





# Radiated Composite Gain Data of 6GHz

# Appendix B

Theta	(45°)	(50°)	(55°)	(60°)	(65°)	(70°)	(75°)	(80°)	(85°)	(90°)	(95°)	(100°)	(105°)	(110°)	(115°)	(120°)	(125°)	(130°)	(135°)	(140°)	(145°)	(150°)	(155°)	(160°)	(165°)	(170°)	(175°)	(180°)
Gain	17.65	18.02	17.81	17.51	17.18	16.82	16.45	16.07	15.68	15.29	14.90	14.51	14.12	13.73	13.34	12.95	12.56	12.17	11.78	11.39	11.00	10.61	10.22	9.83	9.44	9.05	8.66	8.27
Theta	(0°)	(5°)	(10°)	(15°)	(20°)	(25°)	(30°)	(35°)	(40°)	(45°)	(50°)	(55°)	(60°)	(65°)	(70°)	(75°)	(80°)	(85°)	(90°)	(95°)	(100°)	(105°)	(110°)	(115°)	(120°)	(125°)	(130°)	(135°)
Gain	17.65	18.02	18.39	18.76	19.13	19.50	19.87	20.24	20.61	20.98	21.35	21.72	22.09	22.46	22.83	23.20	23.57	23.94	24.31	24.68	25.05	25.42	25.79	26.16	26.53	26.90	27.27	27.64
Theta	(140°)	(145°)	(150°)	(155°)	(160°)	(165°)	(170°)	(175°)	(180°)	(185°)	(190°)	(195°)	(200°)	(205°)	(210°)	(215°)	(220°)	(225°)	(230°)	(235°)	(240°)	(245°)	(250°)	(255°)	(260°)	(265°)	(270°)	(275°)
Gain	17.65	18.02	18.39	18.76	19.13	19.50	19.87	20.24	20.61	20.98	21.35	21.72	22.09	22.46	22.83	23.20	23.57	23.94	24.31	24.68	25.05	25.42	25.79	26.16	26.53	26.90	27.27	27.64







Freq(Hz)	2.45G	5.2G	5.3G	5.6G	5.785G	5.885G	6.175G	6.475G	6.695G	6.995G
Ant. 1 Max Gain (dBi)	2.12	4.25	3.56	4.66	4.47	4.67	5.88	5.3	5.29	4.25
Ant. 2 Max Gain (dBi)	2.22	4.66	5.9	5.63	5.49	5.94	5.81	5.83	5.9	4.79
Ant. 1 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/112.5/352.5	Theta/97.5/300	Theta/90/307.5	Theta/97.5/30	Theta/90/307.5	Theta/90/262.5	Theta/97.5/60	Theta/90/337.5	Theta/97.5/37.5	Theta/90/292.5
Ant. 2 Polarization/ $\theta(^{\circ})/\phi(^{\circ})$	Theta/75/30	Theta/97.5/240	Theta/97.5/225	Theta/97.5/225	Theta/105/232.5	Theta/90/232.5	Theta/97.5/232.5	Theta/90/285	Theta/105/135	Theta/97.5/232.5
Max Gain (dBi)	2.22	4.66	5.9	5.63	5.49	5.94	5.88	5.83	5.9	4.79









# Radiated Composite Gain Data of scan

# Appendix C

Theta (°)	-19.07:14.35	-19.03:12.8	-18.24:18.2	-17.94:18.91	-17.95:18.7	-17.07:19.08	-12.63:18.65	-17.54:12.55	-11.72:16.65	-8.44:13.49	-11.33:10.51	-11.69:7.32	-11.58:7.28	-9.15:13.78	-18.91:14.45	-15.93:14.6	-17.88:18.58	-17.38:19.12	-17.41:18.79	-17.83:19.08	-18.51:18.21	-18.72:16.83	-19.11:19.16	-13.69:18.32	
Theta (75°)	-13.31:16.32	-17.89:12.91	-18.37:18.37	-18.56:16.5	-18.52:18.55	-15.91:19.08	-16.86:19	-15.44:13.26	-11.93:11.51	-8.29:15.96	-16.3:12.7	-16.84:7.66	-15.05:12.14	-14.87:17.78	-18.85:16.28	-16.51:17.37	-18.7:18.58	-18.07:19.12	-17.36:18.76	-18.75:18.06	-18.64:13.11	-18.32:16.83	-18.96:19.19	-19.33:17.97	
Theta (82.5°)	-11.78:18.11	-17.61:18.21	-17.69:19.04	-17.94:18.94	-18.56:14.82	-14.37:17.46	-15.71:19.39	-18.11:13.36	-11.56:12.3	-15.1:15.13	-19.17:16.65	-16.62:16	-19.17:16.65	-15.66:13.97	-18.23:18.58	-16.64:15.21	-18.23:18.58	-17.98:17.96	-18.23:18.58	-17.98:17.96	-18.23:18.58	-18.23:18.58	-18.23:18.58	-18.23:18.58	-18.23:18.58
Theta (90°)	-13.16:18.06	-17.33:18.18	-16.47:15.18	-19.21:18.58	-18.36:15.15	-13.22:17.55	-19.35:17.58	-18.36:17.01	-15.24:16.87	-19.41:16.3	-14.69:11.11	-11.09:18.88	-17.67:13.64	-15.17:15.65	-17.63:18.84	-15.56:15.81	-18.51:17.68	-18.91:18.75	-18.69:18.95	-18.04:18.28	-18.88:17.99	-17.45:19.31	-18.88:17.43	-17.92:18.92	
Theta (97.5°)	-16.89:16.98	-17.69:16.08	-15.08:11.21	-18.62:15.94	-12.76:18.01	-13.22:17.11	-19.2:17.75	-18.56:18.3	-11.28:12.07	-18.02:18.02	-12.88:15.48	-12.38:19.01	-16.18:17.68	-19.16:13.27	-12.9:15.56	-11.84:15.03	-17.81:18.34	-18.26:17.41	-18.09:17.72	-18.93:18.36	-18.52:17.19	-16.2:19.16	-19.09:18.11	-18.45:18.91	
Theta (105°)	-19.23:17.13	-17.97:17.68	-12.56:13.61	-14.44:18.55	-12.19:9.89	-11.21:6.55	-18.37:17.94	-17.95:14.56	-15.14:15.32	-18.81:8.82	-15.83:17.66	-16.18:18.05	-16.11:15.19	-19.16:13.11	-17.74:18.81	-15.41:13.65	-19.25:18.17	-18.18:18.34	-17.74:18.77	-18.14:18.97	-18.58:17.76	-17.74:17.67	-17.92:17.61	-18.64:18.36	
Theta (112.5°)	-18.48:18.97	-18.04:19.06	-15.39:19.22	-18.45:11.45	-12.59:10.64	-10.11:13.3	-16.88:15.06	-16.76:12.97	-15.49:10.18	-12.06:18.69	-10.86:19.18	-13.81:14.94	-18.21:11.91	-12.95:18.93	-16.82:11.13	-8.05:14.03	-17.78:14.22	-17.68:18.88	-18.13:17.99	-18.21:18.35	-18.72:18.14	-18.75:18.5	-19.41:16.44	-18.17:18.86	
Theta (120°)	-18.1:19.05	-18.01:18.71	-19.05:18.7	-17.65:18.65	-16.82:14.72	-9.94:12.27	-14.98:12.8	-14.65:10.29	-14.74:13.2	-11.95:18.78	-15.74:18.59	-15.51:18.11	-16.81:15.03	-18.19:14.45	-16.74:10.44	-16.28:11.38	-17.47:11.76	-15.74:14.64	-16.93:18.06	-17.75:16.34	-13.02:12.63	-12.73:18.01	-18.06:17.97	-18.46:18.22	
Theta (127.5°)	-18.66:18.89	-18.56:18.07	-10.78:18.01	-17.15:19.12	-14.35:16.68	-11.57:12.29	-13.7:12.5	-13.49:11.3	-18.85:14.45	-12.33:17.83	-18.76:12.79	-13.35:12.8	-12.57:16.6	-15.58:13.91	-18.81:17.43	-18.94:17.86	-13.16:12.68	-16.83:17.53	-14.2:15.07	-16.58:18.51	-17.05:18.24	-16.05:12.86	-15.87:19.07	-18.42:18.2	
Theta (135°)	-16.67:17.57	-18.88:13.96	-17.35:14.36	-15.05:17.64	-17.65:19.41	-14.46:17.86	-15.92:18.45	-18.03:13.4	-13.53:11.86	-11.02:9.43	-13.13:8.26	-16.39:12.28	-8.73:16.27	-13.15:13.09	-9.34:18.24	-18.17:16.1	-17.77:14.01	-13.52:16.74	-16.18:15.79	-17.35:17.67	-14.92:18.02	-18.78:18.25	-16.08:15.87	-19:18.09	
Theta (142.5°)	-16.22:16.08	-19.11:18.15	-15.33:13.04	-15.35:9.48	-10.42:18.17	-18.32:18.25	-14.25:18.84	-17.61:13.17	-14.46:14.45	-11.13:9.23	-10.05:11.4	-9.02:7.37	-16.79:9.87	-9.83:17.64	-18.84:14.51	-18.88:18.14	-18.72:18.52	-18.4:19.1	-16.04:18.12	-18.55:19.49	-17.89:17.68	-19.09:13.95	-17.89:13.49	-18.71:14.53	
Theta (150°)	-17.36:18.35	-17.55:11.69	-9.13:12.27	-18.65:13.15	-10.28:10.3	-9.94:17.75	-13.86:10.78	-15.46:13.84	-14.01:14.71	-18.26:13.06	-10.06:10.2	-12.4:10.77	-15.24:17.19	-18.55:17.87	-18.89:15.44	-17.49:18.79	-18.42:18.13	-10.17:18.84	-18.24:18.72	-19.11:16.66	-17.65:12.82	-15.91:19.21	-15.91:19.21	-18.26:18.99	
Theta (157.5°)	-17.46:18.81	-16.8:15.53	-16.15:10.39	-8.23:9.53	-14.96:18.26	-10.61:9.31	-12.69:18.68	-17.47:18.85	-18.02:18.66	-18.82:15.12	-18.33:16.61	-17.2:18.71	-18.93:17.82	-13.73:13.6	-18.02:17.79	-18.85:18.81	-18.04:18.78	-19.41:18.72	-18.18:17.84	-17.72:18.33	-17.8:18.33	-18.71:18.72	-14.15:12.36	-13.22:13.63	
Theta (165°)	-18.3:19.01	-17.98:17.85	-16.36:15.15	-12.35:18.01	-17.43:14.23	-12.57:14.97	-18.65:18.59	-18.22:18.45	-16.72:16	-14.77:13.2	-14.97:13.69	-18.79:18.5	-18.52:19.05	-14.75:19.1	-18.41:17.55	-12.48:14.69	-17.72:17.85	-16.93:17.48	-19.21:18.61	-18.49:18.5	-18.44:18.68	-14.38:13.93	-12.95:11.78	-18.11:15.38	
Theta (172.5°)	-18.79:18.26	-18.28:14.97	-16.72:18.48	-18.79:17.63	-17.74:15.63	-18.24:17.75	-18.18:18.41	-18.65:18.58	-16.25:16.12	-17.93:14.9	-13.13:13.98	-14.58:16.28	-18.15:15.59	-15.32:16.57	-18.67:17.96	-18.88:18.46	-18.17:17.93	-15.11:16.17	-18.11:18.25	-19.41:17.86	-18.9:18	-17.31:17.87	-18.54:19.42	-17.51:18.82	
Theta (180°)	-14.47:15.37	-14.54:12.86	-15.05:12.23	-12.85:14.44	-13.87:16.61	-18.23:16.42	-16.13:16.49	-17.29:17.03	-18.1:19.13	-17.71:18.3	-17.98:18.71	-18.08:17.73	-14.01:13.92	-13.02:14.79	-18.12:14.7	-14.22:18.53	-18.83:18.68	-18.15:19.21	-17.8:18.92	-19.58:18.04	-18.52:16.55	-16.63:18.72	-18.74:17.93	-15.85:16.44	
Theta (75°)	5.785GPol	Theta/Ant. 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Gain	Phi(0°)Phi(75°)	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°)	-17.92:17.84	-18.74:18.89	-18.58:16.64	-18.94:17.96	-15.99:15.95	-16.64:17.2	-16.56:16.32	-18.12:17.28	-16.05:15.46	-14.45:15.35	-16.19:14.75	-14.37:14.63	-15.25:14.74	-15.3:15.17	-14.72:14.65	-14.72:15.83	-15.74:13.41	-14.32:15.34	-15.4:15.72	-17.02:18.5	-18.06:18.4	-18.75:19.18	-17.98:18.98	-18.68:19.42	
Theta (7.5°)	-9.84:9.81	-11.08:10.86	-11.85:19.11	-12.85:14.62	-14.55:13.98	-15.5:16.11	-16.84:17.69	-17.61:17.81	-17.84:18.39	-16.71:17.56	-18.81:17.47	-16.63:15.24	-13.74:14.48	-13.49:12.72	-13.04:13.5	-12.79:15.82	-16.87:17.43	-16.15:18.37	-18.15:18.33	-16.74:18.16	-13.92:12.53	-12.72:11.05	-9.9:9.92	-10.38:10.43	
Theta (15°)	-17.35:19.22	-17.11:19.15	-19.38:19.76	-18.42:19.26	-11.86:13.58	-18.29:17.87	-18.01:16.65	-15.18:16.57	-16.56:15.17	-17.3:18.49	-18.02:18.61	-18.54:18.13	-18.03:16.24	-12.91:12.31	-14.03:14.21	-11.81:12.94	-17.10:18.88	-10.17:11.55	-11.18:12.94	-13.81:16.09	-15.62:12.32	-10.25:6.86	-9.04:10.11	-11.09:11.3	
Theta (22.5°)	-8.74:8.76	-12.95:12.33	-15.29:18.08	-17.83:13.63	-11.73:16.56	-19.28:15.81	-18.92:17.72	-16.93:14.63	-16.56:17.79	-16.87:11.06	-9.34:10.13	-10.56:10.3	-9.44:6.99	-6.38:5.21	-4.38:6.29	-7.77:5.75	-5.23:7.01	-8.13:6.89	-5.06:5.76	-6.78:9.76	-14.74:13.99	-10.95:8.47	-7.78:6.18	-6:7.32	
Theta (30°)	-7.53:9.56	-10.76:10.03	-11.95:9.83	-18.98:9.56	-9.56:16.02	-11.5:8.62	-11.76:11.99	-9.47:9.8	-6.79:5.00	-7.61:14.2	-17.4:17.55	-13.1:12.46	-9.37:8.89	-9.15:9.35	-10.33:10	-9.3:10.86	-8.64:7.84	-8.43:9.55	-9.43:7.57	-4.91:6.32	-10.36:9.52	-8.71:6.27	-6.24:7.09	-10.64:11.15	
Theta (37.5°)	-5.09:10.21	-11.12:13.14	-14.31:9.93	-11.78:10	-6.88:12.08	-10.12:11.39	-11.39:9.25	-9.97:9.87	-6.14:5.88	-13.67:12.01	-14.98:9.25	-9.3:9.15	-6.38:5.24	-7.44:9.28	-6.58:5.72	-6.45:8.65	-7.4:8.36	-5.08:18.2	-8.43:9.42	-8.58:8.78	-10.09:9.23	-9.15:6.35	-9:15:6.35	-9:15:6.35	
Theta (45°)	-6.85:11.53	-9.6:14.4	-8.72:8.68	-6.58:11.51	-6.08:7.12	-13.8:9.78	-15.26:8.61	-7.68:4.86	-6.07:7.83	-9.68:12.55	-7.18:5.57	-3.95:3.89	-4.19:5.4	-5.77:7.43	-6.75:5.8	-8.1:10.33	-5.83:9.29	-4.74:4.8	-4.81:9.23	-5.19:5.33	-4.71:7.91	-8.31:11.29	-7.22:5.17	-6.97:5.2	
Theta (52.5°)	-9.94:8.61	-8.25:8.87	-9.21:5.04	-6.71:7.47	-9.34:5.07	-8.06:6.47	-7.16:6.57	-5.07:4.45	-4.09:3.68	-2.68:3.33	-11.62:16.67	-18.42:10.8	-8.49:5.36	-6.01:7.18	-13.92:14.84	-16.25:13.04	-17.37:9.69	-7.35:5.48	-4.52:3.86	-5.31:9.74	-4.67:9.37	-12.69:12.14	-1.77:12.23	-13.02:14.99	
Theta (60°)	-11.73:8.14	-6.78:7.96	-10.16:8.66	-7.26:7.63	-9.61:5.41	-8.01:13.75	-18.04:16.66	-9.91:14.14	-10.78:11.35	-11.89:7.45	-7.31:8.64	-13.23:18.02	-15.37:14.59	-11.07:8.54	-6.05:3.2	-5.68:9.27	-6.17:9.28	-6.17:9.28	-6.17:9.28	-6.17:9.28	-6.17:9.28	-6.17:9.28	-6.17:9.28	-6.17:9.28	-6.17:9.28
Theta (67.5°)	-6.9:3.75	-2.65:6.66	-8.83:7.97	-5.89:9.78	-9.58:11.01	-9.89:5.22	-4.25:2.39	-3.98:6.38	-2.46:4.05	-6.60:11	-2.78:3.63	-3.99:1.83	-1.21:0.33	-3.26:1.69	-4.64:3.26	-5.69:4.99	-2.38:11.39	-4.59:7.15	-4.25:7.77	-5.47:3.35	-3:4.1	-4.38:1.66	-3.16:2.54	-3.74:8.73	
Theta (75°)	-0.22:1.25	0.21:3.26	-6.39:2.3	-5.21:5.35	-4.9:5.74	-1.67:0.19	-2.2:2	-8.35:6.13	-3.53:9.03	0.87:1.15	-2.87:5.25	-5.31:3.44	-4.22:1.5	-3.45:2.55	-2.52:4.95	-6.02:5.66	-1.55:2.37	-4.73:1.58	-1.81:0.46	-1.28:1.35	-0.47:1.21	-1.86:0.67	-1.22:1.03	0.34:0.6	
Theta (82.5°)	2.120:3.7	1.78:0.65	-1.15:1.44	-2.12:0.34	-0.06:0.21	0.480:2.4	2.03:2.27	-3.27:6.54	-2.64:2.24	-6.02:2.88	-2.91:3.23	-6.74:4.22	-2.19:3.14	-4.14:6.53	-4.79:4.05	-1.43:1.21	-0.41:0.89	2.123	1.150:5.7	1.583:9.3	1.813:4.8	0.38:0.09	2.880:8.2		
Theta (90°)	2.73:1.23	1.991:0.6	1.93:7.3																						





# Radiated Composite Gain Data of scan

# Appendix C

Theta (°)	-18.91-16.94	-15.47-18.96	-18.62-18.69	-19.51-15.8	-11.65-10.44	-10.27-10.78	-13.07-14.91	-13.72-11.9	-12.55-16.77	-16.39-18.59	-15.74-16.57	-18.17-12.56	-17.81-13.69	-14.93-12.71	-11.05-11.38	-11.61-12.54	-19.19-14.01	-18.19-14.25	-16.03-18.83	-18.98-18.03	-19.22-18.34	-17.85-18.49	-17.75-18.12	-17.11-18.97	
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 (°)	-18.91-16.94	-15.47-18.96	-18.62-18.69	-19.51-15.8	-11.65-10.44	-10.27-10.78	-13.07-14.91	-13.72-11.9	-12.55-16.77	-16.39-18.59	-15.74-16.57	-18.17-12.56	-17.81-13.69	-14.93-12.71	-11.05-11.38	-11.61-12.54	-19.19-14.01	-18.19-14.25	-16.03-18.83	-18.98-18.03	-19.22-18.34	-17.85-18.49	-17.75-18.12	-17.11-18.97	
Theta (120°)	-17.55-17.24	-17.71-17.73	-18.32-18.61	-15.98-17.16	-17.68-10.23	-10.41-11.65	-9.74-10.18	-15.9-9	-10.86-9.47	-13.51-17.49	-18.19-16.13	-15.78-13.87	-13.82-17.82	-16.15-17.01	-8.92-13.34	-8.26-18.11	-11.59-17.97	-15.2-12.69	-18.53-17.39	-18.76-17.17	-16.25-12.67	-12.28-19.05	-17.22-18.06	-17.44-17.28	
Theta (127.5°)	-18.61-19.34	-18.03-19.13	-19.18-18.98	-15.91-16.02	-15.71-17.61	-13.83-16.4	-10.77-10.08	-18.04-18.3	-17.71-19.79	-17.79-19.1	-13.22-10.58	-13.73-11.35	-13.66-17.31	-11.17-12.2	-18.91-17.22	-17.64-18.97	-14.21-17.17	-17.17-17.48	-18.86-17.28	-16.25-12.67	-18.41-18.75	-15.91-15.21	-16.11-13.52	-15.32-14.33	-14.44-13.72
Theta (135°)	-16.43-13.35	-13.23-18.16	-17.32-19.17	-16.55-10.32	-18.77-19.16	-13.91-14.86	-13.89-17	-17.92-16.92	-19.03-16.54	-9.78-8.76	-10.83-11.64	-14.94-9.38	-15.59-13.31	-181-15.35	-9.84-17.63	-16.72-15.88	-13.03-17.72	-13.62-18.63	-17.95-18.6	-18.62-19.04	-16.31-18.11	-16.74-17.42	-15.82-15.38	-17.37-17.64	
Theta (142.5°)	-15.84-18.93	-15.72-12.09	-18.9-18.18	-19.06-18.51	-11.58-13.01	-18.77-16.34	-17.16-17.73	-17.81-14.95	-10.24-12.64	-9.88-19	-10.69-5.78	-10.82-16.54	-18.61-18.61	-18.48-18.38	-16.43-18.26	-17.45-17.45	-18.37-13.75	-17.55-18.98	-15.55-15.68	-12.07-11.68	-16.71-17.77	-15.82-15.68	-17.17-17.77	-19.21-17.64	
Theta (150°)	-15.92-16.02	-16.12-16.01	-15.52-10.57	-15.91-16.12	-17.17-17.61	-13.83-16.4	-10.77-10.08	-18.04-18.3	-17.71-19.79	-17.79-19.1	-13.22-10.58	-13.73-11.35	-13.66-17.31	-11.17-12.2	-18.91-17.22	-17.64-18.97	-14.21-17.17	-17.17-17.48	-18.86-17.28	-16.25-12.67	-18.41-18.75	-15.91-15.21	-16.11-13.52	-15.32-14.33	-14.44-13.72
Theta (157.5°)	-17.49-18.62	-15.71-14.98	-18.57-12.38	-16.13-12.38	-9.85-16.59	-17.98-14.68	-14.96-16.66	-18.71-18.01	-13.58-12.06	-17.88-18.97	-19.04-16.19	-10.41-14.47	-18.41-18.55	-17.83-15.67	-18.91-15.48	-18.83-19.26	-19.06-17.56	-17.89-16.77	-17.62-18.98	-17.42-18.24	-13.43-12.33	-13.22-13.43	-12.85-11.81	-13.41-17.52	
Theta (165°)	-14.49-16.09	-13.71-12.32	-11.69-12.12	-18.72-18.29	-18.04-18.64	-18.82-19.43	-12.79-12.78	-17.26-18.5	-18.16-13.84	-12.1-14.92	-18.73-17.64	-18.34-13.13	-11.38-19.06	-18.82-19.03	-12.2-14.11	-19.64-15.78	-18.47-18.26	-17.52-17.29	-18.06-18.71	-17.51-18.47	-16.23-15.15	-15.86-15.6	-16.01-17.75	-16.17-16.43	
Theta (172.5°)	-15.89-17.11	-17.81-19.07	-18.73-18.52	-15.94-16.67	-15.84-18.99	-18.62-17.45	-16.99-15.6	-14.85-16.73	-12.84-15.15	-16.51-12.92	-18.42-18.15	-19.13-12.84	-12.97-10.29	-16.61-17.44	-14.93-16.12	-14.07-14.26	-17.11-18.58	-18.19-18.12	-17.87-16.69	-18.77-18.37	-18.53-19.13	-19.36-17.84	-14.59-11.96		
Theta (180°)	-16.98-15.82	-17.44-15.89	-16.65-17.62	-16.84-18.34	-18.75-18.36	-17.34-18.25	-17.33-17.77	-19.29-19.12	-18.04-18.43	-17.94-17.87	-17.72-16.92	-18.47-16.67	-17.31-17.96	-17.85-18.39	-19.45-17.13	-17.06-19.11	-17.76-18.41	-18.49-18.1	-17.46-18.66	-17.51-18.36	-19.14-17.75	-17.97-17.76	-16.79-16.02	-14.76-15.98	
Theta (187.5°)	-15.89-17.11	-17.81-19.07	-18.73-18.52	-15.94-16.67	-15.84-18.99	-18.62-17.45	-16.99-15.6	-14.85-16.73	-12.84-15.15	-16.51-12.92	-18.42-18.15	-19.13-12.84	-12.97-10.29	-16.61-17.44	-14.93-16.12	-14.07-14.26	-17.11-18.58	-18.19-18.12	-17.87-16.69	-18.77-18.37	-18.53-19.13	-19.36-17.84	-14.59-11.96		
Theta (195°)	-16.98-15.82	-17.44-15.89	-16.65-17.62	-16.84-18.34	-18.75-18.36	-17.34-18.25	-17.33-17.77	-19.29-19.12	-18.04-18.43	-17.94-17.87	-17.72-16.92	-18.47-16.67	-17.31-17.96	-17.85-18.39	-19.45-17.13	-17.06-19.11	-17.76-18.41	-18.49-18.1	-17.46-18.66	-17.51-18.36	-19.14-17.75	-17.97-17.76	-16.79-16.02	-14.76-15.98	
Theta (202.5°)	-15.89-17.11	-17.81-19.07	-18.73-18.52	-15.94-16.67	-15.84-18.99	-18.62-17.45	-16.99-15.6	-14.85-16.73	-12.84-15.15	-16.51-12.92	-18.42-18.15	-19.13-12.84	-12.97-10.29	-16.61-17.44	-14.93-16.12	-14.07-14.26	-17.11-18.58	-18.19-18.12	-17.87-16.69	-18.77-18.37	-18.53-19.13	-19.36-17.84	-14.59-11.96		
Theta (210°)	-16.98-15.82	-17.44-15.89	-16.65-17.62	-16.84-18.34	-18.75-18.36	-17.34-18.25	-17.33-17.77	-19.29-19.12	-18.04-18.43	-17.94-17.87	-17.72-16.92	-18.47-16.67	-17.31-17.96	-17.85-18.39	-19.45-17.13	-17.06-19.11	-17.76-18.41	-18.49-18.1	-17.46-18.66	-17.51-18.36	-19.14-17.75	-17.97-17.76	-16.79-16.02	-14.76-15.98	
Theta (217.5°)	-15.89-17.11	-17.81-19.07	-18.73-18.52	-15.94-16.67	-15.84-18.99	-18.62-17.45	-16.99-15.6	-14.85-16.73	-12.84-15.15	-16.51-12.92	-18.42-18.15	-19.13-12.84	-12.97-10.29	-16.61-17.44	-14.93-16.12	-14.07-14.26	-17.11-18.58	-18.19-18.12	-17.87-16.69	-18.77-18.37	-18.53-19.13	-19.36-17.84	-14.59-11.96		
Theta (225°)	-16.98-15.82	-17.44-15.89	-16.65-17.62	-16.84-18.34	-18.75-18.36	-17.34-18.25	-17.33-17.77	-19.29-19.12	-18.04-18.43	-17.94-17.87	-17.72-16.92	-18.47-16.67	-17.31-17.96	-17.85-18.39	-19.45-17.13	-17.06-19.11	-17.76-18.41	-18.49-18.1	-17.46-18.66	-17.51-18.36	-19.14-17.75	-17.97-17.76	-16.79-16.02	-14.76-15.98	
Theta (232.5°)	-15.89-17.11	-17.81-19.07	-18.73-18.52	-15.94-16.67	-15.84-18.99	-18.62-17.45	-16.99-15.6	-14.85-16.73	-12.84-15.15	-16.51-12.92	-18.42-18.15	-19.13-12.84	-12.97-10.29	-16.61-17.44	-14.93-16.12	-14.07-14.26	-17.11-18.58	-18.19-18.12	-17.87-16.69	-18.77-18.37	-18.53-19.13	-19.36-17.84	-14.59-11.96		
Theta (240°)	-16.98-15.82	-17.44-15.89	-16.65-17.62	-16.84-18.34	-18.75-18.36	-17.34-18.25	-17.33-17.77	-19.29-19.12	-18.04-18.43	-17.94-17.87	-17.72-16.92	-18.47-16.67	-17.31-17.96	-17.85-18.39	-19.45-17.13	-17.06-19.11	-17.76-18.41	-18.49-18.1	-17.46-18.66	-17.51-18.36	-19.14-17.75	-17.97-17.76	-16.79-16.02	-14.76-15.98	
Theta (247.5°)	-15.89-17.11	-17.81-19.07	-18.73-18.52	-15.94-16.67	-15.84-18.99	-18.62-17.45	-16.99-15.6	-14.85-16.73	-12.84-15.15	-16.51-12.92	-18.42-18.15	-19.13-12.84	-12.97-10.29	-16.61-17.44	-14.93-16.12	-14.07-14.26	-17.11-18.58	-18.19-18.12	-17.87-16.69	-18.77-18.37	-18.53-19.13	-19.36-17.84	-14.59-11.96		
Theta (255°)	-16.98-15.82	-17.44-15.89	-16.65-17.62	-16.84-18.34	-18.75-18.36	-17.34-18.25	-17.33-17.77	-19.29-19.12	-18.04-18.43	-17.94-17.87	-17.72-16.92	-18.47-16.67	-17.31-17.96	-17.85-18.39	-19.45-17.13	-17.06-19.11	-17.76-18.41	-18.49-18.1	-17.46-18.66	-17.51-18.36	-19.14-17.75	-17.97-17.76	-16.79-16.02	-14.76-15.98	
Theta (262.5°)	-15.89-17.11	-17.81-19.07	-18.73-18.52	-15.94-16.67	-15.84-18.99	-18.62-17.45	-16.99-15.6	-14.85-16.73	-12.84-15.15	-16.51-12.92	-18.42-18.15	-19.13-12.84	-12.97-10.29	-16.61-17.44	-14.93-16.12	-14.07-14.26	-17.11-18.58	-18.19-18.12	-17.87-16.69	-18.77-18.37	-18.53-19.13	-19.36-17.84	-14.59-11.96		
Theta (270°)	-16.98-15.82	-17.44-15.89	-16.65-17.62	-16.84-18.34	-18.75-18.36	-17.34-18.25	-17.33-17.77	-19.29-19.12	-18.04-18.43	-17.94-17.87	-17.72-16.92	-18.47-16.67	-17.31-17.96	-17.85-18.39	-19.45-17.13	-17.06-19.11	-17.76-18.41	-18.49-18.1	-17.46-18.66	-17.51-18.36	-19.14-17.75	-17.97-17.76	-16.79-16.02	-14.76-15.98	
Theta (277.5°)	-15.89-17.11	-17.81-19.07	-18.73-18.52	-15.94-16.67	-15.84-18.99	-18.62-17.45	-16.99-15.6	-14.85-16.73	-12.84-15.15	-16.51-12.92	-18.42-18.15	-19.13-12.84	-12.97-10.29	-16.61-17.44	-14.93-16.12	-14.07-14.26	-17.11-18.58	-18.19-18.12	-17.87-16.69	-18.77-18.37	-18.53-19.13	-19.36-17.84	-14.59-11.96		
Theta (285°)	-16.98-15.82	-17.44-15.89	-16.65-17.62	-16.84-18.34	-18.75-18.36	-17.34-18.25	-17.33-17.77	-19.29-19.12	-18.04-18.43	-17.94-17.87	-17.72-16.92	-18.47-16.67	-17.31-17.96	-17.85-18.39	-19.45-17.13	-17.06-19.11	-17.76-18.41	-18.49-18.1	-17.46-18.66	-17.51-18.36	-19.14-17.75	-17.97-17.76	-16.79-16.02	-14.76-15.98	
Theta (292.5°)	-15.89-17.11	-17.81-19.07	-18.73-18.52	-15.94-16.67	-15.84-18.99	-18.62-17.45	-16.99-15.6	-14.85-16.73	-12.84-15.15	-16.51-12.92	-18.42-18.15	-19.13-12.84	-12.97-10.29	-16.61-17.44	-14.93-16.12	-14.07-14.26	-17.11-18.58	-18.19-18.12	-17.87-16.69	-18.77-18.37	-18.53-19.13	-19.36-17.84	-14.59-11.96		
Theta (300°)	-16.98-15.82	-17.44-15.89	-16.65-17.62	-16.84-18.34	-18.75-18.36	-17.34-18.25	-17.33-17.77	-19.29-19.12	-18.04-18.43	-17.94-17.87	-17.72-16.92	-18.47-16.67	-17.31-17.96	-17.85-18.39	-19.45-17.13	-17.06-19.11	-17.76-18.41	-18.49-18.1	-17.46-18.66	-17.51-18.36	-19.14-17.75	-17.97-17.76	-16.79-16.02	-14.76-15.98	
Theta (307.5°)	-15.89-17.11	-17.81-19.07	-18.73-18.52	-15.94-16.67	-15.84-18.99	-18.62-17.45	-16.99-15.6	-14.85-16.73	-12.84-15.15	-16.51-12.92	-18.42-18.15	-19.13-12.84	-12.97-10.29	-16.61-17.44	-14.93-16.12	-14.07-14.26	-17.11-18.58	-18.19-18.12	-17.87-16.69	-18.77-18.37					







# Radiated Composite Gain Data of scan

# Appendix C

Theta	Phi	Gain	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)																						
0	0	-9.92/9.93	-10.76/11.77	-12.07/11.12	-11.46/11.52	-11.93/12.84	-13.88/14.54	-14.85/15.73	-16.52/16.97	-16.47/15.22	-13.19/13.25	-12.48/12.63	-12.41/11.74	-10.54/9.63	-9.51/10.4	-11.99/12.62	-12.34/12.24	-12.61/13.38	-14.62/16.28	-17.16/17.37	-17.50/17.76	-17.12/15.18	-13.14/12.39	-12.39/13.36	-13.06/11.08	-9.84/9.76	-10.32/10.97	-11.13/11.12	-11.47/12.05	-12.65/13.21	-14.17/15.05	-15.27/15.66	-15.97/16.01	-15.78/14.97	-13.57/13.12	-13.34/13.03	-12.21/11.73	-11.58/11.83	-11.34/11.83	-12.95/13.72	-13.97/13.8	-13.64/13.71	-14.5/16.28	-17.02/17.37	-17.93/17.96	-16.8/15.01	-13.49/12.39	-12.11/11.91	-11.33/10.45																						
7.5	0	-12.21/12.13	-12.81/13.67	-13.76/13.26	-12.99/13.21	-13.45/13.72	-15.09/18.19	-17.68/17.45	-18.43/18.28	-16.58/15.06	-14.78/16.47	-19.12/17.9	-19.11/18.23	-16.85/16.96	-17.26/15.85	-13.54/12.05	-11.61/11.92	-12.41/13.16	-14.79/16.8	-17.25/16.46	-15.99/15.24	-14.01/12.97	-12.39/11.86	-11.95/12.15	-11.39/12.51	-5.83/4.99	-3.99/3.64	-4.15/5.1	-5.93/6.5	-6.73/6.82	-7.35/6.1	-8.7/2.5	-7.15/7	-8.69/10.77	-15.89/17.89	-10.52/6.99	-6.08/6.67	-7.46/7.15	-6.36/6.79	-8.42/9.15	-8.44/7.51	-7.34/8.21	-9.86/11.4	-13.71/14	-13.42/10.5	-9.99/6.65	-6.24/6.16																								
15	0	-16.96/16.08	-14.68/13.51	-12.42/11.47	-10.93/10.89	-10.8/10.99	-12.16/14.77	-17/15.21	-12.98/11.9	-11.6/11.98	-14.22/13.86	-19.11/15.88	-14.3/13.75	-11.94/10.31	-9.64/9.71	-9.14/8.07	-7.64/7.94	-6.62/9.96	-12.23/15.1	-16.19/15.42	-14.66/14.08	-13.61/13.71	-15.01/17.78	-18.72/18.88	-18.77/17.49	-5.83/4.99	-3.99/3.64	-4.15/5.1	-5.93/6.5	-6.73/6.82	-7.35/6.1	-8.7/2.5	-7.15/7	-8.69/10.77	-15.89/17.89	-10.52/6.99	-6.08/6.67	-7.46/7.15	-6.36/6.79	-8.42/9.15	-8.44/7.51	-7.34/8.21	-9.86/11.4	-13.71/14	-13.42/10.5	-9.99/6.65	-6.24/6.16																								
22.5	0	-5.83/4.99	-3.99/3.64	-4.15/5.1	-5.93/6.5	-6.73/6.82	-7.35/6.1	-8.7/2.5	-7.15/7	-8.69/10.77	-15.89/17.89	-10.52/6.99	-6.08/6.67	-7.46/7.15	-6.36/6.79	-8.42/9.15	-8.44/7.51	-7.34/8.21	-9.86/11.4	-13.71/14	-13.42/10.5	-9.99/6.65	-6.24/6.16	-5.83/4.99	-3.99/3.64	-4.15/5.1	-5.93/6.5	-6.73/6.82	-7.35/6.1	-8.7/2.5	-7.15/7	-8.69/10.77	-15.89/17.89	-10.52/6.99	-6.08/6.67	-7.46/7.15	-6.36/6.79	-8.42/9.15	-8.44/7.51	-7.34/8.21	-9.86/11.4	-13.71/14	-13.42/10.5	-9.99/6.65	-6.24/6.16																										
30	0	-8.41/12.66	-9.07/15.1	-3.75/19.9	-3.69/4.32	-5.05/5.76	-6.05/6.63	-4.82/4.56	-5.34/7.4	-8.8/11.5	-12.16/18.9	-5.15/3.98	-4.22/5.23	-6.4/6.55	-5.43/3.38	-4.58/9.99	-9.77/10.16	-11.69/15.41	-14.72/10.66	-8.93/9.29	-6.97/4.7	-3.19/2.93	-3.36/3.89	-3.36/3.89	-7.08/5.91	-4.03/3.36	-4.2/5.33	-5.01/4.88	-6.07/8.18	-8.54/6.11	-4.31/4.26	-5.56/6.5	-6.51/6.38	-5.18/3.16	-2.28/3.47	-6.37/7.99	-6.66/5	-3.74/3.49	-4.22/5.73	-7.82/8.94	-9.17/9.58	-9.12/7.55	-7.77/10.51	-9.72/6.27	-4.82/4.79	-4.5/3.19	-2.71/4.18	-6.64/7.71																							
37.5	0	-19.39/17.75	-10.3/8.82	-10.86/16.17	-11.88/4.79	-6.58/9.03	-12.64/7.7	-4.94/4.73	-6.92/6.09	-4.18/3.9	-3.16/1.82	-1.96/4.72	-9.94/8.16	-5/3.85	-3.57/3.1	-2.86/3.75	-5.58/6.67	-6.35/6.82	-7.7/8.6	-4.98/2.67	-5.76/3.29	-2.59/3.66	-3.36/3.17	-18.01/16.86	-8.41/12.66	-9.07/15.1	-3.75/19.9	-3.69/4.32	-5.05/5.76	-6.05/6.63	-4.82/4.56	-5.34/7.4	-8.8/11.5	-12.16/18.9	-5.15/3.98	-4.22/5.23	-6.4/6.55	-5.43/3.38	-4.58/9.99	-9.77/10.16	-11.69/15.41	-14.72/10.66	-8.93/9.29	-6.97/4.7	-3.19/2.93	-3.36/3.89	-3.36/3.89	-7.08/5.91	-4.03/3.36	-4.2/5.33	-5.01/4.88	-6.07/8.18	-8.54/6.11	-4.31/4.26	-5.56/6.5	-6.51/6.38	-5.18/3.16	-2.28/3.47	-6.37/7.99	-6.66/5	-3.74/3.49	-4.22/5.73	-7.82/8.94	-9.17/9.58	-9.12/7.55	-7.77/10.51	-9.72/6.27	-4.82/4.79	-4.5/3.19	-2.71/4.18	-6.64/7.71
45	0	-8.41/12.66	-9.07/15.1	-3.75/19.9	-3.69/4.32	-5.05/5.76	-6.05/6.63	-4.82/4.56	-5.34/7.4	-8.8/11.5	-12.16/18.9	-5.15/3.98	-4.22/5.23	-6.4/6.55	-5.43/3.38	-4.58/9.99	-9.77/10.16	-11.69/15.41	-14.72/10.66	-8.93/9.29	-6.97/4.7	-3.19/2.93	-3.36/3.89	-3.36/3.89	-7.08/5.91	-4.03/3.36	-4.2/5.33	-5.01/4.88	-6.07/8.18	-8.54/6.11	-4.31/4.26	-5.56/6.5	-6.51/6.38	-5.18/3.16	-2.28/3.47	-6.37/7.99	-6.66/5	-3.74/3.49	-4.22/5.73	-7.82/8.94	-9.17/9.58	-9.12/7.55	-7.77/10.51	-9.72/6.27	-4.82/4.79	-4.5/3.19	-2.71/4.18	-6.64/7.71																							
52.5	0	-19.39/17.75	-10.3/8.82	-10.86/16.17	-11.88/4.79	-6.58/9.03	-12.64/7.7	-4.94/4.73	-6.92/6.09	-4.18/3.9	-3.16/1.82	-1.96/4.72	-9.94/8.16	-5/3.85	-3.57/3.1	-2.86/3.75	-5.58/6.67	-6.35/6.82	-7.7/8.6	-4.98/2.67	-5.76/3.29	-2.59/3.66	-3.36/3.17	-18.01/16.86	-8.41/12.66	-9.07/15.1	-3.75/19.9	-3.69/4.32	-5.05/5.76	-6.05/6.63	-4.82/4.56	-5.34/7.4	-8.8/11.5	-12.16/18.9	-5.15/3.98	-4.22/5.23	-6.4/6.55	-5.43/3.38	-4.58/9.99	-9.77/10.16	-11.69/15.41	-14.72/10.66	-8.93/9.29	-6.97/4.7	-3.19/2.93	-3.36/3.89	-3.36/3.89	-7.08/5.91	-4.03/3.36	-4.2/5.33	-5.01/4.88	-6.07/8.18	-8.54/6.11	-4.31/4.26	-5.56/6.5	-6.51/6.38	-5.18/3.16	-2.28/3.47	-6.37/7.99	-6.66/5	-3.74/3.49	-4.22/5.73	-7.82/8.94	-9.17/9.58	-9.12/7.55	-7.77/10.51	-9.72/6.27	-4.82/4.79	-4.5/3.19	-2.71/4.18	-6.64/7.71
60	0	-8.41/12.66	-9.07/15.1	-3.75/19.9	-3.69/4.32	-5.05/5.76	-6.05/6.63	-4.82/4.56	-5.34/7.4	-8.8/11.5	-12.16/18.9	-5.15/3.98	-4.22/5.23	-6.4/6.55	-5.43/3.38	-4.58/9.99	-9.77/10.16	-11.69/15.41	-14.72/10.66	-8.93/9.29	-6.97/4.7	-3.19/2.93	-3.36/3.89	-3.36/3.89	-7.08/5.91	-4.03/3.36	-4.2/5.33	-5.01/4.88	-6.07/8.18	-8.54/6.11	-4.31/4.26	-5.56/6.5	-6.51/6.38	-5.18/3.16	-2.28/3.47	-6.37/7.99	-6.66/5	-3.74/3.49	-4.22/5.73	-7.82/8.94	-9.17/9.58	-9.12/7.55	-7.77/10.51	-9.72/6.27	-4.82/4.79	-4.5/3.19	-2.71/4.18	-6.64/7.71																							
67.5	0	-19.39/17.75	-10.3/8.82	-10.86/16.17	-11.88/4.79	-6.58/9.03	-12.64/7.7	-4.94/4.73	-6.92/6.09	-4.18/3.9	-3.16/1.82	-1.96/4.72	-9.94/8.16	-5/3.85	-3.57/3.1	-2.86/3.75	-5.58/6.67	-6.35/6.82	-7.7/8.6	-4.98/2.67	-5.76/3.29	-2.59/3.66	-3.36/3.17	-18.01/16.86	-8.41/12.66	-9.07/15.1	-3.75/19.9	-3.69/4.32	-5.05/5.76	-6.05/6.63	-4.82/4.56	-5.34/7.4	-8.8/11.5	-12.16/18.9	-5.15/3.98	-4.22/5.23	-6.4/6.55	-5.43/3.38	-4.58/9.99	-9.77/10.16	-11.69/15.41	-14.72/10.66	-8.93/9.29	-6.97/4.7	-3.19/2.93	-3.36/3.89	-3.36/3.89	-7.08/5.91	-4.03/3.36	-4.2/5.33	-5.01/4.88	-6.07/8.18	-8.54/6.11	-4.31/4.26	-5.56/6.5	-6.51/6.38	-5.18/3.16	-2.28/3.47	-6.37/7.99	-6.66/5	-3.74/3.49	-4.22/5.73	-7.82/8.94	-9.17/9.58	-9.12/7.55	-7.77/10.51	-9.72/6.27	-4.82/4.79	-4.5/3.19	-2.71/4.18	-6.64/7.71
75	0	-8.41/12.66	-9.07/15.1	-3.75/19.9	-3.69/4.32	-5.05/5.76	-6.05/6.63	-4.82/4.56	-5.34/7.4	-8.8/11.5	-12.16/18.9	-5.15/3.98	-4.22/5.23	-6.4/6.55	-5.43/3.38	-4.58/9.99	-9.77/10.16	-11.69/15.41	-14.72/10.66	-8.93/9.29	-6.97/4.7	-3.19/2.93	-3.36/3.89	-3.36/3.89	-7.08/5.91	-4.03/3.36	-4.2/5.33	-5.01/4.88	-6.07/8.18	-8.54/6.11	-4.31/4.26	-5.56/6.5	-6.51/6.38	-5.18/3.16	-2.28/3.47	-6.37/7.99	-6.66/5	-3.74/3.49	-4.22/5.73	-7.82/8.94	-9.17/9.58	-9.12/7.55	-7.77/10.51	-9.72/6.27	-4.82/4.79	-4.5/3.19	-2.71/4.18	-6.64/7.71																							
82.5	0	-19.39/17.75	-10.3/8.82	-10.86/16.17	-11.88/4.79	-6.58/9.03	-12.64/7.7	-4.94/4.73	-6.92/6.09	-4.18/3.9	-3.16/1.82	-1.96/4.72	-9.94/8.16	-5/3.85	-3.57/3.1	-2.86/3.75	-5.58/6.67	-6.35/6.82	-7.7/8.6	-4.98/2.67	-5.76/3.29	-2.59/3.66	-3.36/3.17	-18.01/16.86	-8.41/12.66	-9.07/15.1	-3.75/19.9	-3.69/4.32	-5.05/5.76	-6.05/6.63	-4.82/4.56	-5.34/7.4	-8.8/11.5	-12.16/18.9	-5.15/3.98	-4.22/5.23	-6.4/6.55	-5.43/3.38	-4.58/9.99	-9.77/10.16	-11.69/15.41	-14.72/10.66	-8.93/9.29	-6.97/4.7	-3.19/2.93	-3.36/3.89	-3.36/3.89	-7.08/5.91	-4.03/3.36	-4.2/5.33	-5.01/4.88	-6.07/8.18	-8.54/6.11	-4.31/4.26	-5.56/6.5	-6.51/6.38	-5.18/3.16	-2.28/3.47	-6.37/7.99	-6.66/5	-3.74/3.49	-4.22/5.73	-7.82/8.94	-9.17/9.58	-9.12/7.55	-7.77/10.51	-9.72/6.27	-4.82/4.79	-4.5/3.19	-2.71/4.18	-6.64/7.71
90	0	-8.41/12.66	-9.07/15.1	-3.75/19.9	-3.69/4.32	-5.05/5.76	-6.05/6.63	-4.82/4.56	-5.34/7.4	-8.8/11.5	-12.16/18.9	-5.15/3.98	-4.22/5.23	-6.4/6.55	-5.43/3.38	-4.58/9.99	-9.77/10.16	-11.69/15.41	-14.72/10.66	-8.93/9.29	-6.97/4.7	-3.19/2.93	-3.36/3.89	-3.36/3.89	-7.08/5.91	-4.03/3.36	-4.2/5.33	-5.01/4.88	-6.07/8.18	-8.54/6.11	-4.31/4.26	-5.56/6.5	-6.51/6.38	-5.18/3.16	-2.28/3.47	-6.37/7.99	-6.66/5	-3.74/3.49	-4.22/5.73	-7.82/8.94	-9.17/9.58	-9.12/7.55	-7.77/10.51	-9.72/6.27	-4.82/4.79	-4.5/3.19	-2.71/4.18	-6.64/7.71																							
97.5	0	-19.39/17.75	-10.3/8.82	-10.86/16.17	-11.88/4.79	-6.58/9.03	-12.64/7.7	-4.94/4.73	-6.92/6.09	-4.18/3.9	-3.16/1.82	-1.96/4.72	-9.94/8.16	-5/3.85	-3.57/3.1	-2.86/3.75	-5.58/6.67	-6.35/6.82	-7.7/8.6	-4.98/2.67	-5.76/3.29	-2.59/3.66	-3.36/3.17	-18.01/16.86	-8.41/12.66	-9.07/15.1	-3.75/19.9	-3.69/4.32	-5.05/5.76	-6.05/6.63	-4.82/4.56	-5.34/7.4	-8.8/11.5	-12.16/18.9	-5.15/3.98	-4.22/5.23	-6.4/6.55	-5.43/3.38	-4.58/9.99	-9.77/10.16	-11.69/15.41	-14.72/10.66	-8.93/9.29	-6.97/4.7	-3.19/2.93	-3.36/3.89	-3.36/3.89	-7.08/5.91	-4.03																						













# Radiated Composite Gain Data of scan

# Appendix C

Theta (°)	-18.18-19.28	-18.08-18.66	-17.24-18	-18.81-17.42	-19.76-18.61	-17.14-16.7	-15.65-13.61	-13.76-13.79	-12.87-13.31	-13.43-11.12	-14.65-13.17	-16.11-19.13	-18.44-18.21	-17.73-18.13	-18.73-17.17	-15.98-18.02	-18.47-14.31	-14.36-15.9	-15.32-16	-17.06-14.17	-14-14.91	-15.16-18.46	-15.91-18.52	-18.51-17.93
Theta (7.5°)	-17.67-18.75	-18.34-18.93	-15.4-13.32	-10.45-9.13	-9.5-10.64	-10.81-12.37	-13.27-14.06	-13.24-11.8	-11.12-11.34	-12.61-12.95	-13.36-18.96	-15.67-17.48	-17.93-17.98	-17.31-19.26	-19.15-17.6	-19.61-18.42	-17.41-17.59	-18.08-16.32	-16.14-13.81	-13.14-12.31	-10.07-10.49	-9.83-8.63	-9.28-9.71	-12.75-13.08
Theta (15°)	-18.66-18.33	-18.29-18.33	-17.96-18.86	-18.18-12.27	-11.17-11.06	-12.85-13.58	-10.96-8.77	-8.89-10.52	-13.15-14.64	-15.08-16.14	-15.9-15.62	-18.1-15.79	-18.22-18.51	-17.78-17.38	-18.38-19.54	-18.25-17.9	-17.36-14.05	-17.49-13.92	-10.64-9.14	-9.59-12.73	-15.1-19.02	-17.72-14.75	-11.78-12.27	-14.99-18.39
Theta (22.5°)	-18.92-18.71	-18.05-18.78	-18.34-10.18	-10.28-12.01	-13.94-11.65	-9.43-8.3	-10.56-9.23	-7.92-10.24	-14.66-14.14	-18.74-17.65	-17.71-18.33	-17.79-17.58	-18.96-18.85	-17.86-17.78	-17.55-17.38	-18.09-18.4	-14.57-14.55	-10.4-9.88	-9.85-12.18	-13.12-13.01	-14.21-12.58	-15.52-17.75	-18.13-18.13	-16.26-15.47
Theta (30°)	-18.35-15.17	-17.02-14.59	-11.05-17.2	-18.16-15.86	-18.96-11.84	-15.62-12.47	-7.49-13.19	-11.39-13.3	-19.05-15.89	-18.74-18.81	-13.29-18.56	-17.62-18.24	-18.49-19.29	-18.77-17.91	-18.03-18.49	-18.88-17.15	-17.64-14.37	-12.36-10.65	-14.41-14.69	-11.21-10.27	-11.68-12.37	-16.29-15.89	-10.64-18.73	-18.36-16.91
Theta (37.5°)	-15.57-7.99	-12.93-15.39	-12.27-17.87	-16.13-8.7	-11.71-18.7	-16.01-17.73	-16.93-17.46	-10.24-11.04	-14.83-18.42	-17.96-18.99	-17.32-15.07	-17.61-18.33	-17.54-17.5	-17.67-19.18	-19-19.1	-12.61-4.57	-18.51-15.58	-14.87-14.12	-13.68-13.88	-12.67-17.94	-18.71-17.84	-15.66-19.29	-18.06-17.81	-16.18-10.62
Theta (45°)	-13.21-13.88	-14.71-11.08	-18.41-6.31	-11.04-18.83	-15.58-18.41	-11.84-11.97	-11.25-18.92	-15.81-12.42	-12.58-19.36	-18.35-18.65	-18.63-17.15	-18.46-18.05	-18.35-17.87	-18.11-17.94	-17.59-19.03	-19.04-13.47	-17.88-18.6	-10.74-12.97	-18.84-15.45	-17.96-13.01	-11.95-13	-18.38-13.48	-15.59-14.81	-15.47-18.72
Theta (52.5°)	-6.76-10.54	-11.81-12.43	-7.34-10.42	-11.59-18.06	-18.94-17.55	-19.11-18.65	-14.38-17.59	-18.12-17.71	-16.87-17.64	-15.08-19.14	-17.74-18.73	-19.33-19.22	-18.41-18.44	-17.91-17.71	-17.91-18.18	-16.72-13.95	-17.92-19.09	-15.74-18.64	-18.05-13.78	-15.65-14.53	-12.44-16.34	-17.44-11.62	-11.32-12.86	-9.56-10.46
Theta (60°)	-7.01-7.8	-12.23-9.13	-17.42-13.89	-9.51-16.26	-10.93-18.27	-13.81-17.41	-14.52-12.38	-18.03-17.48	-13.89-14.65	-18.02-18.48	-18.51-19.54	-17.83-17.85	-18.84-18.74	-18.04-18.75	-18.29-15.9	-18.54-17.05	-18.23-18.06	-18.57-15.26	-15.04-18.29	-18.64-18.81	-17.56-12.63	-10.03-11.91	-8.14-5.39	-4.23-9.08
Theta (67.5°)	-8.08-10.43	-16.29-12.66	-18.35-12.64	-14.08-8.61	-17.34-18.44	-18.51-16.3	-18.78-18.1	-18.75-17.98	-13.41-14.06	-18.56-18.78	-17.26-13.31	-18.59-18.49	-16.83-18.17	-18.96-18.92	-15.27-16.94	-16-17.86	-17.14-18.97	-18.27-18.34	-17.79-18.52	-15.57-18.81	-19.28-18.9	-18.24-11.1	-9.06-7.88	-5.81-8.11
Theta (75°)	-14.36-11.93	-10.47-16.27	-14.72-12.28	-13.66-6.09	-16.11-15.5	-18.88-17.7	-18.55-13.72	-14.14-13.49	-15.72-19.39	-18.61-17.58	-15.15-17.04	-13.31-17.91	-18.31-19.18	-18.44-15.25	-18.09-19.08	-13.45-17.71	-19.57-19.32	-18.93-18.18	-18.74-17.58	-18.05-18.64	-18.29-14.38	-7.33-7.55	-13.31-8.89	-7.25-9.06
Theta (82.5°)	-15.44-18.08	-10.31-15.52	-10.61-13.29	-17.21-7.53	-16.73-17.77	-18.43-17.3	-17.87-13.57	-17.93-16.94	-18.23-16.31	-16.33-19.26	-18.97-18.58	-14.93-19.04	-19.13-19.05	-16.99-16.42	-13.86-14.78	-18.84-17.88	-16.19-16.46	-18.96-17.93	-18.46-18.24	-17.84-18.27	-19.07-18.76	-15.61-12.13	-16.24-16.15	-16.32-12.49
Theta (90°)	-13.54-19.13	-15.72-14.08	-16.89-19.12	-17.23-13.88	-17.61-19.33	-16.26-14.34	-18.08-13.01	-18.52-14.37	-17.89-18.73	-16.78-18.6	-17.19-18.01	-14.21-18.52	-18.51-18.56	-18.06-18.27	-18.47-15.23	-17.9-18.3	-15.31-18.21	-16.21-19.08	-17.13-17.67	-15.13-18.78	-18.61-18.7	-18.09-16.29	-19.46-17.97	-17.13-13.53
Theta (97.5°)	-14.09-19.15	-18.51-18.33	-17.96-18.13	-14.17-16.97	-19.21-15.5	-16.55-14.37	-17.86-16.08	-15.54-16.24	-18.67-15.84	-18.83-17.51	-15.38-17.47	-16.87-18.25	-18.11-17.33	-16.71-18.64	-15.32-18.42	-19.11-14.73	-16.11-16.39	-18.34-18.86	-17.62-18.67	-17.79-16.02	-15.04-15.7	-16.35-10.7	-15.92-17.97	-13.41-17.26
Theta (105°)	-18.71-8.66	-15.32-19.59	-17.77-11.17	-15.42-14	-11.79-13.35	-19.23-16.75	-18.29-18.54	-18.28-17.6	-19.19-19.3	-18.12-18.4	-17.88-19.04	-18.48-13.31	-14.97-13.09	-18.81-18.66	-18.95-12.71	-17.71-16.24	-17.83-15.95	-18.28-19.18	-17.59-18.14	-18.61-18.24	-19.07-18.76	-15.61-12.13	-16.24-16.15	-18.98-11.72
Theta (112.5°)	-18.21-12.35	-16.77-14.55	-18.13-13.92	-18.95-18.42	-11.52-13.67	-14.64-16.98	-18.45-18.64	-18.01-18.65	-18.71-18.97	-17.95-17.73	-18.49-18.6	-17.57-17.76	-18.65-15.76	-18.35-16.99	-17.86-19.16	-17.78-10.98	-17.65-17.68	-17.89-19.11	-14.63-16.76	-19.27-12.35	-16.91-19.69	-12.91-6.08	-8.21-9.85	-9.71-19.4
Theta (120°)	-18.57-8.54	-13.16-18.92	-13.51-18.82	-16.07-18.43	-15.43-13.36	-14.42-18.26	-17.44-18.27	-19.15-17.77	-19.05-17.49	-17.87-18.99	-18.97-18.42	-16.38-15.5	-16.62-15.61	-18.91-18.6	-17.38-19.06	-11.56-18.43	-18.41-14.96	-15.55-17.89	-18.26-16.48	-16.88-19.1	-17.95-18.03	-13.31-11.88	-15.31-11.1	-10.25-13.53
Theta (127.5°)	-17.93-11.52	-18.82-11.77	-12.29-9.67	-13.52-17.52	-14.91-13.98	-17.74-18.68	-13.87-18.77	-18.85-18.29	-13.88-18.95	-16.89-18.16	-18.78-13.05	-18.53-18.48	-18.56-15.43	-17.36-14.75	-11.96-12.49	-18.51-18.31	-19.14-18.7	-17.66-17.24	-18.85-18.56	-14.99-10.02	-19.03-17.78	-16.93-17.71	-12.35-11.52	
Theta (135°)	-14.01-18.02	-11.02-18.15	-12.84-15.53	-13.93-8.28	-15.03-19.03	-17.89-18.96	-18.33-19.05	-18.83-18.8	-18.22-18.13	-14.21-19.26	-14.24-16.54	-19.27-19.02	-17.91-18.03	-18.65-18.62	-14.94-13.11	-12.78-12.81	-17.65-18.25	-13.52-17.67	-14.21-17.79	-10.22-15.94	-18.37-12.23	-18.12-17.75	-14.75-11.22	-18.23-14.14
Theta (142.5°)	-15.14-14.02	-16.42-11.06	-10.77-17.72	-18.17-16.31	-13.99-15.8	-17.94-16.72	-18.52-15.54	-14.59-18.05	-17.56-18.05	-17.36-13.29	-11.63-15.31	-17.85-16.79	-18.31-13.46	-11.01-11.27	-14.63-15.68	-15-14.33	-14.81-15.9	-15.31-18.69	-17.36-17.15	-14.53-15.57	-17.75-17.96	-17.07-17.75	-13.64-13.86	-19.09-17.98
Theta (150°)	-14.38-12.01	-15.15-12.07	-18.38-14.12	-14.13-19.01	-17.68-15.64	-15.41-17.24	-17.92-15.09	-16.97-17.21	-17.62-18.83	-18.17-19.21	-15.86-18.14	-17.93-14.63	-18.56-18.55	-18.69-17.76	-17.75-9.14	-11.68-15.88	-12.36-16.93	-18.11-19.08	-15.53-17.15	-18.87-18.27	-16.81-14.71	-18.88-10.71	-15.83-18.31	-10.53-18.08
Theta (157.5°)	-18.96-19.19	-15.29-11.14	-14-17.84	-18.81-14.58	-13.72-17.93	-18.12-18.22	-14.07-12.77	-17.94-18.41	-17.15-17.75	-19.31-17.98	-18.35-19.17	-17.86-17.76	-18.83-15.88	-18.11-16.59	-10.71-9.61	-11.42-11.96	-14.51-15.88	-13.88-16.1	-19.26-16.62	-14.29-19.4	-18.32-17.51	-18.71-17.63	-17.67-14.44	-12.11-17.57
Theta (165°)	-17.91-18.07	-17.01-12.13	-9.95-9.81	-10.53-10.18	-10.62-12.23	-15.72-17.51	-15.93-16.85	-19-17.61	-13.79-11.45	-13.82-18.93	-19.01-17.86	-17.92-18.07	-18.54-18.29	-17.88-19.26	-18.19-17.71	-12.54-13.14	-9.55-8.33	-9.04-12.78	-17.58-18.26	-18.71-18.26	-17.35-17.28	-13.73-13.46	-12.93-17.24	-18.91-18.41
Theta (172.5°)	-17.44-17.55	-17.68-19.81	-16.13-15.37	-15.95-14.49	-15.69-13.93	-15.67-16.4	-16.28-18.25	-17.86-18.58	-17.18-16.28	-17.01-18.33	-19.37-19.15	-15.08-17.7	-15.76-14.5	-15.85-15.81	-15.45-14.99	-14.06-13.33	-11.32-13.17	-15.88-17.71	-18.56-16.55	-16.59-15.54	-14.45-18.16	-18.41-18.18	-18-18.94	-18.71-17.71
Theta (180°)	-18.67-19.27	-17.84-18.96	-19.11-18.29	-18.12-18.87	-17.88-19.04	-17.76-18.2	-19.09-17.85	-17.34-17.04	-15.94-15.05	-15.89-17.89	-17.47-18.24	-17.74-18.17	-19.14-19.08	-19.03-17.57	-17.92-18.91	-18.09-16.9	-17.47-18.85	-18.09-18.55	-19.32-18.71	-18.04-17.66	-18.69-19.54	-18.85-18.23	-18.01-18.92	-16.64-18.64
Frequency	6.955GHz	Theta/Ant. 2	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
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 (7.5°)	-18.84-14.72	-15.72-16.86	-15.34-15.2	-17.11-17.39	-17.57-18.49	-18.59-18.29	-18.68-18.42	-17.71-18.24	-18.02-18.11	-17.76-15.5	-14.86-12.73	-11.89-10.5	-10.21-9.99	-9.37-10.05	-10.45-10.44	-10.48-10.93	-13.61-16.67	-16.91-17.21	-18.71-17.05	-19.07-17.95	-18.49-17.95	-18.85-17.11	-17.21-18.3	-16.76-17.56
Theta (15°)	-6.29-6.1	-5.39-5.7	-5.83-6.81	-7.01-8.27	-10.16-12.52	-15.01-17.22	-18.64-19.27	-18.29-18.61	-17.73-19.19	-18.46-19	-18.87-16.81	-15.72-16.04	-13.33-15	-16.85-15.87	-17.12-18.56	-18.04-17.75	-18-17.87	-18.31-18.06	-18.45-17.6	-17.06-16.26	-17.51-16.1	-15.81-14.59	-10.59-10	-7.04-7.1
Theta (22.5°)	-4.65-4.72	-5.52-5.77	-5.91-6.52	-5.46-5.82	-6.43-7.46	-8.74-10.5	-12.02-16.79	-18.36-17.9	-15.22-14.99	-17.69-18.83	-18.88-19.03	-17.28-17.54	-19.42-											











# Antenna Pattern of 2.4GHz&5GHz&5.9GHz

# Appendix D

θ (60°)	-8.28/-10.82	-9.31/-9.51	-10.86/-6.08	-11.89/-5.98	-11.26/-10.08	-12.23/-13.85	-12.04/-5.51	-6.10/-5.40	-6.03/-8.20	-7.68/-8.98	-6.48/-11.06	-7.25/-6.08	-15.07/-12.80	-6.94/-7.33	-10.08/-7.59	-13.32/-8.65	-7.97/-5.22	-9.24/-5.43	-7.44/-8.31	-9.93/-12.74	-9.20/-5.85	-5.65/-8.60	-6.61/-4.14	-5.33/-11.23
Gain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
θ (67.5°)	-7.35/-6.36	-8.48/-10.38	-7.09/-3.79	-6.73/-6.39	-8.40/-11.67	-7.71/-4.72	0.03/1.66	0.25/1.41	-0.44/-0.23	-1.18/-1.74	-0.42/-1.86	-0.12/-1.97	-4.59/-3.18	-3.89/-4.73	-5.07/-13.35	-13.94/-8.71	-11.15/-10.52	-8.17/-8.86	-8.09/-8.31	-4.22/-10.64	-6.02/-3.44	-3.15/-5.63	-5.64/-5.36	-5.42/-8.61
θ (75°)	-6.26/-2.24	-2.33/-3.52	-0.10/-0.69	0.35/-4.95	-2.70/-2.73	-1.72/-6.35	-0.37/-0.48	-4.88/-1.63	-3.07/-3.34	-0.86/-1.16	0.87/-2.25	-2.49/-4.72	-6.49/-2.73	-1.73/-3.34	-4.37/-3.84	-3.98/-4.54	-1.85/-4.18	-2.59/-1.66	-5.77/-5.27	-2.02/-2.45	-4.13/-2.74	-3.19/-2.90	-2.82/-2.47	-3.34/-1.76
θ (82.5°)	0.59/2.07	1.21/1.80	1.99/2.11	3.49/0.47	-0.99/-0.34	-5.58/-5.46	-5.73/-4.20	-3.90/-5.86	-3.05/-1.52	-5.82/-6.88	0.59/-4.14	-4.09/-1.41	-10.51/-2.75	-4.34/-2.02	-1.09/0.20	2.11/-1.39	1.60/2.10	2.36/1.98	0.32/-2.48	-0.85/0.70	-1.47/-2.96	-1.80/0.64	-1.23/-0.86	0.41/0.91
θ (90°)	3.02/3.35	3.59/3.69	4.25/4.34	5.08/3.32	0.71/-0.01	-5.47/0.78	1.52/0.07	-1.27/-2.33	0.42/2.19	2.09/-5.89	-0.08/-6.96	-1.53/-6.16	-0.69/-1.24	-1.48/-2.48	1.10/2.35	3.81/-0.28	2.45/4.08	2.44/4.51	2.89/-1.54	0.72/2.76	2.13/-0.61	-1.86/1.07	-1.64/0.38	2.40/2.55
θ (97.5°)	3.56/4.25	4.01/4.08	4.31/4.94	4.70/4.24	5.02/3.33	-2.49/0.62	2.09/0.30	-2.76/0.33	-0.01/-0.01	0.75/-3.09	0.08/-3.50	0.33/-3.15	-1.68/-1.34	-1.92/1.96	2.07/2.64	2.79/0.26	1.37/4.48	3.61/6.85	4.33/-0.85	0.92/2.74	3.37/2.10	2.07/2.62	-2.17/-2.02	2.47/2.42
θ (105°)	1.63/2.09	3.15/3.65	3.25/3.59	3.79/3.17	1.30/0.16	-4.24/-1.59	0.84/-0.88	-4.01/-0.66	-3.84/-2.09	1.01/0.64	0.96/-4.99	-0.27/-8.42	0.49/-1.53	-5.39/-6.76	-1.77/0.40	-0.53/-4.96	-2.20/1.75	-0.97/2.66	0.26/-2.41	-0.94/-0.68	0.85/-2.16	-0.94/0.17	-1.89/-2.34	-0.70/1.17
θ (112.5°)	0.19/-1.95	0.85/0.52	1.22/0.10	1.58/0.08	-1.28/-1.37	-5.54/-8.82	-2.31/-2.27	-3.79/-1.97	-8.49/-4.55	-2.35/-1.91	-6.39/-4.71	-6.04/-12.65	-4.82/-6.22	-10.03/-8.93	-7.28/-8.47	-4.53/-15.30	-4.42/-1.51	-3.81/-8.11	-3.31/-6.85	-5.86/-4.63	-3.28/-6.72	-5.33/-4.90	-5.58/-7.06	-4.51/-2.75
θ (120°)	-4.56/-7.51	-6.12/-6.20	-3.57/-8.23	-3.71/-4.04	-5.27/-5.34	-5.61/-8.07	-7.29/-10.84	-7.99/-13.72	-7.55/-7.55	-5.19/-6.58	-15.45/-11.62	-11.98/-14.59	-13.35/-8.52	-10.41/-10.40	-8.32/-15.37	-5.84/-9.06	-8.25/-10.62	-10.97/-8.38	-15.67/-9.18	-8.86/-10.08	-19.18/-9.39	-13.11/-12.73	-8.46/-8.21	
θ (127.5°)	-14.34/-14.35	-14.62/-14.37	-15.50/-12.56	-11.34/-11.79	-10.50/-10.39	-4.80/-4.46	-2.92/-2.64	-2.30/-5.34	-1.71/-3.22	-7.70/-7.65	-6.87/-9.29	-8.27/-7.93	-11.29/-12.69	-9.09/-10.05	-11.32/-12.53	-14.65/-10.33	-12.22/-11.64	-15.50/-14.97	-11.66/-13.02	-13.74/-15.19	-15.69/-15.32	-11.46/-10.37	-11.32/-12.26	-12.93/-13.74
θ (135°)	-14.97/-8.40	-8.43/-7.76	-12.20/-15.60	-9.23/-15.37	-9.78/-10.57	-9.42/-13.66	-7.34/-6.23	-4.94/-7.28	-12.01/-11.46	-5.25/-9.35	-5.34/-6.88	-8.60/-9.96	-11.95/-12.93	-10.64/-12.67	-8.56/-6.24	-10.70/-8.16	-9.14/-8.07	-6.04/-6.15	-9.94/-15.37	-11.71/-11.71	-9.81/-7.18	-11.11/-9.95	-5.89/-6.65	-6.59/-6.65
θ (142.5°)	-10.97/-8.38	-7.35/-7.97	-11.36/-12.47	-9.56/-11.53	-7.03/-7.01	-11.36/-12.47	-11.54/-10.50	-9.57/-6.42	-6.16/-4.88	-6.00/0.51	-9.95/-15.35	-13.95/-11.20	-13.31/-11.19	-14.77/-14.83	-12.97/-8.67	-10.87/-8.64	-9.18/-8.32	-5.64/-3.36	-12.50/-13.82	-12.36/-10.62	-6.43/-6.75	-11.89/-9.52	-6.42/-6.14	
θ (150°)	-7.19/-7.54	-7.24/-6.36	-6.80/-9.71	-9.55/-7.81	-11.29/-8.53	-6.87/-7.44	-7.64/-8.55	-7.54/-7.29	-7.79/-6.92	-6.97/-7.44	-10.55/-9.99	-12.95/-13.86	-8.30/-8.30	-8.62/-8.91	-6.68/-6.23	-7.55/-10.30	-13.19/-10.97	-10.00/-11.52	-9.93/-9.50	-11.99/-12.50	-8.94/-9.15	-7.50/-5.95	-6.70/-7.17	-6.74/-6.58
θ (157.5°)	-7.06/-8.92	-10.88/-10.43	-10.76/-9.30	-8.01/-7.14	-7.16/-7.74	-8.23/-9.04	-11.46/-10.55	-13.44/-12.57	-13.42/-14.47	-11.64/-8.72	-6.87/-8.49	-12.39/-8.33	-9.67/-9.50	-6.82/-6.83	-6.83/-7.97	-8.10/-10.42	-11.62/-11.32	-14.32/-14.88	-13.37/-12.93	-11.98/-10.95	-7.76/-7.11	-5.91/-5.79	-6.65/-6.42	
θ (165°)	-10.07/9.30	-8.34/-8.88	-9.83/-9.22	-9.98/-10.29	-9.79/-9.39	-8.21/-6.95	-5.80/-6.29	-13.47/-9.06	-11.35/-10.53	-9.43/-9.07	-11.47/-15.73	-12.85/-13.29	-12.42/-12.13	-11.51/-10.15	-12.98/-10.66	-15.02/-13.90	-12.96/-13.52	-13.40/-13.60	-16.05/-14.95	-15.67/-15.29	-13.36/-12.38	-13.12/-12.57	-12.35/-13.31	-12.90/-10.29
θ (172.5°)	-15.20/-13.69	-14.31/-14.45	-11.42/-10.73	-10.46/-10.64	-10.84/-10.55	-10.76/-12.28	-12.98/-13.54	-14.14/-15.13	-15.46/-15.16	-13.43/-13.18	-12.79/-10.80	-11.11/-12.56	-12.09/-12.60	-13.88/-13.64	-12.50/-11.82	-10.74/-9.52	-11.89/-13.98	-14.98/-14.78	-15.66/-15.56	-15.79/-15.24	-15.57/-15.34	-15.13/-14.62	-16.16/-15.78	-15.77/-15.67
θ (180°)	-15.70/-15.06	-13.09/-11.57	-12.50/-11.56	-10.37/-9.01	-8.76/-8.84	-9.10/-9.41	-9.54/-10.55	-12.08/-15.14	-15.25/-12.81	-12.49/-13.70	-10.97/-11.34	-13.34/-12.07	-11.63/-10.89	-10.46/-11.02	-11.96/-12.82	-14.23/-14.77	-15.84/-15.50	-15.80/-15.66	-14.25/-14.01	-14.07/-12.24	-12.44/-13.27	-14.96/-13.52	-12.52/-14.09	-15.21/-13.92
Freq(Hz)	5.65GPol.	TotalAnt 2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gain	Φ(0°)/Φ(7.5°)	Φ(15°)/Φ(22.5°)	Φ(30°)/Φ(37.5°)	Φ(45°)/Φ(52.5°)	Φ(60°)/Φ(67.5°)	Φ(75°)/Φ(82.5°)	Φ(90°)/Φ(97.5°)	Φ(105°)/Φ(112.5°)	Φ(120°)/Φ(127.5°)	Φ(135°)/Φ(142.5°)	Φ(150°)/Φ(157.5°)	Φ(165°)/Φ(172.5°)	Φ(180°)/Φ(187.5°)	Φ(195°)/Φ(202.5°)	Φ(210°)/Φ(217.5°)	Φ(225°)/Φ(232.5°)	Φ(240°)/Φ(247.5°)	Φ(255°)/Φ(262.5°)	Φ(270°)/Φ(277.5°)	Φ(285°)/Φ(292.5°)	Φ(300°)/Φ(307.5°)	Φ(315°)/Φ(322.5°)	Φ(330°)/Φ(337.5°)	Φ(345°)/Φ(352.5°)
θ (0°)	-10.03/-14.29	-12.21/-11.27	-10.93/-11.73	-10.88/-11.10	-12.29/-13.55	-13.81/-12.62	-12.44/-11.90	-11.94/-12.06	-12.05/-12.19	-12.28/-13.46	-12.24/-11.70	-13.43/-11.48	-14.03/-14.61	-12.98/-10.78	-10.24/-10.16	-11.63/-12.23	-10.89/-12.28	-11.70/-12.11	-11.12/-11.52	-10.92/-11.66	-12.30/-12.33	-10.44/-10.36	-12.99/-10.86	-10.88/-10.60
θ (7.5°)	-12.75/-14.45	-14.72/-11.48	-10.93/-11.73	-14.08/-11.14	-10.59/-10.93	-10.21/9.78	-10.54/-11.44	-10.83/-10.60	-11.81/-12.84	-11.40/-11.66	-12.76/-11.55	-11.98/-11.51	-12.65/-13.32	-12.96/-12.56	-12.46/-12.14	-11.98/-11.64	-10.57/-11.29	-10.74/-11.92	-11.73/-12.56	-11.74/-12.66	-10.50/-10.45	-11.10/-10.20	-14.46/-11.39	-14.99/-15.06
θ (15°)	-12.43/-12.61	-13.74/-15.50	-15.64/-14.95	-15.94/-15.14	-14.35/-13.87	-14.73/-15.19	-15.54/-14.16	-11.37/-11.81	-11.54/-11.55	-12.16/-10.27	-9.22/-11.24	-10.77/-10.84	-10.24/-8.84	-8.72/-7.76	-7.51/-8.68	-9.30/-11.67	-14.14/-14.84	-14.01/-13.13	-14.15/-14.09	-14.73/-14.54	-13.14/-13.17	-14.63/-12.13	-11.63/-14.05	-12.41/-12.31
θ (22.5°)	-11.87/-12.42	-14.62/-13.30	-15.80/-13.85	-11.83/-12.27	-13.85/-15.21	-15.19/-15.38	-14.68/-11.69	-12.47/-12.46	-8.55/-7.49	-7.32/-6.39	-6.35/-4.89	-6.64/-6.05	-6.70/-7.60	-6.12/-5.95	-6.95/-7.59	-7.74/-10.24	-13.39/-11.21	-9.52/-9.07	-9.68/-11.99	-11.09/-9.51	-11.06/-12.99	-11.09/-9.51	-11.06/-12.99	-11.13/-11.91
θ (30°)	-11.69/-9.18	-12.76/-10.23	-11.49/-10.23	-8.15/-7.73	-8.06/-10.56	-10.45/-9.89	-10.63/-9.10	-6.98/-6.30	-6.70/-7.19	-10.90/-9.42	-6.66/-7.23	-7.26/-7.40	-7.87/-6.21	-6.61/-6.16	-5.29/-5.75	-8.11/-6.83	-6.62/-8.02	-5.61/-6.71	-8.55/-9.10	-7.76/-7.12	-9.65/-10.53	-9.32/-9.79	-7.81/-7.18	
θ (37.5°)	-8.34/-7.06	-7.29/-5.21	-7.09/-11.14	-5.60/-8.10	-9.23/-9.59	-7.37/-12.04	-7.53/-5.90	-8.20/-10.85	-7.39/-4.43	-7.05/-10.62	-7.28/-4.60	-6.64/-6.52	-7.29/-5.28	-5.00/-6.61	-6.65/-6.65	-5.12/-5.39	-8.38/-9.18	-4.76/-5.89	-6.93/-6.09	-7.87/-10.98	-13.27/-10.70	-9.31/-8.01	-8.12/-7.69	-6.92/-8.25
θ (45°)	-7.90/-12.31	-8.87/-6.20	-5.09/-5.65	-4.01/-0.95	-9.45/-8.57	-6.85/-7.00	-4.54/-6.19	-4.80/-4.44	-3.96/-4.86	-4.59/-7.12	-4.90/-2.96	-3.84/-7.07	-4.03/-1.46	-2.72/-9.62	-3.97/-7.62	-5.55/-4.43	-3.63/-6.69	-4.51/-5.46	-3.84/-4.41	-4.93/-5.75	-8.04/-8.99	-11.37/-8.81	-6.77/-5.93	-6.28/-8.44
θ (52.5°)	-6.34/-9.04	-10.22/-5.64	-4.52/-9.90	-6.58/-10.59	-7.16/-8.53	-6.14/-5.43	-4.95/-5.55	-5.46/-5.96	-11.10/-8.48	-8.49/-7.13	-6.23/-4.92	-6.41/-5.31	-9.88/-11.39	-5.50/-6.09	-4.41/-5.07	-3.28/-7.66	-4.73/-5.77	-5.36/-6.41	-8.65/-10.09	-9.51/-11.22	-11.14/-9.52	-6.06/-9.12	-6.06/-9.12	
θ (60°)	-2.91/-7.15	-8.45/-6.88	-6.50/-15.79	-9.51/-8.57	-5.61/-10.57	-9.71/-11.54	-14.31/-12.45	-7.92/-8.49	-8.92/-5.68	-4.30/-6.32	-9.28/-14.07	-8.26/-10.00	-9.47/-8.03	-5.51/-9.35	-6.57/-4.28	-3.94/-5.89	-5.02/-6.18	-6.89/-9.77	-7.65/-7.24	-8.85/-4.24	-4.62/-6.22	-6.42/-9.34	-10.24/-6.35	-8.49/-11.76
θ (67.5°)	-3.84/-7.51	-7.03/-3.69	-9.54/-8.87	-8.16/-6.50	-9.66/-7.19	-8.57/-5.53	-4.72/-10.15	-0.23/-0.04	-0.88/-5.55	-0.69/-3.07	-1.18/0.24	0.49/-0.18	-1.46/-3.90	-4.58/-2.83	-8.49/-4.97	-9.06/-9.13	-7.85/-5.25	-8.58/-9.94	-8.55/-11.01	-6.44/-5.55	-2.24/-2.37	-4.48/-3.41	-6.71/-9.65	
θ (75°)	-1.08/-3.58	-2.78/-1.34	-1.69/-3.99	-2.96/-0.27	-1.24/-2.18	-1.83/-2.50	-2.14/-3.15	-3.15/-0.26	-0.32/-1.41	2.73/0.65	-0.87/-1.11	-0.19/-2.40	-2.40/-2.40	-0.50/-1.61	-1.70/-3.80	-3.62/-2.24	-1.70/-1.57	-4.94/-3.99	-2.89/-6.23	-2.57/-4.98	0.86/-0.02	-2.21/-2.33	-3.67/-3.24	-1.81/-2.60
θ (82.5°)	0.56/-1.16	1.07/2.11	2.71/0.47	2.57/0.18	1.95/-0.74	-1.06/-8.02	-5.41/-7.40	-9.52/-7.50	-6.65/-8.17	-4.09/-4.07	-1.56/-3.16	-2.13/-9.07	-2.91/-4.52	-1.76/-1.25	0.73/1.95	2.64/1.17	1.23/2.77	1.16/0.43	0.16/-1.10	-0.52/2.27	3.22/2.63	0.35/0.25	-0.97/-0.25	2.08/2.04
θ (90°)	2.04/0.34	3.24/4.39	3.66/3.46	4.08/2.53	2.15/1.20	2.18/1.20	-0.05/-1.77	-0.82/-2.61	0.10/1.95	0.72/-2.79	1.54/-1.81	0.84/-1.92	-0.56/0.54	-2.81/-0.65	0.31/1.44	5.03/3.76	3.17/3.96	2.65/2.08	1.83/-4.44	0.25/1.16	4.61/1.86	1.76/1.69	0.73/1.07	4.46/4.41
θ (97.5°)	1.72/-0.50	4.22/5.39	3.81/4.54	4.26/3.12	2.63/1.98	2.17/2.29	1.83/1.91	-0.20/-1.68	1.71/0.93	-0.62/-5.49	1.57/-3.62	1.89/-3.16	1.11/0.49	-2.77/0.07	0.69/2.87	4.82/1.62	2.05/2.24	1.73/3.15	1.24/-1.83	0.43/0.36	4.08/0.50	1.80/1.13	-0.08/0.25	3.35/4.52
θ (105°)	0.18/0.11																							









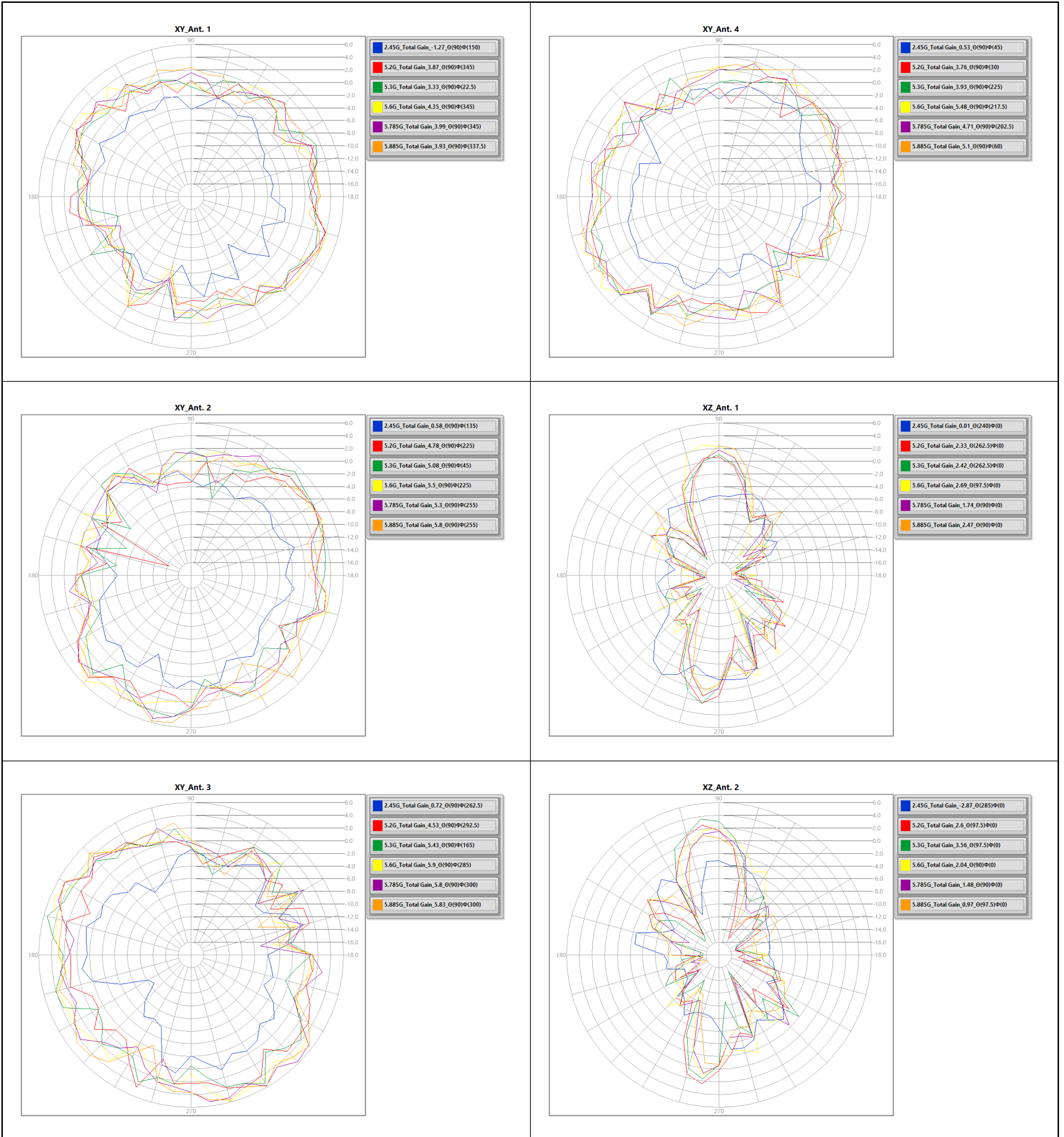
# Antenna Pattern of 2.4GHz&5GHz&5.9GHz

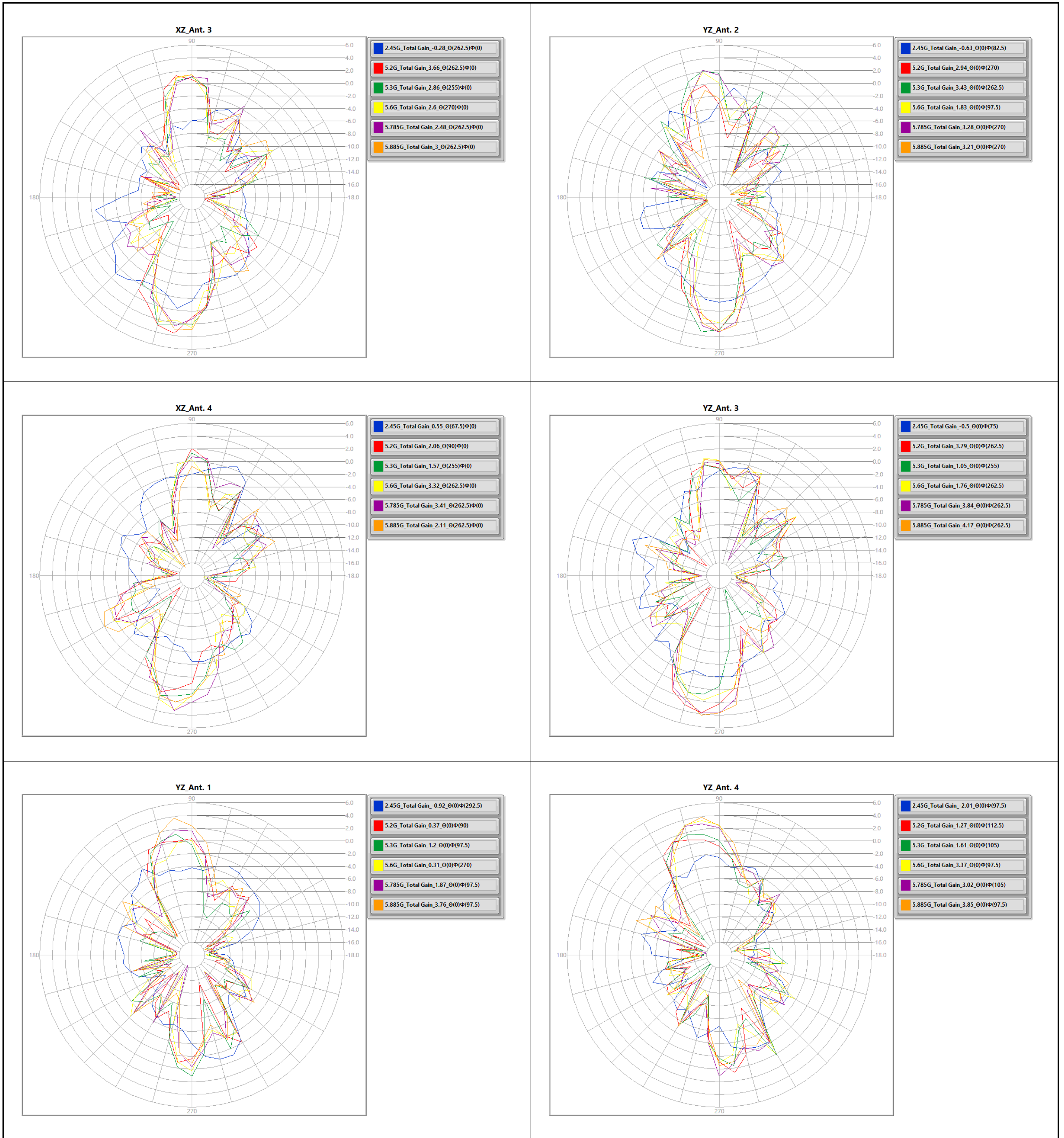
# Appendix D

Theta	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)
Theta(7.5)	-7.78/-9.78	-10.24/-9.90	-9.03/-9.85	-10.22/-11.06	-9.28/-10.26	-12.45/-11.47	-12.26/-12.88	-12.02/-15.18	-12.35/-15.77	-14.45/-15.46	-15.03/-14.49	-15.93/-14.87	-16.20/-14.95	-11.96/-12.31	-13.26/-11.96	-10.93/-10.61	-12.65/-8.89	-8.58/-8.56	-7.65/-8.88	-7.87/-7.21	-7.59/-7.04	-7.07/-7.80	-7.08/-6.61	-7.64/-9.09
Theta(15)	-8.30/-7.60	-7.65/-8.98	-9.55/-11.21	-13.45/-14.77	-14.94/-13.32	-12.83/-13.59	-15.44/-15.66	-16.15/-15.58	-15.62/-15.48	-15.04/-12.99	-15.13/-14.17	-14.89/-14.98	-14.52/-14.94	-14.44/-9.00	-8.28/-7.73	-7.63/-7.05	-6.81/-7.86	-10.29/-12.18	-11.76/-10.99	-10.38/-12.58	-9.92/-10.79	-10.69/-8.48	-8.16/-6.41	-6.93/-6.82
Theta(22.5)	-6.29/-5.58	-6.54/-8.74	-7.43/-7.99	-9.57/-10.79	-12.96/-11.73	-11.04/-10.90	-12.67/-15.04	-10.60/-13.96	-12.03/-14.93	-14.64/-11.02	-10.99/-12.72	-12.84/-14.78	-14.04/-15.21	-13.17/-10.38	-8.53/-7.97	-8.85/-8.91	-11.20/-11.79	-8.35/-9.04	-8.80/-10.65	-11.32/-7.71	-8.38/-6.89	-5.39/-8.41	-7.32/-8.68	-7.64/-6.18
Theta(30)	-8.06/-5.68	-4.91/-6.07	-6.15/-7.00	-7.42/-6.14	-7.52/-12.72	-9.24/-8.57	-10.04/-10.99	-10.79/-13.51	-10.30/-13.35	-10.07/-12.46	-12.74/-11.38	-9.37/-15.70	-8.31/-11.75	-7.84/-10.05	-6.46/-8.42	-9.07/-8.51	-10.70/-6.94	-5.13/-5.85	-4.19/-3.34	-4.25/-4.45	-5.57/-5.40	-9.27/-7.56	-5.03/-4.32	-4.34/-5.21
Theta(37.5)	-7.74/-6.31	-4.76/-4.78	-5.44/-4.14	-6.26/-5.79	-8.07/-5.64	-6.87/-5.69	-6.80/-9.07	-9.72/-13.81	-13.11/-13.52	-11.87/-10.17	-11.39/-10.01	-10.43/-13.17	-7.68/-15.10	-6.99/-7.11	-8.38/-7.87	-5.13/-6.73	-6.76/-6.15	-8.28/-6.25	-9.47/-7.75	-7.78/-11.41	-6.14/-5.88	-4.78/-4.34	-5.46/-6.85	-4.67/-6.12
Theta(45)	-5.39/-7.25	-5.91/-6.01	-5.33/-5.56	-4.81/-6.21	-6.80/-3.83	-5.93/-6.81	-5.77/-5.80	-6.84/-6.04	-7.71/-10.12	-10.91/-8.72	-8.07/-6.70	-7.56/-8.18	-8.84/-6.93	-8.23/-6.85	-8.03/-5.87	-5.40/-6.50	-5.86/-8.36	-8.38/-7.74	-4.63/-6.11	-5.20/-6.61	-5.88/-6.19	-4.74/-4.32	-7.42/-4.32	
Theta(52.5)	-11.67/-10.00	-9.74/-10.06	-7.26/-6.50	-5.74/-5.38	-4.12/-6.31	-5.52/-6.03	-5.80/-8.20	-8.99/-8.73	-5.97/-6.01	-8.06/-10.07	-11.78/-9.70	-7.77/-9.67	-10.30/-5.79	-7.15/-11.27	-3.69/-9.15	-7.50/-7.77	-10.77/-6.96	-10.47/-13.58	-10.36/-8.17	-9.44/-11.48	-12.72/-13.26	-14.89/-9.57	-5.43/-4.36	-7.82/-11.57
Theta(60)	-3.17/-2.66	-3.37/-6.18	-9.25/-11.40	-9.49/-6.50	-5.28/-5.56	-7.38/-5.90	-8.48/-5.46	-6.23/-9.22	-5.99/-9.46	-7.48/-5.39	-5.90/-10.74	-9.18/-8.84	-8.03/-5.94	-8.42/-11.35	-4.45/-9.24	-8.19/-6.36	-5.46/-8.25	-3.57/-3.59	0.03/-2.30	-0.56/-2.16	1.23/0.73	-0.58/-2.84	0.34/2.57	0.30/-1.25
Theta(67.5)	-4.19/-2.18	-0.50/-1.32	-2.83/-7.35	-7.77/-9.01	-4.23/-5.40	-7.13/-4.85	-6.19/-6.90	-5.10/-9.03	-9.01/-11.80	-8.05/-10.00	-8.41/-7.24	-7.20/-5.98	-8.22/-7.68	-7.63/-6.65	-4.71/-2.40	-4.14/-0.81	-6.26/-1.55	-3.12/-4.05	-4.64/-0.61	-1.04/-1.08	-1.67/-3.82	-6.04/-5.48	-6.73/-2.56	-3.21/-5.70
Theta(75)	-7.31/-3.07	-0.53/0.32	0.42/-0.21	4.28/-2.86	-2.05/-5.96	-2.79/-3.80	-4.20/-4.85	-5.40/-9.61	-5.95/-8.61	-7.17/-4.47	-5.74/-7.72	-6.31/-2.78	-3.09/-6.73	-3.10/-0.03	-0.69/0.77	0.03/1.44	-0.47/-0.97	-0.06/-2.03	-6.73/-7.28	-10.57/-6.56	-7.45/-5.58	-3.09/-1.88	-3.64/-5.29	-3.93/-4.59
Theta(82.5)	-2.29/0.58	0.11/1.05	1.50/1.69	0.39/1.38	0.78/-2.45	0.32/-1.13	-1.49/-2.14	-3.35/-7.62	-4.09/-3.43	-1.45/-0.30	-3.94/-4.09	-1.14/0.76	-1.44/-2.28	0.34/3.21	1.67/2.45	2.83/1.70	1.96/-1.37	-2.10/-2.56	-2.84/-1.75	0.75/-0.99	-3.60/-2.54	-1.17/-0.73	-3.92/-5.84	
Theta(90)	0.26/1.63	1.74/0.90	2.49/3.19	2.57/4.05	2.53/2.98	3.88/1.35	2.52/1.88	-0.49/-1.77	-2.55/0.52	1.08/2.25	0.44/-0.34	1.71/2.90	0.85/0.59	3.68/0.07	2.49/5.48	3.53/0.85	1.73/1.68	1.97/0.08	-1.06/0.82	1.57/-0.94	0.54/-3.47	-1.30/-1.76	0.39/0.11	1.96/0.05
Theta(97.5)	-0.28/0.27	2.14/-0.25	2.15/2.93	3.37/4.11	3.89/3.14	5.01/2.69	3.37/2.86	1.45/-0.00	-0.34/1.70	3.06/3.46	0.22/0.57	2.95/3.26	3.32/2.48	3.17/5.18	3.20/4.59	2.01/0.24	-2.15/-0.65	-1.64/-2.81	-4.22/-0.39	-2.79/-1.68	0.92/1.68	-5.57/-4.10	-1.07/-0.41	1.44/-3.61
Theta(105)	-5.70/-1.68	-2.24/0.90	-2.40/0.26	2.64/2.85	4.48/2.80	3.17/3.82	1.32/0.20	2.29/1.66	2.16/2.72	0.85/-0.80	0.70/3.05	2.17/1.39	2.15/3.14	2.18/0.92	0.93/-3.87	-4.74/-5.41	-7.19/-8.52	-11.07/-6.24	-7.90/-3.58	-6.52/-2.92	-5.93/-6.89	-5.13/-3.98	-3.92/-5.84	
Theta(112.5)	-9.86/-6.36	-4.89/-3.28	-4.93/-3.84	-1.69/-2.52	1.53/0.53	2.04/1.20	1.24/1.63	0.40/0.47	0.68/0.71	-0.63/1.01	-2.56/-1.72	1.40/0.80	-1.29/-3.11	-0.92/-1.11	-2.66/-2.87	-2.46/-8.28	-6.66/-8.52	-10.58/-12.94	-12.06/-9.86	-10.18/-9.86	-6.17/-4.46	-11.95/-14.77	-7.77/-5.62	-11.91/-8.89
Theta(120)	-9.98/-10.51	-11.13/-10.80	-12.40/-11.02	-8.69/-12.37	-5.12/-5.92	-4.03/-2.24	-4.68/-3.70	-4.14/-4.72	-6.61/-2.69	-2.76/-3.96	-5.72/-4.90	-3.58/-4.80	-6.96/-5.92	-14.10/-6.41	-12.59/-6.61	-7.10/-15.41	-5.91/-12.53	-12.99/-6.79	-8.09/-6.14	-6.48/-9.98	-4.36/-7.00	-7.13/-11.30	-5.08/-1.76	-7.49/-4.46
Theta(127.5)	-9.90/-13.80	-9.62/-10.74	-12.00/-9.85	-13.90/-14.26	-12.86/-11.73	-15.49/-11.75	-6.68/-9.95	-11.91/-6.99	-7.51/-6.74	-14.85/-11.02	-7.97/-12.74	-12.78/-8.61	-10.52/-12.50	-13.15/-14.12	-9.39/-8.27	-14.01/-4.90	-13.78/-8.65	-9.88/-16.30	-11.31/-12.74	-5.69/-6.26	-15.33/-10.77	-8.29/-5.83	-11.17/-12.12	
Theta(135)	-15.43/-9.61	-6.30/-6.03	-7.19/-6.73	-7.19/-6.73	-7.27/-9.87	-15.08/-7.45	-9.79/-10.14	-9.91/-13.19	-15.68/-14.93	-13.88/-11.92	-11.98/-10.42	-6.00/-10.44	-6.45/-6.95	-4.85/-4.68	-4.05/-5.10	-13.72/-10.40	-9.76/-5.42	-9.25/-15.19	-14.94/-10.13	-11.54/-7.77	-8.16/-5.73	-4.69/-6.88		
Theta(142.5)	-10.41/-10.46	-6.84/-7.16	-8.60/-4.20	-7.05/-8.21	-7.42/-6.46	-9.59/-11.45	-8.70/-8.47	-6.27/-7.11	-9.11/-7.72	-8.65/-10.63	-10.12/-10.86	-8.04/-5.55	-8.40/-3.62	-6.30/-5.46	-4.62/-7.74	-1.56/-3.35	-10.88/-7.86	-13.23/-10.25	-7.61/-9.82	-9.36/-7.94	-11.73/-11.88	-15.53/-12.69	-12.58/-10.62	-7.84/-6.86
Theta(150)	-13.30/-10.01	-7.24/-7.99	-10.10/-5.58	-3.62/-3.37	-9.84/-5.35	-4.57/-4.78	-5.60/-4.90	-3.53/-5.36	-5.43/-6.02	-4.78/-6.20	-8.29/-6.89	-3.80/-2.08	-3.70/-3.42	-3.59/0.10	-7.76/-5.69	-10.81/-5.17	-8.22/-12.13	-12.19/-11.59	-12.48/-12.34	-13.69/-11.30	-9.08/-6.44	-8.54/-6.53	-6.71/-7.10	
Theta(157.5)	-10.28/-10.21	-13.82/-10.94	-10.12/-11.06	-8.21/-7.19	-8.56/-13.45	-10.31/-6.05	-5.98/-4.93	-5.12/-4.15	-6.50/-7.08	-11.05/-9.34	-7.22/-7.10	-4.66/-7.94	-4.32/-6.07	-6.36/-7.22	-4.52/-5.95	-14.47/-7.07	-8.77/-10.70	-7.83/-9.59	-9.51/-9.73	-12.03/-13.79	-9.75/-11.06	-13.11/-10.47	-8.73/-8.68	-14.66/-13.58
Theta(165)	-11.97/-12.18	-11.47/-10.99	-13.22/-15.04	-15.51/-11.52	-12.48/-10.88	-9.80/-11.66	-8.62/-8.84	-8.83/-10.11	-10.16/-9.89	-7.08/-8.63	-6.70/-8.27	-7.99/-7.30	-10.98/-7.25	-8.71/-11.81	-11.94/-9.13	-9.55/-12.57	-15.02/-15.09	-10.29/-7.56	-6.99/-7.62	-10.14/-7.37	-8.96/-8.06	-9.06/-10.43	-9.09/-12.07	
Theta(172.5)	-15.02/-15.71	-15.74/-15.09	-15.18/-14.71	-15.67/-15.17	-16.02/-15.08	-15.39/-16.35	-15.20/-14.99	-14.08/-15.15	-14.02/-14.96	-15.13/-15.29	-15.19/-14.77	-12.96/-9.37	-9.37/-12.84	-11.17/-9.88	-11.09/-11.56	-9.93/-9.20	-11.09/-13.34	-9.41/-12.50	-10.09/-13.34	-10.89/-13.34	-13.05/-11.44	-13.76/-9.96	-12.06/-11.52	-13.71/-16.68
Theta(180)	-13.30/-15.39	-14.61/-16.06	-15.39/-14.65	-14.92/-15.46	-14.76/-15.50	-14.92/-15.65	-15.10/-14.74	-14.87/-14.94	-14.94/-15.46	-15.11/-15.82	-13.01/-15.78	-13.15/-15.20	-15.78/-14.36	-13.87/-15.32	-15.00/-15.66	-16.37/-15.39	-15.73/-14.44	-12.82/-15.81	-15.93/-14.72	-15.10/-15.16	-15.28/-15.48	-14.83/-16.18	-15.50/-15.05	-14.78/-16.13
Freq(Hz)	5.785GPol.	TotalAnt. 4																						
Gain	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)
Theta(7.5)	-15.34/-15.02	-15.81/-16.03	-15.00/-14.89	-14.36/-15.75	-15.44/-15.65	-13.33/-15.25	-14.39/-15.21	-13.25/-14.38	-12.91/-11.88	-13.41/-11.97	-11.96/-11.52	-12.33/-12.85	-13.49/-12.53	-13.39/-13.65	-13.01/-13.35	-13.66/-14.96	-16.11/-14.03	-15.54/-14.05	-14.88/-15.40	-14.66/-15.46	-15.04/-14.78	-15.22/-15.43		
Theta(15)	-10.09/-10.17	-10.87/-10.79	-11.60/-12.99	-13.23/-14.25	-12.80/-14.24	-14.39/-15.18	-14.81/-14.70	-14.79/-14.51	-14.22/-15.32	-13.37/-14.39	-13.83/-13.72	-15.32/-14.32	-15.50/-15.12	-15.43/-15.63	-13.23/-11.81	-11.78/-11.11	-12.60/-11.12	-9.57/-13.99	-9.63/-12.03	-9.02/-11.41	-10.28/-9.42	-10.68/-9.58	-11.17/-10.67	-10.58/-10.45
Theta(22.5)	-7.82/-7.78	-8.96/-9.63	-11.33/-12.11	-11.81/-11.54	-13.19/-14.58	-12.79/-12.66	-15.12/-15.40	-15.02/-14.13	-15.56/-13.78	-15.00/-15.04	-13.90/-12.25	-15.25/-12.03	-15.30/-13.88	-15.68/-12.18	-12.07/-10.25	-9.88/-8.70	-9.25/-8.49	-7.10/-6.66	-8.32/-8.58	-11.34/-9.08	-8.87/-9.19	-8.03/-8.63	-7.86/-8.29	-8.26/-8.46
Theta(30)	-5.33/-3.91	-6.13/-6.64	-6.77/-7.32	-7.66/-11.76	-12.98/-11.05	-13.77/-13.28	-14.60/-14.43	-12.33/-15.21	-16.19/-12.86	-15.22/-12.63	-14.59/-13.05	-13.09/-10.28	-15.28/-14.65	-14.88/-12.80	-10.75/-9.62	-7.20/-5.93	-8.08/-9.34	-7.94/-7.95	-10.25/-6.73	-7.87/-7.11	-7.84/-7.08	-7.22/-8.67	-7.77/-7.83	-6.13/-5.30
Theta(37.5)	-6.50/-4.76	-5.94/-5.23	-5.56/-7.86	-7.04/-7.61	-9.23/-8.75	-8.91/-8.49	-8.48/-11.29	-12.42/-11.84	-10.26/-14.10	-10.25/-10.16	-9.33/-9.94	-9.41/-12.12	-12.87/-8.00	-9.86/-8.31	-6.29/-5.76	-7.12/-10.09	-9.74/-10.79	-6.58/-7.02	-7.38/-5.91	-5.31/-4.32	-3.96/-5.96	-7.98/-8.80	-4.55/-5.60	-6.41/-7.26
Theta(45)	-4.69/-4.85	-4.86/-5.97	-3.28/-5.37	-7.73/-6.60	-6.89/-5.82	-6.25/-7.15	-9.58/-9.80	-10.74/-15.29	-10.61/-11.56	-10.25/-9.09</														



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











# Antenna Pattern of 6GHz

# Appendix E

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°)	
0	0	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	-1.75/-7.07	
0	30	-5.89/-3.86	-2.11/-4.68	-5.18/-8.88	-7.80/-6.33	-7.21/-8.37	-12.10/-13.23	-9.70/-8.17	-7.91/-6.75	-4.48/-2.59	-3.33/-7.77	-9.80/-6.63	-6.25/-5.75	-7.10/-7.76	-4.39/-4.60	-6.73/-5.41	-7.32/-7.04	-7.84/-5.99	-3.30/-4.04	-4.93/-4.20	-1.98/-3.73	-7.20/-7.67	-5.63/-5.10	-4.74/-5.44	-6.26/-5.31	
0	35	-2.97/-3.41	-4.48/-4.34	-6.45/-12.70	-7.45/-9.54	-6.37/-6.67	-7.46/-10.47	-12.91/-18.87	-5.79/-3.16	-2.68/-6.07	-6.22/-4.39	-4.93/-5.22	-6.31/-4.75	-6.70/-7.37	-7.87/-4.31	-6.53/-5.63	-5.73/-3.38	-3.32/-3.36	-3.23/-3.73	-3.34/-3.13	-5.52/-5.66	-5.14/-3.08	-2.76/-1.85	-2.20/-1.58	-2.20/-1.58	
0	45	-5.33/-7.54	-4.45/-4.27	-7.19/-2.39	-3.86/-2.90	-2.13/-1.68	-2.91/-2.38	-3.86/-5.38	-4.35/-3.40	-7.38/-6.56	-8.37/-7.59	-10.06/-5.15	-5.01/-3.52	-2.58/-2.81	-3.25/-2.94	-5.19/-4.67	-6.78/-6.27	-7.34/-6.73	-5.26/-7.04	-2.67/-2.15	-2.93/-6.25	-11.86/-8.50	-4.25/-0.67	-2.50/-3.88	-5.34/-2.02	
0	50	-10.35/-12.43	-5.57/-4.04	-4.99/-1.87	-2.78/-5.03	-1.15/-3.48	-0.26/-2.40	-3.81/-3.76	-1.27/-0.96	-1.08/-3.06	-4.72/-5.16	-3.74/-4.18	-7.44/-8.13	-6.75/-9.26	-11.27/-9.36	-4.63/-5.22	-9.21/-10.29	-14.53/-9.42	-10.12/-11.79	-6.03/-6.68	-3.87/-5.86	-12.41/-5.26	-3.19/-1.94	-5.32/-3.04	-10.24/-6.36	
0	52	-12.38/-6.56	-6.38/-10.63	-10.88/-5.58	-10.26/-3.58	-11.47/-4.38	-3.47/-4.85	-3.48/-0.13	-1.47/-0.25	-3.35/-2.41	-0.69/-2.52	-3.92/-6.18	-8.10/-6.26	-12.98/-9.99	-8.15/-9.41	-9.87/-6.23	-8.42/-12.45	-11.09/-15.45	-15.93/-14.00	-15.03/-6.68	-11.09/-12.58	-6.60/-9.88	-6.60/-7.46	-8.63/-13.47	-14.87/-9.05	
0	55	-6.45/-2.16	-6.73/-11.34	-8.17/-11.66	-8.11/-11.39	-8.71/-13.42	-4.44/-5.14	-5.95/-10.58	-6.45/-8.12	-10.68/-9.30	-9.33/-8.68	-4.02/-7.65	-4.69/-5.18	-4.20/-1.07	-4.29/-3.36	-5.14/-3.78	-4.34/-7.41	-6.30/-4.50	-5.26/-7.13	-6.20/-3.67	-6.46/-10.47	-3.42/-5.63	-6.09/-5.71	-4.85/-8.02	-6.69/-5.63	
0	57	0.01/2.04	-0.68/-1.45	-2.75/-2.80	-2.58/-3.04	-4.36/-4.14	-3.69/-5.68	-6.05/-6.00	-3.45/-0.85	-1.71/-0.33	-0.99/-2.36	-2.47/-2.20	-2.73/-2.38	-0.08/-0.94	-1.99/-6.65	-2.00/-0.55	0.76/-2.05	-1.35/-1.84	1.41/-3.01	-1.04/-0.67	1.42/-3.42	0.08/0.58	-2.24/-0.01	-0.03/-3.69	-1.59/-1.66	
0	60	1.29/4.45	2.47/0.01	-1.50/-1.27	-1.19/-0.43	-3.38/-1.49	-2.98/-3.89	-3.18/-6.42	-2.98/-3.63	-5.83/-3.42	-1.88/0.60	2.67/3.12	-1.71/-1.06	0.86/0.86	0.38/0.23	1.66/3.50	0.40/2.04	0.04/2.27	1.75/-3.21	-2.59/2.62	2.94/4.66	1.15/2.48	0.36/2.53	1.99/2.34	1.82/0.04	
0	65	0.88/5.27	2.25/0.01	0.36/4.38	-0.01/-1.10	-0.51/-1.19	-0.35/0.85	-1.19/0.46	3.48/3.56	-1.82/1.26	-2.24/-0.82	2.51/8.02	-2.45/-4.01	-0.03/-0.48	-0.38/2.46	1.88/1.77	2.81/4.61	0.73/2.83	0.78/3.74	-3.16/2.42	1.51/-10.77	-0.03/3.73	2.25/2.89	2.20/-1.69	3.38/0.20	
0	67	-1.64/3.61	0.69/-1.63	-0.22/1.03	0.23/-0.13	0.03/-1.73	-1.26/-0.52	-2.40/0.85	3.27/3.47	-0.07/2.66	0.25/0.03	3.34/-5.01	-0.85/-1.19	-1.25/-3.53	-1.31/-4.70	0.94/1.53	2.05/2.70	-0.96/-9.00	-4.25/-9.03	-2.56/-7.65	-1.94/2.22	0.74/1.01	1.11/-1.16	2.97/-1.67	-1.59/-1.66	
0	70	-2.61/1.71	-4.17/-3.49	-4.49/-8.51	-1.37/-2.77	-0.09/-2.18	-0.65/-1.68	-3.92/-1.31	0.99/-2.50	-1.21/0.71	-1.02/0.02	1.73/-0.03	-0.32/-4.18	-1.52/-1.97	-5.28/-3.69	-7.05/-5.38	-5.95/0.06	-10.78/-4.45	-4.42/-15.43	-11.64/-5.44	-10.26/-12.83	-3.27/-2.06	-4.47/-4.88	-0.51/-3.36	-0.48/-6.41	
0	75	-12.13/-10.70	-7.71/-9.91	-9.60/-11.38	-3.57/-5.40	-3.97/-5.47	-2.44/-3.06	-3.95/-4.12	-1.81/-5.21	-3.34/-1.25	-3.85/-6.54	-3.37/-12.55	-13.52/-16.08	-13.75/-10.89	-9.33/-10.72	-14.07/-12.43	-10.23/-10.58	-12.93/-13.46	-9.74/-10.60	-11.38/-5.99	-12.13/-12.79	-7.88/-11.31	-7.39/-11.05	-5.98/-11.04	-8.38/-10.00	
0	80	-7.28/-10.81	-14.61/-14.16	-14.99/-11.50	-9.20/-12.94	-7.67/-8.64	-7.81/-6.42	-6.67/-5.83	-8.95/-8.67	-11.83/-5.84	-7.63/-8.87	-9.57/-12.59	-11.56/-10.41	-9.45/-9.35	-9.79/-8.54	-9.89/-10.83	-5.31/-4.50	-13.26/-8.93	-2.48/-7.12	-6.58/-15.08	-5.88/-7.60	-9.37/-11.84	-7.98/-9.84	-8.13/-8.06	-9.36/-10.26	
0	85	-2.34/-6.80	-3.03/-5.16	-8.40/-6.38	-5.13/-3.97	-7.77/-11.49	-3.01/-3.28	-1.83/-3.70	-4.10/-4.78	-6.72/-6.30	-11.80/-9.68	-6.46/-7.89	-8.69/-9.38	-5.53/-3.02	-9.19/-11.01	-1.42/-0.53	0.74/1.25	-10.29/-2.79	1.35/-3.78	-6.16/-4.75	-6.29/-9.08	-6.13/-8.13	-3.20/-2.93	0.24/-0.37	-2.60/-2.18	
0	90	-0.33/-1.48	-2.73/-4.62	-5.83/-7.43	-7.38/-9.35	-15.48/-14.52	-11.46/-13.72	-15.28/-10.83	-12.29/-9.67	-9.57/-7.16	-6.65/-5.46	-4.29/-3.02	-3.72/-6.23	-4.96/-2.38	-3.83/-2.67	-0.48/-0.69	0.66/0.00	-4.84/-0.10	2.64/-2.14	-6.10/-0.53	-2.40/-1.16	1.50/-2.73	-9.22/-4.30	-0.56/0.80	1.31/-2.14	
0	95	-3.00/-4.30	-4.42/-7.89	-9.23/-11.66	-8.80/-9.96	-4.81/-6.46	-7.94/-6.61	-8.52/-11.14	-5.80/-4.98	-11.41/-13.73	-9.23/-4.44	-5.73/-2.19	-3.58/-6.28	-4.15/-0.79	1.77/0.35	-2.32/-2.58	-4.37/-5.04	-4.14/-0.16	1.21/-1.44	-9.30/-7.57	-3.24/-1.31	-1.01/-1.41	-5.40/-3.56	0.36/0.30	-1.27/-1.27	
0	100	-8.93/-6.95	-5.50/-7.77	-7.89/-11.06	-4.22/-2.37	-5.25/-7.82	-12.69/-9.09	-8.64/-6.16	-8.24/-12.17	-11.60/-7.57	-7.70/-12.75	-11.26/-10.73	-8.90/-4.74	-2.22/-2.52	-10.89/-2.00	-2.64/-4.12	-5.03/-5.93	-1.32/-3.43	-1.19/-10.67	-8.52/-3.74	-2.84/-4.03	-2.93/-2.15	-2.76/-1.61	-0.98/-4.78	-1.77/-2.27	
0	105	-6.31/-5.53	-5.96/-6.55	-4.52/-4.69	-5.15/-4.42	-5.89/-7.17	-6.87/-7.88	-9.55/-12.02	-9.30/-6.15	-3.87/-3.45	-7.09/-15.76	-11.08/-10.30	-11.57/-8.00	-7.93/-9.97	-10.22/-13.29	-7.92/-7.87	-6.58/-6.24	-8.20/-8.65	-7.80/-7.17	-6.85/-8.34	-8.09/-6.38	-6.07/-4.43	-2.95/-3.08	-2.05/-1.42	-1.77/-2.27	
0	110	-7.66/-5.61	-6.03/-8.90	-10.27/-7.63	-6.57/-5.68	-7.05/-10.87	-13.49/-14.90	-14.70/-15.35	-13.68/-10.47	-8.94/-7.57	-6.47/-7.13	-6.95/-6.61	-14.64/-9.05	-6.01/-5.53	-4.97/-3.79	-4.60/-7.57	-9.00/-7.59	-6.10/-5.27	-5.67/-7.97	-6.68/-11.27	-10.57/-6.37	-3.36/-3.59	-3.56/-3.11	-4.74/-5.20	-1.77/-2.27	
0	115	-11.57/-10.20	-8.58/-7.57	-6.76/-7.10	-8.35/-9.66	-12.09/-15.08	-15.75/-13.48	-11.35/-9.23	-7.75/-10.87	-8.96/-11.89	-12.63/-10.69	-7.96/-5.60	-5.41/-6.36	-7.23/-6.77	-5.59/-4.92	-5.01/-6.07	-7.09/-7.73	-8.46/-8.75	-10.28/-11.67	-12.38/-13.63	-12.89/-11.62	-10.44/-10.52	-10.25/-9.68	-8.26/-7.81	-9.46/-11.47	
0	120	-10.45/-13.02	-14.02/-13.46	-13.52/-14.18	-14.60/-13.64	-13.67/-12.91	-11.22/-12.88	-12.88/-10.83	-11.05/-12.85	-14.16/-13.70	-14.89/-16.22	-13.08/-12.26	-12.17/-12.97	-13.21/-12.86	-12.76/-13.09	-13.63/-14.21	-14.20/-12.03	-11.83/-11.40	-11.98/-13.45	-14.50/-14.10	-15.10/-14.15	-13.90/-12.84	-11.23/-13.05	-13.95/-13.03	-12.86/-13.40	
0	125	6.475GPol	TotalAnt.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
0	130	Gain	Phi(0°)	Phi(15°)	Phi(30°)	Phi(45°)	Phi(60°)	Phi(75°)	Phi(90°)	Phi(105°)	Phi(120°)	Phi(135°)	Phi(150°)	Phi(165°)	Phi(180°)	Phi(195°)	Phi(210°)	Phi(225°)	Phi(240°)	Phi(255°)	Phi(270°)	Phi(285°)	Phi(300°)	Phi(315°)	Phi(330°)	Phi(345°)
0	135	-14.33/-15.28	-16.14/-14.37	-13.16/-14.33	-15.58/-14.58	-12.80/-13.08	-14.97/-15.25	-15.58/-13.63	-13.99/-14.03	-14.52/-16.01	-15.43/-15.09	-15.74/-14.20	-14.15/-14.58	-15.64/-15.61	-15.94/-15.02	-15.56/-15.33	-15.03/-15.64	-14.99/-14.76	-14.51/-15.28	-14.78/-15.64	-14.97/-15.02	-15.99/-14.77	-15.28/-15.86	-13.28/-13.53	-14.16/-15.20	
0	140	-12.43/-12.53	-12.92/-11.79	-11.99/-11.04	-10.87/-11.02	-12.16/-11.76	-11.12/-12.20	-10.34/-11.19	-9.79/-10.02	-12.48/-14.79	-14.74/-15.08	-15.28/-15.30	-16.13/-15.13	-15.82/-15.96	-15.33/-15.50	-13.84/-14.38	-13.74/-13.61	-15.40/-14.38	-15.40/-14.38	-15.64/-14.33	-14.43/-15.67	-15.68/-15.63	-12.73/-12.98	-14.44/-13.90	-14.44/-13.90	
0	145	-6.01/-5.90	-7.03/-8.63	-8.26/-9.98	-8.95/-8.35	-8.74/-9.25	-8.69/-8.71	-6.96/-6.46	-6.00/-6.56	-8.16/-8.99	-10.53/-11.23	-11.01/-8.71	-8.44/-10.29	-10.99/-11.04	-10.79/-10.03	-12.36/-13.55	-13.04/-11.40	-10.20/-9.91	-8.66/-6.74	-8.04/-7.96	-10.78/-10.15	-9.34/-10.27	-14.27/-15.54	-15.68/-15.12	-13.48/-9.74	
0	150	-10.63/-9.85	-8.82/-7.51	-8.60/-8.95	-9.52/-8.80	-7.88/-7.70	-7.57/-9.92	-10.51/-10.79	-9.27/-8.30	-8.96/-7.46	-6.24/-5.61	-6.77/-6.88	-5.57/-5.64	-6.55/-8.75	-7.45/-9.51	-5.68/-6.03	-7.22/-9.99	-9.67/-8.15	-8.16/-9.94	-8.36/-5.39	-4.11/-4.66	-5.53/-7.06	-7.30/-7.10	-10.00/-9.74	-7.76/-9.01	
0	155	-4.65/-6.22	-12.06/-4.82	-4.78/-6.12	-8.57/-8.84	-7.20/-7.41	-8.11/-7.24	-6.98/-9.84	-8.94/-4.47	-2.83/-3.17	-5.64/-5.58	-6.56/-6.49	-5.22/-5.36	-3.50/-2.87	-6.65/-6.91	-4.29/-4.97	-7.73/-5.58	-6.48/-6.56	-5.65/-8.02	-8.05/-4.99	-3.15/-6.83	-1.51/-5.10	-1.51/-7.10	-6.60/-6.62	-4.10/-4.95	
0	160	-5.32/-4.49	-2.81/-3.68	-6.14/-4.73	-7.39/-9.79	-11.19/-10.44	-9.11/-4.00	-4.26/-6.76	-4.44/-5.62	-10.05/-2.33	-7.15/-7.30	-5.64/-6.46	-4.86/-4.62	-5.21/-5.75	-3.54/-2.84	-2.27/-4.11	-4.93/-7.15	-6.81/-6.64	-8.00/-4.21	-3.17/-5.13	-3.78/-7.60	-10.21/-8.03	-10.64/-6.14	-1.97/-3.48	-3.49/-4.54	
0	165	-4.19/-4.63	-9.03/-7.31	-6.21/-7.43	-4.78/-10.44	-6.29/-9.09	-5.90/-11.01	-5.01/-4.51	-9.30/-15.84	-10.45/-8.60	-6.68/-7.24	-5.51/-4.84	-3.90/-3.68	-3.65/-2.70	-2.10/-4.39	-6.53/-6.09	-6.11/-6.34	-4.40/-1.68	-5.32/-4.24	-6.33/-6.47	-4.57/-4.45	-8.27/-6.62	-4.62/-2.69	-2.27/-3.66	-2.56/-1.46	
0	170	-1.61/-6.75	-8.89/-6.53	-8.91/-4.30	-2.88/-3.21	-1.54/-5.48	-5.41/-4.83	-6.80/-8.65	-4.60/-3.89	-7.63/-6.90	-7.50/-6.97	-7.87/-8.12	-5.10/-5.41	-5.03/-4.22	-6.58/-6.12	-8.00/-5.62	-7.78/-5.32	-8.43/-6.65	-6.09/-10.03	-6.58/-7.44	-5.22/-7.89	-4.67/-5.25	-4.83/-3.29	-4.83/-3.29	-4.83/-3.29	
0	175	-8.68/-11.51	-13.90/-10.29	-8.52/-6.65	-2.51/-6.34	-3.31/-9.32	-3.89/-1.86	-0.93/-9.06	-0.45/-3.26	-2.58/-3.43	-3.90/-6.56	-6.81/-4.95	-9.50/-11.30	-6.52/-8.48	-9.73/-6.43	-6.00/-7.51	-8.53/-12.38	-15.68/-9.94	-13.59/-11.00	-11.39/-12.83	-14.93/-10.90	-13.20/-14.10	-15.40/-13.60	-15.43/-11.33	-7.60/-5.37	
0	180	-5.78/-10.97	-9.90/-15.02	-13.13/-8.87	-12.46/-7.85	-16.41/-10																				