

Test Report for DN024 (CC-Antenna-DK Board #6)

By Richard Wallace

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Application Note DN616

1 SINGLE BAND MODE

1.1 OTA Test Results for Frequency 868.000 MHz

Total Radiated Power	-0.10 dBm
Peak EIRP	5.05 dBm
Directivity	5.15 dBi
Efficiency	-0.10 dB
Efficiency	97.67 %
Gain	5.05 dBi
NHPRP 45°	-2.77 dBm
NHPRP 45° / TRP	-2.67 dB
NHPRP 45° / TRP	54.13 %
NHPRP 30°	-4.79 dBm
NHPRP 30° / TRP	-4.69 dB
NHPRP 30° / TRP	33.97 %
NHPRP 22.5°	-6.05 dBm
NHPRP 22.5° / TRP	-5.94 dB
NHPRP 22.5° / TRP	25.44 %
UHRP	-3.75 dBm
UHRP / TRP	-3.65 dB
UHRP / TRP	43.18 %
LHRP	-2.56 dBm
LHRP / TRP	-2.45 dB
LHRP / TRP	56.82 %
Front/Back Ratio	3.78
PhiBW	293.4 deg
PhiBW Up	212.0 deg
PhiBW Down	81.5 deg
ThetaBW	75.5 deg
ThetaBW Up	34.2 deg
ThetaBW Down	41.3 deg
Boresight Phi	135 deg
Boresight Theta	180 deg
Maximum Power	5.05 dBm
Minimum Power	-11.70 dBm
Average Power	1.12 dBm
Max/Min Ratio	16.75 dB
Max/Avg Ratio	3.93 dB
Min/Avg Ratio	-12.82 dB
Best Single Value	4.24 dBm
Best Position	Phi = 105 deg; Theta = 165 deg; Pol = Hor

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1.1.1 RP_868.000_tot

Azimuth (deg)	Elevation 0 deg (dB)	Elevation 15 deg (dB)	Elevation 30 deg (dB)	Elevation 45 deg (dB)	Elevation 60 deg (dB)	Elevation 75 deg (dB)	Elevation 90 deg (dB)	Elevation 105 deg (dB)
0.00	0.25	0.39	1.35	3.43	1.73	-5.42	-0.30	-1.15
15.00	0.56	0.37	1.37	3.47	1.19	-5.94	0.04	-0.08
30.00	0.88	0.68	0.82	3.18	-0.07	-6.04	0.26	0.31
45.00	1.34	0.44	0.53	2.36	-1.27	-6.48	-0.26	0.06
60.00	1.64	0.51	-0.41	1.44	-3.46	-6.03	-1.00	-0.73
75.00	2.01	0.10	-1.23	-0.02	-6.07	-5.69	-2.09	-2.04
90.00	2.22	-0.32	-1.66	-1.69	-9.13	-4.52	-2.91	-2.81
105.00	2.57	-0.53	-1.80	-3.33	-10.79	-3.13	-2.78	-2.56
120.00	2.91	0.02	-1.24	-4.45	-7.84	-2.01	-1.96	-0.90
135.00	3.29	0.63	0.12	-3.88	-5.87	-1.02	-1.04	0.54
150.00	3.49	1.65	1.01	-2.51	-3.72	-0.49	-0.70	1.28
165.00	3.89	2.38	2.13	-1.07	-2.39	-0.26	-0.87	1.59
180.00	4.07	3.22	2.77	0.30	-1.54	-0.09	-1.69	1.09
195.00	4.25	4.00	3.31	0.78	-0.98	-0.04	-2.74	0.28
210.00	4.27	4.36	3.39	0.89	-1.69	-0.14	-4.25	-0.91
225.00	4.34	4.47	3.33	0.08	-2.74	-0.60	-5.62	-2.26
240.00	3.84	4.47	3.03	-1.03	-5.09	-1.75	-6.37	-3.44
255.00	3.56	4.06	2.49	-2.53	-7.61	-3.19	-6.38	-4.16
270.00	3.12	3.30	1.85	-4.01	-7.48	-5.46	-5.22	-4.52
285.00	2.47	2.36	1.30	-3.41	-3.95	-7.27	-3.67	-3.85
300.00	1.79	1.53	1.08	-1.45	-1.97	-6.84	-2.34	-4.03
315.00	1.27	0.82	1.11	0.40	0.20	-5.90	-1.32	-3.68
330.00	0.85	0.38	1.24	1.79	1.19	-4.88	-0.82	-3.45
345.00	0.71	0.49	1.59	2.91	1.77	-4.89	-0.65	-2.37
360.00	0.31	0.39	1.62	3.39	1.42	-5.47	-0.34	-1.22

(continuation of the "RP_868.000_tot" table from column 9 ...)

Azimuth (deg)	Elevation 120 deg (dB)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)	Elevation 180 deg (dB)
0.00	0.51	4.19	3.56	2.37	1.46
15.00	0.49	4.36	3.61	2.41	1.16
30.00	-0.13	3.92	3.47	2.71	1.24
45.00	-1.95	3.16	3.49	3.11	1.75
60.00	-4.81	2.21	3.57	3.74	2.28
75.00	-7.98	1.23	3.66	3.97	3.21
90.00	-8.05	0.50	3.83	4.26	4.05
105.00	-4.18	0.15	4.12	4.59	4.69
120.00	-1.17	0.73	4.26	4.62	4.95
135.00	0.98	1.31	4.32	4.51	5.05
150.00	2.00	1.78	4.00	4.20	4.92
165.00	2.35	1.99	3.59	3.85	4.52
180.00	2.07	1.50	2.93	3.50	3.90
195.00	1.50	0.54	1.83	3.16	3.35
210.00	0.53	-0.82	0.74	3.10	2.84
225.00	-0.39	-3.53	-0.38	2.76	2.85
240.00	-1.43	-7.46	-1.74	2.67	2.84
255.00	-2.14	-11.70	-2.04	2.58	3.14
270.00	-2.22	-8.06	-1.31	2.58	3.28
285.00	-1.99	-3.70	0.05	2.61	3.46
300.00	-1.19	-0.94	1.21	2.44	3.55
315.00	-0.85	1.10	2.42	2.58	3.23
330.00	-0.13	2.52	2.82	2.34	2.92
345.00	0.09	3.54	3.43	2.15	2.11
360.00	0.63	4.01	3.49	2.22	1.70

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1.1.2 RP_868.000_hor

Azimuth (deg)	Elevation 0 deg (dB)	Elevation 15 deg (dB)	Elevation 30 deg (dB)	Elevation 45 deg (dB)	Elevation 60 deg (dB)	Elevation 75 deg (dB)	Elevation 90 deg (dB)	Elevation 105 deg (dB)
0.0	-9.44	-14.82	-16.34	-8.91	-10.57	-15.91	-16.16	-10.41
15.0	-7.86	-11.19	-11.51	-6.28	-10.46	-12.91	-12.70	-7.31
30.0	-4.05	-6.25	-7.17	-4.41	-11.15	-9.80	-8.60	-5.47
45.0	-1.02	-3.34	-4.52	-3.91	-11.69	-8.25	-6.03	-4.03
60.0	0.60	-1.49	-3.48	-3.48	-13.35	-6.51	-4.53	-3.17
75.0	1.67	-0.80	-2.93	-3.97	-15.27	-5.91	-3.93	-3.14
90.0	1.97	-0.78	-2.76	-4.30	-16.63	-5.40	-3.69	-3.11
105.0	1.74	-1.39	-3.49	-4.88	-17.24	-5.53	-3.85	-3.55
120.0	0.94	-2.49	-4.73	-5.90	-18.51	-6.07	-4.33	-3.46
135.0	-0.37	-4.74	-6.58	-7.53	-21.81	-6.93	-4.84	-4.45
150.0	-2.92	-8.55	-10.02	-9.68	-22.90	-7.93	-6.09	-5.25
165.0	-7.02	-17.21	-13.69	-12.60	-22.90	-10.64	-7.62	-7.07
180.0	-13.09	-11.28	-11.16	-14.66	-22.90	-12.69	-10.98	-9.98
195.0	-9.32	-5.18	-6.19	-11.82	-21.59	-13.01	-15.92	-14.93
210.0	-4.20	-1.73	-3.13	-8.54	-17.29	-10.69	-18.19	-16.23
225.0	-1.37	0.37	-0.66	-5.89	-13.37	-9.26	-12.31	-10.93
240.0	0.53	1.91	0.63	-4.46	-11.88	-8.18	-8.63	-8.06
255.0	1.81	2.50	1.49	-3.77	-10.68	-7.51	-6.89	-6.10
270.0	2.50	2.63	1.60	-4.18	-10.64	-8.19	-6.18	-5.24
285.0	2.38	2.24	1.20	-5.26	-11.09	-9.12	-6.08	-4.73
300.0	1.64	1.39	0.21	-7.20	-13.35	-10.05	-6.56	-6.13
315.0	0.38	-0.35	-1.81	-11.03	-16.87	-11.72	-8.29	-7.76
330.0	-1.59	-2.84	-4.17	-18.07	-18.11	-13.71	-10.26	-11.12
345.0	-4.71	-6.35	-8.73	-14.71	-15.59	-16.67	-15.53	-13.20
360.0	-9.06	-11.00	-15.19	-10.44	-12.30	-16.83	-20.45	-12.78

(continuation of the "RP_868.000_hor" table from column 9 ...)

Azimuth (deg)	Elevation 120 deg (dB)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)	Elevation 180 deg (dB)
0.0	-9.49	-10.68	-5.18	-6.50	-14.23
15.0	-12.05	-6.48	-3.36	-4.04	-12.02
30.0	-13.12	-4.43	-0.94	-1.07	-4.05
45.0	-13.29	-2.49	1.00	1.33	-0.18
60.0	-13.31	-1.27	2.60	3.06	1.75
75.0	-12.82	-0.35	3.40	3.85	3.12
90.0	-14.73	0.05	3.79	4.21	3.85
105.0	-16.93	-0.13	3.83	4.24	4.01
120.0	-17.46	-0.59	3.39	3.55	3.60
135.0	-17.27	-1.42	2.59	2.39	2.60
150.0	-18.67	-2.63	1.00	0.40	0.75
165.0	-15.92	-4.45	-0.86	-2.20	-2.28
180.0	-14.84	-6.49	-3.40	-5.27	-7.87
195.0	-11.69	-9.36	-5.61	-6.01	-16.99
210.0	-8.68	-11.74	-5.94	-3.20	-7.03
225.0	-6.40	-14.57	-4.65	-0.79	-1.83
240.0	-4.54	-14.90	-3.61	0.96	0.83
255.0	-3.32	-14.43	-2.36	2.00	2.56
270.0	-2.64	-12.75	-1.69	2.50	3.22
285.0	-2.57	-12.86	-1.48	2.42	3.31
300.0	-2.60	-12.94	-1.82	1.68	2.88
315.0	-3.86	-15.90	-2.72	0.37	1.57
330.0	-5.38	-16.85	-4.03	-1.83	-0.48
345.0	-7.38	-15.27	-5.16	-4.74	-4.34
360.0	-9.81	-11.89	-5.57	-6.28	-11.29

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1.1.3 RP_868.000_ver

Azimuth (deg)	Elevation 0 deg (dB)	Elevation 15 deg (dB)	Elevation 30 deg (dB)	Elevation 45 deg (dB)	Elevation 60 deg (dB)	Elevation 75 deg (dB)	Elevation 90 deg (dB)	Elevation 105 deg (dB)
0.0	-0.25	0.25	1.27	3.17	1.47	-5.83	-0.42	-1.70
15.0	-0.12	0.06	1.14	2.98	0.88	-6.91	-0.20	-0.99
30.0	-0.81	-0.30	0.06	2.35	-0.42	-8.41	-0.34	-1.03
45.0	-2.43	-1.92	-1.09	1.19	-1.68	-11.21	-1.59	-2.09
60.0	-5.06	-3.84	-3.37	-0.25	-3.93	-15.79	-3.55	-4.39
75.0	-9.23	-7.17	-6.11	-2.26	-6.63	-18.73	-6.71	-8.51
90.0	-10.23	-10.36	-8.14	-5.15	-9.98	-11.86	-10.78	-14.62
105.0	-4.99	-8.00	-6.73	-8.58	-11.90	-6.85	-9.40	-9.49
120.0	-1.47	-3.56	-3.82	-9.92	-8.22	-4.17	-5.71	-4.40
135.0	0.85	-0.86	-0.92	-6.33	-5.99	-2.31	-3.39	-1.12
150.0	2.36	1.21	0.65	-3.44	-3.77	-1.35	-2.18	0.18
165.0	3.53	2.33	2.01	-1.39	-2.43	-0.68	-1.90	0.95
180.0	3.98	3.06	2.59	0.16	-1.57	-0.34	-2.23	0.74
195.0	4.05	3.44	2.79	0.53	-1.02	-0.27	-2.96	0.15
210.0	3.60	3.13	2.30	0.36	-1.81	-0.54	-4.43	-1.04
225.0	2.99	2.33	1.11	-1.19	-3.13	-1.23	-6.67	-2.89
240.0	1.10	0.95	-0.68	-3.65	-6.10	-2.87	-10.29	-5.28
255.0	-1.23	-1.13	-4.38	-8.56	-10.56	-5.19	-15.90	-8.61
270.0	-5.67	-5.18	-10.75	-17.97	-10.35	-8.76	-12.23	-12.68
285.0	-14.67	-13.27	-15.04	-8.01	-4.89	-11.87	-7.36	-11.24
300.0	-13.00	-13.58	-6.36	-2.79	-2.29	-9.66	-4.41	-8.19
315.0	-6.04	-5.45	-1.99	0.08	0.12	-7.22	-2.29	-5.83
330.0	-2.80	-2.44	-0.23	1.74	1.14	-5.49	-1.35	-4.26
345.0	-0.76	-0.52	1.17	2.83	1.69	-5.19	-0.79	-2.75
360.0	-0.22	0.06	1.53	3.20	1.24	-5.80	-0.38	-1.54

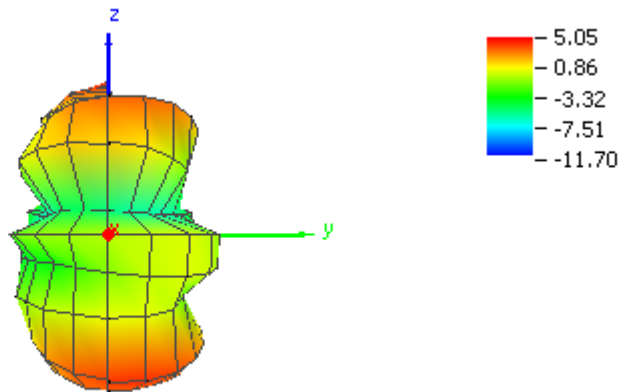
(continuation of the "RP_868.000_ver" table from column 9 ...)

Azimuth (deg)	Elevation 120 deg (dB)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)	Elevation 180 deg (dB)
0.0	0.05	4.04	2.93	1.76	1.34
15.0	0.24	3.98	2.63	1.29	0.95
30.0	-0.36	3.23	1.52	0.35	-0.28
45.0	-2.28	1.78	-0.11	-1.63	-2.70
60.0	-5.48	-0.38	-3.41	-4.66	-7.14
75.0	-9.71	-3.94	-8.68	-11.75	-13.97
90.0	-9.10	-9.62	-17.21	-15.05	-9.42
105.0	-4.42	-11.79	-7.74	-6.57	-3.70
120.0	-1.27	-5.08	-3.16	-2.00	-0.79
135.0	0.92	-2.00	-0.52	0.39	1.40
150.0	1.96	-0.17	0.98	1.86	2.82
165.0	2.29	0.87	1.65	2.61	3.51
180.0	1.98	0.75	1.78	2.88	3.60
195.0	1.28	0.08	0.96	2.61	3.31
210.0	-0.02	-1.18	-0.31	1.93	2.37
225.0	-1.64	-3.89	-2.41	0.24	1.04
240.0	-4.33	-8.32	-6.32	-2.20	-1.48
255.0	-8.38	-15.00	-13.46	-6.42	-5.89
270.0	-12.56	-9.86	-12.10	-15.23	-14.87
285.0	-11.05	-4.26	-5.22	-11.00	-11.40
300.0	-6.77	-1.23	-1.78	-5.53	-4.89
315.0	-3.86	1.01	0.83	-1.42	-1.74
330.0	-1.67	2.47	1.81	0.24	0.26
345.0	-0.76	3.48	2.78	1.16	0.99
360.0	0.22	3.89	2.92	1.56	1.48

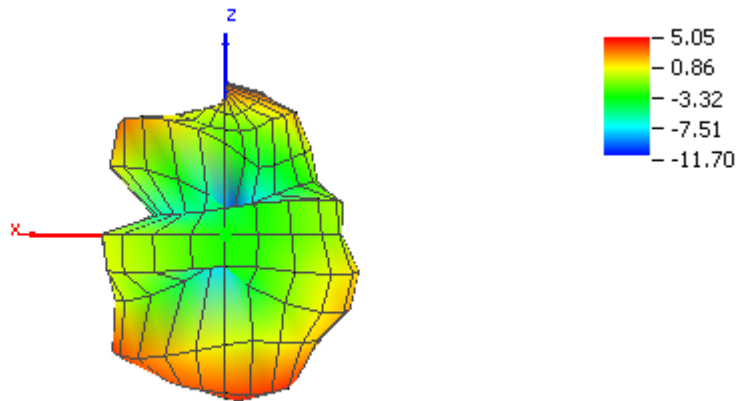
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1.1.4 Radiation Patterns

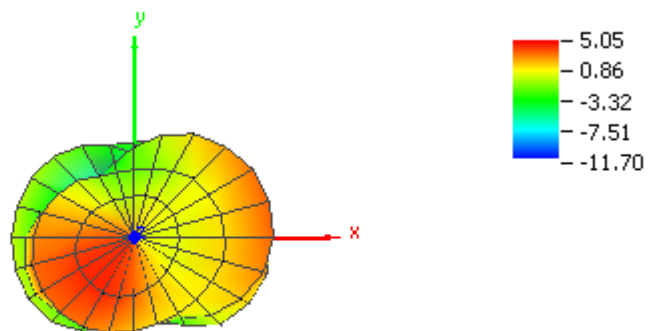
Theta = 90, Phi = 0



Theta = 90, Phi = 90

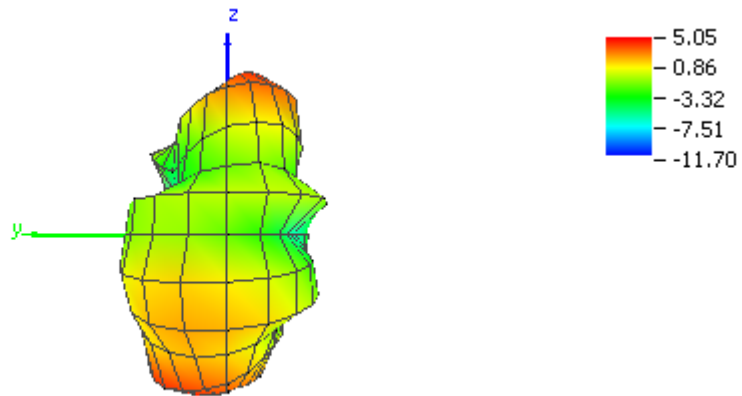


Theta = 0, Phi = 0

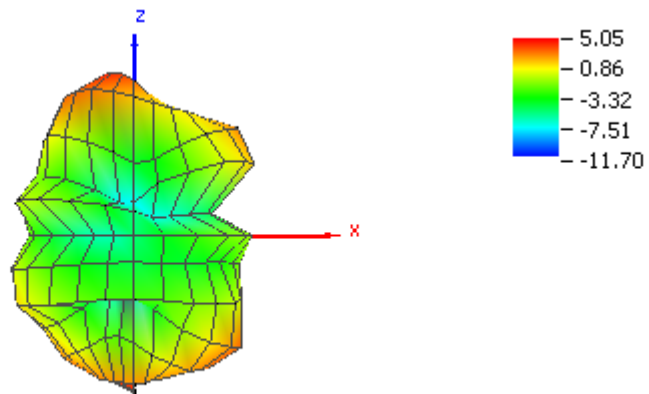


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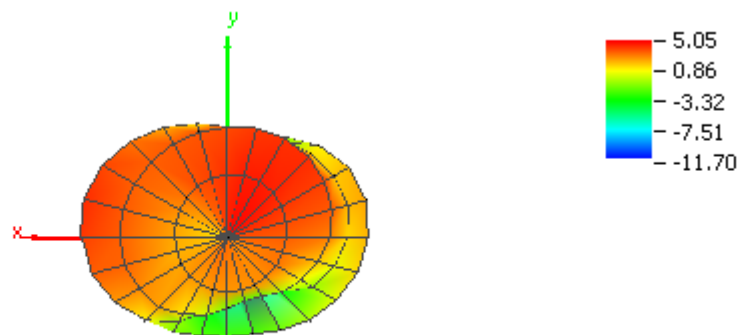
Theta = 90, Phi = 180



Theta = 90, Phi = 270



Theta = 180, Phi = 0



Application Note DN616

2 DUAL BAND MODE

2.1 OTA Test Results for Frequency 868.000 MHz

Total Radiated Power	-0.25 dBm
Peak EIRP	4.85 dBm
Directivity	5.09 dBi
Efficiency	-0.25 dB
Efficiency	94.48 %
Gain	4.85 dBi
NHPRP 45°	-2.87 dBm
NHPRP 45° / TRP	-2.62 dB
NHPRP 45° / TRP	54.65 %
NHPRP 30°	-4.85 dBm
NHPRP 30° / TRP	-4.61 dB
NHPRP 30° / TRP	34.61 %
NHPRP 22.5°	-6.10 dBm
NHPRP 22.5° / TRP	-5.85 dB
NHPRP 22.5° / TRP	25.98 %
UHRP	-3.94 dBm
UHRP / TRP	-3.69 dB
UHRP / TRP	42.75 %
LHRP	-2.67 dBm
LHRP / TRP	-2.42 dB
LHRP / TRP	57.25 %
Front/Back Ratio	3.28
PhiBW	300.3 deg
PhiBW Up	230.8 deg
PhiBW Down	69.5 deg
ThetaBW	59.9 deg
ThetaBW Up	20.6 deg
ThetaBW Down	39.3 deg
Boresight Phi	120 deg
Boresight Theta	180 deg
Maximum Power	4.85 dBm
Minimum Power	-11.84 dBm
Average Power	0.96 dBm
Max/Min Ratio	16.69 dB
Max/Avg Ratio	3.89 dB
Min/Avg Ratio	-12.80 dB
Best Single Value	4.15 dBm
Best Position	Phi = 90 deg; Theta = 165 deg; Pol = Hor

Application Note DN616

2.1.1 RP 868.000 tot

Azimuth (deg)	Elevation 0 deg (dB)	Elevation 15 deg (dB)	Elevation 30 deg (dB)	Elevation 45 deg (dB)	Elevation 60 deg (dB)	Elevation 75 deg (dB)	Elevation 90 deg (dB)	Elevation 105 deg (dB)
0.00	0.24	0.22	1.30	3.35	1.37	-6.12	-0.35	-1.55
15.00	0.46	0.45	1.22	3.30	0.63	-6.20	-0.13	-0.37
30.00	0.84	0.44	0.80	2.80	-0.09	-6.00	-0.11	-0.05
45.00	1.10	0.48	0.15	1.99	-1.93	-5.87	-0.42	0.07
60.00	1.54	0.13	-0.71	0.81	-3.89	-5.88	-1.17	-1.10
75.00	1.80	-0.16	-1.70	-0.78	-6.72	-5.58	-2.15	-2.57
90.00	2.16	-0.71	-2.19	-2.31	-10.11	-4.66	-2.94	-3.45
105.00	2.47	-0.60	-2.17	-4.47	-10.72	-3.30	-2.65	-2.41
120.00	2.70	-0.16	-1.32	-5.33	-7.63	-1.86	-1.58	-0.89
135.00	2.92	0.61	-0.10	-4.43	-5.15	-0.95	-0.87	0.52
150.00	3.28	1.34	0.98	-2.15	-3.51	-0.29	-0.38	1.34
165.00	3.78	2.44	2.06	-0.93	-1.96	-0.01	-0.63	1.74
180.00	3.93	3.18	2.69	0.15	-1.30	0.16	-1.33	1.39
195.00	3.96	3.91	3.04	0.65	-1.42	-0.22	-2.68	0.35
210.00	4.04	4.15	3.20	0.78	-1.88	-0.62	-4.46	-0.85
225.00	3.96	4.30	2.95	-0.24	-3.66	-1.42	-6.13	-2.42
240.00	3.77	4.12	2.78	-1.48	-5.56	-2.47	-7.24	-3.37
255.00	3.15	3.54	2.01	-3.25	-8.19	-4.48	-7.10	-4.43
270.00	2.84	2.81	1.49	-4.47	-6.85	-6.28	-5.19	-4.36
285.00	1.96	1.93	0.95	-3.53	-3.92	-7.49	-3.34	-4.28
300.00	1.57	1.21	0.78	-1.59	-1.53	-6.67	-2.02	-3.97
315.00	1.09	0.56	0.90	0.47	0.13	-5.86	-1.24	-3.50
330.00	0.74	0.22	1.20	1.79	1.15	-4.63	-0.87	-3.04
345.00	0.24	0.21	1.29	2.81	1.51	-5.19	-0.33	-2.51
360.00	0.06	0.12	1.39	3.22	1.45	-5.90	-0.43	-1.37

(continuation of the "RP_868.000_tot" table from column 9 ...)

Azimuth (deg)	Elevation 120 deg (dB)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)	Elevation 180 deg (dB)
0.00	0.31	4.08	3.62	2.08	1.14
15.00	0.33	4.05	3.39	2.36	0.80
30.00	-0.60	3.65	3.46	2.66	0.92
45.00	-2.32	2.89	3.28	2.99	1.52
60.00	-5.40	2.13	3.47	3.44	2.42
75.00	-9.57	0.88	3.53	3.87	3.28
90.00	-8.62	0.16	3.82	4.23	3.93
105.00	-3.88	0.10	4.06	4.38	4.53
120.00	-1.02	0.41	4.21	4.48	4.85
135.00	0.98	1.22	4.06	4.40	4.84
150.00	2.21	1.59	3.82	4.03	4.61
165.00	2.50	1.65	3.25	3.68	4.26
180.00	2.17	1.40	2.65	3.27	3.63
195.00	1.51	0.42	1.58	2.98	2.98
210.00	0.84	-1.28	0.44	2.66	2.81
225.00	-0.48	-4.06	-0.78	2.54	2.64
240.00	-1.42	-7.80	-2.03	2.55	2.63
255.00	-2.06	-11.84	-2.25	2.42	2.97
270.00	-2.38	-8.23	-1.31	2.55	3.13
285.00	-2.14	-3.54	-0.08	2.35	3.43
300.00	-1.66	-1.06	1.21	2.23	3.44
315.00	-1.03	1.16	2.18	2.23	3.36
330.00	-0.48	2.37	2.79	2.05	2.68
345.00	0.19	3.43	3.33	2.20	2.11
360.00	0.54	3.90	3.50	2.00	1.43

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2.1.2 RP_868.000_hor

Azimuth (deg)	Elevation 0 deg (dB)	Elevation 15 deg (dB)	Elevation 30 deg (dB)	Elevation 45 deg (dB)	Elevation 60 deg (dB)	Elevation 75 deg (dB)	Elevation 90 deg (dB)	Elevation 105 deg (dB)
0.0	-10.28	-15.73	-16.69	-8.17	-10.17	-15.77	-19.15	-11.64
15.0	-7.90	-10.68	-10.23	-5.91	-10.59	-12.32	-12.08	-7.86
30.0	-3.41	-5.39	-6.56	-4.61	-10.57	-9.58	-8.51	-5.84
45.0	-0.95	-2.95	-4.20	-3.96	-11.81	-7.70	-6.09	-4.31
60.0	0.63	-1.62	-3.38	-4.05	-14.80	-6.43	-4.56	-3.73
75.0	1.53	-0.95	-3.16	-4.40	-16.48	-5.76	-3.68	-3.46
90.0	1.86	-1.10	-3.16	-4.71	-18.68	-5.71	-3.54	-3.58
105.0	1.57	-1.78	-4.18	-5.86	-20.67	-5.93	-3.88	-3.63
120.0	0.51	-3.13	-5.16	-7.16	-19.27	-6.08	-4.46	-4.40
135.0	-1.35	-5.47	-7.98	-9.60	-23.05	-7.56	-5.10	-4.94
150.0	-3.88	-10.34	-11.52	-11.30	-20.17	-8.73	-6.13	-6.00
165.0	-8.48	-16.34	-15.63	-17.33	-18.65	-10.65	-8.07	-7.74
180.0	-13.97	-9.56	-10.45	-17.65	-17.25	-12.21	-10.35	-10.80
195.0	-8.27	-4.30	-5.60	-12.06	-17.82	-14.13	-16.45	-16.54
210.0	-3.36	-1.38	-2.59	-8.13	-16.80	-12.79	-17.74	-16.50
225.0	-1.00	0.58	-0.68	-6.03	-13.72	-10.42	-12.38	-10.65
240.0	0.92	1.88	0.69	-4.73	-11.47	-9.36	-8.98	-7.37
255.0	1.67	2.31	1.20	-4.38	-11.13	-9.35	-7.36	-6.18
270.0	2.30	2.32	1.31	-4.73	-10.11	-9.10	-6.47	-5.47
285.0	1.93	1.88	0.74	-5.99	-11.52	-9.70	-6.38	-5.72
300.0	1.29	0.95	-0.36	-8.50	-13.51	-10.83	-7.15	-6.75
315.0	-0.15	-0.87	-2.22	-13.22	-17.23	-12.33	-8.85	-8.84
330.0	-2.19	-3.52	-4.84	-20.59	-17.31	-14.45	-11.03	-12.05
345.0	-6.22	-7.92	-10.09	-13.17	-14.12	-17.41	-15.26	-15.66
360.0	-10.56	-13.65	-16.71	-8.93	-11.82	-16.87	-22.46	-13.25

(continuation of the "RP_868.000_hor" table from column 9 ...)

Azimuth (deg)	Elevation 120 deg (dB)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)	Elevation 180 deg (dB)
0.0	-11.54	-9.97	-5.01	-6.90	-19.78
15.0	-13.50	-6.69	-3.21	-3.88	-10.32
30.0	-14.35	-4.10	-0.59	-0.65	-3.72
45.0	-14.93	-2.47	1.17	1.44	-0.09
60.0	-13.93	-1.11	2.59	2.86	1.97
75.0	-14.57	-0.50	3.35	3.79	3.20
90.0	-15.64	-0.16	3.76	4.15	3.65
105.0	-15.64	-0.17	3.68	3.91	3.72
120.0	-17.37	-0.88	3.17	3.28	3.29
135.0	-15.56	-1.93	1.98	1.97	2.00
150.0	-14.57	-3.61	0.68	0.03	0.12
165.0	-14.57	-5.59	-1.60	-2.69	-3.01
180.0	-12.79	-7.56	-4.01	-5.89	-8.54
195.0	-10.46	-10.49	-6.12	-6.04	-14.98
210.0	-7.27	-13.24	-6.29	-3.15	-5.77
225.0	-5.52	-15.99	-4.62	-0.66	-1.22
240.0	-3.97	-14.58	-3.42	1.04	1.07
255.0	-2.86	-13.45	-2.46	1.96	2.53
270.0	-2.54	-13.19	-1.76	2.52	3.11
285.0	-2.71	-13.11	-1.56	2.15	3.23
300.0	-3.18	-14.67	-1.80	1.31	2.67
315.0	-4.05	-15.91	-2.57	-0.15	1.52
330.0	-5.53	-20.20	-4.03	-2.40	-1.01
345.0	-7.54	-14.47	-5.32	-5.30	-5.19
360.0	-10.47	-11.37	-5.15	-6.77	-13.24

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2.1.3 RP_868.000_ver

Azimuth (deg)	Elevation 0 deg (dB)	Elevation 15 deg (dB)	Elevation 30 deg (dB)	Elevation 45 deg (dB)	Elevation 60 deg (dB)	Elevation 75 deg (dB)	Elevation 90 deg (dB)	Elevation 105 deg (dB)
0.0	-0.17	0.11	1.23	3.04	1.06	-6.62	-0.41	-1.99
15.0	-0.23	0.10	0.90	2.74	0.29	-7.42	-0.42	-1.23
30.0	-1.20	-0.87	-0.08	1.93	-0.50	-8.51	-0.79	-1.38
45.0	-3.15	-2.14	-1.83	0.72	-2.40	-10.50	-1.79	-1.89
60.0	-5.72	-4.66	-4.09	-0.91	-4.25	-15.14	-3.84	-4.51
75.0	-10.50	-7.94	-7.15	-3.26	-7.20	-19.48	-7.41	-9.92
90.0	-9.66	-11.34	-9.21	-6.04	-10.76	-11.36	-11.86	-18.65
105.0	-4.78	-6.84	-6.48	-10.10	-11.18	-6.72	-8.72	-8.52
120.0	-1.32	-3.20	-3.64	-9.95	-7.94	-3.92	-4.73	-3.46
135.0	0.88	-0.62	-0.87	-6.00	-5.22	-2.02	-2.93	-0.94
150.0	2.35	1.03	0.73	-2.72	-3.61	-0.97	-1.72	0.45
165.0	3.51	2.39	1.98	-1.03	-2.05	-0.40	-1.49	1.22
180.0	3.86	2.94	2.47	0.08	-1.42	-0.10	-1.91	1.12
195.0	3.69	3.20	2.40	0.41	-1.52	-0.40	-2.87	0.26
210.0	3.17	2.72	1.87	0.18	-2.03	-0.89	-4.67	-0.97
225.0	2.29	1.90	0.49	-1.57	-4.11	-2.00	-7.31	-3.13
240.0	0.60	0.18	-1.40	-4.26	-6.85	-3.46	-12.07	-5.57
255.0	-2.26	-2.53	-5.66	-9.64	-11.26	-6.19	-19.49	-9.22
270.0	-6.47	-6.91	-12.31	-16.86	-9.62	-9.49	-11.10	-10.81
285.0	-18.78	-17.02	-12.18	-7.15	-4.75	-11.48	-6.32	-9.77
300.0	-10.54	-11.20	-5.59	-2.58	-1.81	-8.78	-3.61	-7.22
315.0	-4.97	-4.96	-2.01	0.28	0.05	-6.97	-2.06	-5.00
330.0	-2.36	-2.16	-0.05	1.77	1.09	-5.10	-1.32	-3.62
345.0	-0.87	-0.52	0.96	2.70	1.39	-5.45	-0.47	-2.73
360.0	-0.34	-0.06	1.33	2.95	1.24	-6.26	-0.46	-1.66

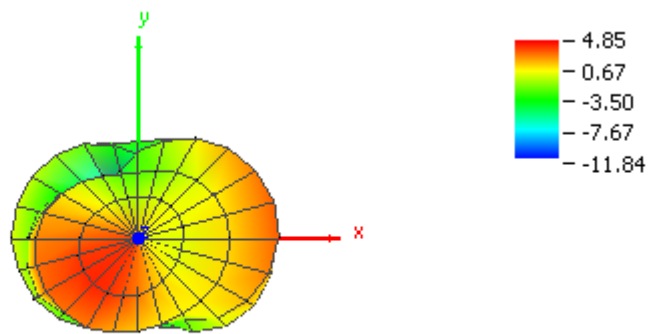
(continuation of the "RP_868.000_ver" table from column 9 ...)

Azimuth (deg)	Elevation 120 deg (dB)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)	Elevation 180 deg (dB)
0.0	0.02	3.91	2.98	1.49	1.11
15.0	0.14	3.66	2.32	1.19	0.45
30.0	-0.79	2.85	1.28	-0.07	-0.90
45.0	-2.57	1.39	-0.88	-2.24	-3.58
60.0	-6.05	-0.66	-3.89	-5.57	-7.63
75.0	-11.22	-4.79	-10.54	-13.36	-14.06
90.0	-9.59	-11.21	-15.17	-12.93	-8.07
105.0	-4.18	-12.03	-6.72	-5.51	-3.14
120.0	-1.12	-5.49	-2.53	-1.71	-0.37
135.0	0.88	-1.66	-0.13	0.73	1.65
150.0	2.12	0.02	0.93	1.83	2.71
165.0	2.42	0.74	1.53	2.55	3.36
180.0	2.03	0.81	1.60	2.71	3.36
195.0	1.22	0.06	0.77	2.39	2.91
210.0	0.11	-1.56	-0.59	1.34	2.16
225.0	-2.12	-4.35	-3.09	-0.28	0.34
240.0	-4.96	-8.83	-7.63	-2.79	-2.56
255.0	-9.78	-16.93	-15.61	-7.59	-7.21
270.0	-16.75	-9.90	-11.43	-18.88	-19.30
285.0	-11.19	-4.05	-5.47	-11.04	-10.24
300.0	-6.95	-1.26	-1.81	-4.97	-4.42
315.0	-4.03	1.08	0.41	-1.52	-1.24
330.0	-2.11	2.35	1.78	0.12	0.25
345.0	-0.61	3.36	2.69	1.35	1.22
360.0	0.18	3.77	2.86	1.39	1.28

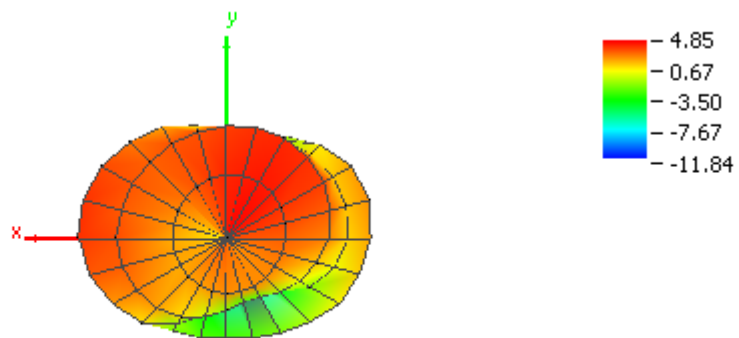
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2.1.4 Radiation Patterns

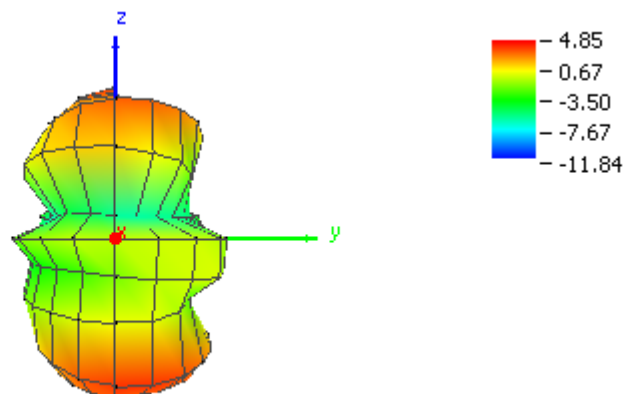
Theta = 0, Phi = 0



Theta = 180, Phi = 0

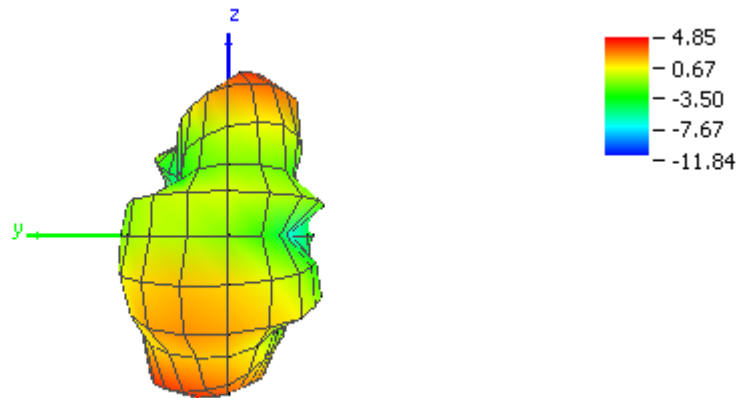


Theta = 90, Phi = 0

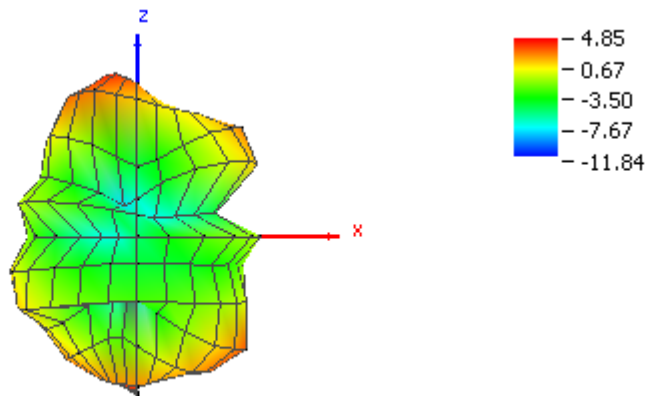


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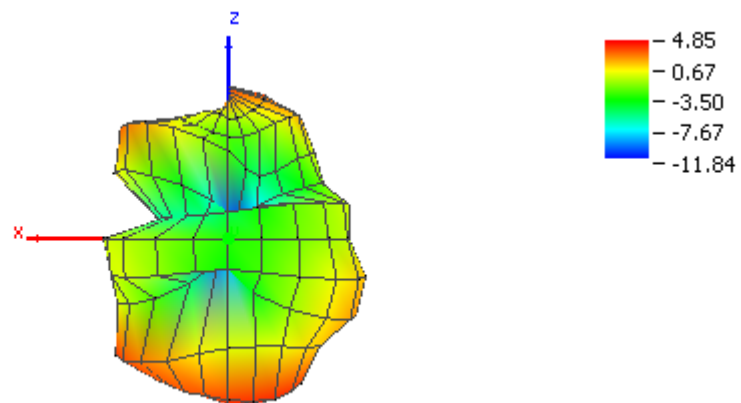
Theta = 90, Phi = 180



Theta = 90, Phi = 270



Theta = 90, Phi = 90



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2.2 OTA Test Results for Frequency 2440.000 MHz

Total Radiated Power	-0.21 dBm
Peak EIRP	3.35 dBm
Directivity	3.56 dBi
Efficiency	-0.21 dB
Efficiency	95.35 %
Gain	3.35 dBi
NHPRP 45°	-1.92 dBm
NHPRP 45° / TRP	-1.71 dB
NHPRP 45° / TRP	67.38 %
NHPRP 30°	-3.72 dBm
NHPRP 30° / TRP	-3.51 dB
NHPRP 30° / TRP	44.54 %
NHPRP 22.5°	-4.98 dBm
NHPRP 22.5° / TRP	-4.77 dB
NHPRP 22.5° / TRP	33.35 %
UHRP	-3.25 dBm
UHRP / TRP	-3.04 dB
UHRP / TRP	49.62 %
LHRP	-3.18 dBm
LHRP / TRP	-2.98 dB
LHRP / TRP	50.38 %
Front/Back Ratio	1.39
PhiBW	91.9 deg
PhiBW Up	39.7 deg
PhiBW Down	52.2 deg
ThetaBW	119.4 deg
ThetaBW Up	102.8 deg
ThetaBW Down	16.6 deg
Boresight Phi	90 deg
Boresight Theta	45 deg
Maximum Power	3.35 dBm
Minimum Power	-7.53 dBm
Average Power	-0.03 dBm
Max/Min Ratio	10.88 dB
Max/Avg Ratio	3.38 dB
Min/Avg Ratio	-7.50 dB
Best Single Value	2.62 dBm
Best Position	Phi = 75 deg; Theta = 60 deg; Pol = Ver

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2.2.1 RP 2440.000 tot

Azimuth (deg)	Elevation 0 deg (dB)	Elevation 15 deg (dB)	Elevation 30 deg (dB)	Elevation 45 deg (dB)	Elevation 60 deg (dB)	Elevation 75 deg (dB)	Elevation 90 deg (dB)	Elevation 105 deg (dB)
0.00	-1.88	-2.22	-2.25	0.08	0.51	-0.42	0.63	-0.08
15.00	-2.51	-2.68	-1.58	-0.25	1.29	-0.38	1.88	0.43
30.00	-2.29	-3.36	-2.70	0.19	0.07	0.09	1.22	-0.20
45.00	-2.06	-2.67	-1.29	0.50	-0.30	-0.43	-0.01	-0.76
60.00	-2.05	-2.29	-0.42	1.68	0.71	0.46	-0.91	0.09
75.00	-2.72	-1.85	0.52	2.71	2.85	1.71	0.69	1.36
90.00	-2.02	-2.45	0.68	3.35	1.80	2.75	1.70	1.69
105.00	-2.02	-3.29	0.64	2.34	0.94	2.95	0.36	0.78
120.00	-2.46	-3.14	-0.45	1.91	-1.37	0.31	-1.96	-1.80
135.00	-2.27	-4.83	-1.99	-0.49	-3.69	-3.88	-7.53	-5.71
150.00	-1.58	-4.33	-2.66	-1.46	-2.94	-5.57	-3.08	-4.71
165.00	-1.11	-2.22	-2.63	-0.85	-3.16	-2.47	-0.85	-3.52
180.00	-1.32	-1.86	-1.06	-0.06	-3.13	-3.99	-1.92	-2.95
195.00	-1.28	-1.05	0.48	0.29	-2.69	-7.42	-5.44	-3.01
210.00	-0.95	-0.76	0.95	0.67	-0.60	-5.91	-3.63	-4.66
225.00	-0.65	-0.09	2.21	0.18	0.51	-2.50	-2.21	-2.66
240.00	-0.42	0.62	1.62	0.25	0.63	-1.00	-1.51	-0.97
255.00	-0.02	0.64	2.06	-0.08	-0.43	-1.02	-1.55	-0.49
270.00	0.25	0.95	1.27	0.57	-0.76	-0.33	-0.66	-0.56
285.00	0.58	1.38	1.72	0.57	-1.43	-1.18	-0.69	-0.97
300.00	1.38	1.48	1.26	0.79	-1.87	-0.36	-0.36	-1.58
315.00	-0.44	0.87	0.98	0.89	-0.50	-0.85	-1.31	-1.43
330.00	-0.62	0.08	0.39	0.59	-0.62	-1.02	-2.50	-0.18
345.00	-0.82	-0.77	-0.58	0.60	0.02	-0.44	-2.15	-1.31
360.00	-1.42	-2.22	-0.96	0.01	0.01	-0.94	-0.96	-0.36

(continuation of the "RP_2440.000_tot" table from column 9 ...)

Azimuth (deg)	Elevation 120 deg (dB)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)	Elevation 180 deg (dB)
0.00	-0.40	-2.95	-0.50	-2.13	1.86
15.00	-0.58	-2.88	0.41	-1.28	1.30
30.00	0.29	-0.15	1.22	-0.84	1.79
45.00	0.98	1.93	1.91	-0.32	2.02
60.00	1.40	2.35	1.74	-0.54	2.61
75.00	1.29	2.34	1.29	-0.26	2.62
90.00	0.38	2.17	0.04	-0.64	2.55
105.00	-0.94	0.33	-1.06	-0.58	2.14
120.00	-2.82	-2.14	-1.96	-1.66	1.68
135.00	-1.34	-3.79	-1.64	-2.73	0.84
150.00	-0.44	-1.57	-1.46	-3.29	1.22
165.00	-0.77	0.28	-0.61	-1.73	1.47
180.00	-1.18	0.84	-0.52	0.73	1.41
195.00	-0.54	0.29	-0.35	1.24	2.10
210.00	0.44	1.32	0.60	1.05	2.04
225.00	0.25	1.93	0.79	0.81	2.03
240.00	-0.10	2.83	1.30	0.49	1.91
255.00	-0.34	1.80	1.90	0.33	2.06
270.00	-0.30	1.96	1.85	0.13	1.79
285.00	0.59	1.34	2.29	0.11	2.26
300.00	0.14	0.88	2.33	0.37	1.97
315.00	0.58	0.45	1.62	-0.12	2.06
330.00	-0.11	-0.70	0.60	-1.43	2.12
345.00	-0.49	-1.62	0.87	-1.39	2.39
360.00	-1.31	-3.40	-1.15	-2.19	1.62

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2.2.2 RP 2440.000 hor

Azimuth (deg)	Elevation 0 deg (dB)	Elevation 15 deg (dB)	Elevation 30 deg (dB)	Elevation 45 deg (dB)	Elevation 60 deg (dB)	Elevation 75 deg (dB)	Elevation 90 deg (dB)	Elevation 105 deg (dB)
0.0	-4.17	-3.69	-3.80	-3.36	-5.54	-9.21	-8.76	-9.01
15.0	-3.69	-4.81	-4.78	-4.63	-6.62	-9.75	-7.62	-8.22
30.0	-2.88	-5.11	-7.88	-7.30	-9.64	-11.51	-7.36	-7.79
45.0	-2.70	-4.70	-8.44	-9.25	-12.43	-13.48	-9.07	-7.73
60.0	-3.36	-4.39	-8.88	-8.06	-13.49	-12.91	-11.13	-6.56
75.0	-4.82	-3.73	-6.46	-4.94	-9.94	-11.75	-11.60	-4.83
90.0	-4.86	-3.61	-3.81	-2.87	-6.18	-11.23	-8.45	-5.10
105.0	-8.27	-4.19	-2.09	-0.86	-4.40	-8.02	-8.83	-4.61
120.0	-10.46	-5.10	-1.30	0.23	-3.67	-6.41	-9.51	-7.06
135.0	-11.25	-9.84	-2.72	-1.48	-4.79	-7.38	-13.06	-7.61
150.0	-8.26	-14.76	-6.58	-5.98	-9.77	-11.26	-11.40	-12.76
165.0	-4.66	-7.49	-13.28	-14.03	-15.55	-15.55	-10.93	-8.15
180.0	-3.32	-3.81	-4.95	-5.11	-9.67	-13.42	-11.71	-6.13
195.0	-1.94	-2.34	-1.56	-2.98	-5.54	-15.33	-11.83	-5.14
210.0	-1.53	-2.28	-1.10	-2.39	-3.58	-13.91	-11.98	-6.86
225.0	-2.13	-2.48	-1.36	-4.02	-3.24	-11.15	-11.56	-10.22
240.0	-3.28	-5.20	-4.73	-8.41	-6.60	-10.95	-11.34	-10.43
255.0	-5.01	-10.45	-8.02	-14.51	-10.19	-12.31	-9.99	-12.42
270.0	-7.05	-13.01	-14.44	-9.43	-14.25	-13.45	-11.15	-14.82
285.0	-10.45	-9.10	-9.93	-7.21	-10.36	-14.97	-10.90	-14.92
300.0	-13.32	-4.63	-5.98	-5.54	-12.27	-11.34	-11.50	-11.17
315.0	-10.24	-2.97	-3.76	-4.56	-8.85	-11.24	-12.09	-11.45
330.0	-7.54	-2.74	-2.37	-3.63	-6.68	-8.56	-13.79	-12.16
345.0	-5.57	-2.94	-2.42	-2.37	-5.49	-8.09	-11.02	-13.82
360.0	-3.63	-3.86	-3.37	-2.57	-5.32	-8.14	-10.53	-9.07

(continuation of the "RP_2440.000_hor" table from column 9 ...)

Azimuth (deg)	Elevation 120 deg (dB)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)	Elevation 180 deg (dB)
0.0	-10.75	-10.47	-7.27	-6.67	-1.99
15.0	-13.27	-15.55	-7.70	-5.09	-1.23
30.0	-12.15	-12.38	-4.19	-4.64	0.86
45.0	-9.18	-10.20	-2.50	-5.77	1.45
60.0	-6.95	-12.14	-1.25	-6.46	1.98
75.0	-6.59	-9.27	-1.07	-6.40	1.10
90.0	-5.25	-6.21	-1.79	-5.54	-0.09
105.0	-4.12	-4.37	-2.62	-4.51	-2.67
120.0	-3.58	-3.88	-4.89	-5.58	-6.95
135.0	-3.72	-7.47	-7.87	-7.90	-13.03
150.0	-7.64	-12.97	-9.21	-10.47	-7.17
165.0	-14.73	-7.31	-5.56	-7.19	-2.90
180.0	-7.57	-3.78	-1.95	-1.98	-0.98
195.0	-1.90	-1.36	-0.94	-0.40	0.23
210.0	-0.68	0.24	-0.38	-0.04	0.88
225.0	-2.03	-0.70	-1.81	0.35	1.13
240.0	-5.20	-1.95	-4.95	-0.86	0.84
255.0	-8.34	-5.00	-10.20	-2.16	0.50
270.0	-12.04	-7.68	-13.30	-5.28	-1.19
285.0	-9.63	-12.19	-7.90	-7.95	-1.92
300.0	-10.28	-14.62	-4.93	-13.26	-4.44
315.0	-9.18	-9.38	-3.93	-14.47	-5.67
330.0	-11.76	-7.82	-3.65	-11.03	-5.24
345.0	-9.15	-7.62	-4.58	-8.56	-5.05
360.0	-10.75	-10.38	-6.71	-7.19	-3.45

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2.2.3 RP 2440.000_ver

Azimuth (deg)	Elevation 0 deg (dB)	Elevation 15 deg (dB)	Elevation 30 deg (dB)	Elevation 45 deg (dB)	Elevation 60 deg (dB)	Elevation 75 deg (dB)	Elevation 90 deg (dB)	Elevation 105 deg (dB)
0.0	-5.75	-7.66	-7.49	-2.54	-0.73	-1.04	0.10	-0.67
15.0	-8.75	-6.80	-4.40	-2.22	0.53	-0.91	1.36	-0.20
30.0	-11.28	-8.16	-4.27	-0.66	-0.42	-0.23	0.57	-1.04
45.0	-10.70	-6.94	-2.22	0.01	-0.57	-0.65	-0.59	-1.73
60.0	-7.88	-6.47	-1.09	1.19	0.54	0.26	-1.34	-0.97
75.0	-6.89	-6.41	-0.45	1.89	2.62	1.51	0.42	0.17
90.0	-5.21	-8.72	-1.24	2.17	1.05	2.57	1.25	0.66
105.0	-3.20	-10.55	-2.68	-0.49	-0.56	2.59	-0.20	-0.70
120.0	-3.21	-7.55	-7.94	-3.03	-5.24	-0.72	-2.80	-3.34
135.0	-2.85	-6.48	-10.07	-7.41	-10.19	-6.46	-8.96	-10.22
150.0	-2.64	-4.74	-4.92	-3.34	-3.94	-6.94	-3.77	-5.45
165.0	-3.65	-3.75	-3.02	-1.07	-3.41	-2.69	-1.30	-5.35
180.0	-5.67	-6.29	-3.35	-1.69	-4.22	-4.52	-2.40	-5.79
195.0	-9.78	-6.94	-3.79	-2.48	-5.88	-8.19	-6.58	-7.12
210.0	-9.97	-6.08	-3.29	-2.29	-3.63	-6.66	-4.32	-8.66
225.0	-6.06	-3.81	-0.30	-1.90	-1.87	-3.13	-2.75	-3.50
240.0	-3.58	-0.70	0.48	-0.39	-0.28	-1.47	-1.99	-1.49
255.0	-1.68	0.29	1.61	-0.24	-0.91	-1.36	-2.22	-0.78
270.0	-0.65	0.77	1.15	0.11	-0.96	-0.55	-1.07	-0.73
285.0	0.22	0.98	1.41	-0.22	-2.02	-1.36	-1.13	-1.15
300.0	1.23	0.26	0.35	-0.36	-2.28	-0.72	-0.71	-2.08
315.0	-0.93	-1.45	-0.80	-0.57	-1.19	-1.27	-1.69	-1.88
330.0	-1.61	-3.14	-2.89	-1.47	-1.86	-1.86	-2.83	-0.46
345.0	-2.59	-4.82	-5.20	-2.45	-1.41	-1.26	-2.76	-1.57
360.0	-5.41	-7.25	-4.68	-3.47	-1.49	-1.86	-1.47	-0.99

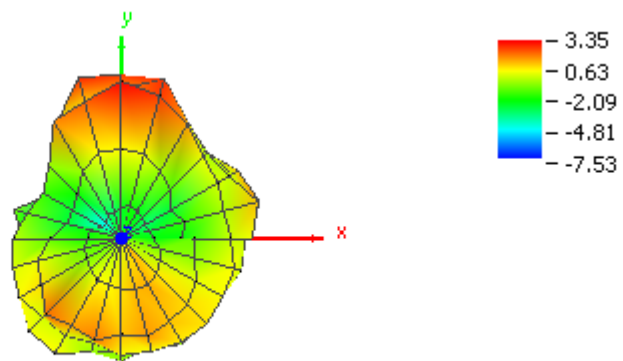
(continuation of the "RP_2440.000_ver" table from column 9 ...)

Azimuth (deg)	Elevation 120 deg (dB)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)	Elevation 180 deg (dB)
0.0	-0.82	-3.80	-1.53	-4.01	-0.45
15.0	-0.82	-3.13	-0.32	-3.62	-2.26
30.0	0.03	-0.42	-0.25	-3.19	-5.40
45.0	0.54	1.66	-0.05	-1.77	-7.05
60.0	0.71	2.19	-1.29	-1.83	-6.08
75.0	0.52	2.03	-2.48	-1.47	-2.66
90.0	-1.01	1.49	-4.61	-2.34	-0.86
105.0	-3.79	-1.46	-6.28	-2.82	0.40
120.0	-10.77	-6.96	-5.06	-3.91	1.04
135.0	-5.08	-6.23	-2.83	-4.30	0.66
150.0	-1.36	-1.90	-2.26	-4.21	0.54
165.0	-0.95	-0.55	-2.28	-3.19	-0.51
180.0	-2.32	-0.99	-6.03	-2.60	-2.31
195.0	-6.26	-4.74	-9.35	-3.77	-2.46
210.0	-6.00	-5.28	-6.33	-5.50	-4.29
225.0	-3.63	-1.50	-2.69	-9.16	-5.25
240.0	-1.70	1.07	0.12	-5.26	-4.73
255.0	-1.09	0.79	1.62	-3.28	-3.16
270.0	-0.61	1.46	1.72	-1.35	-1.25
285.0	0.15	1.14	1.86	-0.63	0.17
300.0	-0.28	0.76	1.43	0.18	0.85
315.0	0.09	-0.03	0.21	-0.28	1.26
330.0	-0.42	-1.64	-1.45	-1.94	1.23
345.0	-1.13	-2.88	-0.59	-2.32	1.52
360.0	-1.84	-4.37	-2.57	-3.84	0.00

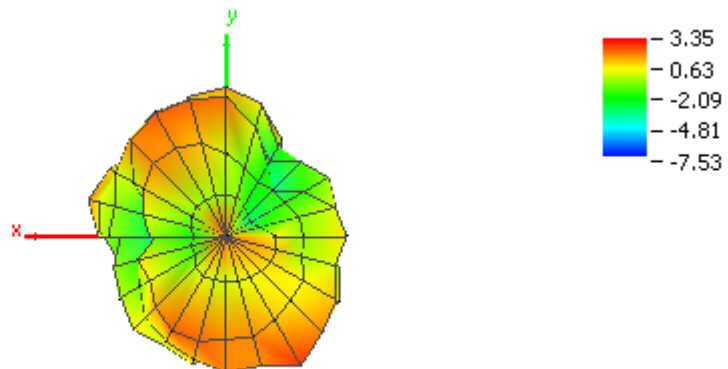
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2.2.4 Radiation Patterns

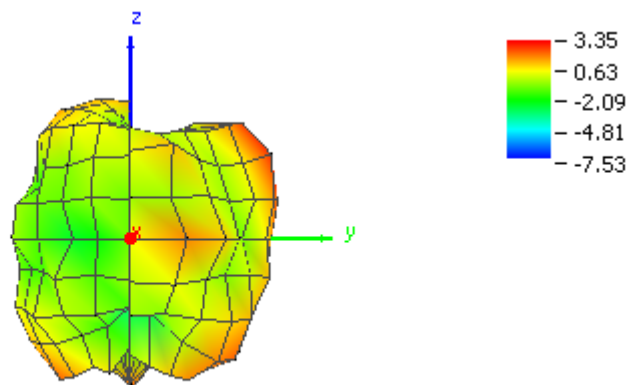
Theta = 0, Phi = 0



Theta = 180, Phi = 0

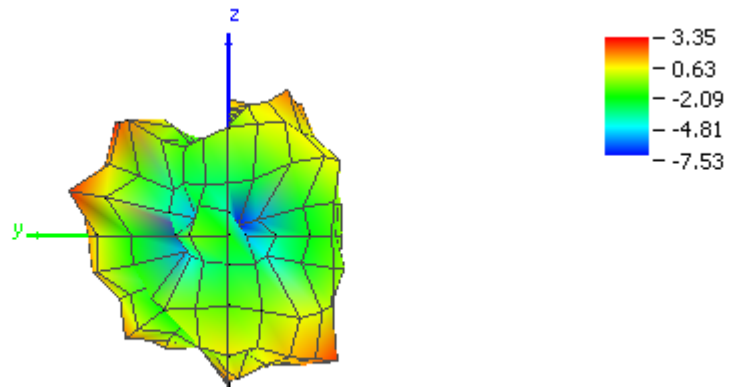


Theta = 90, Phi = 0

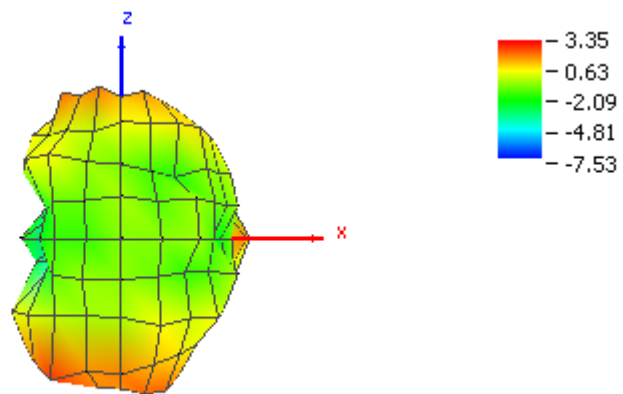


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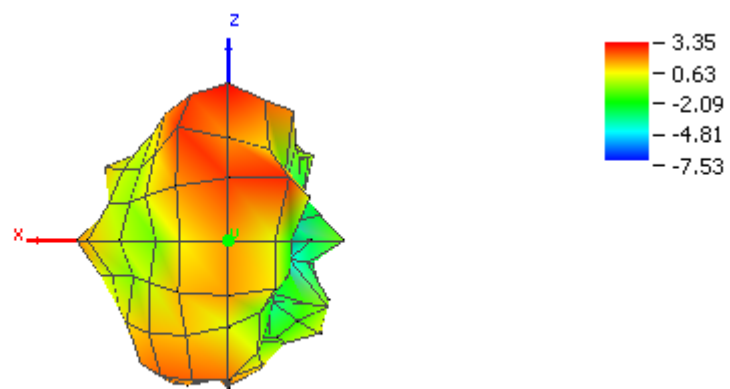
Theta = 90, Phi = 180



Theta = 90, Phi = 270



Theta = 90, Phi = 90



3 General Information

3.1 Document History

Revision	Date	Description/Changes
SWRA345	2010-08-12	Initial release.
SWRA345A	2010-10-20	Updated with DN024 Single Mode & Dual Band Mode Measurements

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