



Antenna Composite Gain Test Report

FCC ID	MSQ-RTBE6X00
Equipment	BE30000 Quad Band WiFi Router
Brand Name	ASUS
Model Name	BQ16 Pro
Applicant	ASUSTeK COMPUTER INC. 1F., No. 15, Lide Rd., Beitou, Taipei City 112, Taiwan
Sample Received	Jul. 31, 2023
Start Test Date	Aug. 22, 2023
Final Test Date	Aug. 23, 2023

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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History of this test report

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1. Operation Mode and Antenna Information

Antenna Position	RF Port	Brand Name	Model Name	Ant. Type	Connector	Modes of Operation
2G5G Ant1	1	Walsin	RFDPA220510IMLB901	Dipole	I-PEX	2.4GHz, 5GHz UNII 1~3
2G5G Ant2	2	Walsin	RFDPA220513IMLB901	Dipole	I-PEX	2.4GHz, 5GHz UNII 1~3
2G5G Ant3	3	Walsin	RFPCA180916IMLB901	Dipole	I-PEX	2.4GHz, 5GHz UNII 1~3
2G5G Ant4	4	Walsin	RFPCA251813IMLB901	Dipole	I-PEX	2.4GHz, 5GHz UNII 1~3
6GL Ant1	3	Walsin	RFDPA100504IM6B901	Dipole	I-PEX	6GHz UNII 5~6
6GL Ant2	2	Walsin	RFDPA100514IM6B901	Dipole	I-PEX	6GHz UNII 5~6
6GL Ant3	1	Walsin	RFDPA100509IM6B901	Dipole	I-PEX	6GHz UNII 5~6
6GL Ant4	4	Walsin	RFDPA100507IM6B901	Dipole	I-PEX	6GHz UNII 5~6
6GH Ant1	2	Walsin	RFDPA100506IM6B901	Dipole	I-PEX	6GHz UNII 7~8
6GH Ant2	1	Walsin	RFDPA100506IM6B902	Dipole	I-PEX	6GHz UNII 7~8
6GH Ant3	3	Walsin	RFDPA100505IM6B901	Dipole	I-PEX	6GHz UNII 7~8
6GH Ant4	4	Walsin	RFDPA100512IM6B901	Dipole	I-PEX	6GHz UNII 7~8

Note:

2.4GHz and 5GHz Operation Mode (4TX/4RX)

2G5G Ant1~4 can be used as transmitting/receiving antenna.

2G5G Ant1~4 could transmit/receive simultaneously.

6GHz Operation Mode (4TX/4RX)

For UNII 5~6

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

6GL Ant1~4 could transmit/receive simultaneously.

For UNII 7~8

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

6GH Ant1~4 could transmit/receive simultaneously.



2. Test Frequency

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

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

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	23.5-24.5 / 40-50	Aug. 22, 2023 ~ Aug. 23, 2023

Note:

Testing Site Information

Brand Name: TDK

Dimension: 11m*6m*6m

Characteristic: Fully Anechoic Chamber

4. Test Facility and Configuration

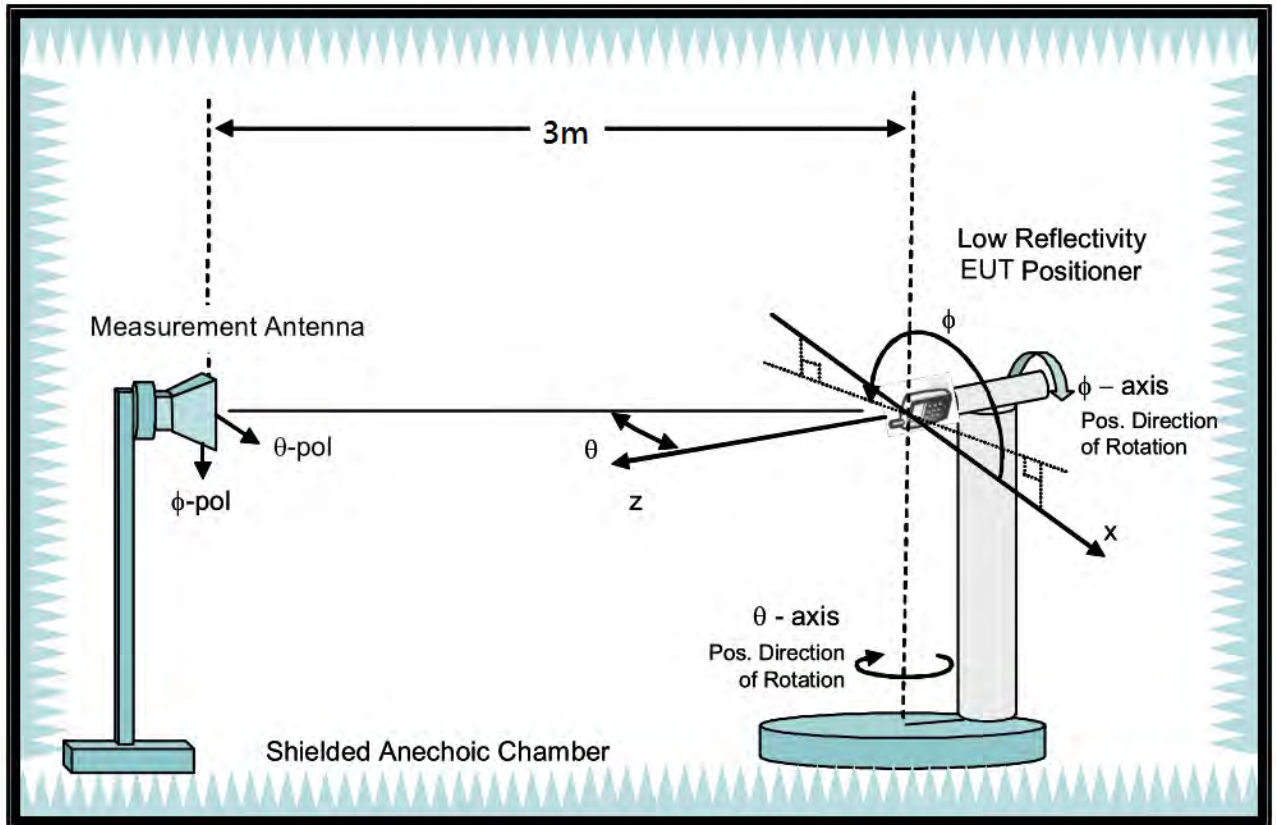
Test configuration: Reference to CITA OTA distributed-axes system configuration.

Chamber: Fully Anechoic Chamber.

Measurement antenna: Dual Polarization Horn antenna

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

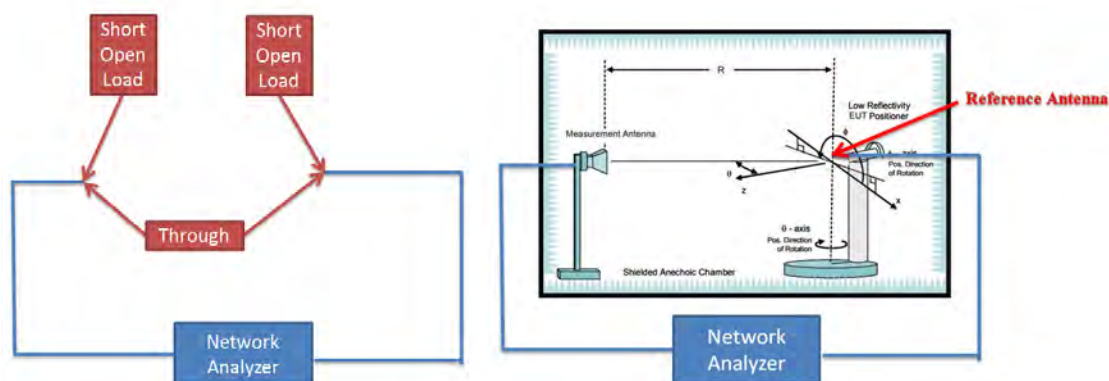
#Reference to CTIA "ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1"



5. Reference Calibration

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

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



Frequency (MHz)	2400	2450	2500	5150	5200	5300	5600	5750	5800	5900	6000	6500	7000	7200
G(theta) reading (dB)	-33.75	-33.64	-32.91	-32.21	-32.45	-32.33	-32.57	-32.94	-32.78	-33.35	-32.91	-33.81	-34.54	-35.64
G(phi) reading (dB)	-33.19	-32.12	-32.48	-32.51	-32.64	-31.68	-32.24	-32.45	-32.45	-32.85	-32.45	-33.62	-34.48	-35.24
Reference gain (dBi)	10	10.4	10.6	12.3	12.5	13.3	13.3	13.2	13.1	13	13.2	12.4	11.8	11.1
Factor(theta) (dB)	43.75	44.04	43.51	44.51	44.95	45.63	45.87	46.14	45.88	46.35	46.11	46.21	46.34	46.74
Factor(phi) (dB)	43.19	42.52	43.08	44.81	45.14	44.98	45.54	45.65	45.55	45.85	45.65	46.02	46.28	46.34

Note:

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

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

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

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



6. Test Method

EUT set on multi-axis positioner and adjust EUT's physical center to measurement reference center. Measurement antenna set at phi polarization and 1.5 meter height. Port 1 of Network analyzer connect to antenna 1 of EUT. Record G value every 7.5 degree from 0 to 352.5 degree on Phi angle and 0 to 180 on theta angle of multi-axis positioner. Then set measurement antenna to theta polarization and repeat process. Repeat process to each antenna of EUT.

DG steps:

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

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

7. Measured Values and Calculation of Maximum Gain Positions

For 2G5G Ant1~4:

DG_1SS max value position

Frequency (Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 (dBi)	-8.31	2.1	0.96	2.31	2.25
Ant. 2 (dBi)	-8.19	2.28	1.43	1.43	1.97
Ant. 3 (dBi)	2.8	-8.03	-10.13	-12.24	-18.53
Ant. 4 (dBi)	1.88	-5.04	-2.45	-4.4	-2.3
DG [1SS] (dBi)	4.6	4.94	4.51	4.43	4.7
Polarization	Phi	Theta	Theta	Theta	Theta
$\Theta(^{\circ})$	60	105	105	105	105
$\Phi(^{\circ})$	142.5	187.5	187.5	195	195

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

DG_1SS max value position calculation

Frequency (Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 [$10^{(G/20)}$]	$10^{(-8.31/20)}$	$10^{(2.1/20)}$	$10^{(0.96/20)}$	$10^{(2.31/20)}$	$10^{(2.25/20)}$
Ant. 2 [$10^{(G/20)}$]	$10^{(-8.19/20)}$	$10^{(2.28/20)}$	$10^{(1.43/20)}$	$10^{(1.43/20)}$	$10^{(1.97/20)}$
Ant. 3 [$10^{(G/20)}$]	$10^{(2.8/20)}$	$10^{(-8.03/20)}$	$10^{(-10.13/20)}$	$10^{(-12.24/20)}$	$10^{(-18.53/20)}$
Ant. 4 [$10^{(G/20)}$]	$10^{(1.88/20)}$	$10^{(-5.04/20)}$	$10^{(-2.45/20)}$	$10^{(-4.4/20)}$	$10^{(-2.3/20)}$
Ant. 1 [$10^{(G/20)}$] value	0.384	1.274	1.117	1.305	1.296
Ant. 2 [$10^{(G/20)}$] value	0.389	1.3	1.179	1.179	1.255
Ant. 3 [$10^{(G/20)}$] value	1.38	0.397	0.312	0.244	0.118
Ant. 4 [$10^{(G/20)}$] value	1.242	0.56	0.754	0.603	0.767
Sum All Antenna [Amax]	3.396	3.53	3.362	3.331	3.436
DG [$10^{\log(A_{max}^2/N_{ant})}$]	4.6	4.94	4.51	4.43	4.7

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



For 6GL Ant1~4:

DG_1SS max value position

Frequency (Hz)	6.175G	6.475G
Ant. 1 (dBi)	-2.95	-0.59
Ant. 2 (dBi)	-1.18	-7.88
Ant. 3 (dBi)	0.79	2.37
Ant. 4 (dBi)	-5.41	-5.01
DG [1SS] (dBi)	4.13	4.12
Polarization	Theta	Theta
$\Theta(^{\circ})$	60	135
$\Phi(^{\circ})$	45	262.5

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

DG_1SS max value position calculation

Frequency (Hz)	6.175G	6.475G
Ant. 1 [$10^{(G/20)}$]	$10^{(-2.95/20)}$	$10^{(-0.59/20)}$
Ant. 2 [$10^{(G/20)}$]	$10^{(-1.18/20)}$	$10^{(-7.88/20)}$
Ant. 3 [$10^{(G/20)}$]	$10^{(0.79/20)}$	$10^{(2.37/20)}$
Ant. 4 [$10^{(G/20)}$]	$10^{(-5.41/20)}$	$10^{(-5.01/20)}$
Ant. 1 [$10^{(G/20)}$] value	0.712	0.934
Ant. 2 [$10^{(G/20)}$] value	0.873	0.404
Ant. 3 [$10^{(G/20)}$] value	1.095	1.314
Ant. 4 [$10^{(G/20)}$] value	0.536	0.562
Sum All Antenna [Amax]	3.217	3.213
DG [$10 \cdot \log(A_{max}^2/N_{ant})$]	4.13	4.12

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 6GH Ant1~4:****DG_1SS max value position**

Frequency (Hz)	6.695G	6.995G
Ant. 1 (dBi)	0.54	-2.65
Ant. 2 (dBi)	-9.72	-1.51
Ant. 3 (dBi)	3.71	-0.16
Ant. 4 (dBi)	-9.56	-0.59
DG [1SS] (dBi)	4.23	4.84
Polarization	Theta	Theta
$\Theta(^{\circ})$	135	90
$\Phi(^{\circ})$	262.5	120

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

DG_1SS max value position calculation

Frequency (Hz)	6.695G	6.995G
Ant. 1 [$10^{(G/20)}$]	$10^{(0.54/20)}$	$10^{(-2.65/20)}$
Ant. 2 [$10^{(G/20)}$]	$10^{(-9.72/20)}$	$10^{(-1.51/20)}$
Ant. 3 [$10^{(G/20)}$]	$10^{(3.71/20)}$	$10^{(-0.16/20)}$
Ant. 4 [$10^{(G/20)}$]	$10^{(-9.56/20)}$	$10^{(-0.59/20)}$
Ant. 1 [$10^{(G/20)}$] value	1.064	0.737
Ant. 2 [$10^{(G/20)}$] value	0.327	0.84
Ant. 3 [$10^{(G/20)}$] value	1.533	0.982
Ant. 4 [$10^{(G/20)}$] value	0.333	0.934
Sum All Antenna [Amax]	3.256	3.494
DG [$10 \cdot \log(A_{\max}^2/N_{\text{ant}})$]	4.23	4.84

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

8. Summary of Test Result

For 2G5G Ant1~4:

Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	2.48	2.1	2.16	2.31	2.3
Ant. 2 Max Gain (dBi)	2.46	3.09	3.47	2.84	3.65
Ant. 3 Max Gain (dBi)	2.8	2.67	2.36	2.36	2.39
Ant. 4 Max Gain (dBi)	2.04	2.15	2.42	2.5	2.01
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/105/157.5	Theta/105/187.5	Theta/90/60	Theta/105/195	Theta/105/202.5
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/105/225	Theta/120/277.5	Theta/120/277.5	Theta/97.5/315	Theta/120/277.5
Ant. 3 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/60/142.5	Phi/90/165	Phi/90/165	Phi/90/97.5	Phi/97.5/90
Ant. 4 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/67.5/127.5	Theta/82.5/202.5	Theta/82.5/210	Theta/75/172.5	Theta/75/172.5
Max Gain (dBi)	2.8	3.09	3.47	2.84	3.65
DG [1SS] (dBi)	4.6	4.94	4.51	4.43	4.7
DG [2SS] (dBi)	2.8	3.09	3.47	2.84	3.65
DG [4SS] (dBi)	2.8	3.09	3.47	2.84	3.65

For 6GL Ant1~4:

Frequency (Hz)	6.175G	6.475G
Ant. 1 Max Gain (dBi)	1.72	1.94
Ant. 2 Max Gain (dBi)	1.68	1.96
Ant. 3 Max Gain (dBi)	2.77	2.37
Ant. 4 Max Gain (dBi)	2.08	1.77
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/82.5/187.5	Phi/97.5/157.5
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/165/127.5	Theta/157.5/217.5
Ant. 3 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/135/262.5	Theta/135/262.5
Ant. 4 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/60/172.5	Theta/37.5/180
Max Gain (dBi)	2.77	2.37
DG [1SS] (dBi)	4.13	4.12
DG [2SS] (dBi)	2.77	2.37
DG [4SS] (dBi)	2.77	2.37

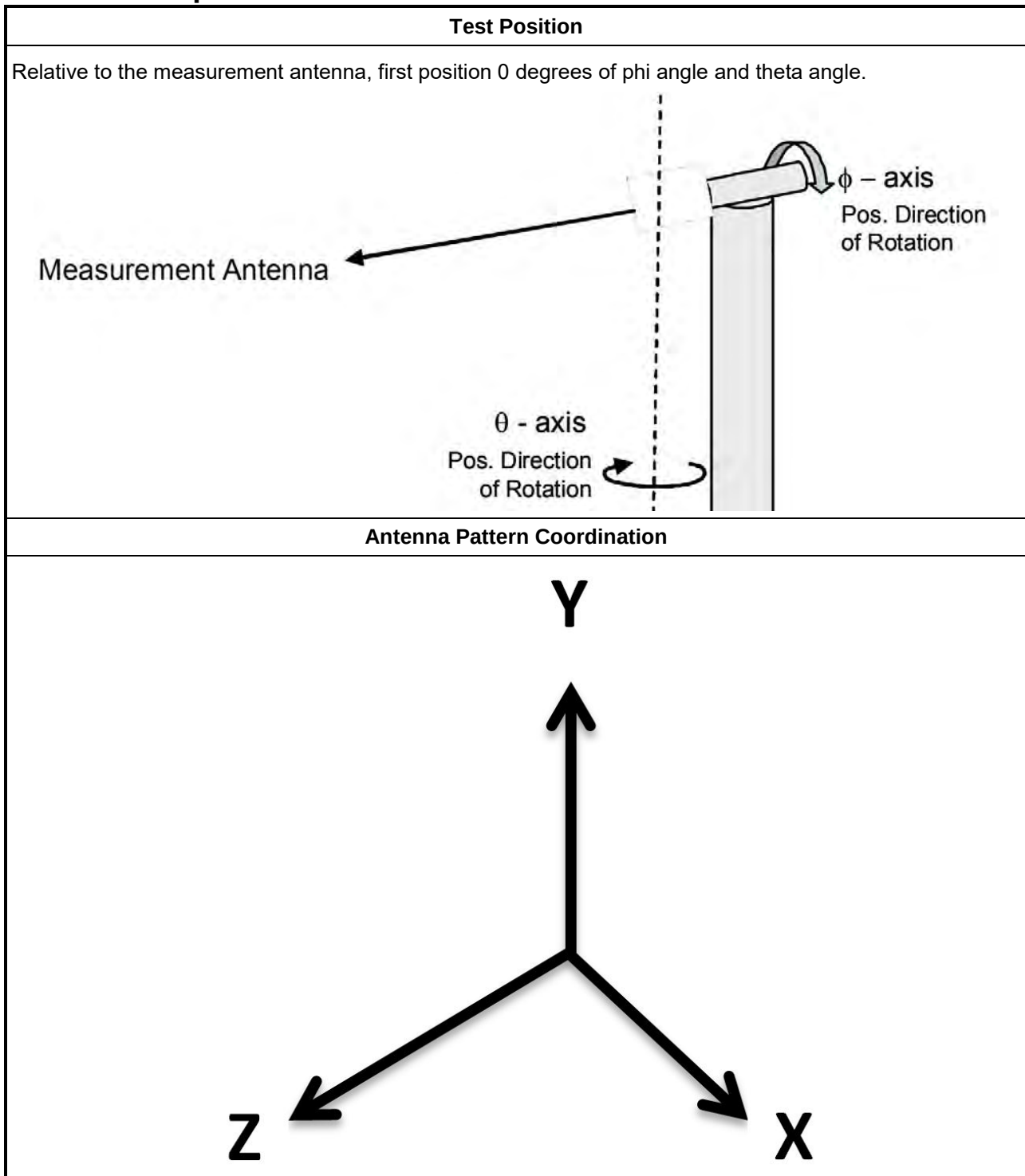
For 6GH Ant1~4:

Frequency (Hz)	6.695G	6.995G
Ant. 1 Max Gain (dBi)	2.27	1.82
Ant. 2 Max Gain (dBi)	1.52	1.7
Ant. 3 Max Gain (dBi)	3.71	3.4
Ant. 4 Max Gain (dBi)	2.11	2.23
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/75/180	Theta/112.5/217.5
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/60/345	Theta/97.5/270
Ant. 3 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/135/262.5	Theta/135/262.5
Ant. 4 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/37.5/157.5	Theta/37.5/172.5
Max Gain (dBi)	3.71	3.4
DG [1SS] (dBi)	4.23	4.84
DG [2SS] (dBi)	3.71	3.4
DG [4SS] (dBi)	3.71	3.4

Note:

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

9. Test Setup



Note:

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

**10. Test Equipment and Calibration Data**

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1543	1GHz~18GHz	May 11, 2023	May 10, 2024
Dual Polarization Horn Antenna	Sporton	S0209DP	S0209DP-001	2GHz~9GHz	N.C.R.	N.C.R.
ENA Series Network Analyzer	AGILENT	E5071C	MY46419477	100kHz~8.5GHz	Jul. 28, 2023	Jul. 27, 2024
VNA Calibration Kit	TS RF	TS85033E-F	-	DC~9GHz	N.C.R.	N.C.R.
Multi-axis positioner	Sporton	MAPS01	MAPS01-001	Theta / Phi axis	N.C.R.	N.C.R.
Test Software	SPORTON	SENSE-RDG	V1.0.8	-	N.C.R.	N.C.R.

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

NCR means Non-Calibration required.



11. Test Results

Please refer to the appendix.

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Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	2.48	2.1	2.16	2.31	2.3
Ant. 2 Max Gain (dBi)	2.46	3.09	3.47	2.84	3.65
Ant. 3 Max Gain (dBi)	2.8	2.67	2.36	2.36	2.39
Ant. 4 Max Gain (dBi)	2.04	2.15	2.42	2.5	2.01
Ant. 1 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/105/157.5	Theta/105/187.5	Theta/90/60	Theta/105/195	Theta/105/202.5
Ant. 2 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/105/225	Theta/120/277.5	Theta/120/277.5	Theta/97.5/315	Theta/120/277.5
Ant. 3 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Phi/60/142.5	Phi/90/165	Phi/90/165	Phi/90/97.5	Phi/97.5/90
Ant. 4 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Phi/67.5/127.5	Theta/82.5/202.5	Theta/82.5/210	Theta/75/172.5	Theta/75/172.5
Max Gain (dBi)	2.8	3.09	3.47	2.84	3.65
DG [1SS] (dBi)	4.6	4.94	4.51	4.43	4.7
DG [2SS] (dBi)	2.8	3.09	3.47	2.84	3.65
DG [4SS] (dBi)	2.8	3.09	3.47	2.84	3.65



Radiated Composite Gain of 2.4GHz and 5GHz UNII 1~3

Appendix A

DG 1SS Result

Freq(Hz)	2.45GPol.	PhiL	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+		
DG(dB)	Φ(0°)Φ(7.5°)	Φ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)
Θ(0°)	-1.25/-1.44	-1.56/-1.67	-1.87/-2.22	-2.53/-2.77	-2.94/-3.02	-2.79/-2.29	-1.85/-1.47	-0.99/-0.52	-0.22/-0.1	-0.1/-0.02	-0.1/-0.28	-0.69/-1.06	-1.21/-1.37	-1.63/-1.7	-1.65/-2.05	-2.27/-2.45	-2.11/-1.85	-1.71/-1.32	-0.95/-0.57	-0.56/-0.43	-0.42/-0.36	-0.51/-0.66	-0.78/-1.07	-1.24/-1.44
Θ(7.5°)	-1.92/-2.24	-2.31/-2.28	-2.97/-3.07	-3.07/-2.93	-3.07/-2.93	-2.59/-2.09	-1.44/-0.92	-0.59/-0.22	0.06/0.02	-0.04/-0.14	-0.41/-0.92	-1.31/-2.17	-1.03/-1.39	-1.48/-1.36	-1.27/-1.64	-1.79/-1.64	-1.98/-1.88	-1.56/-1.24	-0.98/-0.86	-0.79/-0.73	-0.69/-0.82	-0.91/-1.02	-1.51/-1.79	
Θ(15°)	-2.35/-2.76	-2.95/-2.86	-2.89/-3.14	-3.36/-3.38	-3.13/-2.91	-2.5/-1.74	-1.06/-0.73	-0.37/-0.12	0.06/0.07	-0.02/-0.17	-0.41/-0.51	-0.87/-1.01	-0.95/-0.99	-0.99/-1.05	-0.87/-0.85	-1.19/-1.39	-1.49/-1.58	-1.77/-1.96	-1.87/-1.56	-1.32/-1.26	-1.13/-0.9	-0.72/-0.69	-0.82/-1.11	-1.54/-1.97
Θ(22.5°)	-2.8/-3.14	-3.57/-3.5	-3.47/-3.66	-3.87/-3.85	-3.69/-3.46	-3.05/-2.41	-1.91/-1.47	-1.06/-0.81	-0.5/-0.36	-0.41/-0.56	-0.88/-1.31	-1.17/-1.54	-1.77/-1.5	-1.66/-1.29	-1.44/-1.32	-1.39/-1.48	-1.64/-1.71	-1.73/-1.76	-1.7/-1.53	-1.11/-0.68	-0.54/-0.28	-0.21/-0.25	-0.43/-0.84	-1.51/-2.16
Θ(30°)	-3.04/-3.74	-4.33/-4.38	-4.45/-4.67	-4.96/-5.12	-5.14/-4.74	-4.16/-3.27	-2.48/-1.94	-1.59/-1.23	-0.79/-0.39	-0.14/-0.12	-0.21/-0.51	-1.02/-1.3	-1.36/-1.8	-1.55/-1.76	-1.87/-2.14	-2.32/-2.24	-2.62/-2.72	-2.75/-2.35	-1.96/-1.54	-1.14/-0.04	-0.24/0.13	0.17/0.04	-0.33/-0.69	-1.51/-2.34
Θ(37.5°)	-3.65/-4.62	-5.23/-5.58	-5.77/-5.97	-6.42/-7.05	-7.08/-6.21	-4.83/-3.53	-2.43/-1.82	-1.34/-0.67	-0.05/0.6	0.86/0.74	0.34/-0.36	-0.75/-0.88	-1.53/-1.53	-2.07/-2.3	-2.83/-3.04	-3.38/-3.78	-3.85/-3.73	-3.41/-2.63	-1.82/-1.11	-0.64/-0.31	0.05/0.32	0.2/0.08	-0.21/-0.83	-1.63/-2.73
Θ(45°)	-4.31/-5.12	-5.78/-6.46	-6.42/-7.14	-8.36/-9.73	-9.68/-8.18	-5.96/-3.85	-2.36/-1.21	-0.19/0.51	1.23/1.82	2.28/3.32	2.03/1.5	0.84/0.27	-0.21/-0.66	-0.98/-1.38	-1.92/-2.57	-2.96/-3.8	-3.93/-3.73	-3.28/-2.6	-1.79/-1.06	-0.6/-0.41	-0.31/-0.11	0.05/-0.12	-0.56/-1.03	-1.91/-3.19
Θ(52.5°)	-4.07/-4.54	-4.89/-5.16	-6/-7.49	-8.83/-10.04	-9.34/-7.64	-5.75/-3.69	-1.81/-0.23	1.06/1.89	2.48/2.83	3.21/3.04	2.37/1.39	0.89/0.39	-0.07/-0.59	-1.18/-1.67	-2.33/-2.62	-3.48/-4.11	-4.26/-4.27	-4.31/-3.73	-2.68/-1.89	-1.54/-1.56	-1.69/-1.48	-1.23/-1.36	-1.95/-2.44	-2.92/-3.4
Θ(60°)	-2.91/-3.14	-3.57/-4.41	-5.5/-7.14	-7.74/-6.83	-5.67/-4.4	-3.25/-2.07	-0.96/0.2	1.41/2.41	3.14/3.57	3.84/4.6	3.19/2.28	1.14/0.21	-0.48/-1.18	-1.46/-1.72	-1.98/-2.75	-3.39/-3.34	-3.4/-3.35	-3.01/-2.08	-0.84/-0.01	0.4/0.37	-0.11/-0.63	-0.13/-1.51	-2.1/-2.47	-2.7/-2.81
Θ(67.5°)	-4.05/-4.79	-5.59/-6.72	-7.96/-9.97	-8.71/-6.54	-4.59/-2.82	-1.6/-0.87	-0.38/0.14	1.02/1.95	2.73/2.79	2.41/-7.6	0.97/-0.16	-0.84/-0.84	-0.89/-0.98	-1.41/-1.92	-2.08/-2.35	-2.85/-3.06	-2.52/-1.77	-0.45/0.71	1.51/1.95	2.13/1.99	1.24/0.45	-0.2/-0.57	-1.24/-1.25	-2.76/-3.33
Θ(75°)	-3.43/-3.88	-4.38/-5.03	-6.07/-7.08	-7.62/-7.07	-5.43/-3.29	-1.74/-0.88	-0.36/0.11	0.64/1.32	2.12/2.69	2.81/2.56	1.91/1.12	0.56/0.25	0.09/-0.15	-0.72/-1.62	-2.79/-4.09	-4.05/-4.38	-4.54/-3.24	-1.47/-0.09	0.74/1.1	0.99/0.46	-0.53/-1.46	-1.94/-2.19	-2.48/-2.89	-3.11/-3.09
Θ(82.5°)	-3.09/-2.93	-3.37/-4.17	-5.41/-6.32	-6.13/-5.61	-4.68/-2.94	-1.42/-0.47	0.13/0.62	1.11/1.4	1.91/2.51	2.65/2	0.89/-0.31	-1.12/-0.9	-0.97/-1.07	-1.67/-2.35	-2.85/-2.97	-3.45/-3.8	-3.86/-3.21	-2.11/-1.23	-0.5/0.1	0.41/0.45	0.19/0.11	-0.15/-0.07	-0.87/-2.13	-3.28/-3.48
Θ(90°)	-5.21/-4.52	-4.45/-5.1	-5.78/-5.74	-4.39/-3.64	-3.68/-3.17	-1.85/-0.77	-0.23/0.03	0.13/0.1	0.43/1.52	2.11/1.92	1.35/0.81	0.55/0.43	-0.46/-0.99	-1.29/-1.1	-1.27/-2.16	-3.85/-5.39	-3.6/-3.79	-7.11/-6.82	-6.46/-5.55	-5.2/-5.04	-3.83/-2.31	-1.41/-1.38	-2.28/-2.46	-6.99/-6.11
Θ(97.5°)	-4.95/-4.79	-5.08/-6.39	-7.25/-7.35	-5.62/-4.1	-3.43/-2.71	-1.64/-0.48	0.35/0.82	0.82/0.5	0.37/0.94	1.34/1.23	1.13/1.02	0.89/0.61	-0.19/-1.17	-1.54/-2.03	-2.72/-3.98	-4.47/-3.56	-2.03/-0.98	-0.41/-0.22	-0.55/-1.14	-1.92/-3.08	-2.39/-1.04	-0.82/-1.7	-3.23/-4.86	-6/-5.78
Θ(105°)	-5.44/-5.32	-6.48/-8.2	-8.34/-7.03	-5.36/-4.94	-5.26/-5.39	-4.24/-2.53	-1.16/-0.29	0.10/1.9	0.35/0.44	0.37/0.27	0.33/-0.24	-0.87/-1.38	-1.66/-1.51	-1.89/-2.57	-3.32/-3.75	-3.92/-3.27	-2.17/-1.22	-0.36/-0.13	-0.42/-1.42	-2.94/-3.2	-1.76/-0.98	-0.95/-2.27	-5.03/-7.26	-7.04/-5.95
Θ(112.5°)	-3.88/-3.32	-4/-5.4	-6.58/-5.19	-3.8/-3.03	-2.96/-3.25	-3.22/-2.7	-1.92/-1.3	-0.77/-0.35	0.05/-0.11	-0.30/1.3	-0.02/-0.68	-1.73/-2.48	-2.46/-2.18	-2.32/-3.01	-2.25/-2.45	-2.68/-0.9	0.31/0.88	1.04/0.88	0.49/-0.18	-1.34/-2.1	-1.67/-1.1	-0.82/-2.22	-5.59/-8.49	-7.73/-5.06
Θ(120°)	-4.45/-3.47	-3.43/-4.2	-5.51/-5.68	-4.64/-3.58	-2.96/-2.34	-1.14/0.03	0.64/0.62	-0.12/-0.14	-1.44/-1.48	-1.22/-0.92	-0.58/-1.03	-2.02/-3.42	-3.42/-2.7	-2.54/-1.99	-1.53/-1.81	-2.82/-0.6	-0.04/0.64	0.93/1.15	1.23/0.71	-0.77/-1.8	-2.29/-2.19	-1.56/-4.29	-5.27/-8.52	-8.33/-5.57
Θ(127.5°)	-9.03/-7.1	-6.57/-4.95	-4.39/-3.4	-2.46/-1.68	-0.52/0.39	0.88/0.54	-0.53/-1.81	-2.46/-2.02	-1.16/-0.51	0/-0.31	-1.45/-3.21	-3.83/-3.28	-2.68/-2.13	-2.13/-2.68	-3.4/-2.26	-1.42/-0.99	-0.61/-0.63	-0.89/-1.71	-3.15/-4.67	-6.1/-4.5	-2.49/-2.23	-3.03/-4.64	-9.28/-9.88	
Θ(135°)	-7.32/-10.27	-11.43/-9.6	-6.46/-3.76	-2.5/-2.37	-2.75/-2.52	-2.28/-2.09	-2.31/-3.16	-4.29/-5.18	-5.75/-5.35	-4.34/-2.91	-1.97/-1.84	-2.45/-3.76	-5.19/-6.21	-5.91/-5.04	-4.44/-3.56	-1.85/-1.02	-1.32/-1.86	-2.42/-3	-3.55/-3.81	-3.63/-3.02	-2.18/-0.94	0.03/0.29	-0.4/-1.79	-3.45/-5.57
Θ(142.5°)	-6.85/-6.98	-11.58/-8.57	-4.79/-2.23	-0.93/-0.65	-0.93/-1.7	-1.87/-2.05	-2.01/-2.07	-2.29/-2.83	-4.09/-6.53	-7.05/-5.44	-4.8/-5.1	-5.59/-5.62	-6.58/-6.46	-6.23/-5.79	-5.03/-4.54	-3.8/-3.52	-3.94/-4.55	-4.93/-4.84	-4.14/-3.19	-2.37/-1.77	-1.3/-0.67	0.06/0.13	-0.3/-1.6	-3.66/-5.86
Θ(150°)	-7.67/-9.96	-8.39/-5.68	-3.64/-1.56	-0.48/-0.15	-0.44/-1.21	-1.97/-2.56	-3.13/-3.83	-3.86/-4.07	-4.83/-5.83	-6.58/-6.27	-5.92/-5.73	-5.69/-5.89	-6.22/-6.4	-5.82/-5.61	-5.93/-5.37	-7.12/-6.24	-5.53/-5.79	-5.75/-6.1	-5.63/-5.22	-2.94/-3.35	-2.99/-3.12	-3.62/-5.16	-7.04/-5.95	
Θ(157.5°)	-10.93/-10.52	-9/-6.86	-5.05/-3.79	-2.9/-2.45	-2.55/-3.01	-3.68/-4.55	-5.71/-6.47	-6.75/-7.61	-7.66/-7.55	-7.33/-6.86	-6.27/-6.71	-6.85/-7.48	-7.88/-7.36	-6.73/-5.79	-5.55/-5.11	-5.37/-5.5	-5.53/-5.4	-5.57/-5.21	-5.1/-5.14	-5.12/-5.27	-5.95/-6.45	-7.04/-7.85	-8.31/-9.18	-10.47/-10.53
Θ(165°)	-9.92/-10	-10.39/-9.51	-8.59/-6.97	-7.27/-7.07	-6.81/-7.04	-7.29/-7.26	-7.03/-7	-7.19/-6.8	-6.71/-6.72	-6.7/-6.75	-7.16/-7.66	-8.43/-8.87	-8.46/-7.68	-7.11/-6.68	-5.88/-4.39	-3.86/-3.49	-3.34/-3.45	-3.76/-4.26	-4.91/-5.57	-6.33/-7.28	-8.03/-8.52	-9.6/-9.8	-9.28/-8.78	-8.57/-8.46
Θ(172.5°)	-7.23/-8.82	-6.54/-6.62	-10.93/-11.58	-10.57/-10.28	-9.71/-8.08	-7/-6.04	-5.38/-5	-5.09/-5.17	-5.39/-5.71	-5.68/-6.51	-6.81/-7.76	-8.8/-9.2	-7.71/-7.05	-6.06/-5.21	-4.63/-4.33	-4.08/-4.07	-4.14/-4.5	-6.4/-6.85	-6.99/-7.16	-7.03/-6.88	-6.37/-6.09	-6.11/-6.41		
Θ(180°)	-7.16/-7.94	-8.69/-9.12	-9.52/-9.56	-9.35/-8.24	-7.25/-6.16	-5.39/-5.04	-4.54/-4.54	-4.59/-4.54	-4.74/-5.11	-5.51/-5.74	-5.89/-6.29	-6.51/-6.93	-7.57/-7.97	-8.14/-8.12	-7.61/-6.56	-5.92/-5.36	-5.28/-4.94	-4.74/-4.37	-4.24/-4.46	-5/-5.44	-5.64/-5.36	-5.3/-5.18	-5.17/-5.34	-5.73/-6.41
Freq(Hz)	2.45GPol.	ThetaL	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
DG(dB)	Φ(0°)Φ(7.5°)	Φ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)
Θ(0°)	-1.95/-1.6	-1.38/-1.22	-1.14/-1.05	-1.09/-1.23	-1.24/-1.22	-1.34/-1.53	-1.88/-2.12	-2.43/-2.86	-3.45/-4.03	-4.51/-4.75	-4.54/-3.87	-3.13/-2.72	-2.43/-2.2	-2.02/-1.81	-2.5/-1.74	-2.44/-1.99	-2.18/-2.37	-2.9/-2.97	-3.06/-3.36	-3.77/-4.18	-4.39/-4.35	-4.2/-4.02	-3.68/-3.09	-2.45/-1.95
Θ(7.5°)	-1.72/-1.49	-1.27/-1.14	-1.14/-1.07	-1.27/-1.4	-1.48/-1.58	-1.56/-1.79	-2.06/-2.39	-2.71/-3.15	-3.66/-4.11	-4.5/-4.71	-4.53/-3.84	-3.35/-2.95	-2.71/-2.38	-2.32/-2.01	-2.97/-1.92	-2.31/-2.54	-2.75/-2.67	-2.8/-2.96	-3.05/-3.2	-3.53/-3.91	-4.11/-4.19	-4.12/-3.93	-3.54/-2.94	-2.32/-1.87
Θ(15°)	-1.61/-1.46	-1.29/-1.22	-1.32/-1.45	-1.64/-1.69	-1.82/-1.74	-1.47/-1.41	-1.54/-1.8	-2.05/-2.33	-2.63/-2.9	-3.2/-3.48	-3.15/-3.19	-3.21/-3.08	-2.96/-2.91	-3.78/-3.87	-3.41/-3.1	-2.9/-2.71	-2.69/-2.78	-3.27/-3.02	-3.27/-3.55	-3.83/-3.93	-3.82/-3.56	-3.14/-2.6	-2.05/-1.7	
Θ(22.5°)	-1.61/-1.54	-1.53/-1.61	-1.94/-2.2	-2.07/-1.73	-1.49/-1.33	-0.93/-0.75	-0.84/-1.1	-1.39/-1.65	-1.89/-2.12	-2.27/-2.36	-2.47/-2.43	-2.42/-2.49	-2.72/-2.92	-3.07/-3.67	-3.5/-3.8	-4.1/-4.18	-3.92/-3.67	-3.35/-3.02	-2.87/-3.01	-3.3/-3.6	-3.81/-3.93	-3.73/-3.29	-2.88/-2.44	-2.03/-1.7
Θ(30°)	-1.63/-1.65	-1.84/-2.09	-2.29/-2.27	-2.06/-1.7	-1.37/-1.25	-0.9/-0.66	-0.68/-0.88	-1.18/-1.45	-1.56/-1.44	-1.16/-0.85	-0.61/-0.53	-0.49/-0.59	-0.87/-1.23	-1.69/-2.18	-2.76/-3.36	-4.03/-4.17	-4.4/-4.54	-4.39/-3.66	-2.94/-2.66	-2.76/-3.04	-3.35/-3.44	-2.92/-2.28	-1.89/-1.82	-1.8/-1.7
Θ(37.5°)	-1.65/-1.78	-2.17/-2.46	-2.46/-2.31	-2.21/-1.88	-1.63/-1.64	-1.37/-1.07	-1.05/-1.26	-1.54/-1.52	-1.31/-0.93	-0.34/0.32	0.93/1.29	1.39/1.25	0.98/0.57	0.06/-0.56	-1.06/-1.53	-2.19/-2.96	-3.61/-3.96	-3.93/-3.59	-2.96/-2.12	-2.46/-2.11	-2.48/-2.69	-2.44/-1.61	-1.11/-1.09	-1.34/-1.58
Θ(45°)	-1.63/-1.88	-2.3/-2.49	-2.24/-2.02	-2/-2.26	-2.04/-1.9	-1.64/-1.37	-1.31/-1.25	-1.16/-1.23	-0.95/-0.76	-0.34/0.45	1.42/2.05	2.33/2.33	2.14/1.84	1.47/1.03	0.57/-0.01	-0.79/-1.47	-2.24/-2.82	-3.17/-3.53	-3.65/-3.28	-2.68/-2.31				



Radiated Composite Gain of 2.4GHz and 5GHz UNII 1~3

Appendix A

Θ(22.5°)	-3.76/-5.14	-7.45/-8.68	-8.37/-7.06	-5.99/-5.3	-5.27/-4.89	3.91/-3.86	-3.26/-2.9	-2.15/-1.52	-1.07/-0.93	-0.91/-1.31	-2.12/-2.81	-3.72/-3.71	-3.5/-3.3	-3.37/-4.06	-4.8/-5.4	-5.41/-5.15	-4.72/-4.33	-3.22/-2.11	-1.47/-1.21	-1.19/-1.22	-1.03/-0.85	-0.8/-0.71	-0.96/-1.53	-2.23/-2.77
Θ(30°)	-6.1/-7.76	-9.13/-9.21	-8.41/-7.09	-7.19/-6.56	-6.82/-6.13	-4.83/-3.82	-2.76/-2.17	-1.82/-1.72	-1.73/-1.68	-1.55/-1.67	-2.34/-3.4	-4.4/-5.16	-5.35/-4.18	-3.65/-4.07	-4.53/-4.61	-4.17/-3.75	-3.25/-3.04	-2.53/-2.14	-1.74/-1.35	-0.93/-0.76	-1.17/-1.43	-1.8/-1.43	-1.78/-1.9	-2.85/-4.45
Θ(37.5°)	-7.13/-8.6	-10.27/-10.7	-10.39/-10.39	-10.26/-8.18	-5.99/-4.29	-2.99/-2	-1.52/-1.61	-1.83/-1.61	-1.32/-1.06	-0.96/-0.65	-1.42/-2.84	-3.97/-5.65	-5.33/-4.16	-3.73/-3.7	-3.67/-3.29	-2.84/-2.54	-3.4/-49	-3.15/-2.44	-1.77/-1.46	-1.78/-1.84	-1.25/-1.03	-1.39/-1.63	-2.13/-2.77	-3.81/-5.41
Θ(45°)	-6.03/-7.07	-8.65/-9.83	-8.97/-6.02	-3.63/-2.88	-2.43/-1.91	-1.65/-2	-2.16/-2.37	-2.39/-2.13	-2.27/-2.26	-1.94/-1.49	-1.28/-1.75	-2.49/-4.05	-4.77/-4.8	-4.3/-4.5	-4/-2.87	-2.59/-2.84	-2.29/-1.13	-0.8/-1.16	-0.98/-0.72	-0.64/-0.44	-0.54/-0.74	-1.41/-1.94	-2.3/-3.49	-4.52/-5.69
Θ(52.5°)	-5.62/-7.42	-8.52/-8.13	-6.15/-5.05	-4.67/-3.83	-4.14/-3.97	-3.15/-1.73	-1.45/-1.76	-2.32/-2.37	-2.7/-3.08	-3.3/-2.8	-2.14/-2.13	-2.62/-3.7	-4.86/-4.89	-3.62/-2.58	-1.53/-1.71	-2.69/-2.33	-2.19/-2	-1.3/-0.46	-0.31/-0.42	-1.58/-1.89	-0.180.36	0.44/-0.27	-1.56/-3.74	-4.84/-5.47
Θ(60°)	-6.43/-7.23	-8.83/-7.95	-6.11/-5.16	-3.42/-3.22	-3.37/-2.92	-2.14/-1.09	-0.58/-0.57	-0.69/-1.37	-2.11/-2.43	-3.65/-4.17	-3.51/-2.15	-1.81/-2.25	-3.32/-4.25	-4.35/-2.63	-2.52/-2.98	-2.59/-3.42	-3.3/-2.94	-2.29/-1.6	-0.73/-0.74	-1.53/-1.95	-0.73/-0.74	-0.88/-0.6	-2.27/-3.71	-4.87/-5.33
Θ(67.5°)	-5.77/-6.93	-8.5/-8.58	-5.9/-4.49	-4.23/-5.8	-5.05/-4.17	-2.55/-0.97	-0.37/-0.45	-1.24/-2.5	-3.05/-2.91	-3.36/-3.18	-3.61/-2.41	-1.91/-2.04	-2.28/-2.72	-2.21/-1.38	-1.19/-0.84	-1.58/-1.57	-2.14/-2.76	-3.08/-2.1	-1.82/-1.45	-1.19/-2.05	-2.43/-1.74	-0.16/-0.45	-1.59/-2.87	-3.59/-4.93
Θ(75°)	-5.83/-7.74	-9.85/-8.7	-4.7/-3.61	-4.02/-6.48	-5.39/-4.42	-2.66/-0.74	-0.07/-0.59	-1.77/-2.5	-3.02/-3.14	-1.88/-1.6	-2.22/-2.08	-2.15/-2.27	-1.88/-1.6	-2.35/-2.54	-2.43/-1.7	-1.59/-1.05	-2.3/-2.77	-2.64/-2.54	-1.9/-1.68	-1.59/-1.21	-1.91/-3.69	-2.97/-1.59	-1.89/-3.86	-4.37/-5.14
Θ(82.5°)	-6.58/-9.57	-11.96/-9.68	-6.57/-5.36	-4.84/-5.06	-4.53/-3.44	-1.99/0.03	0.830.54	-0.66/-2.67	-3.25/-3.49	-2.56/-1.4	-0.86/-0.76	-0.93/-1.9	-2.54/-1.65	-0.55/-1.47	-1.01/-2.14	-4.21/-3.08	-2.32/-2.48	-2.79/-3.98	-3.27/-2.37	-2.39/-2.45	-2.3/-2.45	-2.21/-2.47	-3.8/-5.85	
Θ(90°)	-7.83/-9.32	-10.31/-7.89	-4.8/-3.68	-4.82/-4.48	-4.22/-3.02	-1.5/-0.59	0.390.95	0.19/-1.31	-3.01/-2.68	-1.7/-1.47	-1.05/-0.38	0.16/-1.02	-2.04/-2.45	-1.83/-2.2	-3.67/-3.75	-3.33/-4.01	-4.58/-4.11	-3.48/-2.89	-3.12/-1.66	-2.42/-3.51	-3.05/-1.63	-0.6/-0.63	-1.68/-3.4	-5.33/-6.02
Θ(97.5°)	-5.71/-6.29	-5.78/-6.46	-6.76/-7.19	-9.16/-8.44	-4.82/-3.49	-2.95/-0.73	-0.45/-0.94	-1.48/-1.69	-2.53/-2.54	-1.46/-0.92	-1.26/-1.27	-1.29/-2.54	-2.76/-2.49	-3.48/-3.83	-5.31/-6.18	-6.63/-8.37	-8.41/-5.54	-4.47/-2.49	-1.61/-1.48	-1.31/-0.98	-1.35/-1.17	-0.28/-0.2	-1.06/-2.21	-4.92/-5.69
Θ(105°)	-3.39/-4.39	-6.07/-4.13	-4.01/-5.07	-6.85/-6.69	-5.14/-3.26	-2.12/-2.47	-3.03/-3.38	-3.28/-3.1	-2.99/-2.58	-1.85/-1.37	-1.9/-2.4	-2.68/-2.9	-2.38/-2.14	-2.97/-4.03	-4.88/-5.97	-6.52/-7.66	-7.62/-9.25	-6.23/-5.12	-4.3/-3.05	-3.25/-2.46	-1.53/-1.3	-2.12/-1.52	-1.92/-3.6	-4.91/-4.86
Θ(112.5°)	-6.18/-6.75	-6.24/-5.57	-4.74/-4.26	-4.74/-5.28	-4.42/-4.25	-4.44/-5.22	-5.08/-4.57	-3.62/-3.26	-3.41/-3.1	-1.2/-0.44	-1.05/-2.94	-3.81/-2.63	-1.95/-2.36	-4.71/-3.42	-3.34/-5.81	-5.76/-4.64	-6.51/-6.2	-6.35/-7.74	-4.57/-5.23	-4.95/-3.74	-1.99/-2.88	-2.59/-3.02	-4.24/-5.76	-7.6/-6.29
Θ(120°)	-6.06/-6.95	-7.7/-6.51	-5.25/-6.79	-8.86/-7.6	-5.2/-3.77	-3.38/-3	-3.87/-4.8	-6.25/-5.02	-2.48/-1.72	-1.78/-2.61	-1.86/-1.8	-2.79/-4.42	-3.79/-3.2	-5.16/-7.6	-5.75/-8.47	-5.39/-5.3	-7.5/-5.22	-5.35/-5.36	-2.41/-3.72	-2.77/-3.34	-5.16/-5.15	-4.81/-6.44	-6.69/-9.27	
Θ(127.5°)	-8.12/-6.94	-6.25/-5.55	-6.39/-4.47	-6.12/-8.93	-11.08/-8.52	-6.09/-4.78	-4.7/-6.5	-6.29/-3.78	-2.52/-2.13	-3.28/-1.93	-0.77/-0.74	-2.51/-4.47	-3.83/-2.67	-2.55/-1.74	-4.23/-5.12	-3.33/-3.71	-5.11/-5.36	-5.15/-4.58	-6.01/-5.05	-2.45/-3.93	-3.67/-2.91	-4.56/-6.91	-9.66/-7.32	-8.02/-10.05
Θ(135°)	-10.02/-9.97	-7.89/-5.1	-5.63/-5.75	-5.59/-7.42	-10.47/-10.38	-7.56/-6.81	-5.86/-4.93	-5.39/-3.54	-1.61/-1.81	-2.74/-3.76	-3.38/-2.2	-3.35/-4.26	-6.01/-5.39	-2.71/-3.79	-4.08/-5.5	-4.42/-7.39	-5.53/-5.13	-6.48/-4.62	-5.4/-5.61	-4.9/-3.88	-4.95/-2.43	-4.73/-10.04	-10.53/-9.78	-7.71/-9.69
Θ(142.5°)	-7.21/-7.15	-6.68/-5.58	-5.39/-6.26	-6.22/-7.24	-8.01/-8.07	-8.62/-8.51	-7.92/-6.15	-4.29/-3.31	-2.8/-2.77	-5.06/-5.73	-6.52/-6.68	-6.73/-7.21	-6.36/-5.66	-4.67/-6.41	-4.88/-9.29	-6.73/-7.93	-6.35/-4.96	-4.35/-3.33	-3.08/-3.86	-8.36/-3.83	-8.26/-4.8	-7.53/-9.31	-10.8/-26	
Θ(150°)	-4.82/-6.04	-8.19/-9.13	-9.31/-9.07	-8.45/-6.83	-6.32/-5.65	-4.63/-5.35	-6.42/-7.65	-8.3/-7.79	-7.59/-7.75	-7.68/-7.73	-5.83/-7	-9.71/-10.4	-9.33/-10.22	-9.65/-7.7	-6.35/-7.5	-6.95/-6.71	-7.46/-9.06	-4.05/-6.07	-6.14/-5.65	-7.41/-7.92	-6.91/-6.81	-6.62/-7.52	-7.38/-5.31	
Θ(157.5°)	-7.11/-7.06	-7.17/-7.11	-7.15/-7.47	-7.51/-7.34	-6.6/-5.29	-5.13/-6.29	-7.6/-8.54	-9.97/-11.34	-10.76/-9.87	-8.86/-8.87	-7.65/-6.96	-7.53/-7.82	-7.75/-6.68	-6.28/-6.15	-6.14/-6.6	-8.51/-9.52	-6.09/-4.84	-5.63/-7.32	-7.67/-5.92	-4.92/-4.55	-4.48/-4.48	-4.67/-4.54	-4.72/-5.81	-6.96/-7
Θ(165°)	-7.05/-6.75	-6.81/-7.81	-9.51/-10.92	-9.71/-8.66	-8.11/-7.46	-7.77/-8.01	-8.54/-8.53	-8.83/-9.34	-9.48/-9.77	-9.55/-9.79	-9.37/-8.74	-8.78/-7.87	-6.8/-5.61	-5.08/-5.4	-5.81/-6.29	-4.46/-5.12	-3.71/-3.32	-3.83/-5.5	-6.52/-6.64	-6.05/-6.42	-3.49/-2.34	-3.8/-5.09	-6.64/-8.12	-8.69/-8.34
Θ(172.5°)	-11.59/-11.65	-12.01/-12.54	-12.31/-12.45	-11.26/-11.34	-10.96/-10.44	-10.41/-10.43	-11.03/-11.6	-12.09/-11.74	-10.49/-9.93	-9.02/-9.13	-9.61/-9.18	-8.48/-7.91	-7.99/-8.02	-7.81/-7.92	-7.88/-7.7	-7.67/-7.51	-7.62/-6.12	-9/-9.94	-9.05/-8.29	-7.68/-7.22	-7.09/-7.79	-8.82/-10.45	-11.23/-12.42	-12.29/-12.07
Θ(180°)	-11.77/-11.53	-11.7/-10.54	-10.47/-9.91	-9/-8.33	-7.79/-7.33	-6.93/-7.21	-7.45/-7.63	-7.87/-8.78	-9.2/-10.05	-10.36/-11.22	-11.55/-11.8	-11.76/-11.41	-11.53/-11.57	-11.83/-12.15	-11.8/-11.38	-11.72/-12.07	-11.84/-12.34	-11.9/-12.68	-12.02/-12.75	-12.31/-12.74	-11.76/-11.16	-11.74/-11.25	-11.59/-11.96	-12.1/-11.62
Freq(Hz)	5.3GPol.	Theta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
DG(dB)	Φ(0°)/Φ(7.5°)	Φ(15°)/Φ(22.5°)	Φ(30°)/Φ(37.5°)	Φ(45°)/Φ(52.5°)	Φ(60°)/Φ(67.5°)	Φ(75°)/Φ(82.5°)	Φ(90°)/Φ(97.5°)	Φ(105°)/Φ(112.5°)	Φ(120°)/Φ(127.5°)	Φ(135°)/Φ(142.5°)	Φ(150°)/Φ(157.5°)	Φ(165°)/Φ(172.5°)	Φ(180°)/Φ(187.5°)	Φ(195°)/Φ(202.5°)	Φ(210°)/Φ(217.5°)	Φ(225°)/Φ(232.5°)	Φ(240°)/Φ(247.5°)	Φ(255°)/Φ(262.5°)	Φ(270°)/Φ(277.5°)	Φ(285°)/Φ(292.5°)	Φ(300°)/Φ(307.5°)	Φ(315°)/Φ(322.5°)	Φ(330°)/Φ(337.5°)	Φ(345°)/Φ(352.5°)
Θ(0°)	-2.51/-1.98	-1.54/-1.32	-1.15/-1.09	-0.93/-0.92	-1.19/-1.37	-1.68/-2.69	-3.45/-4.33	-4.52/-4.79	-4.54/-4.12	-3.69/-3.26	-2.99/-3.1	-2.76/-2.45	-2.03/-1.59	-1.43/-1.28	-1.37/-1.45	-1.46/-2.07	-2.69/-3.26	-3.84/-4.29	-4.57/-5.01	-5.23/-5.75	-5.3/-5.2	-5.47/-5.06	-4.57/-4.01	-3.39/-3.03
Θ(7.5°)	-2.42/-2.05	-1.84/-1.77	-1.63/-1.8	-1.94/-1.98	-2.25/-2.8	-3.06/-3.79	-4.64/-5.53	-5.66/-5.84	-6.72/-6.35	-5.62/-4.72	-4.49/-4.28	-3.96/-3.53	-2.87/-2.1	-1.35/-0.94	-0.350.1	0.260.09	-0.46/-1.29	-2.5/-3.38	-3.52/-3.48	-3.9/-4.12	-3.82/-3.69	-3.86/-3.43	-2.97/-2.77	-2.67/-2.68
Θ(15°)	-2.36/-2.5	-2.47/-2.55	-2.35/-2.42	-2.67/-2.71	-2.78/-3.23	-3.19/-3.14	-3.67/-4.15	-5.05/-5.46	-6.08/-6.1	-5.76/-5.55	-5.46/-5.63	-5.74/-4.73	-3.29/-2.29	-1.23/-0.31	0.290.83	0.890.38	-0.49/-1.4	-2.45/-3.25	-3.57/-3.91	-3.95/-3.95	-3.32/-3.3	-3.28/-2.46	-1.87/-1.58	-1.98/-2.21
Θ(22.5°)	-2.73/-3.09	-3.01/-2.54	-2.34/-2.8	-3.54/-3.62	-3.16/-3.24	-3.35/-2.96	-2.93/-2.88	-2.95/-3.04	-3.37/-3.89	-3.86/-3.69	-3.69/-4.14	-4.2/-3.78	-3.2/-2.6	-1.02/-0.51	0.040.04	-0.34/-0.74	-1.12/-1.61	-2.12/-2.51	-2.51/-2.2	-2/-2.14	-2.76/-3.58	-4.27/-4.19	-3.15/-2.25	-2.03/-2.39
Θ(30°)	-2.82/-3.93	-4.1/-4.03	-4.14/-3.6	-3.58/-3.78	-4.14/-4.95	-5.13/-5.09	-4.65/-3.89	-3.28/-2.61	-2.34/-2.29	-2.2/-2.31	-2.57/-3.15	-3.26/-2.99	-2.74/-2.18	-1.73/-1.56	-1.38/-1.28	-1.18/-0.93	-0.72/-0.35	-0.46/-0.73	-1.21/-1.45	-1.0/-1.79	-1.37/-2.1	-2.84/-3.58	-4.26/-3.65	-2.46/-2.15
Θ(37.5°)	-4.12/-4.94	-4.97/-4.47	-3.9/-3.1	-3.83/-4.77	-5.08/-5.11	-4.9/-4.59	-4.39/-3.67	-2.71/-7.6	-1.49/-1.95	-2.53/-2.56	-2.64/-3.05	-3.14/-2.52	-2.34/-2.74	-2.82/-2.17	-1.97/-2.38	-2.5/-2.01	-1.68/-1.75	-1.72/-1.31	-1.14/-1.89	-2.49/-3.05	-3.16/-3.38	-3.34/-3.4	-3.69/-3.79	-3.44/-3.23
Θ(45°)	-2.92/-4.94	-5.95/-5.58	-3.63/-3.2	-3.31/-4.46	-4.93/-4.99	-4.84/-4.35	-4.03/-3.68	-2.02/-2.19	-1.59/-1.57	-1.85/-2.24	-1.99/-2.04	-1.88/-1.32	-1.95/-2.16	-1.91/-2.29	-2.76/-3.32	-2.87/-2.4	-2.55/-2.33	-1.87/-2.22	-2.59/-2.67	-2.98/-3.35	-3.89/-4.64	-4.58/-4.3	-3.57/-3.9	-2.81/-1.83
Θ(52.5°)	-1.12/-4.65	-5.69/-3.78	-2.89/-3.41	-2.77/-3.54	-3.87/-4.26	-4.48/-4.22	-4.59/-4.33	-2.67/-1.41	-0.52/-0.49	-0.85/-1.95	-2.18/-1.77	-1.1/-0.48	-0.46/-0.5	-0.79/-0.73	-1.48/-1.73	-1.5/-1.69	-2.55/-2.51	-2.67/-2.38	-1.9/-1.48	-1.66/-2.77	-3.66/-4.86	-7.29/-6.64	-4.64/-2.98	-2.61/-1.08
Θ(60°)	-0.9/-5.41	-6.43/-3.46	-4.01/-4.2	-1.87/-2.47	-2.9/-3.12	-2.78/-1.89	-1.97/-1.92	-1.59/-1.49	-1.64/-1.57	-0.72/-0.94	-1.3/-0.71	0.280.58	0.671.09	0.15/-0.13	-0.40/-42	1.26/-0.33	-1.68/-2.8	-4.54/-5.32	-4.02/-3.37	-3.18/-3.48	-3.25/-4.84	-7.16/-5.69	-3.11/-2.88	-3.77/-1.77
Θ(67.5°)	-1.13/-4.53	-5.55/-2.86	-2.62/-2.72	-2.21/-3.51	-2.29/-2.25	-1.56/-1.6	-1.97/-2.67	-3.13/-2.57	-1.91/-2.35	-1.04/-0.5	-0.190.85	1.11/-0.4	0.41/-33	0.060.66	1.24/-0.24	0.83/-2	-2.12/-9.3	-5.3/-6.73	-8.46/-7.35	-4.15/-2.47	-1.98/-1.03	-1.51/-3.04	-2.84/-2.83	-2.99/-2.03
Θ(75°)	0.02/-1.04	-2.41/-2.73	-2.98/-2.35	-2.83/-5.35	-3.31/-3.04	-1.89/-1.66	-0.66/-0.93	-2.25/-2.53	-0.85/-0.84	-0.470.88	1.38/-7.6	1.93/-12	1.18/-91	0.360.8	1.63/-81	-0.1/-2.2	-2.49/-4.34	-4.29/-3.69	-4.32/-3.5	-3.35/-2.71	-2.03/-2.65	-1.34/-0.42	-0.75/-1.86	-0.35/-0.79
Θ(82.5°)	-0.11/-1.06	-0.6/-0.14	-0.14/-0.22	-2.19/-3.82	-2.51/-2.43	-0.93/-0.94	-0.87/-1.21	-2.27/-1.72	0.050.69	0.34/-2.64	3.41/-2.64	1.42/-31	1.38/-157	2.31/-2.51	2.91/-09	0.59/-0.								



Radiated Composite Gain of 2.4GHz and 5GHz UNII 1~3

Appendix A

Θ(60°)	-3.82/4.8	-6.16/-6.68	-5.28/-5.34	-5.62/-5.38	-4.38/-2.81	-1.1/-0.08	-0.16/-1	-1.67/-1.36	-1.17/-1.53	-1.66/-1.87	-3.37/-3.57	-3.23/-2.97	-3.05/-2.89	-2.57/-2.82	-3.34/-3.7	-4.41/-4.46	-5.09/-5.88	-4.95/-2.98	-1.66/-0.79	-1.05/-2.96	-1.19/0.78	1.47/0.34	-3.4/-4.15	-4.45/-5.29
Θ(67.5°)	-3.12/-4.16	-5.46/-5.87	-3.83/-3.28	-4.35/-4.66	-3.16/-2.1	-1.04/0.6	1.19/0.71	-0.18/-1.1	-1.01/-1.93	-1.92/-2.78	-4.57/-4.09	-2.91/-3.78	-3.73/-2.42	-1.62/-2.23	-2.84/-3.2	-3.69/-3.91	-5.28/-3.97	-2.39/-1.71	-2.02/-2.49	-2.74/-3.27	-3.64/-1.04	-0.61/-1.52	-3.05/-4.58	-3.16/-4.52
Θ(75°)	-3.49/-5.92	-7.94/-9.02	-8.06/-6.88	-7.47/-6.1	-4.46/-1.95	-0.31/0.94	1.47/1.13	-0.53/-1.84	-2.13/-2.77	-2.87/-1.68	-3.03/-4.43	-3.91/-4.31	-4.59/-3.1	-2.8/-3.96	-3.83/-3.8	-3.18/-2.49	-3.2/-3.12	-2.96/-2.39	-1.62/-1.73	-3.37/-3.13	-2.47/-1.89	-0.79/-2.23	-4.11/-3.11	-2.65/-3.01
Θ(82.5°)	-4.85/-7.63	-10.1/-8.65	-7.27/-6.76	-5.44/-3.61	-2.47/-1.13	0.08/1.66	2.24/1.45	-0.38/-2.83	-4.12/-3.66	-3.43/-1.44	-2.22/-2.34	-2.19/-3.79	-4.15/-3.83	-3.4/-3.45	-2.68/-2.61	-2.16/-2.52	-3.5/-2.5	-2.13/-2.96	-2.58/-1.73	-1.53/-1.23	-1.65/-1.6	-2.49/-3.53	-2.12/-1.67	-3.74/-4.74
Θ(90°)	-4.56/-6.23	-9.25/-8.32	-8.61/-6.62	-6.09/-5.57	-4.4/-1.54	1.05/2.25	2.67/1.88	-0.39/-1.78	-2.92/-2.9	-2.65/-2.76	-1.6/-0.59	-2.24/-2.99	-3.28/-3.62	-2.14/-1.86	-3.72/-3.37	-2.71/-3.4	-4.74/-3.66	-4.35/-2.24	-1.57/-1.6	-1.96/-1.11	-0.38/-1.15	-0.87/-1.36	-1.29/-2.01	-4.4/-6.37
Θ(97.5°)	-4.02/-4.62	-5.6/-5.16	-6.53/-6.8	-6.68/-5.38	-3.64/-2.43	0.19/1.6	2.14/0.73	-0.64/-1.54	-2.43/-2.04	-2.1/-2.55	-2.78/-1.87	-2.11/-2.07	-0.81/-1.61	-0.56/-1.55	-2.77/-5.4	-5.65/-3.64	-1.71/-2.19	-1.83/-0.24	0.5/0.57	-0.46/-1.4	-1.77/-2.18	-4.82/-4.45		
Θ(105°)	-4.23/-3.46	-3.18/-4.47	-4.73/-4.1	-6.27/-6.76	-3.64/-1.41	-1.19/-0.28	-0.15/-1.48	-2.84/-3.68	-2.8/-1.82	-1.98/-2.07	-2.91/-3.41	-2.74/-1.82	-1.5/-1.59	-2.27/-2.49	-3.16/-3.93	-4.22/-4.67	-5.97/-6.01	-1.99/-0.81	-1.34/-0.49	-2.19/-2.26	-0.85/-1.41	-2.81/-2.07	-2.29/-3.69	-4.88/-5.81
Θ(112.5°)	-5.26/-4.18	-4.83/-5.75	-5.05/-4.12	-4.75/-5.76	-5.41/-4.45	-3.74/-3.95	-3.97/-2.98	-3.4/-4.18	-2.8/-0.91	-0.35/-0.92	-2.6/-3.35	-4.43/-4.1	-2.62/-2.24	-3.69/-3.79	-4.87/-3.42	-4.3/-1.58	-3.11/-4.17	-3.12/-4.15	-2.5/-1.74	-6.06/-5.37	-2.87/-2.23	-1.64/-0.62	-2.23/-5.21	-5.01/-7.89
Θ(120°)	-3.76/-4.61	-4.87/-6.3	-5.14/-3.9	-3.15/-4.12	-6.66/-5.27	-3.97/-2.83	-2.8/-3.4	-4.42/-3.7	-3.12/-1.5	-1.31/-1.81	-1.95/-0.34	-1/-3.51	-3.85/-2.51	-4.08/-3.02	-3.28/-6.44	-5.01/-3.67	-3.4/-2.74	-4.5/-8.46	-4.8/-4.47	-5.69/-5.37	-3.29/-2.8	-3.4/-3.4	-5.46/-5.37	-7.37/-6.1
Θ(127.5°)	-5.52/-6.12	-5.2/-5.48	-6.49/-8.1	-8.2/-6.09	-4.35/-4.28	-3.1/-2.27	-2.54/-4.29	-4.93/-4.34	-4.59/-4.24	-3.96/-3.02	-1.63/-2.08	-3.26/-5.37	-4.27/-5.61	-6.77/-5.02	-4.96/-6.64	-5.85/-6.13	-5.97/-3.45	-4.92/-4.74	-5.48/-5.23	-4.85/-5.34	-4.2/-3.03	-4.8/-6.84	-9.62/-8.95	-8.36/-7.9
Θ(135°)	-6.01/-5.92	-5/-4.79	-5.42/-7.63	-8.61/-8.55	-8.21/-5.27	-3.36/-2.97	-2.9/-3.45	-3.89/-4.27	-5.47/-5.34	-5.62/-5.06	-4.06/-2.19	-2.23/-4.87	-6.25/-4.87	-3.48/-3.16	-5.6/-7.11	-7.8/-8.58	-5.76/-3.27	-4.03/-4.77	-6.27/-5.48	-4.89/-7.66	-9.43/-4.28	-5.22/-6.92	-7.13/-9.21	-11.78/-7.96
Θ(142.5°)	-6.78/-6.03	-5.66/-7.56	-9.55/-9.77	-8.7/-6.12	-4.64/-4.32	-4.27/-3.7	-4.28/-4.05	-4/-4.29	-5.13/-5.92	-6.2/-5.61	-4.93/-3.94	-4.12/-5.33	-7.56/-8.46	-7.19/-7.04	-5.75/-5.58	-9.09/-11.53	-10.61/-8.27	-6.81/-7.76	-8.35/-7.54	-6.94/-7.74	-7.58/-8.27	-8.34/-9.23	-9.34/-7.77	
Θ(150°)	-5.62/-7.23	-9.8/-11.94	-8.91/-9.42	-10.55/-8.59	-5.23/-3.54	-3.36/-3.92	-5.19/-6.94	-8.3/-9.27	-8.02/-6.68	-4.79/-3.94	-4/-5.07	-5.93/-5.53	-6.23/-7.07	-6.15/-6.86	-7.61/-8.21	-8.67/-7.87	-7.82/-5.15	-4.73/-5.9	-7.35/-5.92	-5.22/-5.17	-7.06/-7.52	-6.43/-5.91	-5.78/-6.05	-6.3/-4.83
Θ(157.5°)	-5.99/-7.22	-8.26/-6.65	-5.56/-6.24	-8.06/-8.02	-6.77/-5.73	-6.43/-8.37	-10.73/-11.74	-10.54/-8.39	-5.62/-4.31	-3.38/-2.83	-2.63/-3.6	-4.83/-6.68	-8.85/-8.23	-8.27/-10.71	-12.52/-12.11	-11.25/-10.94	-9.04/-6.15	-5.22/-5.99	-8.38/-8.59	-7.03/-6.16	-7.16/-1.64	-7.4/-6.25	-4.92/-4.87	-5.72/-5.56
Θ(165°)	-8.42/-8.47	-7.03/-5.28	-4.56/-4.52	-4.95/-6.01	-7.02/-8.16	-8.55/-9.09	-8.38/-8.02	-8.03/-7.66	-6.8/-7.39	-7.26/-6.52	-5.64/-5.67	-6.34/-7.59	-8.67/-8.78	-7.94/-7.14	-7.25/-8.23	-8.83/-8.21	-6.79/-5.54	-5.79/-7.6	-8.75/-10.14	-9.14/-7.79	-7.54/-6.89	-6.8/-7.49	-8.5/-8.78	-8.92/-8.72
Θ(172.5°)	-12.59/-11.16	-9.54/-8.36	-8.05/-7.44	-7.54/-7.71	-8.56/-9.06	-8.65/-10.31	-11.24/-11.94	-11.62/-10.6	-10.16/-8.6	-7.5/-7.32	-6.8/-6.17	-6.27/-6.32	-6.24/-6.21	-6.42/-7.04	-8.01/-7.45	-6.34/-5.83	-5.41/-5.81	-6.91/-8.35	-9.43/-8.98	-8.82/-8.68	-8.66/-9.31	-10.33/-10.8	-11.7/-12.27	-12.36/-12.59
Θ(180°)	-11.53/-11.06	-11.42/-11.27	-12.19/-11.84	-11.39/-11.28	-10.13/-9.67	-9.58/-9.57	-10.09/-10.96	-10.55/-10.24	-9.95/-9.7	-9.4/-9.63	-9.91/-10.66	-11.47/-11.88	-10.93/-11.34	-11.14/-11.34	-11.29/-10.55	-9.93/-9.55	-9.1/-9.17	-9.64/-10.1	-10.37/-10.52	-10.73/-11.05	-10.86/-11.53	-11.99/-12.65	-12.87/-12.04	-11/-11.58
Freq(Hz)	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz	5.785GHz
Θ(60°)	Φ(0°)/Φ(7.5°)	Φ(15°)/Φ(22.5°)	Φ(30°)/Φ(37.5°)	Φ(45°)/Φ(52.5°)	Φ(60°)/Φ(67.5°)	Φ(75°)/Φ(82.5°)	Φ(90°)/Φ(97.5°)	Φ(105°)/Φ(112.5°)	Φ(120°)/Φ(127.5°)	Φ(135°)/Φ(142.5°)	Φ(150°)/Φ(157.5°)	Φ(165°)/Φ(172.5°)	Φ(180°)/Φ(187.5°)	Φ(195°)/Φ(202.5°)	Φ(210°)/Φ(217.5°)	Φ(225°)/Φ(232.5°)	Φ(240°)/Φ(247.5°)	Φ(255°)/Φ(262.5°)	Φ(270°)/Φ(277.5°)	Φ(285°)/Φ(292.5°)	Φ(300°)/Φ(307.5°)	Φ(315°)/Φ(322.5°)	Φ(330°)/Φ(337.5°)	Φ(345°)/Φ(352.5°)
Θ(0°)	-0.67/-0.61	-0.58/-0.36	-0.34/-0.44	-0.65/-1	-1.68/-2.23	-3.24/-4.51	-5.42/-5.85	-5.89/-5.52	-5.26/-4.51	-3.83/-3.16	-2.47/-1.66	-1/-0.66	-0.37/-0.11	0.04/-0.13	-0.32/-0.7	-1.1/-1.57	-2.14/-3.15	-4.14/-4.85	-5.33/-5.35	-5.43/-5.49	-5.26/-5.24	-4.59/-3.58	-2.48/-1.64	-1.32/-0.99
Θ(7.5°)	-0.05/-0.02	0.08/-0.26	-0.53/-0.89	-1.39/-1.67	-2.24/-2.63	-3.19/-3.95	-4.41/-4.86	-5.12/-5	-4.99/-5.15	-4.83/-4.22	-3.53/-2.56	-1.88/-1.29	-0.8/-0.36	-0.19/-0.33	-0.63/-1.1	-1.74/-2.25	-2.71/-3	-3.56/-4.78	-5.26/-5.78	-6.04/-5.62	-4.73/-3.88	-2.97/-2.07	-1.22/-0.7	-0.88/-0.32
Θ(15°)	0.63/0.48	0.15/-0.31	-1.09/-1.61	-1.93/-1.71	-2.03/-2.24	-2.5/-2.72	-3.14/-3.39	-3.57/-3.54	-3.87/-4.58	-5.36/-5.47	-4.85/-4.1	-3.54/-3.15	-2.67/-2.29	-2.38/-2.42	-2.41/-2.02	-1.59/-1.15	-1.05/-1.2	-1.37/-1.78	-2.41/-2.83	-3.08/-3.4	-3.65/-3.64	-3.19/-2.62	-1.57/-0.9	-0.11/0.36
Θ(22.5°)	0.45/0.06	-0.48/-0.92	-1.22/-0.91	-1.07/-1.61	-2.04/-1.79	-1.61/-1.49	-1.21/-1.16	-0.91/-0.72	-0.67/-1.21	-2.1/-2.9	-2.86/-2.47	-2.34/-2.6	-2.8/-2.52	-2.25/-1.66	-1.19/-0.7	-0.29/0.04	0.01/-0.07	0.02/-0.07	-0.32/-0.22	-0.14/-0.17	-0.42/-0.88	-1.69/-2.2	-1.91/-0.99	-0.80/0.36
Θ(30°)	0.87/1.01	0.28/-0.55	-0.72/-0.93	-1.62/-2.16	-1.96/-1.73	-1.33/-0.88	-0.84/-0.57	-0.22/-0.1	-0.48/-1.17	-1.51/-1.89	-1.89/-1.46	-1.22/-1.28	-1/-0.36	0.22/0.29	-0.05/-0.32	-0.44/-0.66	-1.2/-0.98	-0.49/-0.29	-0.17/-0.19	0.1/-0.03	0.35/0.82	0.64/0.28	-0.15/-0.15	0.53/0.67
Θ(37.5°)	0.79/0.16	-0.6/-1.4	-1.35/-1.45	-1.55/-1.1	-0.79/-0.38	0.27/0.83	0.92/0.23	-0.65/-1.46	-2.16/-2.77	-3.1/-3.07	-2.41/-1.59	-1.57/-1.61	-0.97/-0.51	-0.09/0.48	0.31/-0.65	-0.92/-1.54	-2.33/-1.78	-0.6/-0.26	-0.05/0.86	1.09/0.84	0.31/0.07	0.52/0.46	0.46/0.8	1.03/1.26
Θ(45°)	0.17/-1.14	-2.71/-3.08	-2.81/-2.61	-2.77/-1.58	-0.77/0.03	0.48/0.31	0.11/-0.16	-0.41/-1.03	-1.49/-1.77	-1.97/-2.18	-1.25/-0.22	-0.43/-1.52	-1.41/-0.18	0.31/1.11	1.65/0.68	0.04/-0.8	-1.68/-1.71	-1.82/-1.72	-0.37/0.21	0.09/0.3	0.1/-0.53	-2.12/-2.39	-1.64/-0.67	-0.25/0.38
Θ(52.5°)	-0.59/-1.49	-2.38/-5.01	6.22/-5	-5.16/-4.26	-3.57/-2.55	-1.89/-1.56	-1.73/-2.62	-2.73/-2.34	-2.13/-2.12	-2.26/-1.74	-0.63/0.5	0.5/-0.75	-1.45/-0.44	0.4/0.32	0.49/-0.79	-0.99/-1.19	-3.09/-4.38	-2.68/-1.82	-1.99/-1.67	-1.54/-1.57	-2.09/-2.89	-3.54/-3.94	-4.2/-2.04	0.25/0.51
Θ(60°)	0.81/-0.36	-0.32/-2.54	-2.23/-1.22	-3.01/-4.36	-3.82/-2.56	-2.55/-2.88	-1.3/-0.69	-0.66/0.21	0.74/0.14	-1.03/-1.1	-0.39/0.78	1.39/-0.1	-2.3/-1.07	0.35/0.56	0.99/0.65	-0.71/-2.78	-2.82/-2.92	-1.79/-1.84	-1.58/-1.12	-2.49/-3.63	-4.22/-4.07	-3.42/-3.45	-5.82/-4.63	0.35/2.06
Θ(67.5°)	2.05/0	-0.27/-1.6	-1.14/0.01	-1.27/-1.33	-0.68/-0.38	-1.13/-2.31	-2.63/-2.33	-1.38/0.18	0.88/0.72	0.02/0.32	0.62/1.08	1.6/0.23	-0.89/0.18	0.86/0.83	1.31/0.42	-0.74/-1.88	-3.13/-2.69	-2.53/-1.79	-1.73/-2.11	-2.84/-2.79	-2.61/-3.96	-4.02/-2.46	-3.72/-4.77	-0.44/2.81
Θ(75°)	2.58/0.17	-0.64/-0.82	-1.62/-1.1	-1.64/-1.67	-1.38/-0.51	-1.23/-2.58	-3.6/-3.37	-2.79/-1.61	-1.12/-1.1	-0.97/-0.48	0.71/1.27	1.88/2.6	1.21/0.64	1.61/1.19	0.68/0.54	-0.02/-1.87	-3.88/-3.95	-6.11/-4.29	-5.28/-4.6	-4.07/-3.03	-2.93/-2.88	-2.69/-3.74	-2.11/-0.59	-0.16/2.38
Θ(82.5°)	1.08/-0.58	-0.36/-1.47	-1.99/-0.37	-1.34/-0.51	-0.9/-0.99	-1.19/-2.02	-3.27/-4.18	-4.02/-3.2	-2.29/-1.6	-2.02/-0.33	1.36/1.55	1.76/1.77	1.43/1.94	1.19/0.02	-0.91/0.29	-0.34/-1.5	-2.59/-2.07	-2.54/-2.85	-2.64/-1.13	-2.26/-2.6	-0.92/-0.28	-1.55/-2.69	-2.85/-0.16	2.47/2.31
Θ(90°)	-2.04/-1.31	0.03/-2.16	-1.72/-1.98	-1.56/-0.75	-1.55/-1.87	-2.34/-2.52	-4.46/-4.23	-4.06/-2.49	-2.49/-1.41	-0.05/0.4	1.03/0.95	2.16/2.08	1.85/3.39	2.59/1.89	-0.72/-0.44	-1.42/-0.3	-1.24/-2.05	-2.63/-2.85	-4.99/-1.79	-1.45/-3.07	0.65/-1.6	0.79/0.25	-0.73/-1.32	0.84/0.61
Θ(97.5°)	-3.54/-1.93	-0.89/-2.93	-2.13/-0.34	-0.19/-0.72	-1.67/-1.97	-3.51/-3.87	-3.66/-2.77	-2.9/-2.11	-2.33/-1.49	0.68/1.2	1.31/1.27	1.68/2.46	3.05/3.7	2.82/2.84	0.39/0.33	-0.56/-0.96	0.19/-4.18	-5.45/-2.96	-4.06/-0.85	-2.99/-2.99	-0.59/-0.19	1.11/0.09	-1.06/-3.57	-1.15/0.54
Θ(105°)	-5.15/-4.54	-3.7/-2.87	-1.04/-0.15	-0.55/-0.43	-1.07/-2.3	-2.07/-1.71	-2.19/-2.8	-3/-2.55	-1.93/0.78	2.16/2.06	1.73/2.75	3.65/3.05	3.62/4.3	4.74.59	2.1/1.03	0.76/-1.25	-0.69/-3.71	-3.62/-3.07	-4.06/0.19	-2.77/-2.17	0.84/-1.27	-1.17/-1.67	-5.04/-4.83	-1.13/0.02
Θ(112.5°)	-5.21/-3.6	-5.42/-1.89	-0.71/-1.06	-0.82/-2.08	-1.37/-0.72	-0.34/-0.85	-1.23/-2.49	-2.76/-1.71	-0.6/0.24	1.5/3	3.49/3.71	4.32/4.21	4.53/4.4	3.78/2.9	2.04/0.56	0.55/-2.73	-1.73/-4	-2.15/-7.06	-2.66/0.7	-4.22/-2.57	-0.51/0.24	0.37/-2.39	-6.07/-6.21	-2.68/-1.87
Θ(120°)	-1.41/-2.43	-2.46/-1.49	-1.24/-1.74																					



Radiated Composite Gain of 2.4GHz and 5GHz UNII 1~3

Appendix A

Gain Result

Freq(Hz)	2.45GPol.	PhiAnt.1	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)Ψ(7.5°)	Φ(15°)Ψ(22.5°)	Φ(30°)Ψ(37.5°)	Φ(45°)Ψ(52.5°)	Φ(60°)Ψ(67.5°)	Φ(75°)Ψ(82.5°)	Φ(90°)Ψ(97.5°)	Φ(105°)Ψ(112.5°)	Φ(120°)Ψ(127.5°)	Φ(135°)Ψ(142.5°)	Φ(150°)Ψ(157.5°)	Φ(165°)Ψ(172.5°)	Φ(180°)Ψ(187.5°)	Φ(195°)Ψ(202.5°)	Φ(210°)Ψ(217.5°)	Φ(225°)Ψ(232.5°)	Φ(240°)Ψ(247.5°)	Φ(255°)Ψ(262.5°)	Φ(270°)Ψ(277.5°)	Φ(285°)Ψ(292.5°)	Φ(300°)Ψ(307.5°)	Φ(315°)Ψ(322.5°)	Φ(330°)Ψ(337.5°)	Φ(345°)Ψ(352.5°)	
Θ(0°)	-18.12/-17.27	-15.81/-14.53	-12.91/-11.85	-11/-10.5	-10.58/-11.09	-11.98/-13.29	-14.81/-15.82	-16.14/-16.07	-16.23/-16.96	-18.47/-18.02	-18.88/-18.53	-18.27/-17.84	-15.93/-14.08	-11.53/-12.38	-12/-12.18	-12.16/-13.25	-14.12/-15.6	-17.95/-18.04	-18.66/-17.17	-18.92/-18.04	-18.95/-18.2	-18.57/-18.39	-18.19/-18.37	-17.89/-17.72	
Θ(7.5°)	-17.74/-18.26	-16.4/-14.46	-13.1/-12.13	-11.59/-11.56	-12.18/-13.5	-15.49/-17.91	-18.44/-17.84	-19.25/-19.18	-17.91/-19.14	-18.93/-18.16	-18.15/-18.31	-17.57/-15.55	-14.19/-13.04	-12.25/-11.83	-11.63/-11.9	-12.99/-13.03	-14.05/-15.39	-18.09/-18.26	-18.46/-18.18	-17.82/-17.55	-18.75/-15.7	-17.77/-18.51	-18.62/-17.91	-18.98/-18.31	
Θ(15°)	-18.1/-18.12	-18.11/-15.18	-13.28/-12.48	-12.32/-12.87	-14.16/-16.68	-18.73/-18.24	-17.4/-18.69	-17.99/-15.84	-18.48/-18.17	-18.6/-18.8	-19.59/-16.72	-14.67/-13.26	-12.25/-11.45	-10.13/-10.1	-10.13/-10.1	-10.33/-10.3	-10.65/-11.34	-12.63/-14.25	-15.84/-16.53	-16.61/-16.53	-16.59/-16.77	-16.96/-17.26	-17.69/-18.46	-18.62/-17.4	
Θ(22.5°)	-19/-17.87	-19.37/-15.82	-13.93/-13.29	-12.37/-14.73	-14.56/-18.19	-18.97/-18.64	-17.23/-19.55	-18.35/-19.12	-18.29/-17.7	-18.45/-18.41	-18.45/-16.28	-14.69/-13.34	-12.29/-11.39	-10.59/-9.8	-9.22/-8.81	-8.44/-8.1	-7.98/-8.17	-8.84/-9.86	-10.98/-11.77	-12.33/-12.69	-13.14/-13.8	-14.63/-15.56	-16.46/-17.54	-19.31/-18.54	
Θ(30°)	-18.45/-18.87	-19.4/-15.5	-14.21/-13.65	-14.56/-15.91	-17.46/-17.56	-18.56/-18.57	-18.09/-17.74	-18.43/-18.45	-18.55/-18.94	-18.7/-19.28	-18.22/-17.29	-15.31/-13.2	-12.04/-11.23	-10.32/-9.87	-9.61/-9.51	-9.3/-8.8	-8.39/-8.2	-8.37/-8.4	-9.32/-9.72	-10.24/-10.94	-12.03/-13.51	-15.19/-17.53	-17.98/-17.13	-18.99/-18.15	
Θ(37.5°)	-18.41/-19.2	-17.5/-15.59	-14.57/-14.62	-15.72/-17.33	-18.51/-18.21	-18.19/-19.08	-17.76/-18.41	-18.17/-17.87	-16.35/-16.06	-16.92/-18.17	-15.39/-12.98	-11.52/-10.52	-10.78/-11.42	-11.85/-11.63	-11.26/-10.72	-10.08/-9.56	-9.12/-9	-9.4/-10.57	-12.54/-15.32	-19.41/-18.25	-17.86/-19.22	-18.71/-19.58	-18.15/-17.99		
Θ(45°)	-18.9/-16.18	-15.83/-15.33	-15.27/-15.94	-17.57/-18.49	-19.16/-18.78	-18.33/-17.82	-17.69/-16.98	-14.71/-13.12	-12.16/-11.91	-12.34/-13.1	-13.88/-14	-12.89/-11.17	-9.73/-8.87	-8.59/-8.83	-9.14/-9.26	-9.54/-10.22	-11.21/-12	-11.94/-10.87	-9.62/-9.93	-9.19/-10.6	-13.17/-16.95	-18.38/-18.87	-18.99/-16.63	-15.56/-15.58	
Θ(52.5°)	-13.8/-14.1	-14.96/-16.33	-16.53/-16.01	-15.42/-14.89	-13.92/-13.33	-13/-12.61	-12.04/-11.22	-10.49/-9.88	-9.51/-9.54	-10.03/-10.88	-12.05/-12.91	-12.53/-11.95	-10.14/-9.51	-9.41/-9.63	-9.35/-9.86	-9.17/-10.28	-12.39/-15.48	-18.67/-16.32	-12.92/-11.25	-11.46/-13.3	-16.14/-18.22	-18.49/-18.38	-19.26/-16.46	-14.67/-13.85	
Θ(60°)	-11.54/-12.03	-14.11/-18.6	-18.44/-17.11	-13.97/-11.51	-9.96/-9.66	-10.1/-10.65	-10.55/-9.86	-8.93/-8.43	-8.54/-9.14	-10.03/-8.31	-10.69/-14.29	-14.42/-14.8	-15.3/-12.76	-11.51/-10.54	-9.29/-8.46	-8.71/-9.78	-11.23/-13.15	-15.15/-14.67	-12.96/-12.77	-14.27/-17.29	-19.26/-18.12	-18.61/-19.03	-18.35/-15.31	-13.34/-11.9	
Θ(67.5°)	-12.61/-12.24	-13.47/-17.6	-17.83/-18.73	-18.58/-11.89	-9.91/-9.92	-11.1/-12.1	-12.05/-10.82	-9.45/-8.67	-8.96/-10.31	-12.02/-15.42	-17.88/-18.69	-14.09/-14.38	-11.09/-9.1	-9.18/-9.77	-8.09/-8.74	-8.45/-9.28	-9.79/-10.47	-10.73/-10.21	-9.84/-10.65	-12.42/-14.93	-17.86/-18.48	-18.91/-17.44	-17.32/-18.59	-15.52/-13.98	
Θ(75°)	-12.83/-13.69	-14.09/-15.93	-17.78/-16.3	-13.63/-10.66	-9.06/-9.1	-9.6/-9.6	-9.13/-8.6	-8.25/-7.9	-8.2/-9.5	-10.38/-11.23	-12.14/-12.98	-13.64/-14.22	-14.51/-14.83	-15.68/-18.7	-14.8/-14.6	-16/-17.65	-15.82/-12.93	-10.53/-8.87	-8.33/-8.85	-10.44/-13.07	-17.69/-18.99	-19.19/-18.97	-17.84/-16.06	-14.19/-12.65	
Θ(82.5°)	-7.56/-8.24	-9.6/-12.4	-16.13/-19.6	-13.33/-10.48	-9.17/-8.66	-7.76/-6.59	-5.94/-6	-6.5/-6.92	-7.01/-7.14	-7.64/-8.5	-9.98/-12.57	-17.33/-18.22	-16.52/-18.7	-12.42/-10.55	-12.54/-14.8	-13.09/-10.67	-8.82/-7.5	-6.8/-6.84	-9.74/-9.62	-12.76/-16.71	-17.96/-18.04	-18.51/-15.74	-11.74/-8.66		
Θ(90°)	-7.16/-7.03	-8.35/-10.64	-14.38/-16.65	-13.23/-10.84	-10.27/-9.88	-8.53/-7	-6.29/-6.5	-7.37/-8.25	-8.09/-7.24	-7.29/-8.3	-10.02/-13.19	-17.58/-17.35	-15.95/-14.61	-12.4/-10.8	-14.04/-10.71	-13.81/-18.58	-17.39/-13.78	-10/-8.1	-7.94/-9.17	-11.52/-14.73	-14.34/-10.22	-8.76/-9.76	-16.22/-16.24	-16.32/-10.08	
Θ(97.5°)	-6.47/-5.85	-7.17/-9.92	-14.46/-18.57	-17.28/-12.35	-10.92/-10.18	-8.91/-7.3	-6.32/-6.25	-7.12/-7.97	-6.91/-5.34	-4.99/-5.57	-6.48/-8.34	-11.01/-13.75	-16.27/-18.4	-17.67/-16.71	-17.08/-18.26	-18.89/-13.03	-7.53/-8.3	-3.13/-2.58	-3.39/-5.83	-10.23/-17.53	-11.87/-6.93	-5.53/-5.69	-9.48/-12.2	-12.48/-9.34	
Θ(105°)	-7.33/-6.44	-7.53/-10.27	-13.96/-19.73	-17.19/-16.18	-14.06/-12.07	-11.42/-9.83	-8.55/-8.32	-9.74/-11.8	-10.08/-7.39	-6.63/-8.66	-6.11/-7.8	-10.3/-12.74	-16.92/-17.96	-17.54/-15.26	-14.52/-15.67	-18.29/-12.83	-6.83/-4.12	-2.4/-1.82	-2.9/-1.64	-6.94/-3.37	-2.61/-3.84	-7.28/-11.23	-11.38/-9.42		
Θ(112.5°)	-6.72/-6.58	-8.06/-11.99	-18.98/-17.7	-19.16/-16.15	-13.36/-10.48	-14.8/-12.59	-14.04/-15.12	-18.5/-18.34	-11.76/-8.28	-7.2/-6.85	-6.8/-7.86	-9.78/-12.2	-15.66/-18.16	-16.26/-14.94	-15.8/-10.4	-18.17/-8.42	-4.4/-2.26	-0.97/-0.81	-2.25/-2.57	-13.75/-16.32	-7.54/-1.1	-3.57/-5.22	-9.29/-12.9	-9.34/-7.53	
Θ(120°)	-9.15/-8.49	-9.28/-12.17	-17.05/-18.89	-18.81/-18.68	-17.51/-19.07	-19.03/-18.3	-17.16/-15.27	-15.45/-16.04	-14.49/-12.57	-11.89/-11.07	-10.42/-11.22	-12.49/-13.03	-13.41/-12.77	-11.1/-9.67	-9.81/-13.59	-17.38/-8.89	-4.99/-2.99	-1.92/-2.03	-3.81/-8.1	-17.99/-15.61	-7.82/-5.08	-4.87/-6.93	-12.43/-18.23	-14.49/-10.53	
Θ(127.5°)	-14.67/-13.82	-13.66/-13.84	-15.66/-15.31	-14.25/-15	-15.85/-17.08	-18.99/-18.53	-18.12/-17.3	-13.89/-12.33	-12.63/-14.54	-17.38/-13.13	-15.54/-12.2	-10.27/-8.96	-9.93/-9.92	-10.43/-11.1	-10.78/-10.05	-11.26/-17.19	-19.2/-13.98	-6.67/-7.42	-3.67/-3.79	-5.19/-8.76	-9.33/-6.2	-6.62/-8.4	-13.61/-18.64	-19.1/-15.9	
Θ(135°)	-16.03/-17.65	-18.56/-17.31	-15.5/-14.51	-16.88/-19.19	-18.75/-18.38	-18.97/-16.32	-13.28/-12.33	-12.98/-14.62	-16.65/-17.56	-19.16/-18.46	-15.6/-14.2	-15.83/-18.78	-16.89/-18.59	-14.63/-14.13	-15.13/-15.99	-11.53/-8.1	-6.19/-5.2	-4.68/-6.46	-5.3/-6.37	-7.48/-8.54	-9.66/-15.5	-14.82/-18.09	-19.06/-17.49	-14.59/-14.54	
Θ(142.5°)	-14.12/-16.95	-18.5/-16.11	-13.35/-12.45	-13.32/-16.03	-17.11/-17.9	-18.44/-16.3	-14.11/-12.89	-12.21/-11.88	-12.16/-13.63	-16.86/-18.87	-17.18/-15.32	-14.26/-12.86	-11.05/-9.31	-8.1/-7.73	-8.26/-9.36	-10.19/-10.25	-10.18/-10.25	-10.02/-9.73	-9.75/-10.21	-10.83/-12.16	-14.68/-18.76	-18.68/-18.17	-13.07/-11.11	-10.9/-11.97	
Θ(150°)	-12.66/-13.38	-12.6/-10.81	-9.21/-8.5	-9.04/-8.06	-13.79/-18.1	-18.74/-19.9	-16.82/-18.42	-15.59/-14.34	-14.11/-14.72	-15.62/-15.73	-14.88/-13.98	-12.74/-11.46	-10.4/-9.68	-9.35/-9.76	-10.27/-11.94	-14.36/-17.12	-17.33/-19.35	-15.76/-13.29	-12.13/-11.78	-12.07/-14.23	-15.92/-18.36	-18.97/-18.47	-13.49/-11.56	-11.22/-16.4	
Θ(157.5°)	-13.68/-15.38	-15.96/-14.23	-12.38/-11.41	-11.73/-11.1	-15.18/-16.57	-16.07/-14.76	-13.59/-12.64	-12.11/-18.7	-11.86/-12.04	-12.43/-13.17	-14.21/-15.11	-15.84/-16.19	-16.34/-16.66	-17.17/-18.23	-18.52/-18.72	-18.9/-19.75	-13.49/-12.65	-12.39/-14.42	-13.07/-13.43	-16.27/-17.83	-18.85/-18.65	-15.9/-13.36	-12.86/-12.51		
Θ(165°)	-13.12/-15.24	-19.09/-17.81	-17.77/-18.05	-19.17/-18.37	-17.84/-16.52	-14.07/-12.26	-10.98/-10.17	-9.79/-9.7	-10/-10.71	-11.95/-13.84	-16.51/-17.89	-18.45/-19.05	-18.5/-18.05	-18.91/-18.86	-16.43/-14.23	-12.55/-11.39	-10.74/-10.66	-11.18/-12.15	-13.43/-14.8	-16.05/-17.43	-17.62/-17.74	-19.1/-18.83	-15.63/-13.47	-12.35/-12.2	
Θ(172.5°)	-11.33/-12.12	-13.34/-14.35	-15.27/-16.52	-17.87/-18.65	-15.67/-16.47	-14.1/-12.16	-10.89/-10.11	-8.87/-10.58	-10.88/-12.43	-14.94/-16.48	-17.48/-18.36	-18.43/-17.18	-15.99/-14.62	-13.64/-12.65	-11.59/-10.56	-9.74/-9.21	-9.04/-9.5	-10.48/-12.18	-14.51/-14.25	-16.26/-17.11	-17.71/-18.41	-17.65/-16.17	-14.28/-12.72	-11.29/-11.71	
Θ(180°)	-10.49/-10.68	-10.3/-11.1	-11.28/-11.77	-12.59/-13.16	-13.56/-13.74	-12.67/-11.77	-11.05/-10.78	-9.89/-11.58	-13/-15.86	-18.36/-19.46	-19.03/-18.6	-15.3/-13.47	-12.65/-12.11	-11.78/-14.41	-11.06/-10.75	-10.32/-10.07	-19.16/-18.02	-11.49/-12.58	-13.45/-14.57	-18.06/-18.02	-17.55/-15.06	-13.46/-12.17	-11.36/-11.02		
Freq(Hz)	2.45GPol.	ThetaAnt.1	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Gain	Φ(0°)Ψ(7.5°)	Φ(15°)Ψ(22.5°)	Φ(30°)Ψ(37.5°)	Φ(45°)Ψ(52.5°)	Φ(60°)Ψ(67.5°)	Φ(75°)Ψ(82.5°)	Φ(90°)Ψ(97.5°)	Φ(105°)Ψ(112.5°)	Φ(120°)Ψ(127.5°)	Φ(135°)Ψ(142.5°)	Φ(150°)Ψ(157.5°)	Φ(165°)Ψ(172.5°)	Φ(180°)Ψ(187.5°)	Φ(195°)Ψ(202.5°)	Φ(210°)Ψ(217.5°)	Φ(225°)Ψ(232.5°)	Φ(240°)Ψ(247.5°)	Φ(255°)Ψ(262.5°)	Φ(270°)Ψ(277.5°)	Φ(285°)Ψ(292.5°)	Φ(300°)Ψ(307.5°)	Φ(315°)Ψ(322.5°)	Φ(330°)Ψ(337.5°)	Φ(345°)Ψ(352.5°)	
Θ(0°)	-15.24/-16.21	-17.17/-19.59	-19.1/-18.33	-17.76/-18.31	-17.82/-17.37	-18.19/-18.07	-18.27/-16.85	-15.84/-15.35	-15.25/-15.33	-15.08/-14.19	-13.03/-12.16	-11.86/-12.14	-12.92/-13.64	-14.58/-16.06	-17.97/-19.15	-19.32/-18.78	-18.39/-17.97	-18.83/-17.64	-16.64/-16.78	-17.42/-17.93	-17.82/-17.24	-16.27/-15.35	-14.68/-14.34	-14.22/-14.55	
Θ(7.5°)	-14.41/-15.42	-16.3/-17.55	-19.55/-18	-19.02/-18.62	-17.97/-18.95	-18.33/-18.8	-18.58/-18.5	-18.02/-17.61	-17.21/-16.97	-16.54/-15.71	-14.82/-14.23	-13.86/-14.1	-14.57/-15.23	-16.19/-17.24	-18.67/-17.66	-19.09/-18.1	-19.19/-17.5	-16.32/-15.58	-15.73/-16.07	-16.64/-16.65	-15.86/-14.85	-13.84/-13.14	-12.73/-12.67	-13/-13.66	
Θ(15°)	-11.85/-12.91	-14.1/-16.1	-18.79/-19.08	-18.61/-18.59	-18.89/-18.65	-15.5/-14.76	-13.63/-14.64	-14.74/-15.63	-14.32/-14.105	-13.85/-13.62	-11.53/-13.59	-13.98/-14.86	-16.23/-17.05	-18.21/-19.04	-19.49/-19.54	-18.52/-17.32	-18.14/-14.84	-13.61/-13.02	-12.73/-12.52	-12.11/-11.68	-11.08/-10.46	-9.98/-9.68	-9.81/-9.79	-10.17/-10.92	
Θ(22.5°)	-8.97/-9.99	-11.44/-13.87	-17.47/-18.05	-15.07/-12.71	-11.33/-10.44	-9.92/-9	-10.28/-10.84	-11.45/-11.77	-11.86/-11.68	-11.42/-11.93	-12.78/-14.15	-15.46/-16.86	-17.86/-18.64	-17.17/-18.23	-18.52/-18.72	-18.9/-19.75	-13.49/-12.65	-12.39/-14.42	-13.07/-13.43	-16.27/-17.83	-18.85/-18.65	-15.9/-13.36	-12.86/-12.51		
Θ(30°)	-7.03/-8.1	-9.72/-11.76	-12.66/-11.02	-9.1/-7.93	-7.26/-																				



Radiated Composite Gain of 2.4GHz and 5GHz UNII 1~3

Appendix A

Θ(22.5°)	-11.32/-12.82	-14.72/-17	-18.4/-18.49	-17.99/-19.1	-18.01/-19.04	-17.77/-17.25	-17.51/-18.99	-19.01/-16.88	-17.2/-18.45	-18.39/-18.2	-19.18/-17.27	-16.63/-12.77	-11.4/-11.18	-12.2/-13.93	-17.15/-19.21	-18.7/-18.66	-17.93/-19.36	-18.11/-18.37	-18.16/-17.79	-18.33/-19.29	-16.48/-12.84	-11.33/-10.11	-9.79/-9.38	-9.38/-9.74
Θ(30°)	-16.09/-16.73	-18.76/-19.28	-18.89/-18.35	-17.7/-18.24	-17.83/-18.82	-19.49/-18.65	-18.5/-18.27	-17.28/-18.63	-16.91/-17.29	-17.64/-17.73	-18.31/-19.22	-18.91/-16.12	-15.33/-14.47	-14.58/-15.83	-16.5/-14.06	-12.74/-12.99	-14.24/-18.1	-18.98/-19.06	-17.36/-18.86	-16.34/-14.78	-17.7/-17.99	-16.94/-12.19	-10.32/-9.38	-10.39/-12.96
Θ(35°)	-19.24/-18.55	-17.99/-18.2	-18.43/-18.27	-18.76/-15.32	-14.53/-15.64	-17.96/-17.93	-19.52/-16.7	-19.24/-15.96	-15.49/-17.28	-15.85/-14.1	-14.9/-18.01	-19.02/-18.54	-15.69/-13.2	-11.02/-9.88	-10.51/-10.96	-13.03/-12.92	-16.51/-18.49	-17.64/-16.15	-17.64/-16.15	-12.35/-15.67	-18.91/-15.48	-10.79/-9.22	-10.96/-15.87	
Θ(45°)	-18.11/-16.8	-15.78/-15.08	-18.77/-18.99	-15.89/-13.3	-12.37/-11.88	-12.53/-16.21	-18.17/-18.84	-19.36/-17.77	-18.29/-19.13	-17.32/-16.16	-16.23/-17.84	-18.61/-18.84	-17.87/-19.3	-18.85/-16.26	-14.51/-13.59	-15.67/-15.94	-13.19/-12.99	-16.05/-18.44	-16.3/-13.46	-10.61/-7.76	-7.53/-9.19	-13.77/-15.17	-10.47/-9.14	-9.95/-14.99
Θ(52.5°)	-19.14/-16.06	-11.6/-12.35	-17.02/-18.49	-18.37/-16.3	-17.92/-18.11	-18.39/-17.46	-18.26/-19.78	-19.82/-17.7	-18.1/-18.65	-18.96/-18.67	-18.22/-18.35	-18.7/-17.8	-19.06/-19.4	-15.29/-12.78	-12.36/-13.93	-16.97/-14.07	-14.24/-14.48	-14.03/-13.95	-13.88/-11.61	-16.72/-15.54	-7.15/-6.5	-8.38/-13.08	-12.63/-10.18	-9.33/-12.58
Θ(60°)	-19.38/-18.6	-19.26/-18.44	-16.61/-18.35	-16.59/-17.19	-18.19/-4	-18.74/-17.78	-16.45/-18.5	-18.31/-18.56	-18.52/-18.78	-15.95/-19.33	-19.07/-16.86	-18.78/-18.75	-19.41/-18.18	-17.65/-18.3	-18.14/-18.94	-19.09/-16.07	-10.5/-8.75	-8.04/-9.37	-18.65/-9.17	-6.24/-6.19	-12.96/-14.03	-11.93/-13.59		
Θ(67.5°)	-13.49/-18.69	-18.72/-19.18	-18.56/-17.57	-18.99/-17.93	-18.11/-18.7	-17.41/-13.62	-13.57/-16.02	-15.08/-13.58	-18.94/-18.88	-18.98/-14.74	-14.6/-16.78	-18.2/-17.27	-12.02/-10.28	-10.62/-13.9	-14.57/-13.81	-13.21/-9.47	-8.87/-10.3	-14.35/-13.78	-14.58/-10.69	-8.81/-10.07	-13.34/-14.9	-7.82/-8.53	-11.36/-13.94	-10.88/-10.25
Θ(75°)	-12.87/-14.57	-18.07/-19.11	-18.23/-18.3	-18.07/-18.37	-15.28/-13.05	-10.99/-9.58	-10.19/-12.76	-17.77/-18.41	-19.02/-17.19	-18.14/-18.97	-18.37/-16.18	-16.02/-17.95	-15.58/-12.68	-14.01/-16.49	-15.74/-16.59	-11.43/-10.37	-9.69/-10.1	-10.17/-10.32	-13.91/-19.12	-18.12/-14.79	-15.23/-13.17	-9.9/-6.66	-8.17/-11.82	-10.83/-14.12
Θ(82.5°)	-15.42/-18.54	-16.22/-16.85	-18.26/-19.66	-18.93/-17.98	-17.95/-13.47	-13.36/-15.25	-15.28/-14.33	-15.95/-19.44	-18.15/-19.14	-19.41/-17.06	-17.91/-18.72	-18.33/-19.48	-17.41/-12.19	-12.42/-18.85	-13.79/-13.85	-12.01/-11.28	-14.15/-12.75	-17.57/-16.68	-17.86/-17.75	-16.34/-18.77	-17.58/-9.82	-7.86/-10.15	-12.68/-11.64	-9.93/-11.95
Θ(90°)	-15.2/-18.1	-17.28/-12.13	-10.84/-14.5	-17.7/-13.24	-14.29/-17.47	-19.28/-19.14	-17.78/-12.24	-10.1/-10.74	-13.85/-12.99	-12.24/-15.21	-14.2/-17.16	-18.93/-19.44	-18.22/-18.03	-17.98/-19.07	-15.45/-9.99	-8.86/-10.47	-12.77/-14.27	-16.04/-18.53	-19.36/-18.23	-18.07/-18.74	-18.24/-14.36	-11.31/-10.97	-10.24/-13.77	-14.71/-13.34
Θ(97.5°)	-11.11/-12.48	-17.99/-18.57	-10.44/-8.46	-10.68/-11.21	-9.57/-10.86	-14.82/-17.66	-18.02/-17.21	-16.73/-13.4	-14.4/-14.54	-14.69/-15.38	-15.41/-15.44	-16.56/-18.13	-12.1/-16.35	-17.33/-19.1	-17.56/-19.05	-18.46/-18.17	-17.2/-16.86	-16.55/-17.15	-15.83/-19.22	-17.6/-18.29	-17.88/-18.8	-13.14/-11.13	-8.06/-7.56	-10.99/-13.43
Θ(105°)	-9.64/-10.87	-14.23/-18.2	-14.37/-8.78	-6.72/-7.59	-7.45/-7.22	-8.67/-11.8	-18.26/-18.44	-15.03/-14.88	-17.43/-18.89	-15.84/-16.91	-17.83/-18.61	-13.9/-11.19	-13.92/-14.07	-16.04/-14.45	-17.5/-17.02	-15.59/-17.2	-17.7/-18.15	-18.5/-18.41	-18.68/-12.04	-13.09/-9.18	-5.59/-6.38	-13.09/-9.18	-10.04/-11.82	
Θ(112.5°)	-11.33/-17.53	-18.16/-18.75	-13.73/-7.82	-5.76/-4.79	-9.08/-12.66	-15.05/-19.45	-18.23/-18.02	-14.24/-11.69	-13.68/-18.25	-15.58/-15.98	-15.87/-17.16	-16.48/-13.35	-11.26/-14.56	-18.59/-15.81	-9.38/-12.39	-14.91/-14.67	-18.46/-14.71	-11.94/-14.1	-18.14/-18.7	-17.25/-18.94	-18.83/-17.01	-7.22/-6.01	-7.08/-12	-14.68/-11.7
Θ(120°)	-13.43/-19.27	-19.26/-18.32	-15.55/-10.66	-10.74/-12.11	-11.31/-11.15	-11.87/-12.16	-13.66/-18.45	-18.98/-13.78	-10.37/-9.94	-11.43/-10.83	-12.1/-16.35	-12.14/-10.85	-12.14/-10.85	-17.33/-19.1	-17.56/-19.05	-18.46/-18.17	-17.2/-16.86	-19.37/-15.49	-13.35/-17.3	-17.04/-18.2	-17.87/-10.8	-9.88/-8.25	-11.18/-15.87	-17.74/-18.68
Θ(127.5°)	-15.64/-18.96	-16.94/-11.3	-9.68/-9.1	-9.18/-12.1	-17.75/-15.09	-13.5/-11.99	-14.11/-12.66	-14.73/-11.26	-8.27/-8.66	-11.7/-10.41	-8.37/-8.14	-10.93/-13.18	-17.13/-12.19	-18.57/-19.11	-11.7/-10.2	-15.51/-14.43	-17.98/-19.48	-16.27/-13.87	-12.19/-12.72	-18.29/-11.72	-10.51/-11.78	-17.87/-18.39	-18.84/-18.17	
Θ(135°)	-18.86/-19.09	-12.64/-8.65	-7.75/-8.55	-9.45/-12.25	-17.57/-15.32	-11.35/-10.82	-11.91/-13.37	-13.45/-9.01	-6.34/-6.91	-9.49/-8.66	-6.98/-7.56	-10.91/-16.72	-13.84/-9.48	-8.87/-14.24	-17.24/-18.13	-14.69/-18.23	-17.39/-15.32	-18.56/-14.7	-13.89/-14.52	-19.06/-14.66	-18.82/-17.89	-18.16/-18.02	-15.75/-16.96	-18.51/-18.36
Θ(142.5°)	-12.88/-10.67	-8.23/-6.61	-6.13/-5.17	-9.74/-13.21	-17.99/-10.88	-17.49/-18.99	-15.56/-12.78	-10.79/-4.97	-8.99/-5	-9.52/-8.76	-8.78/-8.95	-11.33/-16.41	-16.78/-14.79	-15.44/-17.22	-18.36/-15.11	-13.32/-17.79	-11.64/-12.16	-18.75/-18.1	-13/-10.9	-12.59/-13.64	-13.42/-12.12	-16.44/-17.16	-14.87/-17.67	-15.79/-15.99
Θ(150°)	-6.85/-7.26	-9.24/-12.3	-14.81/-16.7	-15.67/-17.85	-18.5/-18.25	-17.74/-18.99	-18.22/-18.16	-16.44/-13.67	-11.72/-10.79	-11.07/-12.7	-12.15/-11.36	-11.53/-12.4	-13.99/-18.46	-17.46/-17.22	-14.19/-11.08	-12.96/-16.14	-13.33/-16.14	-18.87/-18.15	-13.67/-17.83	-17.94/-16.04	-17.32/-15.97	-17.17/-17.93	-17.51/-14.89	-11.57/-14.08
Θ(157.5°)	-5.97/-6.81	-9.35/-13.5	-18.18/-18.1	-14.3/-12.7	-12.43/-12.83	-13.95/-16.03	-18.19/-17.57	-16.57/-15.24	-13.13/-12.48	-13.84/-13.6	-10.25/-9.02	-9.28/-10.1	-11.56/-13.48	-14.6/-13.72	-12.53/-13.17	-16.3/-18.74	-17.63/-17.51	-18.4/-15.11	-12.64/-11.12	-11.42/-13.86	-16.78/-18.34	-18.02/-13.89	-11.38/-10.15	-8.23/-6.37
Θ(165°)	-8.04/-8.8	-10.74/-15.07	-18.65/-17.99	-15.65/-13.73	-12.95/-13.16	-14.35/-17.36	-19.38/-18.5	-17.72/-18.65	-17.95/-16.33	-17.08/-18.58	-15.26/-12.81	-11.4/-10.97	-11.68/-12.94	-15.03/-17.65	-18.15/-18.83	-19.05/-17.95	-16.2/-15.17	-13.9/-13.25	-13.3/-13.53	-13.06/-12.25	-11.5/-11.12	-11.42/-12.26	-13.41/-13.15	-10.39/-8.32
Θ(172.5°)	-15.27/-15.29	-15.92/-17.86	-17.75/-17.58	-15.94/-14.74	-13.35/-12.85	-12.38/-12.96	-14.07/-15.43	-16.42/-18.07	-17.82/-17.9	-17.52/-17.68	-18.61/-15.82	-14.56/-14.53	-16.13/-18.61	-17.97/-18.03	-17.75/-16.4	-14.54/-13.56	-13.74/-14.19	-15.88/-15.68	-14.94/-14.21	-13.64/-12.6	-12.01/-12.01	-13.3/-15.76	-18.14/-18.76	-17.26/-16.92
Θ(180°)	-16.81/-16.07	-15.47/-13.81	-12.45/-11.18	-10.38/-9.99	-9.42/-8.64	-8.22/-8.34	-8.74/-9.08	-9.51/-10.63	-12.39/-14.28	-16.35/-18.92	-18.51/-18.01	-18.62/-18.52	-18.2/-18.51	-17.96/-19.32	-18.49/-17.97	-18.45/-18.66	-17.57/-19.25	-17.77/-18.85	-17.78/-18.64	-18.65/-18.83	-18.47/-18.2	-18.96/-17.96	-17.87/-17.85	-18.68/-17.46
Freq(Hz)	5.36Pol.	ThetaAnt. 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)Φ(7.5°)	Φ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)
Θ(0°)	-18.26/-18.14	-18.64/-17.6	-15.79/-15.05	-13.73/-12.05	-10.53/-9.82	-9.81/-10.25	-10.69/-11.47	-11.99/-12.6	-14.05/-15.26	-15.95/-16.79	-17.59/-19.74	-19.14/-18.53	-18.05/-17.57	-18.54/-16.95	-15.87/-15.2	-15.28/-15.7	-15.21/-14.62	-14.7/-14.24	-13.59/-13.39	-14.09/-14.68	-14.67/-14.79	-15.86/-17.12	-18.08/-18.48	-17.64/-19.1
Θ(7.5°)	-18.51/-18.17	-19.02/-18.82	-17.88/-18.77	-17.35/-15.05	-13.76/-13.41	-13.27/-13.35	-14.14/-14.45	-13.16/-12.5	-14.1/-16.29	-16.13/-14.83	-15.35/-17.09	-17.71/-16.38	-19.04/-18.99	-15.93/-13.46	-11.81/-16.07	-10.08/-9.93	-9.86/-9.57	-9.74/-10.23	-10.35/-10.89	-12.04/-12.39	-13.83/-14.65	-18.34/-18.48	-18.55/-18.24	-17.99/-18.92
Θ(15°)	-18.16/-19.3	-18.03/-16.51	-14.62/-13.16	-12.33/-12.08	-13.13/-14.09	-13.68/-13.4	-13.83/-14.46	-12.33/-13.28	-12.95/-14.02	-13.81/-13.01	-15.53/-15.61	-15.35/-18.96	-17.17/-17.92	-14.18/-11.23	-9.83/-9.15	-9.29/-9.53	-9.79/-9.89	-9.83/-9.88	-10.41/-11.57	-12.86/-13.91	-14.09/-15.28	-17.37/-18.37	-19.01/-19.13	-19.37/-18.39
Θ(22.5°)	-16.23/-15.45	-14.25/-11.98	-10.69/-10.52	-10.45/-10.51	-10.21/-9.54	-9.91/-10.54	-11.36/-11.9	-10.85/-9.37	-8.78/-9.44	-9.43/-8.5	-8.89/-10.33	-13.02/-17.09	-18.84/-18.47	-14.91/-12.08	-10.55/-9.82	-9.58/-9.92	-10.19/-10.58	-11.05/-11.79	-12.85/-13.29	-12.35/-11.22	-10.91/-11.36	-12.51/-12.75	-11.71/-10.85	-11.29/-13.59
Θ(30°)	-11.56/-11.56	-10.76/-9.71	-8.69/-8.01	-7.71/-6.86	-10.07/-12.47	-13.19/-12.69	-11.89/-11.01	-9.51/-7	-6.58/-6.41	-6.46/-6.68	-7.71/-8.57	-9.46/-11.67	-17.05/-18.92	-19.03/-15.89	-12.98/-12.13	-11.82/-11.82	-11.31/-8.37	-6.96/-7.49	-9.07/-9.93	-9.18/-9.57	-9.72/-10.89	-11.42/-12	-12.37/-11.16	-10.31/-10.51
Θ(37.5°)	-17.41/-17.72	-12.99/-10.88	-9.08/-8.89	-11.1/-14.25	-17.13/-10.71	-11.73/-10.19	-10.44/-10.28	-9.68/-8.12	-7.17/-6.98	-7.22/-7.17	-7.34/-8.28	-9.78/-11.56	-13.89/-18.96	-18.52/-17.07	-17.53/-19.09	-18.12/-14.08	-10.35/-8.79	-7.73/-5.65	-5.06/-6.4	-7.47/-7.15	-7.59/-8.66	-9.09/-10.63	-11.5/-10.5	-9.67/-11.8
Θ(45°)	-8.61/-12.79	-15.91/-12.79	-8.9/-9.56	-12.18/-14.71	-15.79/-16.19	-15.08/-11.92	-9.99/-9.61	-9.37/-8.93	-8.19/-8.32	-10.2/-11.94	-9.96/-8.27	-8.09/-8.19	-8.3/-10.06	-12.01/-18.04	-18.26/-15.86	-14.47/-10.84	-10.98/-14.36	-11.61/-9.2	-7.84/-6.9	-6.61/-6.94	-6.44/-6.75	-8.58/-12.03	-12.04/-11.7	-8.25/-8.77
Θ(52.5°)	-5.83/-9.93	-11.8/-9.58	-7.95/-9.8	-8.57/-8.45	-11.07/-13.27	-17.3/-14.77	-12.46/-11.88	-11.67/-10.66	-8.64/-8.2	-11.51/-15.24	-15.25/-11.82	-10.9/-8	-8.15/-8.92	-11.42/-13.46	-12.21/-10.86	-12.22/-12.02	-15.98/-18.48	-12.37/-8.25	-6.35/-6.47	-7.87/-9.48	-10.21/-9.68	-9.76/-11.74	-18.38/-17.67	-12.3/-6.63
Θ(60°)	-4.51/-6.85	-8.28/-8.15	-6.86/-6.26	-6.21/-6.68	-9.8/-14.21	-15.41/-1																		



Radiated Composite Gain of 2.4GHz and 5GHz UNII 1~3

Appendix A

Θ(75°)	-11.28/-16.16	-18.89/-17.61	-16.91/-18.58	-18.3/-14.03	-13.06/-12.56	-14.67/-18.09	-18.63/-17.45	-18.96/-18.72	-18.17/-18.17	-18.52/-12.75	-11.24/-17.45	-18.91/-19.27	-18.66/-11.44	-8.57/-13.26	-19.34/-14.62	-13.22/-10.73	-9.95/-9.16	-12.9/-11.51	-9.28/-10.31	-16.13/-18.36	-16.58/-14.63	-7.91/-12.11	-17.93/-10.34	-10.05/-10.81
Θ(82.5°)	-10.02/-11.58	-18.35/-14.46	-13.11/-18.47	-13.87/-8.88	-9.38/-10.99	-16.57/-16.01	-15.51/-14.03	-12.94/-15.32	-12.33/-14.8	-18.72/-10.7	-13.35/-16.46	-12.96/-16.1	-17.47/-16.46	-13.31/-15.85	-14.52/-14.82	-13.74/-12.5	-10.93/-8.4	-8.71/-17.1	-18.1/-18.4	-13.77/-15.71	-18.55/-10.27	-9.68/-10.04	-8.71/-8.32	-10.45/-13.35
Θ(90°)	-8.24/-12.79	-18.11/-14.26	-15.51/-18.12	-18.33/-13.86	-6.15/-14.14	-15.24/-15.55	-13.01/-14.4	-12.31/-11.18	-12.65/-14.25	-13.63/-15.19	-10.39/-18.73	-18.03/-18.71	-17.97/-16.48	-18.39/-16.64	-15.62/-14.57	-14.27/-12.88	-14.77/-13.53	-17.81/-13.53	-19.1/-18.2	-19.18/-32	-18.92/-16.61	-10.82/-9.21	-9.39/-8.07	-9.71/-9.92
Θ(97.5°)	-8.51/-12.2	-13.27/-9.29	-12.73/-17.84	-11.47/-10.61	-13.02/-17.78	-18.19/-19.02	-15.24/-13.17	-16.66/-12.42	-12.8/-14.3	-18.63/-14.94	-18.33/-19.48	-13.4/-12	-12.56/-15.45	-18.85/-19.16	-18.27/-18.03	-19.04/-13.06	-13.72/-15.65	-17.8/-14.28	-18.65/-16.55	-15.09/-16.11	-18.56/-17.2	-10.47/-8.21	-5.69/-6.46	-10.25/-8.63
Θ(105°)	-11.54/-9.37	-8.03/-10.41	-12.37/-9.31	-8.86/-8.7	-9.68/-11.25	-13.29/-14.68	-14.53/-15.31	-16.48/-18.36	-15.4/-11.22	-14.79/-13.54	-13.52/-17.9	-18.72/-13.49	-11.23/-12.3	-17.79/-14.99	-15.17/-16.7	-16.78/-17.77	-17.57/-14.99	-13.05/-11.56	-12.8/-14.7	-14.28/-16.68	-18.69/-13.54	-11.18/-4.35	-3.72/-7.44	-8.43/-10.71
Θ(112.5°)	-13.4/-8.53	-10.78/-13.24	-12.14/-7.26	-6.27/-6.38	-7.94/-13.25	-16.53/-17.65	-18.32/-18.73	-18.75/-18.76	-17.36/-10.45	-8.4/-10.03	-17.71/-17.4	-15.53/-14.33	-9.49/-9.32	-14.97/-18.76	-18.64/-13.31	-18.99/-9.85	-8.38/-10.94	-13.92/-15.06	-18.03/-18.45	-17.32/-17.5	-18.77/-8.02	-18.77/-8.02	-4.86/-10.8	-8.66/-14.47
Θ(120°)	-8.85/-10.63	-15.5/-10.82	-6.87/-6.66	-5.76/-5.7	-8.01/-8.8	-9.21/-9.23	-10.96/-13.53	-17.49/-18.87	-16.66/-9.39	-7.71/-10.58	-9.48/-7.98	-9.37/-15.98	-19.18/-17.56	-14.31/-13.11	-18.11/-18.71	-16.02/-16.81	-10.6/-8.52	-13.06/-18.16	-12.45/-13.41	-16.53/-13.62	-14.38/-7.43	-7.57/-6.91	-10.16/-14.45	-18.91/-14.47
Θ(127.5°)	-10.41/-10.05	-10.2/-9.45	-7.76/-9.08	-12.23/-12.09	-8.91/-5.77	-5.21/-6.49	-8.17/-10.09	-10.83/-12.16	-18.1/-13.24	-11.66/-12.75	-13.6/-16.96	-18.59/-18.91	-18.55/-18.64	-18.7/-18.51	-18.61/-18.68	-12.97/-18.5	-18.6/-18.33	-14.13/-14.72	-18.54/-16.51	-14.42/-8.04	-14.63/-10.82	-7.61/-9.22	-14/-18.84	-17.36/-15.31
Θ(135°)	-11.01/-8.28	-7.32/-8.16	-9.07/-11.54	-18.29/-15	-9.01/-6.34	-4.5/-4.2	-6.37/-8.13	-7.68/-9.86	-16.17/-15.28	-16.14/-15.37	-14.12/-14.9	-15.74/-17.59	-19.1/-18.59	-18.08/-14.02	-12.16/-13.77	-16.07/-17.87	-14.91/-14.16	-18.72/-18.58	-17.35/-17.58	-18.06/-18.72	-17.8/-15.56	-16.43/-13	-13.4/-15.76	-18.79/-17.39
Θ(142.5°)	-6.65/-4.83	-5.81/-8.41	-12.88/-18.44	-17.6/-11.74	-8.58/-6.72	-6.08/-5.68	-5.68/-5.25	-5.48/-6.71	-9.26/-10.45	-8.74/-10.21	-10.53/-12.85	-17.43/-18.25	-18.28/-15.49	-11.42/-11.05	-16.73/-17.86	-18.73/-18.76	-15.88/-10.38	-17.38/-19.13	-18.71/-19.18	-14.79/-8.52	-7.23/-7.59	-10.75/-19.09	-17.83/-18.45	-15.9/-9.19
Θ(150°)	-5.51/-7.8	-13.18/-18.12	-10.62/-12.06	-16.29/-17.68	-14.94/-13.95	-14.72/-15.57	-14.93/-13.6	-13.51/-11.92	-9.05/-8.04	-7.89/-6.54	-6.06/-5.94	-6.14/-8.14	-10.62/-12	-13.33/-16.15	-18.25/-17.45	-18.29/-17.7	-15.46/-12.29	-16.27/-17.34	-19.2/-17.05	-17.8/-11.33	-8.94/-9.23	-10.52/-16.59	-11.53/-7.88	-6.37/-15.4
Θ(157.5°)	-6.7/-10.58	-16.99/-14.41	-10.73/-9.99	-11.42/-13.05	-13.55/-14.58	-17.29/-18.2	-17.85/-19.09	-16.81/-11.2	-8.29/-7.9	-7.19/-6.45	-3.98/-4.05	-4.58/-6.01	-8.27/-11.77	-17.22/-18.61	-19.78/-17.83	-19.69/-18.89	-19.33/-18.38	-18.33/-14.65	-15.27/-17.58	-17.91/-17.14	-18.34/-18.05	-15.63/-12.05	-8.67/-12.83	-5.56/-5.24
Θ(165°)	-9.62/-10.43	-9.27/-7.61	-6.42/-6.38	-6.94/-8.01	-9.69/-11.65	-13.78/-15.22	-14.69/-13.92	-12.73/-10.3	-9.16/-9.99	-9.7/-8	-6.83/-6.97	-8.35/-11.17	-15.43/-17.89	-17.89/-17.86	-17.13/-17	-18.61/-18.81	-18.98/-15.09	-15.2/-17.83	-17.58/-18.4	-17.94/-18.28	-19.33/-15.88	-12.41/-11.52	-11.78/-10.11	-8.72/-9.04
Θ(172.5°)	-19.78/-15.13	-12.59/-11.39	-10.24/-9.32	-9.14/-9.58	-10.13/-11.81	-15.61/-17.9	-19.14/-18.7	-19.26/-17.02	-15.95/-12.74	-10.58/-10.08	-9.4/-8.85	-9.01/-9.78	-10.87/-12.22	-13.98/-16.08	-18.18/-17.94	-18.23/-19.14	-18.19/-18.37	-18.45/-17.4	-18.15/-19	-17.74/-16.87	-19.36/-18.51	-19.46/-18.95	-18.27/-18.83	-18.39/-18.52
Θ(180°)	-17.87/-13.38	-18.93/-18.17	-18.43/-17.52	-18.64/-19.42	-16.29/-15.17	-15.44/-16.21	-17.68/-18.18	-16.35/-15.71	-15.46/-14.54	-13.81/-12.53	-11.93/-12.68	-17.89/-18.64	-17.76/-18.49	-17.11/-15.92	-14.92/-14.32	-14.52/-15.56	-16.58/-17.06	-16.86/-18.24	-18.41/-17.97	-18.79/-18.25	-17.55/-18.76	-18.97/-17.35	-17.06/-17.94	
Freq(Hz)	5.785GPol.	ThetaAnt. 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)Φ(7.5°)	Φ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)
Θ(0°)	-10.05/-9.51	-9.01/-8.46	-7.9/-8.05	-8.38/-8.28	-8.15/-8.18	-8.74/-5.67	-10.34/-10.41	-10.88/-11.64	-12.33/-11.49	-10.83/-11.07	-11.29/-12.57	-9.09/-8.47	-7.98/-7.8	-7.77/-7.77	-7.55/-7.6	-7.45/-7.68	-8.12/-8.88	-9.76/-10.57	-11.01/-10.77	-10.84/-11.57	-13.36/-15.59	-15.63/-14.4	-13.31/-12.33	-12.17/-13.51
Θ(7.5°)	-8.58/-8.41	-7.8/-8.05	-8.05/-8.8	-9.23/-9.23	-8.78/-8.33	-8.6/-9.12	-9.99/-11.26	-12.22/-12.32	-13.47/-15.48	-16.46/-15.8	-15.28/-13.77	-12.42/-11.12	-10.19/-9.7	-9.42/-8.99	-8.84/-8.49	-8.54/-8.75	-9.45/-9.65	-9.71/-9.83	-10.56/-11.38	-11.78/-11.76	-11.36/-11.15	-10.78/-10.23	-9.71/-9.41	-9.69/-9.09
Θ(15°)	-10.7/-10.22	-10.46/-10.57	-10.24/-10.31	-9.78/-9.38	-9.57/-10.05	-9.81/-10.7	-11.39/-12.33	-10.81/-11.14	-11.97/-14.46	-18.07/-18.85	-18/-18.88	-18.04/-18.48	-16.71/-14.7	-12.94/-13.16	-9.85/-8.27	-7.54/-6.94	-6.44/-5.9	-5.49/-5.52	-6.47/-7.5	-8.27/-8.49	-9.03/-8.89	-10.52/-10.87	-11.04/-11.01	-10.53/-10.97
Θ(22.5°)	-14.93/-14.51	-12.99/-10.39	-8.67/-8.71	-8.38/-10.48	-12.72/-13.07	-11.9/-9.94	-8.57/-8.28	-8.07/-7.4	-7.13/-6.63	-11.96/-13.22	-11.62/-11.55	-10.21/-11.32	-10.59/-9.76	-10.21/-11.55	-13.15/-13.71	-9.83/-11.38	-6.71/-6.42	-6.91/-6.52	-5.31/-5.68	-6.17/-6.42	-6.91/-7.61	-8.9/-9.79	-11.08/-12.94	-15/-16.21
Θ(30°)	-16.8/-11.22	-8.24/-6.65	-6.12/-7.54	-9.96/-9.81	-9.35/-9.25	-8.01/-7.04	-7.02/-7.19	-6.98/-6.48	-7.1/-9.33	-10.96/-10.9	-11.07/-11.45	-11.27/-9.26	-6.75/-4.2	-5.71/-7.36	-9.75/-12.36	-16.78/-18.89	-18.3/-13.8	-10.76/-9.47	-7.37/-5.69	-4.4/-4.14	-4.21/-4.07	-4.59/-5.14	-5.62/-6.85	-9.27/-13.86
Θ(37.5°)	-7.74/-7.99	-7.32/-5.91	-6.94/-8.85	-8.18/-11.8	-6.47/-6.28	-6.13/-5.95	-6.91/-8.76	-11.43/-14.55	-18.43/-17.7	-16.28/-14.14	-10.34/-11.86	-6.29/-5.96	-5.88/-6.74	-8.95/-12.3	-14.83/-18.11	-19.3/-17	-9.78/-7.3	-6.79/-7.48	-3.51/-3.52	-4.48/-4.64	-3.95/-4.86	-5.41/-7.48	-5.06/-6.47	
Θ(45°)	-6.55/-9.49	-8.04/-8.21	-6.51/-9.49	-4.53/-5.5	-7.25/-8.36	-9.24/-10.49	-12.16/-13.69	-14.33/-13.91	-14.36/-15.09	-11.26/-8.77	-8.93/-12.82	-10.04/-5.95	-4.66/-4.06	-4.69/-6.85	-8.66/-10.32	-12.75/-13.34	-9.68/-7.79	-4.31/-3.78	-4.56/-3.49	-2.73/-4.5	-6.47/-6.66	-6.11/-5.92	-6.25/-7.3	
Θ(52.5°)	-4.44/-5.47	-6.44/-10.37	-10.74/-9.26	-8.64/-8.79	-8.15/-7.38	-7.85/-8.37	-10.05/-13.04	-12.93/-10.19	-8.82/-8.39	-8.18/-9.07	-10.09/-8.99	-7.95/-8.61	-9.82/-6.81	-6.3/-6.97	-7.02/-8.01	-11.1/-11.62	-16.73/-19.29	-13.13/-10.51	-9.07/-6.22	-5.02/-5.78	-6.51/-5.84	-7.26/-11.01	-10.12/-5.96	-4.02/-4.61
Θ(60°)	-2.97/-3.42	-4.11/-6.43	-5.03/-3.61	-5.18/-6.34	-6.62/-8.05	-11.58/-16.82	-11.08/-8.95	-8.32/-7.27	-7.67/-8.18	-7.02/-8.16	-8.91/-8.6	-7.99/-8.32	-12.73/-9.08	-6.29/-5.38	-4.98/-3.54	-6.76/-13.52	-13.33/-19.22	-10.97/-7.61	-5.86/-4.85	-6.47/-7.77	-8.82/-10.78	-7.89/-8.5	-14.05/-9.43	-2.58/-1.85
Θ(67.5°)	-1.36/-2.53	-1.34/-2.34	-1.61/-0.94	-2.86/-2.94	-3.01/-4.71	-8.47/-17.84	-18.65/-11.21	-8.94/-8.37	-9.59/-11.32	-8.96/-7.64	-10.54/-10.77	-7.3/-7.84	-10.47/-6.56	-15.54/-7.8	-3.61/-2.57	-4.54/-7.19	-11.41/-18.24	-13.59/-10.49	-10.71/-6.2	-6.83/-8.96	-10.27/-12.94	-12.2/-7.59	-11.11/-10.33	-3.84/-0.53
Θ(75°)	0/-1.79	-2.83/-0.56	-0.4/-0.76	-1.11/-1.96	-1.97/-3.44	-7.64/-12.73	-11.46/-10.94	-11.78/-11.41	-11.37/-12.38	-13.69/-10.98	-11.5/-10.12	-5.57/-4.2	-6.02/-5.51	-5.01/-5.59	-2.02/-1.07	-1.9/-2.96	-5.95/-9.21	-15.84/-12.87	-12.82/-10.38	-11.63/-12.37	-17.68/-13.51	-9.11/-9.29	-9.15/-3.56	-1.590/-18
Θ(82.5°)	0.13/-0.74	-1.30/-0.1	0.04/-1.36	-0.98/-0.72	-1.48/-2.81	-4.02/-2.64	-8.21/-12.47	-18.34/-15.05	-10.29/-14	-13.38/-8.21	-6.91/-5.25	-3.6/-3.8	-3.32/-1.63	-2.14/-4.99	-3.11/-1.41	-1/-3.83	-7.91/-6.7	-4.62/-7.18	-6.36/-7.6	-1.84/-12.51	-7.25/-6.69	-5.61/-4	-5.24/-4.38	-0.70/-67
Θ(90°)	-3.06/-1.89	-1.51/-2.16	-1.48/-1.93	0.55/-0.1	-0.68/-3.17	-4.41/-6.94	-9.83/-10.69	-9.74/-9.55	-8.07/-6.79	-6.2/-6.13	-6.85/-4.56	-2.15/-1.85	-1.06/-0.9	-0.83/-2.31	-4.98/-4.08	-3.56/-2.57	-5.54/-6.99	-6.61/-13.19	-17.97/-14.05	-11.12/-11.36	-4.82/-5.03	-9.3/-5.37	-4.43/-4.72	-5.02/-0.9
Θ(97.5°)	-10.61/-5.76	-4.21/-5.6	-2.75/-4.44	-1.28/-0.47	-1.21/-2.35	-4.61/-5.83	-7.32/-7.5	-7.91/-6.48	-8.34/-7.14	-5.7/-3.68	-4.15/-3.57	-1.77/-1.42	-0.49/-0.47	-0.10/-15	-2.04/-0.93	-3.53/-6.14	-2.95/-11.3	-18.35/-9.43	-15.23/-10.99	-15.66/-8.73	-8.71/-9.47	-6.96/-7.55	-5.27/-9.57	-10.51/-5.03
Θ(105°)	-17.23/-10.8	-8.32/-4.52	-2.35/-1.99	-0.22/-0.4	-1.71/-1.71	-2.6/-2.89	-4.2/-6.13	-8.55/-9.24	-11.71/-5.74	-4.05/-2.85	-3.36/-1.6	0.15/-0.65	-0.35/-0.8	2.25/-2.3	0.54/-0.15	-1.23/-7.1	-4.93/-6.88	-18.2/-6.06	-8.1/-8.39	-9.78/-6.89	-10.51/-14.6	-9.77/-10.92	-17.29/-18.26	-9.64/-8.42
Θ(112.5°)	-11.25/-11.28	-9.18/-2.48	-1.56/-1.62	-3.07/-3.44	-1.86/-8.78	-1.14/-2.15	-3.8/-7.93	-10.54/-11.35	-10.54/-6.81	-2.91/-0.86	-1.62/-1.43	0.55/-1.41	1.03/-0.7	0.61/-0.6	0.57/-1.38	-2.27/-8.22	-8.34/-6.11	-12.56/-19.11	-13.69/-8.91	-8.72/-12.3	-18.47/-7.43	-5.62/-11.43	-14.77/-18.69	-12.83/-18.37
Θ(120°)	-4.29/-5.36	-6.89/-2.48	-1.82/-1.73	-3.01/-5.25	-3.68/-1.84	-0.98/-2.2	-4.34/-6.1	-9.93/-11.68	-9.32/-3.25</															



Radiated Composite Gain of 2.4GHz and 5GHz UNII 1~3

Appendix A

Θ(127.5°)	-14.58/-9.5	-9.85/-15.04	-15.39/-9.91	-13.4/-18.88	-15.61/-9.14	-7.69/-8.07	-9.7/-12.35	-11.85/-8.31	-8.55/-12.54	-17.9/-15.95	-10.78/-9.18	-13.9/-17.62	-15.7/-15.96	-9.75/-9.43	-12.02/-10.35	-7.71/-9.8	-10.48/-18.52	-14.21/-16.76	-18.19/-9.95	-8.22/-11.47	-11.66/-6.55	-14.14/-17.86	-18.14/-17.95	-17.94/-18.1
Θ(135°)	-17.63/-13.5	-12.18/-11.04	-19.27/-12.69	-13.64/-18.06	-15.21/-10.29	-9.04/-9.97	-9.59/-9.56	-12.64/-15.91	-15.62/-13.45	-11.66/-11.74	-10.11/-9.69	-12.36/-14.78	-14.79/-16.03	-9.45/-8.41	-6.65/-9.83	-13.65/-14.42	-12.28/-17.82	-14.89/-12.62	-18.8/-16.09	-13.47/-10.49	-9.88/-6.15	-7.16/-13.61	-18.53/-19.14	-13.35/-11.75
Θ(142.5°)	-11.17/-19.12	-17.88/-12.01	-12.54/-18.07	-17.52/-13.64	-11.99/-11.79	-10.78/-10.13	-11.44/-13.77	-14.03/-13.96	-11.91/-9.67	-10.97/-15.91	-15.04/-12.63	-16.93/-14.13	-14.47/-11.36	-9.06/-6.73	-7.47/-16.68	-18.49/-17.9	-18.63/-18.28	-16.38/-18.28	-18.24/-17.1	-12.51/-12.42	-17.16/-14.59	-8.38/-7.54	-12.26/-17.16	-18.52/-15.01
Θ(150°)	-6.19/-9.11	-15.18/-17.59	-14.82/-16.39	-17.52/-19.43	-18.45/-14.08	-9.7/-9.27	-10.57/-14.54	-17.36/-18.21	-17.05/-18.56	-17.97/-19.26	-17.75/-12.4	-9.94/-12.16	-17.47/-17.82	-17.18/-18.11	-18.19/-18.2	-15.99/-15.01	-10.9/-10.38	-12.99/-19.12	-18.58/-12.94	-7.69/-6.66	-7.62/-7.25	-6.04/-5.93	-9.13/-11.97	-7.89/-8.15
Θ(157.5°)	-12.68/-11.1	-11.12/-11.4	-12.47/-12.26	-12.05/-13.41	-13.51/-13.82	-11.36/-12.25	-14.11/-15.36	-15.93/-15.7	-15.5/-14.4	-17.65/-17.7	-18.65/-17.44	-16.51/-16.51	-13.06/-11.46	-12.58/-11.47	-17.77/-18.33	-17.29/-13.36	-9.11/-8.69	-11.06/-16.08	-15.15/-9.94	-7/-5.98	-5.42/-5.42	-4.48/-4.61	-6.78/-10.89	-18.33/-14.46
Θ(165°)	-11.9/-9.59	-9.61/-10.58	-12.05/-12.37	-13.18/-15.02	-15.97/-16.52	-15.43/-15.16	-15.01/-14.94	-16.12/-16.46	-17/-18.55	-18.57/-17.23	-17.2/-18	-16.97/-13.49	-11.04/-9.35	-8.21/-7.56	-7.27/-7.19	-7.83/-7.94	-7.86/-8.8	-10.68/-13.19	-13.07/-10.03	-7.4/-6.2	-5.71/-5.27	-5.66/-6.55	-9.34/-15.18	-18.52/-15.01
Θ(172.5°)	-14.8/-13.61	-14.42/-17.51	-18.95/-18.25	-18.31/-18.64	-18.2/-17.91	-18.29/-19.46	-16.98/-16.62	-18.4/-17	-14.8/-14.61	-15.59/-15.94	-15.46/-13.72	-11.66/-9.67	-8.56/-8.06	-7.58/-7.65	-7.99/-8.85	-10.95/-12.73	-13.7/-14.29	-14.8/-16.14	-14.36/-11.83	-9.7/-9.39	-10.54/-11.35	-13.49/-16.19	-19.3/-19.02	-18.2/-16.87
Θ(180°)	-12.23/-12.19	-13.45/-16.78	-19.04/-17.13	-17.51/-18.89	-17.73/-19.29	-17.85/-18.17	-17.91/-18.18	-17.98/-18.42	-15.19/-14.27	-14.1/-13.89	-13.91/-13.58	-13.59/-14.05	-14.15/-14.71	-15.77/-17.78	-17.83/-18	-18.84/-19.17	-18.76/-17.44	-19.23/-18.16	-18.49/-19.56	-18.08/-18.79	-18.44/-16.58	-15.71/-14.83	-14.26/-13.64	-13.76/-12.68
Freq(Hz)	5.2GPol.	Theta/Ant. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)/Φ(7.5°)	Φ(15°)/Φ(22.5°)	Φ(30°)/Φ(37.5°)	Φ(45°)/Φ(52.5°)	Φ(60°)/Φ(67.5°)	Φ(75°)/Φ(82.5°)	Φ(90°)/Φ(97.5°)	Φ(105°)/Φ(112.5°)	Φ(120°)/Φ(127.5°)	Φ(135°)/Φ(142.5°)	Φ(150°)/Φ(157.5°)	Φ(165°)/Φ(172.5°)	Φ(180°)/Φ(187.5°)	Φ(195°)/Φ(202.5°)	Φ(210°)/Φ(217.5°)	Φ(225°)/Φ(232.5°)	Φ(240°)/Φ(247.5°)	Φ(255°)/Φ(262.5°)	Φ(270°)/Φ(277.5°)	Φ(285°)/Φ(292.5°)	Φ(300°)/Φ(307.5°)	Φ(315°)/Φ(322.5°)	Φ(330°)/Φ(337.5°)	Φ(345°)/Φ(352.5°)
Θ(0°)	-11.37/-11.33	-13.26/-15.91	-17.83/-15.27	-13.58/-14.05	-13.52/-13.62	-15.09/-13.14	-11.46/-10.18	-9.46/-9.68	-9.39/-9.3	-8.66/-8.37	-8.43/-8.71	-9.03/-10.39	-11.35/-11.95	-12.34/-11.88	-12.52/-13.79	-15.86/-17.37	-16.64/-15.52	-16.1/-18.67	-17.28/-15.6	-13.92/-13.02	-13.31/-13.17	-12.48/-12.11	-12.51/-12.53	-11.24/-10.97
Θ(7.5°)	-9.52/-9.58	-10.2/-11.81	-13.92/-13.81	-14.12/-16.64	-17.19/-18.29	-18.82/-19.19	-15.68/-15.22	-14.44/-18.87	-13.81/-13.31	-12.14/-11.92	-12.11/-12.07	-13.68/-14.88	-15.29/-15.86	-14.93/-13.45	-13.96/-15.28	-15.91/-15.14	-13.75/-12.34	-11.81/-12.42	-12.43/-11.48	-10.03/-9.82	-8.78/-8.91	-8.08/-8.7	-8.4/-8.96	-9.14/-9.47
Θ(15°)	-13.59/-13.2	-13.08/-13.7	-15.5/-17.69	-18.47/-17.68	-18.87/-18.34	-14.16/-13.23	-10.94/-11.24	-10.97/-10.85	-11.14/-11.43	-11.24/-11.65	-13.39/-14.02	-17.63/-19.01	-16.83/-14.92	-12.95/-11.54	-10.82/-11.2	-10.96/-11.85	-12.6/-12.89	-13.8/-15.73	-19.33/-18.05	-18.92/-15.25	-13.07/-11	-9.24/-8.69	-8.46/-8.99	-10.32/-12.51
Θ(22.5°)	-16.51/-18	-18.37/-17.53	-19.05/-18.83	-18.49/-19.02	-15.17/-13.12	-10.37/-10.25	-10.42/-11.08	-11.93/-11.66	-11.11/-9.4	-8.52/-9.14	-11.25/-12.7	-13.81/-13.09	-12.88/-11.79	-11.28/-9.11	-8.27/-7.19	-6.2/-5.71	-5.51/-5.94	-6.36/-6.81	-6.95/-7.81	-8.33/-9.64	-10.68/-13.36	-15.55/-14.28	-11.62/-9.56	-10.14/-12.21
Θ(30°)	-11.2/-17.2	-18.45/-19.03	-18.59/-16.7	-17.81/-17.96	-17.8/-18.91	-17.53/-16.97	-18.62/-15.71	-11.47/-8.89	-7.46/-6.5	-6.3/-6.9	-8.33/-10.26	-12.06/-13.98	-15.2/-13.9	-11.19/-9.46	-8.11/-7.12	-5.16/-4.36	-4.47/-5.9	-6.5/-5.72	-4.86/-4.53	-4.98/-7.54	-10.87/-12.02	-11.49/-10.3	-8.36/-9.68	-7.79/-8.99
Θ(37.5°)	-8.74/-10.88	-14.87/-16.03	-13.16/-11.12	-12.61/-17.16	-18.5/-15.02	-12.7/-10.18	-8.37/-7.32	-7.23/-6.93	-6.8/-6.96	-7.95/-8.74	-9.75/-10.47	-11.72/-12.5	-12.99/-12.01	-10.52/-9.24	-9.31/-8.66	-7.53/-7.1	-8.17/-5.5	-6.15/-6.42	-8.77/-12.48	-14.23/-10.72	-8.68/-8.24	-8.45/-9.34	-11.89/-19.04	-13.41/-9.8
Θ(45°)	-7.58/-11.31	-14.41/-19.31	-12.53/-12.03	-12.25/-13	-11.14/-8.52	-8.79/-8.03	-6.48/-5.55	-5.83/-6.41	-6.94/-6.53	-6.61/-7.14	-8.51/-9.98	-10.08/-8.43	-8.12/-8.03	-8.09/-9.51	-12.17/-11.37	-9.99/-10.42	-10.92/-8.69	-8/-7.78	-6.81/-7.54	-11.34/-16.36	-15.05/-10.68	-8.64/-8.69	-9.74/-11.43	-8.69/-5.64
Θ(52.5°)	-6.9/-16.89	-17.97/-12.1	-9.49/-14.02	-11.55/-8.71	-8/-6.47	-7.29/-7.66	-6.79/-4.86	-3.15/-2.56	-3.66/-6.04	-7.91/-9.1	-8.41/-7.28	-6.65/-7.21	-7.35/-8.81	-11.35/-9.81	-6.3/-5.89	-6.19/-1.99	-8.74/-8.33	-7.95/-8.71	-8.65/-8.21	-9.99/-12.68	-10.5/-3.89	-8.36/-9.68	-9.56/-5.12	
Θ(60°)	-5.45/-12.77	-14.3/-7.12	-9.07/-12.75	-5.95/-6.35	-7.39/-7.14	-7.49/-7.17	-6.7/-6.04	-4.56/-3.07	-3.32/-3.63	-4.41/-7.36	-8.89/-7.34	-6.63/-6.16	-4.11/-4.73	-5.91/-6.81	-8.38/-6.91	-3.89/-4.72	-5.39/-7.25	-11.36/-10.49	-12.68/-8.5	-6.36/-5.45	-5.49/-6.06	-6.45/-5.55	-8.09/-10.43	-7.57/-4.42
Θ(67.5°)	-4.03/-4.81	-7.52/-5.64	-9.57/-11.77	-6.15/-13.56	-9.07/-6.79	-5.27/-4.92	-6.71/-8.21	-8.36/-4.66	-2.86/-3.98	-4.31/-5.94	-6.26/-3.62	-4.29/-6.26	-3.24/-2.24	-3.71/-5.58	-4.15/-1.96	-4.48/-4.11	-4.34/-8.27	-10.77/-9.82	-6.55/-7.85	-6.59/-3.16	-2.06/-1.53	-1.2/-2.72	-4.61/-4.05	-13.93/-5.56
Θ(75°)	-1.25/-6.24	-6.19/-8.77	-8.89/-8.32	-5/-12.34	-11.7/-10.71	-6.58/-4.52	-5.45/-6.36	-7.43/-4.62	-2.65/-6.06	-4.65/-3.91	-3.65/-1.9	-1.63/-3.6	-2.52/-1.65	-2.18/-4.37	-3.76/-1.97	-3.24/-4.98	-5.09/-13.03	-11.49/-10.08	-7.44/-4.04	-6.76/-4.5	-1.14/-1.27	0.14/-0.37	-2.06/-2.66	-1.92/-0.86
Θ(82.5°)	0.27/-2.95	-3.05/-3.3	-7.11/-4.26	-2.26/-11.03	-11.81/-16.68	-17.63/-10.26	-8.02/-8.51	-9.09/-5.37	-2.6/-2.93	-3.57/-1.42	-0.53/-0.24	-0.45/-1.94	-2.14/-1.9	-2.29/-2.44	-1.99/-3.44	-4.14/-5.55	-4.72/-9.1	-5.53/-7.08	-3.84/-1.63	-4.54/-2.92	-1.02/-1.18	0.350/68	-0.78/-1.55	-1.60/-5.1
Θ(90°)	-2.22/-6.43	-4.58/-6.27	-11.01/-3.8	-5.23/-17.32	-15.91/-18.3	-17.89/-13	-13.58/-12.13	-6.83/-7.46	-4.73/-3.22	-3.29/-2.06	-0.61/-1.08	-2.18/-1.35	-1.61/-0.72	-0.65/-1.39	-2.15/-4.94	-3.26/-4.5	-4.58/-14.86	-10.87/-13.25	-2.92/-1.22	-2.7/-4	-0.50/-21	0.94/-0.45	-2.77/-2.01	-16.90/-6.4
Θ(97.5°)	-4.09/-7.06	-3.75/-6.88	-11.19/-6.62	-8.44/-12.11	-15.12/-18.98	-14.25/-13.76	-11.74/-17.71	-17.25/-11.4	-6.53/-4.15	-3.13/-1	-0.88/-2.4	-2.120/67	0.24/-0.64	0.850/-21	-1.56/-4.14	-1.14/-3.87	-3.48/-8.21	-7.03/-13.97	-4.22/-1.22	-2.33/-3.18	0.021/-57	1.33/-6.08	-2.9/-1.41	1.01/-0.86
Θ(105°)	-7.02/-7.79	-3.8/-6.73	-9.74/-8.96	-9.51/-8.68	-13.76/-14.29	-18.48/-14.51	-16.87/-17.81	-16.92/-12.61	-5.82/-13.3	-3.1/-1.99	-1.92/-2.1	0.162/-22	1.022/-28	1.961/-39	-2.02/-3.67	-3.73/-3.1	-2.14/-5.39	-3.23/-12.48	-1.262/-31	-2.67/-5.23	0.181/-83	2.07/-0.46	-7.32/-3.22	1.16/-1.67
Θ(112.5°)	-5.23/-17.16	-11.79/-9.64	-12.58/-10.67	-13.54/-14.57	-16.19/-14.93	-15.11/-18.19	-13.58/-11.31	-16.88/-8.05	-4.74/-3.88	-1.58/-10.2	-2.08/-0.55	0.851/-26	-1.230/53	1.431/-16	-5.52/-2.74	-6.77/-1.31	-3.62/-6.82	-2.1/-10.04	0.11/-32.2	-4.07/-4.69	0.210/-7	0.540/-31	-6.18/-8.79	-7.10/-8.9
Θ(120°)	-6.08/-18.48	-13.64/-10.02	-18.49/-10.67	-12.55/-14.51	-17.09/-10.66	-8.71/-8.15	-9.65/-9.77	-8.98/-9.14	-8.42/-7.63	-6.95/-5.36	-2.45/-1.27	-2.7/-2.3	-0.640/-1	0.371/-106	-10.11/-2.73	-7.62/-6.15	-4.05/-2.06	-2.6/-10.8	-9.33/-9.09	-2.35/-8.4	-2.91/-1.16	-3.46/-2.03	-6.13/-12.49	-3.9/-0.5
Θ(127.5°)	-5.35/-12.36	-8.78/-7.49	-12.53/-9.05	-7.69/-8.29	-15.34/-15.85	-13.21/-12.16	-11.92/-13.53	-11.58/-11.87	-15.83/-12.01	-7.93/-4.56	-3.16/-3.14	-4.17/-3.27	-1.73/-1.42	-2.24/-2.77	-3.3/-5.56	-4.85/-3.81	-13.22/-6.49	-8.12/-15.2	-3.520/-5	-3.88/-10.02	-7.35/-14.5	-5.54/-5.43	-7.19/-10.05	-6.2/-2.8
Θ(135°)	-7.83/-8.55	-9.35/-9.02	-13.47/-18.95	-11.5/-9.21	-6.74/-14.2	-17.89/-18.97	-16.91/-16.3	-14.16/-16.75	-14.50/-10.38	-8.57/-3.62	-2.86/-2.74	-3.18/-1.37	-2.59/-2.73	-2.86/-2.94	-4.24/-5.15	-2.96/-6.01	-9.25/-4.95	-5.89/-14.78	-8.81/-4.34	-5.91/-10.48	-14.48/-13.64	-8.73/-8.63	-5.5/-5.86	-7.21/-7.9
Θ(142.5°)	-6.78/-5.22	-5.56/-7.38	-10.39/-12.93	-12.62/-11.55	-13.57/-16.83	-17.17/-16.87	-12.34/-10.57	-10.02/-10.59	-10.6/-7.18	-3.72/-2.24	-1.49/-1.26	-1.89/-3.2	-3.93/-5.5	-2.44/-2.51	-4.82/-4.92	-5.92/-12.86	-8.847/-31	-7.96/-13.97	-11.74/-6.51	-7.88/-16.11	-17.84/-17.96	-14.26/-14.24	-12.01/-8.44	-7.45/-8.74
Θ(150°)	-16.3/-9.84	-7.81/-7.53	-9.56/-11.36	-11.24/-10.93	-10.91/-10.72	-18.44/-16.25	-18.26/-18.6	-19.04/-14.52	-9.31/-5.79	-4.4/-3.48	-2.59/-2.44	-3.81/-6.54	-7.15/-5.58	-3.78/-3.75	-5.08/-6.27	-4.38/-9.66	-7.73/-6.6	-5.9/-8.64	-5.07/-9.11	-12.49/-13.34	-16.57/-10.48	-6.79/-6.52	-7.69/-16.07	
Θ(157.5°)	-14.54/-14.77	-14.53/-16.78	-18.87/-18.99	-17.57/-18.67	-18.71/-17.14	-18.52/-19.32	-18.13/-17.76	-16.93/-14.25	-10.97/-8.57	-7.77/-9.13	-11.51/-13.77	-12.58/-9.82	-7.86/-7.29	-7.64/-8.03	-8.78/-9.55	-17.72/-12.4	-13.11/-15.18	-12.13/-8.71	-8.07/-10.18	-14.11/-18.66	-19.03/-16.15	-13.05/-12.3	-13.03/-14.99	
Θ(165°)	-15.09/-19.06	-18.94/-18.61	-15.49/-15.93	-15.07/-15.4	-14.69/-15.3	-15.44/-16.02	-16.5/-19.65	-17.86/-17.85	-17.67/-16.4	-14.98/-14.44	-15.76/-17.3	-18.92/-18.82	-19.17/-18.62	-17.39/-15.41	-13.6/-11.32	-9.38/-8.16	-7.79/-8.03	-8.94/-10.39	-11.99/-14.04	-14.26/-12.2	-11.76/-12.36	-14.49/-19.53	-17.78/-14.81	-13.58/-15.09
Θ(172.5°)	-18.61/-17.31	-18.34/-18.68	-19.08/-18.1	-18.09/-18.4	-17.44/-18.03	-17.98/-18.68	-18.06/-16.41	-14.73/-12.18	-11.21/-10.1	-9.33/-9.14	-9.09/-9.35	-8.82/-10.9	-											



Radiated Composite Gain of 2.4GHz and 5GHz UNII 1~3

Appendix A

Θ (127.5°)	-17.94/-18.86	-19.09/-17.71	-16.61/-15.99	-17.45/-18.82	-18.24/-14.32	-11.74/-12.78	-12.62/-14.04	-17.02/-17.78	-19.21/-18.91	-18.14/-17.86	-18.12/-16.22	-13.33/-11.28	-9.27/-7.97	-7.13/-6.74	-7/-7.42	-7.89/-7.81	-8.36/-9.48	-12.7/-17.41	-17.72/-16.79	-14.24/-14.42	-17.4/-19.19	-18.53/-17.98	-18.82/-18.93	-19.37/-17.55
Θ (180°)	-11.6/-11.48	-13.12/-15.59	-17.23/-18.77	-17.54/-17.34	-15.66/-12.34	-12.22/-13.3	-14.13/-14.32	-15.19/-17.42	-19.09/-18.77	-18.84/-18.03	-18/-18.16	-18.58/-18.02	-19.19/-18.3	-18.45/-18.85	-17.41/-18.49	-19.1/-18.84	-19.02/-19.23	-18.39/-18.63	-18.54/-18.24	-18.83/-18.18	-18.84/-18.11	-18.47/-19.04	-18.66/-17.68	-13.91/-13.04
Freq(Hz)	5.6G/Pol.	Theta/Ant. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)/Φ(7.5°)	Φ(15°)/Φ(22.5°)	Φ(30°)/Φ(37.5°)	Φ(45°)/Φ(52.5°)	Φ(60°)/Φ(67.5°)	Φ(75°)/Φ(82.5°)	Φ(90°)/Φ(97.5°)	Φ(105°)/Φ(112.5°)	Φ(120°)/Φ(127.5°)	Φ(135°)/Φ(142.5°)	Φ(150°)/Φ(157.5°)	Φ(165°)/Φ(172.5°)	Φ(180°)/Φ(187.5°)	Φ(195°)/Φ(202.5°)	Φ(210°)/Φ(217.5°)	Φ(225°)/Φ(232.5°)	Φ(240°)/Φ(247.5°)	Φ(255°)/Φ(262.5°)	Φ(270°)/Φ(277.5°)	Φ(285°)/Φ(292.5°)	Φ(300°)/Φ(307.5°)	Φ(315°)/Φ(322.5°)	Φ(330°)/Φ(337.5°)	Φ(345°)/Φ(352.5°)
Θ (0°)	-6.59/-7.02	-7/-7.46	-8.48/-8.55	-8.52/-9.17	-9.36/-9.97	-11.35/-12.35	-11.48/-10.22	-10.16/-10.14	-9.84/-8.8	-7.6/-6.44	-6.04/-6.19	-6.33/-6.77	-7.34/-8.16	-9.31/-10.6	-12.53/-14.24	-16.59/-18.4	-17.72/-18.43	-18.71/-17.18	-17.84/-16.13	-13.78/-12.31	-10.4/-9	-8.58/-7.9	-7.69/-7.39	-6.83/-6.41
Θ (7.5°)	-8.22/-8.73	-6/-11.72	-14.65/-18.22	-18.39/-18.06	-18.94/-18.83	-17.67/-19.31	-16.68/-14.08	-13.4/-12.46	-11.69/-10.15	-8.85/-7.96	-7.69/-7.21	-6.9/-6.75	-6.34/-6.16	-6.15/-6.33	-6.51/-7.23	-6.5/-6.69	-10.38/-10.1	-9.76/-10.36	-12.44/-12.08	-9.65/-8.52	-7.84/-6.71	-6.07/-5.72	-6.31/-6.57	-6.67/-7.13
Θ (15°)	-6.58/-7.91	-10.35/-14.89	-17.97/-17.75	-18.6/-18.51	-19.16/-16.35	-14.07/-11.05	-8.89/-7.25	-6.34/-5.87	-5.72/-5.52	-6.13/-7.2	-8.15/-8.62	-8.35/-7.72	-7.03/-6.78	-7.04/-7.48	-8.48/-9.23	-9.62/-9.06	-9.07/-9.19	-8.74/-8.2	-8.13/-9.15	-10.77/-12.49	-14.83/-11.3	-7.57/-5.72	-4.78/-4.39	-4.72/-5.91
Θ (22.5°)	-4.15/-5.82	-7.72/-11.19	-17.49/-18.53	-19.05/-18.93	-17.87/-16.49	-12.18/-9.87	-7.27/-6.48	-5.74/-5.63	-5.55/-5.86	-7.16/-9.56	-12.25/-13.36	-12.62/-11.42	-10.58/-10.67	-11.55/-13.67	-15.72/-14.55	-13.09/-11.55	-9.61/-7.17	-5.61/-5.37	-6.32/-7.55	-6.68/-6.26	-7.25/-6.69	-8.77/-9.67	-7.82/-5.14	-4.52/-4.11
Θ (30°)	-3.83/-4.98	-6.94/-9.71	-13.34/-17.27	-16.21/-14	-14.03/-11.92	-7.57/-4.61	-4.05/-4.94	-6.57/-7.69	-7.71/-7.54	-8.56/-10.94	-14.44/-15.48	-14.3/-14.3	-14.38/-16.2	-18.24/-15.47	-10.59/-8.02	-7.22/-7.71	-7.59/-6.95	-6.82/-7.59	-10.64/-10.69	-8.74/-7.65	-5.45/-4.17	-4.22/-5.34	-6.96/-6.82	-4.36/-3.6
Θ (37.5°)	-5.19/-7.71	-10.32/-12.54	-15.34/-18.21	-16.66/-11.02	-9.43/-8.33	-6.15/-4.17	-3.63/-3.47	-3.69/-3.88	-4.34/-4.88	-6.18/-8.74	-12.48/-12.59	-10.95/-12.05	-17.35/-18.59	-11.06/-6.79	-5.61/-5.68	-6.92/-9.15	-9.59/-8.29	-7.25/-7.51	-7.47/-7.81	-9.53/-11.42	-11.38/-8.82	-6.24/-4.94	-4.42/-5.51	-5.71/-5.06
Θ (45°)	-6.81/-5.79	-8.43/-12.69	-12.77/-11.57	-10.91/-8.73	-8.92/-8.08	-6.81/-5.85	-4.72/-3.47	-2.92/-3.24	-4.37/-6.16	-8.86/-10.84	-14.75/-13.71	-9.72/-9.12	-12.16/-13.11	-9.81/-6.37	-6.86/-8.83	-7.64/-6.42	-6.38/-6.38	-5.71/-6.13	-7.53/-6.87	-7.25/-5.5	-6.3/-9.61	-11.22/-8.79	-6.99/-7.23	-9.03/-9.18
Θ (52.5°)	-7.48/-7.32	-8.45/-14.97	-12.68/-10.5	-10.93/-10.64	-11.1/-9.01	-6.6/-5.29	-3.69/-3.52	-4.93/-4.65	-3.76/-5.03	-8.36/-11.94	-11.75/-6.77	-8.44/-7.68	-10.47/-7.21	-5.22/-4.95	-5.73/-6.94	-5.46/-4.51	-7.67/-8.78	-9.07/-11.12	-11.19/-9.98	-10.67/-9.93	-7.95/-8.17	-11.63/-14.36	-9.17/-4.74	-3.72/-4.18
Θ (60°)	-6.39/-9.46	-7.96/-14.16	-15.17/-9.39	-14.51/-16.18	-9.76/-6	-4.2/-3.94	-3.54/-2.1	-5.12/-4.21	-2.76/-3.86	-6.68/-7.74	-6.47/-3.5	-2.05/-6.14	-7.03/-3.53	-4.11/-6.1	-4.88/-5.11	-3.99/-5.33	-7.59/-5.64	-6.69/-8.2	-9.17/-10.2	-11.99/-12.21	-9.19/-8.52	-3.75/-5.29	-8.37/-6.11	-2.99/-3.72
Θ (67.5°)	-3.94/-13.57	-8.43/-8.43	-13.31/-8.42	-9.65/-11.38	-8.98/-7.32	-5.07/-2.89	-2.76/-5.42	-6.75/-4.54	-3.12/-4.04	-5.88/-4.62	-3.42/-1.81	-0.83/-4.25	-5.14/-3.04	-3.85/-4.12	-5.09/-4.82	-4.55/-6.66	-7.85/-7.24	-8.94/-7.1	-6.23/-7.07	-8.57/-5.58	-3.47/-3.76	-2.71/-3.72	-2.72/-3.74	-1.85/-0.97
Θ (75°)	-1.2/-8.1	-5.23/-8.48	-17.83/-7.85	-12.97/-13.8	-11.57/-7.04	-4.79/-2.6	-3.43/-7.87	-9.25/-5.13	-2.15/-2.6	-5.54/-3.44	-0.77/-1.36	-1.87/-3.26	-4.22/-3.8	-3.74/-3.97	-6.75/-5.56	-6.14/-7.57	-9.01/-14.42	-17.21/-9.23	-7.89/-7.07	-5.96/-2.99	-2.15/-2.38	-2.36/-1.35	-0.94/-1.5	-1.89/-0.3
Θ (82.5°)	-1.46/-4.84	-3.02/-8.37	-14.1/-6.19	-15.89/-12.79	-11.69/-7.81	-6.62/-4.01	-4.26/-7.51	-9.03/-4.92	-3.34/-3.36	-4.49/-3.28	-1.06/-1.49	-2.89/-2.7	-3.5/-4.84	-2.47/-2.62	-5.08/-4.03	-6.44/-10.77	-12.71/-17.93	-15.26/-14.48	-11.27/-1.13	-1.94/-3.55	-1.49/-0.25	-0.97/-1.7	-1.13/-1.01	-0.93/-0.75
Θ (90°)	-3.65/-3.31	-2.29/-7.18	-9.59/-6.29	-11.92/-10.07	-10.7/-10.7	-9.1/-6.52	-12/-16.16	-9.91/-6.76	-5.57/-5.59	-4.67/-2.3	-0.85/-2.51	-2.26/-3.23	-2.01/-2.25	-0.96/-3.03	-3.85/-4.2	-4.84/-7.47	-11.64/-9.24	-12.99/-5.51	-6.28/-6.03	-2.18/-2.94	-0.17/-1.43	1.11/-2.96	-5.31/-2.2	0.99/-0.85
Θ (97.5°)	-8.07/-6.23	-3.61/-8.89	-10.95/-8.89	-11.07/-14.02	-12.71/-13.05	-15.43/-18.4	-14.87/-18.2	-13.46/-10.34	-10.37/-7.01	-2.92/-9.05	-1.93/-1.82	-0.36/-2.49	-1.98/-0.28	-0.36/-3.26	-3.54/-6.63	-5.68/-6.83	-4.36/-15.15	-8.62/-6.14	-6.29/-13.13	-6.57/-6.26	1.33/-2.51	2.84/-1.66	-1.1/-5.64	1.04/-0.04
Θ (105°)	-9.42/-12.69	-3.11/-5.93	-8.44/-10.4	-18.74/-17.71	-13.27/-16.12	-14.3/-15.73	-15.19/-12.99	-14.34/-9.25	-7.23/-2.83	-1.15/-0.44	-0.240/-1.2	0.020/-1.1	1.43/-0.61	1.430/-65	-1.39/-7.08	2.2/-5.07	-2.63/-17.7	-3.43/-13.67	7.061/-35	-6.89/-5.35	0.630/-56	1.52/-0.51	-6.59/-4.69	0.08/-0.09
Θ (112.5°)	-9.58/-11.84	-8.66/-8.91	-10.52/-13.25	-18.96/-10.73	-12.89/-9.13	-13.79/-13.56	-17.31/-17.58	-12.04/-6.14	-2.57/-1.53	-3.86/-1.91	0.130/-5	0.491/-77	1.78/-1.47	1.62/-2.82	-3.9/-18.53	-1.08/-9.33	-0.9/-11.99	-2.98/-12.86	-1.87/-2.36	-5.17/-3.44	1.37/-1.43	0.81/-2.3	-1.01/-6.83	-1.76/-9.94
Θ (120°)	-5.61/-12.95	-18.06/-9.4	-12.85/-18.8	-13.59/-12.44	-16.82/-16	-9.01/-4.89	-9.25/-6.94	-7.33/-5.65	-5.05/-4.97	-3.23/-1.56	-2.13/-2.11	-0.990/-43	-2.19/-1.19	7.06/-1.9	-8.34/-9.04	-2.84/-5.5	-5.02/-5.82	0.13/-2.81	-3.89/-2.04	-12.71/-6.37	-3.78/-3.12	-4.18/-7.73		
Θ (127.5°)	-5.73/-10.1	-11.47/-16.72	-12.26/-18.49	-13.86/-10.54	-17.23/-17.91	-18.28/-11.18	-9.33/-13.37	-11.97/-9.32	-8.19/-6.05	-4.08/-4.1	-3.14/-1.31	-1.83/-2.44	-2.87/-1.53	-1.58/-3.75	-8.24/-5.81	-6.5/-1.52	-3.04/-4.81	-4.04/-5.2	2.731/-2	-4.14/-8	-3.08/-4.47	-8.37/-5.02	-5.85/-5.94	-3.01/-4.36
Θ (135°)	-9.79/-12.52	-11.68/-11.39	-16.6/-16.36	-19.09/-16.3	-11.86/-12.95	-16.93/-17.82	-13.76/-12.55	-11.57/-11.27	-8.07/-4.11	-2.34/-2.91	-2.38/-0.89	-0.91/-3.51	-4.78/-2.48	-1.8/-2.5	-2.24/-8.3	-4.6/-8.3	-4.47/-2.97	-3.14/-8.05	-4.07/-3.55	-4.57/-5.18	-12.51/-6.54	-6.76/-7.33	-6.47/-6.22	-5.26/-7.1
Θ (142.5°)	-17.88/-16.75	-1.63/-7.67	-9.72/-7.38	-17.62/-17.68	-16.07/-19.02	-14.71/-10.21	-9.22/-11.2	-13.5/-13.35	-7.77/-3.33	-1.17/-0.81	-1.56/-2.11	-2.19/-2.33	-3.19/-2.77	-2.54/-1.78	-1.8/-3.92	-1.81/-2.99	-10.79/-5.98	-4.51/-6.43	-5.73/-15.4	-2.48/-9.29	-12.68/-18.88	-12.17/-6.37	-3.87/-3.12	-4.18/-7.73
Θ (150°)	-18.81/-16.36	-10.72/-8.25	-8.62/-12.26	-15.88/-17.4	-18.73/-19.01	-19.31/-12.65	-10.53/-11.18	-11.57/-8.89	-5.74/-4.05	-2.79/-1.91	-1.74/-1.96	-1.9/-2.08	-2.94/-3.7	-3.04/-1.82	-1.87/-2.47	-3.39/-7.78	-14.18/-11.04	-6.59/-4.48	-6.4/-7.53	-6.47/-7.85	-9.99/-10.14	-11.61/-17.81	-18.52/-14.18	-8.64/-9.54
Θ (157.5°)	-13.94/-17.88	-18.31/-17.71	-19.09/-12.72	-17.23/-19.97	-15.76/-17.21	-17.81/-15.97	-14.73/-17.23	-15.41/-12.12	-9.32/-8.72	-8.28/-7	-5.57/-4.8	-4.9/-6.16	-7.8/-8.78	-7.95/-6.91	-6.5/-7.38	-9.65/-12.93	-13.99/-13.21	-10.91/-8.86	-9.23/-9.55	-6.49/-5.16	-5.83/-8.42	-11.72/-13.32	-10.67/-10	
Θ (165°)	-18.64/-18.4	-18.74/-16.59	-15.59/-15.88	-15.69/-17.81	-17.43/-17.71	-18.84/-18.04	-17.38/-16.68	-16.61/-16.25	-15.91/-17.87	-18.17/-18.21	-13.86/-14.96	-13.44/-13.79	-14.52/-14.45	-14.43/-13.8	-14.39/-13.47	-12.83/-10.43	-8.86/-9.45	-9.14/-10.58	-12.85/-14.44	-13.07/-9.72	-7.87/-7.34	-7.89/-9.92	-12.38/-15.13	-16.63/-17.99
Θ (172.5°)	-13.66/-14.85	-15.26/-15.81	-17.08/-17.62	-18.74/-18.5	-19/-17.78	-18.99/-15.01	-12.51/-11.27	-11.76/-11.76	-11.98/-12.36	-12.23/-12.79	-14.02/-16.16	-18.51/-18.73	-18.69/-18.71	-18.86/-19.04	-17.75/-18.64	-17.87/-15.69	-14.07/-12.42	-10.54/-9.96	-11.47/-14.88	-18.23/-17.37	-16.19/-17.11	-19.17/-19.01	-18.74/-18.56	-16.79/-15.57
Θ (180°)	-12.62/-10.41	-16.37/-18.91	-18.41/-17.98	-16.28/-17.02	-18.98/-18.87	-18.18/-17.17	-18.12/-18.48	-19.25/-18.25	-19.19/-18.27	-17.02/-16.53	-15.91/-15.75	-16.03/-15.6	-15.84/-15.99	-16.93/-17.92	-18.97/-15.99	-18.93/-17.53	-19.05/-18.37	-18.18/-18.72	-19.05/-18.27	-18.34/-17.98	-17.84/-15.09	-14.78/-13.73	-12.52/-11.78	-12.72/-14.18
Freq(Hz)	5.785G/Pol.	Theta/Ant. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)/Φ(7.5°)	Φ(15°)/Φ(22.5°)	Φ(30°)/Φ(37.5°)	Φ(45°)/Φ(52.5°)	Φ(60°)/Φ(67.5°)	Φ(75°)/Φ(82.5°)	Φ(90°)/Φ(97.5°)	Φ(105°)/Φ(112.5°)	Φ(120°)/Φ(127.5°)	Φ(135°)/Φ(142.5°)	Φ(150°)/Φ(157.5°)	Φ(165°)/Φ(172.5°)	Φ(180°)/Φ(187.5°)	Φ(195°)/Φ(202.5°)	Φ(210°)/Φ(217.5°)	Φ(225°)/Φ(232.5°)	Φ(240°)/Φ(247.5°)	Φ(255°)/Φ(262.5°)	Φ(270°)/Φ(277.5°)	Φ(285°)/Φ(292.5°)	Φ(300°)/Φ(307.5°)	Φ(315°)/Φ(322.5°)	Φ(330°)/Φ(337.5°)	Φ(345°)/Φ(352.5°)
Θ (0°)	-9.42/-10.02	-11.05/-10.69	-11.53/-12.03	-10.78/-8.98	-8.64/-8.28	-7.64/-8.3	-8.23/-8.2	-9.07/-10.47	-12.15/-13.6	-15.18/-16.87	-16.69/-18.77	-13.31/-11.2	-11.01/-9.86	-8.62/-8.33	-8.32/-8.75	-9.39/-9.22	-9.99/-9.02	-9.16/-10.7	-11.27/-12.27	-13.38/-13.57	-13.43/-14.34	-12.47/-14.2	-15.3/-12.1	
Θ (7.5°)	-9.16/-10.53	-9.71/-8.8	-8.31/-8.45	-8.85/-8.21	-8.54/-8.59	-8.21/-10.18	-10.61/-11.63	-11.21/-11.5	-11.73/-13.17	-13.16/-13.25	-13.18/-13.28	-13.62/-13.96	-12.93/-12.71	-12.44/-11.64	-11.49/-11.64	-10.66/-9.26	-8.68/-8.38	-8.9/-8.62	-7.79/-7.44	-8.9/-31	-10.64/-12.25	-13.85/-14.49	-14.56/-15.85	-15.18/-11.32
Θ (15°)	-15.38/-11	-8.04/-9.38	-8.76/-9.56	-11.4/-12.41	-11.01/-10.75	-10.89/-12.32	-12.51/-14.17	-15.38/-18.29	-18.77/-18.89	-18.62/-18.39	-17.85/-18.07	-17.74/-15.29	-14.43/-14.11	-14.03/-14.84	-15.39/-13.72	-11.43/-10.94	-10.08/-9.17	-8.66/-8.09	-8.38/-8.51	-8.35/-7.96	-7.69/-8.38	-8.82/-8.82	-11.04/-14.08	-18.96/-19
Θ (22.5°)	-17.53/-12.52	-11.59/-11.04	-1																					



Radiated Composite Gain of 2.4GHz and 5GHz UNII 1~3

Appendix A

Θ(22.5°)	-3.02/-2.26	-1.73/-1.31	-1.09/-1.05	-1.11/-1.21	-1.27/-1.38	-1.63/-2.05	-2.56/-3.13	-3.77/-4.53	-5.45/-6.68	-8.28/-10.26	-12.49/-13.78	-13.72/-14.37	-15.1/-15.03	-14.95/-17.13	-13.81/-11.58	-10.58/-9.38	-8.27/-7.65	-7.28/-7.06	-7.09/-7.54	-8.39/-9.56	-10.79/-12.02	-11.95/-10.53	-8.5/-6.56	-4.88/-3.57
Θ(30°)	-3.03/-2.33	-1.83/-1.52	-1.41/-1.46	-1.62/-1.73	-1.77/-1.83	-2.03/-2.39	-2.86/-3.37	-4.02/-4.79	-5.55/-6.36	-7.27/-8.21	-9.21/-10.11	-10.58/-10.63	-11.4/-12.71	-14.49/-16.61	-18.34/-18.15	-17.45/-13.35	-12/-11.82	-10.61/-9.86	-9.55/-9.87	-11/-12.86	-15.53/-17.41	-14.71/-11.19	-8.42/-6.41	-4.82/-3.57
Θ(37.5°)	-2.99/-2.91	-2.59/-2.4	-2.42/-2.54	-2.72/-2.76	-2.67/-2.55	-2.59/-2.81	-3.15/-3.6	-4.26/-5.22	-6.32/-7.65	-8.09/-10.05	-10.04/-9.58	-8.7/-8.66	-9.25/-10.44	-16.95/-17.07	-16.95/-17.07	-16.29/-15.57	-10.42/-11.03	-11.67/-13.65	-16.79/-18.56	-18.42/-12.75	-9.01/-6.75	-5.24/-3.96		
Θ(45°)	-4.11/-3.9	-3.83/-3.75	-3.73/-3.83	-3.9/-3.8	-3.49/-3.16	-2.96/-2.96	-3.09/-3.36	-3.91/-4.83	-6.28/-6.19	-10.45/-12	-11.68/-10.43	-9.36/-8.66	-8.85/-9.93	-11.4/-13.3	-14.47/-14.95	-14.78/-13.71	-13.82/-13.7	-13.08/-12.39	-11.57/-11.29	-11.82/-13.46	-16.54/-17.38	-18.26/-12.62	-8.78/-6.71	-5.26/-4.34
Θ(52.5°)	-5.25/-5.57	-5.94/-6.1	-6.2/-6.29	-6.37/-6.16	-5.65/-5.16	-4.86/-4.63	-4.58/-4.59	-4.77/-5.3	-6.48/-6.67	-12.68/-16.77	-15.08/-11.99	-10.23/-9.79	-9.85/-12.25	-14.54/-15.67	-14.26/-14.13	-13.77/-14.41	-15.55/-16.27	-16.07/-14.68	-13.21/-12.67	-13.11/-14.65	-16.35/-19.06	-16.36/-11.57	-8.46/-6.75	-5.67/-5.14
Θ(60°)	-7.89/-8.71	-6.82/-10.09	-10.12/-10.01	-9.75/-9.25	-8.41/-7.76	-7.49/-7.35	-7.25/-12	-6.93/-6.77	-6.99/-8.24	-11.47/-18.3	-17.7/-18.69	-14.29/-12.33	-11.99/-13.69	-15.87/-18.25	-17.96/-14.31	-13.77/-18.08	-18.45/-16.35	-13.65/-11.62	-10.4/-9.94	-10.42/-11.99	-14.47/-15.86	-14.42/-11.41	-9.12/-8	-7.55/-7.47
Θ(67.5°)	-8.85/-9.31	-9.74/-10.04	-9.99/-9.57	-8.96/-8.33	-7.65/-7.22	-7.21/-7.28	-7.28/-7.08	-6.54/-5.76	-5.23/-5.58	-7.35/-10.54	-15.57/-17.57	-18.01/-17.26	-18.29/-17.63	-16.24/-14.17	-17.36/-16.91	-15.91/-14.68	-12.77/-11.04	-9.83/-9.08	-8.85/-9.11	-10.08/-12.21	-13.96/-15.01	-13.81/-11.3	-9.36/-8.49	-8.41/-8.49
Θ(75°)	-8.63/-9.67	-11.06/-12.46	-12.3/-12.98	-12.55/-12.25	-12.05/-11.94	-12.18/-12.2	-11.98/-13.2	-10.04/-8.33	-6.77/-6.06	-6.5/-8.21	-10.5/-12.5	-13.02/-12.23	-11.2/-12.22	-14.69/-18.5	-19.19/-13.32	-14.89/-11.89	-10.68/-10.05	-9.86/-10.06	-10.42/-11.22	-12.52/-14	-14.44/-12.33	-10.76/-9.18	-8.06/-7.65	-7.84/-8.32
Θ(82.5°)	-10.17/-12.25	-14.88/-17.61	-18.79/-18.72	-17.62/-17.95	-18.14/-18.71	-18.54/-18.83	-18.64/-18.51	-17.17/-13.39	-10.26/-8.64	-8.7/-10.06	-11.89/-13.55	-11.57/-9.28	-13.69/-10.28	-18.07/-18.26	-17.46/-15.47	-13.28/-12.18	-12.04/-12.43	-12.72/-13.38	-14.32/-15.84	-15.29/-14.24	-12.4/-10.68	-9.59/-9.26	-9.53/-10.11	
Θ(90°)	-11.19/-13.54	-16.94/-18.1	-18.78/-18.82	-17.83/-18.34	-18.52/-18.95	-17.75/-18.77	-18.13/-17.1	-18.68/-15.8	-12.72/-11.06	-10.66/-11.59	-12.45/-12.15	-10.78/-8.67	-9.92/-7.77	-8.78/-11.19	-14.24/-14.82	-16.75/-13.36	-12.7/-12.75	-13.39/-14.11	-14.67/-15.98	-18.38/-18.53	-18.96/-17.57	-13.44/-10.7	-9.6/-10.16	-10.98/-11.17
Θ(97.5°)	-12.18/-14.47	-18.34/-19.08	-18.03/-16.17	-14.28/-14.86	-17.28/-18.21	-18.35/-18.66	-18.72/-18.25	-17.78/-17.25	-12.97/-10.71	-10.4/-11.34	-11.95/-13.26	-13.33/-11.79	-11.21/-14.56	-11.55/-12.56	-18.31/-17.29	-15.66/-14.58	-13.84/-14.15	-15.13/-15.51	-16.15/-17.47	-18.79/-18.73	-18.57/-14.97	-12.1/-10.09	-9.36/-10.5	-12.12/-12.14
Θ(105°)	-16.13/-17.81	-17.76/-17.68	-18.44/-18.99	-17.96/-17.49	-18.23/-19.2	-18.05/-18.3	-18.8/-18.49	-19.1/-19.23	-17.98/-12.68	-10.68/-10.2	-8.77/-7.89	-9.89/-12.57	-13.86/-14.2	-14.42/-18.54	-17.77/-17.84	-18.34/-17.52	-17.74/-17.73	-18.2/-17.12	-17.39/-17.04	-17.34/-19.08	-17.68/-18.34	-15.91/-14.97	-13.83/-14.36	-16.67/-17.32
Θ(112.5°)	-18.66/-19.07	-16.67/-15.47	-14.6/-13.37	-13.18/-14.45	-17.21/-18.02	-19.08/-18.19	-18.61/-18.57	-18.72/-18.32	-19.12/-12.93	-10.24/-8.74	-6.39/-5.35	-5.26/-5.17	-5.29/-6.07	-7.75/-10.26	-14.31/-15.4	-13.91/-18.68	-17.86/-18.35	-17.81/-18.76	-16.78/-15.22	-14.01/-13.41	-14.38/-14.22	-12.56/-12.01	-12.38/-12.77	-13.72/-16
Θ(120°)	-12.03/-16.31	-18.87/-18.01	-18.1/-15.16	-14.29/-15.43	-17.74/-18.1	-18.32/-17.49	-19.36/-16.51	-16.41/-17.87	-19.15/-14.84	-8.78/-6.34	-5.84/-4.84	-4.86/-6.35	-9.13/-12.07	-13.04/-14.62	-16.75/-17.98	-18.63/-18.42	-19.29/-17.01	-13.99/-13.24	-13.27/-13.23	-14.42/-16.77	-14.2/-11.39	-10.46/-9.92	-9.37/-10.1	
Θ(127.5°)	-14.65/-18.68	-19.11/-17.99	-14.86/-14.45	-9.44/-9.41	-10.86/-12.94	-14.99/-17.52	-17.99/-18.57	-18.92/-18.39	-15.36/-12.35	-11.9/-10.78	-7.78/-6.69	-5.44/-7.2	-5.47/-7.15	-9.59/-10.92	-11.58/-12.46	-15.05/-12.48	-10.05/-9.54	-9.63/-9.13	-8.43/-8.21	-9.32/-11.89	-14.25/-12.73	-11.49/-11.39	-11.32/-12.27	
Θ(135°)	-15.52/-18.03	-17.78/-19.54	-16.55/-13.29	-11.14/-11.08	-13.08/-17.21	-18.74/-18.06	-19.43/-17.66	-14.81/-12.2	-10.38/-9.98	-11.21/-12.55	-10.72/-8.83	-9.28/-9.37	-10.32/-12.61	-13.92/-14.38	-14.87/-16.33	-18.37/-16.06	-14.07/-14.12	-15.2/-15.07	-14.37/-14.32	-14.75/-14.28	-14.23/-15.14	-14.16/-10.98	-9.32/-9.41	-10.46/-12.44
Θ(142.5°)	-18.53/-18.8	-16.98/-16.08	-16.69/-16.36	-14.45/-14.37	-14.14/-16.54	-18.09/-18.78	-18.24/-17.45	-16.53/-14.9	-14.97/-17.61	-18.9/-17.83	-13.73/-15.54	-12.63/-11.06	-10.55/-9.98	-11.77/-12.09	-13.07/-12.66	-11.25/-10.4	-9.89/-9.43	-8.67/-8.1	-8.13/-9.09	-11.17/-13.95	-17.08/-18.77	-18.05/-15.01	-12.82/-12.72	-14.24/-15.32
Θ(150°)	-16.97/-14.91	-13.54/-12.91	-13.71/-14.69	-16.47/-17.3	-18.23/-19.64	-18.59/-18.26	-18.8/-19.77	-17.27/-16.96	-18.47/-15.64	-16.57/-9.86	-8.99/-7.54	-6.47/-6.49	-6.87/-3.99	-7.48/-8.39	-15.86/-5.63	-5.39/-5.29	-5.34/-5.64	-6.15/-6.91	-8.01/-9.37	-10.9/-12.19	-15.89/-17.08	-18.89/-17.78	-18.86/-18.26	
Θ(157.5°)	-13.72/-11.94	-10.59/-9.66	-9.14/-9.27	-10.06/-11.16	-12.26/-13.42	-14.95/-16.63	-17.75/-18.96	-17.85/-19.25	-16.9/-13.84	-11.5/-10.05	-9.62/-12.08	-11.47/-9.48	-10.52/-8.72	-9.29/-9.81	-9.71/-8.77	-8.42/-8.25	-8.23/-8.43	-8.73/-9.27	-9.71/-10.03	-10.42/-10.81	-10.86/-11.13	-12.14/-13.93	-16.14/-17.31	-16.71/-14.75
Θ(165°)	-12.51/-11.1	-9.81/-8.81	-8.09/-7.86	-8.14/-8.81	-9.7/-10.71	-12/-14.02	-17.09/-18.41	-18.89/-18.54	-16.6/-14.03	-12.55/-11.93	-11.7/-12.09	-14.2/-12.81	-11.4/-11.35	-10.3/-11.06	-11.58/-12.79	-13.95/-14.51	-14.88/-15.5	-15.61/-15.49	-15.15/-14.51	-14.16/-13.49	-13.44/-13.89	-14.75/-15.44	-15.5/-14.48	
Θ(172.5°)	-14.85/-13.86	-12.8/-11.9	-11.28/-10.96	-11.11/-11.64	-12.23/-14.19	-13.29/-14.19	-15.26/-16.01	-15.76/-14.81	-14.04/-13.61	-13.59/-13.96	-14.67/-15.84	-14.43/-14.26	-11.78/-11	-10.78/-12.21	-13.42/-14.32	-14.88/-15.18	-16.2/-18.16	-19/-18.3	-18.62/-18.86	-18.31/-18.67	-18.12/-14.76	-17.22/-17.01	-17.17/-16.47	
Θ(180°)	-19.33/-18.6	-17.95/-17.39	-17.01/-16.83	-16.81/-16.89	-16.79/-16.47	-15.86/-15.69	-15.96/-16.43	-16.81/-17.1	-18.02/-19.08	-19.24/-18.47	-17.55/-19.13	-17.02/-15.45	-14.23/-13.28	-12.97/-12.83	-12.92/-12.75	-12.82/-12.99	-12.86/-12.59	-12.86/-13.84	-11.9/-16.12	-17.19/-18.34	-18.71/-18.7	-19.36/-17.99	-18.99/-17.65	-17.18/-18.66
Freq(Hz)	5.2GPol.	PhiAnt. 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)/Φ(7.5°)	Φ(15°)/Φ(22.5°)	Φ(30°)/Φ(37.5°)	Φ(45°)/Φ(52.5°)	Φ(60°)/Φ(67.5°)	Φ(75°)/Φ(82.5°)	Φ(90°)/Φ(97.5°)	Φ(105°)/Φ(112.5°)	Φ(120°)/Φ(127.5°)	Φ(135°)/Φ(142.5°)	Φ(150°)/Φ(157.5°)	Φ(165°)/Φ(172.5°)	Φ(180°)/Φ(187.5°)	Φ(195°)/Φ(202.5°)	Φ(210°)/Φ(217.5°)	Φ(225°)/Φ(232.5°)	Φ(240°)/Φ(247.5°)	Φ(255°)/Φ(262.5°)	Φ(270°)/Φ(277.5°)	Φ(285°)/Φ(292.5°)	Φ(300°)/Φ(307.5°)	Φ(315°)/Φ(322.5°)	Φ(330°)/Φ(337.5°)	Φ(345°)/Φ(352.5°)
Θ(0°)	-3.48/-3.75	-4.76/-5.61	-6.38/-7.47	-8.69/-9.64	-10.38/-10.7	-10.29/-9.29	-8.09/-7.06	-6.01/-5.15	-4.42/-3.78	-3.32/-2.98	-2.76/-2.66	-2.75/-3.03	-3.53/-4.26	-5.17/-6.36	-7.5/-9.18	-10.86/-11.96	-11.62/-11.07	-9.72/-8.58	-7.63/-6.49	-5.42/-4.77	-4.32/-3.72	-3.32/-3.04	-3.09/-3.01	-3.25/-3.41
Θ(7.5°)	-3.23/-8.31	-4.9/-5.97	-7.34/-9.07	-10.97/-12.76	-13.73/-13.84	-12.14/-10.19	-8.43/-1.38	-6.06/-5.22	-4.43/-3.9	-3.58/-3.32	-3.13/-3.11	-3.22/-3.39	-3.76/-4.33	-5.08/-5.84	-6.81/-8.03	-9.14/-9.6	-9.53/-8.81	-7.86/-7.06	-6.56/-6.19	-5.46/-4.95	-4.22/-3.5	-3.07/-2.89	-2.92/-2.67	-2.88/-3.02
Θ(15°)	-2.92/-3.91	-5.33/-7.21	-9.28/-12.46	-15.25/-17.51	-19.11/-17.53	-14.5/-12.02	-9.59/-8.11	-6.78/-5.69	-4.68/-3.88	-3.38/-3.09	-3.01/-3	-3.22/-3.45	-4.85/-5.59	-6.61/-7.61	-9.53/-8.48	-8.59/-7.91	-6.95/-5.94	-5.41/-4.69	-3.95/-3.29	-2.87/-2.55	-2.33/-2.03	-1.93/-1.72	-2.01/-2.26	
Θ(22.5°)	-4.02/-5.3	-7.12/-9.61	-11.64/-14.82	-18.03/-17.88	-18.16/-66	-12.69/-10.4	-8.51/-8.89	-5.63/-4.48	-3.35/-2.58	-2.13/-2	-2.13/-2.38	-2.74/-3.22	-3.65/-3.98	-4.43/-5.1	-6.09/-7.28	-8.01/-7.94	-7.19/-6.03	-4.88/-4.25	-3.93/-3.61	-3.33/-2.97	-2.49/-2.24	-2.12/-2.17	-2.4/-2.28	-2.61/-3.17
Θ(30°)	-5.91/-7.27	-8.84/-10.69	-11.86/-14.56	-18.97/-19.26	-17.9/-13.34	-9.82/-7.58	-6.17/-4.93	-4.22/-3.75	-3.43/-2.99	-2.57/-2.32	-2.29/-2.43	-2.64/-3.18	-3.89/-4.42	-4.95/-52	-6.54/-8.23	-9.79/-10.81	-11.31/-9.81	-7.42/-5.38	-4.11/-3.36	-3.22/-3.34	-3.08/-2.59	-2.19/-2.08	-2.38/-2.51	-3.55/-4.74
Θ(37.5°)	-8.32/-9.61	-11.31/-14.64	-17.15/-18.26	-18.86/-18.01	-14.63/-13.46	-11.8/-3.96	-7.8/-6.33	-5.14/-2.2	-3.61/-3.08	-2.58/-2.2	-2.19/-2.4	-2.83/-3.52	-4.04/-4.29	-4.85/-5.79	-7.08/-8.21	-9.18/-10.62	-10.66/-9.19	-7.71/-7.07	-6.03/-5.01	-4.19/-4.07	-4.43/-4.73	-4.83/-4.85	-4.89/-5.22	-6.17/-7.42
Θ(45°)	-7.83/-10.19	-14.18/-17.89	-17.62/-18.16	-18.36/-17.74	-18.34/-15.73	-11.37/-9.78	-8.65/-7.42	-6/-4.73	-3.86/-3.48	-2.86/-2.39	-2.39/-2.51	-2.83/-3.46	-3.99/-4.28	-5.16/-6.11	-6.45/-7.33	-8.25/-7.71	-6.53/-5.79	-5.95/-5.35	-4.25/-3.71	-3.46/-3.41	-3.53/-6.2	-4.02/-4.95	-5.92/-6.29	-6.33/-7.52
Θ(52.5°)	-7.49/-8.44	-10.54/-13.57	-13.52/-13.46	-15.51/-15.34	-14.46/-14.16	-12.49/-10.1	-8.1/-6.98	-5.88/-4.77	-3.71/-3.11	-2.7/-2.41	-1.98/-1.62	-1.98/-2.9	-2.97/-2.48	-3.31/-4.54	-5.62/-7.64	-7.71/-7.28	-6.61/-6.75	-6.41/-5.76	-5.29/-4.22	-2.96/-1.94	-1.41/-1.36	-1.39/-1.67	-2.52/-3.67	-5.24/-6.5
Θ(60°)	-6.53/-7.84	-9.66/-11.54	-12.38/-11.96	-10.27/-9.13	-8.29/-6.46	-5.08/-4.05	-3.74/-4.04	-4.01/-1.38	-2.06/-1.23	-1.04/-1.17	-1.33/-1.13	-1.28/-1.91	-2.34/-2.48	-2.83/-3.26	-4.27/-5.52	-6.28/-6.32	-6.64/-7.12	-7.84/-7.71	-6.42/-4.84	-3.73/-3	-2.64/-2.65	-2.93/-2.7	-2.46/-3.26	-4.85/-5.93
Θ(67.5°)	-7.88/-8.66	-9.87/-10.8	-11.37/-9.97	-8.56/-8.31	-7.35/-5.17	-3.68/-2.7	-2.21/-98	-2.31/-2.81	-2.2/-0.93	0.030/-19	0.12													



Radiated Composite Gain of 2.4GHz and 5GHz UNII 1~3

Appendix A

Θ(75°)	-18.97/-18.46	-17.64/-19	-19.11/-16.16	-17.59/-15.35	-12.16/-11.05	-10.41/-10.31	-9.91/-10.37	-12.4/-15.06	-16.95/-18.34	-18.37/-18.86	-15.94/-15.94	-13.76/-15.53	-14.56/-13.13	-14.31/-12.43	-16.53/-16.2	-16.11/-13.41	-16.12/-17.3	-17.66/-15.36	-13.5/-12.41	-10.68/-10.53	-12.41/-17.93	-18.62/-15.53	-15.87/-18.46	-17.68/-17.67		
Θ(82.5°)	-18.2/-19.2	-17.22/-18.64	-18.11/-18.36	-19.04/-18.58	-17.44/-16.36	-14.29/-14.2	-15.47/-16.84	-16.86/-16.45	-16.68/-17.89	-17.55/-18.41	-12.74/-12.81	-13.09/-15.21	-12.7/-14.4	-14.3/-13.7	-18.97/-14.93	-13.06/-12.46	-13.5/-13.3	-13.27/-14.58	-11.28/-18.10	-11.2/-13.47	-18.62/-17.16	-13.6/-11.67	-14.99/-18.69	-18.23/-19.16		
Θ(90°)	-17.26/-17.3	-19.03/-18.51	-18.93/-17.66	-18.59/-18.7	-18.27/-17.46	-16.56/-16.3	-17.16/-18.04	-18.76/-17.9	-17.03/-18.64	-16.71/-19.37	-10.67/-14.62	-13.62/-15.23	-17.17/-17.84	-18.98/-18.49	-13.81/-13.43	-12.65/-15.76	-13.8/-14.23	-14.86/-14.9	-17.06/-17.07	-18.91/-15.04	-18.18/-18.54	-18.09/-18.12	-17.91/-18.78			
Θ(97.5°)	-18.04/-18.65	-14.1/-18.34	-18.6/-14.74	-14.07/-19.02	-18.55/-18.25	-17.63/-18.72	-18.19/-18.98	-15.83/-15	-15.28/-18.05	-18.42/-17.81	-18.93/-16.6	-18.17/-17.45	-15.46/-17.52	-18.52/-19.15	-19.32/-19.15	-17.79/-15.66	-18.22/-16.2	-17.98/-17.25	-15.97/-19.09	-19.12/-16.49	-19.54/-17.49	-18.59/-16.27	-18.27/-17.46	-18.33/-18.54		
Θ(105°)	-13.96/-11.54	-14.28/-16.11	-12.19/-10.33	-11.57/-16.06	-19.08/-17.13	-18.94/-18.83	-14.83/-12.07	-10.39/-10.13	-10.45/-13.3	-17.89/-18.73	-18.42/-16.87	-15.64/-14.47	-12.7/-10.13	-12.34/-14.41	-14.89/-16.14	-19.01/-18.57	-18.53/-17.43	-17.9/-15.31	-19.07/-17.3	-17.28/-19.07	-14.06/-12.44	-12.6/-17.4	-12.58/-15.32	-18.99/-18.9		
Θ(112.5°)	-8.19/-9.37	-8.98/-11.54	-10.46/-8.37	-10.21/-10.06	-15.54/-16.77	-14.37/-12.67	-11.55/-10.08	-9.47/-9.96	-11.39/-14.63	-13.7/-18.42	-18.39/-18.12	-18.62/-15.04	-15.13/-15.67	-17.79/-10.59	-9.03/-10.79	-14.04/-10.93	-11.03/-17.09	-18.53/-15.49	-15.86/-14.88	-17.29/-16.09	-12.77/-15.86	-18.54/-12.33				
Θ(120°)	-6.85/-6.54	-7.73/-12.44	-12.98/-10.06	-10.07/-10.88	-12.3/-15.02	-15.68/-13.01	-10.52/-9.69	-9.85/-10.57	-12.18/-13.54	-19.53/-18.14	-18.09/-15.42	-13.69/-18.24	-14.58/-12.64	-17.1/-14.53	-14.67/-16.71	-14.15/-9.18	-6.79/-6.8	-12.04/-14.04	-9.7/-14.28	-19.25/-14.47	-18.53/-15.14	-18.37/-19.28	-12.5/-15.21	-18.37/-9.39		
Θ(127.5°)	-5.27/-7.16	-8.43/-12.95	-12.73/-10.93	-12.83/-16.82	-18.15/-18.73	-17.33/-16.85	-13.54/-11.87	-12.26/-14	-15.25/-16.67	-19.02/-17.33	-13.67/-12.31	-12.56/-14.7	-13.55/-17.39	-14.16/-10	-12.1/-16.87	-15.36/-7.99	-4.92/-6.68	-10.37/-13.11	-9.67/-12	-18.94/-11.89	-17.62/-12.6	-13.17/-17.7	-17.73/-18.5	-13.16/-10.71		
Θ(135°)	-7.09/-7.64	-11.29/-14.88	-16.35/-14.53	-13.02/-13.47	-16.98/-17.66	-17.83/-13.63	-15.46/-18	-17.81/-17.04	-18.43/-18.03	-19.42/-18.79	-17.46/-13.38	-10.61/-12.39	-11.55/-11.81	-14.53/-15.66	-17.09/-18.09	-10.53/-9.03	-6.24/-5.99	-10.46/-17.9	-13.55/-11.97	-12.38/-9.92	-16.49/-11.63	-8.78/-16.73	-8.44/-12.17	-13.28/-10.53		
Θ(142.5°)	-6.57/-7.1	-10.05/-10.56	-10.31/-10.88	-12.51/-13.89	-15.78/-16.97	-17.88/-17.81	-17.88/-16.76	-17.77/-17.18	-18.48/-18.19	-18.74/-17.97	-14.65/-12.39	-13.44/-15.6	-13.24/-14.87	-14.88/-10.95	-13.49/-9.79	-8.94/-9.5	-6.84/-10.6	-18.27/-18.43	-16.17/-11.22	-11.28/-10.35	-12.72/-11.71	-6.98/-10.82	-11.59/-13.28	-15.37/-9.39		
Θ(150°)	-7.98/-7.58	-10.03/-12.57	-14.62/-14.77	-18.86/-18.32	-19.19/-142	-14.21/-14.99	-18.86/-18.45	-19.19/-142	-17.9/-18.09	-18.16/-17.68	-17.57/-18.34	-17.42/-14.42	-13.77/-14.83	-14.95/-18.72	-18.73/-17.99	-12.18/-10.59	-9.24/-9.07	-10.67/-9.03	-8.56/-14.94	-19.09/-17.85	-16.2/-10.96	-11.33/-11.69	-11.81/-13.72	-12.21/-14.05	-18.13/-19.92	-15.84/-12.33
Θ(157.5°)	-10.67/-7.77	-6.66/-8.45	-12.17/-15.9	-18.1/-17.02	-12.22/-18.46	-18.47/-17.78	-17.64/-18.11	-17.24/-18.33	-18.24/-16.27	-13.24/-12.17	-13.38/-17.7	-18.46/-17.59	-15.23/-13.05	-11.14/-13.19	-15.56/-17.86	-17.3/-18.5	-17.41/-17.19	-18.27/-18.09	-19.28/-16.39	-17.41/-18.52	-17.17/-18.3	-18.94/-18.54	-18.06/-16.47	-15.66/-16.74	-13.39/-12.49	-12.29/-12.47
Θ(165°)	-12.05/-11.32	-11.98/-14.35	-17.61/-17.85	-17.52/-18.91	-18.44/-18.32	-18.88/-18.4	-17.72/-17.86	-19.11/-19.24	-19.39/-15.15	-12.37/-10.67	-9.93/-9.75	-10.02/-11.46	-13.88/-13.73	-11.06/-9.03	-8.28/-9.03	-10.54/-11.96	-13.16/-14.44	-16.45/-17.82	-18.6/-18.33	-18.83/-16.3	-15.41/-15	-15.34/-16.18	-16.97/-18.5	-19.1/-15.59		
Θ(172.5°)	-18.12/-16.57	-15.88/-15.17	-15.04/-17.34	-17.93/-18.81	-18.59/-18.41	-18.2/-17.63	-18.58/-18.84	-17.9/-18.64	-16.51/-14.86	-13.85/-13.25	-12.72/-14.29	-12.35/-12.44	-12.61/-12.52	-12.25/-11.84	-13.09/-13.9	-14.77/-15.52	-16.77/-16.94	-19.12/-17.82	-17.63/-17.54	-17.16/-19.53	-19.29/-18.72	-16.68/-19.12	-17.82/-16.82			
Θ(180°)	-10.88/-10.03	-10.68/-11.6	-12.55/-14.19	-16.76/-18.43	-18.37/-17.77	-18.14/-18.15	-19.17/-17.64	-18.71/-19.4	-19.04/-18.57	-18.23/-17.75	-17.91/-18.08	-17.38/-16.35	-16.03/-16.37	-17.66/-18.24	-17.39/-18.32	-18.47/-18.17	-19.14/-18.82	-17.71/-18.3	-18.94/-18.54	-18.86/-18	-18.08/-16.47	-15.66/-16.74	-13.39/-12.49	-12.29/-12.47		
Freq(Hz)	5.6GPol.	PhiAnt. 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Gain	Φ(0°)Φ(7.5°)	Φ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)		
Θ(0°)	-8.6/-9.66	-10.07/-9.8	-10.06/-11.01	-11.83/-12.37	-12.2/-12.06	-11.94/-11.25	-9.53/-9.36	-9.21/-9.04	-8.95/-8.84	-8.8/-8.73	-9.22/-9.84	-10.28/-15.79	-10.41/-11.25	-12.07/-13	-14.09/-15.28	-16.28/-15.79	-15.14/-13.97	-12.57/-11.86	-10.76/-9.99	-9.8/-9.72	-9.85/-9.41	-9.04/-2.55	-8.91/-8.6			
Θ(7.5°)	-8.58/-9.6	-10.04/-10.5	-11.47/-12.6	-14.4/-16.38	-17.14/-17.09	-16.63/-14.87	-13.61/-12.23	-11.6/-10.78	-10.32/-9.58	-9.16/-8.82	-8.84/-8.97	-9.23/-9.6	-10.13/-10.17	-10.4/-10.53	-10.82/-11.11	-11.38/-11.84	-12.07/-12.37	-12.36/-11.38	-10.31/-10	-9.47/-9.26	-9.07/-9.25	-9.48/-9.11	-8.72/-8.71	-8.81/-8.5		
Θ(15°)	-8.2/-8.41	-9.26/-10.54	-12.9/-14.71	-15.83/-16.06	-15.67/-13.45	-10.98/-9.64	-8.61/-8.74	-7.23/-6.76	-6.45/-6.21	-6.08/-5.81	-6.02/-6.25	-6.66/-7.39	-7.97/-8.3	-8.86/-9.38	-9.81/-10.14	-10.93/-11.8	-13.09/-15.3	-17.45/-15.22	-11.96/-9.56	-8.13/-7.29	-7.02/-7.14	-7.49/-7.25	-6.86/-6.79	-7.38/-7.31		
Θ(22.5°)	-6.49/-6.86	-8.27/-9.48	-12.1/-13.08	-13.12/-11.52	-9.9/-7.96	-6.75/-5.7	-4.88/-4.26	-4.04/-3.99	-4.14/-1.16	-4.11/-4.08	-4.31/-4.39	-4.45/-4.57	-4.91/-5.84	-7.14/-6.48	-9.58/-11.21	-12.22/-12.37	-13.62/-11.55	-9.55/-8.11	-7.05/-6.37	-5.57/-5.15	-4.94/-5.01	-5.33/-5.47	-5.96/-6.41			
Θ(30°)	-6.22/-6.39	-7.69/-10.29	-13.06/-14.21	-13.32/-10.97	-9.5/-7.84	-7.13/-6.26	-5.33/-4.27	-3.3/-2.62	-2.22/-2.13	-2.19/-2.38	-2.69/-2.76	-2.66/-2.83	-3.44/-4.33	-5.13/-5.77	-6.73/-7.89	-9.17/-10.5	-12.17/-12.25	-10.21/-8.64	-7.58/-6.23	-5.22/-4.81	-4.24/-3.66	-3.09/-3.04	-3.74/-4.67	-6.17/-6.94		
Θ(37.5°)	-8.28/-9.71	-8.81/-11.07	-13.69/-14.13	-12.4/-11.19	-10.99/-10.39	-9.93/-7.88	-5.87/-4.21	-3.11/-2.35	-1.79/-1.47	-1.52/-1.75	-1.76/-1.34	-0.97/-1.27	-1.89/-2.51	-3.67/-5.52	-7.15/-9.02	-10.51/-11.52	-10.87/-18.7	-6.48/-5.31	-3.88/-2.93	-2.86/-3.71	-5.21/-6.03	-3.79/-2.81	-2.19/-2.7	-4.3/-7.04		
Θ(45°)	-9.35/-9.84	-12.27/-16.67	-17.27/-17.64	-15.73/-14.98	-16.24/-16.18	-13.04/-8.85	-6.82/-5.49	-4.32/-3.19	-2.33/-1.63	-1.51/-1.92	-2.18/-1.85	-1.31/-1.78	-0.61/-1.06	-2.34/-4.12	-5.59/-6.7	-8.44/-9.28	-8.89/-7.25	-5.65/-3.59	-1.97/-1.09	-1.11/-1.73	-2.35/-3.12	-3.02/-3.23	-4.24/-5.28	-6.7/-7.27		
Θ(52.5°)	-10.1/-10.33	-12.51/-18.74	-19.17/-18.4	-18.98/-18.16	-17.72/-17.28	-14.46/-10.7	-7.27/-4.48	-2.67/-2.04	-2.13/-2.12	-2.12/-2.05	-1.65/-1.25	-0.68/-0.08	0.12/-0.4	-1.82/-3.88	-5/-6.1	-9.04/-11.48	-12.79/-9.13	-5.85/-3.6	-2.72/-2.36	-1.87/-2.07	-2.8/-2.75	-2.93/-3.66	-5.34/-8.05	-9.7/-10.28		
Θ(60°)	-5.39/-8.05	-11.08/-14.73	-17.58/-16.86	-17.49/-14.52	-11.49/-9.61	-8.49/-7.65	-5.99/-4.44	-3.16/-1.84	-0.76/-0.17	-0.37/-1.28	-2.43/-2.99	-3.07/-2.54	-1.36/-1.06	-1.61/-3.21	-4.27/-6.17	-9.03/-10.97	-11.69/-8.91	-6.98/-5.19	-4.35/-4.1	-4.49/-4.11	-3.47/-3.03	-3.34/-4.2	-4.82/-5.34	-6.2/-5.62		
Θ(67.5°)	-5.99/-8.92	-14.89/-16.58	-15.77/-16.24	-18.92/-14.05	-9.12/-6.21	-5.02/-4.66	-4.23/-4.23	-2.34/-1.66	-0.53/-1.07	-0.20/-0.86	-1.71/-2.21	-2.51/-1.78	-0.82/-0.64	-0.85/-1.91	-3.03/-5.56	-9.25/-9.62	-11.64/-6.62	-8.95/-6.67	-9.26/-9.8	-8.35/-5.61	-3.78/-3.44	-3.63/-3.8	-3.32/-3.6	-4.81/-6.18		
Θ(75°)	-6.88/-10.78	-18.95/-19.03	-18.31/-19.08	-15.08/-11.05	-7.75/-5.2	-3.21/-1.77	-1.29/-1.79	-2.92/-3.11	-1.6/-0.16	0.22/-0.07	-0.41/-0.42	-0.89/-1.73	-1.74/-1.46	-1.88/-3.43	-4.28/-6.2	-7.26/-9.29	-13.68/-13.43	-10.97/-11.62	-10.22/-8.16	-5.92/-2.94	-1.84/-1.42	-1.54/-2.46	-3.38/-3.35	-3.51/-5.3		
Θ(82.5°)	-13.29/-18.74	-18.01/-17.53	-17.67/-14.16	-12.03/-16.66	-8.19/-5.57	-2.75/-0.93	-0.33/-0.72	-1.56/-2.38	-2.3/-1.37	-0.37/-0.05	0.210.81	0.750.1	-0.51/-4.09	-0.86/-2.33	-3.34/-6.77	-7.89/-11.47	-16.2/-12.89	-11.82/-11.5	-11.71/-7.19	-5.83/-2.88	-0.11/-0.35	-2.28/-4.88	-4.5/-4.3	-6.08/-11.6		
Θ(90°)	-14.14/-11.55	-18.11/-18.41	-14.02/-11.67	-12.33/-13.16	-8.37/-4.84	-1.710.74	0.29/-1.23	-1.68/-0.91	-0.6/-0.85	-0.350.59	0.930.79	0.47/-0.18	-0.23/-1.5	-3.58/-5.79	-8.24/-12.55	-11/-13.23	-15.48/-17.29	-9.37/-6.62	-2.67/-0.56	-0.14/-1.34	-3.66/-6.96	-7.54/-6.77	-9.37/-15.55			
Θ(97.5°)	-9.1/-8.88	-13.83/-14.42	-12.81/-9.41	-11.89/-16.89	-8.75/-3.64	-1.710.05	0.10/-1.36	-0.64/-0.18	-0.47/-0.35	-0.22/-0.59	-0.730.2	0.460.71	-0.44/-0.44	-0.66/-2.57	-4.31/-6.47	-7.28/-8.82	-11.84/-14.58	-13.63/-11.64	-5.76/-3.89	-3.22/-1.28	-1.21/-2.68	-6.5/-7.64	-8.28/-7.28	-7.72/-9.2		
Θ(105°)	-7.48/-8.78	-10.34/-14.19	-19.32/-18.92	-19.25/-18.07	-7.68/-2.95	-1.57/-0.13	0.36/-0.15	-0.52/-1.09	-1.77/-0.73	-0.19/-0.45	-0.89/-0.58	-0.78/-0.47	-1.15/-1.08	-1.55/-2.41	-3.06/-4.71	-5.29/-7.07	-9.79/-14.54	-10.74/-9.08	-5.7/-4.53	-4.09/-2.61	-3.03/-4.87	-5.59/-6.32	-7.15/-5.52	-6.92/-9.42		
Θ(112.5°)	-7.36/-8.32	-11.53/-14.58	-18.65/-16.82	-16.47/-18.05	-11.25/-4.36	-2.41/-1.76	-1.82/-2.5	-3.34/-1.4	-2.29/-0.66	-1.03/-1.57	-2.01/-0.76	-1.62/-1.96	-2.03/-1.32	-2.07/-3.71	-4.77/-6.11	-7.52/-7.45	-8.24/-11.67	-10.67/-11.17	-8.12/-5.87	-6.18/-5.14	-4.92/-6.17	-6.52/-8.71	-6.43/-9.67	-8.24/-9.89		
Θ(120°)	-9.21/-13.75	-12.5/-13.58	-																							



Radiated Composite Gain of 2.4GHz and 5GHz UNII 1~3

Appendix A

Θ(127.5°)	-11.59/-8.29	-6.76/-9.95	-10.77/-8.54	-7.7/-8.96	-10.85/-13.2	-14.63/-13.99	-12.36/-12.59	-16.27/-18.51	-17.87/-18.13	-12.48/-10.27	-7.7/-12.55	-12.32/-15.26	-15.96/-19.52	-18.97/-18.07	-9.45/-14.31	-14.74/-8.06	-8.87/-6.19	-10.32/-14.46	-7.4/-9.3	-14.49/-16.43	-10.78/-13.89	-11.69/-17.19	-16.23/-13.91	-10.53/-8.94
Θ(135°)	-11.82/-13.67	-8.7/-7.63	-9.05/-9.7	-6.22/-5.67	-6.99/-10.3	-15.38/-17.86	-15.24/-11.94	-12.65/-16.45	-18.35/-19.15	-12.69/-9.19	-8.76/-10.02	-15.03/-16.48	-10.56/-14.12	-9.29/-9.39	-12.27/-13.96	-18.46/-9.08	-9.03/-6.85	-17.16/-18.83	-7.59/-7.32	-7.88/-18.51	-11.28/-12.21	-15.68/-18.92	-16.04/-17.89	-15.82/-14.57
Θ(142.5°)	-17.51/-10.21	-6.12/-6.92	-9.08/-9.77	-11.21/-11.07	-11.01/-13.67	-19.13/-18.4	-18.49/-18.35	-17.35/-18.22	-18.27/-15.55	-12.95/-11.92	-12.27/-14.46	-13.3/-12.2	-15.88/-18.77	-17.64/-19.28	-14.17/-16.02	-11.21/-11.3	-18.66/-17.64	-6.95/-7.76	-6.51/-14.78	-14.87/-11.03	-15.45/-17.58	-15.55/-16.12	-11.43/-13.29	
Θ(150°)	-14.39/-9.47	-6.09/-6.82	-10.14/-14.77	-16.82/-17.28	-17.42/-17.94	-17.75/-18.92	-17.97/-17.25	-18.31/-19.09	-18.8/-17.23	-12.47/-9.66	-8.38/-9.32	-13.16/-18.22	-17.86/-18.22	-19.14/-15.73	-14.24/-15.61	-16.27/-17.69	-15.28/-14.15	-19.72/-19.38	-13.08/-10.74	-11.53/-17.73	-17.91/-17.83	-17.57/-15.5	-13.31/-13.61	-18.21/-17.95
Θ(157.5°)	-8.36/-6.52	-8.26/-10.66	-12.17/-15.03	-18.9/-18.69	-17.73/-18.92	-17.28/-17.63	-18.54/-17.51	-17.84/-18.27	-15.92/-11.11	-9.74/-9.5	-9.03/-9.9	-11.91/-13.51	-15.48/-18.41	-11.88/-6.84	-9.26/-12.06	-16.32/-14.28	-13.86/-10.92	-10.88/-13.58	-18.26/-17.82	-17.3/-17.65	-18.89/-15.68	-15.23/-15.52	-16.04/-16.57	-14.39/-11.78
Θ(165°)	-13.26/-14.46	-16.81/-19.07	-17.47/-15.03	-15.14/-15.15	-18.39/-17.8	-19.08/-17.82	-19.16/-17.4	-18.04/-18.75	-18.19/-19.12	-19.67/-14.65	-11.92/-11.73	-13.5/-18.14	-18.47/-17.45	-13.29/-10.89	-9.17/-8.12	-14.07/-10.36	-12.59/-13.24	-13.31/-14	-17.61/-18.16	-18.09/-18.82	-14.61/-13.56	-13.71/-14.63	-13.31/-11.52	-10.71/-11.05
Θ(172.5°)	-15.77/-17.06	-17.81/-17.37	-18.04/-18.41	-17.14/-17.06	-18.07/-18.67	-19.38/-17.88	-19.08/-18.27	-18.43/-17.9	-18.28/-18.38	-17.93/-17.92	-19.1/-17.8	-18.17/-19.02	-18.54/-15.62	-12.77/-10.43	-9.08/-8.19	-8.17/-9.09	-10.98/-12.74	-14.18/-16.73	-19.06/-17.9	-18.6/-18.94	-18.2/-16.53	-16.58/-17.09	-18/-18.84	-19.23/-18.24
Θ(180°)	-12.54/-13.08	-14.52/-14.34	-15.04/-17.95	-18.69/-19.01	-17.37/-18.69	-18.47/-19.08	-18.99/-19.11	-18.09/-19.1	-18.7/-18.32	-17.55/-16.38	-16.5/-17.16	-17.94/-18.64	-17.73/-18.78	-17.92/-17.91	-18.38/-17.95	-16.43/-17.07	-19.06/-18.61	-17.54/-18.92	-17.7/-19.59	-19.17/-17.94	-19.37/-18.61	-18.61/-17.66	-18.4/-18.5	-17.26/-14.8
Freq(Hz)	2.45GPol.	PhiAnt. 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)/Φ(7.5°)	Φ(15°)/Φ(22.5°)	Φ(30°)/Φ(37.5°)	Φ(45°)/Φ(52.5°)	Φ(60°)/Φ(67.5°)	Φ(75°)/Φ(82.5°)	Φ(90°)/Φ(97.5°)	Φ(105°)/Φ(112.5°)	Φ(120°)/Φ(127.5°)	Φ(135°)/Φ(142.5°)	Φ(150°)/Φ(157.5°)	Φ(165°)/Φ(172.5°)	Φ(180°)/Φ(187.5°)	Φ(195°)/Φ(202.5°)	Φ(210°)/Φ(217.5°)	Φ(225°)/Φ(232.5°)	Φ(240°)/Φ(247.5°)	Φ(255°)/Φ(262.5°)	Φ(270°)/Φ(277.5°)	Φ(285°)/Φ(292.5°)	Φ(300°)/Φ(307.5°)	Φ(315°)/Φ(322.5°)	Φ(330°)/Φ(337.5°)	Φ(345°)/Φ(352.5°)
Θ(0°)	-5.36/-6.16	-6.94/-7.7	-7.85/-8.08	-7.87/-13.7	-6.23/-5.38	-4.69/-3.91	-3.26/-2.75	-2.27/-1.92	-1.69/-1.62	-1.73/-1.96	-2.37/-2.97	-3.75/-14.9	-4.66/-5.13	-5.63/-5.76	-6.32/-6.41	-6.33/-6.33	-5.37/-5.41	-3.8/-3.34	-3.19/-3.15	-3.15/-3.17	-3.27/-3.27	-3.4/-3.59	-3.89/-4.39	-5.06/-5.8
Θ(7.5°)	-5.98/-6.53	-6.89/-7.05	-7.22/-7.41	-7.31/-6.83	-6.26/-5.7	-5.16/-4.54	-3.94/-3.34	-2.81/-2.43	-2.21/-2.18	-2.56/-2.75	-3.37/-4.03	-3.81/-5.08	-4.61/-5.34	-6.81/-7.2	-7.27/-7.04	-6.34/-5.52	-4.67/-3.88	-3.29/-2.94	-2.83/-2.86	-2.85/-2.96	-3.1/-3.17	-3.27/-3.49	-3.77/-4.26	-4.88/-5.4
Θ(15°)	-5.74/-6.09	-6.35/-6.61	-7.1/-7.57	-7.92/-7.97	-7.83/-7.53	-7.07/-6.34	-5.49/-4.59	-3.76/-3.12	-2.69/-2.44	-2.41/-2.59	-3/-3.65	-4.45/-5.07	-5.87/-6.7	-7.56/-8.15	-8.17/-7.73	-7.03/-6	-4.8/-3.63	-3.08/-2.64	-2.46/-2.44	-2.56/-2.84	-3.27/-3.36	-3.37/-3.58	-3.84/-4.27	-4.87/-5.44
Θ(22.5°)	-5.68/-5.77	-5.99/-6.34	-6.84/-7.63	-8.45/-8.25	-10.03/-10.5	-10.19/-9.07	-7.74/-6.31	-5.15/-4.22	-3.51/-3.14	-2.99/-3.17	-3.72/-4.42	-4.19/-4.69	-7.81/-9.25	-10.55/-10.46	-10.93/-10.21	-8.78/-7.28	-5.86/-4.69	-3.71/-3.09	-2.73/-2.54	-2.55/-2.7	-2.91/-2.87	-3.06/-3.4	-3.75/-4.2	-4.76/-5.4
Θ(30°)	-5.36/-5.32	-5.55/-5.99	-6.65/-7.78	-9.35/-11.29	-9.36/-14.04	-12.3/-9.71	-7.72/-6.25	-5.12/-4.27	-3.6/-3.11	-2.81/-2.73	-2.93/-3.49	-4.36/-5.34	-6.71/-8.04	-9.32/-10.32	-10.61/-10.34	-9.47/-8.61	-7.44/-6.37	-5.31/-4.6	-4.05/-3.57	-3.16/-2.89	-2.78/-2.79	-3.15/-3.57	-3.99/-4.36	-4.86/-5.22
Θ(37.5°)	-4.93/-4.91	-5.18/-5.65	-6.49/-7.97	-10.16/-12.9	-14.72/-13.04	-9.88/-7.32	-5.57/-4.33	-3.44/-2.77	-2.32/-2.08	-2.05/-2.27	-2.82/-3.41	-4.41/-5.26	-7.4/-8.12	-10.03/-10.64	-10.66/-10.06	-9.23/-8.43	-7.67/-7.13	-6.61/-6.17	-5.66/-4.88	-3.99/-3.09	-2.43/-2.06	-2.33/-2.84	-3.22/-3.63	-4.24/-4.73
Θ(45°)	-4.62/-4.89	-5.61/-5.87	-6.98/-9.09	-12.15/-15.61	-15.63/-12.37	-9.26/-8.67	-5.05/-3.54	-2.37/-1.59	-1.16/-1.08	-0.95/-1.06	-1.49/-2.33	-3.38/-4.48	-5.69/-6.46	-6.86/-8.68	-6.76/-6.51	-5.77/-6.72	-6.97/-7.18	-7.54/-7.91	-7.92/-7.35	-6.22/-4.89	-3.65/-2.61	-3.23/-2.45	-2.54/-2.71	-3.27/-4.04
Θ(52.5°)	-4.81/-5.23	-5.38/-6.25	-7.53/-9.72	-12.46/-14.7	-15.05/-13.28	-10.99/-8.42	-5.93/-5.56	-1.64/-0.93	0.210/-2.22	-0.23/-3.42	-3.94/-4.89	-5.91/-6.55	-6.74/-6.16	-5.66/-5.57	-5.83/-6.42	-7.25/-8.31	-9.78/-10.73	-10.08/-9.18	-8.73/-8.33	-7.17/-6.37	-4.35/-4.04	-3.81/-3.54	-3.73/-4.34	
Θ(60°)	-7.86/-7.73	-7.75/-7.85	-8.79/-10.25	-11.04/-10.29	-8.64/-6.98	-5.78/-4.81	-3.59/-1.86	-0.091/-2.1	1.881/-9.4	1.551/-8.8	0.281/-1.04	-2.71/-3.93	-4.57/-5.58	-5.29/-4.86	-4.41/-4.28	-4.47/-4.94	-5.45/-5.72	-5.52/-4.57	-3.47/-2.81	-2.74/-3.46	-4.98/-5.78	-5.55/-5.61	-6.25/-6.74	-7.14/-7.67
Θ(67.5°)	-11.97/-12.16	-11.59/-11.3	-11.32/-11.57	-11.14/-9.37	-7.04/-5.24	-4.24/-3.63	-2.91/-6.3	-0.081/-2.1	2.012/-0.4	1.430/-0.1	1.93/-9.36	-5.8/-6.45	-6.48/-6.05	-5.75/-5.31	-4.79/-4.4	-4.66/-4.12	-3.58/-3.13	-2.53/-1.71	-1.01/-0.69	-0.91/-1.71	-3.02/-3.76	-3.77/-3.71	-4.37/-5.61	-7.43/-9.54
Θ(75°)	-9.19/-7.71	-7.7/-7.43	-9.06/-9.9	-7.92/-6.86	-5.16/-4.57	-3.14/-2.77	-5.31/-4.93	-2.93/-1.49	-0.370/-2.2	0.08/-0.59	-2.18/-4.79	-7.64/-8.8	-9.3/-8.52	-8.34/-8.38	-8.33/-7.84	-5.89/-5.62	-4.63/-7.3	-2.91/-2.24	-2.04/-2.59	-1.10/-1.07	-7.56/-10.05	-11.42/-10.91	-10.38/-10.08	-9.71/-9.22
Θ(82.5°)	-13.77/-9.9	-8.38/-8.2	-8.83/-9.67	-9.45/-8.13	-6.82/-6.26	-6.46/-6.9	-6.8/-5.54	-4.08/-2.69	-1.59/-1.21	-1.63/-3.26	-5.73/-8.87	-12.82/-13.64	-11.25/-8.95	-7.93/-6.69	-6.03/-5.12	-4.62/-4.36	-4.03/-3.58	-3.28/-3.31	-3.76/-4.33	-4.82/-5.15	-5.24/-5.21	-5.77/-7.01	-9.12/-13.01	-18.05/-18.65
Θ(90°)	-6.87/-15.31	-12.18/-11.27	-11.28/-10.92	-9.02/-6.52	-4.55/-3.49	-3.73/-4.85	-6.41/-6.76	-7.96/-7.51	-6.78/-6.06	-6.02/-6.63	-7.71/-8.1	-9.79/-10.89	-13.25/-14.65	-12.41/-8.97	-6.63/-5.67	-5.61/-6.26	-7.51/-9.66	-12.74/-15.45	-15.97/-15.84	-15.67/-15.84	-14.01/-10.51	-8.84/-8.58	-9.31/-11.41	-17.06/-17.7
Θ(97.5°)	-18.27/-19.49	-17.24/-16.97	-18.3/-18.56	-14.13/-9.66	-6.39/-4.27	-3.22/-3.07	-3.74/-7.6	-5.93/-6.4	-8.22/-9.37	-11.41/-12.4	-13.31/-9.33	-8.14/-8.16	-8.93/-9.09	-7.91/-6.05	-4.74/-4.15	-3.18/-2.81	-3.17/-3.94	-4.84/-5.74	-6.71/-7.62	-8.79/-8.2	-8.71/-10.64	-12.29/-10.61	-9.36/-9.47	-10.34/-11.62
Θ(105°)	-12.92/-12.26	-12.51/-14.83	-17.84/-17.69	-15.53/-14.72	-15.36/-15.28	-12.54/-10.06	-9.1/-9.04	-8.75/-7.87	-7.7/-9.58	-13.82/-18.44	-17.45/-16.38	-11.89/-9.17	-7.47/-7.2	-8.63/-10.59	-10.31/-7.99	-5.68/-3.92	-3.07/-2.82	-3.32/-4.58	-6.46/-8.71	-10.53/-12.32	-17.3/-18.73	-13.98/-12	-12.75/-13.1	-11.95/-12.3
Θ(112.5°)	-11.14/-8.48	-8.24/-10.45	-14.13/-13.34	-9.92/-7.56	-6.85/-7.8	-10.57/-15.31	-18.9/-17.38	-11.74/-8.29	-7.45/-9.31	-12.09/-12.85	-17.88/-18.08	-14.28/-9.55	-6.39/-5.25	-5.82/-6.16	-4.99/-3.64	-2.8/-2.16	-1.56/-1.59	-2.52/-4.03	-5.59/-7	-7.9/-8.8	-11.37/-11.17	-7.36/-6.29	-8.29/-13.53	-17.23/-19.25
Θ(120°)	-4.67/-8.94	-6.07/-7.75	-12.91/-18.22	-14.15/-8.57	-6.35/-4.09	-3.53/-3.66	-4.56/-4.49	-9.89/-13.3	-14.21/-14.06	-10.65/-8.28	-8.73/-10.66	-13.61/-18.06	-14.48/-9.95	-2.32/-5.55	-4.4/-4.69	-3.26/-2.29	-2.82/-3.18	-3.36/-4.23	-6.78/-8.5	-16.64/-16.5	-8.52/-6.5	-7.91/-13.08	-17.64/-12.56	
Θ(127.5°)	-17.87/-11.33	-9.28/-10.26	-12.9/-11.36	-7.93/-5.14	-2.85/-1.09	-0.17/-0.11	-0.98/-2.89	-6/-8.88	-11.8/-9.37	-5.95/-4.7	-5.46/-7.39	-10.19/-17.14	-17.24/-10.25	-7.48/-5.85	-5.76/-4.58	-4.07/-3.02	-2.23/-2.24	-2.82/-3.46	-4.29/-5.99	-8.95/-13.17	-16.19/-9.62	-5.63/-4.07	-4.6/-7.19	-12.72/-18.22
Θ(135°)	-12.08/-17.79	-18.13/-17.92	-12.93/-8.62	-5.88/-4.29	-3.2/-2.21	-1.61/-1.74	-2.84/-4.99	-8.07/-11.5	-16.18/-16	-9.87/-10.4	-6.32/-6.21	-6.1/-6.97	-9.14/-12.46	-15.67/-17.57	-16.1/-13.49	-10.94/-9.03	-7.98/-7.97	-8.28/-8.61	-9.49/-11.27	-12.48/-10.39	-7.13/-4.26	-2.53/-1.8	-2.25/-3.76	-6.17/-9.36
Θ(142.5°)	-10.6/-12.47	-17.29/-13.91	-9.25/-8.82	-3.48/-2.18	-1.58/-1.32	-1.23/-1.3	-1.59/-2.11	-2.99/-4.53	-7.87/-13.61	-18/-10.71	-9.33/-9.32	-9.03/-8.64	-8.97/-10.04	-11/-11.61	-10.58/-9.34	-6.33/-5.14	-7.47/-4.6	-4.61/-4.6	-4.71/-4.74	-4.59/-4.09	-3.3/-2.64	-2.26/-2.36	-3.24/-4.9	-7.46/-10.69
Θ(150°)	-18.36/-19.28	-15.13/-10.23	-6.7/-4.16	-2.35/-1.21	-0.64/-0.45	-0.5/-0.66	-0.94/-1.41	-2.3/-3.76	-6.33/-10.19	-17/-18.3	-19.09/-19.23	-18.12/-18.24	-18.83/-18.29	-15.17/-13.72	-13.57/-13.51	-12.28/-12.19	-9.25/-8.6	-8/-7.24	-6.32/-5.43	-4.69/-4.12	-3.66/-3.53	-3.82/-4.58	-6.23/-8.81	-16.97/-17.55
Θ(157.5°)	-18.01/-16.64	-12.42/-9.68	-7.55/-5.94	-4.71/-3.96	-3.68/-3.79	-4.15/-4.72	-5.38/-6.24	-7.45/-9.25	-12/-16.04	-18.7/-19.42	-17.95/-18.83	-18.29/-17.64	-18.69/-15.81	-13.51/-12.06	-11.74/-11.21	-14.16/-16.85	-18.96/-18.2	-18.07/-13.46	-10.46/-8.66	-7.36/-6.7	-6.46/-6.82	-7.53/-8.86	-11.14/-14.65	-17.55/-18.83
Θ(165°)	-15.11/-12.87	-11.5/-10.66	-10.24/-10.09	-10.23/-10.95	-12.31/-14.33	-15.93/-15.32	-13.29/-11.41	-10.12/-9.32	-8.99/-9.16	-9.65/-10.63	-12.23/-15.03	-18.19/-17.65	-16.1/-13.27	-11.02/-9.4	-8.41/-7.86	-7.5/-7.75	-8.37/-8.85	-9.23/-9.5	-9.61/-9.66	-9.87/-10.42	-11.71/-12.43	-13.77/-15.22	-16.58/-16.92	-15.76/-13.56
Θ(172.5°)	-11.98/-12.16	-12.78/-13.85	-15.87/-19.38	-17.92/-19.05	-18.95/-14.39	-10.26/-8.1	-6.73/-5.94	-5.47/-5.31	-5.37/-5.67	-6.38/-7.37	-9.13/-12.04	-15.79/-17.99	-15.83/-12.81	-10.66/-9.31	-8.61/-7.47	-1.01/-6.68	-6.43/-6.32	-6.29/-6.42	-6.77/-7.26	-8.12/-9.03				