



# Antenna Composite Gain Test Report

FCC ID	MSQ-RTAX4T00
Equipment	AXE7800 Tri Band WiFi Router, AXE6600 Tri Band WiFi Router
Brand Name	ASUS
Model Name	ET9, ET8, EBM69, AXE7800, AXE6600
Applicant	ASUSTeK COMPUTER INC. 1F., No. 15, Lide Rd., Beitou, Taipei City 112, Taiwan
Standard	KDB662911 D03 v01
Sample Received	Dec. 28, 2023
Start Test Date	Jan. 04, 2024
Final Test Date	Jan. 04, 2024

Approved by: Sam Chen

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## 1. Operation Mode and Antenna Information

Antenna Position	RF Port	Brand Name	Model Name	Ant. Type	Connector	Modes of Operation
2G 5GAnt1	1	M.gear	C660-510551-A	Dipole	I-PEX	2.4GHz, 5GHz UNII 1~3
2G 5GAnt2	2	M.gear	C660-510551-A	Dipole	I-PEX	2.4GHz, 5GHz UNII 1~3
6G Ant1	1	M.gear	C660-510551-A	Dipole	I-PEX	6GHz UNII 5~8
6G Ant2	2	M.gear	C660-510551-A	Dipole	I-PEX	6GHz UNII 5~8
6G Ant3	3	M.gear	C660-510551-A	Dipole	I-PEX	6GHz UNII 5~8
6G Ant4	4	M.gear	C660-510551-A	Dipole	I-PEX	6GHz UNII 5~8

Note:

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

2G 5GAnt1~2 can be used as transmitting/receiving antenna.

2G 5GAnt1~2 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.

## 2. Table for Multiple Listing

The equipment name/model names in the following table are all refer to the identical product.

Equipment Name	Model Name	Description
AXE7800 Tri Band WiFi Router, AXE6600 Tri Band WiFi Router	ET9	All the equipment names / models are identical, the difference equipment names / model served as marketing strategy.
	ET8	
	EBM69	
	AXE7800	
	AXE6600	

Note 1: From the above models, model: ET9 was selected as representative model for the test and its data was recorded in this report.

Note 2: The above information was declared by manufacturer.

## 3. Table for Components Source Information

EUT	Source	DDR4 (Location: U5)
EUT 1	Main	Brand Name: Samsung
EUT 2	Second	Brand Name: Hynix

Note 1: From the above, EUT 1 was selected as representative EUTs for the test and its data was recorded in this report.

Note 2: The above information was declared by manufacturer.



### 4. Table for EUT supports functions

Function	Support Type	Supports Band
AP Router	Master	2.4GHz, 5GHz UNII1~3 and 6GHz UNII 5~8
Bridge	Slave without radar detection	2.4GHz, 5GHz UNII1~3
Repeater	Master	2.4GHz, 5GHz UNII1~3
Mesh	Master	2.4GHz or 5GHz UNII1~3 or 6GHz UNII 5~8

Note: The above information was declared by manufacturer.

### 5. 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

### 6. 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	JunJie Hong	23.5-24.5 / 45-55	Jan. 04, 2024

Note:

Testing Site Information

Brand Name: TDK

Dimension: 11m\*6m\*6m

Characteristic: Fully Anechoic Chamber

## 7. Test Facility and Configuration

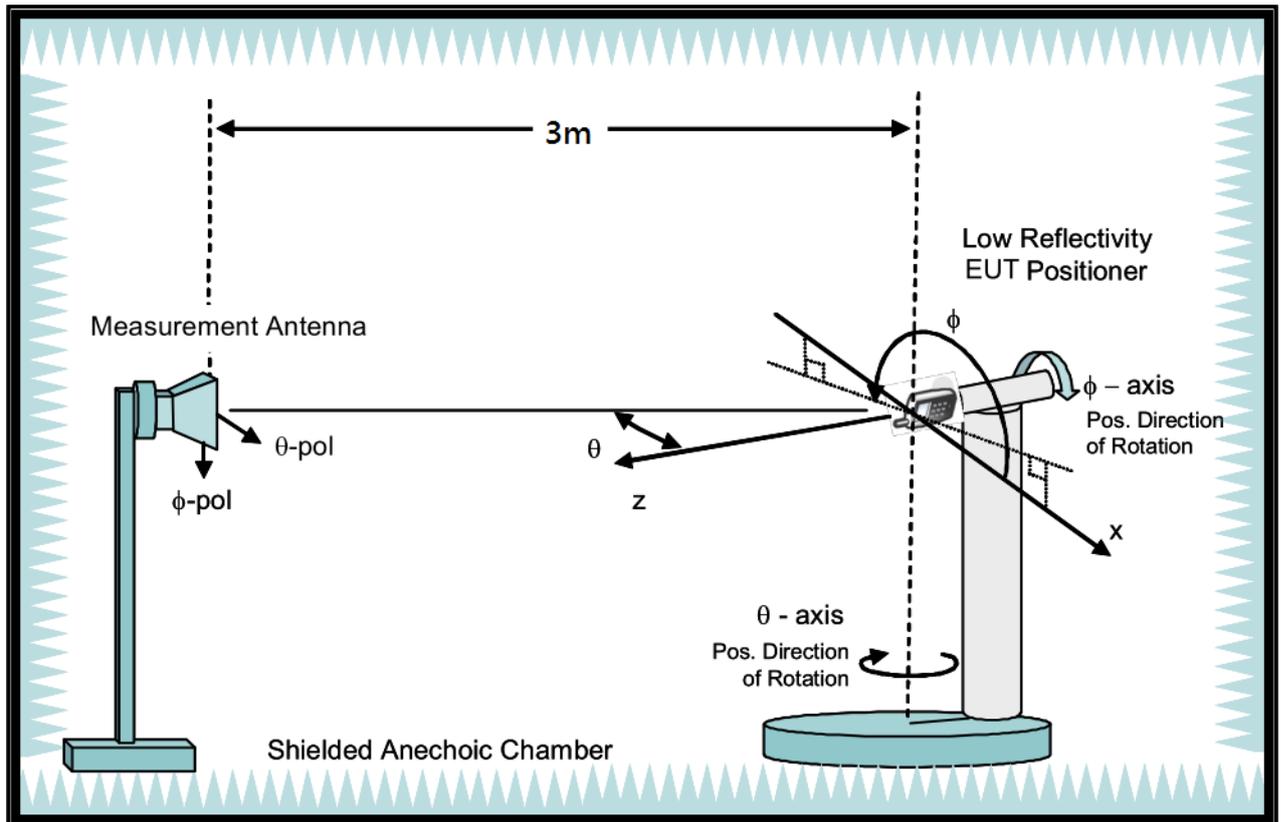
Test configuration: Reference to CITA OTA distributed-axes system configuration.

Chamber: Fully Anechoic Chamber.

Measurement antenna: Dual Polarization Horn antenna

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

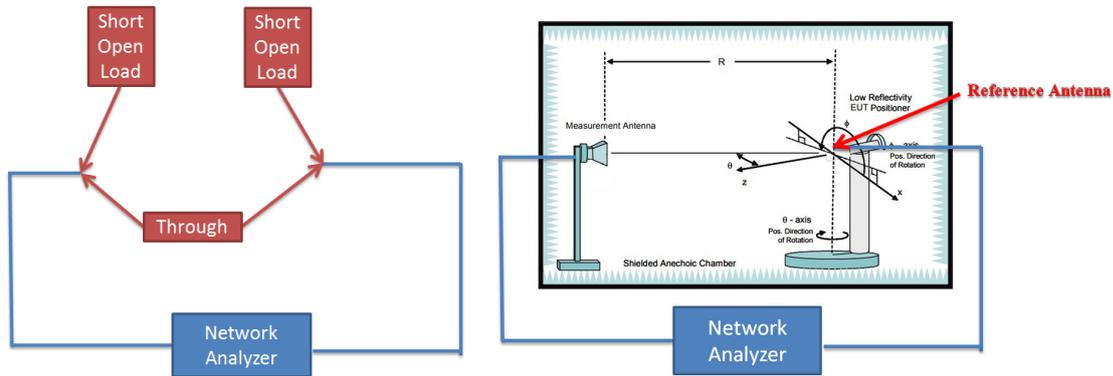
#Reference to CTIA “ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1”



### 8. 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.

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



## **9. 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 10 tables.

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



### 10. Measured Values and Calculation of Maximum Gain Positions

DG\_1SS max value position

Frequency (Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 (dBi)	-1.49	5.33	0.86	4.95	4.45
Ant. 2 (dBi)	4.26	-1.78	4.03	1.01	2.03
DG [1SS] (dBi)	4.86	5.49	5.6	6.21	6.33
Polarization	Theta	Theta	Theta	Theta	Theta
$\Theta(^{\circ})$	105	82.5	82.5	97.5	97.5
$\Phi(^{\circ})$	75	180	352.5	157.5	157.5

Frequency (Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 (dBi)	-0.6	1.95	-2.21	-1.52
Ant. 2 (dBi)	0.66	-2.59	2.8	2.79
Ant. 3 (dBi)	0.81	-1.46	-0.66	-1.46
Ant. 4 (dBi)	-0.93	-0.06	-0.26	0.13
DG [1SS] (dBi)	6.04	5.65	6.14	6.19
Polarization	Theta	Theta	Theta	Theta
$\Theta(^{\circ})$	82.5	97.5	97.5	90
$\Phi(^{\circ})$	97.5	187.5	292.5	292.5

Note: The DG 1SS max value position is the maximum value of section 14 table DG 1SS Result.



**DG\_1SS max value position calculation**

Frequency (Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 [10 <sup>^(G/20)</sup> ]	10 <sup>^(-1.49/20)</sup>	10 <sup>^(5.33/20)</sup>	10 <sup>^(0.86/20)</sup>	10 <sup>^(4.95/20)</sup>	10 <sup>^(4.45/20)</sup>
Ant. 2 [10 <sup>^(G/20)</sup> ]	10 <sup>^(4.26/20)</sup>	10 <sup>^(-1.78/20)</sup>	10 <sup>^(4.03/20)</sup>	10 <sup>^(1.01/20)</sup>	10 <sup>^(2.03/20)</sup>
Ant. 1 [10 <sup>^(G/20)</sup> ] value	0.842	1.847	1.104	1.768	1.669
Ant. 2 [10 <sup>^(G/20)</sup> ] value	1.633	0.815	1.59	1.123	1.263
Sum All Antenna [Amax]	2.475	2.662	2.694	2.891	2.932
DG [10*log(Amax <sup>2</sup> /Nant)]	4.86	5.49	5.6	6.21	6.33

Frequency (Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 [10 <sup>^(G/20)</sup> ]	10 <sup>^(-0.6/20)</sup>	10 <sup>^(1.95/20)</sup>	10 <sup>^(-2.21/20)</sup>	10 <sup>^(-1.52/20)</sup>
Ant. 2 [10 <sup>^(G/20)</sup> ]	10 <sup>^(0.66/20)</sup>	10 <sup>^(-2.59/20)</sup>	10 <sup>^(2.8/20)</sup>	10 <sup>^(2.79/20)</sup>
Ant. 3 [10 <sup>^(G/20)</sup> ]	10 <sup>^(0.81/20)</sup>	10 <sup>^(-1.46/20)</sup>	10 <sup>^(-0.66/20)</sup>	10 <sup>^(-1.46/20)</sup>
Ant. 4 [10 <sup>^(G/20)</sup> ]	10 <sup>^(-0.93/20)</sup>	10 <sup>^(-0.06/20)</sup>	10 <sup>^(-0.26/20)</sup>	10 <sup>^(0.13/20)</sup>
Ant. 1 [10 <sup>^(G/20)</sup> ] value	0.933	1.252	0.775	0.839
Ant. 2 [10 <sup>^(G/20)</sup> ] value	1.079	0.742	1.38	1.379
Ant. 3 [10 <sup>^(G/20)</sup> ] value	1.098	0.845	0.927	0.845
Ant. 4 [10 <sup>^(G/20)</sup> ] value	0.898	0.993	0.971	1.015
Sum All Antenna [Amax]	4.008	3.832	4.053	4.079
DG [10*log(Amax <sup>2</sup> /Nant)]	6.04	5.65	6.14	6.19

Note:

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

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



### 11. Summary of Test Result

Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	3.38	5.33	5.53	5.7	4.45
Ant. 2 Max Gain (dBi)	4.26	3.85	4.03	3.88	3.16
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/97.5/225	Theta/82.5/180	Theta/90/180	Theta/90/180	Theta/97.5/157.5
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/105/75	Theta/82.5/352.5	Theta/82.5/352.5	Theta/90/352.5	Theta/90/22.5
Max Gain (dBi)	4.26	5.33	5.53	5.7	4.45
DG [1SS] (dBi)	4.86	5.49	5.6	6.21	6.33
DG [2SS] (dBi)	4.26	5.33	5.53	5.7	4.45

Note:

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

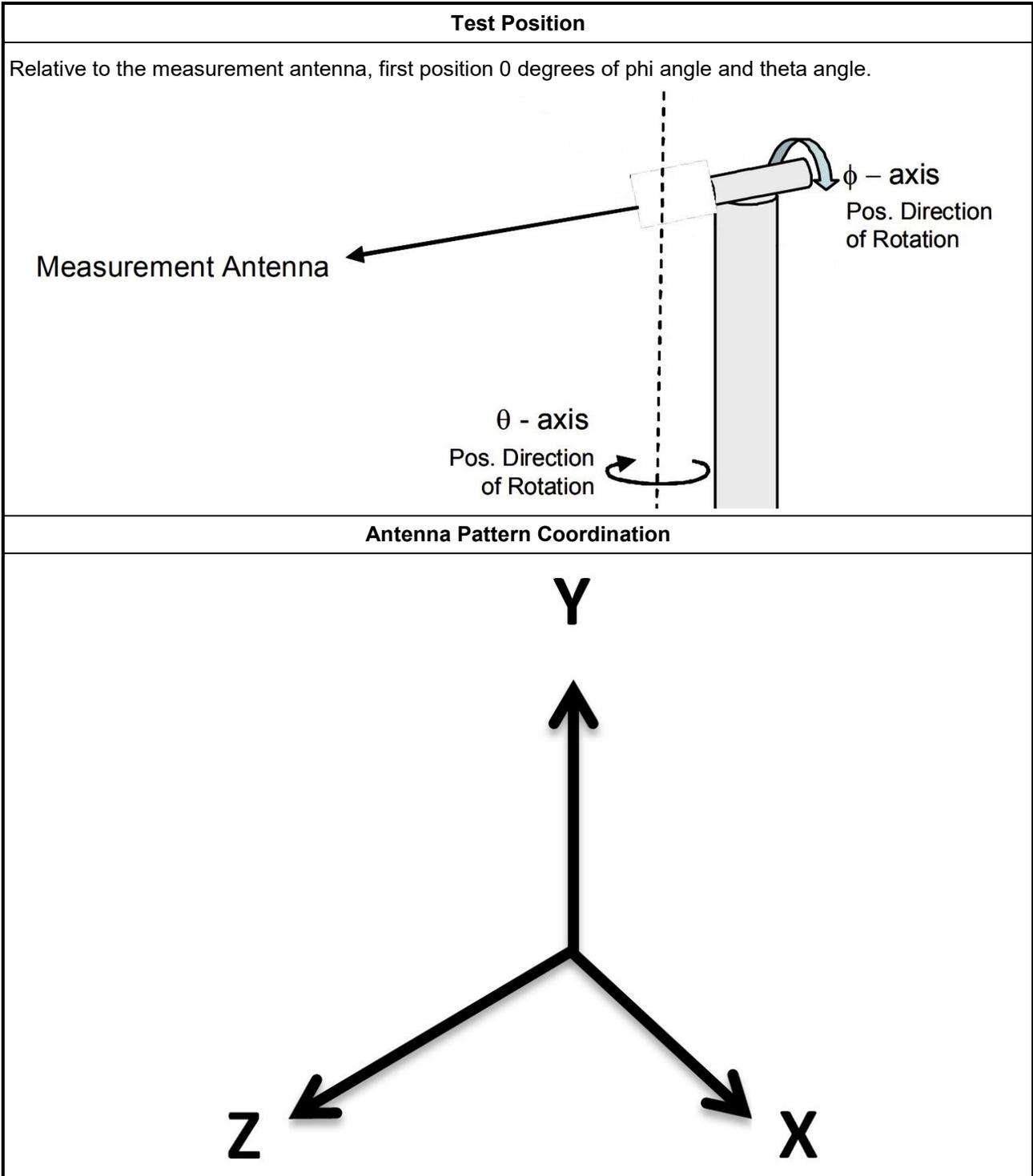


Freq(Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 Max Gain (dBi)	3.14	3.66	3.92	4.79
Ant. 2 Max Gain (dBi)	5.2	5.2	5.91	5.81
Ant. 3 Max Gain (dBi)	4.96	3.16	4.67	5.52
Ant. 4 Max Gain (dBi)	3.14	2.67	2.29	4.15
Ant. 1 Polarization/ $\Theta$ (°)/ $\Phi$ (°)	Theta/52.5/7.5	Theta/45/15	Theta/45/30	Theta/135/195
Ant. 2 Polarization/ $\Theta$ (°)/ $\Phi$ (°)	Theta/142.5/292.5	Theta/135/292.5	Theta/142.5/300	Theta/135/292.5
Ant. 3 Polarization/ $\Theta$ (°)/ $\Phi$ (°)	Theta/52.5/187.5	Theta/52.5/187.5	Theta/60/187.5	Theta/60/195
Ant. 4 Polarization/ $\Theta$ (°)/ $\Phi$ (°)	Theta/150/82.5	Theta/60/225	Theta/112.5/97.5	Theta/157.5/105
Max Gain (dBi)	5.2	5.2	5.91	5.81
DG [1SS] (dBi)	6.04	5.65	6.14	6.19
DG [2SS] (dBi)	5.2	5.2	5.91	5.81
DG [4SS] (dBi)	5.2	5.2	5.91	5.81

Note:

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

## 12. Test Setup



Note:

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



### 13. 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.



## 14. Test Results

Please refer to the appendix.

Appendix A – Radiated Composite Gain of 2.4GHz, 5GHz UNII 1 ~ UNII 3.....	Page 16
Appendix B – Radiated Composite Gain of 6GHz UNII 5 ~ UNII 8.....	Page 25
Appendix C – Antenna Pattern of 2.4GHz, 5GHz UNII 1 ~ UNII 3.....	Page 36
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<b>Freq(Hz)</b>	<b>2.45G</b>	<b>5.2G</b>	<b>5.3G</b>	<b>5.6G</b>	<b>5.785G</b>
Ant. 1 Max Gain (dBi)	3.38	5.33	5.53	5.7	4.45
Ant. 2 Max Gain (dBi)	4.26	3.85	4.03	3.88	3.16
Ant. 1 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/97.5/225	Theta/82.5/180	Theta/90/180	Theta/90/180	Theta/97.5/157.5
Ant. 2 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/105/75	Theta/82.5/352.5	Theta/82.5/352.5	Theta/90/352.5	Theta/90/22.5
Max Gain (dBi)	4.26	5.33	5.53	5.7	4.45
DG [1SS] (dBi)	4.86	5.49	5.6	6.21	6.33
DG [2SS] (dBi)	4.26	5.33	5.53	5.7	4.45





# Radiated Composite Gain Data\_2.4GHz, 5GHz

# Appendix A

Theta (°)	6.99/7.38	-7.76/8.67	-9.37/9.12	-8.68/-8.77	-8.76/-9.38	-9.94/7.41	-4.29/-3.2	-4.06/-6.1	-9.72/13.64	-12.92/9.98	-7.65/-6.38	-5.14/4.21	-4.19/4.47	-4.77/-5	-4.88/-5.09	-6.95/9.66	-12.76/12.63	-11.76/-10.83	-9.98/9.17	-8.24/7.32	-7.12/7.26	-6.94/-6.28	-7.16/-8.8	-8.58/7.12
Theta (30°)	-13.32/-12.45	-12.73/-11.61	-9.89/-8.88	-8.56/-8.51	-7.85/-8.45	-9.8/-8.06	-5.58/-5.07	-5.98/-8.03	-10.97/-11.49	-9.88/-9.43	-8.22/-7.19	-6.5/-6.05	-5.7/-4.99	-4.32/-3.53	-3.02/-3.23	-3.87/-5.02	-7.38/-11.03	-12.58/-10.03	-9.62/-11.23	-11.18/-9.24	-8.72/-8.78	-8.39/-8.63	-9.23/-10.14	-11.58/-12.25
Theta (45°)	-11.07/-7.95	-8.39/-8.53	-8.1/7.6	-7.45/-8.93	-11.26/-12	-12.31/-10.4	-9.25/-12	-9.99/-8.47	-8.56/-10.61	-9.86/-9.19	-9.48/-10.6	-10.45/-8.7	-8.58/-8.82	-8.87/-9.13	-8.63/-8.37	-8.43/-6.72	-6.51/-7.57	-9.44/-11.83	-14.12/-15.63	-16.03/-11.54	-8.79/-8.23	-8.43/-7.09	-7.03/-9.06	-11.71/-11.55
Theta (60°)	-7.79/-7.92	-8.73/-10.1	-6.71/7.9	-8.52/-13.27	-9.05/-10.79	-11.95/-15.22	-15.49/-15.26	-11.17/-9.21	-11.68/-10.19	-7.66/-8.59	-10.17/-10.98	-7.86/-7.92	-8.67/-8.11	-8.06/-8.38	-9.04/-8.4	-9.72/-11.2	-9.47/-8.15	-8.65/-11.04	-13.12/-11.74	-10.71/-5.2	-5.61/-5.32	-7.13/-8.76	-7.72/-7.16	-7.44/-8.88
Theta (75°)	-4.04/-5.45	-8.23/-11.01	-10.41/-8.78	-10.58/-13.92	-11.45/-11.2	-11.92/-10.91	-11.79/-15.88	-15.27/-15.36	-10.71/-5.9	-6.92/-10.99	-11.07/-8.2	-6.85/-9.45	-11.8/-9.72	-9.41/-9.71	-8.98/-7.56	-6.86/-6.78	-9.87/-11.3	-7.58/-8.44	-6.93/-7.41	-6.93/-7.83	-6.86/-6.18	-5.96/-8.04	-7.16/-4.97	-6.67/-4.3
Theta (90°)	-8.92/-10.41	-12.79/-15.56	-13.99/-12.51	-9.41/-12.87	-14.94/-9.02	-7.39/-9.16	-13.21/-12.74	-14.22/-14.39	-10.53/-8.06	-10.85/-11.56	-9.56/-9.31	-11.17/-12.61	-11.45/-10.18	-9.42/-9.11	-8.66/-6.69	-7.13/-10.68	-13.19/-11.04	-9.58/-15.05	-7.06/-4.8	-5.62/-7.84	-7.28/-6.18	-7.07/-7.97	-7.2/-4.38	-4.82/-7.2
Theta (105°)	-8.47/-7.21	-7.06/-8.83	-9.19/-10.71	-12.79/-13.78	-14.73/-11.35	-8.22/-3.29	-6.10/-31	-15.31/-15.17	-12.77/-10.01	-11.99/-11.76	-10.25/-9.63	-10.87/-9.13	-8.94/-8.35	-8.36/-7.93	-7.96/-7.05	-6.68/-9.81	-13.51/-12.95	-12.39/-13.61	-9.35/-8.09	-9.66/-8.78	-9.22/-7.96	-8.35/-6.89	-6.26/-6.15	-6.41/-7.77
Theta (120°)	-7.85/-6.83	-6.91/-7.2	-6.65/-5.58	-5.75/-8.88	-12.09/-12.33	-6.5/-4.04	-5.78/-8.31	-9.49/-10.83	-11.06/-9.87	-11.05/-11.44	-13.08/-8.87	-7.27/-6.23	-6.51/-8.44	-8.84/-8.4	-8.87/-8.59	-4.98/-7.98	-10.54/-11.97	-11.09/-12.13	-7.02/-7.06	-7.73/-7.96	-8.62/-5.83	-5.26/-7.18	-7.88/-7.24	-6.68/-7.61
Theta (135°)	-7.02/-6.48	-8.75/-11.25	-9.44/-7.51	-7.86/-9.37	-7.41/8.04	-11.23/-5.91	-7.18/-8.17	-9.91/-11.7	-11.54/-10.46	-11.95/-12.28	-13.24/-10.33	-9.42/-7.29	-6.16/-6.72	-6.82/-6.64	-8.78/-6.61	-7.02/-8.97	-11.05/-11.81	-12.22/-10.7	-11.75/-8.19	-8.07/-9.09	-8.08/-6.66	-5.76/-7.89	-8.57/-7.89	-7.33/-6.71
Theta (150°)	-4.7/-5.84	-8.8/-12.53	-11.73/-8.27	-7.75/-8.98	-8.1/-9.2	-8.04/-8.47	-7.77/-9.36	-11.97/-11.38	-10.27/-12.01	-10.27/-12.01	-12.77/-15.28	-13.82/-10.34	-9.27/-8.04	-6.83/-6.66	-8.46/-11.49	-12.49/-9.59	-11.30/-10.91	-9.13/-11.86	-11.86/-8.23	-5.94/-7.38	-7.12/-4.94	-5.61/-6.91	-9.25/-5.98	-4.54/-5.49
Theta (165°)	-9.57/-9.04	-9.59/-15.07	-15.68/-9.39	-7.92/-11.66	-10.11/-11.75	-10.32/-11.81	-10.78/-10.1	-10.98/-10.55	-9.81/-11.46	-12.08/-12.78	-12.14/-11.87	-11.79/-9.88	-9.74/-9.07	-7.07/-6.04	-6.84/-8.4	-10.19/-13.39	-15.71/-14.1	-14.11/-9.33	-4.96/-3.89	-6.71/-6.22	-7.27/-11.9	-12.04/-11.92	-11.32/-8.26	
Theta (180°)	-14.11/-14.97	-12.69/-12.93	-14.16/-7.74	-7.15/-14.57	-13.57/-12.89	-15.28/-15.16	-13.46/-14.67	-14.74/-10.74	-8.07/-8.96	-9.58/-10.94	-10.17/-9.83	-12.07/-10.54	-7.57/-6.74	-8.06/-10.21	-10.99/-7.32	-8.85/-14.37	-15.29/-13.53	-12.05/-15.88	-13.04/-9.71	-6.58/-4.43	-6.89/-5.78	-6.3/-10.44	-11.95/-11.3	-12.06/-12.97
Theta (210°)	-12.49/-12.08	-11.09/-10.86	-8.86/-3.98	-5.26/-5.23	-11.76/-13.58	-10.32/-11.38	-11.24/-13.86	-15.51/-15.56	-10.87/-10.86	-10.91/-10.84	-9.88/-8.19	-7.54/-7.46	-7.13/-7.91	-6.77/-6.4	-9.12/-7.69	-7.49/-8.69	-12.67/-14.88	-11.72/-11.31	-9.51/-11.16	-9.97/-4.56	-6.15/-7.63	-6.51/-7.69	-8.95/-9.74	-13.77/-13.24
Theta (225°)	-8.73/-7.43	-8.61/-10.16	-8.54/-6	-5.61/-7.28	-7.46/-10.01	-14.84/-12.03	-11.61/-11.92	-10.03/-10.85	-11.57/-9.51	-8.27/-8.26	-8.12/-6.29	-5.08/-4.37	-4.87/-4.62	-6.48/-6.85	-3.81/-4.25	-7.12/-10.15	-10.64/-14.72	-11.22/-7.63	-7.08/-9.3	-8.75/-4.88	-7.8/-6.62	-7.41/-6.93	-8.18/-7.1	-9.31/-10.19
Theta (240°)	-1.8/-1.27	-3.17/-6.59	-5.99/-3.18	-3.28/-5.42	-7.51/-10.83	-13.33/-14.77	-12.97/-12.05	-10.94/-11.17	-12.04/-9.12	-8.41/-5.32	-4.55/-6.68	-5.13/-2.56	-2.77/-4.24	-3.32/-2.62	-3.75/-5.64	-8.47/-14.92	-11.54/-7.66	-8.38/-4.95	-3.4/-7.77	-7.87/-11.73	-10.35/-10.84	-6.62/-7.82	-7.82/-8.42	-3.31/-1.88
Theta (255°)	-6.67/-7.5	-6.45/-4.3	-3.76/-3.42	-4.91/-6.03	-7.23/-9.24	-13.19/-11.32	-7.33/-6.55	-7.34/-7.68	-7.77/-8.07	-11.25/-12.18	-11.07/-7.89	-7.81/-8.85	-8.87/-9.22	-9.55/-8.5	-9.77/-7.41	-11.51/-11.5	-9.69/-3.18	-3.08/-3.67	-6.62/-12	-11.03/-10.07	-5.26/-2.52	-5.94/-6.05	-7.41/-6.9	
Theta (270°)	-10.17/-10.68	-9.60/-7.13	-6.03/-5.31	-4.89/-4.66	-4.93/-5.98	-7.77/-8.14	-9.77/-10.59	-13.51/-11.63	-11.04/-11.44	-13.11/-15.19	-13.18/-10.43	-9.99/-10.48	-9.82/-9.71	-11.04/-10.63	-9.04/-9.76	-11.46/-13.95	-15.95/-14.87	-8.03/-2.87	-2.33/-4.28	-6.66/-11.16	-12.98/-11.14	-9.82/-8.02	-7.45/-7.85	-8.82/-10.5
Theta (285°)	-6.24/-6.91	-8.37/-8.59	-8.46/-8.92	-9.77/-10.63	-11.36/-11.87	-12.08/-13.33	-14.32/-14.89	-14.27/-14.44	-14.39/-10.66	-10.38/-10.29	-11.18/-11.81	-12.25/-11.8	-11.13/-11.38	-12.74/-14.08	-14.03/-14.35	-13.35/-11.47	-11.25/-13.62	-10.21/-5.76	-4.92/-6.27	-8.3/-10.81	-14.39/-13.53	-12.2/-9.66	-7.74/-6.93	-6.41/-6.22
Theta (300°)	-7.71/-7.15	-7.83/-7.99	-7.83/-7.15	-6.25/-5.28	-4.87/-8.14	-9.81/-12.62	-14.87/-14.96	-14.96/-15.08	-15.13/-14.98	-15.27/-13.94	-10.98/-8.82	-7.64/-7.7	-8.73/-8.88	-10.93/-12.89	-14.61/-14.83	-12.78/-11.01	-8.61/-6.74	-5.14/-3.3	-5.39/-8	-11.26/-13.25	-15.79/-14.61	-14.61/-13.7	-10.1/-8.54	-7.72/-7.56
Theta (315°)	-9.93/-10.38	-10.15/-8.61	-7.58/-7.2	-7.75/-8.34	-9.02/-10.7	-10.19/-9.53	-8.71/-8.23	-8.37/-8.48	-8.21/-7.64	-7.29/-7.57	-10.23/-9.51	-8.49/-7.63	-6.47/-5.61	-3.91/-4.46	-4.87/-6.23	-5.83/-6.44	-6.77/-7.25	-8.01/-8.14	-7.74/-7.8	-8.01/-8.14	-7.74/-7.8	-7.51/-7.73		
Theta (330°)	-14.81/-15.84	-15.42/-15.67	-15.63/-15.79	-15.39/-16.11	-13.82/-11.67	-10.47/-10.95	-9.38/-9.29	-9.63/-10.43	-11.17/-11.98	-12.62/-12.63	-13.85/-15	-16.01/-15.49	-15.41/-14.86	-14.93/-12.83	-12.33/-11.52	-10.66/-9.99	-9.14/-8.44	-8.54/-8.46	-8.44/-8.4	-8.41/-8.55	-6.77/-7.99	-7.64/-8.27	-9.16/-9.7	-10.55/-12.65
Theta (345°)	5.63/Pol	Theta	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
DG(dB)	Phi(75°)Phi(225°)	Phi(30°)Phi(375°)	Phi(45°)Phi(62.5°)	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°)	-6.65/-6.45	-6.86/-7.42	-8.4/-8.96	-9.12/-8.97	-8.68/-8.26	-7.46/-7.06	-7.1/7.16	-7.28/-6.9	-6.99/-7.24	-7.69/-7.96	-7.73/-7.79	-8.1/8.75	-9.17/-9.03	-8.31/-7.66	-7.15/-6.95	-6.9/-7.45	-7.64/-7.47	-7.16/-7.13	-7.35/-7.2	-6.83/-6.49	-6.61/-6.84	-6.81/-6.43	-6.18/-6.3	-6.81/-7
Theta (7.5°)	-7.86/-6.78	-7.86/-7.72	-8.11/-8.56	-9.33/-10.47	-11.02/-10.25	-8.74/-7.56	-6.82/-6.45	-6.36/-6.12	-6.07/-5.8	-5.56/-6.1	-7.23/-7.48	-6.93/-6.78	-7.58/-6.87	-7.8/-7.08	-6.94/-7.01	-6.75/-6.53	-6.53/-6.87	-7.33/-7.38	-7.32/-7.2	-7.21/-7.48	-8.29/-8.75	-8.73/-8.27	-8.26/-8.29	
Theta (15°)	-5.65/-6.18	-6.07/-6.11	-6.32/-6.59	-7.28/-8.25	-8.77/-8.1	-7.54/-6.19	-5.49/-5.35	-5.48/-5.69	-6.57/-6.21	-7.61/-6.97	-5.12/-11.01	-12.98/-12.4	-11.48/-8.48	-6.77/-5.67	-4.18/-3.54	-3.32/-3.46	-4.18/-4.82	-5.38/-5.97	-6.12/-6.03	-5.68/-5.3	-5.22/-5.05	-4.77/-5.01		
Theta (22.5°)	-6.53/-6.71	-5.53/-4.51	-3.53/-2.72	-2.27/-2.74	-3.5/-4.32	-4.46/-4.33	-3.58/-3.43	-4.12/-5.04	-5.36/-4.65	-4.18/-4.06	-4.41/-5.3	-6.56/-7.32	-7.45/-7.27	-8.02/-8.74	-7.58/-6.64	-6.25/-5.65	-4.46/-3.21	-2.29/-1.86	-2.2/-2.88	-3.57/-4.11	-4.32/-4.1	-3.49/-3.04	-3.5/-4.51	-5.06/-5
Theta (30°)	-1.47/-1.94	-3.47/-3.86	-3.25/-2.64	-1.68/-2.11	-1.48/-2.28	-2.82/-2.34	-1.51/-1.29	-1.39/-1	-0.53/-0.56	-1.39/-2.54	-4.16/-4.97	-5.26/-5.16	-5.88/-7.7	-7.22/-5.43	-4.13/-3.7	-3.07/-2.05	-1.23/-0.7	-0.46/-0.7	-1.05/-1.37	-1.96/-2.55	-2.36/-1.7	-1.99/-2.63	-2.82/-2.13	
Theta (37.5°)	0.68/0.31	0.47/0.0	-0.84/-0.92	-1.32/-0.88	-0.75/-1.14	-1.09/-0.35	0.11/0.0	-0.43/0.34	-0.01/-0.05	-0.65/-2.25	-4.54/-6.28	-5.99/-4.7	-5.13/-7.8	-7.35/-6.27	-6.49/-6.5	-4.56/-2.57	-1.13/-0.48	0.08/1.25	2.13/1.89	0.89/0.24	-0.05/-1.11	-2.54/-2.73	-1.54/-2.02	-0.64/-0.48
Theta (45°)	1.91/2.62	2.42/0.6	-1.25/-1.22	-1.69/-2.74	-3.22/-2.99	-1.47/-0.03	0.86/0.7	0.69/0.9	0.55/-0.05	-0.59/-0.97	-1.57/-2.44	-2.18/-1.88	-2.16/-2.72	-3.26/-3.5	-4.36/-6.25	-6.9/-3.8	-1.14/0.28	1.32/2.31	2.52/1.89	1.01/0.48	0.72/0.46	-0.19/-0.16	0.49/0.84	1.07/1.17
Theta (52.5°)	1.21/0.76	1.09/1.01	-0.18/-0.62	-0.41/-1.36	-3.02/-3.9	-2.13/-3.06	0.62/1.05	1.56/1.4	0.41/0.48	-1.53/-1.78	-2.73/-2.35	-3.92/-2.85	-2.15/-1.57	-1.71/-3.25	-5.26/-3.1	-1.09/-0	0.74/1.79	2.69/2.74	0.99/0.77	0.23/1.37	1.49/1.27	0.93/0.25	0.56/1.43	
Theta (60°)	1.61/1.79	2.28/2.58	1.94/0.55	-0.39/-0.62	-1.2/-2.22	-3.91/-3.47	-0.54/0.74	1.24/0.96	0.17/0.13	-0.42/-1.49	-2.84/-2.41	-0.92/-0.84	-0.94/-0.47	-0.88/-0.81	-1.45/-2.17	-1.84/-1.8	-1.37/-0.95	-1.75/-1.72	0.59/0.66	-0.88/-2.47	-0.64/0.3	-0.15/-0.18	0.30/0.69	1.12/1.52
Theta (67.5°)	2.65/2.86	2.84/2.39	1.22/2.02	0.27/0.1	0.49/0.72																			



# Radiated Composite Gain Data\_2.4GHz, 5GHz

# Appendix A

Theta	Phi(75°)	Phi(82.5°)	Phi(90°)	Phi(97.5°)	Phi(105°)	Phi(120°)	Phi(127.5°)	Phi(135°)	Phi(142.5°)	Phi(150°)	Phi(157.5°)	Phi(165°)	Phi(172.5°)	Phi(180°)	Phi(75°)	Phi(82.5°)	Phi(90°)	Phi(97.5°)	Phi(105°)	Phi(120°)	Phi(127.5°)	Phi(135°)	Phi(142.5°)	Phi(150°)	Phi(157.5°)	Phi(165°)	Phi(172.5°)	Phi(180°)																																												
75°	-7.37/-8.75	-10.62/-10.79	-7.58/-7.09	-5.45/-6.4	-9.81/-12.85	-12.09/-15.72	-8.9/-9.35	-9.1/-7.77	-8.37/-8.27	-8.4/-8.53	-9.53/-7.52	-7.08/-8.77	-10.23/-12.37	-8.8/-5.07	-4.77/-6.97	-6.12/-5.11	-4.6/-5.84	-9.07/-7.22	-5.68/-5.85	-7.08/-11.58	-10.35/-11.49	-15.53/-11.17	-11.26/-10.04	-8.61/-7.07	-8.41/-10.26	-7.86/-10.77	-9.72/-10.5	-9.25/-7.64	-7.57/-9.79	-13.17/-15.04	-9.73/-7.14	-7.37/-7.44	-7.58/-9.67	-8.9/-8.61	-11.06/-10.31	-8.8/-11.52	-11.78/-8.58	-6/-4.85	-6.19/-6.6	-6.65/-6.1	-3.22/-2.48	-8.68/-10.18	-7.17/-9.02	-6.23/-14.61	-12.07/-10.46	-9.95/-7.52	-6.45/-7.15	-7.05/-7.02	-7.95/-9.03																							
90°	-11.4/-10.48	-10.93/-11.16	-8.93/-7.2	-6.29/-8.69	-9.61/-11.16	-13.76/-10.74	-8.72/-6.43	-5.64/-6.84	-6.76/-9.48	-14.17/-13.63	-15.17/-13.35	-10.26/-6.51	-3.96/-3.62	-4.45/-5.01	-8.88/-11.78	-8.45/-7.17	-9.99/-9.31	-6.48/-6.02	-9.63/-12.67	-12.19/-15.73	-13.42/-14.52	-8.99/-8.02	-10.5/-11.54	-10.34/-10.44	-14.87/-14.5	-14.79/-12.84	-9.7/-7.08	-6.02/-5.86	-6.74/-6.35	-8.7/-10.51	-8.31/-6.19	-8.79/-7.95	-7.08/-8.7	-10.2/-12.11	-12.44/-11.36	-9.5/-6.66	-4.02/-3.71	-2.69/-3.48	-4.03/-7.58	-11.8/-8.27	-7.1/-10.73	-13.43/-13.74	-13.67/-14.76	-11.34/-11.9	-8.92/-11.62	-9.97/-8.57	-10.44/-10.27	-10.02/-11.33																								
105°	-14.04/-15	-11.67/-6.25	-4.9/-6.61	-7.16/-8.12	-8.4/-13.39	-12.49/-11.59	-8.05/-8.4	-9.07/-8.61	-7.72/-7.29	-9.92/-11	-10.94/-9.19	-6.64/-6.86	-6.94/-3.22	-3.46/-5.67	-5.52/-4.51	-3.96/-4.16	-6.6/-10.44	-10.35/-8.84	-12.03/-9.53	-9.75/-9.35	-6.43/-6	-7.71/-8.53	-9.34/-12.52	-13.6/-11.58	-13.29/-11.25	-11.21/-9.5	-5.18/-2.28	-2.67/-4.87	-7.01/-13.09	-14/-10.7	-10.8/-9.15	-11.88/-9.75	-11.86/-10.55	-10.92/-9.39	-9.1/-10.24	-9.46/-8.44	-6.06/-6.25	-12.64/-9.87	-9.47/-6.23	-3.44/-4.54	-5.43/-10.22	-13.6/-3.82	-8.56/-7.26	-12.27/-6.08	-5.01/-2.02	-4.06/-5.16	-4.42/-7.51	-9.39/-8.94																								
120°	-4.53/-4.32	-3.55/-3.42	-2.14/-2.61	-3.22/-5.77	-7.65/-13.13	-14.99/-11.01	-5.78/-6.13	-8.76/-10.43	-10.69/-9.5	-9.85/-8.5	-7.48/-6.19	-4.89/-8.13	-4.47/-3.86	-5.21/-8.52	-4.74/-3.66	-6.19/-6.95	-5.23/-11.68	-10.93/-3.13	-4.96/-5.92	-11.57/-6.84	-5.55/-4.56	-3.7/-1.97	-2/-1.56	-4.74/-5.14	-14.04/-15	-11.67/-6.25	-4.9/-6.61	-7.16/-8.12	-8.4/-13.39	-12.49/-11.59	-8.05/-8.4	-9.07/-8.61	-7.72/-7.29	-9.92/-11	-10.94/-9.19	-6.64/-6.86	-6.94/-3.22	-3.46/-5.67	-5.52/-4.51	-3.96/-4.16	-6.6/-10.44	-10.35/-8.84	-12.03/-9.53	-9.75/-9.35	-6.43/-6	-7.71/-8.53	-9.34/-12.52	-13.6/-11.58																								
135°	-3.32/-4.72	-4.39/-4.12	-6.61/-6.39	-4.88/-5.64	-7.84/-9.54	-11.18/-10.59	-7.19/-7.34	-8.94/-10.09	-9.37/-9.82	-6.05/-5.42	-6.11/-6.43	-6.9/-5.94	-5.81/-6.34	-5.34/-6.76	-8.99/-10.97	-7.95/-6.16	-12.11/-10.37	-6.26/-1.93	-3.49/-12.8	-15.44/-6.99	-3.8/-3.65	-2.12/-3.01	-3.12/-4.39	-4.14/-2.7	-11.97/-14.4	-11.8/-8.53	-6.67/-6.24	-7.17/-8.04	-8.11/-9.7	-9.93/-11.55	-11.27/-10.59	-12.14/-10.8	-11.16/-8.86	-8.89/-8.56	-8.52/-6.24	-6.86/-7.41	-5.36/-5.88	-8.15/-10.97	-10.71/-11.31	-8.46/-11.22	-10.41/-7.19	-4.83/-2.25	-3.46/-8.09	-7.92/-10.61	-9.82/-8.76	-7.51/-6.1	-5.24/-5.65	-7.9/-10.51																								
150°	-5.71/-6.21	-6.99/-6.95	-6.12/-7.06	-6.82/-7.27	-9.4/-11.88	-12.65/-11.79	-12.62/-12.87	-12.92/-12.45	-12.03/-6.82	-7.27/-6.36	-9.13/-8.47	-7.21/-5.78	-12.65/-6.88	-9.29/-11.8	-15.42/-13.48	-8.74/-6.57	-6.31/-7.7	-6.22/-3.76	-2.76/-4.3	-8.08/-11.03	-12.14/-8.46	-7.56/-7.91	-6.48/-5.5	-5.21/-5.78	-2.89/-3.53	-3.9/-3.8	-4.62/-5.97	-7.78/-9.25	-10/-9.83	-9.99/-11.2	-12.97/-13.27	-12.22/-11.41	-10.84/-11.17	-11.51/-10.53	-9.72/-9.5	-10.04/-10.74	-12.08/-14.55	-5.18/-5.4	-5.32/-4.59	-4.8/-6.55	-8.16/-7.17	-5.52/-4.19	-4.02/-5.59	-8.11/-10.36	-12.94/-15.19	-11.77/-10.43	-8.01/-6.9	-5.07/-3.5																								
165°	-9.85/-11.29	-10.91/-8.83	-7.05/-6.27	-5.73/-5.31	-5.48/-6.01	-6.77/-8.42	-9.84/-12.33	-15.38/-16.01	-15.15/-14.54	-13.23/-12.13	-11.34/-11.86	-11.35/-10.84	-6.1/-6.69	-6.17/-5.3	-4.95/-5.5	-5.75/-4.94	-3.79/-3.19	-3.12/-3.31	-3.87/-5.08	-6.35/-6.96	-7.1/-7.33	-8.26/-9.22	-9.73/-9.46	-8.54/-8.27	-15.28/-13.04	-11.44/-10.9	-10.27/-10.26	-10.32/-11.15	-12.61/-14.91	-15.19/-15.89	-13.69/-12.57	-12.25/-11.88	-10.69/-11.01	-11.23/-10.15	-9.31/-8.32	-7.71/-8.61	-10.58/-11.74	-13.93/-7	-6.04/-5.22	-4.75/-4.55	-4.97/-5.96	-7.27/-7.31	-7.12/-7.6	-8.03/-8.22	-7.89/-7.3	-7.15/-8.93	-10.71/-11.7	-12.83/-13.56																								
180°	5.785GPol	Theta	Phi(75°)	Phi(82.5°)	Phi(90°)	Phi(97.5°)	Phi(105°)	Phi(120°)	Phi(127.5°)	Phi(135°)	Phi(142.5°)	Phi(150°)	Phi(157.5°)	Phi(165°)	Phi(172.5°)	Phi(180°)	Phi(75°)	Phi(82.5°)	Phi(90°)	Phi(97.5°)	Phi(105°)	Phi(120°)	Phi(127.5°)	Phi(135°)	Phi(142.5°)	Phi(150°)	Phi(157.5°)	Phi(165°)	Phi(172.5°)	Phi(180°)	Phi(75°)	Phi(82.5°)	Phi(90°)	Phi(97.5°)	Phi(105°)	Phi(120°)	Phi(127.5°)	Phi(135°)	Phi(142.5°)	Phi(150°)	Phi(157.5°)	Phi(165°)	Phi(172.5°)	Phi(180°)	Phi(75°)	Phi(82.5°)	Phi(90°)	Phi(97.5°)	Phi(105°)	Phi(120°)	Phi(127.5°)	Phi(135°)	Phi(142.5°)	Phi(150°)	Phi(157.5°)	Phi(165°)	Phi(172.5°)	Phi(180°)														
75°	-4.87/-5.27	-4.69/-3.77	-3.08/-2.82	-2.46/-1.99	-1.75/-1.85	-1.82/-1.96	-2.15/-2.23	-2.07/-1.91	-1.94/-2.6	-3.87/-4.77	-4.8/-5.71	-7.73/-8.69	-8.3/-7.47	-6.52/-5.57	-4.48/-3.45	-2.54/-1.84	-1.43/-1.04	-0.8/-0.5	-0.71/-1.17	-1.61/-2.03	-2.2/-2.5	-2.93/-3.38	-3.93/-4.3	-4.98/-4.97	-5.27/-5.61	-5.71/-6.29	-4.72/-4.13	-3.01/-1.78	-1.38/-1.28	-1.39/-1.72	-1.87/-1.83	-1.76/-1.85	-2.39/-3.26	-4.85/-6.82	-8/-7.11	-6.23/-6.06	-5.74/-5.48	-5.65/-5.36	-4.01/-2.76	-1.76/-1.02	-0.67/-0.44	0.01/0.06	-0.33/-1.1	-1.74/-2.01	-2.18/-2.36	-2.76/-3.2	-3.92/-4.29	-4.41/-5.15	-8.84/-8.76	-7.68/-6.02	-4.44/-3.62	-2.02/-0.66	0.03/0.35	0.12/-0.39	-0.84/-0.78	-1.18/-2.38	-4.34/-5.39	-6.24/-6.91	-6.58/-5.42	-4.39/-3.75	-3.49/-3	-3.25/-4.34	-4.91/-4.24	-2.1/-0.72	-0.29/0.36	0.90/0.96	0.17/-1.07	-1.39/-1.39	-1.79/-2.84	-3.43/-3.65	-4.81/-6.81	-7.75/-8.74
90°	-4.53/-3.32	-2.5/-1.64	-0.98/-0.44	-0.13/0.48	1.12/1.83	1.83/2.05	1.74/0.65	-1.1/-2.9	-4.96/-6.96	-6.34/-4.2	-2.59/-1.37	-0.85/-0.67	-0.49/-0.33	-1.22/-3.22	-4.59/-4.2	-2.7/-2.21	-1.5/-0.49	-0.24/-0.8	-0.89/-0.62	-0.98/-2.02	-3.21/-4.19	4.42/-5.67	-7.52/-6.94	-6.33/-6.52	-1.38/0.89	1.56/1.44	1.58/2.21	2.65/3.06	3.32/3.14	2.71/2.52	1.93/1.07	-0.03/-1.03	-2.69/-4.24	-3.33/-1.37	-0.12/0.11	0.51/1.49	1.51/0.78	0.16/-0.14	-0.58/-1.47	-4/-4.51	-1.38/0.14	0.81/1.92	2.19/1.57	0.84/-0.04	-1.18/-2.28	-2.9/-4.69	-7.64/-8.07	-6.55/-4.18	1.78/3.05	3.39/3.35	2.74/1.95	2.12/4.8	2.71/2.73	2.55/2.57	2.41/2.18	1.93/0.8	-0.71/-1.05	0.08/1.17	1.84/2.34	3.08/3.11	2.08/1.23	1.26/0.14	-1.44/-0.92	-1.13/-0.91	-0.61/0.19	1.09/2.3	2.34/1.65	0.91/0.02	-1.68/-3.01	-3.58/-4.16	-4.71/-3.36	-0.41/0.57
105°	1.53/2.6	2.76/3.14	3.73/4.6	2.47/1.59	1.76/2.59	3.06/3.09	2.43/1.61	0.13/-2.44	-4.61/-3.12	-1.39/0.14	1.41/1.19	1.06/1.19	-0.34/-1.55	-0.97/0.48	0.75/0.25	-0.55/0.33	0.5/0.07	0.57/2.1	2.26/1.92	1.85/0.9	0.55/0.94	1.4/0.86	-0.4/-0.77	0.08/0.66	-0.08/-0.53	-2.05/-2.38	-0.05/-1.33	1.64/0.33	0.01/0.92	1/1.84	2.38/2.41	1.86/0.47	-1.73/-2.72	-5.3/-6.62	-0.85/0.38	0.19/0.6	-2/0.84	-1.13/-2.39	-2.11/-2.15	0.13/2.17	1.99/1.54	0.86/0.9	1.88/2.28	2.19/2.38	1.41/0.53	-0.67/-0.84	1.78/3.05	3.39/3.35	2.74/1.95	2.12/4.8	2.71/2.73	2.55/2.57	2.41/2.18	1.93/0.8	-0.71/-1.05	0.08/1.17	1.84/2.34	3.08/3.11	2.08/1.23	1.26/0.14	-1.44/-0.92	-1.13/-0.91	-0.61/0.19	1.09/2.3	2.34/1.65	0.91/0.02	-1.68/-3.01	-3.58/-4.16	-4.71/-3.36	-0.41/0.57		
120°	3.37/3.35	3.76/3.72	1.14/0.52	1.59/0.14	-0.4/0.47	0.16/-0.48	-1.75/-0.37	1.1/1.1	0.2/-0.7	-3.26/-3.34	-2.44/0.64	2.74/3.07	2.24/1.46	1.54/1.43	1.63/1.69	1.12/-0.95	0.19/0.08	-2.71/-2.95	-2.15/-1.3	0.51/-1.3	-1.81/-0.19	-1.5/-0.19	1.41/3.74	4.28/3.26	3.56/3.73	4.65/5.4	4.08/1.69	3/3.06	2.62/2.61	1.87/1.62	0.14/-1	0.64/0.14	0.31/0.57	-2.01/-2.09	0.18/0.69	5.01/3.32	2.85/2.58	1.52/0.63	1.7/3.44	3.76/2.29	2.18/1.98	1.45/0.44	0.09/0.79	3.24/1.9	-1.13/1.35	1.14/0.7	2.05/3.98	5.09/4.48	3.79/4.47	4.55/3.9	4.81/3.76	3.74/3.14	2.06/2.4	3.08/3.28	1.95/0.06	0.72/-0.47	-0.98/0.61	1.31/2.11	-0.36/3.99	5.05/4.17	4.61/2.37	2.32/7.6	2.79/3.23	5.03/3.99	2.73/1.91	1.65/1.51	-0.44/1.74	2.09/0.72	-0.33/-0.27	-0.72/-0.92	2.11/4.75	6.13/6.07
135°	1.64/2.25	3.58/3.64	3.33/3.3	4.29/3.81	2.25/1.88	1.42/1.93	1.53/-0.23	0.09/-2.25	-4.13/-1.66	1.33/-0.93	1.24/6.33	5.65/6.65	4.47/2.74	3.55/3.54	4.03/4.99	4.37/1.29	2.2/3.07	2.03/0.95	0.19/1.58	2.22/0.25	1.41/-1.94	-2.65/-2.41	0.19/2.73	4.36/4.24	-3.86/-4.28	-0.64/0.68	1.46/1.6	2.64/3.72	2.91/1.87	1.61/1.69	0.62/-0.01	-0.23/-2.63	-1.22/-1.6	2.1/0.15	0.88/5.63	4.82/4.16	2.61/0.73	-1.33/-1.23	1.49/3.74	3.98/2.78	-0.88/0.19	3.07/-0.64	-1.34/-0.89	1.51/-0.12	0.14/-4.22	-4.57/-0.14	0.79/1.73	1.05/0.8	1.64/2.25	3.58/3.64	3.33/3.3	4.29/3.81	2.25/1.88	1.42/1.93	1.53/-0.23	0.09/-2.25	-4.13/-1.66	1.33/-0.93	1.24/6.33	5.65/6.65	4.47/2.74	3.55/3.54	4.03/4.99	4.37/1.29	2.2/3.07	2.03/0.95	0.19/1.58	2.22/0.25	1.41/-1.94	-2.65/-2.41	0.19/2.73	4.36/4.24
150°	-3.86/-4.28	-0.64/0.68	1.46/1.6	2.64/3.72	2.91/1.87	1.61/1.69	0.62/-0.01	-0.23/-2.63	-1.22/-1.6	2.1/0.15	0.88/5.63	4.82/4.16	2.61/0.73	-1.33/-1.23	1.49/3.74	3.98/2.78	-0.88/0.19	3.07/-0.64	-1.34/-0.89	1.51/-0.12	0.14/-4.22	-4.57/-0.14	0.79/1.73	1.05/0.8	-2.76/-4.45	-2.77/-3.01	-2.61/-2.93	-6.15/-6.75	-5.49/-1.86	-2.14																																										





# Radiated Composite Gain Data\_2.4GHz, 5GHz

# Appendix A

Theta (°)	-11.43/-19.4	-11.31/-13.76	-15.26/-13.29	-10.62/9.52	-9.93/-13.08	-17.11/-12.2	-7.27/-4.16	-6.21/-8.18	-12.66/-19.08	-17.53/-12.72	-9.54/-7.9	-6.71/-6.56	-7.61/-8.52	-9.18/-10.2	-10.38/-10.95	-13.51/-16.24	-19.43/-18.93	-18.18/-17.17	-15.47/-13.13	-10.65/-8.62	-7.11/-6.16	-5.63/-6.18	-7.55/-9.46	-10.84/-11.53	
Theta (30°)	-19.32/-19.4	-19.41/-17.58	-17.68/-14.72	-11.46/-9.47	-8.77/-10.46	-14.03/-11.61	-7.86/-7.12	-8.42/-11.63	-15.31/-13.21	-9.85/-9.2	-10.11/-10.96	-11.33/-11.69	-11.66/-10.15	-8.74/-7.64	-6.57/-6.33	-6.74/-8.44	-11.91/-13.1	-18.52/-13.99	-12.08/-11.99	-11.35/-10.12	-9.09/-8.5	-8.72/-9.68	-11.22/-14.41	-17.53/-18.1	
Theta (45°)	-12.11/9.45	-8.98/-8.76	-10.08/-11.86	-13.64/-18.25	-19.05/-16.36	-17.77/-11.82	-8.59/-9.95	-14.81/-12.57	-10.68/-11.69	-9.46/-8.79	-11.19/-17.59	-18.77/-12.55	-10.74/-10.11	-9.35/-10.1	-10.87/-11.62	-10.95/-9.58	-9.69/-10.52	-14.32/-18.57	-17.98/-19.08	-19.21/-11.89	-9.71/-10.6	-12.32/-11.53	-10.54/-11.48	-15.05/-14.67	
Theta (60°)	-12.71/-14.94	-16.81/-10.5	-8.92/-9.99	-10.35/-12.43	-13.06/-10.4	-12.36/-17.86	-18.51/-18.58	-12.08/-9.2	-13.41/-9.74	-6.63/-6.06	-13.81/-16.65	-9.36/-8.38	-10.41/-10.64	-10.72/-11.25	-12.14/-11.82	-13.83/-14.66	-12.19/-14.03	-11.64/-18.93	-18.74/-14.35	-11.83/-13.57	-12.36/-7.46	-6.31/-7.77	-11.43/-11.95	-9.44/-7.86	-8.38/-9.9
Theta (75°)	-7.76/-8.7	-11.25/-16.03	-15.25/-10.94	-14.92/-19.25	-17.53/-12.29	-8.15/-4.82	-5.94/-10.7	-17.66/-18.15	-13.81/-9.3	-12.33/-11.93	-11.57/-11.92	-14.83/-12.49	-16.14/-17.72	-18.55/-16.66	-14.49/-12.64	-12.22/-13.5	-16.35/-17.92	-15.77/-14.75	-9.22/-7.44	-9.19/-9.27	-12.61/-9.1	-7.31/-6.11	-5.47/-5.05	-5.31/-6.64	
Theta (90°)	-8.16/-8.18	-6.94/-8.17	-10.81/-3	-7.15/-9.7	-13.02/-13.22	-9.89/-6.38	-5.69/-7.42	-9.14/-11.26	-10.92/-11.75	-15.97/-14.21	-16.41/-11.62	-11.14/-10.92	-13.47/-18.4	-18.06/-17.48	-18.22/-10.2	-8.14/-10.2	-14.17/-13.67	-11.26/-15.68	-7.51/-5.93	-6.81/-7.3	-10.56/-6.46	-5.19/-4.5	-7.29/-6.1	-5.57/-6.38	
Theta (105°)	-11.58/-10.06	-12.21/-13.32	-18.35/-12.31	-8.94/-14.27	-12.62/-18.65	-13.99/-14.12	-10.24/-11.17	-10.63/-10.37	-14.82/-15.58	-14.62/-13.43	-13.65/-13.95	-15.91/-15.44	-10.91/-9.94	-6.33/-13.64	-11.57/-17.39	-19.07/-16.07	-15.45/-15.58	-17.59/-13.06	-4.34/-4.16	-4.11/-13.8	-6.05/-12.28	-12.32/-13	-11.48/-9.68		
Theta (120°)	-17.36/-17.76	-13.63/-13.74	-18.68/-10.9	-8.87/-17.22	-19.18/-16.26	-18.78/-18.16	-17.91/-18.18	-16.77/-11.23	-9.79/-11.51	-10.62/-13	-13.18/-13.5	-18.81/-17.54	-12.81/-11.37	-14.71/-17.84	-17.91/-9.54	-10.17/-16.79	-18.35/-19.17	-12.26/-18.73	-15.61/-9.38	-5.49/-3.37	-5.88/-4.27	-5.96/-10.23	-13.82/-13.2	-13.79/-16.01	
Theta (135°)	-17.43/-14.21	-11.44/-11.88	-14.16/-11.99	-4.67/-5.77	-11.16/-10.88	-8.67/-3.1	-7.01/-7.45	-6.96/-9.08	-15.63/-18.41	-17.51/-23.8	-14.31/-17.82	-18.42/-17.68	-16.47/-14.99	-10.79/-10.2	-15.04/-16.99	-13.98/-18.63	-17.22/-12.21	-9.39/-11.45	-10.23/-4.05	-4.74/-2.9	-5.14/-7.9	-9.31/-8.07	-16.63/-18.5	-15.63/-18.5	
Theta (150°)	-8.64/-7.84	-9.04/-9.92	-8.07/-9.53	-7.31/-7.75	-6.43/-10.23	-17.84/-15.98	-18.41/-12.58	-9.54/-11.16	-17.88/-17.2	-14.92/-15.21	-18.86/-19.14	-14.91/-12.33	-14.31/-16.68	-15.34/-15.94	-7.53/-7.28	-12.21/-13.69	-13.54/-18.94	-19.01/-6.64	-6.23/-6.67	-9.75/-9.47	-7.43/-8.86	-14.07/-10.39	-10.23/-10.86		
Theta (165°)	-3.41/-2.18	-2.44/-5.2	-6.47/-4.84	-4.81/-7.29	-9.36/-11.47	-14.54/-17.52	-18.18/-15.61	-10.74/-11.34	-17.56/-18.44	-12.04/-8.47	-7.23/-10.41	-9.96/-6.48	-7.29/-10.2	-7.89/-5.46	-9.05/-13.46	-12.98/-17.88	-16.63/-11.5	-15.19/-7.71	-4.77/-10.01	-8.84/-12.3	-10.62/-11.29	-6.01/-6.84	-7.10/-7.9	-4.68/-2.95	
Theta (180°)	-7.82/-8.93	-6.86/-5.59	-5.68/-6.67	-6.69/-6.1	-7.97/-11.04	-17.61/-18.3	-13.35/-18.85	-17.97/-17.29	-15.01/-16.79	-18.37/-14.21	-12.31/-14.1	-11.46/-12.02	-17.62/-19.57	-14.94/-9.91	-10.14/-13.1	-11.21/-10.41	-17.11/-12.97	-18.71/-16.07	-16.82/-14.94	-12.12/-3.43	-2.73/-6.98	-6.63/-18.41	-12.88/-11.4	-4.94/-1.16	-5.26/-12.7
Theta (195°)	-9.97/-10.86	-10.61/-10.02	-9.24/-8.48	-8.27/-8.25	-9.37/-13.01	-17.08/-15.73	-15.08/-18.71	-14.82/-12.17	-16.78/-12.4	-16.03/-17.52	-17.39/-12.81	-11.63/-13.48	-14.24/-14.54	-18.55/-18.18	-13.23/-16.09	-17.71/-16.07	-18.76/-18.54	-9.23/-5.53	-7.77/-5.44	-9.81/-18.41	-12.89/-11.5	-9.45/-7.37	-7.83/-9.48	-10.14/-10.3	
Theta (210°)	-7.26/-7.19	-7.95/-7.53	-7.61/-8.26	-9.17/-10.44	-11.48/-12.11	-12.68/-14.34	-16.17/-17.09	-16.43/-16.16	-16.41/-15.7	-15.51/-15.96	-18.56/-19.15	-11.69/-15.47	-14.22/-14.34	-16.15/-18.35	-18.03/-18.18	-18.45/-18.71	-17.35/-18.56	-15.03/-9.16	-7.42/-8.09	-9.78/-12.72	-18.81/-19.36	-18.01/-12.71	-9.89/-9.25	-8.36/-7.53	
Theta (225°)	-6.81/-6.62	-6.89/-7.02	-6.77/-6.11	-6.82/-5.82	-6.14/-7.3	-9.61/-13.44	-17.18/-32	-17.83/-18.13	-17.21/-17.4	-18.47/-15.81	-11.39/-7.92	-6.56/-6.67	-8.02/-9.32	-11.11/-13.88	-17.59/-19.03	-18.91/-17.62	-6.86/-5.49	-6.11/-1.82	-11.29/-14.86	-18.92/-17.77	-17.33/-17.55	-12.75/-10.42	-8.88/-7.7		
Theta (240°)	-9.11/-10.31	-10.12/-8.05	-6.56/-6.23	-6.72/-7.39	-8.68/-9.58	-9.91/-9.21	-8.27/-7.33	-7.33/-7.45	-7.44/-7.58	-7.15/-6.47	-6.06/-6.42	-7.83/-9.84	-12.77/-16.61	-17.85/-17.2	-18.44/-13.13	-9.99/-8.05	-5.85/-4.54	-3.28/-3.37	-3.28/-3.72	-4.44/-5.07	-5.44/-6.37	-6.91/-7.31	-6.99/-7.25	-7.57/-8.24	
Theta (255°)	-17.35/-19.03	-19.25/-18.4	-18.52/-18.48	-18.66/-18.99	-15.88/-12.4	-10.38/-8.5	-8.21/-9.1	-9.59/-10.45	-11.32/-12.37	-15.29/-17.66	-19.11/-18.37	-18.17/-19.2	-18.54/-18.34	-17.45/-15.08	-12.97/-11.62	-10.08/-8.75	-8.31/-8.68	-7.45/-7.59	-7.61/-7.61	-7.57/-6.32	-7.75/-6.32	-8.74/-9.48	-11.11/-8.6		
Theta (270°)	-10.57/-9.41	-8.94/-8.79	-9.44/-10.04	-10.32/-10.36	-10.34/-10.45	-10.33/-10.66	-10.61/-10.66	-11.11/-11.08	-12.19/-13.65	-16.38/-18.59	-18.27/-18	-18.19/-17.13	-14.73/-12.2	-10.23/-9.88	-8.19/-8.22	-8.22/-8.17	-9.52/-9.32	-10.72/-11.61	-12.13/-12.31	-13.12/-13.74	-13.41/-12.7	-11.83/-11.29	-10.76/-10.34		
Theta (285°)	-14.07/-13.83	-13.24/-11.8	-11.11/-10.73	-11.26/-12.07	-12.09/-11.07	-10.06/-9.72	-9.93/-10.1	-10.51/-10.62	-10.97/-12.11	-11.91/-13.92	-16.09/-14.52	-11.63/-9.62	-8.85/-8.43	-8.45/-8.63	-8.29/-7.74	-7.55/-9.76	-8.36/-8.85	-9.49/-10.48	-11.67/-12.24	-13.45/-14.66	-15.84/-16.92	-18.35/-18.88	-18.61/-18.74	-18.81/-16.62	
Theta (300°)	-7.15/-6.7	-5.79/-5.45	-5.59/-6.15	-6.99/-7.69	-8.11/-7.39	-6.41/-5.98	-6.27/-6.96	-8.39/-9.56	-11.64/-13.8	-14.48/-17.76	-18.17/-17.84	-16.71/-16.99	-14.81/-13.15	-11.57/-9.77	-8.88/-8.63	-7.56/-7.59	-7.78/-8.1	-9.31/-10.06	-10.57/-11.76	-12.11/-14.77	-13.57/-16.82	-15.07/-16.6	-17.62/-17.22		
Theta (315°)	-9.53/-9.55	-5.16/-4.52	-3.77/-2.96	-3.02/-3.73	-4.31/-4.44	-3.85/-3.28	-3.31/-4.63	-7.58/-11.39	-14.24/-12.32	-10.64/-9.4	-8.84/-8.47	-8.84/-10.27	-11.07/-9.43	-8.07/-7.8	-8.06/-8.81	-9.59/-9.71	-9.23/-8.49	-7.79/-7.31	-7.55/-7.89	-8.58/-9.43	-10.16/-10.51	-9.67/-8.71	-8.92/-10.14	-10.56/-9.36	
Theta (330°)	-4.52/-5.46	-5.9/-6.13	-4.84/-3.25	-2.41/-2.45	-2.89/-3.38	-2.84/-2.1	-1.78/-2.31	-3.17/-3.38	-2.85/-2.47	-3.17/-4.84	-7.5/-8.2	-8.1/-7.8	-8.51/-10.7	-10.91/-7.3	-10.09/-9.3	-7.24/-6.55	-6.21/-6.26	-6.45/-7.77	-5.08/-5.27	-5.22/-4.85	-5.59/-7.4	-5.54/-5.29	-6.34/-7.56	-6.52/-5.45	
Theta (345°)	-0.15/-0.57	-1.57/-2.6	-3.43/-3.09	-2.31/-2.28	-3.18/-3.83	-2.93/-1.64	-1.06/-1.23	-1.46/-1.36	-2.73/-2.28	-8.53/-10.77	-10.92/-9.27	-8.06/-7.78	-8.44/-9.77	-11.93/-14.09	-10.64/-7.7	-6.15/-5.61	-4.59/-2.47	-0.92/-0.88	-1.95/-3.05	-4.27/-6.72	-10.20/-10.67	-6.94/-7.18	-2.88/-1.94		
Theta (360°)	2.542/9.5	2.570/7.7	-1.32/-2.29	-3.15/-4.89	-7.06/-7.76	-5.28/-2.24	-0.89/-0.91	-0.41/-0.15	-0.95/-2.39	-3.72/-4.28	-4.62/-4.97	-4.17/-3.51	-3.53/-4.51	-5.84/-6.75	-4.82/-12.62	-15.48/-9.83	-5.69/-3.73	-2.24/-1.05	-0.46/-1.28	-2.76/-3.72	-3.69/-4.6	-5.51/-4.2	-2.2/-0.81	0.51/7.7	
Theta (0°)	-0.110/28	0.860/55	-0.110/06	-0.02/-1.78	-5.08/-7.6	-5.33/-3.2	-2.45/-1.47	-0.22/-0.63	-2.36/-3.86	-5.04/-5.19	-6.38/-6.12	-4.37/-5.06	-5.82/-4.4	-3.63/-7.6	-5.2/-8.32	-12.07/-9.97	-6.26/-5.15	-4/-1.1	0.68/-0.08	-3.27/-6.06	-4.57/-3.6	-3.38/-2.65	-2.08/-2.52	-2.15/-0.55	
Theta (15°)	-1.51/-0.68	0.170/12	-0.35/-0.84	-1.11/-1.58	-2.37/-3.62	-6.25/-7.51	-4.86/-2.47	-0.61/-0.67	-1.79/-3.1	-4.19/-5.94	-7.22/-4.53	-2.39/-2.63	-2.31/-1.61	-1.76/-2.99	-4.65/-5.8	-7.58/-6.96	-8.51/-6.23	-7.34/-6.29	-3.61/-3.55	-5.14/-8.55	-4.85/-3.35	-3.78/-3.1	-2.76/-2.72	-2.09/-1.63	
Theta (30°)	0.260/89	0.790/68	-2.14/-2.53	-2.44/-1.58	-0.81/-1.07	-1.07/-1.99	-4.06/-3.59	-2/-3.2	-0.41/-2.74	-7.26/-7.85	-7.96/-3.89	-1.17/-1.42	-2.28/-1.8	-1.17/-1.06	-1.49/-2.32	-3.26/-3.65	-3.7/-2.74	-4.19/-9.74	-5.61/-1.22	-0.41/-2.85	-5.78/-4.09	-5.67/-5.65	-3.09/-1.53	-0.10/74	
Theta (45°)	0.522/04	1.820/18	-0.55/-0.2	-0.3/-0.28	0.130/79	1.782/14	-0.26/-0.49	-4.14/-1.96	-0.66/-1.06	-2.09/-3.22	-5.61/-2.6	-0.86/-2.34	-0.030/55	-2.17/-5.2	-5.03/-2.31	0.04/0.45	-2.46/-1.39	-2.92/-1.85	-0.290/67	0.7/0.53	-4.05/-2.91	-1.81/-0.74	0.1/0.53	1.36/1.33	
Theta (60°)	-0.62/16	1.840/38	0.55/1.12	0.110/64	1.411/54	2.972/66	0.75/1.44	-3.4/-2.75	-1.76/-1.9	-3.86/-3.95	-5.32/3.2	1.471/89	3.932/96	0.85/0.23	-2.93/-1.63	1.650/0.4	-3.22/0.08	-2.740/07	1.741/2	-0.11/0.62	-1.52/-0.91	0.22/-0.51	0.130/06	0.910/86	
Theta (75°)	-2.11/0.69	0.94/0.28	-0.67/-0.17	-0.26/1.36	2.121/91	2.613/06	1.71/1.6	-0.38/-2.02	-3.24/-5.27	-9.92/4.64	-2.97/2.92	2.2/2.83	2.231/41	2.030/98	-3.20/0.34	2.211/27	0.58/-0.27	0.720/27	0.58/0.22	-1.79/-2.21	-0.87/-0.55	-1.79/-2.21	-0.87/-0.55		
Theta (90°)	-0.080/72	0.181/58	-2.69/-1.35	-0.660/54	0.791/33	2.292/47	2.512/16	0.97/0.76	-2.29/4.95	-4.59/-6.68	-0.89/0.5	2.744/64	5.132/54	-0.130/24	1.373/04	3.172/49	2.60/85	2.221/01	1.551/61	0.770/332	-2.27/3.73	-4.29/-4.15	-2.83/-0.9		
Theta (105°)	-0.69/-1.9	-3.05/-4.19	-5.91/-3.06	-2.68/-2.98	-2.040/33	1.190/17	0.060/5	-0.6/-1.7	-0.98/-9.08	-6.37/-13.45															



# Radiated Composite Gain Data\_2.4GHz, 5GHz

# Appendix A

Theta	7.5°	15°	22.5°	30°	37.5°	45°	52.5°	60°	67.5°	75°	82.5°	90°	105°	120°	135°	150°	165°	180°	195°	210°	225°	240°	255°	270°	285°	300°	315°	330°	345°
Gain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Theta	7.5°	15°	22.5°	30°	37.5°	45°	52.5°	60°	67.5°	75°	82.5°	90°	105°	120°	135°	150°	165°	180°	195°	210°	225°	240°	255°	270°	285°	300°	315°	330°	345°
Gain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



# Radiated Composite Gain Data\_2.4GHz, 5GHz

# Appendix A

Theta (°)	-16.76/-15.4	-18.06/-18.59	-18.25/-11.96	-12.91/-16.76	-17.93/-18.09	-19.13/-15.75	-12.56/-13.33	-18.09/-18.82	-17.89/-14.32	-11.46/-10.46	-8.27/-6.09	-5.94/-6.45	-6.53/-8.49	-8.88/-10.5	-10.28/-12.49	-11.75/-17.58	-16.05/-16.42	-11.95/-13.62	-18.62/-18.28	-16.62/-14.88	-18.55/-18.85	-18.56/-14.07	-12.56/-12.93	-14.75/-15.21	
Theta (135°)	-7.9/-8.53	-12.64/-19.12	-16.29/-10.32	-10.48/-13.74	-15.13/-14.4	-14.43/-14.27	-13.07/-13.33	-15.8/-18.37	-19.02/-14.68	-13.32/-10.34	-11.41/-9.11	-7.45/-7.13	-9.23/-8.42	-8.23/-8.4	-9.25/-12.27	-13.64/-16.9	-17.55/-13.84	-8.99/-9.3	-10.31/-13.26	-17.81/-18	-17.53/-18.92	-16.34/-18.05	-17.45/-14.36	-12.1/-10.02	
Theta (142.5°)	-12.95/-17.06	-18.45/-11.23	-9.7/-10.73	-12.17/-15.43	-18.29/-15.86	-13.65/-10.45	-10.47/-5.84	-6.57/-9.99	-9.51/-10.43	-10.32/-9.3	-10.02/-12.59	-15.43/-14.72	-12.29/-12.78	-15.75/-13.44	-12.41/-11.94	-11.94/-12.64	-16.87/-16.8	-12.81/-12.7	-12.41/-12.79	-12.54/-12.12	-12.84/-14.24	-16.4/-18	-16.52/-14.6	-14.18/-13.9	
Theta (150°)	-18.82/-19.07	-14.19/-10.44	-9.27/-9.37	-9.22/-8.63	-7.93/-7.26	-7/8	-9.49/-11.29	-18.06/-19.25	-18.5/-18.07	-18.28/-18.89	-17.95/-18.18	-15.85/-12.66	-12.46/-14.09	-13.93/-14.31	-15.01/-14.1	-17.42/-19.15	-19.2/-15.18	-13.68/-12.99	-13.19/-12.86	-12.35/-12.63	-15.32/-18.25	-18.72/-17.77	-19.06/-17.74	-16.19/-16.78	
Theta (157.5°)	-13.24/-18.87	-18.88/-15.83	-18.04/-17.74	-17.65/-18.72	-18.8/-18	-18.35/-18.12	-18.21/-18.26	-17.34/-17.91	-17.59/-13.16	-12.65/-12.5	-12.54/-13.03	-12.97/-13.1	-14.25/-14.07	-14.34/-14.74	-14.07/-16.03	-18.32/-16.52	-16.62/-18.16	-15.08/-12.39	-12.38/-12.82	-13.62/-15.43	-18.79/-17.3	-16.17/-15.43	-14.69/-13.36	-12.43/-12.47	
Theta (165°)	-12.8/-16.69	-18.16/-18.26	-17.99/-18.43	-16.89/-13.14	-10.47/-19.18	-18.69/-18.19	-18.5/-18.13	-18.18/-18.91	-18.76/-18.99	-16.83/-18.21	-16.16/-18.07	-16.76/-18.36	-16.64/-17.29	-19.01/-18.53	-18.31/-19.33	-15.41/-12.68	-11.51/-11.24	-11.62/-12.07	-12.41/-12.79	-12.04/-12.89	-14.88/-18.6	-18.61/-18.56	-15.81/-15.43	-16.29/-13.93	-11.25/-10.7
Theta (172.5°)	-18.19/-17.93	-18.89/-18.33	-19.19/-18.7	-18.31/-17.74	-18.08/-18.03	-18.63/-18.61	-18.66/-17.94	-17.53/-18.53	-17.92/-19.22	-18.46/-19.06	-18.43/-18.22	-18.07/-18.08	-10.67/-10.12	-9.13/-8.43	-8.13/-8.49	-9.23/-10.27	-11.57/-13.01	-14.59/-16.33	-17.65/-18.44	-17.27/-18.44	-18.02/-18.63	-17.62/-17.08	-18.33/-16.41	-13.6/-12.33	
Theta (180°)	-18.54/-18.84	-19.04/-17.63	-19.13/-17.81	-18.56/-17.74	-17.66/-17.68	-18.27/-18.61	-18.51/-18.04	-18.29/-17.96	-18.2/-18.38	-19.23/-17.61	-18.38/-18.18	-19.12/-18.19	-18.26/-17.71	-19.09/-15.45	-14.39/-14.64	-15.42/-17.12	-18.9/-19.4	-18.06/-18.68	-18.12/-17.94	-19.08/-19.17	-18.23/-17.89	-15.71/-15.38	-16.06/-15.53	-14.89/-14.75	
Gain	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°)	
Theta (0°)	-7.54/-8.3	-9.22/-10.12	-10.9/-11.99	-13.43/-14.98	-16.72/-17.88	-17.47/-17.91	-14.84/-14.57	-10.72/-9.38	-8.53/-7.85	-7.13/-6.52	-5.99/-6.14	-6.38/-6.65	-7.25/-7.78	-8.61/-9.73	-11.34/-13.93	-16.75/-18.13	-18.58/-18.63	-19.29/-16.32	-13.33/-11.61	-10.44/-10	-9.74/-8.94	-7.77/-7.36	-8.11/-8.59	-8.5/-7.92	
Theta (7.5°)	-7.15/-7.97	-9.21/-10.48	-11.24/-12.45	-14.13/-15.75	-17.71/-18.98	-17.98/-18.89	-14.84/-12.52	-11.57/-10.22	-9.29/-8.26	-7.26/-6.82	-6.63/-6.85	-7.52/-8.02	-8.46/-8.98	-10.13/-11	-12.12/-12.42	-12.38/-12.13	-12.41/-12.79	-12.57/-12.3	-11.74/-10.4	-9.37/-8.94	-8.92/-8.25	-7.25/-6.74	-7.72/-7.22		
Theta (15°)	-9.2/-10.83	-13.15/-15.29	-15.77/-15.46	-14.85/-14.11	-15.08/-17.22	-19.31/-19.05	-14.84/-12.09	-10.22/-6.35	-6.96/-6.56	-6.76/-7.21	-7.26/-8.03	-8.59/-11.89	-12.81/-12.52	-12.47/-12.35	-12.19/-11.03	-9.58/-6.64	-8.44/-6.34	-8.65/-8.85	-9.31/-9.19	-8.47/-7.63	-6.79/-7.17	-5.81/-5.15	-5.65/-6.35	-7.43/-8.24	
Theta (22.5°)	-7.26/-8.29	-11.03/-14.31	-12.59/-11.84	-11.81/-11.58	-12.15/-12.59	-13.06/-13.35	-11.58/-8.85	-6.56/-5.2	-4.59/-4.58	-5.24/-6.54	-7.88/-9.09	-10.66/-13.09	-15.1/-14.9	-14.1/-14.1	-12.9/-10.31	-8.23/-7.04	-6.6/-6.14	-5.93/-6.19	-6.61/-6.62	-5.96/-5.1	-4.42/-4.21	-4.47/-4.63	-4.82/-4.54	-6.36/-7.05	
Theta (30°)	-7.13/-7.06	-8.22/-9.72	-9.77/-9.04	-8.87/-8.36	-8.27/-7.19	-9.09/-9.92	-9.66/-7.99	-6.53/-5.42	-4.46/-4.23	-5.32/-6.27	-7.13/-8.67	-10.69/-12.75	-14.02/-14.89	-15.37/-13.48	-10.88/-9.24	-8.03/-6.92	-5.47/-4.76	-4.35/-4.13	-4.12/-4.77	-5.42/-5.38	-4.41/-3.77	-3.86/-4.34	-4.84/-5.64	-6.86/-7.95	
Theta (37.5°)	-6.06/-6.58	-7.43/-8.27	-8.94/-8.29	-8.07/-7.65	-5.81/-4.6	-4.57/-4.84	-5.02/-5.08	-5.66/-5.86	-5.52/-6.08	-6.81/-7.15	-7.39/-8.35	-10.64/-12.71	-13.35/-13.19	-12.66/-11.07	-8.52/-6.64	-6.24/-5.49	-4.59/-3.98	-3.11/-2.5	-2.96/-4.14	-4.12/-3.17	-2.61/-2.36	-2.62/-3.26	-3.95/-4.85	-5.5/-6.01	
Theta (45°)	-8.28/-8.26	-7.95/-6.68	-7.24/-8.85	-7.97/-7.7	-7.31/-6.2	-4.56/-3.38	-2.71/-5.23	-3.01/-3.61	-3.86/-4.55	-5.77/-6.72	-6.45/-6.51	-7.07/-8.42	-10.3/-9.6	-8.62/-8.96	-8.15/-6.36	-5.03/-4.12	-3.74/-3.18	-2.14/-1.6	-1.91/-2.43	-2.53/-2.13	-2.04/-2.3	-2.74/-2.28	-4.06/-5.4	-7.37/-8.47	
Theta (52.5°)	-3.66/-3.9	-5.94/-8.26	-7.13/-9.62	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	-6.59/-7.4	
Theta (60°)	-3.09/-3.12	-3.46/-4.7	-4.24/-5.13	-8.02/-6.76	-5.78/-6.79	-8.24/-10.21	-5.67/-3.33	-3.63/-4.61	-4.85/-5.54	-6.29/-6.26	-6.74/-8.16	-9.11/-10.65	-8.15/-5.97	-4.87/-4.52	-3.62/-3.52	-4.71/-5.93	-4.53/-3.23	-2.98/-2.96	-1.95/-2.22	-3.29/-3.09	-2.49/-2.21	-3/-3.95	-3.46/-2.38	-1.99/-3.02	
Theta (67.5°)	-2.36/-3.3	-3.25/-3.4	-4.24/-5.3	-4.51/-4.63	-5.88/-6.1	-6.22/-6.68	-6.22/-6.68	-6.22/-6.68	-6.22/-6.68	-6.22/-6.68	-6.22/-6.68	-6.22/-6.68	-6.22/-6.68	-6.22/-6.68	-6.22/-6.68	-6.22/-6.68	-6.22/-6.68	-6.22/-6.68	-6.22/-6.68	-6.22/-6.68	-6.22/-6.68	-6.22/-6.68	-6.22/-6.68	-6.22/-6.68	
Theta (75°)	0.47/-0.92	-1.18/-3.04	-2.21/-4.62	-3.86/-3.97	-4.84/-4.36	-3.47/-3.88	-4.78/-3.94	-8.61/-8.65	-8.74/-6.51	-3.82/-4.2	-2.09/-2.72	-1.368/-1.59	-3.56/-4.56	-5.29/-4.99	-2.42/-3.4	-3.39/-4.49	-5.64/-10.7	-11.98/-10.65	-7.46/-6.32	-4.38/-4.34	-3.11/-5.14	-3.11/-5.14	-0.45/-0.98		
Theta (82.5°)	2.62/1.75	0.71/-1.79	-0.47/-2.08	-3.61/-2.81	-2.6/-2.48	-3.11/-3.41	-5.11/-5.92	-5.23/-5.58	-4.87/-2.95	-0.75/-0.26	-0.31/-0.72	-0.76/-0.91	-1.78/-2.87	-2.44/-8.01	-0.09/-1.64	-1.89/-1.47	-1.72/-1.5	-0.83/-0.91	-1.04/-1.12	-4.67/-6.01	-6.78/-16.55	-19.04/-17.49	-4.680/2.2	2.36/3.85	
Theta (90°)	1.33/0.65	0.85/-0.79	-1.36/-2.11	-1.35/-1.05	-1.38/-1.8	-2.55/-2.59	-6.71/-5.08	-3.96/-3.82	-3.54/-1.85	0.20/0.7	0.47/0.02	-1.34/-0.86	-2.27/-2.51	-2.58/-1.6	-0.07/-1.25	-1.74/-0.9	-1.5/-1.1	0.37/0.2	0.02/-1.09	-4.58/-3.66	-3.49/-3.1	-11.73/-9.2	-6.67/-2.06	0.86/1.1	
Theta (97.5°)	-1.24/-3.69	-3.77/-5.94	-4.76/-2.7	-0.75/-0.46	-1.36/-2.46	-2.76/-4.52	-4.34/-5.5	-4.34/-5.5	-4.34/-5.5	-4.34/-5.5	-4.34/-5.5	-4.34/-5.5	-4.34/-5.5	-4.34/-5.5	-4.34/-5.5	-4.34/-5.5	-4.34/-5.5	-4.34/-5.5	-4.34/-5.5	-4.34/-5.5	-4.34/-5.5	-4.34/-5.5	-4.34/-5.5	-4.34/-5.5	
Theta (105°)	-1.88/-3.75	-8.79/-9.55	-7.88/-5.26	-2.58/-1.22	-2.16/-3.25	-2.79/-2.71	-3.32/-3.07	-2.99/-3.35	-3.65/-2.1	-0.48/-0.81	-1.23/-2.86	-4.18/-4.03	-7.47/-3.66	-3.26/-2.55	-2.72/-2.76	-2.84/-4.94	-8.13/-4.32	-3.54/-7.63	-4.11/-4.54	-9.07/-7.9	-4.97/-14.21	-8.59/-3.74	-3.17/-2.55	-2.36/-2.63	
Theta (112.5°)	-7.97/-6.35	-9.02/-7.3	-8.29/-5.24	-4.18/-2.04	-2.58/-3.82	-4.66/-3.96	-3.35/-2.17	-2.28/-2.42	-2.04/-1.5	-1.07/-1.08	-1.27/-3.52	-6.27/-7.11	-8.04/-5.55	-4.25/-3.8	-3.84/-3.32	-7.22/-11.21	-8.57/-8.08	-8.71/-7.17	-15.02/-17.89	-18.48/-13.69	-10.38/-16	-8.03/-3.05	-3.61/-8.99	-5.89/-11.41	
Theta (120°)	-11.02/-7.62	-9.36/-8.86	-11.95/-6.83	-5.03/-4.14	-3.33/-4.94	-8.79/-7.77	-5.09/-3.78	-3.41/-3.49	-3.16/-2.99	-3.72/-3.95	-4.15/-5.37	-10.92/-12.09	-9.43/-9.24	-5.96/-6.79	-9.82/-17.46	-15.18/-9.87	-11.48/-16.76	-17.11/-19.1	-19.09/-17.67	-14.77/-12.06	-16.77/-19.4	-14.39/-18.04	-14.32/-17.46		
Theta (127.5°)	-11.08/-11.66	-18.01/-9.79	-7.69/-8.24	-7.08/-6.2	-5.57/-8.45	-16.71/-13.93	-8.03/-5.81	-5.17/-5.88	-6.37/-6.07	-6.91/-9.32	-9.32/-7.56	-7.87/-8.22	-7.49/-10.19	-14.18/-12.72	-13.95/-15.4	-18.41/-18.18	-18.85/-10.99	-14.55/-12.03	-15.83/-14.78	-10.98/-13.41	-17.85/-9.05	-7.63/-11.93	-9.79/-8.9	-8.99/-9.4	
Theta (135°)	-13.16/-11.71	-11.34/-8.12	-8.19/-9.11	-9.74/-11.09	-12.45/-15.8	-13.41/-9.43	-9.33/-10.12	-11.78/-14.26	-16.92/-16.19	-13.62/-12.27	-10.91/-9.72	-8.92/-7.29	-7.45/-8.7	-8.54/-9.25	-9.75/-12.53	-18.77/-14.94	-16.52/-18.16	-16.44/-18.14	-19.22/-16.02	-9.58/-10.3	-10.44/-10.92	-10.85/-9.73	-9.64/-10.7	-14.26/-17.1	
Theta (142.5°)	-15.98/-16.95	-19.28/-18.63	-12.19/-9.87	-8.08/-7.84	-8.07/-9.53	-13.81/-18.19	-17.84/-18.16	-16.82/-13.23	-11.67/-10.37	-8.79/-8.32	-9.81/-11.92	-11.35/-11.94	-12.47/-12.35	-10.85/-8.75	-9.94/-9.47	-15.83/-12.94	-15.87/-13.35	-10.48/-12.32	-12.32/-10.67	-11.15/-10.65	-10.19/-9.27	-10.37/-10.5	-12.83/-17.58		
Theta (150°)	-8.3/-9.02	-14.97/-17.01	-15.94/-14.31	-14.89/-16.16	-18.67/-18.26	-17.83/-14.77	-10.47/-17.6	-18.56/-18.99	-18.27/-18.49	-18.33/-18.73	-18.65/-19.16	-18.75/-18.19	-16.07/-13.54	-13.29/-13.8	-14.37/-14.42	-14.06/-13.17	-14.28/-16.73	-16.52/-14.14	-14.42/-13.59	-14.6/-14.12	-14.51/-12.27	-11.43/-11.76	-11.48/-10.44	-10.65/-9.46	
Theta (157.5°)	-18.86/-18.27	-18.61/-16.89	-16.59/-18.43	-18.77/-18.96	-18.32/-18.24	-18.89/-16.65	-19.18/-18.74	-18.19/-18.7	-19.29/-18.5	-18.11/-18.94	-16.75/-14.98	-14.67/-14.81	-15.38/-15.15	-14.2/-13.24	-13.69/-11.1	-17.28/-19.42	-17.21/-14.41	-12.07/-10.97	-12.09/-15.16	-16.14/-14.98	-14.55/-15.1	-18.54/-18.74	-18.61/-18.07	-18.09/-19.15	
Theta (165°)	-15.55/-18.95	-18.75/-18.37	-18.91/-18.63	-18.4																					



# Radiated Composite Gain Data\_2.4GHz, 5GHz

# Appendix A

Theta	17.04-17.85	18.58-19.1	18.75-17.9	18.85-18.41	18.72-18.53	18.52-18.22	18.76-18.65	19.38-18.26	18.53-18.48	18.26-19	19.04-19.24	17.56-17.99	18.67-18.5	18.99-6.54	6.98-7.31	7.62-8.32	9.83-12.24	15.44-19.36	17.98-18.71	18.83-18.47	17.8-16.69	15.46-18.05	17.83-17.69	14.66-14.2
Freq(Hz)	5.6GPol	ThetaAnt.2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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°)	-5.27-5.61	-6.05-6.89	-7.91-8.63	-8.74-8.72	-9.1-9.45	-9.64-9.26	-8.17-9.16	-5.9-5.33	-4.94-4.46	-3.88-3.26	-3.12-3.26	-3.56-3.37	-3.27-3.9	-5.07-6.15	-7.09-7.97	-8.57-8.87	-9.17-9.41	-8.98-7.9	-7.01-5.86	-4.75-3.98	-3.83-4.12	-4.58-4.56	-4.19-4.23	-4.8-5.31
Theta(7.5°)	-3.88-4.75	-5.5-5.99	-6.67-7.26	-7.43-8	-8.72-8.78	-8.77-8.7	-8.18-7.16	-5.73-4.47	-4.01-4.18	-4.79-4.43	-4.12-3.73	-4.91-6.07	-6.32-6.52	-7.53-8.88	-9.99-10.51	-10.36-9.64	-9.32-9.23	-8.56-7.86	-7.27-6.48	-5.9-5.36	-4.79-4.23	-3.81-3.6	-3.99-4.17	-4.05-3.8
Theta(15°)	-8.88-10.28	-11.25-11.19	-10.92-10.5	-9.43-8.47	-7.59-6.73	-6.16-5.66	-5.71-5.92	-5.69-5.25	-4.67-4	-3.74-4.15	-4.68-4.84	-5.45-6.6	-7.97-8.7	-9.56-11	-12.19-13.15	-12.56-9.89	-7.7-6.96	-6.81-7.11	-7.32-6.63	-5.37-4.48	-4.16-3.94	-3.99-4.18	-4.84-6.06	-7.8-8.48
Theta(22.5°)	-17.88-18.99	-15.47-14.39	-13-11.61	-10.71-9.62	-8.27-6.78	-5.89-5.88	-6.2-6.39	-6.06-5.33	-4.5-4.14	-4.28-4.81	-5.39-5.74	-6.16-7.72	-9.94-11.23	-14.01-18.96	-14.42-10.36	-8.6-6.71	-5.27-5.43	-6.63-6.89	-5.42-4.06	-3.74-4.21	-5.05-5.61	-6.26-6.76	-7.59-9.55	-14.07-18.61
Theta(30°)	-9.9-6.65	-6.19-7.71	-9.59-8.83	-7.25-5.72	-4.66-3.78	-4.03-4.33	-4.92-5.14	-4.77-4.22	-4.15-3.89	-3.69-3.4	-3.31-3.29	-3.33-3.85	-4.06-4.29	-6.16-9.72	-12.46-10.95	-8.11-5.88	-4.33-4.74	-4.3-2.52	-1.76-2.19	-2.5-2.73	-3.25-3.76	-5.01-7.26	-10.66-12.17	-13.13-14.87
Theta(37.5°)	-5.67-3.62	-2.8-2.6	-3.03-4.23	-4.94-4.18	-2.74-2.27	-2.37-2.63	-3.02-3.54	-2.76-3	-3.83-4.14	-4.16-3.62	-2.45-1.59	-1.74-2.54	-2.73-2.44	-3.4-5.58	-7.62-9.35	-6.86-3.91	-3.35-2.94	-2.1-1.74	-1.71-1.42	-1.45-2.42	-3.97-4.8	-4.82-5.93	-8.94-11.89	-9.4-7.6
Theta(45°)	-5.67-3.64	-2.41-2.27	-1.84-2.47	-2.91-1.96	-0.02-0.15	-1.47-2.81	-3.18-2.69	-2.08-2.58	-4.52-6.22	-6.55-6.06	-4.5-2.76	-2.05-2.94	-4.35-3.91	-3.53-3.87	-3.93-5.23	-5.01-3.59	-2.71-1.24	-0.35-0.47	0.64-0.44	-0.24-1.6	-2.34-1.71	-1.4-2.34	-4.42-7.14	-7.8-6.27
Theta(52.5°)	-15.36-17.79	-13.61-11.31	-7-4.66	-3.64-2.99	-0.51-0.3	0.06-1.86	-2.98-3.67	-3.06-3.65	-4.43-3.74	-3-3.09	-3.74-4.17	-4.58-4.57	-4.73-4.91	-3.53-3.11	-3.67-4.69	-4.19-2.99	-2.16-1.9	-0.6-0.87	0.73-0.33	0.05-0.63	-0.85-0.85	-1.16-1.69	-3.58-8.45	-18.42-15.04
Theta(60°)	-3.08-2.22	-3.51-5.11	-12.58-18.75	-8.68-5.83	-3.72-1.98	-2.56-2.27	-1.65-2.74	-3.62-4.9	-5.94-4.44	-3.05-3.52	-4.43-4.98	-6.36-6.29	-5.44-5.1	-3.56-3.51	-3.2-2.7	-2.8-3.96	-4.33-3.67	-1.12-0.88	-1.46-0.55	-0.63-2.28	-1.74-0.47	0.58-1.12	-3.54-5.4	-5.68-5.81
Theta(67.5°)	0.311-9	1.46-7.5	-2.4-5.55	-6.96-7.73	-7.42-6.05	-7.22-4.58	-2.32-4.88	-5.62-4.38	-4.06-3.62	-3.57-4.53	-4.97-4.96	-6.24-4.64	-4.96-3.09	-2.34-3.99	-5.32-3.88	-2.87-3.76	-4.18-3.18	-1.93-2.55	-2.51-4.6	-2.97-4.73	-3.17-1.14	-2.69-5.27	-3.94-0.68	0.69-0.18
Theta(75°)	-0.02-2.15	1.67-1.23	-3.03-4.67	-2.05-2.1	-2.97-4.07	-7.82-5.77	-4.42-7.31	-8.41-4.39	-3.75-4.45	-4.31-5.03	-5.72-5.31	-6.37-4.93	-6.12-9.27	-1.24-2.23	-4.71-3.11	-1.43-1.65	-2.04-2	-1.62-0.89	-1.26-3.44	-5.04-6.33	-4.53-2.7	-3.17-3.58	-0.66-1.29	2.14-0.41
Theta(82.5°)	0.20-63	1.09-1.59	-0.62-4.36	-6.66-2.63	-1.63-0.95	-3.18-5.61	-4.87-8.93	-8.12-4.04	-3.71-3.54	-3.46-3.79	-4.98-4.63	-5.3-5.19	-5.51-1.35	0.1-1.75	-4.02-1.98	-0.98-1.42	0.01-0.97	0.68-1.25	-1.12-2.85	-3.76-7.68	-5.43-3.45	-3.57-7.55	-3.85-0.77	2.99-4.23
Theta(90°)	2.21-1.51	2.24-2.38	0.86-1	-1.44-2.39	-2.41-0.44	-3.26-3.35	-2.31-7.03	-8.45-4.55	-3.66-2.52	-0.46-0.09	-0.49-0.09	-2.75-2.82	-3.61-1.36	1.05-0.77	-1.11-2	0.76-0.97	-0.22-0.32	1.32-0.23	0.36-0.41	-4.67-5.78	-4.99-10.96	-12.61-16.84	-2.43-1.22	2.76-3.88
Theta(97.5°)	-4.06-3.51	-0.36-7.2	0.22-0.8	1.71-1.16	-0.4-0.11	-2.89-2.83	-2.39-5.96	-5.99-6.23	-2.81-1.58	-0.09-1.2	1.07-0.1	-1.04-2.08	-3.23-0.12	0.33-0.9	-1.76-2.34	0.67-1.1	-1.03-1.01	0.23-0.9	0.43-1.7	-7.02-4.16	-1.81-9.4	-16.46-8.52	-4-1.99	-0.32-1.3
Theta(105°)	-7.42-18.45	-9.2-14.98	-3.7-12.04	0.79-1.29	1.16-0.73	-1.45-2.12	-1.52-1.06	-6.4-5.46	-4.23-3.74	0.93-1.2	-0.93-1.2	-0.93-1.2	-0.93-1.2	-1.89-2.63	-4.23-3.24	-3.63-3.67	-3-6.52	-4.47-2.79	-5.09-6.17	-10.67-5.85	-0.95-9.11	-18.16-6.17	-4.11-1.84	-3.95-5.24
Theta(112.5°)	-12.62-12.6	-16.9-16.93	-9.19-6.91	-4.24-2.02	0.34-0.32	-0.93-0.02	-1.6-3.73	-4.79-3.35	-2.88-2.15	-0.7-0.38	-0.94-2.35	-3.8-5.91	-7.46-7.16	-4.17-6.74	-10.51-7.5	-4.45-7	-9.53-6.39	-7-8.98	-11.53-15.53	-14.77-17.92	-15.19-18.85	-12.8-5.96	-7.55-9.81	-8.11-8.09
Theta(120°)	-15.32-12.33	-8.33-8.75	-9-9.24	-7.72-3.33	-2.2-2.97	-3.34-2.33	-2.96-4.53	-3.06-2.58	-3.09-2.59	-2.55-1.49	-1.23-2.67	-3.5-5.82	-7.56-8.88	-7.31-7.95	-17.34-9.06	-6.74-5.67	-8.77-13.98	-10.42-18.05	-16.82-17.7	-11.96-10.1	-17.01-11.48	-18.71-17.45	-13.91-17.75	-16.64-19.04
Theta(127.5°)	-18.4-7.29	-6.91-4.77	-9.54-6.22	-3.56-3.62	-3.15-0.53	-4.96-2.98	-3.66-3.73	-3.36-2.77	-3.6-5.51	-5.56-4.66	-4.67-3.95	-3.75-8.18	-8.99-8.87	-7.18-10.91	-14.28-9.48	-10.56-18.28	-11.93-6.87	-16.32-16.28	-17.01-17.69	-17.63-16.94	-15.22-13.92	-13.53-12.6	-11.61-11.71	-11.71-12.06
Theta(135°)	-8.69-7.17	-8.89-6.44	-5.15-3.47	-2.82-3.43	-5.68-5.6	-5.32-5.44	-6.57-8.18	-6.05-5.41	-6.48-6.77	-5.61-5.07	-5.05-4.95	-6.59-7.35	-6.84-8.52	-9.08-10.06	-9.46-8.81	-12.51-17.7	-17.84-10.97	-8.21-4.55	-4.89-11.66	-13.78-6.55	-6-8.53	-6.42-7.22	-5.33-8.38	-10.66-16.08
Theta(142.5°)	-10.06-6.47	-6.72-5.08	-2.92-3.17	-3.86-4.36	-4.72-4.77	-5.33-8.25	-2.96-4.53	-3.06-2.58	-3.09-2.59	-2.55-1.49	-1.23-2.67	-3.5-5.82	-7.56-8.88	-7.31-7.95	-17.34-9.06	-6.74-5.67	-8.77-13.98	-10.42-18.05	-16.82-17.7	-11.96-10.1	-17.01-11.48	-18.71-17.45	-13.91-17.75	-16.64-19.04
Theta(150°)	-5.17-6.24	-10.45-11.92	-8.94-7.83	-7-6.23	-5.08-4.35	-5.49-9.31	-14.44-18.03	-17.5-18.2	-18.44-13.87	-13.41-11.63	-8.88-8.28	-8-8.29	-8.17-8.02	-7.9-9.22	-12.63-17.24	-14.52-11.34	-8.53-8.58	-9.85-8.3	-8.22-10.03	-11.78-11.38	-14.38-8.98	-5.12-4.81	-7.09-6.56	
Theta(157.5°)	-11.33-9.84	-8.62-7.94	-9.03-18.24	-18.36-17.5	-18.47-19.04	-18.32-18.89	-18.53-17.78	-18.34-18.86	-19.02-11.63	-10.33-10.85	-11.93-12.57	-12.09-12.06	-13.98-14.29	-13.88-11.49	-9.08-7.91	-9.15-12.05	-14.01-16.33	-18.8-16.58	-15.35-14.21	-10.92-10.32	-13.11-19.01	-17.63-16.68	-11.47-11.63	-18.03-15.79
Theta(165°)	-17.66-15.27	-12.8-11.84	-11.57-10.53	-8.3-7.47	-7.5-18.48	-18.45-18.68	-18.43-17.7	-17.89-12.92	-18.32-19.09	-18.75-19.02	-18.23-18.84	-18.33-17.34	-18.21-19.2	-14.32-13.31	-11.9-12.95	-16.5-18.13	-18.42-19.59	-17.78-16.42	-15.08-12.94	-9.92-8.75	-8.59-9.42	-10.25-11.1	-11.56-11.99	-13.83-17.89
Theta(172.5°)	-18.64-17.57	-18.52-18.05	-18.71-17.43	-17.67-17.87	-18.19-17.98	-17.67-18.58	-18.52-19.16	-18.96-18.66	-17.97-18.23	-18.49-18.34	-17.81-18.81	-13.91-13.58	-14.32-15.99	-18.33-18.58	-19.11-17.69	-17.63-16.28	-17.01-17.69	-16.32-16.28	-15.22-13.92	-13.53-12.6	-11.61-11.71	-11.71-12.06	-12.31-13.7	
Theta(180°)	-18.5-18.33	-18.15-17.69	-19.15-18.36	-18.55-19.09	-19.14-18	-18.04-19.06	-18.01-17.53	-18.99-18.15	-17.89-18.49	-18.91-18.23	-19.18-18.96	-17.64-18.81	-18.71-18.1	-17.5-18.14	-18.03-19	-15.72-14.34	-14.11-14.32	-14.57-15	-15.92-17.15	-16.53-14.69	-13.61-13.74	-14.3-13.94	-13.4-13.22	-12.33-11.38
Freq(Hz)	5.785GPol	PhiAnt.2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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°)	-5.47-5.85	-5.94-5.83	-5.66-6.06	-6.72-6.92	-6.96-6.56	-5.86-5.37	-5.4-5.61	-6.2-6.96	-7.35-7.27	-7.35-7.34	-7.82-9.21	-10.48-10.81	-10.38-9.77	-9.07-8.92	-8.86-8.41	-7.88-7.28	-6.74-6.38	-6.66-6.46	-6.59-7.14	-7.45-7.24	-6.65-6.31	-6.09-6.03	-6.12-5.84	-5.23-5.07
Theta(7.5°)	-14.12-13.33	-10.69-9.4	-8.67-8.13	-7.88-8.87	-6.26-6.11	-5.87-5.75	-6.12-6.09	-6.44-7.28	-7.98-8.6	-9.18-8.3	-6.38-5.73	-6.21-5.94	-4.89-4.44	-4.69-5.01	-5.27-5.6	-5.96-6.43	-7.21-7.83	-8.02-7.54	-7.22-7.16	-6.98-7.6	-6.67-7.03	-7.77-8.7	-9.71-10.52	-10.09-13.74
Theta(15°)	-15.22-11.8	-10.6-9.74	-9.41-8.64	-8-7.09	-6.15-7.5	-5.49-5.48	-5.62-5.																	

Freq(Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 Max Gain (dBi)	3.14	3.66	3.92	4.79
Ant. 2 Max Gain (dBi)	5.2	5.2	5.91	5.81
Ant. 3 Max Gain (dBi)	4.96	3.16	4.67	5.52
Ant. 4 Max Gain (dBi)	3.14	2.67	2.29	4.15
Ant. 1 Polarization/ $\theta$ (°)/ $\phi$ (°)	Theta/52.5/7.5	Theta/45/15	Theta/45/30	Theta/135/195
Ant. 2 Polarization/ $\theta$ (°)/ $\phi$ (°)	Theta/142.5/292.5	Theta/135/292.5	Theta/142.5/300	Theta/135/292.5
Ant. 3 Polarization/ $\theta$ (°)/ $\phi$ (°)	Theta/52.5/187.5	Theta/52.5/187.5	Theta/60/187.5	Theta/60/195
Ant. 4 Polarization/ $\theta$ (°)/ $\phi$ (°)	Theta/150/82.5	Theta/60/225	Theta/112.5/97.5	Theta/157.5/105
Max Gain (dBi)	5.2	5.2	5.91	5.81
DG [1SS] (dBi)	6.04	5.65	6.14	6.19
DG [2SS] (dBi)	5.2	5.2	5.91	5.81
DG [4SS] (dBi)	5.2	5.2	5.91	5.81









# Radiated Composite Gain Data\_6GHz

# Appendix B

Theta	Phi	Gain	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(22.5°)	Phi(7.5°)	-11.55/-12.2	-13.32/-12.43	-11.19/9.56	-7.07/4.45	-2.79/2.59	-3.01/-2.46	-1.91/-1.21	-0.53/-0.64	-1.41/-2.7	-3.91/4.76	-5.83/7.62	-8.57/9.53	-9.36/8.21	-8.89/5.11	-3.33/-2.41	-1.97/-1.87	-1.57/-1.41	-1.37/-3.22	-2.41/2.78	-3.59/4.57	-5.06/6.09	-6.41/6.18	-6.73/8.12	-9.47/11.29
Theta(30°)	Phi(15°)	-10.39/-13.4	-18.85/-18.07	-9.52/-5.22	-3.23/-2.5	-1.37/-0.97	-1.35/-1.23	-1.33/-1.21	-1.23/-0.94	-1.73/-3.33	-5.31/-7.46	-9.6/-13.42	-17.7/-17.83	-19.13/-15.8	-9.43/-6.68	-5.08/-4.29	-3.37/-2.24	-1.5/-7.8	-0.39/-0.71	-2.09/-3.04	-3.74/-4.4	-5.37/-5.72	-5.89/-5.36	-6.47/-5.2	-8.28/-9.79
Theta(37.5°)	Phi(22.5°)	-6.78/-8.43	-12.01/-13.07	-14.08/-11.3	-8.38/-6.46	-4.81/-3.17	-2.62/-2.13	-2.52/-2.57	-2.09/-1.81	-2.13/-3.49	-4.88/-7.76	-9.4/-13.42	-12.03/-18.7	-18.3/-14.2	-12.03/-4.8	-5.74/-3.91	-3.75/-3.49	-4.42/-4.1	-3.75/-3.49	-3.73/-4.83	-6.14/-7.76	-6.02/-6.88	-6.71/-6.07	-7.17/-6.06	-8.24/-12.93
Theta(45°)	Phi(30°)	-13.16/-16.73	-15.27/9.9	-7.81/5.47	-4.71/4.74	-5.61/4.97	-2.61/0.47	0/0.97	-2.3/-1.9	-4.07/-5.58	-6.71/-9.18	-12.05/-13.88	-13.02/-12.5	-14.07/-16.51	-12.58/7.92	-5.25/-3.78	-2.87/2.32	-1.86/-2.25	-2.53/-0.45	-5.01/3.87	-2.44/-3.15	-4.66/-4.15	-3.02/-2.64	-2.79/-4.43	-9.2/-15.13
Theta(52.5°)	Phi(37.5°)	-12.28/-11.41	-9.24/-5.85	-4.68/-4.5	-4.51/-5.22	-5.21/-5.56	-4.72/-2.29	-1.93/-2.88	-3.9/-3.69	-4.16/-5.59	-4.87/-5.98	-7.2/-8.92	-9.3/-10.82	-7.8/-8.51	-4.83/-4.22	-4.53/-3.54	-3.48/-3.78	-4.11/-5.68	-7.48/-6.41	-6.44/-7.8	-9.05/-9.78	-6.71/-4.45	-5.51/-9.41	-12.9/-15.07	-12.9/-15.07
Theta(60°)	Phi(45°)	-11.05/-8.12	-6.99/-6.1	-2.98/-2.38	-2.54/-6	-6.36/-8	-6.82/-2.98	-1.79/-3.3	-3.28/-1.38	-1.38/-3.42	-4.82/-5	-6.98/-7.56	-9.4/-8.86	-4.68/-3.03	-3.66/-4.6	-5.34/-5	-5.74/-7.2	-5.24/-4.1	-4.13/-5.27	-6.12/-8.03	-11.7/-12.7	-8.7/-8.07	-6.61/-9.78	-12.74/-12.93	-12.74/-12.93
Theta(67.5°)	Phi(52.5°)	-16.02/9.53	-6.84/-5.5	-4.6/-3.03	-4.03/-7.8	-7.88/-5.87	-6.36/-8.13	-4.25/-4.35	-5.86/-3.41	-1.43/-3.16	-4.97/-5.32	-4.35/-5.34	-7.46/-7.5	-7.72/-8.39	-6.78/-5.38	-5.56/-6.07	-5.35/-4.35	-4.84/-5.24	-5.44/-4.25	-6.12/-8.98	-8.47/-13.67	-18.53/-7.51	-7.25/-6.77	-7.01/-10.78	-13.54/-16.13
Theta(75°)	Phi(60°)	-18.03/-13.05	-9.51/7.94	-8.39/-7.66	-9.21/-11.73	-12.37/-7.45	-6/-5.2	-3.23/-4.8	-6.49/-4.96	-2.4/-3.96	-6.67/-5.52	-6.09/-7.8	-10.73/-12.87	-14.86/-13.89	-13.28/-7.96	-6.57/-5.88	-3.31/3.54	-4.7/-4.1	-4.43/-9.24	-10.08/-16.05	-12.16/-5.87	-4.99/-8.37	-5.64/-9.1	-13.87/-17.9	-13.87/-17.9
Theta(82.5°)	Phi(67.5°)	-18.55/-11.96	-12.4/-11.24	-15.21/-15.36	-15.76/-14.75	-13.67/-6.2	-5.26/-4.46	-3.71/-2.45	-2.04/-4.22	-4.07/-6.84	-10.82/-7.32	-7.92/-13.04	-13.74/-18.24	-8.78/-8.87	-11.34/-6.73	-2.48/-0.95	-0.98/-0.38	-0.71/-0.46	-6.93/-7.76	-8.53/-4.7	-2.73/-9.93	-13.9/-18.94	-13.34/-12.12	-13.34/-12.12	-13.34/-12.12
Theta(90°)	Phi(75°)	-14.48/-18.26	-17.39/-17.77	-18.7/-18.61	-18.85/-11.61	-10.9/-5.52	-3.93/-6.95	-7.97/-4.37	-3.02/-7.78	-6.53/-7.69	-15.7/-19.16	-13.76/-18.4	-17.96/-12.6	-12.93/-11.73	-11.71/-13.22	-14.73/-8.84	-4.01/-1.19	1.10/39	-0.64/-0.96	-0.65/-2.71	-6.32/-5.49	-4.59/-3.99	-2.27/-7.12	-18.85/-18.26	-14.35/-16.16
Theta(97.5°)	Phi(82.5°)	-14.61/-18.04	-17.81/-17.94	-18.13/-95	-10.66/-11.7	-8.26/-4.5	-4.38/-7.11	-10.57/-5.1	-3.26/-7.84	-7.05/-6.62	-16.29/-17.88	-14.86/-17.03	-18.26/-18.22	-10.69/-9.7	-17.49/-15.59	-9.35/-9.8	-8.05/-1.65	-0.89/-2.72	-2.71/-2.23	-1.96/-0.48	-5.86/-6.84	-4.07/-5.21	-6.44/-7.37	-18.21/-15.79	-18.37/-17.24
Theta(105°)	Phi(90°)	-15.54/-12.6	-13.75/-10.85	-14.52/-9.74	-8.92/-5.57	-3.62/-5.11	-3.36/-3.98	-4.38/-2.76	-0.73/-2.59	-4.52/-5.04	-10.01/-12.1	-18.24/-19.18	-19.19/-15.05	-11.82/-11.29	-15.06/-16.26	-16.54/-11.81	-7.52/-3.34	-3.66/-3.21	-2.92/-6.1	-2.74/-4.3	-7.34/-8.28	-7.8/-6.38	-11.18/-11.16	-10.41/-12.13	-15.38/-19.02
Theta(112.5°)	Phi(97.5°)	-15.25/-15.64	-11.79/-12.12	-9.47/-6.07	-3.78/-3.08	-3.25/-4.84	-7.96/-7.65	-6.46/-9.52	-8.64/-8.94	-4.06/-6.77	-13.9/-13.04	-17.81/-17.44	-19.29/-16.89	-9.34/-10.4	-14.42/-16.96	-17.84/-12.42	-7.91/9.93	-10.13/-4.51	-4.11/-5.28	-2.31/-2.15	-6.77/-7.46	-14.28/-16.2	-13.71/-16.5	-15.95/-9.02	-15.55/-16.75
Theta(120°)	Phi(105°)	-14.18/-12	-19.4/-13.08	-8.56/-7	-7.65/-4.8	-3.94/-4.5	-4.93/-8.75	-13.85/-12.12	-10.63/-8.71	-6.21/-18.2	-16.91/-18.12	-18.97/-12.14	-16.83/-6.97	-8.66/-13.26	-6.65/-6.6	-4.01/-1.51	-18.16/-15.3	-3.61/-3.89	-1.44/-1.51	-3.69/-6.9	-16.61/-18.4	-18.59/-12.28	-11.05/-5.49	-6.36/-10.38	-6.36/-10.38
Theta(127.5°)	Phi(112.5°)	-10.31/-14.19	-13.74/-19.08	-11.76/-7.82	-7.31/-6.6	-6.62/-12.52	-18.74/-9.99	-3.53/-4.23	-7.4/-6.88	-10.06/-17.48	-10.97/-10	-8.94/-14.67	-11.29/-9.62	-4.51/-2.59	-3.47/-3.3	-5.15/-5.42	-7.04/-1.59	-5.97/-11.7	-8.06/-9.68	-9.63/-7.75	-11.97/-17.74	-17.37/-19.07	-18.59/-12.94	-12.75/-11.42	-10.73/-6.63
Theta(135°)	Phi(120°)	-11.8/-12.97	-8.72/-12.05	-13.59/-12.6	-8.88/-11.36	-9.02/-6.96	-10.62/-14.02	-8.66/-8.16	-9.65/-9.92	-15.73/-8.5	-5.94/-4.32	-5.67/-10.16	-11.98/-14.67	-9.31/-5.07	-1.57/-1.67	-6.62/-7.37	-2.84/-0.37	-1.36/-3.71	-7.06/-14.22	-5.26/-2.83	-10.61/-15.94	-8.85/-11.42	-16.38/-10.07	-15.23/-19.05	-10.01/-8.15
Theta(142.5°)	Phi(127.5°)	-12.81/-10.08	-15.44/-16.83	-14.01/-19.07	-17.54/-15.36	-11.09/-3.78	-10.26/-10.2	-16.88/-16.1	-7.98/-5.24	-5.54/-6	-5.41/-2.2	-13.43/-17.05	-16.66/-13.64	-11.41/-6.92	-3.28/-1.97	-2.29/-5.06	-0.47/-0.34	-0.56/-1.63	-9.56/-11.53	-2.16/-0.7	-3.01/-11.09	-5.85/-1.6	-6.44/-9.37	-7.37/-18.69	-18.23/-19.32
Theta(150°)	Phi(135°)	-13.97/-10.87	-12.67/-18.31	-16.19/-19.04	-8.68/-6.86	-8.79/-4.48	-11.71/-14.07	-13.99/-18.04	-10.53/-6.91	-5.86/-7.07	-8.78/-11.55	-16.68/-16.26	-17.14/-14.22	-11.49/-11.39	-5.61/-3.38	-2.98/-2.24	-0.90/16	0.65/-3.93	-15.88/-12.73	<b>1.7914</b>	0.38/-5.07	-12.51/-5.33	-6.44/-15.8	-11.91/-16.17	-14.55/-19.02
Theta(157.5°)	Phi(142.5°)	-10.21/-11.14	-15.34/-17.26	-13.68/-10.51	-12.95/-18.73	-13.95/-12.57	-17.92/-18.45	-12.62/-10.87	-9.04/-7.47	-8.39/-11.14	-11.23/-10.45	-11.86/-13.66	-14.92/-17.34	-13.6/-8.39	-5.28/-4.7	-4.35/-4.4	-4.46/-4.3	-5/-7.86	-9.06/-5.38	-2.13/-0.89	-1.44/-3.45	-4.9/-4.03	-4.21/-7.04	-10.82/-14.6	-16.84/-11.37
Theta(165°)	Phi(150°)	-14.19/-12.82	-12.39/-11.89	-14.33/-16.86	-17.44/-11.86	-11.49/-14.16	-9.02/-8.1	-8.87/-12.57	-18.89/-19.01	-18.79/-13.81	-13.08/-12.15	-12.55/-13.41	-14.17/-16.58	-12.67/-7.44	-4/-1.75	-1.81/-3.35	-5.74/-8.85	-12.27/-15.49	-15.11/-15.1	-8.04/-2.65	-5.54/-5.44	-5.38/-6.66	-6.56/-6.34	-11.84/-13.63	-18.98/-19
Theta(172.5°)	Phi(157.5°)	-17.99/-17.79	-19.38/-18.45	-17.52/-14.28	-14.53/-15.12	-18.34/-18.83	-18.22/-18.13	-17.06/-18.94	-15.03/-11.01	-9.02/-8.08	-7.16/-6.6	-8.67/-5.53	-8.5/-10.64	-14.23/-14.18	-19.16/-14.59	-10.94/-10.4	-12.29/-16.85	-18.38/-18.99	-12.86/-8.61	-6.04/-4.94	-4.13/-6	-4.03/-5.59	-7.44/-10.73	-15.67/-18.66	-19.07/-17.65
Theta(180°)	Phi(165°)	-10.51/-10.19	-8.79/-8.07	-8.74/-7.91	-7.79/-5.12	-7.93/-7.9	-7.28/-6.74	-6.31/-6.23	-6.33/-6.59	-7.56/-6.63	-10.12/-12.96	-16.33/-18.07	-18.37/-17.88	-17.49/-13.04	-12.21/-11.5	-12.25/-13.44	-14.14/-12.84	-9.96/-8.78	-6.22/-5.59	-6.66/-6.46	-8.45/-10.41	-11.65/-11.83	-11.97/-12.64	-11.91/-11.15	-11.91/-11.15
Phi(7.5°)	Theta(22.5°)	0.02/0.01	-0.24/-0.34	-0.88/-1.34	-1.58/-2.32	-3.56/-4.78	-5.99/-6.78	-6.97/-6.57	-6.68/-4.69	-3.65/-2.87	-2.37/-2	-1.83/-1.76	-1.75/-1.86	-1.93/-2.43	-2.93/-3.5	-4.19/-4.83	-5.33/-5.97	-6.38/-6.14	-5.75/-1.9	-4.71/-4.27	-4.03/-3.1	-1.86/-1.1	-0.75/-0.41	-0.08/0.05	0.27/0.32
Phi(15°)	Theta(30°)	-0.09/-0.77	-1.21/-1.22	-1.41/-1.3	-1.45/-1.28	-3.67/-4.41	-6.91/-8.01	-8.43/-7.58	-6.53/-5.45	-4.59/-4.08	-4.58/-5.34	-4.9/-7.41	-8.31/-9.44	-8.92/-8.63	-8.52/-9.92	-10.78/-12.61	-13.16/-13.33	-9.91/-8.5	-6.59/-4.78	-3.88/-3.02	-1.96/-0.97	-0.58/0.04	0.3/0.8	0.61/0.08	0.07/0.04
Phi(22.5°)	Theta(37.5°)	0.80/0.54	0.21/-0.76	-1.95/-2.8	-3.18/-4.3	-5.77/-7.8	-8.47/-7.24	-5.73/-5.37	-6.05/-7	-8.39/-10.13	-11.96/-12.6	-12.01/-11.88	-11.97/-11.2	-10.42/-9.39	-9.29/-9.16	-11.95/-15.91	-17.85/-17.16	-14.34/-9.47	-6.01/-4.03	-3.23/-2.95	-2.8/-2.66	-1.92/-1.2	-0.36/0.55	0.62/0.93	1.32/1.46
Phi(30°)	Theta(45°)	-0.46/-0.66	-0.67/0.19	0.26/0.43	-1.52/-3.28	-5.41/-13.8	-9.15/-9.78	-7.91/-6.83	-6.48/-6.86	-11.22/-16.56	-14.11/-13.94	-17.82/-16.34	-12.69/-10.25	-8.9/-8.16	-6.13/-6.06	-10.51/-14.56	-15.36/-18.72	-17.51/-9.92	-6.54/-4.74	-4.37/-0.47	-3.87/-2.59	-1.03/-0.08	0.95/1.66	1.27/1.24	1.34/0.79
Phi(37.5°)	Theta(52.5°)	2.41/2.52	2.53/2.94	3.31/3.27	0.67/-1.38	3.91/-5.8	-6.18/-4.91	-4.48/-5.35	-6.48/-6.31	-7.63/-9.48	-10.82/-11.32	-13.22/-13.24	-13.86/-18.17	-10.13/-8.26	-8.41/-7.23	-8.19/-11.61	-18.19/-17.89	-11.21/-7.39	-5.97/-4.75	-3.52/2.8	-1.86/-3.02	0.88/0.99	0.37/0.05	-0.5/-0.68	-0.02/1.11
Phi(45°)	Theta(60°)	3.17/3.4	3.47/3.54	<b>3.92/3</b>	0.91/-1.56	-3.97/-5.07	-3.91/-2.53	-1.99/-2.3	-5.39/-7.98	-7.92/-9.9	-10.21/-11.8	-9.11/-8.87	-10.11/-18.41	-13.61/-18.2	-17.88/-18.07	-19.06/-13.27	-10.51/-11.03	-9.88/-7.14	-4.9/-3.05	-2.45/-2.16	-2.39/-1.81	-1.37/-1.12	-1.89/-2.5	-1.18/0.08	0.69/1.98
Phi(52.5°)	Theta(67.5°)	0.92/2.07	3.14/2.85	2.34/1.28	-1.03/-3.22	-4.54/-4.15	-3.71/-4.12	-3.07/-3.65	-7.53/-6.93	-7.46/-7.09	-9.42/-18.65	-18.9/-18.17	-18.34/-15.21	-13.44/-12.87	-12.64/-13.21	-17.59/-13.18	-7.25/-5.63	-8.16/-9.52	-6.11/-2.55	-2.78/-3.56	-8.13/-7.09	-2.93/-2.76	-3.15/-2.89	-1.17/0.4	0.65/0.94
Phi(60°)	Theta(75°)	0.2/0.3	1.53/1.41	0.23/-1.65	-3.54/-5.28	-7.28/-6.4	-5.02/-4.45	-2.63/-1.55	-3.74/-7.06	-6.71/-6.5	-10.57/-10.64	-12.93/-11.58	-17.41/-18.95	-14.14/-12.83	-11.49/-8.78	-9.31/-9.26	-12.24/-7.9	-7.14							



# Radiated Composite Gain Data\_6GHz

# Appendix B

Theta (°)	0.381/4.3	1.63/1.04	-6.15/4.37	-3.54/3.38	-8.54/18.66	-13.52/17.69	-18.95/10.91	-7.54/7.1	-6.43/5.48	4.08/3.24	-2.45/3.16	-3.47/2.59	-2.84/3.48	-3.66/4.87	-5.42/5.8	4.05/5.01	-12.91/12.42	-9.84/9.95	-17.69/18.69	-18.71/14.51	-18.74/14.93	-8.07/4.82	-2/1.23	-0.48/0.18
Theta (°)	0.381/4.3	1.63/1.04	-6.15/4.37	-3.54/3.38	-8.54/18.66	-13.52/17.69	-18.95/10.91	-7.54/7.1	-6.43/5.48	4.08/3.24	-2.45/3.16	-3.47/2.59	-2.84/3.48	-3.66/4.87	-5.42/5.8	4.05/5.01	-12.91/12.42	-9.84/9.95	-17.69/18.69	-18.71/14.51	-18.74/14.93	-8.07/4.82	-2/1.23	-0.48/0.18
Theta (°)	-0.120/9.3	1.46/4.33	-9.78/8.94	-7.68/7.65	-7.58/16.15	-17.82/17.56	-17.56/12.11	-8.86/7.03	-7.74/5.3	-3.59/2.77	-2.5/2.36	-2.67/2.05	-1.36/0.54	-0.96/2.73	-5.17/6.38	-6.64/9.17	-14.17/15.28	-12.64/10.21	-9.04/8.94	-10.98/10.81	-18.33/11.76	4.56/2.62	-2.35/1.47	-5.72/0.44
Theta (°)	-0.120/9.3	1.46/4.33	-9.78/8.94	-7.68/7.65	-7.58/16.15	-17.82/17.56	-17.56/12.11	-8.86/7.03	-7.74/5.3	-3.59/2.77	-2.5/2.36	-2.67/2.05	-1.36/0.54	-0.96/2.73	-5.17/6.38	-6.64/9.17	-14.17/15.28	-12.64/10.21	-9.04/8.94	-10.98/10.81	-18.33/11.76	4.56/2.62	-2.35/1.47	-5.72/0.44
Theta (°)	-0.39/0.6	-0.39/4.31	-10.11/16.79	-11.77/9.81	-10.33/15.47	-17.39/12.41	-15.62/10.66	-8.95/5.52	-5.24/6.23	-4.72/4.01	-3.32/4.23	-6.11/5.77	-6.36/5.51	-2.84/2.12	-4.93/5.54	-4.34/7.32	-13.39/9.84	-6.47/4.36	-8.67/8.95	-12.21/18.17	-14.46/7.62	-6.42/2.07	-3.09/9.51	-11.41/3.92
Theta (°)	-0.39/0.6	-0.39/4.31	-10.11/16.79	-11.77/9.81	-10.33/15.47	-17.39/12.41	-15.62/10.66	-8.95/5.52	-5.24/6.23	-4.72/4.01	-3.32/4.23	-6.11/5.77	-6.36/5.51	-2.84/2.12	-4.93/5.54	-4.34/7.32	-13.39/9.84	-6.47/4.36	-8.67/8.95	-12.21/18.17	-14.46/7.62	-6.42/2.07	-3.09/9.51	-11.41/3.92
Theta (°)	-6.28/3.12	-4.7/3.4	-14.97/15.87	-17.2/13.11	-12.61/14.74	-11.96/14.35	-17.66/17.72	-12/5.75	-6.47/5.43	5.02/6.43	-4.09/4.1	-4.67/4.49	-3.59/3.22	-2.77/0.84	-1.75/5.22	5.53/7.79	-11.77/9.82	-7.99/9.59	-11.69/8.17	-9.89/11.16	-18.3/6.23	-2.98/1.9	4.65/11.04	-14.37/3.7
Theta (°)	-6.28/3.12	-4.7/3.4	-14.97/15.87	-17.2/13.11	-12.61/14.74	-11.96/14.35	-17.66/17.72	-12/5.75	-6.47/5.43	5.02/6.43	-4.09/4.1	-4.67/4.49	-3.59/3.22	-2.77/0.84	-1.75/5.22	5.53/7.79	-11.77/9.82	-7.99/9.59	-11.69/8.17	-9.89/11.16	-18.3/6.23	-2.98/1.9	4.65/11.04	-14.37/3.7
Theta (°)	-8.86/7.38	-4.3/4.4	-7.09/9.25	-13.62/18.65	-17.9/14.74	-15.36/19.7	-18.19/18.66	-6.82/4.4	-3.85/4.32	-4.65/4.18	-3.71/4.3	-4.99/3.3	-3.95/1.64	-2.47/3.91	-5.37/7.51	-18.26/13.79	-14.16/13.8	-10.33/13.04	-10.34/9.63	-8.47/5.22	-2.29/6	-9.27/8.64	-7.63/17.76	
Theta (°)	-8.86/7.38	-4.3/4.4	-7.09/9.25	-13.62/18.65	-17.9/14.74	-15.36/19.7	-18.19/18.66	-6.82/4.4	-3.85/4.32	-4.65/4.18	-3.71/4.3	-4.99/3.3	-3.95/1.64	-2.47/3.91	-5.37/7.51	-18.26/13.79	-14.16/13.8	-10.33/13.04	-10.34/9.63	-8.47/5.22	-2.29/6	-9.27/8.64	-7.63/17.76	
Theta (°)	-10.88/3.1	-6.21/8.79	-11.07/12.43	-13.59/12.61	-5.49/8.43	-12.33/19.19	-18.17/16.67	-10.58/10.52	-5.63/10.36	-6.72/7.01	-6.16/5.9	-8.8/6.59	-5.52/9.83	-12.32/18.98	-19.05/15.35	-6.95/6.38	-4.34/7.32	-10.72/6.2	-4.17/3.94	-11.73/9.4	-10.72/6.2	-4.17/3.94	-11.73/9.4	-10.72/6.2
Theta (°)	-10.88/3.1	-6.21/8.79	-11.07/12.43	-13.59/12.61	-5.49/8.43	-12.33/19.19	-18.17/16.67	-10.58/10.52	-5.63/10.36	-6.72/7.01	-6.16/5.9	-8.8/6.59	-5.52/9.83	-12.32/18.98	-19.05/15.35	-6.95/6.38	-4.34/7.32	-10.72/6.2	-4.17/3.94	-11.73/9.4	-10.72/6.2	-4.17/3.94	-11.73/9.4	-10.72/6.2
Theta (°)	-2.5/4.42	-8.62/12.11	-5.99/9.45	-18.24/15.58	-10.97/11.74	-13.66/17.74	-18.17/10.75	-10.98/7.42	-7.42/8.95	-5.72/5.05	-5.48/4.32	-5.53/4.51	-8.47/9.57	-4.35/3.15	-2.77/4.44	-6.53/17.91	-14.82/18.28	-12.67/15.28	-8.51/7.07	-4.97/5.12	-5.6/7.12	-2.75/1.38	-3.01/5.41	-0.47/1.74
Theta (°)	-2.5/4.42	-8.62/12.11	-5.99/9.45	-18.24/15.58	-10.97/11.74	-13.66/17.74	-18.17/10.75	-10.98/7.42	-7.42/8.95	-5.72/5.05	-5.48/4.32	-5.53/4.51	-8.47/9.57	-4.35/3.15	-2.77/4.44	-6.53/17.91	-14.82/18.28	-12.67/15.28	-8.51/7.07	-4.97/5.12	-5.6/7.12	-2.75/1.38	-3.01/5.41	-0.47/1.74
Theta (°)	-1.18/9.06	-7.82/9.28	-8.84/7.73	-9.79/8.38	-10.11/15.79	-17.54/18.42	-17.74/16.41	-10.19/10.32	-11.32/14.74	-7.06/8.54	-3.24/2.18	-1.81/0.08	-1.05/0.96	-1.56/5.74	-9.6/2.57	-5.74/7.49	-9.95/14.82	-8.31/13.04	-8.81/5.45	-6.55/5.98	-3.68/5.63	-7.75/5.83	-6.42/6.53	-6.72/3.34
Theta (°)	-1.18/9.06	-7.82/9.28	-8.84/7.73	-9.79/8.38	-10.11/15.79	-17.54/18.42	-17.74/16.41	-10.19/10.32	-11.32/14.74	-7.06/8.54	-3.24/2.18	-1.81/0.08	-1.05/0.96	-1.56/5.74	-9.6/2.57	-5.74/7.49	-9.95/14.82	-8.31/13.04	-8.81/5.45	-6.55/5.98	-3.68/5.63	-7.75/5.83	-6.42/6.53	-6.72/3.34
Theta (°)	-3.08/7.44	-12.65/6.37	-5.91/10.1	-11.41/10.04	-7.8/11.45	-9.33/13.39	-17.74/17.33	-16.48/10.69	-7.71/11.78	-7.71/13.34	-5.34/5.15	-0.72/3.03	-3.35/1.09	-3.92/0.28	-10.24/4.62	-7.22/5.22	-6.27/4.65	-6.52/6.22	-3.43/4.65	-6.27/4.65	-6.52/6.22	-3.43/4.65	-6.27/4.65	-6.52/6.22
Theta (°)	-3.08/7.44	-12.65/6.37	-5.91/10.1	-11.41/10.04	-7.8/11.45	-9.33/13.39	-17.74/17.33	-16.48/10.69	-7.71/11.78	-7.71/13.34	-5.34/5.15	-0.72/3.03	-3.35/1.09	-3.92/0.28	-10.24/4.62	-7.22/5.22	-6.27/4.65	-6.52/6.22	-3.43/4.65	-6.27/4.65	-6.52/6.22	-3.43/4.65	-6.27/4.65	-6.52/6.22
Theta (°)	-3.32/1.2	-5.44/13.38	-12.25/14.42	-12.45/16.42	-17.27/15.73	-12.04/14.11	-18.53/18.06	-19.54/18.63	-19.16/8.48	-7.2/10.1	3.44/1.15	0.94/1.2	<b>3.83/3.35</b>	0.68/1.51	2.5/1.01	-13.99/14.01	-3.66/1.93	-5.25/7	-12.19/7.64	-6.7/3.43	-0.99/5.82	-17.37/16.53	-5.67/11.79	-18.61/13.58
Theta (°)	-3.32/1.2	-5.44/13.38	-12.25/14.42	-12.45/16.42	-17.27/15.73	-12.04/14.11	-18.53/18.06	-19.54/18.63	-19.16/8.48	-7.2/10.1	3.44/1.15	0.94/1.2	<b>3.83/3.35</b>	0.68/1.51	2.5/1.01	-13.99/14.01	-3.66/1.93	-5.25/7	-12.19/7.64	-6.7/3.43	-0.99/5.82	-17.37/16.53	-5.67/11.79	-18.61/13.58
Theta (°)	-5.79/6.7	-6.28/7.87	-9.11/7.42	-7.03/9.74	-14.71/18.29	-18.66/17.83	-13.89/11.5	-10.26/12.24	-8.8/6.55	-3.36/0.62	-0.98/3.61	-4.53/0.4	0.98/0.55	-2.89/1.97	-0.8/0.9	-4.18/7.57	-5.13/5.67	-4.43/6.09	-14.65/17.44	-11.25/6.86	-2.81/3.89	-10.72/11.77	-3.88/2.87	-4.29/5.04
Theta (°)	-5.79/6.7	-6.28/7.87	-9.11/7.42	-7.03/9.74	-14.71/18.29	-18.66/17.83	-13.89/11.5	-10.26/12.24	-8.8/6.55	-3.36/0.62	-0.98/3.61	-4.53/0.4	0.98/0.55	-2.89/1.97	-0.8/0.9	-4.18/7.57	-5.13/5.67	-4.43/6.09	-14.65/17.44	-11.25/6.86	-2.81/3.89	-10.72/11.77	-3.88/2.87	-4.29/5.04
Theta (°)	-18.15/14.74	-12.73/14.08	-10.47/7.45	-7.15/9.41	-11.51/11.3	-11.51/11.3	-18.04/19.66	-10.26/12.24	-11.92/9.81	-8.05/7.77	-8.47/4.75	-6.8/8.39	-11.54/13.2	-17.01/18.28	-6.65/4.88	-2.21/9.3	-3.78/4.26	-4.43/7.83	-11.47/13.06	-17.47/13.06	-7.75/6.41	-7.33/6.62	-3.98/4.33	-9.13/18.46
Theta (°)	-18.15/14.74	-12.73/14.08	-10.47/7.45	-7.15/9.41	-11.51/11.3	-11.51/11.3	-18.04/19.66	-10.26/12.24	-11.92/9.81	-8.05/7.77	-8.47/4.75	-6.8/8.39	-11.54/13.2	-17.01/18.28	-6.65/4.88	-2.21/9.3	-3.78/4.26	-4.43/7.83	-11.47/13.06	-17.47/13.06	-7.75/6.41	-7.33/6.62	-3.98/4.33	-9.13/18.46
Theta (°)	-11.92/8.77	-8.65/11.14	-14.88/14.14	-13.27/13.27	-13.96/12.67	-11.51/13.56	-12.31/9.88	-7.73/7	-6.4/5.63	-4.8/3.82	-3.02/2.21	-1.89/1.54	-0.84/0.11	0.320/0.3	0.63/0.06	-1.67/4.04	-5.69/5.76	-6.67/9.8	-14.67/18.07	-14.71/11.02	-8.43/6.11	-5/4.53	-3.92/4.45	-7.71/12.76
Theta (°)	-11.92/8.77	-8.65/11.14	-14.88/14.14	-13.27/13.27	-13.96/12.67	-11.51/13.56	-12.31/9.88	-7.73/7	-6.4/5.63	-4.8/3.82	-3.02/2.21	-1.89/1.54	-0.84/0.11	0.320/0.3	0.63/0.06	-1.67/4.04	-5.69/5.76	-6.67/9.8	-14.67/18.07	-14.71/11.02	-8.43/6.11	-5/4.53	-3.92/4.45	-7.71/12.76
Theta (°)	-12/10.12	-7.31/5.66	-5.57/11.1	-6.4/9.25	-11.59/14.36	-15.8/17.32	-16.58/13.8	-9.08/9.93	-5.34/3.9	-2.59/1.65	-1.24/0.96	-0.81/0.92	-0.88/0.91	-1.17/1.92	-2.25/2.35	-2.6/3.32	-4.51/6.48	-9.35/12.9	-16.14/18.93	-17.37/18.02	-16.82/19.41	-17.03/19.92	-17.11/12.05	-8.71/8.55
Theta (°)	-12/10.12	-7.31/5.66	-5.57/11.1	-6.4/9.25	-11.59/14.36	-15.8/17.32	-16.58/13.8	-9.08/9.93	-5.34/3.9	-2.59/1.65	-1.24/0.96	-0.81/0.92	-0.88/0.91	-1.17/1.92	-2.25/2.35	-2.6/3.32	-4.51/6.48	-9.35/12.9	-16.14/18.93	-17.37/18.02	-16.82/19.41	-17.03/19.92	-17.11/12.05	-8.71/8.55
Theta (°)	-19.05/11.8	-8.84/9.69	-14.11/13.54	-13.18/13.09	-12.72/16.16	-18.18/19.09	-17.87/13.2	-10.37/6.6	-5.85/4.6	-3.31/2.26	-1.55/0.88	-0.37/0.13	-0.09/0.48	-1.01/1.45	-4.8/4.6	-8.87/10.53	-11.85/12.71	-12.71/11.81	-10.35/8.4	-6.75/5.54	-5.28/5.41	-5.28/5.41	-5.28/5.41	-5.28/5.41
Theta (°)	-19.05/11.8	-8.84/9.69	-14.11/13.54	-13.18/13.09	-12.72/16.16	-18.18/19.09	-17.87/13.2	-10.37/6.6	-5.85/4.6	-3.31/2.26	-1.55/0.88	-0.37/0.13	-0.09/0.48	-1.01/1.45	-4.8/4.6	-8.87/10.53	-11.85/12.71	-12.71/11.81	-10.35/8.4	-6.75/5.54	-5.28/5.41	-5.28/5.41	-5.28/5.41	-5.28/5.41
Theta (°)	6.175GPol	Theta Ant 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Theta (°)	6.175GPol	Theta Ant 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Theta (°)	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(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								



# Radiated Composite Gain Data\_6GHz

# Appendix B

Theta	2.84-10.83	-10.03-4.48	-6.68-10.36	-8.81-14.27	-11.19-9.29	-14.93-13.3	-15.05-9.18	-6.34-5.48	-6.77	-7.69-6.81	-8.41-7.87	-8.11-9.28	-5.06-7.54	-4.61-4.31	-4.57-5.05	-8.58-18.79	-15.58-14.79	-11.38-12.14	-16.22-18.67	-5.11-1.85	-6.51-3.25	0.24-3.76	-9.23-12.41	-5.83-0.16	
Theta(120°)	-2.84-10.83	-10.03-4.48	-6.68-10.36	-8.81-14.27	-11.19-9.29	-14.93-13.3	-15.05-9.18	-6.34-5.48	-6.77	-7.69-6.81	-8.41-7.87	-8.11-9.28	-5.06-7.54	-4.61-4.31	-4.57-5.05	-8.58-18.79	-15.58-14.79	-11.38-12.14	-16.22-18.67	-5.11-1.85	-6.51-3.25	0.24-3.76	-9.23-12.41	-5.83-0.16	
Theta(127.5°)	-2.44-9.56	-4.64-17.44	-16.02-7.03	-7.98-8.62	-7.29-9.38	-12.89-17.57	-17.71-10.94	-9.65-10.32	-7.31-10.88	-11.19-7.5	-8.34-4.64	-5.25-4.06	-3.34-2.76	-0.94-3.27	-7.11-8.9	-9.49-9.26	-11.57-13.16	-16.05-18.53	-10.22-17.17	-4.93-2.26	-7.53-8.05	-4.42-9.77	-17.51-9.31	-10.24-4.45	
Theta(135°)	-5.43-6.82	-11.41-7.64	-6.52-7.82	-9.41-7	-13.44-12.37	-12.05-17.76	-18.64-18.85	-13.41-13	-11.47-5.71	-6.58-7.27	-3.35-6.55	-5.62-4.6	-7.71-3.33	-3.35-7	1.96-1.2	-2.03-12.83	-12.54-9.25	-11.91-10.64	-5.81-12.07	-7.29-2.02	-3.79-6.96	-2.35-0.67	-6.78-12.65	-10.21-8.62	
Theta(142.5°)	-2.82-2.8	-6.11-5.86	-6.62-12.45	-18.28-18.71	-15.84-11.77	-12.71-18.54	-18.57-17.99	-17.49-12.16	-13.01-12.88	-5.04-4.39	-7.51-1.82	0.06-3.08	0.67-1.61	-0.19-0.97	1.19-0.07	-8.75-14.53	-14.21-5.95	-8.17-9.83	-10.61-14.76	-8.64-6.05	-0.85-5.09	-11.16-9.32	-5.66-13.22	-6.64-3.95	
Theta(150°)	-3.11-8.66	-15.51-13.92	-11.24-15.36	-16.24-17.47	-18.44-18.83	-19.16-17.2	-17.81-10.7	-15.58-10.49	-5.82-5.6	-7.91-6.37	-3.34-2.57	-4.71-7.22	-3.11-1.86	-3.51-5.22	-6.91-4.86	-2.84-6.04	-6.72-8.8	-10.97-10.93	-13.55-16.15	-12.63-4.98	-3.42-5.5	-9.31-5.63	-3.18-3.05	-2.72-1.83	
Theta(157.5°)	-18.53-18.29	-16.21-9.92	-8.25-9.67	-12.65-17.18	-15.43-13.62	-16.87-17.65	-18.55-18.66	-13.81-13.33	-13.42-12.01	-10.94-12.07	-14.92-19.41	-18.44-12.92	-7.81-7.31	-9.61-2.21	-3.41-4.63	-8.11-7.02	-6.78-8.37	-8.29-10.6	-15.55-18.15	-19.05-12.18	-9.21-8.55	-6.59-3.1	-1.71-2.96	-5.16-9.01	
Theta(165°)	-11.53-10.41	-13.19-18.63	-17.34-16.08	-16.37-17.07	-15.21-14.13	-13.06-15.66	-18.23-19.15	-16.56-12.52	-9.74-8.54	-7.41-6.35	-5.55-5.21	-4.69-4.3	-4.19-3.34	-2.19-1.35	-0.94-1.07	-1.58-3.01	-6.69-8.15	-10.78-14.82	-18.29-18.84	-18.43-17.38	-12.58-9.27	-5.23-4.28	-4.84-5.81	-8.11-12	
Theta(172.5°)	-9.52-9.32	-7.29-6.51	-6.35-6	-8.43-10.71	-12.76-14.99	-16.27-15.53	-11.68-10.3	-9.37-8.27	-6.92-6.57	-4.52-3.53	-2.64-1.83	-1.35-1.34	-1.73-2.21	-3.08-4.79	-7.21-8.52	-9.41-10.74	-10.92-11.8	-12.81-17.77	-18.21-17.87	-17.91-18.05	-18.11-18.81	-19.13-18.63	-17.93-12.6	-10.69-8.73	
Theta(180°)	-11.61-6.75	-5.12-5.86	-6.94-6.55	-8.37-7.07	-11.57-14.14	-15.39-12.11	-9.57-8.15	-6.71-5.05	-3.92-2.99	-2.39-2.03	-2.04-1.55	-0.77-0.67	-0.98-1.58	-2.06-2.75	-3.68-4.74	-6.01-7.63	-18.16-18.2	-18.16-18.2	-18.16-18.2	-18.16-18.2	-18.16-18.2	-18.16-18.2	-18.16-18.2	-18.16-18.2	-18.16-18.2
Freq(Hz)	6.995GPol.	ThetaAnt.2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Gain	Phi(7°)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°)	-11.76-14.12	-11.81-11.86	-10.37-8.51	-7.77-7.86	-7.45-7.22	-6.76-7.58	-5.45-5.06	-6.07-4.92	-4.99-3.77	-6.37-7.07	-8.66-10.19	-12.01-13	-12.27-12.05	-12.24-11.4	-10.99-9.37	-5.81-5.09	-4.72-4.63	-4.31-3.37	-2.29-1.29	-2.39-2.93	-3.52-4.45	-5.27-5.4	-7.05-7.83	-7.55-6.69	
Theta(7.5°)	-13.23-15.01	-13.12-10.79	-8.84-5.87	-4.36-5.14	-5.24-4.84	-4.66-4.02	-3.46-3.18	-2.42-2.46	-2.92-3.54	-4.14-4.67	-5.82-7.49	-8.65-9.81	-11.31-11.58	-11.16-10.56	-9.94-8.92	-7.99-7.2	-7.73-7.16	-6.19-5.14	-4.71-4.97	-4.54-4.97	-5.95-7.33	-8.41-8.39	-9.11-7.73	-12.71-12.48	
Theta(15°)	-14.81-12.42	-8.97-8.42	-8.86-7	-3.86-3.8	-5.24-5.16	-4.14-3.57	-2.76-2.4	-1.89-1.87	-2.28-2.67	-3.19-4.25	-5.82-7.53	-8.79-10.41	-12.18-12.77	-12.84-12.23	-11.93-11.23	-10.47-9.9	-8.76-8.33	-8.45-7.5	-7.13-6.19	-6.69-6.25	-5.09-4.7	-4.81-5.64	-6.51-7.06	-7.05-10.33	
Theta(22.5°)	-18.53-13.71	-9.81-7.84	-6.19-5.08	-4.1-3.19	-3.15-2.34	-1.39-1.23	-0.91-0.46	-0.26-0.79	-2.33-3.32	-4.06-4.44	-5.11-6.5	-8.48-10.12	-12.14-15.4	-18.12-17.76	-14.66-10.86	-8.51-7.59	-7.68-7.72	-8.44-8.49	-4.87-3.94	-3.87-4.52	-6.05-7.1	-7.37-9.94	-11.11-14.2		
Theta(30°)	-15.81-12.99	-9.51-6.89	-5.73-5.53	-4.92-2.61	-1.70-3.53	0.01-0.82	1.21-1.43	0.74-0.31	-1.71-2.61	-2.71-3.48	-5.77-8.57	-10.18-12.47	-15.63-16.78	-14.51-11.69	-10.98-12.59	-12.17-10.27	-7.74-6.47	-6.55-7.93	-7.91-7.21	-7.12-8.77	-9.35-10.37	-11.88-12.62			
Theta(37.5°)	-8.96-7.78	-6.54-3.77	-1.41-1.18	-2.19-1.11	-1.01-1.19	-0.35-0.41	1.74-2.63	1.89-0.39	-0.35-0.39	-0.26-0.88	-1.88-3.59	-6.63-10.45	-13.19-14.34	-13.99-14.82	-14.03-11.53	-11.74-13.93	-12.76-11.28	-12.22-15.41	-13.01-11.22	-13.84-8.55	-5.89-5.11	-5.47-6.9	-8.67-11.51	-12.45-9.88	
Theta(45°)	-6.31-9.87	-5.88-2.64	-0.91-0.02	-0.46-0.62	-0.29-0.24	0.43-1.17	2.25-2.46	2.41-1.44	0.12-0.14	-0.57-1.13	-2.21-2.87	-4.51-5.57	-11.96-12.71	-10.35-10.51	-10.33-11.22	-17.73-17.59	-15.23-16	-18.82-17.63	-15.96-14.89	-14.56-16.22	-16.54-13.91	-8.69-6.46	-7.33-10.79	-10.06-5.73	
Theta(52.5°)	-9.44-6.38	-7.58-3.1	-2.09-0.41	0.41-0.02	-0.95-0.98	-0.71-0.09	1.24-2.56	1.62-0.3	-1.73-0.56	0.53-0.78	0.07-0.64	-3.69-12.21	-18.44-14.69	-12.24-10.92	-8.61-10.7	-12.09-12.54	-10.41-12.86	-18.51-19.07	-18.08-14.43	-10.81-9.16	-17.53-12.69	-8.57-8.07	-81-9.54	-13.52-13.85	
Theta(60°)	-8.07-5.38	-5.78-2.37	-1.12-0.15	0.5-0.3	-0.94-1.37	-1.48-0.36	-1.04-0.86	0.69-1.17	-1.93-1.5	-0.09-0.24	-0.77-1.19	-4.28-8.69	-11.51-9.71	-9.5-9.19	-5.77-5.24	-7.87-10.77	-8.61-11.29	-13.01-15.35	-12.61-18.77	-13.41-10.13	-7.31-6.88	-7.14-6.82	-9.23-8.51	-10.12-14.1	
Theta(67.5°)	-2.53-0.08	0.53-0.2	-0.56-1.57	0.92-1.2	-2.19-1.55	-0.82-1.85	-3.01-0.11	-0.28-2.64	-2.46-2.01	-2.36-1.54	-1.05-2.06	-3.25-6.74	-8.26-6.59	-6.11-7.83	-5.64-5.93	-4.21-7.57	-7.42-6.22	-11.41-15.34	-10.84-15.57	-7.06-3.26	-5.06-7.19	-10.14-17.35	-8.04-3.41	-3.85-2.4	
Theta(75°)	-1.37-0.6	0.68-1.59	1.21-0.21	2.21-0.21	-3.29-2.77	-1.94-2.49	4.28-1.43	-0.99-2.01	-2.17-2.64	-4.85-1.49	-0.83-1.62	-1.21-6.6	-6.66-6.59	-6.14-3.46	-3.31-5.92	-1.87-4.84	-6.77-3.53	-6.64-7.9	-3.58-7.34	-4.83-1.89	-3.54-4.39	-7.57-7.73	-2.68-2.08	-3.33-2.6	
Theta(82.5°)	-2.25-0.32	-0.84-1.25	1.89-0.65	-0.35-1.63	-1.96-1.98	-1.15-1.17	-0.69-1.93	-2.45-1.96	-1.38-2.49	-4.80-3.86	-1.74-3.3	-3.64-12.63	-7.72-7.24	-7.88-3.82	-2.14-4.5	-1.29-2.19	-6.76-9.05	-6.64-9.9	-6.83-7.99	-2.63-0.45	-1.47-0.42	-2.37-7.2	-4.21-1.99	-5.97-3.5	
Theta(90°)	0.07-2.84	-2.86-2.05	0.18-1.08	-1.49-7.12	-4.3-3.04	-3.35-2.94	-5.16-1.53	-5.24-0.07	-1.33-5.11	-8.71-8.45	-2.93-2.02	-6.21-7.19	-10.58-11.43	-8.15-3.65	-1.27-3.48	-4.18-1.61	-2.52-0.46	-1.92-3.01	-0.98-3.16	0.61-2.76	-0.76-2.27	-1.89-2.13	1.14-0.99	-5.74-3.53	
Theta(97.5°)	1.49-2.33	-3.95-8.66	-4.66-2.73	-4.37-7.65	-5.92-4.54	-5.06-7.06	-6.87-3.59	-7.74-6.55	-2.05-6.54	-5.74-7.58	-6.52-7.63	-9.67-9.44	-6.21-3.59	-1.47-1.59	-3.05-0.09	-0.63-0.95	1.37-0.84	0.28-2.27	-0.74-2.8	-1.89-0.31	-1.37-0.02	1.37-0.26	-7.81-3.05		
Theta(105°)	-4.93-3.39	-11.14-5.79	-5.39-7.07	-15.19-13.65	-9.27-7.26	-8.43-6.21	-16.18-10.25	-11.49-9.22	-9.03-5.74	-6.94-8.68	-11.26-14.71	-12.98-8.64	-12.91-7.16	-1.66-5.81	-1.17-1.26	-2.14-3.04	0.71-0.2	-1.31-2.5	-6.91-7.22	-3.80-6.07	-4.02-2.23	0.18-6.1	-4.21-1.99	-10.21-3.53	
Theta(112.5°)	-14.24-8.97	-6.51-5.87	-10.07-14.03	-17.33-16.06	-18.08-14.01	-11.16-16.12	-18.04-19.34	-17.39-9.45	-8.27-14.76	-10.47-10.48	-7.59-12.04	-7.43-15.49	-7.16-6.74	-10.93-2.33	-2.78-1.93	0.04-1.87	-2.63-0.98	0.95-0.39	-2.24-6.21	-1.22-2.05	-1.09-1.47	-7.74-6.23	-1.69-3.35	-4.05-9.1	
Theta(120°)	-3.66-13.75	-17.92-14.86	-10.9-8.67	-9.79-10.64	-12.84-8.85	-12.65-14.32	-13.58-15.44	-8.51-8.61	-18.64-18.65	-16.35-14.79	-15.49-10.29	-13.49-8.71	-6.98-16	-6.66-5.08	-3.14-2.88	-0.45-1.29	-3.61-1.22	2.35-0.02	-5.62-5.07	-0.88-0.07	-9.13-10.29	-5.49-11.03	-10.18-4.56	-1.82-1.35	
Theta(127.5°)	-2.12-5.64	-10.02-11.25	-13.51-9.18	-10.29-14.11	-6.67-7.44	-11.72-9.89	-10.25-12.76	-13.24-9.99	-12.71-11.9	-17.62-16.17	-12.56-13.39	-10.68-10.5	-14.53-12.28	-5.3-3.98	-5.14-1.1	1.07-1.07	4.92-1.1	4.59-0.6	0.36-3.67	-5.03-8.81	-2.51-5.55	0.26-1.53	-7.94-4.46	-6.26-0.16	
Theta(135°)	-4.96-8.49	-9.72-8.33	-7.52-13.35	-14.24-17.93	-16.65-13.98	-11.11-10.66	-11.34-12.52	-12.17-15.4	-13.21-12.61	-17.45-12.34	-15.37-8.74	-10.81-18.19	-16.62-9.74	-12.08-12.43	-0.26-2.05	-0.71-4.78	-2.42-1.97	4.01-0.64	0.48-9.09	1.32-5.36	2.28-8.06	-3.13-13	-6.98-9.24	-4.83-6.15	
Theta(142.5°)	-8.96-14.47	-12.72-12.86	-19.15-15.88	-15.71-10.59	-10.16-10.88	-13.88-11.97	-15.04-15.44	-15.44-16.32	-18.02-14.49	-15.72-16.49	-10.08-10.94	-18.17-11.32	-13.87-8.61	-16.67-18.2	-1.96-0.57										







# Radiated Composite Gain Data\_6GHz

# Appendix B

Theta	Phi	Gain	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(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(60)	Phi(0)	-5.3/6.74	-9.22/13.12	-14.26/11.48	-9.75/9.42	-8.58/7.16	-9.29/14.77	-15.26/18.14	-17.51/13.01	-9.75/5.75	-3.98/2.51	-1.72/1.48	-1.97/3.78	-4.18/4.97	-5.83/3.5	-2.29/1.01	1.95/2.09	1.70/72	-0.04/0.38	-0.81/1.6	-0.39/0.47	0.07/0.69	-0.43/0.86	-1.47/2.84	-5.32/5.58								
Theta(67.5)	Phi(7.5)	-3.98/4.62	-6.41/9.68	-11.04/7.48	-5.29/4.57	-4.16/4.71	-8.11/11.16	-8.63/9.85	-8.53/5.33	-3.39/1.74	-1.89/3.76	-4.86/5.8	-8.57/8.83	-8.09/7.97	-6.48/4.37	-2.21/0.78	0.33/0.29	-0.93/1.79	-3.13/2.71	-2.64/3.94	-2.14/1.26	-1.16/2.19	-1.39/1.15	-2.33/3.55	-4.24/3.75								
Theta(75)	Phi(15)	-5.99/6.51	-7.98/8.63	-11.43/5.42	-2.73/5.35	-4.53/5.45	-5.13/4.46	-8.05/8.02	-5.13/4.46	-2.86/1.29	-1.01/2.09	-3.95/6.88	-5.01/2.17	-8.65/5.56	-2.33/0.85	-5.96/9.69	-3.76/2.33	-4.85/12.05	-10.64/8.63	-6.53/3.38	-4.12/2.43	-1.83/1.99	-0.62/2.76	-3.96/3.21	-3.99/5.92	-7.10/8.10							
Theta(82.5)	Phi(22.5)	-4.64/5.58	-5.36/5.84	-3.04/1.7	-0.76/2.38	-3.31/2.97	-6.67/6.19	-2.27/0.93	-0.04/1.59	1.68/0.91	-1.07/6.39	-5.09/3.07	-5.93/9.1	5.48/2.48	-3.81/3.86	-3.95/2.15	-0.69/0.6	-3.25/8.65	-4.48/2.03	-2.85/1.37	-2.56/3.04	-1.46/2.61	-3.36/3.16	-3.85/5.55	-6.32/6.29								
Theta(90)	Phi(30)	-6.75/7.6	-8.21/6.49	-3.93/1.39	0.09/1.19	-1.41/1.71	-3.57/2.66	0.50/5.9	1.32/2.14	1.41/1.24	0.18/8.52	-7.81/6.31	-8.32/5.6	-5.96/6.66	-3.29/4.52	-1.98/4.44	-2.43/4.44	-11.61/14.81	-7.87/3.28	4.32/2.64	-0.98/1.73	-1.02/2.53	-5.55/4.07	-4.36/6.67	-8.74/7.37								
Theta(97.5)	Phi(37.5)	-12.78/11.03	-10.18/7.16	-4.51/1.6	0.47/0.48	-2.21/1.43	-2.09/1.45	0.84/0.71	1.02/1.71	1.02/1.71	-0.42/3.48	-0.58/13.76	-0.50/2.17	-8.65/5.56	-2.33/0.85	-5.96/9.69	-3.76/2.33	-4.85/12.05	-10.64/8.63	-6.53/3.38	-4.12/2.43	-1.83/1.99	-0.62/2.76	-3.96/3.21	-3.99/5.92	-7.10/8.10							
Theta(105)	Phi(45)	-8.12/9.6	-5.44/4.04	-1.22/0.72	0/0.64	-1.34/0.6	-1.28/1.06	0.34/0.55	0.89/2.44	-0.47/2.69	-4.49/7.51	-3.22/1.56	-6.57/7.14	-3.95/0.7	-5.23/15.85	-8.12/6.27	-10.84/18.2	-11.43/11.92	-9.52/5.6	-7.76/5.62	-4.18/5.35	-4.56/6.18	-5.22/5.29	-4.91/7.33	-12.14/13.45								
Theta(112.5)	Phi(52.5)	-12.84/11	-6.13/4.56	-1.45/0.23	0.37/0.31	0.17/0.72	-0.48/1.13	1.82/0.71	1.32/2.11	-1.26/1.9	-2.31/10.27	-2.62/0.96	-5.49/11.73	-9.09/6.04	-12.63/11.41	-13.29/14.47	-9.33/8.16	-18.83/12.42	-7.7/14.73	-12.35/9.41	-7.79/8.58	-5.48/9.45	-7.94/9.97	-6.92/10.83	-14.14/14.88								
Theta(120)	Phi(60)	-12.21/8.83	-6.71/3.12	-0.81/1.4	0.89/0.25	0.19/0.42	0.79/1.62	1.30/5.9	0.57/0.31	-2.58/3.99	-3.7/7.7	-5.19/2.04	-3.55/13.18	-11.99/4.59	-3.47/10.85	-11.29/6.35	-14.49/12.1	-18.39/11.62	-5.37/12.21	-17.28/10.53	-6.89/7.42	-8.5/5.78	-8.09/13.97	-14.64/13.7									
Theta(127.5)	Phi(67.5)	-12.74/7.33	-6.3/2.82	-1.99/1.27	-0.62/0.27	1.23/2.03	1.51/35	1.55/0.42	0.71/1.47	-3.81/2.97	-1.18/2.48	-1.92/2.42	-2.58/7.1	-10.02/12.6	-18.82/10.39	-8.81/11.68	-12.82/10.53	-10.19/8.66	-5.86/7.21	-8.28/6.91	-3.56/3.31	-6.52/18.92	-11.35/6.66	-6.78/11.55	-17.31/11.06								
Theta(135)	Phi(75)	-10.34/11.26	-5.84/5.41	-2.47/2.55	-1.60/4.8	1.31/1.07	0.97/0.87	0.48/0.18	0.14/0.18	-2.02/1.49	-0.3/1.66	-6.78/2.38	-1.17/0.29	-1.58/2.77	-13.83/12.25	-9.81/13.58	-7.06/4	-6.97/7.5	-8.81/14.83	-10.8/17.01	-18.12/8.92	-15.32/18.38	-15.27/7.87	-9.73/15.66	-18.99/12.72								
Theta(142.5)	Phi(82.5)	-11.84/6.96	-6.42/5.6	-4.6/1.11	0.45/1.5	2.63/2.56	1.84/0.85	-0.14/1.42	-1.62/3.198	-0.34/0.52	0.70/1.7	-1.62/4.19	-4.78/5.24	-4.84/2.63	-5.89/8.57	-18.03/17.61	-6.96/2.25	-7.82/7.28	-7.46/18.19	-11.72/18.4	-10.67/12.45	-16.77/18.87	-15.62/14.11	-13.67/17.97	-18.99/15.72								
Theta(150)	Phi(90)	-11.89/13.61	-18.94/17.76	-9.8/4.96	-1.85/0.03	0.99/1.9	2.85/3.14	2.82/2.25	1.98/1.45	-0.04/2.49	-3.05/0.48	-0.58/3.21	-6.3/17.87	-6.95/2.87	-2.66/5.37	-10.49/10.92	-7.78/8.35	-13.77/11.92	-8.3/8.68	-8.81/11.98	-18.86/17.43	-11.6/11.09	-14.13/12.95	-11.14/9.39	-8.47/10.7								
Theta(157.5)	Phi(97.5)	-12.02/12.17	-10.21/8.83	-4.99/2.92	-2.28/2.26	-2.61/2.66	-2.43/2.38	-2.64/2.41	-1.98/1.93	-2.71/3.98	-4.39/3.49	-4.02/6.44	-9.22/15.37	-17.84/8.08	-7.3/13.43	-19.08/14.62	-13.31/10.39	-10.43/11.75	-11.44/12.77	-17.2/17.76	-16.23/12.1	-11.25/25.32	-9.82/9.24	-8.19/11.24	-12.64/12.72								
Theta(165)	Phi(105)	-14.13/11.47	-12.42/11.44	-8.92/7.25	-4.99/3.4	-2.23/1.69	-1.98/2.66	-2.92/2.57	-1.95/1.32	-0.98/1.43	-2.45/3.71	-4.81/7.05	-11.33/10.63	-16.65/16.81	-14.21/10.65	-9.85/11.87	-14.9/14.21	-13.44/14.25	-17.42/18.42	-18.99/17.9	-18.82/14.85	-12.09/11.39	-11.4/11.15	-12.22/13.1	-12.63/11.82								
Theta(172.5)	Phi(112.5)	-9.79/8.51	-6.94/5.49	-4.45/3.63	-3.3/3.36	-3.56/3.8	-3.89/4.22	-4.47/4.47	-4.46/4.59	-4.73/5.32	-6.53/7.74	-8.5/8.79	-9.74/11.36	-11.43/10.98	-10.96/11.44	-12.79/13.54	-14.78/15.68	-14.54/12.98	-13.31/14.87	-15.88/15.38	-15.77/14.58	-16.3/18.2	-18.12/17.99	-18.48/16.23	-14.35/11.06								
Theta(180)	Phi(120)	-7.42/6.33	-6.51/7.26	-7.36/7.37	-7.33/7.86	-8.72/9.88	-10.98/12.83	-14.61/16.91	-17.86/18.5	-19.24/18.38	-19.15/18.9	-15.7/12.47	-10.65/9.09	-8.27/7.48	-6.77/6.62	-6.89/7.4	-8.39/10.11	-11.64/12.36	-11.97/11.98	-12.62/14.23	-15.12/14.87	-14.24/13.66	-13.38/12.62	-11.36/10.06	-9.14/8.03								
Theta(187.5)	Phi(127.5)	-7.42/6.33	-6.51/7.26	-7.36/7.37	-7.33/7.86	-8.72/9.88	-10.98/12.83	-14.61/16.91	-17.86/18.5	-19.24/18.38	-19.15/18.9	-15.7/12.47	-10.65/9.09	-8.27/7.48	-6.77/6.62	-6.89/7.4	-8.39/10.11	-11.64/12.36	-11.97/11.98	-12.62/14.23	-15.12/14.87	-14.24/13.66	-13.38/12.62	-11.36/10.06	-9.14/8.03								
Theta(195)	Phi(135)	-7.42/6.33	-6.51/7.26	-7.36/7.37	-7.33/7.86	-8.72/9.88	-10.98/12.83	-14.61/16.91	-17.86/18.5	-19.24/18.38	-19.15/18.9	-15.7/12.47	-10.65/9.09	-8.27/7.48	-6.77/6.62	-6.89/7.4	-8.39/10.11	-11.64/12.36	-11.97/11.98	-12.62/14.23	-15.12/14.87	-14.24/13.66	-13.38/12.62	-11.36/10.06	-9.14/8.03								
Theta(202.5)	Phi(142.5)	-7.42/6.33	-6.51/7.26	-7.36/7.37	-7.33/7.86	-8.72/9.88	-10.98/12.83	-14.61/16.91	-17.86/18.5	-19.24/18.38	-19.15/18.9	-15.7/12.47	-10.65/9.09	-8.27/7.48	-6.77/6.62	-6.89/7.4	-8.39/10.11	-11.64/12.36	-11.97/11.98	-12.62/14.23	-15.12/14.87	-14.24/13.66	-13.38/12.62	-11.36/10.06	-9.14/8.03								
Theta(210)	Phi(150)	-7.42/6.33	-6.51/7.26	-7.36/7.37	-7.33/7.86	-8.72/9.88	-10.98/12.83	-14.61/16.91	-17.86/18.5	-19.24/18.38	-19.15/18.9	-15.7/12.47	-10.65/9.09	-8.27/7.48	-6.77/6.62	-6.89/7.4	-8.39/10.11	-11.64/12.36	-11.97/11.98	-12.62/14.23	-15.12/14.87	-14.24/13.66	-13.38/12.62	-11.36/10.06	-9.14/8.03								
Theta(217.5)	Phi(157.5)	-7.42/6.33	-6.51/7.26	-7.36/7.37	-7.33/7.86	-8.72/9.88	-10.98/12.83	-14.61/16.91	-17.86/18.5	-19.24/18.38	-19.15/18.9	-15.7/12.47	-10.65/9.09	-8.27/7.48	-6.77/6.62	-6.89/7.4	-8.39/10.11	-11.64/12.36	-11.97/11.98	-12.62/14.23	-15.12/14.87	-14.24/13.66	-13.38/12.62	-11.36/10.06	-9.14/8.03								
Theta(225)	Phi(165)	-7.42/6.33	-6.51/7.26	-7.36/7.37	-7.33/7.86	-8.72/9.88	-10.98/12.83	-14.61/16.91	-17.86/18.5	-19.24/18.38	-19.15/18.9	-15.7/12.47	-10.65/9.09	-8.27/7.48	-6.77/6.62	-6.89/7.4	-8.39/10.11	-11.64/12.36	-11.97/11.98	-12.62/14.23	-15.12/14.87	-14.24/13.66	-13.38/12.62	-11.36/10.06	-9.14/8.03								
Theta(232.5)	Phi(172.5)	-7.42/6.33	-6.51/7.26	-7.36/7.37	-7.33/7.86	-8.72/9.88	-10.98/12.83	-14.61/16.91	-17.86/18.5	-19.24/18.38	-19.15/18.9	-15.7/12.47	-10.65/9.09	-8.27/7.48	-6.77/6.62	-6.89/7.4	-8.39/10.11	-11.64/12.36	-11.97/11.98	-12.62/14.23	-15.12/14.87	-14.24/13.66	-13.38/12.62	-11.36/10.06	-9.14/8.03								
Theta(240)	Phi(180)	-7.42/6.33	-6.51/7.26	-7.36/7.37	-7.33/7.86	-8.72/9.88	-10.98/12.83	-14.61/16.91	-17.86/18.5	-19.24/18.38	-19.15/18.9	-15.7/12.47	-10.65/9.09	-8.27/7.48	-6.77/6.62	-6.89/7.4	-8.39/10.11	-11.64/12.36	-11.97/11.98	-12.62/14.23	-15.12/14.87	-14.24/13.66	-13.38/12.62	-11.36/10.06	-9.14/8.03								
Theta(247.5)	Phi(187.5)	-7.42/6.33	-6.51/7.26	-7.36/7.37	-7.33/7.86	-8.72/9.88	-10.98/12.83	-14.61/16.91	-17.86/18.5	-19.24/18.38	-19.15/18.9	-15.7/12.47	-10.65/9.09	-8.27/7.48	-6.77/6.62	-6.89/7.4	-8.39/10.11	-11.64/12.36	-11.97/11.98	-12.62/14.23	-15.12/14.87	-14.24/13.66	-13.38/12.62	-11.36/10.06	-9.14/8.03								
Theta(255)	Phi(195)	-7.42/6.33	-6.51/7.26	-7.36/7.37	-7.33/7.86	-8.72/9.88	-10.98/12.83	-14.61/16.91	-17.86/18.5	-19.24/18.38	-19.15/18.9	-15.7/12.47	-10.65/9.09	-8.27/7.48	-6.77/6.62	-6.89/7.4	-8.39/10.11	-11.64/12.36	-11.97/11.98	-12.62/14.23	-15.12/14.87	-14.24/13.66	-13.38/12.62	-11.3									



# Radiated Composite Gain Data\_6GHz

# Appendix B

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°)	-17.71-14.33	-7.43-4.88	-2.99-2.96	-2.16-3.34	-2.38-0.66	-1.71-1.05	0.76-2.29	1.21/1.27	-0.16-2.89	-0.63-2.46	-5.92-2.57	-5.67-16.92	-4.48-3.23	-8.66-18.45	-18.85-14.4	-8.19-7.67	-12.78-8.21	-13.14-15.82	-15.97-8.96	-5.19-7.21	-16.65-6.59	-4.36-8.79	-11.02-14.86	-14.45-18.85
Theta(7.5°)	-8.05-8.66	-4.39-4.28	-2.51-1.4	-0.57-0.24	-0.74-1.06	-0.77-0.4	0.69/1.59	0.65/0.7	1.47-0.81	-3.51-6.14	-8.59-10.2	-8.6-13.46	-17.18-9.12	-9.35-12.83	-12.2-6.9	-12.13-18.2	-18.96-11.52	-9.19-18.24	-13.39-10.26	-4.8-6.25	-6.71-13.08	-8.06-6.71	-18.11-18.63	-18.69-17.7
Theta(15°)	-15.82-10.54	-8.34-3.7	-2.29/0.4	0.44-0.09	-1.18-1.2	-0.68-0.8	0.11/0.55	0.40/0.43	1.05-1.2	-4.81-7.62	-11.62-5.63	-3.96-3.62	-7.41-4.63	-10.04-18.88	-17.38-9.22	-12.73-9.47	-12.37-10.75	-8.38-9.28	-13.25-7.35	-5.48-8.16	-10.21-16.83	-9.26-7.25	-14.37-18.18	-16.66-17.95
Theta(22.5°)	-14.99-7.51	-5.9-2.27	-0.21-0.24	-0.36-2.52	-1.97-1.26	-2.01-3.41	-1.92/1.12	1.81/1.51	0.69-1.85	-4.51-4.57	-5.36-17.12	-7.53-2.74	-0.91-2.77	-9.79-18.34	-17.61-17.64	-9.02-8.35	-9.11-6.26	-14.11-9.85	-13.97-18.44	-12.3-9.45	-8.37-17.79	-18.62-13.22	-17.48-12.04	-12.06-18.13
Theta(30°)	-13.24-9.65	-6.85-6.04	-4.54-3.93	-3.21-2.42	-2.27-2.49	-4.01-3.76	-0.18-1.57	1.47/0.68	0.64-0.45	-2.36-5.1	-5.36-10.78	-8.4-6.66	-6.12-7.91	-10.77-11.83	-16.17-16.53	-10.22-11.12	-12.71-11.41	-17.28-18.03	-15.74-18.33	-12.32-13.64	-17.82-17.47	-13.82-13.69	-13.22-17.82	-13.29-11.7
Theta(37.5°)	-8.47-7.76	-7.25-5.16	-3.29-2.48	-1.84-1.36	-2.19-4.24	-4.45-1.8	0.55/1.38	0.79/0.46	0.64-0.41	-2.17-4.51	-3.28-3.27	-5.15-8.31	-17.7-8.62	-5.19-5.65	-11.07-15.12	-17.58-18.34	-18.91-14.4	-9.17-12.37	-19.15-18.96	-17.67-17.98	-17.82-9.88	-9.04-10.19	-11.01-9.78	-9.1-8.54
Theta(45°)	-11.85-12.28	-8.76-5.63	-4.09-3.17	-2.23-1.39	-0.97-0.72	-0.33-0.65	1.52/2.04	2.11/1.86	0.72-0.74	-2-4.44	-8.47-9.91	-12.48-19	-18.82-14.48	-10.53-13.68	-18.16-17.98	-16.83-12.71	-10.49-8.32	-7.23-8.83	-12.89-13.6	-10.31-6.71	-5.38-5.85	-7.61-8.72	-10.64-14.14	-16.51-13.07
Theta(52.5°)	-18.05-15.3	-13.22-11.06	-10.15-10.28	-10.21-10.01	-9.99-9.25	-7.59-6.43	-5.31-4.26	-3.65-3.78	-4.18-4.48	-5.1-6.66	-8.93-9.76	-9.56-10.99	-10.41-11.05	-12.61-12.1	-11.7-13.89	-17.98-16.24	-12.58-10.13	-9.33-10.26	-11.77-12.98	-14.79-14.18	-13.2-14.89	-12.97-12.01	-13.72-18.51	-18.36-15.56
Theta(57.5°)	-13.14-10.74	-9.85-8.77	-7.4-6.94	-7.29-7.73	-7.47-6.77	-6.18-5.21	-4.6-4.28	-3.89-3.5	-3.25-3.42	-3.72-4.79	-6.13-7.63	-9.33-11.3	-12.61-13.7	-14.01-16.09	-17.73-18.46	-18.92-18.95	-18.67-18.18	-16.72-15.18	-13.27-11.59	-11.84-12.54	-13.61-14.43	-14.07-15.71	-16.01-14.14	-13.1-12.33
Theta(60°)	-16.88-16.69	-16.93-16.04	-15.14-15.41	-15.77-15.52	-15.23-14.37	-12.79-11.43	-11.76-11.71	-11.3-10.64	-10.22-9.86	-9.94-11.14	-12.41-13.01	-12.77-11.88	-11.69-11.05	-10.06-9.32	-9.36-10.58	-12.91-15.11	-16.83-17.72	-17.45-17	-16.84-17.27	-18.25-19.06	-19.09-18.8	-18.05-18.05	-19.39-18.96	-18.12-18.5
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°)	-3.81-3.46	-2.82-2.57	-2.23-2.22	-2.64-3.48	-4.6-5.31	-6.09-7.16	-9.01-10.47	-13.32-18.34	-15.39-11.02	-8.67-7.62	-6.58-5.32	-3.89-3.23	-2.98-2.27	-1.74-1.42	-1.45-1.66	-1.77-2.36	-3.05-3.68	-5.3-7.66	-10.46-13.06	-16.47-17.67	-18.08-15.73	-12.43-10.24	-8.18-6.94	-5.96-4.94
Theta(7.5°)	-3.82-2.99	-2.03-1.21	-0.58-0.93	-1.48-2.06	-2.32-2.6	-3.33-4.4	-5.75-8.25	-12.72-18.64	-16.41-11.71	-9.36-7.77	-7.3-5.88	-4.71-4.45	-4.29-4.11	-4.12-4.4	-4.8-4.94	-5.01-4.91	-5.43-6.94	-9.05-12.01	-15.24-17.28	-15.08-12.95	-11.95-11.17	-10.43-9.5	-8.46-7.57	-6.42-5.04
Theta(15°)	-2.14-1.83	-1.13-0.79	-1.01-1.48	-2.26-2.95	-3.03-2.9	-4.39-6.61	-8.96-11.27	-16-18.27	-17.88-17.65	-15.13-14.43	-16.82-18.63	-17.46-16.64	-14.81-12.13	-9.54-6.69	-3.95-3.66	-4.68-6.71	-9.44-12.68	-18.36-17.84	-18.52-17.41	-12.75-9.29	-7.49-6	-4.61-3.57	-3.33-3.06	
Theta(22.5°)	-1.54-1.54	-1.25-1.47	-1.97-1.66	-1.49-1.74	-2.88-5.03	-7.24-8.05	-8.48-10.61	-15.05-16	-13.41-11.78	-10.97-8.69	-6.01-5.03	-4.06-3.24	-2.91-3.53	-6.49-7.13	-8.2-7.32	-6.14-5.76	-6.52-8.19	-11.41-13.16	-13.17-12.7	-15.22-18.43	-13.18-7.33	-4.33-2.53	-1.33-1.02	-0.88-1.29
Theta(30°)	-1.51-1.42	-1.6-1.81	-2.21-3.17	-3.81-4.64	-5.71-6.45	-6.54-6.96	-8.55-9.94	-12.3-13.41	-11.71-8.65	-6.21-4.31	-3.27-3.45	-3.33-3.14	-3.29-3.08	-3.13-3.51	-4.16-5.82	-7.97-7.95	-6.4-5.59	-9.79-18.76	-14.58-9.85	-11.5-9.34	-5.12-3.91	-3.69-3.58	-2.76-2.01	-1.16-0.81
Theta(37.5°)	-1.07-1.21	-2.19-2.65	-3.79-4.39	-4.46-5.09	-6.01-6.83	-6.87-8.62	-13.43-16.68	-19.08-18.17	-18.41-12.64	-7.86-5.06	-4.51-3.3	-2.71-1.86	-0.45-0.16	0.33-0.57	1.11-0.4	-2.41-1.77	-11.21-9.9	-13.59-12.7	-16.61-16.23	-11.98-9.53	-6.73-4.84	-5.5-4.8	-2.83-2.07	-1.37-0.75
Theta(45°)	0.55-0.36	-1.51-2.44	-3.1-3.91	-5.61-7.68	-10.14-8.87	-8.45-10.67	-11.5-12.85	-18-18.66	-11.55-8.54	-6.61-3.21	-1.59-0.28	0.31-24	10.37	1.17/1.67	0.94-1.18	-3.44-6.71	-9.86-11.87	-18.95-13.29	-16.02-19.04	-11.67-8.13	-6.19-5.2	-5.45-4.41	-2.62-1.05	-0.43-0.11
Theta(52.5°)	-0.31-1.69	-2.38-2.39	-2.6-2.84	-3.79-4.68	-7.05-7.47	-7.22-10.24	-14.08-13.21	-16.71-17.4	-10.51-6.38	-5.63-4.55	-1.42-1.28	-2.64-2.83	-3.8-5.3	-5.57-3.2	-1.9-2.16	-5.27-9.34	-18.72-13.4	-13.88-16.65	-18.84-12.09	-9.71-12.33	-7.74-14.8	-2.76-2.2	-0.93-0.65	1.18-0.58
Theta(60°)	-1.13-1.97	-2.08-2.06	-1.74-2.35	-4.92-6.4	-9.88-17.34	-14.85-12.96	-13.78-11.97	-17.82-18.3	-12.14-7.08	-5.34-5.22	-4.03-2.65	-2.44-3.01	-3.35-4.44	-6.38-5.91	-6.01-8.22	-7.74-5.37	-5.35-10.58	-18.87-14.68	-9.98-15.26	-18.36-14.87	-6.65-4.1	-2.64-0.86	0.11-1.19	1.14-0.33
Theta(67.5°)	-2.95-4.22	-4.3-3.49	-3.25-2.23	-1.96-3.7	-6.82-13.3	-17.02-12.49	-9.51-10.8	-17.94-14.24	-11.21-11.36	-7.96-5.58	-4.37-4.03	-3.35-3.36	-1.31-1.37	-0.71-1.13	-2.52-3.7	-10.25-8.2	-6.12-7.77	-18.05-17.49	-11.98-13.25	-16.91-13.25	-4.5-2.75	-2.67-1.74	0.13-0.24	-0.59-1.47
Theta(75°)	-10.7-12.8	-6.53-4.83	-4.43-2.99	-3.32-4.31	-5.99-12.27	-17.85-10.07	-8.88-11.39	-18.52-14.29	-8.33-10.98	-8.71-9.91	-6.47-3.65	-3.42-3.79	-1.05-1.36	2.53-2.8	-4.92-9.77	-5.84-6.11	-17.73-18.11	-11.41-9.63	-9.71-12.33	-5.12-4.5	-3.55-1.89	-1.71-1.2	-2.84-5.19	
Theta(82.5°)	-11.51-13.67	-11.46-11.32	-9.76-4.99	-2.81-3.67	-4.24-11.17	-18.02-10.01	-6.42-9.91	-18.23-19.06	-11.11-8.46	-9.49-11.52	-7.92-5.25	-4.49-3.24	-0.51-0.19	1.09-2.95	-5.35-2.65	-1.91-7.03	-7.41-8.84	-18.76-18.14	-12.22-10.55	-8.88-6.8	-6.81-5.22	-5.54-3.14	-2.69-4.14	-5.89-8.29
Theta(90°)	-10.26-12.14	-14.32-13.52	-8.06-3.76	-0.93-0.35	-1.26-1.96	-18.36-12.99	-7.8-6.35	-10.85-8.1	-8.39-9.71	-7.56-11	-6.65-4.91	-7.48-11.98	-4.78-0.09	-0.31-6.71	-15.32-4.91	-0.7-3.09	-9.57-10.44	-10.34-13.53	-8.17-12.02	-5.92-5.52	-5.61-4.02	-5.91-4.99	-4.61-8.46	-9.77-10.5
Theta(97.5°)	-8.61-9.57	-10.12-9.16	-5.66-2.47	-0.76-2.04	-4.34-13	-9.67-13.3	-7.43-6.06	-8.67-8.3	-8.3-16.13	-7-7.19	-4.42-6.46	-19.19-16.74	-2.52-0.74	-2.74-5.37	-13.56-11.31	-5.35-3.8	-6.78-9.37	-7.24-7.81	-4.79-8.76	-4.2-6.53	-5.87-6.1	-5.88-4.73	-4.39-6.11	-12.35-10.12
Theta(105°)	-11.56-9.76	-8.21-6.57	-5.65-4.84	-4.11-6.01	-10.02-5.76	-8.48-18.7	-8.89-6.94	-12.28-13.14	-7.62-9.74	-5.33-7.26	-4.54-3.32	-5.26-1.65	-8.27-3.69	-1.44-0.83	-1.75-5.3	-13.19-3.94	-7.64-12.03	-9.4-10.43	-7.53-11.38	-6.79-5.87	-6.83-9.32	-7.99-3.85	-3.91-4.46	-7.74-9.35
Theta(112.5°)	-8.7-5.91	-4.4-4.24	-7.39-10.16	-11.55-10.78	-17.5-11.15	-7.93-12.92	-17.58-12.48	-9.75-8.73	-10.52-4.05	-3.61-1.62	-2.95-2.08	-2.77-3.68	-5.51-1.83	-1.95-0.21	-2.32-9.34	-5.97-2.69	-10.31-17.08	-11.04-7.55	-11.64-10.33	-10.33-11.08	-6.26-9.42	-8.99-5.33	-6.01-7.98	-8.55-9.54
Theta(120°)	-7.36-4.98	-3.89-4.5	-8.89-15.51	-13.99-15.64	-17.55-6.64	-5.31-8.82	-17.54-8.32	-8.04-11.98	-11.34-7.35	-2.83-2.08	-0.99-3.18	-3.17-1.94	-0.6-2.29	-2.15-2.67	-14.24-5.57	-6.3-4.77	-16.85-18.34	-15.25-6.39	-12.11-10.53	-10.87-10.56	-9.49-11.94	-17.33-10.61	-10.83-13.04	-13.08-7.35
Theta(127.5°)	-3.51-2.56	-2.45-3.05	-3.98-0.07	-4.54-3.93	-2.29-1.02	-4.3-14.21	-11.14-7.08	-7.02-15.77	-8.14-5.64	-4.73-2.6	-2.56-3.12	-1.87-0.98	-1.94-1.29	-2.18-1.77	-19.13-13.14	-6.87-8.1	-7.15-19.33	-18.49-10.39	-15.44-14.26	-11.27-9.76	-7.87-11.04	-18.61-19.14	-10.96-7.99	-7.31-5
Theta(135°)	-1.91-1.78	-0.78-1.12	-0.97-1.15	-1.57-2.63	-3.14-3.68	-8.01-11.91	-7.82-4.46	-6.66-8.41	-9.93-5.43	-3.31-2.55	-2.89-6.19	-18.28-7.14	-3.91-2.31	-15.07-9.75	-7.76-13.49	-4.69-10.93	-16.46-6.87	-12.24-6.44	-13.71-14.62					



Total Gain Data

Table with columns for Frequency (MHz), Polarization, and Total Antenna Gain for various angles (0 to 180 degrees) and frequencies (2.45GHz to 5.8GHz).



# Antenna Pattern\_2.4GHz, 5GHz

# Appendix C

Theta	Phi	Gain	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(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(22.5°)	Phi(0°)	4.481-4.86	-4.331-3.44	-3.461-3.40	-4.221-3.97	-3.801-2.68	-2.141-1.88	-1.981-1.96	-2.511-3.90	-5.011-4.71	-4.581-5.07	-6.281-6.74	-6.141-4.97	-4.031-2.82	-2.221-2.28	-2.061-1.55	-0.861-0.13	0.310-8.6	0.890-8.3	0.471-2.20	-0.831-1.42	-1.791-2.27	-2.601-3.07	-3.611-4.15	-4.391-4.50										
Theta(30°)	Phi(0°)	-7.941-8.63	-6.621-4.63	-4.121-3.72	-2.881-2.12	-1.621-0.41	0.120-2.0	-0.081-1.07	-2.651-4.58	-5.211-5.04	-4.861-5.17	-5.831-5.86	-5.421-4.50	-3.521-2.83	-2.711-3.06	-3.051-2.47	-1.691-1.21	-0.261-0.29	-0.601-0.97	-1.471-1.70	-2.281-3.13	-3.801-4.06	-4.281-5.05	-4.901-5.14	-5.621-6.96										
Theta(37.5°)	Phi(0°)	-6.241-3.92	-2.991-2.61	-1.991-1.48	-1.531-1.22	-0.400-0.77	1.341-1.1	0.281-0.73	-1.681-2.45	-2.961-3.80	-4.471-2.29	-3.321-2.53	-2.611-1.08	-1.781-2.23	-2.411-1.91	-1.191-1.23	-0.841-2.93	-3.871-2.57	-0.810-1.8	0.001-0.48	-1.211-2.47	-3.431-3.96	-4.241-5.77	-7.941-8.54	-8.971-8.39										
Theta(45°)	Phi(0°)	-2.131-1.22	-1.081-0.56	-0.551-1.08	-1.581-2.48	-2.751-0.97	0.771-5.7	1.751-7.0	1.071-6.88	-2.881-4.71	-5.191-3.31	-1.571-0.52	0.250-0.9	-0.811-1.66	-2.371-1.0	-3.411-2.33	-0.971-0.7	-2.001-3.01	-1.631-1.5	-1.581-1.27	-3.011-3.25	-4.311-6.27	-5.841-6.47	-3.931-3.65	-3.021-9.51										
Theta(52.5°)	Phi(0°)	1.632-3.6	2.191-5.2	1.200-6.4	-0.791-2.94	-4.211-2.22	0.631-6.6	1.521-2.6	-0.591-3.64	-5.701-7.61	-8.911-5.02	-1.501-1.01	-0.881-1.15	-3.651-6.02	-5.991-4.02	-1.361-0.74	-1.391-1.23	-2.231-3.35	-4.411-1.56	-1.891-3.22	-3.101-2.85	-2.831-3.69	-3.471-2.69	-1.561-0.41	0.070-4.5										
Theta(60°)	Phi(0°)	1.570-6.3	-0.631-0.41	0.670-7.6	-0.381-3.92	-7.651-5.79	-2.600-0.7	1.331-9.3	1.261-0.89	-4.471-2.29	-3.321-2.53	-2.611-1.08	-1.781-2.23	-2.411-1.91	-1.191-1.23	-0.841-2.93	-3.871-2.57	-0.810-1.8	0.001-0.48	-1.211-2.47	-3.431-3.96	-4.241-5.77	-7.941-8.54	-8.971-8.39											
Theta(67.5°)	Phi(0°)	-0.521-1.92	-1.861-1.89	-1.411-0.81	-1.061-2.49	-4.771-3.97	-2.551-1.51	-0.340-9.4	0.491-1.79	-2.881-1.75	-3.411-2.00	-2.070-3.4	1.340-5.6	1.211-8.0	0.461-1.70	-2.711-2.48	-3.881-6.49	-6.751-6.67	-7.661-5.35	-4.661-6.63	-6.511-3.99	-0.051-1.53	-3.451-1.79	-1.040-1.4	0.460-3.1										
Theta(75°)	Phi(0°)	0.361-1.82	-0.950-6.6	0.350-4.0	-0.441-1.95	-1.280-8.2	0.811-1.5	-2.401-1.0	-0.081-1.12	-1.491-1.20	-3.241-2.74	-2.221-0.75	1.391-3.2	0.971-6.0	0.261-1.88	-1.221-1.0	0.151-1.06	-3.241-2.49	-7.061-8.32	-5.461-3.57	0.371-0.97	-2.691-2.96	-3.471-2.71	-1.850-7.5	0.510-0.2										
Theta(82.5°)	Phi(0°)	1.420-2.7	0.821-2.0	3.152-1.4	1.561-1.21	0.691-1.5	2.161-6.2	0.680-2.4	-0.361-1.86	-1.481-1.34	-4.281-4.11	-1.421-1.60	3.660-8.4	1.823-1.1	-0.071-4.9	-2.071-2.3	2.721-1.3	-2.591-3.46	-1.841-2.43	-2.432-4.3	-1.941-1.54	-2.661-0.90	-1.173-1.6	3.342-0.6											
Theta(90°)	Phi(0°)	0.931-0.26	0.231-6.0	3.373-2.0	2.341-1.29	0.110-9.5	2.592-3.9	1.960-4.8	-0.151-3.50	-2.791-0.83	-0.741-9.32	-6.081-1.64	3.602-0.8	3.592-9.7	0.870-1.9	-1.540-8.1	4.073-5.4	0.901-3.38	-3.441-4.31	-3.381-0.91	1.281-9.0	0.391-0.23	-0.891-0.24	0.793-2.1	4.203-3.4										
Theta(97.5°)	Phi(0°)	-2.151-2.46	-0.461-0.29	1.081-0.0	0.360-4.3	-0.320-2.2	-0.181-1.9	0.730-0.9	-1.171-6.38	-0.831-7.12	-0.103-1.74	-5.014-1.0	3.323-9.4	3.722-8.0	2.732-3.4	2.113-5.7	3.101-2.3	-0.341-0.27	-1.521-3.18	-2.381-0.69	2.341-0.43	-0.421-0.72	-0.771-1.6	-0.131-2.0	2.702-6.4										
Theta(105°)	Phi(0°)	-2.321-4.58	-2.051-2.35	-1.401-2.05	-2.901-0.79	-1.121-1.04	-0.791-0.72	-1.831-1.07	-1.751-6.48	-3.781-6.52	-3.051-13.77	-4.960-3.4	2.741-8.7	0.771-0.06	-1.511-3.21	-0.340-0.08	3.141-8.3	-0.901-1.42	1.801-3.41	-2.921-2.58	1.890-3.6	-2.051-6.69	-2.731-1.41	-0.181-0.1	0.881-2.9										
Theta(112.5°)	Phi(0°)	-1.931-3.24	-0.701-1.31	-3.601-5.90	-4.691-3.08	-2.601-6.74	-5.201-5.22	-7.491-4.65	-6.691-7.06	-4.671-10.20	-1.661-0.18	-4.041-3.87	-1.321-2.4	4.941-4.31	-4.761-8.50	-2.961-7.1	1.751-5.3	-2.581-2.43	2.251-1.67	-3.571-1.19	-0.871-1.7	-1.611-2.33	-5.101-3.60	-4.501-0.37	-0.411-0.25										
Theta(120°)	Phi(0°)	-3.181-4.55	-3.711-3.49	-3.501-2.31	-2.241-3.95	-7.771-8.83	-8.141-6.85	-1.011-3.95	-1.611-1.49	-6.881-4.08	-2.861-5.43	-6.791-4.07	-4.041-5.1	-2.851-7.1	-2.441-3.26	-3.641-6.54	-7.641-3.25	-4.551-7.2	-1.341-7.92	-0.451-2.68	-6.251-1.89	-5.221-0.37	-0.251-1.3	-2.461-2.01	-0.390-6.9	0.441-2.8									
Theta(127.5°)	Phi(0°)	-2.201-2.09	-1.001-1.64	-0.211-1.01	-2.051-0.96	-6.231-9.79	-13.331-8.11	-5.681-5.36	-5.661-5.28	-11.931-9.71	-11.611-14.89	-14.031-9.36	-5.521-9.6	-6.261-2.01	-5.141-9.99	-3.311-0.21	0.961-3.44	-5.881-7.30	0.061-1.40	-4.201-1.27	-2.961-0.29	-0.171-1.23	-2.621-1.63	0.3221-1.2	1.700-0.2										
Theta(135°)	Phi(0°)	0.120-8.6	-0.041-1.45	-0.230-3.4	-1.011-1.89	-4.261-8.70	-7.941-5.02	-2.131-3.41	-2.871-1.24	-3.541-7.23	-1.121-6.29	-2.351-1.78	-3.661-3.74	-8.541-11.19	-6.031-3.12	-2.801-0.11	-1.001-8.03	-10.641-3.52	-1.031-2.69	-4.361-5.48	-6.411-4.29	0.1221-3.5	0.820-0.9	1.162-5.9	2.691-2.4										
Theta(142.5°)	Phi(0°)	-5.591-0.43	-2.401-3.34	-6.141-5.72	-2.401-0.61	-1.011-3.95	-5.451-1.78	-1.161-1.49	-6.881-4.08	-2.861-5.43	-6.791-4.07	-4.041-5.1	-2.851-7.1	-2.441-3.26	-3.641-6.54	-7.641-3.25	-4.551-7.2	-1.341-7.92	-0.451-2.68	-6.251-1.89	-5.221-0.37	-0.251-1.3	-2.461-2.01	-0.390-6.9	0.441-2.8										
Theta(150°)	Phi(0°)	-4.561-10.01	-9.001-6.95	-6.301-5.79	-5.541-5.08	-3.641-1.49	-3.741-3.64	-5.951-5.14	-6.691-9.0	-8.761-12	-6.711-6.67	-3.301-1.46	-2.181-2.95	-2.021-3.79	-8.981-8.15	-9.711-5.35	-2.921-2.86	-6.341-10.07	-1.551-8.64	-5.301-4.19	-2.930-7.1	-0.191-0.32	-0.351-1.39												
Theta(157.5°)	Phi(0°)	1.461-3.7	0.570-0.5	0.410-9.6	1.310-8.0	-1.071-3.66	-5.521-7.01	-9.511-11.71	-11.931-11.82	-11.451-10.79	-10.651-9.17	-6.851-5.85	-6.381-5.78	-5.261-6.43	-10.041-14.76	-15.111-13.30	-13.201-14.82	-9.741-5.52	-4.291-7.76	-11.001-9.19	-6.491-4.21	-3.431-1.99	0.020-7.0	0.981-2.3											
Theta(165°)	Phi(0°)	-1.021-0.15	-1.161-1.32	-1.991-3.23	-3.781-4.83	-8.401-7.02	-6.241-6.79	-7.591-7.25	-6.111-6.12	-7.081-9.26	-10.811-9.92	-8.681-7.94	-8.591-10.14	-11.601-14.31	-15.521-15.25	-13.611-11.49	-11.381-10.92	-8.571-6.87	-5.271-5.08	-5.961-3.88	-11.421-13.99	-15.421-15.38	-9.321-6.49	-3.761-2.21	-1.131-0.49										
Theta(172.5°)	Phi(0°)	-6.591-7.60	-7.961-6.36	-4.371-3.20	-2.481-2.24	-2.701-3.48	-4.761-6.73	-7.891-7.69	-6.911-6.75	-6.571-6.63	-6.111-5.86	-5.271-5.09	-5.461-5.88	-4.521-6.42	-1.101-0.31	-2.701-2.40	-2.421-2.50	-2.721-3.31	-4.611-5.35	-4.911-4.55	-4.791-4.97	-5.031-5.01	-4.941-5.06												
Theta(180°)	Phi(0°)	-7.611-7.56	-7.751-7.69	-4.701-7.24	-8.641-10.42	-12.201-15.78	-15.121-12.72	-10.391-9.19	-9.501-9.70	-9.711-10.03	-9.731-8.39	-7.051-5.61	-4.871-5.4	-4.861-4.61	-4.341-3.98	-4.381-3.84	-4.031-3.93	-3.841-4.18	-4.831-5.24	-5.461-6.09	-4.461-6.13	-5.841-5.19	-4.781-4.71	-4.651-5.36	-6.721-7.36										
Freq(Hz)	TotalAnt. 2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Gain	Phi(0°)	2.421-2.33	2.261-2.26	2.301-2.34	2.471-2.52	2.591-2.64	2.741-2.84	2.911-2.92	2.931-2.94	2.921-2.92	2.851-2.71	2.591-2.44	2.261-2.16	2.141-2.21	2.311-2.39	2.261-2.29	2.261-2.30	2.391-2.48	2.541-2.54	2.501-2.42	2.421-2.41	2.451-2.55	2.621-2.70	2.681-2.62	2.551-2.54										
Theta(0°)	Phi(0°)	-1.891-1.65	-1.431-1.24	-1.081-1.00	-1.031-1.12	-1.221-1.34	-1.491-1.71	-1.931-1.92	-2.481-2.75	-2.921-3.05	-3.101-3.07	-3.021-2.97	-3.051-3.26	-3.551-3.83	-4.041-4.10	-4.041-3.95	-3.921-3.92	-3.901-3.84	-3.741-3.58	-3.441-3.30	-3.211-3.08	-2.991-2.88	-2.761-2.69	-2.521-2.35	-2.201-2.05										
Theta(7.5°)	Phi(0°)	-2.021-1.64	-1.221-0.83	-0.451-0.21	-0.111-0.06	-0.091-0.14	-0.231-0.44	-0.791-1.31	-1.931-2.47	-2.941-3.33	-3.521-3.61	-3.791-4.23	-4.731-5.36	-5.611-5.87	-6.521-6.51	-7.511-5.05	-8.491-4.81	-9.511-4.81	-10.511-4.81	-11.511-4.81	-12.511-4.81	-13.511-4.81	-14.511-4.81	-15.511-4.81	-16.511-4.81	-17.511-4.81	-18.511-4.81	-19.511-4.81	-20.511-4.81	-21.511-4.81	-22.511-4.81	-23.511-4.81	-24.511-4.81	-25.511-4.81	-26.511-4.81
Theta(22.5°)	Phi(0°)	-2.271-1.93	-1.381-0.73	-0.180-2.7	0.570-7.9	0.900-9.1	0.780-4.0	-0.361-1.28	-2.371-3.36	-4.201-4.69	-4.771-4.57	-4.281-4.15	-4.281-4.64	-4.941-6.12	-5.171-5.19	-5.271-5.38																			

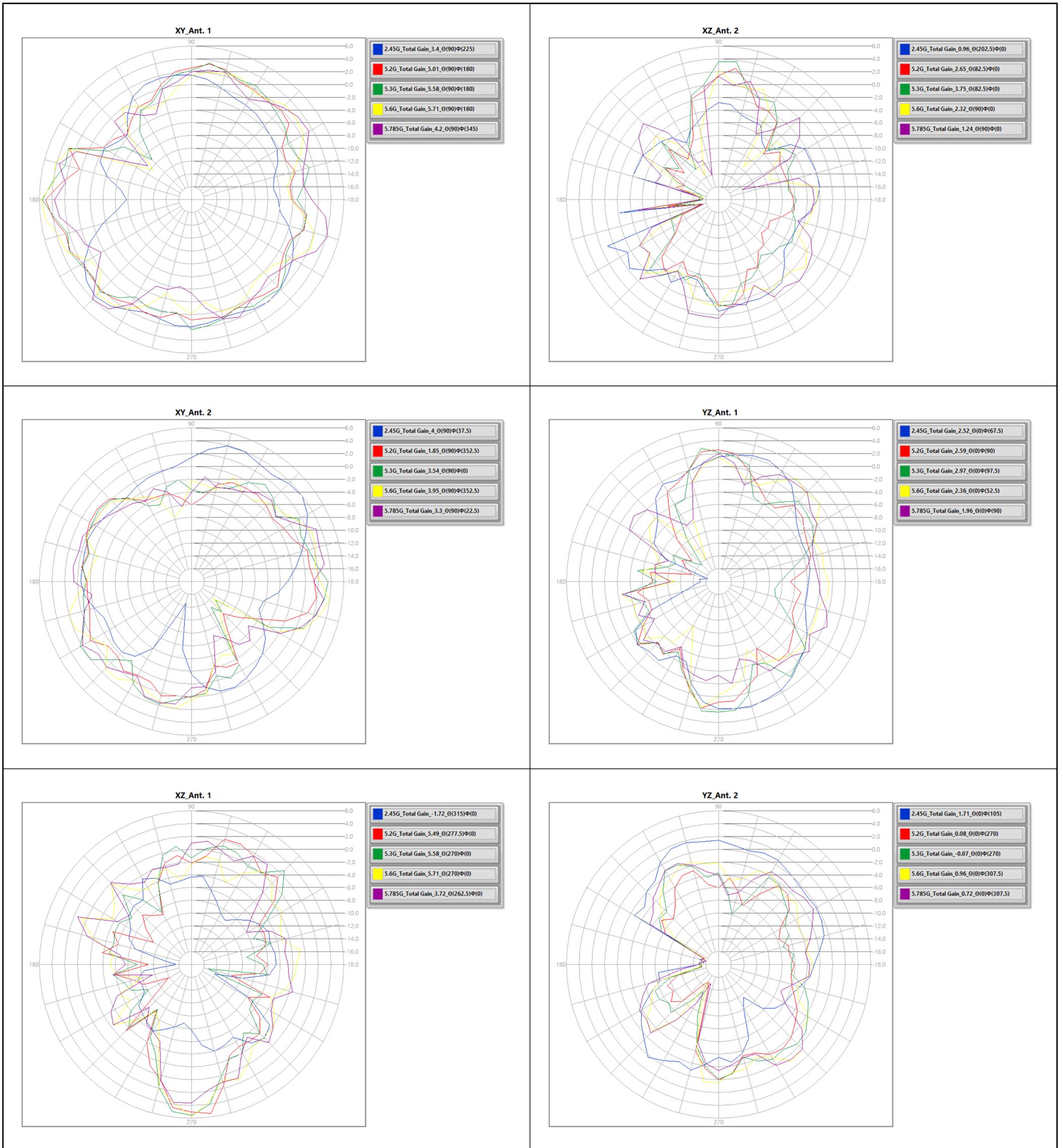


# Antenna Pattern\_2.4GHz, 5GHz

# Appendix C

Theta (°)	0.032/2.27	1.92/1.47	-2.22/3.23	-1.33/-1.99	-2.85/-3.59	-6.27/-6.88	-4.23/-6.94	-8.02/-3.50	-2.08/-2.70	-3.47/-4.85	-5.50/-5.10	-5.53/-3.30	-3.16/-1.44	-0.01/-0.26	-1.66/-1.44	-0.65/-1.17	-1.75/-1.91	-1.06/-0.51	-1.14/-3.16	-4.57/-6.01	-3.99/-2.12	-2.93/-2.87	-0.44/-1.45	2.23/0.48
Theta (82.5°)	0.25/0.72	1.24/1.95	0.54/-2.04	-2.66/-2.53	-1.54/-0.88	-2.89/-5.21	-4.66/-8.25	-6.93/-3.02	-2.50/-2.80	-3.29/-3.64	-4.57/-4.23	-4.79/-4.18	-3.63/-0.43	0.86/-0.83	-2.89/-1.27	-0.37/-1.23	0.18/-0.59	0.92/1.34	-1.02/-2.73	-3.63/-7.31	-5.22/-3.15	-3.04/-6.44	-3.34/-1.05	3.09/2.47
Theta (90°)	2.32/1.64	2.34/2.49	1.21/-0.20	-0.68/-1.95	-2.01/-0.35	-3.13/-2.82	-2.18/-6.44	-7.59/-3.81	-2.70/-1.92	-0.34/-0.04	-0.40/0.00	-2.65/-1.93	-1.40/0.25	2.06/1.65	-0.16/-1.31	1.20/1.16	-0.15/0.40	1.40/2.06	0.42/-0.35	-4.46/-5.56	-4.83/-10.34	-11.63/-13.77	-2.28/1.28	2.82/3.95
Theta (97.5°)	-3.43/-3.15	-0.24/0.76	0.54/1.38	2.04/0.53	-0.08/-0.04	-2.79/-2.52	-2.10/-5.58	-5.73/-2.50	-2.44/-1.23	-0.03/1.16	1.11/1.05	-0.67/-1.03	-1.57/0.88	0.88/-0.25	-1.16/-1.93	1.06/0.76	-0.95/-0.92	0.60/1.18	0.50/-1.63	-6.67/-3.97	-1.70/-9.92	-13.04/-8.10	-3.86/-1.84	-0.09/-0.90
Theta (105°)	-7.10/-14.78	-8.78/-4.78	-3.21/-1.03	1.39/1.64	1.62/0.97	-1.35/-2.02	-1.45/-4.36	-5.92/-5.13	-2.57/-1.67	-0.66/0.80	0.98/1.17	-0.72/-2.01	-2.35/-1.28	-0.51/-1.43	-3.06/-2.18	-2.14/-2.88	-2.87/-6.19	-4.30/-2.67	-4.85/-5.85	-8.50/-5.22	-0.83/-8.23	-14.99/-5.87	-3.95/-1.72	-3.15/-5.01
Theta (112.5°)	-11.42/-11.43	-13.19/-8.96	-5.08/-4.87	-4.10/-1.76	0.55/-0.21	-0.86/0.05	-1.52/-3.37	-4.24/-3.20	-2.61/-1.69	-0.34/-0.21	-0.78/-1.98	-2.75/-4.04	-5.05/-4.70	-2.65/-4.16	-7.33/-7.05	-3.81/-5.97	-8.98/-6.12	-6.77/-8.58	-10.67/-13.74	-13.28/-15.15	-13.74/-12.15	-11.24/-5.74	-7.22/-9.33	-7.73/-7.76
Theta (120°)	-13.67/-11.13	-7.93/-7.29	-5.81/-4.80	-5.30/-3.16	-2.08/-2.80	-3.13/-2.10	-2.84/-5.06	-2.73/-2.38	-2.84/-2.02	-1.97/-1.07	-0.70/-2.11	-2.64/-4.47	-5.10/-5.98	-5.11/-5.76	-11.80/-5.69	-4.76/-4.49	-8.19/-12.02	-9.82/-13.32	-14.75/-15.32	-11.10/-9.48	-14.77/-7.46	-9.91/-13.05	-12.73/-15.03	-14.06/-13.66
Theta (127.5°)	-6.96/-5.96	-5.47/-6.48	-8.22/-5.38	-4.65/-3.29	-3.00/-4.87	-4.76/-2.86	-3.18/-3.24	-2.82/-2.28	-2.91/-4.84	-4.94/-3.62	-3.41/-2.03	-1.34/-3.98	-3.78/-4.60	-3.21/-5.06	-6.16/-4.09	-4.50/-10.36	-9.27/-6.58	-4.86/-6.16	-7.16/-10.69	-8.26/-4.13	-4.17/-4.34	-5.50/-4.75	-7.47/-8.80	-5.49/-8.58
Theta (135°)	-3.87/-4.71	-7.76/-5.71	-4.38/-2.34	-1.78/-2.71	-5.38/-5.39	-5.10/-4.46	-4.91/-6.42	-4.97/-4.53	-5.69/-5.87	-4.98/-4.61	-3.75/-2.04	-2.45/-2.33	-1.67/-2.82	-3.99/-5.60	-5.33/-4.56	-7.44/-13.26	-8.14/-4.90	-4.31/-2.93	-3.26/-10.20	-12.37/-6.26	-5.63/-6.87	-5.11/-6.38	-4.85/-6.45	-7.32/-6.57
Theta (142.5°)	-4.94/-4.60	-5.80/-3.97	-2.18/-2.52	-3.42/-4.20	-4.53/-4.57	-5.09/-7.55	-7.26/-4.90	-4.36/-4.71	-6.05/-7.20	-7.08/-5.70	-3.84/-3.26	-3.57/-3.66	-4.39/-4.50	-4.39/-6.63	-7.89/-7.95	-7.27/-7.97	-10.33/-9.55	-8.14/-3.96	-3.54/-6.12	-6.45/-5.32	-5.16/-5.93	-6.02/-6.65	-6.44/-7.68	-8.02/-7.01
Theta (150°)	-4.96/-6.01	-9.60/-9.17	-7.13/-6.51	-6.31/-5.83	-4.58/-3.54	-4.30/-7.46	-10.20/-9.71	-14.77/-15.38	-15.41/-9.03	-7.50/-5.99	-4.50/-3.14	-2.98/-3.44	-3.60/-3.77	-4.61/-6.29	-8.66/-11.19	-11.04/-10.43	-7.18/-7.06	-8.99/-6.19	-5.81/-7.87	-9.13/-8.35	-9.19/-12.07	-12.77/-8.10	-4.62/-4.50	-6.60/-6.06
Theta (157.5°)	-10.54/-9.34	-8.21/-7.66	-8.04/-15.40	-14.92/-14.68	-15.07/-15.58	-15.04/-15.04	-15.59/-14.70	-15.53/-15.99	-15.27/-7.65	-6.79/-7.19	-8.06/-8.27	-8.16/-8.35	-8.95/-10.11	-11.28/-10.76	-8.26/-6.22	-6.34/-6.85	-6.60/-6.82	-12.06/-8.56	-6.56/-6.91	-7.72/-8.68	-10.93/-12.79	-12.32/-13.08	-9.61/-9.44	-13.59/-13.47
Theta (165°)	-12.07/-11.95	-10.43/-9.97	-10.17/-9.54	-7.97/-7.19	-6.84/-15.57	-15.17/-15.69	-15.75/-14.94	-15.14/-15.29	-15.77/-15.51	-15.63/-15.88	-15.40/-15.78	-15.46/-14.83	-15.30/-16.45	-5.09/-4.69	-4.54/-5.26	-7.57/-9.85	-10.20/-10.30	-9.64/-9.03	-8.30/-7.83	-7.28/-6.94	-7.45/-8.72	-9.64/-10.19	-10.67/-10.94	-12.24/-13.43
Theta (172.5°)	-15.50/-15.17	-15.73/-15.43	-15.82/-14.71	-14.73/-14.67	-15.52/-15.41	-15.54/-15.67	-15.34/-15.53	-15.33/-15.32	-15.77/-15.87	-15.30/-15.31	-15.43/-15.59	-15.21/-15.27	-6.88/-7.83	-8.31/-7.93	-7.53/-7.37	-7.77/-8.30	-9.04/-10.09	-11.26/-13.35	-14.79/-14.45	-12.32/-11.20	-11.82/-11.69	-10.60/-9.74	-9.43/-10.61	-10.89/-10.02
Theta (180°)	-14.70/-15.07	-15.35/-15.33	-15.94/-15.11	-15.69/-15.73	-15.91/-15.25	-15.26/-15.61	-15.36/-15.04	-16.17/-15.19	-15.19/-15.47	-15.56/-15.59	-16.10/-16.09	-14.59/-15.37	-15.68/-15.29	-15.17/-6.25	-6.65/-7.03	-6.99/-7.35	-8.45/-10.15	-11.97/-13.64	-13.82/-14.85	-14.52/-13.17	-12.21/-11.96	-11.83/-12.52	-12.06/-11.89	-10.33/-9.55
Freq(Hz)	5.785GPol.	TotalAnt.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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°)	-3.92/-3.35	-3.46/-3.35	-3.27/-3.44	-3.65/-3.66	-3.70/-3.74	-3.59/-3.50	-3.64/-3.74	-4.08/-4.68	-5.05/-4.73	-4.22/-3.64	-3.72/-4.31	-4.24/-3.72	-3.57/-3.85	-3.39/-2.93	-3.10/-3.48	-3.87/-3.82	-3.57/-3.54	-3.83/-3.82	-3.86/-4.24	-4.39/-4.11	-3.39/-2.97	-2.85/-3.00	-3.11/-3.10	-2.91/-2.84
Theta (7.5°)	-3.06/-3.26	-3.15/-2.99	-3.03/-3.31	-3.64/-3.50	-3.30/-3.48	-3.62/-3.88	-4.20/-3.96	-3.85/-3.71	-3.59/-3.96	-4.83/-4.64	-3.27/-3.01	-3.91/-3.92	-3.23/-3.11	-3.47/-3.51	-3.36/-3.33	-3.30/-3.28	-3.57/-3.74	-3.72/-3.43	-3.59/-4.07	-4.24/-4.30	-4.10/-3.96	-3.80/-3.69	-3.70/-3.69	-3.40/-3.10
Theta (15°)	-4.96/-4.50	-4.08/-3.88	-3.94/-3.74	-3.56/-2.96	-2.57/-2.72	-3.04/-3.23	-3.06/-2.83	-3.01/-2.93	-2.82/-2.81	-3.49/-4.53	-5.09/-4.31	-3.95/-4.66	-5.06/-4.64	-4.17/-3.97	-4.09/-4.15	-4.14/-3.95	-4.25/-4.75	-5.06/-5.39	-5.92/-6.32	-6.36/-5.73	-5.28/-5.19	-4.97/-4.94	-5.03/-4.84	-4.28/-4.49
Theta (22.5°)	-13.89/-12.54	-12.97/-11.67	-9.46/-7.06	-4.78/-2.85	-1.58/-1.44	-1.54/-1.83	-2.00/-1.98	-1.78/-1.95	-2.56/-3.43	-4.57/-5.13	-4.77/-3.39	-2.11/-1.84	-2.25/-2.30	-2.74/-3.57	-4.67/-5.23	-4.43/-3.91	-4.46/-5.15	-5.20/-5.66	-7.35/-9.24	-7.75/-5.58	-5.28/-6.36	-6.86/-7.11	-9.01/-12.46	-13.34/-14.34
Theta (30°)	-5.00/-3.10	-3.76/-4.26	-3.49/-2.94	-3.10/-2.62	-1.65/-1.07	-1.23/-0.68	-0.78/-0.95	-1.27/-1.88	-3.18/-4.94	-5.79/-4.62	-3.20/-2.03	-1.45/-1.28	-0.98/-0.66	-1.20/-2.20	-3.44/-4.68	-4.26/-3.15	-3.22/-3.51	-4.58/-6.15	-5.94/-4.85	-4.83/-5.87	-6.86/-7.59	-8.50/-10.91	-13.51/-11.02	-9.49/-8.33
Theta (37.5°)	-1.87/-0.16	0.22/-0.26	-0.49/0.14	1.00/1.54	1.36/0.07	-1.37/-1.18	-0.95/0.68	-0.91/-1.50	-2.61/-4.06	-3.74/-2.45	-1.34/-1.01	-0.79/-0.40	-0.37/-0.73	-1.19/-1.20	-1.41/-2.35	-5.44/-5.15	-1.51/-0.67	-1.83/-1.97	-1.40/-1.34	-1.43/-2.42	-4.35/-6.04	-5.33/-4.98	-6.52/-7.13	-5.26/-3.86
Theta (45°)	0.10/1.73	2.33/1.81	0.75/-0.23	0.18/1.40	2.05/1.10	-0.91/-1.74	-1.61/0.87	-0.38/-0.41	-0.64/-0.55	-0.19/-0.33	-0.52/-0.20	0.81/0.96	-0.01/-0.39	0.01/-1.24	-2.31/-1.82	-3.15/-3.47	-1.56/-0.56	-0.39/0.55	0.71/0.06	-0.66/-2.14	-3.84/-3.74	-4.02/-4.87	-5.29/-5.29	-2.39/-0.55
Theta (52.5°)	-4.28/-2.53	-1.83/-0.15	0.78/0.90	0.50/0.41	1.65/1.91	0.17/-0.88	-1.35/-2.55	-3.69/-3.76	-2.59/-1.24	-0.90/-0.86	-0.97/-0.94	-0.50/-0.22	-0.88/-1.06	-0.29/0.13	-1.70/-3.68	-4.45/-2.14	-0.43/0.29	-0.00/0.32	0.72/1.05	0.82/-0.94	-1.75/-0.13	1.30/0.19	-3.30/-5.56	-6.33/-5.64
Theta (60°)	-6.19/-6.02	-7.84/-12.35	-7.58/-3.71	-1.21/-0.59	0.38/0.73	-0.58/-1.42	-1.31/-1.80	-2.68/-2.17	-1.87/-2.26	-3.46/-4.90	-4.61/-3.09	-1.23/-0.05	-0.41/-1.28	-1.07/-1.50	-3.26/-3.00	-2.01/-2.20	-1.37/-1.20	-0.32/0.14	0.20/0.53	0.46/-0.38	-0.13/-1.38	2.00/1.71	-0.48/-5.14	-7.80/-7.09
Theta (67.5°)	-1.07/0.45	-0.09/-2.02	-9.32/-8.91	-5.79/-6.75	-6.32/-2.95	-2.43/-2.39	-3.61/-3.25	-1.78/-1.58	-2.36/-5.57	-8.08/-9.55	-8.46/-3.72	-2.01/-2.36	-3.50/-3.35	-1.67/-0.94	-1.08/-2.06	-3.07/-3.00	-3.03/-2.03	-1.45/-2.09	-2.89/-1.70	-1.84/-2.70	-1.57/0.32	-0.25/-3.24	-3.39/-1.70	-0.89/-1.38
Theta (75°)	1.19/2.63	2.47/1.21	-3.00/-4.06	-1.65/-3.23	-5.83/-7.47	-7.13/-5.20	-6.37/-5.93	-3.04/-1.98	-2.86/-4.79	-7.03/-7.81	-5.85/-2.86	-1.03/-0.22	-1.01/-2.90	-1.78/-0.22	-0.19/-0.69	-1.07/-3.90	-1.79/-0.46	-0.94/-1.56	-2.96/-3.14	-4.21/-6.80	-5.25/-1.96	-2.06/-2.48	-1.26/-1.46	-2.95/-1.16
Theta (82.5°)	-0.01/1.51	2.78/3.19	0.33/-2.98	-1.18/-1.04	-1.27/-3.82	-5.19/-4.92	-7.09/-8.68	-3.62/-2.58	-2.51/-4.65	-4.35/-3.78	-2.72/0.26	0.29/0.03	-1.52/-2.72	-0.82/0.36	0.59/0.77	-0.30/-1.88	-0.17/1.31	0.97/-0.12	-2.17/-4.51	-2.21/-6.32	-6.64/-1.25	-0.59/-3.15	-2.82/-1.07	1.08/1.18
Theta (90°)	1.24/3.11	2.88/3.30	0.50/-1.23	-0.15/-0.56	-1.81/-2.33	-2.80/-1.52	-4.04/-6.17	-3.55/-2.35	-3.50/-2.61	-2.09/-1.26	-0.25/0.54	0.35/0.83	0.56/-2.20	-0.55/0.61	1.86/0.59	0.92/-0.20	-0.94/1.37	1.56/1.26	-1.44/-1.43	-3.43/-8.95	-7.80/-5.65	-4.99/-6.66	-1.77/0.68	2.30/3.05
Theta (97.5°)	-0.26/1.05	1.77/1.73	0.08/1.47	2.83/1.64	-0.66/-2.20	-2.96/-2.04	-3.38/-5.53	-2.64/-2.05	-1.87/-1.72	-0.28/1.04	0.75/2.08	0.28/2.00	0.35/-1.23	-0.20/-0.21	0.41/0.32	-0.25/-2.14	-0.76/0.90	0.73/-0.13	-2.40/-1.88	-5.18/-7.03	-2.65/-11.94	-11.67/-10.06	-5.68/-1.68	0.10/-0.09
Theta (105°)	-13.98/-9.83	-5.19/-1.93	-0.99/0.45	2.45/2.75	1.64/-0.04	-1.11/-1.35	-1.90/-3.20	-3.70/-2.93	-2.69/-1.71	1.22/2.23	2.09/2.39	1.23/1.44	0.39/-1.44	-2.42/-1.26	-0.55/-1.60	-1.48/-2.00	-5.51/-3.59	-1.88/-3.47	-5.42/-5.04	-6.32/-7.99	-2.42/-8.77	-12.79/-3.62	-4.04/-3.64	

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







# Antenna Pattern\_6GHz

# Appendix D

θ (22.5°)	-2.67/-1.38	-0.61/-1.23	-2.36/-3.16	-1.33/-2.14	-1.18/-0.81	-0.66/0.04	0.89/1.70	2.35/2.56	2.22/1.43	-0.01/-2.02	-3.51/-3.63	-3.13/-3.24	-3.22/2.88	-2.40/-2.07	-2.48/2.99	-3.39/-4.20	-4.91/-4.54	-3.71/-4.20	-6.24/-7.15	-5.75/-4.46	-3.61/-2.77	-2.13/-1.88	-1.78/-2.49	-3.36/-3.50
θ (30°)	-2.92/-1.74	-1.02/-1.11	-1.68/-1.73	-0.93/-3.04	0.31/0.24	0.35/0.77	1.20/1.19	1.03/1.11	1.31/1.32	0.61/2.02	-0.27/0.31	0.17/0.91	0.81/0.48	0.40/0.28	-0.01/0.68	-2.34/-4.87	-6.27/-4.00	-2.70/-3.40	-4.23/-4.63	-5.53/-6.76	-6.87/-6.47	-5.82/-5.81	-4.87/-3.19	-2.08/-2.47
θ (37.5°)	-1.87/-1.73	-0.75/-0.07	0.44/0.31	-0.60/1.14	1.03/0.88	1.55/1.99	2.11/2.10	2.72/2.69	2.11/1.64	2.05/2.25	2.63/2.77	2.51/1.55	0.36/0.83	-1.89/-2.82	-2.85/-2.90	-3.99/6.24	-8.33/-8.31	-8.18/-8.40	-6.78/-6.76	-7.06/-4.79	-4.04/-4.00	-4.18/-3.99	-4.05/-2.57	-1.22/-1.07
θ (45°)	-3.92/-3.87	-3.70/-1.05	-0.24/-0.40	-0.42/-0.92	-0.67/0.07	0.43/0.73	1.46/2.32	2.72/2.94	2.53/1.66	1.59/2.49	2.93/2.92	2.21/0.78	-1.13/2.90	-3.81/-2.92	-1.69/-1.69	-3.12/-3.63	-4.74/-4.45	-7.21/6.97	-6.43/6.81	-12.52/-15.94	-9.52/6.97	-6.26/5.53	-6.87/-8.11	-6.72/-5.51
θ (52.5°)	-5.19/-2.56	-2.89/-3.77	-2.09/-0.60	-0.70/-0.94	-2.52/-1.53	-0.43/-0.16	0.63/1.39	1.07/0.81	1.34/1.29	1.43/1.71	1.41/1.44	0.74/-0.85	-2.98/-4.00	-5.64/-7.24	-4.19/-4.05	-3.56/-3.35	-4.04/-6.44	-7.31/7.75	-9.37/-12.49	-12.18/-10.17	-7.56/-8.04	-10.61/-9.77	-6.27/-5.39	-7.43/-6.83
θ (60°)	-4.21/1.24	1.17/1.49	0.01/0.99	0.41/-1.39	-2.85/-1.56	-0.28/0.30	-0.53/1.22	1.25/1.28	0.65/-0.25	-0.56/0.47	0.92/1.45	1.20/1.56	-1.30/2.32	-3.45/-2.69	-3.08/-4.79	-4.47/-3.73	-3.65/-5.37	-7.21/7.55	-11.21/7.43	-12.17/4.43	-8.04/-9.1	-6.71/10.30	-5.28/-1.30	-6.02/-1.80
θ (67.5°)	1.56/4.41	4.33/2.72	1.76/0.80	1.43/-0.16	-2.38/-2.41	-1.04/0.18	-0.36/-0.14	0.16/0.25	-0.11/-0.04	-0.25/-0.08	0.30/0.02	-0.69/-2.57	-4.22/4.51	-3.25/-1.32	-0.14/-0.93	-2.07/4.51	-5.88/-5.97	-5.78/-5.16	-6.25/-5.29	-2.72/2.52	-5.47/-7.91	-7.28/4.82	-2.77/2.37	-0.01/1.44
θ (75°)	2.13/3.18	3.73/2.46	0.90/0.49	0.56/0.36	-0.20/-0.77	-0.42/-0.09	-0.12/-0.71	-0.15/0.24	-0.37/0.20	0.40/0.17	-0.36/-0.62	-1.31/-1.51	-1.76/-2.49	-2.53/-1.66	-1.85/-1.82	-1.55/-2.72	-5.19/-6.92	-6.89/-6.26	-3.84/-4.24	-1.49/-3.93	-3.76/-1.93	-4.01/-4.42	-1.28/0.72	1.79/2.15
θ (82.5°)	1.41/1.94	3.42/0.35	0.30/0.98	-0.32/-1.66	-0.74/-0.72	0.21/0.95	0.90/0.88	-0.69/-1.53	-2.02/-1.11	1.00/0.35	-0.68/-0.15	-0.60/-0.92	0.35/0.84	0.40/0.04	-1.14/-0.60	-1.67/-3.34	-3.08/-6.62	-5.40/-0.87	-2.39/2.73	0.79/0.27	-1.90/0.40	-2.97/-1.38	0.73/0.15	-0.72/2.22
θ (90°)	2.16/0.11	1.06/2.84	-1.03/0.26	-1.41/-3.97	-4.55/-5.25	-3.14/-1.37	-0.91/-3.16	-2.07/-1.95	-1.81/-0.96	0.39/0.60	-1.44/-1.00	-2.71/-2.78	-2.55/-3.57	-1.37/0.31	0.99/0.03	-0.57/-0.87	-0.72/-1.26	-1.48/-1.22	-1.15/-1.49	0.58/0.49	-0.50/-1.20	-1.40/1.20	1.17/2.03	-4.36/-1.20
θ (97.5°)	0.55/0.73	-1.65/-3.24	-5.77/-2.85	-5.14/-5.28	-3.79/-3.88	-2.16/-3.18	-2.87/-7.86	-5.82/-4.11	-3.04/-1.05	-0.61/-1.40	-1.36/-1.05	-2.44/-2.45	-2.03/-2.12	-1.56/0.93	2.20/-0.03	-0.05/-1.73	0.31/0.46	-1.64/0.02	-1.67/-0.92	0.13/-0.24	-1.61/1.11	0.51/1.80	1.43/-3.30	-7.72/-3.75
θ (105°)	-3.62/-2.65	-1.49/-3.41	-4.62/-3.32	-8.35/-10.05	-6.69/-9.06	-6.83/-5.72	-5.97/-8.05	-5.08/-4.19	-4.01/-2.06	-1.02/-1.56	-2.21/-2.54	-2.23/-3.14	-4.82/-2.08	-4.20/-4.14	1.55/0.20	-0.67/0.92	0.32/1.45	-1.09/-0.57	-1.40/-3.05	0.32/1.27	-1.17/1.57	1.42/-1.56	-2.13/4.10	-4.95/-13.74
θ (112.5°)	-1.31/1.35	-1.76/-5.31	-10.39/-7.42	-7.08/-10.48	-4.76/-7.95	-10.14/-9.07	-10.07/-8.15	-9.95/-9.19	-7.22/-3.66	-2.88/-3.21	-4.78/-2.99	-4.56/-8.03	-4.74/-6.17	-4.55/-2.00	-1.64/-1.05	0.90/0.55	1.18/0.15	0.52/0.91	-0.23/-0.68	0.08/0.77	-4.66/4.80	-1.31/-2.50	-0.11/-1.65	-3.02/-3.57
θ (120°)	-2.08/-3.75	-7.53/-10.31	-3.94/-5.39	-0.86/-8.05	-5.99/-8.34	-10.67/-11.83	-15.19/-9.97	-9.98/-7.12	-6.04/-6.01	-4.50/-4.47	-4.32/-2.98	-4.05/-2.94	-6.89/-7.92	-2.80/-5.66	1.38/0.85	0.44/-2.62	-2.61/0.16	0.30/-0.50	0.02/-1.14	-1.62/0.68	-4.82/-6.06	-1.00/0.65	-1.59/-3.32	1.25/1.13
θ (127.5°)	-0.42/-0.77	-6.30/-8.12	-6.87/-5.66	-8.52/-6.86	-4.10/-3.19	-6.04/-10.76	-13.31/-14.37	-9.08/-8.83	-6.77/-7.29	-2.48/-2.09	-1.46/0.42	-0.71/0.07	-0.15/-2.60	-2.41/-1.89	-0.90/-3.39	1.96/0.06	2.49/1.59	2.72/2.61	-1.10/0.57	0.93/0.69	0.73/-1.10	-0.11/0.77	-1.52/-1.89	-3.31/-1.04
θ (135°)	-2.11/7.14	-11.30/-6.10	-4.91/-7.61	-9.27/-8.79	-7.06/-9.92	-8.71/-11.89	-14.04/-14.16	-14.61/-9.97	-7.12/-9.35	-7.46/-3.18	-5.10/-3.16	0.44/-2.58	-0.97/0.44	-3.21/2.04	4.03/2.41	-1.09/-5.93	-1.54/-0.15	0.34/3.57	1.97/-2.22	2.01/5.04	2.62/-1.34	-4.21/2.64	0.10/-14.58	-2.02/-0.10
θ (142.5°)	-0.91/-3.2	-5.23/-11.11	-11.41/-12.76	-9.59/-13.92	-11.05/-10.60	-9.27/-8.86	-14.03/-15.25	-11.04/-10.19	-13.21/-8.09	-6.85/-7.27	-2.38/-1.38	1.15/2.18	4.80/0.04	1.90/0.38	4.59/1.53	-12.19/-8.09	-0.63/0.27	1.30/2.38	-3.46/-0.57	1.01/5.76	5.88/4.46	-6.65/-5.99	-1.47/-7.33	-15.43/-6.73
θ (150°)	-2.04/-2.71	-5.32/-6.11	-6.93/-7.06	-6.70/-9.21	-13.18/-15.22	-15.14/-15.15	-10.26/-10.10	-7.07/-5.36	-4.51/-9.77	-0.92/0.31	-0.65/-2.83	-3.14/0.34	1.503/0.02	1.810/3.8	1.917/5.6	-2.19/4.2	-0.48/0.42	3.07/2.53	-3.28/9.21	-1.66/3.87	5.42/1.88	-3.02/10.61	-1.09/-0.69	-3.25/-3.54
θ (157.5°)	-12.64/-10.42	-11.61/-12.66	-9.92/-6.80	-6.13/-7.90	-9.50/-9.39	-9.46/-10.95	-12.84/-16.22	-14.54/-8.70	-5.87/-4.92	-4.34/-4.52	-5.31/-4.95	-4.57/-6.18	-9.79/-11.55	-7.85/-4.84	-3.38/-2.67	-0.03/0.85	-0.54/-0.87	0.26/-1.41	-6.97/-7.49	-2.62/1.18	2.03/-0.16	-4.84/-6.14	-3.81/-4.17	-6.04/-9.14
θ (165°)	-11.08/-8.28	-8.16/-9.93	-10.55/-9.04	-7.92/-7.79	-9.46/-9.67	-10.12/-12.28	-11.43/-9.00	-6.34/-4.98	-4.10/-3.33	-2.78/-2.69	-2.56/-2.11	-1.80/-1.45	-0.67/0.13	0.63/1.07	1.43/1.25	0.51/1.76	-0.62/0.61	0.85/-0.15	-2.02/-3.83	-4.62/-8.35	-2.24/0.68	-0.30/-1.16	-2.39/-3.78	-7.31/-8.17
θ (172.5°)	-11.16/-9.39	-6.97/-5.06	-4.41/-3.43	-3.67/-4.39	-5.79/-6.77	-8.01/-9.03	-8.59/-8.59	-7.04/-5.07	-4.54/-3.63	-2.88/-2.03	0.14/0.41	0.66/0.66	0.96/1.07	1.25/1.42	1.37/0.68	-0.83/-3.02	-5.99/-10.65	-14.03/-15.19	-15.55/-15.25	-10.64/-12.72	-11.78/-9.96	-15.62/-12.72	-1.78/-9.67	-7.63/-8.12
θ (180°)	-7.82/-6.91	-5.02/-4.98	-5.40/-4.20	-3.07/-2.41	-2.21/-2.39	-2.61/-3.22	-3.43/-3.01	-2.38/-2.02	-1.67/-1.26	-0.99/-0.65	-0.29/0.07	0.00/0.15	-0.35/-0.35	-0.13/-0.43	-1.02/-1.96	-3.54/-4.92	-6.05/-7.47	-8.22/7.71	-7.02/-6.80	-6.09/-5.19	-5.05/-5.23	-4.97/-4.74	-6.03/-7.18	
Freq(Hz)	6.475GHz	TotalAnt. 2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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°)	-3.73/3.44	-4.49/5.00	-5.06/4.71	-4.21/4.14	-4.95/4.98	-4.86/4.81	-4.97/4.88	-4.50/4.71	-4.66/4.64	-4.80/4.39	-3.97/3.37	-2.95/3.03	-3.33/3.90	-3.99/3.91	-3.45/3.45	-3.91/4.26	-4.54/4.67	-4.45/4.89	-5.85/5.56	-5.98/5.57	-4.80/4.16	-3.75/3.89	-3.17/2.84	-3.80/3.79
θ (7.5°)	-1.91/-1.86	-1.76/-2.00	-3.37/-4.53	-3.88/-2.45	-2.93/-2.66	-3.46/-3.89	-4.52/4.42	-4.03/-3.82	-4.42/4.54	-4.21/3.77	-4.23/4.23	-4.95/4.53	-4.41/4.64	-5.01/5.38	-5.63/6.05	-6.39/6.96	-6.22/5.49	-5.17/4.69	-6.22/5.49	-4.20/3.48	-2.86/2.41	-2.88/3.44	-2.66/2.17	-1.80/1.49
θ (15°)	-3.08/-2.12	-0.65/-2.08	-0.03/0.03	-0.83/0.78	-0.68/-1.16	-1.27/1.03	-1.48/1.22	-2.69/4.27	-2.41/2.68	-2.94/3.50	-3.29/3.30	-2.97/2.45	-2.03/2.30	-2.95/4.33	-3.29/4.06	-4.89/5.46	-5.82/6.29	-6.45/6.25	-5.82/4.82	-3.21/2.47	-2.14/1.93	-1.68/1.32	-0.84/1.18	-1.88/1.71
θ (22.5°)	-0.19/-1.11	-1.67/-1.49	-0.07/0.80	0.51/-0.08	0.49/0.63	0.46/0.20	-0.98/-0.60	-0.42/-0.83	-1.40/-1.69	-1.78/-1.29	-0.92/-3.02	-0.18/-0.71	-1.95/-2.61	-2.46/3.54	-5.64/6.84	-7.86/10.21	-11.60/9.99	-9.20/9.09	-5.41/3.92	-3.86/4.55	-4.64/3.72	-2.14/-1.07	-0.35/0.07	0.18/0.49
θ (30°)	-1.76/-1.30	-0.40/-0.44	-0.64/-0.94	-0.67/-1.34	-0.59/0.25	0.53/0.37	0.35/0.37	0.11/-0.02	-0.64/-1.09	-1.40/-1.11	-0.68/-0.39	-0.59/0.42	-0.77/1.40	-2.09/-6.89	-4.93/6.42	-3.11/4.59	-6.88/-11.09	-8.93/7.23	-5.93/6.70	-7.63/6.17	-2.36/1.67	-2.55/3.09	-3.07/1.48	-1.80/1.49
θ (37.5°)	2.13/1.56	0.96/0.33	1.07/1.22	0.47/0.30	-0.08/0.16	0.40/1.28	1.92/1.93	1.82/1.56	-0.10/-1.21	-0.60/-0.19	-0.07/0.81	-2.08/2.39	-2.69/3.73	-4.78/4.36	-3.22/3.60	-3.86/4.45	-5.87/8.86	-11.82/10.16	-11.85/15.13	-11.55/9.61	-6.70/4.74	-4.59/4.50	-3.67/1.91	-0.35/0.85
θ (45°)	-2.43/-3.89	-4.34/-2.98	-2.58/-0.54	-0.21/0.00	-0.08/0.86	1.62/0.95	0.98/0.99	1.19/0.99	0.10/-0.50	-0.01/0.06	0.38/-0.09	-1.45/-3.04	-3.47/-3.59	-3.83/-4.79	-4.71/4.26	-4.16/4.57	-6.00/-3.85	-14.48/13.32	-11.52/10.80	-14.24/11.73	-8.67/5.05	-4.31/5.75	-5.47/1.19	-3.14/2.47
θ (52.5°)	-2.95/-2.67	-3.37/-1.49	-1.44/-1.45	-0.09/-0.50	-0.02/0.43	-1.37/0.10	0.73/0.28	0.62/1.31	-0.02/1.43	-0.20/1.00	0.95/0.14	-2.02/1.88	-2.32/2.01	-2.47/2.30	-4.93/4.29	-7.13/11.80	-15.91/13.52	-11.05/8.63	-5.43/5.23	-6.73/5.50	-5.43/5.23	-6.73/5.50	-7.09/4.75	-1.80/1.49
θ (60°)	-0.31/2.57	1.21/0.35	-0.62/1.06	0.94/-0.63	-0.42/0.73	-1.05/0.84	-0.15/-1.55	-0.50/-0.17	-0.78/-1.97	-1.05/0.41	0.90/0.15	-1.41/3.15	-4.16/5.06	-5.32/3.57	-1.94/2.62	-3.44/3.18	-4.61/9.18	-11.78/11.97	-10.42/13.77	-8.72/8.61	-6.77/5.41	-6.81/6.36	-3.27/3.37	-2.58/0.46
θ (67.5°)	3.83/0.45	3.61/2.40	1.83/1.58	1.38/0.58	-2.49/2.31	-1.90/1.74	-1.43/-1.90	-0.77/0.16	-1.58/2.21	-1.03/0.07	-0.09/0.11	-0.46/2.30	-3.26/3.66	-5.10/-6.20	-3.91/2.11	-1.79/2.34	-2.90/-5.51	-10.60/9.99	-9.20/9.09	-5.41/3.92	-7.49/6.33	-6.66/6.05	-3.32/0.43	1.86/3.23
θ (75°)	3.05/0.44	3.73/2.21	2.69/2.14	2.74/1.85	-1.19/2.06	-1.12/0.21	-1.35/2.28	-1.22/-1.21	-0.21/0.58	-0.91/0.57	1.08/4.09	-0.86/2.10	-3.96/4.03	-3.86/2.60	-1.36/2.04									



# Antenna Pattern\_6GHz

# Appendix D

θ (°)	3.081-4.25	-4.69-6.71	-6.29-4.87	-5.12-3.67	-1.39-0.29	-0.12-1.37	2.70-2.52	0.94-0.53	-1.11-0.72	-0.60-1.27	-1.20-0.06	0.33-1.70	2.43-6.63	3.33-3.36	0.66-0.10	-0.45-0.61	-2.13-3.73	-3.37-0.05	-2.76-2.07	-3.18-3.21	-1.61-1.73	-2.06-1.03	-0.93-0.69	-1.58-2.93
φ (75°)	-1.00-1.71	-3.60-4.86	-3.39-2.44	-2.76-2.86	-1.72-1.55	-0.73-1.53	3.45-3.23	1.84-1.20	-1.53-3.99	-3.05-1.17	-1.05-0.17	0.07-1.71	2.30-9.2	2.32-0.28	-0.78-1.17	-3.74-1.87	-3.30-4.95	-2.74-2.88	-1.00-0.60	-2.87-1.57	-0.68-1.19	-1.16-0.20	0.09-0.71	-0.27-0.03
φ (82.5°)	-1.05-0.99	-1.86-2.53	-1.39-0.17	-0.83-3.37	-2.74-1.17	0.70-1.98	2.99-3.51	2.64-0.14	-3.02-3.64	-1.64-0.81	-3.05-2.82	-1.07-0.31	1.08-0.41	0.58-0.32	-2.95-4.79	-8.91-2.52	-3.19-0.32	-1.39-0.32	-0.13-0.59	-1.46-1.59	-1.47-1.30	-2.90-2.12	-2.59-0.26	-0.17-0.29
φ (90°)	-0.25-0.31	-0.85-3.44	-2.89-0.31	0.73-0.02	-1.16-0.63	1.86-1.97	2.30-2.16	2.08-0.19	-1.81-2.93	-2.77-3.11	-6.29-7.34	-3.66-1.22	-0.78-0.94	0.17-0.43	-3.80-8.62	-10.88-5.46	-1.29-0.28	-1.02-0.78	0.65-0.73	-3.00-3.45	-3.08-2.36	-2.54-2.56	-3.58-2.29	-1.74-1.10
φ (97.5°)	0.62-0.57	0.23-0.68	-1.51-0.49	1.34-0.03	-0.95-1.83	1.02-0.51	-0.05-0.09	0.32-1.98	-1.46-1.90	-1.78-3.13	-4.44-5.13	-3.36-2.62	-2.23-3.69	-1.91-3.44	-6.79-7.45	-8.89-8.23	-3.00-2.52	-2.66-3.66	-0.23-0.67	-3.02-3.36	-5.14-6.50	-3.38-5.23	-3.12-0.98	-0.81-0.52
φ (105°)	1.01-1.32	1.92-1.02	0.70-0.79	0.70-0.12	-1.25-3.06	-4.16-3.28	-2.04-1.96	-2.79-4.34	-1.34-0.97	1.00-1.10	-1.79-4.43	-0.96-5.84	-0.68-15.25	-5.75-3.10	-6.36-10.30	-12.15-5.24	-6.05-3.18	-6.54-3.03	2.33-0.39	-2.98-4.14	-4.33-4.46	-4.89-2.56	-0.51-1.20	
φ (112.5°)	0.41-0.18	-0.28-0.95	0.10-1.43	2.07-1.38	-2.39-3.50	-7.27-7.55	-5.18-2.96	-3.13-3.12	-2.03-0.45	1.36-0.57	-2.88-6.02	-6.15-6.37	-7.79-10.67	-8.87-8.84	-6.44-14.60	-6.65-5.95	-3.30-6.21	-8.34-7.11	-3.43-4.69	-2.54-5.90	-9.41-6.37	-7.02-6.72	-2.40-1.42	-0.91-0.16
φ (120°)	-2.91-0.07	0.19-0.39	-0.09-0.58	0.74-0.07	-0.20-0.95	-0.92-3.72	-5.07-2.69	-2.50-3.33	-3.67-2.59	-2.67-2.72	-5.01-7.57	-6.85-4.82	-4.98-5.39	-6.73-7.02	-5.78-9.30	-8.97-7.68	-7.28-4.79	-11.73-2.86	-0.53-3.62	-5.95-2.23	-4.35-6.93	-4.43-6.23	-4.65-3.67	-1.55-3.81
φ (127.5°)	-0.65-0.98	1.49-0.97	1.20-1.32	1.37-1.24	-0.36-2.92	-3.32-2.55	-4.40-5.62	-4.44-5.47	-6.44-6.19	-5.47-6.22	-8.04-9.34	-9.17-6.41	-6.85-4.38	-6.67-7.48	-5.96-9.40	-6.52-4.26	-5.73-11.14	-6.54-3.83	-1.58-4.38	-4.46-11.88	-6.01-4.69	-6.01-4.69	-4.69-0.59	
φ (135°)	-1.28-0.69	1.81-0.72	0.13-0.24	0.32-0.36	0.45-0.29	-0.40-0.47	-1.35-3.34	-5.81-4.73	-2.96-1.44	-1.61-2.01	-2.97-3.91	-6.68-8.37	-8.09-7.18	-6.74-4.92	-5.51-3.93	-3.71-6.10	-8.81-8.01	-12.68-11.25	-5.37-9.60	-6.67-9.45	-5.16-8.16	-3.03-9.76	-6.76-9.15	-7.86-3.35
φ (142.5°)	-2.82-1.01	0.18-1.57	1.19-0.77	0.92-0.65	0.14-0.68	-1.43-1.42	-1.14-1.15	-1.49-2.03	-2.41-2.78	-3.06-3.62	-4.99-7.57	-12.03-6.77	-3.80-2.62	-1.66-3.11	-3.71-5.99	-12.66-6.68	-2.29-3.88	-10.93-10.09	-5.93-12.21	-4.92-4.31	-1.22-0.94	-0.95-0.95	-3.49-3.69	-7.15-6.12
φ (150°)	-1.22-1.71	-0.19-1.68	2.87-0.45	3.71-0.24	2.09-2.17	0.51-0.27	-0.96-0.78	-0.28-0.52	-1.35-1.75	-2.34-3.71	-5.29-9.15	-7.22-6.57	-7.11-4.93	-4.69-4.79	-4.44-9.32	-14.62-7.62	-6.11-10.87	-12.28-9.49	-7.81-4.43	-9.98-5.61	-2.91-1.32	0.61-2.22	2.37-1.51	0.19-1.11
φ (157.5°)	1.16-0.48	0.38-0.62	1.15-1.60	1.19-0.03	-1.48-1.91	-0.94-0.21	0.56-0.09	-0.98-1.32	-1.38-2.06	-3.67-5.86	-7.53-10.37	-11.60-9.92	-6.90-5.21	-4.67-5.52	-9.66-9.32	-5.44-5.28	-7.00-9.02	-13.61-12.58	-7.67-7.53	-9.63-6.95	-4.95-4.33	-2.56-1.33	-0.20-1.74	2.73-2.38
φ (165°)	-1.26-1.59	-2.36-2.84	-2.43-1.75	-1.40-1.68	-2.27-2.61	-2.51-2.11	-2.00-2.46	-3.30-4.27	-5.41-5.84	-5.59-5.11	-4.91-4.69	-4.27-3.48	-2.46-1.91	-2.41-4.22	-6.31-6.65	-6.27-5.57	-5.18-5.03	-4.88-6.47	-5.23-6.59	-6.87-6.67	-6.38-8.85	-4.38-3.17	-3.07-3.08	-2.72-1.96
φ (172.5°)	-5.26-5.25	-5.08-1.99	-5.51-4.89	-3.97-3.55	-3.74-3.74	-3.47-3.47	-3.16-2.62	-2.16-2.15	-2.47-2.91	-3.50-4.22	-5.67-9.14	-13.28-15.41	-15.26-12.51	-10.15-7.81	-5.83-6.68	-4.25-4.35	-4.82-5.84	-6.87-8.29	-9.98-10.79	-10.07-8.92	-7.91-7.60	-7.05-6.58	-5.28-4.98	-4.72-4.68
φ (180°)	-5.43-5.15	-4.93-5.32	-5.41-5.65	-6.20-5.93	-5.41-4.78	-4.26-4.24	-4.31-4.09	-4.17-4.48	-5.19-6.63	-8.37-9.49	-10.65-12.45	-14.34-13.79	-12.73-12.21	-11.82-11.39	-10.60-10.28	-9.88-9.80	-9.50-9.29	-9.11-8.28	-7.12-6.07	-5.40-5.28	-5.41-5.43	-5.23-5.05	-5.26-5.16	-4.74-4.88
Freq(Hz)	6.475G/Pol	TotalAnt. 3	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	φ(0°)/φ(75°)	φ(15°)/φ(22.5°)	φ(30°)/φ(37.5°)	φ(45°)/φ(52.5°)	φ(60°)/φ(67.5°)	φ(75°)/φ(82.5°)	φ(90°)/φ(97.5°)	φ(105°)/φ(112.5°)	φ(120°)/φ(127.5°)	φ(135°)/φ(142.5°)	φ(150°)/φ(157.5°)	φ(165°)/φ(172.5°)	φ(180°)/φ(187.5°)	φ(195°)/φ(202.5°)	φ(210°)/φ(217.5°)	φ(225°)/φ(232.5°)	φ(240°)/φ(247.5°)	φ(255°)/φ(262.5°)	φ(270°)/φ(277.5°)	φ(285°)/φ(292.5°)	φ(300°)/φ(307.5°)	φ(315°)/φ(322.5°)	φ(330°)/φ(337.5°)	φ(345°)/φ(352.5°)
φ (0°)	-0.43-0.37	-0.32-0.29	-0.23-0.21	0.48-0.67	0.78-0.84	0.83-0.94	1.20-1.17	1.22-1.17	1.02-0.64	0.03-0.11	-0.28-0.32	-0.29-0.43	-0.52-0.70	-0.65-0.41	-0.24-0.04	0.39-0.56	0.70-0.71	0.72-0.59	0.69-0.52	0.25-0.19	0.23-0.23	0.13-0.01	-0.16-0.01	0.03-0.23
φ (7.5°)	-1.11-1.40	-1.33-1.17	-1.11-0.62	-0.36-0.05	0.19-0.46	0.56-0.62	0.40-0.23	0.19-0.21	-0.46-0.72	-1.02-0.97	-0.70-0.64	-0.41-0.22	0.05-0.45	0.91-1.20	1.26-1.33	1.28-1.17	1.13-0.99	0.78-0.47	0.22-0.03	-0.33-0.68	-0.93-0.92	-0.83-1.11		
φ (15°)	-4.30-4.42	-4.22-1.46	-3.37-4.49	-2.06-1.74	-1.33-0.76	-0.34-0.24	0.63-0.95	1.15-1.38	1.50-1.30	0.91-0.24	-0.51-1.20	-1.72-0.29	-1.97-1.95	-1.80-1.69	-1.64-1.27	-0.95-0.92	-0.99-1.04	-0.96-0.92	-0.86-0.94	-1.25-1.93	-2.55-3.21	-3.88-4.12	-4.09-3.46	-4.37-4.31
φ (22.5°)	-5.45-5.81	-5.85-5.01	-3.50-2.61	-2.28-2.24	-1.56-0.50	-0.19-0.05	-0.02-0.02	0.29-0.84	1.09-1.12	0.68-0.00	-0.85-1.96	-2.89-2.49	-1.80-1.27	-1.43-1.26	-2.69-2.77	-2.55-2.26	-1.49-0.70	-0.14-0.04	-0.18-0.68	-1.87-3.46	-5.29-6.87	-8.65-9.50	-8.23-6.89	-5.46-5.20
φ (30°)	-3.76-5.70	-6.39-5.31	-4.94-4.27	-3.11-1.88	-1.09-0.88	-0.92-0.49	0.17-0.80	1.15-1.57	1.18-1.68	0.93-0.41	0.73-0.74	0.52-0.77	1.10-1.49	-0.81-1.49	-1.56-1.46	-2.18-1.02	-0.99-0.76	-0.27-0.20	-0.17-0.63	-1.80-2.43	-3.22-3.23	-2.82-2.59	-2.77-2.83	-2.82-2.89
φ (37.5°)	-3.54-5.09	-6.86-6.68	-5.14-5.95	-4.50-3.09	-2.03-1.33	-0.35-0.42	0.73-0.75	0.81-1.38	2.39-2.72	1.79-0.13	-0.58-0.10	1.21-2.69	3.17-2.51	1.56-1.20	0.17-0.95	-1.38-1.48	-1.17-1.05	-0.91-0.54	-0.57-0.80	-1.51-2.30	-2.50-3.06	-2.59-2.11	-2.30-2.64	-3.10-3.44
φ (45°)	-10.06-9.54	-10.24-10.33	-9.28-8.19	-6.42-4.26	-1.93-0.73	-0.85-0.90	-0.82-1.03	-0.60-1.18	0.30-0.32	-0.44-1.25	-0.67-0.98	2.15-3.11	3.32-3.56	3.35-3.25	1.11-0.19	-0.71-0.38	0.15-1.20	0.78-0.55	-0.87-1.17	-1.16-0.77	-1.06-1.73	-3.31-3.19	-4.14-5.81	-6.92-9.93
φ (52.5°)	-5.98-7.53	-9.50-9.97	-7.54-5.42	-4.76-4.12	-3.76-3.19	-2.17-1.00	-0.68-1.64	-1.09-0.13	0.56-0.45	-1.17-0.91	0.52-0.76	3.27-3.57	3.61-3.24	2.79-3.38	-1.01-0.97	-0.64-0.44	0.02-1.02	-3.31-2.13	-0.71-0.23	-1.47-1.11	-4.77-1.11	-4.99-7.06	-5.13-6.65	-6.89-7.71
φ (60°)	-9.92-11.15	-13.38-15.48	-10.25-5.72	-4.39-3.57	-3.08-2.51	-2.14-0.74	0.01-0.40	-1.72-2.35	-1.80-0.71	-1.06-0.53	1.10-2.40	2.33-3.05	2.33-3.37	2.62-1.11	-0.01-1.29	-2.90-3.26	-4.71-4.10	-2.03-2.45	-3.27-2.18	-1.78-2.74	-4.48-5.37	-5.89-5.80	-7.08-8.51	
φ (67.5°)	-10.33-9.62	-11.66-15.65	-12.61-7.96	-4.75-2.68	-1.12-0.87	-0.30-0.98	1.65-0.77	-1.07-0.40	-5.41-3.68	-3.10-1.92	-0.74-0.80	0.70-0.44	-0.49-1.47	1.04-0.50	-1.57-3.90	-2.80-3.35	-1.12-1.57	-3.61-3.95	-3.79-3.79	-3.60-6.06	-4.10-6.11	-5.00-5.62	-6.90-11.67	
φ (75°)	-4.54-3.77	-4.40-8.61	-9.88-6.69	-6.32-1.56	-0.52-0.42	1.50-1.91	2.01-1.62	0.07-2.46	-6.09-6.63	-7.34-4.93	-3.83-2.34	-2.25-1.79	0.05-0.03	0.49-0.80	-0.67-1.65	-0.50-6.62	-4.37-3.59	-2.76-1.26	-2.79-3.33	-2.76-2.98	-3.00-5.15	-4.02-3.45	-4.12-4.59	-6.83-5.23
φ (82.5°)	-0.43-0.34	-1.23-3.71	-4.20-2.42	-1.48-1.40	-1.53-0.74	-0.03-0.53	-0.28-1.18	-1.53-2.59	-8.99-6.95	-4.45-2.08	-1.61-3.26	-5.97-3.32	-0.90-1.10	-2.89-1.43	-3.60-4.71	-7.71-3.62	-3.35-2.79	-1.95-1.26	0.44-1.90	-3.30-3.10	-1.88-3.18	-4.58-3.71	-4.29-4.83	-5.72-1.85
φ (90°)	0.73-0.91	-0.73-3.55	-4.26-1.79	-0.71-1.64	-2.78-0.52	0.29-0.25	-1.17-1.68	-1.62-1.77	-7.21-2.62	-1.48-1.58	-0.14-2.38	-9.17-10.06	-2.70-1.12	-0.35-0.85	-3.80-5.59	-9.26-3.33	-1.27-1.26	-2.11-0.92	-1.29-2.81	-5.07-3.80	-3.78-4.18	-5.72-5.19	-5.52-4.52	-4.00-0.13
φ (97.5°)	0.76-0.67	1.03-1.53	-2.01-0.51	-0.32-2.37	-3.14-1.12	0.41-0.05	-1.70-0.48	-1.43-1.55	-7.31-3.98	-1.76-0.90	-1.92-5.13	-14.23-8.12	-2.40-0.75	-3.07-5.76	-6.29-12.25	-11.37-6.74	-3.90-2.80	-3.97-5.41	-4.76-7.28	-6.51-1.74	-5.64-9.09	-1.01-1.42	-3.49-4.21	-2.87-1.62
φ (105°)	1.48-1.40	0.86-0.51	-0.01-0.01	0.48-1.22	-3.50-1.64	-1.14-2.12	-0.16-1.17	-2.88-3.60	-7.67-9.95	-3.23-2.92	-3.17-4.93	-9.64-												



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

