



Antenna Composite Gain Test Report

FCC ID	MSQ-RTBE8H00
Equipment	ROG STRIX WiFi 7 Tri-Band Gaming Router
Brand Name	ASUS
Model Name	GS-BE18000, GS-BE12000
Applicant	ASUSTeK COMPUTER INC. 1F., No. 15, Lide Rd., Beitou, Taipei City 112, Taiwan
Standard	KDB662911 D03 v01
Sample Received	Jan. 09, 2025
Start Test Date	Jan. 22, 2025
Final Test Date	Feb. 06, 2025

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory

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



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1. Operation Mode and Antenna Information

Antenna Position	RF Port	Brand Name	Model Name	Ant. Type	Connector	Modes of Operation
2G 5GAnt1	1	LYNwave	MLX24X-121AA0-A	PCB	I-PEX	2.4GHz, 5GHz UNII 1~3
2G 5GAnt2	2	LYNwave	MLX24X-121AA0-A	PCB	I-PEX	2.4GHz, 5GHz UNII 1~3
5GAnt3	3	LYNwave	MLX24X-121AA0-A	Dipole	I-PEX	5GHz UNII 1~3
5GAnt4	4	LYNwave	MLX24X-121AA0-A	Dipole	I-PEX	5GHz UNII 1~3
6G Ant1	1	LYNwave	MLX24X-121AA0-A	Dipole	I-PEX	6GHz
6G Ant2	2	LYNwave	MLX24X-121AA0-A	Dipole	I-PEX	6GHz
6G Ant3	3	LYNwave	MLX24X-121AA0-A	Dipole	I-PEX	6GHz
6G Ant4	4	LYNwave	MLX24X-121AA0-A	Dipole	I-PEX	6GHz

Note:

2.4GHz and 5GHz Operation Mode (2TX/2RX)

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

2G 5GAnt1~2 could transmit/receive simultaneously.

5GHz Operation Mode (4TX/4RX)

2G 5GAnt1~2 and 5GAnt3~4 can be used as transmitting/receiving antenna.

2G 5GAnt1~2 and 5GAnt3~4 could transmit/receive simultaneously.

6GHz Operation Mode (4TX/4RX)

6G Ant1~4 can be used as transmitting/receiving antenna.

6G Ant1~4 could transmit/receive simultaneously.

2. Table for Multiple Listing

EUT	Equipment Name	Model Name	Description
1	ROG STRIX WiFi 7 Tri-Band Gaming Router	GS-BE18000	The housing processing technique uses spray painting.
2		GS-BE12000	The housing processing technique uses a textured finish

Note 1: From the above models, model: GS-BE18000 (EUT 1) was selected as representative model for the test and its data was recorded in this report.

Note 2: The above information was declared by manufacturer.



3. 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

4. Testing Location

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

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
Radiated	05CH03-HY	Rofy Chen	23.5-24.5 / 45-55	Jan. 22, 2025~Feb. 06, 2025

Note:

Testing Site Information

Brand Name: TDK

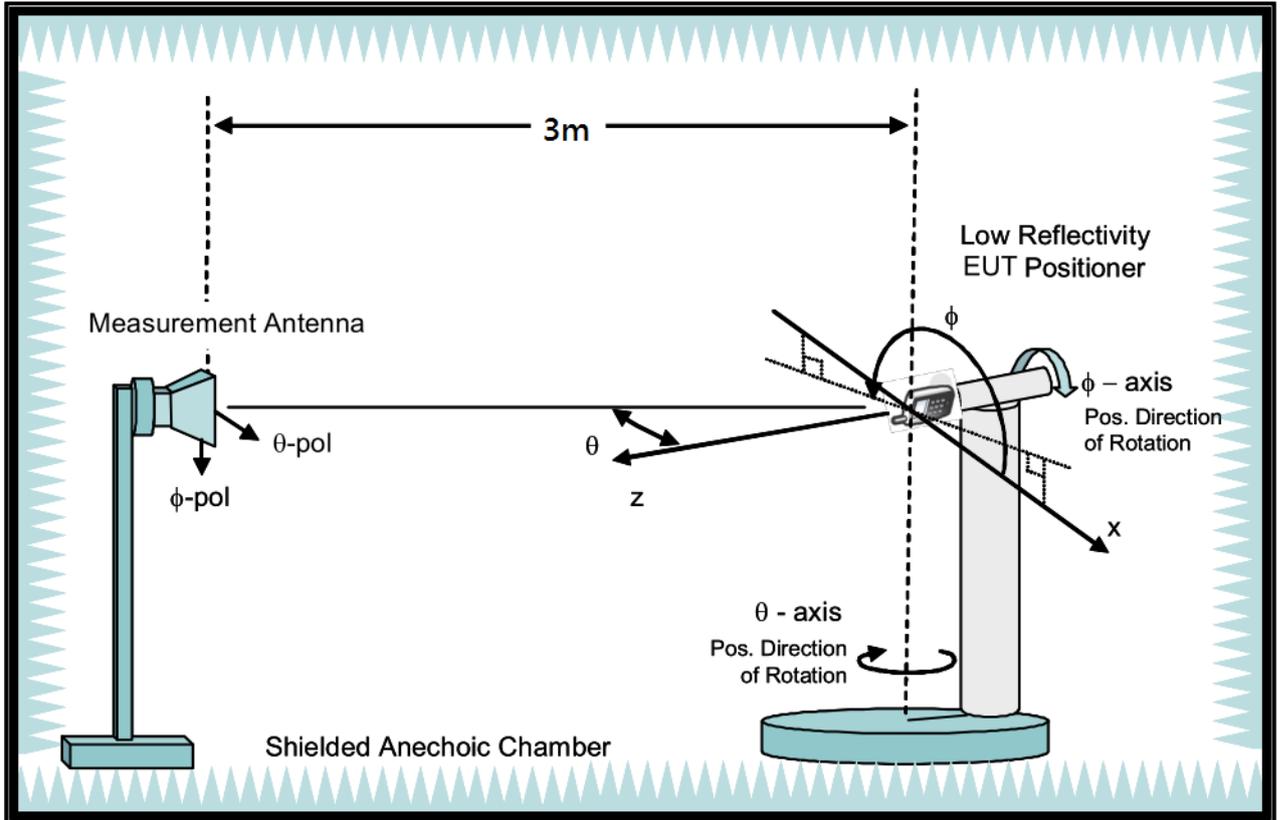
Dimension: 11m*6m*6m

Characteristic: Fully Anechoic Chamber

5. 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).

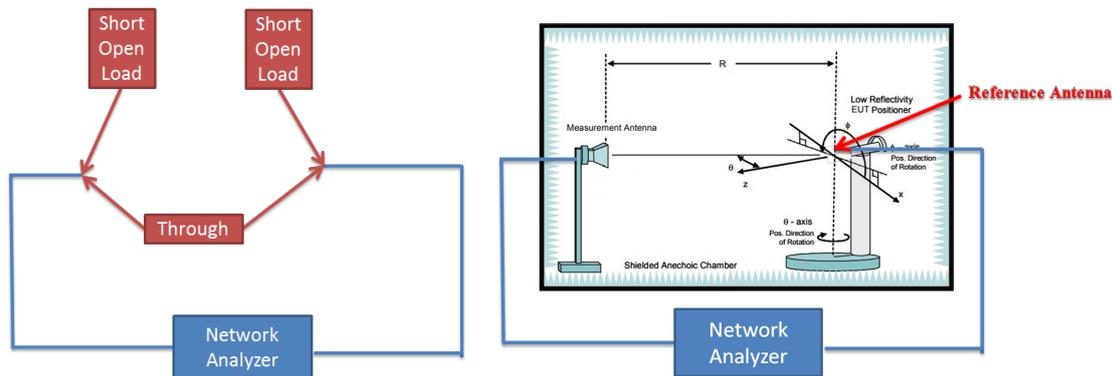
#Reference to CTIA "ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1"



6. 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)	-33.48	-33.18	-32.45	-32.78	-32.43	-32.85	-32.74	-32.13	-32.46	-33.46	-32.73	-33.41	-34.78	-35.31
G(phi) reading (dB)	-33.45	-32.13	-32.74	-32.43	-32.87	-31.78	-32.46	-32.37	-32.73	-32.87	-32.46	-33.68	-34.74	-35.08
Reference gain (dBi)	10.4	10.5	10.2	11.4	11.5	11.9	12.5	11.8	11.7	11.6	11.8	11.5	11.4	10.8
Factor(theta) (dB)	43.88	43.68	42.65	44.18	43.93	44.75	45.24	43.93	44.16	45.06	44.53	44.91	46.18	46.11
Factor(phi) (dB)	43.85	42.63	42.94	43.83	44.37	43.68	44.96	44.17	44.43	44.47	44.26	45.18	46.14	45.88

Note:

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

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

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

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



7. 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 8 tables.

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



8. Measured Values and Calculation of Maximum Gain Positions

DG_1SS max value position

Frequency (Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 (dBi)	2.48	-0.39	2.13	-7.18	-6.06
Ant. 2 (dBi)	2.25	-0.03	1.15	0.07	-0.73
Ant. 3 (dBi)	-	-0.59	-0.82	2.61	1.88
Ant. 4 (dBi)	-	-1.55	-6.56	-0.52	-1.29
DG [1SS] (dBi)	5.38	5.4	5.57	5.43	4.91
Polarization	Phi	Phi	Phi	Theta	Theta
$\Theta(^{\circ})$	90	82.5	105	120	120
$\Phi(^{\circ})$	7.5	135	45	22.5	22.5

Frequency (Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 (dBi)	1.72	0.83	0.3	1.08
Ant. 2 (dBi)	-2.87	-0.7	0.64	-0.29
Ant. 3 (dBi)	3.28	1.09	1.28	-1.47
Ant. 4 (dBi)	-0.3	0.36	0.84	-0.1
DG [1SS] (dBi)	6.77	6.44	6.79	5.87
Polarization	Theta	Theta	Theta	Theta
$\Theta(^{\circ})$	97.5	90	97.5	97.5
$\Phi(^{\circ})$	232.5	172.5	232.5	315

Note: The DG 1SS max value position is the maximum value of section 12 table DG 1SS Result.



DG_1SS max value position calculation

Frequency (Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 [10^(G/20)]	10^(2.48/20)	10^(-0.39/20)	10^(2.13/20)	10^(-7.18/20)	10^(-6.06/20)
Ant. 2 [10^(G/20)]	10^(2.25/20)	10^(-0.03/20)	10^(1.15/20)	10^(0.07/20)	10^(-0.73/20)
Ant. 3 [10^(G/20)]		10^(-0.59/20)	10^(-0.82/20)	10^(2.61/20)	10^(1.88/20)
Ant. 4 [10^(G/20)]		10^(-1.55/20)	10^(-6.56/20)	10^(-0.52/20)	10^(-1.29/20)
Ant. 1 [10^(G/20)] value	1.33	0.956	1.278	0.438	0.498
Ant. 2 [10^(G/20)] value	1.296	0.997	1.142	1.008	0.919
Ant. 3 [10^(G/20)] value		0.934	0.91	1.351	1.242
Ant. 4 [10^(G/20)] value		0.837	0.47	0.942	0.862
Sum All Antenna [Amax]	2.626	3.724	3.799	3.738	3.521
DG [10*log(Amax^2/Nant)]	5.38	5.4	5.57	5.43	4.91

Frequency (Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 [10^(G/20)]	10^(1.72/20)	10^(0.83/20)	10^(0.3/20)	10^(1.08/20)
Ant. 2 [10^(G/20)]	10^(-2.87/20)	10^(-0.7/20)	10^(0.64/20)	10^(-0.29/20)
Ant. 3 [10^(G/20)]	10^(3.28/20)	10^(1.09/20)	10^(1.28/20)	10^(-1.47/20)
Ant. 4 [10^(G/20)]	10^(-0.3/20)	10^(0.36/20)	10^(0.84/20)	10^(-0.1/20)
Ant. 1 [10^(G/20)] value	1.219	1.1	1.035	1.132
Ant. 2 [10^(G/20)] value	0.719	0.923	1.076	0.967
Ant. 3 [10^(G/20)] value	1.459	1.134	1.159	0.844
Ant. 4 [10^(G/20)] value	0.966	1.042	1.102	0.989
Sum All Antenna [Amax]	4.362	4.199	4.372	3.932
DG [10*log(Amax^2/Nant)]	6.77	6.44	6.79	5.87

Note:

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

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

9. Summary of Test Result

Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	2.87	4.03	4.06	3.8	2.74
Ant. 2 Max Gain (dBi)	2.66	2.23	3.44	3.5	3.04
Ant. 3 Max Gain (dBi)		4.56	5.15	4.91	4.77
Ant. 4 Max Gain (dBi)		2.04	2.49	3.65	3.25
Ant. 1 Polarization/ Θ (°)/ Φ (°)	Phi/90/15	Phi/97.5/300	Phi/97.5/300	Phi/97.5/300	Phi/60/292.5
Ant. 2 Polarization/ Θ (°)/ Φ (°)	Phi/90/0	Phi/90/75	Phi/112.5/337.5	Phi/82.5/75	Phi/82.5/75
Ant. 3 Polarization/ Θ (°)/ Φ (°)		Theta/127.5/82.5	Theta/135/82.5	Theta/142.5/82.5	Theta/112.5/82.5
Ant. 4 Polarization/ Θ (°)/ Φ (°)		Theta/120/165	Theta/127.5/172.5	Theta/97.5/240	Theta/105/262.5
Max Gain (dBi)	2.87	4.56	5.15	4.91	4.77
DG [1SS] (dBi)	5.38	5.4	5.57	5.43	4.91
DG [2SS] (dBi)	2.87	4.56	5.15	4.91	4.77
DG [4SS] (dBi)		4.56	5.15	4.91	4.77

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)

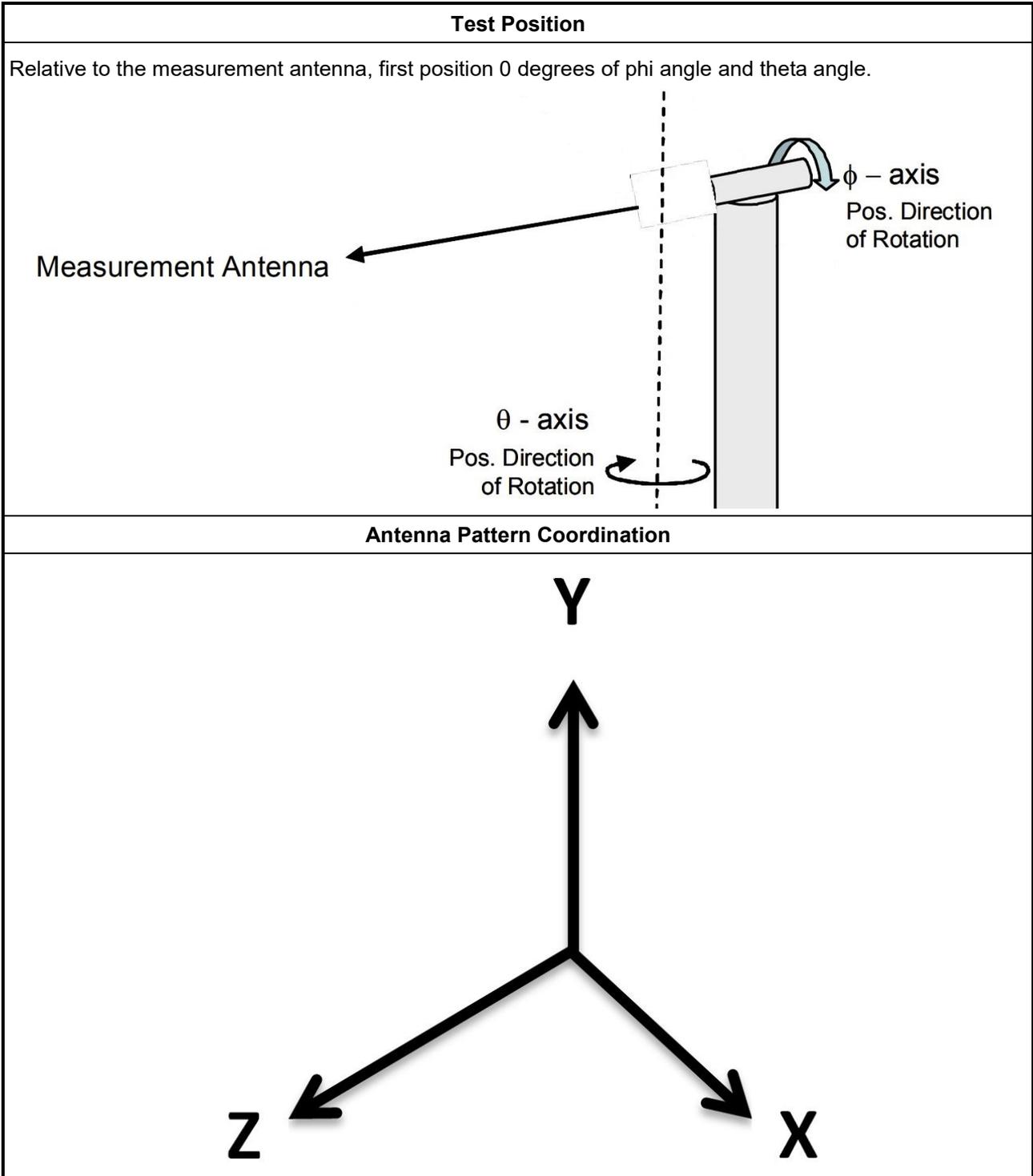


Freq(Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 Max Gain (dBi)	4.57	4.78	4.74	3.82
Ant. 2 Max Gain (dBi)	3.59	4.42	3.92	3.08
Ant. 3 Max Gain (dBi)	4.65	3.94	4.11	4.32
Ant. 4 Max Gain (dBi)	4.66	3.16	3.19	3.36
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/127.5/330	Phi/120/337.5	Theta/97.5/307.5	Theta/82.5/45
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/127.5/337.5	Theta/112.5/300	Theta/127.5/337.5	Theta/105/337.5
Ant. 3 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/135/187.5	Theta/135/187.5	Theta/135/157.5	Theta/135/157.5
Ant. 4 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/60/255	Phi/127.5/337.5	Theta/105/255	Theta/97.5/90
Max Gain (dBi)	4.66	4.78	4.74	4.32
DG [1SS] (dBi)	6.77	6.44	6.79	5.87
DG [2SS] (dBi)	4.66	4.78	4.74	4.32
DG [4SS] (dBi)	4.66	4.78	4.74	4.32

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)

10. Test Setup



Note:

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



11. Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1531	1GHz~18GHz	Dec. 20, 2024	Dec. 19, 2025
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. 30, 2024	Jul. 29, 2025
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.



12. Test Results

Please refer to the appendix.

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Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	2.87	4.03	4.06	3.8	2.74
Ant. 2 Max Gain (dBi)	2.66	2.23	3.44	3.5	3.04
Ant. 3 Max Gain (dBi)		4.56	5.15	4.91	4.77
Ant. 4 Max Gain (dBi)		2.04	2.49	3.65	3.25
Ant. 1 Polarization/ θ (°)/ ϕ (°)	Phi/90/15	Phi/97.5/300	Phi/97.5/300	Phi/97.5/300	Phi/60/292.5
Ant. 2 Polarization/ θ (°)/ ϕ (°)	Phi/90/0	Phi/90/75	Phi/112.5/337.5	Phi/82.5/75	Phi/82.5/75
Ant. 3 Polarization/ θ (°)/ ϕ (°)		Theta/127.5/82.5	Theta/135/82.5	Theta/142.5/82.5	Theta/112.5/82.5
Ant. 4 Polarization/ θ (°)/ ϕ (°)		Theta/120/165	Theta/127.5/172.5	Theta/97.5/240	Theta/105/262.5
Max Gain (dBi)	2.87	4.56	5.15	4.91	4.77
DG [1SS] (dBi)	5.38	5.4	5.57	5.43	4.91
DG [2SS] (dBi)	2.87	4.56	5.15	4.91	4.77
DG [4SS] (dBi)		4.56	5.15	4.91	4.77

Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	2.87	4.03	4.06	3.8	2.74
Ant. 2 Max Gain (dBi)	2.66	2.23	3.44	3.5	3.04
Ant. 3 Max Gain (dBi)		4.56	5.15	4.91	4.77
Ant. 4 Max Gain (dBi)		2.04	2.49	3.65	3.25
Ant. 1 Polarization/ θ (°)/ ϕ (°)	Phi/90/15	Phi/97.5/300	Phi/97.5/300	Phi/97.5/300	Phi/60/292.5
Ant. 2 Polarization/ θ (°)/ ϕ (°)	Phi/90/0	Phi/90/75	Phi/112.5/337.5	Phi/82.5/75	Phi/82.5/75
Ant. 3 Polarization/ θ (°)/ ϕ (°)		Theta/127.5/82.5	Theta/135/82.5	Theta/142.5/82.5	Theta/112.5/82.5
Ant. 4 Polarization/ θ (°)/ ϕ (°)		Theta/120/165	Theta/127.5/172.5	Theta/97.5/240	Theta/105/262.5
Max Gain (dBi)	2.87	4.56	5.15	4.91	4.77
DG [1SS] (dBi)	5.38	5.4	5.57	5.43	4.91
DG [2SS] (dBi)	2.87	4.56	5.15	4.91	4.77
DG [4SS] (dBi)		4.56	5.15	4.91	4.77



Radiated Composite Gain Data_2.4GHz and 5GHz

Appendix A

DG 1SS Result

Freq(Hz)	2.45GPol.	Phi-	Phi+	Phi(30°)	Phi(45°)	Phi(60°)	Phi(75°)	Phi(90°)	Phi(105°)	Phi(120°)	Phi(135°)	Phi(150°)	Phi(165°)	Phi(180°)	Phi(195°)	Phi(210°)	Phi(225°)	Phi(240°)	Phi(255°)	Phi(270°)	Phi(285°)	Phi(300°)	Phi(315°)	Phi(330°)	Phi(345°)
DG(dB)	Phi(0°)	Phi(15°)	Phi(30°)	Phi(45°)	Phi(60°)	Phi(75°)	Phi(90°)	Phi(105°)	Phi(120°)	Phi(135°)	Phi(150°)	Phi(165°)	Phi(180°)	Phi(195°)	Phi(210°)	Phi(225°)	Phi(240°)	Phi(255°)	Phi(270°)	Phi(285°)	Phi(300°)	Phi(315°)	Phi(330°)	Phi(345°)	
Theta(0°)	-14.86-14.93	-15.07-14.68	-15.71-14.4	-14.17-13.97	-11.29-11.22	-11.29-11.22	-11.81-11.31	-11.22-11.33	-12.12-12.44	-12.83-13.41	-14.1-14.74	-14.94-14.24	-15.32-14.33	-14.22-14.14	-13.63-13.14	-12.89-12.94	-12.66-12.46	-12.35-12.45	-12.46-12.52	-12.67-13.27	-13.67-13.27	-14.42-16.13	-15.42-15.18	-15.42-15.18	-15.42-15.18
Theta(7.5°)	-9.78-10.25	-11.08-11.74	-11.55-11.28	-10.83-11.15	-11.29-11.12	-10.13-10	-10.13-10	-10.02-10.24	-12.08-11.19	-14.42-14.92	-16.46-15.45	-14.76-15.89	-14.97-14.6	-14.31-14.21	-12.01-11.43	-11.18-11.48	-11.83-12.21	-12.67-13.15	-13.43-13.44	-12.67-13.15	-12.89-12.49	-11.92-11.21	-10.74-10.68		
Theta(15°)	-5.36-5.73	-6.46-7.29	-8.1-8.29	-8.45-8.89	-8.73-8.4	-7.97-7.59	-7.35-7.13	-7.16-9.2	-6.88-6.93	-7.14-7.51	-8.04-8.82	-10.03-11.41	-12.47-12.32	-11.39-10.15	-8.92-7.99	-7.32-6.9	-6.86-7.14	-7.42-7.89	-8.53-9.32	-10.15-10.6	-10.49-9.88	-9.09-8.28	-7.49-6.71	-6.2-5.92	
Theta(22.5°)	-3.22-3.58	-4.14-4.8	-5.55-6.24	-6.66-6.17	-6.39-6.17	-5.91-5.58	-5.38-5.21	-5.03-4.87	-4.6-4.16	-3.77-3.61	-3.67-4.07	-4.84-5.99	-6.78-6.92	-6.35-5.47	-4.65-4.03	-3.63-3.46	-3.5-3.68	-3.89-4.25	-4.85-5.7	-6.61-7.27	-7.33-6.81	-6.08-5.27	-4.51-3.93	-3.57-3.48	
Theta(30°)	-1.38-1.55	-1.94-2.56	-3.46-4.4	-4.98-5.03	-4.71-4.3	-3.82-3.35	-3-2.28	-2.92-2.95	-2.62-2.12	-1.42-0.82	-0.54-0.65	-1.25-2.22	-3.39-4.1	-3.89-3.04	-2.15-1.5	-1.14-1.1	-1.03-1.16	-1.35-1.67	-2.25-3.02	-3.86-4.46	-4.56-4.21	-3.6-2.99	-2.49-2.14	-1.85-1.7	
Theta(37.5°)	0.33-0.3	-0.12-0.96	-2.21-3.64	-4.62-4.82	-4.28-3.41	-2.35-1.4	-0.8-0.63	-0.83-1.21	-1.42-1.13	-0.37-0.55	1.071.09	0.57-0.43	-1.42-1.94	-1.69-0.96	-0.26-0.17	0.33-0.29	0.13-0.08	-0.32-0.69	-1.19-1.72	-2.1-2.23	-2.17-1.95	-1.62-1.31	-1.1-0.84	-0.44-0.09	
Theta(45°)	1.521.29	0.56-0.49	-1.73-2.75	-2.99-2.46	-1.79-1.3	-0.91-0.35	0.16-0.34	0.19-0.24	-0.72-0.97	-0.72-0.06	0.811.09	0.79-0.01	-0.91-1.48	-1.26-0.37	0.44-0.91	1.081.05	0.91-0.68	0.39-0.18	-0.0-0.08	-0.09-1.02	-0.25-0.47	-0.68-0.85	-0.8-0.28	0.521.11	
Theta(52.5°)	2.532.05	1.32-0.61	0.17-0.17	0.56-0.07	1.471.53	1.24-1.01	1.021.08	1.02-0.7	0.42-0.2	-0.12-0.3	1.011.35	1.2-0.62	-0.04-0.39	0.0-0.2	1.74-2.25	2.52-2.59	2.54-2.46	2.42-2.44	2.23-1.85	2.17-2.11	1.31-0.64	0.01-0.28	0.25-1.23	2.07-2.41	
Theta(60°)	3.65-3.6	3.24-2.8	2.41-2.21	2.2-2.3	2.41-2.36	2.09-1.78	1.68-1.81	1.99-2.06	1.98-1.8	1.61-1.67	2.05-2.39	2.43-2.1	1.61-1.1	0.91-1.44	2.2-2.78	3.09-3.17	3.15-3.2	3.34-3.53	3.55-3.41	3.12-2.71	2.71-1.87	1.56-1.41	1.61-2.1	2.77-2.27	
Theta(67.5°)	4.71-4.74	4.34-3.83	3.37-3.02	2.76-2.65	2.62-2.56	2.41-2.19	2.01-2.02	2.2-2.4	2.52-2.46	2.31-2.29	2.52-2.75	2.77-2.62	2.32-1.98	2.03-2.53	3.07-3.38	3.43-3.29	3.16-3.24	3.41-3.63	3.77-3.93	4.09-4.21	4.18-3.92	3.32-2.39	1.68-2.06	3.24-1.6	
Theta(75°)	4.71-4.68	4.27-3.9	3.64-3.45	3.33-2.8	3.25-3.14	2.92-2.63	2.35-2.15	2.21-2.54	2.94-3.18	3.18-2.97	2.69-2.48	2.36-2.25	1.99-1.56	1.38-1.88	2.65-3.22	3.41-3.27	3.07-3.01	3.13-3.42	3.86-4.4	4.83-4.95	4.76-4.22	3.37-2.42	2.06-2.53	3.54-2.28	
Theta(82.5°)	4.63-4.97	4.78-4.29	3.77-3.31	3.01-2.85	2.77-2.59	2.31-2.04	1.89-1.8	1.89-2.17	2.58-2.95	3.2-3.36	3.38-3.27	3.09-2.77	2.33-1.96	1.98-2.47	3.11-3.53	3.61-3.52	3.41-3.39	3.44-3.58	3.87-4.23	4.44-4.45	4.34-2.4	4.05-3.64	3.11-2.87	3.26-4.06	
Theta(90°)	5.165.38	5.19-4.79	4.32-3.9	3.62-3.57	3.64-3.72	3.73-3.59	3.41-3.4	2.89-2.74	2.77-2.99	3.25-3.47	3.53-3.37	3.03-2.57	2.12-1.94	2.16-2.57	2.94-3.17	3.24-3.21	3.19-3.26	3.36-3.48	3.71-4.05	4.35-4.5	4.44-4.07	3.51-2.77	2.31-2.78	3.84-7.5	
Theta(97.5°)	3.75-3.94	3.85-3.48	2.88-2.35	2.15-2.38	2.73-2.91	2.92-2.78	2.57-2.29	1.97-1.66	1.52-1.74	2.26-2.83	3.05-2.88	2.29-1.48	1.51-1.64	2.42-2.78	2.58-2.11	1.72-1.66	1.94-2.41	2.83-3.19	3.61-4.11	4.54-4.6	4.38-3.67	2.51-1.4	1.21-1.99	2.94-3.62	
Theta(105°)	2.89-3.14	3.13-2.87	2.31-1.58	1.17-1.41	1.89-2.13	2.02-1.72	1.46-1.24	0.98-0.79	0.87-1.42	2.21-2.94	3.37-3.39	2.92-2.07	1.45-1.59	2.29-2.76	2.61-1.98	1.45-1.45	1.86-2.25	2.42-2.48	2.77-3.34	4.44-4.45	4.34-2.4	4.05-3.64	3.11-2.87	2.18-2.6	
Theta(112.5°)	2.57-2.85	3.02-3.06	2.84-2.31	1.75-1.67	2.03-2.38	2.52-2.35	2.03-1.64	1.07-0.23	-0.39-0.17	1.46-2.62	3.16-2.94	2.17-1.46	1.43-1.77	2.03-1.97	1.61-2.7	1.33-1.67	1.95-1.96	1.82-1.88	2.39-3.15	3.84-2.23	4.2-3.72	2.94-2.2	1.76-1.62	1.83-2.29	
Theta(120°)	1.55-1.34	1.09-1.05	1.12-0.8	0.06-0.54	-0.24-0.6	1.28-1.54	1.39-1.93	0.2-0.68	-1.14-0.34	1.82-2.45	3.2-3.4	2.34-2	1.89-1.8	1.48-0.9	0.39-0.53	1.33-1.28	2.61-2.5	2.19-1.24	2.41-2.73	2.94-2.99	2.91-2.67	2.42-1.6	1.95-1.73	1.62-1.62	
Theta(127.5°)	0.55-0.24	-0.4-0.89	-0.93-1.02	-1.6-1.9	-1.19-1.07	0.49-0.56	1.05-0.57	-1.53-2.62	-2.72-1.02	0.79-1.83	2.12-1.8	1.39-1.06	0.67-0.21	-0.29-0.77	1.85-2.52	2.58-2.15	1.72-2.52	2.58-2.15	1.51-1.47	1.34-1.14	0.95-0.83	0.57-0.67	0.53-0.37	0.36-0.5	
Theta(135°)	0.16-0.17	-0.38-1.21	-1.75-1.68	-1.4-1.19	-0.97-0.47	-0.46-0.35	-0.4-0.64	-1.15-1.96	-2.76-2.38	-1.15-0.39	-0.26-0.45	-0.65-0.96	-1.52-2.26	-2.84-2.67	-2.03-0.98	0.09-0.7	0.81-0.63	0.47-0.23	0.12-0.15	-0.63-1.31	-1.86-1.73	-1.04-0.33	-0.06-0.16	-0.23-0.01	
Theta(142.5°)	0.54-0.76	0.49-0.14	-0.9-1.46	-1.9-2.3	-3.45-4.57	-5.08-4.71	-3.83-3.05	-2.58-2.38	-2.28-2.17	-1.93-1.64	-1.32-0.96	-0.53-0.38	-0.57-1.12	-1.85-2.62	-3.05-2.76	-2.42-2.17	-1.96-1.8	-1.91-2.25	-2.67-2.88	-2.73-2.2	-1.5-0.83	-0.28-0.06	0.14-0.01	-0.01-0.29	
Theta(150°)	-0.53-0.46	-0.7-1.19	-1.84-2.58	-3.44-4.6	-4.71-6.65	-7.27-6.14	-5.81-5.21	-4.54-4.07	-3.52-3.61	-2.34-2.15	-1.86-1.43	-1.07-0.96	-2.21-1.98	-3.01-3.91	-4.01-3.91	-2.61-1.59	-1.36-1.29	-1.42-1.76	-2.12-2.4	-2.53-2.58	-2.44-2.11	-1.65-1.19	-0.78-0.05		
Theta(157.5°)	-2.39-2.71	-3.04-3.47	-3.98-4.47	-4.79-4.86	-4.57-4.12	-3.79-3.72	-3.72-3.74	-3.59-3.27	-2.9-2.6	-2.42-2.34	-2.36-2.47	-2.79-3.42	-4.58-6.25	-8.16-9.54	-9.63-8.89	-8.09-7.58	-7.42-7.41	-7.64-8.06	-8.54-8.66	-8.26-7.11	-5.62-4.35	-3.35-2.63	-2.08-1.78	-1.76-1.98	
Theta(165°)	-4.37-4.64	-4.81-4.97	-5.15-5.16	-4.95-4.52	-3.97-3.46	-3.17-3.19	-3.37-3.67	-3.98-4.25	-4.47-4.56	-4.54-4.49	-4.49-4.52	-4.59-4.7	-4.86-5.04	-5.39-5.75	-5.98-6.15	-6.28-6.33	-6.29-6.16	-5.94-5.48	-4.89-4.3	-3.74-3.22	-2.83-2.58	-2.49-2.58	-2.79-3.11	-3.55-4	
Theta(172.5°)	-9.05-9.07	-9.08-9.15	-9.12-8.85	-8.42-7.94	-7.47-7.09	-6.97-7.2	-7.75-8.32	-8.93-9.47	-9.17-10.1	-10.1-9.75	-9.33-8.88	-8.41-9.17	-7.38-8.61	-6.29-8.85	-5.4-5.05	-4.74-4.46	-4.23-4.07	-3.97-3.94	-3.83-4.04	-4.18-4.38	-4.69-5.13	-5.67-6.36	-7.14-7.84	-8.42-8.61	
Theta(180°)	-15.37-15.23	-15.11-15.15	-15.09-15.2	-13.64-12.38	-11.61-11.06	-10.8-10.95	-11.45-12.26	-13.28-14.33	-15.14-14.79	-15.37-15.63	-15.17-15.52	-15.03-15.45	-14.99-14.29	-13.13-12.26	-11.6-10.86	-10.2-9.53	-9.04-8.7	-8.42-8.37	-8.51-8.98	-9.72-10.6	-11.48-12.09	-13.48-14.91	-15.49-15.71	-15.65-15.01	



Radiated Composite Gain Data_2.4GHz and 5GHz

Appendix A

Theta	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°	100°	105°	110°	115°	120°	125°	130°	135°	140°	145°	150°	155°	160°	165°	170°	175°	180°															
Theta	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°	100°	105°	110°	115°	120°	125°	130°	135°	140°	145°	150°	155°	160°	165°	170°	175°	180°															
Gain (dB)	0.7906	0.30	-0.271-0.4	0.1307	-0.28-0.36	-2.28-2.36	-2.83-3.64	-4.11-4.38	-4.31-2.93	-2.31-2.32	-2.63-2.72	-2.64-2.44	-2.33-2.14	-2.22-2.33	-2.16-2.01	-2.01-2.11	-2.22-2.51	-2.87-2.86	-2.25-1.51	-1.34-1.4	-1.41-1.41	-1.21-1.22	-1.48-1.2	-1.02-0.44	0.13-0.13	0.7906	0.30	-0.271-0.4	0.1307	-0.28-0.36	-2.28-2.36	-2.83-3.64	-4.11-4.38	-4.31-2.93	-2.31-2.32	-2.63-2.72	-2.64-2.44	-2.33-2.14	-2.22-2.33	-2.16-2.01	-2.01-2.11	-2.22-2.51	-2.87-2.86	-2.25-1.51	-1.34-1.4	-1.41-1.41	-1.21-1.22	-1.48-1.2	-1.02-0.44	0.13-0.13		
Gain (dB)	1.65187	0.620	-0.271-0.4	0.1307	-0.28-0.36	-2.28-2.36	-2.83-3.64	-4.11-4.38	-4.31-2.93	-2.31-2.32	-2.63-2.72	-2.64-2.44	-2.33-2.14	-2.22-2.33	-2.16-2.01	-2.01-2.11	-2.22-2.51	-2.87-2.86	-2.25-1.51	-1.34-1.4	-1.41-1.41	-1.21-1.22	-1.48-1.2	-1.02-0.44	0.13-0.13	1.65187	0.620	-0.271-0.4	0.1307	-0.28-0.36	-2.28-2.36	-2.83-3.64	-4.11-4.38	-4.31-2.93	-2.31-2.32	-2.63-2.72	-2.64-2.44	-2.33-2.14	-2.22-2.33	-2.16-2.01	-2.01-2.11	-2.22-2.51	-2.87-2.86	-2.25-1.51	-1.34-1.4	-1.41-1.41	-1.21-1.22	-1.48-1.2	-1.02-0.44	0.13-0.13		
Gain (dB)	1.84255	2.17168	1.87178	2.01177	0.99019	-0.611-3.4	-1.491-0.65	-0.181-0.14	-0.821-1.31	-1.101-0.45	0.7707	-0.261-0.05	0.13039	1.11093	-0.191-0.38	0.38089	1.46101	0.40029	0.05016	0.58118	1.15101	1.17176	2.53055	2.53055	2.53055	2.53055	1.84255	2.17168	1.87178	2.01177	0.99019	-0.611-3.4	-1.491-0.65	-0.181-0.14	-0.821-1.31	-1.101-0.45	0.7707	-0.261-0.05	0.13039	1.11093	-0.191-0.38	0.38089	1.46101	0.40029	0.05016	0.58118	1.15101	1.17176	2.53055	2.53055	2.53055	2.53055
Gain (dB)	2.83285	2.89152	0.44118	2.39269	2.28136	-0.031-0.6	-0.461-1	2.14213	1.161-0.15	-0.871-0.25	0.75099	0.83133	1.6821	1.77025	-2.111-0.25	1.85234	1.89114	0.36099	1.4113	1.57265	3.87412	3.44269	3.1364	3.45325	2.83285	2.89152	0.44118	2.39269	2.28136	-0.031-0.6	-0.461-1	2.14213	1.161-0.15	-0.871-0.25	0.75099	0.83133	1.6821	1.77025	-2.111-0.25	1.85234	1.89114	0.36099	1.4113	1.57265	3.87412	3.44269	3.1364	3.45325				
Gain (dB)	3.1277	2.39056	-0.36072	1.33145	1.28047	0.311-0.29	0.571-1.7	2.31253	1.86051	0.531-1.7	1.96245	1.3024	0.72067	-0.141-0.9	2.70285	0.361-0.4	0.92155	2.92235	1.13104	3.83318	1.76226	2.38213	2.06063	3.1277	2.39056	-0.36072	1.33145	1.28047	0.311-0.29	0.571-1.7	2.31253	1.86051	0.531-1.7	1.96245	1.3024	0.72067	-0.141-0.9	2.70285	0.361-0.4	0.92155	2.92235	1.13104	3.83318	1.76226	2.38213	2.06063						
Gain (dB)	1.85264	2.73126	0.92244	2.75171	0.47098	1.52195	2.38222	2.55033	2.49207	2.79344	3.86373	1.97067	0.661-1.1	-0.671-1.9	-2.151-0.46	-0.351-0.69	-0.891-0.1	1.76303	3.26285	1.73106	0.561-1.7	1.3168	2.54288	2.86183	1.85264	2.73126	0.92244	2.75171	0.47098	1.52195	2.38222	2.55033	2.49207	2.79344	3.86373	1.97067	0.661-1.1	-0.671-1.9	-2.151-0.46	-0.351-0.69	-0.891-0.1	1.76303	3.26285	1.73106	0.561-1.7	1.3168	2.54288	2.86183				
Gain (dB)	0.85252	1.79069	0.93265	3.51359	3.58356	3.1429	2.81293	3.48321	2.66369	3.73701	3.41367	2.27177	2.53058	0.27052	-0.271-0.68	-0.511-0.7	-0.901-0.58	0.56094	1.96168	2.2256	2.79119	1.91304	2.26234	2.38049	0.85252	1.79069	0.93265	3.51359	3.58356	3.1429	2.81293	3.48321	2.66369	3.73701	3.41367	2.27177	2.53058	0.27052	-0.271-0.68	-0.511-0.7	-0.901-0.58	0.56094	1.96168	2.2256	2.79119	1.91304	2.26234	2.38049				
Gain (dB)	0.14197	1.5024	0.81215	2.76334	4.48525	4.99394	2.43172	2.35297	3.96467	4.65439	4.04356	2.02153	1.511-0.07	0.08027	-0.051-0.52	-0.891-0.85	-1.411-0.87	1.35112	1.14096	1.31304	3.83318	1.76226	2.38213	2.06063	0.14197	1.5024	0.81215	2.76334	4.48525	4.99394	2.43172	2.35297	3.96467	4.65439	4.04356	2.02153	1.511-0.07	0.08027	-0.051-0.52	-0.891-0.85	-1.411-0.87	1.35112	1.14096	1.31304	3.83318	1.76226	2.38213	2.06063				
Gain (dB)	1.44204	1.57162	1.87247	3.19299	3.84475	4.91458	3.71256	1.93277	3.71448	4.87381	2.88268	1.52123	1.19036	0.83098	0.8702	-0.111-0.29	0.04134	1.74115	1.3158	2.3444	4.52357	2.04157	2.21282	2.01146	1.44204	1.57162	1.87247	3.19299	3.84475	4.91458	3.71256	1.93277	3.71448	4.87381	2.88268	1.52123	1.19036	0.83098	0.8702	-0.111-0.29	0.04134	1.74115	1.3158	2.3444	4.52357	2.04157	2.21282	2.01146				
Gain (dB)	1.31215	2.2931	4.03397	4.37359	2.9268	2.5831	3.13247	2.48295	3.4938	3.97261	1.33232	1.42174	0.81059	0.4704	0.98091	0.95155	2.07279	2.05239	2.21086	2.29398	3.95322	2.2181	3.16341	1.84181	1.31215	2.2931	4.03397	4.37359	2.9268	2.5831	3.13247	2.48295	3.4938	3.97261	1.33232	1.42174	0.81059	0.4704	0.98091	0.95155	2.07279	2.05239	2.21086	2.29398	3.95322	2.2181	3.16341	1.84181				
Gain (dB)	2.06297	4.3469	5.10252	5.5749	1.84078	0.86144	2.08135	0.97213	2.58212	2.4421	2.03226	1.7612	1.111	0.42109	0.4704	0.80133	2.18269	3.03281	2.84365	3.59356	2.89226	3.3493	3.37269	2.06297	4.3469	5.10252	5.5749	1.84078	0.86144	2.08135	0.97213	2.58212	2.4421	2.03226	1.7612	1.111	0.42109	0.4704	0.80133	2.18269	3.03281	2.84365	3.59356	2.89226	3.3493	3.37269						
Gain (dB)	1.32179	3.95399	3.55296	3.11272	1.52012	1.49223	1.65008	-0.5807	0.97044	1.1519	1.78319	0.98003	0.87016	0.261-0.2	0.31148	1.6136	1.4121	2.85274	3.09217	1.09153	-0.37054	2.83286	4.1491	3.82339	1.32179	3.95399	3.55296	3.11272	1.52012	1.49223	1.65008	-0.5807	0.97044	1.1519	1.78319	0.98003	0.87016	0.261-0.2	0.31148	1.6136	1.4121	2.85274	3.09217	1.09153	-0.37054	2.83286	4.1491	3.82339				
Gain (dB)	0.72136	2.61384	1.761-0.25	1.09179	0.03034	0.91105	0.83005	-0.511-0.98	0.82187	1.38075	1.94288	0.051-3.72	-1.281-1.21	0.221-0.5	-0.40168	1.01173	2.39237	2.991-0.1	-0.361-0.77	1.44136	1.041-1.23	1.66401	3.62395	3.62325	0.72136	2.61384	1.761-0.25	1.09179	0.03034	0.91105	0.83005	-0.511-0.98	0.82187	1.38075	1.94288	0.051-3.72	-1.281-1.21	0.221-0.5	-0.40168	1.01173	2.39237	2.991-0.1	-0.361-0.77	1.44136	1.041-1.23	1.66401	3.62395	3.62325				
Gain (dB)	-3.921-2.8	0.09168	0.431-0.17	0.49061	-0.95042	0.72045	-0.29018	0.7144	1.87107	-1.79056	3.53259	-0.951-4.46	-3.691-1.16	0.41109	-1.731-2.53	-1.041-1.76	-0.92016	2.52086	-1.221-0.39	0.05198	-2.851-2.7	0.53219	1.42064	-0.011-1.56	-3.921-2.8	0.09168	0.431-0.17	0.49061	-0.95042	0.72045	-0.29018	0.7144	1.87107	-1.79056	3.53259	-0.951-4.46	-3.691-1.16	0.41109	-1.731-2.53	-1.041-1.76	-0.92016	2.52086	-1.221-0.39	0.05198	-2.851-2.7	0.53219	1.42064	-0.011-1.56				
Gain (dB)	-4.761-5.18	-1.46007	-1.021-1.42	-1.211-0.4	-1.05023	0.281-1.35	-1.211-0.01	0.5016	0.3204	0.54075	0.54064	-1.081-3.13	-4.481-5.76	-1.721-0.62	-1.141-2.2	-2.971-1.81	-1.771-0.15	-0.471-3.06	-3.671-5.32	-5.631-2.47	-1.881-3.04	-4.51-2.51	-2.811-2.33	-5.21-6.18	-4.761-5.18	-1.46007	-1.021-1.42	-1.211-0.4	-1.05023	0.281-1.35	-1.211-0.01	0.5016	0.3204	0.54075	0.54064	-1.081-3.13	-4.481-5.76	-1.721-0.62	-1.141-2.2	-2.971-1.81	-1.771-0.15	-0.471-3.06	-3.671-5.32	-5.631-2.47	-1.881-3.04	-4.51-2.51	-2.811-2.33	-5.21-6.18				
Gain (dB)	-6.031-6.41	-2.271-2.61	-3.371-4.16	-3.931-3.61	-2.991-1.78	-2.331-3.37	-3.571-3.5	-2.841-1.07	0.29082	1.35106	-1.351-2.91	-3.321-4.97	-7.861-7.73	-6.391-5.5	-4.941-7.2	-2.941-2.6	-1.521-1.67	-4.351-5.69	-5.241-4.78	-5.411-5.1	-2.631-1.85	-2.521-4.94	-7.611-7.06	-5.641-7.78	-6.031-6.41	-2.271-2.61	-3.371-4.16	-3.931-3.61	-2.991-1.78	-2.331-3.37	-3.571-3.5	-2.841-1.07	0.29082	1.35106	-1.351-2.91	-3.321-4.97	-7.861-7.73	-6.391-5.5	-4.941-7.2	-2.941-2.6	-1.521-1.67	-4.351-5.69	-5.241-4.78	-5.411-5.1	-2.631-1.85	-2.521-4.94	-7.611-7.06	-5.641-7.78				
Gain (dB)	-4.391-4.24	-3.081-2.35	-2.821-3.35	-3.121-2.67	-2.611-0.77	-2.891-3.28	-2.911-1.42	-0.771-1.33	-1.17071	-0.251-0.39	-1.061-3.04	-2.621-2.5	-4.721-6.1	-3.741-5.6	-3.191-2.56	-2.921-2.62	-1.441-1.67	-3.311-6.1	-4.191-4.55	-5.171-5.91	-6.671-6.67	-4.881-4.24	-4.881-4.43	-5.781-6.17	-4.391-4.24	-3.081-2.35	-2.821-3.35	-3.121-2.67	-2.611-0.77	-2.891-3.28	-2.911-1.42	-0.771-1.33	-1.17071	-0.251-0.39	-1.061-3.04	-2.621-2.5	-4.721-6.1	-3.741-5.6	-3.191-2.56	-2.921-2.62	-											



Radiated Composite Gain Data_2.4GHz and 5GHz

Appendix A

Theta (°)	3.132/1.1	1.26/1.33	-0.18/0.08	-0.52/-0.41	0.48/1.39	2.03/2.41	2.42/2.48	2.81/86	0.83/1.64	0.46/0.1	1.1/0.27	-1.05/-2.62	-0.64/1.11	-0.55/-2.76	-2.71/-3.64	-3.82/-3.32	-1.85/-1.47	0.04/1.9	2.36/2.98	3.02/2.91	2.19/1.8	1.01/0.85	1.44/1.07	0.9/2.46
Theta (75°)	0.89/1.01	2.32/0.29	0.14/-2.49	-2.37/0.79	2.97/3.65	3.92/4.11	3.88/2.61	1.43/0.89	0.81/1.61	2.37/2.19	2.11/1.8	1.22/-0.75	-2.73/0.02	0.71/0.28	-1.4/-1.27	-1.8/-2.43	-3.29/-4.25	-2.36/-0.43	1.47/3.25	2.88/1.9	0.85/-0.88	0.65/0.87	1.09/0.55	1/1.24
Theta (82.5°)	-0.34/-0.01	1.75/1.38	1.34/-0.2	0.64/2.12	2.36/3.12	4.14/3.7	2.83/1.31	0.04/0.55	1.05/2.33	2.23/1.99	1.67/0.99	0.92/-0.92	-1.05/1.16	1.22/0.31	-0.75/-1.52	-1.47/-2.05	-3.92/-2.35	-0.91/-0.03	1.74/1.59	1.39/0.3	1.14/1.66	2.53/2.92	1.52/5	2.73/0.15
Theta (90°)	-1.81/-2.33	-0.87/-0.64	-2.11/0.49	2.09/1.51	1.12/7.5	3.28/2.84	0.67/-2.31	-1.88/0.38	2.63/2.97	2.65/2.29	2.93/1.48	0.43/1.04	-0.13/-0.09	0.5/-1.27	-1.10/1.7	-1.83/-2.72	-2.2/-1.36	0.15/0.77	1.2/-0.74	-1.21/0.8	2.59/3	1.95/2.96	3.23/4.43	3.91/2.2
Theta (97.5°)	-1.44/-1.93	-0.58/1.05	-0.96/0.92	3/3.06	2.12/2.25	1.38/-0.16	-1.75/-1.92	-1.98/0.22	2.71/2.82	1.32/1.4	1.42/0.52	-0.68/0.18	-1.89/-2.44	-2.07/-1.16	1.35/1.87	-0.3/-0.14	0.62/1.31	0.63/2.13	2.81/1.78	1.15/2.27	3.51/2.66	1.92/4	3.92/2.41	1.23/-0.68
Theta (105°)	-0.38/-0.75	1.99/4.13	2.46/1.39	1.82/3.15	3.04/1.77	-0.73/-0.94	-0.44/0.21	1.27/1.68	0.99/0.85	0.89/2.02	2.83/1.86	0.87/0.29	-2.44/-1.88	-0.58/-2.15	-0.53/1.48	1/0.05	0.53/2.27	1.57/0.52	0.62/0.35	1.07/1.89	2.03/1.84	2.41/3.83	3.46/1.01	2.16/2
Theta (112.5°)	-2.82/-1.19	0.92/2.85	3.65/3.47	2.57/0.98	0.56/-0.9	-1.45/0.09	-0.11/-1.22	1.35/1.97	0.91/-0.03	0.7/0.61	1.94/2.57	2.58/-1.81	-3/-0.91	-0.57/-0.54	0.13/0.46	0.53/-0.65	-0.78/-0.07	-2.29/-2.12	-0.11/0.38	-0.64/-0.8	-0.89/0.33	2.01/1.13	0.76/1.34	3.57/1.98
Theta (120°)	-0.8/-1.12	-0.19/-0.98	0.74/0.48	0.19/0.59	0.58/-0.8	-1.62/0.17	0.27/1.41	-2.87/-0.12	1.55/0.81	-0.88/-1.59	-0.49/2.48	2.83/-0.14	-3.57/-3.12	-0.03/0.02	-2.98/-2.85	-2.23/-2	-3.36/-1.74	0.62/-0.43	-0.6/-0.09	0.88/2.18	1.45/-1.62	-1.34/0.02	-0.2/0.82	1.3/0.24
Theta (127.5°)	-0.27/1.19	0.06/-1.51	-6.83/-9.12	-8.08/-5.07	-2.55/-0.47	-2.21/-2.84	-1.21/0.94	-2.02/-2.55	0.16/1.05	-1.07/-0.85	1.15/3.03	1.04/-1.1	-1.95/-3.07	-1.51/-1.86	-2.16/-1.12	-1.71/-1.14	-0.66/-2.81	-4.65/-2.25	0.41/3.37	0.77/-2.57	-3.22/-0.91	-3.24/-2.83	-1.55/-1.97	
Theta (135°)	-5.92/-3.85	-2.74/-3.27	-4.21/4.41	-3.46/-3.39	-3.57/-2.2	-2.05/-1.71	-0.85/0.28	1.02/0.57	-0.42/-0.27	-2.58/-3.41	-0.87/-1.12	-1.38/-0.72	-1.66/-3.09	-5.1/-5.99	-2.88/-5.52	-8.14/-7.11	-2.72/-3.11	-1.62/-6.54	-8.68/-5.81	-4.6/-1.57	-1.79/-6.25	-8.71/-5.74	-3.88/-3.94	-4.66/-3.72
Theta (142.5°)	-6.26/-5.75	-4.79/-5.26	-6.31/-3.52	-1.09/0.19	0.21/-0.46	-1.43/-3.54	-4.84/-3.44	-2.99/-2.92	-2.04/-2.18	-2.36/-1.96	-2.55/-3.48	-4.91/-7.65	-8.32/-7.79	-6.8/-7.45	-8.5/-9.34	-6.03/-7.11	-8.05/-5.75	-3.9/-6.05	-7.51/-8.05	-8.1/-9.25	-4.6/-1.65	-3.92/-5.24	-3.5/-3.14	-4.85/-4.82
Theta (150°)	-4.17/-4.55	-2.88/-1.48	-2.24/-3.17	-3.05/-3.49	-3.29/-2.99	-2.39/-2.67	-4.53/-6.15	-3.65/-1.32	-0.28/-0.34	-0.68/-1.1	-2.63/0.56	0.33/-3.04	-6.43/-6.19	-6.34/-7.77	-5.03/-3.44	-3.42/-2.85	-2.33/-2.99	-6.55/-10.06	-8.26/-6.57	-6.11/-7.42	-4.31/-1.27	-2.25/-4.07	-1.94/-2.21	-3.24/-3.09
Theta (157.5°)	-5.19/-5.64	-5.3/-4.34	-3.35/-2.96	-3.57/-4.84	-5.64/-5.39	-4.95/-5.18	-4.5/-3.8	-4.03/-4.54	-4.64/-4.69	-3.97/-3.74	-2.74/-1.77	-2.94/-5.85	-6.86/-5.34	-4.93/-5.77	-5.79/-5.35	-5.82/-5.85	-5.04/-4.58	-5.44/-6.62	-6.46/-5.88	-6.01/-6.53	-6.29/-5.28	-3.31/-2.41	-2.71/-3.95	-3.8/-4.11
Theta (165°)	-4.19/-5.56	-5.8/-4.47	-3.4/-3.18	-4.01/-5.4	-6.1/-5.72	-5.18/-4.41	-3.44/-2.57	-1.3/-0.03	0.32/0.21	-0.2/-0.97	-7.93/-9.77	-8.68/-6.39	-5.17/-4.95	-6.13/-5.51	-5.99/-5.39	-6.26/-7.27	-7.31/-7.39	-7.31/-6.97	-6.53/-6.21	-4.56/-3.08	-2.73/-2.93	-3.08/-2.82	-2.76/-3.47	
Theta (172.5°)	-3.15/-3.03	-2.85/-2.63	-2.61/-2.85	-3.09/-3	-2.93/-3.05	-2.75/-2.12	-1.45/-0.76	-0.27/0.21	-0.84/-1.53	-2.72/-4.45	-6.44/-8.22	-8.39/-6.89	-7.64/-8.08	-7.14/-6.52	-6.29/-6.37	-7.41/-7.76	-7.72/-6.93	-5.56/-4.86	-4.14/-3.44	-2.93/-2.24	-1.57/-1.33	-1.64/-2.07	-2.76/-3.32	
Theta (180°)	-4.31/-4.07	-4.39/-4.63	-4.81/-4.49	-4.13/-4.38	-5.1/-5.27	-4.72/-4.21	-3.96/-3.54	-3.61/-3.91	-4.04/-4.4	-5.16/-6.49	-7.92/-8.8	-9.77/-10.12	-9.9/-8.75	-7.38/-5.93	-5.06/-4.66	-4.79/-4.86	-4.81/-4.41	-3.88/-3.55	-3.95/-3.79	-3.72/-4.11	-4.05/-4.03	-4.35/-4.58	-5.36/-5.81	-5.54/-4.99
Freq (Hz)	5.785GPol.	Theta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dB)	Phi(0°)Phi(7.5°)	Phi(15°)Phi(22.5°)	Phi(30°)Phi(37.5°)	Phi(45°)Phi(52.5°)	Phi(60°)Phi(67.5°)	Phi(75°)Phi(82.5°)	Phi(90°)Phi(97.5°)	Phi(105°)Phi(112.5°)	Phi(120°)Phi(127.5°)	Phi(135°)Phi(142.5°)	Phi(150°)Phi(157.5°)	Phi(165°)Phi(172.5°)	Phi(180°)Phi(187.5°)	Phi(195°)Phi(202.5°)	Phi(210°)Phi(217.5°)	Phi(225°)Phi(232.5°)	Phi(240°)Phi(247.5°)	Phi(255°)Phi(262.5°)	Phi(270°)Phi(277.5°)	Phi(285°)Phi(292.5°)	Phi(300°)Phi(307.5°)	Phi(315°)Phi(322.5°)	Phi(330°)Phi(337.5°)	Phi(345°)Phi(352.5°)
Theta (0°)	-1.36/-0.65	-0.37/-0.16	-0.12/-0.24	-0.24/0.49	0.99/0.57	-0.56/-1.57	-1.71/-1.82	-2.47/-2.86	-3.05/-2.84	-2.24/-1.82	-1.24/-0.81	-0.63/-0.7	-0.68/-0.77	-0.55/-0.29	-0.04/0.14	0.08/0.12	0.12/0.26	-0.88/-1.43	-1.77/-2.63	-3.41/-3.8	-4.45/-4.27	-3.92/-3.07	-2.41/-2.22	-1.89/-1.85
Theta (7.5°)	0.07/-0.09	-0.2/0.07	0.47/0.59	0.40/0.36	0.69/0.41	-0.25/-1.7	-3.19/-4.16	-4.83/-5.16	-4.98/-4.91	-4.42/-3.52	-2.72/-2.21	-2.05/-1.93	-1.51/-1.46	-1.05/-0.72	-0.56/-0.38	-0.38/-0.35	-0.15/-0.45	-0.93/-1.42	-1.54/-1.8	-2.29/-2.17	-2.07/-1.94	-1.76/-1.01	-0.51/-0.35	-0.25/-0.17
Theta (15°)	0.82/0.16	-0.43/-0.46	-0.37/-0.57	-0.92/-1.2	-1.13/-1.4	-1.13/-0.91	-1.23/-1.94	-2.18/-2.33	-2.76/-3.1	-2.83/-2.89	-3.02/-3	-1.31/-1.79	-1.38/-1.25	-0.92/-0.72	-1.34/-2.26	-2.43/-2.06	-1.77/-1.71	-1.91/-2.23	-2.23/-1.88	-1.62/-1.19	-0.87/-0.37	0.57/1.13	1.42/1.34	
Theta (22.5°)	0.99/0.21	-0.5/-1.12	-1.58/-2.21	-2.99/-2.36	-1.71/-0.58	0.02/-0.24	-0.83/-1.51	-1.38/-1.42	-1.82/-2.25	-2.65/-2.62	-3.22/-3.97	-4.37/-3.27	-1.94/-0.92	-0.85/-1.73	-4.23/-6.94	-7.32/-7.04	-6.27/-4.64	-2.81/-1.84	-1.6/-0.99	-0.94/-1.22	-1.85/-1.67	-1.27/-0.72	0.37/1.07	1.15/1.26
Theta (30°)	0.67/0.56	0.56/0.67	-0.55/-1.93	-1.64/-0.88	-0.41/0.03	-0.04/-0.46	-1.35/-2.07	-2.31/-2.33	-2.59/-3.3	-4.33/-4.77	-4.8/-6.2	-6.14/-5.44	-3.44/-2.24	-2.59/-3.83	-6.62/-7.87	-9.08/-7.59	-4.84/-2.85	-1.68/-0.77	0.23/0.64	0.68/0.81	0.81/0.35	-0.53/-0.82	-0.36/-0.26	0.04/0.73
Theta (37.5°)	0.43/0.52	0.54/0.88	0.22/-0.72	0.04/0.41	1.14/1.72	1.59/0.81	0.31/-1.05	-3.53/-3.17	-2.32/-3.28	-4.31/-4.71	-5.19/-8.09	-8.96/-7.22	-4.02/-1.93	-2.03/-2.52	-4.01/-6.02	-6.35/-5.26	-4.07/-2.67	-2.33/-1.57	-0.75/0.12	1.05/1.72	2.16/2.12	2.05/1.99	1.23/0.03	-0.76/-0.38
Theta (45°)	-0.36/0.12	0.59/1.29	0.88/0.68	0.69/-0.02	-0.46/-1.03	-1.16/-0.95	-0.94/-1.46	-2.56/-4.12	-4.32/-4.21	-3.46/-4.12	-4.22/-3.51	-3.61/-3.67	-1.5/-0.55	-2.06/-2.55	-2.58/-4.29	-4.64/-3.28	-2.16/-0.65	-0.39/0.16	0.56/0.2	0.39/0.77	1.06/1.86	2.49/2.33	2.57/1.63	-0.46/-1.49
Theta (52.5°)	-1.18/-1.61	-1.19/-0.36	-0.73/-0.32	0.69/1.57	0.82/-0.18	-0.56/-0.05	0.3/0.16	-1.01/-0.2	-0.68/-0.65	0.61/1.07	-0.48/-1.02	-2.05/-2.23	-0.39/0.26	-1.71/-4	-3.15/-2.76	-1.48/-0.11	0.65/0.45	1.41/6.9	1.53/1.59	1.66/2.56	2.47/1.89	1.81/8.1	0.33/-0.91	
Theta (60°)	-0.99/-0.69	-0.15/0.42	-0.47/-1.02	0.45/0.88	0.68/-0.06	0.05/1.25	1.89/1.64	1.33/1.42	1.91/0.84	1.11/0.28	-2.32/-3.67	-1.35/-0.47	-1.1/-1.64	-3.06/-2.7	-3.33/-3.55	-2.31/-1.91	-0.73/1.08	2.41/3.41	3.47/2.9	2.71/3.61	3.62/2.5	1.38/1.06	0.18/-0.5	
Theta (67.5°)	-0.45/-1.36	0.28/0.61	-0.1/0.12	1.51/0.41	-1.26/-2.24	-1.85/-1.28	0.46/0.87	0.22/-0.6	1.0.88	-0.6/1.45	1.49/-0.63	-2.14/-1.43	-0.85/-0.79	-1.01/-0.64	-1.48/-3.37	-5.62/-3.07	-3.28/-2.28	0.33/0.08	2.28/2.66	3.46/2.83	2.96/3.54	2.36/1.41	0.96/-0.27	-0.03/0.93
Theta (75°)	2.33/0.9	1.11/1.19	1.39/1.01	2.29/3.15	1.67/-0.58	1.09/1.92	0.99/0.65	0.35/0.06	-0.31/1.41	1.06/1.18	2.39/1.74	-1.87/-1.22	-1.73/-3.42	-1.52/0.96	0.99/-2.22	-4.05/-2.84	-3.17/-3.23	-0.66/-0.57	-1.18/-0.95	0.98/2.07	2.93/2.49	4.11/2.89	0.36/-0.6	-1.53/2.11
Theta (82.5°)	0.82/1.69	1.87/2.03	2.45/1.57	1.54/1.64	1.25/-0.23	0.74/2.54	2.77/1.54	0.41/-0.13	-1.16/-0.54	0.14/0.11	0.75/0.99	-2.14/-1.11	-2.75/-2.98	-0.81/1.76	2.16/1.16	-2.09/-3.58	-1.17/-1.25	-0.63/-0.55	0.02/0.44	1.11/1.6	2.52/89	3.72/3.68	1.76/-0.66	1.11/1.25
Theta (90°)	1.18/2.09	1.33/3.76	3.68/2.66	2.64/2.03	2.63/1.65	-1.3/-1.31	0.86/1.35	-0.42/-1.27	-1.32/-0.3	0.56/0.04	2.19/2.49	1.14/0.45	-1.03/-4.87	-2.24/1.54	2.22/1.97	-0.59/-1.18	2.12/1.88	3.43/2.6	0.49/-0.13	0.86/2.74	1.43/1.49	2.86/2.62	1.81/5.8	1.65/1.86
Theta (97.5°)	2.47/2.49	2.72/9.1	3.11/2.44	2.26/2.85	3.68/2.62	1.64/0.34	0.99/0.52	-2.07/-1.99	-0.69/0.05	2.12/1.48	3.12/2.48	1.76/2.43	0.48/-4.11	-0.66/2.4	1.55/2.4	0.94/-0.34	2.46/3.44	4.28/3.13	0.25/0.11	0.57/3.11	2.48/0.82	2.51/2.3	1.93/2.32	1.43/2.43
Theta (105°)	2.85/3.83	3.77/4.38	4.72/3.55	2.71/2.63	2.52/1.27	1.76/2.49	2.86/2.38	0.08/-1.86	-0.32/0.28	2.04/1.49	2.54/3.48	2.75/2.12	2.36/-1.38	-1.06/1.51	2.78/0.88	0.9/-0.14	1.82/2.82	3.93/74	2.49/2.31	1.1/3.33	-0.49/-2.39	1.74/0.35	-0.07/1.74	1.43/2.35
Theta (112.5°)																								



Radiated Composite Gain Data_2.4GHz and 5GHz

Appendix A

Theta	6.78/3.78	7.42/7.7	8.06/8.18	7.99/7.56	7.5/8.09	9.07/10.22	-11.91/13.25	-14.89/14.4	-14.77/15.26	-16.15/15.91	-15.17/15.99	-17.97/16.39	-12.02/8.92	-7.4/7.66	-6.67/6.64	-6.73/7.29	-7.96/8.58	-8.36/7.99	-7.98/7.99	-7.8/7.56	-7.24/7.25	-7.85/8.03	-7.28/6.58	-6.25/6.64	
Theta(30°)	-2.43/2.81	-3.35/3.78	-4.16/4.23	-4.34/5	-6.44/8.21	-10.74/12.09	-12.99/12.2	-11.74/11.03	-10.95/14.02	-9.86/9.25	-8.72/9.16	-10.09/8.87	-6.41/5.52	-4.87/5.06	-4.99/4.36	-3.88/3.42	-2.81/1.67	-1.03/1.22	-1.62/2.04	-2.5/2.63	-2.18/1.74	-1.61/1.93	-2.69/3.11	-3.14/3.02	
Theta(45°)	-1.37/1.15	-1.3/1.3	-1.43/2.1	-2.28/4.68	-8.36/12.74	-13.2/15.3	-17.25/14.21	-10.7/8.72	-7.13/5.82	-5.14/4.93	-4.47/4.65	-5.04/3.82	-2.57/2.3	-2.26/1.72	-1.11/0.72	-0.29/0.24	0.91/0.03	0.59/0.05	0.45/0.82	-0.56/2.69	-3.28/2.88	-2.67/1.55	-1.17/1.21	-1.58/1.68	
Theta(60°)	-3.03/1.78	-1.84/2.45	-1.88/2.07	-2.21/3.27	-6.02/8.58	-10.08/10.25	9.01/17.3	-5.88/5.56	-5.58/5.29	-5.04/4.35	-2.75/2.36	-3.08/2.5	-1.76/1.8	-2.07/2.34	-3.17/3.31	-2.09/1.11	-0.92/1.18	-1.63/2.09	-2.53/2.93	-3.24/3.75	-5.09/6.35	-5.62/4.28	-3.09/2.32	-2.27/2.67	
Theta(75°)	-1.71/1.42	-0.67/1.67	-2.48/2.64	-1.99/1.73	-2.36/2.75	-3.71/5.07	-5.83/5.47	-4.87/4.86	-5.62/5.22	-4.09/2.43	-3.40/2.07	-1.84/0.94	-0.91/1.28	-3.19/5.77	-5.47/2.86	-1.32/1.16	-1.65/2.9	-3.28/2.16	-1.48/0.97	-0.13/0.88	1.28/0.61	0.15/0.29	0.0/0.22	-0.52/1.07	
Theta(90°)	0.38/0.36	-1.22/3.56	-4.56/4.55	-5.4/11	-3.38/3.08	-3.22/2.89	-2.3/1.95	-1.49/1.13	-1.55/2.75	-3.8/2.9	-1.47/1.51	-1.6/2.16	-1.56/2.24	-6.47/7.36	-6.84/7.76	-3.14/1.93	-1.17/0.96	0.13/1.38	1.42/0.82	0.61/0.07	-0.80/0.75	-0.20/0.16	-0.40/0.20	-0.48/0.40	
Theta(105°)	0.390/3	-1.08/2.22	-2.52/1.74	-2.4/3.78	-5.58/6.05	-5.27/3.68	-2.35/1.75	-1.54/1.33	-1.46/2.01	-2/1.12	0.120/5	-0.67/1.99	-2.15/5.23	-7.3/6.24	-5.89/4.46	-5.24/5.83	-4.9/4.11	-1.17/0.45	1.08/1.35	1.140/2.2	-0.67/0.9	-1.06/2.64	-2.6/0.85	-1.21/0.72	
Theta(120°)	-1.36/0.44	-2.31/3.43	-4.31/1.5	0.08/0.19	-1.47/3.92	-6.98/6.23	-3.25/1.31	-0.25/0.07	-1.33/1.23	-1.46/1.34	-0.42/0.23	-0.46/1.43	-0.1/1.18	-1.18/0.59	-0.69/1.15	-2.84/3.6	-3.22/1.91	-0.50/2.2	1.26/2	1.66/0.2	-0.19/0.09	-1.66/1.19	-1.47/2.51	-1.47/2.51	
Theta(135°)	-2.69/0.74	-1.25/3.45	-3.54/2.72	-1.66/0.97	-1.0/0.05	-1.37/2.86	-0.08/0.14	-0.59/0.46	0.58/0.3	-1.05/0.22	0.73/1.23	-0.26/0.21	0.69/0.2	0.23/0.37	-3.51/4.27	-4.96/3.21	-1.3/0.21	0.16/0.21	1.87/0.71	-1.69/2.06	0.54/0.15	-0.98/3.33			
Theta(150°)	-1.020/46	-0.44/1.51	-1.37/0.15	0.05/0.2	-0.69/0.78	-0.43/0.56	-1.38/2.18	-1.37/0.26	-0.2/0.21	-0.67/0.17	1.15/1.83	-0.17/0.05	1.01/0.66	1.220/44	0.64/0.34	-1.21/1.44	-1.73/1.74	-0.84/0.72	1.61/1.17	1.97/3	2.88/2.06	-0.58/2.28	-1.04/1.73	-2.82/3.03	
Theta(165°)	-3.56/0.57	0.84/0.44	-0.06/0.8	1.52/0.74	-1/2.58	-3.28/2.16	-1.33/1.29	-1.79/2.79	-2.65/2.07	-1.28/0.26	0.2/0.23	-1.73/0.22	-0.17/0.33	-0.1/1.15	-0.54/0.89	-1.07/1.39	-1.58/0.7	0.22/1.94	2.67/0.61	1.34/3.55	4.06/4.02	2.22/0.1	0.54/0.38	-2.2/5.34	
Theta(180°)	-2.36/0.95	1.34/1.1	2.05/2.3	2.13/1.15	-0.27/2.09	-5.14/7.2	-5.25/4.64	-3.07/2.95	-2.22/2.64	-1.04/0.4	0.51/0.79	-0.89/0.28	-0.84/0.53	0.46/1.52	-1.9/1.69	-1.38/0.04	0.39/1.1	1.06/0.72	0.81/2.61	2.99/2.35	1.04/0.27	0.27/1.21	0.81/1.73		
Theta(225°)	-0.810/34	1.03/1.26	-0.170/42	0.470/41	-0.32/1.55	-3.46/5.37	-8.03/11.36	-9.86/6.26	-4.09/1.99	-1/2.05	-0.29/0.36	-0.94/0.85	-0.95/1.09	-1.61/3.52	-3.74/3.49	-2.03/2.43	-2.73/2.18	-1.69/1.84	-2.48/5.58	-5.67/2.29	-4.37/5.54	-4.28/1.27	0.070/31	0.18/0.16	
Theta(240°)	-2.64/0.1	0.13/1.49	-3.53/2.02	-1.73/0.99	-1.88/3.18	-4.06/5.05	-3.53/3.43	-1.97/2.63	-2.8/2.12	-3.54/2.5	-0.79/1.43	-4.25/3.97	-3.53/3.19	-2.3/2.83	-6.83/1.49	-2.34/1.39	-2.25/2.18	-1.93/1.59	-5.74/5.23	-6.13/6.09	-6.13/6.09	-7.74/3.08	-2.83/1.89	-1.91/3.61	
Theta(270°)	-13.42/5.44	-1.69/1.91	-2.63/2.74	-2.33/3.08	-3.35/3.42	-2.99/2.21	-1.84/2.66	-3.51/3.79	-5.86/1.17	-11.78/6.95	-3.58/3.74	-5.56/4.45	-5.22/5.14	-4.29/4.63	-11.69/1.44	-7.86/5.59	-5.96/7.82	-4.39/5.65	-7.73/6.07	-9.57/11.31	-6.34/13	-5.95/5.52	-6.62/7.95	-8.28/6.92	
Theta(315°)	-8.48/8.08	-4.09/3.94	-6.14/7.9	-10.39/10.1	-7.99/6.16	-4.56/4.92	-6.22/6.63	-7.46/12	-15.25/6.16	-3.22/3.27	-5.45/7.95	-9.8/7.98	-5.85/6.3	-5.17/5.68	-10.17/14.79	-13.19/7.51	-5.94/5.94	-8.85/18.89	-14.06/18.5	-17.95/6.33	-3.45/8.62	-9.13/8.66	-14.8/14.81	-15.01/10.78	
Theta(330°)	-12.88/11.73	-12.55/11.23	-17.71/17.71	-14.91/24.99	-12.82/10.04	-8.51/7.31	-17.92/11.58	-13.71/10.95	-6.1/3.54	-5.66/3.63	-7.3/6.67	-4.07/6.79	-8.83/10.62	-11.47/11.52	-13.57/16.42	-9.49/6.68	-4.51/3.27	-4.71/8.64	-11.21/10.16	-12.05/18.55	-10.58/11.51	-10.93/11.52	-12.81/18.03	-14.88/13.41	
Theta(345°)	-13.98/13.43	-15.52/16.65	-18.54/12.32	-7.94/5.53	-5.34/7.02	-9.11/11.14	-18.11/11.48	-13.03/17.79	-17.67/18.87	-16.16/17.33	-16.13/17.07	-13.74/10.42	-10.93/15.37	-15.81/10.32	-8.39/8.46	-10.86/18.93	-18.71/15.29	-14.71/18.13	-19.15/16.03	-17.07/18.12	-17.46/17.86	-15.23/11.63	-15.23/11.63	-17.16/18.38	
Theta(360°)	-8.66/9.1	-9.21/9.44	-11.91/15.96	-18.05/15.79	-13.89/14.23	-15.39/16.43	-16.46/15.44	-13.81/12.45	-12.8/13.49	-12.35/11.61	-13.27/18.54	-17.74/18.73	-19.02/18.3	-18.67/18.54	-14.7/11.16	-9.42/9.95	-11.99/13.6	-14.75/14.36	-13.48/13.25	-13.84/14.7	-16.4/19.14	-19.01/16.09	-15.52/14.55	-11.22/3.97	
Theta(375°)	-8.55/7.26	-6.73/7.04	-8.13/9.34	-10.61/12.22	-13.14/12.68	-12.53/13.05	-13.53/13.45	-13.81/12.35	-10.15/8.02	-7.12/7.41	-8.96/11.75	-15.58/18.73	-18.08/18.49	-18.23/18.75	-18.29/13.79	-11.86/11.7	-14.05/16.97	-17.5/16.24	-14.97/14.59	-14.73/15.42	-17.4/19.38	-18.75/17.93	-17.52/18.16	-15.43/11.18	
Theta(405°)	-17.54/15.91	-14.36/13.63	-14.33/13.91	-13.03/12.86	-12.38/11.19	-10.28/9.99	-9.98/9.34	-8.9/8.69	-8.11/8.13	-8.92/10.42	-12.67/16.32	-18.3/16.2	-14.68/14.54	-15.06/15.94	-16.13/16.58	-17.57/18.6	-16.96/14.44	-13.17/12.46	-12.48/13.7	-15.6/17.56	-17.6/17.83	-19.36/18.17			
Theta(420°)	-15.25/14.71	-10.67/16.06	-16.25/16.45	-17.08/18.05	-18.63/18.71	-17.67/18.63	-19.07/18.63	-18.77/19.53	-18.77/19.53	-17.67/18.63	-19.07/18.63	-18.77/19.53	-18.77/19.53	-18.44/18.1	-18.77/19.53	-18.08/16.51	-14.21/12.79	-12.01/11.03	-10.46/10.42	-10.79/11.33	-11.58/11.75	-12.22/12.88	-13.16/13.92	-12.03/11.33	-11.44/12.08
Theta(435°)	-13.98/13.43	-15.52/16.65	-18.54/12.32	-7.94/5.53	-5.34/7.02	-9.11/11.14	-18.11/11.48	-13.03/17.79	-17.67/18.87	-16.16/17.33	-16.13/17.07	-13.74/10.42	-10.93/15.37	-15.81/10.32	-8.39/8.46	-10.86/18.93	-18.71/15.29	-14.71/18.13	-19.15/16.03	-17.07/18.12	-17.46/17.86	-15.23/11.63	-15.23/11.63	-17.16/18.38	
Theta(450°)	-8.66/9.1	-9.21/9.44	-11.91/15.96	-18.05/15.79	-13.89/14.23	-15.39/16.43	-16.46/15.44	-13.81/12.45	-12.8/13.49	-12.35/11.61	-13.27/18.54	-17.74/18.73	-19.02/18.3	-18.67/18.54	-14.7/11.16	-9.42/9.95	-11.99/13.6	-14.75/14.36	-13.48/13.25	-13.84/14.7	-16.4/19.14	-19.01/16.09	-15.52/14.55	-11.22/3.97	
Theta(465°)	-8.55/7.26	-6.73/7.04	-8.13/9.34	-10.61/12.22	-13.14/12.68	-12.53/13.05	-13.53/13.45	-13.81/12.35	-10.15/8.02	-7.12/7.41	-8.96/11.75	-15.58/18.73	-18.08/18.49	-18.23/18.75	-18.29/13.79	-11.86/11.7	-14.05/16.97	-17.5/16.24	-14.97/14.59	-14.73/15.42	-17.4/19.38	-18.75/17.93	-17.52/18.16	-15.43/11.18	
Theta(480°)	-17.54/15.91	-14.36/13.63	-14.33/13.91	-13.03/12.86	-12.38/11.19	-10.28/9.99	-9.98/9.34	-8.9/8.69	-8.11/8.13	-8.92/10.42	-12.67/16.32	-18.3/16.2	-14.68/14.54	-15.06/15.94	-16.13/16.58	-17.57/18.6	-16.96/14.44	-13.17/12.46	-12.48/13.7	-15.6/17.56	-17.6/17.83	-19.36/18.17			
Theta(495°)	-15.25/14.71	-10.67/16.06	-16.25/16.45	-17.08/18.05	-18.63/18.71	-17.67/18.63	-19.07/18.63	-18.77/19.53	-18.77/19.53	-17.67/18.63	-19.07/18.63	-18.77/19.53	-18.77/19.53	-18.44/18.1	-18.77/19.53	-18.08/16.51	-14.21/12.79	-12.01/11.03	-10.46/10.42	-10.79/11.33	-11.58/11.75	-12.22/12.88	-13.16/13.92	-12.03/11.33	-11.44/12.08
Theta(510°)	-13.98/13.43	-15.52/16.65	-18.54/12.32	-7.94/5.53	-5.34/7.02	-9.11/11.14	-18.11/11.48	-13.03/17.79	-17.67/18.87	-16.16/17.33	-16.13/17.07	-13.74/10.42	-10.93/15.37	-15.81/10.32	-8.39/8.46	-10.86/18.93	-18.71/15.29	-14.71/18.13	-19.15/16.03	-17.07/18.12	-17.46/17.86	-15.23/11.63	-15.23/11.63	-17.16/18.38	
Theta(525°)	-8.66/9.1	-9.21/9.44	-11.91/15.96	-18.05/15.79	-13.89/14.23	-15.39/16.43	-16.46/15.44	-13.81/12.45	-12.8/13.49	-12.35/11.61	-13.27/18.54	-17.74/18.73	-19.02/18.3	-18.67/18.54	-14.7/11.16	-9.42/9.95	-11.99/13.6	-14.75/14.36	-13.48/13.25	-13.84/14.7	-16.4/19.14	-19.01/16.09	-15.52/14.55	-11.22/3.97	
Theta(540°)	-8.55/7.26	-6.73/7.04	-8.13/9.34	-10.61/12.22	-13.14/12.68	-12.53/13.05	-13.53/13.45	-13.81/12.35	-10.15/8.02	-7.12/7.41	-8.96/11.75	-15.58/18.73	-18.08/18.49	-18.23/18.75	-18.29/13.79	-11.86/11.7	-14.05/16.97	-17.5/16.24	-14.97/14.59	-14.73/15.42	-17.4/19.38	-18.75/17.93	-17.52/18.16	-15.43/11.18	
Theta(555°)	-17.54/15.91	-14.36/13.63	-14.33/13.91	-13.03/12.86	-12.38/11.19	-10.28/9.99	-9.98/9.34	-8.9/8.69	-8.11/8.13	-8.92/10.42	-12.67/16.32	-18.3/16.2	-14.68/14.54	-15.06/15.94	-16.13/16.58	-17.57/18.6	-16.96/14.44	-13.17/12.46	-12.48/13.7	-15.6/17.56	-17.6/17.83	-19.36/18.17			
Theta(570°)	-15.25/14.71	-10.67																							



Radiated Composite Gain Data_2.4GHz and 5GHz

Appendix A

Theta	Phi	Gain	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(75°)	Phi(0°)	-1.66/4.04	-1.63/3.05	-2.75/5.12	-6.53/6.31	-3.46/2.1	-1.41/1.29	-2.48/4.02	-5.3/8.18	-6.91/2.39	-0.78/1.2	-3.05/3.58	-4.81/6.17	-10.06/7.65	-5.62/2.92	-3.01/1.49	-1.75/1.91	-4.88/7.79	-5.4/3.35	-1.57/0.45	0.71/0.24	-0.42/0.16	-0.33/6.05	-3.53/3.24	-5.22/1.3	
Theta(82.5°)	Phi(0°)	-2.16/4.58	-2.18/1.9	-0.28/1.41	-4.62/8.46	-8.56/5.49	-3.73/2.57	-1.69/3.22	-6.34/6.15	-2.11/2.07	0.03/2.48	-4.43/5.59	-4.01/3.47	-2.05/0.1	1.07/0.54	-0.24/0.44	-2.79/5.48	-1.71/5.35	-4.35/3.46	-1.95/0.95	-0.11/0.73	1.42/0.15	0.83/0.46	-4.08/1.98	-3.58/6.87	
Theta(90°)	Phi(0°)	-3.18/5.19	-7.54/5.7	-2.66/0.54	-2.06/5.11	-5.26/3.8	-4.1/3.67	-0.90/1.61	-0.13/2.92	0.70/8.1	-0.13/3.23	-2.2/2.05	-1.61/2.69	-1.02/0.65	2.03/0.88	-0.44/1.12	-4.37/4.76	-3.37/3.43	-2.91/2.71	-1.06/1.66	-0.99/0.72	1.27/0.89	-0.64/0.22	-2.54/2.17	-0.72/3.86	
Theta(97.5°)	Phi(0°)	-3.41/4.56	-6.78/3.68	-4.52/1.12	-1.51/0.32	-1.41/0.16	-0.96/4.5	-8.71/9.85	-5.86/1.27	0.96/0.47	-2.99/2.23	-0.72/0.63	-0.12/0.93	-0.54/0.96	1.48/0.45	-0.12/0.19	-1.38/0.2	-0.45/0.12	-0.25/1.75	2.64/1.1	2.09/2.63	2.68/1.32	0.86/0.51	-0.24/1.88	-1.3/3.98	
Theta(105°)	Phi(0°)	-10.43/6.13	-6.23/0.88	-1.96/3.24	-4.81/2.28	-1.01/0.2	-1.01/2.92	-3.8/4.04	-3.22/1.92	-2.27/3.68	-3.2/2.85	-0.49/0.4	1.12/0.31	-0.01/0.85	0.45/1.63	-2.49/1.11	-0.99/0	-0.76/0.39	-0.31/1.3	-0.01/4.13	-0.72/0.89	1.48/1.1	1.68/1.48	0.45/2.02	-2.16/9.44	
Theta(112.5°)	Phi(0°)	-8.57/5.72	-13.52/1.65	-0.11/0.77	-0.5/3.31	-5.07/5.72	-5.91/5.9	-5.1/3.72	-1.9/2.65	-5.66/4.49	-1.97/0.99	-2.77/0.09	-0.42/1.81	-2.96/2.4	-0.72/1.78	-1.45/4.66	-3.79/2.44	-1.48/1.06	-1.55/4	-3.2/5.7	-8.02/7.16	-14.95/1.75	-2.22/0.97	-2.55/1.86	-0.5/2.39	
Theta(120°)	Phi(0°)	-2.35/4.2	-4.59/11.43	-5.94/3.24	-1.72/3.1	-3.88/5.35	-5.69/5.94	-6.63/8.02	-15.2/15.18	-7.95/3.87	-3.55/5.97	-5.35/1.42	-0.75/4.46	-4.45/4.15	-3.92/5.54	-8.1/13.42	-10.78/4.42	-4.69/5.02	-6.43/3.41	-2.3/1.63	-4.54/5.65	-5.12/10.5	-7.69/4.57	-4.38/4.87	-3.76/1.64	
Theta(127.5°)	Phi(0°)	-2.15/1.64	-3.27/6.56	-13.2/18.03	-17.93/8.65	-5.97/0.53	-6.69/7.13	-7.81/9.73	-9.91/10.47	-7.03/3.61	-4.63/2.23	-0.54/2.07	-4.19/5.13	-4.41/5.31	-5.49/6.2	-9.48/10.67	-7.36/4.4	-7.07/10.9	-8.61/3.31	-6.5/4.18	-2.8/11.52	-8.9/15.4	-18.65/13.57	-14.95/13.34	-7.53/9.38	
Theta(135°)	Phi(0°)	-12.74/7.82	-5.63/7.23	-9.71/13.71	-16.77/18.45	-12.22/7.25	-5.56/4.8	-5.38/6.57	-6.27/7.04	-11.45/10.72	-8.93/7.46	-3.36/3.17	-5.44/7.72	-10.94/10.21	-12.08/14.3	-15.43/19.27	-13.41/11.27	-7.22/9.34	-18.51/18	-14.72/18.39	-18.52/11.42	-2.86/4.71	-10.53/14.2	-16.42/13.77	-15.91/11.7	
Theta(142.5°)	Phi(0°)	-17.98/18.13	-13.41/15.51	-19.08/14.08	-13.87/15.61	-18.24/15.75	-11.59/10.67	-9.27/7.77	-8.34/9.48	-7.05/5.48	-5.44/6.39	-10.77/17.05	-17.73/18.02	-14.67/15.18	-17.76/12.08	-11.48/11.57	-14.78/16.24	-15.5/11	-6.37/8.24	-14.03/14.26	-17.3/18.85	-7.28/6.69	-11.84/19.28	-14.02/11.24	-12.88/18.46	
Theta(150°)	Phi(0°)	-11.57/12.57	-11.16/10.8	-18.7/15.96	-10.03/9.53	-11.84/15.96	-18.83/14.88	-13.56/14.39	-11.46/7.58	-5.15/4.8	-5.22/6.46	-7.78/5.46	-5.96/9.65	-10.27/9.72	-11.82/13.88	-11.61/6.52	-6.95/8.67	-13.31/15.04	-14.58/18.97	-18.51/17.7	-18.54/17.35	-17.58/14.48	-12.68/11.17	-7.25/6.72	-11.93/16.28	
Theta(157.5°)	Phi(0°)	-18.16/16.6	-14.86/14.81	-14.74/12.74	-11.71/10.95	-11.95/13.33	-18.94/17.61	-15.69/14.83	-14.9/16.64	-18.21/16	-15.6/17.62	-15.5/12.55	-10.24/8.56	-8.98/11.72	-13.33/10.63	-9.54/7.15	-8.74/10.71	-10.06/10.87	-10.01/10.26	-10.83/10.63	-10.57/10.28	-10.94/13.99	-18.51/18.67	-17.45/15.75	-15.77/17.72	-18.45/17.13
Theta(165°)	Phi(0°)	-18.48/18.32	-14.2/11.12	-9.63/9.06	-10.1/12.53	-14.97/15.59	-14.73/13.86	-12.88/12.18	-11.08/10.03	-11.28/14.87	-18.27/18.13	-18.58/17.99	-17.97/18.2	-16.42/12.75	-10.44/9.81	-11.32/13.53	-12.68/10.44	-9.98/11.47	-15.37/17.64	-17.53/18.36	-18.13/17.79	-18.52/17.54	-17.55/17.25	-15.1/15.37	-16.91/19.1	
Theta(172.5°)	Phi(0°)	-18.81/13.32	-19.07/18.47	-18/18.7	-18.13/18.38	-18.73/18.64	-17.79/17.49	-17.25/16.59	-16.46/16.51	-17.09/16.92	-17.85/17.68	-15.98/14.4	-13.34/12.46	-12.64/13.41	-15.14/18.31	-18.95/19.03	-18.36/18.35	-16.9/15.89	-14.63/13.08	-11.71/11.63	-11.97/11.16	-10.24/9.54	-9.28/12.17	-9.52/10.38	-11.97/14.79	
Theta(180°)	Phi(0°)	-14.63/15.76	-18/18.16	-18.14/18.93	-18.3/17.56	-17.65/18.45	-18.4/18.13	-18.02/18.58	-18.62/18.93	-18.11/18.53	-18.6/16.41	-16.32/16.11	-16.38/18.01	-18.47/18.37	-18.86/18.08	-18.56/16.74	-15.46/15.32	-15.77/15.75	-15.85/16.27	-17.98/18.14	-17.56/14.22	-17.78/17.96	-18.98/16.24	-14.16/13.02	-13.25/13.91	
Phi(0°)	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°)	
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)		
Phi(0°)	Gain	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°)					



Radiated Composite Gain Data_2.4GHz and 5GHz

Appendix A

Theta	Phi	Gain	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)	
0(120°)	0(7.5°)	-7.96/9.19	-2.59/1.3	-0.81/4.82	-4.1/4.4	-14.16/-10.96	-7.57/3.92	-2.89/3.68	-6.39/3.85	-0.95/-1.8	-3.86/2.71	-0.93/3.44	-4.1/11.77	-10.54/6.31	-1.77/1.26	-0.47/0.6	1.04/0.78	-0.16/0.8	-1.26/-0.93	-1.35/-3.14	-1.36/0.12	-2.51/3.5	-0.7/0.48	0.69/1.1	0.44/-2.22		
0(127.5°)	0(15°)	-17.17/-14.84	-4.59/-1.26	-2.81/-6.2	-7.22/-7.3	-16.83/-8.41	-8.47/-6.37	-5.65/-5.67	-4.9/-3.02	-1.44/-1.31	-1.79/-0.75	-0.22/2.22	-5.47/-13.08	-15.64/-6.31	-1.55/-0.08	0.35/-0.1	-0.33/-0.26	-1.16/-2.21	-1.04/-0.41	-1.74/-2.16	-2.06/-3.96	-9.36/-6.18	-1.21/0.71	-0.08/-2.19	-4.87/-9.74		
0(135°)	0(22.5°)	-18.23/-18.45	-6.24/-3.16	-7.86/-9.24	-17.12/-10.82	-18.01/-8.03	-9.59/-12.85	-8.26/-6.45	-5.04/-2.34	-0.2/0.71	-2.98/-4.2	-1.77/-1.78	-2.44/-6.92	-11.21/-18.17	-7.08/-3.64	-1.31/-2.38	-1.83/-1.21	-1.51/-1.71	-3.83/-5.06	-5.67/-5.56	-8.2/10.13	-7.91/-5.57	-4.41/-3.83	-3.68/-4.43	-7.03/-16.72		
0(142.5°)	0(30°)	-17.85/-13.63	-9.39/-9.28	-7.39/-11.53	-18.26/-13.9	-16.61/-10.5	-11.28/-16.82	-11.01/-6.63	-4.94/-4.72	-5.93/-6.15	-4.61/3.65	-4.79/3.87	-4.31/-10.48	-19.17/7.88	-14.73/-9.01	-5.02/-3.98	-4.18/-4.02	-3.93/-5.38	-7.55/-5.84	-3.97/-3.48	-3.74/-3.2	-3.01/-4.5	-6.98/-9.83	-9.4/-8.64	-11.61/-18.85		
0(150°)	0(37.5°)	-19.18/-18.31	-12.53/-9.25	-9.91/-4.42	-17.99/-19.09	-18.11/-17.8	-14.27/-11.18	-10.73/-6.76	-6.94/-5.88	-5.57/-4.33	-2.78/-2.75	-5.47/-4.1	-12.57/-11.02	-16.16/-17.35	-14.21/-10.29	-9.06/-9.18	-8.39/-6.43	-4.77/-3.87	-3.23/-2.99	-3.35/-4.2	-5.24/-6.22	-8.37/-8.77	-7.52/-8.75	-12.28/-19.16	-17.89/-18.83		
0(157.5°)	0(45°)	-16.63/-13.33	-12.27/-11.99	-10.71/-10.59	-12.92/-15.91	-12.92/-15.91	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92	-15.8/-17.92
0(165°)	0(52.5°)	-17.05/-17.12	-17.09/-17.5	-17.97/-18.33	-18.8/-17.82	-14.99/-12.99	-11.61/-9.53	-9.31/-10.47	-11.44/-13.16	-16.87/-17.82	-12.3/-8.2	-6.63/-6.74	-8.64/-12.76	-17.58/-16.16	-13.91/-13.47	-14.21/-14.46	-16.66/-18.98	-19.23/-17.93	-16.79/-16.66	-18.46/-18.35	-18.21/-18.49	-18.39/-17.78	-18.56/-14.99	-15.1/-18.65	-18.72/-19.13		
0(172.5°)	0(60°)	-16.48/-14.44	-11.66/-10.17	-11.09/-11.86	-13.3/-14	-14.47/-14.31	-14.32/-15.49	-16.68/-16.04	-14.97/-13.8	-13.11/-11.43	-10.88/-11.75	-13.86/-17.13	-18.57/-18.89	-16.65/-16.34	-17.82/-17.03	-15.96/-14.87	-12.8/-10.76	-9.5/-9.95	-11.03/-12.49	-14.08/-15.25	-15.3/-16.19	-16.49/-15.25	-17.26/-18.31	-17.85/-18.03			
0(180°)	0(67.5°)	-14.37/-14.8	-15.89/-17.51	-17.44/-14.93	-12.92/-12.25	-11.76/-11.02	-10.94/-11.25	-13.01/-13.25	-14.66/-15.48	-15.2/-14.37	-13.48/-13.15	-13.39/-13.41	-13.88/-12.82	-13.63/-15.28	-17.02/-17.23	-13.31/-13.67	-14.97/-16.23	-17.02/-17.23	-13.31/-13.67	-14.97/-16.23	-17.02/-17.23	-13.31/-13.67	-14.97/-16.23	-17.02/-17.23	-13.31/-13.67	-14.97/-16.23	
0(7.5°)	0(7.5°)	-11.43/-11.02	-11.49/-12.27	-13.73/-15.2	-14.04/-12.7	-12.41/-13.44	-17.28/-18.92	-18.32/-18.35	-18.03/-18.72	-18.94/-17.43	-15.97/-13.86	-12.93/-13.1	-13.45/-13.4	-13.54/-14.07	-15.2/-17.31	-18.98/-17.28	-17.77/-17.97	-18.46/-18.26	-15.54/-17.72	-17.11/-17.91	-17.97/-15.18	-13.07/-12.39	-12.81/-13.35	-13.83/-13.57	-13.99/-12.48		
0(15°)	0(15°)	-13.2/-12.13	-11.6/-12.16	-13.16/-13.33	-14.23/-19.19	-17.93/-15.59	-15.03/-15.14	-16.13/-18.39	-19.12/-15.71	-18.07/-17.85	-17.71/-18.83	-17.57/-13.6	-14.1/-12.33	-12.02/-12.84	-15.33/-18.88	-18.46/-18.66	-19.34/-18.55	-18.14/-15.85	-18.04/-18.85	-18.58/-18.03	-18.12/-15.57	-13.58/-14.83	-18.77/-18.64	-18.17/-16.4	-14.72/-13.89		
0(22.5°)	0(22.5°)	-15.53/-17.78	-12.82/-12.86	-17.12/-17.85	-13.13/-12.17	-15.04/-18.02	-18.34/-12.03	-10.7/-12.04	-18.19/-16.56	-17.17/-17.49	-19.29/-17.83	-17.34/-18.17	-19.13/-18.35	-18.34/-18.68	-17.68/-17.9	-17.43/-16.44	-13.98/-13.12	-14.95/-18.22	-18.63/-19.05	-18.44/-17.6	-17.53/-17.68	-18.12/-18.63	-14.61/-13.03	-13.26/-14.72			
0(30°)	0(30°)	-15.58/-17.67	-18.19/-17.46	-16.82/-14.95	-15.34/-18	-18.04/-13.83	-13.09/-13.17	-12.05/-12.14	-12.23/-13.32	-17.59/-17.8	-13.93/-13.2	-15.22/-18.56	-18.27/-17.63	-18.49/-17.44	-18.63/-15.51	-16.07/-18.25	-14.71/-11.6	-10.72/-10.82	-12.27/-16.16	-17.68/-18.75	-17.4/-17.98	-17.99/-18.25	-18.54/-17.97	-17.37/-18.58	-18.46/-17.14		
0(37.5°)	0(37.5°)	-14.54/-14.75	-14.79/-13.17	-11.62/-12.48	-14.47/-17.56	-19.09/-17.47	-17.13/-15.76	-13.28/-12.66	-12.53/-13.02	-15.29/-16.95	-16.03/-15.13	-18.13/-17.62	-16.77/-14.25	-18.31/-18.34	-12.46/-11.9	-14.68/-14.41	-10.83/-8.84	-8.59/-10.98	-15.85/-18.25	-18.85/-17.61	-17.71/-17.48	-16.91/-14.57	-16.73/-17.62	-18.78/-13.61	-15.05/-14.13		
0(45°)	0(45°)	-18.24/-18.51	-17.43/-15.51	-17.48/-19.02	-18.03/-18.2	-18.44/-17.83	-17.07/-12.91	-11.43/-13.64	-15.71/-16.03	-17.45/-18.81	-18.26/-17.51	-14.65/-18.29	-16.64/-12.52	-15.75/-18.88	-11.02/-9.84	-11.93/-11.36	-9.39/-9.32	-11.58/-14.48	-15.3/-18.41	-19.06/-16.68	-14.09/-14.57	-19.33/-18.29	-17.17/-18.32	-19.06/-17.46	-18.33/-17.13		
0(52.5°)	0(52.5°)	-18.56/-18.26	-17.19/-19.32	-18.32/-18.3	-18.1/-18.53	-18.66/-18.64	-18.51/-19.02	-15.99/-14.75	-16.79/-17.82	-18.13/-15.98	-18.45/-18.71	-17.54/-18.47	-9.73/-10.02	-17.68/-12.28	-9.58/-10.92	-14.57/-15.69	-13.29/-12.33	-13.17/-14.81	-17.74/-19.06	-17.22/-14.24	-14.12/-16.64	-16.36/-16.39	-19.09/-18.29	-18.56/-18.13	-17.21/-16.68		
0(60°)	0(60°)	-12.8/-16.17	-17.86/-15.5	-10.29/-17.4	-13.26/-12.61	-12.67/-14.58	-16.65/-16.98	-17.99/-16.46	-17.18/-18.1	-18.57/-18.62	-15.69/-17.88	-18.08/-17.68	-14.18/-10.96	-16.6/-16.19	-13.51/-14.23	-15.97/-15.96	-14.54/-14.28	-16.62/-16.51	-18.44/-18.5	-18.5/-14.8	-15.48/-13.92	-16.35/-18.9	-15.78/-12.37	-12.44/-13.53	-17.84/-14.24		
0(67.5°)	0(67.5°)	-14.53/-18.27	-19.2/-19.23	-18.35/-18.04	-18.88/-17.39	-14.9/-8.85	-14.98/-7.78	-11.51/-17.9	-13.13/-10.74	-14.64/-18.08	-14.92/-18.55	-18.85/-17.56	-11.98/-11.97	-17.78/-17.68	-11.54/-13.11	-17.78/-17.68	-11.54/-13.11	-17.78/-17.68	-11.54/-13.11	-17.78/-17.68	-11.54/-13.11	-17.78/-17.68	-11.54/-13.11	-17.78/-17.68	-11.54/-13.11	-17.78/-17.68	
0(75°)	0(75°)	-15.55/-18.18	-14.33/-18.24	-17.49/-19.07	-19.21/-15.28	-14.14/-12.02	-9.19/-7.92	-9.94/-13.75	-16.83/-16.54	-16.84/-17.94	-18.78/-15.72	-17.82/-14.62	-13.72/-14.75	-16.37/-18.05	-19.08/-16.64	-18.66/-18.44	-15.17/-14.38	-18.3/-17.62	-18.57/-18.33	-18.49/-18.48	-14.04/-12.67	-10.46/-10.01	-12.18/-18.27	-18.49/-17.53	-18.87/-13.51		
0(82.5°)	0(82.5°)	-14.53/-18.54	-16.28/-14.19	-12.38/-15.4	-16.68/-14.55	-12.12/-11.36	-13.22/-14.92	-18.05/-17.26	-18.28/-18.44	-17.23/-18.42	-17.43/-18.76	-16.68/-18.64	-16.75/-18.55	-17.82/-15.5	-18.12/-17.22	-18.09/-15.89	-16.95/-17.58	-17.83/-14.91	-18.12/-17.32	-16.95/-17.58	-17.83/-14.91	-18.12/-17.32	-16.95/-17.58	-17.83/-14.91	-18.12/-17.32		
0(90°)	0(90°)	-14.38/-17.69	-15.18/-13.35	-16.54/-18.71	-13.79/-9.09	-7.42/-7.96	-12.13/-17.59	-18.29/-13.83	-14.31/-18.04	-16.27/-18.47	-18.27/-17.46	-18.28/-15.19	-16.98/-18.81	-15.82/-16.86	-13.95/-15.31	-18.13/-18.1	-18.02/-16.87	-16.58/-18.4	-17.17/-17.27	-14.57/-15.47	-14.57/-15.47	-14.57/-15.47	-14.57/-15.47	-14.57/-15.47	-14.57/-15.47		
0(97.5°)	0(97.5°)	-13.7/-19.24	-15.25/-12.89	-16.83/-12.96	-8.41/-7.38	-8.71/-11.97	-14.77/-18.88	-18.04/-17.79	-17.62/-17.6	-18.29/-19	-14.8/-16.76	-18.72/-13.01	-18.35/-11.65	-14.35/-16.07	-12.09/-12.79	-15.08/-18.25	-18.71/-15.24	-13.84/-16.5	-18.11/-17.56	-18.55/-17.34	-17.96/-15.66	-13.39/-18.88	-18.48/-15.82	-13.61/-17.45	-18.24/-14.65		
0(105°)	0(105°)	-16.56/-15.76	-11.52/-8.84	-10.11/-13.35	-11.41/-11.42	-12.63/-13.55	-18.49/-17.67	-18.87/-17.97	-17.25/-16.56	-14.29/-12.22	-17.48/-18.01	-12.05/-12.13	-13.16/-14.44	-10.56/-15.88	-13.19/3	-11.57/-16.05	-14.66/-15.93	-17.28/-15.28	-18.79/-17.52	-13.58/-15.49	-14.67/-13.33	-18.87/-17.62	-16.06/-17.93	-18.36/-17.74			
0(112.5°)	0(112.5°)	-16.13/-12.34	-10.92/-7.68	-9.77/-16.48	-12.54/-10.46	-13.74/-18.67	-18.98/-19.06	-18.68/-17.42	-18.28/-15.56	-16.79/-14.22	-12.80/-10.68	-11.26/-12.41	-13.12/-13.62	-15.73/-16.85	-16.04/-6.99	-19.45/-15.33	-13.54/-14.75	-13.96/-14.09	-15.77/-13.86	-13.8/-18.62	-10.83/-12.56	-10.83/-12.56	-10.83/-12.56	-10.83/-12.56	-10.83/-12.56		
0(120°)	0(120°)	-8.18/-8.07	-7.81/-7.12	-7.92/-13.05	-16.91/-15.25	-18.99/-17.95	-17.71/-14.55	-12.35/-17.89	-18.42/-17.31	-18.02/-12.6	-8.03/-9.29	-11.65/-10.93	-13.05/-18.6	-15.05/-10.83	-11.51/-11.43	-10.25/-10.28	-13.32/-17.5	-18.12/-12.26	-14.9/-13.71	-18.3/-16.24	-13.41/-19.35	-12.27/-9.15	-9.43/-14.5	-18.04/-13.11	-12.79/-13.91		
0(127.5°)	0(127.5°)	-6.34/-6.38	-8.65/-9.29	-7.91/-12.2	-17.71/-17.92	-14.17/-13.5	-14.94/-14.86	-8.84/-9.6	-11.56/-18.53	-8.46/-9.74	-11.22/-13.27	-10.93/-9.93	-11.73/-9.22	-8.84/-11.88	-11.22/-9.82	-14.22/-18.48	-18.99/-18.18	-13.09/-13.5	-13.88/-15.24	-14.87/-16.18	-9.97/-10.97	-17.18/-17.58	-13.55/-13.13	-18.46/-9.35			
0(135°)	0(135°)	-6.85/-7.04	-7.27/-8.28	-12.85/-17.7	-17.79/-16.52	-17.99/-18.57	-18.21/-18.44	-11.81/-12.18	-10.57/-11.49	-10.91/-18.6	-11.57/-5.99	-10.77/-17.98	-15.71/-11.09	-11.09/-15.03	-15.78/-12.09	-13.32/-18.55	-14.28/-12.7	-14.67/-17.16	-18.29/-13.42	-18.33/-18.91	-11.08/-10.83	-18.46/-17.31	-14.76/-17.81	-19.01/-9.14			
0(142.5°)	0(142.5°)	-11.59/-9.58	-8.93/-9.93	-14.47/-10.86	-8.88/-5.38	-7.58/-15.14	-18.16/-18.73	-13.2/-13.47	-16.03/-12.69	-10.51/-12.23	-14.25/-13.69	-17.12/-17.6	-18.09/-16.22	-13.12/-13.08	-17.46/-18.81	-15.09/-9.09	-8.76/-11.89	-11.9/-14.42	-17.99/-17.02	-18.13/-15.2	-10.94/-10.07	-8.39/-7.4	-10.37/-18.06	-14.91/-18.66	-18.91/-14.67		
0(15																											



Radiated Composite Gain Data_2.4GHz and 5GHz

Appendix A

θ(75°)	-2.53/-3.44	-3.91/-2.37	-1.130/1.5	0.84/-0.49	-3.13/-5.32	-5.36/-4.56	-5.16/-7.65	-10.81/-10.48	-8.69/-8.12	-6.78/-4.95	-3.08/-2.11	-1.38/-1.36	-3.4/-4.54	-5.74/-3.89	-3.06/-3.18	-5.15/-5.7	-4.84/-9.3	-8.71/-3.05	-1.45/-1.18	-2.11/-3.13	-2.23/-0.7	0.93/1.8	1.99/1.38	0.44/-2.11
θ(82.5°)	-2.25/-4.99	-4.04/-1.33	-0.570/1.3	0.69/-1.01	-3.3/-4.31	-3.52/-3.04	-4.63/-7.64	-8.44/-7.71	-8.26/-9.72	-6.17/-3.63	-2.19/-1.48	-0.63/-0.09	-2.11/-5.2	-5.65/-4.55	-3.79/-3.84	-5.69/-8.19	-6.1/-7.56	-11.55/-6.49	-2.78/-2.13	-2.13/-2.68	-2.52/-0.81	-0.09/-0.05	1.01/1.53	0.72/-0.92
θ(90°)	-1.2/-3.09	-1.76/-0.24	0.65/1.73	0.17/0.15	-2.32/-3.85	-2.56/-1.6	-2.75/-3.67	-4.13/-4.23	-6.38/-8.74	-7.13/-4.72	-3.18/-1.89	0.45/1.22	-0.53/-3.62	-5.43/-4.84	-4.68/-4.62	-6.17/-16.9	-6.71/-3.7	-4.12/-3.95	-2.33/-0.8	-0.15/-1.53	-2.74/-2.05	-1.06/1.73	-0.09/1.33	-1.11/-1.33
θ(97.5°)	-0.15/-0.28	0.120/4.7	0.75/1.31	0.49/-1.71	-4.13/-3.88	-0.91/0.1	0.05/0.41	-1.59/4.33	-8.11/-6.3	-6.07/6.52	-3.92/0.96	0.89/1.17	-1.14/-0.05	-7.78/-8.52	-8.77/5.96	-7.45/-19.3	-6.47/4.1	-3.92/3.33	-3.81/-2.47	-1.35/-2.78	-5.14/-2.9	-3.12/-3.5	-0.88/1.71	-0.87/-0.88
θ(105°)	-0.570/6.5	1.92/1.72	1.53/1.77	0.70/0.57	-1.74/-0.49	0.86/1.55	1.050/0.8	-1.44/-4.1	-5.23/-6.6	-7.05/-7.54	-5.21/-2.76	-1.08/-0.48	-1.62/-3.56	-7.27/-11.55	-12.64/-6.85	-8.04/-16.9	-13.63/-8.22	-7.71/6.5	-6.33/-5.96	-3.72/-4.18	-5.44/-6.25	-4.58/-4.59	-2.29/-0.56	-1.07/-0.94
θ(112.5°)	-1.58/0.08	1.62/1.9	3.05/3.17	2.15/0.61	-0.7/0.05	1.24/1.44	4.293/4.4	1.31/4.1	0.34/-1.4	-2.96/-4.24	-9.81/-13.3	-10.44/-6.76	-5.97/-4.7	-7.19/-8.55	-9.53/-11.44	-9.89/-10.44	-13.54/-11.7	-14.71/-10.88	-11.81/-13.33	-12.01/8.37	-8.19/-11.8	-14.18/-10.49	-9.44/-8.18	-4.58/-4.29
θ(120°)	-1.46/-1.73	-0.230/4.1	-0.030/6.2	0.53/-0.07	0.31/2.2	2.19/2.8	2.190/9.4	-0.85/-2.36	-3.75/-5.84	-13.38/-12	-8.46/-6.73	-4.51/-3.98	-4.48/-6.45	-8.98/-11.6	-13.71/-13.78	-11.36/-17.88	-18.87/-16.82	-16.35/-19.14	-18.95/-14.4	-8.94/-7.49	-12.03/-9.8	-4.13/-5.59	-3.88/-1.44	-0.74/-0.82
θ(127.5°)	-3.57/3.82	-2.45/-2.74	-2.31/-1.9	-0.34/-3.7	2.71/3.59	4.234/4.4	4.31/4.1	1.31/4.1	-2.96/-4.24	-9.81/-13.3	-10.44/-6.76	-5.97/-4.7	-7.19/-8.55	-9.53/-11.44	-9.89/-10.44	-13.54/-11.7	-14.71/-10.88	-11.81/-13.33	-12.01/8.37	-8.19/-11.8	-14.18/-10.49	-9.44/-8.18	-4.58/-4.29	-0.92/-2.9
θ(135°)	-5.66/3.62	-4.44/-3.25	-2.69/-1.31	-0.11/-5.7	2.97/2.44	4.995/1.5	4.234/4.4	1.31/4.1	-2.96/-4.24	-9.81/-13.3	-10.44/-6.76	-5.97/-4.7	-7.19/-8.55	-9.53/-11.44	-9.89/-10.44	-13.54/-11.7	-14.71/-10.88	-11.81/-13.33	-12.01/8.37	-8.19/-11.8	-14.18/-10.49	-9.44/-8.18	-4.58/-4.29	-0.92/-2.9
θ(142.5°)	-5.3/-3.59	-3.15/-2.94	-3.08/-2.59	-1.41/-0.07	1.39/2.39	3.022/6.7	1.91/0.96	-0.06/-2.45	-7.58/-14.45	-11/7.43	-5.16/-5.34	-6.57/8.38	-10.93/-10.66	-11.15/-13.59	-18.85/-15.04	-14.73/-13.5	-16.64/-18.69	-17.61/-16.64	-16.31/-14.37	-14.75/-11.63	-8/9.05	-11.93/-12.21	-10.81/-7.54	-5/5.05
θ(150°)	-13.42/-11.71	-7.93/-4.24	-2.41/-1.43	-0.55/-0.13	0.2/0.1	0.20/0.49	0.36/0.67	-2.56/-4.49	-4.74/-7.97	-11.35/-10.38	-8.16/-8.1	-6.64/-6.56	-7.36/-10.4	-13.05/-16.8	-17.86/-12.16	-11.24/-12.37	-14.65/-18.03	-18.79/-19.15	-18.39/-19.1	-18.67/-17.25	-14.18/-10.49	-9.44/-8.18	-6.53/-6.35	-7.53/-10.42
θ(157.5°)	-10.83/-9.38	-7.54/-4.63	-2.22/-1.21	-0.67/-0.08	0.170/7.1	1.39/1.65	1.02/0.47	-1.04/-2.69	-4.39/-7.37	-13.03/-10.96	-8.39/-8.28	-9.77/12.26	-13.25/-12.74	-12.62/-11.96	-11.29/-10.4	-10.26/-11.37	-12.65/-14.25	-15.18/-15.44	-13.51/-11.23	-10.75/-12.56	-18.32/-18.46	-11.15/-15.48	-12.09/-10.67	-11.11/8
θ(165°)	-15/-13.85	-13.5/-13.21	-10.37/-7.69	-5.74/-4.31	-2.53/-0.99	-0.10/4.5	0.480/0.1	-0.72/-2.12	-4.42/-8.17	-12.75/-13.5	-13.31/-14.32	-15.29/-14.64	-13.97/-13.96	-15.91/-19.06	-17.91/-18.86	-18.23/-17.74	-18.05/-18.35	-17.74/-17.78	-14.21/-12.31	-11.73/-12.46	-14.52/-13.91	-11.22/-10.3	-10.63/-11.83	-13.44/-15.39
θ(172.5°)	-18.99/-15.8	-13.46/-11.85	-10.92/-9.58	-8.08/-6.03	-4.07/-2.64	-2.32/-2.78	-3.71/4.41	-5.33/-6.59	-7.84/-9.05	-9.41/-9.75	-10.96/-12.72	-14.47/-17.26	-18.34/-17.7	-16.56/-13.64	-12.18/-11.84	-11.44/-11.06	-11.63/-13.42	-15.84/-17.96	-18.03/-18.96	-19.16/-18.57	-18.31/-18.21	-18.27/-19.9	-18.57/-17.92	-18.71/9.77
θ(180°)	-17.61/-18.18	-18.44/-17.9	-19.31/-18.89	-15.57/-13.44	-12.15/-11.68	-11.11/-10.27	-9.17/7.2	-7.03/6.7	-6.73/7.52	-8.13/8.46	-9.28/10.91	-13.28/-16.23	-18.19/-18.98	-18.63/18.08	-17.29/-13.25	-10.45/9.43	-9.61/10.43	-10.73/10.14	-9.72/9.4	-8.85/8.46	-8.57/9.15	-10.17/-10.99	-11.99/-12.39	-13.69/-14.88
Freq(Hz)	5.6GPol	PhiAnt.3	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
Gain	Φ(0°)Φ(7.5°)	Φ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)
θ(0°)	-5.48/-5.53	-5.23/-4.8	-4.72/-4.87	-5.47/-6.42	-6.9/-6.86	-6.88/-7.88	-8.83/-8.67	-8.27/-8.02	-7.92/-8.05	-8.09/-8.37	-7.89/-8.61	-5.42/-4.25	-3.31/-2.68	-2.58/-2.91	-3.12/-3.24	-3.93/-4.26	-3.96/-4.76	-6.6/-6.98	-7.41/-9.1	-9.46/-9.84	-10.44/-10	-9.5/-9.05	-8.15/-7.32	-6.22/-5.44
θ(7.5°)	-4.27/4.34	-4.04/3.73	-3.42/3.16	-3.45/-4.6	-6.47/-8.07	-8.77/-9.01	-9.55/-10.9	-13.73/13.46	-11.09/9.96	-8.48/-7.5	-6.06/-5.7	-5.47/-6.67	-6.13/-6.54	-6.84/-6.66	-6.43/6.67	-6.81/6.78	-7.79/-8.7	-9.77/-9.4	-9.77/-9.4	-9.31/9.55	-9.43/9.93	-6.32/6.81	-5.06/-4.3	-3.88/-4.3
θ(15°)	-2.66/2.66	-2.68/-2.81	-2.94/3.34	-2.33/-5.63	-7.09/9.33	-14.8/-17.2	-18.45/-18.66	-17.88/-17.49	-14.52/-13.25	-12.51/-10.6	-8.69/-7.55	-7.35/-8.04	-9.55/-12.31	-15.11/-16.14	-15.09/-14.3	-13.81/-12.53	-10.4/-8.9	-9.06/-8.85	-7.78/-7.99	-9.03/9.55	-9.45/9.93	-6.32/6.81	-5.06/-4.3	-3.88/-4.3
θ(22.5°)	-0.48/0.77	-1.42/-2.06	-2.83/-4.13	-5.82/-7.6	-9.79/-12.27	-16.71/-17.68	-17.37/-12.69	-13.95/-14.8	-11.61/9.33	-9.96/11.3	-9.74/-8.1	-8.32/-10.5	-13.68/-15.06	-14.95/-14.71	-17.81/-19.06	-17.42/-13.12	-11.43/-10	-10.01/-12.03	-14.32/-15.62	-17.62/-14.39	-10.45/-14.4	-4.67/-3.46	-2.59/-1.72	-0.96/-0.56
θ(30°)	0.25/-0.49	-1.54/-2.67	-3.87/-4.95	-5.66/-7.08	-9.88/-13.6	-18.87/-18.88	-13.03/-12.51	-15.94/-18.36	-11.65/-9.76	-7.94/-8.5	-7.38/-6.24	-6.77/8.69	-9.23/-8.45	-8.09/-8.77	-8.43/-10.7	-14.21/-15.08	-10.08/-6.83	-7.16/-6.87	-9.76/-12.59	-15.69/-16.08	-10.94/-7.21	-5.57/-4.56	-2.71/-0.96	0.150/5.1
θ(37.5°)	-0.02/-1.16	-2.46/-3.31	-3.88/-4.53	-5.11/-6.68	-10.34/-16.21	-18.75/-14.25	-9.79/-10.42	-13.18/-12.06	-8.15/-6.53	-8.34/-11.19	-9.09/7.02	-7.42/-9.11	-8.73/-8.88	-7.61/-7.61	-10.48/-10.43	-11.47/-12.68	-11.98/-6.49	-4.48/-6.8	-10.74/-14.95	-16.18/-9.94	-6.86/-5.34	-4.34/3.48	-1.72/-0.08	0.580/5.8
θ(45°)	0.37/-0.99	-3.62/4.73	-4.21/2.43	-4.9/-6.18	-8.1/-10.53	-15.61/-18.96	-13.55/-9.58	-9.85/-12.35	-11.21/8.53	-10.49/-14.28	-9.18/-7.02	-6.86/-9.63	-5.29/-4.9	-5.47/7.14	-10.08/-14.13	-16.38/-12.59	-11.62/-16.21	-13.68/-10.88	-12.13/-18.89	-17.88/-12.76	-7.92/-9.48	-3.11/-2.94	-3.02/2.3	-0.60/0.67
θ(52.5°)	-2.08/-1.93	-2.78/-3.63	-4.99/-5.58	-5.71/-5.73	-5.96/-7.59	-11.84/-18.72	-16.63/-11.92	-10/-9.92	-10.09/-8.88	-8.38/-8.39	-6.86/-5.39	-5.11/-5.59	-6.09/-6.71	-7.26/-9.42	-15.52/-14.58	-13.52/-13.58	-11.99/-16.4	-18.28/-15.1	-13.86/-13.01	-12.67/-10.51	-7.49/-5.22	-1.520/5.2	-0.62/-1.94	-2.2/-2.1
θ(60°)	-2.86/-1.89	-2.28/-3.42	-4.75/-6.43	-7.43/-5.87	-4.73/4.72	-7.65/-14.25	-11.78/-13.55	-7.91/-7.39	-8.21/6.2	-6.25/-13.24	-9.4/-5.3	-4.67/-3.8	-3.34/3.33	-1.22/-6.22	-13.29/-17.61	-18.41/-13.18	-14.76/-14.74	-12.05/-15.71	-17.77/-13.27	-14.28/-12.11	-10.47/-7.1	-4.24/2.4	-2.63/4.77	-4.84/-2.6
θ(67.5°)	-6.43/-3.3	-1.86/-3.25	-7.61/-12.14	-10.7/-6.11	-3.76/-2.83	-4.09/3.11	-18.02/11.05	-9.15/-13.73	-11.51/6.06	-6.62/-7.16	-4.21/5.43	-4.69/-4.76	-6.62/-5.11	-4.21/5.43	-4.69/-4.76	-6.62/-5.11	-4.21/5.43	-4.69/-4.76	-6.62/-5.11	-4.21/5.43	-4.69/-4.76	-6.62/-5.11	-4.21/5.43	-4.69/-4.76
θ(75°)	-6.3/-5.2	-3.17/-4.28	-6.54/-8.03	-8.8/-3.7	-6.31/-4.16	-3.98/-5.62	-8.33/-14.42	-17.28/-18.12	-7.78/-7.36	-3.39/-3.74	-3.66/-3.58	-4.15/-6.97	-7.74/-7.49	-9.06/-19.17	-16.62/-14.84	-12.77/-17.04	-14.88/-12.62	-19.03/-14.47	-18.36/-13.03	-14.23/-9.61	-8.24/-8.79	-6.55/-4.05	-2.97/-3.7	-1.98/-2.6
θ(82.5°)	-5.89/-6.84	-7.51/-7.18	-6.04/-4.96	-4.95/-5.06	-6.05/-5.97	-4.83/-3.96	-5.97/-10.58	-15.71/-12.11	-5.17/-2.27	-1.67/-2.49	-3.03/1.82	-1.64/-1.6	-6.28/-8.35	-12.41/-15.63	-16.98/-18.33	-12.99/-18.66	-17.11/-9.82	-15.56/-18.75	-10.92/-10.17	-10.91/-11.88	-10.18/-15.21	-11.04/-4.74	-3.07/-2.15	-1.94/-0.3
θ(90°)	-7.08/-11.84	-16.48/-11.72	-6.61/-3.38	-1.25/-0.88	-2.6/-4.6	-6.63/-8.17	-9.87/-14.62	-15.91/-9.88	-4.19/-1.82	-2.14/2.71	-2.63/3.12	-4.76/9	-11.65/-15.99	-18.75/-17.72	-17.59/-15.4	-17.98/-19.19	-17.71/-16.12	-16.15/-9.72	-11.67/-9.26	-8.04/-5.3	-4.69/-8.82	-9.4/-4.74	-2.45/-1.51	-0.65/-2.96
θ(97.5°)	-5.26/-7.3	-5.1/-5.23	-5.63/-3.9	-2.16/-1.59	-2.35/-5.78	-11.79/-17.02	-18.8/-18.4	-13.98/-9.75	-4.86/-1.4	-3.66/-2.49	-3.16/-3.92	-5.57/-8.53	-8.95/-16.51	-18.84/-19.5	-16.68/-18.62	-16.97/-14.42	-19.31/-18.77	-14.13/-17.99	-10.32/-12.15	-17/-11.21	-8.56/-10.12	-13.55/-6.37	-3.7/-1.21	-0.92/-1.54
θ(105°)	-1.94/-2.9	-4.34/-8.2	-4.91/6.3	-7.38/-5.42	-5.92/8.55	-18.13/-18.52	-12.64/14.24	-6.84/3.03	-2.45/-3.02	-8.62/12.07	-16.73/15.21	-18.85/-18.94	-13.68/-14.83	-17.19/-18.75	-17.77/-18.63	-17.19/-18.79	-15.84/-15.34	-17.64/-18.48	-14.18/-13.65	-16.22/-10.73	-7.03/-4.83	-2.72/0.97	-0.92/0.77	-1.97/0.97
θ(112.5°)	-3.15/2.86	-2.3/-3.56	-4.12/3.97	-4.17/6.96	-9.1/12.89	-11.9/19.29	-7.32/-10.8	-17.84/-18.08	-15.11/11.39	-9.53/7.39	-5.93/5.71	-5.58/7.87	-11.02/-11.93	-16.21/-19.21	-15.21/-12.05	-9.97/16.63	-18.09/-18.88	-13.55/-13.26	-10.85/-7.24	-6.73/-12.51	-10.66/5.66	-6.91/17.99	-11.06/10.26	-5.21/2.58
θ(120°)	-4.36/3.06	-2.12/-3.67	-6.13/-6.94	-7.48/-8.73	-7.99/-8.24	-8.44/-6.32	-5.04/-6.1	-10.06/-13.42	-15.65/-17.63	-14.75/-12.43	-11.41/6.89	-6.74/-8.45	-15.12/-17.79	-18.24/-19.5	-18.14/49	-18.56/-9.42	-16.76/-14.53	-6.						



Radiated Composite Gain Data_2.4GHz and 5GHz

Appendix A

Theta (112.5°)	1:11/1.36	2:04/2.3	2:14/1.9	0:61/0.26	1:01/0.27	3:76/4.77	4:73/0.2	0:55/1.81	-5:5/7.81	-4:97/2.2	-2:37/1.12	-3:57/3.4	-3:27/14.2	-18:94/15.47	-6:71/5.59	-5:61/13.17	-13:94/11.65	-18:48/12.7	-18:64/10.55	-8:39/11.08	-9:19/6.09	-3:22/9.83	-9:25/5.38	-4:67/0.55
Theta (120°)	-1:11/0.98	1:18/1.88	2:29/2.38	2:28/2.19	1:37/1.72	3:44/4.9	4:57/3.1	1:19/1.42	-5:77/8.1	-6:64/5.46	-3:84/1.81	-3:48/4.27	-4:55/10.28	-10:81/17.76	-17:92/13.28	-17:93/7.62	-12:44/11.35	-11:68/10.79	-17:19/8.57	-6:95/8.98	-9:99/4.11	-1:95/3.87	-9:54/8.15	-7:58/6.61
Theta (127.5°)	-4:42/2.5	-1:98/0.4	0:08/0.42	-0:75/2.54	-2:2/2.02	-0:66/1.5	1:94/1.97	0:37/2.72	-3:85/3.72	-4:03/4.9	-2:74/2.28	-4:03/5.88	-7:95/13.14	-17:19/18.08	-17:57/19.1	-19:08/11.66	-12:48/14.46	-15:79/18.97	-12:91/10.4	-12:92/15.69	-16:26/9.78	-7:68/5.57	-4:48/2.91	-5:87/9.78
Theta (135°)	-7:15/7.49	-5:17/3.63	-0:91/0.11	-0:19/0.68	-0:92/0.18	1:19/1.47	1:35/0.14	-1:65/4.05	-5:5/5.01	-4:77/9.41	-4:03/5.01	-8:29/8.47	-6:35/8.28	-10:38/14.85	-13/9.35	-14:64/18.19	-13:01/16.73	-18:05/18.16	-17:92/15.24	-14:76/17.19	-12:94/10.44	-9:17/6.65	-7:73/5.6	-5:42/0.67
Theta (142.5°)	-6:74/8.49	-10:14/8.25	-3:92/0.75	1:61/0.35	3:79/4.1	3:97/3.62	2:54/0.15	-3:4/7.98	-11:57/9.34	-6:47/6.32	-9:36/8.07	-6:78/8.07	-9:36/8.15	-14:67/17.04	-17:87/18.21	-18:61/15.59	-10:97/8.97	-15:3/18.39	-16:99/14	-11:86/9.9	-10:28/11.06	-10:25/12.04	-12:33/9.88	-10:69/7.41
Theta (150°)	-11:22/9.7	-5:78/3.75	-1:7/0.06	0:82/0.27	2:94/3.49	3:78/3.58	2:88/1.72	-0:04/2.24	-4:54/8.87	-14:6/10.14	-8:41/9.48	-12:07/17.67	-15:13/13.22	-16:77/18.72	-17:51/18.18	-16:93/13.56	-12:02/11.05	-10:46/11.01	-11:54/11.63	-12:87/15.67	-18:54/18.16	-19:41/12.28	-8:79/8.37	-13:12/14.71
Theta (157.5°)	-4:83/3.95	-3:39/2.82	-2:79/1.93	-1:03/0.76	-0:25/0.47	1:17/1.41	1:54/1.29	0:23/1.91	-5:7/9.06	-10:25/10.27	-10:79/13.21	-14:11/15.15	-18:69/17.81	-17:56/18.04	-18:28/18.38	-17:98/14.08	-13:07/15.18	-17:54/16.97	-15:67/14.44	-16:87/18	-17:56/13.88	-12:98/10.04	-8:05/8.43	-8:8/6.6
Theta (165°)	-9:29/8.18	-7:83/7.88	-7:06/6.1	-4:41/2.84	-2:11/2.03	-2:12/1.91	-1:45/1.4	-2:04/3.08	-4:14/5.97	-9:01/13.43	-18:14/17.9	-13:83/13.28	-15:46/18.26	-17:41/15.16	-14:19/13.51	-11:71/11.65	-15:99/18.89	-16:61/14.7	-12:97/10.94	-10:49/11.44	-12:44/14.34	-17:5/19.12	-16:64/18.65	-15:83/11.82
Theta (172.5°)	-11:25/8.93	-7:53/6.17	-4:69/3.09	-2:03/1.16	-0:42/0.25	0:36/0.42	0:39/0.31	-1:57/3.18	-5:29/7.76	-10:71/13.63	-16/15.9	-15:94/16.75	-16/15.9	-11:96/10.47	-9:57/8.74	-8:23/8.7	-10:4/10.47	-10:06/11.24	-13:89/14.74	-14:43/13.15	-11:12/14	-15:6/17.92	-18:5/18.08	-17:86/14.63
Theta (180°)	-17:88/16.64	-13:74/11.11	-9:52/7.84	-6:39/5.64	-5:13/5.11	-5:56/6.53	-7:61/8.93	-9:41/9.91	-11:11/12.05	-12:16/12.14	-13:64/14.91	-16:49/17.44	-17:19/16.85	-17:29/16.27	-13:29/10.96	-9:71/8.94	-7:85/6.59	-6:61/7.52	-8:52/8.69	-8:45/8.86	-9:78/11.32	-13:67/15.88	-18:62/18.42	-18:01/17.55
Freq(Hz)	2.45GPol	PhiAnt.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (7.5°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (15°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (22.5°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (30°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (37.5°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (45°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (52.5°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (60°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (67.5°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (75°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (82.5°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (90°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (97.5°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (105°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (112.5°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (120°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (127.5°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (135°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (142.5°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (150°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (157.5°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (165°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (172.5°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Theta (180°)	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf	-inf
Freq(Hz)	2.45GPol	ThetaAnt.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-8:08/9.24	-9:56/10.81	-11:76/11.61	-10:2/9	-8:01/6.97	-6:09/5.02	-4:32/4.27	-4:18/3.99	-4:24/4.48	-4:63/4.44	-4:66/5.62	-7:53/9.6	-11:17/11.98	-12:44/12.26	-10:74/9.31	-8:67/8.82	-9:22/8.38	-6:95/6.14	-5:67/5.23	-4:57/3.84	-3:36/3.36	-3:35/3.66	-3:82/4.32	-5:61/7.01
Theta (7.5°)	-7:98/8.34	-8:47/9.35	-10:38/11.78	-12:37/12.59	-11:85/9.78	-7:99/6.61	-5:8/5.15	-4:46/3.78	-3:17/3.13	-3:3/3.32	-3:43/4.01	-5:16/6.84	-8:34/9.86	-11:19/11.59	-10:17/8.53	-7:26/6.45	-5:69/4.66	-5:14/4.91	-4:33/3.47	-4:74/5.33	-5:75/5.82	-5:41/5.93	-7:07/7.5	-8:08/9.34
Theta (15°)	-9:36/9.83	-10:19/12.18	-12:14/15.35	-17:33/18.48	-12:95/9.17	-7:03/5.92	-4:41/3.44	-3:7/4.48	-4:45/4.13	-4:48/5.18	-5:06/5.64	-5:49/6.41	-7:68/9.33	-10:89/10.9	-9:33/8.49	-8:62/8.52	-7:72/6.83	-8:82/5.45	-5:93/4.61	-6:17/4.38	-6:91/8.41	-9:8/9.77	-10:21/11.49	-13:01/11.49
Theta (22.5°)	-18:95/15.23	-14:41/12.46	-15:01/18.73	-18:88/11.51	-8:49/7.19	-5:98/5.04	-4:47/5.19	-6:83/7.6	-6:57/5.97	-6:68/8.02	-8:18/7.82	-8:49/10.5	-12:61/13.27	-12:92/11.62	-10:15/9.58	-6:88/9.26	-9:15/9.77	-9:38/8.77	-8:69/8.49	-8:11/8.01	-8:54/11.46	-15:71/17.75	-18:75/17.41	-18:75/17.41
Theta (30°)	-18:53/19.09	-16:82/16.32	-19:42/18.93	-13:75/9.76	-7:06/5.53	-4:4/4.54	-5:31/6.59	-7:98/9.34	-11:48/11.65	-10:49/10.15	-10:99/12.04	-13:41/16.17	-17:42/14.15	-11:85/11.4	-10:04/8.83	-7:97/7.87	-8:95/12.45	-12:99/10.19	-8:87/8.1	-8:07/9.27	-9:65/10.29	-11:58/10.12	-10:99/17.27	-18:79/13.56
Theta (37.5°)	-17:94/18.34	-18:02/17.68	-16:22/13.94	-10:06/6.43	-4:79/3.95	-4:06/4.46	-5:3/5.75	-6:12/7.78	-12:41/18.09	-15:55/12.02	-10:97/11.1	-12:7/14.16	-16:18/14.91	-14:27/15.13	-17:64/18.15	-15:49/16.47	-13:15/10.5	-9:29/7.69	-6:42/6.61	-7:08/6.6	-8:52/12.58	-14:89/18.08	-18:83/17.98	-18:63/16.03
Theta (45°)	-18:47/18.34	-18:44/16.33	-17:33/12.05	-7:96/5.11	-4:43/3.16	-2:36/2.01	-2:41/3.6	-5:12/6.24	-8:14/12.85	-16:72/12.55	-9:57/9.82	-12:91/14.74	-13:87/12.02	-10:25/11.62	-14:64/12.13	-9:43/10.19	-12:45/14.58	-16:26/12.24	-5:94/4.52	-6:72/9.39	-11:98/12.96	-16:25/17.58	-14:84/15.12	-14:84/15.12
Theta (52.5°)	-17:67/15.61	-10:26/10.71	-18:15/16.26	-7:63/4.74	-4:47/3.31	-2:85/2.25	-2:07/2.58	-3:84/4.83	-5:88/9.96	-16:25/13.46	-11:96/13.87	-15:88/14.47	-11:92/10.76	-14:9/18.45	-9:97/6.77	-4:87/3.65	-4:27/5.82	-5:7/3.5	-2:73/4.36	-8:81/10.1	-5:81/3.49	-4:24/8.22	-11:68/9.66	-13:09/18.67
Theta (60°)	-18:05/16.48	-10:15/9.75	-16:09/11.92	-6:55/4.26	-3:29/2.55	-2:62/2.31	-2:07/1.8	-2:21/3.43	-5:75/8.93	-10:14/8.52	-9:26/12.77	-15:31/15.48	-18:93/16.43	-13:26/										



Radiated Composite Gain Data_2.4GHz and 5GHz

Appendix A

Theta (°)	-11.64/-10.82	-8.68/-7.45	-7.12/-7.7	-9.52/-13.25	-18.72/-18.67	-16.72/-10.71	-7.75/-5.66	-5.95/-6.01	-5.15/-3.58	-3.56/-4.34	-2.37/-2.01	0.67/-0.2	-1.65/-6.59	-16.24/4.95	-1.77/-1.42	-2.94/8.62	-10.17/-18.1	-12.45/-13	-16.02/-18.42	-18.07/-12.02	-15.16/-11.05	-10.09/-11.32	-11.05/-10.03	-9.81/-10.77
Theta (157.5°)	-6.4/-6.06	-6.45/-7.62	-8.53/-8.81	-9.61/-11.51	-14.69/-17.59	-16.16/-15.43	-12.75/-11.06	-9.94/-8.02	-6.27/-5.58	-3.53/-1.52	-0.54/-0.8	-2.14/-5.65	-8.36/-4.22	-2.22/-1.6	-2.08/-3.97	-6.69/9.72	-15.61/-16.36	-14.29/-14.76	-14.29/-12.07	-10.89/-12.18	-14.44/-12.56	-11.42/-11.78	-11.62/-9.85	-7.41/-6.65
Theta (165°)	-13.58/-13.13	-13.13/-13.64	-15.72/-15.97	-16.05/-15.91	-16.91/-15.82	-15.3/-13.4	-10.86/-8.8	-7.15/-2.3	-3.48/-2.08	-1.44/-1.67	-2.21/-2.34	-2.06/-1.96	-2.62/-3.81	-5.22/-6.97	-6.68/-11.51	-10.09/9.08	-9.92/9.23	-12.62/-11.12	-13.75/-16.29	-16.15/-14.45	-11.73/-10.39	-10.92/-10.75	-10.92/-12.13	-13.16/-14.55
Theta (172.5°)	-11.44/-11.71	-11.16/-10.86	-9.51/9.47	-9.38/-9.07	-9.28/-11.08	-13.54/-14.64	-12.92/10.49	-8.06/6.54	-4.61/-3.21	-2.49/-2.28	-2.13/-2.07	-2.69/-4.1	-5.78/-6.48	-6.39/6.35	-6.98/-7.91	-9.13/-10.62	-11.98/-14.58	-18.11/-17.91	-18.45/-18.3	-17.41/-15.21	-13.89/-12.94	-11.94/-10.87	-10.52/-11.78	-12.75/-11.98
Theta (180°)	-3.12/-3.29	-4.12/-4.88	-5.28/-5.39	-5.96/-6.95	-8.14/-9.88	-12.34/-15.6	-18.13/-15.11	-11.23/-9.03	-7.39/-6.39	-5.31/4.58	-4.32/-4.48	-5.23/-6.11	-6.71/6.46	-5.97/6.08	-6.92/-8.32	-10.28/-12.42	-14.16/-14.85	-13.53/-12.13	-12.57/-13.85	-12.73/-11.19	-9.53/7.91	-6.33/-5.25	-4.34/-4.07	-3.72/-3.31
Freq(Hz)	5.3GPol	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°)	-7.78/-8.7	-10.16/-13.6	-18.19/-18.21	-18.81/-16.45	-14.28/-12.4	-10.44/-8.8	-7.64/-7.21	-6.65/-5.91	-5.89/-6.52	-7.62/-8.46	-8.37/-7.96	-8.28/-9.34	-10.31/-11.91	-13.94/-16.53	-18.33/-17.42	-17.95/-16.18	-11.96/-9.49	-8.14/-7.55	-6.87/-6.1	-4.95/-4.21	-4.08/-4.4	-4.38/-4.4	-4.74/-5.38	-6.24/-7.01
Theta (7.5°)	-9.23/-9.19	-10.16/-12.51	-16.99/-18.41	-17.51/-18.92	-16.09/-15.77	-14.9/-12.3	-9.55/-7.43	-6.43/-6.24	-6.05/-5.27	-4.77/-5.72	-7.11/-7.89	-8.27/-8.89	-10.27/-12.4	-15.77/-18.8	-19.17/-15.58	-12.56/-11.03	-9.22/-8.11	-7.52/-7.91	-9.29/-9.37	-8.13/-7.55	-7.94/-9.91	-10.39/-9.46	-8.17/-8.02	-8.73/-8.96
Theta (15°)	-10.61/-11.71	-11.84/-12.51	-15.58/-17.55	-18.37/-13.93	-11.13/-10.22	-9.85/-9.26	-8.82/-8.24	-7.58/-6.9	-7.19/-7.55	-7.17/7.04	-7.6/-8.24	-8.46/-9.21	-10.65/-13.08	-16.85/-16.33	-11.01/-7.51	-5.67/-4.58	-3.91/-4.1	-5.25/-6.21	-6.25/-6.5	-7.91/-9.32	-10.47/-11.3	-11.98/-10.57	-17.2/-13.65	-10.71/-9.66
Theta (22.5°)	-10.31/-10.33	-10.48/-13.13	-17.71/-17.79	-10.48/-7.5	-6.67/-6.03	-5.96/-7.02	-8.41/-10.08	-10.98/-10.95	-11.84/-11.97	-10.61/-9.18	-9.22/-9.53	-9.01/-9.09	-10.81/-13.02	-13.96/-11.28	-9.33/-7.95	-7.99/-7.02	-6.55/-7.01	-8.2/-8.95	-8.87/-8.26	-7.63/-8.37	-9.77/-11.12	-13.02/-13.91	-18.58/-17.32	-12.83/-10.8
Theta (30°)	-12.87/-12.27	-16.05/-18.94	-15.17/-10.65	-17.16/-31	-6.14/-5.65	-6.69/-8.08	-9.11/-10.84	-13.71/-16.37	-15.52/-15.37	-14.5/-12.89	-11.24/-11.24	-12.65/-11.65	-9.11/-7.57	-4.75/-7.89	-7.57/-3.4	-9.11/-17	-11.47/-10.98	-9.19/-9.66	-12.89/-13.49	-9.41/-8.51	-9.88/-13.35	-15.86/-18.06	-18.86/-15.37	
Theta (37.5°)	-12.71/-14.28	-18.41/-17.4	-15.31/-11.38	-8.34/-6.9	-6.62/-6.58	-6.79/-6.49	-7.95/-10.57	-15.04/-16.9	-14.18/-12.14	-14.97/-18.12	-15.41/-13.01	-15.77/-18.07	-18.71/-13.58	-9.06/-9.64	-6.47/-8.18	-11.99/-15.81	-17.52/-19.15	-11.57/9.85	-10.49/-10.57	-8.46/-7.74	-12.31/-18.57	-15.26/-16	-18.57/-17.83	-16.11/-12.25
Theta (45°)	-16.32/-15.53	-18.96/-18.87	-12.48/-9.15	-6.65/-6	-5.73/-4.7	-4.67/-5.35	-6.27/-5.88	-6.11/-7.09	-9.45/-12.7	-17.15/-19.31	-11.26/-8.61	-10.94/-14.51	-17.58/-14.97	-10.71/-12.9	-11.32/-12.1	-7.93/-7.07	-8.34/-8.68	-8.77/-7.03	-5.08/-5.48	-7.04/-9.09	-11.31/-14.32	-17.69/-15.7	-15.89/-15.86	
Theta (52.5°)	-18.95/-12.79	-11.85/-17.85	-17.74/-8.3	-5.14/-9.5	-4.45/-4.05	-4.06/-4.4	-4.06/-4.4	-2.03/-2.62	-4.97/-8.6	-12.54/-14.48	-14.61/-13.48	-15.06/-16.79	-12.94/-7.67	-6.58/-9.99	-18.28/-12.46	-6.04/-3.62	-3.94/-4.89	-6.37/-5.35	-4.28/-4.67	-6.35/-4.35	-3.34/-4.09	-7.25/-11.03	-13.45/-13.78	-16.23/-17.67
Theta (60°)	-18.44/-13.42	-10.44/-13.36	-15.49/-7.8	-4.73/-4.41	-3.98/-3.75	-3.52/-2.81	-1.79/-1.19	-1.27/-2.28	-5.07/-9.41	-12.46/-13.46	-12.48/-10.31	-12.84/-18.09	-16.36/-14.89	-9.41/9.88	-8.93/9.47	-6.02/4.52	-5.56/6.59	-4.21/2.27	-1.81/2.38	-4.19/-5.71	-5.45/-6.83	-6.86/7.26	-10.07/-18.08	-17.58/-17.89
Theta (67.5°)	-18.39/-16.75	-10.65/-13.41	-13.53/-6.59	-3.64/-0.41	-4.77/-3.44	-2.12/-1.8	-2.29/-1.62	-1.31/-2.78	-7.04/-10.53	-10.04/-11.33	-12.36/-10.24	-10.59/-16.33	-12.92/-11.08	-10.39/-17.56	-10.48/-5.71	-3.67/-3.93	-5.48/-5.52	-3.61/-3.25	-0.65/-0.95	-3.07/-2.63	-11.66/-11.61	-9.36/-9.33	-6.31/-11.53	-12.42/-17.63
Theta (75°)	-17.13/-11.24	-10.72/-13.15	-11.61/-6.35	-6.14/-6.12	-4.12/-3.16	-2.93/-3.01	-3.25/-3.74	-3.94/-6.21	-1.74/-11.7	-8.99/-11.01	-17.24/-18.28	-18.19/-14.53	-12.19/-13.23	-15.04/-17.61	-14.86/-8.62	-6.46/-8.32	-9.57/8.08	-2.45/-3.67	-3.86/-6.34	-7.95/-10.94	-17.71/9	-6.76/-9.8	-12.95/-17.68	
Theta (82.5°)	-16.89/-12.12	-16.81/-17.8	-12.19/-10.17	-9.64/8.36	-5.69/-3.48	-2.68/-2.97	-4.62/-5.42	-6.43/-9.98	-8.36/-4.57	-2.59/-3.47	-9.24/-15.51	-18.35/-13.26	-13.72/-18.76	-19.33/-18.48	-13.22/-13.69	-10.67/-9.59	-11.83/-16	-8.11/-8.13	-6.16/-4.44	-4.15/-3.83	-4.35/-6.16	-13.29/-18.24	-10.55/-12.17	-18.47/-15.95
Theta (90°)	-13.23/-17.67	-18.21/-18.01	-18.74/-18.41	-11.61/-18.22	-8.9/-3.9	-2.17/-1.81	-1.87/-2.47	-4.57/-7.23	-5.92/-2.29	-1.39/-1.7	-12.33/-14.36	-16.96/-8.72	-8.63/-8.57	-12.98/-10.44	-13.51/-15.52	-17.66/-18.58	-14.56/-8.99	-6.16/-6.57	-7.33/-2.93	-3.24/-3.07	-4.44/-4.86	-9.25/-14.81	-12.86/-13.06	-12.94/-9.17
Theta (97.5°)	-13.96/-18.05	-18.27/-17.11	-8.85/-7.06	-8.98/-10.94	-3.88/-3.35	-3.27/-3.17	-3.27/-3.17	-3.27/-3.17	-3.27/-3.17	-3.27/-3.17	-3.27/-3.17	-3.27/-3.17	-3.27/-3.17	-3.27/-3.17	-3.27/-3.17	-3.27/-3.17	-3.27/-3.17	-3.27/-3.17	-3.27/-3.17	-3.27/-3.17	-3.27/-3.17	-3.27/-3.17	-3.27/-3.17	-3.27/-3.17
Theta (105°)	-12.66/-19.27	-17.61/-11.52	-7.54/-6.42	-6.56/-6.8	-8.33/-5.65	-4.58/-4.14	-3.87/-3.56	-2.62/-1.49	-0.92/-1.65	-3.51/-6.86	-11.93/-12.72	-5.69/-8.42	-5.32/-4.58	-9.88/-8.53	-17.91/-13.2	-16.14/-17.77	-8.14/-6.09	-5.52/-3.54	-4.43/-4.21	-7.63/-6.58	-9.11/-13.72	-9.83/-7.77	-11.13/-8.55	-13.31/-16.79
Theta (112.5°)	-14.51/-16.79	-14.32/-12.05	-10.58/-8.08	-8.47/-11.02	-7.51/-4.54	-3.01/-2.14	-1.11/-3.06	-0.89/-3.1	-6.63/-9.03	-7.65/-8.52	-13.81/-7.29	-6.37/-9.15	-6.34/-9.55	-9.65/-8.08	-15.58/-9.04	-12.18/-10.26	-6.87/-8.29	-7.01/-4.06	-3.06/-5.47	-10.59/-11.73	-19.35/-11.75	-3.91/-9.51	-9.64/-5.66	-8.25/-9.4
Theta (120°)	-9.01/-16.74	-15.29/-10.17	-11.89/-10.67	-6.04/-4.59	-4.74/-5.09	-4.55/-4.32	-4.55/-4.32	-4.55/-4.32	-4.55/-4.32	-4.55/-4.32	-4.55/-4.32	-4.55/-4.32	-4.55/-4.32	-4.55/-4.32	-4.55/-4.32	-4.55/-4.32	-4.55/-4.32	-4.55/-4.32	-4.55/-4.32	-4.55/-4.32	-4.55/-4.32	-4.55/-4.32	-4.55/-4.32	-4.55/-4.32
Theta (127.5°)	-8.11/-17.84	-17.05/-13.99	-19.32/-13.64	-7.11/-5.08	-5.35/-5.65	-5.72/-5.98	-6.13/-5.99	-3.44/-6.61	-1.02/-3.71	-17.35/-7.24	-2.41/-5.02	-11.09/-18.83	-9.55/-7.27	-6.47/-11.61	-13.03/-14.32	-12.32/-17.6	-8.91/-2.63	-2.47/-9.17	-17.64/-15.14	-8.39/-1.93	-17.65/-10.32	-11.76/-7.62	-10.04/-8.23	-5.96/-5.12
Theta (135°)	-8.67/-13.24	-18.34/-17.22	-14.14/-15.33	-11.68/-7.58	-5.87/-9.94	-4.63/-4.34	-4.13/-9.91	-3.79/-4.35	-5.25/-12.58	-8.23/-3.49	-3.32/-6.51	-13.25/-18.73	-14.18/-15.78	-11.28/-9.77	-9.77/-12.14	-17.43/-19.01	-19.03/-15.92	-9.13/-8.92	-11.18/-15.14	-7.67/-8.59	-16.38/-18.09	-19.16/-8.87	-7.29/-9.58	-8.71/-7
Theta (142.5°)	-9.24/-17.8	-17.73/-19.16	-17.48/-18.46	-17.61/-16.63	-10.79/-7.68	-6.25/-5.49	-5.06/-6.49	-5.32/-5.14	-5.32/-5.14	-5.32/-5.14	-5.32/-5.14	-5.32/-5.14	-5.32/-5.14	-5.32/-5.14	-5.32/-5.14	-5.32/-5.14	-5.32/-5.14	-5.32/-5.14	-5.32/-5.14	-5.32/-5.14	-5.32/-5.14	-5.32/-5.14	-5.32/-5.14	-5.32/-5.14
Theta (150°)	-12.84/-17.66	-18.54/-15.08	-10.61/-9.42	-10.81/-12.28	-13.22/-12.33	-10.33/-7.59	-4.29/-1.98	-1.22/-1.95	-2.69/-2.51	-3.26/-5.68	-6.16/-6.22	-8.28/-13.42	-18.98/-18.99	-18.25/-16.75	-10.92/-7.4	-5.23/-3.95	-3.92/-6.49	-9.32/-9.93	-13.21/-17.71	-14.03/-12.89	-13.11/-13.1	-15.11/-17.47	-13.64/-12.19	-12.99/-16.45
Theta (157.5°)	-17.51/-17.62	-17.12/-18.06	-15.88/-14.6	-12.79/-10.19	-7.95/-5.9	-5.06/-4.46	-4.4/-8.62	-5.24/-7.49	-4.69/-6.1	-6.94/-6.1	-6.48/-9.5	-12.15/-14.49	-16.18/-14.84	-11.59/-9.79	-6.82/-5.58	-4.99/-4.99	-6.24/-5.98	-13.72/-17.48	-17.71/-17.71	-18.14/-17.78	-15.26/-16.03	-15.82/-14.21	-13.13/-12.66	-16.29/-17.61
Theta (165°)	-13.54/-13.33	-13.32/-12.74	-12.95/-14.15	-11.54/-7.96	-5.61/-3.66	-2.09/-0.64	0.030/2.6	0.130/6.6	-0.72/-1.25	-2.38/-4.46	-7.09/-9.53	-11.21/-12.48	-13.17/-14.84	-11.62/-10.23	-9.35/-9.69	-12.51/-17.85	-17.99/-15.31	-11.68/-8.85	-7.07/-6.73	-8.15/-9.71	-9.84/-10.24	-12.84/-19.28	-18.03/-17.24	-15.05/-13.67
Theta (172.5°)	-11.38/-11.81	-12.99/-8.6	-8.07/-7	-5.61/-3.55	-2.05/-0.95	0.220/0.49	0.890/0.85	0.040/0.94	-1.74/-2.62	-4.32/-7.03	-10.56/-14.32	-16.16/-16.16	-16.12/-15.52	-13.59/-11.7	-10.97/-9.52	-9.88/-10.66	-10.91/-10.17	-9.52/-9.64	-9.79/-9.26	-8.71/8.84	-10.07/-13.22	-14.87/-11.58	-10.07/-10.83	-12.47/-12.21
Theta (180°)	-13.78/-11.91	-10.34/8.5	-7.23/-6.2	-5.24/-4.17	-3.12/-2.54																			



Radiated Composite Gain Data_2.4GHz and 5GHz

Appendix A

Gain	Φ(0°)Φ(7.5°)	Φ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)	
Θ(0°)	-10.67/13.85	-18.37/18.24	-18.13/17.84	-12.74/10.34	-8.17/6.68	-5.66/4.85	-3.97/3.7	-3.76/3.03	-2.75/3.68	-4.92/5.34	-5.97/6.74	-7.46/8.47	-10.23/13.02	-15.99/17.44	-16.33/15.5	-16.24/11.9	-7.34/5.59	-6.11/6.81	-5.08/3.35	-3.3/4.72	-5.18/4.03	-3.76/5.02	-7.34/8.21	-8.35/8.49	
Θ(7.5°)	-12.45/16	-17.54/18.7	-17.88/14.02	-10.75/9.67	-9.39/8.47	-6.72/5.32	-4.52/4.53	-4.87/4.28	-3.52/4.38	-6.01/6.15	-5.83/6.84	-8.83/11.41	-14.09/18.21	-17.91/18.71	-13.11/9.46	-8.02/6.98	-5.3/3.73	-3.24/3.94	-4.13/2.91	-2.25/2.48	-3.13/3.79	-3.99/4.57	-6.4/8.53	-9.91/10.61	
Θ(15°)	-10.91/15.05	-17.73/18.4	-18.25/18.83	-14.14/12.3	-9.9/7.77	-5.94/5.13	-4.83/4.38	-2.93/2.55	-3.59/4.36	-4.76/6.73	-8.96/9.39	-9.47/11.05	-15.52/17.88	-18.52/14.02	-10.36/8.79	-8.04/8.99	-8.46/8.45	-8.04/7.32	-6.91/6.71	-5.98/4.46	-3.42/4.02	-5.05/4.7	-4.28/5.51	-7.84/9.49	
Θ(22.5°)	-12.77/17.1	-18.05/18.76	-18.91/18.65	-19.27/18.41	-17.66/13.27	-11.09/11.13	-10.62/10.66	-8.37/7.07	-7.81/7.37	-6.81/7.49	-9.09/10.45	-11.82/14.28	-18.61/17.76	-15.61/14.36	-13.87/13.22	-12.92/13.93	-11.69/8.11	-9.98/5.04	-4.94/5.87	-7.1/7.1	-6.34/6.62	-7.63/7.18	-6.27/7.89	-10.43/11.93	
Θ(30°)	-13.86/15.73	-18.11/18.01	-18.19/18.37	-17.75/17.86	-14.22/11.12	-9.85/8.08	-7.67/8.66	-9.43/10.06	-9.64/8.38	-8.46/10.23	-11.55/11.59	-7.67/12.44	-11.55/11.59	-13.97/18.72	-17.86/12.42	-10.06/8.27	-7.89/7.26	-6.67/6.97	-6.84/7.28	-9.3/12.89	-16.53/14.83	-12.52/14.61	-17.92/17.39	-17.62/13.86	-12.41/13.25
Θ(37.5°)	-18.01/19.3	-15.12/14.98	-14.44/19.25	-17.57/17.86	-15.61/11.14	-8.43/6.1	-6.12/6.28	-6.92/8.14	-9.28/8.91	-9.22/10.48	-17.86/16.22	-14.3/15.89	-17.73/14.12	-13.41/11.71	-11.39/11.03	-9.91/10.33	-9.89/12.86	-18.44/10.93	-9.3/10.44	-12.42/12.2	-10.95/11.72	-11.61/12.43	-16.28/18.52	-17.92/18.2	
Θ(45°)	-17.43/16.46	-12.06/9.43	-7.8/9.43	-10.95/14.74	-16.28/9.79	-6.04/4.98	-4.54/4.61	-5.88/6.02	-5.31/5.66	-8.32/8.79	-10.71/17.71	-18.63/18.1	-18.11/11.41	-9.27/6.99	-6.12/8.55	-13.8/17.92	-18.44/17.88	-17.19/11.22	-9/9.91	-9.78/6.83	-6.04/7.68	-6.88/10.66	-15.8/19.17	-16.29/13.52	
Θ(52.5°)	-13.95/18.68	-18.54/14.48	-8.81/7.47	-9.42/14.05	-18.68/12.97	-8.04/5.84	-5.31/5.53	-5.98/6.43	-8.05/9.21	-7.89/8.9	-13.9/18.37	-17.85/18.82	-14.29/7.44	-5.97/6.02	-7.41/11.21	-18.49/18.21	-14.4/10.47	-9.76/7.66	-7.7/9.1	-6.69/3.57	-4.41/4.68	-5.08/9.47	-12.07/12.88	-18.5/15.7	
Θ(60°)	-14.49/12.26	-13.57/18.45	-7.93/6.27	-9.81/18.49	-15.32/9.58	-6.07/3.07	-1.99/2.15	-2.7/3.14	-4.49/5.58	-7.79/12.58	-12.54/13.03	-18.23/17.92	-14.28/6.64	-5.79/5.42	-6.99/12.68	-18.68/12.47	-9.05/7.39	-7.04/4.32	-2.68/4	-3.59/2.78	-4.03/5.05	-7.57/6.36	-8.95/10.69	-14.31/16.65	
Θ(67.5°)	-12.71/8.73	-10.63/17.07	-5.35/4.22	-8.77/12.79	-9.33/5.93	-3.45/0.6	0.99/1.1	-0.02/1.68	-3.19/5.21	-10.86/18.16	-12.44/18.11	-16.63/18.96	-6.81/3.6	-4.76/7.93	-10.83/18.38	-18.17/8.33	-7.24/7.66	-5.19/2.89	-1.72/0.35	-0.44/1.79	-4.85/6.93	-6.73/7.06	-8.87/9.34	-13.41/15.48	
Θ(75°)	-10.57/7	-9.3/19.29	-8.84/7.77	-12.29/7.96	-3.5/2.93	-2.43/1.29	0.01/0.17	-1.29/2.5	-4.45/7.52	-11.71/14.34	-8.7/8.27	-13.81/14.18	-18.23/6.98	-5.56/11	-12.35/13.26	-15.74/11.92	-8.64/9.32	-9.46/5.67	-3.26/0.86	-0.97/1.84	-3.8/8.79	-7.9/6.51	-8.73/15.78	-13.06/18.73	
Θ(82.5°)	-12.49/8.43	-9.76/14.59	-9.83/10.29	-12.28/3.89	-2.34/3.97	-4.75/5.3	-3.68/4.25	-5.5/5.85	-5.73/8.49	-17.55/9.47	-7.56/11.22	-17.18/18.52	-13.33/7.74	-9.8/17.68	-17.21/16.78	-13.05/10.16	-10.4/10.45	-9.43/5.35	-3.33/6.16	-5.76/5.71	-5.85/12.36	-16.29/10.63	-17.44/14.76	-12.02/18.26	
Θ(90°)	-10.3/12.36	-9.62/14.33	-17.86/11.04	-5.94/4.27	-4.9/4.08	-4.79/7.02	-9.05/9.75	-7.57/4.57	-3.82/5.29	-4.66/3.74	-3.59/5.69	-12.87/13.35	-18.63/13.59	-11.3/18.55	-18/17.85	-16.1/13.37	-18.81/18.3	-11.98/12.55	-10.38/19.07	-12.07/9.27	-6.26/8.07	-18.55/11.73	-15.88/13.16	-10.05/16.94	
Θ(97.5°)	-18.16/17.83	-8.73/8.23	-12.67/18.11	-9.5/8.24	-7.56/8.64	-6.88/5.73	-4.63/2.8	-2.63/2.44	-1.46/2.08	-4.26/3.34	-4.29/10.12	-18.73/14.91	-18.61/18.19	-16.22/18.01	-16.31/14.52	-16.03/14.01	-10.79/13.46	-18.69/8.89	-5.56/6.03	-5.99/8.76	-13.09/14.05	-16.27/13.62	-15.31/18.24	-11.94/13.31	
Θ(105°)	-18.09/14.14	-6.61/5.19	-7.13/10.43	-12.35/6.96	-5.11/5.18	-5.92/3.93	-2.69/2.3	-0.84/0.79	-1.93/2.09	-2.41/3.38	-3.77/6.78	-18.58/14.03	-18.03/18.98	-18.31/18.31	-18.19/19.42	-17.62/13.52	-8.37/9.08	-13.93/6.79	-5.27/2.16	-5.15/8.37	-18.82/18.2	-14.18/18.16	-15.09/13.05	-11.13/12.44	
Θ(112.5°)	-18.06/18.94	-10.22/6.73	-4.5/4.24	-5.62/6.07	-7.71/5.53	-5.53/8.05	-7.72/5.31	-2.91/1.86	-1.04/2.8	-4.92/5.68	-5.94/11.08	-9.53/16.06	-14.12/11.37	-14.91/11.22	-11.98/13.46	-16.92/14.23	-6.4/5.77	-17.85/8.83	-4.5/6.42	-9.85/13.37	-11.96/10.59	-7.04/11.88	-14.39/12.28	-13.87/11.69	
Θ(120°)	-5.97/4.84	-18.31/17.51	-9.74/5.46	-4.74/5.88	-7.85/7.36	-5.57/4.88	-5.99/5.81	-3.48/1.62	-2.11/6.02	-6.27/3.45	-6.92/14.25	-5.07/7.23	-19.14/12.04	-9.89/11.21	-10.83/10.06	-6.7/18.08	-12.43/7.9	-2.82/9.74	-17.94/18.64	-4.44/2.68	-4.97/5.11	-8.72/7.07	-13.56/11.37		
Θ(127.5°)	-13.48/13.09	-9.74/12.63	-12.67/9.54	-8.6/9.21	-6.34/6.33	-7.53/8.26	-7.95/9.09	-11.72/13.34	-8.25/5.11	-4.12/7.75	-17.98/9.23	-6.86/9.05	-12.43/11.24	-9.53/11.64	-13.6/6.9	-10.06/9.28	-7.79/7.96	-0.14/9.03	-19.27/10.22	-6.41/1.22	-3.82/6.13	-6.91/3.9	-7.06/7.65	-7.24/7.34	
Θ(135°)	-9.88/11.57	-6.17/7.98	-15.19/9.12	-4.83/3.51	-4.99/5.86	-4.74/3.36	-2.28/1.5	-0.88/1.31	-3.04/3.81	-7.7/11.22	-11.81/10.15	-10.66/10.48	-7.86/7.37	-10.72/17.36	-8.77/14.79	-17.44/18.69	-11.3/7.85	-2.53/10.91	-17.61/12.83	-9.55/2.87	-6.29/16.56	-17.97/9.55	-5.45/7.8	-7.66/5.52	
Θ(142.5°)	-5.97/4.84	-9.27/6.36	-12.93/10.6	-6.32/4.24	-4.02/5.12	-6.33/7.16	-7.61/7.42	-6.33/7.28	-6.02/6.5	-7.89/5.54	-5.33/12.89	-16.63/17.71	-16.69/12.17	-12.01/12.48	-12.27/16.22	-13.83/18.32	-15.56/14.71	-17.55/18.43	-17.98/18.65	-9.9/17.71	-17.91/11.54	-11.27/5.52	-5.96/6.56	-9.13/5.74	
Θ(150°)	-6.36/5.11	-4.85/4.34	-5.87/8.96	-11.72/13.58	-10.32/8.45	-7.92/8.56	-9.14/9.23	-10.18/11.52	-11.06/8.69	-6.79/5.61	-6.37/6.51	-8.35/11.43	-14.19/19.31	-16.49/15.57	-14.84/10.72	-9.87/9.53	-5.72/5.78	-11.4/18.3	-18.59/12.39	-10.24/17.74	-12.15/6.78	-7.43/8.15	-6.27/8.48	-9.61/5.28	
Θ(157.5°)	-10.63/9.17	-8.22/8.13	-8.13/11.11	-14.25/16.9	-15.81/11.94	-7.76/4.93	-3.52/3.54	-5.29/7.16	-9.11/10.64	-12.2/14.24	-14.05/14.02	-11.96/10.85	-10.25/9.22	-7.91/7.65	-10.97/6.7	-5.04/5.73	-8.56/11.44	-13.58/14.65	-13.24/11.22	-10.27/8.78	-7.84/8.88	-10.42/12.88	-10.31/16.16		
Θ(165°)	-17.88/18.56	-17.56/14.06	-11.8/10.16	-9.77/9.83	-9.31/8.48	-7.21/5.66	-4.21/2.68	-1.32/0.73	-1.37/2.34	-3.24/4.15	-5.56/7.7	-10.01/11.35	-11.8/18.6	-13.44/13.5	-12.41/11.14	-10.97/12.06	-15.05/18.25	-9.29/8.62	-8.88/9.28	-8.94/9.88	-13.79/18.11	-17.49/14.13	-12.51/14.74		
Θ(172.5°)	-15.55/12.05	-9.37/7.56	-6.33/5.33	-4.37/3.23	-2.09/1.39	-1.1/1.1	-1.26/1.21	-1.05/1.51	-2.65/3.38	-3.79/4.77	-10.86/10.81	-14.57/16.12	-15.77/15.97	-14.85/12.38	-8.61/7.85	-6.78/6.44	-6.99/8.22	-9.78/10.07	-10.3/10.47	-10.34/10.08	-10.13/10.33	-10.18/9.93	-11.08/13.79	-18.35/17.77	
Θ(180°)	-9.48/7.98	-6.44/5.36	-4.73/4.14	-3.68/3.67	-3.57/3.14	-2.72/2.37	-2.38/2.59	-3.58/4.19	-3.76/3.71	-4.92/7.15	-10/12.1	-14.37/15.46	-14.6/13.92	-12.62/10.48	-8.64/7.52	-7.1/6.75	-6.14/4.92	-3.81/3.42	-3.3/3.26	-3.34/4.02	-5.49/7.17	-8.51/9.8	-12.66/16.43	-14.81/11.84	
Freq(Hz)	5.785GPol	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°)	-4.52/3.82	-3.29/3.53	-3.51/3.75	-4.29/4.31	-4.54/5.4	-7.07/9.79	-12.21/14.69	-18.29/18.35	-18.04/15.63	-11.37/9.13	-7.16/5.93	-5.05/4.4	-3.82/3.28	-2.79/2.36	-2.31/2.77	-3.81/4.92	-5.91/7.48	-9.4/10.94	-11.95/14.88	-18.81/18.04	-19.3/14.97	-11.94/9.25	-7.57/7.31	-6.39/5.55	
Θ(7.5°)	-4.71/4.1	-4.09/4.08	-3.51/3.88	-4.53/4.92	-5.15/5.63	-6.83/9.17	-11.14/13.27	-15.74/18.04	-15.2/14.11	-11.65/8.72	-7.31/6.72	-6.08/5.22	-4.16/3.43	-2.72/2.56	-2.87/3.39	-4.16/4.91	-5.73/7.42	-9.56/11.28	-13.15/16.21	-19.1/18.02	-15.99/13.12	-10.7/7.94	-5.29/6.22	-5.98/5.64	
Θ(15°)	-4.24/4.85	-5.4/5.17	-4.39/4.82	-5.37/6.15	-5.92/5.84	-5.99/6.18	-7.01/8.91	-9.2/8.88	-9.39/8.21	-6/5.68	-6.54/7.11	-6.62/5.4	-4.5/4.12	-3.55/3.46	-4.24/5.98	-8.04/9.5	-10.24/10.12	-9.72/10.23	-11.66/14.13	-16.83/17.8	-18.77/17.23	-14/10.38	-7.06/5	-3.91/3.76	
Θ(22.5°)	-3.36/3.89	-5.55/6.23																							

Freq(Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 Max Gain (dBi)	4.57	4.78	4.74	3.82
Ant. 2 Max Gain (dBi)	3.59	4.42	3.92	3.08
Ant. 3 Max Gain (dBi)	4.65	3.94	4.11	4.32
Ant. 4 Max Gain (dBi)	4.66	3.16	3.19	3.36
Ant. 1 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/127.5/330	Phi/120/337.5	Theta/97.5/307.5	Theta/82.5/45
Ant. 2 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/127.5/337.5	Theta/112.5/300	Theta/127.5/337.5	Theta/105/337.5
Ant. 3 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/135/187.5	Theta/135/187.5	Theta/135/157.5	Theta/135/157.5
Ant. 4 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/60/255	Phi/127.5/337.5	Theta/105/255	Theta/97.5/90
Max Gain (dBi)	4.66	4.78	4.74	4.32
DG [1SS] (dBi)	6.77	6.44	6.79	5.87
DG [2SS] (dBi)	4.66	4.78	4.74	4.32
DG [4SS] (dBi)	4.66	4.78	4.74	4.32



Radiated Composite Gain Data_6GHz

Appendix B

Theta	6.81±5.77	-4.77±2.61	-2.6±3.04	-2.73±2.71	-2.09±2.28	-2.61±2.66	-3.31±3.7	-4.69±4.56	-3.82±2.6	-1.58±1.22	-1.29±1.29	-2.1±3.47	-3.91±3.31	-3.08±3.03	-4.43±5.92	-6.73±5.95	-3.86±2.26	-1.79±1.68	-1.87±2.47	-3.63±4.39	-4.79±5.47	-5.5±6.1	-7.2±7.69	-7.28±6.05																							
Theta(30°)	-7.97±8.2	-6.9±5.81	-4.02±2.63	-1.49±1.14	-0.93±1.74	-1.71±1.49	-1.37±1.81	-2.86±4.51	-5.05±3.9	-2.83±2.41	-1.7±0.96	-0.62±0.88	-1.54±2.92	-3.06±2.64	-2.75±4.18	-4.39±3.38	-1.89±1.32	-1.52±1.51	-1.06±1.35	-1.59±1.88	-2.7±3.98	-5.1±5.7	-5.99±6.69	-7.26±7.9																							
Theta(37.5°)	-5.26±7.21	-4.99±4.82	-3.22±0.46	-0.02±0.39	-0.81±1.33	-1.36±2.23	-3.63±5.73	-7.31±8.42	-8.78±8.48	-7.13±4.62	-1.17±0.27	-2.69±1.62	-1.53±1.42	-0.83±0.1	-0.39±1.28	-1.83±2.91	-4.07±4.63	-5.14±4.02	-4.55±8.4	-8.24±5	-3±2.33	-1.57±2.81																									
Theta(45°)	-3.14±9.8	-3.79±2.43	0.82±2.44	2.09±1.48	0.45±0.35	-0.27±0.2	-0.44±1.19	-3.45±9.7	-6.11±4.99	-5.56±6.61	-4.7±2.74	-1.71±2.12	-1.46±1.01	-1.41±1.53	-0.520±85	0.37±0.16	0.29±0.09	-1.48±3	-2.65±2.82	-4.09±4.68	-5.25±5.1	-8.06±7.6	-4.46±3.93	-3.35±2.05																							
Theta(52.5°)	-2.51±4.7	-3.67±0.17	2.66±2.5	2.38±1.8	-0.46±0.32	0.26±0.17	-0.63±1.07	-0.88±1.53	-2.46±2.4	-4.14±5.44	-4.7±3	-2.78±1.66	0.16±0.39	-0.37±1.75	-0.84±0.17	0.61±1.32	1.98±1.01	-1.04±2.07	-3.05±1.68	-1.8±2.02	-4.3±5.45	-6.28±7.88	-4.72±3.92	-2.97±2.79																							
Theta(60°)	-2.39±0.37	-0.68±2.98	3.51±2.33	1.53±0.48	-0.71±0.25	-0.89±1.35	-2.53±3.75	-3.56±3.02	-2.18±0.97	-0.57±1.07	-3.78±2.78	-1.79±2.24	-0.98±0.4	-1.53±1.87	-2.33±0.04	0.75±0.01	0.52±0.65	-0.66±1.5	-3.17±3.37	-3.04±3.36	-4.13±5.41	-6.41±7.96	-7.35±4.17	-3.8±2.34																							
Theta(67.5°)	-1.16±1.15	0.27±3.55	2.46±1.78	0.95±0.5	-0.57±0.05	-0.6±2.92	-4.67±6.68	-6.5±5.84	-4.51±2.04	-1.84±0.47	-1.63±3.04	-0.15±1	-0.02±1.62	-1.66±0.56	-0.69±1.93	-0.48±0.03	-1.22±1.3	-1.98±3.01	-2.81±3.65	-3.22±3.61	-5.35±5.44	-5.87±7.47	-2.55±4.69	-2.84±1.75																							
Theta(75°)	-1.02±1.18	2.53±4.4	1.35±0.43	1.03±0.35	-2.63±2.89	-1.95±3.14	-5.52±5.94	-4.7±3.81	-1.72±1.14	-1.65±1.05	-0.25±0.8	-2.45±0.62	-1.19±1.37	-4.08±0.27	0.2±1.32	-1.63±1.81	-2.68±1.66	-2.29±4	-4.68±4.62	-3.86±6.26	-8.2±6.16	-5.68±5.36	-3.66±4.69	-2.85±3.33																							
Theta(82.5°)	-1.31±0.05	3.01±2.07	0.44±1.37	0.44±2.95	-4.69±4.34	-3.81±3.42	-5.2±5.97	-3.58±2.64	-3.06±2.38	-3.9±2.16	-2.24±1.36	-1.03±2.21	-0.89±1.76	-2.04±0.72	1.96±0.22	-2.29±1.16	0.13±1.31	-2.39±4.31	-5.25±5.38	-6.16±5.05	-7.82±8.02	-4.86±2.77	-1.69±2.14	-1.62±1.55																							
Theta(90°)	-3.87±2.73	0.42±0.54	-0.04±0.8	-0.86±1.2	-3.48±3.77	-2.91±2.63	-3.24±1.54	-1.36±2.66	-2.55±4.39	-3.88±1.96	-1.23±3.94	-2.09±3.16	-3.49±1.34	0.09±3	0.48±0.16	-1.28±1.26	0.92±2.3	-5.8±4.57	-4.85±5.47	-5.84±4.91	-9.81±5.62	-2.03±1.52	-2.18±4.33	-2.33±1.78																							
Theta(97.5°)	-2.36±2.44	-0.36±0.68	-0.75±0.56	-1.58±0.69	-1.6±6.41	-4.44±4.19	-3.18±1.96	-2.25±1.6	-5.26±5.19	-7.84±1.96	-0.49±1.57	-4.44±5.44	-6.51±2.87	0.9±1.2	0.78±0.94	-1.81±7.2	-3.85±3.2	-5.51±5.68	-6.06±4.79	-7.66±3.12	-2.24±1.26	-1.51±7.47	-1.76±0.41																								
Theta(105°)	-2.08±1.66	-0.60±3.8	-0.34±1.34	-2.23±1.38	-0.67±4.97	-8.44±3.25	-2.72±4.57	-5.46±3.5	-4.53±3.26	-8.74±6.2	-0.05±0.39	-1.48±3.32	-2.07±1.85	-1.22±0.87	-1.75±2.65	-1.93±7.9	0.92±1.72	0.69±3.5	-3.95±5.85	-6.36±5.16	-4.63±1.9	-1.45±1.44	-1.37±2.49	2.47±0.47																							
Theta(112.5°)	-2.25±1.34	-1.15±0.6	-1.57±0.49	-4.12±2.42	-0.45±1.11	-8.22±4.21	-4.71±3.39	-1.54±0.67	-0.87±1.7	-4.82±6.57	-1.92±0.84	-2.1±5.28	-2.52±0.28	-0.34±0.32	-3.08±2.98	0.44±1.24	-4.63±2.95	-0.68±2.65	-2.14±2.07	-2.5±5.55	-2.32±1.65	-3.29±2.82	-3.13±0.67	1.68±1.01																							
Theta(120°)	-1.48±1.7	-3.99±2.07	-3.08±3.4	-3.97±3.11	-2.6±3.71	-3.71±2.32	-1.38±3.67	-1.32±0.47	-0.82±1.07	-3.73±6.74	-3.33±3.03	-1.19±4.43	-3.67±1.7	0.67±1.61	-2.81±2.85	-3.59±3.08	-4.83±5.01	-5.49±1.68	-1.06±1.42	-2.25±2.95	-4.44±2.29	-1.45±2.57	-0.21±2.8	0.9±2.85																							
Theta(127.5°)	-0.49±2.99	-2.84±4.46	-3.85±3.37	-1.2±1.62	-3.23±4.54	-2.65±1.96	-2.07±4.06	-2.76±1.31	-0.55±1.72	-2.27±5.5	-4.3±4.01	-2.67±1.4	-6.91±7.32	-4.04±0.08	-4.67±1.76	-2.71±1.97	-1.61±1.19	-6.57±2.92	-2.19±3.26	-5.67±3.18	-2.76±1.11	-2.62±2.11	-0.23±5	3.31±0.49																							
Theta(135°)	0.18±1.02	-2.09±3.81	-2.81±1.49	-3.84±1.84	-2.5±5.01	-5.79±4	-4.81±6.7	-9.54±3.43	-3.46±5.61	-5.47±6.24	-6.28±5.84	-4.14±3.18	-2.91±1.92	1.04±0.76	-1.09±6.97	-3.32±1.65	1.82±2.08	-0.95±2.58	0.45±0.58	-4.81±5.4	-2.8±2.82	-2.06±0.17	-0.98±2.28	1.81±1.65																							
Theta(142.5°)	-3.33±2.11	-2.96±3.23	-2.98±3.13	-3.08±3.07	-3.01±6.09	-8.04±5.93	-4.6±3.42	-3.55±2.66	-3.19±2.98	-3.54±3.37	-5.04±6.26	-6.51±3.34	-0.97±1.75	-1.74±3.26	-8.53±3.25	-2.46±1.67	-0.5±1.02	-6.67±6.17	-2.86±1.08	-0.79±7.88	-6.4±2.92	-3.9±4.08	-2.11±2.88	-2.92±2.46																							
Theta(150°)	-5.18±8.53	-9.33±7.44	-5.84±5.34	-5.46±5.7	-5.4±5.7	-6.34±6.68	-6.47±6.8	-5.94±5.06	-4.9±2.26	-3.22±1.13	-5.01±6.2	-6.21±7.77	-1.66±1.48	-1.08±2.35	-6.25±6.5	-6±6.68	-4.8±3.79	-3.58±3.08	-6.01±6.62	-6.05±4.65	-2.71±8.8	-3.39±4.06																									
Theta(157.5°)	-1.97±2.33	-2.99±3.67	-3.7±5.32	-6.23±6.41	-5.79±6.23	-7.06±7.31	-4.67±3.23	-3.27±3.31	-2.29±1.71	-2.19±3.47	-3.64±4.06	-5.68±8.09	-7.7±4.78	-3.06±2.14	-1.53±3.26	-4.46±6.08	-7.34±6.46	-3.86±3.03	-4.94±8.95	-8.67±8.5	-8.4±9.26	-6.71±4.49	-3.97±2.46	-2.4±1.98																							
Theta(165°)	-2.52±2.42	-5.84±7.59	-5.84±5.03	-4.95±0.67	-7.99±8.91	-9.26±9.26	-8.16±8.06	-7.24±7.72	-6.67±5.62	-3.29±1.72	-1.14±1.48	-1.73±0.98	0.15±0.34	-0.64±1.97	-2.59±1.45	-0.64±0.72	-0.48±0.1	-0.35±1.68	-3.52±4.81	-6.3±7.32	-7.94±7.75	-7.76±7.81	-6.39±4.34	-2.53±1.87																							
Theta(172.5°)	-9.74±9.58	-8.46±9.38	-9.41±8.45	-8.37±8.67	-8.37±8.66	-8.69±8.97	-8.16±7.4	-6.78±6.91	-6.49±5.88	-5.74±4.28	-2.81±1.82	-1.17±0.87	-0.36±0.06	0.23±0.3	0.04±0.19	-0.52±1.61	-3.15±4.9	-5.74±0.2	-3.51±3.68	-4.9±5.69	-6.55±8.83	-9.6±11.77																									
Theta(180°)	-8.66±6.63	-7.43±8.13	-8.03±6.64	-5.76±5.7	-6.45±6.94	-7.07±6.8	-8.62±7.4	-8.14±8.25	-8.1±7.86	-7.42±6.35	-4.94±4	-3.67±3.05	-2.41±1.94	-1.78±1.79	-2.13±2.76	-3.14±3.05	-2.86±3.44	-4.19±4.87	-4.82±5.78	-6.8±7.69	-9.05±9.15	-8.27±5.6	-6.72±7.3	-7.49±10.01																							
Freq(Hz)	6.985±0.01	Theta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																							
DG(dB)	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°)	-2.3±2.68	-2.73±2.97	-3.17±3.24	-3.49±3.87	-4.2±4.23	-4.48±4.06	-3.37±2.89	-2.51±1.84	-1.53±1.16	-0.61±0.55	-1.18±1.55	-1.74±2.48	-3.39±3.55	-3.74±4.26	-4.73±5.34	-4.97±4.85	-5.05±5.43	-5.19±4.41	-3.55±2.94	-2.77±2.63	-2.62±2.09	-1.74±1.49	-1.74±1.81	-1.66±2.08																							
Theta(7.5°)	-4.32±5.01	-4.59±3.85	-4.46±3.46	-4.38±3.03	-3.43±3.02	-3.12±3.06	-2.93±2.93	-3.09±3.66	-3.09±2.51	-1.76±1.59	-1.47±1.74	-2.03±1.82	-1.46±1.28	-1.17±1.35	-1.42±1.98	-2.84±3.52	-4.21±4.63	-4.91±4.16	-3.45±3.03	-2.36±1.9	-1.73±1.4	-1.53±1.6	-2.4±2.59																								
Theta(15°)	-5.48±4.43	-3.23±2.44	-2.07±1.85	-2.45±2.54	-2.54±2.6	-2.69±2.44	-2.16±1.72	-1.84±2.08	-3.15±3.99	-3.98±3.53	-2.54±2.67	-2.71±2.01	-0.89±0.26	0.17±0.45	0.51±0.33	0.17±1.41	-2.47±3.29	-3.97±4.36	-3.78±3.23	-3.44±3.68	-2.49±1.36	-1.08±0.81	-1.71±2.64	-3.69±5.5																							
Theta(22.5°)	-5.54±0.42	-1.4±0.46	-0.95±2.56	-4.29±3.78	-2.54±2.63	-2.58±2.73	-2.16±2.16	-1.93±1.48	-1.82±2.19	-1.94±1.5	-1.25±0.35	-0.41±0.34	0.56±1.78	2.19±1.47	0.34±1.32	-3.21±4.74	-5.09±4.11	-3.44±3.03	-3.45±4.25	-4.44±2.23	-3.72±2.93	-3.21±3.02	-4.07±4.53																								
Theta(30°)	-3.55±1.66	-0.57±0.67	-1.82±2.65	-2.97±3.07	-3.41±2.8	-2.1±1.54	-1.14±0.08	-0.86±0.92	-1.13±1.99	-2.18±1.69	-0.69±0.61	-0.23±0.73	0.69±0.26	0.51±7.4	1.98±1.28	-0.41±2.08	-2.89±2.37	-1.99±2.53	-3.03±2.89	-2.69±2.13	-1.6±1.6	-1.15±0.96	-0.3±0.17	-0.56±2.55																							
Theta(37.5°)	0.09±1.87	1.19±1.02	-0.27±1.11	-3.01±2.77	-1.4±0.44	-0.49±0.38	-0.47±0.91	1.66±1.91	-2.03±1.63	-1.55±1.29	0.08±1.53	1.64±1.42	1.05±0.1	0.91±1.91	2.21±36	0.41±1.07	-1.91±2.07	-1.86±1.6	-1.69±2.45	-1.93±1.06	0.93±1.38	1.24±1.05	-0.05±0.94	-0.49±0.49																							
Theta(45°)	2.59±3.36	3.07±2.5	2.72±1.28	2.80±1	-0.47±0.6	0.06±1.75	2.88±2.63	0.65±0.68	0.27±0.48	2.08±2.48	1.66±1.97	2.66±2.99	2.03±0.18	1.13±1.09	0.72±1.16	-0.41±1.56	-1.15±0.98	-0.31±0.41	0.54±0.4	0.04±0.41	0.21±0.27	0.63±0.83	1.37±1.06	0.42±0.49																							
Theta(52.5°)	3.78±2.31	2.63±2.86	2.22±55	2.91±2	0.36±1.23	1.88±1.48	1.78±2.33	1.28±1.2	-0.93±0.16	1.58±2.81	3.17±5.54	2.81±2.74	2.4±2.42	0.47±2.13	2.25±2.81	1.39±0.51	-0.02±0.64	0.95±1.97	1.67±1.02	0.19±0.6	-0.64±0.42	2.29±1.62	0.58±2.08	1.94±2.33																							
Theta(60°)	4.49±5.4	3.93±4.1	2.1±94	2.68±2.28	2.28±2.36	3.47±2.51	1.11±2.01	3.06±1.21	0.44±2.08	2.14±63	2.84±2.52	4.02±2.83	1.87±0.61	0.99±0.5	2.63±64	3.03±35	1.69±1.02	-1.71±0.15	1.45±2.03	1.91±1.09	-0.3±0.12	1.64±2.73	1.42±2																								



Radiated Composite Gain Data_6GHz

Appendix B

Gain Result

Freq(Hz)	6.175GPol.	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(7.5)	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)	Phi(360)	Phi(375)	Phi(390)	Phi(405)	Phi(420)	Phi(435)	Phi(450)	Phi(465)	Phi(480)	Phi(495)	Phi(510)	Phi(525)			
6.175GPol.	Phi(7.5)	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)	Phi(360)	Phi(375)	Phi(390)	Phi(405)	Phi(420)	Phi(435)	Phi(450)	Phi(465)	Phi(480)	Phi(495)	Phi(510)	Phi(525)			
Theta(0)	-13.271-14.05	-14.121-14.05	-14.461-13.09	-13.161-11.17	-9.581-7.86	-6.81-5.85	-4.961-4.69	-5.23-5.19	-5.14-5.37	-6.281-7.64	-9.441-10.05	-11.751-16.48	-18.481-17.77	-5.23-19.75	-12.861-15.41	-13.471-11.56	-9.451-7.76	-6.821-6.21	-6.521-7.07	-7.731-7.97	-8.851-8.58	-8.471-11.29	-13.451-13.18	-12.991-12.79															
Theta(7.5)	-17.51-17.72	-18.231-17.96	-17.681-14.28	-14.71-16.98	-18.631-18.11	-18.221-16.27	-12.271-10.58	-9.311-7.78	-6.931-6.21	-6.471-7.05	-7.121-7.46	-9.101-10.66	-10.431-10	-9.51-9.87	-10.271-10.41	-10.221-8.68	-6.251-4.5	-3.151-2.31	-2.241-2.45	-2.751-3.16	-3.931-4.47	-5.251-7.76	-10.781-13.39	-16.251-18.31															
Theta(15)	-18.151-16.97	-13.391-11.73	-8.681-8.32	-8.921-8.98	-8.481-8.93	-10.891-11.24	-11.161-9.94	-7.651-5.51	-3.551-2.16	-1.571-1.52	-2.121-2.73	-3.271-4.6	-5.691-6.69	-7.021-6.68	-6.311-6.61	-7.581-7.59	-7.231-6.15	-5.381-5.02	-5.121-5.81	-6.251-6.55	-6.271-6.68	-6.981-8.74	-9.511-11.08	-15.711-17.75															
Theta(22.5)	-18.841-11.51	-11.231-8.48	-5.441-3.49	-3.121-3.62	-5.321-8.17	-10.611-13.68	-13.481-13.19	-11.571-8.66	-6.161-4.17	-2.491-1.69	-1.51-1.88	-2.161-2.9	-3.741-4	-4.671-4.46	-3.811-3.05	-3.431-4.63	-6.041-7.05	-8.021-9.44	-12.161-18.18	-18.81-18.44	-12.391-9.86	-9.811-9.25	-10.961-10.58	-11.231-11.09															
Theta(30)	-8.31-9.37	-8.011-4.6	-0.901-5.1	-0.431-3.04	-6.641-11.45	-11.921-12.39	-16.21-17.66	-18.671-19.1	-15.991-12.75	-9.761-7.61	-5.671-3.66	-2.231-1.95	-2.331-2.25	-1.751-1.35	-1.081-1.14	-2.331-3.81	-3.771-3.28	-3.881-5.62	-8.011-9.84	-9.861-10.88	-13.931-11.04	-7.341-5.84	-6.611-8.86	-9.561-8.75															
Theta(37.5)	-17.991-13.16	-8.211-5.5	-2.661-3.48	-7.391-11.23	-8.761-8.37	-8.341-7.83	-12.791-17.76	-18.481-19.01	-12.161-10.7	-10.681-9.58	-8.251-5.08	-2.471-1.66	-1.251-0.77	0.4711-0.6	0.971-0.59	-2.051-3.1	-4.81-8.03	-10.711-11.67	-10.021-9.03	-8.81-8.34	-9.791-10.42	-10.21-9.87	-9.141-9.19	-9.171-17.52															
Theta(45)	-15.841-11.29	-8.141-3.55	-1.551-3.34	-6.241-5.73	-4.771-4.32	-16.891-14.65	-13.971-10.61	-11.591-8.51	-6.111-5.03	-6.761-9.78	-16.541-18.39	-18.611-18.74	-16.371-11.79	-6.971-6.68	-8.891-15.17	-12.151-10.77	-4.131-2.01	-6.521-4.75	-4.211-2.01	-14.961-14.23	-18.211-13.42	-7.921-7.17	-14.941-6.66	0.071-0.2	3.511-2.55	0.641-2.77													
Theta(52.5)	-18.841-10.28	-3.131-2.28	-3.211-5.88	-8.111-7.07	-6.31-6.42	-7.61-8.7	-10.981-11.4	-11.931-16.29	-17.391-19.32	-17.951-10.83	-6.181-9.5	-9.211-2.43	-0.71-0.41	-0.241-1.43	-1.281-3.09	-4.521-4.02	-7.821-12.31	-18.231-16.42	-9.371-5.8	-4.071-2.46	-3.271-7.01	-14.091-17.28	-14.331-14.78	-14.661-17.64															
Theta(60)	-13.771-5.67	-2.591-3.47	-7.541-10	-9.941-8.7	-6.571-6.71	-6.41-7.49	-8.341-9.58	-10.461-10.4	-13.551-17.96	-13.661-7.06	-3.451-4.43	-11.421-3.18	-1.331-1.1	-0.521-1.1	-2.281-4.76	-4.261-4.24	-6.111-8.93	-18.471-12	-9.171-6.42	-4.321-5.57	-6.161-6.09	-7.811-7.83	-10.211-10.16	-9.341-11.74															
Theta(67.5)	-9.161-2.96	-1.721-4.03	-7.461-9.62	-16.891-14.65	-13.971-10.61	-11.591-8.51	-6.111-5.03	-6.761-9.78	-16.541-18.39	-18.611-18.74	-16.371-11.79	-6.971-6.68	-8.891-15.17	-12.151-10.77	-4.131-2.01	-6.521-4.75	-4.211-2.01	-14.961-14.23	-18.211-13.42	-7.921-7.17	-14.941-6.66	0.071-0.2	3.511-2.55	0.641-2.77															
Theta(75)	-9.621-2.98	-1.791-3.97	-4.381-9.62	-18.411-15.38	-17.381-14.71	-10.331-8.33	-14.281-18.48	-19.171-16.78	-19.191-18.25	-11.611-5.73	-4.131-9.84	-6.771-6.79	-8.251-4.83	-1.441-0.43	-2.751-3.71	-4.871-6.08	-10.951-11.02	-15.551-18.7	-18.031-17.68	-13.61-3.46	0.531-0.62	-3.141-4.06	-1.271-2.12	-5.481-14.13															
Theta(82.5)	-8.371-2.02	-1.941-3.76	-4.971-6.1	-7.141-14.26	-11.461-2.5	-1.891-3.58	-14.591-16.63	-10.881-16.89	-18.511-18.06	-12.851-6.46	-3.91-3.27	-0.681-1.4	-7.91-7.38	-1.921-2.42	-4.791-5.82	-6.311-6.46	-12.711-16.24	-19.121-19.17	-15.141-17.75	-15.321-3.35	2.421-9.8	-1.611-7.22	-0.951-5.6	-3.151-8.86															
Theta(90)	-4.741-0.89	-0.931-3.06	-4.071-4.07	-7.171-18.34	-11.591-8.51	-6.111-5.03	-6.761-9.78	-16.541-18.39	-18.611-18.74	-16.371-11.79	-6.971-6.68	-8.891-15.17	-12.151-10.77	-4.131-2.01	-6.521-4.75	-4.211-2.01	-14.961-14.23	-18.211-13.42	-7.921-7.17	-14.941-6.66	0.071-0.2	3.511-2.55	0.641-2.77																
Theta(97.5)	-5.191-0.87	0.671-3.51	-6.461-5.83	-9.711-16.99	-15.821-13.06	-11.311-6.78	-10.391-18.82	-14.091-16.43	-18.031-16.06	-9.351-7.34	-6.111-5.55	-8.721-14.2	-19.211-9.2	-6.41-5.09	-10.881-9.31	-4.761-7.24	-13.581-11.36	-15.521-11.53	-10.791-9.99	-10.621-10.83	-0.451-1.2	0.441-1.54	0.371-2.21	-3.461-14.07															
Theta(105)	-4.431-1.21	-0.971-6.04	-4.371-5.98	-9.011-7.94	-16.211-9.1	-12.121-8.84	-11.721-13.55	-18.381-19.2	-14.831-17.8	-4.161-5.6	-9.911-7.56	-5.661-11.7	-17.721-10.15	-5.11-9.6	-16.471-17.1	-7.681-3.42	-9.711-8.76	-15.181-15.54	-5.351-3.36	-11.431-9.12	-2.731-0.17	0.091-0.95	0.581-5.2	-2.911-1.7															
Theta(112.5)	-3.721-2.29	-3.791-6.15	-3.31-5.04	-3.011-3.56	-6.991-18	-11.811-18.85	-18.431-12.17	-12.411-13.84	-7.421-5.25	-3.011-8.35	-13.791-11.87	-11.271-10.7	-18.511-14.24	-8.261-13.99	-15.731-18.12	-11.291-19.15	-10.821-10.13	-11.331-13.68	-18.131-9.97	-6.331-2.46	-1.491-0.36	1.241-1.72	-2.661-6.61																
Theta(120)	0.331-1.19	-3.521-3.5	-5.161-6.32	-2.71-2.49	-6.931-15.13	-11.271-12.49	-18.611-9.04	-5.141-4.66	-5.781-5.17	-6.211-14.62	-12.511-15.47	-17.371-19.08	-14.621-11	-8.961-15.54	-15.871-18.22	-11.251-14.26	-7.361-4.28	-5.711-9.98	-17.031-14.31	-4.491-1.25	-1.731-0.44	1.711-5.2	2.521-1.9	-1.391-2.07															
Theta(127.5)	1.291-0.76	-2.271-1.05	-1.961-1.62	-1.341-3.1	-9.651-12.9	-6.851-9.2	-16.511-15.89	-7.281-4.49	-7.581-6.73	-11.041-18.06	-14.921-19.71	-13.761-18.09	-17.771-18.49	-10.161-13.37	-8.151-7.6	-10.851-14.69	-3.271-10.08	-13.881-10.7	-15.891-11.5	-17.731-17.04	-18.171-8.52	-4.111-1.67	0.7621-5.7	1.0601-5.4															
Theta(135)	-1.281-0.98	-2.371-3.76	-8.321-11.93	-5.491-5.44	-11.291-15.97	-15.271-9.47	-10.481-16.71	-18.971-18.61	-13.551-14.78	-11.671-15.91	-13.211-18.8	-19.051-9.2	-8.961-9.63	-4.871-6.55	-16.211-9.54	-11.621-3.95	-2.641-7.51	-6.961-4.93	-9.221-10.76	-18.341-10.87	-12.911-8.17	-8.321-1.29	-0.841-1.25	-1.761-1.74															
Theta(142.5)	-1.471-0.24	-0.31-2.43	-3.091-5.84	-4.241-4.53	-7.311-13.61	-11.011-8.98	-8.61-8.08	-8.871-15.98	-16.111-17.68	-12.071-9.28	-7.431-7.45	-10.761-9.39	-9.321-18.74	-1.361-6.35	-17.821-13.07	-11.361-3.55	-17.821-13.07	-11.641-10.81	-10.581-8.25	-4.671-6.76	-6.051-5.27	-9.571-6.76	-6.051-5.27	-1.5801-0.3															
Theta(150)	-5.541-6.38	-7.681-8.99	-9.821-12.26	-16.511-9.21	-8.61-10.8	-18.151-16.16	-16.041-18.31	-17.791-18.81	-17.141-17.7	-8.21-9.6	-9.621-19.03	-14.881-11.87	-8.761-8.42	-4.051-3.66	-2.431-2.46	-3.381-8.22	-0.081-1.74	-10.651-10.48	-8.821-7.38	-12.481-11.94	-8.411-11.33	-1.4751-8.86	-6.721-6.31																
Theta(157.5)	-2.411-2.45	-2.021-1.07	0.521-1.28	-5.411-13.39	-18.251-18.35	-18.671-19.36	-16.431-13.79	-14.991-17.28	-13.951-10.07	-8.731-10.59	-16.451-13.66	-12.641-12.72	-10.131-3.77	-6.771-6.85	-11.911-11.15	-8.541-9.78	-17.771-11.82	-8.21-9.02	-9.661-8.23	-7.641-9.86	-10.641-10.79	-11.661-15.82	-13.411-8.5	-4.191-2.68															
Theta(165)	-12.791-9.23	-6.711-6.28	-8.111-11.66	-17.721-18.43	-11.031-10.43	-8.541-8.08	-7.731-8.6	-8.041-8.02	-7.891-8.44	-11.411-11.48	-10.741-11.14	-11.771-11.53	-10.541-8.69	-7.131-6.14	-5.691-5.54	-5.6																							



Radiated Composite Gain Data_6GHz

Appendix B

Theta	2-41.2-33	2-41.1-14	-0.7-2.09	-4.06-5.59	-3.53-2.92	-3.33-5.06	6.33-7.37	-10.72-14.84	-10.81-9.67	-10.67-7.86	-8.07-8.34	-4.01-3.28	-3.55-4.51	-3.57-7.1	-10.53-7.26	-5.08-4.94	-4.11-4.51	-6.74-9.37	-10.62-8.89	-9.96-11.15	-12.04-15.3	-17.64-13.84	-13.28-7.82	-4.12-4.45														
Theta(75°)	-0.83-0.94	-1.31-1.99	-1.66-2.81	-5.44-4.14	-3.9-3.64	-3.65-5.45	-7.08-4.67	-5.92-7.21	-10.57-11.15	-10.92-9.23	-7.03-5.93	-5.11-4.21	-4.25-2.02	-3.54-6.67	-8.23-7.77	-5.08-7.21	-6.65-4.43	-4.3-7.56	-10.56-8.51	-10.39-14.15	-18.88-18.56	-17.61-16.47	-12.61-6.57	-4.79-2.22														
Theta(82.5°)	-2.49-2.33	-1.79-4.56	-5.71-6.91	-5.13-4.32	-5.77-5.39	-5.46-8.48	-6.08-4.64	-6.73-8.7	-10.43-10.59	-11.38-11.43	-11.33-6.62	-3.31-5.72	-3.08-2.56	-3.23-4.34	-5.66-7.36	-8.07-6.32	-6.53-6.82	-9.63-10.08	-8.99-13.02	-11.31-13.25	-18.01-16.14	-10.51-9.94	-7.39-2.64	-4.98-7.77														
Theta(90°)	-3.85-3.76	-1.04-6.38	-7.53-5.74	-2.39-5.52	-7.48-6.43	-7.36-8.23	-4.61-2.76	-4.43-8.28	-8.29-9.96	-11.93-11.94	-14.03-13.4	-8.99-5.85	-7.71-3.38	-3.71-3.05	-5.48-3.07	-4.57-4.57	-7.08-9.11	-4.17-4.71	-7.47-12.76	-11.51-13.8	-9.51-14.62	-17.79-17.06	-14.36-9.42	-5.97-1.57														
Theta(97.5°)	-4.81-4.64	-1.36-9.07	-12.01-8.37	-2.25-10.67	-10.42-7.56	-12.84-5.36	-2.25-3.81	-9.47-18.11	-15.26-11.24	-15.87-17.08	-18.18-16.93	-9.07-6.11	-6.33-4.13	-5.19-3.99	-2.12-3.29	-1.59-4.95	-7.99-17.25	-9.16-6.6	-7.3-4.94	-12.19-12.79	-8.34-8.49	-13.18-18.5	-14.53-11.78	-10.44-9.47														
Theta(105°)	-10.34-4.77	-5.38-9.85	-9.2-7.2	-5.35-8.09	-10.83-14.5	-10.46-8.76	-11.05-13.22	-12.41-18.07	-18.73-17.24	-18.44-17.08	-15.37-19.08	-8.91-11.96	-8.33-4.6	-5.21-5.25	-2.76-1.36	-0.05-1.02	-4.63-6.82	-11.86-15.01	-7.35-4.98	-7.95-7.75	-9.39-12.4	-10.33-14.46	-14.19-10.67	-4.98-7.77														
Theta(112.5°)	-11.56-8.9	-7.03-5.17	-4.61-4.35	-4.89-4.57	-5.57-15.83	-14.9-18.67	-15.71-10.64	-8.25-9.38	-18.05-14.2	-12.3-18.64	-12.72-17.67	-10-18.93	-7.91-7.79	-7.5-9.13	-4.88-3.71	-2.47-2.22	-3.9-10.12	-7.78-7.18	-11.53-9.32	-10.41-5.72	-10.96-12.59	-19.03-18.04	-17.81-11.35	-7.84-8.81														
Theta(120°)	-15.19-12.72	-4.37-3.7	-5.74-7.71	-5.12-5.02	-2.48-7.73	-14.23-9.04	-8.81-13.07	-12.34-11.61	-18.24-16.21	-17.98-16.53	-18.81-10.84	-18.53-19.19	-17.18-17.2	-5.84-10.2	-15.87-7.21	-2.68-1.85	-5.04-5.67	-11.99-13.28	-12.91-18.22	-13.47-14.34	-13.82-11.35	-11.97-9.74	-10.03-7.3	-9.16-16.24														
Theta(127.5°)	-7.37-5.97	-4.01-3.8	-0.88-1.94	-4.98-2.03	-3.78-7.21	-8.74-4.89	-4.17-7.92	-18.18-11.75	-11.77-18.99	-18.87-15.41	-17.31-11.58	-18.01-12.62	-9.54-9.41	-2.75-4.56	-11.3-9.01	-18.74-13.21	-13.55-9.02	-10.84-17.96	-13.16-18.47	-13.68-10.11	-5.17-5.55	-4.38-1.4	-1.48-6.43	-1.48-6.43														
Theta(135°)	-5.06-3.02	-4.57-5.15	-4.8-3.54	-4.25-5.27	-3.91-7.75	-11.28-8.18	-8.06-12.42	-14.96-7.57	-7.86-13.75	-18.66-15.09	-7.92-8.91	-18.12-15.64	-9.66-7.14	-11.54-5.87	-6.44-13.26	-5.75-15.06	-4.24-9.14	-11.29-9.55	-10.73-13.11	-18.75-16.7	-17.09-17.97	-17.27-10.96	-8.66-4.57	-1.52-3.9														
Theta(142.5°)	-9.37-5.31	-4.44-3.95	-2.59-3.92	-3.72-5.08	-7.06-8.93	-6.84-6.06	-6.69-10.06	-18.11-14.96	-11.13-18.77	-19.02-17.98	-17.91-16.14	-13.92-12.51	-14.86-13.31	-7.95-9.08	-8.19-4.79	-4.58-2.57	-7.53-12.02	-5.48-5.14	-6.61-11.06	-12.39-14.68	-16.91-18.22	-17.95-11.39	-13.11-5.47	-5.29-8.8														
Theta(150°)	-15.92-12.61	-9.25-10.08	-7.55-6.57	-10.22-14.66	-18.33-18.1	-17.02-12.61	-10.27-10.95	-15.43-17.95	-17.89-18.61	-18.29-18.74	-15.71-13.41	-11.35-18.2	-10.97-7.85	-9.17-13.08	-12.76-17.64	-4.39-5.34	-13.88-7.16	-6.26-6.66	-9.91-11.91	-11.61-12.24	-17.77-18.45	-17.11-12.32	-8.71-10.78	-8.37-10.21														
Theta(157.5°)	-4.34-5.23	-2.96-2.08	-4.64-6.03	-4.85-5.79	-7.13-8.13	-8.81-8.37	-9.44-13.01	-15.07-14.41	-13.64-13.77	-11.78-8.76	-7.37-9.39	-14.46-11.34	-5.01-1.42	-1.36-4.11	-10.29-15.53	-12.13-9.94	-7.69-6.4	-7.33-11.38	-19.09-16.29	-17.01-18.96	-15.99-12.64	-15.38-18.91	-10.66-5.83	-4.79-3.43														
Theta(165°)	-2.31-1.84	-2.98-6.43	-10.71-13.64	-15-15.93	-15.12-12.08	-11.09-13.41	-15.39-12.44	-8.14-8.32	-8.96-9.95	-8.68-7.48	-7.61-9.19	-9.51-6.8	-4.66-4.34	-2.23-1.45	-1.25-1.59	-3.36-6.27	-10.91-6.31	-16.11-14.34	-14.67-13.61	-13.99-14.86	-14.11-10.25	-8.72-5.61	-2.72-2.32	-2.72-2.32														
Theta(172.5°)	-17.81-17.51	-18.15-14.83	-11.3-9.95	-9.22-9.3	-10.87-13.02	-15.26-16	-18.15-16.41	-13.79-13.98	-16.01-17.92	-18.29-18.24	-17.27-11.9	-7.81-4.8	-2.71-1.18	-10.150.75	1.81-1.27	0.890.31	-0.47-1.78	-3.58-5.59	-8.13-10.81	-12.38-12.82	-17.38-17.78	-16.11-10.29	-9.81-6.19	-9.81-6.19														
Theta(180°)	-14.37-13.41	-15.3-13.13	-9.27-7.24	-6.2-6.8	-7.02-6.47	-6.06-6.84	-7.91-8.69	-9.76-11.47	-13.05-14.99	-15.32-12.48	-9.49-7.4	-5.83-4.93	-4.43-3.92	-3.38-3.05	-2.59-2.45	-2.97-3.85	-4.64-5.41	-5.75-7.32	-8.97-11.82	-15.45-17.56	-17.57-18.26	-15.55-13.61	-11.77-10.12	-9.79-13.48														
Gain	Phi(75°)	Phi(82.5°)	Phi(90°)	Phi(97.5°)	Phi(105°)	Phi(112.5°)	Phi(120°)	Phi(127.5°)	Phi(135°)	Phi(142.5°)	Phi(150°)	Phi(157.5°)	Phi(165°)	Phi(172.5°)	Phi(180°)	Phi(187.5°)	Phi(195°)	Phi(202.5°)	Phi(210°)	Phi(217.5°)	Phi(225°)	Phi(232.5°)	Phi(240°)	Phi(247.5°)	Phi(255°)	Phi(262.5°)	Phi(270°)	Phi(277.5°)	Phi(285°)	Phi(292.5°)	Phi(300°)	Phi(307.5°)	Phi(315°)	Phi(322.5°)	Phi(330°)	Phi(337.5°)	Phi(345°)	Phi(352.5°)
Gain	Phi(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°)	-5.56-5.35	-5.92-6.92	-8.07-9.54	-10.47-11.54	-13.69-15.15	-18.26-19.13	-19.08-16.53	-12.98-10.8	-9.5-8.62	-7.7-6.69	-6.28-5.87	-5.48-5.57	-5.82-6.63	-7.01-7.99	-8.88-9.27	-11.16-13.36	-14.69-15.6	-18.64-18.59	-18.56-19.05	-16.49-17.42	-15.59-15.13	-12.7-9.77	-7.82-6.6	-6.11-5.44	-4.85-7.33													
Theta(7.5°)	-6.48-5.77	-7.28-7.42	-8.23-10.53	-8.59-7.62	-7.15-6.69	-6.64-5.79	-5.49-5.74	-6.02-6.42	-7.24-8.93	-10.56-10.55	-8.64-7.99	-6.58-6	-6.18-6.39	-6.28-5.96	-6.31-7.16	-8.4-9.31	-9.87-10.14	-10.51-10.98	-9.62-9.85	-10.14-9.62	-8.16-6.77	-5.12-4.44	-3.94-4.4	-4.85-7.33														
Theta(15°)	-13.04-10.54	-13.33-11.21	-9.27-8.9	-6.29-5.37	-4.12-4.93	-4.14-2.63	-3.16-3.22	-2.24-3.46	-3.94-0.22	-4.67-6.13	-7.64-7.96	-5.85-6.85	-4.72-7.01	-6.72-6.78	-6.17-7.13	-8.83-10.45	-13.28-18.34	-19.69-19.31	-13.26-10.15	-7.73-6.63	-5.29-4.96	-4.78-6.65	-8.77-11.4	-4.85-7.33														
Theta(22.5°)	-16.04-12.96	-11.73-11.57	-9.19-8.17	-7.57-7.06	-6.77-5.09	-3.65-2.67	-2.21-2.19	-2.18-2.42	-2.78-3.47	-4.86-6.03	-4.46-7.35	-7.47-7.11	-6.08-5.62	-6.14-6.69	-6.37-6.33	-7.21-8.16	-9.86-12.32	-14.82-17.8	-17.46-15.16	-10.85-10.16	-9.1-10.59	-12.11-14.68	-16.07-19.23	-17.94-18.42														
Theta(30°)	-18.49-17.44	-16.89-18.2	-13.07-10.86	-7.07-5.02	-3.01-3.32	-0.46-0.14	-0.47-1.17	-2.22-3.3	-4.69-4.07	-3.16-3.33	-3.25-2.61	-2.64-5.3	-4.74-6.13	-5.81-5.25	-5.09-6.01	-6.7-7.63	-11.22-12.85	-14.88-18.29	-15.22-12.22	-12.86-13.99	-15.25-13.65	-15.26-16.75	-18.48-17.73															
Theta(37.5°)	-11.51-13.31	-16.88-18.9	-18.16-11.38	-8.52-5.31	-3.14-1.9	-0.83-2.04	-1.78-1.5	-1.52-1.5	-1.05-0.54	0.160.11	-1.83-2.33	-0.32-1.47	-4.79-3.78	-2.23-3.14	-4.76-5.49	-4.79-3.18	-4.51-8.06	-11.17-12.85	-14.88-18.29	-15.22-12.22	-12.86-13.99	-15.21-11.23	-12.03-17.5	-11.56-9.74														
Theta(45°)	-7.46-9.97	-13.14-14.98	-11.14-8.35	-4.55-2.23	-2.15-1.05	-0.09-0.07	-0.76-1.66	-1.77-0.92	-1.02-1.06	-0.23-0.9	0.96-0.37	-1.72-2.56	-3.67-3.11	-3.12-4.2	-4.77-8.56	-6.75-4.04	-5.79-9.33	-14.96-18.54	-16.17-10.65	-11.91-12.05	-10.81-14.33	-12.24-7.99	-9.1-10.99	-7.37-6.93														
Theta(52.5°)	-8.94-8	-10.18-11.61	-5.44-2.98	-2.77-3.43	-2.87-0.99	-0.39-0.77	-1.18-1.45	-1.51-1.38	-0.43-0.22	-0.37-1.21	0.191.03	-0.47-1.24	-2.15-0.95	-2.66-3.1	-2.08-4.51	-2.27-1.54	-2.7-1.9	-12.47-10.53	-9.01-9.18	-8.15-5.68	-3.51-3.53	-5.26-2.68	-7.66-10.59	-7.61-6.92														
Theta(60°)	-6.83-8.26	-6.74-5.34	-2.45-2.01	-2.63-3.15	-3.32-0.6	1.081.03	-0.36-1.62	-1.33-0.62	-0.04-0.01	1.280.92	0.640.69	-1.481.34	-1.05-1.27	-1.12-1.89	-0.5-1.14	-1.51-1.6	-4.28-6.57	-8.67-8.04	-7.34-7.62	-5.62-4.97	-3.71-3.72	-4.62-3.14	-2.8-5.63	-8.27-7.74														
Theta(67.5°)	-5.32-5.43	-6.48-3.79	-3.27-2.07	-1.21-4.05	-3.44-0.12	1.108.83	-0.99-0.77	-1.19-0.12	0.82-0.13	-0.73-2.1	-0.611.96	-1.01	-0.44-1.61	-1.04-0.29	-1.44-0.36	-8.91-7.8	-3.48-2.98	-8.81-9.04	-7.54-5.16	-4.73-5.12	-3.81-3.38	-2.51-1.81	-1.31-2.34	-2.86-4.87														
Theta(75°)	-3.36-3.3	-4.46-3.62	-5.62-1.72	-1.55-5	-1.981	2.052.09	0.05-2.72	-5.03-3.29	-0.96-0.55	1.380.07	-3.39-0.92	0.16-0.15	-0.40-0.47	-1.130.54	-2.0-9.6	-0.25-5.46	-3.58-6.28	-7.51-7.4	-4.91-4.57	-6.51-7.09	-4.35-1.49	-0.63-1.07	-1.170.24	-0.82-0.47														
Theta(82.5°)	-1.65-1.57	-4.82-4.16	-5.07-0.16	-2.13-5.64	-1.722.19	2.771.35	-0.82-3.69	-6.21-6.07	-3.36-1.86	-0.1-2.03	-3.14-4.5	-2.65-1.34	-0.371.36	-0.36-2.36	-3.54-2.85	-2.38-2.81	-5.33-5.8	-6.13-5.46	-5.53-5.61	-5.96-2.87	-1.26-1.97	0.560.61	0.20	0.1-7.8														
Theta(90°)	-2.12-3.52	-5.49-4.63	-4.59-1.12	-1.91-6.87	-2.031.92	1.13-1.16	-1.62-3.32	-6.87-4.18	-1.04-3.22	-1.42-4.77	-4.45-2.57	-4.91-1.29	-0.840.09	2.03-1.73	-1.18-2.23	-4.33-0.62	-3.71-4.46	-2.38-3.01	-2.07-1.27																			



Radiated Composite Gain Data_6GHz

Appendix B

Theta (°)	-13.44:9.91	-14.46:10.81	-12.36:7.26	-7.28:8.08	-8.69:6.77	-11.28:9.73	-7.25:12.77	-11.02:9.69	-11.62:9.99	-10.91:10.28	-13.49:14.73	-11.36:13.27	-15.04:12.11	-6.14:7.61	-7.65:6.66	-9.29:6.36	-12.73:16.24	-10.94:11.61	-10.66:13.22	-14.23:9.71	-12.52:18.19	-18.54:14.13	-15.52:16.62	-18.14:10.98	
Theta (127.5°)	-8.04:9.89	-9.37:10.63	-8.12:6.05	-4.54:5.28	-4.27:10.75	-12.11:6.72	-5.38:8.48	-18.77:9.32	-9.78:14.67	-10.81:12.46	-13.71:13.99	-17.28:18.23	-17.52:11.15	-7.58:9.74	-15.96:5.92	-9.61:12.28	-17.82:12.84	-13.77:18.69	-17.41:17.46	-17.44:18.57	-19.15:17.25	-16.29:16.23	-10.36:8.07	-6.83:8.12	
Theta (135°)	-4.11:5.34	-4.49:6.78	-7.86:5.53	-6.09:2.31	-3.31:0.64	-18.26:9.68	-8.05:12.41	-18.38:9.24	-7.71:12.53	-14.44:13.23	-19.08:17.58	-17.02:10.71	-11.19:6.25	-1.93:10.26	-4.24:18.83	-6.91:7.88	-14.82:13.39	-13.71:17.47	-16.26:15.53	-17.04:13.47	-18.17:12.74	-16.93:6.01	-10.15:8.05	-3.72:3.38	
Theta (142.5°)	-10.21:5.51	-3.79:4.27	-5.05:6.6	-6.52:6.23	-5.13:8.58	-10.51:7.99	-7.99:11.28	-18.24:10.76	-10.67:14.5	-13.05:12.25	-12.77:18.06	-17.83:11.17	-7.08:7.02	-4.72:6.05	-17.66:5.56	-18.17:13.16	-12.27:10.38	-16.06:7.89	-10.76:11.57	-10.43:14.57	-13.29:9.98	-16:11:2	-12.55:14.71	-12.35:10.59	
Theta (150°)	-10.68:13.32	-18.89:14.91	-10.94:11.29	-13.06:14.11	-16.28:13.53	-14.87:14.66	-13.96:16.21	-18.29:18.06	-18.44:18.39	-18.61:14.21	-11.44:11.13	-11.76:6.41	-16.29:10.28	-15.4:17.46	-14.89:13.15	-16.09:17.54	-9.6:7.72	-10.2:15.59	-15.24:18.42	-18.4:13.42	-14.09:13.08	-16.29:6.92	-7.83:10.16		
Theta (157.5°)	-3.18:4.29	-6.58:6.89	-6.75:10.58	-12.79:10.25	-9.32:11.08	-10.61:10.07	-10.02:10.96	-13.33:13.1	-11.01:10.44	-10.61:9.78	-6.71:8.67	-9.65:11.96	-14.59:8.45	-6.91:7.84	-11.83:6.67	-9.62:12.39	-13.97:13.31	-13.67:18.1	-17.93:18.38	-18.41:18.15	-17.91:18.71	-14.31:9.33	-7.65:4.7		
Theta (165°)	-3.79:4.98	-5.39:5.3	-6.48:6.73	-8.49:10.54	-12.62:16.06	-18.42:17.52	-17.75:17.04	-14.64:14.15	-14.2:13.67	-11.46:10.15	-9.63:10.71	-9.49:6.45	-4.88:5.53	-8.6:13.2	-14.61:9.19	-5.5:4.18	-4.01:4.22	-5.01:6.39	-8.48:10.6	-11.89:11.96	-11.61:12.38	-13.67:17.81	-12.61:8.29	-5.39:3.25	
Theta (172.5°)	-16.59:19.13	-18.24:19.04	-14.72:10.93	-8.72:9.04	-9.76:13.19	-18.05:18.13	-18.46:16.94	-16.77:17.58	-18.17:13	-18.97:14.53	-9.12:16.6	-4.71:14.09	-3.85:4	-4.06:4.76	-4.84:4.22	-3.01:2.87	-2.74:3.06	-4.06:4.56	-8.06:10.73	-13.66:13.63	-13.92:15.43	-18.48:17.24	-14.9:15.7	-14.86:17.31	
Theta (180°)	-19.04:18.13	-17.5:19.28	-15.28:10.13	-7.83:8.58	-10.84:14.15	-16.05:15.35	-16.64:16.98	-16.73:15.42	-14.97:15.28	-14.03:11.06	-8.62:7.45	-7.42:7.51	-7.57:7.42	-6.62:6.29	-6.74:8.82	-10.37:11.31	-11.88:12.98	-15.2:18.63	-17.48:18.33	-17.98:17.57	-17.44:14.69	-12.47:12.31	-11.18:12.03	-13.55:19.08	
Gain	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°)	
Theta (7.5°)	-4.6:5.47	-5.99:6.22	-6.92:8.99	-10.31:11.26	-11.73:11.8	-11.85:10.41	-11.15:10.41	-9.47:9.7	-7.06:6.32	-5.28:4.63	-3.68:3.41	-2.37:3.71	-1.56:5.96	-0.96:8.11	-0.53:11.55	-12.22:12.77	-12.07:11.65	-10.41:8.49	-6.48:4.94	-4.69:4.29	-3.88:4.32	-3.1:3.16	-3.98:4.45	-3.81:4.4	
Theta (15°)	-6.44:6.53	-7.48:9.21	-10.29:11.33	-15.24:15.28	-13.71:13.38	-11.29:10.19	-8.41:6.92	-6.34:5.39	-4.98:4.18	-3.21:2.73	-3.03:3.33	-3.55:3.6	-3.66:4.04	-4.76:5.28	-6.25:7.7	-9.75:11.92	-15.21:18.37	-19.01:15.18	-12.51:10.23	-8.39:6.62	-6.68:6.82	-7.33:7.28	-9.25:7.56	-6.85:6.38	
Theta (22.5°)	-9.49:10.36	-11.14:13.39	-16.17:18.05	-19.21:16.68	-14.43:10.19	-7.61:7.04	-6.25:4.48	-3.42:3.29	-4.19:5.54	-5.58:5	-4.84:4.89	-4.53:4.22	-3.1:2.67	-2.39:2.89	-4.05:5.97	-8.32:10.27	-12.62:13.65	-14.31:13.97	-11.84:11.52	-10.82:10.32	-10.09:8.77	-7.96:8.11	-6.93:6.58	-9.75:10.12	
Theta (30°)	-17.49:18.75	-17.71:18.51	-18.72:18.17	-17.22:13.99	-10.46:7.65	-6.67:5.64	-4.89:3.38	-3.92:3.38	-3.92:3.38	-3.29:3.77	-4.43:4.29	-3.67:2.88	-2.6:2.88	-3.37:3.66	-5.3:7.35	-9.1:10.95	-14.13:17.27	-18.11:14.75	-12.61:10.83	-13.16:17.63	-18.02:17.93	-17.91:18.58	-14.31:9.33	-16.66:17.94	
Theta (37.5°)	-18.85:18.17	-18.41:17.43	-18.87:14.86	-11.42:9.13	-9.66:8.05	-5.87:3.79	-2.24:1.84	-2.14:2.55	-2.82:3.43	-4.09:4.67	-5.66:7.47	-6.72:4.38	-2.85:2.91	-3.78:4.41	-5.15:6.33	-7.59:10.94	-15.17:13.32	-10.71:10.12	-11.71:14.7	-19.07:17.77	-18.45:18.27	-12.73:12.03	-12.99:15.51	-18.63:18.58	
Theta (45°)	-13.05:11.42	-12.77:9.92	-8.45:6.82	-8.72:8.69	-7.25:4.67	-3.15:1.78	-1.52:0.25	-3.39:4.82	-4.86:4.45	-4.77:4.4	-3.23:2.93	-3.48:4.56	-4.69:3.14	-2.2:2.4	-3.24:3.41	-6.22:11.26	-13.03:12.69	-15.11:17.96	-18.63:18.01	-18:18.72	-16.11:12	-11.54:12.28	-13.09:12.94	-18.16:17.78	
Theta (52.5°)	-13.23:10.77	-10.71:10.57	-7.55:7.55	-8.13:5.99	-4.61:4.54	-4.46:3.03	-1.59:0.81	-1.13:1.92	-2.71:2.22	-4.66:3.07	-2.98:2.94	-1.78:1.41	-3.35:2.54	0.44:2.35	-4:2.63	-6.37:7.75	-6.3:9.08	-14.36:18.06	-18.44:12.11	-10.74:11.63	-14.34:18.54	-16.69:12.13	-19.07:18.74		
Theta (60°)	-6.87:7.46	-8.01:10.53	-8.13:4.74	-3.04:3.38	-4.98:3	-1.49:1.52	-2.17:3.4	-4.45:3.62	-2.35:3.18	-3.14:1.1	-0.06:0.99	4.4:2.24	-1.36:4.53	-1.18:1.75	-2.94:1.99	-2.54:5.74	-6.28:7.59	-12.66:14.41	-10.96:10.65	-9.58:9.54	-8.93:7.23	-7.3:11.75	-18.02:12.58	-13.33:9.65	
Theta (67.5°)	-6.99:8.2	-6.49:7.39	-3.32:1.85	-0.86:2.22	-3.39:2.01	-1.06:0.85	-0.76:0.17	-0.37:1.61	-2.4:0.64	-1.24:1.27	-2.66:3.48	-1.48:5.02	-2.49:2.5	-3.88:1.57	-1.77:1.18	-1:1.32	-3.84:5.3	-11.62:10.66	-6.48:4.41	-4.21:4.02	-5.88:6.88	-5.86:7.18	-1.62:9.21	-7.8:5.2	
Theta (75°)	-5.9:3.86	-4.28:3.73	-4.22:2.41	-2.65:3.44	-4.79:1.18	0.02:1.22	-2.62:3.29	-1.23:2.11	-2.78:2.83	-2.92:3.21	-1.73:4.3	-1.73:4.3	-1.73:4.3	-1.73:4.3	-1.73:4.3	-1.73:4.3	-1.73:4.3	-1.73:4.3	-1.73:4.3	-1.73:4.3	-1.73:4.3	-1.73:4.3	-1.73:4.3	-1.73:4.3	-1.73:4.3
Theta (82.5°)	-2.4:2.67	-1.83:3.55	-4.18:2.06	-0.9:3.18	4.510.8	1.440.8	0.21:2.07	-3.51:9.3	-0.74:1.42	-2.56:6.05	-4.86:2.31	-3.37:2.31	-1.01:2.92	0.64:1.48	-1.88:5.52	-5.06:5.1	-8.52:6.18	-8.05:13.39	-6.96:5.79	-4.23:4.94	-7.15:7.13	-5.31:4.75	-2.33:3.54	-3.71:3.01	
Theta (90°)	-2.51:1.49	-0.74:2.03	-3.17:4.59	-3.61:4.97	-1.210.71	1.391.17	-1.19:9.19	-1.61:6.23	-3.07:3.02	-1.09:1.4	-4.88:3.08	-2.16:1.88	-1.92:1.45	-1.05:1.1	-1.59:1.17	-3.87:6.52	-4.27:6.33	-5.81:9.38	-9.19:7.56	-7.4:3.3	-4.56:4.22	-2.08:1.25	0.34:0.35	-0.58:2.11	
Theta (97.5°)	-0.53:0.83	-1.33:3.25	-5.08:0.08	-1.9:3.27	-3.29:0.52	-0.21:1.22	-2.13:2.42	-1.78:15.04	-4.03:4.05	-2.47:2.79	-1.62:4.98	-5.41:1.28	-1.91:6.01	0.820.24	-0.22:4.44	-2.45:5.97	-3.94:10.32	-9.2:11.76	-12.82:6.8	-5.31:3.48	-5.13:9.94	-0.59:0.39	0.920.55	-10.5:16.04	
Theta (105°)	-1.35:1.5	-1.97:3.65	-5.86:4.14	-3.07:4.89	-2.11:0.02	-2.09:0.43	0.73:2.86	-17.53:4.51	-0.93:5.25	-2.35:4.94	-2.51:3.31	-5.34:2.07	-2.43:0.02	0.4:4.62	-1.71:0.07	-0.10:0.64	-6.01:4.93	-4.8:7.11	-5.17:4.54	-2.74:1.32	2.99:2.21	0.74:1.37	-0.34:1.76	2.24:0.48	
Theta (112.5°)	-1.16:0.31	-2:4.33	-3.95:4.56	-1.13:5.62	-6.02:2.63	-3.99:0.6	-0.36:1.93	-7.86:6.61	-3.04:6.07	-1.33:7.8	-7.16:4.84	-4.97:2.98	-1.66:1.54	-1.810.13	-2.39:5.1	-1.86:1.25	-3.11:0.35	-0.48:0.26	2.03:0.02	1.5:0.61	-1.5:0.61	0.61:0.4	2.84:1.77		
Theta (120°)	-1.480.98	-3.98:1.84	-3.89:4.4	-7.46:10.86	-11.02:12.11	-2.13:2.73	-1.55:1.87	-4.52:6.71	-7.72:11.62	-3.49:6.12	-10.74:13.65	-5.48:7.21	-1.24:3.3	-3.02:4.55	-1.96:0.2	-1.61:2.9	-4.9:12.37	-6.97:9.53	-4.74:0.63	-2.22:0.05	2.48:1.33	-0.06:1.78	1.14:0.29		
Theta (127.5°)	-2.05:1.24	-4.69:5.76	-7.49:6.53	-10.4:9.1	-5.32:5.8	-4.01:7.41	-16.49:6.45	-5.27:8.46	-9.23:12.04	-4.83:11.3	-17.57:15.88	-16.13:7.9	-9.98:3.86	-3.32:6.73	-10.87:4.17	-3.8:2.61	-5.48:7.84	-3.25:6.73	-2.85:3.6	-5.42:1.68	1.87:1.81	-0.04:4.48	-4.27:1.29	1.84:0.45	
Theta (135°)	-2.73:4.59	-6.29:7.49	-9.04:7.79	-13.78:12.92	-6.87:12.43	-6.79:6.53	-11.18:16.57	-16.81:17.89	-12.83:17.37	-8.83:8.44	-16.98:19.26	-18.51:7.3	-9.74:6.06	-6.99:11.54	-17.68:6.33	-8.91:9.55	-17.53:11.34	-5.3:6.08	-0.54:0.52	-6.7:1.54	1.080.57	-2.91:1.98	0.93:0.92	2:3.77	
Theta (142.5°)	-5.9:4.74	-3.82:10.37	-18.13:11.34	-18.83:17.64	-12.81:9.47	-8.21:6.86	-6.65:7.13	-11.33:9.77	-12.86:9.99	-13.88:18.77	-18.31:13.4	-9.84:11.77	-4.51:12.49	-7.94:9.5	-3.38:9.17	-4.61:7.79	-11.03:3.49	-2.45:14.77	-15.78:2.09	-1.07:0.38	-3.15:4.13	-3.78:2.14	1:6:73		
Theta (150°)	-6.57:5.03	-11.86:12.26	-14.24:17.99	-16.11:18.07	-10.71:8.94	-7.17:6.14	-4.25:9.77	-6.31:5.86	-5.47:5.73	-10.19:14.3	-14.44:13.16	-14.88:17.78	-15.08:18.1	-11.96:7.23	-13.79:3.81	-5.84:5.88	-18.12:10.1	0.51:9.46	-1.82:1.53	-1.59:0.23	-2.85:11.34	-4.89:0.31	-1.57:3.34		
Theta (157.5°)	-6.12:5.94	-11.76:12.52	-15.6:15.46	-13.71:15.83	-18.44:17.43	-19.11:18.53	-19.05:16.94	-18.57:18.49	-14.3:10.29	-9.83:12.46	-12.18:8.32	-10.62:18.84	-17.59:12.81	-13.52:9.82	-5.26:9.1	-9.87:8.11	-16.5:9.77	-11.24:7.15	-7.41:17.28	-16.74:16.29	-3.26:2.72	-7.63:3.33	-3.85:1.66	-2.57:3.1	
Theta (165°)	-9.9:11.8	-13.47:12.28	-11.83:15.46	-18.69:18.7	-18.06:17.65	-17.53:13.16	-11.41:11.6	-14.92:18.55	-16.09:15.58	-18.33:18.09	-17.49:15.09	-12.59:10.96	-11.04:12.01	-17.3:17.99	-18.										



Radiated Composite Gain Data_6GHz

Appendix B

Theta (°)	-8.24-7.11	-8.38-10.12	-15.15-18.11	-15.99-12.58	-8.97-7.31	-5.69-4.88	-3.49-2.82	-3.19-3.86	-4.11-4.58	-5.94-7.09	-6.75-5.54	-4.73-4.8	-5.93-7.81	-10.13-11.85	-13.32-12.32	-7.99-5.64	-5.03-5.46	-5.34-5.32	-5.53-4.06	-2.25-1.9	-2.36-2.92	-3.73-6.3	-11.54-18.62	-17.87-11.53
Freq(Hz)	6.175GPol.	ThetaAnt.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Phi(7.5°)	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°)	-9.74-9.56	-8.68-9.17	-10.46-12.71	-15.47-18.22	-17.82-18.9	-18.34-18.52	-18.79-17	-14.18-12.42	-12.06-10.78	-9.98-9.09	-8.71-8.3	-8.05-8.27	-8.64-8.59	-9.19.95	-121-13.94	-15.85-18.91	-19.35-18.65	-17.96-17.85	-17.96-14.66	-11.63-8.43	-7.33-6.96	-8.52-9.28	-9.84-9.2	-8.03-9.31
Theta(7.5°)	-10.3-10.35	-9.97-10.89	-13.87-18.38	-18.29-16.68	-15.81-14.6	-12.78-12.58	-11.88-11.04	-10.07-10.74	-11.36-11.43	-10.71-10.24	-10.43-10.54	-10.16-9.67	-9.28-9.33	-10.01-10.78	-11.36-11.32	-11.98-12.62	-18.81-18.81	-18.68-18.85	-18.41-15.74	-14.09-10.41	-8.78-8.21	-9.43-8.51	-9.08-9.28	-9.96-10.3
Theta(15°)	-8.84-11.46	-9.19-18.88	-18.9-9.6	-6.41-5.31	-6.15-6.76	-6.62-7.14	-8.49-11.46	-15.59-17.77	-17.34-18.56	-17.96-18.53	-17.58-18.9	-18.17-15.08	-10.8-8.07	-6.73-7.37	-10.01-11.85	-12.76-15.19	-18.87-19.02	-18.98-19.4	-17.91-18.13	-14.53-8.72	-6.81-6.15	-6.61-6.44	-6.36-6.32	-6.94-6.72
Theta(22.5°)	-5.47-8.79	-10.86-7.26	-4.14-2.58	-3.23-4.39	-5.55-5.85	-6.86-9.04	-11.14-13.24	-17.37-17.98	-18.52-15.25	-16.26-18.15	-18.95-14.69	-13.53-12.77	-9.68-7.24	-7.13-10.6	-16.82-15.64	-12.99-11.64	-11.43-17.02	-17.28-17.76	-16.04-18.39	-16.25-9.56	-6.41-5.99	-7.31-6.16	-4.77-3.97	-3.37-3.48
Theta(30°)	-3.19-6.36	-8.58-5.51	-2.3-0.79	-1.33-2.83	-4.17-4.46	-5.26-6.96	-9.64-11.04	-12.21-15.32	-14.17-15.24	-11.59-12.74	-17.72-17.77	-13.66-16.6	-4.67-4.16	-7.24-15.22	-14.2-8.03	-6.86-7.56	-10.37-14.98	-13.52-9.1	-8.08-7.91	-4.63-3.05	-4.06-5.17	-5.91-4.64	-2.46-1.49	-1.02-1.39
Theta(37.5°)	-0.02-5.31	-4.31-0.13	-0.75-0.46	-1.62-3.69	-6.22-8.44	-8.38-8.35	-8.72-9.42	-10.47-14.47	-16.71-17.75	-19.13-11.77	-12.41-16.09	-14.37-10.62	-7.21-6.51	-9.72-17.28	-10.16-6.62	-6.99-9.26	-14.56-12.73	-8.92-7.69	-6.54-2.69	-1.15-2.84	-1.64-0.11	-1.53-8.3	-3.9-0.07	1.73-1.99
Theta(45°)	1.820-2.4	0.61-1.25	0.32-0.26	-1.96-5.91	-8.77-7.89	-5.87-4.68	-4.24-3.7	-3.61-6.44	-13.79-12.54	-10.36-16.31	-15.67-13.5	-13.18-12.31	-11.5-11.3	-11.43-16.85	-17.93-16.24	-18.84-18.41	-9.21-7.17	-3.69-2.55	-3.74-4.07	-2.26-1.93	-2.83-4.02	-1.12-1.05	-1.820-7	1.331-68
Theta(52.5°)	2.512-27	2.30-55	0.47-0.44	-3.91-7.03	-6.81-8.47	-4.77-4.73	-5.07-4.7	-2.41-7.08	-2.56-6.87	-8.23-9.2	-6.86-8.95	-9.63-8.23	-13.74-17.93	-17.73-18.76	-10.04-10.33	-10.51-6.93	-8.88-7.6	-9.84-11.68	-11.5-9.24	-6.61-5.4	-2.54-2.35	-1.730-43	0.171-44	1.772-02
Theta(60°)	2.572-21	2.19-0.15	0.5-2.31	-6.41-9.18	-11.01-11.45	-12.46-9.82	-6.54-2.41	-4.77-4.29	-2.48-3.56	-4.68-6.85	-9.9-2.69	-6.14-5.53	-6.89-15.57	-14.44-16.21	-6.74-5.38	-9.25-9.19	-10.34-11.01	-9.52-5.99	-5.74-6.89	-6.71-7.21	-1.99-1.02	1.222-5	2.673-56	
Theta(67.5°)	-0.561-1.1	0.490-1.2	0.671-1.9	-2.47-6.91	-13.65-15.07	-11.69-14.84	-12.64-5.48	-3.29-4.02	-4.32-4.03	-4.81-5.6	-10.58-7.75	-6.8-5.42	-5.07-12.78	-8.36-8.11	-5.72-4.61	-7.41-5	-5.27-7.59	-7.49-7.62	-5.96-5.02	-4.25-7.22	-5.87-3.27	-4.22-7.22	0.492-58	2.612-03
Theta(75°)	-0.310-93	-0.222-31	-1.72-5.17	-7.65-13.44	-8.33-10.38	-14.95-9.82	-11.28-11.85	-5.63-4.73	-6.11-3.37	-2.55-7.72	-6.75-6.32	-3.61-3.11	-1.15-2.4	-2.59-4.56	-4.95-2.57	-1.290-15	-1.07-1.23	-3.83-1.8	-1.58-4.4	-6.18-2.56	-2.14-1.64	-0.261-98	2.291-41	
Theta(82.5°)	2.44-0.92	-1.51-4.05	-5.4-3.66	-7.68-5.46	-6.32-18.47	-14.23-6.46	-5.76-4.93	-2.76-4.26	-7.82-3.9	-2.05-1.19	-6.14-5.53	-6.39-12.25	-0.61-4.24	-2.69-4.09	-5.68-3.78	-3.45-0.02	-0.78-1.14	-6.63-6.53	-2.42-1.95	-2.59-4.4	-5.25-3.69	-9.77-2.23	-3.430-68	1.16-0.16
Theta(90°)	-2.19-2.24	-0.71-4.97	-1.29-5.09	-7.38-3.95	-4.88-17.77	-8.71-7.35	-8.88-6.82	-4.45-5.46	-9.48-4.78	-2.27-0.85	-1.42-4.93	-2.91-1.69	0.04-1.41	-0.44-2.28	-3.82-3.39	-1.25-0.86	-0.62-0.38	-2.91-4.1	-2.55-3.82	-0.72-2.19	-2.26-1.34	-1.22-1.52	0.731-29	-0.91-0.8
Theta(97.5°)	-4.74-3.77	-2.04-9.41	-2.07-7.06	-11.14-4.39	-2.55-11.47	-6.37-3.84	-6.59-18.71	-9.61-7.6	-6.12-3.01	-3.69-0.61	0.75-3.23	-0.73-3.03	0.67-1.67	0.71-2.09	-4.62-1.37	1.753-28	2.270-73	-2.54-1.97	-1.02-2.47	-1.05-7.11	1.390-82	-0.950-97	0.251-204	-2.80-56
Theta(105°)	-6.55-8	-3.74-10.4	-9.99-12.11	-17.62-8.66	-2.42-7.44	-13.5-8.2	-7.49-12.35	-13.01-13.13	-6.96-3.97	-3.23-0.09	2.05-0.3	2.07-1.13	-1.34-1.31	0.06-0.76	-2.03-1.29	-0.682-15	2.05-0.13	-2.23-3.76	-2.17-2.28	-5.95-3.76	-6.49-10.74	-2.66-1.71	-7.5-8.6	-4.65-2.99
Theta(112.5°)	-7.02-5.67	-4.21-18.44	-11.88-18.59	-18.11-12.85	-8.71-16.54	-13.46-11.24	-18.06-13.86	-7.96-10.21	-8.24-5.64	-4.590-5	0.9-0.06	2.23-3	-0.152	-0.70-2.2	-10.71-3.04	-10.03-14	-1.37-2.8	-7.55-4.27	-4.85-6.63	-0.84-4.76	-8.84-0.19	0.72-5.29	-6.83-4.91	-0.2-0.18
Theta(120°)	-6.4-96	-4.97-10.18	-11.88-18.38	-17.82-18.23	-13.62-16.59	-18.91-1.68	-9.96-10.44	-8.97-11.49	-7.13-5.87	-8.78-0.3	1.240-97	1.83-1.27	0.190-98	-0.320-1	-4.33-3.04	0.482-02	1.32-1.97	-8.05-3.68	-1.02-2.26	-4.79-2.26	-18.56-14.02	-8.04-10.11	-5.78-0.83	0.45-1.13
Theta(127.5°)	-3.38-8.57	-4.42-4.33	-12.49-11.17	-17.12-15.15	-14.06-12.34	-13.57-11.45	-12.38-12.93	-10.07-7.67	-3.550-28	1.082-65	1.90-62	3.421-77	-1.03-2.89	-2.030-08	-2.27-6.28	-16.23-14.64	-4.35-2.54	-10.71-6.35	-13.23-10.16	-11.26-7.24	-3.43-2.1	-0.19-0.66		
Theta(135°)	-9.29-10	-4.65-5.24	-5.12-3.62	-4.06-7.42	-18.38-18.37	-10.98-18.13	-17.53-11.13	-7.52-6.31	-7.03-7.7	-4.50-1.2	2.35-0.3	3.682-21	2.24-6.65	4.55-1.64	-13.21-2.21	-1.68-8.55	-5.46-13.65	-12.83-8.42	-9.44-14.67	-8.27-7.3	-6.81-9.82	-14.6-8.41	-2.2-2.1	
Theta(142.5°)	-6.96-9.66	-8.28-13.08	-14.89-15.9	-18.33-17.52	-18.64-12.83	-9.24-9.19	-11.58-12.63	-18.41-11.13	-6.51-7.13	-6.38-4.78	-4.98-9.04	0.91-3.38	-1.883-52	2.54-3.41	-12.73-10.08	-3.06-2.02	-8.89-8.29	-11.89-17.7	-11.25-4.42	-6.17-15.61	-10.56-10.96	-9.33-11.03	-13.24-8.99	-4.81-4.01
Theta(150°)	-13.13-17.46	-17.6-8.33	-6.74-10.88	-16.92-11.98	-9.01-8.55	-4.43-4.95	-6.2-9.69	-13.33-9.13	-3.8-0.64	-7.41-5.5	-6.53-1.94	-0.33-1.17	-1.011-37	2.21-0.03	-4.27-1.16	-6.77-7.68	-11.49-13.47	-18.51-16.62	-15.65-8.87	-6.38-13.58	-17.78-16.59	-18.83-8.49	-7.04-3.41	-5.07-10.1
Theta(157.5°)	-1.88-3.09	-4.86-4.43	-4.4-4.69	-5.98-9.82	-8.86-7.98	-7.54-7.13	-7.09-7.2	-8.03-5.22	-1.021-14	1.791-53	1.221-52	1.91-28	0.310-04	1.511-76	1.0-2.98	-7.9-7	-9.42-9.46	-10.63-11.78	-11.71-13.13	-17.85-15.17	-12.12-11.89	-18.94-13.73	-8.89-7.31	-5.17-2.37
Theta(165°)	-15.8-12.26	-10.41-10.53	-13.03-14.47	-14.94-14.72	-14.06-14.24	-13.16-12.22	-15.92-17.45	-15.95-9.77	-3.48-1.24	0.561-74	2.413-08	3.683-78	3.42-65	1.560-79	-0.25-1.98	4.51-6.84	-9.68-12.57	-12.14-10.62	-9.24-9.97	-10.35-12.9	-12.18-11.37	-12.84-12.06	-16.43-19.05	-18.93-18.8
Theta(172.5°)	-17.15-16.63	-17.58-13.88	-10.5-9.37	-7.3-7.72	-9.07-9.69	-10.53-11.02	-10.47-8.17	-5.55-3.71	-2.23-1.38	-1.09-1.29	-1.5-1.52	-1.22-0.81	-0.090-24	0.19-0.33	-0.89-1.51	-2.02-3.02	-5.12-6.83	-8.68-13	-18.66-15.47	-10.88-6.51	-5.15-5.27	-4.98-5.48	-7.32-7.52	-7.91-9.56
Theta(180°)	-15.21-14.03	-13.83-15.76	-18.03-14.06	-12.01-10.22	-9.61-9.9	-10.77-10.81	-11.17-12.9	-16.6-18.76	-17.49-18.37	-18.21-18.41	-17.83-13.61	-10.82-8.79	-6.88-5.85	-9.56-6.01	-5.62-8.47	-9.27-8.95	-10.01-11.29	-8.77-6.49	-5.17-4.21	-5.26-7.13	-8.42-11.44	-18.77-17.61	-18.77-17.61	
Freq(Hz)	6.475GPol.	ThetaAnt.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Phi(7.5°)	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°)	-13.38-10.09	-8.75-8.79	-7.56-5.67	-4.79-4.62	-4.13-2.85	-3.12-2.8	-2.34-2.63	-3.62-5.18	-5.97-7.25	-8.95-9.92	-10.94-11.89	-12.65-13.3	-13-10.53	-8.54-7.62	-5.8-5.1	-4.47-3.99	-3.69-3.26	-3.11-3.88	-4.82-5.19	-5.45-5.99	-9.91-6.68	-11.52-12.87	-13.18-14.14	
Theta(7.5°)	-13.32-10.31	-6.99-5.61	-6.72-6.3	-5.88-5.66	-6.57-5.86	-6.05-6.35	-8.25-8.61	-7.69-7.28	-7.59-7.24	-6.75-6.65	-8.56-9.94	-12.52-14.49	-14.12-11.05	-8.16-5.71	-4.22-2.75	-1.76-1.27	-1.47-1.69	-1.57-2	-2.07-2.06	-1.82-2.28	-4.47-3.32	-11.21-13.33	-14.73-14.91	-15.12-15.58
Theta(15°)	-18.91-11.51	-9.18-8.41	-7.48-9.83	-11.32-10.86	-11.06-11.21	-9.95-9.36	-11.49-15.86	-17.94-16.72	-18.2-18.94	-14.97-11.37	-9.27-8.55	-9.25-12.72	-12.8-8.5	-5.91-4.08	-3.32-2.8	-2.68-2.79	-3.36-3.81	-3.88-4.54	-4.63-3.83	-3.47-3.35	-4.26-6.94	-9.51-11.11	-14.32-15.24	-18.39-19.35
Theta(22.5°)	-19.44-14.62	-17.57-13.06	-16.66-8.94	-6.93-5.81	-4.54-4.47	-4.26-4.16	-3.88-4.83	-7.25-9.51	-12.94-17.64															



Radiated Composite Gain Data_6GHz

Appendix B

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(112.5°)	1.54/1.14	1.4/0.52	-7.25/-6.76	-3.28/-8.19	-8.5/-5.96	-4.61/-2.09	-1.8/-1.6	-1.83/-4.87	-1.87/-2.35	-1.99/-2.07	-1.34/-0.14	-3.98/-2.79	-7.29/-6.77	-9.2/-11.55	-5.8/-8.61	-16.98/-8.39	-3.95/-4.26	-2.44/-3.32	-6.1/-5.57	-9.99/-11.69	-7.71/-6.82	-6.02/-5.55	-7.6/-8.58	-3.56/-3.66
Theta(120°)	-0.06/0.01	1.28/-1.67	-11.83/-14.3	-5.96/-6.28	-10.93/-14.9	-10.53/-10.53	-9.33/-6.05	-6.3/-3.29	0.53/-0.58	-0.11/-0.32	-1.11/-0.66	-1.82/-4.66	-6.59/-9.01	-10.1/-10.97	-12.24/-10.12	-8.63/-7.15	-10.39/-16.02	-13.02/-13.58	-17.7/-12.76	-18.66/-15.93	-14.71/-16.97	-10.04/-10.77	-10.18/-6.77	-4.33/-1.71
Theta(127.5°)	-1.43/-0.59	-0.24/-2.5	-5.71/-9.95	-8.35/-7.28	-13.86/-16.49	-9.57/-13.15	-16.99/-7.51	-4.29/-3.99	-1.68/0.87	0.93/-0.3	-0.41/-1.19	-1.19/-2.68	-2.7/-8.88	-14.83/-13.35	-6.45/-3.66	-8.32/-7.82	-5.82/-10.18	-16.32/-13.92	-10.33/-5.17	-5.68/-16.18	-15.51/-12.67	-12.81/-12.53	-8.86/-7.01	-4.63/-4.45
Theta(135°)	-5.09/-5.31	-3.4/-3.96	-6.5/-10.95	-17.9/-18.11	-18.73/-8.98	-6.98/-8.29	-18.38/-11.84	-5.73/-3.62	-0.95/0.76	0.35/0.55	-0.36/-1.01	-1.66/-1.38	0.12/-2.9	-7.04/-11.36	-4.9/-6.1	-13.3/-10.54	-10.47/-11.28	-10.02/-6.44	-10.13/-11.06	-9.23/-15.28	-15/-16.92	-18.56/-10.83	-16.79/-13.14	-11.12/-11.35
Theta(142.5°)	-14.89/-9.4	-6.09/-10.04	-18.56/-14.52	-18.64/-15.45	-10.98/-6.05	-3.86/-4.76	-7.82/-15.49	-6.98/-1.33	0.47/0.72	0.98/0.71	0.27/-2.31	-4.25/-1.24	-3.61/-1.82	-7.45/-11.31	-8.25/-7.38	-8.24/-6.37	-9.35/-15.68	-9.84/-11.58	-13.54/-17.17	-5.01/-6.68	-13.43/-8.33	-7/-12.46	-9.67/-12.54	-11.17/-14.64
Theta(150°)	-5.57/-4.09	-4.53/-7.5	-6.99/-5.57	-12.77/-16.87	-9.56/-6.34	-4.11/-3.58	-5.65/-7.93	-5.39/-2.56	-1.43/-1.58	-2/-1.77	-1.88/-5.16	-6.68/-4.92	-4.89/-6.02	-7.73/-13.22	-8.53/-12.89	-18/-18.3	-14.34/-12.23	-18.58/-16.79	-12.73/-18.99	-15.7/-8.96	-11.2/-14.03	-10.04/-12.82	-9.67/-7.34	-6.99/-5.86
Theta(157.5°)	-1.88/-3.18	-4.57/-6.01	-8.31/-12.55	-16.52/-12.08	-8.09/-5.75	-4.92/-4.75	-6.25/-9.7	-13.83/-12.63	-10.14/-8.51	-7.61/-6.95	-6.1/-6.15	-6.58/-6.58	-5.57/-4.54	-5.02/-7.61	-10.34/-9.79	-5.43/-6.46	-11.94/-12.27	-13.03/-11.37	-10.58/-14.07	-19.26/-16.2	-14.05/-18.93	-18.3/-18.79	-9.33/-4.98	-3.1/-3.61
Theta(165°)	-10.34/-9.77	-8.73/-8.26	-9.84/-12.47	-13.89/-11.15	-9.14/-8.95	-10.41/-9.25	-7.65/-6.82	-7.33/-7.17	-6.61/-5.86	-4.63/-4.03	-4.64/-6.53	-8.56/-9.68	-10.84/-11.42	-12.21/-13.71	-11.75/-9.78	-10.99/-17.04	-18.89/-16.94	-12.63/-16.78	-17.73/-18.4	-12.46/-8.64	-7.69/-9.43	-13.4/-16.69	-13.01/-9.93	-9.13/-10.04
Theta(172.5°)	-14.24/-11.37	-10.71/-11.97	-11.4/-9.27	-8.76/-7.9	-7.92/-7.99	-8.08/-8.24	-6.69/-5.99	-5.68/-6.12	-6.76/-8.04	-9.51/-11.7	-11.95/-12.53	-13.34/-13.52	-14.31/-15.07	-15.15/-14.25	-13.66/-13.65	-14.01/-13.26	-12.1/-10.17	-9.83/-9.64	-11.1/-10.79	-10.61/-9.95	-10.75/-13.35	-17.71/-19.22	-17.77/-17.23	-16.22/-15.17
Theta(180°)	-12.87/-13.79	-14.13/-15.44	-16.16/-16.04	-16.73/-15.64	-17.01/-15.42	-14.08/-13.44	-12.98/-10.81	-9.77/-8.8	-7.54/-7.1	-7.2/-7.13	-7.52/-8.21	-7.94/-8.18	-9.33/-10.64	-12.98/-13.31	-12.9/-13.5	-14.96/-16.56	-17.04/-18.59	-17.72/-17.85	-18.36/-16.23	-14.21/-11.7	-9.74/-8.33	-7.45/-8.38	-10.83/-13.96	-13.36/-12.14
Gain	Phi(0°)Phi(7.5°)	Phi(15°)Phi(22.5°)	Phi(30°)Phi(37.5°)	Phi(45°)Phi(52.5°)	Phi(60°)Phi(67.5°)	Phi(75°)Phi(82.5°)	Phi(90°)Phi(97.5°)	Phi(105°)Phi(112.5°)	Phi(120°)Phi(127.5°)	Phi(135°)Phi(142.5°)	Phi(150°)Phi(157.5°)	Phi(165°)Phi(172.5°)	Phi(180°)Phi(187.5°)	Phi(195°)Phi(202.5°)	Phi(210°)Phi(217.5°)	Phi(225°)Phi(232.5°)	Phi(240°)Phi(247.5°)	Phi(255°)Phi(262.5°)	Phi(270°)Phi(277.5°)	Phi(285°)Phi(292.5°)	Phi(300°)Phi(307.5°)	Phi(315°)Phi(322.5°)	Phi(330°)Phi(337.5°)	Phi(345°)Phi(352.5°)
Theta(0°)	-4.4/-4.07	-4.32/-5.1	-6.7/-9.2	-10.37/-12.77	-13.13/-14.68	-15.04/-13.17	-12.71/-11.79	-11.21/-10.76	-9.84/-9.35	-8.45/-7.49	-6.82/-6.47	-5.79/-4.64	-4.38/-4.49	-4.47/-5.51	-6.78/-7.14	-7.8/-9.42	-12.12/-15.81	-17.69/-18.75	-18.92/-13.87	-11.6/-9.18	-7.01/-5.87	-5.32/-4.72	-4.44/-4.44	-3.71/-3.76
Theta(7.5°)	-4.22/-4.07	-4.03/-4.16	-4.71/-6.15	-7.69/-8.64	-9.45/-11.65	-12.77/-13.22	-12.77/-11.2	-9.66/-7.71	-6.33/-5.77	-5.01/-4.74	-3.72/-3.12	-3.37/-3.86	-3.7/-2.71	-3.87/-5.8	-7.14/-8.07	-7.73/-7.37	-7.29/-7.77	-8.76/-9.74	-9.42/-8.11	-7.5/-7.93	-7.18/-6.31	-6.15/-5.04	-6.76/-7.82	-6.87/-6.44
Theta(15°)	-4.3/-3.62	-3.32/-3.78	-5.07/-6.79	-8.34/-9.9	-11.31/-11.18	-11.13/-13.18	-13.29/-13.09	-13.12/-12.47	-12.15/-12.2	-11.22/-9.37	-7.98/-6.44	-4.74/-4.48	-4.7/-3.71	-3.28/-3.3	-4.48/-5.77	-6.24/-6.01	-6.34/-6.93	-8.3/-9.61	-10.67/-10.21	-8.76/-8.39	-8.19/-8.22	-8.19/-7.18	-6.26/-6.02	-6.03/-5.08
Theta(22.5°)	-10.48/-8.14	-7.95/-9.43	-11.43/-11.24	-11.21/-10.56	-9.38/-9.63	-9.62/-11.23	-12.29/-13.92	-13.51/-11.62	-10.93/-12.89	-18.57/-18.34	-15.01/-9.12	-7.94/-7.52	-6.35/-5.28	-6.63/-6.28	-7.85/-9.12	-9.67/-10.45	-12.38/-15.24	-16.69/-17.37	-17.86/-13.83	-11.64/-11.04	-9.58/-7.58	-7.51/-7.74	-7.76/-7.96	-10.09/-12.53
Theta(30°)	-18.36/-13.02	-10.08/-9.41	-7.84/-5.83	-6.12/-7.82	-11.15/-15.01	-15.25/-12.64	-10.7/-6.73	-6.38/-5.89	-5.24/-5.7	-8.72/-13.25	-14.58/-13.54	-12.31/-8.45	-5.37/-6.38	-6.67/-8.6	-11.5/-12.83	-13.04/-15.31	-15.23/-18.09	-18.62/-14.08	-12.7/-12.88	-18.3/-15.73	-10.28/-8.12	-7.14/-6.03	-10.01/-11.84	-14.12/-16.18
Theta(37.5°)	-13.21/-17.49	-14.31/-15.63	-14.9/-12.15	-11.59/-11.72	-11.22/-12.43	-14.63/-18.58	-18.36/-18.24	-17.81/-13.55	-11.39/-8.73	-6.81/-7.78	-5.81/-5.68	-6.49/-7.32	-8.6/-7.9	-6.75/-8.8	-12.52/-11.65	-14.16/-17.92	-17.19/-13.73	-11.32/-8.16	-11.93/-18.17	-18.91/-15.82	-13.58/-11.94	-10.95/-9.21	-8.75/-9.58	-7.05/-7.77
Theta(45°)	-14.35/-15.93	-17.86/-16.52	-11.48/-9.33	-9.91/-14.56	-17.78/-12.68	-10.06/-11.5	-13.9/-12.35	-10.33/-9.4	-6.65/-6.3	-6.51/-8.83	-10.55/-7.32	-4.58/-3.35	-4.68/-8.37	-8.2/-12.45	-13.05/-10.24	-11.68/-12.92	-9.54/-6.44	-6.19/-8.06	-8.53/-9.65	-12.11/-11.34	-12.39/-11.94	-9.74/-6	-5.07/-6.9	-5.41/-6.64
Theta(52.5°)	-16.11/-10.87	-13.01/-14.3	-8.5/-4.51	-4.52/-7.97	-12.5/-17.8	-17.66/-9.6	-7.66/-9.9	-8.04/-5.04	-3.76/-3.62	-5.13/-5.99	-6.28/-6.43	-3.22/-4.67	-9.66/-6.49	-11.53/-9.38	-10.48/-14.79	-15.05/-13.52	-10.8/-13.36	-14.18/-17.61	-13.27/-8.48	-5.75/-5.02	-5.29/-7.34	-8.44/-10.07	-6.94/-16.67	
Theta(60°)	-12.43/-8.62	-12.98/-8.95	-5.11/-4.51	-7.95/-9.44	-10.21/-10.81	-11.19/-11.64	-11.11/-13.17	-13.76/-13.39	-14.61/-9.03	-6.21/-4.7	-4.64/-5.52	-5.03/-6.49	-4.72/-4.56	-6.82/-5.02	-8.63/-9.95	-11.16/-15.99	-16.34/-14.71	-18.23/-17.96	-15.19/-18.26	-10.67/-7.34	-6.17/-4.58	-3.5/-5.36	-7.75/-18.76	-10.14/-14.85
Theta(67.5°)	-8.21/-5.07	-5.88/-3.85	-2.11/-3.1	-2.77/-4.26	-12.09/-12.04	-10.45/-12.02	-16.9/-19.23	-18.33/-17.73	-17.63/-6.07	-2.67/-3.01	-5.52/-7.52	-6.42/-6.08	-5.16/-5.51	-3/-3.7	-9.62/-12.14	-12.89/-17.27	-17.58/-16.05	-12.61/-13.13	-13.18/-18.54	-7.56/-5.6	-6.15/-8.23	-10/-8.48	-15.31/-13.57	-7.22/-14.9
Theta(75°)	-5.21/-5.88	-7.17/-3.93	-3.43/-2.59	-1.37/-1.74	-4.07/-8.03	-12.05/-18.73	-18.82/-17.91	-15.91/-15.4	-9.73/-10.38	-5.8/-2.06	-2.76/-8.1	-12.03/-11.75	-8.71/-3.81	-1.88/-1.52	-7.08/-13.66	-7.63/-6.24	-14.09/-12.27	-7.89/-12.17	-14.99/-14.79	-12.69/-9.95	-8.35/-10.89	-13.97/-9.03	-18.09/-11.51	-11.81/-11.3
Theta(82.5°)	-3.96/-3.86	-2.07/-2.74	-5.39/-2.6	-3.25/-9.87	-12.07/-9.41	-11.01/-17.5	-17.16/-19.09	-18.59/-12.16	-11.38/-11.78	-15.81/-22.22	-8.74/-7.08	-6.26/-7.93	-12.75/-13	-1.22/-1.11	-5.01/-13.6	-8.08/-4.53	-8.18/-17.74	-10.06/-17.45	-14.23/-16.57	-18.26/-14.26	-9.68/-13.4	-12.66/-10.74	-12.22/-5.15	-8.73/-8.46
Theta(90°)	-1.81/-3.62	-1.33/-2.35	-2.98/-1.6	-6.88/-10.2	-10.85/-16.44	-10.01/-13.29	-11.32/-8.85	-10.41/-11.99	-15.82/-12.74	-8/-8.8	-11.79/-17.74	-11.61/-6.08	-6.02/-9.66	-4.81/-5.23	-6.65/-11.55	-14.22/-8.66	-5.75/-5.28	-9.79/-7.08	-8.62/-13.24	-18.3/-10.8	-9.31/-17.92	-15.07/-9.6	-7.21/-6.63	-10.91/-4.25
Theta(97.5°)	-2.15/-0.76	-0.41/-4.52	-5.97/-6.25	-17.81/-12	-9.38/-19.04	-7.82/-7.63	-9.34/-7.72	-4.85/-5.68	-7.31/-17.94	-9.13/-5.46	-5.98/-7.43	-14.44/-11.43	-6.85/-8.15	-4.25/-1.03	-3.54/-6.45	-5.1/-5.94	-5.46/-7.17	-10.28/-13.28	-11.97/-17.44	-14.39/-9.76	-12.43/-8.14	-7.08/-6.98	-6.93/-4.97	-7.21/-2.66
Theta(105°)	-3.5/-2.14	-1.91/-4.34	-5.44/-10.6	-18.55/-18.82	-18.25/-11.46	-9.83/-14.56	-14.32/-6.93	-3.76/-5.09	-2.72/-7.39	-13.59/-10.38	-4.71/-3.06	-10.33/-13.38	-12.52/-4.49	-3.66/-4.74	-4.14/-4.84	-6.19/-33	-17.84/-17.78	-15.39/-19.01	-6.77/-11.94	-8.07/-6.9	-5.69/-5.95	-6.27/-9.76	-4.88/-2.63	
Theta(112.5°)	-6.26/-4.59	-4.28/-6.34	-12.34/-17.59	-9.5/-12.08	-8.78/-11.85	-11.53/-18.15	-12.79/-5.62	-7.2/-7.45	-2.47/-5.3	-7.53/-10.9	-6.29/-6.25	-5.09/-3.59	-6.55/-11.01	-10.19/-7.63	-8.87/-12.86	-15.12/-14.34	-11.54/-4.85	-8.06/-17.8	-16.11/-12.28	-5.83/-16.82	-4.84/-2.34	-3.58/-4.09	-2.8/-2.39	-0.51/-3.48
Theta(120°)	-9.76/-10.4	-9.57/-6.13	-9.84/-17.63	-18.46/-6.66	-5.16/-15.24	-17.85/-9.95	-10.77/-11.3	-13.58/-6.26	-4.52/-3.87	-3.4/-6.09	-5.45/-3.24	-4.63/-4.96	-6.18/-7.77	-6.03/-7.73	-8.12/-11.93	-10.19/-10.51	-10.19/-14.64	-6.04/-13.93	-9.72/-14.52	-13.47/-14.52	-1.08/-0.5	-7.16/-8.13	-4.65/-10.1	-0.62/-6.06
Theta(127.5°)	-3.43/-8.35	-8.05/-11.93	-14.72/-5.95	-3.5/-10.28	-16.41/-11.81	-9.36/-12.96	-12.48/-14.23	-8.14/-7.63	-5.26/-1.56	-1.42/-2.15	-2.51/-2.73	-3.62/-3.34	-6.26/-8.33	-3.91/-2.17	-4.95/-9.78	-13.6/-9.64	-17.73/-9.67	-18.48/-7.41	-13.19/-6.06	-4.73/-5.58	-7.58/-9.36	-3.34/-1.47	-1.79/-1.27	
Theta(135°)	-8.74/-10.16	-7.05/-12.72	-13.44/-8.04	-9.03/-12.25	-9.83/-5.22	-7.45/-13.22	-17.09/-10.46	-8.34/-8.61	-6.3/-3.86	-3.79/-4.22	-4.57/-4.07	-7.77/-5.9	-5.14/-5.64	-3.91/-1.21	-7.04									



Antenna Pattern_2.4GHz and 5GHz

Appendix C

θ (75°)	-2.78/0.75	1.53/-0.25	-2.08/3.04	-0.04/1.21	0.37/1.66	2.62/2.52	2.05/1.26	0.18/0.03	-0.36/-1.32	-1.41/0.50	1.11/-0.72	-1.60/-1.09	-2.67/-4.28	-2.10/-1.63	-2.09/-3.13	-3.62/-4.99	-7.90/-6.70	-3.47/-3.50	-4.11/-3.16	-3.96/-4.74	-3.63/-1.32	-0.20/0.51	1.42/0.44	-0.94/-2.93	
θ (82.5°)	-2.58/1.72	1.48/0.33	-2.37/-2.12	1.05/0.96	0.33/2.64	3.60/2.83	0.70/-0.27	1.33/1.19	-0.28/-1.07	-2.03/-0.85	0.02/-1.72	-1.46/0.28	-1.15/-5.14	-3.77/-2.18	-1.42/-2.65	-4.45/-3.69	-4.72/-4.52	-3.03/-2.83	-2.44/-3.25	-4.03/-5.34	-2.87/-0.12	1.14/0.44	-0.06/-2.49	1.63/-5.11	
θ (90°)	-2.40/0.52	1.49/-0.55	-3.58/-0.86	-0.09/-0.13	1.26/1.53	1.36/1.30	-0.95/-4.47	-4.21/-0.92	0.37/2.01	-3.93/-3.11	-0.29/-1.08	-0.20/-0.11	-4.52/-5.55	-7.47/-7.48	-3.67/-1.05	-1.36/-3.88	-2.98/-0.19	-0.02/-1.11	-2.53/-3.06	-2.71/-2.07	-0.74/0.78	0.89/0.44	0.60/1.50	-1.49/-6.91	
θ (97.5°)	-3.20/-0.72	1.87/-0.01	-0.65/1.05	1.93/0.88	0.78/0.72	-1.22/-1.80	-1.84/-9.30	-7.95/-2.54	-1.13/-3.07	-2.72/3.51	-1.12/0.32	-2.74/-0.53	-2.23/4.67	-5.38/-2.80	-0.98/1.72	1.30/0.59	0.48/1.45	2.53/-0.13	-2.18/-1.63	-1.53/-0.38	-2.18/-1.96	1.99/2.31	1.32/0.05	-2.13/-3.01	
θ (105°)	-4.49/-3.94	1.75/2.22	1.86/0.62	1.53/1.56	0.17/-3.55	-3.64/-1.89	-1.81/-4.23	-3.35/-3.96	-1.67/-2.78	-2.79/-6.43	-3.60/1.93	0.14/-3.45	-4.52/-1.93	-1.11/-0.12	2.02/2.15	2.46/2.26	1.40/1.06	0.64/0.62	0.34/-0.98	0.27/1.36	-0.58/0.29	2.38/2.29	0.79/2.25	2.47/0.12	
θ (112.5°)	-4.96/-0.69	2.29/0.01	0.62/-2.80	0.09/0.82	-1.20/-8.62	-4.75/-0.20	-0.89/-6.22	-4.15/-2.31	-3.62/-1.78	-4.27/4.70	0.74/2.69	0.76/-2.72	-6.89/-3.20	1.02/1.15	1.51/2.13	1.58/0.94	0.78/0.31	0.53/-0.46	-0.05/-1.04	-3.30/2.22	-1.88/0.16	-1.07/0.38	1.23/2.43	2.11/-9.22	
θ (120°)	-14.67/-1.06	2.79/3.51	0.17/-9.04	-5.86/-3.48	-2.49/-4.00	-9.57/-7.96	-5.23/-5.82	-6.40/-4.12	-2.42/-1.59	-2.87/-3.38	0.15/1.64	0.11/-0.98	-6.64/-10.19	-5.19/0.97	1.69/0.70	-0.54/-0.59	0.36/1.32	0.91/0.37	-0.54/-0.94	-0.28/2.12	1.32/-1.99	-1.54/1.83	4.00/2.61	-2.77/-9.77	
θ (127.5°)	-4.82/-1.24	0.59/1.62	-3.12/-10.77	-6.79/-5.36	-7.35/-3.65	-8.38/-13.90	-7.81/-3.06	-2.01/-1.99	-1.85/-2.38	-3.98/-1.81	1.63/2.22	-0.61/-3.56	-12.53/-7.78	-4.10/-1.58	1.43/1.80	-0.03/-3.40	-2.32/-0.67	-1.68/-3.43	-4.21/-0.98	2.43/1.39	-1.55/-2.71	-0.28/0.50	-0.34/-0.32	-4.31/-11.30	
θ (135°)	-0.48/-1.31	-4.06/-0.17	-4.07/-10.23	-16.01/-10.56	-10.43/-7.98	-10.43/-7.98	-5.58/-11.61	-8.18/-3.06	-3.83/-5.06	-3.81/-1.87	-7.58/-11.77	-2.70/0.16	-3.40/-5.77	-2.70/0.16	-3.40/-5.77	-2.70/0.16	-3.40/-5.77	-2.70/0.16	-3.40/-5.77	-2.70/0.16	-3.40/-5.77	-2.70/0.16	-3.40/-5.77	-2.70/0.16	-3.40/-5.77
θ (142.5°)	-4.38/-3.23	-1.77/-2.09	-7.60/-13.70	-7.30/-4.70	-4.89/-3.67	-4.62/-8.91	-8.37/-9.57	-7.97/-3.62	-2.31/3.31	-4.11/-2.39	-3.41/-2.84	-2.81/-5.29	-4.45/-6.87	-10.81/-6.61	-9.03/-5.08	-1.93/0.32	-0.84/-4.97	-6.47/-4.64	-2.39/-4.63	-14.78/-13.80	-6.17/-0.03	1.61/-0.75	-4.96/-10.79	-14.55/-9.61	
θ (150°)	-7.63/-8.19	-5.12/-1.25	-2.89/-10.06	-9.79/-6.29	-7.25/-8.38	-4.89/-4.60	-7.70/-11.99	-5.71/-2.96	-1.48/-0.21	0.47/0.07	-1.81/-3.50	-2.88/-4.09	-4.54/-3.51	-5.59/-8.87	-6.09/-4.59	-5.88/-4.52	-4.23/-5.11	-5.53/-4.86	-3.32/-2.90	-4.99/-7.53	-7.71/-6.86	-9.27/-9.95	-5.92/-6.33	-9.01/-10.12	
θ (157.5°)	-4.63/-4.91	-5.92/-6.60	-8.01/-7.29	-5.67/-5.20	-7.79/-12.57	-11.87/-10.61	-7.79/-12.57	-5.43/-5.82	-5.26/-4.18	-2.84/-1.53	-0.74/-1.51	-4.71/-8.92	-4.54/-1.25	-1.58/-4.77	-4.30/-4.80	-6.09/-7.80	-10.10/-7.30	-4.11/-3.63	-4.75/-6.39	-7.39/-8.58	-9.71/-11.65	-9.71/-11.65	-10.30/-11.43	-9.61/-6.09	
θ (165°)	-12.49/-11.01	-10.57/-9.06	-8.70/-8.63	-8.58/-8.46	-9.13/-12.10	-14.16/-12.09	-9.26/-8.62	-8.42/-9.59	-11.46/-11.14	-7.89/-6.50	-6.27/-6.72	-6.85/-5.15	-3.27/-2.31	-2.47/-3.54	-5.24/-6.03	-5.81/-5.50	-6.88/-9.91	-11.83/-11.34	-11.38/-12.34	-14.51/-15.60	-14.80/-10.63	-9.11/-9.69	-10.74/-12.79	-14.05/-14.24	
θ (172.5°)	-12.58/-13.22	-13.57/-12.23	-11.53/-10.63	-10.28/-10.78	-11.82/-13.37	-10.27/-10.78	-5.41/-5.44	-5.57/-6.44	-6.56/-6.70	-7.28/-8.28	-9.53/-9.41	-8.14/-6.33	-5.26/-5.15	-5.62/-6.34	-7.66/-9.73	-12.87/-13.87	-10.90/-8.61	-8.25/-9.38	-10.29/-8.38	-6.77/-6.38	-6.23/-6.09	-7.12/-8.53	-10.60/-13.16	-15.18/-15.34	
θ (180°)	-8.77/-8.75	-9.57/-9.49	-9.34/-9.29	-9.70/-9.24	-7.10/-5.95	-6.54/-6.57	-6.49/-6.45	-5.99/-5.93	-6.66/-6.52	-6.10/-5.99	-6.32/-6.78	-7.15/-7.30	-7.09/-6.96	-6.87/-6.80	-7.06/-7.34	-7.45/-7.83	-8.23/-8.52	-8.65/-8.16	-7.66/-8.63	-9.32/-9.71	-10.21/-10.57	-11.06/-11.78	-12.38/-10.95	-9.75/-9.92	
Freq(Hz)	5.785GPol.	TotalAnt 2	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	
Gain	Φ(0°)Φ(7.5°)	Φ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)	
θ (0°)	-3.76/3.99	-3.98/3.98	-4.91/6.13	-6.53/5.34	-4.83/-5.25	-5.50/-5.30	-5.24/5.87	-7.04/7.18	-6.54/6.31	-6.94/7.43	-6.89/6.14	-5.97/-5.99	-5.82/5.65	-5.59/-5.76	-5.35/5.33	-5.59/-5.76	-5.32/5.22	-4.71/-4.09	-4.58/-5.32	-5.32/5.17	-5.33/5.17	-5.94/6.46	-6.06/5.81	-5.35/5.50	
θ (7.5°)	-3.14/2.96	-2.84/2.57	-2.87/2.99	-3.09/2.94	-2.45/2.75	-2.86/3.57	-3.92/3.69	-4.80/4.67	-4.70/4.55	-4.83/-5.15	4.71/4.11	-4.29/4.87	-5.41/6.35	-7.04/7.98	-9.04/9.76	-9.48/9.56	-9.94/10.99	-11.44/-10.72	-10.06/-11.96	-13.90/-12.50	-10.86/9.18	-8.73/-8.19	-6.69/5.43	-5.03/-4.62	
θ (15°)	-3.25/3.58	-3.97/4.09	-4.70/-2.55	-5.84/-6.26	-5.81/-6.38	-6.79/-4.89	-4.16/-3.89	-4.29/4.87	-4.70/-4.53	-5.66/-5.44	-5.04/-4.21	-3.65/-3.68	-3.96/5.42	-5.19/6.07	-7.77/8.64	-8.54/7.24	-6.77/5.74	-4.59/4.72	-5.14/-0.58	-5.56/-6.45	-8.16/-10.50	-11.51/-10.12	-7.84/-6.13	-4.72/3.51	
θ (22.5°)	-3.25/3.62	-3.92/4.75	-5.50/-6.28	-6.04/-6.13	-6.35/-5.22	-4.74/-5.10	-4.63/4.91	-2.88/2.51	-3.40/-3.93	-4.46/4.84	-5.64/6.95	-4.40/4.87	-4.62/3.57	-4.62/3.57	-4.62/3.57	-4.62/3.57	-4.62/3.57	-4.62/3.57	-4.62/3.57	-4.62/3.57	-4.62/3.57	-4.62/3.57	-4.62/3.57	-4.62/3.57	
θ (30°)	-4.58/4.15	-3.76/4.33	-5.90/-5.22	-4.21/4.47	-5.57/6.69	-5.84/4.95	-4.18/4.85	-6.56/7.23	-7.84/7.86	-7.31/6.17	4.98/5.63	-7.36/8.13	-6.43/4.80	-3.96/4.50	-4.78/3.61	-2.70/2.40	-2.29/1.96	-2.11/2.08	-1.58/-1.33	-1.45/-1.77	-2.40/-2.89	4.11/6.27	7.36/5.51	-4.36/4.49	
θ (37.5°)	-3.91/3.80	-2.26/2.36	-1.80/-2.21	-1.56/-2.21	-1.29/-0.42	-0.06/-0.72	-1.32/2.46	-3.91/4.64	-4.18/-3.86	-4.34/-5.11	-4.44/-5.02	-6.88/-8.75	-5.26/-3.13	-1.66/3.13	-4.72/4.31	-3.00/2.28	-2.14/2.56	-2.46/-3.03	-3.30/-3.33	-2.94/-2.33	-2.42/3.71	-6.63/6.08	-3.28/-3.22	-2.85/2.74	
θ (45°)	-2.50/-2.47	-2.74/1.71	-1.86/3.18	-3.69/2.82	-1.47/0.35	0.36/0.38	-1.30/1.10	-2.47/4.47	-8.83/13.27	-9.89/8.94	-10.99/6.53	-5.20/5.57	-4.48/2.78	-4.00/4.70	-4.30/2.98	-3.06/3.84	-3.95/3.29	-2.21/2.69	-3.17/2.84	-2.92/4.09	-4.25/4.24	-1.07/0.46	-1.17/0.46	-1.39/4.10	
θ (52.5°)	-5.41/5.26	-2.01/1.34	-3.26/4.03	-2.85/1.67	-0.92/0.72	-0.54/0.31	-0.90/3.55	-10.66/7.50	-5.63/6.76	-6.29/5.77	-8.19/10.31	-10.79/3.15	-0.70/1.27	-3.32/5.61	-5.48/5.00	-5.02/5.58	-6.42/6.08	-6.36/5.23	-4.82/3.50	-1.71/1.30	-3.31/7.43	-8.23/2.93	-0.21/0.27	-2.02/3.95	
θ (60°)	0.07/0.58	-1.23/2.05	-2.58/2.86	-4.14/4.22	-3.04/2.34	-2.02/0.06	0.70/0.75	-2.69/3.54	-2.24/-1.59	-2.62/3.43	-4.67/5.50	-5.86/6.00	-2.05/5.00	-3.10/6.13	-8.14/9.73	-8.62/7.46	-7.69/9.06	-9.92/6.04	-2.97/1.65	-2.03/-3.14	-4.30/5.40	-5.61/4.38	-1.08/-1.34	-5.85/2.74	
θ (67.5°)	-0.40/2.93	-3.53/-10.09	-15.45/12.46	-9.49/-5.93	-6.42/6.10	-3.49/-1.74	0.09/0.99	0.42/1.35	-1.36/0.17	0.41/0.77	-0.53/-1.01	-2.66/4.72	-1.21/1.49	-4.10/6.12	-6.61/6.96	-9.46/10.42	-6.67/2.96	-2.70/3.63	-4.54/4.55	-2.77/2.21	-9.21/7.70	-5.08/4.72	-2.99/0.60	-2.29/0.60	
θ (75°)	-5.50/3.12	-1.91/4.56	-4.38/9.05	-4.73/0.39	0.31/0.02	1.09/1.43	0.87/0.59	1.59/0.75	-1.35/1.07	0.26/1.20	0.28/0.63	0.37/2.35	-3.47/3.58	-2.64/1.69	-3.36/6.17	-5.79/6.46	-10.79/8.40	-4.75/3.48	-2.81/2.67	-3.71/4.45	-5.25/8.53	-5.45/1.63	-2.31/4.22	-1.73/0.54	
θ (82.5°)	-8.22/3.25	-2.09/1.45	-0.93/2.83	0.82/2.04	1.44/2.30	3.42/3.31	1.61/3.99	0.18/1.12	-4.21/5.21	-3.08/2.44	-2.25/0.32	-0.72/3.05	-6.88/6.47	-3.31/3.10	-3.64/5.05	-3.34/3.60	-7.00/4.63	-1.67/2.38	-2.21/2.34	-4.50/9.42	-6.54/0.73	-0.21/0.16	-1.33/2.59	0.71/1.70	
θ (90°)	-10.74/2.94	-1.38/0.40	-2.62/2.43	-1.05/2.51	-1.16/1.35	2.14/2.04	0.17/2.93	-6.04/4.03	-4.19/6.99	-9.77/5.98	-2.32/5.05	-2.60/1.89	-4.74/6.74	-7.65/8.03	-3.88/0.94	-2.64/5.29	-2.65/0.91	-0.22/0.79	-2.19/4.90	-7.52/3.49	-1.85/0.15	0.90/0.81	-0.15/2.04	0.18/12.05	
θ (97.5°)	-3.87/1.98	-0.74/0.56	-1.51/0.61	-0.67/1.41	0.73/1.49	0.01/3.24	-3.20/3.83	-10.03/7.77	-4.21/8.09	-4.98/4.63	-0.59/1.25	-3.53/0.09	-4.08/-11.70	-8.44/3.90	-10.10/0.48	-1.16/2.82	-0.52/1.76	-1.20/0.55	-3.70/4.01	-6.17/2.68	0.44/0.35	-0.66/2.44	1.67/0.54	-6.63/6.79	
θ (105°)	-1.53/2.64	1.54/3.19	1.57/1.93	2.74/2.12	1.07/1.53	-5.14/8.62	-6.07/3.16	-3.62/4.66	-5.40/6.93	-3.01/2.47	-1.15/0.84	0.00/1.51	-3.00/3.49	-3.81/2.51	0.81/1.02	0.67/0.02	-0.90/1.80	2.08/3.45	-1.76/1.76	-1.49/1.31	-1.85/0.70	0.77/2.87	1.97/1.28	-1.37/1.38	
θ (112.5°)	-7.06/1.38	1.65/1.69	1.48/0.40	0.71/0.98	-0.30/5.47	-8.96/1.74	-1.87/1.84	-3.91/1.25	-1.87/1.04	-1.01/1.79	0.35/2.69	1.96/2.51	-6.86/2.51	0.43/0.73	1.80/2.64	1.11/1.40	-1.72/1.57	-2.98/3.43	-2.53/0.68	-0.36/0.62	1.02/0.59	0.13/1.21	0.86/0.99	2.22/4.68	
θ (120°)	-2.91/0.61	0.23/1.52	0.74/2.93	-3.72/4.03	-1.75/4.01	-1.21/3.46	-2.22/5.61	-7.44/1.88	-0.65/0.22	-2.87/2.61	0.53/0.90	1.97/0.54	-5.11/8.97	-0.49/1.77	0.98/0.16	-1.14/3.22	-5.05/1.91	-0.02/0.20	-0.13/0.52	-2.59/0.36	-1.05/0.70	0.36/1.72	0.67/1.56	0.24/6.88	
θ (127.5°)	-2.48/1.41	-1.91/1.81	-5.01/7.56	-10.37/7.67	-4.83/3.38	-10.77/9.23	-2.98/0.84	-1.49/-1.98	-0.44/0.54	-1.66/1.47	2.01/2.02	1.40/1.10	-6.79/6.62	-3.97/0.7											