



# Antenna Composite Gain Test Report

Equipment	Wi-Fi 6E Smart Mesh System
Brand Name	AirTies
Model Name	Air 4980
Applicant	Airties Wireless Networks Sehit Mehmet Mikdat Uluunlu Sokagi No:23 Esentepe, Sisli İstanbul, 34394 Turkey
Manufacturer	Airties Wireless Networks Sehit Mehmet Mikdat Uluunlu Sokagi No:23 Esentepe, Sisli İstanbul, 34394 Turkey
Sample Received	Jan. 11, 2022
Start Test Date	Jan. 21, 2022
Final Test Date	Jan. 21, 2022



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### 1. Operation Mode and Antenna Information

Antenna Position	RF Port	Brand Name	Model Name	Ant. Type	Connector	Modes of Operation
2G 5GAnt1	1	AirTies	A00	PCB	N/A	2.4GHz, 5GHz UNII 1~3
2G 5GAnt2	2	AirTies	A11	PCB	N/A	2.4GHz, 5GHz UNII 1~3
6G Ant1	1	AirTies	A0X	PCB	N/A	2.4GHz, 5GHz UNII 1~3
6G Ant2	2	AirTies	A1X	PCB	N/A	2.4GHz, 5GHz UNII 1~3
6G Ant3	3	AirTies	A2X	PCB	N/A	6GHz
6G Ant4	4	AirTies	A3X	PCB	N/A	6GHz

Note:

2.4GHz and 5GHz

Operation Mode (2TX/2RX)

2G 5GAnt.1~2G 5GAnt.2 can be used as transmitting/receiving antenna.

2G 5GAnt.1~2G 5GAnt.2 could transmit/receive simultaneously.

6GHz

Operation Mode (4TX/4RX)

6G Ant.1~6G Ant.4 can be used as transmitting/receiving antenna.

6G Ant.1~6G Ant.4 could transmit/receive simultaneously

### 2. Test Frequency

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

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
Radiated	05CH03-HY	Rex Liao	19.5-20.5 / 50-55	Jan. 21, 2022

Note:

Testing Site Information

Brand Name: TDK

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

Characteristic: Fully Anechoic Chamber

#### 4. Test Facility and Configuration

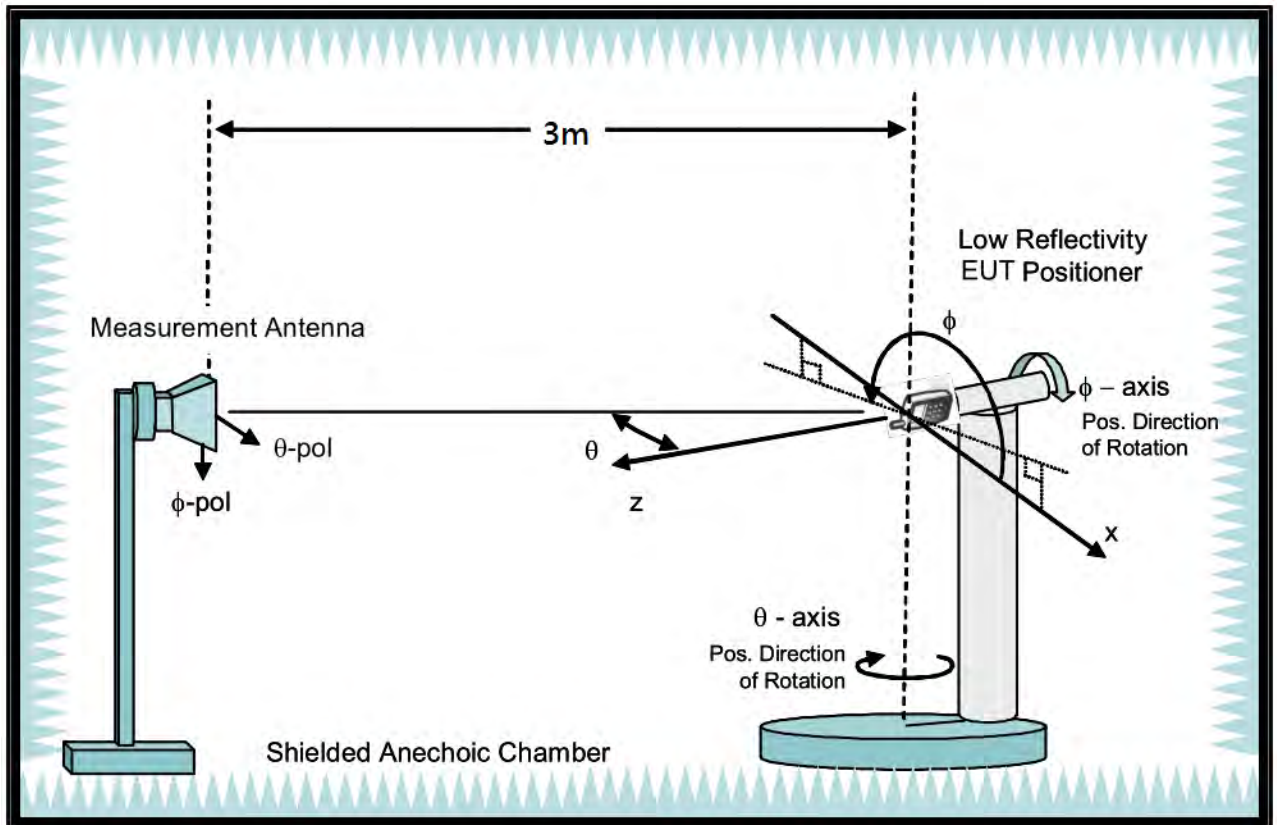
Test configuration: Reference to CITA OTA distributed-axes system configuration.

Chamber: Fully Anechoic Chamber.

Measurement antenna: Single Polarization Horn antenna calibrated according to ANSI C63.5.

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

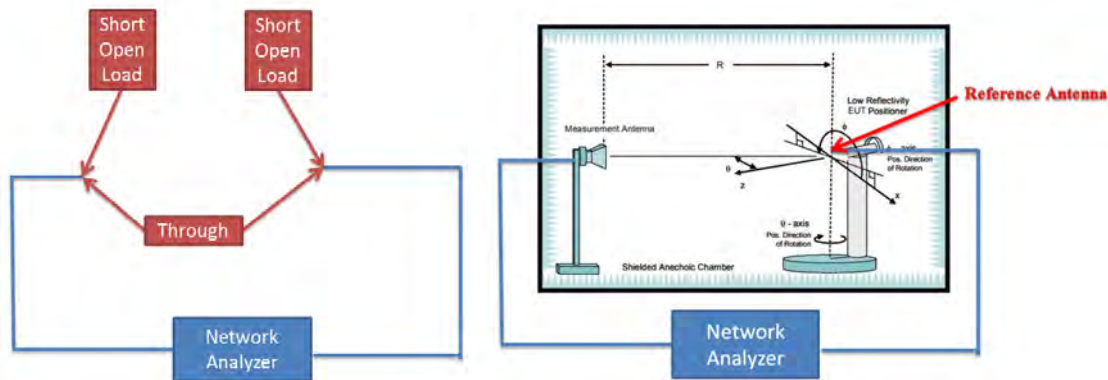
#Reference to CTIA “ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1”



### 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 S21 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 S21 values and used with reference antenna gain to calculate gain factor.



Frequency (MHz)	2400	2450	2500	5150	5200	5300	5600	5750	5800	5900	6000	6500	7000	7500
S21 reading (dB)	-31.4	-31.4	-31.3	-31.3	-31	-30.7	-30.1	-30.5	-30.5	-30.8	-31.3	-32.8	-34.4	-35.4
Reference gain (dBi)	10.2	10.4	10.6	12.4	12.8	13.4	13.4	13.3	13.3	13.1	13.2	12.3	11.7	11.1
Factor (dB)	41.34	41.55	41.68	43.24	43.56	43.68	43.79	43.91	43.99	44.43	44.49	45.24	46.12	46.31

Note:

$$S21 \text{ reading (dB)} = 20 \cdot \log(V2/V1) = 10 \cdot \log(P2/P1)$$

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

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

$$\text{Factor} = \text{gain factor} + \text{power gain conversion} = (\text{Reference antenna gain}) - (S21 \text{ reading})$$



## 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 S21 value every 15 degree from 0 to 345 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 錯誤! 找不到參照來源。 tables.

Note: Antenna gain = S21 reading + factor, The factor of chapter five includes reference antenna gain factor and power gain conversion.





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

For 2.4GHz and 5GHz

### DG\_1SS Max Value Position

Frequency (Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 (dBi)	1.78	-0.59	0.31	-0.15	0.54
Ant. 2 (dBi)	1.51	0.72	0.34	-0.56	0.64
DG [1SS] (dBi)	4.66	3.1	3.34	2.66	3.6
Polarization	Theta	Phi	Phi	Phi	Phi
Θ (°)	60	60	45	75	90
Φ (°)	75	345	0	345	0

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^(1.78/20)	10^(-0.59/20)	10^(0.31/20)	10^(-0.15/20)	10^(0.54/20)
Ant. 2 [10^(G/20)]	10^(1.51/20)	10^(0.72/20)	10^(0.34/20)	10^(-0.56/20)	10^(0.64/20)
Ant. 1 [10^(G/20)] value	1.227	0.934	1.036	0.983	1.064
Ant. 2 [10^(G/20)] value	1.19	1.086	1.04	0.938	1.076
Sum All Antenna [Amax]	2.417	2.021	2.076	1.92	2.141
DG [10*log(Amax^2/Nant)]	4.66	3.1	3.34	2.66	3.6

Note:

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

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



For 6GHz

DG\_1SS Max Value Position

Frequency (Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 (dBi)	-17.61	-1.54	0.99	0.85
Ant. 2 (dBi)	0.77	-3.81	1.57	-1.17
Ant. 3 (dBi)	3.06	-0.77	-6.65	1.16
Ant. 4 (dBi)	-0.42	-2.57	-12.64	-1.66
DG [1SS] (dBi)	5.1	3.92	3.57	5.9
Polarization	Theta	Theta	Theta	Theta
$\Theta$ (°)	105	15	120	30
$\Phi$ (°)	90	270	285	75

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

DG\_1SS Max Value Position Calculation

Frequency (Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 [10^(G/20)]	10 <sup>^</sup> (-17.61/20)	10 <sup>^</sup> (-1.54/20)	10 <sup>^</sup> (0.99/20)	10 <sup>^</sup> (0.85/20)
Ant. 2 [10^(G/20)]	10 <sup>^</sup> (0.77/20)	10 <sup>^</sup> (-3.81/20)	10 <sup>^</sup> (1.57/20)	10 <sup>^</sup> (-1.17/20)
Ant. 3 [10^(G/20)]	10 <sup>^</sup> (3.06/20)	10 <sup>^</sup> (-0.77/20)	10 <sup>^</sup> (-6.65/20)	10 <sup>^</sup> (1.16/20)
Ant. 4 [10^(G/20)]	10 <sup>^</sup> (-0.42/20)	10 <sup>^</sup> (-2.57/20)	10 <sup>^</sup> (-12.64/20)	10 <sup>^</sup> (-1.66/20)
Ant. 1 [10^(G/20)] value	0.132	0.838	1.121	1.103
Ant. 2 [10^(G/20)] value	1.093	0.645	1.198	0.874
Ant. 3 [10^(G/20)] value	1.422	0.915	0.465	1.143
Ant. 4 [10^(G/20)] value	0.953	0.744	0.233	0.826
Sum All Antenna [Amax]	3.599	3.141	3.017	3.946
DG [10*log(Amax^2/Nant)]	5.1	3.92	3.57	5.9

Note:

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

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



### 8. Summary of Test Result

Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	3.36	1.62	2.35	1.37	1.01
Ant. 2 Max Gain (dBi)	4.06	1.92	1.59	0.54	2.18
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/105/240	Theta/90/135	Theta/90/150	Theta/165/60	Theta/165/45
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/120/120	Theta/15/270	Theta/15/285	Theta/45/225	Theta/105/255
Max Gain (dBi)	4.06	1.92	2.35	1.37	2.18
DG [1SS] (dBi)	4.66	3.1	3.34	2.66	3.6
DG [2SS] (dBi)	4.06	1.92	2.35	1.37	2.18

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.

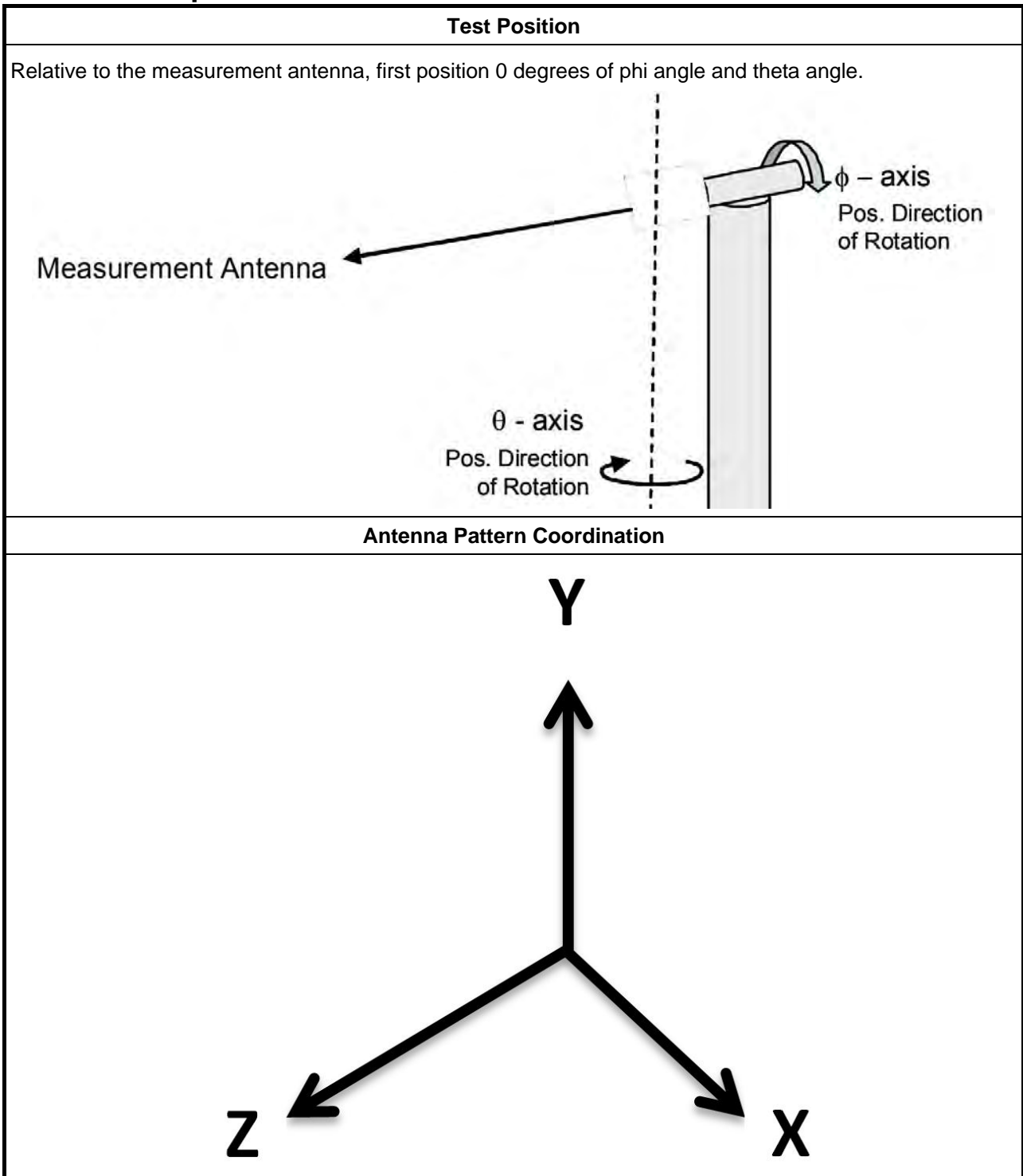


Freq(Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 Max Gain (dBi)	2.4	1.29	1.05	3.33
Ant. 2 Max Gain (dBi)	3.01	2.18	1.57	2
Ant. 3 Max Gain (dBi)	3.06	2.14	1.2	2.68
Ant. 4 Max Gain (dBi)	1.3	1.61	2.56	2.7
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/105/240	Theta/120/240	Theta/15/75	Theta/150/270
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/135/270	Theta/120/285	Theta/120/285	Theta/75/0
Ant. 3 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/105/90	Theta/75/75	Theta/60/90	Theta/75/345
Ant. 4 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Phi/90/0	Phi/75/345	Phi/90/0	Phi/75/0
Max Gain (dBi)	3.06	2.18	2.56	3.33
DG [1SS] (dBi)	5.1	3.92	3.57	5.9
DG [2SS] (dBi)	3.06	2.18	2.56	3.33
DG [4SS] (dBi)	3.06	2.18	2.56	3.33

Note:

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

### 9. Test Setup



Note:

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



**10. Test Equipment and Calibration Data**

<b>Instrument</b>	<b>Brand</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Characteristics</b>	<b>Calibration Date</b>	<b>Calibration Due Date</b>
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1292	1GHz~18GHz	Aug. 04, 2021	Aug. 03, 2022
Test Software	SPORTON	SENSE-RDG	V1.0.6	-	N.C.R.	N.C.R.

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

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



## 11. Test Results

Please refer to the appendix.

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Appendix B – Radiated Composite Gain of 6GHz U-NII 5~U-NII 8.....	Page 22
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Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	3.36	1.62	2.35	1.37	1.01
Ant. 2 Max Gain (dBi)	4.06	1.92	1.59	0.54	2.18
Ant. 1 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Phi/105/240	Theta/90/135	Theta/90/150	Theta/165/60	Theta/165/45
Ant. 2 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Phi/120/120	Theta/15/270	Theta/15/285	Theta/45/225	Theta/105/255
Max Gain (dBi)	4.06	1.92	2.35	1.37	2.18
DG [1SS] (dBi)	4.66	3.1	3.34	2.66	3.6
DG [2SS] (dBi)	4.06	1.92	2.35	1.37	2.18





DG 1SS Result

Table with columns: Freq(Hz), 2.45G, Pol., Phi, and 24 directional gain values (Phi(0°) to Phi(345°)). It contains three main sections for 2.45G and 5.2G frequencies, each with a table of gain values in dB for various angles.



Radiated Composite Gain of 2.4GHz and 5GHz U-NII 1~U-NII 3

Appendix A

Θ(180°)	-7.61	-7.05	-5.71	-3.87	-2.11	-1.65	-2.14	-3.15	-4.19	-6.44	-8.5	-8.5	-8.16	-7.74	-6.93	-6.09	-5.31	-4.01	-3.3	-4.02	-4.59	-7.5	-9.63	-9.55
Freq(Hz)	5.6G	Pol.	Phi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dB)	Φ(0°)	Φ(15°)	Φ(30°)	Φ(45°)	Φ(60°)	Φ(75°)	Φ(90°)	Φ(105°)	Φ(120°)	Φ(135°)	Φ(150°)	Φ(165°)	Φ(180°)	Φ(195°)	Φ(210°)	Φ(225°)	Φ(240°)	Φ(255°)	Φ(270°)	Φ(285°)	Φ(300°)	Φ(315°)	Φ(330°)	Φ(345°)
Θ(0°)	-7.33	-6.77	-6.74	-7.71	-8.59	-8.36	-10.76	-11.27	-8.81	-8.09	-8.23	-7.29	-8.1	-7.84	-6.84	-6.14	-7.62	-9.53	-9.86	-10.79	-12.76	-10.97	-9.79	-8.05
Θ(15°)	-7.56	-6.93	-5.21	-5.08	-8.85	-9.19	-8.89	-9.24	-8.2	-6.09	-6.8	-7.46	-6.69	-4.79	-3.15	-3.73	-4.74	-8.72	-10.15	-11.71	-9.71	-5.35	-4.94	-6.56
Θ(30°)	-5.26	-4.62	-3.49	-4.41	-4.13	-4.78	-6.74	-8.41	-9.2	-6.99	-6.64	-5.56	-3.55	-2.78	-2.53	-3.81	-4.5	-6.69	-8.27	-5.91	-6.17	-8.3	-5.58	-3.92
Θ(45°)	-2.75	-3.73	-3.92	-4.76	-5.03	-5.98	-8.21	-9.72	-9.45	-9.61	-6.7	-5.84	-2.19	-1.56	-5.32	-10.66	-12.41	-10.43	-9.15	-6.34	-3.84	-4.9	-5.59	-0.38
Θ(60°)	-0.91	-0.4	-2.64	-4.52	-4.42	-4.35	-7.64	-6.36	-9.15	-6.87	-3.51	-1.86	-1.07	-2.67	-4.17	-10.22	-9.79	-8.39	-6.8	-5.7	-8.69	-9.47	-3.91	0.02
Θ(75°)	0.7	-1.15	-2.84	-4.6	-5.7	-3.93	-6.37	-6.84	-5.84	-8.06	-1.14	-3.79	-1.1	-2.12	-6.37	-8.66	-7.92	-6.43	-7.23	-6.49	-9.44	-6.16	-4.55	2.66
Θ(90°)	0.78	0.05	-3.61	-6.08	-7.03	-3.2	-6.84	-5.84	-5.66	-8.29	-5.45	-3.51	-2.09	-5.56	-5.46	-7.37	-5.65	-3.37	-3.28	-3.27	-9.77	-8.16	-3.2	-0.43
Θ(105°)	-0.57	-1.19	-4.74	-5.72	-12.12	-3.75	-4.71	-2.89	-4.56	-7.25	-5.23	-3.07	-4.91	-0.39	-7.7	-4.81	-1.94	-2.12	-4.9	-3.23	-10.54	-4.55	-5.21	0.03
Θ(120°)	-5.78	-4.59	-9.03	-10.07	-10.12	-4.9	-4.21	-3.85	-5.4	-8.44	-6.28	-5.67	-8.67	-4.68	-9.1	-5.01	-2.83	-5.72	-8.4	-4.6	-9.82	-7.36	-7.84	-9.8
Θ(135°)	-11.7	-9.12	-8.34	-13.01	-12.67	-10.39	-7.13	-2.77	-2.13	-5.97	-3.95	-3.74	-6.44	-7.63	-9.4	-4.34	-5.05	-6.62	-10.69	-11.86	-11.11	-11.68	-11.65	-11.74
Θ(150°)	-9.42	-11.9	-15.81	-13.25	-13.88	-11.72	-10.42	-9.18	-6.75	-8.44	-6.63	-9.73	-8.6	-12.01	-11.32	-13.57	-8	-8.98	-9.78	-12.16	-9.51	-12.72	-10.32	-15.13
Θ(165°)	-5.06	-6	-8.57	-11.42	-13.08	-12.41	-12.12	-11.5	-7.54	-3.88	-1.64	-1.49	-4.27	-7.68	-9.15	-8.66	-11.59	-11.22	-9.72	-6.77	-5.87	-7.56	-7.52	-8.16
Θ(180°)	-5.89	-9.14	-12.42	-11.48	-8.2	-8.4	-7.82	-4.97	-4.65	-6.42	-6.97	-7.46	-8.61	-9.54	-9.75	-10.04	-11.27	-12.03	-12.61	-9.01	-6.81	-6.07	-6.55	-5.72
Freq(Hz)	5.6G	Pol.	Theta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dB)	Φ(0°)	Φ(15°)	Φ(30°)	Φ(45°)	Φ(60°)	Φ(75°)	Φ(90°)	Φ(105°)	Φ(120°)	Φ(135°)	Φ(150°)	Φ(165°)	Φ(180°)	Φ(195°)	Φ(210°)	Φ(225°)	Φ(240°)	Φ(255°)	Φ(270°)	Φ(285°)	Φ(300°)	Φ(315°)	Φ(330°)	Φ(345°)
Θ(0°)	-10.47	-12.08	-11.41	-9.95	-9.07	-8.29	-7.67	-6.84	-7.09	-6.52	-7.86	-9.8	-10.66	-10.59	-9.47	-8.86	-8.65	-8.56	-7.21	-6.84	-5.57	-5.63	-6.65	-8.96
Θ(15°)	-13.4	-12.75	-9.12	-6.2	-4.32	-3.98	-3.32	-2.41	-2.27	-3.39	-5.81	-7.98	-7.69	-6.11	-4.28	-3.24	-2.5	-2.33	-1.87	-1.72	-2.55	-4.62	-9.29	-14.28
Θ(30°)	-12.97	-11.62	-8.24	-6.81	-4.64	-3.19	-1.97	-0.1	-0.51	-2.92	-2.89	-2.61	-3.76	-3.26	-5.62	-5.3	-4.22	-5.38	-4.56	-6.31	-10.96	-9.87	-8.58	-12.09
Θ(45°)	-10.7	-10.35	-8.6	-7.21	-4.87	-3.62	-2.29	-0.83	0.84	0.87	-0.44	-3.34	-4.04	-5.85	-3.03	-0.91	-2.79	-3.44	-4.47	-3.62	-3.5	-8.81	-15.37	-11.01
Θ(60°)	-6.09	-3.16	-3.86	-1.92	-2.32	-0.23	0.75	-0.14	-2.02	1.13	0.28	-3.14	-1.94	-4.04	-2.4	-2.86	-4.68	-4.01	-6.2	-7.02	-7.07	-5.78	-5.93	-11.12
Θ(75°)	-7.55	-9.4	-4.43	-2.32	-2.98	-0.63	0.84	0.1	-4.18	-1.94	0.12	-1.13	-3.28	0.09	-1.32	-3.93	-4.15	-1.66	-0.56	-2.4	-5.26	-7.06	-2.16	-5
Θ(90°)	-2.54	-1.97	-2.55	-4.33	-5.37	-1.09	-0.24	0	-4.46	-0.48	-0.2	0.07	-3.49	-0.85	-2.26	-5.87	-2.55	-1.63	-1.1	-2.53	-5.16	-5.66	-4.57	-4.79
Θ(105°)	-8.39	-1.92	-3.02	-3.17	-3.26	-3.55	-2.94	-3.8	-4.5	-5.15	-4.35	-1.36	-3.75	0.96	-1.63	-3.11	-2.28	-2.17	-1.77	-1.91	-1.71	-5.73	-6.68	-6.44
Θ(120°)	-4.5	-2.24	-5.94	-7.76	-1.94	-2.15	-4.61	-5.51	-2.76	-2.99	-2.96	-1.89	-2.29	0.37	-5.88	-7.33	-5.44	-8.42	-1.67	-7.81	-2.67	-5.37	-9.49	-2.65
Θ(135°)	-8.54	-6.13	-6.33	-6.07	-3.88	-6.38	-5.49	-5.47	-10.67	-9.77	-5.7	-5.99	-5.27	-2.08	-5.25	-6.03	-5.19	-11.28	-2.13	-11.45	-5.28	-12.93	-9.38	-5.98
Θ(150°)	-7.37	-5.18	-2.37	-2.27	-2.64	-4.66	-4.77	-4.36	-6.6	-7.09	-7.32	-7.72	-7.74	-5.6	-3.77	-2.52	-8.15	-9.42	-4.35	-3.48	-8.12	-1.71	-5.9	-5.07
Θ(165°)	-9.62	-6.62	-3.69	-0.58	-0.19	-1.51	-3.81	-3.69	-4.67	-4.46	-6.13	-7.44	-5	-5.61	-6.55	-6.23	-6.36	-6.13	-5.61	-8.25	-10.03	-12.46	-13.51	-15.6
Θ(180°)	-5.49	-5.22	-4.33	-3.58	-2.83	-2.79	-4.39	-5.66	-8.84	-11.62	-10.45	-7.97	-6.66	-6.19	-6.64	-6.96	-6.3	-5.14	-5.42	-6.85	-8.12	-11.1	-12.72	-10.21
Freq(Hz)	5.785G	Pol.	Phi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dB)	Φ(0°)	Φ(15°)	Φ(30°)	Φ(45°)	Φ(60°)	Φ(75°)	Φ(90°)	Φ(105°)	Φ(120°)	Φ(135°)	Φ(150°)	Φ(165°)	Φ(180°)	Φ(195°)	Φ(210°)	Φ(225°)	Φ(240°)	Φ(255°)	Φ(270°)	Φ(285°)	Φ(300°)	Φ(315°)	Φ(330°)	Φ(345°)
Θ(0°)	-5.91	-5.48	-7.25	-9.88	-9.84	-8.68	-8.15	-6.24	-6.66	-6.31	-5.3	-5.23	-5.57	-6.05	-5.89	-7.11	-9.38	-9.6	-7.48	-7.65	-6.53	-6.24	-5.35	-5.72
Θ(15°)	-6.93	-7.5	-5.64	-4.65	-6.21	-6.22	-7.71	-10.75	-10.67	-9.58	-8.75	-7.67	-5.72	-4.31	-3.4	-5.76	-7.31	-8.67	-9	-8.37	-7.11	-4.91	-4.65	-5.35
Θ(30°)	-6.46	-7.38	-4.62	-5.95	-7.18	-6.79	-7.56	-11.52	-13.56	-9.79	-6.01	-6.22	-6.93	-4.55	-2.47	-3.47	-8.2	-10.01	-10.56	-8.11	-7.02	-7.31	-5.62	-4.79
Θ(45°)	-6.52	-4.52	-4.39	-3.06	-2.47	-4.64	-8.34	-11.07	-12.89	-12.69	-6.53	-2.64	-3.73	-4.61	-4.87	-9.28	-11.59	-9.94	-8.4	-6.71	-3.51	-4.76	-5.25	-4.47
Θ(60°)	-2.15	-2.98	-4.5	-4.36	-3.3	-3.57	-8.69	-10.8	-10.16	-7.4	-4.69	-3.29	-4.02	-3.91	-7.19	-14.39	-15.67	-7.93	-4.01	-3.86	-6.18	-10.62	-6.48	-3.93
Θ(75°)	0.07	-0.71	-3.42	-5.22	-3.61	-1.98	-6.37	-6.98	-7.06	-7.56	-0.94	-1.36	-0.54	-3.66	-5.4	-15.74	-12.03	-6.11	-6.27	-5.19	-8.02	-9.57	-3.73	-0.49
Θ(90°)	3.6	0.41	-2.36	-6.02	-5.79	-3.61	-5.49	-5.86	-7.13	-7.19	-4.74	-2.57	-0.94	-5.35	-7.12	-7.95	-6.83	-4.15	-4.97	-3.29	-6	-7.26	-1.65	-1.09
Θ(105°)	0.29	1.61	-4.11	-5.09	-10.19	-1.39	-3.3	-2.7	-5.21	-6.89	-5.72	-2.64	-4.06	-3.75	-6.92	-8.73	-4.07	0.26	-4.29	-3.79	-11.43	-2.73	-1.72	1.57
Θ(120°)	-2.57	-2.58	-2.98	-6.87	-9.81	-3.09	-1.85	-1.24	-3.78	-9.74	-3.6	-3.22	-11.99	-2.36	-7.9	-6.48	-1.82	-3.68	-3.66	-2.72	-7.32	-6.33	-5.15	-5.98
Θ(135°)	-6.74	-7.28	-9.67	-16.36	-9.5	-6.84	-4.41	-3.32	-4.82	-7.04	-3.67	-2.71	-3.46	-3.77	-10.18	-3.61	-5.97	-8.18	-6.03	-9.14	-8.38	-12.28	-10.21	-6.75
Θ(150°)	-14.61	-13.86	-12.19	-14.36	-14.17	-10.6	-10.45	-10.12	-9.43	-8.88	-8.31	-8.41	-7.63	-9.2	-12.59	-12.19	-8.89	-9.96	-11.12	-13.97	-11.49	-15.07	-11.43	-15.47
Θ(165°)	-7.75	-7.95	-10.63	-14.29	-12.79	-10.75	-10.85	-8.69	-5	-3.47	-2.47	-2.15	-4.29	-8.02	-12.55	-10.13	-9.62	-9.22	-9.49	-8.76	-7.33	-6.71	-5.63	-8.38
Θ(180°)	-6.68	-8	-10.62	-10.92	-9.36	-8.47	-7.86	-6.26	-6.08	-7.54	-9.07	-11.14	-12.4	-12.82	-12.03	-10.71	-9.39	-8.09	-7.97	-6.81	-5.72	-4.95	-6.09	-6.41
Freq(Hz)	5.785G	Pol.	Theta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dB)	Φ(0°)	Φ(15°)	Φ(30°)	Φ(45°)	Φ(60°)	Φ(75°)	Φ(90°)	Φ(105°)	Φ(120°)	Φ(135°)	Φ(150°)	Φ(165°)	Φ(180°)	Φ(195°)	Φ(210°)	Φ(225°)	Φ(240°)	Φ(255°)	Φ(270°)	Φ(285°)	Φ(300°)	Φ(315°)	Φ(330°)	Φ(345°)
Θ(0°)	-9.19	-7.45	-5.99	-4.9	-6.14	-6.8	-5.84	-6.63	-6.97	-7.21	-9.01	-10.55	-9.08	-8.11	-7.09	-5.55	-4.96	-5.69	-6.03	-6.19	-6.94	-8.23	-9.34	-10.81
Θ(15°)	-15.07	-12.62	-8.66	-7.78	-7	-5.75	-4.11	-3.8	-3.98	-3.95	-4.76	-8	-8.38	-7.93	-6.04	-4.37	-3.38	-2.69	-2.28	-2.03	-2.61	-4.98	-6.94	-12.31
Θ(30°)	-12.56	-9.98	-7.21	-6.92	-6.87	-5.95	-5.04	-3.04	-3.02	-4.44	-4.62	-5.09	-8.11	-5.9	-3.75	-3	-3.17	-3.35	-2.95	-5.2	-6.81	-9.53	-14.74	-15.07
Θ(45°)	-10.36	-9.7	-6.97	-6.5	-5.05	-5.19	-4.71	-4.32	-2.03	-2.32	-3.18	-4.32	-4.37	-4.81	-4.01	-5.45	-4.06	-2.09	-2.75	-5.76	-7.16	-9.31	-9.87	-8.76
Θ(60°)	-5.84	-4.43	-4.68	-4.19	-3.01	-4.05	-4.08	-3.12	-1.53	-0.32	-1.56	-5.67	-4.23	-6.25	-5.89	-2.64	-2.82	-3.41	-3.87	-5.19	-5.18	-9.08	-7.16	-11.26
Θ(75°)	-8.98	-3.51	-3.22	-2.48	-2.13	-2.01	-2.58	-2.03	-2.62	-2.83	0.03	-0.79	-2.03	-2.2	-4									



Radiated Composite Gain of 2.4GHz and 5GHz U-NII 1~U-NII 3

Appendix A

Gain Result

Table with columns for Freq(Hz), Gain, and various Phi angles (0 to 345 degrees) for frequencies 2.45G, 5.2G, and 5.3G. The table contains multiple rows of gain data for each frequency and angle combination.



Radiated Composite Gain of 2.4GHz and 5GHz U-NII 1~U-NII 3

Appendix A

Table with columns for frequency (5.6G, 5.785G, 2.45G, 5.2G, 5.2G), gain, and various angles (Theta, Phi) from 0 to 180 degrees. Includes numerical data and some highlighted values like 1.37, 0.54, 1.01, 4.06, 1.51, 1.92, 1.42.





Radiated Composite Gain of 2.4GHz and 5GHz U-NII 1~U-NII 3

Appendix A

Table with columns for Gain, Theta (0 to 180 degrees), and Phi (0 to 345 degrees) for various frequencies (5.3G, 5.6G, 5.785G) and antenna configurations. Includes numerical values for gain in dB.



Freq(Hz)	6.175G	6.475G	6.695G	6.995G
Ant. 1 Max Gain (dBi)	2.4	1.29	1.05	3.33
Ant. 2 Max Gain (dBi)	3.01	2.18	1.57	2
Ant. 3 Max Gain (dBi)	3.06	2.14	1.2	2.68
Ant. 4 Max Gain (dBi)	1.3	1.61	2.56	2.7
Ant. 1 Polarization/ $\Theta$ (°)/ $\Phi$ (°)	Theta/105/240	Theta/120/240	Theta/15/75	Theta/150/270
Ant. 2 Polarization/ $\Theta$ (°)/ $\Phi$ (°)	Theta/135/270	Theta/120/285	Theta/120/285	Theta/75/0
Ant. 3 Polarization/ $\Theta$ (°)/ $\Phi$ (°)	Theta/105/90	Theta/75/75	Theta/60/90	Theta/75/345
Ant. 4 Polarization/ $\Theta$ (°)/ $\Phi$ (°)	Phi/90/0	Phi/75/345	Phi/90/0	Phi/75/0
Max Gain (dBi)	3.06	2.18	2.56	3.33
DG [1SS] (dBi)	5.1	3.92	3.57	5.9
DG [2SS] (dBi)	3.06	2.18	2.56	3.33
DG [4SS] (dBi)	3.06	2.18	2.56	3.33



DG 1SS Result

Table with columns for Freq(Hz), DG(dB), and various Phi angles (0 to 345 degrees) for frequencies 6.175G, 6.475G, and 6.695G. The table contains numerical data for each combination of frequency and angle.



Θ(180°)	-9.83	-9.55	-7.47	-5.19	-4.48	-2.85	-2.01	-1.59	-2.86	-5.38	-6.32	-7.66	-9.69	-9.83	-8.46	-5.97	-3.67	-2.24	-1.55	-1.8	-2.48	-3.68	-6.55	-7.95
Freq(Hz)	6.995G	Pol.	Phi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dB)	Φ(0°)	Φ(15°)	Φ(30°)	Φ(45°)	Φ(60°)	Φ(75°)	Φ(90°)	Φ(105°)	Φ(120°)	Φ(135°)	Φ(150°)	Φ(165°)	Φ(180°)	Φ(195°)	Φ(210°)	Φ(225°)	Φ(240°)	Φ(255°)	Φ(270°)	Φ(285°)	Φ(300°)	Φ(315°)	Φ(330°)	Φ(345°)
Θ(0°)	2.45	2.56	2.18	1.56	-0.01	-1.88	-4.45	-4.93	-3.77	-2.45	-1.68	-0.2	1.89	1.69	1.16	-0.11	-2.11	-4.19	-5.26	-3.05	-0.91	0.83	0.94	
Θ(15°)	1.67	0.93	-0.26	-1.96	-4.71	-5.88	-6.84	-3.24	-2.98	-2.69	-2.69	-2.96	-1.66	0.81	1.03	0.03	-1.1	-2.06	-5.33	-7.02	-5.34	-1.84	-0.17	1.4
Θ(30°)	0.51	-0.51	1.13	0.43	-0.66	-2.32	-3.17	-2.55	-1.81	-1.28	-3.14	-6.06	-2.91	-1.19	-0.4	1.08	0.59	-2.53	-3.68	-4.07	-3.42	-3.73	-2.96	-0.82
Θ(45°)	-0.65	1.53	-0.28	0.8	1.32	-0.11	-0.92	-2.7	-1.2	-3.51	-0.89	-3.06	-1.03	0.31	1.22	-0.27	-2.97	-5.48	-7.03	-4.34	-1.91	-1.41	-0.9	-2.47
Θ(60°)	0.94	3.76	1.95	0.43	-0.29	0.27	-0.59	-0.36	0.07	1.06	0.71	-0.02	-1.89	-0.58	0.54	-0.19	-1.96	-2.99	-1.63	0.12	1.42	2.26	1.83	3.36
Θ(75°)	3.07	4.69	2.3	1.39	1.46	2.21	0.28	-1.39	-2.49	-0.14	1.2	-0.37	-0.4	0.56	0.51	0.2	-1.95	-4.37	-3.73	-0.96	-0.44	2.78	2.74	4.03
Θ(90°)	1.95	3.27	1.15	1.51	-1.82	0.29	-0.27	-3.66	-3.18	1.01	1.34	-0.02	-1.77	0.36	0.16	-0.97	-1.53	-2.12	-3.57	-2.05	1.11	0.5	1.81	1.79
Θ(105°)	0.43	0.01	0.64	-0.03	-3.61	0.94	-1.81	-3.37	-2.95	-1.61	-0.85	-0.9	-2.28	0.73	1.82	0.48	-0.96	-1.83	-3.62	-1.55	2.39	-0.89	1.76	1.56
Θ(120°)	-2.69	-0.65	0.26	-4.23	-0.91	-3.76	-4.61	-2.46	0.75	-1.46	-0.78	-1.63	-2.47	-0.75	-3.36	-1.72	-2.34	-3	-5.08	-3.92	-3.65	-2.43	-0.51	0.45
Θ(135°)	0	-0.93	-1.43	-4.94	-2.37	-6.45	-1.03	0.15	-0.81	0.38	0.09	-0.75	-0.88	0.55	-0.35	-3.51	0.38	2.35	0.14	-2.25	-4.56	-6.82	-3.84	-1.89
Θ(150°)	-6.14	-4.01	-1.25	-1.45	-4.93	-6.17	-2.98	-2.18	-3.83	-3.3	-2.31	-4.19	-6.97	-3.6	-3.77	-0.13	-1.47	-6.73	-6.79	-4.7	-4.56	-2.83	-3.26	-6.06
Θ(165°)	-2.52	-4.41	-4.73	-3.26	-5.83	-7.33	-5.82	-4.2	-3.69	-3.58	-1.55	-1.82	-3.15	-3.17	-2.24	-4.13	-2.73	-3.59	-5.79	-7.21	-7.88	-4.71	-3.34	-2.44
Θ(180°)	-3.77	-2.91	-4.77	-6.05	-7.52	-7.3	-8.3	-9.65	-10.11	-8.18	-7.29	-6.97	-6.1	-5.39	-5.37	-6.13	-5.08	-5.61	-7.34	-7.05	-6.34	-7.04	-6.74	-4.85
Freq(Hz)	6.995G	Pol.	Theta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dB)	Φ(0°)	Φ(15°)	Φ(30°)	Φ(45°)	Φ(60°)	Φ(75°)	Φ(90°)	Φ(105°)	Φ(120°)	Φ(135°)	Φ(150°)	Φ(165°)	Φ(180°)	Φ(195°)	Φ(210°)	Φ(225°)	Φ(240°)	Φ(255°)	Φ(270°)	Φ(285°)	Φ(300°)	Φ(315°)	Φ(330°)	Φ(345°)
Θ(0°)	-4.05	-4.09	-2.56	-0.57	0.41	0.79	2.07	1.9	1.44	0.54	-0.76	-2.35	-4.27	-4.66	-3.25	-1.23	0.26	0.49	1.37	1.64	0.81	0.03	0.08	-2.06
Θ(15°)	-5.6	-4.27	-1.68	0.29	1.17	2.13	1.11	0.29	-0.06	-1.06	-2.1	-2.25	-2.7	-3.33	-2.93	-1.99	-0.78	1.7	2.15	1.44	1.3	-0.14	-2.82	-5.5
Θ(30°)	-1.56	-1.75	-0.67	2.99	5.23	5.9	5.34	3.74	2.6	0.7	-1.9	-1.46	-2.07	-1.97	-1.45	0.06	1.9	3.24	3.38	2.13	0.59	-0.78	-0.52	-1.11
Θ(45°)	2.16	1.64	0.46	1.47	2.75	3.92	3.86	2.34	0.23	0.03	-2.41	-2.64	-1.48	-0.71	1.26	2.23	2.93	3.65	3.45	2.25	0.65	0.26	1.73	0.26
Θ(60°)	2.03	1.68	2.42	2.33	1.21	1.08	1.85	1.5	2.23	2.25	-0.02	-1.28	1.47	0.44	0.51	0.99	1.82	1.12	0.75	0.38	1.53	1.92	2.18	1.73
Θ(75°)	3.23	1.92	2.4	2.37	1.69	0.44	0.3	-0.41	-0.43	0.1	-2.43	-2.53	0.59	0.88	1.05	2.1	0.65	0.46	0.96	0.79	1.39	3.65	3.84	3.61
Θ(90°)	1.79	2.42	2.2	2.48	0.79	0.64	0.14	0.21	-0.1	0.15	0.04	-0.48	1.9	0.71	0.51	0.14	-0.84	-1.81	-0.87	-0.42	0.15	-0.6	1.76	3.57
Θ(105°)	1.38	-1.47	-0.4	-1.13	-1.54	-0.01	-0.23	-2.53	-1.6	-2.68	-2.05	-3.27	-0.8	-2.31	-4.55	-0.51	1.63	-0.49	1.44	2.06	1.3	3.11	-0.53	2.97
Θ(120°)	-1.77	-0.02	-2.12	-1.94	-5.09	0.25	1.4	-2.35	-2.2	-2.91	-2.12	-0.42	1.6	1.59	-1.23	-2.67	1.4	0.59	3.87	4.33	0.58	-2.42	1.05	0.31
Θ(135°)	-1.46	-3.67	-5.31	-7.42	-4.07	0.45	0.71	-2.89	-1.56	-2.71	-8.1	-5.91	-3.64	-0.75	-4.18	-2.34	-0.05	0.83	2.17	0.84	-2.08	-1.09	0.39	3.32
Θ(150°)	-4.28	-4.62	-1.19	-3.48	-3.18	-3.7	-2	-0.6	-1.22	-4.67	-6.27	-6.29	-8.47	-4.93	-4.06	-3.98	-1.68	-4.96	2.45	-4.29	-3.11	-2.56	-3.12	-2.06
Θ(165°)	-3.66	-6.2	-6.41	-7.11	-6.16	-7.48	-7.47	-4.9	-4.96	-4.95	-3.35	-4.5	-5.24	-4.95	-3.58	-5.01	-1.95	-0.72	-0.18	-1.11	-1.94	-4.49	-3.8	-2.77
Θ(180°)	-10.22	-10.84	-7.63	-7.73	-5.67	-2.61	-2.25	-1.91	-2.43	-4.38	-6.25	-6.84	-9.4	-11.21	-11.64	-10.51	-6.2	-3.17	-1.91	-1.61	-1.56	-3.4	-6.87	-7.65





Radiated Composite Gain of 6GHz U-NII 5~U-NII 8

Appendix B

Gain Result

Table with columns for Freq(Hz), Gain, and various Phi and Theta angles (0 to 345 degrees) for frequencies 6.175G, 6.475G, and 6.695G.



Radiated Composite Gain of 6GHz U-NII 5~U-NII 8

Appendix B

Table with columns for Frequency (Hz), Gain, and various Theta and Phi angles (0 to 345 degrees). It contains multiple data blocks for different frequencies (6.995G, 6.175G, 6.475G, 6.475G, 6.695G) and antenna configurations (Ant. 1, Ant. 2).



Radiated Composite Gain of 6GHz U-NII 5~U-NII 8

Appendix B

Table with columns for frequency (6.995G, 6.175G, 6.475G, 6.695G), polarization (Pol.), phase (Phi), antenna (Ant. 2, 3), and gain for various angles (0 to 345 degrees).



Radiated Composite Gain of 6GHz U-NII 5~U-NII 8

Appendix B

Table with columns for Gain, Theta (0 to 180 degrees), and various Phi angles (0 to 345 degrees). It contains multiple data blocks for different frequencies (6.695G, 6.995G, 6.175G, 6.475G) and antenna configurations (Ant. 3, Ant. 4).





Radiated Composite Gain of 6GHz U-NII 5~U-NII 8

Appendix B

Table with columns for Frequency (6.695G, 6.995G), Gain, and various angles (Theta and Phi) from 0 to 180 degrees. The table contains numerical data for gain at different angles and frequencies.



Total Gain Data

Table with columns for Freq(Hz), Pol., Total, and Ant. 1-2, and rows for various frequencies (2.45G, 5.2G, 5.3G, 5.6G, 5.785G, 2.45G) and angles (0 to 120 degrees).

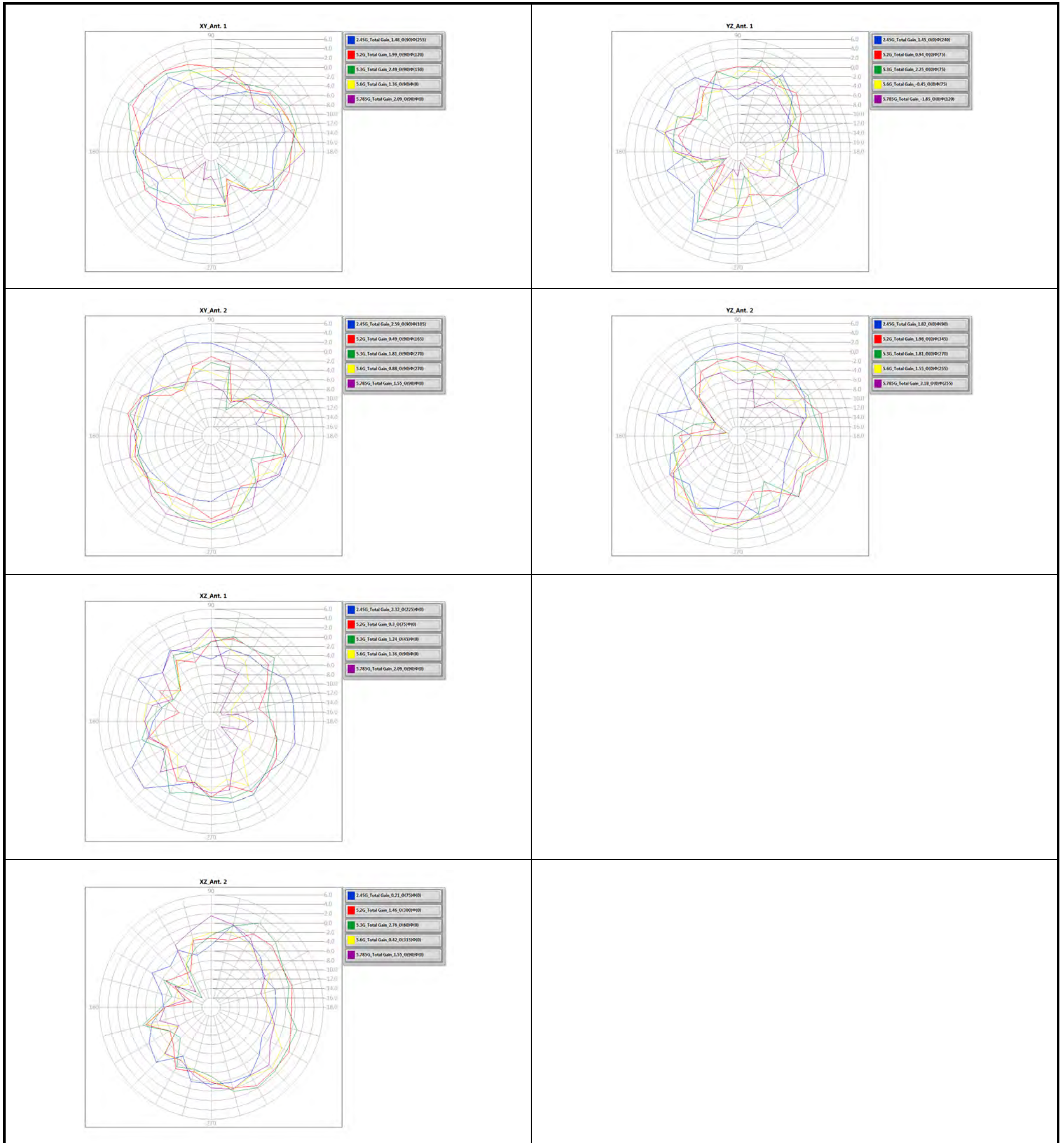


Antenna Pattern of 2.4GHz and 5GHz U-NII 1~U-NII 3

Appendix C

Table with columns for frequency (5.3G, 5.6G, 5.785G), gain, and various azimuth/elevation angles (Theta and Phi) ranging from 0 to 345 degrees.

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









Antenna Pattern of 6GHz U-NII 5~U-NII 8

Appendix D

Table with columns for Azimuth (Theta) and Elevation (Phi) angles, and rows for various frequency bands (6.995G, 6.175G, 6.475G, 6.995G, 6.175G, 6.475G) and antenna configurations (Ant. 2, Ant. 3, Ant. 4). Each cell contains a numerical value representing the antenna gain or loss in dB.



Antenna Pattern of 6GHz U-NII 5~U-NII 8

Appendix D

Theta (°)	2.06	0.56	-2.96	-4.96	-2.25	-0.78	-1.00	-3.62	-4.03	-4.03	-2.61	-2.52	-3.89	-3.91	-7.86	-5.35	-15.08	-8.48	-7.19	-2.14	-6.05	-1.04	-0.91	0.23
Theta (105°)	-0.96	-2.34	-6.36	-3.28	0.16	0.20	-1.33	-1.57	-3.27	-5.51	-3.49	-7.14	-6.27	-10.92	-8.68	-8.20	-9.13	-14.30	-14.00	-4.78	-8.30	-4.66	0.14	-0.38
Theta (120°)	-0.82	-0.96	-2.77	-3.11	-2.53	-1.32	-2.96	-2.19	-2.20	-1.12	-2.51	-1.53	-4.24	-4.30	-9.72	-9.76	-11.63	-10.64	-7.66	-8.58	-6.31	-7.94	-5.28	-1.67
Theta (135°)	-1.17	-3.60	-1.13	-0.47	-2.20	-4.18	-5.92	-7.12	-6.52	-5.51	-3.17	-1.89	-4.53	-5.97	-7.37	-7.22	-11.48	-4.62	-11.39	-6.59	-6.41	-5.38	-7.04	-2.41
Theta (150°)	-5.04	-3.32	-0.11	-1.59	-1.95	-1.34	-0.83	-3.56	-5.07	-4.68	-2.87	-3.02	-5.05	-3.92	-3.20	-1.52	-4.45	-7.23	-7.37	-6.29	-4.37	-0.56	-0.79	-2.21
Theta (165°)	-7.91	-4.87	-1.69	-0.52	0.44	0.86	0.40	-0.67	-0.77	-2.06	-3.27	-2.78	-3.66	-4.76	-9.23	-8.02	-4.48	-4.03	-5.71	-4.66	-4.66	-4.41	-6.08	-6.74
Theta (180°)	-5.05	-5.43	-5.32	-5.74	-5.56	-4.06	-5.08	-4.72	-7.08	-8.64	-10.45	-8.60	-7.59	-8.06	-8.07	-8.42	-6.80	-4.42	-4.23	-4.60	-3.97	-4.62	-5.99	-5.97
Freq(Hz)	6.695G	Pol.	Total	Ant. 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Phi(0°)	Phi(15°)	Phi(30°)	Phi(45°)	Phi(60°)	Phi(75°)	Phi(90°)	Phi(105°)	Phi(120°)	Phi(135°)	Phi(150°)	Phi(165°)	Phi(180°)	Phi(195°)	Phi(210°)	Phi(225°)	Phi(240°)	Phi(255°)	Phi(270°)	Phi(285°)	Phi(300°)	Phi(315°)	Phi(330°)	Phi(345°)
Theta(0°)	-0.65	-0.49	-0.50	0.01	0.18	-0.07	-1.33	-1.96	-1.57	-1.18	-0.74	-0.84	-0.74	-0.01	-0.25	-0.08	-0.33	-0.06	-0.25	-1.04	-0.65	-0.41	-0.75	-0.84
Theta(15°)	0.26	0.19	-0.06	-0.13	-1.06	-1.32	-3.02	-4.13	-4.01	-3.95	-2.43	-2.31	-2.97	-3.12	-2.86	-2.77	-1.10	-0.30	-1.24	-1.37	-1.56	-2.51	-1.29	-0.69
Theta(30°)	-3.84	-1.93	-2.58	-1.84	-2.18	-2.61	-2.79	-4.13	-4.37	-6.07	-4.91	-5.27	-5.42	-6.13	-4.30	-2.89	-2.52	-2.20	-1.40	-2.37	-4.27	-6.04	-6.34	-4.00
Theta(45°)	-2.84	-2.21	-1.75	-0.34	-1.88	-3.89	-3.57	-3.25	-4.10	-4.34	-5.12	-4.50	-4.44	-6.98	-11.11	-13.81	-10.37	-5.73	-5.24	-4.85	-6.00	-9.69	-10.43	-4.83
Theta(60°)	1.10	1.03	1.22	1.26	2.10	2.24	-0.94	-2.22	-3.03	-1.87	-0.53	-2.26	-2.86	-3.54	-6.36	-12.95	-9.24	-8.52	-4.09	-3.53	-10.34	-4.09	-0.70	1.09
Theta(75°)	0.86	0.59	-4.68	-2.33	0.79	2.15	0.80	-2.50	-5.29	-3.06	-1.88	-1.02	-3.07	-5.04	-10.30	-9.52	-8.70	-10.75	-6.93	-4.55	-4.03	-0.02	2.27	2.65
Theta(90°)	2.95	-0.55	-2.47	-2.06	0.74	0.06	-1.65	-3.82	-2.70	-0.94	-2.30	-0.72	-2.52	-3.84	-7.62	-5.14	-10.69	-11.71	-7.19	-5.16	-1.90	-0.60	-0.65	1.26
Theta(105°)	-1.15	-1.91	-5.38	-3.92	-3.29	-1.79	-1.97	-2.25	-6.84	-7.00	-3.95	-3.07	-6.26	-5.35	-6.22	-7.68	-9.67	-12.70	-14.88	-5.81	-6.24	-1.54	0.80	-0.94
Theta(120°)	0.44	-1.74	-3.30	-3.89	-7.59	-3.79	-4.33	-3.64	-4.04	-2.43	-3.20	-1.61	-5.50	-2.40	-8.05	-6.53	-10.80	-7.61	-9.06	-9.56	-7.05	-4.82	-2.84	-1.11
Theta(135°)	-3.18	-1.47	-2.04	-3.47	-3.90	-9.63	-8.08	-4.58	-5.67	-6.00	-5.42	-1.12	-5.00	-4.10	-11.05	-7.42	-6.89	-9.94	-15.53	-5.47	-7.09	-4.94	-5.43	-2.14
Theta(150°)	-5.56	-2.23	-1.10	-4.62	-3.38	-2.94	-1.13	-3.03	-4.78	-6.05	-4.93	-5.97	-7.37	-5.21	-2.37	-1.71	-5.41	-9.56	-9.70	-8.54	-6.56	-0.92	-1.39	-4.96
Theta(165°)	-5.55	-2.26	-0.96	-0.66	-1.16	-0.78	-1.46	-2.38	-2.74	-2.95	-3.94	-4.83	-6.65	-9.84	-8.22	-7.77	-4.46	-3.93	-4.68	-3.81	-5.10	-6.75	-11.94	-11.20
Theta(180°)	-5.75	-6.43	-5.62	-5.79	-4.93	-3.99	-3.32	-3.09	-5.14	-6.14	-7.43	-7.76	-7.71	-9.20	-10.82	-10.85	-7.76	-5.71	-5.54	-5.32	-4.90	-6.77	-8.33	-6.47
Freq(Hz)	6.995G	Pol.	Total	Ant. 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Phi(0°)	Phi(15°)	Phi(30°)	Phi(45°)	Phi(60°)	Phi(75°)	Phi(90°)	Phi(105°)	Phi(120°)	Phi(135°)	Phi(150°)	Phi(165°)	Phi(180°)	Phi(195°)	Phi(210°)	Phi(225°)	Phi(240°)	Phi(255°)	Phi(270°)	Phi(285°)	Phi(300°)	Phi(315°)	Phi(330°)	Phi(345°)
Theta(0°)	-0.54	-0.60	-0.56	-0.23	-0.89	-1.59	-1.07	-0.78	-1.36	-2.53	-3.12	-2.66	-2.70	-1.25	-1.25	-1.36	-0.63	-0.59	-1.28	-1.03	-1.75	-1.18	-0.01	-0.34
Theta(15°)	-1.14	-0.82	-0.23	0.22	-0.58	-1.54	-3.58	-3.32	-4.20	-4.71	-4.66	-5.81	-4.83	-3.60	-3.23	-4.52	-5.40	-2.68	-3.12	-4.23	-2.87	-1.82	-1.11	-0.90
Theta(30°)	-1.18	-2.46	-2.11	0.27	0.09	0.10	-0.14	-1.93	-2.54	-4.26	-6.83	-7.03	-6.71	-7.21	-9.59	-7.39	-3.33	-2.76	-2.00	-3.24	-4.96	-6.62	-3.05	-2.59
Theta(45°)	-1.32	-0.77	-2.66	-1.96	-1.33	0.86	0.87	-2.33	-3.59	-5.04	-7.01	-8.25	-6.85	-7.30	-8.34	-10.24	-12.40	-6.87	-5.66	-6.33	-7.82	-13.64	-4.24	-2.89
Theta(60°)	2.70	1.82	-0.46	-0.70	-0.14	-0.63	-1.33	-1.30	-1.06	-0.68	-2.05	-2.18	-4.04	-7.18	-7.62	-8.33	-14.33	-11.38	-6.50	-4.65	-5.51	-1.51	0.55	1.96
Theta(75°)	2.79	0.15	-2.28	-1.12	1.31	1.46	-0.09	-2.54	-2.98	-2.84	-3.05	-3.88	-2.57	-2.85	-6.16	-4.86	-7.70	-9.43	-9.60	-4.14	-5.39	1.96	2.23	2.60
Theta(90°)	1.61	0.55	-0.71	-1.33	-1.47	-1.44	-2.54	-4.41	-3.96	-0.95	-0.73	-2.36	-2.73	-2.87	-5.84	-6.78	-10.90	-10.10	-7.57	-4.87	-3.03	-1.98	1.28	1.03
Theta(105°)	-1.61	-1.96	-2.95	-2.61	-3.83	-2.98	-6.14	-9.37	-8.13	-6.45	-4.06	-3.27	-5.21	-7.16	-3.16	-5.50	-8.57	-9.40	-12.23	-4.99	-2.71	-3.39	-2.50	0.46
Theta(120°)	-3.43	-1.78	-2.45	-7.56	-2.76	-2.83	-3.39	-5.83	-3.50	-4.03	-3.58	-3.09	-3.92	-5.02	-6.27	-7.24	-9.81	-5.98	-8.95	-8.26	-7.83	-3.40	-4.15	-0.63
Theta(135°)	-2.45	-1.76	-4.46	-8.34	-6.08	-2.96	-2.49	-1.66	-1.87	-3.34	-4.33	-1.34	-3.71	-5.16	-6.86	-8.74	-5.79	-5.99	-7.92	-5.24	-11.58	-6.45	-5.18	-1.52
Theta(150°)	-6.16	-1.56	-1.39	-4.81	-1.99	-1.01	0.31	-0.49	-0.51	-1.70	-2.35	-6.43	-11.59	-7.89	-4.69	-3.97	-5.39	-14.80	-10.63	-11.05	-8.13	-2.57	-2.58	-4.23
Theta(165°)	-6.01	-5.00	-2.03	-2.73	-3.08	-4.37	-3.49	-1.95	-2.38	-1.46	-1.51	-4.35	-6.98	-12.27	-11.93	-9.74	-4.24	-4.25	-4.40	-5.39	-6.18	-9.35	-8.55	-5.46
Theta(180°)	-7.26	-6.51	-6.38	-8.27	-6.56	-4.49	-4.92	-5.98	-6.79	-9.27	-10.93	-15.24	-13.44	-12.64	-13.47	-12.51	-8.51	-5.84	-7.43	-6.22	-6.62	-7.70	-7.16	-7.68



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

