



Antenna Composite Gain Test Report

| | |
|-----------------|--|
| Equipment | Wireless Access Point |
| Brand Name | Arista |
| Model Name | C-330 |
| Applicant | Arista Networks, Inc. 5453 Great America Parkway, Santa Clara, CA 95054 USA |
| Manufacturer | Arista Networks, Inc. 5453 Great America Parkway, Santa Clara, CA 95054 USA |
| Sample Received | Dec. 16, 2022 |
| Start Test Date | Dec. 22, 2022 |
| Final Test Date | Dec. 22, 2022 |


Approved by: Jackson Tsai

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1. Operation Mode and Antenna Information

| Antenna Position | Brand Name | Model Name | Ant. Type | Connector | Modes of Operation |
|------------------|------------|---------------|-----------|-----------|--------------------------|
| 2G5G Ant1 | WHAYU | C393-510223-A | PIFA | I-PEX | Radio 1_2.4G+Radio 0_5G |
| 2G5G Ant2 | WHAYU | C393-510223-A | PIFA | I-PEX | Radio 1_2.4G+ Radio 0_5G |
| 6G Ant1 | WHAYU | C393-510223-A | PIFA | I-PEX | Radio 2_6G |
| 6G Ant2 | WHAYU | C393-510223-A | PIFA | I-PEX | Radio 2_6G |

For 2.4GHz function:

For IEEE 802.11 b/g/n/ax mode (2TX/2RX) (Radio 1)
 2G5G Ant1 and 2G5G Ant2 could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11 a/n/ac/ax mode (2TX/2RX) (Radio 0)
 2G5G Ant1 and 2G5G Ant2 could transmit/receive simultaneously.

For 6GHz function:

For IEEE 802.11 ax mode (2TX/2RX) (Radio 2)
 6G Ant1 and 6G Ant2 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 |
| 5925-6425 | 6175 |
| 6425-6525 | 6475 |
| 6525-6875 | 6695 |
| 6875-7125 | 6995 |

3. Testing Location

| | | | | |
|--|----------------------|--|-------------------------|------------------|
| Test Lab. : Sporton International Inc. Hsinhua Laboratory | | | | |
| <input checked="" type="checkbox"/> Wen 33rd.St. | ADD: | No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) | | |
| | TEL: | 886-3-318-0787 | FAX: | 886-3-318-0287 |
| Test Condition | Test Site No. | Test Engineer | Test Environment | Test Date |
| Radiated | 05CH03-HY | Rex Liao | 23~24°C / 50~55% | 22/Dec/2022 |

Note:

Testing Site Information

Brand Name: TDK

Dimension: 11m*6m*6m

Characteristic: Fully Anechoic Chamber

4. Test Facility and Configuration

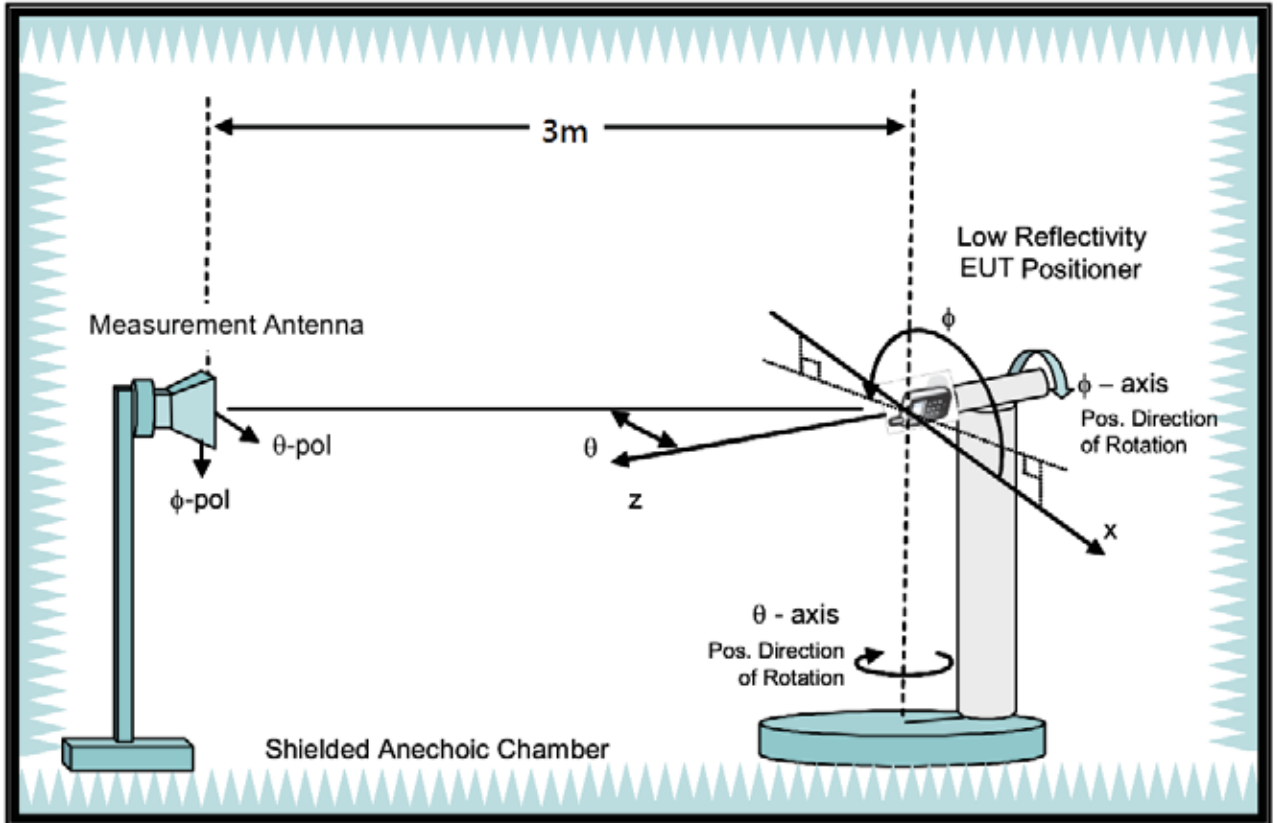
Test configuration: Reference to CITA OTA distributed-axes system configuration.

Chamber: Fully Anechoic Chamber.

Measurement antenna: Dual Polarization Horn antenna

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

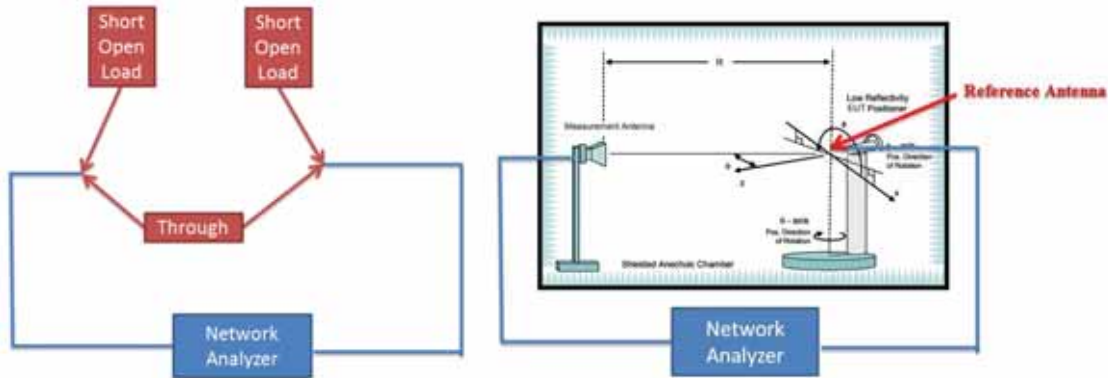
#Reference to CTIA "ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1"



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) | -0.55 | 0.35 | -1.32 | -0.22 | 0.44 |
| Ant. 2 (dBi) | -0.61 | 2.5 | 2.65 | 1.73 | 2.82 |
| DG [1SS] (dBi) | 2.43 | 4.5 | 3.9 | 3.82 | 4.72 |
| Polarization | Phi | Theta | Theta | Theta | Theta |
| Θ(°) | 7.5 | 52.5 | 67.5 | 37.5 | 60 |
| Φ(°) | 97.5 | 52.5 | 210 | 60 | 225 |

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

DG_1SS max value position calculation

| Frequency (Hz) | 2.45G | 5.2G | 5.3G | 5.6G | 5.785G |
|--------------------------|---------------|--------------|---------------|---------------|--------------|
| Ant. 1 [10^(G/20)] | 10^(-0.55/20) | 10^(0.35/20) | 10^(-1.32/20) | 10^(-0.22/20) | 10^(0.44/20) |
| Ant. 2 [10^(G/20)] | 10^(-0.61/20) | 10^(2.5/20) | 10^(2.65/20) | 10^(1.73/20) | 10^(2.82/20) |
| Ant. 1 [10^(G/20)] value | 0.939 | 1.041 | 0.859 | 0.975 | 1.052 |
| Ant. 2 [10^(G/20)] value | 0.932 | 1.334 | 1.357 | 1.22 | 1.384 |
| Sum All Antenna [Amax] | 1.871 | 2.375 | 2.216 | 2.195 | 2.436 |
| DG [10*log(Amax^2/Nant)] | 2.43 | 4.5 | 3.9 | 3.82 | 4.72 |

Note:

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

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



DG_1SS max value position

| Frequency (Hz) | 6.175G | 6.475G | 6.695G | 6.995G |
|--------------------|--------|--------|--------|--------|
| Ant. 1 (dBi) | 4.91 | -1.25 | 4.85 | 4.94 |
| Ant. 2 (dBi) | 0.69 | 4.91 | 2.06 | 0.95 |
| DG [1SS] (dBi) | 6.06 | 5.38 | 6.58 | 6.18 |
| Polarization | Theta | Theta | Theta | Theta |
| $\Theta(^{\circ})$ | 60 | 52.5 | 37.5 | 37.5 |
| $\Phi(^{\circ})$ | 202.5 | 37.5 | 292.5 | 292.5 |

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) | 6.175G | 6.475G | 6.695G | 6.995G |
|---|------------------|-------------------|------------------|------------------|
| Ant. 1 [$10^{(G/20)}$] | $10^{(4.91/20)}$ | $10^{(-1.25/20)}$ | $10^{(4.85/20)}$ | $10^{(4.94/20)}$ |
| Ant. 2 [$10^{(G/20)}$] | $10^{(0.69/20)}$ | $10^{(4.91/20)}$ | $10^{(2.06/20)}$ | $10^{(0.95/20)}$ |
| Ant. 1 [$10^{(G/20)}$] value | 1.76 | 0.866 | 1.748 | 1.766 |
| Ant. 2 [$10^{(G/20)}$] value | 1.083 | 1.76 | 1.268 | 1.116 |
| Sum All Antenna [Amax] | 2.843 | 2.626 | 3.015 | 2.882 |
| DG [$10 \cdot \log(A_{max}^2/N_{ant})$] | 6.06 | 5.38 | 6.58 | 6.18 |

Note:

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

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



8. Summary of Test Result

| Frequency (Hz) | 2.45G |
|-----------------------|-------|
| Ant. 1 Max Gain (dBi) | 1.31 |
| Ant. 2 Max Gain (dBi) | 1.14 |
| Max Gain (dBi) | 1.31 |
| DG [1SS] (dBi) | 2.43 |
| DG [2SS] (dBi) | 1.31 |

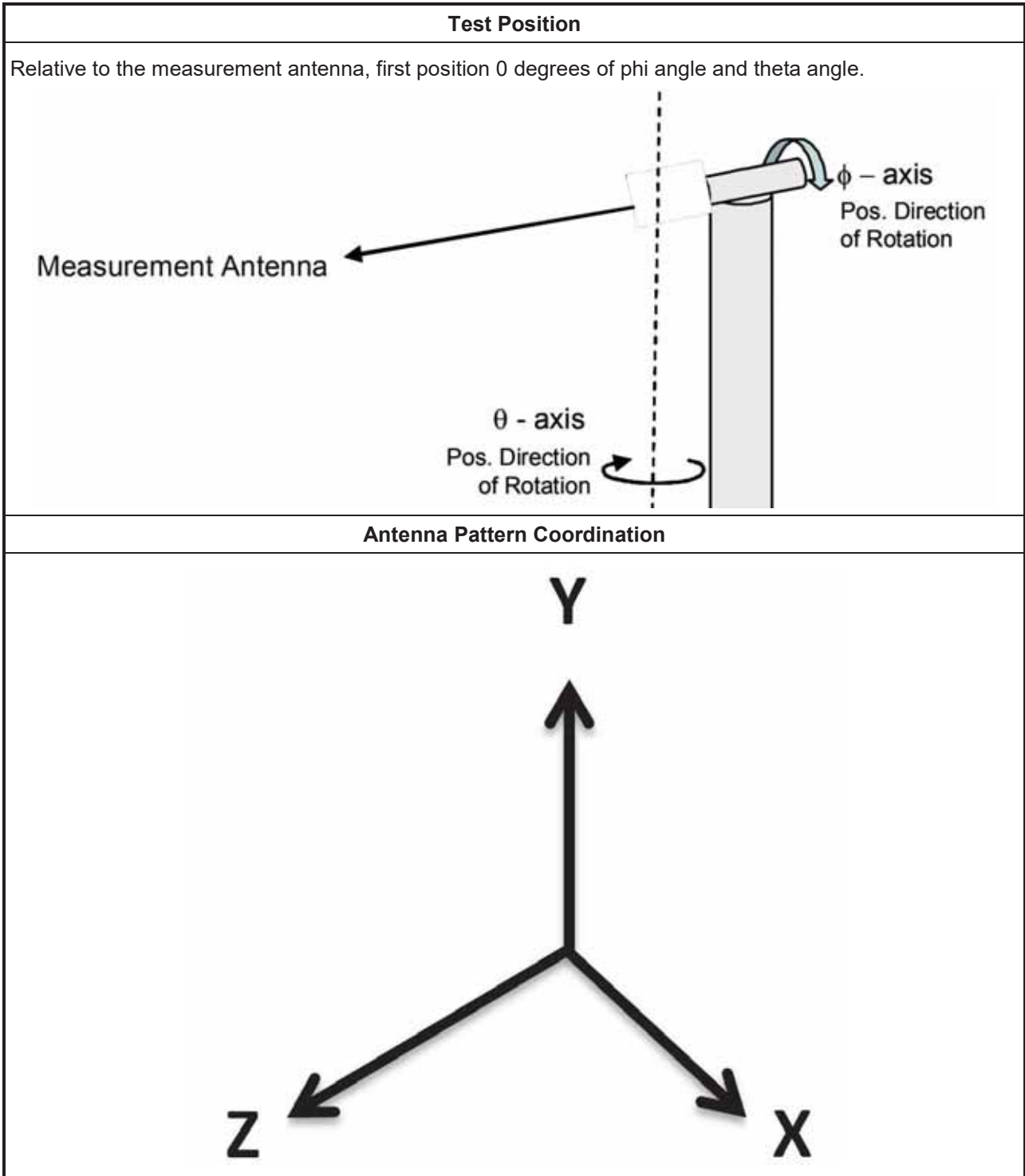
| Frequency (Hz) | 5.2G | 5.3G | 5.6G | 5.785G |
|-----------------------|------|------|------|--------|
| Ant. 1 Max Gain (dBi) | 2.31 | 1.48 | 1.91 | 2.48 |
| Ant. 2 Max Gain (dBi) | 4.29 | 3.18 | 3.16 | 3.09 |
| Max Gain (dBi) | 4.29 | 3.18 | 3.16 | 3.09 |
| DG [1SS] (dBi) | 4.5 | 3.9 | 3.82 | 4.72 |
| DG [2SS] (dBi) | 4.29 | 3.18 | 3.16 | 3.09 |

| Frequency (Hz) | 6.175G | 6.475G | 6.695G | 6.995G |
|-----------------------|--------|--------|--------|--------|
| Ant. 1 Max Gain (dBi) | 5.17 | 4.29 | 5.79 | 4.94 |
| Ant. 2 Max Gain (dBi) | 5.88 | 5.1 | 5.81 | 5.86 |
| Max Gain (dBi) | 5.88 | 5.1 | 5.81 | 5.86 |
| DG [1SS] (dBi) | 6.06 | 5.38 | 6.58 | 6.18 |
| DG [2SS] (dBi) | 5.88 | 5.1 | 5.81 | 5.86 |

Note:

1. Antenna max gain is the max value of each individual antenna through all measurement angles.
2. The max gain is the max value of all antennas.
3. Directional Gain (2SS) = Directional Gain (1SS) – 3dB. If directional gain is less than max gain, use max gain as directional gain. Refer to KDB662911D01 (F) (2) (e) (ii).
4. Directional Gain (4SS) = Directional Gain (1SS) – 6dB. If directional gain is less than max gain, use max gain as directional gain. Refer to KDB662911D01 (F) (2) (e) (ii)

9. Test Setup



Note:

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



10. Test Equipment and Calibration Data

| Instrument | Brand | Model No. | Serial No. | Characteristics | Calibration Date | Calibration Due Date |
|--------------------------------|-------------|------------|-----------------|------------------|------------------|----------------------|
| Horn Antenna | SCHWARZBECK | BBHA9120D | BBHA 9120D-1543 | 1GHz~18GHz | May. 31, 2022 | May. 30, 2023 |
| Dual Polarization Horn Antenna | Sporton | S0209DP | S0209DP-001 | 2GHz~9GHz | NCR. | NCR. |
| 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 | NCR. | NCR. |
| Multi-axis positioner | Sporton | MAPS01 | MAPS01-001 | Theta / Phi axis | NCR. | NCR. |
| Test Software | SPORTON | SENSE-RDG | V1.0.8 | - | NCR. | NCR. |

Note: NCR means Non-Calibration required.



11. Test Results

Please refer to the appendix.

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Appendix B.1 – Antenna Pattern of 2.4GHz, 5GHz.....Page 30
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Appendix C – Test Photos..... Page 37

————THE END————



Radiated Composite Gain Data_2.4GHz WLAN, 5GHz WLAN

Appendix A.1

| Freq(Hz) | 2.45G | 5.2G | 5.3G | 5.6G | 5.785G |
|--|----------------|----------------|--------------|----------------|------------------|
| Ant. 1 Max Gain (dBi) | 1.31 | 2.31 | 1.48 | 1.91 | 2.48 |
| Ant. 2 Max Gain (dBi) | 1.14 | 4.29 | 3.18 | 3.16 | 3.09 |
| Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$ | Theta/67.5/15 | Theta/22.5/285 | Phi/37.5/210 | Theta/30/292.5 | Theta/22.5/277.5 |
| Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$ | Theta/52.5/105 | Theta/52.5/225 | Theta/45/60 | Theta/52.5/225 | Theta/52.5/225 |
| Max Gain (dBi) | 1.31 | 4.29 | 3.18 | 3.16 | 3.09 |
| DG [1SS] (dBi) | 2.43 | 4.5 | 3.9 | 3.82 | 4.72 |
| DG [2SS] (dBi) | 1.31 | 4.29 | 3.18 | 3.16 | 3.09 |



Radiated Composite Gain Data_2.4GHz WLAN, 5GHz WLAN

Appendix A.1

| (2)25) | (3)50) | (4)75) | (5)100) | (6)125) | (7)150) | (8)175) | (9)200) | (10)225) | (11)250) | (12)275) | (13)300) | (14)325) | (15)350) | (16)375) | (17)400) | (18)425) | (19)450) | (20)475) | (21)500) | (22)525) | (23)550) | (24)575) | (25)600) | (26)625) | (27)650) | (28)675) | (29)700) | (30)725) | (31)750) | (32)775) | (33)800) | (34)825) | (35)850) | (36)875) | (37)900) | (38)925) | (39)950) | (40)975) | (41)1000) | (42)1025) | (43)1050) | (44)1075) | (45)1100) | (46)1125) | (47)1150) | (48)1175) | (49)1200) | (50)1225) | (51)1250) | (52)1275) | (53)1300) | (54)1325) | (55)1350) | (56)1375) | (57)1400) | (58)1425) | (59)1450) | (60)1475) | (61)1500) | (62)1525) | (63)1550) | (64)1575) | (65)1600) | (66)1625) | (67)1650) | (68)1675) | (69)1700) | (70)1725) | (71)1750) | (72)1775) | (73)1800) | (74)1825) | (75)1850) | (76)1875) | (77)1900) | (78)1925) | (79)1950) | (80)1975) | (81)2000) | (82)2025) | (83)2050) | (84)2075) | (85)2100) | (86)2125) | (87)2150) | (88)2175) | (89)2200) | (90)2225) | (91)2250) | (92)2275) | (93)2300) | (94)2325) | (95)2350) | (96)2375) | (97)2400) | (98)2425) | (99)2450) | (100)2475) | (101)2500) | (102)2525) | (103)2550) | (104)2575) | (105)2600) | (106)2625) | (107)2650) | (108)2675) | (109)2700) | (110)2725) | (111)2750) | (112)2775) | (113)2800) | (114)2825) | (115)2850) | (116)2875) | (117)2900) | (118)2925) | (119)2950) | (120)2975) | (121)3000) | (122)3025) | (123)3050) | (124)3075) | (125)3100) | (126)3125) | (127)3150) | (128)3175) | (129)3200) | (130)3225) | (131)3250) | (132)3275) | (133)3300) | (134)3325) | (135)3350) | (136)3375) | (137)3400) | (138)3425) | (139)3450) | (140)3475) | (141)3500) | (142)3525) | (143)3550) | (144)3575) | (145)3600) | (146)3625) | (147)3650) | (148)3675) | (149)3700) | (150)3725) | (151)3750) | (152)3775) | (153)3800) | (154)3825) | (155)3850) | (156)3875) | (157)3900) | (158)3925) | (159)3950) | (160)3975) | (161)4000) | (162)4025) | (163)4050) | (164)4075) | (165)4100) | (166)4125) | (167)4150) | (168)4175) | (169)4200) | (170)4225) | (171)4250) | (172)4275) | (173)4300) | (174)4325) | (175)4350) | (176)4375) | (177)4400) | (178)4425) | (179)4450) | (180)4475) | (181)4500) | (182)4525) | (183)4550) | (184)4575) | (185)4600) | (186)4625) | (187)4650) | (188)4675) | (189)4700) | (190)4725) | (191)4750) | (192)4775) | (193)4800) | (194)4825) | (195)4850) | (196)4875) | (197)4900) | (198)4925) | (199)4950) | (200)4975) | (201)5000) | (202)5025) | (203)5050) | (204)5075) | (205)5100) | (206)5125) | (207)5150) | (208)5175) | (209)5200) | (210)5225) | (211)5250) | (212)5275) | (213)5300) | (214)5325) | (215)5350) | (216)5375) | (217)5400) | (218)5425) | (219)5450) | (220)5475) | (221)5500) | (222)5525) | (223)5550) | (224)5575) | (225)5600) | (226)5625) | (227)5650) | (228)5675) | (229)5700) | (230)5725) | (231)5750) | (232)5775) | (233)5800) | (234)5825) | (235)5850) | (236)5875) | (237)5900) | (238)5925) | (239)5950) | (240)5975) | (241)6000) | (242)6025) | (243)6050) | (244)6075) | (245)6100) | (246)6125) | (247)6150) | (248)6175) | (249)6200) | (250)6225) | (251)6250) | (252)6275) | (253)6300) | (254)6325) | (255)6350) | (256)6375) | (257)6400) | (258)6425) | (259)6450) | (260)6475) | (261)6500) | (262)6525) | (263)6550) | (264)6575) | (265)6600) | (266)6625) | (267)6650) | (268)6675) | (269)6700) | (270)6725) | (271)6750) | (272)6775) | (273)6800) | (274)6825) | (275)6850) | (276)6875) | (277)6900) | (278)6925) | (279)6950) | (280)6975) | (281)7000) | (282)7025) | (283)7050) | (284)7075) | (285)7100) | (286)7125) | (287)7150) | (288)7175) | (289)7200) | (290)7225) | (291)7250) | (292)7275) | (293)7300) | (294)7325) | (295)7350) | (296)7375) | (297)7400) | (298)7425) | (299)7450) | (300)7475) | (301)7500) | (302)7525) | (303)7550) | (304)7575) | (305)7600) | (306)7625) | (307)7650) | (308)7675) | (309)7700) | (310)7725) | (311)7750) | (312)7775) | (313)7800) | (314)7825) | (315)7850) | (316)7875) | (317)7900) | (318)7925) | (319)7950) | (320)7975) | (321)8000) | (322)8025) | (323)8050) | (324)8075) | (325)8100) | (326)8125) | (327)8150) | (328)8175) | (329)8200) | (330)8225) | (331)8250) | (332)8275) | (333)8300) | (334)8325) | (335)8350) | (336)8375) | (337)8400) | (338)8425) | (339)8450) | (340)8475) | (341)8500) | (342)8525) | (343)8550) | (344)8575) | (345)8600) | (346)8625) | (347)8650) | (348)8675) | (349)8700) | (350)8725) | (351)8750) | (352)8775) | (353)8800) | (354)8825) | (355)8850) | (356)8875) | (357)8900) | (358)8925) | (359)8950) | (360)8975) | (361)9000) | (362)9025) | (363)9050) | (364)9075) | (365)9100) | (366)9125) | (367)9150) | (368)9175) | (369)9200) | (370)9225) | (371)9250) | (372)9275) | (373)9300) | (374)9325) | (375)9350) | (376)9375) | (377)9400) | (378)9425) | (379)9450) | (380)9475) | (381)9500) | (382)9525) | (383)9550) | (384)9575) | (385)9600) | (386)9625) | (387)9650) | (388)9675) | (389)9700) | (390)9725) | (391)9750) | (392)9775) | (393)9800) | (394)9825) | (395)9850) | (396)9875) | (397)9900) | (398)9925) | (399)9950) | (400)9975) | (401)10000) | (402)10025) | (403)10050) | (404)10075) | (405)10100) | (406)10125) | (407)10150) | (408)10175) | (409)10200) | (410)10225) | (411)10250) | (412)10275) | (413)10300) | (414)10325) | (415)10350) | (416)10375) | (417)10400) | (418)10425) | (419)10450) | (420)10475) | (421)10500) | (422)10525) | (423)10550) | (424)10575) | (425)10600) | (426)10625) | (427)10650) | (428)10675) | (429)10700) | (430)10725) | (431)10750) | (432)10775) | (433)10800) | (434)10825) | (435)10850) | (436)10875) | (437)10900) | (438)10925) | (439)10950) | (440)10975) | (441)11000) | (442)11025) | (443)11050) | (444)11075) | (445)11100) | (446)11125) | (447)11150) | (448)11175) | (449)11200) | (450)11225) | (451)11250) | (452)11275) | (453)11300) | (454)11325) | (455)11350) | (456)11375) | (457)11400) | (458)11425) | (459)11450) | (460)11475) | (461)11500) | (462)11525) | (463)11550) | (464)11575) | (465)11600) | (466)11625) | (467)11650) | (468)11675) | (469)11700) | (470)11725) | (471)11750) | (472)11775) | (473)11800) | (474)11825) | (475)11850) | (476)11875) | (477)11900) | (478)11925) | (479)11950) | (480)11975) | (481)12000) | (482)12025) | (483)12050) | (484)12075) | (485)12100) | (486)12125) | (487)12150) | (488)12175) | (489)12200) | (490)12225) | (491)12250) | (492)12275) | (493)12300) | (494)12325) | (495)12350) | (496)12375) | (497)12400) | (498)12425) | (499)12450) | (500)12475) | (501)12500) | (502)12525) | (503)12550) | (504)12575) | (505)12600) | (506)12625) | (507)12650) | (508)12675) | (509)12700) | (510)12725) | (511)12750) | (512)12775) | (513)12800) | (514)12825) | (515)12850) | (516)12875) | (517)12900) | (518)12925) | (519)12950) | (520)12975) | (521)13000) | (522)13025) | (523)13050) | (524)13075) | (525)13100) | (526)13125) | (527)13150) | (528)13175) | (529)13200) | (530)13225) | (531)13250) | (532)13275) | (533)13300) | (534)13325) | (535)13350) | (536)13375) | (537)13400) | (538)13425) | (539)13450) | (540)13475) | (541)13500) | (542)13525) | (543)13550) | (544)13575) | (545)13600) | (546)13625) | (547)13650) | (548)13675) | (549)13700) | (550)13725) | (551)13750) | (552)13775) | (553)13800) | (554)13825) | (555)13850) | (556)13875) | (557)13900) | (558)13925) | (559)13950) | (560)13975) | (561)14000) | (562)14025) | (563)14050) | (564)14075) | (565)14100) | (566)14125) | (567)14150) | (568)14175) | (569)14200) | (570)14225) | (571)14250) | (572)14275) | (573)14300) | (574)14325) | (575)14350) | (576)14375) | (577)14400) | (578)14425) | (579)14450) | (580)14475) | (581)14500) | (582)14525) | (583)14550) | (584)14575) | (585)14600) | (586)14625) | (587)14650) | (588)14675) | (589)14700) | (590)14725) | (591)14750) | (592)14775) | (593)14800) | (594)14825) | (595)14850) | (596)14875) | (597)14900) | (598)14925) | (599)14950) | (600)14975) | (601)15000) | (602)15025) | (603)15050) | (604)15075) | (605)15100) | (606)15125) | (607)15150) | (608)15175) | (609)15200) | (610)15225) | (611)15250) | (612)15275) | (613)15300) | (614)15325) | (615)15350) | (616)15375) | (617)15400) | (618)15425) | (619)15450) | (620)15475) | (621)15500) | (622)15525) | (623)15550) | (624)15575) | (625)15600) | (626)15625) | (627)15650) | (628)15675) | (629)15700) | (630)15725) | (631)15750) | (632)15775) | (633)15800) | (634)15825) | (635)15850) | (636)15875) | (637)15900) | (638)15925) | (639)15950) | (640)15975) | (641)16000) | (642)16025) | (643)16050) | (644)16075) | (645)16100) | (646)16125) | (647)16150) | (648)16175) | (649)16200) | (650)16225) | (651)16250) | (652)16275) | (653)16300) | (654)16325) | (655)16350) | (656)16375) | (657)16400) | (658)16425) | (659)16450) | (660)16475) | (661)16500) | (662)16525) | (663)16550) | (664)16575) | (665)16600) | (666)16625) | (667)16650) | (668)16675) | (669)16700) | (670)16725) | (671)16750) | (672)16775) | (673)16800) | (674)16825) | (675)16850) | (676)16875) | (677)16900) | (678)16925) | (679)16950) | (680)16975) | (681)17000) | (682)17025) | (683)17050) | (684)17075) | (685)17100) | (686)17125) | (687)17150) | (688)17175) | (689)17200) | (690)17225) | (691)17250) | (692)17275) | (693)17300) | (694)17325) | (695)17350) | (696)17375) | (697)17400) | (698)17425) | (699)17450) | (700)17475) | (701)17500) | (702)17525) | (703)17550) | (704)17575) | (705)17600) | (706)17625) | (707)17650) | (708)17675) | (709)17700) | (710)17725) | (711)17750) | (712)17775) | (713)17800) | (714)17825) | (715)17850) | (716)17875) | (717)17900) | (718)17925) | (719)17950) | (720)17975) | (721)18000) | (722)18025) | (723)18050) | (724)18075) | (725)18100) | (726)18125) | (727)18150) | (728)18175) | (729)18200) | (730)18225) | (731)18250) | (732)18275) | (733)18300) | (734)18325) | (735)18350) | (736)18375) | (737)18400) | (738)18425) | (739)18450) | (740)18475) | (741)18500) | (742)18525) | (743)18550) | (744)18575) | (745)18600) | (746)18625) | (747)18650) | (748)18675) | (749)18700) | (750)18725) | (751)18750) | (752)18775) | (753)18800) | (754)18825) | (755)18850) | (756)18875) | (757)18900) | (758)18925) | (759)18950) | (760)18975) | (761)19000) | (762)19025) | (763)19050) | (764)19075) | (765)19100) | (766)19125) | (767)19150) | (768)19175) | (769)19200) | (770)19225) | (771)19250) | (772)19275) | (773)19300) | (774)19325) | (775)19350) | (776)19375) | (777)19400) | (778)19425) | (779)19450) | (780)19475) | (781)19500) | (782)19525) | (783)19550) | (784)19575) | (785)19600) | (786)19625) | (787)19650) | (788)19675) | (789)19700) | (790)19725) | (791)19750) | (792)19775) | (793)19800) | (794)19825) | (795)19850) | (796)19875) | (797)19900) | (798)19925) | (799)19950) | (800)19975) | (801)20000) | (802)20025) | (803)20050) | (804)20075) | (805)20100) | (806)20125) | (807)20150) | (808)20175) | (809)20200) | (810)20225) | (811)20250) | (812)20275) | (813)20300) | (814)20325) | (815)20350) | (816)20375) | (817)20400) | (818)20425) | (819)20450) | (820)20475) | (821)20500) | (822)20525) | (823)20550) | (824)20575) | (825)20600) | (826)20625) | (827)20650) | (828)20675) | (829)20700) | (830)20725) | (831)20750) | (832)20775) | (833)20800) | (834)20825) | (835)20850) | (836)20875) | (837)20900) | (838)20925) | (839)20950) | (840)20975) | (841)21000) | (842)21025) | (843)21050) | (844)21075) | (845)21100) | (846)21125) | (847)21150) | (848)21175) | (849)21200) | (850)21225) | (851)21250) | (852)21275) | (853)21300) | (854)21325) | (855)21350) | (856)21375) | (857)21400) | (858)21425) | (859)21450) | (860)21475) | (861)21500) | (862)21525) | (863)21550) | (864)21575) | (865)21600) | (866)21625) | (867)21650) | (868)21675) | (869)21700) | (870)21725) | (871)21750) | (872)21775) | (873)21800) | (874)21825) | (875)21850) | (876)21875) | (877)21900) | (878)21925) | (879)21950) | (880)21975) | (881)22000) | (882)22025) | (883)22050) | (884)22075) | (885)22100) | (886)22125) | (887)22150) | (888)22175) | (889)22200) | (890)22225) | (891)22250) | (892)22275) | (893)22300) | (894)22325) | (895)22350) | (896)22375) | (897)22400) | (898)22425) | (899)22450) | (900)22475) | (901)22500) | (902)22525) | (903)22550) | (904)22575) | (905)22600) | (906)22625) | (907)22650) | (908)22675) | (909)22700) | (910)22725) | (911)22750) | (912)22775) | (913 |
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|--------|--------|--------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------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Radiated Composite Gain Data_2.4GHz WLAN, 5GHz WLAN

Appendix A.1

| Theta | -3.61:2.31 | -2.21:0.33 | -0.12:1.68 | 0.38:2.22 | 2.71:1.73 | -5.29:4.34 | -5.57:7.6 | -10.97:6.65 | -14.08:10.37 | -11.13:12.09 | -13.29:8.69 | -8.82:6.13 | -7.69:1.53 | 0.78:0.3 | -0.22:0.61 | -2.01:5.44 | -3.68:3.56 | -5.24:1.75 | -2.71:2 | -4.61:6.06 | -7.51:8.48 | -6.52:10.78 | -9.63:6.67 | -6.85:3.74 | |
|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|
| Theta(25) | 7.614:5.3 | -4.061:1.6 | -1.290:3.8 | 0.491:4.1 | 3.811:6.4 | -6.384:2.9 | -5.189:7.08 | 9:11:16 | -10:42:12.45 | -13:41:15.6 | -12:58:7.77 | -6.67:5.45 | -8.65:2.88 | 2:51:1.7 | 0:50:1 | -3:26:4.42 | -3:36:3.82 | -3:85:1.88 | 2:37:3.48 | -7:54:3.36 | -6:39:9.29 | -10:36:12.73 | -8:05:7.21 | -7:64:3.37 | -6:91:6.85 |
| Theta(50) | 6.817:9.9 | -7:22:2.72 | -1:83:1.29 | -1:83:1.24 | -4:36:7.99 | 6:24:9.8 | -5:76:6.21 | -7:44:8.81 | -9:71:12.45 | -14:91:10.04 | -10:47:1.5 | -5:97:4.17 | -6:42:5.15 | -3:96:2.73 | -2:22:4 | -3:54:1.3 | -5:50:3.51 | -4:83:2.08 | -4:64:4.72 | -10:25:6.88 | -7:07:9.11 | -8:19:11.06 | -8:01:7.61 | -6:91:6.85 | |
| Theta(75) | -10:31:12.48 | -8:66:5.66 | -2:86:3.22 | 3:31:3.35 | 9:54:8.6 | -5:61:4.63 | -6:31:6.73 | -7:02:7.64 | -11:24:12.88 | -14:75:11.19 | -8:37:10.8 | -6:27:4.94 | -6:42:6.27 | -8:43:2.4 | -2:23:1.67 | -5:73:4.82 | -7:94:4.75 | -5:21:4.4 | 6:83:14.37 | -13:01:7.46 | -11:57:11.64 | -10:72:12.22 | -7:95:10.34 | -8:48:6.88 | |
| Theta(100) | -11:21:12.74 | -12:47:10.03 | -4:57:5.85 | -4:26:4.88 | -10:28:9.68 | -6:34:6.16 | -7:64:6.71 | -7:56:7.14 | -12:94:14.35 | -13:25:10.16 | -12:27:9.6 | -6:27:6.33 | -8:08:8.24 | -10:01:8.14 | -4:01:7.69 | -7:72:5.39 | -7:32:7.2 | -7:35:5.88 | 6:86:15.73 | -11:58:9.58 | -12:44:15.36 | -8:03:13.88 | -8:84:9.2 | -6:57:6.42 | |
| Theta(125) | -8:45:13.85 | -12:67:14.02 | -8:33:7.59 | 6:89:7.32 | -6:61:11.08 | -6:50:9.64 | -6:67:6.87 | -11:74:9.14 | -12:77:13.81 | -15:41:11.48 | -10:42:10.05 | -8:67:6.16 | -8:96:10.94 | -12:41:11.63 | -6:69:7.09 | 8:36:8.97 | -9:01:7.58 | 6:12:6.62 | -7:54:13.73 | -14:96:12.76 | -12:89:9.44 | -12:87:11.01 | -8:17:6.58 | -6:74:7.62 | |
| Theta(150) | -15:82:10.74 | -15:56:13.43 | -13:31:6.42 | 6:16:1.7 | -8:87:11.87 | -9:53:12.11 | -10:71:9.67 | -13:76:11.9 | -14:91:11.43 | -13:73:15.65 | -11:81:12.65 | -14:41:10.61 | -9:54:10.26 | -12:55:11.68 | -8:71:7.79 | 8:39:13.11 | -10:43:6.62 | 8:21:10.28 | -8:75:13.99 | -13:07:15.39 | -11:11:12.89 | -13:32:14.72 | -14:13:15.11 | -11:89:11.6 | |
| Theta(175) | -15:56:14.5 | -14:25:11.22 | -15:57:8.3 | 8:97:6.48 | -11:89:8.75 | 8:86:11.41 | -12:18:12.53 | -11:77:10.63 | -15:91:12.1 | -13:15:3 | -15:26:11.59 | -11:84:15.68 | -15:03:16.08 | -13:32:11.47 | -10:99:6.41 | 7:78:10.1 | -13:11:10.49 | -10:43:9.91 | -12:27:15.01 | -14:58:12.62 | -11:33:15.77 | -10:50:10.81 | -10:99:15.44 | -15:74:15.28 | |
| Theta(200) | -15:36:13.28 | -14:57:12.5 | -10:45:12.38 | -12:07:11.96 | -12:12:8.86 | 9:64:10.47 | 8:27:11.63 | -15:42:9.95 | -11:09:15.61 | -14:96:9.99 | -11:74:12.36 | -14:27:15.87 | -14:31:13.15 | -13:05:10.57 | -12:19:9.38 | 8:21:10.4 | -12:61:12.81 | -10:43:7.57 | -7:44:13.88 | -15:53:15.1 | -13:43:13.04 | -8:99:13.64 | -13:26:15.35 | -15:42:14.83 | |
| Theta(225) | -11:05:9.29 | -15:05:11.7 | -8:96:10.61 | -12:35:12.3 | -14:67:13.37 | -14:36:12.19 | -10:81:11.86 | -13:16:15.43 | -12:09:9.32 | -13:54:14.72 | -12:37:11.6 | -12:36:13.81 | 9:17:8.4 | -16:47:11.27 | -16:31:11.88 | -13:57:13.88 | -14:77:11.76 | -13:31:13.18 | -10:96:11.97 | -13:66:15.25 | -13:25:14.87 | -14:58:15.54 | -15:33:10.88 | -9:62:13.44 | |
| Theta(250) | -14:14:14.08 | -13:51:15.42 | -15:78:15.16 | -15:48:15.32 | -13:47:10.68 | -10:77:12.31 | -10:50:10.08 | 9:13:11.14 | -13:97:12.46 | -12:07:11.42 | -11:51:12.41 | -11:86:12.49 | -8:35:13.24 | -13:72:15.32 | -15:41:14.41 | -12:33:14.14 | -14:11:13.27 | -13:22:14.38 | -15:59:12.84 | -14:86:14.81 | -14:36:14.02 | -15:99:13.18 | -15:16:14.64 | 9:86:9.9 | |
| Theta(275) | -13:13:15.54 | -15:54:15.17 | -15:31:11.92 | -16:56:13.47 | -14:52:15.78 | -13:59:13.32 | -10:50:10.57 | -15:51:13.76 | -11:44:8.62 | 8:34:11.29 | -12:17:12.7 | -14:53:13.71 | -14:50:16.78 | -15:52:15.27 | -14:54:15.48 | -15:14:14.28 | -10:11:10.56 | -12:02:13.1 | -10:86:10.27 | -10:33:15.34 | -8:56:16.15 | -11:44:11.55 | -10:17:13.65 | -12:33:12.46 | |
| Theta(300) | -13:81:13.24 | -13:23:13.32 | -12:27:13.7 | -16:01:15.42 | -15:38:14.78 | -14:91:13.91 | -11:43:10.58 | -10:26:10.51 | -10:11:8.18 | -8:63:9.85 | -11:56:13.4 | -14:33:16.06 | -14:91:15.62 | -14:83:14.84 | -13:07:13.19 | -13:77:15.7 | -15:83:15.73 | -15:62:13.44 | -11:26:10.99 | -10:27:10.33 | -10:10:10.59 | -11:27:10.32 | 9:34:9.75 | -11:24:13.03 | |
| Theta(325) | -11:33:12.5 | -15:14:15.98 | -15:31:14.02 | -14:36:15.17 | -13:37:12.59 | -12:29:9.73 | -8:75:8.45 | -7:52:7.75 | -8:57:10.21 | -12:71:13.57 | -14:76:14.01 | -13:95:15.23 | -14:32:13.68 | -13:15:13.15 | -14:13:14.47 | -15:14:14.63 | -13:02:12.82 | -12:38:11.58 | -12:16:11.8 | -11:07:10.78 | -11:01:11.28 | -11:63:10.1 | -9:51 | -10:13:13.21 | |
| Theta(350) | -11:64:12.17 | -13:06:13.95 | -14:31:15.74 | -15:43:15.19 | -14:15:12.3 | -12:72:11.92 | -10:87:10.61 | -11:81:12.57 | -12:43:11.41 | -10:57:10.14 | -10:71:11.87 | -12:86:12.53 | -12:11:13.27 | -15:09:15.62 | -15:26:14.84 | -15:85:15.73 | -13:51:13.91 | -13:96:11.77 | -11:18:10.13 | -9:83:9.68 | -8:94:9.24 | -8:75:7.78 | -7:82:9.1 | -10:74:11.51 | |
| Phi(0) | 0:07:07.57 | 0:15:02.21 | 0:30:03.57 | 0:45:05.15 | 0:60:06.73 | 0:75:08.31 | 0:90:09.89 | 0:105:11.47 | 0:120:13.05 | 0:135:14.63 | 0:150:16.21 | 0:165:17.79 | 0:180:19.37 | 0:195:20.95 | 0:210:22.53 | 0:225:24.11 | 0:240:25.69 | 0:255:27.27 | 0:270:28.85 | 0:285:30.43 | 0:300:32.01 | 0:315:33.59 | 0:330:35.17 | 0:345:36.75 | 0:360:38.33 |
| Phi(5) | 6:21:7.29 | 6:35:4.94 | 6:50:2.59 | 7:05:0.24 | 7:20:0.12 | 7:35:0.01 | 7:50:0.1 | 8:05:0.2 | 8:20:0.3 | 8:35:0.4 | 8:50:0.5 | 9:05:0.6 | 9:20:0.7 | 9:35:0.8 | 9:50:0.9 | 10:05:1 | 10:20:1.1 | 10:35:1.2 | 10:50:1.3 | 11:05:1.4 | 11:20:1.5 | 11:35:1.6 | 11:50:1.7 | 12:05:1.8 | 12:20:1.9 |
| Phi(10) | 4:89:5.73 | 4:76:4.59 | 4:52:4.16 | 4:28:3.13 | 4:03:0.01 | 3:41:1.39 | 3:20:3.24 | 3:00:5.69 | 2:42:9.74 | 2:26:13.79 | 2:11:18.84 | 1:57:23.89 | 1:44:28.94 | 1:32:33.99 | 1:20:39.04 | 1:09:44.09 | 1:00:49.14 | 9:52:54.19 | 9:44:59.24 | 9:37:54.29 | 9:30:49.34 | 9:23:44.39 | 9:16:39.44 | 9:09:34.49 | 9:02:29.54 |
| Phi(15) | 6:39:5.71 | 4:72:3.29 | 1:9:0.68 | 0:53:1.45 | 2:42:6.1 | 2:83:3.1 | 3:43 | 2:54:2.08 | 1:53:1.29 | 1:12:0.76 | -0:86:1.29 | -2:37:2.93 | -3:44:4.43 | -4:73:4.62 | -3:28:2.11 | -1:70:4.4 | 2:56:7.5 | 2:78:2.39 | 1:76:1.28 | 0:96:1.13 | 0:89:0 | -1:22:2.62 | -4:03:0.24 | | |
| Phi(20) | 4:94:4.34 | 4:75:5.83 | 4:65:5.93 | 3:37:0.91 | 0:84:1.55 | 2:13:2.74 | 3:33.6 | 3:25.21 | 1:030.91 | 0:650.24 | 0:02:0.36 | -0:59:1.46 | -3:16:4.3 | -4:12:3.91 | -4:26:4.28 | -3:82:4 | 2:91:1.11 | 0:151.55 | 2:442.97 | 2:722.11 | 0:820.47 | 0:62.22 | -1:55:3.39 | -4:43:5.18 | |
| Phi(25) | 3:54:2.49 | -1:31:0.71 | 0:42:06 | 2:067.97 | 3:022.93 | 2:081.3 | 1:772.9 | 2:881.95 | 0:550.44 | 1:250.66 | 0:010.21 | 0:34:0.28 | 0:44:0.32 | -0:58:0.74 | 0:98:0.4 | 0:06:0.31 | 0:50:0.18 | -1:31:0.12 | 1:012.21 | 2:432.35 | 1:820.89 | 0:740.11 | -1:58:1.89 | -2:76:4.42 | |
| Phi(30) | -1:28:1 | -1:28:0.51 | 2:093.86 | 3:753.22 | 3:663.7 | 2:811.49 | 1:522.16 | 1:671.52 | 2:291.78 | 1:480.21 | -0:280.41 | 0:48:0.41 | 0:86:1.83 | -1:4:0.7 | -1:51:1.72 | -1:12:0.25 | 1:92.03 | 0:34:0.86 | -1:02:0.75 | 1:71:7.3 | 1:120.7 | 0:30.4 | -1:11:1.67 | -1:99:2.09 | |
| Phi(35) | 0:36:1.47 | 3:47:1.98 | 1:562.98 | 3:224 | 1:461.65 | 1:4:0.1 | 0:71:11.35 | -0:41:11.17 | 1:912.92 | 1:78:0.12 | 0:121.21 | 0:95:0.58 | 0:08:0.38 | 0:14:0.44 | 1:52.31 | 2:19:0.62 | 0:261.69 | 1:76:0.43 | 0:61:7.75 | 0:891.57 | 0:110:0.6 | 0:31:0.36 | -1:9:0.05 | 1:64.2 | |
| Phi(40) | 0:12:0.13 | 0:54:0.06 | 1:53:1.82 | 1:83:1.47 | 0:68:0.14 | 0:8:0.22 | -0:36:0.58 | -0:03:3.31 | 0:147.12 | 0:531.09 | 1:150.86 | 0:23:0.92 | -1:130.31 | 1:352.57 | 2:914.01 | 4:59:1.15 | 1:72:1.75 | 2:382.19 | 1:540.39 | 0:571:43 | 0:15:1.5 | 0:08:3.19 | -3:78:0.22 | 2:42.22 | |
| Phi(45) | 1:22:1.25 | -1:27:0.23 | 1:42:0.01 | 3:50:0.05 | -2:11:1.78 | 0:53:0.15 | 2:96:0.59 | 0:61:2.26 | -2:20:0.85 | 1:21.2 | 0:84:0.4 | -0:51:0.39 | -3:20:0.02 | 1:63.06 | 3:394.39 | 1:72:0.57 | 1:65:0.25 | 3:74:0.76 | 1:260.89 | 0:391.28 | 11.59 | 0:84:2.34 | -4:9:9.91 | 1:29:0.06 | |
| Phi(50) | 2:96:4.16 | -2:17:0.51 | 1:16:0.09 | 1:07:0.21 | 3:76:1.58 | -1:52:0.80 | 3:85:1.16 | 0:27:2.47 | -3:86:1.83 | 4:38:1.11 | -2:39:0.5 | 0:11:1.29 | 1:410.97 | 1:32.16 | 3:013.81 | 3:40:0.77 | 2:13:0.38 | 0:26:0.85 | 4:40:5.3 | -0:54:1.02 | 1:07:1.56 | 0:71:1.3 | -6:67:3.43 | -1:34:1.79 | |
| Phi(55) | 3:58:7.31 | 3:52:1.66 | 0:10:0.49 | 1:750.48 | 1:22:3.31 | -4:05:2.99 | -2:85:4.51 | -3:33:3.7 | -3:06:3.64 | -3:40:5.57 | -3:51:1.07 | 0:16:1.3 | 11.18 | 0:85:0.22 | 1:262.08 | 2:41:58 | 2:160.48 | -1:57:0.75 | 0:01:1.55 | 0:23:0.33 | 1:45:1.47 | 0:86:1.47 | -5:99:2.96 | -3:82:3.73 | |
| Phi(60) | 4:41:2.88 | 4:75:4.05 | 1:29:1.41 | 0:34:1.37 | 2:38:1.18 | -5:28:1.37 | 2:56:4.14 | 0:23:4.63 | -2:31:5.46 | -4:54:1.02 | -4:46:1.63 | 0:11:0.7 | 0:74:0.15 | 0:05:1.62 | 0:09:0.39 | 0:07:0.18 | 0:51:0.31 | -2:71:0.89 | 0:091.82 | -0:57:1.41 | 0:69:0.63 | 0:86:2.02 | -7:02:3.27 | -4:29:4.3 | |
| Phi(65) | 4:67:0.13 | 4:26:5.25 | 2:78:3.9 | -2:37:0.78 | 1:41:2.54 | -5:56:3.85 | 3:04:5.1 | -0:8:4.45 | -2:34:6.75 | -8:33:2.76 | -5:96:1.94 | -1:50:0.5 | -3:62:0.43 | -1:68:1.63 | -1:36:1.9 | -1:95:1.4 | -2:0:2 | -3:01:2.38 | -0:38:1.15 | -2:84:2.82 | -1:07:1.01 | -1:13:1.32 | 0:56:3.1 | -6:27:6.1 | |
| Phi(70) | 6:88:10.57 | -7:15:97 | -3:86:4.9 | 3:66:0.56 | -1:54:4.52 | -7:08:4.58 | -5:23:5.49 | -2:08:7.12 | -2:31:8.43 | -7:08:4.88 | -6:04:4.48 | -3:75:3.07 | -6:02:3.23 | -4:59:5.3 | -4:12:6.21 | -4:50:2.85 | 4:13:2 | -5:07:3.8 | -3:09:1.74 | -5:44:4.82 | -3:28:4.06 | -3:88:4.72 | -1:62:6.65 | -6:86:5.66 | |
| Phi(75) | -8:63:10.13 | -8:75:13.3 | -6:66:6.15 | -4:79:7.23 | -3:99:4.78 | -7:84:3.82 | -7:51:7.73 | -7:24:9.73 | -4:32:0.61 | -6:50:3.36 | -8:14:0.93 | -5:84:4.46 | -9:75:1.73 | -6:01:6.29 | -3:67:1.45 | -5:71:8.41 | -6:07:9.91 | -5:91:4.12 | -6:96:4.63 | -5:44:3.77 | -6:04:7.33 | -7:03:9.32 | -10:10:10.28 | -11:21:7.51 | |
| Phi(80) | -8:96:8.69 | -5:71:5.48 | -6:50:3.51 | | | | | | | | | | | | | | | | | | | | | | |



Radiated Composite Gain Data_6GHz WLAN

Appendix A.2

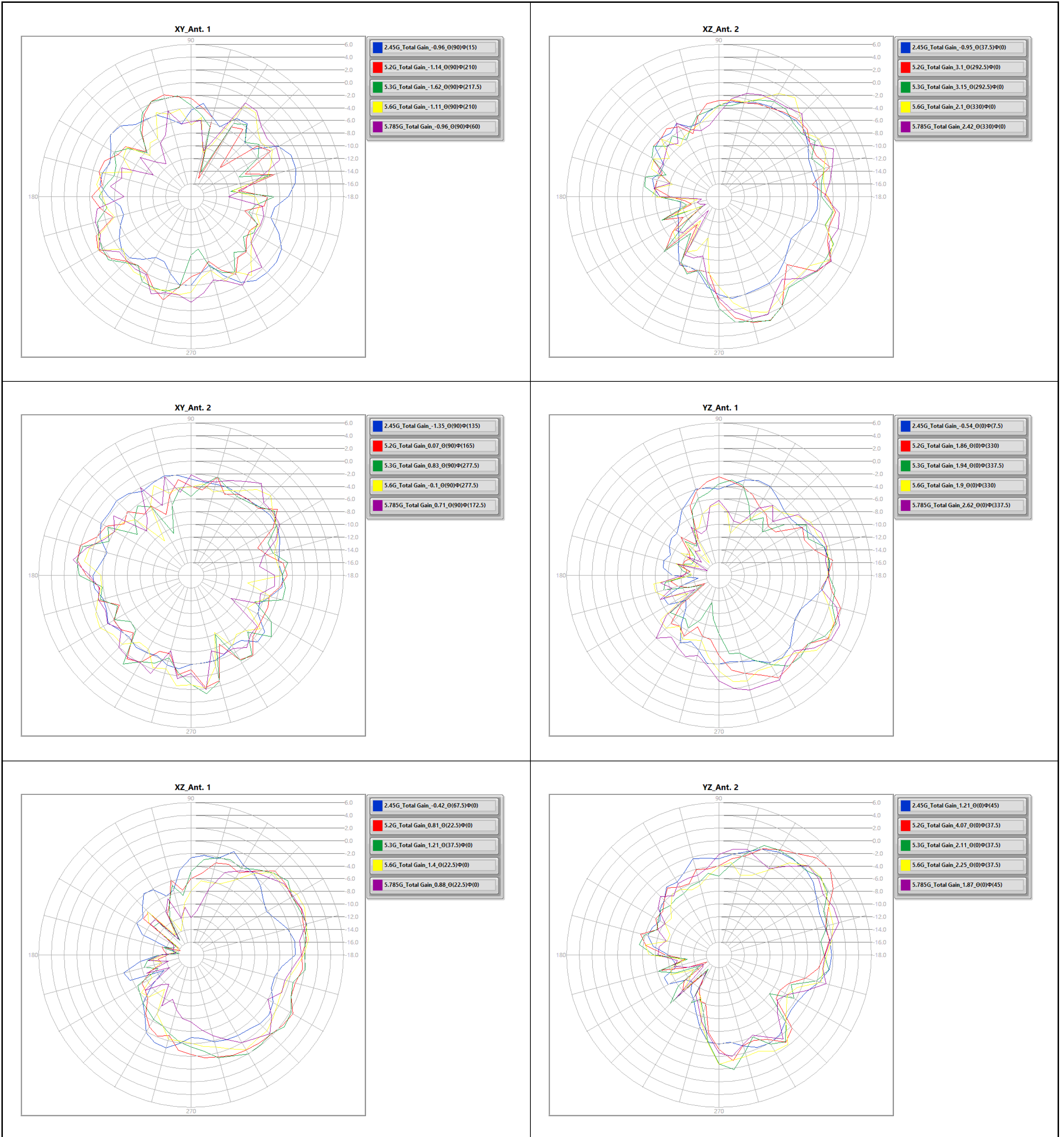
| Freq(Hz) | 6.175G | 6.475G | 6.695G | 6.995G |
|--|------------------|------------------|------------------|------------------|
| Ant. 1 Max Gain (dBi) | 5.17 | 4.29 | 5.79 | 4.94 |
| Ant. 2 Max Gain (dBi) | 5.88 | 5.1 | 5.81 | 5.86 |
| Ant. 1 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$ | Theta/67.5/202.5 | Theta/67.5/202.5 | Theta/67.5/202.5 | Theta/37.5/292.5 |
| Ant. 2 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$ | Theta/45/37.5 | Theta/45/37.5 | Theta/45/37.5 | Theta/52.5/37.5 |
| Max Gain (dBi) | 5.88 | 5.1 | 5.81 | 5.86 |
| DG [1SS] (dBi) | 6.06 | 5.38 | 6.58 | 6.18 |
| DG [2SS] (dBi) | 5.88 | 5.1 | 5.81 | 5.86 |

Antenna Pattern 2.4GHz WLAN, 5GHz WLAN

Appendix B.1

Main data table with columns for Azimuth, Elevation, and multiple signal strength/phase values. Includes sub-headers for different antenna configurations like 'Gain 0.594600' and 'Gain 1.000000'.

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



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

