



Antenna Composite Gain Test Report

Equipment	4x4 Dual-band Enterprise Access Point
Brand Name	ALTA LABS 
Model Name	AP6-Pro
Applicant	SoundVision Technologies, dba Alta Labs 192 N Old Hwy 91, Unit 1 Hurricane,Utah,United States 84737
Manufacturer	SoundVision Technologies, dba Alta Labs 192 N Old Hwy 91, Unit 1 Hurricane,Utah,United States 84737
Sample Received	Mar. 31, 2023
Start Test Date	Apr. 07, 2023
Final Test Date	Apr. 07, 2023


Approved by: Jackson Tsai

SPORTON INTERNATIONAL INC. Hsinhua Laboratory

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1. Operation Mode and Antenna Information

Antenna Position	RF Port	Brand Name	Model Name	Ant. Type	Connector	Modes of Operation
2G5G Ant1	1	LITEON	3010001441GD	PIFA	I-PEX	Radio 1_2.4GHz+ Radio 2_5GHz
2G5G Ant2	2	LITEON	3010001443GD	PIFA	I-PEX	Radio 1_2.4GHz+ Radio 2_5GHz
5G Ant3	3	LITEON	3010001429GD	PIFA	I-PEX	Radio 2_5GHz
5G Ant4	4	LITEON	3010001442GD	PIFA	I-PEX	Radio 2_5GHz

For 2.4GHz function:

For IEEE 802.11 b/g/n/VHT/ax mode (2TX/2RX)

2G5G Ant1 and 2G5G Ant2 could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11 a/n/ac/ax mode (4TX/4RX)

2G5G Ant1, 2G5G Ant2, 5G Ant3 and 5G Ant4 could transmit/receive simultaneously.

2. Test Frequency

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

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

3. Testing Location

Test Lab. : Sporton International Inc. Hsinhua Laboratory				
☒ Wen 33rd.St.	ADD:	No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)		
	TEL: 886-3-318-0787	FAX: 886-3-318-0287		
Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
Radiated	05CH03-HY	Rex Liao	23.5~24.5°C / 50~55%	07/Apr/2023

Note:

Testing Site Information

Brand Name: TDK

Dimension: 11m*6m*6m

Characteristic: Fully Anechoic Chamber

4. Test Facility and Configuration

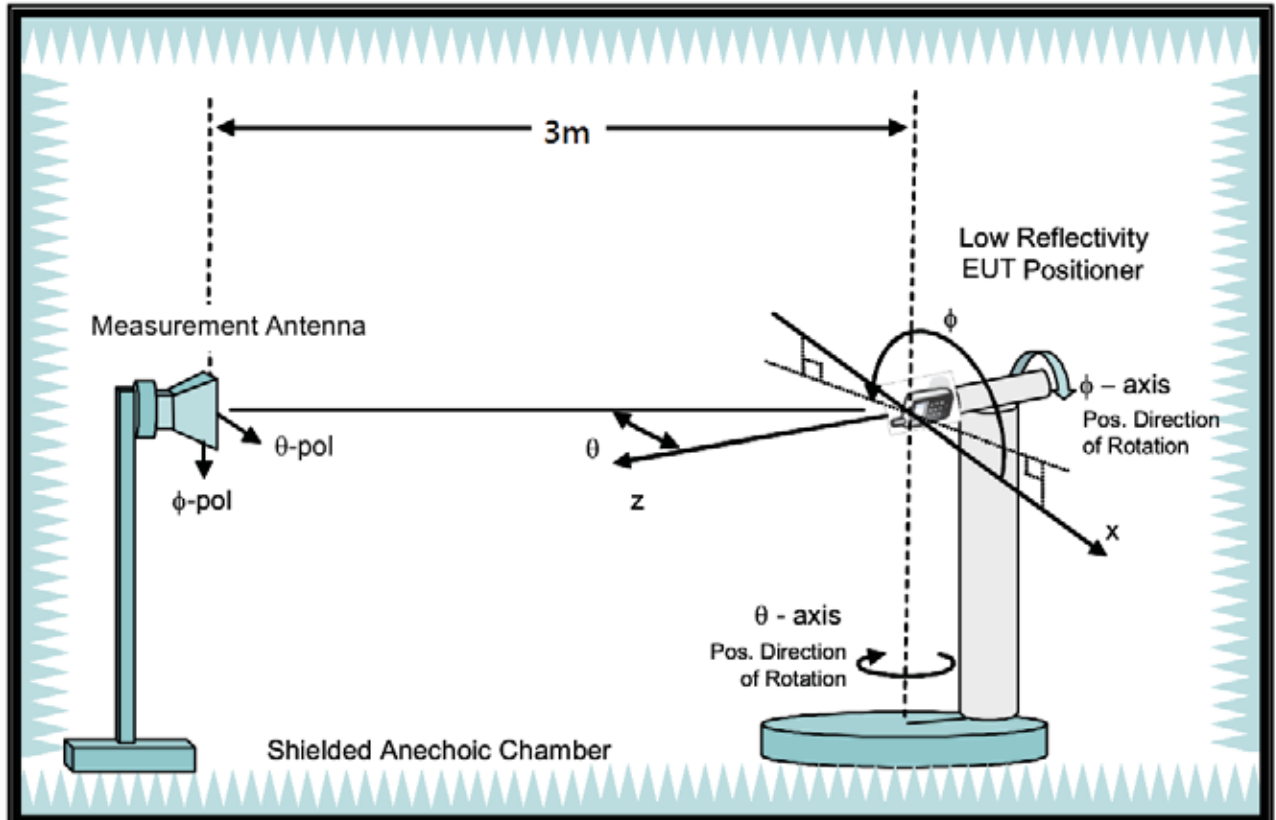
Test configuration: Reference to CITA OTA distributed-axes system configuration.

Chamber: Fully Anechoic Chamber.

Measurement antenna: Dual Polarization Horn antenna

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

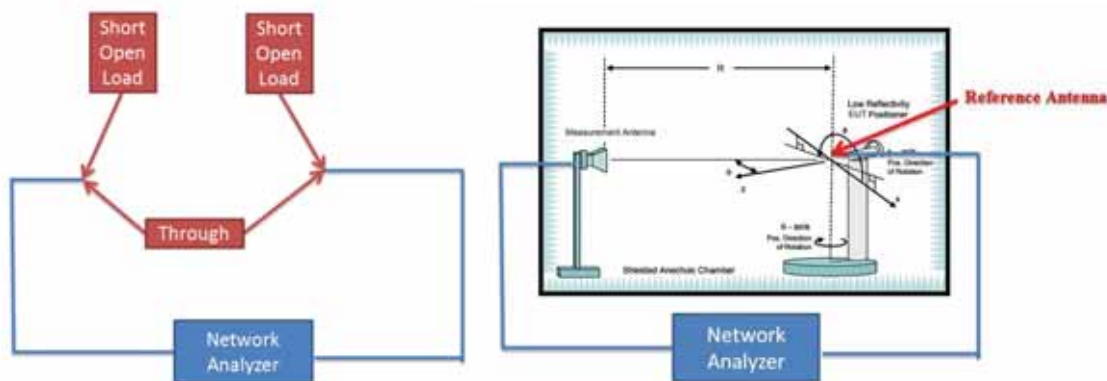
#Reference to CTIA "ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1"



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)	-3.98	-0.43	1.29	0.49	4.23
Ant. 2 (dBi)	3.04	-4.05	-5.31	-5.09	-2.79
Ant. 3 (dBi)	-	1.53	1.91	2.13	0.49
Ant. 4 (dBi))	-	0.16	-0.07	1.61	-6.79
DG [1SS] (dBi)	3.23	5.55	5.89	6.23	5.73
Polarization	Theta	Theta	Theta	Theta	Theta
$\Theta(^{\circ})$	37.5	67.5	82.5	75	82.5
$\Phi(^{\circ})$	300	262.5	262.5	262.5	300

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 [$10^{(G/20)}$]	$10^{(-3.98/20)}$	$10^{(-0.43/20)}$	$10^{(1.29/20)}$	$10^{(0.49/20)}$	$10^{(4.23/20)}$
Ant. 2 [$10^{(G/20)}$]	$10^{(3.04/20)}$	$10^{(-4.05/20)}$	$10^{(-5.31/20)}$	$10^{(-5.09/20)}$	$10^{(-2.79/20)}$
Ant. 3 [$10^{(G/20)}$]		$10^{(1.53/20)}$	$10^{(1.91/20)}$	$10^{(2.13/20)}$	$10^{(0.49/20)}$
Ant. 4 [$10^{(G/20)}$]		$10^{(0.16/20)}$	$10^{(-0.07/20)}$	$10^{(1.61/20)}$	$10^{(-6.79/20)}$
Ant. 1 [$10^{(G/20)}$] value	0.632	0.952	1.16	1.058	1.627
Ant. 2 [$10^{(G/20)}$] value	1.419	0.627	0.543	0.557	0.725
Ant. 3 [$10^{(G/20)}$] value		1.193	1.246	1.278	1.058
Ant. 4 [$10^{(G/20)}$] value		1.019	0.992	1.204	0.458
Sum All Antenna [Amax]	2.051	3.79	3.941	4.096	3.868
DG [$10 \cdot \log(A_{max}^2/N_{ant})$]	3.23	5.55	5.89	6.23	5.73

Note:

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

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



8. Summary of Test Result

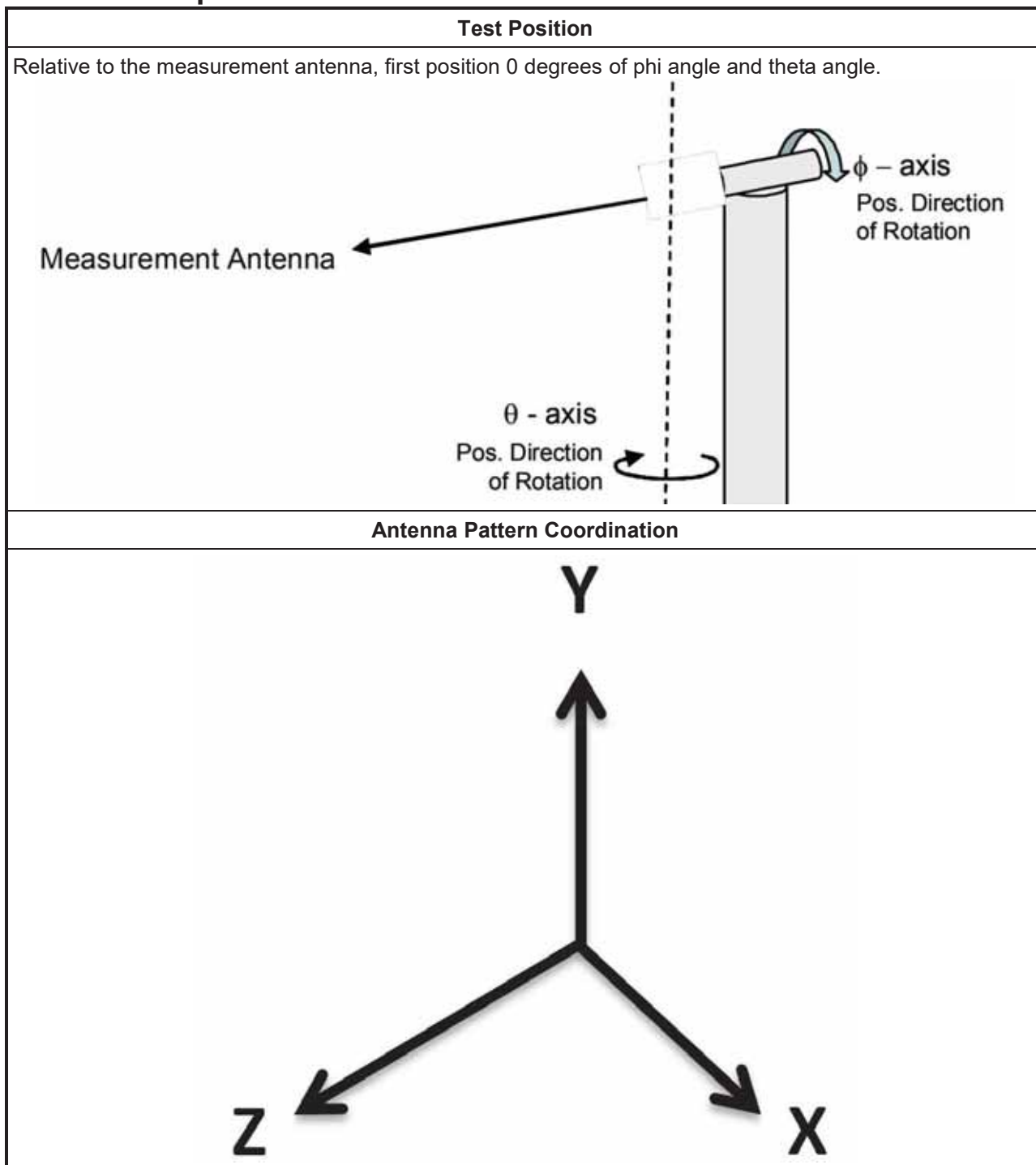
Freq(Hz)	2.45G
Ant. 1 Max Gain (dBi)	2.42
Ant. 2 Max Gain (dBi)	3.04
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/7.5/307.5
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/37.5/300
Max Gain (dBi)	3.04
DG [1SS] (dBi)	3.23
DG [2SS] (dBi)	3.04

Freq(Hz)	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	3.75	3.96	4.18	4.23
Ant. 2 Max Gain (dBi)	3.51	3.83	4.08	3.91
Ant. 3 Max Gain (dBi)	3.28	3.13	3.01	3.19
Ant. 4 Max Gain (dBi)	4.22	4.26	4.12	4.28
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/60/82.5	Theta/82.5/300	Theta/82.5/240	Theta/82.5/300
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/52.5/45	Theta/52.5/150	Theta/52.5/157.5	Theta/60/157.5
Ant. 3 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/82.5/285	Theta/75/285	Theta/82.5/285	Theta/82.5/262.5
Ant. 4 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/75/75	Theta/67.5/75	Theta/60/75	Theta/52.5/82.5
Max Gain (dBi)	4.22	4.26	4.18	4.28
DG [1SS] (dBi)	5.55	5.89	6.23	5.73
DG [2SS] (dBi)	4.22	4.26	4.18	4.28
DG [4SS] (dBi)	4.22	4.26	4.18	4.28

Note:

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

9. Test Setup



Note:

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

**10. Test Equipment and Calibration Data**

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1543	1GHz~18GHz	May 31, 2022	May 30, 2023
Dual Polarization Horn Antenna	Sporton	S0209DP	S0209DP-001	2GHz~9GHz	N.C.R.	N.C.R.
ENA Series Network Analyzer	AGILENT	E5071C	MY46419477	100kHz~8.5GHz	July. 20, 2022	July. 19, 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: NCR means Non-Calibration required.



11. Test Results

Please refer to the appendix.

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————THE END————



Radiated Composite Gain Data

Appendix A

Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	2.42	3.75	3.96	4.18	4.23
Ant. 2 Max Gain (dBi)	3.04	3.51	3.83	4.08	3.91
Ant. 3 Max Gain (dBi)		3.28	3.13	3.01	3.19
Ant. 4 Max Gain (dBi)		4.22	4.26	4.12	4.28
Ant. 1 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Phi/7.5/307.5	Phi/60/82.5	Theta/82.5/300	Theta/82.5/240	Theta/82.5/300
Ant. 2 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Theta/37.5/300	Theta/52.5/45	Theta/52.5/150	Theta/52.5/157.5	Theta/60/157.5
Ant. 3 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$		Theta/82.5/285	Theta/75/285	Theta/82.5/285	Theta/82.5/262.5
Ant. 4 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$		Theta/75/75	Theta/67.5/75	Theta/60/75	Theta/52.5/82.5
Max Gain (dBi)	3.04	4.22	4.26	4.18	4.28
DG [1SS] (dBi)	3.23	5.55	5.89	6.23	5.73
DG [2SS] (dBi)	3.04	4.22	4.26	4.18	4.28
DG [4SS] (dBi)		4.22	4.26	4.18	4.28

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Radiated Composite Gain Data

Appendix A

(H25)	0.73068	0.144011	-0.36-0.39	-0.32034	0.85092	0.02076	0.43036	0.61051	0.050111	0.43114	1.24122	1.07087	0.66051	0.44045	0.67077	0.60307	-0.08-0.72	-0.96-0.95	-0.82001	0.55002	1.15184	1.99183	1.52128	1.07084
(H26)	1.38118	0.9302	-0.63-0.14	-0.91019	0.91122	1.11079	0.48049	0.42035	0.16043	0.9412	1.0909	0.601	-0.42-0.59	-0.21038	0.65088	0.3801	-0.10-0.4	-0.59-1.63	-1.22-0.83	-0.01076	1.48218	2.67027	2.61026	2.3174
(H27)	1.34033	-0.170586	-1.45-1.44	-1.01-0.21	0.53094	1.01108	1.12128	1.58126	0.310109	0.18058	0.59054	0.05034	-0.58-0.25	-0.09627	0.42092	0.88053	0.56006	-0.59-1.14	-1.61-2.9	-2.46-0.58	1.07072	2.9101	2.89028	2.56196
(H28)	1.45138	1.07647	-0.54-0.74	-0.15-0.02	0.12804	1.56137	1.17128	1.42014	0.59-0.6	-1.28-1.34	-0.94-0.56	-0.5-0.3	-0.28-0.71	-2.21-2.79	-1.15-0.1	-0.25-0.61	-0.78-1.38	-2.05-2.72	-2.92-0.47	-0.31-1.43	0.51-1.4	1.57238	2.86073	2.11147
(H29)	1.06127	0.552-0.74	-2.76-1.88	0.19-0.27	0.98128	1.58199	1.66177	1.87147	0.48-0.48	-0.30-1.16	-1.41-0.74	-0.64-1.03	-1.81-2.55	-2.21-2.16	-1.15-0.94	-0.71-0.5	-1.86-3.1	-3.65-4.73	-4.32-0.84	-0.84-0.34	0.45-0.85	1.48138	1.28105	
(H30)	-0.07041	0.57081	2.12-2.32	-0.76-0.97	-1.44-0.83	1.44207	1.551146	1.14-0.42	-1.44-1.92	-2.43-0.32	-2.13-2.26	-2.43-1.61	-1.23-1.26	-1.21-2.78	-3.89-2.3	-2.68-1.93	-0.78-1.37	-2.08-2.89	-3.48-4.59	-3.64-2.65	-1.36-0.59	-0.41-0.03	0.41-0.02	-0.73-0.26
(H31)	0.38-0.01	0.09-1.26	3.64-3.62	-1.99-1.26	-1.05-1.57	-0.05032	0.31162	1.32-0.28	-1.61-2.21	-3.93-4.71	-3.04-2.76	-3.05-3.38	-2.68-0.92	0.21-1.42	-4.15-3.57	-3.17-2.51	-1.18-1.24	-2.38-2.96	-2.83-4.7	-3.54-3.33	-3.23-2.35	-2.33-0.88	-0.88-1.21	-1.95-1.06
(H32)	2.88-2.42	2.89-2.52	4.59-5.66	3.88-0.36	3.16-0.45	-1.25-0.11	0.82-0.2	-0.87-3	-4.29-3.45	-4.35-9.7	-4.36-4.33	-4.54-3.19	-2.9-3.32	-1.58-2.86	4.83-4.87	3.77-2.88	-1.26-1.33	-1.13-2.38	-2.28-1.99	-3.57-3.84	-4.59-3.41	-3.81-2.81	-4.48-4.88	-4.19-3.22
(H33)	3.57-3.32	5.25-5.82	5.25-5.88	5.54-5.97	3.88-6.67	4.47-2.36	-1.32-0.21	-1.34-0.49	7.42-5.22	6.79-9.13	5.86-6.08	5.41-7.73	3.65-4.53	-3.44-4.49	6.84-4.03	3.48-2.93	-2.65-2.16	1.37-2.57	2.45-2.52	-3.17-3.84	-5.97-4.82	-3.88-2.92	-4.39-4.65	-5.73-5.22
(H34)	4.91-4.98	4.93-4.95	6.55-6.87	6.45-6.91	3.88-4.48	6.15-4.62	4.28-2.36	3.63-5.77	6.71-5.28	6.26-5.84	6.82-7.13	4.08-2.88	2.95-5.88	6.84-6.47	-10.67-8.85	4.28-4.14	3.16-2.83	1.41-3.03	-2.61-4.33	-3.9-4.58	-6.42-7.08	5.93-6.88	6.16-6.53	4.42-4.48
(H35)	4.97-5.07	5.89-6.05	4.93-6.07	5.27-6.26	5.36-6.16	7.46-6.26	4.27-3.4	5.07-7.88	6.19-5.72	6.17-7.43	4.02-2.23	2.71-6.58	4.99-7.98	-11.89-9.51	3.83-4.68	6.07-4.87	3.99-5.52	6.30-7.78	5.26-7.32	6.48-7.89	9.76-11.22	5.96-7.22	6.47-6.79	6.03-6.80
(H36)	4.94-5.43	4.91-5.46	4.92-6.41	4.88-6.36	5.36-4.78	7.51-6.08	7.06-5.45	4.75-5.88	4.59-6.42	6.19-6.36	5.52-6.88	3.59-5.57	6.58-6.47	6.58-6.49	4.01-6.13	5.59-6.48	4.86-6.42	4.98-6.89	4.98-6.89	6.89-6.89	7.70-7.55	5.65-5.57		
(H37)	2.31-3.95	-4.22-4.67	5.52-5.19	6.69-6.45	6.63-5.22	-4.38-7.68	-10.57-8.11	4.01-5.16	4.84-7.6	6.37-9.4	3.89-6.45	6.91-6.05	4.91-8.03	-41-29	7.44-6.82	6.62-7.41	4.67-7.17	4.71-7.54	7.64-7.61	4.84-7.16	6.89-7.02	6.16-6.97	6.43-7.23	5.59-6.91
(H38)	2.92-3.38	5.51-6.39	5.16-6.44	4.34-4.53	4.52-5.51	-7.57-7.36	7.91-7.5	6.54-7.08	5.64-7.08	-7.23-7.49	5.53-7.37	4.22-6.44	4.68-7.82	6.42-6.14	4.87-6.41	6.79-7.47	5.47-6.25	9.95-9.5	3.59-4.5	6.14-6.8	5.16-4.57	4.91-4.41	4.91-4.41	
(H39)	2.57-2.67	-3.43-3.31	4.83-3.35	3.89-6.48	6.33-5.5	4.67-7.68	-10.96-10.2	6.29-6.45	6.38-5.99	-5.58-5.35	6.84-6.57	6.90-5.43	3.73-2.55	3.37-3.92	-3.99-4.93	-7.44-5.74	-7.65-6.49	5.77-6.66	6.5-7.8	4.94-5.72	5.41-5.73	6.68-5.31	4.25-6.43	4.52-3.79
(H40)	2.28-1.56	-1.84-2.7	4.24-3.51	-1.87-3.22	4.42-7.29	-7.19-6.68	5.30-5.64	6.78-6.22	6.58-6.73	6.09-7.28	6.61-6.72	5.53-5.32	4.91-4.82	6.31-6.37	-7.38-6.14	4.19-4.58	-7.39-5.62	6.69-6.18	4.74-2.86	3.80-5.88	5.88-5.54	5.98-7.74	-7.64-6.75	
(H41)	-1.69-2.13	-3.71-1.46	-3.13-2.86	-3.17-2.88	3.66-4.47	6.45-6.03	-7.74-7.11	-6.88-5.68	-6.62-5.01	4.67-7.9	-7.68-5.36	9.24-10.29	-10.47-9.91	8.85-7.58	8.07-5.34	4.44-4.25	-7.12-8.55	-6.01-10.68	-10.57-7.14	5.48-3.25	-2.89-5.65	4.77-6.02	-6.69-4.19	-3.72-6.21
(H42)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H43)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H44)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H45)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H46)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H47)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H48)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H49)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H50)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H51)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H52)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H53)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H54)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H55)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H56)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H57)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H58)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H59)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H60)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H61)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.91-9.4	5.71-5.5	-6.98-5.48	6.48-6.48	-6.67-6.82	-6.9-22	4.37-4.83	4.54-4.27	-6.17-29	-11-42.10	-7.78-6.11	-11.77-10.52	-7.44-6.85	4.97-3.89	-2.78-1.95	-1.83-3.12	6.93-3.52		
(H62)	0.58-0.33	-2.83-2.38	3.68-3.36	4.16-4.56	7.07-10.09	8.																		



Radiated Composite Gain Data

Appendix A

0(87.5°)	-3.95(3.67)	-3.57(3.06)	-3.91(3.06)	-1.33(1.22)	-1.36(1.2)	-1.29(1.15)	-1.54(0.19)	0.51(0.31)	-0.79(2.41)	-3.72(3.23)	-2.55(3.35)	-3.16(3.06)	-1.58(0.9)	-0.69(6.1)	-4.18(3.87)	-3.97(3.12)	-2.39(2.72)	-3.18(2.5)	4.1(3.51)	-4.71(4.35)	-3.22(4.1)	-3.14(2.64)	-3.11(3.43)	-2.95(3.68)
0(75°)	-3.23(3.59)	-4.06(3.36)	-3.74(7.9)	-3.56(3.02)	0.03(2.26)	-1.91(1.61)	-2.95(1.19)	-1.33(3.61)	-3.34(3.44)	-4.69(4.17)	-4.94(5.04)	-3.28(4.18)	-3.01(2.08)	-3.62(3.7)	-4.59(2.7)	-3.46(4.04)	-2.67(2.31)	-4.26(2.84)	-3.16(4.76)	-4.72(5.96)	-4.07(6.73)	-5.41(4.84)	-3.77(4.11)	-4.69(3.66)
0(62.5°)	-4.6(6.76)	-4.86(4.5)	-5.49(7.28)	-5.11(3.26)	-4.52(4.38)	-3.35(1.78)	-4.38(2.71)	-3.44(6.13)	-5.09(5.52)	-7.97(4.34)	-5.69(7.72)	-4.97(4.36)	-3.22(3.28)	-4.59(6.89)	-5.48(3.86)	-4.69(3.5)	-3.2(2.77)	-3.69(1.74)	-3.18(4.16)	-4.06(7.57)	-5.59(6.49)	-5.54(5.05)	-4.53(5.37)	-5.18(5.6)
0(50°)	-7.58(6.61)	-5.23(4.91)	-4.59(7.75)	-6.07(5.27)	-6.93(6.17)	-5.42(4.21)	-6.03(3.81)	-4.98(10.34)	-6.01(6.9)	-8.38(9.28)	-6.88(8.16)	-3.89(3.16)	-3.91(4.38)	-6.25(9.87)	-6.04(4.23)	-4.76(5.96)	-6.74(3.3)	-3.03(2.24)	-3.5(6.35)	-6.58(7.73)	-7(6.98)	-6.63(7.48)	-6.77(6.16)	-5.65(6.2)
0(37.5°)	-6.81(6)	-5.84(6.88)	-6.51(7.53)	-7.91(5.96)	-6.89(7.63)	-7.41(6.05)	-7.37(4.41)	-6.08(8.86)	-8.89(8.06)	-6.43(7.44)	-6.99(8.57)	-4.42(4.76)	-4.88(6.16)	-8.12(8.28)	-6.44(5.63)	-7.05(6.58)	-7.99(4.94)	-4.07(5.23)	-6.23(6.77)	-6.26(8.57)	-8.87(11.24)	-8.14(9.2)	-7.1(6.13)	-6.63(6.42)
0(25°)	-4.34(6.72)	-7.53(6.23)	-6.35(7.94)	-7.53(6.91)	-8.24(5.67)	-8.7(4.59)	-7.8(6.21)	-7.58(9.35)	-11.18(8.38)	-6.82(7.23)	-6.53(7.7)	-5.65(5.3)	-5.96(4.93)	-6.41(7.04)	-6.65(7.19)	-10.89(8.57)	-10.86(6.96)	-6.78(7.69)	-8.97(6.26)	-6.81(7.98)	-8.08(12.03)	-10.42(9.14)	-5.94(6.72)	-4.52(4.02)
0(12.5°)	-4.45(3.61)	-5.12(5.88)	-4.19(6.39)	-7.78(8.21)	-6.45(6.63)	-9.44(6.94)	-8.63(8.15)	-9.54(8.5)	-11.39(11.02)	-7.88(6.87)	-6.24(5.38)	-3.81(4.27)	-5.21(3.56)	-6.55(9.27)	-6.31(7.93)	-8.17(7.54)	-8.89(7.85)	-7.72(7.85)	-6.89(6.66)	-6(8.51)	-5.49(6.1)	-6.72(11.57)	-6.88(6.72)	-6.36(6.94)
0(0°)	-4.89(6.13)	-6.52(6.05)	-4.61(5.22)	-6.17(5.7)	-7.73(8.91)	-10.06(12.28)	-11.27(8.03)	-8.89(7.73)	-6.91(6.12)	-7.13(6.18)	-5.84(4.69)	-5.35(6.19)	-4.54(1.03)	-3.9(5.99)	-8.89(8.43)	-10.99(9.79)	-9.59(7.13)	-6.32(8.79)	-6.01(6.96)	-4.09(7.84)	-9.32(8.2)	-6.02(5.81)	-6.54(6.94)	-5.32(3.1)
0(127.5°)	-3.42(3.23)	-4.26(4.8)	-4.67(4.69)	-5.06(4.15)	-6.36(7.59)	-7.32(7.66)	-10.41(9.84)	-9.72(8.61)	-8.79(8.22)	-5.45(5.15)	-5.53(4.03)	-4.4(4.8)	-3.77(2.44)	-5.07(6.91)	-6.83(6.08)	-9.36(7.64)	-6.75(6.23)	-7.87(6.45)	-6.88(4.17)	-2.65(5.82)	-6.64(7.46)	-4.17(6.72)	-8.49(5.3)	-3.19(3.7)
0(115°)	-3.88(4.38)	-4.86(5.32)	-6.89(5.46)	-6.73(6.94)	-7.29(9.01)	-6.71(6.54)	-8.29(8.03)	-8.95(8.03)	-7.29(6.62)	-7.05(6.03)	-5.9(6.39)	-6.62(6.68)	-5.39(4.02)	-6.49(7.5)	-6.15(8.59)	-7.71(5.86)	-7.71(6.13)	-9.37(8.85)	-6.89(6.68)	-4.48(4.08)	-10.22(8.25)	-6.47(6.32)	-6.81(6.39)	-3.24(3.51)
0(102.5°)	-2.46(2.96)	-3.89(3.75)	-3.79(2.07)	-3.1(5.83)	-7.89(6.03)	-5.26(4.6)	-9.1(6.7)	-7.57(9.12)	-8.9(8.13)	-8.4(6.72)	-6.05(4.41)	-5.52(9.32)	-6.03(8.17)	-6.26(8.35)	-6.87(8.38)	-6.88(6.46)	-7.45(9.38)	-10.99(10.26)	-8.78(8.4)	-6.82(3.46)	-4.63(6.16)	-8.07(6.38)	-7.24(7.56)	-7.01(3.46)
0(90°)	-3(3.34)	-3.79(3.62)	-4.3(4.45)	-5.95(6.68)	-6.76(3.71)	-8.02(8.75)	-7.45(7.18)	-7.59(6.29)	-8.32(7.58)	-6.39(5.41)	-5.1(6.45)	-8.26(9.61)	-9.04(5.60)	-4.35(4.44)	-7.82(9.35)	-7.62(7.57)	-7.89(9.41)	-10.36(10.35)	-10.74(10.15)	-7.98(3.9)	-2.86(3.19)	-3.9(3.9)	-4.48(5.3)	-4.59(3.03)
0(75.75°)	-5.69(5.4)	-4.3(3.34)	-4.15(4.29)	-4.81(5.69)	-6.24(6.3)	-6.43(6.64)	-7.23(6.14)	-7.87(8)	-8.45(8.88)	-6.71(6.92)	-5.91(4.15)	-5.11(4.78)	-4.69(4.67)	-5.43(4.43)	-7.93(9.86)	-11.01(12)	-10.22(8.61)	-7.29(7.03)	-7.94(4.25)	-6.74(5.62)	-4.53(3.68)	-3.19(2.39)	-2.98(3.07)	
0(62.75°)	-5.95(3.42)	-2.51(3.6)	-5.1(5.34)	-6.52(5.66)	-6.44(6.3)	-7.03(6.07)	-11.31(12.25)	-11.26(11.36)	-10.26(9.25)	-7.71(6.29)	-6.12(7.02)	-8.38(10.09)	-10.75(11.52)	-10.82(10.03)	-9.59(9.92)	-10.86(10.77)	-11.16(10.96)	-11.17(11.17)	-9.31(8.31)	-7.85(4.76)	-6.19(5.52)	-4.55(3.87)	-3.44(3.78)	-3.54(5.15)
0(50.75°)	-6.89(6.05)	-5.98(4.35)	-3.35(3.17)	-3.38(3.61)	-4.34(5.38)	-7.17(6.81)	-6.71(6.79)	-6.39(8.82)	-7.71(6.91)	-6.25(6.87)	-5.35(6.02)	-5.38(6.31)	-6.44(5.97)	-5.42(5.02)	-4.99(4.39)	-6.08(7.13)	-7.82(9.11)	-8.54(8.74)	-6.78(4.21)	-5.79(5.49)	-5.64(5.78)	-6.08(6.88)	-7.72(7.25)	-7.72(7.25)
0(37.75°)	-4.78(5.21)	-5.75(5.53)	-5.89(5.9)	-6.71(6.17)	-7.21(6.39)	-8.87(8.45)	-8.53(8.09)	-8.42(8.7)	-8.05(9.39)	-8.8(10.04)	-6.77(6.57)	-10.44(10.82)	-10.4(9.68)	-8.62(7.88)	-7.58(7.11)	-7.41(7.36)	-7.82(7.89)	-7.83(8.15)	-6.31(8.86)	-8.21(10.14)	-11.08(12.05)	-11.82(12)	-10.89(8.05)	-4.4(5.05)
Freq(Hz)	5.7850GHz	Theta	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°
0(87.5°)	0(75°)	0(62.5°)	0(50°)	0(37.5°)	0(25°)	0(12.5°)	0(0°)	0(127.5°)	0(115°)	0(102.5°)	0(90°)	0(75.75°)	0(62.75°)	0(50.75°)	0(37.75°)	0(25.75°)	0(12.75°)	0(0.75°)	0(129.75°)	0(117.75°)	0(105.75°)	0(93.75°)	0(81.75°)	0(69.75°)
0(8°)	0.816(0.74)	0.861(0.39)	1.431(8)	2.062(0.8)	1.911(59)	1.250(86)	0.430(0.07)	-0.27(0.72)	-0.76(0.59)	-0.2(0)	0.61(32)	1.781(97)	2(2)	2.162(15)	2.212(38)	2.542(54)	2.472(28)	2.16(19)	1.360(81)	0.28(0.02)	-0.29(0.54)	-0.48(0.15)	0.126(0.5)	0.766(0.82)
0(7.5°)	2.552(63)	2.512(25)	2.082(11)	2.192(36)	2.572(62)	2.582(27)	2.071(76)	1.38(0.63)	0.1(0.46)	-0.57(0.63)	-0.52(0.32)	-0.19(0.27)	-0.68(0.45)	0.058(8)	1.461(86)	2.162(26)	2.021(61)	1.070(58)	0.12(0.43)	-0.84(1.28)	-1.56(1.35)	-0.770(1.8)	0.831(48)	1.862(31)
0(7.15°)	0.961(19)	1.421(34)	1.441(77)	1.932(24)	2.572(79)	2.812(59)	2.181(52)	0.74(0.1)	-0.38(0.35)	0.190(62)	1.051(44)	1.651(55)	1.19(0.72)	0.346(16)	0.230(61)	1.231(73)	2.011(96)	1.570(86)	0.21(0.47)	-1.1(1.66)	-2.11(2.38)	-1.99(1.63)	-1.36(0.76)	0.070(51)
0(22.5°)	0.58(0.44)	0.88(0.3)	0.76(75)	1.191(64)	2.042(63)	1.89(95)	0.23(0.18)	-0.23(0.16)	0.110(37)	0.350(21)	0.380(58)	0.38(0.31)	-1.22(1.77)	-1.45(0.75)	0.06(6)	1.131(31)	1.210(92)	0.590(62)	0.640(66)	0.14(0.27)	-0.030(44)	0.810(62)	0.55(43)	0.15(4.34)
0(20°)	0.220(18)	0.140(7)	0.98(1.12)	1.331(57)	1.991(76)	0.82(0.74)	-1.72(1.24)	-0.92(0.75)	-0.68(0.62)	-0.79(0.97)	-0.6(0.48)	-1.2(3.17)	-4.65(3.57)	-1.79(4.07)	0.531(45)	2.212(6)	2.431(88)	1.041(07)	1.61(99)	1.207(36)	2.22(93)	2.862(36)	1.520(38)	-0.19(5.12)
0(17.5°)	1.21(19)	0.91(0.6)	0.82(0.22)	0.761(43)	1.731(14)	0.735(42)	0.15(0.15)	-1.08(1.47)	-1.11(1.06)	-1.08(0.85)	-0.26(0.27)	-1.49(3.75)	-3.68(1.52)	-0.45(0.64)	-0.97(0.34)	0.741(03)	0.795(41)	-0.03(0.39)	-0.280(4)	1.52(13)	2.282(86)	3.252(79)	1.810(33)	-0.86(5.24)
0(16°)	1.81(62)	1.971(44)	0.71(0.69)	0.11(2)	1.952(13)	1.981(9)	1.410(31)	-0.91(0.85)	0.548(58)	0.230(84)	1.22(1.14)	0.95(0.79)	-1.17(0.73)	-0.16(0.58)	-1.02(0.62)	0.541(22)	1.812(19)	2.461(61)	1.121(58)	1.58(1.77)	2.072(42)	2.97(27)	1.8(11)	0.020(87)
0(152.5°)	1.451(59)	2.242(26)	1.226(31)	0.74(21)	3.023(34)	3.223(37)	3.242(79)	0.96(0.21)	0.24(0.28)	-0.34(1.61)	2.212(38)	1.86(7.8)	0.03(0.79)	-0.95(0.51)	0.69(1.01)	1.030(92)	1.81(39)	3.1(19)	1.222(49)	3.272(39)	2.172(53)	2.722(94)	2.991(96)	1.601(73)
0(140°)	2.37(15)	2.33(54)	1.861(49)	1.05(1.25)	2.242(62)	3.073(79)	4.55(4.17)	2.32(0.36)	0.7(0.07)	-0.35(1.53)	2.513(33)	2.77(69)	1.94(0.19)	0.071(1.94)	-0.87(1.02)	1.88(1.81)	2.123(57)	4.413(38)	2.86(46)	3.193(32)	3.98(65)	2.442(28)	3.984(27)	4.383(39)
0(127.5°)	1.12(45)	2.982(34)	1.652(15)	1.44(1.31)	2.623(75)	4.063(71)	4.794(63)	2.43(0.69)	0.020(0.99)	0.482(41)	3.863(51)	3.403(68)	2.22(0.51)	-1.68(2.21)	-1.53(1.12)	1.911(95)	3.194(61)	5.164(55)	3.98(63)	3.252(36)	4.073(58)	1.932(68)	2.924(75)	4.943(96)
0(125°)	2.252(35)	2.442(17)	0.95(1.24)	1.1(1.75)	2.98(0.9)	3.062(83)	4.94(6.01)	2.88(0.9)	0.480(93)	0.840(96)	3.133(4)	4.174(19)	3.08(1.26)	0.041(63)	-2.22(0.15)	1.492(15)	4.195(17)	5.545(4)	3.594(11)	3.964(49)	4.973(3)	1.863(04)	3.014(64)	4.94(88)
0(80.5°)	3.96(7.2)	2.72(32)	1.06(0.66)	0.34(0.21)	2.523(23)	2.722(42)	2.842(61)	1.77(1.16)	0.740(63)	0.940(91)	2.963(12)	4.224(21)	2.572(51)	0.05(1.13)	-0.2(0)	2.984(19)	5.245(5)	5.418(44)	4.043(94)	3.876(57)	5.73(3.84)	2.532(95)	3.24(03)	4.794(87)
0(69°)	3.11(3.1)	2.402(61)	1.71(1.19)	0.021(62)	3.362(89)	2.542(37)	2.852(34)	1.881(74)	1.021(23)	1.570(96)	1.83(1.14)	2.583(02)	1.182(0.75)	-0.48(1.88)	-2.8(0.87)	2.724(4)	5.67(5.5)	5.024(92)	3.452(99)	2.6(47)	4.51(2.61)	1.281(56)	2.92(99)	4.164(12)
0(57.5°)	1.130(85)	1.581(61)	1.431(51)	0.91(56)	1.122(83)	2.781(96)	2.212(16)	1.41(1.91)	1.32(1.33)	0.9(0.8)	0.880(23)	1.69(1.05)	0.18(1.98)	-0.85(1.91)	-2.66(2.69)	1.493(5)	2.483(53)	3.13(68)	2.182(21)	0.162(84)	2.481(8)	0.420(79)	1.172(31)	3.393(2)
0(45°)	0.89(0.03)	0.87(0.4)	0.81(39)	0.82(1.13)	0.820(6)	2.681(3)	1.672(45)	1.36(1.22)	1.1(0.85)	0.130(14)	-0.34(1)	-0.37(0.14)	-0.36(0.12)	-1.46(4.24)	-1.82(1.29)	-1.82(1.24)	2.242(96)	1.72(197)	1.658(58)	-0.830(12)	0.980(72)	-0.42(1.43)	0.87(0.24)	2.38(1.5)
0(110.5°)	0.620(03)	0.15(0.53)	-0.1(5.57)	-0.17(0.16)	-0.580(89)	1.140(69)	1.25(1.06)	-0.36(0.57)	5.28(0)	-0.83(1.47)	-3.07(3.04)	-3.59(3.52)	-2.57(1.77)	-1.67(4.52)	-3.96(4.54)	-1.23(0.74)	1.076(73)	0.580(97)	0.39(0.96)	0.37(1.68)	0.480(24)	-1.38(1.25)	-0.53(1.27)	1.67(1.13)
0(102°)	-0.95(0.85)	-0.21(0.8)	-1.07(1.07)	-0.31(1.62)	-1.360(13)	-0.13(0.75)	-0.73(1.68)	-2.79(3.12)	-2.76(3.54)	-2.78(3.14)	-5.6(5.76)	-5.8(7.15)	-7.22(4.72)	-6.32(6.74)	-5.34(2.1)	-1.51(0.73)	0.43(0.39)	0.520(99)	-1.07(1.49)	1.01(1.01)	-0.030(36)	-1.54(2.7)	-2.430(64)	-0.66(1.46)
0(127.5°)	-5.22(3.12)	-3.17(3.89)	-3.59(3.87)	-3.21(3.37)	-3.18(2.63)	-2.72(0.87)	-3.04(4.49)	-5.59(5.82)	-6.01(5.61)	-6(6.32)	-5.52(6.83)	-6.39(6.68)	-7.89(5.95)	-4.66(4.36)	-6.45(3.91)	-3.13(0.57)	1.19(1.99)	-3.81(0.96)	-3.39(2.1)	-0.67(1.31)	-6.62(2.7)	-2.38(3.48)	-1.48(2.42)	-0.32(0.16)
0(130°)	-3.97(4.58)	-3.17(3.78)	-4.37(4.68)	-4.78(3.76)	-2.53(2.09)	-2.08(2.93)	-4.44(5.45)	-3.88(3.53)	-4.74(5.55)	-6.07(6.57)	-5.66(5.65)	-4.41												



Gen	5.2GPa	Thet=1.1	0.30°(0.30°)	0.40°(0.40°)	0.50°(0.50°)	0.60°(0.60°)	0.75°(0.75°)	0.90°(0.90°)	0.105°(0.125°)	0.120°(0.125°)	0.135°(0.145°)	0.150°(0.15°)	0.165°(0.175°)	0.180°(0.185°)	0.195°(0.205°)	0.210°(0.215°)	0.225°(0.232°)	0.240°(0.245°)	0.255°(0.26°)	0.270°(0.275°)	0.285°(0.292°)	0.300°(0.305°)	0.315°(0.325°)	0.330°(0.337°)	0.345°(0.352°)
(H1)	2.17-1.69	-1.28-1.02	-1.01-0.73	-1.23-1.34	-1.68-2.49	-3.37-4.52	6.33-8.22	-10.89-14.69	-17.50-23.43	-45.81-51.22	8.71-8.66	5.55-4.33	3.20-1.28	-1.58-1.4	-1.21-1.21	-1.42-1.55	-1.79-2.29	3.15-4.12	5.14-7.17	8.97-13.38	-12.28-18.89	-17.14-18.16	8.30-15.45	4.47-11.31	
(H2)	2.12-1.49	-1.11-1.07	0.8-0.65	-6.49-24.51	-5.01-18.79	-3.91-7.4	4.34-16.26	-18.65-18	-13.72-9.21	6.95-26.28	3.30-3.13	2.40-2.87	-1.67-1.07	-1.09-1.35	-1.26-1.32	2.78-3.45	4.85-5.85	7.93-9.5	9.51-15.46	-18.08-17.2	-15.71-16.19	-11.25-8.66	5.44-7.34		
(H3)	4.86-3.98	-3.09-2.44	1.80-1.38	3.94-6.53	-6.69-10.7	-1.78-3.2	4.36-6.63	4.17-15.58	-16.77-69.69	-10.76-7.34	5.3-3.79	2.87-2.54	2.69-2.35	-2.24-2.04	2.01-2.19	3.23-3.23	2.76-3.01	3.84-4.28	5.64-7.57	8.67-12.95	-17.5-18.2	-10.80-10.67	14.04-16.38	8.46-8.37	
(H22)	62.8-64	4.90-5.61	4.99-5.33	1.24-2.85	-2.93-3.48	4.89-5.56	18.88-11.78	14.55-14.55	-12.47-9.91	-7.96-5.51	3.75-3.27	2.14-1.98	1.94-1.61	-1.74-2.07	2.01-2.39	2.74-2.73	3.17-2.42	-2.18-2.36	3.38-4.87	6.44-7.93	6.78-10.32	-12.28-15.69	-16.02-14.34	-12.86-13.7	
(H17)	14.29-12.64	7.24-6.51	6.25-5.61	4.70-5.29	4.05-5.69	4.05-5.69	14.78-14.78	-18.55-14.78	14.78-14.78	11.77-9.78	7.86-5.49	3.17-3.14	2.91-2.12	-1.39-1.14	2.22-2.22	2.95-3.13	4.72-55	-2.02-1.78	1.89-2.47	4.05-5.34	5.64-6.11	6.55-7.86	9.75-10.25	-0.77-1.79	
(H18)	17.12-17.28	-11.76-11.33	12.22-19.12	7.21-10.8	6.25-5.24	2.71-2.69	1.71-2.62	4.61-6.1	6.1-7.39	5.84-6.84	4.81-5.37	4.05-4.15	3.17-3.14	2.91-2.12	1.54-2.12	1.54-2.12	1.54-2.12	1.54-2.12	1.54-2.12	1.54-2.12	1.54-2.12	1.54-2.12	1.54-2.12	1.54-2.12	
(H19)	15.59-13.77	17.31-11.86	9.86-9.23	15.50-8.45	7.44-7.71	8.81-11.36	13.07-11.37	17.37-11.37	17.37-11.37	17.37-11.37	17.37-11.37	17.37-11.37	17.37-11.37	17.37-11.37	17.37-11.37	17.37-11.37	17.37-11.37	17.37-11.37	17.37-11.37	17.37-11.37	17.37-11.37	17.37-11.37	17.37-11.37	17.37-11.37	
(H52)	12.18-10.73	17.07-18.14	13.02-17.73	18.53-10.86	4.83-7.51	7.55-7.57	6.87-8.27	6.89-8.65	2.94-7.1	-12.15-66	19.99-12.74	17.61-19.2	-12.19-9.44	3.17-2.51	1.89-1.56	2.4-3.56	5.82-6.56	4.074	2.84-1.56	1.40-1.59	0.91-1.16	2.59-3.17	3.45-6.74	9.38-10.86	
(H6)	8.23-15.95	-18.99-18.23	-13.11-15.33	-4.56-17.78	-12.91-8.99	7.96-7.06	4.31-5.66	-11.21-14.71	-17.99-17.91	13.20-15.45	14.90-19.38	11.21-14.71	7.96-7.06	4.31-5.66	1.21-1.37	-1.49-1.41	2.68-2.67	0.63-0.57	0.63-0.57	0.63-0.57	0.63-0.57	0.63-0.57	0.63-0.57	0.63-0.57	
(H87)	6.41-6.88	8.35-11.14	19-18.86	-15.36-14.7	-18.09-15.38	9.24-8.63	4.23-4.47	5.94-6.9	9.34-14.81	-17.92-19.58	-13.11-11.8	-14.02-13.07	-10.92-8.67	3.71-5.96	4.43-1.21	1.99-2.39	3.39-3.82	2.03-0.43	0.24-0.36	0.19-0.47	0.48-0.46	-1.88-2.36	1.91-1.82	3.52-4.06	
(H75)	6.41-6.88	8.35-11.14																							



Radiated Composite Gain Data

Appendix A

(H19°)	4.234.6	8.721.11.78	-15.9-18.57	-18.59-13.43	9.74.63	4.823.77	2.971.259	2.22-1.91	-1.5-1.41	-1.460.2.04	2.913.63	4.4-5.59	6.984.17	8.971.68	8.494.82	-8.147.28	6.53-6.18	-4.02-2.83	2.071.17	-1.391.41	-1.84-2.33	2.843.43	4.395.34	-5.581.91
(H20°)	8.1454.24	-11.36-11.37	-17.72-18.91	-18.4-12.28	8.565.67	4.163.36	2.712.63	2.97-1.65	3.26-3.2	3.59-1.97	-5.13-4.21	7.71-9.4	9.811.65	8.695.58	4.26-3.42	-3.62-4.83	4.5-5.06	4.753.84	2.93-2.09	-1.82-1.19	2.22-2.41	2.69-3.4	4.315.11	-5.32-6.45
(H21°)	4.39-5.17	6.919.81	-16.01-18.14	-19.12-12.15	8.376.578	4.391.31	3.06-3.31	3.64-3.64	3.77-4.51	-6.02-6.22	6.44-7.22	-1.81-1.65	12.02-10.32	7.114.58	-1.96-2.33	-3.16-4.42	2.86-2.66	2.789.284	2.79-2.88	2.789.284	2.789.284	2.789.284	2.789.284	2.789.284
(H22°)	1.88-2.74	4.59-1.97	-14.07-18.21	-17.74-15.49	11.41-4.9	4.963.76	3.59-4.08	3.91-3.44	3.51-4.63	0.64-6.71	-8.66-7.81	-10.02-13.6	-15.21-10.2	6.62-4.5	-2.88-1.32	-0.88-1.19	2.39-4.35	8.63-7.19	5.13-3.67	-3.8-4.13	4.53-4.59	3.91-2.89	-1.95-1.28	-1.17-1.42
(H23°)	2.72-2.74	3.75-4.57	8.3-12.84	-17.48-18.09	-16.27-8.37	4.78-7.65	4.16-4.55	3.74-2.71	3.1-3.72	7.44-2.24	7.22-7.75	8.91-8.7	9.45-9.41	8.871.63	4.58-2.56	-1.85-2.12	2.71-4.12	6.64-6.66	6.814.86	4.46-5.17	5.15-4.11	3.07-2.01	1.021.5.59	-1.27-2.56
(H24°)	2.55-2.87	4.33-6.83	-11.33-12.25	-11.67-19.58	-16.92-7.37	2.81-4.48	2.8-4.28	3.82-3.02	2.79-3.32	4.37-6.88	7.12-7.36	8.88-9.68	-10.41-11.01	8.44-45	-5.55-9.33	-2.98-2.03	2.12-3.79	7.43-9.32	4.85-5.22	6.08-6.12	6.84-6.01	-4.54-3.81	-13.12-13.28	-2.03-2.22
(H25°)	6.12-6.3	4.814.49	6.97-6.36	-10.22-19.04	-10.06-9.67	-16.92-1.01	2.57-3.36	3.19-3.37	4.01-3.57	6.33-6.26	5.6-7.17	9.59-9.38	-10.12-28	8.6-7.03	4.14	2.58-1.9	2.29-3.82	7.11-10.57	7.53-6.55	-5.36-6.38	6.37-5.66	4.9-4.02	-8.33-4.27	-5.54-2.26
(H26°)	8.36-7.86	5.42-5.99	8.9-7.81	8.88-1.81	-17.13-11.43	3.58-1.74	2.75-2.47	3.53-2.22	5.21-2.51	2.45-2.42	5.87-13.3	-17.23-16.33	-15.74-10.37	6.42-10.27	9.55-6.05	2.85-2.29	2.71-3.88	6.78-6.86	6.925.11	5.65-6.72	6.78-7.06	6.71-6.25	6.73-6.84	8.181.68
(H27°)	-13.02-12.97	7.56-7.66	7.95-7.85	-7.11-15.14	-18.22-18.13	5.02-2.71	3.83-2.58	4.69-5.95	8.44-3.53	2.82-6.37	8.87-10.84	-18.64-13.39	-13.15-14.78	8.71-11.18	-10.23-6.64	3.58-2.71	2.84-3.41	5.68-6.4	6.85-5.28	4.87-6.1	6.74-7.28	6.49-6.45	-11.21-13.05	-11.30-11.85
(H28°)	-12.41-10.89	8.72-8.83	8.91-7.48	8.23-13.63	-13.51-16.53	7.72-4.35	4.28-2.76	6.18-15.73	-11.95-4.72	4.72-1.94	-11.58-11.52	-16.02-12.78	-12.48-10.28	-16.10-10.25	-13.69-8.28	-5.09-3.89	4.02-4.15	6.19-7.95	7.15-5.27	4.50-6.49	7.23-7.84	6.25-6.11	-1.97-18.19	-18.03-18.9
(H29°)	16.571.39.38	-10.27-10.78	9.97-9.71	7.38-12.22	-16.48-13.86	-13.94-13.64	6.971.12.34	6.97-12.34	-13.94-13.64	6.97-12.34	-13.94-13.64	6.97-12.34	-13.94-13.64	6.97-12.34	-13.94-13.64	6.97-12.34	-13.94-13.64	6.97-12.34	6.97-12.34	6.97-12.34	6.97-12.34	6.97-12.34	6.97-12.34	6.97-12.34
(H30°)	13.16-12.98	-1.6-3.3	8.53-7.41	11.16-10.29	10.01-1.67	18.75-14.97	8.84-17.1	10.52-12.2	11.18-7.32	11.18-7.32	11.18-7.32	11.18-7.32	11.18-7.32	11.18-7.32	11.18-7.32	11.18-7.32	11.18-7.32	11.18-7.32	11.18-7.32	11.18-7.32	11.18-7.32	11.18-7.32	11.18-7.32	11.18-7.32
(H31°)	8.62-9.84	-11.01-10.84	-11.02-10.86	7.04-6.47	8.9-12.03	-18.77-18.18	-12.37-1.71	-12.71-6.87	10.48-12.13	-13.69-16.54	-10.25-10.33	-11.43-10.99	14.09-11.62	8.85-10.39	-16.69-13.1	14.08-12.31	11.41-10.19	10.06-10.69	9.28-14.4	12.93-18.86	15.54-16.59	18.73-17.08	-12.41-12.91	
(H32°)	-12.33-11.32	8.92-9.54	12.4-10.87	8.71-11.58	8.69-13.79	-13.02-15.96	-16.19-25	-16.19-25	-16.19-25	-16.19-25	-16.19-25	-16.19-25	-16.19-25	-16.19-25	-16.19-25	-16.19-25	-16.19-25	-16.19-25	-16.19-25	-16.19-25	-16.19-25	-16.19-25	-16.19-25	-16.19-25
(H33°)	9.85-11.2	2.86-7.63	6.25-6.4	8.83-11.55	-10.23-13.6	-12.13-12.72	-17.43-18.86	-17.43-18.86	8.4-18.67	-18.71-13.08	-18.71-13.08	-18.71-13.08	-18.71-13.08	-18.71-13.08	-18.71-13.08	-18.71-13.08	-18.71-13.08	-18.71-13.08	-18.71-13.08	-18.71-13.08	-18.71-13.08	-18.71-13.08	-18.71-13.08	-18.71-13.08
(H34°)	6.33-6.26	-11.67-11.61	-11.57-11.19	8.28-12.12	-15.13-15.13	-10.71-12.45	-19.28-19.89	-17.38-13.18	-11.19-18.88	-18.15-18.56	-13.08-12.02	-10.10-10.7	-7.37-11.18	4.01-12.78	-8.64-8.07	-10.53-11.7	-15.72-14.47	-13.28-13.34	-14.84-15.92	-16.04-15.92	-12.92-10.94	-11.97-11.75	7.17-12	-13.14-13.49
(H35°)	9.73-9.12	8.69-8.3	-14.54-14.54	-11.48-11.97	-15.82-18.65	-18.65-18.59	-18.77-18.32	-18.62-18.94	-17.62-19.19	-18.62-18.15	-17.72-17.66	-17.79-11.36	4.36-7.72	-15.56-8.1	-10.04-16.52	-9.02-9.82	-18.08-13.17	-14.4-16.27	-15.17-14.33	-16.52-11.4	-11.77-11.18	8.75-12.58	8.19-12.92	-14.71-12.91
(H36°)	7.46-11.33	-16.55-18.06	-12.68-6.4	11.64-15.87	-17.67-18.62	-16.97-18.16	-18.08-17.61	-18.76-17.41	-15.13-15.92	-18.61-18.3	-17.26-13.18	-18.71-11.88	-16.87-18.71	-17.74-18.67	-18.08-18.09	-10.31-17.5	-15.44-14.34	-15.44-14.34	-15.44-14.34	-15.44-14.34	-15.44-14.34	-15.44-14.34	-15.44-14.34	-15.44-14.34
(H37°)	-11.92-8.55	-8.11-8.94	9.9-10.32	-10.11-19.58	-15.21-18.51	-18.52-18.09	-17.78-18.34	-18.77-18.86	-19.01-17.78	-18.49-17.37	-18.97-18.02	-14.15-6.91	7.59-7.3	7.29-8.18	8.31-18	8.31-18	8.31-18	8.31-18	8.31-18	8.31-18	8.31-18	8.31-18	8.31-18	8.31-18
(H38°)	6.011.75	-7.72-10.13	-13.27-15.97	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07	-18.1-18.07
(H39°)	-10.77-11.36	-14.19-18.98	-18.08-18.79	-19.12-18.76	-18.86-18.63	-14.61-17.54	-17.18-11.51	-18.68-18.76	-18.96-14.17	-12.55-11.65	-10.88-11.1	-11.81-12.88	-14.66-15.13	-13.74-12.15	-11.71-11.78	-12.44-12.66	-14.48-15.78	-18.1-18.35	-18.1-18.35	-18.1-18.35	-18.1-18.35	-18.1-18.35	-18.1-18.35	-18.1-18.35
(H40°)	-10.72-13.64	-10.62-8.89	9.36-10.56	-12.14-10.77	-11.07-17.99	-11.57-18.02	-12.14-10.77	-18.67-17.96	-18.64-17.9	-18.02-14.88	-13.88-12.84	-12.05-11.7	-13.11-10.77	-13.68-18.88	-11.70-11.71	-11.51-12.14	-13.71-15.57	-18.61-17.81	-18.43-17.83	-15.71-18.14	-15.94-18.18	-12.86-12.52	-14.08-18.68	-18.15-18.99
(H41°)	-17.86-18.47	-18.73-18.16	-18.55-19.01	-17.36-19.51	-18.89-18.47	-17.57-18.49	-18.11-17.71	-18.25-18.02	-18.72-18.67	-15.02-13.99	-13.16-11.91	-10.38-9.3	8.14-10.98	8.14-10.98	8.14-10.98	8.14-10.98	8.14-10.98	8.14-10.98	8.14-10.98	8.14-10.98	8.14-10.98	8.14-10.98	8.14-10.98	8.14-10.98
Freq(Hz)	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH	5.85GpH
Gain	(H19°/H20°)	(H20°/H21°)	(H21°/H22°)	(H22°/H23°)	(H23°/H24°)	(H24°/H25°)	(H25°/H26°)	(H26°/H27°)	(H27°/H28°)	(H28°/H29°)	(H29°/H30°)	(H30°/H31°)	(H31°/H32°)	(H32°/H33°)	(H33°/H34°)	(H34°/H35°)	(H35°/H36°)	(H36°/H37°)	(H37°/H38°)	(H38°/H39°)	(H39°/H40°)	(H40°/H41°)	(H41°/H42°)	(H42°/H43°)
(H19°)	3.72-3.34	2.09-2.27	1.89-1.18	1.86-2.21	2.18-2.74	3.5-4.19	5.14-6.6	7.89-10.32	13.17-15.64	15.99-18.94	8.51-6.9	5.13-3.36	3.09-3.28	1.74-1.37	-1.18-1.04	-1.08-1.31	1.82-2.47	3.18-4.16	5.48-6.86	6.27-12.42	15.98-18.21	12.88-10.11	7.76-14.18	5.26-4.33
(H20°)	4.41-4.95	3.22-2.78	2.29-1.79	1.59-1.11	1.61-2.05	2.75-3.7	5.21-7.04	8.48-12.45	14.91-19.08	17.85-19.79	4.07-2.79	2.09-1.4	1.11-1.05	-1.06-1.05	-1.06-1.44	2.2-2.38	3.54-3.4	5.2-6.42	6.95-12.22	16.01-17.58	15.22-11.39	8.94-12.78	6.15-11	
(H21°)	7.96-6.48	5.52-4.49	3.02-2.69	1.93-1.61	1.82-2.38	3.02-3.65	5.17-6.28	10.08-14.42	16.84-17.82	15.51-19.8	6.74-4.59	3.91-2.45	1.5-2.67	0.75-0.48	0.91-0.8	1.18-1.44	1.48-1.67	2.05-2.93	3.86-11.2	7.24-9.48	14.25-17.2	17.64-15.51	11.61-9.71	
(H22°)	10.83-9.42	6.8-5.31	4.39-3.88	2.98-2.58	2.98-3.38	4.12-5.32	7.06-10.36	14.01-17.51	19.27-13.98	15.99-17.1	5.19-5.83	2.94-1.69	1.47-1.37	1.29-1.38	1.59-1.95	2.1-1.93	1.80-2.38	3.2-3.57	6.65-15	10.07-12.99	16.28-19.5	19.07-17.89	13.47-11.81	
(H23°)	14.25-10.82	8.57-4.2	7.03-6.83	4.31-4.67	5.96-6.19	7.52-10.04	14.76-18.32	17.48-19.3	14.37-10.9	7.247.95	4.46-4.86	3.42-3.62	2.42-2.98	1.64-1.91	2.02-2.7	2.93-2.21	1.11-1.07	0.02-0.51	1.71-3.75	5.77-7.91	8.44-7.24	6.61-6.54	6.97-6.02	
(H24°)	16.46-12.87	11.47-9.91	8.85-10.1	-11.14-10.13	8.62-8.37	10.23-12.32	17.33-19.35	16.88-15.22	-11.19-5.8	4.68-4.24	5.92-5.28	6.19-6.58	6.48-6.08	2.812-12.32	2.92-2.97	2.91-2.55	0.71-0.52	1.38-2.62	3.19-2.87	4.42-3.91	3.18-2.88	3.16-2.47	1.94-2.25	
(H25°)	-13.71-15.55	-16.16-16.06	8.01-13.72	-15.58-16.72	6.575-6.74	7.45-10.87	12.93-12.61	13.51-11.88	8.52-6.47	8.61-14.37	10.55-9.17	13.01-11.74	7.93-6.02	3.85-3.23	-2.94-3.49	4.05-3.57	2.86-2.12	-1.4-0.61	-1.07-1.92	3.38-3.28	3.12-3.94	3.24-3.68	2.88-2.59	
(H26°)	6.11-7.39	-14.93-18.28	-13.46-14.47	-17.32-17.37	6.75-16.5	8.84-8.45	-5.41-6.2	4.9-10.13	6.91-7.5	-14.02-10.68	-18.76-18.67	9.68-4.53	-1.87-1.63	3.06-3.76	3.275-4.47	4.05-2.82	-2.03-1.33	-1.35-1.79	2.18-1.79	4.94-11.71	2.44-2.47	1.52-2.48	4.25-5.48	
(H27°)	4.83-8.83	-18.11-18.18	-18.58-18.65	17.84-10.35	17.84-10.35	17.84-10.35	17.84-10.35	17.84-10.35	17.84-10.35	17.84-10.35	17.84-10.35	17.84-10.35	17.84-10.35	17.84-10.35	17.84-10.35	17.84-10.35	17.84-10.35	17.84-10.35	17.84-10.35	17.84-10.35	17.84-10.35	17.84-10.35	17.84-10.35	
(H28°)	5.21-7.3	5.66-6.81	-15.4-1																					



Radiated Composite Gain Data

Appendix A

(H757)	7.950.813	-10.130.834	-7.460.73	-6.910.778	-15.480.1214	-9.054.345	-5.160.626	-3.999.285	-3.980.479	5.110.655	-8.071.1375	-10.860.1229	-11.350.7	7.730.145	-7.850.334	-3.550.149	-6.250.48	-7.308.31	9.370.698	-10.430.922	-8.090.79	-9.11.41	-12.160.813	-5.680.641										
(H758)	8.080.91	-11.540.1289	-8.650.834	8.750.1534	-16.470.178	8.634.44	6.710.466	5.070.625	5.580.446	5.110.666	-10.120.1374	-11.590.1834	-14.440.1037	-11.660.1239	9.260.434	3.750.402	-4.830.768	7.810.424	9.770.1088	-12.310.125	-11.210.1411	-14.750.1762	-14.540.116	8.820.76										
(H825)	8.900.048	9.070.1031	8.10.10.14	8.630.1318	-16.660.1369	-11.450.066	6.130.733	6.680.77	6.390.506	5.110.666	-12.120.1867	-12.390.1784	-13.190.1038	-16.870.1846	-14.010.745	6.160.679	6.140.745	-7.97.5	7.870.444	-10.750.1242	-11.750.1586	-18.440.155	-12.040.1198	-10.440.1037										
(H870)	-10.570.868	-10.010.1067	-8.590.974	8.240.1313	-11.100.1877	-11.410.73	-10.710.677	-8.910.844	9.960.563	8.150.1184	-13.370.1796	-11.720.1139	-17.620.1191	-16.270.1331	-15.840.1138	-10.240.82	8.350.832	8.240.844	-11.610.339	-14.160.1554	-17.780.1458	-15.810.1444	-10.590.1217	-10.590.1217										
(H871)	8.920.873	-10.340.889	9.850.886	8.830.1176	-10.080.1768	-14.540.868	-12.760.689	-11.050.1809	-11.810.583	-12.460.1067	-13.080.1342	-13.320.1861	-12.640.1373	-13.830.1115	-14.880.1735	-18.050.1472	-18.450.1655	-18.040.1433	-16.480.1242	-14.120.1392	-15.630.1196	-12.450.1672	-14.780.1128	-13.610.1585										
(H1125)	8.510.786	-8.960.672	6.710.1169	8.490.1057	-11.760.1506	-18.080.1502	-13.860.151	-14.530.1212	-16.440.1664	-17.360.1467	-13.150.1314	8.810.1214	-17.580.1315	-14.720.1615	-14.920.1304	-12.710.175	-11.360.1634	-17.520.1085	-15.230.1418	-13.120.1808	-10.070.1503	-11.420.1444	-16.430.1326	9.630.674										
(H1207)	8.720.946	-10.580.656	7.260.892	7.930.893	-12.140.165	-18.780.1918	-18.070.14	-18.710.1152	-13.720.1773	-18.160.1808	8.550.1047	9.360.1263	-10.510.64	8.130.1489	-17.890.1633	-18.590.1572	-13.220.1457	-16.490.1304	-16.410.1178	-12.260.1031	-9.420.117	-11.310.1235	-13.370.1235	8.150.73										
(H1275)	5.760.75	5.470.222	6.690.698	8.140.1144	-12.970.1355	-16.970.1636	-18.270.1603	-18.950.1506	-19.080.192	-17.570.1339	-15.530.1529	9.370.068	7.880.773	-10.510.369	-18.380.1433	-15.440.1896	-18.990.192	-18.330.1835	-11.570.1623	-10.590.1036	-12.910.127	-13.080.1132	-13.080.1132	8.910.46										
(H1276)	7.180.1235	-12.530.022	-10.030.1327	-10.280.1335	-13.770.1846	-18.670.1786	-19.020.1662	-18.030.159	-18.010.177	-18.140.1834	-12.260.191	-15.120.1822	-12.650.1076	-14.430.1851	-11.510.135	-17.880.1807	-12.010.1785	-18.610.15	-13.180.182	-14.830.1767	-14.830.892	8.170.128	-12.810.1441	8.920.835										
(H1425)	10.050.1043	-11.590.1495	-13.150.1532	9.940.114	-15.250.1632	-18.850.1521	-14.480.1915	16.160.1851	-14.380.1436	-19.910.798	-15.930.1684	-12.480.8	7.650.844	12.40.1422	-12.750.167	-10.890.13	16.090.144	-14.040.165	-17.470.151	-11.570.168	-11.960.1518	-14.370.1216	-16.370.121	-10.690.1036										
(H1426)	10.050.1043	-11.590.1495	8.730.1152	15.060.1734	-13.100.1844	-18.080.1599	-17.990.1572	12.160.8	8.770.1876	-10.910.567	-12.920.171	-12.460.83	12.090.111	-14.400.1346	-16.560.161	-16.150.1636	-15.220.1533	-16.060.1755	-18.480.1899	-14.370.1216	-15.910.1421	-16.860.1161	-10.320.1639	-10.320.1639										
(H1527)	8.390.971	9.430.1012	-10.760.1156	11.920.1353	-18.990.1587	-16.990.1812	-17.950.1861	-18.210.1889	19.290.191	-18.190.181	-18.210.1504	-11.460.86	7.870.81	-12.140.1314	-14.780.1432	-18.990.154	-18.930.1876	7.870.1858	-15.220.185	-18.930.1899	-17.850.1577	-18.070.1889	-17.590.1414	-10.010.898										
(H1570)	4.770.793	6.290.1029	-10.160.1176	-19.150.1749	-18.160.1789	-17.910.1646	-18.740.1489	-18.930.1867	17.340.1903	-16.10.5	-12.920.1636	-16.690.1646	17.540.1747	-18.440.1929	-17.710.1542	-14.850.1535	-17.210.1906	-17.730.1591	-18.260.1909	-10.070.198	-18.880.1822	-16.880.1849	-15.340.1188	-10.170.108										
(H1725)	-19.180.1823	-17.240.141	-14.610.1675	-17.930.178	-15.040.1787	-18.340.1852	-19.250.186	-18.920.1817	-15.870.1477	-14.030.1338	-12.960.1227	-13.570.1575	-14.860.1474	-13.110.18	-16.070.1025	-10.310.116	-12.870.1552	-15.180.1884	-18.050.1947	-18.190.1924	-16.710.1436	-13.760.131	-13.840.1872	-10.890.1917										
(H1726)	-18.740.1775	-18.260.1815	-18.840.1815	-18.840.1827	-18.170.1833	-18.380.1889	-18.690.1786	-18.790.1791	-15.840.1483	-15.350.1568	-14.930.1339	-13.120.1315	-13.370.1248	-13.040.1341	-15.720.1611	-17.830.1585	-18.290.1812	-18.770.1886	-16.260.1817	-18.750.1874	-17.350.1644	-18.110.1743	-18.840.1878	-18.840.1878										
Freq(Hz)	5.78500Pda	Theta(Kel)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+										
Gain	(H757)	(H758)	(H825)	(H870)	(H871)	(H1125)	(H1207)	(H1275)	(H1425)	(H1426)	(H1527)	(H1570)	(H1725)	(H1726)	(H1870)	(H1871)	(H2025)	(H2170)	(H2175)	(H225)	(H2325)	(H240)	(H250)	(H2625)	(H2707)	(H2775)	(H285)	(H3007)	(H3075)	(H3150)	(H3225)	(H3375)	(H347)	(H3525)
(H757)	2.010.188	-1.650.889	-1.730.204	2.340.286	3.760.489	6.170.56	8.070.1159	13.590.1447	-14.240.978	7.860.632	-5.290.266	-3.360.255	2.210.153	1.710.142	-1.440.178	-2.050.233	2.950.466	5.16	7.140.68	-10.220.112	-10.750.29	8.020.951	4.490.36	2.980.53										
(H758)	3.750.282	2.470.243	2.520.257	2.780.307	3.610.3	4.580.15	5.790.68	3.930.1008	-11.110.1088	8.470.149	-3.570.127	2.020.188	1.110.141	-1.680.228	2.930.36	4.1155	2.770.233	-10.070.1291	-12.590.1288	-16.210.1311	-10.810.844	-10.810.844	-4.390.507	4.390.507										
(H825)	7.250.634	5.560.529	5.480	5.450.546	5.280.55	-5.170.93	7.710.81	-11.020.1368	-11.020.1368	-10.320.1299	-7.490.84	-4.650.403	-3.830.73	-2.730.391	4.250.45	4.400.44	4.780.632	6.430.812	-14.030.1311	-15.510.1399	-18.020.1843	-18.830.1808	-15.610.1577	-11.410.828										
(H870)	-15.120.1489	-11.110.928	8.050.794	7.710.752	4.840.786	-4.840.786	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861	-10.970.861
(H871)	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	-15.880.1838	
(H1125)	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	-15.810.1831	
(H1207)	8.330.148	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	-17.430.1878	
(H1275)	7.940.814	7.350.729	7.090.677	6.730.601	6.420.539	6.070.477	5.720.415	5.370.353	5.020.291	4.670.229	4.320.167	3.970.105	3.620.043	3.270.001	2.920.001	2.570.001	2.220.001	1.870.001	1.520.001	1.170.001	8.800.001	8.450.001	8.100.001	7.750.001	7.400.001	7.050.001	6.700.001	6.350.001	6.000.001	5.650.001	5.300.001	4.950.001	4.600.001	4.250.001
(H1425)	4.880.422	3.520.374	2.850.316	2.180.258	1.510.200	8.800.142	8.130.084	7.460.026	6.790.001	6.120.001	5.450.001	4.780.001	4.110.001	3.440.001	2.770.001	2.100.001	1.430.001	7.700.001	7.030.001	6.360.001	5.690.001	5.020.001	4.350.001	3.680.001	3.010.001	2.340.001	1.670.001	1.000.001	3.300.001	2.630.001	1.960.001	1.290.001	6.600.001	
(H1426)	2.770.320	-1.580.276	5.020.285	8.440.298	3.790.321	2.590.347	-1.660.32	8.360.195	-18.280.1424	-15.540.1446	-12.810.1471	-1.910.154	-12.970.1686	-7.790.165	4.580.81	4.070.75	-0.350.82	0.000	6.880.129	3.760.83	2.260.58	1.190.15	0.120.88	1.990.14										
(H1527)	-1.320.25	-1.090.164	3.690.607	6.460.686	8.950.833	1.250.93	2.930.93	4.670.93	6.410.93	8.150.93	9.890.93	11.630.93	13.370.93	15.110.93	16.850.93	18.590.93	20.330.93	22.070.93	23.810.93	25.550.93	27.290.93	29.030.93	30.770.93	32.510.93	34.250.93	35.990.93	37.730.93	39.470.93	41.210.93	42.950.93	44.690.93	46.430.93	48.170.93	
(H1570)	-1.330.22	0.650.38	3.050.44	8.240.506	7.820.63	7.380.64	6.940.65	6.500.66	6.060.67	5.620.68	5.180.69	4.740.70	4.300.71	3.860.72	3.420.73	2.980.74	2.540.75	2.100.76	1.660.77	1.220.78	8.780.79	8.340.80	7.900.81	7.460.82	7.020.83	6.580.84	6.140.85	5.700.86	5.260.87	4.820.88	4.380.89	3.940.90	3.500.91	
(H1725)	-1.230.228	-1.060.222	-1.310.479	8.220.284	8.370.384	-10.590.334	-8.340.359	-6.100.384	-3.860.409	-1.620.434	0.620.459	2.880.484	5.140.509	7.400.534	9.660.559	11.920.584	14.180.609	16.440.634	18.700.659	20.960.684	23.220.709	25.480.734	27.740.759	30.000.784	32.260.809	34.520.834	36.780.859	39.040.884	41.300.909	43.560.934	45.820.959	48.080.984	50	



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Radiated Composite Gain Data

Appendix A

Phvlet	5.35GPa	Phvlet 4	0.0797(90.57)	0.1517(90.22)	0.3037(90.37)	0.4515(90.52)	0.6027(90.67)	0.7570(90.82)	0.9057(90.97)	0.1057(90.12)	0.1237(90.12)	0.1357(90.14)	0.1507(90.15)	0.1657(90.17)	0.1807(90.19)	0.1957(90.21)	0.2107(90.23)	0.2257(90.25)	0.2407(90.27)	0.2557(90.29)	0.2707(90.31)	0.2857(90.33)	0.3007(90.35)	0.3157(90.37)	0.3307(90.39)	0.3457(90.41)	0.3607(90.43)	0.3757(90.45)	0.3907(90.47)	0.4057(90.49)	0.4207(90.51)	0.4357(90.53)	0.4507(90.55)	0.4657(90.57)	0.4807(90.59)	0.4957(90.61)	0.5107(90.63)	0.5257(90.65)	0.5407(90.67)	0.5557(90.69)	0.5707(90.71)	0.5857(90.73)	0.6007(90.75)	0.6157(90.77)	0.6307(90.79)	0.6457(90.81)	0.6607(90.83)	0.6757(90.85)	0.6907(90.87)	0.7057(90.89)	0.7207(90.91)	0.7357(90.93)	0.7507(90.95)	0.7657(90.97)	0.7807(90.99)	0.7957(91.01)	0.8107(91.03)	0.8257(91.05)	0.8407(91.07)	0.8557(91.09)	0.8707(91.11)	0.8857(91.13)	0.9007(91.15)	0.9157(91.17)	0.9307(91.19)	0.9457(91.21)	0.9607(91.23)	0.9757(91.25)	0.9907(91.27)	1.0057(91.29)	1.0207(91.31)	1.0357(91.33)	1.0507(91.35)	1.0657(91.37)	1.0807(91.39)	1.0957(91.41)	1.1107(91.43)	1.1257(91.45)	1.1407(91.47)	1.1557(91.49)	1.1707(91.51)	1.1857(91.53)	1.2007(91.55)	1.2157(91.57)	1.2307(91.59)	1.2457(91.61)	1.2607(91.63)	1.2757(91.65)	1.2907(91.67)	1.3057(91.69)	1.3207(91.71)	1.3357(91.73)	1.3507(91.75)	1.3657(91.77)	1.3807(91.79)	1.3957(91.81)	1.4107(91.83)	1.4257(91.85)	1.4407(91.87)	1.4557(91.89)	1.4707(91.91)	1.4857(91.93)	1.5007(91.95)	1.5157(91.97)	1.5307(91.99)	1.5457(92.01)	1.5607(92.03)	1.5757(92.05)	1.5907(92.07)	1.6057(92.09)	1.6207(92.11)	1.6357(92.13)	1.6507(92.15)	1.6657(92.17)	1.6807(92.19)	1.6957(92.21)	1.7107(92.23)	1.7257(92.25)	1.7407(92.27)	1.7557(92.29)	1.7707(92.31)	1.7857(92.33)	1.8007(92.35)	1.8157(92.37)	1.8307(92.39)	1.8457(92.41)	1.8607(92.43)	1.8757(92.45)	1.8907(92.47)	1.9057(92.49)	1.9207(92.51)	1.9357(92.53)	1.9507(92.55)	1.9657(92.57)	1.9807(92.59)	1.9957(92.61)	2.0107(92.63)	2.0257(92.65)	2.0407(92.67)	2.0557(92.69)	2.0707(92.71)	2.0857(92.73)	2.1007(92.75)	2.1157(92.77)	2.1307(92.79)	2.1457(92.81)	2.1607(92.83)	2.1757(92.85)	2.1907(92.87)	2.2057(92.89)	2.2207(92.91)	2.2357(92.93)	2.2507(92.95)	2.2657(92.97)	2.2807(92.99)	2.2957(93.01)	2.3107(93.03)	2.3257(93.05)	2.3407(93.07)	2.3557(93.09)	2.3707(93.11)	2.3857(93.13)	2.4007(93.15)	2.4157(93.17)	2.4307(93.19)	2.4457(93.21)	2.4607(93.23)	2.4757(93.25)	2.4907(93.27)	2.5057(93.29)	2.5207(93.31)	2.5357(93.33)	2.5507(93.35)	2.5657(93.37)	2.5807(93.39)	2.5957(93.41)	2.6107(93.43)	2.6257(93.45)	2.6407(93.47)	2.6557(93.49)	2.6707(93.51)	2.6857(93.53)	2.7007(93.55)	2.7157(93.57)	2.7307(93.59)	2.7457(93.61)	2.7607(93.63)	2.7757(93.65)	2.7907(93.67)	2.8057(93.69)	2.8207(93.71)	2.8357(93.73)	2.8507(93.75)	2.8657(93.77)	2.8807(93.79)	2.8957(93.81)	2.9107(93.83)	2.9257(93.85)	2.9407(93.87)	2.9557(93.89)	2.9707(93.91)	2.9857(93.93)	3.0007(93.95)	3.0157(93.97)	3.0307(93.99)	3.0457(94.01)	3.0607(94.03)	3.0757(94.05)	3.0907(94.07)	3.1057(94.09)	3.1207(94.11)	3.1357(94.13)	3.1507(94.15)	3.1657(94.17)	3.1807(94.19)	3.1957(94.21)	3.2107(94.23)	3.2257(94.25)	3.2407(94.27)	3.2557(94.29)	3.2707(94.31)	3.2857(94.33)	3.3007(94.35)	3.3157(94.37)	3.3307(94.39)	3.3457(94.41)	3.3607(94.43)	3.3757(94.45)	3.3907(94.47)	3.4057(94.49)	3.4207(94.51)	3.4357(94.53)	3.4507(94.55)	3.4657(94.57)	3.4807(94.59)	3.4957(94.61)	3.5107(94.63)	3.5257(94.65)	3.5407(94.67)	3.5557(94.69)	3.5707(94.71)	3.5857(94.73)	3.6007(94.75)	3.6157(94.77)	3.6307(94.79)	3.6457(94.81)	3.6607(94.83)	3.6757(94.85)	3.6907(94.87)	3.7057(94.89)	3.7207(94.91)	3.7357(94.93)	3.7507(94.95)	3.7657(94.97)	3.7807(94.99)	3.7957(95.01)	3.8107(95.03)	3.8257(95.05)	3.8407(95.07)	3.8557(95.09)	3.8707(95.11)	3.8857(95.13)	3.9007(95.15)	3.9157(95.17)	3.9307(95.19)	3.9457(95.21)	3.9607(95.23)	3.9757(95.25)	3.9907(95.27)	4.0057(95.29)	4.0207(95.31)	4.0357(95.33)	4.0507(95.35)	4.0657(95.37)	4.0807(95.39)	4.0957(95.41)	4.1107(95.43)	4.1257(95.45)	4.1407(95.47)	4.1557(95.49)	4.1707(95.51)	4.1857(95.53)	4.2007(95.55)	4.2157(95.57)	4.2307(95.59)	4.2457(95.61)	4.2607(95.63)	4.2757(95.65)	4.2907(95.67)	4.3057(95.69)	4.3207(95.71)	4.3357(95.73)	4.3507(95.75)	4.3657(95.77)	4.3807(95.79)	4.3957(95.81)	4.4107(95.83)	4.4257(95.85)	4.4407(95.87)	4.4557(95.89)	4.4707(95.91)	4.4857(95.93)	4.5007(95.95)	4.5157(95.97)	4.5307(95.99)	4.5457(96.01)	4.5607(96.03)	4.5757(96.05)	4.5907(96.07)	4.6057(96.09)	4.6207(96.11)	4.6357(96.13)	4.6507(96.15)	4.6657(96.17)	4.6807(96.19)	4.6957(96.21)	4.7107(96.23)	4.7257(96.25)	4.7407(96.27)	4.7557(96.29)	4.7707(96.31)	4.7857(96.33)	4.8007(96.35)	4.8157(96.37)	4.8307(96.39)	4.8457(96.41)	4.8607(96.43)	4.8757(96.45)	4.8907(96.47)	4.9057(96.49)	4.9207(96.51)	4.9357(96.53)	4.9507(96.55)	4.9657(96.57)	4.9807(96.59)	4.9957(96.61)	5.0107(96.63)	5.0257(96.65)	5.0407(96.67)	5.0557(96.69)	5.0707(96.71)	5.0857(96.73)	5.1007(96.75)	5.1157(96.77)	5.1307(96.79)	5.1457(96.81)	5.1607(96.83)	5.1757(96.85)	5.1907(96.87)	5.2057(96.89)	5.2207(96.91)	5.2357(96.93)	5.2507(96.95)	5.2657(96.97)	5.2807(96.99)	5.2957(97.01)	5.3107(97.03)	5.3257(97.05)	5.3407(97.07)	5.3557(97.09)	5.3707(97.11)	5.3857(97.13)	5.4007(97.15)	5.4157(97.17)	5.4307(97.19)	5.4457(97.21)	5.4607(97.23)	5.4757(97.25)	5.4907(97.27)	5.5057(97.29)	5.5207(97.31)	5.5357(97.33)	5.5507(97.35)	5.5657(97.37)	5.5807(97.39)	5.5957(97.41)	5.6107(97.43)	5.6257(97.45)	5.6407(97.47)	5.6557(97.49)	5.6707(97.51)	5.6857(97.53)	5.7007(97.55)	5.7157(97.57)	5.7307(97.59)	5.7457(97.61)	5.7607(97.63)	5.7757(97.65)	5.7907(97.67)	5.8057(97.69)	5.8207(97.71)	5.8357(97.73)	5.8507(97.75)	5.8657(97.77)	5.8807(97.79)	5.8957(97.81)	5.9107(97.83)	5.9257(97.85)	5.9407(97.87)	5.9557(97.89)	5.9707(97.91)	5.9857(97.93)	6.0007(97.95)	6.0157(97.97)	6.0307(97.99)	6.0457(98.01)	6.0607(98.03)	6.0757(98.05)	6.0907(98.07)	6.1057(98.09)	6.1207(98.11)	6.1357(98.13)	6.1507(98.15)	6.1657(98.17)	6.1807(98.19)	6.1957(98.21)	6.2107(98.23)	6.2257(98.25)	6.2407(98.27)	6.2557(98.29)	6.2707(98.31)	6.2857(98.33)	6.3007(98.35)	6.3157(98.37)	6.3307(98.39)	6.3457(98.41)	6.3607(98.43)	6.3757(98.45)	6.3907(98.47)	6.4057(98.49)	6.4207(98.51)	6.4357(98.53)	6.4507(98.55)	6.4657(98.57)	6.4807(98.59)	6.4957(98.61)	6.5107(98.63)	6.5257(98.65)	6.5407(98.67)	6.5557(98.69)	6.5707(98.71)	6.5857(98.73)	6.6007(98.75)	6.6157(98.77)	6.6307(98.79)	6.6457(98.81)	6.6607(98.83)	6.6757(98.85)	6.6907(98.87)	6.7057(98.89)	6.7207(98.91)	6.7357(98.93)	6.7507(98.95)	6.7657(98.97)	6.7807(98.99)	6.7957(99.01)	6.8107(99.03)	6.8257(99.05)	6.8407(99.07)	6.8557(99.09)	6.8707(99.11)	6.8857(99.13)	6.9007(99.15)	6.9157(99.17)	6.9307(99.19)	6.9457(99.21)	6.9607(99.23)	6.9757(99.25)	6.9907(99.27)	7.0057(99.29)	7.0207(99.31)	7.0357(99.33)	7.0507(99.35)	7.0657(99.37)	7.0807(99.39)	7.0957(99.41)	7.1107(99.43)	7.1257(99.45)	7.1407(99.47)	7.1557(99.49)	7.1707(99.51)	7.1857(99.53)	7.2007(99.55)	7.2157(99.57)	7.2307(99.59)	7.2457(99.61)	7.2607(99.63)	7.2757(99.65)	7.2907(99.67)	7.3057(99.69)	7.3207(99.71)	7.3357(99.73)	7.3507(99.75)	7.3657(99.77)	7.3807(99.79)	7.3957(99.81)	7.4107(99.83)	7.4257(99.85)	7.4407(99.87)	7.4557(99.89)	7.4707(99.91)	7.4857(99.93)	7.5007(99.95)	7.5157(99.97)	7.5307(99.99)	7.5457(100.01)	7.5607(100.03)	7.5757(100.05)	7.5907(100.07)	7.6057(100.09)	7.6207(100.11)	7.6357(100.13)	7.6507(100.15)	7.6657(100.17)	7.6807(100.19)	7.6957(100.21)	7.7107(100.23)	7.7257(100.25)	7.7407(100.27)	7.7557(100.29)	7.7707(100.31)	7.7857(100.33)	7.8007(100.35)	7.8157(100.37)	7.8307(100.39)	7.8457(100.41)	7.8607(100.43)	7.8757(100.45)	7.8907(100.47)	7.9057(100.49)	7.9207(100.51)	7.9357(100.53)	7.9507(100.55)	7.9657(100.57)	7.9807(100.59)	7.9957(100.61)	8.0107(100.63)	8.0257(100.65)	8.0407(100.67)	8.0557(100.69)	8.0707(100.71)	8.0857(100.73)	8.1007(100.75)	8.1157(100.77)	8.1307(100.79)	8.1457(100.81)	8.1607(100.83)	8.1757(100.85)	8.1907(100.87)	8.2057(100.89)	8.2207(100.91)	8.2357(100.93)	8.2507(100.95)	8.2657(100.97)	8.2807(100.99)	8.2957(101.01)	8.3107(101.03)	8.3257(101.05)	8.3407(101.07)	8.3557(101.09)	8.3707(101.11)	8.3857(101.13)	8.4007(101.15)	8.4157(101.17)	8.4307(101.19)	8.4457(101.21)	8.4607(101.23)	8.4757(101.25)	8.4907(101.27)	8.5057(101.29)	8.5207(101.31)	8.5357(101.33)	8.5507(101.35)	8.5657(101.37)	8.5807(101.39)	8.5957(101.41)	8.6107(101.43)	8.6257(101.45)	8.6407(101.47)	8.6557(101.49)	8.6707(101.51)	8.6857(101.53)	8.7007(101.55)	8.7157(101.57)	8.7307(101.59)	8.7457(101.61)	8.7607(101.63)	8.7757(101.65)	8.7907(101.67)	8.8057(101.69)	8.8207(101.71)	8.8357(101.73)	8.8507(101.75)	8.8657(101.77)	8.8807(101.79)	8.8957(101.81)	8.9107(101.83)	8.9257(101.85)	8.9407(101.87)	8.9557(101.89)	8.9707(101.91)	8.9857(101.93)	9.0007(101.95)	9.0157(101.97)	9.0307(101.99)	9.0457(102.01)	9.0607(102.03)	9.0757(102.05)	9.0907(102.07)	9.1057(102.09)	9.1207(102.11)	9.1357(102.13)	9.1507(102.15)	9.1657(102.17)	9.1807(102.19)	9.1957(102.21)	9.2107(102.23)	9.2257(102.25)	9.2407(102.27)	9.2557(102.29)	9.2707(102.31)	9.2857(102.33)	9.3007(102.35)	9.3157(102.37)	9.3307(102.39)	9.3457(102.41)	9.3607(102.43)	9.3757(102.45)	9.3907(102.47)	9.4057(102.49)	9.4207(102.51)	9.4357(102.53)	9.4507(102.55)	9.4657(102.57)	9.4807(102.59)	9.4957(102.61)	9.5107(102.63)	9.5257(102.65)	9.5407(102.67)	9.5557(102.69)	9.5707(102.71)	9.5857(102.73)	9.6007(102.75)	9.6157(102.77)	9.6307(102.79)	9.6457(102.81)	9.6607(102.83)	9.6757(102.85)	9.6907(102.87)	9.7057(102.89)	9.7207(102.91)	9.7357(102.93)	9.7507(102.95)	9.7657(102.97)	9.7807(102.99)	9.7957(103.01)	9.8107(103.03)	9.8257(103.05)	9.8407(103.07)	9.8557(103.09)	9.8707(103.11)	9.8857(103.13)	9.9007(103.15)	9.9157(103.17)	9.9307(103.19)	9.9457(103.21)	9.9607(103.23)	9.9757(103.25)	9.9907(103.27)	10.0057(103.29)	10.0207(103.31)	10.0357(103.33)	10.0507(103.35)	10.0657(103.37)	10.0807(103.39)	10.0957(103.41)	10.1107(103.43)	10.1257(103.45)	10.1407(103.47)	10.1557(103.49)	10.1707(103.51)	10.1857(103.53)	10.2007(103.55)	10.2157(103.57)	10.2307(103.59)	10.2457(103.61)	10.2607(103.63)	10.2757(103.65)	10.2907(103.67)	10.3057(103.69)	10.3207(103.71)	10.3357(103.73)	10.3507(103.75)	10.3657(103.77)	10.3807(103.79)	10.3957(103.81)	10.4107(103.83)	10.4257(103.85)	10.4407(103.87)	10.4557(103.89)	10.4707(103.91)	10.4857(103.93)	10.5007(103.95)	10.5157(103.97)	10.5307(103.99)	10.5457(104.01)	10.5607(104.03)	10.5757(104.05)	10.5907(104.07)	10.6057(104.09)	10.6207(104.11)	10.6357(104.13)	10.6507(104.15)	10.6657(10
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Radiated Composite Gain Data

Appendix A

θ(0°)	7.32(-7.72)	7.57(-7.42)	7.54(-7.93)	-8(-7.83)	-7.27(-7.68)	-7.21(-7.83)	-7.99(-7.56)	-6.41(-6.88)	-5.21(-4.96)	-4.60(-4.46)	-4.43(-4.38)	-4.4(-4.62)	-4.69(-4.81)	-5.29(-5.62)	-6.99(-6.49)	-10.62(-13.36)	-14.44(-12.3)	-10.33(-9.75)	-7.65(-6.36)	-5.19(-4.76)	-4.82(-4.95)	-4.97(-4.57)	-4.44(-4.81)	-5.4(-4.65)
θ(22.5°)	9.04(-8.05)	8.24(-7.97)	7.59(-7.27)	-7.12(-6.7)	-6.13(-6.41)	-7.41(-6.26)	-8.24(-6.82)	-5.19(-4.27)	-3.92(-4.04)	-4.09(-4.23)	-4.47(-4.81)	-5.03(-6.16)	-7.5(-6.66)	-6.97(-6.75)	-10.63(-11.31)	-11.63(-12.04)	-13.03(-14.13)	-14.4(-13.34)	-10.59(-7.75)	-5.97(-5.37)	-6.1(-6.78)	-6.5(-5.54)	-6.21(-6.96)	-6.33(-6.66)
θ(30°)	9.89(-10.09)	-10.65(-9.74)	-8.47(-7.52)	-6.39(-5.77)	-6.14(-6.82)	-6.87(-6.4)	-6.24(-6.97)	-5.97(-5.32)	-4.73(-5.25)	-5.49(-4.89)	-5.94(-6.27)	-7.91(-9.2)	-6.60(-7.26)	-7.07(-8.29)	-10.90(-14.72)	-18.09(-16.36)	-14.63(-15.83)	-17.42(-17.56)	-12.11(-8.97)	-7.12(-6.28)	-5.93(-7.13)	-7.7(-6.2)	-5.8(-7.14)	-6.16(-10.46)
θ(37.5°)	6.75(-6.96)	-8.37(-9.23)	-9(-8.14)	-6.72(-6.68)	-7.14(-6.1)	-4.93(-6.46)	-5.31(-6.54)	-7.54(-7.9)	-7.03(-7.37)	-8.53(-6.48)	-5.16(-6.58)	-6.62(-6.33)	-5.69(-5.39)	-6.33(-6.78)	-13.07(-18.12)	-17.39(-18.28)	-18.07(-18.46)	-18.29(-19.03)	-18.52(-11.21)	-5.63(-3.72)	-4.96(-7.45)	-6.7(-6.8)	-8.04(-10.49)	-9.12(-6.44)
θ(45°)	6.93(-7.59)	-8.62(-10.57)	-10.02(-9.6)	-9.36(-10.66)	-8.79(-7.06)	-5.52(-6.42)	-6.77(-8.63)	-8.44(-7.12)	-6.51(-6.78)	-7.49(-7.51)	-6.63(-7.02)	-9.81(-6.53)	-6.1(-6.61)	-10.01(-8.5)	-19.18(-17.89)	-18.68(-17.8)	-16.63(-15.93)	-17.27(-9.09)	-10.07(-9.46)	-7.3(-4.91)	-4.13(-7.87)	-11.52(-7.76)	-7.94(-6.62)	-6.22(-7.36)
θ(52.5°)	-15.37(-11.93)	-11.08(-9.37)	-9.69(-10.02)	-11.61(-14.06)	-14.48(-12.87)	-10.91(-14.3)	-13.32(-13.67)	-11.42(-9.51)	-8.52(-9.15)	-8.96(-7.3)	-6.05(-6.51)	-7.14(-6.32)	-5.87(-6.66)	-11.22(-18.66)	-13.08(-13.63)	-17.73(-13.47)	-13.32(-16.39)	-11.79(-8.75)	-7.99(-7.81)	-6.43(-6.51)	-6.45(-7.23)	-6.12(-6.2)	-6.41(-6.59)	-12.78(-13.94)
θ(60°)	-18.33(-14.18)	-13.14(-15.18)	-14.11(-11.54)	-12.39(-11.27)	-10.96(-10.39)	-11.42(-13.61)	-14.29(-14.21)	-10.89(-7.64)	-7.06(-8.2)	-9.12(-9.71)	-9.59(-8.57)	-7.57(-5.45)	-4.28(-4.32)	-8.03(-11.38)	-9.91(-9.68)	-17.09(-14.12)	-12.92(-15.63)	-11.6(-4.2)	-11.64(-10.83)	-7.63(-7.71)	-6.9(-10.81)	-8.29(-11.73)	-15.33(-17.73)	-17.15(-17.9)
θ(67.5°)	-17.75(-18.12)	-18.14(-18.89)	-18.34(-13.1)	-10.98(-10.37)	-11.85(-11.22)	-12.78(-17.54)	-17.83(-17.5)	-11.72(-7.89)	-7.43(-9.18)	-10.71(-10.7)	-9.77(-11.62)	-13.26(-11.86)	-9.53(-9.23)	-13.45(-11.13)	-8.34(-9.83)	-19.14(-12.3)	-8.07(-17.47)	-17.71(-8.7)	-6.75(-6.38)	-10.59(-9.66)	-8.04(-10.73)	-8.62(-9.16)	-11.19(-14.62)	-16.26(-17.15)
θ(75°)	-14.86(-18.37)	-18.5(-19.2)	-18.96(-15.52)	-12.12(-12.97)	-12.72(-11.55)	-14.44(-18.78)	-18.64(-16.16)	-17.89(-12.28)	-11.87(-11.1)	-10.51(-13.01)	-15.42(-15.26)	-14.4(-15.9)	-12.49(-11.56)	-10.96(-8.96)	-8(-8.26)	-13.81(-16.64)	-11.44(-11.89)	-18.29(-9.35)	-7.5(-10.12)	-8.84(-11.06)	-7.69(-17.43)	-12.65(-16.4)	-18.51(-17.67)	-14.16(-12.23)
θ(82.5°)	-15.2(-17.96)	-18.56(-17.55)	-19.09(-16.11)	-13.21(-16.16)	-15.19(-18.8)	-11.12(-13.46)	-18.19(-16.18)	-19.03(-14.67)	-16.38(-16.01)	-18.99(-16.57)	-18.29(-16.75)	-17.46(-15.55)	-12.63(-14.21)	-15.21(-9.62)	-8.9(-9.84)	-11.26(-17.81)	-17.74(-13.96)	-15.3(-7.35)	-6.07(-11.9)	-8.52(-17.91)	-8.65(-16.36)	-12.65(-16.84)	-18.17(-17.78)	-15.09(-11.02)
θ(90°)	-14.62(-16.11)	-11.97(-12.33)	-17.43(-16.02)	-17.66(-17.29)	-17.64(-15.12)	-13.86(-17.21)	-19.07(-16.07)	-16.46(-15.93)	-17.39(-16.34)	-17.56(-16.55)	-17.49(-16.93)	-14.5(-12.84)	-16.6(-11.86)	-17.71(-14.99)	-12.12(-12.79)	-9.31(-17.9)	-18.36(-10.33)	-9.92(-8.95)	-5.76(-4.36)	-15.91(-15.86)	-8.23(-17.98)	-16.94(-17.79)	-14.65(-11.62)	-12.85(-9.68)
θ(97.5°)	-14.94(-12.29)	-11.16(-13.56)	-15.07(-15.33)	-15.19(-16.75)	-17.22(-14.85)	-13.22(-17.24)	-18.16(-16.16)	-18.19(-16.16)	-17.13(-17.72)	-12.24(-12.21)	-13.94(-13.39)	-12.94(-16.1)	-11.27(-10.9)	-13.91(-14.94)	-14.39(-12.72)	-8.39(-10.18)	-15.69(-9.72)	-8.97(-17.44)	-10.19(-17.14)	-15.39(-16.81)	-13.96(-16.09)	-13.27(-11.64)	-12.19(-12.5)	
θ(105°)	-16.2(-19.3)	-15.99(-13.15)	-12.93(-13.62)	-16.99(-17.64)	-17.86(-13.92)	-14.84(-17.63)	-18.64(-16.6)	-18.99(-16.2)	-17.81(-13.82)	-10.36(-9.17)	-10.94(-10.68)	-11.57(-12.79)	-11.84(-11.1)	-11.44(-12.98)	-15.21(-16.22)	-15.34(-12.36)	-14.16(-11.75)	-10.77(-17.9)	-15.49(-14.93)	-13.14(-16.67)	-14.43(-16.86)	-17.01(-16.69)	-12.96(-10.79)	-10.41(-16.2)
θ(112.5°)	-17.85(-16.44)	-14.67(-13.62)	-12.67(-12.17)	-15.49(-16.09)	-18.35(-15.02)	-12.49(-15.81)	-17.67(-16.4)	-13.03(-16.52)	-16.77(-16.27)	-12.66(-11.57)	-12(-8.97)	-6.87(-6.4)	-7.49(-9.39)	-14.33(-14.1)	-10.54(-15.58)	-16.46(-16.02)	-11.39(-16.64)	-12.19(-19.11)	-10.03(-13.92)	-10.79(-16.64)	-9.73(-13.01)	-8.29(-17.72)	-16.14(-9.21)	-11.65(-16.29)
θ(120°)	-17.74(-18.03)	-14.64(-10.81)	-9.59(-9.69)	-14.03(-15.6)	-17.12(-15.45)	-11.71(-15.75)	-17.36(-13.99)	-15.93(-17.74)	-17.53(-13.34)	-11.16(-11.79)	-12.95(-10.79)	-10.9(-9.54)	-7.42(-6.77)	-9.3(-10.28)	-15.21(-18.86)	-16.54(-16.94)	-16.32(-16.66)	-14.39(-19.01)	-11.84(-14.36)	-10.93(-16.19)	-18.49(-11.94)	-8.65(-7.51)	-15.21(-13.42)	-11.82(-14.72)
θ(127.5°)	-11.14(-10.43)	-8.87(-9.86)	-8.26(-10.19)	-12.07(-17.36)	-16.61(-13.46)	-12.52(-14.4)	-18.77(-17.31)	-15.59(-19.43)	-17.26(-13.17)	-11.71(-9.23)	-7.72(-7.4)	-10.69(-14.58)	-11.59(-9.62)	-18.69(-11.96)	-10.96(-11.48)	-14.82(-12.18)	-15.11(-11.97)	-10.48(-15.24)	-11.84(-8.24)	-10.27(-13.71)	-8.19(-13.74)	-5.62(-9.43)	-10.42(-9.14)	-8.15(-8.48)
θ(135°)	-11.22(-14.42)	-17.73(-14.49)	-13.66(-15)	-18.89(-16.85)	-16.77(-15.86)	-14.66(-17.84)	-18.93(-17.75)	-18.97(-17.98)	-15.79(-13.62)	-13.45(-17.48)	-17.36(-12.49)	-10.83(-9.3)	-12.71(-16.24)	-16.37(-11.07)	-11(-13.61)	-12.48(-15.92)	-16.64(-14.28)	-16.77(-18.48)	-17.47(-11.65)	-10.44(-9.88)	-17.44(-14.11)	-14.51(-13.54)	-6.31(-6.16)	-6.9(-7.8)
θ(142.5°)	-10.92(-9.87)	-9.16(-8.1)	-8.66(-8.07)	-9.81(-12.46)	-15.65(-16.6)	-17.69(-17.4)	-17.48(-18.64)	-18.09(-18.05)	-17.50(-16.53)	-16.67(-12.32)	-10(-8.79)	-11.86(-18.42)	-17.92(-17.55)	-18.99(-18.1)	-15.32(-14.96)	-17.86(-16.3)	-15.48(-18.12)	-18.96(-17.61)	-17.15(-17.49)	-18.12(-9.57)	-10.61(-10.99)	-15.59(-11.1)	-11.09(-10.33)	-18.92(-12.08)
θ(150°)	-8.81(-8.82)	-6.59(-9.01)	-8.81(-8.31)	-8.39(-9.71)	-13.62(-16.78)	-19.04(-16.61)	-14.3(-14.72)	-16.19(-16.29)	-16.13(-18.22)	-17.89(-13.28)	-11.27(-12.18)	-12.84(-18.34)	-16.49(-9.51)	-6.4(-10.92)	-10.83(-12.11)	-15.56(-19.7)	-18.76(-17.9)	-17.63(-18.26)	-17.59(-18.59)	-16.89(-8.85)	-5.89(-4.97)	-5.18(-7.02)	-11.96(-16.28)	-14.85(-11.36)
θ(157.5°)	-10.32(-11.72)	-11.87(-10.58)	-9.26(-9.96)	-9.94(-11.87)	-16.26(-16.54)	-18.09(-16.39)	-15.19(-14.84)	-12.85(-11.32)	-10.82(-10.29)	-7.89(-6.66)	-5.26(-5.94)	-7.27(-11.49)	-18.72(-15.97)	-11.67(-11.07)	-11.91(-13.65)	-16.22(-18.68)	-18.04(-18.12)	-18.26(-17.2)	-15.51(-14.58)	-12.69(-6.63)	-8.26(-8.13)	-6.77(-4.99)	-4.39(-6.61)	-7.84(-9.48)
θ(165°)	-10.07(-8.76)	-7.73(-6.1)	-9.29(-9.96)	-10.52(-11.89)	-13.06(-13.17)	-13.26(-14.55)	-17.01(-19.09)	-17.4(-18.46)	-15.06(-12.18)	-10.17(-9.14)	-9.78(-11.14)	-12.73(-16.47)	-18.21(-18.54)	-12.97(-10.79)	-10.15(-13.7)	-18.32(-17.11)	-18.65(-16.89)	-15.57(-14.06)	-11.92(-10.38)	-9.94(-9.94)	-9.9(-9.39)	-7.71(-6.07)	-6.01(-6.71)	-7.84(-9.48)
θ(172.5°)	-8.09(-9.95)	-10.71(-10.29)	-10.2(-9.19)	-8.71(-8.91)	-8.92(-11.23)	-12.58(-13.47)	-12.1(-10.63)	-8.41(-8.76)	-8.37(-8.39)	-8.82(-9.77)	-11.45(-13.1)	-15.26(-18.37)	-18.4(-16.15)	-15.11(-15.49)	-15.92(-15.45)	-13.86(-13.1)	-13.17(-13.17)	-12.36(-11.17)	-10.78(-10.47)	-10.52(-10.42)	-10.23(-10.38)	-10.04(-8.66)	-17.47(-6.62)	-6.06(-6.33)
θ(180°)	-10.63(-11.16)	-12(-12.39)	-12.28(-12.16)	-12.21(-13.24)	-15.2(-16.19)	-15.36(-13.37)	-11.26(-10.13)	-10.67(-12.3)	-14.74(-16.94)	-18.33(-18.71)	-19.37(-18.15)	-18.57(-18.24)	-16.11(-14.29)	-12.08(-11.09)	-10.5(-10.63)	-11.13(-11.88)	-12.96(-13.62)	-15.08(-16.9)	-17.94(-18.05)	-17.86(-17.75)	-18.05(-19.12)	-17.79(-19.1)	-18.97(-16.24)	-13.92(-11.4)
Freq(Hz)	5.785GHz																							
Theta(Arc.)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gain	Φ(0°)/Φ(90°/5°)	Φ(15°)/Φ(22.5°)	Φ(30°)/Φ(37.5°)	Φ(45°)/Φ(52.5°)	Φ(60°)/Φ(67.5°)	Φ(75°)/Φ(82.5°)	Φ(90°)/Φ(97.5°)	Φ(105°)/Φ(112.5°)	Φ(120°)/Φ(127.5°)	Φ(135°)/Φ(142.5°)	Φ(150°)/Φ(157.5°)	Φ(165°)/Φ(172.5°)	Φ(180°)/Φ(187.5°)	Φ(195°)/Φ(202.5°)	Φ(210°)/Φ(217.5°)	Φ(225°)/Φ(232.5°)	Φ(240°)/Φ(247.5°)	Φ(255°)/Φ(262.5°)	Φ(270°)/Φ(277.5°)	Φ(285°)/Φ(292.5°)	Φ(300°)/Φ(307.5°)	Φ(315°)/Φ(322.5°)	Φ(330°)/Φ(337.5°)	Φ(345°)/Φ(352.5°)
θ(0°)	6.71(-6.21)	6.99(-6.62)	6.39(-5.79)	5.02(-4.78)	5.13(-5.62)	6.11(-6.85)	-7.79(-6.69)	9.81(-11.63)	-14.72(-16.72)	-18.72(-19.52)	-14.79(-11.82)	-8.86(-8.17)	-7.05(-6.64)	5.51(-5.08)	6.4(-6.28)	4.26(-4.46)	4.76(-4.95)	5.24(-5.77)	6.68(-7.76)	8.81(-9.5)	-12.26(-16.22)	-17.53(-17.72)	-18.1(-14.98)	-12.31(-11.14)
θ(15°)	6.19(-4.65)	4.21(-4.05)	3.93(-3.98)	4.29(-4.42)	4.19(-4.26)	4.83(-5.61)	6.4(-6.4)	7.19(-7.63)	8.47(-9.31)	-10.46(-12.17)	-13.51(-13.96)	-13.74(-13.29)	-12.96(-11.12)	9.8(-6.48)	7.21(-6.2)	5.4(-5.13)	5.44(-5.94)	6.43(-7.1)	8.06(-9.48)	-11.13(-13.7)	-17.19(-16.5)	-16.19(-14.03)	-10.69(-8.49)	-6.75(-6.01)
θ(30°)	5.3(-4.93)	3.91(-3.65)	3.26(-3.1)	3.12(-2.95)	2.74(-2.92)	2.48(-2.76)	3.27(-3.73)	4.49(-4.29)	4.79(-5.35)	6.27(-7.29)	6.11(-6.89)	9.39(-9.19)	9.79(-9.16)	8.69(-7.98)	7.99(-6.23)	5.95(-5.23)	5.14(-6.46)	6.11(-7.31)	9.16(-11.69)	-15.43(-13.25)	-18.17(-17.94)	-12.19(-9.32)	7.39(-6.63)	4.33(-4.09)
θ(45°)	6.77(-6.79)	7.53(-6.31)	5.19(-4.38)	3.37(-3.65)	2.1(-2.78)	2.09(-2.84)	3.3(-3.04)	2.54(-2.49)	2.83(-3.49)	4.61(-5.68)	7.96(-6.96)	8.99(-10.36)	10.79(-9.95)	7.59(-6.66)	5.44(-6.02)	7.79(-7.12)	10.93(-11.45)	10.82(-9.61)	9.97(-9.99)	-10.27(-11.68)	-12.96(-13.12)	-10.69(-9.69)	8.21(-6.21)	6.89(-6.06)
θ(60°)	10.26(-9.2)	-7.19(-6.63)	6.24(-6.54)	4.47(-3.16)	1.57(-0.77)	1.34(-2.5)	2.91(-2.35)	-1.89(-1.82)	2.38(-3.38)	4.2(-5.33)	7.22(-9.15)	-10.86(-13.71)	-13.59(-9.63)	6.96(-4.77)	-3.59(-7.76)	2.31(-2.27)	-3.31(-4.95)	6.31(-5.55)	4.65(-4.42)	-4.94(-6.54)	6.71(-10.5)	-12.03(-11.41)	-11.42(-13.32)	-10.91(-11.26)
θ(75°)	6.18(-4.18)	-3.75(-4.12)	6.29(-5.68)	4.42(-2.12)	0.047(-0.4)	1.25(-0.6)	0.77(-1.37)	-2.19(-2.36)	2.76(-3.82)	4.36(-4.73)	6.39(-6.73)	8.96(-14.51)	-18.19(-19											

Antenna Pattern

Appendix B

Total Gain Data

[illegible]

Sporton International Inc.



Antenna Pattern

Appendix B

(H25.2)	2.021253	-3.815501	-4.871492	-4.580334	-3.780330	-3.899334	-2.744237	-1.889183	-1.920220	-2.300239	-2.010196	-2.177286	-3.835051	-5.471508	-4.173308	-2.251188	-1.889188	-2.272182	-3.330374	-3.850418	-3.711322	-2.659214	-1.950140	-1.560158	
(H26.2)	0.796487	-1.819303	-4.196403	-3.620320	-2.866272	-2.399222	-2.192128	-2.880374	-4.396125	-3.899361	-2.795208	-2.143324	-4.795555	-5.071362	-1.717454	-0.070119	-0.731818	-2.441299	-3.199272	-1.810487	-0.584110	-1.130396	-0.670596	-0.164233	
(H27.2)	-1.580160	-1.999361	-5.209422	-4.070530	-5.059490	-4.023323	-2.693327	-4.359356	-5.530530	-5.160534	-4.900435	-4.795623	-4.320289	-1.580556	-0.240375	-0.280481	-2.420368	-4.299411	-3.830321	-1.790499	-1.091799	-1.949199	-1.760991	-0.520155	
(H28.2)	0.236381	-3.883389	-5.281737	-7.780555	-5.121428	-3.903355	-3.059343	-4.784508	-4.820531	-6.728400	-7.506482	-7.744186	-5.181272	-1.151038	-0.440155	-0.434209	-3.283388	-4.231448	-4.560440	-2.866474	-1.220188	-1.679192	-1.330012	-1.131400	
(H29.2)	3.771446	-4.084688	-6.311780	-8.189488	-4.181302	-2.550268	-2.144244	-3.221278	-4.151708	-8.401783	-7.201738	-7.131721	-5.291337	-0.089185	-1.444085	-0.911222	-3.071282	-3.591460	-6.320461	-2.930482	-1.171251	-1.121500	-0.888060	-0.411433	
(H30.2)	2.230420	-2.103135	-6.311780	-8.889588	-3.051433	-1.481159	0.091485	-1.971196	3.170140	-4.760458	-6.840790	-8.816181	-6.843384	-1.521396	-4.631341	-0.350129	-0.350129	-1.421255	-3.910189	-1.830373	-2.440105	-3.001300	-0.629152	-1.494373	
(H31.2)	-1.621171	-1.101190	-3.434311	-6.652588	-2.511179	-1.280405	0.264270	-0.341950	-0.264270	-0.264270	-0.264270	-0.264270	-0.264270	-0.264270	-0.264270	-0.264270	-0.264270	-0.264270	-0.264270	-0.264270	-0.264270	-0.264270	-0.264270	-0.264270	
(H32.2)	0.471152	0.691133	-2.484031	-6.600628	-5.589138	-3.091677	-1.001185	-3.501487	-5.381398	-3.502429	-5.908481	-7.120103	-6.601466	-2.671555	-5.299222	-2.140228	-2.191388	-0.191843	-2.432421	-0.602122	-2.807103	-0.660108	-0.266217	-2.890140	
(H33.2)	0.651120	-3.241173	-2.091428	-6.721487	-7.291534	-5.841343	-2.791534	-5.331701	-6.141491	-5.321709	-5.940784	-6.761087	-5.931593	-6.201565	-5.351513	-2.032182	-2.461277	-0.021078	-2.631284	-0.440222	-2.430288	-1.380618	-0.471154	-2.531205	
(H34.2)	1.710171	-6.541184	-2.011338	-6.221732	-6.931798	-7.954489	-4.231938	-6.881637	-9.321580	-4.731824	-5.981899	-6.821030	-8.411518	-5.981633	-4.801180	-0.801252	-1.840188	-0.731225	-4.801388	-2.501777	-1.770183	-0.191132	-0.691986	-1.500149	
(H35.2)	2.559172	-1.142320	-2.841368	-4.971752	-1.701908	-6.921729	-2.711916	-2.711916	-1.081916	-1.081916	-1.081916	-1.081916	-1.081916	-1.081916	-1.081916	-1.081916	-1.081916	-1.081916	-1.081916	-1.081916	-1.081916	-1.081916	-1.081916	-1.081916	
(H36.2)	0.290242	-3.042159	-3.081368	-4.001691	-5.541740	-7.721480	-6.851237	-6.851237	-6.851237	-6.851237	-6.851237	-6.851237	-6.851237	-6.851237	-6.851237	-6.851237	-6.851237	-6.851237	-6.851237	-6.851237	-6.851237	-6.851237	-6.851237	-6.851237	
(H37.2)	3.691262	-4.291532	-4.061626	-5.261700	-3.701675	-5.941605	-7.071626	-6.031642	-8.841163	-10.791105	-11.771035	-8.411136	-13.640489	-7.291784	-7.111512	-2.081297	-3.191629	-7.281377	-6.281969	-7.991446	-2.911503	-2.911503	-4.481228	-1.391238	
(H38.2)	0.820490	-0.570462	-5.391455	-6.891424	-6.338347	-1.171076	0.161103	-0.161103	-0.161103	-0.161103	-0.161103	-0.161103	-0.161103	-0.161103	-0.161103	-0.161103	-0.161103	-0.161103	-0.161103	-0.161103	-0.161103	-0.161103	-0.161103	-0.161103	
(H39.2)	0.430360	-3.450574	-0.020421	-8.721005	-1.921955	-12.431472	-8.791302	-15.881102	-15.881102	-15.881102	-15.881102	-15.881102	-15.881102	-15.881102	-15.881102	-15.881102	-15.881102	-15.881102	-15.881102	-15.881102	-15.881102	-15.881102	-15.881102	-15.881102	
(H40.2)	6.071153	-8.681111	-8.591187	-12.131232	-12.501309	-16.851510	-14.891513	-13.191221	-13.191221	-13.191221	-13.191221	-13.191221	-13.191221	-13.191221	-13.191221	-13.191221	-13.191221	-13.191221	-13.191221	-13.191221	-13.191221	-13.191221	-13.191221	-13.191221	
(H41.2)	8.430390	-0.931533	-1.130808	-4.871233	-12.561484	-14.691152	-12.011577	-13.811544	-12.821238	-14.101178	-8.941722	-8.071690	-7.320484	-1.451037	-10.331414	-4.771521	-14.131314	-6.671450	-9.261085	-9.501608	-5.191817	-4.431734	-12.021719	-6.001721	
(H42.2)	0.871070	-0.910403	-8.001691	-9.241060	-12.541100	-10.911038	-11.841345	-14.001403	-14.891434	-13.471258	-11.411077	-10.441154	-11.531068	-10.711190	-14.601374	-11.331599	-13.741376	-13.881869	-10.141412	-13.761041	-12.641108	-11.281398	-8.541433	-7.971795	
(H43.2)	7.550801	-8.891387	-11.011859	-8.891154	-14.771414	-13.311358	-14.911551	-15.891508	-16.851505	-15.411512	-15.041334	-14.661768	-12.648648	-11.391182	-12.821075	-15.881418	-13.591263	-11.301107	-11.291453	-10.501637	-11.411149	-9.941633	-9.751800	-8.861632	
(H44.2)	-8.381748	-9.231185	-13.151413	-16.531498	-15.841521	-14.371002	-15.291537	-15.291537	-16.781535	-14.781535	-14.121232	-13.711266	-14.591179	-13.611518	-15.491159	-15.201428	-13.711288	-11.911118	-15.261142	-14.301350	-15.291457	-13.141128	-10.121932	-9.461673	
(H45.2)	-16.751350	-15.051020	-13.711441	-16.351350	-15.481505	-15.721569	-15.891416	-14.181427	-13.291524	-12.381201	-11.231109	-12.221332	-11.841129	-11.861102	-10.911608	-9.141888	-8.671938	-6.571937	-10.671521	-14.361518	-14.221132	-12.371187	-13.211458	-15.951467	
(H46.2)	-14.021381	-13.841330	-15.281335	-15.581340	-14.741341	-14.001413	-14.141448	-15.001451	-13.841330	-13.151235	-12.101235	-12.011235	-12.011235	-12.011235	-12.011235	-12.011235	-12.011235	-12.011235	-12.011235	-12.011235	-12.011235	-12.011235	-12.011235	-12.011235	
FreqHz	2.450PHz	TableA.2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Gain	0.071907.57	0.15190221.57	0.3019037.57	0.4519063.57	0.6019076.57	0.7519087.57	0.90190912.57	1.05191012.57	1.20191112.57	1.35191212.57	1.50191312.57	1.65191412.57	1.80191512.57	1.95191612.57	2.10191712.57	2.25191812.57	2.40191912.57	2.55192012.57	2.70192112.57	2.85192212.57	3.00192312.57	3.15192412.57	3.30192512.57	3.45192612.57	
(H1)	-1.841172	-1.751187	-2.021199	-2.361253	-2.681287	-3.141348	-4.001424	-4.411450	-4.351459	-4.581450	-4.481448	-4.481441	-4.301413	-3.531363	-3.421334	-3.161307	-2.991298	-2.861270	-2.551229	-1.981169	-1.401125	-1.211126	-1.231136	-0.841635	
(H2)	1.281122	-1.621185	-2.061224	-2.401259	-2.841293	-3.611338	-4.301451	-4.551447	-4.491432	-4.211409	-4.001435	-3.521320	-2.791425	-2.121188	-1.571129	-1.141106	-1.001112	-1.111133	-1.081185	-0.841632	-0.631558	-0.621637	-0.441638	-0.481638	
(H3)	1.041188	-1.381184	-1.951203	-2.291255	-2.691301	-3.421375	-4.121457	-4.901568	-5.011481	-4.491477	-3.861381	-3.101329	-2.261410	-1.601189	-1.241099	-0.791654	-0.471614	-0.361333	-0.311639	-0.250421	-0.191634	-0.031638	0.001638	0.001638	
(H4)	0.831110	-1.451173	-1.951213	-2.361271	-2.731373	-3.591452	-4.481488	-4.981537	-4.981537	-4.361358	-3.511411	-3.151270	-2.561377	-1.481142	-1.281146	-0.791268	-0.291624	-0.301633	-0.251118	-0.201636	-0.081638	-0.011638	0.171638	0.171638	
(H5)	1.141122	-1.491184	-1.891210	-2.301276	-2.701378	-3.161338	-3.481535	-4.001423	-4.221440	-4.891508	-5.081481	-4.291634	-3.071280	-3.071344	-3.491593	-3.191251	-1.891636	-0.411612	-0.201629	-0.031638	0.001638	0.001638	0.001638	0.001638	
(H6)	1.181146	-1.761928	-2.491281	-2.761285	-2.901288	-2.791277	-3.011437	-4.151483	-5.621498	-6.111562	-4.771382	-3.091237	-1.871465	-1.391139	-1.481149	-1.361111	-0.821618	-0.471632	-0.201622	-0.041717	-3.321149	1.351131	1.121807	0.511618	
(H7)	-1.421167	-1.591227	-2.491275	-3.021342	-3.701384	-3.931384	-4.011436	-4.901465	-5.511508	-4.711502	-3.731382	-3.311330	-3.241361	-2.981471	-3.791334	-3.501469	-0.671670	-0.781117	-1.151012	-0.491628	0.911137	1.361147	1.271800	0.781140	
(H8)	2.821337	-3.791411	-4.381403	-4.891556	-6.041607	-5.981478	-3.961341	-3.271335	-3.371333	-3.631456	-5.871474	-7.261404	-6.201428	-2.471268	-3.441408	-3.711287	-1.561147	-0.981125	-1.731230	-1.851158	-0.981479	-0.491635	-0.160013	-0.681232	
(H9)	7.581428	-6.841818	-7.261727	-7.761787	-7.671787	-6.181749	-4.101307	-2.021215	-2.711384	-4.971458	-6.151408	-10.441777	-7.111334	-1.841634	-1.121628	-1.041223	-3.911531	-4.841414	-3.161281	-2.491289	-2.191165	-0.861077	-0.191631	-1.791200	-2.541346
(H10)	5.421633	-7.091733	-6.901613	-5.301453	-3.951355	-3.641631	-3.911491	-3.801499	-6.781781	-8.171635	-6.631617	-7.891787	-6.741485	-3.071198	-1.451138	-1.571192	-2.801236	-3.551355	-3.671346	-2.841166	-2.691499	-2.021689	-1.481634	-2.801320	
(H11)	4.581501	-6.591556	-5.371516	-5.261646	-6.041632	-7.311810	-8.161736	-6.651632	-6.811565	-6.021162	-6.941118	-6.071618	-4.431371	-1.741433	-3.511610	-4.541542	-6.411593	-4.301589	-4.041531	-2.891201	-1.581143	-1.771012	-1.771012	-1.771012	
(H12)	5.891637	-6.821174	-7.301745	-7.401832	-6.911705	-7.081649	-5.201416	-3.861519	-7.381790	-7.081770	-10.481431	-10.911652	-4.161265	-2.481267	-3.841472	-4.511348	-3.081383	-4.191433	-3.701233	-3.061282	-2.891729	-1.091347	-3.981428	-3.981428	
(H13)	5.551647	-6.691465	-8.661619	-7.321674	-7.871438	-8.171498	-7.511565	-6.971630	-11.451797	-6.511634	-14.001139	-19.531494	-6.571611	-6.021100	-7.791674	-5.501629	-5.641168	-4.841451	-4.501591	-2.891269	-2.721802	-3.041304	-3.801435	-3.801435	
(H14)	6.991480	-10.061119	-10.211167	-11.041885	-6.101910	-6.741842	-6.611505	-6.101710	-8.																



Antenna Pattern

Appendix B

φ(0°)	0.38(-0.75	-0.48(-0.98	1.48(-1.59	0.60(-0.50	1.12(-0.09	2.98(-4.08	-1.78(-1.42	-0.44(-4.66	8.89(-3.74	-1.49(-0.33	1.25(-1.97	2.15(-1.67	0.23(-1.91	3.41(-8.48	-14.73(-6.38	-3.97(-8.59	-6.88(-3.28	-4.02(-4.33	-7.99(-7.02	-6.43(-6.40	-3.25(-2.51	-1.43(-0.99	-0.27(-0.42	0.50(-0.11
φ(80°)	0.13(-1.37	-1.52(-1.01	-0.87(-0.30	-0.41(-1.11	0.74(-0.61	3.00(-2.78	-1.36(-1.84	-4.54(-5.43	-1.53(-0.08	0.88(-1.00	1.48(-2.08	0.69(-1.91	3.21(-6.83	-13.46(-7.83	-3.61(-7.46	-4.50(-7.24	-3.58(-7.34	4.31(-5.25	-3.70(-3.82	-2.84(-3.06	-3.16(-2.99	-1.26(-0.68	-0.87(-0.25	
φ(80°)	0.06(-0.03	-0.24(-1.25	-1.45(-1.81	-2.14(-0.73	0.67(-0.33	4.25(-4.95	-1.87(-1.51	-2.46(-4.60	-3.59(-2.40	-2.40(-1.13	-0.45(-0.70	0.68(-1.10	-1.47(-2.39	-4.34(-7.21	-10.66(-7.00	-3.50(-5.68	-6.07(-2.41	-3.01(-3.49	-4.34(-6.83	-3.64(-1.42	-4.17(-1.40	-4.97(-3.96	-1.24(-0.41	-0.58(-0.18
φ(87°)	0.68(-1.02	-0.53(-1.43	-1.65(-3.13	-4.38(-1.80	0.15(-0.40	4.35(-7.91	-4.19(-2.15	-2.80(-4.25	2.58(-1.65	2.73(-1.93	-2.46(-0.85	-0.61(-0.16	2.32(-1.64	4.36(-8.84	9.07(-5.51	-4.09(-6.84	-6.20(-5.25	4.59(-5.73	4.44(-3.89	-5.51(-6.83	-6.86(-6.41	-5.31(-3.84	0.95(-1.07	-1.10(-1.04
φ(105°)	-1.14(-1.16	-0.10(-1.06	2.26(-2.41	3.70(-4.50	1.31(-1.96	2.51(-6.09	-6.15(-4.11	-5.59(-5.62	3.86(-2.68	3.19(-2.57	-3.83(-3.34	2.27(-1.59	3.78(-5.81	6.31(-10.99	-10.39(-7.42	5.55(-10.48	-8.30(-3.83	-4.83(-8.83	6.51(-5.23	6.12(-8.52	-1.00(-7.06	-4.98(-4.23	-2.00(-1.27	-1.88(-1.19
φ(120°)	2.34(-1.18	-2.87(-2.51	-2.67(-3.84	-5.53(-4.88	3.11(-3.59	4.67(-6.39	-6.95(-6.99	-7.15(-6.74	4.58(-3.79	-3.87(-5.51	-7.25(-7.45	-5.19(-4.07	8.81(-4.41	3.74(-13.25	-8.87(-8.41	6.98(-9.53	-7.88(-3.77	6.59(-13.32	-7.75(-6.84	4.68(-7.73	-11.73(-7.02	6.75(-3.92	-8.22(-3.20	-1.91(-2.25
φ(125°)	2.28(-2.53	-3.21(-3.16	-4.28(-4.98	-5.23(-5.51	-5.26(-4.82	-6.13(-6.47	-7.99(-10.49	7.67(-7.19	-4.33(-7.04	-14.86(-10.11	-5.69(-7.00	-6.69(-4.41	-6.26(-14.49	-10.87(-8.32	-7.50(-9.84	-4.57(-4.39	5.09(-9.38	-5.82(-6.19	-1.41(-9.40	-8.02(-8.41	-5.91(-5.55)	-7.81(-5.13)	-3.55(-2.39)	
φ(127°)	6.15(-3.79	-4.88(-6.68	-4.77(-1.75	-7.67(-6.49	-7.34(-5.87	-8.93(-6.48	-14.07(-12.82	-12.87(-6.76	6.82(-6.29	-7.60(-11.11)	-14.87(-10.39	7.30(-10.20	8.50(-5.81)	-10.19(-7.20	6.81(-4.77	-11.21(-6.74	5.07(-4.89	6.84(-9.02	6.18(-6.50)	6.01(-6.80)	-10.36(-13.83)	-8.84(-8.87)	-2.77(-5.55)	-4.74(-5.03)
φ(135°)	3.55(-4.19	-4.20(-7.26	8.27(-6.02	-5.05(-5.60)	-5.56(-4.83	-6.98(-5.39	-8.82(-6.27	-8.79(-7.00	4.96(-4.37	-5.21(-11.43)	-4.99(-5.56	3.75(-6.32)	4.38(-5.37)	-7.55(-9.44	-8.58(-5.87	-8.72(-5.55)	-5.59(-9.99)	-15.08(-13.78)	6.02(-5.98	-1.66(-4.21)	-10.19(-13.33)	8.98(-3.27)	-3.21(-3.38)	-3.54(-2.02)
φ(142°)	2.09(-2.46	-2.23(-2.34	-5.32(-6.86	-8.07(-5.23)	-4.40(-3.30)	3.16(-6.30	-10.19(-8.60)	-4.46(-4.35)	-4.70(-5.17)	4.97(-6.59	-6.97(-10.15)	-10.74(-13.22)	-10.07(-11.36)	-10.39(-13.31)	-8.55(-6.38)	-8.57(-7.87)	-7.48(-6.98)	-13.44(-10.58)	5.68(-4.84)	-8.15(-12.42)	-14.17(-8.86)	-5.18(-5.45)	-1.90(-1.55)	-1.87(-1.67)
φ(150°)	5.75(-5.41)	-4.79(-3.19	3.32(-5.74)	3.07(-7.44)	7.79(-9.48)	-10.59(-9.42)	-6.54(-6.29)	-4.59(-5.47)	5.63(-4.94)	5.41(-6.43)	-8.65(-19.19)	8.03(-6.56)	7.53(-7.51)	7.79(-8.14)	-10.72(-13.78)	-11.39(-9.08)	-8.70(-12.44)	-11.20(-9.62)	-8.19(-9.24)	2.98(-2.92)	2.98(-1.97)	-1.55(-5.55)	-5.84(-2.07)	
φ(157°)	4.87(-6.84	-8.35(-7.77	8.10(-5.19)	3.77(-7.21)	3.07(-7.74)	4.85(-5.71)	-7.52(-9.59)	7.07(-2.29)	7.80(-4.59)	6.25(-6.36)	8.65(-19.46)	12.33(-12.46)	-10.69(-9.63)	10.21(-10.39)	-10.11(-13.42)	-10.68(-10.39)	-5.20(-4.46)	-5.70(-9.38)	-12.27(-11.03)	-10.67(-10.58)	-9.50(-9.19)	-1.87(-1.53)	-1.87(-1.53)	
φ(167°)	6.70(-4.41)	-5.83(-6.85)	-5.85(-5.01)	-4.17(-4.00)	4.98(-5.34)	4.40(-7.51)	-8.70(-15.16)	-11.80(-14.36)	-15.40(-19.35)	-15.11(-16.45)	-14.55(-17.38)	-10.52(-10.76)	-11.31(-11.71)	-11.49(-11.99)	-10.59(-10.92)	-10.19(-9.43)	-8.82(-8.63)	9.29(-10.12)	12.24(-9.67)	9.19(-9.03)	-8.77(-9.38)	6.59(-6.10)	5.14(-4.97)	-4.72(-5.67)
φ(172°)	4.56(-4.27	-3.73(-3.13	2.29(-2.06	-2.36(-2.40)	3.14(-4.04)	5.58(-7.94)	-10.07(-14.62)	-15.04(-14.55)	-13.57(-11.55)	-10.49(-10.32)	-11.47(-11.43)	-10.17(-10.89)	-11.46(-11.14)	8.87(-8.57)	-7.79(-7.85)	-8.80(-10.35)	-11.75(-13.87)	-12.41(-10.77)	9.27(-7.83)	8.96(-8.03)	-5.06(-5.43)	-4.94(-4.88)	5.18(-5.62)	5.51(-6.49)
φ(180°)	5.56(-5.42)	-8.97(-4.72)	-4.22(-4.62)	-7.39(-6.61)	-10.68(-10.82)	-13.95(-14.92)	-15.09(-15.77)	-13.84(-12.24)	-10.83(-10.44)	-10.87(-11.22)	-11.29(-10.78)	-10.12(-9.70)	9.68(-9.83)	9.47(-9.22)	-8.94(-8.80)	-8.59(-8.89)	-9.00(-9.39)	-7.97(-7.15)	7.09(-6.86)	-5.59(-5.21)	-6.00(-4.08)	4.97(-5.55)	5.23(-5.29)	-5.94(-6.49)
FeedNo	5.7652Ph	TotalAnt. 2	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°/φ07.5°)	φ(15°/φ30.7°)	φ(30°/φ37.5°)	φ(45°/φ50.5°)	φ(60°/φ62.5°)	φ(75°/φ68.5°)	φ(90°/φ69.5°)	φ(105°/φ71.2°)	φ(120°/φ72.5°)	φ(135°/φ74.2°)	φ(150°/φ75.5°)	φ(165°/φ76.5°)	φ(180°/φ78°)	φ(195°/φ80.2°)	φ(210°/φ81.7°)	φ(225°/φ83.2°)	φ(240°/φ84.7°)	φ(255°/φ86.2°)	φ(270°/φ87.7°)	φ(285°/φ89.2°)	φ(300°/φ90.7°)	φ(315°/φ92.2°)	φ(330°/φ93.7°)	φ(345°/φ95.2°)
φ(0°)	0.58(-0.60	0.98(-0.27	0.03(-1.11	0.20(-1.18	0.35(-0.45)	0.02(-0.81)	0.78(-0.85)	0.92(-0.87)	0.80(-0.77)	0.82(-0.99)	1.09(-1.12	1.16(-1.16	0.98(-0.87)	1.03(-1.03)	1.38(-1.24	1.26(-1.27	1.16(-0.86	0.93(-1.17	1.22(-1.10	0.93(-0.87)	0.94(-0.83)	0.75(-0.55)		
φ(15°)	0.90(-0.67	0.87(-1.08	1.10(-1.01)	0.84(-0.61)	0.69(-0.85)	0.98(-1.30	0.98(-1.18	1.27(-1.21)	0.92(-0.77)	0.86(-1.50)	0.56(-1.13)	0.13(-0.12)	0.12(-0.45)	0.72(-0.53)	-0.22(-1.13)	0.41(-0.52)	0.42(-0.47)	0.59(-0.63)	0.98(-0.42)	0.42(-0.52)	0.37(-0.21)	0.43(-0.71)	0.43(-0.19)	0.30(-0.85)
φ(30°)	0.13(-0.24	0.65(-0.59	0.81(-1.22	1.19(-0.97)	0.92(-1.08)	0.93(-0.59)	0.30(-0.48)	0.95(-1.28)	0.61(-0.74)	1.18(-1.43)	-1.02(-1.81)	-1.99(-2.86)	-0.65(-0.38)	-1.28(-1.43)	-1.81(-1.86)	-1.56(-0.83)	-0.47(-0.39)	-0.81(-1.31)	-1.59(-2.86)	-3.59(-3.37)	-2.89(-2.29)	-1.79(-0.95)	-0.26(-0.09)	
φ(45°)	1.76(-1.88	1.69(-0.90	0.73(-0.76	0.92(-0.89)	0.79(-0.61)	-0.22(-1.17)	-1.79(-1.87)	-1.36(-2.61)	0.24(-0.74)	0.59(-0.27)	0.34(-0.61)	0.70(-0.42)	0.47(-1.48)	0.17(-1.26)	-2.88(-3.41)	-3.80(-4.14)	-5.13(-4.70)	-3.72(-2.88)	-2.94(-3.93)	-5.72(-6.33)	-4.48(-2.05)	-0.38(-0.57)	1.48(-2.05)	2.11(-0.92)
φ(60°)	3.15(-2.84	1.88(-1.24)	0.96(-0.77)	0.93(-0.73)	0.16(-0.87)	-2.27(-3.44)	-5.11(-4.49)	-3.20(-2.61)	0.84(-0.74)	0.24(-0.50)	0.37(-1.32)	0.24(-0.55)	0.61(-1.19)	0.36(-0.83)	2.64(-2.64)	3.67(-2.68)	0.17(-1.38)	-1.83(-0.56)	0.29(-0.73)	0.91(-1.02)	1.32(-2.08)			
φ(75°)	2.89(-2.87)	2.75(-2.91)	2.22(-1.20)	1.21(-0.34)	1.02(-1.24)	-3.04(-5.45)	-5.74(-5.20)	-2.98(-2.59)	3.47(-1.26)	0.61(-0.18)	0.03(-0.59)	0.31(-1.00)	-1.20(-1.31)	-1.84(-2.30)	-3.95(-2.42)	-4.45(-4.95)	-5.99(-5.99)	6.87(-4.86)	9.51(-7.13)	4.37(-3.19)	-2.94(-0.40)	-1.65(-1.23)	-1.14(-0.87)	0.22(-0.63)
φ(90°)	2.54(-2.18)	2.35(-2.08)	2.25(-0.86)	0.63(-1.40)	1.30(-1.50)	-4.05(-5.09)	-6.06(-4.56)	-4.43(-3.76)	2.36(-0.68)	0.33(-0.84)	2.32(-0.48)	0.15(-0.86)	0.50(-1.48)	-1.74(-1.75)	-3.36(-5.46)	-7.18(-7.15)	-4.97(-5.91)	8.87(-3.71)	7.74(-7.45)	4.93(-4.93)	-4.98(-4.52)	-1.82(-0.95)	-0.16(-0.78)	
φ(95°)	0.89(-1.12	2.49(-3.48)	3.07(-1.72)	1.19(-1.34)	1.12(-0.60)	3.10(-4.48)	-5.19(-5.42)	-3.91(-4.56)	-3.33(-1.47)	0.15(-0.25)	2.76(-3.22)	3.22(-0.32)	4.19(-3.34)	-2.89(-3.45)	8.54(-10.75)	-7.81(-6.42)	-6.18(-11.04)	-11.58(-6.01)	-3.80(-3.43)	-3.71(-2.22)	0.37(-0.52)	1.11(-0.93)	1.89(-1.26)	
φ(100°)	2.02(-2.22	2.29(-2.09)	2.29(-2.09)	0.90(-0.87)	1.09(-1.23)	-1.92(-1.47)	-5.23(-5.71)	-3.49(-4.54)	-3.64(-3.29)	-2.52(-1.57)	0.20(-0.74)	3.22(-2.77)	1.74(-2.55)	3.91(-4.42)	7.16(-6.86)	7.80(-7.86)	4.27(-6.81)	6.58(-5.29)	4.48(-3.73)	-1.71(-0.11)	0.98(-1.06)	0.90(-0.77)	2.89(-1.42)	
φ(105°)	1.92(-0.81)	0.79(-1.02)	1.26(-1.43)	0.34(-0.68)	1.99(-1.74)	3.28(-4.51)	3.41(-2.80)	3.96(-3.78)	7.14(-4.43)	1.02(-2.31)	3.16(-2.93)	1.63(-2.54)	5.31(-1.43)	4.38(-4.14)	7.89(-8.38)	6.68(-4.34)	4.04(-6.48)	9.02(-5.33)	6.87(-3.79)	1.77(-1.19)	0.95(-0.22)	0.95(-0.22)	2.21(-0.56)	
φ(110°)	2.15(-1.37)	1.51(-1.13)	0.36(-0.31)	-1.56(-0.85)	0.68(-0.51)	-2.56(-4.61)	-3.29(-1.27)	-3.03(-4.15)	7.71(-4.41)	2.19(-2.48)	2.02(-2.87)	3.12(-2.77)	0.90(-0.48)	3.04(-6.68)	-11.99(-6.45)	-4.20(-5.99)	-3.38(-2.77)	2.79(-4.49)	6.72(-3.17)	-4.43(-5.10)	-1.59(-2.81)	-2.78(-1.24)	0.30(-0.23)	1.37(-1.97)
φ(120°)	1.25(-0.67)	1.96(-1.31)	0.39(-1.30)	-3.40(-2.44)	4.62(-7.13)	-1.51(-4.09)	-4.88(-2.12)	-3.28(-4.13)	5.21(-4.34)	3.11(-1.59)	0.80(-1.25)	2.14(-2.03)	3.38(-1.38)	3.94(-9.59)	-3.80(-2.74)	-2.72(-4.14)	5.44(-2.33)	-3.91(-5.75)	2.98(-2.91)	3.80(-1.90)	0.99(-0.45)	0.79(-0.62)		
φ(125°)	0.23(-0.18	0.82(-1.13)	1.27(-0.88)	-4.49(-3.69)	1.22(-0.53)	2.35(-0.77)	-5.59(-2.41)	-2.97(-2.55)	-1.83(-2.00)	0.38(-0.82)	-1.98(-0.94)	0.35(-1.18)	-2.28(-3.35)	0.68(-0.19)	0.47(-0.82)	2.29(-3.44)	-4.88(-2.12)	2.77(-3.38)	4.75(-3.96)	-4.86(-5.70)	-2.97(-3.15)	-3.54(-2.59)	0.56(-0.55)	-0.76(-0.29)
φ(130°)	0.87(-0.88)	-0.41(-0.13)	0.38(-1.11)	-4.01(-4.41)	-3.22(-0.60)	2.48(-0.82)	-6.89(-3.57)	-3.19(-2.08)	-1.21(-1.36)	-1.82(-3.02)	-3.26(-2.94)	-0.25(-0.10)	-2.23(-2.48)	-0.90(-1.23)	-0.57(-0.56)	-3.51(-3.18)	-4.67(-2.40)	-6.44(-5.70)	0.59(-0.30)	1.12(-2.40)	-4.53(-3.89)	3.28(-2.68)	1.13(-1.00)	-1.92(-0.44)
φ(135°)	-1.04(-1.01)	-0.45(-0.59)	-0.59(-2.86)	-0.38(-0.64)	-4.09(-2.09)	3.18(-3.70)	-7.86(-7.43)	-2.01(-2.91)	3.24(-2.88)	-3.25(-3.63)	-4.45(-2.75)	2.14(-0.89)	3.31(-3.72)	6.14(-10.51)	-10.47(-9.84)	-8.91(-7.82)	8.24(-3.73)	6.43(-6.28)	-5.52(-4.35)	-9.94(-2.95)	6.29(-4.96)	2.89(-2.82)	-1.30(-1.24)	2.03(-1.42)
φ(140°)	1.12(-1.77)	-1.75(-1.13)	-2.19(-2.32)	-0.96(-2.61)	-4.57(-3.83)	-5.08(-6.53)	-7.95(-6.00)	-4.86(-4.13)	1.24(-2.81)	3.00(-0.50)	4.14(-2.22)	-7.05(-6.03)	1.71(-2.08)	8.94(-1.43)	4.14(-2.22)	-7.05(-6.03)	1.71(-2.08)	8.94(-1.43)	4.14(-2.22)	-7.05(-6.03)	1.71(-2.08)	8.94(-1.43)	4.14(-2.22)	-7.05(-6.03)
φ(145°)	-1.55(-1.09)	2.04(-2.67)	-4.86(-5.38)	-6.10(-4.46)	6.75(-4.84)	6.20(-6.66)	-11.75(-7.87)	-6.82(-6.56)	8.81(-4.41)	4.59(-6.22)	-15.10(-8.62)	-5.14(-6.83)	-7.82(-1.49)	-7.43(-9.78)	-12.65(-8.19)	-6.41(-6.26)	-4.56(-6.03)	4.91(-6.22)	5.27(-11.15)	4.26(-4.84)	-7.40(-3.84)	5.26(-3.40)	2.09(-2.06)	
φ(150°)	6.33(-3.84)	-5.88(-5.54)	-5.33(-5.79)	-6.88(-6.87)	-1.06(-5.86)	-7.37(-3.47)	-9.33(-7.48)	-10.40(-10.00)	7.31(-3.63)	6.91(-5.12)	-10.18(-10.38)	-7.84(-6.71)	-6.99(-5.63)	-11.27(-4.41)	-12.81(-6.05)	-4.08(-3.68)	6.02(-10.87)	6.30(-2.45)	3.78(-10.45)	-7.85(-13.46)	-4.96(-2.37)	1.93(-2.64)	-4.97(-4.08)	
φ(155°)	2.20(-1.36)	-1.65(-1.81)	-4.84(-4.64)	-7.56(-7.26)	-7.39(-7.03)	6.35(-6.39)	-7.62(-6.68)	-8.99(-7.14)</																



Antenna Pattern

Appendix B

φ(120°)	8.4217-15	-8.6710-59	-14.0210-15	-9.4210-17	-11.79-23	-12.13-12.81	-9.15-7.85	-12.37-14.83	-12.00-11.75	-12.66-10.73	-10.20-10.97	-9.34-7.58	-7.65-7.41	-4.81-8.32	-7.14-7.68	-11.58-10.21	-2.55-1.84	-2.39-1.73	5.37-2.47	-1.38-4.08	-4.76-4.44	-4.55-5.74	-4.39-10.21	-14.78-10.85
φ(125°)	-11.02-12.60	-10.36-9.84	-10.78-7.96	-7.79-9.34	-10.99-11.76	-10.68-11.35	-11.25-11.93	-12.42-11.48	-11.50-12.21	-11.01-7.80	-10.14-12.57	-8.39-7.53	-6.33-7.88	-5.80-3.17	-5.56-10.86	-14.99-8.03	-1.68-3.91	-0.16-2.32	4.17-7.23	-1.44-3.50	-5.19-7.66	-5.41-3.98	-5.50-7.72	-7.07-8.02
φ(130°)	6.43-5.68	-10.69-9.84	-10.69-9.84	-7.78-6.87	-9.33-10.00	-10.63-9.28	-11.09-12.87	-11.09-12.50	-11.09-12.50	-11.09-12.50	-11.09-12.50	-12.59-9.45	-8.03-8.74	-6.26-6.46	-11.39-9.33	-14.84-14.13	-14.10-9.29	-4.79-4.81	8.65-4.88	-9.77-16.16	-4.29-9.04	-6.19-5.61	-6.83-7.19	-15.52-6.81
φ(140°)	5.21-4.97	-7.13-6.81	-8.93-6.86	-7.98-6.23	-12.19-13.96	-12.16-12.25	-12.44-10.51	-9.23-9.80	-11.20-15.31	-15.25-15.15	-13.86-12.67	-14.94-14.57	-12.91-9.95	-8.69-8.81	-12.86-14.01	-7.89-6.85	-6.00-2.30	-1.86-0.67	7.92-4.15	-2.06-2.18	-3.48-4.19	-13.50-7.98	-4.93-5.75	-6.80-4.30
φ(150°)	7.80-5.49	-6.16-6.83	-12.72-15.45	-12.63-10.15	-10.34-10.67	9.35-9.70	-10.16-10.33	-11.38-13.05	-11.32-12.00	-10.10-9.89	-11.43-14.53	-14.75-12.26	-10.83-12.14	-12.17-10.84	-6.86-6.85	-10.52-9.56	-5.23-3.46	-4.40-6.82	8.00-0.04	4.24-4.12	-4.96-5.98	-7.13-7.14	-5.12-5.90	-6.85-4.71
φ(157°)	-16.08-12.20	-10.71-11.95	-14.62-14.45	-15.13-12.55	-10.62-9.68	6.88-6.92	-10.35-10.56	-10.07-10.08	-11.57-12.40	-11.12-9.78	-8.59-7.38	-6.59-6.40	-7.15-8.72	-10.99-11.01	-11.73-13.28	-10.56-4.44	-5.50-7.04	-6.82-12.08	-11.22-7.09	4.86-4.45	-5.49-7.34	-6.66-7.74	-6.71-7.42	-10.98-14.61
φ(165°)	-10.87-12.45	-11.21-12.15	-13.67-15.40	-14.76-15.80	-14.89-15.67	-15.21-15.71	-14.96-15.35	-15.50-15.49	-14.84-13.31	-11.88-10.15	-9.25-8.51	-8.49-6.69	-8.93-9.53	-10.09-9.88	-8.51-9.46	-5.44-6.36	-5.22-7.05	-6.88-10.04	-9.77-8.67	-7.92-7.52	-7.79-8.15	-8.84-9.53	-6.28-6.80	-10.49-14.80
φ(172°)	-10.30-16.18	-10.51-11.95	-13.79-15.70	-16.01-15.27	-14.78-15.19	-14.88-15.04	-15.00-14.44	-13.89-13.94	-10.39-12.27	-11.44-10.44	-9.19-7.72	-8.60-9.13	-5.98-6.04	-6.41-6.99	-5.57-8.73	-7.49-7.53	-7.70-7.98	-8.65-9.32	-10.24-11.52	-11.78-11.81	-10.79-11.46	-11.31-9.98	-10.40-10.73	-14.69-14.73
φ(180°)	-14.82-14.25	-15.20-15.21	-15.62-12.80	-12.26-11.91	-12.16-12.41	-11.13-10.08	-13.39-14.09	-15.26-15.71	-15.37-15.67	-17.17-15.48	-15.20-14.89	-15.17-15.48	-15.80-15.46	-15.56-14.75	-15.73-14.42	-14.60-14.54	-13.59-12.86	-10.20-13.94	-15.10-15.52	-15.02-15.16	-15.52-15.29	-14.96-14.67	-13.27-14.54	-14.65-14.78
Frequency	5.85GHz	Table No.3	φ(120°)	φ(125°)	φ(130°)	φ(140°)	φ(150°)	φ(157°)	φ(165°)	φ(172°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)
Gain	φ(120°)	φ(125°)	φ(130°)	φ(140°)	φ(150°)	φ(157°)	φ(165°)	φ(172°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)	φ(180°)
φ(17°)	6.67-6.50	5.95-6.01	5.22-6.15	5.16-6.16	5.29-6.02	5.75-6.29	5.71-6.00	5.16-6.23	5.21-6.10	5.02-6.14	5.26-6.24	5.00-6.05	5.33-6.21	5.65-6.02	5.52-6.41	5.32-6.45	5.09-6.02	4.3-4.33	5.20-6.07	5.18-6.06	5.08-6.00	5.15-6.02	5.09-6.03	5.09-6.03
φ(17°)	5.88-5.14	5.64-6.05	5.53-6.75	5.69-6.39	5.62-6.77	5.82-6.60	5.80-6.24	5.64-6.59	5.46-6.15	5.13-6.34	5.57-6.69	5.59-6.51	5.59-6.63	5.41-6.25	5.33-6.54	5.46-6.29	5.04-6.03	0.00-0.03	0.00-0.01	0.04-0.11	0.04-0.11	0.05-0.12	0.05-0.12	0.05-0.12
φ(19°)	2.21-1.93	-1.68-1.67	2.19-2.36	-2.25-2.23	2.53-2.65	2.47-1.88	-1.43-1.80	-1.92-2.16	1.79-1.25	-1.91-1.12	-1.26-1.44	-2.37-2.40	2.35-2.20	2.35-2.20	-1.91-1.54	-1.14-0.37	0.41-0.10	1.63-0.71	2.91-2.21	2.11-0.81	0.05-0.06	0.40-0.44	-1.23-1.55	-1.61-1.95
φ(22°)	2.29-2.09	-2.17-2.05	-2.71-2.85	-3.17-3.44	-4.23-4.65	4.58-4.10	-3.74-3.40	-3.35-3.79	3.74-3.61	-3.30-3.13	-2.81-2.80	-3.11-3.77	-4.33-4.65	-5.26-5.06	-4.50-3.27	-1.78-0.66	0.20-1.29	2.22-3.42	1.83-3.83	3.31-2.77	2.38-2.12	1.66-0.86	-0.28-1.23	-1.26-1.66
φ(30°)	3.58-3.84	-3.63-4.05	-3.86-2.70	-1.80-1.76	-2.75-3.62	3.71-3.27	-3.36-3.29	-3.49-3.85	4.39-3.61	5.56-5.75	5.31-4.82	-5.04-5.63	6.12-5.69	-4.60-4.84	-3.89-2.65	-1.91-1.59	-1.20-0.13	1.60-0.25	2.63-2.55	2.64-0.36	3.19-2.44	3.34-1.43	0.03-1.30	-2.10-1.13
φ(37°)	4.39-4.31	-4.09-4.29	-5.31-5.17	-3.74-3.47	-4.08-4.12	3.97-3.50	-2.90-3.13	-1.36-2.23	3.39-3.50	7.56-7.94	6.37-5.27	-5.20-5.64	6.97-6.83	-3.99-3.58	-3.29-2.80	-2.49-2.92	-2.45-1.04	-0.00-0.58	1.12-1.22	0.65-0.64	1.43-2.18	2.28-1.68	0.51-1.26	-2.56-0.35
φ(45°)	4.12-4.38	-4.65-4.85	-5.80-7.07	-7.15-6.83	6.19-4.88	4.20-3.47	-1.60-0.43	-0.80-2.47	3.73-4.50	5.44-6.17	5.84-6.47	-5.04-5.75	6.19-6.85	-5.23-5.21	-4.84-4.65	-4.84-4.65	-3.16-5.09	0.97-1.12	-0.36-1.99	-1.21-0.38	0.91-1.11	0.91-1.11	0.51-0.52	-3.54-0.68
φ(52°)	3.33-2.46	-2.87-4.07	-4.27-3.52	-5.30-7.31	6.20-3.94	3.14-0.79	-1.33-0.49	-0.90-2.98	4.70-5.74	6.77-6.57	-4.87-4.82	-5.21-5.26	5.17-4.98	-4.78-4.29	-4.21-4.43	-3.47-3.16	-4.12-4.26	-1.86-0.63	0.47-0.65	-0.04-1.86	-0.69-0.35	-1.62-0.49	5.66-4.57	-3.71-3.75
φ(60°)	1.37-1.44	-0.96-1.97	-4.77-6.02	-5.86-6.42	6.50-4.33	2.98-2.81	-1.72-0.08	-0.64-3.71	5.61-5.53	5.13-5.05	-4.67-4.46	-6.03-4.92	-4.02-4.38	-4.14-3.13	-3.57-3.33	-3.10-3.50	-2.50-2.43	-1.24-0.41	1.78-1.01	-0.03-0.30	-1.20-0.94	4.95-3.09	-1.24-0.19	5.10-0.81
φ(67°)	1.80-2.54	2.15-1.87	-5.27-6.83	6.44-4.95	-8.85-5.50	4.06-2.75	-2.36-1.27	-2.26-1.64	7.07-6.55	-7.20-6.81	-5.71-6.77	-6.60-4.38	-4.19-3.75	-2.84-3.03	-3.38-3.10	-2.49-1.69	-1.05-0.94	0.10-1.84	2.35-1.31	1.41-1.67	0.14-0.49	-4.64-3.08	-1.70-0.67	-1.33-1.81
φ(75°)	1.98-2.89	3.34-3.04	6.57-13.22	-11.60-6.68	5.80-6.47	5.56-4.59	4.03-4.30	-2.94-2.64	8.39-8.07	-7.82-6.21	-10.52-9.50	-7.87-7.48	-3.82-3.84	-3.24-3.11	-2.52-2.60	-4.19-1.59	-0.99-0.76	0.78-0.44	2.52-0.62	2.00-0.68	0.88-1.14	-2.52-0.86	-1.43-2.28	-3.85-2.55
φ(82°)	2.37-4.79	-4.69-2.45	-5.96-12.61	-13.22-6.65	4.94-5.30	-7.58-6.59	-3.90-4.44	-4.97-5.83	8.87-8.79	-8.37-7.85	-6.57-6.86	-6.02-3.82	6.31-3.92	-7.25-3.26	-4.10-5.69	-3.94-3.61	0.18-1.59	1.16-2.69	1.65-1.16	3.21-2.35	-2.43-4.39	-1.54-0.63	-1.37-1.83	-0.74-0.83
φ(90°)	3.28-6.81	-7.59-6.94	-14.76-16.40	-16.40-6.55	6.05-5.31	5.83-6.44	5.31-4.25	-0.04-8.51	9.74-9.71	-10.89-10.62	-9.58-9.58	-8.41-4.39	6.01-2.60	-4.98-4.68	-4.23-5.70	-4.13-1.19	0.78-4.15	0.69-1.91	0.84-0.11	2.41-0.19	-2.71-4.00	-3.71-2.58	-3.87-7.25	-6.92-4.25
φ(97°)	8.47-10.51	-7.31-6.17	-7.30-8.74	-13.08-5.33	5.59-5.05	4.17-5.45	-4.01-3.97	-5.98-7.98	8.53-8.47	9.71-7.83	6.74-6.43	5.13-5.61	5.42-2.22	-3.24-4.48	-4.60-4.46	-3.50-1.65	-2.81-5.68	0.38-1.18	2.01-1.14	0.53-1.56	-4.67-5.38	-6.22-6.99	-7.39-10.30	5.98-5.45
φ(105°)	7.57-12.68	-10.88-10.68	-10.36-11.49	-9.83-11.43	8.80-8.20	3.91-4.49	-4.83-4.67	-8.99-11.17	-12.76-9.68	6.72-7.87	-7.37-5.57	-5.64-5.55	5.69-4.28	-5.20-4.63	-4.52-5.25	-4.81-4.74	-4.81-4.24	-1.96-2.47	-1.83-0.30	-5.64-2.42	-6.89-6.77	-6.88-6.18	-6.18-7.47	-4.69-5.60
φ(112°)	5.64-7.24	-11.50-15.15	-11.96-12.00	-10.52-9.68	5.98-5.86	6.80-6.35	4.32-6.16	8.40-11.58	-15.47-12.29	-11.00-7.88	6.44-7.10	5.29-6.45	8.70-5.62	5.21-6.17	5.54-5.51	4.49-4.67	4.73-5.21	2.22-3.29	2.94-0.90	0.25-0.49	0.60-0.52	0.60-1.15	-10.89-9.92	-5.91-7.74
φ(120°)	9.51-10.07	-8.98-10.07	-10.20-10.28	9.71-9.67	9.51-13.42	-12.27-9.07	6.25-9.70	-10.60-9.84	9.55-10.37	-11.27-10.50	-12.27-1.52	7.86-10.30	9.75-9.40	6.12-6.36	5.12-6.36	7.07-6.28	4.22-0.27	2.98-3.06	6.28-1.67	-0.89-0.44	7.91-6.15	8.47-10.17	9.70-9.57	-12.65-10.17
φ(127°)	9.14-11.88	-12.79-14.05	-10.19-14.54	9.61-11.24	-14.97-13.10	-12.83-12.10	-10.79-13.71	-12.95-9.68	-14.44-9.02	9.27-7.98	6.91-9.06	10.69-9.68	1.76-3.63	3.28-1.67	6.99-9.68	-1.54-2.75	-3.40-3.76	9.70-1.71	9.20-7.76	9.91-9.69	6.99-6.80	6.94-9.40	-8.44-7.02	-6.53-9.51
φ(134°)	4.99-7.75	-11.36-13.72	-8.94-7.86	4.25-11.07	-12.68-10.12	8.62-9.18	-11.36-10.12	8.89-10.97	-11.76-11.79	9.15-9.37	-7.92-9.03	5.10-5.44	3.59-3.42	3.80-3.32	3.99-5.15	9.73-5.44	-1.96-0.45	2.07-4.10	7.11-1.90	0.83-2.36	-7.80-15.36	6.90-6.57	-11.49-9.99	-12.47-13.28
φ(142°)	7.15-7.54	-8.99-9.40	-10.64-10.32	8.96-11.76	-13.85-8.67	8.16-8.63	9.54-13.77	-15.03-14.83	-12.72-12.02	-14.02-13.30	-10.94-9.33	8.00-12.74	4.35-6.40	5.19-6.67	5.19-6.67	4.94-5.44	4.94-5.44	4.94-5.44	4.94-5.44	4.94-5.44	4.94-5.44	4.94-5.44	4.94-5.44	4.94-5.44
φ(150°)	8.89-8.55	-8.70-11.02	-13.22-14.41	-15.38-14.32	-11.50-9.73	9.01-9.78	-10.93-13.83	-15.71-13.57	8.12-8.59	6.90-10.08	-13.51-13.86	-12.57-12.94	8.30-9.03	7.96-8.00	-10.33-10.33	-11.33-13.07	-8.80-5.36	5.91-7.62	-1.14-4.10	-2.58-2.42	-4.58-4.54	-3.95-7.50	-3.54-6.48	-8.76-8.55
φ(157°)	-12.72-11.35	-10.50-12.43	-12.75-15.62	-12.07-6.65	-6.86-9.22	-6.19-9.48	-6.41-10.10	-10.71-10.83	-11.41-9.04	-8.14-8.13	-8.27-9.44	-7.43-7.47	-7.88-8.87	-6.21-6.25	-7.48-8.02	-6.94-6.14	-6.58-6.27	-4.10-10.17	-1.13-1.78	-6.29-4.91	-6.89-6.57	-6.30-7.49	-5.23-6.34	-8.19-15.48
φ(165°)	-12.23-11.69	-10.32-6.64	-9.07-9.62	-10.90-11.35	-11.57-11.31	-11.22-11.53	-13.14-13.90	-11.50-10.53	-8.60-8.86	-6.34-6.15	-8.45-8.89	-6.70-6.71	-11.15-11.23	-10.90-11.02	6.32-6.27	-7.23-6.35	-6.16-6.86	6.89-6.93	6.90-7.23	-5.90-6.85	-4.70-5.48	-6.55-8.20	-6.80-10.14	-12.57-12.93
φ(172°)	-12.55-11.31	-11.60-11.23	-10.95-11.03	-11.89-13.73	-14.37-13.47	-14.37-13.47	-15.70-14.6																	



Antenna Pattern

Appendix B

φ(172.5°)	8.07173	-7.26732	-6.84431	-5.52059	-4.96047	-4.17365	-3.41134	-3.79438	-5.01154	-6.38075	-7.96089	-8.82108	-10.68103	-10.11136	-11.21127	-12.51137	-14.58147	-13.91138	-13.04125	-12.15113	-10.81108	-11.83118	-10.93109	-9.36180
φ(180°)	-15.67154	-14.53135	-11.85117	-10.69106	-11.29111	-10.60109	-10.16106	-11.63121	-11.11148	-14.68144	-14.12143	-14.28142	-14.12143	-15.21157	-14.77149	-14.21140	-14.73151	-15.71152	-15.05158	-14.86154	-14.48166	-15.93159	-15.29156	-15.78158
Freq(Hz)	5.350Ph	Total/4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Gain	φ(0°/φ(0.5°))	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°)	6.55148	4.89718	-7.67102	-7.95158	-7.49172	6.69162	6.90164	6.70148	6.21130	6.42141	6.40141	5.93151	5.87102	6.31173	7.02167	6.19153	5.93154	5.98154	4.99140	4.93151	4.91154	5.19156	5.99157	5.96167
φ(15°)	6.27111	5.83153	5.38157	5.28143	3.86138	3.84139	3.73153	3.51151	3.53136	3.54135	4.13140	5.42150	6.04153	6.95175	8.00159	8.19157	7.49171	7.57177	7.59178	7.10184	6.08155	5.43171	5.51159	5.64166
φ(30°)	3.72120	2.28121	2.26127	2.21123	2.28127	2.38129	2.46126	2.28128	2.26123	2.29126	2.78138	4.09153	5.81157	8.49159	11.71163	14.80166	16.93168	18.91170	20.84172	22.62174	24.15176	25.33178	26.15180	26.67182
φ(45°)	2.71118	1.92116	2.04120	1.95122	2.03121	2.27120	2.50119	2.62118	2.67114	2.64114	2.81119	3.21122	3.60125	4.00128	4.29130	4.29130	3.81143	3.61145	3.61145	3.40146	3.18147	2.93149	2.71151	2.58153
φ(60°)	3.93130	3.78130	3.69125	3.61122	3.29124	2.78134	2.69133	2.61134	2.61134	2.61134	2.61134	2.61134	2.61134	2.61134	2.61134	2.61134	2.61134	2.61134	2.61134	2.61134	2.61134	2.61134	2.61134	2.61134
φ(75°)	6.61173	6.94176	6.42119	6.07111	5.26118	3.98118	2.78118	1.71143	0.44123	3.98118	6.94176	12.51153	17.91158	22.91163	27.91168	32.91173	37.91178	42.91183	47.91188	52.91193	57.91198	62.91203	67.91208	72.91213
φ(90°)	6.74140	6.91122	6.13140	5.73151	5.21158	4.14158	2.71158	1.09158	0.41158	6.74140	6.91122	6.13140	5.73151	5.21158	4.14158	2.71158	1.09158	0.41158	6.74140	6.91122	6.13140	5.73151	5.21158	4.14158
φ(105°)	4.96135	5.29118	5.09116	4.86144	4.94126	5.69148	6.69162	7.49172	8.01176	8.21176	8.01176	7.49172	6.69162	5.69148	4.94126	4.86144	5.09116	5.29118	4.96135	4.96135	4.96135	4.96135	4.96135	4.96135
φ(120°)	2.93128	2.79132	2.73136	2.61138	2.31140	1.82142	1.09142	0.31142	0.00142	2.93128	2.79132	2.73136	2.61138	2.31140	1.82142	1.09142	0.31142	0.00142	2.93128	2.79132	2.73136	2.61138	2.31140	1.82142
φ(135°)	4.67140	5.01122	4.79120	4.53148	4.37151	5.14173	6.14187	6.94191	7.49195	7.81195	7.81195	7.49195	6.94191	6.14187	5.14173	4.53148	4.79120	4.67140	4.67140	4.67140	4.67140	4.67140	4.67140	4.67140
φ(150°)	6.48135	6.91118	6.29116	5.86144	5.43148	6.29116	7.49172	8.49186	9.21186	9.64186	9.64186	9.21186	8.49186	7.49172	6.29116	5.86144	5.43148	5.29118	6.48135	6.48135	6.48135	6.48135	6.48135	6.48135
φ(165°)	4.93128	4.79132	4.73136	4.61138	4.31140	3.82142	2.09142	0.31142	0.00142	4.93128	4.79132	4.73136	4.61138	4.31140	3.82142	2.09142	0.31142	0.00142	4.93128	4.79132	4.73136	4.61138	4.31140	3.82142
φ(180°)	2.93128	2.79132	2.73136	2.61138	2.31140	1.82142	1.09142	0.31142	0.00142	2.93128	2.79132	2.73136	2.61138	2.31140	1.82142	1.09142	0.31142	0.00142	2.93128	2.79132	2.73136	2.61138	2.31140	1.82142
φ(195°)	4.67140	5.01122	4.79120	4.53148	4.37151	5.14173	6.14187	6.94191	7.49195	7.81195	7.81195	7.49195	6.94191	6.14187	5.14173	4.53148	4.79120	4.67140	4.67140	4.67140	4.67140	4.67140	4.67140	4.67140
φ(210°)	6.48135	6.91118	6.29116	5.86144	5.43148	6.29116	7.49172	8.49186	9.21186	9.64186	9.64186	9.21186	8.49186	7.49172	6.29116	5.86144	5.43148	5.29118	6.48135	6.48135	6.48135	6.48135	6.48135	6.48135
φ(225°)	4.93128	4.79132	4.73136	4.61138	4.31140	3.82142	2.09142	0.31142	0.00142	4.93128	4.79132	4.73136	4.61138	4.31140	3.82142	2.09142	0.31142	0.00142	4.93128	4.79132	4.73136	4.61138	4.31140	3.82142
φ(240°)	2.93128	2.79132	2.73136	2.61138	2.31140	1.82142	1.09142	0.31142	0.00142	2.93128	2.79132	2.73136	2.61138	2.31140	1.82142	1.09142	0.31142	0.00142	2.93128	2.79132	2.73136	2.61138	2.31140	1.82142
φ(255°)	4.67140	5.01122	4.79120	4.53148	4.37151	5.14173	6.14187	6.94191	7.49195	7.81195	7.81195	7.49195	6.94191	6.14187	5.14173	4.53148	4.79120	4.67140	4.67140	4.67140	4.67140	4.67140	4.67140	4.67140
φ(270°)	6.48135	6.91118	6.29116	5.86144	5.43148	6.29116	7.49172	8.49186	9.21186	9.64186	9.64186	9.21186	8.49186	7.49172	6.29116	5.86144	5.43148	5.29118	6.48135	6.48135	6.48135	6.48135	6.48135	6.48135
φ(285°)	4.93128	4.79132	4.73136	4.61138	4.31140	3.82142	2.09142	0.31142	0.00142	4.93128	4.79132	4.73136	4.61138	4.31140	3.82142	2.09142	0.31142	0.00142	4.93128	4.79132	4.73136	4.61138	4.31140	3.82142
φ(300°)	2.93128	2.79132	2.73136	2.61138	2.31140	1.82142	1.09142	0.31142	0.00142	2.93128	2.79132	2.73136	2.61138	2.31140	1.82142	1.09142	0.31142	0.00142	2.93128	2.79132	2.73136	2.61138	2.31140	1.82142
φ(315°)	4.67140	5.01122	4.79120	4.53148	4.37151	5.14173	6.14187	6.94191	7.49195	7.81195	7.81195	7.49195	6.94191	6.14187	5.14173	4.53148	4.79120	4.67140	4.67140	4.67140	4.67140	4.67140	4.67140	4.67140
φ(330°)	6.48135	6.91118	6.29116	5.86144	5.43148	6.29116	7.49172	8.49186	9.21186	9.64186	9.64186	9.21186	8.49186	7.49172	6.29116	5.86144	5.43148	5.29118	6.48135	6.48135	6.48135	6.48135	6.48135	6.48135
φ(345°)	4.93128	4.79132	4.73136	4.61138	4.31140	3.82142	2.09142	0.31142	0.00142	4.93128	4.79132	4.73136	4.61138	4.31140	3.82142	2.09142	0.31142	0.00142	4.93128	4.79132	4.73136	4.61138	4.31140	3.82142
φ(360°)	2.93128	2.79132	2.73136	2.61138	2.31140	1.82142	1.09142	0.31142	0.00142	2.93128	2.79132	2.73136	2.61138	2.31140	1.82142	1.09142	0.31142	0.00142	2.93128	2.79132	2.73136	2.61138	2.31140	1.82142

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

