



Antenna Composite Gain Test Report

FCC ID	NKR-ATT CGW450
Equipment	5G Residential Gateway
Brand Name	WNC
Model Name	CGW450-400
Applicant	Wistron NeWeb Corp. 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C
Manufacturer	NEWEB VIET NAM CO., LTD. Land Lot CN01, Dong Van III Industrial zone, Dong Van Ward, Duy Tien Town, Ha Nam Province, VietNam
Sample Received	Aug. 01, 2022
Start Test Date	Aug. 09, 2022
Final Test Date	Aug. 09, 2022

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory

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



Table of Contents

History of this test report.....	3
1. Operation Mode and Antenna Information	4
2. Test Frequency	4
3. Testing Location.....	4
4. Test Facility and Configuration	5
5. Reference Calibration	6
6. Test Method	7
7. Measured Values and Calculation of Maximum Gain Positions.....	8
8. Summary of Test Result	9
9. Test Setup	10
10. Test Equipment and Calibration Data	11
11. Test Results	12



1. Operation Mode and Antenna Information

Antenna Position	RF Port		Brand Name	Model Name	Ant. Type	Connector	Modes of Operation
	2.4GHz	5GHz					
2G5G Ant1	1	1	WNC	48XKAC42	Dipole	I-PEX	2.4GHz & 5GHz UNII 1~3
2G5G Ant2	2	2	WNC	48XKAC3F	Dipole	I-PEX	2.4GHz & 5GHz UNII 1~3
2G5G Ant3	3	3	WNC	48XKAC45	Dipole	I-PEX	2.4GHz & 5GHz UNII 1~3
2G5G Ant4	4	4	WNC	48XKAC46	Dipole	I-PEX	2.4GHz & 5GHz UNII 1~3

Note:

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

2G5G Ant 1~4 can be used as transmitting/receiving antenna.

2G5G Ant 1~4 could transmit/receive simultaneously.

2. Test Frequency

The listed frequency of each bands are selected to represent each frequency bands

Band [MHz]	Test Frequency [MHz]
2400-2483.5	2450
5150-5250	5200
5250-5350	5300
5470-5725	5600
5725-5850	5785

3. Testing Location

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

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
Radiated	05CH03-HY	Rex Liao	23-24 / 40-50	Aug. 09, 2022

Note:

Testing Site Information

Brand Name: TDK

Dimension: 11m*6m*6m

Characteristic: Fully Anechoic Chamber

4. Test Facility and Configuration

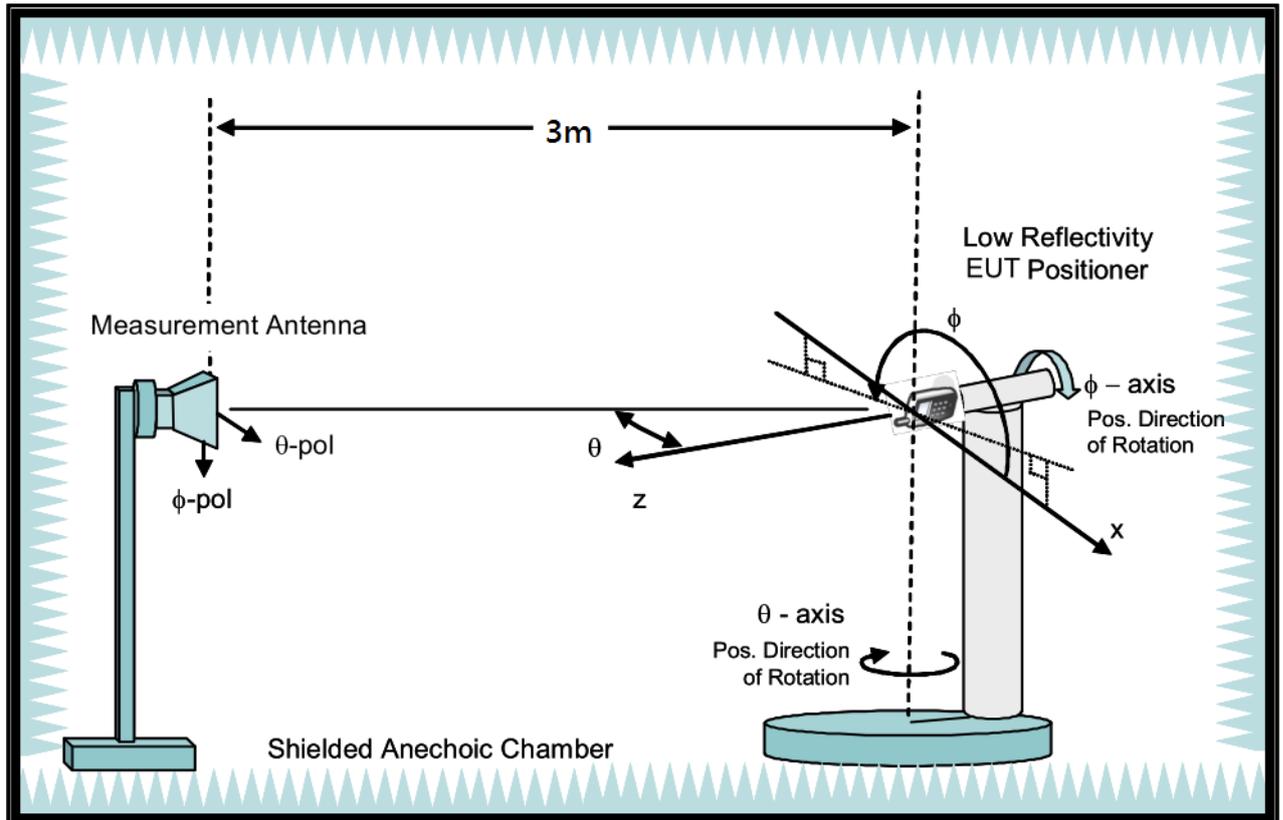
Test configuration: Reference to CITA OTA distributed-axes system configuration.

Chamber: Fully Anechoic Chamber.

Measurement antenna: Dual Polarization Horn antenna

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

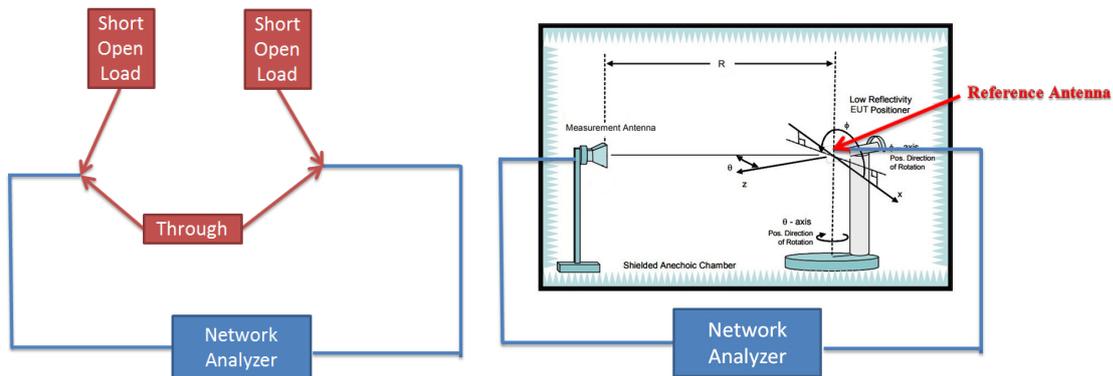
#Reference to CTIA “ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1”



5. Reference Calibration

Connected cables to VNA calibration kit and use network analyzer internal function to do calibration. Do short, open and load to each side. Then connect through to both side and calibrate G values. The cable loss is calibrated and set inside the network analyzer.

Measurement Antenna is connected to port1 of Network analyzer and reference antenna connected to port 2 of Network Analyzer. Record G values and used with reference antenna gain to calculate gain factor.



Frequency (MHz)	2400	2450	2500	5150	5200	5300	5600	5750	5800	5900	6000	6500	7000	7500
G reading (dB)	-31.4	-31.4	-31.3	-31.3	-31	-30.7	-30.1	-30.5	-30.5	-30.8	-31.3	-32.8	-34.4	-35.4
Reference gain (dBi)	10.2	10.4	10.6	12.4	12.8	13.4	13.4	13.3	13.3	13.1	13.2	12.3	11.7	11.1
Factor (dB)	41.34	41.55	41.68	43.24	43.56	43.68	43.79	43.91	43.99	44.43	44.49	45.24	46.12	46.31

Note:

$$G \text{ reading (dB)} = 20 \cdot \log(V2/V1) = 10 \cdot \log(P2/P1)$$

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

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

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

6. Test Method

EUT set on multi-axis positioner and adjust EUT's physical center to measurement reference center. Measurement antenna set at phi polarization and 1.5 meter height. Port 1 of Network analyzer connect to antenna 1 of EUT. Record G value every 10 degree from 0 to 350 degree on Phi angle and 0 to 180 on theta angle of multi-axis positioner. Then set measurement antenna to theta polarization and repeat process. Repeat process to each antenna of EUT.

DG steps:

1. Each Phi and Theta polarization antenna gain are measured for all test angles.
2. Composite Phi and Theta antenna gain are computed, using formula in KDB662911 D01 d) (i) and e) (ii), for all angles.
3. Composite antenna gain are examined for all angles to determine max gain and Phi/Theta position. Max gain and phi/theta position are listed in section 7 tables.

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



7. Measured Values and Calculation of Maximum Gain Positions

DG_1SS max value position

Frequency (Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 (dBi)	4.48	4.76	4.19	1.59	2.86
Ant. 2 (dBi)	-6.14	-10.61	-12.12	-12.36	-13.3
Ant. 3 (dBi)	1.92	1.13	-0.04	4.16	4.1
Ant. 4 (dBi)	-3.39	-1.86	1.42	-0.97	-0.23
DG [1SS] (dBi)	6.22	5.96	6.11	5.91	6.41
Polarization	Theta	Theta	Theta	Theta	Theta
$\Theta(^{\circ})$	70	80	90	80	90
$\Phi(^{\circ})$	90	80	80	100	90

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

DG_1SS max value position calculation

Frequency (Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 [$10^{(G/20)}$]	$10^{(4.48/20)}$	$10^{(4.76/20)}$	$10^{(4.19/20)}$	$10^{(1.59/20)}$	$10^{(2.86/20)}$
Ant. 2 [$10^{(G/20)}$]	$10^{(-6.14/20)}$	$10^{(-10.61/20)}$	$10^{(-12.12/20)}$	$10^{(-12.36/20)}$	$10^{(-13.3/20)}$
Ant. 3 [$10^{(G/20)}$]	$10^{(1.92/20)}$	$10^{(1.13/20)}$	$10^{(-0.04/20)}$	$10^{(4.16/20)}$	$10^{(4.1/20)}$
Ant. 4 [$10^{(G/20)}$]	$10^{(-3.39/20)}$	$10^{(-1.86/20)}$	$10^{(1.42/20)}$	$10^{(-0.97/20)}$	$10^{(-0.23/20)}$
Ant. 1 [$10^{(G/20)}$] value	1.675	1.73	1.62	1.201	1.39
Ant. 2 [$10^{(G/20)}$] value	0.493	0.295	0.248	0.241	0.216
Ant. 3 [$10^{(G/20)}$] value	1.247	1.139	0.995	1.614	1.603
Ant. 4 [$10^{(G/20)}$] value	0.677	0.807	1.178	0.894	0.974
Sum All Antenna [Amax]	4.092	3.971	4.041	3.951	4.183
DG [$10 \cdot \log(Amax^2/N_{ant})$]	6.22	5.96	6.11	5.91	6.41

Note:

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

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

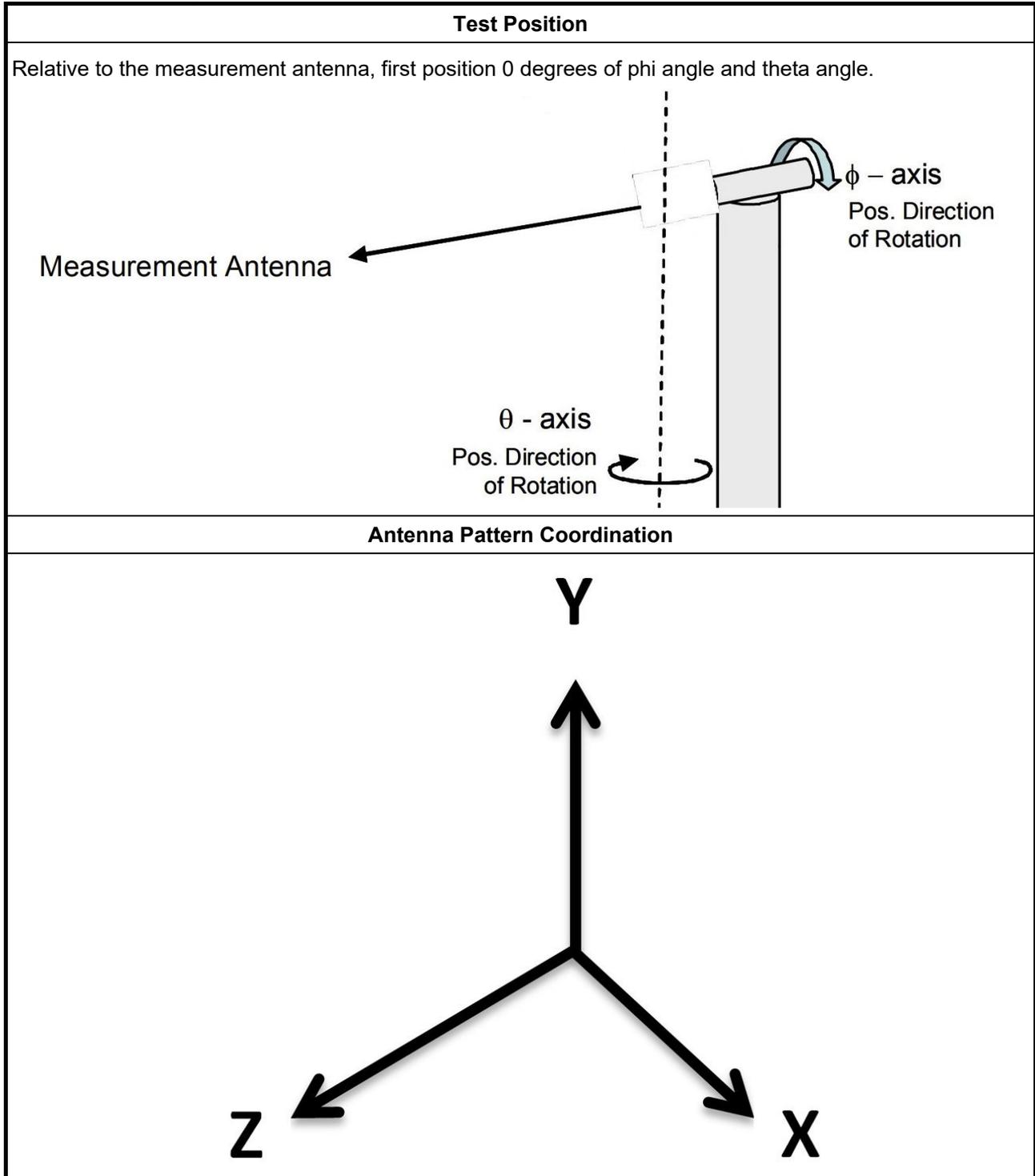
8. Summary of Test Result

Frequency (Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	4.48	4.76	4.98	5.04	4.67
Ant. 2 Max Gain (dBi)	3.97	2.47	3.56	5.02	5.63
Ant. 3 Max Gain (dBi)	3.69	3.02	3.54	4.16	4.1
Ant. 4 Max Gain (dBi)	2.02	2.2	3.17	4.01	3.22
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/70/90	Theta/80/80	Theta/80/70	Theta/90/70	Theta/90/80
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/20/80	Phi/80/80	Phi/40/80	Phi/80/100	Phi/80/100
Ant. 3 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/60/80	Theta/80/90	Theta/90/100	Theta/80/100	Theta/90/90
Ant. 4 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/50/90	Theta/100/130	Theta/110/130	Theta/100/140	Theta/100/150
Max Gain (dBi)	4.48	4.76	4.98	5.04	5.63
DG [1SS] (dBi)	6.22	5.96	6.11	5.91	6.41
DG [2SS] (dBi)	4.48	4.76	4.98	5.04	5.63
DG [4SS] (dBi)	4.48	4.76	4.98	5.04	5.63

Note:

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

9. Test Setup



Note:

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



10. Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1543	1GHz~18GHz	May. 31, 2022	May. 30, 2023
Dual Polarization Horn Antenna	Sporton	S0209DP	S0209DP-001	2GHz~9GHz	N.C.R.	N.C.R.
ENA Series Network Analyzer	AGILENT	E5071C	MY46419201	100kHz~8.5GHz	Feb. 21, 2022	Feb. 20, 2023
VNA Calibration Kit	TS RF	TS85033E-F	-	DC~9GHz	N.C.R.	N.C.R.
Multi-axis positioner	Sporton	MAPS01	MAPS01-001	Theta / Phi axis	N.C.R.	N.C.R.
Test Software	SPORTON	SENSE-RDG	V1.0.8	-	N.C.R.	N.C.R.

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

NCR means Non-Calibration required.



11. Test Results

Please refer to the appendix.

Appendix A – Radiated Composite Gain.....	Page 13
Appendix B – Antenna Pattern.....	Page 24
Appendix C – Test Photos.....	Page 30



Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	4.48	4.76	4.98	5.04	4.67
Ant. 2 Max Gain (dBi)	3.97	2.47	3.56	5.02	5.63
Ant. 3 Max Gain (dBi)	3.69	3.02	3.54	4.16	4.1
Ant. 4 Max Gain (dBi)	2.02	2.2	3.17	4.01	3.22
Ant. 1 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Theta/70/90	Theta/80/80	Theta/80/70	Theta/90/70	Theta/90/80
Ant. 2 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Phi/20/80	Phi/80/80	Phi/40/80	Phi/80/100	Phi/80/100
Ant. 3 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Theta/60/80	Theta/80/90	Theta/90/100	Theta/80/100	Theta/90/90
Ant. 4 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Phi/50/90	Theta/100/130	Theta/110/130	Theta/100/140	Theta/100/150
Max Gain (dBi)	4.48	4.76	4.98	5.04	5.63
DG [1SS] (dBi)	6.22	5.96	6.11	5.91	6.41
DG [2SS] (dBi)	4.48	4.76	4.98	5.04	5.63
DG [4SS] (dBi)	4.48	4.76	4.98	5.04	5.63



Radiated Composite Gain Data

Appendix A

DG 1SS Result

Freq(Hz)	2.45GPol.	Phi-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(BB)	Phi(0°)Phi(10°)	Phi(20°)Phi(30°)	Phi(40°)Phi(50°)	Phi(60°)Phi(70°)	Phi(80°)Phi(90°)	Phi(100°)Phi(110°)	Phi(120°)Phi(130°)	Phi(140°)Phi(150°)	Phi(160°)Phi(170°)	Phi(180°)Phi(190°)	Phi(200°)Phi(210°)	Phi(220°)Phi(230°)	Phi(240°)Phi(250°)	Phi(260°)Phi(270°)	Phi(280°)Phi(290°)	Phi(300°)Phi(310°)	Phi(320°)Phi(330°)	Phi(340°)Phi(350°)
0°	-0.26037	1.11176	2.24248	2.63269	2.33186	1.51137	0.81152	0.23161	-0.79108	1.51137	1.59145	1.33097	1.69184	1.74161	1.22063	1.74161	1.22063	0.13039
10°	-1.02158	0.26101	1.46202	2.39263	2.51224	2.0523	2.24202	1.88144	0.73108	-0.5102	1.07199	2.52298	2.91275	2.41175	1.51134	1.29117	0.701	-0.69112
20°	-1.41132	-1.51124	-0.73057	1.71239	2.64277	2.73287	2.83284	2.75244	1.64071	-0.64193	-1.61002	1.64281	3.24232	2.89221	1.57109	1.08087	0.541022	-0.89115
30°	-0.79115	-1.68124	-2.34119	0.45183	2.58284	2.7127	2.88315	3.3523	2.7117	0.31139	-2.26168	-0.21158	2.68309	1.23109	1.1088	0.281054	-1.25112	
40°	-1.06153	-2.52105	-2.27108	0.41204	3.01336	3.25303	3.22366	4.12432	4.05325	1.99111	1.15089	0.67075	1.27179	1.71096	0.43006	0.21109	-1.15179	-1.98139
50°	-0.75109	-3.16128	-1.18036	1.91334	4.24155	4.16341	3.46394	4.9513	4.45306	1.83162	2.13249	2.136	1.03111	0.7803	-0.19106	-0.02184	-1.71149	-0.91141
60°	-1.251387	-6.76103	-2.32012	0.50197	1.89325	4.33455	3.6223	1.57348	5.01497	3.9213	-0.11161	-0.29143	1.5707	-1.73127	-1.42189	-2.33202	-1.42189	-1.08109
70°	-4137	-3.44109	1.66355	4.21427	4.4445	3.11217	1.91332	4.2362	2.37075	-1.53138	-3.35104	0.61087	0.77116	1.53109	-1.46131	-2.41129	-3.76166	-3.62148
80°	-3.361291	-1.15127	3.35452	4.45318	2.65284	1.3027	3.31236	1.67311	3.31236	0.73163	-3.34142	-5.06149	-3.42127	-2.16151	-1.09103	-1.63127	-3.27125	-5.06149
90°	-0.041358	-0.32229	3.64415	3.54256	-0.05106	1.54238	2.14264	3.41317	2.63125	-2.671456	-6.691504	-4.29131	-1.37102	-1.39122	-3.01182	-3.01182	-3.38169	-3.38169
100°	-4.48141	-1.3908	1.78185	0.77018	1.8308	3.42356	4.12368	2.54139	0.92061	-0.541303	-5.61557	-2.76115	-0.64111	-2.06153	-1.43109	-0.38139	-1.92126	-3.09104
110°	-1.61152	-1.27125	-0.77166	-1.08126	2.07348	3.42239	1.94131	0.92084	0.82056	-0.861255	-2.75127	-1.91132	-0.25132	-2.021298	-3.241288	-2.671234	-2.741265	
120°	-1.91082	-1.07176	-1.73107	0.41177	0.72141	1.23207	1.76103	2.43273	2.43273	1.76103	-2.61103	0.41177	1.23207	1.76103	-1.65158	-2.641308	-3.53185	-4.421514
130°	-3.91218	-1.51139	0.31174	1.26102	-0.39013	-1.161382	-3.72153	1.13135	0.61017	0.59002	-1.761374	-5.051506	-5.75168	-5.45152	-6.06109	-3.111328	-4.56125	-6.871631
140°	-3.761305	-2.81248	-0.83052	0.63136	-1.41161	-3.011515	-7.141623	-3.61294	-3.531365	-3.381375	-3.911333	-3.381375	-4.891793	-9.8165	-9.681786	-6.581536	-4.311362	-3.54138
150°	-2.91318	-3.141277	-1.11107	-0.52197	-4124	-4124	-4124	-3.21249	-1.87185	-2.991435	-5.161679	-8.711901	-7.351603	-5.13128	-6.87194	-9.651687	-4.911358	-2.941309
160°	-4.94155	-6.11151	-4.81141	-4.91746	-3.991458	-9.01191	-4.991537	-4.281424	-4139	-4.991537	-6.57178	-7.291669	-6.081582	-6.241691	-8.091903	-8.451718	-6.311537	-5.041523
170°	-9.54182	-7.981771	-7.581801	-8.991039	-11.241919	-8.281659	-5.911541	-5.511558	-5.681624	-6.831724	-7.371761	-8182	-8.691965	-9.51104	-9.421903	-9.51104	-11.431091	-10.771078
180°	-7.74147	-7.881853	-8.711929	-9.511959	-8.81177	-6.981688	-6.9217	-7.51199	-7.661799	-8.181839	-8.741897	-9.481922	-9.111935	-9.421969	-9.771989	-10.471018	-9.121857	-8.671792
190°	0.82101	0.64072	0.59022	0.33087	1.68125	-1.13145	0.69038	0.36041	1.5918	0.69038	-1.75168	-0.66043	1.13126	1.87175	1.87175	1.44116	1.44116	
200°	0.13053	1.01122	0.9805	0.09107	-1.26126	-0.39023	0.92138	1.82197	2.14187	1.29098	0.72051	0.26129	-0.92127	-1.66192	-11016	0.30149	0.70156	0.21006
210°	-0.17034	0.84112	1.23087	0.44102	-0.52123	0.4109	1.27151	1.63124	1.47146	1.27151	1.63124	1.47146	-1.32184	-2.391286	-0.92108	-0.861	-0.85102	
220°	0.38057	0.62102	1.19152	1.48133	1.34149	2127	2.32125	1.06039	0.04047	0.80174	0.521042	-1.511258	-3.53197	-3.591272	-2.18117	-1.121075	-0.43011	
230°	0.7316	2.04208	2.31259	2.98334	3.53151	3.54353	3.27303	2.5183	1.80142	0.011014	-0.10137	-1.04179	-2.981396	-4.941504	-4.281304	-1.881074	-0.271056	-0.61136
240°	1.76274	3.26233	3.173	3.44125	4.57132	4.09108	4.01369	3.19238	1.4208	0.57034	-0.26121	-21335	-3.8105	-5.111586	-4.81354	-2.29118	-0.76167	-0.57049
250°	2.25272	2.86261	1.74126	2.53439	5.44554	4.94384	3.23285	2.78182	0.57008	0.38096	-0.5613	-41347	-4.551576	-5.81392	-2.44179	-1.681084	0.33123	
260°	1.5527	3.09133	2.33208	3.59498	6.16622	5.08342	2.85182	0.341073	-1.541075	-0.09011	-5.921584	-0.841276	-2.981253	-5.011209	-0.671122	-2.65125	-0.77026	
270°	0.1119	2.9319	2.83234	3.4443	4.93486	3.65199	1.82285	2.5814	-0.541261	-3.02126	-2.11135	-1.561269	-2.61225	-2.71178	6.041244	-0.29146	-1.961372	-2.171069
280°	0.6073	1.38161	1.55185	2.52169	3.25355	2.84025	2.17276	2.63155	-0.04138	-2.081226	-2.551278	-3.61471	-4.381328	-3.481479	-6.111369	-2.211246	-2.68126	-1.40127
290°	-1.181237	-2.67184	-1.17023	0.42121	-1.17066	-1.491218	1.57178	1.8213	-1.491218	-3.08146	-5.2156	-7.471644	-6.57186	-5.2156	-3.871294	-2.051249	-2.611218	-1.71107
300°	-4.331562	-7.061558	-3.521043	0.65115	-3.31019	1.31118	0.96036	-0.77134	-1.36182	-2.431273	-3.441309	-4.141618	-5.851577	-4.961485	-2.341075	-0.52103	-3.031464	-4.59164
310°	-7.81129	-4.681226	-1.12062	2.18175	0.45106	2.42235	0.73138	-3.651394	-2.861283	-2.671383	-5.161584	-5.381047	-3.281431	-6.341858	-4.78123	-2.141305	-4.381624	-6.711704
320°	-5.72149	-6.41158	-4.81139	-2.68123	-1.27065	-2.04201	-4.621524	-4.18147	-4.621524	-4.441323	-3.571353	-3.211244	-3.781605	-3.321351	-3.211244	-3.781605	-4.831915	-7.23123
330°	-6.61133	-7.371564	-3.71138	-3.71138	-2.711099	0.18066	0.09107	-1.781264	-4154	-5.751586	-6.671709	-6.751529	-4.731528	-7.13159	-8.54194	-9.81862	-7.291614	-5.331093
340°	-6.521498	-7.451834	-9.02199	-8.211635	-4.471435	-3.021299	-3.531363	-3.951457	-4.991577	-5.96169	-7.391676	-6.051068	-6.451789	-8.111666	-5.811545	-5.941622	-5.811545	-5.971693
350°	-7.98117	-6.64179	-8.82151	-7.211496	-51544	-3.571287	-5.661578	-6.818	-6.818	-6.818	-6.818	-6.818	-6.818	-6.818	-6.818	-6.818	-6.818	-6.818
360°	-7.431808	-9.411048	-10.441965	-8.671739	-5.731512	-5.311572	-6.05163	-5.191412	-3.921394	-4.531514	-6.141704	-7.611746	-7.041677	-7.031794	-9.221951	-9.19185	-7.721718	-6.931701
370°	-7.291712	-7.261763	-7.61849	-8.21833	-8.481663	-8.191805	-8.831849	-7.511704	-6.121607	-6.11593	-6.011657	-5.791606	-7.21181	-9.521008	-10.241992	-9.551851	-8.091749	-7.41698
380°	5.2GPol.	Phi-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
390°	0.87116	1.7181	1.3109	0.261077	-2.11381	-5.711654	-5.4914	-2.57169	-0.46017	0.71135	1.82216	2.0919	1.2903	-0.871288	-4.611533	-4.251324	-2.29116	-0.51044
400°	0.5712	1.78209	2.1621	1.63085	0.51164	-3.481384	-3.481384	-0.95143	-0.04007	-0.09132	-0.421018	-0.18121	-1.141221	-4.171697	-8.031781	-5.711399	-2.661186	-1.10121
410°	0.86136	1.76157	1.33149	0.0711	-2.171232	0.0711	-2.171232	3.21127	1.29116	-1.97125	3.511356	3.21127	-2.141265	-3.031378	-11.451921	-7.05104	-2.991169	-0.82012
420°	0.98171	2.45214	1.94192	1.11017	-1.021177	-1.661073	-0.291169	-31341	-2.971176	-1.2115	-1.741153	-4.39146	-6.271972	-5.811507	-3.231146	-2.991169	-2.661186	-0.83024
430°	-1.141016	1.24153	1.82181	1.4605	-0.66105	-0.791208	0.32029	0.37013	-2.27116	-1.181059	-2.361325	-2.681349	-4.03143	-7.471863	-4.3165	-7.58152	-4.51217	-0.69158
440°	-2.26106	0.09038	0.55079	1.55104	-0.39168	-1.34013	0.94139	2.15073	-1.81378	-3.96134	-2.671267	-3.161333	-3.811454	-10.281004	-6.411032	-8.691704	-5.291408	-3.261257



Radiated Composite Gain Data

Appendix A

Theta	Phi(0°)	Phi(10°)	Phi(20°)	Phi(30°)	Phi(40°)	Phi(50°)	Phi(60°)	Phi(70°)	Phi(80°)	Phi(90°)	Phi(100°)	Phi(110°)	Phi(120°)	Phi(130°)	Phi(140°)	Phi(150°)	Phi(160°)	Phi(170°)	Phi(180°)
Theta(60°)	-2.48/0.66	1.09/1.51	1.05/0.07	1.48/0.99	1.72/0.54	-0.27/0.54	1.61/0.01	0.06/0.35	-0.31/2.91	-2.79/-3.47	-3.94/4.37	-3.48/-4.01	-4.08/-8.09	-10.73/-6.32	-7.09/-10.63	-10.65/-8.7	-7.09/-5.46	-3.48/-2.99	
Theta(70°)	-0.92/0.52	1.55/1.39	1.51/2.08	3.94/3.56	2.72/2.19	2.65/3.24	4.72/3.6	2.92/3.78	2.03/-0.72	-2.84/-3.9	-4.23/-4.27	-3.71/-5.87	-6.49/-6.17	-9.23/-8.28	-6.87/-9.58	-10.52/-10.6	-6.94/-4.13	-3.29/-2.21	
Theta(80°)	-1.65/-1.17	-0.05	1.12/1.84	4.03/4.09	5.42/4.18	3.17/3.92	3.58/4.17	4.02/2.91	0.06/-1.51	0.67/1.71	-3.68/-6.59	-4.59/-5.05	-6.81/-7.25	-6.57/-7.25	-6.81/-7.58	-10.59/-6.26	-6.47/-6.84	-4.65/-3.19	
Theta(90°)	-5.72/4.71	-1.42/0.64	1.22/2.41	2.73/3.09	6.11/5.2	5.05/4.33	3.29/4.26	4.05/3.7	2.18/-0.55	-2.16/-2.89	-3.53/5.87	-6.22/-3.57	-4.24/-4.97	-6.44/4.82	-3.36/6.34	-6.91/8.79	-8.07/6.5	-5.11/5.19	
Theta(100°)	-3.94/-2.45	-0.03/-0.08	0.17/2.47	1.71/-1.55	3.13/3.69	3.96/4.22	3.54/4.85	4.62/2.58	-0.18/0.6	-0.06/-1.65	-4.39/-4.44	-5.61/-4.27	-5.21/-5.44	-5.71/-7.18	-8.77/5.34	-7.58/8.11	-9.83/-7.45	-3.99/-3.51	
Theta(110°)	-5.03/2.83	-2.23/3.67	-0.45/1.61	-0.05/-2.72	1.47/1.45	1.39/2.17	2.54/3.43	2.3/-3.41	-2.43/-0.21	0.34/1.31	-0.96/-3.41	-4.19/-8.5	-6.64/-7.46	-4.28/-7.57	-9.32/-11.73	-7.64/-9.29	-8.06/-4.24	-3.26/-4.8	
Theta(120°)	-7.13/-6.34	-7.81/3.94	-1.89/-3.28	-6.51/7.92	-1.18/0.66	1.75/1.39	0.63/1.68	0.33/-2.37	-4.12/-2.2	-2.24/-2.49	-2.99/-2.03	-3.18/-3.9	-7.53/-7.65	-6.57/-7.59	-11.96/-10.27	-11.55/-8.68	-6.93/-7.92	-8.51/9.21	
Theta(130°)	-5.54/-4.74	-5.36/4.56	-5.27/-6.26	-7.18/-5.86	-8.77/-3.99	0.91/0.95	-1.23/0.57	0.51/-0.74	-4.18/-3.15	-3.41/-3.66	-3.54/-4.74	-4.15/-2.39	-9.66/-6.07	-6.52/-6.18	-10.33/-10.61	-6.76/-10.07	-6.36/-4.41	-7.75/7	
Theta(140°)	-8.22/-7.29	-6.06/7.59	-8.77/-8.06	-6.36/8.3	-7.61/-3.89	-0.85/-1.8	-2.66/2.77	-4.77/-3.83	-81/8.79	-7.35/-7.89	-9.18/-8.39	-3.98/-6.57	-10.26/-6.2	-5.61/-7.69	-9.56/-10.83				
Theta(150°)	-8.41/7.02	-7.04/8.08	-8.37/5.76	-4.89/5.13	-4.31/4.37	-4.94/5.42	5.82/4.25	4.09/5.51	9.15/10.08	-7.54/7.24	-8.91/8.75	-5.72/4.3	-4.35/9.42	-9.85/-6.47	-6.25/-10.24	-7.08/-6.46	-10.44/-12.5	-12.42/9.35	
Theta(160°)	-6.95/6.86	-6.44/4.49	-5.48/-4.82	-4.54/5.17	-5.16/5.44	-6.16/6.85	-7.63/7.47	-7.57/7.07	-6.94/8.62	-10.13/-10.92	-9.61/6.48	-5.66/-6.42	-8.82/-11.11	-10.92/8.76	-10.23/-11.41	-10.12/-8.62	-8.75/-8.85	-7.83/-7.61	
Theta(170°)	-5.45/6.44	-8.02/9.45	-9.96/9.23	-7.85/6.39	-5.29/5.41	-6.84/8.26	-8.05/7.01	-7.78/8.72	-8.91/8.7	-8.62/7.26	-7.35/7.62	-7.82/9.13	-9.11/9.29	-11.53/11.68	-9.75/9.69	-9.71/9.26	-9.47/8.44	-6.96/5.89	
Theta(180°)	-7.29/7.42	-7.42/7.84	-9.19/10.07	-9.86/9.96	-10.57/10.78	-10.92/8.81	-8.32/8.95	-9.09/9.42	-8.98/9.4	-10.29/10.32	-9.44/8.28	-7.87/7.56	-8.55/9.2	-10.81/10.38	-9.33/8.89	-8.21/8.19	-8.33/7.74	-7.11/6.96	
Freq(Hz)	5.6GPol.	Phi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dB)	Phi(0°)Phi(10°)	Phi(20°)Phi(30°)	Phi(40°)Phi(50°)	Phi(60°)Phi(70°)	Phi(80°)Phi(90°)	Phi(100°)Phi(110°)	Phi(120°)Phi(130°)	Phi(140°)Phi(150°)	Phi(160°)Phi(170°)	Phi(180°)Phi(190°)	Phi(200°)Phi(210°)	Phi(220°)Phi(230°)	Phi(240°)Phi(250°)	Phi(260°)Phi(270°)	Phi(280°)Phi(290°)	Phi(300°)Phi(310°)	Phi(320°)Phi(330°)	Phi(340°)Phi(350°)	
Theta(0°)	-3.21/3.84	-3.71/3.53	-3.64/3.01	-2.61/1.75	-0.72/0.04	0.12/0.27	0.43/0.25	-0.28/0.2	-0.98/2.01	-3.01/2.93	-2.89/2.92	-2.99/3.15	-3.31/1.97	-1.51/0.62	-0.44/0.03	-0.04/0.25	-0.34/0.83	-1.65/2.47	
Theta(10°)	-2.65/3.74	-3.32/3.02	-3.56/3.05	-3.34/3.83	-4.08/3.23	-2.16/1.51	-0.84/0.99	-1.41/2.45	-4.22/4.17	-4.26/3.8	-2.75/2.1	-2.48/1.96	-1.71/0.94	-0.27/0.67	1.04/1.42	1.05/0.94	0.39/0.31	-0.99/2.27	
Theta(20°)	-5.18/5.71	-2.91/1.24	-0.22/0.08	0.17/-0.67	-1.98/2.2	-1.52/2.06	-2.03/2.06	-1.89/1.88	-0.31/0.5	-0.31/0.5	-1.23/1.11	-1.36/1.36	1.04/0.58	0.08/-1.1	0.88/1.63	0.08/0.23	-0.77/3.73		
Theta(30°)	-6.47/6.05	4.12/2.34	-0.60/0.52	0.75/1.04	0.45/0.91	-1.56/0.95	0.39/1.63	1.1/0.5	-1.67/2.17	-1.71/1.24	-1.65/1.95	-1.72/0.94	-0.99/0.39	-0.33/0.22	0.72/0.23	-0.84/0.97	-1.91/3.37	4.26/5.48	
Theta(40°)	-7.51/8.19	-7.48/4.26	-2.26/0.61	1.17/1.61	1.50/86	1.15/1.38	0.06/1.04	1.29/0.02	-1.45/2.23	-3.83/7.6	-7.12/6.46	-5.48/3.63	-2.11/0.09	-0.46/1.44	0.82/1.88	-3.04/3.74	-5.75/4.85	5.95/9.67	
Theta(50°)	-9.31/7.19	-4.93/3.18	-0.66/0.74	2.43/3.39	3.05/0.93	-2.55/5.42	2.15/2.19	-1.07/1.01	-1.36/3.89	-2.29/1.9	-4.75/5.22	-4.82/2.98	-2.31/2.99	-2.58/4.16	-3.28/3.38	-5.91/8.11			
Theta(60°)	-10.48/7.38	-6.93/6.58	-2.44/0.64	2.32/3.28	2.45/1.13	2.69/3.8	0.80/53	0.59/1.34	1.55/0.04	-2.35/2.92	-2.91/2.2	-1.94/2.54	-2.61/2.31	-0.68/2.16	2.21/2.97	-4.59/4.22	-3.48/4.46	-8.99/10.37	
Theta(70°)	-6.27/5.59	-6.62/7.52	-5.02/2.38	0.03/2.32	1.29/1.99	1.69/1.38	1.31/0.1	1.59/2.4	1.69/1.38	-4.76/5.22	-4.26/5.72	-4.61/3.09	-2.61/2.23	-3.02/3.59	-2.81/2.85	-4.98/3.67	-4.17/10.51	-10.53/7.52	
Theta(80°)	-7.79/8.96	-5.77/1.35	-1.13/1.27	2.27/2.58	0.45/2.82	1.03/0.66	-1.88/5.73	0.38/0.66	-1.01/1.28	0.70/0.26	-4.35/5.42	-5.62/4.65	-2.59/4.27	-3.86/3.72	-5.94/8.95	-10.28/8	-7.67/6.51		
Theta(90°)	-6.97/6.63	-4.35/3.05	-2.91/1.53	1.01/2.42	3.74/3.57	2.84/2.08	0.16/1.12	1.85/0.02	-2.29/2.91	-3.43/5.19	-5.62/4.75	-4.74/4.31	-2.37/3.62	-5.73/4.09	-2.76/5.2	-5.43/5.33	-10.85/10.33	-11.84/8.92	
Theta(100°)	-12.47/9.25	-3.49/1.47	-0.97/2.08	-1.26/1.27	1.46/2.26	4.16/0.49	-0.54/0.06	-0.45/0.23	0.47/1.01	-3.71/5.73	-7.89/6.01	-7.24/6.41	-4.33/3.24	-4.26/3.81	-2.42/5.9	-3.78/4.95	-11.91/9.78	-8.43/9.21	
Theta(110°)	-9.87/8.58	-6.43/7.58	-8.41/1.76	-1.76/0.03	0.74/0.84	-4.91/3.95	-2.96/4.85	6.51/6.06	0.82/2.22	-5.19/4.55	-5.86/4.52	-6.95/8.23	-4.23/5.23	-5.58/5.04	-6.95/8.54	-12.31/10.54	-8.27/9.95		
Theta(120°)	-5.11/3.83	-3.97/6.48	-7.66/4.31	-1.60/5	-1.06/1.28	-0.69/0.63	2.79/1.59	-4.08/2.9	-2.82/1.13	-1.35/3.25	-1.94/3.74	-5.36/6.38	-9.98/6.8	-6.42/6.34	-9.24/6.99	-5.37/11.11	-6.53/5.7	-9.51/11.21	
Theta(130°)	-9.53/7.53	-9.03/7.12	-3.02/1.36	-1.44/0.49	-0.35/1.29	0.75/0.32	2.51/0.54	-5.95/5.52	-3.05/2.78	-4.55/5.89	-3.36/2.18	-5.21/7.67	-8.19/8.29	-7.51/8.16	-5.97/6.46	-7.32/6.58	-6.56/4.75	-4.18/6.57	
Theta(140°)	-9.21/11.82	-11.97/6.72	-5.03/4.49	-2.02/3.52	-4.74/2.19	-1.73/0.94	0.64/0.56	-6.53/6.6	-6.58/5.32	-4.81/5.34	-7.59/8.08	-6.89/8.76	-5.74/7.81	-5.72/7.64	-8.76/9.74	-12.16/9.75	-8.48/7.72	-6.74/6.64	
Theta(150°)	-10.26/10.52	-9.41/7.8	-5.48/5.02	-8.71/7.05	-5.01/5.85	-6.54/7.09	-9.69/8.1	-6.92/9.09	-7.68/3.89	-5.61/11.32	-11.56/11.37	-10.54/10.01	-7.75/9.35	-8.83/8.13	-6.76/7.96	-7.69/9.67			
Theta(160°)	-7.17/8.85	-8.25/8.09	-8.85/6.12	-3.11/2.19	-3.61/4.77	-5.02/4.34	-4.37/6.27	-7.92/8.41	-7.82/7.39	-6.82/5.31	-3.61/4.45	-6.19/7.53	-8.86/10.07	-11.41/9.87	-7.74/7.19	-9.85/9.65	-7.95/6.13	-5.15/5.4	
Theta(170°)	-9.93/9.9	-9.86/10.15	-8.36/7.39	-6.56/7.42	-8.66/11.09	-10.34/9.54	-9.87/8.92	-8.96/7.92	-6.51/9.9	-8.34/10.1	-11.37/12.31	-11.49/9.49	-7.95/8.34	-8.41/8.18	-7.91/8.27	-8.98/10.38	-10.92/10.5		
Theta(180°)	-7.88/7.41	-6.83/6.63	-7.54/8.07	-8.59/8.66	-9.14/8.33	-8.24/8.33	-9.81/8.33	-9.27/8.5	-9.08/8.33	-7.89/7.42	-9.27/8.5	-9.63/9.42	-10.34/8.21	-11.02/11.12	-10.91/10.57	-10.34/8.21	-8.57/8.51	-9.09/8.31	
Freq(Hz)	5.6GPol.	Theta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dB)	Phi(0°)Phi(10°)	Phi(20°)Phi(30°)	Phi(40°)Phi(50°)	Phi(60°)Phi(70°)	Phi(80°)Phi(90°)	Phi(100°)Phi(110°)	Phi(120°)Phi(130°)	Phi(140°)Phi(150°)	Phi(160°)Phi(170°)	Phi(180°)Phi(190°)	Phi(200°)Phi(210°)	Phi(220°)Phi(230°)	Phi(240°)Phi(250°)	Phi(260°)Phi(270°)	Phi(280°)Phi(290°)	Phi(300°)Phi(310°)	Phi(320°)Phi(330°)	Phi(340°)Phi(350°)	
Theta(0°)	-0.79/0.3	0.24/0.47	0.19/0.07	-0.54/1.26	-1.81/2.56	-3.12/4.05	-4.07/3.83	-3.37/2.69	-2.18/1.22	-0.56/0.03	0.51/0.27	0.15/0.4	-0.36/0.56	-1.2/2.31	-2.92/3.3	-2.87/3.06	-2.98/2.72	-2.08/1.37	
Theta(10°)	-1.39/0.6	-0.24/0.19	-0.02/0.42	0.32/0.39	0.12/1.17	-2.15/2.98	-3.23/1.74	-2.31/1.54	-0.98/0.64	-0.44/0.26	0.12/0.05	0.11/0.88	-1.47/2.02	-2.75/3.21	-3.91/3.51	-3.91/3.44	-3.51/2.71	-1.99/2.03	
Theta(20°)	0.80/81	0.94/0.97	0.57/0.11	-0.76/0.95	-0.32/0.61	-1.43/2.23	-1.89/1.51	-0.57/0.34	-0.79/0.8	-1.03/0.03	-0.36/0.33	-2.38/4.34	-4.15/3.43	-4.09/4.41	-4.85/5.03	-3.8/2.76	-0.96/0.41		
Theta(30°)	0.54/1.15	1.34/2.06	2.25/1.62	-0.55/2.94	-1.68/0.46	-0.56/0.88	-0.61/0.54	-0.12/0.94	-2.89/3.91	-4.77/4.1	-2.75/1.49	-0.52/0.2	-1.17/3.49	-4.38/4.45	-3.83/2.46	-1.59/1.03	-0.72/0.57		
Theta(40°)	-0.11/0.58	-0.89/0.94	0.64/1.66	1.58/0.46	1.58/0.46	-0.36/0.51	-0.56/0.26	0.83/0.51	-1.95/1.71	-1.93/2.38	-2.78/2.71	-2.45/2.11	-3.38/5.39	-6.86/6.38	-4.35/3.96	-3.92/2.74	-1.20/1.5	-0.09/0.04	
Theta(50°)	0.34/0.19	0.21/1.7	1.54/2	3.26/2.61	1.94/1.48	1.77/1.68	1.51/0.33	-0.84/2.16	-2.59/3	-3.81/3.06	-2.76/3.46	-3.71/6.93	-7.62/4.45	-4.64/1.68	-2.55/6.09	-2.66/0.65	-0.37/0.46		
Theta(60°)	-0.88																		



Radiated Composite Gain Data

Appendix A

Gain Result

Freq(Hz)	2.45GPol	PhiAnt. 1	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
Gain	Phi(°)Phi(10°)	Phi(20°)Phi(30°)	Phi(40°)Phi(50°)	Phi(60°)Phi(70°)	Phi(80°)Phi(90°)	Phi(100°)Phi(110°)	Phi(120°)Phi(130°)	Phi(140°)Phi(150°)	Phi(160°)Phi(170°)	Phi(180°)Phi(190°)	Phi(200°)Phi(210°)	Phi(220°)Phi(230°)	Phi(240°)Phi(250°)	Phi(260°)Phi(270°)	Phi(280°)Phi(290°)	Phi(300°)Phi(310°)	Phi(320°)Phi(330°)	Phi(340°)Phi(350°)	Phi(360°)Phi(370°)	Phi(380°)Phi(390°)
Theta(0°)	-11.14/9.52	-8.34/7.43	-7.34/7.19	-7.46/7.71	-8.57/9.06	-10.18/11.79	-13.23/13.03	-13.34/14.12	-9.39/11.73	-17.68/18.28	-14.06/11.3	-9.39/7.73	-7.07/6.86	-7.12/7.73	-8.3/9.08	-9.86/10.78	-12.21/13.57	-13.29/12.81	-11.44/9.52	-11.44/9.52
Theta(10°)	-17.3/-18.81	-16.19/-12.8	-11.51/9.71	-8.67/8.1	-7.43/7.59	-8.44/9.99	-11.72/13.37	-13.09/11.78	-11.99/13.19	-15.47/13.33	-10/7.8	-6.65/6.15	-6.47/7.34	-8.31/9.5	-11.09/11.81	-13.24/13.6	-14.01/16.21	-17.69/18.34	-12.17/11.56	-12.17/11.56
Theta(20°)	-11.48/-13.51	-18.24/-19.13	-18.87/-14.21	-10.11/8.09	-7.08/6.64	-7.66/8.83	-10.03/9.85	-8.25/6.94	-7.03/8.32	-11.13/18.53	-18.34/11.74	-7.92/6.15	-6.03/6.84	-8.96/11.44	-13.61/16.6	-16.47/16.5	-14.68/13.59	-14.71/16.41	-11.44/9.52	-11.44/9.52
Theta(30°)	-9.36/-10.51	-12.01/14.88	-18.25/-18.07	-13.63/9.05	-7.26/7.24	-8.43/9.8	-9.5/7.48	-4.85/3.31	-2.71/3	-4.59/7.75	-15.17/17.52	-11.61/7.55	-6.61/7.37	-9.53/12.39	-14.51/14.96	-14.3/12.42	-14.3/12.42	-14.3/12.42	-11.44/9.52	-11.44/9.52
Theta(40°)	-13.16/-12.94	-12.79/12.68	-12/11.9	-10.47/7.86	-6.97/7.4	-9.82/12.16	-9.61/5.71	-3.1/1.58	-0.9/1.05	-1.71/3.07	-5.6/10.92	-17.5/13.39	-8.64/8.05	-10.07/13.14	-15.31/18	-18.83/18.84	-17.45/15.15	-14.47/14.16	-11.44/9.52	-11.44/9.52
Theta(50°)	-17.23/-19.12	-18.24/15.15	-10.58/7.64	-6.83/6.3	-6.16/7.36	-10.82/18.62	-11.12/4.67	-1.65/0.3	-0.06/0.34	-1.02/2.13	-4.42/8.36	-16.58/14.85	-8.2/7.31	-9.83/12.02	-13.84/18.5	-17.54/17.64	-18.08/18.03	-19.17/18.41	-11.44/9.52	-11.44/9.52
Theta(60°)	-9.58/-11.83	-17.74/16.99	-8.75/5.86	-6.04/7.95	-8.58/9.4	-11.18/15.64	-15.29/6.42	-2.4/0.91	-0.7/1.15	-1.92/2.81	-3.39/4.63	-12.9/12.52	-11.5/8.8	-9.35/10.28	-13.77/19.26	-17.17/16.21	-18.6/17.24	-14.69/11.76	-11.44/9.52	-11.44/9.52
Theta(70°)	-6.85/8.67	-13.11/10.75	-5.64/3.64	-4.62/8.67	-11.71/13.12	-17.07/13.6	-11.38/7.08	-3.65/2.38	-2.55/3.12	-3.77/3.82	-3.37/3.57	-5.65/12.09	-18.33/10.9	-9.46/9.3	-14.61/17.33	-10.72/11.92	-15.6/11.76	-7.83/6.89	-11.44/9.52	-11.44/9.52
Theta(80°)	-5.28/6.87	-9.23/8.36	-5.98/5.69	-8.85/19.18	-17.31/14.64	-18.11/19.07	-13.76/8.98	-5.67/4	-4.19/5.76	-7.79/9.15	-8.97/8.8	-10.45/16.86	-18.48/14.2	-11.72/13.25	-17.83/10.89	-8.26/9.61	-9.39/7.42	-5.5/7.47	-11.44/9.52	-11.44/9.52
Theta(90°)	-7.12/8.43	-6.89/4.45	-3.7/6.04	-14.53/18.45	-18.99/14.98	-13.65/17.08	-15.29/6.42	-7.85/3.56	-2.7/4.14	-6.7/8.33	-12.82/9.18	-15.5/17.93	-11.65/11.97	-14.9/18.05	-12.82/9.18	-9.25/7.58	-4.83/4.08	-4.33/5.08	-11.44/9.52	-11.44/9.52
Theta(100°)	-10.15/8.55	-6.35/4.66	-4.25/7.04	-11.27/9.67	-13.04/17.61	-13.52/14.08	-12.06/10.75	-7.87/4.1	-2.66/3.14	-4.43/5.95	-6.94/9.06	-13.99/13.09	-12.55/15.69	-18.17/13.05	-9.31/8.64	-9.98/7.33	-4.55/4.43	-6.33/8.6	-11.44/9.52	-11.44/9.52
Theta(110°)	-5.75/4.08	-4.11/5.83	-5.63/6.02	-6.7/7.47	-12.46/18.53	-14.08/14.88	-12.35/10.01	-8/4.63	-3.23/2.85	-3.18/3.48	-4.54/6.17	-8.45/8.66	-11.03/15.96	-18.43/18.19	-15.05/14.4	-15.2/8.96	-5.26/4.96	-6.36/7.04	-11.44/9.52	-11.44/9.52
Theta(120°)	-5.49/3.25	-3.78/6.96	-7.88/6.24	-6.92/8.53	-12.35/15.79	-16.64/17.93	-13.37/9.46	-10.06/9.68	-7.33/5.75	-4.83/4.15	-4.5/6.73	-17.52/19.35	-17.13/15.88	-17.13/15.88	-14.02/12.84	-9.47/12.77	-14.04/12.84	-12.37/9.38	-11.44/9.52	-11.44/9.52
Theta(130°)	-9.02/7.49	-9.09/15.31	-8.63/5.54	-6.93/14.69	-17.75/8.38	-7.77/11.06	-17.77/13.55	-9.91/9.04	-9.37/9.48	-7.73/6.88	-7.5/12.28	-18.05/17.59	-15.42/16.95	-18.82/17.69	-14.64/10.17	-9.03/10.53	-12.84/12.64	-11.99/10.46	-11.44/9.52	-11.44/9.52
Theta(140°)	-8.61/9.53	-12.48/17.46	-11.41/7.23	-7.71/12.67	-15.68/9.18	-6.94/7.48	-12.15/17.83	-17.81/18.95	-17.81/18.95	-18.34/18.16	-16.5/11.79	-10.18/9.38	-9.99/12.13	-13.49/11.93	-12.8/14.59	-16.35/19.32	-13.37/18.07	-8.69/8.07	-11.44/9.52	-11.44/9.52
Theta(150°)	-10.33/15.14	-19.01/16.83	-10.43/7.7	-12.8/12.8	-18.22/11.39	-8.43/12.7	-17.83/14.96	-9.7/10.16	-17.06/13.36	-11.01/9.7	-9.7/10.16	-17.06/13.36	-11.01/9.7	-9.7/10.16	-17.06/13.36	-11.01/9.7	-9.7/10.16	-17.06/13.36	-11.44/9.52	-11.44/9.52
Theta(160°)	-14.16/17.65	-17.33/12.48	-10.25/9.4	-11.55/17.56	-17.97/12.53	-8.58/7.09	-7.23/8.59	-10.81/11.86	-12.89/13.87	-14.34/14.54	-17.99/19.08	-14.55/11.07	-9.38/9.71	-13.47/17.04	-18.17/15.14	-11.68/9.56	-9.25/9.27	-10.32/12.42	-11.44/9.52	-11.44/9.52
Theta(170°)	-18.19/15.33	-13.17/12.34	-12.01/13.5	-16.3/18.83	-19.01/12.35	-9.45/7.81	-7.05/7.14	-8/8.51	-9.47/11.57	-13.67/16.05	-16.31/14.95	-13.78/13.49	-15.62/18.24	-18.04/16.01	-13.54/11.79	-11.99/13.76	-17.07/17.45	-18.92/18.12	-11.44/9.52	-11.44/9.52
Theta(180°)	-12.1/12.16	-13.55/16.2	-17.66/18.81	-18.98/17.21	-14.25/10.95	-10.27/9.47	-9.04/9.04	-11.15/12.33	-13.88/14.27	-15.62/16.71	-19.14/18.88	-18.16/19.29	-17.77/17.88	-17.77/17.88	-17.12/14.66	-12.49/11.04	-10.82/10.66	-11.44/9.52	-11.44/9.52	-11.44/9.52
Freq(Hz)	2.45GPol	ThetaAnt. 1	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
Gain	Phi(°)Phi(10°)	Phi(20°)Phi(30°)	Phi(40°)Phi(50°)	Phi(60°)Phi(70°)	Phi(80°)Phi(90°)	Phi(100°)Phi(110°)	Phi(120°)Phi(130°)	Phi(140°)Phi(150°)	Phi(160°)Phi(170°)	Phi(180°)Phi(190°)	Phi(200°)Phi(210°)	Phi(220°)Phi(230°)	Phi(240°)Phi(250°)	Phi(260°)Phi(270°)	Phi(280°)Phi(290°)	Phi(300°)Phi(310°)	Phi(320°)Phi(330°)	Phi(340°)Phi(350°)	Phi(360°)Phi(370°)	Phi(380°)Phi(390°)
Theta(0°)	-9.63/9.64	-10/10.46	-14.69/14.27	-14.69/14.5	-11.91/11.89	-11.91/11.89	-10.27/11.2	-9.8/4.4	-11.14/11.39	-11.53/12.31	-11.14/11.39	-11.53/12.31	-11.14/11.39	-11.53/12.31	-11.14/11.39	-11.53/12.31	-11.14/11.39	-11.53/12.31	-11.14/11.39	-11.53/12.31
Theta(10°)	-11.25/10.02	-9.02/8.35	-8.76/10.52	-11.12/11.89	-11.58/11.49	-10.92/10.9	-10.64/10.6	-9.61/9.34	-8.65/9.02	-10.02/11	-12.06/13.16	-15.26/17.35	-17.61/15.07	-12.81/12.41	-12.51/12.74	-13.37/13.8	-13.22/13.13	-12.64/12.22	-11.44/9.52	-11.44/9.52
Theta(20°)	-14.29/13.23	-10.6/8.84	-8.02/8.02	-8.05/8.14	-8.17/8.23	-8.26/8.47	-9.32/11.12	-13.91/17.63	-14.23/13.07	-12.92/14.96	-18.26/19.23	-18.38/12.82	-11.09/11.46	-13.98/14.45	-17.94/17.99	-18.09/18.52	-18.09/18.52	-18.77/16.62	-11.44/9.52	-11.44/9.52
Theta(30°)	-8.91/9.24	-10/9.18	-8.9/7.49	-6.84/6.52	-6.5/6.3	-5.21/5.25	-5.21/5.25	-6.44/7.61	-9.9/12.93	-18.66/17.1	-17.39/18.25	-15.94/11.88	-9.37/9.21	-17.07/17.99	-14.81/11.11	-9.85/9.97	-9.85/9.97	-9.85/9.97	-11.44/9.52	-11.44/9.52
Theta(40°)	-3.84/3.79	-4.36/5.12	-5.41/5.05	-4.28/3.53	-2.84/2.03	-1.21/0.52	0.030/0.34	-0.1/1.05	-2.45/3.81	-5.56/7.66	-9.99/12.75	-18.19/18.39	-19.47/16.07	-17.1/19.19	-16.97/12.34	-9.3/7.7	-6.83/6.56	-5.69/4.8	-11.44/9.52	-11.44/9.52
Theta(50°)	-2.83/3.09	-3.5/4	-3.71/2.39	-0.920/1	0.450/8	1.52/68	3.673/64	2.711/05	0.91/2.78	-4.37/5.6	-6.67/8.59	-13.5/17.68	-14.44/11.66	-14.86/18.72	-13.5/11.01	-9.34/8.62	-7.34/5.42	-4.24/3.27	-11.44/9.52	-11.44/9.52
Theta(60°)	-2.05/3.32	-4.22/5.09	-5.11/7.13	1.613/35	3.663/37	3.213/01	4.855/52	3.11/24	0.98/2.62	4.34/4.74	4.85/5.52	-8.36/15.86	-18.39/12.22	-10.33/7.72	-5.9/4.93	-4.27/3.46	-2.16/1.96	-11.44/9.52	-11.44/9.52	-11.44/9.52
Theta(70°)	-2.77/3.09	-3.11/3.68	-5.9/2.69	2.063/47	4.334/48	4.083/92	3.572/53	1.65/0.48	-2.54/4.26	-6.04/5.85	-5.03/5.44	-8.14/17.24	-14.08/8.15	-7.08/8.53	-9.97/8.1	-4.78/3.29	-3.67/4.02	-3.5/3.03	-11.44/9.52	-11.44/9.52
Theta(80°)	-2.67/1.89	-1.14/0.63	-2.16/2.9	0.421/75	3.234/32	4.3/3.45	2.24/63	0.69/3.66	-6.7/8.19	-8.22/6.36	-5.44/9.99	-8.38/16.34	-12.41/7.07	-6.06/8.31	-12.32/7.99	-4.64/3.82	-4.13/5.33	-5.18/3.56	-11.44/9.52	-11.44/9.52
Theta(90°)	-1.47/1.84	-1.49/0.64	-1.42/1.88	-0.87/0.37	2.054/12	4.272/73	0.271/1.32	-2.75/4.98	-7.12/8.03	-6.94/5.6	-5.43/6.69	-8.46/14.08	-16.24/10.06	-9.06/13.84	-17.06/7.22	-4.58/4.29	-3.9/3.59	-3.15/2.06	-11.44/9.52	-11.44/9.52
Theta(100°)	-2.37/4.3	-4.5/3	-2.42/0.9	-1.17/6.16	-4.95/0.2	1.570/95	-1.4/3.02	-3.45/3.11	-4.76/5.07	-6.34/8.17	-11.42/18.04	-15.71/12.96	-11.42/18.04	-15.71/12.96	-11.42/18.04	-15.71/12.96	-11.42/18.04	-15.71/12.96	-11.44/9.52	-11.44/9.52
Theta(110°)	-6.28/11.02	-14.63/11.99	-10.19/3.95	-2.35/5.55	-12.08/4.23	-0.78/0.19	-1.97/5.18	-6.08/4.22	-2.79/2.45	-3.29/4.56	-6.87/8.24	-14.81/17.4	-11.04/10.3	-9.57/10.23	-8.43/5.31	-2.97/1.73	-2.33/4.39	-5.09/4.96	-11.44/9.52	-11.44/9.52
Theta(120°)	-17.54/15.91	-16.29/13.21	-9.96/5.7	-1.92/1.83	4.46/4.08	0.430/36	0.223/2.7	-5.15/4.97	-2.88/1.81	-2.3/5	-7.98/11.24	-10.15/6.38	-6.4/8.12	-9.68/15.16	-13.21/8.98	-6.44/5.39	-6.5/10.76	-19.18/18.64	-11.44/9.52	-11.44/9.52
Theta(130°)	-9.46/7.83	-12.63/17.2	-11.36/8.19	-4.83/3.5	-3.32/1.4	0.56/1.37	0.59/1.16	-2.8/3.47	-4.1/4.71	-5.86/5.83	-4.58/4.64	-8.31/7.94	-9.8/11.14	-8.28/8.48	-9.8/11.14	-13.15/12.2	-16.35/15.23	-16.35/15.23	-11.44/9.52	-11.44/9.52
Theta(140°)	-10.6/13.4	-18.68/13.6	-7.47/6.39	-6.02/5.54	-3.72/0.27	-1.71/0.81	-1.51/2.43	-3.36/0.43	-5.32/6.6	-7.24/7.64	-8.83/13									



Radiated Composite Gain Data

Appendix A

Theta	Phi(0°)	Phi(10°)	Phi(20°)	Phi(30°)	Phi(40°)	Phi(50°)	Phi(60°)	Phi(70°)	Phi(80°)	Phi(90°)	Phi(100°)	Phi(110°)	Phi(120°)	Phi(130°)	Phi(140°)	Phi(150°)	Phi(160°)	Phi(170°)	Phi(180°)	Phi(190°)	Phi(200°)	Phi(210°)	Phi(220°)	Phi(230°)	Phi(240°)	Phi(250°)	Phi(260°)	Phi(270°)	Phi(280°)	Phi(290°)	Phi(300°)	Phi(310°)	Phi(320°)	Phi(330°)	Phi(340°)	Phi(350°)	
Theta(0°)	-14.5/13.42	-10.15/6.66	-4.37/3.86	0.57/0.16	1.02/0.37	-3.73/0.35	-0.82/2	-2.75/3.2	-6.71/17.65	-18.62/18.28	-13.09/11.86	-8.74/14.46	-16.52/17.27	-18.99/11.67	-15.7/18.82	-17.23/18.37	-18.89/17.31	-13.06/13.09	-9.85/8.44	-6.81/4.86	-3.24/2.69	2.06/2.69	1.69/2.3	0.95/1.44	1.52/1.39	0.93/1.07	-1.17/6.66	-17.63/15.19	-15.25/16.7	-12.85/15.91	-18.8/18.66	-14.79/14.25	-18.85/19.18	-18.44/19.08	-11.55/10.09	-18.92/11.33	
Theta(10°)	-8.03/10.11	-6.42/9.99	-3.56/3.26	1.77/1.98	4.38/2.32	1.81/65	0.62/0.77	-7.52/9.79	-13.79/13.54	-0.89/4.18	-7.37/9.79	-9.13/12.17	-18.43/18.94	-12.97/9.79	-18.41/19.54	-19.35/12.38	-13.27/18.76	-12.49/9.08	-17.69/18.18	-10.51/8.86	-7.49/3.54	-2.09/0.59	4.19/3.38	2.05/0.75	0.19/0.11	-1.19/0.05	-0.11/2	-4.77/6.98	-12.01/18.26	-12.86/10.46	-9.77/17.05	-17.84/16.75	-13.6/16.4	-18.25/15.48	-15.63/14.62	-14.17/12.51	
Theta(20°)	-11.3/11.69	-5.78/7.18	-6.11/2.31	-1.94/4.83	-0.73/1.7	1.59/0.56	-0.74/1.49	0/1.15	-3.15/4.28	-3.82/5.8	-6.47/6.79	-9.4/8.16	-11.65/11.68	-14.11/18.93	-12.96/8.48	-13.13/11.16	-18.09/18.85	-10.32/8.64	-14.22/9.19	-6.74/9.31	-5.77/4.37	-7.63/18.2	-1.09/0.13	-0.73/1.7	1.59/0.56	-0.74/1.49	0/1.15	-3.15/4.28	-3.82/5.8	-6.47/6.79	-9.4/8.16	-11.65/11.68	-14.11/18.93	-12.96/8.48	-13.13/11.16	-18.09/18.85	-10.32/8.64
Theta(30°)	-18.44/16.81	-18.42/16.35	-12.31/15.85	-14.78/18.91	-4.27/2.82	-3.75/6.01	-1.63/1.1	-2.24/4.61	-6.38/7.15	-7.17/7.97	-6.76/7.41	-6.18/7.67	-18.89/12.84	-13.89/12.58	-18.32/16.68	-17.79/15.95	-17.43/16.62	-18.33/15.97	-12.82/10.21	-15.44/12.34	-8.23/10.52	-8.15/14.57	-12.31/9.7	-11/10.22	-1.75/3.83	-8.82/9.86	-11.29/10.25	-8.59/10.71	-7.89/5.4	-18.64/18.69	-13.51/8.37	-11.68/14.12	-11.87/16.27	-14.03/10.81	-9.85/17.69	-14.28/18.76	
Theta(40°)	-12.82/10.21	-15.44/12.34	-8.23/10.52	-8.15/14.57	-12.31/9.7	-11/10.22	-1.75/3.83	-8.82/9.86	-11.29/10.25	-8.59/10.71	-7.89/5.4	-18.64/18.69	-13.51/8.37	-11.68/14.12	-11.87/16.27	-14.03/10.81	-9.85/17.69	-14.28/18.76	-12.82/10.21	-15.44/12.34	-8.23/10.52	-8.15/14.57	-12.31/9.7	-11/10.22	-1.75/3.83	-8.82/9.86	-11.29/10.25	-8.59/10.71	-7.89/5.4	-18.64/18.69	-13.51/8.37	-11.68/14.12	-11.87/16.27	-14.03/10.81	-9.85/17.69	-14.28/18.76	
Theta(50°)	-19.13/19.09	-12.55/13.71	-18.14/10.88	-7.31/9.27	-18.9/12.13	-12.62/10.78	-6.88/4.7	-4.66/8.3	-19.12/17.37	-17.9/18.93	-16.78/9.63	-6.09/9.23	-17.47/10.8	-6.1/17.26	-15.26/19.2	-11.23/14.3	-17.16/19.09	-14.28/18.76	-19.13/19.09	-12.55/13.71	-18.14/10.88	-7.31/9.27	-18.9/12.13	-12.62/10.78	-6.88/4.7	-4.66/8.3	-19.12/17.37	-17.9/18.93	-16.78/9.63	-6.09/9.23	-17.47/10.8	-6.1/17.26	-15.26/19.2	-11.23/14.3	-17.16/19.09	-14.28/18.76	
Theta(60°)	-18.12/16.61	-13.9/11	-8.29/7.64	-8.06/11.07	-17.47/16.86	-12.72/9.46	-6.46/4.36	-3.91/6.22	-10.45/15.22	-18.23/18.66	-14.09/13.48	-5.59/2.59	-5.56/17.88	-16.67/19.15	-17.88/15.66	-11.47/12.41	-18.3/18.94	-17.82/18.89	-18.12/16.61	-13.9/11	-8.29/7.64	-8.06/11.07	-17.47/16.86	-12.72/9.46	-6.46/4.36	-3.91/6.22	-10.45/15.22	-18.23/18.66	-14.09/13.48	-5.59/2.59	-5.56/17.88	-16.67/19.15	-17.88/15.66	-11.47/12.41	-18.3/18.94	-17.82/18.89	
Theta(70°)	-17.91/19.48	-17.04/17.5	-14.93/12.14	-9.63/9.98	-10.6/10.29	-10.87/13.25	-13.5/12.66	-11.88/10.24	-10.07/12.29	-16.39/19.14	-14.17/9.26	-7.47/9.28	-12.49/17.42	-18.45/17.17	-15.18/15.93	-17.79/15.81	-11.72/9.6	-10.15/16.72	-17.91/19.48	-17.04/17.5	-14.93/12.14	-9.63/9.98	-10.6/10.29	-10.87/13.25	-13.5/12.66	-11.88/10.24	-10.07/12.29	-16.39/19.14	-14.17/9.26	-7.47/9.28	-12.49/17.42	-18.45/17.17	-15.18/15.93	-17.79/15.81	-11.72/9.6	-10.15/16.72	
Theta(80°)	-7.99/9.67	-12.11/16.84	-17.45/16.08	-12.54/11.09	-11.33/12.58	-15.28/18.38	-8.96/9.15	-9.23/9.62	-17/13.72	-12.41/9.86	-11.43/11.73	-13.95/13.75	-18.5/16.22	-11.43/11.73	-13.95/13.75	-18.5/16.22	-11.43/11.73	-13.95/13.75	-7.99/9.67	-12.11/16.84	-17.45/16.08	-12.54/11.09	-11.33/12.58	-15.28/18.38	-8.96/9.15	-9.23/9.62	-17/13.72	-12.41/9.86	-11.43/11.73	-13.95/13.75	-18.5/16.22	-11.43/11.73	-13.95/13.75	-18.5/16.22	-11.43/11.73	-13.95/13.75	
Theta(90°)	-11.54/11.2	-11.41/12.55	-15.92/16.46	-16.83/14.56	-14.71/14.18	-15.18/13.35	-13.68/14.77	-14/13	-12.49/14.82	-17.07/16.89	-13.05/11.2	-10.5/10.49	-11.31/13.25	-18.93/19.18	-15.19/14.41	-14.97/14.46	-14.42/11.47	-12.02/11	-11.54/11.2	-11.41/12.55	-15.92/16.46	-16.83/14.56	-14.71/14.18	-15.18/13.35	-13.68/14.77	-14/13	-12.49/14.82	-17.07/16.89	-13.05/11.2	-10.5/10.49	-11.31/13.25	-18.93/19.18	-15.19/14.41	-14.97/14.46	-14.42/11.47	-12.02/11	
Gain	Phi(0°)	Phi(10°)	Phi(20°)	Phi(30°)	Phi(40°)	Phi(50°)	Phi(60°)	Phi(70°)	Phi(80°)	Phi(90°)	Phi(100°)	Phi(110°)	Phi(120°)	Phi(130°)	Phi(140°)	Phi(150°)	Phi(160°)	Phi(170°)	Phi(180°)	Phi(190°)	Phi(200°)	Phi(210°)	Phi(220°)	Phi(230°)	Phi(240°)	Phi(250°)	Phi(260°)	Phi(270°)	Phi(280°)	Phi(290°)	Phi(300°)	Phi(310°)	Phi(320°)	Phi(330°)	Phi(340°)	Phi(350°)	
Theta(0°)	-5.25/6.24	-7.71/8.98	-11.6/13.4	-19.2/18.79	-17.36/14.35	-11.63/9.64	-8.7/8.19	-6.79/5.23	-4.49/6.26	-6.91/5.93	-6.57/8.71	-11.24/13.3	-19.07/17.61	-18.99/15.46	-14.07/9.53	-7.29/7.07	-6.17/5.57	-5.44/5.98	-5.25/6.24	-7.71/8.98	-11.6/13.4	-19.2/18.79	-17.36/14.35	-11.63/9.64	-8.7/8.19	-6.79/5.23	-4.49/6.26	-6.91/5.93	-6.57/8.71	-11.24/13.3	-19.07/17.61	-18.99/15.46	-14.07/9.53	-7.29/7.07	-6.17/5.57	-5.44/5.98	
Theta(10°)	-6.93/7.2	-8.22/9.53	-10.71/11.3	-14.46/18.17	-18.26/18.71	-14.8/12.38	-10.02/7.8	-6.99/7.32	-9.27/7.77	-6.37/5.74	-9.33/9.61	-10.41/13.88	-17.99/19.65	-17.15/13.07	-10.22/7.7	-7.65/6.7	-7.22/7.82	-6.65/7.4	-6.93/7.2	-8.22/9.53	-10.71/11.3	-14.46/18.17	-18.26/18.71	-14.8/12.38	-10.02/7.8	-6.99/7.32	-9.27/7.77	-6.37/5.74	-9.33/9.61	-10.41/13.88	-17.99/19.65	-17.15/13.07	-10.22/7.7	-7.65/6.7	-7.22/7.82	-6.65/7.4	
Theta(20°)	-4.17/4.17	-3.96/4.44	-4.37/5.63	-7.57/10.28	-13.46/18.45	-16.65/11.57	-8.94/8.07	-8.21/9.4	-9.71/8.63	-3.62/4.66	-5.49/7.83	-18/10.84	-13.85/12.47	-11.84/11.21	-10.08/9.54	-8.14/6.4	-4.17/4.17	-3.96/4.44	-4.37/5.63	-7.57/10.28	-13.46/18.45	-16.65/11.57	-8.94/8.07	-8.21/9.4	-9.71/8.63	-3.62/4.66	-5.49/7.83	-18/10.84	-13.85/12.47	-11.84/11.21	-10.08/9.54	-8.14/6.4	-4.17/4.17	-3.96/4.44	-4.37/5.63	-7.57/10.28	
Theta(30°)	-6.95/9.85	-9.77/9.65	-9.06/9.65	-13.56/12.18	-12.71/15.25	-14.9/10.32	-10.5/10.24	-11.14/9.83	-7.86/5.9	-3.84/3.6	-4.38/4.46	-4.85/6.81	-11.4/14.57	-18.19/18.78	-16.76/15.27	-15.21/18.7	-12.36/9.41	-5.97/5.87	-6.95/9.85	-9.77/9.65	-9.06/9.65	-13.56/12.18	-12.71/15.25	-14.9/10.32	-10.5/10.24	-11.14/9.83	-7.86/5.9	-3.84/3.6	-4.38/4.46	-4.85/6.81	-11.4/14.57	-18.19/18.78	-16.76/15.27	-15.21/18.7	-12.36/9.41	-5.97/5.87	
Theta(40°)	-16.54/14.58	-9.98/9.57	-10.52/11.19	-12.71/18.49	-17.12/18.74	-15.11/11.65	-13.16/10.95	-10.82/10.23	-6.82/7.43	-5.94/8.26	-9.42/8.87	-9.52/9.23	-9.55/10.27	-14.82/18.49	-18.07/14.92	-17.12/18.15	-15.15/9.95	-10.37/14.72	-16.54/14.58	-9.98/9.57	-10.52/11.19	-12.71/18.49	-17.12/18.74	-15.11/11.65	-13.16/10.95	-10.82/10.23	-6.82/7.43	-5.94/8.26	-9.42/8.87	-9.52/9.23	-9.55/10.27	-14.82/18.49	-18.07/14.92	-17.12/18.15	-15.15/9.95	-10.37/14.72	
Theta(50°)	-13.8/12.68	-8.1/6.39	-4.77/5.86	-1.44/6.91	-18.88/16.96	-11.4/6.91	-18.88/16.96	-4.33/8.78	-4.31/7.42	-3.62/4.66	-18.88/16.96	-11.4/6.91	-18.88/16.96	-4.33/8.78	-4.31/7.42	-3.62/4.66	-18.88/16.96	-11.4/6.91	-13.8/12.68	-8.1/6.39	-4.77/5.86	-1.44/6.91	-18.88/16.96	-11.4/6.91	-18.88/16.96	-4.33/8.78	-4.31/7.42	-3.62/4.66	-18.88/16.96	-11.4/6.91	-18.88/16.96	-4.33/8.78	-4.31/7.42	-3.62/4.66	-18.88/16.96	-11.4/6.91	-18.88/16.96
Theta(60°)	-18.13/12.25	-10.33/10.38	-6.39/6.79	-6.38/5.59	-18.42/15.08	-17.49/14.07	-19.74/9.72	-5.1/7.21	-7.27/5.76	-4.51/2.86	-3.11/4.86	-6.81/8.32	-10.79/14.29	-13.44/18.38	-18.4/18.71	-18/12.92	-9.79/11.79	-15.33/16.04	-18.13/12.25	-10.33/10.38	-6.39/6.79	-6.38/5.59	-18.42/15.08	-17.49/14.07	-19.74/9.72	-5.1/7.21	-7.27/5.76	-4.51/2.86	-3.11/4.86	-6.81/8.32	-10.79/14.29	-13.44/18.38	-18.4/18.71	-18/12.92	-9.79/11.79	-15.33/16.04	
Theta(70°)	-9.11/8.14	-8.71/10.68	-11.86/10.86	-15.6/4.4	-17.54/18.14	-18.95/18.54	-12.53/6.37	-4.81/6.64	-4.84/8.59	-15.33/17.25	-16.68/13.33	-17.76/18.04	-17.76/18.04	-17.76/18.04	-17.76/18.04	-17.76/18.04	-17.76/18.04	-17.76/18.04	-9.11/8.14	-8.71/10.68	-11.86/10.86	-15.6/4.4	-17.54/18.14	-18.95/18.54	-12.53/6.37	-4.81/6.64	-4.84/8.59	-15.33/17.25	-16.68/13.33	-17.76/18.04	-17.76/18.04	-17.76/18.04	-17.76/18.04	-17.76/18.04	-17.76/18.04	-17.76/18.04	
Theta(80°)	-10.57/11.48	-14.95/9.96	-6.07/7.54	-11.94/7.35	-15.82/13.53	-5.05/9.42	-9.77/8.63	-3.56/2.34	-18.88/16.96	-11.4/6.91	-18.88/16.96	-4.33/8.78	-4.31/7.42	-3.62/4.66	-18.88/16.96	-11.4/6.91	-18.88/16.96	-4.33/8.78	-10.57/11.48	-14.95/9.96	-6.07/7.54	-11.94/7.35	-15.82/13.53	-5.05/9.42	-9.77/8.63	-3.56/2.34	-18.88/16.96	-11.4/6.91	-18.88/16.96	-4.33/8.78	-4.31/7.42	-3.62/4.66	-18.88/16.96	-11.4/6.91	-18.88/16.96	-4.33/8.78	-4.31/7.42
Theta(90°)	-14.61/11.33	-8.86/10.64	-6.72/7.24	-12.03/11.5	-9.12/6.73	-8.04/17.75	-15.18/11.14	-5.85/4.1	-3.72/3.54	-5.22/7.64	-13.18/10.84	-13.19/17.56	-19.38/17.93	-17.68/14.88	-17.05/13.76	-15.76/13.25	-19.23/17.98	-16.66/12.61	-14.61/11.33	-8.86/10.64	-6.72/7.24	-12.03/11.5	-9.12/6.73	-8.04/17.75	-15.18/11.14	-5.85/4.1	-3.72/3.54	-5.22/7.64	-13.18/10.84	-13.19/17.56	-19.38/17.93	-17.68/14.88	-17.05/13.76	-15.76/13.25	-19.23/17.98	-16.66/12.61	
Theta(100°)	-18.18/14.04	-9.32/5.76	-4.08/11.04	-11.24/18.95	-7.08/6.8	-8.95/16.96	-6.4/6.96	-8.29/7.48	-6.28/7.66	-8.71/9.43	-11.78/14.28	-15.36/10.86	-19.31/18.32	-16.92/17.88	-12.49/16.14	-13.13/10.44	-16.78/18.99	-15.32/13.18	-18.18/14.04	-9.32/5.76	-4.08/11.04																



Radiated Composite Gain Data

Appendix A

Freq(Hz)	ThetaAnt 2	PhiAnt 2	Phi(0°)Phi(10°)	Phi(20°)Phi(30°)	Phi(40°)Phi(50°)	Phi(60°)Phi(70°)	Phi(80°)Phi(90°)	Phi(100°)Phi(110°)	Phi(120°)Phi(130°)	Phi(140°)Phi(150°)	Phi(160°)Phi(170°)	Phi(180°)Phi(190°)	Phi(200°)Phi(210°)	Phi(220°)Phi(230°)	Phi(240°)Phi(250°)	Phi(260°)Phi(270°)	Phi(280°)Phi(290°)	Phi(300°)Phi(310°)	Phi(320°)Phi(330°)	Phi(340°)Phi(350°)	
Theta(0°)	9.43/11.75	-15.72/17.49	-16.32/12.07	-9.66/9.25	-10.81/15.28	-17.85/15.15	-11.24/10.7	-11.31/12.67	-14.13/15.69	-16.37/18.11	-18.14/17.81	-17.32/13.44	-11.97/12.01	-12.87/13.75	-14.97/13.68	-13.05/11.05	-9.18/8.09	-7.77/8.18			
Theta(10°)	-14.43/14.57	-13.19/12.28	-11.89/11.7	-12.96/14.82	-18.05/17.26	-18.43/12.81	-10.11/9.61	-9.62/10.82	-12.33/15.08	-18.18/18	-18.71/18.52	-18.34/19	-18.14/19.4	-18.7/17.73	-17.72/17.81	-18.98/17.8	-19.23/17.83	-16.34/15.34			
Theta(20°)	-13.58/13.21	-13.43/13.62	-14.12/16	-15.67/16	-15.82/15.06	-14.93/12.82	-12.76/12.24	-12.67/12.85	-13.66/14.86	-16.91/15.85	-14.84/14.55	-16.92/17.91	-16.92/16.64	-15.31/14.86	-14.74/14.45	-15.31/16.76	-15.98/15.98	-15.75/14.48			
Gain	Phi(0°)Phi(10°)	Phi(20°)Phi(30°)	Phi(40°)Phi(50°)	Phi(60°)Phi(70°)	Phi(80°)Phi(90°)	Phi(100°)Phi(110°)	Phi(120°)Phi(130°)	Phi(140°)Phi(150°)	Phi(160°)Phi(170°)	Phi(180°)Phi(190°)	Phi(200°)Phi(210°)	Phi(220°)Phi(230°)	Phi(240°)Phi(250°)	Phi(260°)Phi(270°)	Phi(280°)Phi(290°)	Phi(300°)Phi(310°)	Phi(320°)Phi(330°)	Phi(340°)Phi(350°)			
Theta(0°)	2.48/2.34	2.06/1.54	0.71/0.51	2.37/1.78	-7.62/10.19	6.68/5.49	2.26/1.11	2.52/2.28	1.64/0.72	2.22/2.28	0.42/1.93	0.32/1.34	2.22/2.28	0.22/1.93	3.88/6.43	-9.42/10.77	-7.4/4.35	2.22/0.69	0.49/1.29	2.92/1.54	
Theta(10°)	2.22/2.24	1.79/1.17	0/1.3	-3.13/6.21	-9.23/10.34	-7.48/9.41	-2.82/1.36	0.02/1.16	1.92/2.48	2.63/2.56	2.17/1.45	0.51/0.76	2.82/5.51	-9.41/12.05	-7.95/4.65	-2.14/0.65	0.74/1.55	1.95/2.22			
Theta(20°)	2.17/2.14	1.81/1.24	0.45/1.18	-3.22/6.2	-9/9.8	-7.62/5.14	-3.35/1.92	-0.60/66	1.75/2.33	2.74/2.14	1.12/0.11	2.11/5.33	-10.13/13.95	-8.21/4.19	-1.92/0.11	1.05/1.77	2.16/2.34				
Theta(30°)	1.54/1.42	1.46/1.32	1.01/0.21	-1.47/4.07	-6.95/9.31	-8.36/6.69	-4.78/2.69	-1.15/0.25	1.23/1.87	2.17/2.18	1.87/1.05	0.18/1.25	-3.36/6.48	-11.84/14.01	-8.07/4.21	-1.88/0.18	0.85/1.53	1.81/1.82			
Theta(40°)	0.02/0.24	0.74/1.27	1.63/1.3	0.02/2.31	-6.06/10.42	-10.92/8.05	-5.51/3.35	-1.43/0.08	1.01/1.55	1.81/1.66	1.15/0.06	-1.69/4.01	-6.53/9.41	-13.74/14.24	-10.26/12	-3.38/1.6	-0.25/0.29	0.23/0.02			
Theta(50°)	-1.94/1.42	-0.58/0.37	0.98/0.57	-0.74/3.15	-7.36/15.74	-17.22/10.73	-6.57/4.26	-2.14/0.81	0.07/1.05	1.5/1.51	0.88/0.19	-1.55/3.55	-6.63/9.74	-12.92/15.03	-12.6/8.58	-5.2/2.82	-1.86/1.54	-1.76/2.09			
Theta(60°)	-6.47/5.92	-4.45/2.66	-2.19/3.64	-6.52/10.56	-11.61/11.48	-9.82/10.81	-4.44/2.64	-1.27/0.17	0.32/0.45	0.36/0.24	-0.41/1.49	-1.27/1.07	-3.74/7.08	-11.33/16.34	-19.04/11.62	-6.89/4.46	-3.85/4.23	-5.15/6.01			
Theta(70°)	-13.91/11.89	-9.97/7.27	-5.88/7.96	-12.53/13.54	-8.34/6.14	-6.78/9.44	-12.31/11.22	-6.94/4.51	-3.46/2.98	-2.86/2.32	-1.85/1.64	-1.78/2.23	-4.18/7.09	-12.44/17.38	-14.34/8.08	-5.67/6.06	-7.1/8.36	-10.22/12.34			
Theta(80°)	-19.76/14.61	-11.96/10.61	-7.6/6.84	-7.49/7.33	-5.91/5.66	-7.23/10.95	-18.97/17.38	-10.27/7.48	-7.04/6.72	-5.48/4.66	-3.97/3.57	-3.45/3.57	-4.91/6.85	-10.17/14.01	-10.56/6.38	-4.79/5.43	-7.54/11.28	-15.93/18.67			
Theta(90°)	-18.55/18.85	-16.67/16.94	-12.71/9.68	-9.03/7.86	-6.43/6.91	-9.58/14.48	-17.81/13.17	-8.5/7.52	-7.51/5.87	-4.98/4.79	-4.79/4.53	-5.27/6.04	-6.25/8.19	-12.5/16.9	-14.74/10.9	-9.38/7.83	-9.58/13.95	-19.02/18.2			
Theta(100°)	-14.34/16.49	-17.2/15.96	-17.49/17.39	-16.45/18.52	-16.84/12.49	-14.76/17.83	-16.54/10.26	-7.25/7.53	-8.24/7.1	-7.39/7.67	-7.43/8.37	-8.56/7.3	-7.66/9.26	-12.15/18.12	-18.99/17.94	-12.48/9.92	-11.05/13.58	-17.37/16.21			
Theta(110°)	-12.98/15.08	-15.29/11.88	-11.98/12.74	-11.09/12.42	-15.91/12.42	-10.97/16.05	-17.81/13.42	-11.47/13.87	-14.8/12.33	-10.59/9.59	-11.15/13.08	-13.79/17.72	-18.94/15.79	-13.64/13.96	-12.27/10.77	-9.45/8.24	-9.5/11.87	-13.21/13.17			
Theta(120°)	-17.45/17.47	-12.31/8.02	-7.28/7.43	-6.86/7.19	-9.44/9.53	-8.72/10.81	-16.65/10.75	-12.94/16.44	-19.48/15.23	-10.17/8.38	-9/11.09	-14.91/16	-16.51/18.52	-18.36/13.62	-10.38/9.18	-9.33/10.16	-11.69/13.7	-15.46/18.95			
Theta(130°)	-12.67/16.49	-18.75/17.57	-14.25/17.01	-18.42/18.23	-17.31/12.49	-9.8/11.24	-19.62/18.24	-15.86/17.85	-19.12/17.41	-14.07/12.07	-10.97/9.69	-8.92/8.28	-10.01/17.04	-15.11/8.39	-7.22/8.51	-11.64/15.28	-15.97/14.39	-12.03/11.52			
Theta(140°)	-18.25/18.09	-17.53/17.89	-18.33/17.61	-15.77/16.42	-15.13/12.88	-10.87/10.53	-12.58/15.11	-16.36/16.99	-17.91/19	-17.71/18.02	-17.61/16.07	-14.41/13.06	-13.13/16.91	-16.91/10.64	-10.02/12.64	-17.42/14.25	-11.82/10.26	-13.83/16.17			
Theta(150°)	-8.8/8.38	-8.51/9.8	-11.78/14.82	-17.68/19.45	-18.23/18.18	-18.75/18.05	-15.15/15.33	-16.65/16.42	-13.88/13.12	-12.91/14.96	-15.15/15.33	-15.03/13.29	-13.55/15.44	-16.91/10.64	-12.35/13.29	-16.55/15.73	-11.02/10.05				
Theta(160°)	-16.25/12.55	-11.44/11.05	-11.75/13.81	-17.74/18.13	-19/17.26	-16.94/17.65	-17.42/18.68	-16.03/16.43	-18.82/18.37	-18.44/18.66	-17.58/17.66	-17.79/16.15	-15.06/16.01	-16.2/14.7	-13.3/11.67	-12.07/12.62	-14.12/17.23	-17.5/18.57			
Theta(170°)	-13.08/13.68	-15.85/18.4	-19.15/17.75	-18.31/17.64	-14.43/13.42	-14.32/15.58	-17.92/17.89	-16.3/13.79	-11.99/11.38	-11.55/11.22	-17.74/13.14	-16.88/18.74	-19.05/19.38	-18.22/17.57	-18.22/15.33	-12.97/11.53	-11.3/10.17	-10.98/11.3			
Theta(180°)	-10.78/10.83	-11.09/11.8	-11.83/12.59	-13.14/13.4	-13.98/15.16	-15.49/16.01	-16.97/16.49	-14.5/12.51	-10.98/10.61	-9.77/9.35	-9.47/10.07	-10.72/11.73	-13.53/15.29	-18/18.82	-18.3/16.71	-14.5/12.81	-12.2/11.1	-9.78/9.5			
Freq(Hz)	5.2GHz	PhiAnt 2	PhiAnt 2	PhiAnt 2	PhiAnt 2	PhiAnt 2	PhiAnt 2	PhiAnt 2	PhiAnt 2	PhiAnt 2	PhiAnt 2	PhiAnt 2	PhiAnt 2	PhiAnt 2	PhiAnt 2	PhiAnt 2	PhiAnt 2	PhiAnt 2	PhiAnt 2	PhiAnt 2	
Gain	Phi(0°)Phi(10°)	Phi(20°)Phi(30°)	Phi(40°)Phi(50°)	Phi(60°)Phi(70°)	Phi(80°)Phi(90°)	Phi(100°)Phi(110°)	Phi(120°)Phi(130°)	Phi(140°)Phi(150°)	Phi(160°)Phi(170°)	Phi(180°)Phi(190°)	Phi(200°)Phi(210°)	Phi(220°)Phi(230°)	Phi(240°)Phi(250°)	Phi(260°)Phi(270°)	Phi(280°)Phi(290°)	Phi(300°)Phi(310°)	Phi(320°)Phi(330°)	Phi(340°)Phi(350°)			
Theta(0°)	-15.81/18.4	-14.92/9.71	-2.46/1.2	-2.48/1.35	-0.61/0.28	-0.13/0.51	-0.76/1.42	-1.49/2.18	-0.97/8.73	-0.23/0.25	-2.61/4.7	-1.92/18.8	0.28/0.12	0.67/1.69	0.23/0.25	-0.67/1.69	0.23/0.25	-0.67/1.69	0.23/0.25	0.67/1.69	
Theta(10°)	-13.44/13.92	-11.46/7.96	-5.81/3.97	-2.78/2.06	-1.31/0.84	-0.84/0.65	-0.73/1.16	-1.96/3.08	-5.34/8.61	-14.68/17.91	-12.99/7.92	-5.23/3.48	-1.97/1.06	-0.28/0.01	0.25/0.36	-1.27/1.9	-2.93/4.62	-6.94/9.36			
Theta(20°)	-15.27/11.12	-7.02/4.81	-3.02/1.72	-1.02/0.53	-0.15/0.19	0.29/0.45	-0.4/0.57	-1.12/2.38	-4.43/7.57	-12.21/18.85	-13.5/7.93	-4.81/2.23	-0.73/0.6	0.73/0.73	0.29/0.23	-0.66/1.24	-2.87/5.25	-8.53/12.83			
Theta(30°)	-10.96/8.22	-5.28/3.42	-1.78/0.78	0.10/0.41	0.30/0.77	0.21/0.52	0.28/0.41	-7.54/12.42	-17.92/18.06	-10.29/6.08	-4.49/3.3	-1.64/0.39	-0.25/0.8	-0.89/1.46	-3.13/4.67	-0.99/1.29	9.9/12.29				
Theta(40°)	-16.36/9.73	-6.18/4.39	-3.08/1.77	-1.05/0.07	0.76/0.87	0.92/0.43	-0.39/2.23	-4.26/6.54	-8.25/9.89	-14.83/19.04	-11.22/6.82	-4.78/3.6	-2.03/0.34	0.42/0.91	0.42/0.69	-2.04/2.99	-5.51/9.05	-14.8/18.58			
Theta(50°)	-17.17/12.5	-9.99/7.19	-3.95/1.63	-0.72/0.87	0.54/0.38	1.45/1.26	-0.01/1.53	-2.77/5.54	-7.59/10.05	-15.39/18.96	-17.08/8.55	-4.69/2.7	-1.32/0.08	0.53/0.09	0.73/1.9	-2.12/2.36	-5.5/14	-18.71/18.03			
Theta(60°)	-19.13/18.27	-19.57/11.83	-5.96/2.7	-0.4/0.99	-1.72/0.61	-0.4/0.99	-1.72/0.61	-0.4/0.99	-1.72/0.61	-0.4/0.99	-1.72/0.61	-0.4/0.99	-1.72/0.61	-0.4/0.99	-1.72/0.61	-0.4/0.99	-1.72/0.61	-0.4/0.99	-1.72/0.61		
Theta(70°)	-11.22/15.77	-14.58/10.42	-8.35/5.44	-1.47/0.06	0.61/0.8	0.54/0.01	0.24/0.18	-1.57/3.43	-6.81/9.45	-14.05/19.29	-14.34/10.28	-6.61/5.68	-3.27/2.45	-2.96/3.11	-5.1/2.69	-5.01/7.87	-8.35/11.36	-18.32/14.33			
Theta(80°)	-12.47/10.94	-8.4/4.72	-4.62/2.02	0.71/1.32	2.47/1.85	1.81/0.3	-1/3.77	-4.56/3.93	-4.38/6.61	-9.69/12.12	-8.48/8.08	-7.5/8.75	-3.36/1.95	-3.02/3.65	-3.84/3.31	-5.7/6.32	-9.81/11.77	-13.73/11.72			
Theta(90°)	-19.45/17.06	-18.16/13.51	-12.2/9.46	-6.19/4.32	-3.6/2.5	-3.14/4.15	-4.76/4.95	-7.19/7.49	-8.2/10.34	-12.43/11.84	-9.47/9.05	-9.48/7.7	-6.86/4.32	-2.79/4.23	-4.13/4.42	-4.66/7.69	-13.16/17.98	-14.84/11.79			
Theta(100°)	-14.92/16.53	-18.08/16.54	-12.2/9.46	-6.19/4.32	-3.6/2.5	-3.14/4.15	-4.76/4.95	-7.19/7.49	-8.2/10.34	-12.43/11.84	-9.47/9.05	-9.48/7.7	-6.86/4.32	-2.79/4.23	-4.13/4.42	-4.66/7.69	-13.16/17.98	-14.84/11.79			
Theta(110°)	-18.78/15.11	-8.1/10.11	-13.43/8.41	-6.16/6.23	-6.74/9.68	-7.11/8.35	-5.33/3.14	-6.22/12.41	-17.89/17.21	-17.61/17.8	-10.51/6.88	-8.02/4.68	-4.32/5.77	-11.02/6.27	-7.16/13.34	-18.74/18.93	-17.03/16.31	-17.03/16.31			
Theta(120°)	-17.49/12.07	-8.8/11.48	-18.34/18.35	-16.71/7.35	-5.64/6.72	-5.57/5.91	-8.97/18	-13.62/17.04	-12.72/16.33	-10.25/9.52	-13.66/12.52	-11.22/28.9	-13.26/14.7	-18.99/19.27	-13.26/14.7	-18.99/19.27	-13.26/14.7	-18.99/19.27			
Theta(130°)	-12.06/12.23	-11.76																			



Radiated Composite Gain Data

Appendix A

Theta	Phi	Gain	Phi(10)	Phi(20)	Phi(30)	Phi(40)	Phi(50)	Phi(60)	Phi(70)	Phi(80)	Phi(90)	Phi(100)	Phi(110)	Phi(120)	Phi(130)	Phi(140)	Phi(150)	Phi(160)	Phi(170)	Phi(180)	Phi(190)	Phi(200)	Phi(210)	Phi(220)	Phi(230)	Phi(240)	Phi(250)	Phi(260)	Phi(270)	Phi(280)	Phi(290)	Phi(300)	Phi(310)	Phi(320)	Phi(330)	Phi(340)	Phi(350)			
Theta(10)	Phi(10)	-19.04/12.75	-15.66/15.68	-12.74/9.1	-7.92/7.99	-8.27/8.82	-9.5/6.38	-7.37/14.94	-18.84/18.45	-14.68/13.8	-11.82/16.45	-19.02/17.58	-18.38/19.3	-17.17/16.19	-14.91/10.94	-10.89/12.05	-14.94/18.82	-17.7/18.69	-18.38/18.92	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(20)	-12.96/11.25	-11.26/10.43	-9.99/9.45	-7.43/6.48	-7.89/10.35	-8.38/5.78	-6.94/13.43	-18.94/18.96	-18.04/17.94	-19.33/18.56	-18.28/15.82	-13.46/18.54	-13.83/11.15	-13.77/17.72	-17.18/19.03	-18.07/19.1	-19.34/18.01	-17.91/14.81
Theta(10)	Phi(30)	-18.57/18.15	-17.51/17.93	-9.99/11.91	-9.28/9.58	-12.16/13.61	-8.92/10.22	-10.16/12.98	-15.27/15.38	-18.71/18.24	-16.95/12.27	-10.16/12.98	-18.36/19.33	-18.06/18.63	-17.39/18.47	-18.09/17.31	-16.63/14.04	-15.06/11.51
Theta(10)	Phi(40)	-14.88/12.46	-12.36/11.72	-10.86/11.63	-11.45/13.41	-13.1/12.34	-10.99/9.36	-8.58/7.97	-7.92/8.42	-10.23/11.6	-11.64/12.63	-16.82/17.86	-18.9/17.98	-14.8/13.44	-12.22/13.83	-15.26/17.18	-18.76/18.79	-17.95/19.07	-19.13/17.52
Theta(10)	Phi(50)	-11.49/11.88	-11.86/11.87	-12/12.39	-12.2/12.91	-12.72/12.87	-13.68/14.23	-15.92/17.94	-19.38/18.56	-18.79/18.91	-17.94/18.48	-18.84/19.1	-18.07/17.44	-18.21/17.55	-17.12/15.56	-13.92/13.29	-12.6/12.25	-12.63/13.32	-13.2/13.14
Theta(10)	Phi(60)	-4.03/3.77	-4.09/4.48	-5.07/6.25	-7.79/9.49	-12.25/15.58	-15.58/12.18	-9.28/7.52	-6.09/4.5	-3.79/3.45	-2.91/2.96	-3.37/4.14	-5.05/6.05	-7.42/9.07	-11.66/15.85	-15.05/12.11	-8.85/7.05	-5.68/5.22	-4.52/4.2
Theta(10)	Phi(70)	-3.66/3.43	-3.74/3.78	-3.97/5.31	-6.67/9.41	-14.02/18	-18.55/13.47	-10.52/9.73	-9.21/8.26	-8.35/8.74	-8.79/8.92	-14.53/11.88	-8.44/6.43	-5.14/4.42	-3.93/3.83
Theta(10)	Phi(80)	-7.87/1.11	-6.89/6.73	-6.76/7.48	-8.74/10.15	-13.39/17.94	-18.02/13.3	-12.13/13.84	-17.07/18.52	-18.06/19.22	-18.31/18.53	-14.57/11.43	-9.99/8.72	-9.07/11.57	-16.96/17.42	-17.3/14.6	-15.06/14.74	-13.63/11.33	-9.99/8.72
Theta(10)	Phi(90)	-4.59/4.3	-4.31/4.18	-5.1/6.28	-7.49/9.79	-14.27/18.57	-17.66/17.46	-18.86/17.84	-19.27/17.17	-18.05/18.6	-19.19/15.36	-11.53/9.75	-9.24/9.62	-9.17/9.48	-14.76/18.56	-11.16/10.76	-12.3/12.67	-14.74/13.12	-8.12/5.41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(100)	-3.57/3.8	-2.87/2.56	-3.41/4.68	-5.77/8.02	-13.86/18.08	-18.11/18.21	-15.2/15.5	-17.44/18.88	-17.91/18.21	-12.52/9.4	-8.1/10.98	-9.86/9.22	-10.43/11.79	-18.35/14.39	-9.86/9.22	-10.43/11.79	-13.37/11.45	-6.1/4.22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(110)	-8.26/6.63	-4.49/3.54	-3.66/4.62	-6.12/9.59	-14.78/10.16	-11.58/17.12	-13.88/12.97	-9.57/11.75	-17.53/18.06	-13.01/10.7	-10.04/8.82	-7.37/7.39	-11.69/12.25	-18.71/12.7	-10.33/11.1	-7.79/5.52	-8.04/8.44	-7.51/7.45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(120)	-7.8/5.6	-4.12/3.59	-3.51/4.3	-6.47/8.43	-11.51/8.95	-9.23/10.23	-11.61/7.07	-6.67/8.43	-9.67/12.11	-12.59/13.7	-16.96/17.4	-12.43/9.15	-9.77/13.38	-18.39/17.77	-12.22/10.1	-9.07/7.23	-9.12/13.66	-12.3/10.29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(130)	-8.79/4.76	-5.88/4.52	-3.6/2.95	-1.68/4.06	-4.24/8.84	-9.4/5.76	-11.88/15.98	-8.63/8.23	-8.36/10.48	-12.98/11.48	-13.33/16.14	-14.43/13.15	-15.89/12.53	-13.06/11.64	-9.09/11.01	-8.76/7.75	-6.39/4.67	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(140)	-17.79/18.53	-10.03/3.64	-2.2/2.56	-3.61/3.74	-1.86/7.42	-9.52/7.26	-5.22/3.19	-4.96/8.18	-7.81/7.34	-11.56/15.93	-15.38/7.24	-7.25/7.68	-7.8/17.92	-18.78/9.61	-12.59/11.58	-13.82/9.92	-9.89/13.75	-15.16/17.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(150)	-11.65/9.6	-5.16/2.76	-3.34/4.85	-7.23/1.42	-0.88/2.89	-5.6/4.33	-1.34/0.58	-1.84/3.73	-6/7.92	-10.92/15.28	-18.16/11.1	-9.8/11.27	-18.35/11.9	-11.41/7.44	-10.54/11.14	-9.22/12.66	-13.73/10.74	-10.43/11.79	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(160)	-17.32/11.35	-7.38/7.42	-7.33/9.76	-4.08/1.24	-3.05/4.64	-0.89/1.75	0.92/2.2	0.84/3.73	0.89/3.73	0.88/6.93	0.88/6.93	0.88/6.93	0.88/6.93	0.88/6.93	0.88/6.93	0.88/6.93	0.88/6.93	0.88/6.93	0.88/6.93	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(170)	-14.86/14.44	-14.54/18.89	-13.14/4.64	-3.95/6.3	-5.49/7.38	-6.51/4.79	-2.82/0.12	-2.01/5.03	-5.09/3.7	-4/4.95	-12.03/11	-7.34/8.91	-10.82/18.39	-10.94/13.6	-18.01/17.3	-13.48/12.2	-15.06/9.46	-10.94/16.73	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(180)	-18.36/19.12	-18.57/15.78	-8.11/4.51	-8.81/10.09	-5.2/8.42	-4.8/5.16	-7.27/5.56	-6.4/7.41	-5.24/3.06	-3.03/3.38	-8.82/8.99	-8.62/18.99	-18.26/18.03	-18.14/13.66	-17.03/17.3	-17.15/12.08	-12.24/17.12	-16.58/13.86	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(190)	-16.65/18.06	-15.04/10.19	-10.12/16.38	-17.87/9.77	-6.87/14.26	-4.8/11.25	-9.7/10.57	-8.38/8.11	-8.49/10.67	-3.21/3.82	-6.72/8.87	-18.44/14.29	-14.99/16.5	-18.72/15.47	-14.99/16.5	-18.72/15.47	-14.99/16.5	-18.72/15.47	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(200)	-11.37/13.29	-11.23/13.73	-16.75/15.31	-11.81/12.99	-12.81/4.83	-4.65/8.36	-10.38/13.83	-18.32/18.8	-14.12/11.71	-8.92/5.96	-11.92/15.44	-17.13/14.12	-18.52/18.41	-12.97/17.85	-18.65/12.71	-12.11/12.14	-17.85/18.41	-17.85/18.41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(210)	-14.01/12.51	-14.7/16	-15.72/12.97	-8.08/9.3	-8.32/10.58	-5.16/7.41	-9.26/11.41	-14.31/11.04	-8.52/11.12	-15.83/14.1	-15.08/19.15	-18.06/18.59	-14.72/9.03	-10.02/18.6	-18.04/17.79	-15.83/17.96	-18.42/17.72	-16.58/13.86	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(220)	-11.52/11.69	-12.11/11.1	-8.78/8.4	-10.57/16.67	-19.01/18.09	-12.11/11.25	-9.06/10.64	-15/17.17	-17.98/17.96	-14.99/14.92	-15.77/18.37	-17.09/18.61	-15.72/14.63	-18.47/13.51	-13.27/11.71	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(230)	-13.72/14.46	-15.97/19.45	-19/17.58	-16.44/12.87	-9.83/7.81	-7.46/7.56	-10.42/14.87	-17.34/18.16	-18.24/18.66	-16.31/14.84	-13.22/12.66	-13.95/15.1	-15.3/15.79	-18.14/18.65	-17.77/17.8	-18.5/17.91	-18.93/19.04	-16.25/15.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(240)	-11.31/11.25	-11.41/11.84	-12.67/13.58	-14.13/15.48	-16.91/18.39	-17.76/17.7	-14.12/12.41	-11.44/11.47	-10.98/11.8	-12.13/13.72	-13.79/14.39	-15.02/14.6	-14.45/15.09	-15.89/15.79	-15.16/15.83	-15.17/13.48	-13.11/12.91	-11.9/11.16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(250)	-14.35/16.67	-16.36/13.57	-10.36/7.7	-6.34/5.1	-4.5/3.52	-3.23/2.89	-2.61/2.43	-2.63/3.36	-4.23/5.59	-7.63/11.09	-16.72/18.41	-13.49/8.25	-5.4/3.63	-2.44/1.96	-2.11/2.8	-3.2/3.61	-5.05/6.59	-8.3/10.52	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(260)	-11.41/19.44	-18.28/13.7	-8.94/6.06	-4.19/3.08	-2.49/2.5	-3.43/4.57	-18.34/18.61	-17.52/11.89	-6.24/7.6	-17.52/11.89	-2.32/2.38	-2.32/2.38	-2.32/2.38	-2.32/2.38	-2.32/2.38	-2.32/2.38	-2.32/2.38	-2.32/2.38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(270)	-11.02/10.1	-8.51/6.43	-4.78/3.43	-2.65/2.25	-2.58/3.19	-5.67/9.33	-15.62/18.74	-18.51/15.92	-13.41/13.44	-13.03/14.26	-13.99/14.01	-12.96/10.72	-8.84/7.29	-5.47/3.93	-3.68/4.02	-3.89/3.48	-3.87/5.16	-6.68/9.26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Theta(10)	Phi(280)	-18.57/15.2	-8.79/6.09	-5.21/5.39	-4.21/3.92	-4.69/6.97	-8.26/11.82	-18.4/12.89	-8.86/8.64	-11.5/15.62	-17.94/18.02	-14.94/15.23																												



Radiated Composite Gain Data

Appendix A

Θ(30°)	-13.26/-16.37	-15.83/-14.52	-11.43/-9.76	-9.73/-11.26	-13.64/-18.55	-17.89/-14.95	-10.16/-7.13	-9.34/-18.24	-13.88/-9.43	-8.12/-7.3	-8.74/-11.17	-13.93/-11.95	-7.38/-5.93	-5.34/-4.95	-4.05/-3.4	-4.85/-7	-9.36/-11.45	-11.51/-11.05
Θ(40°)	-17.48/-18.73	-18.15/-13.93	-10.88/-8.32	-7.4/-7.04	-6.64/-11.8	-18.44/-14.82	-9.14/-8.66	-17.82/-12.79	-9.68/-9.17	-17.2/-17.25	-18.76/-17.56	-17.45/-17.31	-11.6/-7.89	-7.13/-6.47	-6.85/-6.3	-8.4/-7.47	-9.1/-13.42	-18.83/-18.86
Θ(50°)	-13.19/-12.58	-18.42/-18.5	-15.04/-10.77	-9.36/-6.36	-4.88/-8.9	-18.16/-17.59	-14.57/-10.86	-15.43/-8.08	-4.5/-3.86	-5.2/-7.4	-7.52/-8.18	-8.56/-7.76	-7.08/-7.76	-8.06/-6.7	-11.29/-15.48	-7.7/-7.45	-13.56/-18.49	-15.29/-13.89
Θ(60°)	-5.58/-5.79	-9.35/-17.13	-18.61/-12.25	-7.5/-5.09	-4.22/-8.72	-11.05/-10.94	-10.86/-8.17	-8.56/-8.95	-10.11/-12.08	-9.23/-8.58	-7.33/-8.56	-9.91/-10.02	-8.75/-11.72	-18.72/-13.25	-10.27/-9.33	-7.15/-6.71	-7.75/-9.65	-17.14/-12.45
Θ(70°)	-6.88/-7.89	-11.62/-18.63	-18.17/-9.31	-2.64/-2.44	-6.72/-12.06	-6.06/-8.51	-14.06/-13.02	-8.77/-4.42	-5.39/-10.54	-18.32/-10.88	-8.5/-7.75	-8.52/-11.71	-9.27/-16.98	-14.36/-11.52	-10.07/-9.67	-8.3/-9.25	-13.06/-13.59	-18.63/-12.38
Θ(80°)	-11.62/-9.19	-9.69/-18.4	-11.05/-4.29	-0.16/-1.13	-9.8/-12.66	-4.07/-10.91	-8.43/-8.22	-11.84/-6.76	-3.43/-6.15	-19.37/-10.59	-7.7/-7.45	-12.89/-15.12	-13.32/-18.49	-15.76/-18.29	-9.38/-11.24	-14.37/-10.88	-15.99/-15.09	-19.21/-16.3
Θ(90°)	-9.93/-10.91	-15.45/-18.8	-14.87/-6.49	-0.61/-0.39	-1.57/-4.49	-9.69/-8.61	-5.1/-3.29	-2.81/-4.38	-5.91/-6.35	-15.05/-18.82	-10.64/-10.21	-12.4/-8.18	-14.01/-17.81	-18.04/-10.7	-5.69/-10.6	-13.41/-18	-18.44/-15.17	-13.63/-16.47
Θ(100°)	-10.87/-17.1	-18.03/-18.12	-9.01/-0.99	-0.31/-1.62	-1.25/-5.75	-3.17/-1.11	-5.57/-3.16	-2.28/-3.03	-8.04/-16.18	-16.43/-11.8	-10.86/-7.61	-10.74/-12.16	-17.69/-18.38	-12.22/-8.81	-7.64/-12.91	-10.4/-17	-18.86/-15.35	-15.18/-10.9
Θ(110°)	-18.56/-18.68	-18.41/-18.31	-6.76/-2.09	-4.07/-7.76	-3.91/-4.33	-1.28/-1.32	-3.36/-0.25	-3.12/-10.86	-12.16/-13.04	-17.88/-14.05	-15.15/-17.87	-18.69/-16.91	-19.35/-16.59	-11.63/-11.43	-7.8/-12.27	-18.65/-17.19	-18.02/-12.83	-16.35/-19.26
Θ(120°)	-14.21/-13.6	-10.37/-16.87	-8.18/-5.24	-4.31/-3.81	-7.15/-7.15	-2.87/-4.26	-2.41/-0.32	-2.57/-11.21	-15.59/-5.96	-6.62/-8.19	-14.64/-11.2	-11.81/-18.67	-18.79/-13.94	-16.01/-9.99	-17.96/-7.42	-10.91/-16.61	-18.33/-11.35	-19.17/-19.04
Θ(130°)	-18.02/-14.77	-11.87/-10.2	-5.38/-5.65	-7.89/-9.25	-6.41/-2.78	-0.95/-1.57	-0.43/-0.95	-7.82/-14.34	-18.04/-11.31	-8.77/-14.38	-14.39/-9.36	-8.9/-9.08	-14.89/-12.65	-16.13/-13.95	-8.57/-10.64	-13.89/-19.24	-10.74/-9.99	-10.31/-14.11
Θ(140°)	-16.52/-18.18	-15.8/-9.12	-7.54/-10.25	-10.95/-4.72	-2.97/-5.7	-7.15/-8.03	-3.45/-0.69	-4.45/-7.95	-7.64/-15.81	-9.4/-6.83	-11.25/-18.46	-18.25/-14.34	-14.96/-16.83	-11.71/-7.59	-18.3/-16.5	-18.83/-14.23	-14.42/-17.84	-17.3/-13.17
Θ(150°)	-15.27/-15.9	-18.49/-18.34	-14.91/-12.76	-9.79/-6.88	-10.23/-14.21	-15.15/-8.9	-5.58/-4.89	-7.44/-9.47	-6.08/-5.63	-8.24/-13.34	-19.68/-18.23	-16.44/-17.58	-18.61/-15.77	-14.33/-18.55	-18.79/-15.58	-17.79/-17.23	-11.39/-11.74	-17.42/-18.27
Θ(160°)	-17.22/-18.12	-16.09/-14.03	-9.78/-8.14	-8.07/-11.51	-13.65/-12.09	-12.16/-9.67	-7.91/-6.87	-7.29/-9.05	-12.07/-14.56	-18.29/-17.63	-12.38/-12.51	-15.51/-14.31	-12.79/-11.66	-11.69/-10.98	-13.36/-17.12	-18.38/-14.81	-14.6/-16.99	-17.06/-18.54
Θ(170°)	-19.08/-18.16	-16.36/-13.74	-11.98/-14.23	-17.23/-18.88	-18.71/-18.58	-19.33/-15.14	-12.71/-12.86	-14.35/-15.32	-17.47/-18.64	-15.45/-11.59	-12.87/-15.4	-18.28/-17.51	-18.67/-17.88	-13.06/-14.49	-17.91/-19.24	-19.3/-18.14	-17.38/-18.51	-18.71/-17.79
Θ(180°)	-9.78/-10.14	-10.59/-10.05	-10.75/-12.33	-13.17/-14.86	-15.45/-17.75	-18.57/-17.75	-18.61/-18.14	-18.52/-17.91	-15.65/-13.11	-12.82/-10.77	-10.45/-10.56	-9.7/-9.27	-9.59/-11.21	-11.51/-13.14	-13.2/-14.67	-16.81/-17.36	-15.71/-13.86	-11.95/-11.57
Freq(Hz)	5.785G/Pol	ThetaAnt. 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)Φ(10°)	Φ(20°)Φ(30°)	Φ(40°)Φ(50°)	Φ(60°)Φ(70°)	Φ(80°)Φ(90°)	Φ(100°)Φ(110°)	Φ(120°)Φ(130°)	Φ(140°)Φ(150°)	Φ(160°)Φ(170°)	Φ(180°)Φ(190°)	Φ(200°)Φ(210°)	Φ(220°)Φ(230°)	Φ(240°)Φ(250°)	Φ(260°)Φ(270°)	Φ(280°)Φ(290°)	Φ(300°)Φ(310°)	Φ(320°)Φ(330°)	Φ(340°)Φ(350°)
Θ(0°)	-3.84/-3.34	-3.9/-4.22	-5.23/-5.53	-6.92/-8.85	-11.66/-15.14	-18.45/-16.26	-12.31/-8.2	-5.89/-4.53	-3.87/-3.12	-2.98/-2.75	-3.27/-5.05	-5.61/-6.36	-8.97/-10.15	-15.01/-18.95	-18.75/-14.19	-10.58/-9.04	-6.86/-5.97	-5/-4.25
Θ(10°)	-2.8/-2.92	-3.75/-5.23	-6.12/-8.16	-10.2/-12.57	-17.04/-19.35	-17.12/-18.85	-16.1/-12.47	-10.05/-8.45	-7.44/-5.94	-4.76/-4.53	-4.3/-4.81	-4.99/-6.21	-7.03/-8.49	-11.41/-17.26	-19.29/-16.37	-10.53/-7.2	-5.31/-3.84	-3.35/-3.07
Θ(20°)	-2.44/-2.42	-2.89/-4.24	-6.25/-7.64	-10.4/-18.4	-18.35/-18.49	-14.43/-13.81	-13.53/-10.51	-8.33/-7.99	-8.54/-9.38	-8.97/-7.11	-6.47/-5.37	-4.38/-4.62	-6.81/-9.45	-15.96/-18.36	-17.73/-18.63	-15.1/-8.41	-5.98/-4.85	-3.74/-3.46
Θ(30°)	-1.69/-1.1	-1.17/-1.38	-1.59/-1.82	-4.57/-9.87	-12.18/-15.52	-18.92/-18.94	-18.85/-18.15	-18.52/-18.19	-15.94/-14.86	-12.91/-10.11	-7.46/-6.8	-6.81/-6.75	-7.66/-10.96	-16.32/-15.9	-16.44/-17.76	-14.14/-11.5	-7.47/-5.04	-3.46/-2.11
Θ(40°)	-3.12/-1.78	-0.96/-1.21	-1.95/-3.29	-4.73/-6.32	-8/-10.14	-15.95/-15.38	-13.85/-13.66	-10.45/-8.05	-8.81/-10.62	-12.2/-11.38	-7.51/-6.97	-7.48/-11.04	-17.23/-15.76	-12.86/-10.94	-12.74/-18.63	-13.44/-7.16	-5.53/-5.04	-3.83/-3.48
Θ(50°)	-3.38/-4.25	-3.29/-2.92	-2.47/-2.84	-4.89/-6.92	-6.48/-5.97	-7.45/-5.56	-6.22/-7.57	-12.77/-9.73	-14.3/-17.85	-14.02/-11.25	-10.08/-9.48	-8.35/-13.78	-18.65/-13.45	-8.71/-7.8	-7.47/-10	-10.41/-7.57	-5.99/-5.37	-4.36/-4
Θ(60°)	-2.67/-2.22	-1.37/-0.67	0.02/0.63	-2.86/-10.46	-10/-7.54	-3.68/-2.71	-17.89/-11.5	-1.4/-1.12	-5.52/-8.98	-8.55/-8.59	-11.44/-14.42	-10.87/-11.63	-15.87/-14.37	-13.54/-10.41	-5.42/-13.48	-13.65/-12.26	-8.9/-4.58	-4.4/-3.09
Θ(70°)	-10.01/-6.58	-4.18/-1.39	-0.74/-0.5	-5.17/-14.08	-11.03/-9.81	-4.96/-4.86	-1.87/-0.98	-1.83/-4.73	-5.77/-5.96	-7.31/-6.18	-8.6/-15.44	-18.38/-14.66	-12.3/-16.25	-9.07/-7.14	-10.13/-16.1	-10.32/-11.81	-5.97/-4.9	-9.16/-12.78
Θ(80°)	-16.55/-8.57	-4.14/-4.07	-4.8/-3.85	-8.14/-12.61	-10.43/-4.05	-2.24/-3.71	-0.16/0.06	-0.24/-1.45	-1.54/-1.04	-0.94/-1.92	-8.68/-13.74	-18.8/-18.19	-13.28/-9.49	-7.54/-8.85	-4.61/-11.02	-12.22/-9.96	-6.4/-5.59	-6.83/-10.46
Θ(90°)	-18.69/-11.52	-9.2/-10.98	-7.37/-2.4	-2.6/-5.15	-7.18/-0.23	1.33/-1.79	-0.69/2.35	2.62/0.71	0.76/-1.23	-3.89/-5.07	-6/-12.19	-18.04/-18.33	-15.58/-18.85	-10.14/-12.25	-8.42/-15.48	-13.66/-10.36	-9.5/-5.93	-7.61/-18.86
Θ(100°)	-15.86/-14.93	-12.39/-11.38	-6.04/-3.75	-5.79/-7.63	-9.34/-4.12	0.2/-0.68	-0.15/0.65	1.71/3.22	1.87/-2.79	-4.81/-5.35	-6.85/-8.84	-7.09/-18.63	-11.19/-8.87	-4.91/-6.12	-6.55/-15.95	-16.24/-8.57	-5.18/-7.28	-13.91/-18.41
Θ(110°)	-12.73/-17.04	-17.55/-14.35	-15.22/-8.4	-8.78/-14.21	-14.82/-5.22	-2.64/-0.55	0.32/1.5	3.05/2.24	-0.71/-1.5	-0.99/-2.64	-4.4/-6.91	-12.5/-18.84	-17.35/-6.95	-11.37/-4.56	-15.47/-11.22	-10.99/-12.3	-7.46/-7.48	-9.07/-14.03
Θ(120°)	-18.19/-13.35	-12.43/-11.25	-7.15/-5	-7.58/-8.78	-6.81/-3.55	-3.31/0.35	1.71/2.16	0.95/-1.91	-2.06/-0.92	-1.08/-0.82	-3.76/-3.17	-1.75/-7.97	-6.73/-14.7	-9.64/-10.97	-9.69/-15.58	-13.27/-10.42	-13.09/-12.3	-15.26/-18.54
Θ(130°)	-17/-13.15	-8.46/-13.74	-16.23/-18.83	-19.13/-12.58	-6.04/-11.08	-4.86/-0.93	-2.04/-0.95	-1.5/-4.46	-2.91/-3.44	-2.66/-1.08	-4.64/-4.2	-5.71/-17.78	-7.34/-8.88	-17.58/-7.96	-12.69/-13.1	-18.38/-18.57	-10.35/-13.66	-10.75/-10.54
Θ(140°)	-18.34/-14.08	-13.57/-16.29	-17.67/-12.2	-6.61/-5.49	-10.02/-7.06	-0.42/-1.75	-4.44/-4.16	-5.26/-11.38	-6.18/-4.96	-4.91/-4.12	-7.75/-8.76	-13.87/-8.78	-13.96/-8.11	-10.67/-10.18	-18.53/-18.8	-14.37/-7.34	-9.29/-18.17	-16.66/-17.25
Θ(150°)	-14.55/-18.46	-18.02/-16.59	-9.06/-5.02	-4.45/-5.57	-8.18/-7.4	-3.93/-5.49	-7.02/-7.52	-10.8/-16.15	-12.63/-9.87	-8.99/-9.41	-11.05/-17.56	-11.72/-6.94	-7.55/-11.54	-14.43/-17.73	-15.51/-16.72	-9.67/-14.59	-17.19/-15.52	-15.76/-14.21
Θ(160°)	-9.43/-12.93	-16.89/-12.22	-8.13/-1.67	-4.8/-5.57	-8.65/-13.92	-13.18/-12.11	-14.69/-18.9	-18.62/-18.54	-16.65/-19.45	-17.24/-17.74	-17.46/-18.1	-18.45/-19.05	-18.29/-18.47	-14.93/-11.91	-13.3/-17.79	-17.32/-17.92	-18.69/-16.81	-13.15/-12.39
Θ(170°)	-18.36/-16.12	-12.45/-9.92	-8.83/-7.16	-5.72/-6.98	-8.06/-8.92	-11.03/-10.82	-11.04/-10.66	-10.22/-9.03	-9.52/-8.7	-10.11/-12.22	-14.96/-13.6	-15.51/-17.68	-18.78/-18.1	-18.08/-17.32	-12/-10.08	-9.72/-10.54	-13.29/-16.28	-18.15/-18.18
Θ(180°)	-18.98/-17.94	-18.35/-18.79	-15.59/-12.97	-11.25/-9.96	-8.48/-8.42	-8.26/-8.45	-8.12/-8.1	-7.74/-8.13	-8.51/-10.67	-13.55/-17.89	-18.61/-19.17	-17.57/-14.6	-10.95/-10.13	-11.08/-9.48	-9.25/-8.07	-8.91/-9.22	-10.16/-11.9	-12.86/-15.73



Total Gain Data

Table with columns for Freq(Hz), TotalAnt. 1, and various gain values (Gain, Phi(0)Phi(10), Phi(20)Phi(30), etc.) for frequencies from 2.45GPol to 5.6GPol.



Antenna Pattern

Appendix B

θ (°)	-4.36/5.09	-4.25/2.27	-0.42/0.83	2.06/2.94	3.33/2.99	2.31/1.73	1.79/1.85	2.01/1.76	1.53/1.18	0.80/0.71	1.16/2.16	2.84/3.03	2.65/2.16	1.88/1.67	1.11/0.19	-0.91/1.48	-1.76/2.12	-2.86/3.71
θ (70°)	-10.25/-11.10	-9.01/-4.17	-0.71/1.28	2.44/3.39	3.78/3.61	2.88/1.94	0.98/0.21	-0.24/-0.66	-1.03/-1.68	-2.43/-2.23	-1.34/-0.15	0.83/1.28	0.92/0.48	0.22/0.33	0.00/-0.83	-1.79/-3.35	-4.84/-5.73	-7.01/-8.13
θ (80°)	-10.65/-13.12	-9.64/5.05	-1.25/1.08	2.27/2.84	2.93/2.59	1.97/1.09	-0.21/-1.40	-2.60/-3.86	-5.40/-6.43	-5.26/4.37	-3.07/-1.48	0.13/0.98	0.98/0.37	-0.52/0.87	-0.47/0.23	-0.70/-2.16	-4.59/-7.04	-8.34/9.11
θ (90°)	-10.54/15.66	-9.86/5.63	-2.95/-1.06	0.40/1.33	1.68/1.93	2.21/2.19	1.95/1.21	-0.33/-3.01	-5.45/5.19	-4.76/4.58	-4.46/2.92	-1.36/0.37	1.23/0.62	-1.53/-3.11	-2.33/-1.12	-0.87/2.37	-4.88/6.69	-7.39/8.38
θ (100°)	-9.04/12.96	-8.84/5.46	-4.66/4.23	-3.76/2.48	-0.77/1.27	2.44/2.83	2.63/1.71	-0.39/4.24	-7.44/-6.81	-6.96/7.28	-7.05/-6.69	-3.39/-0.26	0.84/0.51	-0.59/-1.68	-1.86/-1.40	-1.53/-2.95	-4.46/4.79	-5.18/-6.77
θ (110°)	-7.96/12.79	-13.59/9.90	-9.85/-11.27	-10.00/6.95	-1.99/1.56	2.47/2.32	1.64/0.65	-2.07/6.37	-11.29/11.34	-9.37/-7.79	-8.65/-11.14	-8.44/4.65	-1.10/-0.56	-1.10/-2.11	-1.10/-2.11	-3.76/4.93	-5.39/5.74	-6.62/7.02
θ (120°)	-9.79/11.98	-11.28/7.58	-6.70/6.10	-5.24/5.40	-3.61/-1.04	-0.22/-1.00	-1.24/0.91	-1.46/3.54	-6.57/7.89	-4.91/3.58	-3.78/5.35	-7.98/8.38	-5.45/2.89	-1.53/-1.65	-2.85/-4.05	-4.74/4.80	-4.87/6.06	-9.13/11.29
θ (130°)	-11.68/14.33	-14.29/10.92	-7.61/5.21	-3.60/3.68	-4.49/4.78	-4.87/5.63	-5.21/3.62	-3.34/3.86	-5.47/8.17	-8.41/7.73	-7.76/6.63	-6.19/5.90	-6.59/7.21	-6.53/5.04	-5.02/5.78	-6.13/5.63	-5.50/6.66	-8.09/10.16
θ (140°)	-11.67/12.15	-12.56/12.51	-10.76/7.90	-4.95/3.58	-4.08/6.02	-8.57/9.84	-8.53/7.33	-10.77/9.99	-9.86/9.87	-8.53/7.33	-9.38/11.15	-12.39/9.15	-7.61/9.48	-11.29/9.38	-9.38/11.15	-12.39/9.15	-7.61/9.48	-9.12/11.49
θ (150°)	-7.45/7.58	-7.87/9.15	-9.55/8.29	-6.26/4.75	-4.89/7.05	-10.70/12.34	-10.67/8.90	-8.54/7.61	-7.40/8.18	-9.75/12.53	-13.04/13.63	-13.06/10.28	-9.34/9.75	-10.68/10.66	-10.51/11.31	-12.24/10.17	-8.07/7.14	-6.93/6.98
θ (160°)	-8.61/9.12	-10.06/10.16	-10.45/8.94	-9.03/8.72	-10.19/13.15	-14.36/13.21	-10.30/10.06	-10.05/11.14	-12.86/13.82	-14.27/15.37	-14.84/14.72	-14.54/11.58	-10.24/10.55	-11.21/11.19	-11.04/9.55	-9.52/8.75	-7.97/7.59	-7.33/7.80
θ (170°)	-10.69/11.09	-11.31/11.33	-11.14/10.74	-11.85/12.99	-12.86/11.92	-9.44/9.01	-8.78/9.05	-9.15/9.84	-10.70/10.39	-10.94/12.03	-14.54/15.86	-15.56/16.38	-15.44/14.64	-14.95/13.39	-12.00/10.61	-10.65/10.24	-9.87/9.86	-8.80/8.30
θ (180°)	-8.95/8.85	-9.09/9.61	-9.82/10.96	-11.21/11.50	-11.79/12.10	-11.35/11.12	-11.36/10.85	-10.48/9.67	-9.11/9.22	-8.61/8.47	-8.75/9.41	-10.01/10.79	-11.89/12.90	-13.45/13.39	-13.22/12.42	-11.88/11.34	-10.68/9.88	-8.80/8.30
Gain	5.26dBi	TotalAnt. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)Φ(10°)	Φ(20°)Φ(30°)	Φ(40°)Φ(50°)	Φ(60°)Φ(70°)	Φ(80°)Φ(90°)	Φ(100°)Φ(110°)	Φ(120°)Φ(130°)	Φ(140°)Φ(150°)	Φ(160°)Φ(170°)	Φ(180°)Φ(190°)	Φ(200°)Φ(210°)	Φ(220°)Φ(230°)	Φ(240°)Φ(250°)	Φ(260°)Φ(270°)	Φ(280°)Φ(290°)	Φ(300°)Φ(310°)	Φ(320°)Φ(330°)	Φ(340°)Φ(350°)
θ (0°)	0.20/0.25	0.02/0.06	-0.08/0.05	0.18/0.16	0.09/0.02	-0.04/0.43	-0.33/0.36	-0.37/0.37	-0.14/0.14	-0.15/0.03	-0.00/0.14	-0.11/0.00	0.13/0.11	0.28/0.41	0.35/0.02	-0.19/0.48	-0.32/0.07	-0.07/0.16
θ (10°)	0.68/0.71	0.54/0.42	-0.01/0.02	-0.18/0.55	-0.56/0.54	-0.73/0.48	-0.31/0.12	0.06/0.31	0.19/0.51	0.74/0.78	0.66/0.25	0.03/0.06	0.10/0.05	0.10/0.05	-0.19/0.16	-0.74/0.63	-0.49/0.31	-0.02/0.34
θ (20°)	1.10/1.11	1.22/0.89	0.79/0.81	0.79/0.81	0.74/0.50	0.42/0.05	-0.12/0.13	0.04/0.61	0.19/0.40	0.40/0.61	0.34/0.02	0.11/0.72	0.10/0.78	0.10/0.78	0.02/0.26	0.02/0.26	0.52/0.92	0.52/0.92
θ (30°)	-0.25/0.03	0.09/0.10	0.32/0.56	1.20/1.40	1.18/0.68	0.56/0.89	0.99/0.51	-0.71/1.89	-2.91/3.75	-4.17/3.71	-2.43/-1.73	-1.45/-1.05	-0.51/0.23	0.61/0.36	-0.20/0.60	-0.27/0.03	0.12/0.26	0.03/0.63
θ (40°)	-3.26/2.08	-1.14/-1.40	-1.10/-1.07	-0.44/0.55	1.08/1.17	1.28/0.99	0.42/0.53	-1.10/-1.60	-1.98/-3.37	-4.71/4.34	-3.63/2.68	-1.99/1.74	-0.85/0.21	0.56/0.96	0.58/0.37	-1.35/-1.35	-1.71/2.48	-3.09/2.83
θ (50°)	-4.76/4.58	-3.74/3.56	-2.48/-1.36	-0.64/0.68	-2.19/3.46	-1.63/1.50	-0.47/1.27	-2.19/3.46	-5.37/6.05	-6.35/4.23	-6.61/5.43	-2.25/-1.17	-0.58/0.21	0.60/0.02	-0.66/-1.51	-2.25/-1.17	-3.23/4.76	-4.78/4.29
θ (60°)	-8.85/8.50	-7.31/5.93	-3.79/2.07	-0.14/0.82	-1.64/0.50	0.70/1.13	1.48/0.94	-0.05/1.43	-2.34/3.66	-4.08/5.08	-4.68/4.80	-2.95/1.52	-1.71/1.09	-0.38/1.21	-2.37/2.50	-1.78/-3.47	-7.12/6.82	-6.77/8.03
θ (70°)	-6.75/7.14	-6.13/6.72	-7.22/5.22	-1.39/0.13	0.68/0.92	0.59/0.05	0.50/0.07	-1.29/2.22	-2.80/4.62	-6.11/8.00	-5.31/6.32	-5.05/4.68	-2.85/2.27	-2.56/2.98	-4.92/2.56	-4.82/1.63	-6.68/8.64	-11.55/9.97
θ (80°)	-8.39/7.94	-6.76/6.33	-4.45/-1.94	-0.61/1.49	2.18/1.88	1.83/1.07	-0.87/3.43	-3.96/5.93	-3.81/3.52	-2.89/3.53	-3.70/2.92	-6.09/3.52	-5.45/6.07	-6.09/3.52	-9.40/11.00	-12.27/10.05	-12.27/10.05	-12.27/10.05
θ (90°)	-14.76/14.50	-15.34/12.35	-13.19/12.23	-6.77/3.32	0.12/0.37	-0.58/1.02	-5.15/6.84	-5.88/6.55	-6.82/6.50	-4.93/4.83	-3.48/4.62	-6.77/6.16	-3.51/2.97	-2.72/3.67	-3.35/4.53	-4.01/6.50	-11.73/12.28	-10.59/10.37
θ (100°)	-13.40/14.54	-14.95/14.33	-11.33/8.33	-5.52/1.47	-3.48/4.20	-2.99/3.76	-4.38/6.43	-6.91/7.17	-7.27/11.55	-6.37/4.72	-7.82/8.66	-9.02/4.60	-6.50/1.46	-2.61/4.09	-3.84/4.13	-4.47/7.32	-11.94/15.32	-13.43/11.61
θ (110°)	-15.51/13.34	-7.56/9.50	-12.23/7.95	-5.95/5.94	-6.25/6.72	-6.87/6.53	-3.34/2.79	-5.82/11.30	-15.46/14.78	-11.57/7.21	-7.64/6.19	-9.84/6.31	-4.08/5.52	-10.44/6.53	-6.60/12.05	-15.67/15.26	-14.61/11.98	-14.61/11.98
θ (120°)	-13.01/16.60	-8.28/9.59	-14.33/15.81	-13.47/15.54	-5.36/6.43	-5.21/4.44	-4.31/5.29	-7.16/12.61	-10.47/13.71	-12.16/12.49	-12.16/12.49	-9.76/8.65	-12.29/11.64	-9.76/8.65	-12.29/11.64	-13.62/13.98	-13.62/13.98	-13.62/13.98
θ (130°)	-11.04/10.93	-10.87/12.37	-10.99/8.88	-7.88/7.41	-9.41/6.55	-2.61/3.98	-7.54/8.44	-11.71/12.06	-12.15/14.87	-14.34/10.23	-8.55/11.84	-10.44/10.70	-7.92/13.13	-13.49/14.75	-8.79/9.86	-11.58/14.47	-12.02/15.03	-12.36/11.01
θ (140°)	-9.07/9.55	-10.23/11.18	-10.38/11.44	-13.52/15.16	-14.00/9.69	-4.04/4.23	-6.55/10.47	-13.11/14.40	-13.21/10.92	-12.79/7.64	-8.41/10.16	-10.49/9.42	-10.05/8.47	-6.90/7.92	-14.73/15.32	-14.89/14.47	-12.68/13.79	-12.68/13.79
θ (150°)	-14.65/16.04	-15.56/15.68	-15.06/15.41	-12.98/10.64	-13.40/7.84	-8.59/9.22	-11.56/10.76	-10.22/13.86	-13.40/14.58	-13.68/12.26	-12.07/14.41	-15.12/14.95	-14.65/14.53	-13.83/14.99	-15.12/14.95	-15.23/15.27	-15.64/14.65	-15.64/14.65
θ (160°)	-14.30/13.41	-14.14/13.50	-12.09/11.68	-12.01/12.10	-13.58/14.06	-15.59/14.50	-15.32/13.94	-11.39/11.89	-13.27/13.40	-11.67/11.93	-12.09/12.16	-14.06/15.53	-15.10/15.08	-13.65/13.64	-15.91/15.43	-15.18/15.28	-14.93/15.20	-15.44/14.86
θ (170°)	-10.77/10.16	-11.01/11.97	-13.32/13.36	-13.43/13.35	-13.25/14.06	-15.59/15.10	-13.91/12.01	-12.33/12.72	-13.72/13.84	-14.64/15.29	-14.07/14.11	-13.82/12.18	-12.54/13.57	-15.80/14.97	-15.05/15.24	-15.05/15.24	-15.50/14.04	-12.22/13.91
θ (180°)	-11.99/12.48	-12.67/13.83	-14.12/13.61	-13.05/13.64	-13.33/13.57	-15.47/15.22	-14.43/14.74	-16.12/15.10	-15.47/15.65	-15.00/15.43	-15.24/15.46	-14.83/15.18	-16.35/14.46	-15.24/15.02	-15.12/15.38	-15.73/14.56	-14.33/12.55	-14.33/12.55
Gain	5.36dBi	TotalAnt. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)Φ(10°)	Φ(20°)Φ(30°)	Φ(40°)Φ(50°)	Φ(60°)Φ(70°)	Φ(80°)Φ(90°)	Φ(100°)Φ(110°)	Φ(120°)Φ(130°)	Φ(140°)Φ(150°)	Φ(160°)Φ(170°)	Φ(180°)Φ(190°)	Φ(200°)Φ(210°)	Φ(220°)Φ(230°)	Φ(240°)Φ(250°)	Φ(260°)Φ(270°)	Φ(280°)Φ(290°)	Φ(300°)Φ(310°)	Φ(320°)Φ(330°)	Φ(340°)Φ(350°)
θ (0°)	1.05/1.09	1.34/1.68	1.63/1.89	1.92/1.77	1.67/1.61	1.33/1.14	1.03/0.86	0.62/0.95	1.17/1.07	1.74/1.81	1.74/1.81	1.41/1.87	1.89/1.84	1.60/1.27	1.11/1.07	1.05/1.08	0.80/0.78	0.80/0.78
θ (10°)	1.08/1.14	1.13/1.03	1.15/1.27	1.20/1.23	1.12/1.04	1.11/1.04	0.97/1.08	1.39/1.74	1.63/1.59	1.64/1.69	1.78/2.16	2.24/2.12	2.12/1.96	1.57/1.30	1.21/0.97	0.96/0.87	0.76/0.59	0.59/0.70
θ (20°)	1.47/1.92	2.22/1.71	1.70/2.15	2.31/2.09	1.44/0.95	0.48/0.57	0.90/1.04	1.18/1.26	1.10/0.31	0.01/0.12	0.04/0.68	1.52/1.97	2.26/2.37	2.57/2.26	2.02/1.66	1.01/0.49	0.19/0.07	0.04/0.54
θ (30°)	0.14/0.84	1.02/1.01	1.47/1.13	2.97/2.98	2.51/1.10	0.30/0.87	1.88/1.89	0.63/0.76	-1.66/1.98	-1.86/1.27	-0.47/0.38	0.45/0.58	0.91/1.28	1.17/0.85	1.06/0.72	0.37/0.44	0.50/0.69	0.38/0.18
θ (40°)	-3.91/3.05	-1.63/6.68	0.16/0.06	0.94/2.72	3.84/3.13	2.23/2.46	2.35/1.55	-0.36/1.74	-2.97/4.35	-4.64/2.61	-1.61/0.82	-0.22/0.43	-0.02/0.51	1.03/1.38	1.05/0.22	-1.29/0.97	-0.97/1.52	-1.90/2.99
θ (50°)	-6.86/4.74	-3.97/2.44	-0.73/0.95	-0.48/0.96	2.27/2.86	3.15/2.96	1.85/0.02	-0.13/0.67	-2.32/4.77	-5.53/5.14	-3.87/1.26	0.60/0.80	0.35/0.49	0.98/0.87	0.86/0.41	-2.15/2.22	-2.96/3.42	-4.84/5.29
θ (60°)	-7.76/7.33	-5.53/4.24	-3.44/2.76	-1.18/0.67	0.98/0.12	3.26/2.67	2.72/2.78	0.98/0.12	-0.42/2.28	-3.24/3.82	-4.51/4.59	-1.53/0.22	-0.37/0.71	0.51/0.01	-0.91/2.72	-1.53/0.72	-6.31/7.93	-7.46/8.36
θ (70°)	-6.04/5.75	-6.20/5.79	-5.02/2.37	0.17/0.69	1.20/2.63	2.37/2.02	3.20/2.89	0.61/0.61	-1.56/3.74	-5.00/5.13	-3.91/5.14	-3.57/0.99	-0.63/1.80	-1.22/1.67	-3.31/2.79	-4.07/6.68	-7.90/8.34	-8.37/8.52
θ (80°)	-6.95/8.32	-10.16/13.80	-16.05/8.35	-4.62/0.41	3.05/3.51	2.50/2.85	1.97/0.19	-0.92/1.94	-3.01/3.39	-3.45/3.77	-4.30/3.16	-5.33/5.77	-1.25/0.98	-3.08/2.54	-4.08/2.37	-6.44/6.43	-7.32/10.37	-10.07/9.70
θ (90°)	-11.8																	



Antenna Pattern

Appendix B

Theta (°)	-5.87/4.79	-4.41/4.28	-4.79/5.32	-6.26/6.69	-6.15/5.90	-5.53/6.36	-7.12/8.71	-9.75/9.44	-8.73/8.70	-8.23/8.59	-9.35/9.99	-10.96/11.30	-10.95/9.99	-9.04/8.56	-8.90/10.56	-11.99/12.50	-11.46/10.16	-8.98/7.56
Phi (10°)	-9.31/9.34	-9.69/10.59	-10.98/10.89	-11.34/11.69	-10.86/10.14	-9.70/9.00	-9.09/8.24	-8.30/8.54	-8.56/8.38	-7.74/7.97	-7.78/7.93	-8.32/8.47	-8.54/9.27	-8.91/9.21	-9.65/10.14	-10.64/11.50	-10.66/10.07	-9.80/9.50
Phi (20°)	-11.43/11.66	-12.58/13.16	-13.19/13.38	-12.87/12.67	-12.87/12.07	-10.86/10.44	-9.23/9.63	-9.50/9.77	-9.52/9.16	-9.52/9.16	-9.52/9.16	-9.52/9.16	-9.52/9.16	-9.52/9.16	-9.52/9.16	-9.52/9.16	-9.52/9.16	-9.52/9.16
Freq(Hz)	5.2GPol.	TotalAnt. 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Phi(0°)Phi(10°)	Phi(20°)Phi(30°)	Phi(40°)Phi(50°)	Phi(60°)Phi(70°)	Phi(80°)Phi(90°)	Phi(100°)Phi(110°)	Phi(120°)Phi(130°)	Phi(140°)Phi(150°)	Phi(160°)Phi(170°)	Phi(180°)Phi(190°)	Phi(200°)Phi(210°)	Phi(220°)Phi(230°)	Phi(240°)Phi(250°)	Phi(260°)Phi(270°)	Phi(280°)Phi(290°)	Phi(300°)Phi(310°)	Phi(320°)Phi(330°)	Phi(340°)Phi(350°)
Theta (0°)	6.09/6.60	-7.12/7.02	-7.05/7.30	-6.76/6.88	-6.83/6.88	-6.76/6.80	-6.54/6.21	-6.06/6.13	-6.75/7.48	-6.53/6.98	-5.90/6.44	-7.19/7.64	-7.19/6.86	-6.32/6.18	-6.57/7.18	-6.60/6.53	-6.41/6.01	-6.41/6.01
Theta (10°)	-4.59/4.62	-4.38/4.51	-4.35/4.90	-5.26/5.80	-6.40/4.21	-5.58/5.03	-4.25/3.68	-3.09/2.92	-2.55/2.47	-2.91/3.64	-4.08/4.05	-4.44/5.17	-6.78/7.97	-8.52/9.20	-8.86/7.20	-6.14/5.54	-4.71/4.88	-4.51/4.27
Theta (20°)	-13.99/13.98	-11.86/10.63	-8.80/7.75	-5.98/3.93	-3.43/3.50	-3.73/3.47	-2.96/2.16	-2.10/2.06	-2.84/3.68	-4.59/6.88	-9.22/8.93	-6.95/5.65	-6.22/7.25	-9.60/13.19	-9.82/6.17	-5.20/5.17	-6.49/8.29	-10.02/12.20
Theta (30°)	-9.88/8.14	-6.86/6.04	-6.06/8.00	-10.09/6.32	-2.72/1.49	-2.41/5.06	-5.51/4.52	-3.69/4.48	-7.48/11.82	-9.81/14.50	-13.35/11.85	-13.48/12.90	-8.53/7.77	-7.60/10.35	-15.11/14.51	-13.64/11.45	-13.64/11.45	-13.64/11.45
Theta (40°)	-6.71/6.56	-6.63/6.45	-5.16/4.87	-5.71/7.68	-4.42/2.06	-3.66/8.35	-3.70/2.01	-3.74/6.23	-6.22/6.14	-5.83/7.34	-8.79/9.83	-10.73/15.24	-12.81/9.91	-12.10/16.27	-10.58/11.10	-12.64/10.81	-10.22/9.95	-7.70/7.73
Theta (50°)	-9.96/8.31	-8.44/8.87	-7.35/6.37	-11.07/7.35	-3.51/1.53	-3.65/2.59	0.01/3.63	-8.30/8.37	-10.51/14.91	-15.02/14.96	-11.87/9.32	-12.62/15.28	-15.55/13.66	-15.71/10.96	-9.07/10.08	-10.16/10.32	-11.09/11.97	-13.41/11.07
Theta (60°)	-5.17/4.10	-4.91/8.09	-6.79/1.99	-2.05/3.63	-4.79/2.02	-0.46/0.71	-0.43/4.75	-6.89/10.79	-2.27/4.27	-6.89/10.79	-12.92/14.73	-10.91/15.14	-11.87/11.55	-14.49/14.73	-9.19/13.42	-9.25/12.70	-15.47/15.44	-9.07/6.51
Theta (70°)	-3.00/1.80	-1.56/2.08	-1.11/1.76	-2.52/2.66	-4.20/0.63	0.64/1.46	1.21/0.75	-2.32/1.90	-3.31/4.05	-5.89/9.85	-12.38/15.95	-10.25/10.09	-15.87/11.86	-13.83/14.86	-8.27/14.87	-10.91/16.14	-13.04/9.57	-6.93/5.12
Theta (80°)	-2.99/1.46	-0.74/0.09	0.05/1.57	-1.21/0.19	1.37/3.22	2.17/2.45	1.21/1.24	-2.99/1.24	-2.50/5.39	-8.29/7.56	-6.84/9.68	-15.46/12.91	-9.15/7.20	-7.15/12.46	-9.83/11.07	-9.53/13.87	-11.43/10.70	-6.97/5.09
Theta (90°)	-4.60/2.21	-1.54/1.16	-1.30/1.23	-2.46/1.98	-1.120/5.9	1.890/2.28	-2.94/4.85	-1.98/1.02	-2.97/4.59	-9.65/11.59	-11.28/11.71	-10.62/11.11	-15.37/9.21	-7.18/7.26	-6.48/11.08	-11.25/10.28	-6.78/4.20	-6.78/4.20
Theta (100°)	-2.92/2.20	-2.11/2.57	-1.91/1.56	-3.89/3.17	-2.55/1.29	1.08/2.38	-3.53/2.67	-2.05/4.56	-4.88/4.25	-6.05/5.59	-6.67/9.45	-11.41/12.43	-8.25/11.13	-7.00/6.87	-11.84/14.13	-13.39/14.26	-14.04/6.79	-3.21/2.26
Theta (110°)	-3.36/5.42	-6.53/4.80	-2.97/5.24	-5.02/3.93	-3.44/2.88	-1.84/4.42	-4.25/2.50	-3.11/12.24	-3.71/4.00	-4.91/2.51	-4.50/9.76	-11.10/13.42	-7.32/10.02	-7.53/9.26	-12.88/14.65	-14.70/10.34	-10.05/12.46	-5.97/3.36
Theta (120°)	-6.83/5.97	-6.93/6.19	-6.97/14.64	-9.14/4.86	-8.07/5.76	-1.04/4.19	-7.81/6.71	-8.00/4.94	-8.62/11.18	-8.00/4.94	-8.62/11.18	-11.53/10.42	-11.91/9.89	-9.90/10.32	-11.91/9.89	-9.90/10.32	-11.91/9.89	-10.05/8.07
Theta (130°)	-8.61/6.50	-7.24/8.36	-9.08/10.89	-6.78/6.56	-13.22/11.30	-5.28/6.48	-7.83/14.45	-7.07/6.67	-9.02/8.22	-12.91/15.51	-10.11/7.82	-15.26/14.37	-10.34/9.89	-6.36/8.18	-14.57/7.48	-7.23/6.81	-4.89/4.91	-11.44/8.92
Theta (140°)	-5.88/6.60	-9.80/8.28	-11.41/12.11	-13.61/15.02	-14.60/11.67	-10.16/10.23	-6.79/9.63	-15.47/10.30	-9.68/8.79	-8.39/11.53	-14.16/13.70	-12.91/9.46	-8.42/9.76	-9.73/12.42	-15.60/7.87	-15.61/8.53	-10.28/8.77	-10.28/8.77
Theta (150°)	-9.51/9.25	-12.97/16.01	-14.46/14.14	-14.46/14.14	-9.27/11.58	-14.46/14.14	-9.27/11.58	-14.46/14.14	-9.27/11.58	-14.46/14.14	-9.27/11.58	-14.46/14.14	-9.27/11.58	-14.46/14.14	-9.27/11.58	-14.46/14.14	-9.27/11.58	-14.46/14.14
Theta (160°)	-13.09/14.11	-12.87/12.36	-11.51/12.35	-12.97/10.96	-10.49/12.23	-10.44/9.23	-8.94/11.02	-11.17/11.58	-13.23/15.26	-14.00/12.92	-13.84/15.31	-14.12/11.86	-14.55/15.01	-13.17/12.06	-15.91/15.25	-12.79/11.46	-11.59/11.90	-10.64/11.21
Theta (170°)	-13.79/13.73	-13.50/13.62	-14.28/15.47	-13.59/12.48	-11.67/11.13	-12.00/13.07	-14.64/15.53	-14.81/14.04	-15.98/15.72	-15.73/15.45	-15.05/15.90	-15.31/15.16	-14.30/13.74	-14.28/12.32	-11.00/10.79	-11.95/12.52	-12.10/12.43	-12.60/13.17
Theta (180°)	-11.28/11.79	-13.41/12.87	-12.29/12.61	-14.03/15.01	-13.41/12.85	-11.73/12.37	-13.22/14.02	-14.63/13.28	-13.22/14.02	-14.63/13.28	-13.22/14.02	-14.63/13.28	-13.22/14.02	-14.63/13.28	-13.22/14.02	-14.63/13.28	-13.22/14.02	-14.63/13.28
Freq(Hz)	5.3GPol.	TotalAnt. 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Phi(0°)Phi(10°)	Phi(20°)Phi(30°)	Phi(40°)Phi(50°)	Phi(60°)Phi(70°)	Phi(80°)Phi(90°)	Phi(100°)Phi(110°)	Phi(120°)Phi(130°)	Phi(140°)Phi(150°)	Phi(160°)Phi(170°)	Phi(180°)Phi(190°)	Phi(200°)Phi(210°)	Phi(220°)Phi(230°)	Phi(240°)Phi(250°)	Phi(260°)Phi(270°)	Phi(280°)Phi(290°)	Phi(300°)Phi(310°)	Phi(320°)Phi(330°)	Phi(340°)Phi(350°)
Theta (0°)	-5.95/5.94	-6.56/6.21	-6.78/6.96	-6.84/6.84	-7.13/4.99	-7.71/7.56	-7.60/6.94	-6.23/6.56	-6.67/7.90	-6.42/7.44	-5.84/6.71	-6.48/6.84	-6.27/7.39	-6.48/6.70	-6.24/6.59	-5.92/5.84	-5.92/5.84	-5.92/5.84
Theta (10°)	-3.24/3.28	-3.21/3.32	-3.22/2.99	-3.09/3.51	-3.96/5.07	-5.79/5.91	-5.08/3.71	-3.06/1.82	-1.56/1.73	-1.87/2.03	-2.76/3.63	-3.80/3.89	-5.42/6.29	-7.22/8.15	-8.74/8.60	-7.06/5.80	-5.20/4.64	-4.13/3.24
Theta (20°)	-9.09/8.63	-8.66/6.60	-6.51/5.03	-3.71/3.20	-3.07/3.46	-3.94/3.88	-2.06/3.83	-0.58/6.08	-1.20/2.42	-3.96/4.42	-4.28/6.42	-5.11/5.98	-6.23/7.86	-9.99/13.72	-12.99/8.65	-6.41/5.38	-5.91/7.15	-9.41/10.03
Theta (30°)	-5.96/5.76	-4.77/9.91	-2.97/3.58	-5.51/6.25	-5.28/2.34	-2.23/3.40	-3.28/1.98	-1.72/2.70	-2.99/1.98	-13.99/13.68	-12.05/6.62	-13.05/11.51	-15.19/8.64	-11.05/9.99	-6.83/5.95	-11.05/9.99	-6.83/5.95	-11.05/9.99
Theta (40°)	-7.32/7.19	-4.89/3.12	-2.41/1.91	-2.31/3.56	-4.90/1.50	-0.54/4.47	-4.52/1.99	-2.26/4.76	-5.00/6.03	-6.73/8.03	-10.59/12.68	-10.98/10.69	-7.76/7.35	-11.79/13.94	-8.93/9.82	-8.70/9.68	-9.80/5.32	-4.23/6.01
Theta (50°)	-9.78/8.43	-6.48/4.80	-3.94/3.23	-4.48/4.22	-3.57/1.66	-1.59/2.21	1.04/0.20	-4.60/4.70	-9.07/9.12	-9.41/7.74	-8.15/9.80	-14.67/12.67	-7.88/10.00	-12.85/11.32	-9.53/11.08	-9.54/11.89	-7.56/7.54	-9.60/9.34
Theta (60°)	-6.22/4.45	-3.32/3.32	-7.38/3.29	-5.16/3.24	-4.21/6.72	0.04/0.60	-1.41/2.64	-5.16/3.24	-9.32/11.32	-13.45/11.32	-15.99/9.64	-10.48/14.88	-10.92/10.17	-14.13/9.46	-6.22/5.96	-14.13/9.46	-6.22/5.96	-14.13/9.46
Theta (70°)	-3.17/1.90	-1.12/2.10	-1.93/0.81	-1.94/1.68	-2.95/2.20	1.690/7.8	1.840/0.1	-0.23/0.55	-3.33/4.13	-6.46/12.36	-14.97/10.54	-6.58/9.81	-9.34/6.51	-15.66/10.86	-9.55/14.87	-13.11/14.65	-16.35/8.68	-5.00/4.45
Theta (80°)	-2.92/1.37	-0.69/0.21	0.310/8.3	0.09/3.11	-1.15/2.02	1.592/7.4	2.78/0.85	-0.12/0.64	-1.98/2.87	-4.31/3.58	-7.66/15.55	-9.77/6.08	-6.50/7.35	-7.22/13.24	-11.62/11.43	-9.89/10.42	-10.96/7.08	-5.26/4.00
Theta (90°)	-5.62/3.50	-0.75/0.30	0.420/2.8	1.53/0.13	0.181/4.1	3.68/2.12	-1.74/2.36	-0.30/0.69	-3.70/7.38	-7.78/8.35	-8.50/10.83	-10.56/5.04	-8.07/4.96	-5.77/9.27	-11.12/11.00	-6.54/12.75	-9.12/7.05	-6.38/6.45
Theta (100°)	-4.12/2.47	-0.93/0.59	-1.740/5.9	-0.64/6.62	-0.84/0.41	2.530/3.4	-0.69/1.27	0.60/2.30	-5.37/3.47	-6.33/9.84	-10.69/9.31	-10.18/8.59	-4.94/7.41	-12.69/6.27	-15.72/11.34	-12.69/6.27	-15.72/11.34	-12.69/6.27
Theta (110°)	-3.84/2.91	-2.21/2.46	-1.67/1.54	-3.54/5.74	-3.89/1.87	-0.41/1.89	-5.91/2.03	-1.54/7.15	-3.00/3.16	-5.32/1.67	-4.94/9.73	-6.37/8.80	-8.53/10.28	-6.48/10.54	-10.34/14.08	-15.66/10.67	-11.93/8.35	-4.84/3.75
Theta (120°)	-5.63/5.78	-6.17/2.31	-2.11/7.36	-9.21/8.85	-8.10/5.19	0.20/1.87	4.19/3.64	-8.30/9.55	-7.65/3.69	-5.77/5.77	-6.47/9.02	-9.68/6.26	-10.61/8.54	-6.06/9.60	-16.04/10.75	-10.76/5.59	-8.78/9.74	-9.61/10.12
Theta (130°)	-6.49/4.05	-2.67/3.50	-6.19/8.00	-7.77/11.00	-8.21/11.82	-2.66/4.48	-6.93/6.19	-6.33/6.19	-8.70/15.57	-13.36/13.02	-13.36/13.02	-13.36/13.02	-13.36/13.02	-13.36/13.02	-13.36/13.02	-13.36/13.02	-13.36/13.02	-13.36/13.02
Theta (140°)	-5.73/5.53	-6.24/6.60	-8.97/10.71	-14.44/13.50	-10.39/11.86	-7.70/7.08	-4.64/6.36	-15.14/7.87	-8.01/7.05	-5.77/10.75	-11.21/11.74	-11.91/9.78	-5.50/8.01	-8.11/15.45	-11.36/6.04	-4.91/8.28	-8.57/8.56	-8.57/8.56
Theta (150°)	-8.07/6.19	-8.27/11.23	-15.11/14.30	-10.97/6.53	-5.71/10.10	-15.49/13.89	-10.26/9.27	-11.96/14.94	-15.20/13.88	-11.87/10.47	-10.38/9.24	-10.40/12.59	-10.26/14.27	-9.29/10.31	-10.44/11.78	-9.96/7.13	-9.45/8.04	-8.22/9.46
Theta (160°)	-12.40/12.45	-10.67/9.09	-8.11/8.19	-7.43/6.29	-15.21/14.59	-11.65/11.19	-9.78/9.56	-12.64/14.59	-15.86/13.10	-14.56/13.34	-16.35/15.53	-14.18/13.74	-15.33/15.21	-14.18/13.74	-16.35/15.53	-14.18/13.74	-15.33/15.21	-14.18/13.74
Theta (170°)	-10.39/9.61	-10.36/10.74	-11.13/11.23	-10.94/10.48	-9.43/9.08	-10.07/11.71	-13.03/12.09	-12.94/13.84	-13.55/15.32	-15.19/15.62	-14.55/15.32	-15.34/15.89	-15.21/15.18	-14.39/12.23	-11.73/11.28	-11.25/11.82	-11.60/11.07	-11.18/11.12
Theta (180°)	-12.54/13.14	-12.31/13.14	-14.05/15.08	-14.40/14.41	-14.25/15.29	-13.54/11.												



Antenna Pattern

Appendix B

θ (°)	-7.73/-6.29	-4.33/-3.39	-2.51/-1.70	-2.22/-4.25	-5.70/-3.95	-7.40/-14.59	-12.42/-6.24	-3.44/-4.34	-7.29/-7.04	-6.38/-6.60	-8.88/-7.55	-6.07/-5.79	-8.22/-11.51	-13.40/-7.41	-4.48/-5.57	-5.11/-3.60	-4.20/-5.96	-7.23/-7.17
θ (60°)	-6.93/-4.39	-2.91/-2.05	-1.53/-2.27	-3.45/-5.98	-5.72/-3.28	-4.39/-4.99	-7.68/-3.90	-3.00/-6.06	-7.59/-8.05	-8.51/-9.44	-12.64/-13.94	-9.12/-6.83	-7.75/-11.93	-10.53/-7.65	-6.96/-4.59	-3.91/-4.31	-6.54/-12.39	-11.50/-9.40
θ (70°)	-8.37/-6.47	-5.54/-3.24	-1.46/-0.92	-0.38/-2.08	-2.13/-4.72	-1.46/-6.92	-9.01/-6.49	-9.02/-6.49	-7.71/-7.80	-8.01/-9.17	-12.55/-9.58	-8.56/-11.59	-12.71/-12.20	-12.55/-9.58	-9.08/-5.64	-6.88/-10.34	-8.14/-6.66	-5.69/-6.23
θ (80°)	-15.01/-12.89	-8.42/-3.30	-1.93/-1.39	-1.48/-1.18	0.32/-3.28	-3.75/-3.98	-3.94/-1.77	-2.84/-4.93	-5.53/-6.26	-10.64/-13.36	-12.34/-6.56	-6.43/-6.94	-7.12/-15.01	-15.76/-8.42	-6.34/-6.07	-11.11/-8.76	-7.90/-12.36	-13.37/-13.24
θ (90°)	-10.02/-8.91	-4.81/-2.65	-2.76/-2.40	-4.68/-0.55	0.84/-0.83	-2.07/-1.13	0.421/0.00	-0.83/-3.32	-5.46/-7.49	-10.01/-13.56	-13.51/-9.48	-8.85/-10.56	-15.20/-10.79	-9.74/-6.20	-6.69/-9.27	-8.41/-9.18	-12.07/-10.05	-9.39/-10.57
θ (100°)	-12.14/-10.07	-7.08/-6.01	-5.05/-6.62	-3.25/-0.60	-0.37/-2.63	-0.721/0.07	2.853/9.5	-2.94/-6.61	-2.94/-6.61	-11.60/-15.90	-11.60/-15.90	-13.22/-13.24	-13.63/-14.67	-11.04/-9.76	-5.08/-14.01	-11.04/-9.76	-7.82/-8.73	
θ (110°)	-13.53/-13.22	-11.77/-9.86	-8.95/-4.47	-1.52/-0.52	-4.03/-4.95	-3.81/-2.31	0.861/1.89	-0.95/-4.33	-4.24/-3.07	-3.41/-4.51	-9.17/-9.56	-6.96/-8.42	-10.20/-15.77	-9.74/-12.19	-14.56/-7.56	-8.87/-11.36	-13.57/-7.53	-8.90/-14.79
θ (120°)	-12.93/-12.75	-13.68/-11.91	-6.37/-1.83	-2.70/-3.81	-0.65/-2.39	-1.83/-1.34	-0.56/-0.34	-3.25/-6.99	-4.22/-2.20	-2.46/-3.25	-7.57/-8.16	-7.87/-15.06	-13.05/-14.23	-13.06/-9.88	-14.79/-13.91	-9.38/-9.65	-10.07/-10.88	-14.15/-11.00
θ (130°)	-14.42/-9.14	-8.02/-7.31	-6.43/-6.48	-5.62/-1.31	-0.78/-3.84	-3.32/-3.48	-2.75/-1.85	-4.12/-6.38	-6.59/-4.42	-3.03/-3.20	-15.76/-7.60	-7.08/-8.39	-9.69/-12.81	-15.76/-7.60	-8.46/-10.57	-15.37/-12.47	-12.69/-12.32	
θ (140°)	-10.68/-10.00	-9.89/-11.59	-11.29/-8.17	-6.43/-6.80	-6.96/-3.37	-3.42/-4.25	-5.61/-11.34	-15.56/-15.61	-11.38/-9.62	-7.12/-5.59	-9.59/-12.20	-11.04/-13.94	-14.14/-12.02	-13.34/-10.22	-8.80/-11.04	-13.40/-11.76	-11.05/-11.27	-15.10/-15.65
θ (150°)	-10.44/-8.82	-9.64/-9.37	-9.28/-8.75	-4.73/-4.56	-5.09/-3.95	-3.47/-3.51	-5.44/-8.68	-8.82/-10.71	-12.78/-10.23	-8.17/-10.40	-13.87/-11.87	-11.18/-15.82	-12.44/-10.43	-11.21/-8.48	-9.26/-15.80	-15.04/-15.39	-14.23/-14.97	-15.15/-12.86
θ (160°)	-10.74/-10.81	-10.92/-10.28	-8.32/-6.80	-6.87/-8.80	-11.15/-9.26	-6.84/-6.86	-7.96/-10.86	-13.41/-13.47	-15.56/-15.15	-12.85/-10.39	-9.53/-10.89	-11.54/-15.61	-14.62/-13.79	-13.94/-15.18	-14.62/-13.79	-13.73/-12.76	-12.65/-10.76	-11.06/-10.85
θ (170°)	-11.07/-10.34	-10.79/-11.04	-10.24/-10.65	-10.25/-10.12	-8.15/-6.50	-5.87/-5.36	-6.39/-7.16	-7.45/-7.98	-9.59/-10.82	-10.37/-10.59	-11.65/-11.51	-12.74/-13.30	-12.03/-11.45	-11.23/-12.59	-13.33/-14.47	-15.62/-15.32	-15.40/-16.04	-14.45/-13.44
θ (180°)	-8.39/-8.54	-8.61/-8.84	-9.31/-9.93	-10.05/-11.00	-11.32/-11.80	-12.25/-12.62	-11.92/-11.34	-10.79/-10.69	-10.31/-11.03	-11.12/-12.47	-12.61/-13.13	-13.27/-12.78	-12.92/-13.14	-13.45/-12.66	-11.49/-11.37	-10.69/-9.81	-9.85/-10.10	-9.49/-9.03
Freq(Hz)	5.35GPol	TotalAnt. 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)Φ(10°)	Φ(20°)Φ(30°)	Φ(40°)Φ(50°)	Φ(60°)Φ(70°)	Φ(80°)Φ(90°)	Φ(100°)Φ(110°)	Φ(120°)Φ(130°)	Φ(140°)Φ(150°)	Φ(160°)Φ(170°)	Φ(180°)Φ(190°)	Φ(200°)Φ(210°)	Φ(220°)Φ(230°)	Φ(240°)Φ(250°)	Φ(260°)Φ(270°)	Φ(280°)Φ(290°)	Φ(300°)Φ(310°)	Φ(320°)Φ(330°)	Φ(340°)Φ(350°)
θ (0°)	-4.06/-3.80	-3.12/-3.18	-2.93/-2.64	-2.82/-2.72	-2.87/-2.49	-2.70/-2.66	-2.47/-2.13	-1.79/-1.75	-1.54/-1.56	-1.67/-1.84	-1.91/-2.46	-2.42/-2.00	-1.75/-1.37	-1.20/-1.38	-1.81/-2.65	-3.05/-3.23	-3.89/-4.06	-4.19/-4.17
θ (10°)	-1.80/-1.33	-1.19/-1.18	-1.18/-1.41	-1.40/-1.60	-1.45/-1.14	-1.28/-1.43	-0.97/-0.99	-0.97/-0.99	-0.97/-0.99	-0.97/-0.99	-0.97/-0.99	-0.97/-0.99	-0.97/-0.99	-0.97/-0.99	-0.97/-0.99	-0.97/-0.99	-0.97/-0.99	-0.97/-0.99
θ (20°)	-2.45/-2.02	-1.53/-1.15	-1.17/-1.10	-1.03/-0.92	-1.64/-2.66	-5.44/-8.92	-13.29/-15.52	-15.27/-14.17	-12.12/-11.60	-11.70/-12.88	-12.60/-12.31	-10.75/-8.99	-7.41/-6.27	-5.00/-3.78	-3.52/-3.79	-3.73/-3.33	-2.85/-2.24	-2.00/-2.21
θ (30°)	-2.74/-2.16	-0.59/-0.68	-1.61/-2.10	-1.86/-2.27	-3.63/-6.67	-7.90/-9.96	-11.65/-11.81	-8.45/-8.17	-10.66/-11.70	-8.53/-6.52	-5.21/-5.20	-6.81/-9.95	-10.33/-7.40	-6.12/-5.42	-4.54/-6.78	-7.68/-6.53	-5.14/-4.09	-4.62/-4.00
θ (40°)	-1.24/-0.51	0.64/-0.67	1.14/-0.99	-1.90/-1.44	-0.32/-2.74	-6.42/-8.06	-7.64/-6.97	-10.03/-9.70	-6.01/-5.22	-2.20/-3.84	-6.42/-8.06	-10.03/-9.70	-6.01/-5.22	-2.20/-3.84	-6.42/-8.06	-10.03/-9.70	-6.01/-5.22	-3.18/-1.37
θ (50°)	-4.19/-3.11	-2.14/-1.95	-1.73/-0.65	0.17/-1.23	-5.17/-4.44	-7.56/-10.00	-10.47/-3.72	-1.12/-2.83	-7.18/-9.10	-5.02/-4.01	-6.11/-8.26	-6.54/-7.53	-11.30/-11.65	-14.82/-6.75	-4.28/-8.78	-11.68/-7.58	-5.71/-6.01	-5.40/-5.13
θ (60°)	-4.31/-2.04	-1.07/-0.68	-1.18/-3.73	-3.69/-4.73	-6.31/-2.96	-7.96/-13.46	-5.84/-0.22	-0.32/-4.58	-7.08/-7.06	-5.30/-4.76	-5.50/-8.50	-11.64/-8.03	-9.80/-14.04	-13.73/-7.55	-5.77/-8.46	-7.50/-5.29	-4.78/-9.85	-8.62/-6.18
θ (70°)	-5.39/-3.83	-3.24/-2.86	-1.90/-1.44	-0.32/-2.74	-6.22/-6.69	-6.97/-3.51	-7.20/-2.84	-2.20/-3.84	-6.42/-8.06	-6.97/-3.51	-7.20/-2.84	-6.42/-8.06	-10.99/-11.80	-13.22/-11.03	-6.35/-7.22	-10.21/-14.89	-11.24/-9.49	-6.51/-6.62
θ (80°)	-11.57/-8.61	-6.82/-5.42	-3.86/-1.14	0.71/-1.20	1.14/-2.01	-4.70/-3.58	-5.24/-0.53	0.61/-0.66	-1.71/-3.04	-5.89/-8.38	-10.93/-12.15	-12.03/-11.79	-11.36/-12.89	-10.18/-6.99	-3.98/-5.20	-10.93/-8.24	-7.86/-8.99	-10.34/-12.75
θ (90°)	-12.54/-8.84	-5.38/-3.37	-1.31/-0.76	-1.21/-1.68	2.07/-0.33	-0.39/-0.08	1.74/-2.29	2.29/-1.16	0.76/-4.29	-8.65/-12.47	-13.33/-10.30	-8.72/-10.05	-9.02/-12.43	-12.52/-4.79	-2.46/-7.95	-8.95/-9.84	-8.88/-10.76	-11.47/-13.33
θ (100°)	-9.66/-7.53	-5.92/-8.20	-2.98/-2.37	-3.35/-0.17	0.53/-1.05	-1.28/-1.06	-1.76/-1.62	4.095/1.2	-2.87/-1.06	-8.54/-8.59	-12.15/-11.41	-15.53/-9.47	-11.53/-9.95	-12.15/-7.95	-6.26/-11.02	-11.53/-9.95	-6.81/-7.97	
θ (110°)	-9.45/-7.81	-10.62/-8.25	-4.21/-2.37	-1.15/-0.04	-1.75/-3.31	-5.77/-0.44	4.184/7.6	2.85/-0.92	-3.59/-1.02	-1.45/-2.73	-3.51/-5.70	-9.43/-13.33	-12.06/-8.34	-4.55/-8.12	-11.19/-7.15	-7.04/-11.73	-9.21/-5.99	-6.39/-10.81
θ (120°)	-10.19/-9.13	-11.75/-5.53	-3.48/-0.51	-2.27/-5.29	-1.38/-1.15	-0.48/-0.22	0.62/-0.66	-1.62/-2.67	-4.45/-2.54	-2.31/-2.55	-4.66/-3.26	-4.15/-12.02	-8.18/-14.50	-13.53/-8.87	-13.71/-11.85	-10.89/-10.50	-7.52/-8.28	-12.54/-14.25
θ (130°)	-12.69/-12.77	-10.62/-5.72	-2.96/-2.97	-5.17/-1.62	-1.01/-2.61	-0.19/-0.44	-0.880/0.1	-1.46/-3.23	-5.34/-4.00	-3.13/-3.78	-4.34/-5.17	-7.54/-7.28	-5.84/-7.55	-11.75/-12.21	-15.44/-10.15	-10.66/-10.55	-14.99/-11.08	-10.23/-10.45
θ (140°)	-10.85/-8.86	-9.79/-9.41	-8.41/-5.73	-3.76/-4.89	-5.48/-1.84	-1.36/-2.20	-3.36/-5.54	-9.76/-6.77	-10.06/-8.92	-6.29/-7.15	-9.12/-11.19	-6.65/-10.32	-15.83/-7.21	-14.82/-9.06	-7.52/-11.65	-12.02/-11.47	-8.65/-9.13	-13.31/-15.98
θ (150°)	-8.06/-7.49	-7.01/-7.49	-7.54/-6.48	-7.13/-7.60	-4.26/-2.76	-3.27/-2.59	-4.14/-1.11	-8.84/-9.09	-12.99/-12.94	-7.83/-8.82	-13.11/-15.27	-15.72/-14.54	-10.29/-9.37	-12.15/-9.20	-8.68/-13.19	-11.05/-13.37	-15.06/-16.08	-12.95/-9.00
θ (160°)	-9.60/-9.61	-8.91/-8.46	-7.75/-7.80	-9.46/-12.33	-11.29/-7.88	-6.81/-6.25	-6.56/-7.67	-9.16/-10.08	-10.99/-13.45	-13.67/-10.41	-7.69/-6.35	-6.43/-8.28	-10.85/-13.25	-12.05/-9.36	-10.76/-13.28	-13.21/-12.28	-13.43/-12.83	-12.16/-9.57
θ (170°)	-9.86/-9.99	-10.77/-11.58	-12.83/-12.79	-11.86/-9.29	-7.44/-6.15	-5.37/-5.33	-4.89/-5.05	-5.83/-7.15	-8.07/-9.09	-9.38/-11.08	-7.90/-9.42	-12.12/-15.00	-11.49/-8.44	-14.17/-15.71	-15.05/-15.65	-13.46/-11.20		
θ (180°)	-7.57/-8.15	-8.33/-8.57	-9.54/-11.36	-11.56/-11.09	-11.73/-13.10	-14.16/-13.44	-12.74/-12.62	-12.74/-12.86	-11.74/-10.89	-11.42/-11.99	-12.91/-13.04	-11.66/-11.04	-11.62/-11.30	-11.62/-11.34	-10.81/-9.20	-7.84/-7.54	-7.58/-7.08	-7.39/-7.75
Freq(Hz)	5.65GPol	TotalAnt. 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)Φ(10°)	Φ(20°)Φ(30°)	Φ(40°)Φ(50°)	Φ(60°)Φ(70°)	Φ(80°)Φ(90°)	Φ(100°)Φ(110°)	Φ(120°)Φ(130°)	Φ(140°)Φ(150°)	Φ(160°)Φ(170°)	Φ(180°)Φ(190°)	Φ(200°)Φ(210°)	Φ(220°)Φ(230°)	Φ(240°)Φ(250°)	Φ(260°)Φ(270°)	Φ(280°)Φ(290°)	Φ(300°)Φ(310°)	Φ(320°)Φ(330°)	Φ(340°)Φ(350°)
θ (0°)	-7.00/-7.62	-7.05/-6.86	-6.29/-6.84	-6.28/-7.12	-7.63/-7.51	-8.05/-8.89	-8.59/-8.27	-7.06/-6.25	-6.86/-7.24	-8.40/-7.73	-8.03/-8.10	-7.37/-8.08	-8.75/-7.42	-8.56/-7.95	-7.80/-7.15	-7.26/-7.37	-8.00/-7.79	-7.13/-7.00
θ (10°)	-6.38/-4.44	-5.90/-5.77	-7.07/-6.75	-7.09/-7.82	-8.68/-8.52	-7.54/-7.40	-4.28/-3.49	-4.28/-3.49	-2.69/-2.76	-2.69/-2.76	-2.69/-2.76	-2.69/-2.76	-2.69/-2.76	-2.69/-2.76	-2.69/-2.76	-2.69/-2.76	-2.69/-2.76	-2.69/-2.76
θ (20°)	-2.80/-2.49	-2.33/-2.20	-3.20/-5.38	-6.60/-9.30	-9.65/-9.66	-9.00/-7.56	-6.55/-5.19	-3.80/-3.75	-4.26/-4.54	-5.41/-6.55	-2.96/-2.25	-2.16/-3.22	-4.18/-4.18	-5.41/-6.55	-7.37/-7.04	-4.44/-5.25	-4.45/-3.90	-2.88/-2.43
θ (30°)	-5.15/-3.91	-2.89/-2.49	-2.02/-2.04	-2.53/-3.22	-4.13/-3.71	-11.55/-14.49	-10.87/-8.19	-9.40/-13.24	-14.31/-12.26	-3.88/-4.56	-4.80/-3.17	-3.48/-4.36	-4.33/-3.73	-3.88/-4.50	-4.75/-6.36	-5.34/-3.38	-3.61/-3.90	-4.85/-8.85
θ (40°)	-6.13/-6.94	-5.02/-4.39	-3.60/-4.22	-4.74/-4.00	-2.95/-4.87	-7.83/-7.94	-8.00/-9.24	-11.75/-15.28	-13.00/-10.87	-11.44/-12.17	-11.92/-8.22	-5.00/-3.73	-5.59/-6.35	-7.29/-6.66	-7.17/-7.23	-5.44/-4.22	-3.44/-5.07	-8.34/-8.09
θ (50°)	-2.34/-2.09	-1.37/-1.03	0.07/-0.76	-3.59/-5.89	-6.11/-5.34	-6.06/-2.70	-7.43/-9.22	-6.55/-13.08	-7.43/-9.22	-14.15/-13.60	-14.15/-13.60	-12.87/-11.04	-9.85/-8.27	-7.51/-6.21	-6.13/-4.26	-4.73/-6.33	-6.30/-4.90	-4.04/-2.45
θ (60°)	-4.50/-4.77	-3.16/-1.07	-0.19/-0.24	0.04/-0.99	-5.83/-6.60	-4.86/-1.52	-7.05/-1.62	-2.92/-3.88	-2.87/-5.37	-8.38/-8.82	-8.06/-10.48	-9.64/-12.18	-11.08/-11.29	-6.56/-6.78	-6.56/-6.78	-6.27/-10.04	-9.20/-5.90	-4.90/-5.79
θ (70°)	-5.59/-4.04	-2.13/-0.75	-0.72/-0.52	-0.46/-0.23	-3.98/-6.13	-4.73/-5.01	-1.88/-2.18	-5.11/-3.48	-1.97/-3.53	-5.09/-4.71	-5.90/-9.36	-14.79/-9.76	-7.86/-11.71	-7.69/-6.84	-7.78/-6.73	-10.43/-8.65	-7.43/-5.90	-5.33/-5.35

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

