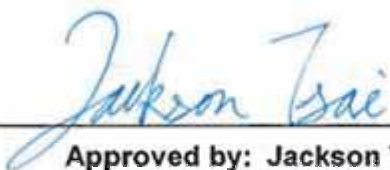




Antenna Composite Gain Test Report

Equipment	11ax Tri-band Extender
Brand Name	ARRIS
Model Name	X6
Applicant	ARRIS 3871 Lakefield Drive Suite 300 SUWANEE Georgia United States 30024
Manufacturer	Gemtek Technology No.15-1 Zhonghua Road, Hsinchu Industrial Park, Hukou, Hsinchu, Taiwan, R.O.C
Sample Received	Aug. 29, 2022
Start Test Date	Sep. 08, 2022
Final Test Date	Sep. 08, 2022


Approved by: Jackson Tsai

SPORTON INTERNATIONAL INC. Hsinhua Laboratory

No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, 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	10
9. Test Setup	11
10. Test Equipment and Calibration Data	12
11. Test Results	13

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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	Gemtek	LPVN-GM-TX-P-005	PCB	I-Pex	2.4GHz+5GHz
2G 5GAnt2	2	Gemtek	LPVN-GM-TX-P-006	PCB	I-Pex	2.4GHz+5GHz
6G Ant1	1	Gemtek	LPVN-GM-TX-P-001	PCB	I-Pex	6GHz
6G Ant2	2	Gemtek	LPVN-GM-TX-P-002	PCB	I-Pex	6GHz
6G Ant3	3	Gemtek	LPVN-GM-TX-P-003	PCB	I-Pex	6GHz
6G Ant4	4	Gemtek	LPVN-GM-TX-P-004	PCB	I-Pex	6GHz

Note:

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

2G 5GAnt1~2G 5Gant2 could transmit/receive simultaneously.

6GHz Operation Mode (4TX/4RX)

6G Ant1~6G Ant4 could transmit/receive simultaneously.

2. Test Frequency

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

Band [MHz]	Test Frequency [MHz]
2400-2483.5	2450
5150-5250	5200
5250-5350	5300
5470-5725	5600
5725-5850	5785
5925-6425	6175
6425-6525	6475
6525-6875	6695
6875-7125	6995

3. Testing Location

Test Lab. : Sporton International Inc. Hsinhua Laboratory				
☒ Wen 33rd.St.	ADD:	No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)		
	TEL: 886-3-318-0787	FAX: 886-3-318-0287		
Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
Radiated	05CH03-HY	Rex Liao	23.5~24.5°C / 45~55%	08/Sep/2022

Note:

Testing Site Information

Brand Name: TDK

Dimension: 11m*6m*6m

Characteristic: Fully Anechoic Chamber

4. Test Facility and Configuration

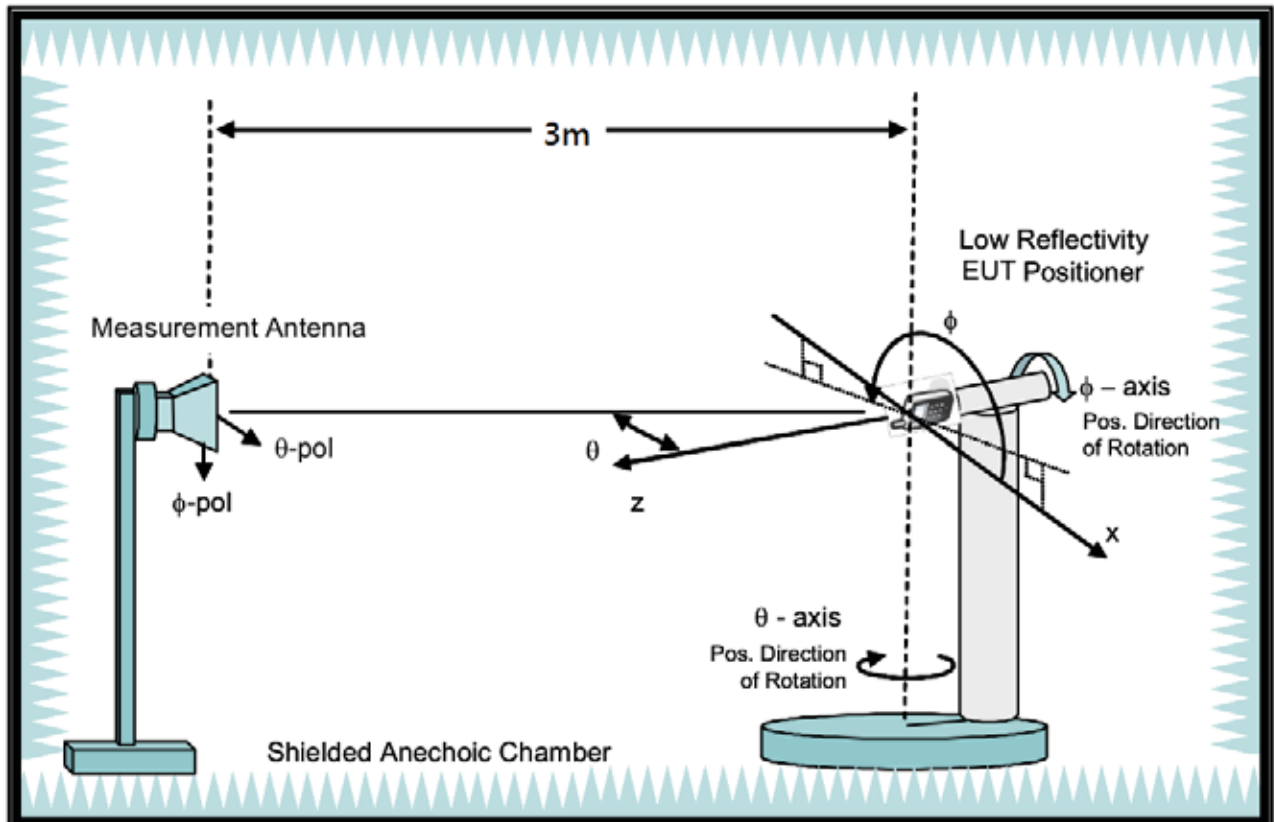
Test configuration: Reference to CITA OTA distributed-axes system configuration.

Chamber: Fully Anechoic Chamber.

Measurement antenna: Dual Polarization Horn antenna

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

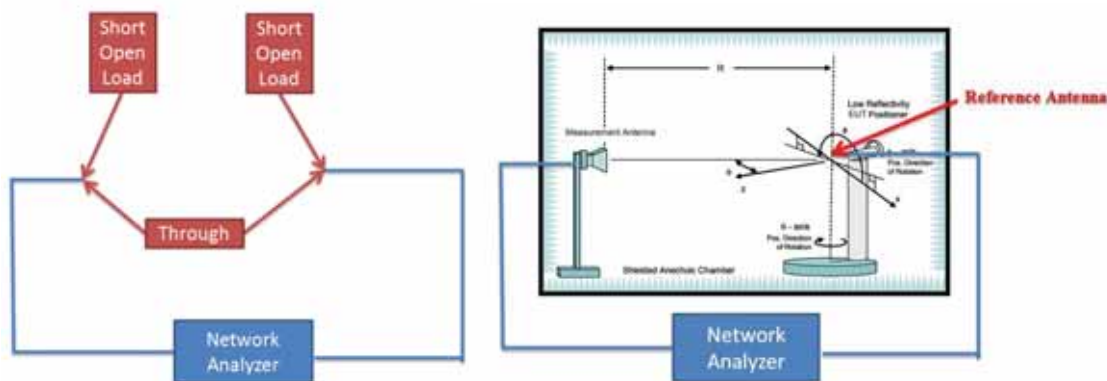
#Reference to CTIA "ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1"



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	7200
G(theta) reading (dB)	-33.55	-33.27	-32.92	-32.91	-32.73	-32.02	-32.67	-32.82	-32.98	-33.18	-32.8	-33.92	-34.62	-35.57
G(phi) reading (dB)	-33.15	-32.7	-32.41	-32.61	-32.43	-31.72	-32.37	-32.51	-32.52	-32.66	-32.5	-33.62	-34.32	-35.48
Reference gain (dBi)	10.1	10.4	10.7	12.5	12.7	13.5	13.4	13.3	13.3	13.2	13.4	12.5	12.1	11.4
Factor(theta) (dB)	43.65	43.67	43.62	45.41	45.43	45.52	46.07	46.12	46.28	46.38	46.2	46.42	46.72	46.97
Factor(phi) (dB)	43.25	43.1	43.11	45.11	45.13	45.22	45.77	45.81	45.82	45.86	45.9	46.12	46.42	46.88

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)	-2.36	1.43	1.18	2.74	-2.05
Ant. 2 (dBi)	4.09	-2.61	-1.92	-3.81	3.61
DG [1SS] (dBi)	4.46	2.65	2.78	3.08	4.24
Polarization	Phi	Theta	Theta	Theta	Theta
$\Theta(^{\circ})$	67.5	75	75	75	52.5
$\Phi(^{\circ})$	300	345	345	345	195

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 [$10^{(G/20)}$]	$10^{(-2.36/20)}$	$10^{(1.43/20)}$	$10^{(1.18/20)}$	$10^{(2.74/20)}$	$10^{(-2.05/20)}$
Ant. 2 [$10^{(G/20)}$]	$10^{(4.09/20)}$	$10^{(-2.61/20)}$	$10^{(-1.92/20)}$	$10^{(-3.81/20)}$	$10^{(3.61/20)}$
Ant. 1 [$10^{(G/20)}$] value	0.762	1.179	1.146	1.371	0.79
Ant. 2 [$10^{(G/20)}$] value	1.601	0.74	0.802	0.645	1.515
Sum All Antenna [Amax]	2.363	1.919	1.947	2.016	2.305
DG [$10 \cdot \log(A_{max}^2/N_{ant})$]	4.46	2.65	2.78	3.08	4.24

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



DG_1SS max value position

Frequency (Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 (dBi)	-5.41	1.73	-5.7	-2.27
Ant. 2 (dBi)	-0.14	-4.08	1.57	-2.8
Ant. 3 (dBi)	-1.76	-2.79	-4.09	0.07
Ant. 4 (dBi)	1.25	-4.96	1.8	-0.71
DG [1SS] (dBi)	4.84	3.91	5.04	4.67
Polarization	Theta	Phi	Theta	Phi
$\Theta(^{\circ})$	52.5	75	52.5	67.5
$\Phi(^{\circ})$	0	82.5	322.5	30

DG_1SS max value position calculation

Frequency (Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 [$10^{(G/20)}$]	$10^{(-5.41/20)}$	$10^{(1.73/20)}$	$10^{(-5.7/20)}$	$10^{(-2.27/20)}$
Ant. 2 [$10^{(G/20)}$]	$10^{(-0.14/20)}$	$10^{(-4.08/20)}$	$10^{(1.57/20)}$	$10^{(-2.8/20)}$
Ant. 3 [$10^{(G/20)}$]	$10^{(-1.76/20)}$	$10^{(-2.79/20)}$	$10^{(-4.09/20)}$	$10^{(0.07/20)}$
Ant. 4 [$10^{(G/20)}$]	$10^{(1.25/20)}$	$10^{(-4.96/20)}$	$10^{(1.8/20)}$	$10^{(-0.71/20)}$
Ant. 1 [$10^{(G/20)}$] value	0.536	1.22	0.519	0.77
Ant. 2 [$10^{(G/20)}$] value	0.984	0.625	1.198	0.724
Ant. 3 [$10^{(G/20)}$] value	0.817	0.725	0.624	1.008
Ant. 4 [$10^{(G/20)}$] value	1.155	0.565	1.23	0.922
Sum All Antenna [Amax]	3.492	3.136	3.572	3.424
DG [$10 \cdot \log(A_{max}^2/N_{ant})$]	4.84	3.91	5.04	4.67

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

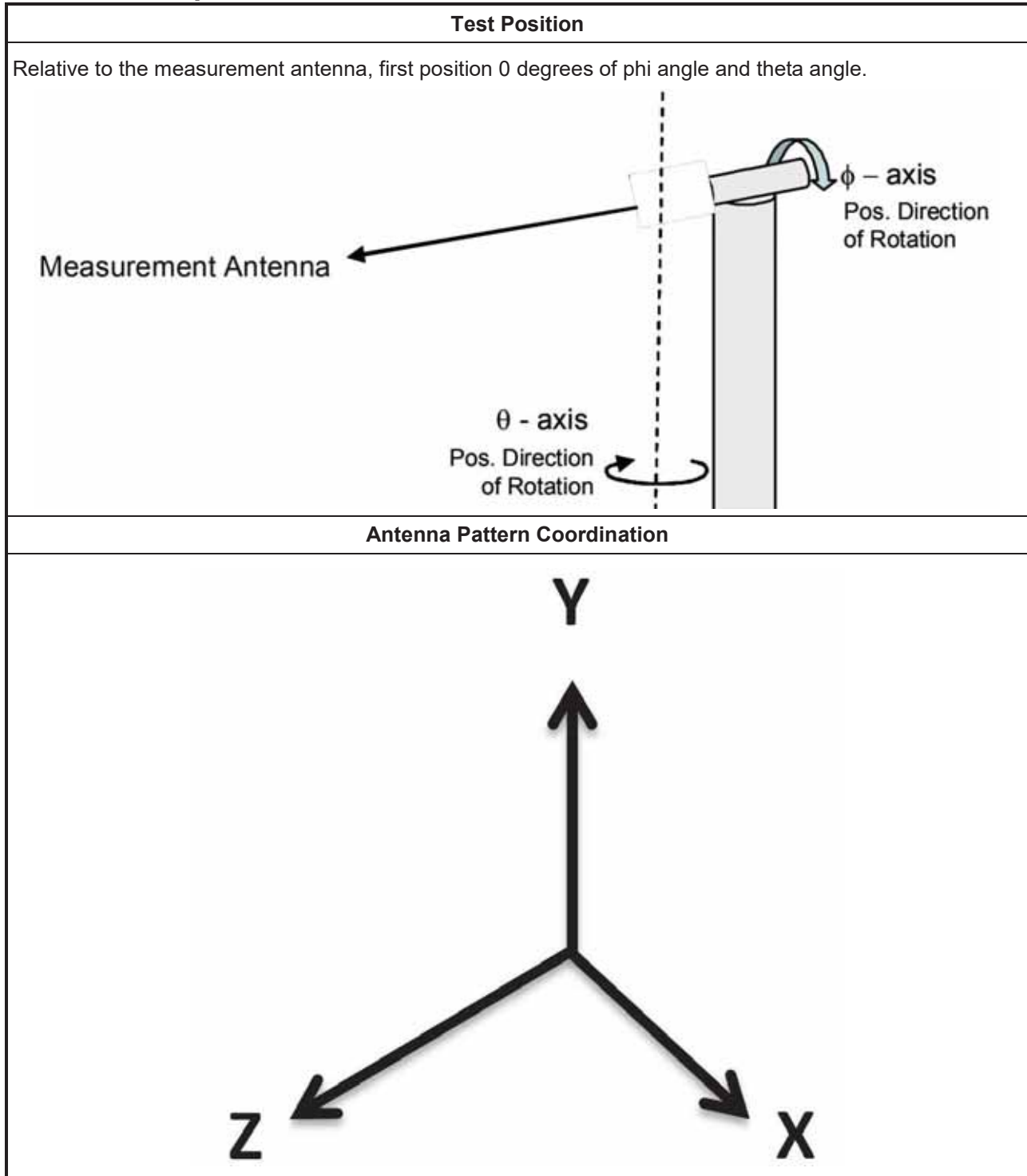
Frequency (Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	3.78	2.01	1.76	2.74	2.04
Ant. 2 Max Gain (dBi)	4.11	2.22	2.21	2.44	3.62
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/97.5/45	Theta/112.5/142.5	Theta/112.5/150	Theta/75/345	Theta/22.5/15
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/67.5/232.5	Theta/37.5/202.5	Theta/37.5/210	Theta/52.5/202.5	Theta/60/195
Max Gain (dBi)	4.11	2.22	2.21	2.74	3.62
DG [1SS] (dBi)	4.46	2.65	2.78	3.08	4.24
DG [2SS] (dBi)	4.11	2.22	2.21	2.74	3.62

Frequency (Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 Max Gain (dBi)	2.62	2.46	2.28	3.06
Ant. 2 Max Gain (dBi)	2.13	2.19	3.4	2.53
Ant. 3 Max Gain (dBi)	2.96	2.22	2.03	3.37
Ant. 4 Max Gain (dBi)	3.02	2.13	2.41	2.78
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/75/187.5	Phi/90/187.5	Phi/75/82.5	Phi/60/97.5
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/37.5/345	Theta/75/337.5	Theta/75/330	Theta/75/315
Ant. 3 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/82.5/150	Phi/67.5/30	Theta/82.5/247.5	Theta/82.5/165
Ant. 4 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/75/37.5	Phi/45/277.5	Phi/45/285	Phi/45/292.5
Max Gain (dBi)	3.02	2.46	3.4	3.37
DG [1SS] (dBi)	4.84	3.91	5.04	4.67
DG [2SS] (dBi)	3.02	2.46	3.4	3.37
DG [4SS] (dBi)	3.02	2.46	3.4	3.37

Note:

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

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 of 2.4GHz&5GHz.....	Page 14
Appendix B – Radiated Composite Gain of 6GHz.....	Page 23
Appendix C – Antenna Pattern of 2.4GHz&5GHz.....	Page 34
Appendix D – Antenna Pattern of 6GHz.....	Page 38
Appendix E – Test Photos.....	Page 44

————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)	3.78	2.01	1.76	2.74	2.04
Ant. 2 Max Gain (dBi)	4.11	2.22	2.21	2.44	3.62
Ant. 1 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Phi/97.5/45	Theta/112.5/142.5	Theta/112.5/150	Theta/75/345	Theta/22.5/15
Ant. 2 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Phi/67.5/232.5	Theta/37.5/202.5	Theta/37.5/210	Theta/52.5/202.5	Theta/60/195
Max Gain (dBi)	4.11	2.22	2.21	2.74	3.62
DG [1SS] (dBi)	4.46	2.65	2.78	3.08	4.24
DG [2SS] (dBi)	4.11	2.22	2.21	2.74	3.62



Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A

φ(0°)	-10.40-13.08	-13.56-11.25	-7.11-3.58	-0.99-0.04	-0.74-1.1	-0.90-1.8	-2.88-3.14	-2.83-2.17	-3.07-5	-6.59-6.86	-6.61-5.59	-4.80-4.35	-4.89-4.88	-4.71-6.89	-6.48-6.96	-4.69-1.36	-0.17-2.21	-4.31-5.18	-2.69-1.17	-0.99-0.34	0.53-0.82	-1.71-5.67	-5.14-6.04	-6.71-9.82	
φ(82.5°)	8.94-9.55	-6.55-6.89	-10.91-9.02	-3.44-0.30	0.11-1.05	2.50-1.17	-3.82-4.48	-4.18-3.85	-6.81-8.82	-6.88-6.52	-5.06-4.99	-4.81-3.85	-5.48-3.43	-4.49-6.38	-6.67-6.9	-3.97-1.12	0.58-0.59	-2.71-4.93	-3.90-7.75	-1.75-0.83	0.73-1.07	-3.60-5.5	-6.31-7.5	-8.95-11.73	
φ(90°)	-10.79-9.14	-8.73-8.52	-8.79-8.43	-4.69-2.36	-2.24-2.64	-4.94-5.83	-6.33-6.13	-4.51-4.59	-5.97-9.7	-6.89-6.99	-7.42-6.07	-7.28-6.97	-7.62-4.55	-6.24-6.64	-6.04-5.99	-6.00-1.87	-0.03-0.71	-2.74-5.22	-3.69-0.62	-0.81-0.6	0.59-2.9	-7.32-8.62	-10.51-12.64	-12.95-14.04	
φ(97.5°)	-12.96-12.37	-10.54-8.89	-8.59-5.71	-4.03-2.94	-3.54-5.74	-6.12-10.06	-6.51-6.73	-5.67-6.01	-8.13-9.54	-8.14-17	-6.84-7.85	-6.40-5.67	-5.34-3.66	-6.51-5.79	-6/6.45	-6.14-3.86	-1.37-1.94	-2.07-3.59	-4.46-5.71	-2.60-0.84	-0.66-4.24	-7.65-8.77	-12.81-13.62	-14.79-15.13	
φ(112.5°)	-7.42-8.24	-7.22-7.7	-8.45-10.53	-10.51-8.22	-7.71-7.22	-7.11-9.28	-7.89-2.88	-2.97-5.48	-8.27-13.08	-12.98-10	-8.23-11.19	-12.33-12.92	-10.18-5.63	-4.04-6.1	-8.32-11.71	-13.13-10.9	-4.81-4.02	-3.52-5.74	-5.71-3.74	-5.11-7.47	-6.19-6.7	-9.91-11.4	-10.43-11.84	-9.37-7.25	
φ(120°)	-8.71-10.08	-11.89-12.44	-12.01-12.54	-9.27-5.77	-6.74-9.47	-8.31-6.35	-7.67-4.47	-4.34-6.08	-8.31-11.69	-13.25-10.28	-7.35-7.61	-6.53-11.39	-12.67-12.24	-11.22-13.98	-10.19-6.67	-8.9-9.51	-7.44-7.86	-4.89-7.69	-6.89-6.21	-6.49-9.19	-7.8-6.52	-14.38-12.64	-8.89-7.31	-5.67-5.55	
φ(127.5°)	-11.91-10.31	-11.49-14.02	-12.13-12.53	-9.51-8.4	-7.37-6.53	-6.75-6.74	-6.96-3.73	-3.80-6.17	-6.39-10.35	-11.58-8.07	-5.36-5.33	-7.55-6.7	-7.39-6.99	-7.11-9.93	-9.09-7.39	-10.84-8.42	-12.21-8.42	-5.89-5.87	-5.26-5.37	-5.65-6.28	-14.79-14.75	-11.91-12.18	-10.23-9.91	-11.27-11.64	
φ(135°)	8.81-8.62	8.29-13.07	-13.96-15.02	-14.59-10.48	-7.9-7.62	-4.20-6.08	-5.11-7.88	-7.61-14.17	-15.49-11.2	-10.59-7.81	-5.71-4.74	-5.25-6.72	-6.3-6.39	-8.27-12.5	-11.49-14.25	-8.9-15.16	-12.8-8.82	-8.03-7.15	-3.67-3.45	-5.71-4.09	-4.85-10.33	-11.24-8.25	-13.61-12.37	-10.42-6.45	
φ(142.5°)	-11.79-12.48	-12.31-14.61	-15.14-13.59	-12.25-6.86	-4.97-3.38	-3.50-5.31	-8.35-7.35	-8.44-9.99	-10.99-7.14	-7.16-6.64	-4.29-5.59	-3.05-4.18	-5.47-7.84	-10.73-15.88	-10.94-6.19	-6.96-7.78	-6.8-6.88	-13.49-7.85	-4.63-4.23	-4.13-3.08	-4.06-6.47	-14.78-11.97	-8.14-10.88	-11.80-16.15	
φ(150°)	-14.83-14.63	-15.52-15.12	-13.37-10.16	-8.62-4.82	-2/1-102	-1.62-3.58	-5.14-5.1	-9-10.3	-8.11-9	-7.81-8.02	-8.18-8.16	-7.39-6.12	-6.39-7.95	-9.07-10.95	-10.59-11.43	-9.39-12.08	-12.77-4.6	-5.02-4.17	-4.31-5.07	-5.83-7.22	-10.07-11.99	-14.43-10.19	-13.69-15.33		
φ(157.5°)	-7.46-8.47	-5.75-5.48	-5.19-6.08	-6.69-6.75	-5.63-4.9	-5.28-5.61	-6.86-6.59	-7.03-7.92	-8.02-7.22	-7.28-7.9	-8.10-11.54	-12.14-9.53	-7.34-5.55	-5.94-5.73	-7.47-8.8	-11.29-13	-15.64-14.73	-12.49-6.65	-5.9-5.72	-6.37-6.43	-7.25-7.3	-6.14-10	-10.90-11.63	-9.34-13	
φ(165°)	-8.17-7.21	-4.88-6.32	-6.53-7.17	-7.79-7.41	-7.14-7.2	-5.96-6.24	-7.98-6.33	-8.34-9.47	-11.31-10.89	-13.11-14.48	-13.46-11.03	-9.27-7.95	-7.04-6.87	-7.89-6.5	-11.41-14.35	-15.11-14.52	-15.43-15.93	-13.81-10.11	-8.68-6.38	-8.51-9.29	-9.92-9.85	-10.22-10.35	-10.41-11.14	-10.11-6.18	
φ(172.5°)	-6.95-6.68	-6.03-5.72	-6.01-6.49	-6.29-6.72	-7.79-8.04	-7.819	-9.21-8.66	-9.48-10.1	-11.91-13.01	-14.42-14.78	-15.35-14.39	-14.23-13.71	-11.99-12.51	-11.67-11.95	-11.91-11.87	-11.82-10.31	-10.77-10.79	-10.75-9.9	-9.95-9.41	-10.99-12.08	-11.37-10.93	-10.34-9.55	-8.24-7.88		
φ(180°)	-14.51-15.94	-15.83-15.95	-15.33-15.02	-14.90-15.06	-14.80-15.33	-15.03-15.03	-14.91-14.06	-12.91-11.85	-10.18-11.43	-10.92-11.78	-10.86-11.52	-11.41-11.67	-11.52-11.77	-11.11-10.39	-10.61-12.38	-12.42-12.61	-11.98-11.15	-11.11-11.39	-11.68-11.62	-12.48-12.14	-11.81-11.15	-11.30-11.61	-11.21-11.98	-12.69-13.75	
Feed(s)	5.7852Pd	Theta	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ		
φ(0°)	φ(97.5°)	φ(157°φ(22.5°)	φ(307°φ(37.5°)	φ(45°φ(52.5°)	φ(60°φ(67.5°)	φ(75°φ(82.5°)	φ(90°φ(97.5°)	φ(105°φ(112.5°)	φ(120°φ(127.5°)	φ(135°φ(142.5°)	φ(150°φ(157.5°)	φ(165°φ(172.5°)	φ(180°φ(187.5°)	φ(195°φ(202.5°)	φ(210°φ(217.5°)	φ(225°φ(232.5°)	φ(240°φ(247.5°)	φ(255°φ(262.5°)	φ(270°φ(277.5°)	φ(285°φ(292.5°)	φ(300°φ(307.5°)	φ(315°φ(322.5°)	φ(330°φ(337.5°)	φ(345°φ(352.5°)	
φ(0°)	0.79-0.71	0.53-0.41	-0.97-1.25	-1.48-2.01	2.75-3.63	4.52-4.25	-7.83-9.27	-10.87-13.45	-11.69-9.97	7.33-5.3	-3.46-2.85	-1.62-0.97	-0.32-0.02	0.07-0.21	-0.16-0.51	-0.96-1.77	-2.94-4.06	-5.79-7.6	9.43-10.53	-12.96-12.23	-10.58-9.12	-6.81-5.79	-5.04-3.73	-2.74-1.48	
φ(17.5°)	1.11-1.26	1.03-0.85	0.24-0.35	-0.65-1.72	-3.01-4.33	6.17-10.49	-11.79-13.51	-14.57-12.14	-10.37-8.88	-7.38-6.19	-5.26-4.03	-3.37-2.66	-1.89-1.87	-1.46-1.15	-1.53-2.01	-2.24-2.63	-3.11-3.89	-4.68-6.27	-7.43-6.18	-8.89-10.29	-9.63-7.5	-5.38-3.65	-2.28-1.16	-0.27-0.52	
φ(15°)	2.48-2.44	2.381-98	1.12-0	-0.80-1.48	-3.17-4.86	-7.28-9.87	-13.52-14.94	-14.00-11.52	9.31-8.16	6.02-5.8	4.5-3.67	2.4-2.15	-1.54-1.27	-1.39-1.53	-2.28-2.86	-3.42-4.24	-4.9-5.41	-5.99-6.15	-7.07-6.19	-8.94-9.19	-7.42-5.02	-2.81-1.37	0.02-0.75	1.38-2.04	
φ(22.5°)	2.373-0.8	3.162-64	1.83-7.3	0.06-0.43	2.14-3.77	-5.85-7.95	-9.93-11.59	-11.28-10.39	8.95-7.69	4.39-5.61	-3.88-2.28	-11-0.24	-0.01-0.33	-0.88-1.03	-1.92-3.22	-2.89-4.08	-3.94-6.67	-7.27-6.9	-7.24-6.4	-8.68-8.15	-5.07-2.43	-0.73-0.05	0.64-0.99	1.031-79	
φ(30°)	0.881-26	1.491-11	0.90-48	-0.22-0.8	2.63-3.8	-4.95-6.82	-8.18-10.59	-12.21-10.45	8.16-5.74	-4.76-3.89	-2.3-0.88	0.34-0.93	1.191-0.8	0.39-0.18	-0.88-1.43	-2.83-4.09	-6.03-6.47	-8.6-7.1	6.77-6.5	-5.93-5.12	-3.78-1.85	-0.55-0.01	0.53-0.29	0.33-0.36	
φ(37.5°)	-1.36-0.34	1.221-53	0.727-0.4	0.671-0.35	-1.57-1.77	2.06-3	-5.75-9.42	-12.47-8.52	-5.11-3.4	-2.72-2.39	-2.08-0.22	1.27-0.3	2.37-0.5	2.367-83	0.58-1	-2.84-4.11	-4.6-6.25	-6.86-6.62	-5.63-4.97	-4.93-4.71	-2.77-1.01	-0.43-0.55	-0.48-1.01	-1.35-1.44	
φ(45°)	-2.6-1.03	0.741-07	1.11-66	0.93-1.38	2.91-3.04	2.68-3.09	4.79-7.01	-9.65-9.46	6.11-4.04	-2.79-1.64	-1.05-0.43	1.45-2.14	3.13-3.53	3.39-2.61	1.071-0.37	2.14-4.7	-6.52-6.67	-7.45-5.72	-4.46-4.37	4.5-4.03	-2.78-1.47	-1.27-1.58	-2.57-3.19	-3.5-3.15	
φ(52.5°)	-2.75-2.83	0.88-1.02	-1.16-0.04	-0.44-2.57	-3.48-4.21	4.54-5.55	-6.63-8.17	-11.19-7.87	-4.42-3.61	-3-2.81	-3.16-1.76	0.18-1.4	2.49-3.1	2.143-78	2.10-36	-3.36-5.68	-7.17-6.33	-6.36-6.04	-4.86-4.73	-4.91-4.94	-2.92-2.78	2.9-2.28	-2.22-2	-2.9-2.96	
φ(60°)	-0.52-1.98	4.3-0.41	-1.19-0.09	-2.29-3.27	-4.34-4.83	-3.76-3.54	-6.36-7.36	-9.66-9.56	-5.64-5.3	-7.23-6.79	-4.49-2.34	-0.10-0.62	1.22-2.74	1.47-0.26	-1.91-1.81	-5.16-6.75	-6.37-6.95	-5.42-7.48	-6.69-6.38	-5.16-5.58	-3.57-1.41	0.66-0.84	0.94-0		
φ(67.5°)	0.21-0.15	-0.24-0.68	-1.58-1.4	2.42-2.43	3.50-3.58	3.37-3.47	6.59-7.97	7.98-9.72	6.73-5.83	6.40-3.33	-3.07-0.61	0.02-0.68	0.66-0.97	2.48-0.5	1.63-0.75	-0.84-3.35	3.89-5.95	7.08-4.48	3.57-4.45	-4.9-3.98	6.01-6.19	2.64-0.24	0.771-0.4	-0.21-0.56	
φ(75°)	1.96-1.27	0.65-0.65	-2.93-3.09	3.07-2.58	-3.83-4.71	-5.07-6.6	-8.39-6.46	-10.31-6.38	-4.31-4.15	-5.02-3.3	-2.92-1.13	-0.97-1.95	-1.31-0.63	1.58-1.95	0.97-0.71	-3-3.25	-3.02-3.77	-4.92-3.79	-2.11-1.78	-2.96-4.53	-4.83-5.25	-1.04-1.09	0.57-0.93	0.941-97	
φ(82.5°)	1.14-0.7	0.60-0.33	-0.10-43	0.22-2.87	-4.48-5.98	-5.51-5.94	-6.93-6.83	-8.31-7.25	-5.27-4.68	-8.72-3.4	3.02-0.2	-0.07-2.36	-1.43-0.46	0.74-0.96	-0.92-0.39	2.72-3.48	-3.21-4.58	-5.67-3.74	-0.73-1.44	-4-5.86	-4.95-2.6	0.64-2.58	1.68-0.81	0.60-49	
φ(90°)	0.45-0.15	-1.871-104	-1.33-1.2	-2.58-3.61	-3.06-5.29	-6.64-6.18	-3.44-4.99	-6.88-6.26	6.90-7.29	-8.76-7.04	0.82-0.32	1.80-0.22	0.23-0.75	0.55-1.98	-1.02-0.48	0.82-1.98	-3.14-5.58	-5.42-3.71	-0.34-1.68	-2.75-4.53	-4.79-2.74	0.571-95	0.45-0.55	-0.84-0.81	
φ(97.5°)	0.121-0.05	-1.811-0.27	-0.111-25	-2.15-4.01	-3.74-5.22	-6.64-6.48	-3.41-4.5	-7.28-4.39	3.04-2.94	-3.81-0.64	0.591-0.83	0.84-0.1	0.01-0.1	-1.161-1.4	-0.99-1.12	-2.58-3.46	-4.64-5.17	-6.21-2.24	-1.37-1.23	-2.89-4.64	-4.19-2.51	-1.14-0.67	-1.011-0.3	-0.85-0.73	
φ(105°)	-1.83-0.01	0.011-23	1.64-0.16	-1.75-0.51	-6.81-9.02	-6.66-1.21	-1.35-2.35	-3.83-3.92	-2.70-3.08	-5.91-4.74	-1.62-0.8	0.701-0.26	0.34-0.41	0.29-0.55	-1.06-0.68	-3.87-4.05	-4.74-6.83	-6.77-3.31	-1.71-2.48	-4.51-5.48	-4.26-3.73	-0.69-3.63	-2.94-1.21	-3.37-3.55	
φ(112.5°)	-4.571-3.06	-3.35-0.93	-3.59-0.93	-4.26-5.75	-6.06-5.75	-6.14-9.1	-3.32-1.88	-1.97-4.16	-4.83-1.97	-2.15-0.41	6.31-0.42	0.011-32	1.08-0.36	-0.97-0.26	-1.84-3.15	-2.69-7.72	-4.33-4.75	-5.89-6.31	6.48-7.13	-3.51-2.6	-5.17-6.3	-4.39-5.42	-11.8-6.87	-7.24-7.96	-6.94-6.65
φ(120°)	-5.971-6.48	-3.39-6.85	-5.99-9.58	-13.93-14.01	-14.41-11.23	-7.27-5.84	-3.97-4.18	-4.46-1.96	0.08-0.16	-1.08-0.89	-3.81-3.55	-3.21-3.21	-4.79-6.5	-14.07-11.81	-9.80-10.04	-7.46-4.86	-6.28-4.42	-6.47-13.57	-4.06-5.24	-4.59-6.1	-4.33-6.89	-6.8-5.68	-6.74-10.74	-6.63-4.7	
φ(135°)	-2.95-6.13	-3.91-9.36	-8-04-11.95	-15.28-13.97	-13.44-7.67	-5.71-8.8	-5.62-6.19	-6.01-5.41	-4.96-3.97	-4.76-6.22	-6.81-5.08	-6.35-6.36	-7.05-4.39	-8.91-6.61	-7.16-9.37	-10.36-6.75	-8.16-6.29	-14.66-14.88	-5.94-4.17	-6.52-7.31	-6.73-6.11	-6.71-6.44	-4.44-13.98	-3.14-0.89	
φ(142.5°)	-5.75-8.34	-9.84-12.01	-11.61-11.44	-12.44-12.91	-11.41-8.08	-5.45-0.53	-4.3-4.45	-4.52-4.47	2.31-1.65	-1.88-3.21	-1.04-5.4	-6.92-6.3	-5.67-5.87	-6.75-9.14	-6.26-12.96	-10.47-10.14	-7.74-8.94	-12.23-11.51	-7.52-7.77	-4					

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Page No. : A7 of A9
Report No. : AP282903AA



Radiated Composite Gain Data of 2.4GHz&5GHz

Appendix A

(H127.5)	7.5716.55	5.8717.32	-10.29-11.93	-14.08-19.18	-18.13.6	-10.33-14.14	-11.48-9.88	-10.12-14.73	-18.39-17.8	-12.82-11.09	-10.59-8.52	-8.52-6.93	-4.82-4.99	-6.70-12.32	-10.01-6.38	-7.87-7.45	-4.03-1.82	2.13-32	3.79-72.3	2.39-4.32	-8.13-9.85	5.33-3.09	4.59-6.07	4.99-8.12
(H142.5)	5.43-4.76	9.71-10.75	-12.22-16.85	-14.99-15.13	-12.88-9.7	7.99-7.55	-12.03-8.77	-12.98-17.7	8.71-7.6	8.73-9.24	8.35-10.13	-13.92-13.53	7.5-6.41	8.34-13.63	8.79-4.43	4.4-4.47	2.91-32	3.38-3.67	2.69-2.24	2.12-1.44	3.39-4.99	4.77-3.75	5.46-8.83	6.39-6.28
(H157.5)	-8.26-18.37	-13.93-11.81	-12.53-14.43	-18.39-17.04	-12.54-14.53	-12.57-14.86	-15.54-19.23	-17.46-17.58	-12.51-10.9	4.98-7.3	8.34-11.82	-14.85-11.16	7.7-6.72	-10.17-12.45	-7.81-5.44	4.07-4.47	4.21-5.55	6.96-3.92	1.32-0.48	-1.03-0.66	6.18-4.83	-11.45-11.72	8.35-10.08	-10.87-7.61
(H167.5)	-10.29-9.83	-10.21-13.1	-15.98-18.1	-18.49-11.43	7.26-5.41	5.53-7.44	-10.11-13.36	-18.01-18.57	-18.74-12.74	8.27-6.87	-7.53-8.52	-8.52-8.45	8.87-9.14	8.71-10.15	-10.17-10.25	-7.83-8.53	5.37-6.88	6.48-10.3	2.11-1.55	2.45-3.36	-5.67-7.98	-11.06-13.13	-11.43-10.25	-10.79-11.08
(H177.5)	-12.87-17.88	-15.65-18.21	-17.82-18.5	-18.78-15.41	-12.35-9.74	9.23-10.09	-12.16-14.14	-16.75-18.82	-16.78-18.06	-10.46-11.38	-10.85-12.9	-12.16-11.21	-10.87-8.84	-10.19-12.72	-13.87-18.47	-18.93-17.88	-17.88-15.41	-12.54-10.44	9.84-13.43	9.89-9.58	9.71-10.87	-13.39-14.75	-15.57-13.98	-16.58-18.95
(H187.5)	-13.47-12.77	-13.41-15.27	-17.06-17.84	-16.75-14.2	-13.44-11.25	-10.89-17.4	-10.89-17.4	-10.89-17.4	-10.89-17.4	-10.89-17.4	-10.89-17.4	-10.89-17.4	-10.89-17.4	-10.89-17.4	-10.89-17.4	-10.89-17.4	-10.89-17.4	-10.89-17.4	-10.89-17.4	-10.89-17.4	-10.89-17.4	-10.89-17.4	-10.89-17.4	-10.89-17.4
(H197.5)	-18.41-18.76	-17.84-17.94	-17.86-18.33	-17.41-18.59	-14.97-12.85	-12.27-11.55	-13.89-10.89	-11.82-11.19	-11.41-11.01	-12.11-12.74	-13.35-13.73	-14.53-15.48	-16.83-18.59	-17.78-19.3	-18.03-18.03	-18.15-17.7	-18.89-14.57	-13.33-12.48	-10.93-8.93	9.75-10.51	-11.09-11.27	-11.33-12.14	-13.59-14.96	-16.82-17.94
FreeRx	5.35Px1.2	FreeRx2.4	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2	5.35Px1.2
(H1)	4.41-4.44	4.14-4.58	4.71-5	4.39-4.69	7.28-3.2	9.46-12.32	-15.25-19.55	-18.02-17.48	15.74-12.5	13.29-19.05	8.71-8.38	5.95-6.45	5.34-4.84	4.65-4.47	4.79-5.27	5.13-4.78	7.57-5.17	-10.65-12.75	-17.82-18.78	-17.57-17.27	-17.93-14.24	-11.97-11.71	7.38-5.99	5.21-5.76
(H2)	4.78-4.32	4.34-4.72	5.39-6.31	2.73-6.86	-10.47-1.67	-13.01-14.57	-16.47-15.15	-17.57-17.29	13.33-9.32	7.82-6.56	5.39-6.12	4.33-3.92	3.64-3.38	3.77-3.97	4.31-4.87	5.77-6.48	7.92-8.88	8.87-10.25	-15.50-17.54	-18.02-19.17	-15.54-11.93	8.87-7.74	4.33-4.74	6.44-6.76
(H3)	4.83-5.33	-3.86-4.73	4.52-7.36	-10.21-11.73	-12.21-13.2	-13.78-13.72	-15.15-15.77	-15.19-12.01	8.72-8.68	-5.23-5.86	-2.98-2.28	2.29-2.15	2.32-2.21	3.34-3.88	-4.64-5.17	4.18-7.19	-8.84-8.81	-10.94-13.42	-15.26-15.95	-16.98-15.45	-15.10-10.25	4.38-5.76	4.17-5.2	4.38-4.41
(H22.5)	5.96-5.35	5.07-5.22	5.4-6.4	-7.89-3.36	-10.47-1.67	-12.70-10.89	-11.95-11.14	8.41-8.93	7.97-6.48	-4.76-10.09	-1.99-1.23	-1.09-1.34	-1.27-1.22	-2.59-2.97	-3.39-3.86	4.59-5.56	6.74-8.02	-15.33-15.75	-13.02-13.44	-15.59-14.63	-8.87-8.22	8.87-7.47	9.71	3.72-4.47
(H32.5)	9.49-8.56	8.21-7.83	9.78-9.77	-8.96-9.78	6.53-10.08	-12.05-10.37	-13.07-11.19	8.23-8.17	7.81-7.42	4.36-4.38	2.67-1.44	-1.02-1.23	-1.16-1.15	8.02-8.65	8.86-1.35	2.35-3.31	4.37-5.53	6.97-10.15	9.97-10.63	8.92-8.73	8.19-10.17	-11.16-13.47	-16.34-15.77	-13.07-10.23
(H37.5)	-12.33-11.15	-10.38-10.19	8.74-8.11	-11.94-11.59	-11.22-11.39	-11.59-13.33	8.73-8.1	7.71-7.68	7.28-6.57	-10.15-11.53	-1.37-1.32	-1.00-1.14	1.47-1.22	3.61-3.73	-1.59-3.81	-1.69-4.84	6.21-6.75	8.96-10.48	-8.01-8.33	6.19-10.17	-11.16-13.47	-16.34-15.77	-13.07-10.23	-13.07-10.23
(H47.5)	-14.81-17.17	-18.73-15.47	-15.79-15.86	-14.02-12.28	-11.64-8.99	8.99-10.15	-10.59-8.83	8.23-7.88	7.06-7.2	7.15-7.4	-3.05-1.71	-1.13-1.1	-0.86-0.68	6.03-6.57	6.81-8.33	3.9-5.23	6.84-8.6	-12.79-13.86	-10.83-14.1	8.71-8.33	-18.89-18.39	-16.27-14.11	-12.58-12.08	-12.58-12.08
(H52.5)	-8.32-13.61	-14.47-13.01	-13.79-17.46	-18.99-18.48	-14.44-11.32	-10.21-10.72	-10.61-11.52	-10.40-10.26	8.36-8.51	8.17-17.8	-4.59-1.24	-1.64-1.49	2.51-1.75	1.59-1.2	-1.91-1.73	2.59-3.81	4.57-5.84	7.54-7.83	-10.43-11.24	9.99-10.66	-10.96-13.86	-17.85-18.03	-15.18-17.11	-16.01-14.83
(H57.5)	-10.84-12.98	-14.26-14.3	-15.79-18.78	-18.44-18.14	-16.16-12.48	-16.71-12.08	-13.16-13.71	8.93-9.06	-10.74-10.37	8.71-8.76	7.43-8.7	-3.43-4.27	-3.9-2.5	2.83-4.13	-3.53-3.16	-2.48-3.17	2.97-3.52	5.04-5.65	4.48-6.03	-11.66-14.47	-12.96-12.42	8.07-8.1	8.57-8.49	8.57-8.49
(H67.5)	7.19-8	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51	-11.76-14.51
(H72.5)	2.5-4.64	4.36-8.13	-10.89-8.91	-8.99-11.82	-18.91-18.46	-14.07-11.81	-14.71-14.85	-11.03-9.94	-14.97-15.14	-11.84-12.33	-11.84-12.33	-11.84-12.33	-11.84-12.33	-11.84-12.33	-11.84-12.33	-11.84-12.33	-11.84-12.33	-11.84-12.33	-11.84-12.33	-11.84-12.33	-11.84-12.33	-11.84-12.33	-11.84-12.33	-11.84-12.33
(H82.5)	-18.89-15.36	-15.99-11.66	-8.69-8.68	4.69-6.15	-17.39-18.28	-12.91-10.95	-12.98-12.16	-14.12-12.21	-14.14-13.11	-11.48-11.41	-1.82-3.65	-6.89-7.43	4.44-5.14	1.89-2.23	3.71-3.43	-3.07-2.79	4.41-4.48	4.59-5.09	2.59-3.84	-41-22	-3.28-2.73	4.41-4.48	4.59-5.09	4.59-5.09
(H97.5)	-13.50-14.54	-15.47-13.99	-10.78-11.82	-8.32-10.38	-16.53-18.16	-14.28-8.71	9.08-14.27	-13.72-16.04	-12.07-11.31	7.89-8.56	8.94-7.65	7.21-8.62	5.11-7.41	7.83-8.67	8.35-8.68	5.99-4.2	5.24-5.44	4.33-3.19	3.61-3.64	4.34-3.29	2.98-3.38	2.69-3.2	8.33-13.84	-11.89-13.37
(H97.5)	8.56-7.53	7.40-7.37	7.4-10.21	7.21-6.69	-14.57-18.98	-11.47-11.89	-11.47-11.89	-11.47-11.89	-11.47-11.89	-11.47-11.89	-11.47-11.89	-11.47-11.89	-11.47-11.89	-11.47-11.89	-11.47-11.89	-11.47-11.89	-11.47-11.89	-11.47-11.89	-11.47-11.89	-11.47-11.89	-11.47-11.89	-11.47-11.89	-11.47-11.89	-11.47-11.89
(H107.5)	7.77-7.83	4.62-7.22	8.12-12.09	7.14-8.94	-14.88-9.32	8.62-8.34	7.22-11.23	-18.98-19.03	-17.73-10.82	-17.74-8.68	8.31-8.62	7.81-8.58	4.94-7.79	8.57-5.33	7.8-8.28	4.51-5.76	4.45-5.39	3.21-6.57	4.29-5.25	-1.89-7.38	-15.07-11.85	7.88-7.89	7.88-7.89	7.88-7.89
(H112.5)	7.4-5.54	6.89-8.87	8.98-10.82	-12.89-9.91	-11.21-10.67	-10.46-10.53	8.81-13.13	-18.98-17.72	-17.58-11.02	5.89-5.98	6.89-7.16	8.97-8.73	4.79-6.22	7.07-6.97	11.35-9.87	-10.57-8.62	9.63-5.07	7.79-8.09	5.89-7.36	5.07-5.32	3.29-10.31	-16.48-8.49	5.99-7.71	-7.96-9.23
(H117.5)	8.27-7.88	8.89-7.77	4.07-10.23	14.74-17.57	16.88-11.05	9.29-11.3	13.07-19.78	-18.98-18.97	8.72-10.67	4.5-5.3	8.71-10.35	10.59-10.68	8.84-13.47	14.81-13.47	11.40-11.45	11.40-11.45	6.01-12.2	7.18-6.9	7.49-6.5	4.32-10.32	8.92-7.18	4.59-8.84	4.59-8.84	4.59-8.84
(H127.5)	-11.14-10.86	5.59-12.81	9.27-7.73	-14.89-17.95	-12.94-13.18	-11.14-11.52	-14.53-10.95	-18.87-17.72	-15.36-12.66	-16.72-16.8	-16.72-16.8	-11.16-14.1	-18.03-17.05	-19.31-17.43	-19.31-17.43	-19.31-17.43	-19.31-17.43	-19.31-17.43	-19.31-17.43	-19.31-17.43	-19.31-17.43	-19.31-17.43	-19.31-17.43	-19.31-17.43
(H137.5)	-10.89-8	6.33-13.3	4.27-12.73	-10.89-17.38	-14.95-8.13	4.64-7.33	7.86-10.15	-15.07-17.51	-15.14-16	-12.94-15.57	-10.57-11.87	-11.85-14.28	-16.75-18.67	-18.45-18.78	-18.45-18.78	-18.45-18.78	-18.45-18.78	-18.45-18.78	-18.45-18.78	-18.45-18.78	-18.45-18.78	-18.45-18.78	-18.45-18.78	-18.45-18.78
(H142.5)	-13.27-11.07	7.78-8.44	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63	-16.36-11.63
(H147.5)	4.75-5.33	-7.59-14.2	-16.15-13	-11.45-12.45	-12.45-12.69	8.93-8.42	4.93-8.27	-12.81-17.81	-18.93-16.59	-16.89-13.54	-14.38-11.87	-17.79-18.33	-12.56-14.84	-12.56-14.84	-12.56-14.84	-12.56-14.84	-12.56-14.84	-12.56-14.84	-12.56-14.84	-12.56-14.84	-12.56-14.84	-12.56-14.84	-12.56-14.84	-12.56-14.84
(H157.5)	-7.48-9.5	-11.57-10.24	-12.79-13.95	-15.48-16.37	-17.63-18.98	-18.47-17.48	-16.98-18.19	-16.84-18.95	-16.45-18.12	-16.08-18.02	-15.47-19.1	8.89-7.7	7.41-8.85	-10.97-12.47	-10.97-12.47	-10.97-12.47	-10.97-12.47	-10.97-12.47	-10.97-12.47	-10.97-12.47	-10.97-12.47	-10.97-12.47	-10.97-12.47	-10.97-12.47
(H167.5)	-10.84-13.34	-11.06-10.98	-11.58-11.23	-11.69-13.37	-17.63-18.98	-18.47-17.48	-16.98-18.19	-16.84-18.95	-16.45-18.12	-16.08-18.02	-15.47-19.1	8.89-7.7	7.41-8.85	-10.97-12.47	-10.97-12.47	-10.97-12.47	-10.97-12.47	-10.97-12.47	-10.97-12.47	-10.97-12.47	-10.97-12.47	-10.97-12.47	-10.97-12.47	-10.97-12.47
(H172.5)	-14.99-16.06	-16.82-18.32	-17.41-17.14	-17.89-13.38	-17.89-15.16	-13.01-13.38	-17.18-17.65	-16.89-17.65	-13.38-16.19	-14.05-12.79	-13.11-13.21	-12.67-13.18	-12.71-13.18	-13.99-14.58	-16.29-15.15	-16.57-17.47	-16.47-18.68	-17.59-18.13	-18.21-18.1	-12.71-13.37	-12.71-13.37	-12.71-13.37	-12.71-13.37	-12.71-13.37
(H187.5)	-14.24-16.09	-17.73-19.08	-19.26-18.13	-17.18-18.58	-16.89-17.32	-18.64-17.18	-18.14-18.55	-17.83-17.68	-15.73-15.48	-14.05-12.71	-13.67-12.47	-12.67-13.18	-12.71-13.18	-13.99-14.58	-16.29-15.									



Radiated Composite Gain Data of 6GHz

Appendix B

Freq(Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 Max Gain (dBi)	2.62	2.46	2.28	3.06
Ant. 2 Max Gain (dBi)	2.13	2.19	3.4	2.53
Ant. 3 Max Gain (dBi)	2.96	2.22	2.03	3.37
Ant. 4 Max Gain (dBi)	3.02	2.13	2.41	2.78
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/75/187.5	Phi/90/187.5	Phi/75/82.5	Phi/60/97.5
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/37.5/345	Theta/75/337.5	Theta/75/330	Theta/75/315
Ant. 3 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/82.5/150	Phi/67.5/30	Theta/82.5/247.5	Theta/82.5/165
Ant. 4 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/75/37.5	Phi/45/277.5	Phi/45/285	Phi/45/292.5
Max Gain (dBi)	3.02	2.46	3.4	3.37
DG [1SS] (dBi)	4.84	3.91	5.04	4.67
DG [2SS] (dBi)	3.02	2.46	3.4	3.37
DG [4SS] (dBi)	3.02	2.46	3.4	3.37



FreeNo	681647	631174	674165	662015	770279	764607	658482	721613	459523	60275	685149	774467	659666	5194487	4511399	339402	438647	4926	468631	485496	4220341	407144	457485	516481
FreeNo	647505a	Theater																						
DocNo	00716071	00716072	00716073	00716074	00716075	00716076	00716077	00716078	00716079	00716080	00716081	00716082	00716083	00716084	00716085	00716086	00716087	00716088	00716089	00716090	00716091	00716092	00716093	00716094
FreeNo	468103	1131087	108239	33344	439655	429858	67846	51938	283192	14039	007087	059029	022004	016067	104143	2361399	387432	443418	446431	342822	228219	034151	1095108	455141
FreeNo	41013	306077	198237	421031	432068	679723	578498	413003	319298	2419269	259284	2746248	1661132	1121133	1311142	1351191	2842191	3171265	3286339	3033237	244251	2561233	090109	0250101
FreeNo	0232425	0510199	289637	228439	591601	6302021	413403	3384037	649268	589517	489537	3431135	0370338	3386431	6202139	3963437	3361087	3866431	4022139	3963437	1961265	1310131	0570219	4257029
FreeNo	0231631	133069	0171123	2371036	3798738	4161436	5665454	5334484	4684405	428261	3691194	0710148	137143	0880108	03861168	2371314	4004448	4084249	411147	419332	0302264	19074	1030146	098145
FreeNo	188105	019093	1575214	219253	25428	3594348	5645393	5396395	298145	1081	058821	068114	1193129	076516	0259166	2771343	43242	359332	4586689	786179	6801374	1720101	0120145	1267134
FreeNo	118075	0386391	2294146	373311	243241	262825	2470185	241184	0895824	9799439	018027	0240461	1052127	1310152	0663	1392114	3445	422342	5064777	0134268	317163	0880201	2822248	28257
FreeNo	257127	012093	3294414	764618	2556159	2841306	1261161	2171132	055015	0281237	0320363	05401	289123	310163	081082	211422	889161	442034	368484	0493485	27656	22027	2402245	21618
FreeNo	141165	099667	2393128	376562	369525	225507	1281186	221055	004424	274423	038002	03401	02027	190245	109033	1481299	5644939	371347	468873	1147559	106126	23428	19527	74146
FreeNo	186216	182037	1171245	263147	353134	292507	1582186	344077	61129	124423	02005	05401	304072	189248	1191175	47149	6274484	3838322	5421024	82343	250513	189241	250214	180207
FreeNo	131191	121016	0194087	238345	251173	188223	2150133	433206	1599195	0691144	1271105	020241	2381174	0180101	007083	08239	398047	602182	330545	58402	021057	10619	226218	1730184
FreeNo	198508	0030498	1052393	360231	2446085	0498226	271176	4280494	0031193	9034	9732929	290201	2381174	2971298	2071298	3591132	371682	5210564	36842	0380363	099079	071149	083206	163206
FreeNo	3260238	222288	283332	3510281	2641345	2353679	4510198	184072	0196399	0086213	3415	199												



Radiated Composite Gain Data of 6GHz

Appendix B

φ(22.5°)	3.09/1.74	-0.38/0.34	0.98/1.36	1.27/1.41	1.07/0.5	-0.26/1.89	-3.28/2.4	-0.83/0.55	1.33/1	0.01/1.21	-3.14/4.43	-5.17/4.4	5.26/4.48	-5.47/4.59	4.13/3.5	-2.09/0.79	1.31/2.14	2.18/2.04	1.77/1.65	2.04/1.87	1.14/0.2	0.92/2.47	-4.89/6.35	-5.62/4.65
φ(30°)	-2.89/4.8	0.51/0.88	1.41/2.34	1.46/0.78	0.28/0.02	-2.29/2.87	-3.3/1.1	0.67/1.89	2.09/1.28	0.31/1.58	-2.81/4.54	-4.8/4.4	-1.39/4.6	-4.28/3.81	-3.07/2.83	-2.1/1.14	0.31/1.6	1.74/1.65	1.08/1.21	1.54/1.76	0.8/1	-2.88/4.32	-4.75/4.49	-4.93/4.02
φ(37.5°)	-1.56/1.05	-0.72/0.37	0.19/0.98	0.61/0.02	0.84/0.25	-0.66/1.21	-2.78/1.32	0.47/1.22	-1.79/4.51	-4.6/3.32	-2.76/1.49	-1.2/1.26	-3.58/2.68	-1.35/4.71	-0.76/1.01	-0.09/1.48	1.53/0.89	1.48/0.06	3.37/0.43	1.11/0.3	-2.82/3.95	-2.99/3.74	-4/2.38	
φ(45°)	0.41/0.14	-0.59/0.02	-0.27/0.2	0.9/0.58	0.8/0.83	-0.73/1.53	-0.14/1.23	2.51/2.25	0.76/1.04	3.2/2.89	-3.59/4.08	-4.99/3.96	5.02/1.751	-6.55/4.97	-3.36/3.12	-2.62/1.46	0.99/0.17	0.2/0.29	-0.71/1.5	2.89/1.94	0.44/0.81	0.56/1.42	5.13/4.29	-3.9/1.56
φ(52.5°)	-2.49/0.74	0.58/0.37	-0.67/2.48	-3.48/2.74	-4.12/2.42	2.44/0.25	0.57/1.24	2.88/2.24	0.45/0.67	-2.91/4.13	-4.02/3.86	-5.12/5.77	7.08/1.12	2.68/2	-0.58/0	-1.86/4.7	-3.32/0.88	-1.51/2.53	-1.86/0.83	1.69/1.05	1.11/1.36	-0.65/2.49	-3.68/2.83	-1.58/2.15
φ(60°)	-4.17/0.72	1.58/2.63	2.44/0.03	3/1.3	0.59/2.43	2.29/0.05	0.28/1.44	2.59/1.09	0.99/0.33	-1.15/3.51	-2.38/2.85	-3.5/5.13	6.15/3.97	-2.77/1.09	-1/1.138	-1.11/1.21	-4.16/1.185	1.19/1.06	-1.78/0.8	1.19/0.89	0.87/0.16	-1.21/2.67	-3.3/1.8	-2.29/4.32
φ(67.5°)	-2.4/2.19	0.09/1.35	2.48/1.81	-1.85/1.52	-0.89/2.46	4.14/2.8	0.12/1.51	1.21/2.13	-2.71/3.28	-0.89/6.34	-4.29/4.68	-6.18/6.34	5.57/4.21	-4.25/2.27	-1.73/0.3	-1.81/0.68	-3.32/1.226	0.25/1.03	0.29/2.1	2.37/1.65	1.1/0.06	-3.15/3.17	-2.42/2.12	-2.36/4.23
φ(75°)	-0.33/1	0.45/1.9	2.86/2.77	0.91/1.6	0.48/3.41	4.93/2.9	1.14/1.89	1.52/1.06	3.33/3.9	5.47/3.71	-3.37/3.74	-3.99/3.12	3.88/2.23	-3.31/2.55	-2.04/2.53	-1.36/1.06	-2.18/0.34	-1.68/0.73	0.53/2.65	2.12/1.65	0.88/0.39	-3.69/1.07	0.88/39	-0.33/3.32
φ(82.5°)	0.43/0.02	0.65/1.58	2.19/2.05	0.39/0.44	1.14/4.06	5.07/3.53	0.41/1.01	0.8/1.16	3.32/2.89	-1.88/2.42	-5.02/4.96	-3.32/3.54	-1.74/1.04	-1.48/1.14	-1.28/0.14	-1.04/1.78	-3.61/1.48	0.96/0.44	2.88/2.27	1.82/0.59	-1.04/0.61	0.64/0.59	-1.02/2.08	
φ(90°)	1.49/0.96	0.41/0.82	1.88/0.64	-1.49/0.48	0.51/0.42	2.88/0.4	-3.27/3.76	2.22/0.47	-3.27/2.55	-2.52/0.67	-1.75/1.81	-0.78/1.86	1.21/1.53	-2.22/4.43	-2.8/0.84	-1.19/2.48	-3.15/2.18	0.22/1.02	-0.67/1.73	2.87/0.89	-4.32/2.29	-0.53/0.35	-4.35/1.58	-1.68/1.7
φ(97.5°)	0.95/1	0.98/1.48	1.82/0.24	2.89/1.14	1.27/2.24	0.56/2.15	4.58/0.69	3.34/1.63	3.37/2	-3.37/2.37	2.05/1.58	0.02/1.19	2.87/1.56	3.5/2.32	-6.55/4.57	3.41/2.69	0.48/1.25	0.62/0.74	0.97/0.31	-1.63/1.81	0.61/0.22	-3.59/1.59	-1.32/0.29	
φ(105°)	1.86/1.39	0.15/1.3	0.07/1.48	0.43/0.12	0.94/0.72	0.28/3.34	4.35/0.01	3.48/0.23	1.32/1.36	-2.07/2.35	-2.54/2.14	2.20/2.59	3.47/3.77	-4.85/4.06	5.14/3.29	-3.8/3.47	0.88/2.29	1.08/1.11	-1.78/1.54	3.25/2.58	1.34/1.29	2.44/1.34	-1.9/0.57	
φ(112.5°)	1.11/0.372	2.91/1.93	2.51/3.15	3.09/1.34	2/0.2	2.52/3.67	1.04/1.35	0.95/0.68	2.28/2.5	2.19/0.58	-0.78/0.24	2.73/0.9	1.07/1.45	0.59/1.35	2.53/2.08	-3.74/3.58	-6.37/0.91	1.53/0.39	0.88/1.92	-0.93/1.31	-0.77/1.23	3.83/0.49	3.22/3.19	2.07/2.81
φ(120°)	4.19/1.39	-4.14/1.47	-4.08/4.42	5.58/1.79	2.83/3.74	-7.82/0.19	1.53/1.49	0.13/1.77	1.19/2.86	3.39/4.42	-6.81/4.48	-5.21/5.65	4.45/4.67	-3.99/3.67	4.14/4.41	-4.11/1.16	0.71/3.32	-0.69/6.32	-1.19/3.32	-0.52/0.36	-2.49/1.19	3.28/0.78	-3.9/2.72	
φ(127.5°)	5.27/4.87	-4.39/4.17	-0.07/1.36	3.82/3.38	-3.25/3.37	-4.89/3.32	-1.6/9.1	0.73/1.18	2.13/4.47	-3.43/1.98	-1.52/4.16	5.17/1.77	6.6/3.21	-5.26/3.07	-3.07/3.62	-3.68/3.38	-1.39/1.49	0.86/1.29	-1.71/2.06	0.33/1.69	-5.48/0.48	-3.45/0.52	3.97/0.62	-3.75/0.68
φ(135°)	6.45/0.83	-8.58/7.67	-6.12/0.54	-4.32/3.36	-3.78/6.68	-4.59/2.42	-1.69/0.24	-0.99/2.78	6.22/0.68	-7.81/3.25	-5.93/1.73	-1.51/4.61	2.25/3.69	-0.46/6.32	-3.26/1.46	-3.72/4.38	-2.15/0.1	0.86/0.72	-2.08/1.78	-1.76/1.48	-3.95/2.28	-4.14/0.14	-6.7/0.98	-6.4/4.25
φ(142.5°)	2.36/3.61	-6.62/4.1	-5.59/1.46	-2.01/1.05	-1.72/1.82	-0.56/0.25	0.5/0.88	0.4/1.48	-2.89/3.5	-4.33/0.4	-5.31/3.9	-7.12/0.83	0.68/1.44	-4.29/4.29	-4.19/3.26	-6.99/4.43	-1.75/0.28	0.86/0.5	-0.5/3.15	-0.52/2.23	-1.29/1.71	-3.5/4.42	-10.0/1.8	-4.17/1.11
φ(150°)	4.84/3.87	-4.96/5.74	-4.62/4.53	-2.98/1.48	0.94/0.73	0.54/0.33	-1.76/1.68	0.51/0.37	3.07/0.59	-0.59/6.25	-7.11/0.86	-7.33/0.61	0.89/1.82	-8.10/7.82	-8.41/6.77	-4.8/3.03	-2.11/0.72	-4.27/1.5	-5.6/5.39	-6.19/6.36	-4.19/6.88	-5.6/1.4	0.88/1.73	4.6/5.06
φ(157.5°)	7.31/4.29	-8.15/8.71	-7.65/1.76	-3.53/4.58	4.47/4.6	-3.26/1.8	-1.16/1.88	-1.87/1.53	0.71/2.29	-4.88/4.67	-7.36/6.73	-6.69/6.31	-7.48/6.89	-8.02/7.22	-4.11/3.28	-5.19/4.66	-6.06/1.46	6.44/2.46	-1.06/0.89	-2.24/3.62	-3.31/2.78	-2.73/3.57	-4.03/4.41	-6.8/4.6
φ(165°)	5.39/4.82	-4.18/3.82	3.56/3.88	-4.06/3.64	2.91/3.88	-0.75/0.34	-0.61/0.77	-1.86/1.26	2.71/3.44	-4.80/4.81	-6.93/5.39	-5.51/5.43	-6.88/6.38	-4.27/4.54	-4.58/4.36	-3.42/1.97	-1.71/3.13	-1.19/1.09	-1.63/3.57	-8.88/6.88	-7.67/8.81	-9.81/9.78	-10.05/1.67	-5.12/4.46
φ(172.5°)	4.53/4.76	-5.07/0.58	3.45/3.85	-3.65/3.34	-2.67/2.98	-3.46/3.17	-6.17/1.11	-7.55/2.77	4.65/4.71	-6.8/4.48	-4.04/4.79	-5.69/5.62	-5.78/5.58	-4.21/4.13	-3.16/2.49	-3/2.4	2.89/4.99	6.69/1.42	-0.04/6.38	-5.65/4.54	-3.9/4.51	-4.51/4.03	-1.54/4.48	-4.09/4.48
φ(180°)	0.44/1.82	-0.55/1.02	-8.16/0.72	-7.43/8.46	0.14/0.13	-9.04/0.89	-9.36/0.92	-6.45/2.76	-6.58/1.57	-3.7/3.56	-7.11/4.71	-6.89/6.06	-3.64/5.97	-4.77/2.21	0.2/0.3	-8.75/8.15	-7.68/6.49	6.89/1.61	-5.56/6.86	-4.26/4.03	-3.9/4.51	-4.51/4.03	-5.26/5.08	-5.77/4.32
Freq(Hz)	0.8950Pda	Thetad																						
Gain(dB)	φ(0°)/φ(90°)	φ(15°)/φ(22.5°)	φ(30°)/φ(37.5°)	φ(45°)/φ(52.5°)	φ(60°)/φ(67.5°)	φ(75°)/φ(82.5°)	φ(90°)/φ(97.5°)	φ(105°)/φ(112.5°)	φ(120°)/φ(127.5°)	φ(135°)/φ(142.5°)	φ(150°)/φ(157.5°)	φ(165°)/φ(172.5°)	φ(180°)/φ(187.5°)	φ(195°)/φ(202.5°)	φ(210°)/φ(217.5°)	φ(225°)/φ(232.5°)	φ(240°)/φ(247.5°)	φ(255°)/φ(262.5°)	φ(270°)/φ(277.5°)	φ(285°)/φ(292.5°)	φ(300°)/φ(307.5°)	φ(315°)/φ(322.5°)	φ(330°)/φ(337.5°)	φ(345°)/φ(352.5°)
φ(0°)	0.44/0.15	0.30/0.38	0.21/0.75	0.09/1.16	-0.28/2.54	-3.56/4.51	-5.29/5.89	-5.97/6	-5.47/4.45	-2.96/2.71	-1/19.23	0.04/0.53	0.87/0.52	0.88/0.57	0.12/0.44	0.74/1.23	-2.05/2.38	3.74/4.48	-5.24/4.48	-4.76/4	-3.44/4.45	-3.48/3.33	-3.09/1.65	-0.77/0.39
φ(15°)	0.52/0.71	0.74/0.36	0.89/1.01	-1.45/1.95	-1.89/2.47	-3.87/3.94	-4.88/4.8	-5.20/4.07	-3.42/2.88	-2.52/2.22	-1.83/1.87	-1.71/1.8	-1.21/0.97	-0.59/0.24	-0.19/0.32	0.74/1.43	-1.22/1.47	3.23/4.41	-4.87/4.95	-5.28/4.48	-4.61/4.41	-3.54/2.19	-1.47/0.93	0.16/0.43
φ(30°)	1.13/0.69	0.65/0.44	0.95/1.41	-1.64/1.23	-2.54/2.27	-2.99/2.38	-4.24/4.1	-3.12/2.18	-1.32/0.97	-0.77/1.27	-0.7/0.87	-1.3/1.71	-0.97/0.48	0.30/0.44	0.22/0.69	0.62/0.98	1.59/2.24	3.26/4.49	-4.55/4.42	-7.61/6.93	-8.02/4.29	-3.31/2.69	-1.33/0.52	0.88/0.91
φ(22.5°)	1.43/2	0.92/0.68	0.49/1.74	-2.89/2.47	-1.53/0.43	-4.01/3.87	-4.29/4.98	-3.96/3.28	-2.32/1.68	-1.52/1.18	-1.72/1.81	0.08/0.46	1.47/2	2.22/1.68	1.86/1.35	2.28/4.49	-6.98/4.21	-9.58/8.85	-8.48/4.98	-3.99/1.22	-4.67/6.52	-1.29/1.81	-0.75/0.8	1.07/0.8
φ(37.5°)	0.49/1.41	0.61/0.38	0.39/1.28	-3.39/2.98	-1.93/1.28	-3.29/2.98	-2.71/3.68	-2.71/3.68	-2.12/1.94	-1.88/1.49	-1.59/2.77	-2.08/2.28	0.98/0.54	0.91/0.79	2.12/1.92	2.39/4.47	-6.98/4.21	-9.58/8.85	-8.48/4.98	-3.99/1.22	-4.67/6.52	-1.29/1.81	-0.75/0.8	1.07/0.8
φ(45°)	0.98/1.3	0.76/0.37	1.79/2.38	-2.89/2.47	-1.53/0.43	-4.01/3.87	-4.29/4.98	-3.96/3.28	-2.32/1.68	-1.52/1.18	-1.72/1.81	0.08/0.46	1.47/2	2.22/1.68	1.86/1.35	2.28/4.49	-6.98/4.21	-9.58/8.85	-8.48/4.98	-3.99/1.22	-4.67/6.52	-1.29/1.81	-0.75/0.8	1.07/0.8
φ(52.5°)	0.81/0.3	0.76/0.37	1.79/2.38	-2.89/2.47	-1.53/0.43	-4.01/3.87	-4.29/4.98	-3.96/3.28	-2.32/1.68	-1.52/1.18	-1.72/1.81	0.08/0.46	1.47/2	2.22/1.68	1.86/1.35	2.28/4.49	-6.98/4.21	-9.58/8.85	-8.48/4.98	-				



Radiated Composite Gain Data of 6GHz

Appendix B

(H19)	6.06/5.09	3.07/2.83	-1.89/1.5	-1.79/-1.68	2.48/1.47	4.46/4.05	3.39/-3.78	4.46/-4.9	5.53/5.82	4.68/6.18	-12.58/10.51	-13.57/-12.74	-11.89/-10.85	-10.51/8.01	5.38/5.56	2.91/2.22	-1.87/-1.47	-1.45/-1.35	2.17/2.71	3/-3.3	4.9/-5.04	-5.87/4.61	4.41/5.67	-7.05/8.63
(H22)	4.3/-5.15	3.47/-2.6	-2.29/2.15	-1.83/-1.38	-1.13/-2.01	2.69/-3.72	-4.02/4.07	-3.02/-2.64	3.16/-4.59	4.43/-10.05	-18.87/-12.72	-18.72/-13.87	-8.83/-7.73	-7.67/-3.5	-7.46/-7.38	-5.73/-3.33	-0.50/0.4	0.48/0.75	2.47/3.91	-4.39/-4.86	-6.43/-7.87	-6.13/-8.47	-6.28/-7.34	-6.57/-12
(H47)	4.79/5.7	-6.5/8	-5.12/3.9	-3.21/2.47	-2.58/5.16	3.49/3.27	-3.31/1.3	-1.16/2.19	1.24/6.75	-6.83/9.26	-14.88/-19.14	-15.03/-10.19	-7.33/6.67	6.03/-4.5	-4.19/4.61	-2.42/0.68	0.45/0.01	-1.36/2.27	-4.42/4.13	-4.49/6.64	-7.35/-10.65	-9.33/8.03	-7.43/-13.4	
(H37)	7.14/6.18	5.2/5.5	-5.07/5.26	-5.95/-7.2	-4.23/-2.63	-1.04/-0.43	-1.47/-3	-1.41/-2.7	3.09/-3.91	-4.54/-13.33	-15.66/-13.55	-12.93/-9.3	5.66/-11	6.8/-5.2	-2.29/5.5	-1.33/-3.5	-5.23/-3.7	2.51/-4.58	4.43/-5.1	4.13/-6.1	-6.12/-5.1	-7.64/-9.25	-7.55/-7.14	-6.73/-4.2
(H45)	6.71/7.02	6.62/5.74	-7.7/6.4	-5.21/-4.3	4.51/-4.93	2.88/-1.11	0.02/1.5	1.38/-1.1	2.08/-3.21	-4.44/-9.9	-8.77/-19.28	-18.92/-9.86	-7.49/-7.24	-5.88/-2.7	-2.53/-5.1	2.18/-2.42	5.43/-6.6	-4.89/-5.27	-10.24/-11.3	4.76/-5.14	8.4/-7.9	6.81/-6.9	-5.57/-7.65	-6.74/-6.1
(H32)	5.98/-4.95	4.47/-5.13	4.1/-9.1	-9.37/-6.51	6.2/-2.96	0.11/0.7	0.06/0.69	1.67/0.95	0.93/-1.97	-7.32/-15.82	-13.81/-16.68	-14.64/-10.27	-8.86/-3.1	-2.89/-1.8	-2.28/-3.1	-1.42/-2.51	-6.48/-8.06	-7.33/8.2	-13.05/-9.7	-7.86/-1.7	-11.4/-6.3	-4.38/-3.38	-5.02/-4.78	-4.8/-4.87
(H87)	7.39/-6.36	-4.37/-4.01	-5.01/-6.65	-15.61/-11.71	6.54/-4.22	-1.23/0.45	-0.78/0.3	0.89/-2.77	-4.93/-12.82	-11.76/-10.88	-7.61/-5.4	6.68/-4	-3.82/-2.86	-2.35/-5.35	-3.59/-3.86	-5.62/-5.87	-4.81/-5.86	-6.96/-6.55	-6.32/4.26	-3.67/-3.19	-4.82/-4.03	-5.57/-6.44	-6.83/-11.7	-4.47/-4.29
(H75)	8.91/-11.83	6.6/5.4	-4.94/-5.75	-5.1/5.21	8.22/-3.85	0.87/2.16	1.54/0.56	0.84/-3.13	4.74/-8.86	-13.52/-18.02	-9.88/-9.31	-9.19/-6.05	5.94/-2.2	-5.54/-7.4	-3.19/-3.07	3.74/4	-5.89/-8.83	-5.82/5.11	-4.58/3.37	-5.03/-2.22	-3.71/-4.15	-6.14/0.62	-7.17/-4.29	-1.48/-1.29
(H19)	11.71/7.98	5.21/-3.6	3.13/-3.42	-7.08/-8.01	1.22/2.38	1.61/1.5	0.59/-2.09	-4.85/-4.28	-10.22/-7.4	-7.02/-2.2	5.71/-2.98	2.50/-2.5	-2.36/-2.1	-4.84/-2.88	0.75/-1.9	-7.07/-5.9	-5.77/4.25	-4.27/-2.08	4.70/-4.46	-3.26/-4.49	-1.16/-5.08	4.19/-4.28	-7.34/-3.21	
(H82)	6.63/6.7	5.88/4.73	-3.83/-4.46	-8.5/-8.38	4.54/-1.85	1.14/0.88	-2.19/-6.89	-5.68/-5.15	-10.31/-15.38	-11.99/-7.63	-12.07/-16.19	4.91/-6.8	1.28/-3.2	-4.58/-5.2	4.6/-5.2	0.39/-2.51	6.41/-5.19	-2.22/-2.82	-1.83/-4.48	-1.23/-1.06	-1.95/-6.16	-6.84/-5.28	-2.58/-4.51	-7.79/-12.3
(H43)	4.48/-3.15	3.89/-2.5	3.93/5.82	4.29/-6.28	4.73/-2.77	0.53/0.9	4.23/6.67	5.12/-7.22	-11.11/-5.7	-17.23/-7.7	-8.93/-17.57	6.77/3.35	0.91/5.96	3.44/4.89	0.89/-2.35	7.89/-19.8	5.38/-2.49	3.32/-3.26	-1.07/0.75	2.88/3.97	-6.66/-5.95	-3.59/-3.34	-5.53/-3.4	
(H97)	6.02/-3.54	2.65/-1.42	4.07/3.02	1.25/0.43	3.28/-3.57	-1.59/-4.43	-14.25/19.73	9.26/-6.98	-8.97/-7.79	6.89/-3.25	-16.70/-19.78	4.86/-2.94	3.87/1.01	6.85/-4.08	6.41/-10.2	4.9/-5.37	3.07/-6.79	1.41/0.98	-2.51/0.28	-4.23/-12.22	-5.55/-5.5	-4.97/-3.83	-6.01/-4	
(H10)	10.6/4.36	7.32/5.76	5.5/-4.4	-7.79/-7.17	-11.32/-10.28	3.33/7.31	-15.58/-16.81	-11.88/-4.88	6.74/-9.94	8.91/-16.88	-14.89/-7.14	-13.17/-10.9	3.72/-1.91	6.61/-8.9	-19.21/-4.8	3.95/-7.36	6.21/0.45	3.07/0.9	0.21/1.78	-3.27/-1.47	-4.38/-17.92	6.12/4.2	-6.33/-4.2	-6.77/-10.58
(H127)	-7.84/-7.7	-9.17/8.86	9.88/-8.95	-11.66/-13.93	-9.02/-5	-13.87/4.3	-5.22/8.45	-4.88/-4.83	-13.25/-14.1	-14.13/-13.2	-15.98/-13.4	4.28/-3.5	6.91/-6.8	-7.88/-10.0	-7.29/-3.1	4.91/-6.58	-6.86/-4.82	3.61/-1.99	2.27/1.34	-1.44/3.73	-10.74/-9.05	-10.59/-8.85	-6.44/-19.6	-7.24/-12.7
(H12)	-7.91/4.78	-5.89/4.04	8.44/-15.15	-16.78/-14.05	-18.26/-13.9	-17.73/-14.31	4.99/6.86	9.23/-5.77	-7.82/8.38	8.47/-14.35	-15.96/8.44	-12.11/9.56	-11.57/-10.78	5.19/-12.98	8.4/-24	-7.81/5.21	6.27/-2.45	0.71/5.58	-4.65/6.49	-6.49/-9.21	6.37/-16.12	-11.52/16.71	-7.02/8.34	-8.96/9.34
(H127)	-7.19/4.4	-8.39/8.98	-16.88/-15	-14.12/-17.7	-10.86/-7.02	-10.17/8.75	-16.18/9.56	-6.51/-3.49	3.84/10.65	-14.52/-12.91	-8.15/6.4	-5.49/-10.14	3.95/-4.51	6.86/4.03	3.14/-9.6	-3.53/5.21	6.89/5.1	0.84/8.84	-3.88/3.47	-1.23/2.82	-6.88/-18.52	-9.31/-6.08	-10.21/-17.3	-7.52/10.02
(H127)	-12.77/-14.15	-16.02/-10.86	-8.88/-11.86	-10.97/-10.46	-13.03/-16.3	-7.28/4.73	-5.74/-4.89	-18.05/-13.76	-10.13/-10.07	-10.77/-10	-14.26/-19.07	-8.19/-9.7	-2.48/-3.28	4.57/6.85	-7.62/-4.17	-3.3/-13.73	-6.84/-1.41	0.42/-4.29	2.33/-1.6	-1.78/4.9	-8.41/-11.36	-8.61/-5.1	-8.88/-10.84	-17.81/-19.9
(H127)	-7.19/7.21	-9.26/7.94	-8.67/3	-6.4/-8.4	-7.66/-10.26	-10.41/12.9	-10.52/8.2	-4.88/-7.34	-8.79/-9	6.84/-8.24	-18.23/-15.99	-14.51/-14.26	-10.47/6.15	-8.81/-13.2	-13.36/7.58	-8.95/4.44	-3.35/0.38	-6.85/-5.56	-14.18/-13.2	-10.57/10.05	-11.61/-8.46	-6.05/-8.95	-13.31/-16.45	-17.81/-19.9
(H12)	-16.14/-14	-14.12/-12.1	-6.77/-10.1	-11.76/-10.92	9.24/8.25	-8.85/-10.22	-17.88/-13	-6.77/-7.24	-5.03/-4.78	7.82/8.69	-6.93/-12.16	-12.36/-17.26	-6.12/-4.48	-11.23/-18.1	-18.54/-12.37	-10.06/-7.1	-2.97/-6.02	-3.29/-7.8	6.26/-10.98	-19.02/-15.92	-10.52/-10.19	-10.05/-12.69	-6.63/-7.95	-8.26/-10.82
(H157)	-18.67/-18.83	-18.35/-18.23	-14.34/-13.76	-12.02/-14.04	-18.67/-18.77	-16.81/-15	6.51/6.68	-8.63/-8.38	-3.88/-4.39	-10.31/10.9	-11.12/-12.97	-13.59/-15.91	-8.63/-18.14	-14.18/-18.14	-10.45/-8.4	-17.88/-8.02	-12.21/-21.3	-6.74/5.71	-7.74/10.17	-11.48/-10.82	-10.23/-12.34	-13.42/-13.52	-17.58/-19.63	
(H157)	-17.91/-15.7	-17.21/-11.64	-10.17/-12.23	-14.09/-14.49	-14.08/-14.29	-17.71/15.8	-7.27/16.59	-4.71/-7.01	6.17/6.48	-7.14/-15	-9.13/-12.43	-16.73/-18.39	-11.68/-10.57	6.66/-12.9	-17.92/-12.07	-8.53/-6.38	6.43/-7.5	8.71/-7.94	6.57/10.08	-11.29/10.64	-11.49/-11.67	-16.18/-15.71	-17.38/-18.48	-14.21/-4.27
(H172)	-6.61/7.17	-7.11/8.31	-8.79/-8.52	-7.52/7.68	6.46/-6.79	7.52/8.42	-9.90/-11.2	-13.5/-13.48	-10.07/-13.67	-11.07/-18.95	-16.16/-13.8	-15.61/-14.89	-14.98/-14.91	-15.68/-15.47	-13.71/-19.9	-12.08/-8.22	-6.82/-5.86	-5.50/-6.24	-10.51/-11.29	-14.11/-18.86	-13.33/-14.73	-8.81/-7.89	-16.47/-18.2	
(H187)	-13.87/-14.21	-13.86/-17.19	-19.19/-17.6	-18.37/-17.81	-17.02/-18.34	-18.01/-18.03	-18.2/-18.93	-17.25/-17.17	-14.92/-13.35	-13.94/-16.38	-17.74/-14.48	-11.74/-11.78	-10.91/-11	-11.94/-13.22	-15.11/-16.85	-16.75/-14.1	-12.87/-10.79	-11.96/-10.4	-10.24/-10.68	-10.46/-10.61	6.22/-9.21	9.95/-9.84	-10.26/-9.44	-10.53/-12.04
Freq(Hz)	6.8959(GHz)	Thx(Hz)	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gain	(H19)(H27)	(H19)(H22)(21)	(H37)(H27)(37)	(H45)(H26)(25)	(H67)(H27)(67)	(H75)(H27)(82)	(H87)(H27)(87)	(H105)(H27)(125)	(H127)(H27)(127)	(H137)(H27)(142)	(H157)(H27)(157)	(H165)(H27)(172)	(H187)(H27)(187)	(H195)(H27)(202)	(H217)(H27)(217)	(H225)(H27)(232)	(H247)(H27)(247)	(H255)(H27)(262)	(H277)(H27)(277)	(H285)(H27)(292)	(H307)(H27)(307)	(H315)(H27)(322)	(H337)(H27)(337)	(H347)(H27)(352)
(H19)	3.53/-4.27	4.51/-3.24	6.77/-7.72	-5.24/-10.89	-10.69/-10.27	-10.89/-10.27	6.91/6.69	4.42/-5.33	2.71/-2.49	2.87/-2.49	5.52/-5.27	2.97/1.5	-1.11/-9.2	2.58/-2.37	-5.45/-3.38	6.94/-6.28	6.94/-7.77	2.38/0.67	7.24/5.45	-4.39/-4.86	3.45/2.35	-2.21/-1.48	-1.29/-0.62	-1.46/-2.5
(H27)	4.14/-5.96	6.73/-6.8	10.59/-11.3	12.45/-12.66	13.61/-15.98	17.61/-16.15	13.39/-11.88	8.89/-7.7	4.47/5.15	2.38/-3.07	2.12/-3.51	0.52/0.35	6.51/6.68	1.93/-3.34	-2.79/-4.3	3.84/4.54	6.79/-7.56	8.61/-10.43	13.28/-16.3	7.91/6.46	6.27/4.41	3.34/-3.82	1.37/-1.8	-1.68/-2.3
(H19)	1.62/2.67	3.34/-0.48	-4.75/4.55	-5.99/-6.03	-11.89/-16.85	-16.34/-19.28	-17.77/-19.19	-10.45/-10.04	8.41/4.68	5.54/6.21	5.83/-4.29	3.19/-2.69	2.43/-1.67	1.74/-1.95	-2.73/-2.27	-1.42/0.45	5.65/-6.88	-7.92/-9.16	9.21/6.61	-13.13/-16.8	-10.67/-10.97	-4.92/-3.54	-2.68/-2.38	-2.27/2.41
(H22)	3.12/-4.03	5.21/-8.2	1.56/-7.88	8.27/-11.05	-15.64/-18.62	-16.18/-17.77	-17.59/-18.02	-11.47/8.25	7.96/-7.47	0.89/6.7	2.72/-3.54	5.54/-4.43	3.52/0.68	1.07/5.32	5.41/-8.2	4.52/4.45	6.51/4.48	-10.95/-11.47	-15.77/17.48	-16.66/-19.18	-13.17/17.7	6.08/-3.6	5.71/4.48	-2.99/-2.61
(H19)	6.97/9.15	-10.84/-11.16	-15.71/-18.84	-16.89/-18.86	-14.68/-17.78	-16.25/-18.05	-18.37/-17.6	-15.84/-11.19	8.26/4.2	5.36/6.81	6.28/6.65	5.62/-4.19	-1.38/-3.07	2.86/3.77	4.31/5.32	5.94/-7.1	6.48/6.86	8.61/-12.58	9.98/-2.91	-12.51/14.1	-11.81/8.63	6.91/-7.68	8.46/6.22	-7.92/10.8
(H27)	61/-82	8.98/8.9	12.25/-18.61	-16.33/-15.94	-14.78/-17.14	-15.27/-18.31	-18.02/-15.2	-11.41/6.75	6.61/-5.46	-3.02/-8.83	2.99/4.34	3.21/-4.23	3.52/4.33	4.76/5.92	-2.54/3.18	6.61/-4.58	-1.61/1.77	-17.11/-18.1	-14.43/-16.66	-6.64/-6.22	-5.58/6.72	-7.29/6.4		
(H47)	3.72/3.73	4.02/-4.6	-7.86/-12.22	-18.77/-15.55	-10.28/9.77	-11.81/-13.07	-14.98/-11.48	-7.9/-4.69	5.19/-4.91	-3.99/-2.27	-1.72/-4.98	4.73/-4.3	5.13/-6.44	-1.17/-1.47	0.58/-2.35	3.98/-3.39	-4.68/-6.66	6.57/-7.47	-11.32/11.78	-14.93/-18.88	-8.81/-6.96	6.38/-6.14	4.17/-4.34	-3.94/-3.3
(H52)	6.22/-5.92	4.82/-4.62	-4.88/6.73	8.94/-10.88	9.22/5.61	6.65/7.83	6.98/4	-2.84/-3.82	5.19/2.73	1.91/-1.8	3.26/5	4.14/-4.14	-4.85/-4.68	-4.28/4.13	-3.33/-2.78	-1.94/-2.41	-7.67/-7.81	-11.61/11.41	-10.21/12.04	-8.69/-6.51	5.46/-5.7	6.99/6.72	6.99/6.72	
(H19)	7.41/7.31	7.56/7.84	-8.37/-10.21	-11.43/-14.53	-10.65/-7.99	6.84/6.14	4.74/-2.57	-1.87/-1.7	4.67/-7.1	1.28/2.38	6.57/8.11	6.15/-6.33	5.24/-4.48	4.94/-5.68	6.96/6.61	6.39/-6.67	-10.12/-7.3	-7.2/-7.8	9.59/-10.23	-10.38/8.63	-11.01/-8.45	6.24/-11.66	-10.47/-12.47	-17.58/-18.8
(H27)	4.30/-4.71	3.72/5.8	5.64/-16.28	-16.11/-16.18	-12.36/-5.65	6.41/-6.16	3.86/-1.95	1.08/-1.48	-1.78/0.7	6.41/-3.66	-5.06/-6.81	5.01/-4.65	-3.88/-2.97	4.84/-5.8	6.57/-4.9	5.61/-4.52	5.67/-7.24	4.50/-5.16	6.03/-7.08	-11.85/-10.4	6.91/-7.2	5.94/-5.83	-11.28/-14.13	-10.44/-4.57
(H47)	6.35/7.07	5.88/-4.68	-4.06/-11.75	-12.97/-13.32	-16.37/-18	3.68/-2.48	-1.77/10.59	-1.22/8.36																



Radiated Composite Gain Data of 6GHz

Appendix B

0180°	-11.50-11.63	-13.05-14.68	-19.35-14.51	-8.98-6.55	-8.37-7.89	-6.87-6.33	-5.98-6.55	-7.14-6.96	-11.91-12.41	-10.42-9.9	-11.19-13.95	-16.53-18.04	-18.68-16.38	-15.82-13.91	-18.50-19.22	-12.28-12.15	-15.78-14.65	-16.19-17.91	-11.86-7.38	-6.67-7.4	-7.93-9.44	-8.63-13.17	-12.28-12.17	-12.12-12.45
0187.5°	-10.11-11	-12.72-12.01	-10.32-8.76	-6.74-7.17	-3.49-3.3	-4.67-6.46	-7.40-10.16	-11.18-13.12	-18.32-18.05	-15.48-16.36	-19.83-16.06	-18.02-18.89	-18.39-12.12	-12.94-12.47	-15.41-12.5	-17.11-11.1	-16.02-17.98	-18.56-18.88	-12.13-7.19	-6.13-6.14	-7.37-8.9	-12.15-15.48	-10.96-9.36	-8.36-10.11
0192°	-14.82-13.03	-12.08-10.17	-8.57-8.67	-6.09-6.54	-4.02-5.15	-4.75-6.57	-6.04-12.89	-18.88-18.15	-18.52-17.81	-15.11-15.02	-18.88-16.47	-18.44-18.06	-18.33-17.58	-17.53-12.81	-17.53-12.81	-16.91-15.1	-12.84-6.68	-5.45-6.78	-8.06-13.36	-17.27-18.22	-14.48-14.95	-16.91-12.94	-14.81-14.95	-16.91-12.94
0198.5°	-11.31-14.28	-10.53-11.1	-8.19-15.56	-4.24-2.04	2.11-3.35	-3.75-7.4	-15.28-17.76	-18.71-14.16	9.15-8.01	7.96-11.4	-14.82-14.92	-13.23-11.69	-18.71-16.75	-18.11-17.47	-18.16-16.38	-11.64-10.18	-13.97-14.12	-17.87-16.59	-11.25-6.93	-3.46-4.13	-8.11-11.78	-17.18-15.74	-16.21-14.33	-16.93-13.97
0199°	-11.97-12.77	-10.58-11.46	-8.48-4.27	-1.36-3.4	3.89-3.52	4.74-9.52	-17.73-19.95	-16.48-9.72	-10.27-11.23	-12.12-11.23	-14.82-16.99	-13.81-10.07	-10.33-14.96	-14.43-11.9	-9.83-12.57	-17.71-11.62	-13.02-18.06	-19.31-14.21	-6.74-2	-6.98-12.17	-12.02-13.79	-16.48-18.58	-19.14-13.36	-16.48-18.58
0199.5°	-12.75-17.77	-17.58-17.25	-11.95-6.36	-4.06-2.27	3.41-4.57	4.98-10.31	8.71-9.51	-4.85-3.41	4.79-4.5	-6.41-6.29	-10.48-11.54	9.19-6.89	6.98-9.34	-10.08-13.4	-11.55-14.24	-18.10-17	-11.54-18.35	-17.94-12.9	-8.54-10.48	-4.58-4.19	8.11-17.92	-14.94-19.29	-15.78-15.98	-13.34-13.77
0200°	-17.34-17.36	-7.91-6.13	3.21-2.21	5.29-7.08	7.92-11.43	6.94-3.42	3.02-3.78	4.44-3.35	4.84-3.75	-8.41-6.75	9.88-7.84	6.41-9.79	-12.94-10.81	-10.16-9.29	-16.02-15.92	-14.14-16	-18.23-10.36	-10.30-10.87	-8.67-8.77	-8.51-9.26	-12.49-13.43	-16.01-15.92	-13.71-19.24	-16.01-15.92
0200.5°	-14.17-17.35	-13.18-6.82	-5.07-2.5	3.74-3.36	4.17-11.53	-11.47-13	-3.94-2.19	5.09-3.94	5.82-6.06	9.8-14.82	-11.44-12.43	8.02-13.02	-13.32-10.95	-10.06-12.65	-18.56-9.55	-15.21-19.01	-17.78-12.48	-10.18-9.55	-8.02-8.63	-11.34-15.52	-15.14-15.52	-18.69-17.88	-15.67-17.88	-15.67-17.88
0201°	-18.64-17.74	-15.78-6.82	-7.84-6.4	-4.87-6.31	8.11-12.78	-10.92-5.37	-3.51-6.18	9.88-2.54	5.09-4.81	5.28-6.31	4.44-11.4	-18.42-9.07	8.45-8.64	-13.51-13.1	6.76-11.37	-16.95-12.02	-10.47-8.93	-11.10-13.1	-4.64-6.55	-6.06-8.43	8.62-14.15	-19.22-19.11	-15.64-14.17	-15.64-14.17
0201.5°	-18.61-16.31	-12.02-12.32	-8.20-14	-14.28-10.26	-12.59-15.87	-18.84-12	-4.43-3.54	-1.53-4.87	-18.88-6.87	4.19-8.84	-11.81-12.62	-17.51-18.81	-12.99-16.44	-10.82-10.25	-18.54-16.92	-18.19-15.38	-6.28-6.25	-13.27-8.3	5.88-11.67	-15.11-14.88	-16.53-15.39	-18.51-18.12	-16.29-13.03	-16.29-13.03
0202°	-14.98-13.56	-10.45-16.18	-12.45-9.51	-12.80-13.39	-13.98-17.78	-10.98-13.2	-10.77-15.26	4.51-9.88	8.43-13.15	-11.41-9.84	-2.88-6.16	-10.41-17.07	-15.92-11.91	-10.92-17.57	-10.32-13.52	-19.11-17.76	4.94-10.13	-11.67-16.75	8.21-17.37	-14.11-16.89	-15.77-16.48	8.32-11.1	-13.17-11.62	-10.02-18.17
0202.5°	-16.25-12.84	-12.12-12.9	-10.71-15.36	-9.64-14.84	-18.43-17.68	-15.98-16.51	-10.42-9.8	8.60-11.38	9.17-14.98	-14.91-14.38	-18.68-12.44	-11.72-11.79	-13.97-12.63	-14.99-10.77	-10.46-16.35	-10.85-12.13	8.58-14.68	-17.98-12.78	-10.27-12.98	8.42-11.53	7.71-12.38	-13.55-18.87	-13.55-18.87	-13.55-18.87
0203°	-18.1-18.3	-17.07-13.96	-12.07-13.18	-16.02-16.02	9.19-9.21	-12.65-18.16	-13.24-28.78	-7.02-9.82	-12.02-9.61	-10.61-13.7	-15.34-13.33	-15.43-17.86	-17.89-15.78	-17.89-15.78	-16.99-16.88	-12.82-12.36	-15.96-15.77	-15.49-17.16	-11.93-12.31	-12.95-13.11	-17.29-11.82	-10.72-16.18	-14.86-18.17	-14.86-18.17
0203.5°	-19.15-19.17	-16.15-19.74	-18.72-19.35	-18.31-19.06	-17.11-15.32	-18.48-19.24	-11.52-9.79	-8.09-11.87	-14.77-17.54	-10.59-17.77	-15.97-12.77	-15.92-16.04	-18.16-19.17	-14.18-9.34	-8.88-12.92	-9.82-12.95	-15.58-16.42	-17.97-19.19	-15.31-15.58	-14.23-12.19	-13.17-17.85	-16.37-17.88	-16.37-17.88	-16.37-17.88
0204°	-16.41-15.98	-15.19-14.48	-14.72-16.49	-17.07-17.88	-18.68-16.16	-16.93-16.87	-18.49-17.24	-15.57-14.18	-16.42-16.16	-14.24-17.23	-12.53-15.35	-18.08-18.96	-18.36-18.26	-16.25-14.72	-15.96-18.13	-18.78-18.32	-19.05-18.36	-15.41-14.23	-12.84-17.27	-12.31-15.08	-14.33-13.68	-14.34-15.96	-18.98-18.03	-15.75-18.98
0204.5°	-17.22-17.65	-16.36-16.88	-18.88-17.88	-18.19-17.81	-17.85-14.83	-12.58-17.83	-10.83-8.97	-10.80-10.22	-19.13-11.87	-11.91-15	-17.41-16.88	-18.14-19.05	-18.28-17.47	-19.18-29	-19.04-18.4	-16.98-15.61	-15.77-15.61	-13.28-13.23	-14.45-13.68	-14.51-13.1	-15.83-17	-18.79-17.35	-18.79-17.35	-18.79-17.35
0205°	-14.87-15.28	-18.48-17.57	-13.88-13.71	-14.49-15.56	-15.61-15.07	-13.49-13.4	-12.27-18.38	-8.25-9.14	-8.6-3.4	-10.04-10.3	-11.06-11.3	-12.18-12.67	-14.41-15.58	-15.88-15.08	-16.78-16.55	-15.78-16.55	-15.64-17.82	-16.37-18.62	-18.81-18.93	-18.68-18.08	-16.28-17.23	-18.64-17.17	-15.47-15.48	-13.17-14.85
Freq(Hz)	6.1750GHz	Theta(d)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Gain	0°(90°)	0°(15°)	0°(30°)	0°(45°)	0°(60°)	0°(75°)	0°(90°)	0°(105°)	0°(120°)	0°(135°)	0°(150°)	0°(165°)	0°(180°)	0°(195°)	0°(210°)	0°(225°)	0°(240°)	0°(255°)	0°(270°)	0°(285°)	0°(300°)	0°(315°)	0°(330°)	0°(345°)
0180°	-8.54-8.69	-7.53-8.4	-3.58-3.07	-3.71-3.87	-2.97-3	-3.36-4.04	-4.65-5.28	-6.28-6.63	6.26-11.82	-13.74-14.55	-18.05-19.13	-13.34-10.15	-7.86-6.38	-6.44-6.42	-2.86-2.36	-1.81-1.39	-1.31-1.15	-1.81-1.31	2.91-3.82	5.04-6.8	-8.58-10.53	-13.03-16.32	-16.27-16.87	-16.27-16.87
0187.5°	-6.34-6.28	-3.89-3.33	-2.33-2.27	-2.02-1.83	-1.61-1.27	-1.72-1.56	-1.98-2.61	-3.21-3.95	-6.66-7.55	-8.11-8.16	-17.09-16.64	-17.79-12.48	-10.4-8.12	-6.13-4.88	-3.76-2.86	-2.3-2.01	-1.88-2.11	2.32-3.99	4.2-5.4	-6.29-6.98	-9.19-13	-14.68-15.14	-14.19-12.28	-8.92-8.4
0192°	-4.45-3.48	-2.92-2.82	-2.62-2.65	-2.16-2.16	-1.36-1.07	-0.77-1.14	-1.56-2.45	-3.72-4.91	-6.44-9.01	-10.78-15.96	-19.16-18.06	-14.76-12.46	-9.05-7.41	-6.11-5.49	-4.94-5.14	-3.32-3.82	-2.74-2.96	-3.58-4.57	-4.31-4.19	-13.89-18.32	-17.33-14.19	-17.76-9.45	-7.63-6.86	-7.63-6.86
0198.5°	-2.32-1.27	-0.91-0.81	-0.86-1.64	-1.98-1.1	-1.25-1.43	-2.38-2.44	-3.42-4.76	-6.78-8.86	-6.28-7.14	-15.41-15.75	-19.63-15.6	-7.82-6.9	-6.74-7.27	-4.42-5.29	-5.93-9.44	-6.5-8.62	-6.28-7.24	-7.53-7.81	-7.82-8.44	-6.42-15.78	-10.11-17.68	-9.91-7.38	-6.43-4.19	-2.93-2.49
0199°	1.26-1.77	1.01-1.11	-1.96-2.07	-1.76-2.31	2.96-3.37	3.91-3.82	-3.64-3.46	6.04-6.48	5.58-5.74	-10.30-13.45	-9.9-9.63	-6.46-6.71	7.14-6.07	8.97-1.1	4.07-1.76	-7.07-7.28	-7.88-8.11	8.98-8.24	-7.99-18.39	-15.14-10.15	-6.45-6.78	1.03-0.57	0.84-0.78	0.84-0.78
0199.5°	0.62-1	0.14-0.67	0.93-2.08	-2.41-2.41	2.41-3.28	3.59-3.27	4.32-5.7	-7.09-7.44	7.53-10.96	-10.46-11.97	4.41-49	-5.43-6.58	6.74-8.19	-10.26-10.19	-10.04-6.82	7.48-6.35	5.50-5.82	8.32-9.93	9.61-17.54	-18.86-18.13	-8.64-8.58	1.32-1.21	2.17-1.89	2.13-1.98
0200°	0.95-1.06	-1.91-2.72	-3.99-3.54	-3.23-3.38	4.28-4.56	4.24-6.24	6.58-6.94	8.62-8.32	8.71-8.67	-12.01-7.1	-13.32-6.46	-10.89-9.15	7.62-8.28	7.19-6.78	4.88-6.15	7.4-8.04	7.25-8.12	8.25-9.31	-13.11-17.9	-14.34-15.73	-9.49-9.52	6.63-6.69	7.21-6.12	7.21-6.12
0200.5°	0.41-0.75	-1.28-1.48	-1.59-2.26	-2.98-3.03	3.92-4.14	5.78-7.05	9.02-11.41	-10.99-9.43	-10.87-10.22	-10.24-11.7	7.91-9.13	7.91-9.13	4.49-4.39	5.19-6.49	10.09-10.19	10.09-10.19	10.09-10.19	10.09-10.19	10.09-10.19	10.09-10.19	10.09-10.19	10.09-10.19	10.09-10.19	10.09-10.19
0201°	0.40-0.63	0.28-1.16	1.58-1.81	3.53-3.98	3.61-3.75	4.79-4.77	8.89-10.12	9.72-9.35	9.79-9.67	-11.87-10.28	6.93-6.48	6.93-6.48	3.92-3.92	3.92-3.92	8.87-8.34	8.87-8.34	8.87-8.34	8.87-8.34	8.87-8.34	8.87-8.34	8.87-8.34	8.87-8.34	8.87-8.34	8.87-8.34
0201.5°	0.89-1.03	1.69-2.04	2.53-2.66	3.22-3.87	4.93-4.84	6.14-6.8	10.91-11.75	11.11-12.34	13.99-16.78	-10.26-17.93	-12.71-12.3	7.24-11.78	-10.71-7.9	8.77-9.18	8.77-9.18	8.77-9.18	8.77-9.18	8.77-9.18	8.77-9.18	8.77-9.18	8.77-9.18	8.77-9.18	8.77-9.18	8.77-9.18
0202°	2.94-4.9	4.49-2.98	3.01-2.15	4.01-4	4.36-5.54	6.17-9.31	7.84-10.85	-11.5-10.83	7.34-8.45	6.81-8.98	2.39-3.59	-7.88-10.97	-16.09-9.05	7.94-10.08	-10.37-10.16	-13.96-16.2	-16.02-9.46	-12.27-10.61	7.24-7.21	6.59-4.65	6.74-6.56	4.47-5.22	2.76-1.96	2.58-1.43
0202.5°	2.01-2	3.88-7.03	6.75-6.06	2.43-2.32	3.27-3.87	9.19-14.12	10.07-11.5	6.38-6.8	7.21-4.28	6.98-7.44	-14.73-8.81	-7.71-8.47	5.98-6.53	-13.09-15.41	-14.45-19.05	-17.81-9.36	-12.21-10.25	7.24-7.37	3.81-3	2.79-6.17	4.13-1.02	1.77-1.27	2.23-0.35	2.23-0.35
0203°	4.56-2.78	2.42-1.74	-1.52-1.14	-1.63-2.4	6.64-6.76	-11.88-11.19	5.79-6.63	-7.08-9.29	7.63-6.51	6.58-6.98	-4.17-3.31	8.1-6.58	-4.31-2.44	5.28-10.75	-13.36-14.74	-15.84-13.41	-13.78-9.67	8.92-10.82	-7.72-9.38	-13.92-10.23	-3.38-4.13	-4.52-3.2	1.42-0.29	1.42-0.29
0203.5°	3.69-2.7	0.27-0.91	0.71-0.62	-2.22-2.08	6.70-10.37	-18.73-19.28	-3.28-4.71	-3.31-2.76	3.71-2.44	4.58-6.07	-6.95-8.81	-13.47-9.73	-4.32-1.27	2.02-0.41	4.79-1.2	-10.78-9.77	-18.39-14.94	-14.81-13.08	-12.33-10.72	-4.87-5.38	-6.58-7.09	-11.25-9.48	-3.57-1.22	4.61-4.5
0204°	4.21-2.46	1.91-0.84	2.39-4.37	-9.1-8	8.01-3.74	2.91-3.68	6.57-9.08	6.07-5.24	2.58-0.05	-1.42-3.57	-4.55-4.91	-16.02-10.78	5.85-1.28	2.44-8.94	-6.13-4.28	-4.41-12.83								



Radiated Composite Gain Data of 6GHz

Appendix B

(H122.5)	-16.42-18.72	-18.87-6.96	-7.62-5.5	-3.29-3.61	-3.57-3.31	4.67-6.68	-7.25-7.59	-5.78-2.74	-3.97-7.24	4.04-2.39	-4.28-6.17	-6.04-4.95	-6.11-12.16	-18.49-10.5	-8.81-6.58	-6.14-16.48	-13.72-17.86	-6.6-8.41	-10.64-7.31	-4.45-12.87	-17.27-10.56	4.29-7.8	-10.85-8.75	-14.15-15.44	
(H120)	-18.15-15	-15.95-8.65	-7.33-7.23	-4.13-4.41	4.83-11.55	-13.34-6.68	-7.81-10.2	-4.89-2.08	4.87-10.32	6.3-4.23	-7.34-12.39	-11.42-8.07	-7.37-10.65	-18.76-17.39	-6.21-7.83	-15.16-17.41	-16.84-15.87	7.13-17.15	-13.15-10.81	-18.35-14.14	-18.13-13.95	8.47-10.53	-10.60-16.62	-14.68-17.87	
(H142.5)	-17.74-6.66	-10.27-12.29	-18.44-10.69	-6.56-6.62	-6.87-12.47	-10.23-10.89	-13.34-7.77	-6.13-9.87	-6.76-4.26	-6.86-15.09	-12.59-6.33	-6.34-13.29	-13.07-12.02	-10.37-10.57	-12.89-10.77	-18.99-13.3	-13.12-13.7	-18.61-7.67	-16.44-17.17	-10.18-9.42	-11.62-17.17	-18.73-13.91	-18.81-14.29		
(H125)	-17.21-19.35	-11.28-16.68	-18.44-14.26	-11.76-14.25	-13.17-13.63	-12.17-17.69	-10.58-10.71	-6.59-6.21	-11.19-15.58	-14.21-10.14	-8.84-6.51	-8.21-7.74	-17.87-17.99	-13.99-18.49	-9.95-14.14	-13.06-14.3	-6.63-16.23	-6.59-7.1	-11.74-8.82	-11.21-13.26	-16.79-8.88	-10.36-7.95	-11.42-18.57	-13.35-13.91	
(H145.5)	-17.74-6.66	-10.27-12.29	-18.44-10.69	-11.76-14.25	-13.17-13.63	-12.17-17.69	-10.58-10.71	-6.59-6.21	-11.19-15.58	-14.21-10.14	-8.84-6.51	-8.21-7.74	-17.87-17.99	-13.99-18.49	-9.95-14.14	-13.06-14.3	-6.63-16.23	-6.59-7.1	-11.74-8.82	-11.21-13.26	-16.79-8.88	-10.36-7.95	-11.42-18.57	-13.35-13.91	
(H127.5)	6.63-12	4.76-8.83	-10.44-14.26	-11.57-10.6	5.36-6.1	7.56-10.43	9.88-8.41	6.35-6.2	8.19-12.45	-11.63-17.43	-15.87-17.74	-15.81-18.45	-17.44-19.21	-15.77-15.22	-15.44-17.72	-13.10-10.34	-12.35-15.36	-17.92-11.03	-16.18-19	-16.46-18.03	-18.26-18.96	-14.00-12.27	-17.89-17.37	-16.16-24	
(H157.5)	9.84-9.45	-12.44-17.45	-18.25-17.11	-18.16-15.39	-13.76-18.4	-16.98-12.25	-9.59-10.89	-11.58-16.1	-13.39-16.15	-15.19-14.35	-16.10-13.27	-17.13-10.44	-18.87-16.02	-17.02-12.24	-13.41-17.3	-14.78-13.84	-11.07-10.88	-9.96-9.93	-11.01-12.42	-14.78-17.37	-15.12-12.42	-13.53-11.2	-17.89-17.37	-16.16-24	
(H185)	6.12-9.44	3.87-5.35	-3.6-4.86	-6.07-7.35	8.11-7.71	7.09-7.59	8.01-9	-10.37-11.41	-13.87-15.88	-16.31-16.76	-14.82-16.46	-12.72-13.75	-16.16-15.47	-17.83-18.1	-16.87-15.89	-16.09-13.59	-14.16-17.56	-14.2-10.74	-10.37-12.52	-15.14-16.2	-14.48-14.28	-14.29-12.37	-12.94-13.75	-7.65-6.36	
(H172.5)	5.37-7.82	5.53-5.24	9.94-9.89	6.97-7.32	6.38-10.1	-10.14-2.8	-12.95-16.58	-18.11-18.62	-17.57-17.59	-13.71-17.26	-14.50-16.16	-8.88-8.86	-5.14-6.41	-11.84-13.5	-8.88-7.95	-6.45-10.44	-14.29-17.33	-13.59-12.75	-11.44-10.34	-5.10-7.75	-7.57-6.87	-9.97-11.9	-8.87-8.89	-7.84-7.92	
(H187)	-16.55-16.78	-16.52-12.78	-10.13-8.44	8.22-8.57	4.88-8.62	-12.84-16.78	-15.16-14.74	-16.86-12.98	-13.25-10.45	-6.62-8.94	-12.69-12.03	-11.71-8.26	8.57-7.77	8.84-8.46	-16.49-11	-16.47-17.79	-12.72-10.84	-16.8-11.35	-11.03-10.5	-8.76-10.83	-11.07-13.12	-15.32-18.86	-16.88-18.84	-16.37-16.22	
FreqHd	6.95929R4	ThxHd=2																							
Gain	(H07'967.5)	(H15'922.5)	(H30'937.5)	(H45'952.5)	(H60'967.5)	(H75'982.5)	(H90'997.5)	(H105'1012.5)	(H120'1027.5)	(H135'1042.5)	(H150'1057.5)	(H165'1072.5)	(H180'1087.5)	(H195'1102.5)	(H210'1117.5)	(H225'1132.5)	(H240'1147.5)	(H255'1162.5)	(H270'1177.5)	(H285'1192.5)	(H300'1207.5)	(H315'1222.5)	(H330'1237.5)	(H345'1252.5)	
(H7)	8.271-8.64	8.037-9.4	7.54-9.19	6.19-8.45	-10.48-11.49	-12.32-12.61	-12.96-13.27	-15.75-17.06	-17.18-15.15	-13.64-11.42	-11.81-13.39	-10.71-10.27	-9.73-8.02	8.05-7.78	7.447-7.39	5.92-8.33	4.16-8.41	4.28-8.51	4.28-8.51	7.94-8.02	8.95-9.1	10.86-12.87	-13.12	-12.64-13.33	-11.72-12.82
(H17)	6.62-5.84	5.661-6.02	4.311-3.69	4.64-6.15	4.48-4.49	4.26-4.3	4.50-6.26	4.67-7.47	7.41-9.35	-10.36-9.64	-16.10-8.5	-8.09-7.82	-7.13-6.23	4.45-6.87	3.58-6.03	4.48-6.91	5.89-7.16	6.10-7.127	-13.47-12.47	-12.49-13.54	-12.84-13.71	-11.07-10.46	4.611-7.37	7.47-8.36	
(H27)	5.54-5.64	5.421-6.01	5.69-6.75	7.65-7.7	6.17-4.42	4.29-4.4	5.09-6.48	4.58-6.13	5.55-5.32	7.66-9.31	-10.17-10.94	-10.46-7.22	5.30-6.48	4.41-4.27	3.52-4.41	3.29-3.97	4.55-6.73	7.58-9.19	9.92-10.79	-13.11-10.68	-13.12-11.61	-10.41-9.19	8.117-7.54	6.66-6.01	
(H22.5)	5.6-6.28	4.61-6.19	4.66-6.49	4.91-5.69	4.11-2.73	2.25-2.26	2.97-2.07	1.77-2.18	3.74-5.76	8.78-13.23	-15.64-7.52	-11.36-6.37	4.2-6.74	7.24-6.56	5.53-6.16	5.85-6.21	5.57-6.78	16.0-9.31	-10.47-10.25	-10.44-10.06	4.91-5.17	4.81-4.28	4.06-4.54	5.59-5.61	
(H40)	6.54-7.37	7.32-7.14	-7.76-6.4	-4.28-3.44	2.89-2.32	-1.87-1.99	2.27-3.35	2.84-3.91	7.42-10.43	-17.70-13.89	6.26-6.4	4.67-3.99	2.17-2.25	12.12-25	3.17-3.3	7.39-8.7	4.27-5.82	4.43-4.69	7.17-8.85	-11.07-10.23	4.56-5.66	3.98-4.36	6.55-6.12	4.95-6.38	
(H37.5)	5.1-4.98	5.68-5.83	4.49-7.01	7.01-6.72	5.23-3.99	3.44-3.85	4.59-5.03	5.57-7.6	11.47-9.79	-13.16-9.66	-4.63-9.93	-3.39-3.29	2.77-2.84	3.3-3.76	5.56-6.05	6.21-5.96	8.91-10.96	8.15-6.34	4.78-6.69	-12.77-9.22	5.54-5.13	1.85-2.62	3.32-3.75	4.44-4.43	
(H46)	4.06-5.28	5.59-6.02	6.44-8.62	7.06-5.45	3.78-3.25	4.12-7.14	5.64-7.28	17.1-7.1	6.15-5.42	6.39-10.27	-7.21-6.81	2.89-4.65	3.03-3.91	6.07-5.26	4.2-7.52	-10.26-9.27	-11.10-10.01	7.63-6.1	5.63-13.52	-11.07-9.55	4.27-5.22	4.65-5.35	-3.14-7.13	-1.94-3.1	
(H52.5)	4.95-5.28	5.03-7.26	8.8-11.31	4.81-1.63	4.41-2.22	3.44-3.75	6.21-8.77	7.28-7.17	-13.86-12.2	3.44-3.75	4.61-4.43	3.44-3.65	2.56-2.41	4.85-7.76	4.89-8.88	8.28-7.78	6.17-74	4.53-10.55	-10.76-9.59	-11.21-10.26	6.43-7.35	1.188-1.04	4.02-1.29		
(H67)	3.23-4.78	4.68-6.35	-7.15-12.51	-1.95-12.72	5.56-7.16	-3.03-1.08	2.88-3.83	7.47-14.42	-10.18-14.87	-18.15-7.88	-6-9.1	6.1-14.6	3.63-6.55	8.82-13.2	4.78-9.51	8.82-12	-17.24-15.22	11.87-11.4	9.37-15.44	-13.29-8.42	3.76-1.8	0.891-7.2	1.735-7.75	3.56-3.34	
(H87.5)	1.62-2.83	3.14-4.83	4.27-6.69	4.29-6.96	4.98-7.94	-3.89-2.46	4.98-7.94	3.26-7.93	-15.92-15.44	-11.12-9.51	-11.12-9.51	6.17-9.39	4.48-9.3	4.85-9.3	4.85-9.3	4.85-9.3	4.85-9.3	4.85-9.3	4.85-9.3	4.85-9.3	4.85-9.3	4.85-9.3	4.85-9.3	4.85-9.3	
(H1)	1.791-2.65	2.23-2.22	-2.46-7.12	-7.82-7.36	7.19-3.15	2.26-3.54	7.26-6.91	-7.44-9.1	5.99-6.9	8.18-14.9	-14.28-12.67	-11.86-12.22	-15.95-10.57	-12.17-9.3	8.91-9.18	-12.10-9.96	-10.18-18.85	-18.41-19.28	8.96-10.34	4.30-3.91	2.57-0.12	1.37-2.81	3.42-3.6	1.99-6.88	
(H82.5)	1.16-2.03	-1.67-4.14	8.37-18.1	8.41-3.38	3.72-3.35	5.7-4.37	-16.41-9.88	-11.27-11.59	-18.93-9.53	-13.11-18.9	-13.11-18.9	-13.11-18.9	-13.11-18.9	-13.11-18.9	-13.11-18.9	-13.11-18.9	-13.11-18.9	-13.11-18.9	-13.11-18.9	-13.11-18.9	-13.11-18.9	-13.11-18.9	-13.11-18.9	-13.11-18.9	
(H97)	8.88-9.75	6.93	4.07-4.38	3.16-2.51	4.19-2.28	5.16-14.62	-15.59-6.16	4.38-6.56	7.52-7.59	4.89-7.81	4.38-6.49	-7.62-8.79	-10.43-11.35	-10.68-14.81	-11.11-10	-17.76-13.1	4.65-6.45	-10.98-9.07	-10.38-1.93	1.80-1.1	-1.59-1.29	2.99-6.68	2.08-1.29	-1.58-6.1	
(H107)	7.78-6.91	3.93-3.12	7.03-6.28	4.12-5.65	6.98-6.45	5.86-6.74	4.88-5.31	4.27-6.21	4.37-2.51	5.86-6.62	4.46-5.72	6.17-7.61	7.11-5.82	6.57-7.22	-12.26-16.58	-16.57-14.68	-12.64-14.58	7.71-7.38	7.78-7.84	1.11-11.36	3.41-1.52	5.91-14.1	3.24-1.9		
(H115)	6.58-5.32	4.59-4.02	3.33-3.88	5.69-5.42	7.07-7.01	3.31-3.28	17.52-15.85	13.79-16.3	15.53-16.1	6.38-7.97	6.38-7.97	6.38-7.97	6.38-7.97	6.38-7.97	6.38-7.97	6.38-7.97	6.38-7.97	6.38-7.97	6.38-7.97	6.38-7.97	6.38-7.97	6.38-7.97	6.38-7.97	6.38-7.97	
(H122.5)	2.16-2.07	-1.25-1.31	-1.21-1.16	-2-1.31	-16.32-18	9.97-5.15	-10.43-7.9	6.99-10.79	12.69-8.47	7.54-10.14	-5.31-3.96	-10.13-7.5	9-17.8	3.88-4.45	9.75-13.34	7.99-13.35	-16.78-5.28	-12.72-9.2	5.33-9.28	-2.60-1.5	-4.17-3.95	5.03-7.39	4.75-7.37	-2.89-3.29	
(H142.5)	4.23-10.77	-12.96-18.84	-12.10-16.95	-16.26-10.92	8.41-5.01	4.68-5.64	4.21-4.77	-17.26-16.28	9.74-4.52	3.62-5.25	4.45-5.95	-10.99-18.29	6.23-6.84	6.23-6.84	6.23-6.84	6.23-6.84	6.23-6.84	6.23-6.84	6.23-6.84	6.23-6.84	6.23-6.84	6.23-6.84	6.23-6.84	6.23-6.84	
(H127.5)	8.89-8.13	9.22-6.3	7.40-5.96	5.10-7.74	4.47-5.52	9.18-9.51	-15.53-6.63	-3.98-3.49	7.26-10.07	4.12-9.21	-11.42-10.33	-13.51-16.78	-13.52-16.4	4.12-9.21	-11.42-10.33	-13.51-16.78	-13.52-16.4	4.12-9.21	-11.42-10.33	-13.51-16.78	-13.52-16.4	4.12-9.21	-11.42-10.33	-13.51-16.78	
(H127.5)	-12.02-6.46	6.77-8.82	-4.39-6.41	-8.01-8.64	9.19-6.34	7.17-5.64	-11.01-11.08	-8.59-6.39	4.57-5.76	-10.32-14.12	-10.29-19.02	-11.11-13.93	-13.11-12.25	4.71-8.35	-11.58-10.39	-13.02-12.98	4.11-18.38	3.09-6.07	-13.17-13.07	-14.58-6.87	-12.72-16.06	9.69-6.48	-3.63-8.02	-17.91-14.58	
(H142.5)	-10.04-7.58	7.8-8.82	-8.13-16.61	-18.88-14.21	-17.13-4.78	-3.38-2.61	-1.68-2.34	4.48-15.82	-16.31-18.49	-10.31-10.13	-12.37-12.25	-12.88-12.92	8.89-12.85	-7.78-13.79	-6.97-12.92	-8.11-8.82	-11.98-16.91	9.50-2.88	8.31-11.29	-7.28-7.21	-7.99-8.2	-12.28-14.87	-16.69-17.89	-6.75-10.01	
(H147.5)	-8.59-7.4	8.88-10.38	-12.51-10.73	-7.82-4.5	8.31-2.46	-1.81-1.39	-1.68-2.34	-16.31-18.49	-10.31-10.13	-12.37-12.25	-12.88-12.92	8.89-12.85	-7.78-13.79	-6.97-12.92	-8.11-8.82	-11.98-16.91	9.50-2.88	8.31-11.29	-7.28-7.21	-7.99-8.2	-12.28-14.87	-16.69-17.89	-6.75-10.01		
(H157.5)	-12.79-12.77	-15.15-18.4	-11.58-11.63	9.94-9.64	-12.19-16.33	-19.29-10.61	-10.24-11.44	-15.84-15.52	-11.42-6.48	4.61-5.98	-10.25-10.55	-12.96-14.28	-12.16-12.52	-14.88-14.28	-12.71-14.17	-12.25-10.55	-12.96-11.16	8.04-6.33	7.92-6.69	-7.46-6.47	-7.02-6.81	-7.25-7.35	-16.16-7.77	-6.55-10.69	
(H167.5)	-9.13-35	-11.16-16.7	-17.83-17.84	9.94-9.66	8.46-8.64	9.19-6.34	9.19-6.34																		



Page No. : B8 of B11
Report No. : AP282903A



Radiated Composite Gain Data of 6GHz

Appendix B

(H1)	-11.64-13.05	-13.89-13.4	-16.8-18.28	-19.08-18.24	-18.96-19.04	-17.65-18.63	-17.89-19.32	-19.04-18.08	-15.22-14.25	-13.30-13.21	-12.39-11.51	-12.38-12.48	-11.87-13.45	-12.63-13.25	-11.21-11.23	-14.64-16.03	-16.86-17.7	-15.76-17.58	-16.88-18.67	-15.95-16.8	-14.99-13.97	-15.14-14.4	-13.21-11.9	-11.77-11.41
(H1S)	8.11-13.4	8.95-8.88	-9.67-12.1	-12.87-15.05	-18.74-16.55	-17.28-18.87	-17.16-17.83	-17.27-18.82	-17.92-18.19	-17.96-15.02	-15.14-11.3	-8.89-7.98	-7.74-6.95	-6.96-7.21	-6.07-8.81	-10.33-12.1	-15.04-15.75	-16.89-18.9	-16.84-16.58	-16.12-14.5	-10.18-10.81	-8.75-8.88	-6.07-6.75	8.33-7.8
(H1S)	-13.96-15.68	-14.09-14.16	-13.89-13.6	-16.96-18.74	-18.75-18.13	-15.07-14.15	-11.61-12.46	-12.69-14.42	-14.97-16.84	-14.42-13.39	-11.10-14.4	-7.57-6.49	-5.26-4.74	-4.67-6.64	-2.72-14.3	-8.74-9.88	-10.24-13.18	-15.29-16.8	-16.05-16.83	-12.76-9.37	-7.25-6.69	-6.86-6.5	-6.72-6.11	
(H2)	8.43-7.97	-8.84-11.27	-16.06-13.81	-14.36-14.52	-16.06-16.57	-14.99-13.1	-12.39-10.88	-8.32-9.3	8.51-8.71	-10.39-11.34	-10.8-6	-8.99-7.21	-6.8-6.6	-6.02-6-7	-6.78-6.7	8.35-10.07	-10.13-11	-10.4-10.57	-13.46-17.78	-17.94-16.13	-13.54-7.73	-6.66-7.05	-7.84-8.84	-8.06-6.77
(H2S)	7.74-5.51	-7.38-6.05	-9.76-12.52	-13.36-15.36	-16.16-16	-17.86-18.97	-18.92-13.14	9.71-7.8	7.27-7.16	-7.39-9.01	-8.05-6.91	-7.31-6.88	-6.88-6.18	-6.83-6.51	8.19-8.01	8.21-8.23	-10.22-11.81	6.51-6.09	8.11-8.22	-13.73-13.74	-7.97-6.77	-6.67-6.59	-5.53-6.48	-3.58-6.11
(H3)	-4.91-4.8	6.66-6.07	-11.87-17.71	-19.54-12.98	-12.21-16.28	-11.91-15.54	-15.95-14.65	-13.36-7.05	6.62-6.04	4.89-6.87	6.52-6.11	4.4-3.82	-3.31-3.34	-3.53-4.28	4.26-4.8	6.52-7.28	8.94-15.28	-12.66-8.81	6.53-6.69	-19.13-12.96	9.21-6.8	-5.23-1.4	-2.48-3.77	-4.02-4.56
(H3S)	5.48-5.09	-5.72-6.55	-6.24-10.88	-16.19-12.98	-12.85-12.63	-14.08-15.28	-12.85-12.06	-9.81-6.71	8.45-9.84	5.71-8	-4.67-5.18	-3.89-2.21	-1.82-2.61	-2.51-1.3	-1.21-2.58	-5.23-6.65	-7.5-10	-16.88-12.69	-6.17-6.17	-17.59-13.13	-8.37-6.54	-3.271-1.52	-2.79-5.7	-7.91-7.21
(H5)	4.45-5.15	6.63-12.02	-12.39-14.11	-16.43-16.32	-11.41-10.08	-17.10-10.25	-8.22-12.38	-9.28-4.09	6.49-6.35	2.94-2.59	-4.19-3.71	-2.07-1.63	-2.26-3.64	-3.72-2.33	-1.71-2.94	2.51-6.74	8.06-14.36	-17.25-11.14	7.01-6.35	-18.13-19	-7.81-2.94	2.06-4.09	8.24-6.39	-4.22-6.89
(H6)	1.55-1.41	2.43-6.03	-14.5-16.34	-13.0-8.54	-7.59-10.49	-12.02-6.67	-8.42-12.11	8.1-1.18	3.17-7.33	2.75-1.28	-1.04-0.53	-1.03-1.88	-3.65-4.63	-4.35-3.78	2.79-2.54	3.10-5.5	-14.20-10.29	-7.73-11.71	-18.18-9	-6.82-5.66	-5.52-7.65	-3.50-7.87	-1.36-1.76	
(H6S)	4.21-6.03	6.79-13.04	-16.59-11.84	-8.27-3.71	-11.89-18.38	-17.28-6.73	-6.29-8.65	-7.65-1.77	5.33-6.32	4.35-1.26	-1.5-0.84	-3.37-3.85	2.22-2.85	-2.08-2.78	6.27-5.81	-4.93-6.89	-6.34-13.24	-7.70-11.41	4.47-6.43	-18.64-15.24	-6.52-6.22	-6.8-6.48	-5.07-6.13	-6.47-15.5
(H7)	2.53-3.35	1.91-5.19	8.49-10.15	5.71-4.44	4.26-14.26	-18.42-11.09	5.77-11.11	4.29-11.15	7.24-4.65	0.35-1.54	-2.82-3.56	-1.73-2.49	2.23-3.15	1.45-1.41	3.56-6.12	3.92-2.91	4.42-16.95	6.44-6.05	1.45-1.49	4.39-5.38	8.47-7.35	3.75-4.12	5.28-3.35	
(H7S)	2.53-1.21	4.14-10.35	-12.71-12.44	7.39-6.55	3.64-9.5	-17.89-17.67	4.03-9.66	4.01-9.35	5.33-4.82	4.61-1.26	-1.28-1.74	2.93-2.18	7.7-7.74	1.34-1.96	-2.78-4.36	3.78-1.92	8.86-13.71	6.11-1.9	3.55-5.48	-17.93-16.28	3.29-3.29	3.76-3.59	-5.36-1.59	
(H8)	1.72-1.94	2.11-5.42	5.01-7.42	5.68-6.47	3.99-6.89	2.28-5.01	7.54-14.73	1.89-5.82	8.4-6.2	1.72-3.49	3.99-2.29	0.97-1.7	0.54-1.83	2.69-1.46	3.20-7.85	4.59-2.26	2.99-1.1	2.99-2.91	6.26-6.28	7.39-9.98	3.11-2.4	3.39-3.2	5.19-5.26	
(H8S)	1.76-1.21	2.49-5.45	9.46-13.9	-10.13-9.88	1.12-3.73	1.21-3.47	4.76-17.54	3.29-1.54	7.03-16.96	2.09-7.78	-1.15-17.4	1.93-1.5	2.09-4.55	3.12-4	-4.48-7.71	5.93-3.49	2.30-2.38	2.88-14.78	2.53-1.69	-11.16-4.45	4.19-4.54	-11.49-1.54	-10.71-10.8	
(H9)	5.88-5.22	4.03-8.81	-18.36-13.68	-7.39-3.89	2.89-6.83	-13.01-7.13	3.53-2.65	-6.69-5.49	6.88-5.52	7.85-4.65	-9.97-4	0.12-1.41	0.74-1.88	1.33-1.94	3.13-5.13	4.39-4.71	5.06-4.24	4.42-14.78	7.41-3.7	3.95-10.98	-12.98-11.48	-7.66-6.52	-12.52-16.75	-11.43-6.88
(H10)	-1.82-3	-7.38-8.73	-6.02-11.04	-11.29-9.49	2.59-5.06	4.79-18.4	4.91-16.88	-5.89-3.86	2.99-1.02	-4.84-2.65	-3.91-2.14	2.62-1.63	-3.08-4.39	4.08-4.18	-7.06-7.47	7.07-5.65	-6.83-6	4.83-6	1.71-9.37	-7.01-12.86	-13.17-9.8	9.88-11.24	-12.13-18.1	-23.03-7.4
(H10S)	-3.2-2.7	-10.37-7.04	-5.56-6.68	-12.86-6.47	4.12-4.42	4.33-3.07	-2.03-12.28	-6.34-0.62	0.067-3.74	-11.26-4.08	-1.89-2.37	-4.23-5.61	-4.26-7.8	-7.79-7.54	-7.13-7.82	-10.19-11.31	5.9-11.3	4.65-10.47	-7.34-11.38	4.6-5.88	-16.56-16.89	-16.99-18.54	-13.68-5.13	-4.11-10.5
(H11)	-8.33-7.9	-10.46-7.89	-8.41-12.09	-18.11-8.65	9.29-7.77	4.45-3.07	-4.09-13.14	-12.54-4.93	3.30-5.43	-11.49-13.48	6.4-9.82	-8.37-9.99	-11.3-12.28	-11.29-12.3	-8.89-10.66	-5.45-3.78	-19.24-12.31	5.51-4.08	2.96-4.26	-16.12-10.32	-13.74-12.37	-14.88-11.54	-17.77-17.7	-17.77-17.7
(H11S)	-10.49-10.23	8.87-8.31	-11.51-16.15	-6.13-6.14	1.84-5.58	-7.79-10.26	-12.19-5.4	6.12-6.82	-10.22-8.64	-6.24-5.04	-7.96-11.19	-13.63-14.57	-14.61-10.21	-8.95-7.78	-18.26-6.4	-12.69-3.73	11.21-14.17	5.72-6.68	-1.26-1.83	-7.51-11.66	-8.81-7.81	8.72-8.88	8.67-10.86	-10.41-10.5
(H12)	6.43-6.47	-7.21-6.6	-12.59-8.85	-5.179-3.69	2.21-3.04	3.56-7.82	-7.64-6.04	4.01-3.01	3.87-4.09	-17.41-17.17	4.4-1.8	-1.01-2.66	-3.84-3.98	7.53-11.42	-15.77-18.53	-16.72-18.52	-10.37-7.27	7.73-9.92	-5.11-11.6	-4.43-17.48	-12.66-16.76	-6.45-6.39	-8.46-13.52	-10.41-10.5
(H12S)	-7.25-6.59	6.35-6.02	-10.57-14.54	-3.3-3.17	3.94-4.38	4.24-5.61	-19.75-8.84	-3.86-2.72	1.75-1.38	-3-2.1	6.91-16.18	-15.22-10.49	-8.76-9.47	-11.44-11.5	-14.32-14.17	-12.39-13.24	-18.61-17.97	-18.14-19.19	-17.67-10.48	-19.47-11.74	-12.29-10.63	6.57-10.2	-1.37-25.3	-2.59-3.12
(H13)	8.48-8.95	7.49-6.42	-6.71-8.31	-12.49-10.53	-9.69-10.92	-11.45-15.25	-17.82-16.14	-10.46-9.7	8.46-6.53	-13.15-16	-16.11-8.1	-8.02-7.73	7.3-7.5	-11.77-12.72	-17.17-17.92	-17.24-16.58	8.99-7.41	7.39-7.95	9.86-6.62	9.04-9.12	-8.22-8.63	4.69-3.74	2.52-2.36	2.59-3.1
(H13S)	-17.52-16.91	-14.53-17.78	-19.16-18.07	-19.29-16.96	-14.44-12.32	-11.51-13.2	-12.03-11.68	-11.47-10.19	-12.03-12.59	-14.22-15.93	-15.17-13.74	-11.58-10.58	-10.12-11.82	-11.67-13.58	-11.92-8.87	-8.47-8.51	6.29-11.35	-13.82-18.67	-10.97-12.51	-10.49-15.32	-14.49-14.36	-11.64-10.16	-8.53-8.87	-14.82-15.3
(H14)	-10.18-12.29	-15.66-17.56	-16.08-14.25	-12.66-12.73	-12.48-14.99	-15.26-18.28	-18.4-18.17	-18.11-15.54	-14.21-13.38	-12.07-11.88	-10.36-10.77	9.65-10.53	-12.74-13.4	-12.74-13.22	-13.34-14.6	-15.36-16.81	-18.83-17.6	-16.16-18.14	-18.11-18.31	-12.79-9.59	-5.83-6.26	-3.72-1.32	-4.48-6.53	-10.41-10.5
(H14S)	-11.47-10.2	-8.64-12.79	-16.17-15.86	-15.61-16.98	-18.4-18.18	-18.76-18.54	-18.13-18.98	-18.31-16.88	-15.22-13.12	-12.25-12.97	-13.31-14.25	-13.49-14.97	-14.98-13.1	-12.78-15.65	-12.37-13.82	-15.75-17.14	-18.49-18.71	-18.74-18.1	-16.25-17.14	-18.89-17.44	-17.75-14.48	-11.39-14.6	-11.18-13.93	-15.77-16.5
Freq(Hz)	6.995(GHz)	Phi(Hz)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gain	(H1)(H2)(H3)	(H4)(H5)(H6)	(H7)(H8)(H9)	(H10)(H11)(H12)	(H13)(H14)(H15)	(H16)(H17)(H18)	(H19)(H20)(H21)	(H22)(H23)(H24)	(H25)(H26)(H27)	(H28)(H29)(H30)	(H31)(H32)(H33)	(H34)(H35)(H36)	(H37)(H38)(H39)	(H40)(H41)(H42)	(H43)(H44)(H45)	(H46)(H47)(H48)	(H49)(H50)(H51)	(H52)(H53)(H54)	(H55)(H56)(H57)	(H58)(H59)(H60)	(H61)(H62)(H63)	(H64)(H65)(H66)	(H67)(H68)(H69)	(H70)(H71)(H72)
(H1)	15.17-16.97	-19.35-19.05	15.12-12.25	-11.43-9.43	7.56-7.75	6.25-6.87	6.55-4.94	6.69-4.93	6.4-1.1	8.32-9.58	-8.87-9.58	-10.12-12.72	14.87-16.16	-17.92-16.98	-13.34-11.61	-11.64-9.48	9.29-7.82	4.42-5.83	5.7-5.21	-5.99-6.24	6.94-7.64	7.09-6.12	-14.33-10.71	-10.71-12.95
(H1S)	16.07-11.25	-13.71-16.2	-14.71-12.22	-12.66-11.28	10.68-10.72	8.91-8.78	9.04-8.99	8.91-11.38	12.28-14.22	-12.77-12.32	-14.92-12.35	9.91-9.82	-11.46-9.77	8.91-9.57	-11.37-11.9	-12.50-14.41	9.71-9.82	6.64-6.23	5.11-6.64	4.23-4.43	5.29-5.67	1.77-1.67	-7.88-8.64	-10.57-10.68
(H2)	7.52-8.64	5.29-10.4	-12.95-13.34	-15.47-15.75	-15.98-15.73	-13.07-11.55	-10.07-11.23	-15.75-14.66	-16.26-16.84	-12.3-2.96	5.8-6.23	7.77-8.67	9.14-8.48	8.83-8.95	-15.47-16.72	-14.73-17.42	-13.94-13.12	11.31-8.45	2.73-7.4	-7.47-6.96	-10.71-7.14	-14.69-16.97	-16.32-17.17	8.67-3.3
(H2S)	5.47-5.61	-10.10-10.45	-9.06-10.48	-11.62-12.68	-10.68-10.77	-13.53-13.07	-14.10-14.24	-12.01-16.52	-17.25-15.59	-10.87-10.73	4.69-6.72	-7.96-6.55	-10.55-10.12	-17.54-17.97	-15.75-15.4	-16.36-18.87	-16.81-12.58	8.66-6.47	4.19-7.94	-14.69-13.71	-16.69-16.15	-13.28-16.84	-7.43-9.74	
(H3)	-8.26-11.14	5.92-9.38	-7.77-10.49	-10.89-13.57	-15.16-17.34	-13.67-17.38	-9.59-13.65	-18.16-18.79	-13.12-18.56	-10.62-8.63	-4.51-3.83	-4.38-6.57	6.18-10.11	-12.45-14.44	-12.56-13.34	-17.14-8.54	5.18-4.01	-4.02-5.62	-7.79-9.01	-14.59-14.83	-13.68-11.96	6.06-11.75	-10.81-16.6	-10.61-6.52
(H3S)	1.43-1.44	3.68-3.97	4.4-4.5	-5.99-5.94	-7.71-7.88	6.87-7.36	6.80-7.36	-12.94-14.36	-18.19-18.74	-14.94-7.68	-2.93-2.31	-4.89-7.32	0.91-0.75	-16.15-18.38	-12.71-9.78	-11.94-12.72	-10.53-9.57	-7.87-8.28	-7.92-5.65	-6.31-4.93	-4.52-6.5	-1.93-1.64	-12.01-7.28	
(H4)	7.971-7.25	-8.38-10.03	-8.59-8.67	-8.80-7.65	-14.51-17.42	6.68-7.33	-10.29-9.91	-10.31-10.68	-10.83-16.68	-17.62-8.55	-6.82-7.23	-10.31-11.4	-12.49-10.68	-7.74-7.47	-7.68-10.24	-11.03-13.99	-15.76-17.12	17.01-9.18	8.99-12.62	-13.06-11.18	4.51-4.48	-4.51-6.02	-10.72-12.8	6.73-7.9
(H4S)	7.23-6.15	-12.72-18.21	-17.32-18.34	-15.22-17.11	8.11-9.27	-13.64-14.68	-6.07-15.1	-13.14-14.05	-10.06-14.45	-6.24-8.67	-13.													



Radiated Composite Gain Data of 6GHz

Appendix B

0100°	5.54/3.43	4.88/5.38	-8.5/-14.76	-12.13/-7.82	5.37/2.28	6.54/14.54	-15.40/7.83	-3.81/3.35	-3.31/3.34	-7.26/17.71	-19.24/17.96	-14.46/-17.16	-11.31/-12.9	-10.39/-13.21	-12.35/-13.08	-14.11/-12.33	-13.22/-8.74	-3.28/-1.71	-5.84/8.11	-8.61/6.79	-2.72/-2.55	-2.31/5.06	9.41/7.97	-8.89/-4.19
0107.5°	4.3/-2.91	5.41/3.05	-2.1/-1.94	-3.26/-3.4	-1.12/3.63	6.79/9.74	-5.5/-2.31	-1.88/-2.16	-4.09/-4.78	-12.57/-10.57	-12.85/-11.02	-11.81/-13.89	-10.17/-13.49	8.95/-14.78	-6.26/-18.1	-12.58/-13.3	-12.59/-8.48	-3.41/-2.76	-10.63/-13.41	-19.3/-8.25	-5.89/-2.06	-1.88/-3.82	-13.61/-4.86	7.6/-8.88
0115°	-1.21/2.25	2.87/3.16	-6.76/-6.56	-15.02/-16.21	-7.86/6.45	-5.89/-4.96	-3.69/-3.22	-1/2.72	-4.54/-3.62	-7.71/-10.98	-17.69/-18.44	-19.08/-19.31	-14.57/-17.72	-10.84/-4.35	-5.83/-6.98	-8.42/-12.49	-8.29/-6.32	-7.91/9.35	-12.79/-18.76	-10.59/-4.57	-1.79/-6.74	-18.3/-11.79	-8.44/-2.48	
0112.5°	4.76/0.93	2.24/-0.7	-1.28/-0.87	-9.96/-1.21	0.41/-0.97	-3.72/-9.2	-10.43/-6.66	-2.22/-5.98	8.8/-5.71	8.07/-17.33	-10.76/-6.39	-10.39/-9.34	8.21/-5.77	7.21/-6.8	-6.05/-7.25	-10.76/-13.52	-7.57/-8.86	8.84/-9.77	-12.12/-3.76	-5.51/-18.84	-8.73/-3.89	-3.46/-11.85	-14.28/-6.59	-3.96/-1.35
0110°	4.23/-4.89	7.81/-2.87	2.14/-1.88	-3.08/-4.01	2.31/-1.43	-1.85/-4.33	3.76/-1.83	-2.54/-2.53	2.82/-2.77	4.06/-10.85	-19.23/-14.38	-8.08/-6.53	7.15/-7	-8.99/-6.32	8.41/-7.75	8.26/-12.36	-6.28/-9.21	-2.93/-3.1	-10.92/-12.3	-7.07/-8.99	-14.19/-8.03	-15.67/-18.23	-4.88/-7.54	-2.53/-1.05
01127.5°	-8.39/-14.47	-19.41/-13.6	-10.49/-12.39	-17.96/-19.87	-18.51/-12.73	8.86/-8	7.95/-4.75	-2.16/-1.84	2.02/-2.98	-3.33/-5.13	-11.96/-10.69	-5.93/-6.67	-2.07/-3.16	-6.48/-8.32	-14.52/-5.41	-6.65/-6.89	5.39/-18.47	-5.91/-2.51	6.43/-4.15	-6.17/-18.07	-17.73/-8.82	-11.64/-10.29	-8.91/-6.26	-4.46/-4.08
01135°	46.7/-4.1	-11.88/-17.41	-18.69/-18.26	-13.24/-7.74	4.87/-4.65	-5.49/-7.29	6.52/-4.05	-2.91/-2.54	3.94/-5.36	-6.31/-12.54	-17.41/-7.79	6.41/-6.08	-2.53/-7.06	-7.36/-19.5	-14.88/-8.21	-6.43/-5.07	-13.57/-15.7	-4.5/-2.09	-3.94/-1	-6.84/-11.56	-6.82/-10.32	-18.51/-8.82	-14.83/-13.47	-9.96/-5.19
01142.5°	-11.88/-17.57	-17.81/-15.14	-10.55/-8.06	8.84/-10.19	-7.03/-4.18	3.21/-1.7	-11.03/-17.12	-11.17/-6.46	8.29/-6.6	-10.89/-14.4	-18.3/-11.7	-7.65/-6.02	-4.5/-6.68	-10.33/-17.8	9.73/-4.2	-8.48/-6.33	-18.77/-9.75	-3.77/-6.92	8.05/-10.08	-12.54/-5.51	-4.83/-6.36	-17.9/-3.97	-10.89/-4.13	-12.07/-15.96
01150°	7.08/-5.29	7.78/-11.87	-13.45/-12.4	-14.07/-17	2.77/-1.13	2.5/-5.53	-10.71/-16.74	-10.55/-8.55	8.75/-6.7	-8.49/-6.86	-8.95/-10.52	-9.92/-9.96	9.17/-10	-11.15/-10.77	-13.97/-7.53	-3.5/-5.04	8.79/-12.19	-18.02/-11.87	-8.35/-6.79	-10.33/-7.41	7.28/-12.11	-18.14/-18.19	-17.53/-17.51	-15.9/-13.07
01157.5°	-12.03/-19.53	-11.09/-6.79	-7.84/-6.88	-11.02/-11.37	6.19/-5.13	5.63/-1.77	-8.89/-9.74	-10.15/-7.33	5.84/-4.83	-4.47/-5.19	8.81/-6.8	-7.98/-6.98	6.51/-5.68	5.12/-6.43	-19.94/-16.31	-19.94/-14.7	-8.84/-7.88	7.31/-7.16	-18.18/-12.2	-15.89/-15.49	-14.79/-18.71	-18.83/-14.8	-10.38/-6.62	-5.73/-7.79
01165°	14.86/-13.37	-10.18/-9.99	-11.44/-12.71	-16.25/-13.07	-12.59/-16.05	-17.87/-18.17	-18.36/-16.04	-13.82/-15.92	-13.44/-10.71	8.41/-4.57	-4.93/-7.3	-2.95/-3.37	3.67/-3.7	3.34/-2.97	-2.74/-1	-6.33/-8.52	9.07/-11.22	-14.97/-17.88	-16.29/-8.52	-7.38/-7.25	-8.12/-7.71	9.45/-14.92	-18.45/-18.01	-18.23/-18.97
01172.5°	13.86/-14.16	-12.74/-13.53	-13.81/-12.58	-12.79/-12.89	-13.36/-13.01	-13.78/-14.93	-15.71/-18.45	-18.51/-17.82	-17.51/-19.48	7.98/-5.58	-4.47/-3.52	-2.91/-4.3	-2.13/-8.03	-4.97/-1.52	8.3/-10.7	-15.55/-18.87	-18.26/-17.85	-15.26/-13.21	-14.22/-14.01	-16.47/-16.56	-16.71/-17.59	-18.59/-17.88	-17.44/-14.41	
01180°	7.53/-7.41	-7.71/-17.37	-7.82/-8.16	6.77/-11.88	-11.61/-12.79	-11.67/-12.44	-11.67/-13.36	-18.85/-18.74	-18.11/-18.24	-18.46/-15.96	-13.39/-11.16	-10.85/-11.48	-10.93/-11.06	-11.28/-11.08	-8.17/-8.93	-8.98/-9.99	-11.02/-11.64	-13.82/-16.11	-18.22/-18.15	-15.58/-16.01	-18.89/-17.85	-15.54/-14.04	-13.61/-12.83	-10.45/-12.78
Freq(Hz)	6.995GHz	Pin(dB)	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	
Gain	010°(0.97.5)	015°(0.922.5)	030°(0.937.5)	045°(0.952.5)	060°(0.967.5)	075°(0.982.5)	90°(0.997.5)	0105°(0.912.5)	0120°(0.912.5)	0135°(0.912.5)	0150°(0.912.5)	0165°(0.912.5)	0180°(0.912.5)	0195°(0.922.5)	0210°(0.927.5)	0225°(0.932.5)	0240°(0.942.5)	0255°(0.952.5)	0270°(0.967.5)	0285°(0.972.5)	0300°(0.987.5)	0315°(0.992.5)	0330°(0.997.5)	0345°(0.992.5)
010°	-17.06/-18.87	-18.65/-17.17	-17.39/-18.94	-15.03/-13.83	-11.73/-9.9	8.86/-9.15	8.24/-8	-7.78/-4.12	4.84/-9.75	-15.54/-10.71	-10.45/-11.43	-14.76/-16.39	-17.43/-19.05	-18.61/-17.75	-18.11/-18	-14.13/-12.86	-11.64/-11.62	-12.28/-10.29	-10.19/-17.5	8.86/-9.8	8.79/-10.83	11.12/-11.65	-11.41/-13.8	-15.24/-16.78
017.5°	-12.81/-18.33	-18.12/-19.43	-14.77/-13.01	-14.34/-16.05	-13.29/-11.62	-11.31/-9.14	-10.55/-9.86	-10.78/-10.62	-10.02/-12.28	-13.16/-13.72	-14.03/-14.95	-15.58/-18.26	-18.26/-17.6	-18.23/-17.5	-18.14/-18.1	-18.14/-16.95	-12.86/-12.95	-10.64/-8.38	-7.09/-6.55	-4.36/-4.86	-5.33/-5.67	-7.08/-7.1	8.43/-14.87	-12.21/-15.86
015°	-15.84/-18.04	-18.14/-13.89	-8.49/-7.78	-10.33/-10	8.11/-8.2	8.22/-7.69	-7.94/-7.46	-6.54/-7.38	-7.95/-4.87	-10.25/-11.51	-15.11/-18.56	-18.41/-19.04	-18.11/-17.88	-17.92/-17.98	-18.43/-18.63	-18.05/-17.63	-13.82/-11.04	-8.54/-6.52	-6.16/-3.89	-3.89/-3.82	-2.76/-2.53	-2.39/-2.9	4.03/-4.16	-10.81/-15.4
022.5°	-8.91/7.86	-5.98/-6.31	-5.89/-4.99	-5.95/-6.17	-4.85/-6.84	-7.06/-62	-5.59/-5.61	-4.81/-5.15	-5.85/-6.94	-7.91/-9.43	-11.19/-14.17	-16.93/-18.77	-17.43/-15.4	-14.21/-11.52	-11.04/-12.3	-12.49/-10.87	-8.83/-9.44	-9.29/-8.06	-4.46/-2.87	-4.01/-5.05	1.34/0.6	0.68/-2.39	-8.87/-6.06	-10.52/-13.71
030°	-6.59/-4.95	-2.68/-2.01	-2.58/-4.4	-3.99/-4.67	5.64/-7.55	-10.21/-5.4	-3.53/-3.83	-4.21/-4.11	5.4/-5.55	-15.22/-18.88	-17.21/-14.07	-14.03/-11.93	-10.73/-10.85	-8.78/-9.26	-7.86/-8.24	-9.98/-11.53	-18.52/-17.89	-12.87/-9.69	-4.72/-1.68	-0.75/0.4	0.63/0.24	0.87/-2.96	7.71/-17.37	-12.58/-6.84
037.5°	-8.6/-6.2	-3.36/-2.37	-1.21/0.3	-0.96/-2.76	6.21/-11.54	9.74/-9.49	4.06/-3.72	-4.34/-3.38	-10.28/-18.64	-17.31/-12.43	-10.19/-10.88	-10.64/-10.02	-8.42/-8.32	-7.82/-7.69	-6.53/-6.87	-6.27/-15.78	-8.32/-6.72	-4.48/-2.72	-1.47/0.15	1.91/-2.9	0.94/-1.1	-4.65/-6.78	8.43/-10.27	-10.54/-10.98
045°	-5.24/-5.43	-4.37/-3.07	-3.53/-3.02	-1.70/-1.5	2.97/-8.86	-15.73/-7.39	-4.79/-4.04	-4.04/-5.36	-10.79/-18.83	-18.47/-18.03	-17.11/-18.23	-19.14/-17.89	-18.54/-11.75	-10.82/-9.48	-5.33/-4.29	-3.79/-6.86	-8.91/-9.12	-5.38/-3.26	-1.58/0.5	2.27/-2.79	1.79/-2.05	-3.92/-3.74	-10.48/-17.5	-18.78/-17.68
052.5°	-4.88/-4.04	5.23/-3.27	-3.62/-5.16	-6.79/-5.24	-10.51/-2.79	-14.59/-44	2.15/-1.89	-3.01/-7.11	-18.51/-19.2	-13.89/-13.17	-13.47/-12.5	-10.59/-10.22	-9.31/-11.54	-18.37/-12.84	-7.48/-7.51	-4.57/-3.92	-5.63/-4.74	-6.12/-4.03	-1.96/0.63	1.92/0.79	-1.02/-1.75	-1.97/-5.45	8.92/-9	-10.11/-10.76
060°	8.85/-4.13	3.05/-1.38	-1.68/-4.81	-13.76/-4.3	-13.47/-4	9.31/-2.14	-1.65/-2.28	-3.54/-4.68	-11.23/-9.47	-10.53/-10.34	-15.34/-9.87	-10.54/-10.9	8.86/-11.9	-13.86/-15.57	-11.02/-8.68	-7.50/-6.93	-4.26/-5.1	-3.87/-2.06	1.26/0.45	-0.59/-1.87	-4.67/-7.35	8.84/-9.58	-15.71/-16.8	-10.57/-10.76
067.5°	-13.5/-5.97	2.47/-1.27	-0.71/-1.88	-10.19/-10.51	2.18/-1.45	5.38/-6.28	4.52/-6.74	5.88/-6.78	-14.26/-18.21	-15.28/-16.45	8.13/-10.81	-11.44/-15.71	-17.89/-18.42	-18.48/-19.29	-12.33/-10.96	-4.59/-5.85	-8.36/-7.18	-3.24/-4.74	-3.35/-1.74	-6.46/-4.02	-2.52/-4.78	7.16/-7.64	-4.94/-7.85	-12.34/-17.88
075°	-6.48/-3.23	-1.58/0.55	0.87/0.86	-7.44/-13.37	4.43/-2.25	5.07/-6.39	-11.71/-13.94	4.59/-6.85	-13.19/-19.79	-13.19/-19.79	8.26/-11.31	-14.11/-18.87	-17.15/-18.04	-10.71/-9.86	-9.59/-6.82	-7.88/-7.73	-2.72/-5.99	-2.54/-3.15	-7.54/-5.77	-4.99/-7.58	-1.41/-4.15	-9.89/-7.58	-11.41/-4.35	-10.87/-13.98
082.5°	4.402/-1.86	5.89/8.97	1.78/1.95	3.45/-18.36	5.43/-1.95	3.37/2.69	-10.45/-18.83	8.26/-6.15	8.16/-14.5	8.92/-8.81	-5.91/-6.82	8.78/-9.78	7.85/-16.23	8.93/-9.02	-12.24/-13.67	8.73/-14.1	9.75/-6.95	4.86/-2.77	3.71/-4.1	-1.23/-2.36	2.72/-3.7	4.2/-3.2	3.51/-4.63	-10.86/-13.98
090°	3.51/-1.98	-6.01/0.19	-0.44/0.74	6.34/-18.43	-4.21/-7.1	-2.59/0.92	-7.53/-11.81	-7.64/-6.95	5.01/-18.2	-13.87/-9.9	9.35/-10.32	-7.93/-8.41	-5.42/-14.21	8.77/-11.82	-10.94/-17.95	-16.86/-17.01	-11.79/-14.34	5.52/-2.97	2.68/0.14	5.21/-3.9	-4.08/-3.12	2.5/-2.61	-5.58/-12.07	-8.22/-3.35
097.5°	2.54/-2	-1.14/-1.16	-2.52/-2.48	-17.07/-13.47	4.94/-3.32	3.27/0.76	4.36/0.84	-7.65/-3.96	-4.77/-17.13	-14.61/-9.96	-13.31/-10.54	-6.76/-6.42	8.34/-13.59	-10.66/0.19	-15.02/-6	-16.96/-12.95	-15.02/-6	-16.96/-12.95	-15.02/-10.31	-8.33/4	4.46/-7.05	-12.25/-14.4	-1.86/0.76	-10.66/0.63
105°	4.94/3.34	-3.84/-82	-5.87/-6.98	-16.98/-12.92	9.88/0.02	-7.43/-9.06	-14.74/-12.1	-18.48/-9.19	7.37/4.47	-6.44/0.774	-18.48/-9.17	7.15/-7.6	8.58/-10.03	-13.75/9.76	-12.53/-13.12	-17.23/4.33	-11.25/9.57	4.74/6.14	5.75/9.06	-18.27/-8.47	8.91/6.46	-4.74/-5.15	5.67/4.48	-8.96/4.91
112.5°	5.84/4.48	-6.35/-14.85	-13.84/-17.99	-7.28/-5.84	-7.12/-12.32	6.11/-15.16	-4.85/-6.05	-14.18/-7.42	-5.99/3.33	-2.91/3.31	-5.81/-13.34	-5.95/-6.81	8.48/-14.81	-16.34/-11.41	-14.16/-16.56	-17.51/8.82	-11.28/-16.86	-8.31/-5.68	-4.84/-6.88	-17.29/-12.92	-14.73/-12.61	9.23/-5.88	-4.43/-4.16	-8.27/-4.4
120°	-7.23/-5.38	-1.58/0.98	-15.25/-14.66	8.25/-8.02	-1.85/0.1498	-11.49/0.38	-2.49/-2.46	-7.41/-6.21	-2.71/-1.88	-2.71/2.49	-4.06/-4.95	-6.08/-6.24	-14.14/-14.88	-16.11/-13	-16.55/-15.65	-18.23/-11	-10.86/-10.92	-6.51/-6.48	-14.85/-18.78	-14.95/9.42	-12.17/-12.28	-7.98/-4.81	-4.97/-3.61	-7.91/4.53
0127.5°	-5.93/-3.1	-7.72/-18.19	-10.68/-13.73	-10.63/-9.34	-5.86/0.164	-6.88/0.78	-4.5/-10.2	-17.88/-12.01	5.02/-5.22	5.21/-6.88	-15.18/8.77	-12.17/-18.69	-19.22/-11.96	-10.35/-13.1	-7.89/-7.32	-9.54/0.27	-9.43/-10.85	-9.50/-5.05	-6.34/-12.29	-14.26/0.97	-16.66/0.25	-4.91/0.89	-15.05/0.83	-8.92/0.63
0135°	-15.45/-18.16	-12.58/-6.17	-12.69/-13.63	-10.59/-3.88	8.03/-16.3	-17.25/8.84	-7.66/-3.42	-6.08/-7.82	6.55/-4.88	4.15/-12.16	-3.91/-4.34	-7.54/-10.15	-16.72/-11.81	-12.47/-13.8	-5.74/-6.96	-9.85/-8.71	-9.99/-8.6	8.32/-5.08	-11.46/-16.81	-10.63/-8.88	-10.06/-10.6	-3.11/-16.85	8.15/-10.61	-12.53/-6



Antenna Pattern of 2.4GHz&5GHz

Appendix C

Total Gain Data

Frequency	2.45GHz	TotalGain 1	0°/0°(W7.5)	0°/0°(W22.5)	0°/0°(W37.5)	0°/0°(W52.5)	0°/0°(W67.5)	0°/0°(W82.5)	0°/0°(W97.5)	0°/0°(W112.5)	0°/0°(W127.5)	0°/0°(W142.5)	0°/0°(W157.5)	0°/0°(W172.5)	0°/0°(W187.5)	0°/0°(W202.5)	0°/0°(W217.5)	0°/0°(W232.5)	0°/0°(W247.5)	0°/0°(W262.5)	0°/0°(W277.5)	0°/0°(W292.5)	0°/0°(W307.5)	0°/0°(W322.5)	0°/0°(W337.5)	0°/0°(W352.5)
0°(T)	2.533-4.36	3.533-4.37	3.05-3.38	3.77-4.47	3.43-4.48	2.57-6.63	4.68-4.78	4.00-4.34	4.61-6.35	4.28-6.78	5.26-6.80	4.60-6.40	5.60-6.34	5.20-6.49	5.20-6.57	5.05-6.25	5.33-6.54	5.58-6.73	5.65-6.85	5.84-6.85	5.59-6.57	5.50-6.15	4.82-6.46	4.48-6.03		
0°(S)	4.584-4.68	3.523-3.54	3.71-3.51	3.31-3.13	3.38-3.14	4.60-4.33	4.70-4.34	4.58-4.54	4.50-4.61	4.44-4.68	4.30-4.34	4.52-6.42	4.51-6.19	4.50-4.46	4.57-6.31	4.53-6.02	4.52-6.45	4.54-6.32	4.60-6.42	4.60-6.42	4.57-6.31	4.54-6.32	4.51-6.32	4.48-6.32	4.45-6.32	
0°(S)	3.753-3.20	3.212-2.97	2.94-2.82	2.23-2.12	2.88-3.04	3.08-3.18	2.40-2.32	3.50-3.32	3.23-3.38	4.76-4.73	4.50-4.46	4.53-4.13	4.10-4.15	4.40-4.78	4.57-6.31	4.53-6.02	4.47-6.70	4.76-6.12	4.83-6.21	4.78-6.47	4.83-6.21	4.83-6.21	4.83-6.21	4.83-6.21	4.83-6.21	
0°(S)	2.552-1.24	2.201-1.82	1.68-1.85	1.30-2.12	2.25-2.52	2.88-2.75	2.70-2.47	2.40-2.36	2.42-2.40	2.48-2.51	2.50-2.37	2.39-2.60	2.50-3.03	3.61-4.18	4.61-4.90	4.70-6.05	4.68-6.98	4.74-7.07	4.78-7.48	4.87-6.24	4.84-6.48	4.77-6.73	4.77-6.73	4.77-6.73	4.77-6.73	
0°(S)	1.761-1.27	1.23-0.74	0.61-0.64	0.80-1.27	1.55-2.28	2.53-2.59	1.96-1.82	1.77-1.16	1.34-1.14	1.16-1.14	1.16-1.14	1.38-1.41	1.60-2.01	2.27-3.13	3.86-4.62	5.44-6.26	7.20-7.58	7.99-8.05	7.94-8.07	7.88-8.07	7.88-8.07	7.88-8.07	7.88-8.07	7.88-8.07	7.88-8.07	
0°(S)	1.151-1.47	0.42-0.35	0.06-0.41	0.25-0.60	1.09-1.63	1.88-2.24	1.76-1.83	1.25-0.85	0.59-0.42	0.16-0.15	0.16-0.15	0.30-0.58	0.99-1.10	1.39-1.68	2.31-3.02	4.06-6.86	7.48-7.72	7.73-7.37	7.73-7.37	7.73-7.37	7.73-7.37	7.73-7.37	7.73-7.37	7.73-7.37	7.73-7.37	
0°(S)	1.820-1.32	0.85-0.60	0.53-0.17	0.48-0.26	0.38-0.82	1.32-1.82	1.17-1.01	0.51-0.08	0.19-0.26	0.28-0.21	0.28-0.21	0.08-0.50	0.98-1.52	2.02-2.49	3.07-3.64	4.51-6.48	6.37-6.15	7.31-7.18	6.43-6.07	6.68-6.23	6.89-6.41	6.89-6.41	6.89-6.41	6.89-6.41	6.89-6.41	
0°(S)	2.73-2.19	2.07-1.12	0.65-0.98	4.12-0.30	0.70-1.25	1.74-1.63	1.26-0.78	0.45-0.29	0.22-0.22	0.26-0.60	1.04-1.51	2.00-2.20	2.57-2.36	3.29-3.92	4.45-4.91	5.28-6.34	6.06-4.53	4.27-3.92	3.92-4.94	3.87-3.55	3.90-3.32	3.90-3.16	3.19-3.22	3.20-2.95		
0°(S)	1.89-0.44	0.781-46	2.072-22	2.241-86	0.88-0.17	1.18-1.42	1.09-0.62	0.29-0.24	0.54-0.60	0.75-1.10	1.27-1.53	1.70-1.77	1.71-1.80	2.16-2.58	3.31-4.04	4.93-6.82	6.37-6.42	3.50-2.98	2.75-2.85	3.24-3.56	3.80-4.17	4.45-4.18	4.21-3.85	3.57-3.72		
0°(S)	3.30-1.38	3.41-3.48	2.672-72	3.002-92	2.88-0.94	0.24-0.48	0.06-0.65	0.98-1.18	1.02-0.75	0.37-0.21	0.80-1.59	2.26-2.75	2.56-2.46	2.28-2.38	3.00-4.17	6.14-6.14	7.91-6.31	4.59-5.21	2.34-1.99	1.82-1.96	2.00-2.20	2.78-3.51	4.57-5.02	5.03-4.51		
0°(S)	5.87-4.29	1.94-0.32	1.91-0.30	3.84-3.74	3.27-1.98	0.64-0.01	0.18-0.72	0.94-0.73	0.59-0.43	0.08-0.68	1.88-3.53	5.16-6.86	5.78-6.49	8.33-8.27	2.52-3.23	3.80-4.85	5.38-4.78	3.40-3.81	2.54-2.39	2.96-3.34	3.32-3.20	3.15-3.81	4.83-6.20	4.63-6.29		
0°(S)	5.33-3.49	1.84-0.52	1.23-0.33	3.86-3.98	3.44-2.48	1.42-0.70	0.39-0.27	0.00-0.05	0.09-0.09	0.30-0.68	1.87-3.70	6.77-6.93	9.58-7.70	6.36-6.03	4.37-4.13	4.42-4.51	4.32-3.76	3.15-1.70	1.40-1.68	2.83-4.14	4.51-5.69	5.07-4.76	6.24-6.90	7.48-7.10		
0°(S)	4.96-3.67	1.88-0.11	1.44-0.27	3.26-3.21	2.50-1.63	0.74-0.43	0.30-0.35	0.21-0.34	0.45-0.56	0.57-1.04	1.28-1.88	1.77-2.47	1.40-0.18	0.64-0.71	6.62-6.01	4.97-5.23	4.21-3.76	2.72-1.74	0.88-1.79	1.38-0.44	7.77-6.47	7.59-5.53	4.49-4.32	4.90-6.49		
0°(S)	3.79-2.14	4.68-0.99	2.49-0.53	4.21-4.15	3.30-1.18	1.13-0.48	0.10-0.68	0.65-0.64	0.53-0.40	0.53-0.44	1.39-1.48	1.48-1.08	0.87-1.05	1.24-1.48	4.96-5.66	5.93-6.58	5.38-5.42	3.33-2.34	1.63-1.77	2.24-4.62	8.79-12.33	11.51-8.95	4.84-4.28	4.24-4.05		
0°(S)	2.88-1.94	4.76-7.79	2.123-37	3.602-83	3.62-0.33	1.59-0.20	0.48-0.61	0.48-0.28	0.39-0.35	0.39-0.35	0.47-0.42	0.29-0.37	0.77-0.79	1.17-1.29	12.01-11.34	8.44-7.02	8.78-4.71	3.84-2.78	1.26-1.69	1.88-0.25	4.82-0.49	10.70-7.18	5.53-4.20	3.24-2.76		
0°(S)	1.92-1.36	4.65-0.55	1.86-0.42	4.19-0.45	4.23-0.54	2.78-1.39	1.24-1.15	1.00-1.18	1.28-0.98	0.47-0.42	1.39-1.53	5.35-6.83	7.66-8.31	6.98-6.98	4.94-5.18	10.56-10.33	11.15-9.12	7.84-7.82	4.84-4.57	6.07-0.48	9.78-12.07	10.79-7.78	5.30-4.68	4.69-4.14		
0°(S)	2.02-1.96	1.56-0.35	0.81-0.23	3.00-3.32	3.17-2.49	1.92-1.26	0.89-0.13	1.10-1.12	1.20-0.38	0.47-0.42	1.20-0.38	0.59-0.75	0.89-0.21	0.70-1.01	12.04-10.52	8.30-4.46	3.70-4.15	3.97-1.01	1.34-1.41	12.91-10.31	10.59-8.05	4.77-4.70	4.40-4.40	4.59-3.87		
0°(S)	2.15-0.96	4.17-0.40	1.132-0.29	2.80-1.14	3.06-0.89	2.11-1.79	1.19-0.82	0.64-0.29	0.31-0.99	1.79-1.92	1.19-0.82	0.64-0.29	0.31-0.99	1.79-1.92	12.04-10.52	8.30-4.46	4.23-4.49	3.09-3.32	5.36-4.44	11.41-11.39	11.63-10.98	9.59-8.08	4.54-4.92	4.24-4.36		
0°(S)	5.86-0.04	2.64-1.36	0.40-0.63	1.36-1.69	1.71-1.73	1.11-1.73	0.89-0.25	0.70-1.47	2.50-3.46	4.75-6.35	7.79-10.24	10.17-10.15	14.10-12.78	12.09-12.38	9.67-9.79	4.36-4.28	4.64-1.71	10.10-11.61	13.04-12.08	12.09-12.08	12.09-12.08	12.09-12.08	12.09-12.08	12.09-12.08	12.09-12.08	
0°(S)	5.82-7.68	5.79-4.34	2.82-1.04	4.39-0.32	4.10-0.20	0.58-1.01	1.60-2.11	3.70-3.50	4.53-5.42	6.22-6.68	6.08-6.25	6.98-6.52	8.80-8.60	6.95-6.95	4.78-4.83	4.04-3.93	4.47-4.88	5.01-5.28	5.28-6.47	5.14-3.41	4.03-5.16	6.30-4.26	7.47-6.78	8.60-8.33		
0°(S)	7.97-7.68	4.68-3.34	4.09-3.11	2.22-1.78	3.11-3.12	1.13-1.84	2.31-2.76	3.24-3.32	4.57-5.34	5.91-6.73	7.54-8.15	8.90-7.97	6.28-6.48	6.74-6.48	4.78-4.47	4.70-4.59	6.10-6.02	6.15-6.48	6.15-6.48	6.15-6.48	6.15-6.48	6.15-6.48	6.15-6.48	6.15-6.48	6.15-6.48	
0°(S)	10.19-9.83	8.58-8.37	7.80-8.04	4.68-4.02	4.68-4.02	2.86-3.18	4.12-4.11	5.31-5.18	5.80-4.47	7.73-7.95	7.01-7.63	7.68-8.32	8.16-9.38	7.79-8.82	8.74-8.18	8.50-8.37	10.28-11.74	12.86-13.36	11.65-14.25	10.50-10.09	9.04-8.40	7.70-7.97	8.35-8.46	10.20-10.75	11.30-10.65	
0°(S)	15.08-10.45	15.55-10.44	12.87-11.06	8.89-8.29	4.68-4.18	4.12-4.10	6.12-4.18	6.91-10.05	10.20-10.80	11.77-12.29	13.10-13.17	13.14-12.70	10.79-10.61	10.60-10.78	11.17-12.27	13.40-13.38	14.36-13.16	15.25-15.28	15.50-14.07	14.84-15.05	14.26-15.12	14.99-15.62	14.99-15.62	14.99-15.62	14.99-15.62	
0°(S)	17.21-11.78	11.21-10.57	9.53-7.86	4.84-7.78	7.33-8.62	7.17-7.42	7.28-7.34	7.27-7.68	7.17-7.07	7.48-7.30	7.84-8.43	8.38-8.62	8.96-8.18	8.42-10.18	10.32-8.65	9.95-10.84	10.10-10.22	10.55-11.05	10.86-11.08	12.42-13.13	13.73-13.50	14.18-14.83	13.85-13.01	12.85-12.61		
0°(S)	17.74-11.87	7.60-7.58	7.58-7.29	7.13-6.79	6.95-6.60	6.85-6.60	6.46-6.81	6.78-7.37	7.40-7.50	7.78-7.57	7.84-7.50	7.89-8.35	8.09-8.46	8.30-8.19	8.73-8.68	8.67-8.49	8.69-8.23	8.16-8.12	8.38-8.32	8.71-8.28	8.81-8.57	8.71-8.76	8.59-8.35	7.70-7.81		
Frequency	5.25GHz	TotalGain 1	0°/0°(W7.5)	0°/0°(W22.5)	0°/0°(W37.5)	0°/0°(W52.5)	0°/0°(W67.5)	0°/0°(W82.5)	0°/0°(W97.5)	0°/0°(W112.5)	0°/0°(W127.5)	0°/0°(W142.5)	0°/0°(W157.5)	0°/0°(W172.5)	0°/0°(W187.5)	0°/0°(W202.5)	0°/0°(W217.5)	0°/0°(W232.5)	0°/0°(W247.5)	0°/0°(W262.5)	0°/0°(W277.5)	0°/0°(W292.5)	0°/0°(W307.5)	0°/0°(W322.5)	0°/0°(W337.5)	0°/0°(W352.5)
Gain	0°/0°(W7.5)	0°/0°(W22.5)	0°/0°(W37.5)	0°/0°(W52.5)	0°/0°(W67.5)	0°/0°(W82.5)	0°/0°(W97.5)	0°/0°(W112.5)	0°/0°(W127.5)	0°/0°(W142.5)	0°/0°(W157.5)	0°/0°(W172.5)	0°/0°(W187.5)	0°/0°(W202.5)	0°/0°(W217.5)	0°/0°(W232.5)	0°/0°(W247.5)	0°/0°(W262.5)	0°/0°(W277.5)	0°/0°(W292.5)	0°/0°(W307.5)	0°/0°(W322.5)	0°/0°(W337.5)	0°/0°(W352.5)		
0°(T)	4.20-2.36	3.89-3.72	3.62-3.69	3.49-3.40	3.25-3.06	3.11-2.77	2.50-2.65	3.01-2.53	2.99-3.07	3.48-3.86	3.38-4.11	4.28-4.36	4.32-3.95	3.94-4.09	3.94-4.10	3.87-4.04	3.20-3.15	2.78-2.82	3.04-2.88	3.03-3.56	3.67-3.99	3.78-4.05	4.27-4.51	4.11-4.34		
0°(S)	2.39-1.29	2.12-0.22	1.56-1.78	2.08-2.42	2.46-2.43	2.51-3.07	3.46-3.68	3.79-4.01	4.48-4.48	4.27-5.13	4.69-5.22	6.02-6.22	6.25-6.97	6.71-6.07	5.89-6.74	5.14-4.73	4.25-4.34	3.80-3.41	2.80-2.52	2.40-2.46	2.48-2.36	2.73-2.68	2.55-2.63	2.28-2.68		
0°(S)	1.52-1.45	1.14-1.01	0.96-0.80	1.15-1.07	1.25-1.27	2.33-2.79	3.74-4.24	4.79-4.85	4.80-5.18	5.67-6.68	6.34-6.72	6.87-6.75	6.80-6.80	6.85-6.83	6.10-6.61	5.48-6.35	5.02-5.46	3.87-3.78	2.31-1.75	1.41-1.08	0.51-0.59	0.75-0.54	1.19-1.61	1.68-1.87		
0°(S)	2.32-2.04	1.44-0.86	0.61-0.59	0.98-1.17	2.28-2.73	3.53-3.78	4.71-4.63	6.88-6.38	6.95-6.68	6.55-6.91	7.27-7.27	7.77-8.01	8.60-8.61	9.14-9.70	4.50-4.27	4.50-4.27	4.50-4.27	4.50-4.27	4.50-4.27	4.50-4.27	4.50-4.27	4.50-4.27	4.50-4.27	4.50-4.27	4.50-4.27	
0°(S)	1.58-1.76	1.73-0.94	0.62-1.14	1.32-1.62	1.63-1.74	1.16-2.16	3.22-3.73	4.22-5.26	5.59-7.16	8.41-9.96	10.38-11.57	9.98-7.91	9.27-9.72	4.98-4.01	4.03-3.83	4.24-4.14	4.16-3.98	3.21-3.28	1.51-1.67	0.69-0.14	0.23-0.46	2.13-2.40	2.00-1.54	0.96-0.75		
0°(S)	2.35-2.21	2																								



Antenna Pattern of 2.4GHz&5GHz

Appendix C

(H25°)	0.41193	2.18192	0.98034	0.03947	1.31220	3.32414	-4.47148	-4.58496	-4.35412	3.33055	-3.47039	-3.85420	-4.57483	-4.55048	-4.79475	-4.47405	-3.53028	-2.53022	-1.88016	-1.03080	-0.45040	-0.13003	0.15026	0.44004
(H20°)	-0.57054	0.97014	0.98011	0.73058	0.60180	2.89349	-4.27407	-3.62033	-3.13216	-1.78926	-1.87013	-1.51220	-2.88035	-3.83448	-4.86601	-5.77472	-3.86032	-3.13031	-3.18928	-2.72021	-2.42173	-1.12046	0.75100	-1.06122
(H15°)	-3.62168	-0.21040	0.40096	1.36129	0.75038	2.16068	-3.44133	-2.56018	-1.95019	-0.91967	-1.30468	-1.87163	-1.29130	-1.85026	-4.37421	-6.23044	-4.96411	-3.09044	-2.57072	-4.66044	-2.76029	-2.27038	-4.00035	-3.26049
(H10°)	-6.95045	-1.53041	0.78198	2.28138	0.84474	-1.85022	-3.00221	-1.47070	-1.00106	-0.27045	-1.69048	-2.36024	-1.54040	-1.93023	-4.13429	-3.99034	-3.53036	-4.36037	-3.70037	-3.73038	-2.49044	-2.78050	0.79095	-8.84042
(H05°)	-5.53058	-2.54132	0.289124	1.58014	0.84409	2.420275	-2.800213	-1.53071	0.08050	-0.82086	-0.65049	-0.240325	-2.71045	-1.900197	-2.900268	-2.510331	-4.86068	-6.32012	-4.41053	-3.17050	-1.700237	-3.830526	-6.880656	-8.91074
(H0°)	-2.670309	-1.49078	-0.04014	1.09011	0.53002	2.050124	-2.900194	-1.530111	0.700137	-3.500400	-6.860447	-3.910321	-3.480388	-4.380471	-5.580400	-6.860410	-4.320655	-6.450429	-4.580448	-4.630461	-4.380462	-2.130328	-2.400486	-4.050426
(H-5°)	-0.800135	-3.410306	-1.28047	1.170181	1.030221	-1.210180	-1.890211	-1.350476	0.500124	-3.480425	-3.590227	-2.270271	-3.470156	-5.530171	-7.780432	-8.420435	-3.890588	-9.440493	-6.190427	-4.070358	-3.980429	-2.450235	-2.890426	-3.710331
(H-10°)	0.170100	-0.380109	-0.850190	0.750158	0.930409	-1.780246	-2.900191	-1.280402	0.120197	-3.380572	-5.140351	-3.480394	-5.420421	-5.520158	-6.830442	-8.800472	-4.430685	-8.970765	-6.820340	-3.980148	-2.830303	-1.370101	-0.570177	-0.270001
(H-15°)	0.810035	0.460020	0.190050	0.750097	1.010108	-2.540254	-2.450160	-1.350165	-1.500274	-3.880379	-5.160386	-4.420402	-5.390442	-5.560386	-6.710195	-8.980532	-4.010429	-7.520138	-6.280428	-4.960392	-1.020129	-0.360083	0.630083	0.420001
(H-20°)	1.530048	2.730232	-1.380108	0.740021	0.380134	2.260204	-1.880189	-1.020138	2.780488	-6.440032	-10.610300	-3.020385	-5.530131	-7.740120	-4.890787	-8.030474	-4.380654	-11.990783	-8.970423	-3.130128	-1.480302	1.580015	0.430048	0.540028
(H-25°)	1.630028	2.950219	-1.800108	0.730075	0.070204	2.960202	-2.250206	-0.320202	3.340154	-4.420417	-6.020459	-6.690521	-5.590422	-5.560436	-7.020378	-4.800748	-1.160078	-5.430496	-6.250391	-3.290238	2.490097	0.200050	0.130139	0.170010
(H-30°)	2.040028	2.590172	-1.380023	-1.160171	1.440341	3.650175	-1.110023	0.770144	0.890197	-2.970246	-5.750178	-8.600472	-6.140353	-7.940122	-5.910411	-4.470376	-6.160953	-13.290172	3.860808	0.560061	4.500362	1.290127	-1.540180	
(H-35°)	2.670407	5.570484	-4.090223	3.570462	5.180408	2.440101	0.260020	-1.250224	1.680124	3.720181	-1.250403	-1.740328	-3.860379	3.110356	3.550448	9.870130	10.880120	10.880139	10.190869	5.640438	8.390140	7.480458	6.550551	
(H-40°)	4.820447	6.530458	-5.890477	5.320461	4.210359	3.960107	-1.060122	-1.240156	0.820040	1.820047	-3.420120	-2.760406	-7.300342	3.490130	4.540346	12.270103	11.630108	10.480109	4.840799	4.710439	9.500431	13.090448	11.850448	-7.230142
(H-45°)	6.860486	6.270486	-6.780430	8.800484	4.710575	4.020299	2.330481	-1.590432	1.110077	0.820360	-5.170494	-6.530497	-10.260149	-14.280123	-17.100181	-13.330187	-14.950400	8.5501307	7.620183	-7.980402	-12.800185	-15.860122	-17.370158	-13.500148
(H-50°)	8.920440	8.450486	-12.940140	14.730482	8.416489	6.450488	4.980473	-4.890465	3.220023	0.560366	-5.760366	-8.140127	-14.680424	-18.14028	-20.64077	-13.520148	-15.150190	-11.060404	-10.580136	-14.020133	-15.880146	-17.350128	-16.470180	-12.560148
(H-55°)	9.430108	-10.730161	-14.840140	11.590146	4.730511	3.930426	-4.130397	-3.510120	-1.020456	-0.860480	-1.950154	-2.900429	-4.300487	-4.950417	-6.960127	-13.920188	-10.290122	-11.750109	-14.080142	-11.690128	-13.070113	-11.960158	-15.8001378	-10.760488
(H-60°)	-10.240120	-15.240158	-15.740122	8.890168	3.840330	2.900275	-2.400290	-2.700281	-3.220276	2.550340	-4.870253	-4.750608	-8.850401	-4.130676	-7.330454	-11.500141	-14.760139	-11.170184	-14.970135	-14.070143	-11.300142	-10.760120	-7.920140	
(H-65°)	-7.780488	-6.330480	-8.140401	-7.790150	6.580482	3.500227	-2.120170	-2.300365	-4.110387	3.570341	-4.190480	-7.300488	-5.280416	0.010422	-8.300129	-15.260148	-13.030148	-15.310177	-14.000147	-14.700447	-15.490133	-14.640147	-13.520117	8.890146
(H-70°)	-5.160476	-6.910487	-5.840606	-6.500464	6.510406	4.240384	-3.770334	-3.260348	-3.230346	3.700347	-3.780019	-6.860404	-6.020177	-15.930153	-14.100189	-13.560157	-15.260157	-15.100174	-13.860183	-13.020136	-11.060485	-7.120065	-6.890146	
(H-75°)	-3.690500	-5.270155	-5.020140	-5.970586	6.700462	6.880479	-5.010501	-5.070556	6.370188	-6.400181	-12.800181	-15.410156	-14.170135	-13.780137	-13.260127	-12.730131	-14.060143	-13.990151	-14.220141	-12.610182	-10.210481	-8.050142	-6.530408	
(H-80°)	-1.150168	-1.000103	-1.300096	-10.900093	9.830127	-10.110167	8.910182	-10.310143	8.740127	9.840181	-5.290186	-8.590126	0.010191	-0.090199	-9.770184	-11.430181	-12.100182	-14.020149	-13.900126	-10.210156	-11.030151	-10.740184	-11.950122	-11.340131
FreeHd	2.450Psd	Table 2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gain	(H25°/H20°)	(H15°/H10°)	(H05°/H0°)	(H-05°/H-10°)	(H-15°/H-20°)	(H-25°/H-30°)	(H-35°/H-40°)	(H-45°/H-50°)	(H-55°/H-60°)	(H-65°/H-70°)	(H-75°/H-80°)	(H-85°/H-90°)	(H-95°/H-100°)	(H-105°/H-110°)	(H-115°/H-120°)	(H-125°/H-130°)	(H-135°/H-140°)	(H-145°/H-150°)	(H-155°/H-160°)	(H-165°/H-170°)	(H-175°/H-180°)	(H-185°/H-190°)	(H-195°/H-200°)	(H-205°/H-210°)
(H1°)	3.010124	2.820428	4.500273	4.560233	4.120326	2.700530	-5.830589	-8.880584	5.330501	4.400484	4.800449	4.720482	4.790478	1.530146	-1.420148	-1.480155	-1.480141	1.250804	0.620270	0.910400	0.870431	3.490351	4.340448	4.980535
(H2°)	4.230460	4.790468	4.450423	4.470445	5.270413	6.330475	7.790475	5.420428	5.870479	6.590472	6.210426	6.130426	7.190465	1.730127	-1.130147	-1.360150	-0.960159	0.930429	3.580478	4.090477	3.110188	3.170322	3.940424	5.040428
(H3°)	4.980458	4.860458	6.500478	6.380470	6.380470	6.840499	9.280176	7.070478	7.880475	8.110478	8.110478	8.110478	8.110478	4.390443	-4.040434	-3.390410	-1.980438	0.000000	4.070476	0.800047	0.860053	3.350478	4.270487	6.690434
(H4°)	5.820472	7.190424	-10.320440	11.110188	11.260170	-10.080002	-8.060475	6.380490	5.040441	3.940432	-3.230100	-1.700122	-0.630423	0.110038	0.410442	0.260015	0.160426	0.180000	2.590390	-3.820430	-3.300420	3.440385	4.470423	5.780429
(H5°)	6.310564	7.920478	9.240474	10.190181	-12.030129	-11.540178	9.160733	6.260457	6.070531	4.640461	-3.910432	-2.710137	-0.920428	0.180050	0.250000	0.080005	0.260144	0.240004	1.010422	-0.290406	0.920112	4.450447	5.170454	
(H6°)	3.610385	-6.260526	5.640496	6.270140	-12.020103	-12.450161	11.230039	-10.640498	8.640728	6.170038	-3.980327	-2.070148	-0.770044	0.360054	0.460047	0.530049	0.530049	0.400034	0.310021	0.320007	-0.330042	3.960440	2.850265	2.580308
(H7°)	3.200245	-1.960217	-3.160331	4.470500	6.250759	7.980468	-7.680503	-7.540733	6.750563	-5.900582	-2.970223	-1.950182	-0.230060	0.410376	0.330454	0.260024	0.230024	0.190044	0.030055	-0.280011	-0.470038	0.090018	1.360036	-1.140144
(H8°)	2.150179	-1.330166	-1.020046	-1.840243	4.190545	6.340525	-5.810563	-5.780156	4.280287	-1.950089	-1.170164	-2.210228	-1.630043	0.170080	1.000221	2.590233	1.750091	0.490035	-0.440047	-0.690050	0.020036	2.380194	-1.730185	2.150207
(H9°)	3.800308	-1.860097	-0.070004	-1.190125	2.620466	5.740167	-5.540465	-7.130453	6.290122	-2.740016	-1.770162	-2.920176	-2.770162	0.120080	1.000221	2.800222	2.090123	0.280107	-0.470022	-0.680026	1.660040	2.030124	-1.590184	2.920207
(H10°)	5.740163	6.550133	4.540456	-4.580430	6.810788	6.550295	-1.440100	-1.800435	4.860451	3.480158	-1.680266	-0.420435	-5.610367	-1.610028	1.760030	3.970426	3.880157	2.100076	1.190150	2.960385	4.330041	1.270212	1.360352	
(H11°)	6.410613	-4.800423	-4.930401	-4.000425	4.430434	3.340288	3.340438	3.340438	5.870589	3.680588	3.450144	3.450144	5.560458	2.980038	1.600032	3.030385	3.450144	1.610131	0.690128	2.260024	2.710051	0.860052	1.000026	-3.290143
(H12°)	6.280520	-4.980433	-5.080467	-6.540605	6.100539	6.230494	-2.910200	-1.970120	4.600179	7.440481	-6.530479	-6.540422	-5.770462	-2.830109	0.010085	2.960344	3.950368	3.130027	1.250103	1.310123	0.780024	2.950321	-3.900428	-6.430438
(H13°)	6.790577	-6.430532	-2.890433	-3.390429	1.870282	3.280284	-1.540425	-2.250425	3.420461	4.860481	-3.710476	-6.570485	-5.160448	-3.440438	-1.770027	2.100422	3.200122	0.830048	0.020042	-1.500120	-1.260141	-1.570127	1.570127	
(H14°)	5.830561	-5.540425	-3.220252	-3.610238	3.320552	6.600535	-3.940133	-2.890255	3.280399	4.490134	-11.030443	-8.720134	-6.730407	-5.260128	-1.140079	2.080295	3.250308	2.460092	0.080472	-0.350003	0.060060	0.500341	4.310497	-5.280498
(H15°)	7.590758	-6.910440	6.750442	4.83																				

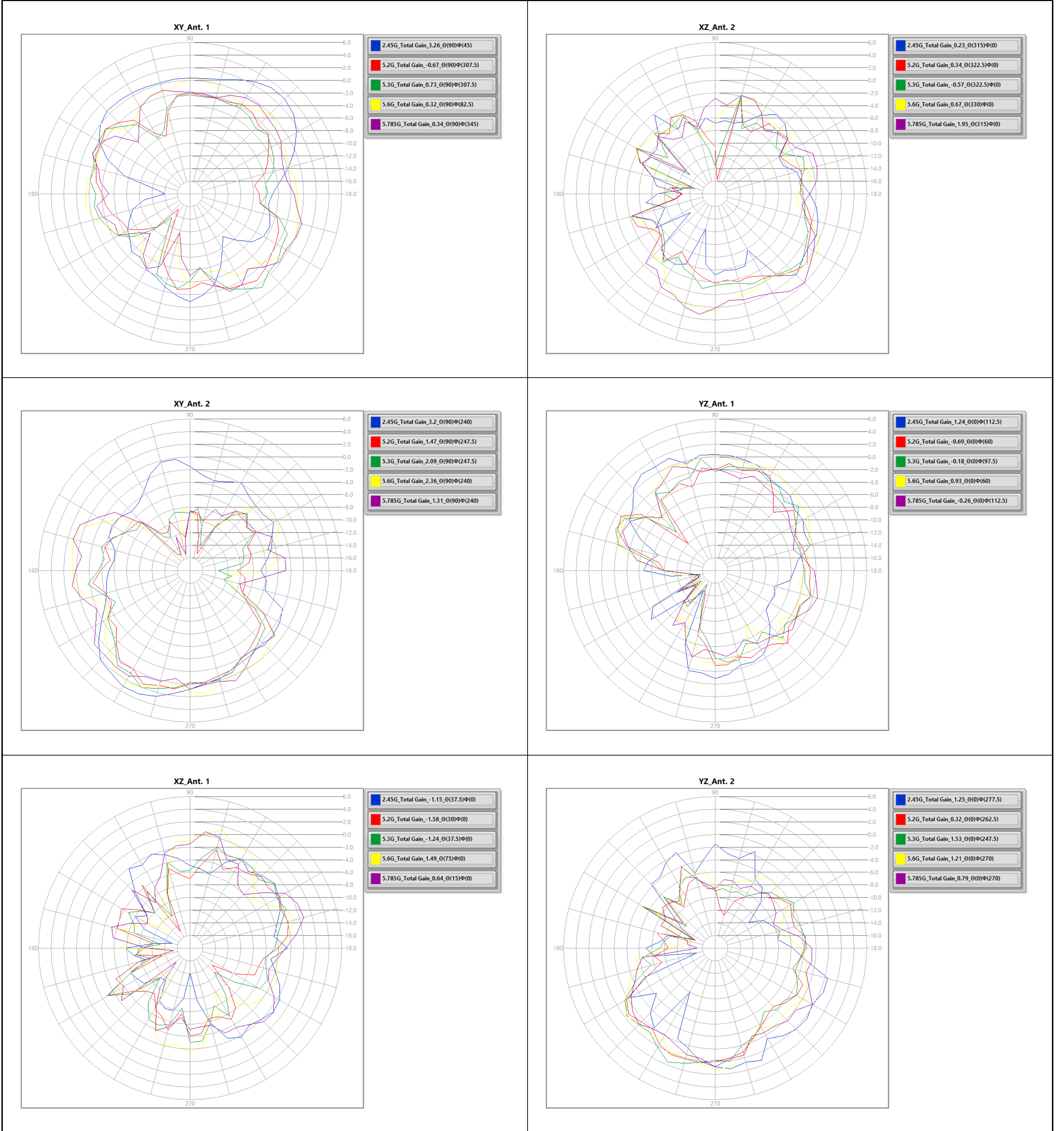


Antenna Pattern of 2.4GHz&5GHz

Appendix C

φ(0°)	-3.00/-4.70	-5.71/-4.68	-4.33/-4.76	-4.79/-5.88	-6.53/-6.29	-5.85/-6.32	-7.45/-8.33	-11.68/-13.27	-13.11/-9.73	-7.38/-9.53	-4.17/-3.00	-1.76/-2.65	-1.47/-0.03	1.12/1.09	1.21/1.96	2.00/1.10	2.48/1.59	-0.47/0.26	-0.30/-0.49	-0.40/-1.41	-2.61/-2.71	-1.85/-2.08	-3.54/-4.48	-2.76/-2.33
φ(80°E)	-3.99/-4.35	-5.00/-2.31	-2.24/-2.73	-2.90/-7.31	-8.22/-7.59	-7.31/-7.65	-7.92/-7.84	-11.03/-14.25	-13.50/-12.57	-6.86/-4.77	-1.86/0.16	0.38/-0.78	-0.77/0.24	0.19/-1.06	-4.50/0.89	0.55/2.08	3.31/2.23	0.94/0.34	0.90/-0.02	-0.43/-1.23	-1.14/-0.91	-0.20/-1.5	-2.50/-4.46	-6.71/-4.16
φ(90°)	-6.46/-3.64	-6.09/-2.74	-2.27/-3.10	-3.50/-7.53	-9.66/-10.05	-9.18/-9.80	-8.49/-6.19	-13.29/-13.68	-15.22/-15.60	-9.39/-4.16	-2.98/0.20	1.12/0.71	0.57/0.43	-1.39/-3.79	-2.91/-0.84	-0.60/-1.70	2.36/2.05	0.84/0.11	1.21/1.57	0.71/-0.21	-0.10/0.05	-0.52/-1.29	-4.47/-10.39	-11.48/-9.59
φ(87°E)	-8.24/-6.20	-8.32/-4.74	-2.34/-4.85	-3.68/-7.87	-8.39/-12.64	-11.21/-7.67	-5.59/-8.42	-12.99/-10.85	-11.35/-14.35	-6.13/-3.94	-5.99/0.84	1.22/0.67	0.41/0.28	-1.31/-3.27	-2.75/-2.90	-1.19/-0.47	0.03/1.64	0.48/0.67	0.42/0.49	0.30/-0.42	-1.91/-1.86	-2.39/-4.62	-8.53/-10.49	-13.44/-13.30
φ(105°)	-8.61/-3.27	-2.61/-1.38	-0.63/-3.19	-4.23/-13.94	-8.59/-8.83	-8.20/-4.48	-5.94/-7.89	-13.38/-13.27	-12.05/-9.28	-4.90/-3.87	-1.87/-0.24	0.70/0.16	-0.15/-1.26	-1.10/-5.64	-6.16/-4.14	2.01/-2.44	-0.85/-1.03	-2.45/-1.08	-0.84/-0.00	-1.78/-1.21	-1.41/-3.54	-7.26/-11.24	-11.53/-11.59	-8.45/-10.11
φ(112°E)	-4.19/-1.29	-1.70/-0.58	-0.88/-7.25	-8.96/-11.38	-7.24/-5.51	-4.24/-5.55	-4.57/-8.24	-10.72/-11.45	-8.84/-7.04	-4.98/-6.73	-4.73/-2.45	-0.88/-0.55	-0.86/-1.65	-3.35/-6.91	-10.29/-7.63	-4.75/-6.50	-2.93/-3.71	-2.74/-2.23	0.16/-0.80	-3.11/-1.33	-2.06/-4.91	-6.64/-6.37	-6.34/-8.20	-9.53/-4.34
φ(120°)	-5.67/-4.17	-4.20/-4.25	-4.69/-6.34	-9.96/-7.95	-6.02/-7.00	-6.01/-6.74	-6.56/-6.43	-8.45/-7.87	-9.59/-9.71	-5.59/-6.86	-3.02/-4.29	-4.41/-2.98	-1.97/-2.67	-6.23/-0.07	-7.93/-5.25	-3.71/-3.09	-5.66/-6.75	-4.91/-4.24	-1.30/-0.95	-3.03/-3.11	-1.78/-8.33	-14.59/-7.57	-6.93/-6.30	-4.67/-4.06
φ(127°E)	-5.25/-5.38	-3.52/-6.12	-5.72/-10.06	-12.21/-11.32	-14.38/-10.89	-6.58/-6.82	-8.97/-7.27	-7.49/-8.48	-7.80/-9.16	-7.14/-6.74	-5.53/-6.23	-5.87/-6.31	-4.66/-4.19	-6.47/-14.33	-10.72/-8.18	-7.33/-4.46	-5.30/-1.98	-3.30/-2.75	-0.68/-0.26	-1.67/-1.85	-3.33/-5.32	-3.49/-1.05	-1.47/-6.01	-5.03/-2.88
φ(135°)	-4.35/-6.11	-3.86/-10.90	-9.46/-7.65	-8.52/-10.68	-10.04/-6.76	-5.52/-5.27	-7.52/-8.52	-8.43/-13.14	-14.03/-8.95	-8.54/-9.31	-8.52/-7.04	-6.33/-6.68	-3.97/-3.89	-8.84/-9.75	-12.81/-6.78	-5.74/-7.61	-5.28/-2.98	-5.86/-5.41	-1.18/0.57	-0.05/-1.86	-1.55/-2.00	-1.55/-0.71	-0.74/-2.79	-2.87/-0.26
φ(142°E)	-4.62/-6.94	-11.32/-15.59	-11.15/-11.32	-13.28/-13.86	-8.14/-8.78	-3.37/-4.79	-8.39/-11.71	-10.95/-14.53	-13.23/-9.57	-8.08/-7.02	-6.58/-7.29	-8.17/-8.51	-6.89/-6.98	-7.59/-8.65	-7.16/-5.13	-6.30/-6.70	-3.46/-4.78	-7.67/-4.19	-6.30/-7.37	0.64/-1.52	-4.19/-4.18	-3.60/-3.85	-3.23/-2.01	-2.09/-2.50
φ(150°)	-3.52/-3.28	-5.14/-7.94	-9.79/-9.64	-8.00/-5.13	-2.97/-2.40	-2.83/-4.21	-7.17/-10.26	-14.80/-15.94	-11.24/-8.84	-8.75/-9.73	-11.58/-14.05	-11.76/-9.27	-6.75/-6.97	-8.42/-10.05	-10.27/-8.60	-7.84/-6.38	-6.54/-8.82	-8.97/-6.88	-1.93/0.36	0.22/-1.97	-4.82/-7.27	-6.12/-7.13	-8.59/-5.27	-3.65/-3.85
φ(157°E)	-6.40/-6.03	-7.86/-10.37	-10.74/-11.99	-12.22/-9.43	-8.32/-7.49	-7.84/-8.88	-9.59/-12.89	-12.01/-13.93	-14.88/-13.28	-13.22/-11.35	-11.07/-15.39	-8.12/-6.13	-5.89/-6.18	-6.93/-8.46	-8.19/-10.61	-11.50/-12.17	-13.18/-13.63	-9.36/-6.69	-3.17/-1.75	-2.92/-2.91	-7.42/-6.51	-7.25/-6.10	-6.43/-5.21	-6.28/-4.80
φ(165°)	-12.79/-13.88	-15.11/-15.69	-14.14/-11.66	-10.44/-9.56	-9.99/-9.34	-10.93/-11.32	-13.88/-15.54	-15.08/-15.03	-14.47/-11.83	-10.21/-8.73	-7.25/-6.54	-5.18/-4.33	-4.59/-6.50	-7.41/-8.99	-12.51/-14.86	-15.46/-14.82	-15.16/-14.03	-9.40/-6.48	-5.49/-4.90	-5.03/-4.99	-6.52/-7.84	-8.13/-7.59	-7.80/-6.95	-12.59/-12.38
φ(172°E)	-10.47/-11.56	-12.99/-12.22	-12.71/-12.69	-13.57/-14.10	-14.98/-14.94	-14.03/-13.64	-12.86/-12.14	-10.85/-11.63	-11.31/-11.88	-11.85/-12.03	-11.84/-13.98	-13.19/-11.63	-10.52/-11.05	-11.07/-11.70	-12.35/-11.98	-12.44/-11.00	-10.49/-8.82	-7.43/-6.41	-5.45/-5.41	-5.59/-4.91	-6.87/-8.00	-6.11/-10.98	-12.22/-11.63	-10.99/-11.81
φ(180°)	-10.90/-11.01	-10.72/-13.02	-14.34/-14.21	-14.28/-13.88	-14.51/-12.59	-11.67/-11.39	-11.96/-12.68	-11.89/-11.25	-11.42/-12.09	-11.49/-12.04	-11.99/-12.75	-12.52/-13.18	-12.98/-12.10	-12.25/-12.87	-12.67/-12.07	-12.72/-11.42	-11.81/-9.78	-10.83/-9.42	-9.64/-8.72	-11.27/-11.86	-12.18/-11.56	-12.62/-13.17	-12.21/-12.10	-11.36/-10.72
Freehd	5.7855/6.64	TotalAnt. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	φ(0°)/φ(97.5°)	φ(15°)/φ(22.5°)	φ(30°)/φ(37.5°)	φ(45°)/φ(52.5°)	φ(60°)/φ(67.5°)	φ(75°)/φ(82.5°)	φ(90°)/φ(97.5°)	φ(105°)/φ(112.5°)	φ(120°)/φ(127.5°)	φ(135°)/φ(142.5°)	φ(150°)/φ(157.5°)	φ(165°)/φ(172.5°)	φ(180°)/φ(187.5°)	φ(195°)/φ(202.5°)	φ(210°)/φ(217.5°)	φ(225°)/φ(232.5°)	φ(240°)/φ(247.5°)	φ(255°)/φ(262.5°)	φ(270°)/φ(277.5°)	φ(285°)/φ(292.5°)	φ(300°)/φ(307.5°)	φ(315°)/φ(322.5°)	φ(330°)/φ(337.5°)	φ(345°)/φ(352.5°)
φ(0°)	-3.00/-2.73	-2.76/-2.56	-3.12/-2.98	-3.29/-2.55	-2.70/-2.76	2.10/-2.41	-2.89/-2.63	-2.94/-2.78	-2.99/-3.23	-3.08/-3.04	-2.83/-2.54	-2.52/-2.88	-2.87/-2.58	-3.06/-3.06	-3.27/-2.87	-3.00/-3.10	-3.16/-3.06	-3.63/-2.93	-3.39/-3.29	-4.08/-3.76	-3.99/-4.00	-3.69/-4.59	-4.58/-4.57	-4.45/-3.70
φ(7.5°)	-1.75/-2.97	-2.49/-2.73	-3.54/-3.30	-3.10/-4.19	-4.08/-3.68	4.07/-3.99	-4.54/-4.95	-4.62/-5.01	-4.67/-4.81	-4.60/-4.96	-4.94/-4.49	-4.65/-4.33	-4.10/-4.34	-4.19/-3.65	-3.44/-3.33	-3.83/-2.98	-2.89/-2.88	-3.24/-3.18	-2.55/-3.83	-1.59/-1.53	-1.87/-1.59	-1.96/-1.85	-1.94/-2.02	-2.00/-2.13
φ(15°)	-1.31/-1.84	-1.71/-2.05	-2.89/-3.82	-4.20/-4.20	-5.29/-5.78	6.22/-6.00	-6.02/-7.16	-7.74/-7.24	-6.61/-6.81	-5.74/-6.96	-6.18/-4.72	-3.80/-3.35	-2.99/-3.15	-3.07/-3.18	-3.19/-3.13	-3.03/-2.94	-3.07/-3.27	-3.50/-3.55	-3.11/-3.97	-2.91/-2.41	-2.29/-1.84	-1.29/-1.36	-1.11/-1.19	-1.56/-1.31
φ(22.5°)	-1.26/-1.74	-1.99/-2.50	-2.46/-2.88	-2.80/-1.96	-3.21/-3.64	5.66/-6.84	-8.01/-6.75	-9.32/-8.71	-6.76/-5.79	-5.39/-4.80	-3.81/-2.24	-1.25/-0.81	-0.84/-1.78	-2.59/-3.29	-3.99/-3.29	-2.80/-2.39	-3.42/-3.14	-3.14/-2.33	-1.94/-1.71	-1.49/-1.68	-1.74/-1.69	-1.60/-2.36	-2.22/-2.37	-2.49/-1.79
φ(30°)	-3.31/-3.80	-4.46/-4.42	-5.22/-4.68	-4.16/-3.50	-3.84/-3.87	-4.86/-4.41	-6.32/-7.42	-7.38/-6.52	-5.50/-4.01	-3.61/-2.71	-1.57/-1.00	-0.41/-0.07	0.01/-0.48	-1.24/-1.13	-0.88/-0.79	-0.84/-1.35	-2.36/-2.29	-1.14/-0.47	-0.92/-1.45	-2.02/-1.70	-1.82/-2.12	-2.14/-2.94	-3.26/-3.03	
φ(37.5°)	-3.78/-2.88	-2.79/-4.00	-5.39/-4.90	-3.96/-2.83	-2.63/-2.30	-3.10/-4.11	-4.36/-7.31	-7.50/-4.01	-4.86/-3.11	-2.15/-1.41	-1.05/-0.31	0.01/-0.90	0.87/0.93	1.02/-1.19	2.91/-0.65	-0.03/-0.52	-0.36/-0.92	-1.53/-2.14	-1.86/-0.87	-0.18/-0.61	-0.75/-0.87	-0.53/-0.88	-1.07/-2.08	-3.27/-2.77
φ(45°)	-5.36/-5.70	-1.71/-2.54	-4.17/-4.55	-5.13/-5.67	-3.85/-2.81	-2.85/-4.01	-5.94/-7.79	-6.96/-5.99	-5.03/-3.54	-2.34/-1.61	-1.39/-0.58	0.22/-1.01	1.95/2.54	2.81/2.79	3.18/-2.22	-2.42/-3.23	-2.87/2.00	-1.66/-1.62	-1.80/-1.65	-1.79/-1.44	-1.27/-1.41	-1.88/-2.75	-3.65/-4.58	
φ(52.5°)	-5.34/-6.17	-4.35/-4.34	-7.70/-6.94	-8.02/-8.62	-4.57/-5.21	-2.58/-4.55	-6.79/-8.68	-8.08/-6.57	-4.86/-4.68	-3.62/-4.49	-4.21/-3.19	-0.92/-2.1	1.45/2.92	3.87/3.54	2.41/-1.71	-0.11/-2.07	-3.43/-3.81	-3.15/-3.36	-2.49/-2.23	-2.10/-2.15	-2.30/-2.38	-2.33/-2.93	-6.22/-6.95	-3.27/-4.37
φ(60°)	-3.28/-3.91	-4.31/-5.71	-8.52/-8.43	-11.93/-8.79	-4.75/-2.33	-1.55/-4.30	-6.70/-9.11	-7.42/-7.55	-6.86/-8.21	-6.63/-6.39	-7.17/-5.14	-1.84/-0.99	-0.19/2.61	3.91/3.60	3.34/3.58	1.28/-0.79	-1.71/-2.91	-4.70/-3.90	-2.69/-2.33	-3.20/-3.22	-3.61/-3.70	-2.98/-2.42	-1.38/-1.09	-1.56/-2.35
φ(67.5°)	-1.80/-1.95	-2.18/-3.21	-4.56/-7.06	-7.81/-8.62	-6.52/-3.66	-2.75/-4.00	-7.75/-12.18	-10.12/-9.98	-11.02/-12.65	-12.18/-6.47	-5.47/-4.20	-2.92/-4.30	-0.49/2.27	3.20/2.26	2.89/2.84	2.44/0.76	0.79/-1.64	-4.03/-3.77	-2.88/-0.43	-1.89/-1.36	-2.32/-2.79	-1.98/-1.58	-2.10/-2.89	-2.20/-1.94
φ(75°)	-1.83/-3.28	-4.41/-6.08	-8.75/-7.32	-4.25/-4.30	-6.33/-5.15	-3.29/-4.82	-7.03/-10.88	-11.88/-8.66	-9.84/-11.32	-6.33/-4.40	-3.86/-2.17	-1.54/-2.09	-0.59/1.83	2.95/2.04	1.73/2.21	2.26/0.54	1.45/2.22	-1.10/-1.48	-0.49/0.15	0.18/-0.10	-0.90/-1.10	-0.87/-0.94	-0.99/-3.90	-2.62/-1.54
φ(82.5°)	-3.86/-4.92	-5.76/-4.49	-6.43/-6.30	-3.59/-4.07	-5.43/-5.62	-5.61/-5.68	-7.05/-13.10	-15.00/-11.40	-13.81/-14.81	-8.99/-2.35	-1.74/-0.36	-0.37/-2.11	-1.02/-1.36	1.53/-0.00	0.72/1.91	1.20/0.84	1.80/0.56	-1.04/-0.98	-0.29/-0.18	-0.34/-0.15	-0.32/-1.14	-1.15/-0.10	-2.05/-4.65	-5.26/-6.01
φ(90°)	-2.86/-2.72	-5.23/-3.97	-5.65/-6.22	-4.29/-6.19	-8.09/-7.43	-9.88/-8.77	-6.58/-12.56	-15.34/-12.17	-15.16/-14.68	-7.58/-2.92	-1.17/0.93	1.16/-0.67	0.11/0.81	-0.46/-2.02	-0.77/-1.1	1.04/-1.29	1.31/0.17	0.17/0.76	0.75/0.21	0.15/0.86	-0.35/-1.67	-1.70/-1.09	-4.51/-9.05	-8.88/-7.42
φ(97.5°)	-4.34/-5.27	-7.19/-2.96	-2.67/-4.60	-5.05/-6.48	-8.09/-10.11	-12.00/-8.07	-7.75/-11.92	-14.86/-10.88	-15.70/-12.58	-5.89/-3.03	0.53/1.74	1.81/-0.12	1.27/-1.27	0.21/-1.47	-0.33/-1.01	-0.75/-0.46	-0.82/0.83	0.49/-0.09	-0.40/-0.56	0.49/-1.40	-0.61/-2.66	-3.92/-3.65	-10.97/-12.37	-10.40/-7.05
φ(105°)	-7.04/-3.31	-3.07/-0.83	0.32/-3.82	-5.89/-9.12	-15.28/-13.43	-7.90/-6.39	-6.74/-10.23	-11.88/-8.72	-11.36/-11.21	-4.97/-2.89	-0.23/1.78	2.34/0.97	0.55/0.46	-0.06/-1.20	-2.61/-1.29	-1.48/-3.35	-3.44/-1.23	-2.67/-1.40	-0.51/0.76	-1.84/-1.00	2.13/-4.76	-10.75/-10.60	-8.80/-13.11	-11.24/-11.57
φ(112°E)	-5.56/-3.98	-4.19/-1.71	-3.40/-10.71	-15.71/-9.71	-7.51/-6.74	-7.89/-7.94	-4.00/-6.58	-7.17/-8.04	-11.83/-9.25	-5.73/-6.02	-1.91/0.89	1.25/0.53	-0.70/-1.79	-2.59/-4.86	-5.38/-6.48	-2.92/-3.64	-1.58/-2.61	-1.77/-1.81	-1.51/-1.66	-3.98/-1.67	-2.20/-4.97	-4.99/-4.57	-6.22/-8.92	-10.08/-7.32
φ(120°)	-7.65/-8.16	-9.34/-7.67	-7.29/-10.14	-6.71/-6.28	-7.67/-6.71	-6.97/-7.05	-6.79/-6.46	-6.74/-6.00	-12.18/-10.27	-5.38/-4.93	-3.25/-1.08	-0.76/-0.79	-0.95/-2.30	-15.99/-9.01	-6.01/-3.92	-2.45/-2.84	-3.17/-4.15	-3.28/-4.92	-2.11/-1.53	-4.61/-4.43	-2.28/-5.51	-12.78/-8.27	-8.89/-6.92	-5.38/-5.10
φ(127°E)	-7.11/-8.80	-5.21/-12.02	-7.23/-12.59	-14.74/-12.53	-12.67/-11.83	-9.12/-10.23	-8.60/-6.24	-6.19/-8.38	-8.17/-8.94	-7.96/-6.94	-3.88/-3.													

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





Antenna Pattern of 6GHz

Appendix D

(H25)	0.870:5.57	-0.020:17	-0.54:-148	-1.73:-070	0.67:0:64	-1.47:-103	-1.51:-208	-3.09:-322	-2.98:-274	-3.42:-347	-3.55:-332	-3.34:-322	-4.42:-557	-5.59:-622	-5.31:-514	-5.27:-557	-6.09:-685	-6.69:-654	-4.88:-434	-3.42:-309	-3.06:-289	-2.97:-257	-1.94:-174	-1.30:-138
(H26)	1.306:86	1.140:63	-0.85:-176	-1.34:-167	0.25:-207	-1.82:-236	-2.02:-182	-2.11:-177	-1.29:-115	-1.75:-281	-3.72:-391	-5.93:-620	-8.82:-584	-6.62:-673	-7.73:-721	-6.47:-625	-6.27:-638	-6.19:-134	-3.82:-439	-4.94:-505	-4.44:-356	-2.71:-116	0.02:-122	1.22:-101
(H27)	0.510:49	0.462:22	-0.48:-155	-1.34:-172	-1.82:-242	-2.01:-250	-1.46:-172	-2.10:-157	-1.05:-075	-1.52:-225	-2.79:-335	-5.22:-561	-6.46:-775	-8.37:-867	-9.94:-979	-8.64:-551	-6.50:-524	-6.50:-524	-6.00:-435	-1.62:-227	-1.56:-241	1.50:-199	2.17:-162	
(H28)	0.310:64	-1.35:-194	-2.86:-238	-1.86:-239	-2.77:-301	-2.35:-216	-2.87:-338	-4.42:-354	-3.15:-338	-3.60:-322	-3.35:-337	-6.17:-746	-6.84:-680	-6.69:-637	-4.85:-636	-6.89:-784	-7.26:-757	-7.56:-647	-5.10:-433	-4.71:-422	-3.59:-157	0.10:-181	1.25:-110	
(H29)	0.220:61	-0.87:-128	-1.62:-185	-2.36:-267	-2.68:-231	-2.48:-257	-2.59:-245	-1.49:-181	-1.71:-051	-2.86:-257	-4.58:-471	-6.65:-671	-6.54:-677	-8.35:-873	-9.48:-926	-7.50:-733	-7.89:-671	-4.71:-521	-4.71:-521	-4.94:-252	-1.06:-243	0.52:-303	0.57:-330	
(H30)	0.730:26	-0.06:-97	-1.49:-158	-1.64:-239	-2.36:-233	-2.66:-261	-3.89:-497	-5.23:-583	-7.71:-946	-6.21:-626	-6.47:-643	-4.73:-391	-4.08:-336	-2.70:-321	-6.40:-728	-7.24:-671	-8.11:-843	-6.29:-641	-6.55:-630	-6.17:-614	-6.53:-626	-6.42:-303	1.25:-173	
(H31)	0.40:-133	-1.36:-182	-1.86:-155	-1.62:-134	-1.13:-086	-2.32:-347	-5.39:-672	-8.43:-1022	-12.60:-916	-6.21:-626	-6.86:-1101	-10.02:-738	-6.02:-627	-7.92:-850	-11.03:-1022	-9.64:-1063	-14.53:-879	-6.27:-840	-4.16:-310	-4.07:-265	-1.74:-460	0.37:-82	0.40:-134	
(H32)	2.45:-436	-3.78:-235	-1.53:-168	-1.91:-226	-1.19:-233	-2.94:-034	-5.39:-686	-10.77:-1015	-7.53:-645	-6.53:-652	-2.54:-347	-7.36:-1457	-10.07:-854	-7.56:-937	-9.81:-844	-8.86:-1199	-11.61:-791	-10.41:-1003	-6.03:-137	-2.49:-255	-3.92:-674	-4.25:-240	-2.25:-175	
(H33)	1.88:-139	0.02:-16	0.87:-62	0.23:-62	0.38:-245	0.43:-636	0.71:-718	0.61:-705	5.50:-275	5.01:-639	3.20:-342	-10.91:-647	-7.38:-459	-5.72:-601	-11.01:-933	-9.81:-936	-10.27:-486	-11.12:-1017	-6.64:-171	-6.02:-632	-11.34:-211	-3.52:-308	0.68:-146	
(H34)	3.84:-225	-1.78:-039	-6.27:-058	1.52:-12	0.74:-259	-3.97:-726	-6.49:-636	-5.74:-647	-6.30:-642	-3.67:-687	-7.10:-741	-3.34:-339	-4.78:-629	-8.24:-113	-13.62:-975	-10.36:-655	-6.49:-1252	-5.99:-176	0.88:-16	-1.07:-689	-3.79:-222	-1.33:-278	-4.32:-339	
(H35)	2.23:-337	0.22:-163	0.26:-152	0.09:-63	-1.02:-258	-2.96:-436	-4.03:-425	-2.94:-155	-5.55:-269	-6.07:-356	-5.80:-428	-3.28:-336	-3.64:-454	-7.07:-1100	-14.05:-848	-10.39:-675	-6.10:-1054	-5.99:-632	-1.28:-336	-1.37:-375	-7.55:-607	-2.69:-253	-5.79:-439	
(H36)	0.06:-193	0.32:-62	1.27:-01	0.86:-64	-1.79:-045	-1.73:-015	-0.19:-225	1.04:-12	-1.68:-136	-6.57:-674	-9.33:-657	-2.29:-146	-1.88:-139	-1.57:-143	-12.74:-837	-10.65:-857	-7.30:-650	-3.26:-344	-4.02:-635	-8.82:-132	0.33:-165	-1.98:-170		
(H37)	2.91:-253	-1.79:-076	-0.50:-117	-2.42:-273	0.33:-641	-2.26:-239	-0.19:-140	0.33:-130	3.83:-346	-4.44:-634	-10.27:-122	2.60:-11	1.69:-622	-2.29:-32	-7.07:-771	-13.34:-725	-13.57:-771	0.94:-637	-1.54:-10	-3.82:-642	-16.21:-991	0.62:-630	-0.59:-330	
(H38)	4.95:-233	-2.90:-059	-1.21:-226	-3.45:-655	-4.28:-323	-2.27:-137	-1.79:-106	0.27:-687	0.57:-633	-1.09:-072	-2.75:-634	-3.90:-649	-2.12:-630	-5.86:-520	-6.27:-621	-8.95:-520	-1.96:-532	-1.92:-335	-6.25:-788	-7.60:-788	0.60:-636	-1.52:-101		
(H39)	4.76:-152	-1.54:-055	-1.29:-339	-6.60:-727	7.65:-686	-4.06:-137	-0.95:-044	0.31:-112	1.45:-022	-1.43:-641	-4.25:-632	-6.71:-1091	-6.07:-631	7.86:-1069	-15.76:-948	-6.63:-742	-3.81:-033	-11.40:-255	-5.45:-034	-2.34:-109	-1.73:-586	-10.26:-533	-3.50:-636	
(H40)	8.12:-159	-3.76:-459	-4.50:-552	-8.09:-627	-7.32:-675	-3.06:-423	-1.35:-074	-0.79:-266	-4.28:-641	-4.47:-620	-6.99:-670	-7.91:-1007	-11.59:-832	-7.70:-1450	-7.76:-849	-16.63:-044	-3.26:-617	-8.11:-865	-6.93:-1248	-6.26:-371	-5.59:-533	-7.62:-627	-6.44:-786	
(H41)	-1.52:-1071	-0.61:-84	-10.70:-917	-7.42:-954	-4.12:-707	-4.94:-140	-5.60:-641	-3.94:-148	-4.70:-344	-5.49:-675	-7.72:-1020	-13.46:-658	-10.93:-657	-7.61:-766	-6.68:-11	-10.16:-337	-6.27:-676	-8.77:-440	-6.59:-155	-12.96:-754	-6.54:-859	-0.89:-769	-7.05:-640	
(H42)	-14.48:-1433	-1.22:-1016	-6.67:-630	-6.90:-671	-3.25:-727	-3.17:-045	-6.19:-793	-7.08:-749	-7.70:-750	-4.79:-611	-4.86:-678	-6.13:-754	-11.69:-1457	-10.26:-1626	-9.51:-648	-7.96:-635	-10.34:-636	-13.14:-1357	-11.22:-1135	-8.89:-1157	-14.73:-1107	-3.66:-336	-12.13:-1577	
(H43)	-14.81:-1474	-14.26:-1471	-15.74:-1612	-14.79:-1636	-13.17:-1044	-11.73:-1178	-15.61:-946	-5.58:-637	-5.48:-734	-6.93:-158	-10.26:-101	-10.68:-1134	-12.50:-1512	-10.82:-836	-7.24:-742	-7.85:-1408	-12.83:-1440	-15.06:-1522	-11.17:-1372	-13.26:-1212	-12.66:-1300	-9.93:-919	-6.32:-823	
(H44)	-12.76:-1349	-12.33:-1321	-12.86:-1464	-16.07:-1449	-12.39:-1232	-12.26:-1331	-15.39:-1413	-12.36:-1148	-12.36:-1123	-11.51:-1128	-12.27:-1114	-13.13:-1044	-15.98:-1312	-14.22:-1554	-15.46:-1545	-15.66:-1528	-13.61:-1129	-15.66:-611	-10.11:-126	-11.01:-106	-13.07:-1423	-15.16:-1252	-12.60:-1162	
(H45)	-14.87:-1517	-14.26:-1532	-15.36:-1527	-15.34:-1532	-15.34:-1532	-11.65:-1035	-10.19:-115	-6.78:-637	-7.92:-844	-6.31:-1139	-11.56:-1390	-15.43:-1560	-15.71:-1542	-16.28:-1512	-13.20:-1312	-13.84:-1375	-11.98:-1196	-12.30:-1242	-13.20:-1252	-11.77:-899	-10.24:-945	-6.97:-689	-10.23:-1162	
(H46)	-11.97:-1152	-12.80:-1214	-10.99:-1206	-11.63:-1106	-11.12:-1166	-11.62:-1240	-11.37:-916	-6.78:-786	-6.84:-837	-8.60:-948	-8.63:-966	-9.32:-1002	-11.60:-1166	-11.03:-1519	-11.01:-1140	-10.16:-1086	-11.49:-1232	-10.51:-1620	-15.73:-1442	-15.73:-1442	-12.50:-1152	-11.49:-1238		
Freq(Hz)	6.4750GHz	Antenna 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Gain	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	0°(H27/H27)	
(H1)	6.35:-648	5.31:-518	4.86:-772	7.67:-615	4.62:-722	7.66:-728	7.57:-743	6.91:-751	4.65:-444	4.51:-538	4.76:-411	4.64:-442	4.31:-426	4.11:-428	4.58:-442	4.74:-548	4.72:-674	5.17:-673	4.22:-646	4.27:-336	3.36:-338	3.09:-377	4.21:-535	
(H2)	5.14:-630	4.33:-449	6.10:-738	5.96:-685	4.92:-537	6.09:-708	5.97:-697	2.99:-244	2.37:-238	2.57:-234	3.49:-637	3.69:-625	3.79:-614	4.19:-742	4.59:-645	4.53:-648	4.49:-629	4.14:-629	4.53:-639	4.74:-627	3.72:-595	3.68:-595	5.57:-648	
(H3)	4.65:-632	4.72:-648	6.05:-654	6.36:-613	5.16:-540	3.85:-630	3.00:-616	3.02:-571	2.51:-212	2.76:-239	3.75:-648	4.28:-622	4.47:-647	4.62:-651	5.69:-642	5.41:-645	4.74:-629	3.41:-729	3.92:-539	3.11:-539	4.16:-645	6.91:-656	7.42:-639	
(H4)	3.80:-521	2.47:-273	2.29:-236	2.10:-271	1.09:-127	1.49:-123	1.32:-171	1.39:-338	4.25:-497	4.90:-536	5.72:-614	3.96:-730	2.79:-527	2.86:-334	3.64:-647	5.16:-532	5.16:-570	4.31:-539	3.89:-616	3.82:-537	4.22:-614	5.46:-657	7.47:-629	
(H5)	2.42:-254	1.70:-187	2.25:-224	2.26:-155	1.37:-127	2.22:-322	3.20:-283	3.61:-283	3.60:-480	4.98:-506	4.84:-544	2.45:-711	-1.16:-114	-1.45:-225	0.32:-344	1.33:-617	1.77:-753	6.63:-517	4.57:-643	4.27:-680	4.76:-616	3.40:-732	2.22:-122	
(H6)	2.73:-246	3.16:-536	4.39:-449	1.32:-427	2.00:-299	3.99:-434	3.52:-470	3.43:-356	2.77:-620	3.19:-635	-1.63:-100	-1.80:-294	3.64:-643	3.82:-635	6.51:-648	6.89:-636	5.19:-636	6.38:-646	4.67:-645	4.45:-613	3.49:-730	-1.07:-631	0.16:-648	
(H7)	2.93:-338	4.64:-646	6.15:-639	6.77:-627	3.07:-646	3.00:-525	1.54:-234	2.69:-325	2.39:-323	2.10:-166	3.94:-634	2.98:-647	4.31:-677	5.57:-681	6.84:-688	6.31:-665	6.91:-639	5.91:-639	3.17:-634	2.92:-122	0.88:-104	-1.19:-136	2.74:-247	
(H8)	2.96:-484	4.21:-535	6.26:-646	7.21:-648	2.94:-240	2.98:-294	3.11:-337	4.54:-648	1.49:-349	4.95:-443	6.67:-649	-10.07:-780	5.13:-647	-1.63:-731	5.76:-622	-10.75:-1230	12.25:-1002	-10.51:-939	6.62:-645	4.95:-616	2.81:-182	0.27:-337	0.35:-648	
(H9)	3.53:-644	3.70:-648	4.93:-649	4.58:-644	6.70:-645	2.14:-325	2.14:-325	4.85:-610	6.21:-739	6.70:-648	6.64:-641	7.58:-620	3.25:-638	2.99:-627	5.23:-622	-11.76:-1015	14.62:-1289	9.40:-634	6.37:-648	7.68:-682	5.99:-640	-1.02:-606	0.69:-623	
(H10)	1.35:-248	3.21:-338	2.96:-385	6.36:-530	2.23:-147	2.07:-320	5.50:-645	6.67:-614	1.67:-614	6.99:-645	-11.67:-826	6.84:-725	7.79:-617	6.24:-635	6.80:-634	-8.55:-657	-11.01:-1516	-10.47:-647	6.89:-143	2.16:-423	-3.59:-131	6.83:-645	0.49:-633	
(H11)	2.11:-346	5.63:-646	6.36:-649	4.97:-628	4.60:-638	0.05:-165	-4.69:-687	-10.38:-674	-11.06:-674	-11.06:-674	-10.21:-1427	-11.49:-1582	-13.10:-1427	-14.08:-1582	-13.06:-1427	-14.28:-1486	-16.01:-720	4.53:-239	2.66:-335	3.41:-154	1.16:-141	1.50:-135	0.61:-633	
(H12)	4.58:-641	6.90:-689	6.70:-646	4.47:-634	0.19:-305	0.14:-245	6.10:-1113	-12.29:-1020	3.71:-647	6.27:-614	-6.46:-642	8.84:-1282	6.93:-1126	6.92:-647	6.15:-849	6.97:-643	6.60:-614	-14.76:-740	4.68:-235	0.91:-504	3.91:-728	2.74:-154	-1.04:-632	
(H13)	3.64:-643	4.21:-646	2.80:-236	2.13:-076	0.14:-124	0.14:-124	-6.89:-630	-10.56:-639	6.84:-500	5.07:-642	-5.24:-635	6.65:-639	6.83:-1559	6.83:-1559	-13.11:-1043	-6.81:-644	6.54:-616	-16.08:-936	4.74:-617	0.31:-691	-2.87:-622	2.63:-616	-11.40:-640	
(H14)	-1.72:-1010	-0.32:-1039	-15.61:-683	-2.36:-077	-0.07:-080	-0.07:-080	-1.15:-467	-6.57:-673	5.86:-740	3.28:-521	-1.62:-200	-2.76:-409	-4.74:-480	-7.15:-636	-6.45:-1057	-13.58:-644	-4.22:-601	-10.36:-140	-0.56:-433	-0.08:-439	3.16:-644	3.52:-644	2.16:-339	
(H15)	-6.78:-124	-6.36:-049	3.03:-151	0.07:-107	-0.07:-104	-2.96:-744	-5.87:-678	2.79:-727	4.40:-288	-1.36:-217	2.16:-641	6.07:-671	4.19:-655	-6.78:-647	6.95:-704	-13.23:-993	9.27:-331	-10.27:-127	7.76:-651	4.41:-748	-1.42:-748	-3.43:-289	-7.41:-645	



Antenna Pattern of 6GHz

Appendix D

(H)57	0.94:3.76	-3.16:2.26	-0.79:0.08	0.80:0.01	-1.95:4.33	-4.36:2.82	-1.24:1.99	-6.93:4.00	-2.29:4.97	-6.10:2.36	-2.49:-1.04	-4.16:-1.92	-0.39:0.48	0.82:0.39	-2.07:1.39	-5.47:2.42	-1.51:1.43	-4.81:8.87	-15.47:8.58	-2.76:2.17	-2.90:5.49	-6.71:6.26	-2.97:0.27	1.50:0.76
(H)58	0.91:4.08	-2.90:1.99	-1.00:0.63	0.19:1.19	-1.54:2.21	-3.05:2.54	-1.07:2.00	-3.38:1.62	0.62:1.93	-0.59:0.83	-2.96:0.17	-5.33:4.05	-0.16:0.85	1.69:1.13	0.71:1.80	-5.60:0.27	-0.91:0.88	-10.74:10.34	-4.77:4.49	-3.47:0.47	-1.07:4.38	-6.97:4.07	-0.57:0.60	1.90:2.37
(H)59	0.63:3.42	-4.11:3.68	-7.30:4.34	6.60:1.32	4.32:1.16	-1.62:1.33	-3.09:6.29	-2.90:1.17	-1.47:6.92	-1.84:0.19	-1.324:0.99	-3.17:0.58	-1.56:3.46	-4.99:2.25	-1.96:1.18	-1.49:1.81	-5.81:2.88	-6.59:5.64	-6.71:5.47	-0.90:2.00	0.11:1.23	-6.69:3.34	-2.67:1.76	-1.01:1.87
(H)60	0.83:0.23	-2.61:2.38	-2.16:0.97	-4.22:0.32	-1.11:2.32	-2.74:3.55	-4.94:6.72	-5.24:2.54	-6.97:0.49	-0.68:0.19	-4.13:2.87	-2.37:5.01	-2.86:0.22	1.02:1.54	0.65:0.33	-3.44:0.60	-0.86:0.37	-5.61:3.84	-2.54:0.61	-0.02:0.24	-1.77:1.65	-2.39:1.96	-0.30:0.56	-1.33:0.63
(H)61	0.43:3.42	-4.11:3.68	-7.30:4.34	6.60:1.32	4.32:1.16	-1.62:1.33	-3.09:6.29	-2.90:1.17	-1.47:6.92	-1.84:0.19	-1.324:0.99	-3.17:0.58	-1.56:3.46	-4.99:2.25	-1.96:1.18	-1.49:1.81	-5.81:2.88	-6.59:5.64	-6.71:5.47	-0.90:2.00	0.11:1.23	-6.69:3.34	-2.67:1.76	-1.01:1.87
(H)62	0.83:0.23	-2.61:2.38	-2.16:0.97	-4.22:0.32	-1.11:2.32	-2.74:3.55	-4.94:6.72	-5.24:2.54	-6.97:0.49	-0.68:0.19	-4.13:2.87	-2.37:5.01	-2.86:0.22	1.02:1.54	0.65:0.33	-3.44:0.60	-0.86:0.37	-5.61:3.84	-2.54:0.61	-0.02:0.24	-1.77:1.65	-2.39:1.96	-0.30:0.56	-1.33:0.63
(H)63	1.07:1.15	-2.71:5.55	-6.33:7.22	-6.93:7.37	-4.07:1.98	-1.45:2.25	-4.40:6.72	-2.88:2.64	-3.24:1.35	-1.76:1.06	-3.70:1.17	-0.45:2.59	-4.82:1.35	-0.01:0.21	-0.95:0.30	-6.29:6.05	-3.96:2.34	-13.25:4.98	-3.09:1.15	-2.28:1.15	-12.22:3.39	-6.84:1.40	-1.08:1.42	-0.75:0.75
(H)64	0.13:1.76	-2.04:1.03	-1.45:3.76	-3.67:1.79	0.40:1.42	1.36:1.16	0.23:3.55	-1.83:0.63	-0.21:3.25	-4.97:1.69	-1.15:0.63	-0.49:2.51	-4.71:2.58	-2.71:2.25	-0.84:0.32	-4.15:7.52	-2.31:3.94	-2.82:6.36	-1.05:0.78	-5.99:1.84	-6.25:6.17	-6.12:0.22	0.71:1.58	
(H)65	2.82:3.97	-4.67:3.74	-5.53:7.96	-7.37:0.89	-4.16:2.64	-2.20:1.43	-0.37:1.94	-4.21:0.48	-0.98:0.59	-1.29:1.05	-5.18:4.37	-5.20:4.61	-3.18:0.80	-0.76:1.32	-0.89:0.36	-10.73:7.16	-1.84:0.84	-2.34:3.73	-3.57:0.61	-0.63:4.92	-8.09:7.35	-11.93:9.85	-4.14:1.18	-0.34:1.87
(H)66	-1.17:1.16	-1.58:0.73	0.24:0.51	0.83:0.50	0.14:0.45	0.52:0.84	-0.98:2.00	-0.79:3.67	0.60:3.34	-2.73:5.40	-7.37:4.32	-6.53:4.88	-0.55:0.75	-0.51:0.48	-3.91:5.13	-10.46:13.54	-1.30:1.18	-0.86:0.16	-3.33:4.41	-1.66:0.67	-7.51:0.85	-4.78:1.14	-11.35:6.51	
(H)67	-7.29:0.68	-3.50:4.58	-4.80:5.80	-3.40:2.10	-1.03:0.79	-0.60:1.00	-3.89:4.75	-2.70:0.71	-1.67:5.50	-8.16:5.37	-5.84:4.59	-3.34:3.58	-3.84:4.17	-5.74:5.50	-4.48:0.78	-13.74:15.11	-0.77:1.98	-3.38:0.43	-2.65:0.87	-1.52:3.97	-2.23:4.44	-6.96:4.60	-4.49:4.40	-3.15:5.53
(H)68	-0.79:3.32	-6.93:5.85	-6.02:6.57	-4.50:3.12	-3.94:3.62	-1.99:1.97	-2.93:0.94	-4.99:2.45	-3.52:1.45	-6.99:6.26	-12.20:11.19	-7.63:6.98	-4.98:0.67	-5.53:7.45	-6.07:6.06	-12.60:10.02	-0.93:3.33	-3.10:0.30	-2.31:0.78	-0.31:0.78	-2.32:0.75	-6.44:11.07	-8.16:12.78	-6.11:10.70
(H)69	-0.27:4.45	-6.17:1.24	-4.20:6.60	-6.60:5.65	-4.88:1.54	-2.98:0.87	-1.79:2.36	-4.96:5.47	-5.94:4.48	-6.19:6.63	-3.75:0.12	-3.94:1.04	-3.29:1.58	-4.93:4.68	-6.60:0.73	-8.60:0.59	-6.22:0.43	-4.19:0.33	-1.94:1.19	-1.50:0.49	-4.07:1.31	-2.80:1.45	-4.25:0.62	
(H)70	-0.47:5.74	-6.94:1.26	-4.93:6.75	-6.61:4.30	-5.07:1.78	-5.52:0.16	-5.91:6.29	-8.07:0.62	-6.24:4.30	-3.95:4.41	-4.41:4.74	-6.29:0.57	-11.24:12.04	-6.42:1.17	-6.84:0.35	-6.20:1.16	-2.81:3.20	-4.56:4.45	-4.39:0.19	-8.19:7.42	-6.80:7.29	-8.59:12.94	-10.59:17.21	
(H)71	-7.34:5.64	-10.42:12.12	-12.84:12.12	-12.34:11.29	-8.15:6.61	-4.09:2.67	-2.76:1.39	-3.16:4.15	-6.29:4.37	-7.25:0.15	-15.24:12.96	-10.87:0.87	-7.59:0.60	-2.97:0.81	-10.16:0.95	-7.81:0.83	-2.92:0.95	-9.51:12.22	-8.93:14.10	-4.14:0.43	-6.14:0.42	-10.72:10.96	-12.72:10.96	-12.72:10.96
(H)72	-5.23:4.19	-4.35:4.35	-7.96:12.38	-14.63:10.40	-10.26:13.40	-12.90:10.46	-5.74:4.30	-3.73:4.37	-3.37:3.18	-3.68:4.17	-4.08:4.30	-5.29:5.82	-6.08:4.32	-6.76:0.60	-4.44:3.13	-3.23:3.57	-4.07:0.58	-6.87:0.40	-7.61:0.10	-8.67:0.17	-8.19:0.20	-4.63:4.56	-4.96:0.97	-1.59:0.83
(H)73	-12.66:10.22	-8.79:7.41	-8.52:11.73	-13.71:14.11	-14.10:13.25	-11.15:10.27	-10.10:10.86	-11.60:13.43	-13.73:12.11	-11.41:11.21	-11.39:10.29	-10.30:11.38	-8.55:10.30	-10.42:10.58	-10.39:10.75	-8.75:10.38	-11.39:10.73	-8.91:8.85	-8.80:7.99	-6.21:5.57	-5.19:5.84	-3.39:0.86	-4.15:5:16	-1.72:0.63
FreeHD	6.4750PdB	TotalEIRP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Gen	(H)79(H)75	(H)19(H)22.51	(H)30(H)30.57	(H)45(H)46.52	(H)60(H)60.57	(H)75(H)82.51	(H)90(H)90.57	(H)105(H)112.51	(H)120(H)127.51	(H)135(H)142.51	(H)150(H)157.51	(H)165(H)172.51	(H)180(H)187.51	(H)195(H)202.51	(H)210(H)217.51	(H)225(H)232.51	(H)240(H)247.51	(H)255(H)262.51	(H)270(H)277.51	(H)285(H)292.51	(H)300(H)307.51	(H)315(H)322.51	(H)330(H)337.51	(H)345(H)352.51
(H)74	-8.13:9.08	-8.93:1.45	-7.36:7.17	-8.01:0.69	-7.68:6.68	-7.15:6.71	-7.40:7.96	-7.50:7.47	-7.48:7.36	-7.79:6.03	-7.67:6.50	-8.02:7.01	-10.12:10.15	-10.12:10.15	-10.21:10.37	-10.30:10.86	-11.14:11.58	-11.64:11.10	-11.30:10.26	-9.90:9.78	-8.73:8.61	-8.86:4.49	-8.22:8.79	-6.91:6.20
(H)75	-1.02:11.30	-1.93:10.65	-12.96:12.39	-11.83:12.88	-12.74:12.22	-11.27:13.34	-12.56:13.99	-11.35:13.41	-12.02:10.98	-10.78:12.03	-9.33:9.87	-8.77:10.17	-7.23:1.15	-6.56:6.56	-6.29:6.85	-6.26:6.96	-6.36:6.69	-6.78:7.30	-6.76:7.37	-7.20:7.11	-6.76:7.73	-6.31:7.92	-6.00:10.16	-6.12:10.16
(H)76	-3.97:8.87	-10.34:11.37	-13.88:12.23	-11.75:11.09	-11.39:11.81	-11.81:12.91	-13.20:15.68	-10.84:9.37	-7.70:4.48	-6.57:6.41	-6.53:6.79	-5.88:6.60	-6.62:6.86	-5.80:5.53	-5.01:5.33	-5.36:5.82	-6.01:6.58	-6.80:6.75	-7.34:7.84	-6.90:6.58	-8.89:8.59	-7.30:7.02	-10.12:10.16	
(H)77	-2.90:3.10	-3.33:3.68	-3.94:4.81	-5.52:7.32	-6.19:6.89	-11.55:14.33	-15.14:12.70	-10.14:11.1	-6.38:4.88	-6.02:4.68	-5.16:4.33	-3.71:3.33	-3.17:3.33	-2.71:3.44	-2.49:3.38	-2.49:3.38	-2.68:3.58	-2.68:3.58	-2.68:3.58	-2.68:3.58	-2.68:3.58	-2.68:3.58	-2.68:3.58	-2.68:3.58
(H)78	-1.80:1.88	-3.02:3.41	-3.91:4.45	-5.27:6.38	-6.84:12.14	-13.40:13.75	-15.14:12.29	-12.13:10.76	-6.63:1.50	-5.26:0.33	-6.06:6.11	-5.52:6.00	-5.29:6.05	-6.26:6.48	-3.97:4.11	-3.69:4.27	-3.52:4.35	-4.29:4.84	-4.65:6.11	-8.11:9.35	-8.66:6.19	-4.20:3.64	-2.89:2.71	-2.93:2.36
(H)79	-1.90:1.71	-2.85:4.14	-4.78:6.02	-6.69:8.61	-8.87:8.56	-7.86:10.49	-8.87:11.43	-14.19:10.69	-8.13:7.45	-6.30:5.00	-7.26:10.19	-10.95:10.24	-8.78:10.09	-7.94:11.01	-4.21:2.94	-3.50:3.74	-3.73:4.35	-4.65:6.10	-6.81:6.70	-5.52:3.86	-2.99:2.54	-2.53:2.65	-2.43:2.24	-2.43:2.24
(H)80	-3.85:4.06	-6.61:7.14	-11.45:11.36	-12.71:12.10	-11.44:10.32	-9.88:10.01	-9.86:14.88	-11.71:15.98	-2.49:7.40	-6.10:5.49	-6.46:7.01	-5.48:7.34	-2.21:2.46	-2.09:2.30	-3.99:5.46	-6.12:5.44	-3.21:4.19	-5.65:5.07	-4.78:6.73	-11.23:10.57	-7.32:6.25	-1.70:2.45	-2.62:1.99	-1.62:2.44
(H)81	-6.67:6.74	-7.13:4.38	-6.01:7.41	-7.00:6.62	-6.05:5.38	-5.13:7.43	-6.93:11.83	-7.99:7.29	-6.26:7.59	-4.40:7.22	-3.40:7.36	-2.41:6.99	-1.64:7.81	-1.35:6.03	-2.36:6.32	-1.89:6.78	-1.69:6.48	-1.60:6.22	-1.26:6.89	-4.83:4.50	-4.28:4.58	-2.48:4.20	-2.65:4.68	-2.65:4.68
(H)82	-4.59:4.29	-6.54:6.20	-6.16:7.35	-3.47:5.32	-7.15:6.05	-4.02:4.66	-4.02:4.66	-4.02:4.66	-4.02:4.66	-4.02:4.66	-4.02:4.66	-4.02:4.66	-4.02:4.66	-4.02:4.66	-4.02:4.66	-4.02:4.66	-4.02:4.66	-4.02:4.66	-4.02:4.66	-4.02:4.66	-4.02:4.66	-4.02:4.66	-4.02:4.66	-4.02:4.66
(H)83	-2.04:1.75	-3.29:1.65	-3.59:1.85	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62	-3.96:1.62
(H)84	-2.07:1.51	-2.58:2.09	-0.05:0.96	-0.86:0.67	-1.08:1.30	-3.86:1.37	-2.77:0.12	-3.71:1.08	-3.34:0.68	-0.69:1.74	-1.89:0.36	-2.90:1.03	-1.59:0.20	-1.71:1.11	-2.84:1.37	-3.95:0.19	-6.00:0.70	-7.59:4.39	-6.90:7.75	-5.47:4.46	-5.69:6.05	-3.74:3.12	-2.77:1.96	-0.96:0.46
(H)85	-1.44:0.40	-3.09:2.46	-1.06:0.27	-1.10:0.72	-3.23:0.96	-6.00:1.92	-0.79:0.81	-2.87:0.67	0.62:1.74	0.53:0.96	-0.50:0.78	-4.41:2.12	-2.02:2.34	-3.98:3.04	-3.17:4.28	-4.04:2.15	-4.89:1.88	-6.33:4.72	-5.45:4.03	-5.36:3.45	-5.03:3.02	-1.19:0.67	-1.60:0.36	-2.20:0.51
(H)86	-0.50:1.98	-1.26:1.92	-1.34:0.40	-4.96:1.50	-3.85:0.38	-3.59:0.32	-2.97:0.38	-2.10:0.47	-1.85:0.38	-2.25:0.70	-3.82:0.75	-2.69:0.78	-1.57:0.87	-1.69:4.76	-3.56:0.89	-1.98:0.24	-0.66:0.87	-0.35:0.26	-3.92:0.19	-4.79:0.23	-2.14:0.23	-0.44:0.69	-5.90:0.24	-5.90:0.24
(H)87	-1.01:0.75	-5.70:4.60	-4.37:3.65	-6.20:3.32	-1.29:2.73	-5.27:4.42	-2.90:1.38	-3.59:3.82	-1.12:1.68	-1.88:1.03	-1.84:1.30	-2.75:1.98	-0.80:1.77	-2.45:1.32	-3.63:3.80	-4.07:3.83	-3.68:2.86	-6.57:0.25	-4.87:4.38	-4.98:4.19	-8.41:6.57	-3.89:0.96	-0.94:0.53	-0.36:0.11
(H)88	-1.22:0.48	-3.91:1.52	-1.91:3.75	-6.88:6.12	-6.25:5.10	-8.81:6.95	-2.86:1.37	-6.57:0.86	-0.64:1.00	-0.80:1.20	-4.47:1.46	-6.10:2.52	-2.45:0.77	-1.80:0.42	-1.48:4.46	-4.73:0.99	-5.45:2.24	-1.76:1.73	-4.78:0.47	-13.70:0.80	-9.50:13.14	-0.17:0.18	-0.98:0.05	-0.98:0.05
(H)89	-0.74:2.96	-8.30:5.21	-3.80:5.69	-10.10:5.01	-2.35:1.18	-4.04:2.83	-1.21:1.13	-3.98:0.86	-1.62:0.33	-2.03:0.57	-7.11:5.50	-5.48:0.65	-2.68:0.43	-4.84:0.14	-5.90:1.13	-4.30:3.36	-1.70:0.61	-5.22:0.75	-2.38:0.76	-10.00:10.05	-8.82:14.65	-4.93:0.37	-2.50:0.64	-2.50:0.64
(H)90	-2.95:6.38	-6.85:5.21																						



Antenna Pattern of 6GHz

Appendix D

φ(120°)	3.33(-6.1)	-5.70(-5.2)	-4.24(-4.1)	-2.87(-2.1)	-1.15(-0.4)	-0.26(-3.5)	-0.55(-9.2)	-3.00(-2)	0.82(-1.2)	-1.77(-1.6)	-2.44(-3.7)	-5.18(-4.7)	-5.71(-5.4)	-6.48(-6.2)	-7.04(-4.5)	-4.12(-5.9)	-5.80(-2.4)	-3.03(-8.4)	-4.38(-7.2)	-8.58(-10.0)	-8.22(-4.7)	-11.75(-11.1)	-4.40(-4.5)	-2.12(-17.3)	
φ(127.5°)	3.61(-6.7)	-16.05(-13.4)	-12.78(-14.7)	6.93(-4.7)	3.52(-2.8)	2.41(-3.6)	-7.11(-4.3)	-1.76(-6.3)	0.58(-1)	0.73(-0.5)	-1.62(-1.7)	-3.89(-6.2)	7.71(-10.4)	6.23(-10.1)	6.51(-3.7)	-3.86(-7.1)	-14.24(-7.1)	-4.03(-5.3)	3.78(-4.6)	9.39(-12.7)	-7.60(-8.2)	-7.86(-7.5)	6.65(-6.1)	6.21(-4.8)	
φ(135°)	2.64(-5.7)	-11.47(-11.8)	-6.65(-5.3)	2.78(-1.2)	-1.09(-1.6)	2.53(-4.8)	-4.94(-3.6)	-9.99(-2.6)	-0.50(-1.5)	-0.22(-1.9)	-1.06(-2.3)	-6.79(-5.8)	-11.51(-7.4)	-8.07(-9.1)	-3.60(-2.4)	-4.30(-10.6)	-15.99(-6.1)	-6.46(-6.1)	3.36(-1.3)	-12.54(-10.3)	-4.26(-4.9)	-6.83(-9.3)	-12.40(-10.3)	-6.27(-5.3)	
φ(142.5°)	4.42(-6.5)	-8.58(-7.3)	-4.50(-4.1)	2.67(-5.3)	0.82(-0.8)	0.01(-1.3)	-3.36(-2.3)	-5.60(-3.5)	0.65(-0.3)	-1.17(-1.4)	-1.17(-1.3)	-6.23(-4.4)	-7.07(-3.9)	-2.86(-4.8)	-6.79(-8.4)	-12.05(-11.7)	-6.00(-2.9)	2.76(-5.1)	5.22(-6.9)	-7.27(-5.2)	-4.65(-2.4)	-11.79(-11.4)	-11.85(-5.3)	-3.23(-3.3)	
φ(150°)	6.33(-7.2)	-10.78(-7.3)	4.93(-1.5)	-6.14(-5.5)	0.50(-0.7)	2.68(-3.0)	-2.09(-0.9)	1.48(-0.8)	0.18(-0.4)	-1.38(-2.4)	-4.60(-5.0)	-8.31(-11.5)	-9.76(-9.7)	-6.11(-8.8)	-7.45(-7.4)	-11.47(-14.9)	-9.49(-4.1)	5.64(-4.9)	4.75(-6.7)	-7.82(-4.8)	-8.02(-7.3)	-9.79(-9.3)	-10.04(-15.3)	-12.47(-8.4)	
φ(157.5°)	7.49(-7.6)	7.95(-6.8)	4.50(-3.1)	2.24(-7.1)	2.16(-3.0)	4.13(-7.6)	2.40(-1.3)	-0.64(-1.5)	0.36(-0.3)	-1.29(-1.5)	2.19(-3.1)	-4.08(-5.3)	-5.85(-7.2)	-7.70(-4.9)	-3.89(-2.8)	3.03(-3.1)	-2.81(-1.9)	2.14(-4.2)	5.66(-4.9)	4.32(-5.7)	-6.57(-10.1)	-11.76(-11.3)	-10.80(-12.8)	9.46(-7.8)	
φ(165°)	9.03(-9.7)	-10.18(-9.9)	-10.58(-10.8)	-10.65(-10.9)	-8.97(-9.1)	-8.16(-7.1)	-5.62(-4.1)	-3.39(-2.4)	-1.28(-0.5)	-0.19(-0.5)	0.71(-0.7)	-0.07(-1.0)	0.71(-1.5)	-2.48(-2.5)	-2.50(-1.1)	-1.13(-2.0)	-2.25(-1.0)	3.16(-5.8)	-7.83(-7.3)	-6.50(-5.7)	-6.36(-7.6)	-7.73(-10.4)	-8.84(-7.1)	-7.51(-6.3)	
φ(172.5°)	-10.07(-11.0)	-11.88(-12.3)	-14.44(-15.8)	-15.00(-13.7)	-13.52(-11.7)	-10.93(-9.4)	-8.46(-7.7)	-7.14(-6.3)	-6.14(-5.3)	-4.54(-3.5)	-3.49(-3.8)	-3.00(-3.6)	-4.14(-3.1)	-3.51(-7.3)	-4.35(-3.4)	-4.57(-4.7)	-6.09(-7.3)	-8.55(-10.5)	-11.49(-12.8)	-10.75(-10.3)	-10.79(-10.9)	-8.19(-7.3)	-7.20(-7.3)	8.97(-6.2)	
φ(180°)	5.82(-1.5)	6.16(-5.6)	5.74(-5.5)	5.02(-4.5)	5.09(-4.7)	5.69(-5.9)	5.67(-5.8)	4.89(-4.5)	4.14(-4.2)	-1.11(-4.2)	-4.73(-5.9)	-4.43(-5.4)	5.60(-5.5)	6.39(-6.9)	6.26(-6.4)	6.67(-11.3)	6.58(-10.3)	-11.70(-11.4)	-8.57(-6.1)	-7.72(-7.4)	-7.67(-7.1)	-7.67(-7.3)	-7.67(-7.3)	-7.51(-6.4)	
FreeSpace	6.475(-6.4)	Table A.4	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	
Gain	φ(0°)/φ(5°)	φ(5°)/φ(22.5°)	φ(22.5°)/φ(30°)	φ(30°)/φ(36.5°)	φ(36.5°)/φ(45°)	φ(45°)/φ(52.5°)	φ(52.5°)/φ(60°)	φ(60°)/φ(67.5°)	φ(67.5°)/φ(75°)	φ(75°)/φ(82.5°)	φ(82.5°)/φ(90°)	φ(90°)/φ(97.5°)	φ(97.5°)/φ(105°)	φ(105°)/φ(112.5°)	φ(112.5°)/φ(120°)	φ(120°)/φ(127.5°)	φ(127.5°)/φ(135°)	φ(135°)/φ(142.5°)	φ(142.5°)/φ(150°)	φ(150°)/φ(157.5°)	φ(157.5°)/φ(165°)	φ(165°)/φ(172.5°)	φ(172.5°)/φ(180°)	φ(180°)/φ(187.5°)	
φ(5°)	4.02(-4.4)	4.46(-4.5)	4.59(-5.2)	4.69(-5.3)	4.69(-5.3)	2.82(-2.2)	1.63(-1.4)	-1.53(-1.7)	-2.09(-2.5)	2.44(-2.2)	2.13(-4.6)	2.41(-5.2)	2.42(-5.2)	2.42(-5.2)	2.42(-5.2)	2.88(-5.7)	4.02(-7.2)	1.94(-1.5)	1.94(-1.5)	1.83(-1.6)	1.56(-1.7)	1.51(-2.2)	3.09(-3.4)	3.89(-4.3)	3.31(-3.1)
φ(7.5°)	1.162(-1.2)	-1.79(-1.7)	-1.37(-1.1)	-1.17(-1.5)	1.61(-1.1)	-1.45(-1.9)	2.23(-2.7)	3.68(-4.1)	6.43(-5.5)	6.04(-5.2)	6.97(-6.8)	7.98(-6.9)	8.00(-4.0)	8.45(-7.7)	7.27(-5.4)	4.68(-4.5)	3.20(-2.8)	2.34(-1.7)	1.75(-1.2)	-1.24(-1.4)	-1.79(-1.8)	-1.88(-1.6)	1.96(-1.8)	1.57(-1.4)	
φ(10°)	1.181(-1.4)	-1.75(-1.7)	-1.57(-2.1)	-2.78(-2.1)	3.28(-2.3)	3.13(-3.8)	4.64(-5.1)	7.47(-4.7)	8.99(-5.1)	9.24(-5.0)	8.90(-2.6)	8.70(-8.0)	8.80(-1.0)	-11.60(-12.5)	11.80(-10.4)	7.89(-2.4)	4.52(-3.1)	2.23(-1.2)	0.91(-0.8)	-0.36(-0.5)	-1.01(-1.5)	2.56(-3.0)	2.94(-2.4)	3.62(-3.1)	
φ(12.5°)	2.19(-1.4)	-1.34(-1.8)	-1.53(-1.1)	-1.88(-1.1)	-1.85(-1.6)	2.96(-3.0)	6.09(-4.1)	-12.25(-12.2)	-10.84(-5.4)	-7.89(-7.3)	-7.07(-1.3)	-7.14(-7.3)	-7.47(-6.8)	-12.23(-13.2)	-11.55(-16.8)	-13.12(-13.5)	-9.80(-6.3)	4.14(-2.4)	-1.43(-1.0)	-0.89(-0.8)	-0.46(-0.4)	-1.06(-1.4)	-2.39(-2.5)	2.88(-2.6)	
φ(15°)	5.46(-4.7)	4.24(-3.7)	-1.42(-2.6)	3.00(-4.6)	-0.06(-0.7)	2.19(-3.4)	-5.92(-10.2)	-11.51(-9.8)	6.65(-5.4)	-4.82(-5.3)	-4.27(-6.8)	-6.59(-5.8)	6.65(-4.3)	4.47(-7.3)	6.91(-7.6)	-13.93(-15.4)	-4.20(-4.4)	5.20(-4.4)	3.64(-1.2)	2.98(-1.9)	-0.06(-0.2)	2.19(-2.6)	2.24(-2.4)	3.64(-2.4)	
φ(17.5°)	-1.82(-1.3)	-0.90(-0.5)	-2.57(-2.7)	-1.83(-0.6)	-1.12(-1.6)	-3.52(-4.7)	-5.64(-5.3)	-4.75(-3.1)	3.02(-1.7)	1.41(-1.5)	-7.80(-6.8)	-7.29(-6.2)	6.43(-6.5)	5.79(-6.2)	-5.90(-4.0)	-8.33(-5.3)	-4.16(-3.7)	3.40(-1.6)	0.05(-0.2)	0.86(-0.5)	1.01(-0.7)	2.41(-2.3)	4.48(-4.5)	-3.79(-2.2)	
φ(20°)	1.50(-0.7)	1.16(-1.2)	0.23(-1.3)	3.30(-2.9)	1.19(-0.2)	-2.71(-4.6)	-8.07(-6.7)	5.53(-3.7)	3.56(-5.2)	-7.31(-4.2)	-10.30(-9.4)	-8.24(-8.5)	8.05(-4.3)	6.55(-4.5)	-4.11(-2.4)	-8.86(-7.4)	-5.20(-4.4)	3.60(-1.9)	1.82(-1.7)	1.83(-1.1)	-1.11(-2.1)	2.09(-1.2)	4.41(-3.7)	4.31(-3.7)	
φ(22.5°)	0.58(-0.5)	-0.22(-1.7)	0.33(-0.6)	3.30(-3.8)	3.30(-3.4)	-4.20(-1.3)	-1.70(-3.1)	-7.14(-5.1)	3.99(-4.3)	6.63(-5.9)	-9.14(-6.3)	-7.57(-6.7)	-7.61(-7.1)	5.75(-6.5)	-4.31(-5.4)	-5.70(-1.5)	-4.37(-4.1)	3.90(-3.5)	-1.62(-0.7)	1.66(-1.3)	1.19(-0.7)	0.80(-0.4)	0.62(-0.1)	0.41(-0.1)	
φ(25°)	0.50(-0.4)	0.21(-1.2)	1.41(-0.6)	2.12(-0.4)	0.08(-3.2)	4.08(-3.2)	6.08(-3.2)	3.70(-1.7)	-8.17(-7.0)	6.46(-2.5)	-7.46(-8.2)	-8.31(-0.3)	-9.64(-1.2)	-10.54(-8.2)	-9.07(-9.2)	-7.05(-1.9)	-6.70(-2.4)	8.54(-3.0)	3.16(-3.67)	-1.87(-0.4)	-0.06(-0.2)	0.10(-0.2)	0.17(-1.1)	-1.86(-1.9)	
φ(27.5°)	1.08(-0.3)	0.26(-5.2)	0.03(-6.6)	-1.36(-9.1)	-1.00(-3.8)	-4.32(-5.8)	-8.52(-10.8)	-7.44(-12.3)	7.20(-3.1)	-7.71(-4.0)	-9.80(-4.3)	-7.75(-8.1)	0.47(-11.4)	-10.38(-10.9)	-4.57(-1.4)	-2.61(-5.4)	-5.81(-2.8)	3.07(-2.1)	-1.41(-5.2)	0.41(-0.9)	-0.07(-0.6)	-1.90(-2.4)	2.27(-4.1)	-4.96(-3.1)	
φ(30°)	0.07(-1.2)	2.16(-7.2)	0.94(-0.2)	0.07(-6.96)	-10.13(-3.4)	-3.08(-4.1)	8.24(-10.5)	6.53(-15.5)	5.57(-3.1)	-8.89(-2.5)	-10.05(-15.1)	-11.32(-10.4)	-11.99(-9.6)	6.34(-5.4)	8.74(-3.0)	3.22(-2.5)	-1.98(-0.4)	-0.14(-1.5)	0.47(-0.9)	-0.22(-2.2)	2.22(-5.2)	2.24(-4.2)	2.24(-4.2)	-4.96(-3.1)	
φ(32.5°)	0.11(-0.7)	1.12(-7.2)	1.10(-4.7)	0.11(-4.6)	-10.07(-5.8)	-2.70(-4.2)	-8.40(-7.9)	-4.33(-15.1)	6.03(-3.2)	-3.75(-1.3)	-6.03(-3.2)	9.94(-14.2)	-10.59(-15.4)	-11.72(-8.9)	-10.09(-4.4)	-6.50(-1.5)	8.96(-2.5)	2.12(-3.0)	-3.73(-0.3)	-1.21(-2.6)	-0.14(-0.3)	0.66(-1.7)	2.75(-5.8)	-15.13(-2.8)	
φ(35°)	0.30(-1.8)	1.04(-6.1)	1.04(-6.1)	1.49(-5.4)	-5.18(-3.2)	-3.29(-4.5)	-7.80(-8.5)	-4.02(-4.3)	6.21(-3.7)	-9.34(-15.9)	-12.56(-13.3)	-11.79(-11.9)	-10.37(-13.1)	-11.15(-15.4)	-9.82(-7.8)	-7.38(-2.7)	1.21(-2.8)	4.80(-1.8)	-1.02(-1.0)	-0.98(-0.3)	0.95(-4.4)	1.48(-8.2)	-13.45(-3.1)	-4.92(-1.3)	
φ(37.5°)	0.25(-0.8)	1.55(-3.1)	0.01(-3.7)	0.79(-2.6)	-4.01(-4.1)	5.33(-4.3)	8.06(-4.1)	-3.42(-3.5)	5.13(-3.4)	4.91(-7.3)	-10.78(-13.1)	8.27(-7.8)	6.38(-7.4)	8.37(-10.2)	-10.44(-11.5)	-11.34(-8.8)	5.54(-1.2)	1.95(-4.6)	6.75(-5.1)	4.37(-5.4)	-1.76(-5.5)	0.83(-6.1)	-7.21(-7.9)	5.52(-2.6)	
φ(40°)	0.20(-0.1)	6.08(-2.4)	4.47(-4.1)	3.87(-1.0)	4.43(-9.1)	7.14(-6.4)	4.64(-2.8)	2.99(-3.4)	3.95(-3.4)	5.25(-5.9)	7.80(-5.3)	6.74(-5.6)	6.48(-6.1)	6.55(-6.1)	6.55(-6.1)	6.55(-6.1)	6.55(-6.1)	6.55(-6.1)	6.55(-6.1)	6.55(-6.1)	6.55(-6.1)	6.55(-6.1)	6.55(-6.1)	6.55(-6.1)	
φ(42.5°)	0.11(-1.2)	3.91(-5.8)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	-1.73(-9.7)	
φ(45°)	0.39(-4.2)	5.84(-5.8)	4.08(-2.3)	2.75(-5.9)	3.99(-1.9)	4.28(-1.1)	7.78(-4.4)	3.47(-3.3)	3.33(-4.4)	4.25(-4.8)	6.93(-7.0)	4.07(-10.3)	4.25(-10.3)	4.25(-10.3)	4.25(-10.3)	4.25(-10.3)	4.25(-10.3)	4.25(-10.3)	4.25(-10.3)	4.25(-10.3)	4.25(-10.3)	4.25(-10.3)	4.25(-10.3)	4.25(-10.3)	
φ(47.5°)	5.51(-10.3)	-15.57(-11.2)	-10.30(-10.2)	8.83(-7.3)	7.71(-13.1)	-10.59(-12.4)	-10.37(-12.4)	2.32(-1.3)	2.30(-7.3)	3.03(-3.4)	5.29(-5.4)	5.09(-5.3)	4.47(-6.8)	8.93(-10.0)	6.46(-7.2)	5.29(-9.1)	0.01(-6.2)	4.40(-4.5)	5.91(-5.1)	9.16(-12.0)	-11.16(-10.3)	7.27(-4.5)	10.61(-4.9)	4.33(-3.7)	
φ(50°)	3.57(-5.2)	-10.19(-10.7)	9.86(-4.7)	3.93(-2.5)	2.72(-7.2)	-4.52(-6.7)	6.94(-5.2)	2.64(-7.2)	0.90(-1.7)	2.67(-4.7)	4.58(-4.6)	6.83(-6.8)	14.82(-15.3)	-10.86(-1.6)	7.74(-4.5)	-14.00(-14.2)	6.78(-1.4)	5.34(-5.9)	-10.27(-14.1)	-10.70(-6.3)	7.88(-14.6)	-15.03(-10.3)	8.50(-9.3)		
φ(52.5°)	0.86(-10.8)	-12.51(-6.0)	8.73(-5.2)	3.56(-1.4)	0.21(-0.4)	0.99(-3.2)	2.07(-2.2)	2.77(-1.5)	0.77(-1.6)	3.89(-1.3)	8.06(-10.3)	-11.40(-9.8)	7.98(-5.6)	3.36(-2.2)	-4.85(-7.3)	8.75(-10.9)	-4.14(-5.2)	2.24(-5.67)	6.83(-7.4)	1.82(-1.7)	3.54(-3.4)	14.36(-10.77)	-12.46(-10.3)	5.87(-6.5)	
φ(55°)	7.63(-5.5)	-5.45(-7.7)	6.48(-3.9)	-1.50(-6.6)	0.30(-2.1)	4.11(-10.6)	2.50(-1.5)	-1.33(-1.7)	1.91(-2.4)	2.28(-4.4)	-11.01(-11.7)	-10.11(-10.7)	-11.13(-12.5)	-8.81(-13.2)	7.36(-10.9)	-10.35(-10.1)	-10.79(-10.7)	3.31(-6.1)	-11.33(-9.2)	8.39(-6.4)	-11.31(-10.7)	-10.61(-14.6)	-15.34(-13.7)	-4.37(-4.5)	
φ(57.5°)	1.78(-5.4)	-6.68(-6.8)	5.08(-4.3)	3.73(-3.7)	2.44(-2.5)	6.22(-1.7)	2.82(-1.1)	-1.21(-1.5)	-1.69(-2.6)	0.01(-1.6)	-5.71(-6.1)	-5.54(-5.5)	8.40(-10.5)	8.38(-1.8)	-7.07(-7.8)	5.82(-1.2)	-3.29(-1.4)	5.05(-4.0)	-5.67(-4.6)	6.60(-5.9)	-1.77(-5.2)	4.49(-6.4)	8.37(-7.4)	-3.17(-4.5)	
φ(60°)	7.62(-10.1)	8.59(-5.0)	-10.53(-10.7)	9.84(-10.8)	8.92(-4.6)	-7.50(-4.8)	-4.57(-3.1)	-3.06(-2.4)	2.28(-2.4)	-2.78(-2.1)	-2.90(-2.4)	-2.98(-1.7)	-1.77(-1.7)	-1.24(-1.5)	-1.88(-2.4)	-2.92(-2.6)	-2.25(-2.8)	4.50(-2.1)	-7.79(-5.4)	-7.01(-7.4)	7.25(-7.4)	9.99(-12.2)	6.91(-12.7)	9.15(-9.3)	
φ(62.5°)	-13.82(-13.8)	-16.71(-15.4)	-16.71(-15.4)	-15.56(-15.1)	-10.63(-12.7)	-10.76(-12.7)	-10.76(-12.7)	-8.36(-7.2)	-6.20(-2.3)	-4.70(-4.57)	-4.63(-15.9)	-4.63(-15.9)	-4.63(-15.9)	-4.63(-15.9)	-4.63(-15.9)	-4.63(-15.9)	-4.63(-15.9)	-4.63(-15.9)	-4.63(-15.9)	-4.63(-15.9)	-4.63(-15.9)	-4.63(-15.9)	-4.63(-15.9)	-4.63(-15.9)	
φ(65°)	6.22(-6.1)	6.58(-6.6)	6.24(-6.1)	6.77(-7.2)	4.72(-6.2)	6.44(-3.0)	6.77(-6.1)	6.82(-6.4)	6.15(-6.1)	6.46(-6.8)	6.42(-7.4)	5.89(-6.3)	6.83(-6.5)	6.32(-6.1)	6.06(-2.7)	5.48(-5.6)	6.48(-7.4)	8.56(-5.0)	-10.16(-10.7)	-9.71(-8.2)	-7.38(-6.6)	6.89(-7.6)	6.87(-6.9)	6.63(-6.2)	
FreeSpace	6.855(-6.4)	Table A.4	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	φ	
Gain	φ(0°)/φ(5°)	φ(5°)/φ(22.5°)	φ(22.5°)/φ(30°)	φ(30°)/φ(36.5°)	φ(36.5°)/φ(45°)</																				

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

