



Antenna Composite Gain Test Report

FCC ID	MSQ-RTAX5D00
Equipment	ROG Rapture Quad-band Gaming Router
Brand Name	ASUS
Model Name	GT-AXE16000
Applicant	ASUSTeK COMPUTER INC. 1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan
Standard	KDB662911 D03 v01
Sample Received	Aug. 23, 2023
Start Test Date	Nov. 28, 2023
Final Test Date	Nov. 29, 2023

Sporton International Inc. Hsinchu Laboratory

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



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1. Operation Mode and Antenna Information

Antenna Position	RF Port	Brand Name	Model Name	Ant. Type	Connector	Remark
2G5GL Ant1	2	WALSIN	RFPCA311406IMLB901	PCB	I-PEX	Radio 1 (WLAN 2.4GHz+WLAN 5GHz UNII 1, UNII2A)
2G5GL Ant2	1	WALSIN	RFDPA181121IMLB901	Dipole	I-PEX	
2G5GL Ant3	4	WALSIN	RFDPA181121IMLB902	Dipole	I-PEX	
2G5GL Ant4	3	WALSIN	RFDPA181105IMLB901	Dipole	I-PEX	
5G Ant1	4	WALSIN	RFPCA191412IM5B901	PCB	I-PEX	Radio 2 (WLAN 5GHz UNII 2C ~ UNII3)
5G Ant2	3	WALSIN	RFDPA181108IM5B901	Dipole	I-PEX	
5G Ant3	2	WALSIN	RFDPA181119IM5B901	Dipole	I-PEX	
5G Ant4	1	WALSIN	RFDPA181125IM5B901	Dipole	I-PEX	
6G Ant1	4	WALSIN	RFPCA170920IM6B901	PCB	I-PEX	Radio 3 (WLAN 6GHz UNII 5 ~ UNII 8)
6G Ant2	3	WALSIN	RFPCA222024IMLB901	PCB	I-PEX	
6G Ant3	2	WALSIN	RFDPA181119IM6B901	Dipole	I-PEX	
6G Ant4	1	WALSIN	RFDPA181110IM6B901	Dipole	I-PEX	

Note:

2.4GHz and 5GHz (UNII 1, UNII2A) Operation Mode (4TX/4RX)

2G5GL Ant1~4 can be used as transmitting/receiving antenna.

2G5GL Ant1~4 could transmit/receive simultaneously.

5GHz (UNII 2C ~ UNII3) Operation Mode (4TX/4RX)

5G Ant1~4 can be used as transmitting/receiving antenna.

5G Ant1~4 could transmit/receive simultaneously.

6GHz Operation Mode (4TX/4RX)

6G Ant1~4 can be used as transmitting/receiving antenna.

6G Ant1~4 could transmit/receive simultaneously.



- Mode1 : Radio1 Dual Band (2G5GL)
Frequency Band : 2.4GHz, 5GHz UNII-1, UNII-2A
Antenna pol. : external antenna vertical, internal fixed antenna(hor.)
- Mode2 : Radio1 Dual Band (DB)
Frequency Band : 2.4GHz, 5GHz UNII-1, UNII-2A
Antenna pol. : external antenna horizontal, internal fixed antenna(hor.)
- Mode3 : Radio2 5GH
Frequency Band : 5GHz UNII-2C, UNII-3
Antenna pol. : external antenna vertical, internal fixed antenna(hor.)
- Mode4 : Radio2 5GH
Frequency Band : 5GHz UNII-2C, UNII-3
Antenna pol. : external antenna horizontal, internal fixed antenna(hor.)
- Mode5 : Radio3 6G
Frequency Band : 6GHz UNII-5, UNII-6, UNII-7, UNII-8
Antenna pol. : external antenna vertical, internal fixed antenna(ver. & hor.)
- Mode6 : Radio3 6G
Frequency Band : 6GHz UNII-5, UNII-6, UNII-7, UNII-8
Antenna pol. : external antenna horizontal, internal fixed antenna(ver. & hor.)

1.1 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: AP1N0529

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Revision of the measurement methods for the antenna.	All test items.



2. Test Frequency

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

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

3. Testing Location

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

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
Radiated	05CH03-HY	Rex Liao	22.5-23.5 / 40-50	Nov. 28, 2023~Nov. 29, 2023

Note:

Testing Site Information

Brand Name: TDK

Dimension: 11m*6m*6m

Characteristic: Fully Anechoic Chamber

4. Test Facility and Configuration

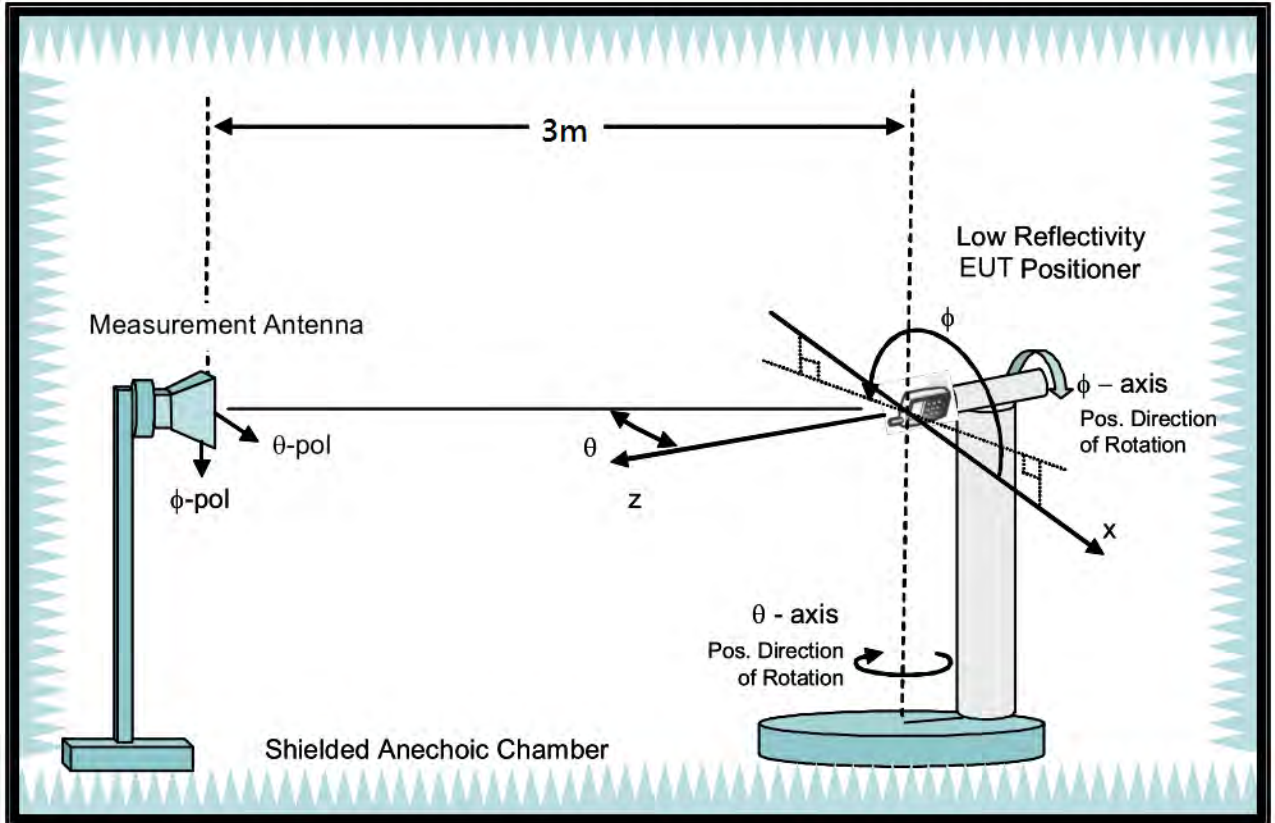
Test configuration: Reference to CITA OTA distributed-axes system configuration.

Chamber: Fully Anechoic Chamber.

Measurement antenna: Dual Polarization Horn antenna

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

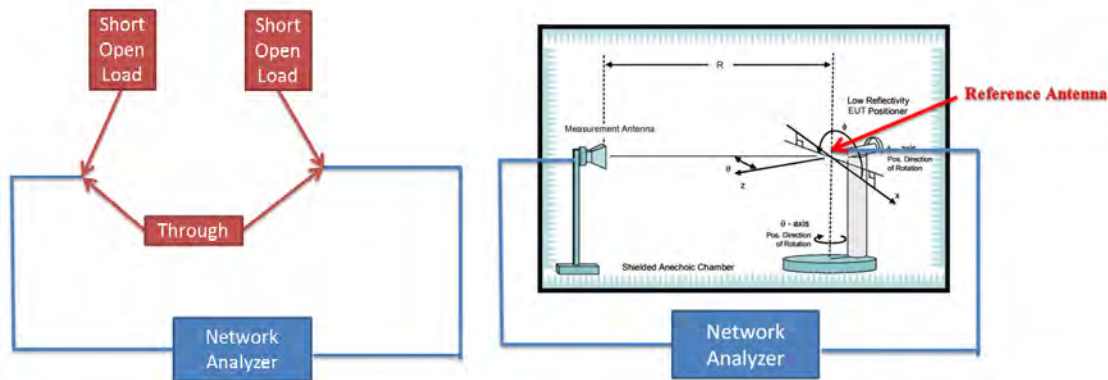
#Reference to CTIA "ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1"



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)	-33.75	-33.64	-32.91	-32.21	-32.45	-32.33	-32.57	-32.94	-32.78	-33.35	-32.91	-33.81	-34.54	-35.64
G(phi) reading (dB)	-33.19	-32.12	-32.48	-32.51	-32.64	-31.68	-32.24	-32.45	-32.45	-32.85	-32.45	-33.62	-34.48	-35.24
Reference gain (dBi)	10	10.4	10.6	12.3	12.5	13.3	13.3	13.2	13.1	13	13.2	12.4	11.8	11.1
Factor(theta) (dB)	43.75	44.04	43.51	44.51	44.95	45.63	45.87	46.14	45.88	46.35	46.11	46.21	46.34	46.74
Factor(phi) (dB)	43.19	42.52	43.08	44.81	45.14	44.98	45.54	45.65	45.55	45.85	45.65	46.02	46.28	46.34

Note:

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

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

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

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



6. Test Method

EUT set on multi-axis positioner and adjust EUT's physical center to measurement reference center. Measurement antenna set at phi polarization and 1.5 meter height. Port 1 of Network analyzer connect to antenna 1 of EUT. Record G value every 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

For Mode 1

DG_1SS max value position

Frequency (Hz)	2.45G	5.2G	5.3G
Ant. 1 (dBi)	1	-3.05	-9.74
Ant. 2 (dBi)	-1.91	-0.16	3.84
Ant. 3 (dBi)	-4.31	-0.48	1.55
Ant. 4 (dBi)	-1.55	3.14	0.52
DG [1SS] (dBi)	4.53	6.17	6.32
Polarization	Theta	Theta	Theta
Θ (°)	45	90	97.5
Φ (°)	157.5	30	187.5

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

DG_1SS max value position calculation

Frequency (Hz)	2.45G	5.2G	5.3G
Ant. 1 [10 ^{^(G/20)}]	10 ^{^(1/20)}	10 ^{^(-3.05/20)}	10 ^{^(-9.74/20)}
Ant. 2 [10 ^{^(G/20)}]	10 ^{^(-1.91/20)}	10 ^{^(-0.16/20)}	10 ^{^(3.84/20)}
Ant. 3 [10 ^{^(G/20)}]	10 ^{^(-4.31/20)}	10 ^{^(-0.48/20)}	10 ^{^(1.55/20)}
Ant. 4 [10 ^{^(G/20)}]	10 ^{^(-1.55/20)}	10 ^{^(3.14/20)}	10 ^{^(0.52/20)}
Ant. 1 [10 ^{^(G/20)}] value	1.122	0.704	0.326
Ant. 2 [10 ^{^(G/20)}] value	0.803	0.982	1.556
Ant. 3 [10 ^{^(G/20)}] value	0.609	0.946	1.195
Ant. 4 [10 ^{^(G/20)}] value	0.837	1.435	1.062
Sum All Antenna [Amax]	3.37	4.067	4.139
DG [10*log(Amax ² /Nant)]	4.53	6.17	6.32

Note:

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

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



For Mode 2

DG_1SS max value position

Frequency (Hz)	2.45G	5.2G	5.3G
Ant. 1 (dBi)	-2.05	-8.45	0.14
Ant. 2 (dBi)	-1.94	-0.03	-2.67
Ant. 3 (dBi)	-0.75	-5.1	1.28
Ant. 4 (dBi)	0.43	3.69	-5.25
DG [1SS] (dBi)	5	4.76	4.75
Polarization	Phi	Phi	Phi
Θ (°)	142.5	112.5	82.5
Φ (°)	45	0	255

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
Ant. 1 [10^(G/20)]	10^(-2.05/20)	10^(-8.45/20)	10^(0.14/20)
Ant. 2 [10^(G/20)]	10^(-1.94/20)	10^(-0.03/20)	10^(-2.67/20)
Ant. 3 [10^(G/20)]	10^(-0.75/20)	10^(-5.1/20)	10^(1.28/20)
Ant. 4 [10^(G/20)]	10^(0.43/20)	10^(3.69/20)	10^(-5.25/20)
Ant. 1 [10^(G/20)] value	0.79	0.378	1.016
Ant. 2 [10^(G/20)] value	0.8	0.997	0.735
Ant. 3 [10^(G/20)] value	0.917	0.556	1.159
Ant. 4 [10^(G/20)] value	1.051	1.529	0.546
Sum All Antenna [Amax]	3.558	3.46	3.457
DG [10*log(Amax^2/Nant)]	5	4.76	4.75

Note:

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

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



For Mode 3

DG_1SS max value position

Frequency (Hz)	5.6G	5.785G
Ant. 1 (dBi)	-8.9	-0.91
Ant. 2 (dBi)	3.96	2.82
Ant. 3 (dBi)	1.76	0.95
Ant. 4 (dBi)	2.27	-1.74
DG [1SS] (dBi)	6.97	6.48
Polarization	Theta	Theta
Θ (°)	90	97.5
Φ (°)	45	135

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)	5.6G	5.785G
Ant. 1 [10^(G/20)]	10^(-8.9/20)	10^(-0.91/20)
Ant. 2 [10^(G/20)]	10^(3.96/20)	10^(2.82/20)
Ant. 3 [10^(G/20)]	10^(1.76/20)	10^(0.95/20)
Ant. 4 [10^(G/20)]	10^(2.27/20)	10^(-1.74/20)
Ant. 1 [10^(G/20)] value	0.359	0.901
Ant. 2 [10^(G/20)] value	1.578	1.384
Ant. 3 [10^(G/20)] value	1.225	1.116
Ant. 4 [10^(G/20)] value	1.299	0.818
Sum All Antenna [Amax]	4.46	4.218
DG [10*log(Amax^2/Nant)]	6.97	6.48

Note:

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

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



For Mode 4

DG_1SS max value position

Frequency (Hz)	5.6G	5.785G
Ant. 1 (dBi)	0.47	-4.59
Ant. 2 (dBi)	2.12	4.31
Ant. 3 (dBi)	0.8	0.51
Ant. 4 (dBi)	-6.26	-8.45
DG [1SS] (dBi)	5.83	5.27
Polarization	Phi	Phi
Θ (°)	112.5	112.5
Φ (°)	82.5	90

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

DG_1SS max value position calculation

Frequency (Hz)	5.6G	5.785G
Ant. 1 [10^(G/20)]	10^(0.47/20)	10^(-4.59/20)
Ant. 2 [10^(G/20)]	10^(2.12/20)	10^(4.31/20)
Ant. 3 [10^(G/20)]	10^(0.8/20)	10^(0.51/20)
Ant. 4 [10^(G/20)]	10^(-6.26/20)	10^(-8.45/20)
Ant. 1 [10^(G/20)] value	1.056	0.59
Ant. 2 [10^(G/20)] value	1.276	1.642
Ant. 3 [10^(G/20)] value	1.096	1.06
Ant. 4 [10^(G/20)] value	0.486	0.378
Sum All Antenna [Amax]	3.915	3.67
DG [10*log(Amax^2/Nant)]	5.83	5.27

Note:

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

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



For Mode 5

DG_1SS max value position

Frequency (Hz)	6.175G	6.475G	6.695G
Ant. 1 (dBi)	-9.88	-19.39	-9.56
Ant. 2 (dBi)	-4.33	-2.95	0.16
Ant. 3 (dBi)	1.6	3.09	3.82
Ant. 4 (dBi)	4.65	2.88	-0.93
DG [1SS] (dBi)	5.66	5.2	5.58
Polarization	Theta	Theta	Theta
Θ (°)	90	90	97.5
Φ (°)	135	127.5	97.5

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

DG_1SS max value position calculation

Frequency (Hz)	6.175G	6.475G	6.695G
Ant. 1 [10^(G/20)]	10^(-9.88/20)	10^(-19.39/20)	10^(-9.56/20)
Ant. 2 [10^(G/20)]	10^(-4.33/20)	10^(-2.95/20)	10^(0.16/20)
Ant. 3 [10^(G/20)]	10^(1.6/20)	10^(3.09/20)	10^(3.82/20)
Ant. 4 [10^(G/20)]	10^(4.65/20)	10^(2.88/20)	10^(-0.93/20)
Ant. 1 [10^(G/20)] value	0.321	0.107	0.333
Ant. 2 [10^(G/20)] value	0.607	0.712	1.019
Ant. 3 [10^(G/20)] value	1.202	1.427	1.552
Ant. 4 [10^(G/20)] value	1.708	1.393	0.898
Sum All Antenna [Amax]	3.838	3.64	3.802
DG [10*log(Amax^2/Nant)]	5.66	5.2	5.58

Note:

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

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



For Mode 6

DG_1SS max value position

Frequency (Hz)	6.175G	6.475G	6.695G
Ant. 1 (dBi)	1.92	1.68	2.55
Ant. 2 (dBi)	-8.78	-11.37	-6.99
Ant. 3 (dBi)	-10.5	-5.59	-1.53
Ant. 4 (dBi)	4.32	2.91	-2.12
DG [1SS] (dBi)	4.99	4.63	4.64
Polarization	Phi	Phi	Phi
Θ (°)	90	97.5	127.5
Φ (°)	330	330	322.5

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

DG_1SS max value position calculation

Frequency (Hz)	6.175G	6.475G	6.695G
Ant. 1 [$10^{(G/20)}$]	$10^{(1.92/20)}$	$10^{(1.68/20)}$	$10^{(2.55/20)}$
Ant. 2 [$10^{(G/20)}$]	$10^{(-8.78/20)}$	$10^{(-11.37/20)}$	$10^{(-6.99/20)}$
Ant. 3 [$10^{(G/20)}$]	$10^{(-10.5/20)}$	$10^{(-5.59/20)}$	$10^{(-1.53/20)}$
Ant. 4 [$10^{(G/20)}$]	$10^{(4.32/20)}$	$10^{(2.91/20)}$	$10^{(-2.12/20)}$
Ant. 1 [$10^{(G/20)}$] value	1.247	1.213	1.341
Ant. 2 [$10^{(G/20)}$] value	0.364	0.27	0.447
Ant. 3 [$10^{(G/20)}$] value	0.299	0.525	0.838
Ant. 4 [$10^{(G/20)}$] value	1.644	1.398	0.783
Sum All Antenna [Amax]	3.554	3.407	3.41
DG [$10 \cdot \log(A_{max}^2/N_{ant})$]	4.99	4.63	4.64

Note:

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

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



8. Summary of Test Result

Mode 1: 2G5GL-external antenna Vertical

Table with 4 columns: Band (MHz), 2400-2483.5, 5150-5250, 5250-5350. Rows include Frequency (Hz), Ant. 1-4 Max Gain (dBi), Ant. 1-4 Polarization, Max Gain (dBi), DG [1SS], [2SS], [4SS] (dBi).

Mode 2: 2G5GL-external antenna Horizontal

Table with 4 columns: Band (MHz), 2400-2483.5, 5150-5250, 5250-5350. Rows include Frequency (Hz), Ant. 1-4 Max Gain (dBi), Ant. 1-4 Polarization, Max Gain (dBi), DG [1SS], [2SS], [4SS] (dBi).



Mode 3: 5GH-external antenna Vertical

Band (MHz)	5470-5725	5725-5850
Frequency (Hz)	5.6G	5.785G
Ant. 1 Max Gain (dBi)	2.56	1.18
Ant. 2 Max Gain (dBi)	4.83	4.59
Ant. 3 Max Gain (dBi)	4.4	4.62
Ant. 4 Max Gain (dBi)	3.82	3.91
Ant. 1 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Theta/37.5/150	Theta/45/150
Ant. 2 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Theta/97.5/112.5	Theta/97.5/75
Ant. 3 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Theta/82.5/247.5	Theta/90/255
Ant. 4 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Theta/97.5/337.5	Theta/90/7.5
Max Gain (dBi)	4.83	4.62
DG [1SS] (dBi)	6.97	6.48
DG [2SS] (dBi)	4.83	4.62
DG [4SS] (dBi)	4.83	4.62

Mode 4: 5GH-external antenna Horizontal

Band (MHz)	5470-5725	5725-5850
Frequency (Hz)	5.6G	5.785G
Ant. 1 Max Gain (dBi)	2.56	1.18
Ant. 2 Max Gain (dBi)	4.84	4.77
Ant. 3 Max Gain (dBi)	3.62	4.56
Ant. 4 Max Gain (dBi)	4.15	4.12
Ant. 1 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Theta/37.5/150	Theta/45/150
Ant. 2 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Phi/82.5/277.5	Phi/82.5/277.5
Ant. 3 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Phi/82.5/285	Phi/82.5/285
Ant. 4 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Phi/112.5/15	Phi/127.5/7.5
Max Gain (dBi)	4.84	4.77
DG [1SS] (dBi)	5.83	5.27
DG [2SS] (dBi)	4.84	4.77
DG [4SS] (dBi)	4.84	4.77



Mode 5: 6G-external antenna Vertical

Table with 5 columns: Band (MHz), Frequency (Hz), and rows for Ant. 1-4 Max Gain, Polarization, Max Gain, DG [1SS], DG [2SS], DG [4SS].

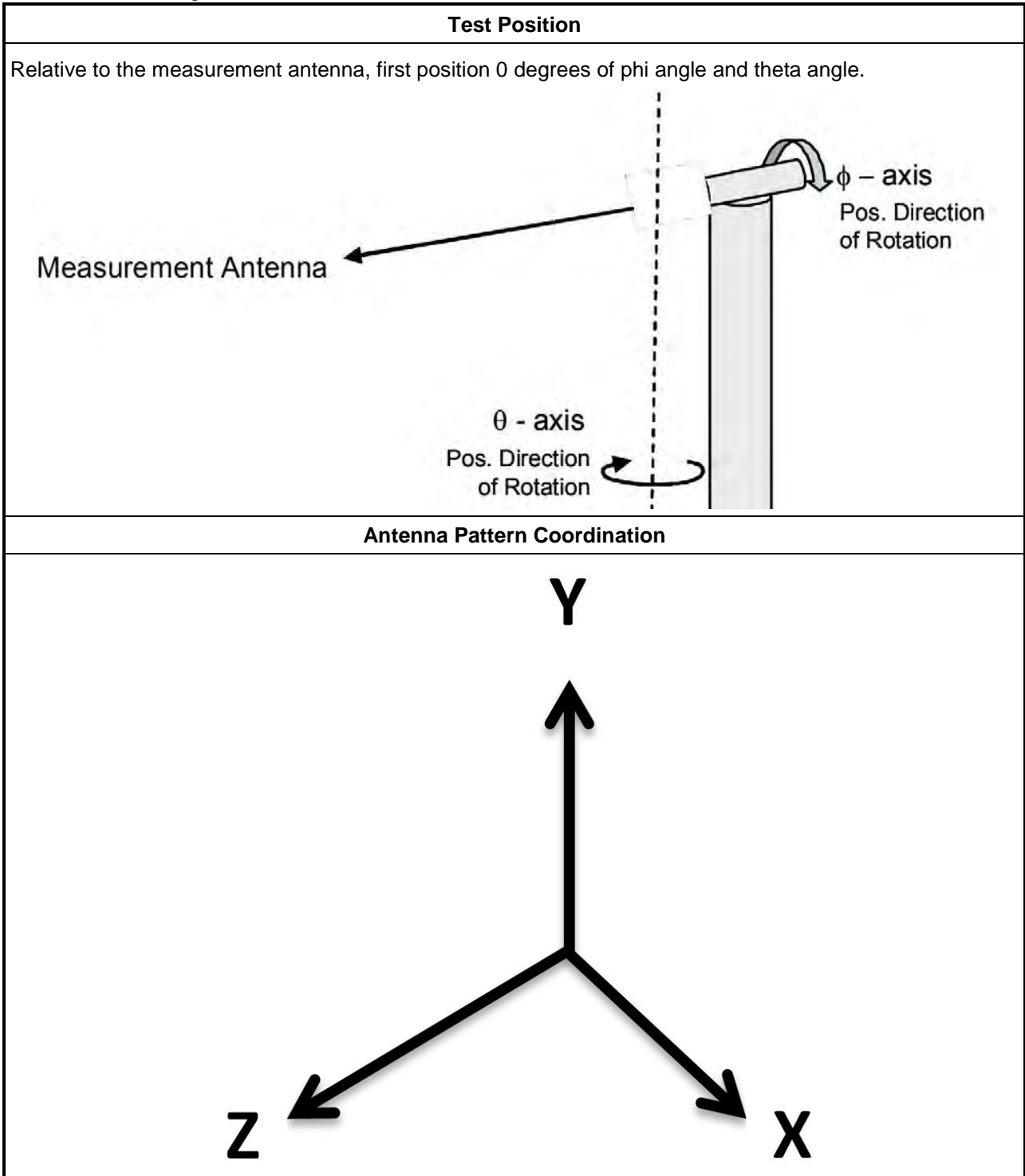
Mode 6: 6G-external antenna Horizontal

Table with 5 columns: Band (MHz), Frequency (Hz), and rows for Ant. 1-4 Max Gain, Polarization, Max Gain, DG [1SS], DG [2SS], DG [4SS].

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.
4. Directional Gain (4SS) = Directional Gain (1SS) - 6dB.

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 11, 2023	May 10, 2024
Dual Polarization Horn Antenna	Sporton	S0209DP	S0209DP-001	2GHz~9GHz	N.C.R.	N.C.R.
ENA Series Network Analyzer	AGILENT	E5071C	MY46419477	100kHz~8.5GHz	Jul. 28, 2023	Jul. 27, 2024
VNA Calibration Kit	TS RF	TS85033E-F	-	DC~9GHz	N.C.R.	N.C.R.
Multi-axis positioner	Sporton	MAPS01	MAPS01-001	Theta / Phi axis	N.C.R.	N.C.R.
Test Software	SPORTON	SENSE-RDG	V1.0.8	-	N.C.R.	N.C.R.

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

NCR means Non-Calibration required.



11. Test Results

Please refer to the appendix.

Appendix A – Radiated Composite Gain.....Page 22
Appendix B – Antenna Pattern.....Page 74
Appendix C – Test Photos..... Page 104



Mode 1

Freq(Hz)	2.45G	5.2G	5.3G
Ant. 1 Max Gain (dBi)	2.46	3.34	3.41
Ant. 2 Max Gain (dBi)	2.3	4.72	3.84
Ant. 3 Max Gain (dBi)	3.43	3.61	3.43
Ant. 4 Max Gain (dBi)	2.12	4.5	4.7
Ant. 1 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Phi/82.5/60	Phi/45/262.5	Phi/45/262.5
Ant. 2 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/97.5/195	Theta/97.5/180	Theta/97.5/187.5
Ant. 3 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/75/270	Theta/105/255	Theta/97.5/255
Ant. 4 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/75/60	Theta/97.5/22.5	Theta/97.5/22.5
Max Gain (dBi)	3.43	4.72	4.7
DG [1SS] (dBi)	4.53	6.17	6.32
DG [2SS] (dBi)	3.43	4.72	4.7
DG [4SS] (dBi)	3.43	4.72	4.7



Radiated Composite Gain Data

Appendix A.1

DG 1SS Result

Freq(Hz)	2.45GPol.	Phi	Phi(0°)	Phi(15°)	Phi(30°)	Phi(45°)	Phi(60°)	Phi(75°)	Phi(90°)	Phi(105°)	Phi(120°)	Phi(135°)	Phi(150°)	Phi(165°)	Phi(180°)	Phi(195°)	Phi(210°)	Phi(225°)	Phi(240°)	Phi(255°)	Phi(270°)	Phi(285°)	Phi(300°)	Phi(315°)	Phi(330°)	Phi(345°)																									
DG(dB)	Phi(0°)	Phi(15°)	Phi(30°)	Phi(45°)	Phi(60°)	Phi(75°)	Phi(90°)	Phi(105°)	Phi(120°)	Phi(135°)	Phi(150°)	Phi(165°)	Phi(180°)	Phi(195°)	Phi(210°)	Phi(225°)	Phi(240°)	Phi(255°)	Phi(270°)	Phi(285°)	Phi(300°)	Phi(315°)	Phi(330°)	Phi(345°)	Phi(0°)	Phi(15°)	Phi(30°)	Phi(45°)	Phi(60°)	Phi(75°)	Phi(90°)	Phi(105°)	Phi(120°)	Phi(135°)	Phi(150°)	Phi(165°)	Phi(180°)	Phi(195°)	Phi(210°)	Phi(225°)	Phi(240°)	Phi(255°)	Phi(270°)	Phi(285°)	Phi(300°)	Phi(315°)	Phi(330°)	Phi(345°)			
Theta(0°)	-7.99-6.66	-5.97-5.27	-4.46-3.61	-2.71-2.09	-1.65-1.12	-0.72-0.83	-1.54-2.49	-3.25-3.65	-3.93-4.49	-5.61-6.9	-7.96-9.47	-10.21-9.89	-9.08-7.83	-6.68-8.52	-4.66-4.26	-3.66-3.2	-2.91-2.78	-2.27-1.56	-1.26-1.65	-2.48-2.69	-3.11-3.52	-4.17-5.22	-5.17-5.68	-6.34-7.26	-8.61-9	0(0°)	-7.99-6.66	-5.97-5.27	-4.46-3.61	-2.71-2.09	-1.65-1.12	-0.72-0.83	-1.54-2.49	-3.25-3.65	-3.93-4.49	-5.61-6.9	-7.96-9.47	-10.21-9.89	-9.08-7.83	-6.68-8.52	-4.66-4.26	-3.66-3.2	-2.91-2.78	-2.27-1.56	-1.26-1.65	-2.48-2.69	-3.11-3.52	-4.17-5.22	-5.17-5.68	-6.34-7.26	-8.61-9
Theta(7.5°)	-7.86-6.63	-5.95-4.98	-4.17-3.59	-2.91-2.55	-2.31-1.99	-1.39-1.26	-2.03-3.21	-3.98-4.18	-4.65-5.33	-6.44-7.55	-8.56-9.77	-10.54-10.11	-9.95-8.07	-7.39-9.62	-4.96-4.2	-3.53-	-2.17-1.79	-1.73-1.46	-0.98-0.95	-1.68-2.61	-2.86-3.04	-4.15-5.22	-5.17-5.68	-6.34-7.26	-8.61-9	Theta(7.5°)	-7.86-6.63	-5.95-4.98	-4.17-3.59	-2.91-2.55	-2.31-1.99	-1.39-1.26	-2.03-3.21	-3.98-4.18	-4.65-5.33	-6.44-7.55	-8.56-9.77	-10.54-10.11	-9.95-8.07	-7.39-9.62	-4.96-4.2	-3.53-	-2.17-1.79	-1.73-1.46	-0.98-0.95	-1.68-2.61	-2.86-3.04	-4.15-5.22	-5.17-5.68	-6.34-7.26	-8.61-9
Theta(15°)	-7.93-6.93	-6.36-5.51	-4.66-4.05	-3.53-3.06	-2.75-2.91	-2.71-2.33	-2.41-2.87	-3.63-3.92	-4.33-5.1	-6.07-6.82	-8.38-9.2	-9.75-10.16	-8.92-8.04	-7.08-6.36	-5.5-4.66	-3.61-2.96	-2.07-1.32	-1.21-1.61	-1.54-1.2	-1.42-2.18	-2.76-2.89	-3.38-4.71	-5.88-6.82	-8.03-8.76	Theta(15°)	-7.93-6.93	-6.36-5.51	-4.66-4.05	-3.53-3.06	-2.75-2.91	-2.71-2.33	-2.41-2.87	-3.63-3.92	-4.33-5.1	-6.07-6.82	-8.38-9.2	-9.75-10.16	-8.92-8.04	-7.08-6.36	-5.5-4.66	-3.61-2.96	-2.07-1.32	-1.21-1.61	-1.54-1.2	-1.42-2.18	-2.76-2.89	-3.38-4.71	-5.88-6.82	-8.03-8.76		
Theta(22.5°)	-6.66-7.01	-6.98-6.07	-5.13-4.56	-3.92-3.58	-3.93-4.08	-3.92-3.15	-2.53-2.03	-2.16-2.63	-2.88-3.39	-4.54-5.84	-7.37-7.78	-8.88-9.71	-9.31-7.78	-6.07-5.23	-5.21-5.2	-4.22-3.38	-3.34-2.28	-2.69-2.49	-1.89-2.06	-1.89-2.06	-2.77-3.03	-3.11-3.89	-5.04-5.94	-6.3-6.3	Theta(22.5°)	-6.66-7.01	-6.98-6.07	-5.13-4.56	-3.92-3.58	-3.93-4.08	-3.92-3.15	-2.53-2.03	-2.16-2.63	-2.88-3.39	-4.54-5.84	-7.37-7.78	-8.88-9.71	-9.31-7.78	-6.07-5.23	-5.21-5.2	-4.22-3.38	-3.34-2.28	-2.69-2.49	-1.89-2.06	-1.89-2.06	-2.77-3.03	-3.11-3.89	-5.04-5.94	-6.3-6.3		
Theta(30°)	-6.72-7.03	-7.17-5.97	-5.1-4.48	-4.25-3.96	-3.37-3.01	-2.69-2.15	-1.64-1.28	-0.92-1.27	-2.31-2.91	-3.55-5.25	-7.02-6.93	-7.48-8.36	-8.58-7.77	-6.63-5.41	-5.21-4.87	-4.9-4.98	-3.37-2.93	-3.33-3.59	-2.47-2.01	-2.51-3.22	-3.39-4.03	-5.61-6.78	-6.55-6.26	Theta(30°)	-6.72-7.03	-7.17-5.97	-5.1-4.48	-4.25-3.96	-3.37-3.01	-2.69-2.15	-1.64-1.28	-0.92-1.27	-2.31-2.91	-3.55-5.25	-7.02-6.93	-7.48-8.36	-8.58-7.77	-6.63-5.41	-5.21-4.87	-4.9-4.98	-3.37-2.93	-3.33-3.59	-2.47-2.01	-2.51-3.22	-3.39-4.03	-5.61-6.78	-6.55-6.26				
Theta(37.5°)	-7.38-7.4	-7.07-5.71	-4.86-4.33	-3.94-3.58	-2.9-1.92	-1.28-0.94	-0.87-1.13	-0.97-0.84	-2.27-4.06	-4.39-5.41	-6.02-5.91	-5.69-6.13	-6.23-6.7	-7.25-6.47	-5.04-4.6	-5.09-6.36	-7.6-6.87	-5.8-4.71	-4.44-3.83	-2.78-2.29	-2.27-2.83	-3.6-4.55	-6.47-8.35	-7.6-7.12	Theta(37.5°)	-7.38-7.4	-7.07-5.71	-4.86-4.33	-3.94-3.58	-2.9-1.92	-1.28-0.94	-0.87-1.13	-0.97-0.84	-2.27-4.06	-4.39-5.41	-6.02-5.91	-5.69-6.13	-6.23-6.7	-7.25-6.47	-5.04-4.6	-5.09-6.36	-7.6-6.87	-5.8-4.71	-4.44-3.83	-2.78-2.29	-2.27-2.83	-3.6-4.55	-6.47-8.35	-7.6-7.12		
Theta(45°)	-7.47-7.53	-6.52-6.02	-5.26-4.78	-3.52-4.23	-1.59-1.11	-0.41-0.24	-0.65-1.11	-1.83-2.24	-2.92-4.46	-4.32-3.75	-4.16-4.79	-4.46-4.21	-5.43-6.99	-7.71-6.3	-5.56-5.6	-5.92-6.76	-6.95-6.61	-5.81-5.58	-4.22-3.79	-3.92-4.12	-3.91-3.34	-3.51-4.94	-7.15-9.11	-9.31-7.88	Theta(45°)	-7.47-7.53	-6.52-6.02	-5.26-4.78	-3.52-4.23	-1.59-1.11	-0.41-0.24	-0.65-1.11	-1.83-2.24	-2.92-4.46	-4.32-3.75	-4.16-4.79	-4.46-4.21	-5.43-6.99	-7.71-6.3	-5.56-5.6	-5.92-6.76	-6.95-6.61	-5.81-5.58	-4.22-3.79	-3.92-4.12	-3.91-3.34	-3.51-4.94	-7.15-9.11	-9.31-7.88		
Theta(52.5°)	-6.65-5.91	-5.43-5.79	-6.41-4.67	-2.83-1.51	-0.96-1.18	-0.99-0.9	-1.64-1.61	-2.08-3.43	-3.27-3.92	-3.86-3.09	-3.38-4.34	-4.76-4.96	-6.79-6.52	-7.65-5.26	-4.89-6.66	-8.43-8.48	-7.75-6.74	-6.01-5.01	-4.16-4.24	-4.84-4.85	-4.57-3.15	-2.95-4.41	-6.15-7.1	-7.41-6.68	Theta(52.5°)	-6.65-5.91	-5.43-5.79	-6.41-4.67	-2.83-1.51	-0.96-1.18	-0.99-0.9	-1.64-1.61	-2.08-3.43	-3.27-3.92	-3.86-3.09	-3.38-4.34	-4.76-4.96	-6.79-6.52	-7.65-5.26	-4.89-6.66	-8.43-8.48	-7.75-6.74	-6.01-5.01	-4.16-4.24	-4.84-4.85	-4.57-3.15	-2.95-4.41	-6.15-7.1	-7.41-6.68		
Theta(60°)	-5.95-4.9	-5.15-6.01	-5.47-3.44	-2.11-1.11	-0.82-1.66	-1.88-1.95	-2.58-1.89	-1.8-2.84	-2.52-2.36	-3.07-2.68	-2.66-4.56	-7.34-8.02	-8.86-9.62	-8.72-6.49	-5.91-7.48	-9.2-9.68	-7.44-6.94	-7.26-7.23	-7.45-8.36	-7.45-6.11	-5.19-3.72	-3.41-4.97	-6.21-5.67	-8.51-6.1	Theta(60°)	-5.95-4.9	-5.15-6.01	-5.47-3.44	-2.11-1.11	-0.82-1.66	-1.88-1.95	-2.58-1.89	-1.8-2.84	-2.52-2.36	-3.07-2.68	-2.66-4.56	-7.34-8.02	-8.86-9.62	-8.72-6.49	-5.91-7.48	-9.2-9.68	-7.44-6.94	-7.26-7.23	-7.45-8.36	-7.45-6.11	-5.19-3.72	-3.41-4.97	-6.21-5.67	-8.51-6.1		
Theta(67.5°)	-5.49-4.26	-4.22-4.72	-3.03-1.46	-0.72-0.01	-0.28-1.54	-2.02-2.66	-3.18-1.55	-1.84-3.74	-2.02-1.1	-1.67-2.04	-1.69-3.64	-8.13-10.25	-9.71-11.62	-11.39-8.84	-7.71-8.15	-7.37-7.23	-6.89-7.45	-9.24-9.73	-11.18-10.88	-7.26-5.36	-6.61-5.83	-4.52-4.39	-5.23-4.82	-5.64-6.35	Theta(67.5°)	-5.49-4.26	-4.22-4.72	-3.03-1.46	-0.72-0.01	-0.28-1.54	-2.02-2.66	-3.18-1.55	-1.84-3.74	-2.02-1.1	-1.67-2.04	-1.69-3.64	-8.13-10.25	-9.71-11.62	-11.39-8.84	-7.71-8.15	-7.37-7.23	-6.89-7.45	-9.24-9.73	-11.18-10.88	-7.26-5.36	-6.61-5.83	-4.52-4.39	-5.23-4.82	-5.64-6.35		
Theta(75°)	-4.57-4.12	-3.21-2.95	-1.09-0.01	0.39-0.82	0.11-1.69	-1.75-3	-3.89-1.16	-1.96-4.22	-1.03-0.07	-0.67-1.33	-1.17-2.59	-6.71-9.43	-10.59-11.86	-11.91-8.71	-9.18-9.78	-6.81-6.38	-6.89-6.07	-7.93-8.78	-8.89-11.13	-6.31-3.33	-4.64-5.94	-5.89-4.69	-5.14-4.1	-5.23-5.03	Theta(75°)	-4.57-4.12	-3.21-2.95	-1.09-0.01	0.39-0.82	0.11-1.69	-1.75-3	-3.89-1.16	-1.96-4.22	-1.03-0.07	-0.67-1.33	-1.17-2.59	-6.71-9.43	-10.59-11.86	-11.91-8.71	-9.18-9.78	-6.81-6.38	-6.89-6.07	-7.93-8.78	-8.89-11.13	-6.31-3.33	-4.64-5.94	-5.89-4.69	-5.14-4.1	-5.23-5.03		
Theta(82.5°)	-2.44-3.16	-3.1-2.28	-0.55-0.38	0.67-1.22	0.7-1.14	-1.39-2.31	-2.88-1.26	-1.95-3.16	0.30-6	-0.59-1.48	-1.53-2.33	-5.46-8.07	-7.93-10.25	-12.19-9.84	-9.13-9.92	-8.45-7.77	-7.91-6.86	-7.27-6.01	-5.87-8.17	-5.22-2.35	-2.86-4.82	-5.78-5.65	-6.59-6.38	-4.73-3.67	Theta(82.5°)	-2.44-3.16	-3.1-2.28	-0.55-0.38	0.67-1.22	0.7-1.14	-1.39-2.31	-2.88-1.26	-1.95-3.16	0.30-6	-0.59-1.48	-1.53-2.33	-5.46-8.07	-7.93-10.25	-12.19-9.84	-9.13-9.92	-8.45-7.77	-7.91-6.86	-7.27-6.01	-5.87-8.17	-5.22-2.35	-2.86-4.82	-5.78-5.65	-6.59-6.38	-4.73-3.67		
Theta(90°)	-1.89-3.02	-3.34-2.76	-0.86-0.39	1.05-1.77	1.41-0.6	-1.26-1.97	-2.51-1.6	-1.95-1.87	-0.15-0.25	-2.19-2.22	-1.79-2.42	-4.82-7.47	-6.32-8.52	-11.67-10.9	-11.31-11.69	-8.56-9.2	-11.75-12.68	-8.33-6.4	-3.87-6.29	-5.07-1.93	-1.81-4.31	-6.71-6.73	-7.26-8.08	-5.31-3.49	Theta(90°)	-1.89-3.02	-3.34-2.76	-0.86-0.39	1.05-1.77	1.41-0.6	-1.26-1.97	-2.51-1.6	-1.95-1.87	-0.15-0.25	-2.19-2.22	-1.79-2.42	-4.82-7.47	-6.32-8.52	-11.67-10.9	-11.31-11.69	-8.56-9.2	-11.75-12.68	-8.33-6.4	-3.87-6.29	-5.07-1.93	-1.81-4.31	-6.71-6.73	-7.26-8.08	-5.31-3.49		
Theta(97.5°)	-2.89-3.6	-3.41-2.2	-0.51-0.5	1.19-1.8	1.15-0.31	-0.75-2.1	-2.26-1.74	-2.62-2.14	-1.22-1.43	-2.22-2.23	-2.71-3.71	-6.65-7.21	-6.8-2.4	-9.17-10.11	-11.42-9.27	-8.15-9.66	-12.62-12.28	-9.42-4.61	-4.3-5.99	-5.46-2.28	-2.66-4.67	-7.27-8.8	-8.42-7.13	-4.58-3.67	Theta(97.5°)	-2.89-3.6	-3.41-2.2	-0.51-0.5	1.19-1.8	1.15-0.31	-0.75-2.1	-2.26-1.74	-2.62-2.14	-1.22-1.43	-2.22-2.23	-2.71-3.71	-6.65-7.21	-6.8-2.4	-9.17-10.11	-11.42-9.27	-8.15-9.66	-12.62-12.28	-9.42-4.61	-4.3-5.99	-5.46-2.28	-2.66-4.67	-7.27-8.8	-8.42-7.13	-4.58-3.67		
Theta(105°)	-3.31-3.8	-3.8-2.29	-0.87-0.16	0.52-1.39	1.30-0.8	-0.84-1.64	-1.58-1.63	-3.09-2.83	-2.17-2.65	-3.16-2.87	-3.94-5.08	-8.35-9.85	-8.85-8.89	-8.32-7.78	-9.31-9.62	-7.91-8.31	-9.94-10.04	-9.81-5.95	-6.03-8.24	-5.8-3.34	-3.52-5.89	-7.65-8.45	-7.73-6.17	-4.91-3.61	Theta(105°)	-3.31-3.8	-3.8-2.29	-0.87-0.16	0.52-1.39	1.30-0.8	-0.84-1.64	-1.58-1.63	-3.09-2.83	-2.17-2.65	-3.16-2.87	-3.94-5.08	-8.35-9.85	-8.85-8.89	-8.32-7.78	-9.31-9.62	-7.91-8.31	-9.94-10.04	-9.81-5.95	-6.03-8.24	-5.8-3.34	-3.52-5.89	-7.65-8.45	-7.73-6.17	-4.91-3.61		
Theta(112.5°)	-3.78-4.36	-3.67-1.15	0.03-2	0.73-1.5	1.46-0.43																																														



Radiated Composite Gain Data

Appendix A.1

Theta (°)	8.62/7.65	-7.79/7.27	-7.86/6.06	-6.65/4.84	-4.99/4.33	-4.86/3.87	-4.2/3.11	-3.73/4.29	-2.74/3.15	-3.76/4.42	-5.54/7.4	-7.82/9.26	-10.31/9.65	-9.4/8.29	-8.57/6.25	-6.4/5.9	-5.09/4.25	-3.85/4.7	-3.76/3.77	-4.9/4.46	-5.64/5.81	-7.28/7.91	-9.9/10.99	-9.71/8.81
Theta (15°)	-10.08/10.34	-11.93/12.8	-11.73/12.09	-10.68/9.19	-6.96/5.17	-4.06/3.93	-3.28/2.21	-1.58/1.92	-2.81/2.56	-3.6/4.3	-5.46/6	-7.01/6.88	-9.32/11.05	-9.45/9.43	-8.69/6.4	-5.27/6.05	-4.9/4.35	-3.44/2.3	-3.18/4.41	-4.36/6.07	-6.46/7.82	-7.89/7.66	-9.9/9.46	-8.42/8.1
Theta (22.5°)	-9.6/10.38	-11.06/8.6	-7.55/6.87	-7.42/7.58	-6.21/5.95	-5.1/3.69	-1.83/1.26	-0.8/1.3	-2.38/2.81	-3.5/5.52	-7.2/7	-7.36/7.52	-8.66/8.09	-7.97/6.59	-5.84/6.19	-5.13/6.79	-6.53/5.16	-4.97/5.07	-3.28/4.52	-5.45/5.56	-5.16/6	-5.15/5.92	-6.42/7.35	-8.49/12
Theta (30°)	-10.2/11.92	-9.5/7.31	-6.07/5.58	-4.97/4.42	-3.84/5.05	-5.64/3.63	-1.64/0.99	-1/0.51	-1.38/2.31	-4.57/5.31	-6.76/6.64	-7.92/8.32	-11.68/11.6	-10.66/8.66	-7.65/4.43	-3.5/4.79	-6.42/5.84	-5.25/4.99	-2.81/2.11	-3.23/3.18	-4.24/5.83	-6.19/6	-5.85/5.04	-6.48/8.72
Theta (37.5°)	-10.88/9.04	-6.91/5.84	-5.79/4.8	-5.52/6.75	-5.13/4.85	-6.44/4.91	-1.93/0.63	-0.19/0.2	-1.13/2.41	-2.52/3.1	-5.61/6.99	-6.51/8	-10.01/9.89	-8.31/6.11	-5.8/3.93	-2.4/2.96	-3.53/2.98	-2.43/2.57	-2.45/2.97	-2.26/2.04	-3.68/4.15	-4.98/5.5	-7.29/8.75	-6.91/8.67
Theta (45°)	-9.73/6.51	-6.89/7.09	-4.81/5.9	-5.83/5.8	-5.12/5.11	-6.02/4.62	-2.97/1.71	-0.07/0.47	-0.9/2.13	-2.59/2.83	-4.67/7.03	-8.52/9.11	-9.9/8.59	-7.54/8.16	-6.29/4.69	-3.52/2.06	-1.95/2.13	-1.59/0.71	-1.6/1.98	-3.06/4.46	-4.56/4.92	-5.98/6.28	-7.17/8.36	-10.88/9.52
Theta (52.5°)	-8.02/6.4	-5.48/6.17	-4.8/6.13	-4.59/2.76	-4.34/4.37	-4.66/4.65	-2.45/2.09	-1.22/0.29	-1.95/1.57	-1.31/1.24	-5.07/6.62	-9.78/10.53	-9.38/6.07	-6.97/6.1	-5.63/3.19	-4.83/4.32	-4.49/3.53	-3.14/3.41	-2.84/2.94	-3.09/1.38	-2.65/7.1	-5.67/6.86	-9.59/9.53	-10.7/9.53
Theta (60°)	-5.52/4.37	-3.93/7.32	-6.45/5.09	-3.79/2.67	-3.22/4.29	-5.09/3.9	-2.38/2.34	-1.37/0.07	-1.18/3.27	-2.23/1.94	-5.16/6.64	-11.15/11.89	-9.59/6.46	-7.55/6.12	-6.75/6.54	-5.4/5.76	-4.01/2.84	-4.06/4.55	-5.26/3.07	-2.57/3.06	-2.79/3.43	-5.83/9.16	-8.01/9.36	-8.24/5.49
Theta (67.5°)	-4.15/3.47	-6.92/7.68	-7.8/3.39	-3.23/1.96	-2.22/3.96	-3.5/2.4	-1.58/2.67	-1.51/0.2	-0.92/1.16	-1.67/3.68	-3.06/7.89	-10.75/9.12	-10.7/7.56	-6.01/4.98	-5.78/6.67	-6.66/7.67	-5.58/4.55	-2.69/2.92	-1.91/3.36	-3.8/2.15	-2.4/2.54	-5.2/12.05	-9.41/9.09	-7.81/5.55
Theta (75°)	-5.98/5.79	-7.2/8.87	-7.22/4.16	-3.5/2.16	-2.31/2.17	-0.78/2.43	-1.14/2.52	-3.35/0.48	0.97/0.37	-2.9/2.5	-5.5/8.54	-8.85/9.74	-8.86/8.46	-9.08/7.11	-6.71/7.29	-6.79/6.15	-5.57/2.53	-1.82/2.57	-3.49/4.88	-4.09/3.12	-3.09/3.29	-4.94/9.53	-11.71/6.7	-6.67/7.94
Theta (82.5°)	-7.73/9.77	-10.54/8.18	-7.79/3.96	-2.57/1.86	-1.09/0.82	-2.14/4.61	-2.58/1.78	-1.42/1.1	-1.08/1.62	-2.25/5.65	-5.21/8.53	-9.93/10.43	-9.98/9.84	-10.34/8.83	-8.89/11.11	-11.87/6.55	-9.39/5.9	-2.53/3.99	-6.31/3.53	-4.55/3.23	-3.87/5.24	-5.77/7.66	-8.77/8.61	-7.5/11.93
Theta (90°)	-8.09/5.23	-9.25/6.87	-6.91/3.8	-1.06/1.06	-0.93/2.36	-1.88/2.45	-3.7/3.45	-1.92/4.21	-2.36/3.45	-4.86/6.45	-9.57/6.53	-8.74/8.38	-10.38/9.97	-9.38/11.11	-10.87/12.14	-10.63/6.97	-7.34/5.36	-5.42/8.04	-5.36/3.94	-5.13/2.33	-3.64/3.9	-7.27/5.49	-7.32/7.41	-7.55/7.53
Theta (97.5°)	-5.91/7.95	-6.91/3.94	-5.2/4.33	-0.89/3.57	-1.8/0.3	0.26/0.78	-2.94/1.46	-4.13/1.69	-5.01/3.1	-4.78/6.32	-8.03/10.54	-8.12/9.85	-11.9/11.82	-10.33/11.12	-7.85/8.74	-7.28/6.03	-8.57/10.06	-7.03/8.03	-4.05/6.96	-2.77/3.5	-0.31/4.4	-7.05/8.62	-9.73/7.04	-6.57/4.63
Theta (105°)	-8.28/8.07	-9.51/4.94	-5.26/4.01	-0.79/1.69	-2.61/1.9	-2.69/1.21	-2.39/6.33	-3.34/1.5	-3.4/3.66	-3.43/6.7	-7.65/8.96	-7.54/8.53	-9.63/9.23	-10.73/12.12	-10.81/9.03	-6.58/4.18	-5.25/7.73	-11.23/5.79	-6.97/4.1	-7.72/4.32	-3.95/6.9	-9.43/8.88	-9.31/9.45	-9.31/5.7
Theta (112.5°)	-8.2/10.15	-11.04/4.62	-6.1/6.65	-4.08/4.23	-3.89/3.32	-2.54/3.05	-3.97/4.98	-6.21/3.4	-5.04/3.68	-3/7.77	-9.01/7.49	-9.23/11.35	-6.61/7.23	-10.15/7.76	-9.12/7.44	-8.33/7.44	-7.84/11.56	-7.95/6.06	-7.3/7.59	-7.48/4.22	-4.93/7.78	-8.45/5.5	-7.38/8.84	-9.71/5.44
Theta (120°)	-8.06/6.41	-10.15/5.89	-7.04/6.52	-5.76/5.4	-6.23/3.18	-2.61/2.82	-4.64/4.14	-3.46/7.03	-2.52/3.22	-3.81/6.67	-7.98/6.06	-9.92/8.11	-11.06/8.67	-10.92/8.07	-8.32/8.09	-10.53/7.6	-8.84/9.3	-6.63/8.53	-8.54/5.42	-7.99/7.18	-10.59/5.08	-8.63/6.96	-7.8/9.07	-7.49/8.79
Theta (127.5°)	-5.35/6.25	-5.32/4	-4.16/4.21	-4.21/5.07	-3.99/2.06	-3.04/3.17	-6.02/6.22	-2.53/2.72	-5.09/3.34	-1.59/6.34	-8.02/12.22	-9.62/6.73	-8.13/9.25	-9.54/6.14	-7.39/6.79	-11.89/5.71	-11.43/10.6	-10.37/8.26	-10.73/7.01	-6.82/8.22	-7.91/5.84	-5.95/9.78	-9.46/6.61	-7.38/8.16
Theta (135°)	-7.26/6.31	-4.35/3.53	-3.74/4.38	-3.67/4.09	-3.49/3.01	-3.49/3.01	-4.37/3.14	-3.15/3.65	-2.62/5.95	-7.37/3.41	-5.13/9.72	-9.39/12.57	-8.05/10.23	-11.19/8.37	-8.89/9.02	-7.12/7.1	-9.82/12.03	-11.25/8.25	-11.21/8.49	-7.54/7.63	-8.33/8.84	-11.98/9.13	-9.56/8.86	-9.11/7.8
Theta (142.5°)	-9.05/6.5	-6.13/3.79	-4.39/2.86	-2.56/2.02	-2.97/5.07	-4.28/3.11	-5.8/4.32	-3.12/4.2	-1.98/8.4	-5.64/6.83	-6.88/7.59	-9.9/8.55	-7.7/7.7	-9.22/7.71	-8.4/9.43	-6.75/7.95	-7.33/9.85	-8.67/9.59	-8.58/9.3	-9.64/7.08	-7.79/8.1	-6.22/5.99	-8.17/8.58	-5.9/8.45
Theta (150°)	-8.47/6.35	-6.28/6.71	-5.47/4.43	-3.17/2.65	-3.21/5.04	-5.92/3.88	-3.98/4.45	-6.33/4.52	-4.19/3.38	-5.49/6.34	-5.85/9.65	-8.47/10.84	-9.04/9.79	-8.98/7.81	-8.81/7.48	-1.63/9.18	-10.44/11.01	-9.83/11.04	-10.43/8.13	-7.11/5.63	-4.58/3.16	-4.02/5.82	-9.01/7.37	-7.91/6.46
Theta (157.5°)	-11.7/7.2	-3.46/3.26	-3.29/2.56	-2.5/2.97	-5.38/5.58	-5.94/3.78	-4.45/4.13	-4.35/3.29	-2.69/4.3	-5.29/4.9	-6.72/10.33	-10.13/8.24	-6.54/6.14	-5.76/7.34	-6.21/6.28	-7.17/8.87	-11.41/10.82	-8.17/7.27	-10.26/8.55	-5.85/5	-3.09/1.87	-2.07/3.24	-4.6/5.93	-6.67/8.47
Theta (165°)	-8.44/8.16	-8.47/7.76	-6.38/6.42	-5.34/6.22	-5.02/6.85	-5.43/6.42	-7.43/6.87	-6.28/6.15	-4.78/3.52	-4.12/5.41	-4.69/5.23	-5.42/4.36	-4.39/6.32	-7.72/6.85	-6.07/5.44	-5.01/5.98	-7.25/6.92	-6.17/5.81	-5.54/5.25	-5/5.56	-5.11/4.23	-4.47/5.01	-4.63/5.29	-6.09/7.57
Theta (172.5°)	-7.59/7.17	-7.61/7.05	-6.5/5.75	-4.87/3.65	-3.39/3.86	-4.22/4.48	-4.17/3.69	-4.04/4.22	-4.7/4.67	-4.13/5.41	-6.19/8.55	-9.81/8.82	-7.69/6.28	-2.97/4.6	-5.63/7.16	-7.71/7.67	-8.02/7.43	-6.71/5.98	-6.31/7.51	-7.64/7.08	-6.72/6.27	-6.89/7.55	-7.4/7.8	-8.24/8.18
Theta (180°)	-4.54/5.11	-4.29/3.82	-4.09/4.19	-4.88/5.14	-6.27/6	-5.91/6.17	-5.5/4.8	-4.85/4.45	-3.91/3.87	-4.9/5.19	-5.45/4.09	-3.13/2.74	-2.45/2.72	-2.19/1.96	-2.75/2.26	-2.46/2.74	-4.02/4.83	-5.38/6	-6.2/6.22	-5.33/5.22	-5.45/5.76	-5.74/5.38	-5.64/4.62	-5.35/4.91
Freq(Hz)	5.30/Pol.	Theta	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
DC(dB)	Phi(7.5°)	Phi(15°)	Phi(30°)	Phi(45°)	Phi(60°)	Phi(75°)	Phi(90°)	Phi(105°)	Phi(120°)	Phi(135°)	Phi(150°)	Phi(165°)	Phi(180°)	Phi(195°)	Phi(210°)	Phi(225°)	Phi(240°)	Phi(255°)	Phi(270°)	Phi(285°)	Phi(300°)	Phi(315°)	Phi(330°)	Phi(345°)
Theta (7.5°)	-3.18/2.53	-2.75/3.31	-3.74/4.14	-4.83/4.99	-5.95/6.75	-7.57/8.56	-10.29/10.85	-11.84/11.66	-11.96/9.19	-7.32/6.15	-5.12/4.54	-4.58/3.92	-3.28/3.58	-4/4.16	-4.31/4.66	-5.4/5.33	-6.12/6.95	-6.51/5.55	-9.04/8.99	-7.57/7.31	-6.43/6.33	-4.86/5.25	-4.37/3.97	-3.55/3
Theta (15°)	-4.03/4.07	-4.17/3.91	-3.76/4.72	-4.42/5.41	-5.7/6.78	-7.78/8.38	-10.21/11.31	-10.67/8.61	-8.37/6.2	-3.9/2.87	-2.44/2.36	-1.85/2.27	-2.33/2.1	-2.72/3.23	-2.97/3.67	-4.85/4.76	-6.23/6.32	-7.74/7.97	-10/10.03	-8.6/9.6	-8.96/8.37	-6.91/6.13	-5.26/4.45	-4.39/4.2
Theta (22.5°)	-5/5.44	-6.2/7.08	-6.86/6.87	-6.04/5.9	-5.9/5.78	-7.38/7.82	-9.66/8.26	-6.34/4.11	-2.96/2.51	-1.66/0.56	-0.62/1.2	-1.19/0.64	-0.55/1.02	-1.57/1.68	-1.06/1.22	-2.64/3.68	-5.15/7.91	-8.6/8.07	-6.45/7.26	-5.42/4.18	-3.41/2.6	-3.4/3.19	-3.52/3.12	-3.22/4.23
Theta (30°)	-1.17/1.85	-2.1/2.15	-2.66/3.22	-3.34/4.11	-4.33/4.89	-5.61/6.16	-5.81/5.4	-4.08/3.23	-2.55/2.08	-1.9/0.54	-0.77/1.22	-1.10/7.2	1.09/0.39	-0.08/1.2	-1.22/0.57	-1.93/1.93	-3.81/4.63	-5.1/5.19	-4.62/4.68	-4.56/5.15	-3.12/1.17	-0.92/1.37	-1.66/1.52	-1.08/0.71
Theta (37.5°)	1.22/0.98	0.23/0.24	-0.68/1.6	-1.81/1.73	-2.48/2.17	-4.1/5.85	-7.07/5.92	-2.64/0.82	0.23/0.83	1.22/0.97	0.8/0.23	-0.16/0.57	0.52/0.26	-0.71/0.26	-0.95/0.96	-2.31/4.31	-3.86/5.88	-4.87/4.59	-2.92/2.69	-2.69/1.5	-1.55/0.6	-1.14/0.24	0.57/0.17	-0.55/0.16
Theta (45°)	1.95/2.19	1.41/1	0.2/0.46	-1.49/4.49	-2.55/3.47	-3.9/1.44	-1.58/2.04	-2.96/1.92	0.61/0.48	-1.89/0.84	0.96/1.42	-0.32/0.24	1.08/0.84	-2.24/3.11	-3.69/3.86	-2.57/2.77	-1.78/1.87	-4.62/4.32	-4.46/5.42	-5.26/3.32	-1.76/1.44	-0.58/0.78	2.02/2.1	1.11/0.56
Theta (52.5°)	-0.84/1.78	1.30/55	0.22/1.63	-1.35/4.65	-4.05/6.83	-6.37/3.35	-5.82/4.24	-1.93/2.62	-1.93/2.85	0.73/0.85	1.4/1.8	1.42/0.9	1.27/0.52	-1.23/1.11	-2.83/3.78	-2.65/6.35	-4.76/5.73	-6.93/6.05	-6.2/4.9	-4.68/3.11	-3.35/4.28	-1.31/0.01	-0.51/0.53	-2.7/3.66
Theta (60°)	-0.11/1.27	-2.43/1.39	-2.17/3.66	-2.85/2.41	-2.01/4.82	-2.23/2.31	-2.74/2.78</																	



Radiated Composite Gain Data

Appendix A.1

Gain Result

Freq(Hz)	2.45GPol.	PhiAnt.1	$\Phi(0^\circ)/\Phi(7.5^\circ)$	$\Phi(15^\circ)/\Phi(22.5^\circ)$	$\Phi(30^\circ)/\Phi(37.5^\circ)$	$\Phi(45^\circ)/\Phi(52.5^\circ)$	$\Phi(60^\circ)/\Phi(67.5^\circ)$	$\Phi(75^\circ)/\Phi(82.5^\circ)$	$\Phi(90^\circ)/\Phi(97.5^\circ)$	$\Phi(105^\circ)/\Phi(112.5^\circ)$	$\Phi(120^\circ)/\Phi(127.5^\circ)$	$\Phi(135^\circ)/\Phi(142.5^\circ)$	$\Phi(150^\circ)/\Phi(157.5^\circ)$	$\Phi(165^\circ)/\Phi(172.5^\circ)$	$\Phi(180^\circ)/\Phi(187.5^\circ)$	$\Phi(195^\circ)/\Phi(202.5^\circ)$	$\Phi(210^\circ)/\Phi(217.5^\circ)$	$\Phi(225^\circ)/\Phi(232.5^\circ)$	$\Phi(240^\circ)/\Phi(247.5^\circ)$	$\Phi(255^\circ)/\Phi(262.5^\circ)$	$\Phi(270^\circ)/\Phi(277.5^\circ)$	$\Phi(285^\circ)/\Phi(292.5^\circ)$	$\Phi(300^\circ)/\Phi(307.5^\circ)$	$\Phi(315^\circ)/\Phi(322.5^\circ)$	$\Phi(330^\circ)/\Phi(337.5^\circ)$	$\Phi(345^\circ)/\Phi(352.5^\circ)$	
Gain	$\Phi(0^\circ)/\Phi(7.5^\circ)$	$\Phi(15^\circ)/\Phi(22.5^\circ)$	$\Phi(30^\circ)/\Phi(37.5^\circ)$	$\Phi(45^\circ)/\Phi(52.5^\circ)$	$\Phi(60^\circ)/\Phi(67.5^\circ)$	$\Phi(75^\circ)/\Phi(82.5^\circ)$	$\Phi(90^\circ)/\Phi(97.5^\circ)$	$\Phi(105^\circ)/\Phi(112.5^\circ)$	$\Phi(120^\circ)/\Phi(127.5^\circ)$	$\Phi(135^\circ)/\Phi(142.5^\circ)$	$\Phi(150^\circ)/\Phi(157.5^\circ)$	$\Phi(165^\circ)/\Phi(172.5^\circ)$	$\Phi(180^\circ)/\Phi(187.5^\circ)$	$\Phi(195^\circ)/\Phi(202.5^\circ)$	$\Phi(210^\circ)/\Phi(217.5^\circ)$	$\Phi(225^\circ)/\Phi(232.5^\circ)$	$\Phi(240^\circ)/\Phi(247.5^\circ)$	$\Phi(255^\circ)/\Phi(262.5^\circ)$	$\Phi(270^\circ)/\Phi(277.5^\circ)$	$\Phi(285^\circ)/\Phi(292.5^\circ)$	$\Phi(300^\circ)/\Phi(307.5^\circ)$	$\Phi(315^\circ)/\Phi(322.5^\circ)$	$\Phi(330^\circ)/\Phi(337.5^\circ)$	$\Phi(345^\circ)/\Phi(352.5^\circ)$			
$\Theta(0^\circ)$	-12.36/8.86	-6.45/4.92	-3.7/2.91	-2.03/1.19	-1.51/0.67	-0.23/0.54	-1.12/1.45	-1.47/1.87	-3.14/5.09	-7.18/9.99	-11.43/14.62	-16.21/13.47	-11.91/9.5	-7.36/5.01	-2.78/2.1	-1.37/1.07	-0.91/3.33	-2.15/2.85	-3.44/4.2	-5.67/8.86	-10.31/13.43	-17.11/16.95					
$\Theta(7.5^\circ)$	-11.76/8.37	-6.09/4.31	-3.11/2.49	-2.21/1.86	-1.38/1.08	-0.89/1.02	-1.78/2.84	-3.08/2.98	-3.77/5.91	-8.75/11.37	-14.14/17.62	-17.73/14.36	-10.74/8.88	-7.73/6.07	-4/2.5	-1.97/1.68	-0.88/0.31	-0.14/0.22	-0.06/0.25	-1.13/2.15	-2.83/3.57	-5.11/7.42	-10.13/13.34	-17.72/16.95			
$\Theta(15^\circ)$	-11.03/8.64	-6.58/4.75	-3.27/2.54	-2.31/2.07	-1.66/1.24	-1.04/1.05	-1.32/2.15	-3.28/3.68	-3.97/5.69	-9.17/13.41	-18.06/17.85	-18.54/15.68	-10.85/7.85	-6.35/5.64	-4.33/2.16	-0.78/0.48	-0.27/0.28	0.63/0.29	-0.02/0.2	-0.42/1.37	-2.37/3.15	-4.59/7.03	-10.08/13.73	-18.11/15.39			
$\Theta(22.5^\circ)$	-10.97/9	-7.06/5.43	-4.23/3.08	-2.12/1.8	-2.06/2.35	-2.22/1.83	-1.42/1.26	-1.84/2.85	-3.43/4.74	-7.62/12.13	-18.24/18.45	-19.24/17.39	-11.91/8.02	-5.79/4.74	-4.01/2.6	-1.18/0.76	-0.79/0.6	-0.24/0.49	-1.02/1.09	-1.16/1.89	-2.93/3.67	-4.87/7.11	-10.24/14.16	-17.39/14.04			
$\Theta(30^\circ)$	-11.33/9.25	-7.35/5.76	-4.38/3.34	-2.51/1.66	-0.96/0.69	-0.73/0.47	-0.26/0.32	-0.04/0.55	-2.15/4.1	-6.34/10.06	-15.51/19.03	-19.32/17.06	-12.54/8.91	-6.68/5.23	-4.17/3.34	-2.88/2.93	-2.94/2.7	-2.15/1.84	-2.03/2.19	-2/2/2.6	-3.52/4.42	-5.49/7.48	-11.02/15.72	-16.18/13.25			
$\Theta(37.5^\circ)$	-11.62/9.72	-7.71/5.1	-4.35/2.5	-2.01/1.5	-0.62/0.2	0.36/0.27	0.40/1.9	0.34/0.62	-0.98/4.78	-6.65/8.34	-12.76/17.73	-16.41/15.05	-11.91/9.31	-7.73/6.29	-5.21/4.51	-4.44/5.4	-6.21/5.49	-4.08/3.31	-3.43/3.58	-3.28/3.31	-3.76/4.29	-5.3/7.4	-12.18/16.68	-16.36/13.6			
$\Theta(45^\circ)$	-11.71/10.7	-7.99/5.62	-4.13/2.85	-1.82/0.85	0.16/1.16	1.66/1.47	1.20/9.3	0.14/0.06	-0.86/4.36	-5.69/5.35	-8.82/18.19	-16.99/13.53	-12.14/9.8	-7.59/6.05	-5.83/6.11	-5.64/5.23	-5.37/5.05	-3.61/2.63	-3.36/4.89	-5.34/5.22	-5.22/4.56	-4.63/4.44	-10.52/18.05	-19.31/14.08			
$\Theta(52.5^\circ)$	-10.84/9.11	-7.19/6.13	-4.86/3.41	-1.76/0.04	1.26/1.77	1.82/1.56	1.14/0.89	0.12/1.03	-1.83/4.01	-5.31/4.45	-6.8/14.36	-18.59/13.98	-13.27/10.46	-8.08/6.74	-7.07/8.79	-9.3/7.85	-6.54/5.37	-3.82/2.78	-3.56/5.7	-7.38/7.64	-7.14/5.22	-4.59/6.13	-9.46/16.54	-19.31/13.2			
$\Theta(60^\circ)$	-9.62/7.38	-6.59/5.73	-4.29/2.92	-1.25/0.57	1.61/1.71	1.19/0.54	0.19/0.1	-0.82/1.53	-1.97/3.21	-4.69/3.69	-4.79/10.46	-19.05/15.5	-15.15/13.93	-11.42/10.58	-11.33/14.68	-16.47/12.17	-9.17/8.81	-8.1/6.86	-7.54/9.73	-11.56/12.41	-11.62/7.35	-5.7/6.07	-8.69/13.23	-19.06/13.57			
$\Theta(67.5^\circ)$	-6.36/4.9	-5.46/3.81	-3.4/2.22	-0.37/1.28	1.93/1.63	0.55/0.65	-0.67/0.44	-1.61/2.22	-1.83/2.63	-3.64/3.5	-4.51/9.19	-17.76/17.02	-14.51/17.76	-15.98/13.75	-14.48/15.51	-13.52/9.66	-6.88/8.6	-14.12/13.99	-13.68/11.41	-14.99/11.33	-7.2/6.65	-8/11.43	-18.61/13.92				
$\Theta(75^\circ)$	-7.36/6.16	-6.12/4.38	-2.89/1.5	0.25/1.72	2.21/7.1	0.54/0.67	-0.76/0.11	-0.84/2.17	-1.21/1.07	-1.85/3.44	-6.32/9.36	-16.25/17.63	-18.13/18.18	-17.68/12.77	-13.66/16.46	-14.7/10.22	-7.09/7.44	-14.66/18.27	-12.03/17.16	-10.38/7.13	-8.17/9.72	-10.98/8.25	-7.95/10.02	-16.23/13.37			
$\Theta(82.5^\circ)$	-6.07/5.14	-6.19/4.42	-2.55/1.26	0.41/0.88	2.46/1.94	0.66/0.43	-0.55/0	-0.05/1.33	-0.51/0.29	-1.53/4.81	-7.08/6.54	-10.92/18.28	-19.01/18.85	-18.92/13.99	-14.82/18.53	-19.05/15.05	-10.58/8.73	-14.57/17.06	-9.86/10.6	-7.1/5.56	-6.42/7.36	-10.03/9.49	-9.43/10.71	-14.32/12.1			
$\Theta(90^\circ)$	-6.36/4.9	-5.46/3.81	-2.4/1.35	0.41/0.89	2.43/1.94	0.64/0.49	-0.42/0.29	0.69/0.11	-0.25/0.22	-2.34/5.63	-6.29/6.23	-10.32/18.36	-19.05/19.23	-17.49/17.77	-17.73/16.9	-12.47/13.82	-18.43/13.81	-18.87/13.35	-8.53/9.9	-6.45/4.25	-5.42/7.9	-9.57/8.88	-10.17/11.74	-13.62/11.98			
$\Theta(97.5^\circ)$	-7.37/5.74	-5.6/3.12	-2.1/1.26	0.55/1.97	2.41/1.92	0.76/0.34	-0.02/0.73	0.56/0.27	-1.2/0.75	-2.16/5.43	-7.37/6.93	-11.98/18.52	-17.53/18.75	-15.39/14.76	-16.92/10.21	-8.58/10.53	-18.71/18.7	-18.06/8.03	-6.07/9.05	-7.29/4.9	-6.38/9.59	-8.89/9.45	-11.48/10.55	-11.85/11.45			
$\Theta(105^\circ)$	-7.68/5.9	-5.76/3.36	-2.26/1.93	-0.31/1.45	2.13/1.82	0.67/0.51	-0.47/0.25	-0.44/0.69	-1.53/6.28	-3.46/4.99	-9.56/6.63	-13.26/12.82	-18.79/17.65	-12.87/12	-15.77/11.88	-16.83/12.39	-14.57/17.06	-10.88/13.9	-10.74/9.6	-8/5.86	-8.23/13.47	-9.46/9.5	-12.5/10.65	-11.82/11.67			
$\Theta(112.5^\circ)$	-7.37/5.98	-5.74/3.11	-1.62/1.51	-0.55/1.03	1.56/0.85	-0.49/1.24	-0.98/0.26	0.04/0.66	-3.53/6.21	-3.11/3.91	-12.15/14.21	-12.97/18.51	-18.82/18.02	-14.62/13.73	-19.71/18.19	-17.09/17.75	-17.02/14.03	-15.63/9.49	-8.03/12.87	-11/17.54	-8.51/5.12	-14.59/11.38	-10.25/10.31	-11.26/10.44			
$\Theta(120^\circ)$	-5.59/4.76	-5.71/4.51	-2.08/0.92	0.42/1.85	2.26/1.74	0.89/0.12	-0.28/0.54	-1.58/3.89	-6.73/4.86	-3.35/6.93	-18.8/12.07	-12.11/18.88	-17.89/18.04	-18.88/19.09	-18.15/17.66	-17.7/17.16	-18.93/18.73	-18.31/9.44	-7.07/10.37	-17.77/13.34	-12.32/18.15	-18.76/14.04	-9.89/8.46	-10.2/8.67			
$\Theta(127.5^\circ)$	-5.53/3.6	-3.45/3.7	-2.84/1.24	-0.86/0.85	1.64/1.13	-0.21/1.45	-2.18/2.78	-2.83/3.73	-5.33/7.12	-10.44/13.14	-12.06/13.99	-16.41/18.63	-18.7/18.74	-18.04/17.35	-18.33/15.92	-12.15/10.7	-12.01/15.48	-17.61/11.37	-8.82/11.03	-16.17/11.77	-18.64/17.85	-15.09/14.29	-12.46/12.55	-14.53/10.57			
$\Theta(135^\circ)$	-7.39/4.88	-3.47/2.77	-1.87/1.57	-1.5/0.9	-0.55/1.25	-1.94/1.88	-1.77/1.39	-1.94/5.05	-10.92/16.75	-10.15/8.62	-13.79/18.04	-14.96/16.65	-18.8/18.11	-18.01/18.82	-16.93/12.49	-10.4/9.09	-8.36/8.97	-11.81/16.02	-15.53/15.63	-15.42/14.91	-14.08/12.43	-11.55/12.38	-15.32/18.51	-19.13/13.28			
$\Theta(142.5^\circ)$	-8.72/6	-4.17/2.87	-1.83/1.54	-2.05/3.14	-4.11/4.51	-3.98/3.55	-3.16/3.34	-5.75/12.32	-15.96/10.23	-9.43/13.24	-18.99/16.07	-14.86/18.9	-18.82/17.89	-15.85/13.82	-12.58/11.57	-9.47/7.79	-7.36/8.53	-11.67/17.23	-18.48/19.17	-19.2/17.7	-14.81/12.51	-12.13/14.44	-19.15/18.77	-18.87/13.82			
$\Theta(150^\circ)$	-10.48/8.18	-5.92/4.32	-3.13/2.86	-3.41/4.79	-6.18/6.86	-6.52/5.26	-4.31/5.22	-8.27/11.21	-10.94/11.94	-16.72/19.28	-15.39/14.79	-18.91/18.11	-17.52/17.58	-14.02/11.83	-11.03/10.3	-9.17/9.14	-10.8/14.7	-18.17/18.45	-18.23/18.64	-18.73/17.89	-17.2/14.29	-14.14/17.84	-17.78/15.74	-14.59/12.85			
$\Theta(157.5^\circ)$	-10.34/9.45	-8.04/6.52	-5.17/4.36	-3.88/3.73	-3.54/3.31	-3.25/3.53	-4.72/6.69	-11.66/14.05	-11.66/14.05	-16.01/15.01	-14.51/18.01	-18.41/19.27	-15.03/12.88	-12.22/11.94	-11.83/12.29	-13.72/16.81	-18.24/18.37	-18.83/15.52	-14.81/14.85	-15.34/16.67	-14.8/13.47	-14.21/19.75	-16.61/14.74	-13.72/11.1			
$\Theta(165^\circ)$	-9.86/8.54	-7.29/6.04	-4.88/3.99	-3.29/3.04	-2.85/2.54	-2.47/2.47	-3.99/4.62	-7.96/10	-11.29/13.38	-14.97/18.31	-19.37/16.21	-13.97/16.21	-10.33/11.53	-9.01/11.67	-13.51/13.5	-11.86/10.81	-10.17/12.64	-7.25/7.91	-8.3/7.83	-8.28/9.6	-10.26/10.42	-11.57/13.77	-15.02/15.11	-12.91/11.44			
$\Theta(172.5^\circ)$	-11.81/9.64	-7.67/5.93	-4.64/3.95	-3.08/2.43	-1.67/1.24	-1.05/1.16	-1.76/2.28	-3.22/4.44	-5.56/7.43	-9.25/10.45	-11.96/13.62	-14.22/13.39	-12.38/12.32	-12.72/11.58	-8.6/4.43	-5.16/4.42	-3.45/3.06	-3.52/4.49	-4.54/4.38	-5.18/6.28	-6.82/7.31	-8.59/10.23	-12.1/14.38	-16.13/14.33			
$\Theta(180^\circ)$	-14.13/12.02	-9.75/7.58	-5.87/4.81	-3.89/3.12	-2.45/2.07	-1.87/1.23	-3.11/3.83	-4.67/5.35	-6.53/8.07	-9.06/9.66	-10.68/11.97	-12.95/13.98	-15.82/17.44	-12.67/8.12	-5.45/4.4	-3.34/2.49	-2.05/2.44	-2.84/2.97	-2.92/3.3	-3.89/4.16	-4.48/5.18	-6.48/8.02	-9.88/12.22	-15.08/16.15			
Gain	$\Phi(0^\circ)/\Phi(7.5^\circ)$	$\Phi(15^\circ)/\Phi(22.5^\circ)$	$\Phi(30^\circ)/\Phi(37.5^\circ)$	$\Phi(45^\circ)/\Phi(52.5^\circ)$	$\Phi(60^\circ)/\Phi(67.5^\circ)$	$\Phi(75^\circ)/\Phi(82.5^\circ)$	$\Phi(90^\circ)/\Phi(97.5^\circ)$	$\Phi(105^\circ)/\Phi(112.5^\circ)$	$\Phi(120^\circ)/\Phi(127.5^\circ)$	$\Phi(135^\circ)/\Phi(142.5^\circ)$	$\Phi(150^\circ)/\Phi(157.5^\circ)$	$\Phi(165^\circ)/\Phi(172.5^\circ)$	$\Phi(180^\circ)/\Phi(187.5^\circ)$	$\Phi(195^\circ)/\Phi(202.5^\circ)$	$\Phi(210^\circ)/\Phi(217.5^\circ)$	$\Phi(225^\circ)/\Phi(232.5^\circ)$	$\Phi(240^\circ)/\Phi(247.5^\circ)$	$\Phi(255^\circ)/\Phi(262.5^\circ)$	$\Phi(270^\circ)/\Phi(2$								



Radiated Composite Gain Data

Appendix A.1

Gain	Φ(0°)Φ(7.5°)	Φ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)
Φ(20°)	-17.41/-17.71	-15.61/-16.11	-8.18/-8.49	-6.48/-6.78	-6.04/-5.26	-2.99/0.99	0.440/7.7	1.280/9.3	0.19/-0.58	-1.06/-3.07	-6.01/-8.1	-12.17/-18.28	-18.21/-19.01	-11.76/-9.71	-10.21/-11.43	-9.04/-7.8	-4.66/-9.2	-2.22/-2.67	-2.65/-3.94	-3.28/-3.05	-2.59/-2.28	-6.47/-8.87	-10.62/-8.41	-10.94/-17.05
Φ(30°)	-12.97/-16.21	-10.06/-8.81	-5.63/-4.63	-3.89/-3.21	-4.46/-3.96	-3.48/-2.13	0.11/1.14	1.29/1.79	1.16/0.01	-1.76/-2.8	-5.74/-6.61	-7.71/-7.1	-15.63/-16.25	-14.18/-11.6	-8.41/-4.8	-2.98/-3.54	-5.43/-4.3	-3.31/-2.16	-1.08/-0.68	-1.69/-2.06	-2.62/-3.6	-5.86/-8.14	-11.61/-6.53	-9.35/-11.12
Φ(37.5°)	-14.42/-9.7	-10.03/-7.11	-6.63/-5.4	-3.71/-5.15	-4.54/-4.81	-4.65/-2.42	-0.73/0.85	1.49/2.49	2.08/3.1	0.04/0.93	-0.95/-5.79	-6.68/-13.25	-17.19/-14.09	-10.02/-8.82	-7.18/-5.38	-2.21/-1.17	-1.54/-1.22	0.07/0.98	0.68/0.25	1.11/0.24	-1.34/-2.69	-5.13/-6.85	-1.01/-9.84	-9.71/-12.13
Φ(45°)	-12.72/-7.72	-5.37/6.99	-3.93/-3.45	-5.14/-5.02	-3.69/-3.45	-3.78/-2.29	-1.02/4	2.11/1.94	1.67/1.18	0.60/1.6	-1.91/-9.52	-10.86/-14.74	-15.87/-10.22	-8.76/-8.01	-4.67/-2.71	-1.36/0.02	1.48/1.14	1.94/3.41	2.31/1	0.12/-1.62	-2.59/3.04	-5.86/-10.06	-12.45/-18.8	-19.15/-15.02
Φ(52.5°)	-9.18/-5.75	-4.68/-6.77	-5.29/0.57	-3.21/0.83	-2.41/-2.72	-1.86/-2.93	-1.21/0.19	1.54/1.68	0.63/1.2	-0.33/0.69	-3.25/-5.8	-16.41/-17.43	-12.03/-6.43	-6.75/-4.99	-3.13/-2.54	-2.44/-2.19	-1.46/-0.56	0.45/0	-0.43/-0.32	0.05/0.96	-1.22/-6.47	-11.12/-14.77	-19.43/-19	-16.51/-11.12
Φ(60°)	-7.23/-5.92	-5.89/-7.98	-6.83/-6.3	-1.07/0.11	-0.21/-1.67	-2.72/-2.61	-2.33/-1.04	0.69/2.12	0.89/0.4	-0.05/-0.77	-2.41/-8.03	-16.21/-19	-10.26/-5.7	-6.75/-4.16	-6.07/-5.47	-2.11/-0.27	-1.25/-2.32	-3.0/3	0.59/0.26	0.35/-1.67	-0.87/-13.83	-11.61/-9.95	-10.51/-8.12	
Φ(67.5°)	-5.99/-6.66	-10.14/-12.49	-9.34/-3.06	-0.22/0.85	0.25/0.94	-1.78/-1.7	0.23/0.87	1.76/1.97	1.92/-1.73	-1.33/-2.51	-3.34/-8.55	-15.25/-18.22	-17.97/-7.77	-5.53/-2.61	-6.77/-9.44	-9.11/23	-7.83/-3.1	-0.30/33	1.15/-1.02	-1.18/-0.12	1.14/0.66	-5.75/-17.49	-14.19/-16.61	-9.2/-8.21
Φ(75°)	-9.18/-7.65	-16.49/-12.72	-8.08/-4.1	-0.34/0.86	-0.96/-3.6	0.04/-1.24	0.39/-1.58	-0.58/1.13	1.31/2.23	-3.78/-2.4	-6.31/-8.36	-16.19/-18.41	-14.01/-11.58	-13.11/-7.56	-9.43/-14.7	-17.86/-8.08	-8.83/-1.45	0.68/-1.27	-2.47/-2.83	-1.77/-1.42	-0.67/-0.92	-6.44/-15.8	-16.95/-18.32	-12.91/-9.1
Φ(82.5°)	-10.56/-13.82	-18.83/-11.47	-7.41/-4.59	-0.92/0.25	-1.17/0.08	-1.06/-3.28	-1.15/-1.92	0.21/4.2	0.38/-0.41	-2.04/-1.68	-15.41/-12.63	-18.02/-13.78	-16.15/-9.39	-11.54/-18.78	-18.04/-7.41	-16.85/-6.59	0.14/-0.05	-9.02/-5.1	-3.68/-2.94	-2.34/-7.1	-7.41/-14.32	-12.64/-18.65	-15.06/-16.37	
Φ(90°)	-16.77/-13.36	-18.5/-8.73	-7.23/-3.53	-0.97/-1.09	-1.34/0.8	-1.35/-2.07	-2.35/-3.35	0.49/-1.14	0.5/-1.49	-4.21/-4.75	-9.88/-9.96	-11.57/-11.79	-12.69/-15.22	-16.74/-18.03	-14.81/-17.28	-18.42/-10.65	-12.73/-5.69	-6.22/-18.8	-7.06/-4.84	-5.72/-1.11	-3.62/-5.55	-9.12/-15.09	-14.71/-17.2	-18.88/-16.34
Φ(97.5°)	-16.55/-19.25	-18.83/-6.98	-7.31/-3.98	-2.05/-2.32	-2.2/-2.31	-2.07/-3.63	-2.92/-3.03	-3.04/-1.17	-2.22/-3.05	-4.6/-8.88	-12.58/-16.32	-13.94/-15.09	-19.21/-17.86	-12.69/-19.42	-12.46/-9.02	-17.87/-12.61	-16.89/-18.08	-12.73/-10.71	-6.17/-9.09	-7.43/-2.39	-2.32/-8.6	-9.67/-18.06	-19.97/-18.36	-18.77/-17.6
Φ(105°)	-14.57/-15.83	-18.67/-10.38	-10.61/-6.09	-3.17/-2.99	-4.6/-5.99	-4.13/-3.48	-3.16/-1.3	-3.95/-4.54	-2.25/-4.18	-1.75/-0.97	-15.12/-18.95	-17.16/-17.53	-19.06/-18.82	-14.71/-18.94	-18.91/-18.42	-8.93/-10.86	-14.97/-10.11	-14.12/-9.71	-7.86/-3.77	-10.27/-4.25	-4.82/-6.83	-10.71/-18.61	-16.12/-13.57	-19.21/-12.57
Φ(112.5°)	-9.51/-11.58	-18.37/-10.25	-11.62/-9.08	-5.89/-3.68	-5.94/-6.99	-4.55/-5.42	-3.46/-3.06	-4.35/-2.9	-3.58/-4.38	-6.89/-13.55	-14.73/-16.5	-18.64/-18.78	-17.47/-18.5	-13.24/-12.79	-14.51/-17.4	-15.14/-10.8	-18.34/-18.75	-17.88/-9.18	-9.69/-10.16	-18.82/-5.05	-6.72/-7.29	-11.72/-18.62	-18.43/-13.8	-13.55/-10.8
Φ(120°)	-10.22/-7.81	-11.99/-8.94	-10.17/-10.11	-6.64/-4.17	-5.58/-5.8	-4.51/-4.82	-4.71/-4.74	-2.04/-5.81	-1.73/-6.91	-7.13/-12.68	-14.62/-13.54	-18.81/-18.84	-18.2/-12.82	-18.38/-8	-10.07/-14.55	-18.14/-19.94	-14.12/-14.24	-18.94/-14.04	-18.07/-13.64	-12.89/-8.85	-14.37/-19.31	-17.69/-15.27	-11.04/-11.56	
Φ(127.5°)	-10.58/-7.63	-5.97/-6.41	-11.51/-10.65	-4.13/-3.24	-4.13/-3.24	-5.09/-5.21	-3.81/-0.95	-1.82/-2.76	-4.88/-5.93	-7.45/-13.31	-11.36/-18.12	-18.03/-18.26	-17.73/-14.3	-18.87/-8.73	-7.4/-9.6	-17.42/-14.29	-15.51/-17.93	-19.62/-19.06	-18.53/-18.53	-19.08/-18.82	-18.36/-14.82	-18.37/-19.31	-18.31/-27	-14.29/-14.11
Φ(135°)	-14.66/-6.44	-4.57/-5.88	-4.93/-3.02	-2.31/-4.08	-5.42/-5.81	-5.6/-4.47	-4.9/-7.4	-3.22/-3.12	-6.96/-6.02	-9.18/-10.4	-11.16/-18.74	-13.1/-18.9	-17.33/-18.29	-18.51/-13.4	-13.72/-14.29	-18.19/-15.55	-15.73/-17.44	-17.01/-15.77	-16.65/-12.44	-15.03/-10.71	-9.82/-12.16	-18.69/-13.73	-17.98/-14.53	-19.22/-14.68
Φ(142.5°)	-11.9/-7.7	-8.35/-6.05	-4.86/-5.07	-4.57/-4.84	-5.27/-5.01	-5.1/-4.69	-5.46/-4.67	-3.44/-6.4	-3.23/-10.3	-9.99/-14.77	-13.22/-18.13	-17.4/-18.79	-18.18/-18.98	-17.49/-11.86	-11.76/-14.82	-18.46/-19.3	-18.42/-14.74	-11.01/-12.58	-11.51/-11.49	-7.98/-9.91	-12.09/-10.58	-16.15/-17.46	-15.21/-21.01	
Φ(150°)	-13.01/-13.26	-10.71/-10.65	-18.17/-11.57	-8.93/-6.92	-6.43/-4.9	-5.59/-4.98	-4.55/-6.1	6.95/-6.8	9.19/-6.56	13.86/-10.1	-8.22/-17.19	-18.34/-18.61	-17.18/-51	-18.74/-14.15	-12.88/-14.69	-16.02/-17.11	-14.14/-15.15	-16.71/-18.89	-13.96/-12.45	-10.57/-7.29	-8.02/-5.06	-4.53/-7.65	-14.26/-14.43	-12.24/-10.34
Φ(157.5°)	-16.65/-13.39	-8.45/-7.3	-8.13/-7.33	-7.86/-9.49	-8.74/-7.11	-5.9/-4.4	-6.11/-6.34	-10.55/-8.81	-6.44/-12.7	-11.27/-7.13	-10.01/-18.36	-18.84/-19.05	-18.48/-14.79	-12.91/-17.36	-17.91/-18.63	-18.22/-14.94	-18.26/-14.97	-12.21/-11.01	-13.61/-10.89	-6.9/-6.31	-5.15/-3.55	-4.57/-4.3	-7.62/-13.56	-14.41/-18.64
Φ(165°)	-13.18/-13.53	-14.23/-14.58	-9.95/-8.35	-8.76/-7.51	-7.13/-6.76	-4.84/-5.51	-6.27/-9.1	-7.53/-9.5	-10.26/-16.5	-6.58/-8.01	-10.97/-15.08	-16.86/-14.78	-13.97/-15.2	-18.91/-17.3	-14.32/-9.52	-7.4/-7.36	-7.5/-8.39	-9.37/-10.6	-7.9/-6.8	-5.99/-5.2	-4.62/-4.32	-5.38/-6.96	-8.02/-11.24	-12.48/-12.54
Φ(172.5°)	-15.13/-11.91	-10.86/-9.23	-7.44/-6.99	-5.96/-4.1	-4.21/-4.25	-5.07/-6.02	-6.11/-7.26	-8.44/-7.98	-6.46/-5.27	-5.17/-8.33	-11.6/-16.87	-17.68/-16.19	-14.97/-11.99	-9.58/-8.83	-10.65/-13.63	-13.74/-13.64	-13.31/-10.27	-9.4/-8.38	-7.86/-10.59	-10.52/-6.67	-8.06/-7.99	-8.66/-9.8	-12.56/-18.66	-16.07/-16.06
Φ(180°)	-17.08/-17.23	-14.11/-10.79	-11.11/-11.35	-9.27/-8.29	-6.71/-5.6	-6.5/-5.93	-6.12/-6.89	-5.98/-5.49	-4.66/-4.49	-6.27/-8.53	-11.56/-10.5	-10.01/-10.95	-12.03/-10.82	-9.06/-7.64	-7.5/-5.86	-17.49/-6.05	-6.06/-6.75	-7.81/-7.89	-7.95/-8.46	-8.11/-8.58	-9.77/-11.25	-12.92/-15.23	-16.79/-16.07	-19.08/-18.94
Gain	Φ(0°)Φ(7.5°)	Φ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)
Φ(0°)	-1.86/-1.74	-1.93/-2.68	-3.25/-3.33	-5.11/-5.59	-7.16/-8.27	-10.56/-13.78	-17.91/-19.17	-18.56/-15.96	-15.84/-11.36	-8.82/-8.43	-6.08/-5.24	-5.56/-6.38	-5.83/-6.16	-6.93/-6.43	-5.51/-7.35	-6.96/-8.29	-6.68/-11.63	-10.73/-14.08	-15.97/-16.14	-13.61/-12.81	-10.19/-7.82	-6.16/-4.73	-3.65/-3.12	-2.66/-1.96
Φ(7.5°)	-7.05/-6.06	-6.04/-5.1	-5.36/-6.23	-4.78/-6.65	-6.68/-8.95	-10.59/-12.29	-14.78/-18.26	-13.75/-9.42	-9.11/-6.48	-3.04/-1.51	-1.15/-1.11	-0.64/-0.74	-0.95/-0.97	-1.62/-8.9	-1.97/-13.3	-5.68/-5.45	-10.12/-10.85	-15.41/-16.09	-17.72/-15.6	-14.15/-14.66	-15.71/-13.85	-11.93/-9.49	-8.81/-8.1	-8.15/-7.62
Φ(15°)	-5.68/-6.89	-8.68/-9.84	-10.15/-10.12	-11.26/-10.88	-9.57/-10.03	-11.05/-13.69	-16.58/-15.86	-13.77/-6.8	-5.75/-4.1	-1.18/0.61	1.31/0.12	-0.36/-0.24	-0.28/0.97	-2.71/-4.61	-4.52/-4.07	-8.87/-13.19	-15.18/-18.29	-19.11/-19.17	-14.04/-12.04	-8.91/-4.67	-6.15/-6.31	-6.07/-6.06		
Φ(22.5°)	-2.91/-3.64	-5.11/-6.39	-8.46/-9.98	-12.4/-13.83	-12.82/-11.76	-14.51/-15.72	-16.46/-15.36	-11.03/-7.43	-3.42/-2.62	-1.24/0.23	0.03/-1.12	-0.98/0.42	0.17/0.19	-0.39/-2.86	-3.55/-2.54	-5.54/-5.22	-5.59/-8.53	-10.16/-14.66	-19.15/-18.33	-13.77/-9.64	-6.28/-3.49	-2.25/-1.95	-2.43/-3.41	-3.84/-2.62
Φ(30°)	0.22/0	-1.25/-3.5	-5.01/-8.83	-10.89/-12.76	-19.02/-17.22	-15.51/-15.99	-15.59/-17.05	-13.15/-7.16	-3.04/-1.22	-1.11/29	0.5/0.3	-0.15/-0.03	-1.8/-3.41	-3.92/-3.67	-4.23/-2.77	-4.41/-8.34	-7.61/-10.52	-11.28/-13.32	-14.72/-18.7	-13.42/-18.8	-4.79/-2.08	-0.53/0.07	-0.97/-1.72	-2.02/-1.38
Φ(37.5°)	0.59/1.01	0.22/-1.56	-3.23/-4.11	-6.99/-10.33	-15.32/-17.96	-14.72/-12.35	-12.19/-18.01	-16.94/-8.41	-3.51/-7.99	-1.02/0.72	1.49/-1.42	0.41/-3.08	-1.46/-3.08	-4.85/-5.58	-5.78/-5.93	-3.98/-3.61	-3.17/-4.92	-6.22/-10.88	-17.94/-18	-17.73/-18.39	-8.18/-3.03	-1.31/1.06	0.65/-0.77	-3.48/-2.9
Φ(45°)	-8.84/1.34	1.29/0.63	-0.57/3.03	-6.99/-10.18	-13.96/-18.78	-18.76/-13.14	-14.92/-15.67	-9.38/-5.24	-4.94/-4.01	-6.17/-12	0.66/-1.78	1.47/1.04	0.72/-1.44	-4.75/-4.72	-5.2/-4.74	-2.30/-10.37	-9.89/-15.61	-16.31/-18.88</						



Radiated Composite Gain Data

Appendix A.1

Theta	17.51-18.61	12.33-18.98	18.72-17.22	18.99-18.75	14.27-9.49	12.24-14.94	13.91-13.57	11.36-17.97	13.28-15.38	17.84-18.91	15.49-13.54	14.34-19.61	17.67-18.07	16.25-14.97	17.79-15.03	16.48-13.31	18.85-18.78	16.28-18.03	15.64-15.86	18.62-19.35	17.54-10.66	11.74-13.17	18.64-12.58	11.87-13.14	
Theta (82.5°)	-18.37-17.38	-12.71-12.24	-18.45-18.77	-18.93-19.09	-18.23-16.13	-18.52-12.25	-17.67-18.68	-14.02-19.02	-15.66-14.73	-18.73-19.11	-16.43-13.55	-16.32-18.73	-18.61-17.51	-14.34-17.33	-17.42-18.09	-18.82-18.32	-16.91-17.49	-17.92-15.98	-10.97-10.03	-15.04-15.61	-18.17-14.55	-14.62-18.69	-18.97-19.75	-7.66-16.14	
Theta (90°)	-14.36-13.25	-9.44-11.24	-12.65-13.87	-16.67-18.99	-16.38-10.34	-13.82-18.44	-13.91-12.75	-19.19-13.35	-14.72-10.37	-10.46-11.76	-16.21-11.15	-18.71-19.04	-18.51-19.08	-17.49-18.17	-18.29-17.96	-17.83-18.91	-16.44-18.44	-12.42-13.25	-16.33-16.58	-10.86-11.71	-11.56-19	-17.97-18.11	-18.38-14.44	-6.89-14.92	
Theta (97.5°)	-15.21-12.61	-8.67-7.63	-9.26-11.09	-7.51-15.18	-12.41-9.84	-10.85-12.83	-9.85-9.98	-13.65-9.44	-18.86-19.8	-13.54-13.09	-16.15-13.01	-13.05-17.2	-18.51-18.05	-14.11-13.78	-18.18-14.63	-12.45-17.64	-10.42-18.45	-15.04-13.58	-14.56-11.93	-7.95-13.67	-8.93-10.91	-15.46-18.64	-18.02-11.35	-12.41-17.91	
Theta (105°)	-19.33-10.89	-16.58-9.13	-12.99-8.47	-12.48-13.44	-15.06-13.64	-13.22-12.11	-13.65-14.87	-17.84-14.14	-18.77-16.7	-10.44-12.66	-16.58-10.25	-10.57-17.86	-17.86-14.25	-15.16-19.21	-15.38-11.15	-16.51-8.98	-19.09-14.4	-17.23-19.09	-17.61-12.65	-10.04-17.62	-16.49-10.4	-18.28-18.45	-17.92-12.05	-10.36-17.27	
Theta (112.5°)	-18.31-16.68	-18.17-12.64	-17.56-18.84	-12.66-17.66	-18.86-16.8	-11.67-12.18	-17.36-14.94	-18.27-15.35	-18.37-18.9	-14.83-12.97	-16.83-9.9	-13.28-17.86	-18.16-14.73	-15.96-17.98	-15.99-12.52	-10.44-13.44	-17.54-18.27	-19.43-18.54	-13.67-11.09	-8.33-17.65	-19.38-11.29	-18.33-17.85	-16.99-15.59	-16.94-13.75	
Theta (120°)	-18.22-15.31	-14.37-17.42	-14.92-14.59	-14.48-18.6	-14.23-10.22	-14.56-15	-18.84-18.06	-18.22-18.29	-17.15-16.96	-17.34-11.34	-12.04-15.93	-18.87-18.59	-14.43-18.19	-18.84-18.72	-14.68-13.28	-12.51-14.14	-12.75-17.61	-18.67-13.32	-10.87-9.49	-12.12-15.7	-16.64-10.81	-11.78-18.41	-14.66-11.88	-14.73-16.56	
Theta (127.5°)	-13.16-17.82	-18.51-18.93	-15.14-14.83	-13.65-14.27	-12.81-8.28	-12.42-12.82	-15.61-17.69	-17.54-18.11	-18.33-19.03	-14.87-12.36	-17.99-17.55	-19.07-18.96	-19.19-17.95	-18.52-18.12	-18.51-19.12	-17.86-11.55	-18.03-18.16	-18.71-13.35	-16.81-7.63	-15.36-13.56	-17.56-9.41	-12.39-18.56	-14.84-13.95	-18.59-16.5	
Theta (135°)	-14.17-19.32	-19.57-15.76	-13.59-19.19	-13.95-15.74	-11.87-10.17	-16.12-15.15	-14.41-15.47	-17.53-18.52	-18.41-13.1	-14.69-12.17	-12.95-18.73	-18.83-17.5	-14.71-18.7	-18.71-15.85	-17.97-18.78	-17.95-18.41	-18.31-18.51	-18.21-14.16	-17.55-12.09	-13.68-18.55	-18.36-16.71	-17.29-18.04	-12.35-8.79		
Theta (142.5°)	-19.99-18.22	-17.77-14.21	-16.87-13.27	-11.77-11.06	-11.88-14.89	-15.35-12.67	-10.28-13.66	-15.91-18.95	-18.85-14.95	-16.83-18.31	-17.81-17.93	-18.85-18.36	-18.53-17.34	-19.35-16.39	-16.69-15.67	-16.81-19.52	-13.15-17.69	-18.77-15.44	-17.41-17.07	-18.55-19.24	-18.05-19.06	-17.92-17.13	-18.86-17.16	-11.52-17.93	
Theta (150°)	-14.32-18.86	-17.87-15.85	-17.19-12.59	-9.18-7.89	-9.84	-8.14-10.28	-16.11-19.05	-17.43-14.14	-19.26-19.04	-17.78-18.65	-17.58-17.01	-12.49-17.86	-14.69-17.34	-12.48-15.93	-15.76-17.53	-18.56-16.64	-13.96-19.03	-17.56-16.85	-18.91-19.94	-15.35-15.73	-18.16-18.34	-18.26-17.16	-13.72-14.09	-16.96-15.96	
Theta (157.5°)	-15.48-17.47	-14.54-9.71	-11.11-10.84	-10.34-7.61	-6.09-7.85	-12.76-17.45	-17.53-15.04	-14.25-14.01	-11.22-12.33	-12.15-11.75	-14.52-12.96	-18.13-13.74	-17.89-11.01	-14.59-16.93	-15.23-17.37	-19.76-17.69	-17.17-16.27	-18.23-15.28	-17.75-18.09	-17.51-16.07	-18.34-12.09	-18.75-18.75	-13.93-17.76	-16.51-19.21	
Theta (165°)	-18.05-18.37	-14.62-9.02	-9.11-10.91	-15.85-18.46	-16.51-14.79	-17.91-18.34	-19.11-18.61	-18.95-17.7	-16.67-13.56	-13.71-11.86	-13.16-14.03	-16.58-18.21	-14.06-18.54	-17.23-15.04	-17.59-19.07	-17.23-18.53	-19.32-19.08	-15.62-11.4	-14.97-10.52	-10.62-15.48	-15.54-18.18	-16.35-16.9	-15.99-17.75	-18.87-17.39	
Theta (172.5°)	-13.74-12.89	-11.11-10.44	-11.53-12.6	-15.31-17.58	-17.72-18.94	-17.19-15.65	-15.42-13.51	-12.71-14.53	-15.38-15.36	-19.11-18.03	-18.28-17.92	-17.98-17.49	-18.95-19.29	-19.15-18.49	-19.06-18.79	-17.52-18.55	-17.76-18.01	-17.98-18.89	-19.06-15.06	-16.26-14.71	-16.86-19.07	-18.81-18.97	-18.34-16.69	-15.74-15.2	
Theta (180°)	-18.43-19.5	-18.33-18.1	-18.61-18.45	-19.32-18.09	-17.96-15.11	-14.54-15.14	-17.08-16.29	-15.77-19.68	-17.73-15.99	-19.32-17.02	-18.27-14.31	-16.36-13.32	-16.31-12.82	-13.32-19.1	-18.92-17.3	-17.14-18.49	-18.95-18.1	-18.31-19.47	-18.42-18.62	-18.06-15.53	-17.77-18.45	-17.57-17.67	-17.87-17.88	-18.98-17.64	
Freq(Hz)	5.2GPol	ThetaAnt 2	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	
Gain	Phi(75°)	Phi(22.5°)	Phi(37.5°)	Phi(52.5°)	Phi(67.5°)	Phi(82.5°)	Phi(97.5°)	Phi(112.5°)	Phi(127.5°)	Phi(142.5°)	Phi(157.5°)	Phi(172.5°)	Phi(187.5°)	Phi(202.5°)	Phi(217.5°)	Phi(232.5°)	Phi(247.5°)	Phi(262.5°)	Phi(277.5°)	Phi(292.5°)	Phi(307.5°)	Phi(322.5°)	Phi(337.5°)	Phi(352.5°)	
Theta (0°)	-8.75-9.06	-10.74-9.23	-7.33-7.8	-8.05-9.1	-9.38-9.1	-10.19-11.9	-13.06-15.26	-18.41-18.66	-17.54-18.88	-18.13-15.22	-15.24-13.53	-11.64-12.91	-9.24-10.25	-10.33-10.09	-10.85-11.82	-13.22-13	-13.52-12.88	-15.33-16.4	-13.15-18.08	-18.22-16.2	-18.41-15.11	-16.06-12.49	-13.19-11.49	-10.31-10.55	
Theta (7.5°)	-18.26-15.03	-14.94-14.9	-14.66-15.71	-15.42-15.96	-15.11-17.74	-16.84-17.32	-18.72-17.2	-14.36-14.12	-10.84-11.2	-8.65-8.66	-8.79-7.95	-9.64-8.37	-7.84-9.27	-8.35-8.25	-8.99-8.3	-9.36-8.78	-10.95-13.11	-11.21-18.18	-18.83-18.37	-17.87-19.08	-18.26-18.83	-15.65-18.49	-16.91-17.2		
Theta (15°)	-17.74-18.5	-18.12-17.91	-16.17-15.57	-14.17-12.45	-11.81-15.25	-15.22-15.41	-18.31-17.31	-18.98-14.84	-11.19-9.1	-9.16-8.56	-8.43-7.19	-6.82-7	-6.41-5.56	-6.15-6.02	-7.85-9.11	-11.36-16.68	-18.83-17.3	-13.66-15.38	-14.47-11.71	-14.71-16.94	-14.64-18.15	-16.41-17.29	-14.51-14.69	-13.19-18.47	
Theta (22.5°)	-15.29-17.78	-15.48-17.98	-11.96-9.1	-9.69-10.24	-14.65-18.9	-16.08-11.76	-10.75-11.61	-10.39-8.89	-8.87-7.9	-10.37-11.91	-12.68-11.51	-7.86-6.34	-5.36-5.89	-7.81-10.02	-15.44-11.66	-10.41-12.6	-19.37-18.52	-13.97-11.26	-13.09-17.88	-14.77-14.02	-17.27-13.62	-15.81-16.09	-15.61-13.61	-13.72-15.22	
Theta (30°)	-9.14-10.97	-7.79-9.1	-12.36-11.5	-9.21-18.14	-7.24-5.56	-4.98-5.42	-8.26-10.63	-7.58-17.7	-9.84-7.55	-7.22-5.62	-8.66-8.76	-12.19-7.5	-6.21-5.7	-5.61-5.92	-8.27-11.46	-17.74-14.31	-13.62-17.12	-16.65-10.11	-8.97-14.08	-18.87-14.71	-10.79-18.17	-16.39-15.99	-14.74-18.07	-14.36-14.77	
Theta (37.5°)	-3.03-4.57	-7.18-5.2	-4.18-6.51	-7.17-6.69	-9.81-7.66	-1.64-8.09	-4.71-6.63	-5.46-10.73	-11.22-4.08	-6.15-13.76	-11.58-6.31	-6.91-6.63	-10.22-7.59	-10.22-7.59	-10.68-11.75	-10.68-6.53	-10.92-18.35	-10.92-18.35	-9.74-14.66	-11.16-5.66	-10.99-8.83	-0.75-7.35	-3.21-2.99		
Theta (45°)	-15.51-13.89	-12.13-11.49	-8.54-9.04	-6.36-6.05	-7.19-6.34	-1.16-10.22	-8.91-13.77	-7.71-10.72	-7.25-7.41	-16.26-8.73	-6.22-8.7	-9.11-8.06	-15.11-4.99	-18.91-19.41	-18.45-4.46	-9.49-19.04	-11.73-16.28	-12.73-8.37	-9.04-18.13	-12.31-14.11	-18.29-15.08	-8.55-5.98	-8.17-10.24	-10.71-12.71	
Theta (52.5°)	-10.29-12.28	-9.99-7.85	-5.85-15.44	-19.19-17.52	-10.11-9.19	-9.98-7.53	-10.91-12.1	-10.55-17.16	-8.24-13.93	-10.77-8	-9.81-11.2	-10.59-15.17	-16.72-13.82	-13.91-12.4	-13.78-16.67	-9.91-18.4	-13.71-15.51	-13.51-8.77	-8.91-16.86	-18.54-19.02	-9.45-19.2	-15.71-11.88	-13.58-9.41	-8.14-13.17	
Theta (60°)	-8.83-6.44	-4.91-3.44	-1.24-11.3	-6.09-7.21	-13.81-9.25	-1.65-10.19	-6.89-11.4	-9.91-10.28	-6.12-12.48	-4.66-10.93	-8.89-4	-8.61-11.45	-17.98-8.63	-3.92-13.21	-7.66-3.66	-5.21-10.91	-6.82-8.15	-9.46-13.59	-7.59-5.06	-6.81-18	-12.29-13.27	-14.78-8.57	-10.63-3.06	-2.89-1.89	-4.92-4.61
Theta (67.5°)	-2.72-2.63	-5.91-10.42	-4.95-8.87	-6.49-6.33	-8.16-9.53	-16.84-6.42	-14.74-8.02	-11.01-7.12	-7.02-8.35	-4.62-6.69	-4.79-6.93	-2.120-19	-0.74-1.83	-4.52-4.48	-6.63-4.79	-4.66-2.66	-6.51-4.34	-5.74-4.28	-13.06-9.66	-8.07-8.5	-9.27-4.27	-1.57-1.74	-0.21-1.69	-1.77-2.06	
Theta (75°)	-2.49-2.51	-8.11-12.86	-14.95-7.46	-10.31-18.89	-9.68-7.81	-13.57-3.1	-8.39-4.62	-7.43-2.69	-4.34-1.95	-0.430-8.8	-1.15-1.05	-0.012-8	1.550-7.1	-0.61-0.8	0.51-1.26	-1.71-6.05	-1.63-1.7	-7.51-2.15	-8.37-4.07	-7.32-11.18	-6.43-6.48	-2.65-6.83	-4.43-6.84	-4.97-4.11	
Theta (82.5°)	-1.68-2.04	-5.86-2.62	-2.11-1.9	-2.41-6.89	-7.07-8.03	-6.18-1.67	-2.06-2.52	-4.15-7.05	-5.46-10.3	0.891-44	-1.770-38	-1.480-72	-8.64-0.45	-1.14-0.39	0.92-1.02	-1.27-3.66	-0.75-5.33	-1.43-0.49	-2.25-0.29	-2.14-4.46	-15.25-4.24	-5.78-5.04	-7.15-5.88	-3.87-3.74	
Theta (90°)	-2.75-4.59	-8.97-6.77	-0.16-2.62	-4.28-3.25	-5.19-6.56	-2.070-22	-1.570-02	-1.421-84	-3.76-2.27	1.233-05	1.030-77	0.091-51	2.412-6	-1.271-85	1.930-65	-1.62-2.96	-2.08-3.51	1.160-9	-1.010-17	0.75-2.3	-3-21	-1.181-44	-3.03-3.78	-5.15-3.75	
Theta (97.5°)	-9.94-8.84	-8.27-7.74	-3.36-2.3	-5.87-8.83	-4.59-3.69	-4.441-03	-6.110-02	-0.912-49	-1.11-7.6	-2.011-96	2.243-08	-0.161-24	4.722-7	-0.482-63	1.861-7	-1.86-2.63	-1.09-9.2	-0.28-0.65	-0.121-2	0.					



Radiated Composite Gain Data

Appendix A.1

Gain	Φ(0°)Φ(7.5°)	Φ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)	
Θ(0°)	-13.32/-12.98	-13.05/-14.8	-17.85/-15.18	-17.47/-14.27	-17.04/-16.18	-16.11/-18.12	-14.89/-17.43	-17.61/-17.58	-15.8/-17.21	-18.37/-15.47	-14.82/-16.88	-18.4/-13.27	-14.52/-11.74	-11.65/-12.03	-11.32/-14.41	-11.17/-15.44	-13.77/-14.1	-16.29/-14.27	-13.79/-16.74	-17.4/-16.83	-16.19/-16.36	-15.85/-16.54	-14.83/-15.92	-14.32/-13.88	
Θ(7.5°)	-7.63/-7.26	-6.48/-7.72	-8.34/-9.21	-10.8/-11.52	-12.12/-14.06	-14.6/-16.79	-18.18/-16.74	-14.79/-15.42	-13.64/-14.21	-14.49/-13.14	-11.93/-12.46	-14.93/-13.87	-13.86/-16.51	-13.21/-16.64	-16.38/-18.23	-17.73/-18.79	-19.06/-17.52	-18.85/-18.23	-18.68/-17.55	-13.97/-13.05	-12.14/-10.22	-9.22/-9.63	-8.47/-7.32	-7.57/-7.99	
Θ(15°)	-9.2/-12.66	-11.7/-8.32	-8.31/-7.81	-8.35/-9.1	-10.06/-13.49	-13.4/-18.22	-14.6/-13.9	-18.09/-12.9	-12.72/-16.33	-15.64/-16.24	-18.41/-17.91	-17.66/-17.71	-15.69/-12.53	-9.57/-10.59	-10.2/-10.17	-11.73/-12.64	-14.84/-15.87	-16.4/-16.63	-15.38/-15.52	-11.73/-10.39	-8.87/-7.4	-6.65/-6.87	-6.99/-7.16	-7.84/-8.53	
Θ(22.5°)	-7.73/-7.8	-8.24/-10.01	-11.19/-9.43	-9.43/-9.43	-9.93/-11.81	-14.45/-17.76	-18.41/-19.07	-17.42/-18.33	-10.38/-9.56	-8.72/-8.02	-9.24/-10.4	-10.97/-13.11	-17.75/-16.2	-19.38/-14.7	-14.71/-18.38	-13.94/-13.78	-12.61/-11.92	-12.13/-12.71	-14.49/-11.74	-10.09/-9.74	-9.12/-9.24	-8.11/-8.37	-9.3/-8.55	-6.88/-6.74	
Θ(30°)	-7.14/-4.12	-4.85/-7.01	-9.46/-15.96	-9.57/-11.18	-8.52/-17.54	-18.76/-18.78	-18.88/-10.98	-10.85/-12.95	-13.37/-9.46	-9.86/-9.41	-9.79/-11.65	-12.63/-15.14	-15.07/-9.38	-9.03/-8.72	-12.5/-17.07	-17.72/-14.06	-14.5/-11.43	-11.91/-10.33	-13.13/-12.05	-8.13/-7.79	-7.46/-9.47	-8.09/-10.5	-7.84/-5.35	-5.13/-6.25	
Θ(37.5°)	-6.22/-4.51	-4.75/-5.74	-7.72/-11.38	-13.4/-10.97	-11.1/-18.11	-9.75/-8.98	-8.55/-8.12	-6.28/-8.06	-12.22/-17.64	-17.5/-14.64	-13.19/-13.59	-13.44/-12.96	-11.95/-10.18	-8.4/-8.67	-15.81/-12.64	-9.93/-13.16	-15.43/-12.63	-10.77/-16.36	-14.88/-9.8	-11.66/-10.24	-10.35/-10.14	-7.21/-8	-8.31/-8.12	-8.79/-9.56	
Θ(45°)	-6.7/-4.72	-4.65/-7.47	-10.62/-11.32	-11.22/-8.58	-9.96/-9.82	-6.06/-5.79	-3.78/-3.5	-8.65/-8.1	-13.96/-7.92	-10.9/-4.66	-5.07/-4.91	-1.78/-3.38	-3.36/-3.61	-4.09/-5.07	-3.06/-6.62	-5.62/-7.65	-17.23/-8.6	-9.82/-11.22	-11.63/-19	-17.19/-14.32	-8.81/-14.48	-10.96/-9.67	-12.59/-11.13	-6.05/-5.94	
Θ(52.5°)	-8.9/-10.99	-7.67/-6.06	-6.77/-19.24	-11.61/-7.16	-9.36/-9.43	-6.55/-5.16	-4.81/-5.22	-8.79/-13.88	-8.74/-8.34	-5.22/-2.96	-6.64/-4	-3.47/-3.33	-2.31/-1.15	-1.93/-5.34	-3.71/-4.91	-11.33/-19	-13.94/-14.87	-15.93/-9.34	-13.47/-15.59	-17.92/-12.79	-15.76/-17.11	-13.99/-16.12	-17.25/-7.46	-6.76/-13.85	
Θ(60°)	-4.06/-7.14	-12.06/-7.5	-8.57/-10.5	-10/-6.35	-5.54/-6.94	-6.3/-10.66	-15.14/-16.13	-9.16/-18.9	-6.24/-5.1	-5.19/-7.13	-15.8/-12.76	-13.21/-19.15	-17.62/-17.44	-16.27/-11.97	-13.34/-12.39	-9.62/-15.42	-15.71/-17.99	-18.57/-11.6	-13.12/-16.87	-18.48/-12.58	-11.22/-7.01	-11.6/-7.95	-14.01/-10.25	-11.46/-6.77	
Θ(67.5°)	-2.69/-1.65	-4.5/-6.58	-4.05/-3.29	-3.63/-2.64	-5.64/-5.45	-9.1/-10.24	-16.68/-9.71	-15.78/-5.01	-10.04/-6.48	-11.94/-18.95	-9.32/-19.07	-7.39/-6.17	-7.04/-8.05	-8.25/-5.79	-4.61/-5.78	-4.01/-7.9	-12.99/-10.68	-9.93/-14.78	-17.69/-10.19	-7.94/-19.01	-8.15/-4.2	-10.96/-10.3	-7.54/-5.63	-5.65/-5.32	-8.44/-3.56
Θ(75°)	0.63/-0.49	-1.49/-1.18	0.57/-0.75	-1.61/-1.82	-0.76/-4.74	-11.63/-3.7	-5.02/-3.37	-6.62/-6.94	-6.79/-15.95	-5.01/-12.68	-8.39/-15.58	-11.49/-8.35	-7.8/-12.1	-6.42/-3.18	-4.07/-3.75	-4.16/-7.12	-6.71/-14.46	-9.38/-7.74	-5.4/-6.27	-7.14/-10.35	-3.22/-6.09	-3.71/-2.07	-2.73/-0.51	-3.73/-2.4	
Θ(82.5°)	0.65/0.48	0.3/-0.36	2.08/2.05	-1.94/-2.03	0.38/-2.89	-6.33/2.39	-2.17/-0.94	-3.96/-4.06	-2.81/-4.46	-0.65/-0.23	-1.77/-6.98	-5.8/-5.73	-4.45/-8.17	-17.36/-8.65	-10.57/-9.38	-6.57/-12.15	-5.55/-5.93	-4.58/-6.81	-3.58/-2.6	-4.41/-3.21	-1.4/-2.38	0.45/1	-1.30/8	0.47/-0.22	
Θ(90°)	1.81/2.59	2.42/1.81	3.14/2.03	3.14/2.03	-0.54/-1.66	0.14/0.57	-2.12/-1.13	-4.88/-1.45	-1.47/-2.31	0.32/0.54	-2.64/-2.23	-1.52/1.44	-0.64/0	0.82/-4.12	-0.99/-2.04	-2.49/0.55	0.46/-1.37	-0.97/-3.28	-3.05/-1.21	1.41/2.41	1.41/2.41	1.01/0.68	1.32/0.9		
Θ(97.5°)	2.49/2.2	3/4.5	2.59/1.21	-1.12/-1.35	1.09/1	-1.19/1.23	-0.44/-1.49	-3.43/-0.25	-1.92/-2.67	0.4/-1.94	-1.51/-5.15	-1.37/-1.88	-2.63/0.59	-0.63/0.27	1.33/-5.71	-1.39/0.37	-4.27/-4.21	0.97/-1.52	1.11/-4.56	-3.68/-2.98	-0.95/-6.67	-0.84/1.85	0.74/0.1	0.22/2.68	
Θ(105°)	0.76/0.53	0.45/-1.59	-6.64/-2.64	-6.38/-1.11	0.73/0.91	-1.31/1.96	0.13/0.55	-0.36/-1.46	1.61/0.17	0.31/1.3	0.05/-7.87	-4.64/-1.48	-2.95/-2.39	-6.04/-5.55	-0.39/-5.95	-3.37/-6.23	-2.69/-4.91	-1.58/-2.28	-3.61/-5.18	-4.6/-2.48	-4.21/-0.66	-5.77/-3.32	-1.29/-3.62	-1.21/-0.76	
Θ(112.5°)	-3.95/-8.45	-11.26/-12.97	-3.21/-3.34	-5.07/-1.16	-2.3/-3.68	-2.13/-2.16	-1.16/-1.27	-4.96/-1.37	-0.34/-0.5	-0.03/0.29	-2.73/-6.34	-12.21/-21.72	-1.82/-2.72	-1.24/-1.15	-1.96/-7.91	-13.88/-2.87	-8.03/-11.31	-2.4/-1.29	-4.81/-13.26	-9.75/-2.83	-4.65/-1.3	-2.83/-2.52	-4.81/-3.94	-3.65/-4.45	
Θ(120°)	-13.87/6.03	-4.64/-4.74	-2.85/-4.14	-9.13/-14.18	-7.81/-16.71	-9.55/-8.54	-6.19/-10.66	-10.53/-5.86	-13.09/-6.66	-6.64/-3.58	-10.17/-6.2	-4.89/-17.22	-1.19/-9.12	-11.96/-4.21	-13.25/-6.4	-10.7/-6.24	-12.3/-18.87	-5.47/-6	-4.65/-13.08	-15.34/-11.21	-10.58/-4.8	-9.78/-2.08	-3.21/-6.3	-5.87/-8.6	
Θ(127.5°)	-11.35/-5.03	-7.06/-6.65	-7.34/-8.83	-11.3/-7.62	-8.69/-15.74	-17.23/-10.55	-17.39/-19.12	-11.34/-13.05	-13.72/-8.51	-6.65/-5.96	-4.28/-2.98	0.9/0.87	-4.93/-7.04	-8.41/-6.86	-12.93/-10.07	-18.77/-9	-11.19/-11.92	-7.11/-17.62	-12.49/-12.85	-10.5/-12.43	-15.41/-17.78	-14.42/-5.2	-3.17/-6.65	-6.6/-17.72	
Θ(135°)	-5.11/-4.48	-4.98/-12.45	-11.58/-8.1	-7.59/-9.42	-8.76/-7.41	-6.27/-11.04	-13.28/-9.07	-10.75/-8.46	-7.25/-7.56	-3.91/-3.34	-0.92/-3.69	-10.61/-14.16	-11.05/-18.5	-12.75/-17.49	-8.48/-7.8	-8.82/-9.86	-11.07/-12.82	-18.88/-13.81	-17.19/-11.52	-10.1/-14	-19.15/-15.29	-15.25/-18.63	-15.16/-10.56	-9.19/-7.2	
Θ(142.5°)	-5.95/-0.2	-6.01/-4.1	-4.23/-2.29	-7.38/-6.19	-4.27/-3.46	-4.05/-10.15	-9.63/-5.55	-6.59/-3.52	-2.58/-2.64	-6.35/-6.4	-6.35/-6.4	-5.95/-14	-7.48/-9.4	-16.96/-16.34	-13.15/-19.19	-13.31/-17.54	-10.88/-5.68	-8.59/-10.75	-9.47/-7.06	-11.07/-0.5	-6.53/-6.49	-6.61/-9.8	-5.67/-6.07		
Θ(150°)	-2.18/-1.97	-1.66/-1.59	-2.06/-2.37	-3.67/-3.94	-4.47/-5.03	-7.22/-9.56	-13.98/-12.05	-11.03/-5.04	-3.31/-3.51	-2.86/-3.23	-8.55/-9.25	-4.59/-2.85	-3.01/-6.99	-9.28/-9.38	-12.91/-16.38	-14.7/-9.8	-8.02/-5.74	-4.91/-4.91	-5.85/-4.88	-7.83/-7.15	-6.02/-4.59	-6.35/-3.08	-1.8/-2.04	-2.12/-3.05	
Θ(157.5°)	-4.88/-5.15	-5.95/-6.05	-5.51/-6.29	-7.55/-10.38	-11.86/-13.78	-18.83/-12.3	-8.49/-10.92	-7.72/-14.19	-9.95/-4.05	-2.83/-3.99	-7.46/-4.94	-4.48/-2.7	-12.78/-9.1	-4.95/-5.82	-8.05/-6.1	-6.24/-5.83	-5.77/-5.2	-6.61/-8.91	-7.15/-5.05	-4.58/-6.37	-9.77/-8.6	-6.51/-6.55	-1.73/-6.64	-5.37/-5.54	
Θ(165°)	-5.17/-4.9	-4.57/-5.11	-6.52/-8.42	-12.54/-14.23	-18.27/-18.08	-18.17/-14.32	-8.17/-5.61	-9.84/-10.23	-5.98/-6.01	-7.86/-8.38	-5.61/-5.21	-5.71/-7.9	-2.28/-9.11	-6.87/-5.89	-5.18/-5.72	-4.64/-4.95	-3.73/-3.92	-4.71/-4.79	-5.34/-5.51	-5.91/-6.33	-7.47/-10.26	-11.82/-9.84	-8.27/-4	-6.56/-5.13	
Θ(172.5°)	-17.53/-18.91	-15.87/-17.9	-18.68/-15.48	-16.72/-14.42	-13.7/-13.59	-18.47/-17.59	-17.06/-16.62	-6.65/-5.77	-7.57/-8.98	-8/-8.15	-6.15/-6.58	-9.77/-13.97	-9.09/-4.91	-3.32/-2.98	-4.91/-6.18	-5.39/-5.45	-4.03/-4.03	-4.2/-4.29	-5.86/-6.54	-6.97/-7.19	-6.29/-6.53	-6.63/-7.02	-8.09/-9.15	-11.47/-13.9	
Θ(180°)	-10.37/-8.98	-8.57/-7.39	-5.97/-5.41	-4.34/-3.85	-3.36/-4.29	-4.3/-3.23	-2.76/-3.7	-7.39/-14.32	-17.34/-12.81	-10.32/-9.04	-9.22/-12.68	-10.37/-7.07	-6.84/-7.67	-9.23/-9.95	-5.56/-4.39	-3.42/-3.58	-3.61/-3.95	-4.35/-4.28	-5.18/-6.18	-5.86/-6.27	-7.68/-7.99	-8.81/-10.03	-10.67/-10.97	-11.28/-11.35	
Freq(Hz)	5.3GHz	PhiAnt. 4	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Gain	Φ(0°)Φ(7.5°)	Φ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)	
Θ(0°)	-18.15/-17.88	-18.46/-18.91	-17.22/-18.93	-16.55/-18.27	-18.96/-17.03	-16.3/-12.74	-15.79/-13.66	-12.36/-14.63	-15.75/-15.84	-18.54/-18.87	-18.56/-18.96	-18.96/-18.29	-18.39/-18.31	-16.92/-15.77	-14.18/-15.77	-13.02/-13.21	-12.29/-12	-13.35/-10.72	-12.24/-14.79	-13.07/-12.14	-12.92/-13.21	-13.31/-14.68	-15.77/-15.92	-17.93/-19.11	
Θ(7.5°)	-18.55/-17.52	-18.51/-16.44	-18.23/-13.46	-16.89/-11.88	-15.42/-13.16	-18.75/-14.01	-19.12/-19.01	-17.21/-16.21	-13.49/-13.48	-14.86/-14.69	-16.25/-17.76	-16.55/-16.48	-16.72/-13.77	-17.38/-13.16	-16.99/-11.99	-16.03/-12.27	-13.55/-11.56	-11.59/-13.48	-11.01/-11.4	-11.70/-11.24	-11.23/-11.57	-12.64/-14.36	-15.18/-18.22	-17.85/-18.79	
Θ(15°)	-18.52/-16.23	-18.65/-18.66	-18.12/-17.32	-19.11/-14.27	-14.41/-15.16	-14.53/-17.54	-16.79/-17.65	-14.99/-16.61	-19.14/-18.42	-17.37/-15.71	-14.31/-15.34	-13.42/-10.02	-11.77/-14.27	-16.06/-18.86	-18.15/-19.06	-15.48/-16.47	-13.57/-12	-12.27/-9.57	-12.44/-13.58	-15.08/-17.92	-18.37/-17.78	-18.42/-17.94	-17.38/-18.39	-19.18/-17.94	
Θ(22.5°)	-19.51/-18.94	-17.81/-17.96	-17.81/-18.93	-19.29/-18.45	-18.03/-18.95	-18.41/-17.33	-14.58/-16.13	-13.39/-15.03	-17.35/-13.31	-14.08/-18.95	-14.51/-10.56	-10.11/-10.53	-11.06/-9.5	-10.25/-11.09	-9.42/-16.6	-19.08/-18.66	-19.11/-19.37	-13.32/-15.52	-17.2/-17.79	-18.72/-18.9	-19.33/-18.66	-18.41/-17.79	-18.66/-17.92	-18.66/-17.92	
Θ(30°)	-17.81/-19.06	-19.96/-18.93	-19.41/-17.94	-16.01/-17.82	-12.5/-15.73	-16.4/-16.21	-13.24/-13.97	-11.32/-14.54	-12.69/-14.13	-17.45/-18.63	-16.09/-15.54	-18.31/-17.15	-18.47/-17.9	-18.81/-14.19	-13.99/-12.6	-12.69/-12.8	-14.41/-17.39	-17.89/-19.07	-14.71/-14.28	-17.95/-17.74	-18.24/-18.7	-18.36/-16.27	-14.87/-14	-14.51/-17.77	
Θ(37.5°)	-18.56/-18.01	-18.56/-18.93	-18.48/-17.39	-17.1																					



Mode 2

Freq(Hz)	2.45G	5.2G	5.3G
Ant. 1 Max Gain (dBi)	2.46	3.34	3.41
Ant. 2 Max Gain (dBi)	3.54	4.16	4.71
Ant. 3 Max Gain (dBi)	4.36	3.44	3.32
Ant. 4 Max Gain (dBi)	3.47	4.31	4.69
Ant. 1 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Phi/82.5/60	Phi/45/262.5	Phi/45/262.5
Ant. 2 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Phi/172.5/180	Phi/112.5/157.5	Phi/112.5/157.5
Ant. 3 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Phi/127.5/67.5	Phi/157.5/247.5	Phi/90/270
Ant. 4 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/157.5/97.5	Phi/105/0	Phi/60/187.5
Max Gain (dBi)	4.36	4.31	4.71
DG [1SS] (dBi)	5	4.76	4.75
DG [2SS] (dBi)	4.36	4.31	4.71
DG [4SS] (dBi)	4.36	4.31	4.71



Radiated Composite Gain Data

Appendix A.2

DG 1SS Result

Freq(Hz)	2.45GPol.	PhiL	Phi(15°)Phi(22.5°)	Phi(30°)Phi(37.5°)	Phi(45°)Phi(52.5°)	Phi(60°)Phi(67.5°)	Phi(75°)Phi(82.5°)	Phi(90°)Phi(97.5°)	Phi(105°)Phi(112.5°)	Phi(120°)Phi(127.5°)	Phi(135°)Phi(142.5°)	Phi(150°)Phi(157.5°)	Phi(165°)Phi(172.5°)	Phi(180°)Phi(187.5°)	Phi(195°)Phi(202.5°)	Phi(210°)Phi(217.5°)	Phi(225°)Phi(232.5°)	Phi(240°)Phi(247.5°)	Phi(255°)Phi(262.5°)	Phi(270°)Phi(277.5°)	Phi(285°)Phi(292.5°)	Phi(300°)Phi(307.5°)	Phi(315°)Phi(322.5°)	Phi(330°)Phi(337.5°)	Phi(345°)Phi(352.5°)
0(0°)	0.66119	1.54176	2.04229	2.51263	2.63228	1.71111	0.8076	0.36051	0.10611	1.16113	0.69026	0.22075	1.58213	2.32223	2.18227	2.24174	1.19092	0.35222	-0.34090	0.66088	0.7606	0.66059	0.35031		
0(7.5°)	0.58118	1.58174	2.08252	2.67247	2.28208	1.59078	0.22045	-0.10111	0.83032	1.46146	1.22015	1.2153	2.27307	1.63139	1.63152	1.1062	0.56010	0.56072	0.56072	0.56072	0.56072	0.56072	0.56072	0.56072	0.56072
0(15°)	0.78142	1.21256	2.8531	3.29326	2.88234	1.58026	-0.95174	-1.51402	-1.05052	0.17096	1.33166	1.79167	1.64223	2.73263	2.2517	1.07076	0.9208	0.55023	-0.1041	0.64096	1.21124	1.27101	0.31013	-0.08027	
0(22.5°)	0.7118	1.96251	2.86322	3.65368	3.07186	0.47181	-1.91212	-1.91098	-0.88046	0.45094	1.07158	1.93191	1.47158	2.42218	1.0708	-0.57167	-0.07023	0.26001	0.1072	0.97138	1.8518	1.83191	1.59123	0.94085	
0(30°)	0.77017	1.37236	2.77301	3.46364	3.23251	1.07103	-0.37001	0.29058	1.23119	1.06091	0.039	1.25109	0.17011	1.3914	-0.36187	-2.07209	-1.60705	-0.14025	0.17614	1.94215	2.11199	2.15034	2.36223	2.04157	
0(37.5°)	1.05063	1.21195	2.53339	4.01399	3.16258	1.92069	0.49097	1.56135	1.81225	1.62095	0.59014	1.48199	0.77048	1.07074	-0.22064	-1.11179	-1.69101	-0.11067	1.01099	1.53218	2.28223	2.44229	1.91171	1.97164	
0(45°)	0.43018	0.67175	2.33326	4.33425	3.24224	2.12138	0.97136	1.33144	0.6617	1.84087	0.88035	0.68147	0.61075	0.72158	-1.69103	-1.31217	-2.06086	-0.05021	0.6101	-0.32025	1.12025	2.53224	1.28022	0.17041	
0(52.5°)	-0.81059	0.62165	2.26323	4.38424	3.21251	1.93129	1.312	1.18104	0.61143	1.74169	2.14064	0.22075	-0.14043	-0.04726	-2.33215	-2.76255	-2.99212	-1.48067	0.5013	-0.9201	0.75146	2.08171	0.31095	-1.55104	
0(60°)	0.05014	0.62189	2.46303	3.92377	3.232	1.34145	2.4311	2.23181	1.71193	1.69196	2.76179	1.43153	-0.38006	-0.96215	-1.66337	-4.47126	-3.15396	-4.71298	-1.29158	-2.22022	0.8609	0.4303	-1.34147	-1.54076	
0(67.5°)	1.45136	0.87194	2.71317	3.42175	2.65207	1.75177	2.69299	1.81176	1.6168	1.26152	2.37236	1.94176	-0.66172	-2.61339	-2.2431	-4.55127	-3.43403	-6.512	-4.01472	-3.35084	-0.16102	-0.91085	-0.1801	-0.81017	
0(75°)	2.04243	1.51205	3.15349	3.39277	2.54258	2.08121	1.53187	1.25198	2.08214	1.46129	1.72171	0.98152	0.18093	-3.68288	-2.57128	-4.84553	-5.23403	-5.84588	-3.64466	-3.46116	-1.31139	-1.46112	-0.02107	0.92048	
0(82.5°)	2.27267	1.94242	3.67368	3.46317	3.06239	1.86077	0.57139	2.22271	3.1328	1.67089	0.41053	1.39224	1.51046	-1.23236	-2.02136	-5.56687	-5.67122	-7.84171	-1.41286	-2.62068	-1.21209	-0.99047	-0.05088	1.46127	
0(90°)	2.5326	1.63244	3.64043	4.28379	3.3227	1.41063	0.17156	2.87331	4.06278	1.88059	0.33172	1.66167	2.3077	-0.03001	-3.96135	-3.44162	-5.49428	-6.75139	-1.35249	-2.84016	-0.89304	-1.59044	0.08076	0.76092	
0(97.5°)	1.99198	1.66243	3.47143	4.4839	3.08255	1.4909	-0.4225	3.1329	3.3222	1.88007	0.7226	1.29151	2.1902	0.04216	-5.06229	-2.45163	-4.42153	-5.08123	-1.35184	-2.56042	-1.52137	-1.37146	-0.7056	0.5406	
0(105°)	0.91117	1.95227	3.37394	4.08384	2.88199	0.42169	0.27203	2.1221	2.07265	1.73102	0.75132	0.36186	1.05157	-1.86351	-2.74126	-3.29302	-2.69137	-5.67136	-2.02172	-1.9905	-1.65401	-1.44164	-1.95077	-0.23016	
0(112.5°)	0.53158	2.29264	3.77421	4.29339	1.51003	0.01063	0.86187	1.55179	1.55199	2.47136	0.56001	0.39134	0.04157	-3.05199	-3.38158	-4.28102	-2.51319	-5.26181	-2.9133	-2.51208	-0.43125	-2.62124	-1.89122	-0.82037	
0(120°)	1.7211	2.46346	4.342	4.16291	1.75251	3.01223	1.56282	2.83158	-0.01117	1.17111	0.78126	0.69046	-1.24202	-3.96172	-2.47146	-2.75121	-1.98048	-5.41352	-2.12199	-4.61164	0.11094	-2.35185	-1.13128	0.4112	
0(127.5°)	3.48345	3.12385	3.89343	3.85438	4.29422	3.8221	0.7016	0.83106	-2.74247	-0.69181	3.71165	-1.6915	0.05066	-4.03198	-0.41101	-1.61033	-0.75132	-1.95146	-2.32116	0.08002	-1.0805	0.05037	0.6215		
0(135°)	3.78426	3.92389	3.74399	4.47456	4.36445	3.37171	-0.52029	-0.15156	-2.86253	2.1367	2.48061	-1.17118	1.91022	-1.38029	-0.81247	-0.34059	0.22121	-2.31452	-3.21107	-0.3009	0.74066	-0.73062	-0.08044	0.39173	
0(142.5°)	3.15362	3.68382	4.17492	4.17492	3.8346	3.21224	0.4001	-0.8244	-3.821	1.03125	0.29031	1.52247	2.8162	1.14043	-2.51315	-0.3101	-0.25087	-3.33174	-2.99161	-0.69011	0.44107	-1.22053	-0.84059	1.46237	
0(150°)	3.19315	2.9297	3.88466	4.8424	3.01153	1.65164	0.64205	-0.85258	-3.79247	1.78404	0.37163	2.55222	2.9127	1.61041	-4.21327	-1.31003	-1.71304	-4.8408	-3.74276	-1.44068	-0.55008	0.28004	0.71182	2.61315	
0(157.5°)	2.8329	3.21376	4.46491	4.85421	3.05179	1.28083	-0.12061	-0.95111	-1.19107	-1.22033	1.52151	2.79244	2.24238	1.37153	-3.7512	-1.16176	-2.32193	-3.51373	-3.58337	-2.83167	-0.09118	1.97226	2.39234	2.29252	
0(165°)	1.21196	2.95377	4.43474	4.53389	2.9925	2.17142	0.35018	-0.47028	0.06022	-1.13017	1.11124	0.69094	1.64124	-0.44214	-1.79018	0.23103	-1.14173	-2.12155	-2.471205	-1.82138	-0.33073	1.46162	1.58132	0.78055	
0(172.5°)	-0.03029	2.12125	6.26253	2.1517	1.89201	1.7083	0.051	-0.81102	-1.02177	-1.18402	-0.02059	1.04106	1.06104	0.13025	2.09278	2.24171	1.37091	0.28028	-0.25029	1.150834	0.54092	1.09114	1.15088	0.15027	
0(180°)	0.5713	1.97235	2.32198	1.89218	2.44241	1.90089	-0.41157	-2.47226	-1.521	0.16117	2.19229	1.25088	0.96028	0.49268	3.836	2.9282	3.0248	1.73147	1.3134	1.36126	1.63193	1.89192	1.88153	0.90143	



Radiated Composite Gain Data

Appendix A.2

Θ(22.5°)	1.191.32	0.770.9	0.440.25	-0.93/-1.29	-1.01/-0.6	-0.81/0.51	1.37/1.48	2.2/2.76	2.02/2.39	2.7/2.55	2.21/1.55	1.09/0.11	-1.14/-1.63	0.31/0.34	0.32/-0.41	-0.11/0.03	0.11/0.73	0.48/-0.2	-0.21/-0.45	-0.47/-0.14	0.8/1	0.99/1.22	0.44/0.36	-0.18/0.42
Θ(30°)	2.38/2.06	2.09/1.35	0.67/0.71	0.41/-0.32	-1.03/-0.61	-0.08/0.89	1.42/2.44	2.53/3.68	2.91/1.45	1.92/1.79	1.76/2.52	2.64/0.45	1.41/0.45	-0.17/-1.39	-1.59/-0.98	-1.32/-1.9	-2.83/-1.43	-0.43/0.04	0.74/1.31	-0.32/-1.29	-1.59/-2.23	-3.17/-1.95	-0.66/0.53	1.34/1.73
Θ(37.5°)	0.93/1.45	1.76/1.25	-0.6/-0.29	-0.85/-1.5	-1.6/-2.2	-2.66/-1.68	-0.71/0.32	1.06/2.51	2.79/2.97	2.13/1.05	0.7/0.39	1.79/0.87	-0.45/-0.3	-0.14/-0.37	-0.97/-3.79	-2.36/-1.27	-2.45/-0.49	0.71/3.6	2.13/2.21	1.65/0.74	-1.55/-2.14	-2.95/-2.52	-2.36/-0.93	0.52/0.99
Θ(45°)	0.89/2.26	2.13/0.75	-1.07/-2.25	-4.17/-3.42	-1.31/-2.77	-3.69/-0.86	-0.13/-0.2	0.84/2.04	2.85/2.23	1.39/2.19	0.86/0.65	1.73/0.72	-0.08/0.09	0/-0.72	-0.90/1.3	-1.67/0.2	2.59/2.62	3.46/3.67	2.03/1.1	0.34/0.77	-2.13/-2.43	-3.07/-4.56	-3.33/-2.65	-0.24/1.18
Θ(52.5°)	2.31/2.98	2.11/-0.3	-1.85/-1.17	-1.49/-1.59	-1.87/-1.41	-0.77/-1.37	-0.38/0.66	1.69/1.56	-0.72/1.4	1.32/3.4	0.81/0.39	0.29/1.29	0.45/0.85	-0.67/-1.86	-2.6/-3.54	-1.58/-1.06	1.98/2.71	2.31/1.6	1.27/0.19	-1.17/-0.89	-0.74/-4.07	-7.5/-4.2	-5.11/-2.38	1.62/2.29
Θ(60°)	2.19/2.62	0.91/0.23	1.11/-0.49	-0.96/-0.7	-0.8/-0.72	-3.4/-1.79	-0.29/0.93	1.54/2.57	1.78/0.73	1.93/0.57	2.56/-0.2	0.73/1.98	3.97/4.26	1.83/0.93	-0.18/-4.69	-4.26/-2.92	-0.26/2.97	1.04/-0.03	1.05/1.33	1.08/1.2	-0.99/-2.07	-4/-7.69	-4.44/-0.92	0.83/2.68
Θ(67.5°)	3.19/2.35	-0.3/-0.83	0.66/0.24	1.03/0.25	0.59/-1.11	-0.73/-0.57	0.29/1.65	0.73/0.63	0.36/-2.3	1.27/1.1	2.03/1.64	-0.56/1.01	0.77/1.93	1.21/0.4	-1.57/-3.75	-3.76/-2.63	0.92/0.6	3.44/1.98	1.05/0.82	0.36/1.35	0.92/0.83	-1.93/-6.12	-5.4/-2.34	1.37/1.91
Θ(75°)	4/2	-0.3/-1.13	-0.8/0.96	0.63/1.17	1.72/-0.58	-0.38/0.61	-0.27/1.71	2.36/1.86	1.11/0.67	0.5/1.14	-0.98/2.58	0.54/2.07	2.33/2.15	-2.56/-4.66	-2.61/-3.51	-8.49/-5.3	-0.57/0.23	2.22/2.09	1.3/-0.29	1.46/3.53	-0.15/0.74	-1.41/-4.02	-4.64/-0.97	2.39/2.69
Θ(82.5°)	3.22/1.98	-0.3/-2.54	-0.54/-0.34	1.95/0.98	1.33/-1.48	-0.39/0.77	0.79/2.2	1.37/2.48	1.84/0.21	0.57/-0.19	1.07/-0.14	2.42/2.08	1.87/1.29	0.19/-3.44	-2.48/-1.74	-6.11/-4.11	0.98/1.49	4.75/3.76	1.41/0.23	2.62/2.25	1.61/0.01	-1.85/-4.47	-2.75/-1.3	1.83/1.55
Θ(90°)	2.54/1.96	0.86/-0.92	-1.59/0.55	3.23/0.86	0.77/-1.1	0.21/2.15	-1.01/0.11	2.82/2.78	1.13/0.23	-2.77/-1.87	-1.29/1.38	-0.21/3.49	2.32/2.51	-1.36/-1.12	-3.82/-0.34	-3.68/-5.91	2.22/1.27	2.37/1.19	0.76/1.15	1.34/1.71	-0.22/-2.96	-2.84/-3.69	-3.32/-2.61	0.35/1.56
Θ(97.5°)	1.35/0.99	1.73/0.58	-1.96/0.47	2.61/1.52	1/-2.33	0.9/0.1	-2.78/1.79	0.56/0.24	1.53/0.49	-1.94/-1.69	1.12/0.28	2.69/1.99	0.84/-2.36	-4.2/-3.63	-0.21/2.42	-6.15/-5.88	-1.77/-0	1.2/1.15	0.55/-0.79	-0.06/0.76	-0.38/-3.81	-3.55/-4.69	-4.74/-6.07	-0.61/0.92
Θ(105°)	3.4/1.94	1.81/0.5	-1.59/-0.65	2.74/1.31	0.6/-2.34	-2.19/1.71	-0.38/0	-0.29/1.39	3.02/1.41	-4.2/-1.32	-1.78/1.69	0.45/2.63	1.34/0.95	0.52/-2.36	-1.79/-2.24	-2.37/8.63	-1.56/-1.25	0.45/0.52	-0.67/-1.92	-1.04/1.57	-0.41/-2.53	-4.43/-3.74	-4.55/-3.3	-0.69/0.97
Θ(112.5°)	4.44/2.39	0.91/0.43	-2.36/-1.08	2.06/0.25	-1.14/-2.67	1.12/0.98	-1.06/0.49	0.23/1.16	1.29/0.67	-1.72/-2.66	-0.88/2.07	0.57/1.72	2.91/1.53	1.26/-0.96	-4.55/-3.19	-7.86/-7.07	-2.89/-2.75	-0.32/-0.03	-1.35/-3.4	-2.05/1.15	-0.94/-1.79	-4.37/-4.13	-3.84/-2.61	1.43/1.79
Θ(120°)	3.8/2.16	2.09/0.56	-0.45/-1.5	0.72/1.17	-0.93/-1.17	-2.37/0.75	-0.7/0.58	2.04/0.2	-0.38/-1.94	-2.05/-2.43	0.57/1.65	1.52/2.85	2.91/2.07	-1.8/-3.1	5.11/-5.98	-8.85/-5.22	-2.96/-4.4	-0.36/0.5	-2.86/-3.92	-1.87/-2.77	-4.59/-4.81	-6.11/-3.79	-2.68/2.36	
Θ(127.5°)	3.46/1.93	2.31/1.38	0.02/-0.95	0.22/-1.48	0.58/-1.46	-4.09/-1.4	-1.23/-1.79	1.18/-0.15	0.75/0.65	0.15/-0.92	-0.48/0.91	2.99/2.41	0.41/0.12	-2.11/-4.37	-5.16/-6.86	-1.184/5.4	-3.75/4.04	-1.78/0.8	-2.39/5.24	-3.57/3.66	-4.08/3.93	-5.16/-2.3	-1.69/-0.33	2.55/2.72
Θ(135°)	1.31/1.67	2.39/0.89	1.06/-1.01	-1.68/-0.75	-2.03/-1.96	-1.4/0.19	-0.88/-1.87	-0.13/0.66	-2.33/-0.31	-2.51/-1.78	0.85/1.53	0.22/-0.33	0.92/-0.01	-4.83/-2.66	-2.2/-7.33	-10.31/5.66	-4.21/-3.4	-3.46/-2.04	-2.54/-3.6	-4.94/-4.92	-5.16/-4.99	-6.42/-4.43	-1.73/1.81	2.86/1.93
Θ(142.5°)	0.49/2.16	3.31/2.45	-0.35/-4.6	-1.69/-2.49	-2.58/-1.14	-1.07/0.52	-1.59/-1.64	0.66/-4.6	-2.63/-1.32	2.35/2.07	0.07/0.29	-0.27/0.4	0.12/-2.73	-3.89/-5.06	-2.22/-2.42	-2.5/-3.58	-5.69/-3.68	-3.99/-3.27	-3.69/-2.86	-0.29/0.6	2.9/2.06	2.49/1.34	1.81/1.13	
Θ(150°)	0.04/0.94	2.02/2.21	0.74/0.51	-1.66/-3.23	-1.25/-1.35	-1.9/-0.59	-3.04/-3.24	-1.62/0.5	-0.79/0.44	-2.31/4.2	2.39/0.95	-1.91/-2.15	0.34/-2.71	-6.49/-1.25	-1.31/-2.04	-2.89/-2.18	-0.77/2.44	-3.97/-3.26	-3.01/-4.1	-3.72/-3.97	-4.53/-2.61	-2.04/-1.97	0.62/2.8	1.81/1.13
Θ(157.5°)	0.48/0.88	2.38/3.37	2.76/1.29	-1.53/-2.55	-3.05/-2.25	-2.41/-2.45	-4.32/-4.64	-4.88/-3.71	-0.81/-2.02	1.08/2.04	-0.52/-0.99	-4.4/-4.76	-4.67/-3.43	0.65/1.58	1.08/-0.05	-0.92/-0.52	-1.66/-1.79	-2.32/-2.44	-3.14/-2.88	-1.41/-1.5	-2.09/-0.62	0.74/2.23	1.83/1.84	1.38/0.01
Θ(165°)	0.14/1.53	1.51/1.08	0.75/-0.22	-1.32/-3.54	-4.12/-2.94	-4.05/-5.23	-5.21/-3.62	-3.04/-2.32	-1.32/0.44	0.79/0.9	-0.73/-1.22	-0.37/-2.81	-0.39/1.47	1.5/0.17	-0.31/-0.29	0.55/0.82	1.03/0.5	-0.46/-2.15	-2.98/-3.19	-1.88/-0.92	-0.90/0.49	1.01/1.33	1.14/0.48	-0.23/0.54
Θ(172.5°)	0.85/0.27	-0.21/-0.88	-0.88/-1.33	-1.71/-1.98	-3.48/-3.12	-2.46/-2.09	-2.85/-4.54	-3.16/-1.15	1.02/2.1	2.57/0.42	0.33/-0.52	-2.02/0.14	1.37/1.76	1.35/0.79	0.1/0.25	-1.35/-1.18	-0.55/-0.07	-0.64/-2.27	-3.21/-3.59	-2.92/-1.49	0.03/0.87	1.13/1.77	2.21/1.7	1.94/1.47
Θ(180°)	2.03/2.13	2.59/3.21	3.4/3.06	2.67/1.2	-0.88/-1.49	-1.57/-2.56	-2.96/-1.84	-0.63/0.38	1.42/1.87	0.49/-0.02	0/-0.03	1.88/2.96	3.13/3.66	2.91/4.6	1.88/1.65	2.12/2.65	2.52/2.1	0.75/0.16	-0.63/-1.19	-1.7/-1.38	-0.25/0.37	1.07/1.37	1.55/1.93	1.82/1.81
Freq(Hz)	5.3GPol	Thetaz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dB)	Φ(0°)/Φ(7.5°)	Φ(15°)/Φ(22.5°)	Φ(30°)/Φ(37.5°)	Φ(45°)/Φ(52.5°)	Φ(60°)/Φ(67.5°)	Φ(75°)/Φ(82.5°)	Φ(90°)/Φ(97.5°)	Φ(105°)/Φ(112.5°)	Φ(120°)/Φ(127.5°)	Φ(135°)/Φ(142.5°)	Φ(150°)/Φ(157.5°)	Φ(165°)/Φ(172.5°)	Φ(180°)/Φ(187.5°)	Φ(195°)/Φ(202.5°)	Φ(210°)/Φ(217.5°)	Φ(225°)/Φ(232.5°)	Φ(240°)/Φ(247.5°)	Φ(255°)/Φ(262.5°)	Φ(270°)/Φ(277.5°)	Φ(285°)/Φ(292.5°)	Φ(300°)/Φ(307.5°)	Φ(315°)/Φ(322.5°)	Φ(330°)/Φ(337.5°)	Φ(345°)/Φ(352.5°)
Θ(0°)	-0.28/0.16	0.19/0.74	0.72/0.78	0.69/1.42	1.16/1.48	1.06/0.05	-0.21/-0.03	-0.41/0.6	-0.21/0.5	1.41/0.4	1.12/-0.05	-0.81/-1.67	-2.24/-2.16	-0.96/-0.08	0.15/0.3	1.37/1.06	0.7/0.33	0.34/0.33	-0.6/0.38	0.73/0.43	0.59/1.14	0.8/0.8	0.15/-0.22	-0.73/-0.9
Θ(7.5°)	-2.44/-1.78	-0.41/0.45	0.95/0.94	0.76/0.88	1.09/0.76	0.65/0.74	-0.13/0.19	0.65/0.63	0.84/0.21	1.07/97	1.13/0.86	0.52/0.29	0.35/0.28	0.53/1.23	1.71/1.68	1.36/2.09	1.32/1.14	1.14/0.7	0.15/0.28	0.11/0.39	-0.14/0.41	0.37/0.43	-0.34/-0.54	-1.85/-2.69
Θ(15°)	-3.78/-3.28	-3.51/-2.53	-1.2/-0.77	-0.67/0.1	0.77/0.74	0.56/0.06	-0.43/0.42	0.28/0.61	1.62/1.66	2.25/4.64	2.34/1.43	0.05/0.25	0.39/0.29	0.17/0.32	0.41/1.16	0.94/1.36	0.35/0.72	-0.34/0.4	-0.48/-2.01	-1.35/-0.64	0.37/0.03	1.52/0.42	-0.55/-1.65	-3.3/-4.1
Θ(22.5°)	-1.63/-2.45	-2.79/-3.96	-3.26/-2.46	-2.66/-2.09	-0.23/0	-1.28/-2.53	-2.7/-1.27	-1.2/0.09	1.36/2.13	1.48/1.99	1.2/-0.31	-0.36/-0.93	0.35/1.26	1.57/0.59	-1.37/-1.16	-1.45/-1.07	0.14/-2.22	-1.87/-4.1	-4.3/-3.86	-3.49/-2.48	-1.02/0.16	0.06/0.02	-1.64/-2.94	-3.51/-2.82
Θ(30°)	-1.59/-2.79	-2.11/-2.39	-1.3/-1.41	-1.71/-2.56	-2.26/-1.77	-2.6/-4.77	-3.39/-2.43	-2.45/-2.88	-2/0.48	1.24/3.33	2.78/0.79	-0.25/-0.89	-1.68/-1.21	-1.14/-0.6	-2.3/-3	-2.61/-3.93	-4.3/-5.55	-6.6/-6.15	-6.6/-9.92	-7.22/-3.93	-2.48/-0.19	0.24/-0.26	-0.99/-1.7	-1.36/-1.16
Θ(37.5°)	-2.22/-1.61	-1.38/-1.7	-1.99/-2.45	-2.89/-2.76	-5.75/-4.66	-3.64/-4.96	-4.98/-4.44	-5.17/-4.44	-2.23/0.46	0.76/1.84	1.84/0.01	-1.65/-2.18	-3.2/-3.8	-4.89/-6.65	-3.81/-2.87	-2.89/-2.57	-1.29/-2.59	-4.68/-5.43	-6.64/-8.62	-11.41/-9.54	-4.37/-1.49	0.41/0.65	0.23/-1.42	-2.52/-3.77
Θ(45°)	-3.14/-0.67	-0.27/-0.55	-3.38/-3.3	-4.05/-5.75	-6.31/-5.2	-4.5/-6.17	-9.1/-7.53	-4.63/-2.97	-1.48/-0.02	-0.46/-1.39	-0.63/0.45	0.26/-0.18	-0.76/-1.03	-3.49/-6.11	-5.94/-5.08	-5.75/-4.72	-5.24/-5.41	-5.35/-8.08	-5.98/-8.22	-6.2/-5.53	-5.49/-7.47	-3.07/0.51	-0.3/-3.25	-7.09/-4.49
Θ(52.5°)	-3.7/-1.4	-0.02/-0.9	-4.11/-2.62	-3.54/-5.71	-8.45/-6.72	-4.55/-4.85	-9.74/-7.48	-5.48/-6.4	-4.4/-1.09	-1.3/2.1	-0.26/0.48	-1.19/-1.38	-1.62/-2.05	-3.84/-4.36	-6.07/-9.1	-6.21/-3.65	-2.59/-2.02	-5/-5.24	-5.08/-12.43	-6.57/-6.08	-7.68/-6.92	-7.11/-4.43	-4.98/-3.84	-6.27/-5.23
Θ(60°)	-3.21/-3.53	-0.67/-1.13	-3.17/-4.16	-5.52/-6.39	-7.36/-7.2	-5.26/-5.81	-7.56/-7.57	-5.07/-7.83	-4.55/-4.47	-3/-3.3	-2.52/-1.1	-3.75/-2.14	-1.74/-1.5	-2.82/-5.45	-3.5/-6.03	-11.43/-9.46	-7.44/-4.35	-2.49/-2.9	-5.67/-9.45	-4.99/-6.51	-5.04/-2.83	-6.25/-7.65	-5.72/-4.85	-7.8/-4.35
Θ(67.5°)	-3.5/-3.08	-4.61/-2.37	-3.1/-2.56	-5.45/-7.26	-5.18/-8.14	-7.95/-3.75	-5.32/-7.38	-7.73/-7.69	-3.91/-5.66	-6.2/-3.27	-2.89/-0.88	-2.16/-1.57	-4.11/-3.19	-2.35/-3.1	-5.78/-5.88	-8.5/-8.88	-6.88/-5.38	-4.43/-1.98	-1.41/-2.36	-5.92/-3.81	-5.1/-2.25	-4.99/-5.63	-5.77/-5.46	-6.45/-2.35
Θ(75°)	-3.43/-4.1	-8.45/-2.21	-3.81/-2.55	-4.59/-8.93	-10.28/-7.08	-5.98/-3.87	-4.62/-5.39	-7.67/-7.22	-3.71/-5.16	-4.69/-4.89	-5.83/-3.52	-2.12/-3.77	-3.27/-2.89	-5.19/-5.71	-4.32/-4.46	-4.95/-7.25	-2.16/-2.24	-3.11/-0.8	-0.29/-1.78	-5.92/-5.5	-3.22/-5.11	-5.18/-5.84	-6.65/-6.17	-3.92/-4.22
Θ(82.5°)	-7.09/-4.75	-6.32/-3.39	-5.86/-5.79	-3.76/-5.71	-6.49/-5.46	-8.18/-7.25	-4.8/-5.8	-6.29/-7.67	-7.28/-8.44	-8.33/-6.08	-4.31/-6.78	-2.53/-4.89	-4.44/-4.74	-6.83/-5.22	-5.2									



Radiated Composite Gain Data

Appendix A.2

Theta (°)	-17.41/-17.21	-15.61/10.81	-8.18/4.19	-6.48/6.78	-6.04/5.26	-2.99/0.99	0.440/7.7	1.280/9.3	0.19/-0.58	-1.06/3.07	-6.01/8.1	-12.17/-18.28	-18.84/-19.05	-11.76/-9.71	-10.21/11.43	-9.04/7.8	-4.66/2.92	-2.22/2.67	-2.65/3.94	-3.28/3.65	-2.59/2.48	-6.47/8.87	-10.62/8.41	-10.94/17.05		
Theta (30°)	-12.97/-16.21	-10.06/-8.81	-5.63/-4.63	-3.89/-3.21	-4.46/-3.96	-3.48/-1.23	0.11/1.14	1.29/1.79	1.16/0.01	-1.76/-2.8	-5.74/-6.61	-7.71/-11.7	-15.63/-16.25	-14.18/-11.6	-8.41/-4.8	-2.98/-3.8	-5.43/-4.3	-3.31/2.16	-1.08/-0.68	-1.69/-2.06	-2.62/-3.6	-5.86/-8.14	-8.11/-6.53	-9.35/-11.2		
Theta (35°)	-14.42/-9.7	-7.03/-7.11	-6.83/-3.54	-3.75/-5.15	-4.54/-4.81	-4.65/-2.42	-0.73/0.85	1.49/2.49	2.08/3.1	0.04/0.93	-0.95/-5.79	-6.68/-13.25	-17.19/-14.09	-10.02/8.82	-7.18/-5.38	-2.21/-1.17	-1.54/-1.22	0.07/0.98	0.68/0.25	0.11/0.24	-1.34/-2.69	-5.13/-6.85	-1.01/9.84	-9.71/-12.3		
Theta (45°)	-12.72/-7.72	-5.37/6.99	-3.93/3.45	-5.14/5.02	-3.69/3.45	-3.78/2.29	-1.02/4	2.11/1.94	1.67/1.18	0.60/1.6	-1.95/9.2	-10.86/-14.74	-15.87/-10.22	-8.76/8.01	-4.67/2.71	-1.36/0.02	1.48/1.14	1.94/3.41	2.31/1	0.12/-1.62	-2.59/3.04	-5.86/-10.06	-12.45/-18.8	-17.28/-15.02		
Theta (52.5°)	-9.18/-5.75	-4.68/-7.67	-5.29/5.07	-3.20/3.83	-2.42/2.72	-1.86/-2.93	-1.21/0.19	1.54/1.68	0.63/1.2	-0.33/0.69	-3.25/-5.8	-16.41/-18.73	-12.03/-6.43	-6.75/-4.99	-3.13/2.54	-2.44/-2.19	-1.46/-5.06	0.45/0	-0.43/-0.32	0.05/0.96	-1.22/-4.67	-11.12/-14.77	-19.27/-19.02	-16.51/-11.2		
Theta (60°)	-7.23/-9.2	-5.89/-7.98	-6.83/-3.6	-1.07/0.11	-0.21/1.67	-2.72/-2.61	-2.33/-1.04	0.69/2.12	0.89/0.4	-0.05/-0.77	-2.41/8.03	-16.21/-17.76	-10.26/5.7	-6.75/-4.16	-6.07/5.47	-5.76/-5.83	-2.11/0.27	-1.25/2.32	-3.0/3	0.59/0.26	0.35/-1.67	-8.87/-13.83	-11.61/-17.87	-10.51/-8.12		
Theta (67.5°)	-5.99/6.66	-10.14/-12.49	-9.34/3.06	-0.22/0.85	0.25/0.94	-1.78/-1.7	-0.23/0.87	1.76/1.97	1.92/1.73	-1.33/2.51	-3.34/8.55	-15.25/-18.22	-17.97/7.77	5.53/2.61	-6.77/9.44	-9.11/23	-7.83/-3.1	-0.30/33	1.15/-1.02	-1.18/-0.12	1.14/0.66	-5.75/-17.49	-14.19/-16.61	-9.2/8.21		
Theta (75°)	-9.18/-7.65	-16.49/-12.72	-8.08/-4.1	-0.34/0.86	-0.96/-0.36	0.04/-1.24	-0.39/-1.58	-0.58/1.13	1.31/0.23	-3.78/-2.4	-6.31/8.36	-16.19/-18.41	-14.01/-11.58	-13.11/-7.56	-9.43/-14.7	-17.86/8.08	-8.83/-1.67	0.68/-1.27	-2.47/-2.83	-1.77/-1.42	-0.67/-0.92	-6.44/-15.32	-18.56/-18.32	-12.91/9.1		
Theta (82.5°)	-10.56/-13.82	-18.11/-11.47	-7.41/4.59	-0.92/0.25	-1.17/0.08	-1.06/-3.28	-1.15/-1.92	0.21/4.2	0.38/-0.41	-2.04/-1.68	-5.19/9.98	-15.41/-12.63	-18.02/-13.78	-16.15/9.39	-11.54/19.65	-17.78/-7.41	-16.85/-6.59	0.14/4.05	-9.02/-5.1	-3.68/-2.94	-2.33/-4.71	-7.41/-14.32	-12.64/-18.68	-15.06/-16.37		
Theta (90°)	-16.77/-13.36	-18.67/8.73	-7.23/3.53	-0.97/1.09	-1.34/0.8	-1.35/2.07	-2.35/3.35	0.49/-1.14	0.5/-1.49	-4.21/4.75	-9.88/9.96	-11.57/11.79	-12.69/-15.22	-16.74/18.64	-14.81/17.28	-18.42/-10.65	-12.73/5.69	-6.22/18.68	-7.06/4.84	-5.72/-1.11	-3.62/5.55	-9.12/-15.09	-14.7/18.4	-18.84/-16.34		
Theta (97.5°)	-16.55/-18.45	-19.17/6.98	-7.31/3.98	-2.05/-2.32	-2.2/3.21	-2.07/-3.63	-2.92/3.03	-3.04/1.17	-2.22/-3.05	-4.6/-8.88	-12.58/-16.32	-13.94/-15.09	-17.77/-17.86	-12.69/-17.48	-12.46/-9.02	-17.46/-12.61	-16.89/18.99	-12.73/-10.71	-6.17/-9.09	-7.43/-2.39	-2.32/-8.6	-9.67/-18.06	-18.96/-15.56	-19.34/-17.86		
Theta (105°)	-14.57/-15.83	-18.68/-10.38	-10.67/6.09	-3.17/2.99	-4.6/5.99	-4.13/3.48	-3.16/1.13	-1.95/4.58	-2.25/4.18	-1.25/-10.97	-15.12/17.77	-17.53/-18.41	-14.71/18.06	-18.97/17.88	-8.93/10.86	-14.97/10.11	-14.12/9.71	-7.86/3.77	-10.27/4.25	-4.82/6.83	-10.7/18.74	-16.12/13.57	-19.04/12.57			
Theta (112.5°)	-9.51/-11.58	-18.47/-10.25	-11.62/9.08	-5.89/3.68	-5.94/6.99	-4.55/5.42	-3.46/3.06	-4.35/2.9	-3.58/4.38	-6.89/13.55	-14.73/16.5	-18.64/18.78	-18/18.88	-13.24/12.79	-14.5/-11.74	-15.14/10.18	-18.56/18.21	-18.9/18.9	-9.69/10.16	-18.72/5.05	-6.72/-7.29	-11.72/18.67	-17.22/13.8	-13.55/-10.8		
Theta (120°)	-10.22/-7.81	-11.99/8.94	-10.17/10.11	-6.64/-4.17	-5.58/5.8	-4.51/4.82	-4.71/4.74	-2.04/5.81	-1.73/-6.91	-7.13/-12.68	-14.62/13.54	-18.97/17.57	-19.57/12.82	-19.05/8	-10.07/14.55	-14.12/14.24	-18.87/13.64	-14.37/-12.61	-18.73/17.62	-18.13/15.27	-18.13/15.27	-11.04/11.56				
Theta (127.5°)	-10.58/7.63	-5.97/6.41	-5.71/6.49	-4.31/4.24	-4.1/3.53	-5.09/5.21	-3.81/8.05	-1.82/2.76	-4.88/9.93	-7.45/-13.31	-11.36/18.12	-18.62/18.26	-17.85/-14.3	-17.96/8.73	-7.4/4.96	-17.42/14.29	-15.51/17.93	-19.62/18.8	-18.63/18.89	-18.66/18.08	-18.36/14.82	-13.71/18.2	-17.85/9.27	-14.29/14.11		
Theta (135°)	-14.66/-6.44	-4.57/5.88	-4.93/-3.69	-2.31/4.08	-5.42/5.81	-5.6/4.47	-4.9/4.76	-3.22/3.12	-6.96/6.02	-9.18/10.4	-11.16/17.63	-13.1/18.45	-17.3/-17.88	-18.51/13.4	-13.72/14.29	-18.19/15.55	-15.73/17.62	-17.01/15.77	-16.65/12.44	-15.03/10.71	-9.82/12.16	-18.69/13.73	-19.14/14.53	-18.17/14.68		
Theta (142.5°)	-11.07/-7	-8.35/6.05	-4.86/5.07	-4.57/4.84	-5.27/5.01	-5.14/4.69	-5.46/4.67	-3.44/4.6	-3.23/10.75	-9.99/14.77	-8.22/18.22	-17.47/17.77	-18.2/-18.5	-17.49/11.91	-11.76/14.28	-18.46/18.24	-18.55/15.14	-11.01/12.58	-11.51/11.49	-12.2/7.77	-7.98/1.91	-12.09/15.68	-16.15/14.72	-15.21/20.1		
Theta (150°)	-13.01/13.26	-10.71/10.65	-12.18/11.57	-8.93/6.92	-6.47/4.9	-5.59/4.98	-4.55/6.1	6.95/6.68	9.19/6.56	-13.86/10.1	-8.72/17.19	-18.71/18.99	-17/14.87	-19.59/14.15	-12.88/14.69	-10.62/15.71	-14.14/15.15	-16.71/18.89	-13.96/12.45	-10.57/1.29	-8.02/5.06	-4.53/7.65	-14.26/14.43	-12.24/10.34		
Theta (157.5°)	-16.65/-13.39	-8.45/7.3	-8.13/7.33	-7.86/9.49	-8.74/7.11	-5.9/4.4	-6.11/6.34	-10.55/8.81	-6.44/12.7	-11.27/7.13	-10.01/18.36	-18.42/18.59	-18.48/14.79	-12.9/17.36	-19.16/18.63	-17.82/14.94	-17.74/14.97	-12.21/11.01	-13.61/10.89	-6.9/3.1	-5.15/3.55	-5.77/4.3	-7.62/13.56	-18.36/18.62		
Theta (165°)	-13.18/-13.53	-14.23/-14.58	-9.95/8.35	-8.76/7.51	-7.13/6.76	-4.84/5.51	-6.27/1.91	-7.53/9.75	-10.26/6.15	-6.58/8.01	-10.97/15.88	-16.86/14.78	-13.97/15.2	-19.37/18.04	-14.32/9.52	-7.4/7.36	-7.5/8.39	-9.37/17.6	-7.9/6.8	-5.99/5.7	-4.62/3.42	-5.38/6.96	-8.02/11.24	-12.48/12.53		
Theta (172.5°)	-15.13/11.91	-10.86/9.23	-7.44/6.99	-5.96/4.1	-4.21/4.25	-5.07/6.02	-6.11/7.26	-8.44/7.98	-6.46/5.27	-5.17/8.33	-11.6/10.67	-17.68/-16.19	-14.97/11.99	-9.58/8.83	-10.65/13.63	-13.74/13.64	-13.31/10.27	-9.4/8.38	-8.76/10.59	-10.52/6.67	-8.06/7.99	-8.66/9.8	-12.56/18.66	-16.07/16.06		
Theta (180°)	-17.08/-17.23	-14.11/10.79	-11.11/11.35	-9.27/8.29	-7.61/7.56	-6.5/5.93	-6.12/5.69	-5.98/5.49	-4.66/4.49	-6.27/8.53	-11.56/10.5	-10.01/10.95	-12.03/10.82	-9.08/7.64	-7.5/5.86	-7.49/6.05	-6.06/6.75	-7.81/7.89	-8.75/8.46	-8.11/8.58	-9.77/11.25	-12.92/15.23	-16.79/16.07	-19.88/18.36		
Freq(Hz)	5.36Pol.	ThetaAnt. 2																								
Gain	Phi(°)	Phi(15°)	Phi(30°)	Phi(45°)	Phi(60°)	Phi(75°)	Phi(90°)	Phi(105°)	Phi(120°)	Phi(135°)	Phi(150°)	Phi(165°)	Phi(180°)	Phi(195°)	Phi(210°)	Phi(225°)	Phi(240°)	Phi(255°)	Phi(270°)	Phi(285°)	Phi(300°)	Phi(315°)	Phi(330°)	Phi(345°)		
Theta (0°)	-1.86/-1.74	-1.93/-2.68	-3.23/3.33	-5.11/5.59	-7.16/8.27	-10.56/13.78	-17.19/18.88	-18.56/15.96	-15.84/11.36	-8.72/8.43	-6.08/5.24	-5.56/6.38	-5.83/6.16	-6.93/6.43	-5.51/7.35	-6.96/8.29	-8.68/11.63	-10.73/14.08	-15.97/16.14	-13.61/12.81	-10.19/7.82	-6.16/4.73	-3.65/3.12	-2.66/1.96		
Theta (7.5°)	-7.05/6.66	-6.04/5.51	-5.36/6.23	-4.78/6.65	-6.68/8.95	-10.59/12.29	-17.48/17.11	-13.75/9.42	-9.11/6.48	-3.04/1.95	-1.15/1.11	-0.64/0.74	-0.95/0.97	-1.62/8.9	-1.97/3.13	-5.68/5.45	-10.12/10.85	-15.41/16.09	-17.72/15.6	-14.15/14.66	-15.71/13.85	-11.93/9.49	-8.81/8.1	-8.15/7.62		
Theta (15°)	-5.68/6.89	-6.88/9.84	-10.15/10.12	-11.26/9.88	-9.57/10.03	-11.05/13.69	-16.58/15.86	-13.37/6.68	-5.75/4.17	-1.18/0.61	1.13/0.12	-0.36/0.24	-0.28/0.97	-2.71/4.61	-4.52/4.02	-6.62/7.02	-8.67/13.19	-15.18/18.58	-18.09/19.16	-14.04/12.04	-8.91/4.67	-5.79/5.63	-6.15/6.31	-6.07/6.06		
Theta (22.5°)	-2.91/3.64	-5.11/6.39	-8.69/9.98	-12.47/13.83	-12.82/11.76	-14.51/15.72	-16.46/15.36	-11.03/7.43	-3.42/2.62	-1.24/0.23	0.33/1.12	-0.98/0.42	0.17/0.19	2.39/2.86	-3.55/2.54	-5.58/5.22	-8.59/8.53	-10.16/14.66	-18.41/17.59	-13.77/9.64	-6.28/3.49	-2.25/1.95	-2.43/3.41	-3.84/2.62		
Theta (30°)	0.22/0	-1.25/3.5	-5.01/8.63	-10.89/12.76	-18.44/17.22	-15.51/15.99	-15.59/17.05	-13.15/7.16	-3.04/1.22	-1.1/1.29	0.5/0.3	-0.15/0.03	-1.8/3.41	-3.92/3.67	-4.23/2.27	-4.41/8.34	-7.61/10.52	-11.28/13.32	-14.72/18.7	-13.42/7.88	-4.79/2.08	-0.53/0.77	-0.97/1.72	-2.02/1.38		
Theta (37.5°)	0.59/1.01	0.22/1.56	-3.23/4.41	-6.99/10.33	-15.32/17.36	-14.12/12.35	-12.19/18.03	-16.94/8.41	-3.51/0.79	-1.02/0.72	1.49/1.42	0.41/0.38	-1.46/3.08	-4.85/5.58	-5.78/5.93	-3.98/3.3	-3.17/4.92	-6.22/10.88	-17.94/18	-18.63/18.39	-8.18/3.03	-1.31/0.16	0.65/0.77	-3.48/2.9		
Theta (45°)	-0.84/1.34	1.29/0.63	-0.57/3.03	-6.99/10.18	-13.96/17.89	-18.76/13.14	-14.92/15.67	-9.38/5.24	-4.94/4.01	-1.6/1.2	0.86/1.78	1.47/1.04	-0.72/1.44	-4.75/4.72	-5.2/4.74	-6.23/10.37	-9.89/15.61	-16.31/19.25	-18.03/18.78	-18.15/18.24	-13.15/10.66	-0.99/1.77	-1.58/2.9	-11.75/6.18		
Theta (52.5°)	-3.4/0.62	-1.63/1.39	-1.71/3.18	-4.06/7.03	-13.84/17.88	-18.31/13.49	-18.16/16.19	-9.62/7.53	-6.81/5.62	-3.74/4.52	-0.24/1.27	1.01/1.8	-2.7/3.88	-5.19/4.22	-5.51/7.46	-8.85/7.28	-6.62/6.43	-10.68/11.24	-12.9/18.83	-17.69/17.61	-17.19/13.6	-11.53/4.76	-7.05/6.34	-18.92/9.64		
Theta (60°)	-3.57/3.79	-4.14/5.29	-5.56/3.82	-5.76/8.69	-12.34/17.36	-19.03/18.4	-18.97/16.44	-12.67/7.29	-4.95/5.61	-2.88																



Radiated Composite Gain Data

Appendix A.2

Theta	Phi	Phi(7.5)	Phi(15)	Phi(22.5)	Phi(30)	Phi(37.5)	Phi(45)	Phi(52.5)	Phi(60)	Phi(67.5)	Phi(75)	Phi(82.5)	Phi(90)	Phi(97.5)	Phi(105)	Phi(112.5)	Phi(120)	Phi(127.5)	Phi(135)	Phi(142.5)	Phi(150)	Phi(157.5)	Phi(165)	Phi(172.5)	Phi(180)	Phi(187.5)	Phi(195)	Phi(202.5)	Phi(210)	Phi(217.5)	Phi(225)	Phi(232.5)	Phi(240)	Phi(247.5)	Phi(255)	Phi(262.5)	Phi(270)	Phi(277.5)	Phi(285)	Phi(292.5)	Phi(300)	Phi(307.5)	Phi(315)	Phi(322.5)	Phi(330)	Phi(337.5)	Phi(345)	Phi(352.5)	
Theta(75)	Gain	Phi(0)	Phi(7.5)	Phi(15)	Phi(22.5)	Phi(30)	Phi(37.5)	Phi(45)	Phi(52.5)	Phi(60)	Phi(67.5)	Phi(75)	Phi(82.5)	Phi(90)	Phi(97.5)	Phi(105)	Phi(112.5)	Phi(120)	Phi(127.5)	Phi(135)	Phi(142.5)	Phi(150)	Phi(157.5)	Phi(165)	Phi(172.5)	Phi(180)	Phi(187.5)	Phi(195)	Phi(202.5)	Phi(210)	Phi(217.5)	Phi(225)	Phi(232.5)	Phi(240)	Phi(247.5)	Phi(255)	Phi(262.5)	Phi(270)	Phi(277.5)	Phi(285)	Phi(292.5)	Phi(300)	Phi(307.5)	Phi(315)	Phi(322.5)	Phi(330)	Phi(337.5)	Phi(345)	Phi(352.5)
Theta(75)	Gain	Phi(0)	Phi(7.5)	Phi(15)	Phi(22.5)	Phi(30)	Phi(37.5)	Phi(45)	Phi(52.5)	Phi(60)	Phi(67.5)	Phi(75)	Phi(82.5)	Phi(90)	Phi(97.5)	Phi(105)	Phi(112.5)	Phi(120)	Phi(127.5)	Phi(135)	Phi(142.5)	Phi(150)	Phi(157.5)	Phi(165)	Phi(172.5)	Phi(180)	Phi(187.5)	Phi(195)	Phi(202.5)	Phi(210)	Phi(217.5)	Phi(225)	Phi(232.5)	Phi(240)	Phi(247.5)	Phi(255)	Phi(262.5)	Phi(270)	Phi(277.5)	Phi(285)	Phi(292.5)	Phi(300)	Phi(307.5)	Phi(315)	Phi(322.5)	Phi(330)	Phi(337.5)	Phi(345)	Phi(352.5)
Theta(75)	Gain	Phi(0)	Phi(7.5)	Phi(15)	Phi(22.5)	Phi(30)	Phi(37.5)	Phi(45)	Phi(52.5)	Phi(60)	Phi(67.5)	Phi(75)	Phi(82.5)	Phi(90)	Phi(97.5)	Phi(105)	Phi(112.5)	Phi(120)	Phi(127.5)	Phi(135)	Phi(142.5)	Phi(150)	Phi(157.5)	Phi(165)	Phi(172.5)	Phi(180)	Phi(187.5)	Phi(195)	Phi(202.5)	Phi(210)	Phi(217.5)	Phi(225)	Phi(232.5)	Phi(240)	Phi(247.5)	Phi(255)	Phi(262.5)	Phi(270)	Phi(277.5)	Phi(285)	Phi(292.5)	Phi(300)	Phi(307.5)	Phi(315)	Phi(322.5)	Phi(330)	Phi(337.5)	Phi(345)	Phi(352.5)



Radiated Composite Gain Data

Appendix A.2

Theta (°)	-8.91/9.05	-10.44/10.26	-15.08/13.61	-3.71/0.94	3.57/4.36	3.62/0.5	0.26/1.52	-3.8/7.32	-18.12/13.44	-6.11/3.46	-3.42/6.58	-12.91/10.92	-9.16/11.63	-18.93/19.25	-15.49/18.82	-7.66/2.99	-2.38/3.54	-3.25/2.06	-1.01/0.7	-1.03/1.85	-2.99/3.79	-4.02/4.71	-6.01/7.89	-9.87/10.11
Theta (135°)	-8.64/9	-10.95/14.08	-17.62/6.62	-0.03/2.3	4.33/8.2	2.18/0.7	-1.75/3.31	-5.66/9.76	-9.12/4.99	-2.56/2.18	-3.45/5.83	-7.75/8.04	-9.11/13.3	-17.85/19.21	-13.85/14.54	-5.74/2.26	-1.56/2.25	-3.11/2.47	-0.85/0.24	0.35/1.9	-1.27/2.65	-4.04/5.72	-6.56/8.89	-11.15/10.16
Theta (142.5°)	-7.18/8.94	-13.17/17.89	-21.11/5.37	-0.75/3.1	0.80/5.7	1.72/1.2	0.17/0.86	-2.71/4.59	-4.93/3.88	-3.00/3.04	-3.71/4.75	-5.9/6.93	-8.63/11.69	-12.88/12.55	-11.33/9.94	-4.35/2	-1.18/1.59	-2.52/2.21	-0.67/0.61	1.25/3.6	0.93/0.07	-1.57/3.23	-4.98/6.56	-7.6/4.3
Theta (150°)	-5.92/8.93	-17.42/19.46	-9.36/4.55	-2.04/1.25	-1.2/0.57	0.61/4	1.4/0.6	-0.96/3.02	-5.06/6.18	-6.46/5.9	-5.52/5.97	-6.93/8.16	-9.31/9.87	-11.22/11.6	-18.23/7.65	-3.66/2.03	-1.41/1.53	-2/1.6	-0.64/0.21	0.98/1.55	1.78/1.45	0.66/0.36	-1.42/2.64	-3.83/4.58
Theta (157.5°)	-10.78/16.48	-14.13/8.26	-4.58/2.15	-1.16/2.17	-3.55/2.72	-0.78/0.61	1.06/0.78	0.02/1.31	-2.99/5.08	-6.85/7.91	-8.68/9.77	-11.22/11.89	-10.69/9.92	-11.47/13.93	-9.84/5.48	-2.89/1.82	-1.69/1.94	-1.98/1.49	-0.89/0.61	-0.42/0.14	0.09/0.11	-0.58/1.34	-2.53/4.24	-6.27/8.12
Theta (165°)	-18.58/15.9	-9.78/5.59	-2.71/1.37	-1.57/3.25	-4.46/3.09	-1.49/0.37	0.05/0.15	-0.78/1.61	-3.22/4.92	-3.71/1.01	-15.9/17.23	-17.56/14.59	-12.09/11.58	-11.18/8.78	-5.83/3.58	-2.17/1.56	-1.64/1.86	-1.87/1.62	-1.44/1.24	-2.22/2.76	-3.46/4.5	-6.01/8.11	-11.26/17.41	
Theta (172.5°)	-18.27/18.17	-10.52/5.93	-3.74/3.45	4.33/4.72	-2.98/1.12	-0.22/0.16	-0.85/2	-3.56/5.23	-7.15/8.39	-10.2/11.46	-11.09/10.59	-10.78/12.37	-13.51/12.8	-10.13/6.67	-4/2.29	-1.33/0.83	-0.6/0.5	-0.4/0.26	-0.13/0.08	0.19/0.53	-1.13/1.99	-2.94/4.01	-5.19/6.96	-10.55/16.35
Theta (180°)	-19.57/14.27	-9.14/6.66	-5.97/6.06	-4.82/2.57	-0.74/0.35	0.54/0.16	-1.72/0.43	-5.93/5.95	-4.71/3.87	-3.47/3.27	-3.43/4.55	-7.15/11.81	-18.51/15.83	-9.21/5.25	-2.73/1.3	-0.54/0.4	0.52/0.87	1.15/1.39	1.51/1.43	1.16/0.76	0.2/0.63	-1.64/2.76	-4.06/2.25	-9.81/14.95
Freq(Hz)	2.45GPol	Theta/Ant. 3																						
Gain	Phi(0°)/Phi(7.5°)	Phi(15°)/Phi(22.5°)	Phi(30°)/Phi(37.5°)	Phi(45°)/Phi(52.5°)	Phi(60°)/Phi(67.5°)	Phi(75°)/Phi(82.5°)	Phi(90°)/Phi(97.5°)	Phi(105°)/Phi(112.5°)	Phi(120°)/Phi(127.5°)	Phi(135°)/Phi(142.5°)	Phi(150°)/Phi(157.5°)	Phi(165°)/Phi(172.5°)	Phi(180°)/Phi(187.5°)	Phi(195°)/Phi(202.5°)	Phi(210°)/Phi(217.5°)	Phi(225°)/Phi(232.5°)	Phi(240°)/Phi(247.5°)	Phi(255°)/Phi(262.5°)	Phi(270°)/Phi(277.5°)	Phi(285°)/Phi(292.5°)	Phi(300°)/Phi(307.5°)	Phi(315°)/Phi(322.5°)	Phi(330°)/Phi(337.5°)	Phi(345°)/Phi(352.5°)
Theta (0°)	-1.78/1.05	-1.23/2.44	-4.41/3.62	-7.59/8.11	-8.76/9.7	-10.41/10.59	-10.26/9.79	-9.68/9.59	-8.47/6.79	-5.62/5.01	-4.17/3.35	-2.82/2.6	-2.28/1.79	-1.72/2.29	-3.12/3.13	-4.96/5.92	-6.98/6.69	-7.93/8.34	-8.95/9.46	-9.03/8.16	-7.31/3.69	-5.47/6.33	-3.94/3.51	-3.29/2.73
Theta (7.5°)	-1.64/1.37	-1.66/2.7	-4.3/6.25	-8.12/9.24	-8.84/10.49	-10.85/10.61	-9.84/9.06	-8.83/8.78	-7.17/6.05	-5.4/9.7	-5.22/4.59	-3.46/2.77	-2.82/2.55	-2.43/2.29	-3.53/4.42	-5.06/5.77	-6.71/7.54	-8.29/9.05	-10.54/11.51	-10.44/12.74	-16.46/19.15	-17.9/14.81	-9.72/6.61	-7.3/3.99
Theta (15°)	-1.62/1.65	-2.25/3.24	-4.66/6.66	-9.04/11.63	-13.54/14.51	-14.24/12.95	-11.69/10.6	-10.05/10.26	-10.09/8.56	-6.62/5.78	-6.59/7.77	-6.82/5.21	-4.72/5.01	-5.15/5.13	-5.57/6.56	-7.2/7.38	-7.83/8.65	-9.65/10.82	-12.97/15.19	-15.18/13.56	-11.37/9.36	-7.35/5.42	-4.06/3.06	-2.39/1.9
Theta (22.5°)	-0.86/6.06	-1.41/3.07	-5.35/8.3	-12.01/11.27	-17.74/19.04	-18.2/18.19	-16.11/13.37	-10.97/9.85	-9.37/8.16	-6.4/5.3	-5.94/7.97	-9.28/8.08	-7.02/7.19	-7.9/8.64	-9.48/10.57	-10.24/8.93	-8.57/9.31	-10.68/12.49	-15.76/18.83	-17.89/17.51	-12.66/9.37	-7.3/5.36	-4.69/3.57	-2.51/1.64
Theta (30°)	-1.64/1.83	-2.3/4.3	-5.56/9.09	-11.11/19.21	-17.83/16.2	-17.66/18.52	-19.24/15.97	-12.05/9.95	-8.78/7.4	-5.55/4.34	-4.49/5.88	-7.91/8.97	-8.62/8.68	-9.22/9.97	-11.61/14.97	-14.4/10.24	-8.82/9.1	-10.44/12.74	-16.46/19.15	-17.9/14.81	-9.72/6.61	-7.3/3.99	-3.84/3.27	-2.17/1.56
Theta (37.5°)	-2.86/4.68	-6.28/6.31	-5.95/7.14	-10.6/14.04	-13.28/14.37	-18.44/18.18	-17.87/19.17	-19.28/16.49	-15.34/13.13	-9.02/6.23	-5.41/6.35	-8.47/11.15	-12.21/12.26	-11.4/9.99	-9.99/12.88	-16.03/11.87	-10.31/10.69	-11.91/13.66	-15.71/18.13	-17.7/14.46	-9.56/6.24	-4.14/3.15	-2.78/2.6	-2.11/1.9
Theta (45°)	-2.48/4.74	-9.55/11.37	-7.15/5.97	-7.84/11.11	-11.1/13.34	-18.02/18.92	-18.3/18.75	-13.47/11.97	-13.12/14.51	-15.02/10.66	-8.03/7.41	-9.21/13.38	-17.47/19.16	-19.9/12.18	-8.65/8.78	-11.34/11.53	-11.92/11.91	-18.24/15.05	-14.55/18.44	-18.38/15.08	-9.63/6.2	-4.5/3.75	-3.34/2.98	-2.48/1.92
Theta (52.5°)	-3.25/4.72	-8.92/13.71	-9.11/6.96	-8.42/10.5	-9.27/11.36	-17.82/17.53	-15.77/10.64	-7.9/7.26	-8.82/11.85	-14.3/12.77	-9.6/8.28	-9.31/11.82	-13.43/15.37	-17.87/14.67	-9.13/8	-8.47/8.54	-9.84/15.29	-18.18/13.24	-12.87/17.13	-18.51/15.94	-9.55/9.1	-3.33/3.82	-3.83/4.18	-4.43/3.71
Theta (60°)	-5.36/5.68	-8.27/8.63	-7.78/9.57	-12.22/9.66	-7.71/10.3	-17.57/19.22	-12.66/8.02	-6.43/6.15	-7.1/9.53	-13.65/14.1	-10.53/9.08	-10.96/15.48	-14.19/12	-13.4/12.4	-9.34/8.79	-9.19/9.93	-10.81/14.23	-18.91/13.69	-11.49/13.08	-18.37/18.72	-11.08/7.77	-6.12/5.28	-4.51/4.04	-4.89/6.4
Theta (67.5°)	-8.04/7.98	-9.28/7.57	-5.01/11.2	-14.92/7.46	-6.45/8.95	-17.31/18.58	-12.27/4.5	-6.27/5.9	-5.45/7.05	-12.51/14.73	-10.83/9	-10.35/16.16	-18.1/13.94	-11.17/9.3	-7.27/6.23	-7.19/11.62	-18.69/12.29	-17.32/15.93	-11.36/11.74	-17.73/16.14	-11.87/8.94	-8.51/7.65	-6.22/4.89	-5.61/7.96
Theta (75°)	-11.06/7.94	-9.63/6.35	-5.44/13.57	-13.07/7.06	-11.41/11.67	-18.17/18.32	-11.35/6.49	-6.32/7.22	-6.4/7.33	-13.07/16.61	-11.02/8.2	-7.52/19.77	-16.22/18.69	-16.96/15.56	-9.78/5.74	-4.79/7.4	-14.71/17.95	-18.78/14.97	-13.66/15.57	-12.11/10.94	-6.92/9.98	-9.12/7.16	-6.86/9.67	
Theta (82.5°)	-17.44/13.3	-10.37/9.08	-8.63/17.25	-13.66/8.81	-10.93/16.27	-18.53/18.31	-12.85/9.17	-8.65/10.91	-11.1/10.61	-15.51/17.79	-13.54/10.57	-9.32/10.43	-17.61/17.35	-16.62/18.35	-12.72/8.7	-6.7/9.22	-18.82/19.47	-17.8/10.68	-7.36/7.61	-9.17/10.26	-11.25/12.42	-11.27/11.79	-12.21/10.2	-8.7/10.61
Theta (90°)	-18.31/16.15	-12.95/16.13	-15.05/16.88	-17.91/12.49	-14.97/19.04	-15.9/17.73	-19.28/16.29	-15.78/18.15	-19.71/13.71	-12.85/12.87	-13.56/12.48	-10.06/10.36	-16.01/16.78	-18.53/15.06	-13.33/17.48	-13.3/15.9	-18.12/18.21	-17.99/9.96	-5.93/5.74	-6.53/8.07	-8.76/9.59	-12.09/15.45	-17.53/14.52	-12.35/13.37
Theta (97.5°)	-8.81/17.52	-19.46/18.8	-17.97/15.86	-17.08/15.32	-17.93/12.7	-11.01/16.73	-17.42/15.94	-18.14/17.85	-14.28/10.35	-9.56/10.64	-11.16/8.6	-6.02/6.69	-8.19/12.85	-17.47/13.69	-13.63/18.59	-19.58/18.45	-18.87/13.84	-18.11/17	-5.61/3.98	-4.4/7.62	-9.71/8.5	-9.79/13.73	-17.87/17.14	-17.19/18.72
Theta (105°)	-18.46/18.29	-18.63/18.04	-18.23/15.45	-12.07/12.01	-11.71/8.46	-8.08/11.35	-12.04/11.45	-12.04/10.95	-9.79/10.28	-13.48/11.8	-18.76/11.81	-7.15/6.33	-8.29/12.01	-14.49/11.63	-12.79/18.6	-17.58/18.13	-18.74/14.6	-16.89/19.16	-8.58/4.52	-3.67/5.49	-8.24/8.9	-10.37/15.28	-17.05/13.76	-15.16/18.68
Theta (112.5°)	-9.73/11.69	-13.23/19.04	-18.87/14.27	-11.62/10.64	-7.51/5.28	-5.32/7.18	-8.65/9.21	-9.63/10.99	-11.89/13.96	-18.14/12.48	-15.27/13.32	-7.77/11.78	-10.05/11.71	-16.31/18.11	-10.41/12.56	-17.67/16.78	-18.33/17.76	-18.59/17.27	-11.84/6.68	-5.71/7.73	-7.43/7.16	-8.74/15.5	-15.42/9.17	-7.87/8.01
Theta (120°)	-4.75/9.27	-19.17/18.3	-14.78/9.81	-9.13/17.77	-5.15/3.92	-3.93/5.23	-7.45/9.3	-10.64/12.84	-16.77/12.81	-8.05/9.41	-7.47/5.7	-7.93/4.45	-17.32/12.6	-14.74/18.06	-18.58/18.47	-18.05/18.21	-17.04/7.51	-6.71/11.2	-11.9/9.89	-8.35/11.58	-12.92/9.1	-5.07/3.7		
Theta (127.5°)	-5.5/12.53	-18.87/10.77	-7.74/5.21	-4.24/4.03	-4.47/5.05	-4.86/5.5	-7.16/10.09	-13.89/15.23	-12.35/9.88	-8.99/9.28	-6.8/3.73	-2.8/3.87	-6.03/8.57	-13.46/18.36	-14.85/11.8	-11.88/14.83	-19.16/17.03	-13.72/18.21	-18.71/8.38	-5.76/6.74	-12.02/19.45	-17.03/17.45	-12.52/7.91	-5.02/3.92
Theta (135°)	-10.37/19.45	-9.01/4.82	-3.45/2.22	-1.49/1.95	-4.15/6.45	-5.93/1.72	-6.07/9.52	-18.72/18.41	-13.52/13.13	-18.25/14.74	-7.5/4.1	4/0.45	-3.75/4.1	-6.59/12.69	-19.06/11.12	-8.87/7.7	-15.02/17.37	-14.53/12.34	-18.82/17.7	-8.02/5.7	-5.93/7.57	-8.79/7.92	-6.34/5.3	-5.33/6.11
Theta (142.5°)	-12.49/11.16	-5.08/2.43	-1.71/3.26	-1.7/2.87	-4.9/6.08	-5.52/5.25	-6.43/9.68	-12.3/8.43	-5.4/3.46	-4.68/5.05	-4.35/3.17	-2.15/1.46	-1.39/2.61	-16.03/10.12	-8.01/8.18	-11.09/19.1	-17.12/10.83	-10.98/17.74	-16.38/8.51	-5.71/4.38	-3.88/2.68	-2.17/2.24	-3.18/5.8	
Theta (150°)	-6.23/5.98	-3.53/1.54	-1.04/1.84	-3.69/6.11	-6.72/5.78	-5.55/6.76	-9.43/14.49	-13.68/7.65	-4.23/5.22	-2.45/2.78	-1.52/1.41	-2.4/7.3	-9.35/9.08	-16.05/10.11	-8.66/8.37	-9.53/14.51	-18.76/11.65	-8.74/9.43	-13.67/16.7	-10.51/6.25	-3.86/2.37	-1.76/2.04	-3.04/4.8	
Theta (157.5°)	-4.13/4.42	-1.22/0.04	-0.82/3.28	-5.58/8.53	-8.3/7.33	-8.06/11.11	-17.63/19.18	-12.97/14.7	-5.06/4.13	-3.97/3.52	-3.2/2.65	-2.9/4.12	-5.9/7.79	-10.07/12.05	-10.78/9.91	-8.92/9								



Radiated Composite Gain Data

Appendix A.2

Theta (°)	14.75/9.73	6.25/3.92	-4.85/3.13	-8.94/12.28	-16.43/11.43	-14.57/18.5	-10.51/8.4	-9.09/8.44	-8.84/3.44	-4.25/4.7	6.07/7.9	-13.01/17.88	-18.58/11.55	9.51/14.69	6.04/5.81	-3.72/0.74	0.75/1	0.82/0.38	-2.51/4.18	-4.52/4.63	-5.57/5.44	-6.5/7.7	-8.81/10.31	-16.27/17.85
Theta (°)	-9.27/8.78	-10.65/13.11	-18.88/18.99	-15.81/13.18	-18.27/15.58	-9.41/8.51	-10.88/14.19	-8.31/3.44	-0.70/0.4	-0.53/2.16	-4.77/7.7	-8.64/9.01	-8.02/8.1	-9.84/10.64	-10.99/9.91	-7.01/4.65	-3.08/1.51	-1.04/1.73	-2.29/3.18	-3.63/3.86	-3.71/4.58	-6.6/7.09	-6.68/9.44	-9.22/9.92
Theta (°)	-17.54/16.56	-10.94/7.39	-4.82/3.37	-4.25/8.05	-18.03/12.43	-8.63/10.91	-15.02/8.08	-4.13/3.13	-4.39/6.4	-8.22/8.15	-8.23/7.68	-7.06/7.61	-9.48/9.3	-9.62/9.86	-8.53/6.85	-5.32/4.38	-3.39/2.28	-2.44/2.07	-1.96/2.28	-2.8/3.07	-3.03/3.58	-4.21/5.13	-7.08/10.32	-13.54/18.34
Freq(Hz)	5.3GPol	Theta/Ant. 3	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
Gain	Phi(°)Phi(7.5°)	Phi(15°)Phi(22.5°)	Phi(30°)Phi(37.5°)	Phi(45°)Phi(52.5°)	Phi(60°)Phi(67.5°)	Phi(75°)Phi(82.5°)	Phi(90°)Phi(87.5°)	Phi(105°)Phi(112.5°)	Phi(120°)Phi(127.5°)	Phi(135°)Phi(142.5°)	Phi(150°)Phi(157.5°)	Phi(165°)Phi(172.5°)	Phi(180°)Phi(187.5°)	Phi(195°)Phi(202.5°)	Phi(210°)Phi(217.5°)	Phi(225°)Phi(232.5°)	Phi(240°)Phi(247.5°)	Phi(255°)Phi(262.5°)	Phi(270°)Phi(277.5°)	Phi(285°)Phi(292.5°)	Phi(300°)Phi(307.5°)	Phi(315°)Phi(322.5°)	Phi(330°)Phi(337.5°)	Phi(345°)Phi(352.5°)
Theta (°)	-1.32/1.83	-3.01/2.36	-4.4/6.29	-6.68/6.52	-6.38/6.9	-9.02/14.03	-18.11/18.36	-15.58/10.8	-9.22/7.63	-4.96/4.25	-2.75/2.1	-1.93/2.72	-1.93/2.72	-1.93/2.72	-1.93/2.72	-1.93/2.72	-1.93/2.72	-1.93/2.72	-1.93/2.72	-1.93/2.72	-1.93/2.72	-1.93/2.72	-1.93/2.72	-1.93/2.72
Theta (°)	-1.63/2.1	-1.86/2.06	-1.98/3.86	-7.23/2.84	9.21/10.1	-12.13/12.96	-12.59/11.69	-12.62/10.63	-9.34/9.14	-7.25/5.98	-4.61/3.81	-2.28/2.02	-0.93/2	-1.81/1.34	-1.92/2.73	-4.18/5.01	-6.05/5.21	-9.04/12.52	-16.92/18.36	-19.14/24	-11.25/9.18	-6.33/5.16	-4.39/2.6	-2.6/2.51
Theta (°)	-7.35/5.04	-4.69/3.67	-2.07/2.86	-4.3/5.05	-5.44/7.36	-10.78/15.52	-18.05/18.93	-18.13/14.91	-10.51/9.08	-7.21/6.3	-6.98/6.31	-6.36/3.55	-1.39/0.66	0.30/8.6	0.12/0.46	-1.4/2.56	-4.04/5.72	-7.23/8.63	-10.78/15.86	-18.15/15.7	-12.58/8.61	-6.56/7.58	-7.49/6.08	-7.13/7.79
Theta (°)	-8.81/9.89	-8.99/12.83	-7.87/6.47	-8/6.11	-3.92/5.5	-11.6/18.81	-18.83/18.13	-19.18/17.32	-8.97/7.35	-6.57/5.64	-6.08/8.1	-5.91/5.8	-2.99/2.13	-1.51/1.26	-2.32/3.49	-2.55/2.83	-4.26/7.44	-11.48/14.96	-18.65/17.56	-16.5/13.39	-11.95/8.68	-7.84/8.14	-11.42/12.18	-10.73/12.63
Theta (°)	-18.93/15.37	-14.66/16.96	-19.1/13.99	-13.51/5.48	-3.85/5.23	-7.51/13.03	-17.76/18.59	-19.07/17.71	-11.37/12.01	-11.03/8.58	-5.89/7.96	-10.02/11.17	-10.14/14.17	-3.83/3.33	-5.55/8.29	-8.63/9.52	-7.6/9.72	-17.6/15.92	-14.59/18.96	-12.33/9.66	-10.26/10.34	-9.36/14.05	-18.51/15.99	-16.22/16.84
Theta (°)	-16.85/11.6	-9.6/12.39	-17.57/18.2	-13.55/7.76	-7.08/3.39	-7.57/9.89	-15.3/17.34	-18.54/16.77	-17.98/14.74	-17.78/12.73	-9.47/9.79	-11.64/11.03	-12.55/8.85	-9.58/15.96	-13.87/10.52	-11.39/14.52	-7.55/6.28	-11.21/10.69	-9.07/11.82	-18.67/17.47	-11.12/10.22	-9.21/6.81	-14.94/18.21	-19.18/18.07
Theta (°)	-8.75/15.37	-14.66/16.96	-19.1/13.99	-13.51/5.48	-3.85/5.23	-7.51/13.03	-17.76/18.59	-19.07/17.71	-11.37/12.01	-11.03/8.58	-5.89/7.96	-10.02/11.17	-10.14/14.17	-3.83/3.33	-5.55/8.29	-8.63/9.52	-7.6/9.72	-17.6/15.92	-14.59/18.96	-12.33/9.66	-10.26/10.34	-9.36/14.05	-18.51/15.99	-16.22/16.84
Theta (°)	-16.85/11.6	-9.6/12.39	-17.57/18.2	-13.55/7.76	-7.08/3.39	-7.57/9.89	-15.3/17.34	-18.54/16.77	-17.98/14.74	-17.78/12.73	-9.47/9.79	-11.64/11.03	-12.55/8.85	-9.58/15.96	-13.87/10.52	-11.39/14.52	-7.55/6.28	-11.21/10.69	-9.07/11.82	-18.67/17.47	-11.12/10.22	-9.21/6.81	-14.94/18.21	-19.18/18.07
Theta (°)	-8.75/15.37	-14.66/16.96	-19.1/13.99	-13.51/5.48	-3.85/5.23	-7.51/13.03	-17.76/18.59	-19.07/17.71	-11.37/12.01	-11.03/8.58	-5.89/7.96	-10.02/11.17	-10.14/14.17	-3.83/3.33	-5.55/8.29	-8.63/9.52	-7.6/9.72	-17.6/15.92	-14.59/18.96	-12.33/9.66	-10.26/10.34	-9.36/14.05	-18.51/15.99	-16.22/16.84
Theta (°)	-16.85/11.6	-9.6/12.39	-17.57/18.2	-13.55/7.76	-7.08/3.39	-7.57/9.89	-15.3/17.34	-18.54/16.77	-17.98/14.74	-17.78/12.73	-9.47/9.79	-11.64/11.03	-12.55/8.85	-9.58/15.96	-13.87/10.52	-11.39/14.52	-7.55/6.28	-11.21/10.69	-9.07/11.82	-18.67/17.47	-11.12/10.22	-9.21/6.81	-14.94/18.21	-19.18/18.07
Theta (°)	-8.75/15.37	-14.66/16.96	-19.1/13.99	-13.51/5.48	-3.85/5.23	-7.51/13.03	-17.76/18.59	-19.07/17.71	-11.37/12.01	-11.03/8.58	-5.89/7.96	-10.02/11.17	-10.14/14.17	-3.83/3.33	-5.55/8.29	-8.63/9.52	-7.6/9.72	-17.6/15.92	-14.59/18.96	-12.33/9.66	-10.26/10.34	-9.36/14.05	-18.51/15.99	-16.22/16.84
Theta (°)	-16.85/11.6	-9.6/12.39	-17.57/18.2	-13.55/7.76	-7.08/3.39	-7.57/9.89	-15.3/17.34	-18.54/16.77	-17.98/14.74	-17.78/12.73	-9.47/9.79	-11.64/11.03	-12.55/8.85	-9.58/15.96	-13.87/10.52	-11.39/14.52	-7.55/6.28	-11.21/10.69	-9.07/11.82	-18.67/17.47	-11.12/10.22	-9.21/6.81	-14.94/18.21	-19.18/18.07
Theta (°)	-8.75/15.37	-14.66/16.96	-19.1/13.99	-13.51/5.48	-3.85/5.23	-7.51/13.03	-17.76/18.59	-19.07/17.71	-11.37/12.01	-11.03/8.58	-5.89/7.96	-10.02/11.17	-10.14/14.17	-3.83/3.33	-5.55/8.29	-8.63/9.52	-7.6/9.72	-17.6/15.92	-14.59/18.96	-12.33/9.66	-10.26/10.34	-9.36/14.05	-18.51/15.99	-16.22/16.84
Theta (°)	-16.85/11.6	-9.6/12.39	-17.57/18.2	-13.55/7.76	-7.08/3.39	-7.57/9.89	-15.3/17.34	-18.54/16.77	-17.98/14.74	-17.78/12.73	-9.47/9.79	-11.64/11.03	-12.55/8.85	-9.58/15.96	-13.87/10.52	-11.39/14.52	-7.55/6.28	-11.21/10.69	-9.07/11.82	-18.67/17.47	-11.12/10.22	-9.21/6.81	-14.94/18.21	-19.18/18.07
Theta (°)	-8.75/15.37	-14.66/16.96	-19.1/13.99	-13.51/5.48	-3.85/5.23	-7.51/13.03	-17.76/18.59	-19.07/17.71	-11.37/12.01	-11.03/8.58	-5.89/7.96	-10.02/11.17	-10.14/14.17	-3.83/3.33	-5.55/8.29	-8.63/9.52	-7.6/9.72	-17.6/15.92	-14.59/18.96	-12.33/9.66	-10.26/10.34	-9.36/14.05	-18.51/15.99	-16.22/16.84
Theta (°)	-16.85/11.6	-9.6/12.39	-17.57/18.2	-13.55/7.76	-7.08/3.39	-7.57/9.89	-15.3/17.34	-18.54/16.77	-17.98/14.74	-17.78/12.73	-9.47/9.79	-11.64/11.03	-12.55/8.85	-9.58/15.96	-13.87/10.52	-11.39/14.52	-7.55/6.28	-11.21/10.69	-9.07/11.82	-18.67/17.47	-11.12/10.22	-9.21/6.81	-14.94/18.21	-19.18/18.07
Theta (°)	-8.75/15.37	-14.66/16.96	-19.1/13.99	-13.51/5.48	-3.85/5.23	-7.51/13.03	-17.76/18.59	-19.07/17.71	-11.37/12.01	-11.03/8.58	-5.89/7.96	-10.02/11.17	-10.14/14.17	-3.83/3.33	-5.55/8.29	-8.63/9.52	-7.6/9.72	-17.6/15.92	-14.59/18.96	-12.33/9.66	-10.26/10.34	-9.36/14.05	-18.51/15.99	-16.22/16.84
Theta (°)	-16.85/11.6	-9.6/12.39	-17.57/18.2	-13.55/7.76	-7.08/3.39	-7.57/9.89	-15.3/17.34	-18.54/16.77	-17.98/14.74	-17.78/12.73	-9.47/9.79	-11.64/11.03	-12.55/8.85	-9.58/15.96	-13.87/10.52	-11.39/14.52	-7.55/6.28	-11.21/10.69	-9.07/11.82	-18.67/17.47	-11.12/10.22	-9.21/6.81	-14.94/18.21	-19.18/18.07
Theta (°)	-8.75/15.37	-14.66/16.96	-19.1/13.99	-13.51/5.48	-3.85/5.23	-7.51/13.03	-17.76/18.59	-19.07/17.71	-11.37/12.01	-11.03/8.58	-5.89/7.96	-10.02/11.17	-10.14/14.17	-3.83/3.33	-5.55/8.29	-8.63/9.52	-7.6/9.72	-17.6/15.92	-14.59/18.96	-12.33/9.66	-10.26/10.34	-9.36/14.05	-18.51/15.99	-16.22/16.84
Theta (°)	-16.85/11.6	-9.6/12.39	-17.57/18.2	-13.55/7.76	-7.08/3.39	-7.57/9.89	-15.3/17.34	-18.54/16.77	-17.98/14.74	-17.78/12.73	-9.47/9.79	-11.64/11.03	-12.55/8.85	-9.58/15.96	-13.87/10.52	-11.39/14.52	-7.55/6.28	-11.21/10.69	-9.07/11.82	-18.67/17.47	-11.12/10.22	-9.21/6.81	-14.94/18.21	-19.18/18.07
Theta (°)	-8.75/15.37	-14.66/16.96	-19.1/13.99	-13.51/5.48	-3.85/5.23	-7.51/13.03	-17.76/18.59	-19.07/17.71	-11.37/12.01	-11.03/8.58	-5.89/7.96	-10.02/11.17	-10.14/14.17	-3.83/3.33	-5.55/8.29	-8.63/9.52	-7.6/9.72	-17.6/15.92	-14.59/18.96	-12.33/9.66	-10.26/10.34	-9.36/14.05	-18.51/15.99	-16.22/16.84
Theta (°)	-16.85/11.6	-9.6/12.39	-17.57/18.2	-13.55/7.76	-7.08/3.39	-7.57/9.89	-15.3/17.34	-18.54/16.77	-17.98/14.74	-17.78/12.73	-9.47/9.79	-11.64/11.03	-12.55/8.85	-9.58/15.96	-13.87/10.52	-11.39/14.52	-7.55/6.28	-11.21/10.69	-9.07/11.82	-18.67/17.47	-11.12/10.22	-9.21/6.81	-14.94/18.21	-19.18/18.07
Theta (°)	-8.75/15.37	-14.66/16.96	-19.1/13.99	-13.51/5.48	-3.85/5.23	-7.51/13.03	-17.76/18.59	-19.07/17.71	-11.37/12.01	-11.03/8.58	-5.89/7.96	-10.02/11.17	-10.14/14.17	-3.83/3.33	-5.55/8.29	-8.63/9.52	-7.6/9.72	-17.6/15.92	-14.59/18.96	-12.33/9.66	-10.26/10.34	-9.36/14.05	-18.51/15.99	-16.22/16.84
Theta (°)	-16.85/11.6	-9.6/12.39	-17.57/18.2	-13.55/7.76	-7.08/3.39	-7.57/9.89	-15.3/17.34	-18.54/16.77	-17.98/14.74	-17.78/12.73	-9.47/9.79	-11.64/11.03	-12.55/8.85	-9.58/15.96	-13.87/10.52	-11.39/14.52	-7.55/6.28	-11.21/10.69	-9.07/11.82	-18.67/17.47	-11.12/10.22	-9.21/6.81	-14.94/18.21	-19.18/18.07
Theta (°)	-8.75/15.37	-14.66/16.96	-19.1/13.99	-13.51/5.48	-3.85/5.23	-7.51/13.03	-17.76/18.59	-19.07/17.71	-11.37/12.01	-11.03/8.58	-5.89/7.96	-10.02/11.17	-10.14/14.17	-3.83/3.33	-5.55/8.29	-8.63/9.52	-7.6/9.72	-17.6/15.92	-14.59/18.96	-12.33/9.66	-10.26/10.34	-9.36/14.05	-18.51/15.99	-16.22/16.84
Theta (°)	-16.85/11.6	-9.6/12.39	-17.57/18.2	-13.55/7.76	-7.08/3.39	-7.57/9.89	-15.3/17.34	-18.54/16.77	-17.98/14.74	-17.78/12.73	-9.47/9.79	-11.64/11.03	-12.55/8.85	-9.58/15.96	-13.87/10.52	-11.39/14.52	-7.55/6.28	-11.21/10.69	-9.07/11.82	-18.67/17.47	-11.12/10.22	-9.21/6.81	-14.94/18.21	-19.18/18.07



Radiated Composite Gain Data

Appendix A.2

Theta	7.5°	15°	22.5°	30°	37.5°	45°	52.5°	60°	67.5°	75°	82.5°	90°	97.5°	105°	112.5°	120°	127.5°	135°	142.5°	150°	157.5°	165°	172.5°	180°
Gain	17.44	-13.52	-11.24	-10.24	-19.18	-18.45	-11.33	-17.44	-13.89	-14.29	-16.81	-15.51	-14.33	-19.38	-15.57	-14.12	-18.34	-18.34	-14.23	-3.49	-8.39	-10.62	-9.41	-9.41
Phi	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°
Gain	17.44	-13.52	-11.24	-10.24	-19.18	-18.45	-11.33	-17.44	-13.89	-14.29	-16.81	-15.51	-14.33	-19.38	-15.57	-14.12	-18.34	-18.34	-14.23	-3.49	-8.39	-10.62	-9.41	-9.41
Phi	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°	0°

Mode 3

Freq(Hz)	5.6G	5.785G
Ant. 1 Max Gain (dBi)	2.56	1.18
Ant. 2 Max Gain (dBi)	4.83	4.59
Ant. 3 Max Gain (dBi)	4.4	4.62
Ant. 4 Max Gain (dBi)	3.82	3.91
Ant. 1 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/37.5/150	Theta/45/150
Ant. 2 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/97.5/112.5	Theta/97.5/75
Ant. 3 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/82.5/247.5	Theta/90/255
Ant. 4 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/97.5/337.5	Theta/90/7.5
Max Gain (dBi)	4.83	4.62
DG [1SS] (dBi)	6.97	6.48
DG [2SS] (dBi)	4.83	4.62
DG [4SS] (dBi)	4.83	4.62



Radiated Composite Gain Data

Appendix A.3

DG 1SS Result

Freq(Hz)	5.6G/Pol.	Phi-	Phi(0°)/Phi(7.5°)	Phi(15°)/Phi(22.5°)	Phi(30°)/Phi(37.5°)	Phi(45°)/Phi(52.5°)	Phi(60°)/Phi(67.5°)	Phi(75°)/Phi(82.5°)	Phi(90°)/Phi(97.5°)	Phi(105°)/Phi(112.5°)	Phi(120°)/Phi(127.5°)	Phi(135°)/Phi(142.5°)	Phi(150°)/Phi(157.5°)	Phi(165°)/Phi(172.5°)	Phi(180°)/Phi(187.5°)	Phi(195°)/Phi(202.5°)	Phi(210°)/Phi(217.5°)	Phi(225°)/Phi(232.5°)	Phi(240°)/Phi(247.5°)	Phi(255°)/Phi(262.5°)	Phi(270°)/Phi(277.5°)	Phi(285°)/Phi(292.5°)	Phi(300°)/Phi(307.5°)	Phi(315°)/Phi(322.5°)	Phi(330°)/Phi(337.5°)	Phi(345°)/Phi(352.5°)
DG(dB)	Phi(0°)/Phi(7.5°)	Phi(15°)/Phi(22.5°)	Phi(30°)/Phi(37.5°)	Phi(45°)/Phi(52.5°)	Phi(60°)/Phi(67.5°)	Phi(75°)/Phi(82.5°)	Phi(90°)/Phi(97.5°)	Phi(105°)/Phi(112.5°)	Phi(120°)/Phi(127.5°)	Phi(135°)/Phi(142.5°)	Phi(150°)/Phi(157.5°)	Phi(165°)/Phi(172.5°)	Phi(180°)/Phi(187.5°)	Phi(195°)/Phi(202.5°)	Phi(210°)/Phi(217.5°)	Phi(225°)/Phi(232.5°)	Phi(240°)/Phi(247.5°)	Phi(255°)/Phi(262.5°)	Phi(270°)/Phi(277.5°)	Phi(285°)/Phi(292.5°)	Phi(300°)/Phi(307.5°)	Phi(315°)/Phi(322.5°)	Phi(330°)/Phi(337.5°)	Phi(345°)/Phi(352.5°)		
Theta(°)	Phi(0°)/Phi(7.5°)	Phi(15°)/Phi(22.5°)	Phi(30°)/Phi(37.5°)	Phi(45°)/Phi(52.5°)	Phi(60°)/Phi(67.5°)	Phi(75°)/Phi(82.5°)	Phi(90°)/Phi(97.5°)	Phi(105°)/Phi(112.5°)	Phi(120°)/Phi(127.5°)	Phi(135°)/Phi(142.5°)	Phi(150°)/Phi(157.5°)	Phi(165°)/Phi(172.5°)	Phi(180°)/Phi(187.5°)	Phi(195°)/Phi(202.5°)	Phi(210°)/Phi(217.5°)	Phi(225°)/Phi(232.5°)	Phi(240°)/Phi(247.5°)	Phi(255°)/Phi(262.5°)	Phi(270°)/Phi(277.5°)	Phi(285°)/Phi(292.5°)	Phi(300°)/Phi(307.5°)	Phi(315°)/Phi(322.5°)	Phi(330°)/Phi(337.5°)	Phi(345°)/Phi(352.5°)		
Theta(7.5°)	-7.56/7.7	-6.51/6.6	-6.57/6.58	-5.87/5.02	-4.85/4.91	-5.49/5.59	-5.25/4.95	-4.66/5.87	-5.89/7.55	-7.82/8.39	-9.29/10.53	-11.11/10.95	-11.01/10.61	9.5/8.41	-7.81/7.19	-6.45/5.19	-4.27/4.33	-3.11/3.18	-3.49/2.57	-2.79/2.72	-2.96/3.61	-4.02/4.48	-5.85/5.21	6.08/7		
Theta(15°)	-11.35/9.82	-8.52/6.15	-7.5/5.45	-5.3/5.06	-5.59/5.13	-5.01/5.32	-6.93/6.55	-7.01/8.4	-8.79/9.25	-8.94/8.93	-9.19/11.03	-11.93/12.03	-12.22/11.08	-10.07/9.29	-7.25/6.7	-4.83/2.9	-2.72/2.55	-2.43/3.37	-3.79/3.85	-3.77/4.02	-4.61/5.91	-6.58/7.15	-6.53/7.78	-7.84/9.72		
Theta(22.5°)	-9.3/10.28	-10.47/10.42	-8.87/7.74	-6.84/6.24	-4.96/5.34	-5.41/6.2	-7.11/8.98	-9.07/8.36	-8.39/8.61	-7.87/8.73	-9.37/9.74	-11.73/10.23	-9.72/10.6	-9.4/8.69	-8.76/6.56	-5.25/3.75	-2.14/2.96	-1.68/1.89	-1.27/3.25	-4.03/4.63	-6.18/7.02	-7.32/7.04	-6.23/6.11	-6.24/7		
Theta(30°)	-7.57/9.25	-10.56/8.99	-8.51/7.98	-5.72/4.2	-4.19/4.85	-5.92/6.61	-9.15/10.78	-9/8.6	-8.01/6.28	-4.15/5.58	-6.45/8.3	-9.95/12.01	-11.03/9.18	-6.22/5.85	-7.27/6.24	-5.39/3.58	-3.5/3.66	-3.17/2.95	-3.27/3.78	-4.34/5.59	-5.37/7.44	-7.99/8.2	-7.77/7.87	-6.82/7.52		
Theta(37.5°)	-6.9/8.01	-11.09/10.29	-7.93/4.46	-2.78/2.13	-2.68/2.91	-5.32/9.01	-10.03/8.93	-7.82/5.35	-5.09/4.72	-2.96/4.63	-6.86/7.38	-10.21/10.26	-10.76/8.85	-7.63/7.14	-7.24/4.78	-4.35/5.22	-4.44/4.88	-5.42/4.59	-4.08/3.63	-4.72/6.21	-6.88/9.69	-6.52/5.91	-5.47/5.79	-6.27/7		
Theta(45°)	-6.93/9.79	-11.84/8.15	-4.69/2.87	-2.48/1.46	-1.56/2.12	-5.33/9.04	-10.67/9.97	-8.12/4.51	-3.05/3.39	-4.68/6.57	-6.58/8.01	-8.34/9.13	-8.12/7.94	-6.39/5.25	-4.13/4.56	-5.37/6.78	-5.33/5.86	-6.92/5.74	-5.98/6.02	-5.47/4.96	-5.25/0.7	-4.19/5.25	-4.88/4.31	-3.43/4.98		
Theta(52.5°)	-6.97/10.21	-9.3/4.17	-3.93/2.99	-3.34/2.41	-1.78/2.19	-2.81/4.4	-5.94/6.92	-3.24/3.31	-3.9/2.98	-5.37/5.83	-6.39/5.5	-4.69/7.67	-6.78/6.66	-6.59/6.68	-8.57/6.45	-4.74/5.13	-6.14/7.01	-7.29/5.45	-5.91/5.42	-6.2/5.53	-5.58/5.12	-3.76/4.14	-4.22/4.05	-3.17/5.06		
Theta(60°)	-7.09/10.38	-8.64/4.06	-2.97/1.13	-3.19/1.6	-1.85/0.61	-1.57/3.37	-3.75/4.34	-3.06/2.3	-4.35/3.84	-5.23/4.7	-4.42/4.69	-4.33/5.06	-6.78/7.59	-10.16/7.32	-6.47/9.11	-6.56/6.33	-6.79/5.22	-7.64/5.93	-6.65/8.57	-7.14/5.5	-5.96/6.66	-6.64/5.31	-5.92/5.18	-4.71/4.53		
Theta(67.5°)	-7.45/9.47	-9.5/6.25	-3.53/2.14	-3.13/1.46	-1.22/1.29	-3.27/3.11	-2.75/3.67	-2.19/3.67	-3.92/7	-5.34/3.59	-4.08/6.82	-5.75/10.42	-8.28/10.62	-7.55/9.47	-8.92/8.06	-9.91/6.96	-8.36/6.56	-6.4/6.66	-6.74/7.48	-6.53/7.04	-7.09/6.82	-6.05/5.89	-6.94/6.73	-5.29/4.11		
Theta(75°)	-9.4/7.83	-8.75/6.64	-3.26/2.52	-2.75/1.34	-2.46/2.37	-4.83/4.24	-3.99/2.54	-1.12/2.92	-5.4/5.75	-3.87/4.49	-5.48/7.36	-8.6/7.09	-9.3/4.62	-12.01/7.77	-9.81/7.23	-8.03/9.3	-6.94/9.01	-8.79/8.24	-9.03/12.34	-8.08/5.16	-7.65/6	-4.41/5.22	-6.71/6.38	-6.44/5.97		
Theta(82.5°)	-8.98/9.79	-6.25/6.07	-2.4/2	-2.34/2.21	-2.51/2.79	-3.25/4.29	-3.33/2.91	-3.19/4.52	-6.24/4.58	-4.1/6.29	-7.16/6.2	-8.5/8.55	-10.68/8.45	-10.86/7.92	-8.26/9.48	-6.41/6.89	-6.62/7.98	-7.33/8.18	-6.69/7.4	-9.28/7.17	-6.04/8.92	-6.95/9.13	-8.87/7.94	-4.9/6.71		
Theta(90°)	-8.04/8.47	-4.08/4.93	-1.2/1.79	-0.72/2.38	-2.44/2.11	-2.89/3.5	-2.89/3.9	-4.48/4.7	-4.61/4.49	-6.94/7.17	-6.28/7.18	-8.9/5.6	-7.44/10.59	-9.62/8.7	-7.97/7.83	-8.99/6.98	-5.8/8.45	-9.87/8.66	-8.05/10.62	-8.27/6.64	-8.08/6.75	-9.43/10.27	-11.72/9.05	-5.45/8.65		
Theta(97.5°)	-7.71/7.83	-5.67/3.57	-2.49/1.74	-1.23/3.01	-4.03/3.52	-3.24/3.59	-4.77/4.82	-3.79/2.19	-3.17/4.69	-6.26/6.04	-6.73/7.76	-6.53/4.59	-6.67/9.56	-7.05/8.74	-4.4/7.89	-6.96/6.78	-9.76/10.64	-9.58/7.85	-11.25/10.97	-9.31/6.62	-5.27/6.24	-7.45/10.31	-11.85/11.69	-8.59/9.45		
Theta(105°)	-7.73/7.88	-5.5/5.07	-3.4/1.03	-0.81/2.2	-3.6/4.7	-4.7/3.12	-4.84/3.8	-3.38/2.83	-5.24/4.91	-8.35/6.26	-6.72/9.76	-6.41/3.73	-8.74/7.45	-8.2/3.72	-6.51/4.72	-6.68/5.87	-9.14/8.71	-9.94/6.47	-11.75/7.77	-10.94/7.48	-8.89/11.74	-8.38/8.24	-11.61/11.01	-9.95/9.06		
Theta(112.5°)	-6.21/5.43	-6.85/6.27	-4.21/4.15	-3.72/4.12	-4.61/3.48	-2.85/2.6	-4.05/3.7	-2.34/1.51	-3.85/4.88	-10.85/9.67	-9.35/8.4	-8.55/8.8	-5.51/7.36	-4.06/7.87	-6.31/9.28	-11.43/9.15	-9.25/9.69	-11.04/8.99	-10.91/5.79	-9.68/14.4	-7.16/6.57	-8.87/8.57	-11.72/9.05	-11.75/9.34		
Theta(120°)	-3.52/5.5	-5.24/4.99	-5.41/6.6	-5.7/5.67	-4.05/3.13	-2.89/1.95	-3.27/3.27	-3.1/3.74	-3.37/4.52	-3.39/7.4	-9.99/10.26	-7.96/10.23	-8.42/9.72	-10.22/6.12	-8.42/6.03	-5.34/9.67	-7.95/7.9	-10.8/5.82	-8.46/11.82	-10.36/8.42	-12.88/8.58	-6.55/6.26	-7.29/8.15	-9.07/7.09		
Theta(127.5°)	-5.02/5.97	-3.67/3.99	-5.99/7.04	-5.68/4.27	-3.27/2.28	-2.58/1.16	-2.85/2.08	-3.43/4.06	-3.07/3.3	-3.73/2.23	-7.46/8.95	-9.43/4.02	-8.69/4.1	-10.49/8.09	-6.11/8.2	-8.2/9.16	-9.02/8.99	-9.49/8.94	-8.35/8.73	-9.77/7.82	-11.31/12.11	-9.93/11.71	-7.99/8.02	-7.76/6.86		
Theta(135°)	-7.73/5.87	-5.05/4.87	-5.78/6.01	-5.84/4.74	-4.64/2.7	-2.41/2.87	-2.88/2.17	-2.96/2.93	-3.9/4.01	-5.05/7.68	-10.73/9.96	-10.59/9.41	-12.57/11.73	-8.14/8.37	-9.73/9.62	-12.09/11.63	-10.73/8.56	-7.91/8.95	-8.71/9.91	-10.22/11.8	-7.42/8.28	-7.99/7.79	-8.38/6.42			
Theta(142.5°)	-5.4/6.33	-5.84/5.18	-6.67/4.57	-4.06/4.12	-3.31/3.56	-0.95/2.84	-4.52/2.69	-4.48/5.15	-6.75/6.82	-9.46/10.63	-11.28/10.16	-9.95/8.27	-10.71/10	-8.71/9.07	-9.42/9.54	-9.46/10.39	-11.86/12.51	-11.19/9.04	-7.38/9.09	-9.62/8.99	-9.44/9.17	-8.13/8.09	-9.84/7.87			
Theta(150°)	-7.68/7.64	-8.13/8.39	-6.45/5.98	-4.52/3.86	-3.66/2.34	-2.33/3.41	-3.89/3.39	-6.06/4.71	-2.86/2.91	-6.64/9.16	-12.23/9.71	-9.06/11.08	-12.32/9.79	-9.64/9.47	-9.22/9.82	-11.04/12.05	-10.38/8.81	-9.51/10.08	-10.17/9.88	-10.39/10.26	-8.71/7.29	-8.02/7.54	-8.94/8.46	-11.04/10.69		
Theta(157.5°)	-10.67/9.65	-9.69/9.04	-6.73/6.03	-3.76/3.59	-4.28/2.96	-3.54/4.03	-5.01/5.01	-5.91/5.42	-6.34/6.59	-7.09/8.18	-8.58/9.3	-8.68/9.04	-9.99/10.27	-10.39/12.37	-11.68/12.04	-10.32/10.13	-9.44/9.79	-8.97/7.37	-9.3/9.33	-9.08/7.15	-6.82/7.47	-7.84/9.82	-10.56/8.58	-8.24/8.65		
Theta(165°)	-11.98/9.56	-8.95/6.6	-5.43/6.69	-6.17/5.57	-5.16/4.8	-5.99/7.27	-7.67/6.04	-5.64/3.92	-2.89/3.88	-4.32/7.17	-7.95/7.23	-7.28/9.23	-9.46/9.35	-4.32/7.12	-11.5/9.41	-8.08/6.2	-9.44/9.17	-8.81/4.79	-5.76/9.97	-7.92/7.67	-6.46/4.4	-6.4/6.71	-8.51/10.57	-10.92/11.64		
Theta(172.5°)	-9.02/9.07	-9.64/8.51	-8.2/8.46	-7.37/6.4	-7.86/7.79	-7.86/7.88	-8.07/7.87	-6.98/6.61	-6.11/5.27	-5.55/4.41	-5.04/6.71	-8.38/8.38	-8.44/9.06	-10.21/12.25	-11.26/9.54	-7.47/6.11	-4.71/4.26	-4.33/4.47	-6.33/6.13	-7.53/6.87	-7.45/6.16	-9.39/9.87	-9.41/8.85	-8.97/9.4		
Theta(180°)	-9.29/9.79	-9.07/9.31	-8.67/9	-8.77/8.61	-8.64/7.61	-8.62/8.1	-8.87/7.67	-8.74/7.98	-8.32/8.35	-8.84/11.01	-9/10.99	-10.91/11.54	-11.44/10.19	-10.59/10.09	-7.44/6.15	-5.47/5.92	-4.85/6.81	-6.49/4.87	-7.97/9.12	-8.83/10.16	-10.08/10.46	-10.55/10.34	-10.25/9.94	-9.89/8.92		
Theta(187.5°)	-9.29/9.79	-9.07/9.31	-8.67/9	-8.77/8.61	-8.64/7.61	-8.62/8.1	-8.87/7.67	-8.74/7.98	-8.32/8.35	-8.84/11.01	-9/10.99	-10.91/11.54	-11.44/10.19	-10.59/10.09	-7.44/6.15	-5.47/5.92	-4.85/6.81	-6.49/4.87	-7.97/9.12	-8.83/10.16	-10.08/10.46	-10.55/10.34	-10.25/9.94	-9.89/8.92		
Theta(195°)	-9.29/9.79	-9.07/9.31	-8.67/9	-8.77/8.61	-8.64/7.61	-8.62/8.1	-8.87/7.67	-8.74/7.98	-8.32/8.35	-8.84/11.01	-9/10.99	-10.91/11.54	-11.44/10.19	-10.59/10.09	-7.44/6.15	-5.47/5.92	-4.85/6.81	-6.49/4.87	-7.97/9.12	-8.83/10.16	-10.08/10.46	-10.55/10.34	-10.25/9.94	-9.89/8.92		
Theta(202.5°)	-9.29/9.79	-9.07/9.31	-8.67/9	-8.77/8.61	-8.64/7.61	-8.62/8.1	-8.87/7.67	-8.74/7.98	-8.32/8.35	-8.84/11.01	-9/10.99	-10.91/11.54	-11.44/10.19	-10.59/10.09	-7.44/6.15	-5.47/5.92	-4.85/6.81	-6.49/4.87	-7.97/9.12	-8.83/10.16	-10.08/10.46	-10.55/10.34	-10.25/9.94	-9.89/8.92		
Theta(210°)	-9.29/9.79	-9.07/9.31	-8.67/9	-8.77/8.61	-8.64/7.61	-8.62/8.1	-8.87/7.67	-8.74/7.98	-8.32/8.35	-8.84/11.01	-9/10.99	-10.91/11.54	-11.44/10.19	-10.59/10.09	-7.44/6.15	-5.47/5.92	-4.85/6.81	-6.49/4.87	-7.97/9.12	-8.83/10.16	-10.08/10.46	-10.55/10.34	-10.25/9.94	-9.89/8.92		
Theta(217.5°)																										



Radiated Composite Gain Data

Appendix A.3

Gain Result

Freq(Hz)	5.6GPol.	PhiAnt.1	PhiAnt.2	PhiAnt.3	PhiAnt.4	PhiAnt.5	PhiAnt.6	PhiAnt.7	PhiAnt.8	PhiAnt.9	PhiAnt.10	PhiAnt.11	PhiAnt.12	PhiAnt.13	PhiAnt.14	PhiAnt.15	PhiAnt.16	PhiAnt.17	PhiAnt.18	PhiAnt.19	PhiAnt.20	PhiAnt.21	PhiAnt.22	PhiAnt.23	PhiAnt.24	PhiAnt.25	PhiAnt.26	PhiAnt.27	PhiAnt.28	PhiAnt.29	PhiAnt.30	PhiAnt.31	PhiAnt.32	PhiAnt.33	PhiAnt.34	PhiAnt.35																	
Gain	Phi(75°)	Phi(15°)	Phi(22.5°)	Phi(30°)	Phi(37.5°)	Phi(45°)	Phi(52.5°)	Phi(60°)	Phi(67.5°)	Phi(75°)	Phi(82.5°)	Phi(90°)	Phi(97.5°)	Phi(105°)	Phi(112.5°)	Phi(120°)	Phi(127.5°)	Phi(135°)	Phi(142.5°)	Phi(150°)	Phi(157.5°)	Phi(165°)	Phi(172.5°)	Phi(180°)	Phi(187.5°)	Phi(195°)	Phi(202.5°)	Phi(210°)	Phi(217.5°)	Phi(225°)	Phi(232.5°)	Phi(240°)	Phi(247.5°)	Phi(255°)	Phi(262.5°)	Phi(270°)	Phi(277.5°)	Phi(285°)	Phi(292.5°)	Phi(300°)	Phi(307.5°)	Phi(315°)	Phi(322.5°)	Phi(330°)	Phi(337.5°)	Phi(345°)	Phi(352.5°)						
Theta(75°)	-12.56/11.22	-9.81/9.03	-8.26/5.99	-5.39/4.45	-4.42/3.93	-3.43/3.01	-2.97/2.21	-3.53/2.85	-3.6/3.64	-4.35/4.64	-5.99/7.08	-7.57/9.08	-10.22/9.28	-9.47/8.6	-17.48/16.54	-14.12/13.3	-12.33/10.83	-8.87/5.69	-3.66/2.93	-1.05/1.12	-0.29/0.21	0.47/0.54	-1.15/1.93	-4.15/5.08	-6.02/5.67	-6.01/6.96	-8.2/8.46	-10.43/13.72	-18.45/14.89	-10.33/7.72	-5.21/4.11	-3.22/3.82	-1.40/1.83	-1.14/0.83	1.65/0.44	-4.3/9.12	-12.65/13.14	-8.22/4.11	-1.76/1.55	-3.09/4.51	-5.89/7.93	-7.2/9.02	-9.55/7.82	-6.11/3.75	-4.03/3.81	-3.98/4.61	-5.24/4.15	-3.6/4.15	-3.8/3.69	-4.36/3.51	-2.93/4.83	-4.75/3.9	-3.66/4.78



Radiated Composite Gain Data

Appendix A.3

Theta (°)	-17.52/-18.46	-13.13/13.75	-15.34/-18.86	-16.11/-18.56	-17.79/-18.19	-18.79/-17.6	-17.72/-18.08	-18.77/-14.56	-14.64/-16.71	-14.29/-18.16	-18.74/-16.12	-15.25/-11.29	-12.45/8.82	-17.88/-14.06	-18.6/-18	-18.16/-14.84	-12.43/-17.88	-18.43/-18.94	-18.56/-15.77	-14.73/-16.32	-17.09/-19.04	-10.96/-14.32	-13.12/-11.41	-19.48/-14.37
Theta (82.5°)	-11.97/-18.46	-12.03/-19.01	-16.51/-17.82	-19.22/-14.85	-14.31/-14.36	-16.07/-15.11	-12.04/-12.25	-15.69/-12.1	-12.83/-13.61	-13.75/-14.88	-14.31/-15.24	-18.53/-17.68	-18.05/-11.11	-13.88/-8.79	9.65/-15.71	-16.32/-13.78	-8.86/-11.6	-14.09/-14.72	-10.62/-11.58	-15.59/-16.28	-15.79/-19.19	-17.66/-17.65	-17.75/-19.29	-18.66/-14.96
Theta (90°)	-13.17/-18.9	-12.63/-18.11	-13.12/-14.52	-19.01/-14.68	-12.91/-12.45	-12.24/-12.6	-8.45/-11.38	-17.64/-18.19	-18.98/-18.99	-17.96/-17.7	-14.64/-12.9	-13.58/-14.55	-12.11/-18.55	-16.62/-8.93	9.22/-14.86	-12.66/-18.99	-16.32/-15.64	-11.95/-18.99	-18.66/-19.58	-19.17/-13.09	-18.62/-18.53	-19.57/-13.96	-12.41/-19.38	
Theta (97.5°)	-18.42/-15.8	-18.85/-13.11	-17.76/-16.15	-18.04/-18.08	-18.88/-19.18	-12.99/-19.25	-14.35/-18	-13.96/-12.26	-13.51/-16.28	-15.44/-13.57	-19.07/-15.41	-10.76/-11.18	-11.81/-14.93	-11.19/-11.73	-10.17/-14.82	-10.08/-9.44	-13.21/-8.21	-10.34/-9.91	-18.64/-14.39	-11.88/-15.65	-10.9/-65	-15.23/-18.65	-18.35/-18.74	-12.88/-16.76
Theta (105°)	-18.49/-17.82	-17.31/-15.19	-14.81/-11.29	-8.24/-17.05	-18.51/-15.9	-14.29/-17.17	-18.71/-18.01	-12.94/-10.98	-14.57/-17.73	-18.76/-14.19	-14.04/-16	-10.39/-12.2	-14.55/-12.51	-19.37/-12.5	-13.28/-13.58	-13.11/-10.32	-9.33/-8.39	-14.65/-10.67	-17.48/-13.63	-18.93/-18.59	-16.21/-8.2	-18.18/-17.89	-18.23/-17.4	-18.99/-16.63
Theta (112.5°)	-14.89/-12.7	-19.17/-19.08	-16.89/-15.36	-13.84/-17.18	-19.22/-12.08	-13.34/-17.52	-15.85/-18.32	-8.47/-6.98	9.8/-11.42	-13.31/-17.28	-19.01/-10.91	-17.96/-16.9	-13.31/-10.95	-18.49/-14.72	-16.04/-18.01	-12.82/-16.71	-10.93/-11.77	-11.95/-16.95	-18.04/-14.76	-15.76/-10.86	-18.31/-16.79	-14.31/-15.48	-16.29/-18.52	-16.04/-18.89
Theta (120°)	-9.13/-18.14	-15.28/-18.88	-15.02/-15.76	-16.34/-14	-17.88/-12.5	-17.93/-13.31	-14.53/-18.1	-10.46/-9.41	-10.51/-10.85	-12.62/-17.84	-17.71/-15.15	-18.61/-19.18	-14.61/-16.76	-18.8/-15.39	-17.41/-17.73	-19.27/-18.12	-12.21/-18.45	-15.42/-12.84	-18.87/-18.49	-17.31/-9.51	-19.31/-14.37	-10.02/-7.44	-13.64/-16.1	-18.11/-16.5
Theta (127.5°)	-12.24/-18.48	-15.33/-17.69	-18.61/-18.01	-17.27/-12.86	-18.47/-13.82	-16.24/-10.63	-14.48/-15.24	-12.37/-13.95	9.8/-5.85	-11.48/-16.14	-15.78/-18.92	-18.51/-17.67	-18.17/-17.4	-17.89/-15.14	-14.46/-14.52	-14.83/-18.71	-17.56/-17.56	-18.17/-15.9	-18.74/-15.27	-16.03/-13.63	-16.52/-18.13	-14.14/-18.07	-12.21/-12.47	-17.57/-15.65
Theta (135°)	-17.61/-18.78	-18.12/-15.17	-18.86/-17.85	-17.64/-18.09	-19.17/-13.82	-14.45/-15.99	-16.66/-11.53	9.41/-14.51	-12.59/-9.51	-11.24/-18.42	-17.97/-15.84	-14.58/-17.15	-16.62/-14.58	-18.92/-15.03	-17.92/-19.16	-18.23/-17.62	-18.12/-18.85	-15.14/-13.94	-12.95/-13.19	-11.82/-15.49	-10.9/-13.07	-14.36/-16.55	-18.87/-11.29	
Theta (142.5°)	-11.17/-11.59	-14.78/-13.63	-19.07/-19.05	-17.04/-18.31	-17.81/-12.75	-14.49/-18.77	-12.08/-12	-19.41/-17.42	-18.23/-16.24	-191/-18.24	-19.21/-15.62	-18.34/-17.01	-19.31/-12.45	-14.45/-16.85	-13.83/-16.7	-18.06/-14.3	-12.79/-13.76	-18.18/-19.13	-19.05/-18.35	-12.21/-13.77	-19.23/-15.47	-14.99/-18.38	-161/-16.1	-19.06/-18.38
Theta (150°)	-14.21/-17.91	-17.06/-17.79	-18.84/-18.36	-16.26/-14.97	-18.71/-17.77	-16.15/-17.77	-18.91/-15.67	-16.16/-17.69	-18.27/-14.17	-9.91/-10.44	-16.01/-15.98	-17.67/-17.67	-18.64/-17.27	-18.54/-17.48	-12.09/-13.06	-16.52/-18.8	-18.93/-18.62	-18.06/-19.23	-17.51/-18.13	-17.13/-18.42	-11.62/-9.9	-12.66/-17.79	-15.87/-12.42	-16.07/-18.61
Theta (157.5°)	-17.73/-18.42	-18.61/-61	-17.72/-18.22	-18.41/-18.1	-16.51/-14.92	-19.46/-18.31	-18.12/-17.79	-19.32/-18.2	-19.13/-15	-11.72/-13.29	-14.44/-17.38	-17.46/-17.53	-17.46/-18.92	-17.47/-18.38	-18.44/-18.5	-18.08/-18.67	-19.02/-17.14	-18.56/-16.64	-17.19/-19.22	-18.37/-16.05	-12.73/-12.59	-14.94/-15.42	-16.91/-17.72	
Theta (165°)	-16.68/-14.6	-19.24/-19.07	-18.49/-19.38	-17.91/-17.73	-16.27/-12.42	-12.59/-16.78	-14.83/-11.03	-10.78/-10.59	9.98/-9.47	9.28/-10.27	-11.07/-15.01	-18.86/-19.27	-17.64/-15.85	-15.51/-19.59	-18.38/-18.23	-181/-15.69	-10.73/-10.56	-13.62/-17.66	-17.18/-19.04	-19.33/-15.33	-13.07/-10.85	-8.22/-9.57	-14.46/-18.26	-18.44/-17.5
Theta (172.5°)	-9.61/-10.47	-12.16/-13.37	-15.81/-18.85	-18.85/-18.66	-18.22/-18.18	-18.92/-18.24	-17.51/-15.7	-16.91/-15.05	-13.27/-11.01	-10.35/-9.92	9.63/-11.52	-14.11/-15.67	-16.99/-16.6	-17.65/-18.83	-18.21/-17.42	-17.77/-19.08	-16.81/-14.88	-16.66/-17.95	-17.11/-15.8	-15.16/-14.1	-13.44/-16.11	-18.21/-17.98	-16.03/-13.35	-10.85/-9.97
Theta (180°)	-18.64/-18.44	-18.27/-17.55	-16.37/-19.29	-18.41/-18.05	-18.6/-17.75	-18.41/-17.91	-18.55/-17.75	-18.06/-17.56	-17.44/-16.2	-16.77/-16.06	-15.07/-15.59	-16.64/-17.55	-19.19/-17.58	-18.67/-17.93	-17.48/-18.19	-19.03/-18.09	-17.96/-17.58	-18.59/-19.14	-17.67/-18.75	-18.03/-19.05	-19.02/-18.83	-17.84/-17.98	-19.4/-18.86	-18.31/-17.5
Freq(Hz)	5.6GPol.	ThetaAnt 3																						
Gain	Phi(0°)Phi(7.5°)	Phi(15°)Phi(22.5°)	Phi(30°)Phi(37.5°)	Phi(45°)Phi(52.5°)	Phi(60°)Phi(67.5°)	Phi(75°)Phi(82.5°)	Phi(90°)Phi(97.5°)	Phi(105°)Phi(112.5°)	Phi(120°)Phi(127.5°)	Phi(135°)Phi(142.5°)	Phi(150°)Phi(157.5°)	Phi(165°)Phi(172.5°)	Phi(180°)Phi(187.5°)	Phi(195°)Phi(202.5°)	Phi(210°)Phi(217.5°)	Phi(225°)Phi(232.5°)	Phi(240°)Phi(247.5°)	Phi(255°)Phi(262.5°)	Phi(270°)Phi(277.5°)	Phi(285°)Phi(292.5°)	Phi(300°)Phi(307.5°)	Phi(315°)Phi(322.5°)	Phi(330°)Phi(337.5°)	Phi(345°)Phi(352.5°)
Theta (0°)	-18.28/-19.06	-18.43/-18.77	-17.91/-17.46	-18.59/-18.85	-17.10/-18.08	-16.34/-16.26	-16.49/-16.74	-14.99/-14.56	-13.79/-14.82	-16.21/-16.75	-17.29/-15.51	-16.22/-18.13	-17.16/-15.84	-16.08/-18.08	-14.39/-12.7	-16.25/-12.43	-12.64/-14.03	-13.71/-13.95	-14.47/-15.31	-16.23/-16.56	-16.54/-17.38			
Theta (7.5°)	-19.25/-18.89	-13.81/-12.38	-11.53/-10.11	9.37/-9.82	-10.05/-10.04	-10.67/-10.83	-11.32/-11.97	-12.32/-12.7	-13.96/-15.3	-15.82/-15.62	-17.23/-18.61	-18.01/-18.83	-18.24/-18.39	-18.03/-18.84	-18.54/-19.15	-19.18/-18.55	-19.18/-18.24	-18.14/-18.42	-19.43/-19.27	-16.84/-13.47	-13.22/-14.38	-15.89/-16.24	-17.25/-18.46	
Theta (15°)	-11.77/-10.69	-9.78/-10.95	-14.17/-16.71	-17.85/-16.52	-16.71/-15.72	-16.13/-15.54	-16.78/-17.77	-19.19/-17.7	-18.97/-18.35	-19.23/-18.25	-18.71/-18.2	-18.11/-19.34	-16.94/-17.93	-16.98/-15.42	-13.53/-13.03	-14.03/-12.57	-10.46/-9.46	9.03/-6.99	-10.24/-11.9	-13.24/-13.76	-13.02/-10.89	-10.44/-11.43	-13.15/-13.71	-14.26/-14.31
Theta (22.5°)	-14.21/-19.1	-18.13/-12.84	-10.91/-12.98	9.91/-12.79	-13.85/-14.73	-14.82/-12.37	-10.67/-9.77	8.86/-4.89	9.57/-11.34	-12.47/-10.47	-14.45/-18.88	-18.04/-13.14	-11.65/-10.89	-12.52/-12.58	-10.34/-11.51	-11.10/-10.99	-10.46/-12.54	-13.68/-11.82	-11.22/-10.21	9.95/-9.77	-7.72/-4.42	-12.39/-10.73	-10.41/-11.52	
Theta (30°)	-7.55/-7.05	-11.76/-12.49	-9.7/-7.06	-6.14/-3.93	-3.41/-3.9	-5.59/-8.07	-13.27/-18.36	-13.21/-8.9	7.85/-7.71	-10.71/-10.5	-6.76/-6.48	-8.79/-12.78	-12.92/-10.39	-8.77/-7.9	-8.52/-8.41	-7.18/-7.06	-7.11/-7.8	-6.02/-4.39	4.47/-7.34	-8.81/-4.86	-3.72/-4.34	-4.35/-4.84	-5.86/-6.15	-9.25/-11.39
Theta (37.5°)	-9.77/-10.11	-8.34/-6.66	9.06/-13.27	-12.01/-11.42	-14.66/-12.74	-7.81/-3.59	-2.75/-3.96	6.12/-5.63	-5.83/-7.56	-4.86/-4.75	-11.04/-10.86	-6.61/-6.57	-10.57/-9.1	5.88/-9.59	-8.55/-7.24	-7.58/-8.56	-8.82/-13.1	-11.36/-11.16	-10.14/-7.72	-6.78/-4.74	-7.67/-8.37	-7.01/-6.78	-7.15/-7.17	-8.78/-11.3
Theta (45°)	-7.25/-3.78	-4.55/-6.69	-1.580/-4.2	-0.41/-0.85	-0.80/-2.7	0.63/-0.59	-3.29/-6.99	-2.51/-3.26	8.02/-10.27	-10.94/-10.65	-12.71/-10.61	-5.86/-9.86	-10.71/-10.52	-6.17	-5.28/-4.94	-7.23/-10.27	-12.27/-11.6	-10.71/-9.6	-9.08/-7.74	-6.37/-3.33	-4.37/-2.57	-4.37/-2.57	-4.37/-2.57	-4.37/-2.57
Theta (52.5°)	-8.99/-4.64	-5.27/-11.64	-4.36/-4.95	-8.79/-8.17	-9.13/-4.32	-0.780/-3.7	-0.43/-2.05	-3.93/-3.13	-3.67/-3.33	-4.78/-7.46	-13.34/-6.15	-6.97/-11.51	-6.79/-6.08	-6.16/-5.98	-5.93/-5.9	-8.45/-8.88	-7.53/-4.23	-3.71/-7.51	-7.21/-5.77	-6.71/-5.8	-10.27/-12.7	-7.45/-9.78	-5.78/-9.42	-4.97/-6.1
Theta (60°)	-10.67/-8.38	-10.32/-16.94	-18.42/-8.55	-8.74/-11.99	-5.71/-9.44	-16.22/-12.41	-9.67/-16.56	-18.01/-6.9	-6.17/-8.96	-5.94/-9.73	-4.43/-8.39	5.88	-6.13/-10.78	-5.99/-4.86	-7.87/-10.7	-5.35/-2.53	-7.88/-8.76	-4.06/-9.51	-7.41/-5.03	-6.21/-9.58	-6.62/-7.74	-5.16/-5.81	-3.41/-7.1	-2.49/-7.6
Theta (67.5°)	-6.71/9.1	-1.53/-6.23	-6.19/-3.22	-3.91/-3.17	-0.47/-0.08	-1.80/-5.88	-2.42/-3.07	8.51/-18.55	-5.18/-8.31	-4.80/-7.98	-3.65/-9.42	-4.67/-18.02	-4.91/-2.69	-5.93/-8.49	-9.36/-1.67	-0.05/-4.79	-3.21/-10.3	-1.39/-3.49	-4.37/-9.22	-3.59/-2.92	-4.37/-9.22	-3.59/-2.92	-4.37/-9.22	-3.59/-2.92
Theta (75°)	-2.22/-6.6	1.47/-2.72	-5.03/-2.78	1.61/-0.6	-0.49/-0.88	-1.83/-0.58	1.5/-0.67	-1.732/-6.6	-2.37/-3.22	-10.41/-6.8	4.11/-10.44	-2.43/-4.45	-6.91/-9.78	-2.45/-5.55	0.12/-5.06	-0.65/-1.67	-1.283/4	2.84/-0.4	-2.14/8.84	3.980	1.32/66	-1.41/-0.09	-1.43/-3.71	-1.52/-0.55
Theta (82.5°)	-1.26/-3.1	1.05/-7.2	-5.64/-5.43	2.11/-1.94	1.490/-6.4	-0.65/-2.18	4.04/-2.15	-9.080/-26	-4.25/-1.26	-2.06/-3.35	-5.26/-8.94	-3.51/-2.5	-4.79/-8.88	1.240/99	0.180/-12	1.730/67	2.034/-4	3.592/-12	0.772/65	4.170/-1.5	1.652/6	2.090/16	-1.27/-3.81	-2.880/65
Theta (90°)	-1.81/5.39	1.69/-6.94	-2.76/-1.92	1.76/-4.88	-0.53/-3.56	-1.53/-0.8	-1.89/-2.82	-4.041/-16	-0.211/-3.5	-3.43/-6.02	-1.05/-4.3	-2.72/-1.48	0.13/-3.25	0.781/-17	-0.11/-8.3	3.891/-22	1.11/7.3	3.231/08	1.782/44	3.360/-0.02	0.361/97	1.391/-12	-1.21/-2.13	0.141/05
Theta (97.5°)	-5.06/-5.84	-0.23/-8.8	-5.92/-4.79	-0.86/-2.91	-0.9/-2.91	-1.97/-2.14	-0.31/-2.43	-3.782/94	0.752/23	1.81/-2.04	-3.18/-2.65	-0.770/-32	0.89/-0.72	-1.332/33	1/5.17	1.82/69	0.64/3	3.12/-0.66	1.411/46	3				



Radiated Composite Gain Data

Appendix A.3

Theta (°)	Phi (°)	Phi (15°)	Phi (30°)	Phi (45°)	Phi (60°)	Phi (75°)	Phi (90°)	Phi (105°)	Phi (120°)	Phi (135°)	Phi (150°)	Phi (165°)	Phi (180°)	Phi (195°)	Phi (210°)	Phi (225°)	Phi (240°)	Phi (255°)	Phi (270°)	Phi (285°)	Phi (300°)	Phi (315°)	Phi (330°)	Phi (345°)	
Theta (127.5°)	-17.03/-17.77	-12.57/-10.11	-11.38/-18.78	-13.52/-10.7	-10.27/-13.31	-19.19/-13.25	-15.41/-10.32	-19.23/-17.23	-10.32/-17.58	-13.89/-11.95	-14.33/-12.3	-14.94/-15.55	-13.75/-10.13	-18.75/-8.4	-12.33/-19.11	-16.47/-18.03	-17.94/-19.15	-14.42/-12.55	-16.07/-18.11	-12.54/-11.92	-18.37/-18.71	-13.96/-17.77	-19.26/-18.03	-19.09/-17.66	
Theta (135°)	-18.21/-17.16	-15.74/-14.93	-15.23/-17.77	-18.1/-15.29	-18.99/-17.33	-17.9/-16.7	-13.67/-9.9	-18.5/-9.9	-8.81/-9.72	-14.56/-13.43	-15.02/-17.68	-18.1/-18.79	-18.99/-17.17	-19.14/-17.92	-18.9/-16.06	-19.16/-17.51	-19.15/-19.16	-17.93/-18.08	-18.72/-18.9	-14.11/-16.99	-18.16/-18.31	-12.22/-17.29	-18.06/-17.79	-16.89/-14.65	
Theta (142.5°)	-17.9/-18.67	-17.73/-17.54	-18.29/-12.5	-13.24/-11.16	-10.21/-12.27	-12.56/-13.71	-18.83/-12.35	-16.41/-13.28	-18.28/-14.51	-17.67/-17	-19.36/-15.56	-14.3/-18.04	-17.33/-16.63	-19.75/-15.71	-15.54/-16.05	-14.16/-17.35	-15.15/-18.7	-13.42/-10.51	-15.69/-18.44	-11.84/-10.6	-17.52/-19.34	-17.9/-18.88	-18.87/-18.99		
Theta (150°)	-17.98/-14.97	-14.91/-17.73	-16.63/-17.52	-14.76/-17.85	-18.24/-16.57	-14.48/-16.37	-16.01/-15.75	-18.14/-18.53	-14.17/-11.76	-11.06/-14.11	-17.81/-18.53	-18.53/-18.84	-18.48/-17.84	-19.42/-18.33	-17.97/-17.16	-18.81/-18.21	-17.38/-16.54	-17.26/-18.48	-14.21/-11.23	-12.59/-12.14	-12.57/-11.64	-12.59/-13.07	-18.01/-18.5	-19.13/-18.07	
Theta (157.5°)	-17.94/-18.77	-18.65/-14.87	-11.32/-10.25	-8.79/-11.11	-18.11/-14.83	-14.65/-16.03	-19.3/-18.61	-16.47/-11.88	-16.33/-19.07	-18.38/-15.32	-17.45/-18.55	-19.28/-17.84	-17.98/-18.42	-18.1/-19.22	-16.54/-17.29	-17.77/-18.45	-18.94/-18.4	-18.64/-17.98	-17.78/-13.73	-13.31/-11.11	-9.26/-10.18	-11.69/-15.39	-15.49/-12.59	-11.71/-14.43	
Theta (165°)	-18.3/-16.42	-14.44/-9.06	-8.61/-8.83	-6.13/-7.93	-13.41/-16.77	-17.56/-18.88	-19.09/-18.2	-17.14/-11.8	-19.13/-12.05	-17.86/-19.33	-19.35/-18.8	-17.76/-17.45	-19.77/-18.01	-18.88/-19.06	-18.19/-17.89	-18.57/-17.75	-17.51/-18.71	-16.4/-14.06	-13.12/-11.68	-12.22/-12.76	-13.13/-14.38	-16.5/-18.77	-18.49/-18.39	-18.95/-18.27	
Theta (172.5°)	-17.46/-17.29	-18.24/-12.85	-11.94/-12.4	-10.04/-11.03	-12.18/-12.23	-12.36/-14.24	-18.18/-17.52	-16.18/-28	-17.39/-18	-18.61/-14.99	-12.82/-12.79	-11.96/-11.16	-11.41/-12.5	-13.87/-16.89	-16.03/-16.19	-15.4/-15.4	-16.38/-16.92	-17.58/-16.51	-16.91/-16.59	-18.43/-17.41	-18.52/-18.35	-18.48/-18.39	-15.81/-15.96	-18.05/-18.06	
Theta (180°)	-14.72/-17.26	-15.56/-18.48	-19.34/-18.91	-18.52/-18.95	-17.47/-17.37	-18.95/-18.61	-18.64/-18.41	-18.14/-16.11	-15.01/-15.49	-18.63/-18.15	-19.21/-18.24	-16.53/-16.12	-16.79/-15.18	-15.5/-14.94	-15.47/-17.55	-18.36/-17.84	-19.03/-18.04	-18.82/-18.33	-18.39/-19.32	-18.35/-17.87	-16.39/-15.88	-13.39/-13.28	-15.11/-13.7		
Freq (Hz)	5.6G/Pol.	Theta/Ant. 4																							
Gain	Phi(0°)/Phi(7.5°)	Phi(15°)/Phi(22.5°)	Phi(30°)/Phi(37.5°)	Phi(45°)/Phi(52.5°)	Phi(60°)/Phi(67.5°)	Phi(75°)/Phi(82.5°)	Phi(90°)/Phi(97.5°)	Phi(105°)/Phi(112.5°)	Phi(120°)/Phi(127.5°)	Phi(135°)/Phi(142.5°)	Phi(150°)/Phi(157.5°)	Phi(165°)/Phi(172.5°)	Phi(180°)/Phi(187.5°)	Phi(195°)/Phi(202.5°)	Phi(210°)/Phi(217.5°)	Phi(225°)/Phi(232.5°)	Phi(240°)/Phi(247.5°)	Phi(255°)/Phi(262.5°)	Phi(270°)/Phi(277.5°)	Phi(285°)/Phi(292.5°)	Phi(300°)/Phi(307.5°)	Phi(315°)/Phi(322.5°)	Phi(330°)/Phi(337.5°)	Phi(345°)/Phi(352.5°)	
Theta (0°)	-18.94/-18.79	-18.41/-19.09	-18.33/-18.65	-18.94/-17.6	-18.62/-17.98	-18.19/-14.1	-17.6/-18.58	-18.9/-18.7	-18.3/-19.35	-18.77/-17.92	-17.18/-17.07	-17.22/-17.97	-18.94/-18.08	-19.35/-17.35	-18.3/-18.37	-18.57/-18.78	-18.87/-17.87	-18.27/-19.11	-17.43/-18.29	-17.89/-18.41	-18.2/-18.44	-17.59/-18.62	-18.27/-19.08	-18.66/-19.36	
Theta (7.5°)	-18.95/-19.17	-19.1/-18.31	-17.76/-18.99	-15.25/-16.91	-16.03/-15.26	-15.71/-17.08	-18.81/-18.08	-19.2/-18.01	-17.81/-18.15	-18.21/-18.64	-18.21/-18.23	-18.75/-17.51	-15.72/-15.82	-18.11/-18.04	-17.54/-18.29	-16.89/-15.06	-16.58/-16.35	-13.93/-13.56	-15.88/-14.66	-14.58/-14.21	-14.65/-15.66	-14.8/-16.52	-18.65/-19.61	-3.49/-4.2	
Theta (15°)	-12.1/9.66	9.93/9.77	-10.73/-14.72	-13.83/-13.79	-14.71/-15.07	-13.08/-15.44	-15.98/-15.87	-14.66/-14.92	-15.33/-17.05	-17.19/-17.93	-17.89/-17.32	-17.77/-15.54	-14.8/-15.42	-13.84/-14.85	-19.18/-18.88	-15.98/-11.68	-11.24/-14.37	-15.25/-12.3	-12.41/-10.69	-11.30/-8.88	-11.12/-9.77	9.32/-10.3	-11.6/-12.83	-12.79/-13.06	
Theta (22.5°)	-8.66/-7.48	-8.9/-10.03	9.29/-12.28	-7.96/-8.72	-10.69/-11.49	-14.2/-17.48	-17.56/-17.87	-18.11/-18.79	-17.78/-14.67	-13.61/-17.77	-17.85/-15.3	-17.31/-15.93	-15.37/-15.46	-14.01/-11.33	-10.51/-10.71	-14.8/-16.33	-10.55/-9.82	-13.39/-12.26	-11.82/-8.16	-7.32/-6.53	-5.39/-3.79	-4.09/-5.68	-7.5/-9.8	-8.2/-7.44	
Theta (30°)	-8.15/-8.1	9.5/-8.96	8.61/-12.8	-6.47/-11.47	-10.78/-9.63	-10.84/-11.07	-10.9/-8.6	-12.71/-12.47	-14.91/-13.17	-11.88/-12.69	-10.03/-11.59	-11.09/-11.99	-11.91/-12.68	-8.57/-9.19	-10.9/-3.9	-7.4/-8	-6.26/-8.14	-7.4/-6.29	-6.29/-6.1	-4.76/-6.29	-6.29/-6.1	-5.06/-4.25	-3.49/-4.92		
Theta (37.5°)	-4.46/-7.15	-11.03/-8.15	-7.24/-8.85	-5.4/-7.8	-13.57/-6.66	-8.02/-4.74	-6.51/-10.19	-7.29/-7.75	-8.28/-7.05	-9.6/-13.61	-9.54/-6.23	-5.98/-6.29	-3.99/-4.76	-7.52/-6.28	-4.84/-5.4	-6.47/-7.06	-7.71/-8.51	-10.16/-11	-6.96/-11.34	-10.08/-10.3	-8.17/-7.58	-9.44/-8.09	-6.43/-4.8	-4.24/-3.72	
Theta (45°)	-4.34/-6.66	-12.86/-10.56	-8.43/-9.15	-10.02/-8.54	-8.86/-8.38	-11.21/-6.15	-5.07/-9.1	-13.77/-19.38	-16.14/-11.57	-11.46/-8.3	-5.82/-3.56	-2.91/-2.98	-3.58/-5.17	-3.34/-2.47	-5.44/-6.54	-3.96/-3.58	-4.28/-6.37	-6.75/-6.12	-7.28/-11.52	-8.94/-10.04	-5.23/-6.69	-7.35/-5.45	-8.99/-9.14	-6.33/-4.74	
Theta (52.5°)	-6.28/-5.58	-5.22/-6.8	-8.2/-6.48	-5.78/-13.53	-8.36/-13.23	-7.48/-9.39	-9.63/-13.58	-7.58/-5.77	-4.12/-3.16	-4.62/-3.22	-4.94/-4.37	-4.66/-2.9	-3.25/-2.56	-3.84/-4.46	-3.23/-5.27	-5.22/-6.33	-4.37/-6.52	-7.74/-6.55	-3.77/-10.5	-5.12/-6.34	-4.95/-6.42	-5.03/-6.34	-4.6/-6.31	-9.91/-7.99	
Theta (60°)	-2.19/-4.79	-6.6/-8.99	-6.88/-2.81	-8.21/-6.37	-9.69/-11.33	-5.76/-10.53	-5.03/-3.05	-4.5/-5.36	-2.29/-2.76	-6.79/-7.54	-6.14/-7.21	-9.22/-18.64	-17.5/-18.62	-10.47/-18.32	-7.47/-8.3	-6.72/-7.47	-11.35/-4.49	-7.76/-5.96	-5.18/-8.17	-1.8/-3.73	-3.95/-5.25	-6.26/-1.93	-1.89/-4	-8.28/-6.72	
Theta (67.5°)	-0.710/-8.4	-1.16/-4.25	-3.91/-0.71	-8.95/-2.06	-7.58/-5.22	-6.47/-7.7	-3.86/-8.49	-12.19/-10.93	-10.22/-3.37	-7.79/-6.32	-6.99/-4.39	-4.02/-2.57	0.01/4	-6.95/-3.75	-8.47/-13.97	-12.19/-11.31	-9.35/-6.34	-4.25/-4.51	-5.33/-4.33	-2.43/-1.28	-3.92/-6.54	-4.17/-9.91	-3.78/-2.38	-0.88/-3.53	
Theta (75°)	-3.240/-2.25	-0.52/-0.02	-1.15/-1.35	-1.12/-1.51	-3.04/-3.74	-9.11/-4.6	-9.59/-9.71	-5.91/-11.75	-1.52/-3.6	-0.57/-1.15	-1.0205/2	2.39/-5.66	-0.860/2.62	-0.5/-2.91											
Theta (82.5°)	-1.790/0.63	0.43/-0.46	0.18/-0.08	1.2/-3.06	-4.46/-14.49	-3.33/-3.64	-5.82/-3.64	-3.11/-4.15	-2.97/1.38	-1.46/-0.8	-0.07/-2.44	-3.64/-3.68	0.27/-3.24	-1.92/-0.66	-0.88/-1.03	0.53/-3.6	-0.34/-4.94	-3.340/6.6	1.66/-2.38	-2.73/-0.63	2.3/-4.36	0.86/-1.08	1.21/0.04	0.52/-0.46	
Theta (90°)	0.093/3.3	1.77/0.16	0.75/0.8	2.27/-3.36	-2.04/-3.54	0.46/-0.31	-4.4/-2.51	-5.56/-1.06	-4.27/-4.75	0.85/0.63	0.15/-4.97	-1.310/2.7	-3.16/-1.23	-0.87/-0.62	0.16/-2.7	-1.45/-1.16	-2.352/6.1	6.17/0.85	3.540/2.1	3.50/7.1	1.61/2.37	1.61/2.37	1.61/2.37		
Theta (97.5°)	1.552/8.8	2.280/2.9	-1.27/-0.24	3.18/-1.53	-2.84/-3.9	-0.81/-1.71	-9.38/-1.7	-1.52/-3.6	-8.020/3.1	-4.6/-11.77	-10.72/-9.41	-6.86/-10.15	-4.28/-9.44	-3.65/-9.16	-3.43/-6.26	0.07/-2.46	-9.25/-1.93	-4.37/-1.51	-3.56/-9.96	-4.61/-6.7	-3.4/-9.1	-2.86/-5	-3.21/-4.65	-1.93/-6.64	
Theta (105°)	-2.242/6.4	3.810/4.7	0.25/1.43	2.37/-2.7	-2.4/-3.6	-1.56/-1.91	-6.84/-6.85	-3.04/-10.59	-8.93/-3.96	-7.14/-14.32	-6.19/-9.22	-4.35/-4.43	-1.44/-10.43	-4.71/-2.52	-5.66/-3.02	-2.39/-2.84	-3.11/-5.27	-7.390/0.9	-3.18/-1.79	-3.62/-0.51	1.81/-2.57	-1.17/-2.12	-0.91/3.12	1.020/6	
Theta (112.5°)	-2.892/9.5	1.21/-1.05	0.60/0.8	-2.48/-1.05	-3.49/-3.95	-3.29/-3.9	-5.12/-4.52	-2.09/-6.04	-15.45/-12.96	-13.67/-4.05	-6.31/-6.14	-6.71/-3.14	-4.28/-9.23	-5.78/-9.12	-0.96/-3.1	-2.12/-0.05	-4.93/-5.8	-3.97/-0.4	-4.12/-3.57	-2.01/-4.4	-3.31/-4.24	0.11/-3.7	0.28/1.1	-1.03/-0.2	
Theta (120°)	-3.530/0.2	-4.49/-8.68	-3.73/-3.77	-4.01/-1.44	-4.44/-4.49	-3.98/-1.42	-4.14/-2.62	-0.97/-4.53	-4.26/-7	-10.72/-9.19	-12.83/-8.04	-6.58/-6.87	-10.04/-10.2	-13.75/-10.26	-11.34/-6.14	-7.08/-17.15	-6.2/-6.8	-10.34/-15.13	-14.18/-5.8	-9.19/-17.49	-7.79/-5.72	-8.86/-17.34	-9.06/-6.59	-4.82/-8.82	-6.47/-7.43
Theta (127.5°)	-7.26/-12.46	-8.38/-7.2	-3.65/-2.67	-3.23/-6.47	-5.71/-7.62	-5.29/-1.77	-5.6/-3.15	-4.07/-7.53	-8.28/-8.14	-10.83/-8.04	-6.58/-6.87	-10.04/-10.2	-13.75/-10.26	-11.34/-6.14	-7.08/-17.15	-6.2/-6.8	-10.34/-15.13	-14.18/-5.8	-9.19/-17.49	-7.79/-5.72	-8.86/-17.34	-9.06/-6.59	-4.82/-8.82	-6.47/-7.43	
Theta (135°)	-3.65/-3.25	-4.02/-2.21	-2.78/-6.56	-8.6/-9.18	-11.76/-6.87	-6.29/-6.75	-5.21/-4.75	-13.2/-10.88	-9.67/-6.83	-8.41/-17.24	-10.15/-12.21	-11.39/-7	-11.54/-12.5	-16.19/-9.76	-16.09/-14.1	-19.02/-18.52	-17.18/-17.7	-17.65/-16.73	-14.64/-11.82	-18.28/-17.7	-13.18/-11	-9.21/-9.09	-7.85/-9.95	-13.46/-3.5	
Theta (142.5°)	-6.06/-2.4	-1.84/-6.22	-7.36/-8.79	-10.35/-9.19	-5.52/-6.44	-5.35/-7.5	-9.83/-8.08	-9.63/-11.26	-17.36/-12.1	-17.65/-19.01	-15.06/-11.56	-14.21/-14.91	-10.56/-12.91	-18.05/-14.88	-18.6/-12.84	-14.57/-18.99	-10.37/-10.18	-18.13/-11.69	-18.98/-15.62	-14.28/-7.86	-10.3/-7.9	-14.13/-11.47	-8.59/-8.82	-10.02/-10.2	
Theta (150°)	-10.18/-9.07	-8.16/-5.31	-4.72/-7.39	-9.88/-6.96	-4.42/-9.39	-11.92/-12.28	-10.38/-8.73	-14.01/-14.45	-11.88/-13.67	-18.52/-18.99	-15.89/-12.99	-12.87/-13.59	-14.25/-17.51	-18.57/-18.13	-7.68/-3.78	-4.63/-9.94</									



Mode 4

Freq(Hz)	5.6G	5.785G
Ant. 1 Max Gain (dBi)	2.56	1.18
Ant. 2 Max Gain (dBi)	4.84	4.77
Ant. 3 Max Gain (dBi)	3.62	4.56
Ant. 4 Max Gain (dBi)	4.15	4.12
Ant. 1 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Theta/37.5/150	Theta/45/150
Ant. 2 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Phi/82.5/277.5	Phi/82.5/277.5
Ant. 3 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Phi/82.5/285	Phi/82.5/285
Ant. 4 Polarization/ $\theta(^{\circ})/\Phi(^{\circ})$	Phi/112.5/15	Phi/127.5/7.5
Max Gain (dBi)	4.84	4.77
DG [1SS] (dBi)	5.83	5.27
DG [2SS] (dBi)	4.84	4.77
DG [4SS] (dBi)	4.84	4.77



Radiated Composite Gain Data

Appendix A.4

Gain Result

Freq(Hz)	5.6GPol.	PhiAnt.1	PhiAnt.2	PhiAnt.3	PhiAnt.4	PhiAnt.5	PhiAnt.6	PhiAnt.7	PhiAnt.8	PhiAnt.9	PhiAnt.10	PhiAnt.11	PhiAnt.12	PhiAnt.13	PhiAnt.14	PhiAnt.15	PhiAnt.16	PhiAnt.17	PhiAnt.18	PhiAnt.19	PhiAnt.20	PhiAnt.21	PhiAnt.22	PhiAnt.23	PhiAnt.24	PhiAnt.25	PhiAnt.26	PhiAnt.27	PhiAnt.28	PhiAnt.29	PhiAnt.30	PhiAnt.31	PhiAnt.32	PhiAnt.33	PhiAnt.34	PhiAnt.35
Gain	Phi(75)Phi(75)	Phi(15)Phi(22.5)	Phi(30)Phi(37.5)	Phi(45)Phi(52.5)	Phi(60)Phi(67.5)	Phi(75)Phi(82.5)	Phi(90)Phi(97.5)	Phi(105)Phi(112.5)	Phi(120)Phi(127.5)	Phi(135)Phi(142.5)	Phi(150)Phi(157.5)	Phi(165)Phi(172.5)	Phi(180)Phi(187.5)	Phi(195)Phi(202.5)	Phi(210)Phi(217.5)	Phi(225)Phi(232.5)	Phi(240)Phi(247.5)	Phi(255)Phi(262.5)	Phi(270)Phi(277.5)	Phi(285)Phi(292.5)	Phi(300)Phi(307.5)	Phi(315)Phi(322.5)	Phi(330)Phi(337.5)	Phi(345)Phi(352.5)												
Theta(0°)	-12.56/-11.22	9.84/9.03	8.2/8.63	6.84/5.43	4.17/3.36	3.49/3.29	3.31/3.27	3.61/3.75	3.83/4.22	5.44/7.16	7.31/8.71	12.09/15.05	17.11/15.84	13.49/12.65	10.31/8.34	6.98/5.89	4.72/3.43	-1.52/2.71	0.57/1.22	-1.23/-1.66	1.56/2.18	-2.45/2.93	-3.62/4.06	-6/7.12	8.79/10.95											
Theta(15°)	-14.44/-12.5	-10.76/-8.33	-8/5.59	-4.77/3.77	-3.23/-3.12	-3.79/4.04	-5.56/6.98	-6.29/8.74	-8.92/9.33	-9/10.48	-11.61/14.71	-17.2/18.73	-19.65/19.97	-11.91/10.72	-6.57/7.44	-3.81/3.99	-3.25/3.41	-2.87/2.97	-3.37/4.1	-4.31/4.94	-5.89/7.55	-9.03/9.82	-11.28/12.72	-8.2/8.46												
Theta(30°)	-17.55/-10.24	-19.47/17.45	-10.26/6.75	-3.33/2.14	-2.46/4	-6.55/10.61	-11.33/13.86	-11.7/9.7	-8.1/4.69	-3.52/3.3	-6.9/7.59	-18.39/18.54	-13.9/11.27	-6.75/5.95	-6.22/5.27	-3.57/1.76	-1.4/1.34	-0.5/0.2	-0.38/1.06	-2/3.89	-4.9/6.64	-7.34/8.11	-6.97/7.76	-7.45/7.7												
Theta(45°)	-8.21/10.02	-15.39/15.72	-9.82/4.09	-1.84/4.09	-0.36/1.5	-5.73/16.64	-18.06/15.23	-10.68/5.34	-3.56/2.7	-1.48/3.24	-6.81/7.12	-12.46/12.68	-14.77/9.53	-7.09/7.71	-10.07/7.86	-5.69/3.98	-2.62/4.02	-3.75/1.76	-1.17/1.45	-3.05/4.36	-4.84/5.47	-5.79/5.8	-4.91/5.32	-6.72/7.9												
Theta(60°)	-8.71/14.93	-18.69/14.4	8.19/3.68	-1.14/0.83	1.65/0.44	-4.3/1.2	-12.65/13.14	-8.22/4.11	-1.76/1.55	-3.09/4.51	-5.99/4.73	-2/2.02	-6.11/3.75	-4.03/3.81	-5.43/4.79	-3.98/4.61	-5.24/4.15	-3.6/4.15	-3.8/3.69	-4.36/3.51	-2.93/4.83	-4.75/3.9	-3.66/4.78													
Theta(75°)	-8.31/16.59	-16.01/8.36	-4.55/2.08	-0.71/0.99	1.87/1.05	-1.55/5.17	-7.32/7.13	-5.11/2.04	-1.47/1.14	-4.19/5.27	-4.71/4.67	-6.15/7.5	-7.99/5.93	-6.07/5.94	-8.19/6.27	-4.71/4.33	-4.6/5.64	-6.56/4.88	-4.08/4.54	-3.93/3.48	-3.11/2.45	-2.17/2.93	-4.71/3.92	-3.37/3.45												
Theta(90°)	-8.35/14.53	-14.3/6.57	-2.2/0.5	-0.26/0.88	1.45/1.18	-1.16/2.61	-3.02/4.89	-2.46/4.14	-1.78/2.7	-5.13/4.86	-1.69/5.78	-5.35/6.18	-11.77/8.41	-14.14/6.94	-8.64/15.5	-9.78/10.17	-6.6/6.17	-6.77/9.43	-7.36/3.72	-5.19/5.08	-4.53/4.35	-4.94/4.8	-4.49/3.6													
Theta(105°)	-9.79/17.73	-16.81/5.64	-0.78/0.82	0.10/0.97	1.25/0.32	-1.45/2.14	-2.01/3.97	-1.42/1.95	-2.48/6.62	-4.56/2.99	-3/6.55	-5.77/17.48	-12.99/11.53	-9.93/11.03	-12.15/12.45	-18.75/14.82	-9.22/7.77	-6.76/7.35	-8.08/7.43	-6.23/6.73	-8.18/6.87	-5.57/5.84	-6.9/5.9	-4.23/4.22												
Theta(120°)	-13.17/14.55	-11.94/7.2	-0.77/0.99	0.11/1.05	0.82/0.74	-1.95/1.41	-3.13/2.48	-0.73/1.77	-4.63/4.87	-2.75/2.74	-4.12/6.83	-10.12/13.36	-14.16/8.9	-18.23/13.09	-13.47/7.74	-10.21/17.32	-15.27/10.26	-10.02/9.71	-9.21/19.15	-8.86/5.61	-7.39/6.59	-6.05/7.68	-7.92/8.64	-5.86/6.27												
Theta(135°)	-13.13/13.09	-9.21/5.77	-0.52/0.82	0.45/1.12	0.56/0.04	-0.8/2.39	-3.77/2.31	-0.66/3	-5.98/4.01	-2.27/5.53	-7.32/7.3	-13.79/10	-14.87/13.54	-18.51/13.95	-16.87/11.48	-6.23/11.25	-12.01/17.98	-9.79/10.19	-12.5/6.99	-5.67/9.96	-6.64/12.62	-9.8/11.06	-7.1/11.44													
Theta(150°)	-15.2/9.33	-6.38/3.4	0.13/0.47	0.73/0.75	0.33/0.71	-0.41/2.4	-3.27/2.37	-1.89/2.96	-3.08/2.73	-5.51/7.08	-7.09/12.43	-15.39/6.67	-12.96/14.88	-18.79/10.84	-11.1/19.08	-16.97/17.2	-17.57/13.77	-19.18/6.88	-7.32/6.86	-15.75/15.62	-15.32/12.16	-8.16/11.19														
Theta(165°)	-12.98/9.96	-5.16/2.37	-0.08/0.83	0.21/0.22	-1.06/0.14	-0.9/1.18	-2.97/2.51	-2.57/1.78	-3.42/3.95	-6.01/6.93	-9.53/12.78	-13.87/6.91	-13.56/16.93	-12.37/13.54	-7.04/19.24	-17.68/15.35	-15.42/15.4	-18.39/18.98	-19.04/16.58	-14.87/6.77	-11.38/9.05	-14.07/18.83	-18.04/16.6	-13.49/15.89												
Theta(180°)	-10.07/7.81	-4.51/2.99	-0.6/2.19	-0.59/4.08	-2.39/4.23	-1.03/0.15	-2.05/1.49	-2.92/2.83	-3.84/4.48	-7.94/6.46	-9.99/16.6	-13.63/17.3	-14.97/12.3	-11.99/15.47	-14.72/10.54	-16.26/15.55	-15.71/11.46	-13.41/12.13	-12.95/16.07	-17.21/17.11	-15.71/17.31	-15.71/17.31	-15.71/17.31													
Theta(225°)	-1.31/17.73	-4.99/4.24	-2.77/2.74	-1.38/3.3	-2.65/1.92	-0.23/0.47	-1.29/1.93	-2.92/2.89	-4.24/5.12	-4.58/8.54	-15.03/17.91	-10.38/12.63	-12.98/13.66	-9.97/16.94	-6.52/14.09	-16.25/17.9	-18.9/19.6	-18.9/14.36	-13.63/11.31	-18.76/18.78	-13.77/18.74	-13.71/12.08	-15.26/13.17	-19.17/12.02												
Theta(270°)	-5.22/4.54	-3.63/3.93	-6.07/6.24	-3.77/4.84	-2.43/0.83	0.37/0.43	-0.64/2.52	-2.7/3.75	-3.43/3.75	-3.81/7.53	-14.36/18.02	-19.24/13.45	-16.64/14.92	-15.72/9.95	-17.24/10.29	-10.58/17.41	-15.23/18.16	-15.73/12.79	-14.23/18.54	-19.09/18.97	-18.52/18.89	-17.48/14.31	-10.65/9.22	-8.94/7.55												
Theta(315°)	4.29/4	-2.05/3.08	-5.99/3.58	-4.67/4.69	-1.58/0.08	0.52/0.66	-0.37/1.8	-2.39/3.43	-4.85/4.36	-4.48/7.15	-12.27/18.64	-18.04/17.53	-16.68/18.3	-13.89/19.41	-10.41/13.48	-17.26/16.49	-18.65/17.17	-15.95/19.04	-9.31/12.42	-17/13.13	-15.94/18.32	-18.41/18.4	-14.74/10.91	-6.87/6.61												
Theta(360°)	-6.91/5.03	-2.87/3.58	-4.18/4.07	-4.01/2.66	-1.63/0.08	0.07/0	-0.9/1.5	-3.25/3.59	-6.03/6.5	-5.67/9.47	-16.59/12.21	-16.78/19.45	-14.53/13.7	-17.31/13.76	-14.64/15.75	-17.04/18.77	-17.91/17.24	-17.61/13.66	-11.17/12.44	-18.18/18.7	-18.76/18.27	-19.17/18.69	-13.69/11.16	-8.87/8.02												
Theta(405°)	-5.39/7.13	-4.62/4.05	-4.73/3.37	-2.81/2.74	-2.51/0.6	0.16/0.29	-1.32/2.71	-3.07/3.08	-4.87/6.93	-10.33/13.53	-15.15/8	-12.82/10.4	-15.74/19.34	-13.78/12.65	-16.52/18.07	-18.36/18.92	-17.58/18.22	-16.98/18.56	-18.69/18.92	-15.78/15.91	-17.96/18.68	-18.15/17.96	-11.83/9.18	-10.24/7												
Theta(450°)	8.5/7.87	9.2/8.11	-5.67/4.12	-3.14/2.13	-1.54/0.41	0.23/0.85	-1.97/4.84	-5.43/4.02	-3.64/4.99	-9.39/15.18	-18.89/13.03	-10.16/14.88	-18.29/15.31	-15.12/16.43	-15.79/13.71	-14.49/17.84	-14.09/9.98	-11.16/15.25	-18.7/18.53	-17.4/18.2	-18.28/17.56	-18.9/19.2	-18.38/18.1	-16.74/15.6												
Theta(495°)	-14.93/10.16	-10.45/10.95	8.08/5.23	-3.32/2.35	-1.52/0.71	-1.18/2.3	-3.87/4.96	-5.65/5.81	-6.87/7.64	-9.03/12.14	-15.84/12.05	-12.62/11.84	-10.17/12.25	-13.32/17.89	-18.79/17.54	-12.46/11.97	-10.21/10.49	-8.71/7.62	-9.73/14.12	-18.41/17.98	-18.49/19.3	-18.33/17.17	-17.26/19.1	-18.47/18.45												
Theta(540°)	-17.19/14.32	-11.15/9.12	-7.02/5.68	-4.57/4.28	-4.13/4.19	-5.73/6.25	-7.52/7.59	-6.07/4.67	-5.37/5.06	-6.7/9.58	-10.89/9.99	-8.44/9.73	-10.08/11.65	-14.04/17.37	-16.53/12.43	-8.62/6.26	-4.67/4.29	-3.61/4.07	-5.93/8.31	-10.4/12.29	-11.62/15.64	-18.55/19.06	-17.58/18.29	-18.38/18.78												
Theta(585°)	-18.09/16.34	-15/14.15	-11.88/10.72	-10.22/9.85	9.78/9.51	9.64/8.59	7.89/7.48	6.79/5.8	5.81/5.14	6/6.39	7.81/10.47	13.85/13.73	13.1/13.87	15.15/18.54	17.66/11.58	17.25/4.69	3.56/2.72	3.07/3.49	5.68/7.1	8.52/10.32	13.33/17.02	18.37/18.95	18.61/18.86	18.69/18.19												
Theta(630°)	-11.61/11.14	-10.58/9.88	9.28/9.17	8.71/8.4	9.25/8.13	8.93/8.92	9.01/8.91	8.82/9.29	9.61/9.98	10.37/16.24	15.44/17.95	17.74/17.86	16.71/16.33	18.39/13.46	7.96/4.53	4.38/18.4	3.83/6.28	6.06/7.94	8.94/8.97	8.15/11.24	11.24/12.8	14.14/13.64	15.17/15.16	12.94/11.62												
Theta(675°)	-4.16/4.29	-4.39/4.7	-4.59/5.22	-6.71/7.53	8.49/9.72	11.23/13.15	12.88/12.31	10.52/9.3	8.35/8.05	5.48/4.2	3.95/5.22	3.22/3.14	3.35/4.64	5.13/5.46	8.9/9	12.14/14.21	15.02/14.77	12.25/11.01	9.07/7.3	6.3/5.04	4.52/4.48	3.91/4														
Theta(720°)	-2.67/2.94	-3.18/3.65	-4.34/5.27	-6.77/8.95	-11.08/12.17	-14.62/17.43	-14.68/14.58	-11.32/10.08	-7.69/7.85	-6.6/5.8	-4.26/4.77	-5.51/5.71	-4.03/4.26	-1.42/1.41	-4.06/4.6	-5.12/5.78	-6.96/8.43	-10.35/12.54	-12.34/11.16	-10.07/9.44	-7.65/6.72	-5.4/4.24	-3.42/2.91	-2.72/2.61												
Theta(765°)	-3/2.74	-3.12/3.95	-4.37/4.36	-5.41/5.64	-8.31/11.18	-14.66/15.71	-16.29/12.58	-10.93/11.42	-8.88/8.95	-6.29/5.38	-3.79/2.12	-2.51/3.06	2.09/1.9	-2.72/3.33	-3.14/2.99	-2.92/4.98	-5.71/6.13	-8.87/10.19	-14.32/19.38	-18.61/14.29	9.98/8.81	-8.01/6.37	-6.51/5.09	-4.19/3.43												
Theta(810°)	-3.39/2.5	-1.86/2.1	-1.78/2.3	-3.65/6.19	9.97/14.15	-14.93/17.96	-17.42/15.75	-11.58/11.13	-6.75/6.84	-3.29/1.79	-1.03/0.45	-0.2/1.72	-2.26/1.9	-2.75/4.04	3.59/4.52	-6.52/7.14	-10.35/13.72	-16.79/18.97	-17.97/16.15	-12.29/11.03	-9.82/7.73	-7.06/5.97	-4.89/3.86													
Theta(855°)	-3.45/1.35	0.21/0	-0.2/0.67	-1.54/3.84	-6.46/10.3	-12.7/15.25	-18.82/18.9	-13.85/12.7	-6.21/4.69	-1.01/0.83	1.81/0.87	0.85/0.54	0.53/1.53	-2.66/3.25	-3.16/3.04	-3.45/4.12	-6.1/6.65	-7.26/11.44	-18.64/19.24	-15.26/15.57	-14.28/9.9	-10.66/11.1	-9.15/7.74	-6.23/6.28												
Theta(900°)	-4.52/2.51	-1.46/0.04	-0.4/0.27	-0.82/2.71	-6.04/11.26	-13.99/18.58	-19.28/14.01	9.43/6.81	-4.18/3.36	0.57/1.27	2.56/1.07	0.68/0.12	-1.47/4.47	-7.19/8.59	-7.93/5.41	-5.27/6.07	-7.53/10.6	-11.34/16.18	-16.63/14.95	-12.94/14.48	9.55/9.62	-6.67/8.38	-8.63/11.93	-12.8/0.6												
Theta(945°)	-6.13/3.71	0.03/0.44	0.02/0.07	-1.37/2.84	-7.16/10.98	-8.78/11.44	-11.84/12.58	-8.76/5.64																												