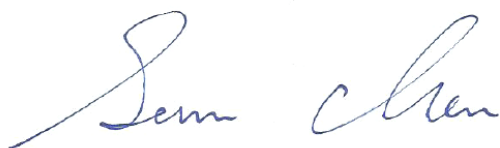


Antenna Composite Gain Test Report

FCC ID	2ABLKU6HE
Equipment	GigaPro GPR2032H
Brand Name	Calix
Model Name	GPR2032H
Applicant	Calix Inc. 1035 N. McDowell Blvd. Petaluma, CA94954 U.S.A.
Manufacturer	Calix Inc. 1035 N. McDowell Blvd. Petaluma, CA94954 U.S.A.
Sample Received	Mar. 04, 2022
Start Test Date	Mar. 10, 2022
Final Test Date	Mar. 10, 2022



Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory

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



Table of Contents

History of this test report.....	3
1. Operation Mode and Antenna Information	4
2. Test Frequency	4
3. Testing Location.....	4
4. Test Facility and Configuration	5
5. Reference Calibration	6
6. Test Method	7
7. Measured Values and Calculation of Maximum Gain Positions.....	8
8. Summary of Test Result	9
9. Test Setup	10
10. Test Equipment and Calibration Data	11
11. Test Results	12

[illegible]



1. Operation Mode and Antenna Information

Antenna Position	RF Port	Brand Name	Model Name	Ant. Type	Connector	Modes of Operation
2G 5G Ant1	2	Galtronics	60-2891-03-2	PCB antenna	I-PEX	2.4GHz, 5GHz UNII 1~3
2G 5G Ant2	1	Galtronics	60-2914-03-1	PCB antenna	I-PEX	2.4GHz, 5GHz UNII 1~3

Note:

For WLAN 2.4GHz:

Operation Mode (2TX/2RX)

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

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

For WLAN 5GHz:

Operation Mode (2TX/2RX)

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

2G 5G Ant.1~2 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

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	Mar. 10, 2022

Note:

Testing Site Information

Brand Name: TDK

Dimension: 11m*6m*6m

Characteristic: Fully Anechoic Chamber

4. Test Facility and Configuration

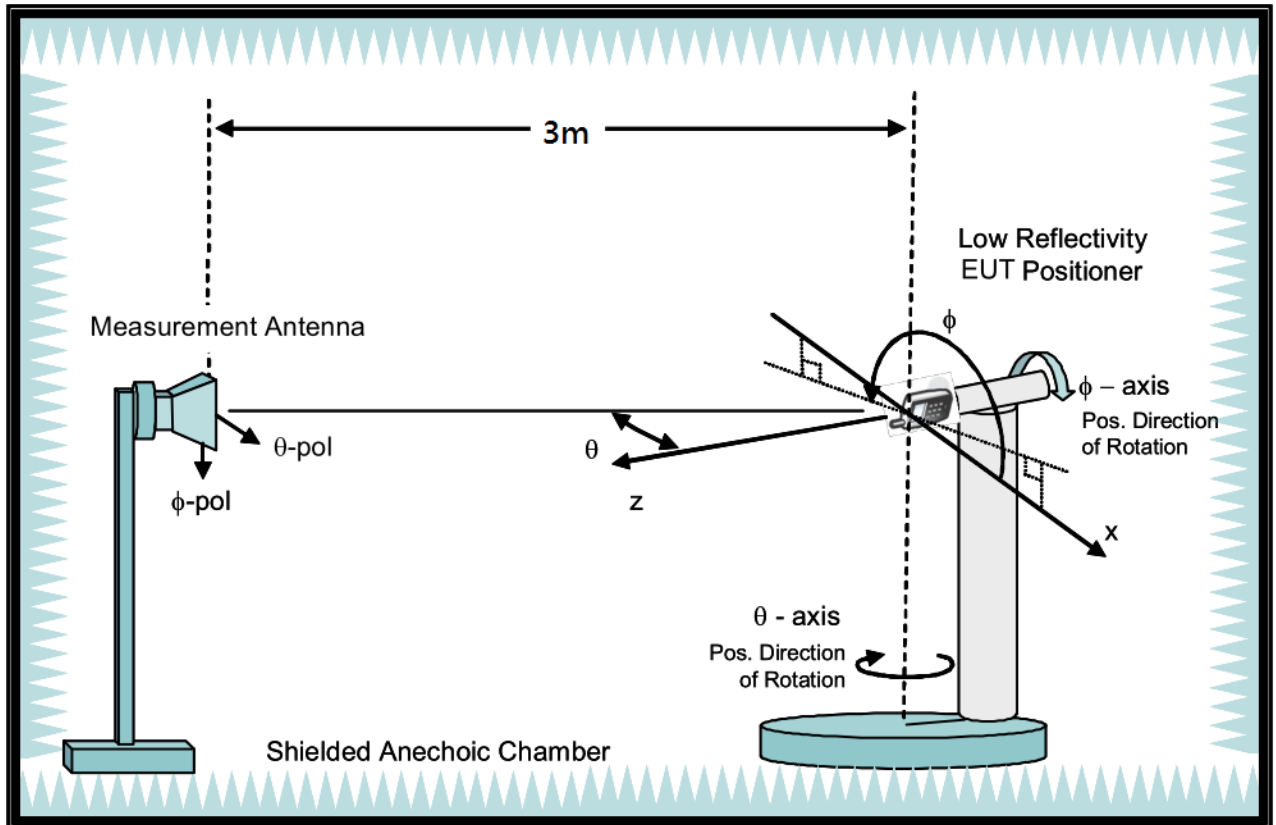
Test configuration: Reference to CITA OTA distributed-axes system configuration.

Chamber: Fully Anechoic Chamber.

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

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

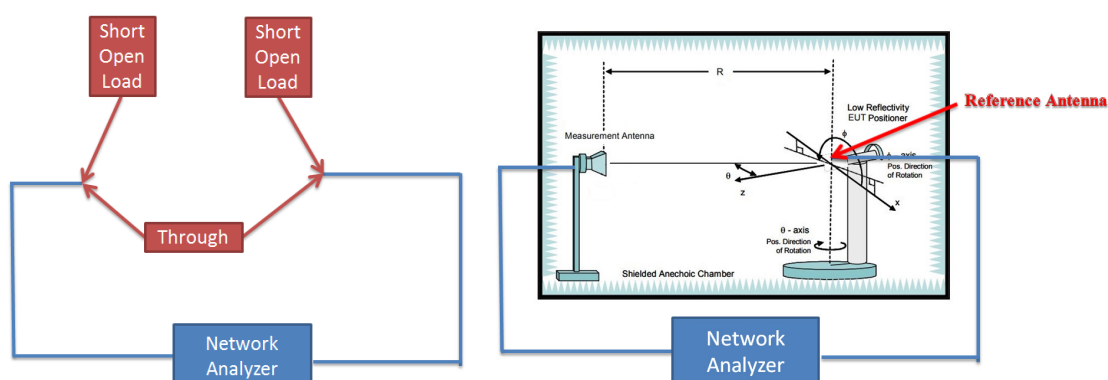
#Reference to CTIA "ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1"



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 G values. The cable loss is calibrated and set inside the network analyzer.

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



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

Note:

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

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

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

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

6. Test Method

EUT set on multi-axis positioner and adjust EUT's physical center to measurement reference center. Measurement antenna set at phi polarization and 1.5 meter height. Port 1 of Network analyzer connect to antenna 1 of EUT. Record G value every 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 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

DG_1SS max value position

Frequency (Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 (dBi)	5.34	0.63	2.03	2.64	1.71
Ant. 2 (dBi)	2.1	1.62	0.15	2.95	3.65
DG [1SS] (dBi)	6.88	4.15	4.15	5.81	5.74
Polarization	Theta	Theta	Theta	Theta	Theta
$\Theta(^{\circ})$	75	90	75	90	90
$\Phi(^{\circ})$	105	105	120	135	45

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 [$10^{(G/20)}$]	$10^{(5.34/20)}$	$10^{(0.63/20)}$	$10^{(2.03/20)}$	$10^{(2.64/20)}$	$10^{(1.71/20)}$
Ant. 2 [$10^{(G/20)}$]	$10^{(2.1/20)}$	$10^{(1.62/20)}$	$10^{(0.15/20)}$	$10^{(2.95/20)}$	$10^{(3.65/20)}$
Ant. 1 [$10^{(G/20)}$] value	1.849	1.075	1.263	1.355	1.218
Ant. 2 [$10^{(G/20)}$] value	1.274	1.205	1.017	1.404	1.522
Sum All Antenna [Amax]	3.123	2.28	2.281	2.76	2.74
DG [$10 \cdot \log(A_{max}^2/N_{ant})$]	6.88	4.15	4.15	5.81	5.74

Note:

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

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

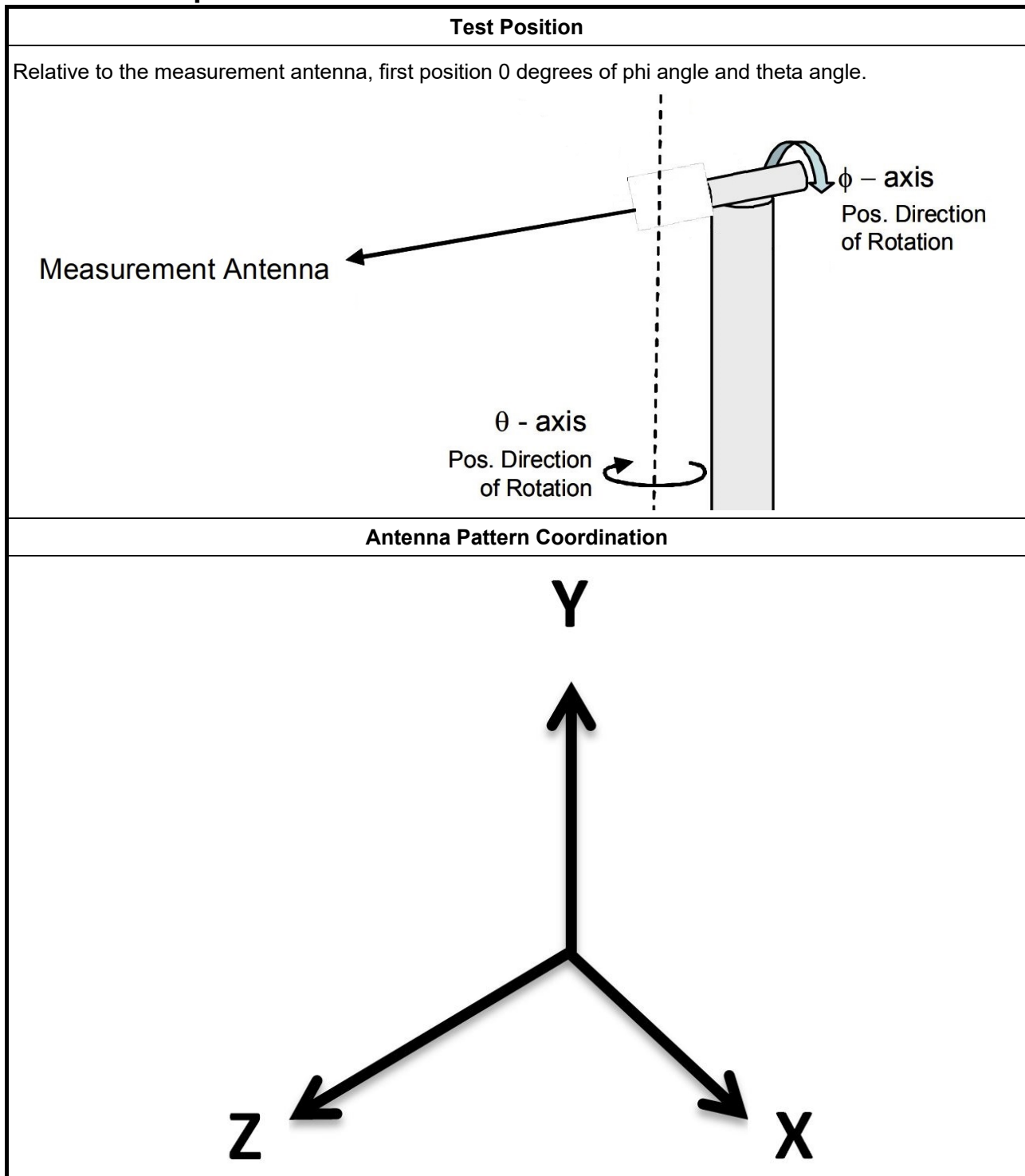
8. Summary of Test Result

Frequency (Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	5.62	1.36	2.03	2.64	1.84
Ant. 2 Max Gain (dBi)	4.97	2.22	2.77	4.1	3.65
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/60/105	Theta/75/315	Theta/75/120	Theta/90/135	Theta/75/330
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/75/45	Theta/105/105	Theta/105/105	Theta/105/120	Theta/90/45
Max Gain (dBi)	5.62	2.22	2.77	4.1	3.65
DG [1SS] (dBi)	6.88	4.15	4.15	5.81	5.74
DG [2SS] (dBi)	5.62	2.22	2.77	4.1	3.65

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.

9. Test Setup



Note:

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

**10. Test Equipment and Calibration Data**

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1292	1GHz~18GHz	Aug. 04, 2021	Aug. 03, 2022
ENA Series Network Analyzer	AGILENT	E5071C	MY46419201	100kHz~8.5GHz	Feb. 21, 2022	Feb. 20, 2023
Test Software	SPORTON	SENSE-RDG	V1.0.6	-	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.

Appendix A – Radiated Composite Gain.....	Page 13
Appendix B – Antenna Pattern.....	Page 20
Appendix C – Test Photos.....	Page 23



Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G
Ant. 1 Max Gain (dBi)	5.62	1.36	2.03	2.64	1.84
Ant. 2 Max Gain (dBi)	4.97	2.22	2.77	4.1	3.65
Ant. 1 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/60/105	Theta/75/315	Theta/75/120	Theta/90/135	Theta/75/330
Ant. 2 Polarization/ $\Theta(^{\circ})/\Phi(^{\circ})$	Theta/75/45	Theta/105/105	Theta/105/105	Theta/105/120	Theta/90/45
Max Gain (dBi)	5.62	2.22	2.77	4.1	3.65
DG [1SS] (dBi)	6.88	4.15	4.15	5.81	5.74
DG [2SS] (dBi)	5.62	2.22	2.77	4.1	3.65



DG 1SS Result

Freq(Hz)	2.45G	Pol.	Phi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
DG(dBi)	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°)	-8.88	-8.12	-8.14	-9.99	-10.96	-12.62	-13.73	-14.77	-14	-12.46	-11.75	-10.31	-8.99	-9.28	-11.03	-13.12	-14.87	-15.33	-15.78	-14.16	-12.86	-12.08	-9.58	-9.23
Θ(15°)	-5.83	-6.7	-7.36	-9.35	-12.7	-12.69	-13.51	-11.51	-8.24	-5.56	-4.43	-4.16	-3.18	-3.35	-5.01	-7.68	-10.09	-12.38	-12.59	-11.93	-9.06	-7.58	-5.38	-4.7
Θ(30°)	-3.08	-6.05	-9.63	-9.34	-7.6	-7.21	-10.29	-14.23	-10.13	-5.92	-2.95	-1.06	-0.69	-1.91	-4.39	-8.66	-7.85	-8.36	-11.65	-12.59	-8.89	-4.65	-2.15	-1.29
Θ(45°)	-4.49	-7.34	-8.71	-6.42	-4.64	-5.25	-8.12	-11.82	-7.4	-5.91	-5.01	-3.16	-2.96	-4.31	-5.92	-8.31	-5.51	-5.88	-10.62	-11.97	-9.68	-6.08	-4.4	-3.87
Θ(60°)	-5.23	-5.75	-5.18	-5.43	-6.47	-9.06	-11.47	-12.35	-7.52	-7.12	-11.92	-9.63	-6.86	-7.75	-10.24	-12.14	-6.99	-5.64	-10.82	-14.8	-16.04	-10.21	-5.21	-4.78
Θ(75°)	-8	-7.81	-7.82	-7.95	-8.17	-8.2	-9.25	-6.2	-4.37	-5.73	-7.51	-9.65	-13	-14.84	-15.45	-14.52	-9.62	-9.93	-13.94	-13.65	-15.04	-11.55	-7.47	-5.92
Θ(90°)	-8.43	-6.82	-5.99	-6.53	-8.34	-4.19	-5.5	-6.24	-4.03	-3.02	-4.53	-8.65	-13.25	-15	-14.22	-12.99	-13.24	-11.76	-10.35	-12.08	-8.69	-7.46	-8.06	-8.96
Θ(105°)	-5.68	-6.85	-3.79	-4.89	-10.1	-5.48	-6.42	-7.2	-5.31	-2.4	-4.92	-9.82	-14.07	-10.41	-12.93	-14.78	-15.97	-12.02	-12.62	-10.45	-9.14	-9.27	-8.53	-7.19
Θ(120°)	-4.15	-5.2	-4.11	-6.42	-10.79	-8.04	-7.8	-3.14	-0.69	-3.68	-5.98	-8.49	-10.3	-12.65	-12.44	-9.62	-13.41	-6.35	-6	-10.99	-8.76	-8.47	-4.25	-5
Θ(135°)	-7.09	-10.25	-10.87	-8.47	-4.13	-6.12	-8.56	-1.79	-0.55	-3.86	-2.75	-2.65	-3.72	-4.87	-7.86	-8.03	-11.06	-12.36	-6.38	-3.83	-8.3	-10.72	-6.08	-2.7
Θ(150°)	-1.35	-3.64	-4.67	-5.06	-5.73	-7.94	-9.91	-5.83	-5.91	-5.15	-2.6	-2.16	-2.8	-4.58	-9.63	-10.77	-8.88	-8.78	-7.27	-8.52	-10.79	-4.21	-2.47	-1.23
Θ(165°)	-6.57	-8.68	-11.57	-12.83	-13.16	-11.61	-11.82	-11.25	-7.92	-5.37	-3.58	-3.12	-4.59	-7.94	-11.64	-13.17	-8.43	-4.78	-4.62	-7.72	-10.7	-7.66	-6.78	-6.03
Θ(180°)	-8.54	-8.77	-7.43	-5.81	-5.57	-5.46	-5.84	-6.54	-6.71	-7.49	-8.73	-9	-8.96	-8.37	-8.11	-7.73	-6.15	-5.37	-6.34	-8.89	-9.61	-9.45	-8.9	-8.28
Freq(Hz)	2.45G	Pol.	Theta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dBi)	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°)	-15.64	-15.23	-14.09	-12.25	-11.24	-9.72	-10.17	-9.18	-9.16	-9.58	-11.53	-15.99	-15.39	-14.83	-13.28	-13.6	-12.18	-11.77	-11.93	-11.86	-13.2	-13.91	-13.76	-15.1
Θ(15°)	-5.82	-5.31	-6.05	-6.13	-5.88	-5.59	-3.35	-1.43	-0.29	-0.52	-1.93	-5.29	-7.81	-8.42	-8.28	-10	-13.68	-15.49	-14.07	-10.62	-7.95	-6.53	-6.11	-5.73
Θ(30°)	0.72	1.63	1.24	-0.34	-3.28	-3.71	-0.18	1.51	2.63	2.87	1.92	-0.42	-4.23	-5.86	-4.8	-7.54	-10.37	-9.23	-7.36	-6.4	-5.81	-5.65	-4.35	-1.48
Θ(45°)	2.6	4.41	4.41	2.84	0.45	-1.15	3.07	4.8	4.47	3.83	2.97	-0.28	-3.78	-3.86	-3.07	-3.91	-3.59	-3.38	-2.65	-2.99	-4.45	-6.59	-2.52	0.52
Θ(60°)	2.9	4.7	6.26	5.4	2.89	0.81	4.24	6.61	5.65	3.71	2.68	1.17	0.33	-0.39	-0.37	-1.43	-0.72	-2.17	-3.03	-3.36	-4.16	-4.02	-1.77	1.44
Θ(75°)	2.35	4.04	6.12	6.06	3.83	3	5.52	6.88	5.74	4.51	3.52	1.17	0.25	0.37	0.11	-0.02	1.47	1.41	0.29	-0.7	-3.29	-3.29	-1.97	0.84
Θ(90°)	1.64	2.89	5.48	5.64	2.65	-0.39	4.9	6.42	5.61	4.51	3.27	1.14	1.78	1.57	0.4	0.27	2.39	0.73	-1.27	-2.92	-3.93	-2.49	-1.75	-0.2
Θ(105°)	-0.73	0.07	2.95	3.51	4.48	4.49	3.48	3.26	0.87	1.63	1.73	-0.76	-0.36	-0.1	1.37	1.79	2.57	-0.06	-0.79	-1.18	-3.9	-3.41	-2.66	-1.74
Θ(120°)	-0.23	-2.52	2.06	4.11	4.32	3.5	3.24	4.36	3.26	2.14	-1.93	-0.43	-0.23	0.78	1.43	1.76	-0.24	-4.41	-1.46	-2.3	-5.02	-3.33	-1.56	-1.19
Θ(135°)	-2.78	-1.06	1.63	2.62	1.81	-1.08	-2.87	0.18	0.67	0.11	-1.75	-1.8	-0.88	-1.11	-0.38	1.52	1.6	0.38	1.38	1.58	-2.2	-3.31	-4.49	-6.58
Θ(150°)	-6.03	-5.19	-4.12	-3.58	-3.48	-3.63	-3.12	-3.37	-3.35	-3.66	-4.33	-3.96	-3.45	-4.17	-4.19	-2.21	-0.14	1.12	1.17	-0.75	-4.59	-8.48	-7.38	-6.37
Θ(165°)	-6.75	-6.24	-5.8	-6.04	-6.89	-7.54	-7.67	-7.55	-8.12	-8.78	-9.45	-9.84	-8.19	-6.45	-5.68	-4.38	-3.03	-2.86	-4.23	-5.64	-5.62	-6.09	-8.09	-7.89
Θ(180°)	-4.34	-5.06	-6.51	-7.95	-10.2	-10.34	-10	-7.67	-7.13	-6.15	-5.49	-4.27	-3.48	-4.23	-6.14	-9.07	-11.39	-10.9	-9.07	-8.2	-6.91	-6.96	-5.81	-4.79
Freq(Hz)	5.2G	Pol.	Phi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dBi)	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°)	-3.94	-2.71	-3.47	-4.79	-6.72	-9.47	-13.71	-14.92	-11.85	-7.13	-4.54	-3.39	-2.11	-1.58	-2.6	-4.49	-6.68	-9.67	-13.43	-14.52	-9.42	-7.09	-3.63	-3.29
Θ(15°)	-7.92	-10.31	-6.76	-4.66	-4.49	-5.94	-8.15	-10.13	-9.1	-7.86	-9.06	-11.49	-15.31	-12.55	-15.15	-12.75	-11.56	-14.65	-15.26	-13.43	-11.29	-9.31	-8.27	-7.04
Θ(30°)	-4.16	-2.3	-2.12	-3.69	-4.8	-1.47	-3.52	-6.62	-9.27	-6.61	-9.19	-12.59	-9.42	-10.2	-11.99	-15.78	-12.89	-11.87	-15.84	-14.78	-6.7	-7.33	-7.78	-5.96
Θ(45°)	-6.35	-4.44	-7.35	-9.27	-8.67	-6.52	-5.23	-5.39	-7.97	-6.35	-7.05	-8.44	-10.69	-12.81	-7.93	-12.22	-12.72	-8.16	-11.44	-9.15	-7.57	-8.6	-11.52	-8.69
Θ(60°)	-8.71	-12.24	-8.76	-8.89	-15.81	-5.65	-7.06	-9.06	-14.18	-10.17	-11.75	-8.24	-16.02	-13.27	-13.77	-8.86	-13.43	-7.73	-10.12	-11.32	-8.03	-12.86	-11.28	-8.27
Θ(75°)	-10.44	-9.59	-8.47	-14.06	-8.5	-7.27	-9.61	-14.79	-10.46	-8.13	-3.9	-5.62	-13.12	-7.89	-12.28	-9.42	-10.25	-9.83	-11.28	-12.72	-10.15	-14.84	-12.39	-12.12
Θ(90°)	-15.82	-15.13	-7.67	-9.38	-9.48	-10.47	-8.96	-6.4	-10.31	-7.56	-7.43	-5.4	-10.56	-11.49	-11.21	-10.53	-7.58	-12.42	-12.92	-13.13	-9.73	-14.22	-13.02	-15.47
Θ(105°)	-14.89	-11.84	-8.12	-8.94	-15.47	-15.45	-12.97	-8.12	-11.51	-9.85	-10.85	-10.32	-10.74	-12.51	-13.11	-7.96	-15.92	-14.93	-15.37	-13.33	-14.56	-10.74	-14.17	-15.56
Θ(120°)	-8.98	-8.89	-7.89	-12.65	-11.81	-11.61	-8.63	-6.65	-5.73	-7.73	-9.57	-11.25	-13.71	-14.21	-11.62	-8.86	-15.11	-14.42	-10.83	-12.68	-12.58	-15.96	-10.68	-10.07
Θ(135°)	-7.08	-5.49	-8.11	-8.48	-12.58	-7.11	-5.21	-12.22	-8.27	-8.91	-7.28	-6.81	-6.36	-8.47	-8.8	-9.53	-10.21	-11.15	-13.01	-13.14	-15.14	-11.9	-11.86	-12.71
Θ(150°)	-10.02	-10.4	-12.93	-9.27	-9.2	-6.02	-5.44	-9.5	-12.94	-14.73	-15.64	-15.51	-11.21	-15.11	-13.2	-11.16	-14.28	-13.51	-11.51	-14.56	-13.21	-13.71	-8.11	-7.32
Θ(165°)	-3.58	-2.84	-2.97	-3.01	-3.84	-6.39	-10.27	-14.73	-15.82	-13.59	-11.32	-10.93	-11.68	-12.2	-10.72	-13.17	-14.69	-13.79	-15.42	-14.99	-16.24	-10.08	-6.74	-3.35
Θ(180°)	-3.48	-4.74	-5.81	-6.82	-9.29	-13.7	-15.74	-15.61	-11.99	-8.07	-5.33	-3.5	-3.1	-2.42	-2.99	-4.61	-7.05	-11.12	-15.64	-13.67	-7.6	-5.2	-3.78	-3.63
Freq(Hz)	5.2G	Pol.	Theta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dBi)	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°)	-13.62	-15.66	-11.48	-7.19	-5.76	-3.61	-2.15	-1.69	-1.97	-3.18	-5.48	-10.05	-13.75	-15.41	-9.29	-5.49	-3.98	-2.92	-2.43	-2.56	-2.9	-4.52	-6.28	-10.42
Θ(15°)	-6.64	-7.15	-6.73	-5.62	-3.19	-1.41	-0.92	-1.31	-4.23	-8.09	-14.28	-14.88	-15.52	-14.72	-12.01	-14.25	-15.03	-11.31	-8.24	-7.98	-9.36	-8.91	-10.59	-6.97
Θ(30°)	-5.93	-5.27	-4.72	-5.13	-4.38	-1.86	-0.01	-0.43	-4.19	-8.5	-10.25	-10.18	-15.61	-11.41	-9.14	-8.83	-6.54	-8.35	-8.91	-14.17	-14.52	-10.7	-11.05	-7.04
Θ(45°)	-8.65	-6.91	-7.54	-3.77	-4.02	-4.08	-0.82	-1	-5.05	-3.86	-3.13	-3.59	-5.93	-9.74	-8.26	-1.59	-3.7	-2.89	-5.05	-13.62	-6.18	-3.79	-3.74	-7.46
Θ(60°)	-4.94	-0.8	-0.15	-1.7	-1.83	0.46	1.5	0.38	0.86	0.66	-1.78	-3.38	-5.05	-7.32	-5.08	-1.81	-1.16	-1.17	-4.18	-8.13	-1.85	-0.07	-2.15	-5.45
Θ(75°)	0.65	0.59	1.08	1.64	1.66	1.17	0.22	2.43	3.21	0.83	0.61	-3.12	-4.07	-5.82	-1.41	-2.4	0.07	-3.1	-2.1	-5.29	-1.49	-0.52	-1.07	0.12
Θ(90°)	1.22	2.4	1.62	1.0																				



Θ (180°)	-15.21	-13.94	-8.9	-8.16	-6.99	-6.72	-5.34	-4.38	-5.94	-9.81	-10.89	-13.78	-14.75	-15.98	-10.97	-8.41	-6.59	-5.41	-5.42	-5.52	-5.24	-6.22	-8.69	-11.37
Freq(Hz)	5.6G	Pol.	Phi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dBi)	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°)	-5.51	-3.65	-3.69	-3.75	-5.33	-4.63	-6.35	-7.68	-8.6	-8.63	-9.29	-5.76	-6.71	-3.29	-2.05	-3.33	-4.63	-5.98	-7.16	-7.97	-6.92	-8.48	-6.93	-7.9
Θ (15°)	-5.11	-8.69	-6.55	-8.51	-8.33	-8.44	-6.54	-6.54	-5.5	-4.9	-5.33	-6.5	-4.69	-4.59	-6.99	-7.45	-6.89	-7.92	-7.7	-6.51	-5.55	-3.93	-5.57	-6.36
Θ (30°)	-9.82	-13.11	-15.47	-10.6	-9.51	-5.96	-5.45	-6.3	-14.89	-14.46	-10.51	-5.85	-2.64	-5.77	-4.5	-4.38	-11.09	-6.9	-7.16	-5.84	-3.99	-6.57	-8.63	-10.49
Θ (45°)	-9.66	-8.88	-9.8	-7.41	-10.78	-3.98	-3.98	-3.42	-15.32	-8.44	-6.74	-1.73	-0.74	-3.11	-10.41	-9.16	-6.67	-10.26	-13.73	-5.12	-8.97	-6.74	-6.62	-8.41
Θ (60°)	-7.56	-9.3	-9.61	-8.1	-15.18	-8.42	-6.04	-8.73	-8.03	-7.71	-10.53	-8.81	-10.31	-8.91	-3.11	-7.44	-8.4	-6.54	-15.74	-10.16	-8.98	-5.19	-11.32	-6.76
Θ (75°)	-9.62	-13.43	-9.33	-11.07	-14.92	-10.83	-6.92	-14.38	-5.19	-8.58	-9.71	-4.82	-7.45	-10.95	-10.84	-6.72	-10.59	-9.34	-12.06	-13.58	-8.75	-11.71	-15.16	-9.42
Θ (90°)	-15.13	-14.57	-5.41	-11.04	-13.27	-5.22	-5.95	-11.36	-11.72	-13.46	-9.21	-6.53	-11.35	-9.04	-10.2	-4.88	-11.47	-11.29	-14.51	-14.37	-8.01	-10.85	-14.57	-13.07
Θ (105°)	-13.64	-13.31	-8.42	-10.63	-15.04	-10.06	-10.8	-8.06	-5.36	-10.75	-6.21	-10.14	-13.3	-10.68	-16.01	-9.65	-15.17	-13.7	-15.83	-14.69	-15.66	-9.68	-13.21	-13.89
Θ (120°)	-7.37	-5.16	-5.5	-10.95	-10.56	-8.86	-7.49	-6.33	-6.04	-9.42	-7.54	-8.41	-9.81	-15.42	-10.5	-6.25	-13.82	-12.67	-14.03	-13.95	-13.31	-15.69	-15.22	-14.41
Θ (135°)	-5.06	-5.63	-5.22	-6.92	-7.95	-8.47	-7.23	-14.63	-4	-6.39	-8.98	-14.3	-13.56	-15.26	-9.02	-9.46	-13.93	-15.38	-11.01	-13.97	-12.98	-13.91	-12.44	-9.67
Θ (150°)	-8.14	-9.9	-7.46	-6.26	-8.95	-7.18	-3.9	-4.42	-9.22	-12.06	-11.02	-10.41	-10.86	-10.42	-13.46	-12.4	-10.01	-12.11	-15.2	-11.07	-14.91	-13.89	-8.83	-7.96
Θ (165°)	-5.05	-5.29	-5.16	-3.03	-4.18	-7.12	-8.71	-10.26	-11.39	-9.77	-6.42	-8.31	-10.72	-6.82	-8.53	-7.96	-14.47	-13.89	-12.71	-14.18	-14.65	-11.86	-7.83	-5.12
Θ (180°)	-3.01	-2.92	-4.27	-8.35	-13.18	-12.51	-12.78	-11.42	-8.39	-4.56	-2.92	-2.46	-1.04	-1.29	-2.87	-3.72	-6.57	-10.89	-13.46	-13.9	-6.82	-3.4	-3.67	-1.94
Freq(Hz)	5.6G	Pol.	Theta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dBi)	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	-7.58	-7.2	-9.72	-9.65	-7.94	-4.97	-4.25	-3.44	-2.93	-2.89	-4.16	-5.86	-6.38	-7.11	-8.24	-8.73	-6.95	-6.13	-3.76	-3.81	-4.11	-4.29	-5.38
Θ (15°)	-6.05	-5.54	-6.11	-6.46	-5.59	-6.64	-5.59	-3.37	-2.19	-4.21	-7.81	-6.44	-8.99	-8.74	-10.33	-8.62	-10.31	-8.37	-6.45	-7.84	-8.58	-6.59	-5.4	-4.85
Θ (30°)	-7.22	-6.82	-7.3	-8.8	-5.61	-1.76	-2.78	-5.83	-2.95	-4.79	-1.29	-3.21	-8.9	-11.16	-9.55	-10.52	-9.93	-9.29	-7.14	-9.24	-9.85	-9.55	-6.44	-6.35
Θ (45°)	-3.52	-2.61	-5.14	-6.8	-3.6	-0.55	-5.42	-7.76	-10.48	-5.78	-1.14	-0.16	-2.08	-7.34	-8.43	-12.24	-6.62	-2.83	-5.8	-6.79	-7.2	-3.34	-2.51	-1.98
Θ (60°)	-4.01	-2.45	0.39	-4.4	-1.51	-2.55	-1.48	-2.75	-3.37	1.85	-0.57	0.88	-0.33	-7.82	-3.56	-2.26	-7.36	-1.56	-3.71	-9.06	-3.15	-0.46	-0.5	-1.51
Θ (75°)	2.15	2.78	0.68	1.58	1.6	1.29	0.97	-2.61	0.8	3.56	-1.9	0.43	-2.47	-2.58	-5.2	0.75	-5.3	-2.6	-3.41	-5.35	-1.15	-1.42	-0.18	1.65
Θ (90°)	4.31	4.52	1.44	4.35	-0.06	2.88	3.46	1.15	4.2	5.81	0.92	-0.41	-2.54	-4.51	-2.02	-0.27	-2.46	-0.61	-2.24	-0.9	0.44	-1.18	0.48	2.51
Θ (105°)	-0.22	1.68	1.13	3.84	1.27	4.92	4.56	4.47	5.22	4.12	-1.37	-0.98	-2.05	-3.89	-2.41	-2.9	-7.49	-4.97	-4.09	-2.9	-3.01	-2.2	-2.15	-0.44
Θ (120°)	-4.9	-0.74	1.2	0.85	-1.27	4.54	3.53	3.03	1.28	0.39	0.53	-1.7	-1.9	-2.75	-3.72	-9.42	-8.1	-8.05	-12.87	-5.47	-4.34	-4.71	-4.47	-5.03
Θ (135°)	-4.54	-3.14	-1.69	0.46	1.44	2.32	-0.9	0.91	2.01	0.03	-4.01	-4.41	-4.53	-2.81	-2.71	-9.14	-6.71	-5.89	-8.72	-5.33	-8.61	-7.64	-5.32	-7.29
Θ (150°)	-3.04	-5.24	-6.48	-4.2	0.43	1.42	1.27	-4.04	-4.8	-4.57	-6.99	-4.61	-4.52	-6.1	-7.92	-8.65	-6.17	-10.12	-9.46	-9.38	-10.29	-10.24	-5.21	-4
Θ (165°)	-10.29	-9.9	-10.72	-8.82	-5.75	-2.82	-2.31	-5.78	-8.17	-11.17	-13.82	-13.87	-11.36	-8.58	-5.25	-3.16	-5.91	-12.05	-15.29	-15.25	-9.32	-7.65	-7.97	-7.67
Θ (180°)	-12.32	-9.76	-6.82	-7.81	-6.27	-5.36	-4.8	-3.98	-5.21	-7.93	-8.86	-10.7	-14.09	-14.59	-11.95	-8.53	-5.48	-4.4	-4.75	-3.44	-3.67	-4.89	-6.72	-13.22
Freq(Hz)	5.785G	Pol.	Phi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dBi)	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°)	-15.07	-10.7	-10.1	-12.38	-10.17	-7.73	-8.32	-9.86	-10.3	-10.61	-10.99	-13.15	-11.08	-11.88	-8.67	-8.22	-8.67	-9.87	-9.54	-9.73	-10.1	-9.02	-13.13	-14.59
Θ (15°)	-9.56	-7.04	-5.49	-4.87	-3.37	-6.35	-8.88	-5.37	-6.81	-9.3	-5.68	-3.51	-2.8	-2.36	-6.67	-12.32	-12.02	-8.16	-8.63	-7.56	-7.04	-6.28	-9.24	-8.27
Θ (30°)	-9.45	-9.62	-11.24	-10.64	-8.99	-6.13	-10.23	-6.13	-7.51	-6.67	-4.92	-4.27	-2.84	-4.25	-3.33	-5.53	-14.18	-9.59	-9.27	-5.5	-3.91	-5.04	-4.97	-8.72
Θ (45°)	-5.74	-7.02	-11.31	-13.3	-9.73	-2.39	-4.26	-6.85	-7.66	-5.5	-2.11	-0.1	-1.42	-2.78	-6.77	-7.27	-6.23	-14.02	-8.73	-5.26	-4.48	-4.87	-6.47	-6.32
Θ (60°)	-7.43	-5.99	-7.93	-7.07	-11.25	-6.47	-5.85	-6.56	-7.49	-5.82	-7.92	-6.74	-7.46	-7.04	-3.61	-5.43	-7.94	-6.67	-12.15	-8.01	-10.17	-6.23	-15.17	-7.6
Θ (75°)	-6.27	-10.74	-5.72	-9.55	-12.23	-7.66	-7.29	-13.99	-5.68	-13.19	-9.34	-2.45	-5.98	-4.95	-7.15	-2.72	-14.2	-7.25	-11.01	-9.33	-7.12	-12.49	-15.62	-7.49
Θ (90°)	-12.83	-9.88	-13.39	-7.09	-7.03	-3.42	-3.43	-13.88	-9.59	-12.68	-9.89	-3.75	-7.65	-5.89	-8.15	-3.68	-11.26	-8.58	-8.3	-11.44	-8.99	-10.52	-13.96	-9.59
Θ (105°)	-12.51	-14.74	-5.32	-8.79	-8.96	-7.33	-13	-6.93	-7.92	-10.1	-5.5	-11.81	-8.54	-8.16	-12.69	-8.74	-14.86	-9.32	-12.09	-12.66	-11.65	-9.89	-12.21	-13.11
Θ (120°)	-10	-9.21	-9.53	-6.23	-9.49	-8.17	-12.26	-4.71	-8.16	-13.63	-7.88	-10.17	-12.26	-13.01	-8.99	-7.44	-10.95	-13.4	-16.17	-15.19	-13.84	-14.05	-15.06	-13.26
Θ (135°)	-9.29	-6.47	-6.71	-8.5	-7.32	-15.05	-8.07	-12.19	-4.94	-5.92	-9.33	-6.17	-9.5	-10.27	-8.36	-8.03	-11.25	-15.53	-8.45	-15.05	-12.96	-14.59	-13.33	-12.47
Θ (150°)	-10.63	-12.62	-6.07	-5.01	-10.15	-6.85	-4.91	-4.76	-8.13	-7.66	-7.58	-8.17	-9.21	-9.05	-10.68	-15.61	-8.08	-13.62	-15.3	-11.06	-11.33	-13.99	-11.03	-9.17
Θ (165°)	-4.39	-6.28	-4.15	-3.46	-4.25	-6.84	-7.95	-9.52	-6.91	-6.1	-5.27	-7.97	-9.55	-8.81	-6.34	-6.71	-12.36	-15.79	-15.3	-15.09	-13.53	-11.47	-6.63	-3.72
Θ (180°)	-1.98	-3.01	-3.74	-7.37	-10.99	-14.84	-15.79	-12.94	-11.33	-4.75	-3.01	-1.57	-1.11	-0.73	-1.55	-3.18	-5.04	-9.85	-13.8	-12.45	-8.46	-4.01	-3.25	-2.15
Freq(Hz)	5.785G	Pol.	Theta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG(dBi)	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°)	-9.46	-8.8	-10.13	-12.25	-14.21	-14.1	-13.97	-12.6	-10.8	-8.6	-8.39	-6.26	-7.35	-6.69	-7.23	-7.57	-9.85	-9.74	-10.53	-12.16	-10.55	-9.95	-7.9	-7.75
Θ (15°)	-4.83	-5.58	-7.2	-12.24	-11.13	-5.97	-5.86	-3.77	-2.75	-4.98	-5.52	-4.64	-5.57	-8.01	-12.61	-12.55	-10.52	-8.93	-8.11	-4.23	-2.8	-1.87	-3.55	-4.18
Θ (30°)	-8.5	-6.98	-6.36	-6.14	-6.97	-8.62	-1.3	-0.66	-2.17	-1.25	-0.75	-2.97	-7.6	-6.78	-10.59	-10.67	-13.82	-10.14	-9.63	-5.28	-6.59	-6.64	-6.8	-9.05
Θ (45°)	-2.97	-3.66	-7.96	-4.33	-2.2	-2.97	0.2	-3.81	-3.01	-3.89	-1.26	-0.54	-4.34	-7.79	-15	-8.94	-6.39	-6.61	-7.15	-5.99	-5.46	-4.43	-2.66	-0.62
Θ (60°)	-1.15	-0.47	-1.28	-3.2	-1.47	0.39	-2.68	-4.4	-2.73	1.56	1.98	-0.29	-2.8	-9.93	-8.62	-1.78	-4.78	-3.25	-3.28	-4.29	-5.66	-1.24	0.95	1.01
Θ (75°)	-0.35	1.91	0.32	1.2	2.45	2.86	-0.25	-2.71	2.51	3.21	2.													



Radiated Composite Gain Data

Appendix A

Θ(180°)	-17.1	-19.55	-10.88	-9.57	-8.01	-7.99	-6.44	-5.38	-6.59	-9.54	-11.08	-15.08	-18.4	-18.68	-11.34	-7.53	-5.39	-4.04	-3.8	-4.33	-4.22	-5.05	-7.79	-11.78
Freq(Hz)	5.6G	Pol.	Phi	Ant. 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-9.94	-7.38	-5.89	-4.64	-5.33	-3.39	-5.21	-6.57	-8	-11.88	-18.36	-12.33	-11.36	-7.26	-4.04	-3.88	-4.65	-5.38	-5.91	-7.01	-8.67	-12.85	-17.37	-15.67
Θ(15°)	-5.98	-8.06	-5.27	-7.73	-7.87	-8.06	-6.18	-8.6	-10.99	-14.05	-13.18	-11.89	-6.75	-6.62	-8.2	-11.32	-9	-8.24	-6.8	-7.93	-8.01	-5.99	-7.21	-7.16
Θ(30°)	-13.18	-17.32	-18.38	-10.46	-9.22	-5.78	-6.18	-7.72	-16.89	-17.6	-16.07	-15.91	-9.33	-18.32	-8.11	-5.34	-11.08	-13.14	-6.78	-6.83	-5.5	-7.17	-10.46	-14.62
Θ(45°)	-19.27	-13.85	-16.11	-9.98	-17.35	-3.49	-3.95	-3.55	-18.71	-11.33	-15.24	-4.93	-3.7	-5.04	-11.99	-11.11	-7.51	-14.52	-15.58	-7.44	-8.42	-10.35	-12.19	-18.1
Θ(60°)	-13.17	-14.06	-15.56	-12.4	-17.67	-10.13	-10.7	-10.01	-10.31	-8.41	-10.73	-8.3	-10.06	-17.4	-4.34	-9.73	-10.13	-7.63	-19.79	-14.31	-11.12	-5.89	-11.75	-11.65
Θ(75°)	-14.48	-14.81	-12.91	-11.23	-19.16	-17.87	-7.06	-18.21	-4.38	-11.47	-9.62	-5.62	-9.5	-12.63	-11.6	-5.57	-19.06	-12.18	-19.17	-18.33	-13.64	-12.09	-17.96	-14.27
Θ(90°)	-17.96	-18.16	-9.53	-13.3	-18.34	-8.04	-5.77	-11.78	-13.41	-17.28	-14.31	-6.63	-13.71	-12.78	-10.32	-8.42	-15.52	-12.24	-18.26	-16.36	-14.11	-18.26	-16.72	-14.28
Θ(105°)	-17.75	-14.57	-15.58	-11.32	-17.95	-12.44	-12.69	-10.28	-4.53	-10.88	-19.16	-16.7	-14.57	-15.79	-18.96	-9.63	-18.48	-16.41	-18.99	-17.49	-19.38	-18.02	-17.07	-15.75
Θ(120°)	-15.05	-10.77	-10.96	-15.98	-16.46	-17.39	-9.49	-6.72	-8.45	-15.78	-9.15	-11.56	-9.55	-18.86	-10.34	-7.71	-18.85	-17.34	-18.32	-18.3	-17.6	-18.83	-18.75	-17.08
Θ(135°)	-15.5	-17.63	-12.33	-9.26	-7.1	-9.65	-7.46	-18.06	-6.89	-11.51	-14.07	-17.2	-14.98	-17.65	-8.88	-11.08	-17.85	-18.2	-14.84	-16.15	-18.05	-18.54	-13.6	-16.87
Θ(150°)	-10.56	-10.02	-6.35	-6.25	-12.58	-8.29	-5.68	-7.64	-17.52	-17	-18.08	-18.98	-18.8	-15.59	-19.1	-13.2	-17.85	-14.94	-18.22	-15.83	-19.02	-15.09	-13.79	-13.47
Θ(165°)	-10.29	-10.18	-9.32	-6.72	-7.34	-9.41	-12.06	-13.27	-19.2	-18.03	-12.16	-13.6	-17.11	-14.73	-12.15	-18.03	-18.55	-19.21	-14.17	-16.69	-18.31	-17.67	-14.12	-10.98
Θ(180°)	-5.31	-4.3	-6.49	-10.62	-18.87	-18.06	-19.01	-18.07	-15.49	-7.97	-6.25	-5.07	-3.98	-4.66	-5.75	-6.3	-9.51	-16.88	-17.91	-16.04	-10.3	-6.52	-6.07	-5.77
Freq(Hz)	5.6G	Pol.	Theta	Ant. 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-5.72	-6.74	-8.48	-15.11	-17.78	-15.87	-9.86	-7.13	-5.15	-5.04	-3.6	-4.26	-4.48	-5.34	-8.31	-13.38	-15.98	-12.22	-11.31	-7.26	-6.1	-5.18	-4.47	-4.96
Θ(15°)	-6.68	-6.55	-7.36	-7.4	-7.82	-11.73	-8.07	-3.4	-3.24	-6.57	-11.88	-7.67	-10.29	-10.89	-16.27	-17.35	-18.14	-15.4	-15.96	-15.94	-10.83	-5.99	-5.22	-5.94
Θ(30°)	-7.55	-8.33	-8.68	-13.71	-8.6	-4.28	-4.78	-9.6	-4.77	-13.16	-7.02	-9.68	-18.52	-15.98	-12.01	-14.25	-9.77	-10.11	-10.99	-13.43	-10.02	-8.93	-5.9	-5.96
Θ(45°)	-6.2	-5.65	-7.6	-10.11	-7.35	-5.34	-6.78	-7.08	-10.41	-11.28	-2.97	-0.64	-1.43	-6.41	-11.69	-18.67	-8.79	-5.23	-7.37	-7.98	-7.35	-2.96	-3.11	-3.48
Θ(60°)	-2.18	-4.04	-3.64	-4.79	-4.44	-3.14	-1.33	-2.48	-6.72	-0.12	-1.49	-2.15	-3.66	-16.37	-8.28	-3.82	-12.6	-5.24	-5.58	-8.55	-3.72	-0.49	0.74	0.53
Θ(75°)	0.41	0.05	-1.47	-1.33	-1.24	-0.52	-0.42	-1.97	0.03	0.11	-14.51	-8.43	-10.89	-7.29	-18.14	-2.21	-10.46	-6.46	-5.58	-5.18	-0.53	0.2	0.98	0.63
Θ(90°)	-0.21	0.71	-0.73	-1.29	-3.38	0.09	0.45	-3.04	1.87	2.64	-3.93	-9.77	-11.02	-13.6	-4.79	-1.27	-6.58	-3.74	-4.97	-1.97	1.41	-0.75	-0.42	-1.98
Θ(105°)	-2.04	-0.2	-2.88	-3.99	-1.98	0.55	0.91	-1.12	-0.21	-1.81	-14.46	-13.78	-11.09	-13.06	-7.5	-3.3	-14.17	-7.17	-8.61	-4.23	-2.05	-4.14	-4.03	-4.7
Θ(120°)	-5.18	-4.2	-4.51	-3.78	-5.08	-0.43	-2.61	-3.78	-6.19	-4.97	-7.72	-14.2	-11.63	-12.29	-10.64	-11.53	-12.54	-19.15	-13.56	-4.48	-5.66	-6.37	-6.32	-6.25
Θ(135°)	-6.37	-4.75	-6.48	-5.72	-3.69	-1.8	-7.73	-3.15	-1.98	-5.32	-12.28	-12.63	-16.09	-9.69	-10.36	-18.78	-7.38	-18.03	-9.07	-6.48	-16.12	-9.66	-5.93	-8.49
Θ(150°)	-6.13	-13.07	-17.8	-16.81	-6.15	-3.35	-4.39	-6.67	-7.04	-8.81	-12.98	-10.06	-16.26	-16.5	-17.54	-12.52	-11.41	-17.38	-14.27	-9.38	-9.98	-10.95	-5.97	-7.39
Θ(165°)	-11.92	-15.2	-19.4	-14.61	-7.67	-5.52	-7.12	-10.82	-12.03	-15.46	-15.38	-19.39	-16.83	-14.32	-12.43	-11.61	-14.17	-18.25	-18.84	-18.38	-12.92	-10.11	-10.1	-8.76
Θ(180°)	-17.63	-14.97	-9.24	-10.56	-9.87	-9.61	-8.58	-7.51	-9.35	-15.02	-14.41	-14.01	-17.53	-16.94	-12.25	-8.53	-5.8	-4.99	-5.39	-4.39	-6.1	-7.28	-8.86	-14.54
Freq(Hz)	5.785G	Pol.	Phi	Ant. 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-18.4	-11.64	-12.87	-13.05	-9.89	-7.78	-7.5	-9.71	-9.93	-10.53	-11.29	-18.54	-18.01	-14.51	-12.92	-11.51	-9.49	-9.66	-9.13	-9.12	-10	-9.2	-17.23	-17.32
Θ(15°)	-11	-6.29	-4.42	-3.15	-2.21	-4.91	-8.66	-7.01	-11.26	-17.74	-9.51	-6.6	-5.2	-5.88	-10.54	-14.64	-13	-7.39	-7.63	-7.01	-8.96	-10.84	-16.73	-13.3
Θ(30°)	-13.1	-10.72	-14.2	-19.04	-8.86	-6.26	-14.96	-9.26	-11.97	-11.29	-10.45	-10.92	-8.74	-16.92	-9.09	-8.14	-17.76	-9.55	-8.52	-5.22	-5.93	-9.76	-9.46	-11.6
Θ(45°)	-15.91	-17.94	-15.14	-15.06	-9.42	-2.41	-3.45	-5.85	-10.3	-12.18	-7.89	-3.01	-3.95	-5.22	-7.65	-7.06	-4.72	-16.68	-8.47	-6.76	-7.42	-5.8	-14.91	-17.45
Θ(60°)	-9.94	-8.21	-11.28	-12.35	-14.65	-8.13	-6.51	-7.46	-11.64	-7.39	-6.97	-10.93	-13.15	-11.44	-2.61	-6.91	-8.63	-10.55	-13.09	-11.38	-9.85	-8.29	-17.45	-8.77
Θ(75°)	-15.46	-14.77	-8.5	-13.26	-18.59	-8.94	-8.59	-16.01	-5.55	-14.55	-14.01	-6.65	-17.13	-7.07	-8.12	-5.6	-17.51	-11.37	-18.37	-15.98	-9.29	-13.09	-18.76	-17.58
Θ(90°)	-18.9	-14.98	-18.4	-8.51	-9.15	-4.2	-5.04	-15.7	-11.05	-17.54	-18.73	-5.79	-12.3	-9.52	-9.91	-9.3	-13.3	-12.61	-15.26	-18.98	-11.84	-15.69	-16.29	-16.61
Θ(105°)	-18.41	-17.49	-9.27	-7.9	-9.52	-10.12	-14.41	-11.07	-6.76	-14.94	-7.9	-19.24	-12.46	-11.18	-19.22	-13.13	-19.12	-14.3	-18.05	-19.05	-17.51	-17.91	-13.77	-14.39
Θ(120°)	-16.65	-10.97	-12.46	-6.28	-16.61	-11.64	-19.05	-4.36	-7.22	-17.37	-9.14	-10.36	-13.54	-16.16	-8.31	-11.55	-18.02	-15.35	-19.33	-18.36	-15.7	-19.15	-18.78	-18.45
Θ(135°)	-15.54	-18.12	-13.98	-9.99	-6.15	-17.76	-9.06	-18.67	-6.26	-18.41	-17.13	-16.27	-18.03	-17.48	-10.37	-14.15	-16.32	-18.47	-17.06	-17.82	-19.13	-18.99	-14.99	-18.58
Θ(150°)	-12.89	-13.69	-6.42	-4.57	-11.49	-10.64	-7.81	-7.18	-14.44	-14.92	-18.29	-17.84	-18.46	-12.64	-18.42	-19.24	-13.2	-18.33	-18.83	-13.5	-16.56	-19.51	-18.72	-14.48
Θ(165°)	-8.3	-8.88	-7.57	-7.44	-6.51	-10.21	-14	-18.31	-18.28	-17.33	-12.56	-13.47	-18.87	-13.07	-11.01	-15.46	-18.65	-19.07	-17.82	-19.09	-14.57	-13.88	-11.66	-9.01
Θ(180°)	-4.89	-4.47	-5.08	-9.26	-14.96	-19.2	-18.72	-17.4	-17.66	-8.03	-6.29	-5.46	-4.42	-3.92	-5.46	-7.02	-7.64	-14.36	-17.88	-13.44	-9.88	-6.32	-5.34	-5.2
Freq(Hz)	5.785G	Pol.	Theta	Ant. 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-8.82	-8.06	-9.91	-12.72	-17.28	-19.22	-19.13	-17.11	-11.83	-9.56	-9.51	-6.33	-6.88	-5.91	-7.44	-9.55	-12.07	-14.85	-15.42	-15.7	-12.91	-12.8	-9.36	-9.39
Θ(15°)	-3.16	-5.51	-7.86	-16.8	-16.3	-9.04	-12.31	-6.91	-4.45	-7.7	-9.73	-6.87	-8.45	-9.51	-18.81	-17.31	-16.98	-18.63	-17.98	-8.79	-4.39	-2.16	-2.69	-2.65
Θ(30°)	-8.06	-6.18	-5.83	-4.66	-7.1	-18.06	-6.91	-6.92	-7.56	-4.38	-2.73	-3.26	-8.75	-7.88	-10.27	-10.78	-17.61	-12.72	-18.3	-9.82	-5.7	-5.44	-5.59	-8.13
Θ(45°)	-6.01	-8.54	-8.67	-12.02	-5.42	-10.74	-4.08	-11.35	-8.29	-12.67	-2.83	0.16	-2.79	-6.88	-18.21	-14.99	-6.1	-7.17	-8.87	-6.48	-4.12	-4.89	-4.07	-2.57
Θ(60°)	-1.09	-1.52	-4.93	-4.62	-3.58	-0.72</																		



Radiated Composite Gain Data

Appendix A

Θ (180°)	-6.25	-7.24	-8.88	-12.04	-18	-18.12	-13.92	-8.56	-6.55	-5.02	-5.02	-4.42	-4.47	-6.02	-8.91	-14.83	-18.04	-13.98	-9.47	-7.32	-5.93	-5.64	-5.63	-5.83
Freq(Hz)	5.2G	Pol.	Phi	Ant. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-9.54	-8.11	-9.35	-10.59	-12.71	-15.69	-17.35	-17.13	-14.03	-9.11	-8.26	-7.39	-6.52	-6.56	-8.41	-11.26	-13.49	-15.78	-17.98	-17.34	-11.32	-9.83	-7.49	-8.12
Θ (15°)	-8.22	-12.69	-14.29	-11.64	-12.61	-16.69	-16.88	-15.52	-13.69	-10.34	-10.29	-13.25	-18.25	-13.91	-18.92	-13.79	-11.8	-16.62	-18.85	-14.49	-11.81	-10.13	-9.84	-7.01
Θ (30°)	-2.55	-1.37	-2.94	-6.89	-14.4	-11.74	-16.16	-18.51	-15.91	-13.13	-15.18	-17.83	-17.77	-18.46	-18.52	-18.61	-17.27	-17.86	-18.69	-18.89	-11.49	-12.82	-8.93	-4.48
Θ (45°)	-9.85	-6.25	-7.53	-9.66	-8.72	-19.12	-19.2	-11.34	-12.95	-12.08	-15.75	-12.68	-14.85	-18.18	-17.04	-17.05	-13.46	-17.8	-18.48	-14.79	-16.02	-13.16	-12.12	-12.98
Θ (60°)	-10.57	-13.3	-7.92	-9.55	-19.28	-10.27	-9.15	-9.46	-17.84	-18.34	-12.4	-14.73	-18.57	-19.52	-15.66	-11.15	-18.73	-19.09	-14.64	-18.12	-18.74	-13.73	-18.01	-10.62
Θ (75°)	-11.29	-9.05	-10.88	-19.21	-7.89	-9.54	-14.1	-18.89	-16.71	-13.04	-10.63	-13.79	-17.8	-18.95	-17.97	-12.99	-17.38	-18.08	-18.69	-18.11	-15.81	-17.72	-15.83	-17.61
Θ (90°)	-18.42	-17.94	-8.01	-8.93	-15.44	-12.43	-10.37	-10.56	-11.5	-11.72	-15.69	-16.96	-16.41	-12.04	-18.39	-19.03	-13.52	-18.16	-17.7	-18.02	-11.17	-16.72	-14.18	-18.43
Θ (105°)	-16.72	-12.04	-8.56	-16.78	-18.68	-18.91	-16.26	-19.02	-16.95	-11.77	-13.89	-14.6	-11.58	-14.44	-18.15	-18.36	-18.93	-17.34	-18.73	-15.12	-17.5	-10.92	-15.55	-18.56
Θ (120°)	-8.31	-8.11	-7.98	-13.76	-14.06	-15.53	-13.29	-11.17	-14.09	-14.61	-9.55	-19.11	-18.88	-18.14	-11.88	-17.82	-17.57	-17.68	-11.46	-17.27	-13.33	-18.78	-12.27	-12.49
Θ (135°)	-6.04	-3.87	-7.2	-11.8	-17.64	-18.52	-9.72	-17.48	-18.68	-17	-13.46	-8.86	-6.62	-7.69	-11.54	-14.11	-10.03	-13.46	-18.41	-14.88	-18.65	-11.92	-17.83	-13.33
Θ (150°)	-11.35	-12.28	-17.43	-17.68	-16.18	-12.12	-9.82	-13.61	-14.28	-16.59	-18.36	-18.77	-17.62	-17.89	-15.22	-11.44	-15.72	-15.33	-12.07	-17.88	-17.7	-17.29	-12.96	-8.16
Θ (165°)	-7.45	-8.19	-8.27	-8.53	-8.37	-10.64	-15.68	-18	-18.95	-18.98	-17.46	-18.74	-18.3	-13.94	-13.58	-14.39	-16.57	-14.93	-19.13	-17.5	-19.31	-13.55	-10.26	-7.78
Θ (180°)	-12.49	-13.3	-14.34	-14.97	-16.05	-19.11	-18.64	-19.32	-18.54	-15.69	-14.27	-12.28	-11.44	-9.08	-9.36	-12.16	-15.56	-18.74	-18.9	-15.42	-11.84	-10.33	-10.03	-11.06
Freq(Hz)	5.2G	Pol.	Theta	Ant. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-17.72	-18.74	-14.68	-9.86	-8.73	-7.28	-6.35	-6.05	-7.07	-8.25	-9.95	-18.35	-18.42	-19.24	-10.61	-7.69	-7.36	-6.95	-6.73	-7.53	-8.47	-11.07	-12.46	-18
Θ (15°)	-9.86	-12.6	-12.55	-10.87	-8.3	-6.8	-6.26	-6.69	-8.35	-10.85	-17.59	-17.37	-17.87	-18.21	-13.18	-15.9	-17.66	-11.73	-10.41	-13.8	-17.19	-17.42	-19.06	-10.74
Θ (30°)	-4.37	-3.73	-5.17	-7.29	-9.52	-8.31	-6.91	-6.11	-9.58	-11.38	-13.03	-16.95	-18.96	-14.8	-11.31	-10.27	-7.47	-14.16	-14.15	-18.22	-17.88	-17.92	-16.97	-8.92
Θ (45°)	-11.61	-7.24	-7.35	-7.22	-10.22	-13.38	-5.74	-1.84	-3.59	-5.24	-7.46	-5.82	-5.39	-9.1	-8.84	-7.31	-6.65	-7.06	-11.41	-15.71	-10.14	-11.9	-11.96	-13.91
Θ (60°)	-11.89	-3.18	-0.52	-2.97	-3.78	-2.25	-3.13	-1.34	-1.88	-4.35	-1.37	-2.87	-5.47	-6.18	-5.01	-6.17	-6.35	-4.3	-10.51	-8.3	-5.71	-10.07	-18.83	-17.65
Θ (75°)	-2.72	-1.46	-1.56	0.79	-1.53	-1.67	-2.87	-1.22	-0.4	-0.04	0.79	-3.27	-5.49	-6.16	-3.14	-5.33	-3.12	-7.61	-7.31	-8.94	-10.42	-15.79	-17.51	-4.3
Θ (90°)	-0.08	0.47	-2.1	-1.18	-1.28	-2.52	-1.36	1.62	0.31	-1.13	-0.58	-3.42	-4.14	-4.28	-3.68	-7.56	-4.21	-4.45	-5.53	-10.17	-8.81	-7.54	-14.09	-0.15
Θ (105°)	-3.12	-2.47	-1.61	0.85	0.75	0.69	1.9	2.22	0.44	1.3	-0.2	-1.15	-2.45	-5.78	-5.67	-7.82	-7.59	-10.11	-8.86	-13	-18.16	-8.09	-6.51	-0.66
Θ (120°)	-10.59	-2.76	-1.27	-1.83	-0.57	1.8	2.07	-0.24	1.57	1.08	-1.77	-1.78	-2.15	-3.25	-3.81	-11.05	-10.98	-19.86	-11.32	-15	-18.72	-9.27	-9.77	-12.74
Θ (135°)	-8	-8.65	-9.28	-4.27	-1.33	-1.11	-1.95	-1.59	-2.91	-5.94	-4.79	-2.57	-4.28	-4.13	-4.24	-12.55	-8.46	-8.28	-15.21	-18.6	-13.24	-7.8	-11.79	-11.99
Θ (150°)	-12.19	-8.35	-7.33	-5.72	-0.84	-0.98	-0.77	-1.42	-5.34	-11.59	-10.78	-10.28	-9.2	-9.41	-6.65	-8.47	-15.54	-18.08	-8.66	-17.66	-13.65	-14.33	-11.98	-9.7
Θ (165°)	-16.71	-17.12	-11.02	-8.44	-10.09	-11.98	-6.66	-3.79	-5.4	-10.5	-16	-12.77	-10.93	-12.68	-9.36	-9.45	-10.83	-10.49	-15.46	-18.62	-10.96	-11.06	-10.49	-12.04
Θ (180°)	-17.14	-15.93	-15.71	-14.56	-14.88	-13.52	-11.11	-9.67	-11.84	-17.37	-18.48	-18.03	-18.02	-18.33	-16.75	-17.7	-17.75	-18.42	-18.25	-19.39	-15.75	-17.23	-18.56	-17.68
Freq(Hz)	5.3G	Pol.	Phi	Ant. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-7.46	-7.88	-8.19	-8.84	-11.8	-13.01	-18.96	-18.9	-14.72	-11.16	-8.7	-5.9	-6.03	-6.71	-6.9	-8.75	-13.86	-19.2	-18.6	-14.77	-11.5	-9.5	-6.97	-5.9
Θ (15°)	-8.6	-10.49	-10.92	-11.53	-15.15	-12.97	-9.78	-9.58	-10.57	-9.84	-12.03	-11.46	-10.22	-15.51	-12.46	-9.8	-14.4	-15.28	-18.39	-12.07	-10.58	-8.89	-7.47	-8.19
Θ (30°)	-4.63	-3.35	-5.01	-10.54	-15.3	-11.16	-13.9	-17.66	-14.55	-14.11	-17.14	-12.26	-13.16	-17.84	-15.44	-18.24	-19.24	-13.81	-18.33	-15.55	-10.33	-8.83	-8.18	-5.04
Θ (45°)	-8.92	-4.86	-5.17	-7.9	-9.8	-13.38	-18.42	-14.12	-12.81	-13.87	-9.02	-6.89	-8.66	-15.52	-18.36	-18.37	-15	-18.15	-17.8	-17.95	-15.57	-13.59	-16.4	-17.71
Θ (60°)	-10.34	-17.51	-7.71	-7.92	-18.49	-7.88	-8.64	-10.83	-17.43	-18.74	-14.44	-11.88	-13.97	-17.22	-12.55	-17.18	-16.32	-18.58	-18.41	-17.01	-13.47	-11.69	-19.53	-9.74
Θ (75°)	-10.74	-8.72	-14.16	-11.33	-11.42	-9.33	-17.9	-15.57	-16.32	-11.95	-10.63	-19.07	-18.49	-18.25	-17.95	-12.75	-17.53	-18.85	-18.79	-18.04	-18.55	-18.29	-17.95	-18.11
Θ (90°)	-17.75	-13.19	-7.86	-10.06	-15.9	-10.4	-15.85	-14.67	-17.28	-16.06	-12.77	-15.49	-18.07	-13.99	-13.07	-18.93	-13.08	-19.12	-18.03	-17.14	-10.55	-12.06	-11.92	-18.54
Θ (105°)	-18.81	-15.52	-7.18	-15.9	-18.03	-17.62	-16.67	-18.04	-18.8	-11.6	-10.85	-9.94	-13.86	-12.86	-19.03	-16.86	-18.98	-17.59	-18.4	-14.6	-18.6	-10.61	-13.85	-18.55
Θ (120°)	-7.69	-8.28	-9.15	-17.4	-12.7	-12.81	-15.25	-11.82	-14.3	-12.06	-16.26	-17.93	-19.38	-18.36	-18.76	-13.83	-16.68	-18.19	-11.8	-18.85	-13.28	-17.92	-11.7	-14.78
Θ (135°)	-5.2	-4.23	-5.67	-9.08	-17.88	-17.59	-12.37	-16.91	-12.44	-9.27	-10.04	-12.5	-8.78	-6.69	-15.91	-17.79	-14.08	-17.55	-17.86	-14.92	-17.53	-15.67	-18.93	-10.93
Θ (150°)	-9.77	-14.04	-14.2	-17.58	-19.28	-11.92	-10.75	-13.15	-12.06	-14.09	-16.22	-18.59	-17.82	-17.96	-17.86	-11.04	-13.11	-15.84	-13.86	-19.05	-16.57	-16.65	-10.47	-6.44
Θ (165°)	-6.12	-6.67	-8.18	-8.22	-6.63	-7.93	-12.72	-18.43	-18.27	-17.5	-16.45	-16.39	-15.67	-13.33	-11.62	-18.04	-17.77	-13.9	-18.26	-19.05	-18.91	-14.87	-9.37	-5.1
Θ (180°)	-9.43	-11.46	-11.56	-13.83	-16.48	-18.73	-18.13	-17.78	-15.35	-12.73	-11.17	-9.25	-8.42	-8.32	-8.37	-9.84	-11.6	-15.52	-16.39	-11.98	-9.9	-9.02	-9.75	-8.53
Freq(Hz)	5.3G	Pol.	Theta	Ant. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-17.75	-18.33	-14.52	-11.38	-10.29	-7.36	-6.48	-6.35	-7.01	-9.34	-12.92	-13.4	-18.91	-19.26	-12.46	-9.22	-6.6	-5.74	-7	-7.77	-8.22	-9.34	-11.2	-16.99
Θ (15°)	-7.99	-8.16	-7.57	-7.31	-6.43	-5.23	-3.96	-4.05	-7.1	-12.92	-18.01	-17.41	-17.23	-13.47	-14.17	-13.88	-15.79	-12.41	-9.55	-13.74	-16.37	-19.22	-15.13	-10.16
Θ (30°)	-5.2	-4.8	-4.64	-6.67	-8.56	-8.05	-7.98	-8.22	-12.32	-10.91	-15.03	-17.75	-18.22	-17.47	-13.15	-13.14	-7.87	-13.34	-18.01	-19.42	-19.3	-17.69	-14.53	-7.92
Θ (45°)	-13.68	-6.4	-5.56	-7.9	-13.14	-11.57	-5.05	-2.62	-3.48	-5.55	-4.45	-5.39	-8.42	-5.62	-6.42	-8.04	-4.65	-						



Freq(Hz)	5.785G	Pol.	Phi	Ant. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-17.78	-16.43	-13.36	-18.6	-18.54	-15.25	-18.36	-17.89	-18.93	-18.45	-17.96	-14.29	-11.4	-15.28	-10.6	-10.95	-14.61	-18.04	-18.26	-19.05	-18.01	-16.24	-15.17	-17.9
Θ(15°)	-14.48	-16.81	-16.45	-19.04	-14.72	-18.96	-17.1	-10.02	-8.59	-9	-7.94	-6.45	-6.47	-4.89	-8.89	-16.07	-17.69	-18.02	-19.32	-16.69	-11.29	-7.98	-9.31	-9.65
Θ(30°)	-11.87	-15.07	-14.3	-10.35	-16.96	-13.48	-11.81	-9.02	-9.27	-8.33	-5.98	-4.73	-3.69	-2.8	-4.26	-8.97	-16.65	-17.36	-19.08	-13.88	-8.04	-6.62	-6.71	-11.87
Θ(45°)	-4.88	-5.96	-13.58	-17.76	-18.17	-10	-14.24	-17.55	-11.05	-5.94	-3.03	-3.21	-4.93	-6.39	-12.61	-15.45	-19.19	-17.4	-17.04	-10.1	-7.56	-10.62	-6.16	-5.21
Θ(60°)	-10.98	-9.88	-10.62	-8.28	-13.88	-11.08	-12.1	-12.37	-9.5	-10.56	-18.41	-8.71	-8.43	-8.86	-14.29	-10.31	-14.13	-8.89	-17.89	-10.68	-18.65	-10.31	-18.97	-12.96
Θ(75°)	-5.71	-12.83	-8.97	-11.91	-12.83	-12.84	-12.43	-18.12	-13.67	-18.24	-10.95	-4.42	-4.86	-8.96	-12.82	-5.87	-16.92	-9.27	-11.13	-9.78	-11.05	-18.85	-18.5	-6.65
Θ(90°)	-13.58	-11.21	-14.77	-12.06	-11.03	-9.45	-8.1	-18.28	-14.48	-14.16	-9.44	-7.86	-9.28	-8.33	-12.62	-4.69	-15.37	-10.67	-8.61	-11.49	-12.17	-11.8	-17.71	-9.87
Θ(105°)	-13.36	-18.02	-7.48	-19.06	-15.4	-10.57	-17.98	-8.94	-19.27	-11.6	-9.17	-11.9	-10.72	-11.17	-13.21	-10.56	-16.78	-10.73	-12.9	-13.24	-12.52	-9.74	-16.97	-18.29
Θ(120°)	-10.46	-13.67	-12.62	-13.78	-9.72	-10.75	-12.64	-13.26	-18.64	-15.97	-13.09	-17.37	-17.44	-15.89	-18.53	-9.47	-11.21	-17.62	-19.03	-18.05	-18.18	-15.38	-17.42	-14.53
Θ(135°)	-9.95	-5.24	-6.88	-13.36	-18.7	-18.37	-13.73	-12.73	-10.04	-4.5	-9.27	-5.33	-9.16	-10.46	-12.51	-8.75	-12.6	-18.61	-8.09	-18.3	-13.66	-16.41	-17.94	-13.2
Θ(150°)	-14.47	-18.13	-12.92	-13.82	-15.22	-9.15	-8.04	-8.41	-8.76	-7.83	-6.57	-7.46	-8.63	-11.51	-10.65	-18.04	-9.39	-15.21	-17.82	-14.67	-12.58	-15.05	-11.02	-10.37
Θ(165°)	-6.59	-9.73	-6.76	-5.6	-8.08	-9.5	-8.72	-9.09	-5.74	-4.97	-5.42	-9.05	-8.94	-10.72	-7.95	-6.29	-13	-18.54	-18.82	-17.21	-19.08	-15.12	-8.01	-4.92
Θ(180°)	-5.1	-7.9	-8.83	-11.66	-13.13	-16.68	-18.88	-14.71	-11.94	-7.49	-5.76	-3.79	-3.84	-3.56	-3.75	-5.44	-8.48	-11.58	-15.85	-18.11	-13.41	-7.79	-7.28	-5.13
Freq(Hz)	5.785G	Pol.	Theta	Ant. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-18.89	-18.55	-18.35	-18.86	-17.16	-15.41	-15.26	-14.33	-16.37	-14.31	-13.83	-13.75	-16.25	-16.6	-14.41	-11.76	-13.74	-11.06	-11.99	-14.68	-14.26	-13.13	-12.79	-12.39
Θ(15°)	-18.73	-13.41	-13.45	-13.93	-12.41	-8.92	-6.42	-6.66	-7.31	-8.29	-7.48	-8.51	-8.71	-12.84	-13.29	-14.1	-11.07	-8.21	-7.34	-5.93	-7.51	-8.86	-13.73	-17.26
Θ(30°)	-17.32	-16.93	-15.45	-18.96	-14.32	-7.97	-2.32	-1.31	-3.32	-4.15	-4.92	-9.96	-12.98	-12.23	-19.08	-18.05	-16.11	-13.6	-9.24	-6.99	-16.85	-18.14	-18.35	-19.42
Θ(45°)	-5.95	-5.14	-14.11	-4.31	-5	-2.93	-1.7	-3.86	-4.22	-3.47	-6	-10.18	-17.52	-18.14	-17.82	-9.71	-14.79	-13.04	-11.67	-12.56	-17.59	-11.07	-7.63	-4.84
Θ(60°)	-8.94	-6.01	-3.7	-8.15	-5.49	-5.06	-9.49	-6.89	-1.89	-1.63	-2.49	-4.77	-8.25	-9.18	-17.91	-2.53	-8.89	-8.62	-4.38	-6.85	-13.5	-7.65	-8.96	-7.62
Θ(75°)	-4.4	-2.6	-6.21	-4.54	1.58	-2.53	-7.5	-8.75	-0.24	-1.02	2.52	0.83	-1.8	-2.77	-10.94	-3.36	-5.36	-6.26	-3.97	-9.35	-10.96	-9.8	-4.14	-8.26
Θ(90°)	1.48	1.08	-3.55	3.65	2.43	-0.07	-0.75	-2.1	0.83	-1.1	0.42	0.98	-0.78	-0.06	-2.92	-5.73	-7.7	-0.36	-3.89	-5.2	-10.56	-8.96	-4.82	0.69
Θ(105°)	-4.62	-2.84	0.04	2.38	-2.25	2.35	1.94	3.02	2.24	2.22	0.62	2.1	-0.23	-1.25	-3.79	-6.37	-12.6	-4.49	-7.16	-5.64	-8.81	-8.12	-5.6	-1.89
Θ(120°)	-8	-3.27	0.67	-2.96	-0.21	1.83	2.13	2.43	1.41	1.28	2.01	1.23	0.91	-1.5	-3.1	-5.26	-14.5	-7.54	-13.26	-17.14	-12.31	-9.83	-8.74	-7.87
Θ(135°)	-8.12	-8.78	0.01	1.44	1.36	-3.02	-2.24	1.65	-0.72	-3.25	-5.76	-3.45	-1.57	-3.62	-2.46	-8.71	-13.83	-6.74	-10.39	-9.13	-8.44	-12	-9.41	-10.58
Θ(150°)	-4.99	-6.01	-5.76	-2.4	0.15	-1.13	-3.05	-5.21	-2.01	-4.89	-6.61	-3.96	-2.12	-2.55	-5.92	-9.32	-17.48	-11.69	-18.44	-13.12	-17.74	-17.37	-12.63	-7.81
Θ(165°)	-10.32	-10.12	-11.12	-11.47	-9.42	-5.23	-4.26	-8.57	-6.61	-6.93	-11.47	-16.03	-11.05	-7.62	-5.41	-1.52	-3.95	-10.37	-19.25	-19.04	-17.9	-11.89	-9.87	-11.22
Θ(180°)	-12.98	-12.89	-12.04	-10.98	-8.83	-5.96	-5.86	-6.5	-6.52	-7.6	-8.2	-10.17	-15.31	-17.7	-17.94	-11.16	-6.12	-5.38	-8.61	-7.95	-5.46	-7.19	-8.32	-16.24



Total Gain Data

Freq(Hz)	2.45G	Pol.	Total	Ant. 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Gain	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°)	-9.67	-8.74	-8.64	-9.23	-8.82	-8.58	-9.02	-8.34	-7.58	-7.82	-9.02	-11.16	-9.32	-9.36	-9.94	-12.34	-11.76	-11.38	-11.43	-11.36	-11.12	-10.59	-9.39	-9.64
Θ(15°)	-12.86	-11.95	-9.72	-8.34	-6.40	-4.67	-3.39	-2.42	-1.55	-1.24	-1.32	-2.01	-2.36	-4.08	-7.12	-10.30	-13.26	-12.49	-12.37	-12.09	-10.62	-10.33	-9.74	-10.32
Θ(30°)	-3.26	-3.02	-3.70	-4.04	-3.95	-2.51	-1.49	-0.79	0.73	2.25	2.48	2.06	0.82	-1.43	-5.26	-13.94	-11.84	-7.46	-7.03	-6.97	-7.14	-6.47	-5.10	-3.47
Θ(45°)	0.19	0.90	-0.07	-1.18	-0.70	1.69	3.62	4.71	5.14	4.64	3.31	0.91	-0.47	-2.30	-5.88	-15.25	-7.16	-3.46	-3.08	-4.26	-5.76	-7.12	-4.11	-1.47
Θ(60°)	-0.53	1.51	2.61	1.96	0.45	1.48	4.51	5.67	4.96	3.33	0.14	-3.07	-2.61	-4.16	-7.07	-11.41	-4.67	-2.49	-3.07	-4.15	-7.79	-8.39	-3.70	-1.53
Θ(75°)	-1.13	0.28	1.82	0.72	-1.93	0.64	4.82	5.73	4.28	3.62	0.56	-4.52	-6.66	-7.28	-7.64	-10.53	-2.87	0.11	-1.50	-3.18	-6.69	-7.90	-5.68	-2.42
Θ(90°)	-2.65	-1.28	1.27	1.38	-1.53	0.67	3.80	4.32	3.53	2.97	0.12	-4.33	-3.43	-3.99	-5.95	-6.54	-1.76	-0.83	-2.34	-6.44	-10.06	-8.43	-4.74	-4.01
Θ(105°)	-1.52	-0.18	0.38	-1.31	-0.56	2.91	4.50	2.65	-1.05	-0.26	-2.01	-6.83	-5.41	-4.35	-3.97	-6.42	-3.19	-0.90	-2.02	-2.99	-6.48	-6.99	-6.04	-5.19
Θ(120°)	-1.29	-1.47	-1.59	-1.24	-1.59	0.15	1.71	2.58	2.90	1.02	-5.85	-4.46	-6.29	-7.70	-3.62	-0.85	-3.05	-6.00	-4.17	-8.46	-8.03	-7.28	-3.08	-0.88
Θ(135°)	-2.57	-5.27	-6.24	-6.19	-5.56	-4.54	-1.59	1.96	2.31	0.03	-1.69	-2.21	-2.32	-3.95	-6.01	-3.14	-2.54	-4.02	-2.33	-0.35	-2.85	-5.43	-6.19	-2.51
Θ(150°)	-1.90	-2.10	-2.35	-3.97	-5.80	-6.23	-5.01	-3.14	-3.88	-3.91	-2.50	-2.62	-4.03	-7.28	-12.12	-6.00	-2.52	-1.70	-2.35	-3.67	-5.16	-5.09	-3.35	-2.29
Θ(165°)	-8.26	-8.65	-9.43	-10.06	-10.47	-10.15	-10.62	-10.71	-8.22	-5.91	-4.78	-5.16	-6.27	-8.15	-11.36	-12.88	-9.21	-5.60	-3.99	-3.61	-4.35	-5.93	-7.80	-8.14
Θ(180°)	-6.97	-8.07	-8.70	-7.72	-7.64	-8.39	-10.30	-10.86	-9.85	-8.12	-7.38	-6.56	-6.27	-7.02	-8.66	-9.45	-9.72	-8.77	-8.61	-9.17	-8.80	-8.45	-7.08	-6.49
Freq(Hz)	5.2G	Pol.	Total	Ant. 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-4.61	-3.71	-3.91	-4.46	-5.11	-4.58	-3.85	-3.40	-3.05	-3.70	-4.06	-4.14	-3.61	-2.84	-3.16	-3.57	-3.83	-3.91	-3.97	-3.79	-3.50	-3.91	-3.37	-3.75
Θ(15°)	-8.35	-7.22	-4.19	-2.79	-1.40	-0.57	-1.05	-1.92	-4.94	-8.38	-12.44	-14.02	-15.79	-14.43	-14.40	-15.58	-15.53	-15.40	-11.11	-8.47	-8.72	-7.73	-8.41	-8.20
Θ(30°)	-15.36	-11.69	-6.41	-4.60	-1.81	1.61	1.89	0.08	-3.99	-5.82	-8.39	-8.89	-8.65	-8.53	-9.77	-12.63	-10.33	-7.61	-9.62	-13.51	-7.71	-6.46	-9.46	-10.64
Θ(45°)	-7.07	-7.64	-12.07	-5.93	-4.40	-1.20	0.15	-3.54	-8.78	-5.00	-2.73	-5.66	-10.70	-12.82	-6.65	-2.22	-6.52	-2.97	-4.69	-9.44	-4.75	-2.77	-3.35	-6.10
Θ(60°)	-4.58	-4.30	-6.70	-6.29	-5.80	-1.53	0.19	-3.86	-2.26	-0.24	-9.79	-7.21	-11.09	-12.64	-11.75	-3.14	-2.18	-2.12	-4.01	-10.15	-2.30	0.79	0.20	-3.44
Θ(75°)	-1.85	-3.38	-1.89	-3.93	-1.08	-1.50	-2.15	0.11	1.04	-3.73	-2.61	-4.22	-8.00	-5.80	-5.19	-4.61	-2.09	-3.58	-2.72	-6.77	-0.61	1.41	1.07	-1.38
Θ(90°)	-3.79	-1.75	-0.55	-2.75	-1.18	-2.61	-0.60	1.14	-1.34	-4.08	-1.42	-3.01	-6.32	-13.20	-2.20	-2.87	0.77	-3.48	-2.26	-2.58	-0.86	0.60	0.16	-3.56
Θ(105°)	-3.12	-1.44	-1.51	-1.60	-0.78	-3.17	-4.80	-1.54	-3.25	-9.05	-6.93	-11.17	-8.35	-14.37	-5.35	-2.79	-3.31	-5.79	-4.86	-4.83	-3.71	-2.99	-2.55	-4.82
Θ(120°)	-3.21	-3.01	-3.62	-3.32	-2.50	-5.14	-5.85	-4.70	-1.89	-6.31	-14.00	-8.93	-13.77	-14.39	-10.57	-7.29	-11.12	-10.42	-11.38	-5.98	-6.60	-4.61	-4.57	-5.47
Θ(135°)	-4.05	-5.46	-6.21	-4.76	-3.56	-2.61	-2.77	-6.21	-3.40	-5.48	-7.32	-10.02	-10.32	-15.30	-9.78	-10.02	-11.39	-11.95	-9.44	-6.09	-8.46	-7.17	-5.57	-6.57
Θ(150°)	-6.76	-6.70	-8.97	-7.18	-4.92	-3.90	-2.78	-4.56	-9.79	-10.69	-10.71	-10.31	-10.97	-15.12	-14.74	-8.99	-10.97	-11.95	-8.72	-5.61	-7.70	-7.46	-4.26	-5.95
Θ(165°)	-4.72	-3.73	-4.03	-3.21	-2.68	-3.32	-6.91	-14.56	-14.20	-9.90	-8.95	-9.58	-11.24	-13.05	-12.81	-12.77	-12.13	-16.01	-15.00	-16.03	-12.67	-7.82	-5.60	-3.11
Θ(180°)	-2.85	-4.18	-4.13	-4.27	-5.12	-7.13	-5.79	-4.80	-4.47	-5.02	-3.64	-2.52	-2.70	-2.77	-2.80	-2.06	-1.92	-1.92	-2.18	-2.65	-2.38	-2.34	-2.25	-2.88
Freq(Hz)	5.3G	Pol.	Total	Ant. 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-3.53	-3.03	-3.33	-2.73	-3.03	-2.27	-1.80	-1.51	-2.14	-2.54	-3.17	-2.57	-2.51	-3.14	-2.41	-1.72	-1.73	-1.89	-3.01	-2.45	-3.09	-2.88	-1.85	-2.83
Θ(15°)	-8.44	-7.44	-6.33	-4.52	-2.68	-1.39	-1.11	-2.31	-4.18	-7.10	-13.97	-11.89	-11.95	-9.63	-11.94	-12.18	-12.99	-13.10	-10.28	-8.37	-8.49	-7.69	-7.98	-8.49
Θ(30°)	-12.85	-14.00	-12.46	-5.12	-4.01	-1.69	0.72	-0.11	-4.38	-8.54	-9.98	-11.25	-7.37	-6.85	-11.35	-10.30	-8.77	-10.18	-15.80	-10.18	-4.81	-4.62	-5.66	-11.06
Θ(45°)	-4.26	-5.96	-7.51	-6.34	-2.74	-2.68	-0.29	-3.85	-7.26	-2.59	-3.17	-3.77	-8.71	-6.12	-4.94	-3.85	-7.65	-2.14	-8.98	-6.48	-2.92	-3.04	-5.08	-4.50
Θ(60°)	-2.36	-1.36	-3.65	-7.13	-3.02	-2.90	0.84	-3.89	-2.71	0.96	-5.29	-5.70	-5.87	-10.80	-13.26	-2.70	-4.74	-1.34	-6.85	-6.70	-2.38	-0.54	-0.66	-1.52
Θ(75°)	-0.48	-0.30	-2.59	-4.02	-1.80	0.48	-1.16	-0.75	2.23	-2.88	-4.40	-3.72	-8.88	-10.03	-4.59	-4.48	-2.22	-3.97	-7.12	-4.89	-1.44	-0.04	0.67	-0.05
Θ(90°)	-1.73	-1.81	-0.00	-3.60	-0.68	-0.74	-1.52	0.64	-0.24	-4.85	-2.28	-1.04	-4.66	-12.72	-4.12	-0.82	-0.38	-3.36	-3.93	-0.27	-0.60	0.09	0.44	-1.39
Θ(105°)	-2.58	-1.25	0.41	-2.51	-0.92	-2.23	-2.65	-1.54	-0.62	-8.14	-7.38	-9.65	-7.60	-12.30	-4.35	-2.90	-2.93	-6.93	-6.33	-2.95	-3.02	-2.90	-2.52	-4.85
Θ(120°)	-2.51	-1.97	-1.78	-4.19	-2.57	-4.25	-2.60	-3.79	-1.95	-5.27	-13.81	-11.74	-13.12	-11.95	-8.28	-5.59	-10.85	-10.93	-11.04	-4.97	-5.13	-3.60	-5.48	-4.93
Θ(135°)	-4.47	-3.01	-5.71	-4.13	-3.74	-2.97	-2.28	-3.55	-2.17	-5.27	-9.72	-10.64	-10.09	-15.59	-8.04	-8.90	-11.15	-12.56	-10.94	-5.53	-7.78	-9.95	-5.88	-5.34
Θ(150°)	-5.08	-6.13	-10.00	-12.91	-5.25	-3.15	-0.83	-2.73	-8.39	-9.50	-10.32	-10.88	-9.86	-15.87	-14.07	-7.66	-11.23	-12.78	-9.25	-6.02	-8.11	-7.64	-4.69	-5.10
Θ(165°)	-6.13	-5.04	-5.21	-5.05	-3.58	-3.69	-6.49	-7.87	-15.00	-12.77	-8.28	-10.59	-13.35	-13.99	-11.70	-10.99	-11.30	-15.41	-15.60	-13.59	-12.00	-8.66	-5.98	-3.59
Θ(180°)	-3.85	-3.38	-4.22	-5.95	-5.99	-7.55	-6.20	-5.14	-6.26	-6.14	-4.74	-3.52	-2.91	-3.44	-3.49	-3.32	-3.91	-3.38	-3.65	-4.13	-3.36	-3.12	-3.05	-3.77
Freq(Hz)	5.6G	Pol.	Total	Ant. 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-4.33	-4.04	-3.98	-4.27	-5.09	-3.15	-3.93	-3.83	-3.33	-4.22	-3.46	-3.63	-3.67	-3.18	-2.66	-3.42	-4.34	-4.56	-4.81	-4.12	-4.19	-4.49	-4.25	-4.61
Θ(15°)	-3.31	-4.23	-3.18	-4.55	-4.83	-6.51	-4.01	-2.25	-2.57	-5.86	-9.47	-6.28	-5.16	-5.24	-7.57	-10.35	-8.50	-7.48	-6.30	-7.29	-6.18	-2.98	-3.09	-3.50
Θ(30°)	-6.50	-7.81	-8.24	-8.78	-5.89	-1.96	-2.41	-5.55	-4.51	-11.83	-6.51	-8.75	-8.84	-13.98	-6.63	-4.81	-7.37	-8.36	-5.38	-5.97	-4.19	-4.95	-4.60	-5.41
Θ(45°)	-5.99	-5.04	-7.03	-7.03	-6.94	-1.31	-2.13	-1.96	-9.81	-8.29	-2.72	0.73	0.59	-2.66	-8.83	-10.41	-5.09	-4.75	-6.76	-4.69	-4.84	-2.23	-2.60	-3.33
Θ(60°)	-1.85	-3.63	-3.37	-4.10	-4.24	-2.35	-0.85	-1.77	-5.14	0.48	-1.00	-1.21	-2.76	-13.84	-2.87	-2.83	-8.18	-3.26	-5.42	-7.53	-2.99	0.61	0.98	0.79
Θ(75°)	0.55	0.19	-1.17	-0.91	-1.17	-0.44	0.43	-1.87	1.37	0.40	-8.40	-3.79	-7.13	-6.18	-10.73	-0.56	-9.90	-5.43	-5.39	-4.97	-0.32	0.45	1.04	0.77
Θ(90°)	-0.14	0.77	-0.19	-1.02	-3.24	0.71	1.38	-2																



Θ (135°)	-3.90	-2.62	-5.11	-3.56	-1.23	-1.03	-1.28	-1.48	-2.80	-5.61	-4.24	-1.65	-2.28	-2.54	-3.50	-10.25	-6.16	-7.13	-13.51	-13.34	-12.14	-6.38	-10.82	-9.60
Θ (150°)	-8.74	-6.87	-6.93	-5.45	-0.71	-0.66	-0.26	-1.17	-4.82	-10.40	-10.08	-9.70	-8.62	-8.83	-6.08	-6.70	-12.62	-13.48	-7.03	-14.76	-12.21	-12.55	-9.43	-5.85
Θ (165°)	-6.96	-7.67	-6.42	-5.47	-6.14	-8.25	-6.15	-3.63	-5.21	-9.92	-13.66	-11.79	-10.20	-10.25	-7.97	-8.24	-9.80	-9.16	-13.91	-15.01	-10.37	-9.12	-7.36	-6.40
Θ (180°)	-11.21	-11.41	-11.96	-11.75	-12.42	-12.46	-10.40	-9.22	-11.00	-13.44	-12.87	-11.26	-10.58	-8.69	-8.63	-11.09	-13.51	-15.57	-15.55	-13.96	-10.36	-9.52	-9.46	-10.20
Freq(Hz)	5.3G	Pol.	Total	Ant. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-7.07	-7.51	-7.28	-6.92	-7.97	-6.31	-6.24	-6.12	-6.33	-7.15	-7.31	-5.19	-5.81	-6.48	-5.83	-5.97	-5.85	-5.55	-6.71	-6.98	-6.55	-6.41	-5.58	-5.57
Θ (15°)	-5.27	-6.16	-5.92	-5.92	-5.88	-4.55	-2.95	-2.98	-5.49	-8.10	-11.05	-10.48	-9.43	-11.36	-10.22	-8.37	-12.03	-10.60	-9.02	-9.81	-9.56	-8.51	-6.78	-6.05
Θ (30°)	-1.90	-1.00	-1.81	-5.18	-7.73	-6.32	-6.99	-7.75	-10.28	-9.21	-12.95	-11.18	-11.98	-14.64	-11.14	-11.97	-7.56	-10.56	-15.16	-14.06	-9.81	-8.30	-7.27	-3.24
Θ (45°)	-7.67	-2.55	-2.35	-4.89	-8.15	-9.37	-4.85	-2.32	-3.00	-4.95	-3.15	-3.07	-5.53	-5.20	-6.15	-7.66	-4.27	-7.60	-9.84	-13.07	-10.05	-9.35	-8.97	-12.83
Θ (60°)	-6.60	-4.11	0.07	-1.71	-3.95	-0.56	-1.93	-0.94	-2.94	-2.43	-1.48	-6.18	-7.52	-5.83	-4.23	-4.22	-5.32	-5.63	-7.49	-11.86	-8.32	-7.17	-15.65	-9.29
Θ (75°)	-2.10	-0.73	-1.86	1.36	-2.07	-2.62	-2.98	0.48	0.25	0.48	-0.70	-4.33	-2.27	-3.21	-4.38	-3.96	-3.96	-3.96	-8.46	-9.18	-8.75	-10.74	-14.74	-4.05
Θ (90°)	0.51	1.24	-2.21	1.68	-2.05	-0.79	-2.64	1.97	1.48	0.27	0.39	-1.41	-0.69	-2.31	-2.45	-6.21	-3.14	-4.84	-2.99	-8.59	-8.35	-7.28	-6.53	-0.30
Θ (105°)	-5.19	-2.42	-0.77	2.72	1.26	2.71	2.07	2.81	2.60	1.64	1.52	0.40	-1.12	-3.21	-3.86	-8.18	-4.90	-9.26	-6.95	-10.89	-15.30	-5.02	-5.74	-0.86
Θ (120°)	-5.81	-2.01	0.08	-1.21	-0.28	2.85	2.43	0.76	1.91	0.98	-3.19	-0.97	-0.35	-1.14	-3.80	-8.14	-8.85	-14.91	-8.80	-12.01	-11.86	-9.06	-7.18	-10.04
Θ (135°)	-3.87	-3.51	-3.20	-1.32	-1.34	-1.90	-2.12	-2.89	-1.62	-4.45	-4.19	-2.55	-2.23	-2.72	-3.31	-10.30	-6.86	-5.86	-14.91	-13.34	-10.32	-8.66	-11.25	-8.61
Θ (150°)	-7.06	-7.23	-6.31	-3.71	0.21	-0.10	0.36	-1.66	-5.97	-9.25	-11.09	-11.21	-7.50	-7.52	-7.29	-5.58	-10.56	-13.85	-8.38	-15.97	-12.44	-14.42	-7.95	-4.35
Θ (165°)	-5.56	-5.98	-5.97	-5.71	-5.18	-5.88	-4.54	-3.93	-7.06	-11.31	-12.71	-10.93	-10.57	-8.44	-6.14	-7.20	-8.83	-10.57	-15.22	-15.81	-10.03	-8.84	-6.69	-4.35
Θ (180°)	-9.02	-9.85	-9.24	-10.46	-11.10	-11.08	-10.07	-9.35	-10.49	-11.63	-10.37	-8.81	-7.88	-7.99	-7.90	-9.30	-10.72	-13.46	-14.48	-10.79	-8.95	-8.45	-9.26	-8.08
Freq(Hz)	5.6G	Pol.	Total	Ant. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-7.01	-5.72	-6.35	-7.16	-7.87	-7.25	-6.12	-7.09	-7.55	-5.62	-5.89	-5.14	-7.91	-5.16	-5.27	-6.65	-7.25	-7.40	-7.10	-6.06	-6.09	-6.95	-4.92	-6.94
Θ (15°)	-8.60	-10.36	-10.55	-11.26	-8.78	-7.48	-8.18	-7.77	-4.11	-2.77	-3.96	-6.20	-7.65	-7.25	-8.67	-5.87	-7.55	-7.71	-5.54	-6.15	-7.47	-7.35	-8.55	-8.22
Θ (30°)	-10.23	-10.02	-11.40	-9.66	-8.15	-4.76	-5.64	-6.42	-7.06	-4.29	-1.76	-1.33	-1.92	-3.75	-6.02	-8.25	-15.34	-6.88	-8.49	-8.35	-8.22	-11.96	-11.08	-10.57
Θ (45°)	-4.79	-4.33	-6.49	-7.15	-4.82	-1.75	-8.04	-9.90	-15.12	-5.59	-2.93	-2.51	-3.12	-6.98	-9.72	-10.08	-8.43	-5.46	-9.84	-7.20	-12.94	-7.36	-5.21	-4.23
Θ (60°)	-8.19	-5.62	-1.15	-7.54	-4.45	-7.49	-5.49	-9.27	-5.03	-2.05	-6.04	-2.01	-2.91	-4.99	-3.45	-5.62	-7.22	-3.32	-7.60	-11.17	-7.93	-6.39	-11.15	-7.79
Θ (75°)	-1.82	-0.46	-2.72	-1.44	-1.46	-2.48	-3.64	-10.73	-4.83	1.19	-0.38	1.18	-1.69	-3.86	-3.50	-2.20	-5.04	-4.16	-6.14	-11.19	-7.36	-13.41	-10.71	-3.16
Θ (90°)	2.63	2.30	-1.30	3.42	-2.50	0.27	0.60	-0.74	0.55	3.01	-0.15	0.37	-2.00	-3.25	-5.02	-3.57	-3.97	-3.31	-5.22	-6.16	-6.36	-7.42	-5.11	0.81
Θ (105°)	-4.27	-2.53	-0.30	3.95	-1.42	3.18	2.23	3.57	4.15	3.32	1.38	0.82	-1.44	-2.78	-3.61	-8.99	-7.51	-8.26	-5.59	-7.57	-12.22	-4.67	-5.94	-2.24
Θ (120°)	-6.06	-1.50	1.07	-0.50	-2.89	3.41	2.97	2.77	1.54	-0.28	0.98	0.05	-1.08	-1.97	-3.89	-9.14	-8.76	-6.21	-14.21	-12.94	-8.43	-8.83	-8.30	-9.58
Θ (135°)	-2.88	-2.72	-1.18	0.14	0.19	0.46	-1.06	-1.06	0.67	-0.27	-2.90	-3.99	-3.19	-3.04	-2.55	-7.40	-11.23	-4.38	-11.27	-9.95	-7.62	-10.25	-10.72	-8.01
Θ (150°)	-4.96	-4.91	-5.12	-2.44	0.25	0.12	0.84	-4.33	-5.80	-5.71	-6.18	-4.36	-2.56	-4.31	-6.47	-10.17	-5.48	-9.10	-10.23	-11.28	-14.74	-14.55	-7.72	-4.66
Θ (165°)	-5.73	-5.40	-5.44	-4.04	-5.27	-4.91	-3.13	-6.19	-7.84	-7.94	-7.03	-8.42	-8.83	-4.88	-4.38	-1.47	-5.33	-10.74	-14.69	-14.92	-10.64	-8.92	-6.86	-5.23
Θ (180°)	-5.96	-6.19	-6.15	-8.58	-7.63	-6.36	-6.19	-5.39	-4.86	-4.64	-4.25	-5.18	-3.89	-3.79	-5.79	-6.67	-7.81	-8.20	-9.62	-8.62	-5.21	-4.28	-5.69	-4.04
Freq(Hz)	5.785G	Pol.	Total	Ant. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	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°)	-15.29	-14.35	-12.16	-15.72	-14.79	-12.32	-13.53	-12.74	-14.45	-12.89	-12.41	-11.00	-10.17	-12.88	-9.09	-8.33	-11.14	-10.27	-11.07	-13.33	-12.73	-11.40	-10.81	-11.31
Θ (15°)	-13.09	-11.78	-11.69	-12.76	-10.40	-8.51	-6.06	-5.01	-4.89	-5.62	-4.69	-4.35	-4.44	-4.24	-7.54	-11.96	-10.21	-7.78	-7.07	-5.58	-5.99	-5.39	-7.97	-8.96
Θ (30°)	-10.78	-12.89	-11.83	-9.79	-12.43	-6.89	-1.86	-0.63	-2.34	-2.75	-2.41	-3.59	-3.21	-2.33	-4.12	-8.46	-13.36	-12.07	-8.81	-6.18	-7.50	-6.32	-6.42	-11.17
Θ (45°)	-2.37	-2.52	-10.83	-4.12	-4.80	-2.15	-1.46	-3.68	-3.40	-1.52	-1.26	-2.41	-4.70	-6.11	-11.47	-8.68	-13.44	-11.68	-10.56	-8.15	-7.15	-7.83	-3.82	-2.01
Θ (60°)	-6.83	-4.52	-2.90	-5.20	-4.90	-4.09	-7.59	-5.81	-1.20	-1.11	-2.38	-3.30	-5.33	-6.01	-12.72	-1.86	-7.75	-5.74	-4.19	-5.35	-12.34	-5.77	-8.55	-6.51
Θ (75°)	-2.00	-2.21	-4.36	-3.81	1.73	-2.14	-6.29	-8.27	-0.05	-0.94	2.71	1.96	-0.06	-1.83	-8.77	-1.43	-5.07	-4.50	-3.21	-6.55	-7.99	-9.29	-3.98	-4.37
Θ (90°)	1.61	1.33	-3.23	3.77	2.62	0.40	-0.02	-2.00	0.96	-0.89	0.85	1.51	-0.21	0.54	-2.48	-2.17	-7.01	0.03	-2.63	-4.28	-8.28	-7.14	-4.60	1.06
Θ (105°)	-4.08	-2.71	0.75	2.41	-2.04	2.57	1.98	3.29	2.27	2.40	1.05	2.27	0.14	-0.83	-3.32	-4.97	-11.20	-3.56	-6.13	-4.94	-7.27	-5.84	-5.29	-1.79
Θ (120°)	-6.05	-2.89	0.87	-2.61	0.25	2.06	2.27	2.55	1.45	1.36	2.14	1.29	0.97	-1.34	-2.98	-3.86	-9.54	-7.13	-12.24	-14.56	-11.31	-8.76	-8.19	-7.02
Θ (135°)	-5.93	-3.65	0.82	1.58	1.40	-2.90	-1.94	1.81	-0.24	-0.82	-4.16	-1.28	-0.87	-2.80	-2.05	-5.72	-10.16	-6.47	-6.08	-8.63	-7.30	-10.66	-8.84	-8.69
Θ (150°)	-4.53	-5.75	-5.00	-2.10	0.27	-0.49	-1.85	-3.51	-1.18	-3.11	-3.58	-2.36	-1.24	-2.03	-4.66	-8.77	-8.76	-10.09	-15.11	-10.82	-11.42	-13.05	-8.74	-5.89
Θ (165°)	-5.06	-6.91	-5.40	-4.60	-5.69	-3.85	-2.93	-5.81	-3.14	-2.83	-4.46	-8.26	-6.86	-5.89	-3.49	-0.27	-3.44	-9.75	-16.02	-15.02	-15.44	-10.20	-5.83	-4.01
Θ (180°)	-4.44	-6.70	-7.13	-8.30	-7.46	-5.61	-5.65	-5.89	-5.42	-4.53	-3.80	-2.89	-3.54	-3.40	-3.59	-4.41	-4.13	-4.45	-7.86	-7.55	-4.81	-4.47	-4.76	-4.81

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

