



Antenna Composite Gain Test Report

| | |
|-----------------|--|
| FCC ID | O2U-FW7881 |
| Equipment | CBN 5G NR Fixed Wireless Router |
| Brand Name | CBN |
| Model Name | FW7881 |
| Applicant | Compal Broadband Networks, Inc. 13F-1, No.1 Taiyuan 1st ST. Zhubei City, Hsinchu County 30288, Taiwan |
| Manufacturer | Compal Broadband Networks, Inc. 13F-1, No.1 Taiyuan 1st ST. Zhubei City, Hsinchu County 30288, Taiwan |
| Sample Received | Sep. 12, 2022 |
| Start Test Date | Sep. 22, 2022 |
| Final Test Date | Sep. 22, 2022 |

Approved by: **Sam Chen**

Sporton International Inc. Hsinchu Laboratory

No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



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History of this test report

| Report No. | Version | Description | Issued Date |
|------------|---------|-------------------------|---------------|
| AP282902 | 01 | Initial issue of report | Nov. 11, 2022 |
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1. Operation Mode and Antenna Information

| Antenna Position | RF Port | Brand Name | Model Name | Ant. Type | Connector | Modes of Operation |
|------------------|---------|------------|-----------------|-----------|-----------|--------------------------|
| Ant1 | 2 | Lynwave | ALX21P-221AA1-A | Dipole | I-PEX | 2.4GHz, 5GHz UNII 1~3 |
| Ant2 | 1 | Lynwave | ALX21P-221AA1-A | Dipole | I-PEX | 2.4GHz, 5GHz UNII 1~3 |
| Ant3 | 3 | Lynwave | ALX21P-221AA2-A | Dipole | I-PEX | 2.4GHz, 5GHz UNII 1~3 |
| Ant4 | 4 | Lynwave | ALX21P-221AA2-A | Dipole | I-PEX | 2.4GHz, 5GHz UNII 1~3 |

Note:

2.4GHz and 5GHz Operation Mode (4TX/4RX)

Ant1~4 can be used as transmitting/receiving antenna.

Ant1~4 could transmit/receive simultaneously.

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

| Testing Location | | |
|---|--------|--|
| Sporton International Inc. Hsinhua Laboratory | | |
| <input checked="" type="checkbox"/> | HWA YA | ADD : No.13-1 & 14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333, Taiwan R.O.C. |

| Test Condition | Test Site No. | Test Engineer | Test Environment (°C / %) | Test Date |
|----------------|---------------|---------------|---------------------------|---------------|
| Radiated | 05CH03-HY | Rex Liao | 23.5-24.5 / 45-55 | Sep. 22, 2022 |

Note:

Testing Site Information

Brand Name: TDK

Dimension: 11m*6m*6m

Characteristic: Fully Anechoic Chamber

4. Test Facility and Configuration

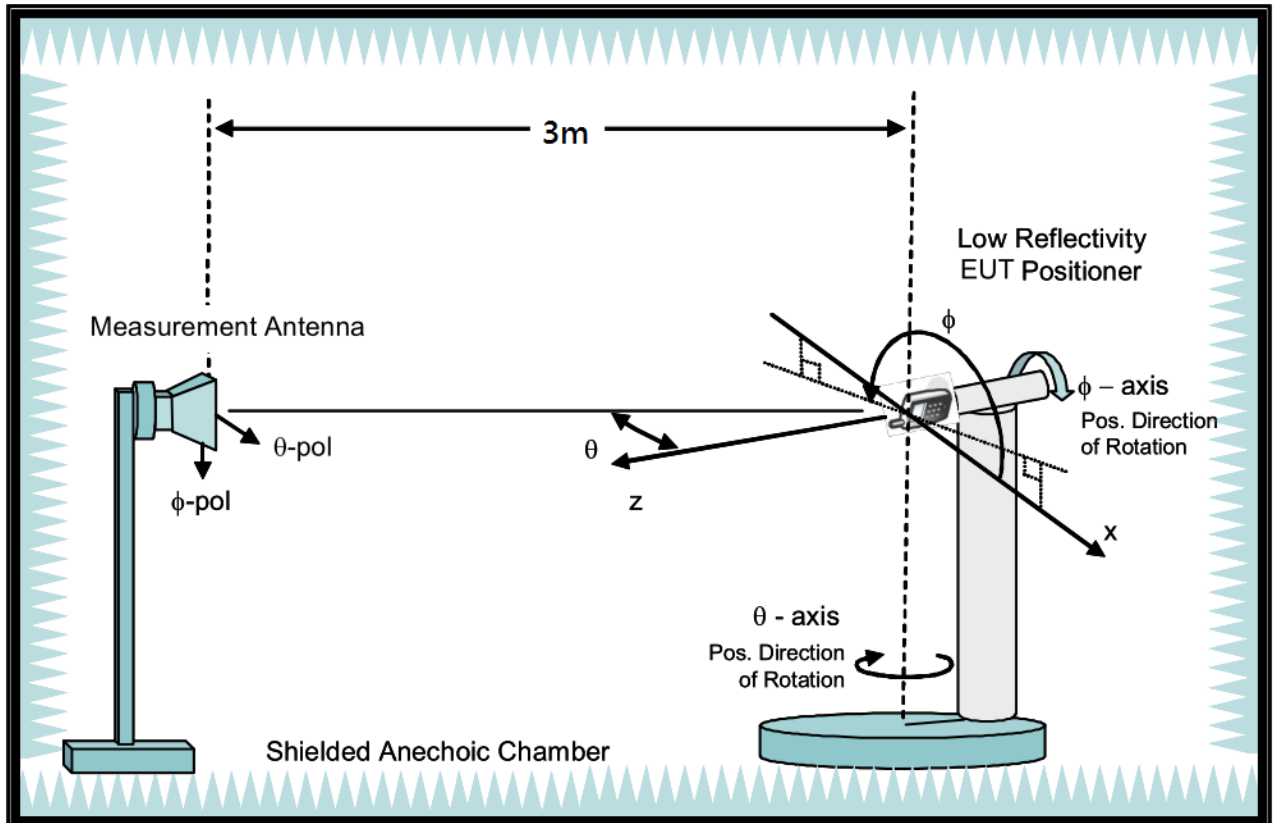
Test configuration: Reference to CITA OTA distributed-axes system configuration.

Chamber: Fully Anechoic Chamber.

Measurement antenna: Dual Polarization Horn antenna

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

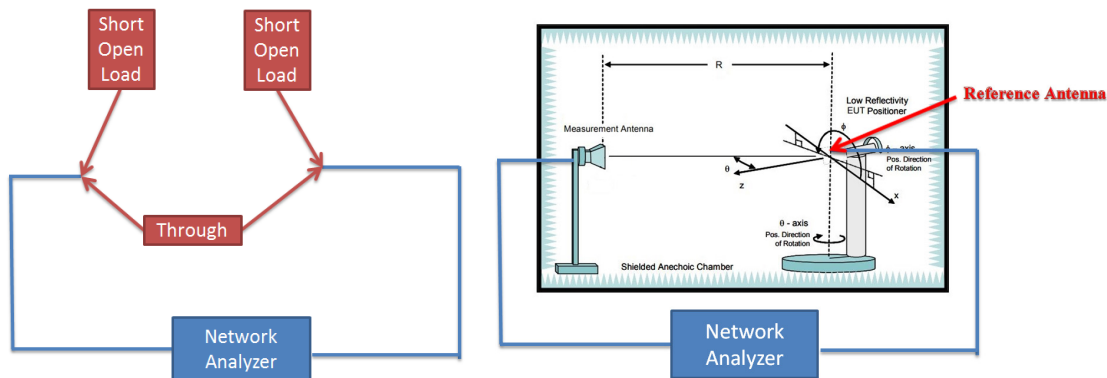
#Reference to CTIA "ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1"



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 | -33.27 | -32.92 | -32.91 | -32.73 | -32.02 | -32.67 | -32.82 | -32.98 | -33.18 | -32.8 | -33.92 | -34.62 | -35.57 |
| G(phi) reading (dB) | -33.15 | -32.7 | -32.41 | -32.61 | -32.43 | -31.72 | -32.37 | -32.51 | -32.52 | -32.66 | -32.5 | -33.62 | -34.32 | -35.48 |
| Reference gain (dBi) | 10.1 | 10.4 | 10.7 | 12.5 | 12.7 | 13.5 | 13.4 | 13.3 | 13.3 | 13.2 | 13.4 | 12.5 | 12.1 | 11.4 |
| Factor(theta) (dB) | 43.65 | 43.67 | 43.62 | 45.41 | 45.43 | 45.52 | 46.07 | 46.12 | 46.28 | 46.38 | 46.2 | 46.42 | 46.72 | 46.97 |
| Factor(phi) (dB) | 43.25 | 43.1 | 43.11 | 45.11 | 45.13 | 45.22 | 45.77 | 45.81 | 45.82 | 45.86 | 45.9 | 46.12 | 46.42 | 46.88 |

Note:

$$G \text{ reading (dB)} = 20 \cdot \log(V2/V1) = 10 \cdot \log(P2/P1)$$

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) | 3.18 | -8.11 | -4.37 | -9.66 | -3.64 |
| Ant. 2 (dBi) | 3.42 | -4.97 | 1.37 | 4.99 | 4.79 |
| Ant. 3 (dBi) | -5.85 | 0.35 | 3.01 | -0.24 | -7.59 |
| Ant. 4 (dBi) | -0.54 | 5.27 | -5.12 | 1.01 | 2.17 |
| DG [1SS] (dBi) | 6.8 | 5.65 | 5.45 | 6.45 | 6.22 |
| Polarization | Theta | Phi | Theta | Theta | Theta |
| $\Theta(^{\circ})$ | 37.5 | 120 | 75 | 60 | 67.5 |
| $\Phi(^{\circ})$ | 105 | 15 | 337.5 | 22.5 | 37.5 |

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 [$10^{(G/20)}$] | $10^{(3.18/20)}$ | $10^{(-8.11/20)}$ | $10^{(-4.37/20)}$ | $10^{(-9.66/20)}$ | $10^{(-3.64/20)}$ |
| Ant. 2 [$10^{(G/20)}$] | $10^{(3.42/20)}$ | $10^{(-4.97/20)}$ | $10^{(1.37/20)}$ | $10^{(4.99/20)}$ | $10^{(4.79/20)}$ |
| Ant. 3 [$10^{(G/20)}$] | $10^{(-5.85/20)}$ | $10^{(0.35/20)}$ | $10^{(3.01/20)}$ | $10^{(-0.24/20)}$ | $10^{(-7.59/20)}$ |
| Ant. 4 [$10^{(G/20)}$] | $10^{(-0.54/20)}$ | $10^{(5.27/20)}$ | $10^{(-5.12/20)}$ | $10^{(1.01/20)}$ | $10^{(2.17/20)}$ |
| Ant. 1 [$10^{(G/20)}$] value | 1.442 | 0.393 | 0.605 | 0.329 | 0.658 |
| Ant. 2 [$10^{(G/20)}$] value | 1.483 | 0.564 | 1.171 | 1.776 | 1.736 |
| Ant. 3 [$10^{(G/20)}$] value | 0.51 | 1.041 | 1.414 | 0.973 | 0.417 |
| Ant. 4 [$10^{(G/20)}$] value | 0.94 | 1.834 | 0.555 | 1.123 | 1.284 |
| Sum All Antenna [Amax] | 4.374 | 3.833 | 3.744 | 4.201 | 4.095 |
| DG [$10 \cdot \log(A_{max}^2/N_{ant})$] | 6.8 | 5.65 | 5.45 | 6.45 | 6.22 |

Note:

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

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



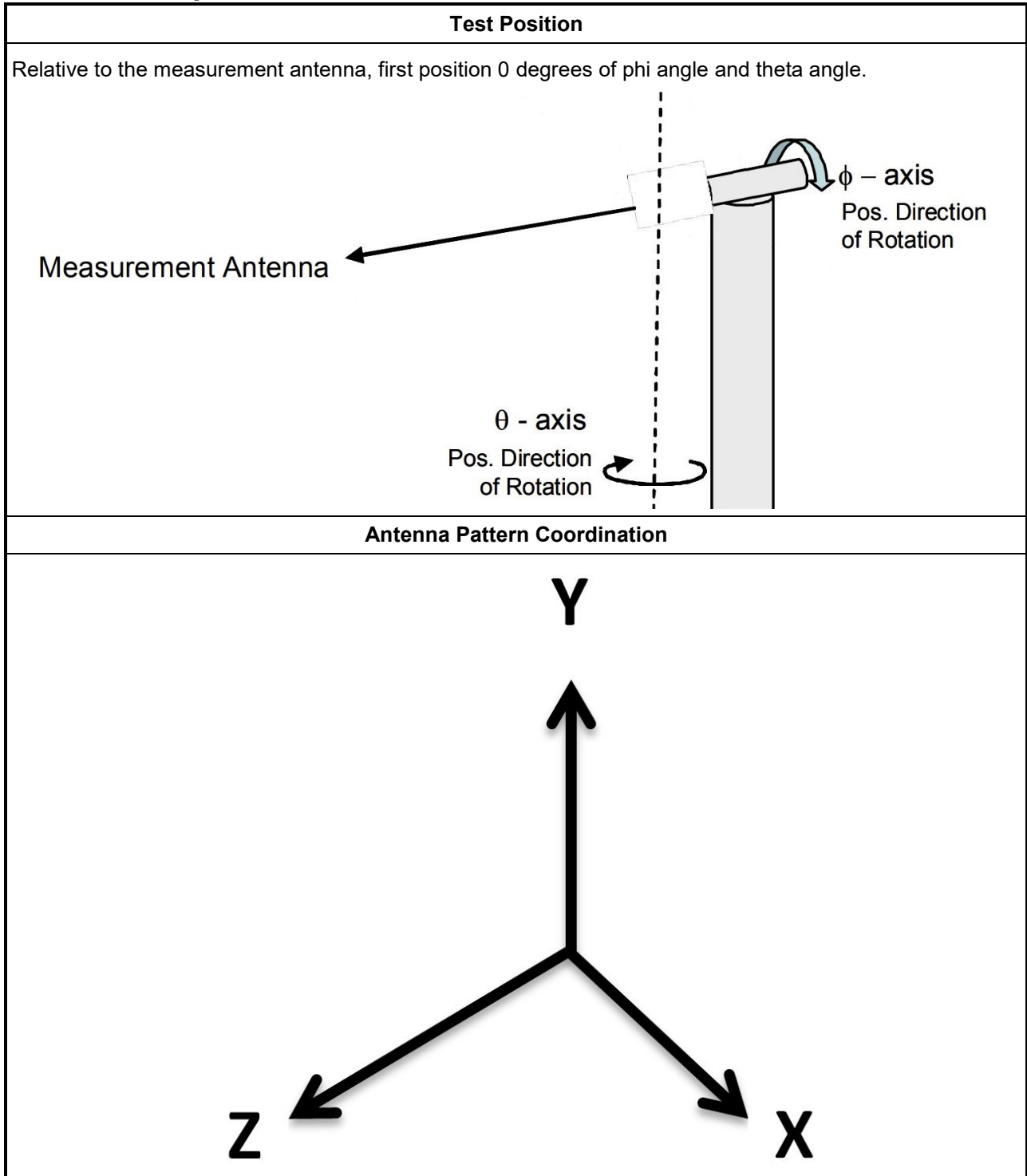
8. Summary of Test Result

| Frequency (Hz) | 2.45G | 5.2G | 5.3G | 5.6G | 5.785G |
|--|-----------------|-----------------|------------------|------------------|-----------------|
| Ant. 1 Max Gain (dBi) | 3.78 | 3.44 | 2.93 | 3.89 | 4.93 |
| Ant. 2 Max Gain (dBi) | 3.54 | 4.09 | 4.35 | 4.99 | 5.82 |
| Ant. 3 Max Gain (dBi) | 2.96 | 4.48 | 3.51 | 2.81 | 3.46 |
| Ant. 4 Max Gain (dBi) | 3.55 | 5.29 | 4.52 | 4.63 | 5.75 |
| Ant. 1 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$ | Theta/45/120 | Theta/60/150 | Theta/52.5/150 | Theta/112.5/52.5 | Theta/112.5/45 |
| Ant. 2 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$ | Phi/37.5/112.5 | Theta/112.5/135 | Theta/112.5/135 | Theta/60/22.5 | Theta/112.5/135 |
| Ant. 3 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$ | Theta/75/270 | Theta/75/330 | Theta/82.5/337.5 | Theta/60/0 | Theta/82.5/285 |
| Ant. 4 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$ | Theta/37.5/52.5 | Phi/120/7.5 | Phi/120/15 | Phi/112.5/15 | Phi/127.5/7.5 |
| Max Gain (dBi) | 3.78 | 5.29 | 4.52 | 4.99 | 5.82 |
| DG [1SS] (dBi) | 6.8 | 5.65 | 5.45 | 6.45 | 6.22 |
| DG [2SS] (dBi) | 3.79 | 5.29 | 4.52 | 4.99 | 5.82 |
| DG [4SS] (dBi) | 3.78 | 5.29 | 4.52 | 4.99 | 5.82 |

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) – 3.01dB. If directional gain is less than max gain, use max gain as directional gain.
4. Directional Gain (4SS) = Directional Gain (1SS) – 6.02dB. If directional gain is less than max gain, use max gain as directional gain.

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-1543 | 1GHz~18GHz | May 31, 2022 | May 30, 2023 |
| Dual Polarization Horn Antenna | Sporton | S0209DP | S0209DP-001 | 2GHz~9GHz | N.C.R. | N.C.R. |
| ENA Series Network Analyzer | AGILENT | E5071C | MY46419201 | 100kHz~8.5GHz | Feb. 21, 2022 | Feb. 20, 2023 |
| 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 of 2.4GHz, 5GHz U-NII 1~U-NII 3..... | Page 13 |
| Appendix B – Antenna Pattern of 2.4GHz, 5GHz U-NII 1~U-NII 3..... | Page 27 |
| Appendix C – Test Photos..... | Page 34 |



| Freq(Hz) | 2.45G | 5.2G | 5.3G | 5.6G | 5.785G |
|--|-----------------|-----------------|------------------|------------------|-----------------|
| Ant. 1 Max Gain (dBi) | 3.78 | 3.44 | 2.93 | 3.89 | 4.93 |
| Ant. 2 Max Gain (dBi) | 3.54 | 4.09 | 4.35 | 4.99 | 5.82 |
| Ant. 3 Max Gain (dBi) | 2.96 | 4.48 | 3.51 | 2.81 | 3.46 |
| Ant. 4 Max Gain (dBi) | 3.55 | 5.29 | 4.52 | 4.63 | 5.75 |
| Ant. 1 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$ | Theta/45/120 | Theta/60/150 | Theta/52.5/150 | Theta/112.5/52.5 | Theta/112.5/45 |
| Ant. 2 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$ | Phi/37.5/112.5 | Theta/112.5/135 | Theta/112.5/135 | Theta/60/22.5 | Theta/112.5/135 |
| Ant. 3 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$ | Theta/75/270 | Theta/75/330 | Theta/82.5/337.5 | Theta/60/0 | Theta/82.5/285 |
| Ant. 4 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$ | Theta/37.5/52.5 | Phi/120/7.5 | Phi/120/15 | Phi/112.5/15 | Phi/127.5/7.5 |
| Max Gain (dBi) | 3.78 | 5.29 | 4.52 | 4.99 | 5.82 |
| DG [1SS] (dBi) | 6.8 | 5.65 | 5.45 | 6.45 | 6.22 |
| DG [2SS] (dBi) | 3.79 | 5.29 | 4.52 | 4.99 | 5.82 |
| DG [4SS] (dBi) | 3.78 | 5.29 | 4.52 | 4.99 | 5.82 |



Radiated Composite Gain Data

Appendix A

DG 1SS Result

Table with columns for Frequency (Freq/Hz), Polarization (Pol.), and various gain data points (Phi values) for frequencies from 3.673 to 5.375 GHz. The table is organized into sections for 2.45G Pol., 5.2G Pol., and 5.3G Pol., each with a sub-section for Theta (Theta) and Delta Gamma (DG) values.



Radiated Composite Gain Data

Appendix A

| Theta | 152.5 | 157.5 | 162.5 | 167.5 | 172.5 | 177.5 | 182.5 | 187.5 | 192.5 | 197.5 | 202.5 | 207.5 | 212.5 | 217.5 | 222.5 | 227.5 | 232.5 | 237.5 | 242.5 | 247.5 | 252.5 | 257.5 | 262.5 | 267.5 | 272.5 | 277.5 | 282.5 | 287.5 | 292.5 | 297.5 | 302.5 | 307.5 | 312.5 | 317.5 | 322.5 | 327.5 | 332.5 | 337.5 | 342.5 | 347.5 | 352.5 | 357.5 | 362.5 | 367.5 | 372.5 | 377.5 | 382.5 | 387.5 | 392.5 | 397.5 | 402.5 | 407.5 | 412.5 | 417.5 | 422.5 | 427.5 | 432.5 | 437.5 | 442.5 | 447.5 | 452.5 | 457.5 | 462.5 | 467.5 | 472.5 | 477.5 | 482.5 | 487.5 | 492.5 | 497.5 | 502.5 | 507.5 | 512.5 | 517.5 | 522.5 | 527.5 | 532.5 | 537.5 | 542.5 | 547.5 | 552.5 | 557.5 | 562.5 | 567.5 | 572.5 | 577.5 | 582.5 | 587.5 | 592.5 | 597.5 | 602.5 | 607.5 | 612.5 | 617.5 | 622.5 | 627.5 | 632.5 | 637.5 | 642.5 | 647.5 | 652.5 | 657.5 | 662.5 | 667.5 | 672.5 | 677.5 | 682.5 | 687.5 | 692.5 | 697.5 | 702.5 | 707.5 | 712.5 | 717.5 | 722.5 | 727.5 | 732.5 | 737.5 | 742.5 | 747.5 | 752.5 | 757.5 | 762.5 | 767.5 | 772.5 | 777.5 | 782.5 | 787.5 | 792.5 | 797.5 | 802.5 | 807.5 | 812.5 | 817.5 | 822.5 | 827.5 | 832.5 | 837.5 | 842.5 | 847.5 | 852.5 | 857.5 | 862.5 | 867.5 | 872.5 | 877.5 | 882.5 | 887.5 | 892.5 | 897.5 | 902.5 | 907.5 | 912.5 | 917.5 | 922.5 | 927.5 | 932.5 | 937.5 | 942.5 | 947.5 | 952.5 | 957.5 | 962.5 | 967.5 | 972.5 | 977.5 | 982.5 | 987.5 | 992.5 | 997.5 | 1002.5 | 1007.5 | 1012.5 | 1017.5 | 1022.5 | 1027.5 | 1032.5 | 1037.5 | 1042.5 | 1047.5 | 1052.5 | 1057.5 | 1062.5 | 1067.5 | 1072.5 | 1077.5 | 1082.5 | 1087.5 | 1092.5 | 1097.5 | 1102.5 | 1107.5 | 1112.5 | 1117.5 | 1122.5 | 1127.5 | 1132.5 | 1137.5 | 1142.5 | 1147.5 | 1152.5 | 1157.5 | 1162.5 | 1167.5 | 1172.5 | 1177.5 | 1182.5 | 1187.5 | 1192.5 | 1197.5 | 1202.5 | 1207.5 | 1212.5 | 1217.5 | 1222.5 | 1227.5 | 1232.5 | 1237.5 | 1242.5 | 1247.5 | 1252.5 | 1257.5 | 1262.5 | 1267.5 | 1272.5 | 1277.5 | 1282.5 | 1287.5 | 1292.5 | 1297.5 | 1302.5 | 1307.5 | 1312.5 | 1317.5 | 1322.5 | 1327.5 | 1332.5 | 1337.5 | 1342.5 | 1347.5 | 1352.5 | 1357.5 | 1362.5 | 1367.5 | 1372.5 | 1377.5 | 1382.5 | 1387.5 | 1392.5 | 1397.5 | 1402.5 | 1407.5 | 1412.5 | 1417.5 | 1422.5 | 1427.5 | 1432.5 | 1437.5 | 1442.5 | 1447.5 | 1452.5 | 1457.5 | 1462.5 | 1467.5 | 1472.5 | 1477.5 | 1482.5 | 1487.5 | 1492.5 | 1497.5 | 1502.5 | 1507.5 | 1512.5 | 1517.5 | 1522.5 | 1527.5 | 1532.5 | 1537.5 | 1542.5 | 1547.5 | 1552.5 | 1557.5 | 1562.5 | 1567.5 | 1572.5 | 1577.5 | 1582.5 | 1587.5 | 1592.5 | 1597.5 | 1602.5 | 1607.5 | 1612.5 | 1617.5 | 1622.5 | 1627.5 | 1632.5 | 1637.5 | 1642.5 | 1647.5 | 1652.5 | 1657.5 | 1662.5 | 1667.5 | 1672.5 | 1677.5 | 1682.5 | 1687.5 | 1692.5 | 1697.5 | 1702.5 | 1707.5 | 1712.5 | 1717.5 | 1722.5 | 1727.5 | 1732.5 | 1737.5 | 1742.5 | 1747.5 | 1752.5 | 1757.5 | 1762.5 | 1767.5 | 1772.5 | 1777.5 | 1782.5 | 1787.5 | 1792.5 | 1797.5 | 1802.5 | 1807.5 | 1812.5 | 1817.5 | 1822.5 | 1827.5 | 1832.5 | 1837.5 | 1842.5 | 1847.5 | 1852.5 | 1857.5 | 1862.5 | 1867.5 | 1872.5 | 1877.5 | 1882.5 | 1887.5 | 1892.5 | 1897.5 | 1902.5 | 1907.5 | 1912.5 | 1917.5 | 1922.5 | 1927.5 | 1932.5 | 1937.5 | 1942.5 | 1947.5 | 1952.5 | 1957.5 | 1962.5 | 1967.5 | 1972.5 | 1977.5 | 1982.5 | 1987.5 | 1992.5 | 1997.5 | 2002.5 | 2007.5 | 2012.5 | 2017.5 | 2022.5 | 2027.5 | 2032.5 | 2037.5 | 2042.5 | 2047.5 | 2052.5 | 2057.5 | 2062.5 | 2067.5 | 2072.5 | 2077.5 | 2082.5 | 2087.5 | 2092.5 | 2097.5 | 2102.5 | 2107.5 | 2112.5 | 2117.5 | 2122.5 | 2127.5 | 2132.5 | 2137.5 | 2142.5 | 2147.5 | 2152.5 | 2157.5 | 2162.5 | 2167.5 | 2172.5 | 2177.5 | 2182.5 | 2187.5 | 2192.5 | 2197.5 | 2202.5 | 2207.5 | 2212.5 | 2217.5 | 2222.5 | 2227.5 | 2232.5 | 2237.5 | 2242.5 | 2247.5 | 2252.5 | 2257.5 | 2262.5 | 2267.5 | 2272.5 | 2277.5 | 2282.5 | 2287.5 | 2292.5 | 2297.5 | 2302.5 | 2307.5 | 2312.5 | 2317.5 | 2322.5 | 2327.5 | 2332.5 | 2337.5 | 2342.5 | 2347.5 | 2352.5 | 2357.5 | 2362.5 | 2367.5 | 2372.5 | 2377.5 | 2382.5 | 2387.5 | 2392.5 | 2397.5 | 2402.5 | 2407.5 | 2412.5 | 2417.5 | 2422.5 | 2427.5 | 2432.5 | 2437.5 | 2442.5 | 2447.5 | 2452.5 | 2457.5 | 2462.5 | 2467.5 | 2472.5 | 2477.5 | 2482.5 | 2487.5 | 2492.5 | 2497.5 | 2502.5 | 2507.5 | 2512.5 | 2517.5 | 2522.5 | 2527.5 | 2532.5 | 2537.5 | 2542.5 | 2547.5 | 2552.5 | 2557.5 | 2562.5 | 2567.5 | 2572.5 | 2577.5 | 2582.5 | 2587.5 | 2592.5 | 2597.5 | 2602.5 | 2607.5 | 2612.5 | 2617.5 | 2622.5 | 2627.5 | 2632.5 | 2637.5 | 2642.5 | 2647.5 | 2652.5 | 2657.5 | 2662.5 | 2667.5 | 2672.5 | 2677.5 | 2682.5 | 2687.5 | 2692.5 | 2697.5 | 2702.5 | 2707.5 | 2712.5 | 2717.5 | 2722.5 | 2727.5 | 2732.5 | 2737.5 | 2742.5 | 2747.5 | 2752.5 | 2757.5 | 2762.5 | 2767.5 | 2772.5 | 2777.5 | 2782.5 | 2787.5 | 2792.5 | 2797.5 | 2802.5 | 2807.5 | 2812.5 | 2817.5 | 2822.5 | 2827.5 | 2832.5 | 2837.5 | 2842.5 | 2847.5 | 2852.5 | 2857.5 | 2862.5 | 2867.5 | 2872.5 | 2877.5 | 2882.5 | 2887.5 | 2892.5 | 2897.5 | 2902.5 | 2907.5 | 2912.5 | 2917.5 | 2922.5 | 2927.5 | 2932.5 | 2937.5 | 2942.5 | 2947.5 | 2952.5 | 2957.5 | 2962.5 | 2967.5 | 2972.5 | 2977.5 | 2982.5 | 2987.5 | 2992.5 | 2997.5 | 3002.5 | 3007.5 | 3012.5 | 3017.5 | 3022.5 | 3027.5 | 3032.5 | 3037.5 | 3042.5 | 3047.5 | 3052.5 | 3057.5 | 3062.5 | 3067.5 | 3072.5 | 3077.5 | 3082.5 | 3087.5 | 3092.5 | 3097.5 | 3102.5 | 3107.5 | 3112.5 | 3117.5 | 3122.5 | 3127.5 | 3132.5 | 3137.5 | 3142.5 | 3147.5 | 3152.5 | 3157.5 | 3162.5 | 3167.5 | 3172.5 | 3177.5 | 3182.5 | 3187.5 | 3192.5 | 3197.5 | 3202.5 | 3207.5 | 3212.5 | 3217.5 | 3222.5 | 3227.5 | 3232.5 | 3237.5 | 3242.5 | 3247.5 | 3252.5 | 3257.5 | 3262.5 | 3267.5 | 3272.5 | 3277.5 | 3282.5 | 3287.5 | 3292.5 | 3297.5 | 3302.5 | 3307.5 | 3312.5 | 3317.5 | 3322.5 | 3327.5 | 3332.5 | 3337.5 | 3342.5 | 3347.5 | 3352.5 | 3357.5 | 3362.5 | 3367.5 | 3372.5 | 3377.5 | 3382.5 | 3387.5 | 3392.5 | 3397.5 | 3402.5 | 3407.5 | 3412.5 | 3417.5 | 3422.5 | 3427.5 | 3432.5 | 3437.5 | 3442.5 | 3447.5 | 3452.5 | 3457.5 | 3462.5 | 3467.5 | 3472.5 | 3477.5 | 3482.5 | 3487.5 | 3492.5 | 3497.5 | 3502.5 | 3507.5 | 3512.5 | 3517.5 | 3522.5 | 3527.5 | 3532.5 | 3537.5 | 3542.5 | 3547.5 | 3552.5 | 3557.5 | 3562.5 | 3567.5 | 3572.5 | 3577.5 | 3582.5 | 3587.5 | 3592.5 | 3597.5 | 3602.5 | 3607.5 | 3612.5 | 3617.5 | 3622.5 | 3627.5 | 3632.5 | 3637.5 | 3642.5 | 3647.5 | 3652.5 | 3657.5 | 3662.5 | 3667.5 | 3672.5 | 3677.5 | 3682.5 | 3687.5 | 3692.5 | 3697.5 | 3702.5 | 3707.5 | 3712.5 | 3717.5 | 3722.5 | 3727.5 | 3732.5 | 3737.5 | 3742.5 | 3747.5 | 3752.5 | 3757.5 | 3762.5 | 3767.5 | 3772.5 | 3777.5 | 3782.5 | 3787.5 | 3792.5 | 3797.5 | 3802.5 | 3807.5 | 3812.5 | 3817.5 | 3822.5 | 3827.5 | 3832.5 | 3837.5 | 3842.5 | 3847.5 | 3852.5 | 3857.5 | 3862.5 | 3867.5 | 3872.5 | 3877.5 | 3882.5 | 3887.5 | 3892.5 | 3897.5 | 3902.5 | 3907.5 | 3912.5 | 3917.5 | 3922.5 | 3927.5 | 3932.5 | 3937.5 | 3942.5 | 3947.5 | 3952.5 | 3957.5 | 3962.5 | 3967.5 | 3972.5 | 3977.5 | 3982.5 | 3987.5 | 3992.5 | 3997.5 | 4002.5 | 4007.5 | 4012.5 | 4017.5 | 4022.5 | 4027.5 | 4032.5 | 4037.5 | 4042.5 | 4047.5 | 4052.5 | 4057.5 | 4062.5 | 4067.5 | 4072.5 | 4077.5 | 4082.5 | 4087.5 | 4092.5 | 4097.5 | 4102.5 | 4107.5 | 4112.5 | 4117.5 | 4122.5 | 4127.5 | 4132.5 | 4137.5 | 4142.5 | 4147.5 | 4152.5 | 4157.5 | 4162.5 | 4167.5 | 4172.5 | 4177.5 | 4182.5 | 4187.5 | 4192.5 | 4197.5 | 4202.5 | 4207.5 | 4212.5 | 4217.5 | 4222.5 | 4227.5 | 4232.5 | 4237.5 | 4242.5 | 4247.5 | 4252.5 | 4257.5 | 4262.5 | 4267.5 | 4272.5 | 4277.5 | 4282.5 | 4287.5 | 4292.5 | 4297.5 | 4302.5 | 4307.5 | 4312.5 | 4317.5 | 4322.5 | 4327.5 | 4332.5 | 4337.5 | 4342.5 | 4347.5 | 4352.5 | 4357.5 | 4362.5 | 4367.5 | 4372.5 | 4377.5 | 4382.5 | 4387.5 | 4392.5 | 4397.5 | 4402.5 | 4407.5 | 4412.5 | 4417.5 | 4422.5 | 4427.5 | 4432.5 | 4437.5 | 4442.5 | 4447.5 | 4452.5 | 4457.5 | 4462.5 | 4467.5 | 4472.5 | 4477.5 | 4482.5 | 4487.5 | 4492.5 | 4497.5 | 4502.5 | 4507.5 | 4512.5 | 4517.5 | 4522.5 | 4527.5 | 4532.5 | 4537.5 | 4542.5 | 4547.5 | 4552.5 | 4557.5 | 4562.5 | 4567.5 | 4572.5 | 4577.5 | 4582.5 | 4587.5 | 4592.5 | 4597.5 | 4602.5 | 4607.5 | 4612.5 | 4617.5 | 4622.5 | 4627.5 | 4632.5 | 4637.5 | 4642.5 | 4647.5 | 4652.5 | 4657.5 | 4662.5 | 4667.5 | 4672.5 | 4677.5 | 4682.5 | 4687.5 | 4692.5 | 4697.5 | 4702.5 | 4707.5 | 4712.5 | 4717.5 | 4722.5 | 4727.5 | 4732.5 | 4737.5 | 4742.5 | 4747.5 | 4752.5 | 4757.5 | 4762.5 | 4767.5 | 4772.5 | 4777.5 | 4782.5 | 4787.5 | 4792.5 | 4797.5 | 4802.5 | 4807.5 | 4812.5 | 4817.5 | 4822.5 | 4827.5 | 4832.5 | 4837.5 | 4842.5 | 4847.5 | 4852.5 | 4857.5 | 4862.5 | 4867.5 | 4872.5 | 4877.5 | 4882.5 | 4887.5 | 4892.5 | 4897.5 | 4902.5 | 4907.5 | 4912.5 | 4917.5 | 4922.5 | 4927.5 | 4932.5 | 4937.5 | 4942.5 | 4947.5 | 4952.5 | 4957.5 | 4962.5 | 4967.5 | 4972.5 | 4977.5 | 4982.5 | 4987.5 | 4992.5 | 4997.5 | 5002.5 | 5007.5 | 5012.5 | 5017.5 | 5022.5 | 5027.5 | 5032.5 | 5037.5 | 5042.5 | 5047.5 | 5052.5 | 5057.5 | 5062.5 | 5067.5 | 5072.5 | 5077.5 | 5082.5 | 5087.5 | 5092.5 | 5097.5 | 5102.5 | 5107.5 | 5112.5 | 5117.5 | 5122.5 | 5127.5 | 5132.5 | 5137.5 | 5142.5 | 5147.5 | 5152.5 | 5157.5 | 5162.5 | 5167.5 | 5172.5 | 5177.5 | 5182.5 | 5187.5 | 5192.5 | 5197.5 | 5202.5 | 5207.5 | 5212.5 | 5217.5 | 5222.5 | 5227.5 | 5232.5 | 5237.5 | 5242.5 | 5247.5 | 5252.5 | 5257.5 | 5262.5 | 5267.5 | 5272.5 | 5277.5 | 5282.5 | 5287.5 | 5292.5 | 5297.5 | 5302.5 | 5307.5 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----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|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----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Radiated Composite Gain Data

Appendix A

| Theta (°) | -1.55/-0.21 | 0.02/-0.19 | -0.07/-0.03 | -0.13/-1.01 | -1.68/-0.97 | -0.62/-1.5 | -2.17/0.05 | 1.21/3 | 1.46/0.21 | -1.19/-1.51 | -1.27/-1.22 | -1.5/-1.58 | -3.12/-4.16 | -0.89/-0.14 | -2.18/-5.87 | -6.95/-5.87 | -6.38/-6.27 | -3.53/-5.32 | -3.13/-2.89 | -3.8/-6.46 | -3.22/-1.5 | -0.21/-0.33 | 0.09/-0.96 | -1.55/-2.74 |
|----------------|------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Theta (82.5°) | -0.88/1.4 | 2.5/2.87 | 2.64/1.83 | 1.59/1.43 | -0.26/-1.98 | -2.08/-0.4 | 1.79/3.43 | 4.3/3.38 | -0.36/-3.37 | -2.07/-1.58 | -0.71/-0.4 | -0.43/-2.47 | -2.57/-1.1 | -1.27/-1.89 | -2.52/-3.41 | -4.54/-5.95 | -6.04/-5.54 | -5.36/-4.54 | -6.45/-6.33 | -4.3/-3.44 | -4.8/-3.15 | -2.57/-5.15 | -6.26/-5.05 | -3.89/-2.87 |
| Theta (90°) | 0.4/1.88 | 2.87/3.32 | 2.18/1.74 | 1.97/0.66 | -1.1/-1.4 | -1.03/0.54 | 1.83/2.77 | 2.65/0.17 | -3.37/-1.76 | 1.96/2.15 | 1.71/5.2 | 1.11/-0.91 | -2.17/-1.65 | -1.23/-2.15 | -2.26/-2.34 | -2.54/-3.15 | -9.04/-9.62 | -4.63/-7.52 | -5.53/-1.16 | -2.26/-2.84 | -2.77/-3.79 | -3.89/-3.54 | -2.59/-0.53 | 0.01/0.08 |
| Theta (97.5°) | 1.98/1.98 | 2.66/3.24 | 2.66/1.91 | 0.72/-1.3 | -1.05/-1.38 | -1.34/0.99 | 3.25/3.45 | 2.04/0.78 | -2.19/-1.29 | 0.79/1.79 | 2.31/2.54 | 1.9/-2.93 | -5.71/-2.01 | -2.09/-3.12 | -3.36/-1.14 | -0.89/-3.22 | -7.07/-6.2 | -6.31/-6.85 | -3.99/-3.59 | -4.74/-0.79 | -1.43/-5.1 | -3.4/-2.19 | 0.06/2.02 | 2.21/1.04 |
| Theta (105°) | 2.23/2.23 | 1.95/1.47 | 0.68/0.79 | 0.26/-0.81 | -4.49/-7.82 | -3.63/-1.26 | 2.08/1.34 | -0.03/-3.24 | -3.5/-0.5 | 1.25/0.92 | 0.63/-1.1 | -4.34/-8.29 | -11.78/-7.24 | -2.97/-3.01 | -3.97/-4.3 | -1.1/-1.55 | -6.1/-7.33 | -0.75/-4.54 | -3.89/-6.28 | -7.37/-5.05 | -2.88/-3.94 | -4.57/-2.31 | -0.09/-1.17 | 2.53/2.35 |
| Theta (112.5°) | 1.3/2.62 | 3.56/3.61 | 2.71/1.88 | 0.56/-0.31 | -1.59/-2.22 | -0.51/-1.54 | 1.25/0.32 | 0.65/1.02 | 1.74/1.04 | 0.86/2.0 | 1.48/-1.12 | -4.64/-4.69 | -3.35/-4.76 | -1.94/-2.61 | -2.64/-3.55 | -4.62/-2.96 | -4.26/-5.41 | -3.63/-6.47 | -8.16/-5.73 | -7.45/-10.41 | -4.56/-2.78 | -4.01/-4.89 | -2.87/0.53 | 0.78/0.16 |
| Theta (120°) | 2.16/3.19 | 3.75/4.13 | 3.92/3.56 | 3.86/2.92 | 0.13/-2.59 | -2.84/-2.25 | -1.03/-1.51 | -0.01/2.55 | 1.44/-0.23 | -0.04/1.15 | 0.55/-2.56 | -7.29/-5.18 | -2.58/-2.25 | -0.99/-1.13 | -2.88/-2.82 | -2.62/-1.36 | -7.84/-4.12 | 0.75/-1.38 | -4.83/-3.77 | -1.86/-5.66 | -6.56/-4.67 | -4.83/-1.54 | 0.26/-0.05 | -0.23/1.22 |
| Theta (127.5°) | 4.69/4.89 | 4.54/3.72 | 3.69/3.46 | 3.26/3.43 | 2.59/0.73 | 0.55/1.1 | -0.72/-4.01 | -3.02/-0.26 | 1.14/1.4 | 0.84/0.16 | -0.36/-1.28 | -1.39/-0.51 | -1.47/-0.77 | -0.48/-0.36 | -2.47/-4.29 | -6.36/-5.02 | -4.79/-4.6 | -3.92/-2.95 | -2.25/-3.39 | -5.64/-4.87 | -3.91/-1.8 | -1.34/-0.01 | 2.25/2.86 | 3.78/4.06 |
| Theta (135°) | 2.68/2.73 | 3.15/2.41 | 1.5/2.22 | 2.97/2.33 | 1.38/1.46 | 1.19/0.95 | 0.19/0.07 | 1.93/2.68 | 2.34/2.44 | 2.36/2.79 | 2.08/0.47 | -1.14/-3.53 | -1.09/-1.77 | -4.25/-4.66 | -3.45/-3.59 | -4.79/-5.79 | -3.56/-2.42 | -3.85/-3.95 | -1.73/-1.97 | 0.87/1.26 | 0.42/-1.53 | 0.92/3.9 | 1.91/2.49 | |
| Theta (142.5°) | -1.33/-0.9 | -0.36/-1.19 | 1.69/2.15 | 2.67/2.06 | 0.27/-0.48 | 1.24/1.67 | 0.79/0.23 | 0.56/0.37 | -0.78/-2.09 | -1.31/-0.81 | -1.31/-4.54 | -4.67/-2.87 | -2.16/-2.96 | -4.08/-4.01 | -2.89/-1.44 | -3.82/-6.02 | -4.54/-4.66 | -3.65/-2.72 | -1.37/-3.15 | -5.81/-5 | -2.85/-4.13 | -4.8/-3.04 | -3.39/-1.85 | -1.89/-1.85 |
| Theta (150°) | -0.61/0.35 | 0.12/-0.51 | -0.78/-1.31 | -1.32/-2.08 | -3.42/-4.06 | -3.81/-3.06 | -1.73/-0.17 | 0.68/0.33 | 0.06/0.38 | -0.07/-1.92 | -5.12/-7.15 | -3.09/1.07 | 3.05/2.64 | 0.05/-3.6 | -4.82/-2.17 | 0.53/2.01 | 1.87/0.55 | -1.2/-1.98 | -2.36/-2.67 | -3.05/-3.68 | -6.43/-6.33 | -7.64/-6.34 | -5.05/-5.24 | -2.75/-0.8 |
| Theta (157.5°) | -0.46/0.03 | -0.14/-0.71 | -1.35/-1.86 | -2.02/-2.14 | -2.54/-3.19 | -3.59/-3.77 | -3.61/-2.48 | -1.54/-1.46 | -2.3/-3.34 | -2.94/-3.08 | -4.13/-4.58 | -1.61/1 | 1.15/-0.34 | -2.09/-2.67 | -0.72/2.14 | 3.46/2.99 | 1.12/-0.68 | -2.2/-3.53 | -4.83/-5.14 | -4.27/-3.07 | -2.92/-2.93 | -3.31/-3.78 | -4.67/-5.21 | -3.79/-1.46 |
| Theta (165°) | -2.4/-2.1 | -1.86/-2.85 | -4.56/-5.6 | -4.69/-2.66 | -1.27/-0.44 | -0.05/-0 | -0.17/-0.41 | -0.78/-1.78 | -2.97/-3.1 | -2.97/-3.13 | -3.86/-4.76 | -5.48/-5.62 | -3.41/-0.95 | 1.12/4.2 | 3.13/3.44 | 3/1.69 | -0.34/-2.16 | -3.73/-5.19 | -5.89/-5.08 | -3.1/-1.66 | -0.71/0.12 | 0.76/0.66 | 0.06/-0.7 | -1.17/-2.12 |
| Theta (172.5°) | -4.54/-5.94 | -6.87/-5.37 | -3.33/-1.97 | -1.22/-0.92 | -0.69/-0.49 | -0.48/-1.01 | -0.69/-0.78 | -1.35/-2.09 | -2.74/-2.34 | -1.93/-1.9 | -1.95/-1.86 | -1.68/-1.53 | -0.87/-0.37 | 0.12/0.05 | -0.46/-1.22 | -1.88/-2.26 | -3.15/-3.89 | -3.9/-3.56 | -3.36/-3.14 | -2.42/-1.38 | -0.43/0.12 | 0.01/0.61 | -0.98/-1.2 | -2.28/-3.46 |
| Theta (180°) | -6.51/-6 | -5.34/-5.05 | -5.75/-6.19 | -6.86/-7.48 | -7.94/-7.59 | -7.46/-7.2 | -6.43/-6.66 | -7.16/-7.36 | -7.42/-6.96 | -6.09/-5.5 | -4.77/-4.05 | -4.14/-4.77 | -5.5/-6.06 | -5.84/-6.32 | -7.41/-8.01 | -8.21/-8.18 | -9.11/-9.35 | -8.98/-8.63 | -8.23/-8.04 | -7.32/-6.67 | -6.29/-6.94 | -5.8/-5.51 | -5.99/-7.19 | -9.34/-8.4 |
| Freq(Hz) | 5.785GPol. | Theta | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| DG(dB) | Phi(0°)Phi(7.5°) | Phi(15°)Phi(22.5°) | Phi(30°)Phi(37.5°) | Phi(45°)Phi(52.5°) | Phi(60°)Phi(67.5°) | Phi(75°)Phi(82.5°) | Phi(90°)Phi(97.5°) | Phi(105°)Phi(112.5°) | Phi(120°)Phi(127.5°) | Phi(135°)Phi(142.5°) | Phi(150°)Phi(157.5°) | Phi(165°)Phi(172.5°) | Phi(180°)Phi(187.5°) | Phi(195°)Phi(202.5°) | Phi(210°)Phi(217.5°) | Phi(225°)Phi(232.5°) | Phi(240°)Phi(247.5°) | Phi(255°)Phi(262.5°) | Phi(270°)Phi(277.5°) | Phi(285°)Phi(292.5°) | Phi(300°)Phi(307.5°) | Phi(315°)Phi(322.5°) | Phi(330°)Phi(337.5°) | Phi(345°)Phi(352.5°) |
| Theta (0°) | -3.3/-2.69 | -2.05/-1.43 | -1.17/-0.72 | -0.35/-0.03 | 0.21/0.1 | -0.2/-0.74 | -1.46/-2.64 | -4.26/-5.53 | -6.49/-7.45 | -8.18/-7.93 | -6.66/-5.02 | -3.44/-2.19 | -1.3/-0.95 | -1.08/-1.27 | -1.28/-1.44 | -2.4/-2.7 | -3.06/-3.92 | -4.19/-4.64 | -3.61/-3.92 | -7.85/-7.44 | -7.13/-6.71 | -6.18/-5.55 | -5.11/-4.31 | |
| Theta (7.5°) | -1.47/-1.56 | -1.53/-1.58 | -1.59/-1.96 | -2.3/-2.79 | -3.33/-3.33 | -3.24/-2.58 | -2.56/-2.46 | -2.78/-3.39 | -4.43/-5.51 | -5.65/-6.05 | -5.86/-5.53 | -4.71/-3.52 | -2.51/-1.59 | -0.59/0.3 | 0.89/1.21 | 1.23/1.13 | 1.02/0.7 | 0.24/0.31 | -0.98/-2.04 | -3.41/-4.88 | -5.76/-5.3 | -4.15/-3.29 | -2.94/-2.77 | -2.3/-1.69 |
| Theta (15°) | -0.43/-0.52 | -0.75/-1.66 | -2.32/-2.53 | -2.17/-2.65 | -3.45/-2.6 | -1.52/-0.54 | -0.04/0.51 | 0.79/0.57 | -0.11/-1.14 | -1.9/-2.18 | -2.02/-2.17 | -1.93/-1.33 | -0.87/-0.7 | -0.43/-0.2 | 0.23/0.8 | 1.16/1.44 | 1.54/1.48 | 1.13/0.5 | -0.36/-1.15 | -1.81/-2.53 | -2.89/-2.68 | -1.96/-1.65 | -1.57/-1.3 | -0.71/-0.44 |
| Theta (22.5°) | -0.12/-0.22 | -0.63/-0.72 | -0.64/-0.38 | -0.52/-1.67 | -2.37/-1.44 | -0.35/0.85 | 1.92/2.77 | 2.98/2.5 | 1.50/3.7 | -0.79/-1.3 | -1.32/-1.23 | -1.03/-1.07 | -1.48/-1.51 | -1.4/-1.4 | -0.93/-0.68 | -0.51/-0.44 | -0.18/0.52 | 0.76/0.43 | -0.55/-2.19 | -2.93/-2.77 | -2.41/-2.14 | -1.83/-1.14 | -0.30/0.38 | 0.57/0.23 |
| Theta (30°) | 2.15/1.44 | 0.46/-0.17 | 0.44/0.53 | 0.62/0.35 | 0.62/1.36 | 2.11/3.21 | 4.09/4.51 | 4.58/4.11 | 2.66/0.55 | -1.3/-1.71 | -1.57/-1.26 | -0.65/-0.23 | 0.02/0.46 | 0.97/0.91 | -0.12/-0.59 | -0.72/-1.19 | -1.99/-2.71 | -2.2/-1.8 | -1.77/-2.64 | -3.01/-3.04 | -1.71/-0.08 | 0.92/1.79 | 2.43/2.71 | 2.56/2.15 |
| Theta (37.5°) | 3.23/3.73 | 3.21/2.4 | 2.85/2.77 | 1.76/0.63 | 0.46/0.82 | 2.03/3.29 | 4.16/4.94 | 4.77/4.08 | 2.38/0.06 | -1.52/-1.23 | -0.41/-0.5 | -0.64/-1.09 | -1.85/-1.45 | -1.14/-1.11 | -0.71/-0.42 | -1.06/-1.71 | -1.75/-1.59 | -1.34/-1.81 | -3.12/-3.7 | -3.73/-1.74 | -1.37/0.1 | 1.18/2.51 | 3/3.7 | 3.74/3.58 |
| Theta (45°) | 4.34/4.2 | 4.02/3.35 | 3.05/2.88 | 2.42/1.51 | 0.96/1.17 | 2.18/3.05 | 3.63/7.2 | 3.66/3.09 | 1.33/1.01 | -2.61/-1.63 | -0.17/-0.29 | -0.08/0.47 | 0.42/0.34 | -0.67/0.56 | 1.29/1.26 | 0.41/0.26 | 0.16/0.21 | 0.52/0.23 | -1.85/-3.38 | -4.73/-3.12 | -2.29/0.69 | 1.83/2.82 | 2.86/3.29 | 3.38/3.9 |
| Theta (52.5°) | 2.79/3.6 | 3.74/4 | 3.72/3.1 | 1.79/1.24 | 0.58/1.13 | 2.07/2.43 | 2.68/3.05 | 3.19/2.14 | 0.14/-0.79 | -0.86/-0.47 | -0.27/-0.15 | 0.64/0.24 | -0.98/-1.46 | 0.23/1.65 | 2.59/1.5 | -1.15/-1.59 | -1.16/-0.19 | 0.71/0.2 | 0.53/-0.71 | -2.75/-0.9 | 0.78/1 | 1.58/2.56 | 2.58/2.26 | 2.17/2.06 |
| Theta (60°) | 4.02/4.17 | 4.59/5.13 | 5.14/4.8 | 4.87/4.01 | 2.06/0.78 | 1.82/2.79 | 2.98/2.41 | 1.46/1.26 | 0.57/0.32 | 0.06/1.54 | 1.78/0.85 | 0.2/-0.82 | 0.96/2.37 | 3/1.87 | 2.93/2.72 | 1.08/-0.52 | -0.73/-0.85 | 0.41/1.36 | 0.38/-1.24 | -0.25/0.49 | 1.18/1.26 | 0.71/2.6 | 2.25/2.56 | 2.82/3.56 |
| Theta (67.5°) | 5.01/4.87 | 5.33/5.82 | 6.22/6.22 | 5.79/5.28 | 4.16/1.22 | -1.78/0.81 | 2.36/2.73 | 2.95/3.01 | 2.36/0.5 | 0.67/2.31 | 2.04/0.01 | -1.61/-0.8 | 0.74/2.17 | 2.24/0.97 | 1.94/2.62 | 0.9/-1.22 | -0.21/-0.63 | -1.48/0.29 | 0.06/-1.35 | -1.06/-0.37 | -1.17/0.49 | 2.21/2.98 | 2.11/2.29 | 3.24/4.6 |
| Theta (75°) | 5.6/5.48 | 5.33/5.87 | 5.75/4.81 | 3.97/3.31 | 2.33/1.47 | 1.46/1.42 | 2.68/3.66 | 4.65/4.79 | 3.26/1.26 | 2.59/3.23 | 1.17/-0.61 | -1.28/-0.63 | 0.63/2.75 | 2.74/0.11 | 1.01/2.71 | 2.01/0.58 | -2.74/-1.56 | -1.37/0.03 | 0.58/0.58 | 1.15/0.62 | -2.29/-2.09 | -0.42/-0.05 | 1.36/2.82 | 4.45/5.19 |
| Theta (82.5°) | 4.88/5.34 | 5.14/5.5 | 3.74/2.8 | 2.37/0.15 | -0.08/1.16 | 2.55/3.54 | 3.85/4.74 | 4.98/4.06 | 2.41/-0.18 | 1.33/0.9 | 1.94/0.4 | 0.41/-1.13 | -1.19/2.41 | 1.84/-0.44 | 2.98/4.44 | 3.88/0.32 | -1.13/-0.84 | -0.34/-0.63 | 1.65/2.49 | 2.83/0.65 | -1.48/-1.22 | -0.23/1.2 | 2.59/3.15 | 4.56/4.92 |
| Theta (90°) | 4.09/4.54 | 3.76/2.42 | 2.33/1.92 | 1.99/1.28 | 1.57/1.39 | 2.71/3.43 | 3.14/2.51 | 2.93/2.96 | 0.64/-1.6 | 1.23/4 | 2.16/0.72 | -0.92/-0.43 | 0.53/0.95 | 1.01/-1.79 | 1.67/4.32 | 3.73/0.04 | -2.46/0.04 | 0.89/-2.38 | 0.22/0.95 | 1.91/1.33 | -1.31/-1.16 | 0.9/0.2 | -0.60/2.5 | 2.83/85 |
| Theta (97.5°) | 1.49/2.06 | 1.61/1.69 | 1.66/1.49 | 0.91/2.6 | 1.14/1.38 | 1.73/2.73 | 2.52/0.87 | 0.3/-0.38 | -1.69/-1.35 | 2.28/3.54 | 1.27/-1.2 | -3.34/-5.17 | -1.82/0.34 | -3.34/-2.95 | -0.01/2.51 | 3.12/-0.35 | -4.29/0.32 | -0.94/-2 | 0.63/-2.79 | -3.35/-2.93 | -5.47/-1.97 | -1.24/-3.39 | -3.09/-1.28 | 0.94/1.57 |
| Theta (105°) | 2.77/4.35 | 4.1/3.96 | 4.49/5.44 | 5.49/6.65 | 4.56/3.85 | 1.47/1.82 | 2.74/2.96 | 2.12/0.4 | -0.96/-0.84 | 1.96/2.94 | 1.79/0.75 | -1.6/-2.2 | -1.90/2.7 | -2.93/-8.21 | -6.06/-0.39 | 1.52/-1.04 | -4.42/0.1 | 0.66/-2.9 | -4.24/-3.94 | -3.09/-3.12 | -4.78/-1.89 | 0.19/-1.08 | -3.07/-2.92 | -0.17/1.83 |
| Theta (112.5°) | 4.77/4.79 | 3.77/3.86 | 3.6/4.03 | 4.94/5.6 | 5.34/5.28 | 4.12/1.77 | 0.16/-0.87 | 0.13/0.77 | 0/1.42 | 3.44/3.62 | 3.29/2.15 | 1.33/-0.57 | -1.41/-1.17 | -6.38/-6.72 | -5.36/-1.56 | -3.69/-4.37 | -5.76/-5.42 | -0.42/-1.4 | -4.54/-5.92 | -3.13/-3.33 | -3.71/-5.46 | -6.54/-2.2 | -0.88/2.68 | 4.39/4.79 |
| Theta (120°) | 2.05/2.67 | 1.38/1.17 | 1.62/2.39 | 2.83/3.89 | 4.62/4.42 | 3.36/1.56 | 0.96/0.26 | -0.61/-1.71 | -0.66/1.28 | 3.07/3.28 | 2.77/2.21 | 0.8/-1.94 | -3.73/-1.07 | -1.67/-4.97 | -3.79/-0.79 | -1.55/-3.42 | -6.98/-2.77 | 0.49/-2.74 | -5/-1.14 | -1.22/-2.06 | -3.18/-4.51 | -4.41/-2.28 | -1.17/1 | 1.03/1.9 |
| Theta (127.5°) | 1.21/43 | 1.19/2.68 | 3.63/66 | 2.81/2.2 | 2.27/1.76 | -1.01/-3.98 | -1.65/-0.21 | -0.34/-1.12 | 0.49/-0.56 | -1.26/0.93 | 1.47/1.74 | 1.57/-0.96 | -1.48/-1.28 | 0.62/-2.23 | -1.6/-0.07 | 0.59/-3.65 | -4.88/-2.85 | -1.82/0.85 | -0.54/-1.64 | 1.32/-4.48 | -3.58/-4.13 | -2.25/-1.89 | 1.05/0.89 | 3.06/2.19 |
| Theta (135°) | -1.97/0.46 | 2.65/3.68 | 5.44/5.52 | 4.68/3.35 | 2.36/1.91 | 0.38/-1.74 | -2.16/-2.02 | -0.43/1.76 | 1.9/0.92 | -1.28/0.54 | 2.41/2.4 | | | | | | | | | | | | | |



Radiated Composite Gain Data

Appendix A

| Theta (°) | -13.07:11.88 | -16.31:18.13 | -17.89:19.23 | -18.31:15.08 | -13.17:9.67 | -6.46:4.48 | -3.34:4.1 | -3.36:4.4 | -4.17:3.3 | -4.54:5.24 | -5.91:6.64 | -7.66:9.24 | -10.88:13.3 | -15.14:15.37 | -13.22:12.49 | -11.71:10.29 | -7.66:6.29 | -6.63:8.59 | -11.21:14.04 | -14.09:11.16 | -9.05:7.66 | -7.66:9.4 | -12.78:14.95 | -15.05:12.95 | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|
| Gain | Phi(0°)Phi(7.5°) | Phi(15°)Phi(22.5°) | Phi(30°)Phi(37.5°) | Phi(45°)Phi(52.5°) | Phi(60°)Phi(67.5°) | Phi(75°)Phi(82.5°) | Phi(90°)Phi(97.5°) | Phi(105°)Phi(112.5°) | Phi(120°)Phi(127.5°) | Phi(135°)Phi(142.5°) | Phi(150°)Phi(157.5°) | Phi(165°)Phi(172.5°) | Phi(180°)Phi(187.5°) | Phi(195°)Phi(202.5°) | Phi(210°)Phi(217.5°) | Phi(225°)Phi(232.5°) | Phi(240°)Phi(247.5°) | Phi(255°)Phi(262.5°) | Phi(270°)Phi(277.5°) | Phi(285°)Phi(292.5°) | Phi(300°)Phi(307.5°) | Phi(315°)Phi(322.5°) | Phi(330°)Phi(337.5°) | Phi(345°)Phi(352.5°) | | | | | | | | | | | | | | | | | | | | | | | | |
| Theta (°) | 0 | 7.5 | 15 | 22.5 | 30 | 37.5 | 45 | 52.5 | 60 | 67.5 | 75 | 82.5 | 90 | 97.5 | 105 | 112.5 | 120 | 127.5 | 135 | 142.5 | 150 | 157.5 | 165 | 172.5 | 180 | 187.5 | 195 | 202.5 | 210 | 217.5 | 225 | 232.5 | 240 | 247.5 | 255 | 262.5 | 270 | 277.5 | 285 | 292.5 | 300 | 307.5 | 315 | 322.5 | 330 | 337.5 | 345 | 352.5 |
| Gain | -12.76:12.46 | -9.06:17.2 | -9.41:10.11 | -11.16:12.7 | -13.45:18.02 | -15.86:15.06 | -14.01:12.92 | -13.31:13.79 | -15.03:15.44 | -15.79:18.54 | -15.55:13.36 | -11.88:11.06 | -10.13:9.91 | -12.11:12.69 | -11.91:12.3 | -14.14:14.9 | -14.82:14.36 | -13.72:13.47 | -12.35:11.44 | -10.81:10.69 | -11.39:11.24 | -10.36:9.69 | -8.67:8.45 | -8.42:8.37 | | | | | | | | | | | | | | | | | | | | | | | | |



Radiated Composite Gain Data

Appendix A

| Theta (°) | 5.3-4.89 | 4.97-7.35 | -12.16-11.94 | -8.25-6.39 | -6.91-9.77 | -13.21-19.3 | -12.61-13.37 | -11.39-7.98 | -5.03-3.71 | -4.01-5.43 | -7.88-9.21 | -7.22-5.95 | -4.06-4.56 | -6.16-6.33 | -6.94-13.06 | -17.61-16.47 | -14.37-18.42 | -10.63-6.21 | -9.34-14.79 | -13.34-12.88 | -9.81-13.23 | -12.21-17.27 | -11.61-11.99 | -11.71-11 |
|----------------|------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Theta (127.5°) | -8.59-8.83 | -9.82-12.41 | -14.57-11.94 | -18.08-11.53 | -9.96-10.05 | -7.32-4.12 | -2.56-2.02 | -1.71-2.16 | -1.76-3.66 | -6.18-9.12 | -7.72-6.44 | -5.33-5.69 | -7.16-8.1 | -5.14-5.86 | -5.73-6.17 | -14.94-19.15 | -15.94-11.42 | -13.23-12.47 | -17.66-10.81 | -7.68-8.89 | -19.85-9.61 | -15.12-14.37 | -12.38-9.71 | -11.29-7.46 |
| Theta (135°) | -15.54-15.88 | -18.54-18.28 | -18.21-15.89 | -11.42-9.37 | -6.75-3.58 | -2.21-1.79 | -1.47-1.14 | -1.32-2.62 | -4.76-6.3 | -7.07-7.17 | -9.57-7.5 | -8.59-7.93 | -10.33-13.74 | -7.98-4.28 | -4.01-9.64 | -9.57-16.77 | -16.81-15.23 | -17.22-13.24 | -14.24-14.21 | -9.58-6.78 | -9.64-18.23 | -12.69-11.93 | -14.43-17.68 | -19.34-18.59 |
| Theta (142.5°) | -17.81-12.4 | -12.44-13.67 | -11.82-8.9 | -6.04-4.39 | -3.47-2.06 | -0.520-12 | -0.09-9.99 | -2.27-3.24 | -4.18-5.2 | -6.29-7.65 | -5.26-3.42 | -2.1-0.4 | -2.69-3.72 | -3.81-6.39 | -11.87-11.1 | -11.04-19.45 | -18.19-10.3 | -18.25-18.12 | -17.77-18.63 | -15.66-10.41 | -9.16-11.1 | -12.32-13.92 | -13.02-11.8 | -16.85-18.12 |
| Theta (150°) | -8.32-4.91 | -3.73-4.14 | -4.6-5.24 | -5.71-5.51 | -4.89-4.6 | -4.28-3.46 | -3.13-3.2 | -3.58-4.1 | -4.88-6.01 | -7.39-7.87 | -6.69-6.03 | -3.77-4.34 | -0.77-11.03 | -14.51-13.77 | -15.46-19.04 | -11.08-10.03 | -17.63-13.23 | -9.54-6.89 | -7.25-6.25 | -6.83-8.98 | -12.67-16.62 | -15.36-14.18 | -15.7-15.9 | -16.42-11.9 |
| Theta (157.5°) | -12.55-8.91 | -7.26-6.43 | -5.07-3.7 | -2.81-2.39 | -2.12-1.7 | -2.31-2.35 | -2.12-1.85 | -1.77-1.91 | -2.56-3.84 | -5.62-6.54 | -6.19-5.53 | -5.64-6.73 | -8.29-8.85 | -12.53-13.66 | -8.32-5.31 | -5.17-8.12 | -12.93-9.14 | -7.62-8.33 | -9.43-9.77 | -10.07-11.43 | -14.09-16.99 | -14.11-8.9 | -12.55-14.77 | -10.56-15.87 |
| Theta (165°) | -13.75-10.55 | -8.77-7.47 | -6.19-5.01 | -4.32-3.76 | -3.07-2.52 | -2.47-2.5 | -2.45-2.31 | -2.47-3.03 | -4.22-6.02 | -7.98-9.42 | -9.96-10.15 | -10.53-10.74 | -11.67-14.53 | -18.35-14.05 | -10.87-11.01 | -13.15-14.6 | -11.31-9.04 | -9.01-10.88 | -13.59-16.06 | -18.84-18.72 | -18.21-18.25 | -18.69-17.6 | -18.07-18.13 | -18.73-19 |
| Theta (172.5°) | -15.14-15.39 | -14.67-13.24 | -11.95-11.31 | -10.88-10.85 | -10.73-10.4 | -10.15-12.8 | -10.74-10.19 | -11.03-12.1 | -13.98-16.63 | -17.55-15.14 | -12.78-11.26 | -10.53-10.22 | -10.85-12.12 | -14.03-16.08 | -15.94-12.41 | -9.37-7.57 | -6.84-9.47 | -8.06-8.95 | -12.41-14.31 | -15.81-16.6 | -16.41-15.61 | -14.38-12.73 | -12.84-14.18 | -15.64-16.6 |
| Theta (180°) | -13.46-13.37 | -12.12-11.78 | -12.31-13.55 | -15.92-16.97 | -16.34-14.6 | -12.75-11.41 | -10.23-11.53 | -8.99-8.25 | -7.76-7.1 | -6.81-6.95 | -7.33-8.15 | -9.43-11.3 | -13.78-17.13 | -18.47-18.11 | -18.08-16.39 | -14.54-13.73 | -13.21-12.29 | -10.48-8.99 | -8.08-7.75 | -7.73-8.1 | -8.27-8.21 | -8.53-9.66 | -11.07-12.35 | |
| Phi (°) | 5.23Pol | ThetaAnt 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Gain | Phi(0°)Phi(7.5°) | Phi(15°)Phi(22.5°) | Phi(30°)Phi(37.5°) | Phi(45°)Phi(52.5°) | Phi(60°)Phi(67.5°) | Phi(75°)Phi(82.5°) | Phi(90°)Phi(97.5°) | Phi(105°)Phi(112.5°) | Phi(120°)Phi(127.5°) | Phi(135°)Phi(142.5°) | Phi(150°)Phi(157.5°) | Phi(165°)Phi(172.5°) | Phi(180°)Phi(187.5°) | Phi(195°)Phi(202.5°) | Phi(210°)Phi(217.5°) | Phi(225°)Phi(232.5°) | Phi(240°)Phi(247.5°) | Phi(255°)Phi(262.5°) | Phi(270°)Phi(277.5°) | Phi(285°)Phi(292.5°) | Phi(300°)Phi(307.5°) | Phi(315°)Phi(322.5°) | Phi(330°)Phi(337.5°) | Phi(345°)Phi(352.5°) |
| Theta (0°) | -9.75-10.17 | -9.78-9.63 | -9.96-10.76 | -11.36-11.41 | -10.74-9.74 | -8.43-7.37 | -6.35-7 | -5.37-5.25 | -5.09-5 | -4.94-5.12 | -5.35-7.5 | -6.25-6.97 | -7.78-8.74 | -9.48-10.23 | -10.85-10.71 | -12.96-12.6 | -2.38-2.16 | -2.17-1.25 | -7.19-6.5 | -6.14-5.79 | -6.07-6.47 | -6.89-7.14 | -7.72-8.2 | -8.54-8.81 |
| Theta (7.5°) | -3.5-3.74 | -4.06-4.72 | -5.16-11.94 | -8.32-8.26 | -8.28-7.74 | -6.91-6 | -5.43-5.24 | -5.27-5.37 | -5.59-5.97 | -6.71-7.97 | -9.17-11.14 | -13.55-16.68 | -18.82-17.56 | -18.67-18.24 | -18.14-14.13 | -11.49-9.62 | -8.13-6.75 | -5.59-4.56 | -3.86-3.32 | -2.83-2.57 | -2.61-2.51 | -2.61-2.93 | -3.08-3 | -2.94-3.06 |
| Theta (15°) | -1.34-1.48 | -1.52-1.62 | -2.26-3.36 | -4.48-5.34 | -6.81-7.83 | -7.74-7.79 | -7.81-7.5 | -6.78-6.69 | -6.94-7.66 | -8.81-10.45 | -12.44-14.54 | -17.47-18.58 | -18.81-18.61 | -18.45-14.85 | -12.24-10.36 | -8.89-7.76 | -6.41-5.23 | -3.84-2.82 | -2.07-1.87 | -1.84-2.05 | -2.28-2.3 | -2.17-1.92 | -1.61-1.38 | -1.34-1.35 |
| Theta (22.5°) | 0.350-1.7 | 0.100-0.8 | -0.121-1.8 | -2.41-3.82 | -5.96-7.75 | -9.1-10.46 | -10.91-10.2 | -10.08-9.61 | -9.16-8.67 | -8.79-9.8 | -10.86-11.33 | -11.37-11.82 | -13.25-16.51 | -18.85-18.87 | -16.09-12.58 | -10.74-9.54 | -7.63-3.57 | -3.06-2.88 | -3.06-3.7 | -4.3-4.55 | -4.12-3.42 | -2.36-1.22 | -0.260-1 | 0.290-38 |
| Theta (30°) | 1.070-6.4 | 0.210-1.4 | 0.160-0.41 | -1.29-2.4 | -4.52-7.51 | -13.24-14.64 | -9.94-7.18 | -6.14-5.56 | -5.19-4.85 | -4.54-4.7 | -4.96-4.89 | -4.72-4.83 | -5.32-6.15 | -8.29-12.22 | -18.69-18.08 | -14.02-11.46 | -7.63-5.64 | -5.74-6.9 | -4.73-8.47 | -7.34-6.6 | -4.78-2.68 | -1.37-0.46 | 0.51-1.4 | 1.381-36 |
| Theta (37.5°) | 1.521-0.6 | 0.560-0.5 | 0.41-0.02 | -0.39-1.14 | -2.82-5.7 | -9.97-14.85 | -13.19-7.53 | -5.52-5.08 | -6.07-6.34 | -4.59-4.19 | -4.04-4.23 | -4.82-4.94 | -4.39-4.46 | -6.37-9.55 | -14.81-18.07 | -17.95-14.96 | -9.51-7.47 | -6.36-6.21 | -7.26-7.96 | -7.78-7.18 | -8.88-6.48 | -4.08-1.34 | -0.610-18 | 0.81-44 |
| Theta (45°) | 1.121-3.1 | 1.211-4.2 | 1.380-8 | -0.02-1.23 | -2.35-3.25 | -4.65-5.9 | -7.37-6.49 | -4.32-3.15 | -3.16-3.98 | -4.92-5.38 | -5.44-5.73 | -6.47-6.68 | -6.92-6.48 | -6.29-6.42 | -11.53-15.17 | -17.21-19.11 | -13.57-9.03 | -5.97-6.67 | -6.24-6.01 | -5.47-5.78 | -5.64-4.95 | -5.79-3.74 | -1.310-12 | 0.750-75 |
| Theta (52.5°) | 2.572-3.8 | 2.562-6.4 | 2.311-7.8 | 0.76-0.69 | -1.58-2.18 | -3.47-5.98 | -10.43-17.61 | -11.59-7.81 | -6.42-6.24 | -5.6-4.14 | -2.93-2.69 | -3.23-3.26 | -3.76-4.39 | -4.29-4.33 | -3.73-5.07 | -9.13-18.74 | -18.11-12.7 | -12.83-10.88 | -7.12-6.64 | -5.38-3.43 | -4.23-2.4 | 0.261-72 | 2.172-52 | |
| Theta (60°) | -1.78-1.42 | -0.630-2.4 | 0.160-0.3 | -1.06-1.59 | -1.41-1.12 | -1.33-2.96 | -5.45-9.27 | -13.19-14.92 | -15.13-16.03 | -14.91-11.46 | -7.83-6.87 | -4.43-2.85 | -2.04-2.31 | -3.33-5 | -5.3-5.43 | -6.11-9.99 | -17.25-19.32 | -17.69-13.74 | -17.49-12.38 | -7.14-2.84 | -2.38-3.32 | -0.52-4.51 | -1.92-0.81 | -0.721-71 |
| Theta (67.5°) | 0.731-2.5 | 1.121-4.4 | 0.810-1.9 | -2.14-1.8 | -5.68-4.58 | -4.63-3.92 | -3.95-4.73 | -6.08-7.95 | -9.65-9.95 | -6.06-4.73 | -4.14-3.76 | -2.79-2.3 | -2.47-3.84 | -6.26-7.12 | -5.4-3.61 | -4.79-5.85 | -8.99-11.26 | -17.36-15.01 | -11.19-10.82 | -6.67-6.47 | -6.81-7.77 | -11.44-8.98 | -4.87-1.44 | 0.06-3 |
| Theta (75°) | -0.090-7.2 | 0-0.69 | -2.3-3.36 | -3.68-2.75 | -3.42-1.9 | -5.81-7.23 | -8.02-8.1 | -8.09-10.38 | -13.9-12.32 | -8.17-7.4 | -7.23-8.54 | -8.37-9.89 | -8.79-12.29 | -13.63-14.95 | -9.71-9.28 | -7.49-7.94 | -10.15-9.37 | -6.21-11.06 | -11.66-11.36 | -18.55-11.96 | -5.02-5.56 | -5.78-3.99 | -2.54-9.07 | -0.781-0.2 |
| Theta (82.5°) | -12.48-9.07 | -0.54-3.61 | -2.04-1.85 | -2.33-1.96 | -1.93-2.26 | -3.26-4.74 | -6.36-9.8 | -14.83-18.63 | -11.93-7.06 | -4.58-4.79 | -6.31-8.22 | -8.31-7.57 | -7.86-8.51 | -7.64-7.11 | -6.76-7.98 | -14.93-18.71 | -16.01-11.76 | -8.35-5.14 | -8.81-5.88 | -10.37-6.66 | -7.47-10.38 | -11.27-6.6 | -5.61-6.94 | -10.09-10.72 |
| Theta (90°) | -4.59-3.38 | -2.59-0.94 | -0.450-7.1 | 1.542-2.7 | 1.74-0.02 | -2.64-3.38 | -4.84-5.05 | -6.57-7.28 | -4.93-2.77 | -1.72-1.76 | -3.15-3.84 | -4.32-3.67 | -3.89-3.69 | -4.52-5.54 | -7.36-7.27 | -6.73-17.56 | -12.97-9.87 | -9.54-7.91 | -7.27-10.77 | -9.81-6.62 | -10.49-11.49 | -15.58-11.26 | -7.92-7.82 | -7.41-6.03 |
| Theta (97.5°) | -6.91-4.99 | -3.81-2.83 | -2.37-0.69 | 1.221-8.8 | 1.57-0.04 | -3.34-6.94 | -10.11-12.33 | -14.27-9.44 | 0.852-1.0 | 0.581-0.2 | 0.960-7.4 | 0.25-1.1 | -2.13-3.87 | -5.73-8.94 | -8.19-9.74 | -13.28-18.43 | -13.44-7.17 | -8.84-9.25 | -7.61-6.69 | -7.93-8.18 | -11.43-18.07 | -17.88-12.48 | -9.31-8.14 | -8.95-6.5 |
| Theta (105°) | -18.42-12.04 | -9.5-7.76 | -7.97-6.69 | -3.67-3.55 | -2.74-3.55 | -5.67-6.75 | -10.8-7 | -7.16-7.45 | -8.93-8.1 | -2.792-9.1 | 2.311-5.9 | 0.21-1.48 | -3.42-5.26 | -6.88-11.82 | -17.63-13.03 | -10.58-18.6 | -11.64-7.46 | -5.12-4.16 | -4.14-7.18 | -12.3-7.18 | -11.24-13.03 | -14.24-7.4 | -7.34-9.43 | -15.67-17.64 |
| Theta (112.5°) | -18.54-18.24 | -18.86-18.07 | -18.32-19.13 | -17.76-19.17 | -18.16-13.72 | -10.62-9.1 | -8.52-5.31 | -1.870-7.8 | 2.83-8.9 | 4.093-38 | 2.321-11 | -0.83-2.46 | -3.39-5.44 | -9.42-15.18 | -11.41-9.22 | -9.9-14.93 | -14.31-10.42 | -8.91-8.26 | -6.49-8.62 | -16.41-13.4 | -18.46-18.91 | -12.82-13.41 | -13.14-17.96 | -18.58-17.98 |
| Theta (120°) | -7.46-6.18 | -5.04-5.18 | -5.46-6.49 | -5.94-7.17 | -11.41-17.95 | -18.62-18.27 | -9.66-3.56 | 0.342-0.4 | 2.662-7.1 | 21-33 | 0.11-1.11 | -3.68-4.53 | -5.25-4.41 | -7.38-9.83 | -7.76-7.2 | -7.59-12.15 | -13.57-11.26 | -12.22-9.7 | -5.87-5.5 | -6.97-13 | -15.83-18.44 | -18.61-18.35 | -17.43-13.16 | -8.85-8.18 |
| Theta (127.5°) | -14.65-10.26 | -6.77-5.17 | -1.45-1.84 | -8.82-14.2 | -18.45-19.25 | -16.12-15.29 | -7.07-2.76 | -0.031-5.4 | 3.282-2.6 | 1.670-2.2 | -1.2-3.3 | -3.81-3.36 | -4.17-2.53 | -3.84-8.83 | -8.42-3.89 | -7.23-7.98 | -7.37-6.95 | -13.47-9.87 | -6.43-8.62 | -11.55-11.46 | -17.81-13.52 | -17.43-18 | -13.61-12.79 | -11.56-18.18 |
| Theta (135°) | -5.32-5.26 | -4.69-3.42 | -4.67-5.53 | -8.28-13.59 | -17.48-17.72 | -18.49-11.03 | -6.21-8.25 | -0.410-9.6 | 1.330-9.7 | -0.110-8.4 | -1.77-2.47 | -2.46-2.27 | -1.65-1.84 | -3.121-8.09 | -18.28-18.91 | -18.64-11.98 | -4.4-0.56 | -1.92-3.55 | -4.89-2.95 | -5.98-10.9 | -7.75-7.23 | -16.06-15.21 | -11.71-11.81 | -13.13-11.12 |
| Theta (142.5°) | -0.98-1.78 | -4.75-6.38 | -8.49-13.7 | -18.16-16.78 | -11.76-10.9 | -13.79-16 | -10.94-7.11 | -4.35-3.3 | -3.49-4.54 | -5.95-7.63 | -10.27-11.52 | -12.78-7.32 | -4.46-2.86 | -7.25-7.43 | -7.56-8.35 | -10.75-11.03 | -8.95-11.02 | -12.61-14.81 | -18.14-17.9 | -16.14-12.1 | -9.86-5.37 | -3.13-1.95 | -1.09-7.03 | -0.33-5.52 |
| Theta (150°) | -6.89-7.17 | -10.41-9.1 | -12.91-12.88 | -9.82-8.01 | -7.32-7.22 | -8.16-11.26 | -15.58-9.38 | -5.28-3.42 | -2.61-2.62 | -3.26-4.71 | -6.78-7.83 | -6.69-5.35 | -4.3-2.81 | -2.29-2.17 | -1.97-3.35 | -5.81-4.18 | -2.69-4.25 | -7.03-7.66 | -7.34-7.65 | -9.46-11.43 | -11.35-12.84 | -13.51-11.63 | -9.85-9.18 | -12.67-12.68 |
| Theta (157.5°) | -10.68-10.75 | -13.85-18.94 | -17.85-16.15 | -11.47-8.14 | -6.36-6.07 | -6.94-7.76 | -8.02-7.46 | -6.75-6.21 | -5.65-5.05 | -4.61-4.37 | -4.04-3.41 | -2.81-1.92 | -0.540-8.1 | 1.51-2.7 | -0.46-4.33 | -12-19.17 | -17.67-11.88 | -6.56-5.48 | -7.11-9.29 | -9.44-7.06 | -5.01-3.57 | -2.58-2.14 | -2.75-4.07 | -6.43-6.16 |
| Theta (165°) | -16.04-18.68 | -18.19-15.21 | -12.24-11.69 | -13.15-16.67 | -17.66-18.86 | -17.82-16.36 | -13.18-10.64 | -8.31-7.24 | -2.12-1.94 | -2.15-2.87 | -4.2-6.7 | -9.71-10.45 | -9.06-9.6 | -13.2-19.7 | -7.43-9.56 | -6.83-7.59 | -9.87-14.45 | -19.05-16.45 | -18.74-18.44 | -17.31-17.66 | -18.14-18.44 | -17.31-17.66 | -19 | |



Radiated Composite Gain Data

Appendix A

| Theta (°) | -18.37-16.68 | -14.37-12.42 | -10.59-9.08 | -7.8-6.74 | -5.9-5.21 | -4.69-4.36 | -4.16-3.9 | -3.61-3.45 | -4.23-4.91 | -6.02-7.54 | -9.71-13.02 | -18.17-17.82 | -15.64-11.18 | -8.31-6.25 | -4.58-3.33 | -2.38-1.17 | -1.19-0.96 | -0.99-1.34 | -1.95-2.83 | -3.91-5.11 | -6.29-7.31 | -8.22-9.25 | -10.61-12.36 | -14.89-17.71 | |
|------------|-----------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|--------------|
| Phi (°) | -12.33-13.7 | -15.15-15.91 | -15.67-14.6 | -13.15-11.61 | -10.27-9.15 | -8.23-7.39 | -6.55-5.78 | -4.96-4.49 | -4.27-3.49 | -4.81-5.57 | -6.8-8.84 | -11.99-16.33 | -16.84-12.31 | -8.61-6 | -3.94-2.45 | -1.39-0.68 | -0.25-0.14 | -0.29-0.76 | -1.5-2.42 | -3.48-4.4 | -5.73-6.58 | -7.05-7.47 | -9.1-8.69 | -9.81-11.22 | |
| Freq (GHz) | 5.2GPol | PhiAnt 3 | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | |
| Gain | Phi(0°)Phi(75°) | Phi(15°)Phi(22.5°) | Phi(30°)Phi(37.5°) | Phi(45°)Phi(52.5°) | Phi(60°)Phi(67.5°) | Phi(75°)Phi(82.5°) | Phi(90°)Phi(97.5°) | Phi(105°)Phi(112.5°) | Phi(120°)Phi(127.5°) | Phi(135°)Phi(142.5°) | Phi(150°)Phi(157.5°) | Phi(165°)Phi(172.5°) | Phi(180°)Phi(187.5°) | Phi(195°)Phi(202.5°) | Phi(210°)Phi(217.5°) | Phi(225°)Phi(232.5°) | Phi(240°)Phi(247.5°) | Phi(255°)Phi(262.5°) | Phi(270°)Phi(277.5°) | Phi(285°)Phi(292.5°) | Phi(300°)Phi(307.5°) | Phi(315°)Phi(322.5°) | Phi(330°)Phi(337.5°) | Phi(345°)Phi(352.5°) | |
| Theta (°) | -11.19-11.34 | -11.05-12.6 | -13.49-12.51 | -12.31-12.03 | -10.9-10.54 | -9.16-8.18 | -8.6-9.02 | -8.43-7.77 | -7.81-7.77 | -7.9-8.37 | -8.89-9.54 | -10.35-11.09 | -11.77-12.73 | -13.53-14.59 | -15.28-15.86 | -14.31-13.2 | -11.38-10.44 | -9.61-9.39 | -8.91-8.4 | -7.94-8.21 | -9.29-11.09 | -11.34-11.41 | -11.26-11.17 | -12.29-11.01 | |
| Phi (°) | -7.04-8.82 | -9.96-10.91 | -10.88-9.71 | -8.51-7.86 | -8-8.86 | -9.22-10.8 | -15.11-18.31 | -16.13-17.92 | -14.44-13.77 | -13.47-13.48 | -13.23-12.85 | -12.46-12.12 | -11.91-13.43 | -13.64-13.75 | -13.67-12.88 | -12.14-12.04 | -11.91-11.32 | -10.3-9.23 | -7.84-6.91 | -5.91-5.42 | -5.3-5.14 | -5.17-5.37 | -5.71-5.67 | -6.3-6.46 | |
| Freq (GHz) | 5.2GPol | PhiAnt 3 | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | |
| Gain | Phi(0°)Phi(75°) | Phi(15°)Phi(22.5°) | Phi(30°)Phi(37.5°) | Phi(45°)Phi(52.5°) | Phi(60°)Phi(67.5°) | Phi(75°)Phi(82.5°) | Phi(90°)Phi(97.5°) | Phi(105°)Phi(112.5°) | Phi(120°)Phi(127.5°) | Phi(135°)Phi(142.5°) | Phi(150°)Phi(157.5°) | Phi(165°)Phi(172.5°) | Phi(180°)Phi(187.5°) | Phi(195°)Phi(202.5°) | Phi(210°)Phi(217.5°) | Phi(225°)Phi(232.5°) | Phi(240°)Phi(247.5°) | Phi(255°)Phi(262.5°) | Phi(270°)Phi(277.5°) | Phi(285°)Phi(292.5°) | Phi(300°)Phi(307.5°) | Phi(315°)Phi(322.5°) | Phi(330°)Phi(337.5°) | Phi(345°)Phi(352.5°) | |
| Theta (°) | -9.06-8.58 | -9.27-9.76 | -10.34-10.45 | -10.76-10 | -9.85-10.32 | -9.86-9.7 | -10.29-10.68 | -12.13-12.78 | -12.64-12.53 | -13.06-13.2 | -12.37-11.13 | -10.3-9.96 | -9.78-9.39 | -8.8-8.17 | -7.57-7.37 | -7.61-8.1 | -8.95-9.36 | -9.46-9.48 | -9.36-9.27 | -8.84-10.39 | -11.03-10.49 | -9.51-9.19 | -9.2-9.74 | -9.34-9.16 | |
| Phi (°) | -7.06-6.49 | -6.77-7.34 | -7.61-8.12 | -8.76-9.17 | -9.42-9.95 | -7.89-7.29 | -7.47-7.41 | -7.52-7.86 | -7.99-8.13 | -8.71-9.34 | -9.86-10.16 | -10.64-10.93 | -11.16-10.96 | -10.60-10.1 | -9.66-9.12 | -8.4-7.6 | -7.1-6.87 | -6.91-7.09 | -7.32-7.33 | -8.22-9.45 | -11.6-13.28 | -15.87-13.5 | -15.87-13.5 | -10.49-8.25 | |
| Freq (GHz) | 5.2GPol | PhiAnt 3 | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | |
| Gain | Phi(0°)Phi(75°) | Phi(15°)Phi(22.5°) | Phi(30°)Phi(37.5°) | Phi(45°)Phi(52.5°) | Phi(60°)Phi(67.5°) | Phi(75°)Phi(82.5°) | Phi(90°)Phi(97.5°) | Phi(105°)Phi(112.5°) | Phi(120°)Phi(127.5°) | Phi(135°)Phi(142.5°) | Phi(150°)Phi(157.5°) | Phi(165°)Phi(172.5°) | Phi(180°)Phi(187.5°) | Phi(195°)Phi(202.5°) | Phi(210°)Phi(217.5°) | Phi(225°)Phi(232.5°) | Phi(240°)Phi(247.5°) | Phi(255°)Phi(262.5°) | Phi(270°)Phi(277.5°) | Phi(285°)Phi(292.5°) | Phi(300°)Phi(307.5°) | Phi(315°)Phi(322.5°) | Phi(330°)Phi(337.5°) | Phi(345°)Phi(352.5°) | |
| Theta (°) | -14.44-16.62 | -15.84-14.6 | -12.55-10.24 | -8.52-8.71 | -9.13-9.5 | -10.05-13.39 | -19.01-19.22 | -18.01-17.37 | -18.64-18.8 | -19.15-16.45 | -13.13-11.99 | -10.42-8.8 | -7.47-6.56 | -6.21-6.1 | -5.88-5.84 | -5.56-5.53 | -5.72-6.35 | -6.76-7.36 | -7.85-7.61 | -7.35-9.77 | -6.74-6.58 | -6.33-6.51 | -7.8-7.77 | -11.14-12.17 | |
| Phi (°) | -12.81-13.44 | -12.05-12.07 | -11.83-10.77 | -9.54-10.09 | -10.67-10.5 | -11.82-12.51 | -13.48-16.04 | -17.77-18.24 | -19.09-17.77 | -15.63-15.45 | -15.27-14.28 | -12.59-11.61 | -11.58-11.92 | -12.09-11.22 | -9.31-7.44 | -6.04-5.47 | -4.87-5.13 | -5.87-7.46 | -8.95-9.6 | -8.92-7.44 | -6.29-6.56 | -5.46-5.92 | -6.59-8.1 | -10.64-12.11 | |
| Freq (GHz) | 5.2GPol | PhiAnt 3 | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | |
| Gain | Phi(0°)Phi(75°) | Phi(15°)Phi(22.5°) | Phi(30°)Phi(37.5°) | Phi(45°)Phi(52.5°) | Phi(60°)Phi(67.5°) | Phi(75°)Phi(82.5°) | Phi(90°)Phi(97.5°) | Phi(105°)Phi(112.5°) | Phi(120°)Phi(127.5°) | Phi(135°)Phi(142.5°) | Phi(150°)Phi(157.5°) | Phi(165°)Phi(172.5°) | Phi(180°)Phi(187.5°) | Phi(195°)Phi(202.5°) | Phi(210°)Phi(217.5°) | Phi(225°)Phi(232.5°) | Phi(240°)Phi(247.5°) | Phi(255°)Phi(262.5°) | Phi(270°)Phi(277.5°) | Phi(285°)Phi(292.5°) | Phi(300°)Phi(307.5°) | Phi(315°)Phi(322.5°) | Phi(330°)Phi(337.5°) | Phi(345°)Phi(352.5°) | |
| Theta (°) | -14.78-13.65 | -9.77-6.74 | -6.09-5.8 | -6.81-9.43 | -6.28-5.22 | -2.04-4.66 | -11.86-17.98 | -12.84-10.92 | -10.81-13.77 | -12.52-13.2 | -10.95-9.31 | -9.18-10.01 | -8.31-10.21 | -8.97-10.83 | -9.76-6.58 | -5.68-5.1 | -4.5-6.13 | -4.8-4.59 | -5.83-11.48 | -7.89-11.48 | -11.87-17.6 | -16.02-10.49 | -9.88-12.3 | -12.67-11.88 | -14.71-17.09 |
| Phi (°) | -9.86-9.77 | -12.84-17.77 | -18.58-12.05 | -10.15-10.15 | -11.03-13.17 | -15.38-16.5 | -12.27-9.58 | -9.04-6.03 | -15.63-11.44 | -8.2-9.04 | -8.95-7.87 | -9.35-14.39 | -7.55-2.49 | -5.23-18.16 | -6.89-4.32 | -1.62-12.9 | -2.66-5.2 | -8.35-13.9 | -8-8.6 | -8.68-9.82 | -15.44-18.83 | -18.28-16.7 | -11.5-9.09 | -2.45-2.46 | |
| Freq (GHz) | 5.3GPol | PhiAnt 3 | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | |
| Gain | Phi(0°)Phi(75°) | Phi(15°)Phi(22.5°) | Phi(30°)Phi(37.5°) | Phi(45°)Phi(52.5°) | Phi(60°)Phi(67.5°) | Phi(75°)Phi(82.5°) | Phi(90°)Phi(97.5°) | Phi(105°)Phi(112.5°) | Phi(120°)Phi(127.5°) | Phi(135°)Phi(142.5°) | Phi(150°)Phi(157.5°) | Phi(165°)Phi(172.5°) | Phi(180°)Phi(187.5°) | Phi(195°)Phi(202.5°) | Phi(210°)Phi(217.5°) | Phi(225°)Phi(232.5°) | Phi(240°)Phi(247.5°) | Phi(255°)Phi(262.5°) | Phi(270°)Phi(277.5°) | Phi(285°)Phi(292.5°) | Phi(300°)Phi(307.5°) | Phi(315°)Phi(322.5°) | Phi(330°)Phi(337.5°) | Phi(345°)Phi(352.5°) | |
| Theta (°) | -10.18-11.14 | -11.41-11.88 | -13.02-15.35 | -14.62-14.29 | -14.33-14.47 | -13.92-13.62 | -12.42-11.38 | -10.19-9.57 | -9.88-10.25 | -9.91-8.59 | -7.69-7.6 | -8.21-8.69 | -8.83-8.82 | -9.01-10.26 | -12.35-13.94 | -14.89-15.95 | -16.98-15.75 | -14.06-12.16 | -10.63-10.22 | -9.91-9.61 | -10.04-9.78 | -9.15-8.89 | -8.97-8.66 | -9.02-9.24 | |
| Phi (°) | -7.78-7.79 | -8.31-8.93 | -10.3-12.58 | -12.61-13.86 | -12.79-11.47 | -10.35-10.08 | -8.44-7.84 | -7.12-6.8 | -6.71-6.93 | -7.13-6.95 | -7.07-7.54 | -8.41-9.53 | -10.86-13.25 | -16.16-17.78 | -14.71-12.36 | -10.62-9.54 | -9.2-10.33 | -11.23-12.27 | -13.48-12.85 | -12.33-11.41 | -10.28-8.79 | -7.53-7.56 | -7.53-7.56 | -7.53-7.56 | |
| Freq (GHz) | 5.3GPol | PhiAnt 3 | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | |
| Gain | Phi(0°)Phi(75°) | Phi(15°)Phi(22.5°) | Phi(30°)Phi(37.5°) | Phi(45°)Phi(52.5°) | Phi(60°)Phi(67.5°) | Phi(75°)Phi(82.5°) | Phi(90°)Phi(97.5°) | Phi(105°)Phi(112.5°) | Phi(120°)Phi(127.5°) | Phi(135°)Phi(142.5°) | Phi(150°)Phi(157.5°) | Phi(165°)Phi(172.5°) | Phi(180°)Phi(187.5°) | Phi(195°)Phi(202.5°) | Phi(210°)Phi(217.5°) | Phi(225°)Phi(232.5°) | Phi(240°)Phi(247.5°) | Phi(255°)Phi(262.5°) | Phi(270°)Phi(277.5°) | Phi(285°)Phi(292.5°) | Phi(300°)Phi(307.5°) | Phi(315°)Phi(322.5°) | Phi(330°)Phi(337.5°) | Phi(345°)Phi(352.5°) | |
| Theta (°) | -7.83-7.97 | -8.8-9.67 | -10.32-9.16 | -7.77-7.66 | -7.31-7.24 | -7.79-7.92 | -7.26-6.91 | -6.47-5.96 | -5.49-5.82 | -6.71-8.45 | -9.89-9.67 | -8.53-8.43 | -9.27-10.72 | -12.08-12.72 | -14.26-16.42 | -18.8-17.42 | -13.67-10.23 | -7.52-5.89 | -5.2-5.97 | -6.62-8.37 | -9.73-9.63 | -9.49-9.33 | -9.21-8.66 | -7.08-7.23 | |
| Phi (°) | -15.01-13.02 | -10.78-8.45 | -6.66-5.3 | -4.49-3.72 | -3.2-3.65 | -4.92-5.8 | -6.86-6.85 | -6.82-6.94 | -7.12-7.49 | -7.57-7.12 | -6.94-7.82 | -10.2-13.16 | -15.51-17.65 | -19.18-17.16 | -13.75-11.68 | -9.7-8 | -6.6-6.47 | -4.9-4.78 | -4.57-5.44 | -6.46-6.34 | -5.44-5.36 | -5.81-5.95 | -6.82-7.23 | -8.62-12.43 | |
| Freq (GHz) | 5.3GPol | PhiAnt 3 | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | + | - | |
| Gain | Phi(0°)Phi(75°) | Phi(15°)Phi(22.5°) | Phi(30°)Phi(37.5°) | Phi(45°)Phi(52.5°) | Phi(60°)Phi(67.5°) | Phi(75°)Phi(82.5°) | Phi(90°)Phi(97.5°) | Phi(105°)Phi(112.5°) | Phi(120°)Phi(127.5°) | Phi(135°)Phi(142.5°) | Phi(150°)Phi(157.5°) | Phi(165°)Phi(172.5°) | Phi(180°)Phi(187.5°) | Phi(195°)Phi(202.5°) | Phi(210°)Phi(217.5°) | Phi(225°)Phi(232.5°) | Phi(240°)Phi(247.5°) | Phi(255°)Phi(262.5°) | Phi(270°)Phi(277.5°) | Phi(285°)Phi(292.5°) | Phi(300°)Phi(307.5°) | Phi(315°)Phi(322.5°) | Phi(330°)Phi(337.5°) | Phi(345°)Phi(352.5°) | |
| Theta (°) | -1.34-1.74 | -2.34-2.53 | -2.88-3.99 | -6.63-10.04 | -16.61-14.27 | -8.52-6.81 | -6.35-7.19 | -10.72-13.47 | -10.54-8.2 | -7.76-9.84 | -12.67-11.46 | -10.51-11.74 | -8.16-6.46 | -5.97-4 | -2.19-2.22 | -4.45-8.12 | -9.08-5.75 | -3.6-2.56 | -2.4-2.8 | -1.80-3.8 | 0.61-1.47 | 2.13-1.98 | 1.15-1.8 | -0.81-0.95 | |



Radiated Composite Gain Data

Appendix A

| Freq(Hz) | Theta/Phi Ant. 4 | Phi(15°)/Phi(22.5°) | Phi(30°)/Phi(37.5°) | Phi(45°)/Phi(52.5°) | Phi(60°)/Phi(67.5°) | Phi(75°)/Phi(82.5°) | Phi(90°)/Phi(97.5°) | Phi(105°)/Phi(112.5°) | Phi(120°)/Phi(127.5°) | Phi(135°)/Phi(142.5°) | Phi(150°)/Phi(157.5°) | Phi(165°)/Phi(172.5°) | Phi(180°)/Phi(187.5°) | Phi(195°)/Phi(202.5°) | Phi(210°)/Phi(217.5°) | Phi(225°)/Phi(232.5°) | Phi(240°)/Phi(247.5°) | Phi(255°)/Phi(262.5°) | Phi(270°)/Phi(277.5°) | Phi(285°)/Phi(292.5°) | Phi(300°)/Phi(307.5°) | Phi(315°)/Phi(322.5°) | Phi(330°)/Phi(337.5°) | Phi(345°)/Phi(352.5°) |
|---------------|-------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Theta(142.5°) | -10.14/-15.39 | -18.06/-18.24 | -11.23/-7.13 | -6.18/-6.96 | -8.47/-8.97 | -9.8/-11.45 | -11.13/-8.05 | -8.37/-10.38 | -8.19/-6.08 | -7.05/-9.62 | -11.67/-19.22 | -11.3/-7.47 | -17.57/-8.28 | -3.53/-5.81 | -1.76/-0.32 | -6.28/-1.76 | 0.61/1.35 | 1.22/-2.22 | -2.05/-7.22 | -2.38/-9.99 | -5.95/-8.99 | -11.68/-14.95 | -7.02/-10.53 | -18.08/-13.66 |
| Theta(150°) | -11.45/-11.85 | -8.23/-6.11 | -6.04/-7.57 | -9.48/-9.32 | -6.53/-8.89 | -11.13/-16.94 | -18.08/-18.46 | -17.84/-14.83 | -11.37/-9.84 | -10.51/-14.52 | -18.51/-17.25 | -13.48/-12.2 | -9.02/-6.66 | -5.54/-3.1 | -2.67/-0.58 | -5.32/-2.91 | -0.95/0.53 | -0.06/-3.39 | -7.19/-8.93 | -4.83/-0.98 | -1.08/-3.32 | -2.6/-1.7 | -2.63/-3.61 | -6.15/-10.55 |
| Theta(157.5°) | -14.15/-12.82 | -12.14/-12.91 | -17.66/-16.38 | -14.13/-15.45 | -15.26/-18.82 | -18.32/-13.15 | -10.62/-9.92 | -9.32/-8.82 | -8.26/-9.09 | -11.62/-15.65 | -18.65/-18.24 | -19.75/-15.33 | -12.79/-8.51 | -4.63/-2.57 | -2.31/-3.05 | -3.63/-2.84 | -0.94/0 | -0.23/-1.6 | -3.12/-5.15 | -6.17/-3.56 | -2.26/-3.55 | -5.98/-6.74 | -6.47/-8.22 | -11.13/-10.32 |
| Theta(165°) | -14.47/-15.2 | -12.48/-9.35 | -7.37/-3.55 | -8.94/-12.08 | -15.21/-17.2 | -14.83/-12.25 | -11.82/-13.03 | -15.28/-18.34 | -19.32/-17.6 | -18.09/-17.46 | -15.64/-15.2 | -16.22/-17.62 | -15.76/-12.58 | -9.87/-7.2 | -6.48/-5.16 | -3.65/-2.27 | -0.98/0.2 | 0.19/0.01 | -0.85/-2.69 | -5.33/-5.75 | -5.33/-6.65 | -6.96/-10.47 | -13.81/-14.45 | -14.05/-13.55 |
| Theta(172.5°) | -11.17/-10.77 | -10.23/-9.77 | -9.17/-10.57 | -12.65/-13.35 | -13.49/-12.98 | -14.46/-16.15 | -15.71/-13.8 | -9.94/-6.48 | -4.44/-3.88 | -4.53/-6.34 | -7.94/-5.95 | -11.09/-11.76 | -10.11/-7.88 | -5.92/-4.54 | -3.59/-3.1 | -2.71/-2.59 | -2.87/-3.02 | -3.21/-3.68 | -4.45/-5.71 | -6.61/-6.13 | -5.91/-6.07 | -6.6/-5.9 | -7.43/-9.11 | -9.68/-9.86 |
| Theta(180°) | -1.466/-1.71 | -1.134/-8.16 | -6.23/-5.59 | -5.41/-4.65 | -4.35/-4.38 | -5.36/-6.28 | -7.25/-7.46 | -6.22/-5.19 | -4.5/-4.84 | -5.72/-7.39 | -8.72/-8.97 | -8.47/-7.66 | -6.81/-5.88 | -4.69/-3.83 | -3.16/-2.86 | -2.85/-2.7 | -2.8/-2.7 | -2.84/-3.22 | -3.36/-3.49 | -4.34/-5.97 | -9.28/-13.63 | -14.26/-13.82 | -12.55/-11.1 | -11.8/-11.47 |
| Freq(Hz) | Theta/Phi Ant. 4 | Phi(15°)/Phi(22.5°) | Phi(30°)/Phi(37.5°) | Phi(45°)/Phi(52.5°) | Phi(60°)/Phi(67.5°) | Phi(75°)/Phi(82.5°) | Phi(90°)/Phi(97.5°) | Phi(105°)/Phi(112.5°) | Phi(120°)/Phi(127.5°) | Phi(135°)/Phi(142.5°) | Phi(150°)/Phi(157.5°) | Phi(165°)/Phi(172.5°) | Phi(180°)/Phi(187.5°) | Phi(195°)/Phi(202.5°) | Phi(210°)/Phi(217.5°) | Phi(225°)/Phi(232.5°) | Phi(240°)/Phi(247.5°) | Phi(255°)/Phi(262.5°) | Phi(270°)/Phi(277.5°) | Phi(285°)/Phi(292.5°) | Phi(300°)/Phi(307.5°) | Phi(315°)/Phi(322.5°) | Phi(330°)/Phi(337.5°) | Phi(345°)/Phi(352.5°) |
| Gain | Phi(0°)/Phi(7.5°) | Phi(15°)/Phi(22.5°) | Phi(30°)/Phi(37.5°) | Phi(45°)/Phi(52.5°) | Phi(60°)/Phi(67.5°) | Phi(75°)/Phi(82.5°) | Phi(90°)/Phi(97.5°) | Phi(105°)/Phi(112.5°) | Phi(120°)/Phi(127.5°) | Phi(135°)/Phi(142.5°) | Phi(150°)/Phi(157.5°) | Phi(165°)/Phi(172.5°) | Phi(180°)/Phi(187.5°) | Phi(195°)/Phi(202.5°) | Phi(210°)/Phi(217.5°) | Phi(225°)/Phi(232.5°) | Phi(240°)/Phi(247.5°) | Phi(255°)/Phi(262.5°) | Phi(270°)/Phi(277.5°) | Phi(285°)/Phi(292.5°) | Phi(300°)/Phi(307.5°) | Phi(315°)/Phi(322.5°) | Phi(330°)/Phi(337.5°) | Phi(345°)/Phi(352.5°) |
| Theta(0°) | -4.39/-4.86 | -6.71/-7.15 | -7.42/-7.35 | -8.61/-10.28 | -11.71/-13.32 | -14.79/-16.28 | -13.28/-11.53 | -10.22/-9.55 | -8.93/-7.66 | -6.29/-5.04 | -4.85/-4.55 | -5.65/-5.81 | -6.67/-5.58 | -8.84/-6.01 | -6.67/-7.66 | -16.22/-10.61 | -12.62/-10.6 | -8.29/-7.51 | -15.76/-14.84 | -16.22/-10.6 | -6.15/-4.99 | -4.19/-4.1 | -3.99/-4.4 | -4.25/-4.65 |
| Theta(7.5°) | -4.14/-4.51 | -6.43/-6.77 | -6.25/-6.29 | -7.91/-9.47 | -10.21/-12.38 | -13.83/-12.17 | -10.38/-7.4 | -5.09/-3.56 | -2.71/-2.11 | -1.44/-0.84 | -0.38/-0.6 | -1.05/-1.51 | -2.21/-2.73 | -3.24/-4.2 | -5.46/-6.93 | -8.69/-9.78 | -11.88/-12.36 | -15.31/-17.15 | -19.37/-17.78 | -15.07/-13.79 | -11.47/-10.47 | -9.58/-8.41 | -6.9/-5.81 | -4.65/-4.52 |
| Theta(15°) | -3.99/-5.19 | -6.72/-5.84 | -4.34/-6.69 | -6.98/-9.2 | -10.57/-14.8 | -13.07/-11.04 | -8.69/-5.38 | -3.03/-1.33 | -2.20/-2.56 | 0.97/1.15 | 1.02/0.56 | -0.22/-1.28 | -2.37/-3.85 | -5.26/-6.2 | -6.66/-7.19 | -7.6/-7.93 | -9.09/-10.75 | -14.56/-18.3 | -19.17/-18.07 | -18.11/-18.17 | -18.21/-13 | -10.62/-9.31 | -8.71/-6.71 | -3.66/-3.48 |
| Theta(22.5°) | -8.07/-8.43 | -7.37/-6.87 | -6.68/-7.68 | -9.63/-10.53 | -10.82/-14.4 | -13.96/-12.91 | -9.94/-6.37 | -1.94/-0.67 | 0.11/0.4 | 0.49/0.65 | 0.43/-0.28 | -1.07/-2.25 | -3.82/-4.64 | -8.11/-10.84 | -14.37/-15.44 | -12.19/-11.15 | -11.81/-13.1 | -15.17/-19.22 | -17.28/-18.58 | -18.52/-19.17 | -18.21/-13.09 | -12.51/-12.97 | -12.68/-8.37 | -5.41/-5.96 |
| Theta(30°) | -10.78/-8.38 | -9.99/-11.34 | -9.21/-10.3 | -6.81/-7.8 | -9.68/-11.73 | -11.23/-10.43 | -7.73/-6.64 | -5.39/-3.86 | -2.79/-2.62 | -3.05/-2.97 | -2.41/-1.92 | -1.82/-2.33 | -3.46/-5.27 | -7.81/-9.5 | -10.41/-11.61 | -15.51/-18.41 | -18.57/-18.76 | -18.89/-19.27 | -19.02/-18.74 | -17.86/-18.19 | -17.84/-18.1 | -18.9/-18.74 | -18.95/-16.62 | -14.65/-14.59 |
| Theta(37.5°) | -8.48/-10.81 | -15.54/-13.49 | -10.82/-9.25 | -9.43/-10.58 | -9.42/-9.86 | -10.96/-12.22 | -10.27/-12.1 | -4.74/-4.2 | -4.81/-4.57 | -4.52/-2.62 | -1.48/-1.56 | -2.99/-4.7 | -5.44/-5.87 | -8.42/-13.54 | -16.95/-15.64 | -14.75/-14.4 | -14.96/-16.74 | -18.78/-17.8 | -15.71/-15.25 | -16.85/-17.68 | -13.53/-14.04 | -17.56/-12.02 | -11.13/-13.03 | -10.24/-8.51 |
| Theta(45°) | -14.69/-13.64 | -15.31/-11.8 | -7.63/-4.46 | -3.91/-5.84 | -6.67/-6.49 | -5.92/-5.68 | -5.43/-11.1 | -9.73/-12.22 | -11.7/-3.2 | -4.4/-2.92 | -2.28/-2.95 | -5.39/-6.71 | -5.68/-8.23 | -16.53/-19.51 | -12.44/-13.78 | -14.55/-10.25 | -16.29/-14.11 | -14.55/-10.25 | -17.22/-4.78 | -18.52/-19.17 | -18.21/-13.09 | -12.51/-12.97 | -12.68/-8.37 | -5.41/-5.96 |
| Theta(52.5°) | -14.66/-10.4 | -8.9/-3.84 | -2.38/-3.07 | -4.57/-7.13 | -10.63/-13.67 | -11.41/-8.63 | -6.77/-6.24 | -7.14/-9.58 | -9.26/-5.76 | -2.44/-0.38 | 0.3/-2.56 | -6.86/-7.45 | -6.74/-8.93 | -13.36/-14.13 | -10.71/-9 | -8.83/-10.4 | -17.29/-18.13 | -14.91/-11.89 | -9.78/-9.08 | -9.33/-9.86 | -11.61/-14.81 | -13.61/-13.33 | -14.71/-10.32 | -11.31/-11.9 |
| Theta(60°) | -8.44/-6.85 | -8.14/-10.23 | -8.67/-3.1 | -8.74/-10.2 | -10.05/-11.1 | -10.96/-13.45 | -16.36/-15.61 | -14.02/-13.36 | -9.34/-5.46 | -3.63/-3 | -1.33/-6.66 | -10.96/-13.63 | -13.09/-10.89 | -6.98/-7.3 | -9.18/-14.11 | -14.61/-13.61 | -13.28/-14.14 | -18.32/-18.94 | -18.49/-18.35 | -13.38/-14.77 | -12.22/-15.48 | -18.35/-17.21 | -16.16/-16.27 | -11.15/-10.18 |
| Theta(67.5°) | -6.77/-8.2 | -10.75/-14.2 | -3.02/-4.55 | -7.46/-12.81 | -11.45/-9.07 | -8.87/-8.84 | -10.88/-13.29 | -11.91/-11.48 | -8.96/-7.75 | -7.71/-6.58 | -6.78/-9.03 | -12.39/-10.62 | -9.83/-12.61 | -9.64/-6.92 | -7.24/-8.88 | -15.12/-17.16 | -14.73/-14.09 | -17.41/-17.9 | -18.96/-15.97 | -13.43/-12.68 | -13.24/-13.49 | -13.49/-12.06 | -11.66/-18.23 | -18.21/-10.71 |
| Theta(75°) | -2.79/-1.6 | -0.78/-0.3 | -2.49/-6.2 | -9.31/-10.58 | -10.82/-9.95 | -9.73/-10.8 | -11.9/-10.58 | -8.49/-7.96 | -8.79/-10.53 | -13.69/-16.68 | -18.43/-18.33 | -12.61/-10.66 | -11.27/-8.1 | -5.22/-6.07 | -8.55/-10.38 | -8.83/-9.55 | -19.63/-16.56 | -13.88/-19.11 | -15.44/-11.35 | -9.91/-14.1 | -14.17/-12.37 | -12.49/-11.16 | -8.94/-5 | -4.76/-3.79 |
| Theta(82.5°) | -0.55/-0.97 | -0.97/-0.23 | -1.06/-1.9 | -7.52/-9.53 | -14.53/-18.54 | -18.27/-13.65 | -12.41/-15.27 | -14.33/-10.94 | -8.23/-6.38 | -6.31/-8.68 | -10.41/-9.38 | -6.85/-4.79 | -4.78/-3.37 | -4.29/-6.29 | -5.43/-4.24 | -0.72/-1.51 | -8.33/-18.92 | -7.77/-13.58 | -16.45/-9.07 | -7.34/-12.95 | -11.84/-8.6 | -8.87/-8.08 | -4.36/-1.92 | -0.43/-0.92 |
| Theta(90°) | 0.61/1.69 | 1.16/0.51 | -0.02/-1.4 | 6.33/-13.24 | -18.38/-12.95 | -11.57/-17.69 | -12.11/-11.33 | -12.58/-12.7 | -12.97/-12.76 | -11.87/-11.07 | -4.13/-3.37 | -2.14/-4.71 | -3.24/-2.72 | -2.43/-6.9 | -2.55/-3.08 | -2.43/-6.9 | -10.55/-14.2 | -5.62/-10.56 | -18.26/-9.72 | -7.58/-11.77 | -7.34/-19 | -0.99/-0.48 | 0.09/-0.31 | |
| Theta(97.5°) | 0.88/1.71 | 1.66/0.84 | -1.04/-3.01 | -6.18/-13.54 | -12.92/-8.28 | -11.11/-13.87 | -10.37/-8.35 | -11.07/-14.16 | -13.43/-10.21 | -13.32/-13.31 | -12.96/-6.01 | -6.09/-5.53 | -8.46/-8.8 | -5.25/-4.7 | -5.93/-6.08 | -3.84/-3.61 | -8.18/-17.91 | -6.84/-12.1 | -18.01/-12.04 | -6.74/-7.84 | -2.55/-1.34 | -1.62/-2.22 | -0.82/0.18 | 0.62/0.76 |
| Theta(105°) | 2.24/2.8 | 2.21/2.66 | 0.96/-0.63 | -5.93/-12.93 | -17.02/-12.21 | -14.49/-13.92 | -8.27/-0.2 | -7.08/-4.77 | -5.15/-5.68 | -7.54/-8.09 | -9.95/-8.04 | -5.89/-6.41 | -8.76/-8.48 | -4.33/-7.1 | -9.63/-5.64 | -5.44/-5.55 | -5.46/-16.41 | -12.22/-18.32 | -13.43/-3.96 | -9.19/-10.7 | -6.84/-4.38 | -2.08/-1.4 | 0.38/0.86 | 1.08/1.15 |
| Theta(112.5°) | 3.65/4.21 | 3.82/1.6 | 0.83/-0.6 | -2.18/-3.54 | -4/-4.77 | -10.16/-6.2 | -9.13/-4.66 | -6.76/-7.61 | -5.17/-5.68 | -8.16/-7.75 | -5.46/-6.08 | -11.81/-14.81 | -10.14/-14.18 | -15.03/-10.8 | -8.14/-10.8 | -7.42/-5.23 | -7.61/-13.43 | -18.54/-18.82 | -14.14/-12.06 | -7.94/-5.27 | -2.91/-2.56 | -2.81/-3.36 | -0.88/0.31 | 0.88/1.66 |
| Theta(120°) | 2.22/4.4 | 4.52/2.92 | 1.65/-0.39 | -3.24/-4.59 | -5.07/-5.81 | -6.61/-7.01 | -6.31/-8.09 | -11.45/-10.84 | -8.42/-8.56 | -10.88/-6.61 | -4.05/-6.2 | -18.21/-15.86 | -11.24/-6.3 | -7.04/-14.7 | -11.97/-9.8 | -11.98/-8.75 | -5.98/-10.47 | -18.06/-14.84 | -14.33/-15.74 | -14.88/-7.71 | -6.95/-2.81 | -1.25/0.35 | -0.93/-0.88 | 1.25/1.56 |
| Theta(127.5°) | 0.26/-0.46 | 0.92/1.54 | 0.71/0.17 | -2.71/-4.57 | -3.76/-3.62 | -4.44/-5.55 | -8.52/-12.36 | -17.86/-18.54 | -14.17/-13.62 | -13.96/-10.82 | -6.74/-7.27 | -4.18/-9.06 | -5.95/-3.13 | -11.53/-11.87 | -9.25/-9.92 | -11.58/-13.33 | -8.81/-3.67 | -4.58/-6.97 | -17.76/-16.42 | -10.54/-7.3 | -6.14/-8.51 | -3.17/-2.82 | 1.52/2.92 | 0.77/0.78 |
| Theta(135°) | 0.78/-0.26 | -2.67/-2.24 | -2.21/3.33 | -4.47/-7.55 | -10.19/-14.35 | -19.67/-15.03 | -16.76/-15.25 | -13.78/-11.63 | -13.53/-6.68 | -11.54/-12.38 | -6.14/-9.66 | -11.76/-17.88 | -12.09/-11.1 | -10.84/-12.94 | -9.34/-10.37 | -13.21/-15.3 | -16.04/-13.36 | -8.8/-5.47 | -3.19/-6.84 | -17.17/-12.1 | -6.14/-6.84 | -17.17/-12.1 | -18.75/-17.42 | -18.03/-14.71 |
| Theta(142.5°) | -3.53/-2.79 | -3.05/-3.06 | -4.09/-7.01 | -8.63/-7.43 | -7.75/-7.99 | -8.32/-10.61 | -13.18/-12.2 | -11.41/-12.94 | -13.27/-10.5 | -9.34/-9.64 | -14.36/-11.59 | -14.28/-6.12 | 0.27/0.97 | -2.09/-3.4 | -3.75/-5.94 | -4.41/-5.41 | -7.41/-6.63 | -7.25/-8.21 | -6.12/-4.08 | -5.49/-6.25 | -6.52/-17.92 | -5.18/-4.42 | -5.92/-4.64 | |
| Theta(150°) | -3.45/-3.13 | -7.95/-15.65 | -18.41/-17.64 | -13.84/-11.4 | -13.71/-16.76 | -14.84/-12.6 | -10.91/-10.87 | -14.61/-15.33 | -10.82/-8.76 | -7.77/-7.69 | -9.19/-9.69 | -5.62/-1.22 | 0.35/-1.02 | -3.85/-3.4 | -4.89/-3.61 | -1.85/-8.06 | -2.35/-5.04 | -7.85/-8.91 | -13.33/-10.42 | -16.95/-7.2 | -6.14/-9.19 | -8.39/-5.67 | -6.69/-5.76 | -7.5/-8.22 |
| Theta(157.5°) | -10.49/-8.78 | -6.78/-5.96 | -5.97/-5.98 | -6.16/-7.55 | -9.29/-13.6 | -8.34/-8.44 | -9.8 | | | | | | | | | | | | | | | | | |



Radiated Composite Gain Data

Appendix A

| 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°) | -12.12-08 | -14.11/-16.89 | -18.28/-18.47 | -17.93/-18.55 | -17.93/-15.75 | -12.99/-11.59 | -10.06/-8.46 | -7.14/-6.43 | -5.97/-5.92 | -6.51/-7.33 | -7.63/-7.97 | -8.39/-9.38 | -10.71/-11.98 | -13.92/-16.14 | -17.54/-18.81 | -17.59/-17.01 | -13.77/-11.98 | -10.75/-9.91 | -9.05/-8.58 | -8.77-7.64 | -6.94/-7.96 | -6.69-9.64 | -9.55/-10.06 | -10.41/-12.23 |
| θ(7.5°) | -12.96/-18.03 | -17.84-18.93 | -18.05/-19.03 | -17.32/-16.73 | -14.55/-12.71 | -11.96/-12.38 | -14.35/-14.83 | -15.09/-13.89 | -12.92/-13.53 | -15.66/-18.93 | -18.99/-15.34 | -11.88/-9.8 | -8.85/-8.26 | -7.47/-7.53 | -8.67/-10.86 | -13.74/-17.49 | -18.31/-19.13 | -14.25/-10.2 | -7.58/-6.41 | -5.61/-5.45 | -5.29/-6.68 | -6.44/-6.48 | -7.41/-7.83 | -8.23/-9.74 |
| θ(15°) | -18.91-18.03 | -18.82/-14.82 | -13.55/-12.82 | -12.82/-12.91 | -14.48/-16.04 | -18.42/-18.04 | -18.98/-18.08 | -13.71/-10.49 | -8.55/-7.62 | -7.24/-8.25 | -10.65/-14.47 | -15.16/-10.55 | -7.28/-5.32 | -3.93/-3.49 | -3.81/-4.68 | -6.13/-8.91 | -13.58/-18.37 | -17.59/-12.42 | -9.11/-7.61 | -6.76/-6.18 | -5.57/-5.02 | -5.52/-6.98 | -7.79/-8.63 | -9.31/-13.1 |
| θ(22.5°) | -10.64/-9.22 | -9.04/-9.76 | -9.78/-11.02 | -14.47/-19.12 | -19.29/-18.78 | -18.43/-18.38 | -17.65/-15.66 | -10.15/-5.61 | -2.49/-0.81 | -0.22/-0.82 | -2.58/-5.79 | -11.14/-19.44 | -17.76/-17.02 | -17.71/-14.73 | -12.51/-11.61 | -11.99/-13.55 | -17.46/-18.48 | -18.49/-16.05 | -12.11/-11.49 | -10.35/-7.52 | -5.46/-5.03 | -5.84/-7.18 | -7.65/-8.46 | -8.08/-9.75 |
| θ(30°) | -18.99/-14.57 | -17.75/-14.37 | -11.21/-10.81 | -10.87/-12.69 | -16.19/-14.47 | -10.78/-9.45 | -12.21/-11.71 | -10.31/-4.02 | -1.020.12 | -0.06/-0.85 | -2.4/-5.85 | -12.87/-19.08 | -13.21/-11.03 | -12.1/-14.41 | -15.9/-19.29 | -18.54/-12.35 | -10.71/-12.66 | -16.21/-14.37 | -12.45/-10 | -6.78/-6.8 | -9.23/-12.56 | -15.75/-18.45 | -18.35/-18.83 | |
| θ(37.5°) | -10.57/-13.03 | -10.93/-8.51 | -7.85/-5.93 | -5.78/-6.44 | -8.64/-9.88 | -10.28/-9.35 | -10.33/-12.86 | -12.17/-6.98 | -3.86/-2.69 | -3.31/-6.01 | -9.32/-9.37 | -10.24/-10.05 | -11.34/-14.98 | -17.52/-18.25 | -18.78/-15.9 | -14.02/-16.42 | -11.97/-10.99 | -12.07/-12 | -10.32/-7.76 | -5.19/-5.58 | -7.89/-8.3 | -10.99/-15.83 | -19.25/-18.58 | -18.55/-14.29 |
| θ(45°) | -12.77/-14.59 | -9.63/-9.3 | -7.63/-5.63 | -3.93/-3.51 | -4.64/-6.22 | -10/-12.15 | -9.5/-6.56 | -5.46/-5.19 | -6.01/-8.24 | -10.54/-11.12 | -6.15/-3.67 | -2.84/-1.75 | -2.76/-6.15 | -8.76/-7.44 | -8.44/-15.23 | -16.12/-15.52 | -12.07/-13.62 | -13.85/-8.66 | -5.7/-4.74 | -4.7/-5.6 | -7.63/-12.4 | -14.12/-15.98 | -18.95/-19.15 | -18.9/-13.58 |
| θ(52.5°) | -9.72/-10.07 | -9.18/-6.76 | -6.77/-9.49 | -12.72/-11.93 | -14.07/-14.63 | -18.7/-18.89 | -14.19/-10.31 | -8.63/-7.1 | -7.62/-6.66 | -9.63/-9.45 | -7.89/-8.88 | -5.53/-6.1 | -8.69/-13.26 | -18.52/-18.19 | -18.09/-14.73 | -18.52/-18.75 | -18.61/-18.16 | -18.2/-17.86 | -6.8/-3.43 | -4.4/-8.46 | -13.29/-13.86 | -9.97/-6.53 | -6.18/-10.48 | -12.57/-11.56 |
| θ(60°) | -10.71-7.28 | -4.73/-2.83 | -2.44/-3.27 | -4.68/-9.02 | -16.56/-17.95 | -13.04/-13.81 | -17.46/-13.04 | -7.95/-6.18 | -4.76/-3.18 | -1.88/-1.64 | -4.11/-10.97 | -10.82/-5.85 | -6.53/-13.85 | -16.71/-12.35 | -11.98/-13.5 | -19.06/-13.41 | -11.14/-15.39 | -15.72/-9.38 | -8.3/-6.48 | -6.21/-8.09 | -7.83/-7.61 | -5.35/-5.95 | -5.46/-6.76 | -10.04/-13.2 |
| θ(67.5°) | -7.47/-2.66 | 0/0.31 | -1/-3.94 | -7.18/-9.9 | -15.3/-18.79 | -10.31/-7.41 | -7.52/-6.67 | -6.55/-9.39 | -18.83/-13.91 | -8.99/-6.47 | -5.87/-8.25 | -18.71/-17.76 | -10.59/-10.17 | -6.19/-5.46 | -9.38/-17.95 | -15.77/-12.16 | -16.21/-18.46 | -16.43/-18.02 | -11.13/-8.8 | -10.79/-18.04 | -9.44/-5.57 | -5.64/-5.57 | -4.44/-5.19 | -9.45/-13.18 |
| θ(75°) | -11.24-5.84 | -3.31/-2.39 | -2.66/-4.01 | -5.08/-7.89 | -13.09/-13.59 | -12.11/-11.61 | -13.31/-17.08 | -15.84/-9.8 | -7.33/-8.66 | -10.57/-12.78 | -16.63/-19.03 | -17.85/-15.43 | -17.92/-14.23 | -3.72/-4.76 | -8.91/-15.31 | -10.85/-8.29 | -11/-12.54 | -15.18/-12.14 | -7.37/-4.99 | -7.3/-12.69 | -6.68/-4.84 | -4.9/-4.79 | -4.93/-6.24 | -7.33/-16.89 |
| θ(82.5°) | -3.030.21 | 2.183.21 | 2.740.87 | -1.61/-4.64 | -9.95/-18.25 | -17.45/-17.89 | -16.54/-9.76 | -5.53/-4.78 | -8.87/-11.01 | -12.95/-18.81 | -18.57/-17.93 | -13.06/-11.62 | -9.59/-3.88 | -2.96/-3.67 | -5.56/-7.83 | -4.9/-8.29 | -171/-13.24 | -18.81/-13.45 | -10.56/-11.85 | -16.02/-15.22 | -11.14/-10.42 | -12.18/-14.49 | -11.25/-10.58 | -9.56/-6.9 |
| θ(90°) | -1.27/-1.59 | -0.260.83 | 1.07/0.01 | -3.38/-8.39 | -12.66/-16.75 | -18.66/-17.82 | -17.01/-11.11 | -9.76/-12.97 | -14.31/-10.05 | -8.14/-7.79 | -18.49/-15.07 | -9.9/-10.68 | -7.03/-4.68 | -2.61/-3.62 | -5.09/-3.55 | -1.42/-1.13 | -8.56/-12.2 | -7.45/-12.86 | -5.52/-6.05 | -12.11/-9.53 | -5.96/-6.7 | -6.26/-7.32 | -4.62/-0.97 | 0.12/-1.81 |
| θ(97.5°) | 0.79/0.02 | -0.060.09 | -0.95/-2.56 | -5.16/-8.16 | -9.96/-12.41 | -16.73/-18.94 | -9.88/-6.06 | -4.06/-4.7 | -6.61/-9.64 | -15.77/-12.85 | -12.66/-9.11 | -3.76/-7.93 | -7.47/-2.44 | -3.28/-3.81 | -3.23/-1.9 | -0.97/-3.37 | -12.42/-7.38 | -8.54/-18.29 | -6.89/-7.45 | -18.45/-8.16 | -6.18/-6.79 | -4.22/-2.57 | -0.43/-1.15 | 0.49/-0.6 |
| θ(105°) | -0.17/0.89 | 1.86/1.66 | -0.41/-3.08 | -7.93/-9.04 | -18.2/-18.4 | -13.48/-12.67 | -17.29/-10.18 | -6.33/-7.34 | -7.25/-11.77 | -10.62/-13.51 | -9.16/-8.15 | -10.03/-13.98 | -16.81/-9.93 | -4.46/-3.1 | -4.46/-5.42 | -2.31/-3.13 | -9.32/-14.59 | -4.01/-13.17 | -7.35/-12.6 | -15.12/-7.27 | -6.59/-6.3 | -5.6/-1.67 | 1.01/0.52 | 1.85/0.59 |
| θ(112.5°) | 0.32/5.6 | 3.763.31 | 2.790.2 | -3.71/-7.92 | -15.05/-17.23 | -10.39/-10.66 | -14.29/-6.69 | -3.71/-2.85 | -2.22/-2.99 | -6.55/-3.4 | -3.03/-6 | -11.95/-9.82 | -7.15/-14.54 | -6.44/-10.39 | -7.32/-6.17 | -5.92/-2.64 | -6.75/-12.16 | -9.04/-17.9 | -13.02/-10.98 | -18.7/-12.56 | -6.02/-3.23 | -2.93/-2.23 | -1.80/8.6 | -0.71/-0.97 |
| θ(120°) | 2.833.28 | 3.633.71 | 3.04/1.93 | 1.49/-2.16 | -8.82/-9.27 | -7.8/-10.48 | -7.99/-4.37 | -2.41/-1.49 | -2.76/-6.18 | -7.95/-4.16 | -2.11/-3.84 | -11.47/-17.73 | -12.24/-17.03 | -5.24/-4.46 | -10.61/-17.85 | -7.32/-5.45 | -18.09/-14.58 | -4.03/-7.87 | -18.92/-19.13 | -13.21/-11.55 | -6.32/-4.24 | -3.38/-3.26 | 0.51/6.1 | 0.39/1.68 |
| θ(127.5°) | 5.65.75 | 4.492.47 | 1.880.19 | -0.56/-0.11 | -2.11/-4.03 | -3.09/-3.22 | -5.86/-10.57 | -15.24/-11.4 | -7.1/-8.1 | -10.5/-7.56 | -4.69/-3.85 | -7.66/-7.67 | -18.53/-13.24 | -12.8/-6.84 | -13.28/-17.38 | -12.12/-8.51 | -7.49/-12.93 | -7.1/-8.82 | -6.41/-4.42 | -9.45/-7.57 | -5.48/-2.56 | -2.25/0.51 | 1.92/4.3 | 4.28/2.26 |
| θ(135°) | 2.142.54 | 3.762.35 | -0.27/-1.52 | -2.41/-3.57 | -2.73/-2.37 | -3.53/-5.98 | -11.07/-9.01 | -11.24/-7.73 | -7.3/-5.81 | -6.84/-6.52 | -4.76/-3.11 | -3.96/-4.92 | -4.82/-3.96 | -7.15/-5.28 | -6.66/-8.9 | -10.53/-7.86 | -18.73/-14.57 | -14.54/-10.62 | -6.19/-4.03 | -6.82/-7.72 | -3.06/-2.66 | -1.08/-3.1 | -0.41/-1.8 | -0.94/-0.99 |
| θ(142.5°) | -5.04/-7.4 | -6.22/-2.24 | -1.15/-1.29 | -0.87/-1.95 | -4.27/-6.67 | -5.44/-4.45 | -4.93/-6.25 | -8.05/-12.74 | -18.28/-17.86 | -9.39/-5.85 | -4.84/-11.05 | -11.81/-5.95 | -3.22/-2.74 | -5.17/-8.6 | -6.81/-6.25 | -9.83/-7.34 | -7.43/-15.59 | -17.8/-9.09 | -4.75/-5.93 | -9/-19.52 | -11.71/-11.65 | -9.98/-2.63 | -2.16/-1.02 | -1.89/-5.23 |
| θ(150°) | -1.78/-0.19 | 0.26/-0.07 | -0.5/-2.12 | -4.24/-8.32 | -15.4/-17.59 | -13.65/-11.83 | -10.03/-8.43 | -7.02/-6.6 | -5.11/-3.14 | -2.87/-4.85 | -9.38/-17.9 | -9.16/-2.09 | 1.69/1.44 | -3.54/-10.36 | -6.4/-2.83 | -2.22/-2.68 | -4/-5.97 | -7.85/-8.59 | -10.66/-14.16 | -14.02/-10.83 | -15.84/-19.01 | -13.71/-12.05 | -6.99/-5.92 | -4.36/-1.85 |
| θ(157.5°) | -8.06/-6.19 | -6.41/-7.66 | -7.22/-6.12 | -5.28/-6.38 | -8.76/-12.25 | -13.32/-11.76 | -10.61/-9.99 | -9.88/-9.08 | -7.82/-6.83 | -6.24/-6.69 | -8.87/-8.46 | -4.06/-4.13 | -1.28/-3.19 | -6.56/-1.07 | -4.08/-2.08 | -2.57/-4.72 | -8.14/-7.77 | -11.39/-14.1 | -18.3/-19.21 | -12.92/-6.61 | -5.02/-4.93 | -6.09/-6.76 | -7.03/-10.21 | -13.68/-10.05 |
| θ(165°) | -6.55/-5.46 | -4.02/-5.28 | -9.2/-14.22 | -18.45/-13.7 | -9.4/-7.52 | -6.85/-6.68 | -6.83/-7.42 | -9.88/-11.92 | -17.16/-18.48 | -18.53/-19.05 | -18.58/-13.31 | -9.65/-7.01 | -5.47/-4.08 | -2.5/-1.05 | 0/0.2 | -0.61/-2.09 | -10.74/-15.01 | -18.69/-17.19 | -10.98/-6.87 | -3.79/-1.89 | -1.22/-1.66 | -2.13/-2.56 | -3.18/-5.67 | |
| θ(172.5°) | -2.21/-5.17 | -10.09/-11.25 | -7.62/-5.28 | -4.33/-3.86 | -3.64/-3.92 | -4.86/-6.21 | -7.66/-9.93 | -15.01/-17.39 | -15.51/-10.64 | -8.32/-6.9 | -5.94/-5.9 | -3.39/-2.52 | -2.03/-1.74 | -1.53/-1.67 | -1.9/-2.56 | -3.53/-4.92 | -6.62/-7.99 | -9.11/-10.22 | -11.39/-11.97 | -10.07/-6.17 | -2.55/-0.91 | -0.32/-0.44 | -0.06/0.89 | 0.29/-0.86 |
| θ(180°) | -10.12/-9.15 | -9.06/-9.3 | -9.83/-10.04 | -10.59/-11.55 | -12.89/-13.66 | -17.24/-17.33 | -17.96/-19.13 | -17.72/-18.56 | -18.72/-18.32 | -17.7/-18.95 | -17.99/-13.98 | -12.06/-10.97 | -10.28/-9.8 | -9.24/-9.8 | -11.2/-13.51 | -17.03/-18.23 | -18.81/-16.92 | -13.24/-11.74 | -10.8/-11.19 | -10.04/-6.69 | -8.29/-7.69 | -7.04/-6.04 | -6.44/-8.54 | -18.02/-14.91 |
| Freq(Hz) | 5.785GPol. | Theta/Ant. 4 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| 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°) | -12.61/-11.86 | -9.25/-8.16 | -7.49/-7.35 | -7.24/-7.04 | -6.71/-6.85 | -7.1/-7.87 | -9/-11.06 | -13.4/-14.68 | -16.54/-18.19 | -18.34/-19.03 | -15.89/-13.25 | -11.16/-9.37 | -7.99/-7.2 | -6.92/-6.92 | -6.59/-6.86 | -7.24/-7.47 | -7.96/-8.9 | -10.56/-11.85 | -11.21/-11.71 | -14.41/-18.57 | -18.35/-17.77 | -17.79/-17.59 | -19.23/-15.23 | -14.43/-13.85 |
| θ(7.5°) | -10.61/-10.31 | -9.81/-8.66 | -9.57/-12.03 | -14.24/-14.92 | -15.83/-16.08 | -17.57/-17.95 | -19.44/-14.81 | -12.36/-13.77 | -16.98/-17.78 | -15.96/-14.75 | -15.66/-16.3 | -16.64/-16.25 | -15.07/-13.45 | -10.98/-8.81 | -7.38/-6.17 | -5.08/-4.59 | -4.63/-5 | -5.42/-5.87 | -6.79/-9 | -11.41/-14.18 | -17.76/-18.84 | -16.93/-13.9 | -11.96/-11.48 | -10.21/-9.78 |
| θ(15°) | -12.03/-13.96 | -13.86/-17.42 | -16.97/-11.71 | -8.15/-6.02 | -5.08/-4.5 | -4.04/-3.6 | -3.55/-3.56 | -3.3/-3.46 | -4.42/-6.55 | -9.03/-12.02 | -14.09/-15.1 | -14.64/-13.67 | -12.88/-12.62 | -11.67/-10.93 | -9.69/-7.64 | -5.99/-4.86 | -4.19/-4.68 | -5.96/-8.03 | -11.62/-16.13 | -17.78/-18.08 | -17.35/-15.19 | -12.19/-10.68 | -10.82/-9.59 | -9.04/-10.68 |
| θ(22.5°) | -10.95/-10.19 | | | | | | | | | | | | | | | | | | | | | | | |



Antenna Pattern

Appendix B

| Theta (°) | -12.771-11.66 | -11.22-8.44 | -7.94-8.38 | -7.44-7.16 | -6.34-6.36 | -8.11-7.55 | -5.16-3.18 | -2.40-2.07 | -1.57-0.93 | -0.82-1.27 | -2.10-2.60 | -2.64-3.11 | -3.95-4.47 | -4.04-3.55 | -3.28-3.60 | -4.39-5.43 | -6.38-6.88 | -6.54-5.94 | -5.41-5.25 | -5.37-5.99 | -7.05-9.37 | -8.98-10.62 | -12.29-11.23 | -10.79-10.68 | |
|-----------|---------------|-------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|--------------|--------------|--------|
| Gain | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Theta (°) | 0 | 30 | 45 | 60 | 75 | 90 | 105 | 120 | 135 | 150 | 165 | 180 | 195 | 210 | 225 | 240 | 255 | 270 | 285 | 300 | 315 | 330 | 345 | 360 | |
| Gain | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Theta (°) | 0 | 30 | 45 | 60 | 75 | 90 | 105 | 120 | 135 | 150 | 165 | 180 | 195 | 210 | 225 | 240 | 255 | 270 | 285 | 300 | 315 | 330 | 345 | 360 | |
| Gain | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |



Antenna Pattern

Appendix B

| Theta (°) | 1842.17 | 2.523.24 | 2.181.57 | 1.222.014 | -1.201.138 | -0.082.12 | 3.694.49 | 4.082.52 | -0.081.300 | -4.931.531 | -5.691.637 | -6.981.732 | -7.701.108 | -13.391.546 | -12.751.974 | -6.501.562 | -5.771.493 | -4.101.322 | -5.361.673 | -6.021.673 | -5.121.549 | -2.211.124 | -0.851.097 | 0.191.09 |
|-----------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| 0 (75°) | 2.452.45 | 1.471.045 | -1.321.130 | 0.190.70 | 1.111.60 | 1.260.90 | 1.421.79 | 1.690.14 | -4.291.1125 | -8.761.440 | -7.151.232 | -15.381.506 | -12.681.926 | -8.881.847 | -7.271.978 | -6.491.919 | -4.481.596 | -3.521.142 | -4.851.566 | -5.321.184 | -9.911.118 | -0.681.91 | 0.691.640 | 8.002.24 |
| 0 (90°) | -4.711.321 | -2.561.334 | -4.731.434 | -3.731.441 | -4.451.470 | -2.631.089 | -1.871.026 | 1.833.25 | 4.234.91 | 4.563.44 | 1.640.21 | -2.101.517 | -4.641.584 | -6.121.824 | -13.271.106 | -10.671.1048 | -6.741.655 | -5.001.958 | -11.511.141 | -9.151.672 | -5.281.746 | -6.721.579 | -8.761.1182 | -8.501.650 |
| 0 (105°) | -3.231.262 | -1.341.152 | -1.161.97 | -0.061.016 | -1.411.224 | -0.381.35 | 2.282.17 | 1.330.02 | -1.831.175 | -0.461.015 | -1.251.225 | -6.581.1249 | -10.341.1096 | -12.551.1449 | -13.561.991 | -8.841.1168 | -10.361.535 | -1.341.210 | -5.171.118 | -7.261.558 | -5.351.728 | -6.021.618 | -8.321.1125 | -6.931.461 |
| 0 (120°) | -4.801.495 | -3.651.436 | -3.611.219 | -0.801.10 | 1.021.70 | 1.441.00 | -2.831.613 | -5.621.379 | -0.652.08 | 3.613.58 | 3.012.36 | 0.471.227 | -6.351.881 | -14.971.1504 | -13.871.1139 | -8.641.866 | -8.761.591 | -3.581.250 | -3.701.497 | -5.691.651 | -9.001.1366 | -15.751.1403 | -15.561.1334 | -6.451.515 |
| 0 (135°) | -8.151.399 | -4.731.434 | -3.731.441 | -4.451.470 | -2.631.089 | -1.871.026 | 1.833.25 | 4.234.91 | 4.563.44 | 1.640.21 | -2.101.517 | -4.641.584 | -6.121.824 | -13.271.106 | -10.671.1048 | -6.741.655 | -5.001.958 | -11.511.141 | -9.151.672 | -5.281.746 | -6.721.579 | -8.761.1182 | -8.501.650 | -10.021.964 |
| 0 (150°) | -6.581.689 | -5.961.474 | -4.621.432 | -5.301.560 | -5.211.403 | -3.811.551 | -8.901.762 | -2.291.11 | 3.273.96 | 3.722.08 | -0.251.283 | -4.831.510 | -5.901.626 | -7.821.937 | -8.001.749 | -8.081.1428 | -11.891.455 | -5.551.815 | -6.591.1175 | -6.731.711 | -10.911.1518 | -13.671.1447 | -11.441.783 | -4.881.561 |
| 0 (165°) | -6.501.568 | -4.111.324 | -2.961.348 | -3.951.159 | -7.251.87 | -6.091.445 | -5.151.518 | -1.251.811 | 3.504.04 | 3.504.00 | -0.201.194 | -2.831.281 | -2.821.352 | -4.841.474 | -6.181.577 | -10.371.922 | -9.211.919 | -8.171.1013 | -11.061.976 | -7.381.389 | -14.941.993 | -13.901.1166 | -9.061.599 | -5.241.669 |
| 0 (180°) | -5.061.446 | -1.881.142 | -1.501.214 | -3.481.513 | -5.141.392 | -3.641.552 | -6.851.582 | -3.691.118 | 0.941.66 | 1.621.01 | 0.591.403 | -1.031.311 | -2.951.393 | -3.931.118 | -3.421.705 | -10.531.796 | -6.901.1530 | -11.691.917 | -11.691.917 | -6.511.772 | -12.801.1084 | -14.781.1005 | -8.121.971 | |
| 0 (195°) | -1.871.234 | -3.851.493 | -7.841.1014 | -9.061.609 | -3.341.158 | -0.901.114 | -1.851.112 | 0.481.63 | 2.373.13 | 3.503.00 | 1.381.125 | -3.371.571 | -6.421.515 | -4.841.481 | -5.901.588 | -7.341.794 | -9.601.828 | -5.481.506 | -3.731.384 | -6.591.669 | -6.011.785 | -6.781.602 | -4.291.214 | -1.461.143 |
| 0 (210°) | -6.521.822 | -9.441.1124 | -11.551.933 | -6.461.446 | -3.051.149 | -0.791.107 | -1.901.267 | -2.541.173 | -0.921.69 | -0.871.015 | -1.171.148 | -1.681.661 | 0.201.62 | -1.491.298 | -7.141.1155 | -8.831.283 | -2.791.255 | -7.521.820 | -9.791.1301 | -14.991.1341 | -12.671.1101 | -10.141.895 | -8.361.556 | |
| 0 (225°) | -7.161.605 | -6.201.619 | -4.841.132 | -1.871.133 | -1.231.123 | -1.491.211 | -2.791.343 | -4.211.497 | -5.101.444 | -2.931.122 | -2.891.269 | -2.301.232 | -1.501.444 | -2.521.198 | -1.351.108 | -0.731.102 | -2.011.95 | -5.241.82 | -11.381.110 | -10.911.1097 | -9.641.1102 | -9.491.917 | -6.371.547 | -5.761.698 |
| 0 (240°) | -5.061.387 | -2.781.199 | -1.661.128 | -0.841.044 | -0.441.077 | -1.071.135 | -1.571.151 | -1.261.097 | -0.641.046 | -0.401.044 | -0.531.057 | -0.661.098 | -1.761.313 | -4.751.558 | -6.131.756 | -10.841.1440 | -9.781.670 | -5.441.562 | -7.261.880 | -11.471.1179 | -11.671.1287 | -14.301.1234 | -11.211.1017 | -9.001.685 |
| 0 (255°) | -5.231.412 | -2.971.252 | -2.331.234 | -2.251.223 | -2.341.239 | -3.551.554 | -4.541.502 | -5.181.544 | -5.801.635 | -7.111.92 | -8.951.983 | -9.601.886 | -7.931.703 | -6.261.578 | -5.271.547 | -6.281.686 | -7.191.770 | -8.551.913 | -8.931.834 | -8.041.867 | -9.811.118 | -12.241.1212 | -10.911.1063 | -10.231.786 |
| 0 (270°) | -10.601.1079 | -11.141.1034 | -9.561.938 | -8.961.822 | -8.091.844 | -8.401.813 | -8.061.751 | -6.941.631 | -5.921.537 | -4.971.66 | -4.361.645 | -3.721.537 | -3.661.388 | -4.301.489 | -5.291.571 | -6.221.640 | -6.231.631 | -6.791.736 | -7.411.682 | -6.001.565 | -5.561.588 | -6.171.641 | -6.281.646 | -7.291.909 |
| Freq(Hz) | 5.785GPol. | TotalAnt. 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Gain | Φ(0°)Φ(75°) | 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°) |
| 0 (°) | -1.371.136 | -1.401.134 | -1.321.110 | -0.841.087 | -1.091.121 | -1.391.164 | -1.961.223 | -2.501.251 | -2.361.232 | -2.621.227 | -2.201.201 | -1.651.165 | -1.071.254 | -0.361.348 | -0.421.520 | -0.311.342 | -0.291.241 | -0.291.241 | -0.361.311 | -2.591.241 | -2.321.206 | -2.011.193 | -1.801.154 | -1.171.144 |
| 0 (75°) | -9.321.922 | -8.851.800 | -6.321.528 | -4.721.444 | -3.961.308 | -2.501.196 | -1.521.128 | -1.011.086 | -0.781.058 | -0.271.019 | -0.061.000 | 0.040.16 | 0.220.16 | 0.090.05 | -0.061.020 | -0.521.098 | -1.541.207 | -2.661.322 | -3.581.395 | -4.221.480 | -5.261.580 | -6.381.708 | -8.201.877 | -8.941.940 |
| 0 (15°) | -4.301.421 | -4.481.564 | -6.801.870 | -8.181.829 | -7.751.572 | -6.331.189 | -0.991.306 | 0.030.11 | 0.101.008 | -0.231.060 | -0.911.115 | -1.331.140 | -1.511.155 | -1.491.117 | -0.851.665 | -0.711.109 | -1.691.324 | -2.961.538 | -4.141.745 | -5.631.557 | -7.181.731 | -6.971.679 | -6.101.572 | -5.121.348 |
| 0 (22.5°) | 0.421.29 | 0.171.056 | -1.621.85 | -4.561.571 | -11.041.849 | -4.691.221 | -1.671.008 | 0.031.035 | -0.891.163 | -4.561.455 | -4.841.540 | -5.401.506 | -4.961.310 | -4.311.400 | -3.341.411 | -5.321.633 | -3.431.411 | -5.321.633 | -3.431.411 | -5.321.633 | -3.431.411 | -5.321.633 | -3.431.411 | -5.321.633 |
| 0 (30°) | 3.092.63 | 1.911.24 | 0.261.104 | -3.161.621 | -7.231.509 | -3.021.162 | -0.881.074 | -1.191.213 | -3.401.522 | -4.951.438 | -3.341.277 | -2.421.257 | -3.401.431 | -4.911.520 | -5.571.622 | -7.241.692 | -5.911.542 | -5.431.575 | -5.861.624 | -4.831.291 | -0.581.21 | 2.373.34 | 3.833.81 | 3.563.18 |
| 0 (37.5°) | 2.142.40 | 1.840.58 | -0.491.96 | -5.211.483 | -7.431.422 | -1.911.065 | -0.841.302 | -1.171.473 | -4.151.749 | -2.991.143 | -0.621.068 | -0.991.187 | -3.681.556 | -6.131.638 | -6.341.679 | -7.241.599 | -4.581.409 | -4.731.599 | -7.221.560 | -2.851.609 | -0.252.02 | 2.623.91 | 3.222.58 | |
| 0 (45°) | 3.012.79 | 2.441.60 | -3.041.643 | -7.751.401 | -1.070.22 | 0.510.005 | -0.761.177 | -4.581.512 | -4.931.432 | -4.561.522 | -5.891.596 | -5.321.541 | -4.681.596 | -5.321.541 | -4.681.596 | -5.321.541 | -4.681.596 | -5.321.541 | -4.681.596 | -5.321.541 | -4.681.596 | -5.321.541 | -4.681.596 | -5.321.541 |
| 0 (52.5°) | 1.331.65 | 1.421.31 | 1.481.38 | 0.810.08 | -0.721.072 | -0.111.044 | -1.081.295 | -5.051.718 | -8.881.1038 | -10.991.118 | -11.531.1278 | -14.491.1421 | -11.641.1079 | -9.631.891 | -7.761.592 | -4.971.428 | -4.881.535 | -3.641.243 | -3.331.503 | -4.571.24 | -0.231.11 | 2.292.92 | 2.402.08 | 1.971.42 |
| 0 (60°) | 0.110.93 | 1.872.61 | 2.972.97 | 2.130.01 | -1.280.01 | 0.800.29 | -1.371.221 | -1.671.174 | -3.151.758 | -9.081.139 | -8.411.814 | -9.951.916 | -7.091.517 | -4.861.689 | -8.221.767 | -6.211.335 | -4.311.476 | -4.331.380 | -5.231.733 | -1.461.163 | -2.361.014 | 1.260.98 | 0.221.145 | -1.081.62 |
| 0 (67.5°) | 1.672.27 | 2.823.73 | 4.624.81 | 4.212.66 | 1.050.19 | 0.130.11 | 0.240.68 | 1.020.35 | -1.981.619 | -8.191.853 | -4.931.443 | -3.871.31 | -1.921.258 | -3.321.500 | -5.301.428 | -4.211.333 | -2.931.82 | -4.981.376 | -3.361.367 | -3.891.610 | -4.961.274 | -2.091.32 | -0.591.100 | -0.191.00 |
| 0 (75°) | 1.962.85 | 3.323.67 | 4.214.04 | 3.131.25 | -0.601.069 | 0.331.35 | 2.553.62 | 3.712.37 | -0.471.437 | -8.891.479 | -4.081.432 | -5.011.455 | -3.921.442 | -5.161.795 | -10.691.785 | -6.981.738 | -4.961.261 | -3.691.513 | -4.791.531 | -5.251.600 | -6.701.434 | -2.071.245 | -2.011.295 | -0.461.31 |
| 0 (82.5°) | 3.783.67 | 3.273.03 | 3.102.22 | 0.931.253 | -4.571.300 | 0.341.32 | 5.266.20 | 5.673.31 | -0.901.804 | -8.451.96 | -3.631.441 | -4.881.558 | -5.151.661 | -9.111.1628 | -8.331.658 | -5.241.744 | -3.821.178 | -3.531.599 | -3.261.341 | -5.301.332 | 0.260.39 | -1.661.113 | 1.943.62 | |
| 0 (90°) | -1.461.060 | -1.231.200 | -3.051.514 | -4.371.279 | -0.112.24 | 3.022.92 | 2.312.39 | 1.681.152 | -9.411.721 | -1.060.24 | 0.181.190 | -4.631.667 | -6.101.478 | -5.251.144 | -9.631.552 | -5.011.103 | -8.081.553 | -3.281.653 | -5.491.505 | -1.361.197 | -6.281.444 | -0.791.195 | -6.641.643 | -1.711.061 |
| 0 (97.5°) | -6.941.640 | -6.361.521 | -5.941.667 | -3.781.338 | -2.460.32 | 2.643.62 | 3.612.41 | 0.401.205 | -3.141.143 | 1.452.13 | 2.400.42 | -2.261.489 | -4.401.298 | -5.871.355 | -2.311.432 | -11.331.287 | -0.901.382 | -5.051.369 | -2.861.142 | -6.611.1088 | -4.281.550 | -8.181.820 | -6.401.533 | |
| 0 (105°) | -8.781.811 | -7.251.524 | -6.501.564 | -4.051.107 | 1.012.74 | 2.802.13 | 1.821.60 | -0.441.628 | -5.161.118 | 3.933.94 | 3.130.80 | -2.181.368 | -5.521.640 | -4.391.800 | -10.271.886 | -5.811.773 | -8.051.422 | -1.071.142 | -4.941.660 | -4.821.859 | -8.591.799 | -10.791.1536 | -13.761.876 | -6.961.688 |
| 0 (120°) | -5.381.505 | -6.041.786 | -11.791.1174 | -8.341.352 | 0.222.69 | 2.961.06 | -2.881.566 | -3.431.121 | 1.824.40 | 6.126.17 | 5.634.51 | 2.311.021 | -3.411.309 | -4.541.595 | -7.771.971 | -8.801.135 | -9.131.508 | -2. | | | | | | |



Antenna Pattern

Appendix B

| θ (172.5°) | -1.65/-3.22 | -5.11/-4.62 | -3.88/-4.31 | -5.17/-5.82 | -6.69/-8.50 | -11.50/-14.04 | -13.64/-12.61 | -9.43/-6.05 | -3.70/-2.66 | -2.44/-2.61 | -2.22/-1.82 | -1.55/-1.45 | -1.28/-1.02 | -0.72/-0.66 | -0.78/-1.11 | -1.39/-1.59 | -2.20/-2.67 | -3.05/-3.52 | -4.28/-5.18 | -5.39/-4.46 | -3.58/-2.68 | -1.66/-1.22 | -1.36/-2.33 | -2.50/-1.97 |
|------------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| θ (180°) | -10.50/-8.91 | -4.96/-3.17 | -2.96/-2.30 | -2.65/-2.69 | -2.65/-2.90 | -3.90/-4.63 | -5.26/-5.20 | -4.25/-3.22 | -2.30/-2.06 | -2.42/-2.87 | -3.22/-3.12 | -2.91/-2.68 | -2.49/-2.18 | -1.72/-1.40 | -1.26/-1.29 | -1.44/-1.51 | -1.66/-1.73 | -1.97/-2.40 | -2.49/-2.42 | -2.71/-3.40 | -4.58/-4.84 | -4.38/-4.04 | -4.58/-6.68 | -8.29/-8.34 |
| Freq(Hz) | 5.3G/Pol. | Total/Ant. 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 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°) | -3.57/-3.91 | -4.95/-4.90 | -4.51/-4.05 | -4.06/-3.94 | -3.61/-3.72 | -4.30/-5.45 | -5.64/-5.07 | -4.39/-3.61 | -3.65/-4.03 | -4.32/-3.85 | -3.83/-4.46 | -5.07/-5.61 | -5.41/-5.25 | -5.18/-4.78 | -4.80/-4.96 | -4.80/-4.53 | -4.41/-4.58 | -4.69/-4.72 | -4.45/-4.09 | -3.67/-3.61 | -3.64/-3.32 | -2.66/-2.57 | -3.00/-3.38 | -3.54/-3.91 |
| θ(7.5°) | -3.95/-4.24 | -5.12/-4.17 | -3.14/-2.55 | -2.22/-1.76 | -1.19/-1.26 | -1.48/-1.94 | -2.45/-2.50 | -1.82/-0.79 | -0.21/-0.22 | -0.44/-0.37 | -0.05/-0.27 | -0.76/-1.25 | -1.87/-2.16 | -2.29/-2.75 | -3.37/-3.88 | -4.28/-4.54 | -5.42/-6.10 | -6.57/-6.49 | -6.93/-7.44 | -7.83/-7.79 | -7.15/-6.63 | -6.45/-6.30 | -6.17/-5.54 | -4.44/-4.33 |
| θ(15°) | -3.46/-3.61 | -3.01/-1.61 | -0.26/-0.01 | 0.04/-0.02 | -0.05/-0.02 | 0.63/-0.05 | 1.73/-0.34 | 2.58/-0.45 | 2.32/-0.26 | 2.10/-1.82 | 1.31/-0.69 | -0.06/-0.97 | -1.89/-3.17 | -4.34/-5.12 | -5.51/-6.09 | -6.31/-6.44 | -7.06/-7.70 | -8.34/-7.87 | -8.07/-9.06 | -10.01/-9.95 | -8.61/-7.08 | -7.00/-7.90 | -8.07/-6.43 | -3.54/-3.27 |
| θ(22.5°) | -6.18/-4.76 | -2.91/-1.28 | -0.12/-0.22 | 0.63/-0.06 | 1.17/-1.51 | 2.15/-2.76 | 3.37/-3.69 | 3.78/-3.59 | 3.20/-2.63 | 2.08/-1.74 | 1.14/-0.09 | -0.86/-2.06 | -3.58/-5.30 | -6.67/-7.42 | -8.14/-9.34 | -10.60/-10.46 | -10.94/-11.42 | -10.41/-11.59 | -5.82/-6.56 | -9.16/-11.74 | -11.23/-9.06 | -9.99/-11.74 | -11.70/-7.86 | -5.18/-5.42 |
| θ(30°) | -7.20/-5.71 | -4.89/-3.45 | -1.55/-0.41 | 0.16/-0.38 | -0.23/-0.29 | 0.00/-0.62 | 1.06/-0.96 | 0.74/-1.00 | 1.14/-0.85 | 0.29/-0.37 | 0.68/-0.43 | -0.49/-1.80 | -3.03/-4.30 | -5.99/-6.52 | -7.11/-9.47 | -13.81/-15.36 | -15.93/-15.57 | -13.71/-9.72 | -6.70/-6.45 | -9.17/-13.99 | -14.83/-13.11 | -11.56/-12.39 | -14.29/-12.81 | -10.24/-9.22 |
| θ(37.5°) | -6.77/-6.77 | -8.20/-7.36 | -5.41/-3.59 | -2.60/-1.81 | -0.71/-0.21 | 0.52/-0.31 | 0.01/-0.04 | 0.29/-0.06 | -0.40/-1.06 | -0.91/-0.31 | 0.02/-0.27 | -1.28/-2.80 | -4.37/-5.52 | -6.40/-6.99 | -7.17/-8.25 | -9.27/-10.99 | -13.57/-14.70 | -13.86/-14.68 | -12.19/-10.88 | -11.52/-11.34 | -9.67/-8.98 | -8.38/-7.81 | -9.02/-11.84 | -9.61/-7.60 |
| θ(45°) | -6.61/-5.84 | -6.48/-7.00 | -4.23/-0.93 | 0.88/-1.24 | 1.41/-1.54 | 1.34/-1.37 | 1.58/-0.68 | 1.32/-2.55 | -2.59/-1.96 | -1.34/-1.52 | -1.56/-1.95 | -3.53/-4.87 | -4.63/-6.82 | -11.64/-12.99 | -11.54/-10.43 | -9.94/-10.43 | -14.11/-11.75 | -13.08/-12.73 | -12.98/-9.52 | -5.75/-4.59 | -5.04/-6.37 | -7.11/-8.51 | -11.15/-10.11 | -6.79/-6.91 |
| θ(52.5°) | -3.51/-2.26 | -2.18/-0.42 | 0.86/-1.17 | 1.29/-1.32 | 1.10/-0.79 | 0.65/-1.34 | 1.42/-0.50 | -0.85/-1.52 | -1.34/-0.71 | -0.05/-0.34 | 0.49/-2.24 | -4.31/-4.80 | -3.80/-4.32 | -6.89/-9.10 | -8.16/-8.01 | -8.09/-9.87 | -14.50/-14.22 | -13.18/-10.93 | -8.43/-8.43 | -7.50/-6.52 | -5.91/-7.72 | -8.70/-5.14 | -3.61/-2.58 | -2.62/-3.81 |
| θ(60°) | -2.61/-1.44 | -2.25/-3.10 | -2.41/-1.58 | -1.12/-1.67 | -3.54/-4.47 | -2.83/-1.82 | -2.03/-3.30 | -5.03/-3.17 | -1.34/-0.63 | -0.69/-0.89 | -1.03/-4.84 | -6.56/-7.95 | -5.96/-3.73 | -2.35/-3.29 | -4.72/-8.08 | -10.67/-12.13 | -12.16/-12.83 | -14.62/-15.42 | -15.31/-13.31 | -7.22/-8.41 | -11.53/-10.64 | -9.38/-6.74 | -4.27/-2.77 | -2.43/-2.55 |
| θ(67.5°) | -3.69/-1.18 | 0.62/-0.16 | -0.96/-2.30 | -3.18/-3.59 | -3.47/-2.42 | -1.63/-1.45 | -3.48/-4.36 | -3.10/-3.57 | -5.11/-4.82 | -4.23/-3.85 | -4.27/-7.94 | -10.95/-6.71 | -2.45/-1.45 | -2.16/-4.39 | -6.70/-8.44 | -13.55/-13.57 | -10.88/-10.89 | -11.55/-9.77 | -11.71/-13.41 | -10.91/-9.10 | -10.22/-11.22 | -8.06/-6.43 | -4.51/-3.45 | -3.31/-4.45 |
| θ(75°) | -1.95/-1.08 | -0.00/-1.03 | 0.44/-0.65 | -2.27/-2.61 | -2.52/-1.76 | -1.15/-1.87 | -3.17/-3.53 | -3.75/-3.52 | -4.69/-4.78 | -4.68/-6.75 | -11.27/-15.06 | -9.46/-6.48 | -5.80/-1.15 | -1.39/-4.95 | -6.69/-5.23 | -5.83/-8.96 | -7.23/-3.84 | -4.29/-5.86 | -5.42/-7.82 | -7.34/-8.93 | -10.04/-10.11 | -8.91/-6.89 | -4.51/-2.05 | -2.48/-2.27 |
| θ(82.5°) | 0.46/-0.57 | -0.05/-1.16 | 0.45/-2.09 | -5.23/-6.16 | -5.53/-6.04 | -6.87/-4.87 | -4.87/-5.75 | -3.52/-3.45 | -4.59/-2.57 | -0.41/-1.62 | -3.70/-7.30 | -3.91/-6.19 | -3.17/-1.54 | -3.16/-5.02 | -2.55/-0.07 | 0.25/-1.44 | -5.93/-6.19 | -3.32/-5.47 | -8.98/-7.55 | -6.79/-10.64 | -11.02/-8.16 | -7.26/-6.16 | -2.34/-0.20 | 0.79/0.00 |
| θ(90°) | 1.85/-2.37 | 1.51/-1.26 | 0.49/-1.16 | -3.44/-5.44 | -6.20/-6.95 | -6.91/-10.51 | -11.23/-8.16 | -7.77/-9.17 | -7.49/-3.05 | 0.05/-2.48 | -4.05/-2.63 | -0.35/-4.05 | -3.61/-1.08 | -1.40/-2.38 | 1.67/-9.00 | -8.72/-9.99 | -4.88/-9.00 | -7.39/-5.58 | -5.60/-8.15 | -7.01/-2.35 | -1.13/-0.24 | 0.50/-1.63 | 1.97/-1.09 | |
| θ(97.5°) | 2.09/-2.91 | 2.25/-1.34 | -0.17/-1.38 | -3.13/-8.88 | -9.45/-6.50 | -9.07/-10.40 | -8.81/-9.98 | -9.55/-9.60 | -7.51/-6.18 | -4.06/-7.65 | -6.35/-4.40 | -3.63/-4.57 | -5.71/-4.17 | -1.45/-4.16 | -5.24/-1.67 | 2.26/-0.96 | -3.63/-5.99 | -2.94/-6.74 | -10.04/-5.91 | -8.88/-3.89 | -1.76/-0.29 | 1.85/-2.84 | 3.03/-1.11 | 2.86/-2.44 |
| θ(105°) | 3.12/-3.44 | 2.67/-1.94 | 1.16/-0.47 | -2.94/-9.83 | -14.74/-10.85 | -10.91/-11.00 | -7.63/-6.74 | -6.80/-6.98 | -4.90/-4.74 | -5.35/-6.09 | -6.98/-7.58 | -5.22/-6.10 | -7.43/-5.65 | -2.29/-5.34 | -8.59/-2.01 | -1.28/-1.93 | -1.97/-3.79 | -1.40/-0.64 | -3.25/-2.91 | -3.78/-3.61 | -1.75/-0.16 | 1.49/-2.20 | 4.17/-6.22 | 3.93/-3.20 |
| θ(112.5°) | 4.18/-4.38 | 3.89/-2.46 | 1.22/-0.47 | -2.06/-2.05 | -1.86/-3.49 | -1.78/-8.69 | -6.89/-5.52 | -6.55/-7.14 | -5.57/-6.03 | -7.68/-7.06 | -5.81/-5.83 | -11.03/-10.93 | -9.66/-12.55 | -9.51/-6.69 | -3.60/-5.98 | -3.55/-3.30 | -1.19/-3.30 | -3.32/-0.61 | -1.65/-1.82 | -1.44/-0.37 | -0.81/-0.83 | 1.57/-1.11 | 2.62/-0.79 | |
| θ(120°) | 2.45/-4.66 | 4.56/-2.95 | 1.70/-0.32 | -3.11/-4.22 | -3.97/-4.39 | -4.35/-4.00 | -4.77/-6.93 | -8.47/-8.96 | -7.91/-8.02 | -9.65/-5.96 | -3.81/-5.97 | -12.85/-13.88 | -6.44/-5.51 | -3.22/-3.44 | -6.64/-2.67 | -3.28/-1.84 | -2.74/-4.75 | -3.81/-5.20 | -2.98/-4.70 | -2.67/-1.03 | 1.32/-2.42 | 1.79/-3.88 | 2.82/-4.44 | |
| θ(127.5°) | 0.34/-0.39 | 0.96/-1.70 | 0.84/-0.08 | -2.06/-3.40 | -3.00/-2.81 | -2.66/-2.74 | -3.87/-6.61 | -10.61/-11.76 | -9.43/-9.75 | -9.44/-6.31 | -4.91/-5.88 | -4.01/-6.14 | -5.69/-3.04 | -7.66/-8.82 | -6.38/-10.39 | -0.75/-0.92 | -4.02/-2.51 | -0.36/-1.51 | -5.33/-1.23 | 2.68/-0.36 | -1.98/-3.16 | -0.77/-0.49 | 3.64/-0.09 | 1.02/-0.45 |
| θ(135°) | 1.11/-0.14 | -2.50/-1.88 | -1.64/-2.48 | -2.76/-6.66 | -9.52/-12.72 | -12.00/-9.00 | -8.57/-8.83 | -7.63/-8.29 | -10.98/-10.42 | -5.87/-8.06 | -10.75/-11.94 | -8.04/-7.26 | -6.25/-7.44 | -3.18/-2.66 | 1.21/-6.67 | -1.79/-0.59 | 1.53/-0.94 | -3.80/-1.61 | 3.24/-6.1 | 0.23/-0.94 | -12.11/-10.16 | 1.59/-3.02 | 3.48/-1.33 | |
| θ(142.5°) | -2.62/-2.39 | -2.74/-2.59 | -3.81/-6.48 | -7.52/-6.75 | -7.17/-7.08 | -6.09/-6.80 | -8.99/-6.61 | -7.35/-8.03 | -7.08/-4.30 | -3.95/-3.31 | -7.05/-8.12 | -13.02/-3.37 | 0.64/-1.93 | 2.13/-0.71 | 2.48/-2.88 | -2.76/-0.85 | 1.32/-0.39 | 2.10/-1.07 | -2.66/-3.52 | -1.45/-0.64 | -2.70/-3.61 | -5.69/-7.85 | -9.91/-1.18 | -3.71/-3.94 |
| θ(150°) | -3.18/-2.79 | -5.40/-6.73 | -6.95/-8.29 | -9.72/-8.11 | -7.13/-6.61 | -6.19/-6.08 | -6.31/-7.63 | -8.80/-6.60 | -5.05/-4.58 | -4.92/-6.10 | -8.58/-9.08 | -5.31/-1.08 | 0.62/-0.08 | -1.52/-1.76 | -1.50/-2.07 | -0.85/-0.93 | 1.35/-1.61 | 0.52/-2.90 | -6.92/-8.70 | -4.07/-0.00 | 0.05/-3.13 | -2.50/-1.30 | -2.35/-2.86 | -4.93/-7.13 |
| θ(157.5°) | -8.83/-6.91 | -5.07/-4.59 | -5.26/-5.51 | -5.27/-5.75 | -6.32/-7.02 | -7.39/-7.91 | -7.94/-8.80 | -5.53/-4.80 | -4.84/-5.47 | -6.36/-7.14 | -7.38/-6.56 | -4.44/-3.22 | -1.21/-1.08 | 0.40/-1.36 | 1.75/-1.91 | 2.26/-2.43 | 2.31/-8.6 | 0.53/-1.80 | -4.75/-8.05 | -7.08/-2.64 | -0.53/-0.69 | -3.44/-0.93 | -1.71/-5.46 | -8.89/-9.87 |
| θ(165°) | -2.89/-5.45 | -7.40/-6.44 | -4.93/-4.59 | -4.71/-3.93 | -3.80/-4.18 | -4.90/-6.54 | -8.78/-11.30 | -13.48/-13.95 | -14.28/-15.61 | -14.52/-12.18 | -9.49/-7.30 | -5.34/-3.59 | -2.31/-1.46 | -0.63/-0.01 | 0.55/-0.12 | 1.42/-0.60 | 1.44/-1.18 | 0.81/-0.03 | -1.27/-2.85 | -4.10/-3.63 | -2.21/-1.18 | -1.59/-2.62 | -2.61/-1.60 | -2.31/-2.26 |
| θ(172.5°) | -0.46/-1.36 | -2.71/-3.67 | -3.73/-4.21 | -5.02/-5.55 | -6.21/-7.03 | -8.67/-11.13 | -14.56/-12.96 | -10.29/-8.52 | -6.73/-5.05 | -3.65/-2.86 | -2.49/-2.37 | -2.45/-2.58 | -2.81/-2.69 | -2.50/-2.34 | -2.40/-2.54 | -2.61/-2.72 | -2.96/-3.55 | -3.89/-4.15 | -4.43/-4.36 | -4.43/-4.11 | -3.16/-1.65 | -0.49/-0.19 | -0.15/-0.59 | -1.30/-1.08 |
| θ(180°) | -13.00/-9.34 | -6.45/-4.30 | -3.30/-3.45 | -4.10/-4.50 | -4.39/-4.87 | -4.86/-4.76 | -4.48/-4.27 | -4.05/-4.27 | -4.91/-5.32 | -5.13/-5.08 | -4.81/-4.74 | -4.83/-4.96 | -5.02/-4.85 | -4.38/-3.67 | -3.01/-2.82 | -3.09/-3.45 | -3.62/-3.67 | -3.48/-3.17 | -3.34/-3.98 | -4.58/-5.63 | -6.46/-6.78 | -6.47/-5.77 | -6.69/-6.61 | -11.42/-12.06 |
| Freq(Hz) | 5.785G/Pol. | Total/Ant. 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 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°) | -5.86/-5.27 | -5.20/-5.33 | -5.20/-5.18 | -5.71/-5.45 | -5.79/-5.87 | -5.77/-5.32 | -5.04/-5.28 | -6.41/-6.59 | -6.26/-6.23 | -6.05/-6.00 | -6.07/-6.27 | -6.66/-7.04 | -6.94/-6.54 | -6.07/-6.06 | -5.95/-5.90 | -6.16/-6.47 | -6.49/-6.07 | -5.99/-6.21 | -6.28/-6.24 | -5.97/-5.73 | -5.46/-5.34 | -5.62/-5.62 | -5.67/-5.82 | -6.30/-6.30 |
| θ(7.5°) | -6.39/-6.45 | -5.67/-5.11 | -4.75/-3.18 | -5.17/-4.79 | -4.44/-4.55 | -4.21/-3.46 | -2.95/-2.75 | -3.67/-4.19 | -4.72/-4.58 | -4.10/-4.30 | -5.05/-5.96 | -6.41/-6.60 | -6.49/-6.48 | -6.65/-6.39 | -6.54/-6.50 | -6.73/-6.32 | -6.65/-6.66 | -6.91/-6.60 | -6.46/-7.13 | -7.37/-6.65 | -6.94/-7.02 | -7.58/-7.98 | -7.75/-7.38 | -7.46/-7.64 |
| θ(15°) | -8.92/-8.16 | -6.70/-6.31 | -5.31/-5.02 | -3.87/-3.07 | -2.22/-1.92 | -1.74/-1.36 | -1.64/-1.20 | -1.11/-1.34 | -1.76/-2.15 | -2.31/-2.88 | -3.74/-4.48 | -5.05/-5.43 | -5.93/-6.40 | -6.90/-7.25 | -7.17/-6.90 | -6.73/-6.69 | -7.07/-7.43 | -7.73/-7.49 | -7.29/-7.59 | -8.61/-9.51 | -9.27/-8.27 | -8.50/-9.77 | -10.28/-10.07 | -9.98/-8.53 |
| θ(22.5°) | -8.46/-6.26 | -3.71/-2.48 | -1.53/-1.06 | 0.25/-0.80 | 1.21/-0.96 | 0.65/-0.36 | 0.89/-1.12 | 0.88/-0.72 | 0.68/-0.60 | -0.07/-1.52 | -3.58/-5.48 | -6.81/-7.49 | -7.46/-7.37 | -7.45/-7.71 | -7.73/-7.65 | -7.71/-7.90 | -8.00/-8.27 | -9.07/-9.30 | -7.05/-6.11 | -7.03/-10.19 | -12.69/-12.97 | -10.32/-10. | | |

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 $\Theta(0-180)\Phi(270)$

