



Antenna Composite Gain Test Report

Equipment	WiFi 7 Router with Backup
Model Name	CBE1V1K
Applicant	ASKEY COMPUTER CORPORATION 10F, No.119, Jiankang Rd., Zhonghe Dist., New Taipei City, Taiwan
Manufacturer	ASKEY COMPUTER CORPORATION 10F, No.119, Jiankang Rd., Zhonghe Dist., New Taipei City, Taiwan
Standard	KDB 662911 D03 v02
Sample Received	Feb. 26, 2025
Start Test Date	Mar. 10, 2025
Final Test Date	Mar. 10, 2025



Approved by: Jackson Tsai

SPORTON INTERNATIONAL INC. Hsinhua Laboratory

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



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History of this test report

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1. Operation Mode and Antenna Information

Antenna Position	RF Port	Brand Name	Model Name	Ant. Type	Connector	Modes of Operation
2G 5GAnt1	1	NA	N03AKCGB-PK1-LE150U	PCB	I-Pex	2.4GHz, 5GHz
2G 5GAnt2	2	NA	N03AKCGC-PK1-LG210U	PCB	I-Pex	2.4GHz, 5GHz
2G 5GAnt3	3	NA	N03AKCGD-PK1-LB210U	PCB	I-Pex	2.4GHz, 5GHz
2G 5GAnt4	4	NA	N03AKCGE-PK1-LW180U	PCB	I-Pex	2.4GHz, 5GHz

Note:

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

2G5G Ant1~2G5G Ant4 could transmit/receive simultaneously.

2. Test Frequency

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

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

3. Testing Location

Test Lab. : Sporton International Inc. Hsinhua Laboratory				
☒ Wen 33rd.St.	ADD:	No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)		
	TEL: 886-3-318-0787	FAX: 886-3-318-0287		
Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
Radiated	05CH03-HY	Rofy Chen	23.5-24.5°C / 45-55%	10/Mar/2025

Note:

Testing Site Information

Brand Name: TDK

Dimension: 11m*6m*6m

Characteristic: Fully Anechoic Chamber

4. Test Facility and Configuration

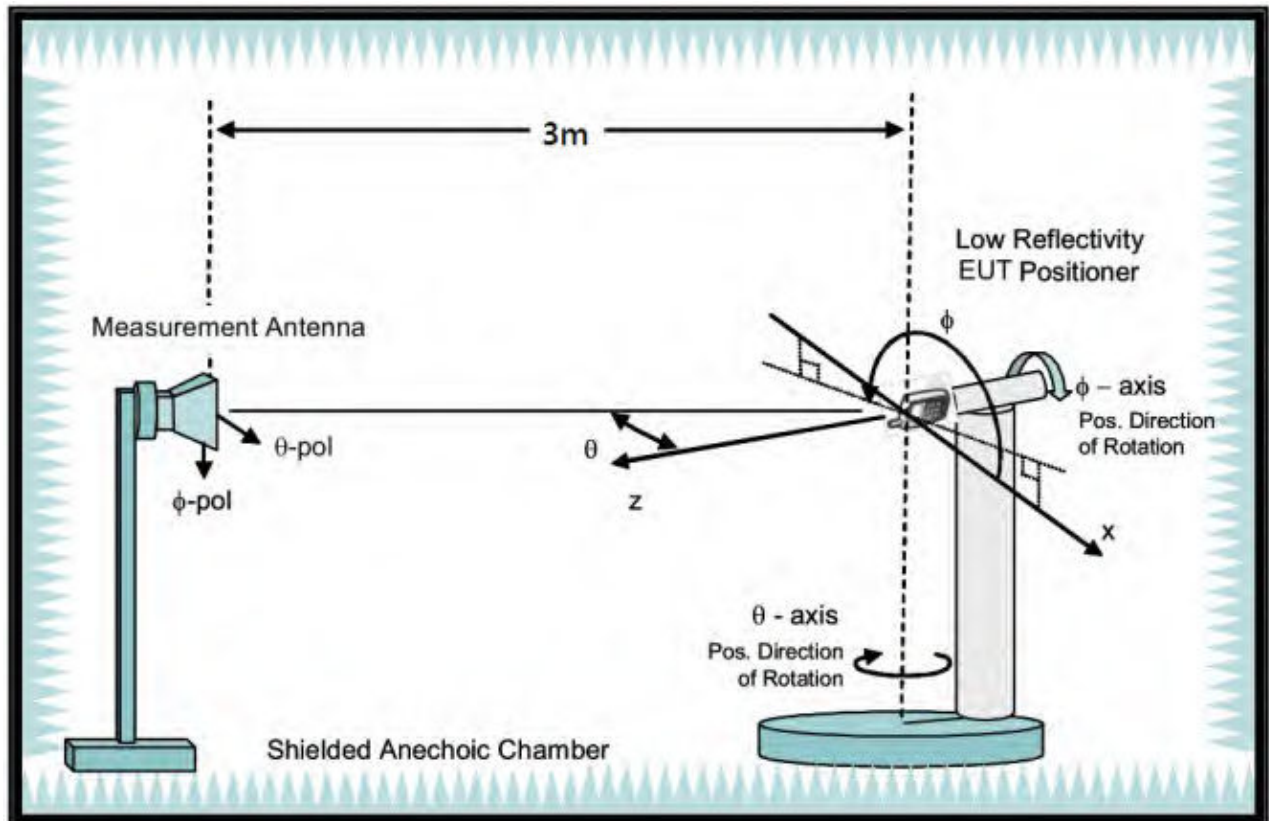
Test configuration: Reference to CITA OTA distributed-axes system configuration.

Chamber: Fully Anechoic Chamber.

Measurement antenna: Dual Polarization Horn antenna

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

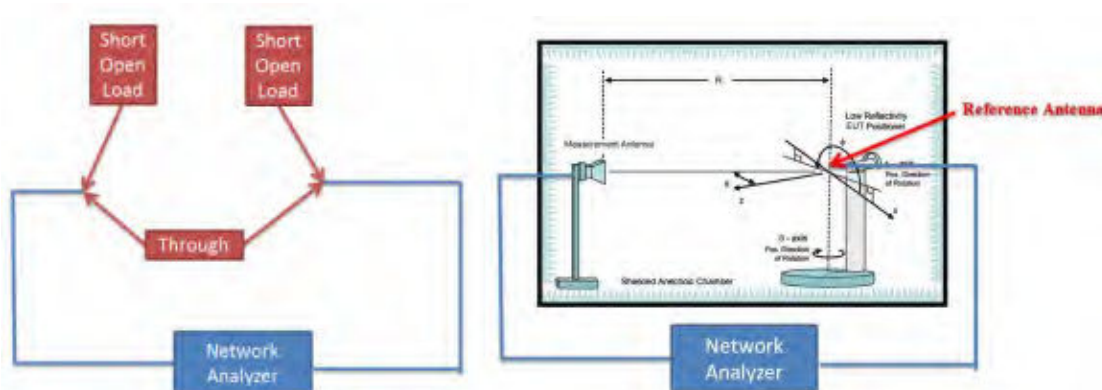
#Reference to CTIA "ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1"



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	2400	2450	2500	5150	5200	5300	5600	5750	5800	5900	6000	6500	7000	7200
G(theta) reading (dB)	-33.48	-33.18	-32.45	-32.78	-32.43	-32.85	-32.74	-32.13	-32.46	-33.46	-32.73	-33.41	-34.78	-35.31
G(phi) reading (dB)	-33.45	-32.13	-32.74	-32.43	-32.87	-31.78	-32.46	-32.37	-32.73	-32.87	-32.46	-33.68	-34.74	-35.08
Reference gain (dBi)	10.4	10.5	10.2	11.4	11.5	11.9	12.5	11.8	11.7	11.6	11.8	11.5	11.4	10.8
Factor(theta) (dB)	43.88	43.68	42.65	44.18	43.93	44.75	45.24	43.93	44.16	45.06	44.53	44.91	46.18	46.11
Factor(phi) (dB)	43.85	42.63	42.94	43.83	44.37	43.68	44.96	44.17	44.43	44.47	44.26	45.18	46.14	45.88

Note:

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

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

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

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



6. Test Method

EUT set on multi-axis positioner and adjust EUT's physical center to measurement reference center. Measurement antenna set at phi polarization and 1.5 meter height. Port 1 of Network analyzer connect to antenna 1 of EUT. Record G value every 7.5 degree from 0 to 352.5 degree on Phi angle and 0 to 180 on theta angle of multi-axis positioner. Then set measurement antenna to theta polarization and repeat process. Repeat process to each antenna of EUT.

DG steps:

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

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



7. Measured Values and Calculation of Maximum Gain Positions

DG_1SS max value position

Frequency (Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 (dBi)	-0.19	-7.55	-7.27	-1.51	-2.02
Ant. 2 (dBi)	-1.32	2.18	1.23	-1.19	-1.08
Ant. 3 (dBi)	3.39	2.8	0.25	2.81	3.28
Ant. 4 (dBi))	-3.62	-15.1	-9.78	-18.75	-11.92
DG [1SS] (dBi)	5.96	4.25	3.34	4.11	4.58
Polarization	Phi	Theta	Theta	Theta	Theta
$\Theta(^{\circ})$	30	82.5	75	90	90
$\Phi(^{\circ})$	45	165	165	165	157.5

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

DG_1SS max value position calculation

Frequency (Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 [$10^{(G/20)}$]	$10^{(-0.19/20)}$	$10^{(-7.55/20)}$	$10^{(-7.27/20)}$	$10^{(-1.51/20)}$	$10^{(-2.02/20)}$
Ant. 2 [$10^{(G/20)}$]	$10^{(-1.32/20)}$	$10^{(2.18/20)}$	$10^{(1.23/20)}$	$10^{(-1.19/20)}$	$10^{(-1.08/20)}$
Ant. 3 [$10^{(G/20)}$]	$10^{(3.39/20)}$	$10^{(2.8/20)}$	$10^{(0.25/20)}$	$10^{(2.81/20)}$	$10^{(3.28/20)}$
Ant. 4 [$10^{(G/20)}$]	$10^{(-3.62/20)}$	$10^{(-15.1/20)}$	$10^{(-9.78/20)}$	$10^{(-18.75/20)}$	$10^{(-11.92/20)}$
Ant. 1 [$10^{(G/20)}$] value	0.978	0.419	0.433	0.84	0.793
Ant. 2 [$10^{(G/20)}$] value	0.859	1.285	1.152	0.872	0.883
Ant. 3 [$10^{(G/20)}$] value	1.477	1.38	1.029	1.382	1.459
Ant. 4 [$10^{(G/20)}$] value	0.659	0.176	0.324	0.115	0.254
Sum All Antenna [Amax]	3.974	3.261	2.939	3.21	3.388
DG [$10 \cdot \log(A_{max}^2/N_{ant})$]	5.96	4.25	3.34	4.11	4.58

Note:

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

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

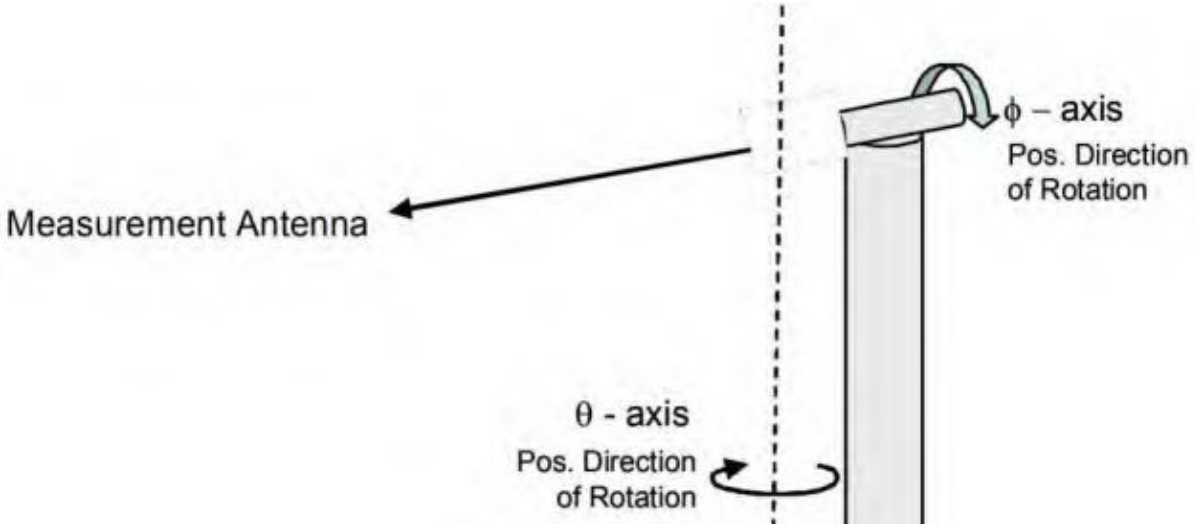
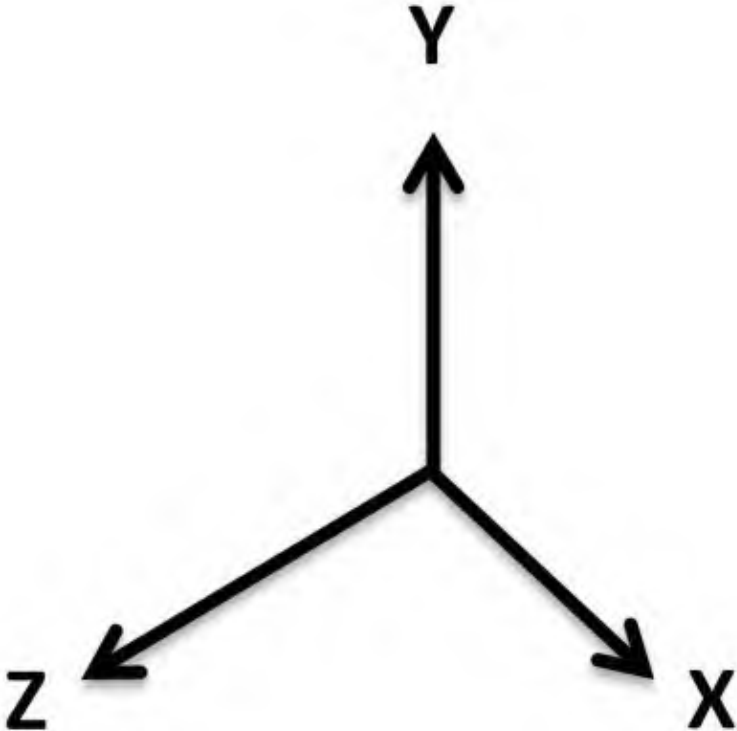
**8. Summary of Test Result**

Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	2.9	2.22	2.66	2.37	2.98
Ant. 2 Max Gain (dBi)	3.72	2.79	2.84	2.77	2.64
Ant. 3 Max Gain (dBi)	3.72	3.09	3.04	2.82	3.28
Ant. 4 Max Gain (dBi)	2.79	2.33	2.96	3.13	2.59
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/60/352.5	Theta/52.5/307.5	Theta/37.5/330	Theta/37.5/330	Theta/45/330
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/22.5/90	Phi/120/270	Phi/7.5/277.5	Phi/7.5/262.5	Theta/60/180
Ant. 3 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/37.5/142.5	Theta/82.5/172.5	Theta/67.5/172.5	Theta/90/157.5	Theta/90/157.5
Ant. 4 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/7.5/345	Phi/45/37.5	Phi/52.5/37.5	Phi/82.5/165	Phi/82.5/45
Max Gain (dBi)	3.72	3.09	3.04	3.13	3.28
DG [1SS] (dBi)	5.96	4.25	3.34	4.11	4.58
DG [2SS] (dBi)	3.72	3.09	3.04	3.13	3.28
DG [4SS] (dBi)	3.72	3.09	3.04	3.13	3.28

Note:

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

9. Test Setup

Test Position
Relative to the measurement antenna, first position 0 degrees of phi angle and theta angle.  Measurement Antenna ϕ - axis Pos. Direction of Rotation θ - axis Pos. Direction of Rotation
Antenna Pattern Coordination


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-1531	1GHz~18GHz	Dec. 20, 2024	Dec. 19, 2025
Dual Polarization Horn Antenna	Sporton	S0209DP	S0209DP-001	2GHz~9GHz	N.C.R.	N.C.R.
ENA Series Network Analyzer	AGILENT	E5071C	MY46419477	100kHz~8.5GHz	Jul. 30, 2024	Jul. 29, 2025
VNA Calibration Kit	TS RF	TS85033E-F	-	DC~9GHz	N.C.R.	N.C.R.
Multi-axis positioner	Sporton	MAPS01	MAPS01-001	Theta / Phi axis	N.C.R.	N.C.R.
Test Software	SPORTON	SENSE-RDG	V1.0.8	-	N.C.R.	N.C.R.

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

NCR means Non-Calibration required.



11. Test Results

Please refer to the appendix.

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————THE END————



Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A

Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	2.9	2.22	2.66	2.37	2.98
Ant. 2 Max Gain (dBi)	3.72	2.79	2.84	2.77	2.64
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Ant. 4 Max Gain (dBi)	2.79	2.33	2.96	3.13	2.59
Ant. 1 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/60/352.5	Theta/52.5/307.5	Theta/37.5/330	Theta/37.5/330	Theta/45/330
Ant. 2 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Phi/22.5/90	Phi/120/270	Phi/7.5/277.5	Phi/7.5/262.5	Theta/60/180
Ant. 3 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/37.5/142.5	Theta/82.5/172.5	Theta/67.5/172.5	Theta/90/157.5	Theta/90/157.5
Ant. 4 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Phi/7.5/345	Phi/45/37.5	Phi/52.5/37.5	Phi/82.5/165	Phi/82.5/45
Max Gain (dBi)	3.72	3.09	3.04	3.13	3.28
DG [1SS] (dBi)	5.96	4.25	3.34	4.11	4.58
DG [2SS] (dBi)	3.72	3.09	3.04	3.13	3.28
DG [4SS] (dBi)	3.72	3.09	3.04	3.13	3.28



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Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A

(H75)	6.86E-01	0.8937	1.2912	1.7251	1.1808	0.0962	-1.0916	-1.43124	-0.96075	-8.61055	-6.6903	-1.14152	-1.72143	-1.13037	-0.21036	0.43074	0.82886	0.62035	0.16101	0.77674	0.48006	-0.23022	-0.51049	-0.47073
(H75)	1.02022	0.93106	1.48173	1.98021	0.86013	-1.01517	-0.01197	-1.76114	-1.75185	-2.19626	-2.850282	-2.49172	-2.388191	-1.390485	-0.350001	0.21027	0.40403	-0.450206	0.20804	1.32122	1.08071	0.26059	-1.23172	-1.31013
(H225)	-1.71155	-0.90401	0.02801	0.13162	-0.67158	2.986445	4.86417	-3.880386	-4.07045	-4.850351	-2.450226	-1.96077	-1.59138	-1.080383	-0.68061	-0.7106	-0.42018	0.4095	1.33083	1.62012	1.0203	-0.14046	-1.12044	
(H30)	2.31185	-1.72126	0.42008	0.27015	-1.17076	4.94034	-7.12059	-7.69053	-6.26048	-3.16177	-1.070105	-0.7707	-0.66003	-1.29154	-1.510129	-1.430158	-1.470131	-1.31029	-0.78004	0.01108	1.67058	0.95014	-1.19045	-2.03024
(H35)	2.551285	-2.16181	0.56427	0.22061	-1.61038	5.551555	-5.23014	-5.52036	-4.21032	-3.26038	-1.530146	-1.32002	-0.95013	-2.03024	-2.270179	-1.450138	-1.560189	-1.510488	-0.25029	0.32015	-0.840256	-3.880436	-3.81042	
(H45)	3.40268	-1.71029	0.50038	0.30401	-1.23	3.750555	-5.790449	-5.440379	-2.980283	-2.840223	-1.62018	-1.620107	-1.150114	-0.760115	-1.210467	-0.35042	-0.589055	-1.030116	-1.610118	-1.280035	-0.510153	-1.460239	-3.230303	-2.920335
(H525)	2.580164	-0.88046	1.21198	1.04039	1.30046	-0.770223	-2.850442	-2.610245	-2.950361	-3.410246	-2.55073	-3.980416	-4.280371	-3.190212	-1.180552	-0.090929	-0.31	-0.88024	0.04029	0.55004	0.120022	-0.550189	-2.58024	-2.520301
(H67)	0.770167	-0.44022	0.55019	0.05096	1.91056	1.04016	-1.76038	-4.410381	-3.91039	2.89023	2.94038	4.060426	-4.120375	-2.96027	-1.930485	-0.43016	-0.74019	-2.61049	-0.110468	0.53042	0.430449	-0.740107	-1.430151	-1.190488
(H87)	1.31017	-1.660131	-1.020472	0.58013	2.95239	1.70051	-1.480443	-5.75045	-4.67043	-2.29011	-2.950393	4.530446	-4.530489	-4.220296	-1.790175	-1.650181	-1.440148	-1.94023	-1.12007	0.80087	0.830077	-0.6901	-1.040102	-1.02037
(H75)	-0.14052	2.510272	2.280127	-1.450405	0.190184	1.580156	3.280159	4.790552	4.110448	2.960284	-1.190365	-3.880335	-3.94035	-3.170381	-3.470349	-3.290345	-4.160419	-3.180213	-1.160109	-1.040484	0.540426	-0.160113	-2.250207	-1.190438
(H825)	2.810287	2.490222	2.450247	-2.020476	0.420041	3.060192	-5.440586	-6.140167	-7.450423	-2.76025	-0.300366	-4.550449	-3.430179	-1.010112	-1.570383	-4.49037	-3.51037	-1.94031	-2.950172	-1.410147	-1.320393	-0.670117	-2.230254	-2.740237
(H97)	3.24001	-3.730338	-3.63043	2.590499	-1.080297	4.240443	-4.090351	-3.660443	-3.46018	-1.620181	-4.290456	-3.580336	-4.20273	-0.930507	-0.93025	-1.490498	-0.510262	-0.880249	-3.090182	-1.770243	-2.270151	-1.120178	-1.210313	-2.680266
(H35)	3.220337	2.89042	5.160355	4.14038	4.940389	4.940389	4.910428	2.310118	2.310118	3.180251	3.880251	2.680329	3.860292	3.11023	2.760347	2.62031	3.550335	3.680297	3.480238	2.130237	-1.180362	-1.83032	-0.21038	-4035
(H10)	4.880449	-4.150488	-4.18047	4.890771	4.840536	4.730475	4.730475	4.730475	4.730475	3.640321	2.400238	-2.890317	-3.9221	-1.570133	-2.020338	4.810527	-3.680236	4.440557	4.940536	2.210251	3.49058	4.740737	4.84059	4.84059
(H125)	6.06053	5.24013	5.01058	5.73055	6.150438	5.010448	4.920556	6.81053	3.38014	4.820373	2.950398	-1.350438	2.410303	3.630281	1.930121	1.710303	3.760409	2.070181	1.13022	3.120126	2.58042	3.590457	4.860786	5.840103
(H135)	4.840496	4.8401	4.570484	6.69077	5.71045	6.05039	3.730431	-4.080336	3.870583	4.63025	4.82033	4.8304	3.290251	2.930336	3.960285	1.7104	0.88024	1.150117	-0.850337	2.870199	2.970298	4.45041	7.27013	10.91051
(H1275)	8.710482	5.930544	4.91042	5.71045	7.090486	6.120578	5.490504	3.080336	4.440522	4.550336	3.580399	4.330554	3.740275	-0.1601	-0.170255	3.220266	-1.480211	1.210182	2.52035	0.57057	1.300375	5.510584	5.44011	9.460398
(H10)	-1.070416	-1.470442	-4.940587	4.390486	4.670785	-7.570457	-5.59047	-5.40025	-2.950256	-2.460256	-7.110405	3.570177	2.350404	-3.160488	5.110447	-0.280266	4.280426	-1.940802	0.520347	-0.620599	-5.850793	-0.870109	-10.91039	-10.91039
(H425)	-1.430102	-5.890451	-4.260459	5.290474	4.18049	7.040445	5.410336	-2.820422	-2.440258	3.220331	3.890411	-1.570425	-5.580465	-4.290501	-5.89045	3.980186	-3.730281	-3.330361	4.240509	3.39023	2.940387	-4.65032	4.660436	-4.690484
(H30)	-0.280102	0.960429	0.790429	5.36043	0.87049	6.450432	-4.870449	-4.840482	-4.860449	-4.870447	-7.910411	-11.910191	-11.920138	-0.48022	-7.90055	-2.930244	-2.790399	-5.960421	-5.790586	4.280494	-4.860491	-4.910431	-1.360403	-0.950422
(H1075)	5.65058	-4.65079	3.82044	0.84051	-0.06053	5.070441	-1.130395	-4.150473	-5.250452	5.150541	5.570407	5.910508	-4.860635	-6.490403	-6.490403	0.810105	-10.790148	-10.70041	-7.58079	-7.980378	-7.990717	4.860459	-7.340718	-4.590452
(H10)	4.160473	5.260577	4.690473	4.770483	4.770483	4.770483	4.770483	4.770483	4.770483	4.770483	4.770483	4.770483	4.770483	4.770483	4.770483	4.770483	4.770483	4.770483	4.770483	4.770483	4.770483	4.770483	4.770483	4.770483
(H1275)	4.22078	4.690473	4.680434	4.310466	6.990492	6.970121	4.610407	-0.56045	-5.460449	-5.460453	-6.470172	-7.630185	-7.970734	6.510408	4.050413	4.52071	-7.760485	-0.26079	6.990492	4.92032	4.640411	4.520789	4.610412	-5.990445
(H10)	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166	-10.910166
Freq(Hz)	5.850Pst	Ther	Ther	Ther	Ther	Ther	Ther	Ther	Ther	Ther	Ther	Ther	Ther	Ther	Ther	Ther	Ther	Ther	Ther	Ther	Ther	Ther	Ther	Ther
Gain(dB)	(H75)(H225)	(H30)(H35)	(H45)(H525)	(H67)(H87)	(H10)(H125)	(H135)(H15)	(H175)(H225)	(H207)(H275)	(H237)(H25)	(H267)(H275)	(H297)(H35)	(H327)(H425)	(H357)(H475)	(H387)(H525)	(H417)(H625)	(H447)(H725)	(H477)(H825)	(H507)(H925)	(H537)(H1025)	(H567)(H1125)	(H597)(H1225)	(H627)(H1325)	(H657)(H1425)	(H687)(H1525)
(H75)	3.40083	-1.290161	-1.620112	6.840676	0.790576	0.880675	-0.11022	-0.69035	0.039197	1.01003	1.6505	1.24036	0.510101	0.16008	0.22005	0.84002	-0.52044	0.57048	-1.290168	-0.36037	0.88021	1.36014	1.41027	0.87001
(H35)	5.59029	0.890105	-1.48011	7.73056	-0.60049	-1.270158	-1.55012	-0.69025	0.08002	-0.290091	0.69017	-1.41002	-1.560139	-1.550149	-1.41002	0.89004	-0.76008	-1.01005	0.39009	0.89009	0.89009	1.79024	2.14026	1.09009
(H10)	4.07007	0.84007	1.470129	1.590134	1.540137	-1.290135	-1.440122	-1.16014	-1.070129	-3.01042	-3.150438	-3.150438	-3.150438	-3.150438	-3.150438	-3.150438	-3.150438	-3.150438	-3.150438	-3.150438	-3.150438	-3.150438	-3.150438	-3.150438
(H225)	1.590136	2.930339	3.200337	3.280136	1.201137	1.590494	0.59045	1.590494	1.590494	3.74049	4.45042	4.45042	4.45042	4.45042	4.45042	4.45042	4.45042	4.45042	4.45042	4.45042	4.45042	4.45042	4.45042	4.45042
(H30)	3.300336	4.33053	5.720460	4.570386	1.980123	1.980123	1.980123	1.980123	1.980123	1.980123	1.980123	1.980123	1.980123	1.980123	1.980123	1.980123	1.980123	1.980123	1.980123	1.980123	1.980123	1.980123	1.980123	1.980123
(H275)	3.300336	2.670336	3.900340	3.980295	2.150122	0.56001	0.350413	-1.760372	4.060798	7.650576	2.570085	4.020102	0.69008	1.200136	1.260076	0.250116	-1.720234	-1.890114	0.540034	-1.670186	-1.250462	0.98003	1.250126	3.550426
(H10)	1.230044	-1.52046	-3.780586	5.280441	2.79017	0.930507	0.540107	0.250435	-4.620438	-4.440438	-4.440438	-4.440438	-4.440438	-4.440438	-4.440438	-4.440438	-4.440438	-4.440438	-4.440438	-4.440438	-4.440438	-4.440438	-4.440438	-4.440438
(H525)	0.510028	-1.090248	-4.570584	-4.33027	-1.170058	-1.230133	0.03008	-0.180231	-3.430247	2.270258	-1.850208	-1.950165	-1.390117	0.060014	0.780142	1.88013	-1.510182	3.250267	2.540244	-3.43032	2.770142	-0.870087	2.350426	2.030498
(H10)	0.880072	-1.790279	-4.4907	4.102081	-1.83005	-0.450154	-0.95003	-0.270239	-1.560131	0.720058	0.640064	0.680001	0.070037	-1.060129	-2.060103	1.820119	1.510187	3.730243	-2.910246	-2.850236	-2.930278	-1.760141	-1.930267	-1.96037
(H875)	1.140001	2.330409	5.030426	6.41017	-1.25004	0.460030	0.350037	-0.990195	-1.03008	0.190067	1.760257	2.87003	2.180145	0.110118	-0.40076	0.640091	1.570149	4.070286	-2.960217	-2.590286	-3.350366	-3.150102	-1.840238	-1.15015
(H10)	1.260019	-1.630461	-4.360561	4.290272	-1.710102	-1.150109	-0.450045	-0.320421	1.160071	1.670071	1.760071	1.760071	1.760071	1.760071	1.760071	1.760071	1.760071	1.760071	1.760071	1.760071	1.760071	1.760071	1.760071	1.760071
(H825)	2.110116	-2.670339	-4.96049	4.290489	-2.570122	-1.330038	-0.040459	-1.670283	-1.950121	0.560008	1.860033	3.070027	2.180157	0.860491	-0.560436	-0.560436	-0.560436	-0.560436	-0.560436	-0.560436	-0.560436	-0.560436	-0.560436	-0.560436
(H10)	2.370181	3.680174	3.680174	4.21046	-1.690033	0.970008	0.88017	-0.400086	-1.910118	1.230116	0.89013	2.93027	2.180172	0.790194	-1.140017	0.530026	-1.010033	-0.810045	-3.280487	3.470334	3.520146	-3.420383	-2.080305	-1.560183
(H875)</																								



Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A

θ(80°)	4.91338	-1.47-0.07	1.42232	2.21021	1.81116	0.13-1.04	-1.771338	2.86-4.02	-3.59-3.86	-3.71-2.72	-1.76-1.04	0.8-1.56	-1.98-2.22	-2.19-2.54	-1.78-0.92	-0.37-0.71	0.88-0.34	0.12-0.34	-1.13-1.19	-1.14-0.53	-0.48-0.05	-0.24-0.06	-0.01153	-3.83-4.96
θ(82.5°)	4.08-2.66	-1.69-0.05	1.72-0.23	3.14-2.84	2.53-2	2.28-1.81	0.46-0.19	-2.04-3.09	-3.71-3.5	-2.63-2.22	-2.11-5.3	-1.14-0.5	-0.61-1.1	-1.19-0.63	-1.11-1.16	-0.88-0.21	0.44-0.56	-0.28-0.15	-0.36-0.84	-1.46-1.57	-1.26-0.06	0.05-0.17	-2.09-3.24	-5.01-4.59
θ(75°)	3.44-2.87	-2.88-1.01	0.98-0.68	1.33-4.2	3.07-2	2.68-1.58	-0.32-0.19	-3.31-4.41	-4.31-2.28	-1.12-1.29	-2.23-2.63	0.14-0.97	0.77-0.86	-1.19-1.15	-1.89-2.28	-2.01-0.53	0.19-0.52	-1.12-1.94	-1.58-1.74	-3.23-3.75	-2.41-1.02	0.21-0.39	-1.19-2.94	-3.99-3.82
θ(82.5°)	2.21-1.3	-1.94-1.6	0.54-0.84	2.16-2.25	2.14-1.08	0.93-0.2	-0.99-2.75	4.2-4.82	-1.39-0.15	0.39-2.25	-2.24-0.67	0.73-1.48	0.69-0.05	-0.32-1.55	-2.53-3.28	-2.44-1.55	-0.48-0.54	-1.29-0.4	-2.97-2.38	-2.12-1.93	-0.91-0.87	0.48-0.09	-1.36-3.42	-3.03-2.6
θ(80°)	3.01-2.45	-2.12-1.28	0.56-0.33	0.28-0.28	-0.41-0.95	-2.57-3.24	-3.16-3.08	-4.34-4.42	-1.63-1.58	-1.84-1.49	-0.72-0.81	0.98-0.9	-1.52-1.79	-2.29-2.89	-3.54-2.72	-1.18-0.37	0.61-0.08	-0.83-2.44	-2.62-2.35	-2.35-2.31	-1.09-1.6	-1.62-0.84	-1.49-2.59	-3.5-3.58
θ(87.5°)	5.16-4.24	-2.93-0.94	-1.07-1.21	0.75-1.49	-1.89-3.09	-4.86-6.32	-6.02-2.75	-0.48-0.25	-0.49-2.02	-2.11-0.69	-0.68-1.02	-1.59-1.82	-2.67-2.12	-3.25-5.58	-5.98-4.08	-2.97-1.45	-1.82-0.28	0.07-0.34	0.38-0.11	-1.34-3.63	-2.13-1.75	-2.39-1.26	-2.17-3.3	-4.47-4.87
θ(105°)	-4.76-4.13	-3.19-2.21	-2.41-2.26	2.27-2.39	-3.11-4.71	-6.05-6.2	-3.52-1.22	-0.47-0.76	-1.59-1.98	0.37-0.05	-0.71-1.21	-2.45-0.97	-3.89-2.82	-6.23-3.96	-6.29-3.24	-9.9-0.7	-0.58-0.54	-0.65-1.57	-1.27-1.82	-3.03-4.08	-4.56-4.44	-4.29-4.08	-4.06-4.35	-4.12-5.29
θ(112.5°)	4.36-4.35	-4.51-3.2	-2.07-0.92	0.83-1.41	-2.43-4.35	-4.98-3.98	-2.41-0.77	-1.11-2.81	-3.61-2.62	0.17-0.78	-2.25-2.6	-3.72-2.5	-1.26-0.5	-1.52-3.58	-5.67-5.22	-4.29-2.16	-1.88-2.53	-2.49-3.4	-2.47-3.2	-4.67-3.8	-3.85-3.26	-5.89-6.12	-7.22-6.41	-7.54-6.74
θ(120°)	5.69-5.48	-4.74-3.11	-1.93-1.9	-2.71-2.53	-4.62-6.13	-4.84-3.61	-3.27-3.5	-4.44-6.89	-5.35-1.84	-1.56-2.67	-2.81-2.75	-4.66-2.81	-3.87-2.21	-3.05-2.74	-1.75-2.03	-1.13-2.25	-2.11-0.89	-3.93-2.61	-1.93-3.09	-5.08-4.02	-3.19-2.48	-4.89-5.71	-7.52-7.31	-4.63-3.26
θ(127.5°)	6.85-4.9	-3.61-2.68	-3.19-4.84	4.13-9.39	-4.62-2.74	0.81-0.15	-1.07-3.11	-3.93-2.18	-0.97-1.58	-3.54-4.27	-4.19-4.88	-6.47-5.84	-3.86-2.83	-2.34-1.75	-2.81-1.09	-3.54-2.58	-2.49-1.55	-2.61-1.72	-2.75-3.7	-3.52-2.34	-2.43-2.49	-4.84-5.35	-6.97-6.8	-10.51-8.28
θ(135°)	-7.18-5.17	-2.99-2.15	-2.38-2.75	-3.36-3.75	-3.59-1.96	0.55-0.76	-2.59-2.9	-0.78-0.6	0.59-0.17	-2.34-2.73	-2.31-3.39	-4.88-7.35	-3.09-0.98	-2.80-3.82	-2.02-1.63	-2.75-4.79	-0.89-5.49	-3.9-2.33	-3.19-3.74	-0.70-0.45	0.86-2.98	-6.71-8.73	-6.12-5.95	-6.24-8.12
θ(142.5°)	6.35-6.28	-7.32-8.38	-7.19-6.37	4.54-3.58	-2.98-2.73	-3.37-3.43	-2.0-0.4	1.44-1.98	1.49-0.35	-1.76-2.71	-4.58-6.78	-6.28-9.14	-1.01-0.86	-2.13-2.94	-4.22-5.49	-6.91-1.97	-3.88-6.83	-1.36-2.72	-5.59-6.48	-2.99-4.54	0.85-0.18	-4.67-7.57	-7.11-5.1	-3.87-4.74
θ(150°)	8.41-8.75	-7.94-7.01	-5.02-3.31	2.45-2.08	-2.13-2.66	-3.01-2.65	-1.89-1.28	-6.52-1.1	-1.54-1.88	-2.06-1.26	-0.88-0.37	-5.86-7.33	-6.4-2.7	-3.71-4.67	-6.8-6.07	-4.89-5.13	-5.41-5.83	-6.83-6.5	-3.86-3.82	-4.85-5.87	-7.89-5.87	-7.88-7.16	-7.16-7.72	
θ(157.5°)	-10.89-11.58	-8.5-8.51	-4.41-3.27	3.18-3.84	-4.52-5.71	-7.13-6.98	-5.81-4.85	-4.92-4.79	-4.15-3.85	-4.4-4.49	-5.65-5	-4.96-3.41	-2.92-3.01	-3.96-7.06	-9.48-7.05	-5.57-5.85	-6.92-5.36	-5.51-6.74	-6.86-8.15	-4.65-6.2	-5.99-6.29	-4.11-4.88	-5.27-6	-4.93-6.73
θ(165°)	-8.17-7.9	-7.29-7.37	-6.79-7.1	-7.967-19	-8.07-6.08	-5.15-4.65	-4.52-4.75	-5.22-4.19	-7.64-6.48	-8.03-6.9	-5.54-4.11	-3.11-2.63	-2.963-3.76	-5.52-7.13	-8.31-7.99	-7.29-6.91	-7.07-7.25	-7.84-8.24	-8.57-8.74	-8.73-8.6	-5.44-4.89	-4.57-4.77	-4.19-5.21	-6.02-7.33
θ(172.5°)	-6.75-6.4	-5.16-4.74	-4.77-4.69	-4.75-5.69	-5.71-5.89	-5.94-4.78	-4.55-4.67	-4.79-5.42	-6.05-6.62	-6.83-6.88	-6.46-6.07	-6.01-6.06	-6.49-6.19	-6.13-5.61	-5.42-5.61	-5.99-6.23	-6.54-6.59	-7.12-7.38	-8.22-8.8	-8.29-9.07	-8.471-7.48	-7.22-6.56	-6.29-6.4	-5.84-5.3
θ(180°)	-7.59-7.89	-8.16-7.96	-7.29-6.52	-6.28-5.68	-5.96-6.23	-6.42-6.43	-6.77-7.25	-8.25-8.89	-10.14-10.36	-10.39-10.33	-8.85-9.62	-9.88-9.54	-8.99-9.24	-7.49-6.59	-7.25-7.98	-8.69-8.95	-8.61-8.9	-8.69-9.7	-10.53-11.96	-12.36-12.32	-11.76-10.63	-10.29-10.18	-10.29	-9.36-7.97
Frequency	5.785024	Thetas	θ	θ	θ	θ	θ	θ	θ	θ	θ	θ	θ	θ	θ	θ	θ	θ	θ	θ	θ	θ	θ	θ
DOH00	θ(0°)/θ(0.5°)	θ(15°)/θ(22.5°)	θ(30°)/θ(37.5°)	θ(45°)/θ(52.5°)	θ(60°)/θ(67.5°)	θ(75°)/θ(82.5°)	θ(90°)/θ(97.5°)	θ(105°)/θ(112.5°)	θ(120°)/θ(127.5°)	θ(135°)/θ(142.5°)	θ(150°)/θ(157.5°)	θ(165°)/θ(172.5°)	θ(180°)/θ(187.5°)	θ(195°)/θ(202.5°)	θ(210°)/θ(217.5°)	θ(225°)/θ(232.5°)	θ(240°)/θ(247.5°)	θ(255°)/θ(262.5°)	θ(270°)/θ(277.5°)	θ(285°)/θ(292.5°)	θ(300°)/θ(307.5°)	θ(315°)/θ(322.5°)	θ(330°)/θ(337.5°)	θ(345°)/θ(352.5°)
θ(0°)	-0.59-1.07	-1.38-1.66	-1.98-1.84	-1.38-1.48	-1.34-1.02	0.53-0.26	0.162	0.53-0.5	1.41-1.61	1.61-1.61	1.41-06	0.85-0.08	-0.86-1.54	-1.86-2.41	-2.76-2.45	-2.34-1.85	-1.33-0.74	-0.31-0.11	0.23-0.23	0.49-0.56	0.81-1.08	1.31-1.41	1.29-1.81	0.32-0.09
θ(7.5°)	-1.78-2.11	-2.63-3.16	-3.44-2.64	-2-1.62	-1.17-1.09	0.82-0.73	-0.69-0.66	-0.41-0.07	0.59-0.95	1.21-1.31	1.35-1.39	0.93-2.07	-0.3-0.28	-0.08-0.05	-0.19-0.52	-0.99-1.36	-1.62-1.78	-1.11-0.62	-0.03-0.21	0.69-0.87	1.18-1.32	1.35-1.25	0.94-0.48	-0.27-0.89
θ(15°)	0.14-0.66	-1.92-3	-4-3.45	2.79-2.77	-2.62-2.87	-3-2.98	-2.84-2.61	-1.97-1.15	-0.28-0.37	0.87-0.89	0.72-0.27	-0.45-0.76	-0.58-0.03	0.55-0.85	0.94-0.51	-0.07-0.76	-1.52-2.12	-2.32-1.27	-0.47-0.05	0.42-0.71	0.88-0.99	1.07-1.06	1.12-1	0.79-0.65
θ(22.5°)	1.22-0.28	-0.62-1.72	2.91-3.89	3.88-4.45	-4.05-4.03	-3.52-2.58	-2.11-1.83	-1.49-0.87	-0.27-0.19	0.34-0.59	-0.92-1.82	-2.14-1.73	-0.99-0.58	-0.53-0.52	-0.84-0.98	-1.26-0.97	-0.69-1.26	-2.32-2.27	-1.84-0.9	-0.21-0.28	0.71-0.1	1.16-0.94	1.15-1.35	1.86-1.71
θ(30°)	0.04-0.59	-1.49-2.53	-3.54-4.68	-4.85-6.39	-5.27-5.08	-4.52-3.59	-2.92-2.38	-1.94-1.55	-1.28-1.06	-1.08-1.71	-2.71-3.45	-4.37-4.18	-3.39-2.27	-1.59-1.09	-1.03-1.41	-1.81-1.95	-2.03-1.77	-1.08-0.58	-0.06-0.22	0.05-0.06	0.03-0.51	0.88-1.12	1.26-1.12	0.88-0.49
θ(37.5°)	2.15-2.92	-3.89-4.58	-5.06-6.61	-7.757-5.09	-5.87-4.46	-3.34-2.73	-2.82-2.44	-1.98-1.37	-1.06-1.07	-1.12-1.1	-1.53-1.68	-1.74-1.59	-1.71-1.71	-2.17-2.97	-2.86-2.73	-2.41-2.08	-1.52-1.41	-0.72-0.04	-0.06-0.93	-1.01-0.72	0.51-0.31	0.07-0.54	0.19-0.05	-0.42-1.14
θ(45°)	-1.3-1.35	-1.96-2.72	-4.81-6.47	-7.14-7.17	-5.55-2.98	-1.47-0.47	-0.18-0.61	-1.65-2.88	-3.53-3.72	-2.76-1.24	-0.88-0.83	-1.34-1.48	-1.19-1.18	-1.69-0.65	-0.58-1.16	-1.72-1.79	-1.75-1.4	-2.12-2.31	-2.14-1.55	-1.62-1.49	-1.5-1.14	0.11-0.82	0.83-1.18	1.03-0.21
θ(52.5°)	-0.46-1.82	-3.14-3.13	-6.45-8.4	-8.24-7.94	-7.23-3.81	-0.03-0.16	1.58-1.11	0.52-1.07	-4.25-3.84	-0.26-0.4	-6.39-1.23	-1.01-0.32	-0.52-1.65	-1.59-0.08	0.55-0.07	-0.79-2.09	-2.86-1.23	-0.33-0.35	0.56-0.1	-1.12-1.37	-1.94-2.25	-1.19-0.15	0.27-0.51	0.84-0.25
θ(60°)	-0.67-2.98	-4.27-4.19	-5.95-5.98	-5.24-5.46	-3.84-1.61	0.38-1.66	1.88-1.01	0.14-0.63	-1.69-2.62	-0.89-0.51	-6.85-1.64	0.69-0.72	2.33-0.84	0.49-1.2	2.05-2.26	1.77-0.27	-3.84-2.86	-2.53-1.69	-0.89-1.75	-2.16-2.28	-2.53-2.1	-2.62-2.72	-2.22-1.74	-0.76-0.48
θ(67.5°)	0.42-1.96	-4.51-5.18	-5.55-5.56	-3.22-2.85	-1.36-0.59	1.13-2.12	2.31-1.75	0.79-0.3	2.19-0.99	0.92-0.99	0.73-1.17	0.67-1.44	1.86-0.99	0.41-0.42	1.17-1.16	2.59-1.12	-2.19-4.39	-4.22-4.12	-4.02-4.09	-3.59-2.99	-4.12-4.36	-3.99-2.97	-1.77-1.15	-0.17-0.42
θ(75°)	0.16-1.89	-4.71-5.58	-6.21-4.97	3.81-3.84	3.89-2.1	2.96-2.51	2.201	0.71-0.57	0.25-0.44	0.28-0.73	2.44-0.93	1.21-0.36	3.11-0.7	0.46-0.67	0.44-0.48	1.44-0.69	0.12-1.8	-5.317-5.51	0.56-2.08	3.27-3.64	5.62-4.07	2.13-3.94	-2.56-2.42	-1.10-0.8
θ(82.5°)	2.27-3.95	-4.01-2.96	-3.48-2.88	-1.42-0.87	-1.44-0.65	1.29-1.98	1.53-1.35	0.39-0.2	-0.33-0.54	1.72-0.75	3.25-0.83	3.71-0.4	4.05-0.65	-0.08-2.15	-0.46-1.67	0.53-1.09	-2.73-1.11	-2.96-4.05	-5.75-5.03	-2.99-0.97	-2.49-3.91	-2.13-1	-2.85-3.76	-3.62-2.46
θ(90°)	-1.32-0.67	-5.22-3.6	-4.16-3.27	0.88-0.38	2.53-2.75	0.48-0.86	1.87-0.25	-0.6-1.54	-1.84-0.13	1.65-2.97	3.95-0.58	4.55-0.91	3.49-2.39	0.75-2.01	-0.21-0.81	1.17-0.34	2.78-1.91	-1.11-2.24	-3.61-5.06	-4.39-2.82	-2.42-2.57	-2.34-2.95	-5.67-7.41	-3.82-2.36
θ(97.5°)	0.48-3.95	-4.35-1.09	-1.32-1.54	-0.88-2.1	2.59-2.31	0.42-0.4	2.48-0.14	-0.27-0.12	-0.86-0.19	1.51-0.6	3.71-0.46	4.16-2.97	3.25-0.3	0.76-0.39	1.63-2.26	1.17-0.58	-0.22-0.13	-0.24-1.2	-3.52-4.07	-1.47-2.15	-1.88-1.24	-1.97-3.3	-3.61-6.38	-4.81-1.89
θ(105°)	-1.03-3.47	-4.16-2.5	-3.45-2.39	3.15-4.18	-4.71-3.16	-0.22-2.2	1.9-1	-0.99-1.41	-3.13-0.25	1.38-0.74	1.37-0.02	3.42-0.3	2.81-1.3	1.35-0.11	0.10-0.36	1.69-0.79	0.23-0.59	0.99-1.5	0.03-0.2	-0.89-1.52	-1.29-0.95	-3.4-5.7	-4.4-6.51	-5.11-1.25
θ(112.5°)	5.19-5.33	-4.54-2.58	-2.28-1.82	-2.22-4.36	-4.21-2.12	0.02-1.55	1.27-0.71	-1-0.65	-1.32-0.26	0.77-0.49	1.09-1.97	2.12-1.39	1.45-2	1.53-0.45	-0.44-0.8	1.69-1.1	0.88-0.36	0.34-1.57	1.29-1.16	1.57-1.3	-2.84-4.01	-4.29-5.47	-6.08-6.44	-5.59-5.13
θ(120°)	2.67-1.5	-2.54-1.87	-2.24-2.36	2.35-2.79	-251-3.14	-3.11-1.14	-0.42-0.69	-1.66-2.72	-1.45-0.52	-2.11-2.08	-1													





Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A

(E22)2	7.5-8.27	-7.617-56	6.45-5.38	4.19-3.55	3.63-4.84	6.91-9.83	-11.97-16.13	-16.98-18.52	-16.9-19.03	-16.17-19.11	-15.36-12.21	6.99-8	6.87-8.92	6.13-4.81	4.20-3.92	4.13-4.13	3.89-3.3	3.36-3.9	4.2-4.26	4.72-4.84	4.9-5.58	6.34-6.11	3.89-3.8	7.59-6.94
(E20)	8.43-11.3	-11.81-22.7	5.31-3.55	5.25-2.25	2.75-4.3	6.95-6.26	-12.96-16.88	-17.84-19.51	-17.93-19.01	-16.79-11.36	-6.02-7.48	6.72-6.28	5.88-5.36	4.87-4.11	3.43-3.26	3.64-4.22	4.74-4.03	5.06-4.71	4.92-6.66	6.05-5.62	4.46-4.49	6.8-5.68	-11.11-8.85	8.58-8.2
(E17)	-1.74-12.13	-8.19-6.83	7.34-6.27	5.46-4.74	5.25-6.94	9.52-10.44	9.51-9.44	-10.40-11.53	-11.42-11.06	8.93-8.49	7.01-6.3	5.73-5.14	4.87-4.72	4.14-3.33	3.15-3.77	3.23-4.95	4.36-4.81	5.52-6.16	4.98-4.81	6.06-6.26	4.03-4.37	8.55-12.85	-14.63-15.93	-15.37-10.68
(E16)	-15.90-10.18	-5.91-5.84	6.48-5.86	5.72-6.07	6.57-7.41	7.59-7.88	6.89-6.89	7.21-6.44	6.54-6.41	6.92-7.71	7.79-7.33	7.22-6.26	5.82-4.91	3.79-3.2	3.04-3.02	3.71-4.84	5.34-5.02	5.03-4.5	5.93-6.82	7.05-6.47	4.36-5.4	7.59-12.07	-19.91-18.58	-15.79-16.94
(E15)	-12.42-6.18	-4.96-1.96	-1.99-2.35	4.17-6.13	4.21-4.95	6.09-6.53	4.81-4.78	4.51-10.43	-10.86-13.71	-12.02-10.6	4.51-10.06	7.58-6.91	6.86-4.96	3.67-3.38	3.89-4.31	5.41-6.42	4.53-4.17	4.16-4.44	5.59-6.81	6.89-7.03	7.30-13.63	-17.97-18.38	-16.87-17.52	
(E14)	5.95-7.17	5.29-4.53	4.89-6.01	6.50-7.1	5.41-1.38	1.89-3.17	6.02-7.68	7.57-7.68	8.76-11.35	-17.46-17.78	-17.83-17.74	-14.21-11.68	-10.09-9.25	7.76-7.87	3.92-7.55	2.41-5.15	4.66-5.95	7.17-8.9	6.86-7.33	5.64-5.86	6.83-6.85	-10.41-13.9	-14.15-14.4	-14.63-11.84
(E13)	-16.15-10.24	6.81-6.5	6.47-7.06	6.01-1.7	2.46-1.71	2.44-4.4	7.74-7.26	15.40-13.46	-16.96-16.98	-17.97-16.98	-17.97-16.98	-14.01-13.57	4.53-4.46	6.39-7.26	7.88-8.27	8.02-9.52	4.16-4.17	6.02-10.33	-12.56-11.29	-11.29-16.08	-18.84-12.5	-18.91-10.34	-17.02-17.17	-17.74-16.5
(E12)	-11.99-10.03	-13.71-15.44	-13.71-10.08	7.25-6.15	3.35-2.3	2.42-5.52	-11.84-17.56	-16.26-18.88	-15.16-12.84	-12.71-12.68	-17.39-19	-16.61-14.06	-13.26-11.4	8.74-8.3	6.52-6.29	5.71-5.24	5.56-6.65	6.52-11.39	-12.30-11.28	-10.77-10.82	8.25-8.65	-10.13-11	-14.57-14.47	-11.39-11.46
(E11)	-16.91-12.26	-16.91-17.58	-16.91-10.89	7.98-8.46	4.24-5.19	7.48-10.88	-14.76-16.08	-16.40-18.05	-13.89-10.38	9.21-9.72	-11.78-13.62	-15.37-13.43	-11.95-9.52	7.30-6.88	6.4-6.23	6.19-6.47	6.32-6.48	8.88-12.35	-16.37-13.92	-11.3-9.09	6.1-5.86	7.93-12.9	-16.41-12.75	-10.32-10.31
(E10)	8.89-10.97	8.14-10.91	-10.08-12.82	8.01-8.62	6.29-9.13	-11.83-12.68	-10.25-16.34	6.27-10.68	-10.55-9.84	8.42-7.52	7.49-7.71	7.29-7.65	-12.81-15.35	-12.23-8.29	6.99-5.64	7.47-8.18	8.83-10.1	6.53-10.81	-12.32-13.87	-15.31-12.67	-10.11-10.86	6.43-12.42	-18.73-17.13	-15.65-9.84
(E9)	-13.90-14.88	-13.02-17.44	-17.81-17.55	-10.35-17.31	-17.76-16.56	-11.96-9.99	-10.83-8.85	8.44-8.13	-10.83-8.85	8.44-8.13	7.16-7.59	7.22-7.61	-10.07-10.84	6.89-7.52	4.47-5.42	7.56-10.88	13.56-12.93	-13.22-16.39	-15.85-15.81	-14.47-12.87	-12.61-15.78	-14.87-17.73	-17.09-16.35	-17.09-16.35
(E8)	-10.24-11.17	-13.27-15.57	-10.74-19.05	-13.67-18.49	-13.07-10.49	9.81-9.93	-10.42-11.93	-11.27-10.41	6.96-9.52	-10.25-8.7	8.26-7.4	6.53-5.46	6.39-7.26	7.88-8.27	8.02-9.52	4.16-4.17	6.02-10.33	-12.56-11.29	-11.29-16.08	-18.84-12.5	-18.91-10.34	-17.02-17.17	-17.74-16.5	-15.91-6.7
(E7)	-11.31-16	-16.32-16.25	-17.89-15.11	-10.12-16.63	8.91-11.9	-11.59-11.67	8.77-8.16	-10.31-11.87	-12.31-10.43	4.43-4.35	5.12-4.41	5.96-7.1	5.84-5.49	4.57-5.64	7.16-9.99	-11.71-17.41	-11.71-17.41	-11.71-17.41	-11.71-17.41	-11.71-17.41	-11.71-17.41	-11.71-17.41	-11.71-17.41	-11.71-17.41
(E6)	-12.92-13.85	-16.46-14.5	6.84-13.57	-17.56-15.92	-16.92-12.59	-16.91-10.26	8.77-8.43	8.93-12.57	-17.02-19.96	-16.77-19.93	-11.47-19.92	-16.46-12.7	5.71-6.65	4.84-6.84	6.89-7.37	2.23-2.83	7.47-13.84	13.81-13.85	9.93-11.8	-17.64-15.84	-17.74-15.84	-17.74-15.84	-17.74-15.84	-17.74-15.84
(E5)	7.02-10.84	-12.3-10.34	6.86-11.96	-15.91-16.15	-18.43-19.5	-12.31-10.26	-12.31-10.26	8.75-9.79	9.83-11.29	-13.86-17.48	9.58-9.16	-16.01-16.76	-16.37-11.73	-10.79-13.35	-15.17-14.38	6.25-6.37	3.52-3.98	3.54-4.44	17.81-19.48	7.91-9.73	16.87-19.37	-10.86-10.37	-12.56-13.02	-10.41-11.39
(E4)	7.75-6.87	7.21-6.14	8.73-13.54	5.93-9.1	16.99-12.4	10.69-9.71	6.71-13.2	-10.51-12.08	8.15-15.3	7.96-9.25	13.73-16.95	-16.34-16.52	-15.76-12.14	6.84-6.36	4.23-11.39	18.84-11.47	6.89-6.42	4.71-7.8	13.51-17.49	12.12-13.71	5.99-12.36	-18.95-13.1	-17.36-17.42	-18.95-13.1
(E3)	-16.91-17.55	5.94-5.81	-11.49-10.87	-17.77-17.53	-17.75-18.98	-14.12-19.32	7.23-6.78	4.29-6.87	8.27-10.14	-15.12-16.15	-16.96-17.92	-16.15-10.39	-10.56-8.62	7.36-6.25	4.37-7.87	4.59-6.52	5.71-6.51	-12.91-17.71	-13.46-18.08	-13.73-16	4.59-6.4	-12.70-16.92	-7.57-6.89	8.15-11.42
(E2)	-14.53-18.85	-18.96-17.43	-16.88-12.58	-11.47-16.13	-14.26-19.84	8.89-7.16	8.23-9.88	-12.04-19.72	-12.92-10.34	-13.81-13.17	-13.18-17.7	-17.20-14.32	-17.47-16.77	-13.46-19.18	-13.39-12.54	8.66-7.14	5.86-6.27	9.49-14.57	-18.96-18.48	-18.41-10.3	4.72-8.47	-18.42-17.78	-18.84-17.01	-16.49-17.1
(E1)	-16.95-11.14	-10.79-11.82	-14.34-14.61	-11.47-10.82	7.58-7.1	7.32-7.41	7.47-4.3	4.19-6.9	-11.67-16.77	-10.19-10.68	-10.19-11.26	-12.22-12.51	-12.71-16.28	-13.12-12.53	-12.77-13.56	-14.62-18.07	7.82-10.65	-15.61-11.04	6.51-10.39	-16.85-11.21	-14.16-17.18	-16.89-18.85	-16.89-18.85	-16.89-18.85
(E0)	-14.76-11.28	-8.46-8.13	8.4-8.22	4.34-5.27	7.83-7.97	8.40-7.98	7.89-7.72	8.40-7.98	-10.52-10.26	-16.84-16.33	-16.10-14.4	-11.61-11.39	-11.61-11.37	-12.95-14.58	-15.96-17.49	-13.95-18.53	-16.71-17.87	-17.62-19.19	-18.15-18.38	-15.84-12.36	10.93-10.39	6.57-10.9	-12.06-14.79	-18.25-17.1
(E-1)	-10.44-12.75	-11.40-10.66	8.79-8.31	7.41-6.86	4.71-7.17	7.37-7.62	7.78-8.03	4.44-6.17	-10.21-11.21	-11.26-11.16	-10.33-9.15	4.15-7.32	6.81-6.48	4.53-6.62	7.37-8.26	9.10-10.14	-11.19-12.72	-13.89-15.26	-13.77-12.06	-11.03-10.98	-12.96-13.84	-10.81-10.26	-18.84-17.3	-18.84-17.3
(E-2)	-16.01-17.77	-19.46-11.43	-10.81-16.61	-10.71-11.16	-11.82-12.38	-11.03-13.43	-15.86-17.35	-18.18-17.16	-18.96-18.99	-17.78-17.16	-16.41-16.37	-13.81-14.87	-17.78-18.47	-18.72-18.82	-19.03-17.99	-18.47-18.74	-18.76-18.51	-17.18-18.72	-18.63-18.39	-18.97-18.55	-14.57-18.65	-13.93-13.83	-18.84-17.3	-18.84-17.3
Freq(Hz)	5.330Psi	Threshold	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Gain	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	(E17)(E25)	
(E17)	7.81-67	12.01-16.76	-18.1-18.59	-17.97-14.99	-12.86-9.66	7.91-6.49	6.53-4.88	4.31-3.82	3.4-3.13	3.19-3.35	3.66-4.18	5.19-5.93	7.04-6.43	8.92-11.42	13.71-18.52	-18.89-17.48	12.96-10	8.19-8.84	5.84-5.78	3.8-3.21	3.11-3.4	3.63-3.67	4.13-4.48	5.99-6.43
(E15)	5.31-6.87	8.52-6.69	-17.91-15.19	-11.32-10.33	6.55-6.2	7.99-6.49	6.16-4.89	5.79-5.43	5.14-4.99	5.34-5.68	5.46-5.87	6.43-10.17	-11.12-11	-13.93-16.18	-18.18-17.57	-16.18-15.84	-13.81-13.85	-10.67-10.61	7.34-7.65	3.63-3.02	2.79-2.53	3.11-3.18	2.23-2.44	3.76-4.13
(E13)	2.28-3.62	4.46-4.51	5.81-5.68	7.34-6.94	-11.98-12.59	12.01-11.04	6.42-6.45	7.95-7.84	6.45-5	6.51-10.06	-10.23-6.77	-16.71-12.9	-13.21-13.95	-14.14-14.81	-16.84-12.7	-10.53-6.53	8.86-8.61	7.99-6.43	5.43-4.39	3.21-2.67	2.31-1.8	1.1-1.65	0.76-0.52	0.76-1.46
(E12)	2.69-3.98	4.46-4.51	5.81-5.68	7.34-6.94	-11.98-12.59	12.01-11.04	6.42-6.45	7.95-7.84	6.45-5	6.51-10.06	-10.23-6.77	-16.71-12.9	-13.21-13.95	-14.14-14.81	-16.84-12.7	-10.53-6.53	8.86-8.61	7.99-6.43	5.43-4.39	3.21-2.67	2.31-1.8	1.1-1.65	0.76-0.52	0.76-1.46
(E11)	2.69-3.98	4.46-4.51	5.81-5.68	7.34-6.94	-11.98-12.59	12.01-11.04	6.42-6.45	7.95-7.84	6.45-5	6.51-10.06	-10.23-6.77	-16.71-12.9	-13.21-13.95	-14.14-14.81	-16.84-12.7	-10.53-6.53	8.86-8.61	7.99-6.43	5.43-4.39	3.21-2.67	2.31-1.8	1.1-1.65	0.76-0.52	0.76-1.46
(E10)	2.69-3.98	4.46-4.51	5.81-5.68	7.34-6.94	-11.98-12.59	12.01-11.04	6.42-6.45	7.95-7.84	6.45-5	6.51-10.06	-10.23-6.77	-16.71-12.9	-13.21-13.95	-14.14-14.81	-16.84-12.7	-10.53-6.53	8.86-8.61	7.99-6.43	5.43-4.39	3.21-2.67	2.31-1.8	1.1-1.65	0.76-0.52	0.76-1.46
(E9)	2.69-3.98	4.46-4.51	5.81-5.68	7.34-6.94	-11.98-12.59	12.01-11.04	6.42-6.45	7.95-7.84	6.45-5	6.51-10.06	-10.23-6.77	-16.71-12.9	-13.21-13.95	-14.14-14.81	-16.84-12.7	-10.53-6.53	8.86-8.61	7.99-6.43	5.43-4.39	3.21-2.67	2.31-1.8	1.1-1.65	0.76-0.52	0.76-1.46
(E8)	2.69-3.98	4.46-4.51	5.81-5.68	7.34-6.94	-11.98-12.59	12.01-11.04	6.42-6.45	7.95-7.84	6.45-5	6.51-10.06	-10.23-6.77	-16.71-12.9	-13.21-13.95	-14.14-14.81	-16.84-12.7	-10.53-6.53	8.86-8.61	7.99-6.43	5.43-4.39	3.21-2.67	2.31-1.8	1.1-1.65	0.76-0.52	0.76-1.46
(E7)	2.69-3.98	4.46-4.51	5.81-5.68	7.34-6.94	-11.98-12.59	12.01-11.04	6.42-6.45	7.95-7.84	6.45-5	6.51-10.06	-10.23-6.77	-16.71-12.9	-13.21-13.95	-14.14-14.81	-16.84-12.7	-10.53-6.53	8.86-8.61	7.99-6.43	5.43-4.39	3.21-2.67	2.31-1.8	1.1-1.65	0.76-0.52	0.76-1.46
(E6)	2.69-3.98	4.46-4.51	5.81-5.68	7.34-6.94	-11.98-12.59	12.01-11.04	6.42-6.45	7.95-7.84	6.45-5	6.51-10.06	-10.23-6.77	-16.71-12.9	-13.21-13.95	-14.14-14.81	-16.84-12.7	-10.53-6.53	8.86-8.61	7.99-6.43	5.43-4.39	3.21-2.67	2.31-1.8	1.1-1.65	0.76-0.52	0.76-1.46
(E5)	2.69-3.98	4.46																						



Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A

(H127.5)	14.96-18.26	-16.06-13.58	-11.09-12.38	-10.25-11.5	-16.16-12.44	-12.26-16.84	-17.46-18.86	-17.15-16.17	-18.54-14.6	-13.8-16.36	-12.25-9.96	-10.07-6.45	6.03-8.65	-7.86-3.28	-3.89-4.18	-3.37-17	-7.03-167	0.11-4.32	0.02-4.27	-1.07-4.63	-8.88-18.86	-15.11-16.15	-16.34-15.6	
(H128)	-18.01-18.71	-10.82-8.78	-4.18	8.96-9.27	-10.02-17.44	18.89-17.39	-15.06-17.78	-16.89-11.65	-12.51-13.14	-15.33-13.43	-17.89-15.73	-17.82-18.47	-13.89-7.44	-4.28-7.37	8.19-6.08	4.59-7.4	-5.57-3.44	-3.19-3.76	-3.88-2.33	-1.9-6.84	-6.65-4.36	-9.02-17.57	-12.37-15.01	-13.2-14.82
(H128.5)	-15.34-18.13	-10.71-12.72	-7.23-6.48	7.81-8.41	8.72-10.56	-18.09-17.78	-18.16-17.48	-16.61-16.86	-16.98-14.14	-17.12-16.08	-14.61-17.96	-16.84-14.08	-7.99-8.07	-7.56-2.87	-1.13-12.18	-3.99-4.06	-4.76-8.11	-7.42-1.35	-6.03-1.26	-12.32-14.91	-18.39-18.74	-17.34-16.19	-18.39-18.74	
(H129)	8.63-8.64	-10.07-12.72	-13.34-12.28	-14.57-17.71	-16.29-13.86	-10.96-10.37	-10.46-11.2	-14.61-16.15	-14.91-11.66	-10.42-10.98	-12.99-15.46	-15.63-14.28	-16.14-18.02	-16.97-17.42	-14.86-17.15	5.39-7.29	-7.98-17.18	-7.06-7.1	87.89-3	-8.71-9.42	-12.03-15.1	-18.14-15	-12.97-14.17	-19.2-15.48
(H129.5)	8.66-8.27	-8.54-8.36	-16.96-12.33	-12.72-12.13	-11.21-10.8	-11.96-13.97	-10.48-15.12	-14.34-15.64	-17.68-18.28	-16.72-15.02	-16.28-19.15	-16.14-17.14	-16.19-18.92	-16.91-18.04	-16.77-17.32	-16.07-18.34	-18.04-18.5	-16.95-19.25	-11.62-14.13	-13.06-13.4	-11.93-12.76	-12.37-14.17	-13.57-18.82	-14.64-15.48
(H130)	-12.15-11.08	-10.96-12.34	-15.33-16.89	-16.83-14.97	-11.13-17.97	-6.03-4.84	4.43-5.22	6.37-4.86	-12.82-17.2	-17.37-17.13	-15.53-15.58	-16.66-17.86	-17.13-14.5	-12.75-12.4	-14.17-18	-16.91-18.51	-18.79-16.18	-17.92-16.18	-12.96-12.24	-11.41-11.27	-11.63-11.54	-12.22-13.16	-14.39-13.08	-12.22-16.76
(H130.5)	-16.05-15.25	-15.25-12.1	-12.72-14.71	-16.82-18.29	-16.86-18.33	-17.98-17.28	-16.79-15.62	-15.98-14.36	-13.93-11.24	-10.10-10.22	-10.99-12.92	-15.55-17.48	-16.65-18.98	-15.91-17.78	-17.76-17.13	-15.91-14.16	-12.07-11.17	-10.66-10.65	-10.25-11.06	-12.35-13.54	-14.89-16.78	-16.79-17.9	-17.34-16.19	-17.34-16.19
(H131)	-17.66-17.38	-16.17-18.79	-17.58-16.41	-12.23-16.78	-8.61-7.78	-7.17-6.88	6.17-6.77	6.77-8.1	-7.23-7.76	8.77-10.05	-11.76-13.92	-16.06-17.57	-17.76-18.36	-19.18-18.89	-16.79-14.82	-13.52-12.4	-10.97-9.11	-7.88-7.22	-6.89-7.42	-8.45-9.71	-11.21-12.75	-14.27-15.76	-17.34-13.14	-18.54-17.98
Freq(Hz)	5.625Psi	ThetadB2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Gain	(H131.5)	(H132)	(H132.5)	(H133)	(H133.5)	(H134)	(H134.5)	(H135)	(H135.5)	(H136)	(H136.5)	(H137)	(H137.5)	(H138)	(H138.5)	(H139)	(H139.5)	(H140)	(H140.5)	(H141)	(H141.5)	(H142)	(H142.5)	
(H131.5)	0.026-0.4	8.04-23	-41-63	-41-63	-41-63	-2.89-4.21	8.23-9.51	-12.22-17.07	-18.31-13.88	-10.67-13.39	-4.93-3.37	-1.89-8.87	0.005	0.74-8.5	0.88-7.7	4.02-8.02	-8.81-13	-3.08-4.58	6.51-8.46	-14.78-16.54	-16.91-16.8	-8.55-8.14	-16.91-16.8	
(H132)	0.005	1.35-6.48	0.006-0.27	-1.42-2.36	-3.92-5.33	7.56-10.06	-10.87-16.24	-16.09-19.09	8.44-6.68	5.09-3.75	2.92-1.95	-1.29-5.84	0.78-5.95	4.25-2.39	2.54-1.79	1.59-1.91	3.29-4.29	6.59-4.65	12.22-12.15	17.92-12.24	8.46-7.9	3.73-3.4	-1.66-2.35	
(H132.5)	0.05-1	4.59-17.5	2.51-2.87	3.98-4.1	6.59-5.51	7.17-9.84	12.94-14.27	12.99-10.38	8.52-6.45	5.51-4.13	3.29-2.88	2.73-2.4	1.84-2.2	2.26-2.2	2.53-2.8	3.48-4.01	5.27-5.15	11.16-17.47	16.15-12.27	8.16-7.64	3.91-3.92	1.91-1.7	-1.19-1.94	
(H133)	3.22-3.49	1.68-1.72	8.36-9.14	8.91-9.53	8.55-7.19	8.24-9.33	-10.46-11.23	-11.17-13.08	-11.41-11.85	-11.04-11.08	8.74-7.38	6.28-5.55	5.08-4.73	4.06-4.19	3.73-3.48	3.51-3.7	4.24-4.87	4.44-4.7	11.59-12.95	18.48-15.24	10.16-9.57	9.31-3	2.89-2.4	
(H133.5)	5.04-7.14	-10.26-12.86	-14.51-12.47	-12.37-13.12	-10.59-8.66	-9.09-9.25	8.88-11.35	-13.96-17.19	-14.84-17.66	-15.64-15.93	8.17-8.47	5.59-5.51	5.44-6.2	3.66-4.1	3.91-1.92	2.63-3.02	5.89-7.93	6.43-10.55	12.21-15.04	14.05-11.5	8.38-6.55	4.14-3.85	3.63-3.92	
(H134)	9.31-16.17	-13.77-16.75	-18.71-18.5	-18.12-18.43	-12.15-18.16	-17.89-11.84	-13.02-12.76	-16.84-8.8	-7.08-4.14	-5.94-5.02	4.12-3.85	4.14-3.1	3.68-2.33	3.25-4.4	3.03-4.1	2.12-2.94	5.33-8.41	-12.42-14.73	15.49-14.08	13.32-12.93	12.19-11.11	8.49-8.36	7.93-7.82	
(H134.5)	-7.34-8.66	-8.19-8.58	8.62-10.17	-13.07-13.12	-12.36-12.77	-14.83-17.99	-13.28-8.63	-6.35-5.15	-4.65-4.94	-5.53-4.59	-3.46-4.14	-6.84-6.52	-3.33-1.69	-0.66-2.4	-0.33-0.7	-1.52-3.3	-7.06-11.84	-15.76-14.93	-13.66-14.62	-15.93-17.46	-17.84-18.19	-19.06-18.35	-19.06-18.35	
(H135)	0.43-10.39	-11.51-12.36	-13.71-16.79	-17.32-17.31	-13.41-17.94	-19.19-18.03	-12.46-8.51	-4.69-4.11	-5.74-4.65	-6.49-4.36	-3.36-3.73	-3.79-4.6	-1.31-2.58	2.1-1.71	-12.93-9.7	-0.66-2.28	-4.58-9.29	-16.87-16.11	-13.97-9.69	-11.84-11.39	-16.71-12.75	-11.19-10.84	-10.88-10.76	
(H135.5)	0.43-10.39	-11.51-12.36	-13.71-16.79	-17.32-17.31	-13.41-17.94	-19.19-18.03	-12.46-8.51	-4.69-4.11	-5.74-4.65	-6.49-4.36	-3.36-3.73	-3.79-4.6	-1.31-2.58	2.1-1.71	-12.93-9.7	-0.66-2.28	-4.58-9.29	-16.87-16.11	-13.97-9.69	-11.84-11.39	-16.71-12.75	-11.19-10.84	-10.88-10.76	
(H136)	-7.34-8.66	-8.19-8.58	8.62-10.17	-13.07-13.12	-12.36-12.77	-14.83-17.99	-13.28-8.63	-6.35-5.15	-4.65-4.94	-5.53-4.59	-3.46-4.14	-6.84-6.52	-3.33-1.69	-0.66-2.4	-0.33-0.7	-1.52-3.3	-7.06-11.84	-15.76-14.93	-13.66-14.62	-15.93-17.46	-17.84-18.19	-19.06-18.35	-19.06-18.35	
(H136.5)	0.43-10.39	-11.51-12.36	-13.71-16.79	-17.32-17.31	-13.41-17.94	-19.19-18.03	-12.46-8.51	-4.69-4.11	-5.74-4.65	-6.49-4.36	-3.36-3.73	-3.79-4.6	-1.31-2.58	2.1-1.71	-12.93-9.7	-0.66-2.28	-4.58-9.29	-16.87-16.11	-13.97-9.69	-11.84-11.39	-16.71-12.75	-11.19-10.84	-10.88-10.76	
(H137)	-7.34-8.66	-8.19-8.58	8.62-10.17	-13.07-13.12	-12.36-12.77	-14.83-17.99	-13.28-8.63	-6.35-5.15	-4.65-4.94	-5.53-4.59	-3.46-4.14	-6.84-6.52	-3.33-1.69	-0.66-2.4	-0.33-0.7	-1.52-3.3	-7.06-11.84	-15.76-14.93	-13.66-14.62	-15.93-17.46	-17.84-18.19	-19.06-18.35	-19.06-18.35	
(H137.5)	-7.34-8.66	-8.19-8.58	8.62-10.17	-13.07-13.12	-12.36-12.77	-14.83-17.99	-13.28-8.63	-6.35-5.15	-4.65-4.94	-5.53-4.59	-3.46-4.14	-6.84-6.52	-3.33-1.69	-0.66-2.4	-0.33-0.7	-1.52-3.3	-7.06-11.84	-15.76-14.93	-13.66-14.62	-15.93-17.46	-17.84-18.19	-19.06-18.35	-19.06-18.35	
(H138)	-7.34-8.66	-8.19-8.58	8.62-10.17	-13.07-13.12	-12.36-12.77	-14.83-17.99	-13.28-8.63	-6.35-5.15	-4.65-4.94	-5.53-4.59	-3.46-4.14	-6.84-6.52	-3.33-1.69	-0.66-2.4	-0.33-0.7	-1.52-3.3	-7.06-11.84	-15.76-14.93	-13.66-14.62	-15.93-17.46	-17.84-18.19	-19.06-18.35	-19.06-18.35	
(H138.5)	-7.34-8.66	-8.19-8.58	8.62-10.17	-13.07-13.12	-12.36-12.77	-14.83-17.99	-13.28-8.63	-6.35-5.15	-4.65-4.94	-5.53-4.59	-3.46-4.14	-6.84-6.52	-3.33-1.69	-0.66-2.4	-0.33-0.7	-1.52-3.3	-7.06-11.84	-15.76-14.93	-13.66-14.62	-15.93-17.46	-17.84-18.19	-19.06-18.35	-19.06-18.35	
(H139)	-7.34-8.66	-8.19-8.58	8.62-10.17	-13.07-13.12	-12.36-12.77	-14.83-17.99	-13.28-8.63	-6.35-5.15	-4.65-4.94	-5.53-4.59	-3.46-4.14	-6.84-6.52	-3.33-1.69	-0.66-2.4	-0.33-0.7	-1.52-3.3	-7.06-11.84	-15.76-14.93	-13.66-14.62	-15.93-17.46	-17.84-18.19	-19.06-18.35	-19.06-18.35	
(H139.5)	-7.34-8.66	-8.19-8.58	8.62-10.17	-13.07-13.12	-12.36-12.77	-14.83-17.99	-13.28-8.63	-6.35-5.15	-4.65-4.94	-5.53-4.59	-3.46-4.14	-6.84-6.52	-3.33-1.69	-0.66-2.4	-0.33-0.7	-1.52-3.3	-7.06-11.84	-15.76-14.93	-13.66-14.62	-15.93-17.46	-17.84-18.19	-19.06-18.35	-19.06-18.35	
(H140)	-7.34-8.66	-8.19-8.58	8.62-10.17	-13.07-13.12	-12.36-12.77	-14.83-17.99	-13.28-8.63	-6.35-5.15	-4.65-4.94	-5.53-4.59	-3.46-4.14	-6.84-6.52	-3.33-1.69	-0.66-2.4	-0.33-0.7	-1.52-3.3	-7.06-11.84	-15.76-14.93	-13.66-14.62	-15.93-17.46	-17.84-18.19	-19.06-18.35	-19.06-18.35	
(H140.5)	-7.34-8.66	-8.19-8.58	8.62-10.17	-13.07-13.12	-12.36-12.77	-14.83-17.99	-13.28-8.63	-6.35-5.15	-4.65-4.94	-5.53-4.59	-3.46-4.14	-6.84-6.52	-3.33-1.69	-0.66-2.4	-0.33-0.7	-1.52-3.3	-7.06-11.84	-15.76-14.93	-13.66-14.62	-15.93-17.46	-17.84-18.19	-19.06-18.35	-19.06-18.35	
(H141)	-7.34-8.66	-8.19-8.58	8.62-10.17	-13.07-13.12	-12.36-12.77	-14.83-17.99	-13.28-8.63	-6.35-5.15	-4.65-4.94	-5.53-4.59	-3.46-4.14	-6.84-6.52	-3.33-1.69	-0.66-2.4	-0.33-0.7	-1.52-3.3	-7.06-11.84	-15.76-14.93	-13.66-14.62	-15.93-17.46	-17.84-18.19	-19.06-18.35	-19.06-18.35	
(H141.5)	-7.34-8.66	-8.19-8.58	8.62-10.17	-13.07-13.12	-12.36-12.77	-14.83-17.99	-13.28-8.63	-6.35-5.15	-4.65-4.94	-5.53-4.59	-3.46-4.14	-6.84-6.52	-3.33-1.69	-0.66-2.4	-0.33-0.7	-1.52-3.3	-7.06-11.84	-15.76-14.93	-13.66-14.62	-15.93-17.46	-17.84-18.19	-19.06-18.35	-19.06-18.35	
(H142)	-7.34-8.66	-8.19-8.58	8.62-10.17	-13.07-13.12	-12.36-12.77	-14.83-17.99	-13.28-8.63	-6.35-5.15	-4.65-4.94	-5.53-4.59	-3.46-4.14	-6.84-6.52	-3.33-1.69	-0.66-2.4	-0.33-0.7	-1.52-3.3	-7.06-11.84	-15.76-14.93	-13.66-14.62	-15.93-17.46	-17.84-18.19	-19.06-18.35	-19.06-18.35	
(H142.5)	-7.34-8.66	-8.19-8.58	8.62-10.17	-13.07-13.12	-12.36-12.77	-14.83-17.99	-13.28-8.63	-6.35-5.15	-4.65-4.94	-5.53-4.59	-3.46-4.14	-6.84-6.52	-3.33-1.69	-0.66-2.4	-0.33-0.7	-1.52-3.3	-7.06-11.84	-15.76-14.93	-13.66-14.62	-15.93-17.46	-17.84-18.19	-19.06-18.35	-19.06-18.35	
(H143)	-7.34-8.66	-8.19-8.58	8.62-10.17	-13.07-13.12	-12.36-12.77	-14.83-17.99	-13.28-8.63	-6.35-5.15	-4.65-4.94	-5.53-4.59	-3.46-4.14	-6.84-6.52	-3.33-1.69	-0.66-2.4	-0.33-0.7	-1.52-3.3	-7.06-11.84	-15.76-14.93	-13.66-14.62	-15.93-17.46	-17.84-18.19	-19.06-18.35	-19.06-18.35	
(H143.5)	-7.34-8.66	-8.19-8.58	8.62-10.17	-13.07-13.12	-12.36-12.77	-14.83-17.99	-13.28-8.63	-6.35-5.15	-4.65-4.94	-5.53-4.59	-3.46-4.14	-6.84-6.52	-3.33-1.69	-0.66-2.4	-0.33-0.7	-1.52-3.3	-7.06-11.84	-15.76-14.93	-13.66-14.62	-15.93-17.46	-17.84-18.19	-19.06-18.35	-19.06-18.35	
(H144)	-7.34-8.66	-8.19																						



Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A

0°	0°	-13.17	-13.12	-15.94	-16.07	-17.50	-16.12	-16.93	-15.26	-13.62	-12.55	-11.25	-9.85	-8.25	-6.55	-4.85	-3.15	-1.45	0.25	1.95	3.65	5.35	7.05	8.75	10.45	12.15	13.85	15.55	17.25	18.95	20.65	22.35	24.05	25.75	27.45	29.15	30.85	32.55	34.25	35.95	37.65	39.35	41.05	42.75	44.45	46.15	47.85	49.55	51.25	52.95	54.65	56.35	58.05	59.75	61.45	63.15	64.85	66.55	68.25	69.95	71.65	73.35	75.05	76.75	78.45	80.15	81.85	83.55	85.25	86.95	88.65	90.35	92.05	93.75	95.45	97.15	98.85	100.55	102.25	103.95	105.65	107.35	109.05	110.75	112.45	114.15	115.85	117.55	119.25	120.95	122.65	124.35	126.05	127.75	129.45	131.15	132.85	134.55	136.25	137.95	139.65	141.35	143.05	144.75	146.45	148.15	149.85	151.55	153.25	154.95	156.65	158.35	160.05	161.75	163.45	165.15	166.85	168.55	170.25	171.95	173.65	175.35	177.05	178.75	180.45	182.15	183.85	185.55	187.25	188.95	190.65	192.35	194.05	195.75	197.45	199.15	200.85	202.55	204.25	205.95	207.65	209.35	211.05	212.75	214.45	216.15	217.85	219.55	221.25	222.95	224.65	226.35	228.05	229.75	231.45	233.15	234.85	236.55	238.25	239.95	241.65	243.35	245.05	246.75	248.45	250.15	251.85	253.55	255.25	256.95	258.65	260.35	262.05	263.75	265.45	267.15	268.85	270.55	272.25	273.95	275.65	277.35	279.05	280.75	282.45	284.15	285.85	287.55	289.25	290.95	292.65	294.35	296.05	297.75	299.45	301.15	302.85	304.55	306.25	307.95	309.65	311.35	313.05	314.75	316.45	318.15	319.85	321.55	323.25	324.95	326.65	328.35	330.05	331.75	333.45	335.15	336.85	338.55	340.25	341.95	343.65	345.35	347.05	348.75	350.45	352.15	353.85	355.55	357.25	358.95	360.65	362.35	364.05	365.75	367.45	369.15	370.85	372.55	374.25	375.95	377.65	379.35	381.05	382.75	384.45	386.15	387.85	389.55	391.25	392.95	394.65	396.35	398.05	399.75	401.45	403.15	404.85	406.55	408.25	409.95	411.65	413.35	415.05	416.75	418.45	420.15	421.85	423.55	425.25	426.95	428.65	430.35	432.05	433.75	435.45	437.15	438.85	440.55	442.25	443.95	445.65	447.35	449.05	450.75	452.45	454.15	455.85	457.55	459.25	460.95	462.65	464.35	466.05	467.75	469.45	471.15	472.85	474.55	476.25	477.95	479.65	481.35	483.05	484.75	486.45	488.15	489.85	491.55	493.25	494.95	496.65	498.35	500.05	501.75	503.45	505.15	506.85	508.55	510.25	511.95	513.65	515.35	517.05	518.75	520.45	522.15	523.85	525.55	527.25	528.95	530.65	532.35	534.05	535.75	537.45	539.15	540.85	542.55	544.25	545.95	547.65	549.35	551.05	552.75	554.45	556.15	557.85	559.55	561.25	562.95	564.65	566.35	568.05	569.75	571.45	573.15	574.85	576.55	578.25	579.95	581.65	583.35	585.05	586.75	588.45	590.15	591.85	593.55	595.25	596.95	598.65	600.35	602.05	603.75	605.45	607.15	608.85	610.55	612.25	613.95	615.65	617.35	619.05	620.75	622.45	624.15	625.85	627.55	629.25	630.95	632.65	634.35	636.05	637.75	639.45	641.15	642.85	644.55	646.25	647.95	649.65	651.35	653.05	654.75	656.45	658.15	659.85	661.55	663.25	664.95	666.65	668.35	670.05	671.75	673.45	675.15	676.85	678.55	680.25	681.95	683.65	685.35	687.05	688.75	690.45	692.15	693.85	695.55	697.25	698.95	700.65	702.35	704.05	705.75	707.45	709.15	710.85	712.55	714.25	715.95	717.65	719.35	721.05	722.75	724.45	726.15	727.85	729.55	731.25	732.95	734.65	736.35	738.05	739.75	741.45	743.15	744.85	746.55	748.25	749.95	751.65	753.35	755.05	756.75	758.45	760.15	761.85	763.55	765.25	766.95	768.65	770.35	772.05	773.75	775.45	777.15	778.85	780.55	782.25	783.95	785.65	787.35	789.05	790.75	792.45	794.15	795.85	797.55	799.25	800.95	802.65	804.35	806.05	807.75	809.45	811.15	812.85	814.55	816.25	817.95	819.65	821.35	823.05	824.75	826.45	828.15	829.85	831.55	833.25	834.95	836.65	838.35	840.05	841.75	843.45	845.15	846.85	848.55	850.25	851.95	853.65	855.35	857.05	858.75	860.45	862.15	863.85	865.55	867.25	868.95	870.65	872.35	874.05	875.75	877.45	879.15	880.85	882.55	884.25	885.95	887.65	889.35	891.05	892.75	894.45	896.15	897.85	899.55	901.25	902.95	904.65	906.35	908.05	909.75	911.45	913.15	914.85	916.55	918.25	919.95	921.65	923.35	925.05	926.75	928.45	930.15	931.85	933.55	935.25	936.95	938.65	940.35	942.05	943.75	945.45	947.15	948.85	950.55	952.25	953.95	955.65	957.35	959.05	960.75	962.45	964.15	965.85	967.55	969.25	970.95	972.65	974.35	976.05	977.75	979.45	981.15	982.85	984.55	986.25	987.95	989.65	991.35	993.05	994.75	996.45	998.15	999.85	1001.55	1003.25	1004.95	1006.65	1008.35	1010.05	1011.75	1013.45	1015.15	1016.85	1018.55	1020.25	1021.95	1023.65	1025.35	1027.05	1028.75	1030.45	1032.15	1033.85	1035.55	1037.25	1038.95	1040.65	1042.35	1044.05	1045.75	1047.45	1049.15	1050.85	1052.55	1054.25	1055.95	1057.65	1059.35	1061.05	1062.75	1064.45	1066.15	1067.85	1069.55	1071.25	1072.95	1074.65	1076.35	1078.05	1079.75	1081.45	1083.15	1084.85	1086.55	1088.25	1089.95	1091.65	1093.35	1095.05	1096.75	1098.45	1100.15	1101.85	1103.55	1105.25	1106.95	1108.65	1110.35	1112.05	1113.75	1115.45	1117.15	1118.85	1120.55	1122.25	1123.95	1125.65	1127.35	1129.05	1130.75	1132.45	1134.15	1135.85	1137.55	1139.25	1140.95	1142.65	1144.35	1146.05	1147.75	1149.45	1151.15	1152.85	1154.55	1156.25	1157.95	1159.65	1161.35	1163.05	1164.75	1166.45	1168.15	1169.85	1171.55	1173.25	1174.95	1176.65	1178.35	1180.05	1181.75	1183.45	1185.15	1186.85	1188.55	1190.25	1191.95	1193.65	1195.35	1197.05	1198.75	1200.45	1202.15	1203.85	1205.55	1207.25	1208.95	1210.65	1212.35	1214.05	1215.75	1217.45	1219.15	1220.85	1222.55	1224.25	1225.95	1227.65	1229.35	1231.05	1232.75	1234.45	1236.15	1237.85	1239.55	1241.25	1242.95	1244.65	1246.35	1248.05	1249.75	1251.45	1253.15	1254.85	1256.55	1258.25	1259.95	1261.65	1263.35	1265.05	1266.75	1268.45	1270.15	1271.85	1273.55	1275.25	1276.95	1278.65	1280.35	1282.05	1283.75	1285.45	1287.15	1288.85	1290.55	1292.25	1293.95	1295.65	1297.35	1299.05	1300.75	1302.45	1304.15	1305.85	1307.55	1309.25	1310.95	1312.65	1314.35	1316.05	1317.75	1319.45	1321.15	1322.85	1324.55	1326.25	1327.95	1329.65	1331.35	1333.05	1334.75	1336.45	1338.15	1339.85	1341.55	1343.25	1344.95	1346.65	1348.35	1350.05	1351.75	1353.45	1355.15	1356.85	1358.55	1360.25	1361.95	1363.65	1365.35	1367.05	1368.75	1370.45	1372.15	1373.85	1375.55	1377.25	1378.95	1380.65	1382.35	1384.05	1385.75	1387.45	1389.15	1390.85	1392.55	1394.25	1395.95	1397.65	1399.35	1401.05	1402.75	1404.45	1406.15	1407.85	1409.55	1411.25	1412.95	1414.65	1416.35	1418.05	1419.75	1421.45	1423.15	1424.85	1426.55	1428.25	1429.95	1431.65	1433.35	1435.05	1436.75	1438.45	1440.15	1441.85	1443.55	1445.25	1446.95	1448.65	1450.35	1452.05	1453.75	1455.45	1457.15	1458.85	1460.55	1462.25	1463.95	1465.65	1467.35	1469.05	1470.75	1472.45	1474.15	1475.85	1477.55	1479.25	1480.95	1482.655
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Appendix A

[illegible]

Report No. AP47171

Report No. : AP471712



Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A

θ(22.5°)	2.27/6.71	5.77/6.05	5.76/5.72	5.32/6.12	8.9/9.82	-10.11/10.85	-10.96/12.96	-17.07/18.01	-16.41/12.24	9.99/6.82	-4.19/5.18	2.48/-1.93	-1.92/2.09	2.32/2.76	3.42/3.89	-4.25/4.78	-5.29/6.38	-8.11/10.91	-14.91/18.87	-14.89/12.36	9.61/6.13	6.67/5.67	5.38/5.48	5.8/6.69
θ(30°)	2.38/2.74	2.79/3.35	4.09/4.91	5.88/8.23	8.79/10.56	10.41/10.04	10/12.03	-16.71/18.53	-17.99/12.91	8.29/5.13	2.69/-1.02	9.19/10.09	-0.48/1.03	-1.86/2.89	-3.74/4.6	-5.71/6.45	-6.41/7.5	-8.16/9.42	-9.82/8.35	-6.37/4.82	-3.97/3.06	2.36/1.8	-1.52/1.47	-1.89/2.11
θ(37.5°)	1.49/2.16	2.22/2.97	2.12/2.26	-1.32/4.6	-6.17/3.4	8.91/10.59	-13.04/18.21	-18.35/10.11	-6.51/4.55	2.77/0.88	0.89/1.2	1.29/0.48	-0.49/-1.81	-3.99/3.82	-6.02/6.78	-8.09/10.11	-12.55/12.32	-11.93/10.99	-8.12/5.36	-4.51/4.17	-3.14/2.3	-1.99/1.61	-1/0.91	-0.99/1.12
θ(45°)	0.41/1.58	-1.42/1.19	-1.27/1.31	-1.54/2.25	-3.07/4.23	-5.97/8.7	-11.15/17.88	-15.43/9.57	-6.59/4.38	2.57/1.29	0.22/0.68	0.32/0.4	-0.71/2	-3.59/6.39	8.71/10.48	-17.25/18.28	-13.99/12.91	-14.54/12.89	-9.47/6.85	-4.13/2.35	2.01/1.83	-1.16/0.58	-0.81/0.44	-0.79/0.73
θ(52.5°)	5.11/3.57	-3.64/2.16	-0.59/0.01	0.31/0.32	-1.46/2.35	-3.43/5.8	-9.32/12.22	-11.33/6.01	-5.46/3.22	-1.33/0.54	0.71/1.46	-2.21/1.74	2.14/2.64	4.52/6.89	8.91/16.56	-18.41/18.72	-14.96/11.67	-10.67/13.78	-18.17/12.4	6.71/3.98	3.17/2.64	-2.03/1.83	-1.26/2.41	4.23/6.17
θ(60°)	5.53/5.58	-4.29/1.88	-6.17/6.78	1.37/0.92	0.12/-1.11	2.11/3.14	4.89/1.72	-12.74/13.18	-7.64/4.94	-2.91/2.3	2.12/2.35	-1.91/1.9	2.15/2.04	2.96/4.97	7.74/11.19	-17.93/18.51	-18.15/12.81	-10.08/1.58	-8.28/6.12	-5.2/3.1	2.04/1.81	2.48/1.88	-1.51/1.56	-3.02/4.82
θ(67.5°)	3.14/2.98	-2.29/1.27	0.08/0.84	0.91/0.61	0.02/0.51	-2.07/3.88	-6.82/10.36	-15.24/11.28	-6.58/4.95	2.10/2.05	-1.02/1.46	-1.79/0.85	-1.02/1.74	-3.14/6	-7.81/13.58	-10.89/12.03	-11.22/16.06	-13.81/16.47	-8.14/6.61	-5.64/3.6	-1.91/1.29	-2.04/3.52	-5.25/6.61	-4.77/3.77
θ(75°)	0.83/1.58	-1.64/1.2	0.18/0.82	1.51/0.87	-0.29/1.57	2.89/4.54	8.33/11.78	-19.6/7.2	-10.96/4.96	-1.86/1.46	2.63/2.43	-1.08/0.09	-0.41/1.89	-4.54/5.08	-7.14/12	-15.69/10.56	-18.18/9.72	-15.38/16.33	-7.76/5.32	6.71/6.02	3.28/1.62	-1.16/1.86	-2.78/4.62	-3.2/1.75
θ(82.5°)	0.53/0.84	0.91/0.75	1.05/1.42	2.59/1	-0.63/2.87	-5.43/7.72	-12.42/11.85	-11.81/14.34	-5.85/1.77	-1.06/1.68	-1.87/0.98	0.77/0.95	0.38/1.22	-1.29/2.89	-4.71/10.28	-19.07/18.86	-18.41/14.37	-10.82/10.6	-7.51/4.89	-3.71/3.64	-3.75/2.39	-1.03/1.62	-2.46/3.35	-1.88/0.42
θ(90°)	0.03/0.86	0.86/5.58	0.71/0.74	0.64/0.96	3.82/7.85	-10.71/12.05	-12.11/11.82	-16.18/13.15	-6.46/4.75	-3.8/2.52	0.75/0.25	8.19/10.34	-1.49/-2.68	-3.08/4.9	6.71/16.51	-18.94/10.6	-11.19/17.81	-14.09/6.13	-6.87/7.76	-5.06/4.45	0.67/5.93	-4.05/3.55	-4.13/4.85	-3.89/0.89
θ(97.5°)	2.99/-1.28	-0.61/0.46	-1.03/-0.83	-0.44/0.19	-3.04/7.15	-12.09/17.97	-18.71/18.67	-7.59/3.82	-2.78/2.36	-1.31/0.99	-1.52/-1.85	-1.83/-1.74	-2.53/-1.2	-5.07/9.24	-12.72/18.88	-17.82/13.29	-13.71/18.61	-16.84/7.95	-4.83/4.93	-4.82/5.37	-5.27/5.84	-5.08/4.18	-5.42/6.07	-6.37/4.45
θ(105°)	5.86/4.32	2.39/1.53	-1.99/1.93	-1.58/0.87	-1.78/4.79	8.38/12.58	11.15/7.72	4.59/2.79	2.8/2.43	-1.31/0.93	0.93/0.66	-1.46/3.31	6.45/9.38	6.97/8.87	8.19/9.34	8.91/13.3	-18.23/17.16	-13.36/14.28	-8.16/4.38	-4.14/4.42	-10.48/11.24	-11.55/9.79	-12.9/9.27	-7.4/7.43
θ(112.5°)	8.43/8.01	6.64/5.37	3.72/2.61	3.31/2.47	2.86/4.16	4.69/7.63	8.74/4.22	-3.48/-4.1	-3.58/2.41	-1.26/1.5	-2.31/3.19	-5.07/6.18	6.24/7.15	7.96/7.83	-13.28/13.09	-18.11/19.12	-17.21/11.28	-8.87/11.03	8.57/8.23	7.94/6.54	-13.29/9.64	-17.01/16.9	-14.42/10.51	-12.38/6.45
θ(120°)	8.31/8.16	-10.08/11.07	8.47/7.19	5.81/5.44	-5.81/5.58	-6.93/7.17	6.27/7.77	8.99/12.34	8.13/9.3	-2.91/2.75	2.52/3.04	-4.06/6.15	-10.41/16.37	-16.62/11.12	-18.35/17.71	-12.89/14.33	-18.11/16.88	-16.79/16.32	-19.18/17.57	-17.43/13.88	-17.07/13.16	-16.02/16.05	-17.11/17.57	8.42/7
θ(127.5°)	-18.98/-16.95	-11.78/-10.05	8.66/9.51	8.39/9.51	5.69/4.38	4.33/5.38	8.21/14.55	-12.94/17.63	-5.65/5.42	8.57/6.21	4.89/3.4	8.65/13.76	-16.83/10.1	-10.77/14.44	7.23/5.49	9.33/15.15	-17.83/16.98	-17.38/13.53	7.23/7.32	8.12/11.25	-12.98/9.47	-16.69/16.78	-18.31/18.7	-16.31/16.7
θ(135°)	-10.7/7.4	7.23/5.21	-5/1.97	-4.41/5.71	-5.83/4.8	8.27/10.61	14.36/16.05	8.82/10.96	-5.55/4.89	4.27/2.24	1.87/2.39	6.02/14.26	-14.76/11.26	8.91/11	-3.1/4.21	10.05/13.68	-18.71/14.22	-19.01/16.48	-13.92/14.4	-4.94/2.89	3.82/9.46	11.02/18.7	-7.53/9.08	-17.41/13.74
θ(142.5°)	-14.99/-9.67	8.9/-16.35	-18.31/-18.91	-12.44/-10.73	-11.33/-12.69	-16.33/13.45	8.49/5.22	-3.53/2.94	3.83/4.54	6.91/6.1	-5.01/5.44	-3.87/3.35	-8.51/13.99	-14.71/12.85	-11.28/8.23	-11.65/10.23	-12.76/14.59	-5.57/9.7	-12.24/9.63	-7.89/9.77	-7.01/6.39	-11.34/18.51	-17.07/12.62	-13.21/15.48
θ(150°)	-18.37/11.74	8.99/4.85	7.28/7.2	8.25/9	-10.48/13.51	-14.4/-11.23	8.14/6.97	-4.77/4.58	-4.7/4.63	4.21/2.87	-2.39/3.83	8.91/12.72	-17.98/18.3	-17.88/16.76	-11.76/10.51	-7.33/4.77	-9.73/18.43	-17.99/15.52	-14.83/11.39	7.28/4.53	-11.23/19.48	-17.7/13.85	-15.26/18.77	-17.83/19.63
θ(157.5°)	-17.32/-16.38	-10/7.39	-6.71/4.25	4.13/8.02	-10.74/14.22	-16.27/13.75	-11.33/9.14	-8.06/7.56	-8.12/9.74	-13.2/17.56	-16.69/10.56	-0.89/6.62	-3.65/4.21	-3.38/6.48	-12.85/17.88	-16.82/16.42	-15.14/18.18	-18.41/17.28	-18.41/18.86	-17.22/12.48	-8.37/8.11	-11.8/8.87	-4.83/4.19	-4.78/6.83
θ(165°)	-9.07/10.01	-10.68/11.39	-11.56/11.87	-11.45/11.54	-11.48/11.41	-10.97/10.45	-10.03/10.13	-10.87/12.41	-15.81/19.27	-15.83/11.25	-7.97/5.58	-3.91/2.81	-2.46/2.79	-4.97/7.39	-11.18/13.87	-13.78/13.27	-14.83/17.05	-18.95/18.84	-18.43/18.64	-16.82/11.91	-4.09/5.52	-3.88/3.17	-2.86/3.47	-4.79/7.18
θ(172.5°)	-5.21/6.38	-6.63/6.47	-7.77/9.34	-9.24/11.05	-14.35/10.79	-17.24/18.86	-14.83/12.42	-10.73/10.03	-9.73/9.99	-10.43/11.18	-11.82/11.78	-11.61/10.58	8.91/9.74	-9.76/9.72	-8.79/10.23	-10.71/11.41	-12.88/15.34	-15.55/17.5	-19.23/18.17	-16.84/12.57	-9.61/4.5	4.23/5.59	-5.11/5.05	-4.81/4.68
θ(180°)	8.02/-10	-12.05/13.06	-13.45/14.35	-16/17.61	-18.5/18.89	-18.75/19.25	-18.84/18.14	-18.11/18.94	-18.74/18.39	-14.53/13.14	-12.48/12.7	-13.64/14.47	-14.65/14.79	-15.01/14.38	-14.76/16.03	-17.99/19.68	-18.51/19.16	-17.59/17.84	-18.74/18.93	-18.12/18.96	-15.86/13.46	-12.21/11.64	-11.44/12.06	-11.7/9.98
Freq(Hz)	5.785GHz	Thermostat	4	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gain	θ(7°)θ(97.5°)	θ(15°)θ(92.5°)	θ(30°)θ(77.5°)	θ(45°)θ(52.5°)	θ(60°)θ(67.5°)	θ(75°)θ(82.5°)	θ(90°)θ(97.5°)	θ(105°)θ(135°)	θ(120°)θ(127.5°)	θ(135°)θ(142.5°)	θ(150°)θ(157.5°)	θ(165°)θ(172.5°)	θ(180°)θ(187.5°)	θ(195°)θ(202.5°)	θ(210°)θ(217.5°)	θ(225°)θ(232.5°)	θ(240°)θ(247.5°)	θ(255°)θ(262.5°)	θ(270°)θ(277.5°)	θ(285°)θ(292.5°)	θ(300°)θ(307.5°)	θ(315°)θ(322.5°)	θ(330°)θ(337.5°)	θ(345°)θ(352.5°)
θ(7°)	-14.26/14.85	-12.31/10.71	8.61/6.48	-4.89/3.97	-3.28/2.67	-2.07/1.57	1.33/1.19	-1.17/1.25	-1.62/1.21	-3.04/4.16	-5.89/4.67	-10.36/13.34	-16.62/17.63	-13.52/11.47	9.42/7.38	5.63/4.39	-3.51/2.88	2.35/1.87	-1.72/2.31	2.37/3.01	3.51/3.85	4.23/5.28	6.69/6.7	-11.38/10.88
θ(7.5°)	-18.93/18.32	-17.73/18.08	-13.96/10.5	8.75/7.92	7.11/6.21	5.44/4.66	3.83/3.18	2.51/2.29	2.4/2.66	3.21/4.38	6.14/6.37	-11.79/16.42	-17.77/13.58	9.31/6.46	4.6/3.24	2.29/1.18	-1.71/1.64	-1.4/1.36	-1.36/1.72	2.2/2.75	-3.32/3.54	-4.72/5.86	-7.33/9.35	-11.83/14.82
θ(15°)	-11.56/13.29	-15.84/15.92	-12.86/14.21	-11.85/14.22	-13.36/13.78	-13.91/12.4	8.88/7.53	-5.81/4.7	3.45/3.12	-3.58/4.87	-6.89/9.88	-14.76/17.76	-17.42/11.13	-7.44/4.73	2.71/1.174	-1.09/0.81	-0.81/0.83	-1.08/1.32	-1.81/2.75	3.51/4.5	5.52/6.24	6.71/7.47	-8.21/9.35	-10.98/10.56
θ(22.5°)	-10.97/12.01	-12.12/10.6	-12.74/11.8	-10.85/11.35	-10.75/11.09	-10.97/9.74	8.98/7.7	6.67/5.67	-4.98/4.52	-4.80/6.02	-7.52/9.61	-11.71/12.57	-10.12/14.1	-5.98/4.14	3.24/2.75	2.38/2.15	-1.92/1.91	-2/2.2	-2.82/2.98	3.16/3.32	3.68/4.57	6.73/6.68	-7.41/8.54	-11.52/10.16
θ(30°)	-13.45/12.16	-12.07/14.81	-18.71/18.83	-14.08/12.79	-12.3/12.65	-12.91/11.68	-10.06/8.04	6.72/4.2	-5.96/6.03	-6.53/7.24	-7.89/6.82	-11.31/13.06	-8.26/6.02	-4.96/4.07	-4.81/5.57	-6.97/6.4	-7/8.01	-3.83/2.26	-1.28/1.2	2.98/3.59	-4.69/5.23	-7.03/6.36	-8.38/9.85	-11.6/12.89
θ(37.5°)	-16.02/17.41	-18.87/19.18	-15.39/19.29	-17.78/13.96	-11.96/12.95	-15/14.46	-10.50/7.45	6.33/4.05	-3.75/4.51	-7.59/6.02	-6.07/6.11	-8.63/7.34	4.81/4.05	5.51/4.7	6.52/6.74	8.02/5.32	8.95/6.64	7.37/4.79	3.26/3.16	-3.42/3.41	4.41/7.08	8.96/10.58	-19.33/18.69	-16.64/15.19
θ(45°)	-19/15.58	-13.95/13.87	-15.22/15.28	-11.36/8.08	-6.99/7.13	8.82/11.14	-11.03/10.11	6.62/10.3	-11.61/10.78	7.24/4.55	-4.58/4.53	-11.66/11.45	-8.01/4.79	6.53/6.11	5.81/4.84	3.84/4.64	8.27/11.2	-13.82/13.82	8.49/5.97	4.71/5.86	6.43/4.45	9.19/14.89	-17.01/18.02	-16.05/16.56
θ(52.5°)	-10.67/10.16	-10.51/12	-18.54/19.4	-11/17.63	-7.07/6.85	6.71/7.51	9.06/9.69	-10.08/12.51	-13.78/8.72	-5.89/5.28	-7.97/17.84	-16.29/8.97	6.87/4.62	5.61/5.54	6.57/5.37	7.09/4.53	-10.71/11.1	-7.8/7.37	-5.61/4.11	5.18/6.42	7.34/10	-13.08/14.09	-16.22/18.14	-16.18/12.54
θ(60°)	-11.55/12.28	-11.73/13.91	-18.03/16.91	-11.81/9.16	-7.89/7.11	7.57/9.98	8.03/9.52	-12.67/15.17	-11.21/8.14	6.58/6.38	-10.48/17.7	-14.83/8.65	-5.52/4.48	-3.84/4.39	3.89/4.46	6.19/11.71	-18.31/16.45	-16.01/13.86	-8.34/5.81	6.89/10.51	-14.97/19.3	-16.74/17.03	-17.41/13.78	-14.29/14.82
θ(67.5°)	-18.03/19	-16.23/15.45	-18.71/17.45	-11.47/13.37	6.81/6.43	5.91/6.18	7.43/9.67	-12.25/10.51	6.84/7.04	8.78/11.82	-12.84/13.34	-16.45/18.86	-11.31/17.42	7.26/6.95	5.03/3.3	4.14/8.79	-10.23/12.22	-16.49/15.7	-11.72/7.94	6.48/10.05	-17			



Antenna Pattern of 2.4GHz&5GHz

Appendix B

e(225)	0.36076	-1.90334	-0.02153	4.65949	-4.63412	-4.23145	6.90767	-10.301223	-12.521028	-11.801230	-11.591971	7.49153	-3.64425	-1.72180	-1.48112	-1.00047	0.54674	0.93939	-0.14023	0.70136	2.12226	2.89282	2.15210	1.69311
e(20)	0.800286	-1.85234	2.84277	3.55648	4.66480	4.98731	4.88074	-4.77883	-10.121024	-9.74159	-9.13046	-11.30348	-5.40146	-2.84124	-2.86126	-1.64013	0.800392	0.81041	-0.88056	1.60201	2.31262	2.85510	2.92186	2.47169
e(18)	-1.862261	-3.39331	-3.63127	-2.49120	-4.67640	-5.81185	-6.71108	-13.101389	-12.101458	-9.74159	-9.13046	-7.58476	-7.74433	-6.88420	-6.81470	-3.30251	-1.27171	0.40140	-0.39062	0.63042	1.06147	1.21286	2.99188	0.30138
e(45)	0.330493	-1.54264	-2.98126	-1.61180	-2.67434	-8.491018	4.870358	-5.57816	-10.381037	-11.101421	-10.081252	-15.291532	-11.759131	-5.30383	-3.811418	-4.95134	-1.91051	0.69116	-1.80022	0.03071	0.77012	2.09919	1.22238	0.89126
e(52.5)	0.601108	2.171426	5.211496	3.731235	1.213260	4.368441	-4.841345	-4.481626	-10.451050	-10.691031	-11.751383	-12.544622	-3.711275	-2.441247	-2.261269	-1.19004	0.46085	0.98095	0.86054	0.07117	1.00197	1.19041	2.151197	-0.19159
e(70)	0.611142	-3.70144	-5.04158	5.631420	-3.241276	-2.911243	-3.231131	-1.01113	-3.80112	-6.491628	-8.79144	-7.721394	-7.951478	-4.861420	-1.261047	-1.601248	-1.671596	0.37056	-0.751085	0.16033	-0.171037	0.06051	0.047251	-2.70019
e(105)	1.020158	4.491537	-5.211514	-4.321762	-0.971033	-0.601263	-3.341301	-3.221371	-6.001451	-10.011486	-5.741454	-5.741454	-1.701455	-2.701692	0.190176	-1.171455	-1.861244	0.266162	-1.681189	-0.591054	0.213132	-1.271032	-1.591449	-0.70061
e(175)	0.231303	0.491423	-7.151624	-2.611031	1.011149	0.871027	0.531833	0.711448	-3.271437	-2.981250	-4.711199	5.641538	-4.171588	-4.311177	-0.511421	0.071022	1.110120	3.711229	-2.011224	-1.321179	-3.211266	0.691406	-1.681228	-0.72069
e(82.5)	3.261436	-11.701040	9.981633	2.471089	0.031006	0.861299	6.621884	-7.261101	-1.011070	-1.811185	-1.541401	3.321084	-1.131172	-2.981272	-2.441191	-1.571089	0.771161	2.831122	-2.961338	2.511219	-2.341191	-1.251188	-3.071059	-4.771244
e(130)	3.7811182	-14.8511223	-14.8511223	-2.601133	-1.501338	0.601339	5.601348	-7.521460	3.411116	0.341126	-2.861184	1.351215	2.361211	2.051190	-1.761157	-1.141113	-1.821139	4.251462	-6.651506	-3.971385	-3.021198	-2.201247	-5.421721	-4.331282
e(157.5)	5.4311226	-14.391046	-12.181043	2.991331	-5.131466	5.491261	2.341363	-3.931196	-1.651935	0.861115	-0.147101	0.280125	-0.521177	-0.281115	-1.091124	-2.991260	-4.071472	-4.961346	-3.421458	-1.471280	-4.121260	-3.791457	-5.4311048	-8.521488
e(105)	7.1711037	9.491423	-13.521789	8.691533	8.341535	-3.091127	-1.361342	-2.841168	0.780130	0.991239	-1.80014	0.571084	0.621161	0.411110	-2.791264	-0.400135	0.701027	2.891459	-5.911435	-7.901495	-4.531520	-1.711439	-6.891147	-12.80163
e(112.5)	10.171104	-12.691108	-12.611036	-10.391145	-14.651417	-4.901329	3.361513	-1.560173	0.121031	-1.421123	-1.461052	0.931140	-0.571049	0.841214	-4.231380	-1.52012	0.556197	5.301469	-4.711431	-6.971119	-5.641911	-4.481405	-12.251442	-15.59133
e(120)	7.501527	8.841489	-6.491701	-1.191523	-15.301535	8.901380	3.381438	-2.781139	0.150114	-2.261338	-2.801321	-1.521016	-1.060118	0.841036	-1.431235	-1.191033	0.811233	4.911838	-3.981198	4.681155	7.881724	-11.131124	-15.491493	-4.69152
e(127.5)	11.711048	7.341444	-6.481771	7.641691	8.151128	6.771426	5.341302	0.01115	0.591270	-1.801236	-0.401735	3.351343	3.011238	0.011281	3.371233	1.221217	2.261036	9.711558	4.871049	-15.591108	-13.911137	-15.151222	-14.491159	0.16138
e(135)	12.231045	4.79104	-7.471689	4.891498	-14.031111	3.771158	3.351052	1.280129	0.691058	-4.241319	-4.911491	7.421331	-1.191235	-1.961235	-1.901230	2.961274	1.871171	3.801230	7.981493	-6.041515	-4.461924	-10.201111	-10.771844	-13.291130
e(142.5)	14.581043	5.151439	-5.581179	4.571429	-5.501534	5.751372	-3.471351	-2.991169	-1.341351	-5.451548	-6.911435	7.771438	5.261150	0.511253	4.161727	5.191147	3.231347	3.201743	9.991408	-6.691460	-3.911459	-15.231143	-17.47163	5.47132
e(150)	4.341783	0.241749	6.991470	5.891487	4.141538	2.911212	2.341322	-4.451444	5.911508	4.971458	6.381550	-11.001107	4.251448	-4.301451	8.591148	-1.578160	3.341258	4.961735	6.191737	6.891737	-10.0711281	-11.561496	-4.22167	
e(157.5)	-11.3711134	8.441749	8.701485	8.411747	-7.551616	-8.061740	-7.711622	-6.931154	-4.891445	-6.801459	8.6211426	-13.541160	-11.001107	-10.7310142	-10.711533	-6.031488	-7.4411283	-10.7511383	-10.2611176	-10.901488	-6.911416	-7.34162	-6.60143	-5.12128
e(165)	-13.5210175	8.711429	-6.8711089	-11.1111032	-10.361029	-8.061740	-8.311419	-9.9211029	-12.511238	-11.721103	-10.711050	-10.881108	-11.121128	-13114140	-14.761186	-12.781449	-13.841499	-10.751638	-13.531142	-5.621452	-7.351473	-10.511327	-10.911327	-13.841018
e(172.5)	14.841411	7.491712	-4.001528	-5.221536	-5.001529	-5.261508	-5.151526	-5.341573	-5.801538	-5.931538	-5.761714	6.431465	4.491439	-6.261337	-4.991467	4.911468	-5.971524	4.831491	-5.471337	-7.481449	8.9511074	-11.971123	-10.161137	-8.61173
e(180)	-11.1011152	-12.071108	-11.581962	8.741823	6.781476	6.941678	4.941793	-1712163	-1712163	8.411431	8.511430	-7.981789	8.151843	-6.149180	-9.821932	-10.311139	-12.501135	-14.181487	-15.151545	-15.7211504	-11.431180	-11.431180	-11.431180	-10.421172
Freq(Hz)	2450P(Hz)	Theta(2)		+	0	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Gain	0(°) 9(°) 18(°) 27(°) 36(°) 45(°) 52.5(°) 60(°) 67.5(°) 75(°) 82.5(°) 90(°) 97.5(°) 105(°) 112.5(°) 120(°) 127.5(°) 135(°) 142.5(°) 150(°) 157.5(°) 165(°) 172.5(°) 180(°)	1.971024	2.12119	2.24213	2.38345	2.48251	2.59258	2.70240	2.82121	2.16230	2.26235	2.46210	2.77218	2.75213	2.96270	2.67201	2.96232	2.62263	2.99253	2.73272	2.13202	2.00192	1.841180	
e(0)	1.571061	1.791134	2.10128	2.47266	2.79252	3.04310	3.26312	2.94291	2.99290	2.96298	3.05112	3.14310	2.93210	2.98200	2.93243	2.96234	2.72274	2.12200	1.80171	1.60154	1.44135	1.26121	1.07106	
e(9)	1.121131	1.481013	1.83219	2.48276	3.03331	3.50331	3.73137	3.73137	3.73137	3.73137	3.73137	3.73137	3.73137	3.73137	3.73137	3.73137	3.73137	3.73137	3.73137	3.73137	3.73137	3.73137	3.73137	
e(18)	0.580166	0.740185	1.08139	1.73210	2.54031	3.43039	3.84100	4.07410	4.09146	4.02138	3.93180	3.57140	3.19139	3.04291	2.77163	2.48213	2.13204	1.69182	1.27163	1.05135	1.13010	0.71017	0.450139	0.400148
e(27)	0.240139	0.490139	-0.16014	0.530186	1.52216	2.70314	3.440168	3.81934	3.81075	3.67081	3.59155	3.60141	3.33323	3.140156	2.99286	2.70252	2.38225	2.10211	2.01184	1.59123	0.820148	0.290120	0.130105	-0.030103
e(36)	1.591184	2.691201	-1.791148	-1.103145	0.621001	1.76231	2.820147	3.30279	2.97257	2.91523	2.580164	2.680172	2.76285	2.87284	2.740159	2.58168	2.40137	1.961164	1.200176	0.360106	-0.101019	0.340105	-0.441122	
e(45)	3.781426	4.95116	5.041458	3.741260	-1.451028	0.761513	2.071050	2.802180	2.80215	1.801144	1.191114	1.291152	1.731195	2.192140	2.682148	2.982149	2.330117	1.571071	1.250178	0.390114	0.010120	-0.441073	-2.291296	
e(52.5)	5.921497	6.841638	6.561754	5.831585	2.061046	0.771556	1.910120	2.001183	1.531141	0.710104	0.260103	0.240108	0.691195	1.441170	1.950122	2.182114	2.182114	2.001191	1.520197	0.660158	0.361007	0.010120	-0.441073	
e(60)	7.531430	9.241497	8.231486	6.991440	-1.591125	-1.99127	2.35125	2.62105	2.62105	3.24103	3.74140	-1.361186	-1.291239	-1.94145	-1.09102	0.620126	0.221040	0.871109	1.51147	1.360148	-1.001123	2.07135	4.99106	6.691177
e(67.5)	9.891781	9.471481	-8.701489	6.241540	6.731402	4.921487	0.561028	0.561028	0.561028	0.561028	0.561028	0.561028	0.561028	0.561028	0.561028	0.56								



Appendix B

Sporton International Inc.



Antenna Pattern of 2.4GHz&5GHz

Appendix B

(H12)27	1.860-2.41	2.442-6.9	-3.760-3.8	8.877-7.0	-7.937-3.1	4.403-3.6	3.364-4.3	-7.450-11.2	6.465-1.9	6.080-9.8	-6.660-5.4	6.346-6.5	-7.016-3.4	-7.266-6.1	-5.800-3.71	-4.059-4.8	-6.910-10.8	8.807-6.3	-5.270-10.37	-14.720-8.82	-7.086-6.9	-5.995-1.6	5.144-2.5	-5.610-2.55
(H12)28	3.330-3.38	2.693-3.1	3.240-4.6	-10.120-9.2	9.226-6.5	4.773-1.5	3.195-5.0	-6.438-1.0	6.599-4.71	-13.118-0.4	-4.795-1.2	7.179-5.5	-5.900-6.7	-8.890-6.7	4.719-5.91	-8.111-13.15	-10.231-13.62	8.570-10.3	-7.440-10.2	-15.006-8.46	-4.516-2.6	-7.854-8.7	-7.400-6.2	-8.848-4.0
(H12)29	6.194-4.1	-6.886-0.6	-6.665-8.3	-10.159-9.7	8.874-6.9	6.717-1.74	7.767-4.3	-6.396-3.0	5.739-6.0	-6.627-5.2	-4.198-6.8	6.717-5.4	-8.824-6.7	-9.730-11.34	-8.016-6.9	9.971-7.94	-15.310-13.3	-1.5010-8.2	-8.970-12.28	-15.330-10.38	-6.710-8.0	-7.470-6.2	-7.740-7.2	-5.940-6.0
(H12)30	7.957-3.7	-7.894-1.6	-8.820-9.4	-9.910-10.74	-10.340-9.7	-9.020-8.0	4.380-9.7	-6.930-7.78	-7.045-6.4	-5.800-4.45	-4.880-6.7	-11.080-10.73	-7.720-4.7	-13.400-14.27	-7.980-8.80	-7.420-13.81	-7.900-9.1	-15.630-12.45	-10.070-12.31	-8.002-6.37	-8.870-8.7	-8.830-3.8	-4.550-5.4	-4.770-4.38
(H12)31	7.710-6.82	-8.450-9.99	-11.779-9.55	-8.850-9.06	-6.920-6.8	-9.230-9.49	-10.670-11.83	-8.844-6.5	-4.424-0.5	-4.710-4.48	-5.230-7.82	-10.670-10.2	-6.750-4.8	-8.810-9.98	-10.980-13.1	-13.450-4.96	-5.520-9.77	-14.580-13.13	-8.860-9.56	-8.544-10.28	-10.820-13.26	-12.230-6.8	-6.894-6.6	-6.630-5.37
(H12)32	-11.980-16.22	-12.530-8.89	-6.410-9.62	-8.830-9.42	-10.400-11.01	-11.880-11.84	-12.080-11.89	-11.170-8.82	-8.550-7.8	-7.240-6.59	-7.420-10.19	-11.330-10.12	-9.310-8.8	-7.710-7.1	-7.080-6.1	-6.880-9.16	-13.810-12.71	-10.360-10.28	-11.260-14.14	-11.820-13.59	-10.280-9.3	-6.800-6.5	-11.860-10.58	-11.860-10.58
(H12)33	6.780-16.23	-10.530-11.89	-11.460-12.45	-10.180-13.80	-10.920-14.09	-10.470-13.75	-11.070-13.97	-6.610-7.8	-6.480-9.4	-6.980-3.83	-4.290-5.97	-10.640-12.76	-12.520-14.00	-15.450-15.58	-14.760-11.52	-6.700-7.36	-10.600-9.56	-6.660-9.52	-7.840-9.32	-7.640-9.32	-10.660-8.77	-7.610-8.40	-7.610-8.40	-7.610-8.40
(H12)34	9.750-12.43	-15.550-15.73	-15.540-15.88	-14.930-14.88	-14.740-15.08	-14.680-15.30	-15.750-15.34	-15.710-14.24	-12.360-11.87	-8.640-8.7	-7.460-7.14	-7.420-8.25	-10.910-8.4	-10.330-11.9	-13.400-14.47	-14.770-15.17	-14.350-13.55	-11.680-11.27	-10.910-15	-10.850-11.72	-11.270-14.01	-10.320-10.45	-9.840-8.2	-7.180-7.6
(H12)35	-13.260-14.23	-14.860-14.29	-13.740-14.68	-14.260-13.77	-14.340-14.29	-14.260-13.77	-14.760-15.47	-14.780-15.47	-14.180-15.64	-12.040-11.92	-12.040-11.92	-14.290-14.26	-15.800-15.26	-15.760-14.92	-14.760-14.01	-14.250-14.26	-14.080-13.81	-13.310-13.92	-14.320-14.32	-15.850-15.84	-15.150-15.27	-14.010-14.35	-12.890-12.74	-12.890-12.74
(H12)36	-14.860-14.86	-14.210-13.84	-13.320-13.71	-14.270-14.37	-13.580-12.88	-12.260-11.57	-11.220-10.94	-10.860-11.53	-11.560-11.32	-10.360-11.00	-10.430-10.28	-10.860-11.1	-11.890-12.61	-13.360-13.43	-14.160-13.34	-14.630-15.19	-14.890-14.81	-13.760-12.75	-12.840-13.02	-13.580-14.47	-14.030-13.10	-12.020-11.87	-12.140-12.67	-13.370-13.30
Freq(Hz)	5.625GHz	Table(4)	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Gain	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)	0(dB)(°/90°)
(H12)37	-10.890-10.27	-10.070-10.20	-9.980-10.07	-8.840-10.55	-11.210-11.82	-12.380-12.57	-11.220-11.80	-11.570-10.98	-10.630-10.72	-11.310-11.60	-12.380-12.14	-9.150-11.73	-11.720-11.8	-10.860-11.19	-11.310-11.65	-11.540-11.64	-11.210-10.38	-10.280-10.33	-10.660-10.65	-10.820-10.32	-11.300-11.01	-10.680-10.59	-10.040-10.34	-10.510-10.82
(H12)38	8.830-4.28	8.310-4.18	-8.040-4.77	-7.880-4.20	-7.840-4.87	-8.210-4.57	-8.460-7.95	-8.470-6.08	-8.060-3.4	-8.400-6.38	-8.070-5.5	-7.950-7.34	-7.770-5.6	-8.200-8.4	-8.340-10.08	-10.100-10.22	-9.990-8.88	-9.680-10.49	-11.280-12.72	-13.190-13.37	-11.900-11.50	-10.750-10.29	-10.400-10.8	-10.830-8.6
(H12)39	7.780-7.7	-7.847-7.5	-6.580-6.32	-6.290-5.9	-5.640-5.28	-5.600-4.83	-4.860-5.15	-5.230-5.44	-5.490-5.88	-7.270-7.31	-7.340-7.25	-6.240-6.45	-6.500-7.53	-8.300-8.80	-8.890-8.34	-7.470-6.64	-6.190-6.01	-6.510-7.23	-7.280-6.83	-6.930-7.23	-7.470-7.54	-7.540-7.20	-7.300-7.02	
(H12)40	-11.890-11.65	-10.220-8.84	-8.090-7.53	-7.140-6.59	-5.900-6.09	-3.900-3.58	-3.510-3.23	-3.420-3.57	-4.070-3.42	-4.070-3.42	-4.070-3.42	-6.800-4.96	-6.800-4.96	-6.790-6.33	-6.020-5.90	-6.050-6.76	-7.480-6.93	-6.810-6.6	-6.990-5.15	-6.510-5.15	-6.740-7.3	-7.890-6.2	-10.260-10.78	-11.370-11.44
(H12)41	9.180-7.98	-7.530-8.21	8.050-10.02	8.970-8.22	-8.800-8.19	-4.420-4.07	-3.360-3.34	-3.040-3.57	-4.590-3.72	-6.860-7.44	-7.350-6.13	-5.760-5.20	-4.930-5.16	-5.240-4.19	-2.860-2.02	-2.190-3.28	-5.680-6.16	-7.980-6.01	-4.170-3.17	-3.140-4.12	-5.680-6.35	-11.430-13.74	-15.330-14.72	-14.880-13.62
(H12)42	6.350-6.27	-5.130-6.52	-7.360-6.87	9.480-8.18	-4.590-6.41	-4.860-6.32	-3.510-5.60	-1.730-1.51	-2.870-2.25	-8.250-10.68	-8.950-7.98	-5.900-4.40	-3.670-3.77	-2.310-1.58	-1.890-3.1	-1.600-4.90	-4.680-6.45	-4.720-4.04	-3.460-3.77	-5.220-7.70	-12.060-12.77	-14.070-12.48	-8.390-6.49	-8.390-6.49
(H12)43	5.740-6.76	8.230-6.1	-8.580-8.69	-11.290-10.36	-7.800-6.21	-3.510-3.94	-3.220-3.59	-3.800-4.88	-8.370-14.27	-11.100-10.39	-8.170-9.73	-3.020-3.28	-3.020-3.28	-4.650-5.09	-3.880-2.55	-1.090-1.04	-2.230-3.75	-4.780-5.45	-4.740-3.88	-5.920-6.33	-12.880-8.63	-10.280-8.84	-6.370-6.33	
(H12)44	3.860-3.5	4.230-4.1	-5.180-5.97	-7.530-6.49	-6.290-3.22	-17.020-8.62	-5.970-5.77	-1.950-4.59	-12.190-15.03	-9.530-7.30	-6.930-6.41	-3.900-3.27	-3.380-3.61	-6.100-6.15	-4.460-1.84	-6.680-2.5	-1.610-2.59	-6.070-3.70	-5.580-6.11	-7.420-8.74	-8.1400-8.5	-6.450-4.38	-6.500-4.32	
(H12)45	4.900-4.79	-4.480-4.94	-3.480-3.75	-4.490-4.79	-4.520-3.07	-8.860-3.12	-1.010-3.19	-2.930-4.58	-7.780-7.89	-6.370-4.63	-3.460-2.39	-1.350-2.23	-2.570-3.47	-8.880-7.14	-4.940-2.31	-2.020-2.35	-1.870-4.88	-7.480-7.51	-5.730-10.25	-11.330-11.38	-9.850-8.39	-7.820-7.99	-4.710-8.4	-4.800-3.27
(H12)46	4.040-4.38	4.490-3.74	-2.390-3.15	-2.190-3.85	-3.870-4.40	-0.250-0.2	0.280-0.14	6.730-2.93	6.120-3.42	-6.050-3.9	1.170-1.5	1.100-0.67	0.660-1.99	-5.230-4.96	-6.820-4.23	-1.470-1.2	-4.330-5.64	-7.780-5.39	-6.780-6.41	-6.070-12.21	-11.680-8.63	-4.490-3.45	-2.550-3.74	-2.740-3.49
(H12)47	2.270-1.99	2.420-1.5	3.420-3.75	3.990-4.72	4.010-3.97	6.760-4.08	1.560-1.93	2.130-4.07	7.990-4.50	1.940-6.01	6.200-6.9	1.500-3.4	2.530-3.6	-3.820-3.28	-2.730-3.36	-1.420-1.86	3.990-4.23	4.980-7.96	7.790-6.80	13.980-13.87	15.760-15.97	5.390-2.25	2.310-1.27	2.940-2.48
(H12)48	2.460-1.80	-1.990-2.54	-2.760-3.73	3.930-5.26	4.240-5.5	6.180-5.25	3.230-4.81	6.140-5.16	6.790-5.23	3.950-5.7	2.510-3.7	1.820-3.02	3.010-3.96	7.960-4.49	1.750-2.97	1.620-3.02	3.010-3.96	6.740-4.49	6.390-5.56	6.240-3.72	12.780-11.97	7.420-7.32	7.880-7.43	4.590-3.42
(H12)49	-1.290-1.0	-0.840-0.83	-1.960-2.73	-2.850-3.51	-2.960-3.82	-0.330-0.47	-0.210-1.0	-1.620-3.05	-3.710-1.2	0.130-1.58	2.490-1.9	2.980-0.9	1.240-0.9	-1.710-8.81	-8.230-3.96	-1.260-3.29	7.480-3.87	6.130-3.2	4.650-10.96	-7.370-7.23	4.790-4.42	5.310-4.22	-4.330-4.94	-2.950-1.26
(H12)50	-1.270-1.26	-0.590-1.13	-0.760-1.19	2.820-3.34	3.950-3.00	-1.270-1.6	-0.360-0.57	-2.230-0.54	-1.600-0.78	0.810-1.2	0.530-1.26	-1.730-1.07	3.410-4.82	7.900-2.42	6.440-2.27	-11.140-14.2	6.410-9.5	6.860-10.29	6.320-9.75	3.300-3.74	3.750-3.45	2.520-3.35	1.190-1.1	1.190-1.1
(H12)51	2.340-1.76	-3.250-2.43	-3.480-3.31	-3.240-3.17	-1.770-1.27	0.350-1.1	0.150-1.62	-3.530-4.96	-6.820-3.25	-2.570-2.08	-2.570-2.08	0.220-1.11	0.740-4.06	-1.380-5.50	-5.960-3.01	-2.710-4.86	7.230-3.63	-1.580-2.75	4.670-11.51	3.360-3.61	6.330-4.68	4.840-4.24	-4.840-4.29	-3.390-3.14
(H12)52	3.470-1.75	-1.720-1.6	-1.120-1.80	-2.340-1.95	-1.080-0.83	0.980-0.81	0.120-1.63	-2.840-1.73	-3.910-3.2	-1.420-1.81	-2.230-1.32	-2.250-1.63	-2.890-1.38	-4.310-3.97	-5.840-3.24	-3.310-1.24	-11.700-8.88	2.890-3.1	-8.870-11.51	-4.100-1.94	-3.220-6.95	-4.880-4.44	-4.780-4.79	-2.830-2.34
(H12)53	-1.790-2.27	-2.890-2.23	-2.170-1.75	-2.980-2.22	-2.020-2.5	-1.560-0.9	0.420-0.99	-4.750-11.13	-5.500-9.36	-3.300-3.39	-5.680-3.0	-5.400-3.61	-2.620-3.07	-7.980-12.15	-3.800-2.62	-4.550-8.6	-1.320-10.39	-4.840-7.87	-7.450-9.74	-3.480-7.16	-7.180-7.12	-3.350-2.61	-5.590-2.47	-4.190-3.38
(H12)54	-1.130-1.34	-1.710-1.76	-1.390-2.02	-1.790-2.71	-3.360-4.5	-3.030-3.22	-1.770-3.55	-6.850-7.99	-6.610-7.30	-7.080-6.82	-7.450-6.04	-5.950-6.81	-8.450-6.45	-8.360-6.79	-11.310-11.6	6.020-4.7	8.860-10.10	4.820-3.26	4.900-7.23	-4.450-7.34	-3.350-1.57	-11.250-1.65	-11.250-1.65	
(H12)55	4.800-4.65	4.110-3.15	-1.700-1.81	-3.330-4.12	-3.520-3.16	0.540-1.0	0.380-2.49	-4.480-2.36	-4.830-4.42	-4.950-3.40	-2.600-3.4	-12.360-13.41	6.470-4.45	-5.710-8.82	-7.740-10.38	-5.590-12.28	0.390-13.10	6.510-8.0	-8.420-8.12	-4.450-8.63	-5.210-8.5	-4.290-5.20	-2.660-5.42	-6.620-6.04
(H12)56	4.830-4.82	6.910-3.24	-6.960-4.8	-8.170-7.6	-7.050-6.59	-4.760-3.83	-3.000-2.69	-2.630-2.87	-3.790-3.4	-5.740-6.42	-4.640-3.66	-10.570-10.06	6.470-4.45	-5.710-7.85	-13.890-13.99	-12.520-12.53	-6.430-9.96	-6.800-9.71	-7.590-7.51	-11.690-14.40	-6.730-3.32	-6.620-4.16	-6.690-4.62	
(H12)57	-1.250-0.94	6.530-4.20	-7.140-5.68	6.610-6.60	5.480-5.07	-4.580-4.97	5.800-5.58	-4.880-5.16	-6.760-5.2	-7.710-6.08	-5.660-4.78	8.740-9.03	-10.690-11.8	-10.040-9.49	-8.450-8.61	6.970-3.7	6.110-6.38	-7.530-8.5	-12.230-13.79	-12.760-12.96	-11.700-11.48	-14.270-10.78		



Antenna Pattern of 2.4GHz&5GHz

Appendix B

W157	4:47:10	-6:09:87	-1:54:11	-7:40:32	5:70:48	4:55:43	5:13:57	-7:09:17	-8:07:79	-8:09:00	5:30:15	-7:89:25	-5:84:86	9:70:142	-14:33:118	9:91:1019	-13:09:134	-15:50:158	-15:17:152	-15:30:152	-15:45:140	-12:71:1058	8:70:738	4:54:685
W167	5:02:46	-6:09:87	-1:54:11	-7:40:32	5:70:48	4:55:43	5:13:57	-7:09:17	-8:07:79	-8:09:00	5:30:15	-7:89:25	-5:84:86	9:70:142	-14:33:118	9:91:1019	-13:09:134	-15:50:158	-15:17:152	-15:30:152	-15:45:140	-12:71:1058	8:70:738	4:54:685
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	0:58:138	
W175	5:04:15	0:16:50	-2:58:13	-1:22:13	1:40:14	-1:38:13	1:25:06	0:52:00	0:51:57	-1:19:118	1:19:118	1:23:127	1:29:156	1:78:199	2:07:208	1:59:179	1:42:111	0						



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

