



Antenna Composite Gain Test Report

FCC ID	2AHKM-NOVA1214
Equipment	Wi-Fi 6 Voice GPON HGU
Brand Name	Hitron
Model Name	NOVA-1214
Applicant	Hitron Technologies Inc. No. 1-8, Li-Hsin 1st Rd. Hsinchu Science Park, Hsinchu 30078, Taiwan
Manufacturer	Hitron Technologies Inc. No. 1-8, Li-Hsin 1st Rd. Hsinchu Science Park, Hsinchu 30078, Taiwan
Sample Received	Dec. 08, 2022
Start Test Date	Dec. 30, 2022
Final Test Date	Dec. 30, 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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1. Operation Mode and Antenna Information

Antenna Position	RF Port		Brand Name	Model Name	Ant. Type	Connector	Modes of Operation
	WLAN 2.4GHz	WLAN 5GHz					
2G Ant1	1	-	HONGBO	290-20512	PIFA	I-PEX	2.4GHz
2G Ant2	2	-	HONGBO	290-20511	Dipole	I-PEX	2.4GHz
5G Ant1	-	1	HONGBO	290-20513	Dipole	I-PEX	5GHz UNII 1~3
5G Ant2	-	2	HONGBO	290-20515	Dipole	I-PEX	5GHz UNII 1~3
5G Ant3	-	3	HONGBO	290-20514	Dipole	I-PEX	5GHz UNII 1~3

Note:

2.4GHz Operation Mode (2TX/2RX)

2G Ant1~2 can be used as transmitting/receiving antenna.

2G Ant1~2 could transmit/receive simultaneously.

5GHz Operation Mode (3TX/3RX)

5G Ant1~3 can be used as transmitting/receiving antenna.

5G Ant1~3 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	2400
2400-2483.5	2450
2400-2483.5	2483.5
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	23-24 / 50-55	Dec. 30, 2022

Note:

Testing Site Information

Brand Name: TDK

Dimension: 11m*6m*6m

Characteristic: Fully Anechoic Chamber

4. Test Facility and Configuration

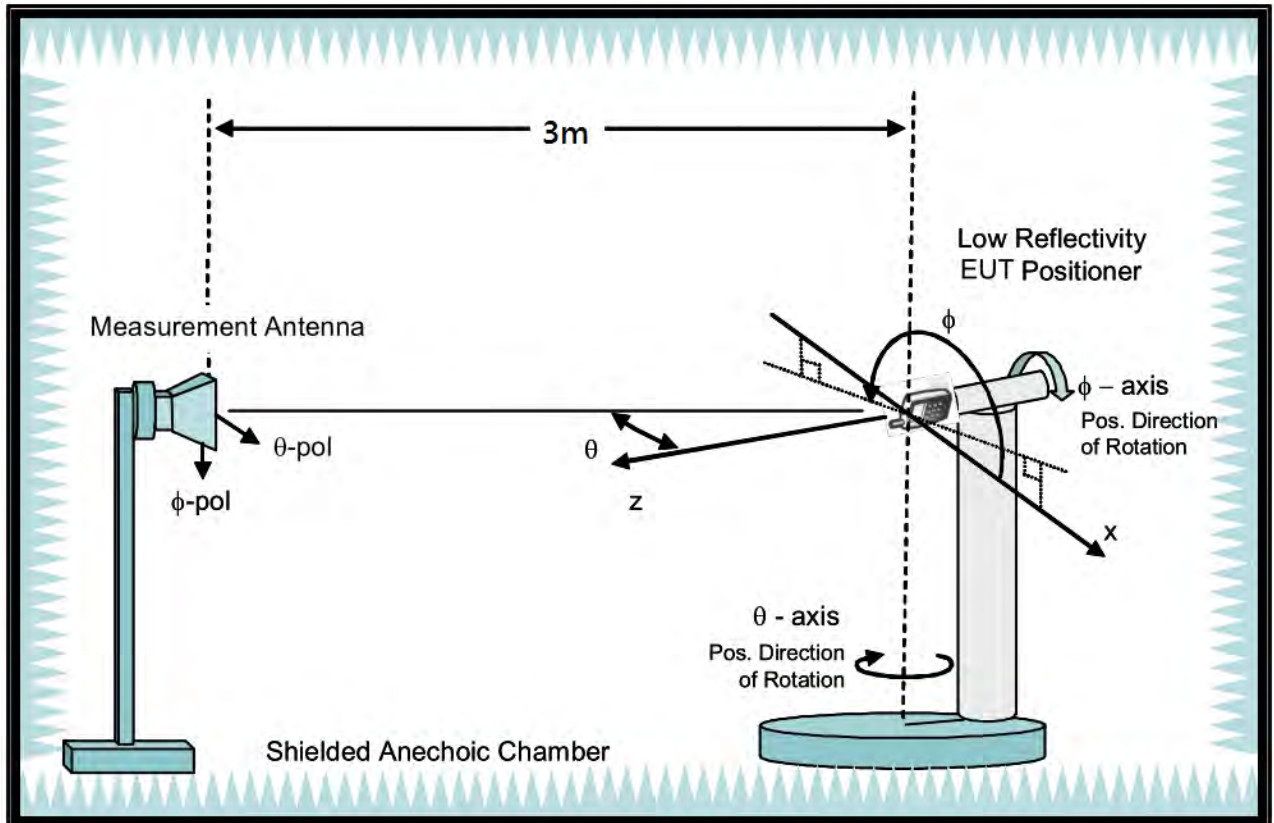
Test configuration: Reference to CITA OTA distributed-axes system configuration.

Chamber: Fully Anechoic Chamber.

Measurement antenna: Dual Polarization Horn antenna

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

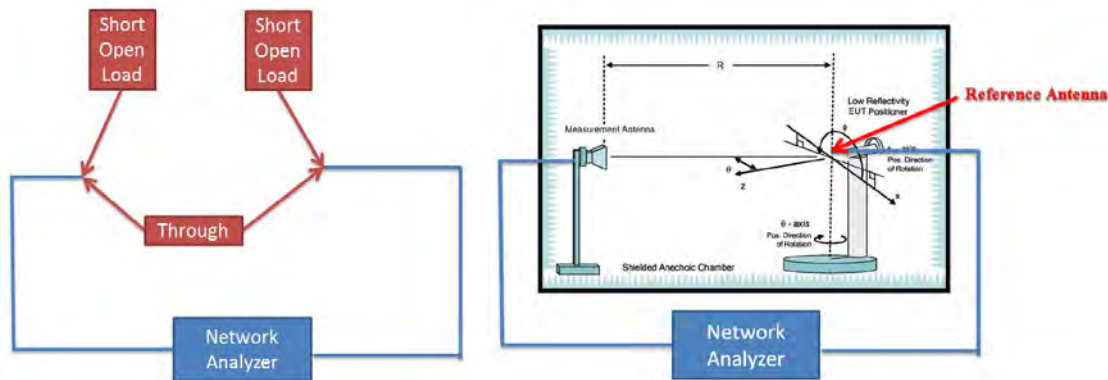
#Reference to CTIA “ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1”



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

For WLAN 2.4GHz

DG_1SS max value position

Frequency (Hz)	2.4G	2.45G	2.4835G
Ant. 1 (dBi)	-1.23	-0.83	0.77
Ant. 2 (dBi)	-0.66	-0.21	0.33
DG [1SS] (dBi)	2.07	2.5	3.56
Polarization	Theta	Theta	Theta
Θ (°)	97.5	97.5	97.5
Φ (°)	127.5	142.5	142.5

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)	2.4G	2.45G	2.4835G
Ant. 1 [$10^{(G/20)}$]	$10^{(-1.23/20)}$	$10^{(-0.83/20)}$	$10^{(0.77/20)}$
Ant. 2 [$10^{(G/20)}$]	$10^{(-0.66/20)}$	$10^{(-0.21/20)}$	$10^{(0.33/20)}$
Ant. 1 [$10^{(G/20)}$] value	0.868	0.909	1.093
Ant. 2 [$10^{(G/20)}$] value	0.927	0.976	1.039
Sum All Antenna [Amax]	1.795	1.885	2.131
DG [$10 \cdot \log(A_{max}^2/N_{ant})$]	2.07	2.5	3.56

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



For WLAN 5GHz

DG_1SS max value position

Frequency (Hz)	5.2G	5.3G	5.6G	5.785G
Ant. 1 (dBi)	-0.94	-1.72	1.54	0.04
Ant. 2 (dBi)	-7.67	-3.36	-2.42	-1.85
Ant. 3 (dBi)	2.68	0.88	-2.06	0.27
DG [1SS] (dBi)	3.77	3.55	3.98	4.31
Polarization	Theta	Theta	Theta	Theta
$\Theta(^{\circ})$	75	60	37.5	67.5
$\Phi(^{\circ})$	352.5	0	52.5	15

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)	5.2G	5.3G	5.6G	5.785G
Ant. 1 [$10^{(G/20)}$]	$10^{(-0.94/20)}$	$10^{(-1.72/20)}$	$10^{(1.54/20)}$	$10^{(0.04/20)}$
Ant. 2 [$10^{(G/20)}$]	$10^{(-7.67/20)}$	$10^{(-3.36/20)}$	$10^{(-2.42/20)}$	$10^{(-1.85/20)}$
Ant. 3 [$10^{(G/20)}$]	$10^{(2.68/20)}$	$10^{(0.88/20)}$	$10^{(-2.06/20)}$	$10^{(0.27/20)}$
Ant. 1 [$10^{(G/20)}$] value	0.897	0.82	1.194	1.005
Ant. 2 [$10^{(G/20)}$] value	0.414	0.679	0.757	0.808
Ant. 3 [$10^{(G/20)}$] value	1.361	1.107	0.789	1.032
Sum All Antenna [Amax]	2.672	2.606	2.74	2.844
DG [$10 \cdot \log(A_{max}^2/N_{ant})$]	3.77	3.55	3.98	4.31

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

For WLAN 2.4GHz

Table with 4 columns: Freq(Hz), 2.4G, 2.45G, 2.4835G. Rows include Ant. 1 Max Gain, Ant. 2 Max Gain, Ant. 1 Polarization, Ant. 2 Polarization, Max Gain, DG [1SS], and DG [2SS].

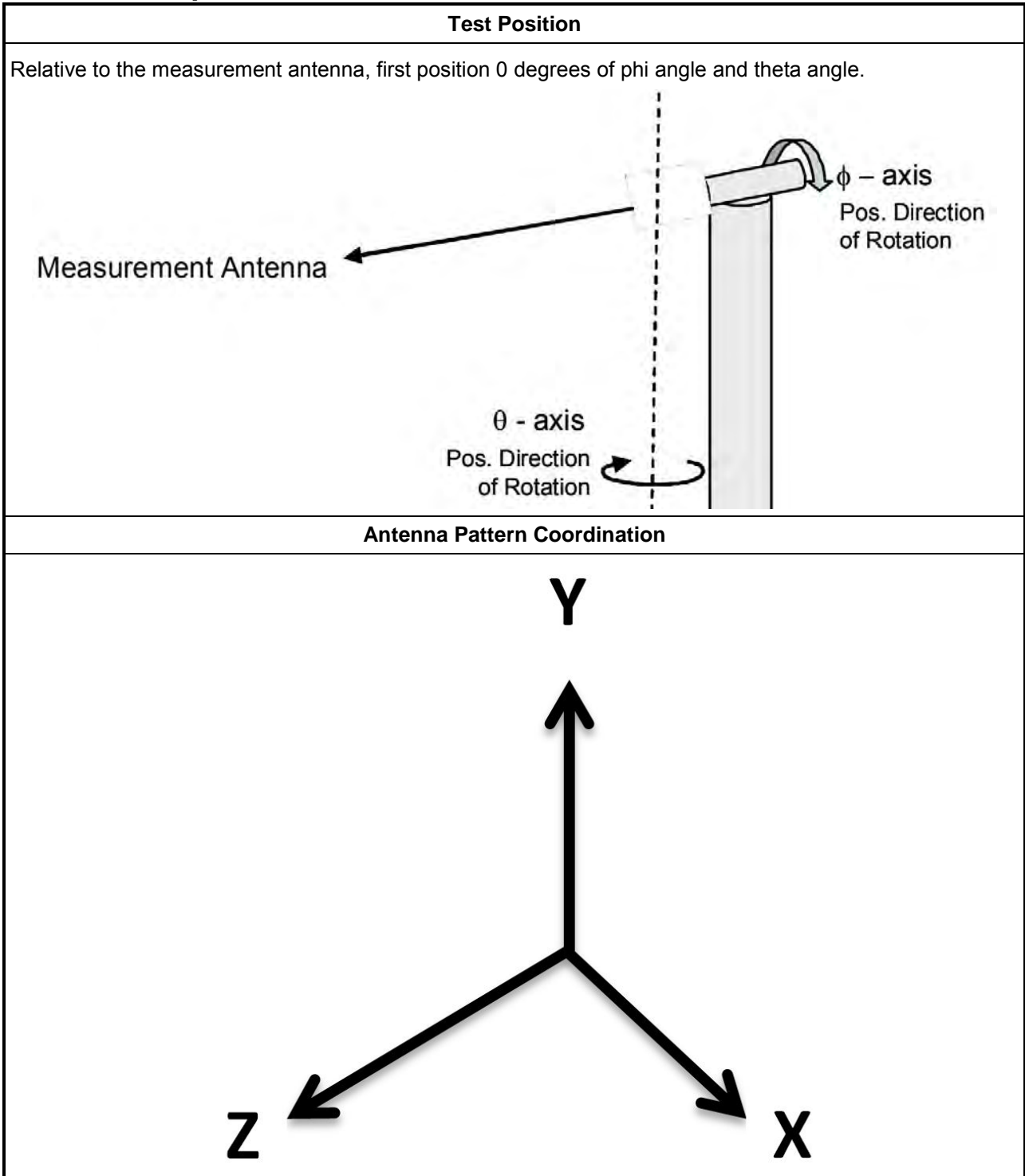
For WLAN 5GHz

Table with 5 columns: Freq(Hz), 5.2G, 5.3G, 5.6G, 5.785G. Rows include Ant. 1 Max Gain, Ant. 2 Max Gain, Ant. 3 Max Gain, Ant. 1 Polarization, Ant. 2 Polarization, Ant. 3 Polarization, Max Gain, DG [1SS], DG [2SS], and DG [3SS].

Note:

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

9. Test Setup



Note:

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



10. Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-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.

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Freq(Hz)	2.4G	2.45G	2.4835G
Ant. 1 Max Gain (dBi)	1.98	2.11	1.82
Ant. 2 Max Gain (dBi)	1.45	1.13	1.01
Ant. 1 Polarization/ θ (°)/ ϕ (°)	Phi/127.5/157.5	Phi/150/157.5	Theta/97.5/180
Ant. 2 Polarization/ θ (°)/ ϕ (°)	Theta/60/90	Theta/67.5/45	Theta/67.5/45
Max Gain (dBi)	1.98	2.11	1.82
DG [1SS] (dBi)	2.07	2.5	3.56
DG [2SS] (dBi)	1.98	2.11	1.82



Radiated Composite Gain of 2.4GHz

Appendix A

DG 1SS Result

Freq(Hz)	2.4GPol.	Phi	Phi(15°)	Phi(30°)	Phi(45°)	Phi(60°)	Phi(75°)	Phi(90°)	Phi(105°)	Phi(120°)	Phi(135°)	Phi(150°)	Phi(165°)	Phi(180°)	Phi(195°)	Phi(210°)	Phi(225°)	Phi(240°)	Phi(255°)	Phi(270°)	Phi(285°)	Phi(300°)	Phi(315°)	Phi(330°)	Phi(345°)	
DG(dB)	Phi(0°)	Phi(15°)	Phi(30°)	Phi(45°)	Phi(60°)	Phi(75°)	Phi(90°)	Phi(105°)	Phi(120°)	Phi(135°)	Phi(150°)	Phi(165°)	Phi(180°)	Phi(195°)	Phi(210°)	Phi(225°)	Phi(240°)	Phi(255°)	Phi(270°)	Phi(285°)	Phi(300°)	Phi(315°)	Phi(330°)	Phi(345°)		
Theta(0°)	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05	-7.99-0.05



Table with columns for frequency (MHz), theta (degrees), and various phi (degrees) angles. It contains numerical data for gain values across a range of frequencies from 2.4835GPa to 2.5125GPa.



Gain Result

Table with columns: Freq(Hz), 2.4GPol, PhiAnt, and 35 Phi(Theta) columns. Rows include Gain, Theta(0-150), and Freq(Hz) for both 2.4GPol and 2.45GPol. Values are in dBm/m2.



Radiated Composite Gain of 2.4GHz

Appendix A

Large data table with columns for Azimuth, Elevation, Frequency, and various gain measurements (Gain, Phi, Theta, etc.)



Freq(Hz)	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	2.06	2.01	2.62	2.37
Ant. 2 Max Gain (dBi)	3.72	2.34	2.92	2.76
Ant. 3 Max Gain (dBi)	2.87	3.4	3.65	4
Ant. 1 Polarization/ θ (°)/ ϕ (°)	Theta/82.5/90	Theta/82.5/82.5	Theta/67.5/75	Theta/45/60
Ant. 2 Polarization/ θ (°)/ ϕ (°)	Phi/22.5/255	Phi/112.5/90	Phi/90/270	Phi/127.5/240
Ant. 3 Polarization/ θ (°)/ ϕ (°)	Theta/90/300	Theta/82.5/307.5	Theta/82.5/352.5	Theta/82.5/315
Max Gain (dBi)	3.72	3.4	3.65	4
DG [1SS] (dBi)	3.77	3.55	3.98	4.31
DG [2SS] (dBi)	3.72	3.4	3.65	4



DG 1SS Result

Table with columns for Frequency (MHz), Polarization (Pol), and various DG (dB) values for different antenna configurations. The table is organized into multiple sections, each starting with a 'Freq (MHz)' and 'DG (dB)' header row, followed by rows of numerical data for various antenna types like Phi(0)Phi(7.5), Phi(15)Phi(22.5), etc.



Table with columns for Frequency (MHz), Theta (degrees), and various gain values (DG, DB, etc.) for different antenna configurations. The table contains multiple rows of data for each frequency and theta value.



Gain Result

Table with columns for Freq(Hz), PhiAnt, and Gain for various antenna configurations. The table contains multiple rows of data for different frequencies and antenna types, with values representing gain in dB.



Radiated Composite Gain of 5GHz

Appendix B

Theta (°)	-13.15/-12.96	-13.23/-14.66	-17.27/-18.23	-18.64/-17.68	-17.67/-17.54	-13.12/-11.07	-10.53/-10.48	-12.06/-15.7	-19.06/-16.48	-14.87/-14.19	-12.69/-11.83	-11.88/-12.94	-15.39/-19.75	-18.14/-18.37	-19.18/-16.49	-17.23/-14.48	-11.42/-8.63	-7.4/-5.5	-6.16/-5.53	-6.06/-7.57	-10.36/-13.06	-16.54/-19.09	-17.91/-17.88	-15.97/-14.03	
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°)	-19.22/-17.81	-16.71/-13.92	-11.66/-10.69	-9.22/-8.54	-8.52/-8.14	-7.4/-6.84	-6.36/-6.54	-6.96/-7.48	-8.36/-8.98	-11.71/-14.32	-17.18/-18.86	-18.04/-18.76	-18.4/-16.29	-14.6/-12.55	-10.92/-9.77	-8.72/-8.48	-6.46/-6.14	-4.9/-4.7	-3.71/-3.5	-2.84/-2.6	-2.09/-1.9	-1.51/-1.4	-1.07/-1.0	-0.76/-0.7	
Theta (7.5°)	-14.63/-12.11	-10.62/-9.42	-8.68/-8.02	-7.39/-7.51	-7.84/-7.6	-6.78/-6.58	-5.94/-6.11	-6.67/-6.95	-7.58/-7.71	-10.48/-12.48	-14.07/-16.32	-16.78/-18.32	-17.36/-18.32	-14.36/-12.55	-10.38/-12.12	-7.06/-6.81	-4.91/-4.71	-3.38/-3.2	-2.53/-2.3	-1.88/-1.7	-1.39/-1.3	-1.01/-1.0	-0.74/-0.7	-0.55/-0.5	
Theta (15°)	-12.63/-11.04	-8.86/-7.79	-7.21/-6.62	-6.55/-6.16	-5.51/-5.47	-4.53/-4.11	-3.44/-3.25	-4.23/-4.79	-5.08/-5.53	-6.11/-6.67	-7.29/-7.85	-10.16/-13.35	-16.63/-18.73	-17.89/-13.11	-9.91/-8.23	-7.36/-7.07	-5.39/-5.16	-4.07/-3.8	-3.13/-3.0	-2.37/-2.2	-1.76/-1.7	-1.34/-1.3	-1.02/-1.0	-0.77/-0.7	
Theta (30°)	-10.72/-11.24	-10.68/-9.41	-8.29/-6.93	-5.89/-5.03	-4.01/-3.77	-1.44/-4.64	-4.63/-4.37	-4.23/-3.86	-3.88/-3.9	-4.05/-4.3	-5.04/-5.13	-4.88/-5.27	-6.17/-6.28	-8.64/-10.1	-10.48/-9.39	-8.65/-8.87	-8.96/-8.68	-8.43/-8.28	-7.77/-7.74	-8.86/-11.27	-16.17/-18.27	-19.15/-18.38	-16.4/-15.5	-13.18/-11.53	
Theta (45°)	-8.64/-6.6	-6.28/-5.74	-4.6/-3.1	-2.82/-3.69	-4.6/-5.3	-5.19/-5.01	-4.98/-4.98	-4.47/-4.32	-4.04/-4.29	-4.69/-4.76	-4.81/-3.97	-3.51/-4.11	-6.17/-3.88	-4.57/-4.54	-4.51/-4.91	-6.17/-7.98	-8.67/-10.81	-14.24/-10.96	-14.72/-9.6	-11.77/-8.6	-11.65/-16.34	-19.06/-17.5	-16.18/-13.6	-13.43/-8.28	
Theta (60°)	-1.44/-2.96	-2.41/-1.84	-1.65/-0.72	-0.86/-1.13	-1.1/-1.37	-1.85/-2.13	-2.28/-2.21	-2.35/-2.94	-3.21/-3.53	-4.04/-3.69	-3.83/-4.41	-4.09/-3.72	-2.71/-3.32	-0.86/-1.31	-1.71/-2.06	-2.86/-3.69	-5.73/-8.8	-9.05/-9.43	-10.88/-12.08	-11.73/-10.7	-9.69/-9.7	-8.33/-9.4	-9.05/-7.21	-4.73/-2.03	
Theta (75°)	-0.01/-0.9	-2.18/-1.5	0.41/-1.5	1.35/-1.87	2.37/-3.7	1.93/-4.8	0.78/-0.2	0.03/-0.6	0.03/-0.6	-2.07/-2.94	-2.45/-2.94	-4.12/-4.71	-5.21/-3.17	-2.82/-3.46	-3.78/-4.93	-7.43/-9.53	-12.62/-14.8	-12.73/-9.3	-9.47/-9.3	-9.07/-10.54	-7.87/-8.26	-6.23/-3.66	-1.72/-0.75	-1.27/-0.51	
Theta (90°)	-0.24/-2.44	-2.54/-3.01	-1.29/-1.58	-1.10/-0.89	-3.40/-9.1	1.28/-1.5	0.62/-0.4	0.63/0.68	0.61/0.7	0.24/-3.89	-4.71/-5.14	-1.51/-4.64	-3.08/-2.84	-1.25/-1.74	-2.59/-5.08	-6.28/-12.93	-6.18/-10.48	-14.29/-11.49	-14.27/-19.09	-16.32/-13.61	-7.65/-9.7	-8.44/-0.6	-5.27/-8.44	-13.46/-16.25	
Theta (105°)	-1.72/-1.1	-1.83/-2.28	-1.75/-1.03	-0.91/-0.4	0.15/-0.55	-1.29/-1.39	-1.68/-1.65	-1.38/-1.86	-1.84/-1.09	-0.32/0.65	-1.15/-2.77	-4.49/-6.21	-6.88/-5.13	-3.24/-2.24	-1.98/-4.7	-3.65/-5.18	-7.95/-11.44	-18.38/-18.98	-15.21/-11.21	-11.71/-13.5	-12.78/-10.6	-5.92/-5.65	-7.56/-8.43	-4.13/-2.71	
Theta (120°)	-0.32/-1.02	0.04/0.4	0.64/0.3	0.25/0.6	-0.25/-0.48	-1.47/-1.8	-0.97/-2.17	-2.13/-2.14	-2.5/-2.26	-1.45/-0.61	-0.67/-2.9	-7.02/-6.77	-4.54/-2.64	-2.75/-2.69	-5.27/-7.25	-7.99/-11.1	-11.55/-13.93	-10.91/-15.05	-19.13/-18.93	-19.15/-15.43	-12.69/-8.91	-6.95/-6.41	-4.26/-4.7	-2.37/-1.6	
Theta (135°)	-2.52/-2.79	-1.13/-0.43	0.47/0.3	0.04/0.3	-0.85/0.3	0.81/0.88	0.59/0.36	0.10/2.05	-1.82/-1.64	-1.61/-1.94	-2.25/-3.84	-5.97/-7.23	-10.49/-9.64	-5.13/-4.59	-5.07/-4.69	-6.28/-10.35	-7.76/-11.53	-6.8/-8.04	-9.79/-11.4	-12.69/-11.4	-6.62/-6.04	-4.2/2	-6.26/-6.6	-3.03/-3.05	
Theta (150°)	0.57/0.04	-0.19/0.19	0.11/0.06	-0.46/0.66	-0.47/0.03	0.28/0.52	0.68/0.65	0.79/0.7	-0.57/1.84	-3.72/-4.4	-3.29/-2.83	-3.71/-4.12	-5.98/-5.28	-2.11/-4.37	-5.63/-6.65	-9.5/-9.61	-7.15/-5.76	-6.56/-7.31	-10.49/-13.03	-10.36/-7.88	-17.29/-8.77	-3.26/-4.52	-4.96/-4.48	-0.08/0.34	
Theta (165°)	2.8/-2.39	-1.98/-2.1	-2.71/-0.69	-0.73/-1.12	-0.07/-0.36	0.09/0.36	1.13/1.65	1.49/1.55	0.11/-2.33	-3.21/-3.94	-3.46/-4.31	-5.97/-4.74	-2.36/-2.23	-2.43/-2.45	-2.98/-3.91	-4.6/-3.38	-3.63/-3.79	-13.5/-10.06	-6.14/-4.85	-4.82/-4.36	-1.93/-1.94	-3.33/-2.47	-1.34/-1.67	-0.04/0.2	
Theta (180°)	-0.84/-6.63	-1.76/-4.94	-3.28/-3.4	-3.45/-2.7	-1.62/-0.21	0.52/0.84	0.60/0.63	-1.76/-2.97	-3.62/-3.52	-6.26/-10.51	-14.56/-5.12	-1.10/-4.9	-2.24/-3.63	-3.13/-2.59	-5.12/-6.08	-6.28/-5.4	-16.1/-18.64	-6.28/-5.4	-16.1/-18.64	-6.28/-5.4	-16.1/-18.64	-6.28/-5.4	-16.1/-18.64	-6.28/-5.4	-16.1/-18.64



Table with columns for Frequency (FreqHz), Gain, and various Phi values (Phi(0) to Phi(345)). Rows represent different antenna configurations and gain measurements.



Radiated Composite Gain of 5GHz

Appendix B

Theta (°)	-14.16:17.4	-16.46:9.41	-4.96:3.26	-2.68:1.59	-0.65:0.06	0.78:0.56	-0.19:0.96	-1.84:2.92	-4.02:4.76	-7.11:8.76	-10.88:12.74	-14.61:9.53	-7.77:7.51	-8.52:7.87	-4.82:7.35	-12.29:8.33	-1.79:0.42	-1.39:2.05	-3.34:5.53	-6.51:5.43	-9.67:6.97	-13.31:8.17	-6.62:12.82	-17.71:15.57
Theta (127.5°)	-18.28:16.01	-12.97:7.26	-5.55:3.56	-2.96:3.24	-2.69:1.53	-1.47:1.33	-1.29:2.34	-3.81:4.92	-6.38:9.71	-9.84:9.94	-10.42:10	-11.55:9.81	-11.51:11.18	-16.63:8.68	-5.01:9.99	-2.79:0.93	1.39:0.85	-1.38:2.57	-2.75:4.02	-2.99:6.43	-7.33:8.93	-6.71:5.56	-9.41:18.85	-19.25:17.59
Theta (135°)	-10.53:12.07	-11.71:7.77	-4.81:3.27	-2.77:3.24	-4.52:6.54	-6.15:6.01	-6.33:6.82	-8.91:12.4	-14.78:12.54	-12.68:18.1	-16.58:11.94	-11.56:9.68	-13.92:18.85	-15.41:7.09	-4.57:5.34	-7.69:5.51	-2.72:1.22	0.91:0.21	-0.71:4.41	-1.49:10.06	-8.08:10.86	-8.32:11.36	-15.55:13.08	-13.09:12.62
Theta (142.5°)	-14.89:10.66	-7.38:5.61	-5.54:5.38	-4.91:4.18	-3.89:8.85	-6.76:7.2	-6.88:6.62	-6.11:5.78	-6.53:6.51	-8.49:9.74	-10.44:11.02	-13.59:14.96	-10.61:7.47	-5.11:3.66	-4.75:7.73	-12.96:15.46	-5.76:2.22	-2.01:3.27	-2.55:1.05	-2.96:11.01	-18.81:9.34	-9.28:14.89	-17.56:14.02	-12.14:17.15
Theta (150°)	-15.51:13.66	-7.78:5.01	-3.78:4.2	-5.75:7.96	-9.82:10.09	-9.95:10.92	-12.36:12.96	-13.14:12.65	-10.36:8.07	-6.8:7.5	-8.58:6.23	-10.82:11.44	-10.25:9.25	-9.4:9.88	-7.47:5.78	-7.19:8.37	-6.52:6.66	-8.94:10.72	-9.87:8.83	-10.8:17.72	-18.48:17.91	-18.22:16.47	-10.58:9.37	-9.78:11.73
Theta (157.5°)	-18.02:11.82	-7.69:5.37	-2.62:1.26	-2.62:3.21	-3.89:4.72	-5.02:5.43	-8.89:10.2	-10.88:10.5	-10.81:11.07	-11.58:13.88	-16.28:14.86	-16.28:14.86	-16.28:14.86	-16.28:14.86	-16.28:14.86	-16.28:14.86	-16.28:14.86	-16.28:14.86	-16.28:14.86	-16.28:14.86	-16.28:14.86	-16.28:14.86	-16.28:14.86	-16.28:14.86
Theta (165°)	-15.47:17.24	-14.34:10.33	-7.69:6.36	-5.73:5.05	-4.74:4.93	-5.3:5.66	-6.67:8.59	-11.03:14.22	-17.88:18.5	-16.42:15.09	-14.84:14.63	-13.14:11.17	-10.09:9.3	-8.66:7.98	-7.13:6.24	-6.45:4.79	-4.45:4.39	-4.69:5.54	-7.21:10.11	-13.8:12.6	-11.84:13.14	-16.47:16.77	-12.86:11.02	-11.19:13.37
Theta (172.5°)	-9.68:9.52	-9.45:9.51	-8.86:8.62	-8.37:8.97	-10.48:12.78	-16.33:17.55	-17.63:18.83	-19:16.65	-16.76:14.33	-13.94:15.14	-17.13:18.41	-17.96:18.72	-19:15:17.76	-15.96:14.89	-13.61:12.22	-10.96:10.23	-8.94:9.72	-10.24:11.45	-13.18:14.83	-15.61:16.17	-17.09:18.23	-18.45:16.81	-13.57:11.95	-11.08:10.48
Theta (180°)	-14.51:13.68	-11.84:11.88	-11.57:10.72	-9.42:8.52	-8.36:8.83	-9.6:10.51	-10.99:11.77	-13.04:14.68	-15.39:16.23	-16.99:17.54	-17.48:17.37	-16.52:15.74	-15.32:15.16	-15.85:16.26	-16.25:15.96	-15.31:14.68	-13.91:13.95	-13.97:14.11	-14.01:15.17	-16.11:16.03	-15.63:15.24	-15.15:15.65	-16.62:17.91	-17.6:16.15
Freq(Hz)	5.6GHz	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°)	-1.77:2.15	-3.07:4.2	-5.59:7.24	-9.36:11.67	-14.42:18.04	-16.68:12.1	-9.14:7.18	-5.4:4.2	-3.02:2.26	-1.69:1.25	-1.13:1.04	-0.93:0.93	-1.2:1.6	-2.27:1.77	-4.41:5.87	-7.67:9.86	-12.13:14.07	-12.81:10.33	-7.96:6.17	-4.73:3.65	-2.63:1.79	-1.28:1.24	-1.34:1.3	-1.45:1.36
Theta (7.5°)	-1.63:2.47	-3.25:4.02	-4.71:6.95	-8.52:7.23	-9.72:11.32	-11.22:11.68	-10.37:7.97	-6.4:5.11	-3.89:3.04	-2.22:1.88	-1.83:1.78	-1.87:2.04	-2.29:2.65	-3.08:3.71	-4.65:6	-7.76:10.04	-12.91:15.03	-13.29:10.25	-7.92:6.27	-2.47:1.41	-0.7:0.42	-0.13:0.31	-0.3:0.73	
Theta (15°)	-1.5:2.04	-2.57:3.09	-3.25:3.54	-4.61:6.37	-8.72:10.34	-13.89:15.49	-12.64:10.47	-8.37:6.42	-4.5:3.25	-2.48:2.34	-2.77:3.56	-4.41:4.77	-6.42:4.08	-3.95:4.27	-5.01:5.92	-7.18:8.59	-10.84:13.57	-14.87:12	-9.08:6.8	-5.18:3.94	-3.05:2.18	-1.26:0.62	-0.05:0.07	0.09:0.76
Theta (22.5°)	-1.05:1.94	-2.95:3.21	-3.56:4.41	-5.75:7.16	-8.38:9.9	-14.65:16.61	-19.06:13.61	-10.06:8.45	-7.16:5.76	-4.47:4.2	-4.85:6.32	-7.02:5.95	-4.56:4.18	-4.48:4.89	-5.27:5.75	-6.72:7.92	-9.51:10.61	-10.89:10.3	-9.29:3.79	-4.8:2.74	-1.54:0.97	-0.6:0.34	-0.07:0.37	-0.25:0.83
Theta (30°)	-1.9:3.01	-3.63:3.16	-2.64:3.16	-3.71:4.35	-5.26:6.61	-9.56:12.58	-17.83:19.24	-12.97:8.34	-6.03:5.4	-4.85:3.97	-4.03:4.95	-4.47:2.95	-2.53:2.88	-2.43:1.56	-1.43:2.3	-3.77:6.1	-10.14:16.04	-18.78:12.91	-8.57:6.92	-6.2:4.68	-2.48:1.02	-0.53:0.29	-0.09:0.84	-1.47:1.73
Theta (37.5°)	-5.09:4.5	-3.93:3.69	-2.98:3.05	-2.82:2.42	-3.86:6.32	-9.4:15.06	-18.61:17.84	-13.18:9.59	-6.61:4.96	-4.65:4.59	-4.14:3.76	-2.52:1.97	-1.83:0.85	-0.08:0.09	-1.29:3.02	-4.72:7.44	-8.94:10.43	-14.11:18.64	-17.85:13.05	-6.52:4.04	-3.45:2.25	-1.25:0.68	-0.69:1.46	-2.71:4.36
Theta (45°)	-5.53:3.55	-1.49:1.49	-1.49:1.03	-1.82:2.14	-2.27:6.04	-8.68:13.24	-17.95:19.02	-16.57:12.17	-9.82:6.98	-4.52:4.02	-3.17:2.87	-2.2:2.07	-2.46:1.15	-0.52:0.69	-1.97:3.97	-5.77:6.69	-7.8:9.57	-9.7:12.07	-15.83:12.54	-10.16:5.53	-3.21:2.64	-2.65:2.86	-2.33:1.3	-3.97:4.88
Theta (52.5°)	-6.13:6	-1.73:1.91	-1.84:2.66	-3.71:5.52	-6.76:8.1	-12.16:15.44	-15:14.14	-14.18:11.6	-9.11:7.96	-6.57:5.26	-4.92:6.05	-6.46:6.8	-7.82:4	-3:12.4	-4.23:5.65	-6.73:8.01	-13.51:16.72	-14.8:15.35	-10.56:9.9	-7.25:5	-3.89:1.7	-2.69:6.23	-0.96:7.33	
Theta (60°)	-4.79:2.59	-1.32:1.35	-2.76:5.54	-6.82:11.92	-16.04:18.3	-17.81:19.12	-18.83:16.3	-15.04:14.63	-11.1:8.61	-5.51:5.66	-6.86:7.84	-10.65:9.23	-10.84:9.5	-9.04:9.43	-7.71:9.18	-8.37:8.07	-8.95:10.6	-10.11:12.7	-17.91:13.76	-9.77:7.17	-6.03:7.19	-8.64:10.7	-10.61:12.81	-10.74:7.07
Theta (67.5°)	-4.11:3.5	-4.29:5.31	-7.75:10.54	-12.92:15.97	-18.94:19.14	-18.14:16.96	-13:9.88	-8.49:7.87	-9.09:9.7	-8.37:5.58	-9.25:7.52	-6.28:2.3	-3.46:3.04	-2.52:2.75	-9.17:11.38	-10.33:13.12	-12.47:13.7	-15.07:19.04	-18.91:18.65	-17.52:12.48	-13.41:14.21	-16.69:13.4	-11.29:6.76	-5.22:3.84
Theta (75°)	-8.22:8.18	-10.86:11.52	-11.8:11.22	-11.99:12.22	-15.53:18.6	-16.81:17.94	-18.28:17.68	-14.09:11.86	-11.17:11.54	-14.17:10.81	-8.77:9.45	-4.3:3.31	-4.11:5.38	-6.07:11.49	-11.7:10.55	-11.85:8.68	-9.59:11.7	-17.93:19.03	-17.93:14.62	-15.31:17.48	-18.72:17.52	-10.9:8.12	-5.97:5.42	-5.73:5.87
Theta (82.5°)	-18.97:17.15	-18.34:11.87	-10.52:9.84	-9.84:9.75	-9.86:10.19	-11.78:14.13	-14:05:15.4	-17.78:19.12	-18.06:18.22	-18.97:15.38	-13.25:9.93	-10.41:10.01	-11:10:9.76	-11.74:18.34	-8.67:10.92	-9.83:10.11	-11:07:12.47	-13.56:13.58	-14.74:16.84	-14.84:15.54	-17.11:14.11	-10.13:9.81	-6.9:8.54	-10.41:17.84
Theta (90°)	-17.76:16.95	-18.11:18.63	-11.89:7.46	-7.78:9.09	-8.64:7.41	-7.06:8.06	-8.99:10.72	-14.53:18.39	-19.27:18.03	-17.23:14.92	-16.29:14.18	-13.55:11.79	-10.35:10.32	-11.78:11.94	-12.04:11.15	-12.41:10.75	-10.59:9.93	-9.97:9.92	-10.27:11.32	-11.94:14.69	-8.91:8.44	-9.13:12.05	-17.52:18.04	-17.36:17.62
Theta (97.5°)	-9.14:13.59	-17.28:12.1	-8.2:7.24	-7.95:7.17	-7.07:7.59	-8.42:10.2	-10.27:10.91	-10.03:11.79	-13.45:14.68	-16.46:16.78	-18.55:14.56	-12.58:13.1	-14.74:16.64	-15.74:10.97	-9.83:12.09	-10.42:9.84	-11.88:8.57	-12.85:14.6	-10.8:10.47	-9.69:7.6	-9.14:11.52	-18.03:18.03	-16.87:11.88	-10.59:11.83
Theta (105°)	-15.35:14.77	-18.48:12.72	-7.97:5.18	-5.87:8.18	-11.31:11.52	-9.43:10.58	-9.89:9.62	-9.94:9.39	-10.49:12.43	-12.85:15.97	-19.44:19.08	-11.17:11.97	-13.31:18.57	-18.18:19.07	-19.49:19.14	-9.98:13.16	-9.21:8.09	-10.98:13.27	-15.42:17.99	-10.57:16.29	-9.33:10.24	-10.38:10.2	-11.55:14.53	-10.56:13.74
Theta (112.5°)	-11.85:14.91	-13.28:19.25	-10.82:10.07	-11.15:12.31	-16:12:19.02	-17.27:17.94	-14.08:11.16	-9.5:10.97	-11:15:10.03	-11:29:12.18	-14.73:18.33	-18.23:16.53	-14.42:11.48	-15.29:10.81	-14.28:17.89	-17.96:14.81	-16.89:9.29	-10.41:14.22	-7.55:8.3	-15.69:11.75	-13.94:12.74	-14.67:13.94	-13.41:18.19	-18.99:18.89
Theta (120°)	-10.28:9.4	-11.09:16.11	-13.78:8.78	-8.14:9.39	-12:04:14.67	-16.41:13.78	-17.87:18.88	-15.52:11.04	-7.96:6.62	-6.41:6.67	-7.15:16.7	-7.59:12.92	-12.5:9.08	-10.39:12	-10.94:15.16	-18.2:16.42	-18.2:16.42	-11.92:16.09	-18.99:19.09	-12.77:9.82	-13.34:10.7	-11.13:11.78	-19:11.78	-19:11.78
Theta (127.5°)	-4.44:10.31	-12:18.55	-11.81:13.12	-13:25:13.36	-14.31:18.46	-19.15:18.23	-16.28:14.79	-16.83:15.52	-16.94:17.82	-14.85:11.17	-9.16:9.88	-12.44:12.72	-12.57:12.68	-8.74:8.08	-8.71:10.57	-12.37:17.69	-15.26:19.08	-12.97:17.18	-10.75:4.8	-9.06:13.6	-15.36:7.92	-10.86:10.6	-9.49:10.84	-10.05:6.48
Theta (135°)	-8.62:8.7	-13.18:17.5	-18.52:12.99	-10.66:10	-9.61:9.27	-9.61:9.76	-9.27:6.1	-6.31:6.04	-5.9:6.6	-7.67:9.03	-8.69:8.56	-9.55:13.67	-17.96:17.79	-14.79:13.53	-16.09:18.32	-14.97:17.11	-13.10:13.03	-11.71:12.72	-6.34:2.7	-6.1:16.18	-9.49:18.49	-9.64:9.57	-5.09:3.74	-5.51:10.46
Theta (142.5°)	-9.9:4.4	-8.15:8.67	-9.75:10.03	-9.38:8.02	-7.39:7.23	-7.74:7.33	-7.78:9.58	-14.25:17.21	-15.49:17.32	-18:11.41	-7.22:6.4	-6.41:12.34	-17.56:17.48	-13.65:10.15	-10.88:11.9	-10.87:10.59	-12.21:13.15	-13.74:14.72	-8.61:6.06	-7.5:11.36	-18.83:18.18	-16.64:10.69	-6.66:5.82	-12.37:12.5
Theta (150°)	-6.17:2.87	-5.1:6.68	-9.93:14.56	-16.49:18.83	-19:05:18.04	-18.83:18.64	-19.31:18.05	-16.54:14.1	-16.17:19.01	-16.17:19.01	-16.17:19.01	-16.17:19.01	-16.17:19.01	-16.17:19.01	-16.17:19.01	-16.17:19.01	-16.17:19.01	-16.17:19.01	-16.17:19.01	-16.17:19.01	-16.17:19.01	-16.17:19.01	-16.17:19.01	-16.17:19.01
Theta (157.5°)	-4.39:4.59	-5.55:7.2	-9.85:12.92	-11.57:9.66	-9.21:8.69	-8.04:7.39	-7.37:7.23	-7.3:8.04	-9.84:11.2	-8.93:7.69	-7.73:6.87	-6.41:6.99	-8.41:10.78	-11.62:10.6	-11:05:14.07	-16.6:16.64	-18:07:17.93	-19:2:12.62	-11.14:13.81	-17.63:14.75	-14.75:16.62	-12.53:9.04	-8.47:6.67	-4.78:4.27
Theta (165°)	-4.87:5.11	-5.13:5.55	-5.93:6.12	-6.23:6.07	-5.86:5.86	-6.24:6.42</																		



Radiated Composite Gain of 5GHz

Appendix B

Θ (157.5°)	-9.92/-8.24	-6.55/-5.68	-5.84/-7.06	-8.52/-9.63	-10.99/-13.4	-14.56/-13.19	-12.39/-14.96	-18.88/-19.29	-13.29/-11.28	-10.74/-9.62	-8.4/-6.54	-6.32/-7.23	-8.87/-10.3	-9.82/-7.95	-6.49/-6.47	-7.75/-10.31	-13.56/-12.72	-10.86/-10.56	-12.44/-13.57	-11.44/-8.25	-6.15/-5.45	-6/-7.47	-11/-11.81	-17.82/-13.18
Θ (165°)	-7.59/-7.24	-6.84/-6.14	-5.9/-6.5	-7.91/-9.16	-10.36/-11.3	-12.94/-13.09	-17.16/-16.6	-19.14/-19.2	-13.86/-12	-12.22/-12.51	-11.51/-9.54	-8.08/-4.73	-7.32/-7.35	-7.1/-7.28	-5.78/-5.59	-5.79/-6.33	-6.46/-6.48	-6.46/-7.56	-9.22/-10.36	-8.93/-8.16	-8.05/-9.21	-11.98/-17.31	-18.67/-15.18	-10.59/-6.69
Θ (172.5°)	-13.06/-11.01	-9.32/-7.75	-7/-7	-6.99/-6.87	-6.77/-7.01	-8.11/-9.03	-9.37/-10.26	-10.14/-11.02	-12.05/-13.49	-14.55/-15.58	-14.91/-15.32	-15.23/-14.54	-12.61/-10.27	-8.28/-6.5	-5.4/-4.98	-4.82/-4.92	-5.22/-5.82	-6.41/-6.03	-7.69/-8.11	-8.21/-10.52	-14.51/-18.41	-18.82/-18.18	-18.17/-16.15	
Θ (180°)	-10.62/-10.79	-11.75/-11.56	-11.83/-11.51	-10.4/-9.33	-8.87/-8.8	-9.31/-9.17	-8.82/-8.84	-9.52/-11.04	-14.79/-18.32	-18.65/-14.85	-12.86/-11.87	-11.09/-10.53	-9.98/-9.35	-8.89/-8.7	-8.59/-9.07	-10.03/-11.54	-12.93/-13.3	-13.84/-12.76	-13.91/-15.06	-16.14/-16.21	-14.08/-14.18	-15.58/-16.77	-17.91/-16.57	-14.05/-11.8
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°)	-18.94/-17.29	-16.69/-15.86	-15.59/-15.23	-15.21/-15.46	-13.68/-13	-13.26/-13.94	-15.61/-17.73	-17.88/-18.58	-17.28/-17.99	-18.11/-18.91	-18.01/-18.16	-17.82/-17.26	-18.11/-15.76	-14.42/-13.81	-13.24/-12.8	-13.02/-13.34	-13.93/-13.89	-14.45/-13.96	-14.55/-14.89	-14.78/-15.43	-16.48/-17.93	-18.55/-17.92	-19.26/-17.9	-18.99/-18.18
Θ (7.5°)	-17.79/-15.32	-12.72/-10.84	-9.46/-9.06	-9.15/-9.98	-10.86/-11.63	-14.02/-16.15	-15.58/-15.89	-16.39/-18.45	-17.78/-18.17	-18.43/-19.13	-18.62/-17.21	-18.45/-18.5	-18.04/-19.2	-17.93/-18.5	-18.19/-19.13	-18.61/-19.11	-17.96/-17.23	-18.95/-17.42	-17.52/-18.51	-17.31/-17.9	-18.71/-18.7	-17.53/-17.2	-18.22/-16.22	-18.45/-18.84
Θ (15°)	-15.41/-11.93	-9.26/-7.34	-6.2/-5.58	-5.32/-5.81	-6.62/-7.61	-8.38/-9.32	-9.62/-10.45	-11.98/-13.2	-14.19/-13.96	-14.14/-21	-14.78/-15.21	-15.69/-15.56	-16.01/-17.73	-18.68/-19.05	-18.71/-18.53	-18.42/-15.39	-14.26/-12.32	-11.66/-11.8	-11.54/-11.52	-10.91/-10.72	-11.76/-13.6	-16.16/-18.02	-19.12/-17.32	-18.16/-16.52
Θ (22.5°)	-17.77/-5.94	-4.45/-3.63	-3.03/-2.92	-3.13/-3.96	-5.1/-6.38	-7.49/-8.12	-8.46/-8.58	-8.71/-8.52	-8.82/-9.07	-10.46/-11.38	-11.21/-10.52	-10.35/-10.42	-10.97/-12.12	-12/-11.52	-10.18/-9.38	-9.05/-8.79	-8.54/-8.31	-7.95/-8	-8.27/-8.86	-8.35/-8.34	-8.74/-9.39	-11.19/-13.81	-15.67/-14.95	-12.04/-9.33
Θ (30°)	-5.74/-3.91	-2.32/-1.6	-1.57/-2.23	-3.16/-4.2	-5.3/-6.28	-6.56/-6.57	-6.63/-6.85	-6.95/-7.41	-7.57/-7.86	-8.08/-8.61	-8.71/-8.65	-8.53/-8.89	-9.49/-9.09	-7.45/-5.75	-4.77/-5.17	-3.88/-8.07	-8.96/-9.07	-8.68/-7.64	-7.65/-7.4	-7.66/-8.01	-7.38/-6.54	-6.53/-7.07	-7.8/-8.13	-8.28/-7.93
Θ (37.5°)	-4.57/-3.49	-1.59/-0.35	-0.62/-1.45	-2.09/-1.9	-1.87/-2.3	-2.92/-3.48	-4.09/-4.7	-5.75/-7.16	-7.81/-7.62	-8.62/-8.66	-6.12/-5.89	-6.32/-8.13	-4.94/-7.96	-5.11/-3.3	-2.99/-4	-3.78/-8.4	-9.19/-9.16	-8.37/-6.83	-7.26/-7.51	-6.23/-5.01	-4.51/-4.73	-5.25/-5.97	-4.73/-4.97	-5.34/-7.97
Θ (45°)	0.020/31	0.84/1.57	1.15/0.08	-0.74/-0.49	-0.81/-1.71	-2.74/-3.49	-4.02/-4.11	-4.53/-4.59	-6.12/-6.38	-6.16/-6.42	-6.54/-5.52	-4.17/-3.79	-3.29/-2.05	-1.21/-7.6	-3.77/-5.78	-8.24/-6.03	-5.57/-3.33	-5.61/-6.83	-9.01/-9.91	-8.74/-6.95	-4.53/-2.98	-3.05/-4.09	-5.7/-6.24	-3.51/-11
Θ (52.5°)	0.920/7	-0.030	-0.44/-1.4	-1.09/-0.62	-1.27/-1.86	-2.12/-2.38	-2.32/-2.64	-2.79/-4.21	-4.46/-8.1	-6.03/-5.44	-4.73/-6.28	-6.62/-8.88	-6.05/-1.9	0.910/19	-1.77/-2.7	-3.93/-5.08	-4.79/-5.78	-5.79/-7.26	-7.68/-7.11	-6.06/-2.58	-4.54/-3.2	-3.04/-3.15	-2.66/-2.64	-1.73/-0.18
Θ (60°)	1.28/1.1	-0.21/-0.87	-0.54/-0.54	-0.53/-0.9	-1.59/-1.77	-2.06/-3.24	-4.07/-3.9	-4.86/-5.72	-9.73/-11.66	-6.89/-6.61	-6.29/-6.01	-8.97/-5.78	-1.67/-2.44	-5.62/-5.25	-3.55/-3.62	-3.69/-5.4	-7.81/-8.45	-6.89/-6.41	-4.71/-9.4	-1.94/-2.4	-2.43/-3.9	-2.85/-0.06		
Θ (67.5°)	0.99/-0.42	-0.73/-0.52	-0.87/-1.07	-1.04/-1.49	-1.71/-1.29	-1.69/-2.82	-3.86/-4.71	-4.62/-4.35	-3.48/-2.66	-4.09/-9.55	-10.11/-5.56	-3.13/-3.76	-5.81/4.91	-1.33/-2.59	-5.28/-5.11	-3.45/-2.61	-2.36/-3.96	-6.52/-6.87	-7.26/-7.11	-4.92/-3.12	-1.360/0.71	-1.07/-3.04	-3.49/-4.56	-3.02
Θ (75°)	2.62/-1.18	-2/0.21	-0.89/-0.78	-1.02/-0.24	-0.630/2	-1.16/-2.35	-2.87/-3.65	-4.28/-4.81	-6.51/-5.95	-2.89/-4.62	-6.99/-54.1	-3.74/-2.04	-1.16/-1.53	-0.27/-0.97	-1.87/-1.02	-1.52/-3.84	-4.51/-3.05	-2.85/-2.29	-0.92/-0.31	0.070/26	-0.21/-2.33	-3.57/-3.67	-8.72/-6.8	
Θ (82.5°)	2.15/-1.93	-1.61/1.04	-1.06/-0.83	-1.23/-2.91	-0.79/-0.02	-2.02/-3.61	-4.37/-3.53	-3.15/-2.77	-5.12/-2.77	-4.24/-5.3	-4.49/-2.88	-1.3/-2.5	-1.59/-0.72	-0.93/-2.53	-1.340/69	-1.01/-1.58	-3.23/-1.04	-2.62/-2.4	-1.23/0.98	1.61/-1.34	2.72/79	1.61/-1.4	0.92/81	
Θ (90°)	1.29/1.69	-0.78/1.08	-3.46/4.25	-1.95/-2	-0.77/-0.46	-4.24/-6.3	-5.91/4.73	-3.34/2.98	-4.68/-6.77	-2.52/-2.47	-5.79/-5.13	-5.78/-4.67	-0.86/-2.46	-3.77/-1.49	-1.63/4.51	-3.69/-1.39	-2.23/-2.72	-3.88/-2.58	-0.160/34	0.592/32	2.87/1.83	0.55/1.61	-2.31/-3.06	-0.72/1.71
Θ (97.5°)	-0.28/-2.43	-1.220/33	-4.89/5.84	-3.53/-3.88	-2.61/-2.12	-4.91/-5.44	-4.08/-2.52	-2.15/-1.63	-2.57/-6.2	-3.61/3	-4.74/-2.56	-3.78/-1.79	1.620/28	-1.74/-1.52	-1.17/-3.62	-4.15/-3.4	-4.64/-5.2	-4.97/-4.33	-4.72/-2.92	-3.16/-1.98	0.570/99	-2.01/-2.65	-2.77/-2.29	-1.04/-0.22
Θ (105°)	-0.63/-2.95	-0.28/-0.86	-4.65/-9.92	-5.93/-3.84	-2.95/-2.71	-6.12/-6.38	-4.96/-2.59	-2.01/-9.6	-4.08/-6.58	-3.91/-2.62	-4.51/-7.6	-1.89/-3.72	-0.74/1.65	-2.63/-3.4	-3.79/-1.91	-2.51/2.74	-2.84/-5.88	-2.44/-2.94	-3.98/-2.88	-4.17/-3.41	-0.75/-0.04			
Θ (112.5°)	-1.38/-1.8	-1.09/-0.68	-4.23/-8.29	-6.87/-3.16	-3.03/-3.34	-8.05/-15.44	-7.82/-4.65	-2.94/-3.79	-8.38/-9.52	-2.22/-1.46	-2.39/-3.89	-1.49/-0.27	-0.050/35	-0.11/-2.22	-3.71/4.39	-4.36/-3.82	-4.74/-10.85	-9.44/-3.26	-3.48/4.18	-2.94/-3.07	-3.43/-3.44	-3.63/-1.4	-1.78/-2.32	-1.22/-1.07
Θ (120°)	-0.97/-2.76	-1.43/-1.39	-5.75/-13.21	-11.66/-4.2	-5.64/-8.69	-16.25/-16.65	-8.51/-4.21	-3.28/-3.06	-4.67/-11.81	-8.77/-4.41	-4.16/-5.63	-3.27/-4.26	0.09/-0.9	-1.66/-4.5	-3.41/4.57	-7.54/-4.64	-4.43/-10.71	-9.92/-2.72	-3.42/-7.74	-1.64/-4.7	-5.76/-2.37	-0.83/-2.66	-5.17/-4.52	-0.410/92
Θ (127.5°)	-4.16/-5.74	-3.91/-3.21	-7.44/-15.96	-18.05/-14.99	-8.94/-11.31	-17.67/-15.72	-8.02/-12.6	-6.33/-6.65	-11.39/-18	-15.18/-10.06	-6.27/-13.4	-4.31/-9.23	-6.44/-8.52	-4.91/9.76	-7.23/-5.7	-7.65/-14.24	-9.88/4.06	-4.9/-3.9	-13.81/-12.6	-14.58/-13.4	-1.45/-4.5	-1.99/-2.65	-4.87/-3.36	-1.52/-2.15
Θ (135°)	-3.28/-4.01	-2.71/-3.21	-7.93/-13.19	-19.19/-18.92	-18.48/-14.98	-16.5/-18.8	-19.08/-17.78	-18.18/-17.48	-12.54/-9.85	-8.12/-5.7	-7.25/-5.97	-6.91/-3.73	-2.01/-5.09	-8.23/-8.84	-8.11/-8.02	-7.95/-12.89	-17.42/-18.57	-10.78/-5.08	-8.09/-18.41	-18.72/-15.15	-8.84/-8.45	-6.46/-5.88	-10.09/-7.85	-4.62/-3.15
Θ (142.5°)	-3.84/-5.08	-3.93/-4.47	-6.14/-10.05	-13.55/-14.2	-12.08/-11.89	-12.96/-13.48	-15.47/-18.22	-18.13/-18.15	-14.23/-17.2	-12.14/-14	-13.61/-8.83	-5.46/-2.5	-2.03/-4.32	-6.75/-7.66	-7.61/-6.28	-7.27/-18.8	-10.41/-18.04	-14.65/-9	-12.22/-18.35	-17.31/-19.26	-8.47/-10.48	-12.94/-18.26	-18.67/-19.04	-8.06/-4.03
Θ (150°)	-8.27/-16.28	-18.62/-15.18	-17.11/-18.32	-18.88/-17.13	-16.63/-14.89	-18.31/-18.81	-18.55/-18.9	-17.85/-17.86	-12.48/-19.7	-7.24/-6.85	-9.55/-7.81	-7.83/-7.21	-8.72/-10.4	-12.78/-12.35	-10.75/-6.92	-5.23/-7.8	-13.34/-12.7	-18.75/-16.31	-14.59/-12.84	-13.83/-14.26	-12.53/-10.28	-9.98/-9.83	-17.79/-15.74	-8.95/-5.4
Θ (157.5°)	-7.65/-8.23	-10.87/-13.44	-12.17/-11.95	-13.71/-16.39	-15.83/-12.66	-9.98/-9.34	-10.01/-12.47	-15.33/-18.83	-18.14/-18.19	-18.33/-13.19	-10.56/-8.94	-7.63/-6.72	-8.94/-8.38	-11.22/-15.38	-16.35/-13.61	-12.74/-13.69	-10.24/-7.97	-7.47/-8.11	-9.1/-11.73	-14.18/-14.94	-12.68/-9.32	-8.07/-9.19	-9.99/-9.08	-8.09/-7.9
Θ (165°)	-13.78/-19.02	-18.14/-19.31	-19.15/-18.18	-18.81/-18.04	-18.54/-16.24	-17.83/-18.69	-19.17/-19.88	-9.14/-9	-9.13/-10.4	-12.14/-17.5	-14.71/-13.61	-12.14/-11.22	-10.37/-10.13	-10.71/-11.21	-14.36/-17.81	-17.91/-19.05	-16.01/-12.35	-9.62/-9.29	-5.84/-5.32	-4.79/-4.42	-4.73/-5.27	-4.84/-5.7	-7.05/-7.2	
Θ (172.5°)	-16.43/-13.41	-12.63/-12.94	-13.38/-14.61	-19.27/-18.95	-18.71/-15.15	-11.29/-9.09	-7.6/-6.8	-6.83/-7.47	-8.14/-8.59	-7.61/-8.6	-6.76/-6.13	-5.57/-5.14	-5.07/-5.54	-6.63/-6.8	-9.78/-12.44	-17.79/-19.37	-18.65/-15.93	-12.73/-11.71	-9.77/-9.33	-10.06/-10.9	-11.77/-12.85	-12.81/-13.12	-18.44/-18.7	-17.68/-18.93
Θ (180°)	-11/-11.79	-12.77/-13.85	-14.96/-18.16	-18.26/-19.09	-13.71/-10.93	-8.17/-8.32	-7.69/-6.8	-6.15/-5.85	-5.88/-6.04	-6.51/-6.83	-7.41/-7.7	-8.26/-9.14	-10.23/-11.7	-14.21/-17.13	-18.29/-17.74	-17.29/-15.42	-13.94/-12.74	-11.22/-10.69	-10.15/-9.89	-9.9/-10.51	-11.63/-12.41	-12.87/-13.01	-12.32/-11.11	-10.86/-11.11
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°)	-16.91/-16.11	-16.06/-16.48	-17.47/-19.25	-19.08/-19.03	-18.3/-18.49	-17.77/-17.12	-18.86/-19.12	-18.08/-17.76	-17.42/-15.56	-14.23/-13.2	-12.72/-12.95	-13.69/-14.01	-14.56/-15	-15.67/-16.58	-16.8/-17.17	-18.08/-17.97	-19.19/-18.04	-18.11/-19.08	-17.92/-18.81	-18.13/-18.84	-18.47/-18.56	-16.78/-15.34	-14.37/-14.47	-11.51/-16.59
Θ (7.5°)	-12.49/-11.69	-12.51/-14.58	-16.63/-17.25	-18.92/-19.09	-18.02/-18.63	-17.83/-18.69	-19.19/-19.07	-18.51/-18.96	-17.54/-18.49	-17.96/-18.95	-18.16/-18.15	-17.79/-17.99	-17.49/-17.58	-18.62/-17.3	-17.17/-17.81	-18.62/-17.3	-17.05/-16.31	-15.72/-14.75	-15.91/-14.8	-14.14/-14.61	-15.26/-14.91	-14.83/-13.77	-13.06/-13.36	-13.07/-12.53
Θ (15°)	-7.38/-7.35	-8.09/-9.07	-10.31/-12.08																					



Table with columns for frequency (FreqHz), gain (Gain), and various polarization/angle combinations (Phi(0) to Phi(352.5)). Rows include elevation angles from 7.5 to 180 degrees and gain values for each combination.



Antenna Pattern of 2.4GHz

Appendix C

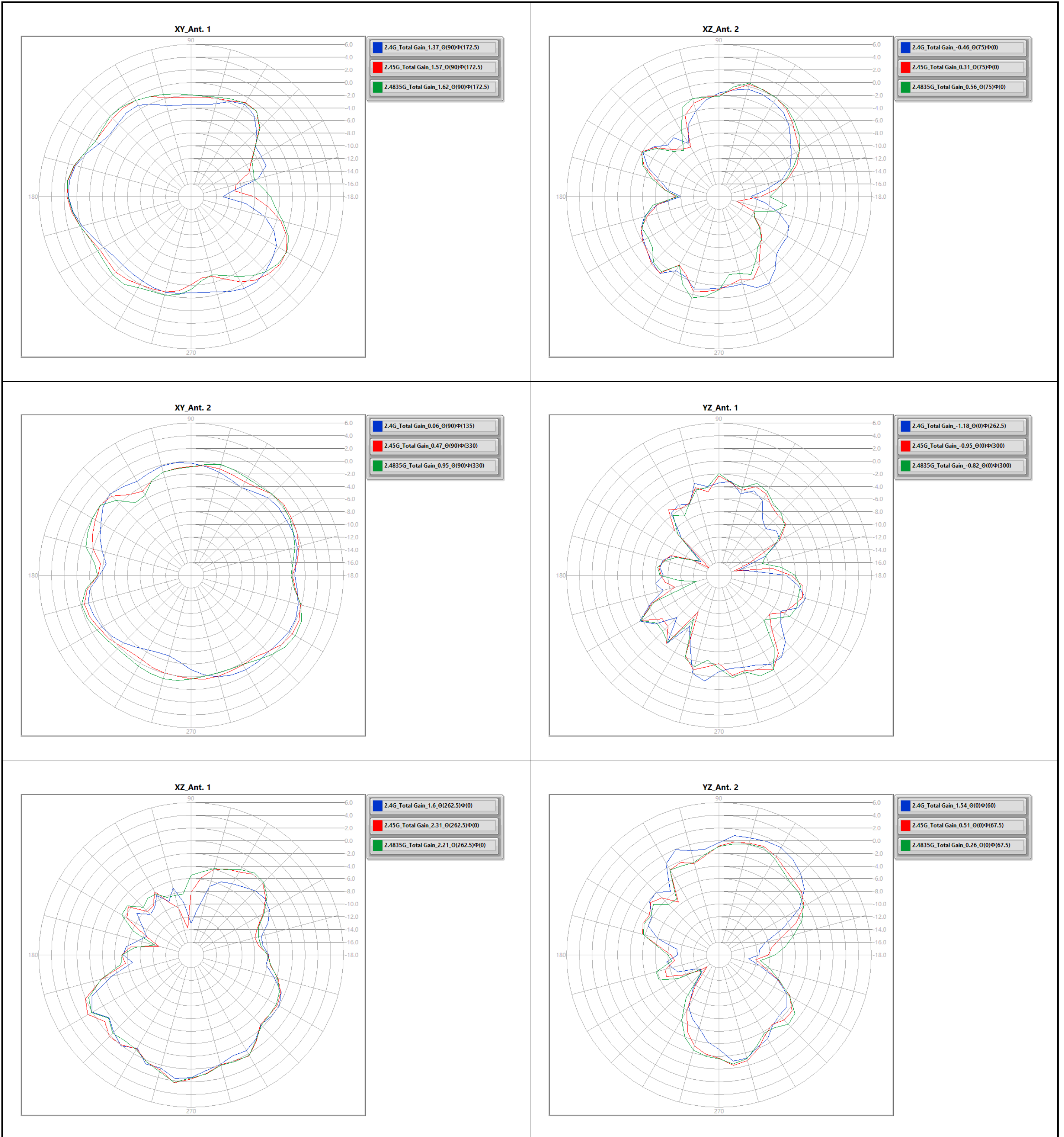
Total Gain Data

Freq(Hz)	2.4GPol.	TotalAnt.1	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°)		
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°)				
Φ(0°)	-5.74/-5.79	-5.89/-6.00	-6.06/-6.47	-6.83/-7.18	-7.50/-7.67	-7.57/-7.39	-7.39/-7.53	-7.76/-7.55	-7.35/-7.29	-7.40/-7.46	-7.45/-7.53	-7.48/-7.46	-7.55/-7.84	-8.26/-8.42	-8.56/-8.76	-8.90/-9.38	-9.11/-9.89	-9.33/-10.56	-9.81/-9.89	-10.33/-10.56	-9.81/-9.89	-10.33/-10.56	-9.81/-9.89	-10.33/-10.56	-9.81/-9.89	-10.33/-10.56		
Φ(7.5°)	-6.60/-7.25	-8.00/-8.88	-9.86/-10.88	-11.79/-12.63	-13.41/-14.27	-13.95/-13.07	-12.72/-12.65	-12.49/-11.22	-10.23/-9.55	-8.98/-8.16	-7.37/-7.00	-6.56/-6.44	-6.05/-5.68	-5.37/-5.15	-5.02/-4.96	-4.88/-4.87	-4.96/-4.98	-4.96/-5.07	-5.38/-5.69	-5.70/-5.71	-5.75/-5.72	-5.51/-5.31	-5.25/-5.45	-5.85/-6.26	-6.55/-6.84			
Φ(15°)	-6.53/-7.38	-8.43/-9.58	-10.83/-11.67	-11.96/-12.11	-12.70/-13.98	-14.71/-15.99	-14.75/-15.46	-15.09/-15.62	-13.64/-11.95	-10.23/-8.76	-7.84/-6.74	-6.53/-5.09	-4.48/-3.99	-3.62/-3.37	-3.37/-3.37	-3.37/-3.37	-3.37/-3.37	-3.37/-3.37	-3.37/-3.37	-3.37/-3.37	-3.37/-3.37	-3.37/-3.37	-3.37/-3.37	-3.37/-3.37	-3.37/-3.37	-3.37/-3.37	-3.37/-3.37	-3.37/-3.37
Φ(22.5°)	-4.90/-5.63	-6.41/-7.18	-7.75/-7.67	-7.51/-7.52	-7.94/-8.50	-9.09/-9.51	-10.06/-10.54	-11.37/-11.82	-12.29/-11.21	-9.69/-8.00	-6.48/-5.19	-4.13/-3.24	-2.62/-2.16	-1.90/-1.84	-2.00/-2.34	-2.78/-3.14	-3.48/-3.56	-3.89/-4.29	-4.53/-4.58	-4.43/-4.24	-3.90/-3.63	-3.48/-3.55	-3.84/-4.28	-4.59/-4.84				
Φ(30°)	-3.72/-4.47	-5.28/-5.94	-6.19/-5.97	-5.72/-5.58	-5.79/-6.19	-6.48/-6.71	-6.89/-7.13	-7.49/-8.08	-8.56/-8.75	-8.37/-7.40	-6.15/-4.83	-3.68/-2.70	-1.98/-1.54	-1.31/-1.33	-1.62/-2.17	-2.92/-3.49	-4.13/-4.77	-5.54/-6.29	-6.76/-6.62	-6.08/-5.30	-4.48/-3.72	-3.15/-2.75	-2.51/-2.47	-2.68/-3.10				
Φ(37.5°)	-3.35/-4.27	-5.36/-6.17	-6.41/-6.30	-5.96/-6.01	-6.29/-6.60	-6.70/-6.73	-6.57/-6.53	-6.59/-6.80	-7.15/-7.53	-7.67/-7.26	-6.37/-5.11	-3.87/-2.82	-2.12/-1.75	-1.67/-1.85	-2.31/-2.98	-3.50/-4.03	-4.37/-4.75	-5.21/-5.60	-5.72/-5.55	-5.04/-4.28	-3.52/-2.89	-2.51/-2.28	-2.15/-2.16	-2.36/-2.74				
Φ(45°)	-3.72/-4.67	-6.04/-7.44	-7.48/-8.26	-8.06/-8.22	-8.60/-8.85	-8.55/-8.10	-7.59/-7.06	-6.58/-6.40	-5.66/-7.08	-4.73/-4.18	-2.40/-2.09	-2.03/-2.18	-2.49/-2.84	-3.04/-3.17	-3.21/-3.22	-3.21/-3.21	-3.18/-3.16	-2.92/-2.78	-2.70/-2.67	-2.64/-2.66	-2.79/-2.67	-2.79/-2.67	-2.79/-2.67	-2.79/-2.67	-2.79/-2.67			
Φ(52.5°)	-4.49/-5.94	-8.12/-10.68	-12.60/-12.89	-12.00/-10.31	-9.35/-8.65	-8.28/-7.45	-6.77/-6.15	-5.53/-5.32	-5.61/-6.50	-7.31/-7.66	-7.06/-5.24	-3.38/-1.99	-1.27/-1.01	-1.00/-1.14	-1.38/-1.68	-1.89/-2.03	-2.02/-1.83	-1.62/-1.62	-1.81/-2.22	-2.87/-3.54	-4.05/-4.22	-3.93/-3.57	-3.19/-3.02	-3.18/-3.71				
Φ(60°)	-5.05/-7.03	-9.66/-12.39	-13.40/-11.79	-9.31/-7.31	-6.36/-6.03	-5.65/-5.04	-4.32/-3.69	-3.36/-3.29	-3.62/-4.63	-4.79/-7.32	-7.14/-6.16	-3.04/-1.46	-0.56/-0.16	-0.08/-0.25	-0.66/-1.24	-1.70/-1.99	-1.86/-1.59	-1.41/-1.40	-1.76/-2.59	-3.00/-5.08	-5.78/-5.41	-4.27/-3.18	-2.54/-2.40	-2.76/-3.68				
Φ(67.5°)	-5.54/-7.49	-8.94/-8.78	-7.49/-6.45	-5.41/-4.53	-4.19/-4.28	-4.20/-3.91	-3.64/-3.39	-3.14/-2.87	-2.80/-3.35	-4.55/-5.62	-5.55/-4.25	-2.00/-1.50	-0.82/-0.47	-0.45/-0.72	-1.31/-1.88	-2.25/-2.40	-2.68/-2.20	-2.10/-2.22	-2.68/-3.40	-4.13/-4.50	-4.29/-3.61	-2.79/-2.26	-2.07/-2.29	-2.80/-3.84				
Φ(75°)	-6.88/-9.85	-11.52/-10.51	-8.82/-7.38	-5.72/-4.20	-3.61/-4.01	-4.49/-4.61	-4.69/-4.87	-4.82/-4.27	-3.64/-3.59	-3.95/-4.11	-3.64/-2.52	-1.37/-0.57	-0.19/-0.10	-0.19/-0.47	-0.82/-0.99	-1.11/-1.32	-1.62/-1.82	-1.86/-2.24	-3.03/-3.88	-4.28/-4.00	-3.34/-2.69	-2.29/-2.04	-2.09/-2.67	-3.62/-4.88				
Φ(82.5°)	-10.78/-14.82	-11.67/-8.37	-7.09/-5.79	-3.71/-1.98	-1.33/-1.79	-2.55/-2.91	-3.12/-3.42	-2.89/-3.31	-1.32/-3.42	-0.50/-0.21	0.36/0.18	-0.24/-0.73	-0.98/-1.03	-1.05/-1.24	-1.52/-1.60	-1.64/-2.24	-3.26/-4.35	-4.68/-4.11	-3.19/-2.48	-2.11/-1.91	-2.06/-3.02	-4.81/-7.11						
Φ(90°)	-13.04/-11.57	-7.08/-5.21	-5.20/-5.16	-3.44/-1.74	-1.18/-1.79	-2.88/-3.35	-3.41/-3.46	-1.23/-2.22	-1.39/-1.31	-1.74/-1.85	-1.30/-0.23	0.81/1.37	1.30/0.73	-0.21/-1.25	-2.08/-2.60	-2.75/-2.73	-2.36/-2.47	-2.37/-2.61	-2.83/-2.82	-2.47/-1.85	-1.30/-1.09	-1.35/-1.85	-2.50/-3.87	-6.02/-9.22				
Φ(97.5°)	-9.72/-6.08	-3.41/-2.61	-3.07/-3.45	-2.66/-1.61	-1.32/-1.93	-3.06/-3.75	-3.90/-4.11	-3.99/-3.18	-2.21/-0.62	-1.95/-1.73	-1.00/-0.10	1.16/1.72	1.60/0.95	0.03/-0.97	-1.71/-1.92	-1.82/-1.72	-1.63/-1.38	-1.21/-1.22	-1.18/-1.12	-0.97/-0.81	-0.87/-1.55	-2.94/-4.69	-6.69/-9.15	-11.00/-11.64				
Φ(105°)	-7.11/-5.12	-3.52/-3.41	-4.08/-4.13	-3.12/-2.18	-1.90/-2.33	-3.05/-3.28	-2.99/-2.64	-2.25/-1.66	-0.89/-0.45	-0.49/-0.63	-0.36/-0.41	1.05/1.05	0.58/-0.42	-1.39/-1.84	-1.67/-1.35	-1.29/-1.57	-1.69/-1.33	-1.10/-1.50	-2.03/-2.38	-2.42/-1.24	-2.20/-2.99	-4.39/-5.88	-7.52/-9.35	-9.73/-6.66				
Φ(112.5°)	-8.91/-6.65	-4.83/-6.41	-5.42/-5.74	-4.88/-4.07	-4.00/-4.70	-5.80/-6.33	-5.89/-4.83	-3.56/-2.44	-1.41/-0.48	0.190/0.54	0.991/0.65	1.991/0.56	0.58/-0.52	-1.09/-0.61	0.230/0.55	0.11/0.80	-1.61/-2.22	-2.74/-4.22	-6.07/-7.13	-6.89/-5.84	-5.00/-4.80	-5.47/-6.77	-6.39/-10.25	-10.50/-10.01				
Φ(120°)	-7.15/-5.72	-4.61/-4.63	-5.68/-6.51	-5.82/-4.88	-4.79/-5.40	-6.05/-6.07	-5.25/-4.01	-2.79/-1.92	-1.38/-0.60	-0.020/0.75	1.391/1.81	1.630/0.61	-0.02/-0.92	-1.17/-3.38	-2.52/-1.68	-2.43/-3.72	-5.25/-2.08	-9.09/-10.68	-8.75/-6.91	-5.53/-3.89	-2.29/-1.55	-2.07/-3.54	-5.25/-6.74	-7.89/-6.06				
Φ(127.5°)	-8.56/-8.51	-8.22/-8.57	-10.49/-12.65	-13.88/-12.00	-10.99/-11.06	-9.71/-7.60	-5.67/-4.04	-2.77/-1.84	-1.08/-2.05	0.85/1.98	2.833/1.13	2.76/1.67	0.12/-1.84	-3.64/-4.19	-3.85/-3.76	-3.70/-3.31	-3.19/-3.76	-4.65/-4.95	-4.56/-4.00	-3.15/-1.96	-0.97/0.84	-1.88/-3.80	-5.86/-7.31	-8.42/-9.15				
Φ(135°)	-9.01/-7.17	-5.48/-4.76	-4.99/-6.08	-7.20/-7.99	-8.45/-9.02	-10.07/-10.08	-9.58/-8.76	-7.69/-6.63	-5.28/-3.50	-1.57/-0.15	1.34/1.81	1.530/0.63	-0.79/-2.67	-5.05/-7.00	-7.80/-7.76	-6.85/-6.60	-5.09/-5.82	-7.50/-7.87	-8.60/-7.93	-7.24/-6.18	-5.22/-5.18	-6.39/-8.44	-10.01/-9.95	-9.87/-9.88				
Φ(142.5°)	-7.27/-5.95	-4.73/-4.22	-4.43/-5.39	-6.79/-7.84	-8.53/-9.77	-12.15/-15.03	-14.45/-15.06	-12.62/-9.63	-6.82/-4.23	-2.07/0.47	0.450/0.68	0.30/-0.58	-1.74/-3.31	-5.01/-7.00	-9.08/-11.08	-11.63/-10.67	-9.46/-8.75	-7.85/-6.47	-5.39/-4.97	-5.09/-5.26	-5.72/-5.33	-6.73/-6.27	-6.89/-7.21	-7.60/-7.80				
Φ(150°)	-9.14/-8.38	-7.64/-7.33	-7.63/-8.73	-10.62/-12.84	-14.05/-14.19	-15.33/-15.11	-13.04/-10.00	-7.45/-5.35	-3.46/-1.83	-0.450/0.59	1.17/1.33	1.120/0.65	0.04/-0.59	-1.22/-1.85	-2.62/-3.46	-4.12/-4.45	-4.52/-4.43	-4.24/-3.88	-3.60/-3.58	-3.75/-3.97	-4.21/-4.50	-5.07/-6.00	-6.86/-7.74	-8.37/-8.66				
Φ(157.5°)	-10.43/-10.43	-10.52/-11.26	-12.03/-13.18	-14.25/-14.63	-15.85/-15.37	-13.42/-11.85	-10.12/-8.24	-6.53/-4.92	-3.50/-2.33	-1.36/-0.66	-0.25/-0.11	-0.28/-0.65	-1.13/-1.65	-2.21/-2.90	-3.85/-4.99	-6.06/-6.71	-7.00/-7.13	-7.03/-6.70	-6.36/-6.07	-5.87/-5.71	-5.74/-6.06	-6.72/-7.72	-9.01/-9.99	-10.59/-10.38				
Φ(165°)	-9.36/-9.66	-10.78/-10.89	-11.24/-11.31	-11.26/-11.19	-11.29/-11.17	-10.62/-9.73	-8.83/-8.05	-7.26/-6.57	-5.91/-5.29	-4.23/-4.57	-4.10/-4.10	-4.23/-4.57	-6.04/-5.59	-8.80/-10.72	-11.63/-12.61	-13.26/-12.61	-11.58/-10.51	-9.59/-7.79	-7.01/-6.53	-6.34/-6.54	-6.70/-6.86	-8.56/-9.12	-9.40/-9.36					
Φ(172.5°)	-7.76/-7.97	-8.22/-8.45	-8.58/-8.46	-8.34/-8.47	-8.77/-9.06	-9.14/-8.97	-8.62/-8.26	-7.96/-7.88	-7.83/-7.83	-7.77/-7.74	-7.78/-7.92	-8.15/-8.47	-8.72/-9.02	-9.45/-9.99	-10.49/-10.41	-10.02/-9.72	-9.53/-9.21	-8.76/-8.35	-7.89/-7.44	-7.12/-7.05	-7.11/-7.36	-7.67/-7.98	-8.29/-8.23	-8.19/-8.03				
Φ(180°)	-7.31/-7.52	-7.76/-8.08	-8.60/-8.66	-8.71/-8.90	-9.16/-9.47	-9.73/-9.53	-9.20/-8.96	-8.82/-9.11	-9.50/-9.58	-9.60/-9.50	-9.25/-9.02	-8.60/-8.14	-7.95/-7.84	-7.74/-7.62	-7.43/-7.14	-6.85/-6.74	-6.76/-6.83	-6.86/-7.00	-7.25/-7.46	-7.54/-7.57	-7.66/-7.85	-8.07/-8.23	-8.21/-8.05	-7.86/-7.46				
2.45GPol.	TotalAnt.1	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°)			
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°)				
Φ(0°)	-6.82/-5.85	-5.93/-5.95	-5.92/-5.95	-5.88/-5.99	-6.03/-6.22	-6.47/-6.71	-6.80/-6.46	-6.27/-6.08	-6.06/-6.03	-5.89/-5.89	-6.00/-6.18	-6.36/-6.39	-6.33/-6.54	-6.88/-7.08	-7.17/-7.16	-7.04/-6.96	-6.90/-6.96	-6.63/-6.52	-6.58/-6.68	-6.58/-6.23	-6.02/-6.05	-						



Θ(22.5°)	-4.65/-4.81	-4.83/-4.83	-4.76/-4.63	-4.47/-4.43	-4.42/-4.53	-4.69/-4.75	-4.92/-5.30	-5.63/-6.02	-6.71/-7.53	-8.59/-9.76	-11.03/-12.15	-12.81/-12.14	-12.04/-12.01	-11.80/-11.21	-10.69/-9.97	-9.49/-8.85	-8.25/-8.00	-7.95/-8.18	-7.93/-7.51	-7.01/-6.56	-6.11/-5.68	-5.30/-4.97	-4.70/-4.50	-4.44/-4.49
Θ(30°)	-3.33/-3.99	-3.73/-3.76	-3.67/-3.49	-3.28/-3.09	-2.91/-2.77	-2.67/-2.51	-2.54/-2.67	-2.83/-3.23	-3.97/-5.06	-6.47/-8.14	-9.93/-10.86	-10.79/-11.01	-11.47/-10.95	-10.17/-9.32	-8.59/-8.10	-7.73/-7.26	-6.55/-6.10	-5.93/-5.66	-5.15/-4.71	-4.28/-3.90	-3.50/-3.17	-2.98/-2.88	-2.83/-2.83	-2.90/-3.06
Θ(37.5°)	-2.60/-2.95	-3.12/-3.01	-2.70/-2.33	-2.01/-1.76	-1.62/-1.55	-1.52/-1.52	-1.60/-1.63	-1.69/-1.93	-2.45/-3.24	-4.39/-5.99	-7.82/-9.10	-9.55/-9.70	-9.70/-9.15	-8.18/-7.17	-6.36/-5.91	-5.63/-5.41	-5.02/-4.77	-4.54/-4.00	-3.49/-3.06	-2.69/-2.35	-2.05/-1.87	-1.84/-1.90	-1.96/-2.00	-2.09/-2.29
Θ(45°)	-1.61/-1.83	-1.87/-1.62	-1.21/-0.85	-0.60/-0.52	-0.63/-0.83	-1.04/-1.24	-1.36/-1.38	-1.28/-1.23	-1.21/-1.48	-2.08/-3.24	-4.88/-6.31	-7.25/-8.06	-8.50/-8.01	-6.94/-5.91	-5.24/-5.00	-4.85/-4.67	-4.48/-4.23	-3.98/-3.79	-3.53/-3.24	-2.99/-2.79	-2.58/-2.32	-2.05/-1.81	-1.61/-1.46	-1.41/-1.43
Θ(52.5°)	-0.54/-0.37	-0.09/-0.23	0.57/-0.79	0.85/0.68	0.29/0.19	-0.54/-0.81	-0.91/-0.82	-0.66/-0.44	-0.20/-0.08	-0.45/-1.61	-3.31/-4.92	-6.20/-7.29	-7.37/-6.48	-5.69/-5.38	-5.47/-5.62	-5.44/-4.94	-4.38/-4.05	-4.03/-4.19	-4.24/-4.37	-4.50/-4.44	-4.19/-3.61	-2.76/-1.96	-1.30/-0.90	-0.77/-0.67
Θ(60°)	0.00/0.40	0.93/1.34	1.66/1.88	1.90/1.62	1.03/0.38	0.01/-0.09	-0.05/0.10	0.18/0.17	0.20/0.29	0.06/-0.92	-2.56/-4.10	-5.21/-5.86	-5.41/-4.57	-4.39/-4.94	-5.62/-5.99	-5.84/-5.51	-4.62/-3.83	-3.50/-3.46	-3.44/-3.45	-3.60/-3.72	-3.49/-2.94	-2.17/-1.29	-0.44/0.07	0.06/-0.14
Θ(67.5°)	0.28/0.64	1.24/1.73	2.10/2.36	2.38/2.03	1.40/0.84	0.67/0.59	0.51/0.50	0.45/0.20	-0.08/-0.00	0.15/-0.40	-1.59/-2.68	-3.53/-4.10	-3.92/-3.67	-4.03/-4.61	-4.72/-4.84	-5.21/-4.76	-3.94/-3.15	-2.77/-2.46	-1.97/-1.47	-1.32/-1.48	-1.60/-1.44	-1.17/-0.73	0.03/0.70	0.76/0.37
Θ(75°)	0.31/0.66	1.23/1.65	1.92/2.09	1.97/1.50	0.93/0.61	0.66/0.57	0.25/0.05	-0.09/-0.44	-0.94/-0.75	-0.02/-0.01	-0.95/-2.05	-3.01/-4.14	-4.50/-4.11	-3.84/-3.47	-2.98/-2.94	-2.85/-2.17	-1.35/-1.12	-1.18/-1.18	-0.80/-0.14	0.36/0.38	0.03/-0.21	-0.29/-0.42	-0.31/0.19	0.44/0.26
Θ(82.5°)	-0.97/-0.30	0.29/0.64	0.85/1.00	0.81/0.26	-0.12/-0.08	0.20/0.20	-0.10/-0.30	-0.51/-1.22	-2.27/-2.01	-0.78/-0.64	-1.58/-2.28	-3.00/-4.35	-4.09/-2.47	-1.48/-1.14	-1.20/-1.44	-1.47/-1.11	-0.66/-0.52	-0.58/-0.63	-0.50/-0.19	0.14/0.18	-0.15/-0.35	-0.18/-0.05	-0.20/-0.36	-0.64/-1.12
Θ(90°)	-2.02/-1.16	-0.36/-0.01	0.21/0.37	0.07/0.65	-1.00/-0.89	-0.64/-0.62	-0.87/-0.99	-1.18/-1.85	-2.72/-1.98	-0.34/0.11	-0.61/-1.21	-1.98/-3.59	-3.36/-1.54	-0.63/-0.76	-1.29/-1.70	-2.20/-2.68	-2.60/-2.24	-2.06/-1.99	-1.71/-1.52	-1.54/-1.64	-1.74/-1.68	-1.01/-0.05	0.47/0.41	-0.17/-1.46
Θ(97.5°)	-2.15/-1.81	-0.96/-0.60	-0.17/0.16	-0.24/-1.29	-1.75/-1.61	-1.52/-1.70	-2.20/-2.17	-1.70/-1.44	-1.37/-0.40	0.84/0.88	-0.35/-1.68	-2.87/-4.02	-2.93/-1.47	-1.24/-1.53	-1.32/-0.85	-0.89/-1.40	-2.05/-2.46	-2.82/-2.89	-2.28/-1.69	-1.61/-1.60	-1.28/-1.11	-1.05/-0.36	0.36/0.53	0.21/-0.89
Θ(105°)	-2.74/-3.11	-2.49/-2.16	-1.49/-0.70	-0.95/-2.42	-3.57/-3.21	-2.73/-2.77	-3.04/-2.69	-1.87/-1.47	-1.51/-0.77	0.40/0.37	-1.19/-2.74	-2.97/-2.92	-2.46/-2.18	-2.41/-2.07	-0.82/0.25	0.66/0.23	-1.03/-2.53	-3.76/-4.01	-3.15/-1.94	-1.55/-1.47	-0.99/-0.86	-1.52/-1.78	-1.21/-0.78	-0.83/-1.56
Θ(112.5°)	-4.09/-3.65	-2.79/-2.50	-2.13/-1.29	-1.21/-2.61	-4.76/-5.13	-3.84/-2.87	-2.24/-1.64	-1.19/-1.11	-0.68/0.67	1.71/1.26	-0.54/-1.88	-2.23/-3.17	-4.54/-5.28	-4.31/-2.50	-0.89/0.20	0.65/0.17	-1.25/-3.00	-4.64/-5.64	-5.00/-3.24	-2.49/-2.26	-1.70/-1.38	-2.13/-3.24	-3.39/-3.22	-3.44/-3.83
Θ(120°)	-9.02/-7.33	-5.12/-3.94	-3.22/-2.25	-1.77/-2.62	-4.67/-6.07	-4.94/-3.44	-2.58/-2.19	-2.18/-2.12	-1.13/0.38	1.08/0.19	-2.02/-3.65	-4.16/-5.29	-5.55/-3.57	-1.52/-0.53	-0.06/0.17	-0.06/-1.07	-2.69/-4.38	-6.42/-8.39	-7.91/-5.17	-3.72/-2.89	-1.70/-0.69	-0.65/-1.60	-2.78/-3.83	-5.46/-7.79
Θ(127.5°)	-8.57/-10.85	-8.30/-6.11	-5.04/-4.31	-3.76/-4.21	-6.15/-9.52	-11.05/-9.16	-7.55/-6.67	-5.67/-3.96	-1.89/-0.64	-0.60/-1.70	-3.03/-3.53	-3.94/-4.17	-2.80/-0.88	0.13/0.34	0.22/-0.11	-1.00/-2.50	-4.24/-5.90	-8.31/-11.36	-11.91/-8.33	-6.19/-4.48	-2.73/-1.14	-0.54/-0.94	-1.74/-2.40	-3.33/-5.28
Θ(135°)	-7.54/-12.43	-12.53/-8.47	-6.31/-5.32	-4.85/-4.31	-4.67/-5.70	-6.71/-6.58	-5.25/-3.47	-1.72/-0.34	0.59/0.86	0.41/-0.61	-1.92/-3.25	-4.39/-4.44	-3.00/-1.60	-0.94/-0.87	-1.03/-1.46	-2.45/-3.91	-5.37/-6.73	-9.04/-12.49	-15.36/-10.41	-7.72/-5.81	-3.94/-2.16	-1.27/-1.37	-2.13/-2.85	-3.44/-4.74
Θ(142.5°)	-5.30/-6.62	-13.06/-15.25	-10.85/-8.71	-7.71/-7.05	-6.80/-6.94	-6.94/-6.09	-4.41/-2.61	-1.10/-0.17	0.24/0.05	1.08/0.19	-2.02/-3.65	-4.16/-5.29	-5.55/-3.57	-1.52/-0.53	-0.06/0.17	-0.06/-1.07	-2.69/-4.38	-6.42/-8.39	-7.91/-5.17	-3.72/-2.89	-1.70/-0.69	-0.65/-1.60	-2.78/-3.83	-5.46/-7.79
Θ(150°)	-3.82/-5.47	-7.78/-9.31	-10.18/-9.18	-8.27/-7.73	-7.42/-7.22	-7.01/-6.47	-5.42/-4.26	-3.21/-2.66	-2.63/-3.14	-4.27/-6.20	-8.66/-10.69	-8.93/-6.13	-4.12/-2.79	-1.94/-1.55	-1.00/-2.11	-3.11/-4.53	-6.51/-9.02	-12.31/-13.36	-11.82/-8.83	-6.49/-7.40	-3.26/-2.13	-1.45/-1.26	-1.45/-1.81	-2.23/-2.86
Θ(157.5°)	-5.22/-6.58	-8.14/-8.73	-9.19/-8.36	-7.20/-6.19	-5.50/-5.06	-4.89/-4.95	-5.02/-5.02	-4.92/-5.00	-5.42/-6.29	-7.73/-9.69	-11.40/-10.63	-8.30/-6.22	-4.70/-3.53	-2.72/-2.28	-2.26/-2.62	-3.29/-4.18	-5.44/-6.93	-8.51/-9.28	-9.11/-8.76	-7.46/-6.07	-4.81/-3.81	-3.17/-2.89	-2.91/-3.15	-3.60/-4.31
Θ(165°)	-7.70/-8.60	-9.44/-9.65	-9.12/-8.15	-7.13/-6.18	-5.49/-5.02	-4.85/-5.03	-5.51/-6.17	-6.78/-7.33	-8.01/-8.94	-10.03/-10.97	-11.22/-10.43	-9.01/-7.50	-6.30/-5.43	-4.81/-4.45	-4.39/-4.62	-5.09/-5.63	-6.96/-9.24	-8.19/-8.71	-9.24/-9.57	-9.27/-8.48	-7.60/-6.79	-6.27/-6.07	-6.10/-6.27	-6.64/-7.16
Θ(172.5°)	-9.39/-9.80	-9.80/-9.66	-9.35/-8.90	-8.42/-8.02	-7.82/-7.82	-7.95/-8.20	-8.74/-9.46	-10.14/-10.39	-10.81/-10.96	-11.05/-10.94	-10.55/-9.98	-9.37/-8.76	-8.27/-7.88	-7.62/-7.50	-7.57/-7.63	-7.86/-8.42	-8.96/-9.94	-10.67/-10.96	-10.97/-10.96	-10.81/-10.64	-10.30/-10.03	-9.92/-9.87	-9.80/-9.75	-9.37/-9.25
Θ(180°)	-11.22/-11.80	-11.83/-11.70	-11.64/-11.64	-11.19/-10.70	-10.77/-10.66	-10.41/-10.53	-10.39/-10.38	-10.49/-10.66	-10.87/-11.06	-11.06/-11.13	-11.03/-10.86	-10.76/-10.68	-10.61/-10.62	-10.58/-10.57	-10.76/-10.98	-11.03/-10.89	-10.78/-10.82	-10.78/-10.82	-10.50/-10.45	-10.43/-10.48	-10.55/-10.74	-10.98/-11.11	-11.03/-10.73	-10.72/-10.78
Freq(Hz)	2.4835GPol.																							
	TotalAnt.2	-																						
	Gain	Φ(0°)Φ(7.5°) Φ(15°)Φ(22.5°) Φ(30°)Φ(37.5°) Φ(45°)Φ(52.5°) Φ(60°)Φ(67.5°) Φ(75°)Φ(82.5°) Φ(90°)Φ(97.5°) Φ(105°)Φ(112.5°) Φ(120°)Φ(127.5°) Φ(135°)Φ(142.5°) Φ(150°)Φ(157.5°) Φ(165°)Φ(172.5°) Φ(180°)Φ(187.5°) Φ(195°)Φ(202.5°) Φ(210°)Φ(217.5°) Φ(225°)Φ(232.5°) Φ(240°)Φ(247.5°) Φ(255°)Φ(262.5°) Φ(270°)Φ(277.5°) Φ(285°)Φ(292.5°) Φ(300°)Φ(307.5°) Φ(315°)Φ(322.5°) Φ(330°)Φ(337.5°) Φ(345°)Φ(352.5°)																						
Θ(0°)	-9.97/-10.31	-10.89/-11.02	-10.99/-11.02	-11.11/-11.10	-10.84/-10.41	-10.03/-9.69	-9.14/-8.59	-8.16/-7.85	-7.49/-7.19	-6.96/-6.71	-6.50/-6.25	-6.08/-5.95	-6.04/-6.20	-6.35/-6.55	-6.83/-7.13	-7.48/-7.72	-8.10/-8.56	-9.10/-9.55	-10.21/-10.60	-10.89/-10.34	-9.87/-9.49	-9.19/-9.02	-9.02/-9.13	-9.38/-9.61
Θ(7.5°)	-8.69/-8.94	-9.01/-8.89	-8.63/-8.35	-8.13/-7.96	-7.72/-7.57	-7.57/-7.57	-7.47/-7.24	-7.10/-6.97	-6.78/-6.54	-6.33/-6.27	-6.35/-6.35	-6.57/-6.92	-7.24/-7.69	-8.22/-8.55	-8.97/-9.37	-9.70/-9.99	-10.33/-10.70	-10.98/-11.50	-11.41/-10.90	-10.18/-9.59	-9.24/-8.99	-8.74/-8.54	-8.43/-8.43	-8.43/-8.48
Θ(15°)	-7.03/-7.15	-7.13/-7.03	-6.87/-6.61	-6.33/-6.02	-5.79/-5.73	-5.79/-5.74	-5.74/-5.67	-5.65/-5.68	-5.65/-5.58	-5.61/-5.80	-5.68/-6.88	-7.48/-8.19	-9.06/-10.10	-10.74/-11.01	-11.04/-10.99	-10.72/-10.18	-9.75/-9.59	-9.86/-10.04	-9.66/-9.03	-8.33/-7.81	-7.48/-7.21	-6.97/-6.79	-6.66/-6.62	-6.64/-6.76
Θ(22.5°)	-5.23/-5.38	-5.35/-5.35	-5.29/-5.17	-4.98/-4.71	-4.50/-4.45	-4.38/-4.09	-3.88/-3.82	-3.71/-3.72	-3.91/-4.17	-4.62/-5.30	-6.29/-7.51	-8.84/-10.32	-11.92/-13.52	-14.08/-12.99	-11.29/-10.16	-9.05/-8.27	-7.58/-7.43	-7.59/-8.02	-7.77/-7.10	-6.29/-5.67	-5.28/-5.01	-4.73/-4.47	-4.33/-4.38	-4.62/-4.90
Θ(30°)	-3.31/-3.47	-3.44/-3.42	-3.42/-3.40	-3.32/-3.19	-3.10/-3.08	-3.05/-2.89	-2.68/-2.44	-2.20/-2.12	-2.28/-2.66	-3.34/-4.35	-5.68/-7.25	-8.80/-10.42	-11.58/-13.62	-14.14/-12.27	-10.12/-8.49	-7.28/-6.40	-5.81/-5.50	-5.32/-5.49	-5.18/-4.55	-3.91/-3.35	-2.95/-2.64	-2.38/-2.14	-2.00/-2.12	-2.46/-2.90
Θ(37.5°)	-2.05/-2.38	-2.34/-2.17	-1.98/-1.84	-1.74/-1.68	-1.69/-1.78	-1.94/-2.04	-2.04/-1.87	-1.70/-1.54	-1.55/-1.76	-2.38/-3.46	-4.94/-6.47	-7.79/-8.86	-9.93/-10.55	-10.04/-8.87	-7.75/-6.92	-6.19/-5.53	-4.87/-4.19	-3.77/-3.43	-2.91/-2.45	-2.03/-1.63	-1.28/-1.03	-0.86/-0.74	-0.68/-0.80	-1.11/-1.55
Θ(45°)	-1.23/-1.71	-1.79/-1.48	-1.09/-0.82	-0.66/-0.68	-0.82/-1.09	-1.45/-1.78	-2.00/-2.01	-1.91/-1.60	-1.20/-0.95	-1.08/-1.76	-3.05/-4.56	-5.89/-7.20	-8.55/-9.13	-8.44/-7.33	-6.52/-5.94	-5.47/-4.96	-4.37/-3.76	-3.24/-2.95	-2.54/-2.16	-1.83/-1.46	-1.08/-0.70	-0.42/-0.22	-0.11/-0.19	-0.38/-0.72
Θ(52.5°)	-0.42/-0.66	-0.60/-0.27	0.14/0.37	0.43/0.28	-0.04/-0.39	-0.86/-1.26	-1.40/-1.47	-1.43/-1.21	-0.73/-0.09	0.19/-0.25	-1.48/-3.01	-4.46/-6.29	-7.95/-8.06	-7.14/-6.45	-5.97/-5.55	-5.00/-4.43	-3.89/-3.60	-3.52/-3.52	-3.59/-3.70	-3.53/-3.20	-2.67/-1.87	-1.05/-0.41	-0.03/0.03	-0.08/-0.19
Θ(60°)	-0.02/0.09	0.47/0.87	1.24/1.42	1.43/1.18	0.72/0.26	-0.19/-0.44	-0.51/-0.45	-0.40/-0.42	-0.29/0.22	0.66/0.38	-0.76/-2.21	-3.50/-5.22	-6.45/-6.14	-5.73/-6.03	-6.35/-6.16	-5.60/-4.91	-4.19/-3.63	-3.43/-3.58	-3.80/-4.01	-4.09/-3.88	-3.19/-2.18	-1.12/-0.19	0.46/0.60	0.35/0.11
Θ(67.5°)	0.17/0.14	0.66/1.18	1.59/1.85	1.88/1.58	1.09/0.81	0.54/0.34	0.26/0.29	0.29/-0.03	-0.51/-0.36	0.24/0.20	-0.69/-1.69	-2.63/-4.01	-4.77/-7.70	-5.02/-5.66	-5.61/-5.11	-4.82/-4.41	-3.63/-2.91	-2.69/-2.67	-2.50/-2.37	-2.37/-2.30	-1.83/-1.16	-0.53/0.12	0.86/1.25	1.03/0.57
Θ(75°)	0.56/0.51	1.04/1.56	1.89/2.00	1.87/1.43	0.98/0.91	0.82/0.45	0.07/-0.11	-0.14/-0.47	-1.21/-1.23	-0.17/0.33	-0.27/-1.17	-2.15/-3.93	-5.49/-5.40	-4.90/-4.38	-3.56/-3.11	-2.92/-2.29	-1.36/-1.12	-1.22						

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





Total Gain Data

Table with columns for Frequency (Freq/Hz), Polarization (Pol), Total Antenna Gain (TotalAnt 1), and 28 directional gain entries (Phi(0) to Phi(345)). Rows represent various frequencies from 5.000 to 5.875 GHz.



Antenna Pattern of 5GHz

Appendix D

Frequency	Gain	$\theta(22.5^\circ)$	$\theta(30^\circ)$	$\theta(37.5^\circ)$	$\theta(45^\circ)$	$\theta(52.5^\circ)$	$\theta(60^\circ)$	$\theta(67.5^\circ)$	$\theta(75^\circ)$	$\theta(82.5^\circ)$	$\theta(90^\circ)$	$\theta(97.5^\circ)$	$\theta(105^\circ)$	$\theta(112.5^\circ)$	$\theta(120^\circ)$	$\theta(127.5^\circ)$	$\theta(135^\circ)$	$\theta(142.5^\circ)$	$\theta(150^\circ)$	$\theta(157.5^\circ)$	$\theta(165^\circ)$	$\theta(172.5^\circ)$	$\theta(180^\circ)$	$\theta(187.5^\circ)$	$\theta(195^\circ)$	$\theta(202.5^\circ)$	$\theta(210^\circ)$	$\theta(217.5^\circ)$	$\theta(225^\circ)$	$\theta(232.5^\circ)$	$\theta(240^\circ)$	$\theta(247.5^\circ)$	$\theta(255^\circ)$	$\theta(262.5^\circ)$	$\theta(270^\circ)$	$\theta(277.5^\circ)$	$\theta(285^\circ)$	$\theta(292.5^\circ)$	$\theta(300^\circ)$	$\theta(307.5^\circ)$	$\theta(315^\circ)$	$\theta(322.5^\circ)$	$\theta(330^\circ)$	$\theta(337.5^\circ)$	$\theta(345^\circ)$	$\theta(352.5^\circ)$																			
5.30GHz	5.30GHz	-1.09/-0.71	-0.46/-0.78	-1.39/-1.62	-1.19/-1.02	-1.20/-1.17	-1.32/-1.65	-1.65/-1.48	-1.27/-1.07	-0.06/0.20	0.68/0.29	-0.26/-0.13	0.63/1.18	0.95/0.56	0.73/1.50	2.44/3.18	3.63/3.84	3.90/3.99	3.75/5.57	3.43/3.28	2.90/2.50	2.13/1.79	1.44/1.02	0.52/0.09	-0.72/-0.05	-1.09/-0.71	-0.46/-0.78	-1.39/-1.62	-1.19/-1.02	-1.20/-1.17	-1.32/-1.65	-1.65/-1.48	-1.27/-1.07	-0.06/0.20	0.68/0.29	-0.26/-0.13	0.63/1.18	0.95/0.56	0.73/1.50	2.44/3.18	3.63/3.84	3.90/3.99	3.75/5.57	3.43/3.28	2.90/2.50	2.13/1.79	1.44/1.02	0.52/0.09	-0.72/-0.05																
		-0.85/-0.60	-0.24/-0.45	-1.29/-1.58	-1.38/-1.86	-2.49/-1.98	-1.54/-1.10	-0.85/-0.68	-0.66/-0.91	-1.26/-1.15	-0.63/-0.84	-1.98/-2.18	-1.30/-0.92	-0.99/-0.15	1.19/1.21	2.85/3.19	3.32/3.53	3.59/3.18	2.47/2.01	1.69/1.60	1.98/2.59	2.66/2.09	1.50/1.36	1.01/0.33	1.01/0.33	-0.67/-0.84	-1.02/-1.67	-0.85/-0.60	-0.24/-0.45	-1.29/-1.58	-1.38/-1.86	-2.49/-1.98	-1.54/-1.10	-0.85/-0.68	-0.66/-0.91	-1.26/-1.15	-0.63/-0.84	-1.98/-2.18	-1.30/-0.92	-0.99/-0.15	1.19/1.21	2.85/3.19	3.32/3.53	3.59/3.18	2.47/2.01	1.69/1.60	1.98/2.59	2.66/2.09	1.50/1.36	1.01/0.33	1.01/0.33	-0.67/-0.84	-1.02/-1.67												
		5.35GHz	5.35GHz	-1.98/-1.01	-0.12/-0.32	-0.02/-0.29	-0.20/-0.58	-1.03/-0.82	-0.80/-0.64	-1.03/-1.49	-1.56/-1.65	-2.52/-3.66	-3.12/-2.44	-2.90/-2.46	-1.60/-1.46	-3.62/-1.17	-1.00/8.85	1.44/1.45	1.57/1.44	2.59/0.27	1.08/1.91	2.15/2.05	1.51/1.33	2.02/2.28	1.01/0.31	-0.67/-0.84	-1.02/-1.67	-1.98/-1.01	-0.12/-0.32	-0.02/-0.29	-0.20/-0.58	-1.03/-0.82	-0.80/-0.64	-1.03/-1.49	-1.56/-1.65	-2.52/-3.66	-3.12/-2.44	-2.90/-2.46	-1.60/-1.46	-3.62/-1.17	-1.00/8.85	1.44/1.45	1.57/1.44	2.59/0.27	1.08/1.91	2.15/2.05	1.51/1.33	2.02/2.28	1.01/0.31	-0.67/-0.84	-1.02/-1.67														
				-4.63/-3.02	-1.37/-1.41	-1.04/-0.42	-0.46/-0.40	-0.11/0.04	-0.27/-0.46	-0.71/-1.32	-1.91/-1.82	-1.34/-1.37	-1.24/-0.63	-1.12/-2.37	-2.93/-0.08	-5.27/-0.40	-2.28/-1.22	-0.15/0.73	1.33/1.39	1.61/1.86	1.19/0.31	0.28/0.53	0.88/0.68	-0.24/-0.22	-0.37/-1.64	-2.88/-4.22	-4.79/-4.63	-4.63/-3.02	-1.37/-1.41	-1.04/-0.42	-0.46/-0.40	-0.11/0.04	-0.27/-0.46	-0.71/-1.32	-1.91/-1.82	-1.34/-1.37	-1.24/-0.63	-1.12/-2.37	-2.93/-0.08	-5.27/-0.40	-2.28/-1.22	-0.15/0.73	1.33/1.39	1.61/1.86	1.19/0.31	0.28/0.53	0.88/0.68	-0.24/-0.22	-0.37/-1.64	-2.88/-4.22	-4.79/-4.63														
				5.40GHz	5.40GHz	-4.38/-2.92	-1.71/-1.42	-0.49/-0.18	-0.78/-0.93	-1.07/-0.86	-3.40/-0.11	-0.41/-0.69	-1.05/-1.75	-2.49/-2.88	-3.32/-3.57	-4.24/-4.84	-4.94/-5.41	-2.80/-4.39	-3.19/-1.44	-0.85/-0.80	-0.35/-0.17	-0.23/-0.28	0.29/0.81	1.12/1.42	1.61/1.71	1.31/0.13	-1.25/-2.90	-4.11/-4.05	-3.78/-3.86	-4.38/-2.92	-1.71/-1.42	-0.49/-0.18	-0.78/-0.93	-1.07/-0.86	-3.40/-0.11	-0.41/-0.69	-1.05/-1.75	-2.49/-2.88	-3.32/-3.57	-4.24/-4.84	-4.94/-5.41	-2.80/-4.39	-3.19/-1.44	-0.85/-0.80	-0.35/-0.17	-0.23/-0.28	0.29/0.81	1.12/1.42	1.61/1.71	1.31/0.13	-1.25/-2.90	-4.11/-4.05	-3.78/-3.86												
						-3.56/-3.41	-2.21/-2.12	-1.80/-1.99	-2.34/-2.19	-2.20/-1.45	-0.90/-0.53	-0.92/-2.26	-4.05/-5.55	-5.50/-5.55	-5.97/-5.60	-4.35/-2.97	-1.75/-1.01	-1.25/-0.36	-0.97/-0.42	-1.22/0.75	-0.62/-0.95	-0.23/-0.51	-0.39/-0.79	-1.09/-1.42	-1.44/-1.54	1.94/-2.19	-2.74/-2.97	-4.22/-4.81	-4.83/-4.38	-3.56/-3.41	-2.21/-2.12	-1.80/-1.99	-2.34/-2.19	-2.20/-1.45	-0.90/-0.53	-0.92/-2.26	-4.05/-5.55	-5.50/-5.55	-5.97/-5.60	-4.35/-2.97	-1.75/-1.01	-1.25/-0.36	-0.97/-0.42	-1.22/0.75	-0.62/-0.95	-0.23/-0.51	-0.39/-0.79	-1.09/-1.42	-1.44/-1.54	1.94/-2.19	-2.74/-2.97	-4.22/-4.81	-4.83/-4.38												
						5.45GHz	5.45GHz	-3.73/-3.62	-2.91/-2.27	-2.29/-2.51	-2.76/-2.77	-2.93/-2.46	-2.12/-1.55	-1.26/-1.38	-1.65/-2.04	-3.07/-5.74	-6.08/-5.10	-3.43/-2.83	-2.34/-2.71	-0.04/-2.36	-2.90/-1.59	-1.32/-0.66	-1.50/-1.78	-1.73/-1.89	-2.68/-3.43	-4.15/-4.47	-4.20/-4.05	-4.10/-4.11	-3.75/-2.61	-2.57/-2.90	-3.24/-4.55	-3.73/-3.62	-2.91/-2.27	-2.29/-2.51	-2.76/-2.77	-2.93/-2.46	-2.12/-1.55	-1.26/-1.38	-1.65/-2.04	-3.07/-5.74	-6.08/-5.10	-3.43/-2.83	-2.34/-2.71	-0.04/-2.36	-2.90/-1.59	-1.32/-0.66	-1.50/-1.78	-1.73/-1.89	-2.68/-3.43	-4.15/-4.47	-4.20/-4.05	-4.10/-4.11	-3.75/-2.61	-2.57/-2.90	-3.24/-4.55										
								-6.79/-6.85	-6.94/-5.11	-4.27/-3.59	-3.38/-3.36	-2.38/-0.82	-0.08/-0.45	-0.76/-0.89	-1.38/-2.27	-3.20/-4.93	-5.67/-4.92	-5.15/-5.58	-7.75/-7.22	-7.73/-5.50	-6.53/-3.36	-3.15/-2.85	-3.06/-1.33	-0.48/-0.22	-1.11/-1.47	-0.74/-1.63	-3.07/-3.29	-4.78/-5.11	-6.19/-5.45	-5.83/-6.46	-6.16/-6.87	-6.79/-6.85	-6.94/-5.11	-4.27/-3.59	-3.38/-3.36	-2.38/-0.82	-0.08/-0.45	-0.76/-0.89	-1.38/-2.27	-3.20/-4.93	-5.67/-4.92	-5.15/-5.58	-7.75/-7.22	-7.73/-5.50	-6.53/-3.36	-3.15/-2.85	-3.06/-1.33	-0.48/-0.22	-1.11/-1.47	-0.74/-1.63	-3.07/-3.29	-4.78/-5.11	-6.19/-5.45	-5.83/-6.46	-6.16/-6.87										
								5.50GHz	5.50GHz	-13.94/-13.60	-10.75/-7.14	-5.28/-4.83	-4.32/-2.84	-4.32/-2.84	-0.78/0.09	0.05/0.50	-0.69/-0.94	-2.14/-3.93	-6.57/-4.22	-4.99/-6.68	-4.97/-6.13	-6.50/-6.21	-2.45/-0.09	-0.33/-0.30	-0.22/0.33	0.32/0.60	-1.45/-1.55	-1.34/-0.40	-0.31/-1.02	-2.74/-5.46	-7.97/-9.95	-8.96/-10.42	-10.62/-13.76	-13.94/-13.60	-10.75/-7.14	-5.28/-4.83	-4.32/-2.84	-4.32/-2.84	-0.78/0.09	0.05/0.50	-0.69/-0.94	-2.14/-3.93	-6.57/-4.22	-4.99/-6.68	-4.97/-6.13	-6.50/-6.21	-2.45/-0.09	-0.33/-0.30	-0.22/0.33	0.32/0.60	-1.45/-1.55	-1.34/-0.40	-0.31/-1.02	-2.74/-5.46	-7.97/-9.95	-8.96/-10.42	-10.62/-13.76								
										-13.20/-13.57	-8.95/-4.88	-2.47/-0.98	-1.10/-1.63	-1.02/0.12	0.84/0.72	0.21/-0.37	-1.30/-2.44	-3.04/-3.90	-5.70/-4.89	-5.64/-7.84	-11.14/-8.72	-4.45/-3.97	-3.49/-2.11	-2.26/4.02	-2.66/-1.10	-0.96/-0.18	-0.08/-0.08	-0.10/0.92	-0.49/-2.09	-4.48/-6.86	-8.91/-12.97	-15.77/-11.24	-10.87/-12.79	-13.20/-13.57	-8.95/-4.88	-2.47/-0.98	-1.10/-1.63	-1.02/0.12	0.84/0.72	0.21/-0.37	-1.30/-2.44	-3.04/-3.90	-5.70/-4.89	-5.64/-7.84	-11.14/-8.72	-4.45/-3.97	-3.49/-2.11	-2.26/4.02	-2.66/-1.10	-0.96/-0.18	-0.08/-0.08	-0.10/0.92	-0.49/-2.09	-4.48/-6.86	-8.91/-12.97	-15.77/-11.24	-10.87/-12.79								
										5.55GHz	5.55GHz	-9.33/-6.74	-7.10/-4.84	-2.87/-2.03	-2.03/-1.51	-0.64/0.30	0.63/0.08	-0.20/-0.81	-1.22/-1.66	-3.43/-4.51	-4.77/-5.50	-7.15/-12.39	-13.84/-10.12	-8.41/-10.77	-8.74/-5.71	-6.07/-5.71	-7.56/-8.83	-0.21/0.62	1.26/0.66	-0.55/-2.22	-4.97/-6.53	-11.84/-12.79	-11.84/-10.13	-11.63/-11.04	-9.33/-6.74	-7.10/-4.84	-2.87/-2.03	-2.03/-1.51	-0.64/0.30	0.63/0.08	-0.20/-0.81	-1.22/-1.66	-3.43/-4.51	-4.77/-5.50	-7.15/-12.39	-13.84/-10.12	-8.41/-10.77	-8.74/-5.71	-6.07/-5.71	-7.56/-8.83	-0.21/0.62	1.26/0.66	-0.55/-2.22	-4.97/-6.53	-11.84/-12.79	-11.84/-10.13	-11.63/-11.04								
												-4.04/-5.74	-4.97/-4.02	-3.71/-3.36	-2.66/-1.35	-1.93/1.15	1.19/1.15	1.19/1.15	0.73/0.03	-0.80/-1.86	-4.96/-8.00	-10.60/-13.25	-13.19/-9.96	-8.30/-6.83	-7.01/-5.64	-5.71/-9.81	-2.81/-1.20	-1.22/0.99	0.24/-1.10	-4.82/-4.15	-4.90/-6.14	-7.61/-7.99	-7.09/-6.30	-7.75/-8.99	-4.04/-5.74	-4.97/-4.02	-3.71/-3.36	-2.66/-1.35	-1.93/1.15	1.19/1.15	1.19/1.15	0.73/0.03	-0.80/-1.86	-4.96/-8.00	-10.60/-13.25	-13.19/-9.96	-8.30/-6.83	-7.01/-5.64	-5.71/-9.81	-2.81/-1.20	-1.22/0.99	0.24/-1.10	-4.82/-4.15	-4.90/-6.14	-7.61/-7.99	-7.09/-6.30	-7.75/-8.99								
												5.60GHz	5.60GHz	-9.69/-6.05	-7.67/-5.84	-3.02/-1.05	0.06/0.55	0.75/0.46	1.09/1.25	0.73/0.23	0.09/0.83	-3.35/-6.45	-10.28/-12.80	-13.69/-13.33	-13.83/-10.60	-8.33/-8.06	-6.84/-4.93	-3.86/-3.83	-5.43/-4.16	-4.57/-2.89	-6.48/-8.11	-5.98/-10.25	-12.32/-7.43	-6.90/-5.31	-7.32/-5.82	-4.82/-5.65	-12.06/-12.13	-9.69/-6.05	-7.67/-5.84	-3.02/-1.05	0.06/0.55	0.75/0.46	1.09/1.25	0.73/0.23	0.09/0.83	-3.35/-6.45	-10.28/-12.80	-13.69/-13.33	-13.83/-10.60	-8.33/-8.06	-6.84/-4.93	-3.86/-3.83	-5.43/-4.16	-4.57/-2.89	-6.48/-8.11	-5.98/-10.25	-12.32/-7.43	-6.90/-5.31	-7.32/-5.82	-4.82/-5.65	-12.06/-12.13				
														-9.61/-10.30	-9.08/-7.28	-6.72/-6.29	-3.66/-2.60	-1.46/-0.35	-0.58/-1.07	-1.91/-3.34	-3.13/-3.48	-3.88/-3.88	-4.07/-4.44	-4.27/-3.68	-1.31/-2.74	-1.94/-1.42	-1.93/-3.25	-3.92/-4.15	-4.71/-5.58	-6.76/-7.59	-5.44/-5.44	-4.41/-5.44	-2.59/-2.99	-0.20/-1.44	-1.81/-6.46	-15.57/-15.72	-12.63/-8.80	-5.19/-3.72	-3.54/-7.52	-9.61/-10.30	-9.08/-7.28	-6.72/-6.29	-3.66/-2.60	-1.46/-0.35	-0.58/-1.07	-1.91/-3.34	-3.13/-3.48	-3.88/-3.88	-4.07/-4.44	-4.27/-3.68	-1.31/-2.74	-1.94/-1.42	-1.93/-3.25	-3.92/-4.15	-4.71/-5.58	-6.76/-7.59	-5.44/-5.44	-4.41/-5.44	-2.59/-2.99	-0.20/-1.44	-1.81/-6.46	-15.57/-15.72	-12.63/-8.80	-5.19/-3.72	-3.54/-7.52
														5.65GHz	5.65GHz	-13.94/-13.60	-10.75/-7.14	-5.28/-4.83	-4.32/-2.84	-4.32/-2.84	-0.78/0.09	0.05/0.50	-0.69/-0.94	-2.14/-3.93	-6.57/-4.22	-4.99/-6.68	-4.97/-6.13	-6.50/-6.21	-2.45/-0.09	-0.33/-0.30	-0.22/0.33	0.32/0.60	-1.45/-1.55	-1.34/-0.40	-0.31/-1.02	-2.74/-5.46	-7.97/-9.95	-8.96/-10.42	-10.62/-13.76	-13.94/-13.60	-10.75/-7.14	-5.28/-4.83	-4.32/-2.84	-4.32/-2.84	-0.78/0.09	0.05/0.50	-0.69/-0.94	-2.14/-3.93	-6.57/-4.22	-4.99/-6.68	-4.97/-6.13	-6.50/-6.21	-2.45/-0.09	-0.33/-0.30	-0.22/0.33	0.32/0.60	-1.45/-1.55	-1.34/-0.40	-0.31/-1.02	-2.74/-5.46	-7.97/-9.95	-8.96/-10.42	-10.62/-13.76		
																-13.20/-13.57	-8.95/-4.88	-2.47/-0.98	-1.10/-1.63	-1.02/0.12	0.84/0.72	0.21/-0.37	-1.30/-2.44	-3.04/-3.90	-5.70/-4.89	-5.64/-7.84	-11.14/-8.72	-4.45/-3.97	-3.49/-2.11	-2.26/4.02	-2.66/-1.10	-0.96/-0.18	-0.08/-0.08	-0.10/0.92	-0.49/-2.09	-4.48/-6.86	-8.91/-12.97	-15.77/-11.24	-10.87/-12.79	-13.20/-13.57	-8.95/-4.88	-2.47																							



Table with columns for Frequency, Azimuth, Elevation, and Gain for various antenna configurations (Theta and Phi angles).

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

