



Antenna Composite Gain Test Report

Equipment	Wi-Fi 7 Router
Brand Name	Q Fiber
Model Name	W1700K
Applicant	Gemtek Technology Co., Ltd. No. 15-1 Zhonghua Road, Hsinchu Industrial Park, Hukou, Hsinchu, Taiwan, 30352.
Manufacturer	Gemtek Technology Co., Ltd. No. 15-1 Zhonghua Road, Hsinchu Industrial Park, Hukou, Hsinchu, Taiwan, 30352.
Sample Received	Jun. 28, 2023
Start Test Date	Jul. 07, 2023
Final Test Date	Jul. 07, 2023



Approved by: Jackson Tsai

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History of this test report

Report No.	Version	Description	Issued Date
AP362827	01	Initial issue of report	Jul. 27, 2023



1. Operation Mode and Antenna Information

Antenna Position	RF Port	Brand Name	Model Name	Ant. Type	Connector	Modes of Operation
2G5G Ant1	1	Gemtek	WAPE-269BE_Dual_Ant1	PIFA	UFL	2.4G+5G
2G5G Ant2	2	Gemtek	WAPE-269BE_Dual_Ant2	PIFA	UFL	2.4G+5G
2G5G Ant3	3	Gemtek	WAPE-269BE_Dual_Ant3	PIFA	UFL	2.4G+5G
2G5G Ant4	4	Gemtek	WAPE-269BE_Dual_Ant4	PIFA	UFL	2.4G+5G
6E Ant1	1	Gemtek	WAPE-269BE_6E_Ant1	PIFA	UFL	6G
6E Ant2	2	Gemtek	WAPE-269BE_6E_Ant2	PIFA	UFL	6G
6E Ant3	3	Gemtek	WAPE-269BE_6E_Ant3	PIFA	UFL	6G
6E Ant4	4	Gemtek	WAPE-269BE_6E_Ant4	PIFA	UFL	6G

Note:

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

2G5G Ant1, 2G5G Ant2, 2G5G Ant3 and 2G5G Ant4 could transmit/receive simultaneously.

6GHz Operation Mode (4TX/4RX)

6E Ant1, 6E Ant2, 6E Ant3 and 6E Ant4 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 (°C / %)	Test Date
Radiated	05CH03-HY	Rex Liao	23.5~24.5°C / 40~50%	Jul. 07, 2023

Note:

Testing Site Information

Brand Name: TDK

Dimension: 11m*6m*6m

Characteristic: Fully Anechoic Chamber

4. Test Facility and Configuration

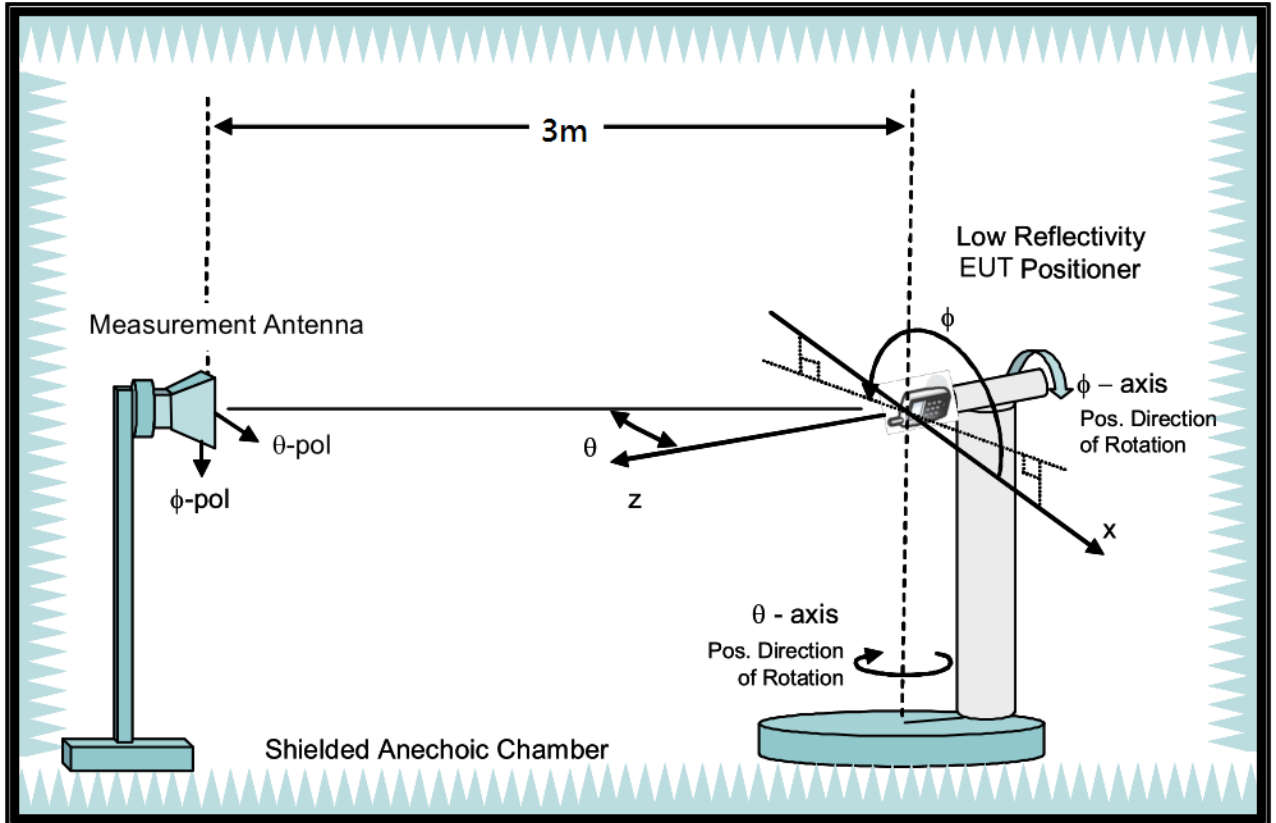
Test configuration: Reference to CITA OTA distributed-axes system configuration.

Chamber: Fully Anechoic Chamber.

Measurement antenna: Dual Polarization Horn antenna

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

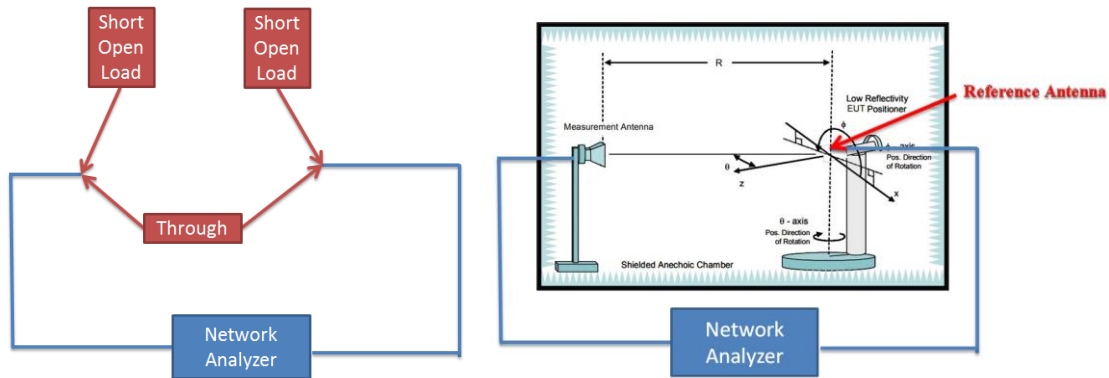
#Reference to CTIA “ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1”



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)	-33.75	-33.64	-32.91	-32.21	-32.45	-32.33	-32.57	-32.94	-32.78	-33.35	-32.91	-33.81	-34.54	-35.64
G(phi) reading (dB)	-33.19	-32.12	-32.48	-32.51	-32.64	-31.68	-32.24	-32.45	-32.45	-32.85	-32.45	-33.62	-34.48	-35.24
Reference gain (dBi)	10	10.4	10.6	12.3	12.5	13.3	13.3	13.2	13.1	13	13.2	12.4	11.8	11.1
Factor(theta) (dB)	43.75	44.04	43.51	44.51	44.95	45.63	45.87	46.14	45.88	46.35	46.11	46.21	46.34	46.74
Factor(phi) (dB)	43.19	42.52	43.08	44.81	45.14	44.98	45.54	45.65	45.55	45.85	45.65	46.02	46.28	46.34

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

Table with 6 columns: Frequency (Hz), 2.45G, 5.2G, 5.3G, 5.6G, 5.785G. Rows include Ant. 1-4 (dBi), DG [1SS] (dBi), Polarization, Theta, and Phi values.

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

DG_1SS max value position calculation

Table with 6 columns: Frequency (Hz), 2.45G, 5.2G, 5.3G, 5.6G, 5.785G. Rows show calculations for Ant. 1-4 [10^(G/20)] value, Sum All Antenna [Amax], and DG [10*log(Amax^2/Nant)].

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*log(10^(G_ant1/20)+10^(G_ant2/20)+ +10^(G_ant3/20) +10^(G_ant4/20)+.....)^2/N_ant)



DG_1SS max value position

Frequency (Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 (dBi)	-0.51	-1.46	-1.43	-0.12
Ant. 2 (dBi)	0.44	2.46	1.49	1.39
Ant. 3 (dBi)	-0.16	-1.29	-1.32	-0.14
Ant. 4 (dBi)	-2.73	-1.69	-0.73	-4.48
DG [1SS] (dBi)	5.36	5.71	5.61	5.44
Polarization	Theta	Phi	Theta	Theta
$\Theta(^{\circ})$	82.5	90	82.5	90
$\Phi(^{\circ})$	270	270	270	262.5

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^(-0.51/20)	10^(-1.46/20)	10^(-1.43/20)	10^(-0.12/20)
Ant. 2 [10^(G/20)]	10^(0.44/20)	10^(2.46/20)	10^(1.49/20)	10^(1.39/20)
Ant. 3 [10^(G/20)]	10^(-0.16/20)	10^(-1.29/20)	10^(-1.32/20)	10^(-0.14/20)
Ant. 4 [10^(G/20)]	10^(-2.73/20)	10^(-1.69/20)	10^(-0.73/20)	10^(-4.48/20)
Ant. 1 [10^(G/20)] value	0.943	0.845	0.848	0.986
Ant. 2 [10^(G/20)] value	1.052	1.327	1.187	1.174
Ant. 3 [10^(G/20)] value	0.982	0.862	0.859	0.984
Ant. 4 [10^(G/20)] value	0.73	0.823	0.919	0.597
Sum All Antenna [Amax]	3.707	3.858	3.814	3.741
DG [10*log(Amax^2/Nant)]	5.36	5.71	5.61	5.44

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*log(10^(G_{ant1}/20)+10^(G_{ant2}/20)+ +10^(G_{ant3}/20) +10^(G_{ant4}/20)+.....)^2/N_{ant})



8. Summary of Test Result

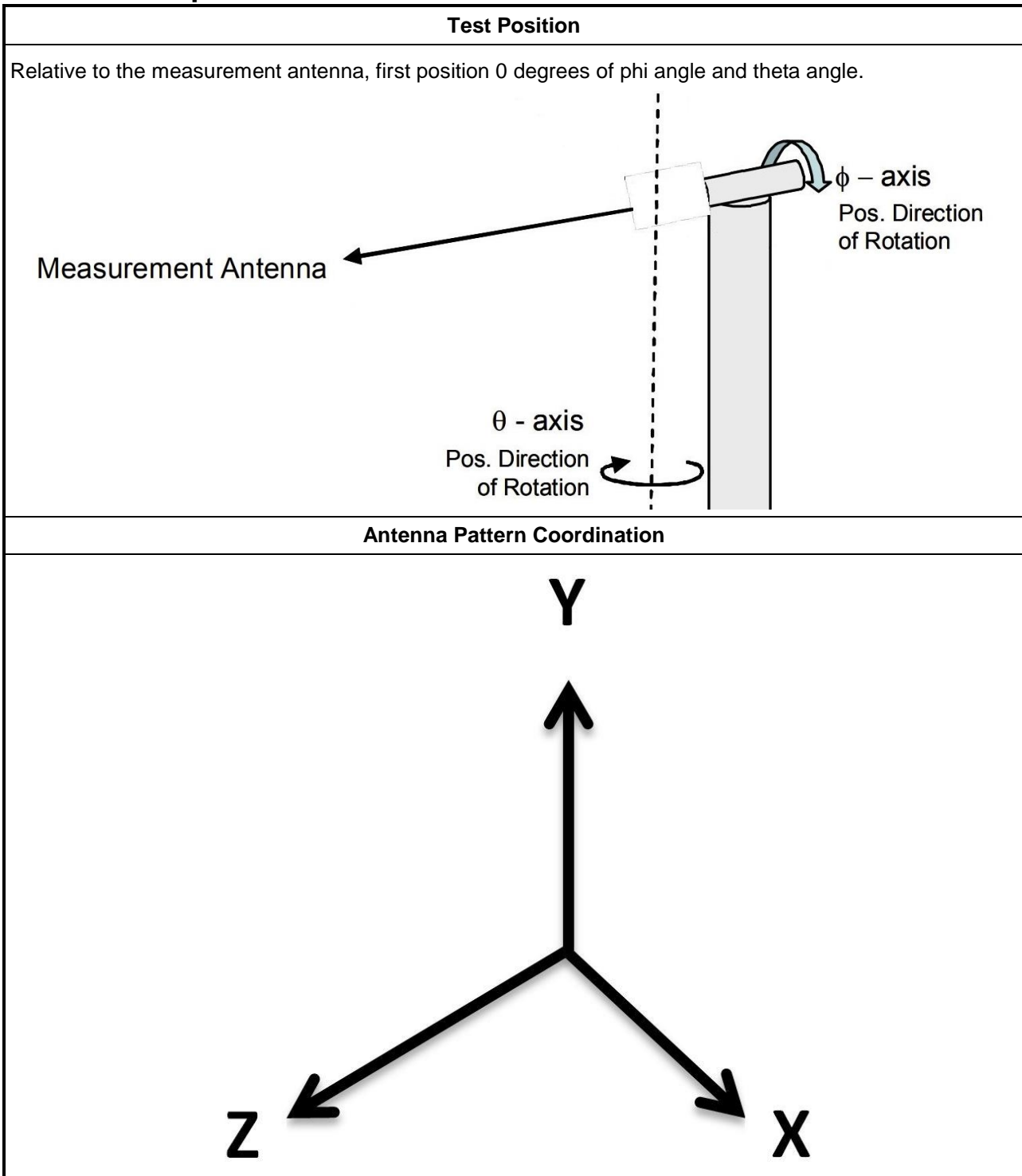
Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	1.13	2.45	1.39	1.42	1.32
Ant. 2 Max Gain (dBi)	1.49	3.28	2.3	1.07	1.57
Ant. 3 Max Gain (dBi)	1.67	3.66	1.55	2.81	2.9
Ant. 4 Max Gain (dBi)	1.69	2.9	2.2	3.28	3.6
Ant. 1 Polarization/Θ(°)/Φ(°)	Phi/82.5/352.5	Theta/0/75	Theta/30/240	Theta/45/232.5	Theta/75/240
Ant. 2 Polarization/Θ(°)/Φ(°)	Phi/22.5/82.5	Phi/30/52.5	Theta/15/150	Phi/7.5/240	Phi/22.5/45
Ant. 3 Polarization/Θ(°)/Φ(°)	Phi/37.5/90	Theta/15/15	Phi/45/292.5	Theta/22.5/22.5	Theta/22.5/7.5
Ant. 4 Polarization/Θ(°)/Φ(°)	Phi/90/112.5	Phi/22.5/345	Phi/0/330	Theta/37.5/345	Theta/45/352.5
Max Gain (dBi)	1.69	3.66	2.3	3.28	3.6
DG [1SS] (dBi)	4.31	6.6	5.42	4.55	5.46
DG [2SS] (dBi)	1.69	3.66	2.42	3.28	3.6
DG [4SS] (dBi)	1.69	3.66	2.3	3.28	3.6

Freq(Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 Max Gain (dBi)	1.06	1.01	1.22	1.09
Ant. 2 Max Gain (dBi)	1.85	2.46	2.59	1.97
Ant. 3 Max Gain (dBi)	2.9	2.01	2.76	2.71
Ant. 4 Max Gain (dBi)	2.39	2.69	3.3	1.46
Ant. 1 Polarization/Θ(°)/Φ(°)	Theta/52.5/225	Phi/52.5/307.5	Theta/52.5/225	Theta/52.5/217.5
Ant. 2 Polarization/Θ(°)/Φ(°)	Theta/45/202.5	Phi/90/270	Phi/90/270	Theta/90/247.5
Ant. 3 Polarization/Θ(°)/Φ(°)	Theta/52.5/52.5	Theta/75/97.5	Theta/60/67.5	Theta/67.5/82.5
Ant. 4 Polarization/Θ(°)/Φ(°)	Theta/75/90	Phi/82.5/105	Theta/75/82.5	Theta/52.5/45
Max Gain (dBi)	2.9	2.69	3.3	2.71
DG [1SS] (dBi)	5.36	5.71	5.61	5.44
DG [2SS] (dBi)	2.9	2.71	3.3	2.71
DG [4SS] (dBi)	2.9	2.69	3.3	2.71

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 11, 2023	May 10, 2024
Dual Polarization Horn Antenna	Sporton	S0209DP	S0209DP-001	2GHz~9GHz	N.C.R.	N.C.R.
ENA Series Network Analyzer	AGILENT	E5071C	MY46419477	100kHz~8.5GHz	Jul. 20, 2022	Jul. 19, 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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————THE END————



Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	1.13	2.45	1.39	1.42	1.32
Ant. 2 Max Gain (dBi)	1.49	3.28	2.3	1.07	1.57
Ant. 3 Max Gain (dBi)	1.67	3.66	1.55	2.81	2.9
Ant. 4 Max Gain (dBi)	1.69	2.9	2.2	3.28	3.6
Ant. 1 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Phi/82.5/352.5	Theta/0/75	Theta/30/240	Theta/45/232.5	Theta/75/240
Ant. 2 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Phi/22.5/82.5	Phi/30/52.5	Theta/15/150	Phi/7.5/240	Phi/22.5/45
Ant. 3 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Phi/37.5/90	Theta/15/15	Phi/45/292.5	Theta/22.5/22.5	Theta/22.5/7.5
Ant. 4 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Phi/90/112.5	Phi/22.5/345	Phi/0/330	Theta/37.5/345	Theta/45/352.5
Max Gain (dBi)	1.69	3.66	2.3	3.28	3.6
DG [1SS] (dBi)	4.31	6.6	5.42	4.55	5.46
DG [2SS] (dBi)	1.69	3.66	2.42	3.28	3.6
DG [4SS] (dBi)	1.69	3.66	2.3	3.28	3.6



Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A.1

DG 1SS Result

Freq(Hz)	2.45GPol.	Phi-	Phi+	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°)	
0(°)	-1.591-3.33	-0.92-0.44	0.150-0.74	1.151-5.56	1.821-9.19	1.811-5.99	1.417-2.27	1.160-0.97	0.780-0.41	0.110-0.51	-0.871-1.59	-1.441-1.61	-1.410-0.79	-1.200-0.41	0.740-0.96	1.091-2.55	1.321-2.22	1.040-0.85	0.840-0.85	0.920-0.82	0.570-2.06	0.040-2.02	-0.480-0.81	-1.180-1.55		
7.5°	-0.91-0.83	-0.73-0.52	-0.100-0.38	0.841-1.12	1.291-3.56	1.210-9.19	1.017-2.89	0.991-0.98	1.080-0.85	0.430-0.11	-0.280-0.54	-0.841-1.22	-1.161-1.22	-0.300-0.46	1.131-0.64	2.032-2.77	2.352-3.44	2.282-2.16	2.021-0.84	1.551-1.14	0.740-2.05	-0.150-0.55	-0.810-0.91	-1.070-1.09		
15°	0.120-0.01	-0.23-0.37	-0.210-0.17	0.560-0.99	1.321-6.61	1.661-5.51	1.431-4.44	1.491-5.53	1.561-3.77	0.880-0.36	-0.080-0.31	-0.450-0.69	-1.110-1.18	-0.830-0.24	1.412-3.37	2.993-3.31	3.373-3.34	3.283-1.88	3.022-2.77	2.381-1.83	1.160-4.44	-0.220-0.56	-0.670-0.56	-0.150-1.17		
22.5°	1.060-0.09	0.490-0.09	-0.120-0.02	0.430-0.95	1.491-9.33	2.162-5.28	2.031-8.77	1.491-2.19	0.910-0.57	0.130-0.19	-0.420-0.49	-0.640-0.47	-0.390-0.44	1.652-0.74	3.433-3.72	3.673-3.49	3.233	2.822-6.6	2.221-6.6	0.790-0.04	-0.640-0.79	-0.510-0.07	0.380-9.8			
30°	1.321-0.93	0.980-0.55	-0.020-0.03	0.370-0.98	1.612-11.1	2.492-6.6	2.542-3.33	1.971-5.1	1.060-0.86	0.800-0.2	-0.280-0.49	-0.550-0.31	0.020-0.62	1.442-3.35	3.023-3.5	2.621-2.1	2.081-9.9	1.610-6.6	0.290-0.52	-0.990-0.92	-0.510-0.07	0.560-0.5				
37.5°	0.821-0.07	1.040-0.81	0.350-0.18	0.681-4.8	2.182-6.6	2.832-9.5	3.453-0.2	2.610-8.6	0.940-4.7	0.710-2.4	1.240-0.6	-0.370-0.92	-0.650-0.03	0.470-0.78	1.161-6.8	2.132-3.7	2.412-1.1	1.591-2.2	1.060-9.8	0.760-3.8	-0.050-0.45	-0.730-0.68	-0.330-0.08	0.260-6.2		
45°	-0.040-0.14	0.330-0.3	0.040-0.1	0.781-7.5	2.512-8.2	2.652-4.7	2.683-0.2	2.952-2.4	1.090-3.3	1.800-3.7	-1.132-2.42	-1.930-0.93	-0.310-0.06	0.290-5.8	0.851-1.1	0.970-5.3	-0.120-0.63	-0.720-0.59	-0.750-1.94	-1.030-1.21	-1.100-7.8	-0.740-0.53	-0.290-0.03			
52.5°	-0.440-0.46	-0.310-0.11	0.110-0.67	1.362-2.8	2.882-8.2	2.231-5.8	1.792-5.5	3.032-5.4	1.420-5.2	0.531-0.6	1.080-2.1	-1.322-2.47	-1.580-0.53	-0.160-0.25	-0.490-0.57	0.300-0.7	0.250-1.3	-0.390-1.01	-1.350-1.31	-1.340-1.73	-2.580-2.58	-1.370-1.08	-1.271-1.5	-1.120-0.56		
60°	-0.170-0.3	-0.610-0.44	-0.910-0.6	0.992-1.3	2.852-8.7	2.351-8.9	2.029-8.6	3.372-9.3	1.480-1.3	-0.270-0.37	0.650-1.3	-0.890-1.54	-0.650-0.27	0.580-0.05	-1.130-1.82	-1.550-0.86	-0.180-0.27	0.210-0.38	-0.690-0.11	0.420-0.16	-1.850-3.04	-2.790-2.24	-2.520-2.38	-1.480-0.5		
67.5°	-0.380-0.48	-0.350-0.09	0.140-0.18	0.110-1.1	1.942-0.3	2.032-4.5	3.093-7.3	3.933-3.8	1.950-1.2	-0.590-0.17	-0.120-0.67	-1.510-2.03	-1.260-1.07	-0.030-1.19	-2.710-2.56	-1.980-1.31	-0.310-0.52	0.640-1.9	0.060-8.9	1.540-8.6	-1.350-1.21	-2.410-2.26	-3.350-3.7	-2.070-0.75		
75°	-0.861-1.34	-0.890-0.42	1.010-6.1	0.460-0.95	1.291-3.7	1.612-3.1	3.083-7.3	4.113-7.8	2.661-0.7	0.280-0.29	-1.150-1.74	-1.970-2.39	-2.490-1.98	-1.940-1.24	-2.290-2.12	-2.080-1.89	-1.010-0.1	0.590-0.56	0.330-6.8	1.180-5.5	-1.860-3.39	-1.980-1.31	-2.780-3.07	-1.300-0.35		
82.5°	-0.990-2.16	-1.570-1.11	0.910-8.1	0.610-0.56	1.270-0.94	1.532-2.2	3.013-9.3	4.313-7.3	2.210-9.4	0.190-0.23	-0.940-1.32	-1.620-2.5	-3.080-2.34	-1.640-1.4	-1.540-2.18	-2.520-2.33	-2.030-0.27	-0.130-0.27	0.660-4.9	1.960-1.9	-1.120-3.12	-1.230-1.15	-2.140-2.58	-1.080-0.98		
90°	-1.470-2.35	-1.450-0.14	0.660-5.9	0.911-1.3	0.650-0.5	1.192-2.1	3.183-9.5	4.083-3.3	1.981-0.6	0.670-0.05	-0.740-0.57	-1.010-1.29	-2.430-1.62	-0.880-1.39	-2.680-2.84	-2.010-1.4	-0.360-0.66	0.930-8.7	1.312-2.7	2.615-5.2	-1.350-3.12	-1.580-0.97	-2.510-2.33	-0.680-0.2		
97.5°	-1.370-2.34	-2.140-0.4	0.200-0.2	0.631-1.5	0.740-4.1	1.112-0.6	2.763-2.7	3.452-9.1	1.860-9.2	0.210-0.6	-0.890-0.7	-1.430-2.22	-2.930-2.88	-2.520-3.27	-3.370-2.14	-2.140-2.7	-0.690-0.7	1.832-0.5	2.022-3.2	2.410-1.2	-1.560-3.1	-2.160-2.16	-3.460-2.89	-0.680-0.06		
105°	-2.240-2.19	-1.270-0.26	-0.080-0.77	-0.500-0.1	0.710-4.2	0.412-2.3	2.130-3.1	3.583-1.1	1.960-6.9	0.410-1.25	-1.020-0.72	-1.060-2.14	-4.130-4.82	-3.340-3.52	-3.340-1.77	-2.010-2.6	-2.010-0.34	1.021-2.7	0.890-7.4	1.093-0.3	-1.320-1.1	-1.270-1.24	-2.410-2.58	-1.080-0.98		
112.5°	-2.720-2.54	-1.340-0.8	-0.490-1.1	-0.870-0.28	0.870-0.9	0.891-1.5	1.642-1.1	2.151-6.4	0.890-0.8	-0.860-0.94	-1.070-1.45	-2.660-5.05	-0.840-1.79	-4.240-3.2	-1.920-1.93	-2.760-3.13	-3.090-1.42	-0.330-0.23	-0.240-4.7	1.100-4.7	-1.250-2.58	-2.430-2.4	-2.970-1.96	-0.740-0.95		
120°	-3.120-3.42	-2.060-1.17	-0.480-0.34	-0.680-0.54	-0.340-0.39	-0.650-0.43	0.371-5.1	2.240-1.8	1.260-0.38	-1.620-2.1	-2.220-2.8	-3.910-4.59	-4.360-3.72	-3.340-2.97	-3.240-5.6	-5.490-4.22	-2.270-0.9	0.890-3.1	-1.370-2.32	-1.860-1.68	-1.930-1.99	-2.030-2.29	-2.750-2.26	-1.510-1.51		
127.5°	-2.260-2.66	-3.030-3.62	-3.430-2.57	-1.440-1.47	-1.790-1.76	-0.840-3.7	1.221-1.1	-0.120-2.18	-2.690-2.36	-1.380-1.43	-2.460-3.5	-4.060-5.32	-6.640-6.32	-5.050-3.93	-4.240-2.02	-1.420-1.3	-1.720-4.13	-2.620-1.76	-1.720-1.9	-2.070-2.85	-4.220-2.54	-2.910-6.3	-3.190-4.63			
135°	-2.520-1.97	-2.130-3.21	-5.370-5.36	-4.060-3.08	-2.180-1.43	-0.880-3.1	0.290-9.1	1.260-8.6	-0.380-1.82	-2.710-2.94	-2.930-3.56	-4.750-5.58	-6.270-6.17	-5.470-5.6	-4.110-3.09	-2.750-2.96	-3.150-2.78	-3.130-4.33	-4.930-3.49	-1.780-1.07	-1.330-1.56	-2.910-2.9	-5.260-6.41	-5.180-5.18		
142.5°	-6.070-4.5	-3.130-2.58	-2.630-2.53	-2.330-2.12	-2.320-2.55	-2.480-1.68	-0.670-1.4	0.440-0.5	-0.920-3.1	-3.560-4.45	-4.610-4.97	-5.550-6.1	-6.030-5.69	-6.310-5.78	-6.480-5.24	-4.280-4.4	-4.160-3.88	-4.460-6.77	-6.480-5.24	-3.560-2.82	-2.550-2.54	-2.760-2.89	-3.490-4.16	-5.190-5.98		
150°	-6.220-6.08	-4.530-3.5	-2.670-2.22	-2.120-2.2	-2.570-3.22	-3.830-3.87	-2.450-1.48	-0.930-0.89	-1.430-2.23	-2.830-3.2	-3.710-3.49	-5.510-5.98	-6.630-6.34	-6.230-5.44	-5.230-4.4	-2.320-2.45	-1.950-1.89	-2.550-3.94	-2.520-5.95	-5.910-5.15	-2.520-5.95	-5.910-5.15	-3.320-2.71	-2.520-2.54	-3.190-4.63	
157.5°	-5.070-5.81	-5.540-4.73	-3.680-3.38	-2.680-2.26	-1.830-1.64	-1.950-2.21	-2.570-2.29	-2.370-2.5	-2.430-2.98	-2.910-3.64	-4.010-4.61	-4.570-5.34	-6.870-7.55	-6.790-5.57	-4.420-3.24	-2.020-1.34	-1.010-1.29	-2.240-3.58	-5.250-6.45	-6.390-5.34	-4.430-3.78	-2.760-2.25	-2.330-2.59	-2.980-3.77		
165°	-6.340-7.11	-7.110-6.7	-5.410-4.73	-3.710-3.05	-2.620-2.49	-2.470-2.95	-3.620-4.4	-4.960-6.69	-4.380-4.48	-4.690-5.68	-4.080-4.82	-4.210-5.7	-5.530-6.21	-7.310-7.03	-5.440-4.22	-3.350-2.57	-2.950-3.7	-4.850-6.87	-6.890-7.54	-6.880-5.6	-4.910-3.84	-3.170-3.5	-3.530-3.83	-4.480-5.54		
172.5°	-10.380-9.84	-9.520-8.17	-7.330-6.39	-5.890-4.66	-4.260-4.73	-5.410-6.45	-7.610-6.84	-7.570-7.33	-7.510-7.87	-4.890-4.21	-4.890-4.9	-5.330-6.25	-7.610-8.17	-8.980-8.37	-7.250-6.57	-6.390-6.8	-6.780-6.19	-9.160-9.42	-9.220-8.24	-7.330-6.46	-6.050-5.92	-6.550-5.99	-6.780-7.17	-8.770-9.58		
180°	-9.130-8.81	-8.030-8.29	-7.430-7.17	-7.610-7.38	-7.460-8.45	-9.250-10.21	-10.670-9.97	-10.080-10.02	-9.650-9.14	-8.250-7.63	-7.510-7.67	-8.420-9.95	-11.140-11.16	-10.990-9.79	-10.450-10.5	-10.960-11.25	-11.920-11.13	-10.240-8.93	-8.450-7.86	-7.250-7.78	-8.560-8.65	-9.380-9.62	-10.290-9.28	-10.430-10.4		



Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A.1

Gain Result

Freq(Hz)	2.45GPol.	PhiAnt.1	PhiAnt.2	PhiAnt.3	PhiAnt.4	PhiAnt.5	PhiAnt.6	PhiAnt.7	PhiAnt.8	PhiAnt.9	PhiAnt.10	PhiAnt.11	PhiAnt.12	PhiAnt.13	PhiAnt.14	PhiAnt.15	PhiAnt.16	PhiAnt.17	PhiAnt.18	PhiAnt.19	PhiAnt.20	PhiAnt.21	PhiAnt.22	PhiAnt.23	PhiAnt.24	PhiAnt.25	PhiAnt.26	PhiAnt.27	PhiAnt.28	PhiAnt.29	PhiAnt.30	PhiAnt.31	PhiAnt.32	PhiAnt.33	PhiAnt.34	PhiAnt.35																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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°)	2.651-2.68	-2.761-2.74	-2.731-2.81	-3.021-3.34	-3.891-4.64	-5.371-6.53	-7.371-8.77	-9.811-11.81	-12.711-15.11	-16.011-18.41	-19.711-23.11	-23.811-28.21	-28.311-33.71	-33.211-39.61	-38.511-45.91	-44.111-52.51	-50.011-58.41	-56.111-65.51	-62.411-72.91	-68.911-80.61	-75.611-88.51	-82.611-96.71	-89.911-104.31	-97.411-113.31	-105.111-122.41	-113.111-131.51	-121.311-140.71	-129.711-150.11	-138.311-159.81	-147.111-168.91	-156.111-177.41	-165.311-186.31	-174.711-195.01	-184.311-204.01	-194.111-213.01	-204.111-222.21	-214.311-231.61	-224.711-241.21	-235.311-251.01	-246.111-261.01	-257.111-271.21	-268.311-281.61	-279.711-292.41	-291.311-303.41	-303.111-314.61	-315.111-326.11	-327.311-337.91	-339.711-349.91	-352.311-362.11	-365.111-375.11	-378.111-387.31	-391.311-399.71	-404.711-417.31	-418.311-431.11	-432.111-445.11	-446.111-459.31	-460.311-473.71	-474.711-488.31	-489.311-503.11	-504.111-518.11	-519.111-533.31	-534.311-548.71	-549.711-564.31	-565.311-580.11	-581.111-596.11	-597.111-612.31	-613.311-629.71	-629.511-647.31	-646.911-664.51	-664.511-682.31	-682.311-700.31	-700.311-718.51	-718.511-736.91	-736.911-755.51	-755.511-774.31	-774.311-793.31	-793.311-812.51	-812.511-831.91	-831.911-851.51	-851.511-871.31	-871.311-891.31	-891.311-911.51	-911.511-931.91	-931.911-952.51	-952.511-973.31	-973.311-994.31	-994.311-1015.51	-1015.511-1036.91	-1036.911-1058.51	-1058.511-1080.31	-1080.311-1102.31	-1102.311-1124.51	-1124.511-1146.91	-1146.911-1169.51	-1169.511-1192.31	-1192.311-1215.31	-1215.311-1238.51	-1238.511-1261.91	-1261.911-1285.51	-1285.511-1309.31	-1309.311-1333.31	-1333.311-1357.51	-1357.511-1381.91	-1381.911-1406.51	-1406.511-1431.31	-1431.311-1456.31	-1456.311-1481.51	-1481.511-1506.91	-1506.911-1532.51	-1532.511-1558.31	-1558.311-1584.31	-1584.311-1610.51	-1610.511-1636.91	-1636.911-1663.51	-1663.511-1690.31	-1690.311-1717.31	-1717.311-1744.51	-1744.511-1771.91	-1771.911-1800.51	-1800.511-1829.31	-1829.311-1858.31	-1858.311-1887.51	-1887.511-1916.91	-1916.911-1946.51	-1946.511-1976.31	-1976.311-2006.31	-2006.311-2036.51	-2036.511-2066.91	-2066.911-2097.51	-2097.511-2128.31	-2128.311-2159.31	-2159.311-2190.51	-2190.511-2221.91	-2221.911-2253.51	-2253.511-2285.31	-2285.311-2317.31	-2317.311-2349.51	-2349.511-2381.91	-2381.911-2414.51	-2414.511-2447.31	-2447.311-2480.31	-2480.311-2513.51	-2513.511-2546.91	-2546.911-2580.51	-2580.511-2614.31	-2614.311-2648.31	-2648.311-2682.51	-2682.511-2716.91	-2716.911-2751.51	-2751.511-2786.31	-2786.311-2821.31	-2821.311-2856.51	-2856.511-2891.91	-2891.911-2927.51	-2927.511-2963.31	-2963.311-2999.31	-2999.311-3035.51	-3035.511-3071.91	-3071.911-3108.51	-3108.511-3145.31	-3145.311-3182.31	-3182.311-3219.51	-3219.511-3256.91	-3256.911-3294.51	-3294.511-3332.31	-3332.311-3370.31	-3370.311-3408.51	-3408.511-3446.91	-3446.911-3485.51	-3485.511-3524.31	-3524.311-3563.31	-3563.311-3602.51	-3602.511-3641.91	-3641.911-3681.51	-3681.511-3721.31	-3721.311-3761.31	-3761.311-3801.51	-3801.511-3841.91	-3841.911-3882.51	-3882.511-3923.31	-3923.311-3964.31	-3964.311-4005.51	-4005.511-4046.91	-4046.911-4088.51	-4088.511-4130.31	-4130.311-4172.31	-4172.311-4214.51	-4214.511-4256.91	-4256.911-4299.51	-4299.511-4342.31	-4342.311-4385.31	-4385.311-4428.51	-4428.511-4471.91	-4471.911-4515.51	-4515.511-4559.31	-4559.311-4603.31	-4603.311-4647.51	-4647.511-4691.91	-4691.911-4736.51	-4736.511-4781.31	-4781.311-4826.31	-4826.311-4871.51	-4871.511-4916.91	-4916.911-4962.51	-4962.511-5008.31	-5008.311-5054.31	-5054.311-5100.51	-5100.511-5146.91	-5146.911-5193.51	-5193.511-5240.31	-5240.311-5287.31	-5287.311-5334.51	-5334.511-5381.91	-5381.911-5429.51	-5429.511-5477.31	-5477.311-5525.31	-5525.311-5573.51	-5573.511-5621.91	-5621.911-5670.51	-5670.511-5719.31	-5719.311-5768.31	-5768.311-5817.51	-5817.511-5866.91	-5866.911-5916.51	-5916.511-5966.31	-5966.311-6016.31	-6016.311-6066.51	-6066.511-6116.91	-6116.911-6167.51	-6167.511-6218.31	-6218.311-6269.31	-6269.311-6320.51	-6320.511-6371.91	-6371.911-6423.51	-6423.511-6475.31	-6475.311-6527.31	-6527.311-6579.51	-6579.511-6631.91	-6631.911-6684.51	-6684.511-6737.31	-6737.311-6790.31	-6790.311-6843.51	-6843.511-6896.91	-6896.911-6950.51	-6950.511-7004.31	-7004.311-7058.31	-7058.311-7112.51	-7112.511-7166.91	-7166.911-7221.51	-7221.511-7276.31	-7276.311-7331.31	-7331.311-7386.51	-7386.511-7441.91	-7441.911-7497.51	-7497.511-7553.31	-7553.311-7609.31	-7609.311-7665.51	-7665.511-7721.91	-7721.911-7778.51	-7778.511-7835.31	-7835.311-7892.31	-7892.311-7949.51	-7949.511-8006.91	-8006.911-8064.51	-8064.511-8122.31	-8122.311-8180.31	-8180.311-8238.51	-8238.511-8296.91	-8296.911-8355.51	-8355.511-8414.31	-8414.311-8473.31	-8473.311-8532.51	-8532.511-8591.91	-8591.911-8651.51	-8651.511-8711.31	-8711.311-8771.31	-8771.311-8831.51	-8831.511-8891.91	-8891.911-8952.51	-8952.511-9013.31	-9013.311-9074.31	-9074.311-9135.51	-9135.511-9196.91	-9196.911-9258.51	-9258.511-9320.31	-9320.311-9382.31	-9382.311-9444.51	-9444.511-9506.91	-9506.911-9569.51	-9569.511-9632.31	-9632.311-9695.31	-9695.311-9758.51	-9758.511-9821.91	-9821.911-9885.51	-9885.511-9949.31	-9949.311-10013.31	-10013.311-10077.51	-10077.511-10141.91	-10141.911-10206.51	-10206.511-10271.31	-10271.311-10336.31	-10336.311-10401.51	-10401.511-10466.91	-10466.911-10532.51	-10532.511-10598.31	-10598.311-10664.31	-10664.311-10730.51	-10730.511-10796.91	-10796.911-10863.51	-10863.511-10930.31	-10930.311-10997.31	-10997.311-11064.51	-11064.511-11131.91	-11131.911-11199.51	-11199.511-11267.31	-11267.311-11335.31	-11335.311-11403.51	-11403.511-11471.91	-11471.911-11540.51	-11540.511-11609.31	-11609.311-11678.31	-11678.311-11747.51	-11747.511-11816.91	-11816.911-11886.51	-11886.511-11956.31	-11956.311-12026.31	-12026.311-12096.51	-12096.511-12166.91	-12166.911-12237.31	-12237.311-12307.91	-12307.911-12378.51	-12378.511-12449.31	-12449.311-12520.31	-12520.311-12591.51	-12591.511-12662.91	-12662.911-12734.51	-12734.511-12806.31	-12806.311-12878.31	-12878.311-12950.51	-12950.511-13022.91	-13022.911-13095.51	-13095.511-13168.31	-13168.311-13241.31	-13241.311-13314.51	-13314.511-13387.91	-13387.911-13461.51	-13461.511-13535.31	-13535.311-13609.31	-13609.311-13683.51	-13683.511-13757.91	-13757.911-13832.51	-13832.511-13907.31	-13907.311-13981.91	-13981.911-14056.51	-14056.511-14131.31	-14131.311-14206.31	-14206.311-14281.51	-14281.511-14356.91	-14356.911-14432.51	-14432.511-14508.31	-14508.311-14584.31	-14584.311-14660.51	-14660.511-14736.91	-14736.911-14813.51	-14813.511-14890.31	-14890.311-14967.31	-14967.311-15044.51	-15044.511-15121.91	-15121.911-15199.51	-15199.511-15277.31	-15277.311-15355.31	-15355.311-15433.51	-15433.511-15511.91	-15511.911-15590.51	-15590.511-15669.31	-15669.311-15748.31	-15748.311-15827.51	-15827.511-15906.91	-15906.911-15986.51	-15986.511-16066.31	-16066.311-16146.31	-16146.311-16226.51	-16226.511-16306.91	-16306.911-16387.51	-16387.511-16468.31	-16468.311-16549.31	-16549.311-16630.51	-16630.511-16711.91	-16711.911-16793.51	-16793.511-16875.31	-16875.311-16957.31	-16957.311-17039.51	-17039.511-17121.91	-17121.911-17204.51	-17204.511-17287.31	-17287.311-17370.31	-17370.311-17453.51	-17453.511-17536.91	-17536.911-17620.51	-17620.511-17704.31	-17704.311-17788.31	-17788.311-17872.51	-17872.511-17956.91	-17956.911-18041.51	-18041.511-18126.31	-18126.311-18211.31	-18211.311-18296.51	-18296.511-18381.91	-18381.911-18467.51	-18467.511-18553.31	-18553.311-18639.31	-18639.311-18725.51	-18725.511-18811.91	-18811.911-18898.51	-18898.511-18985.31	-18985.311-19072.31	-19072.311-19159.51	-19159.511-19246.91	-19246.911-19334.51	-19334.511-19422.31	-19422.311-19510.31	-19510.311-19598.51	-19598.511-19686.91	-19686.911-19775.51	-19775.511-19864.31	-19864.311-19953.31	-19953.311-20042.51	-20042.511-20131.91	-20131.911-20221.51	-20221.511-20311.31	-20311.311-20401.31	-20401.311-20491.51	-20491.511-20581.91	-20581.911-20672.51	-20672.511-20763.31	-20763.311-20854.31	-20854.311-20945.51	-20945.511-21036.91	-21036.911-21128.51	-21128.511-21220.31	-21220.311-21312.31	-21312.311-21404.51	-21404.511-21496.91	-21496.911-21589.51	-21589.511-21682.31	-21682.311-21775.31	-21775.311-21868.51	-21868.511-21961.91	-21961.911-22055.51	-22055.511-22149.31	-22149.311-22243.31	-22243.311-22337.51	-22337.511-22431.91	-22431.911-22526.51	-22526.511-22621.31	-22621.311-22716.31	-22716.311-22811.51	-22811.511-22906.91	-22906.911-23002.51	-23002.511-23098.31	-23098.311-23194.31	-23194.311-23290.51	-23290.511-23386.91	-23386.911-23483.51	-23483.511-23580.31	-23580.311-23677.31	-23677.311-23774.51	-23774.511-23871.91	-23871.911-23969.51	-23969.511-24067.31	-24067.311-24165.31	-24165.311-24263.51	-24263.511-24361.91	-24361.911-24460.51	-24460.511-24559.31	-24559.311-24658.31	-24658.311-24757.51	-24757.511-24856.91	-24856.911-24956.51	-24956.511-25056.31	-25056.311-25156.31	-25156.311-25256.51	-25256.511-25356.91	-25356.911-25457.31	-25457.311-25557.91	-25557.911-25658.51	-25658.511-25759.31	-25759.311-25860.31	-25860.311-25961.51	-25961.511-26062.91	-26062.911-26164.51	-26164.511-26266.31	-26266.311-26368.31	-26368.311-26470.51	-26470.511-26572.91	-26572.911-26675.51	-26675.511-26778.31	-26778.311-26881.31	-26881.311-26984.51	-26984.511-27087.91	-27087.911-27191.51	-27191.511-27295.31	-27295.311-27399.31	-27399.311-



Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A.1

Theta (°)	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°)
Theta (22.5°)	-1.28/-2.83	-4.49/-5.67	-6.92/-7.76	-8.98/-11.61	-16.32/-10.57	-6.53/-3.92	-3.11/-2.21	-1.24/-0.93	-1.23/-1.49	-1.66/-1.96	-2.29/-2.49	-2.44/-1.94	-1.31/-1.19	-1.43/-1.89	-2.92/-4.48	-6.24/-8.12	-10.35/-14.07	-17.17/-13.73	-8.58/-5.98	-3.94/-2.43	-1.45/-0.8	-0.68/-0.65	-0.43/-0.4	-0.14/-0.34
Theta (30°)	-1.21/-1.87	-4.52/-7.1	-7.4/-6.5	-7.52/-9.72	-15.04/-11.21	-7.79/-6.6	-6.76/-5.87	-5.11/-4.84	-4.72/-4.28	-3.82/-3.41	-2.59/-1.51	-0.92/-0.99	-1.47/-1.78	-1.63/-1.95	-3.38/-5.3	-6.83/-8.65	-14.36/-18.07	-14.71/-8.85	-8.75/-9.91	-2.75/-2.37	-2.11/-1.51	-1.17/-0.94	-0.29/-0.08	-0.58/-1.15
Theta (37.5°)	-2.54/-4.19	-6.93/-6.67	-8.63/-6.64	-6.47/-7.5	-12.64/-13.05	-9.37/-9.94	-8.73/-6.45	-6.55/-7.15	-7.23/-6.31	-4.39/-3.21	-2.52/-1.91	-0.81/-1.1	-0.42/-1	-0.71/-0.53	-2.78/-7.22	-6.86/-9.66	-16.69/-12.3	-11.11/-4.23	-3.05/-2.66	-2.23/-1.99	-1.74/-1.02	-0.30/-0.46	-0.84/-0.68	-0.73/-1.58
Theta (45°)	-2.27/-3.73	-5.56/-7.52	-9.61/-10.67	-9.28/-9.47	-16.24/-13.18	-9.18/-9.65	-7.52/-7.85	-10.48/-8.32	-7.05/-7.28	-5.71/-7.06	-3.37/-2.66	-1.49/-0.95	-0.55/-0.28	-1.22/-0.88	-2.77/-10.68	-11.53/-12.92	-14.86/-11.01	-7.07/-5.36	-5.56/-5.72	-4.87/-3.9	-2.93/-1.75	-0.47/-0.18	-0.62/-0.47	-0.07/-1.05
Theta (52.5°)	-2.77/-3.11	-5.71/-9.64	-11.75/-11.62	-12.93/-12.59	-18.9/-18.22	-14.35/-16.66	-15.22/-14.17	-9.62/-6.82	-7.06/-8.91	-9.41/-6.57	-4.82/-1.9	-1.35/-2.5	-1.28/-0.84	-3.35/-3.8	-5.99/-18.82	-14.35/-15.97	-16.38/-12.64	-7.58/-5.05	-4.63/-5.2	-4.59/-3.34	-2.77/-1.82	-0.65/-0.57	-1.17/-1.4	-1.67/-2.72
Theta (60°)	-4.65/-5.04	-7.29/-8.15	-6.71/-11.29	-16.03/-12.72	-17.68/-18.49	-13.67/-12.25	-12.17/-15.21	-14.53/-9.9	-11.33/-11.06	-10.48/-9.29	-6.57/-2.63	-1.07/-1.9	-1.85/-1.16	-3.08/-5.09	-4.94/-14.42	-12.22/-11.65	-9.51/-9	-6.04/-4.21	-4.65/-5.11	-3.55/-2.79	-1.35/-1.29	-1.35/-0.83	-1.21/-3.38	-1.21/-3.38
Theta (67.5°)	-3.9/-5.18	-5.9/-6.77	-9.17/-13.19	-19.06/-14.82	-18.08/-17.03	-15.65/-18.06	-13.11/-13.31	-18.16/-16.52	-18.67/-12.79	-12.24/-10.42	-6.98/-3.9	-2.67/-3.64	-2.88/-3	-5.47/-7.01	-6.85/-18.23	-9.47/-7.33	-6.3/-7.13	-5.04/-3.5	-2.89/-3.68	-4.4/-3.74	-2.98/-2.42	-1.29/-1.17	-1.77/-2.91	-3.69/-3.49
Theta (75°)	-5.66/-7.64	-6.57/-5.5	-8.22/-11.62	-15.16/-18.57	-17.88/-14.07	-11.35/-15.53	-17.66/-18.25	-17.31/-17.92	-19.05/-14.64	-12.88/-13.1	-11.14/-8.55	-5.76/-6.83	-4.89/-5.04	-7.25/-8.59	-6.61/-10.94	-7.36/-6.07	-5.47/-5.48	-4.42/-6.31	-2.36/-3.04	-3.2/-4.3	-3.19/-3.24	-2.39/-2.22	-2.01/-1.83	-2.91/-4.46
Theta (82.5°)	-4.84/-8.27	-7.59/-7.01	-11.15/-13.67	-13.71/-14.26	-18.82/-18.42	-12.75/-10.04	-10.91/-16.67	-18.17/-18.87	-19.04/-16.28	-16.31/-15.99	-18.12/-12.5	-9.79/-8.66	-6.73/-7.14	-8.59/-9.11	-6.27/-7.66	-4.85/-2.92	-2.85/-2.26	-2.92/-2.19	-1.01/-1.83	-1.92/-3.32	-4.11/-3.89	-4.04/-3	-2.84/-0.08	-4.13/-4.78
Theta (90°)	-6.16/-7.4	-5.58/-7.2	-12.84/-15.17	-15.35/-13.17	-17.39/-15.48	-19.08/-13.95	-9.24/-10.91	-13.01/-15.42	-17.16/-16.42	-16.61/-17.88	-18.91/-15.79	-11.59/-9.81	-8.15/-8.63	-9.63/-10.3	-8.06/-6.58	-4.71/-3.54	-2.84/-3.98	-3.84/-3.91	-2.33/-3.22	-3.23/-4.46	-6.3/-5.38	-4.49/-4.28	-3.31/-4.04	-4.52/-5.17
Theta (97.5°)	-7.8/-8.85	-6.54/-6.56	-9.71/-11.06	-13.53/-13.98	-18.44/-14.25	-11.62/-12.66	-13.42/-15.92	-16.16/-16.14	-15.83/-13.69	-15.92/-17.55	-14.75/-13.45	-15.22/-12.4	-11.21/-11.11	-14.95/-14.89	-8.42/-4.77	-4.76/-3.87	-2.82/-2.43	-3.27/-4.85	-2.5/-3.55	-4.63/-5.63	-7.54/-5.98	-5.26/-5.37	-5.44/-3.74	-3.51/-6.07
Theta (105°)	-5.63/-7.49	-6.9/-7.52	-10.02/-9.04	-9.29/-10.9	-14.45/-14.74	-16.68/-17.6	-7.54/-10.56	-18.29/-17.95	-14.2/-11.71	-17.99/-18.2	-12.33/-13.5	-12.33/-12.47	-9.28/-10.43	-7.99/-5.45	-5.16/-6.4	-3.87/-4.4	-4.81/-8.06	-5.16/-6.4	-4.53/-7.72	-1.19/-6.2	-4.11/-3.69	-3.06/-3.47	-5.42/-4.95	-5.42/-4.95
Theta (112.5°)	-4.97/-4.29	-5.18/-7.96	-11.09/-10.25	-8.82/-9.83	-17.18/-18.22	-17.64/-10.57	-8.87/-9.34	-13.18/-18.76	-19.02/-17.45	-18.62/-18.77	-14.96/-18.61	-18.27/-12.78	-12.13/-9.1	-14.2/-13.91	-6.6/-5.07	-5.42/-5.12	-3.62/-4.31	-4.81/-7.84	-4.72/-5.98	-4.96/-6.79	-9.44/-7.72	-7.81/-6.21	-5.85/-4.88	-4.27/-5.02
Theta (120°)	-6.54/-6.8	-5.5/-5.65	-7.4/-9.74	-9.74/-11.43	-18.19/-19.09	-16.96/-11.48	-11.76/-16.09	-15.38/-19.1	-18.73/-16.24	-17.31/-18.78	-15.38/-18.02	-13.29/-13.52	-11.62/-10.18	-18.33/-14.23	-6.26/-5.82	-5.51/-4.84	-3.16/-4.1	-3.79/-4.32	-3.61/-3.66	-5.39/-7.91	-8.73/-10.41	-8.92/-8.82	-7.33/-4.86	-5.91/-5.49
Theta (127.5°)	-5.21/-7.9	-5.55/-7.23	-6.07/-8.64	-9.78/-10.62	-14.15/-12.74	-15.68/-8.32	-7.74/-9.57	-9.52/-11.29	-15.37/-19.08	-18.62/-17.78	-18.13/-10.65	-12.26/-11.06	-13.24/-8.4	-14.56/-11.39	-10.34/-11.23	-6.44/-5.85	-2.85/-4.41	-5.05/-5.21	-4.42/-3.31	-5.73/-8.08	-12.86/-13.71	-11.19/-6.8	-5.62/-7.58	-6.68/-4.9
Theta (135°)	-4.44/-7.01	-8.16/-6.6	-5.66/-6.21	-6.6/-7.51	-10.81/-11.21	-10.75/-8.37	-8.45/-13.04	-11.94/-8.17	-9.8/-14.23	-18.31/-18.91	-17.62/-11.97	-11.93/-11.43	-12.6/-10.32	-13.64/-11.78	-10.76/-11.48	-8.49/-8.61	-5.37/-6.96	-8.01/-4.77	-3.66/-3.69	-3.9/-5.95	-7.67/-7.86	-13.09/-13.96	-9.98/-7.68	-6.96/-4.82
Theta (142.5°)	-9.85/-10.04	-7.84/-6.64	-6.86/-11.4	-5.43/-7.87	-12.32/-11.03	-14.72/-18.07	-11.69/-14.74	-14.54/-12.66	-11.54/-10.18	-13.85/-14.87	-19.36/-15.07	-12.41/-17.25	-9.63/-7.79	-11.15/-11.8	-11.92/-13.6	-11.15/-11.8	-12.92/-13.4	-11.55/-8.08	-7.3/-8.13	-7.74/-9.04	-9.59/-12.51	-17.41/-16.19	-13.96/-9.81	-7.29/-5.35
Theta (150°)	-14.01/-16.69	-17.31/-14.88	-10.85/-10.19	-9.97/-11.16	-11.33/-9.85	-9.56/-8.43	-8.41/-11.19	-15.84/-15.15	-17.5/-19.38	-18.71/-18.06	-17.14/-18.01	-15.85/-14.62	-16.44/-12.46	-14.14/-18.19	-15.85/-14.62	-16.44/-12.46	-14.14/-18.19	-15.85/-14.62	-16.31/-12.05	-11.09/-11.79	-13.31/-12.05	-17.13/-14.97	-14.44/-10.28	-7.91/-5.75
Theta (157.5°)	-17.94/-13.3	-9.08/-6.52	-4.09/-2.98	-3.25/-4.92	-5.36/-5.37	-5.81/-8.25	-11.11/-11.95	-13.25/-11.86	-16.88/-18.06	-17.79/-12.26	-11.51/-13.4	-12.69/-12.74	-12.96/-19.02	-14.66/-14.88	-18.57/-17.57	-16.52/-18.05	-18.21/-16.85	-13.55/-11.37	-10.33/-9.34	-9.47/-10.46	-13.71/-7.89	-14.63/-10.37	-8.71/-8.53	-9.62/-13.29
Theta (165°)	-13.12/-11.56	-9.19/-7.33	-6.54/-5.51	-6.45/-9.52	-5.28/-8.87	-10.81/-15.2	-19.16/-68	-17.65/-16.3	-14.52/-16.75	-15.29/-12.69	-11.78/-12.13	-16.79/-18.15	-16.73/-11.89	-8.27/-5.9	-9.29/-11.02	-13.63/-17.96	-17.81/-13.91	-18.29/-18.58	-18.52/-15.4	-16.66/-15.2	-14.72/-11.5	-9.09/-8.46	-16.15/-8.1	-10.16/-12.09
Theta (172.5°)	-11.09/-11.14	-11.22/-8.42	-7.25/-6.87	-7.35/-6.31	-6.35/-7.25	-10.97/-14.39	-15.58/-19.15	-19.05/-19.11	-18.89/-17.25	-16.38/-16.66	-14.15/-14.99	-18.48/-19.01	-18.17/-17.12	-13.59/-11.07	-11.81/-12.34	-14.17/-15.65	-15.12/-14.01	-14.03/-13.68	-13.91/-12.26	-10.84/-8.5	-8.06/-9.56	-9.38/-8.98	-9.02/-11	-9.02/-11
Theta (180°)	-18.11/-18.41	-18.16/-17.16	-13.8/-12.94	-12.59/-13.28	-14.45/-14.7	-16.23/-18.26	-18.11/-18.81	-18.14/-18.83	-17.76/-18.9	-18.25/-19.88	-18.04/-18.27	-17.81/-17.5	-18.43/-17.55	-18.31/-18.65	-18.46/-18.8	-17.61/-17.03	-17.72/-14.82	-15.27/-14.15	-13.98/-12.93	-12.87/-13.76	-11.16/-11.39	-11.44/-11.64	-13.01/-14.95	-16.31/-8.78
Freq(Hz)	5.3GPol.	Theta/Ant. 1	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
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°)	-3.44/-6.21	-5.2/-4.1	-2.95/-1.83	-0.82/-0.05	0.51/0.71	0.84/0.66	0.34/-0.05	-0.34/-0.77	-1.45/-2.47	-3.91/-5.69	-7.81/-10.7	-13.44/-13.9	-11.42/-4.89	-5.79/-4.07	-2.85/-1.94	-1.05/-0.5	-0.35/-0.29	-0.29/-0.22	-0.36/-0.28	-0.64/-1.6	-2.94/-3.4	-4.91/-5.64	-8.16/-12.15	-13.63/-11.52
Theta (7.5°)	-16.88/-9.51	-6.37/-5.11	-4.33/-3.2	-2.11/-1.8	-0.63/-0.57	-0.35/-0.63	-1.15/-1.7	-2.19/-3.08	-4.09/-5.35	-7.03/-8.81	-10.34/-11.2	-10.76/-9.41	-7.34/-5.36	-3.66/-2.44	-1.71/-1.11	-0.59/-1.6	-0.16/-0.1	0.11/0.15	0.02/0.04	-0.17/-0.7	-1.82/-3.46	-4.25/-4.82	-7.87/-6.15	-18.31/-18.1
Theta (15°)	-10.87/-8.02	-5.82/-5.03	-5.07/-5.05	-2.75/-1.53	-0.96/-0.72	-0.72/-1.34	-2.52/-3.87	-4.56/-6.8	-8.36/-11.07	-14.98/-17.74	-17.78/-14.42	-13.76/-10.71	-9.54/-6.02	-3.82/-2.51	-1.74/-1.55	-1.31/-1.24	-1.38/-1.36	-1.37/-1.29	-1.34/-1.41	-1.66/-2.25	-3.54/-5.5	-7.34/-6.87	-12.34/-17.87	-26.16/-12.37
Theta (22.5°)	-8.71/-6.8	-5.07/-4.82	-5.22/-4.3	-2.62/-1.33	-0.51/-0.39	-0.68/-1.34	-2.05/-3.05	-4.21/-4.87	-5.4/-5.6	-5.93/-6.81	-8.61/-10.87	-12.09/-11.01	-8.77/-6.71	-5.19/-3.84	-2.83/-2.22	-1.86/-1.68	-1.41/-1	-0.66/-0.46	-0.6/-1.33	-2.01/-2.65	-4.07/-6.68	-10.16/-12.36	-12.81/-14.53	-14.99/-10.96
Theta (30°)	-6.34/-5.67	-4.39/-3.97	-3.52/-3.13	-2.78/-2.29	-1.68/-2.04	-3.25/-4.51	-5.27/-5.4	-4.85/-4.66	-4.45/-4.13	-4.2/-4.75	-5.96/-2.3	-10.93/-10.33	-8.64/-4.49	-6.04/-4.19	-2.78/-2.25	-1.47/0.04	1.39/0.81	0.21/-0.38	-0.37/-0.86	-1.81/-2.29	-2.94/-9.1	-7.49/-4.95	-11.17/-13.15	-10.89/-6.27
Theta (37.5°)	-4.49/-3.37	-3.84/-4.27	-2.96/-2.7	-3.89/-4.98	-4.41/-4.6	-5.81/-6.34	-6.54/-7.9	-4.38/-4.51	-5.48/-5.52	-4.24/-2.99	-3.81/-6.67	-10.11/-11.38	-10.68/-10.81	-8.88/-4.6	-1.77/-1.21	-0.91/-1.03	0.59/0.88	0.25/-1.13	-1.66/-1	-1.63/-3.66	-5.07/-5.58	-9.52/-8.76	-10.28/-11.96	-9.44/-6.29
Theta (45°)	-5.57/-3.57	-4.44/-4.07	-4.34/-5.9	-7.24/-9.25	-6.53/-9.7	-6.78/-7.03	-8.81/-7.48	-6.41/-8.27	-7.68/-6.88	-2.96/-1.97	-1.7/-2.8	-11.71/-11.36	-11.26/-11.97	-8.6/-5.36	-2.59/-1.21	-0.39/0.07</								



Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A.1

Freq(Hz)	Theta Ant 1	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(75°)	-2.23/4.56	-5.45/6.56	-7.16/14.48	-18.47/11.96	-11.89/9.54	-6.63/8.17	-13.54/10.67	-14.71/15.77	-13.04/11.84	-9.61/14.22	-12.44/8.63	-5.31/8.83	-4.23/4.56	-6.69/4.81	-7.51/10.46	-6.71/7.85	-7.39/5.47	-5.59/5.15	-4.63/3.33	-3.31/3.09	-3.17/3.71	-5.89/5.55	-4.01/3.99	-6.19/4.08	
Theta(82.5°)	-2.54/6.2	-4.66/4.65	-6.77/15.48	-16.66/8.52	-9.26/9.56	-7.79/8.08	-10.26/8.24	-11.49/12.57	-18.92/17.84	-14.2/18.03	-15.21/14.31	-9.17/9.86	-6.46/9.49	-6.63/6.53	-9.67/9.64	-6.13/6	-5.47/5.49	-5.99/5.15	-4.06/3.4	-2.91/3.31	-2.23/3.56	-7.5/9.48	-4.33/5.11	-8.93/5.25	
Theta(90°)	-3.42/6.3	-6.42/7.95	-8.66/17.83	-12.12/7.63	-9.92/7.56	-7.2/8.18	-11.17/9.77	-10.63/9.07	-18.18/18.8	-14.78/19.14	-17.44/14.24	-8.23/11.82	-7.03/9.05	-8.87/8.84	-9.18/9.53	-5.14/5.77	-4.88/3.75	-5.17/3.28	-3.67/3.08	-4.5/3.24	-2.96/3.1	-7.47/8.66	-4.48/6.97	-11.17/6.89	
Theta(97.5°)	-3.59/6.79	-4.23/7.15	-10.83/16.67	-11.66/6.41	-8.96/7.84	-8.22/8.6	-9.91/10.77	-19.48/11.38	-17.41/18.91	-14.31/18.29	-17.36/18.86	-8.92/14.35	-7.16/12.81	-15.06/11.95	-9.73/10.33	-7.12/7.16	-5.66/4.77	-6.25/4.19	-4.37/4.12	-4.75/3.91	-3.57/3.82	-7.37/8.96	-4.31/7.44	-13.18/4.43	
Theta(105°)	-5.84/8.47	-5.25/6.61	-9.27/13.22	-10.4/6.34	-7.97/8.92	-11.01/8.31	-10.99/12.3	-19.63/17.59	-14.86/18.74	-16.03/18.4	-8.27/11.48	-9.32/12.21	-13.45/12.3	-10.63/8.35	-9.08/9.64	-6.08/3.91	-7.59/5.3	-4.78/3.99	-4.74/5.92	-4.49/6.13	-9.54/7.72	-5.64/7.57	-9.82/6.27		
Theta(112.5°)	-7.27/8.34	-6.42/7.92	-10.76/11.07	-10.42/6.57	-8.56/6.55	-8.10/6.7	-6.35/4.89	-11.03/18.51	-17.95/17.39	-18.45/17.83	-16.55/19.02	-14.45/15.89	-8.49/16.35	-17.05/14.37	-10.44/8.62	-7.53/6.94	-7.26/3.89	-7.69/3.91	-3.21/2.85	-10.34/5.92	-6.12/9.67	-10.44/6.78	-3.84/7.77	-11.17/6.89	
Theta(120°)	-5.85/6.64	-9.02/8.54	-7.98/8.16	-9.59/6.71	-11.45/10.87	-8.66/9.41	-8.85/7.5	-11.46/17.54	-17.85/18.38	-18.4/18.73	-19.13/19.18	-15.98/19.06	-12.23/17.96	-14.21/18.69	-10.11/6.23	-10.49/7.43	-6.86/4.42	-11.47/7.7	-3.09/2.67	-4.01/7.01	-10.86/15.27	-8.51/5.27	-4.74/8.5	-6.85/6.19	
Theta(127.5°)	-7.46/7.45	-6.92/7.87	-8.74/10.58	-11.06/14.2	-7.47/4.27	-9.74/14.53	-14.32/11.06	-6.17/3.37	-7.23/8.55	-11.57/14.87	-19.05/18.8	-18.69/15.13	-18.11/18.51	-10.3/11.84	-19.08/14.01	-7.65/6.97	-8.71/4.4	-7.66/10.15	-18.71/18.3	-2.72/3.41	-6.23/7.86	-12.64/18.82	-10.61/8.26	-7.51/8.02	
Theta(135°)	-5.27/3.07	-4.51/6.79	-5.83/8.17	-9.15/5.57	-8.69/7.57	-6.62/9.09	-9.99/9.36	-11.74/13.46	-11.55/17.97	-18.32/17.73	-16.04/11.61	-16.71/14.81	-10.82/18.96	-12.93/14.04	-14.24/15.58	-9.01/5.99	-11.26/18.54	-15.58/11.5	-7.03/5.31	-7.14/7.02	-11.89/13.29	-17.98/11.3	-11.63/9.77	-6.24/6.73	
Theta(142.5°)	-5.65/5.06	-7.38/8.05	-5.84/7.47	-8.12/6.52	-9.67/18.1	-12.91/15.21	-12.63/9.35	-14.37/17.84	-15.38/17.46	-18.02/18.49	-16.77/16.38	-17.51/14.83	-9.64/14.84	-18.87/12.67	-13.76/15.3	-11.72/10.94	-14.2/16.44	-12.64/13.23	-18.48/14.72	-11.43/10.8	-16.99/18.65	-14.98/17.09	-16.05/12.25	-9.72/6.98	
Theta(150°)	-8.03/8.7	-10.41/9.88	-11.06/14.2	-16.91/13.56	-12.17/9.98	-8.02/9.07	-10.46/12.58	-11.43/12.17	-14.17/7	-18.11/18.69	-18.64/18.05	-19.18/18.38	-18.25/16.86	-13.01/13.96	-15.39/14.2	-16.04/15.54	-13.53/14.04	-17.08/18.89	-19.08/18.79	-16.46/17.19	-15.83/13	-15/18.39	-14.79/10.58	-9.35/9.13	
Theta(157.5°)	-11.72/15.67	-13.43/13.92	-15.13/8.07	-4.28/2.6	-2.57/3.55	-4.25/6.06	-7.42/9.16	-12.55/13.71	-13.36/14.3	-18.69/18.11	-18.66/17.79	-16.22/16.49	-14.24/15.84	-15.52/18.03	-18.11/17.69	-17.55/17.08	-12.34/15.16	-12.82/12.25	-11.76/15.08	-12.82/12.25	-16.60/15.08	-17.28/17.87	-18.37/18.92	-14.67/15.4	
Theta(165°)	-7.77/9.2	-7.96/9.32	-10.75/8.97	-7.12/6.34	-5.94/6.31	-6.17/11.18	-11.95/17.99	-18.94/18.77	-18.56/18.79	-18.59/19.42	-19.78/18.6	-18.25/13.88	-13.4/13.16	-11.6/13.17	-13.3/13.27	-13.39/15.21	-18.38/18.83	-18.79/18.18	-19.09/17.14	-18.47/18.18	-17.27/17.79	-14.1/11.4	-10.31/9.32	-7.54/6.96	
Theta(172.5°)	-12.75/15.76	-13.01/11.2	-10.96/9.99	-9.26/8.97	-8.2/10.33	-10.35/12.5	-16.93/18.69	-17.83/18.66	-18.54/19.07	-18.84/18.87	-17.75/17.68	-16.07/18.36	-18.04/17.35	-18.38/17.69	-17.71/18.69	-18.12/18.93	-17.77/18.69	-19.07/18.3	-18.24/17.03	-17.23/15.81	-13.34/12.88	-13.18/12.26	-10.12/10.27		
Theta(180°)	-15.79/14.55	-11.61/12.2	-12.99/13.92	-12.11/16.76	-17.46/17.57	-18.2/17.79	-18.01/19.71	-19.34/18.89	-18.98/17.46	-18.61/17.68	-17.99/18.43	-18.2/17.54	-18.07/17.74	-17.42/15.52	-15.16/17.51	-15.65/15.75	-14.67/15.83	-15.62/17.03	-18.76/19.59	-16.01/15.38	-13.93/12.78	-12.42/13.54	-12.33/12.65	-13.25/14.96	
Freq(Hz)	5.785GPol.	Theta Ant 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
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(75°)	-17.72/10.72	-6.68/5.46	-4.63/3.43	-2.12/1.4	-1.09/0.8	-0.55/0.69	-0.95/1.09	-1.34/2.26	-0.93/1.31	-0.76/5.8	-1.44/18.08	-19.05/15.27	-10.82/6.62	-6.97/4.99	-3.7/2.65	-1.91/1.68	-1.43/2.96	-0.69/0.71	-0.96/1.37	-1.55/2.16	-3.02/4.48	-6.14/7.23	-9.92/16.61	-19.33/19.07	
Theta(82.5°)	-9.11/8.49	-5.83/3.77	-2.86/2.62	-2.08/1.62	-1.36/1.32	-1.33/1.44	-1.59/1.63	-1.72/2.21	-3.3/4.19	-4.49/5.47	-7.92/11.16	-15.07/18.55	-16.39/10.73	-7.73/5.32	-3.57/2.19	-1.3/1.04	-0.87/0.78	-1.1/3.2	-1.55/2.29	-3.53/4.96	-6.24/7.2	-10.22/15.09	-18.83/18.42	-13.27/10.54	
Theta(90°)	-10.12/8.89	-6.93/5.11	-4.1/3.43	-2.89/2.74	-2.82/3.1	-3.52/3.91	-4.47/5.12	-5.6/6.4	-7.93/8.96	-8.82/11.48	-16.37/17.14	-17.38/17.13	-10.34/6.97	-5.52/4.36	-3.31/2.61	-2.1/7.4	-1.56/1.37	-1.3/3.16	-1.43/1.87	-2.53/3.39	-4.59/6.06	-8.09/10.1	-13.19/14.99	-12.89/11.69	
Theta(97.5°)	-12.03/6.15	-5.26/6.15	-5.19/6.43	-4.48/4.67	-4.59/4.16	-3.54/3.33	-4.25/6.68	-1.72/8.8	-10.31/11.71	-13.41/14.34	-13.07/11.74	-13.59/15.38	-12.56/14.93	-18.11/17.69	-17.55/17.08	-14.21/12.1	-12.81/11.2	-11.04/7.04	-7.1/1.08	-1.8/2.39	-3.25/4.59	-6.72/9.6	-11.61/11.33	-8.98/7.63	
Theta(105°)	-8.27/5.47	-4.25/4.41	-4.58/4.04	-3.96/4.69	-5.46/4.45	-3.41/4.44	-6.49/8.14	-8.42/6.43	-4.81/5.07	-6.09/6.75	-6.98/9.05	-14.77/17.94	-11.22/8.87	-9.91/8.63	-4.32/9.09	0.44/0.38	-0.27/0.68	-0.6/0.4	-0.21/0.48	-1.56/2.29	-3.74/5	-7.84/11.87	-14.57/14.55	-11.29/10.76	
Theta(112.5°)	-10.45/8.14	-4.14/3.23	-4.44/4.77	-4.85/6.75	-4.85/6.75	-5.42/7.35	-7.45/6.43	-5.98/5.44	-4.9/4.79	-4.44/5.87	-8.42/6.8	-8.97/10.69	-12.32/8.65	-3.85/5.06	0.94/0.7	-0.19/1.35	-1.43/0.59	-0.87/2.4	-2.9/2.61	-4.23/5.51	-8.63/17.02	-13.49/16.46	-12.39/10.51		
Theta(120°)	-4.25/4.78	-4.52/5.28	-4.09/5.68	-4.85/5.88	-8.79/7.86	-8.61/7.73	-8.48/6.69	-10.76/11.86	-11.04/6.55	-3.49/1.9	-1.53/2.68	-6.76/9.33	-8.56/10.12	-8.72/6.64	-3.06/0.1	-0.25/1.43	-1.07/1.35	-1.08/1.09	-4.23/6.47	-4.43/3.46	-7.06/8.5	-8.16/11.58	-9.49/9.07		
Theta(127.5°)	-5.5/5.22	-6.08/4.91	-3.17/4.03	-6.01/8.55	-10.22/7.48	-6.53/7.22	-8.09/9.05	-9.44/8.16	-6.65/5.57	-4.09/1.96	-1.29/1.51	-6.57/9.48	-8.69/9.88	-6.32/6.5	-4.6/1.53	-1.93/2.33	-0.9/1.57	-1.86/2.02	-2.95/3.11	-3.37/4.18	-5.57/5.83	-6.5/9	-8.63/6.83	-6.38/6.87	
Theta(135°)	-6.62/6.21	-6.13/5.62	-3.92/4.29	-7.15/6.25	-7.98/6.43	-6.94/13.75	-11.82/10.01	-8.59/7.4	-6.21/6.53	-7.55/6.43	-4.32/1.13	-4.73/7.27	-10.77/12.05	-4.95/5.06	-1.87/1.36	-2.7/2.74	-0.32/0.57	-0.33/1.03	-1.65/1.84	-3.97/2.19	-4.47/6.61	-9.84/8.73	-6.29/4.07	-6.27/6.56	
Theta(142.5°)	-4.14/8.81	-5.37/6.15	-5.74/5.44	-4.54/3.32	-9.06/12.06	-7.68/5.11	-8.73/11.61	-7.03/8.29	-7.48/8.05	-7.17/6.77	-4.71/3.36	-4.91/2.05	-4.23/6.06	-4.36/4.57	-8.56/4.08	-2.04/1.4	-0.03/2.53	-0.02/1.51	-0.64/1.88	-4.03/2.33	-4.78/9.98	-11.84/8.1	-4.13/2.57	-4.04/4.19	
Theta(150°)	-4.04/6.69	-6.74/6.35	-5.99/4.86	-7.8/9.24	-7.13/5.87	-9.59/6.27	-4.43/5.12	-4.24/5.47	-7.84/8.34	-5.93/2.65	-5.77/3.68	-5.51/5.18	-11.15/12.58	-5.25/4.48	-6.96/5.95	-0.55/0.32	1.32/0.49	0.39/1.39	0.24/1	-2.4/1.67	-6.03/9.94	-12.08/7.91	-3.64/1.83	-3.17/4.26	
Theta(157.5°)	-3.71/6.12	-6.12/4.63	-7.15/6.35	-7.29/3.77	-6.02/6.79	-8.31/4.64	-4.07/4.54	-3.52/3.94	-5.71/5.75	-7.35/3.01	-6.43/4.98	-10.42/5.71	-16.78/11.69	-8.06/5.22	-6.15/6.43	-0.34/0.54	0.34/0.19	0.21/1.12	0.59/1.05	-2.47/2.51	-5.78/6.89	-11.17/8.71	-3.73/6.23	-2.31/4.09	
Theta(165°)	-5.35/5.12	-4.06/3.81	-5.2/6.83	-6.97/6.59	-5.1/6.73	-8.62/6.22	-5.54/5.62	-4.59/4.06	-6.22/8.77	-9.18/3.75	-7.37/6.17	-14.62/9.29	-18.38/12.76	-11.13/8.3	-5.68/5.82	-0.94/0.54	-0.88/1.44	-1.02/2.68	-1.37/2.73	-3.5/7.6	-7.11/9.03	-10.3/8.46	-4.56/3.97	-2.23/4.61	
Theta(172.5°)	-4.41/5.23	-3.33/2.89	-5.29/6.82	-5.86/6.77	-5.28/6																				



Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A.1

Theta (°)	8.17-1.13	-5.66-3.66	-4.18-6.16	-6.96-5.29	-4.96-5.44	-6.58-8.7	-10.17-8.07	-7.33-11.92	-9.71-6.36	-9.47-18.59	-11.75-10.38	-8.69-11.43	-14.59-16.39	-18.04-16.56	-8.95-15.31	-12.79-18.72	-12.22-9.11	-9.27-10.76	-7.15-13.04	-12.63-15.97	-7.63-21.51	-2.26-1.94	-3.17-7.59	-9.95-8.62					
Phi (°)	135	142.5	150	157.5	165	172.5	180	187.5	195	202.5	210	217.5	225	232.5	240	247.5	255	262.5	270	277.5	285	292.5	300	307.5	315	322.5	330	337.5	345
Freq(Hz)	5.2GPol	Theta/Ant 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°)	1.6069	-0.921-1.54	-1.963-3.9	-6.651-8.07	-10.231-15.79	-16.041-11.93	-7.551-4.99	-3.551-2.57	-1.511-0.72	-0.150-3.9	0.830-98	0.970-97	0.730-27	-0.271-1.11	-2.231-3.78	-5.841-9.08	-13.911-17.9	-14.961-9.91	-6.431-4.56	-2.841-1.31	-0.101-56	0.911-28	1.751-88	1.991-92					
Theta (7.5°)	0.63011	-1.181-2.29	-2.451-3.68	-6.741-2.66	-11.091-15.6	-14.751-11.44	-7.791-4.42	-2.451-1.01	-0.180-41	0.781-29	1.691-6	1.41	0.421-25	-0.891-1.97	-3.411-5.11	-6.991-10.2	-15.131-15.58	-11.681-9.04	-6.591-4.28	-2.781-1.81	-0.851-3.39	-0.101-34	0.780-88	0.970-94					
Theta (15°)	-0.611-0.93	-1.641-2.7	-3.491-5.4	-6.411-9.8	-14.411-18.63	-14.811-9.48	-6.741-3.59	-1.711-0.65	0.220-77	1.051-49	1.611-27	1.050-79	0.371-0.15	-0.841-2.3	-3.831-5.76	-8.511-11.27	-15.811-15.58	-14.771-9.29	-6.081-3.66	-1.851-1.1	-0.611-4.8	-0.601-65	-0.671-0.85	-0.831-0.73					
Theta (22.5°)	-1.831-1.71	-1.871-2.59	-3.141-3.91	-6.431-14.44	-18.731-13.04	-7.841-5.19	-3.691-1.79	-0.511-0.15	0.511-1	1.311-64	1.882-07	2.251-1.89	0.951-0.26	-1.631-3.05	-4.21-5.75	-8.451-11.88	-16.081-19.3	-16.341-10.76	-7.191-4.21	-2.271-1.27	-0.891-0.95	-1.021-1.02	-1.011-1.25	-1.681-1.76					
Theta (30°)	-4.591-3.79	-3.21-3.74	-4.721-6.16	-9.521-18.5	-13.771-7.41	-4.571-6.69	-1.461-0.2	-0.410-9	-0.360-74	1.511-87	1.791-48	1.110-54	1.201-57	-4.651-9.8	-5.141-6.14	-7.541-10.1	-14.861-18.8	-14.491-8.2	-5.671-3.82	-2.291-1.76	-1.501-92	-0.631-95	-1.341-2.09	-3.351-4.39					
Theta (37.5°)	-4.091-4.04	-4.921-7.25	-10.791-15.78	-18.311-18.08	-12.751-7.52	-4.751-3.25	-1.521-1.02	-0.210-26	-0.111-21	1.311-29	1.741-05	0.590-55	-0.491-21	-4.151-5.5	-6.051-9.03	-11.111-15.83	-14.571-11.36	-9.531-7.2	-2.711-2.84	-2.131-0.75	-0.331-0.94	-1.241-1.84	-3.521-4.74						
Theta (45°)	-3.681-4.54	-5.441-9.24	-16.661-18.68	-17.631-15.14	-15.871-9.94	-4.811-2.92	-1.951-2.13	-2.341-2.12	-0.780-06	-0.51-0.31	0.620-96	1.590-61	-1.291-3.86	-6.021-5.91	-8.811-12.2	-19.131-18.94	-17.741-17.16	-12.421-8.57	-5.731-2.79	-1.721-3.09	-2.991-1.14	-0.511-0.88	-1.011-1.1	-1.551-3.17					
Theta (52.5°)	-4.531-4.83	-6.011-9.29	-14.611-18.99	-16.811-12.05	-10.571-6.65	-2.571-1.5	-3.11-3	-1.991-2.75	-2.951-1.41	-1.880-15	-1.801-25	-1.841-2.48	-3.961-8	-9.061-9.28	-12.831-18.59	-17.811-17.37	-17.181-10.6	-12.221-9.58	-5.961-3.97	-4.611-4.59	-3.451-1.45	-0.721-1.15	-0.931-1.14	-2.131-2.86					
Theta (60°)	-7.471-7.29	-8.171-11.95	-14.881-14.47	-8.891-6.4	-7.371-6.22	-3.391-3.62	-5.071-4.36	-3.841-1.5	-3.691-2.75	-2.831-1.98	-1.771-2.11	-2.91-0.47	-7.361-10.68	-14.61-16.8	-18.311-17.74	-17.781-17.23	-13.721-10.64	-7.761-6.33	-8.851-6.17	-3.391-1.77	-1.711-1.96	-1.711-1.45	-1.991-4.45						
Theta (67.5°)	-6.161-6.15	-7.081-12.2	-18.31-15.14	-9.41-7.2	-8.521-9.14	-5.011-3.71	-5.91-6.41	-3.841-3.2	-5.141-3.2	-4.091-3.58	-5.231-4.82	-3.831-3.45	-7.141-12.23	-19.031-15.74	-18.781-17.47	-14.651-12.5	-10.171-7.8	-9.541-5.84	-3.991-3.4	-4.241-2.81	-2.241-2.14	-3.881-4.52							
Theta (75°)	-6.021-6.33	-8.71-12.32	-13.271-10.45	-7.91-6.12	-7.091-8.4	-6.251-7.7	-8.211-6.3	-5.371-5.93	-5.281-6.46	-6.711-5.57	-6.151-0.9	-4.841-1.7	-5.731-11.97	-13.841-10.87	-14.471-9.74	-10.791-9.22	-15.581-18.35	-18.811-12.71	-7.341-5.35	-10.021-6.44	-4.761-0.57	-4.121-4.72	-3.971-3.99	-3.291-4.7					
Theta (82.5°)	-5.781-6.98	-7.741-9.18	-10.571-8.18	-6.541-7.16	-6.621-7.13	-5.151-5.82	-8.691-7.49	-8.011-6.22	-4.981-9.95	-10.231-6.17	-5.241-6.81	-6.641-4.9	-7.731-11.72	-16.611-18.88	-17.261-16.39	-8.941-7.61	-15.511-17.98	-18.951-12.6	-6.651-4.21	-9.871-7.84	-6.441-7.7	-5.061-5.82	-7.121-5.16	-2.631-4.15					
Theta (90°)	-5.181-7.14	-8.821-10.84	-9.671-6.55	-5.961-7.6	-4.851-7.44	-5.681-7.52	-8.151-6.6	-7.971-6.82	-6.261-11.06	-10.61-8.43	-6.441-7.69	-6.481-4.96	-7.081-9.97	-19.581-13.61	-16.531-13.61	-11.451-7.81	-17.581-16.25	-18.021-13.79	-7.391-7.17	-16.911-10.24	-8.271-6.76	-6.861-7.93	-8.211-6.65	-4.531-5.35					
Theta (97.5°)	-5.051-8.14	-7.761-8.06	-6.571-4.2	-3.541-6.43	-5.551-5.77	-7.061-10.54	-7.751-10.3	-11.531-8.56	-8.031-11.67	-10.531-10.62	-7.871-8.27	-8.771-5.55	-6.411-2.4	-11.141-10.79	-11.511-6.69	-13.451-13.95	-19.421-18.68	-13.361-13.15	-9.511-12.75	-16.111-7.7	-14.031-12.96	-8.471-8.85	-9.571-9.32	-5.011-3.33					
Theta (105°)	-4.071-7.77	-7.571-7.19	-5.331-3.25	-2.461-3.25	-3.681-4.44	-7.681-10.33	-11.391-9.78	-9.331-14.44	-10.431-9.49	-11.191-12.28	-10.431-9.49	-9.291-10.83	-9.481-7.27	-7.611-15.69	-18.751-16.89	-19.281-10.4	-17.831-18.03	-17.511-13.12	-16.821-16.82	-18.741-17.87	-18.071-14.2	-12.211-8.13	-8.111-13.23	-8.521-2.88					
Theta (112.5°)	-6.271-7.89	-6.291-5.04	-4.421-2.29	-1.631-1.69	-2.391-4.24	-8.721-9.65	-8.011-10.59	-12.741-9.36	-11.731-13.65	-10.741-12.37	-12.441-14.97	-17.811-11.26	-8.351-13.45	-12.971-17.95	-13.951-14.36	-14.041-16.57	-18.031-17.02	-15.991-17.06	-19.351-13.66	-11.751-14.09	-11.471-18.9	-11.511-12.99	-7.811-10.77	-10.691-6.75					
Theta (120°)	-5.691-8.68	-6.271-3.7	-3.561-2.98	-2.241-1.44	-2.41-6.69	-13.751-9.46	-8.681-11.72	-12.391-11.24	-11.211-13.82	-13.051-14.4	-13.231-17.43	-18.671-17.83	-13.141-14.16	-18.451-18.78	-17.111-11.8	-15.681-8.42	-17.861-9.6	-17.391-16.29	-13.981-10.45	-10.471-19.08	-18.321-17.99	-19.191-14.69	-10.071-9.31	-13.271-11.7					
Theta (127.5°)	-9.681-11.23	-8.751-4.58	-3.431-3.08	-1.741-1.5	-3.261-7.13	-7.391-6.22	-7.541-10.37	-10.521-10.17	-11.811-18.66	-12.151-11.03	-15.681-14.49	-18.421-16.46	-18.651-18.91	-16.811-18.41	-10.831-10.29	-15.911-16.44	-13.811-14.09	-9.131-15.69	-15.641-17.51	-12.411-18.26	-14.551-17.02	-18.991-13.88	-11.711-10.58	-14.851-10.43					
Theta (135°)	-8.411-13.27	-15.91-6.16	-2.691-1.16	-0.441-0.44	-2.091-3.31	-2.961-1.3	-4.941-4.7	-10.671-13.45	-19.371-19.02	-12.631-12.17	-14.331-18.89	-18.911-18.54	-13.061-10.53	-8.531-9.71	-10.811-9.88	-13.841-10.92	-10.181-17.53	-17.181-13.87	-9.861-11.87	-17.791-19.29	-16.771-15.61	-15.611-16.12	-11.031-8.56						
Theta (142.5°)	-6.111-9.9	-15.521-8.89	-3.771-1.42	-0.611-1	-1.461-1.08	-1.641-3.07	-4.881-9.03	-18.121-14.89	-9.511-10.96	-17.991-12.94	-10.151-9.93	-9.191-10.86	-9.391-21	-13.631-17.31	-19.51-14.7	-11.361-12.64	-15.571-12.22	-15.841-15.77	-14.471-16.45	-8.761-8.48	-13.141-14.54	-10.811-13.15	-16.431-17.75	-11.951-9.74					
Theta (150°)	-7.631-8.29	-9.791-10.16	-9.81-6.9	-5.581-3.98	-2.551-2.44	-3.071-4.44	-7.111-10.42	-15.421-15.96	-11.811-7.96	-6.721-8.39	-14.291-17.34	-9.761-7.25	-7.911-11.39	-13.751-15.16	-17.881-17.03	-16.371-18.71	-17.881-16.96	-121-11.89	-15.261-17.7	-17.941-19.3	-13.311-11.18	-13.211-12.15	-15.391-18.58	-16.971-9.88					
Theta (157.5°)	-16.661-15.71	-16.281-11.04	-7.91-6.85	-5.321-3.97	-4.341-3.55	-5.231-4.73	-6.311-10.31	-13.091-8.96	-6.41-6.91	-8.91-10.75	-14.411-14.31	-17.411-17.2	-18.321-16.95	-14.251-13.42	-14.041-16.57	-18.031-17.02	-17.571-17.48	-13.951-11.88	-12.131-16.82	-16.871-12.22	-11.741-14.44	-11.211-10	-11.071-17.37						
Theta (165°)	-11.261-10.16	-9.711-9.14	-7.991-5.88	-3.411-2.7	-3.481-3.54	-3.761-6.09	-8.241-7.33	-7.021-8.14	-11.021-15.08	-15.121-14.47	-16.741-17.19	-16.951-18.22	-18.051-18.35	-18.681-18.32	-16.611-14.23	-13.531-14.19	-15.61-15.43	-14.141-10.97	-7.941-6.41	-6.731-7.78	-10.121-14.25	-18.471-17.48	-17.621-14.37	-11.821-11.4					
Theta (172.5°)	-19.621-18.35	-17.991-16.62	-16.911-12.2	-11.711-10.21	-10.481-7.77	-8.341-6.36	-4.871-5.07	-6.941-10.1	-15.361-19.24	-18.351-19.09	-17.271-19.44	-13.871-14.3	-16.391-17.56	-17.671-18.09	-18.961-19.18	-18.051-17.91	-15.741-13.9	-13.541-12.62	-10.621-10.35	-11.761-12.86	-13.811-12.24	-13.081-12.17	-13.491-15.42	-17.531-10.92					
Theta (180°)	-12.911-12.05	-10.781-10.35	-10.561-9.95	-8.681-8.06	-8.111-7.11	-6.681-5.19	-6.271-9.03	-13.011-14.14	-12.741-12.15	-12.891-14.22	-14.571-14.56	-14.961-15.41	-15.461-15.67	-16.791-16.05	-13.771-12.11	-10.781-9.91	-8.051-8.7	-9.611-9.87	-10.261-11.09	-10.881-10.09	-9.781-9.84	-9.841-9.14	-9.491-10.35	-10.951-11.94					
Freq(Hz)	5.3GPol	Phi/Ant 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(



Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A.1

Theta	Phi	Gain	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(172.5°)	Phi(15°)	-10.41/10.36	-10.52/10.99	-12.68/12.45	-9.26/7.28	-6.78/6.64	-6.7/7.8	-9.86/12.25	-15.35/19.54	-17.88/15.62	-15.37/13.01	-12.01/12.43	-14.57/18.2	-17.9/18.34	-19.47/17.24	-13.34/11.57	-11.22/10.87	-10.9/12.7	-15.2/16.34	-17.44/18.55	-17.17/17.07	-13.34/10.22	-8.73/8.59	-8.47/8.65	-9.74/10.51		
Theta(180°)	Phi(15°)	-8.22/7.69	-7.38/6.46	-6.1/6.33	-6.19/6.98	-8.78/10.44	-11.98/17.42	-18.89/18.89	-18.41/11.23	-18.08/18.01	-17.67/14.94	-14.02/14.42	-17.08/17.82	-15.54/14.34	-11.8/11.71	-12.1/12.46	-12.91/13.73	-14.51/14.47	-15.33/16.95	-18.21/18.18	-18.68/18.76	-18.98/18.28	-14.83/13.11	-11.02/9.4	-9.01/9.08		
Theta(180°)	Phi(30°)	5.66/Pol.	Theta/Ant 2																								
Theta(180°)	Phi(45°)	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°)	Phi(7.5°)	-1.08/-1.8	-2.21/-4.4	-3.81/-5.4	-6.83/-9.07	-13.3/16.54	-15.35/18.81	-7.97/6.59	-5.19/3.41	-2.16/1.56	-1.14/1.07	-0.84/0.62	-0.82/1.01	-1.32/-1.81	-2.83/-3.61	-4.49/-6.12	-7.95/-10.49	-15.62/18.49	-13.41/9.9	-7.76/5.77	-3.98/2.73	-2.05/1.55	-1.21/0.64	-0.31/0.25	-0.25/0.48		
Theta(7.5°)	Phi(7.5°)	-1.94/-2.14	-3.29/-4.22	-4.82/-6.28	-9.35/-11.56	-14.3/18.08	-17.58/13.66	-7.97/4.83	-3.3/2.61	-1.58/0.66	-0.11/0.26	0.57/0.62	0.49/0.17	-0.64/-1.03	-3.4/4.73	-6.33/8.74	-11.7/14.29	-11.85/-7.78	-6.02/-5.18	-3.47/2.27	-1.76/1.54	-1.45/1.09	-0.92/-1.13	-1.49/-1.93			
Theta(15°)	Phi(7.5°)	-2.9/3.39	-4.7/5.56	-7.26/9.64	-12.96/18.27	-19.14/11.9	-7.82/6.77	-4.43/-2.48	-1.38/1.09	-1.01/0.82	-0.37/0.29	0.84/1	0.67/0.05	-0.62/-0.87	-1.54/2.25	-4.23/6.73	-9.08/12.09	-14.26/14.46	-12.91/9.54	-7.4/6.05	-4.41/3.26	-2.79/2.88	-3.16/-2.82	-2.03/-1.95	-2.2/3.12		
Theta(22.5°)	Phi(7.5°)	-3.62/4.77	-6.53/8.07	-11.05/18.72	-17.97/15.85	-11.03/7.16	-5.96/5.12	-3.37/2.33	-1.88/1.31	-0.69/0.2	0.19/0.51	0.66/0.71	0.41/0.09	-0.36/-1.08	-2.54/4.33	-6.64/9.3	-11.91/14.83	-19.3/13.81	-11.14/9.05	-6.97/5.93	-4.92/4.01	-3.1/2.49	-2.4/1.82	-1.78/2.09	-2.52/3.4		
Theta(30°)	Phi(7.5°)	-2.98/3.99	-6.24/9.44	-15.35/18.65	-13.88/11.39	-7.92/6.46	-6.61/5.02	-3.09/2.23	-2.04/2.3	-1.95/1.39	-0.91/0.47	-0.54/0.46	-0.54/0.7	-3.18/4.55	-6.73/8.67	-10.56/14.46	-18.86/14.51	-11.25/8.65	-7.35/6.96	-5.24/3.37	-3.98/1.41	-1.13/1.33	-1.55/2.31	-2.57/2.54			
Theta(37.5°)	Phi(7.5°)	-4.04/6.33	-9.97/16.47	-18.36/13.57	-8.54/7.68	-4.8/4.61	-1.6/5.97	-3.5/2.71	-3.34/3.88	-3.57/2.82	-2.37/1.27	-1/1	-0.96/0.99	-1.15/2.28	-4.73/6.2	-7.28/9.37	-15.68/17.53	-17.68/12.25	-9.03/7.89	-7.26/7.73	-1.36/0.71	-1.63/1.99	-1.99/2.11	-2.01/2.22			
Theta(45°)	Phi(7.5°)	-6.63/9.7	-11.12/14.43	-14.71/9.7	-6.92/4.64	-4.66/5.03	-4.48/5.37	-4.81/4.36	-4.67/4.42	-5.3/5.03	-4.41/5.61	-6.38/4.36	-4.75/4.42	-3.61/4.99	-8.34/7.81	-9.1/9.81	-13.74/15.78	-15.07/11.69	-10.2/6.82	-8.07/2.41	-0.75/1.76	-1.45/0.93	-1.41/2.2	-3.24/6.06			
Theta(60°)	Phi(7.5°)	-5.39/7.06	-11.83/12.79	-10.64/6.87	-4.73/4.33	-4.33/3.85	-5.46/7.38	-4.99/4.39	-5.38/4.27	-4.71/6.72	-5.87/9.96	-7.83/6.83	-8.52/7.67	-7.71/12.37	-14.45/10.45	-10.34/12.34	-11.77/13.32	-15.58/15.23	-9.25/8.59	-9.98/10.14	-6.2/2.63	-1.96/0.69	-1.37/2.16	-1.99/2.25	-2.72/4.96		
Theta(67.5°)	Phi(7.5°)	-3.52/7.84	-14.92/17.93	-11.72/7.88	-4.77/1.45	-4.85/3.66	-4.4/21.65	-5.11/4.2	-6.17/4.45	-4.49/6.06	-5.8/8.09	-11.88/7.46	-6.28/2.61	-6.38/9.66	-10.94/12.3	-16.24/13.44	-12.29/15.8	-14.81/15.97	-14.37/12.51	-13.57/9.4	-6.27/0.59	-3.92/1.33	-1.91/3.14	-2.03/2.66	-3.26/3.1		
Theta(75°)	Phi(7.5°)	-4.22/9.55	-15.84/13.7	-11.07/8.34	-5.28/4.47	-4.74/3.88	-4.44/7.18	-4.69/4.03	-6.35/4.78	-3.92/7.85	-7.07/7.44	-11.81/10.13	-7.38/5.07	-4.92/6.71	-8.51/10.77	-19.11/18.27	-18.14/15.46	-10.98/17.28	-14.19/9.47	-12.39/10.6	-6.95/2.25	-5.97/3.25	-2.43/2.07	-2.75/2.27	-1.83/2.05		
Theta(82.5°)	Phi(7.5°)	-4.63/7.96	-11.44/12.02	-11.71/9.45	-6.46/4.45	-4.33/3.46	-4.2/7.74	-5.36/4.02	-6.08/5.23	-4.62/7.93	-6.82/8.38	-14.26/9.65	-9.09/6.75	-4.73/6.01	-9.02/11.89	-12.84/15.94	-17.6/14.26	-10.14/14.35	-14.31/6.95	-9.7/11.81	-5.97/7.39	-8.92/4.53	-4.07/3.59	-2.7/1.81	-2.12/3.05		
Theta(90°)	Phi(7.5°)	-4.46/6.11	-11.11/13.25	-13.93/11.81	-7.72/5.32	-5.21/4.56	-4.22/6.2	-6.73/5.58	-1.6/6.57	-5.23/8.71	-7.38/6.47	-14.39/16.22	-9.16/7.35	-7.16/9.01	-11.68/11.8	-11.4/12.77	-11.9/13.2	-10.5/10.73	-14.74/8.02	-7.87/10.27	-6.86/12.1	-9.29/5.54	-7.65/5.15	-2.83/2.37	-2.36/3.74		
Theta(97.5°)	Phi(7.5°)	-5.22/6.55	-11.28/10.68	-9.57/9.37	-8.42/6.54	-6.56/5.69	-5.42/4.72	-5.4/7.27	-8.19/6.22	-8.82/9.24	-12.92/9.47	-9.68/9.74	-14.71/16.42	-11.59/15.1	-15.11/15.1	-14.71/13.2	-9.9/9.65	-15.31/11.65	-12.97/11.49	-12.73/14.87	-10.26/8.04	-10.26/8.04	-6.4/6.43	-3.51/2.93	-3.81/5.35		
Theta(105°)	Phi(7.5°)	-7.79/6.99	-8.39/8.43	-7.71/9.47	-9.17/7.4	-6.5/7.74	-5.74/4.82	-5.68/7.16	-11.55/8.11	-5.86/8.08	-9.73/11.12	-15.26/15.21	-18.49/12.77	-13.47/12.64	-10.94/10.88	-12.42/18.63	-18.78/15.03	-17.73/12.91	-18.95/18.94	-17.8/18.24	-17.63/14.72	-10.56/10.79	-17.99/9.61	-5.82/5.68	-3.45/5.29		
Theta(112.5°)	Phi(7.5°)	-11.18/9.99	-9.22/8.83	-7.5/7.55	-7.72/7.53	-8.82/8.13	-6.07/7.61	-8.89/9.7	-10.07/6.77	-8.76/9.17	-18.09/14.22	-15.88/18.19	-16.9/11.49	-17.42/17.02	-12.64/17.97	-17.97/12.59	-18.24/17.8	-14.13/15.65	-11.53/12.19	-11.9/13.44	-15.47/15.67	-13.92/13.74	-10.68/10.74	-4.16/6.96			
Theta(120°)	Phi(7.5°)	-9.26/12.61	-11.4/9.31	-9.57/9.58	-5.03/7.48	-5.13/6.64	-4.99/7.72	-14.63/12.38	-10.88/10.22	-10.39/16.57	-12.17/10.55	-14.77/14.83	-13.77/14.83	-14.39/19.08	-11.64/15.94	-14.77/16.1	-15.51/10.31	-12.53/13.27	-11.61/16.91	-19.04/19.18	-17.85/16.86	-17.71/17.47	-18.02/11.5	-5.72/5.14			
Theta(127.5°)	Phi(7.5°)	-9.51/10.1	-7.3/5.78	-4.91/4.39	-5.36/6.84	-5.93/5.8	-6.05/11.18	-18.88/11.41	-11.69/12.27	-12.62/14.05	-16.38/15.94	-14.1/12.62	-9.2/10.13	-13.67/13.82	-11.16/18.53	-14.1/11.65	-14.9/18.78	-15.46/11.22	-11.78/14.1	-14.28/17.82	-17.85/18.06	-17.95/17.83	-10.66/10.9	-15.51/18.88	-8.82/8.27		
Theta(135°)	Phi(7.5°)	-12.99/12.29	-7.62/4.54	-3.32/2.84	-3.37/4.59	-6.03/7.58	-11.22/18.76	-15.93/14.21	-13.53/14.4	-13.03/13.13	-15.97/18.04	-18.31/14.35	-13.63/12.01	-10.6/9.26	-8.8/10.14	-11.31/12.59	-17.76/15.72	-16.27/9.59	-11.39/18.19	-14.92/10.87	-10.44/17.69	-18.33/16.72	-13.68/9.91	-12.69/12.32	-11.15/8.9		
Theta(142.5°)	Phi(7.5°)	-8.65/18.78	-16.31/9.67	-5.6/3.73	-3.34/3.57	-5.12/5.15	-13.27/13.98	-11.02/8.45	-7.97/10.76	-18.06/16.22	-13.65/16.04	-19.14/17.04	-17.49/17.82	-13.26/13.67	-18.64/17.58	-18.86/13.18	-17.88/12.42	-8.83/12.45	-19.12/15.19	-12.67/11.16	-11.73/13.9	-15.39/13.55	-17.75/14.26	-8.61/6.08	-6.54/5.8		
Theta(150°)	Phi(7.5°)	-10.21/14.43	-18.57/12.16	-8.7/6.53	-5.09/4.5	-5.48/7.5	-9.01/8.68	-7.7/21.61	-5.22/6.5	-10.69/15.81	-14.56/12.12	-15.04/17.83	-17.89/12.64	-10.55/15.02	-14.46/14	-18.31/19.29	-13.79/15.56	-17.59/14.96	-13.64/9.87	-12.85/18.69	-17.65/13.04	-7.03/8.29	-16.35/18.27	-14/8.41	-6.22/7.38		
Theta(157.5°)	Phi(7.5°)	-17.61/17.82	-11.71/7.68	-5.91/5.48	-5.05/5.57	-7.23/7.41	-9.76/7.48	-4.37/0.47	-7.28/14.71	-19.01/16.44	-14.48/15.45	-17.91/19.01	-18.99/10.33	-18.51/18.55	-19.06/17.87	-16.51/15.25	-16.38/18.8	-18.32/15.44	-12.09/12.95	-10.16/13.45	-11.75/13.99	-9.9/9.82	-9.18/11.28	-11.57/13.29			
Theta(165°)	Phi(7.5°)	-5.8/6.69	-9.02/10.47	-10.24/7.68	-6.82/6.95	-5.5/4.48	-6.27/5.88	-6.06/6.02	-4.23/3.63	-4.6/7.13	-11.55/15.94	-16.31/14.55	-13.11/12.43	-12.59/13.91	-17.98/17.49	-11.99/15.58	-14.15/12.9	-17.98/15.9	-14.51/12.9	-11.61/10.44	-10.67/11.16	-11.73/13.9	-15.39/13.55	-17.75/14.26	-8.61/6.08		
Theta(172.5°)	Phi(7.5°)	-13.15/10.52	-7.35/5.99	-4.57/4.39	-4.42/4.65	-3.99/4.37	-4.3/3.32	-2.15/1.74	-2.38/3.74	-5.85/8.38	-9.24/9.94	-11.14/9	-8.81/8.93	-10.02/12.08	-14.12/16.59	-17.83/17.8	-18.52/16.53	-13.54/11.73	-10.21/9.19	-9.15/8.91	-9.31/10.41	-11.12/11.39	-13.43/17.47	-18.66/18.79	-17.61/16.74		
Theta(180°)	Phi(7.5°)	-14.11/16.2	-18.52/18.41	-18.15/19.3	-14.03/12.53	-10.39/8.34	-6.99/6.8	-7.34/9.06	-11.55/12.23	-11.38/10.55	-10.36/11.08	-12.95/15.51	-18.18/19.1	-18.66/18.57	-17.39/17.95	-15.46/12.96	-11.43/10.98	-10.81/10.28	-9.79/9.34	-8.5/7.65	-7.53/8.2	-7.84/7.5	-7.83/8.33	-9.66/10.08	-10.59/11.25		
Theta(180°)	Phi(30°)	5.785/Pol.	Theta/Ant 2																								
Theta(180°)	Phi(45°)	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°)	Phi(7.5°)	-6.9/4.84	-2.98/2.02	-1.36/0.56	-0.22/0.38	-0.07/0.24	-0.18/0.5	-0.55/1.1	2.1/3.12	-4.29/5.85	-7.91/10.33																



Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A.1

Theta (°)	-14.75/-15.85	-13.46/-11.68	-9.07/-9.11	-11.99/-10.56	-9.54/-8.89	-7.49/-13.97	-12.64/-5.71	-4.83/-3.48	-3.04/-3.78	-4.59/-5.39	-5.81/-9.8	-19.04/-15.51	-10.51/-6.32	-6.18/-8.25	-13.03/-7.87	-10.35/-14.19	-19.12/-18.2	-14.88/-17.21	-16.54/-15.39	-18.26/-15.75	-13.99/-13.19	-9.95/-13.29	-18.61/-18.92	-18.91/-14.12
Theta (135°)	-12.06/-15.38	-17.81/-13.07	-18.25/-10.38	-7.42/-3.76	-10.93/-10.66	-7.21/-7.87	-13.54/-14.99	-9.63/-6.48	-4.79/-4.43	-4.49/-4.38	-5.65/-10.59	-18.41/-19.31	-10.46/-4.5	-4.03/-5.92	-10.15/-13.18	-11.63/-18.85	-17.38/-18.12	-18.46/-19.07	-19.16/-14.6	-13.85/-10.2	-9.63/-9.08	-12.57/-18.2	-17.2/-18.2	-16.79/-13.02
Theta (142.5°)	-7.54/-14.17	-15.58/-8.9	-12.53/-14.25	-7.65/-5.92	-7.88/-9.85	-9.69/-9.15	-12.08/-12.15	-8.74/-7.34	-5.46/-3.4	-2.14/-2.29	-3.62/-3.51	-13.91/-15.14	-7.93/-4.97	-5.55/-7.32	-13.91/-19.05	-16.77/-13.33	-19.09/-19.07	-15.72/-16.94	-14.06/-9.7	-11.27/-9.39	-6.93/-6.88	-10.14/-18.51	-16.96/-10.14	-6.89/-5.9
Theta (150°)	-8.12/-7.74	-13.21/-16.25	-13.38/-10.72	-8.36/-10.16	-13.75/-11.82	-9.27/-11.04	-9.37/-10.75	-5.23/-3.77	-2.96/-2.86	-2.64/-3.03	-5.15/-7.27	-11.54/-17.93	-14.76/-9.94	-10.36/-13.53	-13.36/-11.78	-10.72/-18.96	-13.61/-15.72	-19.06/-14.61	-13.97/-11.04	-14.06/-17.13	-14.49/-12.82	-13.52/-15.42	-18.44/-19.12	-14.91/-7.32
Theta (157.5°)	-18.27/-16.9	-10.81/-9.19	-9.94/-15.01	-17.43/-14.6	-10.12/-4.44	-6.31/-4.99	-9.64/-8.74	-6.78/-5.94	-6.19/-7.24	-7.65/-9.17	-14.49/-15.12	-16.47/-17.27	-15.06/-14.19	-11.51/-10.89	-12.11/-10.65	-9.3/-9.34	-10.07/-14.69	-13.16/-16.69	-14.32/-18.08	-13.83/-18.01	-17.56/-12.17	-8.89/-9.63	-9.02/-9.96	-17.51/-7.28
Theta (165°)	-18.44/-14.36	-17.41/-19.02	-12.53/-15.51	-13.73/-12.75	-11.85/-13.49	-6.93/-9.13	-10.84/-13.68	-9.61/-8.4	-9.05/-8.75	-10.93/-9.23	-13.87/-19.23	-18.78/-17.13	-18.05/-19.13	-12.79/-11.5	-7.41/-7.49	-8.86/-10.88	-13.71/-18.65	-17.82/-12.7	-18.05/-18.38	-18.15/-16.38	-11.75/-14.33	-11.74/-9.43	-6.14/-6.32	-7.81/-3.4
Theta (172.5°)	-12.24/-13.23	-13.89/-15.9	-16.39/-14.96	-13.71/-12.99	-11.81/-11.64	-13.25/-14.36	-14.71/-13.96	-13.66/-12.83	-11.22/-10.94	-11.43/-11.58	-14.34/-16.93	-16.96/-18.3	-18.67/-18.72	-15.52/-12.93	-12.13/-12.46	-13.83/-15.85	-18.28/-19.29	-18.73/-18.52	-18.82/-18.01	-16.38/-13.05	-12.87/-14.04	-14.96/-15.55	-14.88/-14.17	-14.12/-12.98
Theta (180°)	-15.07/-14.75	-15.56/-15.2	-16.27/-16.49	-15.02/-15.36	-17.2/-18.45	-19.56/-16.42	-15.86/-15.18	-13.07/-12.09	-11.38/-9.96	-8.73/-9.98	-8.8-8.59	-9.51/-15.2	-14.34/-16.99	-17.62/-18.32	-18.57/-17.4	-17.06/-17.4	-18.22/-18.61	-17.61/-17.54	-17.71/-16.32	-16.64/-17.95	-16.42/-17.34	-18.86/-16.68	-17.58/-17.33	-14.86/-14.87
Theta (180°)	2.45GPol.	PhiAnt. 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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°)	-6.17/-6.01	-5.87/-5.81	-5.85/-5.99	-6.53/-6.69	-7.11/-7.58	-8.19/-8.91	-9.19/-9.15	-8.91/-8.85	-8.24/-7.73	-7.59/-7.59	-7.48/-7.27	-6.69/-5.96	-5.11/-4.61	-4.54/-4.72	-5.18/-5.72	-6.66/-7.32	-8.14/-8.94	-9.61/-9.85	-9.44/-8.75	-7.97/-7.42	-7.13/-7.62	-6.3/-6.12	-5.98/-5.96	-6.03/-6.33
Theta (7.5°)	-5.22/-5.03	-5.14/-5.29	-5.4/-5.68	-6.58/-6.52	-7.43/-8.51	-8.71/-10.89	-9.16/-9.3	-8.25/-8.14	-6.71/-6.13	-5.79/-5.69	-5.73/-5.97	-6.07/-6.34	-6.18/-5.88	-5.48/-5.27	-6.67/-7.33	-8.04/-8.51	-9.61/-8.69	-8.61/-8.57	-8.37/-8.18	-7.21/-6.66	-6.02/-6.55	-5.23/-5.66	-5.01/-5.51	
Theta (15°)	-4.11/-3.85	-3.88/-4.15	-4.57/-5.09	-5.81/-6.65	-7.86/-9.3	-11.02/-12.63	-12.38/-10.3	-8.41/-7.29	-6.23/-5.56	-5.15/-4.49	-4.84/-5.03	-5.62/-6.41	-6.93/-6.92	-6.66/-6.94	-5.18/-4.63	-4.39/-4.62	-5.43/-6.29	-7.17/-7.96	-8.42/-8.64	-8.94/-9.14	-9.21/-9.2	-9.26/-8.81	-8.23/-7.24	-5.59/-4.41
Theta (22.5°)	-3.61/-3.27	-3.39/-3.65	-4.37/-5.4	-6.11/-6.94	-9.28/-10.79	-12.13/-13.61	-13.51/-11.5	-9.21/-8.72	-6.78/-5.92	-5.27/-4.57	-4.15/-4.43	-5.53/-6.66	-7.79/-8.2	-7.41/-6.15	-4.83/-3.8	-3.47/-3.67	-4.61/-5.8	-7.54/-9.04	-9.75/-9.92	-9.93/-10.26	-10.82/-11.12	-10.88/-10.09	-8.71/-8.18	-5.95/-5.23
Theta (30°)	-4.34/-3.87	-3.83/-4.26	-5.32/-6.47	-7.88/-9.29	-10.25/-11.38	-12.11/-12.67	-12.65/-11.25	-9.88/-8.37	-7.73/-6.91	-5.53/-4.3	-3.68/-3.92	-4.84/-6.35	-7.88/-8.51	-7.95/-6.67	-5.38/-4.19	-3.45/-3.5	-4.59/-6.3	-8.82/-11.49	-11.49/-10.5	-10.75/-10.86	-11.95/-12.73	-12.51/-11	-9.39/-8.08	-6.48/-5.7
Theta (37.5°)	-6.22/-5.54	-5.66/-6.44	-7.46/-8.33	-9.48/-9.23	-12.12/-8.55	-15.31/-10.12	-16.92/-7.99	-10.69/-6.33	-8.61/-7.24	-6.17/-4.4	-3.36/-3.44	-4.31/-5.61	-6.72/-6.87	-6.5/-6.23	-5.93/-5.33	-4.84/-4.8	-5.2/-6.88	-9.82/-12.03	-11.48/-10.03	-9.64/-10.37	-11.79/-13.03	-13.81/-13.01	-10.77/-9.38	-7.91/-6.79
Theta (45°)	-8.41/-8.1	-10.19/-12.31	-14.35/-14.29	-10.74/-7.86	-6.47/-6.44	-5.48/-9.1	-7.91/-5.25	-3.64/-3.63	-4.89/-6.66	-6.38/-5.5	-4.42/-5.07	-5.59/-5.77	-5.84/-6.06	-6.51/-6.66	-6.54/-5.73	-5.71/-7.65	-8.91/-10.67	-10.11/-8.52	-8.87/-10.54	-13.28/-13.75	-17.83/-12.27	-17.86/-12.9	-9.92/-9.29	
Theta (52.5°)	-7.78/-8.81	-11.75/-15.54	-17.24/-16.64	-9.86/-6.54	-4.82/-4.72	-6.11/-8.52	-7.82/-4.43	-2.29/-2.25	-3.36/-4.8	-4.11/-6.52	-4.98/-3.9	-3.33/-3.66	-4.29/-4.62	-5.76/-5.71	-6.71/-7.67	-7.95/-9.93	-9.16/-8.45	-10.17/-10.67	-9.97/-11.48	-16.73/-19.45	-15.91/-15.09	-18.11/-15.07	-10.09/-7.69	
Theta (60°)	-7.26/-8.52	-12.86/-17.52	-17.54/-12.23	-9.19/-6.82	-3.71/-3	-3.63/-5.32	-5.81/-3.66	-1.56/-1.23	-2.35/-3.8	-3.96/-3.19	-3.01/-3.58	-4.07/-4.07	-4.21/-7.5	-5.32/-6.04	-7.23/-8.84	-9.61/-8.23	-6.29/-5.48	-5.94/-7.37	-9.01/-9.37	-9.73/-11.74	-15.41/-17.06	-15.49/-14.04	-15.82/-13.39	-9.48/-7.82
Theta (67.5°)	-10.17/-13.41	-17.41/-14.98	-9.67/-8.58	-7.96/-6.52	-4.13/-4.37	-3.41/-3.61	-2.98/-1.28	0.14/-0.16	-0.98/-2.46	-3.16/-3.1	-3.53/-4.27	-4.36/-2.45	-4.62/-5.49	-6.33/-7.05	-9.05/-10.86	-11.39/-8.88	-6.44/-6.57	-6.42/-6.35	-9.51/-9.12	-9.44/-11.37	-16.74/-17.7	-19.18/-10.94	-19.24/-19.04	-12.25/-10.25
Theta (75°)	-9.52/-12.48	-17.71/-11.83	-7.12/-6.26	-6.47/-1.1	-3.63/-2.92	-2.87/-2.87	-1.95/-0.1	1.23/1.3	0.29/-1.16	-1.83/-2.58	-1.47/-1.08	-6.34/-5.71	-1.91/-4.77	-8.95/-9.98	-10.54/-10.86	-10.44/-10.88	-9.81/-10.75	-13.33/-13.09	-10.92/-10.99	-10.51/-10.99	-12.81/-12.9	-12.85/-11.97	-12.85/-9.55	
Theta (82.5°)	-10.31/-14.13	-19.26/-11.82	-7.11/-6.18	-6.06/-5.27	-4.51/-3.13	-2.27/-2.04	-1.21/-0.48	1.58/1.46	0.43/-0.68	-1.19/-1.42	-2.85/-5.57	-6.98/-6.69	-7.08/-8.06	-9.39/-9.39	-9.35/-9.92	-10.54/-9.6	-8.87/-7.98	-7.82/-8.51	-8.77/-7.37	-6.86/-7.85	-10.51/-12.42	-9.93/-8.41	-11.94/-18.93	-13.81/-10.04
Theta (90°)	-10.83/-15.41	-18.35/-10.57	-6.31/-5.7	-5.41/-4.16	-4.28/-4.12	-3.51/-3.02	-1.83/0.13	1.52/1.69	0.84/-0.27	-0.71/-1.28	-2.57/-4.48	-5.61/-5.54	-5.71/-7.01	-8.34/-9.07	-9.22/-10.28	-11.47/-9.78	-7.13/-5.8	-6.39/-7.71	-6.71/-5.27	-5.71/-5.27	-12.61/-13.4	-9.66/-7.64	-12.51/-18.96	-14.29/-10.16
Theta (97.5°)	-11.32/-13.07	-17.98/-10.8	-6.87/-6.47	-4.77/-4.92	-2.83/-3.13	-2.24/0.3	1.10/1.69	0.08/-0.92	-1.04/-1.27	-2.86/-4.74	-5.29/-6.5	-7.78/-10.68	-11.83/-13.32	-12.44/-12.94	-12.59/-14.93	-11.47/-9.87	-7.74/-6.87	-6.91/-6.47	-7.42/-11.65	-14.64/-11.02	-9.89/-9.21	-12.74/-17.96	-12.84/-10.43	
Theta (105°)	-15.61/-14.73	-14.05/-10.55	-7.63/-7.4	-7.44/-4	-3.43/-2.44	-2.22/-2.76	-2.29/-0.38	1.08/1.26	0.41/-0.87	-1.21/-1.98	-3.41/-5.98	-7.64/-7.96	-9.18/-11.7	-15.88/-18.59	-14.03/-13.09	-14.56/-14.13	-9.93/-7.51	-6.63/-7.33	-8.06/-9.26	-9.71/-10.75	-9.23/-7.81	-6.81/-7.12	-10.48/-18.89	-14.13/-12.99
Theta (112.5°)	-13.68/-13.84	-12.03/-11.13	-8.23/-3.72	-6.31/-7.2	-3.66/-2.73	-2.04/-1.99	-1.39/0.1	0.74/0.58	-0.38/-1.39	-1.71/-2.02	-3.47/-6.01	-8.16/-9.43	-10.53/-13.3	-15.22/-17.08	-13.67/-13.35	-8.47/-6.76	-7.39/-8.33	-7.58/-9.62	-7.38/-7.17	-10.83/-10.04	-8.27/-8.66	-11.04/-13.17	-11.02/-10.08	
Theta (120°)	-11.61/-11.8	-11.26/-11.43	-9.57/-7.87	-7.44/-6.05	-5.15/-4.59	-4.46/-3.79	-2.45/-0.72	0.19/0.21	-1.48/-2.57	-2.42/0.81	-3.99/-5.62	-9.31/-10.06	-10.72/-12.08	-15.92/-17.72	-18.81/-18.95	-13.66/-13.73	-8.22/-4.99	-5.29/-6.28	-7.96/-10.33	-13.41/-13.51	-10.97/-8.01	-6.05/-6.67	-6.91/-6.9	-10.41/-8.85
Theta (127.5°)	-10.09/-10.11	-10.34/-12.8	-12.98/-9.6	-7.31/-6.86	-4.94/-4.94	-5.99/-6.42	-5.05/-3.03	-1.81/-1.88	-2.92/-4.12	-3.85/-3.6	-4.47/-6.81	-9.91/-11.89	-12.51/-14.27	-17.99/-18.27	-18.87/-17.78	-14.14/-10.22	-7.4-2.2	-7.67/-11.31	-14.91/-11.76	-8.65/-7.16	-6.31/-6.05	-6.26/-7.08	-9.4/-12.97	-12.85/-10.15
Theta (135°)	-9.42/-8.77	-8.72/-10.35	-13.92/-13.66	-10.86/-8.46	-7.35/-6.92	-6.95/-8.88	-4.33/-2.94	-2.19/-2.4	-3.2/-8.2	-5.84/-6.38	-7.85/-10.79	-14.85/-16.7	-16.25/-15.52	-15.96/-16.45	-16.85/-18.13	-17.69/-14.14	-10.89/-8.68	-11.59/-12.51	-10.33/-8.22	-7.54/-8.82	-10.76/-13.5	-16.88/-17.5	-12.05/-9.58	
Theta (142.5°)	-10.86/-10.46	-9.83/-10.52	-12.11/-11.96	-10.55/-8.82	-9.19/-10.77	-11.97/-11.7	-11.97/-11.7	-5.99/-3.16	-2/-2.12	-3.27/-5.3	-7.88/-10.13	-12.43/-15.64	-18.09/-17.58	-19.09/-19.42	-18.22/-18.91	-18.95/-17.2	-15.38/-14.1	-13.51/-11.6	-9.85/-8.77	-8.54/-6.42	-10.98/-14.08	-18.45/-18.72	-18.59/-15.86	-12.05/-10.44
Theta (150°)	-12.86/-13.06	-13.29/-13.85	-14.27/-13.36	-11.73/-10.58	-10.81/-13.26	-17.47/-18.31	-9.89/-6.06	-4.61/-4.51	-5.08/-6.16	-7.71/9.04	-10.46/-11.48	-12.77/-13.81	-15.57/-15.93	-15.41/-15.7	-17.33/-18.59	-17.79/-15.44	-13.18/-11.25	-10.04/-9.79	-9.98/-10.56	-11.31/-12.51	-14.81/-18.68	-18.99/-18.1	-18.25/-15.34	-13.56/-12.6
Theta (157.5°)	-15.98/-15.94	-17.14/-17.73	-18.14/-18.69	-15.11/-13.18	-13.18/-14.89	-17.11/-25.25	-18.49/-13.9	-11.32/-10.53																



Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A.1

θ (180°)	-7.41/7.92	-7.85/8.17	-8.64/10.44	-11.74/13.45	-15.76/18.13	-19.15/18.07	-17.21/13.23	-10.49/8.39	-6.86/5.95	-5.13/4.27	-3.56/3.04	-2.66/2.65	-2.74/2.68	-2.81/3.75	-5.35/7.35	-8.51/10.3	-14.43/18.12	-18.24/14.48	-11/9.38	-8.85/8.08	-7.13/6.41	-5.75/5.21	-4.98/5.25	-5.8/6.62
Freq(Hz)	5.63Pol.	PhiAnt.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)Φ(7.5°)	Φ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)
θ(0°)	0.64/0.03	-1.12/-2.22	-3.44/-5.73	-9.38/-14.33	-18.73/-16.47	-11.85/-8.71	-4.78/-2.96	-1.56/-0.35	0.67/1.15	1.49/1.82	1.76/1.65	1.74/1.38	0.25/-1.04	-1.85/-3.36	-6.16/-10.31	-15.66/-18.14	-17.39/-10.74	-6.97/-4.21	-2.32/-1.07	-0.19/0.65	1.41/1.81	1.95/1.21	2.21/1.99	1.51/1.02
θ(7.5°)	0.05/-0.53	-2.27/-4.71	-6.95/-9.99	-11.27/-12.5	-10.91/-8.41	-5.84/-3.88	-2.36/-1.24	-0.26/0.46	1.03/1.35	1.51/1.62	1.59/1.43	1.4/1.54	1.28/0.27	-0.69/-1.18	-1.85/-3.41	-6.04/-9.19	-13.43/-17.79	-17.32/-10.83	-8.84/-3.97	-1.89/-0.43	0.66/1.3	1.59/1.88	2.1/1.89	1.4/0.59
θ(15°)	-0.22/-1.22	-2.47/-3.52	-4.04/-4.05	-4.43/-5	-5.44/-5.22	-4.36/-3.49	-2.57/-1.76	-0.99/-0.53	-0.21/-0.06	0.19/0.58	0.96/1.31	1.51/1.73	1.86/1.61	0.94/1.6	-0.58/-1.6	-3.25/-4.82	-6.19/-8	-11.65/-18.9	-17.09/-9.43	-5.24/-2.55	-1.03/-0.25	0.02/0.24	0.52/0.47	0.33/0.28
θ(22.5°)	1.64/0.17	0.41/0.37	-1.23/-1.36	-2.15/-3.13	-4.3/4.81	-4.45/-3.62	-2.59/-1.76	-1.45/-1.3	-1.72/-2.06	-2.27/2.02	-1.15/0.01	0.97/1.51	1.61/1.4	0.73/0.43	-2.27/4.88	-7.66/-9.02	-9.02/-10.46	-14.63/-19.06	-17.04/-9.66	-5.77/-3.8	-3.06/-2.87	-2.58/-1.44	0.13/1.52	2.02/3
θ(30°)	-0.9/-2.16	-2.23/-1.79	-1.86/-2.76	-4.13/-3.56	-6.4/-6.28	-5.03/-3.5	-2.29/-1.87	-1.69/-1.79	-2.12/-2.84	-3.83/-4	-2.38/-0.26	0.89/0.95	0.13/-1.05	-2.85/-5.61	-10.1/-15.59	-18/-17.96	-18.79/-10.44	-17.07/-12.55	-9.52/-7.79	-6.01/-4.14	-2.83/-2.67	-3.23/-3.17	-1.82/-0.15	0.66/0.34
θ(37.5°)	-1.68/-2.13	-2.4/-2.84	-4.12/-6.39	-9.25/-11.01	-10.49/-8.4	-5.9/-3.26	-1.72/-1.04	-1.08/1.56	-2.35/-3.42	-4.45/-3.9	-1.83/-0.16	0.6/0.48	-0.46/-2.37	-5.07/-9.39	-12.88/-17.58	-18.71/-18.51	-18.51/-18.22	-18.43/-15.69	-9.68/-8.4	-7.72/-5.78	-4.04/-3.38	-3.33/-5.67	-3.56/-1.26	-0.72/-1.11
θ(45°)	-1.86/-1.37	-2.35/-3.96	-5.85/-7.64	-8.72/-9.4	-7.76/-9.09	-8.04/-5.31	-3.13/-1.6	-1.11/-1.44	-2.86/-1.9	-3.61/-2.22	-1.06/-0.4	-0.16/-0.07	-0.15/-0.46	-1.31/-2.54	-4.41/-7.14	-12.01/-14.39	-16.19/-17.68	-11.5/-9.65	-10.07/-12.44	-11.54/-7.33	-3.68/-2.75	-4.07/-6.38	-5.04/-2.55	-1.94/-2.38
θ(52.5°)	-1.87/-1.82	-3.3/-3.97	-4.52/-7.4	-7.17/-8.49	-9.49/-11.1	-12.76/-9.72	-4.38/-1.32	-0.41/-0.75	-2.97/-5.18	-3.92/-2.08	-0.97/-0.99	-1.49/-1.47	-1.83/-2.57	-3.23/-4.84	-8.36/-12.87	-16.25/-18.97	-17.36/-17.91	-18.23/-17.6	-13.12/-13.41	-19.03/-10.53	-6.54/-4.69	-4.93/-6.72	-4.52/-2.52	-2.91/-3
θ(60°)	-3.19/-4.28	-6.07/-5.17	-5.13/-7.3	-9.45/-10.42	-10.73/-11.1	-8.97/-8.8	-6.02/-1.01	0.44/0.03	-2.15/-4.44	-3.45/-2.08	-0.99/-0.85	-1.43/-1.52	-2.60/-3.03	-3.19/-4.01	-6.44/-9.22	-9.98/-10.55	-13.93/-14.97	-9.02/-8.91	-15.54/-18.38	-11.16/-9.3	-7.35/-9.98	-11.79/-9.26	-4.88/-3.92	-6.28/-5.17
θ(67.5°)	-5.78/-12.23	-11.37/-6.9	-7.88/-11.69	-13.29/-12.95	-16.41/-14.25	-9.97/-8.3	-6.25/-1.6	-0.75/-0.97	-2.25/-3.25	-3.19/-3.49	-2.68/-2.44	-2.89/-3.15	-2.72/-2.95	-4.21/-7.53	-10.89/-11.36	-10.84/-15.66	-17.92/-18	-18.06/-10.36	-10.34/-13.52	-12.36/-7.28	-7.16/-10.25	-11.11/-12.98	-7.37/-5.43	-7.62/-6.58
θ(75°)	-7.22/-15.68	-10.73/-8.51	-11.31/-15.42	-18.55/-17.8	-18.54/-10.66	-7.03/-4.32	-5.21/-1.88	-1.37/-1.47	-2.17/-2.46	-2.67/-4.57	-3.81/-2.48	-2.5/-3.4	-3.19/-3.02	-4.05/-6.04	-12.65/-11.41	-9.87/-12.5	-17.78/-18.11	-11.96/-7.57	-9.18/-7.53	-6.9/-6.11	-6.04/-10.9	-13.68/-12.62	-8.69/-8.18	-12.06/-6.76
θ(82.5°)	-9.36/-15.42	-11.03/-13.41	-17.99/-15.41	-17.74/-15.74	-19.37/-7.72	-6.73/-5.18	-5.97/-2.16	-2.46/-2.17	-2.44/-2.17	-2.84/-5.7	-5.45/-3.92	-3.52/-4.08	-3.45/-3.01	-4.52/-9.4	-17.62/-12.88	-9.64/-12.66	-12.76/-18.2	-12.77/-5.61	-6.89/-10.25	-6.66/-5.46	-6.81/-9.06	-13.62/-16.45	-11.66/-13.08	-15.82/-6.12
θ(90°)	-14.87/-12.96	-9.73/-15.87	-19.46/-17.26	-19.27/-18.37	-11.29/-5.79	-5.37/-3.14	-4.4/-1.76	-3.02/-3.17	-2.71/-2.54	-2.78/-1.65	-6.91/-5.37	-4.41/-4.33	-3.79/-3.58	-5.16/-8.82	-15.4/-14.75	-11.22/-16.06	-13.45/-13.25	-17.64/-6.01	-6.18/-6.16	-7.48/-7.61	-7.79/-10.5	-9.34/-14.07	-19/-18.7	-15/-9.05
θ(97.5°)	-17.41/-11.57	-13.3/-18.2	-17.91/-12.98	-17.87/-11.87	-9.74/-8.48	-4.44/-3.83	-4.78/-2.26	-3.75/-3.31	-2.96/-2.6	-3.25/-6.22	-7.44/-6.03	-4.35/-6.44	-4.49/-1.48	-4.35/-7.22	-11.45/-15.53	-11.05/-8.87	-10.52/-13.13	-10.72/-8.71	-11.77/-0.6	-13.3/-7.6	-10.29/-15.61	-18.85/-19.02	-15.71/-10.88	-15.71/-10.88
θ(105°)	-12.56/-11.9	-16.65/-16.38	-16.78/-12.81	-16.98/-11.04	-8.41/-4.83	-3.57/-3.93	-4.07/-2.88	-4.69/-4.15	-3.07/-3.42	-3.29/-6.21	-7.44/-6.03	-4.24/-4.58	-4.43/-4.46	-4.07/-9.17	-11.3/-18.07	-12.09/-17.22	-13.77/-6.61	-8.12/-13.39	-10.47/-13.9	-10.89/-15.9	-13.66/-16.62	-18.02/-18.91	-15.83/-13.29	-15.83/-13.29
θ(112.5°)	-9.64/-10	-18.84/-13.76	-17.14/-16.09	-19.27/-10.61	-9.4/-8.59	-9.78/-4.95	-5.31/-3.59	-5.17/-3.76	-3.25/-2.76	-3.39/-6.77	-10.1/-9.26	-5.69/-4.46	-4.11/-5.15	-5.88/-6.18	-8.43/-12.12	-12.37/-15.09	-16.76/-9.38	-12.21/-11.54	-5.85/-8.74	-14.31/-17.45	-12.67/-7.88	-12.42/-14.01	-14.71/-17.89	-16.59/-18.2
θ(120°)	-10.11/-15	-17.48/-13.2	-19.24/-15.62	-18.73/-14.5	-17.03/-12.54	-12.27/-9.38	-10.49/-7.38	-8.57/-7.47	-3.23/-4.41	-5.29/-7.15	-11.03/-10.63	-6.42/-3.94	-3.46/-4.44	-5.77/-6.44	-10.82/-8.05	-10.85/-14.95	-17.94/-10.16	-7.37/-10.13	-15.56/-8.84	-8.32/-17.18	-16.35/-11.58	-7.92/-10.36	-18.64/-14.44	-19.07/-17.19
θ(127.5°)	-14.69/-18.52	-16.65/-15.63	-13.64/-9.25	-8.92/-8.83	-12.21/-17.02	-18.42/-17.24	-14.28/-8.84	-10.57/-3.41	-5.06/-6.83	-6.11/-8.25	-11.06/-11.54	-9.64/-5.33	-4.05/-4.79	-19.21/-9.65	-8.05/-6.44	-9.85/-9.39	-14.26/-15.44	-12.76/-9.51	-13.26/-15.51	-9.57/-4.44	-8.44/-14.77	-10.44/-10.5	-16.08/-17.97	-18.82/-18.2
θ(135°)	-12.06/-16.56	-17.44/-17.83	-15.19/-10.8	-8.87/-6.82	-6.67/-7.96	-9.27/-10.07	-8.82/-7.55	4.03/-3.41	-5.12/-6.71	-5.69/-6.12	-6.92/-8.57	-7.41/-9.49	-3.78/-3.01	-4.27/-5.86	-6.64/-7.37	-12.96/-14.84	-17.86/-11.43	-11.74/-18.31	-13.77/-9.94	-13.63/-10.01	-5.73/-6.23	-14.68/-13.2	-18.93/-14.66	-11.14/-9.84
θ(142.5°)	-12.63/-14.92	-15.84/-15.18	-11.99/-8.61	-6.48/-7.31	-11.31/-10.08	-4.32/-3.55	-4.94/-5.52	-4.73/-4.47	-6.29/-8.21	-7.61/-7.37	-9.45/-10	-8.76/-6.82	-5.38/-4.9	-5.28/-6.69	-6.02/-8.54	-12.89/-17.79	-10.24/-7.75	-7.74/-12.17	-18.28/-12	-15.45/-18.71	-14/-12.66	-18.11/-13.45	-13.89/-10.84	-10.63/-10.2
θ(150°)	-19.09/-19.07	-12.05/-10.79	-10.45/-17.45	-19.34/-16.1	-17.71/-13.51	-8.68/-7.12	-7.36/-6.65	-5.74/-6.13	-9.88/-15.4	-16.86/-13.45	-12.32/-10.9	-10.75/-10.34	-9.03/-8.61	-9.87/-10.13	-9.96/-11.1	-17.51/-14.1	-11.71/-15.81	-11.71/-15.81	-12.41/-14.56	-14.89/-14.21	-15.11/-18.64	-17.89/-15.69	-15.41/-13.29	-15.41/-13.29
θ(157.5°)	-18/-17.59	-13.95/-12.84	-13.37/-18.41	-17.75/-18.88	-15.2/-11.91	-9.48/-9.08	-10.2/-9.72	-7.9/-6.89	-7.63/-10.46	-14/-14.88	-13.69/-14.26	-15.77/-13.86	-10.02/-7.82	-6.36/-5.87	-6.21/-6.37	-5.64/-5.89	-5.92/-4.84	-4.42/-5.04	-6.21/-7.59	-8.87/-10.71	-12.05/-14.03	-15.44/-16.94	-18.15/-17.95	-19.32/-17.46
θ(165°)	-14.91/-14.72	-13.59/-14.45	-14.53/-12.89	-12.15/-12.64	-13.43/-12.29	-11.19/-10.27	-10.77/-10.72	-9.84/-9.16	-9.74/-11.72	-14.82/-17.4	-17.11/-16.86	-16.67/-14.52	-12.51/-11.34	-11.53/-11.61	-9.88/-7.6	-5.76/-4.45	-3.28/-2.88	-3.27/-4.56	-6.62/-8.48	-12.42/-13.58	-12.48/-13.68	-16.3/-18.58	-16.64/-18.43	-13.82/-12.27
θ(172.5°)	-17.97/-15.24	-12.51/-11.51	-10.62/-10.48	-10.85/-10.79	-11.07/-11.62	-11.26/-10.03	-9.72/-8.42	-8.13/-7.77	-7.72/-8.49	-9.72/-11.34	-17.08/-13.04	-9.96/-9.89	-6.24/-9.44	-3.95/-3.68	-9.04/-12.41	-17.25/-18.31	-18.82/-18.2	-16.67/-15.02	-16.17/-18	-17.56/-15.02	-16.17/-18	-18.67/-18.47	-18.67/-18.47	-18.67/-18.47
θ(180°)	-14.71/-13.18	-12.54/-11.53	-9.67/-9.58	-7.69/-6.54	-6.02/-5.94	-5.76/-5.53	-5.28/-5.16	-5.21/-5.35	-5.56/-6.14	-7.08/-8.29	-10.01/-12.25	-15.51/-19.91	-17.99/-19	-15.78/-12.82	-10.85/-9.47	-8.26/-7.68	-8.01/-8.7	-9.69/-11.03	-12.13/-11.94	-11.65/-11.93	-12.07/-11.58	-11.84/-13.24	-15.19/-15.28	-15.71/-15.82
Freq(Hz)	5.63Pol.	ThetaAnt.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)Φ(7.5°)	Φ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)
θ(0°)	-5.94/4.05	-2.55/-1.16	-0.12/0.65	0.97/1.33	1.71/1.95	1.83/1.48	1.03/0.52	-0.29/-1.49	-3.02/-4.92	-8.25/-13.45	-17.31/-16.85	-9.98/-7.4	-5.08/-2.21	-0.40/-18	0.41/0.9	1.43/1.67	1.67/1.51	1.27/0.83	0.14/0.7	-1.39/-2.28	-3.96/-6.16	-9.25/-14.62	-17.54/-18.84	-12.52/-8.87
θ(7.5°)	-3.78/-1.88	-0.60/2.2	0.84/-1.26	1.46/-1.49	1.62/-1.49	1.01/0.3	-0.32/-1.06	-2.13/-3.69	-5.5/-7.25	-10.01/-13.79	-16.77/-14.62	-11.87/-10.14	-9.14/-6.03	-3.31/-2.96	-1.76/-1.69	-0.64/0.52	1.25/1.43	1.27/0.96	0.55/0.05	-0.53/-1.31	-2.56/-4.72	-4.11/-4.14	-18.76/-13.19	-9.22/-6.32
θ(15°)	-2.69/-1.48	-0.44/0.4	0.05/0.59	1.03/1.33	1.44/1.35	1.01/0.38	-0.61/-1.79	-3.45/-5.37	-6.81/-7.01	-7.31/8.82	-11.37/-8.85	-11.37/-8.85	-13.16/-18.94	-19.49/-19.03	-13.34/-22.99	-6.35/-6.61	-5.9/-5.1	-3.83/-3.05	-2.59/-1.96	-1.37/-1.28	-1.54/-2.23	-3.79/-3.78	-7.97/-8.57	-7.73/-6.88
θ(22.5°)	-3.1/-1.24	-0.02/0.36	0.45/0.24	0.17/0.24	0.35/0.72	1.03/0.82	0.02/-1.59	-3.64/-5.08	-5.2/-4.84	-4.86/-5.3	-5.91/-7.16	-10.94/-16.79	-14.51/-14.16	-15.07/-10.41	-6.92/-5.79	-5.8/-6.69	-8.26/-9.85	-9.21/-6.42	-5.03/-5.33	-6.21/-7.34	-7.65/-6.43	-5.07/-3.71	-3.58/-5.32	-7.09/-5.46
θ(30°)	-2.28/-1.23	-0.88/-0.61	-0.53/-0.6	-1.48/-2.13	-2.28/-1.17	-0.08/-1</																		



Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A.1

Theta(°)	2.4G	-0.18/2.09	-4.29/6.28	-6.56/6.57	-6.49/-5.93	-5.09/-4.64	-3.68/-3.26	-3.61/-5.37	-10.26/-7.51	-2.25/0.25	1.49/2.17	2.28/1.89	1.23/-0.06	-2.72/-6.52	-10.58/-13.51	-15.87/-15.17	-12.88/-10.03	-7.36/-6.82	-9.7/-18.82	-14.65/-10.59	-8.33/-6.08	-4/-2.12	-0.44/1.18	2.54/0.07
Theta(37.5°)	0.21/-0.42	-1.62/-3.09	-3.7/-4.19	-5.81/-8.46	-9.88/-8.02	-5.09/-3.74	-2.81/-2.67	-3.25/-5.93	-10.04/-5.42	-1.42/0.37	0.89/0.98	0.97/0.92	0.46/-0.65	-1.88/-2.8	-3.88/-5.46	-8.36/-11.9	-13.55/-10.19	-7.63/-8.38	-12.24/-15.62	-10.94/-9.32	-11.81/-8.22	-5.52/-4.61	-2.46/0.05	1.33/0.89
Theta(45°)	-0.36/-0.14	-1.31/-3.7	-4.02/-3.48	-5.74/-9.45	-11/-11.72	-7.69/-3.57	-1.53/-1.37	-2.29/-6.35	-10.64/-4.51	-1.24/0.08	-0.07/-0.84	-0.86/0.22	0.37/-0.93	-3.18/-6.73	-9.02/-10.32	-11.16/-12.48	-11.68/-9.36	-7.96/-7.05	-10.51/-12.83	-8.37/-8.32	-10.53/-8.14	-6.06/-6.39	-3.78/-0.87	0.26/-0.28
Theta(52.5°)	0.18/0.55	-1.72/-4.49	-4.89/-4.62	-6.81/-7.27	-5.53/-5.2	-5.44/-4.38	-1.92/-1.23	-2.52/-6.36	-10.33/-4.73	-1.4/0.37	-0.51/-1.78	-2.33/-0.54	0.32/-0.95	-5.16/-9.62	-8.63/-8.77	-10.57/-14.25	-13.19/-9.74	-7.48/-9.09	-10.31/-13.11	-18.67/-15.01	-11.29/-7.28	-6.05/-7.62	-4.81/-2.04	-1.64/-1.26
Theta(60°)	-2/-1.39	-5.08/-6.43	-7.17/-9.13	-11.07/-7.54	-6.91/-8.11	-9.48/-8.84	-5.85/-4.06	-4.33/-7.23	-9.34/-5.65	-2.4/-1.68	-2.02/-2.88	-2.65/-0.54	0.54/-1.17	-8.05/-14.99	-18.73/-18.17	-15.38/-16.74	-15.92/-18.11	-17.98/-18.34	-18.41/-14.66	-13.89/-14.72	-12.17/-13.09	-11.98/-12.01	-6.43/-3.05	-3.18/-3.85
Theta(67.5°)	-5.38/-4.62	-7.96/-6.41	-7.93/-15.22	-18.13/-8.79	-9.3/-11.98	-14.92/-12.79	-6.71/-4.38	-4.44/-6.58	-8.37/-5.14	-3.34/-3.55	-3.87/-3.47	-2.91/-0.98	0.04/-2.79	-11.15/-17.48	-17.72/-17.83	-18.17/-17.79	-18.69/-18.68	-10.95/-6.48	-6.49/-12.46	-17.18/-9.58	-8.86/-11.03	-10.17/-9.64	-6.01/-3.25	-5.03/-7.86
Theta(75°)	-8.07/-8.74	-13.84/-8.47	-12.43/-19.3	-18.31/-12.1	-17.67/-16.29	-18.63/-17.06	-9.35/-9.2	-8.08/-8.3	-8/-6.28	-4.87/-5.11	-5.02/-3.44	-2.52/-1.56	0.24/-1.85	-9.19/-13.47	-18.35/-18.01	-18.03/-18.13	-18.38/-14.33	-18.04/-14.71	-8.9/-10.33	-18.38/-9.29	-8.05/-9.28	-8.73/-10.1	-8.11/-6.2	-7.11/-10.54
Theta(82.5°)	-11.08/-14.22	-14.45/-8.74	-19.05/-16.98	-18.49/-16.41	-18.76/-18.98	-11.33/-9.5	-7.4/-6.41	-5.68/-8.55	-7.2/-6.33	-5.72/-6.15	-6/-3.35	-2.86/-2.39	-0.55/-2.55	-8.82/-15.49	-18.17/-19.1	-17.76/-17.73	-18.42/-14.99	-13.01/-14.54	-7.32/-5.93	-11.33/-10.74	-6.56/-6.88	-6.06/-8.8	-9.44/-7.26	-10.55/-9.86
Theta(90°)	-12.26/-18.94	-18.09/-12.26	-17.88/-12.21	-18.82/-18.84	-14.1/-9.47	-9.06/-7.12	-7.37/-8.47	-9.56/-9.86	-8.36/-7.81	-7.04/-7.65	-7.15/-4.95	-4.55/-3.83	-1.21/-1.78	-8.72/-16	-13.6/-13.53	-17.85/-18.27	-10.1/-14.69	-11.67/-9.88	-15.65/-10.49	-12.12/-9.17	-6.94/-8.07	-7.25/-10.13	-12.07/-11.18	-16.24/-10.89
Theta(97.5°)	-16.08/-17.67	-18.61/-14.49	-18.38/-10.61	-18.47/-18.34	-16.58/-13.09	-8.75/-7.51	-5.97/-5.75	-7.31/-8.89	-9.75/-8.17	-7.75/-7.28	-7.04/-5.07	-4.91/-4.34	-1.78/-2.56	-8.79/-13.74	-11.55/-12.64	-15.53/-18.25	-10.22/-12.72	-13.33/-9.21	-8.93/-10.29	-18.87/-14.18	-8.41/-10.12	-9.48/-13.19	-14.33/-14.09	-14.25/-9.58
Theta(105°)	-18.65/-18.7	-14.78/-18.08	-16.33/-11.24	-18.78/-19.04	-11.47/-8.8	-8.96/-7.85	-7.77/-8.61	-10.92/-16.05	-12.32/-8.46	-7.98/-9.01	-8.81/-7.03	-6.69/-5.54	-3.31/-3.76	-9.3/-9.8	-12.22/-17.08	-18.11/-18.85	-8.67/-6.77	-7/-11.29	-10.48/-7.5	-13.73/-11.83	-8.59/-11.33	-9.53/-12.93	-12.43/-12.01	-12.12/-11.83
Theta(112.5°)	-13.37/-16.88	-14.38/-16.63	-19.67/-14.59	-18.41/-17	-17.74/-16.56	-12.47/-13.44	-7.95/-6.72	-10.27/-11.71	-9.42/-9.42	-9.85/-9.86	-9.17/-7.07	-6.35/-5.71	-4.62/-5.42	-9.24/-8.03	-6.79/-8.1	-11.6/-16.48	-18.39/-11.6	-8.39/-10.68	-19.15/-11.33	-10.9/-13.81	-11.28/-17.14	-10.8/-17.42	-13.82/-12.84	-14.29/-11.39
Theta(120°)	-16.53/-15.41	-14.05/-18.28	-15.14/-18.01	-19.01/-19.09	-16.51/-12.78	-18.24/-18.15	-9.63/-10.07	-16.39/-15.37	-13.2/-10.73	-9.29/-10.29	-10.4/-9.81	-8.31/-7.27	-4.57/-5.13	-4.25/-7.83	-8.8/-17.01	-11.98/-13.14	-18.6/-11.77	-14.84/-17.97	-19/-14.35	-6.06/-4.91	-9.34/-18.07	-8.77/-8.5	-13.12/-18.95	-18.62/-15.15
Theta(127.5°)	-11.95/-17.59	-18.35/-18.83	-16.93/-18.1	-11.88/-9.25	-10.4/-11.77	-15.59/-18.42	-14.06/-12.84	-17.8/-18.65	-11.73/-8.8	-8.4/-8.98	-12.06/-17.25	-14/-10.03	-6.53/-4.25	-12/-6.54	-7.1/-6.56	-10.65/-17.45	-7.93/-4.55	-4/-7.43	-12.87/-17.5	-14.65/-12.19	-11.09/-16.21	-17.55/-18.12	-17.4/-13.46	
Theta(135°)	-14.96/-11.55	-17.69/-18.27	-17.5/-16.1	-10.82/-9.11	-10.14/-9.73	-14.9/-12.21	-7.38/-7.29	-10.21/-12.42	-8.38/-7.73	-8.76/-11.84	-14.47/-16.36	-18.03/-11.33	-5.25/-2.02	-1.73/-4.02	-7.1/-9.29	-11.52/-13.06	-5.68/-5.07	-7.28/-18.96	-8.68/-6.52	-9.5/-17.35	-18.83/-9.53	-8.15/-12.51	-13.27/-13.26	-11.68/-14.73
Theta(142.5°)	-16.75/-19.03	-18.13/-19.28	-17.78/-15.5	-16.56/-18.99	-10.06/-4.99	-5.47/-8.94	-9.12/-8.46	-7.92/-8.07	-8.44/-9.49	-12.32/-12.88	-12.52/-15.73	-18.42/-11.23	-5.99/-2.45	-2.53/-5.64	-6.78/-9.56	-10.18/-6.39	-7.95/-7.98	-5.03/-5.77	-9.02/-18.34	-11.29/-15.02	-13.35/-12.64	-17.11/-13.05	-15.08/-13.52	-19.08/-12.8
Theta(150°)	-14.64/-15.98	-16.31/-14.71	-15.4/-18.74	-17.46/-18.68	-17.18/-13.72	-12.85/-12.48	-11.86/-11.09	-18.6/-18	-11.16/-10.61	-13.46/-19.61	-17.4/-15.9	-18.95/-16.1	-10.67/-6.61	-5.06/-6.54	-8.5/-9.4	-5.44/-5.98	-4.28/-3.5	-6.32/-16.57	-17.88/-18.26	-13.79/-13.24	-12.5/-12.42	-14.05/-16.18	-16.79/-16.32	-18.64/-15.14
Theta(157.5°)	-18.52/-18.78	-13.71/-13.1	-14.09/-15.92	-19.16/-17.45	-18.95/-18.54	-18.33/-17.74	-11.51/-12.97	-13.06/-15.86	-15.3/-13.02	-13.77/-18.6	-17.92/-17.72	-18.3/-17.25	-16.27/-12.84	-10.14/-7.88	-6.34/-6.45	-7.11/-7.79	-12.61/-16.47	-8.5/-5.42	-15.14/-6.24	-7.28/-8.25	-8.81/-9.57	-11.37/-16.45	-18.8/-18.2	-18.91/-18.03
Theta(165°)	-18.24/-17.87	-18.63/-18.67	-14.92/-12.83	-13.66/-16.15	-16.72/-15.73	-13.35/-11.19	-9.21/-7.77	-9.07/-8.97	-8.6/-8.66	-10.07/-12.85	-18.98/-17.55	-17.1/-12.2	-9.22/-7.51	-6.46/-4.51	-2.74/-2.28	-4.14/-1.71	-1.38/-1.45	-2.2/-3.37	-4.4/-5.82	-8.24/-10.2	-11.01/-11.74	-11.67/-12.27	-15.24/-18.61	-17.8/-16.95
Theta(172.5°)	-18.37/-16.8	-14.46/-13.02	-11.44/-11.01	-8.36/-7.42	-6.92/-6.32	-5.53/-5.25	-5.04/-5.07	-5.29/-5.79	-6.53/-7.48	-9.06/-11.64	-15.57/-19.26	-17.55/-14.72	-9.93/-6.9	-5.33/-3.95	-2.77/-2.09	-1.75/-1.35	-1.53/-2.98	-5.6/-8.65	-11.7/-16.04	-17.65/-18.1	-18.51/-18.23	-18.63/-15.5	-17.5/-16.62	-18.39/-18.88
Theta(180°)	-17.48/-15.04	-12.18/-9.13	-7/-5.93	-4.78/-3.55	-3.08/-2.58	-2.16/-2.03	-1.89/-2.02	-2.29/-2.83	-3.5/-4.16	-5.22/-6.85	-9.37/-13.21	-18.53/-18.49	-16.89/-12.51	-9.31/-7.48	-6.61/-5.54	-4.58/-4.5	-5.43/-9.97	-11.68/-11.93	-11.11/-9.8	-8.43/-7.36	-7.91/-9.96	-13.16/-15.78	-19.62/-19.24	
Freq(Hz)	5.785GPol.	ThetaAnt 4																						
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°)	-8.36/-5.29	-3.35/-2.09	-0.90/0.09	0.72/1.2	1.59/1.83	1.98/1.88	1.53/0.94	0.11/0.77	-1.72/-3.2	-5.01/-7.2	-10.61/-14.44	-14.58/-9.27	-6.57/-4.73	-2.16/-0.38	1.62/2.2	2.24/2.13	2.05/1.77	1.22/0.77	0.26/0.6	-1.84/-3.22	-5.03/-7.56	-11.22/-15.64	-16.07/-12.44	
Theta(7.5°)	-4.56/-2.68	-0.87/0.26	0.86/1.68	2.36/2.62	2.59/2.51	2.23/2	1.59/0.9	0.1/0.61	-1.65/-3.1	-4.63/-6.29	-9.5/-12.96	-15.04/-14.14	-8.75/-6.06	-4.53/-2.59	-1.3/-0.91	-0.64/-0.1	0.51/0.66	0.5/0	-0.71/-1.38	-1.75/-2.4	-3.78/-5.3	-7.06/-10.1	-14.79/-15.35	-9.73/-6.18
Theta(15°)	-0.35/0.41	1.21/1.61	1.64/1.8	1.88/1.69	1.26/0.83	0.41/0.04	-0.76/-1.44	-1.79/-1.96	-2.15/-2.36	-2.82/-3.97	-5.62/-6.87	-6.62/-5.54	-4.25/-3.18	-2.34/-1.89	-1.63/-1.71	-2.44/-3.1	-3.26/-3.18	-3.58/-4.46	-5.7/-6.77	-7.25/-8.19	-9.82/-12.12	-14.99/-16.36	-10.69/-6.03	-3.02/-1.16
Theta(22.5°)	-1.26/-0.43	0.38/1	1.19/0.88	0.74/0.6	0.19/-0.41	-1.48/-2.67	-3.79/-4.41	-4.46/-4.07	-3.66/-3.62	-4.53/-6.34	-7.07/-6.01	-4.27/-2.01	-0.63/0.25	0.75/0.72	0.18/-1.01	-2.5/-3.7	-4.53/-5.41	-7.05/-9.94	-12.25/-13.14	-14.8/-16.43	-17.81/-18.2	-16.83/-9.08	-5.06/-3.02	-2.25/-1.69
Theta(30°)	-0.09/0.38	1.28/1.59	0.77/-0.44	-0.98/-1.03	-0.89/-0.93	-1.71/-3.31	-4.22/-4.78	-5.55/-5.53	-4.63/-4.97	-7.17/-9.44	-9.9/-8.87	-5.77/-2.97	-1.49/-0.66	-0.26/-0.51	-1.49/-2.81	-4.23/-4.83	-4.79/-5.86	-8.12/-12.29	-16.97/-18.21	-17.59/-18.58	-17.38/-14.93	-15.72/-12.25	-7.63/-4.69	-2.04/-0.41
Theta(37.5°)	2.48/2.32	2.65/2.8	2.31/0.9	-0.66/-1.87	-1.83/-1.21	-2.4/-4.41	-5.74/-6.35	-5.42/-3.93	-3.74/-4.99	-8.57/-11.46	-9.29/-7.18	-4.94/-3	-2.16/-2.39	-3.31/-3.81	-4.29/-6.06	-8.49/-8.81	-9.19/-8.4	-7.64/-9.96	-14.72/-17.63	-16.55/-9.09	-8.02/-10.32	-13.08/-8.29	-3.71/-0.98	1.37/2.58
Theta(45°)	3.16/2.57	3.06/2.78	1.67/0.61	-0.78/-2.25	-2.37/-2.08	-3.55/-5.14	-5.97/-6.42	-6.13/-5.48	-5.99/-9.42	-18.34/-12.68	-8.12/-6.8	-6.47/-6.62	-5.37/-3.86	-3.85/-5.75	-8.48/-9.22	-10.46/-11.82	-14.9/-14.35	-18.79/-18.22	-18.97/-18.37	-16.09/-10.93	-7.97/-7.71	-9.96/-7.88	-3.28/0.08	2.39/3.6
Theta(52.5°)	2.05/1.48	0.98/-0.68	-2.67/-2.95	-2.49/-1.83	-1.54/-2.64	-5.82/-7.62	-8.14/-11.04	-7.23/-5.32	-6.53/-13.32	-17.58/-7.85	-6.22/-6.81	-7.3/-7.18	-5.12/-4.6	-6.81/-10.37	-16.18/-18.65	-18.26/-17.21	-18.42/-17.53	-13.13/-16.14	-18.54/-17.44	-14.38/-9.53	-7.26/-6.21	-8.72/-11.34	-4.33/-0.9	1.12/1.99
Theta(60°)	2.62/2.08	0.42/-3.42	-9.12/-7.54	-4.48/-2.95	-2.56/-3.81	-7.04/-8.19	-7.49/-10.89	-14.41/-10.27	-8.42/-11.02	-15.18/-9.18	-7.58/-9.38	-7.62/-4.99	-3.11/-1.8	-4/-7.67	-11.23/-12.1	-12.71/-12.7	-15.65/-15.3	-15.03/-18.28	-15.7/-18.52	-12.14/-10.14	-9.91/-9.28	-14.98/-10.45	-3.11/-0.97	0.41/1.99
Theta(67.5°)	2.44/1.93	0.68/-2.57	-5.46/-5.31	-3.92/-4.17	-4.37/-3.81	-4.86/-4.36	-4.24/-9.61	-12.79/-9.37	-8.24/-12.71	-13.84/-8.67	-7.8/-7.16	-5.76/-4.55	-2.15/-0.29	-3.49/-9.4	-11.57/-9.71	-12.86/-14.57	-16.69/-11.24	-13.41/-10.55	-11.02/-17.25	-10.12/-16.05	-7.17/-10.13	-17.81/-7.45	-1.95/-0.71	0.64/1.71
Theta(75°)	0.91/1.15	0.11/-0.93	-3.11/-4.91	-4.94/-7.71	-7.21/-4.22	-4.03/-4.16	-4.17/-6.66	-7.63/-7.76	-9.91/-15.8	-12.86/-8.82	-11.32/-8.07	-4.89/-5.09	-2.2/-0.52	-2.17/-8.46	-10.8/-8.97	-10.11/-12.36	-14.45/-11.96	-11.61/-10.32	-8.16/-12.56	-12.35/-6.36	-6.92/-11			



Radiated Composite Gain Data of 6GHz

Appendix A.2

Freq(Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 Max Gain (dBi)	1.06	1.01	1.22	1.09
Ant. 2 Max Gain (dBi)	1.85	2.46	2.59	1.97
Ant. 3 Max Gain (dBi)	2.9	2.01	2.76	2.71
Ant. 4 Max Gain (dBi)	2.39	2.69	3.3	1.46
Ant. 1 Polarization/ θ (°)/ ϕ (°)	Theta/52.5/225	Phi/52.5/307.5	Theta/52.5/225	Theta/52.5/217.5
Ant. 2 Polarization/ θ (°)/ ϕ (°)	Theta/45/202.5	Phi/90/270	Phi/90/270	Theta/90/247.5
Ant. 3 Polarization/ θ (°)/ ϕ (°)	Theta/52.5/52.5	Theta/75/97.5	Theta/60/67.5	Theta/67.5/82.5
Ant. 4 Polarization/ θ (°)/ ϕ (°)	Theta/75/90	Phi/82.5/105	Theta/75/82.5	Theta/52.5/45
Max Gain (dBi)	2.9	2.69	3.3	2.71
DG [1SS] (dBi)	5.36	5.71	5.61	5.44
DG [2SS] (dBi)	2.9	2.71	3.3	2.71
DG [4SS] (dBi)	2.9	2.69	3.3	2.71



Radiated Composite Gain Data of 6GHz

Appendix A.2

DG 1SS Result

Freq(Hz)	6.175GPol.	PhiL	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°)
DG(dB)	Phi(0°)Phi(7.5°)	Phi(15°)Phi(22.5°)	Phi(30°)Phi(37.5°)	Phi(45°)Phi(52.5°)	Phi(60°)Phi(67.5°)	Phi(75°)Phi(82.5°)	Phi(90°)Phi(97.5°)	Phi(105°)Phi(112.5°)	Phi(120°)Phi(127.5°)	Phi(135°)Phi(142.5°)	Phi(150°)Phi(157.5°)	Phi(165°)Phi(172.5°)	Phi(180°)Phi(187.5°)	Phi(195°)Phi(202.5°)	Phi(210°)Phi(217.5°)	Phi(225°)Phi(232.5°)	Phi(240°)Phi(247.5°)	Phi(255°)Phi(262.5°)	Phi(270°)Phi(277.5°)	Phi(285°)Phi(292.5°)	Phi(300°)Phi(307.5°)	Phi(315°)Phi(322.5°)	Phi(330°)Phi(337.5°)	Phi(345°)Phi(352.5°)	
Theta(0°)	-3.74-3.3	-8.08-7.25	-9.41-10.75	-9.05-8.73	-8.67-7.1	-5.28-4.07	-2.72-1.89	-1.05-1.33	-0.95-0.92	-0.71-0.78	-1.25-1.49	-2.21-3.38	-3.78-4.54	-6.88-7.47	-7.91-8.36	-8.54-8.23	-8.86-5.54	-4.51-3.5	-3.05-2.53	-2.23-1.63	-1.26-3.09	-0.61-0.9	-1.33-1.88	-2.74-3.4	
Theta(7.5°)	-6.73-7.34	-8.21-9.45	-9.56-9.14	-7.81-7.08	-6.69-6.53	-5.56-3.8	-2.34-1.42	-0.62-0.12	0.520-0.64	0.550-0.35	0.191-0.42	-1.36-2.44	-3.54-4.97	-7.21-8.32	-9.92-9.72	-9.39-8.71	-8.02-7.02	-5.32-3.96	-2.97-2.42	-1.97-1.61	-1.41-1.36	-1.32-1.43	-2.19-3.47	-4.68-6.05	
Theta(15°)	-3.48-4.46	-5.06-6.09	-6.64-6.88	-5.92-5.41	-5.25-5.35	-4.36-2.62	-1.04-0.01	0.370-0.82	1.091-2.22	1.190-0.55	-0.56-1.45	-2.26-3.26	-3.74-4.39	-6.19-8.05	-8.76-9.52	-9.41-8.79	-7.13-5.22	-4.05-3.35	-2.61-2.16	-1.74-1.04	-0.49-0.26	-0.08-0.33	-0.83-0.85	-1.28-2.25	
Theta(22.5°)	-4.42-4.82	-5.41-5.27	-5.12-5.53	-6.76-7.2	-5.94-4.48	-3.43-1.5	-0.150-0.4	-0.29-0.35	-0.180-0.21	0.28-0.12	-0.72-1.17	-1.69-2.75	-3.39-4.31	-7.02-10.97	-11.64-10.93	-8.82-7.08	-6.27-4	-2.31-1.56	-1.69-1.89	-0.34-1.74	2.72-2.93	2.85-2.33	1.60-98	-0.16-1.88	
Theta(30°)	-7.41-8.55	-7.86-7.13	-5.91-5.41	-5.39-6.33	-4.29-3.33	-3.01-2	-1.16-1.41	-1.69-1.16	0.371-1.22	1.251-5.8	1.720-2.8	-1.51-3.13	-5.24-8	-10.09-10.02	-8.04-7.22	-5.26-4.88	-5.73-4.15	-2.07-0.66	-0.110-2.9	1.39-0.1	3.32-3.4	1.83-97	1.89-0.92	-0.59-3.98	
Theta(37.5°)	-5.47-6.89	-6.16-6.17	-7.17-5.25	-4.77-4.71	-5.13-3.66	-1.81-0.68	-1.21-1.57	-0.75-0.07	0.120-0.7	0.61-1.1	1.21-0.46	-2.17-0.45	-4.54-6.73	-11.49-8.79	-7.62-7.78	-5.83-6.42	-6.58-4.3	-2.11-1.99	-0.53-1.21	1.71-2.43	2.41-75	2.04-77	2.48-1.06	-0.27-2.65	
Theta(45°)	-6.23-9.82	-8.05-6.61	-7.92-5.5	-4.74-5.78	-5.29-3.56	-1.140-4.4	-0.57-1.56	0.460-8.5	0.540-5.6	1.91-1.6	1.80-7.8	-1.52-2.55	-2.39-3.17	-6.01-8.13	-4.81-7.94	-3.28-2.47	-1.49-1.24	0.030-8.5	0.120-5.8	1.841-8.5	1.420-8.5	-0.15-1.05	-2.24-4.09	-2.24-4.09	
Theta(52.5°)	-5.36-6.19	-7.08-5.99	-6.02-5.63	-4.98-5.5	-5.36-6.14	-2.94-0.05	-0.11-1.11	0.911-4	1.061-5.3	2.23-2.9	-0.42-0.68	-2.15-2.82	-3.28-2.64	-4.95-5.08	-2.85-4.97	-4.42-5.03	-4.81-3.75	-1.05-1.46	-2.14-2.22	-2.181-3.6	2.711-4	-0.08-0.72	-0.99-1.8	-2.19-4.16	
Theta(60°)	-3.23-4.59	-6.62-7.05	-5.93-6.16	-6.51-5.02	-5.04-7.01	-4.35-1.56	-1.35-0.82	1.391-5.7	1.281-0.4	0.920-6.2	-1.61-0.61	-2.55-2.61	-3.66-3.79	-4.69-4.23	-0.99-4.95	-4.44-3.45	-4.74-4.32	-2.93-1.9	-2.63-1.77	-2.38-1.29	0.230-3.1	-0.23-0.78	0.230-3.1	-2.19-2.65	
Theta(67.5°)	-5.33-6.73	-8.06-6.9	-6.15-5.89	-5.44-3.21	-3.75-6.04	-3.28-0.99	-1.1-1.07	1.261-4.9	0.920-3.6	0.480-6.6	-1.71-2.47	-3.04-2.35	-4.61-4.21	-6.58-6.84	-3.43-3.47	-4.49-3.23	-2.56-4.78	-4.58-1.86	-0.22-1.29	-1.61-2.36	-1.74-1.68	-1.47-1.99	-2.61-2.12	-3.15-2.31	
Theta(75°)	-5.39-9.41	-12.18-10.19	-8.35-6.9	-4.82-2.4	-3.54-5.26	-3.72-2.06	-0.56-0.73	1.050-6.5	0.250-5.9	-0.21-1.41	-2.75-4.09	-5.17-4.32	-5.35-4.21	-6.71-5.32	-6.76-2.12	-2.31-3.89	-2.18-2.76	-2.06-0.33	2.461-3	-0.84-2.1	-2.24-1.32	-1.65-2.02	-2.77-2.56	-5.05-3.94	
Theta(82.5°)	-8.66-11.7	-11-12.1	-9.14-5.92	-5.21-2.01	-3.08-0.76	-2.41-3.06	-0.64-0.5	0.35-0.34	0.190-5.9	-0.25-1.9	-3.39-4.7	-5.89-6.74	-6.68-4.86	-6.33-5.7	-5.25-1.95	-2.32-3.38	-0.85-0.36	1.063-5.1	4.68-3.78	2.21-0.76	-0.72-1.21	-1.71-2.32	-3.67-5.83	-5.83-4.09	
Theta(90°)	-7.88-8.17	-8.74-11.18	-7.74-4.75	-6.26-2.09	-2.38-1.23	-1.1-1.07	-0.85-0.5	0.17-0.58	-0.510-6	-0.15-1.9	-4.33-3.69	-5.06-6.16	-5.32-4.48	-5.24-5.87	-3.47-3.03	-2.53-2	-1.060-2.2	1.293-3.5	3.873-9.7	2.070-4.9	-0.62-2.9	-3.58-3.71	-6.04-8.96	-8.35-5.56	
Theta(97.5°)	-6.57-6.13	-7.75-9.33	-5.2-3.01	-7.19-3.12	-2.54-1.45	-1.50-5.6	-0.95-1.42	-0.61-0.38	-0.61-0.17	-0.34-2	-3.83-2.86	-4.18-6.32	-5.97-6.01	-6.31-6.87	-3.19-2.35	-4.81-1.81	0.31-1.6	0.543-1.9	3.150-8.9	-0.63-2.22	-1.56-3.56	-3.88-3.64	-6.34-7.95	-8.61-6.02	
Theta(105°)	-8.66-7.27	-8.22-7.12	-3.93-3.11	-9.14-5.92	-6.07-3.31	-2.81-2.49	-0.230-8.9	0.170-5.1	-1.41-1.35	-1.04-0.57	-0.58-1.78	-2.66-0.82	-2.35-5.57	-7.96-6.04	-6.39-6.9	-4.25-3.32	-3.43-2.53	-0.96-0.49	-2.791-1.2	1.640-1.7	-1.42-5.38	-2.04-3.42	-4.81-4.77	-7.79-7.21	
Theta(112.5°)	-4.87-5.33	-6.02-3.46	-2.38-2.5	-4.95-6.25	-4.77-4.32	-2.020-8.8	-0.09-0.36	-2.46-2.15	-1.25-2.15	-1.23-2.92	-3.23-1.24	-3.08-5.32	-6.16-7.8	-8.38-8.19	-4.09-3.15	-3.36-1.17	-2.59-3.6	-1.891-6.2	2.099-1.4	-1.67-4.98	-3.25-1.97	-3.78-3.18	-4.98-8.28	-6.56-6.29	
Theta(120°)	-6.74-8.25	-3.94-2.97	-2.06-3.54	-5.81-5.29	-3.81-4.08	-1.21-0.4	-1.47-1.15	-3.06-2.69	-2.79-3.05	-2.29-2.58	-2.44-0.69	-1.91-4.51	-7.29-9.3	-11.12-6.97	-5.23-4.82	0.21-0.44	-3.31-4.52	-2.970-1.3	-0.46-3.58	-1.46-2.56	-7.12-1.3	0.13-8.31	-9.81-8.05	-6.79-6.64	
Theta(127.5°)	-10.21-6.13	-5.67-3.76	-3.93-2.9	-2.19-5.25	-3.94-5.11	-8.66-1.38	-2.65-2.63	-4.39-2.48	-2.48-2.01	-2.39-3.24	-3.22-3.15	-4.08-2.42	-9.3-9.59	-10.15-11.36	-5.15-1.66	-1.31-3.39	-1.77-2.79	-2.04-3.1	-2.06-2.8	-2.50-5.95	-2.54-3.42	-4.67-6.99	-5.4-7.3	-6.04-7.28	
Theta(135°)	-7.71-8.36	-6.31-5.84	-4.31-3.81	-3.58-6.4	-5.49-2.97	-4.59-6.46	-4.72-1.64	2.23-4.53	-4.53-3.76	-3.31-3.28	-3.54-5.56	-5.59-6.85	-5.81-5.8	-6.07-4.24	-4.34-5.5	-4.74-3.12	-2.82-2.67	-2.07-3.18	-4.46-3.17	-3.44-3.68	-2.86-6.33	-6.29-6.91	-4.74-3.93	-3.24-6.33	
Theta(142.5°)	-5.62-5.96	-6.13-5.48	-6.81-7.72	-8.36-4.78	-2.71-2.27	-2.67-3.89	-4.32-3.36	-3.37-3.46	-2.58-4.09	-4.32-3.42	-4.25-4.77	-5.84-7.12	-5.56-5.07	-5.08-4.54	-5.07-6.82	-5.92-3.93	-0.71-0.99	-1.19-2.57	-4.99-5.93	-5.24-2.55	-1.86-2.82	-4.45-8.12	-6.69-3.84	-4.54-5.27	
Theta(150°)	-6.66-3.68	-2.86-3.13	-5.3-0.4	-8.02-3.68	-1.87-1.67	-2.5-2.6	-3.02-4.42	-6.07-5.82	-3.25-2.81	-3.68-4.16	-3.59-3.93	-6.34-8.1	-5.77-5.09	-4.75-5.33	-4.33-4.74	-3.12-3.99	-2.38-4.4	-5.99-6.02	-5.12-5.74	-4.08-3.38	-2.46-3.86	-4.65-5.56	-5.66-4	-4.29-6.55	
Theta(157.5°)	-10.18-7.27	-8.63-8.13	-8.78-8.59	-8.52-7.45	-6.07-6.03	-5.02-2.88	-1.91-3.41	-6.16-5.9	-6.31-3.97	-3.19-4.5	-8.26-9.25	-9.38-9.82	-8.86-6.66	-6.72-5.68	-7.42-9.64	-9.24-8.62	-6.83-4.27	-2.66-3.27	-5.54-6.78	-6.31-5.02	-3.81-3.97	-5.31-6.96	-9.07-11.39		
Theta(165°)	-5.18-3.8	-4.1-3.5	-3.12-3.42	-5.15-6.09	-7.31-6.65	-5.23-3.82	-3.54-4.08	-5.26-1.3	-5.85-5.8	-5.44-6.3	-7.03-6.62	-10.48-10.13	-8.3-9.92	-5.53-3.79	-2.11-4.7	-3.18-1.17	-1.64-3.43	-6.16-5.67	-4.71-5.18	-5.51-5.88	-5.87-6.13	-4.14-4.26	-5.99-7.49	-8.32-7.46	
Theta(172.5°)	-5.54-4.9	-5.13-6.18	-6.71-6.19	-9.88-10.55	-10.38-8.86	-7.61-7.62	-6.64-6.57	-6.64-7.1	-7.48-7.64	-7.71-7.2	-7.34-7.29	-7.21-6.6	-5.71-5.72	-5.47-4.64	-4.24-4.63	-4.61-6.63	-4.99-5.62	-6.25-6.84	-6.81-6.88	-6.41-6.18	-6.44-6.72	-5.5-5.41	-4.82-4.33	-5.18-6.2	
Theta(180°)	-9.52-9.02	-8.24-6.99	-6.75-6.03	-5.21-4.73	-4.51-4.88	-6.12-7.3	-8.01-9.2	-9.63-9.05	-8.66-8.78	-9.63-10.22	-11.36-11.55	-10.49-9.52	-9.93-10.02	-8.08-7.43	-7.13-7.09	-6.66-6.27	-6.04-6.44	-7.15-6.78	-6.17-5.63	-5.31-5.32	-5.45-5.96	-6.19-7.59	-8.24-8.37	-9.35-10.14	
Theta(187.5°)	-3.42-2.56	-2.12-1.85	-1.13-0.72	-0.98-1.16	-1.38-2.02	-2.67-3.18	-3.96-5.12	-1.61-7.04	-3.96-9.39	-9.15-8.84	-7.63-6.45	-5.08-4.56	-3.82-2.87	-2.62-2.89	2.61-2.24	-2.15-2.27	2.91-3.75	4.71-5.38	6.41-7.9	-8.91-9.22	-8.91-7.78	-7.42-6.3	-4.92-6.18		
Theta(195°)	-2.58-1.99	-1.64-1.94	-2.26-1.95	-1.84-1.85	-2.37-3.02	-3.32-3.41	-3.84-4.78	-6.02-7.4	-8.33-4.45	-7.59-7.08	-6.01-4.32	-3.61-2.87	-1.72-1.06	-0.81-0.87	-0.84-0.67	-0.88-1.29	-1.76-2.05	-2.51-3.71	-5.31-6.29	-7.42-9.11	-9.21-7.83	-6.73-5.28	-4.33-3.68	-2.89-2.31	
Theta(202.5°)	0.950-7.6	0.781-6.4	1.661-9.6	1.790-9.5	0.3-0.42	-1.29-2.06	-3.21-4.7	-5.22-5.87	-6.64-6.84	-6.95-5.97	-4.13-3.47	-3.12-1.75	-1.56-1.76	-0.95-0.29	-0.88-1.85	-1.46-0.8	-1.03-1.47	-1.92-3.08	-4.41-6.1	-8.31-10.27	-10.52-9.42	-6.47-6.42	-3.41-1.97	-0.90-35	
Theta(210°)	1.462-1.1	1.841-5.9	2.362-7.2	2.451-6.1	0.970-4.6	0.12-0.47	-1.13-1.37	-1.24-1.61	-2.41-3.8	-6.45-4.2	-2.94-2.34	-1.92-1.52	-1.04-0.39	0.050-2.2	0.470-2.2	-0.03-0.02	0.470-5.7	0.12-0.47	-1.21-2.25	-4.32-1.87	-11.41-9.47	-6.25-3.93	-2.35-1.99	-0.130-1.9	
Theta(217.5°)	1.391-8.2	1.791-9.8	1.540-9.8	1.422-0.3	1.740-7.2	0.590-8.5	0.820-7.4	-0.11-1.61	-3.47-3.51	-1.27-0.08	0.240-6.6	0.890-6.6	1.051-4.9	1.811-8.6	1.891-7.8	1.681-8.5	1.721-5								



Radiated Composite Gain Data of 6GHz

Appendix A.2

Theta (deg)	-14.32/-11.81	-10.04/-12.75	-17.56/-19.14	-18.34/-12	-9.7/-8.68	-7.26/-8.15	-12.49/-11.15	-6.31/-4.08	-2.95/-2.98	-3.78/-5	-5.53/-5.54	-6.75/-9.23	-13.98/-17.8	-17.61/-17.55	-17.39/-18.21	-17.71/-16.63	-12.77/-10.56	-10.19/-9.77	-6.86/-3.73	-2.53/-2.76	-3.36/-3.78	-4.24/-5.61	-7.32/-9.16	-11.18/-13.89
Theta (30°)	-14.03/-13.81	-11.02/-9.27	-13.29/-15.99	-12.41/-12.26	-9.06/-5.26	-5.29/-8.45	-9.99/-7.62	-6.43/-6.18	-6.57/-7.53	-6.66/-5.13	-4.7/-4.41	-4.8/-7.23	-11.27/-15.59	-17.44/-17.7	-18.92/-19.21	-17.55/-13.36	-11.43/-8.81	-6.22/-5.13	-3.99/-2.51	-1.09/-0.58	-0.63/-0.7	-1.35/-3.17	-6.97/-8.5	-10.54/-12.88
Theta (45°)	-17.03/-16.81	-14.73/-18.68	-15.78/-15.9	-10.77/-9.58	-9.42/-6.66	-6.81/-7.4	-5.35/-7.8	-8.92/-8.3	-8.03/-10.78	-10.42/-9.76	-5.88/-4.6	-4.59/-7.57	-12.96/-16.43	-17.32/-14.21	-18.12/-14.4	-10.72/-8.33	-4.26/-8.41	-5.78/-4.9	-3.47/-2.36	-1.49/-1.53	-1.6/-0.45	-0.69/-2.75	-4.96/-8.5	-11.02/-14.78
Theta (60°)	-10.32/-12.67	-14.11/-17.32	-10.16/-11.33	-10.84/-8.42	-9.55/-6.32	-6.77/-8.13	-9.56/-11.74	-8.41/-6.64	-8.63/-12.31	-9.3/-8.46	-5.52/-4.75	-5.32/-9.03	-8.26/-9.13	-14.78/-18.38	-18.55/-13.76	-7.41/-7.17	-9.9/-10.46	-7.88/-8.3	-3.81/-4.07	-2.07/-1.16	-1.09/-0.6	-0.16/-2.86	-4.15/-6.05	-9.15/-9.75
Theta (75°)	-12.97/-14.14	-14.05/-18.94	-12.37/-12.98	-12.3/-8.52	-9.12/-9.48	-14.36/-10.75	-9.41/-11.9	-9.39/-9.67	-9.5/-7.3	-6.93/-7.48	-4.33/-4.49	-8.23/-11.9	-7.92/-5.54	-8.32/-15.45	-11.24/-8.76	-8.62/-6.81	-11.79/-10.62	-9.71/-6.16	-6.92/-6.92	-4.02/-2.14	-1.67/-0.65	-1.35/-4.28	-4.63/-6.95	-10.68/-12.07
Theta (90°)	-12.81/-14.08	-17.85/-14.6	-11.68/-14.91	-12.57/-11.64	-11.21/-9.59	-9.81/-15.92	-15.74/-12.4	-8.81/-11.51	-8.5/-7.88	-11.01/-13.79	-8.56/-8.89	-6.55/-8.44	-11.44/-10.75	-13.11/-12.47	-17.14/-10.07	-11.84/-12.34	-12.88/-19.05	-8.99/-8.74	-4.67/-3.62	-3.66/-1.64	-2.84/-3.4	-4.59/-6.98	-12.97/-14.54	
Theta (105°)	-14.95/-10.37	-18.48/-14.24	-14.85/-12.8	-18.65/-12.63	-14.93/-10.95	-10.53/-10.7	-10.17/-11.35	-12.22/-12.18	-11.81/-13.15	-18.74/-13.77	-16.25/-13.7	-5.54/-5.51	-18.2/-12.3	-9.79/-9.64	-10.83/-18.2	-10.15/-8.21	-17.45/-18.98	-13.23/-13.44	-6.21/-6.95	-3.96/-4.6	-3.33/-1.6	-2.54/-2.38	-4.23/-6.55	-18.61/-17.81
Theta (120°)	-14.46/-11.37	-19.08/-11.05	-14.62/-10.55	-18.22/-14.94	-10.99/-13.68	-9.87/-13.63	-12.14/-12.99	-10.44/-11.7	-16.32/-19.18	-16.43/-11.6	-15.25/-18.43	-10.41/-7.92	-17.27/-18.28	-12.15/-9.68	-11.28/-13.92	-15.28/-12.05	-17.29/-13.58	-10.16/-11.39	-4.7/-5.6	-4.61/-5.64	-4.98/-3.17	-3.75/-3.39	-3.71/-5.65	-18.32/-18.34
Theta (135°)	-16.12/-12.1	-18.92/-8.7	-15.89/-10.9	-18.24/-16.88	-11.21/-9.96	-11.35/-14.1	-12.85/-11.97	-10.77/-11.22	-12.49/-9.54	-13.51/-18.55	-14.44/-10.75	-16.02/-18.59	-15.08/-15.33	-12.05/-11.56	-12.39/-12.23	-16.92/-9.65	-8.13/-8.21	-4.11/-4.21	-4.99/-5.59	-5.47/-5.49	-4.38/-3.39	-3.55/-5.07	-18.94/-18.99	
Theta (150°)	-18.37/-14.11	-16.88/-9.52	-10.79/-10.6	-17.8/-17	-10.26/-11.08	-9.45/-10.78	-9.8/-11.61	-11.77/-8.96	-15.24/-8.93	-10.49/-10.37	-14.38/-18.16	-18/-18.61	-14.68/-18.41	-13.37/-15.73	-13.27/-13.73	-11.72/-17.15	-18.87/-8.4	-7.91/-5.74	-3.23/-2.56	-4.98/-7.61	-6.6/-7.3	-5.57/-5.41	-4.17/-6.4	-18.49/-18.77
Theta (165°)	-16.66/-18.51	-16.67/-10.47	-7.58/-9.85	-15.53/-14.37	-9.97/-12.43	-9.33/-10.84	-8.89/-9.7	-9.06/-7.06	-15.19/-10.69	-18.71/-17.71	-18.72/-16.25	-13.65/-18.41	-15.58/-17.13	-12.93/-17.86	-13.96/-16.19	-19.09/-12.22	-8.82/-3.64	-4.78/-3.5	-7.59/-10.31	-8.63/-8	-6.94/-7.58	-4.66/-7.03	-18.45/-18.57	
Theta (180°)	-18.22/-13.95	-16.25/-9.27	-6.56/-7.98	-14.81/-17.16	-11.75/-12	-8.67/-16.11	-14.73/-16.92	-14.32/-10.88	-19.26/-13.63	-19.41/-14.78	-18.21/-18.39	-13.32/-15.61	-18.41/-18.45	-10.75/-13.2	-18.28/-17.55	-11.22/-8.64	-11.88/-10.49	-6.87/-6.4	-16.66/-14.36	-11.76/-7.06	-5.43/-8.93	-9.32/-10.14	-17.39/-17.16	
Theta (225°)	-17.11/-9.94	-18.38/-7.82	-7.49/-7.99	-12.58/-12.06	-18.08/-15.48	-8.43/-9.96	-11.88/-10.51	-11.95/-13.09	-18.25/-15.36	-18.15/-14.65	-18.97/-17.55	-15.35/-16.35	-16.53/-17.92	-16.47/-18.71	-18.36/-13.13	-18.22/-14.82	-11.86/-11.56	-16.99/-11.63	-6.4/-6.99	-8.88/-11.13	-18.4/-9.33	-7.75/-10.82	-11.66/-18.62	-18.43/-14.36
Theta (240°)	-17.87/-14.13	-18.52/-9.53	-7.95/-6.99	-9.77/-11.54	-14.88/-11.31	-13.79/-12.3	-12.52/-11.66	-16.13/-16.69	-15.87/-18.24	-18.71/-17.71	-18.72/-16.25	-19.05/-14.35	-18.24/-13.83	-13.07/-17.36	-16.37/-18.4	-10.76/-12.28	-14.21/-15.63	-17.9/-9.1	-8.29/-10.96	-17.92/-9.11	-8.33/-14.33	-18.03/-17.8	-15.31/-14.93	
Theta (255°)	-16.18/-18.72	-12.76/-18.1	-8.92/-6.5	-8.55/-10.4	-13.14/-10.23	-11.31/-18.12	-17.78/-19.64	-17.01/-18.49	-17.96/-13.45	-11.14/-15.63	-16.17/-13.26	-18.66/-17.73	-18.99/-14.56	-16.25/-10.51	-5.79/-19.06	-12.33/-11.57	-7.6/-6.45	-5.85/-12.8	-12.25/-7.41	-10.74/-16.45	-18.24/-17.97	-18.86/-15.76		
Theta (270°)	-18.81/-18.01	-14.14/-11.51	-10.3/-6.36	-7.12/-10.48	-10.31/-7.93	-10.79/-12.48	-14.97/-17.63	-18.84/-14.3	-16.23/-17.91	-17.92/-17.78	-12.99/-14.58	-18.85/-16.14	-18.14/-15.97	-14.26/-13.35	-8.86/-9.54	-13.29/-12.03	-8.38/-4.89	-11.11/-18	-11.14/-15.03	-9.35/-9.45	-12.26/-8.68	-13.66/-17.42	-18.49/-19.27	-18.66/-19.15
Theta (285°)	-17.83/-17.1	-19.09/-17.7	-8.73/-9.55	-4.56/-6.67	-10.94/-10.12	-9.86/-15	-9.18/-13.16	-15.55/-12.68	-15/-14.72	-15.49/-19.21	-14.81/-15.68	-18.36/-17.97	-17.63/-15.81	-18.62/-18.88	-18.11/-15	-16.82/-12.66	-6.82/-9.09	-5.92/-5.25	-6.79/-5.6	-17.47/-17.83	-18.36/-15.75	-18.16/-18.78	-18.51/-17.57	
Theta (300°)	-14.14/-12.32	-15.43/-12.63	-11.11/-7.53	-5.96/-6	-9.04/-11.73	-10.18/-9.53	-9.46/-10.57	-10.08/-11.03	-12.55/-14.96	-16.21/-17.47	-18.02/-17.46	-16.98/-14.54	-18.29/-18.52	-13.51/-10.77	-8.09/-6.2	-7.62/-13.28	-11.88/-9.59	-6.63/-8.45	-8.89/-8.54	-10.08/-12.72	-13.43/-16.24	-17.61/-16.75	-14.16/-16.26	
Theta (315°)	-18.23/-19.44	-16.84/-14.49	-12.32/-12.82	-15.54/-14.81	-9.96/-8.86	-11.49/-12.25	-10.71/-9.99	-9.75/-10.38	-12.11/-15.73	-17.56/-15.71	-18.05/-17.73	-15.04/-18.17	-18.32/-17.82	-17.07/-18.69	-17.56/-18.08	-17.34/-18.47	-19.3/-18.51	-14.27/-9.97	-8.2/-9.15	-10.1/-11.67	-14.31/-19.42	-18.95/-18.17	-17.96/-17.64	-19.15/-17.74
Theta (330°)	-16.21/-18.95	-19.24/-19.51	-18.97/-18.86	-14.03/-9.1	-7.32/-7.65	-8.19/-9.4	-10.71/-10.9	-11.4/-12.04	-13.49/-14.79	-16.59/-16.63	-17.03/-16.42	-18.85/-18.71	-15.51/-13.53	-14.11/-14.59	-14.73/-14.11	-12.02/-18.59	-17.44/-16.48	-12.46/-11.08	-10.15/-9.16	-9.07/-10.13	-11.31/-13.98	-18.28/-19.61	-15.89/-14.93	-13.74/-13.12
Theta (345°)	-18.31/-15.23	-13.73/-13.1	-13.59/-11.27	-9.42/-9.05	-8.42/-8.01	-9.16/-10.88	-13.53/-17.77	-19.02/-18.65	-17.83/-19.1	-17.63/-19.3	-17.72/-18.97	-19.07/-18.62	-18.03/-18.21	-19.11/-18.49	-17.09/-15.42	-12.74/-11.25	-10.21/-9.86	-9.94/-10.97	-11.95/-14.37	-16.49/-18.27	-18.56/-19.03	-17.81/-18.88		
Theta (360°)	-18.9/-17.99	-18.56/-18.33	-14.39/-13.19	-14.39/-14.01	-14.59/-16.65	-17.17/-19	-18.94/-18.16	-18.27/-17.64	-17.87/-17.89	-18.35/-19.3	-19.02/-18.49	-18.99/-17.67	-18.78/-17.05	-14.35/-13.15	-12.43/-11.56	-10.63/-10.19	-10.23/-9.43	-9.53/-9.63	-10.37/-11.17	-12.65/-13.54	-14.74/-16.44	-17.89/-17.71	-18.65/-18.68	
Gain (dBi)	6.95GPol	ThetaAnt. 1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gain (dBi)	PhiAnt. 2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gain (dBi)	PhiAnt. 1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gain (dBi)	PhiAnt. 2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gain (dBi)	PhiAnt. 1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gain (dBi)	PhiAnt. 2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gain (dBi)	PhiAnt. 1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gain (dBi)	PhiAnt. 2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+



Radiated Composite Gain Data of 6GHz

Appendix A.2

Freq(Hz)	ThetaAnt 2	Phi(75°)	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°)	
6.175GPol.	ThetaAnt 2	Phi(75°)	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°)	
Gain	Phi(75°)	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°)	3.41-2.62	2.38-2.77	1.88-2.44	1.30-3.89	4.99-6.05	2.81-2.82	9.98-11.27	12.36-12.34	11.64-10.24	8.16-6.91	6.46-6.25	5.64-4.92	4.55-4.7	4.23-4.39	5.05-4.53	5.86-7.24	8.88-9.76	11.54-13.48	13.49-12.59	10.63-8.11	6.96-5.95	4.65-3.84				
Theta(7.5°)	5.33-5.49	5.91-6.69	7.49-8.07	7.94-8	8.81-9.77	9.83-9.63	9.26-9.24	9.83-10.92	11.34-10.33	9.21-7.42	5.47-4.03	3.08-2.84	2.24-1.33	0.76-1.03	1.28-1.25	1.65-2.49	3.53-4.27	5.49-7.43	10.49-12.64	14.32-16.1	16.39-13.68	10.87-8.61	6.54-5.86	5.78-5.71		
Theta(15°)	2.91-3.1	2.55-2.85	3.85-3.82	3.79-5.44	6.36-7.84	-11.04-12.25	-12.54-12.91	-13.59-15.14	-15.8-13.18	-10.17-7.92	-6.89-6.45	-5.95-5.87	-6.82-5.05	-3.91-3.44	-2.4-2.36	-3.32-4.3	-4.65-6.62	-7.94-11.1	-15.44-17.7	-17.16-11.98	-8.76-6.65	-5.54-5	-3.84-2.97			
Theta(22.5°)	9.31-4.52	8.54-5.31	4.92-5.74	5.57-6.19	6.85-8.72	-8.8-10.99	-8.57-12.98	-11.91-12.98	-15.12-11.24	-8.5-9.96	-10.87-18.86	-19.14-16	-10.89-13.13	-8.2-7.85	-9.64-15.37	-18.31-15.76	-18.34-15.76	-18.34-15.76	-18.34-15.76	-18.34-15.76	-18.34-15.76	-18.34-15.76	-18.34-15.76	-18.34-15.76	-18.34-15.76	-18.34-15.76
Theta(30°)	2.38-2.93	2.58-2.31	4.43-7.13	7.24-7.71	9.52-12.02	-14.39-18.45	-18.75-17.54	-13.88-11.48	-11.1-10.88	-10.87-11.11	-5.27-2.69	-3.72-3.96	-3.44-2.44	-0.93-1.02	-1.44-1.46	-1.42-1.64	-1.7-2.03	2.67-2.32	2.66-4.13	6.15-10.07	-14.5-18.32	-11.5-7.38	-5.01-3.94	-2.73-2.65		
Theta(37.5°)	6.35-3.54	1.57-1.7	4.14-6.22	8.22-10.34	-11.8-12.12	-13.63-15.38	-17.57-14.47	-10.65-5.74	-5.59-4.6	-4.16-12.44	-2.81-3.03	-1.95-3.01	0.4-1.17	-2.05-1.29	-0.70-7.1	0.47-1.05	-2.32-2.47	2.28-4.1	4.57-6.27	-12.91-18.74	-14.37-9.01	-6.81-7.63	-7.38-7.14			
Theta(45°)	4.31-3.74	-3.81-3.78	-5.92-8.09	-8.73-8.82	-10.15-10.27	-9.06-10.58	-18.75-18.48	-16.82-13.96	-6.57-3.93	-4.08-4.53	-4.73-3.7	-2.58-1.96	1.020-7.6	0.67-0.01	-0.75-1.82	-0.43-2.93	-6.32-4.33	-2.65-3.4	-4.35-7.66	-13.84-9.81	-11.47-11.81	-11.17-12.19	-6.54-7.1			
Theta(52.5°)	4.1-3.05	-3.98-7.22	-9.24-9.4	-10.99-9.86	-6.88-9.98	-9.52-10.79	-10.81-7.44	-10.4-8.98	-7.86-5	-2.73-3.73	-6.19-8.61	-2.47-1.66	-0.810-7.3	1.770-9.2	-0.57-0.62	-0.16-0.08	-1.1-3.12	-4.99-5.07	-4.1-3.74	-5.5-5.92	-14.84-9.97	-10.06-12.74	-11.03-7.91	-5.85-6.11		
Theta(60°)	6.41-8.44	4.32-8.46	-10.59-12.18	-12.04-9.27	-7.36-7.1	-5.94-6.6	-5.88-5.35	-4.45-3.05	-4.75-7.54	-3.05-3.21	-1.11-1.78	-4.02-3.4	-3.01-0.75	0.01-1.1	5.63-9.27	-0.82-0.51	-2.08-3.45	-5.06-6.43	-5.35-5.22	-4.88-6.5	-11.47-7.96	-8.06-10.56	-11.91-9.54	-5.72-9.98		
Theta(67.5°)	6.74-7.46	-10.19-9.36	-5.8-5.29	-4.91-4.21	-3.04-4.43	-6.21-3.45	-5.33-3.83	-3.08-1.51	-5.03-5.03	-2.94-3.8	-6.08-6.72	-3.72-4.53	-11.44-2.34	-2.74-3.34	-9.24-5.08	1.88-2.07	1.030-6.9	0.850-2	0.46-1.21	-0.93-7.35	-17.94-10.25	-14.66-8.25	-9.46-7.55	-14.29-13.98		
Theta(75°)	-8.32-7.52	-12.02-9.74	-6.44-7.16	-4.85-3.91	-3.76-5.08	-7.71-4.82	-6.22-4.6	-5.11-2.09	-7.29-7.07	-3.5-6.93	-8.58-6.73	-4.58-6.85	-14.35-5.3	-6.06-4.57	-9.7-7.72	-7.68-3.97	-3.04-0.45	-0.32-1.21	-1.42-3.61	-3.26-11.1	-12.32-11.01	-14.63-9.47	-7.78-7.52	-10.71-8.99		
Theta(82.5°)	9.08-8.27	-10.15-11.31	-10.47-8.87	-5.46-6.96	-4.87-4.83	-8.13-5.38	-9.27-9.86	-9.15-5.44	-10.94-10.4	-5.7-6.24	-8.82-9.25	-7.81-12.12	-16.03-8.88	-8.8-10.48	-10.85-8.43	-7.97-5.87	-5.48-5.52	-3.55-9.51	-7.2-18.46	-8.79-7.77	-9.12-13.26	-7.57-7.99	-8.29-9.46			
Theta(90°)	2.89-5.7	-8.7-12.97	-16.54-9.58	-7.71-7.16	-6.07-7.2	-6.85-8.11	-13.75-12.21	-15.74-9.59	-13.25-10.33	-6.75-8.66	-6.84-11.82	-10.29-11.53	-18.46-9.51	-11.08-5.76	-7.84-11.7	-7.97-11.42	-9.26-8.39	-12.07-16.4	-9.43-9.73	-15.65-17.03	-7.26-7.33	-6.98-2.22	-6.98-2.22	-4.88-3.5		
Theta(97.5°)	2.37-4.8	-7.27-12.05	-9.59-8.54	-6.24-10.24	-10.2-11.47	-10.73-10.67	-8.24-13.77	-17.47-13.87	-13.77-19.54	-8.52-5.48	-5.88-17.04	-10.36-9.57	-10.03-7.28	-11.8-10.28	-8.49-9.84	-6.68-6.13	-7.77-8.83	-6.41-5.6	-18.37-16.44	-17.59-12.81	-6.58-9.39	-5.53-8.49	-4.7-2.6	-3.46-3.12		
Theta(105°)	-3.35-4.64	-8.1-16.09	-18.03-9.54	-10.3-12.15	-14.35-15.13	-13.46-18.96	-16.57-13.37	-10.76-10.34	-11.37-14.97	-11.43-6.86	-7.58-16.61	-10.22-12.83	-12.33-6.12	-16.71-9.55	-18.49-16.52	-13.1-13.46	-12.93-5.46	-6.9-6.8	-12.46-7.59	-8.71-15.03	-12.55-9.59	-4.94-3.32	-0.72-2.16	-3.72-5.08		
Theta(112.5°)	1.99-3.05	-3.01-7.4	-14.68-17.34	-18.67-13.22	-8.32-7.41	-11.69-17.55	-17.43-14.55	-12.73-9.58	-7.47-9.93	-13.87-10.63	-8.11-11.63	-12.19-10.88	-18.69-11.08	-11.51-8.48	-10.42-12.53	-11.18-11.71	-18.07-15.35	-13.87-8.87	-13.49-11.1	-7.98-12.86	-6.3-3.46	0.840-1.7	-0.18-2.72			
Theta(120°)	2.07-1.5	-3.89-6.09	-12.58-15.25	-11.47-15.27	-10.9-10.52	-11.59-13.68	-17.41-14.07	-10.65-5.74	-11.01-10.23	-12.73-15.76	-16.83-13.18	-8.67-7.71	-11.42-6.17	-9.37-7.76	-6.81-10.25	-17.33-13.13	-9.32-8.49	-7.1-6.82	-12.05-16.92	-10.96-12.18	-7.94-7.67	-6.32-3.82	-6.39-7.14			
Theta(127.5°)	4.66-4.4	-5.05-5.98	-7.89-9.75	-9.86-12.2	-14.49-15.46	-18.02-17.09	-13.74-12.18	-12.26-12.13	-14.61-12.44	-10.98-12.26	-12.18-11.5	-14.24-15.25	-12.97-18.3	-15.6-14.34	-16.24-17.94	-18.93-16.25	-10.13-10.66	-11.22-12.37	-13.44-14.56	-12.89-9.94	-7.3-6.03	-5.59-7.22	-7.14-7.87	-7.91-5.34		
Theta(135°)	8.53-9.22	-8.43-7.87	-7.49-7.14	-7.94-10.16	-12.51-12.96	-13.65-16.91	-17.65-18.92	-18.38-18.62	-14.27-13.63	-16.7-14.5	-11.18-13.02	-18.06-17.2	-16.91-14.94	-13.15-14.61	-18.34-18.49	-15.52-12.86	-13.21-17.51	-17.61-18.45	-11.8-8.22	-9.48-11.62	-13.14-12.88	-7.26-5.07	-6.43-7.06	-6.96-7.71		
Theta(142.5°)	5.45-6.35	-7.75-10.3	-12.72-12.62	-13.32-16.59	-15.12-13.53	-12.75-13.51	-19.14-18.41	-12.15-9.75	-9.05-8.88	-9.11-6.8	-17.99-16.38	-14.19-13.99	-12.93-10.52	-9.64-13.25	-18.24-17.67	-17.21-18.44	-17.33-18.81	-17.98-17.4	-10.12-7.21	-7.34-6.72	-5.18-3.74	-3.53-4.47	-5.34-5.73	-4.66-4.8		
Theta(150°)	4.66-4.4	-5.05-5.98	-7.89-9.75	-9.86-12.2	-14.49-15.46	-18.02-17.09	-13.74-12.18	-12.26-12.13	-14.61-12.44	-10.98-12.26	-12.18-11.5	-14.24-15.25	-12.97-18.3	-15.6-14.34	-16.24-17.94	-18.93-16.25	-10.13-10.66	-11.22-12.37	-13.44-14.56	-12.89-9.94	-7.3-6.03	-5.59-7.22	-7.14-7.87	-7.91-5.34		
Theta(157.5°)	8.53-9.22	-8.43-7.87	-7.49-7.14	-7.94-10.16	-12.51-12.96	-13.65-16.91	-17.65-18.92	-18.38-18.62	-14.27-13.63	-16.7-14.5	-11.18-13.02	-18.06-17.2	-16.91-14.94	-13.15-14.61	-18.34-18.49	-15.52-12.86	-13.21-17.51	-17.61-18.45	-11.8-8.22	-9.48-11.62	-13.14-12.88	-7.26-5.07	-6.43-7.06	-6.96-7.71		
Theta(165°)	5.45-6.35	-7.75-10.3	-12.72-12.62	-13.32-16.59	-15.12-13.53	-12.75-13.51	-19.14-18.41	-12.15-9.75	-9.05-8.88	-9.11-6.8	-17.99-16.38	-14.19-13.99	-12.93-10.52	-9.64-13.25	-18.24-17.67	-17.21-18.44	-17.33-18.81	-17.98-17.4	-10.12-7.21	-7.34-6.72	-5.18-3.74	-3.53-4.47	-5.34-5.73	-4.66-4.8		
Theta(172.5°)	5.84-6.47	-7.21-7.64	-7.17-7.96	-8.51-7.97	-8.35-9.07	-9.38-10.2	-11.94-14.65	-18.55-17.98	-19.01-18.93	-18.46-18.55	-16.09-15.35	-16.76-16.81	-16.03-15.34	-15.25-12.54	-9.58-6.87	-8.27-7.84	-8.92-11.79	-17.26-19.38	-17.85-19.28	-18.17-18.27	-17.47-11.26	-8.06-6.87	-6.45-5.69	-5.58-6.62		
Theta(180°)	5.81-5.53	-6.68-6.99	-8.04-9.19	-9.87-11.2	-14.45-18.13	-18.66-18.37	-18.26-18.37	-17.87-13.91	-10.53-8.89	-7.77-7.41	-7.08-7.39	-8.44-7.96	-10.4-9.66	-9.01-9.54	-10.53-10.46	-10.85-12.21	-13.32-15.01	-18.09-18.75	-17.75-18.66	-18.09-17.87	-15.38-11.72	-9.44-8.87	-8.54-8.54	-7.75-7.32		
6.475GPol.	ThetaAnt 2	Phi(75°)	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°)	
Gain	Phi(75°)	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°)	-18.1-18.93	-18.81-18.86	-18.89-15.5	-11.93-10.78	-9.96-8.88	-7.68-7.54	-7.35-7.19	6.71-6.46	6.87-7.67	-7.96-8.21	-8.6-8.88	-10.3-13.8	-15.86-17.45	-18.1-7.84	-18.74-17.38	-13.98-11.83	-11.41-11.2	-10.5-9.27	-8.65-8.54	-8.67-8.72	-8.99-10	-11.22-14.21	-11.06-11.91	-13.89-16.65		
Theta(7.5°)	-10.29-15.73	-16.52-19.43	-11.74-12.64	-9.42-9.59	-8.32-7.67	-6.86-5.86	-4.9-5.01	-6.02-6.79	-7.54-8.41	-9.67-10.84	-11.93-12.34	-13.77-15.94	-18.49-18.85	-18.21-6.4	-14.71-13.58											



Radiated Composite Gain Data of 6GHz

Appendix A.2

Table with 36 columns and 100 rows of gain data. Columns represent frequency offsets in MHz and dBm, and rows represent antenna gain in dBi. The table contains numerical values for each combination of frequency offset and gain, representing the radiated composite gain data.



Radiated Composite Gain Data of 6GHz

Appendix A.2

Theta (165°)	-12.65/-10.6	-10.08/-9.82	-11.54/-15.48	-17.75/-18.72	-17.06/-13.26	-10.58/-9.36	-10.87/-15.31	-17.87/-13.53	-10.64/-9.3	-8.78/-8.81	-9.31/-11.25	-12.47/-11.63	-9.95/-9.02	-9.09/-9.84	-8.59/-6.63	-5.22/-5.15	-6.09/-8.18	-11.87/-14.57	-14.04/-16.82	-18.61/-19.31	-19.24/-12.87	-8.19/-6.39	-7.41/-9.51	-13.68/-14.78
Theta (172.5°)	-10.25/-10.27	-10.18/-10.89	-12.31/-13.83	-16.07/-18.29	-19.28/-16.16	-14.95/-13.43	-14.44/-14.97	-12.85/-14.02	-8.31/-7.45	-7.23/-6.96	-6.46/-6.09	-6.23/-6.27	-5.96/-6.23	-6.49/-6.24	-5.91/-5.5	-6.62/-8.57	-11.51/-16.38	-18.15/-18.29	-18.47/-18.14	-18.61/-18.37	-19.19/-17.57	-14.49/-10.72	-9.41/-8.57	-8.85/-9.4
Theta (180°)	-15.82/-17.04	-16.84/-17.04	-18.17/-16.44	-15.12/-14.29	-13.68/-13.55	-14.31/-15.88	-16.81/-18.29	-18.98/-17.92	-19.12/-17.79	-17.95/-16.54	-16.72/-16.99	-16.72/-15.39	-16.28/-17.97	-17.65/-19.27	-17.92/-18.39	-18.65/-18.52	-17.84/-17.61	-17.36/-14.27	-12.14/-18.47	-8.55/-9.99	-9.86/-9.88	-8.85/-9.8	-10.79/-10.54	-11.96/-14.79
Freq(Hz)	6.175GPol	Theta/Ant. 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Phi(0°)Phi(7.5°)	Phi(15°)Phi(22.5°)	Phi(30°)Phi(37.5°)	Phi(45°)Phi(52.5°)	Phi(60°)Phi(67.5°)	Phi(75°)Phi(82.5°)	Phi(90°)Phi(97.5°)	Phi(105°)Phi(112.5°)	Phi(120°)Phi(127.5°)	Phi(135°)Phi(142.5°)	Phi(150°)Phi(157.5°)	Phi(165°)Phi(172.5°)	Phi(180°)Phi(187.5°)	Phi(195°)Phi(202.5°)	Phi(210°)Phi(217.5°)	Phi(225°)Phi(232.5°)	Phi(240°)Phi(247.5°)	Phi(255°)Phi(262.5°)	Phi(270°)Phi(277.5°)	Phi(285°)Phi(292.5°)	Phi(300°)Phi(307.5°)	Phi(315°)Phi(322.5°)	Phi(330°)Phi(337.5°)	Phi(345°)Phi(352.5°)
Theta (0°)	-9.41/-7.03	-6.13/-6.29	-6.09/-6.2	-6.95/-6.79	-6.89/-7.48	-6.88/-8.71	-9.41/-10.25	-11.76/-13.04	-14.67/-16.78	-17.33/-16.64	-15.61/-14.8	-11.19/-9.02	-8.19/-7.63	-7.52/-7.5	-7.51/-7.23	-7.12/-6.82	-6.76/-6.71	-7.78/-8.99	-11.51/-13.71	-14.21/-16.3	-17.86/-14.46	-14.74/-12.82	-9.92/-9.96	
Theta (7.5°)	-9.12/-7.99	-8.87/-6.24	-5.81/-5.6	-5.74/-4.86	-4.59/-4.67	-5.13/-5.62	-7.05/-9.49	-13.11/-16.14	-17.95/-18.78	-15.23/-13.8	-12.22/-11.55	-11.19/-9.06	-7.21/-6.98	-7.97/-9	-9.64/-9.8	-10.04/-10.02	-10.56/-10.49	-10.15/-11.02	-12.46/-12.9	-14.08/-16.71	-14.39/-13.55	-14.16/-11.56	-10.13/-10.92	-9.78/-8.84
Theta (15°)	-3.88/-4.84	-5.25/-3.55	-2.71/-2.66	-3.28/-3.98	-3.87/-4.04	-4.73/-6.26	-8.47/-11.79	-11.88/-10.98	-11.06/-11.7	-13.29/-14.1	-10.91/-10.3	-10.51/-8.63	-7.41/-8.23	-8.61/-8.78	-11.16/-16.67	-15.69/-12.84	-12.21/-11.54	-11.11/-9.9	-14.12/-17	-17.96/-19.08	-16.39/-18.49	-17.99/-17.75	-16.12/-11.75	-9.38/-5.67
Theta (22.5°)	-2.91/-1.25	-1.48/-2.25	-1.23/-1.23	-2.71/-4.58	-5.03/-5.29	-4.53/-4.05	-5.44/-6.72	-6.21/-6.18	-6.57/-8.03	-9.63/-9.02	-8.11/-7.81	-8.14/-7.9	-7.15/-6.6	-6.81/-7.46	-8.23/-11.26	-13.16/-11.83	-9.44/-8.23	-8.55/-9.84	-10.52/-11.29	-12.66/-12.46	-15.55/-18.67	-18.36/-13.82	-9.34/-6.59	-4.43/-5.25
Theta (30°)	-8.74/-4.73	-3.67/-2.89	-2.84/-3.54	-4.05/-2.9	-2.81/-3.22	-1.79/-1.34	-2.48/-3.64	-3.45/-3.03	-3.55/-5.59	-8.05/-9.46	-8.13/-6.86	-8.35/-8.32	-5.84/-5.7	-6.16/-5.27	-5.81/-9.22	-11.48/-10.19	-9.19/-8.14	-6.72/-6.46	-7.41/-6.93	-5.71/-6.85	-10.66/-13.39	-12.08/-8.67	-9.66/-6.09	-4.93/-5.9
Theta (37.5°)	-2.79/-1.76	-3.29/-3.19	-3.64/-6.16	-2.93/-3.8	1.15/0.93	0.65/0.16	-0.86/-2.95	-3.98/-3.78	-4.82/-8.65	-7.88/-7.94	-6.63/-7.71	-6.54/-7.71	-3.77/-6.71	-4.51/-5.51	-7.58/-8.61	-6.62/-6.85	-3.14/-3.2	-1.79/-2.26	-4.26/-4.84	-4.58/-6.85	-13.47/-12.41	-6.78/-5.43	-4.78/-3.64	
Theta (45°)	-1.87/-1.72	-2.46/-3.12	-2.17/-2.44	-0.95/-1.61	2.76/2.77	1.73/0.61	1.31/0.63	-1.89/-1.49	-3.31/-5.55	-5.81/-6.35	-4.99/-5.14	-5.06/-8.42	-8.18/-8.39	-7.94/-6.79	-5.67/-3.8	-3.89/-6.01	-4.55/-1.14	-1.78/-2.19	-3.92/-5.85	-8.86/-12.32	-8.66/-12.42	-6.89/-6.32	-3.51/-6.9	
Theta (52.5°)	-2.73/-2.43	-3.27/-4.38	-2.82/-0.5	1.22/2.9	2.77/2.41	1.76/1.14	2.14/0.61	-1.03/0.08	-2.01/-3.26	-4.94/-6.9	-4.91/-4.22	-5.11/-10.88	-10.15/-9.39	-6.27/-8.78	-5.89/-3.17	-1.44/-3.31	-3.18/-3.35	-4.54/-5.13	-4.89/-4.25	-6.52/-5.12	-5.61/-7.8	-6.04/-4.25	-6.71/-8.88	-4.53/-3.1
Theta (60°)	-3.07/-1.82	-2.19/-4.98	-5.31/-1.08	1.31/8.1	0.91/1.52	1.98/1.22	2.09/0.84	0.86/0.59	-2.62/-3.19	-7.23/-9.36	-5.31/-4.93	-5.97/-7.07	-9.24/-13.04	-5.76/-5.27	-6.61/-8.2	-1.08/-2.36	-3.51/-0.7	-3.95/-6.85	-8.76/-7.37	-8.25/-6.2	-7.06/-6.57	-3.54/-4.47	-11.77/-11.33	-5.16/-3.21
Theta (67.5°)	-2.64/-1.08	-0.51/-2.77	-5.29/-2.65	-0.25/-0.22	-1.67/0.56	1.33/-0.4	1.28/0.58	1.32/0.04	-1.69/-2.06	-10.02/-10.48	-8.21/6.94	-7.21/-5.74	-1.58/-16.71	-9.77/-7.01	-5.59/-2.12	-2.56/4	-4.37/-4.33	-4.43/-6.08	-3.77/-5.07	-6.78/-8.1	-11.99/-8.76	-5.04/-5.45	-15.05/-8.8	-4.53/-2.56
Theta (75°)	-1.06/-0.21	-0.58/-2.12	-3.79/-4.05	-2.52/-2.68	-4.42/-2.19	-0.33/-1.3	-0.02/0.51	0.96/0.21	-1.24/-1.25	-8.97/-10.76	-12.51/-10.17	-5.84/-4.54	-5.98/-18.75	-15.62/-7.25	-7.14/-3.81	-2.19/-4.38	-4.79/-4.75	-3.07/-2.85	-1.26/-3.18	-4.45/-6.18	-12.89/-7.06	-3.32/-7.03	-11.41/-6.55	-3.82/-1.58
Theta (82.5°)	-2.09/-1.65	-2.14/-2.57	-3.23/-2.46	-4.08/-4.69	-8.11/-4.86	-2.61/-4.68	-2.57/-8.09	0.11/1.93	-1.87/-2.6	-7.88/-8.1	-9.81/-9.32	-5.35/-3.7	-6.81/-8.16	-14.42/-11.03	-7.23/-3.13	-3.51/-5.72	-7.04/-9.42	-3.74/-7.1	-0.16/-4.28	-3.98/-3.25	-5.71/-3.13	-2.64/-5.1	-7.83/-4.86	-3.74/-3.28
Theta (90°)	-3.58/-4.02	-5.18/-5.84	-4.13/-3.99	-4.4/5.4	-8.05/-9.02	-6.41/-9.16	-5.75/-3.15	-2.96/4.03	-3.07/-2.82	-6.45/-8.4	-11.72/-17.64	-7.09/-5.5	-7.01/-15.58	-14.10/-11.19	-12.87/-6.62	-5.48/-6.84	-9.03/-11.56	-6.62/-4.25	-4.83/-5.25	-3.88/-2.44	-5.69/-3.6	-3.09/-5.76	-10.71/-5.76	-5.39/-3.37
Theta (97.5°)	-6.33/-6.87	-6.82/-9.94	-7.42/-5.6	-4.88/-4.04	-5.83/-10.83	-8.22/-11.3	-10.44/-6.49	-5.48/-7.29	-7.27/-5.7	-7.11/-7.41	-12.09/-15.84	-11.51/-5.96	-4.63/-9.53	-14.99/-13.69	-191/-7.79	-8.06/-8.43	-12.65/-17.66	-11.62/-7.86	-12.71/-6.38	-5.62/-5.62	-7.86/-10.81	-8.42/-8.88	-15.78/-8.19	-9.48/-4.53
Theta (105°)	-5.87/-5.13	-5.71/-7.06	-14.89/-13.94	-6.93/-5.7	-7.12/-7.29	-7.28/-10.77	-18.03/-11.51	-10.69/-10.4	-11.52/-9.74	-8.31/-6.31	-8.59/-15.54	-17.93/-8.39	-6.04/7.1	-10.15/-11.79	-11.41/-8.76	-16.83/-13.93	-14.24/-15.66	-19.09/-17.17	-11.71/-13.73	-9.51/-7.2	-14.58/-13.92	-18.11/-19.05	-15.07/-16.69	-17.63/-10.23
Theta (112.5°)	-4.157/-4.78	-4.91/-5.46	-8.99/-14.4	-14.19/-15.44	-14.96/-8.76	-8.67/-14	-13.44/-7.75	-7.24/-7.45	-9.89/-10.78	-9.76/-5.8	-4.22/-6.99	-9.07/-7.4	-7.85/-15.33	-10.47/-13.62	-8.27/-14.74	-8.34/-9.98	-11.42/-6.37	-12.71/-12.8	-8.27/-14.74	-8.34/-9.98	-11.42/-6.37	-12.71/-12.8	-8.27/-14.74	-8.34/-9.98
Theta (120°)	-11.05/-11.44	-9.88/-7.44	-5.79/-6.91	-18.96/-12.96	-12.31/-7.59	-7.34/-7.4	-8.77/-6.75	-6.61/-10.77	-11.77/-6.17	-4.59/-4.68	-5.72/-4.64	-3.13/-2.7	-2.39/-4.29	-5.44/-8.02	-7.05/-9.67	-8.82/-7.96	-12.31/-15.95	-17.48/-13.72	-8.18/-13.86	-13.41/-6.49	-9.28/-10.22	-7.19/-10.29	-5.08/-6.89	-12.01/-8.22
Theta (127.5°)	-12.41/-18.67	-16.41/-14.37	-8.17/-10.56	-8.05/-19.07	-13.91/-12.29	-13.67/-7.47	-71/-10.48	-9.06/8.41	-6.59/-5.02	-6.78/-4.72	-2.72/-9.07	-2.01/-3.44	-4.73/-6.23	-4.39/-6.14	-6.88/-9.9	-3.85/-12.16	-15.51/-15.93	-16.58/-18.03	-17.34/-13.32	-18.71/-10.8	-10.91/-16.99	-11.32/-14.69	-16.78/-13.74	-9.77/-13.4
Theta (135°)	-15.71/-13.19	-18.15/-14.93	-7.43/-18.8	-5.46/-15.49	-11.48/-8.33	-13.02/-13.51	-7.27/-6.85	-2.66/-14.75	-6.74/-4.78	-3.84/-4.5	-4.43/-3.78	-1.07/-1.15	-1.24/-3.3	-3.71/-3.4	-5.32/-7.12	-1.67/-9.69	-10.43/-6.83	-8.79/-9.99	-19.07/-19.12	-16.35/-18.88	-16.97/-17.18	-10.71/-12.2	-8.96/-5.71	-17.13/-18.13
Theta (142.5°)	-7.25/-8.6	-8.87/-7.75	-6.67/-6.45	-8.78/-12.93	-18.44/-11.69	-8.59/-12.84	-17.81/-18.97	-15.49/-11.03	-6.28/-5.65	-6.72/-5.87	-4.06/-1.28	0.12/-0.28	-1.69/-3.28	-4.66/-6.89	-6.55/-10.4	-11.98/-11.04	-10.59/-11.56	-18.78/-19.92	-11.04/-9.07	-13.54/-11.81	-8.94/-10.05	-16.27/-10.11	-6.96/-6.25	-6.25/-6.85
Theta (150°)	-12.21/-14.37	-14.18/-11.39	-12.36/-18.54	-19.38/-15.5	-18.25/-18.14	-10.84/-9.96	-12.08/-13.96	-13.94/-14.98	-12.97/-11.08	-9.38/-7.65	-5.03/-2	-0.61/-0.48	-2.13/-5.15	-8.18/-9.07	-10.11/-10.72	-13.67/-16.33	-7.65/-6.33	-4.68/-6.11	-11.51/-13.48	-9.87/-7.44	-10.34/-10.65	-16.37/-11.83	-16.49/-15.22	-11.74/-10.25
Theta (157.5°)	-5.06/-6.35	-10.41/-13.6	-12.99/-12.49	-12.61/-13.41	-16.16/-18.06	-17.09/-16.67	-18.12/-18.26	-17.74/-13.78	-8.91/-5.58	-4.52/-3.86	-2.89/-2.66	-1.42/-1.68	-6.97/-7.55	-8.89/-10.5	-2.89/-3.86	-6.97/-7.55	-8.89/-10.5	-2.89/-3.86	-6.97/-7.55	-8.89/-10.5	-2.89/-3.86	-6.97/-7.55	-8.89/-10.5	-2.89/-3.86
Theta (165°)	-11.82/-11.55	-12.94/-12.16	-10.41/-9.82	-10.38/-12.01	-13.43/-15.5	-17.41/-18.24	-18.17/-17.69	-18.48/-18.98	-15.51/-10.76	-8.66/-6.77	-4.48/-3.96	-4.11/-4.06	-4.73/-4.67	-4.48/-5.89	-9.11/-9.52	-7.89/-8.33	-11.44/-10.5	-6.09/-4.21	-5.26/-9	-16.39/-19.05	-18.97/-19.29	-19.04/-18.92	-15.41/-13.81	-10.54/-11.73
Theta (172.5°)	-16.03/-15.78	-17.15/-15.28	-12.83/-10.77	-10.26/-10.46	-10.32/-9.93	-6.89/-6.73	-6.98/-7.05	-7.77/-8.01	-8.01/-9.44	-11.19/-12.41	-14.06/-14.08	-13.24/-12.61	-11.57/-10.7	-11.38/-12.57	-12.64/-11.87	-11.63/-11.64	-10.89/-9.52	-8.25/-5.78	-7.56/-8.88	-9.67/-8.7	-7.58/-8.23	-7.97/-8.66	-10.23/-12.9	-15.13/-16.63
Theta (180°)	-17.89/-18.48	-18.81/-17.74	-17.71/-19.06	-18.69/-18.16	-17.13/-16.84	-15.13/-12.98	-13/-12.8	-12.85/-13.07	-12.8/-12.91	-12.87/-11.98	-10.99/-10.38	-10.12/-10.19	-10.48/-10.96	-12.03/-11.68	-10.76/-10.27	-10.24/-10.75	-11.22/-12.19	-14.71/-19.22	-17.55/-18.47	-19.19/-17.79	-19.01/-18.83	-17.83/-19.07	-17.78/-17.86	-18.52/-17.76
Freq(Hz)	6.475GPol	Phi/Ant. 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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°)	-5.66/-6.57	-8.18/-7.9	9/-10.14	-10.79/-10.66	-10.54/-9.75	-8.97/-7.65	-6.72/-6.19	-5.11/-4.66	-4.32/-4.27	-3.61/-3.36	-3.76/-3.88	-3.93/-4.41	-5.35/-5.54	-6.31/-9.33	-9.63/-10.75	-11.11/-10.37	-9.31/-8.57	-7.62/-6.52	-6.01/-5.32	-4.36/-3.77	-4.35/-4.31	-4.21/-4.56	-4.11/-4.11	-6.08/-6.65
Theta (7.5°)	-4.56/-4.6	-6.39/-8.85	-10.65/-13.7	-12.37/-9.19	-7.21/-5.83	-4.84/-4.09	-3.85/-4.03	-3.79/-3.52	-3.41/-3.55	-3.85/-3.95	-4.12/-4.89	-5.24/-4.97	-6.31/-8.78	-9.27/-9.51	-11.34/-14.72	-18.18/-17.54	-18.35/-18.57	-19.78/-16.8	-11.49/-10.45	-8.61/-6.79	-5.16/-3.86	-3.14/-2.55	-2.65/-2.38	-2.21/-3.53
Theta (15°)	-4.91/-4.97	-5.99/-6.92	-7.75/-9.81	-10.58/-9.73	-6.51/-																			



Radiated Composite Gain Data of 6GHz

Appendix A.2

θ(7.5°)	-5.32/4.36	-3.66/3.36	-3.2/3.09	-3.34/4.16	-5.1/6.37	-8.11/9.93	-11.96/12.77	-12.69/12.8	-12.8/12.92	-13.63/14.19	-11.97/10.41	-10.32/8.01	-6.41/5.89	-4.96/3.94	-3.57/3.61	-3.8/4.06	-4.28/4.39	-4.79/5.24	-5.48/5.83	-6.41/7.05	-8.38/10.49	-12.11/11.12	-9.74/8.6	-8.28/6.55
θ(15°)	-4.7/3.04	-3.36/3.3	-4.04/4.68	-4.95/5.07	-9.02/11.3	-11.02/10.83	-9.86/8.98	-8.89/8.62	-8.39/8	-7.34/6.68	-6.12/5.68	-7.11/6.44	-5.17/3.74	-2.71/2.29	-2.12/2.88	-4.02/5.89	-6.73/5.82	-5.44/5.2	-5.99/5.68	-7.71/10.26	-13.45/16.07	-18.77/14.95	-11.51/11.35	-8.2/6.02
θ(22.5°)	-2.9/1.99	-3.5/3.74	-3.35/3.36	-6.51/5.98	-6.09/4.76	-4.73/5.98	-6.91/6.79	-6.89/6.65	-6.95/7.24	-8.1/8.96	-8.15/6.64	-6.23/5.54	-2.99/1.66	-2.25/2.41	-2.28/2.56	-4.07/6.03	-6.09/4.81	-4.15/3.63	-4.62/5.73	-7.04/9.54	-12.07/17.1	-17.79/18.52	-12.95/8.87	-8.02/4.17
θ(30°)	-4.73/4.62	-3.79/4.67	-4.91/3.28	-1.24/1.36	-2.19/2.59	-3.63/4.42	-5.86/4.66	-5.53/6.14	-7.58/7.5	-7.65/7.59	-6.18/3.88	-2.85/4.2	-4.34/3.83	-4.84/4.94	-4.33/3.88	-4.61/4.75	-6.22/7.25	-7.12/5.26	-6.43/6.63	-8.64/10.6	-12.33/11.02	-9.59/11.76	-12.14/8.37	-6.6/3.03
θ(37.5°)	-3.68/4.54	-8.06/7.49	-6.23/2.24	-0.36/0.35	-0.89/1.75	-2.2/2.9	-3.73/3.93	-3.06/4.04	-5.52/6.44	-7.92/7.87	-5.63/3.9	-3.28/4.68	-6.77/6.05	-5.17/5.18	-4.65/6.36	-3.73/4.52	-8.06/8.09	-5.63/4.19	-3.69/3.91	-3.75/3.94	-4.62/5.88	-8.21/8.78	-6.91/6.58	-5.31/3.19
θ(45°)	-0.16/1.63	-5.42/5.37	-5.84/3.78	-0.94/0.1	0.76/0.12	-0.73/0.24	-1.03/1.79	-0.91/2.54	-4.92/5.72	-6.43/6.48	-7.63/9.22	-11.04/8.73	-7.36/5.53	-5.72/3.64	-3.98/5.81	-4.44/3.4	-5.49/5.16	-4.61/2.99	-3.5/4.76	-3.96/5.82	-7.85/1.11	-0.75/6.39	-5.2/4.97	-5.25/1.66
θ(52.5°)	-2.62/2.97	-7.7/6.8	-4.87/3.46	-1.13/0.62	1.26/1.88	0.78/0.8	0.23/1.04	-1.01/3.64	-4.33/5.24	-4.16/4.18	-7.41/9.58	-9.38/9.22	-10.26/9.79	-7.23/3.67	-3.46/5.91	-4.39/2.66	-2.59/2.16	-3.37/2.34	-2.57/2.74	-2.54/4.49	-4.52/4.83	-7.15/6.52	-5.03/8.93	-5.8/3.32
θ(60°)	-5.42/5.03	-7.02/8.81	-5.54/2.82	0.20/9.1	1.48/2.76	1.96/1.12	0.85/0.3	-1.55/3.96	-4.0/6	-5.19/4.2	-6.8/8.54	-8.43/14.1	-18.92/11.67	-12.32/4.32	-1.47/0.63	-3.04/3.43	-3.79/3.2	-5.95/5.43	-3.98/5.82	-3.81/5.46	-5.42/7.2	-6.38/10.8	-5.8/6.16	
θ(67.5°)	-4.1/4.49	-4.94/4.2	-3.2/2.02	0.58/0.64	2/2.64	1.63/1.43	1.91/27	-0.78/1.86	-2.49/5.54	-5.52/7.21	-7.64/6.4	-7.92/11.06	-14.63/10.75	-8.19/4.04	-1.33/2.81	-3.43/4.91	-6.88/5.28	-8.09/10.8	-12.95/11.29	-9.56/9.18	-4.66/6.6	-5.32/3.26	-7.78/14.4	-3.42/3.85
θ(75°)	-4.03/3.54	-2.85/2.9	-3.07/2.21	-0.49/0.11	0.24/1.5	1.22/1.55	2.51/2.6	0.68/0.32	-0.86/3.61	-6.16/8.78	-5.61/8.58	-10.07/12.55	-15.56/9.09	-6.91/5.39	-1.37/2.05	-3.17/4.69	-9.07/6	-6.31/5.51	-6.64/8.21	-7.32/9.52	-6.94/10.53	-3.49/3.88	-9.58/6.29	-2.91/2.75
θ(82.5°)	-4.84/4.65	-2.63/2.61	-2.13/3.29	-3.9/2.31	-0.46/0.55	0.71/0.65	2.32/69	1.41/1.04	-0.74/2.74	-6.24/11.7	-7.23/8.94	-11.33/10.92	-11.79/10.55	-6.67/5.47	-3.5/2.47	-4.86/6.06	-3.98/3.56	-3.5/1.81	-1.32/3.52	-3.46/5.94	-1.17/5.62	-10.88/4.15	-4.36/2.21	
θ(90°)	-3.88/6.26	-3.23/2.35	-1.73/3.42	-5.98/5.31	-2.74/3.07	-0.87/1.85	1.08/2.07	1.26/2.42	0.38/0.79	-4/10.45	-8.79/9.64	-11.54/11.01	-11.63/13.11	-9.16/18	-4.53/3.22	-5.63/5.22	-12.29/9.91	-3.29/1.13	-0.51/2.73	-4.78/4.4	-7.52/4.66	-0.01/4.72	-10.89/3.3	-6.18/5.59
θ(97.5°)	-11.29/8.79	-4.69/3.98	-2.44/3.66	-4.81/8.05	-5.83/3.82	-4.47/4.35	-0.150/99	-0.110/61	0.46/4.08	-3.43/8.21	-10.01/9.67	-10.66/10.03	-13.3/8.88	-9.16/12.57	-6.37/3.73	-6.32/4.88	-10.95/15.11	-8.71/4.56	-4.91/10.59	-10.75/6.71	-8.82/8.67	-2.15/6.25	-11.85/6.12	-13.13/8.09
θ(105°)	-6.6/9.72	-5.93/8.69	-8.3/4.83	-3.29/0.65	-7.34/5.91	-5.95/7.9	-2.8/1.29	-2.23/1.7	-1.4/1.78	-4.05/4.85	-8.29/7.94	-12.21/11.84	-13.96/15.68	-8.05/7.94	-8.61/6.87	-10.29/11.91	-12.4/11.68	-12.36/17.47	-13.64/11	-10.87/18.97	-13.92/12.42	-17.97/18.67	-17.6/6.5	
θ(112.5°)	-4.78/5.62	-5.4/9.91	-18.4/12.43	-4.12/2.88	-8.56/4.56	-5.74/8.98	-7.47/5.09	-6.58/4.35	-3.06/3.78	-4.69/4.8	-8.98/9.65	-15.91/11.33	-9.23/10.05	-16.93/14.97	-14.07/19.38	-16.86/10.9	-12.66/11.81	-16.48/18.81	-14.86/6.37	-4.07/0.69	-19.49/8.69	-13.27/8.23	-3.31/6.44	-8.26/6.63
θ(120°)	-12.25/13.26	-3.95/2.83	-6/19.01	-7.78/4.55	-6.47/5.32	-4.8/6.65	-8.35/10.11	-10.48/8.17	-6.09/6.27	-8.42/4.08	-8.24/11.76	-18.04/9.41	-7.96/9.41	-12.31/12.66	-15.43/19.11	-18.48/18.92	-17.2/18.73	-10.76/10.66	-9.78/5.53	-2.19/4.55	-15.76/8.41	-4.52/3.48	-4.91/3.13	-9.41/8.36
θ(127.5°)	-14.63/16.53	-11.21/8.35	-10.22/14.26	-12.59/5.94	-8.32/7.48	-6.7/9.34	-9.65/11.34	-17.34/11.62	-7.69/9.01	-9.57/7.4	-10.69/14.7	-11.54/8.45	-11.99/9.94	-10.71/11.84	-18.54/11.68	-6.75/7.4	-15.95/16.14	-14.87/12.57	-11.33/19.22	-7.25/10.61	-17.77/10.09	-16.02/16.2	-3.83/5.62	-15.64/11.96
θ(135°)	-8.72/9.74	-12.11/13.85	-8.42/14.47	-14.53/5.42	-5.33/9.35	-13.24/10.52	-12.88/18.39	-16.72/16.58	-13.27/10.86	-9.62/10.63	-9.16/12.25	-6.39/4.18	-7.55/8.7	-10.88/12.92	-14.61/15.31	-12.1/16.38	-13.83/18.67	-16.27/17.73	-18.91/9.25	-16.27/9.95	-6.83/7.77	-15.22/14.73	-14.78/8.04	-8.23/9.57
θ(142.5°)	-8.8/11.95	-15.12/17.71	-18.44/18.48	-14.63/5.72	-3.59/5.52	-9.69/11.98	-13.99/15.59	-13.11/10.99	-9.07/9.79	-10.82/12.17	-10.85/6.76	-2.3/2.15	-2.44/4.86	-10.79/18.45	-11.96/15.66	-17.49/10.39	-10.44/18.92	-19.24/10.91	-12.21/12.91	-9.67/8.14	-6.3/7.6	-18.84/12.06	-11.55/12.96	-18.11/13.44
θ(150°)	-8.24/11.72	-14.58/12.36	-13.15/17	-18.87/12.96	-9.38/4.4	-10.21/11.33	-11.45/12.23	-11.95/10.2	-8.19/3.67	-4.99/4.31	-2.98/1.93	-2.16/1.05	-1.92/4.79	-9.57/11.71	-18.41/13.85	-15.45/17.71	-16.84/9.73	-11.41/15.01	-18.82/12.62	-11.49/13.39	-10.08/6.63	-13.78/18.63	-17.41/10.63	-6.24/6.63
θ(157.5°)	-7.1/13.09	-18.12/14.43	-10.55/10.23	-11.22/11.37	-12.15/12.16	-13.81/12.37	-10.57/8.64	-6.81/6.15	-5.61/4.96	-5.05/5.14	-3.1/2	-2.54/2.21	-3.43/5.69	-7.05/11.53	-16.34/10.24	-8.98/10.22	-11.98/14.33	-18.23/18.64	-19.24/13.29	-12.91/12.9	-13.98/13.4	-15.85/12.61	-6.94/5.56	-4.54/4.09
θ(165°)	-18.79/13.81	-9.34/6.6	-5.65/5.89	-5.75/5.52	-9.24/11.86	-13.45/11.73	-8.71/7.71	-6.59/5.51	-4.52/4.07	-5.28/5.28	-4.28/4.73	-4.77/4.39	-4.79/6	-6.43/6.65	-7.21/10.56	-11.80/19.23	-17.63/13.67	-11.49/10.2	-9.08/8.33	-9.52/11.25	-10.7/8.44	-8.69/10.29	-13.43/17.61	
θ(172.5°)	-18.67/18.74	-16.15/12.87	-12.52/10.58	-9.69/10.59	-10.53/9.48	-8.63/9.14	-8.99/8.26	-9.14/6.66	-8.48/7.32	-6.83/6.01	-5.88/5.2	-5.51/6.5	-6.01/7.15	-10.44/15.52	-18.71/19.09	-13.61/12.02	-12.75/13.57	-14.65/18.66	-17.87/17.37	-15.58/14.43	-11.93/10.72	-9.71/9.67	-12.85/17.65	-17.78/18.24
θ(180°)	-9.97/11.71	-15.44/15.58	-16.54/14.97	-13.11/13.04	-12.02/10.38	-9.68/9.46	-8.44/8.12	-8.06/14.7	-7.05/6.63	-5.99/5.94	-5.37/5.41	-7.02/7.62	-8.95/12.54	-14.23/11.48	-11.05/10.7	-11.67/11.8	-11.19/9.97	-9.87/10.73	-11.45/10.84	-9.39/8.16	-7.61/7.2	-7.39/7.67	-7.45/6.32	-6.96/9.61
Freq(Hz)	6.995GPol.	PhiAnt.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)/Φ(7.5°)	Φ(15°)/Φ(22.5°)	Φ(30°)/Φ(37.5°)	Φ(45°)/Φ(52.5°)	Φ(60°)/Φ(67.5°)	Φ(75°)/Φ(82.5°)	Φ(90°)/Φ(97.5°)	Φ(105°)/Φ(112.5°)	Φ(120°)/Φ(127.5°)	Φ(135°)/Φ(142.5°)	Φ(150°)/Φ(157.5°)	Φ(165°)/Φ(172.5°)	Φ(180°)/Φ(187.5°)	Φ(195°)/Φ(202.5°)	Φ(210°)/Φ(217.5°)	Φ(225°)/Φ(232.5°)	Φ(240°)/Φ(247.5°)	Φ(255°)/Φ(262.5°)	Φ(270°)/Φ(277.5°)	Φ(285°)/Φ(292.5°)	Φ(300°)/Φ(307.5°)	Φ(315°)/Φ(322.5°)	Φ(330°)/Φ(337.5°)	Φ(345°)/Φ(352.5°)
θ(0°)	-8.27/7.73	-8.79/10.49	-11.68/12.8	-13.16/11.5	-9.54/8.04	-7.84/7.93	-6.82/6.51	-5.67/4.93	-4.62/6.2	-5.47/7.07	-6.2/6.2	-7.88/9.79	-10.42/9.64	-8.94/10.21	-10.31/10.02	-12.97/9.78	-9.28/7.22	-6.71/6.56	-5.72/5.41	-6.61/6.16	-5.67/6.15	-6.81/6.16	-6.91/6.32	
θ(7.5°)	-7.66/9.99	-9.81/9.3	-8.87/7.46	-7.42/7.09	-6.7/6.64	-6.63/7.23	-7.68/7.73	-7.78/6.89	-6.43/5.53	-4.69/4.73	-4.87/5.4	-5.46/5.77	-7.99/9.49	-10.82/12.82	-12.83/13.62	-15.06/14.15	-13.34/12.25	-12/11.7	-10.18/8.29	-7.16/6.08	-4.82/3.37	-2.71/2.72	-3.1/3.31	-3.69/5.1
θ(15°)	-3.61/6.6	-10.31/14.56	-14.19/11.03	-9.54/8.12	-7.71/7.94	-8.52/9.13	-9.11/7.63	-8.51/5.24	-5.67/5.41	-5.63/5.57	-5.16/5.53	-5.73/5.65	-6.48/9.25	-10.78/14.18	-16.06/14.47	-17.16/17.74	-17.17/18.88	-18.98/17.65	-13.43/10.89	-8.77/4.04	-5.92/4.61	-3.09/3.29	-1.56/1.87	-2.14/2.28
θ(22.5°)	-2.25/5.08	-8.1/8.54	-8.82/11.21	-11.99/15.32	-18.95/13.28	-9.12/6.56	-5.69/5.38	-4.94/5.2	-5.79/6.49	-5.89/5.32	-5.15/6.54	-7.37/7.3	-8.71/9.14	-8.76/10.22	-12.3/13.2	-16.92/18.19	-19.17/18.81	-19.17/9.2	-17.51/4.64	-3.36/2.2	-3.33/3.28	-3.93/2.27	-2.73/1.86	
θ(30°)	-2.81/5.53	-11.78/19.09	-10.29/10.13	-9.79/8.1	-8.81/12.86	-12.68/7.08	-4.54/3.71	-3.61/4	-4.98/4.62	-4.86/4.62	-5.49/6.4	-6.99/8.18	-9.45/9.46	-8.98/15.05	-14.3/12.98	-15.78/14.34	-15.92/15.27	-9.02/8.07	-11.47/8.2	4.04/2.4	-1.98/2.94	-5.09/4.75	-4.12/6.24	
θ(37.5°)	-9.86/9.1	-13.16/17.01	-13.25/8.62	-6.66/6.72	-6.59/6	-8.36/8.76	-4.83/5.97	-5.93/4.79	-4.54/2.92	-2.21/3.98	-7.12/7.58	-5.47/8.68	-5.34/7.08	-9.71/12.75	-17.72/17.61	-17.97/17.04	-18.11/17.38	-13.76/10.7	-11.24/11.74	-7.43/5.7	-5.17/3.98	-4.34/6.92	-8.82/12.92	
θ(45°)	-8.12/13.22	-16.38/10.8	-8.12/7.8	-8.07/12.63	-10.78/5.26	-4.98/6.62	-3.48/3.42	-4.11/6.31	-7.89/4.4	-3.72/4.62	-6.31/4.91	-5.16/6.74	-4.47/4.32	-6.12/11.56	-17.96/16.83	-19.03/8.94	-18.27/11	-9.1/4.72	-7.65/11.02	-7.39/8.61	-5.57/5.72	-6.54/8.15	-4.99/5.26	
θ(52.5°)	-12.87/18.96	-14.87/4.91	-4.61/9	-12.21/18.42	-19.08/5.09	-0.89/1.02	-1.85/2.77	-3.18/3.7	-4.38/3.47	-6.17/8.33	-6.18/3.81	-3.19/4.44	-4.47/7.24	-9.78/12.54	-14.94/17.57	-12.73/12.76	-19.08/8.74	-12.02/6.99	-5.73/1.21	-3.4/10.04	-3.15/4.63	-8.32/11.42	-10.38/5.52	-7.24/7.65
θ(60°)	-14.26/15.61	-10.5/5.48	-6.22/10.55	-10.9/18.81	-12.56/4.93	0.2/0.8	-2.08/1.75	-0.6/2.28	-3.16/2.44	-7.83/8.53	-8/													



Radiated Composite Gain Data of 6GHz

Appendix A.2

Theta	Phi	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(60)	Phi(0)	-3.32/6.4	-6.27/3.96	-3.19/6.03	-6.41/2.06	-1.58/0.64	1/1/29	-0.03/1.18	-2.16/3.35	-3.92/4.45	-3.27/5.97	-7.67/7.86	-4.62/2.07	-4.32/6.81	-6.44/3.82	-4.61/3.87	-8.1/10.7	-13.94/16.12	-13.91/9.77	-3.88/4.85	-5.16/4.42	-7.39/4.36	-1.93/2.85	-3.92/4.28	-1.76/1.65	Theta(67.5)	Phi(7.5)	-3.37/4.97	-5.06/4.16	-2.93/3.54	-4.89/1.11	-0.29/0.3	1.21/1.75	1.41/0.25	-0.92/3.31	-5.05/4.63	-5.1/5.84	-7.26/11.96	-4.95/1.89	-3.33/6.12	-5.11/3.22	-5.67/7.3	-10.04/12.33	-13.58/14.63	-10.81/6.6	-3.17/4.08	-6.17/4.4	-3.21/1.99	-2.63/1.89	-1.81/3.46	Theta(75)	-2.24/2.45	-4.92/5.05	-2.62/2.06	-3.46/0.82	0.11/0.83	1.04/1.24	2.39/1.07	0.03/1.94	-2.62/6.6	-6.63/2.51	-6.27/18.06	-6.73/2.08	-1.72/4.99	-6.41/2.72	-5.31/9.42	-11.77/17.48	-13.81/14.62	-10.69/3.85	-2.43/4.64	-3.56/2.08	-3.45/2.97	-4.03/3.93	Theta(82.5)	-1.49/2.66	-7.79/7.41	-3.68/2.62	-1.89/0.78	-0.36/0.64	0.80/5.1	2.26/1.55	0.57/1.39	-1.74/5.96	-7.85/6.67	-8.13/19.01	-5.94/1.1	-1.49/4.04	4.93/2.14	-6.97/11.53	-12.67/18.76	-13.47/12.72	-8.82/3.41	-2.73/6.04	-5.31/5.51	-2.96/6.76	-4.38/4.06	-7.73/4.54	-6.33/6.19	Theta(90)	-2.42/5.3	-12.94/9.54	-4.67/3.51	-2.2/2.25	-2.45/1.26	0.25/0.15	1.41/1.37	0.93/1.09	-0.17/3.05	-6.07/6.55	-7.21/18.68	-6.04/2.54	-1.38/1.92	-3.37/3.06	-4.1/15.08	-10.59/15.72	-11.08/7.24	-7.1/4.52	-4.7/8.12	-3.71/5.69	-8.23/5.79	-7.14/5.79	Theta(97.5)	-5.8/14.45	-10.56/10.61	-5.74/5.14	-5.51/6.71	-6.21/3.46	-1.05/1.31	0.09/0.12	0.47/1.14	-0.24/2.84	-5.21/7.01	-10.41/18.95	-9.51/5.48	-1.86/2.44	-2.97/4.09	-4.63/9.34	-12.06/13.63	-10.35/16.92	-14.68/10.19	-10.35/6.51	-7.57/7.05	-8.55/4.13	-2.75/6.96	-7.8/5.57	-8.47/6.63	Theta(105)	-11.64/11.23	-5.93/9.44	-6.73/7.59	-11.13/18.23	-14.27/7.47	-3.72/4.13	-2.73/2.62	-1.69/2.43	-0.29/1.52	-3.92/5.52	-10.18/16.85	-12.67/8.77	-6.03/3.57	-2.85/4.12	-4.74/6.57	-9.54/9.05	-8.02/12.77	-10.33/7.57	-6.6/11.29	-11.81/11.29	-9.58/5.22	-3.67/11.34	-12.55/7.34	-12.9/12.21	Theta(112.5)	-12.28/6.4	-3.43/8.51	-9.8/9.93	-12.09/12.27	-18.05/13.22	-7.66/10.9	-8.15/4.78	-5.35/3.11	-1.43/3.31	-3.94/4.36	-8.93/13.23	-10.96/14.93	-9.23/3.47	-4.7/3.37	-5.42/4.88	-8.01/7.55	-7.89/9.22	-9.19/6.04	-6.47/16.28	-12.49/10.83	-10.17/13.11	-8.23/18.05	-15.65/18.47	-13.34/15.01	Theta(120)	-7.8/6.76	-5.49/12.83	-18.39/19.25	-8.84/7.61	-8.6/12.79	-12.11/14.35	-15.9/19.05	-7.58/4.14	-3.64/4.74	-4.25/4.79	-6.21/11.58	-9.32/15.48	-18.8/5.52	-6.98/5.78	-3.87/7.88	-6.05/6.81	-9.94/11	-14.53/11.57	-9.22/13.86	-15.14/16.28	-11.04/11.53	-12.38/8.86	-11.29/13.29	-5.94/7.28	Theta(127.5)	-16.21/18.4	-18.2/18.28	-16.92/17.93	-11.57/8.69	-6.98/9.58	-10.05/9.06	-11.64/13.17	-10.78/8.18	-6.4/5.92	-5.08/4.59	-5.52/7.77	-9.97/9.35	-17.28/18.25	-8.32/7.67	-4.97/5.54	-5.5/7.92	-10.51/18.27	-15.08/12.95	-19.01/13.77	-13.44/18.27	-15.04/9.32	-13.85/14.11	-11.25/10.02	-4.38/8.41	Theta(135)	-12.43/8.72	-8.09/8.58	-8.75/12.32	-18.1/9.1	-5.05/5.52	-11.71/14.09	-11.11/9.57	-8.42/11	-14.43/13.42	-8.17/5.07	-4.15/6.52	-7.33/6.58	-6.96/11.49	-19.11/7.93	-6.75/6.34	-6.36/15.76	-10.3/14.11	-12.65/18.42	-18.57/12.69	-16.16/13.38	-9.14/10.77	-17.31/18.67	-18.53/17.9	-9.49/17.63	Theta(142.5)	-13.49/13.59	-8.8/6.85	-7.21/11.77	-15.73/13.58	-7.14/5.12	-6.56/9.51	-13.77/18.49	-16.84/17.63	-16.41/12.63	-11.69/9.38	-8.18/7.53	-6.56/6.11	-10.98/10.01	-18.84/17.09	-9.44/9.86	-10.68/18.27	-18.38/14.36	-11.88/19.2	-14.81/16.74	-14.81/16.4	-16.48/12.7	-16.84/19.21	-18.31/18.66	-14.41/15.55	Theta(150)	-17.38/18.2	-15.73/10.47	-10.1/12.89	-15.22/17.44	-17.13/11.78	-10.41/12.33	-17.91/18.95	-16.12/14.54	-14.93/12.83	-14.11/18.24	-11.5/8.33	-6.17/10.16	-13.26/19.11	-17.17/15.49	-14.74/9.28	-11.22/13.06	-17.09/17.31	-18.96/18.05	-18.7/18.74	-18.5/12.17	-12.71/13.7	-15.83/18.45	-18.18/15.7	Theta(157.5)	-6.93/7.77	-7.53/6.82	-7.91/11.08	-12.81/12.42	-12.49/13.66	-15.79/14.73	-13.41/11.4	-9.09/7.69	-8.11/11.35	-16.42/17.85	-13.86/12.2	-7.52/4.02	-4.88/8.82	-10.73/19.25	-18.15/14.37	-14.23/10.81	-12.55/13.93	-11.37/16.94	-17.33/16.94	-18.17/16.41	-15.51/14.11	-12.65/10.08	-7.24/6.44	Theta(165)	-10.93/8.27	-7.47/8.02	-8.2/8.53	-9.6/9.32	-9.61/9.42	-10.26/9.91	-9.91/11.89	-15.53/15.63	-13.2/12.52	-14.42/18.45	-19.31/15.3	-12.77/8.55	-5.97/5.98	-7.27/6.74	-6.23/6.42	-12.78/19.07	-16.97/13.04	-15.27/15.44	-10.71/8.67	-9.43/11.88	-15.45/16.9	-14.82/14.93	-16.75/14.8	-11.21/9.87	-9.98/11.95	Theta(172.5)	-19.23/16.43	-15.86/15.33	-12.41/11.55	-12.31/11.51	-11.27/12.15	-12.56/13.3	-14.16/14.94	-16.41/18.69	-17.38/19.07	-18.11/18.67	-15.86/12.52	-10.73/10.43	-10.35/11.28	-11.96/11.42	-11.1/13.1	-15.76/18.78	-18.82/17.05	-14.04/13.91	-17.5/19.41	-17.77/14.58	-11.41/10.85	-10.51/9.43	-9.53/10.95	-13.38/18.14	Theta(180)	-14.54/15.97	-18.87/17.45	-18.33/19.08	-19.05/18.52	-18.5/18.8	-16.57/14.53	-13.3/12.93	-12.9/12.61	-13.38/13.81	-12.73/11.79	-12.83/13.25	-13.85/13.24	-12.16/12.26	-12.01/11.11	-12.15/14.32	-16.38/18.36	-18.71/17.57	-18.25/17.19	-18.41/19	-17.85/18.48	-17.74/17.2	-15.05/13.82	-14.18/15.45	-15.94/14.51	Theta(187.5)	Gain	Phi(0)	Phi(7.5)	Phi(15)	Phi(22.5)	Phi(30)	Phi(37.5)	Phi(45)	Phi(52.5)	Phi(60)	Phi(67.5)	Phi(75)	Phi(82.5)	Phi(90)	Phi(97.5)	Phi(105)	Phi(112.5)	Phi(120)	Phi(127.5)	Phi(135)	Phi(142.5)	Phi(150)	Phi(157.5)	Phi(165)	Phi(172.5)	Phi(180)	Phi(187.5)	Phi(195)	Phi(202.5)	Phi(210)	Phi(217.5)	Phi(225)	Phi(232.5)	Phi(240)	Phi(247.5)	Phi(255)	Phi(262.5)	Phi(270)	Phi(277.5)	Phi(285)	Phi(292.5)	Phi(300)	Phi(307.5)	Phi(315)	Phi(322.5)	Phi(330)	Phi(337.5)	Phi(345)	Phi(352.5)



Radiated Composite Gain Data of 6GHz

Appendix A.2

Table with columns for frequency, gain, and various antenna configurations. It lists gain values for frequencies from 10.97 to 18.00 GHz across 28 different antenna types (Theta and Phi).



Antenna Pattern of 2.4GHz&5GHz

Appendix B.1

Theta (°)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345
Gain	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Theta (°)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345
Gain	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000