



Radiated Composite Gain Data

Appendix A

Table with columns for Frequency (MHz), Gain (dBi), and various antenna configurations (Theta and Phi). It contains a large grid of numerical data points for each configuration across a range of frequencies from 5.20 to 5.35 GHz.



Radiated Composite Gain Data

Appendix A

Θ (°)	-3.3/2.99	-2.56/5.9	-4.71/4.24	4.49/4.12	-0.79/5.91	3.2/5.3	5.74/5.6	-1.91/6.49	4.43/3.73	-2.06/2.13	-2.91/3.5	1.43/1.93	3.04/2.5	0.11/0.45	0.43/1.24	-0.71/5.24	-6.15/6.64	6.19/2.42	-3.56/6.17	-4.72/5.97	-7.61/2.83	-4.75/3.76	-4.63/5.27	-4.98/3.79
Θ (6.75°)	-3.6/2.6	-4.8/7.825	-7.41/3.84	2.94/1.17	-2.99/4.89	-4.53/6.32	4.36/6.76	-4.3/3.37	2.66/2.02	-0.32/3.09	-1.66/2.8	-1.3/3.7	-6.07/5.26	4.07/6.47	-3.9/5.2	-6.32/6.69	-6.16/5.69	-7.61/8.69	-3.51/6.07	-3.12/4.81	-5.75/4.71	-5.17/2.07	-2.15/3.26	4.8/4.31
Θ (7.5°)	-1.75/0.03	-2.29/3.7	-1.09/0.8	0.95/2.21	-3.83/3.34	-5.01/3.45	4.35/6.12	-1.97/4.39	6.08/2.1	-5.12/2.45	-4.27/6.51	-1.27/1.88	-0.88/5.21	-0.95/3.29	-3.24/3.52	-6.41/6.58	-7.47/6.61	-6.92/5.36	-4.98/5.31	-5.03/4.33	-4.93/2.73	-2.29/2.15	-1.99/1.69	-1.68/3.78
Θ (8.25°)	0.43087	-1.22/1.27	1.37/0.19	1.54/5.74	3.4/3.12	-1.45/4.84	-3/0.76	-8.15/2.34	-2.64/0.84	-1.52/1.1	-1.98/1.88	-2.29/0.17	0.08/1.11	-1.43/1.54	-8.9/2.04	4.1/3.63	-1.9/6.62	-2.52/4.25	-3.75/2.4	-6.46/6	3.44/1.11	-1.90/5.6	0.1/2.02	0.96/0.42
Θ (9.0°)	0.74/1.15	-1.34/1.37	0.15/6.08	1.96/5.81	4.19/3.67	-1.43/8.45	-2.87/2.6	6.74/2.89	3.11/2.22	-1.41/0.09	-1.09/0.22	0.29/1.94	-4.23/2.59	-2.04/2.58	-7.2/3.02	-3.33/2.07	-3.01/5.67	-3.49/3.04	9.99/2.22	4.26/1.71	-2.69/0.04	-0.45/3.42	-4.77/0.03	
Θ (9.75°)	1.39/1.31	-0.88/1.69	0.43/5.43	-1.73/3.57	-5.67/5.57	-3.55/4.89	-6.57/5.73	-2.18/6.68	4/0.63	-12.49/4.08	-8.52/12.07	-5.96/7.2	-5.91/5.53	-2.51/6.12	-12.3/8.23	-6.75/5.98	-6.97/9	-6.21/5.16	-3.56/5.87	-14.18/3.99	-6.24/0.18	-0.69/4.15	-4.39/0.89	
Θ (10.5°)	1.66/1.04	-1.22/1.13	2.08/0.93	-0.82/8.13	-2.95/5.25	-3.55/4.37	-4.31/4.95	-3.6/5.46	-6.91/16.83	-5.84/1.62	-4.11/4.82	-4.53/9.09	-4.1/4.86	-7.07/7.07	-11.8/8.15	-3.04/8.95	-17.86/11.09	-6.98/6.55	-6.46/6.35	-7.63/6.3	-5.85/3.28	0.07/1.1	-1.21/5.57	-0.67/1.24
Θ (11.25°)	-2.43/7.5	-2.28/4.12	0.55/1.25	-2.79/7	-6.9/5.34	4.74/3.7	6.7/5.63	4.58/8.57	-8.18/4.58	5.31/2.22	-4.6/4.6	-5.15/6.55	-3.63/6.35	-6.67/6	9.29/12.32	-4.92/12.92	-11.15/8.7	-7.02/5.41	-9.67/6.36	-9.79/3.7	5.03/5.93	-3.55/3.88	-3.66/4.08	0.99/1.35
Θ (12.0°)	-6.36/6.78	-10.82/8.35	-3.5/1.52	-8.1/1.17	-13.84/6.38	-10.61/10.7	8.58/9.28	-8.36/8.28	-7.09/6.5	8.27/7.58	-8.75/7.38	-8.24/14.48	-16.81/12.93	-12.96/11.6	-9.67/8.88	-4.23/13.25	-14.55/6.97	-10.38/11.75	-13.54/13.64	-14.38/7.63	-4.95/8.7	-9.68/7	-7.32/10.11	-8.33/4.93
Θ (12.75°)	-7.03/8.74	-10.36/12.01	-16.11/10.88	-8.97/7.62	-12.31/14.31	-14.76/11.23	-16.5/13.77	-12.66/18.09	-14.83/11.96	-17.72/12.04	-9.56/5.2	-4.85/5.83	-5.11/6.53	-6.6/9.57	-17.3/8.72	-18.84/10.25	-17.94/12.82	-10.56/12.41	-18.61/14	-18.2/8.27	-5.18/10.48	-14.87/7.97	-10.49/6.81	-8.14/9.78
Θ (13.5°)	-11.92/13.35	-13.09/10.39	-7.68/8.81	-5.36/6.03	-10.33/11.74	-12.94/13.95	-12.77/11.94	-8.24/11.71	-17.91/9.41	-11.08/14.36	-12.84/13.83	-11.35/12.05	-13.93/12.94	-17.75/14.39	-12.13/11.8	-11.97/18.17	-15.23/19.29	-13.71/7.13	-11.77/18.18	-10.94/12.69	-4.83/4.67	-7.26/13.39	-13.28/14.91	
Θ (14.25°)	-2.63/3.21	-4.55/5.4	-7.2/10.3	-13.1/12.16	-18.79/9.26	-7.59/13.72	-10.5/3.65	-4.44/10.89	-13.95/11.37	-8.56/14.9	-17.69/18.37	-11.93/10	-15.16/18.9	-14.77/9.12	-6.93/11.2	-16.27/12.67	-18.29/16.44	-13.06/9.02	-7.61/10.42	-18.27/15.38	-7.68/3.71	-7.88/5.34	-4.97/5.79	-3.92/3.69
Θ (15.0°)	-7.11/8.06	6.47/5.82	-5.27/6.2	-9.18/7.51	-7.42/9.49	-7.44/6.35	-7.99/9.47	-9.95/7.27	-7.16/13.81	-15.14/17.23	-18.53/18.02	-18.98/18.72	-16/15.89	-17.15/18.15	-13.88/18.57	-19.06/18.77	-11.57/4.43	-5.69/6.6	-9.62/13.83	-12.29/14.96	-18.18/12.02	-9.72/7.73	-4.32/4.37	-5.57/5.59
Θ (15.75°)	-9.46/7.73	9.35/9.75	9.27/7.52	5.16/6.57	-12.25/10.3	-8.4/14.19	-11.94/6.39	-4.66/3.03	-12.77/11.94	-8.4/14.19	-18.96/9.27	-7.22/8.27	-9.64/8.49	-8.53/2.59	-12.92/15.15	-7.09/7.23	-8.71/11.8	-12.61/14.18	-18.55/16.39	-10.56/9.05	-10.96/9.84	-9.07/11.72		
Θ (16.5°)	-7.18/2.1	8.26/9.16	-10.2/10.8	-11.54/9.21	6.9/8.02	-9.09/7.97	-6.29/7.04	-8.34/10.9	-14.31/9.67	-8.28/9.03	-9.97/11.09	-11.76/10.73	-9.34/8.06	-8.16/10.89	-15.37/14.78	-12.33/12.99	-12.41/13.96	-14.85/14.57	-11.21/10.53	-11.42/12.6	-18.75/9.43	-6.9/6.72	6.7/5.75	
Θ (17.25°)	-9.62/9.01	8.09/7.48	-7.51/7.99	-8.39/10.37	-15.24/18.18	-12.18/9.23	-8.69/9.61	-12.46/16.12	-19.37/18.28	-14.14/11.3	-11.18/12.76	-12.75/14.07	-11.78/9.02	-8.61/8.33	-8.27/10.31	-12.3/13.99	-15.98/17.44	-19.2/18.41	-16.78/13.56	-10.44/9	-9.04/8.96	-9.12/10.6	-10.93/10.51	-10.73/11.47
Θ (18.0°)	-11.98/13.05	-17.97/18.23	-18.13/18.94	-19.35/15.53	-12.53/14.94	-10.97/11.45	-13.05/15.23	-15.03/12.78	-12.73/14.99	-18.49/18.42	-17.16/18.96	-19.06/18.86	-18.66/17.79	-17.66/18.95	-18.6/17.06	-16.69/18.83	-19.04/18.12	-17.92/15.67	-14.46/13.9	-12.6/11.36	-11.77/12.95	-12.97/13.83	-15.04/16.54	-16.22/15.23
Freq(Hz)	5.6GHz	Phi/Ant. 3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Gain	Φ (0°)/ Φ (7.5°)	Φ (15°)/ Φ (22.5°)	Φ (30°)/ Φ (37.5°)	Φ (45°)/ Φ (52.5°)	Φ (60°)/ Φ (67.5°)	Φ (75°)/ Φ (82.5°)	Φ (90°)/ Φ (97.5°)	Φ (105°)/ Φ (112.5°)	Φ (120°)/ Φ (127.5°)	Φ (135°)/ Φ (142.5°)	Φ (150°)/ Φ (157.5°)	Φ (165°)/ Φ (172.5°)	Φ (180°)/ Φ (187.5°)	Φ (195°)/ Φ (202.5°)	Φ (210°)/ Φ (217.5°)	Φ (225°)/ Φ (232.5°)	Φ (240°)/ Φ (247.5°)	Φ (255°)/ Φ (262.5°)	Φ (270°)/ Φ (277.5°)	Φ (285°)/ Φ (292.5°)	Φ (300°)/ Φ (307.5°)	Φ (315°)/ Φ (322.5°)	Φ (330°)/ Φ (337.5°)	Φ (345°)/ Φ (352.5°)
Θ (0°)	-17.83/18.42	-17.43/18.54	-19.19/19	-18.58/18.58	-17.93/17.49	-18.92/16.57	-15.21/13.9	-14.12/14.74	-17.72/17.89	-17.48/17.29	-18.39/17.92	-17.82/18.3	-18.58/18.44	-16.66/18.1	-18.98/17.84	-17.88/17.44	-16.64/16.34	-18.57/18.51	-18.06/18.52	-19.4/18.36	-18.58/18.07	-18.51/18.06	-19.3/19.08	-18.96/18.91
Θ (7.5°)	-18.96/18.76	-19.17/17.18	-17.41/17.69	-18.83/17.15	-18.87/15.45	-16.48/16.36	-18.34/19.63	-16.76/15.65	-17.99/18.19	-18.58/18.09	-19.73/18.42	-17.73/19.13	-16.74/16.52	-18.26/18.83	-16.27/12.67	-18.29/16.44	-14.29/12.93	-12.28/13.62	-14.53/14.75	-14.71/13.91	-14.89/17.17	-18.67/18.01		
Θ (15°)	-18.9/18.3	-18.28/18.74	-19.36/18.15	-15.18/12.06	-14.06/15.43	-14.94/18.54	-18.25/14.68	-11.94/12.99	-15.93/17.8	-16.01/13.33	-15.34/18.49	-17.36/17.62	-18.19/18.21	-18.22/18.15	-17.59/18.06	-18.31/18.72	-13.58/12.96	-11.78/10.92	-12.45/15.21	-19.37/18.63	-17.75/16.9	-17.4/18.17	-17.94/17.49	-18.16/17.96
Θ (22.5°)	-18.72/17.14	-16.53/17.67	-17.81/19.51	-15.34/13.71	-11.22/11.31	-13.66/17.41	-15.84/11.14	-10.42/11.92	-18.18/17.47	-16.88/17.66	-17.74/17.71	-18.04/18.74	-18.22/18.47	-18.09/18.59	-17.43/18.19	-18.27/8.99	-13.36/19.18	-12.88/9.96	-11.75/19.09	-13.87/14.21	-16.89/18.42	-18.71/17.72		
Θ (30°)	-17.19/18.31	-18.4/18.54	-17.95/16.71	-15.58/13.83	-11.72/12.5	-14.22/18.52	-13.2/11.73	-10.67/15.12	-14.18/17.97	-17.83/16.17	-12.71/11.63	-15.57/19.27	-18.38/18.09	-17.19/19.51	-14.63/16.08	-16.51/15.26	-18.9/13.66	-18.9/13.66	-12.47/16.55	-12.57/10.64	-11.89/17.97	-18.83/17.53	-17.56/17.8	-18.68/18.01
Θ (37.5°)	-18.83/16.35	-14.37/14.08	-19.17/18.35	-17.69/17.84	-18.59/12.87	-17.87/15.01	-12.3/17.61	-18.92/18.4	-17.24/16.93	-18.17/17.29	-16.73/19.2	-17.53/18.89	-18.4/18.16	-17.52/18.7	-12.71/14.88	-17.17/17.95	-18.73/19	-17.6/18.35	-17.99/17.65	-11.33/12.23	-18.08/17.91	-13.23/12.57	-18.87/17.66	-18.77/17.52
Θ (45°)	-19.37/18.83	-18.12/13.32	-12.43/18.68	-14.87/16.76	-19.04/13.81	-13.86/19.08	-17.17/19.04	-17.85/19.1	-17.46/19.21	-19.44/17.14	-17.51/18.11	-18.89/18	-17.95/18.87	-18.2/18.25	-13.85/17.82	-16.17/17.18	-18.73/17.06	-18.99/17.8	-18.62/18.29	-17.7/19.11	-19.17/15.25	-17.29/18.5	-17.96/18.79	-18.18/18.61
Θ (52.5°)	-18.4/18.47	-18.77/18.99	-14.37/18.51	-18.93/18.03	-12.78/19.34	-10.66/16.14	-14.33/18.94	-17.26/17.12	-17.23/18.37	-17.98/18.2	-17.17/18.49	-12.71/14.16	-18.66/18.3	-18.48/18.64	-17.52/17.61	-18.46/18.69	-18.67/19.08	-18.67/19.08	-17.92/14.82	-17.79/18.88	-14.83/19.44	-17.66/18.77		
Θ (60°)	-13.74/15.29	-18.27/17.53	-15.82/17.22	-18.96/16.98	-12.71/17.99	9.19/18.23	-18.86/11.17	-13.53/18.32	-16.61/8.69	-11.8/10.35	-11.03/10.34	-12.31/19.01	-16.75/14.71	-16.29/15.66	-17.94/15.53	-18.16/18.09	-17.82/18.84	-14.5/16.79	-12.47/11.3	-18.02/13.81	-18.08/18.82	-17.72/12.92	-14.92/19.04	-17.75/17.15
Θ (67.5°)	-18.9/19.07	-19.06/18.96	-18.71/17.5	-18.91/18.38	-19.38/12.09	-12.73/14.61	-10.87/12.34	-10.3/8.95	-10.91/9.44	-16.25/13.33	-11.59/11.97	-11.91/14.76	-16.51/15.66	-18.19/16.66	-13.51/17.58	-11.58/18.28	-18.34/19.18	-18.63/18.12	-13.67/10.68	-17.86/15.72	-18.93/16.43	-15.1/12.03	-13.05/16.28	-17.7/19.4
Θ (75°)	-18.1/16.82	-14.95/18.29	-15.18/15.77	-14.47/13.92	-18.64/18.82	-15.27/18.18	-18.15/15.13	-14.11/16.88	-18.58/18.16	-18.73/16.83	-16.71/5.8	-16.78/16.27	-13.24/18.79	-16.35/17.9	-15.18/16.36	-18.92/19.36	-17.49/17.55	-14.4/12.73	-18.15/15.6	-15.99/16.51	-19.12/15.61	-19.12/15.61	-17.09/16.81	
Θ (82.5°)	-18.31/15.31	-17.47/18.67	-13.52/19.23	-18.46/17.52	-17.95/19.28	-12.4/16.6																		



Radiated Composite Gain Data

Appendix A

Table with columns for Frequency (MHz), Gain (dBi), and various polarization combinations (Phi/Theta). Rows include frequency bands like 2.45 GHz, 5.2 GHz, and 28 GHz, and gain values ranging from approximately -11 to 15 dBi.



Radiated Composite Gain Data

Appendix A

Theta	Phi	Gain	Phi(0°)	Phi(5°)	Phi(10°)	Phi(15°)	Phi(20°)	Phi(25°)	Phi(30°)	Phi(35°)	Phi(40°)	Phi(45°)	Phi(50°)	Phi(55°)	Phi(60°)	Phi(65°)	Phi(70°)	Phi(75°)	Phi(80°)	Phi(85°)	Phi(90°)	Phi(95°)	Phi(100°)	Phi(105°)	Phi(110°)	Phi(115°)	Phi(120°)	Phi(125°)	Phi(130°)	Phi(135°)	Phi(140°)	Phi(145°)	Phi(150°)	Phi(155°)	Phi(160°)	Phi(165°)	Phi(170°)	Phi(175°)	Phi(180°)																																																																																																																														
Theta(150°)	Phi(150°)	-11.63/8.02	7.74/5.64	5.24/6.68	7.29/10.35	18.49/12.28	11.98/15.2	18.4/16.84	9.76/13.16	18.75/16.78	11.31/9.95	9.87/10.87	16.86/16.31	14.55/9.88	8.72/7.49	7.49/6.22	16.69/13.9	9.27/9.01	12.4/12.61	13.24/12.1	12.61/15.27	12.78/8.74	7.41/6.6	6.22/6.76	8.84/11.24	Theta(157.5°)	Phi(157.5°)	-6.29/7.03	8.43/11	12.37/8.03	6.68/9.74	17.5/16.04	9.17/6.3	7.55/13.12	19.06/14.05	7.79/6.9	9.26/10.09	15.99/14.81	18.89/16.58	16.47/13.48	8.48/7.71	8.69/12.74	15.15/14.53	12.58/9.52	8.97/10.1	17.23/15.03	8.7/8.67	8.53/8.58	8.92/8.25	8.44/6.69	Theta(165°)	Phi(165°)	-7.71/7.53	7.1/5.66	6.11/3.64	13.32/19.2	17.79/12.52	9.08/8.13	10.15/14.56	18.61/17.92	12.39/13.89	15.73/16.16	17.99/17.66	18.71/18.57	18.25/18.48	16.1/11.92	9.28/9.46	16.1/11.92	18.38/17.34	16.99/12.95	10.39/9.28	8.46/9.5	10.09/7.63	6.76/7.23	6.16/6.25	5.78/6.31	Theta(172.5°)	Phi(172.5°)	8.23/7.7	8.54/11.22	16.55/19.36	17.46/18.95	18.52/17.22	13.08/13.08	15.9/18.19	17.62/18.34	18.32/18.5	18.15/18.32	17.73/17.9	19.56/18.59	18.58/17.94	17.35/16.2	15.38/16.14	16.17/17.53	17.79/18.3	18.12/17.36	19.22/18.27	17.91/16.86	15.09/13.74	12.5/9.81	9.35/10.42	9.92/8.48	Theta(180°)	Phi(180°)	17.49/18.32	18.87/18.47	16.31/14.13	14.57/18.08	17.51/18.66	17.64/18.35	18.66/14.08	13/15.37	17.87/18.13	18.51/18.56	16.78/17.99	19.04/18.81	18.49/17.26	18.75/18.57	18.42/17.67	16/14.92	15.68/15.69	14.73/15.05	15.36/16.12	18.14/18.94	18.14/18.06	18.86/19.13	17.66/18.06	18.77/17.93	Phi(0°)	Phi(5°)	Phi(10°)	Phi(15°)	Phi(20°)	Phi(25°)	Phi(30°)	Phi(35°)	Phi(40°)	Phi(45°)	Phi(50°)	Phi(55°)	Phi(60°)	Phi(65°)	Phi(70°)	Phi(75°)	Phi(80°)	Phi(85°)	Phi(90°)	Phi(95°)	Phi(100°)	Phi(105°)	Phi(110°)	Phi(115°)	Phi(120°)	Phi(125°)	Phi(130°)	Phi(135°)	Phi(140°)	Phi(145°)	Phi(150°)	Phi(155°)	Phi(160°)	Phi(165°)	Phi(170°)	Phi(175°)	Phi(180°)



Radiated Composite Gain Data

Appendix A

θ (°)	-17.61/18.78	-17.41/18.42	-18.61/17.07	-17.84/18.48	-18.35/17.9	-19.08/19.27	-18.81/18.9	-18.31/17.39	-18.35/19.21	-17.47/18.43	-19.52/18.18	-18.45/18.61	-19.08/18.85	-18.63/18.8	-18.02/18.77	-17.43/17.2	-19.2/18.78	-18.96/19.22	-19.33/18.58	-17.48/17.97	-18.88/18.53	-19.47/18.16	-18.15/19.32	-17.13/17.13
θ (7.5°)	-19.08/18.32	-18.47/18.8	-18.76/18.86	-18.39/19.26	-18.03/16.94	-17.81/18.57	-17.5/18.31	-19.26/17.89	-19.07/18.27	-18.54/19.27	-18.07/18.99	-17.8/18	-18.81/19.04	-18.21/18.46	-18.02/17.43	-18.86/17.78	-18.22/17.84	-18.86/19.36	-18.68/18.06	-18.42/19.07	-18.52/17.65	-18.18/18.79	-18.29/18.86	-19.32/17.63
θ (15°)	-19.26/17.78	-18.09/18.42	-18.77/18.49	-18.64/18.59	-18.55/18.91	-19.07/17.77	-17.55/18.79	-18.9/17.66	-15.83/14.3	-14.91/13.99	-15.65/18.61	-18.54/18.65	-18.36/18.66	-17.57/17.93	-19.07/18.99	-19.05/17.9	-17.57/18.08	-18.12/18.48	-18.38/18.15	-16.02/18.85	-19.1/17.63	-18.32/18.98	-18.63/17.93	-18.47/18.36
θ (22.5°)	-18.41/17.76	-19.14/18.7	-18.74/17.77	-15.79/17.87	-18.26/18.83	-17.82/16.62	-16.89/17.08	-15.1/14.61	-15.59/17.88	-18.62/17.81	-18.9/15.86	-18.93/17.2	-18.19/17.72	-18.81/15.7	-18.19/19.02	-17.64/18	-18.25/18.58	-18.83/17.84	-18.27/18.46	-17.36/18.96	-18.72/18.13	-19.3/17.09	-18.44/18.9	-18.22/17.32
θ (30°)	-17.63/18.78	-18.36/17.84	-18.74/17.53	-18.34/18.74	-18.16/18.99	-17.48/15.5	-16.49/16.58	-14.51/18.8	-17.53/15.55	-14.85/14.83	-17.82/19.02	-18.73/17.04	-17.83/18.43	-18/13.06	-16.2/15.79	-18.36/18.49	-18.72/17.59	-18.8/19.1	-18.83/17.93	-18.57/18.68	-19.01/18.44	-17.56/17.99	-18.31/18.48	-18.31/18.48
θ (37.5°)	-18.33/18.76	-19.06/18.13	-19.17/19.96	-17.85/17.67	-18.29/18.93	-18.79/18.07	-19.39/17.75	-18.72/18.14	-13.9/10.78	-12.53/10.68	-11.19/16.78	-18.5/17.67	-17.71/19.16	-17.8/19.1	-18.48/19.33	-18.7/17.56	-15.35/16.58	-18.87/19.63	-18.32/18.36	-19.24/17.8	-18.06/17.29	-18.47/17.84	-18.46/19.44	-18.89/18.41
θ (45°)	-19.1/18.09	-19.07/13.84	-13.97/17.48	-18.56/17.97	-19.08/18.59	-18.83/18.27	-15.92/16.82	-17.12/15.72	-11.71/16.7	-16.07/13.62	-16.87/15.79	-19.21/19.06	-19.15/18.25	-18.68/17.54	-17.66/18.8	-15.81/10.44	-13.01/13.87	-18.33/17.61	-16.36/17.51	-17.53/18.66	-13/12.51	-12.82/18.8	-17.42/17.71	-18.66/17.68
θ (52.5°)	-17.23/15.38	-15.17/18.12	-18.63/18.46	-18.61/18.6	-14.3/16.85	-18.07/18.29	-18.5/19.25	-18.22/16.07	-13.16/13.75	-16.36/18.99	-17.34/19.01	-18.71/17.88	-18.93/13.76	-18.31/17.76	-18.37/12.48	-15.44/16.93	-18.72/17.86	-18.99/17.87	-18.62/18.53	-16.81/19.06	-14.85/14.41	-12.39/14.19	-15.51/16.94	-16/18.17
θ (60°)	-18.47/18.15	-18.07/17.27	-15.91/14.98	-12.4/16.26	-17.5/18.39	-17.32/17.54	-18.14/17.54	-13.9/17.7	-19.33/17.19	-12.86/12.15	-13.23/11.17	-15.33/19.26	-17.78/17.26	-19/18.89	-16.04/13.18	-18.44/18.26	-15.57/18.54	-18.88/18.77	-18.22/18.43	-17.72/17	-19.38/18.1	-17.8/17.28	-15.42/15.76	-18.9/18.92
θ (67.5°)	-17.67/15.61	-14.12/17.48	-15.55/17	-18.85/18	-18.92/19.19	-17.32/18.68	-19.03/19.05	-19.05/19.37	-16.83/13.77	-10.79/8.57	-14.38/16.63	-13.43/12.14	-17.92/18.39	-17.67/14.6	-18.81/14.06	-17.54/14.6	-18.88/19.02	-19.29/18.23	-18.86/18.66	-17.28/16.39	-18.03/17.99	-18.51/16.07	-18.44/18.06	-19.1/17.59
θ (75°)	-17.72/18.89	-17.1/17.68	-19.01/18.82	-17.03/12.04	-16.55/11.56	-8.81/18.34	-14.8/18.25	-17.09/15.61	-18.56/17.26	-18.5/18.59	-17.14/18.88	-16.68/18.19	-17.95/15.86	-18.34/15.67	-10.56/11.62	-18.94/10.56	-14.71/18.84	-17.53/16.19	-17.26/17.04	-17.68/17.99	-17.78/18.26	-18.04/18.58	-13.63/15.22	-18.01/15.18
θ (82.5°)	-19.01/16.36	-19.43/18	-18.57/15.12	-13.04/9.82	-14.33/12.72	-13.35/18.39	-13.92/19.23	-11.12/18.04	-18.07/15	-17.8/17.57	-13.63/17.95	-17.97/19.11	-15.27/18.09	-18.12/14.25	-12.09/9.82	-18.25/15.18	-16.86/19.04	-17.3/10.94	-15.91/15.57	-19.19/15.74	-18.06/18.37	-13.87/18.58	-14.02/18.92	-13.11/12.05
θ (90°)	-16.39/17.92	-16.88/16.34	-14.42/19.27	-16.49/12.47	-18.6/18.5	-12.76/17.82	-11.25/14.99	-10.61/18	-18.98/16.81	-16.41/11.07	-9.92/12.68	-18.71/11.52	-17.79/17.83	-16.85/17.13	-13.68/16.86	-16.27/18.12	-17.51/17.85	-16.92/12.03	-16.66/18.45	-18.24/18.5	-18.56/17.02	-18.19/12.66	-12.86/18.73	-18.13/17.52
θ (105°)	-14.78/18.37	-17.2/18.97	-17.17/17.68	-19.01/18.82	-16.55/11.56	-8.81/18.34	-14.8/18.25	-17.09/15.61	-18.56/17.26	-18.5/18.59	-17.14/18.88	-16.68/18.19	-17.95/15.86	-18.34/15.67	-10.56/11.62	-18.94/10.56	-14.71/18.84	-17.53/16.19	-17.26/17.04	-17.68/17.99	-17.78/18.26	-18.04/18.58	-13.63/15.22	-18.01/15.18
θ (120°)	-19.2/16.57	-17.15/19.2	-17.14/16.2	-17.83/10.79	-17.99/13.05	-18.27/19.06	-18.64/17.22	-10.87/15.72	-18/17.87	-15.02/16.21	-15.03/15.41	-17.58/18.67	-14.18/17.91	-18.29/18.43	-19.11/18.88	-17.35/14.36	-17.5/16.91	-18.44/13.92	-18.96/14.52	-14.63/16.74	-18.96/17.87	-18.03/18.51	-18.73/15.05	-15.28/18.69
θ (135°)	-17.47/18.22	-14.32/12.36	-18.44/16.58	-11.89/16.49	-16.13/13.86	-12.22/17.41	-17.28/18.47	-15.88/19.22	-19.09/17.48	-18.92/19.58	-13.88/16.14	-14.06/18.79	-18.03/17.75	-14.91/15.32	-17.23/15.09	-10.47/12.46	-16.69/14.51	-17.56/18.95	-19.18/16.9	-18.12/18.48	-13.49/14.03	-17.61/17.95	-16.03/11.97	-16.87/19.33
θ (150°)	-14.78/18.37	-17.2/18.97	-17.17/17.68	-19.01/18.82	-16.55/11.56	-8.81/18.34	-14.8/18.25	-17.09/15.61	-18.56/17.26	-18.5/18.59	-17.14/18.88	-16.68/18.19	-17.95/15.86	-18.34/15.67	-10.56/11.62	-18.94/10.56	-14.71/18.84	-17.53/16.19	-17.26/17.04	-17.68/17.99	-17.78/18.26	-18.04/18.58	-13.63/15.22	-18.01/15.18
θ (172.5°)	-15.78/18.61	-17.97/15.21	-11.87/17.4	-17.49/12.63	-14.85/18.48	-15.98/15.8	-18.26/18.3	-16.36/14.4	-15.01/9.42	-8.6/12.72	-18.91/14.61	-11.54/18.75	-18.23/18.71	-18.22/13.74	-14.35/13.37	-13.56/10.64	-14.04/18.61	-18.93/17.96	-15.38/18.17	-15.57/18.48	-17.6/15.01	-18.12/17.56	-18.6/18.2	-17.51/13.74
θ (180°)	-18.42/18.55	-19.07/17.32	-18.51/18.86	-14.5/18.87	-10.19/11.9	-13.18/9.98	-12.18/14.39	-18.12/10.61	-10.3/14.71	-10.03/10.07	-18.77/17.47	-16.05/12.23	-17.09/18.41	-18.89/13.76	-10.97/10.78	-10.47/19.01	-18.21/14.09	-17.94/18.27	-16.5/15.24	-17.8/17.95	-15.9/18.41	-7.33/8.41	-14.28/18.85	-18.6/17.59
Freq(Hz)	5.785GHz	Theta/Ant 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gain	Φ (7°)/ 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 (7.5°)	-18.12/19.17	-17.82/17.74	-18.22/18.49	-18.87/19.06	-18.57/19.09	-18.43/18.53	-19/18.5	-18.17/17.85	-18.09/17.37	-17.14/18.68	-17.61/18.77	-18.52/18.08	-18.45/18.58	-17.38/17.59	-19.15/17.91	-18.55/19.34	-18.16/18.32	-18.87/18.65	-18.73/17.97	-17.69/18.1	-17.16/18.95	-18.27/19.09	-18.97/17.24	-19.22/19.27
θ (7.5°)	-17.8/18.03	-18.66/18.39	-17.99/18.54	-17.91/18.84	-15.51/18.8	-17.88/19.16	-18.25/18.21	-17.94/18.9	-17.81/18.4	-19.37/17.85	-17.56/18.67	-16.76/18.85	-15.94/17.01	-16.79/18.68	-18.63/18.65	-18.25/18.82	-16.92/17.09	-16.63/14.91	-16.71/18.36	-18.26/18.7	-18.59/19.03	-18.95/17.85	-18.14/17.06	-17.01/17.74
θ (15°)	-18.52/16.36	-18.35/18.62	-18.62/18.56	-17.88/18.63	-18.9/18.47	-17.81/19.01	-18.63/17.21	-19.08/18.19	-18.08/16.45	-14.09/11.87	-11.25/10.91	-12.78/13.33	-13.54/12.76	-12.26/11.08	-10.08/10.74	-11.35/14.07	-16.99/17.79	-17.51/17.29	-16.06/15.84	-16.85/18.39	-18.44/18.76	-18.83/18.64	-18.47/17.77	-16.33/18.69
θ (22.5°)	-11.52/11.42	-12.28/13.28	-12.68/12.97	-14.81/17.13	-16.56/18.1	-17.68/18.53	-17.91/19.05	-13.72/13.25	-14.83/14.78	-14.13/13.89	-13.45/14.55	-13.98/14.97	-13.44/12.69	-11.58/11.87	-10.53/9.23	-9.83/11.1	-12.96/14.66	-13.02/11.08	-12.53/15.67	-16.18/16.43	-14.24/12.37	-11.6/11.82	-11.57/11.78	-10/10.96
θ (30°)	-9.9/15.29	-18.72/18.75	-10.56/12.27	-10.4/9.16	-8.48/5.99	-7.35/7.43	-8.23/10.45	-11.02/9.64	-6.1/5.53	-7.13/7.6	-8.31/8.56	-8.82/6.93	-7.19/7.87	-7.6/5.83	-10.7/8.38	-6.31/6.57	-6.52/7.49	-9.21/9.75	-7.58/7.24	-5.21/5.23	-7.66/8.25	-8.37/8.84	-8.46/9.56	-7.62/8.67
θ (37.5°)	-6.18/10.26	-8.82/6.67	-8.91/8.36	-7.17/6.38	-5.2/5.31	-5.87/7.22	-12.29/11.67	-11.03/7.57	-5.83/5.78	-5.05/4.08	-3.24/3	-2.12/2.14	-0.84/1.02	-2.72/3.95	-4.91/4.78	-4.78/7.13	-5.84/5.27	-5.07/7.98	-9.31/8.47	-7.19/6.14	-5.68/5.38	-7.22/6.1	-4.71/4.96	-4.45/6.62
θ (45°)	-6.75/8.76	-7.45/5.14	-5.3/6.72	-5.82/9.01	-6.26/6.8	-9.32/10.63	-7.58/6.76	-3.78/4.99	-6.37/5.81	-6.83/5.3	-4.65/7.61	-9.26/8.12	-7.6/6.16	-6.3/5.79	-4.48/4.48	-4.43/3.68	-4.47/6.78	-5.12/5.1	-3.68/5.28	-5.11/8.23	-4.6/5.52	-5.32/5.57	-5.95/5.61	-4.78/5.73
θ (52.5°)	-6.38/7.12	-6.37/7.69	-5.6/9.81	-10.21/8.13	-7.01/6.42	-6.59/11.01	-6.74/9.55	-13.35/12.38	-7.59/6.22	-5.33/3.92	-3.46/3.25	-2.27/3.21	-3.42/2.8	-3.03/5.19	-4.25/3.04	-5.9/4.37	-5.45/6.84	-6.62/5.99	-5.62/5.37	-6.51/4.35	-5.49/8.06	-6.83/8.42	-5.95/5.31	-7.19/5.83
θ (60°)	-2.59/5.92	-5.47/5.63	-6.3/3.9																					



Total Gain Data

Table with columns for Frequency (MHz), Total Ant. 1, and Gain for various antenna configurations (Phi(0) to Phi(360) at various elevations). The table contains multiple rows of numerical data representing gain values.



Antenna Pattern

Appendix B

Theta	Phi	15.5	16.5	17.5	18.5	19.5	20.5	21.5	22.5	23.5	24.5	25.5	26.5	27.5	28.5	29.5	30.5	31.5	32.5	33.5	34.5	35.5	36.5	37.5	38.5	39.5	40.5	41.5	42.5	43.5	44.5	45.5	46.5	47.5	48.5	49.5	50.5	51.5	52.5	53.5	54.5	55.5	56.5	57.5	58.5	59.5	60.5	61.5	62.5	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5	74.5	75.5	76.5	77.5	78.5	79.5	80.5	81.5	82.5	83.5	84.5	85.5	86.5	87.5	88.5	89.5	90.5	91.5	92.5	93.5	94.5	95.5	96.5	97.5	98.5	99.5	100.5
Theta	Phi	15.5	16.5	17.5	18.5	19.5	20.5	21.5	22.5	23.5	24.5	25.5	26.5	27.5	28.5	29.5	30.5	31.5	32.5	33.5	34.5	35.5	36.5	37.5	38.5	39.5	40.5	41.5	42.5	43.5	44.5	45.5	46.5	47.5	48.5	49.5	50.5	51.5	52.5	53.5	54.5	55.5	56.5	57.5	58.5	59.5	60.5	61.5	62.5	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5	74.5	75.5	76.5	77.5	78.5	79.5	80.5	81.5	82.5	83.5	84.5	85.5	86.5	87.5	88.5	89.5	90.5	91.5	92.5	93.5	94.5	95.5	96.5	97.5	98.5	99.5	100.5
Theta	Phi	15.5	16.5	17.5	18.5	19.5	20.5	21.5	22.5	23.5	24.5	25.5	26.5	27.5	28.5	29.5	30.5	31.5	32.5	33.5	34.5	35.5	36.5	37.5	38.5	39.5	40.5	41.5	42.5	43.5	44.5	45.5	46.5	47.5	48.5	49.5	50.5	51.5	52.5	53.5	54.5	55.5	56.5	57.5	58.5	59.5	60.5	61.5	62.5	63.5	64.5	65.5	66.5	67.5	68.5	69.5	70.5	71.5	72.5	73.5	74.5	75.5	76.5	77.5	78.5	79.5	80.5	81.5	82.5	83.5	84.5	85.5	86.5	87.5	88.5	89.5	90.5	91.5	92.5	93.5	94.5	95.5	96.5	97.5	98.5	99.5	100.5



Antenna Pattern

Appendix B

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(5°)	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	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		
Theta(60°)	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	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	0.00

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



