

CTIA Report (RP_2442.000_tot)

Test Information

Test Method:	Antenna Measurement
Test Condition:	FS: Free Space
Frequency:	2442.000 MHz
Test Time:	Start: 12/20/2022 6:23:17 PM; Stop: 12/20/2022 6:28:40 PM
Cal Data Phi:	47.97 dB (ZNB PORT2 to HOR MA1)
Cal Data Theta:	48.31 dB (ZNB PORT3 to VER MA1)

OTA Evaluation Results

Total Radiated Power	-30.28 dBm
Directivity	5.46 dBi
Total Efficiency	-30.28 dB
Total Efficiency	0.09 %
Peak Realized Gain	-24.82 dBi
NHPRP 45°	-33.31 dBm
NHPRP 45° / TRP	-3.03 dB
NHPRP 45° / TRP	49.79 %
NHPRP 30°	-35.30 dBm
NHPRP 30° / TRP	-5.02 dB
NHPRP 30° / TRP	31.51 %
NHPRP 22.5°	-36.60 dBm
NHPRP 22.5° / TRP	-6.32 dB
NHPRP 22.5° / TRP	23.36 %
UHRP	-34.89 dBm
UHRP / TRP	-4.60 dB
UHRP / TRP	34.66 %
LHRP	-32.49 dBm
LHRP / TRP	-2.21 dB
LHRP / TRP	60.13 %
PGRP (0-120°)	-32.86 dBm
PGRP / TRP	-2.58 dB
PGRP / TRP	55.21 %
Front/Back Ratio	3.14
PhiBW	149.5 deg
PhiBW Up	88.9 deg
PhiBW Down	60.6 deg
ThetaBW	42.4 deg
ThetaBW Up	26.3 deg
ThetaBW Down	16.1 deg
Boresight Phi	210 deg
Boresight Theta	15 deg
Maximum Power	-24.82 dBm
Minimum Power	-46.35 dBm
Average Power	-29.55 dBm
Max/Min Ratio	21.53 dB
Max/Avg Ratio	4.73 dB
Min/Avg Ratio	-16.80 dB
Worst Single Value	-60.57 dBm
Worst Position	Azi = 45 deg; Elev = 60 deg; Pol = Phi
Best Single Value	-25.76 dBm
Best Position	Azi = 225 deg; Elev = 150 deg; Pol = Phi

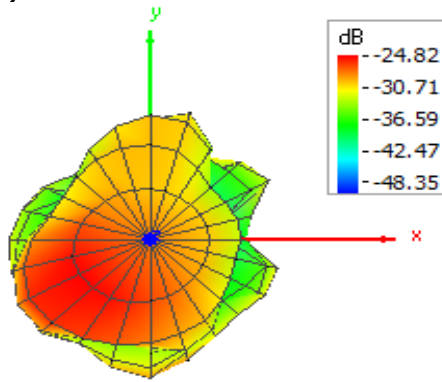
RP 2442.000 tot

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)	Elevation 120 deg (dB)
0.00	-27.68	-29.42	-31.89	-39.92	-46.35	-39.68	-37.17	-36.32	-37.73
15.00	-27.68	-29.53	-32.04	-36.58	-43.39	-40.20	-40.06	-34.79	-36.52
30.00	-27.68	-29.69	-32.52	-37.05	-39.02	-35.02	-31.79	-29.94	-30.34
45.00	-27.68	-29.84	-32.75	-37.29	-40.83	-35.51	-33.54	-31.02	-29.14
60.00	-27.68	-29.99	-31.33	-31.99	-33.52	-35.57	-38.24	-37.93	-30.55
75.00	-27.68	-29.59	-29.70	-29.60	-30.35	-32.94	-35.39	-38.46	-30.28
90.00	-27.68	-29.44	-29.21	-29.23	-31.70	-34.04	-36.00	-35.48	-29.11
105.00	-27.68	-29.25	-29.18	-30.23	-34.43	-36.01	-35.54	-34.90	-29.24
120.00	-27.68	-28.76	-29.57	-31.93	-36.38	-35.88	-36.34	-34.45	-31.53
135.00	-27.68	-28.49	-30.21	-33.91	-39.45	-41.98	-40.71	-34.39	-31.61
150.00	-27.68	-27.80	-30.61	-34.50	-38.34	-37.28	-34.11	-32.00	-31.36
165.00	-27.68	-26.79	-30.11	-33.81	-35.81	-34.17	-32.54	-30.52	-30.75
180.00	-27.68	-26.01	-28.29	-31.80	-33.64	-33.17	-31.49	-29.53	-30.32
195.00	-27.68	-25.07	-26.73	-29.79	-31.91	-32.18	-31.11	-29.73	-30.93
210.00	-27.68	-24.82	-25.72	-28.50	-31.18	-31.53	-30.95	-29.65	-28.94
225.00	-27.68	-24.94	-25.82	-28.54	-30.90	-30.91	-29.65	-28.30	-27.90
240.00	-27.68	-25.12	-26.30	-30.42	-36.07	-32.14	-31.41	-29.18	-29.25
255.00	-27.68	-25.71	-27.01	-32.87	-35.49	-31.54	-29.71	-27.80	-29.36
270.00	-27.68	-26.49	-27.77	-31.25	-32.46	-31.02	-28.62	-27.49	-28.28
285.00	-27.68	-27.08	-28.63	-30.41	-32.98	-33.06	-31.85	-28.38	-28.09
300.00	-27.68	-27.88	-29.26	-31.64	-35.32	-35.66	-36.50	-30.70	-29.48
315.00	-27.68	-28.59	-30.54	-34.35	-37.54	-36.64	-37.15	-31.72	-29.61
330.00	-27.68	-29.00	-31.70	-36.49	-37.09	-35.72	-33.39	-30.57	-30.01
345.00	-27.68	-29.32	-32.30	-38.91	-38.81	-34.59	-34.03	-30.68	-31.11
360.00	-27.68	-29.42	-31.89	-39.92	-46.35	-39.68	-37.17	-36.32	-37.73

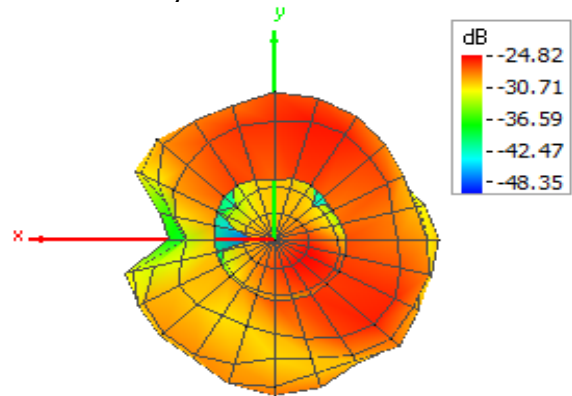
(continuation of the "RP_2442.000_tot" table from column 10 ...)

Azimuth (deg)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)
0.00	-35.99	-32.51	-29.44
15.00	-33.80	-30.32	-28.73
30.00	-30.47	-28.58	-27.96
45.00	-28.08	-27.70	-26.89
60.00	-27.73	-26.63	-26.26
75.00	-27.54	-25.96	-26.62
90.00	-26.49	-25.86	-27.12
105.00	-26.64	-25.29	-26.31
120.00	-27.16	-25.39	-26.22
135.00	-28.03	-26.22	-27.11
150.00	-28.88	-26.69	-27.60
165.00	-29.17	-27.74	-27.20
180.00	-28.48	-27.64	-26.57
195.00	-27.72	-26.72	-26.40
210.00	-27.76	-25.71	-26.03
225.00	-27.24	-25.51	-26.15
240.00	-28.04	-26.43	-25.91
255.00	-29.37	-27.93	-26.47
270.00	-29.84	-29.17	-26.56
285.00	-28.60	-29.89	-27.54
300.00	-28.04	-30.13	-28.39
315.00	-28.18	-29.50	-28.70
330.00	-28.76	-29.36	-28.97
345.00	-31.65	-31.16	-29.29
360.00	-35.99	-32.51	-29.44

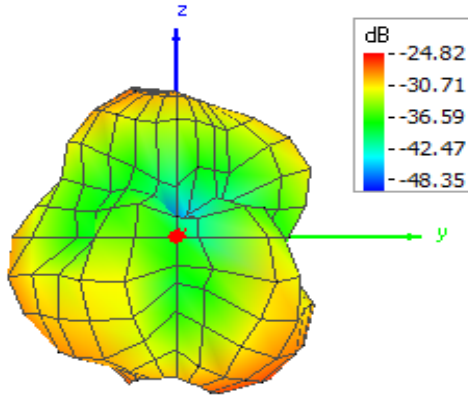
Theta = 0, Phi = 0



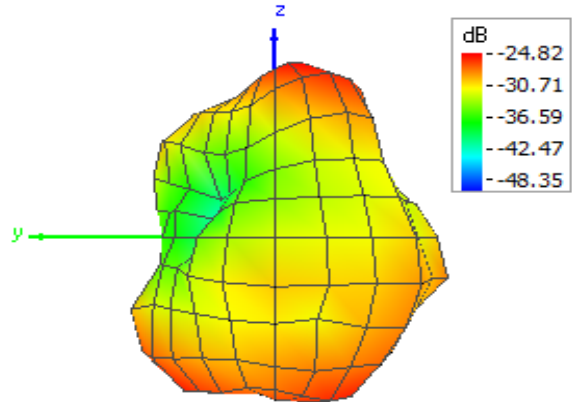
Theta = 180, Phi = 0



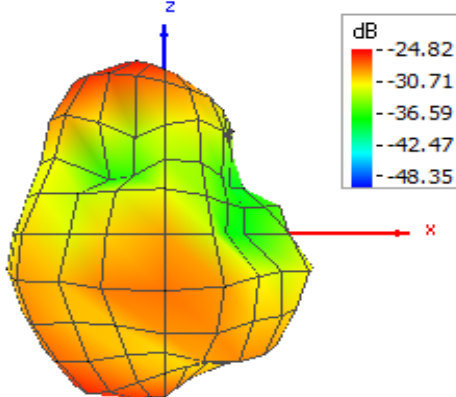
Theta = 90, Phi = 0



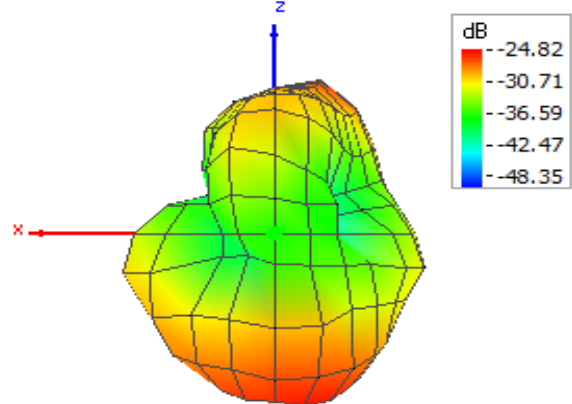
Theta = 90, Phi = 180



Theta = 90, Phi = 270



Theta = 90, Phi = 90



CTIA Report (RP_2472.000_tot)

Test Information

Test Method:	Antenna Measurement
Test Condition:	FS: Free Space
Frequency:	2472.000 MHz
Test Time:	Start: 12/20/2022 6:23:17 PM; Stop: 12/20/2022 6:28:40 PM
Cal Data Phi:	48.56 dB (ZNB PORT2 to HOR MA1)
Cal Data Theta:	48.04 dB (ZNB PORT3 to VER MA1)

OTA Evaluation Results

Total Radiated Power	-30.34 dBm
Directivity	5.60 dBi
Total Efficiency	-30.34 dB
Total Efficiency	0.09 %
Peak Realized Gain	-24.74 dBi
NHPRP 45°	-33.26 dBm
NHPRP 45° / TRP	-2.92 dB
NHPRP 45° / TRP	51.08 %
NHPRP 30°	-35.24 dBm
NHPRP 30° / TRP	-4.90 dB
NHPRP 30° / TRP	32.34 %
NHPRP 22.5°	-36.56 dBm
NHPRP 22.5° / TRP	-6.22 dB
NHPRP 22.5° / TRP	23.87 %
UHRP	-35.05 dBm
UHRP / TRP	-4.71 dB
UHRP / TRP	33.79 %
LHRP	-32.54 dBm
LHRP / TRP	-2.20 dB
LHRP / TRP	60.19 %
PGRP (0-120°)	-32.99 dBm
PGRP / TRP	-2.65 dB
PGRP / TRP	54.34 %
Front/Back Ratio	2.46
PhiBW	160.8 deg
PhiBW Up	89.5 deg
PhiBW Down	71.3 deg
ThetaBW	41.7 deg
ThetaBW Up	21.8 deg
ThetaBW Down	19.9 deg
Boresight Phi	225 deg
Boresight Theta	15 deg
Maximum Power	-24.74 dBm
Minimum Power	-42.60 dBm
Average Power	-29.51 dBm
Max/Min Ratio	17.86 dB
Max/Avg Ratio	4.78 dB
Min/Avg Ratio	-13.09 dB
Worst Single Value	-58.10 dBm
Worst Position	Azi = 150 deg; Elev = 165 deg; Pol = Phi
Best Single Value	-25.05 dBm
Best Position	Azi = 240 deg; Elev = 165 deg; Pol = Phi

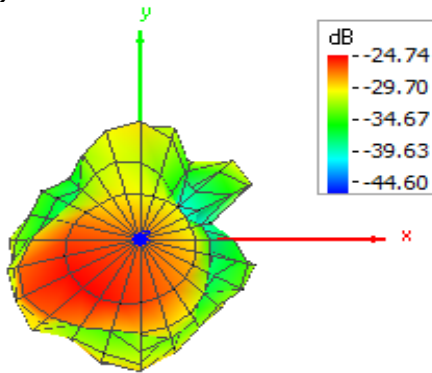
RP 2472.000 tot

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)	Elevation 120 deg (dB)
0.00	-26.73	-29.42	-33.56	-40.81	-41.00	-41.52	-35.48	-37.13	-36.25
15.00	-26.73	-30.03	-34.47	-37.88	-42.60	-38.88	-39.58	-37.07	-37.98
30.00	-26.73	-30.02	-36.37	-39.09	-37.83	-34.52	-32.00	-30.12	-31.61
45.00	-26.73	-29.83	-36.88	-41.32	-39.22	-37.15	-33.50	-29.82	-30.16
60.00	-26.73	-30.07	-34.58	-33.93	-34.59	-36.57	-40.22	-34.84	-30.71
75.00	-26.73	-30.17	-32.30	-30.67	-31.05	-33.83	-38.83	-36.37	-30.26
90.00	-26.73	-29.86	-30.82	-29.12	-31.35	-34.44	-36.99	-34.14	-28.89
105.00	-26.73	-29.51	-30.32	-29.75	-32.59	-35.02	-34.60	-35.26	-29.15
120.00	-26.73	-29.15	-31.00	-31.49	-34.40	-34.58	-33.15	-34.53	-31.07
135.00	-26.73	-28.99	-31.99	-34.42	-37.39	-36.69	-34.83	-34.51	-31.25
150.00	-26.73	-28.00	-31.96	-35.81	-37.25	-35.40	-33.39	-33.18	-31.22
165.00	-26.73	-26.92	-30.85	-34.84	-36.11	-35.33	-33.36	-32.08	-32.16
180.00	-26.73	-26.05	-28.70	-32.39	-33.34	-34.33	-32.19	-29.86	-30.51
195.00	-26.73	-25.30	-26.84	-29.94	-30.91	-31.98	-31.30	-29.84	-31.04
210.00	-26.73	-24.84	-26.03	-28.85	-30.33	-31.94	-31.66	-30.32	-29.48
225.00	-26.73	-24.74	-26.60	-29.09	-29.56	-30.27	-29.95	-28.75	-28.02
240.00	-26.73	-24.83	-27.54	-32.00	-33.04	-31.61	-31.22	-29.10	-28.76
255.00	-26.73	-25.34	-28.50	-34.29	-33.22	-31.19	-29.58	-27.17	-28.92
270.00	-26.73	-25.80	-28.53	-31.67	-31.35	-30.40	-28.79	-27.56	-27.65
285.00	-26.73	-26.44	-28.88	-30.90	-32.54	-33.59	-31.40	-28.95	-27.16
300.00	-26.73	-27.09	-29.61	-31.91	-34.93	-36.03	-35.10	-31.33	-28.36
315.00	-26.73	-27.76	-30.87	-34.87	-36.76	-36.05	-35.97	-32.44	-29.04
330.00	-26.73	-28.27	-32.33	-37.10	-36.73	-36.48	-33.04	-31.48	-29.93
345.00	-26.73	-28.91	-33.27	-39.83	-36.95	-34.91	-33.55	-31.41	-31.00
360.00	-26.73	-29.42	-33.56	-40.81	-41.00	-41.52	-35.48	-37.13	-36.25

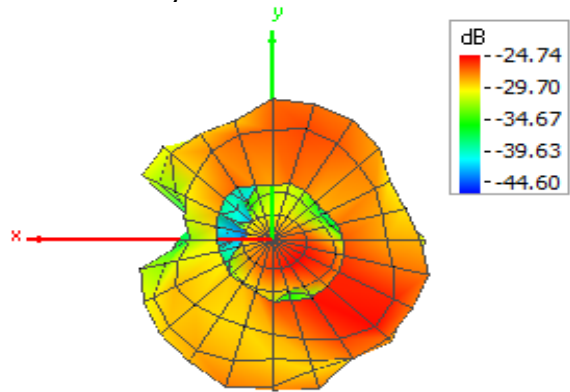
(continuation of the "RP_2472.000_tot" table from column 10 ...)

Azimuth (deg)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)
0.00	-35.77	-31.95	-29.51
15.00	-34.77	-30.83	-28.81
30.00	-31.78	-29.65	-28.22
45.00	-28.72	-28.83	-27.19
60.00	-28.73	-27.47	-26.60
75.00	-28.67	-26.74	-27.52
90.00	-26.82	-26.55	-27.95
105.00	-26.88	-26.09	-26.95
120.00	-27.11	-26.40	-27.37
135.00	-27.98	-27.21	-28.17
150.00	-29.40	-27.58	-28.11
165.00	-29.20	-28.11	-27.03
180.00	-28.29	-28.05	-26.48
195.00	-27.08	-26.95	-25.95
210.00	-27.08	-25.39	-25.40
225.00	-26.84	-24.92	-25.36
240.00	-27.03	-25.95	-25.04
255.00	-28.37	-27.31	-25.77
270.00	-28.92	-28.37	-26.11
285.00	-28.24	-29.03	-27.67
300.00	-28.00	-29.05	-28.51
315.00	-28.57	-28.68	-28.72
330.00	-29.32	-28.37	-29.50
345.00	-31.93	-30.06	-29.53
360.00	-35.77	-31.95	-29.51

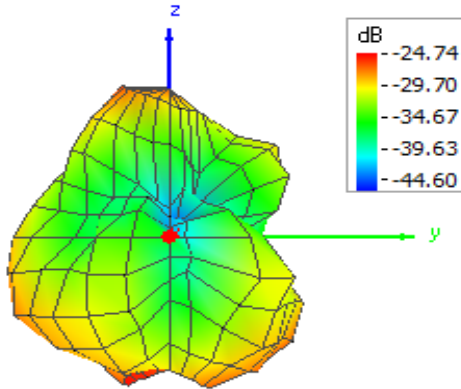
Theta = 0, Phi = 0



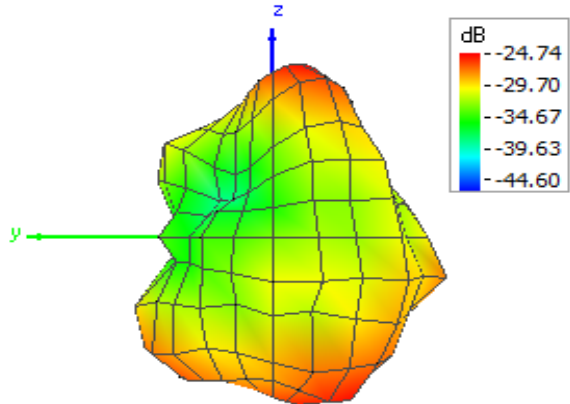
Theta = 180, Phi = 0



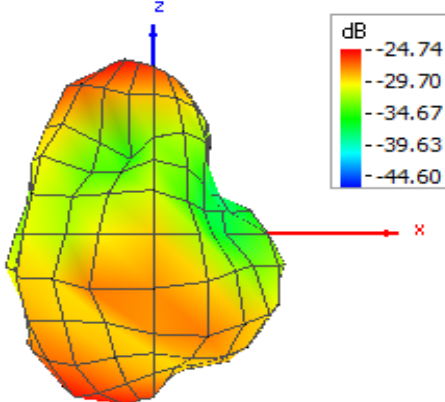
Theta = 90, Phi = 0



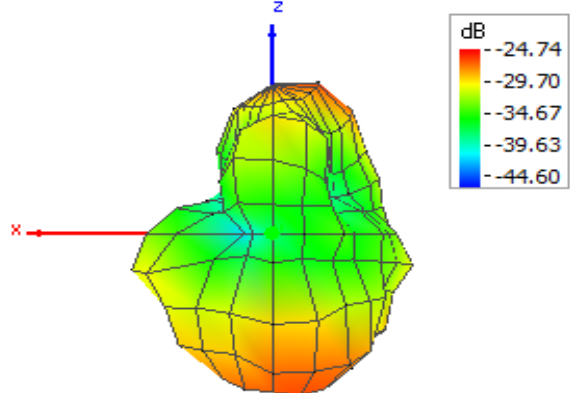
Theta = 90, Phi = 180



Theta = 90, Phi = 270



Theta = 90, Phi = 90



CTIA Report (RP_2412.000_tot)

Test Information

Test Method:	Antenna Measurement
Test Condition:	FS: Free Space
Frequency:	2412.000 MHz
Test Time:	Start: 12/20/2022 6:23:17 PM; Stop: 12/20/2022 6:28:40 PM
Cal Data Phi:	48.78 dB (ZNB PORT2 to HOR MA1)
Cal Data Theta:	48.96 dB (ZNB PORT3 to VER MA1)

OTA Evaluation Results

Total Radiated Power	-29.27 dBm
Directivity	5.45 dBi
Total Efficiency	-29.27 dB
Total Efficiency	0.12 %
Peak Realized Gain	-23.82 dBi
NHPRP 45°	-32.44 dBm
NHPRP 45° / TRP	-3.17 dB
NHPRP 45° / TRP	48.18 %
NHPRP 30°	-34.53 dBm
NHPRP 30° / TRP	-5.27 dB
NHPRP 30° / TRP	29.73 %
NHPRP 22.5°	-35.87 dBm
NHPRP 22.5° / TRP	-6.60 dB
NHPRP 22.5° / TRP	21.87 %
UHRP	-33.80 dBm
UHRP / TRP	-4.54 dB
UHRP / TRP	35.17 %
LHRP	-31.56 dBm
LHRP / TRP	-2.30 dB
LHRP / TRP	58.91 %
PGRP (0-120°)	-31.91 dBm
PGRP / TRP	-2.64 dB
PGRP / TRP	54.42 %
Front/Back Ratio	2.11
PhiBW	251.7 deg
PhiBW Up	155.8 deg
PhiBW Down	95.9 deg
ThetaBW	48.7 deg
ThetaBW Up	20.6 deg
ThetaBW Down	28.2 deg
Boresight Phi	120 deg
Boresight Theta	165 deg
Maximum Power	-23.82 dBm
Minimum Power	-44.13 dBm
Average Power	-28.46 dBm
Max/Min Ratio	20.31 dB
Max/Avg Ratio	4.64 dB
Min/Avg Ratio	-15.67 dB
Worst Single Value	-57.04 dBm
Worst Position	Azi = 150 deg; Elev = 60 deg; Pol = Theta
Best Single Value	-24.66 dBm
Best Position	Azi = 105 deg; Elev = 165 deg; Pol = Phi

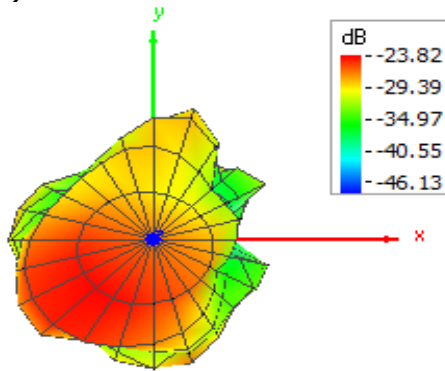
RP 2412.000 tot

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)	Elevation 120 deg (dB)
0.00	-26.26	-28.04	-31.69	-37.07	-40.90	-44.13	-39.76	-36.88	-39.19
15.00	-26.26	-28.53	-30.91	-35.61	-39.13	-39.66	-38.48	-35.20	-33.04
30.00	-26.26	-29.14	-31.58	-35.04	-36.16	-35.33	-31.50	-32.46	-28.80
45.00	-26.26	-29.27	-31.73	-35.15	-36.65	-35.62	-32.84	-33.00	-29.20
60.00	-26.26	-29.52	-30.47	-30.12	-31.37	-33.04	-37.42	-37.18	-30.23
75.00	-26.26	-29.46	-29.02	-27.93	-28.55	-31.04	-33.29	-35.08	-29.67
90.00	-26.26	-29.04	-28.12	-28.32	-30.71	-32.88	-32.98	-31.86	-30.43
105.00	-26.26	-28.57	-28.17	-30.37	-35.17	-34.84	-33.23	-32.42	-30.93
120.00	-26.26	-28.19	-28.92	-31.90	-39.15	-37.13	-34.57	-33.78	-33.11
135.00	-26.26	-27.52	-29.15	-32.74	-39.38	-43.92	-37.12	-32.77	-33.00
150.00	-26.26	-26.82	-28.87	-33.04	-37.22	-35.91	-33.27	-29.89	-30.75
165.00	-26.26	-25.88	-27.82	-32.10	-35.67	-33.17	-31.15	-28.30	-29.47
180.00	-26.26	-25.05	-26.52	-29.58	-33.26	-30.87	-29.62	-27.64	-28.29
195.00	-26.26	-24.36	-25.29	-28.43	-33.85	-31.61	-30.75	-28.96	-29.77
210.00	-26.26	-24.09	-24.70	-27.07	-32.24	-31.45	-31.42	-29.79	-27.47
225.00	-26.26	-23.88	-24.40	-26.73	-31.55	-29.81	-29.30	-27.17	-26.19
240.00	-26.26	-23.98	-24.71	-28.88	-34.31	-31.99	-31.49	-28.59	-28.20
255.00	-26.26	-24.28	-25.59	-30.24	-37.08	-31.21	-29.34	-28.52	-27.81
270.00	-26.26	-24.99	-26.55	-29.38	-31.71	-29.57	-28.77	-26.84	-26.43
285.00	-26.26	-25.37	-27.64	-29.28	-30.61	-32.10	-33.01	-26.59	-26.22
300.00	-26.26	-25.92	-29.20	-30.74	-31.91	-35.99	-41.22	-29.33	-28.07
315.00	-26.26	-26.55	-31.32	-33.26	-33.27	-35.14	-36.51	-31.89	-28.61
330.00	-26.26	-26.87	-33.09	-34.89	-32.90	-33.93	-32.80	-31.44	-28.63
345.00	-26.26	-27.50	-32.27	-36.14	-35.76	-33.65	-32.82	-32.10	-30.74
360.00	-26.26	-28.04	-31.69	-37.07	-40.90	-44.13	-39.76	-36.88	-39.19

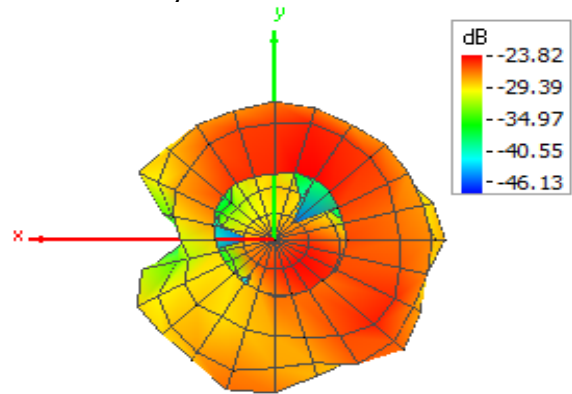
(continuation of the "RP_2412.000_tot" table from column 10 ...)

Azimuth (deg)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)
0.00	-37.34	-30.22	-28.38
15.00	-32.38	-28.86	-27.42
30.00	-29.25	-27.54	-26.42
45.00	-27.96	-27.07	-25.44
60.00	-27.12	-25.79	-24.79
75.00	-27.01	-25.19	-24.76
90.00	-26.45	-25.07	-24.68
105.00	-26.68	-24.49	-23.85
120.00	-27.09	-24.80	-23.82
135.00	-26.86	-25.11	-24.29
150.00	-27.09	-25.55	-25.15
165.00	-27.14	-26.31	-25.64
180.00	-26.84	-26.17	-25.38
195.00	-26.74	-25.73	-25.64
210.00	-26.62	-24.70	-25.45
225.00	-25.71	-24.41	-26.29
240.00	-25.76	-25.54	-26.11
255.00	-27.54	-26.99	-26.26
270.00	-27.45	-27.62	-26.31
285.00	-26.65	-28.10	-27.62
300.00	-27.25	-28.76	-28.19
315.00	-28.07	-28.23	-28.81
330.00	-29.22	-28.94	-28.82
345.00	-33.02	-30.99	-28.63
360.00	-37.34	-30.22	-28.38

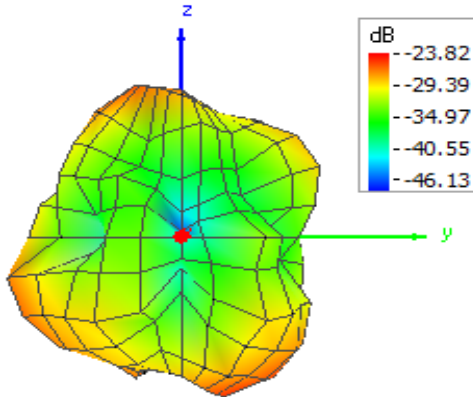
Theta = 0, Phi = 0



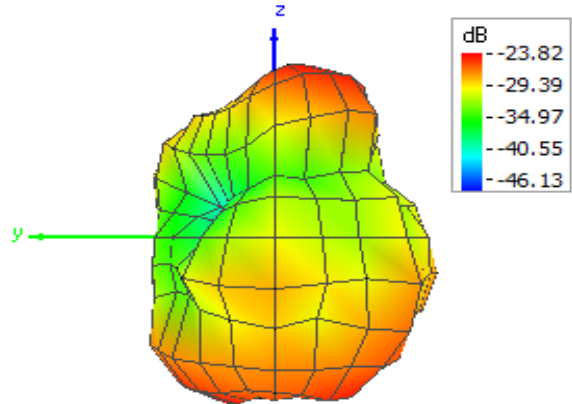
Theta = 180, Phi = 0



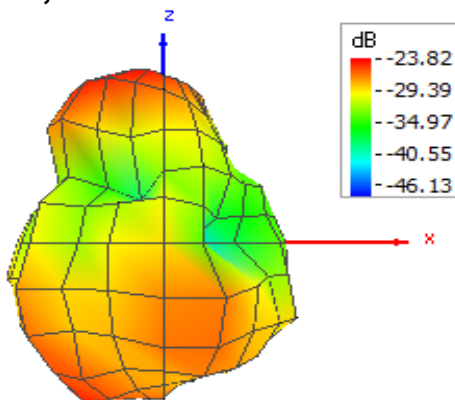
Theta = 90, Phi = 0



Theta = 90, Phi = 180



Theta = 90, Phi = 270



Theta = 90, Phi = 90

