

**1. Antenna Composite Gain Test Report**

Equipment	Indoor Wi-Fi 7 2x2 Tri-Band Enterprise Access Point
Brand Name	LITEON
Model Name	WPB8326
Applicant	LITE-ON TECHNOLOGY CORP. 22 F., No. 392, Ruiguang Rd., Neihu Dist., Taipei City 114753, Taiwan (R.O.C.)
Manufacturer	LITE-ON TECHNOLOGY CORP. 22 F., No. 392, Ruiguang Rd., Neihu Dist., Taipei City 114753, Taiwan (R.O.C.)
Standard	KDB 662911 D03 v02
Sample Received	Apr. 25, 2025
Start Test Date	May 06, 2025
Final Test Date	May 06, 2025


Approved by: Jackson Tsai**SPORTON INTERNATIONAL INC. Hsinhua Laboratory**

No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)



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History of this test report

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2. Operation Mode and Antenna Information

Antenna Position	RF Port	Brand Name	Model Name	Ant. Type	Connector	Modes of Operation
2G 5GAnt1	1	LITEON	20301-004290A000	PIFA	I-Pex	2.4G+5G
2G 5GAnt2	2	LITEON	20301-004290A000	PIFA	I-Pex	2.4G+5G

Note:

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

2G 5GAnt1~2G 5GAnt2 could transmit/receive simultaneously.

3. Table for Multiple Listing

Table for Explanation of 2nd Source

Object/part or Description	Location	main source	2nd source
Ethernet IC	GU7	Realtek, RTL8251B-CG	Realtek, RTL8251B-VB-CG
DDR	U4	NANYA, NT5AD512M16C4-JR	MICRON, MT40A512M16TB-062E:R

4. 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
5850-5895	5885

5. Testing Location

Test Lab. : Sporton International Inc. Hsinhua Laboratory				
☒ Wen 33rd.St.	ADD:	No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)		
	TEL:	886-3-318-0787	FAX:	886-3-318-0287
Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
Radiated	05CH03-HY	Rofy Chen	23.5~24.5°C / 45~55%	06/May/2025

Note:

Testing Site Information

Brand Name: TDK

Dimension: 11m*6m*6m

Characteristic: Fully Anechoic Chamber

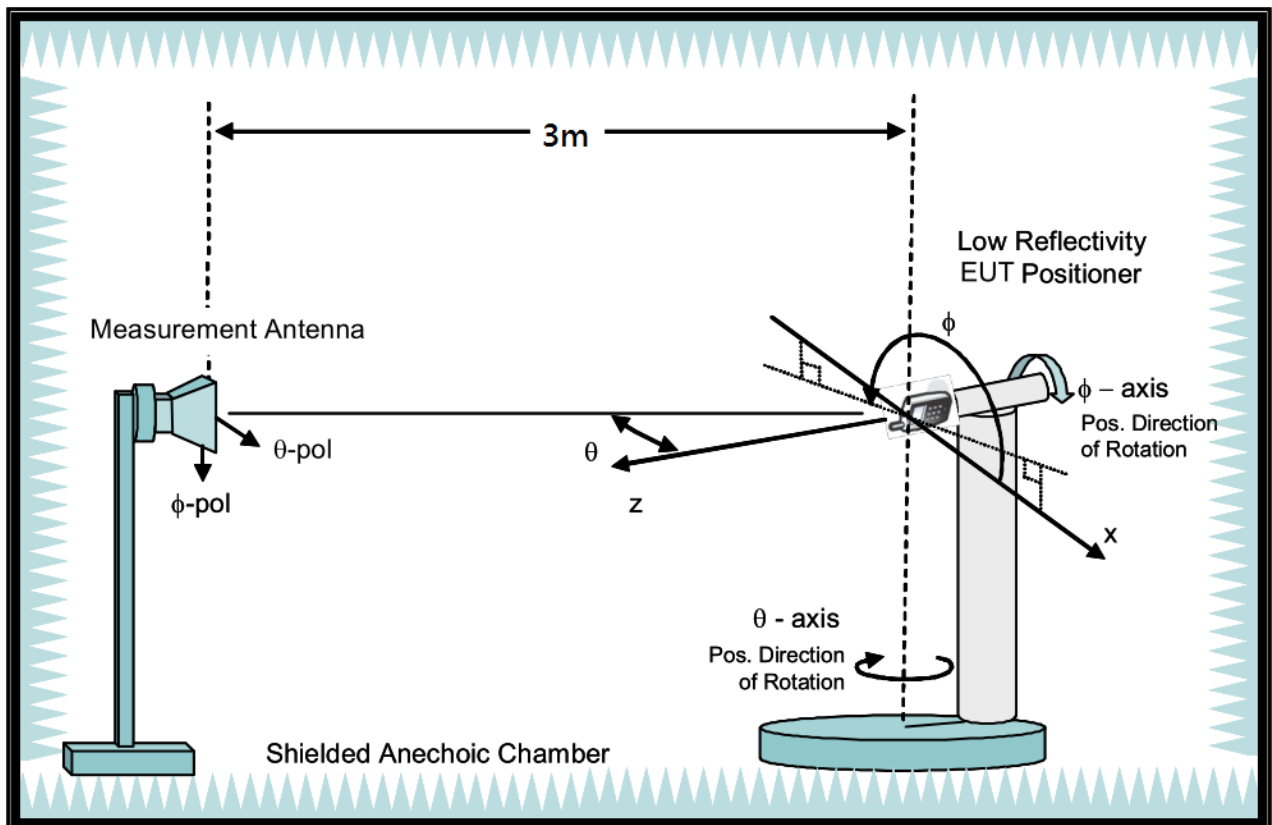
6. Test Facility and Configuration

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

Chamber: Fully Anechoic Chamber.

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

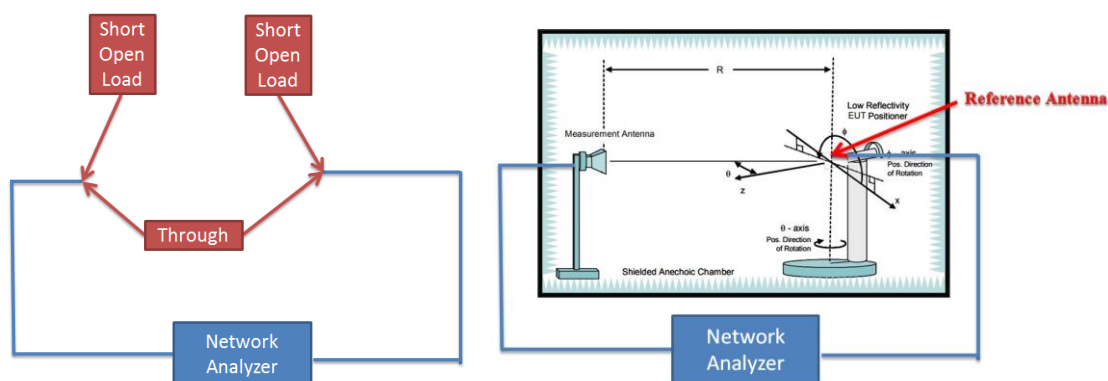
#Reference to CTIA "ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1"



7. 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	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.

Factor = gain factor + power gain conversion= (Reference antenna gain)-(G reading)



8. 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 9 tables.

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

9. Measured Values and Calculation of Maximum Gain Positions

DG_1SS max value position

Frequency (Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 (dBi)	3.29	2.77	2.7	2.96	4.29
Ant. 2 (dBi)	3.19	3.47	3.66	5.4	4.69
DG [1SS] (dBi)	6.25	6.14	6.2	7.28	7.5
Polarization	Theta	Theta	Theta	Theta	Theta
$\Theta(^{\circ})$	60	60	67.5	67.5	67.5
$\Phi(^{\circ})$	165	75	67.5	60	67.5

Note: The DG 1SS max value position is the maximum value of section 13 table DG 1SS Result.

DG_1SS max value position calculation

Frequency (Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 [$10^{(G/20)}$]	$10^{(3.29/20)}$	$10^{(2.77/20)}$	$10^{(2.7/20)}$	$10^{(2.96/20)}$	$10^{(4.29/20)}$
Ant. 2 [$10^{(G/20)}$]	$10^{(3.19/20)}$	$10^{(3.47/20)}$	$10^{(3.66/20)}$	$10^{(5.4/20)}$	$10^{(4.69/20)}$
Ant. 1 [$10^{(G/20)}$] value	1.46	1.376	1.365	1.406	1.639
Ant. 2 [$10^{(G/20)}$] value	1.444	1.491	1.524	1.862	1.716
Sum All Antenna [Amax]	2.904	2.867	2.889	3.268	3.355
DG [$10 \cdot \log(A_{max}^2/N_{ant})$]	6.25	6.14	6.2	7.28	7.5

Note:

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

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

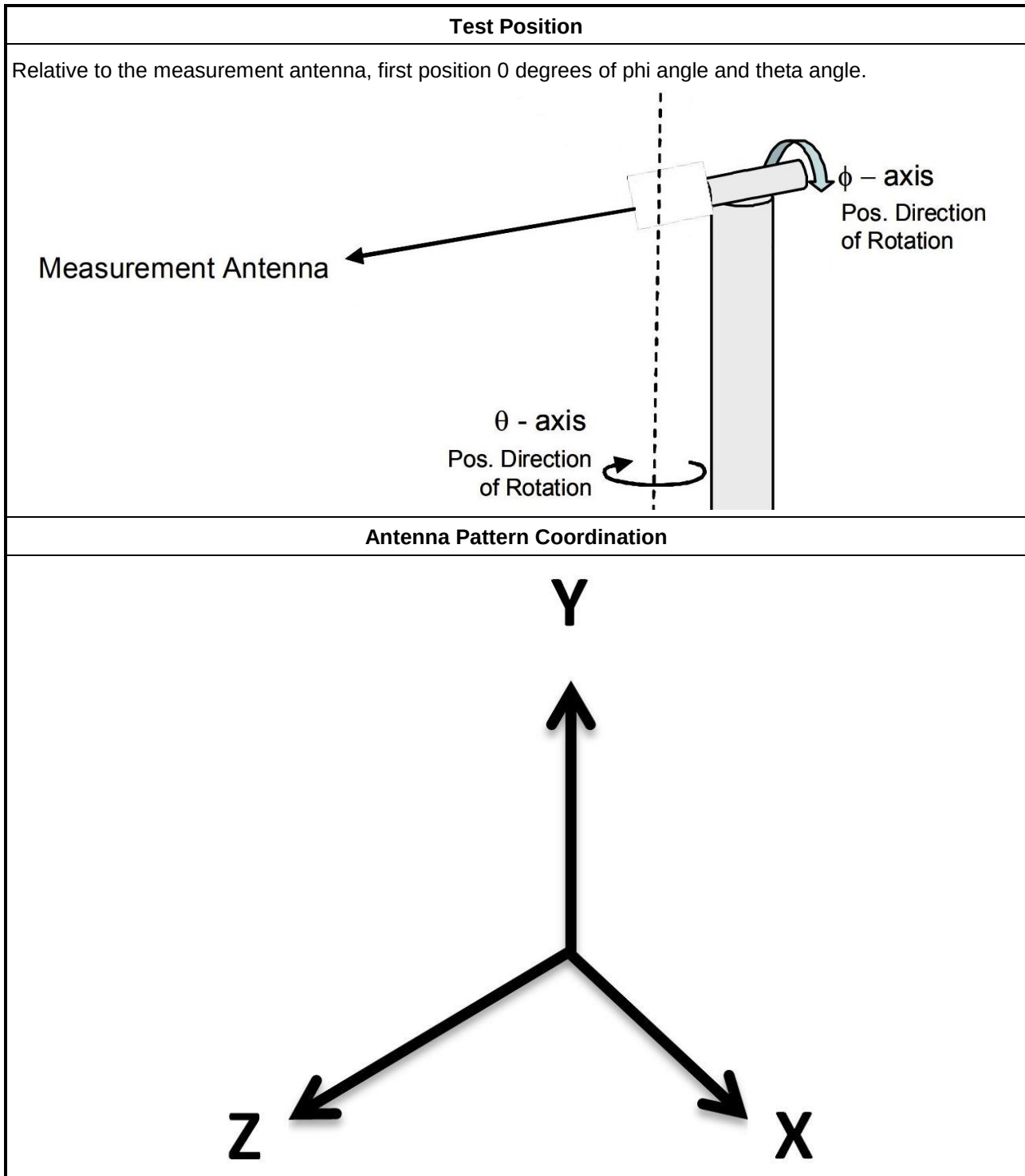
**10. Summary of Test Result**

Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	3.76	3.47	4.03	4.42	4.75
Ant. 2 Max Gain (dBi)	3.29	4.12	4.45	5.58	5.38
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/60/172.5	Theta/52.5/127.5	Theta/52.5/135	Theta/75/217.5	Theta/60/67.5
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/60/157.5	Theta/60/60	Theta/67.5/45	Theta/67.5/52.5	Theta/75/60
Max Gain (dBi)	3.76	4.12	4.45	5.58	5.38
DG [1SS] (dBi)	6.25	6.14	6.2	7.28	7.5
DG [2SS] (dBi)	3.76	4.12	4.45	5.58	5.38

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. If directional gain is less than max gain, use max gain as directional gain. Refer to KDB662911D01 (F) (2) (e) (ii).
4. Directional Gain (2SS) = Directional Gain (1SS) – 3dB

11. Test Setup



Note:

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



12. 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	NCR.	NCR
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	NCR.	NCR
Multi-axis positioner	Sporton	MAPS01	MAPS01-001	Theta / Phi axis	NCR.	NCR
Test Software	SPORTON	SENSE-RDG	V1.0.8	-	NCR.	NCR

Note: Calibration Interval of instruments listed above is one year.

NCR means Non-Calibration required.



13. Test Results

Please refer to the appendix.

Appendix A – Radiated Composite Gain of 2.4GHz/5GHz.....	Page 13
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Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	3.76	3.47	4.03	4.42	4.75
Ant. 2 Max Gain (dBi)	3.29	4.12	4.45	5.58	5.38
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/60/172.5	Theta/52.5/127.5	Theta/52.5/135	Theta/75/217.5	Theta/60/67.5
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/60/157.5	Theta/60/60	Theta/67.5/45	Theta/67.5/52.5	Theta/75/60
Max Gain (dBi)	3.76	4.12	4.45	5.58	5.38
DG [1SS] (dBi)	6.25	6.14	6.2	7.28	7.5
DG [2SS] (dBi)	3.76	4.12	4.45	5.58	5.38



Radiated Composite Gain Data of 2.4GHz/5GHz

Appendix A

DG 1SS Result

Freq(Hz)	2.45G/Pol.	Phi-L	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-		
DG(dB)	Φ(0°)/Φ(7.5°)	Φ(15°)/Φ(22.5°)	Φ(30°)/Φ(37.5°)	Φ(45°)/Φ(52.5°)	Φ(60°)/Φ(67.5°)	Φ(75°)/Φ(82.5°)	Φ(90°)/Φ(97.5°)	Φ(105°)/Φ(112.5°)	Φ(120°)/Φ(127.5°)	Φ(135°)/Φ(142.5°)	Φ(150°)/Φ(157.5°)	Φ(165°)/Φ(172.5°)	Φ(180°)/Φ(187.5°)	Φ(195°)/Φ(202.5°)	Φ(210°)/Φ(217.5°)	Φ(225°)/Φ(232.5°)	Φ(240°)/Φ(247.5°)	Φ(255°)/Φ(262.5°)	Φ(270°)/Φ(277.5°)	Φ(285°)/Φ(292.5°)	Φ(300°)/Φ(307.5°)	Φ(315°)/Φ(322.5°)	Φ(330°)/Φ(337.5°)	Φ(345°)/Φ(352.5°)
Θ(0°)	-0.19/-0.16	-0.07/-0.25	-0.44/-0.75	-1.25/-2.04	-2.32/-2.26	-1.41/-0.83	-0.36/-0.05	0.47/0.75	0.88/0.85	0.71/0.38	-0.14/-0.75	-0.92/-0.57	-0.2/0	0.04/-0.11	-0.39/-0.78	-1.35/-1.85	-1.72/-1.38	-0.68/-0.15	0.33/0.74	0.97/1.05	1.02/0.88	0.51/0.08	-0.36/-0.59	-0.5/-0.31
Θ(7.5°)	-0.14/-0.04	-0.05/-0.15	-0.41/-0.74	-1.27/-1.81	-1.54/-1.07	-0.63/-0.39	-0.26/-0.11	0.07/0.2	0.21/0.16	0.02/-0.25	-0.58/-0.75	-0.63/-0.34	-0.12/-0.04	-0.12/-0.34	-0.67/-1.12	-1.78/-2.54	-2.47/-2.1	-1.13/-0.39	0.22/0.69	0.99/1.14	1.17/1.05	0.70/0.18	-0.48/-0.91	-0.73/-0.39
Θ(15°)	-0.12/0	-0.04/-0.28	-0.71/-1.27	-1.98/-1.9	-1.68/-1.11	-0.68/-0.34	-0.08/0.09	0.15/0.05	-0.21/-0.58	-1.02/-1.51	-1.87/-1.72	-1.12/-0.61	-0.42/-0.44	-0.63/-0.89	-1.21/-1.65	-2.27/-2.96	-3.34/-2.47	-1.43/-0.64	-0.15/0.12	0.2/0.21	0.19/0.07	-0.23/-0.78	-1.12/-1.22	-0.9/-0.42
Θ(22.5°)	-0.3/-0.09	-0.19/-0.56	-1.2/-1.97	-2.74/-2.74	-2.97/-2.47	-1.81/-1.04	-0.30/-27	0.56/0.47	-0.05/-0.86	-1.84/-2.78	-3.52/-3.1	-2.68/-1.98	-1.68/-1.63	-1.74/-1.92	-2.19/-2.55	-2.93/-3.23	-2.98/-2.22	-1.61/-1.29	-1.29/-1.56	-1.92/-2.19	-2.25/-2.25	-2.36/-2.12	-2.22/-1.99	-1.29/-0.72
Θ(30°)	-0.75/-0.38	-0.43/-0.95	-1.78/-2.81	-3.98/-4.61	-5.29/-5.2	-3.96/-2.42	-0.99/0.17	0.91/1.04	0.47/-0.74	-2.5/-4.3	-5.56/-5.74	-4.71/-4.32	-3.86/-3.95	-3.57/-3.51	-2.63/-3.79	-3.83/-3.65	-3.09/-2.6	-2.45/-2.64	-3.14/-3.94	-4.94/-5.57	-5.5/-5.03	-4.42/-3.91	-3.72/-3.1	-2.25/-1.42
Θ(37.5°)	-1.68/-1.08	-1.17/-1.86	-3/-4.28	-5.66/-7.23	-7.94/-8.27	-6.6/-4.27	-2.09/-0.3	0.87/1.21	0.64/-1.01	-3.82/-7.03	-8.79/-8.33	-7.26/-6.57	-6.51/-6.42	-6.42/-5.96	-5.92/-5.82	-5.33/-4.3	-3.39/-3.34	-3.93/-4.87	-5.83/-6.52	-6.88/-7.29	-7.82/-7.9	-7.19/-6.11	-5.3/-4.66	-3.63/-2.59
Θ(45°)	-3.23/-2.52	-2.67/-3.68	-5.31/-7.07	-8.47/-9.6	-10.39/-10.37	-9.22/-6.56	-3.84/-1.45	0.2/0.3	0.31/-1.69	-5.6/-11	-11.84/-10.11	-8.37/-7.46	-7.56/-8.84	-9.98/-8.82	-7.98/-8.33	-7.9/-5.39	-3.38/-3.16	-4.37/-6.29	-7.79/-7.92	-7.25/-7.02	-7.75/-9.1	-9.26/-8.29	-7.45/-6.76	-5.56/-4.3
Θ(52.5°)	-5.28/-4.63	-4.85/-6.28	-8.88/-11.31	-11.08/-10.11	-10.11/-10.36	-9.36/-7.82	-6.17/-3.64	-1.46/-0.58	-1.23/-3.9	-8.37/-9.05	-8.07/-8.53	-7.52/-7.58	-8/-11.23	-12.97/-9.12	-7.13/-9.26	-4.14/-3.47	-4.72/-6.64	-7.81/-7.47	-6.69/-6.51	-7.56/-9.47	-9.78/-8.79	-8.2/-8.05	-7.92/-8.05	-7.88/-6.44
Θ(60°)	-7.3/-6.28	-6.35/-8.13	-11.9/-12.56	-10.89/-8.16	-7.74/-7.97	-7.84/-7.11	-7.84/-6.18	-5.05/-3.25	-3.08/-4.14	-5.14/-5.7	-3.98/-5.82	-6.61/-6.61	-6.3/-8.62	-15.43/-8.38	-4.31/-4.63	-8.94/-9.78	-5.82/-4.89	-6.44/-7.53	-7.33/-7.37	-7.84/-8.61	-9.92/-11.88	-12/-10	-9.2/-8.17	-9.65/-9.06
Θ(67.5°)	-9.96/-7.87	-7.79/-9.94	-14.04/-13.68	-10.34/-8.14	-7.53/-7.58	-6.96/-6.58	-8.35/-12.65	-7.71/-3.59	-2.38/-3.26	-4.65/-4.13	-3.84/-6.66	-6.18/-4.07	-2.73/-5.09	-14.85/-8.96	-3.62/-3.64	-8.06/-9.33	-5.93/-5.91	-8.01/-8.36	-6.57/-6.71	-8.96/-9.97	-10.72/-10.42	-12.39/-12.73	-11.12/-10.43	-12.79/-13.19
Θ(75°)	-12.24/-10.51	-10.98/-13.79	-15.82/-13.75	-9.92/-7.81	-7.21/-7.43	-6.85/-5.81	-7.13/-9.13	-8.37/-4.06	-3.36/-5.37	-6.58/-3.82	-2.58/-5.53	-6.89/-3.18	-1.71/-3.46	-10.29/-8.46	-2.68/-2.38	-6.4/-9.9	-7.9/-8.18	-11.5/-9.29	-6.39/-6.67	-10.14/-9.74	-8.97/-8.69	-10.25/-12.83	-12.5/-10.61	-11.35/-13.56
Θ(82.5°)	-14.44/-14.74	-15.84/-14.26	-12.46/-8.72	-6.42/-5.58	-6.32/-7.88	-7.09/-5.74	-6.99/-12.35	-10.33/-5.17	-4.41/-5.56	-4.46/-1.65	-0.84/-3.55	-7.08/-3.92	-2.63/-4.65	-11.07/-6.6	-2.03/-1.97	-5.39/-7.94	-7.09/-8.39	-11.65/-9.49	-6.68/-7.26	-11.58/-10.22	-8.53/-8.55	-10.09/-12.83	-14.29/-12.06	-10.95/-12.18
Θ(90°)	-12.74/-13.91	-15.89/-14.78	-13.14/-9.67	-7.36/-6.59	-7.24/-8.18	-6.31/-4.53	-5.66/-9.51	-10.89/-5.3	-4.11/-5.43	-5.13/-2.09	-1.08/-3.32	-6.8/-4.07	-2.16/-3.27	-8.62/-8.62	-3.49/-2.77	-5.57/-8.31	-7.33/-8.37	-11.93/-9.18	-7.08/-8.13	-13.57/-11.59	-8.28/-8.16	-8.75/-10.35	-12.08/-11.65	-11.27/-12.2
Θ(97.5°)	-10.99/-10.83	-12.7/-14.12	-13.34/-10.57	-7.85/-6.14	-6.01/-7.14	-6.02/-4.28	-5.37/-9.76	-13.66/-6.7	-5.34/-6.6	-5/-1.8	-1.16/-1.49	-8.64/-4.53	-2.57/-4.45	-9.65/-6.98	-2.72/-2.18	-10.05/-11	-13.44/-8.85	-8.52/-10.76	-15.51/-12.43	-9.18/-9.02	-8.61/-10	-10.93/-9.74	-9.61/-11.7	
Θ(105°)	-11.53/-11.5	-11.9/-13.85	-12.91/-11.65	-10.02/-9.62	-10.46/-13.07	-10.03/-6.99	-7.67/-10.94	-10.93/-6.32	-4.77/-7.11	-6.05/-2.67	-1.93/-5.06	-10.58/-4.62	-2.36/-3.75	-7.56/-8.31	-4.85/-3.96	-6.82/-10.82	-12.66/-13.73	-15.33/-14.61	-11.48/-12.63	-15.63/-11.83	-9/-8.8	-9.02/-8.55	-8.63/-7.89	-7.18/-9.03
Θ(112.5°)	-10.14/-10.48	-10.84/-13.2	-13.02/-10.5	-9.54/-9.45	-9.69/-9.84	-7.96/-7.25	-7.61/-9.35	-10.33/-8.56	-8.31/-8.63	-5.89/-2.41	-1.44/-3.79	-7.1/-4.87	-3.81/-5.65	-10.13/-10.25	-5.14/-12	-5.1/-6.49	-8.48/-10.01	-9.65/-9.98	-6.54/-8.23	-13.28/-14.31	-11.33/-10.01	-9.61/-9.46	-10.7/-10.81	-8.93/-8.79
Θ(120°)	-6.31/-6.75	-7.9/-10.83	-12/-9.29	-6.75/-5.85	-6.37/-8.41	-10.12/-10.3	-9.9/-12.73	-13.15/-10.46	-7.45/-6.3	-5.21/-2.36	-1.6/-4.22	-8.72/-6.14	-4.27/-6.69	-7.86/-9.33	-7.76/-7.56	-8.55/-11.57	-13.37/-11.7	-10.67/-9.25	-6.98/-7.27	-10.51/-12.47	-11.44/-9.43	-8.25/-7.54	-8.5/-10.82	-9.28/-6.47
Θ(127.5°)	-6.99/-7.48	-9.11/-11.37	-14.56/-14.38	-10.65/-8.83	-8.85/-11.08	-11.38/-13.87	-14.24/-15.84	-11.76/-8.66	-4.77/-2.24	-2.35/-6.23	-11.56/-5.89	-3.18/-3.44	-5.8/-6.49	-4.59/4	-5.35/-6.61	-6.4/-6.22	-7.44/-9.47	-9.31/-9.09	-10.43/-12.97	-11.58/-9.16	-7.51/-6.43	-6.97/-9.86	-7.18/-9.03	
Θ(135°)	-10.59/-8.91	-7.81/-7.5	-8.91/-12.68	-14.45/-12.78	-11.88/-11.08	-10.55/-11.36	-11.87/-12.55	-11.52/-10.65	-10.78/-10.3	-5.66/-2.93	-2.75/-5.16	-7.89/-6.76	-5.65/-6.77	-9.03/-9.32	-5.8/-4.35	-4.66/-6.39	-5.32/-4.65	-4.72/-5.5	-6.16/-6.65	-8.21/-11.2	-12.07/-9.2	-8.03/-7.69	-8.12/-10.05	-13.44/-12.89
Θ(142.5°)	-11.7/-9.68	-7.9/-6.73	-6.63/-8.03	-11.04/-12.91	-12.39/-12.04	-11.14/-10.44	-10.54/-11.36	-13.1/-14.92	-15.78/-10.39	-6.09/-3.93	-3.84/-5.02	-5.86/-6.04	-6.65/-8.33	-9.2/-7.62	-6.29/-6.03	-6.91/-8.73	-8.95/-8.67	-8.19/-7.84	-7.27/-6.93	-7.55/-8.53	-7.83/-6.4	-5.76/-6.31	-7.34/-8.72	-10.77/-12.49
Θ(150°)	-8.11/-7.58	-6.45/-5.26	-4.62/-5.07	-6.61/-9.52	-10.44/-10.77	-10.12/-10.21	-9.86/-10.41	-10.16/-9.13	-6.07/-6.39	-5.21/-4.39	-4.77/-5.91	-7.16/-8.41	-10.16/-8.86	-5.94/-4.11	-3.47/-3.81	-4.89/-6.39	-7.24/-7.78	-10.28/-10.16	-14.33/-13.02	-10.99/-8.8	-6.63/-4.97	-4.22/-4.39	-5.32/-6.59	-7.73/-8.21
Θ(157.5°)	-4.97/-4.72	-4.39/-4.06	-3.98/-4.4	-5.64/-7.74	-8.34/-8.47	-8.15/-7.92	-7.82/-7.63	-7.37/-7.16	-6.09/-5.34	-5.11/-6.28	-6.24/-8.44	-11.38/-15.15	-12.11/-7.64	-5.07/-3.75	-3.39/-3.64	-4.26/-4.86	-5.22/-5.48	-6.29/-7.82	-10.29/-13.75	-14.45/-12.21	-8.84/-6.59	-5.3/-4.82	-4.9/-5.2	-5.31/-5.2
Θ(165°)	-5.95/-5.92	-5.84/-5.83	-6.09/-6.87	-8.06/-7.82	-7.41/-6.88	-6.75/-6.86	-7.1/-7.46	-7.82/-8.23	-8.54/-8.36	-8.43/-9	-9.79/-11.64	-14.01/-13.33	-11.42/-9.67	-8.11/-7.07	-6.75/-6.82	-6.98/-6.93	-6.61/-6.21	-6.18/-6.66	-7.92/-10.07	-13.03/-14.44	-12.02/-10.96	-8.99/-7.79	-7.14/-6.74	-6.42/-6.06
Θ(172.5°)	-9.3/-9.05	-9.25/-8.92	-9.09/-8.79	-7.95/-7.32	-7.21/-7.73	-8.63/-9.57	-10.66/-11.61	-13.34/-14.63	-14.88/-14.83	-13.54/-15.84	-15.3/-14.39	-13.56/-12.81	-11.73/-11.56	-11.68/-12.14	-13.37/-14.58	-14.77/-12.39	-10.64/-9.48	-9.08/-9.46	-15.04/-12.14	-14.03/-13.76	-13.32/-12.63	-12.37/-11.8	-11.28/-10.89	-9.99/-9.7
Θ(180°)	-8.17/-8.09	-8.35/-8.49	-8.31/-8.17	-8.19/-8.46	-8.82/-9.42	-10.22/-11	-11.59/-12	-12.66/-13.63	-13.87/-13.11	-13.44/-13.33	-13.01/-13.1	-13.42/-14.18	-14.7/-15.32	-15.09/-15.32	-15.52/-16.27	-15.26/-14.6	-14.56/-14.06	-14.47/-15.43	-14.97/-15.21	-14.52/-14.22	-13.98/-14.02	-14.39/-13.77	-12.79/-11.37	-9.97/-8.82
Freq(Hz)	2.45G/Pol.	Theta-L	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
DG(dB)	Φ(0°)/Φ(7.5°)	Φ(15°)/Φ(22.5°)	Φ(30°)/Φ(37.5°)	Φ(45°)/Φ(52.5°)	Φ(60°)/Φ(67.5°)	Φ(75°)/Φ(82.5°)	Φ(90°)/Φ(97.5°)	Φ(105°)/Φ(112.5°)	Φ(120°)/Φ(127.5°)	Φ(135°)/Φ(142.5°)	Φ(150°)/Φ(157.5°)	Φ(165°)/Φ(172.5°)	Φ(180°)/Φ(187.5°)	Φ(195°)/Φ(202.5°)	Φ(210°)/Φ(217.5°)	Φ(225°)/Φ(232.5°)	Φ(240°)/Φ(247.5°)	Φ(255°)/Φ(262.5°)	Φ(270°)/Φ(277.5°)	Φ(285°)/Φ(292.5°)	Φ(300°)/Φ(307.5°)	Φ(315°)/Φ(322.5°)	Φ(330°)/Φ(337.5°)	Φ(345°)/Φ(352.5°)
Θ(0°)	0.09/0.49	0.74/0.87	0.85/0.73	0.43/-0.04	-0.72/-1.17	-1.4/-0.84	-0.37/-0.06	0.01/-0.06	-0.29/-0.72	-1.32/-2.04	-2.57/-1.93	-0.94/-0.08	0.61/-0.09	1.37/1.48	1.4/-1.1	0.63/-0.01	-0.68/-1.01	-0.87/-0.52	-0.15/0.07	0.07/-0.13	-0.49/-0.95	-1.5/-2.18	-2.19/-2.27	-1.31/-0.5
Θ(7.5°)	-0.07/0.25	0.37/0.32	0.14/-0.22	-0.69/-1.25	-1.67/-1.53	-1.11/-0.65	-0.26/-0.03	0.03/-0.05	-0.31/-0.75	-1.38/-1.86	-1.77/-1.38	-0.55/0.17	0.72/-1.19	1.54/1.76	1.84/1.76	1.46/1	0.27/-0.72	-1.04/-1.1	-0.66/-0.4	-0.33/-0.48	-0.75/-1.15	-1.59/-2	-2.24/-1.96	-1.31/-0.47
Θ(15°)	0.44/0.71	0.73/0.58	0.27/-0.18	-0.69/-1.12	-1.3/-1.22	-0.99/-0.69	-0.34/-0.08	0.06/0.04	-0.1/-0.4	-0.75/-1.01	-1.05/-0.88	-0.66/-0.39	-0.06/0.38	0.06/1.27	1.58/1.74	1.73/1.47	0.99/0.34	-0.23/-0.58	-0.8/-0.97	-1.24/-1.59	-1.98/-2.29	-2.41/-2.29	-1.87/-1.27	-0.62/0
Θ(22.5°)	1.36/1.52	1.42/1.13	0.74/0.34	-0.04/-0.31	-0.42/-0.49	-0.58/-0.58	-0.37/-0.02	0.27/0.46	0.54/0.48	0.36/0.23	0.11/-0.01	-0.18/-0.37	-0.43/-0.28	-0/0.38	0.8/1.1	1.22/1.09	0.75/0.31	-0.03/-0.28	-0.59/-1.01	-1.49/-1.98	-2.4/-2.63	-2.54/-2.13	-1.38/-0.51	0.33/0.96
Θ(30°)	2.19/2.18	1.88/1.41	0.92/0.61	0.51/0.54	0.67/0.77	0.79/0.65	0.42/0.22	0.24/0.55	0.91/1.13	1.21/-1.22	1.3/-1.44	1.47/1.3	1.07/0.82	0.54/0.37	0.42/0.64	0.8/0.78	0.55/0.21	0.02/-0.02	-0.05/-0.25	-0.52/-0.8	-1.01/-1.18	-1.21/-1.02	-0.52/0.34	1.26/1.91
Θ(37.5°)	2.46/2.3	1.81/2.2	0.8/0.71	0.91/1.25	1.55/1.8	1.98/2.06	1.97/1.55	0.86/0.48	0.84/1.45	1.88/2.22	2.73/3.3	3.63/6.6	3.38/2.97	2.34/1.57	0.96/0.76	0.81/0.84	0.65/0.42	0.36/0.53	0.77/0.93	0.95/0.89	0.81/0.65	0.37/0.07	0.11/0.72	1.58/2.21
Θ(																								



Radiated Composite Gain Data of 2.4GHz/5GHz

Appendix A

Θ(15°)	1.181/25	1.140/72	0.35/-05	-0.08/-08	0.070/28	0.691/09	1.040/66	-0.15/-12	-2.69/-3.19	-2.61/-1.35	-0.340/37	0.640/52	0.088/-0.58	-1.08/-1.12	-0.84/-0.25	0.470/94	1.020/98	0.790/4	-0.13/-0.78	-1.59/-1.88	-2.09/-1.9	-1.81/-1.2	-0.460/09	0.50/91
Θ(22.5°)	0.370/46	0.470/72	1.151/16	0.910/34	0.170/49	1.221/6	1.210/19	-1.34/-3.11	-3.41/-2.62	-1.63/-1.2	-1.07/-0.65	0.070/62	0.59/-0.38	-2.36/-3.02	-1.21/-0.05	-0.16/-0.81	-1.25/-1.32	-1.31/-1.22	-1.25/-1.93	-2.99/-3.24	-2.98/-2.48	-2.28/-1.94	-1.44/-1.23	-0.73/-0.25
Θ(30°)	-1.1/-1.23	-1.65/-1.03	0.61/37	1.50/9	0.40/5	0.890/73	0.420/05	-0.61/-142	-2.09/-2.13	-1.77/-1.74	-2.61/-2.87	-1.020/42	0.60/-14	-1.96/-2.83	-0.86/-0.60	-0.53/-1.57	-1.26/-1.21	-1.74/-1.19	-0.49/-0.26	-0.85/-1.82	-2.34/-2.04	-1.32/-1.11	-1.22/-1.43	-1.16/-1.02
Θ(37.5°)	-1.97/-1.11	-0.55/-0.83	-0.120/72	0.63/-0.4	-1.12/-1.36	-1.99/-2.72	-1.95/-0.44	0.2/-0.53	-2.05/-1.7	-0.77/-1.53	-4.39/-4.99	-2.84/-2.46	-3.37/-2.91	-1.59/-0.4	1.03/-1.34	-0.34/-0.96	-0.4/-0.67	-1.17/-1.49	-2.04/-2.84	-3.24/-2.95	-2.58/-1.94	-1.25/-1.08	-0.9/-0.4	-0.67/-1.68
Θ(45°)	-1.150/35	1.150/51	-1.56/-2.37	-2.68/-3.12	-1.89/-0.86	-2.42/-5.05	-3.17/-1.15	-0.54/-1.33	-3.64/-2.32	-0.11/-0.75	-3.23/-2.59	-1.83/-3.5	-5.05/-2.92	-1.64/-1.18	-0.73/-0.47	-1.01/-0.96	-1.01/-1.67	-1.76/-2.05	-2.61/-4.2	-4.95/-3.99	-3.24/-2.19	-1.31/-1.32	-1.15/-0.43	-0.72/-2.42
Θ(52.5°)	-2.76/-1.35	0.05/-0.23	-2.22/-3.58	-4.51/-4.73	-2.13/-0.04	-0.54/-1.24	-0.47/-0.81	-2.38/-3.41	-4.12/-1.22	0.55/-0.58	-3.51/-1.41	-2.2/-2.83	-0.32/-0.56	-0.90/-35	-0.48/-1.2	-0.93/-0.41	-1.1/-1.31	-4.31/-3.48	-3.21/-4.03	-3.79/-2.3	-1.91/-2.06	-0.05/-1.7	-1.29/-0.67	-1.47/-3.41
Θ(60°)	-3.02/-1.81	-0.92/-0.76	-2/-4.02	-3.59/-3.18	-1.17/-1.13	0.840/26	-0.84/-2.34	-1.77/-1.83	-2.18/-2.17	-0.48/-1.04	-3.87/-0.88	-0.09/-1.02	0.85/-1.49	1.21/-1.75	0.80/03	-0.25/-0.46	-1.28/-2.01	-3.06/-6.04	-3.71/-2.52	-3.53/-2.76	-3.01/-2.73	-1.58/-1.24	-2.06/-1.74	-2.65/-3.74
Θ(67.5°)	-4.13/-4.71	-3.97/-2.73	-4.81/-6.24	-3.05/-2.83	-1.60/04	-0.40/-17	-0.54/-1.04	-0.57/-1.93	-2.99/-2.74	-1.38/-1.59	-4.05/-1.03	0.33/-06	0.610/82	1.11/-1.54	0.870/72	0.18/-1.01	-1.83/-1.76	-1.65/-5.29	-5.12/-2.69	-2.95/-3.58	-3.9/-2.93	-1.63/-2.13	-3.52/-3.63	-4.13/-4.76
Θ(75°)	-5.28/-5.74	-5.43/-4.3	-5/-6.85	-3.45/-3.19	-1.96/-1.03	-1.66/-0.61	-2.6/-3.27	-2.33/-4.24	-4.03/-2.75	-2.56/-2.29	-4.68/-2.77	-1.03/-0.79	-0.38/-0.46	0.360/07	-0.640/36	-0.42/-1.44	-1.63/-1.86	-1.7/-4.58	-6.48/-2.65	-2.48/-4.27	-6.82/-5.48	-2.86/-2.85	-5.49/-6.03	-5.19/-4.88
Θ(82.5°)	-6.69/-8.04	-7.11/-5.91	-6.74/-7.94	-4.36/-5.18	-4.23/-3.56	-2.43/-1.36	-3.5/-2.73	-3.17/-6.11	-4.04/-2.78	-3.12/-3.93	-6.57/-4.9	-3.06/-2.18	-1.89/-1.96	-1.11/-2.43	-2.53/-0.8	-1.32/-3	-2.98/-3.26	-2.23/-4.63	-7.89/-2.88	-4.18/-6.68	-8.34/-6.37	-4.2/-3.38	-5.72/-7.8	-7.05/-6.18
Θ(90°)	-6.37/-10.18	-10.6/-7.89	-8.36/-9.42	-5.18/-5.83	-6.13/-6.21	-5.21/-3.38	-5.37/-3.84	-4.79/-7.82	-7.47/-9.47	-4.2/-4.42	-9.92/-8.13	-5.24/-5.09	-4.16/-3.77	-2.81/-4.76	-6.68/-4.56	-3.26/-4.05	-4.24/-6.04	-5.74/-5.81	-9.24/-4.63	-6.53/-9.12	-10.49/-7.31	-5.28/-7	-8.71/-10.87	-9.32/-5.94
Θ(97.5°)	-7.86/-10.44	-10.66/-8.62	-8.69/-10.33	-7.11/-8.72	-7.59/-7.64	-4.93/-4.53	-7.14/-4.86	-8.39/-10.56	-7.28/-5.62	-5.2/-6.83	-12.62/-12.1	-6.57/-10.2	-7.03/-5.79	-5.61/-9.27	-9.67/-7.22	-5.96/-7.82	-8.6/-12.06	-9.36/-9.24	-12.82/-8.05	-7.41/-12.73	-13.63/-8.81	-4.73/-9.7	-10.18/-12.29	-10.46/-8.06
Θ(105°)	-8.76/-12.42	-12.21/-9.21	-10.6/-10.92	-6.25/-7.26	-8.78/-9.7	-5.65/-5.71	-6.9/-4.11	-7.55/-9.72	-8.2/-7.46	-6.11/-6.71	-14.21/-13.19	-8.17/-7.77	-9.61/-6.46	-6.29/-11.05	-9.12/-8.52	-7.67/-10.24	-12.32/-13.37	-14.36/-12.22	-11.23/-10.13	-9.2/-14.59	-14.32/-9.97	-7.51/-10.91	-10.79/-13.35	-12.67/-8.21
Θ(112.5°)	-7.39/-15.69	-15.11/-10.77	-12.34/-11.91	-7.42/-8.16	-7.66/-8.57	-6.87/-9.1	-7.53/-6.42	-8.97/-9.56	-7.54/-9.92	-7.36/-10.29	-13.21/-15.6	-9.63/-9.36	-11.9/-7.01	-9.54/-13.75	-9.31/-9.74	-7.5/-11.9	-11.43/-13.56	-13.53/-10.94	-9.8/-8.72	-12/-12.91	-12.74/-8.4	-7.87/-14.28	-13.06/-13.29	-11.01/-9.97
Θ(120°)	-10.22/-13.03	-14.24/-11.92	-15.01/-11.58	-7.98/-7.35	-5.68/-7.36	-6.68/-8.87	-10.01/-7.32	-8.91/-9.76	-6.21/-8.33	-9.59/-9.02	-15.32/-12.3	-10.87/-10.41	-13.01/-8.13	-8.79/-13.37	-14.28/-12.45	-15.46/-12.05	-11.86/-12.01	-10.04/-6.81	-9.66/-15.22	-15.82/-11.07	-9.86/-13.45	-14.09/-13.9	-11.81/-10.72	-14.12/-11.84
Θ(127.5°)	-10.95/-9.51	-11.92/-12.45	-13.31/-15.47	-9.8/-6.6	-4.77/-7.44	-7.46/-7.76	-9.06/-7.46	-8.58/-11.08	-8.7/-9.96	-8.83/-9.42	-8.72/-10.58	-15.23/-8.79	-13.37/-12.81	-8.76/-9.33	-11.35/-15.29	-9.95/-13.17	-10.49/-12.55	-10.63/-7.07	-10.37/-8.61	-14.08/-13.21	-9.62/-14.99	-10.87/-9.15	-11.9/-14.85	-9.62/-11.69
Θ(135°)	-12.12/-12.27	-13.43/-11.64	-12.48/-15.78	-16.11/-8.79	-7.01/-8.97	-6.79/-6.63	-11.48/-9.31	-7.13/-13.52	-8.84/-8.26	-11.83/-14.02	-10.71/-9.73	-11.97/-9.18	-11.26/-15.3	-8.62/-9.78	-14.67/-14.46	-15.92/-10.72	-11.41/-11.69	-8.86/-7.25	-10.79/-7.91	-14.6/-14.5	-14.05/-15.64	-13.54/-16.32	-13.89/-14.72	-12.16/-10.03
Θ(142.5°)	-11.81/-12.41	-13.04/-11.94	-13.76/-13.27	-13.58/-11.43	-10.87/-14.66	-9.44/-8.33	-11.43/-14.44	-9.58/-12.49	-15.66/-11.72	-10.74/-11.4	-9.77/-9.18	-11.97/-13.51	-12.83/-10.38	-10.89/-15.13	-15.4/-12.33	-10.69/-9.85	-8.29/-11.98	-14.48/-13.8	-14.37/-14.2	-15.12/-15.21	-14.83/-15.04	-15.61/-10.52	-14.09/-13.26	-10.27/-11.53
Θ(150°)	-11.03/-10.35	-11.04/-11.97	-12.28/-11.81	-12.55/-11.95	-11.91/-10.07	-7/-7.08	-10.81/-15.37	-15.48/-15.62	-15.74/-14.97	-13.75/-10.42	-9.27/-10.97	-13.22/-15.75	-12.75/-10.4	-12.7/-15.63	-15.13/-15.42	-13.26/-15.07	-13.15/-10.06	-10.42/-12.72	-15.58/-13.13	-12.24/-13.08	-12.9/-13.33	-10.94/-11.05	-11.49/-11.4	-9.96/-12.42
Θ(157.5°)	-11.01/-10.68	-12.32/-11.55	-9.95/-10.88	-13.79/-14.77	-15.33/-13.72	-12.33/-11.72	-11.45/-12.46	-14.27/-15.04	-14.76/-14.7	-14.84/-14.02	-12.59/-12.46	-14.66/-15.06	-11.15/-9.75	-11.2/-12.08	-11.97/-12.76	-13.62/-13.45	-12.42/-13.35	-15.12/-15.51	-14.72/-13.58	-13.12/-14.06	-14.7/-12.84	-10.49/-9.34	-9.04/-9.1	-9.43/-10.39
Θ(165°)	-9.69/-8.77	-8.25/-7.58	-7.19/-4.75	-7.91/-8.52	-10.06/-11.53	-11.02/-10.08	-9.42/-9.7	-11.13/-13.9	-15.05/-15.23	-13.81/-11.88	-11.59/-13.26	-14.54/-15.21	-15.32/-15.62	-15.68/-14.1	-13.45/-13.25	-14.17/-14.7	-15.38/-15.88	-14.83/-14.6	-14.01/-15.43	-14.72/-13.76	-12.53/-11.45	-10.67/-10.66	-11.12/-11.06	-11.3/-11.15
Θ(172.5°)	-13.64/-11.98	-11.42/-11.6	-11.03/-9.66	-9.17/-9.7	-9.81/-10.11	-10.1/-10.18	-9.48/-9.16	-10.12/-11.97	-13.38/-14.99	-15.77/-15.34	-14.86/-15.92	-14.62/-16.21	-15.19/-15.45	-15.2/-14.71	-15.55/-14.81	-14.93/-14.71	-11.47/-11.03	-11.1/-10.8	-10.03/-9.72	-9.9/-10.04	-10.54/-11.78	-15.03/-15.19	-15.49/-14.07	
Θ(180°)	-15.38/-14.55	-15.67/-14.88	-12.91/-12.4	-12.86/-12.91	-11.74/-10.95	-10.94/-11.8	-12.8/-12.74	-14.12/-14.64	-13.67/-14.24	-13.7/-12.79	-12.65/-13.14	-13.59/-14.99	-15.93/-15.4	-15.65/-14.9	-12.82/-11.62	-10.8/-9.71	-8.71/-8.06	-7.55/-7.83	-8.71/-9.2	-8.78/-4.55	-8.51/-9.55	-10.39/-11.53	-13.09/-14.66	-14.98/-15.44
Freq(Hz)	5.60Pol	Theta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dB)	Φ(15°)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°)	1.281/16	0.940/69	0.34/-0.01	0.32/-0.07	1.81/2.31	2.532/48	2.231/77	1.320/87	0.33/-0.58	-1/-0.52	0.170/65	1.091/28	0.940/58	0.330/12	0.260/94	1.71/25	2.332/26	2.252/38	2.292/06	1.340/74	-0.020/-14	0.160/76	0.931/04	0.951/07
Θ(7.5°)	-0.39/-0.56	-0.440/03	0.270/49	0.821/3	1.789/03	2.081/83	1.581/34	1.291/31	1.250/74	-0/-0.02	0.471/18	1.79/2	1.721/27	0.950/58	-0.05/-0.23	0.241/06	1.281/16	1.161/23	1.381/13	0.31/-0.61	-1.2/-1.65	-1.05/-0.24	-0.14/-0.43	-0.52/-0.4
Θ(15°)	-2.97/-2.99	-2.66/-1.95	-1.16/-0.34	0.340/79	0.620/83	0.471/-0.04	-0.060/84	1.842/28	2.342/07	1.721/54	1.561/34	0.870/38	0.330/36	-0.12/-0.96	-1.87/-2.27	-1.65/-1.36	-1.10/-0.89	-0.58/-0.6	-1.19/-2.26	-0.33/-3.49	-3.16/-2.48	-2.34/-2.58	-2.83/-3	
Θ(22.5°)	-3.92/-344	-2.79/-2.6	-2.33/-1.66	-0.850/16	0.831/3	1.281/24	1.191/21	1.271/27	1.371/88	2.482/87	3.193/26	2.791/75	1.171/38	1.851/63	0.47/-1.03	-2.14/-1.77	-0.440/67	1.391/56	1.240/75	0.21/-0.18	-0.93/-2.58	-5.02/-5.28	-3.88/-3.35	-3.59/-3.95
Θ(30°)	-2.24/-3.48	-3.18/-2.09	-1.43/-1.23	-1/-0.04	1.132/0.1	2.512/84	2.892/75	2.452/36	2.352/31	2.42/71	3.313/55	3.152/22	1.561/62	2.222/42	1.620/45	0.30/-0.21	0.330/55	0.951/54	1.160/14	-1.15/-0.67	0.4/-0.15	-2.68/-5.56	-3.63/-1.88	-1.46/-1.63
Θ(37.5°)	-0.47/-1.52	-2.3/-0.53	0.711/17	1.181/39	1.591/61	1.51/53	1.681/97	2.463/07	3.794/28	3.792/76	2.512/57	2.621/23	0.60/53	0.830/95	0.680/42	0.29/-0.56	-2.13/-2.98	-0.28/-0.88	-0.39/-0.86	-1.51/-0.78	0.601/15	-0.66/-2.42	-0.99/-0.16	0.41/06
Θ(45°)	2.110/68	-0.440/97	2.432/31	2.842/75	3.493/8	3.525/25	0.32/-0.49	0.962/07	2.973/87	3.872/52	1.851/37	0.86/-0.19	-0.49/-0.93	-1.17/-0.81	-0.68/-1.18	-1.17/-2.66	-5.59/-6	-4.91/-2.46	0.411/49	-0.15/-2.14	-0.090/52	0.373/-0.34	0.450/95	1.212/23
Θ(52.5°)	3.352/52	1.031/83	3.544/77	4.284/05	5.085/31	5.234/46	2.13/-0.54	0.411/77	2.63/5	3.381/56	1.280/96	0.560/49	0.13/-1.9	-2.68/-2.05	-1.2/-1.48	-1.32/-2.43	-5.49/-6.41	-5.39/-2.51	0.291/37	0.42/-1.63	-0.99/-0.3	-0.77/-0.1	0.751/55	1.883/28
Θ(60°)	4.022/09	1.612/09	3.535/21	4.774/84	5.715/86	5.825/18	3.651/41	0.242/33	3.294/19	3.711/73	1.851/51	0.331/22	0.531/-28	-2.54/-1.85	0.230/78	1.701/43	-1/-2.9	-4.91/-3.68	-1.350/98	0.64/-2.06	-0.280/49	0.561/-1	1.563/57	
Θ(67.5°)	3.92/73	1.541/72	3.715/06	4.645/03	662	6.054/96	3.180/47	-1.382/42	4.284/74	3.761/4	2.921/97	1.671/67	0.9/-0.28	-1.34/-1.17	1.682/64	2.281/98	1.44/-1.16	-3.61/-3.13	-2.91/-0.69	0.19/-1.48	-0.97/-1.47	-3.37/-1.31	0.390/56	1.23/14
Θ(75°)	2.751/42	0.451/23	3.																					



Radiated Composite Gain Data of 2.4GHz/5GHz

Appendix A

Θ(67.5°)	-5.4/-4.46	-3.24/-3.57	-3.42/-5.33	-3.1/-0.32	-1.96/-1.07	-0.26/-0.39	-0.42/-3.03	-4.89/-4.12	-2.6/-2.02	-2.53/-3	-3.68/-3.91	-3.53/-1.9	0.67/-1.53	0.33/-1.4	1.09/0.37	-1.36/-3.51	-2.12/-3.22	-6.92/-9.74	-7.25/-5.13	-3.5/-2.39	-4.24/-2.55	-3.77/-6.12	-4.64/-3.24	-2.96/-3.51
Θ(75°)	-8.05/-7.21	-5.54/-5.25	-5.08/-7.19	-3.7/-0.66	-2.96/-1.86	-1/-0.87	-0.23/-2.68	-5.4/-4.52	-4.79/-3.06	-2.42/-2.75	-3.73/-5.15	-4.64/-2.12	1.1/2.25	0.71/0.46	0.4/-0.81	-1.62/-2.94	-1.8/-1.68	-4.51/-6.92	-6.93/-3.96	-2.45/-2.25	-4.18/-2.68	-3.68/-4.33	-6.17/-4.33	-3.75/-5.37
Θ(82.5°)	-7.88/-7.36	-7.1/-7.09	-8.66/-8.69	-4.92/-2.35	-3.89/-2.7	-2.67/-2.41	-0.91/-2.17	-5.44/-6.21	-7.01/-3.86	-3.38/-2.5	-3.86/-6.69	-5.56/-2.18	0.78/-1.49	0.1/-1.44	-1.89/-3.13	-2.5/-1.93	-2.16/-2.19	-4.1/-6.55	-5.73/-3.56	-2.94/-4.79	-7.3/-3.62	-4.78/-5.17	-6.84/-6.28	-5.39/-7.07
Θ(90°)	-11.07/-10.92	-10.54/-8.82	-12.91/-9.74	-6.19/-3.48	-5.77/-4.9	-5.24/-3.98	-3.27/-2.98	-6.84/-7.81	-8.65/-3.96	-3.99/-4.77	-5.32/-8.81	-6.37/-4.42	-1.18/-0.54	-2.56/-4.58	-5.87/-5.27	-4.33/-4.24	-4.17/-5.29	-4.51/-7.12	-8.84/-5.74	-5.06/-6.78	-9.08/-4.4	-5.91/-5.35	-8.77/-8.06	-6.67/-9.09
Θ(97.5°)	-12.57/-13.45	-12.54/-13.11	-15.53/-10.31	-7.52/-5.33	-7.55/-6.8	-8.75/-5.97	-6.4/-4.55	-9.12/-6.67	-8.75/-5.16	-4.52/-4.74	-6.31/-10.85	-7.68/-5.33	-2.12/-2.83	-3.65/-8.11	-9.5/-10.03	-7.16/-6.84	-11.15/-10.98	-9.4/-11.65	-11.36/-6.5	-7.38/-9.33	-12.66/-7.86	-6.77/-6.54	-10.23/-10.06	-9.68/-11.74
Θ(105°)	-12.9/-14.4	-14.16/-13.91	-15.08/-11.62	-9.52/-7.8	-9.39/-7.49	-10.29/-6.52	-9.19/-5.12	-10.78/-6.02	-10.81/-7.69	-5.38/-5.92	-7.07/-14.25	-9.47/-6.93	-4.75/-6.99	-5.14/-9.48	-10.81/-9.85	-11.6/-9.96	-12.27/-11.57	-10.01/-11.34	-12.85/-9.51	-8.73/-11.76	-11.49/-6.82	-9.23/-9.53	-11.57/-9.82	-11.99/-12.1
Θ(112.5°)	-13.39/-15.89	-14.34/-15.88	-15.24/-14.53	-10.31/-8.58	-9.83/-9.71	-10.05/-6.62	-9.82/-6.42	-11.79/-6	-9.04/-8.59	-6.14/-5.91	-7.45/-12.66	-7.91/-10.9	-5.78/-7.38	-7.15/-14.84	-9.29/-11.06	-10.57/-9.04	-15.13/-14.01	-13.07/-11.49	-10.55/-5.77	-8.33/-9.88	-11.87/-6.45	-9.67/-11.82	-11.3/-11.91	-12.54/-13.37
Θ(120°)	-13.66/-14.59	-14.16/-15.1	-14.77/-12.3	-10.59/-9.03	-10.76/-10.19	-11.41/-7.53	-10/-7.08	-10.63/-7.77	-9.64/-8.43	-9.03/-6.44	-9.65/-13.78	-7.16/-11.53	-10.08/-12.48	-10.23/-11.86	-10.97/-10.23	-11.56/-9.76	-14.17/-14.52	-14.48/-12.05	-9.65/-5.96	-10/-9.24	-13.45/-6.9	-10.37/-14.2	-14.78/-11.64	-13.17/-12.64
Θ(127.5°)	-13.73/-14.32	-15.38/-15.37	-14.96/-11.71	-9.47/-9.76	-8.74/-8.67	-11.18/-9.09	-9.65/-9.16	-8.03/-10.69	-7.55/-7.22	-10.12/-8.19	-12.21/-10.44	-8.12/-12.73	-12.1/-8.94	-13.05/-11.3	-7.16/-13.04	-9.6/-11.62	-7.45/-14.7	-14.84/-9.22	-8.68/-5.03	-9.39/-8.98	-9.99/-10.75	-9.05/-12.13	-11.13/-8.2	-13.35/-14.77
Θ(135°)	-14.86/-15.71	-15.18/-15.12	-15.06/-14.66	-11.19/-11.28	-8.25/-8.15	-12.36/-9.21	-11.85/-12.76	-8.69/-12.07	-8.77/-8.65	-15.73/-13.16	-15.22/-12.14	-11.7/-10.44	-9.97/-11.41	-11.48/-11.48	-12.36/-14.23	-12.19/-11.83	-11.38/-10.2	-10.15/-6.46	-9.36/-6.41	-11.27/-14.35	-11.01/-12.92	-13.01/-12.27	-14.33/-12.74	-11.96/-13.86
Θ(142.5°)	-15.7/-15.66	-14.78/-13.59	-15.12/-15.25	-15.33/-13.92	-9.67/-10.01	-12.42/-9.87	-11.09/-15.33	-11.37/-14.78	-13.27/-13.75	-15/-15.74	-10.42/-11.43	-12.61/-12.9	-12.93/-16.11	-15.73/-13.12	-15.66/-14.44	-11.2/-10.68	-11.26/-10.96	-11.86/-10.53	-10.53/-11.59	-13.35/-15.99	-14.19/-13.34	-14.78/-15.06	-14.71/-14.06	-15.53/-15.21
Θ(150°)	-14.42/-15.03	-15.33/-14.87	-13.79/-14.14	-12.61/-12.29	-11.59/-11.42	-12.21/-13.18	-14.55/-13.74	-14.32/-13.48	-11.74/-12.29	-11.65/-10.98	-14.87/-15.85	-15.67/-13.93	-13.95/-15.98	-14.01/-15.79	-15.19/-15.89	-15.46/-14.92	-13.47/-13.24	-14.4/-15.41	-14.65/-13.8	-14.01/-13.84	-13.21/-12.86	-13.82/-12.96	-10.66/-10.94	-14.78/-14.22
Θ(157.5°)	-12.34/-9.8	-9.29/-11.14	-13.07/-12.43	-12.87/-12.99	-12.34/-12.2	-12.22/-13.19	-14.1/-15.9	-15.76/-14.99	-14.23/-12.78	-9.16/-9.35	-12.07/-15.06	-15.56/-12.08	-13.63/-14.4	-15.73/-15.49	-15.05/-15.64	-15.51/-10.37	-8.12/-8.7	-13.45/-15.66	-15.68/-14	-13.05/-13.75	-12.6/-12.03	-13.59/-11.4	-10.3/-12.98	-16.03/-15.19
Θ(165°)	-12.71/-10.29	-10.89/-11.04	-11.02/-10.1	-9.74/-9.7	-10/-10.65	-11.87/-12.86	-12.53/-11.21	-10.16/-10.39	-12.54/-12.73	-11.6/-10.46	-11.01/-12.68	-13.75/-14.06	-14.43/-13.4	-12.8/-12.35	-10.7/-10.72	-11.16/-12.05	-12.85/-13.2	-14.11/-13.53	-14.82/-15.62	-13.11/-10.7	-8.67/-9.2	-10.14/-9.63	-10.31/-11.79	-14.51/-15.55
Θ(172.5°)	-11.68/-9.77	-9/-9.18	-9.81/-10.68	-11.66/-12.38	-13.83/-13.89	-14.44/-13.58	-15/-15.5	-15.11/-15.42	-14.88/-14.85	-15.01/-14.93	-14.35/-12.52	-11.61/-11.43	-11.7/-11.33	-11.2/-10.4	-10.39/-12.02	-12.26/-12.53	-13.14/-13.73	-14.94/-15.48	-15.93/-14.75	-13.58/-13.51	-14.88/-15.27	-14.88/-14.58	-13.73/-12.29	-11.55/-12.29
Θ(180°)	-11.13/-10.43	-9.78/-9.42	-9.25/-9.67	-10.24/-10.38	-10.79/-10.85	-11.64/-11.75	-11.94/-12.59	-14.39/-14.55	-13.5/-13.28	-13.05/-12.12	-11.94/-12.79	-14.52/-14.96	-15.09/-14.97	-15.26/-15.71	-15.51/-14.56	-13.31/-13.19	-13.69/-15.32	-15.25/-15.4	-15.18/-14.83	-15.02/-15.21	-14.63/-15.13	-15.02/-15.77	-16.06/-14.05	-13.16/-12.04
Freq(Hz)	5.785GPol.	Theta	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
ΔG(dB)	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°)	-2.19/-2.26	-2.6/-2.72	-2.59/-2.69	-2.66/-2.11	-1.74/-1.45	-1.35/-1.31	-1.59/-2.23	-2.97/-3.36	-3.81/-4.13	-4.29/-4.13	-3.54/-2.48	-2.19/-2.83	-3.34/-3.73	-4.31/-4.39	-4.2/-3.14	-2.05/-1.53	-1.29/-1.39	-1.43/-1.21	-1.12/-1.7	-2.81/-3.87	-4.21/-4.31	-3.59/-3.01	-2.79/-2.8	-2.5/-2.21
Θ(7.5°)	-5.78/-6.32	-6.25/-5.12	-3.79/-2.51	-1.26/-0.41	0.06/0.25	0.35/0.3	0.11/-0.45	-1.46/-2.65	-3.87/-2.59	-2.17/-1.9	-1.28/-0.37	0.22/0.31	0.31/0.42	0.4/0.01	-0.45/-0.88	-1.2/-1.26	-1.3/-0.82	-0.61/-0.53	-0.48/-0.66	-0.99/-1.49	-1.87/-2.6	-3.4/-3.88	-3.82/-3.69	-4.41/-5.07
Θ(15°)	-1.3/-1.05	-0.91/-0.81	-0.23/0.41	0.74/0.94	0.97/1.15	1.51/1.74	1.67/1.31	0.71/0.45	0.72/1.07	1.04/0.77	0.70/0.96	1.21/1.61	1.51/1.38	0.94/0.4	-0.06/-0.32	-0.53/-0.9	-1.31/-1.32	-1.26/-0.85	-0.47/-0.55	-0.9/-1.05	-1.25/-1.76	-2.79/-3.83	-3.62/-3.2	-1.78/-1.3
Θ(22.5°)	0.66/1.11	1.59/2.04	2.36/2.45	1.86/0.39	-1/-0.52	0.43/0.62	0.6/0.63	1.4/2.26	3.21/4	4.06/3.08	1.69/1.52	2.14/2.41	1.96/1.32	0.86/0.79	1.01/1.5	1.61/1.34	0.85/-0.05	-1.09/-1.57	-1.69/-1.59	-1.89/-2.45	-2.9/-3.12	-1.97/-1.2	-1.62/-2.48	-1.51/-0.2
Θ(30°)	0.3/0.58	1.44/1.88	1.98/2.14	1.66/0.22	-0.42/0.53	1.13/0.84	0.5/0.92	1.76/2.69	3.63/4.2	4.37/3.68	2.82/3.17	3.88/4.08	3.58/2.71	1.64/1.35	1.84/2.01	1.94/1.74	0.96/-0.76	-2.47/-2.19	-1.15/0.07	0.71/0.8	-0.11/-1.57	-0.17/0.87	0.72/0.45	0.38/0.19
Θ(37.5°)	0.95/1.2	1.48/1.42	1.49/2.42	2.69/1.99	2.38/3.45	3.8/3.6	3.22/2.77	2.48/2.08	2.28/3.62	4.87/5.23	4.85/4.34	3.75/3.4	3.43/3.29	2.04/1.05	1.99/2.37	0.71/-1.28	-2.17/-2.71	-1.79/-0.72	-0.75/-1.47	-0.76/-0.01	-0.78/-2.85	-2.38/-0.17	0.73/2.09	2.48/1.82
Θ(45°)	3.42/3.59	3.42/2.76	1.99/3.62	4.57/4.29	4.32/4.82	4.89/4.85	4.47/3.34	1.82/1.13	1.3/2.81	3.86/4.28	4.4/3.94	2.47/0.34	1.76/3.38	2.28/-1.97	-0.67/0.66	-1.49/-1.53	-1.06/-2.9	-3.81/-1.57	-0.28/-1.41	-3.23/-2.4	-3.24/-6.56	-4.22/-0.96	0.16/1.93	3.04/3.01
Θ(52.5°)	4.19/4.34	4.11/3.49	3.04/3.94	5.01/5.17	5.64/6.02	5.34/4.67	3.92/97	1.58/-0.14	-0.07/0.87	2.1/2.29	3.1/2.99	1.01/-0.62	1.24/2.88	1.67/-4.4	-1.74/0.59	-1.55/-1.62	-2.52/-5.94	-7.25/-5.57	-4.18/-3.7	-5.21/-2.4	-1.4/-3.28	-3.29/-2.67	-0.26/2.38	3.41/3.43
Θ(60°)	4.07/4.59	4.42/4.12	3.59/4.05	5.14/5.67	6.87/7.25	6.26/5.08	3.55/2.66	2.31/0.93	1.43/1.92	2.52/2.42	2.3/2.47	1.30/4.8	0.88/1.42	0.93/-2.61	0.36/3.08	0.2/-0.68	-3.22/-7.99	-7.03/-7.6	-7.75/-5.13	-6.54/-2.18	-1.18/-1.53	-1.18/-2.38	-1.65/-1.19	3.07/3.16
Θ(67.5°)	3.47/3.82	3.54/3.73	3.39/3.87	4.46/5.63	7.15/7.5	6.78/5.42	3.44/2.58	2.64/1.34	2.65/2.98	3.13/3.64	3.34/3.21	1.49/-1.41	0.25/-0.27	0.35/-1.45	2.05/4.04	1.87/0.72	-2.08/-6.09	-3.29/-6.52	-7.68/-6.25	-6.49/-2.57	-1.01/-0.7	0.17/-0.59	-2.56/-0.47	1.62/2.22
Θ(75°)	2.77/2.21	2.49/3.23	3.22/3.27	3.65/5.35	6.65/6.83	6.154.86	3.34/2.73	2.92/1.66	2.55/3.29	3.04/4.51	3.61/3.2	1.6/2.04	-0.84/-2.18	0.7/-0.09	2.54/4.95	3.18/2.21	-0.44/-2.44	-0.07/-3.07	-5.26/-3.74	-3.21/-1.97	-0.73/-0.79	1.26/1	-2.05/-1.51	-0.51/0.9
Θ(82.5°)	1.81/0.1	1.38/2.31	2.24/1.98	2.48/4.67	5.63/5.66	4.91/3.53	1.98/1.18	1.14/0.76	2.45/3.21	2.01/4.51	3.38/2.14	1.53/1.06	-1.93/-2.49	0.28/-0.56	2.73/4.69	3.68/2.44	0.57/-0.51	0.58/-4.12	-4.99/-3.09	-2.35/-2.53	-0.8/-0.69	1.46/1.24	-1.64/-2.41	-3.29/-1.01
Θ(90°)	1.16/0.33	0.03/1.24	1.78/1.26	0.67/3.31	4.23/4.57	3.78/2.52	1.03/-1.25	-1.59/-0.59	1.54/2.74	0.47/3.44	2.49/0.88	0.02/0.22	-2.88/-4.19	-0.52/-2.72	0.16/3.12	3/1.86	0.68/0.07	-0.36/-5.92	-5.55/-4.05	-2.84/-3.45	-1.54/-0.95	0.92/0.29	-2.59/-3.62	-5.5/-2.41
Θ(97.5°)	-0.5/-1.64	-2.47/0.22	1.04/0.18	-0.72/1.74	3.09/3.66	2.65/1.69	-0.01/-2.38	-4.27/-3.06	0.28/1.7	-0.28/1.52	1.05/-1.47	-0.78/-1.68	-3.3/-2.64	-1.19/-4.5	-1.61/1.36	0.59/-1.6	-1.64/-1.78	-2.35/-8.31	-7.45/-5.78	-3.15/-3.97	-2.82/-2.46	-0.55/-0.73	-3.79/-4.84	-7.04/-3.38
Θ(105°)	-1.75/-3.38	-3.96/-1.29	0.09/0.46	-2.95/-0.36	1.14/2.24	1.6/0.85	-0.95/-2.89	-5.29/-5.01	-1.48/0.01	-2.04/-1.41	-0.82/-2.61	-1.74/-2.33	-3.83/-4.76	-1.31/-6.41	-5.09/-1.22	-2.42/-4.33	-2.69/-5.06	-4.34/-8.57	-11.53/-5.69	-4.48/-4.78	-4.82/-5.05	-2.83/-3.05	-4.34/-6.82	-8.89/-5.89
Θ(112.5°)	-3.81/-4.95	-6.61/-3.35	-1.11/-0.86	-6.03/-2.24	0.49/0.73	0.07/-0.46	-1.94/-2.66	-4.74/-6.74	-5.52/-2.87	-3.58/-4.17	-3.49/-6.14	-3.82/-4.88	-3.32/-5.02	-2.89/-4.76	-7.04/-4.23	-4.53/-5.85	-5.38/-8.42	-5.6/-8.26	-15.43/-7.17	-3.77/-4.53	-6.09/-6.75	-5.15/-5.55	-7.07/-7.82	-12.25/-8.86
Θ(120°)	-5.43/-4.47	-5.56/-5.3	-2.49/-3.4	-8.15/-7.03	-3.3/-1.52	-1.77/-2.27	-2.59/-3.16																	





Radiated Composite Gain Data of 2.4GHz/5GHz

Appendix A

Θ(15°)	-6.39/7.94	-10.05/-12.8	-14.34/-13.74	-9.89/-6.81	-4.92/-3.36	-2.21/-1.44	-1.01/-0.86	-0.98/-1.08	-1.28/-1.37	-1.58/-1.83	-2.31/-2.82	-3.73/-5.16	-7.1/9.19	-10.78/-11.69	-12.11/-11.07	-8.49/-6.15	-4.67/-3.57	-2.68/-1.76	-0.91/-0.35	0.02/0.12	-0.44/-1.45	-2.43/-3.07	-3.69/-4.51	-4.97/-5.48
Θ(22.5°)	-8.43/-10.22	-12.59/-11.8	-8.69/-7.12	-6.14/-5.68	-4.93/-3.68	-2.16/-0.93	-0.47/-0.6	-1.11/-1.68	-1.51/-0.78	-0.76/-1.84	-3.8/-5.16	-5.08/-4	-4.76/-6.59	-12.24/-18.29	-13.3/-11.54	-12.22/-13.43	-12.97/-10.96	-8.22/-5.3	-3.16/-2.19	-1.68/-1.29	-1.09/-1.52	-2.39/-3.2	-4.29/-6.22	-7.51/-8.11
Θ(30°)	-10.04/-12.29	-18.01/-16.7	-8.21/-5.7	-5.11/-5.73	-6.39/-5.85	-4.28/-2.68	-1.27/-0.76	-1.13/-1.69	-1.57/-0.48	0.29/-0.38	-3.04/-5.08	-3.59/-2.56	-3.37/-5.92	-12.22/-18.38	-10.93/-10.72	-17.99/-13.47	-10.29/-8.85	-8.74/-5.56	-0.27/-0.58	-0.98/-0.26	-1.80/-0.66	-1.84/-3.47	-5.15/-7.52	
Θ(37.5°)	-9.19/-6.85	-7.38/-13.61	-13.38/-8.15	-6.95/-7.91	-8.7/-5.7	-7.12/-5.07	-2.72/-1.47	-1.06/-1.63	-2.45/-1.32	0.12/-0.39	-3.38/-4.45	-3.48/-4.68	-7.85/-10.12	-11.35/-10.66	-9.03/-11.01	-18.53/-13.15	-7.75/-6.73	-6.97/-6.83	-5.9/-9.44	-3.74/-2.43	-1.59/-0.63	-0.16/-0.51	-0.85/-0.93	-2.98/-7.25
Θ(45°)	-6.88/-3.19	-2.07/-6.11	-19.18/-18.79	-14.16/-11.44	-6.98/-5.9	-6.94/-7.91	-5.02/-1.92	-0.85/-1.19	-2.73/-3.05	-0.48/-0.49	-2.72/-1.1	-1.05/-4.41	-8.47/-7.52	-11.83/-10.95	-18.38/-16.91	-15.43/-11.37	-11.51/-12.01	-9.27/-7.54	-5.64/-6.73	-5.3/-2.79	-2.3/-1.11	-0.48/-0.96	-1.46/-0.9	-2.4/-8.52
Θ(52.5°)	-1.87/-3.65	-2.32/-6.12	-16.06/-14.25	-15.14/-17.95	-10.6/-7.1	-6.13/-7.08	-4.96/-1.5	-0.32/-1.58	-3.08/-3.57	-0.050/2.3	-1.85/0.62	-0.25/-3.1	-2.1/-3.82	-8.08/-7.93	-11.34/-18.73	-14.62/-8.89	-10.91/-18.39	-17.07/-8.69	-5.36/-4.78	-3.29/-1.11	-0.5/-0.75	-0.29/-2.15	-2.14/-1.03	-2.54/-7.81
Θ(60°)	-6.24/-3.7	-3.25/-5.64	-9.97/-10.63	-10.08/-14.25	-12.58/-8.03	-6.35/-7.33	-8.6/-5.83	-2.84/-2.22	-2.17/-2.79	-0.41/0.41	-1.99/0.98	1.04/-0.83	-0.84/-1.9	-3.54/-3.77	-5.97/-10.92	-13.29/-9.07	-10.52/-10.34	-10.37/-15.11	-4.93/-2.87	-3.11/-1.01	-1.08/-0.99	-0.34/-1.59	-4.04/-2.91	-4.09/-7.19
Θ(67.5°)	-5.33/-5.66	-5.97/-7.27	-13.48/-12.67	-11.76/-16.95	-15.3/-11.68	-11.21/-10.68	-9.78/-6.13	-3.01/-3.31	-4/-2.94	0.04/0.5	0.30/1.3	-0.38/-3.37	-2.2/-2.32	-5.76/-9.65	-12.72/-9.88	-8.3/-6.51	-5.29/-9.81	-6.22/-3.69	-2.95/-1.73	-2.1/-1.52	-0.12/-2.33	-5.73/-5.35	-5.49/-6.3	
Θ(75°)	-6.4/-7.78	-8.02/-8.27	-11.21/-12.49	-12.66/-17.65	-15.02/-14.45	-15.4/-12.22	-13.54/-10.99	-5.2/-5.09	-4.64/-3.29	-2.11/-0.76	-4.32/-1.5	-1.35/-0.58	-1.64/-4.1	-2.64/-4.33	-8.61/-9.97	-18.05/-12.03	-6.78/-4.32	-3.45/-6.97	-7.51/-4.21	-2.68/-2.8	-1.33/-2.67	-7.25/-7.36	-6.03/-5.49	
Θ(82.5°)	-6.47/-8.87	-8.51/-8.45	-12.53/-18.14	-13.96/-18.94	-18.97/-16.68	-12.98/-11.76	-13.38/-10.56	-5.93/-6.47	-4.16/-3.24	-3.4/-2.83	-6.25/-4.34	-4.74/-2.02	-3.21/-5.61	-2.76/-6.55	-10.49/-11.19	-18.93/-17.12	-8.35/-4.74	-2.97/-6.2	-10.44/-5.15	-4.48/-5.35	-8.47/-5.96	-3.09/-3.86	-7.57/-9.74	-7.19/-6.07
Θ(90°)	-7.04/-11.08	-12.19/-11.19	-16.52/-18.58	-14.28/-13.74	-19.1/-17.69	-17.91/-14.29	-18.22/-13.68	-7.21/-8.24	-6.23/-4.73	-4.56/-3.99	-10.12/-7.4	-8.13/-4.63	-5.91/-7.71	-4.01/-8.47	-17.53/-18.37	-18.32/-15.36	-8.1/-6.94	-6.54/-7.52	-11.25/-7.34	-6.69/-8.43	-13.06/-7.18	-4.87/-7.4	-9.77/-12.61	-9.31/-6.2
Θ(97.5°)	-8.74/-11.9	-12.41/-11.84	-16.4/-18.65	-16.33/-19.15	-18.57/-17.79	-12.89/-10.88	-17.05/-12.96	-9.34/-13.11	-6.02/-5.42	-16.59/-12.44	-14.65/-12.55	-11.37/-6.75	-8.55/-8.94	-7.16/-15.8	-18.66/-15.52	-14.77/-18.9	-10.83/-12.69	-8.8/-10.83	-14.73/-12.21	-7.96/-14.23	-18.38/-8.08	-6.95/-10.17	-10.51/-14.69	-10.36/-7.73
Θ(105°)	-9.43/-13.4	-14.99/-12.91	-18.23/-17.96	-13.18/-16.19	-18.98/-15.39	-11.58/-12.61	-18.5/-11.39	-9.64/-12.89	-7.29/-6.62	-7.61/-7.15	-18.29/-14.91	-15.46/-9.1	-9.63/-12.09	-8.45/-15.01	-14.24/-13.84	-10.17/-18.64	-12.91/-18.9	-16.29/-14.84	-13.93/-18.3	-11.19/-18.49	-17.81/-9.51	-6.96/-11.08	-14.71/-17.8	-13.41/-8.25
Θ(112.5°)	-10.06/-19.63	-17.77/-14.6	-16.83/-18.7	-13.54/-17.02	-18.97/-13.91	-12.19/-15.85	-17.79/-15.17	-15.07/-16.92	-8.4/-9.59	-8.72/-9.99	-17.84/-18.87	-17.84/-12.2	-15.33/-11.12	-10.18/-17.1	-15.52/-14.25	-10.12/-17.1	-14.86/-12.03	-13.93/-13.58	-16.53/-14.83	-16.27/-8.35	-7.64/-16.5	-15.98/-16.36	-11.52/-12.78	
Θ(120°)	-11.63/-13.83	-18.27/-13.59	-18.05/-18.83	-12.54/-12.87	-14.02/-13.42	-13.62/-17.62	-18.56/-16.83	-17.61/-19.57	-10.05/-11.51	-9.75/-9.99	-18.89/-14.73	-18.28/-16.78	-17.77/-13.87	-10.88/-14.69	-17.06/-13.95	-8.37/-12.81	-15.39/-17.92	-9.81/-9.87	-18.61/-10.39	-13.56/-18.48	-18.2/-12.53	-10.35/-14.45	-16.4/-15.44	-16.84/-14.21
Θ(127.5°)	-10.98/-11.27	-14.69/-14.09	-15.15/-18.8	-14.09/-11.33	-11.25/-13.91	-17.58/-18.68	-14.97/-18.38	-18.9/-18.13	-17.92/-16.18	-9.33/-9.55	-9.67/-11.44	-18.33/-12.27	-14.66/-18.54	-10.02/-14.47	-18.11/-17.82	-9.76/-17.51	-14.39/-16.14	-10.91/-8.86	-17.4/-11.45	-18.45/-14.61	-9.14/-18.44	-10.91/-9	-12.15/-17.71	-11.96/-13.9
Θ(135°)	-12.8/-15.02	-14.54/-12.19	-13.03/-18.48	-19.11/-15.42	-14.38/-18.1	-18.08/-18.49	-16.67/-16.69	-13.1/-11.18	-8.35/-9.98	-10.15/-12.22	-14.17/-8.65	-12.31/-17.35	-11.32/-10.15	-17.65/-17.67	-19.47/-17.7	-17.46/-18.2	-8.17/-7.34	-13.45/-8.32	-19.42/-17.21	-15.96/-16.77	-19.12/-10.62	-15.33/-17.42	-14.65/-10.8	
Θ(142.5°)	-12.02/-12.9	-14.34/-17.45	-14.86/-14.74	-14.64/-12.43	-13.23/-18.53	-18.61/-18.29	-15.13/-15.73	-19.13/-14.5	-12.02/-13.73	-10.39/-8.25	-12.43/-14.83	-14.33/-10.43	-12.84/-17.95	-18.35/-13.31	-14.77/-15.68	-11.11/-12.88	-17.69/-15.35	-17.29/-15.68	-18.12/-17.36	-18.37/-18.1	-15.66/-18.7	-12.4/-10.62	-12.62/-13.96	
Θ(150°)	-11.31/-10.41	-11.69/-12.31	-12.69/-12.84	-13.06/-12.73	-12.3/-10.99	-9.54/-9.73	-12.69/-18.31	-18.86/-18.59	-18.53/-17.24	-18.37/-14.73	-11.01/-11.06	-14.14/-19.07	-14.25/-10.46	-14.06/-19.05	-17.16/-19.53	-18.7/-17.61	-15.32/-11.42	-9.89/-13.25	-18.56/-14.35	-13.69/-14.42	-14.38/-14.44	-11.02/-11.47	-12.45/-11.99	-11.97/-18.42
Θ(157.5°)	-11.15/-11.91	-13.3/-12.14	-11.86/-13.58	-18.01/-18.95	-17.9/-15.5	-13.5/-11.96	-1.86/-13.97	-18.75/-18.62	-17.51/-17.28	-17.18/-18.98	-18.47/-17.92	-19.01/-18.32	-12.47/-11.01	-11.51/-12.4	-14.4/-18.51	-18.68/-15.08	-13.55/-14.65	-19.13/-18.82	-17.08/-15.68	-16.99/-17.35	-17.22/-13.63	-10.13/-8.7	-8.4/-8.68	-8.89/-10.04
Θ(165°)	-11.21/-9.77	-8.95/-8.64	-8.47/-8.52	-8.72/-9.6	-11.18/-11.85	-10.92/-9.66	-9.54/-11.06	-13.84/-18.46	-17.73/-18.13	-18.54/-18.68	-18.06/-19.06	-18.51/-17.73	-18.19/-17.77	-18.85/-18.07	-18.51/-18.02	-18.08/-17.57	-18.7/-18.19	-17.9/-16.84	-16.15/-17.6	-17.07/-15.96	-13.9/-11.54	-10.89/-10.98	-11.68/-11.42	-11.9/-12.7
Θ(172.5°)	-14.84/-12.39	-12.13/-12.84	-12.29/-10.72	-9.52/-9.27	-10.16/-10.31	-9.73/-9.79	-10.82/-13.1	-15.3/-17.15	-19.26/-18.96	-17.75/-18.82	-19.02/-17.7	-19.19/-17.75	-17.52/-18.11	-19.19/-17.75	-17.52/-17.44	-18.24/-14.84	-12.19/-11.72	-12.9/-12.74	-11.13/-10.41	-10.39/-12.33	-16.96/-19.1	-18.95/-16.74		
Θ(180°)	-18.13/-17.55	-19.02/-18.37	-17.9/-18.87	-19.09/-18.07	-15.9/-13.73	-12.97/-13.12	-13.41/-13.7	-15.63/-18.42	-17.51/-17.98	-16.03/-14.48	-14.36/-15.13	-16.17/-18.09	-18.18/-17.93	-18.74/-18.48	-15.13/-13.55	-12.65/-11.5	-10.13/-8.95	-8.22/-8.54	-10.03/-10.78	-10.62/-10.11	-9.47/-9.34	-10.21/-11.57	-13.96/-17.57	-17.99/-18.14
Freq(Hz)	5.3GPol	ThetaAnt. 1	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
Gain	Φ(0°)/Φ(7.5°)	Φ(15°)/Φ(22.5°)	Φ(30°)/Φ(37.5°)	Φ(45°)/Φ(52.5°)	Φ(60°)/Φ(67.5°)	Φ(75°)/Φ(82.5°)	Φ(90°)/Φ(97.5°)	Φ(105°)/Φ(112.5°)	Φ(120°)/Φ(127.5°)	Φ(135°)/Φ(142.5°)	Φ(150°)/Φ(157.5°)	Φ(165°)/Φ(172.5°)	Φ(180°)/Φ(187.5°)	Φ(195°)/Φ(202.5°)	Φ(210°)/Φ(217.5°)	Φ(225°)/Φ(232.5°)	Φ(240°)/Φ(247.5°)	Φ(255°)/Φ(262.5°)	Φ(270°)/Φ(277.5°)	Φ(285°)/Φ(292.5°)	Φ(300°)/Φ(307.5°)	Φ(315°)/Φ(322.5°)	Φ(330°)/Φ(337.5°)	Φ(345°)/Φ(352.5°)
Θ(0°)	-0.53/0.3	1.06/1.53	1.82/1.58	1.41/1.42	1.47/1.36	0.92/0.1	-1.22/-3.05	-5.49/-3.5	-12.37/-18.28	-18.33/-11.86	-7.67/-15.08	-2.92/-1.36	-0.44/0.17	0.68/1.09	1.39/1.77	2.04/1.88	1.06/0.04	-0.92/-1.74	-2.78/-4.17	-6.57/-9.83	-15.29/-28.12	-15.94/-9.84	-6.76/-4.67	-3.27/-1.75
Θ(7.5°)	-1.62/-0.99	-0.41/0.15	0.33/0.05	-0.55/-0.9	-0.93/-1.04	-1.47/-2.51	-3.97/-5.84	-7.83/-9.76	-11.69/-14.72	-17.31/-13.28	-8.9/-5.73	-3.45/-1.67	-0.6/0.17	0.79/1.24	1.61/2.03	2.47/2.4	1.6/0.51	-0.52/-1.53	-2.46/-3.96	-6.26/-9.5	-12.87/-16.53	-13.89/-9.39	-7.17/-5.73	-4.35/-2.78
Θ(15°)	-6.49/-5.43	-4.52/-3.64	-3.09/-2.77	-2.97/-3.29	-3.6/-3.92	-4.67/-5.97	-8.05/-10.61	-11.9/-10.35	-8.14/-7.39	-7.33/-7.25	-6.44/-5.38	-4.5/-3.89	-3.15/-2.23	-1.24/-0.56	-1.08/-0.22	-0.25/-0.42	-0.83/-1.88	-3.12/-4.34	-5.46/-6.78	-8.92/-12.93	-15.97/-18.28	-16.55/-12.67	-11.21/-10.49	-9.63/-8.14
Θ(22.5°)	-12.24/-10.25	-8.04/-6.72	-6.33/-6.32	-6.72/-6.19	-5.27/-4.75	-4.88/-5.15	-5.98/-6.43	-6.82/-7.48	-7.85/-6.67	-4.92/-3.16	-1.71/-1.35	-2.3/-3.55	-2.69/-0.79	0.66/1.13	0.47/-0.78	-1.55/-1.02	0.12/0.93	1.19/0.45	-1.13/-2.88	-3.89/-4.2	-5.09/-8.38	-17.8/-19.03	-11.55/-10.51	-11.59/-12.96
Θ(30°)	-9.88/-16.98	-15.46/-9.64	-7.76/-8.71	-11.57/-12.88	-10.76/-8.4	-6.67/-5.07	-4.2/-3.69	-3.65/-3.25	-2.63/-2.3	-2.14/-1.5	-0.07/0.24	-0.93/-0.34	-3.46/-1.76	0.09/0.78	0.36/-0.61	-1.14/-1.42	-0.55/0.79	1.78/1.82	0.57/-1.79	-4.62/-3.71	-1.48/-2.1	-6.94/-17.98	-10.48/-6.53	-6.04/-7.16
Θ(37.5°)	-4.78/-11.97	-15.25/-6.9	-4.48/-5.12	-7.03/-9.1	-11.17/-11.89	-10.87/-8.76	-5.92/-3.4	-1.82/-1.06	0.07/1.38	1.21/0.03	0.13/-0.09	-1.37/-3.03	-3.38/-3.36	-2.81/-1.83	-1.5/-2	-3.18/-4.36	-4.19/-2.48	-0.78/-0.21	-1.47/-4.42	-6.94/-5.31	-2.92/-1.15	-4.69/-9.84	-5.46/-5.9	-5.36/-3.39
Θ(45°)	-3.51/-8.83	-11.17/-3.42	-1.37/-2.11	-3.76/-4.68	-3.96/-2.63	-2.47/-3.44	-5.35/-4.56	-1.71/-0.92	0.022/5.1	3.43/1.79	1.02/0.36	-0.85/-1.68	-1.96/-4.25	-5.83/-4.45	-3.28/-3.07	-3.51/-5.33	-7.02/-6.4	-5.81/-4.66	-2.31/-3.38	-4.51/-7.85	-2.04/-0.95	-2.82/-5.92	-4.55/-4.53	-6.38/-2.89
Θ(52.5°)	-2.38/-5.39	-7.18/-11.4	0.54/-0.13	-1.88/-2.35	-0.42/0.95	1.55/1	-1.27/-4.28	-1.91/-0.01	0.92/3.2	4.03/1.97	1.57/1.26	0.48/0.44	-0.53/-4.22	-5.54/-3.41	-2.86/-1.65	-1.71/-3.61	-8.22/-11.75	-8.01/-5.1	-3.31/-2.36	-3.64/-9.32	-3.52/-1.08	-3.42/-4.07	-3.66/-5.69	-5.51/-1.38
Θ(60°)	-0.81/-2.47	-4.59/-0.56	0.78/-0.03	-1.98/-0.9	0.92/2.13	2.31/5.6	1.98/-0.7	0.37/-2.11	-2.76/0.89	1.05/0.58	3.36/1.43	2.08/2.6	1.21/2.73	0.04/-2.84	-4.42/-3.43	-5.51/1.63	1.44/-0.09	-3.09/-6.93	-8.55/-7.53	-6.72/-3.54	-4.04/-8.75	-3.41/-1.11		



Radiated Composite Gain Data of 2.4GHz/5GHz

Appendix A

Θ(67.5°)	-7.39/-7.95	-5.62/-4.81	-6.86/-10.41	-10.22/-9.72	-12.44/-16.55	-16.33/-10.76	-7/-6.85	-5.52/-3.74	-3.3/-3.67	-2.95/-2.17	-1.84/-2.55	-1.94/-1.18	-0.73/-2.66	-8.77/-7.25	-7.73/-8.06	-13.99/-18.82	-12.04/-17.61	-16.59/-18.17	-6.99/-4.59	-4.1/-5.03	-5.35/-1.05	-1.93/-5.91	-4.85/-3.89	-3.21/-4.1
Θ(75°)	-10.04/-10.1	-7.19/-5.66	-8.05/-13.72	-10.8/-9.97	-16.17/-18.51	-17.8/-14.75	-8.19/-7.96	-8.3/-4.32	-4.29/-0.55	-2.4/-2.08	-2.3/-3.48	-3.75/-1.64	-0.53/-2.17	-6.57/-8.74	-10.49/-12.26	-17.87/-18.96	-9.04/-9.11	-9.38/-11.38	-7.72/-3.94	-3.52/-5.24	-5.48/-1.24	-1.86/-4.26	-6.4/-5.23	-4.45/-5.72
Θ(82.5°)	-9.31/-10.16	-8.52/-7.91	-12.14/-17.7	-14.99/-14.7	-17.6/-18.1	-18.57/-19.15	-9.02/-7.62	-11.01/-5.94	-5.83/-5.8	-2.87/-2.89	-4.38/-5.47	-5.1/-2.6	-1.56/-3.18	-5.36/-9.33	-12.37/-16.04	-18.56/-12.64	-7.5/-8.22	-7.38/-9.58	-6.2/-3.95	-5.49/-8.79	-7.38/-2.24	-3.3/-5.58	-7.67/-7.69	-6.76/-7.19
Θ(90°)	-11.73/-15.34	-10.77/-9.62	-16.08/-18.44	-18.55/-15.22	-17.84/-18.18	-15.98/-18.75	-12.09/-9.53	-13.65/-7.73	-7.84/-6.33	-4.18/-4.93	-6.37/-7.85	-7.47/-6.01	-3.98/-5.76	-7.45/-11.86	-15.5/-13.84	-17.48/-17.4	-8.59/-9.8	-6.25/-8.19	-11.61/-6.68	-8.16/-11.82	-8.91/-3.48	-4.55/-5.6	-10.13/-9.23	-8.71/-8.6
Θ(97.5°)	-13.83/-17.44	-13.36/-14.46	-19.09/-17.44	-18.07/-14.59	-17.18/-18.65	-18.36/-18.67	-17.28/-12.06	-17.17/-13.52	-8.12/-8.66	-5.82/-5.61	-8.22/-10.8	-11.29/-7.84	-7.45/-13.92	-14.47/-18.51	-18.33/-19.1	-14.38/-17.98	-10.89/-12.09	-17.57/-8.93	-13.6/-15.79	-13.07/-16.4	-7.16/-6.26	-10.59/-11.68	-13.72/-12.07	
Θ(105°)	-14/-15.78	-16.87/-15.09	-17.93/-16.59	-18.57/-18.29	-17.8/-16.12	-17.25/-16.13	-18.55/-12.58	-17.09/-8.47	-10.25/-9.55	-8.12/-7.8	-8.75/-15.38	-10.43/-17.55	-7.54/-10.75	-8.06/-15.4	-12.97/-11.76	-19.43/-16.74	-15.09/-18.77	-12.27/-11.59	-19.36/-15.2	-14.76/-18.55	-12.31/-6.85	-9.79/-10.87	-13.76/-14.14	-14.98/-12.85
Θ(112.5°)	-14.31/-19.06	-16.49/-19.21	-18.4/-18.32	-19.05/-18.35	-18.39/-18.89	-14.18/-11.96	-18.67/-19.21	-18.84/-9.79	-10.31/-9.43	-8.77/-7.75	-9.67/-14.06	-17.23/-16.43	-8.81/-13.48	-8.11/-16.58	-10.47/-14.81	-17.66/-19.09	-17.98/-18.52	-18.73/-12.05	-17.82/-11.21	-15.65/-18.37	-12.67/-7.54	-10.71/-13.39	-13.54/-18.36	-18.11/-15.08
Θ(120°)	-15.25/-16.38	-16.25/-18.32	-16.9/-18.27	-16.54/-17.88	-18.88/-19.35	-15.34/-10.56	-15.55/-18.84	-18.42/-12.6	-14.76/-11.29	-12.64/-8.68	-9.27/-15.26	-12.7/-18.61	-12.86/-18.87	-10.12/-13.32	-14.32/-14.72	-13.77/-12.17	-18.13/-16.01	-17.77/-17.89	-17.95/-11.21	-18.33/-12.42	-14.55/-10.52	-13.79/-17.66	-18.24/-15.18	-14.79/-13.4
Θ(127.5°)	-14.87/-17.09	-18.2/-17.73	-18.61/-12.12	-11.6/-14.65	-17.26/-18.69	-16.58/-12.42	-14.73/-18.97	-18.37/-13.68	-12.78/-11.52	-14.07/-11.38	-12.57/-11.17	-12.63/-18.44	-13.97/-15.45	-14.03/-13.38	-15/-15.21	-11.76/-17.22	-17.08/-14.54	-18.84/-10.79	-18.58/-11.79	-9.68/-18.58	-10.9/-12.75	-15.19/-11.09	-14.76/-16.9	
Θ(135°)	-17.24/-19.3	-18.51/-17.23	-18.4/-17.64	-12.74/-13.52	-13.92/-15.31	-18.01/-18.61	-19.17/-17.68	-19.22/-17.17	-13.28/-14.92	-18.99/-16.31	-18.67/-12.45	-12.35/-18.46	-11.5/-18.61	-13.24/-12.39	-17.21/-17.54	-17.85/-17.9	-17.63/-12.72	-10.88/-8.48	-18.1/-11.46	-17.55/-16.26	-10.94/-18.74	-14.42/-14.45	-16.7/-14.6	-12.75/-15.53
Θ(142.5°)	-18.13/-18.43	-17.32/-14.95	-18.23/-18.8	-18.68/-15.59	-12.68/-11.69	-13.19/-17.89	-17.71/-17.93	-18.18/-17.72	-18.25/-19.77	-18.46/-18.75	-13.78/-15.87	-13.86/-13.97	-14.13/-19.04	-19.6/-15.41	-18.94/-16.71	-14/-15.04	-13.07/-14.43	-17.58/-16.88	-17.91/-18.81	-18.85/-18.85	-19.25/-16.7	-17.99/-18.43	-14.79/-16.89	-18.26/-17.85
Θ(150°)	-17.17/-17.71	-18.69/-19.15	-16.31/-16.36	-16.11/-14.15	-12.07/-11.7	-13.41/-15.7	-19.46/-17.9	-18.74/-15.18	-12.92/-12.86	-19.09/-17.89	-16.57/-18.89	-16.54/-19.14	-16.81/-18	-16.54/-14.77	-16.11/-17.98	-18.91/-17.84	-16.82/-15.45	-16.87/-15.44	-18.01/-19.69	-14.95/-13.44	-17.52/-19.47	-14.94/-16.7		
Θ(157.5°)	-12.88/-10.54	-10.68/-12.9	-14.21/-13.57	-14.7/-14.86	-13.52/-12.61	-12.98/-14.34	-16.18/-19.35	-19.08/-18.66	-16.45/-13.45	-11.95/-12.5	-15.95/-17.91	-19.06/-16.65	-14.77/-16.41	-18.77/-18.32	-17.91/-19.12	-19.38/-13.52	-10.04/-10.35	-15.64/-18.83	-18.86/-18.14	-15.55/-15.4	-13.62/-12.43	-15.19/-13.34	-11.84/-13.89	-19.25/-18.02
Θ(165°)	-14.49/-11.31	-11.15/-11.39	-10.92/-9.72	-9.41/-9.9	-10.44/-11.33	-12.84/-14.15	-11.4/-14.41	-15.28/-17.64	-17.74/-19.35	-11.78/-11.49	-11.86/-13.42	-15.89/-16.71	-15.97/-16.84	-18.95/-19.19	-14.26/-12.36	-12.49/-14.75	-18.18/-17.98	-18.84/-16.26	-17.34/-18.86	-15.81/-17.25	-13.26/-12.56	-11.23/-9.51	-9.92/-12.46	-13.34/-19.02
Θ(172.5°)	-10.37/-12.24	-10.9/-10.86	-11.62/-13.06	-14.65/-15.15	-15.73/-15.6	-15.92/-16.14	-17.1/-18.58	-18.61/-18.94	-18.73/-19.95	-17.52/-17.86	-19.38/-18.44	-16.77/-17.75	-19.27/-18.05	-18.14/-16.9	-16.56/-18.41	-17.75/-17.32	-17.22/-17.89	-18.96/-17.71	-19.36/-14.61	-16.9/-18.43	-17.42/-17.45	-16.19/-15.3	-14.75/-14.55	
Θ(180°)	-12.4/-12.16	-11.34/-10.44	-10.04/-10.19	-9.93/-10.19	-10.6/-10.98	-11.78/-11.96	-13.11/-14.98	-17.22/-18.21	-17.71/-17.97	-18.09/-18.09	-18.16/-18.54	-19.12/-18.11	-18.25/-17.65	-18.94/-19.06	-18.08/-17.11	-14.99/-14.12	-15.66/-18.14	-18.99/-18.71	-19.08/-17.79	-17.98/-17.81	-17.53/-18.57	-18.16/-18.7	-18.96/-17.59	-15.29/-13.22
Freq(Hz)	5.785GPol	ThetaAnt.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°)	-2.6/-2.16	-1.68/-1.09	-0.66/-0.7	-0.84/-1.21	-1.45/-1.69	-2.11/-2.91	-4.22/-6.18	-8.73/-11.39	-14.15/-15.43	-14.24/-11.66	-8.93/-6.36	-4.66/-3.98	-3.18/-2.74	-2.67/-2.65	-2.53/-2.24	-1.9/-2.05	-2.65/-3.98	-4.95/-5.24	-5.85/-7.8	-10.8/-14.39	-18.04/-18.31	-13.56/-10.01	-7.71/-6.1	-4.5/-3.39
Θ(7.5°)	-7.42/-6.91	-6.12/-5.66	-5.38/-4.96	-4.34/-4.05	-4.13/-4.59	-5.17/-5.83	-6.83/-8.61	-12.16/-18.82	-19.11/-16.61	-12.22/-9.12	-6.56/-4.69	-3.44/-2.48	-1.72/-1.05	-0.49/-0.09	0.29/0.66	0.9/0.82	0.44/-0.19	-1.1/-7.5	-2.43/-3.78	-5.77/-7.69	-9.41/-12.04	-13.56/-12.6	-10.93/-9.66	-9.14/-8.2
Θ(15°)	-7.1/-5.74	-4.59/-3.97	-3.81/-3.87	-4.69/-4.53	-6.16/-6.8	-6.69/-6.55	-7.2/-8.84	-11.72/-12.66	-10.96/-9.3	-8.18/-7.53	-6.54/-5.6	-4.77/-4.12	-3.65/-3.42	-3.24/-2.69	-1.77/-0.78	0.16/0.61	0.32/-0.24	-0.95/-1.39	-1.64/-2.41	-3.53/-4.68	-6.05/-8.44	-12.69/-18.31	-17.95/-15.52	-10.39/-13.8
Θ(22.5°)	-9.68/-8.69	-6.99/-5.18	-4.11/-4.06	-5.45/-8.55	-12.23/-11.1	-8.29/-7.29	-7.3/-7.01	-5.13/-5.54	-2.34/-1.89	-2.59/-0.53	-8.02/-7.29	-5.24/-4.22	-4.62/-5.88	-6.01/-3.97	-1.86/-0.39	0.48/0.92	1.09/0.76	-0.43/-1.84	-2.55/-2.44	-2.81/-4.47	-7.51/-11.87	-12.79/-11.9	-13.94/-18.49	-15.92/-11.21
Θ(30°)	-14.84/-17.13	-11.15/-7.91	-7.13/-6.67	-7.53/-9.19	-10.03/-9.06	-8.06/-8.31	-8.81/-7.08	-4.15/-1.79	-0.39/0.04	0.11/-1.35	-3.71/-3.29	-2.21/-1.52	-1.62/-2.5	-3.11/-2.95	-2.57/-1.84	0.70/0.58	-0.52/-0.28	-2.81/-1.95	-1.02/-1.14	-0.95/-13.71	-11.22/-8.97	-10.14/-11.1	-12.12/-15.63	
Θ(37.5°)	-14.47/-10.96	-8.05/-6.8	-6.43/-5.97	-6.12/-6.15	-4.16/-1.75	-0.18/0	-1.3/-3.01	-3.03/-2.59	-1.55/0.51	2.26/2.34	1.73/-1.37	-0.18/-1.86	-1.24/-0.27	-1.17/-2.46	-1.92/-0.91	-0.67/-0.86	-1.57/-2.53	-3.38/-4.91	-7.4/-10.54	-8.75/-3.1	-3.72/-11.05	-14.33/-8.4	-8.11/-6.35	-6.38/-9.31
Θ(45°)	-4.15/-2.93	-2.14/-2.12	-1.65/-1.18	-1.82/-2.16	-1/-1.43	3.43/3.96	3.13/1.33	-0.56/-0.97	-0.85/0.65	2.12/2.68	2.68/2.57	0.11/-4.12	-0.71/-1.48	0.17/-2.76	-2.46/-1.25	-1.86/-3.25	-4.13/-4.96	-6.34/-6.72	-7.79/-13.08	-12.09/-4.78	-3.63/-10.7	-10.21/-4.94	-5.16/-3.06	-1.44/-3.32
Θ(52.5°)	-0.28/0.28	0.26/0.65	0.38/0.81	0.5/0.61	2.24/0.42	4.54/-1.4	3.93/0.2	2.11/0.6	0.881/-54	2.52/-47	2.51/-241	-0.28/-1.07	1.89/1.95	-0.42/-4.29	-1.18/0.68	-1.32/-3.58	-8.4/-9.77	-13.46/-14.92	-11.59/-11.17	-18.25/-5.77	-4.11/-6.62	-7.14/-4.57	-4.37/-1.14	-0.45/-0.48
Θ(60°)	1.03/0.9	0.3/0.58	1.98/1.91	0.93/1.05	3.27/4.75	4.58/3.62	2.98/1.2	2.96/1.02	1.282/-58	3.44/2.58	1.53/2.35	1.77/1.7	2.68/-142	-1.52/-2.98	1.273/-22	1.01/-4.23	-14.13/-17.79	-17.49/-18.66	-13.03/-6.92	-16.84/-7.59	-4.51/-7.78	-2.99/-2.66	-4.64/-1.88	0.22/-0.01
Θ(67.5°)	-0.19/-0.05	-1.14/-0.39	1.75/-1.17	-0.42/0.35	2.82/-4.29	3.46/3.64	2.82/-72	2.83/-1.3	1.473/-0.9	3.43/-58	1.55/-277	2.77/3.03	2.21/-0.89	-2.73/-1.76	2.45/-3.96	2.6/-2.17	-8.87/-16.42	-14.03/-14.48	-11.75/-7.71	-10.59/-7.02	-4.22/-4.92	-2.17/-2.27	-4.73/-2.83	-1.43/-1.26
Θ(75°)	-1.95/-2.31	-3.44/-0.99	1.19/-1.04	-2.55/-0.75	1.456/-7.2	2.92/-74	2.22/-2.16	2.77/-1.01	0.662/-87	2.752/-41	0.932/-18	2.923/-61	1.31/-3.92	-3.17/-2.53	2.034/-14	3.58/-0.02	-4.97/-8.31	-8.35/-8.49	-9.01/-5.04	-5.79/-6.28	-4.97/-4.67	-0.79/-1.16	-4.97/-4.06	-4.52/-3.71
Θ(82.5°)	-3.51/-4.08	-5.29/-2.48	-0.13/-2.58	-4.34/-1.6	-0.51/0.57	1/1.37	0.75/0.39	1.23/0.15	0.212/-41	1.281/-37	0.241/-47	2.392/-93	-0.39/-3.71	-4.2/-4.81	0.97/3.3	3.68/0.14	-2.36/-4.56	-6.97/-8.33	-9/-3.83	-4.88/-6.98	-6.09/-5.55	-0.71/-0.89	-5.64/-5.29	-8.32/-6.58
Θ(90°)	-3.7/-4.18	-6.15/-3.51	-1.13/-4.08	-6.55/-2.85	-2.11/-0.88	-0.34/0.51	-0.68/-1.88	-0.28/-0.59	-0.75/-1	-0.04/-0.47	-0.8/-0.29	0.48/2.35	-1.35/-11.46	-7.13/-11.21	-2.85/-1.1	2.72/0.52	-1.32/-2.96	-8.83/-11.41	-10.55/-4.32	-4.73/-3.82	-6.37/-5.11	-1.93/-2.78	-7.65/-6.2	-10.29/-6.99
Θ(97.5°)	-4.4/-5.68	-5.08/-5.03	-2.17/-5.04	-7.13/-6.75	-3.12/-1.49	-1.49/-0.77	-2.16/-2.66	-2.46/-2.69	-1.6/0.04	-1.33/-1.88	-2.34/-2.06	-0.63/0.45	-3.67/-8.72	-8.36/-11.93	-5.25/-1.62	-0.16/-2.07	-2.63/-4.22	-6.98/-13.97	-13.18/-5.94	-4.75/-9.55	-8.34/-7.28	-3.99/-4.33	-9.6/-8.36	-13.43/-6.26
Θ(105°)	-5.21/-6.15	-10.75/-6.8	-2.54/-3.82	-9.26/-5.31	-4.52/-2.46	-1.94/-2.39	-3.25/-3.72	-3.91/-4.3	-3.3/-2.03	-3.78/-5.56	-4.71/-2.9	-1.74/-0.48	-4.27/-10.3	-9.29/-18.33	-9.94/-4.68	-4.09/-5.01	-3.03/-8.17	-10.76/-17.5	-18.42/-6.08	-5.41/-11.71	-11.14/-9.47	-7.69/-8.57	-12.47/-10.98	-13.26/-7.14
Θ(112.5°)	-6/-7.27	-13.1/-6.96	-3.77/-4.66	-12.36/-8.47	-4.41/-3.1	-3.63/-4.55	-4.63/-3.54	-4.11/-5.68	-6.04/-0.53	-6.81/-9.05	-6.42/-7.53	-4.11/-4.33	-5.82/-8.47	-8.56/-14.3	-13.29/-9.82	-5.91/-8.31	-8.11/-11.6	-11.88/-18.04	-17.87/-6.21	-4.43/-				



Radiated Composite Gain Data of 2.4GHz/5GHz

Appendix A

Θ(112.5°)	-11.21/-18.55	-14.19/-12.5	-13.92/-9.52	-7.87/-6.67	-7.63/-13.2	-8.66/-10.29	-5.74/-6.02	-8.91/-9.37	-13.06/-13.1	-10.34/-11.28	-17.69/-13.17	-14.68/-16.98	-14.21/-15.12	-18.52/-19.14	-15.88/-12.51	-10.89/-17.52	-18.7/-18.83	-17.79/-12.4	-11.3/-11.22	-13.83/-19.24	-14.73/-15.07	-18.12/-18.01	-14.79/-18.31	-17.72/-11.54	
Θ(120°)	-14.46/-18.3	-15.25/-15.6	-18.88/-14.0	-9.56/-7.61	-6.35/-9.32	-8/-10.68	-9.98/-7.72	-7.93/-8.37	-10.15/-14.2	-14.11/-11.36	-17.65/-13.78	-15.25/-14.64	-14.83/-12.53	-17.31/-19.2	-18.49/-19.05	-17.44/-18.74	-12.54/-12.07	-18.63/-11.71	-10.2/-11.06	-14.07/-18.27	-16.58/-13.31	-17.96/-18.6	-17.57/-14.42	-14.35/-14.01	
Θ(127.5°)	-16.17/-11.28	-16.05/-17.59	-15.7/-14.53	-10.35/-7.67	-7.38/-10.37	-5.52/-7.68	-9.22/-8.08	-7.92/-10.12	-9.59/-13.83	-15.31/-13.31	-13.45/-14.08	-18.42/-15.54	-13.79/-19.12	-18.57/-10.27	-12.97/-17.46	-18.62/-14.43	-13.29/-14.42	-18.12/-12	-10.27/-13.61	-15.86/-18.1	-18.28/-19.33	-18.7/-19.14	-16.63/-18.39	-12.18/-15.76	
Θ(135°)	-17.15/-15.78	-18.65/-17.34	-18.51/-18.31	-17.48/-8.22	-7.33/-9.83	-7.48/-6.92	-13.14/-10.06	-8.74/-17.38	-12.24/-16.15	-18.43/-18.79	-13.12/-9.54	-17.84/-9.74	-13.12/-18.71	-12.31/-11.66	-19.06/-16.46	-17.14/-13.99	-12.82/-15	-18.08/-13.58	-11.43/-12.5	-15.38/-18.06	-18.51/-18.94	-16.64/-18.27	-18.99/-18.99	-14.15/-14.14	
Θ(142.5°)	-17.97/-18.1	-18.67/-18.28	-17.71/-19.37	-18.91/-15.05	-15.06/-19.17	-11.18/-10.81	-19.13/-13.8	-11.31/-17.79	-18.13/-16.68	-18.93/-13.62	-12.22/-15.55	-14.08/-18.32	-15.54/-18.61	-14.44/-18.44	-17.26/-17.78	-12.59/-9.5	-10.76/-15.69	-17.98/-18.34	-18.67/-17.7	-19.16/-18.25	-18.65/-18.3	-19.12/-17.7	-18.63/-17.86	-13.6/-15.02	
Θ(150°)	-18.21/-19.19	-17.15/-19.05	-18.89/-18.39	-17.79/-18	-18.79/-17.7	-11.61/-11.23	-15.94/-17.77	-18.16/-16.74	-14.57/-16.27	-15.24/-14.77	-18.22/-18.34	-18.71/-17.15	-18.22/-18.34	-17.76/-18.82	-14.92/-17.99	-18.78/-18.93	-17.44/-18.11	-18.85/-18.6	-17.94/-18.6	-18.29/-18.4	-18.07/-18.15	-16.21/-14.1	-16.63/-13.67		
Θ(157.5°)	-14.11/-13.83	-15.44/-16.44	-14.58/-13.77	-13.51/-13.67	-14.78/-17.4	-18.67/-17.95	-19.17/-18.71	-17.82/-18.2	-17.98/-17.1	-13.75/-12.6	-13.56/-16.99	-18.09/-18.37	-19.57/-17.48	-19.15/-19.08	-15.29/-14.66	-15.69/-17.91	-17.2/-18.06	-15.91/-16.07	-18.25/-18.05	-18/-15.59	-18.16/-18.17	-18.36/-18.96	-18.36/-19.92	-19.22/-18.39	
Θ(165°)	-15.83/-14.81	-12.88/-11.09	-10.88/-11.45	-12.73/-12.95	-14.4/-17.23	-18.28/-17.06	-16.04/-16.81	-17.74/-19.27	-17.89/-18.01	-16.28/-12.92	-12.62/-14.37	-16.63/-18.99	-18.91/-18.75	-18.4/-15.52	-14.35/-15.71	-18.14/-19.33	-18.94/-17.74	-16.75/-18.36	-18.13/-18.44	-18.94/-18.81	-19.88/-17.17	-17.68/-17.51	-19.02/-17.1	-18.6/-18.42	
Θ(172.5°)	-14.37/-14.89	-14.04/-13.96	-13.62/-13.54	-15.12/-17.33	-19.62/-18.11	-19.04/-18.16	-19.08/-17.94	-19.64/-18.58	-19.06/-18.92	-18.78/-18.64	-18.67/-17.86	-17.75/-18.32	-19/-18.27	-18.04/-18.97	-18.83/-17.63	-18.71/-17.28	-18.32/-18.25	-18.09/-18.46	-17.03/-16.56	-15.7/-16.02	-17.08/-18.33	-18.91/-17.99	-19.23/-17.18	-14.87/-14.17	
Θ(180°)	-17.4/-17.81	-16.35/-15.73	-14/-12.33	-12.35/-12.78	-13.17/-13.6	-13.66/-14.38	-15.1/-16.23	-16.67/-17.19	-17.18/-16.22	-15.93/-16.12	-17.35/-19.32	-17.73/-17.54	-17.69/-18.06	-17.69/-17.11	-17.39/-16.14	-14.64/-13.97	-14.22/-14.07	-13.68/-13.22	-13.82/-14.75	-15.66/-15.67	-16.61/-17.3	-19.59/-19.22	-18.37/-18.26	-18.5/-17.9	
Freq(Hz)	5.2GPol	Theta/Ant. 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°)	-2.55/-4.23	-6.66/-9.79	-15.56/-17.93	-17.13/-11.6	-8.18/-5.7	-3.82/-2.22	-0.97/-0.26	0.10/0.3	0.16/0.59	1/1.04	0.56/-0.58	-1.67/-2.92	-4.23/-6.03	-9.33/-13.93	-18.16/-16.15	-11.06/-7.9	-5.24/-3.46	-2.08/-0.93	-0.04/0.61	1.15/1.39	1.55/1.35	0.96/0.64	0.3/-0.17	-0.74/-1.46	
Θ(7.5°)	-5.92/-7.81	-9.99/-10.56	-8.83/-6.85	-5.54/-4.27	-3.14/-2.16	-1.33/-0.33	0.5/1.15	1.32/-1.26	1.18/1.38	1.83/-1.19	1.92/-0.1	-0.29/-1.44	-1.95/-3.1	-5.16/-7.5	-9.18/-11.69	-16.14/-15.65	-11.28/-7.64	-5.25/-3.61	-2.43/-1.4	-0.25/0.33	0.69/0.61	0.02/-0.72	-1.42/-2.32	-3.34/-4.46	
Θ(15°)	-9.04/-10	-9.01/-6.72	-4.5/-2.98	-2.26/-1.73	-1.56/-1.51	-1.29/-0.95	-0.31/0.39	0.85/1.16	1.24/1.34	1.72/2.21	2.33/-1.65	0.42/-1.06	-2.08/-3.19	-4.53/-5.63	-6.39/-8.17	-11.8/-15.69	-14.01/-9.18	-6.21/-4.13	-2.85/-1.63	-0.7/-0.45	-0.49/-0.75	-1.48/-2.14	-3/-3.85	-5.26/-7.02	
Θ(22.5°)	-6.96/-7	-6.34/-5.2	-3.11/-2.1	-1.26/-0.37	0.24/0.6	0.77/0.97	1.27/1.64	1.85/1.73	1.11/0.59	0.74/1.39	1.89/1.9	1.18/-0.12	-1.36/-2.64	-3.88/-4.65	-5.57/-7.79	-11.09/-10.58	-8.16/-6.04	-4.62/-3.46	-2.2/-1.15	-0.66/-0.98	-1.96/-3.37	-4.73/-5.55	-5.82/-5.89	-5.97/-6.57	
Θ(30°)	-3.21/-3.3	-3.48/-2.29	-1.91/-0.96	1.01/1.1	2.69/1.6	3.13/0.4	2.99/2.85	2.62/2.45	1.68/1.47	0.63/0.32	0.65/-1.27	1.3/-0.54	-0.52/-1.54	-2.62/-3.6	-4.27/-5.24	-5.9/-4	-3.8/-4.82	-5.78/-5.6	-3.99/-2.68	-1.42/-0.96	-1.58/-2.98	-4.77/-6.24	-6.82/-8.16	-4.95/-3.81	
Θ(37.5°)	-2.18/-2.1	-2.41/-2.89	-0.43/-1.03	0.68/1.61	1.68/2.75	3.57/3.66	3.18/2.71	2/1.03	0.65/-1.15	2.63/-1.31	0.74/-0.05	-0.99/-0.9	-2.44/-1.46	-2.24/-1.19	-2.33/-3.29	-4.25/-4.41	-3.3/-2.77	-4.25/-6.99	-8.21/-9.91	-5.85/-3.03	-1.47/-0.84	-1.21/-2.01	-2.71/-3.6	-4.7/-4.51	-3.32/-4.25
Θ(45°)	-1.21/-0.84	-1.41/-1.72	0.94/2.58	2.53/1.11	3.69/3.17	2.52/1.79	0.04/-1.71	-1.84/-0.97	-0.68/-1.61	-2.37/-3.05	-4.59/-4.3	-3.42/-4.85	-6.05/-5.3	-4.05/-4.38	-5.02/-5.29	-5.34/-5.19	-6.57/-9.19	-10.3/-9.07	-5.92/-3.42	-1.92/-1.43	-2.03/-3.06	-2.6/-2.26	-2.5/-1.83	-1.05/-1.25	
Θ(52.5°)	0.58/0.78	-0.62/-2	1.24/2.4	2.9/3.56	4.07/3.46	3.37/2.82	1.17/0.63	-1.89/-2.24	-2.69/-4.59	-6.32/-7	-9.03/-8.98	-6.83/-5.26	-4.22/-4.62	-5.21/-6.37	-6.93/-6.5	-7.02/-6.95	-6.83/-5.75	-9.24/-9.32	-5.13/-2.24	-1.17/-1.21	-2.84/-5.44	-4.45/-4.38	-2.95/-8.08	0.2/0.08	
Θ(60°)	1.79/0.99	-1.39/-3.18	1.46/4.01	3.57/3.96	4.123.32	2.07/0.19	-1.9/-1.4	-0.05/-1.45	-4.57/-7.06	-8.28/-10.27	-7.2/-6.05	-5.49/-5.34	-4.08/-5.46	-5.98/-6.1	-8.77/9.3	-5.93/-5.4	-6.63/-1.97	-0.68/-0.85	-2.88/-6.8	-5.15/-3.8	-2.98/-0.65				
Θ(67.5°)	1.42/0.68	-0.16/-1.96	1.22/3.88	3.56/4.05	3.97/3.42	3.66/3.07	1.94/-0.8	-3.63/-1.3	0.98/0.4	-3.85/-7.19	-6.19/-8.85	-5.85/-6.81	-5.7/-4.48	-4.93/-5.86	-5.92/-5.4	-6.88/-7.14	-4.5/-4.43	-5.34/-5.67	-3.93/-1.4	-0.21/-0.96	-3.97/-9.62	-7.78/-4.89	-2.89/-1.22	-1.28/0.21	
Θ(75°)	0.1/-0.44	-0.67/-1.98	0.89/9.29	2.87/3.01	2.84/2.68	2.82/-1.4	-1.26/-2.3	-6.21/-2.2	1.02/1.2	-2.85/-7.92	-3.71/-6	-4.27/-5.62	-5.39/-4.66	-4.41/-5.29	-6.48/-4.73	-4.75/-5.93	-5.11/-5.44	-7.22/-6.75	-4.83/-2.38	-0.16/-0.45	-3.49/-8.52	-8.65/-6.98	-3.48/-2.12	-2.61/-2.19	
Θ(82.5°)	-0.54/-0.67	-0.52/-3.32	-0.63/-2.59	2.34/2.24	2.15/2.05	1.41/0.6	0.26/-0.59	-9.42/-3.08	0.65/0.86	-3.84/-8.64	-2.42/-5.24	-4.01/-6.87	-5.69/-5.07	-4.45/-4.38	-8.27/-4.14	-3.86/-5.99	-5.85/-7.96	-10.53/-8.4	-4.77/-1.77	-0.03/0	-3.37/-1.74	-8.29/-7.46	-4.73/-3.41	-3.2/-2.5	
Θ(90°)	-2.6/-1.85	-2.59/-4.67	-2.01/-1.33	1.03/0.93	0.9/0.87	0.18/-0.31	-1.48/-7.42	-9.7/-6.21	-1.96/-0.85	-2.73/-11.05	-5.06/-8.33	-5.21/-7.63	-4.79/-6.36	-5.92/-4.97	-7.55/-4.95	-4.36/-6.64	-8.36/-15.76	-14.22/-8.2	-5.2/-2.55	-1.55/-0.71	-4.56/-7.67	-9.78/-7.92	-5.4/-4.61	-4.18/-4.43	
Θ(97.5°)	-3.81/-3.35	-3.89/-5.39	-3.15/-3.04	-0.21/-0.31	-0.4/-0.12	-1.01/-1.44	-2.52/-7.14	-0.83/-0.69	-5.39/-3.61	-4.82/-13.53	-8.81/-14.71	-9.04/-11.19	-5.47/-8.18	-7.3/-6	-8.89/-6.12	-6.68/-8.85	-15.18/-9.18	-6.46/-3.62	-3.7/-2.83	-6.49/-10.47	-13.36/-9.63	-7.68/-9.97	-5.72/-5.46		
Θ(105°)	-6.11/-5.65	-6.32/-8.77	-4.91/-2.33	-1.68/-1.87	2.6/-2.06	-4.02/-7.66	-8.93/-8.31	-6.68/-6.31	-8.25/-14.64	-13.42/-14.72	-8.07/-14.72	-6.42/-6.18	-10.32/-8.63	-10.76/-11.2	-18.44/-19.17	-17.69/-10.07	-8.87/-6.96	-5.97/-5.07	-6.99/-12.27	-15.95/-10.99	-6.47/-7				
Θ(112.5°)	-7.7/-6.56	-7.94/-6.57	-6.5/-4.55	-3.61/-3.79	-4.63/-3.92	-4.37/-4.41	-4.63/-7.84	-10.25/-7.16	-7.16/-9.03	-13.32/-14.52	-13.69/-9.27	-9.37/-13.59	-6.86/-6.16	-13.6/-12.88	-10.65/-11.05	-14.09/-11.98	-17.44/-15.16	-15.71/-11.22	-10.98/-9.05	-6.77/-6.72	-6.34/-9.94	-12.73/-10.66	-8.25/-9.13	-8.95/-8.23	
Θ(120°)	-10.16/-11.01	-9.09/-11.18	-9.86/-7.15	-7.48/-7.96	-7.65/-7.42	-6.93/-8.27	-7.29/-12.68	-14.12/-8.38	-7.17/-7.13	-10.53/-15.01	-16.64/-9.67	-7.72/-9.35	-10.32/-7.61	-13.35/-17.73	-15.41/-14.05	-14.08/-14.65	-18.58/-13.38	-16.37/-12.41	-10.1/-7.86	-5.65/-6.26	-5.77/-9.9	-14.19/-14.88	-8.29/-8.13	-10.45/-9.02	
Θ(127.5°)	-11.3/-10.88	-9.17/-10.04	-11.03/-8.78	-9.66/-10.48	-9.03/-10.1	-13.41/-10.16	-13.31/-18.41	-18.32/-14.47	-7.58/-5.73	-7.75/-18.68	-18.2/-13.71	-17.73/-12.91	-13.44/-12.04	-18.18/-18.25	-17.95/-18.16	-12.82/-17.61	-18.27/-12.32	-12.83/-11.43	-11.3/-9.23	-8.99/-10	-17.82/-13.27	-9.72/-7.47	-11.59/-13.04		
Θ(135°)	-11.98/-10.93	-14.55/-11.57	-9.28/-9.98	-11.44/-13.45	-18/-17.73	-16.39/-10.77	-11.34/-17.87	-15.03/-16.79	-17.18/-13.12	-12.08/-17.01	-17.51/-14.91	-11.92/-11.43	-13.75/-15.85	-17.24/-18.63	-18.24/-19.33	-11.79/-18.94	-17.56/-13.83	-13.45/-18.46	-15.48/-10.7	-9.64/-10.14	-12.33/-11.71	-17.79/-17.66	-10.77/-9.63	-14.36/-17.91	
Θ(142.5°)	-13.13/-14.99	-18.72/-18.44	-12.77/-12.22	-13.3/-13.98	-15.44/-17.81	-16.01/-11.92	-12.49/-15.54	-14.85/-13.72	-14.76/-18.31	-17.14/-17.51	-19.16/-12.35	-10.12/-11.87	-15.01/-18.79	-18.31/-18.96	-17.56/-18.46	-15.95/-18.73	-15.04/-13.69	-13.22/-18.32	-17.67/-14.83	-11.56/-10.32	-10.86/-10.67	-12.55/-11.36	-8.63/-8.61	-11.61/-15.1	
Θ(150°)	-17.62/-14.2	-11.67/-12.02	-14.8/-15.06	-12.39/-12.11	-12.86/-13.55	-14.87/-15.57	-17.51/-17.81	-14.45/-11.07	-11.49/-14.13	-14.5/-13.17	-14.24/-18.37	-17.33/-15.6	-12.99/-19	-18.47/-14.82	-14.35/-16.67	-17.89/-18.66	-13.91/-11.18	-13.31/-18.96	-18.55/-13.63	-10.28/-18.07	-12.53/-13.93	-14.97/-15.68	-13.38/-11.92	-13.31/-17.74	
Θ(157.5°)	-19.05/-18.21	-15.29/-13.43	-12.37/-11.34	-10.57/-10.07	-9.88/-9.21	-9.39/-11.15	-14.62/-18.11	-17.55/-16.18	-15.94/-17.95	-18.16/-17.82	-17.88/-18.04	-17.45/-17.46	-16.77/-16.42	-15.99/-15.9	-16.73/-19.04	-19.55/-19.25	-17.49/-18.09	-16.84/-18.01							



Radiated Composite Gain Data of 2.4GHz/5GHz

Appendix A

Θ(157.5°)	-18.38/-15.8	-19.24/-18.53	-18.49/-17.81	-18.81/-18.04	-16.68/-16.18	-18.22/-17.52	-14.34/-14.24	-15.59/-17.03	-18.33/-18.53	-15.97/-17.52	-19.14/-17.62	-14.39/-16.26	-17.5/-18.19	-19/-18.88	-16.34/-14.25	-16.56/-19.2	-18.43/-16.76	-18.06/-18.69	-16.81/-14.77	-14.13/-15.62	-17.37/-17.85	-19.26/-17.43	-17.71/-18.54	-19.23/-18.14
Θ(165°)	-19.06/-17.71	-18.99/-17.93	-18.2/-18.4	-18.53/-15.61	-14.17/-14.17	-16.9/-17.98	-18.53/-13.68	-11.38/-12.71	-18.18/-17.57	-17.65/-17.65	-18.41/-18.14	-19.14/-18	-18.3/-17.75	-18.08/-16.22	-13.13/-12.62	-13.53/-14.45	-13.99/-14.08	-12.8/-13.22	-14.07/-17.56	-17.98/-17.27	-18.08/-17.87	-17.77/-18.14	-17.46/-17.33	-18.76/-17.47
Θ(172.5°)	-16.91/-15.31	-14.46/-15.12	-16.09/-16.29	-16.98/-17.39	-17.77/-17.31	-17.14/-18.17	-19.04/-19.26	-18.74/-16.4	-15.41/-17.88	-17.8/-18.59	-18.54/-16.98	-16.59/-16.99	-15.74/-13.78	-13.59/-13.63	-12.36/-11.41	-10.68/-11.53	-13.09/-14.12	-14.45/-15.97	-18.62/-18.64	-18.93/-19.18	-18.71/-18.08	-18.71/-19.19	-17.9/-15.64	-15.03/-16.3
Θ(180°)	-18.14/-18.99	-18.71/-19.07	-18.05/-19	-18.76/-18.3	-18.14/-18.52	-18.48/-18.17	-18.43/-18.08	-18.54/-17.89	-18.46/-19.19	-16.59/-14.02	-13.56/-14.36	-18.16/-17.76	-18.08/-17.34	-19.04/-18.16	-17.13/-19.06	-18.61/-17.17	-17.64/-18.51	-17.98/-19.14	-17.28/-18.72	-17.64/-18.23	-18.37/-17.58	-18.35/-17.32	-18.51/-19	-18.68/-17.05
Freq(Hz)	5.6GPol.	Theta/Ant. 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°)	-3.99/-5.83	-8.35/-10.83	-15.67/-17.66	-17.14/-11.68	-8.44/-5.99	-4.44/-3.02	-1.93/-0.96	-0.180.18	0.19/-0.22	-0.6/-0.69	-0.57/-0.81	-2.25/-4.72	-7.31/-9.77	-12.77/-15.27	-14.42/-11.84	-8.7/-6.18	-4.13/-2.72	-1.59/-0.67	0.21/0.59	0.43/0.17	0.0/2.1	0.44/0.49	-0.01/-1.01	-1.99/-2.85
Θ(7.5°)	-9.09/-12.59	-15.19/-10.43	-6.63/-4.57	-3.08/-1.75	-0.76/0.06	0.45/0.94	1.24/1.47	1.63/1.73	1.75/1.76	1.47/1.06	1.07/1.09	0.66/-0.36	-1.21/-1.94	-3.22/-5.52	-8.7/-12.87	-18.11/-18.89	-12.88/-8.02	-4.99/-3.38	-2.17/-1.16	-0.48/-0.4	-0.55/-0.7	-1.13/-1.47	-1.94/-2.79	-4.22/-6.41
Θ(15°)	-6.32/-7.98	-8.68/-6.81	-4.37/-2.4	-0.99/0.34	1.36/2.13	2.45/2.5	2.41/2.32	2.35/2.54	2.97/3.34	3.36/3.06	2.84/2.49	1.99/1.29	0.76/0.48	-0.21/-1.69	-4.28/-7.74	-12.39/-19.28	-11.99/-7.12	-4.72/-3.57	-2.99/-2.6	-2.39/-2.26	-2.18/-2.32	-2.79/-2.8	-2.91/-2.91	-3.81/-4.93
Θ(22.5°)	-1.69/-1.64	-1.64/-1.6	-1.61/-1.63	-1.28/-0.09	1.25/2.11	2.22/0.9	1.76/1.65	1.73/2.13	2.86/3.56	3.87/3.71	3.29/3.01	2.59/1.76	1.02/0.91	0.54/-0.99	-3.13/-5.16	-6.89/7.96	-7.06/-6.15	-5.49/-4.4	-3.47/-2.71	-3.32/-4.34	-4.9/-5.17	-5.22/-4.22	-3.42/-2.84	-2.49/-1.85
Θ(30°)	0.74/1.42	1.52/1.31	1.08/0.94	0.66/1.07	2.23/0.5	3.36/3.68	3.62/3.1	2.09/1.63	2.05/2.35	2.01/1.62	1.87/2.33	2.81/3.35	1.36/0.81	-0.08/-1.18	-1.89/-2.31	-3.35/-5.45	-6.57/-5.95	-4.8/-3.55	-1.91/-0.76	-0.71/-1.34	-2.64/-3.13	-2.95/-2.92	-2.45/-1.28	-0.53/0
Θ(37.5°)	1.95/2.46	2.78/2.26	2.35/3.03	3.2/4.1	2.75/3.27	3.61/4.6	4.26/3.28	1.6/0.87	1.29/1.36	1.07/0.87	0.48/0.38	1/0.4	-0.84/-1.36	-1.24/-2.23	-2.17/-5.33	-7.9/-5.11	-1.98/0.39	1.27/0.93	0.19/-0.6	-1.66/-2.52	-2.38/-1.96	-0.34/-1.55	2.32/2.08	
Θ(45°)	2.97/3.19	3.15/2.13	1.74/3.26	4.02/3.35	3.02/2.99	2.84/3.12	2.79/1.23	-1.01/-1.51	-1.33/-2.12	-3.46/-2.94	-2.45/-2.9	-1.98/-2.94	-6.12/-5.74	-3.56/-4.92	-6.18/-3.33	-3.86/-6.01	-4.31/-3.74	-2.07/0.77	2.35/2.05	-0.05/-3.41	-6.88/-6.85	-5.9/-4.75	-1.91/-1.31	2.82/2.85
Θ(52.5°)	3.2/2.67	2.39/1.88	0.96/3.05	4.63/3.98	3.66/2.95	1.84/1.54	0.69/-1.44	-2.75/-2.25	-2.38/-4.28	-7.45/-6.42	-6.25/-6	-4.6/-7.73	-10.74/-9.05	-5.86/-7.69	-6.32/-5.33	-2.75/-2.99	-1.79/0.39	0.64/-0.07	-1.37/-3.76	-9.54/-6.89	-7.28/-10.32	-4.73/0.03	2.06/3.04	
Θ(60°)	2.06/2.13	2.05/1.45	-0.52/2.03	4.73/4.89	4.68/3.74	2.22/1.31	0.37/-1.25	-2.33/-1.65	-1.14/-1.93	-4.79/-5.99	-5.92/-5.04	-5.69/-8.82	-11.41/-9.68	-5.98/-6.1	-6.13/-3.97	-1.85/-4.02	-3.4/-1.46	-1.63/-1.51	-1.92/-3.67	-7.13/-5.08	-4.93/-8.64	-6.92/-2.33	0.32/1.66	
Θ(67.5°)	1.12/1.86	1.59/0.73	-2.36/1.43	5.27/5.58	5.44/4.2	2.20/7	0.39/-1.05	-2.79/-1.6	-0.26/-1.47	-2.92/-2.68	-2.23/-3.29	-7/-9.5	-16.13/-6.77	-4.19/-4.69	-8.36/-5.62	-4.45/-3.25	-2.29/-6.04	2.77/-2.49	-4.85/-3.16	-2.18/-2.15	-5.58/-5.34	-5.94/-7.64	-7.38/-3.97	-0.97/0.23
Θ(75°)	0.02/0.96	0.83/0.19	-2.92/0.93	4.86/5.09	5.16/4.28	2.15/0.3	0.05/-2.25	-5.48/-3.66	0.19/-1.08	-2.56/-1.31	-0.87/-1.87	-5.69/-7.34	-16.27/-9.44	-3.13/-3.92	-4.57/-3.26	-2.23/-2.63	-3.01/-8.09	-2.3/-3.36	-9.03/-5.03	-1.11/-1.59	-6.31/-7.73	-7.77/-4.78	-2.69/-1.47	
Θ(82.5°)	-1.25/-0.78	-0.32/-0.18	-2.97/0.57	3.78/4.13	4.26/3.28	1.41/0.12	0.03/-3.69	-9.11/-5.04	-0.43/-1.25	-2.14/-0.49	-0.4/-1.95	-3.92/-8.48	-11.19/-3.91	-4.32/-3.05	-2.97/-1.47	-0.32/-2.81	-5/-7.91	-1.9/-5.26	-13.09/-5.01	-0.28/-0.37	-2.1/-4.37	-6.59/-8.78	-7.9/-4.35	-3.71/-2.75
Θ(90°)	-1.77/-1.78	-1.61/-1.17	-3.61/-0.37	2.41/2.55	3.05/2.11	0.19/-0.85	-1.21/-5.71	-13.22/-7.48	-1.33/-1.39	-3.38/-0.81	-0.81/-2.89	-4.75/-7.48	-9.52/-4.8	-4.72/-4.61	-3.48/-2.22	-1.05/-5.9	-8.48/-7.48	-2.45/-6.39	-13.08/-6.06	-1.53/-1.34	-3.48/-6.29	-8.41/-8.52	-8.08/-5.55	-4.71/-2.23
Θ(97.5°)	-2.14/-3.31	-2.58/-1.95	-4.69/-1.37	0.41/34	1.88/0.86	-1.02/-1.59	-2.29/-7.8	-17.22/-10.12	-3.5/-2.24	-3.04/-2.44	-2.51/-6.65	-6/-11.05	-7.94/-4.9	-5.38/-6.03	-5.76/-3.25	-3.06/-10.5	-5.09/-8.18	-18.34/-8.5	-3.77/-2.72	-5.16/-7.82	-10.37/-9.19	-6.92/-5.38	-5.31/-5.02	
Θ(105°)	-4.05/-4.52	-3.26/-2.26	-7.34/-4.31	-1.18/0.21	0.88/-0.58	-2.12/-2.33	-3.28/-8.12	-16.42/-15.92	-8.06/-5.98	-5.68/-4.58	-3.86/-11.16	-9.76/-11.84	-5.65/-8.97	-5.81/-7.16	-4.84/-5.77	-4.39/-13.28	-11.72/-8.94	-8.5/-10.22	-18.29/-12.62	-6.71/-3.98	-5.95/-11.39	-6.05/-6.27	-7.15/-7.43	
Θ(112.5°)	-6.45/-5.92	-5.75/-4.84	-6.84/-7.11	-3.36/-2.21	-1.82/-2.71	-3.67/-3.79	-4.48/-7.53	-16.7/-18.18	-13.37/-6.83	-8.41/-9.7	-7.15/-13.13	-8.72/-17.99	-7.44/-4.88	-9.02/-7.13	-7.48/-7.71	-10.65/-13.04	-10.72/-11.3	-8.41/-8.93	-17.74/-16.68	-8.81/-5.18	-4.89/-10.12	-12.44/-7.58	-6.93/-8.06	-9.37/-8.24
Θ(120°)	-8.95/-8.69	-8.38/-6.95	-8.27/-1.62	-5.61/-4.4	-5.39/-5.75	-6.39/-7.03	-5.98/-8.48	-18.29/-15.73	-8.94/-8.96	-8.76/-10.59	-10.6/-11.28	-10.82/-17.19	-9.63/-6.68	-12.94/-9.69	-8.89/-11.45	-16.21/-16.61	-14.34/-19.04	-8.51/-9.3	-13.95/-12.91	-8.85/-7.19	-6.19/-14.38	-15.08/-8.37	-7.77/-15.66	-16.97/-9.95
Θ(127.5°)	-11.51/-14.54	-9.57/-17	-9.04/-10.71	-9.76/-11.11	-7.02/-6.25	-8.48/-7.21	-6.36/-11.36	-18.86/-14.04	-10.02/-5.77	-6.5/-8.81	-16.38/-18.48	-17.44/-15.25	-14.55/-11.28	-19.34/-17.71	-10.75/-17.7	-15.37/-17.01	-18.88/-17.1	-9.96/-12.15	-16.12/-11.39	-9.3/-9.92	-8.45/-18.34	-13.93/-9.4	-6.95/-11.61	-19.09/-10.36
Θ(135°)	-9.84/-15.03	-10.39/-8.87	-12.35/-10.45	-11.27/-16.17	-11.02/-13	-13.86/-9.58	-9.55/-13.91	-18.88/-19.33	-13.95/-8.93	-9.01/-11.84	-15.18/-12.93	-11.88/-11.82	-16.66/-19.27	-14.89/-12.51	-18.88/-18.06	-11.68/-10.91	-14.43/-14.18	-9.57/-10.27	-19.01/-13.64	-11.47/-9.1	-10.89/-15.66	-16.74/-11.37	-10.92/-13.23	-16.1/-10.02
Θ(142.5°)	-11.75/-11.29	-13.28/-16.51	-15.02/-13.07	-17.75/-18.33	-15.22/-19.1	-19.24/-18.99	-14.16/-14.79	-16.91/-14.31	-15.86/-13.78	-11.82/-19.33	-18.89/-16.54	-13.97/-18.5	-15.94/-19.07	-18.4/-18.51	-19.26/-17.74	-11.41/-16.48	-18.02/-10.64	-10.23/-16.82	-18.02/-14.39	-15.55/-12.23	-12.46/-19.4	-17.68/-17.92	-17.67/-18.23	-18.14/-17.73
Θ(150°)	-17.44/-17.96	-18.3/-14.06	-11.95/-13.2	-14.28/-12.12	-12.51/-16.45	-18.66/-17.99	-19.04/-18.82	-17.58/-14.08	-14.48/-16.28	-16.98/-17.11	-12.56/-13.48	-17.74/-18.12	-18.56/-18.77	-18.2/-14.19	-13.9/-13.86	-15.9/-17.81	-16.79/-17.76	-17.94/-18.51	-18/-14.41	-18.05/-17.65	-14.3/-17.37	-16.79/-13.58	-16.57/-17.84	-18.83/-17.85
Θ(157.5°)	-15.85/-17.47	-17.99/-19.07	-18.42/-16.18	-11.27/-9.89	-10.26/-10.86	-10.96/-10.93	-11.4/-12.75	-14.69/-16.07	-17.59/-16.87	-17.64/-18.18	-15.92/-12.82	-12.39/-14.15	-16.05/-17.53	-17.78/-18.68	-18.01/-18.1	-17.83/-16.43	-14.53/-14.58	-13.39/-14.94	-17.72/-14.74	-10.46/-9.78	-18.89/-11.75	-11.12/-11.56	-13.74/-15.32	
Θ(165°)	-14.86/-12.49	-11.66/-13.06	-15.53/-13.67	-13.03/-14.07	-15.91/-17.82	-16.44/-14.27	-14.3/-15.72	-15.31/-13.85	-13.97/-16.43	-17.44/-17.18	-17.55/-15.99	-18.7/-18.23	-18.74/-18.3	-17.48/-18.79	-17.73/-18.25	-17.55/-18.02	-19.09/-17.5	-18.77/-18.13	-16.45/-18.14	-19.57/-18.73	-17.96/-18.75	-16.68/-16.48	-18.69/-18.72	-16.48/-15.47
Θ(172.5°)	-17.71/-17.4	-19/-18.19	-18.35/-18.21	-17.49/-18.81	-17.98/-16.72	-13.45/-11.45	-10.9/-11.81	-13.86/-16.14	-18.28/-18.36	-17.95/-19.02	-17.67/-15.28	-14.64/-15.72	-16.94/-18.91	-17.32/-17.14	-17.21/-18.02	-16.7/-15.19	-17.43/-18.92	-18.38/-16.64	-14.7/-14.61	-14.67/-15.93	-17.15/-16.83	-15.09/-13.9	-14.28/-15.4	-15.66/-15.43
Θ(180°)	-17.52/-18.88	-18.81/-18.46	-17.52/-18.59	-17.44/-18.78	-17.59/-17.92	-18.48/-18.65	-19.07/-17.43	-18.15/-18.84	-18.39/-19.24	-17.88/-19.06	-15.56/-14.28	-14.34/-15.91	-17.79/-18.83	-18.91/-18.04	-18.7/-15.4	-19.02/-18.6	-18.77/-19.19	-19.02/-18.6	-18.19/-17.74	-18.95/-17.66	-18.65/-17.88	-17.72/-18.88	-18.87/-18.86	-17.99/-19
Freq(Hz)	5.785GPol.	Phi/Ant. 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°)	-4.7/-4.62	-4.06/-3.7	-3.72/-3.81	-4.27/-4.47	-4.76/-4.93	-5.63/-6.71	-7.9/-10.17	-14.87/-19.12	-18.82/-17.66	-16.75/-9.66	-6.31/-5.03	-4.73/-4.46	-3.91/-3.27	-3.09/-3.4	-3.46/-3.52	-4.25/-2.26	-6.02/-6.69	-8.13/-10.27	-11.91/-14.55	-17.88/-17.97	-11.51/-11.69	-10.75/-10.08	-8.85/-6.66	-4.78/-4.64



Antenna Pattern of 2.4GHz/5GHz

Appendix B

Total Gain Data

Freq(Hz)	2.450Pol.	TotalAnt. 1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+				
Gain	Φ(0°)Φ(7.5°)	Φ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)
Θ(0°)	0.960.91	0.941.01	1.071.08	1.041.02	1.050.96	1.091.08	1.090.93	0.951.02	1.161.27	1.381.43	1.441.39	1.371.34	1.331.29	1.271.26	1.261.19	1.290.92	0.760.51	0.360.30	0.390.58	0.760.87	0.991.01	1.071.14	1.271.20	1.121.04
Θ(7.5°)	0.980.83	0.670.55	0.410.27	0.140.10	0.070.03	-0.140.22	-0.310.40	-0.420.29	-0.060.21	0.490.74	0.941.07	1.221.37	1.471.53	1.611.67	1.741.79	1.791.75	1.711.58	1.481.39	1.381.44	1.501.58	1.681.74	1.741.70	1.581.41	1.251.11
Θ(15°)	1.060.93	0.700.48	0.250.02	-0.130.11	-0.090.06	-0.090.14	-0.230.41	-0.610.79	-0.890.83	-0.690.48	-0.170.22	0.600.94	1.181.33	1.431.49	1.531.57	1.621.60	1.561.48	1.431.36	1.251.17	1.111.15	1.281.43	1.561.56	1.461.31	1.201.14
Θ(22.5°)	1.100.94	0.650.34	0.050.12	-0.130.07	0.260.48	0.970.88	0.890.84	0.610.20	-0.360.99	-1.481.62	-1.310.71	-0.060.45	0.730.86	0.820.69	0.530.43	0.430.40	0.330.24	0.130.04	-0.020.06	-0.090.06	0.100.40	0.730.93	0.991.01	1.081.13
Θ(30°)	0.700.42	-0.030.50	-0.870.98	-0.810.37	0.060.48	0.951.41	1.741.88	1.791.41	0.600.52	-1.790.25	-2.310.35	-0.390.28	0.630.71	0.550.21	-0.210.55	-0.710.82	-0.960.106	-1.100.106	-0.910.79	-0.760.88	-0.960.81	-0.410.01	0.220.42	0.640.75
Θ(37.5°)	-0.430.91	-1.590.22	-2.510.47	-2.170.73	-1.210.69	0.020.80	1.441.89	2.061.84	1.100.14	-1.640.235	-1.550.12	0.941.47	1.581.41	1.020.48	-0.130.65	-1.010.116	-1.230.123	-1.100.84	-0.550.32	-0.340.64	-1.070.135	-1.280.97	-0.630.41	-0.240.25
Θ(45°)	-1.740.249	-3.300.391	-4.070.391	-3.750.366	-3.460.289	-1.930.67	0.411.22	1.651.66	1.140.15	-1.090.159	-0.421.25	2.320.71	2.612.30	1.861.35	0.760.22	-0.070.00	0.220.34	0.370.38	0.460.63	0.640.32	-0.300.99	-1.310.112	-0.730.56	-0.720.12
Θ(52.5°)	-2.430.346	-4.180.457	-4.620.450	-4.650.484	-4.750.406	-2.800.138	-0.180.56	0.870.75	0.300.34	-1.000.98	0.522.27	3.223.45	3.373.11	2.752.25	1.631.10	1.071.44	1.882.04	1.851.39	0.950.83	0.800.45	-0.330.124	-1.610.121	-0.510.15	-0.470.134
Θ(60°)	-2.620.336	-3.610.365	-3.630.374	-3.950.382	-3.240.250	-1.810.123	-0.790.61	-0.740.112	-1.400.134	-1.130.65	0.882.64	3.563.79	3.783.61	3.112.24	1.721.06	0.811.20	1.772.13	1.130.53	0.220.29	-1.250.243	-2.860.12	-1.030.43	-0.670.163	
Θ(67.5°)	-2.950.301	-2.890.274	-2.810.317	-3.450.281	-1.900.137	-1.370.181	-2.420.278	-2.550.205	-1.660.128	-0.860.28	1.232.87	3.550.60	3.603.31	2.541.63	1.030.16	-0.980.62	0.501.41	1.911.82	1.160.16	-0.640.124	-2.110.352	-4.310.321	-1.910.140	-1.880.274
Θ(75°)	-3.180.261	-2.640.256	-2.780.339	-3.660.282	-1.970.174	-2.120.300	-0.404.33	-3.160.196	-1.680.185	-1.600.91	0.572.15	2.752.86	3.082.92	1.991.10	0.470.82	-2.370.204	-0.460.66	1.211.14	0.440.68	-1.530.185	-2.410.386	-5.500.471	-2.770.213	-2.870.383
Θ(82.5°)	-4.720.344	-3.390.331	-3.270.362	-3.560.261	-1.870.184	-2.330.330	-4.640.550	-4.590.321	-2.860.276	-1.620.26	1.172.21	2.412.45	2.622.03	0.770.07	-0.680.217	-3.860.337	-1.790.075	-0.160.08	-0.450.195	-3.060.279	-2.820.406	-5.920.611	-4.430.348	-3.970.543
Θ(90°)	-5.280.437	-3.910.398	-4.180.340	-3.860.274	-1.930.185	-2.440.372	-5.730.703	-5.690.346	-2.530.227	-1.260.00	0.991.50	1.421.36	1.280.44	-1.140.249	-2.980.365	-4.840.471	-3.200.183	-0.900.017	-3.390.370	-2.300.372	-4.760.437	-3.490.314	-3.240.449	
Θ(97.5°)	-2.650.275	-2.470.253	-3.270.402	-3.370.215	-1.580.183	-2.610.395	-5.850.446	-4.680.258	-1.860.194	-1.190.010	0.340.09	-0.280.48	-1.030.234	-4.070.549	-4.460.368	-4.930.485	-2.880.156	-1.050.054	-0.680.205	-4.020.534	-5.510.618	-6.310.400	-2.980.280	-2.610.224
Θ(105°)	-2.860.332	-3.030.222	-2.540.378	-3.480.235	-2.130.281	-3.670.433	-4.700.416	-2.570.137	-1.530.280	-2.900.185	-1.900.420	-2.270.192	-2.030.299	-5.380.888	-6.770.502	-4.970.436	-1.720.093	-0.940.083	-0.560.066	-1.330.372	-5.350.709	-8.230.617	-4.260.491	-5.070.337
Θ(112.5°)	-3.060.366	-4.950.441	-4.270.613	-6.970.513	-3.880.329	-2.930.625	-2.290.189	-1.390.163	-3.430.539	-3.370.170	-1.420.134	-1.520.209	-2.690.410	-7.460.906	-5.450.475	-4.970.335	-2.580.177	-1.590.288	-5.610.744	-3.030.372	-4.850.474	-8.850.474	-5.570.421	
Θ(120°)	-3.370.317	-4.570.521	-4.710.575	-7.160.580	-3.660.218	-1.440.110	-0.850.84	-1.150.226	-4.210.397	-1.720.079	-1.030.168	-3.110.481	-4.900.497	-6.120.578	-3.970.396	-4.170.309	-2.940.380	-4.710.547	-5.510.393	-2.650.312	-5.730.759	-7.480.754	-7.230.774	-8.320.560
Θ(127.5°)	-6.470.514	-5.660.574	-9.250.1035	-12.880.1167	-8.050.59	-3.900.259	-1.610.143	-2.120.366	-4.680.355	-2.440.242	-2.760.233	-4.260.454	-3.720.835	-5.430.622	-6.040.870	-8.980.573	-6.750.658	-7.170.82	-12.680.852	-5.310.527	-7.190.730	-5.680.492	-5.180.642	-8.520.58
Θ(135°)	-5.490.383	-3.110.343	-4.420.541	-6.340.694	-6.680.537	-3.750.241	-1.820.173	-2.710.420	-4.980.464	-4.410.56	-4.450.69	-5.080.438	-3.400.366	-5.230.635	-6.980.922	-12.560.1225	-10.240.380	-7.520.849	-11.470.1223	-11.250.1177	-13.730.955	-6.980.655	-6.420.591	-6.900.706
Θ(142.5°)	-9.630.700	-5.200.426	-3.940.396	-4.190.441	-4.400.411	-3.560.319	-3.310.405	-5.380.655	-7.160.46	-5.400.470	-4.600.513	-5.360.494	-4.850.573	-6.680.678	-7.100.873	-11.460.196	-15.000.1413	-12.630.1169	-10.730.980	-10.310.1142	-9.740.701	-5.470.531	-6.250.808	-10.450.1155
Θ(150°)	-10.970.1152	-10.020.821	-6.720.585	-5.670.559	-5.610.556	-5.640.555	-5.510.544	-5.230.466	-3.750.285	-2.480.273	-3.710.250	-6.910.815	-8.970.96	-8.390.735	-7.100.827	-10.330.1220	-10.900.878	-7.780.742	-7.500.785	-8.250.815	-6.870.516	-3.950.633	-4.090.514	-6.810.885
Θ(157.5°)	-6.110.649	-6.150.534	-4.350.345	-2.870.256	-2.370.215	-1.980.185	-1.780.167	-1.480.131	-1.190.125	-1.710.275	-4.560.721	-10.230.1236	-11.440.918	-7.010.604	-5.440.625	-5.080.469	-4.010.345	-3.240.346	-3.870.440	-4.900.522	-5.230.484	-4.390.429	-4.480.477	-5.140.568
Θ(165°)	-6.310.619	-5.800.508	-4.160.329	-2.620.214	-1.820.159	-1.340.122	-1.220.129	-1.450.173	-2.190.282	-3.790.527	-7.420.1028	-13.100.1338	-10.470.878	-7.180.591	-4.950.420	-3.710.332	-3.100.308	-3.310.373	-4.190.459	-5.090.666	-6.260.674	-7.110.742	-7.680.758	-7.130.667
Θ(172.5°)	-8.150.804	-7.930.752	-6.940.635	-5.810.542	-5.210.508	-5.060.512	-5.340.556	-5.990.654	-7.390.814	-9.050.1037	-11.440.1219	-12.150.1119	-10.150.904	-8.070.730	-6.620.616	-5.770.575	-5.810.614	-6.610.715	-7.650.798	-8.390.888	-9.500.1024	-10.890.1127	-10.860.1014	-9.300.854
Θ(180°)	-9.630.975	-10.130.1037	-10.490.1086	-11.810.1255	-12.960.1419	-14.900.1543	-14.670.1413	-13.690.1386	-13.480.1300	-12.410.1173	-11.300.1120	-11.180.1142	-11.660.1197	-11.560.1130	-11.260.1155	-11.420.1214	-12.430.1331	-14.010.1554	-15.370.1595	-14.800.1348	-13.000.1294	-12.960.1282	-12.270.1122	-10.330.975
Freq(Hz)	5.2GPol.	TotalAnt. 1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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°)	1.3711.26	1.0211.12	1.3811.65	1.940.78	2.030.07	2.1121.21	2.302.28	2.282.35	2.302.20	2.091.97	1.801.62	1.561.54	1.560.147	1.301.40	1.620.54	1.271.13	1.341.74	1.980.190	1.811.86	2.060.20	2.081.94	1.801.69	1.691.52	1.450.148
Θ(7.5°)	0.030.04	-0.190.403	-0.280.11	0.700.94	0.930.83	0.871.05	1.381.52	1.391.25	1.241.34	1.461.37	1.211.08	0.980.97	1.020.90	0.821.01	1.241.22	1.121.12	1.241.36	1.381.21	1.151.12	1.391.59	1.511.12	1.700.31	0.240.27	0.300.19
Θ(15°)	-4.560.243	-4.390.451	-4.070.306	-1.890.92	-0.260.05	0.080.43	0.781.13	1.250.102	0.760.46	0.140.00	-0.140.405	-0.690.68	-0.420.02	0.390.51	0.510.57	0.490.29	0.230.51	0.660.39	-0.200.071	-0.610.444	-0.570.801	-1.210.188	-2.700.342	-3.790.434
Θ(22.5°)	-9.060.817	-7.090.569	-4.520.328	-2.470.208	-1.900.166	-1.260.065	-0.270.00	0.170.55	1.071.17	0.790.29	-0.140.401	-0.260.30	1.202.07	2.221.77	1.030.53	0.102.21	-0.160.26	0.921.39	1.440.83	0.050.407	-0.760.93	-1.460.232	-3.070.385	-5.350.757
Θ(30°)	-8.530.1154	-11.440.756	-4.420.270	-1.970.200	-2.250.227	-1.820.110	-0.400.18	0.571.08	1.792.30	2.231.63	0.990.78	0.680.02	0.070.83	1.150.98	0.740.49	0.170.23	-0.570.48	-0.100.42	0.901.26	1.441.09	0.710.104	0.700.82	-2.430.307	-4.110.579
Θ(37.5°)	-5.220.682	-8.070.496	-4.460.319	-3.450.463	-5.760.584	-4.540.243	-0.500.84	1.371.52	2.430.49	3.432.72	1.941.32	0.570.100	-2.020.217	-2.090.103	-0.210.79	-2.540.429	-4.270.330	-1.750.034	0.190.061	-1.330.013	0.470.97	1.070.38	-0.360.075	-2.050.420
Θ(45°)	-2.840.387	-3.640.314	-2.520.234	-3.860.507	-4.970.321	-2.780.259	-1.740.033	1.160.23	3.240.57	4.590.01	2.662.55	1.420.404	-1.860.369	-5.750.472	-2.380.217	-3.930.493	-4.980.587	-5.760.294	-0.050.21	0.620.005	1.091.87	1.781.36	0.580.39	-0.600.167
Θ(52.5																								



Antenna Pattern of 2.4GHz/5GHz

Appendix B

Θ (15°)	-4.00/-4.20	-4.05/-3.82	-3.65/-3.53	-3.97/-4.38	-4.47/-4.25	-3.34/-2.28	-1.60/-1.73	-1.16/-1.03	-1.25/-1.46	-1.61/-1.41	-1.16/-1.10	-1.14/-1.35	-1.54/-1.79	-2.07/-2.00	-1.51/-0.70	0.25/0.95	1.01/0.79	0.62/0.98	1.34/1.34	1.09/0.98	0.66/0.35	0.28/0.00	-0.40/-1.36	-2.49/-3.34
Θ (22.5°)	-6.62/-7.01	-6.19/-4.86	-3.95/-3.68	-3.65/-4.35	-3.16/-2.86	-2.50/-2.00	-1.44/-0.78	0.04/0.43	0.32/-0.20	-1.04/-1.99	-2.38/-2.21	-2.15/-2.51	-3.39/-4.30	-4.09/-2.79	-1.45/-0.32	0.54/1.22	1.70/1.77	1.22/0.45	-0.02/-0.02	0.26/0.52	0.47/0.34	0.48/0.29	-0.39/-1.72	-3.55/-5.18
Θ (30°)	-7.02/-6.73	-6.29/-6.09	-6.78/-6.57	-5.84/-5.16	-4.30/-3.41	-3.06/-2.87	-2.67/-1.98	-0.58/0.85	-1.48/-1.21	-0.09/-0.06	-0.44/-0.12	-0.59/-0.06	-0.31/-1.21	-2.28/-2.73	-0.24/-1.76	-0.64/0.65	1.22/0.77	-0.12/-0.64	-0.17/0.64	1.33/1.58	1.07/0.18	-0.50/-0.71	-1.33/-2.87	-0.02/-6.77
Θ (37.5°)	-4.35/-4.00	-3.72/-4.19	-4.85/-5.17	-5.52/-5.04	-2.86/-0.69	0.67/1.07	0.79/0.19	-0.37/-0.08	1.15/0.25	2.82/2.92	2.69/2.22	0.79/-0.38	-0.07/0.21	-0.79/-1.84	-1.32/-0.43	-0.34/-0.74	-1.49/-2.42	-2.96/-4.14	-3.94/-2.42	-0.74/0.76	1.43/0.29	-1.07/-0.55	-0.49/-1.75	-4.03/-4.42
Θ (45°)	-1.11/-0.62	-0.51/-0.78	-0.37/-0.28	-1.17/-1.52	-0.24/-2.18	3.92/4.36	3.85/2.66	1.19/0.53	1.21/0.43	3.00/3.31	3.27/2.99	0.90/-2.79	-0.57/-1.53	0.26/-3.24	-2.30/-1.15	-1.63/-3.04	-3.95/-3.31	-3.96/-5.64	-7.26/-8.71	-5.51/-2.31	-0.99/-1.31	-1.62/0.30	0.78/-0.12	-0.36/-0.76
Θ (52.5°)	-1.46/1.39	1.35/0.93	1.71/1.78	1.15/1.13	2.65/4.39	4.78/4.40	4.08/3.86	3.01/1.77	2.30/3.07	3.34/3.35	3.28/3.02	1.24/0.24	2.36/2.39	-0.35/-4.05	-1.08/0.73	-1.23/-5.21	-8.03/-4.78	-6.05/-8.38	-9.20/-9.78	-7.41/-3.29	-1.67/-2.37	-1.99/-0.68	0.46/1.12	1.69/-1.32
Θ (60°)	1.95/1.74	1.38/1.87	2.69/2.30	1.25/1.47	3.53/4.90	4.68/3.73	3.28/3.70	3.75/2.37	2.69/3.70	4.23/3.66	2.99/3.41	3.23/3.12	4.09/2.90	-1.18/-2.26	1.63/3.39	1.08/4.10	-11.49/-15.59	-10.76/-14.83	-9.59/-5.61	-5.82/-3.36	-1.34/0.05	0.25/-0.91	-0.48/1.11	2.11/1.64
Θ (67.5°)	0.57/0.60	0.18/1.54	2.31/1.46	0.01/0.76	2.95/4.33	4.40/3.79	3.23/3.17	3.42/2.28	2.72/3.92	4.33/3.83	3.19/3.89	4.03/4.43	3.99/1.32	-1.76/-0.68	2.85/4.22	2.69/-2.07	-7.16/-13.96	-12.11/-12.93	-5.74/-2.87	-3.22/-2.92	-1.74/0.44	0.96/-0.71	-1.78/-0.32	0.78/0.56
Θ (75°)	-1.32/-1.64	-1.91/0.28	1.68/0.05	-1.94/-0.26	1.52/2.73	2.97/2.82	2.60/2.56	3.10/2.20	1.87/3.52	3.91/3.73	2.62/2.22	3.77/4.74	3.50/0.05	-1.54/-1.60	2.27/4.24	3.61/0.04	-3.53/-5.68	-5.82/-6.69	-5.31/-1.44	-1.50/-2.72	-2.21/0.39	1.72/0.57	-2.62/-1.60	-1.47/-1.59
Θ (82.5°)	-2.50/-3.12	-3.60/-1.39	0.14/-2.45	-3.98/-1.39	-0.43/0.63	1.05/1.41	1.19/1.03	1.48/1.11	1.18/3.02	2.69/2.75	1.53/2.27	3.10/4.00	2.07/-1.76	-1.73/-3.50	1.17/3.35	3.71/0.36	-1.20/-3.61	-4.12/-5.90	-4.37/-0.88	-2.16/-4.78	-3.68/-0.58	1.20/0.38	-3.33/-3.32	-4.46/-3.86
Θ (90°)	-3.07/-3.86	-4.86/-2.56	-0.99/-3.92	-6.28/-2.61	-2.00/-0.80	-0.22/0.56	-0.38/-1.03	-0.08/0.18	0.03/1.74	1.38/1.57	0.26/0.41	1.13/2.94	0.54/-4.72	-4.28/-8.51	-2.62/1.25	2.76/0.59	-0.57/-2.14	-4.34/-6.50	-8.04/-2.33	-3.10/-6.72	-4.45/-1.15	-0.04/-0.95	-5.71/-4.45	-6.42/-4.71
Θ (97.5°)	-3.93/-5.31	-7.70/-4.56	-2.08/-4.82	-6.91/-3.41	-2.95/-1.41	-1.44/0.70	-2.03/-2.19	-2.31/-1.46	-0.73/0.69	-0.01/-0.35	-1.34/-1.55	-0.27/1.05	-1.51/-5.23	-4.87/-9.80	-4.76/-1.53	-0.09/-1.98	-2.35/-4.04	-6.82/-9.92	-11.83/-4.17	-4.22/-8.62	-7.08/-4.45	-2.28/-2.18	-7.04/-6.70	-10.56/-5.25
Θ (105°)	-4.67/-5.70	-9.80/-6.20	-2.42/-3.60	-8.78/-5.10	-4.32/-2.28	-1.81/-2.21	-3.12/-3.29	-3.70/-2.89	-2.50/-1.32	-2.42/-3.53	-3.27/-2.66	-1.45/-0.15	-2.59/-7.51	-5.62/-13.61	-8.19/-3.90	-3.96/-4.78	-2.77/-7.81	-8.44/-10.80	-15.85/-5.58	-4.93/-10.89	-8.68/-4.96	-5.60/-6.56	-10.06/-9.27	-11.03/-6.11
Θ (112.5°)	-5.40/-6.99	-11.46/-9.20	-3.62/-4.48	-11.52/-8.05	-4.24/-2.99	-11.52/-8.05	-4.24/-2.99	-3.97/-4.26	-4.66/-3.68	-4.67/-5.34	-4.74/-5.13	-3.90/-3.22	-4.05/-7.28	-5.32/-12.28	-8.64/-8.62	-5.63/-7.96	-7.68/-10.43	-11.06/-11.07	-14.83/-5.02	-4.11/-10.09	-11.53/-9.59	-7.02/-9.63	-11.15/-12.71	-14.78/-8.74
Θ (120°)	-6.49/-5.48	-7.22/-8.87	-4.35/-5.51	-12.14/-12.67	-6.60/-3.84	-4.43/-3.64	-4.08/-4.19	-3.60/-4.26	-5.51/-5.83	-6.71/-6.32	-6.55/-8.12	-5.11/-4.23	-3.75/-10.97	-7.94/-11.12	-11.46/-7.31	-5.32/-6.85	-8.29/-8.34	-15.12/-10.45	-15.29/-7.67	-11.09/-9.06	-12.39/-7.81	-6.74/-12.08	-13.06/-12.69	-13.54/-10.05
Θ (127.5°)	-5.66/-5.30	-8.25/-6.82	-6.19/-6.37	-9.34/-11.37	-6.85/-4.75	-5.63/-5.65	-5.34/-4.25	-3.97/-5.67	-5.65/-5.70	-6.82/-7.54	-11.50/-10.54	-5.22/-3.40	-5.00/-10.14	-8.17/-11.10	-10.58/-6.24	-8.06/-8.89	-7.29/-7.37	-14.29/-11.28	-12.93/-8.80	-7.82/-10.93	-9.17/-10.81	-6.59/-9.06	-7.61/-9.48	-13.02/-9.75
Θ (135°)	-6.43/-6.11	-8.21/-12.82	-9.17/-8.57	-7.05/-6.84	-9.03/-8.04	-8.06/-7.08	-7.76/-6.76	-5.13/-5.78	-6.22/-7.66	-9.31/-9.69	-13.05/-10.69	-9.34/-6.50	-9.29/-12.36	-9.59/-9.03	-14.53/-10.45	-11.22/-11.58	-10.00/-8.68	-10.20/-8.68	-15.27/-9.80	-8.19/-14.22	-10.03/-11.13	-13.10/-11.36	-14.04/-12.85	-10.76/-8.64
Θ (142.5°)	-9.70/-8.24	-9.83/-11.55	-14.50/-10.72	-8.48/-8.11	-7.73/-6.78	-6.75/-7.09	-7.65/-8.97	-10.79/-11.53	-13.20/-11.98	-10.12/-11.75	-9.30/-30.11	-10.63/-12.60	-16.26/-13.06	-14.48/-14.07	-11.10/-10.28	-10.64/-10.51	-15.05/-14.49	-15.05/-13.15	-15.40/-9.38	-7.49/-8.81	-11.73/-15.51	-14.49/-14.89	-13.80/-12.16	
Θ (150°)	-14.25/-14.62	-12.92/-12.98	-9.22/-7.24	-6.74/-6.89	-7.39/-7.81	-8.12/-7.75	-7.34/-6.43	-6.25/-7.29	-9.96/-11.84	-12.17/-13.24	-14.45/-15.13	-15.16/-11.86	-10.54/-13.27	-10.15/-12.83	-15.66/-15.69	-15.20/-15.47	-11.32/-10.82	-13.73/-15.48	-14.94/-14.38	-14.62/-12.48	-12.50/-10.25	-9.42/-8.59	-8.12/-9.87	-15.19/-14.40
Θ (157.5°)	-8.85/-6.91	-6.67/-7.73	-9.45/-9.65	-9.75/-9.94	-8.70/-9.73	-10.23/-11.15	-12.10/-12.53	-11.89/-13.02	-13.78/-11.85	-10.35/-9.76	-10.65/-11.43	-11.51/-12.10	-13.16/-14.44	-15.34/-15.50	-14.67/-14.61	-14.38/-11.68	-9.12/-9.09	-12.65/-13.90	-13.15/-11.98	-11.27/-12.24	-11.69/-10.92	-12.06/-10.93	-10.41/-12.11	-13.36/-11.22
Θ (165°)	-10.63/-9.10	-9.58/-10.58	-10.13/-9.02	-8.39/-8.31	-8.15/-8.61	-9.75/-10.70	-11.15/-11.77	-12.23/-12.97	-13.35/-11.89	-10.70/-10.52	-12.56/-12.91	-13.44/-13.72	-13.48/-13.84	-12.29/-11.29	-11.55/-13.02	-15.42/-14.99	-15.60/-14.38	-14.91/-15.30	-15.06/-14.93	-12.29/-11.67	-10.32/-9.07	-9.31/-11.52	-13.52/-13.37	
Θ (172.5°)	-12.66/-11.23	-10.24/-10.05	-10.88/-11.18	-11.66/-11.61	-11.83/-11.88	-12.09/-12.15	-12.14/-11.84	-11.27/-11.33	-11.96/-13.08	-14.89/-15.00	-16.31/-15.37	-15.00/-14.87	-15.94/-15.86	-14.63/-14.60	-13.86/-14.45	-13.74/-13.22	-14.90/-14.84	-14.90/-14.53	-14.81/-13.91	-12.25/-11.76	-12.67/-13.75	-14.00/-14.63	-14.40/-13.75	-12.82/-13.27
Θ (180°)	-10.03/-10.00	-9.57/-9.29	-9.55/-9.64	-9.42/-9.64	-9.95/-10.02	-10.06/-9.55	-9.90/-11.04	-11.98/-12.53	-12.75/-13.15	-13.83/-14.38	-14.43/-13.97	-14.15/-13.81	-13.49/-12.85	-13.14/-13.52	-13.14/-13.05	-13.12/-12.84	-13.55/-15.25	-15.42/-15.78	-15.07/-13.51	-13.16/-13.42	-12.36/-11.40	-10.50/-10.38	-10.22/-10.00	-10.00/-9.82
Freq(Hz)	2.450Pol	TotalAnt 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Θ(0°)Φ(7.5°)	Θ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)
Θ (0°)	-0.07/-0.19	-0.31/-0.37	-0.39/-0.27	-0.13/-0.08	-0.12/-0.19	-0.40/-0.60	-0.71/-0.64	-0.47/-0.32	-0.23/-0.22	-0.24/-0.28	-0.29/-0.25	-0.23/-0.15	0.01/0.13	0.23/0.32	0.46/0.59	0.61/0.57	0.55/0.56	0.47/0.35	0.34/0.38	0.32/0.22	0.14/0.09	0.02/-0.02	-0.08/-0.11	-0.10/-0.06
Θ (7.5°)	-0.32/-0.35	-0.35/-0.30	-0.18/0.05	0.32/0.53	0.59/0.53	0.40/0.27	0.25/0.35	0.50/0.62	0.64/0.64	0.58/0.50	0.45/0.39	0.31/0.23	0.14/0.05	-0.05/-0.06	-0.01/0.05	-0.03/-0.17	-0.31/-0.45	-0.60/-0.90	-0.94/-0.87	-0.85/-0.92	-0.98/-1.01	-0.98/-0.82	-0.63/-0.53	-0.47/-0.35
Θ (15°)	-0.26/-0.10	0.00/0.06	0.09/0.20	0.34/0.42	0.32/0.10	-0.04/-0.03	0.18/0.48	0.77/0.98	1.11/1.13	1.10/1.02	0.90/0.70	0.39/-0.01	-0.42/-0.76	-0.99/-1.00	-0.82/-0.62	-0.52/-0.58	-0.73/-0.94	-1.30/-1.65	-1.93/-2.12	-2.37/-2.69	-2.97/-3.11	-2.99/-2.57	-1.90/-1.36	-0.91/-0.51
Θ (22.5°)	0.23/0.63	0.81/0.73	0.52/0.34	0.11/0.24	-0.74/-1.23	-1.43/-1.27	-0.80/-0.21	0.33/0.73	0.98/1.17	1.27/1.23	1.01/0.65	0.00/-0.76	-1.41/-1.89	-2.12/-2.00	-1.53/-1.01	-0.57/-0.33	-0.34/-0.59	-0.97/-1.39	-1.94/-2.61	-3.33/-4.02	-4.60/-4.98	-4.94/-4.26	-3.36/-2.27	-1.16/-0.35
Θ (30°)	1.24/1.71	1.81/1.46	0.93/0.37	-0.21/-0.87	-1.50/-2.01	-2.16/-1.97	-1.46/-0.81	-0.16/0.37	0.79/1.11	1.33/1.32	1.08/0.68	0.14/-0.62	-1.25/-1.82	-2.24/-2.44	-2.17/-1.45	-0.84/-0.02	0.16/-0.09	-0.58/-1.14	-1.75/-2.52	-3.28/-3.71	-3.85/-3.96	-4.00/-3.88	-3.32/-2.08	-0.63/0.50
Θ (37.5°)	1.99/2.46	2.36/1.79	1.01/0.36	-0.07/-0.33	-0.50/-0.64	-0.76/-0.78	-0.58/-0.31	-0.07/0.18	0.51/0.90	1.23/1.40	1.43/1.36	1.11/0.64	0.15/-0.37	-1.14/-2.02	-2.52/-2.04	-0.92/0.00	0.29/-0.05	-0.80/-1.66	-2.26/-2.55	-2.55/-2.35	-2.07/-1.94	-2.17/-2.66	-2.77/-1.83	-0.26/-1.10
Θ (45°)	2.37/2.74	2.40/1.58	0.68/0.23	0.43/0.84	1.10/1.10	0.95/0.84	0.94/1.06	0.97/0.75	0.60/0.78	1.20/1.51	1.77/2.04	2.14/-1.96	1.70/1.36	0.69/-0.56	-2.00/-2.51	-1.43/-0.14	0.49/0.23	-0.82/-2.14	-2.79/-2.34	-1.48/-0.90	-0.63/-0.64	-1.16/-2.24	-3.08/-2.30	-0.40/-1.32
Θ (52.5°)	2.48/2.81	2.17/1.03	0.02/0.06	0.95/1.81	2.19/2.24	2.15/2.14	2.31/2.47	2.37/1.95	1.43/1.34	1.72/2.08	2.43/2.81	2.79/2.39	2.98/1.94	1.59/0.52	-1.01/-2.14	-1.58/-0.21	0.57/0.30	-0.88/-2.22	-2.52/-1.46	-0.27/0.28	0.30/0.07	-0.64/-2.09	-3.52/-2.92	-0.87/-1.21
Θ (60°)	1.96/2.39	1.62/0.27	-0.62/0.11	1.35/2.34	2.57/2.45	2.47/2.20	2.57/2.60	2.47/2.20	1.80/1.78	2.27/2.66	2.94/3.35	3.36/2.74	2.02/1.76	1.75/1.37	0.63/-0.26	-0.42/0.52	1.18/0.77	-0.53/-1.78	-1.70/-0.47	0.69/1.16	1.14/0.87	-0.88/-1.43	-3.42/-4.02	-2.11/0.37
Θ (67.5°)	1.47/2.07	1.41/0.19	-0.39/0.33	1.54/2.26	2.14/1.67	1.58/1.74	1.85/1.64																	



Antenna Pattern of 2.4GHz/5GHz

Appendix B

Θ (67.5°)	1.40/2.16	1.96/1.04	-0.99/2.02	5.71/6.58	6.52/6.38	5.26/4.28	3.15/1.76	-0.85/-1.49	-0.14/-0.98	-2.46/-2.30	-2.13/-2.67	-5.73/-6.20	-4.03/-1.03	1.76/1.73	1.08/1.77	1.30/1.31	1.77/-0.83	-1.99/-2.13	-4.68/-2.40	-1.40/-1.60	-4.82/-4.96	-5.52/-7.26	-6.82/-3.64	-0.86/0.40
Θ (75°)	0.26/1.22	1.15/0.49	-2.04/1.43	5.36/6.14	6.23/5.96	4.81/4.25	3.14/1.63	-1.95/-3.52	0.24/-0.61	-2.23/-0.83	-0.69/-1.77	-4.74/-5.53	-3.60/-0.04	1.40/0.89	1.15/2.33	2.38/1.65	0.77/-2.61	-1.61/-2.80	-8.60/-3.68	-0.50/-1.23	-3.00/-5.15	-6.08/-7.42	-7.45/-4.51	-2.47/-1.30
Θ (82.5°)	-1.07/-0.49	-0.13/-0.05	-1.94/1.11	4.23/5.05	5.18/4.90	3.76/3.69	2.73/0.93	-3.79/-4.86	-0.35/-0.84	-1.73/0.43	-0.02/-1.77	-3.39/-5.94	-2.53/-0.01	-0.05/-0.24	0.30/2.21	2.70/1.13	-0.50/-3.17	-1.19/-4.56	-11.87/-3.93	0.19/-0.14	-1.99/-4.21	-6.29/-8.05	-7.46/-4.18	-3.55/-2.54
Θ (90°)	-1.69/-1.62	-1.40/-1.07	-2.96/0.32	2.99/3.41	3.83/3.46	2.09/2.08	0.89/-0.43	-6.45/-6.53	-1.24/-0.93	-2.83/-0.18	-0.45/-2.74	-3.75/-5.79	-3.52/-1.72	-1.65/-2.34	-2.01/0.21	1.27/-0.82	-3.83/-5.38	-1.93/-6.12	-11.73/-4.43	-0.96/-1.13	-3.34/-5.99	-7.94/-8.15	-7.76/-5.31	-4.02/-3.07
Θ (97.5°)	-2.05/-3.18	-2.45/-1.83	-4.19/-0.71	1.20/2.10	2.33/1.67	0.58/0.84	-0.60/-2.19	-10.61/-7.55	-3.37/-1.84	-2.06/-1.52	-2.28/-5.98	-5.06/-7.27	-3.22/-2.96	-3.42/-4.98	-4.82/-1.56	-1.14/-4.75	-9.56/-5.87	-4.76/-7.79	-15.73/-6.18	-2.89/-2.59	-5.01/-6.95	-9.70/-8.63	-6.59/-5.18	-5.13/-4.74
Θ (105°)	-3.89/-4.36	-3.15/-2.15	-6.55/-3.38	-0.25/0.87	1.34/0.02	-0.85/-0.34	-1.27/-2.12	-9.63/-7.41	-7.68/-5.40	-4.06/-3.09	-3.60/-10.27	-6.93/-9.52	-4.81/-4.05	-4.65/-5.94	-7.90/-4.36	-3.16/-6.91	-10.80/-7.90	-8.07/-9.64	-15.41/-6.81	-4.69/-3.48	-5.61/-9.69	-11.29/-7.98	-5.83/-5.99	-6.77/-7.03
Θ (112.5°)	-6.11/-5.68	-5.55/-4.66	-6.46/-6.06	-1.81/-1.05	-1.13/-2.11	-2.85/-2.62	-2.77/-2.81	-8.20/-7.59	-8.92/-6.08	-6.08/-6.27	-6.14/-11.06	-7.46/-10.87	-4.41/-3.77	-8.16/-6.81	-6.69/-5.57	-6.74/-6.88	-9.91/-10.61	-7.86/-8.16	-12.24/-6.80	-6.45/-4.52	-4.69/-8.45	-10.88/-7.27	-6.59/-7.69	-8.86/-7.83
Θ (120°)	-8.43/-8.28	-7.95/-6.68	-7.80/-9.88	-3.94/-2.58	-3.02/-4.21	-4.95/-5.11	-4.42/-4.89	-7.97/-8.21	-5.00/-5.43	-8.57/-6.66	-10.00/-10.46	-6.96/-9.32	-8.21/-5.48	-10.65/-9.04	-8.41/-9.17	-11.06/-12.68	-10.82/-13.35	-7.81/-7.63	-8.42/-7.08	-7.13/-6.52	-5.92/-9.81	-11.91/-7.96	-7.04/-14.00	-14.88/-9.43
Θ (127.5°)	-10.72/-13.08	-9.06/-6.81	-8.55/-9.59	-7.23/-7.86	-3.59/-3.56	-6.50/-4.63	-4.71/-5.79	-7.31/-10.97	-5.86/-3.95	-5.56/-7.11	-13.01/-13.83	-11.94/-10.17	-11.32/-7.55	-15.29/-11.39	-6.60/-13.12	-10.11/-12.67	-9.32/-12.83	-9.45/-7.59	-7.05/-5.66	-7.00/-8.72	-8.03/-14.90	-12.73/-8.87	-6.59/-9.55	-15.30/-9.80
Θ (135°)	-8.93/-11.94	-9.78/-8.48	-11.21/-9.91	-10.06/-13.40	-6.90/-7.47	-8.26/-4.74	-7.21/-10.19	-6.80/-12.78	-8.42/-6.11	-8.45/-9.41	-9.92/-10.54	-11.22/-7.27	-9.97/-13.61	-10.64/-10.56	-13.50/-15.51	-9.88/-8.47	-9.71/-13.04	-9.05/-8.41	-8.94/-7.90	-8.96/-8.66	-10.28/-12.76	-15.71/-10.74	-10.28/-12.24	-14.35/-9.24
Θ (142.5°)	-10.94/-10.35	-12.11/-14.14	-13.10/-11.87	-14.83/-15.12	-11.21/-15.64	-12.03/-6.70	-8.64/-13.24	-9.43/-11.99	-13.11/-10.90	-10.95/-12.84	-10.02/-10.96	-12.55/-12.74	-14.24/-15.69	-15.68/-15.88	-15.63/-14.93	-7.92/-8.90	-13.37/-9.73	-9.22/-12.47	-11.28/-10.64	-13.42/-11.26	-11.55/-15.59	-14.44/-15.18	-15.25/-15.20	-14.06/-13.51
Θ (150°)	-14.76/-15.03	-15.04/-12.78	-11.02/-11.88	-13.06/-11.14	-11.46/-14.53	-15.05/-11.67	-13.15/-15.96	-14.67/-12.83	-12.06/-13.88	-12.52/-10.76	-11.06/-12.32	-14.92/-15.11	-15.48/-15.07	-15.49/-12.89	-11.44/-11.37	-11.95/-12.55	-12.95/-13.95	-14.92/-14.98	-14.81/-12.71	-14.71/-14.96	-12.91/-14.98	-14.33/-12.01	-13.51/-14.26	-15.67/-15.14
Θ (157.5°)	-13.92/-13.54	-15.56/-15.78	-15.44/-13.91	-10.57/-9.27	-9.37/-9.74	-10.21/-10.07	-9.62/-10.42	-12.11/-13.51	-14.93/-14.61	-13.71/-14.83	-14.23/-11.58	-10.27/-12.07	-13.70/-14.84	-15.34/-15.77	-13.78/-12.99	-14.21/-15.60	-15.11/-13.58	-12.94/-13.16	-11.76/-11.84	-12.55/-12.15	-9.65/-9.15	-10.30/-10.71	-10.26/-10.77	-12.66/-13.49
Θ (165°)	-13.46/-11.35	-10.92/-11.84	-13.65/-12.41	-11.95/-11.76	-11.94/-12.61	-13.65/-12.73	-12.91/-11.57	-9.90/-10.23	-12.57/-13.95	-14.53/-14.40	-14.95/-13.92	-15.90/-15.10	-15.50/-15.01	-14.76/-14.31	-11.84/-11.57	-12.08/-12.87	-12.82/-12.45	-11.82/-12.00	-12.09/-14.83	-15.69/-14.93	-15.01/-15.28	-14.18/-14.22	-15.02/-14.96	-14.46/-13.51
Θ (172.5°)	-14.28/-13.22	-13.15/-13.38	-14.06/-14.13	-14.22/-15.03	-14.86/-13.99	-11.90/-10.67	-10.28/-11.09	-12.64/-13.26	-13.60/-15.10	-14.86/-15.79	-15.07/-13.04	-12.50/-13.30	-13.29/-12.62	-12.06/-12.03	-11.13/-10.55	-9.71/-9.98	-11.73/-12.88	-12.97/-13.28	-13.22/-13.16	-13.29/-14.25	-14.85/-14.40	-13.23/-12.77	-12.71/-12.51	-12.32/-12.83
Θ (180°)	-14.81/-15.92	-15.74/-15.74	-14.77/-15.78	-15.04/-15.52	-14.85/-15.20	-15.47/-15.39	-15.73/-14.73	-15.33/-15.33	-15.41/-16.20	-14.18/-12.84	-11.44/-11.31	-12.15/-13.73	-14.92/-15.01	-15.96/-15.09	-14.53/-15.22	-15.30/-14.50	-15.16/-15.83	-15.46/-15.85	-14.70/-15.19	-15.24/-14.93	-15.50/-14.72	-15.01/-15.02	-15.68/-15.92	-15.31/-14.91
Freq(Hz)	5.785/5Pol.	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°)	-3.31/-3.55	-3.53/-3.47	-3.57/-3.67	-4.07/-3.82	-3.65/-3.36	-3.42/-3.33	-3.20/-3.37	-3.56/-3.10	-2.79/-2.83	-3.29/-3.10	-2.41/-1.85	-2.21/-2.93	-3.20/-2.94	-2.95/-3.27	-3.31/-3.10	-3.24/-3.42	-3.17/-2.66	-2.55/-2.51	-2.20/-2.18	-2.54/-2.79	-2.31/-2.11	-2.15/-2.46	-2.95/-3.05	-2.61/-2.84
Θ (7.5°)	-1.81/-1.15	-1.13/-0.78	-0.38/-0.08	-0.03/0.05	0.23/0.36	0.43/0.27	0.18/-0.03	-0.31/-0.52	-0.75/-0.83	-1.29/-1.87	-1.91/-1.25	-0.89/-1.41	-1.89/-1.83	-1.87/-2.39	-2.59/-2.36	-2.63/-3.18	-3.35/-2.98	-2.77/-2.74	-2.80/-2.61	-2.11/-2.06	-1.80/-1.77	-1.90/-2.25	-2.15/-1.79	-1.79/-1.94
Θ (15°)	0.73/1.40	1.89/2.28	2.59/2.85	2.99/3.11	3.07/3.12	3.18/3.04	2.96/2.89	2.76/2.45	2.20/2.10	1.73/1.23	0.88/0.92	1.19/1.22	1.13/1.29	1.11/0.64	0.85/-0.27	-3.62/-3.71	-3.64/-3.04	-2.65/-2.09	-1.68/-1.29	-1.46/-0.56	0.26/1.01	2.18/3.29	3.56/3.61	-0.06/0.29
Θ (22.5°)	2.66/3.51	4.25/4.47	4.52/4.40	4.00/3.40	2.77/2.51	2.38/2.00	1.99/1.89	1.98/2.05	2.44/3.22	3.65/3.41	2.76/2.32	2.29/2.19	1.96/2.04	1.94/1.36	0.61/-0.10	-0.97/-1.32	-1.22/-1.61	-3.02/-4.13	-5.21/-5.69	-6.47/-5.77	-4.03/-2.29	-0.53/0.24	0.49/0.54	1.35/1.92
Θ (30°)	3.51/4.09	4.60/4.61	4.51/4.36	4.01/3.39	2.94/2.95	3.07/2.81	2.31/1.73	1.19/1.06	1.61/2.33	2.62/2.54	2.57/2.79	3.25/3.27	2.94/2.53	1.76/1.77	2.40/2.25	1.38/0.45	-0.10/-1.00	-2.70/-3.28	-2.50/-1.73	-1.83/-1.72	-0.73/0.91	2.03/2.30	2.50/2.44	2.60/2.93
Θ (37.5°)	3.95/3.91	3.65/3.47	3.77/4.47	4.73/4.24	3.59/3.36	3.31/3.01	2.65/2.40	2.02/1.28	0.68/1.06	1.65/2.18	2.00/1.40	1.68/2.33	2.45/2.00	1.26/1.69	3.27/3.72	2.25/1.22	0.85/-0.27	-1.09/-0.38	0.10/0.16	-0.29/-1.21	-1.46/-0.56	0.26/1.01	2.18/3.29	3.56/3.61
Θ (45°)	3.91/3.93	3.18/2.36	2.68/4.35	5.39/5.08	3.83/2.95	2.12/0.97	0.16/-0.08	-0.13/-0.25	-0.89/-0.64	-0.29/-0.20	0.04/-0.84	-1.17/-1.34	-1.34/-0.06	0.53/0.15	2.25/3.38	2.65/2.68	1.93/-1.37	-3.96/-1.63	0.35/0.37	-2.24/-5.22	-8.05/-6.68	-3.63/-1.69	0.34/1.65	2.01/2.79
Θ (52.5°)	2.46/3.09	2.53/2.16	2.26/3.11	4.25/4.60	3.67/3.43	2.73/0.39	-2.14/-4.28	-5.66/-6.19	-7.47/-6.66	-4.27/4.25	-2.81/-2.77	-4.00/-6.92	-7.85/-1.72	1.04/-0.13	0.53/1.59	1.08/1.60	1.40/-1.72	-5.32/-4.46	-3.94/-3.12	-2.97/-3.86	-3.80/-2.60	-5.03/-5.23	-1.21/0.87	1.35/1.68
Θ (60°)	1.40/2.76	2.86/2.06	0.91/1.56	4.01/5.35	5.28/5.36	4.60/2.51	-0.28/-4.23	-6.60/-6.17	-4.29/-4.71	-4.59/-3.92	-3.36/-4.15	-6.99/-10.49	-8.41/-1.98	1.67/1.43	1.32/1.11	-0.07/1.13	1.79/-0.92	-3.78/-5.87	-7.93/-6.43	-4.99/-2.09	-2.98/-1.79	-5.04/-8.09	-3.29/-0.72	0.90/0.59
Θ (67.5°)	1.43/2.16	2.46/1.46	-0.01/1.30	3.90/5.84	6.19/6.19	5.50/3.77	1.25/-2.34	-4.45/-4.83	-1.72/-2.70	-3.82/-1.57	-1.02/-3.25	-9.52/-8.87	-4.02/0.51	2.48/2.18	2.14/2.10	0.73/0.99	1.15/0.07	-0.79/-4.65	-8.73/-9.43	-6.14/-1.97	-2.82/-2.42	-3.44/-4.68	-5.38/-3.07	-0.80/0.11
Θ (75°)	1.37/0.83	1.94/1.49	-0.14/1.23	3.78/5.89	6.21/6.11	5.37/3.84	2.02/-0.79	-2.98/-4.12	-1.49/-1.91	-3.02/0.70	0.35/-2.30	-0.09/-8.13	-3.41/1.22	2.65/2.28	2.54/2.75	1.38/1.71	0.94/0.54	1.11/-2.87	-6.47/-7.04	-4.25/-1.50	-1.82/-2.76	-2.71/-2.46	-4.53/-3.84	-1.88/-0.46
Θ (82.5°)	0.79/0.06	1.15/0.96	-1.02/0.87	3.04/5.23	5.67/5.49	4.34/2.63	1.19/-0.97	-3.59/-5.06	-1.32/-1.66	-3.51/1.96	0.84/-3.92	-7.63/-7.75	-2.69/1.36	1.78/1.13	1.68/2.09	1.10/1.88	0.10/0.59	1.25/-4.46	-5.98/-6.71	-3.14/-2.41	-1.78/-2.00	-2.35/-2.25	-3.26/-4.52	-3.65/-1.81
Θ (90°)	-0.23/-1.10	-0.57/-0.17	-1.19/0.56	1.62/3.84	4.29/4.28	2.73/1.12	-0.15/-2.44	-6.31/-7.52	-2.16/-0.77	-4.91/0.63	0.12/-4.32	-7.09/-8.48	-4.11/0.12	0.75/-0.40	-0.85/0.47	-0.35/0.05	-1.54/-1.49	0.47/-5.95	-5.78/-8.27	-4.53/-3.24	-2.88/-2.70	-2.15/-2.23	-3.52/-6.18	-5.50/-3.92
Θ (97.5°)	-2.58/-3.53	-2.83/-0.93	-1.67/-0.58	-0.11/1.76	2.91/3.02	1.19/-0.01	-1.60/-3.37	-8.57/-9.09	-3.86/-1.84	-4.32/-0.65	-1.08/-7.46	-6.40/-8.47	-3.62/-0.78	-0.09/-3.25	-3.22/-1.05	-2.74/-3.62	-6.44/-4.39	-2.51/-8.79	-6.83/-8.34	-4.93/-3.78	-3.77/-3.72	-2.77/-2.90	-4.44/-6.63	-6.21/-6.26
Θ (105°)	-4.17/-6.41	-4.14/-2.27	-3.18/-1.16	-2.48/-0.60	0.65/1.32	-0.48/-0.45	-3.24/-3.35	-10.48/-8.44	-5.64/-3.45	-4.46/-2.60	-2.47/-9.20	-7.38/-8.04	-6.06/-4.21	-0.40/-3.97	-5.97/-3.42	-5.70/-7.22	-8.58/-6.46	-4.39/-7.71	-9.55/-8.35	-6.83/-4.32	-5.17/-6.14	-4.01/-3.75	-3.84/-7.01	-9.35/-10.34
Θ (112.5°)	-7.42/-8.31	-6.83/-3.83	-4.30/-2.96	-4.96/-1.70	-0.40/-0.85	-1.86/-1.38	-3.86/-3.36	-9.96/-7.82	-9.99/-6.14	-4.67/-4.35	-5.33/-13.02	-5.70/-10.89	-4.71/-4.85	-3.34/-3.95	-6.89/-4.64	-7.12/-5.77	-8.23/-10.26	-5.57/-7.13	-10.13/-6.54	-5.67/-3.83	-4.61/-6.88	-6.42/-5.74	-6.39/-7.00	-10.52/-12.83
Θ (120°)	-9.42																							

E1(XY plane) – $\Theta(90)\Phi(0-360)$
E2(XZ plane) – $\Theta(0-180)\Phi(0)$ and $\Theta(0-180)\Phi(180)$
E3(YZ plane) – $\Theta(0-180)\Phi(90)$ and $\Theta(0-180)\Phi(270)$

