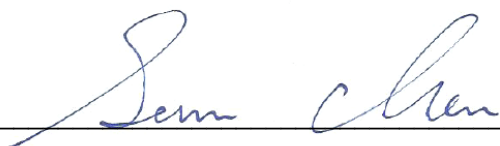


Antenna Composite Gain Test Report

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

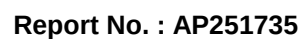
Sporton International Inc. Hsinchu Laboratory

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



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[illegible]

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

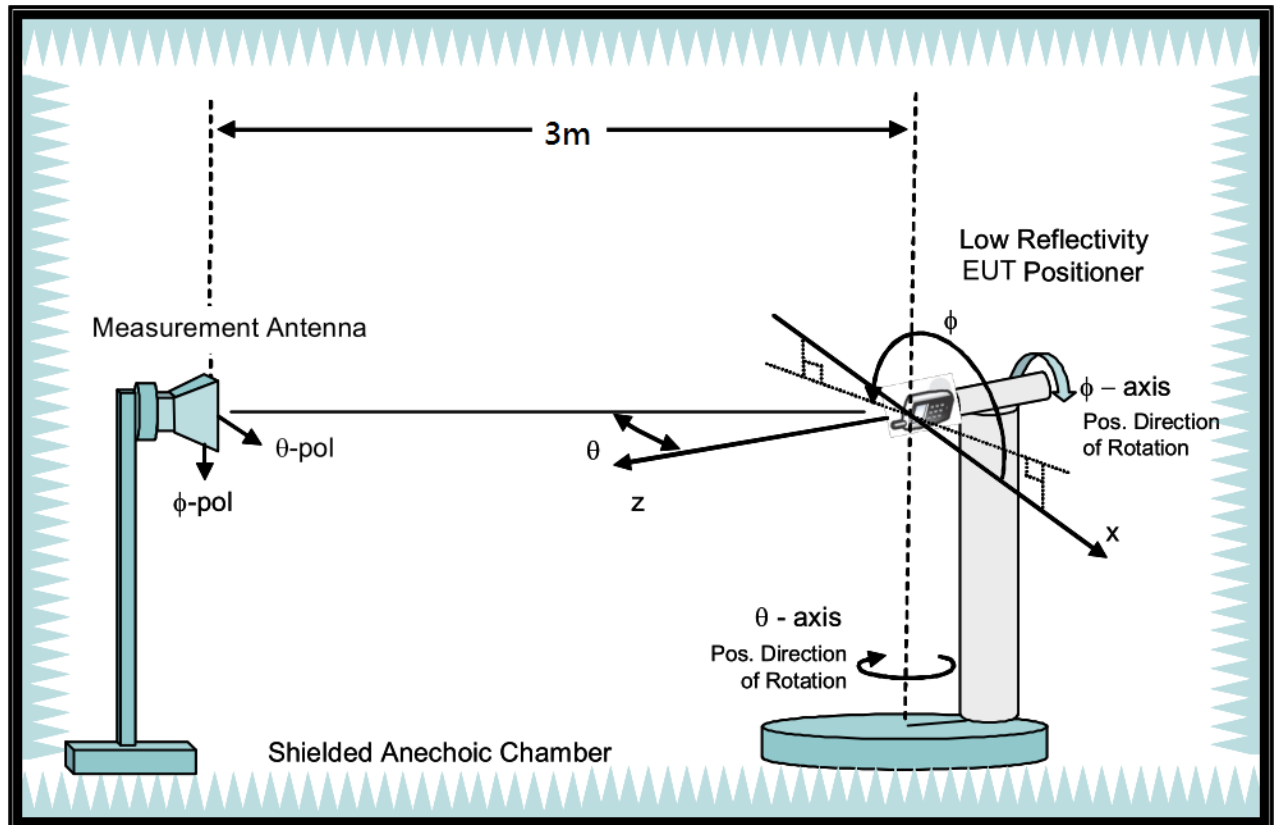
Test configuration: Reference to CITA OTA distributed-axes system configuration.

Chamber: Fully Anechoic Chamber.

Measurement antenna: Dual Polarization Horn antenna

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

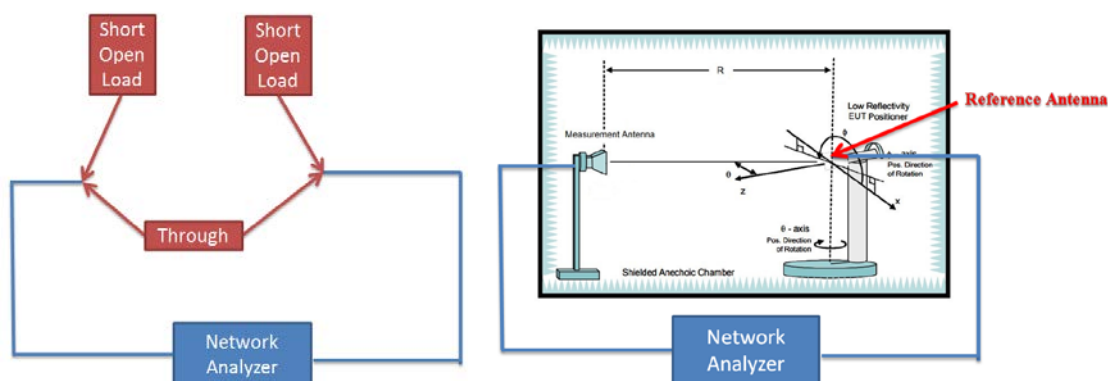
#Reference to CTIA "ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1"



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

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.

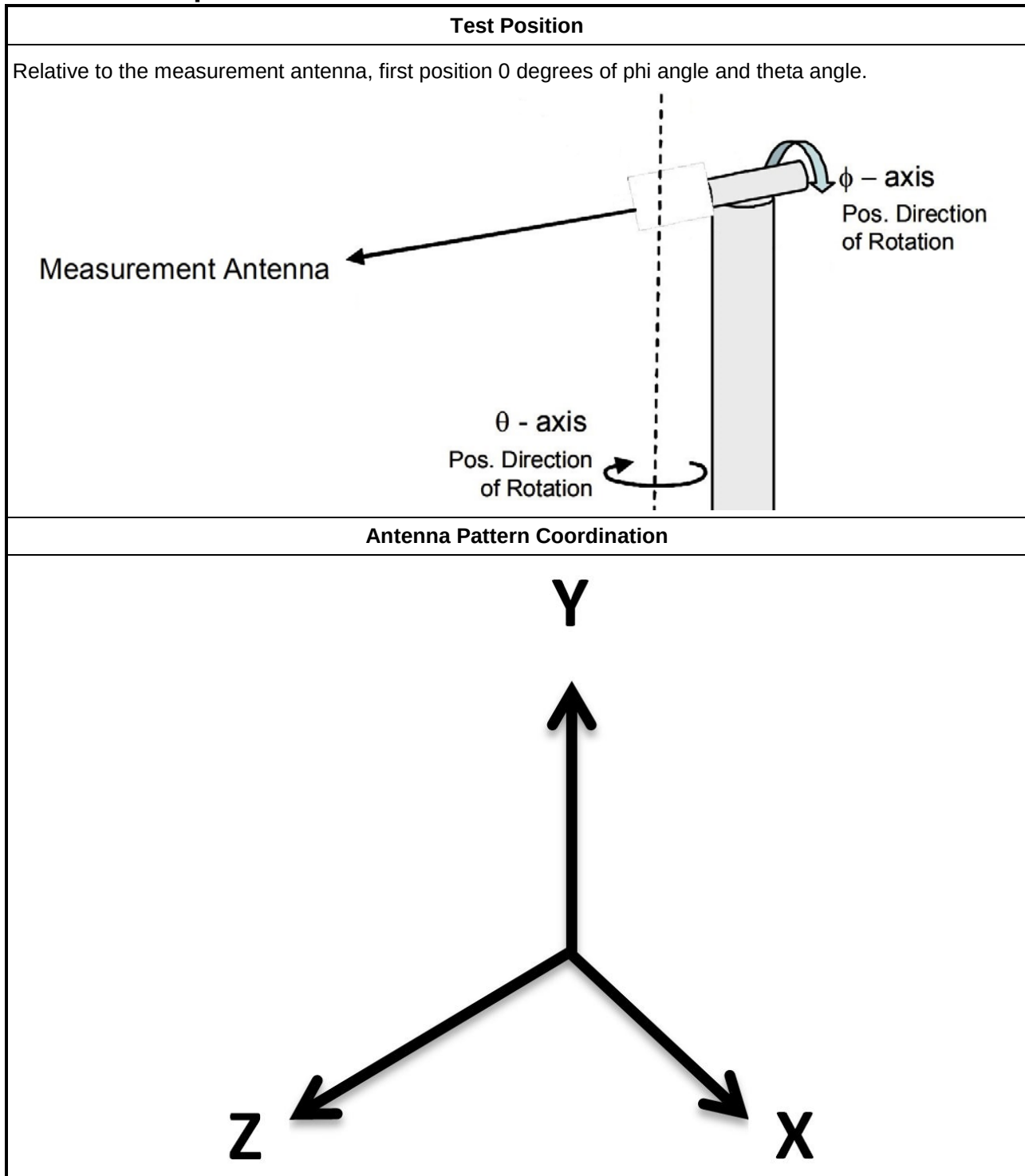
For 4TX

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
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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

Page	2.620E+01	Table 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
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Appendix A

Sporton International Inc. Hsinchu Laboratory



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

DG 1SS Result

Frage	807/18/1	807/18/2	807/18/3	807/18/4	807/18/5	807/18/6	807/18/7	807/18/8	807/18/9	807/18/10	807/18/11	807/18/12	807/18/13	807/18/14	807/18/15	807/18/16	807/18/17	807/18/18	807/18/19	807/18/20	807/18/21	807/18/22	807/18/23	807/18/24	807/18/25	807/18/26	807/18/27	807/18/28	807/18/29	807/18/30	807/18/31	807/18/32	807/18/33	807/18/34	807/18/35	807/18/36	807/18/37	807/18/38	807/18/39	807/18/40	807/18/41	807/18/42	807/18/43	807/18/44	807/18/45	807/18/46	807/18/47	807/18/48	807/18/49	807/18/50	807/18/51	807/18/52	807/18/53	807/18/54	807/18/55	807/18/56	807/18/57	807/18/58	807/18/59	807/18/60	807/18/61	807/18/62	807/18/63	807/18/64	807/18/65	807/18/66	807/18/67	807/18/68	807/18/69	807/18/70	807/18/71	807/18/72	807/18/73	807/18/74	807/18/75	807/18/76	807/18/77	807/18/78	807/18/79	807/18/80	807/18/81	807/18/82	807/18/83	807/18/84	807/18/85	807/18/86	807/18/87	807/18/88	807/18/89	807/18/90	807/18/91	807/18/92	807/18/93	807/18/94	807/18/95	807/18/96	807/18/97	807/18/98	807/18/99	807/18/100	807/18/101	807/18/102	807/18/103	807/18/104	807/18/105	807/18/106	807/18/107	807/18/108	807/18/109	807/18/110	807/18/111	807/18/112	807/18/113	807/18/114	807/18/115	807/18/116	807/18/117	807/18/118	807/18/119	807/18/120	807/18/121	807/18/122	807/18/123	807/18/124	807/18/125	807/18/126	807/18/127	807/18/128	807/18/129	807/18/130	807/18/131	807/18/132	807/18/133	807/18/134	807/18/135	807/18/136	807/18/137	807/18/138	807/18/139	807/18/140	807/18/141	807/18/142	807/18/143	807/18/144	807/18/145	807/18/146	807/18/147	807/18/148	807/18/149	807/18/150	807/18/151	807/18/152	807/18/153	807/18/154	807/18/155	807/18/156	807/18/157	807/18/158	807/18/159	807/18/160	807/18/161	807/18/162	807/18/163	807/18/164	807/18/165	807/18/166	807/18/167	807/18/168	807/18/169	807/18/170	807/18/171	807/18/172	807/18/173	807/18/174	807/18/175	807/18/176	807/18/177	807/18/178	807/18/179	807/18/180	807/18/181	807/18/182	807/18/183	807/18/184	807/18/185	807/18/186	807/18/187	807/18/188	807/18/189	807/18/190	807/18/191	807/18/192	807/18/193	807/18/194	807/18/195	807/18/196	807/18/197	807/18/198	807/18/199	807/18/200	807/18/201	807/18/202	807/18/203	807/18/204	807/18/205	807/18/206	807/18/207	807/18/208	807/18/209	807/18/210	807/18/211	807/18/212	807/18/213	807/18/214	807/18/215	807/18/216	807/18/217	807/18/218	807/18/219	807/18/220	807/18/221	807/18/222	807/18/223	807/18/224	807/18/225	807/18/226	807/18/227	807/18/228	807/18/229	807/18/230	807/18/231	807/18/232	807/18/233	807/18/234	807/18/235	807/18/236	807/18/237	807/18/238	807/18/239	807/18/240	807/18/241	807/18/242	807/18/243	807/18/244	807/18/245	807/18/246	807/18/247	807/18/248	807/18/249	807/18/250	807/18/251	807/18/252	807/18/253	807/18/254	807/18/255	807/18/256	807/18/257	807/18/258	807/18/259	807/18/260	807/18/261	807/18/262	807/18/263	807/18/264	807/18/265	807/18/266	807/18/267	807/18/268	807/18/269	807/18/270	807/18/271	807/18/272	807/18/273	807/18/274	807/18/275	807/18/276	807/18/277	807/18/278	807/18/279	807/18
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Sporton International Inc. Hsinchu Laborator

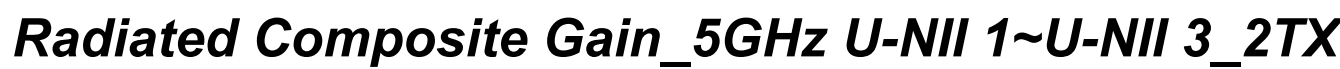
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Freq(Hz)	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	3.18	2.87	2.65	2.51
Ant. 2 Max Gain (dBi)	3.24	3.59	3.6	3.35
Ant. 1 Polarization/Θ(°)/Φ(°)	Theta/50/280	Theta/60/180	Theta/50/290	Theta/40/250
Ant. 2 Polarization/Θ(°)/Φ(°)	Theta/40/260	Theta/40/260	Theta/70/0	Theta/60/0
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

Sporton International Inc. Hsinchu Laboratory

[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

[illegible]

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

[illegible]

[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	-0.030/4.4	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	-3.34/-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/-6.34	-6.59/-7.08	-6.87/-6.57	-4.22/-4.52	-3.72/-3.79	-4.43/-4.09	-3.52/-3.79	-3.23/-3.48	-3.13/-3.17	-3.22/-3.38	-3.40/-3.92	-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/-9.37	-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/-6.47	-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	-15.60/-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	-5.64/-3.52	-4.49/-4.32	-4.06/-3.52	-3.67/-3.79	-3.63/-3.52	-3.67/-3.79	-3.63/-3.52	-2.86/-2.45	-2.36/-2.45	-2.27/-2.50	-2.77/-3.01	-3.13/-3.30
Θ(20°)	-5.57/-4.91	-3.75/-2.52	-1.96/-1															



Antenna Pattern_2.4GHz

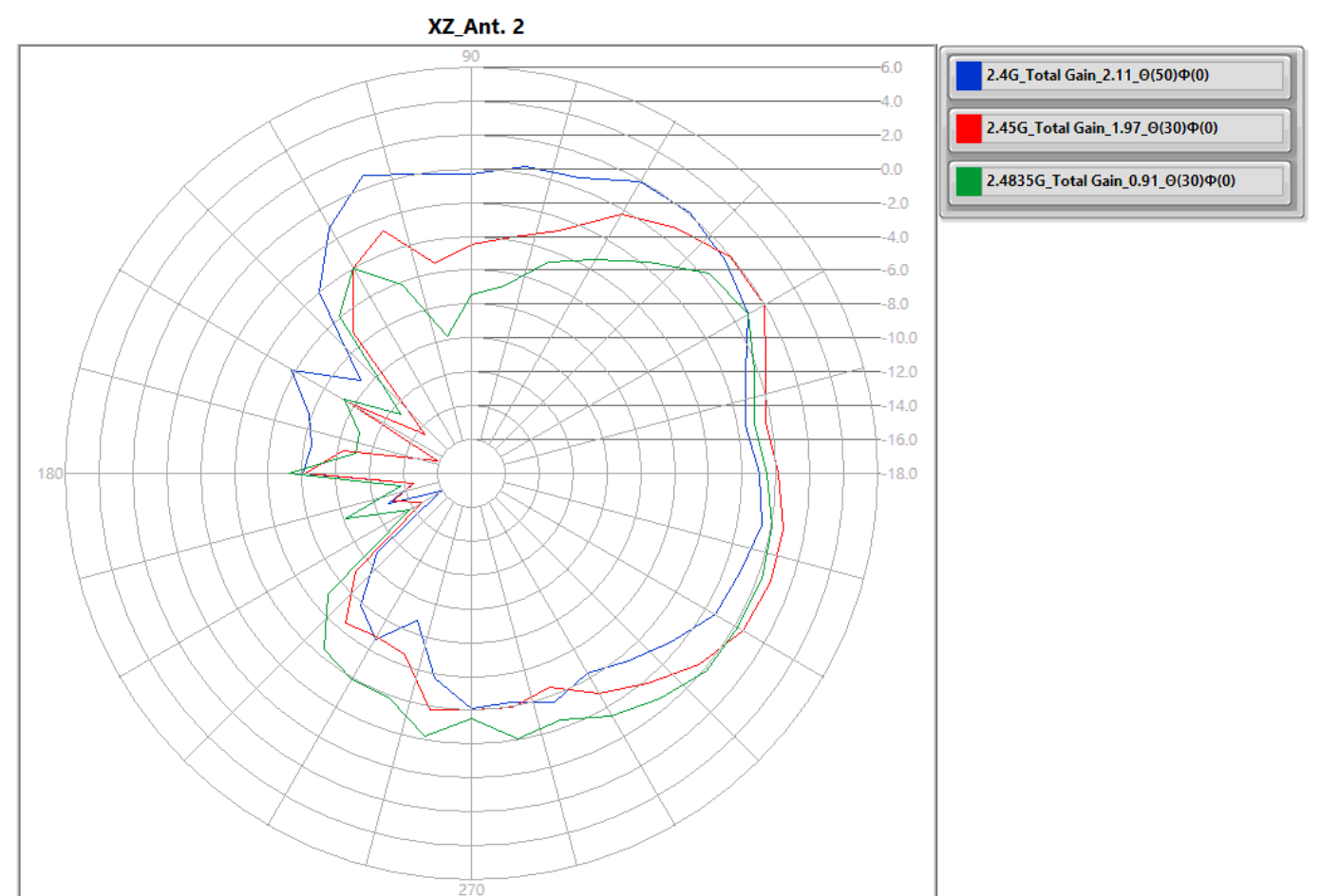
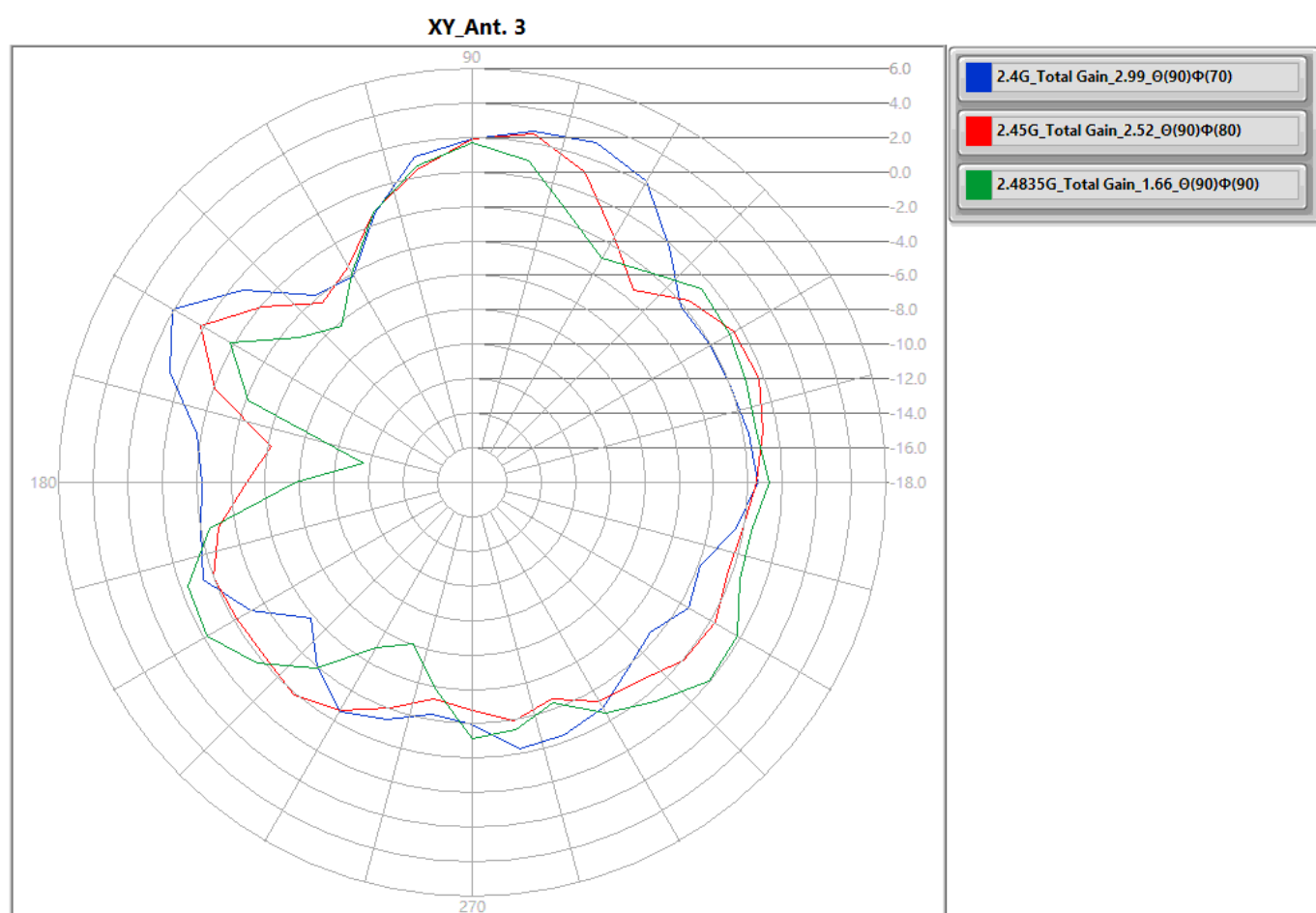
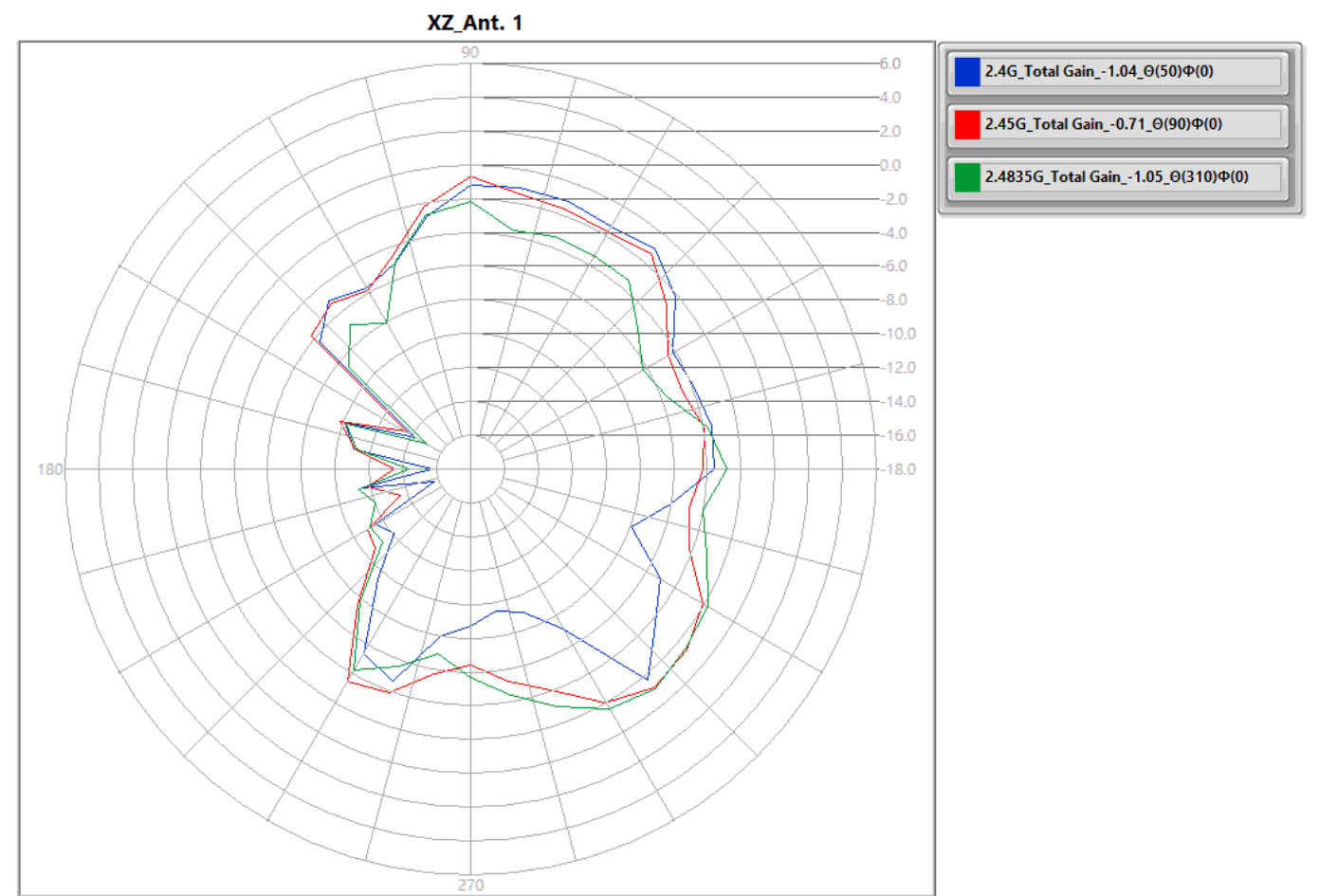
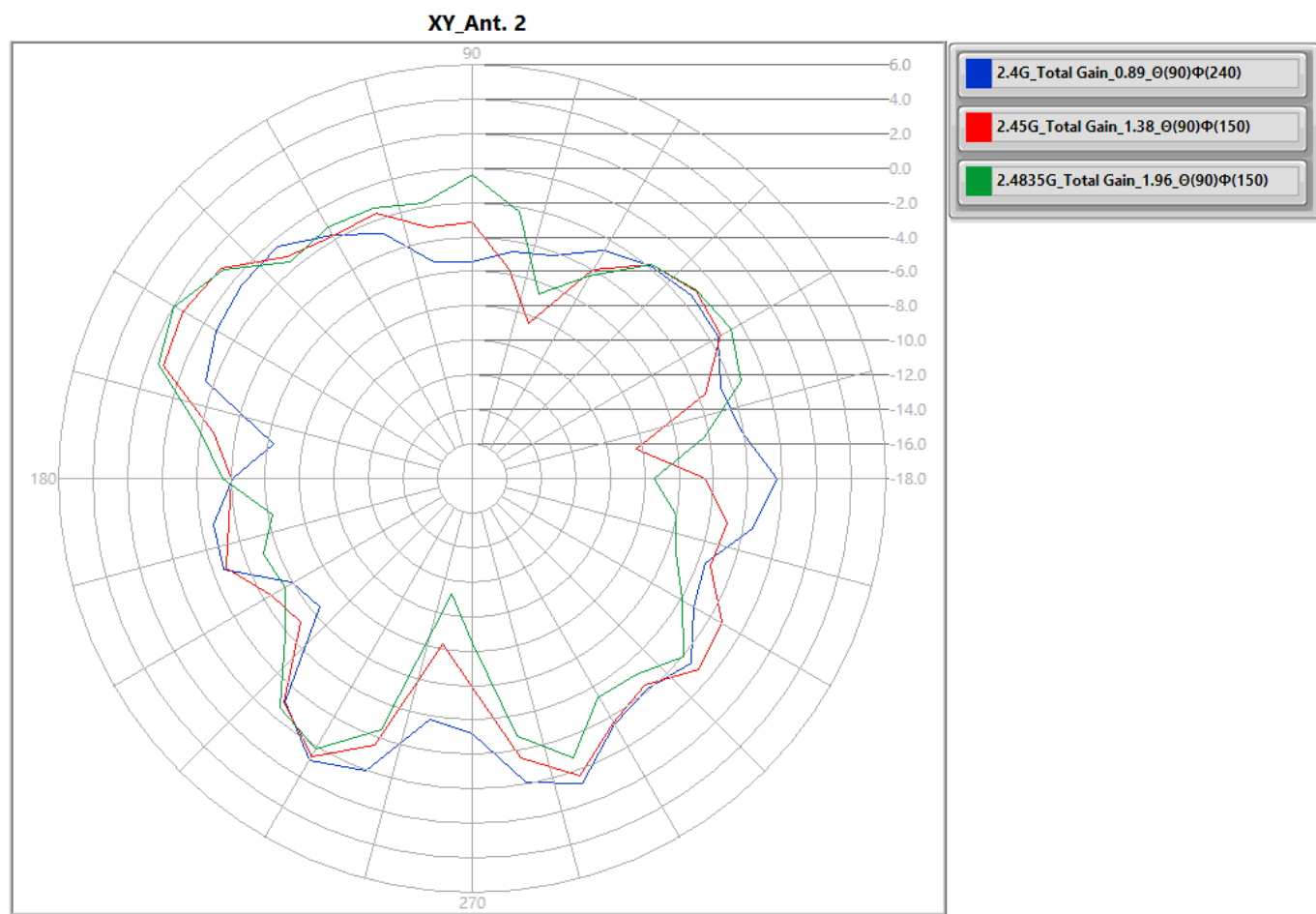
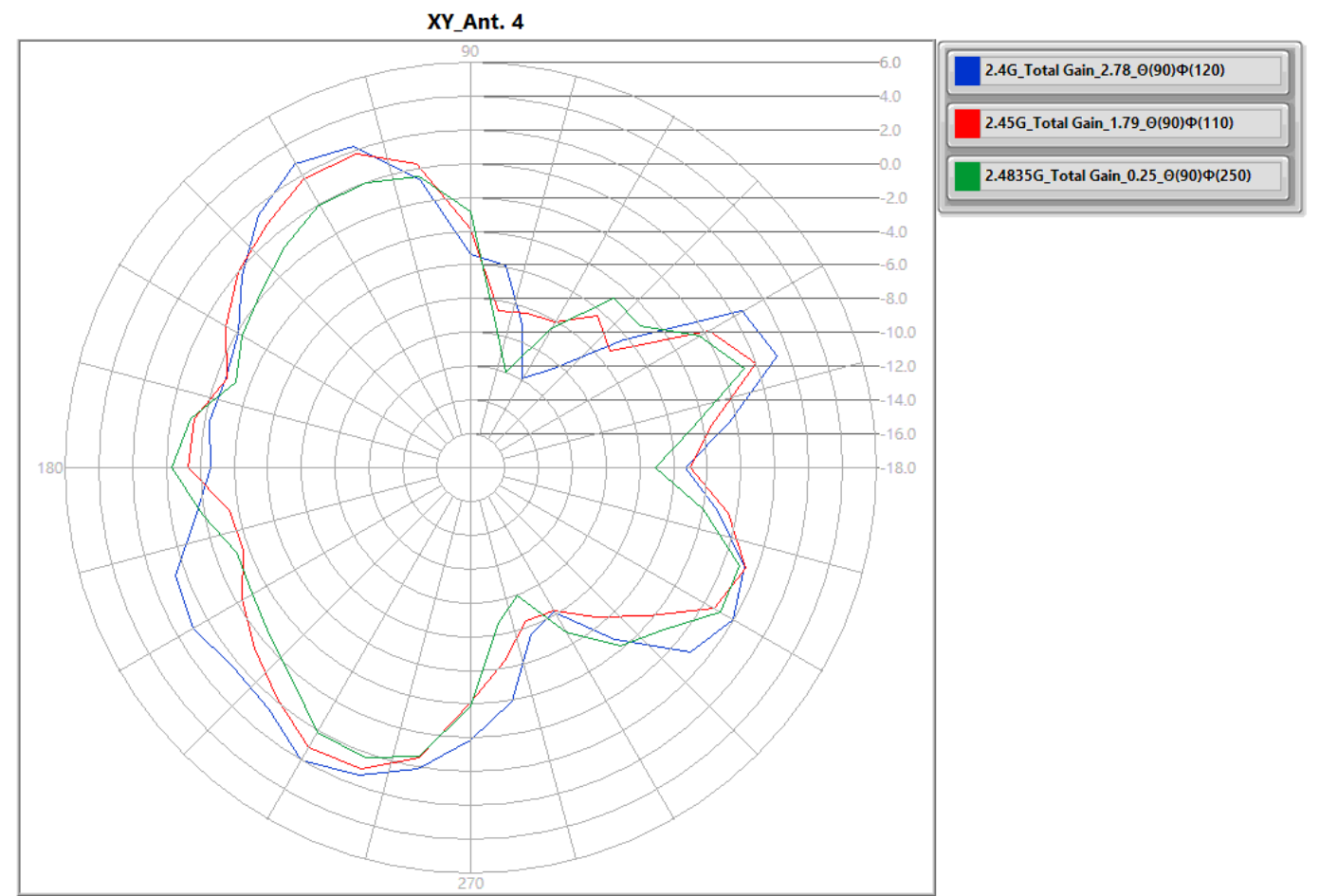
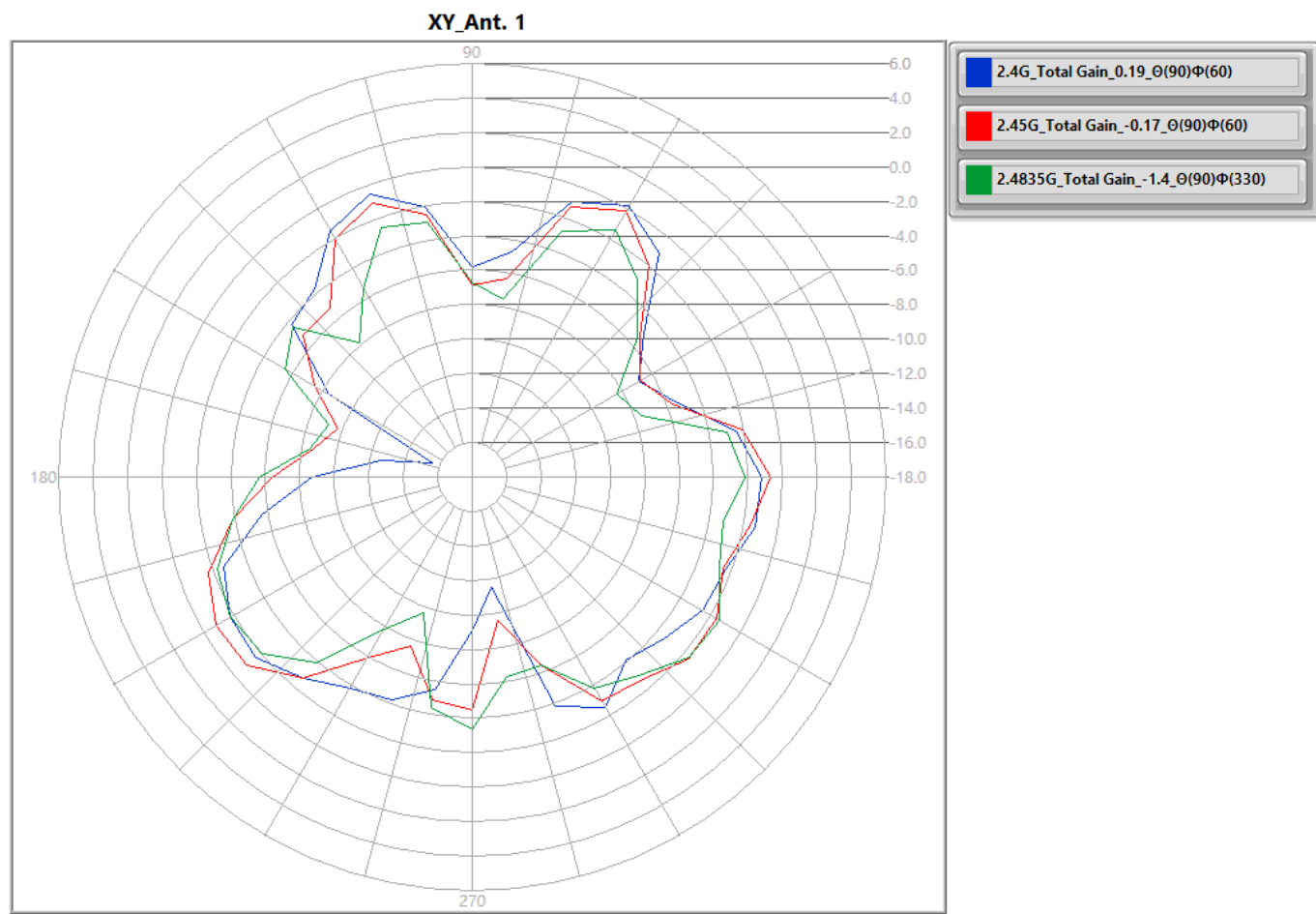
Appendix E

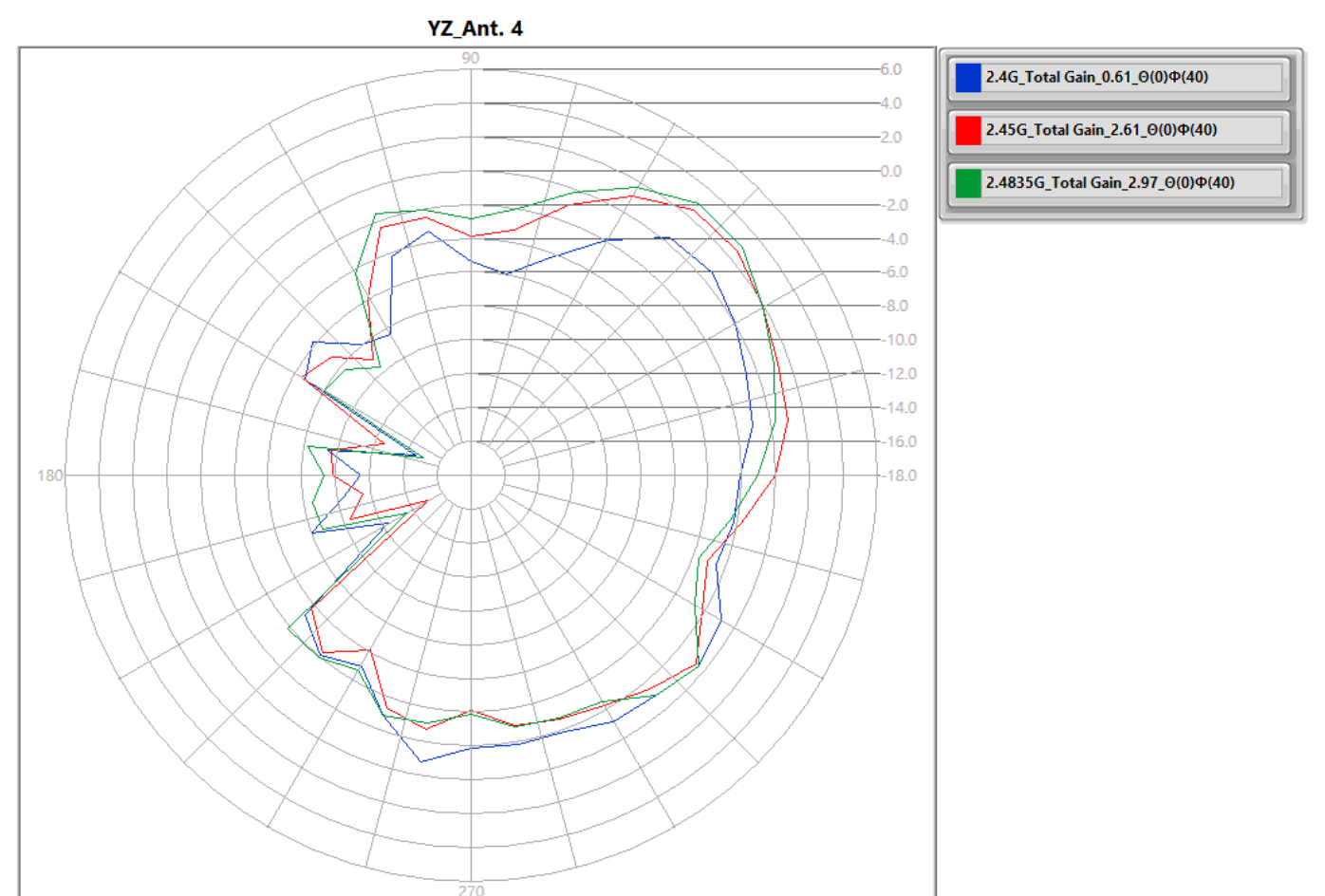
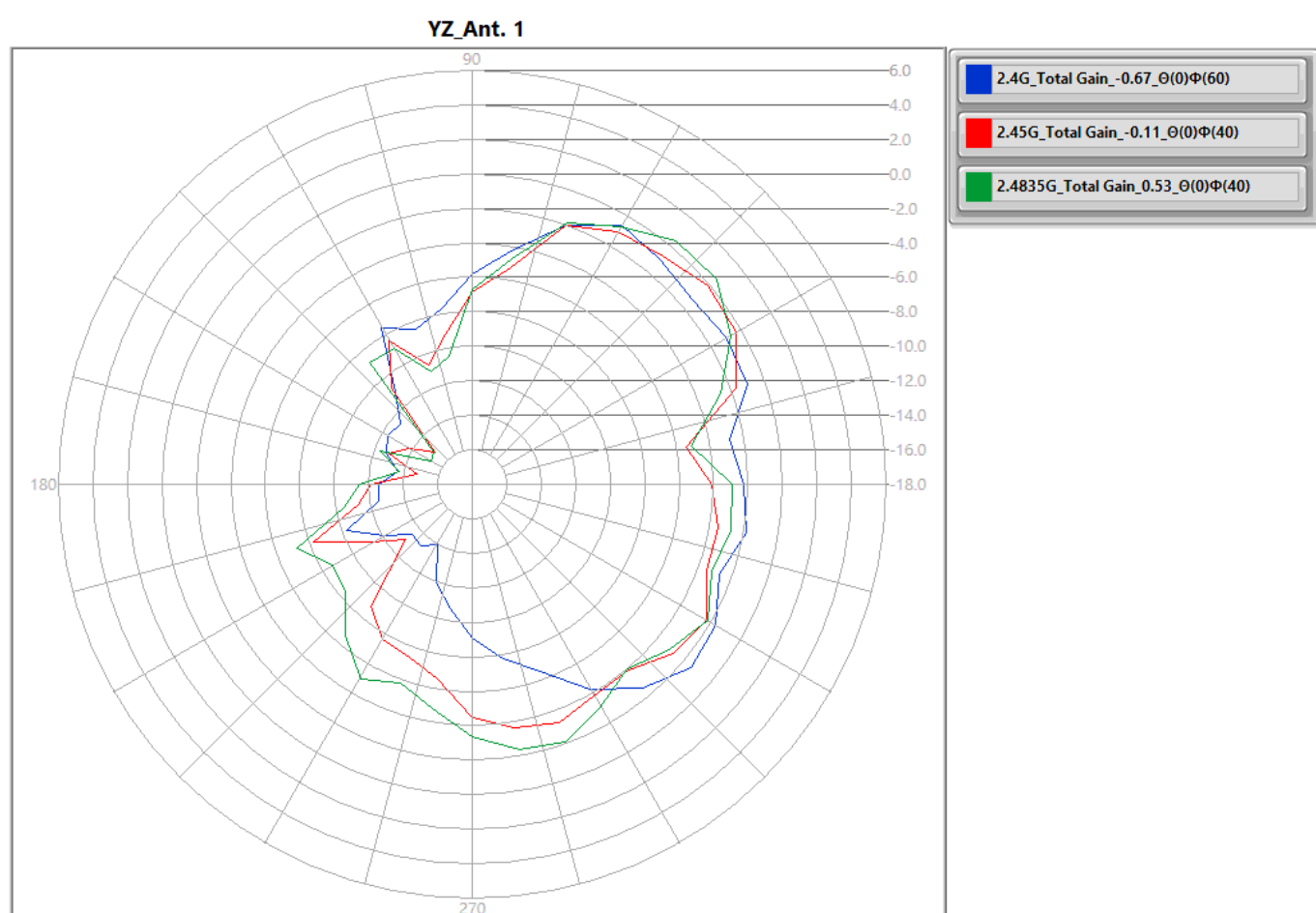
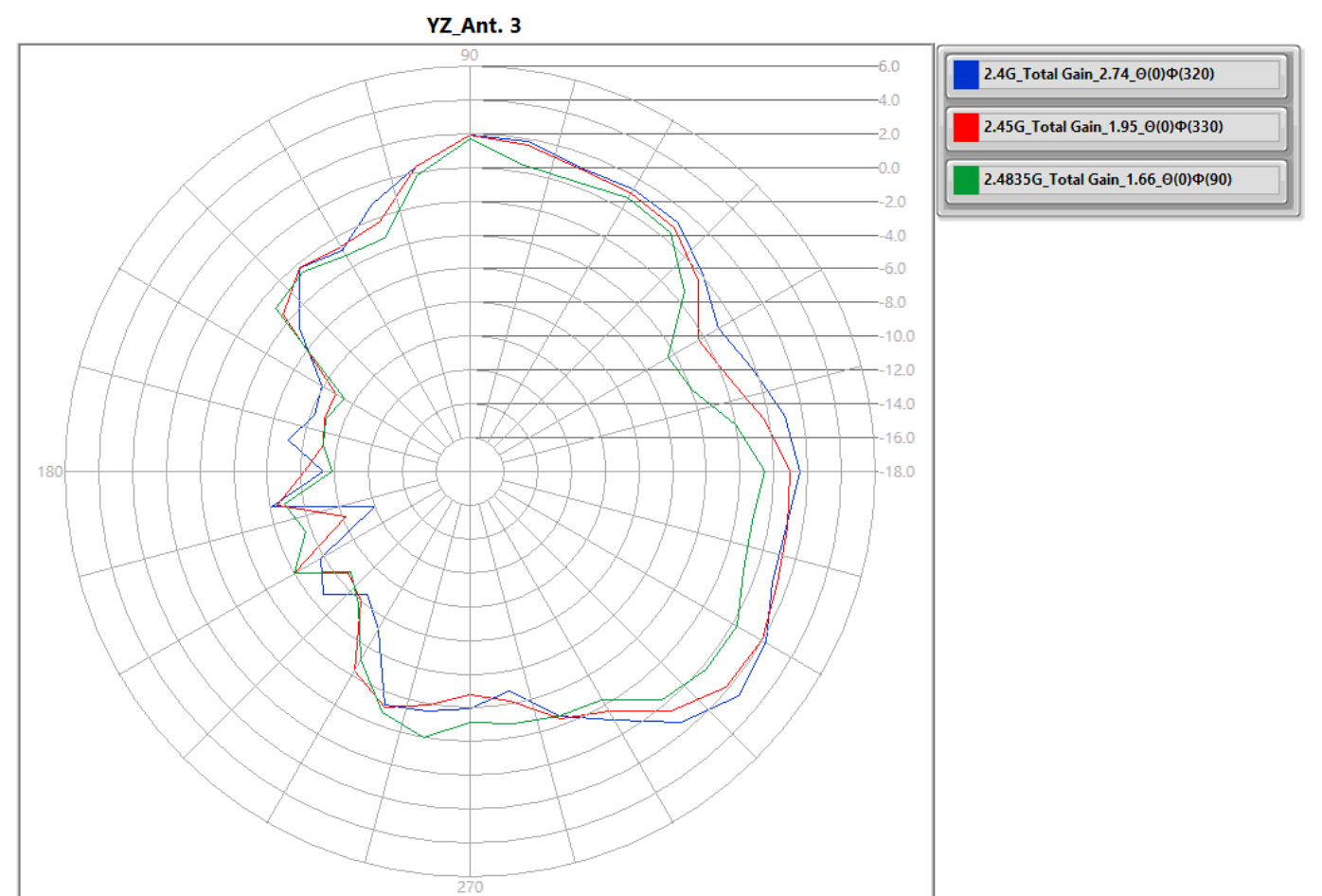
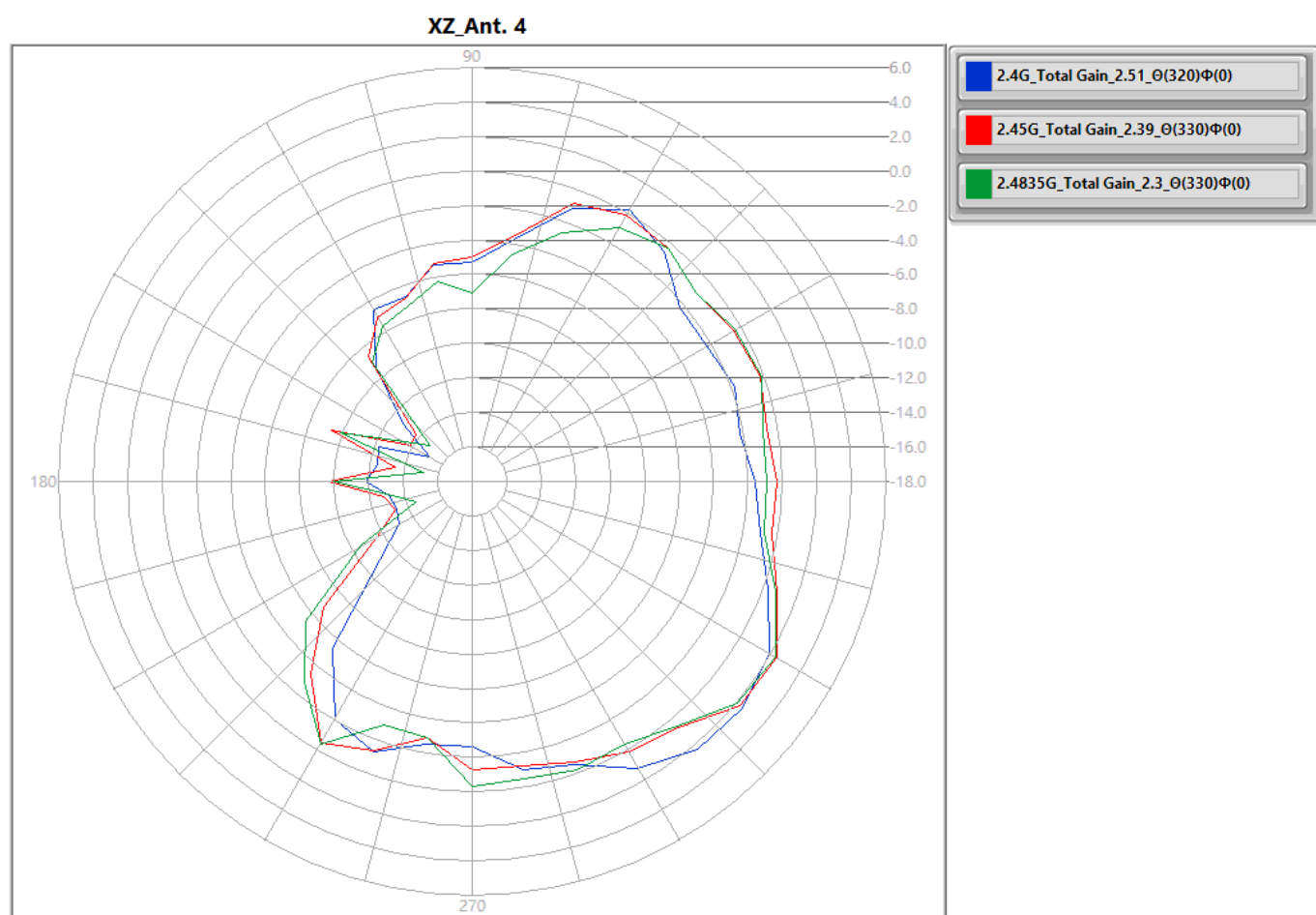
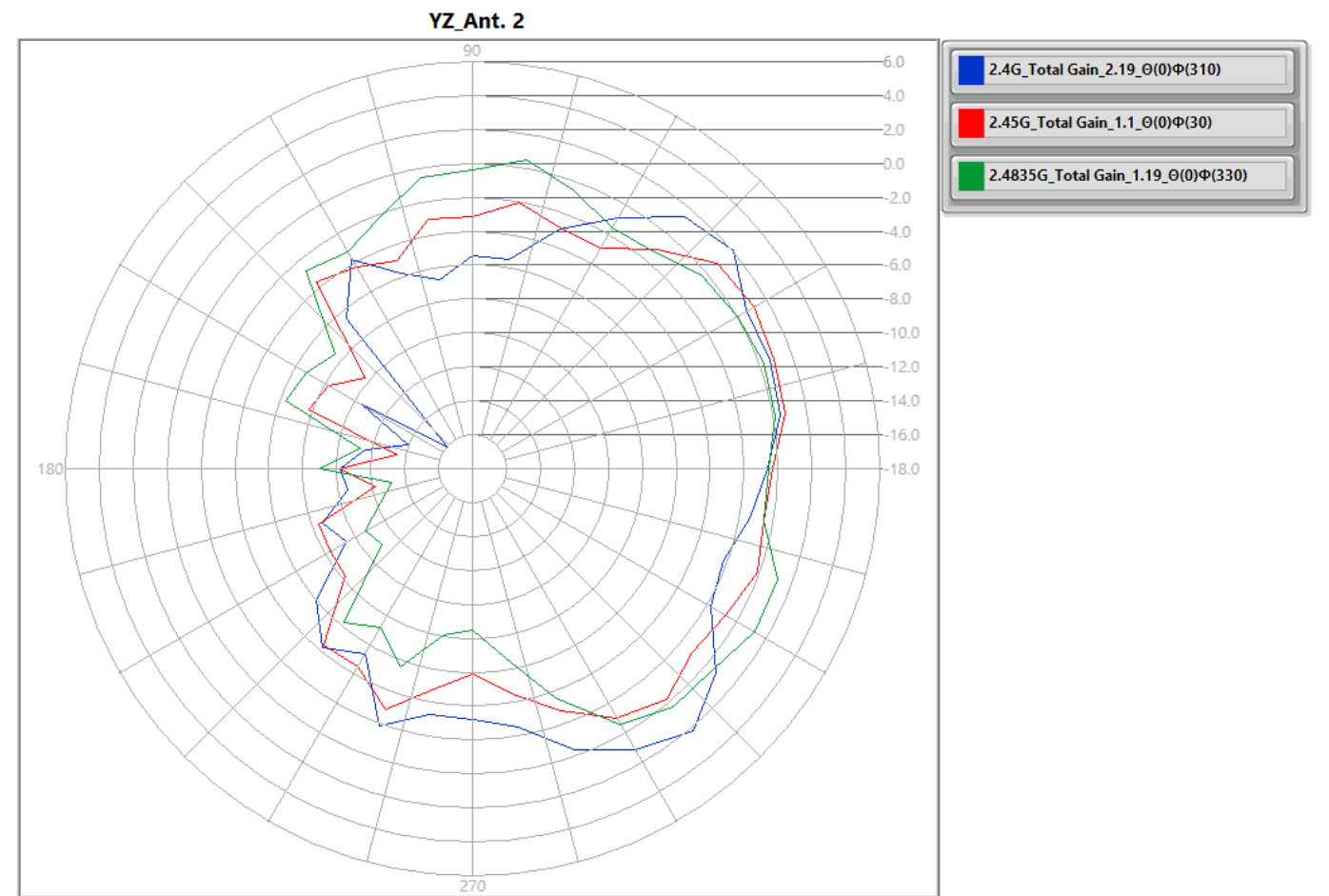
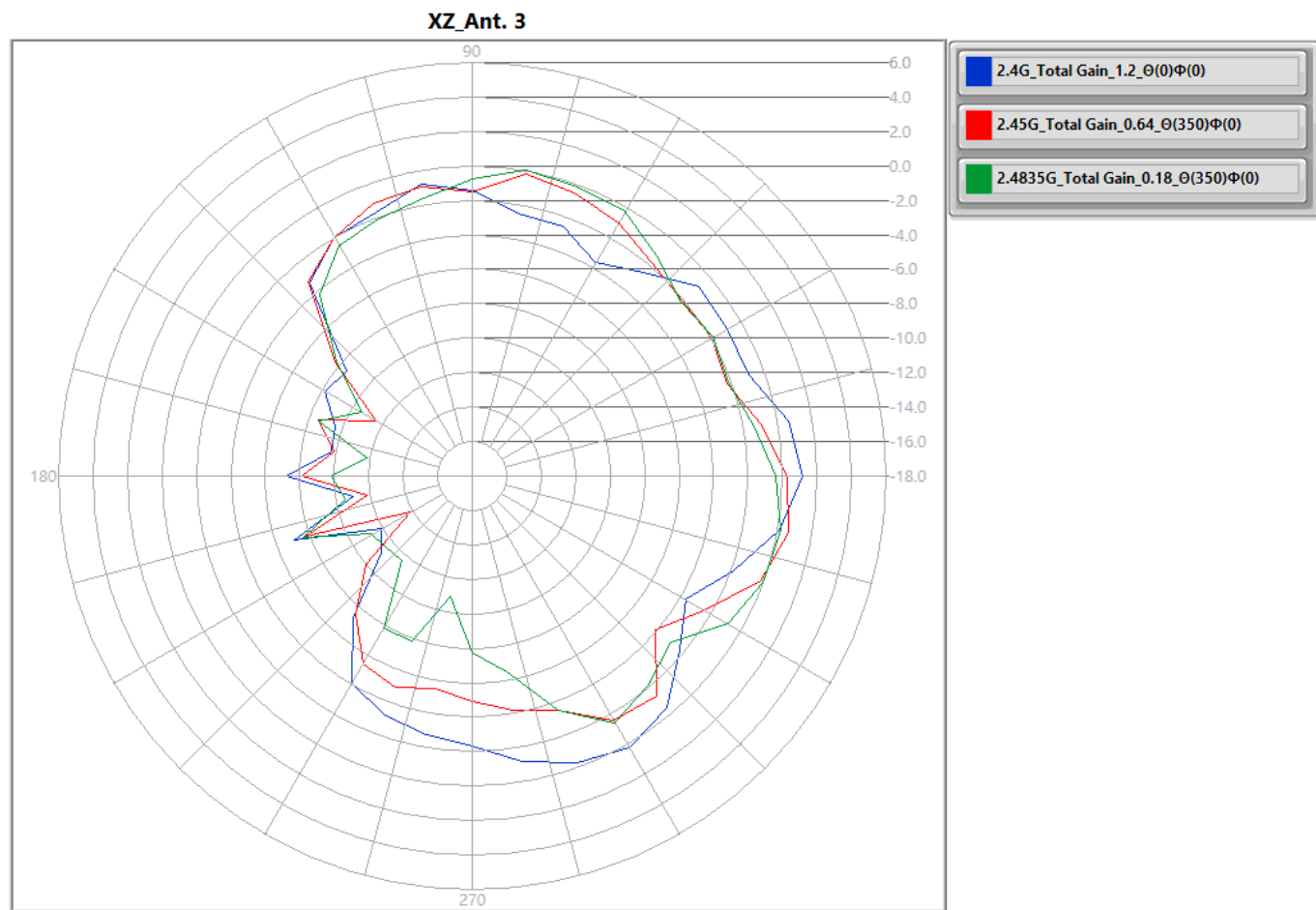
θ(60°)	-3.45/-3.24	-1.06/0.06	0.42/0.34	-1.79/-3.59	-2.38/-1.57	-2.20/-2.29	-0.88/0.55	1.68/3.24	3.12/1.08	-1.47/-3.92	-1.67/1.19	2.38/1.83	0.52/-0.48	-0.85/-0.58	-0.25/-0.88	-1.58/-0.36	0.01/-0.79	-1.84/-3.18
θ(70°)	-4.72/-2.99	-0.98/-0.51	-0.21/-0.08	-2.45/-4.31	-1.97/-0.56	-1.25/-1.38	-0.40/0.75	2.02/3.34	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	1.04/2.37	2.53/0.35	-2.09/-5.01	-5.45/-2.59	-0.97/0.69	0.98/-1.35	-3.79/-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	-4.74/-5.39	-8.72/-5.43	-6.39/-5.16	-7.34/-6.47	-5.75/-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	0.46/3.08	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	-3.71/-3.24	-3.39/-3.46	-5.45/-4.37	-10.06/-10.96	-5.55/-6.49	-4.77/-9.56	-5.67/-6.92				
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	-8.75/-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	-7.27/-7.12	-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	1.72/2.05	1.72/2.05	-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/-1.54	-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	-6.39/-8.20	-1.97/-1.32	-3.29/-3.00	-1.97/-1.73	-2.25/-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 $\Theta(0-180)\Phi(270)$







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/-3.40	-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	0.180/0.37	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	-5.99/-3.42	-3.10/-3.65	-1.62/-1.82	1.99/0.71	-7.14/-1.78	1.65/0.71	-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	-1.33/-1.46	-1.33/-1.46	-1.05/-1.08
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	-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	0.95/0.34	0.82/1.53	0.95/0.34	0.52/0.80	0.28/0.26	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	2.83/2.27	2.82/0.86	0.77/-1.77	-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	-6.46/-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	-6.87/-6.63	-5.69/-2.91	-1.39/-2.39	-5.12/-9.32	-3.42/-4.10	-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	-8.17/-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	-9.13/-8.86	-6.44/-8.34	-10.09/-13.23	-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	-13.72/-12.46	-11.47/-9.36	-15.00/-13.68	-13.44/-14.72	-11.74/-13.26	-15.00/-15.26	-11.94/-12.23	-14.77/-14.99	-7.72/-7.88	
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	-1.45/-1.46	-0.50/-6.20	-5.09/-6.20	-4.72/-4.92	-4.95/-5.12	-5.69/-6.27	-3.84/-4.32	-4.20/-4.29	-5.59/-6.27	-6.63/-6.41		
Θ(20°																		



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	-3.13/-5.16	-2.05/-0.36	-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/-5.69
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/-1.42
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	-0.10/0.86	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/-1.28	-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/-12.49	-8.13/-13.36	-9.10/-14.51	-13.73/-11.05	-14.28/-9.88	-4.91/-10.45	-13.73/-11.05	-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	-13.00/-13.63	-10.50/-13.77	-11.80/-15.03	-8.55/-6.68	-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	-15.76/-13.18	-12.08/-15.45	-12.63/-14.20	-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/-13.36	-14.04/-13.36	-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	-0.61/0.16	-1.68/-1.87	0.06/-1.6	-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	-0.59/-2.53	-2.98/-1.09	-6.19/-1.45	-2.98/-1.09	-2.98/-1.09	-2.98/-1.09	-2.98/-1.09	-2.98/-1.09	-2.98/-1.09	-2.98/-1.09	-2.98/-1.09	-2.98/-1.09	-2.98/-1.09	-2.98/-1.09
θ(70°)	2.36/2.60	2.28/2.21	1.58/-1.28	-0.18/-1.0	-1.31/-0.71	-2.88/-0.58	-1.17/-0.65	-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/-9.40	-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	-2.91/-2.16	-1.83/-4.89	-5.93/-2.04	-4.75/-4.73	-1.75/-2.09	-3.48							



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/-3.33	-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	-1.19/-1.27	-1.48/-1.21	-1.48/-1.21	-0.88/-0.92	-0.22/-0.73	-1.40/-1.33	-0.44/-0.50	-1.01/-0.91	-1.01/-0.91	-0.43/-0.75	-0.43/-0.75
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/-1.55	-3.93/-3.68	-3.09/-3.05	-3.65/-3.32	-3.14/-2.86	-3.72/-4.00	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	-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	0.15/0.19	-0.42/-0.94	-0.75/-0.62	-0.12/0.02	-0.75/-0.62	-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/-0.45	-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	-1.39/-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	-14.11/-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 $\Theta(0-180)\Phi(270)$

