



Antenna Pattern of 2.4GHz and 5GHz UNII 1~3

Appendix D

Theta (°)	9.71-7.75	9.32-10.34	-11.54/-9.99	-10.57/-7.98	-7.06/-6.51	-8.65/-7.56	-6.72/-6.36	-5.07/-5.95	-6.05/-6.16	-7.23/-7.80	-8.80/-8.64	-7.04/-6.89	-6.90/-6.72	-6.89/-6.56	-7.25/-10.47	-9.13/-7.67	-8.65/-10.02	-8.46/-6.88	-8.09/-10.06	-10.78/-12.45	-10.81/-10.24	-11.97/-10.23	-8.11/-6.52	-7.16/-11.57
Theta (30°)	-8.13/-6.79	-5.43/-7.89	-11.39/-8.56	-5.78/-5.45	-4.21/-3.97	-5.20/-8.32	-13.52/-15.42	-15.01/-15.42	-12.88/-12.34	-13.19/-10.63	-7.98/-6.16	-4.75/-5.00	-7.52/-10.19	-10.56/-10.56	-5.29/-5.27	-9.58/-6.67	-5.49/-3.92	-3.58/-4.63	-8.01/-10.46	-9.56/-9.28	-6.71/-5.22	-3.92/-3.86	-4.31/-4.98	-7.37/-5.60
Theta (45°)	-2.73/-5.77	-4.26/-5.13	-6.03/-6.68	-5.27/-7.31	-4.69/-3.79	-3.20/-2.04	-1.23/-0.55	-0.63/-1.53	-2.59/-2.83	-4.74/-6.27	-8.52/-3.83	-9.98/-8.80	-7.23/-9.93	-7.07/-5.11	-5.41/-3.95	-5.18/-3.95	-2.99/-3.37	-4.44/-4.89	-6.00/-6.91	-6.15/-5.11	-4.68/-5.25	-4.35/-3.79	-3.68/-3.45	-2.08/-3.53
Theta (60°)	-2.83/-4.21	-1.59/-3.22	-3.20/-3.24	-3.17/-2.06	-1.24/-2.29	-1.74/-1.89	-1.20/-1.44	-1.85/-1.15	-0.73/-0.66	-1.78/-3.56	-5.83/-6.14	-5.55/-5.85	-8.12/-6.87	-4.63/-6.11	-7.09/-3.44	-3.88/-4.00	0.28/-1.39	-5.43/-5.17	-4.19/-5.69	-6.32/-3.59	-6.00/-2.02	-3.92/-5.51	-3.79/-1.65	-2.04/-0.84
Theta (75°)	-4.70/-4.42	-2.53/-1.73	-5.03/-1.86	-3.19/-1.69	-3.92/-1.98	-4.53/-5.70	-4.74/-6.39	-4.16/-3.32	-3.58/-5.33	-5.40/-7.95	-4.71/-3.48	-5.22/-5.80	-5.31/-5.48	-4.27/-4.72	-8.33/-4.30	-5.20/-4.01	-1.08/-4.84	-3.56/-2.74	-6.20/-4.52	-4.00/-3.96	-3.41/-3.21	-3.91/-4.63	-5.51/-8.00	-3.23/-2.52
Theta (90°)	-3.65/-3.16	-2.30/-0.81	-1.97/-2.25	-1.24/-1.74	-0.47/-1.45	-0.90/-1.13	-0.64/-0.69	-1.10/-0.39	-0.27/-1.77	-3.11/-2.28	-4.26/-2.48	-5.12/-3.37	-3.75/-3.83	-4.03/-6.52	-4.56/-2.41	-2.15/-2.69	-5.25/-2.41	-3.34/-2.28	-2.59/-3.04	-3.34/-2.28	-2.66/-4.33	-3.96/-3.38	-5.00/-2.74	-4.50/-6.15
Theta (105°)	-3.58/-3.03	-2.68/-3.82	-3.23/-1.56	0.39/-1.09	-2.10/-0.25	-0.58/-0.62	-0.46/-0.02	-0.68/-0.44	-0.46/-0.07	-0.06/-5.95	-1.34/-2.69	-3.46/-3.91	-3.13/-4.94	-4.32/-5.01	-3.77/-4.00	-3.63/-5.29	-3.16/-2.35	-3.23/-2.71	-2.49/-0.33	-0.93/-3.62	-5.94/-7.90	-5.10/-2.24	-5.97/-2.81	-0.94/-8.88
Theta (120°)	-3.69/-2.31	-2.88/-1.95	-2.90/-2.09	-2.59/-1.74	-1.31/-0.81	-0.92/-1.49	-0.94/-1.50	-0.97/-2.31	-2.47/-0.80	-1.99/-1.59	-1.30/-1.30	-2.77/-4.33	-1.78/-5.39	-7.40/-4.90	-4.15/-3.78	-2.70/-2.13	-4.95/-2.14	-0.62/-0.80	-1.70/-2.33	-2.33/-2.41	-0.62/-4.72	-6.54/-1.63	-6.47/-6.80	
Theta (135°)	-0.52/-0.79	-2.49/-5.21	-4.36/-1.10	-0.88/-1.11	-0.80/-1.79	-2.45/-2.32	-0.49/-1.84	-0.14/-0.71	-0.53/-0.58	-4.36/-3.93	-3.93/-2.12	-6.91/-4.49	-4.35/-5.44	-2.34/-1.62	-0.84/-0.96	-1.80/-2.67	-0.78/-2.11	-1.02/-1.01	-1.67/-0.72	0.06/-2.33	-0.69/-1.64	-0.00/-0.77	-1.10/-2.70	
Theta (150°)	-0.14/-3.16	-6.43/-6.36	-3.64/-4.15	-1.35/-0.17	1.750/-5.7	2.271/8.9	1.86/-0.03	2.851/9.6	-1.22/-1.40	-0.10/-1.44	-1.24/-0.35	9.271/13.85	-5.10/-2.61	6.31/-2.49	-5.65/-3.14	0.18/-1.76	-1.39/-2.03	0.580/3.3	0.22/-3.14	-1.91/-0.70	-2.19/-7.55	-0.77/-0.93	-0.09/-1.28	-2.63/-6.75
Theta (165°)	-2.47/-4.49	-6.42/-5.75	-6.59/-9.45	-3.77/-1.11	-3.92/-7.10	-3.99/-2.43	-1.80/-2.43	-0.52/-2.93	-4.14/-4.07	-2.86/-2.42	-5.09/-6.30	-7.62/-9.14	-3.06/-0.96	-4.31/-7.02	-2.46/-1.19	-2.59/-1.56	-1.62/-3.30	-2.15/-3.83	-0.25/-0.81	-1.76/-2.04	-0.67/-3.69	-0.73/-2.87	-1.81/-1.41	-2.96/-4.17
Theta (180°)	-1.40/-3.57	-9.07/-15.34	-5.52/-4.91	-3.91/-0.39	-2.66/-2.70	-3.03/-5.44	-3.54/-3.78	-2.42/-2.53	-4.30/-7.88	-5.55/-4.53	-10.62/-8.91	-6.84/-2.44	-3.47/-5.77	-4.85/-2.26	0.16/-2.54	-1.99/-3.15	0.53/-0.65	-0.24/-0.26	-1.35/-0.89	-2.20/-8.71	0.78/-0.51	-0.59/-1.72	-0.38/-2.00	
Theta (225°)	-5.07/-4.29	-10.85/-15.37	-15.36/-11.55	-15.79/-5.35	-4.35/-3.32	-5.34/-11.91	-9.95/-6.43	-6.27/-8.83	-10.27/-9.99	-6.58/-15.14	-8.29/-5.87	-5.56/-7.67	-0.07/-2.66	-1.46/-8.71	-5.89/-3.19	-4.82/-5.82	-3.67/-3.82	-2.80/-3.91	-1.21/-2.65	-4.01/-3.23	-2.23/-9.89	-1.29/-5.37	-3.84/-3.23	-4.54/-4.33
Theta (240°)	-3.49/-5.29	-4.34/-3.16	-4.47/-3.27	-3.04/-6.53	-4.14/-6.08	-9.60/-11.87	-9.29/-7.69	-7.44/-5.28	-9.72/-8.15	-14.85/-13.76	-11.63/-7.84	-7.35/-4.76	-4.60/-1.48	-2.76/-7.82	-3.51/-3.07	-1.36/-3.68	-4.37/-4.84	-8.99/-8.92	-5.38/-2.70	-6.51/-11.30	-10.52/-8.18	-8.52/-5.78	-3.73/-6.28	
Theta (255°)	-6.652/0.1	-6.15/-4.64	-4.45/-4.35	-6.47/-9.23	-5.43/-4.04	-3.18/-1.12	-9.30/-6.89	-15.65/-10.03	-9.24/-2.43	-5.01/-2.80	-8.85/-6.56	-5.80/-6.00	-4.82/-7.74	-4.42/-2.60	-2.16/-2.34	-2.96/-5.04	-2.18/-1.43	-2.83/-2.77	-3.65/-6.51	-6.91/-10.33	-7.57/-5.61	-1.59/-2.38	0.45/-2.01	
Theta (270°)	0.46/-3.88	0.50/-7.92	-5.21/-8.31	-5.42/-2.87	-0.65/-3.52	-5.26/-5.57	-6.66/-6.45	-6.19/-6.89	-7.30/-8.79	-10.83/-12.66	-3.94/-4.84	-9.77/-6.97	-7.59/-4.56	-3.63/-7.69	-4.46/-0.81	-1.76/-5.06	-15.42/-13.93	-12.60/-9.90	-10.67/-9.88	-11.71/-9.18	-9.44/-7.07	-8.45/-7.85	-5.15/-5.85	-4.62/-1.78
Theta (285°)	-5.02/-5.88	-7.13/-5.11	-8.37/-6.25	-8.19/-7.84	-7.07/-7.85	-13.06/-10.39	-10.28/-12.65	-11.40/-7.92	-10.88/-10.86	-11.93/-10.74	-5.27/-3.29	-4.57/-4.00	-3.79/-4.16	-1.44/-3.66	-6.90/-3.47	-2.49/-5.00	-6.95/-1.37	-5.71/-9.63	-7.13/-8.74	-14.25/-11.65	-9.37/-11.98	-8.89/-5.68	-11.00/-6.64	-4.62/-12.06
Theta (300°)	-2.16/-2.33	-3.61/-5.11	-9.03/-7.91	-10.01/-14.68	-8.96/-6.57	-7.22/-5.56	-5.24/-8.97	-12.91/-13.38	-10.69/-5.46	-6.72/-7.72	-5.24/-3.99	-3.26/-2.17	-2.98/-2.53	-3.00/-5.00	-3.18/-3.09	-6.89/-6.99	-5.49/-3.51	-3.55/-4.08	-5.62/-3.30	-3.24/-8.73	-9.92/-8.86	-5.60/-5.03	-6.72/-6.80	-4.61/-2.03
Theta (315°)	-8.62/-3.33	-3.49/-5.77	-3.90/-6.66	-7.77/-8.85	-5.30/-2.19	-1.89/-3.02	-4.76/-7.29	-9.29/-12.83	-12.36/-8.31	-4.11/-3.13	-1.85/-0.84	0.12/-0.36	-1.19/-1.48	0.180/3.2	0.05/-0.21	-1.38/-2.66	-6.67/-13.03	-7.20/-3.34	-4.60/-4.21	-3.57/-5.64	-7.24/-8.65	-9.29/-7.28	-4.21/-3.15	-6.31/-11.98
Theta (330°)	-1.56/-1.59	-8.33/-5.29	-7.96/-8.61	-3.66/-2.75	-2.08/-1.88	-2.36/-4.08	-4.70/-3.87	-3.52/-3.02	-1.85/-1.07	0.700/9.8	0.841/5.3	1.911/9.7	2.543/1.4	3.412/8.1	1.25/-0.02	0.040/0.9	-1.09/-2.58	-4.23/-4.92	-5.25/-6.17	-7.90/-7.04	-7.14/-6.19	-6.25/-4.12	-3.32/-6.77	-4.45/-2.78
Theta (345°)	-2.85/-1.08	-8.53/-4.98	-1.61/-1.03	-2.41/-4.53	-4.71/-3.54	-1.86/-4.01	-0.04/-0.44	-0.36/-0.49	-0.36/-0.23	0.040/6.6	1.531/6.1	2.142/7.1	2.912/9.7	2.641/8.2	0.61/-0.89	-0.30/-3.19	-3.70/-4.75	-4.66/-5.27	-5.95/-5.26	-4.34/-5.35	-4.45/-4.10	-4.68/-6.17	-5.33/-4.01	-2.14/-1.09
Theta (360°)	-4.02/-5.75	-4.10/-3.04	-2.64/-4.53	-1.62/-4.02	-1.46/-0.54	0.10/-0.52	-1.93/-1.47	-0.55/-1.74	-2.02/-1.56	-1.21/-1.68	-1.58/-1.41	-1.13/-1.49	-1.96/-1.39	-1.01/-0.85	-1.00/-1.20	-1.67/-1.91	-2.40/-2.83	-2.89/-2.88	-3.06/-3.02	-2.84/-2.11	-3.10/-3.35	-3.21/-1.79	-1.59/-0.77	-4.03/-2.62
Freq(Hz)	2.450/Pol.	TotalAnt 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Phi(°)Phi(7.5°)	Phi(15°)Phi(22.5°)	Phi(30°)Phi(37.5°)	Phi(45°)Phi(52.5°)	Phi(60°)Phi(67.5°)	Phi(75°)Phi(82.5°)	Phi(90°)Phi(97.5°)	Phi(105°)Phi(112.5°)	Phi(120°)Phi(127.5°)	Phi(135°)Phi(142.5°)	Phi(150°)Phi(157.5°)	Phi(165°)Phi(172.5°)	Phi(180°)Phi(187.5°)	Phi(195°)Phi(202.5°)	Phi(210°)Phi(217.5°)	Phi(225°)Phi(232.5°)	Phi(240°)Phi(247.5°)	Phi(255°)Phi(262.5°)	Phi(270°)Phi(277.5°)	Phi(285°)Phi(292.5°)	Phi(300°)Phi(307.5°)	Phi(315°)Phi(322.5°)	Phi(330°)Phi(337.5°)	Phi(345°)Phi(352.5°)
Theta (0°)	-4.85/-5.39	-6.84/-6.05	-6.31/-6.75	-7.23/-7.50	-6.65/-5.96	-6.35/-7.71	-7.43/-2.25	-5.87/-6.02	-6.25/-6.39	-6.41/-6.24	-5.78/-5.37	-5.11/-4.98	-5.04/-5.37	-5.52/-5.50	-5.69/-5.75	-6.11/-6.72	-6.88/-6.15	-5.43/-5.52	-7.00/-7.50	-5.99/-4.45	-4.05/-4.55	-5.12/-5.26	-5.26/-5.19	-5.11/-5.31
Theta (7.5°)	-5.69/-6.02	-6.17/-6.10	-6.06/-6.24	-6.35/-6.56	-5.05/-4.65	-5.38/-6.65	-6.67/-5.40	-4.49/-6.46	-6.03/-5.34	-5.58/-5.38	-5.58/-5.38	-5.57/-5.82	-6.24/-6.83	-7.28/-7.46	-7.41/-7.65	-8.29/-9.00	-8.97/-8.38	-8.14/-8.46	-9.64/-9.58	-8.34/-6.69	-6.30/-6.35	-6.46/-6.84	-6.42/-9.57	-5.70/-5.70
Theta (15°)	-7.11/-7.22	-7.01/-6.74	-6.69/-6.87	-6.98/-6.38	-5.31/-6.44	-4.80/-5.47	-6.25/-5.95	-4.81/-6.14	-4.90/-5.47	-5.93/-5.91	-5.74/-5.56	-5.80/-6.16	-6.24/-6.02	-6.71/-7.07	-10.96/-10.51	-10.10/-10.56	-9.93/-9.09	-8.82/-9.85	-12.49/-12.89	-11.87/-11.90	-12.19/-10.61	-9.47/-8.84	-8.01/-7.65	
Theta (22.5°)	-8.37/-8.66	-8.84/-9.46	-9.78/-9.18	-8.10/-7.37	-6.53/-5.79	-5.21/-5.03	-5.29/-5.54	-5.42/-5.88	-6.69/-7.75	-8.52/-8.62	-8.15/-7.67	-7.61/-7.69	-8.37/-9.59	-11.35/-11.82	-10.66/-10.71	-10.06/-8.97	-8.01/-7.48	-7.62/-9.32	-12.32/-11.86	-11.19/-11.45	-11.21/-7.59	-5.78/-5.86	-6.87/-7.66	-7.96/-8.37
Theta (30°)	-8.52/-9.06	-10.99/-13.46	-11.94/-8.61	-6.87/-7.77	-7.33/-8.31	-9.20/-8.70	-7.73/-6.67	-5.78/-5.52	-5.32/-5.28	-6.00/-7.06	-8.57/-9.40	-10.13/-9.53	-8.37/-7.24	-7.14/-7.05	-7.83/-9.39	-10.73/-9.33	-7.12/-5.90	-5.65/-6.70	-8.47/-11.04	-8.87/-8.48	-6.99/-6.68	-4.20/-3.45	-3.78/-4.79	-6.27/-8.01
Theta (37.5°)	-7.71/8.27	-11.67/-13.25	-9.76/-7.30	-6.47/-7.34	-8.49/-8.16	-7.24/-6.52	-5.59/-5.02	-4.34/-3.93	-3.13/-2.70	-2.91/-3.78	-5.10/-7.18	-10.13/-13.25	-9.51/-6.40	-5.33/-4.91	-5.78/-8.74	-14.29/-10.37	-5.76/-4.04	-3.84/-4.91	-6.31/-8.23	-6.63/-5.13	-4.97/-6.49	-5.01/-3.88	-3.71/-5.06	-7.62/-8.65
Theta (45°)	-4.23/-5.00	-8.13/-9.28	-7.22/-5.51	-4.95/-4.37	-3.08/-1.55	-0.50/-0.20	-0.82/-1.72	-2.17/-2.44	-2.15/-1.88	-1.98/-2.58	-3.28/-3.80	-5.38/-9.59	-11.58/-7.17	-4.88/-4.32	-5.13/-8.29	-14.05/-8.84	-4.54/-3.10	-3.35/-4.49	-4.56/-4.46	-3.83/-3.80	-4.37/-4.14	-6.69/-5.00	-4.66/-7.29	-11.89/-6.98
Theta (52.5°)	-1.03/-2.16	-4.87/-6.07	-4.59/-2.64	-1.16/-0.02	0.590/8.5	1.091/3.7	1.200/9.1	0.26/-0.48	-0.60/-0.80	-1.11/-1.44	-1.44/-1.90	-3.36/-4.66	-8.64/-6.95	-4.62/-3.48	-4.52/-0.89	-10.51/-5.71	-3.04/-2.84	-3.52/-3.73	-2.53/-2.03	-2.19/-3.33	-3.91/-3.54	-5.46/-4.15	-4.66/-9.13	-8.04/-2.74
Theta (60°)	-1.11/-1.94	-3.20/-4.80	-3.88/-1.54	0.611/7.2	1.831/5.8	1.351/6.4	2.032/3.7	1.720/6.7	0.13/-0.84	-1.62/-0.67	0.650/7.5	-0.52/-1.26	-3.61/-4.80	-4.89/-3.42	-3.77/-7.03	-8.04/-6.44	-2.85/-2.72	-2.27/-1.05	-0.26/-1.14	-2.39/-3.13	-2.62/-3.59	-3.71/-2.62	-3.73/-6.38	-3.32/-2.20
Theta (67.5°)	-2.07/-3.20	-2.56/-5.20	-4.40/-2.31	0.040/7.7	0.420/11.1	-0.210/0.3	-0.11/-0.23	-0.64/-1.61	-1.50/-2.68	-1.53/-1.36	0.141/1.4	0.370/1.5	-0.23/-1.30	-3.39/-2.82	-2.79/-4.59	-4.66/-3.78	-2.78/-3.28	-1.000/8.0	0.46/-1.37	-2.46/-2.25	-1.97/-2.85	-2.21/-1.38	-2.30/-2.31	-1.51/-1.05
Theta (75°)	0.550/9.8	-2.35/-5.14	-5.56/-6.53	-5.05/-4.32	-4.08/-2.98	-2.98/-3.32	-4.07/-5.00	-8.20/-11.38	-9.03/-7.04	-8.63/-10.13	-4.15/-9.98	-0.260/6.5	1.761/4.5	-0.42/-1.96	-1.77/-1.51	-1.28/-2.20	-4.16/-4.40	-1.290/7.7	0.55/-0.53	-1.50/-1.83	-1.40/-1.44	-		



Antenna Pattern of 2.4GHz and 5GHz UNII 1~3

Appendix D

Theta	Phi	Gain	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(75°)	Phi(0°)	-8.88-7.89	-5.65-5.82	-4.88-2.43	-4.28-0.48	-1.000-27	1.230-11	0.090-22	0.80-0.81	-2.19-1.18	-1.01-0.78	-4.41-5.29	-8.26-6.03	-2.64-2.02	-3.32-1.95	-1.04-3.03	-4.24-0.76	-1.62-1.25	-1.46-0.71	-0.380-55	-1.39-1.32	-0.25-2.35	0.73-1.09	-3.88-4.27	-2.67-3.32	
Theta(82.5°)	Phi(0°)	-6.11-9.95	-7.40-10.66	-4.85-2.23	-3.47-0.43	-2.15-1.09	1.15-1.33	-0.17-1.41	-0.94-0.11	-1.95-0.72	-3.33-1.67	-6.81-11.49	-15.66-8.28	-0.36-3.39	0.33-0.58	-0.74-0.57	-3.22-1.56	0.94-2.90	1.55-1.25	1.95-1.88	0.92-0.93	1.14-0.79	0.70-0.40	-2.92-3.80	-1.21-1.94	
Theta(90°)	Phi(0°)	0.27-4.47	-1.36-6.71	-2.40-3.68	-3.67-1.17	-5.27-0.88	-2.32-4.52	-4.04-4.68	-0.50-1.0	-1.77-1.51	-3.73-0.47	-8.48-8.42	-9.27-5.37	-2.96-1.31	2.07-1.31	-2.66-0.02	-1.15-0.91	1.54-2.25	0.34-0.00	1.98-2.31	0.36-1.25	0.36-1.25	-0.24-1.40	-3.00-5.04	-1.77-1.73	
Theta(97.5°)	Phi(0°)	0.34-0.53	-6.61-4.13	-2.37-6.00	-10.72-1.82	-8.14-5.12	-6.62-10.91	-12.40-9.67	5.84-2.69	-5.28-2.17	-4.32-2.29	-1.88-10.09	-13.64-2.41	-1.93-3.11	0.77-0.33	-0.93-0.72	-1.60-2.65	1.48-1.12	1.45-1.39	2.22-2.35	2.18-1.01	-4.48-0.15	0.63-0.57	-2.04-3.16	1.03-0.42	
Theta(105°)	Phi(0°)	-3.40-5.10	-3.80-4.41	-6.50-5.45	-12.78-1.85	-6.52-7.04	-5.32-3.14	-7.44-8.76	-3.11-6.27	-10.87-11.20	-10.46-5.46	-5.01-4.77	-6.69-5.28	-3.45-3.75	-0.09-4.32	-2.05-3.00	-2.61-2.13	1.07-0.99	2.17-1.31	1.50-0.11	-0.34-0.17	-2.80-1.16	1.05-2.87	-10.94-4.40	0.60-2.21	
Theta(112.5°)	Phi(0°)	0.40-2.15	-4.22-3.03	-2.22-6.11	-14.96-9.46	-12.02-6.13	-4.76-6.45	-6.50-4.73	-6.61-1.79	-4.76-1.89	-6.19-5.20	-1.75-1.76	0.62-2.34	-4.20-8.23	-1.75-1.76	0.62-2.34	-4.20-8.23	-1.75-1.76	0.62-2.34	-4.20-8.23	-1.75-1.76	0.62-2.34	-4.20-8.23	-1.75-1.76	0.62-2.34	-4.20-8.23
Theta(120°)	Phi(0°)	-2.51-2.44	-4.78-1.25	-5.16-6.23	-10.46-4.43	-3.33-12.36	-12.14-9.84	9.78-9.05	-7.06-3.44	-1.90-1.87	-3.93-6.09	-2.04-12.10	-7.22-7.71	-4.35-3.67	-3.56-2.42	-5.58-10.94	-14.96-7.08	-2.34-6.04	-8.09-7.30	-7.70-5.65	-3.75-2.72	-5.00-10.21	-9.05-14.64	-9.70-7.48	-1.07-1.44	
Theta(127.5°)	Phi(0°)	-12.83-1.88	-6.74-11.54	-11.84-11.31	-9.13-7.77	-6.41-4.65	-8.32-1.42	-2.83-6.76	-6.87-4.08	-4.83-1.64	-4.90-13.44	-7.05-9.38	-12.44-8.66	-5.64-6.17	-8.00-8.40	-14.07-11.21	-10.90-8.79	-6.35-6.79	-7.27-3.67	-5.25-4.07	-8.77-6.71	-15.24-13.22	-6.60-5.62	-8.33-11.38	0.53-0.79	
Theta(135°)	Phi(0°)	-2.97-5.01	-4.51-3.61	-5.56-12.92	-12.65-7.37	-7.25-11.78	-12.61-12.56	-9.38-9.01	-5.51-7.40	-9.78-11.81	-11.15-12.57	-9.87-12.60	-10.78-4.48	-8.03-7.90	-10.28-13.25	-9.78-6.83	-10.90-8.65	-4.31-6.68	-8.63-10.89	-15.05-9.60	-6.41-5.78	-3.90-6.64	-12.91-15.00	-3.89-1.18	-4.55-8.49	
Theta(142.5°)	Phi(0°)	-1.93-3.89	-3.34-1.37	-2.14-5.71	-7.88-10.03	-10.83-9.15	-9.51-10.56	-15.25-9.72	-6.02-4.51	-6.83-11.62	-10.05-5.21	7.00-11.30	-3.82-4.05	-2.54-2.90	-6.77-8.29	-2.93-3.72	-6.69-8.04	-6.27-3.05	-2.88-4.57	-3.12-2.07	-3.83-7.99	-6.69-6.68	-7.55-6.74	-3.75-5.67	-4.31-1.77	
Theta(150°)	Phi(0°)	-3.61-4.73	-4.06-5.58	-7.71-12.05	-8.31-7.85	-6.46-9.10	-8.57-7.20	-5.94-6.05	-10.36-11.84	-14.27-7.62	-4.06-5.28	-5.85-6.88	-3.10-1.19	0.13-1.14	-2.89-3.65	-6.84-9.94	-7.74-6.95	-5.41-2.84	-3.42-5.78	-11.31-12.28	-7.65-3.78	-10.99-7.71	-6.89-6.46	0.32-1.26	-1.03-0.26	
Theta(157.5°)	Phi(0°)	-0.93-3.73	-0.89-10.70	-6.75-8.13	-6.50-6.42	-7.01-9.39	-8.70-10.26	-7.95-9.32	-11.81-13.35	-9.93-4.97	-3.55-4.13	-5.07-1.80	-0.44-0.57	0.20-1.12	-0.05-0.13	-2.53-7.08	-10.90-13.69	-13.35-8.13	-4.71-4.45	-5.65-9.79	-14.81-7.72	-6.72-7.34	-3.22-0.03	0.35-0.89	-0.83-0.70	
Theta(165°)	Phi(0°)	-4.84-8.59	-8.14-6.92	-7.28-6.13	-3.78-1.78	-1.69-1.54	-2.13-2.37	-2.10-1.57	-2.55-3.32	-4.77-4.68	-3.12-2.22	-2.13-1.69	-0.70-0.03	-0.26-1.98	-5.43-6.80	-6.50-7.88	-8.56-8.81	-9.27-7.42	-6.31-5.15	-3.47-2.49	-2.37-1.02	-0.75-0.26	1.51-1.56	0.99-0.81	-0.83-2.99	
Theta(172.5°)	Phi(0°)	-0.70-0.55	-0.88-1.55	-0.90-0.21	0.24-0.06	0.09-0.17	-0.45-0.51	-0.98-1.62	-1.97-1.82	-1.35-0.55	-0.16-0.11	0.66-1.24	1.42-1.24	0.60-0.51	-1.43-1.51	-1.81-1.79	-1.67-2.41	-2.76-2.50	-2.29-2.22	-1.49-0.94	-0.18-0.03	0.94-1.78	2.85-1.63	-1.05-3.49	-4.62-1.96	
Theta(180°)	Phi(0°)	-1.41-0.64	-1.04-0.13	2.36-3.51	4.15-6.61	4.75-4.15	4.04-3.70	3.64-3.57	3.22-2.96	3.10-3.11	3.16-2.87	2.77-2.00	3.11-3.11	3.16-2.87	2.77-2.00	3.11-3.11	3.16-2.87	2.77-2.00	3.11-3.11	3.16-2.87	2.77-2.00	3.11-3.11	3.16-2.87	2.77-2.00	3.11-3.11	3.16-2.87
Phi(75°)	Theta(0°)	-13.78-15.43	-15.61-15.59	-14.52-15.64	-14.87-15.64	-14.87-15.64	-14.87-15.64	-15.16-15.37	-15.78-14.94	-15.90-15.03	-15.89-15.79	-15.14-15.79	-15.74-15.13	-15.84-15.53	-15.41-14.83	-15.14-15.11	-15.20-13.85	-15.04-14.90	-15.06-15.24	-14.52-13.85	-15.00-15.23	-14.66-15.86	-13.87-14.74	-14.66-13.73		
Phi(75°)	Theta(7.5°)	-13.24-15.27	-15.54-16.24	-15.21-15.40	-15.74-15.23	-14.34-13.59	-12.35-13.17	-13.94-11.87	-12.12-12.24	-13.04-13.38	-15.07-15.61	-14.98-15.15	-15.85-14.83	-14.47-13.72	-13.23-13.56	-13.97-12.64	-12.12-12.24	-12.72-13.31	-12.71-13.54	-14.12-12.70	-13.55-15.00	-12.53-13.93	-13.81-12.83	-13.00-10.55	-11.92-12.80	
Phi(75°)	Theta(15°)	-10.86-10.34	-10.24-11.09	-10.02-9.64	-9.53-13.91	-12.93-11.17	-9.75-9.47	-8.81-8.22	-8.72-9.00	-9.11-8.75	-8.03-8.27	-8.87-10.92	-12.02-10.28	-12.70-13.22	-12.36-12.00	-10.29-9.39	-10.81-11.82	-11.95-15.09	-15.62-15.54	-14.70-14.11	-13.51-12.46	-12.27-10.87	-9.24-6.93	-5.24-7.77	-10.34-9.99	
Phi(75°)	Theta(22.5°)	-11.59-10.46	-9.97-9.33	-7.08-8.31	-6.56-4.46	-2.98-3.13	-4.34-4.97	-5.14-6.61	-4.96-6.04	-8.76-10.87	-8.96-9.34	-11.49-12.64	-11.40-10.57	-13.56-9.65	-6.74-6.59	-8.22-6.92	-13.52-10.47	-15.31-12.30	-6.39-8.99	-15.64-8.48	-17.11-8.97	-10.26-11.59				
Phi(75°)	Theta(30°)	-6.73-6.49	-8.91-7.00	-5.61-4.89	-5.85-4.85	-6.65-8.36	-7.95-7.18	-7.62-8.18	-7.75-5.89	-6.80-6.02	-4.62-5.73	-6.01-4.83	-4.70-4.33	-4.91-4.73	-7.53-8.30	-7.17-9.83	-9.11-9.93	-7.17-6.62	-7.68-8.48	-8.57-6.99	-5.36-3.74	-4.11-4.74	-7.47-7.51	-5.46-6.47	-9.64-9.75	
Phi(75°)	Theta(37.5°)	-13.34-10.19	-8.79-4.31	-4.11-6.00	-4.71-3.02	-2.87-2.55	-3.49-2.58	-3.99-2.58	-3.74-4.64	-3.94-3.91	-5.26-5.78	-6.68-7.04	-12.19-5.24	-4.85-5.88	-5.14-4.77	-9.33-6.35	-7.25-11.06	-10.04-9.12	-13.34-13.96	-9.92-7.92	-10.68-10.70	-5.23-4.43	-4.50-1.33	-8.22-6.63	-4.55-7.27	
Phi(75°)	Theta(45°)	-3.56-5.08	-5.59-4.88	-3.83-2.63	-1.91-2.10	-2.45-1.45	-1.53-1.83	-1.28-0.50	0.19-1.77	-2.51-2.29	-1.82-3.61	-2.89-4.19	-5.92-6.24	-4.76-3.41	-4.59-3.95	-6.43-5.36	-4.73-9.93	-6.94-8.24	-7.90-5.11	-2.94-5.95	-8.99-8.99	-4.50-2.56	-2.73-13.21	-5.07-6.31	-7.20-7.56	
Phi(75°)	Theta(52.5°)	-4.40-4.43	-5.50-6.75	-5.10-5.54	-7.16-8.36	-7.30-4.75	-3.38-4.04	-4.22-5.05	-5.61-3.37	-1.31-3.54	-3.94-4.91	-3.95-4.36	-3.48-7.41	-6.23-9.38	-5.99-8.66	-7.06-5.78	-7.08-8.06	-5.32-4.98	-4.30-2.99	-1.70-2.15	-1.64-0.89	-2.90-6.63	-4.73-6.84	-9.02-3.01	-4.28-8.80	
Phi(75°)	Theta(60°)	-8.23-8.48	-7.43-7.24	-3.15-3.69	-1.98-0.05	-0.21-1.01	-0.78-2.13	-1.54-0.35	-0.46-1.65	-4.67-2.35	-2.48-1.80	-2.44-6.28	-6.00-9.68	-8.07-5.35	-5.16-4.79	-4.31-6.42	-3.94-3.21	-2.76-1.39	-2.55-1.24	1.28-1.42	1.53-2.63	-2.25-4.32	-2.60-8.17	-1.32-4.31	-3.41-6.17	
Phi(75°)	Theta(67.5°)	-5.26-6.42	-9.64-5.42	-2.78-3.55	-2.57-2.73	-3.75-2.63	-2.99-0.74	-2.78-1.88	-0.28-1.90	-2.75-1.35	-4.53-5.06	-5.31-12.80	-3.80-4.10	-1.46-2.37	-4.51-3.79	-1.01-1.57	-0.16-0.32	-1.49-0.55	1.63-2.09	1.08-3.92	-2.53-2.69	-2.61-2.92	-2.75-2.39	-4.24-1.50		
Phi(75°)	Theta(75°)	-7.72-9.36	-12.22-10.59	-8.65-9.30	-3.35-4.55	-1.00-1.30	0.51-1.0	-0.66-0.24	-1.50-2.80	-3.09-1.12	-3.14-4.33	-1.81-7.72	-1.23-5.64	-4.94-3.42	-2.21-2.22	-2.41-1.97	-1.93-0.96	0.73-0.86	2.35-0.97	1.04-1.76	-0.72-1.86	-3.15-0.10	-2.76-2.49	-4.22-4.21	-3.12-3.14	
Phi(75°)	Theta(82.5°)	-6.05-6.36	-8.32-10.77	-6.10-4.59	-2.76-1.04	-1.05-0.53	0.91-1.12	-1.17-0.16	1.63-0.98	-2.68-1.02	-2.38-1.16	-6.80-15.10	-13.97-5.75	-0.80-1.44	-0.35-1.27	-0.32-1.65	-1.48-2.09	2.04-0.64	0.28-0.11	2.14-2.01	2.01-0.50	0.94-1.12	0.63-1.75	-0.71-9.42	-1.89-2.12	
Phi(75°)	Theta(90°)	-2.28-8.68	-12.04-5.84	-2.16-4.23	-3.85-1.44	-4.78-1.75	-1.59-4.64	-2.01-2.08	-3.26-2.18	-2.20-1.0	-0.91-0.77	-7.42-6.76	-0.69-2.93	2.30-0.55	0.26-1.53	0.76-2.01	1.58-1.92	1.98-1.72	2.39-1.86	0.82-0.95	2.96-1.03	0.62-1.74	-2.28-6.74	-0.71-1.74		
Phi(75°)	Theta(97.5°)	-1.72-1.72	-6.66-1.97	-0.74-1.47	-5.91-1.05	-6.36-4.74	-2.62-7.82	-7.27-4.52	-2.62-2.66	-2.24-1.37	-3.18-0.48	-6.55-2.03	-1.61-3.73	2.17-1.21	-1.24-1.48	0.46-1.17	-0.74-1.04	-1.43-1.58	1.27-0.78	2.02-1.74	1.70-2.41	1.70-2.41	-3.14-7.23	-1.01-1.00		
Phi(75°)	Theta(105°)	-1.93-1.16	-2.44-0.69	-3.29-5.76	-8.99-7.80	-9.47-6.74	-10.51-12.42	-8.91-7.21	-6.79-11.54	-7.85-12.66	-9.40-3.47	-3.70-3.31	-10.42-10.76	-0.30-4.39	-1.94-2.89	-1.76-1.70	-0.46-2.09	0.26-1.88	0.02-1.28	-0.14-1.65	-1.62-1.33	-2.88-1.39	1.04-3.25	-3.21-7.32	-0.67-1.23	
Phi(75°)	Theta(112.5°)	-1.80-0.57	-2.58-3.62	-3.43-10																						



Antenna Pattern of 2.4GHz and 5GHz UNII 1~3

Appendix D

Theta (°)	Phi (°)	Phi(7.5°)	Phi(15°)	Phi(22.5°)	Phi(30°)	Phi(37.5°)	Phi(45°)	Phi(52.5°)	Phi(60°)	Phi(67.5°)	Phi(75°)	Phi(82.5°)	Phi(90°)	Phi(97.5°)	Phi(105°)	Phi(112.5°)	Phi(120°)	Phi(127.5°)	Phi(135°)	Phi(142.5°)	Phi(150°)	Phi(157.5°)	Phi(165°)	Phi(172.5°)	Phi(180°)	Phi(187.5°)	Phi(195°)	Phi(202.5°)	Phi(210°)	Phi(217.5°)	Phi(225°)	Phi(232.5°)	Phi(240°)	Phi(247.5°)	Phi(255°)	Phi(262.5°)	Phi(270°)	Phi(277.5°)	Phi(285°)	Phi(292.5°)	Phi(300°)	Phi(307.5°)	Phi(315°)	Phi(322.5°)	Phi(330°)	Phi(337.5°)	Phi(345°)	Phi(352.5°)	
Theta (120°)	-15.76	-11.70	-11.70	-10.99	-11.35	-8.67	-10.33	-9.59	-7.32	-7.74	-11.95	-10.64	-12.17	-11.27	-14.80	-11.78	-7.10	-5.68	-7.23	-8.26	-11.13	-7.71	-5.07	-6.76	-8.91	-6.26	-5.94	-5.53	-6.38	-5.16	-6.71	-13.66	-2.87	-6.51	-9.91	-8.93	-10.09	-3.71	-5.69	-3.87	-5.39	-3.84	-7.00	-7.59	-5.16	-13.10	-13.20	-5.18	
Theta (127.5°)	-3.86	-1.98	-9.46	-8.13	-11.96	-5.27	-5.53	-14.00	-12.46	-4.89	-9.35	-9.64	-10.83	-8.60	-10.71	-12.91	-13.29	-11.13	-5.68	-5.03	-7.66	-9.47	-11.99	-8.20	-5.59	-8.55	-9.05	-9.91	-7.41	-5.98	-8.80	-11.35	-14.62	-6.52	-15.40	-12.75	-7.90	-6.25	-7.44	-10.07	-5.96	-11.78	-10.46	-10.49	-5.79	-3.33	-6.11	-8.48	
Theta (135°)	-11.26	-8.52	-10.80	-12.83	-10.10	-7.42	-6.25	-14.46	-12.39	-9.38	-5.30	-7.41	-5.43	-7.00	-12.10	-12.91	-8.94	-10.22	-15.08	-8.17	-6.66	-4.17	-5.18	-7.14	-5.71	-5.48	-6.42	-5.44	-5.90	-9.32	-6.31	-11.01	-6.33	-9.22	-6.13	-15.08	-7.76	-3.92	-8.13	-13.08	-6.64	-9.93	-4.19	-7.20	-9.45	-5.47	-7.91	-11.95	
Theta (142.5°)	-12.67	-7.53	-6.49	-4.56	-7.05	-9.37	-8.62	-14.10	-9.87	-15.24	-7.12	-6.83	-3.90	-6.37	-6.11	-4.36	-4.86	-10.57	-8.69	-3.66	-4.55	-4.47	-5.85	-9.13	-8.65	-10.48	-15.92	-13.23	-9.16	-5.31	-9.16	-4.30	-3.04	-8.92	-9.33	-11.94	-11.12	-3.83	-3.46	-12.65	-8.47	-9.35	-8.71	-8.51	-10.59	-9.19	-7.60	-6.63	
Theta (150°)	-5.69	-3.86	-6.23	-5.96	-9.39	-10.37	-12.66	-13.04	-9.76	-8.63	-8.03	-8.83	-6.37	-5.31	-6.52	-5.54	-7.50	-10.03	-8.03	-5.07	-4.27	-4.67	-5.23	-3.32	-3.88	-5.03	-5.04	-4.18	-3.97	-5.15	-6.97	-2.23	-2.27	-6.39	-5.90	-12.30	-7.17	-6.16	-11.10	-10.35	-10.44	-11.84	-15.38	-12.17	-13.09	-11.10			
Theta (157.5°)	-8.64	-8.29	-11.44	-13.50	-11.32	-9.27	-7.03	-5.35	-6.93	-7.38	-4.66	-3.58	-4.94	-7.08	-10.65	-8.00	-5.99	-4.76	-6.08	-7.41	-9.07	-7.22	-6.33	-6.10	-5.98	-7.26	-7.29	-5.72	-4.04	-5.86	-10.84	-9.79	-10.61	-9.56	-5.88	-4.12	-6.18	-12.35	-9.54	-5.67	-7.55	-9.07	-9.27	-7.68					
Theta (165°)	-13.05	-12.13	-9.66	-6.08	-5.33	-4.45	-5.47	-6.96	-9.19	-9.19	-6.69	-6.46	-7.73	-6.83	-5.47	-5.46	-4.93	-4.44	-3.73	-3.55	-3.85	-4.97	-5.95	-6.77	-7.68	-8.51	-9.28	-8.20	-6.95	-7.23	-9.56	-14.29	-12.20	-9.91	-8.15	-5.71	-4.18	-4.25	-5.65	-6.32	-6.26	-7.65	-10.11	-8.87	-8.58	-10.94	-10.32	-11.09	
Theta (172.5°)	-10.76	-10.81	-8.97	-9.74	-9.31	-9.41	-13.27	-15.21	-14.79	-11.70	-10.15	-8.32	-6.90	-6.13	-5.91	-6.03	-6.29	-6.81	-6.25	-6.21	-6.59	-6.78	-6.15	-6.10	-6.65	-7.68	-7.92	-8.45	-8.90	-8.08	-7.53	-8.07	-8.57	-10.23	-11.91	-13.90	-13.58	-10.46	-7.39	-6.45	-6.14	-7.62	-7.19	-11.73	-13.46				
Theta (180°)	-15.09	-15.57	-15.64	-14.95	-15.70	-15.25	-15.20	-15.50	-15.39	-13.56	-13.25	-13.50	-12.92	-13.38	-13.63	-14.18	-13.66	-13.01	-13.14	-12.55	-13.49	-13.76	-14.09	-15.42	-14.09	-15.25	-15.00	-15.20	-13.14	-12.19	-11.51	-10.96	-11.62	-12.23	-13.94	-12.28	-10.76	-10.22	-9.93	-10.24	-11.64	-13.46	-12.52	-10.50	-10.17	-9.42	-10.85	-13.62	-13.81
Freq(Hz)	5.625Pol.	TotalAnt. 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Gain	Phi(0°)	Phi(7.5°)	Phi(15°)	Phi(22.5°)	Phi(30°)	Phi(37.5°)	Phi(45°)	Phi(52.5°)	Phi(60°)	Phi(67.5°)	Phi(75°)	Phi(82.5°)	Phi(90°)	Phi(97.5°)	Phi(105°)	Phi(112.5°)	Phi(120°)	Phi(127.5°)	Phi(135°)	Phi(142.5°)	Phi(150°)	Phi(157.5°)	Phi(165°)	Phi(172.5°)	Phi(180°)	Phi(187.5°)	Phi(195°)	Phi(202.5°)	Phi(210°)	Phi(217.5°)	Phi(225°)	Phi(232.5°)	Phi(240°)	Phi(247.5°)	Phi(255°)	Phi(262.5°)	Phi(270°)	Phi(277.5°)	Phi(285°)	Phi(292.5°)	Phi(300°)	Phi(307.5°)	Phi(315°)	Phi(322.5°)	Phi(330°)	Phi(337.5°)	Phi(345°)	Phi(352.5°)	
Theta (0°)	-12.10	-10.51	-10.63	-9.05	-10.24	-10.14	-10.45	-11.02	-11.37	-9.97	-9.69	-9.41	-10.48	-8.85	-9.96	-10.69	-11.76	-11.69	-10.62	-11.46	-11.61	-12.06	-11.74	-12.75	-12.74	-14.12	-14.11	-14.59	-12.14	-12.82	-12.85	-12.27	-13.01	-12.27	-10.49	-10.23	-10.69	-10.90	-9.99	-9.94	-9.91	-10.26	-9.55	-10.26	-11.32	-11.03			
Theta (7.5°)	-11.66	-13.38	-12.87	-13.84	-13.86	-13.40	-12.85	-13.53	-13.73	-12.41	-12.02	-9.57	-8.74	-8.93	-9.42	-8.17	-8.61	-8.05	-8.16	-7.95	-7.81	-7.87	-8.61	-8.75	-9.05	-8.64	-8.31	-9.52	-9.83	-12.20	-10.25	-8.32	-13.01	-11.85	-9.80	-10.32	-9.76	-9.11	-9.89	-9.94	-9.50	-11.49	-11.72	-10.29	-11.19	-10.57	-12.48	-12.97	
Theta (15°)	-11.51	-11.10	-8.40	-6.24	-7.80	-7.49	-9.90	-12.27	-10.89	-8.85	-7.24	-6.48	-12.16	-14.12	-13.06	-10.88	-9.62	-8.43	-8.02	-7.38	-7.92	-3.31	-7.87	-8.04	-10.33	-10.53	-10.77	-6.63	-6.42	-8.46	-8.05	-6.56	-7.25	-7.58	-8.76	-10.56	-7.51	-8.76	-10.13	-12.78	-13.91	-14.02	-11.13	-11.28	-9.73	-10.78	-12.14		
Theta (22.5°)	-8.83	-5.90	-8.23	-8.07	-7.10	-5.31	-6.97	-11.88	-12.28	-7.67	-5.29	-6.58	-6.95	-6.01	-5.80	-5.97	-6.13	-8.65	-11.83	-11.45	-12.03	-9.45	-7.98	-7.91	-8.28	-9.91	-7.98	-7.63	-8.77	-11.52	-9.70	-6.06	-5.50	-7.58	-11.89	-9.75	-7.26	-7.00	-6.09	-5.53	-5.62	-5.49	-6.29	-3.68	-3.66				
Theta (30°)	-6.99	-5.60	-4.99	-7.08	-9.67	-5.47	-4.47	-5.27	-6.57	-6.51	-6.10	-6.75	-5.27	-4.70	-9.22	-6.65	-5.05	-5.98	-4.97	-4.72	-4.77	-8.25	-7.69	-4.57	-3.86	-4.64	-3.92	-3.79	-3.50	-4.55	-8.24	-12.02	-5.43	-6.39	-14.67	-4.14	-2.63	-6.67	-8.55	-4.53	-5.23	-12.01	-10.90	-8.59	-7.78	-6.65	-8.07	-9.32	-9.09
Theta (37.5°)	-3.16	-3.14	-1.61	-2.58	-2.14	-3.54	-1.61	-5.59	-4.08	-3.78	-4.88	-4.79	-6.95	-4.14	-3.84	-4.92	-6.42	-5.92	-6.76	-8.11	-4.72	-4.24	-5.06	-7.74	-10.37	-2.82	-2.85	-2.88	-4.13	-3.97	-5.74	-6.00	-3.08	-3.88	-4.56	-7.51	-9.28	-2.87	-5.26	-6.93	-5.26	-4.23	-2.51	-3.58	-4.25	-3.28			
Theta (45°)	-2.51	-2.22	-0.71	-3.07	-1.73	-4.00	-2.38	-3.44	-2.87	-2.47	-3.90	-7.70	-5.49	-2.86	-4.71	-7.29	-5.82	-4.43	-4.71	-5.51	-5.82	-7.19	-5.25	-3.89	-3.84	-5.03	-4.14	-2.65	-2.37	-3.81	-4.31	-3.82	-4.31	-3.82	-4.31	-2.93	-2.27	-0.93	-2.14	-3.93	-2.90	-2.21	-1.32	-1.53	-2.35				
Theta (52.5°)	-6.74	-8.24	-9.79	-9.21	-6.62	-1.61	-1.30	-3.61	-2.22	-4.30	-5.18	-2.85	-4.26	-5.07	-4.53	-3.11	-3.43	-3.42	-1.86	-2.22	-1.13	-2.59	-1.69	-1.07	0.520	0.80	-0.13	-1.31	-1.09	-0.56	-1.99	-6.17	-2.62	-5.25	-2.66	-5.52	-2.13	-2.73	0.29	-4.23	-3.73	-1.80	-0.01	-3.04	-2.96	-10.16	-7.78	-5.86	
Theta (60°)	3.70	1.73	1.98	6.73	1.50	3.33	2.60	6.64	-1.14	-2.33	-4.64	-1.52	-1.89	-1.11	-3.28	-3.02	-1.17	-3.33	-1.49	-1.62	-0.24	-0.34	-2.64	-6.01	1.39	1.96	0.60	0.60	-1.05	-1.28	-3.62	-2.19	-3.62	-2.09	-3.72	-5.59	-1.15	-1.79	-5.67	-6.69	-1.90	-1.24	-3.05	-9.99	-1.02	1.63			
Theta (67.5°)	0.280	4.7	-2.17	-0.41	-2.14	-0.89	-3.20	-4.88	-2.76	-1.54	-2.53	-3.96	-4.80	-3.76	-3.80	-3.20	-1.12	-2.56	-5.13	-4.00	-1.74	-1.10	-1.44	-1.12	-2.70	-2.12	-2.30	-2.25	-1.49	-2.39	-3.92	-4.71	-1.49	-1.08	-3.98	-2.50	-1.79	-3.96	-1.16	-2.04	-1.50	0.510	0.57	-0.82	-1.19	-0.36	-3.20		
Theta (75°)	-0.21	-0.68	-0.57	-1.70	-0.91	-1.21	0.82	-2.50	-2.44	-3.88	-2.51	-4.07	-1.06	-4.73	-4.31	-4.49	0.61	1.46	-0.56	-1.07	-0.95	-1.31	-1.68	-0.76	-1.13	0.77	-1.61	-2.16	-2.99	-3.03	-3.75	-3.32	0.69	-6.54	-2.48	-1.92	-4.22	-2.54	-1.13	-2.65	-4.34	-4.08	0.19	1.33	1.37	-0.36			
Theta (82.5°)	-1.25	-0.74	-1.26	-1.71	-1.36	-1.00	-1.47	-3.32	-1.47	-3.92	-3.35	-3.14	-4.86	-2.16	-3.44	-5.60	-1.92	0.92	0.92	0.92	0.92	0.92	1.602	4.80	2.25	0.42	1.62	0.00	0.00	-0.40	-1.17	-1.26	-2.63	-2.06	-1.13	-2.07	-2.48	-6.31	-2.02	-6.81	-9.01	-2.21	-6.35	-4.29	-3.07				
Theta (90°)	-0.31	-1.45	0.980	-0.67	-1.21	-2.76	-1.12	-1.36	-2.69	-3.13	-0.77	-7.89	-2.17	-1.89	-7.53	-4.00	-2.78	-0.0																															



Antenna Pattern of 2.4GHz and 5GHz UNII 1~3

Appendix D

θ (172.5°)	-12.19/-13.12	-12.49/-11.44	-9.78/-9.58	-10.13/-10.81	-12.81/-14.51	-14.98/-14.71	-13.35/-11.01	-9.36/-8.65	-7.84/-6.50	-6.03/-5.71	-5.87/-6.51	-7.76/-8.56	-8.98/-6.19	-5.82/-7.19	-10.47/-13.74	-11.80/-10.34	-11.45/-12.59	-12.68/-10.99	-10.98/-12.87	-15.71/-15.49	-15.29/-10.92	-9.58/-9.44	-10.11/-11.78	-12.57/-11.69
θ (180°)	-15.35/-15.76	-15.34/-16.12	-14.97/-14.51	-15.58/-15.33	-15.90/-15.72	-14.89/-15.69	-15.12/-15.53	-14.98/-15.36	-14.87/-15.51	-15.06/-14.70	-14.09/-13.80	-12.74/-12.25	-11.55/-10.77	-12.15/-11.77	-12.58/-12.88	-14.96/-15.51	-15.96/-12.59	-15.21/-13.30	-12.64/-11.91	-14.26/-14.24	-11.34/-11.11	-11.72/-13.19	-15.38/-15.33	-15.12/-15.91
Freq(Hz)	5.3G/Pol.	Total/Ant. 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)Φ(7.5°)	Φ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)
θ(0°)	-11.05/-11.79	-10.92/-11.90	-12.16/-11.55	-10.89/-10.56	-10.95/-10.12	-10.42/-10.66	-10.48/-9.84	-10.30/-12.11	-12.01/-10.03	-11.00/-11.73	-11.12/-11.14	-10.35/-10.68	-10.43/-10.18	-9.80/-10.03	-10.38/-9.61	-9.45/-9.25	-9.68/-10.06	-10.55/-11.09	-10.34/-8.79	-9.77/-12.26	-11.54/-12.25	-12.22/-11.66	-12.73/-12.14	-12.77/-10.51
θ(7.5°)	-13.16/-12.68	-12.23/-10.41	-10.90/-10.66	-9.64/-9.52	-9.54/-9.12	-9.61/-11.03	-12.15/-12.67	-13.32/-12.39	-13.99/-15.71	-12.73/-14.78	-15.90/-13.53	-15.23/-14.02	-12.58/-11.66	-11.93/-11.93	-13.01/-11.61	-9.94/-10.06	-11.05/-12.06	-12.74/-13.07	-12.80/-12.57	-12.75/-12.16	-14.10/-13.42	-13.74/-14.97	-13.48/-14.86	-12.45/-14.84
θ(15°)	-9.39/-10.45	-11.28/-12.87	-13.69/-11.95	-11.61/-10.83	-9.47/-9.11	-8.87/-8.81	-9.07/-10.07	-11.10/-11.15	-10.17/-9.41	-8.25/-8.13	-8.27/-8.65	-10.15/-10.79	-11.10/-9.81	-9.20/-11.76	-10.60/-12.50	-10.35/-9.31	-10.42/-12.74	-13.74/-14.13	-13.64/-12.53	-10.36/-9.59	-9.49/-9.75	-8.96/-9.60	-9.38/-7.66	-7.80/-6.96
θ(22.5°)	-8.37/-9.36	-9.34/-9.19	-11.27/-12.65	-14.52/-15.92	-12.68/-8.98	-8.30/-9.30	-9.37/-8.58	-7.56/-8.11	-9.27/-11.55	-10.78/-9.67	-10.97/-11.60	-12.34/-15.00	-12.25/-11.37	-9.64/-12.53	-15.46/-15.28	-11.38/-9.91	-10.62/-10.35	-10.41/-13.55	-14.16/-14.43	-11.21/-9.08	-10.06/-10.96	-9.28/-8.92	-6.39/-6.21	-7.13/-8.41
θ(30°)	-4.03/-3.45	-4.81/-4.42	-4.28/-5.46	-5.71/-6.75	-12.93/-13.28	-8.47/-10.17	-11.16/-7.86	-7.78/-9.08	-11.69/-12.60	-11.90/-9.63	-14.44/-12.36	-14.55/-14.38	-12.60/-9.28	-10.48/-11.94	-11.08/-12.77	-14.86/-12.36	-11.59/-14.75	-10.14/-7.40	-6.98/-6.17	-6.21/-7.54	-7.33/-6.65	-4.65/-4.30	-5.17/-6.20	-6.91/-5.92
θ(37.5°)	-7.82/-6.55	-5.02/-7.25	-6.02/-4.90	-6.42/-5.18	-5.35/-5.27	-6.38/-6.35	-6.55/-5.64	-7.25/-9.56	-11.42/-9.09	-8.14/-8.60	-10.22/-10.41	-10.48/-10.10	-6.83/-5.07	-8.42/-7.50	-9.59/-8.78	-7.30/-7.91	-6.07/-8.75	-6.28/-7.76	-6.23/-7.40	-5.98/-6.10	-6.81/-6.33	-8.08/-9.29	-9.24/-11.49	-9.05/-7.68
θ(45°)	-2.58/-2.10	-4.06/-4.48	-6.33/-5.48	-4.85/-4.76	-4.58/-5.07	-5.33/-3.16	-1.61/-2.32	-2.96/-3.71	-5.56/-6.03	-6.26/-6.47	-6.84/-6.88	-5.30/-5.06	-5.72/-4.07	-5.67/-5.65	-3.96/-5.06	-2.67/-6.47	-3.34/-5.23	-1.82/-9.22	-3.82/-5.61	-9.28/-5.31	-5.17/-6.92	-5.53/-6.67	-8.69/-7.09	-4.91/-3.94
θ(52.5°)	1.07/0.93	-0.43/-0.36	0.08/-0.24	-2.66/-1.81	-2.45/-4.21	-4.21/-5.99	-2.61/-1.97	-2.98/-3.52	-2.10/-3.66	-0.96/-1.20	-2.05/-1.90	-4.55/-6.63	-1.57/-2.15	-3.45/-5.63	-2.97/-2.80	-2.22/-5.69	-4.02/-4.51	-1.56/-2.41	-1.15/-1.60	-4.72/-1.88	-1.27/-0.34	-0.04/-0.49	-0.44/-0.57	-0.24/-0.39
θ(60°)	-2.67/-1.25	-1.26/-3.48	-2.93/-1.93	-0.18/-1.08	-2.31/-3.00	-3.54/-4.37	-5.90/-2.36	-3.55/-2.87	-3.65/-3.01	-2.47/-3.03	-2.13/-2.70	-1.90/-2.22	-2.01/-2.52	-3.43/-3.62	-3.56/-2.54	-4.88/-3.70	-2.54/-3.58	-3.79/-2.95	-5.22/-4.20	-3.32/-2.88	-2.78/-3.90	-2.28/-1.75	-4.04/-3.91	-5.07/-2.44
θ(67.5°)	0.86/-0.30	-1.33/-0.53	-1.49/-2.64	-2.33/-2.63	-1.68/-2.25	-0.04/-1.06	-1.12/-1.91	-1.02/-2.08	-2.33/-1.02	1.75/1.07	0.12/-0.27	1.75/1.07	0.12/-0.27	-1.77/-1.31	0.79/-2.14	-1.80/-9.98	-2.47/-6.47	-0.79/-2.22	1.56/-2.41	-3.18/-0.83	-0.58/-1.13	-0.73/0.41	0.54/-0.92	-0.68/-0.39
θ(75°)	-2.30/-1.03	-2.25/-2.70	-1.35/-1.63	-1.75/-1.69	-3.35/-0.09	-3.36/-1.73	-4.04/-1.58	-2.77/-3.72	-4.01/-1.58	-2.25/-3.35	-1.47/-1.04	0.55/-2.11	-1.37/-1.63	-2.31/-1.66	-2.34/-3.04	-1.02/-3.47	-0.17/-1.86	-3.31/-10.78	-3.01/-2.64	-1.75/-2.81	-3.92/-1.13	-1.32/-1.95	0.04/-1.16	-1.19/-0.61
θ(82.5°)	0.61/2.02	0.56/2.18	-1.32/1.07	-0.00/-0.18	-1.87/-1.41	-5.97/-3.32	-1.40/-1.97	-6.50/4.88	-1.48/-3.33	-1.06/-0.41	-0.05/-2.08	-0.13/1.98	-1.83/-1.31	4.78/-3.80	-0.44/-4.14	-4.60/-2.20	-1.85/-1.65	-0.39/-2.07	-3.79/-4.35	-2.07/-2.70	-6.05/-1.50	-4.81/-2.89	1.06/1.52	1.30/0.16
θ(90°)	0.50/-1.06	-1.45/-1.12	0.49/-2.36	-2.25/-0.31	-1.77/-4.95	-0.78/-2.25	-2.25/-2.08	-1.77/-0.60	-1.59/-4.02	-2.62/-2.02	2.31/1.30	1.36/1.53	0.06/1.11	-0.49/-2.12	0.60/-1.04	-0.58/-2.68	-10.25/-0.90	-0.73/-4.65	-3.96/-6.15	-1.43/-2.80	-3.14/1.16	-1.94/-3.75	-0.96/-3.13	-0.89/0.52
θ(97.5°)	-0.75/-0.13	-5.22/-0.91	0.52/0.20	-0.65/0.09	-2.93/-3.72	-4.04/-1.58	-2.77/-3.42	-1.41/-1.04	0.55/-2.11	-1.37/-1.63	-2.05/-1.66	-2.34/-3.04	-1.02/-3.47	-0.27/-6.34	-0.17/-1.86	-3.32/-13.07	-3.11/-10.78	-3.01/-2.64	-1.75/-2.81	-3.92/-1.13	-1.32/-1.95	0.04/-1.16	-1.19/-0.61	-1.19/-0.61
θ(105°)	-9.36/-9.47	-10.62/-3.61	-7.93/-4.02	-5.20/-3.06	-3.22/-5.20	-13.91/-4.26	-3.89/-5.63	-8.46/-9.47	-6.04/-6.01	-4.04/-3.09	-1.76/-1.68	-3.68/-6.35	-3.22/-3.04	-3.02/-5.32	-2.95/-4.96	-4.80/-5.46	-3.11/-2.16	-9.75/-6.87	-3.97/-4.87	-1.36/-1.01	-10.54/-2.14	-3.82/-7.95	-2.93/-4.57	-3.99/-5.93
θ(112.5°)	-6.42/-5.05	-3.49/-5.42	-6.12/-4.04	-4.09/-4.16	-4.95/-7.19	-4.25/-6.80	-5.16/-6.58	-5.17/-6.33	-6.86/-5.60	-5.68/-3.61	-2.02/0.04	-1.15/-1.97	-2.92/-1.50	-3.28/-1.86	-3.13/0.08	-1.13/-7.37	-10.02/-8.56	-12.95/-5.68	-7.17/-6.77	-5.22/-6.72	-6.30/-4.97	-8.95/-8.71	-9.00/-11.90	-6.71/-1.13
θ(120°)	-2.83/-5.93	-6.39/-5.01	-4.81/-2.99	-1.65/-4.36	-2.95/-6.43	-8.25/-3.89	-5.52/-10.08	-13.23/-5.45	-6.33/-5.09	-6.82/-9.96	-5.85/-7.09	-8.00/-7.40	-6.92/-9.28	-9.68/-3.60	-4.60/1.18	-6.96/-9.35	-6.34/-9.12	-6.56/-7.78	-6.82/-9.48	-11.37/-9.96	-10.74/-9.36	-8.73/-6.66	-9.07/-10.42	-3.59/-1.72
θ(127.5°)	-11.65/-12.63	-10.09/-15.34	-12.20/-4.53	-5.74/-5.95	-12.67/-8.12	-15.29/-12.13	-6.26/-12.33	-7.46/-11.27	-12.52/-9.71	-7.85/-7.43	-7.95/-7.27	-7.57/-5.00	-8.99/-8.32	-9.91/-7.36	-10.32/-7.28	-4.72/-4.63	-8.80/-8.62	-9.87/-12.22	-10.55/-10.63	-7.54/-3.12	-9.17/-15.38	-6.50/-4.08	-14.01/-14.14	-10.84/-8.42
θ(135°)	-4.46/-12.32	-5.10/-4.75	-5.29/-5.19	-9.94/-9.41	-7.04/-9.83	-10.98/-7.82	-6.22/-7.48	-10.38/-6.48	-15.20/-14.30	-14.36/-14.60	-9.87/-13.40	-10.23/-6.78	-7.07/-6.47	-7.69/-8.47	-10.89/-8.57	-11.37/-9.96	-10.89/-8.57	-8.62/-9.48	-11.37/-9.96	-10.89/-8.57	-8.62/-9.48	-11.37/-9.96	-10.89/-8.57	-8.62/-9.48
θ(142.5°)	-8.23/-9.01	-5.39/-3.40	-1.37/-4.61	-4.98/-6.55	-4.29/-8.82	-15.02/-6.69	-9.28/-7.02	-6.32/-7.48	-10.38/-6.48	-5.67/-6.60	-3.26/-4.49	-3.83/-5.00	-4.07/-6.78	-8.43/-7.88	-9.76/-7.17	-10.49/-10.28	-13.38/-8.79	-10.25/-4.99	-8.31/-14.56	-13.29/-11.14	-10.14/-8.12	-6.28/-10.13	-14.92/-14.75	-14.92/-14.75
θ(150°)	-11.61/-6.66	-3.23/-4.06	-5.60/-5.59	-5.37/-4.49	-2.88/-5.45	-7.42/-8.56	-6.63/-6.51	-6.69/-6.91	-4.95/-1.62	-0.31/-0.67	-2.53/-3.01	-2.71/-3.99	-3.72/-2.28	-1.89/-4.32	-6.43/-6.68	-9.77/-6.00	-9.34/-9.31	-7.69/-5.58	-6.59/-6.19	-8.54/-9.03	-7.78/-13.94	-9.19/-7.01	-7.18/-8.03	-10.70/-8.72
θ(157.5°)	-7.75/-7.10	-5.70/-6.62	-6.34/-5.91	-5.21/-4.52	-4.42/-6.26	-6.00/-7.68	-9.17/-13.3	-7.67/-8.58	-8.51/-8.02	-6.62/-5.73	-6.67/-6.33	-5.71/-4.81	-4.37/-5.44	-4.15/-3.08	-3.78/-5.93	-8.61/-8.43	-5.62/-6.37	-7.71/-7.56	-7.35/-7.45	-7.43/-5.90	-4.48/-7.42	-8.45/-12.73	-10.46/-12.46	-8.83/-10.76
θ(165°)	-7.28/-7.56	-7.19/-4.90	-8.60/-7.17	-7.21/-9.93	-13.93/-14.88	-11.93/-9.99	-9.22/-8.52	-8.10/-8.62	-11.46/-12.88	-12.38/-12.20	-9.57/-7.19	-6.95/-6.13	-7.23/-7.41	-9.42/-9.86	-8.12/-7.01	-6.17/-6.27	-8.51/-11.20	-10.76/-7.84	-6.88/-7.88	-9.42/-10.45	-12.26/-15.03	-15.61/-11.89	-10.53/-8.08	-7.54/-7.73
θ(172.5°)	-13.34/-13.24	-14.67/-13.65	-13.34/-13.53	-14.70/-15.32	-15.63/-14.48	-14.96/-14.48	-14.52/-13.92	-11.59/-9.49	-7.61/-6.47	-6.15/-5.71	-5.83/-6.85	-7.66/-8.34	-6.92/-6.15	-5.38/-5.40	-9.13/-9.75	-8.20/-8.39	-9.92/-10.56	-10.79/-10.05	-9.81/-12.35	-16.01/-13.26	-11.38/-9.38	-8.08/-9.12	-9.28/-10.46	-12.04/-11.86
θ(180°)	-14.85/-14.99	-15.34/-14.18	-14.82/-14.12	-13.10/-12.58	-12.91/-12.73	-13.23/-15.24	-15.41/-15.24	-13.13/-12.85	-13.33/-13.28	-13.03/-13.40	-14.48/-11.46	-9.56/-8.58	-8.40/-8.82	-11.40/-15.60	-15.26/-11.60	-10.88/-12.44	-15.20/-14.92	-14.53/-14.84	-13.82/-14.16	-13.49/-12.02	-10.43/-10.04	-11.78/-14.22	-13.80/-15.87	-13.95/-15.77
Freq(Hz)	5.6G/Pol.	Total/Ant. 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ(0°)Φ(7.5°)	Φ(15°)Φ(22.5°)	Φ(30°)Φ(37.5°)	Φ(45°)Φ(52.5°)	Φ(60°)Φ(67.5°)	Φ(75°)Φ(82.5°)	Φ(90°)Φ(97.5°)	Φ(105°)Φ(112.5°)	Φ(120°)Φ(127.5°)	Φ(135°)Φ(142.5°)	Φ(150°)Φ(157.5°)	Φ(165°)Φ(172.5°)	Φ(180°)Φ(187.5°)	Φ(195°)Φ(202.5°)	Φ(210°)Φ(217.5°)	Φ(225°)Φ(232.5°)	Φ(240°)Φ(247.5°)	Φ(255°)Φ(262.5°)	Φ(270°)Φ(277.5°)	Φ(285°)Φ(292.5°)	Φ(300°)Φ(307.5°)	Φ(315°)Φ(322.5°)	Φ(330°)Φ(337.5°)	Φ(345°)Φ(352.5°)
θ(0°)	-12.67/-11.89	-12.68/-13.22	-13.81/-13.32	-12.41/-12.51	-12.20/-12.23	-12.83/-12.22	-11.72/-10.96	-10.78/-11.46	-11.08/-12.98	-11.79/-12.12	-13.28/-11.51	-14.24/-14.82	-15.13/-13.03	-13.16/-13.18	-13.47/-14.33	-14.76/-14.35	-14.48/-16.01	-15.07/-12.94	-11.73/-13.54	-15.53/-11.97	-14.50/-16.03	-12.52/-12.25	-12.36/-13.22	-12.12/-12.27
θ(7.5°)	-13.74/-12.61	-12.82/-15.37	-14.45/-14.02	-14.01/-14.87	-15.70/-15.34	-15.46/-14.48	-11.90/-9.96	-10.16/-9.88	-9.57/-8.47	-7.73/-8.43	-8.31/-7.78	-7.99/-7.86	-8.65/-10.74	-12.16/-10.65	-9.50/-10.82	-10.83/-9.99	-10.51/-11.37	-11.10/-11.44	-11.24/-11.79	-13.43/-12.77	-12.57/-13.43	-14.63/-14.33	-13.25/-13.12	-12.74/-11.93
θ(15°)	-14.15/-14.14	-11.66/-12.09	-11.40/-10.08	-8.89/-8.36	-7.75/-8.81	-11.93/-14.99	-10.77/-7.04	-5.44/-5.47	-5.83/-6.19	-6.38/-6.63	-7.54/-7.49	-7.38/-6.56	-5.66/-6.39	-7.44/-7.19	-5.45/-6.40	-9.30/-9.18	-8.84/-10.65	-12.35/-14.47						

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





