79   | -7.3/-11.41     | -10.41/-11      | -11.64/-9.68    | -6.09/-6.4      | -9.69/-13.38    | -14.41/-18.62   | -17.49/-18.55     | -12.27/-6.27      | -3.54/-1.34       | 0.3/1             | 0.92/1.41         | 1.6/1             | -0.08/-1.84       | -4.45/-5.39       | -7.54/-13.71      | -12.39/-8.22      | -7.52/-8.64       | -11.31/-9.5       | -4.33/-3.27       | -5.42/-6.94       | -8.24/-7.53       | -3.88/-1          |                   |               |
| Θ(45°)    | -1.16/-3.78   | -7.46/-6.33     | -5.49/-6.7      | -6.37/-4.34     | -4.81/-7        | -7.55/-9.14     | -17.53/-18.72   | -15.56/-13.24     | -10.03/-8.37      | -7.43/-4.31       | 2.46/-1.9         | -1.92/-1.57       | -0.88/0.21        | 0.83/-0.57        | -5.12/-8.08       | -6.98/-8.19       | -8.04/-9.98       | -10.23/-9.79      | -8.85/-8.59       | -13.15/-18.73     | -10.89/-9.89      | -17.3/-9.82       | -8.06/-6.13       | -4.07/-1.37       |               |
| Θ(52.5°)  | -4.38/-5.05   | -5.51/-3.95     | -5.52/-5        | -4.73/-1.79     | -4.3/-7.29      | -9.39/-19       | -13.84/-8.59    | -9.37/-8.62       | -8.57/-9.5        | -5.73/-3.41       | -1.97/-1.18       | -0.74/-0.31       | -1.45/-2.08       | -0.73/-0.74       | -4.96/-1.4        | -13.38/-9.69      | -9.16/-8.04       | -6.25/-4.09       | -6.14/-12.8       | -18.49/-17.59     | -18.49/-17.82     | -9.7/-6.42        | -6.22/-3.57       | -3.42/-3.87       |               |
| Θ(60°)    | -5.64/-5.89   | -7.42/-6.95     | -2.71/-5.33     | -4.44/-2.14     | -5.47/-8.54     | -11.71/-10.7    | -6.96/-4.91     | -4.26/-3.25       | -4.6/-4.47        | -2.85/-2.06       | -2.37/-2.16       | -0.84/0.44        | 0.01/-1.08        | -1.31/-2.28       | -6.58/-14.29      | -17.94/-9.57      | -7.4/-0.9         | -3.59/-5.97       | -8.81/-8.89       | -8.64/-7.74       | -18.2/-14.97      | -11.23/-8.7       | -8.47/-5.88       | -7.2/-8.46        |               |
| Θ(67.5°)  | -1.53/-7.29   | -12.21/-9.13    | -7.63/-6.36     | -6.08/-3.47     | -8.3/-7.1       | -8.84/-5.7      | -3.31/-2.53     | -2.1/-1.88        | -2.17/-1.45       | -1.45/-1.25       | -3.04/-4.15       | -3.06/-2.09       | -1.61/-1.43       | -2.63/-5.14       | -7.11/-10.57      | -11.87/-11.32     | -7.66/-4.42       | -3.55/-2.89       | -5.49/-4.88       | -5.64/-4.2        | -11.9/-9.76       | -11.46/-11.39     | -8.04/-9.34       | -17.01/-7.69      |               |
| Θ(75°)    | -1.54/-11.71  | -7.55/-10.9     | -4.89/-9.56     | -6.99/-4.62     | -7.24/-5.39     | -6.85/-3.8      | -2.29/-2.99     | -2.09/-1.34       | -1.11/-0.59       | -1.78/-1.34       | -2.01/-3.34       | -4.81/-4.31       | -3.35/-2.14       | -1.4/-4.38        | -9.75/-13.92      | -16.56/-12.75     | -7.41/-3.7        | -4.16/-3.68       | -4.99/-2.12       | -3.46/-3.16       | -7.93/-5.57       | -13.62/-12.78     | -5.78/-12.82      | -9.06/-10.6       |               |
| Θ(82.5°)  | -1.93/-17.76  | -4.42/-7.76     | -3.88/-10.83    | -8.09/-6.34     | -7.85/-3.84     | -4.35/-3.72     | -2.99/-3.83     | -1.08/-1.1        | -0.31/-1.38       | -2.44/-1.35       | -2.1/-2.94        | -4.82/-6.29       | -5.81/-3.01       | -1.32/-4.94       | -11.43/-16.49     | -14.87/-13.72     | -13/-5.65         | -3.41/-3.61       | -7.63/-2.01       | -3.24/-0.74       | -4.52/-2.79       | -18.28/-16.72     | -5.16/-14.89      | -5.22/-12.99      |               |
| Θ(90°)    | -3.06/-16.3   | -3.84/-7.59     | -4.48/-11.81    | -9.03/-5.78     | -5.96/-4.11     | -5.61/-3.97     | -2.25/-3.53     | -2.01/-2.22       | -1.75/-2.9        | -3.47/-1.78       | -2.16/-3.16       | -4.53/-6.44       | -6.79/-4.48       | -2.61/-6.38       | -11.24/-15.36     | -18.1/-14.45      | -8.84/-8.37       | -9.29/-4.83       | -5.04/-4.79       | -8.11/-2.85       | -4.43/-1.83       | -18.44/-19.09     | -4.95/-17.85      | -4.62/-12.86      |               |
| Θ(97.5°)  | -2.92/-16.63  | -3.66/-7.94     | -4.95/-14.82    | -12.26/-6.34    | -6.43/-3.03     | -4.95/-5.4      | -3.31/-4.48     | -2.17/-2.82       | -1.59/-5.02       | -5.01/-5.1        | -2.67/-3.35       | -6.01/-7.89       | -6.3/-4.72        | -2.43/-5.09       | -16.5/-15.33      | -18.29/-17.89     | -13.98/-8.97      | -7.66/-8.67       | -7.51/-3.82       | -11.8/-5.99       | -7.78/-1.86       | -17.36/-17.81     | -9.41/-14.66      | -4.79/-15.79      |               |
| Θ(105°)   | -5.83/-17.61  | -5.21/-10.21    | -8.07/-14.26    | -12.71/-5.96    | -7.75/-5.29     | -5.13/-4.52     | -3.13/-4.1      | -2.84/-2.37       | -2.76/-5.98       | -6.59/-4.77       | -4.54/-5.21       | -6.58/-8.67       | -8.66/-5.78       | -5.61/-5.36       | -11.88/-13.2      | -14.47/-18.85     | -13.1/-10.34      | -6.4/-3.54        | -5.69/-6.53       | -14.87/-13.7      | -15.43/-18.89     | -8.84/-19.17      | -6.14/-14.52      |                   |               |
| Θ(112.5°) | -10.63/-18.59 | -6.18/-15.86    | -13.58/-13.72   | -13.34/-7.12    | -8.27/-4.99     | -6.33/-6.32     | -2.83/-4.04     | -4.07/-3.65       | -3.69/-7.08       | -8.98/-6.36       | -6.3/-6.68        | -8.21/-9.81       | -7.9/-7.85        | -5.01/-8.76       | -10.49/-8.31      | -13.87/-13.45     | -10.77/-8.86      | -9.82/-2.53       | -3.71/-4.17       | -14.05/-9.5       | -19.35/-4.82      | -11.24/-19.66     | -7.48/-18.74      | -7.41/-19.47      |               |
| Θ(120°)   | -18.5/-18.26  | -11.82/-15.25   | -17.22/-16.99   | -12.07/-7.22    | -16.14/-6.61    | -8.55/-16.7     | -4.85/-3.4      | -5.59/-4.62       | -4.3/-5.84        | -1.61/-6.07       | -6.05/-7.32       | -9.33/-10.1       | -8.16/-8.35       | -4.87/-6.47       | -10.38/-15.39     | -8.71/-12.45      | -10.94/-11.8      | -11.35/-4.63      | -6.93/-5.89       | -15.24/-13.58     | -10.47/-18.23     | -10.91/-9.26      | -10.59/-15.03     | -16.05/-18.05     |               |
| Θ(127.5°) | -14.51/-18.57 | -16.15/-7.89    | -14.86/-14.92   | -17.62/-11.77   | -15.14/-9.25    | -8.38/-11.7     | -5.38/-4.28     | -8.2/-8.15        | -5.87/-6.15       | -6.77/-6.7        | -6.84/-8.33       | -9.49/-9.81       | -12.15/-12.77     | -6.84/-6.12       | -7.75/-8.14       | -8.02/-17.59      | -8.1/-13.14       | -9.94/-2.63       | -6.65/-6.52       | -18.77/-17.33     | -9.43/-6.57       | -7.17/-49         | -14.72/-13.05     | -15.61/-18.96     |               |
| Θ(135°)   | -9.89/-17.91  | -12.94/-9       | -9.38/-10.79    | -14.96/-17.96   | -12.22/-8.04    | -9.53/-15.01    | -10.09/-4.71    | -5.95/-9.53       | -7.6/-7.38        | -6.55/-5.41       | -7.33/-11.1       | -15.28/-14.9      | -13.07/-8.56      | -7.22/-8.8        | -6.86/-5.04       | -5.56/-18.29      | -9.27/-8.4        | -14.28/-7.12      | -9.05/-10.29      | -12.17/-15.33     | -10.18/-9.62      | -11.7/-11.83      | -19.43/-13.02     | -17.4/-18.61      |               |
| Θ(142.5°) | -13.82/-18.41 | -14.97/-14.15   | -14.12/-13.05   | -11.5/-14.08    | -14.4/-12.19    | -12.9/-16.06    | -12.96/-8.01    | -7.92/-11.95      | -11.07/-1.85      | -6.01/-5.81       | -8.02/-12.61      | -15.74/-17.71     | -15.29/-10.99     | -10.68/-5.05      | -6.68/-6.78       | -7.52/-7.68       | -17.33/-16.8      | -6.83/-3.7        | -7.71/-14.02      | -10.4/-9.53       | -7.17/-14.02      | -10.49/-5.3       | -10.95/-10.3      | -11.8/-17.42      | -17.79/-19.17 |
| Θ(150°)   | -15.51/-14.15 | -12.52/-12.38   | -10.13/-9.86    | -10.55/-10.56   | -11.34/-13.39   | -16.76/-18.78   | -17.29/-14.41   | -10.39/-10.55     | -12.59/-15.13     | -11.77/-7.96      | -8.93/-15.34      | -18.22/-17.11     | -18.22/-17.11     | -10.69/-7.58      | -15.55/-10.15     | -16.65/-12.96     | -14.23/-18.27     | -9.66/-5.57       | -5.12/-6.63       | -8.39/-12.65      | -13.9/-12.13      | -15.4/-18.23      | -12.2/-11.63      | -14.96/-16.56     |               |
| Θ(157.5°) | -15.98/-15.83 | -10.47/-18.13   | -15.86/-15.61   | -13.34/-10.92   | -9.29/-9.28     | -11.2/-15.28    | -17.6/-14       | -10.38/-8.87      | -9.13/-10.45      | -14.24/-18.29     | -18.9/-17.68      | -16.53/-14.19     | -11.07/-8.86      | -8.84/-10.23      | -13.4/-17.88      | -12.29/-9.57      | -9.36/-9.57       | -9.4/-8.3         | -7.45/-8.39       | -11.31/-15.83     | -18.08/-14.77     | -16.85/-16.09     | -12.36/-11.08     | -13.84/-14.46     |               |
| Θ(165°)   | -17.43/-17.98 | -18.63/-18.08   | -17.99/-16.96   | -13.79/-11.01   | -9.52/-9.12     | -10.05/-12.16   | -12.93/-11.76   | -10.53/-10.27     | -10.75/-12.18     | -15.2/-18.26      | -18.7/-18.3       | -17.98/-16.3      | -14.13/-12.46     | -13.3/-15.3       | -13.2/-10.5       | -8.66/-8.16       | -9.33/-11.4       | -14.78/-17.18     | -13.92/-13.01     | -13.25/-12.53     | -13.66/-13.95     | -18.03/-15.4      | -18.25/-17.52     | -17.61/-14.69     |               |
| Θ(172.5°) | -15.68/-14.58 | -13.53/-12.56   | -10.88/-10.6    | -9.13/-7.91     | -7.22/-7.04     | -7.23/-7.57     | -7.98/-8.66     | -9.09/-9.56       | -10.39/-10.98     | -12.35/-15.31     | -18.74/-18.32     | -18.55/-18.64     | -17.43/-14.34     | -11.12/-8.6       | -7.31/-6.94       | -7.36/-8.72       | -11.35/-14.68     | -18.13/-18.54     | -17.61/-18.67     | -18.77/-18.17     | -17.44/-18.28     | -18.05/-17.32     | -17.48/-18.49     |                   |               |
| Θ(180°)   | -16.55/-18.26 | -15.98/-13.51   | -12.9/-11.05    | -9.43/-8.57     | -7.87/-7.69     | -8.19/-7.85     | -8.88/-10.05    | -10.9/-10.94      | -13.39/-18.03     | -18.44/-17.97     | -18.45/-18.16     | -18.45/-18.43     | -15.58/-13.74     | -13.37/-15.64     | -16.4/-14.8       | -13.37/-12.54     | -13.16/-14.4      | -15.23/-15.28     | -14.61/-14.57     | -14.21/-12.96     | -13.14/-16.19     | -18.49/-17.53     | -18.39/-18.94     |                   |               |
| Freq(Hz)  | 5.3GPol       | ThetaAnt.1      | -               | -               | -               | -               | -               | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 |               |
| Gain      | Φ(0°)/Φ(7.5°) | Φ(15°)/Φ(22.5°) | Φ(30°)/Φ(37.5°) | Φ(45°)/Φ(52.5°) | Φ(60°)/Φ(67.5°) | Φ(75°)/Φ(82.5°) | Φ(90°)/Φ(97.5°) | Φ(105°)/Φ(112.5°) | Φ(120°)/Φ(127.5°) | Φ(135°)/Φ(142.5°) | Φ(150°)/Φ(157.5°) | Φ(165°)/Φ(172.5°) | Φ(180°)/Φ(187.5°) | Φ(195°)/Φ(202.5°) | Φ(210°)/Φ(217.5°) | Φ(225°)/Φ(232.5°) | Φ(240°)/Φ(247.5°) | Φ(255°)/Φ(262.5°) | Φ(270°)/Φ(277.5°) | Φ(285°)/Φ(292.5°) | Φ(300°)/Φ(307.5°) | Φ(315°)/Φ(322.5°) | Φ(330°)/Φ(337.5°) | Φ(345°)/Φ(352.5°) |               |
| Θ(0°)     | -9.23/-6.71   | -0.51/-3.85     | -2.31/-1.88     | -0.96/-0.55     | -0.38/0.1       | 0.0/2.4         | 0.13/-0.6       | -0.92/-1.5        | -2.85/-3.37       | -5.34/-6.14       | -10.16/-16.27     | -18.76/-13.47     | -11.02/-6.69      | -4.11/-3.22       | -2.18/-1.05       | -0.22/0.31        | <b>0.790/7.3</b>  | 0.48/0.38         | -0.02/-0.68       | -1.43/-2.4        | -3.86/-5.94       | -8.37/-11.21      | -16.83/-17.73     | -17.41/-14.09     |               |
| Θ(7.5°)   | -8.3/-5.69    | -4.23/-2.59     | -1.45/-1.09     | -0.68/-0.38     | -0.26/-0.37     | -0.71/-1.01     | -1.64/-2.59     | -3.64/-4.1        | -5.17/-6.02       | -7.93/-10.79      | -16.12/-19.07     | -17.99/-13.82     | -11.19/-8.74      | -5.12/-3.2        | -2.78/-2.71       | -1.55/-1.09       | 0.64/0.76         | 0.61/0.6          | 0.44/0            | -0.49/-0.95       | -2.06/-3.85       | -6.1/-6.85        | -12.5/-18.07      | -17.82/-17.18     |               |
| Θ(15°)    | -6.59/-5.11   | -3.93/-2.71     | -2.28/-2.95     | -3.27/-2.54     | -2.71/-5.59     | -4.71/-6.64     | -6.73/-6.85     | -7.02/-8.17       | -10.07/-12.96     | -13.72/-11.86     | -14.51/-10.86     | -9.94/-9.85       | -7.83/-5.41       | -4.1/-3.38        | -2.43/-1.6        | -1.21/-2.39       | -1.63/-1.47       | -1.05/-0.74       | -0.29/-0.35       | -0.99/-1.2        | -3.74/-5.25       | -7.56/-11.13      | -12.6/-9.33       |                   |               |
| Θ(22.5°)  | -7.47/-4.51   | -2.3/-1.31      | -1.53/-2.44     | -4.63/-7.68     | -7.43/-5.96     | -5.46/-5.63     | -6.31/-6.93     | -7.18/-8.09       | -10.89/-14.99     | -17.7/-16.33      | -9.73/-7.76       | -7.85/-7.64       | -7.92/-8.43       | -7.71/-7          | -6.21/-4.47       | -2.72/-1.9        | -2.44/-3.83       | -4.88/-4.19       | -3.41/-3.48       | -3.56/-4.16       | -4.77/-5.45       | -5.89/-5.89       | -7.21/-10.15      | -11.48/-10.8      |               |
| Θ(30°)    | -5.95/-3.78   | -2.63/-2.37     | -2.94/-4.54     | -7.17/-10.5     | -11.66/-10.2    | -8.48/-6.16     | -4.91/-5.37     | -6.89/-8.08       | -10.66/-11.26     | -13.94/-18.97     | -17.44/-16.6      | -10.88/-6.69      | -6.4/-5.03        | -5.56/-4.75       | -7.22/-4.77       | -2.38/-1.05       | -1.92/-3.29       | -4.13/-4.22       | -4.16/-4.07       | -5.06/-6.89       | -9.09/-11.48      | -11.54/-10        | -9.59/-10.48      | -10.23/-8.57      |               |
| Θ(37.5°)  | -9.5/-5.54    | -3/-2.89        | -5.03/-11.45    | -18.01/-17      | -12.1/-10.85    | -6.96/-3.56     | -2.78/-3.06     | -4.38/-5.3        | -5.74/-7.16       | -13.08/-14.45     | -7.73/-5.96       | -6.04/-9.08       | -8.54/-5          | -4.15/-5.22       | -8.18/-7.55       | -4.03/-3.08       | -3.42/-4.44       | -7.84/-10.39      | -8.53/-9.04       | -11.88/-15.19     | -13.07/-11.64     | -10.46/-11.2      | -13.65/-10.62     | -7.84/-8.5        |               |
| Θ(45°)    | -11.34/-6.76  | -3.51/-4.06     | -5.61/-9.46     | -15.33/-14.41   | -7.58/-6.54     | -4.28/-1.82     | -1.47/-1.47     | -1.74/-3.1        | -4.89/-6.52       | -10.62/-13.93     | -8.25/-3.95       | -12.25/-4.12      | -10.2/-8.51       | -5.97/-4.37       | -4.5/-7.1         | -7.22/-6.09       | -5.41/-11.3       | -17.73/-17.46     | -18.72/-16.91     | -12.69/-13.83     | -17.52/-18.81     | -16.05/-13.77     | -18.21/-17.58     | -14.23/-17.31     |               |
| Θ(52.5°)  | -7.93/-10.13  | -7.61/-8.22     | -9.22/-13.04    | -18.61/-11.31   | -4.14/-3.93     | -1.57/-0.09     | -0.59/-0.5      | -1.35/-2.32       | -2.91/-3.33       | -5.05/-6.84       | -9.19/-3.81       | -2.08/-2.38       | -5.81/-7.08       | -6.7/-4.85        | -4.05/-6.31       | -7.93/-5.98       | -9.73/-18.87      | -9.31/-11.68      | -11.71/-10.08     | -10.66/-10.95     | -12.21/-12.52     | -11.23/-9.23      | -10.14/-14.61     | -13.56/-7.63      |               |
| Θ(60°)    | -8.29/-9.83   | -6.2/-3.5       | -12.53/-11.7    | -15.99/-8.25    | -1.88/-1.98     | 0.04/-0.34      | -1.06/-0.55     | -1.34/-2.39       | -2.21/-3.55       | -3.99/-6.18       | -11.94/-4.74      | -2.69/-3.3        | -4.92/-6.41       | -5.68/-17         | -5.3/-7.1         | -8.46/-6.57       | -6.06/-14.39      | -6.66/-9.52       | -4.08/-5.05       | -6.89/-5.74       | -6.96/-9.5        | -12.14/-12.14     | -15.25/-18.63     | -13.71/-4.35      |               |
| Θ(67.5°)  | -10.24/-3.67  | -2.18/-5.88     | -9.33/-4.95     | -0.58/-1.51     | -0.74/-1.36     | -1.47/-0.91     | -1.5/-0.79      | -2.22/-4.44       | -3.3/-5.89        | -10.54/-6         | -2.57/-3.83       | -6.16/-6.59       | -4.25/-3.1        | -5.33/-6.71       | -6.66/-4.97       | -5.59/-10.69      | -3.34/-5.66       | -2.08/-1.84       | -4.67/-4.11       | -6.27/-11.58      | -14.04/-10.57     | -18.77/-11.13     | -12.33/-5.05      |                   |               |
| Θ(75°)    | -10.3/-2.54   | -1.68/-5.63     | -11.69/-4.99    | -6.17/-4.72     | -0.98/-3.12     | -1.71/-7.25     | -2.69/-2.7      |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |               |



# Radiated Composite Gain Data

# Appendix A

|           |               |                 |                 |                 |                 |                 |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
|-----------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Θ(75°)    | -1.19/-8.24   | -5.92/-17.18    | -10.89/-6.48    | -4.49/-2.13     | -4.63/-5.95     | -3.26/-4.54     | -5.52/-4.63     | -7.06/-7.52       | -10.49/-7.2       | -4.59/-2.2        | -1.95/-2.65       | -1.96/-0.57       | -1.44/-6.08       | -7.36/-8.58       | -13.05/-6.51      | -14.81/-18.59     | -17.53/-11.5      | -7.76/-5.81       | -7.85/-7.79       | -2.43/-4.36       | -2.51/-5.21       | -9.37/-4.53       | -8.11/-4.89       | -8.06/-17.51      |
| Θ(82.5°)  | 0.17/-9.24    | -5.09/-10.5     | -8.47/-7.8      | -5.84/-3.92     | -3.6/-6.86      | -3.76/-5.22     | -6.6/-5.26      | -7.84/-6.03       | -9.11/-6.45       | -6.47/-3.75       | -2.4/-2.55        | -2.92/-0.93       | -2.08/-9.2        | -6.67/-8.0        | -11.84/-7.63      | -18.24/-17.96     | -9.9/-10.88       | -6.61/-4.5        | -4.34/-9.34       | -4.86/-7.12       | -3.59/-2.97       | -13.52/-4.02      | -3.87/-4.45       | -5.65/-16.03      |
| Θ(90°)    | 0.49/-13.69   | -3.32/-7.9      | -6.51/-7.81     | -6.66/-6.69     | -5.05/-5.11     | -3.95/-8.04     | -6.66/-5.26     | -8.67/-5.82       | -6.87/-2.73       | -7.24/-3.5        | -3.48/-3.7        | -2.87/-2.29       | -2.3/-8.32        | -6.58/-8.71       | -13.64/-10.34     | -18.28/-14.9      | -9.98/-10.34      | -7.1/-2.78        | -6.99/-5.74       | -3.34/-9.3        | -3.74/-3.38       | -9.86/-7.51       | -6.28/-6.98       | -4.36/-14.9       |
| Θ(97.5°)  | -0.36/-13.91  | -3.01/-7.89     | -7.67/-9.43     | -9.43/-8.12     | -3.99/-7.54     | -6.41/-4.98     | -6.71/-3.79     | -6.01/-3.64       | -5.02/-6.09       | -8.24/-5.59       | -5.07/-4.82       | -4.35/-2.99       | -3.8/-7.8         | -6.34/-11.46      | -11.23/-8.8       | -18.74/-9.66      | -7.58/-9.34       | -6.86/-3.5        | -6.12/-6.51       | -6.74/-14.98      | -4.63/-5.19       | -15.78/-7.65      | -6.08/-9.08       | -4.43/-13.8       |
| Θ(105°)   | -2.07/-18.85  | -4.28/-9.3      | -8.66/-14.4     | -11.81/-10.3    | -6.66/-7.74     | -6.61/-3.54     | -5.23/-3.06     | -4.86/-3.71       | -5.35/-5.41       | -7.45/-5.74       | -5.13/-6.24       | -4.45/-4.23       | -6.03/-9.11       | -6.03/-12.28      | -13.31/-11.05     | -18.41/-12.8      | -8.57/-9.59       | -11.35/-3.29      | -2.83/-4.19       | -8.18/-17.58      | -5.52/-11.16      | -16.86/-10.84     | -10.56/-10.12     | -8.23/-12.03      |
| Θ(112.5°) | -7.79/-18.45  | -8.07/-17.62    | -13.66/-13.61   | -14.09/-10.3    | -6.38/-8.1      | -9.32/-4.33     | -3.28/-1.99     | -3.73/-3.97       | -5.45/-5.07       | -9.08/-6.97       | -6.45/-7.27       | -6.27/-6.18       | -9.96/-8.8        | -6.92/-9.83       | -12.02/-9.3       | -17.42/-8.8       | -11.27/-10.14     | -6.67/-6.69       | -2.77/-4.87       | -6.74/-18.94      | -7.3/-8.54        | -10.53/-10.59     | -8.91/-11.7       | -11.47/-11.86     |
| Θ(120°)   | -17.65/-18.51 | -14.43/-17.33   | -18.82/-12.41   | -12.58/-18.09   | -7.06/-6.97     | -7.9/-4.74      | -4.49/-3.84     | -3.73/-4.44       | -8.5/-6.88        | -6.53/-8.54       | -8.74/-7.92       | -6.83/-7.82       | -9.3/-7.26        | -8.69/-8.17       | -12.24/-10.48     | -13.65/-4.94      | -5.71/-17.5       | -6.47/-6.14       | -6.06/-10.6       | -12.24/-16.55     | -9.58/-14.67      | -11.14/-4.62      | -17.51/-12.33     | -17.4/-11.28      |
| Θ(127.5°) | -13.61/-16.02 | -11.9/-7.85     | -12.52/-10.79   | -17.09/-18.16   | -8.46/-9.38     | -9.31/-4.65     | -3.27/-4.51     | -5.03/-4.28       | -8.31/-9.99       | -11.05/-12.56     | -11.89/-9.75      | -10.71/-9.59      | -8.72/-8.71       | -11.64/-11.96     | -11.27/-9.95      | -9.83/-9.31       | -7.95/-18.27      | -17.51/-8.5       | -4.84/-9.63       | -18.23/-9.52      | -16.22/-13.34     | -12.25/-6.18      | -18.86/-11.12     | -14.74/-13.16     |
| Θ(135°)   | -10.3/-18.18  | -9.41/-8.62     | -10.46/-10.65   | -16.95/-18.23   | -12.63/-15.98   | -10.84/-10.3    | -10.29/-7.8     | -9.55/-7.15       | -8.79/-15.26      | -14.58/-16.11     | -11.18/-8.09      | -8.46/-9.48       | -12.47/-11.59     | -10.38/-9.47      | -7.85/-6.49       | -5.75/-11.35      | -14.22/-8.89      | -4.06/-7          | -18.07/-14.88     | -13.77/-9.01      | -11.73/-7.08      | -14.75/-10.93     | -16.25/-18.2      | -15.86/-13.86     |
| Θ(142.5°) | -18.66/-17.27 | -12.1/-10.04    | -8.53/-7.95     | -9.77/-16.11    | -13.75/-14.7    | -18.19/-15.21   | -14.34/-11.04   | -12.9/-11.46      | -8.55/-9.38       | -12.89/-13.33     | -12.83/-12.31     | -10.79/-14.41     | -14.89/-15.16     | -9.27/-7.32       | -10.07/-10.68     | -11.49/-7.42      | -8.08/-13.79      | -10/-9.5          | -10.8/-7.96       | -6.24/-9.47       | -18.88/-11.66     | -12.71/-17.95     | -12.76/-17.33     | -17.88/-18.03     |
| Θ(150°)   | -18.38/-16.1  | -10.94/-9.06    | -8.98/-12.7     | -10.4/-9.39     | -10.94/-13.57   | -19.51/-16.21   | -10.63/-8.83    | -10.61/-13.02     | -11.77/-10.95     | -10.37/-10.59     | -11.44/-12.39     | -11.86/-11.07     | -12.61/-15.98     | -15.71/-14.79     | -11.57/-15.4      | -11.49/-12.79     | -17.09/-13.8      | -8.67/-6.21       | -8.77/-10.25      | -6.93/-8.9        | -18.88/-15.19     | -12.39/-17.68     | -12.23/-10.28     | -18.4/-18.2       |
| Θ(157.5°) | -17.23/-18.16 | -18.34/-18.36   | -17.45/-12.81   | -8.46/-7.23     | -6.83/-8.27     | -8.75/-8.9      | -9.47/-9.61     | -11.51/-12.43     | -10.55/-9.67      | -9.32/-9.52       | -10.74/-12.68     | -17.3/-18.58      | -13.63/-17.91     | -17.47/-17.35     | -16.79/-11.91     | -13.43/-14.05     | -7.62/-5          | -4.32/-5.33       | -9.95/-16.85      | -13.71/-19.07     | -18.72/-14.48     | -10.20/-17.65     | -15.63/-12.82     | -18.51/-18.97     |
| Θ(165°)   | -18.81/-17.94 | -15.64/-12.29   | -12.66/-10.82   | -9.93/-9.31     | -8.27/-7.46     | -6.45/-6.26     | -7.33/-8.09     | -8.98/-9.57       | -9.59/-8.87       | -8.94/-9.93       | -11.52/-12.7      | -15.35/-17.75     | -16.71/-11.79     | -10.8/-9.82       | -7.97/-7.26       | -7.78/-7.18       | -6.37/-6.78       | -8.67/-12.16      | -18.75/-18.58     | -17.84/-17.72     | -16.68/-18.1      | -18.77/-16.56     | -15.52/-16.53     | -17.79/-18.97     |
| Θ(172.5°) | -17.86/-17.96 | -18.17/-16.36   | -14.48/-10.52   | -8.45/-7.34     | -6.18/-5.44     | -5.28/-5.28     | -5.62/-7.03     | -7.7/-8.18        | -8.96/-9.79       | -10.07/-13.3      | -10.88/-12.76     | -17.81/-19.1      | -17.91/-15.62     | -13.6/-14.71      | -10.63/-8.41      | -9.01/-10.6       | -13.32/-15.67     | -14.98/-13.59     | -12.59/-13.83     | -15.07/-14.39     | -14.72/-17.04     | -17.58/-17.49     | -17.67/-18.46     | -17.78/-18.65     |
| Θ(180°)   | -17.74/-16.37 | -12.97/-10.78   | -8.7/-7.23      | -6.77/-5.92     | -5.22/-5.06     | -5.42/-4.83     | -5.6/-5.5       | -5.95/-6.82       | -7.99/-6.68       | -10.1/-13.3       | -12.49/-15.8      | -18.49/-18.26     | -19.37/-14.42     | -11.92/-9.99      | -10.14/-10.38     | -9.98/-10.31      | -10.76/-10.15     | -10.04/-10.93     | -10.74/-10.94     | -10.85/-10.29     | -9.69/-9.28       | -9.89/-12.3       | -14.03/-15.26     | -18.34/-18.78     |
| Freq(Hz)  | 5.785GPol.    | Theta/Ant. 1    | -               | -               | -               | -               | -               | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 |
| Gain      | Φ(0°)/Φ(7.5°) | Φ(15°)/Φ(22.5°) | Φ(30°)/Φ(37.5°) | Φ(45°)/Φ(52.5°) | Φ(60°)/Φ(67.5°) | Φ(75°)/Φ(82.5°) | Φ(90°)/Φ(97.5°) | Φ(105°)/Φ(112.5°) | Φ(120°)/Φ(127.5°) | Φ(135°)/Φ(142.5°) | Φ(150°)/Φ(157.5°) | Φ(165°)/Φ(172.5°) | Φ(180°)/Φ(187.5°) | Φ(195°)/Φ(202.5°) | Φ(210°)/Φ(217.5°) | Φ(225°)/Φ(232.5°) | Φ(240°)/Φ(247.5°) | Φ(255°)/Φ(262.5°) | Φ(270°)/Φ(277.5°) | Φ(285°)/Φ(292.5°) | Φ(300°)/Φ(307.5°) | Φ(315°)/Φ(322.5°) | Φ(330°)/Φ(337.5°) | Φ(345°)/Φ(352.5°) |
| Θ(0°)     | -7.03/-0.74   | -5.29/-5.4      | -5.13/-4.54     | -4.25/-3.76     | -2.5/-2.92      | -2.46/-2.29     | -2.32/-2.36     | -2.15/-2.62       | -4.18/-4.48       | -5.25/-7.32       | -7.35/-7.77       | -8.38/-7.11       | -6/-5.85          | -5.07/-4.56       | -3.78/-3.59       | -2.69/-2.96       | -3.29/-3.39       | -3.43/-3.58       | -4.24/-4.86       | -5.19/-5.76       | -6.32/-6.87       | -7.51/-8.1        | -8.61/-9.16       | -9.72/-10.1       |
| Θ(7.5°)   | -5.36/-6.25   | -5.64/-4.34     | -4.51/-3.6      | -2.5/-2.19      | -2.13/-2.51     | -2.52/-2.84     | -3.25/-3.18     | -2.52/-2.28       | -2.58/-2.59       | -3.13/-3.69       | -3.86/-5.2        | -6.25/-5.96       | -6.67/-7.64       | -6.24/-5.24       | -4.82/-4.58       | -3.93/-3.02       | -2.11/-1.51       | -1.26/-1.16       | -1.28/-1.85       | -2.58/-3.1        | -3.92/-4.49       | -4.83/-5.56       | -6.61/-6.38       | -6.2/-5.53        |
| Θ(15°)    | -4.86/-2.8    | -1.63/-10.8     | -1.43/-1.65     | -2.3/-2.7       | -2.85/-3.02     | -3.07/-3.68     | -4.83/-5.26     | -4.8/-3.46        | -2.79/-3.53       | -3.56/-4.13       | -3.5/-3.25        | -2.98/-3.8        | -5.8/-7.08        | -8.21/-9.08       | -8.78/-7.72       | -7.33/-6.28       | -4.38/-3.09       | -2.18/-1.62       | -1.67/-2.22       | -3.15/-4.33       | -5.29/-5.21       | -4.63/-5.35       | -7.97/-10.87      | -10.99/-7.77      |
| Θ(22.5°)  | -1.125/-5.6   | -2.99/-2.39     | -2.98/-3.5      | -1.3/-4.36      | -6.52/-7.32     | -5.54/-5.09     | -7.58/-9.4      | -5.82/-3.8        | -4.15/-5.76       | -3.89/-3.66       | 0.890/-79         | 0.2/-1.32         | -3.62/-5.67       | -6.07/-4.73       | -3.25/-5.13       | -5.43/-4.44       | -3.25/-3.78       | -5.21/-5.84       | -4.71/-4.78       | -6.13/-4.66       | -4.82/-2.31       | -1.31/-1.66       | -3.81/-7.95       | -12.45/-14.24     |
| Θ(30°)    | -6.75/-3.14   | -1.2/-0.65      | -3.35/-4.7      | -3.69/-3.15     | -5.87/-10.38    | -9.67/-8.18     | -7.42/-6.93     | -5.19/-4.28       | -6.25/-7          | -3.5/-1.36        | -1.22/-1.51       | -1.66/-2.63       | -4.91/-7.6        | -7.32/-4.66       | -3.58/-4.24       | -5.32/-7.12       | -6.05/-4.31       | -4.59/-6.32       | -8.88/-7.01       | -6.12/-8.15       | -9.53/-7.6        | -7.45/-10.73      | -9.63/-8.5        | -12.3/-18.08      |
| Θ(37.5°)  | -15.58/-6.57  | -2.96/-4.23     | -2.55/-14.94    | -8.51/-4.26     | -3.43/-5.57     | -3.38/-5.7      | -3.37/-2.1      | -2.95/-3.95       | -5.95/-7          | -7.51/-7.31       | -1.86/-1.39       | 1.66/-0.05        | -3/-5.42          | -4.96/-4.16       | -4.34/-3.3        | -3.35/-6.98       | -18.09/-8.49      | -5.29/-5.34       | -9.94/-10.13      | -5.76/-7.84       | -14.28/-17.36     | -19.17/-8.65      | -5.02/-6.13       | -10.49/-15.19     |
| Θ(45°)    | -19.43/-6.65  | -3.34/-6.2      | -8.17/-16.17    | -10.09/-9.58    | -7.63/-4.32     | -3.35/-3.67     | -1.47/-0.77     | -2.55/-2.83       | -3.86/-4.79       | -3.59/-13.89      | -2.680/-9.75      | 0.65/-1.9         | -6.59/-7.81       | -6.26/-4.1        | -3.08/-5.84       | -6.05/-5.08       | -8.45/-18.48      | -19.23/-13.06     | -12.49/-16.67     | -11.83/-12.03     | -13.93/-14.97     | -16.8/-15.17      | -8.42/-18.28      | -8.9/-8.84        |
| Θ(52.5°)  | -10.22/-7.95  | -5.92/-11.63    | -15.58/-11.18   | -8.61/-7.82     | -8.9/-6.33      | -2.34/-2.19     | -1.03/-1.47     | -2.74/-3.85       | -5.96/-6.16       | -10.92/-10.08     | -2.970/-75        | 1.070/-15         | -3.95/-9.87       | -6.41/-2.67       | -1.54/-3.53       | -11.25/-13.04     | -10.79/-18.16     | -17.94/-17.81     | -13.67/-14        | -16.44/-14.9      | -10.83/-11.08     | -13.45/-17.55     | -9.82/-16.75      | -7.95/-18.4       |
| Θ(60°)    | -16.19/-14.81 | -8.3/-10.81     | -18.35/-12.04   | -5.51/-2.65     | -3.83/-6.74     | -4.04/-2.68     | -2.54/-1.47     | -2.17/-1.49       | -5.29/-5.15       | -8.66/-10.48      | -7.82/-6.69       | -1.52/-7.57       | -6.91/-4.88       | -1.29/-1.75       | -8.82/-13.5       | -6.17/-10.47      | -14.44/-7.69      | -9.7/-6.71        | -10.11/-11.47     | -10.17/-11.86     | -10.45/-18.85     | -9.61/-11.26      | -9.34/-11.37      |                   |
| Θ(67.5°)  | -17.27/-5.84  | -1.64/-7.93     | -11.37/-8.37    | -5.09/-2.22     | -2.6/-3.36      | -5.34/-2.66     | -1.91/-1.21     | -1.38/-2.23       | -2.14/-3.36       | -6.17/-13.99      | -10.5/-1.39       | <b>2.640/-5</b>   | -3.45/-8.24       | -7.26/-6.42       | -2.63/-3.49       | -1.73/-15.08      | -7.51/-4.66       | -7.67/-5.69       | -6.04/-12.18      | -9.86/-14.2       | -12.58/-11.8      | -9.24/-15.59      | -17.85/-14.94     |                   |
| Θ(75°)    | -14.44/-4.4   | -3.35/-6.31     | -6.91/-5.97     | -4.81/-2.95     | -4.13/-6.67     | -5.91/-3.69     | -2.22/-1.2      | -0.29/-1.1        | -0.94/-3.03       | -6.8/-16.97       | -13.37/-3.73      | <b>0.340/-0.2</b> | -2.74/-6.7        | -4.91/-6.15       | -4.26/-5.21       | -7.07/-9.03       | -6.88/-4.52       | -3.76/-4.77       | -2.24/-4.3        | -3.11/-8.89       | -8.61/-15.75      | -10.72/-8.41      | -10.41/-18.67     | -13.1/-3.96       |
| Θ(82.5°)  | -16.51/-5.36  | -5.53/-7.67     | -5.34/-4.85     | -5.22/-6.42     | -7.38/-8.54     | -6.85/-8.18     | -2.95/-1.74     | -0.46/-1.29       | -0.47/-2.06       | -5.37/-15.66      | -12.7/-3.63       | -0.09/-0.16       | -1.9/-6.03        | -5.16/-5.42       | -4.46/-6.36       | -7.66/-7.11       | -8.39/-6.39       | -3.93/-3.85       | -1.53/-5.58       | -4.32/-7.75       | -7.32/-14.5       | -8.93/-6.52       | -8.87/-8.13       | -10.83/-4.3       |
| Θ(90°)    | -9.72/-8.88   | -8.7/-9.05      | -8.86/-5.17     | -9.39/-12.15    | -11.44/-11.93   | -8.56/-7.91     | -4.59/-3.55     | -1.18/-2.61       | -1.26/-2.6        | -5.23/-14.47      | -15.25/-8.53      | -0.9/-0.45        | -1.32/-3.5        | -6.64/-6.15       | -3.51/-6.36       | -9.21/-7.01       | -8.16/-6.37       | -7.81/-7.22       | -1.72/-6.55       | -4.31/-10.07      | -8.98/-14.11      | -9.08/-9.72       | -13.03/-18.77     | -9.28/-6.06       |
| Θ(97.5°)  | -8.35/-7.8    | -15.48/-15.08   | -8.27/-9.04     | -18.43/-18.04   | -15.43/-13.94   | -13.25/-9.39    | -6.66/-4.87     | -2.39/-3.5        | -2.93/-3.86       | -6.5/-15.31       | -12.3/-4.92       | -0.68/-0.87       | -1.84/-3.48       | -7.49/-4.74       | -6.83/-7.46       | -9.08/-7.64       | -10.31/-11.19     | -9.22/-11.95      | -5.13/-7.99       | -8.65/-12.1       | -10.06/-11.74     | -11.03/-18.53     | -17.9/-13.93      | -11.74/-17.02     |
| Θ(105°)   | -6.79/-1.01   | -10.85/-17.42   | -14.1/-17.29    | -18.11/-14.33   | -1.746/-17.95   | -15.72/-12.84   | -8.02/-6.74     | -3.27/-5.9        | -4.72/-6.3        | -8.03/-12.89      | -10.27/-6.26      | -1.41/-1.31       | -1.95/-3.28       | -5.16/-6.21       | -3.56/-7.26       | -10.13/-9.29      | -11.89/-10.38     | -13.1/-18.18      | -9.48/-13.27      | -11.67/-12.87     | -18.37/-9.52      | -11.74/-18.52     | -18.25/-10.35     | -15.49/-12.74     |
| Θ(112.5°) | -8.59/-3.5    | -10.89/-17.49   | -18.23/-14.62   | -8.8/-12.75     | -13.86/-13.56   | -18.05/-14.25   | -9.69/-7.8      | -4.55/-8.63       | -10.07/-10.35     | -9.4/-10.21       | -7.33/-3.69       | -0.94/-1.29       | -1.33/-4.21       | -7.49/-4.11       | -6.08/-7.16       | -10.01/-7.84      | -13.34/-11.32     | -17.61/-18.11     | -9.85/-18.09      | -18.56/-12.65     | -16.69/-7.78      | -11.54/-14.37     | -17.62/-9.97      | -17.53/-10.15     |
| Θ(120°)   | -18.58/-10.78 | -16.98/-13.45   | -17.12/-11.89   | -9.36/-10.57    | -7.62/-8.1      | -13.62/-17.93   | -11.77/-11      | -6.56/-10.56      | -12.46/-18.28     | -13.89/-11.78     | -5.71/-3.89       | -1.38/-1.86       | -1.27/-5.47       | -6.84/-5.23       | -5.72/-13.17      | -6.81/-8.13       | -15.41/-11.65     | -11.26/-13.21     | -8.18/-12.48      | -13.06/-7.24      | -9.27/-10.05      | -17.9/-16.45      | -12.86/-14.97     | -17.9/-14.4       |
| Θ(127.5°) | -8.3/-9.97    | -9.68/-15.63    |                 |                 |                 |                 |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |



# Radiated Composite Gain Data

# Appendix A

|           |               |                |                |                |                |                |                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |
|-----------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Θ(127.5°) | -9.98/-7.7    | -8.83/-9.45    | -11.62/-9.12   | -4.09/-2.06    | -2.01/-2.42    | -5.4/-18.36    | -9.34/-9.47    | -8.33/-5.82      | -7.9/-8.35       | -15.14/-8.03     | -8/-15.87        | -11.86/-14.84    | -18.93/-9.2      | -9.2/-12.14      | -7.28/-10.23     | -7.16/-3.46      | -9.63/-18.89     | -18.24/-6.69     | -8.23/-18.89     | -16.63/-12.12    | -7.54/-4.9       | -5.27/-4.49      | -1.49/-4.63      | -7.8/-8.07       |
| Θ(135°)   | -16.07/-12.66 | -7.48/-8.68    | -8.81/-8.65    | -7.94/-6       | -2.62/-0.57    | -3.1/-18.62    | -7.79/-6.04    | -5.83/-2.96      | -5.63/-8.91      | -12.22/-11.49    | -13.86/-10.68    | -8.31/-7.81      | -18.03/-6.44     | -8.29/-18.27     | -3.85/-7.58      | -6.19/-3.16      | -6.18/-7.1       | -5.7/-5.43       | -10.7/-16.94     | -18.5/-12.85     | -8.7/-5.41       | -6.46/-6.06      | -6.11/-6.39      | -11.95/-12.97    |
| Θ(142.5°) | -10.98/-15.05 | -8.75/-6.76    | -5.93/-3.34    | -2.33/-4.06    | -6.64/-9.23    | -11.47/-6.38   | -3.42/-5.88    | -7.71/-4.61      | -5.74/-12.83     | -8.97/-11.05     | -14.01/-10.77    | -6.91/-11.64     | -11.44/-8.55     | -17.34/-8.26     | -10.53/-14.46    | -8.29/-12.2      | -12.51/-6.9      | -8.82/-5.42      | -7/-7            | -15.51/-2.56     | -8.92/-5.6       | -5.04/-6.47      | -7.42/-12.28     | -16.59/-13.11    |
| Θ(150°)   | -14.86/-10.7  | -11.44/-8.02   | -6.07/-7.22    | -9.01/8.96     | -7.03/-6.87    | -8.41/-6.99    | -4.18/-3.85    | -5.64/-6.37      | -7.91/-10.87     | -13.21/-3.68     | -16.21/-7.9      | -17.39/-18.44    | -13.57/-11.06    | -15.38/-14.63    | -10.08/-10.02    | -18.24/-18.18    | -10.38/-5.59     | -3.83/-4.96      | -6.29/-3.49      | -3.27/-5.35      | 8.04/-10.07      | -7.83/-8.33      | -9.07/-10.93     | -16.65/-18.04    |
| Θ(157.5°) | -14.38/-10.3  | -7.02/-5.91    | -4.44/-2.66    | -2.32/-2.98    | -4.26/-5.42    | -5.61/-5.78    | -6.34/-7.18    | -8.69/-9.97      | -12.71/-15.03    | -15.88/-13.97    | -13.48/-13.07    | -12.99/-11.31    | -10.37/-11.41    | -11.74/-12.13    | -17.22/-18.44    | -16.31/-10.8     | -6.72/-4.45      | -4.07/-4.67      | -4.33/-3.93      | -4.28/-4.8       | -6.3/-8.81       | -10.43/-11.83    | -16.53/-17.95    | -14.86/-14.46    |
| Θ(165°)   | -15.76/-13.65 | -10.93/-8.68   | -6.44/-5.21    | -5.62/-6.76    | -9.81/-12.13   | -13.67/-12.03  | -9.03/-7.29    | -7.3/-8.23       | -10.22/-11.63    | -12.71/-13.98    | -12.32/-12.95    | -13.34/-13.32    | -11.23/-11.45    | -15.66/-16.68    | -17.49/-13.94    | -12.16/-8.36     | -6.34/-5.51      | -4.52/-5.42      | -6.19/-6.09      | -7.08/-7.48      | -8.21/-10.64     | -14.1/-19.18     | -17.87/-19       | -16.72/-15.25    |
| Θ(172.5°) | -17.77/-17.69 | -17.98/-18.11  | -17.59/-18.17  | -16.33/-13.45  | -11.66/-9.32   | -7.86/-6.67    | -6.11/-6.66    | -8.2/-10.08      | -12.29/-14.57    | -16.79/-17.18    | -16.19/-15.3     | -16.41/-18.9     | -15.84/-15.32    | -18.14/-16.17    | -13.18/-12.28    | -10.79/-8.84     | -8.49/-8.21      | -7.48/-8.01      | -8.73/-9.08      | -10.76/-12.58    | -13.71/-16.39    | -17.3/-18.85     | -17.83/-17.54    | -18.89/-18.57    |
| Θ(180°)   | -13.26/-12.98 | -13.4/-14.12   | -13.68/-13.18  | -12.74/-12.38  | -12.36/-12.02  | -11.66/-11.83  | -13.34/-17.11  | -18.01/-18.66    | -18.19/-18.27    | -17.52/-18.01    | -17.62/-16.54    | -15/-14.86       | -17.74/-18.24    | -17.91/-17.12    | -18.71/-17.17    | -18.52/-17.57    | -18.92/-18.99    | -17.62/-17.28    | -18.68/-18.47    | -16.87/-15.77    | -16.68/-18.62    | -18.78/-18.49    | -14.3/-13.07     | -13.79/-14.07    |
| Freq(Hz)  | 5.2GPol.      | ThetaAnt.2     | -              | -              | -              | -              | -              | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                |
| Gain      | Φ(0°)Φ(7.5°)  | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°) | Φ(90°)Φ(97.5°) | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°) | Φ(165°)Φ(172.5°) | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°) | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°) | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |
| Θ(0°)     | -1.84/-1.79   | -2.18/-1.77    | -1.28/-0.5     | 0.240.78       | 1.41/1.78      | 2.18/2.63      | 2.78/2.63      | 2.55/2.51        | 2.32/1.98        | 1.55/1.19        | 1.1/0.87         | 0.53/0.19        | 0.02/-0.16       | -0.32/-0.17      | 0.35/0.84        | 1.01/1.27        | 1.59/1.91        | 2.17/2.28        | 2.14/2.36        | 2.62/36          | 1.79/1.16        | 0.62/0.49        | 0.01/-0.87       | -1.62/-1.78      |
| Θ(7.5°)   | 0.37/0.36     | -1.52/-2.55    | -3.09/-2.41    | -1.71/-1.1     | -0.81/-0.8     | -0.69/-0.45    | -0.01/0.25     | 0.23/-0.1        | -0.72/-1.44      | -2.61/-3.8       | -4.54/-4.99      | -5.53/-6.18      | -6.2/-5.63       | -4.4/-2.93       | -1.52/-0.02      | 1.02/1.54        | 2.17/2.71        | <b>2.88/2.94</b> | 2.82/2.8         | 2.92/75          | 2.45/2.27        | 2.22/27          | 2.28/1.99        | 1.5/0.84         |
| Θ(15°)    | -0.82/-2.06   | -4.46/-6.43    | -6.79/-5.82    | -5.15/-4.18    | -3.08/-2.53    | -2.65/-2.68    | -2.97/-3.29    | -3.05/-2.44      | -1.86/-1.77      | -2.31/-3.5       | -5.17/-6.6       | -6.06/-4.32      | -4.23/-5.36      | -6.54/-6.65      | -6.5/-4.87       | -2.83/-1.4       | -0.34/0.12       | 0.61/07          | 0.89/0.16        | -0.08/0.16       | 0.23/0.46        | 0.64/0.98        | 1.54/1.83        | 1.19/0.03        |
| Θ(22.5°)  | -0.06/-1.65   | -3.46/-5.08    | -5.08/-4.45    | -3.64/-2.05    | -0.47/0.19     | -0.04/-0.76    | -1.55/-1.99    | -1.86/-1.93      | -2.24/-2.92      | -4.54/-7.8       | -11.83/-18.77    | -18.43/-12.63    | -9.29/-17.3      | -7.48/-9.33      | -9.07/-5.51      | -2.53/-0.55      | 0.11/-0.56       | -0.63/-0.55      | -1.22/-1.81      | -2.48/-3.52      | -4.57/-5.24      | -4.11/-1.59      | 0.94/1.76        | 1.2/0.79         |
| Θ(30°)    | 0.27/-0.72    | -3.24/-6.08    | -7.69/-7.63    | -6.03/-2.58    | -0.12/0.73     | -0.01/-1.62    | -2.11/-1.81    | -1.94/-2.52      | -4.47/-7.8       | -12.21/-11.84    | -12.91/-14.86    | -15.51/-15.34    | -12.84/-11.36    | -12.56/-9.14     | -3.45/-1.55      | -1.81/-3         | -2.16/-3.59      | -3.23/-1.87      | -2.61/-3.59      | -2.48/-3.87      | -9.88/-4.69      | -1.9/-1.06       | -0.29/0.3        |                  |
| Θ(37.5°)  | 1.23/-0.22    | -4.57/-7.33    | -6.46/-5.72    | -5.79/-4.61    | -2.12/-0.64    | -1.83/-5.42    | -7.48/-7.63    | -9.32/-9.15      | -8.36/-10.12     | -15.48/-19.26    | -17.17/-18.39    | -14.82/-9.38     | -9.57/-10.68     | -10.93/-10.65    | -11.24/-13.71    | -8.86/-6.21      | -5.67/-6.81      | -7.27/-5.99      | -4.4/-1.76       | -0.92/-1.52      | -2.59/-4.98      | -4.5/-3.89       | -7.49/-5.06      | -0.49/0.75       |
| Θ(45°)    | 0.24/-3.13    | -5.96/-8.48    | -2.85/-1.99    | -2.29/-3.42    | -3.46/-2.38    | -3.21/-7.55    | -13.18/-18.16  | -13.18/-14.86    | -17.74/-12.66    | -12.87/-14.55    | -12.93/-11.65    | -5.99/-4.24      | -8.87/-15.68     | -9.61/-14.85     | -9.41/-6.83      | -8.91/-8.14      | -5.75/-8.18      | -10.82/-8.49     | -4.35/-2.86      | -0.56/-0.35      | -2.27/-2.13      | -2.6/-3.8        | -7.88/-3.85      | 0.07/1.1         |
| Θ(52.5°)  | -0.83/-5.9    | -7.55/-5.54    | -2.39/-1.49    | -1.31/-1.15    | -0.55/-1.19    | -2.65/-5.84    | -11.11/-17.16  | -4.52/-5.42      | -10.55/-15.4     | -15.31/-16.2     | -15.41/-15.29    | -7.75/-7.52      | -12.92/-15.06    | -9.69/-18.63     | -6.42/-4.51      | -5.62/-5.91      | -7.15/-12.99     | -10.11/-7.66     | -3.42/-1.88      | -1.63/-1.01      | -1.38/-0.53      | -1.58/-4.47      | -8.03/-3.71      | -10.41           |
| Θ(60°)    | -0.97/-4.44   | -5.57/-5.05    | -3.13/-3.07    | -3.13/-0.88    | 1.35/0.69      | -2.4/-4.08     | -3.13/-8.19    | -4/3.62          | -7.33/-5.84      | -10.52/-14.23    | -17.11/-18.05    | -13.8/-13.51     | -12.1/-8.4       | -11.55/-19.1     | -6.93/-3.34      | -5.89/-7.54      | -5.7/-8.86       | -4.55/-4.79      | -1.02/-3.1       | -1.03/-1.68      | -4.28/-3.53      | -3.12/-3.17      | -3.71/-6.83      | -2.92/0.3        |
| Θ(67.5°)  | -0.72/-2.47   | -1.88/-1.55    | -2.13/-3.62    | -3.45/-0.57    | 1.73/0.38      | -2.09/-5.56    | -0.93/-2.65    | -0.83/-3.54      | -7.02/-6.27      | -9.74/-14.73     | -16.65/-6.94     | -3.19/-1.2       | -5.45/-5.58      | -1.31/-13.34     | -7.45/-6.42      | -8.97/-10        | -3.24/-3.99      | -1.57/-2.26      | -0.56/-1.58      | -1.86/-3.01      | -6.78/-5.73      | -3.27/-3.4       | -5.38/-6.82      | -2.04/-1.13      |
| Θ(75°)    | -2.18/-3.46   | -1.72/-1.6     | -2.54/-3.91    | -3.57/-1.25    | 1.50/1.36      | -1.22/0.62     | 0.65/0.33      | 0.28/-3.52       | -10.46/-7.87     | -7.95/-8.55      | -15.02/-5.22     | -1.07/0.2        | -1.87/-5.47      | -10.66/-10.23    | -7.71/-6.78      | -12.24/-14.83    | -2.87/0.6        | 0.6/0.54         | 0.62/-1.83       | -1.6/-3.66       | -8.31/-6.12      | -3.66/-3.85      | -7.26/-8.97      | -1.09/0.65       |
| Θ(82.5°)  | -2.87/-4.03   | -2.58/-2.82    | -3.28/-3.41    | -2.66/-2.64    | -0.31/-1.17    | -2.64/0.2      | 1.03/0.14      | -1.07/-6.23      | -12.44/-11.77    | -7.85/-6.97      | -12.53/-4.7      | -0.81/0.58       | -3.8/-7.61       | -11.63/-5.17     | -3.23/-7.4       | -13.69/-19.1     | -2.23/1.35       | 1.26/0.37        | -0.49/-2.03      | -2.28/-4.82      | -10.31/-7.97     | -3.8/-5.03       | -8.08/-7.08      | -0.37/0.18       |
| Θ(90°)    | -2.82/-2.43   | -2.27/-2.86    | -2.6/-3.3      | -2.4/-2.66     | -1.62/-2.91    | -2.59/0.11     | 0.34/0.51      | -2.45/-0.94      | -18.15/-14.73    | -7.15/-5.57      | -8.62/-2.48      | -3.73/-3.44      | -5.11/-14.54     | -8.92/-4.19      | -2.62/-4.83      | -19.12/-17.53    | -5.07/0.31       | 1.5/-0.57        | -1.88/-5.4       | -4.01/-6.32      | -14.09/-5.92     | -3.8/-5.25       | -13.95/-6.67     | -0.11/-0.52      |
| Θ(97.5°)  | -2.64/-6.72   | -4.74/-6.16    | -3.37/-3.94    | -3.61/-5.11    | -3.84/-2.99    | -2.92/-1.73    | -1.75/-2.81    | -4.67/-11.62     | -18.09/-7.1      | -5.19/-4.24      | -7.46/-4.98      | -5.83/-6.92      | -14.97/-18.21    | -4.26/-3.34      | -4.09/-7.51      | -12.53/-10.6     | -4.63/-1.14      | 0.27/0.51        | -3.21/8.77       | -9.3/-10.27      | -13.35/-6.01     | -3.57/-6.57      | -14.95/-4.22     | 1.15/-0.17       |
| Θ(105°)   | -3.75/-5.61   | -5.77/-6.14    | -2.96/-3.24    | -3.83/-5.39    | -4.67/-6.44    | -3.88/-1.39    | -3.33/-5.31    | -6.58/-18.26     | -13.01/-6.41     | -5.26/-6.46      | -9.85/-8.73      | -10.52/-11.88    | -14.44/-15.84    | -3.17/-3.24      | -6.62/-8.29      | -14.3/-11.16     | -10.75/-3.93     | -0.99/-3.69      | -2.97/-18.57     | -15.15/-11.09    | -12.11/-8.16     | -5.22/-8.02      | -14.75/-5.24     | 0.09/-1.36       |
| Θ(112.5°) | -3.04/-7.59   | -5.67/-6.62    | -3.68/-4.2     | -5.66/-7.67    | -7.66/-10.06   | -6.35/-3.81    | -4.57/-3.85    | -7.67/-18.99     | -8.99/-5.84      | -6.41/-10.87     | -11.23/-16.1     | -17.56/-4.25     | -6.21/-5.05      | -4.42/-12.2      | -14.23/-9.19     | -5.59/-8.61      | -7.67/-6.48      | -3.11/-6.8       | -3.98/-18.09     | -18.13/-10.06    | -10.88/-10.16    | -4.41/-11.31     | -1.71/-8.49      | 0.81/-2.4        |
| Θ(120°)   | -7.24/-9.88   | -8.71/-6.17    | -3.81/-3.97    | -6.49/-6.62    | -9.28/-9.33    | -7.16/-5.78    | -5.22/-5.93    | -8.83/-15.33     | -9.69/-1.44      | -8.31/-18.33     | -12.1/-10.14     | -12.36/-11.64    | -5.18/-12.82     | -4.88/-11.42     | -11.35/-10.28    | -4.94/-7.57      | -10.85/-5.58     | -2.02/-4.69      | -4.34/-9.61      | -18.42/-7.3      | -15.04/-14.76    | -3.45/-7.87      | -8.1/-4.6        | -1.39/-2.33      |
| Θ(127.5°) | -9.53/-13.59  | -9.47/-7.77    | -5.78/-6.02    | -6.28/-7.23    | -10.97/-17.93  | -13.76/-9.88   | -6.84/-5.15    | -10.2/-10.71     | -17.01/-12.92    | -3.52/-4.2       | -6.88/-9.4       | -12.62/-13.64    | -10.28/-18.59    | -17.63/-10.71    | -10.02/-13.29    | -8.23/-9.9       | -8.55/-2.23      | -1.69/-4.58      | -7.81/-10.32     | -13.98/-5.03     | -9.55/-15.17     | -9.84/-7.64      | -4.28/-2.07      | -1.28/-4.89      |
| Θ(135°)   | -4.56/-10.96  | -11.74/-10.23  | -9.37/-6.83    | -5.62/-5.5     | -7.71/-13.35   | -18.74/-13.27  | -9.03/-9.04    | -13.34/-15.82    | -13.84/-13.68    | -7.78/-7.75      | -11.13/-16.56    | -17.47/-17.84    | -18.74/-17.63    | -16.57/-7.78     | -8.61/-9.47      | -18.86/-14.54    | -1.49/-4.76      | -6.31/-8.29      | -7.3/-6.13       | -9.86/-6.75      | -8.84/-17.59     | -14.46/-4.93     | -2.43/-1.26      | 0.67/-1.92       |
| Θ(142.5°) | -3.75/-3.72   | -14.95/-13.91  | -11.44/-9.84   | -7.86/-7.86    | -10.64/-15.52  | -18.71/-17.98  | -14.73/-13.08  | -13.83/-15.57    | -9.13/-4.35      | -1.82/-2.02      | -4.26/-7.43      | -6.37/-6.66      | -8.04/-19.21     | -17.18/-8.36     | -6.92/-15.47     | -17.11/-13.85    | -12.5/-9.49      | -8.78/-9.51      | -16.22/-14.73    | -12/-9.64        | -4.28/-4.17      | -3.22/-1.2       | -1.47/-3.1       |                  |
| Θ(150°)   | -5.7/-7.17    | -10.35/-9.98   | -8.55/-8.93    | -10.07/-11.23  | -13.78/-18.33  | -18.29/-18.25  | -15/-9.5       | -6.84/-6         | -4.8/-3.13       | -3.62/-5.56      | -7.92/-11.55     | -17.57/-17.84    | -17.16/-18.96    | -17.95/-15.31    | -9.45/-5.52      | -5.15/-8.37      | -8.58/-11.77     | -13.75/-13.91    | -1.11/-10.85     | -13.83/-12.21    | -8.48/-10.62     | -7.26/-4.96      | -4.32/-2.15      | -1.67/-4.79      |
| Θ(157.5°) | -11.03/-10.16 | -8.88/-8.84    | -8.89/-8.68    | -8.34/-8.66    | -8.17/-11.54   | -17.45/-18.34  | -14.72/-9.86   | -8.3/-8.9        | -10.07/-12.15    | -13.18/-11.28    | -11.65/-17.62    | -18.94/-13.94    | -15.91/-16.26    | -11.56/-8.94     | -8.6/-8.94       | -9.81/-10.24     | -8.16/-9.02      | -8.65/-1.77      | -6.91/-7.78      | -8.46/-6.74      | -5.02/-5.41      | -6.72/-5.59      | -4.31/-3.76      | -4.01/-6.93      |
| Θ(165°)   | -13.38/-15.76 | -13.78/-11.14  | -12.34/-13.17  | -15.67/-18.44  | -18.71/-18.07  | -18.28/-18.34  | -18.22/-17.63  | -17.74/-18.09    | -18.48/-15.37    | -13.33/-14.24    | -14.55/-16.65    | -15.33/-12.14    | -11.31/-12.49    | -12.94/-11.68    | -10.59/-10.29    | -11.53/-11.44    | -10.75/-10.32    | -9.5/-9.01       | -9.53/-9.2       | -8.05/-8.67      | -3.78/-3.49      | -4.44/-5.32      | -5.86/-4.74      | -10.12/-12.72    |
| Θ(172.5°) | -7.41/-8.81   | -10.61/-12.12  | -11.16/-10.69  | -10.71/-11.27  | -12.01/-11.92  | -11.4/-10.92   | -10.88/-11.17  | -12.82/-14.91    | -18.13/-18.05    | -18.68/-18.62    | -15.73/-13.02    | -10.72/-9.77     | -9.45/-10.44     | -12.91/-15.54    | -14.3/-15.99     | -18.87/-16.91    | -14.34/-12.92    | -11.25/-9.9      | -10.11/-10.24    | -8.66/-7.39      | -6.61/-6.08      | -6.81/-7.48      | -7.38/-7.24      | -7.7/-7.11       |
| Θ(180°)   | -16.16/-15.57 | -15.95/-16.18  | -17.98/-17.99  |                |                |                |                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |



# Radiated Composite Gain Data

# Appendix A

|            |               |                |                |                |                |                |                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |
|------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Θ (180°)   | -18.45/-18.18 | -17.25/-14.97  | -9.88/-8.69    | -8.67/-7.23    | -6.2/-7.2      | -10.17/-14.18  | -18.63/-18.34  | -18.55/-19.15    | -17.48/-18.01    | -18.89/-19.04    | -18.02/-17.23    | -18.71/-16.29    | -14.48/-13.19    | -9.98/-8.39      | -9.04/-8.3       | -6.81/-7.32      | -7.4/-6.51       | -6.97/-8.27      | -8.3/-8.99       | -9.5/-9.63       | -9.38/-9.81      | -10.66/-12.02    | -14.36/-16.87    | -18.11/-18.56    |
| Freq(Hz)   | 5.6GPol.      | ThetaAnt. 2    | -              | -              | -              | -              | -              | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                |
| Gain       | Φ(0°)Φ(7.5°)  | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°) | Φ(90°)Φ(97.5°) | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°) | Φ(165°)Φ(172.5°) | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°) | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°) | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |
| Θ (0°)     | -12.87/-15.93 | -13.53/-8.03   | -3.93/-1.8     | -0.820/7       | 2.283/15       | 3.774/29       | 4.474/47       | 4.434/27         | 3.873/26         | 2.581/65         | 0.03/-2.38       | -5.42/-8.58      | -11.47/-12.53    | -6.24/-3.93      | -2.030/34        | 1.242/18         | 3.473/73         | 3.674/17         | 4.34/18          | 4.133/66         | 3.092/56         | 1.790/55         | -0.76/-2.82      | -4.78/-7.48      |
| Θ (7.5°)   | -5.47/-4.46   | -4.44/-3.04    | -0.890/9.95    | 1.922/31       | 2.372/27       | 3.123/6        | 3.683/36       | 2.922/74         | 2.421/78         | 1.260/68         | -0.53/-1.97      | -3.41/-4.79      | -4.98/-6.28      | -7.43/-5.68      | -6/-4.18         | 1.552/62         | 2.673/58         | 4.023/84         | 4.083/86         | 3.452/98         | 2.041/5          | 0.74/-1.3        | -3.8/-5.48       |                  |
| Θ (15°)    | -5.45/-7.44   | -6.1/-4.29     | -3.83/-3.11    | -2.93/-3.29    | -3.32/-3.1     | -2.63/-5.1     | -0.78/-0.8     | -1.28/-1.46      | -1.98/-2.88      | -3.17/-3.81      | -4.66/-6.33      | -9.57/-12.55     | -9.69/-7.02      | -4.15/-1.58      | -0.61/-0.64      | -0.54/-1.37      | -2.14/-2.19      | -2.9/-2.33       | -1.74/-1.36      | -0.360/23        | 1.171/53         | 1.411/44         | 0.74/-0.43       | -2.08/-3.55      |
| Θ (22.5°)  | -4.3/-5.83    | -7.01/-7.82    | -6.96/-5.95    | -6.23/-7.79    | -11.16/-11.41  | -8.97/-6.73    | -5.75/-5.12    | -4.87/-4.35      | -4.79/-6.04      | -6.44/-4.64      | -3.09/-3.06      | -4.13/-6.16      | -8.6/-11.71      | -12.77/-5.78     | -3.14/-2.79      | -2.69/-3.69      | -5.71/-6.33      | -10.01/-17.12    | -16.26/-8.2      | -5.63/-4.26      | -2.73/-2.11      | -1.63/-1.88      | -1.84/-1.18      | -1.5/-2.62       |
| Θ (30°)    | -4.54/-7.6    | -9.42/-6.44    | -4.2/-4.65     | -6.28/-7.66    | -9.76/-12.53   | -13.28/-10.78  | -9.24/-8.76    | -8.73/-5.72      | -4.11/-4.21      | -4.37/-5.94      | -5.76/-7.18      | -11.31/-7.34     | -4.15/-5.03      | -11.55/-13.64    | -10.19/-7.52     | -5.25/-6.44      | -8.1/-11.6       | -19.06/-18.56    | -14.28/-11.49    | -6.79/-4.2       | -4.88/-4.54      | -3.24/-3.27      | -2.13/-0.64      | -0.11/-1.89      |
| Θ (37.5°)  | -4.48/-7.46   | -6.01/-5.77    | -7.71/-7.84    | -6.95/-5.77    | -6.63/-8.15    | -9.11/-8.91    | -9.54/-9.72    | -7.91/-6.55      | -8.18/-9.83      | -5.62/-6.52      | -5.28/-3.78      | -7.15/-15.91     | -15.56/-11.9     | -18.76/-14.21    | -9.53/-6.97      | -7.48/-10.66     | -12.76/-10.38    | -8.96/-9.13      | -6/-5.7          | -6.46/-9.63      | -11.62/-7.85     | -4.45/-3.89      | -3.31/-1.67      | -0.75/-1.27      |
| Θ (45°)    | -4.4/-5.54    | -2.59/-3.21    | -8.25/-11.83   | -9.7/-7.5      | -5.47/-3.24    | -2.57/-5.26    | -12.95/-17.42  | -14.38/-7.4      | -9.1/-17.84      | -9.1/-7.95       | -6.77/-4.77      | -5.56/-8.42      | -17.57/-13.78    | -13.41/-13.38    | -5.97/-5.8       | -7.46/-15.51     | -9.58/-3.12      | -1.31/-1.17      | 1.05/-1.17       | -1.93/-7.49      | -13.08/-13.11    | -7.83/-6.27      | -4.18/-0.17      | 1.28/-0.08       |
| Θ (52.5°)  | -9.17/-5.06   | -3.56/-4.02    | -7.71/-15.81   | -10.52/-4.14   | -0.61/-0.07    | 0.11/-2.86     | -7.14/-9.84    | -19.8/-8.4       | -7.87/-18.22     | -11.21/-15.42    | -9.91/-10.8      | -17.63/-8.47     | -8.83/-12.39     | -7.92/-5.11      | -3.69/-5.85      | -6.74/-11.22     | -7.280/4         | 1.250/88         | 0.65/-1.72       | -0.69/-8.61      | -11.43/-18.33    | -12.58/-7.74     | -3.360/-3.1      | 1.31/-2.03       |
| Θ (60°)    | -5.06/-2.33   | -4.94/-6.33    | -8.56/-9.93    | -5.220/48      | 1.760/87       | 1.060/87       | 1.09/-2.25     | -6.7/-9.36       | -7.07/-9.7       | -12.13/-16.89    | -6.58/-6.17      | -11.44/-18.57    | -13.31/-10.02    | -13.45/-6.35     | -3.31/-4.38      | -3.93/-6.1       | -8.1/-0.99       | 1.252/46         | 0.522/36         | -1.29/-1.94      | -6.43/-18.89     | -11.44/-8.01     | -2.610/28        | 0.11/-3.45       |
| Θ (67.5°)  | -2.7/-1.01    | -3.3/-10.05    | -9.02/-6.01    | -2.122/22      | 1.81/74        | 2.520/04       | 0.850/81       | -1.93/-5.52      | -8.64/-9.23      | -12.08/-18.05    | -8.94/-8.11      | -15.26/-16.18    | -9.49/-4.11      | -16.32/-6.15     | -5.15/-5.71      | -6.06/-4.02      | -2.471/22        | 0.823/07         | 1.413/75         | 0.07/-0.08       | -5.41/-11.14     | -10.15/-7.65     | -2.84/-1.2       | -1.85/-3.3       |
| Θ (75°)    | -1.44/-1.81   | -2.69/-9.5     | -7.44/-4.02    | -0.323/12      | 2.581/22       | 2.040/5        | 1.241/28       | -0.42/-2.55      | -8.49/-9.51      | -12.21/-16.57    | -13.1/-18.85     | -13.44/-12.25    | -10.35/-2.8      | -18.27/-5.53     | -4.73/-6.55      | -9.32/-4.51      | 0.132/27         | -0.612/43        | 2.123/64         | 1.61/97          | -9.24/-5.69      | -7.28/-9.23      | -2.9/-0.65       | -0.71/-0.74      |
| Θ (82.5°)  | -1.89/-3.55   | -4.02/-10.88   | -6.56/-2.55    | -0.322/69      | 2.160/47       | 0.85/-1.24     | 0.780/93       | -0.18/-2.51      | -11.11/-9.66     | -11.07/-15.57    | -17.52/-10.01    | -5.47/-10.79     | -9.87/-6.28      | -14.21/-4.92     | -4.91/-6.94      | -16.35/-2.71     | 1.561/71         | -2.981/21        | 2.213/66         | 1.781/08         | -6.295/-5.11     | -6.85/-12.47     | -2.37/-1.78      | -0.04/-0.85      |
| Θ (90°)    | -2.89/-3.31   | -3.19/-8.38    | -5.95/-2.55    | -1.40/76       | 1.20/52        | -0.26/-3.01    | -0.39/-1.13    | -2.24/-2.21      | -11.62/-14.77    | -13.12/-13.26    | -18.04/-8.88     | -3.11/-8.45      | -11.42/-10.08    | -11.37/-3.47     | -7.13/-7.04      | -18.83/-4.41     | 1.70/76          | -4.8/-1.02       | 0.483/04         | 1.02/-0.4        | -6.52/-5.94      | -6.98/-8.32      | -1.84/-0.82      | 0.25/-0.88       |
| Θ (97.5°)  | -3.65/-3.97   | -5.67/-7.38    | -6.34/-3.16    | -2.18/-9.07    | -1.47/-0.95    | -1.4/-4.71     | -0.98/-2.59    | -3.2/-5.32       | -16.77/-10.83    | -11.46/-9.68     | -12.89/-5.47     | -6.09/-11.82     | -7.25/-14.15     | -4.83/-9.65      | -13.78/-9.08     | -16.77/-4.43     | 0.47/-1.02       | -4.89/-4.74      | -3.06/-0.5       | -2.04/-3.24      | -6.48/-8.32      | -7.87/-9.32      | -2.24/-1.27      | 0.46/-1.41       |
| Θ (105°)   | -6.2/-6.12    | -5.48/-7.69    | -7.04/-5.3     | -5.41/-2.85    | -3.91/-2.26    | -2.84/-8.6     | -1.16/-3.47    | -5.75/-7.58      | -17.76/-9.47     | -12.97/-9.67     | -14.46/-5.86     | -5.74/-6.72      | -4.89/-9.92      | -6.36/-16.5      | -16.27/-7.66     | -11.71/-8.09     | -2.07/-3.36      | -4.7/-5.42       | -1.37/-5.6       | -6.72/-6.21      | -7.65/-8.31      | -11.29/-7        | -2.75/-1.92      | -0.45/-1.78      |
| Θ (112.5°) | -6.55/-3.66   | -8.62/-5.69    | -6.9/-7.43     | -10.17/-4.51   | -3.54/-3.59    | -6.74/-4.63    | -3.86/-6.53    | -6.8/-8.82       | -18.77/-6.1      | -5.97/-5.53      | -13.05/-6.44     | -5.51/-0.71      | -5.99/-17.48     | -8.63/-10.28     | -7.21/-5.49      | -5.88/-3.98      | -4.16/-3.78      | -3.8/-5.15       | -17.78/-8.73     | -14.56/-6.85     | -10.09/-11.09    | -11.51/-5.08     | -1.73/-1.38      | -2.14/-1.64      |
| Θ (120°)   | -3.87/-5.44   | -7.03/-6.28    | -7.88/-8.2     | -7.75/-5.86    | -5.3/-5.64     | -9.79/-8.57    | -6.71/-10.32   | -8.28/-12.47     | -10.86/-8.05     | -7.21/-11.6      | -14.24/-5.64     | -6.24/-3.37      | -8.97/-11.93     | -7.74/-13.32     | -8.75/-4.94      | -3.17/-4.2       | -1.17/-2.57      | -0.87/-2.8       | -11.89/-18.66    | -17.64/-11.63    | -10.63/-10.06    | -6.36/-5.45      | -3.48/-2.09      | -3.35/-2.72      |
| Θ (127.5°) | -4.91/-5.3    | -6.76/-9.16    | -8.59/-7.54    | -4.81/-4.66    | -4.65/-10.35   | -12.51/-11.01  | -18.3/-14.27   | -12.09/-10.24    | -7.63/-5.97      | -19.01/-5.99     | -6.62/-5.43      | -4.97/-8.84      | -18.21/-7.35     | -14.46/-6.19     | -9.17/-11.65     | -12.87/-9.06     | -4.38/-5.34      | -3.42/-5.63      | -9.69/-9.18      | -12.56/-11.31    | -9.84/-10.35     | -4.92/-3.76      | -4.39/-4.61      | -5.95/-4.72      |
| Θ (135°)   | -5.65/-6.28   | -5.94/-7.9     | -8.65/-8.89    | -7.32/-6.76    | -7.41/-8.58    | -13.54/-18.41  | -11.06/-8.73   | -10.9/-11.74     | -6.65/-6.04      | -13.46/-17.21    | -15.07/-8.17     | -6.52/-11.36     | -6.51/-4.13      | -18.17/-6.27     | -9.04/-13.39     | -18.11/-18.98    | -10.61/-9.71     | -7.27/-7.66      | -8.85/-5.09      | -9.87/-12.6      | -12.09/-5.63     | -2.54/-3.25      | -4.85/-3.58      | -3.67/-5.16      |
| Θ (142.5°) | -7.42/-8.45   | -6.59/-7.81    | -8.69/-9.07    | -9.9/-11.58    | -17.18/-18.59  | -18.55/-17.34  | -15.57/-13.28  | -7.75/-6.62      | -7.78/-9.48      | -13.45/-13.01    | -12.98/-13.35    | -4.89/-2.89      | -1.98/-4.56      | -17.55/-19.22    | -12.24/-14.47    | -17.81/-12.76    | -12.83/-11.98    | -9.37/-6.61      | -6.83/-9.8       | -15.47/-14.11    | -7.81/-6.34      | -3.63/-3.19      | -7.05/-6.15      | -7.25/-7.45      |
| Θ (150°)   | -7.93/-7.81   | -9.92/-10.85   | -13.13/-15.18  | -14.83/-18.13  | -18.54/-16     | -18.15/-17.63  | -14.59/-19.18  | -13.51/-9.82     | -7.53/-5.61      | -5.76/-8.31      | -13.3/-17.75     | -15.82/-15.24    | -11.97/-10.18    | -9.66/-15.95     | -18.52/-17.11    | -13.66/-9.48     | -12.7/-18.87     | -15.85/-18.36    | -17.55/-12.13    | -7.71/-5.86      | -7.76/-3.31      | -5.82/-6.93      | -1.94/-1.36      | -6.91/-10.34     |
| Θ (157.5°) | -7.88/-6.25   | -7.8/-12.65    | -15.21/-14.45  | -15.2/-14.24   | -13.38/-15.36  | -18.71/-17.97  | -18.08/-13.71  | -11.08/-11.01    | -10.34/-10.15    | -11.16/-11.89    | -12.39/-17.67    | -17.48/-16.82    | -8.55/-6.47      | -10.65/-14.46    | -10.62/-10.11    | -9.78/-9.11      | -10.23/-11.95    | -13.92/-14.03    | -11.77/-9.87     | -8.9/-6.95       | -5.33/-6.29      | -7.51/-7.84      | -7.12/-6.63      | -7.62/-9.1       |
| Θ (165°)   | -5.78/-4.84   | -6.3/-6.95     | -7.86/-11.12   | -13.57/-13.55  | -12.13/-10.85  | -10.71/-11.28  | -12.9/-14.81   | -17.95/-17.41    | -18.76/-17.98    | -18.29/-18.81    | -15.67/-16.05    | -17.33/-14.43    | -12.09/-11.88    | -11.71/-14.28    | -18.34/-17.68    | -16.87/-18.18    | -17.71/-18.66    | -18.22/-16       | -19.23/-18.9     | -13.44/-11.33    | -9.94/-10.27     | -12.96/-12.4     | -9.2/-8.02       | -6.62/-6.92      |
| Θ (172.5°) | -13.68/-12.74 | -12.39/-13.1   | -10.82/-9.29   | -9.99/-11.64   | -13.28/-15.76  | -18.23/-17.63  | -18.93/-18.29  | -15.81/-14.48    | -12.59/-11.1     | -11.54/-13.12    | -15.27/-17.78    | -13.13/-13.09    | -11.9/-10.28     | -10.89/-11.37    | -11.71/-14.12    | -12.8/-12.08     | -13.81/-17.08    | -16.05/-14.37    | -11.84/-10.34    | -10.64/-10.76    | -9.12/-9.88      | -12.19/-14.13    |                  |                  |
| Θ (180°)   | -6.42/-6.77   | -7.13/-7.55    | -8.14/-8.8     | -10.52/-14.2   | -17.93/-18.15  | -18/-19.15     | -17.94/-17.5   | -16.2/-16.87     | -16.49/-15.67    | -15.15/-14.78    | -14.47/-13.98    | -13.17/-11.38    | -9.95/-9.84      | -9.78/-10.17     | -9.81/-10.57     | -12.73/-15.18    | -17.94/-19.58    | -17.25/-16.2     | -15.24/-14.11    | -13.41/-12.56    | -12.11/-11.28    | -10.76/-10.53    | -9.62/-9         | -8.24/-7.33      |
| Freq(Hz)   | 5.785GPol.    | PhiAnt. 2      | -              | -              | -              | -              | -              | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                |
| Gain       | Φ(0°)Φ(7.5°)  | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°) | Φ(90°)Φ(97.5°) | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°) | Φ(165°)Φ(172.5°) | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°) | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°) | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |
| Θ (0°)     | 3.874/28      | 4.173/73       | 3.232/78       | 1.740/87       | 0.12/-0.53     | -2.63/-5.3     | -9.2/-11.31    | -8.46/-5.04      | -2.280/04        | 1.932/11         | 2.883/31         | 3.654/31         | 4.84/46          | 3.913/88         | 3.22/49          | 2.010/8          | -0.1/-1.68       | -0.51/-8.59      | -10.95/-11.55    | -7.9/-5          | -1.58/-0.46      | 0.391/38         | 2.333/17         | 3.63/84          |
| Θ (7.5°)   | 4.474/25      | 3.753/49       | 2.9/23         | 1.640/27       | -1.1/-1.2      | -3.95/-6.11    | -9.28/-11.23   | -10.1/-7.28      | -4.74/-2.39      | -0.590/85        | 1.9/273          | 3.2/368          | 4.284/55         | 4.274/22         | 4.183/6          | 3.132/29         | 0.37/-0.94       | -3.04/-5.38      | -5.37/-5.22      | -3.6/-2.02       | -0.320/88        | 1.732/66         | 3.123/4          | 4.084/58         |
| Θ (15°)    | 3.472/7       | 2.51/84        | 0.47/-0.96     | -3.75/-6.35    | -7.5/-8.63     | -8.01/-6.5     | -6.63/-7.1     | -5.8/-6.03       | -5.034/0.04      | -2.61/-1.02      | 0.151/32         | 2.453/28         | 3.814/21         | 4.173/8          | 3.512/54         | 1.40/1           | -1.89/-3.08      | -3.81/-4.05      | -3.93/-4.19      | -3.73/-3.73      | -3.41/-2.27      | -0.950/3         | 1.141/86         | 2.623/45         |
| Θ (22.5°)  | 2.012/02      | 1.22/-0.57     | -2.63/-3.56    | -3.21/-2.37    | -1.41/-0.46    | -0.81/-2.46    | -4.6/-7.4      | -10.99/-13.04    | -12.41/-8.73     | -4.61/-2.4       | -1.26/-0.49      | 0.65/-1.59       | 2.182/68         | 2.581/79         | 0.78/-0.3        | -0.88/-2.58      | -5.63/-5.78      | -4.13/-3.74      | -5.56/-8.53      | -9.17/-6.69      | -5.34/-3.82      | -2.22/-0.91      | 0.671/42         | 1.571/67         |
| Θ (30°)    | 0.610/86      | 0.37/-0.41     | -0.03/-1.19    | 1.280/3        | 0.230/71       | 0.740/04       | -2.53/-6.61    | -13.53/-10.85    | -16.03/-8.74     | -4.83/-3.22      | -2.81/-1.26      | 1.311/95         | 0.93/-0.31       | -1.18/-2.58      | -4.68/-5.83      | -3.82/-2.53      | -4.02/-7.45      | -3.88/-7.1       | -9.96/-5.99      | -2.89/-2.92      | -4.26/-3.88      | -2.92/-2.67      | -1.59/-8.09      | -0.490/05        |
| Θ (37.5°)  | -0.15/-0.46   | -0.14          |                |                |                |                |                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |



# Radiated Composite Gain Data

# Appendix A

| Θ (22.5°)  | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
|------------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Θ (30°)    | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (37.5°)  | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (45°)    | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (52.5°)  | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (60°)    | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (67.5°)  | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (75°)    | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (82.5°)  | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (90°)    | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (97.5°)  | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (105°)   | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (112.5°) | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (120°)   | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (127.5°) | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (135°)   | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (142.5°) | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (150°)   | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (157.5°) | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (165°)   | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (172.5°) | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Θ (180°)   | -Inf-Inf      | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf        | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          | -Inf-Inf          |
| Freq(Hz)   | 5.2GPol       | Phi/Ant. 3      | -               | -               | -               | -               | -               | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 |
| Gain       | Φ(0°)/Φ(7.5°) | Φ(15°)/Φ(22.5°) | Φ(30°)/Φ(37.5°) | Φ(45°)/Φ(52.5°) | Φ(60°)/Φ(67.5°) | Φ(75°)/Φ(82.5°) | Φ(90°)/Φ(97.5°) | Φ(105°)/Φ(112.5°) | Φ(120°)/Φ(127.5°) | Φ(135°)/Φ(142.5°) | Φ(150°)/Φ(157.5°) | Φ(165°)/Φ(172.5°) | Φ(180°)/Φ(187.5°) | Φ(195°)/Φ(202.5°) | Φ(210°)/Φ(217.5°) | Φ(225°)/Φ(232.5°) | Φ(240°)/Φ(247.5°) | Φ(255°)/Φ(262.5°) | Φ(270°)/Φ(277.5°) | Φ(285°)/Φ(292.5°) | Φ(300°)/Φ(307.5°) | Φ(315°)/Φ(322.5°) | Φ(330°)/Φ(337.5°) | Φ(345°)/Φ(352.5°) |
| Θ (0°)     | -9.54/-7.26   | -6.38/-5.85     | -5.89/-5.47     | -5.01/-4.43     | -4.13/-4.16     | -4.59/-5.83     | -6.33/-6.42     | -7.58/-10.65      | -12.58/-14.54     | -16.07/-16.73     | -15.41/-11.93     | -8.94/-7.71       | -6.43/-6.01       | -6/-4.92          | -4.24/-4.63       | -4.32/-3.86       | -4.67/-5.64       | -5.09/-5.07       | -5.63/-6.94       | -7.99/-10.32      | -13.92/-17.46     | -18.03/-18.53     | -18.28/-14.22     | -14.28/-11.87     |
| Θ (7.5°)   | -6.14/-4.49   | -3.6/-3.45      | -3.71/-3.28     | -2.99/-2.48     | -2.23/-1.66     | -1.15/-1.81     | -2.97/-3.86     | -4.45/-5.91       | -7.29/-9.06       | -11.08/-15.33     | -18.55/-17.74     | -12.72/-9.91      | -8.22/-5.67       | -5.16/-3.69       | -2.39/-2.21       | -2.61/-2.98       | -3.39/-4.78       | -5.53/-6.51       | -5.98/-8.25       | -12.08/-12.12     | -10.46/-11.04     | -12.61/-12.79     | -12.22/-11        | -9.65/-7.19       |
| Θ (15°)    | -5.92/-3.38   | -1.41/-1.04     | -1.59/-2.63     | -3.15/-2.47     | -1.12/-0.06     | 0.60/-0.57      | -0.19/-1.56     | -2.91/-3.73       | -5.11/-6.75       | -7.29/-9.01       | -13.57/-17.77     | -18.14/-15.47     | -10.18/-6.42      | -4.01/-2.19       | -0.55/-0.06       | -0.17/-0.07       | 0.01/-0.77        | -2.33/-4.13       | -5.2/-7.1         | -11.88/-17.72     | -13.68/-10.41     | -8.6/-7.9         | -8.96/-11.46      | -8.77/-11         |
| Θ (22.5°)  | -7.84/-4.18   | -0.99/-0.08     | -0.88/-3.94     | -8.53/-5.15     | -1.61/-0.81     | -1.87/-3.48     | -4.78/-6.05     | -5.65/-4.83       | -4.81/-6.05       | -8.22/-10.99      | -14.03/-16.73     | -18.03/-12.69     | -7.29/-4.55       | -3.42/-2.48       | -1.35/-0.75       | -1.16/-0.84       | -0.04/-0.16       | -0.79/-1.85       | -2.58/-3          | -4.43/-7.01       | -11.38/-18.73     | -18.68/-15.45     | -15.4/-17.62      | -12.09/-9.1       |
| Θ (30°)    | -11.51/-11.37 | -8.65/-5.36     | -4.14/-4.68     | -18.29/-8.43    | -3.95/-4.23     | -4.74/-4.36     | -4.21/-4.5      | -6.42/-6.87       | -4.79/-4.66       | -7.69/-12.85      | -18.82/-18.21     | -13.74/-9.2       | -7.8/-6.9         | -5.3/-3.88        | -2.03/-0.75       | -1.06/-1.88       | -1.71/-0.81       | -0.82/-1.03       | -1.37/-1.14       | -1.45/-3.09       | -6.74/-17.16      | -9.58/-6.69       | -12.33/-16.26     | -15.96/-10.17     |
| Θ (37.5°)  | -4.91/-5.83   | -11.32/-17.42   | -7.22/-8.46     | -17.86/-5.65    | -5.03/-4.1      | -0.09/-0.32     | -2.03/-3.68     | -3.39/-3.12       | -3.05/-3.82       | -5.16/-5.01       | -4.55/-3.06       | -3.19/-7.79       | -12.92/-11.51     | -7.07/-3.12       | -0.99/-0.93       | -3.05/-3.54       | -5.63/-3.74       | -2.7/-2.09        | -1.93/-2.21       | -2.57/-3.91       | -6.24/-6.67       | -5.5/-3.93        | -4.52/-5.53       | -5.79/-5.64       |
| Θ (45°)    | -5.12/-4.99   | -5.42/-11.16    | -12.63/-7.22    | -8.11/-5.54     | -15.78/-3.34    | 0.53/-2.14      | -3.5/-0.26      | -1.02/-0.24       | -1.42/-2.54       | -5.02/-3.04       | -1.39/-0.64       | 0.72/-3.35        | -9.55/-11.4       | -8.74/-6.22       | -1.67/-1.02       | -3.41/-5.5        | -7.17/-8.79       | -7.38/-4.01       | -1.23/-0.91       | -2.89/-5.3        | -6.35/-8.27       | -8.31/-6.2        | -4.66/-10.2       | -7.27/-11         |
| Θ (52.5°)  | -4.08/-6.36   | -5.86/-5.83     | -18.02/-7.12    | -16.9/-6.09     | -13.05/-3.35    | -2.51/-6.98     | -1.89/-1.59     | 2.06/-0.82        | -1.68/-4.5        | -2.21/-0.49       | 0.68/-1.61        | 0.18/-3.23        | -7.42/-17.29      | -12.02/-14.44     | -5.69/-4.02       | -4.32/-4.04       | -6.88/-13.47      | -11.29/-8.43      | -1.52/-0.99       | -3.13/-10.18      | -14.98/-14.03     | -15.8/-13.04      | -12.18/-16.62     | -10.27/-5.79      |
| Θ (60°)    | -7.46/-4.71   | -6.17/-3.02     | -12.14/-6.55    | -10.87/-3.66    | -9.24/-5.05     | -7.73/-6.02     | -2.01/-1.15     | 1.62/-1.31        | -4.42/-6.59       | -1.74/-1.58       | <b>1.73/-2.65</b> | 1.28/-2.41        | -8.39/-13.57      | -5.89/-10.1       | -5.53/-3.64       | -1.99/-0.69       | -2.83/-6.91       | -10.66/-6.68      | -2.32/-1.25       | -3.86/-10.89      | -10.05/-10.37     | -11.85/-11.94     | -18.63/-10.32     | -10.97/-16.92     |
| Θ (67.5°)  | -3.49/-1.82   | -7.65/-1.49     | -6.81/-2.89     | -1.46/-4.02     | -13.28/-8.07    | -5.29/-3.89     | -6.73/-0.76     | 1.82/-3.05        | -10.57/-4.55      | 0.42/-2.27        | 1.24/-1.3         | -0.31/-2.85       | -8.95/-9.4        | -3.41/-7.01       | -7.33/-4.04       | -0.71/-0.66       | -1.49/-4.55       | -7.2/-8.9         | -4.47/-2.78       | -4.21/-9.92       | -12.43/-18.35     | -7.96/-5.6        | -1.63/-0.71       | -10.28/-5.06      |
| Θ (75°)    | -4.84/-2.38   | -8.46/-0.64     | -5.8/-1.25      | -9.96/-5.11     | -17.78/-13.36   | -2.52/-4.63     | -12.46/-2.87    | 1.44/-5.02        | -17.62/-4.77      | -0.18/-1.73       | 1.62/-0.75        | -2.08/-3.2        | -5.7/-5.57        | -3.71/-5.07       | -5.12/-3.33       | -1.07/-1.2        | 0.34/-3.34        | -7.4/-10.84       | -4.84/-2.53       | -5.17/-8.5        | -7.68/-11.91      | -13.02/-5.25      | -4.97/-3.12       | -5.28/-3.86       |
| Θ (82.5°)  | -5.19/-1.03   | -9.19/-1.99     | -5.29/-1.1      | -10.09/-5.34    | -13.71/-18.66   | -1.57/-9.2      | -4.68/-4.01     | 0.28/-12.69       | -9.96/-2.74       | -0.22/-1.2        | 0.83/-1.42        | -4.43/-6.11       | -6/-2.72          | -0.88/-3.74       | -4.06/-3.09       | -1.14/-0.84       | -0.41/-3.73       | -5.04/-8.17       | -6.49/-5.18       | -6.14/-6.19       | -7.13/-8.65       | -7.52/-1.78       | -1.17/-0.26       | -3.76/-2.18       |
| Θ (90°)    | -4.84/-2.47   | -8.35/-0.91     | -4.82/-0.68     | -12.25/-8.29    | -11.11/-18.06   | -1.22/-5.82     | -3.13/-18.21    | -5.55/-7.02       | -6.88/-13.57      | -6.61/-2.4        | -0.54/-0.75       | -2.0/-0.69        | -4.75/-5.32       | -5.2/-0.82        | -0.61/-2.43       | -3.89/-4.37       | -1.94/-0.3        | 0.03/-5.61        | -12.86/-8.86      | -5.82/-7.52       | -6.91/-6.75       | -7.8/-6.8         | -5.65/-1.84       | -1.63/-0.71       |
| Θ (97.5°)  | -4.27/-2.33   | -11.44/-2.41    | -7.26/-1.82     | -7.84/-4.33     | -15.24/-16.91   | -1.83/-18.73    | -1.46/-5.71     | -1.31/-8.91       | -4.1/-1.64        | -3.07/-0.01       | -0.29/-2.71       | -7.79/-6.83       | -3.22/-0.4        | -0.61/-3.84       | -5.23/-5          | -4.65/-2.75       | -3.78/-9.4        | -8.42/-10.12      | -8.32/-8.53       | -9.48/-8.52       | -7.32/-8.09       | -6.7/-4.5         | -4.04/-0.52       | -2.76/-1.61       |
| Θ (105°)   | -5.82/-0.1    | -4.92/-2.71     | -7.2/-5.15      | -13.08/-5.93    | -19.3/-11.65    | -4.71/-12.25    | -1.93/-9.59     | -2.91/-8.06       | -4.62/-3.38       | -5.86/-1.43       | -0.3/-1.08        | -4.57/-4.68       | -5.32/-1.35       | -0.87/-3.05       | -5.67/-4.64       | -3.02/-3.31       | -5.42/-14.99      | -17.92/-8.9       | -5.59/-8.95       | -9.66/-9.17       | -7.12/-6.46       | -4.84/-4.16       | -3.11/-2.12       | -7.71/-4.58       |
| Θ (112.5°) | -7.59/-3.54   | -5.86/-2.77     | -8.3/-5.28      | -4.39/-4.49     | -18.01/-14.82   | -6.16/-9.35     | -3.22/-13.5     | -3.41/-8.41       | -6.92/-5.55       | -8.91/-1.97       | -1.79/-1.36       | -5.06/-6.05       | -4.54/-0.17       | -2.24/-6.68       | -2.64/-6.7        | -4.46/-4.33       | -6.27/-14.12      | -13.18/-9.31      | -4.76/-8.33       | -13.04/-7.24      | -4.92/-9.28       | -8/-0.8           | -7.82/-3.58       | -5.03/-5.16       |
| Θ (120°)   | -3.84/-0.06   | -8.05/-5.94     | -8.23/-7        | -7.36/-2.68     | -8.69/-12.79    | -9.97/-11.83    | -9.35/-17.56    | -7.31/-7.8        | -11.27/-6.41      | -12.43/-6.2       | -3.51/-0.7        | -1.55/-1.62       | -4.67/-4          | -4.52/-8.62       | -11.53/-4.76      | -2.73/-4.18       | -7.57/-15.82      | -19.8/-16         | -1.9/-3.77        | -12.21/-11.52     | -5.83/-11.14      | -14.01/-18.49     | -17.36/-14.34     | -12.49/-7.78      |
| Θ (127.5°) | -2.86/-2.38   | -3.65/-6.32     | -7.86/-5.45     | -9.1/-6.42      | -5.47/-6.12     | -12/-12.17      | -12.66/-12.14   | -8.22/-10.62      | -18.2/-8.36       | -16.58/-9.58      | -3.09/-0          | -2.35/-2.41       | -3.11/-5.09       | -9.93/-8.67       | -3.81/-3.4        | -7.01/-6.52       | -10.47/-17.48     | -12.66/-6.43      | -2.41/-5.38       | -14.17/-15.15     | -8.79/-11.59      | -14.93/-8.03      | -3.89/-13.71      | -18.7/-5.66       |
| Θ (135°)   | -4.4/-9.88    | -9.88/-8.43     | -8.53/-4.84     | -6.67/-5.66     | -4.37/-3.86     | -8.94/-5.11     | -11.71/-12.38   | -4.32/-7.1        | -17.71/-11.39     | -10.59/-4.73      | -1.29/-5.45       | -1.93/-7.54       | -7.6/-6.75        | -10.78/-11.96     | -5.52/-6.34       | -18.2/-17.46      | -18.03/-16.46     | -8.26/-12.58      | -16.52/-12.97     | -7.06/-7.53       | -18.38/-11.72     | -4.63/-2.75       | -6.87/-6.91       |                   |
| Θ (142.5°) | -8.4/-7.12    | -7.9/-4.7       | -2.34/-2.11     | -3.72/-3.73     | -3.43/-4.59     | -9.25/-17.64    | -10.98/-8.82    | -6.48/-9.3        | -18.84/-12.15     | -17.87/-11.97     | -8.89/-5.86       | -6.91/-9.42       | -12.04/-12.87     | -13.96/-14.04     | -12.61/-18.24     | -9.42/-11.97      | -18.35/-16.53     | -17.92/-16.21     | -10.76/-7.54      | -8.29/-6.24       | -4.34/-2.6        |                   |                   |                   |



# Radiated Composite Gain Data

# Appendix A

|           |               |                |                |                |                |                |                |                  |                  |                  |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |
|-----------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|-------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Θ(75°)    | -3.46/-3.82   | -4.27/-1.96    | -3.19/-2.22    | -5.1/-5.27     | -2.06/-4.89    | -6.69/-19      | -0.82/-1.96    | -5.39/-5.86      | -1.58/-2.68      | -6.79/-12.87     | -6.5/-0.2         | -1.49/-0.47      | 3.37/-3.9        | 2.72/-0.78       | -0.3/-1.92       | -6.13/-8.23      | -5.71/-5.95      | -4.27/-1.85      | -2.27/-0.22      | 0.51/-2.47       | -5.45/-5.64      | -5.14/-3.76      | -3.76/-3.54      | -0.64/-3         |
| Θ(82.5°)  | -4.72/-4.5    | -8.05/-4.32    | -6.35/-4.5     | -6.13/-5.7     | -2.05/-4.2     | -4.63/-0.42    | -1.77/-5.87    | -12.53/-4.05     | -0.86/-2.48      | -5.87/-14.18     | -9.13/-1.29       | -3.17/-0.35      | 3.12/-1.9        | 0.70             | -1.06/-1.96      | -4.21/-5.25      | -5.17/-6.38      | -4.07/-2.26      | -3.98/-1.3       | 1.32/-3.06       | -5.49/-4.22      | -4.67/-3.51      | -3.96/-7.02      | -2.92/-3.25      |
| Θ(90°)    | -8.84/-6.74   | -10.6/-8.05    | -9.01/-6.97    | -9.04/-6.98    | -2.77/-3.11    | -4.23/-7.1     | -2.71/-5.2     | -8.54/-4.38      | -1.46/-3.5       | -6.46/-13.89     | -1.47/-5.55       | -4.32/-2.91      | 0.61/-1.22       | -0.46/-2.5       | -3.05/-2.89      | -3.24/-4.19      | -4.85/-7.39      | -4.16/-2.78      | -4.96/-1.22      | 1.05/-1.5        | -6.03/-4.95      | -6.41/-5.32      | -5.52/-11.65     | -5.51/-6.48      |
| Θ(97.5°)  | -8.01/-8.42   | -16.44/-15.11  | -9.69/-11.36   | -17.9/-9.15    | -4.41/-2.15    | -3.26/-9.62    | -5.82/-3.61    | -6.39/-4.71      | -3.21/-4.12      | -9.65/-13.28     | -12.73/-9.3       | -6.58/-6.87      | -2.55/-2.37      | -2.27/-4.59      | -6.39/-4.7       | -4.28/-4.49      | -4.26/-6.07      | -4.07/-4.04      | -6.47/-2.61      | 0.02/-6.38       | -9.71/-6.38      | -8.87/-10.52     | -11.35/-17.85    | -9.95/-4.91      |
| Θ(105°)   | -11.46/-8.88  | -17.38/-12.24  | -7.7/-16.75    | -18.65/-16.35  | -7.22/-3.99    | -4.52/-11      | -9.95/-2.38    | -4.19/-8.09      | -6.54/-7.15      | -9.85/-9.86      | -8.37/-17.86      | -14.25/-9.17     | -9.23/-6.11      | -5.61/-8.57      | -9.12/-5.37      | -2.47/-2.93      | -3.86/-4.15      | -4.23/-4.2       | -4.39/-4.26      | -1.84/-6.44      | -10.73/-7.61     | -8.34/-15.58     | -13.05/-11.08    | -6.38/-8.44      |
| Θ(112.5°) | -10.34/-13.3  | -17.86/-9.24   | -5.82/-10.72   | -9.13/-12.99   | -9.55/-5.43    | -3.71/-4.25    | -18.44/-6.15   | -10.4/-18.3      | -12.74/-5.75     | -10.64/-9.28     | -8.42/-10.17      | -16.69/-6.3      | -10.74/-16.75    | -9.36/-18.88     | -16.84/-3.8      | -2.48/-2.87      | -2.1/-3.67       | -7.14/-6.83      | -3.44/-5.89      | -5.44/-4.77      | -7.02/-1.18      | -10.54/-16.24    | -17.4/-19.08     | -8.43/-6.4       |
| Θ(120°)   | -11.37/-17.01 | -6.64/-4.61    | -4.18/-9.36    | -5.48/-7.32    | -8.2/-6.22     | -2.75/-2.54    | -11.47/-11     | -12.26/-11.7     | -7.72/-1.83      | -0.28/-4.48      | -6.29/-6.16       | -8.93/-4.21      | -6.47/-7.29      | -4.98/-12.73     | -13.2/-6.66      | -2.3/-2.75       | -4.84/-3.16      | -9.74/-14.37     | -4.82/-4.41      | -12.95/-5.83     | -3.05/-12.31     | -11.97/-7.64     | -11.07/-13.18    | -9.06/-11.68     |
| Θ(127.5°) | -18.56/-18.96 | -8.85/-4.43    | -4.28/-7.33    | -5.88/-5.44    | -5.92/-8.28    | -5.49/-4.28    | -8.03/-12.54   | -9.62/-9.56      | -7.94/-3.05      | -2.59/-4.45      | -4.42/-5.37       | -8.01/-6.27      | -5.55/-2.95      | -3.66/-5.13      | -12.5/-9.38      | -3.61/-8.69      | -2.88/-5.47      | -12.72/-7.86     | -3.19/-3.56      | -6.18/-4.55      | -0.76/-5.89      | -11.66/-5.83     | -7.64/-13.35     | -10.31/-9.92     |
| Θ(135°)   | -17.5/-11.69  | -10.74/-6.37   | -7.65/-10.57   | -8.22/-6.58    | -6/-11.68      | -16.21/-9.93   | -7.06/-7.67    | -9.64/-11.87     | -13.75/-9.02     | -6.81/-6.2       | -4.21/-4.13       | -6/-8.85         | -8.67/-7.39      | -7.08/-9.66      | -18.09/-11.6     | -16.82/-7.66     | -3.21/-13.02     | -7.47/-5.68      | -1.81/-2.93      | -5.48/-6.38      | -1.08/-2.81      | -10.69/-8.06     | -8.49/-10.56     | -6.91/-18.83     |
| Θ(142.5°) | -7.1/-5.79    | -5.52/-6.76    | -13.05/-13.91  | -10.13/-9.18   | -9.09/-13.51   | -11.59/-13.1   | -16.73/-12.83  | -16.49/-18.68    | -18.98/-16.57    | -12.07/-3.39     | -1.2/-3.16        | -6.76/-9.1       | -11.59/-14.69    | -8.85/-10.77     | -14.72/-12.15    | -5.86/-2.86      | -4.93/-6.29      | -2.94/-2.75      | -2.28/-2.92      | -4.64/-7.42      | -3.97/-4.02      | -9.1/-11.62      | -8.02/-8.6       | -12.15/-10.78    |
| Θ(150°)   | -7.58/-9.66   | -14.2/-16      | -11.27/-8.81   | -10.36/-14.99  | -16.22/-15.53  | -14.02/-10.97  | -8.52/-7.29    | -8.99/-10.72     | -8.47/-6.26      | -7.57/-9.13      | -7.66/-7.19       | -6.84/-7.07      | -7.14/-7.2       | -7.14/-6.93      | -6.25/-5.69      | -7.29/-11.22     | -14.36/-8.91     | -5.73/-4.64      | -5.14/-7.56      | -9.98/-12.97     | -10.37/-18.7     | -10.09/-11.76    | -7.8/-5.45       | -5.11/-6.87      |
| Θ(157.5°) | -18.44/-17.37 | -17.54/-16.68  | -10.58/-8.42   | -8.77/-11.64   | -16.02/-18.79  | -18.71/-17.88  | -16.86/-14.87  | -13.86/-12.57    | -12.52/-13.72    | -10.16/-12.13    | -8.97/-9.42       | -10.61/-12.76    | -14.69/-11.93    | -10.09/-8.24     | -6.02/-5.68      | -7.4/-9.71       | -7.49/-4.68      | -4.05/-4.43      | -6.03/-7.01      | -8.75/-12.73     | -16.52/-16.39    | -19.01/-18.43    | -16.43/-14.68    | -17.52/-19.6     |
| Θ(165°)   | -14.88/-18.5  | -17.69/-18.56  | -13.9/-12.36   | -12.06/-13.68  | -17.12/-18.64  | -18.19/-17.52  | -18.69/-16.73  | -18/-16.91       | -14.45/-13.59    | -15.02/-17.66    | -17.71/-18.79     | -18.32/-18.4     | -16.38/-9.94     | -8.57/-9.41      | -7.97/-6.95      | -8.4/-10.66      | -7.82/-5.61      | -6.09/-7.85      | -8.07/-7.83      | -9.73/-12.82     | -17.57/-18.55    | -17.84/-17.98    | -18.1/-15.73     | -13.81/-13.29    |
| Θ(172.5°) | -14.62/-13.14 | -11.87/-10.39  | -8.8/-9.09     | -9.38/-10.71   | -12.13/-13.43  | -14.3/-13.47   | -11.35/-12.41  | -14.65/-13.69    | -12.98/-15.96    | -17.84/-17.9     | -18.93/-18.67     | -19.15/-17.77    | -18.38/-14.6     | -13.98/-14.8     | -12.32/-9.23     | -8.71/-9.09      | -7.26/-5.46      | -5.49/-6.44      | -6.91/-7.73      | -10.39/-13.39    | -17.61/-17.64    | -16.61/-9.10     | -10.4/-10.13     | -10.39/-12.23    |
| Θ(180°)   | -13.83/-12.73 | -10.74/-10.17  | -9.29/-9.11    | -9.75/-10.55   | -11.87/-12.43  | -11.85/-11.29  | -11.22/-13.35  | -15.86/-15.92    | -17.12/-17.84    | -18.65/-19.02    | -17.76/-18.45     | -18.82/-18.06    | -18.32/-17.87    | -17.54/-19.23    | -18.08/-18.88    | -17.72/-18.24    | -16.51/-16.9     | -15.83/-14.84    | -16.04/-17.8     | -19.48/-18.89    | -17.56/-17.59    | -18.49/-18.35    | -18.52/-17.98    | -18.79/-17.93    |
| Freq(Hz)  | 5.6GPol.      | PhiAnt.3       | -              | -              | -              | -              | -              | -                | -                | -                | -                 | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                |
| Gain      | Φ(0°)Φ(7.5°)  | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°) | Φ(90°)Φ(97.5°) | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°)  | Φ(165°)Φ(172.5°) | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°) | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°) | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |
| Θ(0°)     | -12.35/-9.01  | -8.83/-8.1     | -7.75/-7.62    | -7.09/-5.71    | -4.54/-4.47    | -5.18/-5.28    | -4.91/-9.15    | -5.73/-6.69      | -6.13/-12.66     | -14.76/-17.56    | -18.18/-18.54     | -15.64/-12.5     | -11.69/-12.18    | -7.62/-6.25      | -10.02/-8.36     | -7.62/-6.25      | -5.49/-5.34      | -4.62/-4.97      | -5.15/-5.94      | -5.75/-7.51      | -8.97/-9.26      | -10.80/-10.99    | -13.92/-13.73    | -17.42/-13.67    |
| Θ(7.5°)   | -17.65/-15.33 | -18.44/-14.6   | -12.51/-10.69  | -9.43/-8.79    | -7.26/-6.71    | -5.77/-5.29    | -5.46/-5.99    | -5.33/-5.71      | -6.85/-8.43      | -9.45/-11.91     | -13.44/-12.88     | -10.33/-8.17     | -7.1/-5.51       | -5.39/-5.88      | -5.36/-4.85      | -5.21/-5.3       | -4.11/-3.86      | -3.98/-3.65      | -3.62/-5.34      | -9.08/-11.91     | -12.92/-12.32    | -14.04/-18.7     | -18.25/-16.42    | -14.97/-17.47    |
| Θ(15°)    | -17.22/-10.77 | -12.97/-8.62   | -6.96/-6.72    | -7.51/-8.58    | -8.71/-8.67    | -6.31/-5.02    | -3.95/-3.78    | -4.58/-4.8       | -4.38/-4.79      | -5.64/-8.13      | -11.15/-12.55     | -7.32/-5.02      | -3.84/-3.23      | -3.05/-3.99      | -4.65/-4.15      | -3.17/-2.32      | -1.98/-1.6       | -1.19/-0.59      | -0.98/-2.21      | -3.8/-5.7        | -8.83/-11.67     | -16.24/-18.78    | -19.41/-15.9     | -17.93/-16.29    |
| Θ(22.5°)  | -13.58/-10.97 | -9.11/-8.69    | -5.08/-5.53    | -11.01/-18.13  | -9.59/-5.88    | -5.92/-5.67    | -1.65/-5.45    | -5.63/-6.66      | -10.54/-12.73    | -10.31/-7.6      | -9.64/-18.07      | -5.07/-6.77      | -7.57/-3.68      | -1.96/-1.03      | -0.65/-0.55      | -0.51/-0.27      | 0.030.37         | -0.82/-1.01      | -2.57/-4.53      | -7.28/-4.54      | -8.75/-9.38      | -11.31/-13.05    | -17.32/-15.61    | -16.01/-17.38    |
| Θ(30°)    | -6.88/-7.02   | -9.36/-8.52    | -4.26/-3.06    | -7.73/-7.64    | -1.29/-0.11    | -2.69/-8.27    | -14.32/-12.04  | -7.66/-4.38      | -1.98/-3.1       | -9.86/-12.64     | -10.26/-11.59     | -18.43/-16.6     | -11.46/-9.02     | -4.89/-2.1       | -1.2/-1.53       | -1.73/-1.47      | -1.55/-1.98      | -0.68/-0.32      | 0.430.02         | -1.09/-4.49      | -9.41/-11.34     | -9.92/-8.49      | -9.66/-11.53     | -17.1/-16.08     |
| Θ(37.5°)  | -14.05/-12.24 | -10.02/-10.94  | -8.93/-3.37    | -5.5/-5.96     | -0.95/-3.06    | -0.86/-1.87    | -4.09/-5.69    | -5.26/-3.43      | -1.33/-2.8       | -11.09/-18.71    | -14.63/-16.38     | -17.91/-15.1     | -8.6/-6.89       | -4.14/-0.8       | 0.28/-0.65       | -0.84/-0.99      | -0.9/-3.36       | -5.33/-3.82      | -1.96/-1.24      | -1.72/-3.82      | -6.94/-11.78     | -8.28/-8.47      | -11.57/-8.81     | -9.46/-13.7      |
| Θ(45°)    | -9.94/-8.31   | -8.05/-7.12    | -12.08/-8.55   | -7.98/-6.58    | -14.73/-3.84   | -1.24/-2.68    | -5.1/-2.66     | -0.1/-0.39       | -10.22/-5.77     | -7.47/-10.24     | -5.11/-2.66       | -6.08/-9.68      | -12.79/-16.51    | -12.22/-4        | -0.92/-1.25      | -0.99/-0.18      | -1.45/-3.25      | -4.29/-5.11      | -6.29/-7.18      | -4.82/-3.62      | -6.42/-10.32     | -5.67/-6.23      | -12.92/-12.9     | -12.94/-17.68    |
| Θ(52.5°)  | -4.77/-4.39   | -6.45/-3.12    | -4.97/-18.78   | -14.99/-9.96   | -12.95/-4.04   | -0.92/-4.34    | -4.86/-0.88    | 1.93/-1.97       | -0.84/-3.18      | -4.38/-3.51      | 0.93/-1.53        | -1.78/-7.82      | -16.37/-19.92    | -15.58/-4.98     | -2.55/-2.28      | -0.44/-0.2       | -3.19/-1.87      | -7.17/-3.21      | -6.06/-5.77      | -5.77/-5.25      | -7.12/-15.53     | -6.5/-5.52       | -7.19/-8.42      | -11.22/-10.04    |
| Θ(60°)    | -3.86/-8.03   | -0.66/-2.38    | -2.1/-14.39    | -11.07/-12.78  | -18.12/-2.06   | -2.24/-1.4     | -2.12/-0.27    | 1.97/-1.71       | -1.69/-6.19      | -2.25/-3.08      | 1.82/-0.1         | -0.21/-3.97      | -12.4/-5.69      | -3.59/-3.83      | -2.94/-0.2       | -2.29/-0.55      | -0.57/-0.79      | -1.8/-2.67       | -2.89/-3.48      | -7.43/-9.18      | -7.34/-8.45      | -6.53/-18.3      | -7.38/-10.57     | -17.54/-9.33     |
| Θ(67.5°)  | -4.7/-5.06    | -0.67/-1.72    | -0.05/-10.5    | -11.74/-9.35   | -17.78/-3.82   | -5.25/-2.83    | -4.03/-2.93    | 0.16/-0.12       | -4.88/-7.53      | 0.11/-1.36       | <b>3.02/-1.61</b> | -2.08/-6.7       | -4.85/-2.09      | -2.5/-2.65       | -3.91/-4.03      | -1.52/-1.16      | -1.52/-1.55      | -2.2/-2.56       | -4.2/-4          | -6.62/-13.07     | -11.19/-10.96    | -6.54/-9.56      | -8.54/-15.81     | -8.87/-8.44      |
| Θ(75°)    | -1.04/-7.49   | -2.86/-5.39    | -0.4/-8.43     | -8.43/-10.37   | -18.48/-6.85   | -5.51/-2.89    | -8.88/-5.6     | 0.58/-0.7        | -7.42/-8.72      | 0.22/-1.2        | 2.46/-1.33        | -1.89/-6.68      | -3.92/-0.02      | -0.45/-2.56      | -3.32/-1.85      | 0.57/-0.74       | -1.56/-1.78      | -1.52/-5.07      | -4.19/-3.07      | -4.7/-10.5       | -8.47/-9.64      | -7.29/-6.25      | -2.93/-6.83      | -4.4/-5.12       |
| Θ(82.5°)  | -2.66/-5.94   | -1.73/-6.48    | -2.58/-6.02    | -8.15/-9.66    | -15.46/-9.32   | -2.21/-3.85    | -16.68/-4.9    | 1.05/-1.48       | -17.86/-6.7      | -0.22/-1.02      | 1.8/-1            | -5.07/-4.55      | -2.31/-4.07      | -3.52/-3.86      | -3.39/-0.63      | 0.74/-0.04       | -0.95/-0.92      | -1.1/-0.23       | -5.89/-4.98      | -5.28/-12.53     | -6.7/-7.62       | -5.82/-6.45      | -2.17/-4.68      | -4.98/-8.95      |
| Θ(90°)    | -2.52/-6.38   | -2.63/-7.97    | -1.25/-5.22    | -5.65/-8.85    | -17.27/-13.96  | -2.95/-8.77    | -7.72/-4.71    | 0.2/-6.35        | -11.05/-5.17     | -2.11/-0.24      | 0.67/-2.85        | -5.05/-6.62      | -3.93/-1.09      | -3.08/-5.95      | -2.95/-0.33      | 0.28/-0.01       | -4.3/-3.11       | -3.02/-1.36      | -8.49/-6.55      | -5.48/-17.98     | -6.37/-4.12      | -7.61/-7.04      | -3.34/-5.14      | -2.1/-6.23       |
| Θ(97.5°)  | -0.97/-7.25   | -2.69/-11.81   | -2.93/-7.17    | -6.87/-8.79    | -18.59/-18.53  | -2.88/-15.25   | -3.38/-5.77    | -1.89/-8.72      | -6.49/-4.54      | -2.37/-1.1       | -2.26/-5.16       | -2.96/-4.87      | -6.13/-0.69      | -2.65/-4.21      | -5.53/-2.83      | -2.82/-4.89      | -6.27/-4.54      | -5.39/-2.33      | -12.05/-7.59     | -5.73/-19.34     | -7.93/-5.2       | -4.35/-6.37      | -2.84/-4.42      | -2.63/-0.45      |
| Θ(105°)   | -1.79/-7.7    | -2.27/-4.54    | -4.13/-6.79    | -7.67/-12.57   | -18.81/-17.35  | -4.68/-19.11   | -3.66/-11.05   | -2.54/-8.71      | -6.22/-5.05      | -6.39/-2.79      | -3.3/-5.14        | -3.72/-6.15      | -4.17/-2.13      | -3.98/-7.39      | -4.44/-3.77      | -2.63/-3.71      | -11.3/-7.34      | -6.25/-3.91      | -9.69/-5.46      | -5.21/-19.21     | -12.71/-16.16    | -5.78/-5.59      | -1.56/-5.97      | -3.31/-6.53      |
| Θ(112.5°) | -1.76/-4.76   | -3.22/-4.75    | -6.08/-10.38   | -13.98/-9.21   | -15.49/-14.32  | -6.51/-16.08   | -4.23/-16.61   | -7.54/-7.71      | -7.17/-6.56      | -11.94/-6.44     | -3.07/-4.13       | -3.82/-5.47      | -3.98/-1.04      | -2.65/-4.43      | -6.67/-4.23      | -3.77/-6.86      | -6.12/-6.58      | -5.75/-4.96      | -9.33/-3.57      | -6.53/-14.89     | -8.98/-7.5       | -4.83/-6.41      | -3.25/-9.39      | -2.52/-2.67      |
| Θ(120°)   | -3.41/-4.32   | -4.45/-4.95    | -6.16/-7.75    | -10.2/-12.34   | -11.64/-12.89  | -11.72/-17.99  | -9.78/-17.62   | -11.72/-12.88    | -8.81/-6.02      | -18.45/-7.36     | -4.39/-2.39       | -3.91/-8.51      | -5.15/-3.39      | -9.88/-12.58     | -6.87/-4.19      | -5.65/-8.86      | -9.47/-8.56      | -10.34/-18.88    | -6.37/-2.69      | -8.07/-8.16      | -5.11/-5.1       | -5.9/-8.26       | -3.91/-14.92     | -10.25/-6.33     |
| Θ(127.5°) | -10.66/-4.17  | -6.18/-5.57    | -5.97/-7.11    | -8.09/-10.89   | -7.38/-5.81    | -10.27/-9.69   | -10.67/-1      |                  |                  |                  |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |



|           |               |               |               |               |               |               |               |               |               |               |               |               |               |               |              |              |               |              |             |              |               |               |               |               |
|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|--------------|---------------|--------------|-------------|--------------|---------------|---------------|---------------|---------------|
| Θ(127.5°) | -7.34/-8.91   | -11.75/-12.23 | -6.55/-5.57   | -7.22/-7.09   | -7.53/-8.12   | -8.81/-5.34   | -6/-9.92      | -10.06/-8.22  | -5.98/-3.53   | -3.88/-4.4    | -3.62/-3.16   | -3.87/-2.96   | -9.57/-6.8    | -2.62/-8.39   | -15/-9.42    | -0.76/-0.95  | -2.22/-1.61   | -7.96/-2.81  | 1.95/-5.5   | -12.5/-2.37  | -4.16/-16.19  | -3.27/-9.05   | -6.51/-8.31   | -8.92/-12.63  |
| Θ(135°)   | -13.87/-14.97 | -8.51/-10.91  | -11.6/-9.85   | -9.35/-10.19  | -13.33/-10.38 | -11.08/-16.45 | -10.51/-6.61  | -8.33/-12.71  | -14.56/-13.2  | -8.18/-4.1    | -3.15/-3.71   | -6.08/-6.62   | -7.06/-4.73   | -1.82/-3.28   | -16.04/-5.52 | -2.18/-5.12  | -1.6/-5.93    | -12.63/-5.65 | 1.9/-1.78   | -18.71/-6.63 | -0.97/-6.19   | -7.1/-6.58    | -12.77/-11.3  | -19.01/-13.51 |
| Θ(142.5°) | -17.44/-14.86 | -9.41/-9.24   | -11.83/-17.77 | -14.71/-10.13 | -10.78/-8.95  | -5.86/-7.61   | -14.04/-13.61 | -15.01/-14.21 | -12.62/-7.85  | -4.17/-2.86   | -4.16/-7.37   | -12.2/-12.44  | -8.02/-4.37   | -3.37/-5.57   | -7.77/-9.61  | -17.8/-9.56  | -8.71/-18.01  | -17.5/-4.34  | 0.33/-2.46  | -11.94/-9.42 | -4.65/-5.85   | -13.62/-11.75 | -8.9/-9.56    | -7.73/-11.72  |
| Θ(150°)   | -14.45/-13.96 | -13.25/-17.2  | -18.9/-15.44  | -12.14/-10.87 | -10.81/-12.98 | -14.23/-12.18 | -10.98/-9.28  | -9/-10.66     | -13.08/-14.66 | -14.1/-12.3   | -9.43/-7.64   | -7.3/-9.4     | -16.4/-17.24  | -10.55/-13.16 | -13.43/-16.7 | -9.85/-9.15  | -13.72/-17.89 | -11.63/-5.11 | -2.29/-3.45 | -8.14/-9.96  | -5.1/-3.66    | -5.79/-7.91   | -8.08/-9.99   | -13.02/-12.13 |
| Θ(157.5°) | -14.34/-11.48 | -9.05/-7.75   | -7.78/-8.17   | -9.01/-11.28  | -13.49/-17.44 | -18.78/-16.96 | -18.25/-16.38 | -14.26/-14.44 | -15.82/-11.53 | -10/-9.03     | -8.08/-9.11   | -11.44/-14.84 | -11.18/-7.42  | -7.33/-7.38   | -6.88/-7.42  | -10.31/-9.19 | -6.57/-7.17   | -10.53/-9.65 | -7.07/-7.48 | -11.47/-16.8 | -11.73/-9.02  | -9.31/-12.95  | -18/-18.77    | -18.11/-18.05 |
| Θ(165°)   | -10.67/-10.7  | -11.85/-14.1  | -17.98/-18.82 | -19.07/-18.6  | -15.98/-13.94 | -18.83/-18.62 | -17.65/-18.64 | -18.44/-18.79 | -18.17/-18.69 | -17.03/-17.89 | -18.35/-17.57 | -13.99/-10.53 | -9.16/-8.51   | -9.16/-9.46   | -9.58/-10.43 | -11.39/-9.28 | -8.11/-8.12   | -7.46/-5.24  | -4.36/-5.04 | -8.43/-11.98 | -15.68/-13.76 | -12.2/-12.87  | -15.99/-19.11 | -14.51/-12.81 |
| Θ(172.5°) | -13.93/-12.09 | -11.02/-10.38 | -10.05/-9.52  | -10.14/-11.07 | -12.47/-15.92 | -16.76/-17.56 | -18.96/-17.9  | -16.68/-16.88 | -16.94/-18.42 | -18.2/-18.1   | -19.1/-17.49  | -18.69/-13.83 | -10.63/-9     | -8.49/-7.68   | -7.27/-7.4   | -7.2/-6.18   | -5.65/-5.51   | -4.52/-4.12  | -5.04/-5.48 | -6.25/-8.21  | -12.08/-16.1  | -17.72/-15.03 | -13.4/-15.47  | -15.03/-13.64 |
| Θ(180°)   | -18.71/-18.05 | -18.34/-18.28 | -18.66/-18.09 | -15.4/-12.81  | -12.24/-12.1  | -12.57/-14.07 | -13.82/-14.76 | -17.53/-19.17 | -18.71/-18.45 | -18.84/-19.12 | -18.82/-17.12 | -15.37/-13.72 | -12.38/-10.46 | -8.98/-8.41   | -7.61/-7.01  | -6.9/-6.77   | -6.44/-6.26   | -6.1/-6.08   | -6.49/-7.44 | -9.75/-11.11 | -12.55/-14.33 | -17.97/-18.62 | -17.96/-18.37 | -18.89/-18.56 |



# Antenna Pattern

# Appendix B

## Total Gain Data

| Freq(Hz)  | 2.45G/Pol.    | TotalAnt. 1     | +               | -               | +               | -               | +               | -                 | +                 | -                 | +                 | -                 | +                 | -                 | +                 | -                 | +                 | -                 | +                 | -                 | +                 | -                 | +                 | -                 | + | - |
|-----------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|---|---|
| Gain      | Φ(0°)/Φ(7.5°) | Φ(15°)/Φ(22.5°) | Φ(30°)/Φ(37.5°) | Φ(45°)/Φ(52.5°) | Φ(60°)/Φ(67.5°) | Φ(75°)/Φ(82.5°) | Φ(90°)/Φ(97.5°) | Φ(105°)/Φ(112.5°) | Φ(120°)/Φ(127.5°) | Φ(135°)/Φ(142.5°) | Φ(150°)/Φ(157.5°) | Φ(165°)/Φ(172.5°) | Φ(180°)/Φ(187.5°) | Φ(195°)/Φ(202.5°) | Φ(210°)/Φ(217.5°) | Φ(225°)/Φ(232.5°) | Φ(240°)/Φ(247.5°) | Φ(255°)/Φ(262.5°) | Φ(270°)/Φ(277.5°) | Φ(285°)/Φ(292.5°) | Φ(300°)/Φ(307.5°) | Φ(315°)/Φ(322.5°) | Φ(330°)/Φ(337.5°) | Φ(345°)/Φ(352.5°) |   |   |
| Θ(0°)     | -11.23/-11.18 | -10.42/-10.22   | -10.11/-10.09   | -10.39/-10.42   | -10.89/-10.98   | -10.66/-10.25   | -10.66/-10.23   | -10.54/-11.04     | -11.15/-11.53     | -11.34/-12.17     | -11.14/-10.94     | -11.34/-12.17     | -11.14/-10.94     | -11.34/-12.17     | -11.14/-10.94     | -11.34/-12.17     | -11.14/-10.94     | -11.34/-12.17     | -11.14/-10.94     | -11.34/-12.17     | -11.14/-10.94     | -11.34/-12.17     | -11.14/-10.94     | -11.34/-12.17     |   |   |
| Θ(7.5°)   | -12.33/-11.36 | -9.88/-3.67     | -7.78/-7.18     | -6.83/-6.77     | -6.80/-6.73     | -6.47/-6.42     | -6.50/-6.77     | -7.15/-7.55       | -8.66/-9.84       | -10.92/-11.59     | -11.43/-11.55     | -12.11/-11.89     | -11.63/-11.49     | -11.23/-11.28     | -11.34/-10.67     | -10.06/-5.76      | -9.00/-8.72       | -8.35/-8.13       | -8.02/-8.03       | -8.00/-7.94       | -7.99/-8.42       | -9.17/-9.94       | -10.60/-11.11     | -11.77/-12.27     |   |   |
| Θ(15°)    | -13.22/-11.44 | -9.20/-7.59     | -6.12/-4.94     | -4.19/-3.67     | -3.27/-2.89     | -2.66/-2.65     | -2.92/-3.26     | -3.75/-4.52       | -5.72/-7.32       | -9.07/-10.46      | -11.12/-10.67     | -11.08/-11.50     | -11.10/-10.49     | -9.91/-9.29       | -8.86/-7.93       | -6.81/-5.76       | -4.85/-4.13       | -3.63/-3.38       | -3.38/-3.16       | -3.88/-4.26       | -4.71/-5.48       | -6.61/-7.99       | -9.52/-11.17      | -12.99/-13.68     |   |   |
| Θ(22.5°)  | -13.24/-11.76 | -10.11/-8.24    | -6.42/-4.90     | -3.54/-2.40     | -1.69/-1.25     | -1.06/-1.26     | -1.68/-2.08     | -2.43/-2.97       | -3.95/-5.30       | -6.79/-8.16       | -9.03/-9.00       | -8.97/-9.29       | -9.30/-8.83       | -8.18/-7.66       | -7.18/-6.36       | -5.17/-3.87       | -2.66/-1.76       | -1.10/-0.79       | -0.82/-1.17       | -1.67/-2.31       | -5.66/-7.47       | -9.55/-11.86      | -13.45/-13.49     |                   |   |   |
| Θ(30°)    | -14.34/-14.23 | -12.56/-10.09   | -7.89/-5.78     | -4.02/-2.52     | -1.59/-1.12     | -1.07/-1.32     | -1.58/-1.59     | -1.45/-1.54       | -1.96/-2.45       | -3.11/-4.03       | -5.31/-6.74       | -7.97/-8.87       | -8.93/-8.01       | -6.78/-5.93       | -5.49/-5.23       | -4.72/-3.62       | -2.30/-1.10       | -0.19/-0.27       | 0.23/-0.27        | -1.12/-2.09       | -3.08/-4.10       | -5.29/-6.58       | -8.12/-10.09      | -12.76/-13.61     |   |   |
| Θ(37.5°)  | -16.12/-15.74 | -12.86/-9.19    | -6.59/-5.42     | -4.61/-3.43     | -2.26/-1.70     | -1.66/-1.62     | -1.25/-0.69     | -0.29/-0.25       | -0.31/-0.50       | -0.82/-1.67       | -3.32/-5.66       | -8.21/-9.93       | -9.33/-7.41       | -5.17/-4.57       | -4.12/-4.20       | -4.19/-3.52       | -2.32/-1.06       | -0.16/-0.17       | -0.22/-1.24       | -2.63/-3.77       | -4.20/-4.17       | -4.06/-4.10       | -4.52/-5.77       | -8.41/-12.76      |   |   |
| Θ(45°)    | -12.25/-12.53 | -9.17/-6.62     | -4.88/-4.26     | -4.18/-3.88     | -2.80/-2.03     | -1.83/-1.60     | -0.80/-0.2      | 0.502/0.09        | 0.15/-0.71        | -2.37/-4.89       | -9.56/-7.00       | -4.93/-3.87       | -3.59/-3.79       | -4.11/-3.95       | -2.92/-1.71       | -0.86/-0.67       | -1.41/-3.17       | -5.04/-5.03       | -3.75/-2.72       | -2.15/-1.98       | -2.19/-3.27       | -5.73/-9.92       |                   |                   |   |   |
| Θ(52.5°)  | -11.28/-8.29  | -5.39/-3.94     | -3.32/-3.21     | -3.32/-3.44     | -2.74/-2.04     | -1.83/-1.62     | -0.79/-0.10     | 0.46/0.45         | 0.45/0.47         | 0.18/-0.81        | -2.85/-5.35       | -8.59/-10.29      | -8.61/-6.06       | -4.38/-3.64       | -3.53/-3.66       | -3.92/-3.98       | -3.45/-2.64       | -1.93/-1.63       | -2.37/-4.00       | -5.26/-4.14       | -2.33/-1.20       | -0.80/-0.78       | -1.07/-2.25       | -4.89/-9.16       |   |   |
| Θ(60°)    | -8.88/-5.70   | -4.26/-2.75     | -2.26/-2.21     | -2.37/-3.05     | -3.10/-2.66     | -2.53/-2.35     | -1.37/-0.41     | -0.04/-0.14       | -0.02/0.25        | 0.22/-0.49        | -2.15/-4.56       | -7.03/-8.31       | -7.36/-5.48       | -3.92/-3.27       | -3.43/-4.04       | -3.64/-4.00       | -4.05/-3.59       | -2.66/-1.83       | -1.89/-3.30       | -5.44/-5.33       | -1.94/-0.44       | -0.10/0.71        | -0.11/-0.84       | -3.21/-8.00       |   |   |
| Θ(67.5°)  | -8.88/-5.70   | -3.60/-2.95     | -2.56/-2.03     | -1.98/-2.71     | -3.53/-3.69     | -3.88/-3.56     | -1.95/-0.81     | -0.63/-0.81       | -0.68/-0.17       | 0.04/-0.62        | -2.30/-4.39       | -6.00/-6.31       | -5.40/-4.07       | -3.14/-2.81       | -2.97/-3.48       | -2.40/-4.95       | -4.76/-3.81       | -2.64/-1.53       | -1.39/-3.30       | -6.86/-5.13       | -1.48/-0.12       | 0.08/-0.41        | -0.47/-0.84       | -3.00/-7.10       |   |   |
| Θ(75°)    | -7.59/-4.10   | -2.68/-3.37     | -3.90/-2.47     | -1.55/-2.11     | -3.42/-3.94     | -4.45/-4.59     | -2.71/-1.33     | -1.07/-1.20       | -0.90/-0.28       | 0.10/-0.36        | -1.73/-3.55       | -4.92/-5.50       | -5.21/-4.56       | -3.88/-3.25       | -3.17/-3.90       | -5.20/-5.81       | -4.37/-2.98       | -2.35/-1.62       | -1.64/-3.84       | -8.27/-6.07       | -2.01/-0.51       | -0.92/-2.10       | -2.37/-2.35       | -4.11/-7.74       |   |   |
| Θ(82.5°)  | -7.20/-4.56   | -3.14/-4.38     | -5.67/-3.63     | -2.33/-2.74     | -4.24/-4.47     | -4.69/-4.83     | -3.31/-2.47     | -2.40/-2.07       | -1.28/-0.43       | 0.02/-0.29        | -1.57/-3.32       | -4.77/-5.72       | -6.07/-5.83       | -4.93/-3.92       | -3.93/-4.82       | -5.94/-5.32       | -3.44/-2.50       | -2.65/-2.54       | -2.76/-4.93       | -9.46/-7.30       | -3.17/-1.79       | -2.61/-4.16       | -4.14/-3.76       | -5.21/-7.59       |   |   |
| Θ(90°)    | -6.33/-4.23   | -3.07/-4.57     | -6.23/-4.34     | -3.53/-4.21     | -5.80/-5.30     | -4.71/-4.66     | -3.35/-2.85     | -3.47/-3.33       | -2.28/-1.40       | -0.82/-0.88       | -1.69/-3.06       | -4.61/-6.39       | -7.49/-7.54       | -6.44/-4.83       | -3.72/-3.52       | -4.67/-5.57       | -4.55/-3.52       | -3.79/-3.76       | -3.45/-5.27       | -11.37/-7.94      | -2.82/-1.52       | -3.62/-4.13       | -6.29/-4.91       | -6.60/-8.05       |   |   |
| Θ(97.5°)  | -7.29/-4.95   | -3.43/-4.32     | -5.20/-3.42     | -3.42/-5.04     | -7.28/-6.64     | -5.21/-4.65     | -3.50/-2.98     | -3.30/-2.99       | -2.19/-1.69       | -1.34/-1.21       | -1.77/-3.20       | -5.33/-6.94       | -7.35/-7.56       | -6.59/-4.42       | -2.75/-2.92       | -5.34/-6.65       | -4.30/-3.09       | -3.95/-4.92       | -4.33/-5.37       | -9.74/-7.69       | -3.14/-1.88       | -3.74/-8.96       | -7.67/-5.44       | -7.99/-10.87      |   |   |
| Θ(105°)   | -6.93/-5.42   | -3.94/-3.87     | -3.93/-2.90     | -3.37/-5.33     | -7.68/-5.81     | -6.86/-5.73     | -4.78/-4.42     | -4.31/-3.58       | -2.65/-2.11       | -1.53/-1.12       | -1.58/-3.24       | -4.79/-4.99       | -5.13/-6.02       | -5.83/-3.81       | -1.98/-2.27       | -4.75/-6.28       | -4.43/-3.04       | -4.05/-5.38       | -3.43/-3.33       | -7.53/-13.28      | -6.65/-3.42       | -4.62/-8.78       | -9.43/-7.16       | -9.95/-11.59      |   |   |
| Θ(112.5°) | -7.09/-4.56   | -3.55/-3.39     | -3.26/-2.87     | -3.89/-5.71     | -6.94/-8.01     | -5.64/-6.32     | -5.68/-5.48     | -5.02/-3.82       | -2.38/-1.49       | -1.09/-1.36       | -2.88/-3.98       | -5.58/-3.07       | -3.72/-4.95       | -4.43/-2.38       | -1.22/-2.23       | -5.25/-6.54       | -3.53/-1.83       | -2.89/-5.34       | -4.86/-5.14       | -10.99/-12.30     | -4.72/-2.78       | -3.64/-3.60       | -9.02/-9.51       | -12.66/-13.54     |   |   |
| Θ(120°)   | -9.29/-5.33   | -3.67/-3.45     | -3.59/-4.01     | -5.61/-7.22     | -6.63/-5.85     | -5.78/-5.22     | -5.01/-4.92     | -4.24/-2.89       | -1.64/-0.86       | -0.75/-1.32       | -2.13/-2.17       | -1.29/-1.04       | -1.93/-3.35       | -3.55/-2.34       | -1.87/-3.07       | -4.86/-4.38       | -2.31/-1.65       | -3.83/-8.46       | -6.91/-4.79       | -6.43/-10.39      | -6.92/-4.42       | -4.23/-5.26       | -6.94/-9.32       | -14.08/-14.70     |   |   |
| Θ(127.5°) | -12.11/-7.69  | -5.58/-4.94     | -4.97/-5.78     | -7.49/-8.41     | -6.47/-5.07     | -4.72/-4.64     | -4.68/-4.44     | -3.27/-1.77       | -0.91/-0.90       | -1.55/-2.23       | -2.20/-1.43       | -0.81/-1.04       | -1.92/-2.72       | -2.68/-2.44       | -2.69/-3.43       | -4.16/-3.99       | -3.14/-3.28       | -5.49/-6.62       | -3.57/-2.19       | -3.56/-6.87       | -13.90/-9.98      | -7.73/-7.47       | -7.98/-9.76       | -13.88/-15.44     |   |   |
| Θ(135°)   | -10.59/-9.14  | -8.77/-8.47     | -8.09/-8.29     | -8.86/-7.99     | -5.76/-4.56     | -4.43/-4.86     | -5.13/-5.19     | -4.11/-2.65       | -1.65/-1.45       | -1.71/-1.74       | -1.35/-0.76       | -0.27/-0.18       | -0.38/-0.70       | -1.10/-1.64       | -2.62/-3.88       | -4.83/-4.44       | -3.31/-3.19       | -4.48/-5.44       | -4.18/-3.47       | -5.05/-10.17      | -13.40/-9.05      | -7.01/-7.18       | -8.28/-10.16      | -12.05/-12.31     |   |   |
| Θ(142.5°) | -7.39/-7.93   | -8.86/-1.78     | -11.37/-10.28   | -9.33/-7.37     | -5.49/-4.72     | -5.24/-6.30     | -6.72/-6.41     | -5.20/-4.16       | -3.37/-2.78       | -2.20/-1.63       | -1.21/-0.86       | -0.62/-0.62       | -1.01/-1.78       | -2.69/-3.62       | -4.38/-4.71       | -4.40/-3.57       | -3.31/-3.80       | -6.51/-7.41       | -7.23/-7.16       | -9.36/-14.32      | -11.67/-7.00      | -6.23/-6.65       | -7.94/-8.85       | -8.71/-7.84       |   |   |
| Θ(150°)   | -6.91/-8.08   | -9.82/-10.67    | -10.89/-10.64   | -9.77/-8.13     | -6.53/-5.90     | -6.35/-7.46     | -7.73/-7.08     | -5.32/-4.06       | -3.33/-2.92       | -2.64/-2.50       | -2.57/-2.82       | -3.13/-3.65       | -4.50/-5.20       | -5.15/-4.57       | -4.03/-3.64       | -3.28/-3.02       | -3.24/-3.41       | -6.21/-8.47       | -9.54/-9.60       | -10.02/-10.67     | -11.07/-9.50      | -8.49/-8.33       | -8.26/-7.61       | -6.86/-5.63       |   |   |
| Θ(157.5°) | -9.05/-9.37   | -8.70/-8.19     | -8.36/-8.92     | -9.69/-9.13     | -8.13/-7.40     | -7.40/-7.87     | -7.83/-7.27     | -5.76/-4.53       | -3.74/-3.26       | -3.07/-3.22       | -3.68/-4.28       | -4.80/-5.07       | -4.99/-4.50       | -3.83/-3.53       | -3.55/-3.70       | -4.42/-5.79       | -7.67/-9.64       | -9.45/-9.34       | -9.68/-9.79       | -9.48/-9.12       | -8.72/-8.22       | -7.99/-8.27       |                   |                   |   |   |
| Θ(165°)   | -11.54/-10.21 | -9.80/-8.44     | -8.66/-9.91     | -11.05/-11.30   | -10.59/-10.48   | -10.08/-9.63    | -8.88/-8.42     | -7.15/-6.08       | -5.22/-4.59       | -4.19/-4.02       | -3.98/-3.98       | -3.98/-3.99       | -4.03/-4.16       | -4.46/-4.84       | -5.42/-5.73       | -6.01/-6.54       | -7.62/-9.26       | -11.19/-12.87     | -13.35/-12.74     | -11.99/-11.47     | -10.91/-10.57     | -10.13/-10.23     | -10.89/-11.32     | -14.94/-12.63     |   |   |
| Θ(172.5°) | -14.91/-13.53 | -12.65/-12.36   | -12.74/-13.64   | -14.47/-14.87   | -14.32/-13.51   | -12.22/-11.35   | -10.50/-9.41    | -8.83/-8.11       | -7.55/-6.80       | -6.23/-5.75       | -5.52/-5.55       | -5.72/-6.00       | -6.41/-7.08       | -7.86/-8.72       | -9.39/-10.16      | -10.36/-10.83     | -11.67/-12.59     | -12.95/-12.74     | -12.13/-11.29     | -11.23/-12.05     | -12.65/-12.94     | -12.77/-12.80     | -12.80/-13.85     | -14.09/-14.83     |   |   |
| Θ(180°)   | -14.04/-13.16 | -11.95/-11.60   | -11.85/-12.42   | -13.10/-12.88   | -12.21/-11.66   | -11.22/-10.79   | -10.36/-9.92    | -9.59/-9.52       | -9.12/-8.91       | -8.79/-8.94       | -9.15/-9.59       | -10.15/-10.91     | -12.05/-12.66     | -13.52/-12.82     | -12.29/-11.84     | -11.53/-11.81     | -12.14/-12.90     | -12.42/-11.95     | -11.43/-11.19     | -11.79/-12.85     | -13.64/-14.84     | -14.93/-13.94     | -13.11/-13.45     | -14.10/-15.26     |   |   |
| Freq(Hz)  | 5.2G/Pol.     | TotalAnt. 1     | +               | -               | +               | -               | +               | -                 | +                 | -                 | +                 | -                 | +                 | -                 | +                 | -                 | +                 | -                 | +                 | -                 | +                 | -                 | +                 | -                 | + | - |
| Gain      | Φ(0°)/Φ(7.5°) | Φ(15°)/Φ(22.5°) | Φ(30°)/Φ(37.5°) | Φ(45°)/Φ(52.5°) | Φ(60°)/Φ(67.5°) | Φ(75°)/Φ(82.5°) | Φ(90°)/Φ(97.5°) | Φ(105°)/Φ(112.5°) | Φ(120°)/Φ(127.5°) | Φ(135°)/Φ(142.5°) | Φ(150°)/Φ(157.5°) | Φ(165°)/Φ(172.5°) | Φ(180°)/Φ(187.5°) | Φ(195°)/Φ(202.5°) | Φ(210°)/Φ(217.5°) | Φ(225°)/Φ(232.5°) | Φ(240°)/Φ(247.5°) | Φ(255°)/Φ(262.5°) | Φ(270°)/Φ(277.5°) | Φ(285°)/Φ(292.5°) | Φ(300°)/Φ(307.5°) | Φ(315°)/Φ(322.5°) | Φ(330°)/Φ(337.5°) | Φ(345°)/Φ(352.5°) |   |   |
| Θ(0°)     | 1.58/1.55     | 1.48/1.81       | 1.70/1.50       | 1.29/1.21       | 1.00/1.01       | 0.85/0.89       | 0.67/1.18       | 1.30/0.93         | 1.78/2.05         | 1.86/2.25         | 2.07/1.94         | 2.27/1.99         | 2.04/1.77         | 1.16/1.05         | 1.58/1.66         | 1.10/0.32         | 0.10/0.17         | 0.32/0.42         | 0.54/0.75         | 1.23/1.56         | 1.41/1.36         | 1.37/1.61         | 1.78/1.63         | 1.46/1.61         |   |   |
| Θ(7.5°)   | 1.84/1.37     | 0.98/1.07       | 1.08/0.89       | 0.85/0.73       | 0.54/0.31       | -0.24/-0.68     | -0.55/-0.43     | -0.92/-1.13       | -0.29/0.24        | 0.27/0.48         | 0.76/0.94         | 1.54/1.65         | 1.58/1.81         | 1.50/0.87         | 0.93/1.30         | 1.35/0.87         | 0.20/0.11         | 0.17/0.43         | 0.54/0.78         | 1.11/1.39         | 1.46/1.61         | 1.51/1.55         | 1.82/1.88         | 1.44/1.51         |   |   |
| Θ(15°)    | 1.67/1.30     | 0.43/-0.76      | -1.47/-1.76     | -2.05/-1.89     | -1.62/-1.29     | -1.20/-0.95     | -0.94/-1.15     | -2.00/-2.22       | -0.87/0.55        | 1.41/2.47         | 3.11/2.88         | 2.96/2.36         | 3.02/2.56         | 2.32/1.95         | 1.55/1.02         | 0.35/-0.45        | -1.47/-1.74       | -1.26/-1.04       | -0.97/-0.69       | -0.36/-0.14       | -0.13/-0.19       | 0.80/1.11         | 1.30/1.92         | 2.55/2.28         |   |   |
| Θ(22.5°)  | 2.46/2.41     | 2.22/1.44       | 0.25/-1.34      | -3.75/-5.97     | -6.59/-4.13     | -2.22/-1.56     | -1.61/-2.03     | -2.70/-2.21       | -0.62/0.67        | 1.44/1.67         | 1.64/1.01         | -0.08/-0.32       | 0.08/0.03         | 0.53/1.49         | 1.76/1.36         | 0.24/-1.21        | -2.97/-4.24       | -4.12/-4.29       | -3.57/-2.95       | -2.98/-2.90       | -2.63/-1.79       | -0.59/0.51        | 1.55/2.28         | 2.76/2.85         |   |   |
| Θ(30°)    | -0.09/-0.59   | -0.13/0.45      | -0.36/-0.31     | -0.60/-5.63     | -7.03/-4.62     | -4.05/-4.43     | -3.97/-3.15     | -3.69/-5.05       | -5.07/-2.86       | -0.65/0.14        | 0.93/2.12         | 2.78/2.55         | 2.31/1.54         | -0.12/-0.18       | 0.48/0.62         | 0.54/-0.16        | -1.26/-3.04       | -5.52/-6.74       | -5.93/-4.35       | -3.38/-3.08       | -2.79/-2.04       | -1.42/-1.37       | -1.82/-1.28       | -1.50/-4.05       |   |   |
| Θ(37.5°)  | 0.65/0.12     | -0.99/-1.89     | -2.08/-3.18     | -5.19/-7.80     | -4.14/-1.99     | -3.34/-3.21     | -2.26/-2.03     | -3.64/-4.39       | -3.29/-2.04       | -1.21/-0.36       | 0.96/2.29         | 2.92/3.08         | 3.53/3.25         | 1.35/-1.08        | -2.04/-1.84       | -1.53/-2.17       | -2.98/-4.90       | -6.67/-5.99       | -6.77/-           |                   |                   |                   |                   |                   |   |   |



# Antenna Pattern

# Appendix B

|           |               |                 |                 |                 |                 |                 |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
|-----------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Θ(22.5°)  | -2.46/-2.14   | -1.89/-1.55     | -1.68/-1.60     | -1.18/-1.70     | -2.65/-4.27     | -3.73/-1.62     | -0.50/0.06      | -0.42/-0.98       | -0.01/-1.52       | 2.80/3.46         | 3.67/3.32         | 2.99/2.75         | 2.35/-1.44        | 1.09/1.00         | -0.11/-1.61       | -2.39/-2.54       | -2.70/-3.65       | -4.92/-5.08       | -3.74/-3.19       | -3.81/-4.59       | -4.22/-2.03       | -0.19/0.73        | 0.74/0.02         | -1.03/-2.12       |
| Θ(30°)    | 1.32/1.68     | 1.63/1.03       | -1.14/-2.64     | -3.27/-3.02     | -5.41/-9.57     | -9.19/-7.74     | -5.95/-5.67     | -4.50/-2.73       | -1.26/0.22        | 1.41/1.62         | 1.54/1.95         | 2.24/1.69         | 0.77/-0.22        | -0.91/-0.79       | -1.75/-3.52       | -4.07/-4.49       | -3.32/-2.52       | -3.59/-6.06       | -6.24/-2.93       | -1.76/-4.45       | -8.79/-4.26       | -3.20/-3.32       | -2.86/-2.12       | -1.36/-0.11       |
| Θ(37.5°)  | -2.31/-1.61   | -0.47/-0.67     | -3.00/-7.06     | -6.60/-2.91     | -2.98/-4.79     | -6.17/-4.56     | -2.47/-1.39     | -2.33/-2.66       | -1.77/-0.96       | -0.53/0.15        | 2.19/3.70         | 3.80/3.28         | 1.99/0.52         | 0.10/-1.17        | -2.63/-6.19       | -8.54/-3.26       | -2.34/-4.07       | -7.66/-4.07       | -2.02/-4.48       | -11.22/-3.42      | -2.15/-4.61       | -3.41/-2.21       | -1.81/-2.09       |                   |
| Θ(45°)    | 0.72/-0.73    | -1.80/-3.60     | -7.45/-11.13    | -9.50/-4.40     | -2.60/-1.25     | -2.71/-2.70     | -0.95/-0.38     | -2.19/-2.27       | -0.67/-0.45       | -1.11/-0.38       | 1.17/2.64         | 2.57/1.90         | 0.44/-1.43        | -1.43/-2.06       | -2.13/-3.20       | -2.48/-3.67       | -6.41/-5.92       | -5.59/-7.12       | -8.95/-5.32       | -5.33/-8.12       | -12.32/-6.18      | -5.90/-11.22      | -5.50/-6.84       | -5.51/-0.91       |
| Θ(52.5°)  | 0.44/-2.37    | -5.40/-9.10     | -13.80/-5.22    | -2.84/-2.38     | -3.51/-2.08     | -1.95/-0.28     | -0.48/-0.86     | -2.09/-2.32       | -1.14/-1.87       | -1.33/0.10        | 0.77/2.57         | 3.32/2.89         | 0.70/-2.84        | -3.95/-1.49       | -0.54/-2.27       | -5.15/-3.75       | -6.99/-7.75       | -5.75/-4.01       | -12.39/-5.49      | -8.96/-6.88       | -7.70/-8.16       | -11.88/-8.59      | -5.59/-14.35      | -6.75/-0.90       |
| Θ(60°)    | -6.38/-7.14   | -6.09/-9.99     | -13.93/-2.94    | -0.06/1.17      | -1.26/-2.29     | -1.26/-0.37     | -1.32/-0.42     | -1.34/-2.48       | -2.50/-2.31       | -0.84/-0.23       | -0.12/1.97        | 4.20/4.04         | 1.94/-1.27        | -4.34/-3.64       | -1.11/-1.02       | -6.03/-4.46       | -5.14/-8.07       | -9.01/-3.34       | -6.49/-3.38       | -5.52/-6.43       | -4.81/-8.94       | -9.83/-4.95       | -8.80/-7.12       | -6.62/-2.88       |
| Θ(67.5°)  | -5.56/-4.51   | -2.31/-7.52     | -10.35/-3.33    | -0.73/-1.29     | 0.01/-3.00      | -2.20/-0.20     | -0.71/0.23      | -0.28/-0.83       | -1.26/-1.84       | -1.20/-0.92       | -0.67/1.58        | <b>4.22/2.93</b>  | 0.31/-3.52        | -4.46/-4.68       | -0.87/-1.29       | -5.88/-13.58      | -7.16/-3.36       | -5.47/-5.24       | -4.12/-2.49       | -2.80/-5.53       | -4.70/-6.60       | -9.42/-3.08       | -8.30/-5.73       | -8.54/-3.64       |
| Θ(75°)    | -0.99/-2.92   | -1.44/-5.97     | -5.45/-3.21     | -1.64/0.49      | -1.36/-3.28     | -1.38/-1.08     | -0.55/0.43      | 0.94/-0.21        | -0.48/-1.62       | -2.55/-2.06       | -1.65/-0.15       | 2.35/2.75         | 0.97/-3.37        | -2.95/-4.19       | -3.72/-2.80       | -6.39/-8.57       | -6.50/-3.73       | -1.19/-2.69       | 0.25/-3.05        | -1.56/-4.84       | -6.98/-3.04       | -6.10/-4.71       | -6.88/-3.77       |                   |
| Θ(82.5°)  | 0.26/-3.87    | -2.29/-5.86     | -3.62/-3.07     | -2.51/-1.98     | -2.08/-4.61     | -2.03/-2.66     | -1.39/-0.14     | 0.27/-0.03        | 0.09/-0.71        | -2.87/-3.48       | -2.01/-0.05       | 1.73/2.48         | -2.04/-4.34       | -2.84/-3.54       | -3.73/-3.94       | -7.30/-6.77       | -6.07/-5.07       | -2.06/-1.15       | 0.30/-4.05        | -1.57/-4.41       | -2.06/-2.67       | -7.63/-2.08       | -2.68/-4.27       | -4.50/-4.15       |
| Θ(90°)    | 0.89/-7.64    | -2.42/-5.43     | -3.16/-3.28     | -5.99/-5.60     | -4.15/-4.29     | -2.66/-3.86     | -2.88/-1.34     | -0.47/-0.91       | -0.21/-0.97       | -3.09/-3.95       | -3.20/-1.63       | 0.87/1.74         | 1.23/-2.26        | -4.49/-4.23       | -3.11/-4.90       | -8.70/-6.36       | -5.97/-4.91       | 4.43/-1.45        | -0.59/-3.12       | -0.79/-6.56       | -2.32/-3.94       | -6.44/-5.17       | 4.61/-6.70        | -3.15/-5.46       |
| Θ(97.5°)  | 0.28/-5.16    | -2.77/-7.13     | -4.95/-6.22     | -8.92/-7.70     | -3.69/-6.64     | -5.59/-3.64     | -3.67/-1.29     | -0.82/-0.56       | -0.84/-1.82       | -4.27/-5.15       | -4.32/-1.86       | 0.87/1.21         | 0.30/-2.11        | -3.87/-3.90       | -3.77/-5.07       | -8.63/-5.52       | -5.72/-7.16       | -4.87/-2.03       | -2.59/-5.23       | -4.58/-10.30      | -3.54/-4.32       | -9.78/-7.31       | -5.80/-7.85       | -3.69/-6.19       |
| Θ(105°)   | -0.81/-0.94   | -3.42/-8.69     | -7.57/-12.41    | -10.89/-8.86    | -6.31/-7.34     | -6.11/-3.06     | -3.39/-1.51     | -0.98/-1.66       | -2.01/-2.82       | -4.72/-4.97       | -3.97/-3.24       | 0.35/0.48         | -0.52/-2.27       | -2.56/-5.25       | -3.11/-5.74       | -9.53/-6.75       | -6.91/-6.96       | -9.13/-3.15       | -1.98/-3.68       | -6.57/-11.61      | -5.30/-7.25       | -10.88/-10.16     | -9.88/-7.22       | -7.48/-9.36       |
| Θ(112.5°) | -5.16/-3.36   | -6.24/-14.54    | -12.36/-11.08   | -7.67/-8.34     | -5.68/-7.01     | -8.77/-3.91     | -2.39/-0.98     | -1.11/-2.69       | -4.16/-3.94       | -6.23/-5.28       | -3.86/-2.11       | 0.18/-0.07        | -0.77/-2.91       | -4.19/-3.08       | -5.09/-5.09       | -9.29/-5.28       | -9.17/-7.68       | -6.33/-6.39       | -1.99/-4.67       | -6.46/-11.73      | -6.83/-5.13       | -7.89/-9.07       | -8.36/-7.76       | -10.51/-7.91      |
| Θ(120°)   | -15.08/-10.10 | -12.51/-11.96   | -14.95/-9.13    | -7.67/-13.31    | -4.32/-4.49     | -6.87/-4.54     | -3.75/-3.08     | -1.91/-3.49       | -7.03/-6.58       | -5.80/-6.85       | -3.96/-2.44       | -0.29/-0.88       | -0.64/-3.26       | -5.02/-3.45       | -4.85/-8.61       | -5.99/-3.24       | -5.27/-10.65      | -5.23/-5.36       | -3.98/-8.43       | -6.37/-8.76       | -10.31/-4.34      | -11.58/-10.44     | -11.68/-10.44     | -14.63/-9.56      |
| Θ(127.5°) | -7.18/-9.01   | -7.64/-7.18     | -11.17/-8.36    | -11.51/-10.44   | -5.27/-6.84     | -7.74/-4.28     | -3.00/-4.36     | -3.99/-4.02       | -7.91/-8.51       | -7.75/-8.19       | -4.00/-1.89       | -1.30/-1.05       | -2.40/-5.51       | -5.53/-7.60       | -8.35/-5.76       | -5.55/-7.46       | -7.16/-8.17       | -12.86/-8.05      | -4.14/-8.13       | -14.61/-6.55      | -5.90/-9.63       | -8.12/-4.75       | -9.50/-10.36      | -8.67/-7.00       |
| Θ(135°)   | -4.94/-6.82   | -6.06/-7.66     | -7.61/-8.31     | -9.60/-6.42     | -6.48/-13.66    | -8.26/-7.29     | -8.36/-6.78     | -8.60/-6.87       | -8.36/-10.94      | -8.09/-7.70       | -5.35/-2.50       | -1.32/-1.73       | -3.42/-5.53       | -6.09/-6.79       | -5.09/-3.89       | -3.08/-9.64       | -11.87/-8.23      | -3.87/-6.71       | -14.86/-13.40     | -12.48/-8.52      | -10.93/-6.51      | -12.38/-8.51      | -9.58/-9.39       | -14.19/-11.34     |
| Θ(142.5°) | -9.69/-12.90  | -8.91/-6.83     | -6.07/-6.76     | -8.14/-9.67     | -10.69/-13.68   | -11.06/-10.37   | -13.01/-8.68    | -9.08/-8.43       | -7.39/-8.72       | -8.60/-5.29       | -3.23/-2.32       | -1.58/-1.68       | -4.13/-3.47       | -5.19/-5.68       | -6.46/-7.23       | -8.48/-6.02       | -7.73/-11.67      | -9.42/-9.03       | -10.06/-7.62      | -5.98/-8.14       | -10.45/-7.01      | -7.75/-15.22      | -8.99/-8.79       | -11.78/-13.29     |
| Θ(150°)   | -6.23/-5.29   | -3.57/-4.68     | -7.83/-11.37    | -9.79/-8.72     | -10.12/-11.68   | -12.02/-10.95   | -9.37/-8.34     | -8.61/-7.49       | -6.50/-6.74       | -6.55/-5.19       | -4.53/-3.96       | -3.89/-4.98       | -4.84/-6.68       | -10.75/-11.10     | -8.66/-9.75       | -13.55/-11.31     | -8.30/-5.93       | -7.40/-7.42       | -5.58/-7.08       | -10.36/-11.35     | -10.25/-14.91     | -11.41/-9.69      | -12.65/-9.87      | -12.50/-6.57      |
| Θ(157.5°) | -9.05/-10.31  | -9.65/-9.76     | -12.28/-11.22   | -8.02/-6.90     | -6.50/-7.78     | -8.32/-8.16     | -7.58/-7.06     | -6.64/-5.05       | -4.05/-3.18       | -2.58/-2.67       | -2.09/-1.77       | -3.51/-4.63       | -6.19/-9.03       | -10.68/-10.36     | -10.22/-10.17     | -12.28/-12.06     | -6.89/-4.63       | 4.18/-5.14        | -9.12/-14.06      | -12.41/-12.12     | -13.39/-12.88     | -12.40/-11.40     | -10.10/-9.86      | -10.10/-6.57      |
| Θ(165°)   | -7.88/-8.28   | -9.17/-7.28     | -10.05/-10.07   | -9.39/-8.85     | -7.86/-7.09     | -6.18/-5.91     | -6.39/-6.32     | -6.23/-6.74       | -6.60/-5.97       | -5.88/-5.51       | -5.20/-5.55       | -5.06/-4.04       | -5.56/-7.12       | -7.60/-7.94       | -5.79/-9.44       | -5.72/-5.98       | -5.56/-6.25       | -8.23/-11.25      | -15.59/-15.34     | -13.19/-12.99     | -12.65/-13.24     | -12.35/-11.37     | -11.08/-9.64      | -8.85/-9.29       |
| Θ(172.5°) | -11.26/-10.38 | -9.53/-9.58     | -8.65/-7.10     | -6.70/-6.27     | -5.47/-5.12     | -5.07/-5.03     | -5.26/-5.91     | -5.99/-6.15       | -5.69/-5.70       | -5.77/-5.01       | -4.71/-5.24       | -5.32/-6.18       | -5.84/-5.62       | -5.69/-5.79       | -5.61/-6.22       | -7.69/-9.15       | -11.22/-12.86     | -13.12/-12.00     | -11.64/-12.43     | -13.50/-12.93     | -13.10/-14.70     | -14.45/-14.53     | -13.93/-13.72     | -12.83/-12.92     |
| Θ(180°)   | -5.69/-6.09   | -5.93/-5.99     | -5.53/-5.12     | -5.33/-5.14     | -4.82/-4.85     | -5.20/-5.17     | -5.40/-5.50     | -5.37/-5.75       | -6.19/-6.36       | -6.42/-6.09       | -5.75/-5.47       | -5.11/-5.13       | -5.21/-5.68       | -6.23/-6.92       | -5.08/-8.90       | -8.67/-8.85       | -9.82/-9.57       | -9.38/-10.06      | -10.06/-9.68      | -9.41/-8.85       | -7.76/-6.35       | -5.92/-5.95       | -5.54/-5.51       | -5.74/-5.70       |
| Freq(Hz)  | 2450Pol       | TotalAnt.2      | +               | -               | +               | -               | +               | -                 | +                 | -                 | +                 | -                 | +                 | -                 | +                 | -                 | +                 | -                 | +                 | -                 | +                 | -                 | +                 | -                 |
| Gain      | Φ(0°)/Φ(7.5°) | Φ(15°)/Φ(22.5°) | Φ(30°)/Φ(37.5°) | Φ(45°)/Φ(52.5°) | Φ(60°)/Φ(67.5°) | Φ(75°)/Φ(82.5°) | Φ(90°)/Φ(97.5°) | Φ(105°)/Φ(112.5°) | Φ(120°)/Φ(127.5°) | Φ(135°)/Φ(142.5°) | Φ(150°)/Φ(157.5°) | Φ(165°)/Φ(172.5°) | Φ(180°)/Φ(187.5°) | Φ(195°)/Φ(202.5°) | Φ(210°)/Φ(217.5°) | Φ(225°)/Φ(232.5°) | Φ(240°)/Φ(247.5°) | Φ(255°)/Φ(262.5°) | Φ(270°)/Φ(277.5°) | Φ(285°)/Φ(292.5°) | Φ(300°)/Φ(307.5°) | Φ(315°)/Φ(322.5°) | Φ(330°)/Φ(337.5°) | Φ(345°)/Φ(352.5°) |
| Θ(0°)     | -5.03/-4.97   | -4.83/-4.79     | -4.86/-5.00     | -5.24/-5.52     | -5.81/-6.10     | -6.28/-6.24     | -5.89/-5.47     | -5.02/-4.59       | -4.19/-3.98       | -3.89/-3.93       | -4.00/-4.13       | -4.27/-4.43       | -4.54/-4.55       | -4.48/-4.35       | -4.10/-3.87       | -3.78/-3.85       | -3.93/-3.89       | -3.96/-4.14       | -4.20/-4.11       | -4.11/-4.11       | -4.18/-4.28       | -4.46/-4.61       | -4.64/-4.57       | -4.54/-4.71       |
| Θ(7.5°)   | -3.11/-3.12   | -3.10/-3.09     | -3.06/-2.96     | -2.81/-2.72     | -2.77/-3.05     | -3.41/-3.75     | -3.95/-3.96     | -3.81/-3.60       | -3.49/-3.51       | -3.72/-4.10       | -4.62/-3.25       | -5.92/-6.47       | -6.62/-6.42       | -6.29/-5.60       | -6.96/-7.35       | -7.50/-7.32       | -6.64/-6.02       | -5.65/-4.53       | -5.17/-4.95       | -4.69/-4.34       | -4.00/-3.81       | -3.81/-3.86       | -3.78/-3.57       | -3.32/-3.18       |
| Θ(15°)    | -2.83/-2.93   | -3.11/-3.31     | -3.44/-3.42     | -3.16/-2.83     | -2.65/-2.69     | -2.84/-2.91     | -2.90/-2.74     | -2.41/-2.17       | -2.11/-2.24       | -2.72/-3.43       | -4.32/-5.32       | -6.34/-7.02       | -6.75/-5.96       | -5.36/-5.29       | -5.44/-5.42       | -5.40/-4.93       | -4.43/-4.02       | -3.86/-3.88       | -3.98/-4.50       | -3.86/-3.47       | -2.54/-2.67       | -2.72/-2.77       | -2.77/-2.73       |                   |
| Θ(22.5°)  | -4.00/-4.14   | -4.04/-4.00     | -3.91/-3.79     | -3.55/-3.26     | -3.18/-3.24     | -3.33/-3.21     | -2.78/-2.08     | -1.31/-0.85       | -0.80/-1.16       | -1.94/-3.01       | -4.22/-5.34       | -6.40/-5.84       | -4.93/-4.08       | -3.56/-3.16       | -2.88/-2.41       | -1.84/-1.41       | -1.22/-1.39       | -1.77/-2.27       | -2.73/-2.98       | -2.89/-2.46       | -1.91/-1.58       | -1.59/-1.81       | -2.08/-2.49       | -3.05/-3.54       |
| Θ(30°)    | -5.10/-4.83   | -3.94/-3.09     | -2.54/-2.24     | -2.00/-1.90     | -1.99/-2.34     | -2.80/-2.92     | -2.26/-1.18     | -0.15/0.37        | 0.30/-0.35        | -1.51/-2.96       | -4.25/-4.83       | -4.59/-3.96       | -3.50/-3.40       | -3.33/-2.99       | -2.49/-1.90       | -1.18/-0.58       | -0.35/-0.55       | -1.00/-1.43       | -1.79/-2.02       | -2.02/-1.78       | -1.39/-1.11       | -1.14/-1.39       | -1.83/-2.52       | -3.52/-4.54       |
| Θ(37.5°)  | -4.07/-3.32   | -2.34/-1.63     | -1.30/-1.17     | -1.00/-0.92     | -1.02/-1.39     | -1.92/-1.95     | -1.20/-0.18     | 0.63/0.85         | 0.44/-0.62        | -2.20/-3.67       | -4.05/-3.27       | -2.36/-2.13       | -2.86/-4.24       | -5.06/-4.75       | -4.16/-3.58       | -2.71/-1.87       | -1.47/-1.62       | -1.80/-1.74       | -1.60/-1.48       | -1.40/-1.30       | -1.04/-0.72       | -0.57/-0.71       | -1.24/-2.19       | -3.34/-4.20       |
| Θ(45°)    | -2.01/-1.55   | -1.18/-1.07     | -1.15/-1.24     | -1.14/-0.94     | -0.82/-0.93     | -1.30/-1.52     | -1.40/-1.03     | -0.60/-0.27       | -0.45/-1.22       | -2.39/-3.27       | -3.18/-2.38       | -1.70/-1.75       | -2.74/-4.20       | -4.56/-3.77       | -3.29/-3.30       | -1.89/-2.24       | -0.92/-2.25       | -1.29/-0.62       | -0.41/-0.61       | -0.69/-0.40       | -0.01/-0.01       | -0.58/-1.52       | -2.26/-2.44       |                   |
| Θ(52.5°)  | -0.52/-0.48   | -0.77/-1.25     | -1.66/-1.84     | -1.75/-1.46     | -1.13/-1.12     | -1.47/-2.06     | -2.89/-3.74     | -3.59/-2.48       | -1.60/-1.62       | -2.25/-2.71       | -2.58/-2.16       | -1.73/-1.66       | -2.07/-2.46       | -2.02/-1.30       | -1.52/-2.41       | -2.71/-1.86       | -1.21/-1.58       | -2.28/-2.10       | -0.99/0.20        | 0.82/0.66         | 0.25/0.21         | 0.53/0.52         | -0.05/-0.87       | -1.19/-0.90       |
| Θ(60°)    | -0.10/-0.59   | -1.41/-2.07     | -2.17/-1.94     | -1.92/-2.08     | -2.19/-2.58     | -3.16/-3.68     | -4.68/-6.21     | -6.60/-4.69       | -3.04/-2.73       | -3.41/-3.67       | -2.98/-3.20       | -1.48/-0.71       | -0.90/-2.00       | -2.29/-1.29       | -1.06/-2.31       | -3.88/-2.12       | -1.37/-1.56       | -2.29/-2.25       | -1.49/-0.25       | <b>1.833/3.0</b>  | 1.71/0.63         | 1.02/1.54         | 0.56/-0.18        | -0.37/-0.11       |
| Θ(67.5°)  | 0.37/-0.46    | -1.71/-2.50     | -2.07/-1.52     | -1.87/-2.78     | -3.61/-4.31     | -4.57/-4.31     | -4.85/-6.61     | -8.17/-7.03       | -5.35/-5.07       | -5.36/-3.93       | -2.49/-2.66       | -2.60/-1.50       | -1.36/-2.36       | -2.50/-1.18       | -0.54/-1.69       | -3.32/-1.91       | -0.52/-1.00       | -1.09/-1.67       | -1.09/-0.31       | 0.88/1.49         | 1.16/0.53         | 0.56/0.73         | 0.38/0.09         | 0.30/0.61         |
| Θ(75°)    | 0.62/-0.14    | -1.29/-1.99     | -1.54/-1.24     | -2.04/-3.40     | -4.53/-5.17     | -5.00/-4.68     | -5.37/-3.77     | -9.19/-7.69       | -5.67/-5.83       | -7.15/-5.25       | -3.02/-3.72       | -5.61/-3.51       | -1.56/-1.42       | -1.89/-0.79       | 0.23/-0.96        | -3.91/-2.85       | -0.82/-0.91       | -1.37/-1.06       | -1.16/-0.83       | 0.60/1.56         | 1.42/0.72         | 0.33/0            |                   |                   |



# Antenna Pattern

# Appendix B

|            |              |                |                |                |                |                |                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |
|------------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Θ (67.5°)  | 0.84/1.68    | 1.06/0.25      | -0.62/3.16     | -1.99/2.78     | 3.02/2.53      | 3.70/1.59      | 1.82/2.72      | 0.33/-1.13       | -2.86/-4.09      | -4.77/-9.69      | -4.97/-13.14     | -2.38/-4.89      | -8.52/-2.08      | -2.69/-4.05      | -3.51/-4.08      | -4.60/-1.25      | -0.42/1.84       | 1.64/3.21        | 3.33/4.37        | 2.21/0.44        | -0.65/3.43       | -2.88/-3.00      | -0.06/1.60       | 1.90/1.64        |
| Θ (75°)    | 1.03/1.32    | 0.78/-0.33     | -1.06/-2.36    | -0.23/-4.6     | 3.72/1.95      | 2.74/1.72      | 2.39/3.31      | 0.75/-1.22       | -1.29/-3.47      | -3.18/-4.65      | -8.85/-5.53      | -2.82/-2.44      | -6.51/-2.47      | -1.67/-3.71      | -2.54/-6.24      | -6.04/-1.26      | 1.63/5.51        | 2.10/3.53        | 5.22/4.69        | 4.36/2.53        | -2.61/-2.71      | -1.88/-5.00      | 0.20/1.85        | 2.32/1.90        |
| Θ (82.5°)  | 0.92/0.48    | -0.22/-1.66    | -1.73/-1.85    | -0.10/2.77     | 2.84/1.17      | 1.68/0.38      | 1.25/2.97      | 1.17/0.95        | -2.27/-3.80      | -2.59/-3.13      | -7.96/-5.00      | -1.22/-2.97      | -3.25/-5.87      | -1.14/-3.73      | -1.48/-6.12      | -6.79/-0.70      | 2.60/3.45        | 1.01/2.37        | 5.12/4.07        | 4.11/1.41        | -1.81/-3.54      | -2.89/-6.94      | 0.63/1.52        | 2.16/1.13        |
| Θ (90°)    | -0.12/0.07   | -0.49/-2.71    | -2.29/-1.45    | -1.00/0.92     | 1.53/0.73      | 0.55/0.12      | 0.42/0.74      | -0.75/0.61       | -1.89/-2.87      | -3.89/-2.38      | -7.02/-3.60      | -0.77/-0.89      | -3.74/-3.56      | -2.40/-1.55      | -2.84/-6.66      | -8.19/-2.13      | 2.24/3.24        | -0.72/1.88       | 3.80/3.93        | 3.15/0.32        | -2.07/-4.12      | -3.59/-5.19      | 0.85/1.61        | 1.55/0.77        |
| Θ (97.5°)  | -0.80/-0.22  | -1.95/-3.30    | -3.01/-1.46    | -1.30/-0.80    | -0.64/-0.13    | -0.84/-1.74    | -0.05/-0.55    | -1.76/-1.70      | -3.39/-3.22      | -4.14/-3.44      | -6.27/-2.10      | -2.58/-2.71      | -0.85/-5.88      | -1.31/-4.55      | -3.90/-8.45      | -4.90/-6.29      | 0.80/0.66        | -3.27/-1.07      | 1.11/0.73        | 0.58/-2.46       | -2.93/-4.22      | -3.76/-6.36      | 0.07/0.44        | 1.19/-0.27       |
| Θ (105°)   | -2.32/-0.04  | -2.79/-4.24    | -3.48/-2.49    | -1.99/-2.20    | -2.59/-1.42    | -2.07/-2.28    | -0.09/-1.35    | -2.74/-3.57      | -3.86/-4.05      | -4.70/-2.13      | -6.92/-2.49      | -4.70/-2.13      | -3.77/-2.74      | -2.30/-7.29      | -1.98/-0.97      | -4.06/-0.98      | -2.13/-1.36      | -1.79/-3.93      | -4.86/-5.82      | -5.88/-6.02      | -0.21/-0.42      | 0.29/-0.33       |                  |                  |
| Θ (112.5°) | -2.38/-1.43  | -5.67/-3.57    | -3.05/-4.10    | -4.02/-2.85    | -1.08/-0.81    | -3.61/-2.21    | -2.10/-5.20    | -3.08/-3.85      | -8.22/-4.02      | -2.28/-4.58      | -6.08/-3.74      | -4.83/-0.07      | -3.49/-12.67     | -5.08/-9.65      | -2.85/-4.40      | -1.47/-2.28      | -3.93/-3.03      | -3.59/-1.39      | -2.32/-1.73      | -5.81/-5.29      | -5.75/-5.51      | -6.32/-4.86      | -0.44/0.02       | -1.54/-0.51      |
| Θ (120°)   | -1.94/-2.66  | -4.58/-4.58    | -4.64/-4.53    | -3.33/-3.13    | -1.74/-2.08    | -5.42/-3.54    | -3.46/-6.12    | -4.11/-6.04      | -4.98/-7.00      | -5.54/-6.74      | -5.73/-4.87      | -5.42/-4.22      | -6.99/-10.86     | -6.08/-11.11     | -2.30/-4.04      | 0.76/-4.16       | 0.28/-2.46       | -0.54/-1.33      | -8.44/-6.22      | -14.72/-8.90     | -6.41/-8.17      | -4.95/-6.05      | -1.89/-0.96      | -2.69/-2.15      |
| Θ (127.5°) | -3.98/-4.07  | -6.87/-7.14    | -6.58/-4.29    | -2.07/-2.27    | -1.20/-1.31    | -3.96/-3.28    | -3.23/-4.24    | -4.70/-7.13      | -5.31/-3.55      | -14.07/-5.68     | -4.52/-4.50      | -3.85/-7.74      | -14.92/-5.14     | -11.68/-5.35     | -4.54/-10.90     | -3.73/-4.26      | -0.45/-4.69      | -2.94/-3.44      | -9.10/-6.34      | -11.51/-7.82     | -5.23/-8.41      | -4.12/-3.29      | -3.58/-2.75      | -4.99/-3.87      |
| Θ (135°)   | -4.63/-4.11  | -3.33/-5.73    | -5.70/-5.52    | -2.81/-3.01    | -2.95/-2.81    | -4.54/-4.12    | -5.29/-5.99    | -3.77/-4.60      | -4.36/-5.82      | -11.62/-14.93    | -10.98/-7.70     | -4.48/-4.10      | -6.21/-2.12      | -10.65/-5.53     | -4.98/-9.44      | -3.46/-4.06      | -1.91/-6.45      | -3.79/-4.21      | -7.25/-2.66      | -7.43/-4.81      | -4.65/-4.19      | -1.59/-2.55      | -3.44/-2.67      | -2.70/-4.40      |
| Θ (142.5°) | -5.44/-5.40  | -4.02/-4.55    | -4.78/-4.90    | -6.71/-6.83    | -6.63/-8.42    | -9.45/-6.45    | -6.96/-8.79    | -5.99/-5.20      | -6.02/-7.08      | -11.17/-11.03    | -9.92/-9.30      | -2.88/-1.72      | -1.82/-3.66      | -14.45/-8.12     | -10.26/-8.09     | -14.18/-6.30     | -5.30/-10.00     | -6.36/-2.45      | -4.08/-4.22      | -5.56/-6.56      | -6.70/-3.48      | -3.43/-2.81      | -6.10/-5.31      | -6.03/-5.68      |
| Θ (150°)   | -6.08/-6.22  | -6.35/-4.78    | -5.04/-6.26    | -6.94/-6.03    | -9.23/-9.26    | -11.22/-10.58  | -10.69/-10.41  | -8.53/-7.38      | -6.33/-5.23      | -5.48/-7.44      | -11.15/-14.85    | -12.42/-11.97    | -10.75/-9.58     | -8.73/-9.74      | -6.18/-7.11      | -8.82/-5.32      | -5.45/-8.94      | -13.98/-8.04     | -5.90/-6.52      | -4.08/-3.79      | -4.61/-4.91      | -4.90/-6.23      | -4.62/-4.65      | -5.41/-7.17      |
| Θ (157.5°) | -5.85/-5.29  | -6.25/-8.23    | -9.07/-11.00   | -11.07/-10.93  | -11.39/-12.19  | -10.74/-9.04   | -9.50/-8.13    | -6.41/-6.23      | -6.18/-6.30      | -6.89/-8.68      | -11.44/-15.00    | -12.78/-11.27    | -8.16/-5.75      | -8.03/-11.07     | -8.50/-7.72      | -7.87/-6.22      | -4.57/-4.85      | -5.59/-3.20      | -1.80/-3.01      | -3.69/-2.53      | -1.97/-3.32      | -5.47/-6.75      | -6.39/-5.56      | -6.08/-6.76      |
| Θ (165°)   | -5.56/-4.30  | -3.81/-3.49    | -3.44/-3.50    | -3.48/-4.11    | -4.74/-5.03    | -5.68/-6.72    | -8.66/-10.53   | -9.26/-8.75      | -10.18/-11.37    | -11.62/-12.63    | -13.41/-14.06    | -14.08/-12.99    | -11.10/-9.85     | -13.87/-14.66    | -14.93/-13.78    | -9.74/-8.06      | -7.01/-5.34      | -4.81/-5.14      | -5.69/-6.04      | -9.30/-10.56     | -6.84/-7.62      | -6.29/-6.64      |                  |                  |
| Θ (172.5°) | -9.28/-8.77  | -6.62/-6.68    | -7.11/-6.05    | -5.15/-5.58    | -5.86/-5.80    | -5.94/-6.31    | -8.01/-10.43   | -12.54/-12.80    | -11.47/-10.30    | -9.23/-8.86      | -12.66/-13.94    | -14.53/-14.13    | -11.99/-11.97    | -11.15/-9.33     | -9.26/-8.41      | -8.41/-10.25     | -9.95/-9.76      | -10.10/-10.70    | -9.40/-7.15      | -5.14/-6.20      | -6.70/-7.73      |                  |                  |                  |
| Θ (180°)   | -6.16/-6.47  | -6.73/-6.83    | -5.91/-5.73    | -6.49/-6.43    | -5.92/-6.86    | -9.51/-12.98   | -15.26/-14.89  | -14.21/-14.85    | -13.95/-13.67    | -13.62/-13.40    | -12.88/-12.30    | -12.10/-10.16    | -8.64/-7.88      | -6.87/-6.18      | -6.40/-6.28      | -5.82/-6.66      | -7.03/-6.30      | -6.58/-7.62      | -7.50/-7.83      | -8.02/-7.84      | -7.52/-7.47      | -7.70/-8.20      | -8.36/-8.34      | -7.81/-7.01      |
| Freq(Hz)   | 5.785GPol.   | TotalAnt. 2    | -/-            | -/-            | -/-            | -/-            | -/-            | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              |
| Gain       | Φ(0°)Φ(7.5°) | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°) | Φ(90°)Φ(97.5°) | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°) | Φ(165°)Φ(172.5°) | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°) | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°) | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |
| Θ (0°)     | 3.98/4.30    | 4.24/4.02      | 3.90/3.87      | 3.53/3.77      | 4.41/4.83      | 4.81/4.65      | 4.55/4.65      | 4.83/4.92        | 4.97/5.08        | 5.34/4.98        | 4.88/4.66        | 4.46/4.66        | 4.95/4.51        | 4.10/4.32        | 4.11/4.18        | 4.38/4.29        | 4.58/4.54        | 4.46/4.54        | 4.45/4.42        | 4.65/4.51        | 4.63/4.50        | 4.39/4.49        | 4.30/4.28        | 4.39/4.28        |
| Θ (7.5°)   | 4.66/4.41    | 3.93/3.80      | 3.56/3.55      | 3.32/3.63      | 2.26/2.42      | 2.64/2.46      | 2.13/2.24      | 2.49/2.68        | 2.80/3.06        | 3.33/3.69        | 3.93/4.19        | 4.20/4.25        | 4.55/4.67        | 4.33/4.38        | 4.48/4.29        | 4.48/4.39        | 3.98/4.30        | 4.27/4.44        | 4.52/4.27        | 4.77/4.86        | 4.49/4.88        | 4.67/4.94        | 4.89/4.48        | 4.67/4.90        |
| Θ (15°)    | 3.69/2.82    | 2.73/2.33      | 1.25/0.25      | -1.47/-1.85    | -3.70/-4.59    | -4.11/-2.72    | -2.15/-1.72    | -0.83/-0.20      | -0.24/-0.38      | -0.21/0.46       | 1.24/2.08        | 2.98/3.61        | 4.04/4.40        | 4.31/4.10        | 3.82/2.89        | 1.96/0.99        | 0.15/0.06        | 0.47/0.92        | 1.17/1.47        | 1.95/2.27        | 2.74/3.05        | 3.32/3.70        | 3.99/3.98        | 3.88/4.03        |
| Θ (22.5°)  | 2.29/2.09    | 1.37/0.02      | -1.00/-0.80    | -0.54/-0.36    | 0.31/1.21      | 0.83/-0.93     | -2.59/-2.57    | -1.42/-1.16      | -2.14/-2.99      | -2.26/-1.34      | -0.32/0.72       | 1.90/2.34        | 2.36/2.72        | 2.61/2.02        | 1.22/0.00        | -0.75/-2.47      | -4.69/-4.16      | -2.33/-0.42      | 0.09/0.39        | 0.47/1.29        | 2.51/2.99        | 3.24/3.58        | 3.96/3.65        | 2.90/2.47        |
| Θ (30°)    | 1.16/1.14    | 0.90/0.10      | 0.28/1.37      | 0.39/0.53      | 1.06/2.09      | 0.78/-1.63     | -0.64/-1.01    | -1.21/-2.47      | -0.96/-3.64      | -0.96/0.35       | -0.37/-1.11      | 2.07/2.70        | 1.79/0.68        | -0.77/-2.16      | -4.47/-5.60      | -2.63/-2.40      | -3.02/-3.23      | -5.98/-3.07      | -0.88/-0.42      | -0.07/1.30       | 1.95/2.84        | 3.81/4.16        | 6.29/6.64        |                  |
| Θ (37.5°)  | 0.40/0.52    | -0.12/-0.05    | 0.94/2.06      | 2.82/1.80      | 0.90/1.29      | 0.14/-0.53     | -0.33/-1.01    | -4.87/-8.04      | -7.02/-4.50      | -2.38/-1.35      | -0.92/-1.00      | 2.80/2.86        | 0.98/-2.07       | -8.54/-4.39      | -3.51/-6.66      | -5.07/-4.49      | -7.06/-7.68      | -10.03/-8.22     | -5.77/-5.62      | -4.64/-5.15      | -4.59/-0.70      | 1.21/2.18        | 2.83/3.16        | 2.73/1.75        |
| Θ (45°)    | -1.88/-1.29  | -1.35/0.30     | 0.56/0.73      | 1.44/0.92      | -0.76/-0.05    | 0.70/-0.74     | -1.32/-3.70    | -9.96/-6.19      | -4.31/-4.32      | -2.38/-1.06      | 1.20/1.06        | -2.35/-8.40      | -5.89/-2.45      | -4.22/-6.53      | -11.06/-6.01     | -7.52/-3.73      | -3.30/-1.03      | -0.51/-1.40      | -2.24/-4.85      | -4.13/-1.04      | -0.15/0.89       | 2.83/3.38        | 2.22/0.37        |                  |
| Θ (52.5°)  | -0.81/0.52   | -0.11/1.91     | 2.10/0.73      | -0.92/1.29     | 2.01/0.50      | 2.56/2.56      | 0.78/-1.63     | -3.81/-4.12      | -5.94/-7.61      | -8.39/-6.41      | -2.45/-1.34      | -0.60/-1.87      | -4.46/-7.60      | -0.12/-0.29      | -5.30/-3.48      | -5.44/-9.06      | -6.04/-0.64      | -1.02/-0.81      | 0.25/-0.95       | -4.40/-4.26      | -2.00/0.93       | 2.80/3.37        | 2.20/2.72        |                  |
| Θ (60°)    | -1.35/1.52   | 1.68/1.97      | 1.58/0.27      | -1.73/1.74     | 3.45/2.12      | 3.87/3.63      | 2.41/3.36      | 1.76/-1.53       | -3.51/-5.10      | -8.88/-6.47      | -4.10/-1.21      | 0.16/-1.29       | -4.02/-10.67     | -3.61/0.17       | -2.66/-1.50      | -3.65/-4.55      | -5.30/0.50       | 0.46/-1.15       | 0.93/0.43        | -0.13/-4.43      | -2.92/-3.98      | 4.41/0.50        | 1.97/3.09        | 1.95/0.12        |
| Θ (67.5°)  | -0.73/1.34   | 1.92/0.72      | 0.33/-0.22     | 0.38/1.90      | 3.92/2.73      | 3.30/3.54      | 3.27/3.95      | 1.72/2.29        | 0.42/-3.06       | -4.59/-4.38      | -3.95/-5.00      | -0.59/-4.82      | -5.08/-5.80      | -3.66/-4.71      | -1.58/-0.99      | -3.47/-1.95      | -1.96/0.51       | 0.73/1.03        | 2.85/2.22        | 0.97/-2.33       | -1.90/-1.81      | -4.80/-1.64      | 1.50/2.64        | 1.02/-0.69       |
| Θ (75°)    | -1.92/0.63   | 1.11/0.27      | -0.53/-0.86    | 1.82/1.93      | 3.39/1.60      | 1.81/1.25      | 2.21/3.23      | 1.44/2.40        | 2.37/-1.06       | -5.59/-2.73      | -4.66/-2.12      | -2.80/-5.56      | -5.25/-4.03      | -1.35/-5.98      | -0.84/-1.15      | -0.38/2.42       | 2.30/1.96        | 4.57/4.25        | 2.71/-0.61       | -1.60/-1.96      | -6.00/-2.35      | 1.37/2.73        | 1.07/1.31        |                  |
| Θ (82.5°)  | -1.17/-1.87  | -0.19/-0.28    | -1.78/-1.63    | 2.21/1.70      | 1.89/-0.32     | -0.55/-1.11    | -0.32/1.58     | 0.15/2.14        | 0.53/-1.06       | -4.49/-3.13      | -6.27/-1.84      | -4.01/-2.45      | -4.14/-4.35      | 0.56/-6.69       | 0.55/-1.04       | -6.53/-0.29      | 0.42/0.56        | 0.72/2.28        | 4.50/4.32        | 2.78/-0.28       | -1.84/-1.42      | -4.53/-3.58      | 0.83/2.44        | 0.73/-0.90       |
| Θ (90°)    | -1.76/-2.86  | -0.84/-1.06    | -2.36/-1.06    | 1.82/1.00      | 1.61/-1.25     | -3.60/-2.54    | -0.60/-1.38    | -1.45/0.60       | 1.01/-0.69       | -2.73/-3.84      | -5.76/-2.17      | -3.82/-0.89      | -8.12/-0.48      | -1.74/-5.36      | -1.50/-2.85      | -4.22/-0.35      | -0.20/-0.32      | 0.13/0.96        | 3.99/2.77        | 2.68/-2.82       | -1.53/-2.39      | -3.56/-3.27      | 1.91/2.85        | 1.10/-1.32       |
| Θ (97.5°)  | -1.45/-2.64  | -1.78/-1.98    | -2.76/-1.76    | 1.26/0.61      | 0.18/-2.49     | -4.46/-4.41    | -2.71/-4.04    | -6.02/-1.34      | -1.68/-1.02      | -1.72/-2.86      | -7.02/-1.37      | -4.03/-0.65      | -2.41/-1.78      | -1.75/-8.86      | -1.80/-5.54      | -3.29/0.35       | -2.04/-3.35      | -4.28/-3.02      | 0.45/-1.09       | -0.33/-6.90      | -2.32/-1.37      | -4.87/-3.72      | 1.53/2.14        | 1.04/-1.04       |
| Θ (105°)   | -2.59/-2.41  | -2.87/-3.82    | -3.53/-1.88    | 0.06/-1.87     | -1.29/-2.07    | -4.24/-5.47    | -5.08/-5.80    | -4.86/-3.77      | -2.81/-1.56      | -1.14/-2.42      | -6.23/-3.52      | -5.28/-0.53      | -2.74/0.13       | -3.08/-9.20      | -2.44/-6.43      | -3.25/-1.97      | -2.81/-4.05      | -2.64/-5.71      | 0.95/-2.35       | -3.31/-7.03      | -2.98/-2.94      | -5.14/-2.39      | 0.25/2.02        | 0.66/-1.92       |
| Θ (112.5°) | -2.51/-3.25  | -4.54/-6.59    | -2.19/-2.08    | -2.78/-2.38    | -2.84/-3.47    | -2.36/-3.95    | -7.13/-2.57    | -6.00/-1.14      | -6.91/-3.22      | -0.98/-2.43      | -5.48/-5.81      | -7.22/-0.67      | -2.86/-8.92      | -5.23/-8.11      | -3.27/-7.06      | 0.32/0.63        | -2.78/-4.62      | -2.32/-3.40      | -0.77/-3.16      | -6.08/-7.98      | -2.12/-2.13      | -9.41/-3.73      | 0.78/-0.21       | -2.03/-3.29      |
| Θ (120°)   | -4.41/-2.65  | -4.77/-4.77    | -2.46/-3.20    | -5.59/-3.53    | -3.07/-4.51    | -3.38/-3.96    | -3.68/-7.70    | -6.65/-9.94      | -5.84/-3.29      | -5.11/-7.53      | -4.94/-9.70      | -3.78/-5.86      | -7.83/-10.11     | -6.38/-12.42     | -1.91/-3.78      | 1.78/-3.03       | 0.76/-2.85       | 0.94/-2.53       | -1.90/-3.14      | -6.25/-6.14      | -4.60/-2.88      | -4.51/-2.82      | -1.73/-1.48      | -2.65/-2.92      |
| Θ (127.5°) | -5.78/-8.04  | -6.10/-4.1     |                |                |                |                |                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |



Antenna Pattern

Appendix B

|            |               |                 |                 |                 |                 |                 |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
|------------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Θ (112.5°) | -5.12/-3.68   | -4.80/-1.94     | -3.42/-3.20     | -4.08/-3.88     | -9.08/-5.03     | -1.67/-3.55     | -3.05/-5.76     | -4.34/-6.71       | -6.75/-2.29       | -1.35/-2.34       | -1.18/-2.01       | -4.25/-3.70       | -2.61/-0.26       | -0.87/-4.59       | -4.87/-1.34       | -0.83/-0.63       | -0.85/-2.86       | -6.39/-6.14       | -1.42/-2.31       | -3.87/-3.76       | -4.81/-9.07       | -5.87/-3.19       | -3.87/-4.31       | -2.45/-2.38       |
| Θ (120°)   | -4.24/-2.17   | -3.95/-1.85     | -2.49/-3.24     | -3.19/-2.39     | -6.00/-4.95     | -1.43/-2.42     | -7.24/-10.33    | -6.11/-7.37       | -5.73/-0.24       | -0.15/-2.99       | -2.88/-0.86       | -3.27/-0.04       | -2.93/-1.77       | -3.22/-7.98       | -9.26/-4.04       | -0.30/-0.70       | -2.67/-2.44       | -9.08/-7.23       | -0.12/-0.47       | -7.56/-4.12       | -1.75/-10.18      | -8.12/-4.19       | -6.29/-12.15      | -8.57/-8.61       |
| Θ (127.5°) | -5.19/-2.68   | -2.00/-1.36     | -2.47/-2.68     | -3.31/-2.89     | -3.36/-4.44     | -4.36/-3.69     | -6.73/-8.10     | -5.92/-6.28       | -7.43/-1.64       | -2.47/-3.57       | -1.27/-0.18       | -2.85/-1.40       | -2.18/-1.12       | -3.39/-4.75       | -5.60/-3.54       | -2.27/-3.48       | -1.77/-5.28       | -9.16/-3.00       | 1.21/-0.02        | -4.73/-4.20       | -0.40/-5.63       | -10.70/-5.27      | -6.90/-11.31      | -8.57/-8.15       |
| Θ (135°)   | -7.07/-6.31   | -6.89/-5.04     | -4.13/-3.12     | -4.70/-4.85     | -3.02/-3.33     | -8.37/-8.51     | -6.14/-4.76     | -4.38/-7.05       | -12.53/-8.04      | -6.29/-5.91       | -3.78/-2.39       | -2.34/-1.09       | -2.69/-5.48       | -5.88/-6.55       | -8.03/-8.27       | -6.58/-2.86       | -2.71/-12.05      | -6.70/-4.13       | -0.09/-1.18       | -5.29/-6.09       | -0.58/-2.16       | -9.88/-7.17       | -7.76/-5.04       | -5.59/-15.49      |
| Θ (142.5°) | -5.65/-3.71   | -3.62/-3.19     | -3.26/-3.20     | -4.52/-5.10     | -3.27/-3.40     | -6.45/-11.62    | -12.67/-9.21    | -7.66/-10.02      | -15.24/-14.48     | -11.04/-2.87      | -0.75/-2.17       | -5.74/-6.60       | -9.32/-11.69      | -7.04/-8.11       | -10.29/-11.38     | -4.61/-2.06       | -4.74/-5.85       | -2.82/-2.59       | -1.94/-2.62       | -4.10/-5.75       | -2.78/-1.15       | -4.17/-10.86      | -7.52/-8.19       | -9.64/-7.53       |
| Θ (150°)   | -6.89/-9.11   | -7.61/-3.16     | -2.83/-4.67     | -7.02/-9.44     | -7.12/-5.28     | -6.66/-8.09     | -6.56/-4.60     | -5.06/-6.81       | -6.11/-4.44       | -5.44/-6.41       | -6.58/-6.73       | -5.05/-4.72       | -4.95/-4.43       | -3.54/-4.24       | -4.74/-4.40       | -5.11/-8.56       | -12.04/-7.39      | -5.49/-4.47       | -4.90/-7.06       | -8.42/-7.83       | -5.82/-3.34       | -4.85/-9.29       | -8.33/-5.15       | -4.57/-6.05       |
| Θ (157.5°) | -7.04/-8.41   | -7.71/-6.32     | -5.25/-5.67     | -6.55/-9.56     | -12.32/-11.75   | -10.95/-10.37   | -10.00/-9.67    | -10.57/-10.37     | -10.30/-9.87      | -10.19/-9.70      | -8.48/-8.59       | -7.05/-4.79       | -3.07/-2.52       | -3.39/-4.67       | -4.83/-5.30       | -7.03/-8.64       | -5.60/-3.32       | -3.09/-3.80       | -4.97/-4.81       | -4.80/-4.55       | -3.94/-3.37       | -2.78/-2.76       | -3.30/-3.66       | -3.36/-4.67       |
| Θ (165°)   | -7.78/-9.88   | -11.52/-12.46   | -11.39/-11.40   | -11.11/-12.43   | -13.71/-12.45   | -11.18/-10.43   | -10.93/-13.15   | -15.20/-14.91     | -12.80/-12.27     | -13.32/-14.68     | -14.67/-12.74     | -8.95/-7.02       | -5.58/-4.55       | -5.09/-6.22       | -5.57/-5.38       | -6.46/-8.32       | -6.28/-4.92       | -5.70/-7.46       | -7.70/-6.64       | -6.29/-5.60       | -5.87/-5.20       | -4.01/-3.46       | -3.47/-4.13       | -4.98/-7.13       |
| Θ (172.5°) | -10.62/-10.04 | -8.63/-8.45     | -8.80/-8.46     | -8.77/-10.02    | -11.27/-12.24   | -13.11/-12.25   | -10.34/-11.03   | -12.51/-11.22     | -10.29/-11.26     | -10.50/-10.19     | -11.08/-9.98      | -8.55/-8.37       | -8.79/-8.25       | -7.81/-8.33       | -7.93/-6.68       | -6.46/-7.54       | -6.69/-5.10       | -5.04/-5.94       | -6.35/-5.98       | -5.99/-6.05       | -6.25/-6.51       | -6.81/-5.82       | -6.16/-7.06       | -8.89/-9.95       |
| Θ (180°)   | -9.79/-9.80   | -8.89/-8.75     | -8.18/-7.67     | -8.11/-8.65     | -9.91/-10.87    | -11.04/-10.30   | -10.37/-11.14   | -12.05/-12.49     | -13.06/-12.12     | -11.73/-12.90     | -13.82/-13.67     | -12.40/-11.99     | -12.64/-13.13     | -12.53/-13.39     | -13.04/-13.13     | -13.50/-15.15     | -14.05/-14.91     | -14.12/-13.20     | -14.04/-14.75     | -15.05/-15.50     | -14.99/-15.12     | -15.07/-15.49     | -15.85/-15.28     | -15.89/-13.79     |
| Freq(Hz)   | 5.6GPol.      | TotalAnt. 3     | -/-             | -/-             | -/-             | -/-             | -/-             | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               | -/-               |
| Gain       | Φ(0°)/Φ(7.5°) | Φ(15°)/Φ(22.5°) | Φ(30°)/Φ(37.5°) | Φ(45°)/Φ(52.5°) | Φ(60°)/Φ(67.5°) | Φ(75°)/Φ(82.5°) | Φ(90°)/Φ(97.5°) | Φ(105°)/Φ(112.5°) | Φ(120°)/Φ(127.5°) | Φ(135°)/Φ(142.5°) | Φ(150°)/Φ(157.5°) | Φ(165°)/Φ(172.5°) | Φ(180°)/Φ(187.5°) | Φ(195°)/Φ(202.5°) | Φ(210°)/Φ(217.5°) | Φ(225°)/Φ(232.5°) | Φ(240°)/Φ(247.5°) | Φ(255°)/Φ(262.5°) | Φ(270°)/Φ(277.5°) | Φ(285°)/Φ(292.5°) | Φ(300°)/Φ(307.5°) | Φ(315°)/Φ(322.5°) | Φ(330°)/Φ(337.5°) | Φ(345°)/Φ(352.5°) |
| Θ (0°)     | -4.22/-3.56   | -3.35/-3.47     | -4.01/-4.72     | -5.33/-4.79     | -4.12/-4.27     | -4.98/-5.05     | -4.37/-4.76     | -5.97/-6.32       | -6.03/-6.16       | -6.56/-6.57       | -6.89/-7.35       | -6.71/-6.54       | -7.12/-6.66       | -6.42/-8.02       | -7.39/-6.05       | -6.07/-5.22       | -5.21/-5.10       | -4.46/-4.74       | -4.69/-4.63       | -3.94/-5.07       | -5.36/-4.81       | -4.39/-3.85       | -3.28/-3.30       | -3.80/-3.90       |
| Θ (7.5°)   | -8.34/-8.21   | -8.34/-7.54     | -7.27/-7.00     | -7.54/-8.04     | -6.59/-6.22     | -5.39/-4.80     | -4.87/-5.12     | -4.36/-3.90       | -3.09/-2.92       | -2.63/-2.04       | -1.83/-1.83       | -1.12/-0.93       | -1.45/-0.75       | -0.72/-1.80       | -1.94/-1.44       | -2.26/-3.04       | -2.76/-3.10       | -3.79/-3.50       | -3.41/-4.91       | -6.58/-5.93       | -6.00/-6.71       | -7.92/-9.76       | -9.05/-7.96       | -8.28/-8.40       |
| Θ (15°)    | -6.86/-7.94   | -7.85/-6.05     | -5.49/-5.49     | -5.68/-5.89     | -6.00/-5.79     | -5.39/-4.72     | -3.74/-3.17     | -3.33/-2.96       | -1.72/-1.25       | -0.82/-0.40       | -0.45/-0.10       | 0.51/0.61         | 0.60/1.04         | 1.22/0.62         | 0.30/0.10         | -0.36/-0.59       | -0.80/-0.94       | -0.92/-0.38       | -0.60/-1.46       | -2.84/-3.70       | -2.00/-2.12       | -5.51/-5.29       | -6.31/-6.32       |                   |
| Θ (22.5°)  | -5.20/-5.85   | -5.46/-4.08     | -3.06/-3.16     | -5.53/-6.40     | -5.21/-4.61     | -5.69/-5.48     | -3.33/-1.55     | -0.86/-1.45       | -1.94/-2.66       | -2.39/-1.05       | -0.67/-0.03       | 0.60/0.52         | 0.27/0.36         | 0.71/1.21         | 1.44/1.26         | 1.17/1.43         | 1.47/1.44         | 1.28/1.10         | 0.33/-0.39        | -0.66/-0.79       | -1.69/-2.45       | -2.76/-3.05       | -3.48/-3.92       | -4.79/-4.49       |
| Θ (30°)    | -4.34/-3.09   | -3.13/-2.09     | -0.19/-0.11     | -2.70/-3.19     | -0.58/0.09      | -2.42/-7.33     | -10.69/-9.66    | -5.93/-2.88       | -0.76/-0.52       | -1.32/-0.81       | -1.30/-1.61       | -0.77/-0.30       | -0.32/-0.42       | 0.43/-0.80        | 2.29/1.88         | 1.29/0.66         | -0.54/-1.27       | -0.13/0.84        | 1.12/1.36         | 1.34/0.59         | -0.17/-0.58       | -1.09/-2.06       | -5.33/-9.45       | -9.88/-8.85       |
| Θ (37.5°)  | -5.76/-5.12   | -4.73/-3.68     | -1.68/0.19      | -0.34/0.30      | 2.18/2.04       | 0.16/-1.77      | -3.57/-3.62     | -1.66/-0.45       | 1.27/1.64         | 0.56/0.64         | 0.75/0.44         | -0.05/-0.69       | -1.05/-1.44       | -0.98/1.32        | -1.87/0.79        | 0.39/0.72         | 0.41/-0.63        | -2.26/-2.42       | -0.78/0.55        | 1.12/0.29         | -1.14/-2.32       | -1.61/-3.17       | -8.38/-8.31       | -9.84/-8.51       |
| Θ (45°)    | -1.86/-3.61   | -3.44/-1.49     | -2.57/-3.00     | -2.44/-0.41     | 0.73/-0.41      | -1.08/-1.72     | -3.26/-0.22     | 2.23/1.91         | 1.97/2.13         | 0.35/-1.03        | 0.57/1.73         | -0.24/-1.71       | -0.88/0.61        | -0.75/-0.48       | 0.29/-0.62        | -0.55/0.27        | -0.22/-0.85       | -2.18/-3.34       | -4.07/-2.93       | -0.73/-0.15       | -2.93/-7.14       | 4.46/-5.06        | -11.79/-7.84      | -5.22/-2.91       |
| Θ (52.5°)  | 0.41/-0.42    | -2.98/-0.99     | -4.09/-15.50    | -6.34/-1.42     | -0.07/-0.09     | 0.72/-1.40      | -3.43/-0.13     | 2.53/2.95         | 2.17/2.04         | 0.15/-1.42        | 1.77/2.90         | 1.62/0.53         | 1.84/2.69         | 0.61/-0.28        | -0.90/-1.54       | 0.11/0.10         | -1.05/-1.15       | -0.56/-1.64       | -3.18/-2.53       | -2.32/-1.29       | -2.67/-7.29       | -6.03/-5.30       | -6.81/-3.09       | -1.43/-6.57       |
| Θ (60°)    | -0.04/-2.26   | 1.29/1.07       | -0.01/-8.41     | -0.59/-3.44     | -1.27/1.08      | -0.05/-3.34     | -1.29/1.60      | 3.21/3.04         | 1.12/-0.42        | 0.50/0.76         | 2.74/3.23         | 2.51/3.05         | 2.77/3.60         | 3.26/2.26         | 0.84/-1.57        | -0.12/0.45        | 0.43/0.11         | -0.51/-0.13       | -1.14/-2.30       | -3.95/-5.99       | -4.52/-6.80       | -3.95/0.78        | 1.44/0.63         |                   |
| Θ (67.5°)  | 0.52/-1.80    | 0.46/0.03       | 2.35/-4.32      | -5.82/-4.72     | -1.97/0.12      | -3.22/-2.11     | -0.64/1.88      | 2.91/1.83         | -0.75/-2.10       | 0.99/2.23         | 4.14/3.32         | 3.02/2.63         | 4.10/4.84         | 4.02/3.11         | 1.50/-0.55        | -0.69/-0.53       | -0.25/0.56        | 0.66/-0.06        | -1.57/0.12        | 0.11/-2.90        | -7.85/-8.97       | -3.12/-3.18       | -2.01/1.31        | 1.73/2.38         |
| Θ (75°)    | 1.65/-2.97    | -0.87/-0.70     | 2.44/-1.83      | -4.52/-5.54     | -2.20/-1.32     | -3.14/-0.24     | -0.94/1.79      | 3.10/1.18         | -0.33/-1.71       | 0.72/1.71         | 3.47/3.25         | 3.16/3.14         | 3.85/4.69         | 4.44/2.73         | 2.64/2.25         | 2.17/2.05         | 1.06/1.58         | 1.84/1.55         | -0.39/0.99        | 0.78/-1.71        | -6.47/-7.94       | -2.62/-0.45       | 1.02/1.45         | 0.82/2.55         |
| Θ (82.5°)  | -0.08/-2.82   | 0.00/-0.54      | -0.88/-3.41     | -5.76/-5.72     | -2.33/-2.22     | 0.20/0.83       | -0.54/0.51      | 2.64/-0.24        | -0.57/-0.87       | 0.10/1.45         | 2.81/2.12         | 2.43/1.39         | 3.35/4.12         | 2.12/1.23         | 2.08/2.13         | 2.28/1.93         | 2.29/2.75         | 2.56/2.27         | -0.63/-1.10       | 1.00/-1.17        | -3.29/-6.16       | -2.58/-0.15       | 1.42/0.41         | -1.26/-0.04       |
| Θ (90°)    | -0.69/-3.65   | -0.95/-2.68     | -0.72/-4.29     | -4.74/-5.91     | -2.84/-2.69     | 0.83/-1.52      | -0.75/0.23      | 1.83/-1.65        | -1.22/-0.16       | -1.55/0.41        | 1.47/-0.04        | 1.47/-0.56        | 1.50/2.36         | 1.77/-0.81        | 1.32/2.11         | 1.63/1.70         | 1.03/1.64         | 2.04/1.25         | -2.30/0.97        | 1.62/-2.02        | -3.20/-2.50       | -4.56/-2.25       | -0.32/-1.60       | -0.90/-1.26       |
| Θ (97.5°)  | -0.26/-3.51   | -1.26/-7.78     | -2.68/-6.48     | -8.80/-6.48     | -3.73/-3.69     | -0.98/-0.74     | -0.02/-4.92     | -2.76/-0.75       | -1.87/-0.82       | -1.50/-3.41       | 0.07/-1.77        | -1.76/1.53        | -0.14/-2.77       | -1.50/0.04        | -0.22/-1.54       | -0.73/0.41        | 0.12/0.20         | -2.56/-0.42       | 0.33/-3.02        | -4.57/-3.29       | -2.74/-4.00       | -2.62/-0.35       | -1.95/-1.81       |                   |
| Θ (105°)   | -0.39/-5.74   | -2.08/-3.48     | -3.25/-6.42     | -6.44/-10.04    | -6.97/-5.68     | -0.88/-6.62     | -2.87/-2.32     | -0.94/-7.29       | -4.99/-2.22       | -4.43/-2.14       | -1.59/-4.67       | -2.34/-4.70       | -1.64/-0.92       | -1.62/-6.06       | -0.03/-0.31       | -0.23/-1.36       | -2.97/1.88        | -0.74/-0.51       | -1.52/-0.04       | 0.67/1.09         | -8.33/-4.26       | -3.75/-3.30       | -1.41/-5.30       | -3.15/-2.63       |
| Θ (112.5°) | -0.90/-2.15   | -3.03/-2.74     | -3.99/-9.71     | -6.60/-5.44     | -7.51/-7.74     | -2.50/-3.83     | -3.92/-7.22     | -5.22/-6.86       | -4.65/-1.70       | -5.79/-3.03       | -1.07/-3.35       | -3.01/-3.16       | -3.33/-0.58       | -2.04/-3.79       | -4.68/-0.68       | -0.40/-2.09       | -0.86/-0.55       | -2.04/-0.68       | 0.88/0.29         | -1.33/-3.17       | -6.22/-4.18       | -2.95/-4.91       | -3.12/-4.72       | -2.01/-1.04       |
| Θ (120°)   | -1.87/-3.89   | -4.11/-2.20     | -1.50/-4.45     | -5.22/-4.86     | -4.14/-5.43     | -3.69/-2.39     | -5.69/-14.72    | -9.49/-6.41       | -2.89/-0.24       | -2.26/-3.78       | -1.95/-1.07       | -2.79/-1.85       | -2.11/-2.31       | -3.91/-5.60       | -5.88/-3.07       | 0.07/0.71         | -0.33/-0.39       | -5.26/-4.05       | 2.09/0.27         | -4.64/-1.29       | -1.63/-3.22       | -2.08/-1.92       | -2.53/-5.93       | -6.97/-7.18       |
| Θ (127.5°) | -6.50/-2.99   | -5.24/-4.49     | -2.00/-2.79     | -4.04/-5.38     | -4.07/-3.74     | -6.08/-2.88     | -3.24/-5.86     | -7.60/-5.29       | -4.10/-0.81       | -3.29/-4.12       | -1.17/-0.68       | -1.06/0.28        | -1.58/-3.34       | -2.78/-4.73       | -7.60/-3.49       | 1.66/-1.12        | -1.40/-2.03       | -13.02/-6.24      | 3.33/0.80         | -6.09/-1.48       | 1.05/-5.47        | -0.83/-3.59       | -3.98/-8.00       | -9.45/-6.37       |
| Θ (135°)   | -14.12/-9.88  | -7.79/-6.83     | -3.93/-3.19     | -5.16/-7.72     | -7.94/-4.59     | -7.13/-10.45    | -5.97/-3.09     | -3.31/-7.20       | -11.07/-9.88      | -8.82/-5.43       | -2.18/-1.11       | -2.54/-2.34       | -1.76/-3.01       | -3.43/-2.38       | -4.77/-2.25       | -0.33/-1.80       | -0.31/-7.12       | -12.48/-4.98      | 2.87/0.66         | -7.09/-3.60       | 1.42/-3.12        | -5.28/-3.51       | -8.70/-11.60      | -11.75/-8.29      |
| Θ (142.5°) | -12.24/-7.62  | -3.85/-3.81     | -3.76/-3.64     | -6.84/-8.30     | -5.58/-7.64     | -5.43/-6.75     | -9.00/-9.53     | -12.13/-14.78     | -14.11/-9.06      | -4.41/-1.12       | -1.85/-4.59       | -7.13/-5.04       | -6.97/-5.28       | -3.09/-4.91       | -8.01/-10.12      | -8.90/-3.87       | -7.32/-14.77      | -8.07/-4.52       | 0.41/-1.92        | -9.63/-8.92       | -4.04/-1.89       | -7.18/-7.21       | -4.68/-7.09       | -6.66/-8.05       |
| Θ (150°)   | -5.39/-8.20   | -8.83/-7.63     | -7.28/-7.44     | -7.40/-7.50     | -7.62/-8.08     | -8.72/-8.41     | -6.21/-5.22     | -6.73/-9.37       | -9.60/-8.60       | -8.28/-8.39       | -7.43/-6.24       | -5.04/-4.73       | -5.83/-10.34      | -14.75/-15.87     | -14.95/-10.02     | -6.88/-6.83       | -11.97/-10.73     | -10.15/-6.85      | -4.30/-5.90       | -8.80/-7.81       | -5.64/-4.14       | -5.30/-8.22       | -8.69/-8.19       | -6.40/-5.00       |
| Θ (157.5°) | -5.43/-6.47   | -6.94/-6.41     | -6.10/-5.84     | -6.63/-8.10     | -10.64/-13.63   | -10.88/-8.06    | -7.09/-7.82     | -10.83/-13.43     | -13.89/-13.12     | -11.64/-8.81      | -6.90/-6.05       | -6.16/-5.80       | -4.28/-3.47       | -3.81/-3.87       | -4.17/-4.82       | -5.40/-5.36       | -3.95/-2.74       | -3.88/-6.05       | -7.33/-7.89       | -6.61/-6.49       | -5.35/-5.53       | -6.11/-6.76       | -5.87/-5.08       | -4.65/-5.41       |
| Θ (165°)   | -6.09/-7.40   | -9.22/-11.39    | -11.99/-10.16   | -8.48/-9.21     | -11.76/-15.20   | -15.82/-14.24   | -14.08/-13.10   | -12.51/-10.59     | -9.61/-9.93       | -10.64/-9.28      | -7.26/-3.64       | -6.04/-5.50       | -5.46/-5.60       | -5.84/-7.16       | -8.80/-7.35       | -5.72/-6.69       | -6.05/-5.46       |                   |                   |                   |                   |                   |                   |                   |

E1(XY plane) –  $\Theta(90)\Phi(0-360)$   
 E2(XZ plane) –  $\Theta(0-180)\Phi(0)$  and  $\Theta(0-180)\Phi(180)$   
 E3(YZ plane) –  $\Theta(0-180)\Phi(90)$  and  $\Theta(0-180)\Phi(270)$

