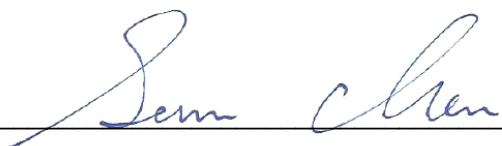


Antenna Composite Gain Test Report

FCC ID	QXO-AP5050
Equipment	Access Point
Brand Name	Extreme Networks
Model Name	AP5050U
Applicant	Extreme Networks, Inc. 2121 RDU Center Drive Morrisville North Carolina United States 27560
Manufacturer	Extreme Networks, Inc. 2121 RDU Center Drive Morrisville North Carolina United States 27560
Sample Received	May 16, 2022
Start Test Date	May 16, 2022
Final Test Date	May 16, 2022



Approved by: Sam Chen

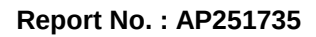
Sporton International Inc. Hsinchu Laboratory

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



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Issued Date : Oct. 31, 2022
Report Version : 01

1. Operation Mode and Antenna Information

Antenna Position	2.4GHz Port	5GHz Port	Brand Name	Model Name	Ant. Type	Connector	Modes of Operation
2G Ant1	1	-	WNC	95XEAJ15.G45	Metal PIFA	I-PEX	2.4GHz
2G Ant2	2	-	WNC	95XEAJ15.G46	Metal PIFA	I-PEX	2.4GHz
2G Ant3	3	-	WNC	95XEAJ15.G53	Metal PIFA	I-PEX	2.4GHz
2G Ant4	4	-	WNC	95XEAJ15.G53	Metal PIFA	I-PEX	2.4GHz
5G Ant1	-	1	WNC	95XEAJ15.G47	Metal PIFA	I-PEX	5GHz UNII 1~3
5G Ant2	-	2	WNC	95XEAJ15.G48	Metal PIFA	I-PEX	5GHz UNII 1~3
5G Ant3	-	3	WNC	95XEAJ15.G91	Metal PIFA	I-PEX	5GHz UNII 1~3
5G Ant4	-	4	WNC	95XEAJ15.G92	Metal PIFA	I-PEX	5GHz UNII 1~3

Note:

2.4GHz Operation Mode (1TX/4RX)

Only 2G Ant1 can be used as transmitting antennas.

2G Ant1~2G Ant4 can be used as receiving antennas and can receive simultaneously.

2.4GHz Operation Mode (2TX/4RX)

2G Ant1~2G Ant2 can be used as transmitting antennas and can transmit simultaneously.

2G Ant1~2G Ant4 can be used as receiving antennas and can receive simultaneously.

2.4GHz Operation Mode (4TX/4RX)

2G Ant1~2G Ant4 can be used as transmitting antennas and can transmit simultaneously.

2G Ant1~2G Ant4 can be used as receiving antennas and can receive simultaneously.

5GHz Operation Mode (1TX/4RX)

Only 5G Ant1 can be used as transmitting antennas.

5G Ant1~5G Ant4 can be used as receiving antennas and can receive simultaneously.

5GHz Operation Mode (2TX/4RX)

5G Ant1~5G Ant2 can be used as transmitting antennas and can transmit simultaneously.

5G Ant1~5G Ant4 can be used as receiving antennas and can receive simultaneously.

5GHz Operation Mode (4TX/4RX)

5G Ant1~5G Ant4 can be used as transmitting antennas and can transmit simultaneously.

5G Ant1~5G Ant4 can be used as receiving antennas and can receive simultaneously.



2. Test Frequency

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

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

3. Testing Location

Testing Location		
Sporton International Inc. Hsinhua Laboratory		
☒	HWA YA	ADD : No.13-1 & 14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333, Taiwan R.O.C.

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
Radiated	05CH03-HY	Rex Liao	20-21 / 50-55	May 16, 2022

Note:

Testing Site Information

Brand Name: TDK

Dimension: 11m*6m*6m

Characteristic: Fully Anechoic Chamber

4. Test Facility and Configuration

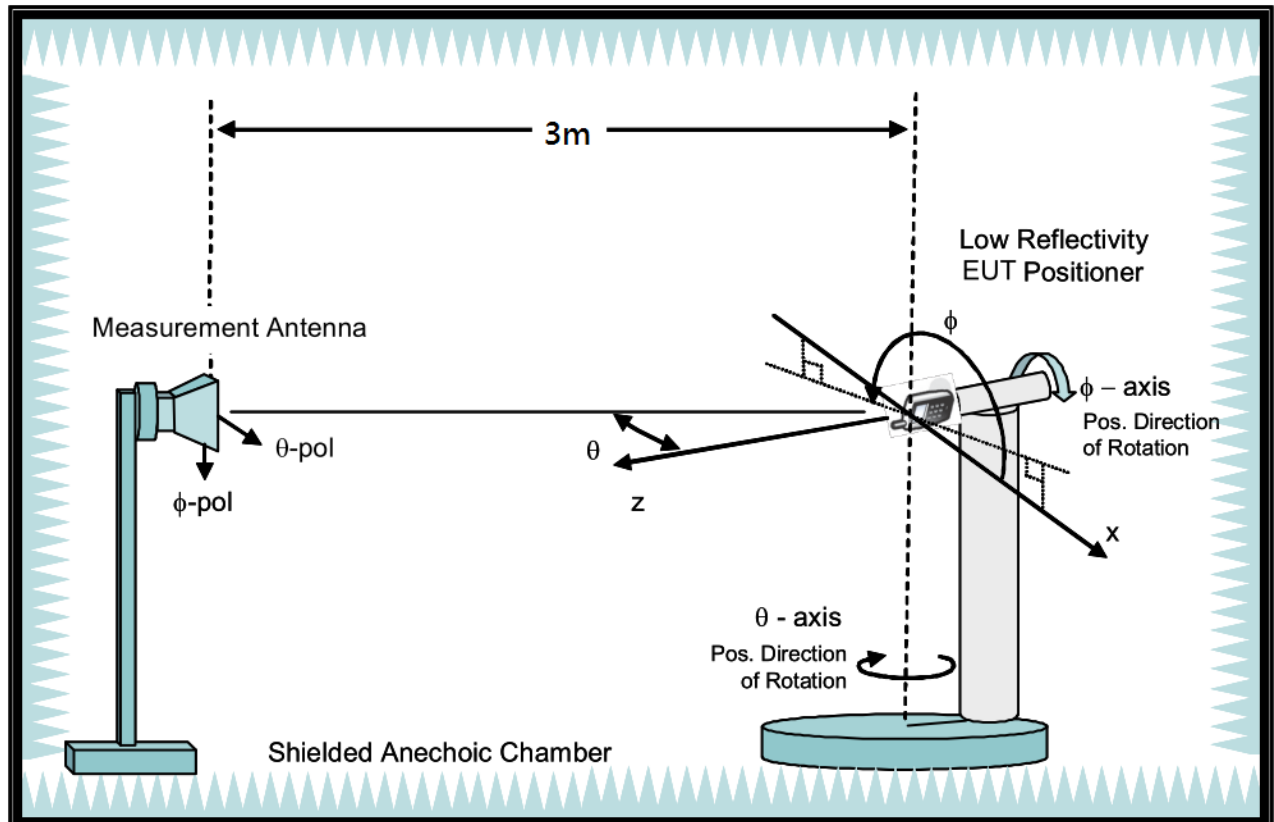
Test configuration: Reference to CITA OTA distributed-axes system configuration.

Chamber: Fully Anechoic Chamber.

Measurement antenna: Dual Polarization Horn antenna

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

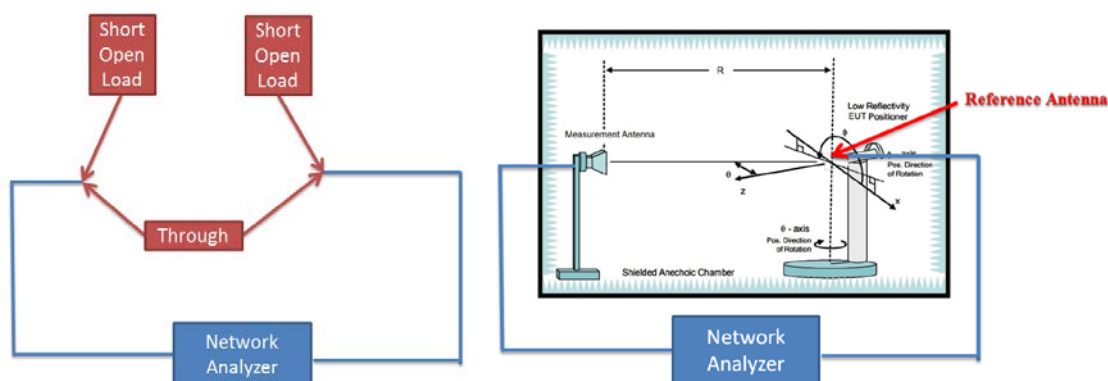
#Reference to CTIA "ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1"



5. Reference Calibration

Connected cables to VNA calibration kit and use network analyzer internal function to do calibration. Do short, open and load to each side. Then connect through to both side and calibrate G values. The cable loss is calibrated and set inside the network analyzer.

Measurement Antenna is connected to port1 of Network analyzer and reference antenna connected to port 2 of Network Analyzer. Record G values and used with reference antenna gain to calculate gain factor.



Frequency (MHz)	2400	2450	2500	5150	5200	5300	5600	5750	5800	5900	6000	6500	7000	7500
G reading (dB)	-31.4	-31.4	-31.3	-31.3	-31	-30.7	-30.1	-30.5	-30.5	-30.8	-31.3	-32.8	-34.4	-35.4
Reference gain (dBi)	10.2	10.4	10.6	12.4	12.8	13.4	13.4	13.3	13.3	13.1	13.2	12.3	11.7	11.1
Factor (dB)	41.34	41.55	41.68	43.24	43.56	43.68	43.79	43.91	43.99	44.43	44.49	45.24	46.12	46.31

Note:

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

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

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

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

6. Test Method

EUT set on multi-axis positioner and adjust EUT's physical center to measurement reference center. Measurement antenna set at phi polarization and 1.5 meter height. Port 1 of Network analyzer connect to antenna 1 of EUT. Record G value every 10 degree from 0 to 350 degree on Phi angle and 0 to 180 on theta angle of multi-axis positioner. Then set measurement antenna to theta polarization and repeat process. Repeat process to each antenna of EUT.

DG steps:

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

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

7. Measured Values and Calculation of Maximum Gain Positions

For 2.4GHz

For 2TX

DG_1SS max value position

Frequency (Hz)	2.4G	2.45G	2.4835G
Ant. 1 (dBi)	2.3	0.38	-0.26
Ant. 2 (dBi)	-0.24	2.86	2.34
DG [1SS] (dBi)	4.13	4.72	4.15
Polarization	Theta	Theta	Theta
Θ (°)	50	40	50
Φ (°)	210	30	220

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

DG_1SS max value position calculation

Frequency (Hz)	2.4G	2.45G	2.4835G
Ant. 1 [$10^{(G/20)}$]	$10^{(2.3/20)}$	$10^{(0.38/20)}$	$10^{(-0.26/20)}$
Ant. 2 [$10^{(G/20)}$]	$10^{(-0.24/20)}$	$10^{(2.86/20)}$	$10^{(2.34/20)}$
Ant. 1 [$10^{(G/20)}$] value	1.303	1.045	0.971
Ant. 2 [$10^{(G/20)}$] value	0.973	1.39	1.309
Sum All Antenna [Amax]	2.276	2.435	2.28
DG [$10 \cdot \log(A_{max}^2/N_{ant})$]	4.13	4.72	4.15

Note:

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

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

For 4TX

DG_1SS max value position

Frequency (Hz)	2.4G	2.45G	2.4835G
Ant. 1 (dBi)	1.18	0.3	-0.94
Ant. 2 (dBi)	0.58	2.05	2.29
Ant. 3 (dBi)	-0.49	1.91	2.56
Ant. 4 (dBi)	3.27	2.26	-0.36
DG [1SS] (dBi)	7.27	7.68	7.05
Polarization	Theta	Theta	Theta
Θ (°)	50	50	60
Φ (°)	220	220	220

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

DG_1SS max value position calculation

Frequency (Hz)	2.4G	2.45G	2.4835G
Ant. 1 [$10^{(G/20)}$]	$10^{(1.18/20)}$	$10^{(0.3/20)}$	$10^{(-0.94/20)}$
Ant. 2 [$10^{(G/20)}$]	$10^{(0.58/20)}$	$10^{(2.05/20)}$	$10^{(2.29/20)}$
Ant. 3 [$10^{(G/20)}$]	$10^{(-0.49/20)}$	$10^{(1.91/20)}$	$10^{(2.56/20)}$
Ant. 4 [$10^{(G/20)}$]	$10^{(3.27/20)}$	$10^{(2.26/20)}$	$10^{(-0.36/20)}$
Ant. 1 [$10^{(G/20)}$] value	1.146	1.035	0.897
Ant. 2 [$10^{(G/20)}$] value	1.069	1.266	1.302
Ant. 3 [$10^{(G/20)}$] value	0.945	1.246	1.343
Ant. 4 [$10^{(G/20)}$] value	1.457	1.297	0.959
Sum All Antenna [Amax]	4.617	4.844	4.501
DG [$10 \cdot \log(A_{max}^2/N_{ant})$]	7.27	7.68	7.05

Note:

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

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

For 5GHz

For 2TX

DG_1SS max value position

Frequency (Hz)	5.2G	5.3G	5.6G	5.785G
Ant. 1 (dBi)	3.18	2.36	-1.76	1.94
Ant. 2 (dBi)	1.75	3.22	3.6	1.08
DG [1SS] (dBi)	5.5	5.81	4.34	4.53
Polarization	Theta	Theta	Theta	Theta
Θ (°)	50	50	70	80
Φ (°)	280	270	0	110

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

DG_1SS max value position calculation

Frequency (Hz)	5.2G	5.3G	5.6G	5.785G
Ant. 1 [$10^{(G/20)}$]	$10^{(3.18/20)}$	$10^{(2.36/20)}$	$10^{(-1.76/20)}$	$10^{(1.94/20)}$
Ant. 2 [$10^{(G/20)}$]	$10^{(1.75/20)}$	$10^{(3.22/20)}$	$10^{(3.6/20)}$	$10^{(1.08/20)}$
Ant. 1 [$10^{(G/20)}$] value	1.442	1.312	0.817	1.25
Ant. 2 [$10^{(G/20)}$] value	1.223	1.449	1.514	1.132
Sum All Antenna [Amax]	2.665	2.761	2.33	2.383
DG [$10 \cdot \log(A_{max}^2/N_{ant})$]	5.5	5.81	4.34	4.53

Note:

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

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

For 4TX
DG_1SS max value position

Frequency (Hz)	5.2G	5.3G	5.6G	5.785G
Ant. 1 (dBi)	3.18	2.79	2.65	0.59
Ant. 2 (dBi)	1.75	0.28	-1.19	0.62
Ant. 3 (dBi)	1.22	2	-0.83	4.07
Ant. 4 (dBi)	3.3	3.05	2.6	0.81
DG [1SS] (dBi)	8.43	8.12	7.02	7.68
Polarization	Theta	Theta	Theta	Theta
Θ (°)	50	50	50	60
Φ (°)	280	180	290	50

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

DG_1SS max value position calculation

Frequency (Hz)	5.2G	5.3G	5.6G	5.785G
Ant. 1 [$10^{(G/20)}$]	$10^{(3.18/20)}$	$10^{(2.79/20)}$	$10^{(2.65/20)}$	$10^{(0.59/20)}$
Ant. 2 [$10^{(G/20)}$]	$10^{(1.75/20)}$	$10^{(0.28/20)}$	$10^{(-1.19/20)}$	$10^{(0.62/20)}$
Ant. 3 [$10^{(G/20)}$]	$10^{(1.22/20)}$	$10^{(2/20)}$	$10^{(-0.83/20)}$	$10^{(4.07/20)}$
Ant. 4 [$10^{(G/20)}$]	$10^{(3.3/20)}$	$10^{(3.05/20)}$	$10^{(2.6/20)}$	$10^{(0.81/20)}$
Ant. 1 [$10^{(G/20)}$] value	1.442	1.379	1.357	1.07
Ant. 2 [$10^{(G/20)}$] value	1.223	1.033	0.872	1.074
Ant. 3 [$10^{(G/20)}$] value	1.151	1.259	0.909	1.598
Ant. 4 [$10^{(G/20)}$] value	1.462	1.421	1.349	1.098
Sum All Antenna [Amax]	5.278	5.091	4.487	4.84
DG [$10 \cdot \log(A_{max}^2/N_{ant})$]	8.43	8.12	7.02	7.68

Note:

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

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

8. Summary of Test Result

For 2.4GHz

For 2TX

Frequency (Hz)	2.4G	2.45G	2.4835G
Ant. 1 Max Gain (dBi)	2.3	2.62	2.51
Ant. 2 Max Gain (dBi)	2.79	3.09	3.11
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/50/210	Theta/50/200	Theta/50/200
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/50/150	Theta/40/20	Theta/70/150
Max Gain (dBi)	2.79	3.09	3.11
DG [1SS] (dBi)	4.13	4.72	4.15
DG [2SS] (dBi)	2.79	3.09	3.11

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.

For 4TX

Frequency (Hz)	2.4G	2.45G	2.4835G
Ant. 1 Max Gain (dBi)	2.3	2.62	2.51
Ant. 2 Max Gain (dBi)	2.79	3.09	3.11
Ant. 3 Max Gain (dBi)	3.18	2.35	2.56
Ant. 4 Max Gain (dBi)	3.8	4.63	3.64
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/50/210	Theta/50/200	Theta/50/200
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/50/150	Theta/40/20	Theta/70/150
Ant. 3 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/40/290	Theta/60/230	Theta/60/220
Ant. 4 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/50/110	Theta/50/110	Theta/50/100
Max Gain (dBi)	3.8	4.63	3.64
DG [1SS] (dBi)	7.27	7.68	7.05
DG [2SS] (dBi)	4.27	4.68	4.05
DG [4SS] (dBi)	3.8	4.63	3.64

Note:

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

For 5GHz

For 2TX

Frequency (Hz)	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	3.18	2.87	2.65	2.51
Ant. 2 Max Gain (dBi)	3.24	3.59	3.6	3.35
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/50/280	Theta/60/180	Theta/50/290	Theta/40/250
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/40/260	Theta/40/260	Theta/70/0	Theta/60/0
Max Gain (dBi)	3.24	3.59	3.6	3.35
DG [1SS] (dBi)	5.5	5.81	4.34	4.53
DG [2SS] (dBi)	3.24	3.59	3.6	3.35

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.

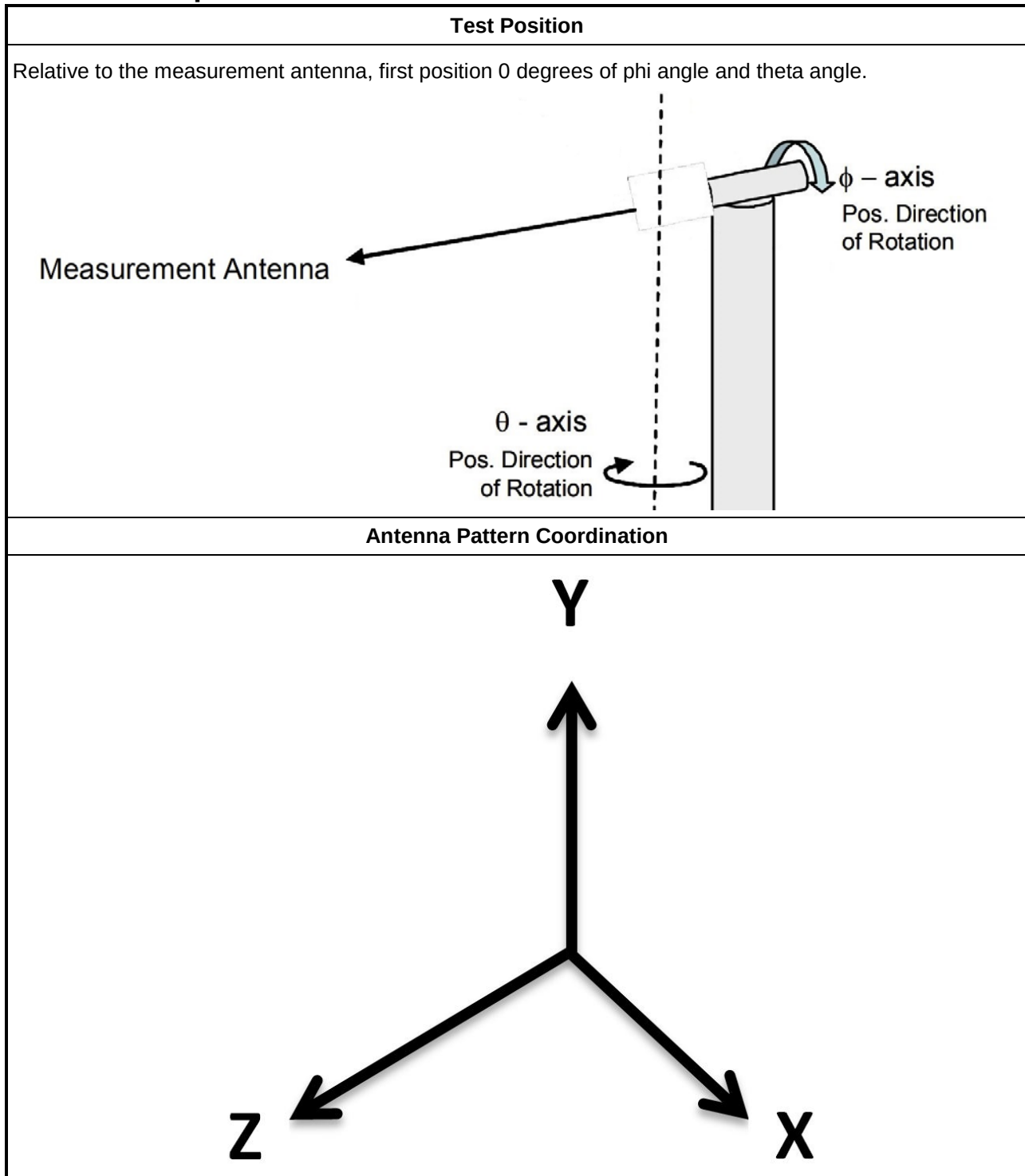
For 4TX

Frequency (Hz)	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	3.18	2.87	2.65	2.51
Ant. 2 Max Gain (dBi)	3.24	3.59	3.6	3.35
Ant. 3 Max Gain (dBi)	3.75	4.08	3.8	4.59
Ant. 4 Max Gain (dBi)	3.3	3.05	2.6	2.53
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/50/280	Theta/60/180	Theta/50/290	Theta/40/250
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/40/260	Theta/40/260	Theta/70/0	Theta/60/0
Ant. 3 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/60/70	Theta/60/70	Theta/60/50	Theta/50/30
Ant. 4 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/50/280	Theta/50/180	Theta/50/290	Theta/40/250
Max Gain (dBi)	3.75	4.08	3.8	4.59
DG [1SS] (dBi)	8.43	8.12	7.02	7.68
DG [2SS] (dBi)	5.43	5.12	4.02	4.68
DG [4SS] (dBi)	3.75	4.08	3.8	4.59

Note:

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

9. Test Setup



Note:

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

**10. Test Equipment and Calibration Data**

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1292	1GHz~18GHz	Aug. 04, 2021	Aug. 03, 2022
Dual Polarization Horn Antenna	Sporton	S0209DP	S0209DP-001	2GHz~9GHz	N.C.R.	N.C.R.
ENA Series Network Analyzer	AGILENT	E5071C	MY46419201	100kHz~8.5GHz	Feb. 21, 2022	Feb. 20, 2023
VNA Calibration Kit	TS RF	TS85033E-F	-	DC~9GHz	N.C.R.	N.C.R.
Multi-axis positioner	Sporton	MAPS01	MAPS01-001	Theta / Phi axis	N.C.R.	N.C.R.
Test Software	SPORTON	SENSE-RDG	V1.0.8	-	N.C.R.	N.C.R.

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

N.C.R. means Non-Calibration required.



11. Test Results

Please refer to the appendix.

Appendix A – Radiated Composite Gain of 2.4GHz_2TX.....	Page 18
Appendix B – Radiated Composite Gain of 2.4GHz_4TX.....	Page 22
Appendix C – Radiated Composite Gain of 5GHz U-NII 1~U-NII 3_2TX.....	Page 27
Appendix D – Radiated Composite Gain of 5GHz U-NII 1~U-NII 3_4TX.....	Page 31
Appendix E – Antenna Pattern of 2.4GHz.....	Page 37
Appendix F – Antenna Pattern of 5GHz U-NII 1~U-NII 3.....	Page 42
Appendix G – Test Photos.....	Page 47



Freq(Hz)	2.4G	2.45G	2.4835G
Ant. 1 Max Gain (dBi)	2.3	2.62	2.51
Ant. 2 Max Gain (dBi)	2.79	3.09	3.11
Ant. 1 Polarization/Θ(°)/Φ(°)	Theta/50/210	Theta/50/200	Theta/50/200
Ant. 2 Polarization/Θ(°)/Φ(°)	Theta/50/150	Theta/40/20	Theta/70/150
Max Gain (dBi)	2.79	3.09	3.11
DG [1SS] (dBi)	4.13	4.72	4.15
DG [2SS] (dBi)	2.79	3.09	3.11

**Radiated Composite Gain_2.4GHz_2TX**

Appendix A

Gain Result

[illegible]



Freq(Hz)	2.4G	2.45G	2.4835G
Ant. 1 Max Gain (dBi)	2.3	2.62	2.51
Ant. 2 Max Gain (dBi)	2.79	3.09	3.11
Ant. 3 Max Gain (dBi)	3.18	2.35	2.56
Ant. 4 Max Gain (dBi)	3.8	4.63	3.64
Ant. 1 Polarization/Θ(°)/Φ(°)	Theta/50/210	Theta/50/200	Theta/50/200
Ant. 2 Polarization/Θ(°)/Φ(°)	Theta/50/150	Theta/40/20	Theta/70/150
Ant. 3 Polarization/Θ(°)/Φ(°)	Theta/40/290	Theta/60/230	Theta/60/220
Ant. 4 Polarization/Θ(°)/Φ(°)	Theta/50/110	Theta/50/110	Theta/50/100
Max Gain (dBi)	3.8	4.63	3.64
DG [1SS] (dBi)	7.27	7.68	7.05
DG [2SS] (dBi)	4.27	4.68	4.05
DG [4SS] (dBi)	3.8	4.63	3.64

Sporton International Inc. Hsinchu Laborator

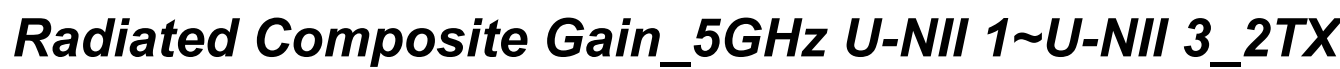
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[illegible]



Freq(Hz)	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	3.18	2.87	2.65	2.51
Ant. 2 Max Gain (dBi)	3.24	3.59	3.6	3.35
Ant. 1 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/50/280	Theta/60/180	Theta/50/290	Theta/40/250
Ant. 2 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/40/260	Theta/40/260	Theta/70/0	Theta/60/0
Max Gain (dBi)	3.24	3.59	3.6	3.35
DG [1SS] (dBi)	5.5	5.81	4.34	4.53
DG [2SS] (dBi)	3.24	3.59	3.6	3.35

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[illegible]

[illegible]



Freq(Hz)	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	3.18	2.87	2.65	2.51
Ant. 2 Max Gain (dBi)	3.24	3.59	3.6	3.35
Ant. 3 Max Gain (dBi)	3.75	4.08	3.8	4.59
Ant. 4 Max Gain (dBi)	3.3	3.05	2.6	2.53
Ant. 1 Polarization/Θ(°)/Φ(°)	Theta/50/280	Theta/60/180	Theta/50/290	Theta/40/250
Ant. 2 Polarization/Θ(°)/Φ(°)	Theta/40/260	Theta/40/260	Theta/70/0	Theta/60/0
Ant. 3 Polarization/Θ(°)/Φ(°)	Theta/60/70	Theta/60/70	Theta/60/50	Theta/50/30
Ant. 4 Polarization/Θ(°)/Φ(°)	Theta/50/280	Theta/50/180	Theta/50/290	Theta/40/250
Max Gain (dBi)	3.75	4.08	3.8	4.59
DG [1SS] (dBi)	8.43	8.12	7.02	7.68
DG [2SS] (dBi)	5.43	5.12	4.02	4.68
DG [4SS] (dBi)	3.75	4.08	3.8	4.59

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Gain Result

[illegible]

Radiated Composite Gain_5GHz U-NII 1~U-NII 3_4TX

[illegible]



Radiated Composite Gain_5GHz U-NII 1~U-NII 3_4TX

Appendix D

EUTRA	U-NII 1	4.7645	4.8414	4.9281	5.0147	5.1014	5.1881	5.2748	5.3615	5.4482	5.5349	5.6216	5.7083	5.7950	5.8817	5.9684	6.0551	6.1418	6.2285	6.3152	6.4019	6.4886	6.5753	6.6620	6.7487	6.8354	6.9221	7.0088	7.0955	7.1822	7.2689	7.3556	7.4423	7.5290	7.6157	7.7024	7.7891	7.8758	7.9625	8.0492	8.1359	8.2226	8.3093	8.3960	8.4827	8.5694	8.6561	8.7428	8.8295	8.9162	9.0029	9.0896	9.1763	9.2630	9.3497	9.4364	9.5231	9.6098	9.6965	9.7832	9.8699	9.9566	10.0433	10.1300	10.2167	10.3034	10.3901	10.4768	10.5635	10.6502	10.7369	10.8236	10.9103	10.9970	11.0837	11.1704	11.2571	11.3438	11.4305	11.5172	11.6039	11.6906	11.7773	11.8640	11.9507	12.0374	12.1241	12.2108	12.2975	12.3842	12.4709	12.5576	12.6443	12.7310	12.8177	12.9044	12.9911	13.0778	13.1645	13.2512	13.3379	13.4246	13.5113	13.5980	13.6847	13.7714	13.8581	13.9448	14.0315	14.1182	14.2049	14.2916	14.3783	14.4650	14.5517	14.6384	14.7251	14.8118	14.8985	14.9852	15.0719	15.1586	15.2453	15.3320	15.4187	15.5054	15.5921	15.6788	15.7655	15.8522	15.9389	16.0256	16.1123	16.1990	16.2857	16.3724	16.4591	16.5458	16.6325	16.7192	16.8059	16.8926	16.9793	17.0660	17.1527	17.2394	17.3261	17.4128	17.4995	17.5862	17.6729	17.7596	17.8463	17.9330	18.0197	18.1064	18.1931	18.2798	18.3665	18.4532	18.5399	18.6266	18.7133	18.8000	18.8867	18.9734	19.0601	19.1468	19.2335	19.3202	19.4069	19.4936	19.5803	19.6670	19.7537	19.8404	19.9271	20.0138	20.1005	20.1872	20.2739	20.3606	20.4473	20.5340	20.6207	20.7074	20.7941	20.8808	20.9675	21.0542	21.1409	21.2276	21.3143	21.4010	21.4877	21.5744	21.6611	21.7478	21.8345	21.9212	22.0079	22.0946	22.1813	22.2680	22.3547	22.4414	22.5281	22.6148	22.7015	22.7882	22.8749	22.9616	23.0483	23.1350	23.2217	23.3084	23.3951	23.4818	23.5685	23.6552	23.7419	23.8286	23.9153	24.0020	24.0887	24.1754	24.2621	24.3488	24.4355	24.5222	24.6089	24.6956	24.7823	24.8690	24.9557	25.0424	25.1291	25.2158	25.3025	25.3892	25.4759	25.5626	25.6493	25.7360	25.8227	25.9094	25.9961	26.0828	26.1695	26.2562	26.3429	26.4296	26.5163	26.6030	26.6897	26.7764	26.8631	26.9498	27.0365	27.1232	27.2099	27.2966	27.3833	27.4700	27.5567	27.6434	27.7301	27.8168	27.9035	27.9902	28.0769	28.1636	28.2503	28.3370	28.4237	28.5104	28.5971	28.6838	28.7705	28.8572	28.9439	29.0306	29.1173	29.2040	29.2907	29.3774	29.4641	29.5508	29.6375	29.7242	29.8109	29.8976	29.9843	30.0710	30.1577	30.2444	30.3311	30.4178	30.5045	30.5912	30.6779	30.7646	30.8513	30.9380	31.0247	31.1114	31.1981	31.2848	31.3715	31.4582	31.5449	31.6316	31.7183	31.8050	31.8917	31.9784	32.0651	32.1518	32.2385	32.3252	32.4119	32.4986	32.5853	32.6720	32.7587	32.8454	32.9321	33.0188	33.1055	33.1922	33.2789	33.3656	33.4523	33.5390	33.6257	33.7124	33.7991	33.8858	33.9725	34.0592	34.1459	34.2326	34.3193	34.4060	34.4927	34.5794	34.6661	34.7528	34.8395	34.9262	35.0129	35.0996	35.1863	35.2730	35.3597	35.4464	35.5331	35.6198	35.7065	35.7932	35.8799	35.9666	36.0533	36.1400	36.2267	36.3134	36.4001	36.4868	36.5735	36.6602	36.7469	36.8336	36.9203	37.0070	37.0937	37.1804	37.2671	37.3538	37.4405	37.5272	37.6139	37.7006	37.7873	37.8740	37.9607	38.0474	38.1341	38.2208	38.3075	38.3942	38.4809	38.5676	38.6543	38.7410	38.8277	38.9144	39.0011	39.0878	39.1745	39.2612	39.3479	39.4346	39.5213	39.6080	39.6947	39.7814	39.8681	39.9548	40.0415	40.1282	40.2149	40.3016	40.3883	40.4750	40.5617	40.6484	40.7351	40.8218	40.9085	40.9952	41.0819	41.1686	41.2553	41.3420	41.4287	41.5154	41.6021	41.6888	41.7755	41.8622	41.9489	42.0356	42.1223	42.2090	42.2957	42.3824	42.4691	42.5558	42.6425	42.7292	42.8159	42.9026	42.9893	43.0760	43.1627	43.2494	43.3361	43.4228	43.5095	43.5962	43.6829	43.7696	43.8563	43.9430	44.0297	44.1164	44.2031	44.2898	44.3765	44.4632	44.5499	44.6366	44.7233	44.8100	44.8967	44.9834	45.0701	45.1568	45.2435	45.3302	45.4169	45.5036	45.5903	45.6770	45.7637	45.8504	45.9371	46.0238	46.1105	46.1972	46.2839	46.3706	46.4573	46.5440	46.6307	46.7174	46.8041	46.8908	46.9775	47.0642	47.1509	47.2376	47.3243	47.4110	47.4977	47.5844	47.6711	47.7578	47.8445	47.9312	48.0179	48.1046	48.1913	48.2780	48.3647	48.4514	48.5381	48.6248	48.7115	48.7982	48.8849	48.9716	49.0583	49.1450	49.2317	49.3184	49.4051	49.4918	49.5785	49.6652	49.7519	49.8386	49.9253	50.0120	50.0987	50.1854	50.2721	50.3588	50.4455	50.5322	50.6189	50.7056	50.7923	50.8790	50.9657	51.0524	51.1391	51.2258	51.3125	51.3992	51.4859	51.5726	51.6593	51.7460	51.8327	51.9194	52.0061	52.0928	52.1795	52.2662	52.3529	52.4396	52.5263	52.6130	52.6997	52.7864	52.8731	52.9598	53.0465	53.1332	53.2199	53.3066	53.3933	53.4800	53.5667	53.6534	53.7401	53.8268	53.9135	54.0002	54.0869	54.1736	54.2603	54.3470	54.4337	54.5204	54.6071	54.6938	54.7805	54.8672	54.9539	55.0406	55.1273	55.2140	55.3007	55.3874	55.4741	55.5608	55.6475	55.7342	55.8209	55.9076	55.9943	56.0810	56.1677	56.2544	56.3411	56.4278	56.5145	56.6012	56.6879	56.7746	56.8613	56.9480	57.0347	57.1214	57.2081	57.2948	57.3815	57.4682	57.5549	57.6416	57.7283	57.8150	57.9017	57.9884	58.0751	58.1618	58.2485	58.3352	58.4219	58.5086	58.5953	58.6820	58.7687	58.8554	58.9421	59.0288	59.1155	59.2022	59.2889	59.3756	59.4623	59.5490	59.6357	59.7224	59.8091	59.8958	59.9825	60.0692	60.1559	60.2426	60.3293	60.4160	60.5027	60.5894	60.6761	60.7628	60.8495	60.9362	61.0229	61.1096	61.1963	61.2830	61.3697	61.4564	61.5431	61.6298	61.7165	61.8032	61.8900	61.9767	62.0634	62.1501	62.2368	62.3235	62.4102	62.4969	62.5836	62.6703	62.7570	62.8437	62.9304	63.0171	63.1038	63.1905	63.2772	63.3639	63.4506	63.5373	63.6240	63.7107	63.7974	63.8841	63.9708	64.0575	64.1442	64.2309	64.3176	64.4043	64.4910	64.5777	64.6644	64.7511	64.8378	64.9245	65.0112	65.0979	65.1846	65.2713	65.3580	65.4447	65.5314	65.6181	65.7048	65.7915	65.8782	65.9649	66.0516	66.1383	66.2250	66.3117	66.3984	66.4851	66.5718	66.6585	66.7452	66.8319	66.9186	67.0053	67.0920	67.1787	67.2654	67.3521	67.4388	67.5255	67.6122	67.6989	67.7856	67.8723	67.9590	68.0457	68.1324	68.2191	68.3058	68.3925	68.4792	68.5659	68.6526	68.7393	68.8260	68.9127	69.0000	69.0867	69.1734	69.2601	69.3468	69.4335	69.5202	69.6069	69.6936	69.7803	69.8670	69.9537	70.0404	70.1271	70.2138	70.3005	70.3872	70.4739	70.5606	70.6473	70.7340	70.8207	70.9074	70.9941	71.0808	71.1675	71.2542	71.3409	71.4276	71.5143	71.6010	71.6877	71.7744	71.8611	71.9478	72.0345	72.1212	72.2079	72.2946	72.3813	72.4680	72.5547	72.6414	72.7281	72.8148	72.9015	72.9882	73.0749	73.1616	73.2483	73.3350	73.4217	73.5084	73.5951	73.6818	73.7685	73.8552	73.9419	74.0286	74.1153	74.2020	74.2887	74.3754	74.4621	74.5488	74.6355	74.7222	74.8089	74.8956	74.9823	75.0690	75.1557	75.2424	75.3291	75.4158	75.5025	75.5892	75.6759	75.7626	75.8493	75.9360	76.0227	76.1094	76.1961	76.2828	76.3695	76.4562	76.5429	76.6296	76.7163	76.8030	76.8897	76.9764	77.0631	77.1498	77.2365	77.3232	77.4099	77.4966	77.5833	77.6700	77.7567	77.8434	77.9301	78.0168	78.1035	78.1902	78.2769	78.3636	78.4503	78.5370	78.6237	78.7104	78.7971	78.8838	78.9705	79.0572	79.1439	79.2306	79.3173	79.4040	79.4907	79.5774	79.6641	79.7508	79.8375	79.9242	80.0109	80.0976	80.1843	80.2710	80.3577	80.4444	80.5311	80.6178	80.7045	80.7912	80.8779	80.9646	81.0513	81.1380	81.2247	81.3114	81.3981	81.4848	81.5715	81.6582	81.7449	81.8316	81.9183	82.0050	82.0917	82.1784	82.2651	82.3518	82.4385	82.5252	82.6119	82.6986	82.7853	82.8720	82.9587	83.0454	83.1321	83.2188	83.3055	83.3922	83.4789	83.5656	83.6523	83.7390	83.8257	83.9124	84.0000	84.0867	84.1734	84.2601	84.3468	84.4335	84.5202	84.6069	84.6936	84.7803	84.8670	84.9537	85.0404	85.1271	85.2138	85.3005	85.3872	85.4739	85.5606	85.6473	85.7340	85.8207	85.9074	85.9941	86.0808	86.1675	86.2542	86.3409	86.4276	86.5143	86.6010	86.6877	86.7744	86.8611	86.9478	87.0345	87.1212	87.2079	87.2946	87.3813	87.4680	87.5547	87.6414	87.7281	87.8148	87.9015	87.9882	88.0749	88.1616	88.2483	88.3350	88.4217	88.5084	88.5951	88.6818	88.7685	88.8552	88.9419	89.0286	89.1153	89.2020	89.2887	89.3754	89.4621	89.5488	89.6355	89.7222	89.8089	89.8956	89.9823	90.0690	90.1557	90.2424	90.3291	90.4158	90.5025	90.5892	90.6759	90.7626	90.8493	90.9360	91.0227	91.1094	91.1961	91.2828	91.3695	91.4562	91.5429	91.6296	91.7163	91.8030	91.8897	91.9764	92.0631	92.1498	92.2365	92.3232	92.4099	92.4966	92.5833	92.6700	92.7567	92.8434	92.9301	93.0168	93.1035	93.1902	93.2769</
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[illegible]



Total Gain Data

Freq(Hz)	2.4GPol.	TotalAnt. 1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Gain	Φ(0°)/Φ(10°)	Φ(20°)/Φ(30°)	Φ(40°)/Φ(50°)	Φ(60°)/Φ(70°)	Φ(80°)/Φ(90°)	Φ(100°)/Φ(110°)	Φ(120°)/Φ(130°)	Φ(140°)/Φ(150°)	Φ(160°)/Φ(170°)	Φ(180°)/Φ(190°)	Φ(200°)/Φ(210°)	Φ(220°)/Φ(230°)	Φ(240°)/Φ(250°)	Φ(260°)/Φ(270°)	Φ(280°)/Φ(290°)	Φ(300°)/Φ(310°)	Φ(320°)/Φ(330°)	Φ(340°)/Φ(350°)
Θ(0°)	-3.59/-3.43	-3.07/-2.81	-2.71/-2.44	-2.25/-2.32	-2.73/-2.24	-2.33/-2.44	-2.51/-2.65	-2.65/-2.59	-2.87/-2.99	-2.13/-2.44	-2.38/-3.15	-2.96/-2.67	-2.11/-2.47	-2.64/-3.27				
Θ(10°)	-3.54/-3.39	-3.29/-2.80	-2.66/-2.59	-2.56/-2.67	-2.55/-2.84	-3.27/-3.99	-4.55/-4.75	-4.78/-4.92	-5.62/-5.99	-6.01/-5.79	-5.19/-4.80	-4.37/-3.55	-3.26/-3.00	-2.56/-1.85	-1.77/-1.71	-1.75/-1.47	-1.58/-1.72	-2.23/-2.62
Θ(20°)	-3.93/-3.60	-2.90/-2.26	-1.77/-1.40	-1.06/-0.91	-0.83/-1.02	-1.53/-2.05	-2.81/-3.64	-4.35/-5.62	-8.04/-9.09	-7.90/-6.73	-5.90/-5.34	-4.76/-4.15	-3.48/-2.74	-2.83/-2.72	-2.69/-2.87	-3.09/-2.71	-2.46/-2.72	-3.31/-3.99
Θ(30°)	-4.17/-3.14	-2.32/-1.95	-1.73/-1.44	-1.21/-1.06	-0.75/-0.98	-1.30/-1.49	-1.98/-2.23	-2.54/-3.62	-5.29/-6.20	-5.04/-3.36	-1.76/-2.13	-1.89/-1.45	-1.24/-1.67	-2.24/-3.21	-3.86/-3.90	-3.30/-2.92	-3.35/-3.88	
Θ(40°)	-2.21/-1.89	-1.57/-1.44	-1.63/-2.00	-2.23/-1.98	-1.68/-1.33	-1.25/-1.67	-2.27/-2.30	-2.49/-3.17	-4.72/-5.27	-3.73/-1.66	-0.030/4.48	0.33/-0.44	-1.08/-1.05	-1.09/-1.46	-2.43/-3.55	-4.70/-5.29	-4.42/-3.11	-2.61/-2.44
Θ(50°)	-1.04/-1.16	-1.42/-1.49	-1.46/-1.94	-2.59/-2.39	-1.72/-0.98	-1.04/-1.42	-1.71/-1.70	-2.12/-3.76	-4.05/-3.04	-1.75/-1.21	1.35/2.44	1.70/0.01	-0.65/-1.19	-1.62/-2.58	-3.42/-3.93	-4.46/-4.80	-4.17/-2.34	-1.39/-1.33
Θ(60°)	-1.43/-2.15	-2.97/-2.31	-1.37/-1.68	-1.68/-1.80	-1.55/-0.67	-0.31/-1.14	-2.01/-1.55	-1.65/-4.23	-8.25/-9.63	-7.10/-3.21	-0.35/0.71	0.63/-0.30	-1.24/-2.17	-2.96/-4.29	-5.59/-4.65	-3.80/-3.60	-3.08/-2.24	-1.75/-1.60
Θ(70°)	-1.15/-2.62	-4.97/-4.28	-2.70/-1.43	-0.57/-1.33	-2.75/-2.06	-0.93/-1.30	-2.63/-2.41	-2.35/-5.64	-9.87/-11.01	-8.98/-3.71	-0.86/0.05	-0.15/-0.77	-1.89/-3.17	-4.46/-6.46	-9.36/-5.45	-3.39/-3.00	-2.81/-2.35	-1.99/-1.22
Θ(80°)	-1.11/-2.33	-5.44/-5.74	-3.56/-0.90	0.53/-0.47	-3.73/-4.23	-1.57/-0.69	-2.38/-3.90	-3.56/-7.13	-12.11/-12.14	-9.46/-5.18	-1.98/-0.49	-0.64/-1.49	-2.74/-3.87	-5.09/-7.74	-12.56/-5.60	-3.37/-3.51	-2.87/-2.41	-2.74/-1.69
Θ(90°)	-1.19/-2.48	-5.35/-6.86	-5.01/-1.07	0.19/-0.97	-4.71/-5.85	-2.11/-0.55	-1.55/-3.78	-4.28/-8.39	-15.52/-12.63	-8.69/-5.63	-2.69/-1.77	-1.65/-2.78	-3.85/-4.22	-5.44/-9.05	-11.49/-3.88	-2.57/-4.15	-3.43/-2.52	-2.37/-1.31
Θ(100°)	-2.81/-3.43	-6.87/-9.15	-7.36/-3.15	-3.32/-3.57	-5.82/-7.70	-4.53/-2.76	-2.24/-3.53	-4.59/-5.92	-12.62/-10.52	-7.94/-5.54	-3.72/-3.15	-2.66/-3.60	-4.22/-4.34	-5.42/-10.67	-9.13/-3.34	-2.82/-4.92	-4.20/-3.39	-3.65/-3.20
Θ(110°)	-5.00/-5.69	-12.08/-14.77	-9.07/-4.50	-9.68/-8.51	-7.80/-8.46	-5.54/-7.49	-5.41/-4.99	-5.61/-6.51	-10.03/-6.03	-4.62/-3.03	-2.86/-3.96	-4.42/-6.23	-6.85/-6.39	-6.97/-11.92	-5.66/-6.56	-5.86/-6.01	-4.88/-6.16	-6.70/-5.99
Θ(120°)	-5.66/-6.74	-10.63/-12.71	-8.49/-4.03	-5.12/-4.85	-5.32/-7.49	-5.29/-7.85	-6.57/-5.80	-10.38/-10.49	-10.90/-6.37	-5.42/-5.24	-5.25/-5.64	-6.60/-7.54	-7.08/-8.82	-10.67/-7.43	-4.77/-3.13	-3.95/-5.58	-5.80/-5.12	
Θ(130°)	-4.96/-7.02	-7.89/-10.63	-10.37/-5.15	-5.04/-5.78	-8.47/-11.04	-7.00/-7.72	-6.33/-6.93	-13.90/-13.92	-13.75/-10.28	-9.47/-9.59	-7.79/-6.64	-5.80/-4.53	-4.43/-7.43	-11.91/-13.35	-12.25/-7.09	-3.52/-3.62	-7.05/-9.42	-7.93/-5.57
Θ(140°)	-6.35/-6.79	-5.80/-7.44	-10.85/-8.71	-7.62/-9.40	-11.71/-12.61	-9.75/-9.71	-8.66/-10.20	-14.83/-11.41	-9.98/-12.57	-12.10/-11.30	-11.41/-10.61	-9.04/-8.74	-8.34/-8.67	-9.67/-13.45	-13.35/-7.21	-5.15/-6.53	-8.78/-6.97	-5.79/-5.58
Θ(150°)	-14.24/-9.76	-7.55/-9.32	-14.00/-15.03	-14.83/-14.96	-13.65/-12.38	-12.18/-13.96	-15.38/-15.20	-12.13/-8.52	-8.33/-10.46	-11.50/-11.26	-9.28/-6.95	-6.89/-8.06	-10.05/-8.84	-9.24/-12.05	-11.72/-8.76	-7.70/-7.86	-6.94/-6.08	-7.32/-11.86
Θ(160°)	-10.06/-9.66	-8.57/-8.18	-8.40/-9.24	-10.38/-11.68	-12.47/-12.72	-12.92/-12.26	-11.41/-11.04	-8.87/-9.00	-8.80/-12.63	-15.74/-15.45	-11.84/-13.14	-10.79/-12.32	-12.36/-11.61	-10.18/-10.27	-11.84/-13.56	-16.32/-12.63	-10.18/-9.03	-9.34/-10.09
Θ(170°)	-10.99/-11.96	-12.95/-13.70	-14.36/-15.44	-15.89/-15.58	-13.49/-13.64	-12.10/-12.15	-11.59/-11.77	-12.26/-12.76	-13.91/-13.47	-11.43/-11.26	-12.23/-11.59	-11.17/-10.94	-10.84/-11.31	-11.57/-12.49	-14.06/-15.62	-15.29/-14.76	-13.32/-12.36	-12.15/-11.73
Θ(180°)	-15.72/-15.11	-14.06/-13.71	-12.81/-12.34	-12.94/-12.61	-12.66/-12.54	-12.12/-11.80	-11.92/-11.46	-10.87/-10.97	-10.64/-10.28	-9.88/-10.15	-10.76/-10.93	-10.34/-10.37	-10.63/-10.94	-11.35/-11.15	-11.26/-11.56	-11.71/-12.31	-12.46/-12.74	-13.30/-14.38
Freq(Hz)	2.45GPol.	TotalAnt. 1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gain	Φ(0°)/Φ(10°)	Φ(20°)/Φ(30°)	Φ(40°)/Φ(50°)	Φ(60°)/Φ(70°)	Φ(80°)/Φ(90°)	Φ(100°)/Φ(110°)	Φ(120°)/Φ(130°)	Φ(140°)/Φ(150°)	Φ(160°)/Φ(170°)	Φ(180°)/Φ(190°)	Φ(200°)/Φ(210°)	Φ(220°)/Φ(230°)	Φ(240°)/Φ(250°)	Φ(260°)/Φ(270°)	Φ(280°)/Φ(290°)	Φ(300°)/Φ(310°)	Φ(320°)/Φ(330°)	Φ(340°)/Φ(350°)
Θ(0°)	-4.27/-3.61	-3.08/-2.95	-3.04/-3.66	-3.36/-3.77	-4.11/-4.09	-3.50/-3.04	-3.15/-3.24	-3.34/-3.48	-3.60/-3.68	-3.76/-3.58	-3.29/-3.54	-3.62/-3.60	-3.70/-3.91	-3.89/-3.78	-4.16/-4.23	-3.91/-3.95	-3.89/-4.03	-4.28/-4.54
Θ(10°)	-3.98/-3.50	-3.23/-3.22	-3.29/-3.47	-3.71/-3.90	-4.67/-5.38	-5.99/-5.77	-6.29/-6.54	-6.97/-7.08	-6.59/-6.57	-4.22/-4.52	-3.74/-3.48	-3.52/-3.79	-4.43/-4.09	-3.22/-3.79	-3.63/-4.48	-3.13/-3.17	-3.22/-3.38	-3.69/-3.92
Θ(20°)	-4.65/-3.63	-2.41/-1.66	-1.26/-0.82	-0.54/-0.66	-1.04/-1.73	-2.77/-3.69	-4.82/-5.78	-6.93/-7.83	-7.55/-5.96	-4.21/-2.97	-2.48/-2.73	-2.72/-3.01	-3.13/-3.34	-3.26/-3.50	-4.07/-4.54	-4.85/-4.97	-4.76/-4.82	-5.32/-5.63
Θ(30°)	-4.50/-2.58	-0.98/-0.16	0.30/0.53	0.62/0.55	0.16/-0.36	-1.16/-2.34	-3.34/-3.84	-4.02/-4.46	-4.74/-3.77	-2.12/-0.80	-0.16/-0.13	-0.29/-0.80	-1.26/-1.59	-1.88/-2.31	-3.07/-3.91	-4.97/-4.59	-5.40/-5.05	-5.31/-5.41
Θ(40°)	-2.91/-1.60	-0.20/0.62	0.79/0.74	0.28/0.31	0.13/-0.11	-0.68/-1.36	-2.37/-2.65	-2.83/-3.03	-3.52/-3.11	-1.34/0.45	1.44/-1.55	1.16/0.36	-0.56/-1.74	-1.51/0.58	-4.77/-4.08	-4.75/-5.68	-5.67/-4.75	-4.02/-3.64
Θ(50°)	-1.41/-0.99	-0.38/-0.39	0.79/0.25	-0.56/-0.98	-0.93/-0.78	-0.81/-1.28	-1.71/-2.06	-2.76/-3.89	-4.40/-3.39	-1.14/0.93	2.65/1.65	1.19/0.19	-1.28/-2.58	-3.04/-3.89	-5.20/-5.38	-5.07/-5.01	-4.47/-3.77	-2.81/-2.09
Θ(60°)	-1.79/-1.25	-1.52/-0.46	0.42/-0.14	-1.20/-1.75	-1.67/-1.07	-0.94/-1.47	-1.93/-1.67	-2.60/-4.90	-5.22/-4.21	-2.08/-0.07	1.00/-1.33	1.04/0.01	-1.82/-3.23	-3.17/-3.81	-6.04/-6.71	-4.67/-3.39	-2.73/-2.19	-2.34/-2.49
Θ(70°)	-1.64/-2.42	-3.93/-2.31	-0.86/-1.12	-1.37/-2.27	-2.64/-2.04	-1.05/-1.73	-0.99/-2.29	-2.35/-4.86	-5.82/-5.57	-4.05/-1.52	0.03/0.54	0.26/-1.09	-3.65/-4.95	-3.24/-3.31	-7.12/-8.38	-4.41/-2.78	-1.64/-1.54	-2.24/-2.17
Θ(80°)	-1.46/-2.67	-6.09/-6.02	-4.08/-2.17	-0.92/-2.05	-5.74/-5.25	-2.28/-1.41	-3.08/-4.54	-3.61/-5.41	-6.28/-6.32	-5.23/-2.61	-0.77/-0.12	-0.22/-1.34	-4.21/-6.48	-4.27/-3.69	-8.35/-6.69	-3.99/-2.58	-1.67/-1.76	-2.60/-2.35
Θ(90°)	-0.71/-2.09	-5.63/-6.72	-5.29/-2.04	-0.17/-1.33	-6.31/-6.83	-2.55/-1.06	-2.05/-1.56	-5.15/-7.46	-9.66/-8.65	-6.42/-3.88	-1.70/-0.81	-0.97/-2.75	-5.94/-7.59	-4.89/-4.48	-9.53/-6.34	-2.95/-2.64	-1.57/-1.60	-2.49/-1.63
Θ(100°)	-2.21/-2.89	-6.38/-8.96	-8.34/-6.96	-8.34/-6.96	-6.10/-9.17	-5.85/-2.77	-3.14/-4.06	-6.89/-8.35	-11.89/-9.17	-5.68/-4.62	-3.20/-2.60	-2.09/-3.70	-5.87/-6.74	-5.11/-6.52	-10.74/-4.97	-2.75/-3.19	-2.54/-2.93	-3.02/-2.93
Θ(110°)	-4.59/-4.25	-9.38/-14.96	-11.19/-5.98	-8.77/-6.36	-7.57/-10.66	-6.56/-7.12	-4.53/-4.63	-7.08/-7.65	-9.36/-5.78	-3.96/-3.60	-3.72/-4.19	-3.90/-5.56	-6.86/-6.62	-5.24/-7.33	-6.32/-4.25	-4.30/-4.55	-3.74/-4.36	-5.73/-5.99
Θ(120°)	-5.85/-7.43	-11.60/-12.64	-11.60/-5.99	-7.84/-5.42	-5.55/-8.40	-5.35/-7.62	-6.99/-5.50	-9.30/-10.02	-8.47/-6.74	-3.51/-4.26	-4.79/-8.47	-5.26/-7.93	-9.84/-10.86	-7.99/-7.66	-7.66/-8.37	-7.42/-4.77	-4.02/-5.34	-5.87/-5.35
Θ(130°)	-5.22/-7.07	-8.12/-10.44	-14.61/-7.24	-6.17/-6.38	-8.01/-10.68	-7.15/-7.41	-7.54/-6.83	-12.52/-13.29	-11.34/-7.91	-7.14/-6.03	-5.12/-4.99	-6.48/-8.90	-5.23/-8.43	-8.76/-7.24	-4.52/-3.90	-5.23/-7.48	-7.58/-5.45	
Θ(140°)	-5.72/-7.73	-7.38/-8.19	-10.91/-8.83	-8.12/-10.35	-14.27/-15.14	-11.18/-10.57	-10.69/-11.79	-14.58/-12.15	-11.97/-13.49	-10.66/-8.95	-8.52/-8.33	-7.65/-8.04	-9.68/-9.09	-9.62/-12.98	-13.02/-7.43	-5.55/-6.62	-8.05/-6.66	-5.23/-4.78
Θ(150°)	-13.61/-14.38	-11.50/-11.42	-15.47/-15.38	-15.29/-15.32	-15.55/-13.79	-15.80/-14.79	-14.89/-14.79	-13.07/-11.47	-11.39/-11.31	-10.93/-10.17	-9.07/-8.37	-9.78/-11.52	-9.32/-7.32	-8.02/-11.24	-11.12/-8.08	-7.37/-7.98	-7.14/-6.07	-6.64/-9.93
Θ(160°)	-9.77/-9.38	-9.11/-9.78	-10.27/-10.71	-11.15/-11.20	-11.43/-12.85	-12.43/-12.39	-10.97/-11.97	-12.45/-12.71	-13.54/-13.34	-12.29/-11.31	-11.68/-12.49	-10.13/-9.18	-8.84/-9.56	-11.28/-11.61	-10.13/-9.46	-10.09/-10.72		
Θ(170°)	-11.06/-10.96	-12.22/-14.76	-15.13/-14.71	-15.51/-15.63	-15.32/-14.76	-13.62/-12.89	-12.41/-12.69	-12.75/-12.70	-12.04/-12.21	-11.80/-10.97	-10.17/-10.05	-10.29/-11.06	-10.98/-10.31	-10.44/-11.32	-13.18/-14.09	-14.81/-14.52	-14.42/-13.00	-12.68/-11.96
Θ(180°)	-13.47/-14.40	-13.85/-13.73	-12.89/-12.16	-12.05/-12.73	-12.58/-12.13	-12.28/-12.57	-11.76/-11.16	-11.00/-10.47	-10.14/-9.77	-9.76/-9.82	-10.07/-10.09	-10.50/-10.74	-10.66/-10.63	-10.70/-10.90	-10.86/-11.35	-11.15/-10.91	-11.06/-12.17	-12.92/-13.46
Freq(Hz)	2.4835GPol.	TotalAnt. 1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gain	Φ(0°)/Φ(10°)	Φ(20°)/Φ(30°)	Φ(40°)/Φ(50°)	Φ(60°)/Φ(70°)	Φ(80°)/Φ(90°)	Φ(100°)/Φ(110°)	Φ(120°)/Φ(130°)	Φ(140°)/Φ(150°)	Φ(160°)/Φ(170°)	Φ(180°)/Φ(190°)	Φ(200°)/Φ(210°)	Φ(220°)/Φ(230°)	Φ(240°)/Φ(250°)	Φ(260°)/Φ(270°)	Φ(280°)/Φ(290°)	Φ(300°)/Φ(310°)	Φ(320°)/Φ(330°)	Φ(340°)/Φ(350°)
Θ(0°)	-2.85/-2.71	-2.84/-3.11	-3.14/-3.60	-4.00/-1.47	-3.74/-2.93	-2.53/-2.56	-2.77/-2.68	-2.63/-2.63	-3.10/-3.16	-3.12/-2.93	-3.19/-3.56	-3.46/-3.38	-3.30/-3.08	-3.00/-2.59	-2.56/-2.35	-2.27/-2.43	-2.89/-3.08	-2.96/-2.94
Θ(10°)	-3.71/-4.05	-4.24/-3.46	-4.33/-4.62	-4.85/-5.05	-5.12/-5.11	-4.50/-5.24	-5.43/-5.12	-4.49/-4.32	-4.06/-3.52	-3.63/-3.53	-3.67/-3.79	-3.26/-3.79	-2.77/-3.01	-2.63/-3.53	-2.36/-2.45	-2.27/-2.50	-2.77/-3.01	-3.13/-3.30
Θ(20°)	-5.57/-4.91	-3.75/-																



Antenna Pattern_2.4GHz

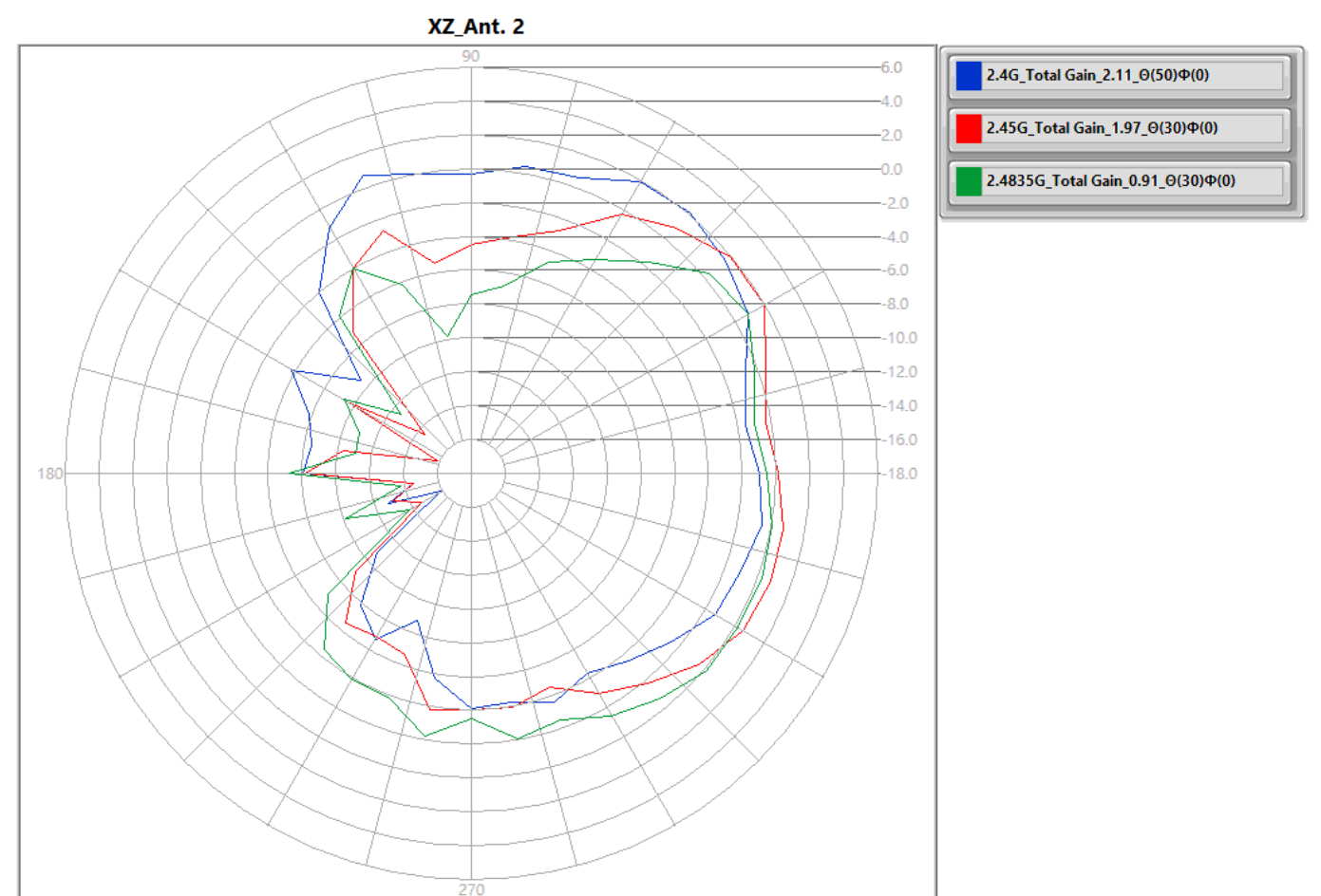
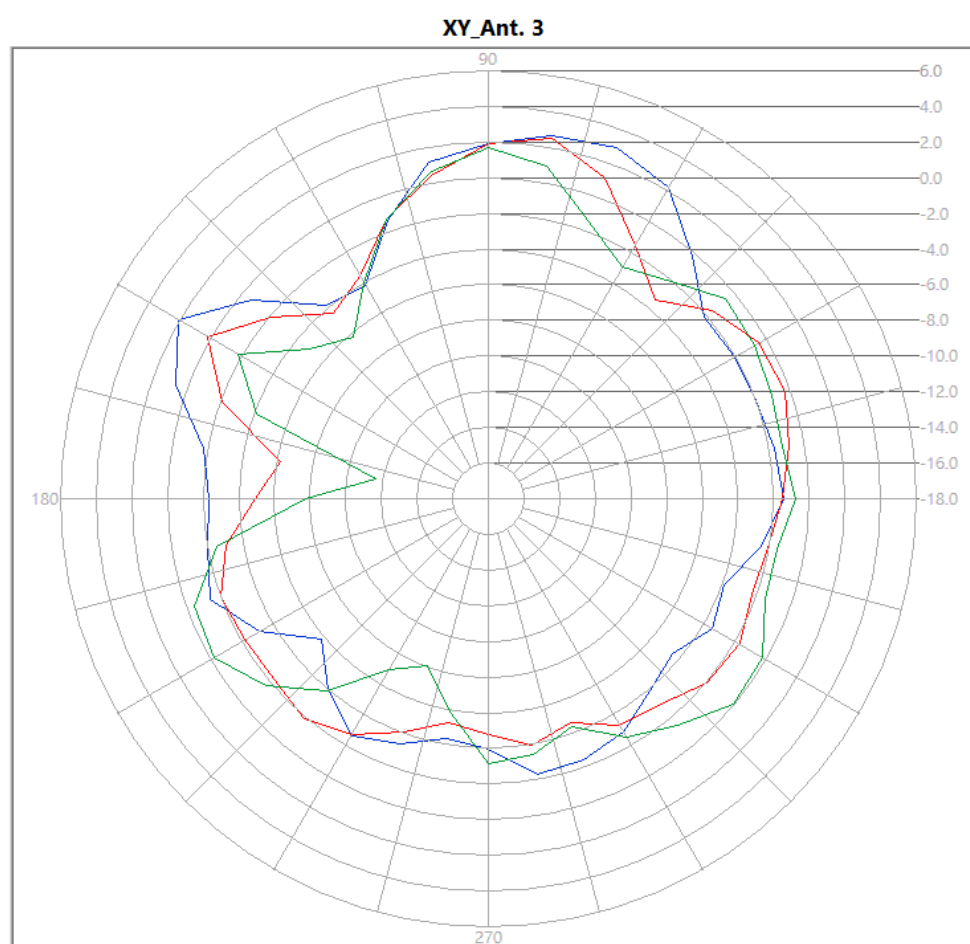
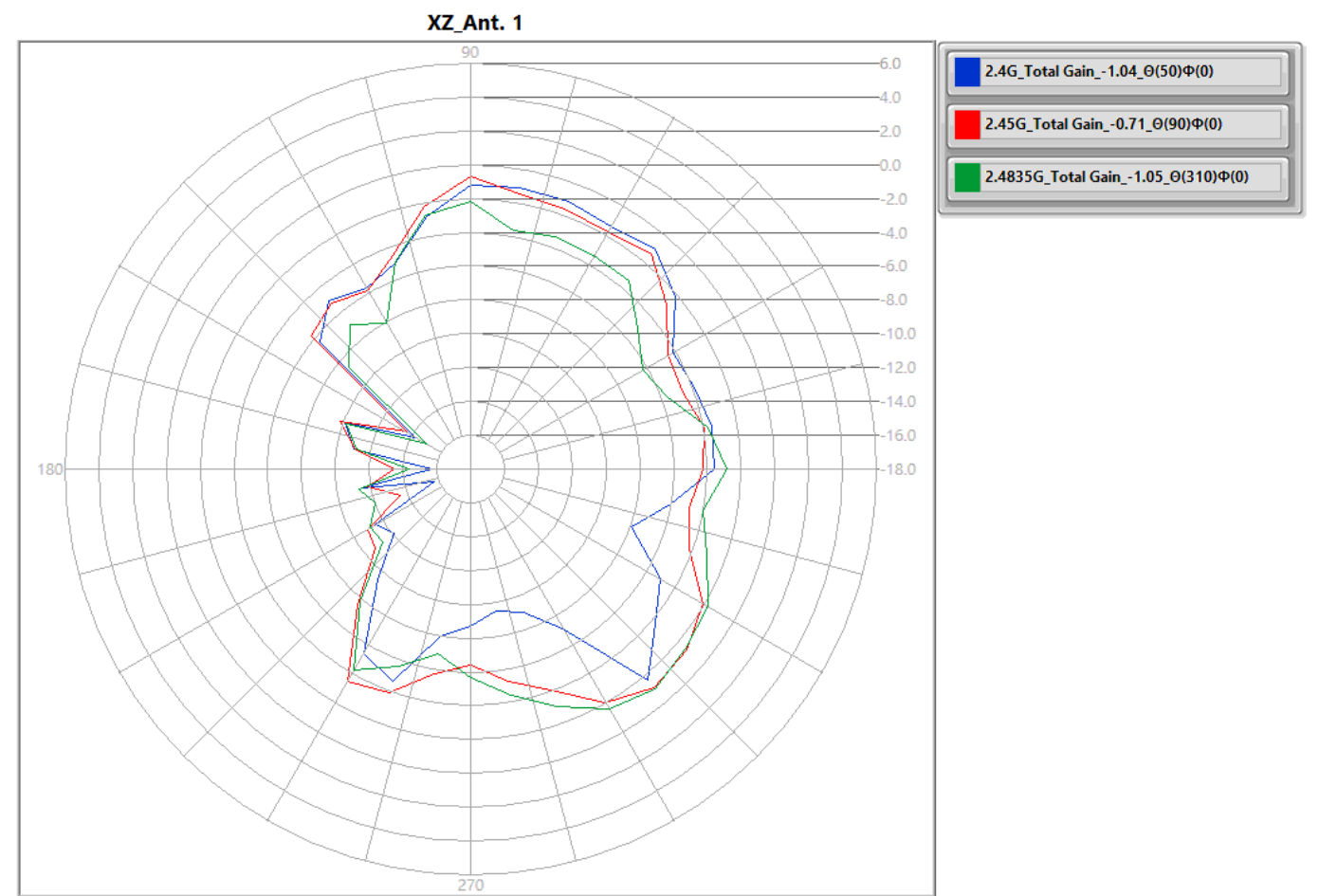
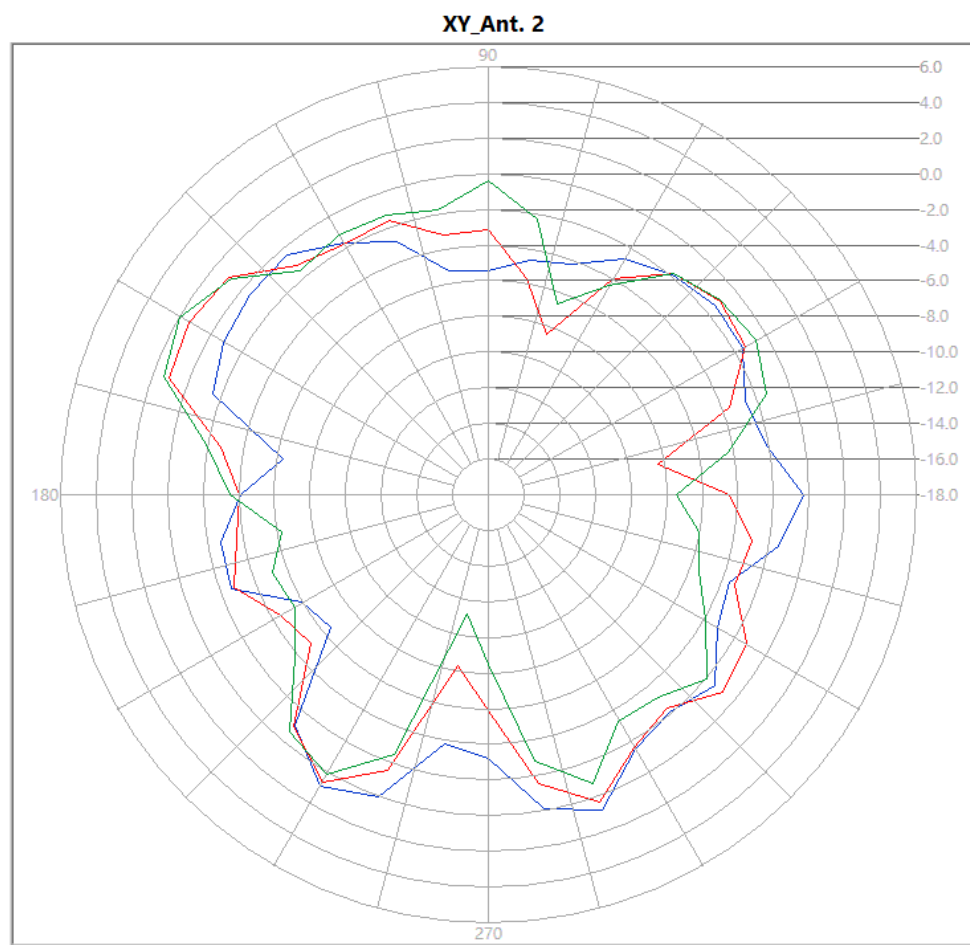
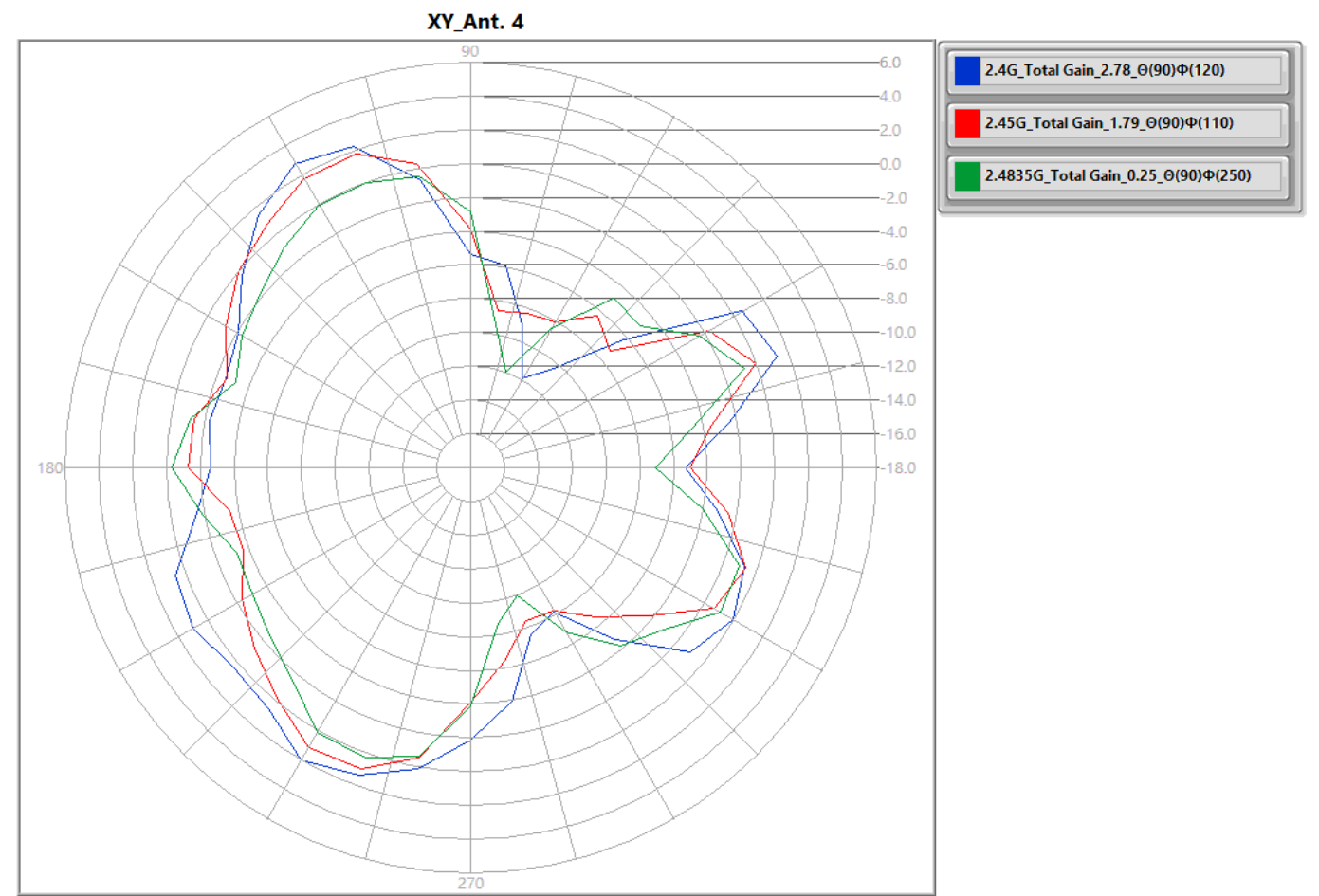
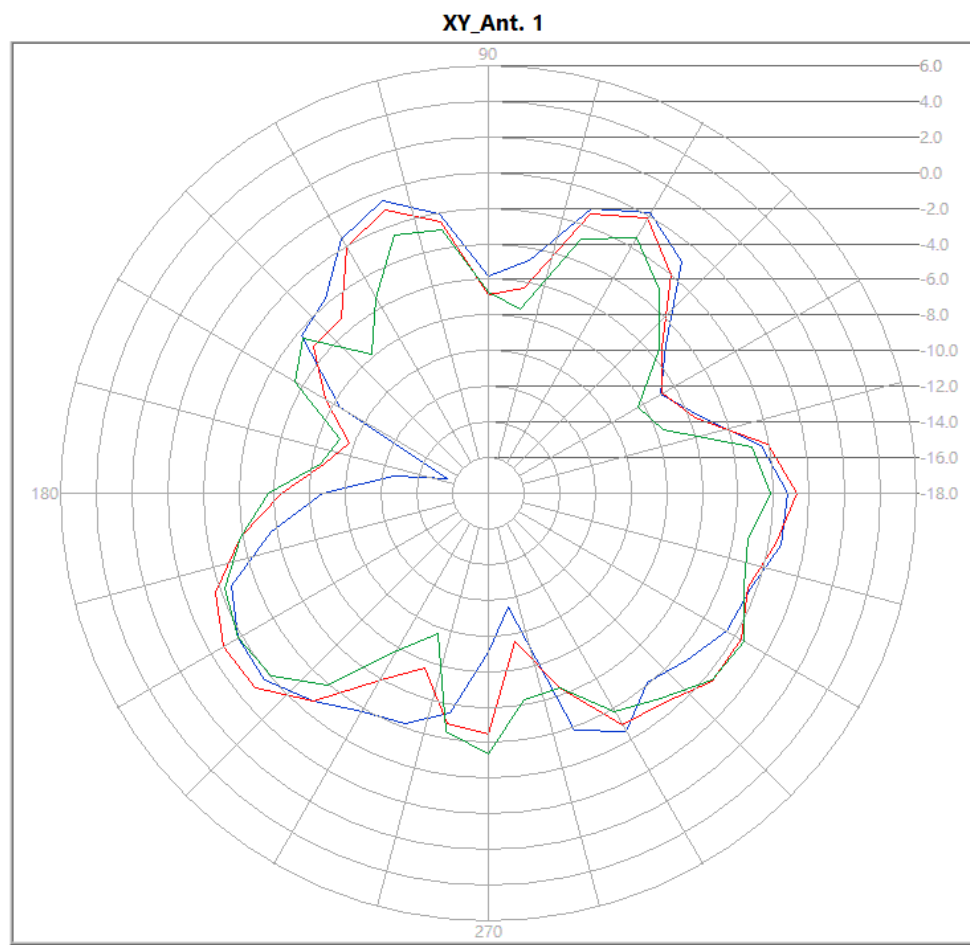
Appendix E

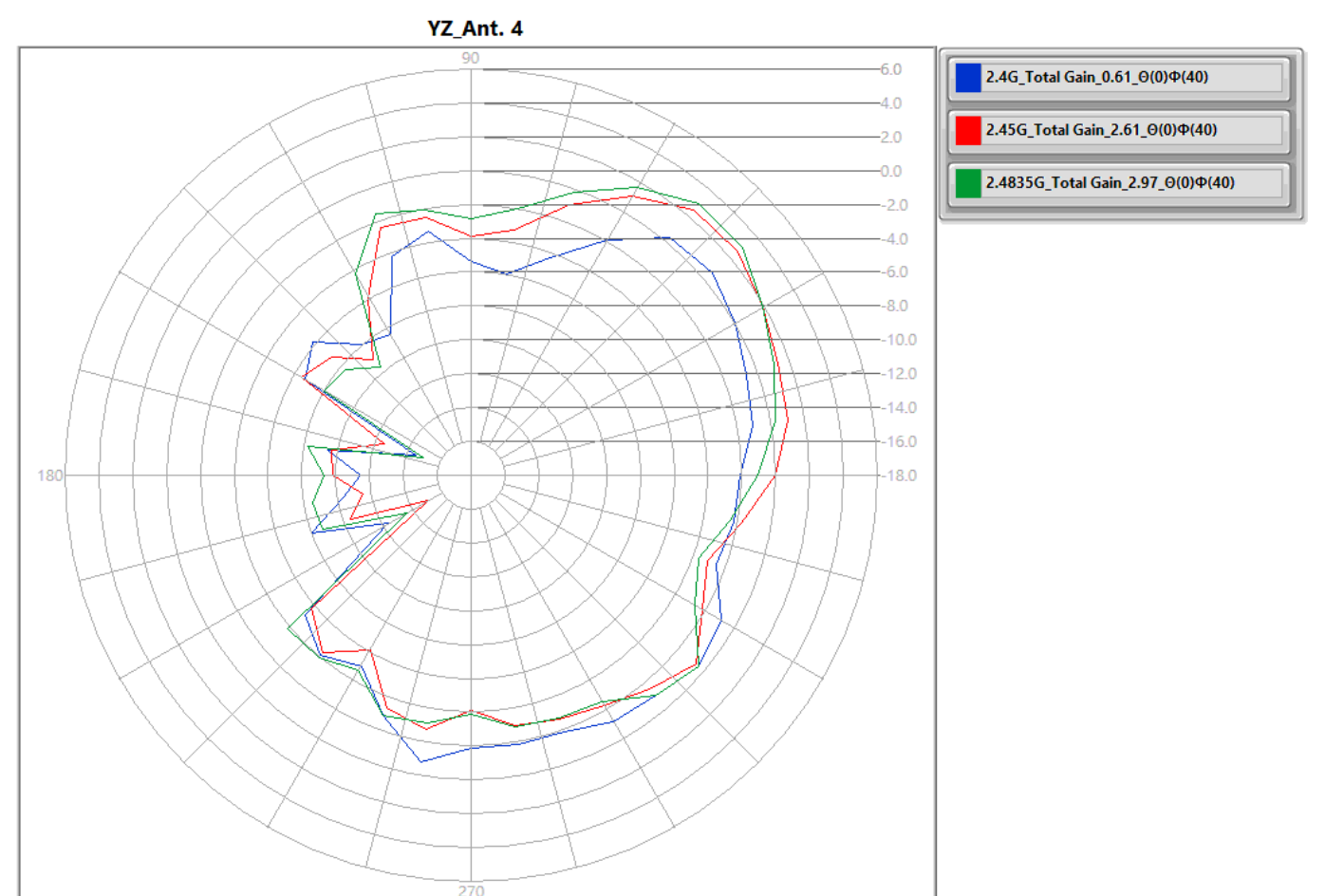
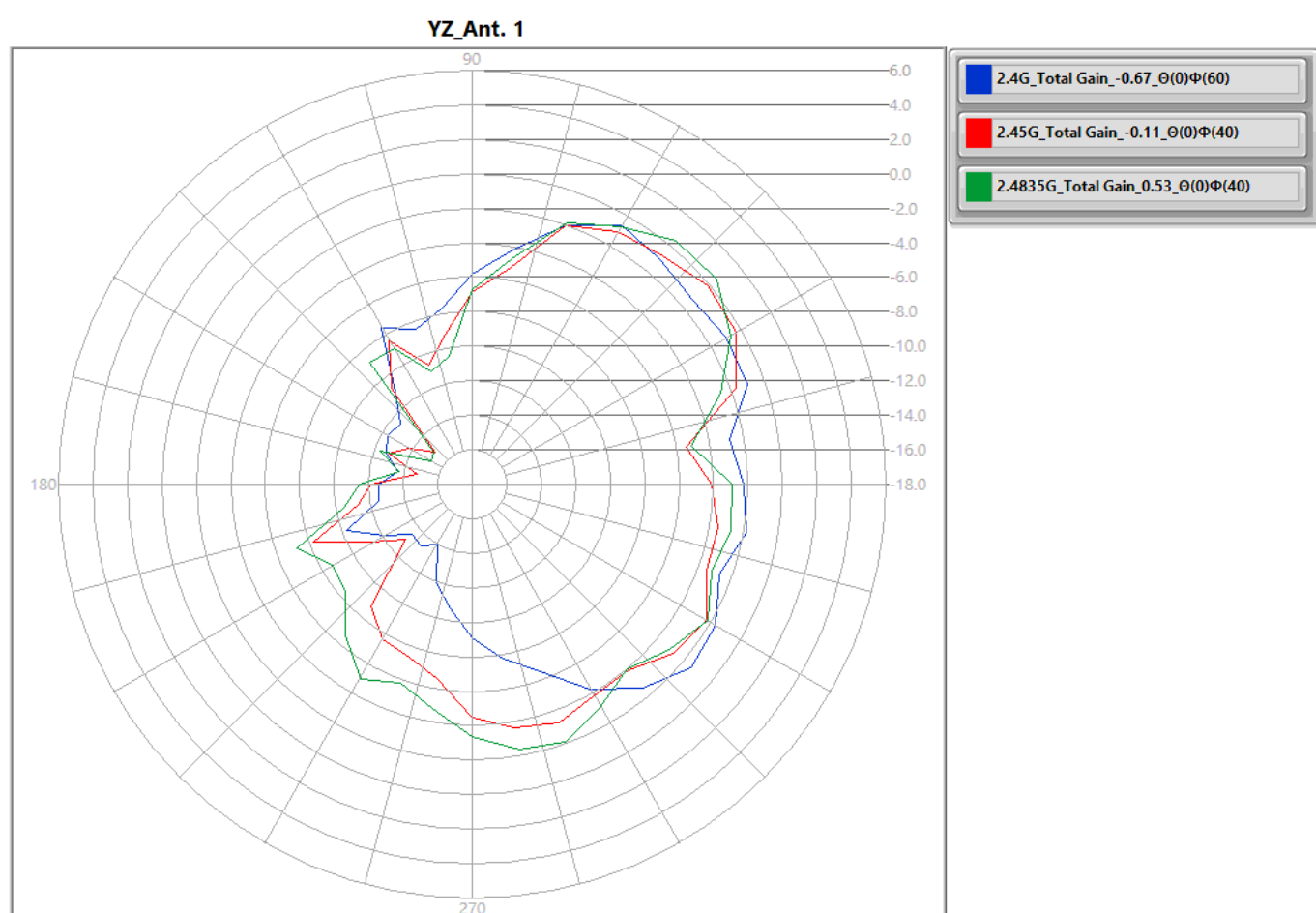
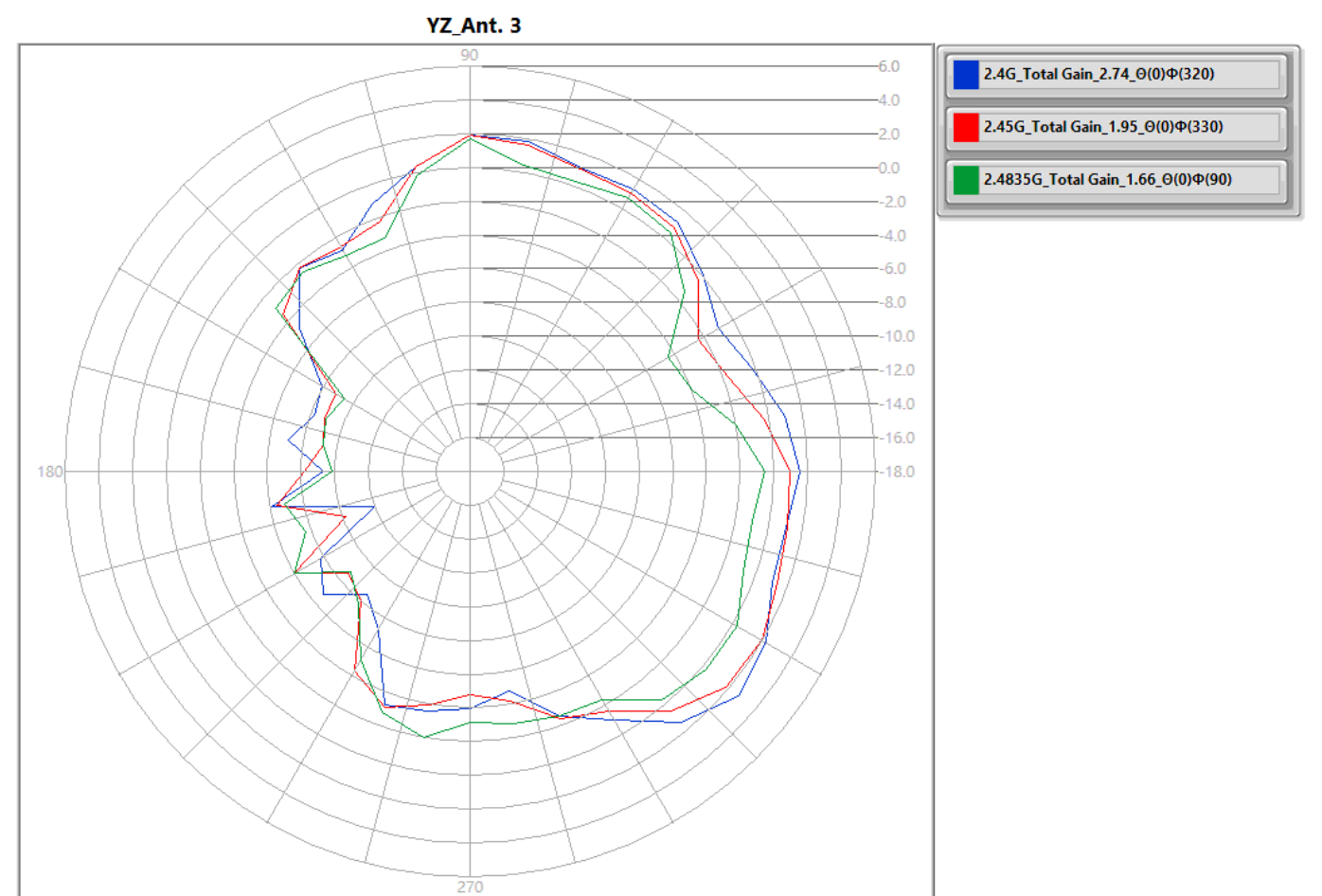
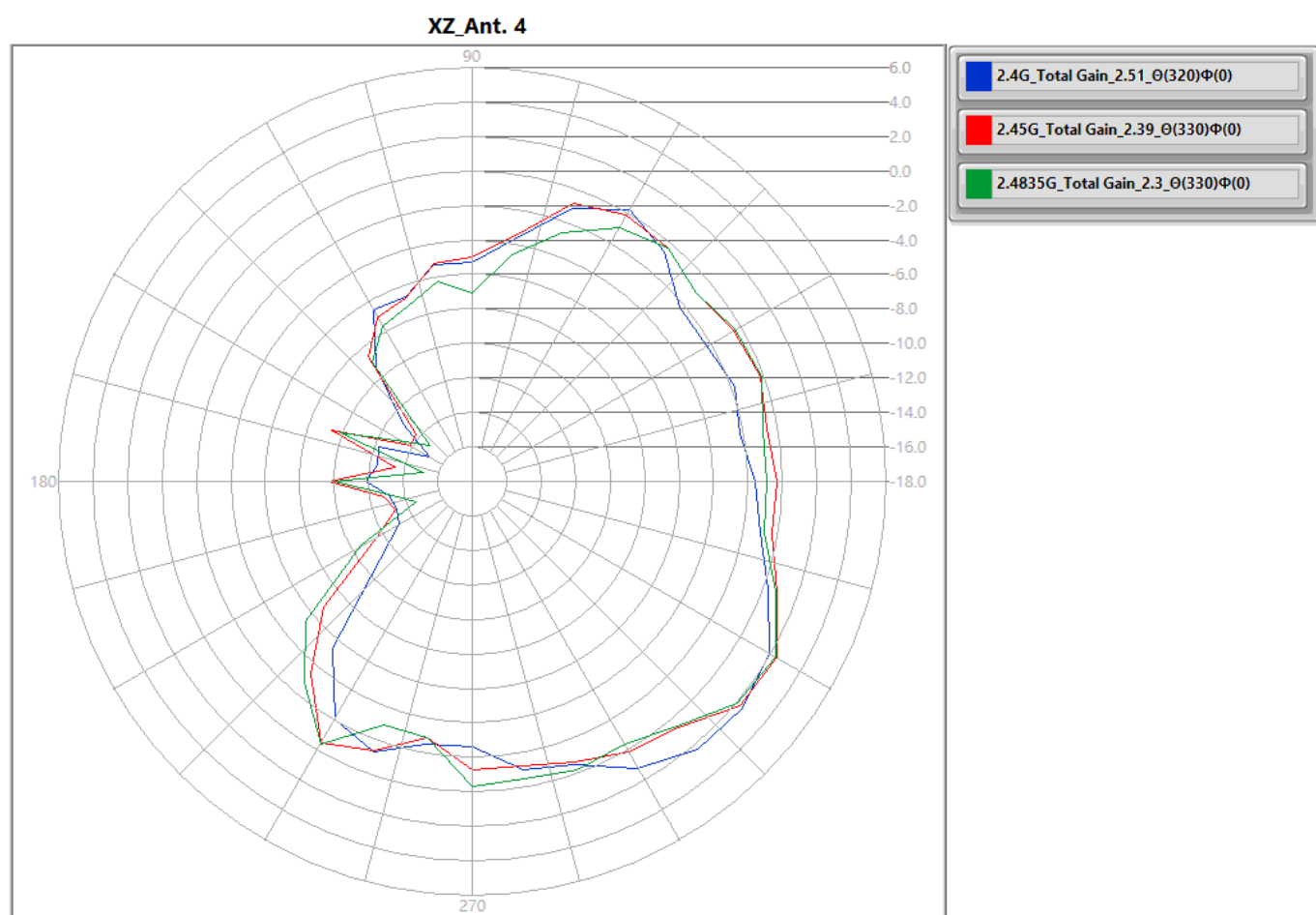
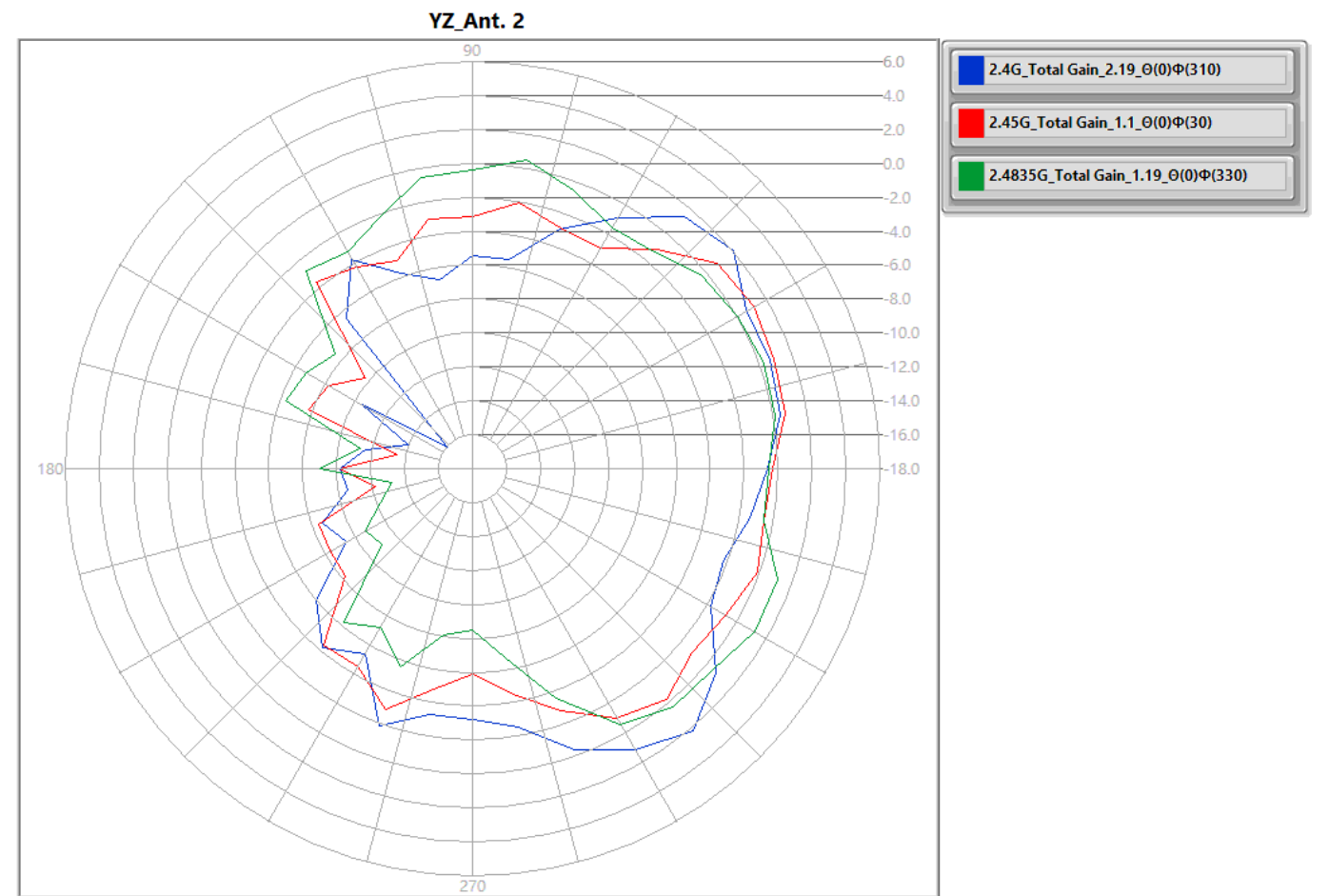
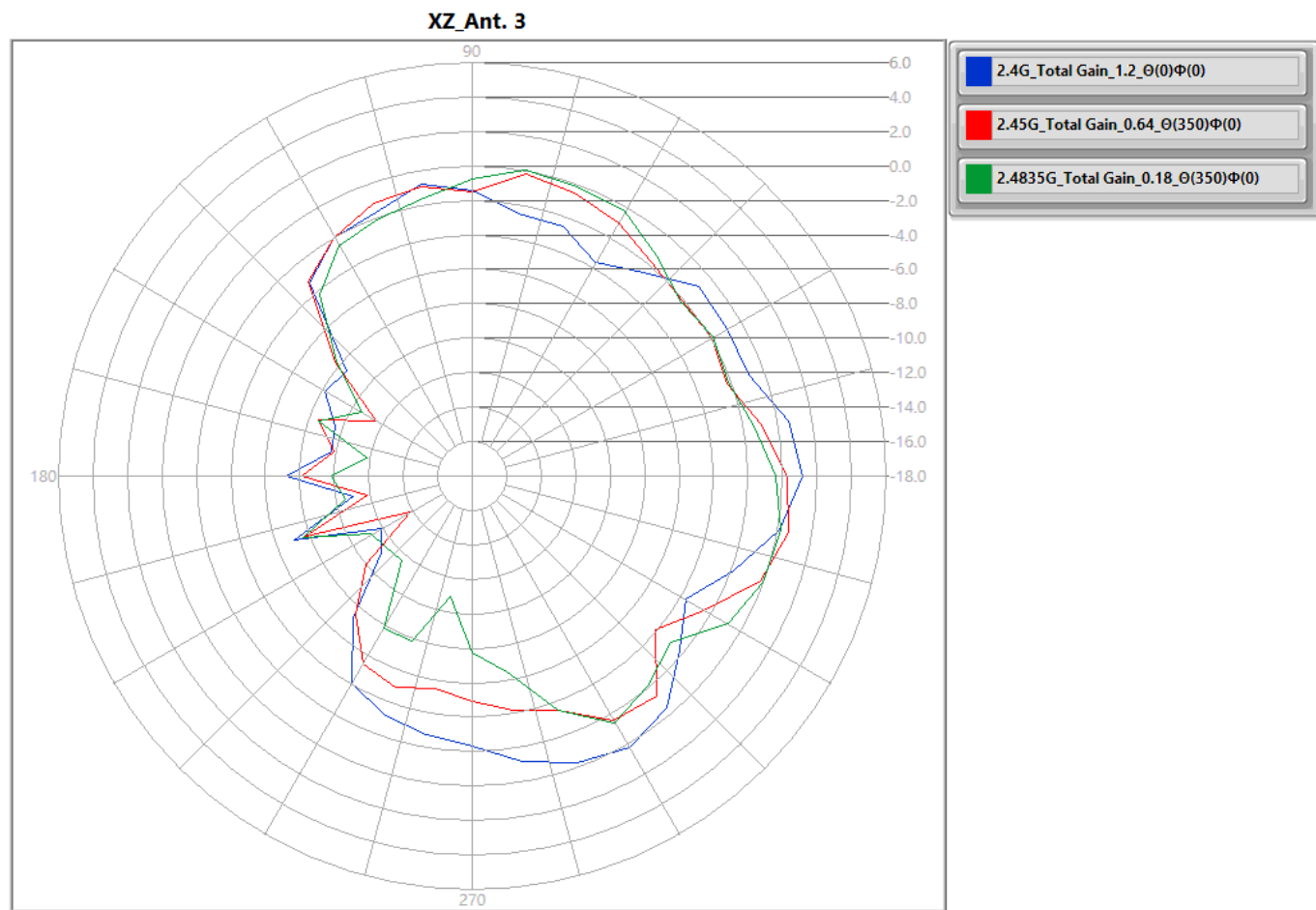
θ(60°)	-3.45/-3.24	-1.06/0.06	0.42/0.34	-1.79/-3.59	-2.38/-1.57	-2.20/-2.29	-0.88/0.55	1.68/3.24	3.12/1.08	-1.47/-3.92	-1.67/1.19	2.38/1.83	0.52/-0.48	-0.85/-0.58	-0.25/-0.88	-1.58/-0.36	0.01/-0.79	-1.84/-3.18
θ(70°)	-4.72/-2.99	-0.98/-0.51	-0.21/-0.08	-2.45/-4.31	-1.97/-0.56	-1.25/-1.38	-0.40/0.75	2.02/3.34	2.68/0.34	-2.47/-4.57	-2.95/0.04	1.46/1.70	1.06/-1.28	-4.12/-3.59	-1.74/-1.39	-1.92/0.21	0.30/-1.29	-2.46/-4.99
θ(80°)	-6.76/-3.79	-1.56/-1.37	-1.29/-1.34	-4.32/-5.70	-1.56/0.52	-2.09/-1.65	-0.45/-0.27	1.04/0.37	2.53/0.35	-2.39/-5.01	-5.45/-2.59	-0.97/0.69	0.98/-1.35	-0.79/-6.67	-2.32/-1.13	-3.00/-1.59	-0.76/-2.19	-2.82/-4.72
θ(90°)	-7.47/-6.35	-1.43/-0.67	-1.00/-1.80	-4.48/-6.61	-2.29/-0.38	-1.76/-1.30	-1.15/-1.57	0.84/1.96	1.34/-1.92	-3.52/-6.20	-5.15/-5.44	-3.88/-0.67	0.11/-2.53	-11.22/-8.47	-2.84/-0.78	-3.37/-3.20	-1.99/-3.97	-5.42/-6.00
θ(100°)	-9.78/-6.97	-3.19/-1.67	-2.03/-3.96	-5.28/-5.67	-1.96/-0.54	-1.75/-2.18	-3.08/-1.73	0.13/-0.41	-0.89/-2.85	-2.23/-5.55	-6.06/-6.95	-6.10/-2.05	-1.12/-2.98	-11.23/-8.01	-4.82/-1.71	-2.30/-6.65	-5.34/-5.27	-7.64/-6.86
θ(110°)	-6.12/-2.02	-3.96/-2.49	-1.84/-4.97	-4.74/-5.21	-2.10/-2.18	-3.87/-3.84	-8.02/-3.84	-1.59/-1.17	-4.45/-5.39	-8.72/-5.43	-6.39/-5.16	-7.34/-6.47	-0.55/-5.45	-6.39/-5.60	-6.39/-5.16	-3.27/-7.06	-7.34/-6.77	-8.94/-7.77
θ(120°)	-4.03/-3.79	-1.52/-2.79	-3.57/-6.02	-12.56/-8.78	-4.47/-3.23	-2.38/-2.49	-4.39/-2.64	-1.50/-0.76	-2.28/-3.35	-3.92/-8.55	-8.64/-7.65	-8.73/-4.67	-5.60/-6.24	-9.00/-7.20	-7.22/-9.21	-5.37/-6.82	-6.84/-7.66	-7.57/-6.50
θ(130°)	-5.88/-5.78	-4.03/-0.54	-6.28/-6.95	-10.83/-14.05	-5.93/-2.74	-3.04/-5.73	-5.50/-4.63	-4.43/-3.45	-3.97/-3.39	-4.42/-6.83	-6.62/-8.26	-9.41/-4.87	-4.47/-6.45	-7.55/-6.16	-6.25/-8.61	-8.71/-12.22	-10.40/-11.89	-8.98/-7.24
θ(140°)	-12.60/-9.90	-6.19/-5.04	-5.69/-7.27	-8.95/-10.50	-8.92/-7.43	-6.78/-6.48	-5.13/-6.03	-9.49/-8.37	-5.28/-4.87	-6.95/-10.27	-10.48/-9.79	-14.29/-11.81	-10.93/-12.36	-12.88/-11.04	-12.67/-11.43	-10.50/-9.65	-9.62/-14.65	-15.21/-14.44
θ(150°)	-9.30/-10.17	-10.56/-9.66	-11.10/-12.41	-10.47/-8.00	-6.65/-6.67	-7.83/-8.99	-8.73/-8.95	-9.07/-7.33	-6.16/-8.26	-13.76/-13.96	-9.20/-7.02	-7.99/-11.12	-15.25/-13.46	-11.54/-10.74	-13.45/-15.22	-12.85/-8.75	-7.57/-10.16	-13.75/-12.27
θ(160°)	-10.95/-9.87	-11.07/-11.77	-12.04/-14.22	-13.49/-10.02	-6.73/-6.26	-7.63/-9.78	-12.33/-12.43	-11.12/-9.52	-8.30/-8.56	-10.10/-10.84	-11.74/-11.96	-13.25/-14.05	-13.84/-13.00	-11.71/-12.20	-14.93/-14.10	-15.02/-13.14	-13.07/-14.35	-15.89/-15.11
θ(170°)	-11.09/-10.86	-10.25/-10.58	-10.35/-9.77	-9.98/-10.22	-9.98/-11.25	-13.01/-14.16	-12.28/-12.10	-12.99/-12.22	-12.68/-12.94	-13.77/-14.58	-16.15/-15.50	-15.32/-14.41	-13.76/-13.54	-13.59/-13.16	-12.77/-12.99	-12.94/-11.74	-12.25/-11.46	
θ(180°)	-7.20/-7.39	-7.55/-7.45	-7.64/-8.51	-9.68/-9.98	-9.67/-9.00	-8.53/-7.93	-7.71/-7.47	-7.03/-6.98	-7.47/-8.42	-9.45/-9.71	-9.77/-10.07	-9.90/-10.08	-10.89/-10.70	-9.98/-8.72	-7.80/-7.42	-7.62/-7.46	-6.97/-7.20	-7.54/-7.08
Freq(Hz)	2.45GPol.	TotalAnt. 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)/Φ(10°)	Φ(20°)/Φ(30°)	Φ(40°)/Φ(50°)	Φ(60°)/Φ(70°)	Φ(80°)/Φ(90°)	Φ(100°)/Φ(110°)	Φ(120°)/Φ(130°)	Φ(140°)/Φ(150°)	Φ(160°)/Φ(170°)	Φ(180°)/Φ(190°)	Φ(200°)/Φ(210°)	Φ(220°)/Φ(230°)	Φ(240°)/Φ(250°)	Φ(260°)/Φ(270°)	Φ(280°)/Φ(290°)	Φ(300°)/Φ(310°)	Φ(320°)/Φ(330°)	Φ(340°)/Φ(350°)
θ(0°)	1.20/1.28	1.27/0.91	0.68/0.78	1.09/1.31	1.44/1.55	1.54/1.56	1.63/1.71	1.95/2.11	2.08/1.80	1.55/1.21	1.09/1.11	1.12/0.93	0.73/0.79	1.06/1.09	0.99/0.97	1.05/0.98	0.67/0.59	0.78/0.95
θ(10°)	0.61/0.85	1.02/0.83	0.71/0.74	1.01/1.03	1.04/0.96	0.64/0.41	0.39/0.41	0.60/0.61	0.36/0.13	0.11/0.12	0.09/0.28	0.45/0.61	0.45/0.53	0.87/1.05	0.99/1.07	1.06/0.94	0.58/0.46	0.55/0.57
θ(20°)	-0.94/-0.26	0.17/0.01	-0.46/-0.40	-1.22/-1.44	-1.30/-0.23	-0.75/-1.13	-1.35/-1.32	-0.09/0.14	-1.87/-1.88	-1.96/-1.63	-1.29/-0.94	-0.77/0.17	-0.61/-1.26	0.64/1.08	1.31/1.26	0.77/0.17	-0.61/-1.12	-1.19/-1.11
θ(30°)	-0.94/0.24	0.66/0.41	-0.64/-1.28	-1.40/-1.31	-0.99/-1.02	-1.24/-1.32	-1.34/-1.39	-1.22/-1.35	-2.29/-3.21	-3.69/-3.61	-3.01/-1.99	-1.03/-0.15	0.46/1.11	1.74/2.26	2.59/2.50	1.58/-0.04	-1.90/-3.11	-2.96/-2.30
θ(40°)	-0.87/0.74	1.47/1.41	0.89/0.44	0.23/0.06	-0.08/0.00	0.20/0.23	-0.44/-1.28	-1.19/-0.86	-1.34/-2.13	-2.26/-2.19	-2.22/-1.21	0.39/1.48	1.86/2.14	2.31/2.74	3.32/3.24	2.47/0.76	-2.17/-4.60	-4.65/-3.04
θ(50°)	-2.54/-0.45	0.82/1.61	2.09/2.22	2.60/2.22	1.42/1.22	1.24/1.33	0.63/-0.29	-0.45/-0.39	0.07/1.39	1.68/-1.17	0.95/2.00	1.08/1.42	2.26/2.71	1.97/1.47				
θ(60°)	-3.67/-1.71	-0.31/1.01	2.08/2.85	3.48/3.18	1.95/1.32	1.09/1.32	1.36/0.34	0.88/2.55	1.96/0.42	0.23/0.01	-1.52/-2.50	-0.39/1.40	1.53/0.43	-0.82/-1.05	0.09/1.17	1.33/-0.13	-3.03/-4.99	-5.29/-5.31
θ(70°)	-2.59/-1.57	-1.14/-0.13	1.38/2.64	3.35/3.07	1.95/1.14	0.92/0.69	0.22/-0.69	0.46/0.38	2.04/-0.30	-0.28/0.37	-2.46/-0.29	-0.44/-1.68	-2.50/-2.55	-1.33/0.06	0.35/-1.11	-4.01/-4.49	-4.72/-4.32	
θ(80°)	-2.50/-0.26	-2.24/-1.30	0.05/1.23	2.49/2.93	2.44/1.87	1.21/2.04	1.32/-0.40	-0.51/-2.74	0.29/3.20	-1.14/-0.44	-5.52/-4.83	-2.77/-1.35	-2.26/-4.35	-2.77/-1.35	-0.71/-1.76	-3.99/-3.74	-4.33/-3.53	
θ(90°)	-1.41/-1.74	-2.01/-2.07	-2.18/-0.24	2.19/2.99	2.65/1.90	1.15/-1.39	-4.18/-3.85	-0.64/2.11	0.67/-1.78	-2.32/-2.04	-1.41/-3.15	-5.77/-4.05	-2.65/-3.40	-4.35/-3.96	-2.27/-2.42	-2.89/-3.93	-4.50/-3.50	-3.91/-2.48
θ(100°)	-0.77/-1.88	-3.30/-4.24	-4.89/-2.12	0.39/1.50	1.12/0.37	0.38/-2.45	-6.25/-1.00	-1.41/0.92	0.14/-1.44	-2.79/-3.04	-3.48/-6.36	-8.80/-6.58	-3.36/-3.23	-3.38/-3.58	-1.66/-2.41	-4.19/-5.46	-4.97/-4.26	-4.70/-7.22
θ(110°)	-1.69/-2.83	-5.35/-7.21	-6.25/-2.52	-1.37/-1.58	-1.94/-1.16	-1.04/-4.15	-5.28/-9.43	-3.47/-5.15	-3.73/-3.24	-3.39/-3.46	-5.45/-4.37	-10.06/-10.96	-5.55/-6.49	-4.77/-5.96				
θ(120°)	-2.01/-2.24	-5.52/-8.59	-5.68/-2.37	-2.30/-3.46	-3.24/-2.88	-4.25/-7.31	-8.06/-10.34	-6.72/-4.37	-3.38/-3.37	-4.10/-4.00	-7.14/-9.49	-8.16/-10.51	-8.82/-9.15	-6.99/-7.15	-5.89/-6.29	-7.37/-5.93	-9.49/-10.66	-8.17/-5.63
θ(130°)	-3.34/-3.79	-7.48/-9.17	-6.66/-4.07	-3.09/-2.83	-1.70/-2.27	-3.84/-3.84	-5.11/-9.85	-6.88/-7.73	-7.43/-7.35	-7.24/-7.06	-7.53/-8.03	-10.54/-15.79	-11.37/-13.09	-11.31/-4.87	-7.74/-8.33	-9.44/-6.91	-8.01/-10.01	-7.47/-6.26
θ(140°)	-8.53/-7.72	-6.00/-4.92	-7.19/-9.73	-8.00/-5.09	-3.65/-4.85	-5.24/-4.04	-5.03/-9.68	-12.51/-10.35	-8.26/-9.23	-11.08/-11.62	-9.32/-8.90	-10.85/-11.40	-7.71/-6.71	-7.10/-6.65	-6.11/-6.57	-9.26/-9.84	-8.34/-7.36	-6.59/-7.85
θ(150°)	-8.17/-7.48	-5.99/-6.35	-9.13/-12.66	-10.62/-8.20	-7.43/-7.85	-7.26/-7.02	-15.15/-15.33	-11.87/-12.81	-12.86/-13.03	-11.87/-12.92	-15.59/-11.75	-9.51/-9.29	-8.48/-7.79	-9.51/-8.64	-13.31/-13.24	-9.51/-6.82	-6.33/-7.06	
θ(160°)	-9.55/-11.46	-13.16/-10.88	-9.75/-8.34	-7.51/-6.72	-7.54/-8.21	-8.71/-8.53	-8.84/-7.71	-7.71/-8.77	-9.05/-8.34	-7.03/-6.88	-7.64/-9.39	-10.66/-12.23	-14.49/-15.06	-14.68/-12.01	-9.08/-8.21	-7.54/-7.58	-6.98/-6.18	-5.97/-6.84
θ(170°)	-9.73/-11.88	-11.77/-12.82	-10.92/-9.26	-8.12/-7.10	-7.07/-7.09	-7.39/-8.38	-9.74/-11.19	-11.69/-12.37	-13.43/-12.78	-10.99/-10.99	-10.74/-11.21	-11.49/-10.74	-9.55/-8.27	-7.35/-6.05	-5.31/-5.15	-5.19/-5.59	-5.88/-6.57	-7.20/-8.22
θ(180°)	-7.20/-7.35	-7.49/-7.92	-7.78/-7.90	-7.77/-8.28	-7.62/-9.33	-10.76/-11.31	-8.29/-7.93	-7.66/-8.12	-8.92/-8.97	-7.16/-7.23	-7.57/-7.82	-7.38/-7.18						
Freq(Hz)	2.45GPol.	TotalAnt. 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)/Φ(10°)	Φ(20°)/Φ(30°)	Φ(40°)/Φ(50°)	Φ(60°)/Φ(70°)	Φ(80°)/Φ(90°)	Φ(100°)/Φ(110°)	Φ(120°)/Φ(130°)	Φ(140°)/Φ(150°)	Φ(160°)/Φ(170°)	Φ(180°)/Φ(190°)	Φ(200°)/Φ(210°)	Φ(220°)/Φ(230°)	Φ(240°)/Φ(250°)	Φ(260°)/Φ(270°)	Φ(280°)/Φ(290°)	Φ(300°)/Φ(310°)	Φ(320°)/Φ(330°)	Φ(340°)/Φ(350°)
θ(0°)	0.29/0.56	0.96/1.05	0.91/0.73	0.62/0.64	0.79/0.97	1.11/1.14	1.13/1.23	1.07/0.90	0.71/0.34	0.38/0.42	0.51/0.50	0.63/0.75	1.05/1.19	0.97/0.64	0.68/0.85	0.78/0.84	0.60/0.51	0.51/0.34
θ(10°)	-0.95/-1.00	-0.60/-0.28	-0.11/-0.43	-0.64/-0.73	-0.54/-0.28	-0.01/0.06	0.09/0.16	0.23/0.30	0.64/0.93	1.11/1.24	1.22/1.26	1.36/1.39	1.39/1.07	0.90/0.76	0.60/0.20	0.09/-0.04	-0.28/-0.54	
θ(20°)	-2.28/-1.98	-1.46/-1.04	-0.97/-1.35	-1.85/-1.94	-1.92/-1.71	-1.61/-1.80	-1.93/-2.04	-0.23/0.24	-1.36/-0.89	0.81/0.88	1.19/1.34	1.16/0.62	0.22/-0.75	1.07/1.09	1.17/0.62	0.22/-0.75	-2.31/-2.40	
θ(30°)	-1.97/-1.01	-0.22/0.30	0.10/-0.38	-0.88/-1.53	-2.09/-2.41	-2.39/-2.54	-2.93/-3.40	-3.32/-3.20	-3.20/-2.96	-2.45/-1.87	-0.97/-0.18	0.33/0.65	0.96/1.22	1.62/1.95	2.10/1.57	0.24/-1.74	-3.82/-4.77	-4.39/-3.37
θ(40°)	-2.11/-0.71	0.74/1.48	1.51/1.45	1.39/1.12	0.29/-0.38	-0.50/-0.57	-1.48/-2.87	-3.20/-2.64	-2.74/-3.70	-4.10/-3.13	-1.41/0.37	1.43/2.03	2.15/1.84	1.64/1.83	1.95/1.63	0.21/-2.28	-5.10/-5.54	-4.74/-3.62
θ(50°)	-1.81/-0.90	0.19/1.13	1.75/2.11	2.44/2.45	1.77/0.84	0.48/0.39	-2.16/-1.00	-1.41/-2.24	-1.33/-0.49	0.07/1.40	2.57/2.59	1.85/1.04	0.45/0.48	1.16/0.99	-0.46/-3.17	-5.01/-3.64	-2.91/-2.72	
θ(60°)	-1.04/-0.96	-0.68/0.19	1.22/1.81	2.29/2.57	2.09/1.09	0.39/0.28	-0.64/-0.18	-0.85/0.80	-0.13/-2.20	-1.61/-0.53	-0.25/0.96	2.67/2.83	1.09/-0.76	-1.42/-1.57	-0.81/0.23	-1.30/-3.62	-4.17/-2.57	-1.87/-1.85
θ(70°)	-0.55/-0.25	-0.28/-0.06	0.50/0.82	1.61/2.10	1.88/1.02	0.13/-0.30	-0.11/-4.74	-0.79/1.66	-0.12/-3.51	-3.55/-1.66	-0.84/-0.24	1.45/1.66	-0.78/-2.98	-3.13/-2.45	-1.70/-1.23	-1.89/-3.89	-3.21/-1.80	-1.74/-1.95
θ(80°)	-0.22/0.37	-0.15/-0.45	-0.33/-0.73	-0.16/-1.17	1.96/1.60	0.68/-0.61	-1.36/-1.76	-1.16/1.67	0.58/-3.55	-4.21/-1.65	-0.81/-1.27	-0.34/0.04	-2.54/-5.29	-5.89/-4.19	-2.75/-2.23	-2.12/-3.15	-2.41/-1.74	-1.68/-1.86
θ(90°)	-1.48/-0.84	-0.32/-0.50	-1.59/-3.48	-1.57/1.16	2.52/1.94	0.42/-1.35	-2.13/0.15	-2.09/-6.15	-4.91/-3.27	-1.99/-2.18	-2.29/-1.94	-2.71/-4.05	-6.59/-6.25	-1.97/-1.73	-3.29/-3.00	-1.97/-1.73	-2.55/-2.09	
θ(100°)	-0.92/-0.41	-0.11/-0.84	-3.70/-5.59	-2.43/0.49	1.55/0.32	-0.84/-2.31	-4.96/-9.58	-2.99/-1.41	-2.37/-3.60	-5.50/-6.02	-5.39/-5.19	-5.79/-4.37	-2.84/-3.30	-3.99/-3.95	-2.96/-5.54	-5.74/-3.73	-2.67/-	



Θ (160°)	-9.34/-8.90	-8.92/-10.19	-10.72/-10.82	-12.23/-14.49	-15.63/-12.56	-9.44/-7.52	-6.76/-6.41	-5.94/-6.16	-7.08/-9.50	-13.23/-12.95	-12.06/-11.17	-10.22/-8.19	-7.28/-7.40	-9.00/-10.37	-10.19/-9.99	-10.19/-10.93	-11.57/-10.64	-9.78/-9.44
Θ (170°)	-13.50/-14.09	-13.48/-13.77	-13.08/-13.91	-13.11/-12.00	-10.88/-9.63	-8.27/-7.27	-6.96/-7.22	-7.82/-8.40	-9.22/-11.65	-12.83/-12.72	-12.57/-11.13	-8.65/-7.59	-7.48/-8.47	-9.65/-11.49	-12.41/-13.07	-14.85/-15.09	-15.48/-15.08	-12.82/-11.87
Θ (180°)	-9.67/-10.49	-10.54/-10.87	-10.49/-10.27	-10.16/-10.04	-9.62/-9.79	-9.63/-9.96	-9.92/-10.55	-10.03/-9.60	-10.40/-11.05	-11.18/-10.92	-10.81/-10.93	-10.40/-10.27	-10.78/-11.10	-11.45/-11.92	-12.55/-11.98	-11.06/-11.16	-11.17/-10.81	-10.18/-10.12
Freq(Hz)	2.48350Pol.	TotalAnt. 4	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
Gain	Φ(0°)/Φ(10°)	Φ(20°)/Φ(30°)	Φ(40°)/Φ(50°)	Φ(60°)/Φ(70°)	Φ(80°)/Φ(90°)	Φ(100°)/Φ(110°)	Φ(120°)/Φ(130°)	Φ(140°)/Φ(150°)	Φ(160°)/Φ(170°)	Φ(180°)/Φ(190°)	Φ(200°)/Φ(210°)	Φ(220°)/Φ(230°)	Φ(240°)/Φ(250°)	Φ(260°)/Φ(270°)	Φ(280°)/Φ(290°)	Φ(300°)/Φ(310°)	Φ(320°)/Φ(330°)	Φ(340°)/Φ(350°)
Θ (0°)	-0.94/-0.83	-0.73/-0.83	-0.71/-0.71	-1.02/-1.06	-1.07/-1.09	-1.25/-1.00	-1.01/-1.38	-1.81/-1.65	-1.40/-1.25	-0.94/-0.91	-0.96/-1.15	-1.27/-1.05	-0.85/-0.64	-0.64/-0.82	-1.13/-1.27	-1.21/-1.19	-0.76/-0.33	-0.44/-0.79
Θ (10°)	-0.86/-0.43	-0.13/0.02	0.34/0.41	0.31/0.20	0.36/0.23	0.20/0.30	0.56/0.30	0.06/-0.28	-0.57/-0.81	-0.76/-0.83	-1.00/-1.35	-1.93/-2.35	-2.64/-2.45	-2.37/-2.49	-2.91/-3.09	-2.87/-2.71	-2.14/-1.33	-0.92/-0.95
Θ (20°)	-0.12/0.14	0.66/0.94	1.20/1.30	1.31/1.23	1.02/1.02	0.96/0.99	1.04/1.02	0.90/0.85	0.88/0.86	0.77/0.78	0.39/0.04	-0.57/-1.37	-2.04/-2.72	-3.24/-3.69	-3.65/-3.44	-3.06/-2.50	-1.77/-1.09	-0.64/-0.35
Θ (30°)	-0.37/-0.01	0.06/0.06	0.47/0.85	1.16/1.34	1.58/1.91	2.14/2.02	1.36/0.75	0.72/1.12	1.61/2.00	2.30/2.31	2.01/1.60	1.37/1.09	0.71/-0.14	-1.35/-2.71	-2.70/-2.16	-1.62/-1.37	-0.82/-0.19	-0.24/-0.37
Θ (40°)	-1.00/-0.81	-1.14/-2.22	-2.11/-0.93	-0.15/0.68	1.73/2.97	3.76/3.64	2.46/0.87	0.04/0.43	1.12/1.62	2.03/2.19	2.19/1.95	2.12/2.46	2.68/2.30	1.16/-0.48	-1.31/-0.83	-0.45/-0.39	-0.21/0.21	0.26/-0.19
Θ (50°)	-0.36/-0.37	-0.50/-1.69	-1.88/-0.92	-1.20/-0.95	0.94/2.93	4.02/3.89	2.70/1.17	0.00/-0.26	-0.17/0.24	0.55/0.85	1.24/1.57	2.06/2.99	3.50/3.05	1.48/-0.99	-2.39/-1.47	-0.15/0.35	0.08/-0.02	0.31/0.19
Θ (60°)	-0.97/-0.66	-0.40/-2.23	-1.13/0.59	-1.41/-3.27	-1.02/1.63	3.04/3.22	2.14/0.60	-0.14/-0.69	-1.32/-0.89	-0.37/0.03	0.64/0.86	1.28/2.51	3.09/2.39	0.52/-2.59	-3.83/-2.75	-0.80/0.21	-0.37/-0.73	0.36/0.19
Θ (70°)	-2.69/-2.23	-0.44/-2.66	-2.21/-0.23	-3.18/-6.26	-3.21/-0.19	1.55/1.83	1.08/-0.18	-0.90/-1.33	-2.04/-1.03	-0.22/-0.50	-0.61/-0.60	-0.24/1.18	2.26/1.90	-0.05/-2.74	-5.40/-6.12	-3.03/-1.29	-2.30/-1.88	-0.40/-0.65
Θ (80°)	-4.61/-3.54	-0.65/-1.98	-4.09/-2.47	-6.64/-11.04	-6.49/-2.04	-0.03/0.96	0.82/-0.43	-1.67/-2.27	-3.35/-1.82	-0.52/-0.96	-1.66/-2.16	-1.65/0.20	1.86/1.48	-0.23/-2.94	-6.99/-8.91	-4.64/-2.27	-2.73/-1.34	-0.81/-2.47
Θ (90°)	-7.10/-4.70	-0.77/-2.36	-4.95/-4.86	-8.45/-11.97	-9.40/-2.83	-0.53/-0.05	-0.07/-0.92	-1.81/-2.36	-3.25/-1.18	-0.33/-1.94	-3.30/-3.10	-2.47/-1.58	0.14/0.25	-0.62/-3.90	-8.66/-9.94	-6.77/-4.24	-3.08/-0.95	-1.11/-4.06
Θ (100°)	-6.26/-6.67	-2.82/-3.96	-6.88/-8.22	-8.00/-7.83	-6.10/-2.06	0.28/0.04	-1.23/-2.13	-3.41/-3.88	-3.57/-2.65	-2.90/-3.49	-2.78/-2.93	-4.57/-6.04	-2.70/-1.68	-0.74/-3.17	-4.04/-4.40	-5.90/-5.21	-2.80/-1.76	-2.40/-4.59
Θ (110°)	-7.13/-6.51	-6.44/-8.67	-8.18/-10.29	-11.22/-8.78	-4.57/-1.54	0.04/-0.29	-2.76/-3.92	-5.17/-4.07	-3.48/-4.17	-3.01/-2.56	-3.90/-5.45	-10.89/-9.32	-5.35/-1.87	-0.41/-2.90	-3.71/-3.95	-5.31/-5.01	-4.27/-6.08	-5.80/-6.06
Θ (120°)	-7.63/-6.26	-6.50/-9.03	-8.53/-9.04	-10.04/-15.35	-6.92/-4.30	-3.76/-4.25	-6.81/-6.37	-6.78/-7.48	-6.92/-3.19	-0.40/-1.60	-5.90/-9.72	-13.62/-5.72	-3.47/-1.90	-1.85/-4.67	-4.44/-5.50	-6.40/-5.30	-4.91/-10.17	-8.14/-5.29
Θ (130°)	-9.01/-8.57	-8.21/-9.33	-9.54/-13.37	-11.11/-13.18	-11.12/-9.69	-10.56/-10.55	-8.89/-6.31	-6.14/-9.94	-7.48/-3.73	-2.82/-5.57	-8.12/-8.60	-7.89/-5.50	-4.71/-3.24	-3.06/-3.98	-5.55/-9.09	-13.59/-11.76	-6.88/-8.74	-9.17/-6.86
Θ (140°)	-14.79/-11.13	-10.52/-10.02	-11.71/-13.90	-10.95/-9.98	-11.87/-8.31	-6.24/-6.13	-8.43/-8.69	-8.37/-7.88	-5.49/-4.98	-5.37/-6.19	-7.23/-7.67	-7.86/-7.51	-5.07/-2.31	-1.82/-3.88	-8.62/-10.91	-12.91/-15.83	-9.21/-8.55	-11.03/-14.90
Θ (150°)	-13.44/-15.02	-15.53/-14.91	-14.07/-11.88	-9.46/-9.02	-9.38/-8.00	-7.00/-7.17	-9.68/-15.29	-13.62/-8.61	-7.15/-8.55	-10.57/-12.36	-9.27/-7.68	-8.08/-7.04	-8.25/-13.60	-12.60/-9.31	-10.33/-14.42	-15.16/-14.91	-13.31/-11.92	
Θ (160°)	-9.82/-9.41	-10.01/-11.17	-10.67/-10.26	-12.85/-14.83	-15.98/-14.97	-11.41/-8.09	-6.36/-6.03	-6.15/-6.48	-7.99/-10.79	-14.54/-14.33	-12.63/-10.71	-9.81/-7.95	-7.10/-6.73	-7.71/-8.68	-8.98/-10.02	-10.53/-11.44	-11.43/-11.60	-10.81/-9.96
Θ (170°)	-15.17/-14.04	-13.36/-13.57	-14.14/-14.94	-12.69/-10.62	-9.34/-8.16	-7.56/-6.72	-5.91/-6.15	-7.16/-8.54	-10.12/-12.52	-13.35/-12.49	-12.15/-10.31	-8.57/-6.96	-6.67/-7.15	-7.96/-8.46	-10.57/-12.48	-14.35/-14.61	-15.64/-14.99	-13.43/-13.28
Θ (180°)	-9.95/-10.75	-11.43/-11.05	-11.07/-10.58	-10.31/-9.57	-8.92/-9.34	-9.71/-9.04	-8.82/-9.54	-9.98/-9.88	-10.04/-10.69	-10.91/-10.83	-10.99/-11.12	-10.23/-10.09	-10.65/-10.58	-11.55/-11.43	-12.56/-11.58	-11.32/-11.25	-10.21/-9.80	-9.71/-9.83

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_5GHz U-NII 1~U-NII 3

Appendix F

Total Gain Data

Freq(Hz)	5.2GPol.	TotalAnt. 1	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	
Gain	Φ(0°)Φ(10°)	Φ(20°)Φ(30°)	Φ(40°)Φ(50°)	Φ(60°)Φ(70°)	Φ(80°)Φ(90°)	Φ(100°)Φ(110°)	Φ(120°)Φ(130°)	Φ(140°)Φ(150°)	Φ(160°)Φ(170°)	Φ(180°)Φ(190°)	Φ(200°)Φ(210°)	Φ(220°)Φ(230°)	Φ(240°)Φ(250°)	Φ(260°)Φ(270°)	Φ(280°)Φ(290°)	Φ(300°)Φ(310°)	Φ(320°)Φ(330°)	Φ(340°)Φ(350°)
Θ(0°)	-0.64/-1.07	-0.76/-0.31	-0.53/-0.62	-0.90/-1.14	-1.45/-1.45	-1.85/-1.54	-1.85/-1.76	-1.48/-1.48	-1.51/-1.33	-1.41/-1.51	-1.21/-1.25	-0.93/-1.43	-1.52/-1.71	-1.41/-1.53	-1.21/-1.03	-1.15/-0.89	-0.76/-0.90	-0.61/-0.64
Θ(10°)	-7.81/-6.48	-4.95/-4.63	-4.42/-4.28	-3.79/-3.83	-3.53/-3.14	-2.58/-2.29	-1.79/-1.49	-1.52/-1.34	-0.93/-0.90	-1.23/-2.06	-2.17/-2.69	-4.09/-4.91	-5.99/-6.69	-6.69/-5.63	-6.03/-6.16	-6.43/-6.23	-7.27/-8.24	-8.68/-9.07
Θ(20°)	-7.01/-7.33	-7.19/-7.33	-5.88/-4.82	-3.94/-3.52	-3.14/-3.06	-3.60/-3.12	-2.58/-2.80	-3.94/-3.97	-2.99/-1.18	0.33/0.86	1.35/0.68	-1.05/-2.87	-3.51/-3.05	-2.72/-3.53	-5.41/-6.82	-5.47/-4.93	-5.54/-7.17	-8.29/-7.84
Θ(30°)	-6.36/-7.64	-8.51/-6.29	-4.57/-2.83	-3.02/-4.11	-4.81/-4.30	-1.94/-0.71	-0.56/-0.34	-0.17/-1.22	-2.61/-2.00	-1.67/-1.38	-0.05/-0.93	-1.13/-0.78	0.09/0.24	-0.39/-1.04	-1.11/-0.61	-0.17/0.08	-1.45/-2.23	-2.72/-4.88
Θ(40°)	-7.43/-7.21	-7.69/-4.29	-3.00/-0.97	-0.62/-3.19	-2.76/-2.03	-1.97/-0.59	0.28/-0.71	-1.36/-1.14	0.46/1.22	0.51/-0.35	-0.12/-1.05	0.02/1.16	0.97/-0.79	-0.35/-1.22	1.59/1.21	0.81/-0.78	-1.59/-1.53	-2.28/-5.55
Θ(50°)	-5.34/-3.38	-3.05/-3.64	-2.48/-2.95	-2.22/-4.08	-2.79/-2.33	-3.52/-2.09	1.74/1.48	-0.37/-0.61	1.35/2.77	2.14/0.92	-0.91/-3.41	-1.57/-0.71	-0.44/-0.37	0.70/2.88	3.36/1.25	0.12/-1.70	-0.95/-1.21	-1.82/-4.86
Θ(60°)	-1.73/-0.62	-2.09/-4.61	-2.72/-5.32	-5.58/-6.53	-4.27/-1.92	-3.23/-4.45	1.21/0.17	-0.27/-1.59	-0.41/2.55	2.24/-0.18	-4.27/-6.58	-2.43/0.97	-1.99/-1.79	-2.43/0.97	3.19/1.28	-0.54/-0.49	-0.89/-2.48	-1.61/-0.96
Θ(70°)	-0.32/0.94	-0.72/-2.93	-2.00/-4.97	-6.29/-4.35	-3.40/-2.05	-0.20/-2.60	-0.62/-0.92	-3.59/-4.27	-2.75/1.45	0.49/-1.81	-6.37/-7.68	-6.05/-2.74	1.00/0.70	0.18/0.37	2.62/1.71	0.05/0.72	0.20/-3.04	-1.57/0.53
Θ(80°)	0.24/1.03	-0.46/-3.96	-2.28/-6.08	-6.70/-4.27	-2.73/-1.91	0.87/-0.86	-1.62/-0.38	-6.32/-7.58	-4.98/-0.98	-1.40/-2.34	-5.30/-7.96	-7.65/-0.87	2.61/2.33	0.78/-0.30	2.42/2.37	0.80/0.02	0.24/-2.23	-2.63/-4.08
Θ(90°)	-0.16/-1.20	-0.21/-6.64	-2.43/-7.87	-7.34/-5.24	-2.73/-1.58	0.42/-2.00	-2.88/-2.74	-8.84/-10.67	-5.99/-3.42	-3.10/-3.65	-5.72/-8.03	-1.62/-1.82	1.99/0.71	-1.62/-1.82	1.99/0.71	-0.33/-2.07	-1.50/-2.55	-4.00/-2.26
Θ(100°)	-2.14/-4.73	-5.29/-7.13	-2.26/-8.02	-13.43/-10.07	-4.34/-4.06	-1.76/-3.83	-5.23/-1.94	-10.26/-9.89	-7.96/-7.40	-6.34/-5.84	-9.25/-10.79	-10.47/-3.16	-0.87/-1.72	-5.05/-5.41	-2.15/-3.30	-2.83/-3.25	-4.09/-4.25	-5.99/-5.47
Θ(110°)	-6.39/-5.79	-6.31/-6.14	-7.52/-7.98	-11.60/-11.57	-5.02/-7.45	-4.66/-6.29	-10.85/-4.34	-7.44/-7.59	-9.59/-14.97	-7.24/-10.64	-6.81/-9.86	-12.50/-5.57	-7.45/-6.88	-8.52/-12.71	-7.67/-4.20	-3.88/-5.22	-4.73/-7.56	-9.63/-6.28
Θ(120°)	-5.24/-3.80	-5.80/-5.47	-10.89/-8.46	-6.15/-7.74	-5.86/-8.85	-5.82/-6.23	-7.34/-7.34	-6.18/-13.44	-10.43/-9.99	-9.70/-8.94	-7.70/-11.56	-10.03/-7.63	-11.04/-15.01	-10.03/-6.01	-3.58/-6.12	-4.98/-8.93	-9.67/-7.88	
Θ(130°)	-4.85/-4.52	-10.00/-6.37	-9.38/-11.39	-11.30/-8.86	-5.31/-6.36	-5.84/-5.89	-12.09/-8.25	-13.00/-9.81	-7.94/-14.44	-9.92/-7.02	-8.12/-9.54	-9.77/-6.37	-10.92/-9.27	-11.48/-15.65	-8.25/-5.89	-7.82/-9.34	-4.71/-12.26	-7.85/-5.70
Θ(140°)	-6.47/-1.95	-9.16/-12.99	-9.21/-11.06	-10.11/-6.72	-8.40/-10.64	-8.91/-7.86	-8.01/-10.71	-12.69/-8.14	-7.40/-15.65	-11.03/-9.53	-5.77/-12.76	-15.07/-5.46	-9.80/-15.18	-7.85/-7.84	-15.07/-5.46	-8.45/-10.72	-7.03/-9.16	
Θ(150°)	-8.25/-8.33	-9.36/-10.80	-12.01/-11.46	-8.71/-10.34	-9.02/-9.10	-8.60/-10.23	-13.03/-11.43	-10.65/-8.55	-9.58/-7.29	-8.30/-8.94	-15.26/-10.32	-11.55/-14.67	-14.78/-13.37	-10.43/-10.47	-8.00/-14.71	-15.62/-12.65	-11.10/-10.54	
Θ(160°)	-7.12/-10.49	-12.55/-13.42	-10.79/-11.36	-12.94/-12.96	-10.61/-9.51	-11.71/-14.30	-12.19/-13.00	-14.02/-11.58	-11.62/-9.61	-9.91/-9.19	-12.11/-15.22	-12.13/-11.91	-13.85/-14.81	-13.78/-11.92	-13.78/-11.92	-10.85/-11.91	-10.85/-11.91	
Θ(170°)	-9.29/-11.61	-12.61/-13.79	-15.58/-14.58	-14.46/-11.97	-10.84/-10.67	-11.84/-12.84	-15.32/-12.69	-12.47/-14.91	-14.83/-13.89	-10.72/-9.55	-10.11/-12.25	-13.27/-13.24	-14.56/-13.75	-14.34/-13.50	-13.91/-16.16	-16.08/-13.17	-11.03/-8.51	-7.92/-8.96
Θ(180°)	-10.36/-10.30	-9.86/-9.41	-10.00/-10.24	-11.23/-11.89	-12.70/-12.55	-11.74/-10.80	-11.86/-12.72	-12.84/-13.77	-13.63/-11.97	-12.81/-11.40	-11.75/-11.17	-11.33/-9.88	-10.41/-11.73	-10.37/-10.69	-11.12/-11.70	-12.05/-12.09	-12.58/-12.42	-12.03/-11.12
Freq(Hz)	5.3GPol.	TotalAnt. 1	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-
Gain	Φ(0°)Φ(10°)	Φ(20°)Φ(30°)	Φ(40°)Φ(50°)	Φ(60°)Φ(70°)	Φ(80°)Φ(90°)	Φ(100°)Φ(110°)	Φ(120°)Φ(130°)	Φ(140°)Φ(150°)	Φ(160°)Φ(170°)	Φ(180°)Φ(190°)	Φ(200°)Φ(210°)	Φ(220°)Φ(230°)	Φ(240°)Φ(250°)	Φ(260°)Φ(270°)	Φ(280°)Φ(290°)	Φ(300°)Φ(310°)	Φ(320°)Φ(330°)	Φ(340°)Φ(350°)
Θ(0°)	-0.87/-0.77	-1.14/-0.98	-0.92/-1.06	-1.04/-1.33	-1.45/-1.65	-1.04/-1.92	-2.26/-1.75	-1.14/-1.54	-1.87/-1.92	-1.99/-1.62	-1.85/-1.25	-1.62/-1.78	-1.61/-1.46	-1.33/-1.46	-1.33/-1.46	-1.05/-0.88	-1.33/-1.46	-1.05/-0.88
Θ(10°)	-4.35/-4.37	-4.13/-3.99	-3.27/-2.60	-2.49/-2.22	-2.24/-2.06	-2.47/-2.56	-1.76/-2.14	-1.91/-1.87	-2.00/-1.95	-2.45/-3.64	-4.11/-5.67	-6.66/-7.42	-6.81/-6.45	-6.13/-5.99	-5.49/-5.53	-6.16/-6.06	-6.38/-6.44	-5.94/-5.46
Θ(20°)	-5.62/-6.32	-7.30/-7.41	-6.87/-5.96	-3.86/-2.76	-2.21/-2.54	-3.42/-4.32	-3.71/-6.00	-3.67/-6.04	-3.39/-1.95	-0.78/-0.93	-1.18/-1.87	-3.06/-4.28	-4.43/-4.88	-5.10/-5.42	-4.91/-3.61	-3.49/-4.43	-5.71/-6.25	-6.33/-6.40
Θ(30°)	-4.25/-5.43	-7.11/-6.11	-4.99/-3.68	-3.21/-4.56	-4.86/-3.51	-2.25/-1.39	-1.03/-1.02	-0.90/-2.48	-3.99/-4.19	-4.10/-4.34	-2.11/-1.55	-1.15/-0.58	-0.32/-1.12	-2.61/-3.21	-2.34/-1.41	0.08/0.44	-1.61/-1.91	-2.42/-3.46
Θ(40°)	-5.27/-5.58	-5.91/-5.01	-3.04/-1.85	-2.42/-4.81	-0.08/0.89	-0.24/-1.01	-0.40/-2.39	-1.28/-1.33	0.36/0.14	0.80/-1.12	-1.15/-1.03	-1.38/-1.00	0.92/0.34	0.52/0.80	0.82/1.53	0.95/0.34	0.52/0.80	0.40/-3.12
Θ(50°)	-4.08/-7.12	-4.30/-3.68	-1.58/-3.44	-3.89/-5.09	-1.50/-0.51	-0.24/-0.40	0.04/0.33	0.73/1.84	1.52/-0.58	2.83/2.27	0.77/-1.77	-0.47/-2.09	-1.12/0.75	2.04/2.65	2.82/0.86	0.82/0.97	1.50/0.48	1.01/-0.62
Θ(60°)	-1.96/-6.44	-3.33/-3.67	-1.06/-5.88	-7.17/-6.56	-0.34/0.12	-0.44/-2.13	-1.87/-1.22	1.41/-0.48	0.46/2.03	2.92/2.74	-0.63/-3.32	-1.51/-6.02	-2.37/-0.92	-1.56/0.83	2.46/1.23	0.29/1.15	1.91/-0.17	0.62/1.27
Θ(70°)	-0.02/-3.82	-1.18/-3.12	-0.79/-5.97	-6.86/-6.43	-1.84/-1.00	-0.82/-2.36	-1.11/-0.39	-0.64/-1.91	-0.82/2.36	-1.11/-0.39	-3.27/-2.95	-2.47/-2.72	0.38/0.46	1.89/1.29	1.20/2.24	2.20/-0.87	-0.18/1.38	
Θ(80°)	-0.59/-2.82	-1.90/-4.27	-0.58/-6.04	-8.46/-3.43	-0.90/-1.40	0.56/-1.14	-2.04/-0.56	-2.05/-2.46	-2.47/1.21	0.33/-3.83	-3.83/-4.44	-2.72/-0.44	2.81/2.28	-1.76/-2.73	1.57/1.68	2.03/1.23	1.12/-1.30	-2.40/-1.22
Θ(90°)	-2.00/-3.59	-4.53/-5.51	-1.57/-9.49	-8.22/-3.52	-1.73/-2.11	-0.91/-4.04	-3.45/-5.19	-3.28/-5.19	-3.77/-0.61	-1.30/-5.11	-5.29/-8.46	-4.88/-2.34	2.64/1.13	-4.54/-4.90	0.57/0.49	0.89/-0.56	-0.70/-1.78	-5.53/-2.04
Θ(100°)	-4.07/-5.36	-4.49/-8.10	-2.71/-7.32	-10.13/-5.64	-9.69/-8.88	-6.23/-5.73	-5.09/-3.59	-6.28/-5.73	-5.69/-1.95	-4.15/-9.92	-6.87/-6.63	-5.69/-2.91	-1.39/-2.39	-7.51/-9.51	-3.42/-4.10	-2.12/-2.32	-2.07/-2.44	-7.07/-5.28
Θ(110°)	-8.08/-6.45	-6.63/-8.09	-7.16/-8.30	-12.26/-8.23	-5.42/-8.71	-4.41/-5.23	-8.64/-3.90	-11.52/-8.60	-8.64/-4.90	-5.51/-13.29	-8.49/-6.28	-9.16/-3.93	-7.18/-8.39	-8.42/-12.98	-7.84/-5.35	-3.21/-3.17	-3.21/-5.57	-9.87/-6.00
Θ(120°)	-7.91/-6.65	-8.63/-7.01	-13.02/-5.88	-4.97/-6.69	-5.71/-8.14	-6.83/-7.97	-15.51/-5.86	-5.86/-14.14	-6.17/-5.77	-8.80/-11.23	-6.33/-10.23	-7.67/-5.98	-8.03/-8.10	-11.72/-14.04	-9.91/-5.51	-2.81/-5.12	-6.17/-7.66	-13.62/-7.13
Θ(130°)	-5.95/-6.67	-10.05/-7.56	-11.62/-11.51	-7.03/-6.44	-9.13/-8.86	-6.66/-8.37	-7.57/-5.73	-10.91/-11.32	-8.64/-8.34	-10.09/-13.23	-7.35/-5.78	-10.35/-5.78	-10.64/-13.66	-6.66/-6.49	-7.34/-8.78	-4.72/-13.68	-8.24/-5.26	
Θ(140°)	-5.17/-6.48	-9.13/-12.43	-9.72/-10.89	-10.59/-9.28	-9.49/-11.50	-9.93/-6.94	-9.20/-12.30	-10.32/-7.99	-6.81/-12.39	-9.39/-9.79	-6.31/-11.14	-7.41/-14.53	-11.02/-14.67	-8.89/-12.44	-6.97/-8.65	-10.30/-4.14	-13.41/-10.78	-7.01/-7.00
Θ(150°)	-8.68/-7.21	-10.63/-12.49	-14.75/-10.16	-7.48/-9.30	-7.92/-7.43	-8.10/-10.13	-12.42/-12.07	-11.86/-10.88	-10.88/-11.00	-11.44/-6.30	-9.90/-11.42	-13.38/-12.19	-11.56/-13.04	-13.10/-15.48	-12.78/-14.70	-10.33/-15.18	-12.61/-11.85	-8.71/-7.91
Θ(160°)	-9.50/-12.94	-14.24/-12.39	-9.79/-11.58	-11.73/-10.45	-11.70/-11.73	-11.70/-13.23	-13.72/-12.46	-11.70/-13.23	-11.47/-9.36	-13.72/-12.46	-11.47/-9.36	-13.72/-12.46	-11.47/-9.36	-13.72/-12.46	-11.47/-9.36	-13.72/-12.46	-11.47/-9.36	-13.72/-12.46
Θ(170°)	-9.84/-10.04	-12.91/-15.09	-15.07/-15.00	-14.70/-13.82	-11.94/-13.12	-11.92/-10.99	-12.36/-9.87	-11.30/-13.40	-14.75/-14.47	-12.81/-10.74	-11.82/-14.45	-15.22/-15.18	-12.94/-11.90	-13.78/-15.46	-14.45/-14.46	-12.84/-10.32	-9.07/-8.69	-9.69/-9.11
Θ(180°)	-11.52/-10.66	-11.51/-13.23	-12.09/-14.12	-15.34/-15.36	-15.27/-15.61	-13.40/-13.44	-14.04/-14.96	-13.85/-14.12	-14.34/-13.92	-12.75/-12.75	-13.24/-14.46	-14.48/-13.91	-12.57/-13.28	-12.46/-12.70	-14.41/-13.94	-14.60/-14.83	-14.07/-12.57	-11.84/-11.87
Freq(Hz)	5.6GPol.	TotalAnt. 1	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-	+-
Gain	Φ(0°)Φ(10°)	Φ(20°)Φ(30°)	Φ(40°)Φ(50°)	Φ(60°)Φ(70°)	Φ(80°)Φ(90°)	Φ(100°)Φ(110°)	Φ(120°)Φ(130°)	Φ(140°)Φ(150°)	Φ(160°)Φ(170°)	Φ(180°)Φ(190°)	Φ(200°)Φ(210°)	Φ(220°)Φ(230°)	Φ(240°)Φ(250°)	Φ(260°)Φ(270°)	Φ(280°)Φ(290°)	Φ(300°)Φ(310°)	Φ(320°)Φ(330°)	Φ(340°)Φ(350°)
Θ(0°)	-1.90/-2.04	-2.49/-2.47	-2.38/-2.52	-2.58/-2.70	-2.81/-2.93	-3.40/-3.27	-3.71/-3.55	-3.67/-3.29	-2.97/-2.89	-2.99/-3.18	-3.20/-3.34	-3.70/-2.90	-3.16/-3.52	-3.06/-2.83	-2.88/-2.77	-2.24/-2.24	-1.86/-1.81	-1.62/-1.99
Θ(10°)	-5.88/-4.89	-4.48/-4.56	-3.73/-2.28	-2.03/-1.89	-2.88/-3.75	-1.57/-1.42	-1.50/-2.59	-0.59/-6.20	-6.44/-8.34	-4.20/-4.29	-4.72/-4.92	-4.95/-5.12	-5.59/-6.27	-3.84/-4.32				



Antenna Pattern_5GHz U-NII 1~U-NII 3

Appendix F

θ(60°)	3.44/3.69	1.66/1.23	-2.15/-1.35	1.97/0.71	0.55/-1.31	0.58/0.64	-0.08/-2.37	-1.21/-2.37	-2.59/-0.22	-1.79/-3.80	-0.50/-0.36	-2.27/-2.97	-4.21/-2.46	-2.04/0.79	-0.77/-0.84	-1.49/-0.29	-1.06/1.43	1.72/2.27
θ(70°)	2.82/3.41	1.91/1.60	-0.64/-0.10	1.39/-0.63	0.92/-1.14	-0.42/-0.17	0.28/-3.93	-2.28/-4.29	-3.53/-2.71	-2.96/-3.22	-1.40/-0.04	-1.81/-2.23	-3.10/-1.83	-2.00/-1.27	-2.17/-1.36	-1.85/-1.72	-1.82/1.39	1.88/2.18
θ(80°)	1.47/2.15	1.52/0.76	0.29/0.55	0.26/-1.77	-0.20/-1.81	-2.19/-1.04	-3.89/-3.36	-3.22/-3.26	-2.69/-5.16	-3.10/-5.06	-3.20/-0.47	-2.51/-2.23	-2.67/-1.81	-1.69/-0.25	-1.73/-1.17	-2.67/-1.81	1.44/2.66	
θ(90°)	-0.79/-0.49	0.72/-0.71	-1.30/-0.98	-2.60/-3.35	-2.66/-2.84	-1.83/-2.86	-5.13/-6.15	-3.52/-3.97	-4.11/-8.09	-6.05/-3.07	-5.14/-1.74	-4.22/-4.68	2.46/0.07	-0.34/0.47	-2.13/-1.09	-2.88/-2.98	-3.57/-4.42	0.61/0.60
θ(100°)	-2.50/-3.43	-1.16/-1.36	-1.85/-3.23	-4.23/-6.06	-6.34/-8.48	-3.51/-3.81	-6.95/-8.45	-4.96/-6.75	-5.20/-6.20	-9.12/-5.86	-7.61/-3.73	-6.33/-6.00	-3.07/-5.95	-4.61/-3.30	-5.08/-4.77	-3.79/-5.05	-5.97/-6.24	-1.96/-1.24
θ(110°)	-4.62/-5.88	-2.52/-3.52	-1.93/-4.33	-5.63/-8.61	-9.26/-7.87	-6.38/-10.65	-6.57/-15.79	-7.37/-4.52	-13.39/-10.66	-6.44/-7.16	-7.90/-7.38	-7.68/-9.43	-5.14/-10.99	-7.33/-7.52	-4.29/-6.87	-8.09/-6.92	-3.49/-2.69	
θ(120°)	-4.74/-6.19	-3.16/-3.02	-3.58/-4.27	-7.10/-8.22	-9.43/-6.99	-7.53/-8.43	-9.56/-9.79	-13.09/-5.59	-6.19/-8.01	-14.87/-7.17	-5.69/-7.63	-6.12/-6.16	-7.78/-9.15	-5.72/-10.68	-9.18/-6.88	-7.05/-8.25	-8.59/-8.01	-3.76/-3.51
θ(130°)	-7.25/-7.45	-6.04/-3.06	-5.57/-5.81	-5.14/-14.29	-10.73/-10.16	-6.90/-7.15	-11.55/-14.87	-9.78/-6.32	-12.50/-8.66	-11.14/-12.15	-6.67/-10.17	-10.47/-9.09	-10.72/-9.64	-8.73/-12.39	-7.33/-10.56	-9.09/-10.65	-9.52/-7.33	-2.71/-5.74
θ(140°)	-11.43/-9.22	-11.00/-5.53	-4.10/-5.96	-8.17/-12.79	-10.44/-9.86	-7.06/-7.94	-13.23/-15.22	-8.06/-13.22	-11.69/-13.64	-15.48/-10.21	-9.70/-10.29	-13.33/-9.05	-16.23/-8.81	-10.46/-11.71	-7.66/-13.89	-10.19/-12.23	-14.27/-5.40	-3.77/-6.97
θ(150°)	-14.21/-10.23	-9.65/-10.03	-7.69/-7.09	-11.02/-12.17	-9.93/-12.58	-8.70/-9.70	-8.56/-13.83	-15.32/-12.13	-13.92/-15.77	-15.50/-11.97	-12.02/-11.40	-13.33/-14.35	-13.09/-14.70	-12.80/-14.58	-11.19/-15.15	-15.70/-11.95	-8.54/-4.60	-7.36/-11.81
θ(160°)	-15.04/-12.20	-10.61/-11.97	-11.39/-12.76	-11.42/-10.16	-12.30/-13.56	-9.37/-9.10	-9.24/-10.41	-10.44/-11.67	-15.36/-15.51	-15.37/-15.35	-14.53/-11.46	-9.53/-11.32	-14.98/-12.67	-12.73/-13.94	-10.76/-10.99	-14.01/-9.88	-8.72/-8.50	-9.18/-11.42
θ(170°)	-14.86/-15.10	-14.95/-16.35	-15.20/-14.68	-14.79/-15.86	-15.74/-16.29	-14.54/-11.36	-12.84/-12.56	-13.08/-15.65	-14.46/-11.73	-13.35/-12.09	-11.17/-9.81	-11.23/-11.54	-12.28/-14.74	-10.44/-15.41	-15.69/-16.09			
θ(180°)	-13.73/-13.52	-13.70/-15.06	-13.92/-13.70	-11.77/-13.04	-13.87/-14.78	-15.54/-15.14	-13.88/-12.72	-12.32/-11.50	-13.34/-15.62	-13.48/-13.31	-14.01/-14.04	-13.03/-12.50	-12.91/-11.78	-12.00/-12.79	-14.35/-14.43	-13.30/-12.89	-13.64/-14.46	-15.47/-13.91
Freq(Pol.)	5.6G/Pol.	TotalAnt. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)/Φ(10°)	Φ(20°)/Φ(30°)	Φ(40°)/Φ(50°)	Φ(60°)/Φ(70°)	Φ(80°)/Φ(90°)	Φ(100°)/Φ(110°)	Φ(120°)/Φ(130°)	Φ(140°)/Φ(150°)	Φ(160°)/Φ(170°)	Φ(180°)/Φ(190°)	Φ(200°)/Φ(210°)	Φ(220°)/Φ(230°)	Φ(240°)/Φ(250°)	Φ(260°)/Φ(270°)	Φ(280°)/Φ(290°)	Φ(300°)/Φ(310°)	Φ(320°)/Φ(330°)	Φ(340°)/Φ(350°)
θ(0°)	-10.41/-11.58	-11.70/-12.66	-12.74/-13.71	-12.08/-12.24	-12.28/-12.43	-12.85/-11.60	-13.91/-11.58	-11.71/-10.49	-9.09/-9.48	-10.59/-10.98	-11.80/-10.86	-10.91/-10.11	-10.91/-9.99	-10.54/-9.78	-10.26/-11.50	-12.06/-12.03	-10.89/-10.14	-10.20/-11.02
θ(10°)	-6.32/-6.73	-6.54/-8.58	-10.34/-11.08	-11.44/-12.18	-13.21/-11.57	-11.97/-9.80	-8.80/-7.46	-5.84/-5.42	-5.29/-5.81	-5.68/-6.47	-6.84/-8.81	-13.40/-13.43	-13.42/-13.40	-9.84/-8.21	-7.23/-6.87	-7.12/-6.78	-6.73/-5.78	-5.69/-6.69
θ(20°)	-3.33/-3.09	-3.81/-5.02	-6.37/-8.61	-9.78/-9.23	-8.80/-6.96	-6.28/-8.39	-11.73/-7.61	-3.33/-2.20	-2.06/-3.38	-5.11/-6.42	-6.66/-6.37	-5.63/-5.24	-4.71/-4.35	-3.35/-3.44	-2.94/-3.75	-3.32/-2.91	-3.35/-3.24	-3.79/-3.24
θ(30°)	-1.37/-1.19	-1.58/-1.98	-1.51/-2.24	-3.59/-3.88	-3.04/-4.65	-6.40/-8.51	-6.13/-4.61	-5.86/-4.20	-1.96/-2.40	-3.64/-1.62	-1.58/-2.56	-2.12/-0.93	-0.03/-0.25	-0.64/0.24	0.73/-0.12	-0.10/0.74	-0.58/-2.40	-1.99/-0.96
θ(40°)	-0.13/-0.22	-2.25/-1.34	-1.67/0.76	2.30/0.28	-3.45/-7.23	-3.32/-2.31	-3.78/-4.27	-6.08/-3.33	-4.33/-3.40	0.27/-0.42	-2.92/-2.97	-2.37/-2.60	-1.50/-0.50	0.00/0.24	-0.12/-0.11	-0.16/1.16	-1.02/-4.68	-1.25/-4.42
θ(50°)	1.31/0.43	-0.25/0.16	-2.20/0.66	3.23/2.52	-0.58/-8.51	-2.51/-4.36	-2.31/0.60	-2.15/-3.24	-2.51/-2.96	-1.71/-3.15	-0.19/-1.08	0.01/0.28	1.01/-1.76	0.45/-1.02	-0.05/0.77	0.45/-1.02	-0.01/2.86	0.07/1.94
θ(60°)	2.98/2.42	0.04/-1.32	-4.24/-1.23	1.49/1.69	1.42/4.47	-9.22/-1.68	0.25/0.53	-6.17/0.06	0.77/-2.14	-4.33/-3.41	-2.74/-1.36	1.55/-1.38	-5.56/-9.44	-4.38/-2.85	-2.18/-3.94	-3.25/0.52	1.23/-1.34	0.24/1.75
θ(70°)	3.62/2.37	-1.08/-1.80	-3.10/-0.10	0.36/0.29	0.52/-1.51	-6.63/-1.34	-0.70/0.22	-4.95/-2.62	0.23/-1.12	-5.63/-6.33	-2.57/-3.07	0.63/-2.33	-4.54/-6.94	-4.26/-4.55	-3.57/-3.79	-4.18/-1.26	-1.67/-3.70	-0.16/1.63
θ(80°)	2.31/0.25	-1.41/-0.57	-0.62/-1.35	0.73/-1.30	-0.58/-2.16	-4.68/-1.03	-3.70/-1.37	-4.42/-4.62	-6.37/-6.65	-1.19/-2.71	0.21/0.86	-0.89/-5.25	-2.82/-2.82	-6.42/-0.77				
θ(90°)	0.33/-1.02	-2.45/-0.23	0.16/0.66	0.35/-2.04	-2.92/-4.23	-4.31/-2.32	-4.06/-1.59	-6.54/-5.97	-0.66/-5.93	-6.96/-7.95	-6.14/-2.25	-0.97/-0.87	-1.80/-2.20	-1.41/-5.25	-4.68/-3.84	-3.04/-4.96	-9.54/-7.74	-3.02/-0.53
θ(100°)	-1.71/-3.28	-4.75/-3.39	-3.05/-1.20	-2.94/-5.37	-6.20/-5.57	-5.83/-4.90	-6.25/-9.19	-3.10/-7.35	-7.92/-7.90	-7.86/-6.41	-6.01/-3.77	-4.15/-4.49	-2.97/-7.16	-7.75/-7.04	-7.04/-6.56	-10.35/-8.89	-4.58/-2.29	
θ(110°)	-3.24/-6.74	-5.62/-3.43	-4.07/-0.90	-4.39/-8.25	-7.24/-6.19	-12.92/-6.38	-10.69/-7.36	-4.07/-8.49	-4.84/-12.46	-13.13/-13.36	-14.28/-9.88	-4.91/-10.45	-13.73/-11.05	-14.28/-9.88	-4.91/-10.45	-13.73/-11.05	-7.03/-4.86	
θ(120°)	-8.18/-10.49	-5.69/-4.85	-2.04/-3.34	-4.52/-10.50	-7.88/-7.74	-7.81/-9.17	-6.58/-8.20	-10.27/-6.24	-4.72/-10.05	-12.08/-8.85	-10.75/-10.79	-9.35/-7.35	-6.90/-11.29	-7.31/-9.58	-13.79/-7.88	-9.19/-11.43	-9.81/-10.99	-7.41/-6.85
θ(130°)	-6.03/-9.47	-7.49/-5.33	-4.31/-3.55	-8.98/-13.62	-8.78/-7.51	-7.38/-11.82	-7.63/-7.58	-8.45/-8.64	-9.25/-10.10	-13.86/-8.27	-9.72/-9.34	-8.57/-9.40	-9.63/-11.47	-9.55/-9.78	-15.21/-7.12	-13.07/-13.34	-10.01/-8.19	-11.80/-8.51
θ(140°)	-7.31/-8.77	-9.75/-7.00	-5.79/-8.37	-11.16/-15.35	-7.58/-8.46	-6.65/-8.02	-13.05/-11.17	-8.78/-9.98	-6.08/-12.46	-15.75/-9.07	-12.91/-12.03	-13.41/-8.85	-13.87/-11.63	-13.09/-13.63	-10.50/-13.77	-11.80/-15.03	-8.55/-6.60	-7.38/-7.27
θ(150°)	-9.28/-8.44	-11.14/-10.86	-13.35/-10.74	-13.46/-14.21	-6.62/-8.57	-11.26/-9.46	-10.67/-14.20	-11.50/-7.64	-14.40/-13.63	-14.60/-11.12	-10.71/-12.20	-14.78/-14.59	-15.75/-13.18	-12.08/-15.45	-12.61/-13.42	-12.83/-14.20	-12.51/-9.48	-8.14/-8.24
θ(160°)	-9.33/-10.55	-14.89/-13.50	-13.35/-15.44	-14.12/-9.71	-10.14/-10.00	-9.63/-12.39	-11.84/-12.67	-13.61/-13.12	-13.74/-15.20	-12.15/-14.12	-13.37/-14.05	-12.78/-10.23	-11.61/-11.09	-11.67/-15.21	-15.27/-15.21	-15.60/-14.57	-12.17/-9.23	-11.34/-11.65
θ(170°)	-13.66/-15.63	-15.30/-14.81	-14.35/-14.21	-12.75/-13.44	-12.94/-11.33	-11.55/-15.21	-15.59/-15.63	-15.25/-15.24	-16.19/-15.58	-16.26/-15.57	-13.17/-11.72	-8.92/-8.11	-8.56/-9.59	-10.48/-12.54	-14.59/-14.26	-12.33/-11.17	-12.40/-14.00	-15.24/-13.99
θ(180°)	-11.20/-11.71	-11.24/-11.41	-12.57/-12.06	-11.30/-10.65	-11.65/-11.77	-14.89/-15.70	-14.89/-15.16	-14.00/-14.05	-14.04/-13.56	-14.04/-13.53	-13.60/-10.30	-9.41/-9.74	-10.19/-9.83	-13.25/-13.39	-14.34/-13.45	-12.96/-11.88	-12.49/-11.88	
Freq(Hz)	5.785G/Pol.	TotalAnt. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)/Φ(10°)	Φ(20°)/Φ(30°)	Φ(40°)/Φ(50°)	Φ(60°)/Φ(70°)	Φ(80°)/Φ(90°)	Φ(100°)/Φ(110°)	Φ(120°)/Φ(130°)	Φ(140°)/Φ(150°)	Φ(160°)/Φ(170°)	Φ(180°)/Φ(190°)	Φ(200°)/Φ(210°)	Φ(220°)/Φ(230°)	Φ(240°)/Φ(250°)	Φ(260°)/Φ(270°)	Φ(280°)/Φ(290°)	Φ(300°)/Φ(310°)	Φ(320°)/Φ(330°)	Φ(340°)/Φ(350°)
θ(0°)	-9.62/-9.80	-8.94/-10.06	-10.24/-11.43	-10.42/-9.96	-10.50/-12.14	-12.65/-14.07	-12.84/-10.45	-11.04/-11.24	-11.71/-9.73	-10.50/-10.66	-11.72/-11.37	-10.88/-10.61	-9.82/-10.24	-10.27/-10.05	-10.06/-9.37	-9.94/-9.74	-9.64/-9.49	-9.58/-9.37
θ(10°)	-7.67/-7.67	-7.86/-7.38	-6.40/-5.97	-6.24/-6.72	-7.28/-7.74	-8.71/-8.42	-7.64/-6.72	-6.99/-7.59	-7.56/-7.45	-8.06/-7.33	-7.40/-7.23	-9.42/-12.14	-11.73/-13.08	-14.66/-14.25	-11.26/-10.21	-9.36/-8.08	-9.15/-9.73	-8.67/-8.64
θ(20°)	-3.22/-3.13	-4.07/-5.75	-7.18/-9.44	-11.02/-14.00	-12.68/-7.38	-3.77/-3.43	-7.85/-15.68	-10.12/-4.56	-3.00/-2.83	-4.91/-9.45	-10.27/-7.92	-5.65/-3.79	-2.53/-2.04	-1.77/-2.64	-3.49/-3.87	-3.48/-4.09	-5.77/-7.19	-7.49/-5.59
θ(30°)	-2.73/-2.65	-2.70/-4.70	-5.04/-4.71	-7.46/-11.57	-10.66/-6.52	-4.13/-3.55	-7.89/-8.86	-8.69/-5.82	-3.55/-5.31	-5.73/-3.36	-0.70/-0.22	-0.61/-1.66	-1.68/-1.87	0.06/-1.16	-0.67/-0.37	-2.08/-2.80	-3.33/-1.59	
θ(40°)	0.11/-0.16	0.65/-0.35	-3.20/-0.40	0.58/-1.69	-1.90/-4.59	-4.55/-1.43	-1.52/-3.11	-7.35/-5.11	-2.77/-4.91	-3.01/-2.74	-7.91/-9.58	-3.81/-2.74	-2.27/-0.78	0.77/0.46	-0.37/-1.71	-1.44/-0.04	-1.16/-0.03	1.86/1.82
θ(50°)	2.68/2.46	3.31/2.42	1.16/0.90	-1.07/-1.61	-0.20/-6.33	-9.06/-3.97	-5.27/-3.76	-5.57/-0.86	-0.70/-5.02	-2.86/-2.18	-6.62/-5.46	-2.09/-1.37	-2.78/-1.01	0.89/-0.01	-0.83/-1.92	0.40/1.31	0.13/-0.90	1.20/2.53
θ(60°)	3.41/3.48	3.26/2.45	1.83/0.78	-0.55/-1.23	-0.95/-2.53	-5.98/-5.76	-2.98/-1.09	-6.19/-1.45	-2.98/-1.09	-2.98/-1.09	-2.90/-2.59	-2.73/-1.89	-2.40/-3.89	-2.40/-4.28	-2.73/-1.89	-0.79/-1.05	-0.92/-0.99	-0.15/2.08
θ(70°)	2.36/2.60	2.28/2.21	1.58/-1.28	-0.18/-1.10	-1.31/-0.71	-2.88/-0.58	-1.17/-0.65	-6.00/-4.02	-0.49/-1.68	-4.11/-0.55	-0.19/-1.69	-0.52/-4.57	-6.15/-4.27	-2.76/-7.03	-1.86/-1.60	-1.95/-2.41	-0.68/-2.23	-0.37/0.41
θ(80°)	0.27/1.22	1.48/2.03	1.76/-1.88	-0.91/-0.04	-0.23/0.57	-3.21/1.70	-1.57/-2.67	-4.51/-3.44	-1.72/-3.28	-5.63/-0.99	0.70/-0.42	-0.30/-0.48	-3.00/0.97	2.17/-6.04	-2.15/-0.94	-1.96/-4.05	-2.26/-4.90	-0.44/-0.67
θ(90°)	-2.39/-0.77	0.23/0.96	0.29/-2.79	-1.52/-1.15	-1.45/-0.08	-2.81/-4.89	-1.83/-4.89	-5.93/-2.04	-0.23/-2.17	-1.75/-								



Antenna Pattern_5GHz U-NII 1~U-NII 3

Appendix F

Θ(160°)	-14.22/-14.83	-15.76/-14.08	-10.31/-9.01	-10.32/-12.00	-9.42/-9.36	-9.77/-13.60	-14.68/-15.37	-12.83/-12.13	-15.87/-15.16	-14.74/-15.51	-15.79/-14.95	-13.42/-11.43	-13.63/-15.29	-14.47/-16.14	-16.12/-13.80	-14.57/-13.56	-13.59/-11.92	-13.57/-13.49
Θ(170°)	-15.53/-14.91	-14.87/-14.06	-14.59/-15.28	-13.93/-13.42	-13.11/-14.36	-14.10/-15.38	-13.41/-14.30	-15.54/-14.73	-14.93/-15.71	-16.04/-14.95	-15.51/-15.22	-15.67/-13.65	-12.99/-14.02	-14.82/-11.93	-11.29/-10.65	-11.33/-12.42	-12.16/-14.32	-15.09/-14.85
Θ(180°)	-13.73/-13.16	-13.45/-13.99	-14.49/-14.82	-15.43/-15.75	-14.64/-14.99	-14.64/-15.02	-16.02/-15.41	-13.92/-14.17	-15.43/-15.15	-15.32/-15.41	-14.88/-14.10	-14.51/-14.36	-15.46/-14.33	-13.53/-13.22	-11.34/-11.44	-10.91/-11.23	-12.80/-13.33	-14.44/-14.53
Freq(Hz)	5.785GPol	TotalAnt. 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)Φ(10°)	Φ(20°)Φ(30°)	Φ(40°)Φ(50°)	Φ(60°)Φ(70°)	Φ(80°)Φ(90°)	Φ(100°)Φ(110°)	Φ(120°)Φ(130°)	Φ(140°)Φ(150°)	Φ(160°)Φ(170°)	Φ(180°)Φ(190°)	Φ(200°)Φ(210°)	Φ(220°)Φ(230°)	Φ(240°)Φ(250°)	Φ(260°)Φ(270°)	Φ(280°)Φ(290°)	Φ(300°)Φ(310°)	Φ(320°)Φ(330°)	Φ(340°)Φ(350°)
Θ(0°)	-7.14/-7.55	-7.39/-6.66	-6.45/-6.63	-6.58/-6.46	-6.22/-6.86	-6.41/-6.84	-5.12/-4.77	-5.06/-5.40	-5.45/-5.27	-5.49/-5.40	-5.39/-5.60	-6.30/-6.43	-5.86/-5.71	-6.13/-6.39	-6.91/-6.44	-6.02/-7.38	-6.59/-6.90	-6.59/-6.90
Θ(10°)	-9.10/-10.75	-11.12/-8.58	-8.60/-7.72	-7.13/-6.89	-7.04/-7.00	-7.62/-9.01	-10.64/-11.99	-11.82/-11.89	-13.73/-13.19	-14.16/-12.55	-11.13/-8.84	-6.98/-6.70	-5.51/-4.80	-4.94/-4.98	-4.09/-3.71	-4.13/-3.84	-3.92/-4.56	-5.29/-7.02
Θ(20°)	-3.72/-7.01	-6.25/-3.79	-3.03/-3.14	-3.43/-2.43	-1.77/-1.85	-2.93/-3.56	-4.29/-5.69	-8.40/-12.17	-15.08/-14.22	-12.79/-11.12	-9.28/-8.54	-8.41/-8.19	-7.26/-5.60	-4.68/-5.48	-6.15/-4.19	-3.05/-1.91	-1.12/-0.37	-0.24/-0.84
Θ(30°)	0.42/-0.90	-0.99/-0.39	1.120/0.1	-2.04/-1.55	-0.89/-0.94	-1.28/-3.27	-6.81/-12.14	-9.08/-7.39	-1.28/-3.27	-8.10/-5.69	-3.20/-1.86	-2.51/-1.26	-1.61/-3.03	-2.62/-2.66	-1.92/-0.60	-0.52/-0.34	0.42/-1.39	1.09/0.82
Θ(40°)	0.05/-1.78	0.45/-1.99	1.89/2.51	3.45/3.58	0.71/-2.42	-2.62/-4.87	-5.42/-5.92	-2.73/-2.59	-4.20/-3.29	-4.24/-1.11	-0.19/-1.10	-0.32/0.25	-1.56/-4.74	-4.76/-3.01	-0.05/-0.04	-2.30/-2.96	-2.31/-1.38	0.49/2.19
Θ(50°)	-0.59/-0.00	4.014.81	3.77/4.70	4.01/2.70	0.71/-2.56	-5.49/-9.02	-5.48/-4.42	-3.33/-1.02	-4.69/-0.89	-0.14/-2.99	-2.04/-0.12	2.69/1.80	1.03/-1.14	-2.82/-1.22	-0.30/-0.19	1.36/-0.04	-1.21/-4.19	-2.34/0.15
Θ(60°)	-2.63/0.17	2.30/-1.23	0.39/4.34	2.42/0.45	0.40/-1.07	-2.43/-1.88	-4.15/-3.62	-4.83/-2.88	-4.70/-1.25	-0.57/-3.94	-2.67/-1.89	1.87/-1.21	-1.23/-1.13	-3.89/-5.47	-5.00/-4.00	-1.29/0.39	-0.63/-5.81	-2.91/-1.13
Θ(70°)	-4.03/-0.42	-0.39/-2.67	-1.29/3.46	1.00/-1.17	0.19/-1.80	-0.43/0.93	-3.66/-3.10	-4.22/-2.38	-3.60/-3.16	-3.16/-5.13	-1.41/-1.68	0.89/-2.35	-1.92/-2.54	-5.75/-5.84	-6.49/-4.08	-5.45/-0.22	-2.05/-7.47	-2.24/-2.23
Θ(80°)	-4.38/-1.03	-1.89/-3.93	-1.47/2.41	0.96/-1.04	-0.88/-0.97	-1.31/-0.45	-3.40/-2.96	-4.20/-3.09	-4.60/-6.12	-4.58/-6.02	-0.96/-1.92	-1.05/-3.22	-0.69/-3.61	-5.34/-2.44	-0.15/0.49	-1.99/-1.08	-3.30/-4.68	-2.39/-4.45
Θ(90°)	-5.03/-3.50	-3.05/-4.70	-3.68/-0.40	-0.06/-0.08	-3.29/-2.72	-3.66/-2.57	-4.31/-4.56	-6.40/-8.00	-6.72/-7.30	-2.60/-5.46	-3.73/-5.34	-0.45/-2.79	-4.43/-2.80	0.59/1.06	-0.87/-3.58	-4.80/-6.46	-4.12/-5.96	-4.12/-5.96
Θ(100°)	-6.79/-5.57	-2.55/-4.43	-5.32/-3.05	-2.33/-3.48	-4.30/-5.10	-5.57/-4.72	-8.01/-4.36	-7.08/-7.86	-7.28/-10.94	-8.38/-10.57	-3.45/-6.62	-4.76/-9.21	-3.56/-6.10	-7.56/-6.23	-2.73/-0.75	-4.49/-5.12	-7.27/-5.82	-5.19/-8.54
Θ(110°)	-8.65/-5.70	-5.01/-5.43	-5.73/-5.96	-4.70/-6.11	-7.56/-6.32	-8.86/-5.87	-8.50/-5.79	-6.57/-15.47	-10.54/-10.88	-9.32/-11.21	-5.03/-9.20	-6.74/-9.40	-6.26/-7.76	-13.70/-13.73	-5.36/-7.07	-4.06/-8.63	-7.41/-5.29	-7.44/-10.81
Θ(120°)	-14.28/-12.11	-5.43/-6.76	-11.53/-10.07	-4.94/-8.89	-13.73/-5.32	-9.01/-12.16	-9.14/-5.22	-9.24/-9.90	-12.72/-12.58	-7.67/-9.04	-15.50/-9.64	-5.27/-7.48	-8.35/-12.55	-6.90/-8.35	-6.75/-8.55	-7.15/-7.23	-13.14/-12.46	-13.43/-13.17
Θ(130°)	-13.04/-8.81	4.33/-9.46	-13.18/-8.64	-6.27/-7.45	-13.31/-7.88	-10.18/-9.57	-8.71/-8.47	-7.23/-13.09	-15.64/-16.09	-12.87/-12.02	-10.77/-8.85	-8.65/-9.13	-8.77/-9.96	-8.13/-12.37	-10.24/-9.42	-6.77/-9.97	-10.17/-5.56	-7.81/-7.94
Θ(140°)	-12.67/-10.28	-3.99/-7.26	-10.35/-9.68	-9.72/-11.43	-12.63/-9.02	-11.99/-10.64	-7.80/-7.15	-12.98/-13.60	-11.04/-15.84	-10.72/-12.11	-14.95/-7.98	-11.51/-8.27	-11.68/-11.87	-10.19/-14.75	-11.73/-10.58	-11.59/-6.53	-9.84/-15.18	-10.26/-15.21
Θ(150°)	-14.41/-15.36	-9.23/-9.27	-10.92/-10.71	-16.00/-15.01	-14.48/-9.45	-15.80/-12.81	-12.31/-11.56	-15.80/-12.81	-12.31/-11.56	-11.05/-15.48	-10.45/-15.30	-11.58/-12.54	-10.15/-15.30	-11.16/-10.41	-11.16/-10.41	-11.16/-10.41	-13.41/-15.46	-13.43/-13.17
Θ(160°)	-10.96/-15.79	-15.34/-15.71	-13.82/-13.14	-13.53/-13.15	-11.18/-10.48	-7.92/-9.61	-15.32/-12.65	-12.93/-13.67	-14.92/-14.33	-14.98/-12.43	-11.46/-14.16	-14.60/-16.00	-15.16/-14.84	-11.42/-12.31	-13.83/-11.99	-12.92/-15.21	-10.07/-9.05	-15.91/-11.84
Θ(170°)	-15.64/-14.72	-13.37/-11.09	-14.38/-16.00	-14.96/-15.02	-13.76/-12.32	-13.56/-12.16	-10.94/-11.97	-13.26/-14.69	-15.21/-14.31	-13.41/-12.49	-12.75/-12.94	-15.22/-14.96	-15.98/-15.13	-15.10/-15.55	-15.45/-15.49	-14.14/-11.98	-10.56/-11.83	-13.60/-14.69
Θ(180°)	-13.56/-12.27	-12.74/-13.75	-13.59/-14.53	-14.60/-15.02	-15.06/-15.60	-15.40/-15.08	-15.77/-15.20	-15.48/-14.82	-14.97/-15.61	-16.02/-15.46	-16.26/-15.00	-15.68/-15.90	-15.29/-15.63	-15.45/-13.51	-13.86/-14.54	-13.73/-12.75	-14.70/-15.50	-13.69/-12.76
Freq(Hz)	5.2GPol.	TotalAnt. 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)Φ(10°)	Φ(20°)Φ(30°)	Φ(40°)Φ(50°)	Φ(60°)Φ(70°)	Φ(80°)Φ(90°)	Φ(100°)Φ(110°)	Φ(120°)Φ(130°)	Φ(140°)Φ(150°)	Φ(160°)Φ(170°)	Φ(180°)Φ(190°)	Φ(200°)Φ(210°)	Φ(220°)Φ(230°)	Φ(240°)Φ(250°)	Φ(260°)Φ(270°)	Φ(280°)Φ(290°)	Φ(300°)Φ(310°)	Φ(320°)Φ(330°)	Φ(340°)Φ(350°)
Θ(0°)	-0.66/-0.87	-0.60/-0.41	-0.70/-0.79	-0.98/-1.15	-1.26/-1.61	-1.45/-1.01	-1.23/-1.68	-1.59/-1.27	-1.91/-1.64	-1.48/-1.27	-0.88/-0.92	-0.22/-0.73	-1.40/-1.33	-0.44/-1.33	-0.44/-1.33	-1.01/-0.91	-0.93/-0.75	-0.43/-0.50
Θ(10°)	-8.40/-7.28	-5.53/-5.34	-5.20/-4.52	-3.59/-3.90	-3.42/-2.75	-2.18/-1.96	-1.78/-1.43	-1.16/-1.32	-1.09/-1.05	-1.09/-2.10	-2.57/-2.86	-4.10/-4.94	-5.86/-6.37	-6.95/-6.58	-6.06/-6.15	-6.29/-6.12	-7.04/-7.96	-8.58/-8.73
Θ(20°)	-6.93/-1.11	-7.80/-6.74	-5.97/-5.15	-3.93/-3.68	-3.09/-3.05	-3.65/-3.32	-3.14/-2.86	-3.72/-4.00	-3.46/-1.06	0.19/0.79	1.33/0.62	-1.08/-2.80	-3.35/-3.11	-2.81/-3.60	-5.46/-6.30	-5.85/-5.21	-5.36/-6.96	-8.31/-8.67
Θ(30°)	-6.30/-8.05	-10.02/-6.51	-5.04/-3.00	-2.69/-3.87	-4.46/-3.16	-1.39/-1.74	-0.08/-0.77	-0.24/-1.36	-1.39/-1.42	-0.42/-0.94	-1.23/-0.49	-0.75/-0.62	0.15/0.19	-0.42/-0.94	-0.75/-0.62	-0.12/0.02	-2.98/-4.59	-2.98/-4.59
Θ(40°)	-7.87/-7.08	-7.07/-4.25	-2.97/-0.52	-0.74/-2.86	-3.12/-2.20	-1.64/-0.40	0.27/-0.91	-1.49/-1.25	0.29/1.04	0.16/-0.50	-0.20/-1.49	-0.26/-1.13	0.76/-0.75	-0.48/-1.35	1.60/-1.32	0.79/-0.68	-1.57/-1.14	-2.22/-5.70
Θ(50°)	-5.34/-3.46	-3.61/-3.92	-2.40/-3.39	-2.35/-3.98	-2.68/-2.06	-3.40/-2.46	1.65/-1.24	-0.01/-0.70	1.16/2.98	2.24/1.08	-0.91/-3.33	-1.46/-0.92	-0.42/-0.03	0.67/2.91	3.46/1.15	0.02/-1.59	-0.76/-1.26	-1.91/-4.99
Θ(60°)	-2.09/-0.99	-2.02/-4.76	-2.53/-5.32	-5.89/-6.57	-4.42/-1.67	-3.49/-4.30	2.20/-0.02	-0.39/-1.63	-1.76/-1.76	3.32/-0.02	-4.25/-6.48	-0.82/-0.35	-0.78/-2.53	-1.84/-1.00	-1.84/-1.00	-1.84/-1.00	-1.84/-1.00	-1.84/-1.00
Θ(70°)	-0.68/0.95	-0.75/-3.34	-2.14/-4.73	-6.48/-4.83	-3.33/-1.47	-0.29/-2.74	-0.93/-0.82	-3.20/-4.38	-2.79/1.58	0.62/-1.69	-6.45/-7.89	-6.07/-2.56	1.01/0.60	-0.14/0.44	2.79/1.68	0.02/0.71	-0.08/-3.27	-1.76/0.41
Θ(80°)	0.26/0.90	-0.75/-3.80	-1.83/-6.21	-7.09/-4.57	-2.93/-1.98	1.04/-0.87	-1.39/-0.51	-5.94/-7.08	-4.96/-1.20	-0.99/-2.52	-5.26/-8.08	-7.60/-9.32	2.49/2.47	0.77/-0.09	2.70/2.35	0.87/0.07	0.14/-2.00	-2.79/-0.68
Θ(90°)	-0.21/-1.70	-2.54/-5.69	-2.39/-8.84	-7.84/-6.23	-3.06/-1.71	0.36/-2.11	-2.67/-2.56	-8.81/-10.85	-5.21/-3.53	-3.24/-3.59	-5.87/-8.04	-6.66/-1.81	-1.78/0.83	-1.23/-1.55	1.81/0.79	-0.36/-1.67	-1.89/-2.32	-4.32/-2.53
Θ(100°)	-2.37/-4.57	-4.58/-7.14	-2.97/-7.95	-12.98/-10.76	-3.65/-3.78	-1.57/-3.99	-5.36/-2.18	-9.87/-11.28	-8.06/-7.13	-5.73/-5.60	-9.68/-10.63	-11.47/-3.49	-1.35/-1.87	-5.76/-6.29	-1.68/-3.37	-2.79/-3.26	-3.94/-4.13	-6.63/-4.68
Θ(110°)	-5.39/-5.33	-7.19/-6.05	-6.99/-8.60	-12.07/-10.98	-4.34/-6.94	-4.13/-7.11	-12.06/-4.17	-9.87/-15.25	-7.58/-7.31	-6.81/-10.14	-7.06/-9.39	-11.89/-5.32	-6.38/-7.19	-10.11/-14.71	-8.96/-4.37	-3.05/-4.89	-5.37/-7.82	-9.11/-6.91
Θ(120°)	-4.39/-5.07	-7.13/-5.45	-11.09/-8.19	-6.99/-8.21	-6.30/-10.11	-6.70/-5.71	-6.45/-7.12	-6.38/-14.28	-10.94/-10.47	-10.29/-8.99	-7.43/-12.85	-8.09/-7.92	-10.44/-7.83	-10.16/-15.07	-8.67/-5.34	-3.50/-5.97	-4.83/-8.40	-9.69/-8.60
Θ(130°)	-5.17/-6.29	-10.16/-7.05	-9.50/-12.11	-10.47/-9.02	-6.37/-6.36	-11.59/-13.94	-8.60/-7.17	-7.79/-13.33	-11.59/-14.32	-8.53/-10.17	-8.91/-6.22	-12.27/-9.23	-7.91/-6.07	-7.58/-8.04	-4.17/-11.79	-8.41/-6.40	-8.41/-6.40	-8.41/-6.40
Θ(140°)	-7.90/-5.66	-8.62/-11.84	-7.90/-11.80	-10.79/-9.07	-8.07/-8.90	-7.55/-7.11	-8.24/-10.27	-13.46/-8.23	-6.68/-14.43	-10.93/-9.83	-6.13/-12.05	-9.61/-15.45	-9.89/-13.85	-9.14/-13.91	-8.03/-4.74	-9.77/-8.21	-8.51/-6.68	-8.51/-6.68
Θ(150°)	-10.30/-8.05	-8.39/-10.82	-12.40/-11.65	-8.34/-10.76	-8.53/-9.01	-8.25/-10.12	-12.91/-12.47	-12.56/-10.40	-11.50/-15.49	-8.74/-8.60	-8.94/-9.23	-14.29/-10.27	-11.35/-15.68	-13.34/-13.75	-11.07/-11.56	-8.44/-15.45	-14.01/-13.19	-11.04/-10.71
Θ(160°)	-9.63/-11.81	-12.76/-11.37	-10.29/-10.42	-11.62/-11.74	-10.55/-10.91	-12.36/-13.96	-14.41/-13.94	-15.16/-11.68	-11.59/-14.32	-10.39/-9.13	-10.12/-9.71	-14.27/-14.51	-11.76/-13.07	-12.87/-14.09	-12.16/-11.01	-11.76/-13.07	-10.17/-9.75	-10.17/-9.75
Θ(170°)	-12.63/-12.92	-11.72/-13.94	-13.21/-14.12	-14.07/-11.91	-12.36/-12.33	-13.75/-15.70	-15.65/-15.36	-13.06/-12.81	-12.66/-10.42	-10.29/-9.52	-9.49/-11.60	-15.19/-13.38	-13.69/-15.43	-13.70/-14.18	-15.04/-14.93	-15.72/-14.44	-13.31/-12.18	-11.52/-11.59
Θ(180°)	-11.18/-9.91	-10.22/-10.27	-10.67/-10.54	-11.82/-12.87	-13.53/-13.41	-12.73/-11.50	-12.82/-13.42	-15.30/-15.63	-13.33/-12.09	-10.15/-10.57	-10.90/-10.85	-10.33/-10.10	-8.70/-9.84	-9.37/-10.63	-11.06/-11.71	-		

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

