CTIA Report (RP_2406.000_tot)

Test Information

Test Method:	Antenna Measurement
Test Condition:	FS: Free Space
Frequency:	2406.000 MHz
Test Time:	Start: 9/29/2022 14:40:30 AM; Stop: 9/29/2022 14:32:14 AM
Cal Data Phi:	55.55 dB (FSV RFIN to Phi1, CHAMBER CAL Phi1)
Cal Data Theta:	54.81 dB (FSV RFIN to Theta1, CHAMBER CAL Theta1)

OTA Evaluation Results

Total Radiated Power	3.58 dBm
Peak Gain	4.49 dBi
Total Efficiency	3.68 dB
Total Efficiency	225.21 %
Peak EIRP	8.40 dBm
NHPRP 45°	1.76 dBm
NHPRP 45° / TRP	-1.89 dB
NHPRP 45° / TRP	65.43%
NHPRP 30°	0.31 dBm
NHPRP 30° / TRP	-3.67 dB
NHPRP 30° / TRP	46.57 %
NHPRP 22.5°	-0.78 dBm
NHPRP 22.5° / TRP	-4.58dB
NHPRP 22.5° / TRP	35.89 %
UHRP	0.56 dBm
UHRP / TRP	-3.41 dB
UHRP / TRP	49.90 %
LHRP	0.51 dBm
LHRP / TRP	-3.34 dB
LHRP / TRP	49.89 %
PGRP (0-120°)	2.35 dBm
PGRP / TRP	-1.54 dB
PGRP / TRP	74.39 %
Front/Back Ratio	1.63
PhiBW	161.4 deg
PhiBW Up	107.6 deg
PhiBW Down	55.3 deg
ThetaBW	34.0 deg
ThetaBW Up	19.0 deg
ThetaBW Down	15.0 deg
Boresight Phi	300 deg
Boresight Theta	15 deg
Maximum Power	8.37 dBm
Minimum Power	-7.06 dBm
Average Power	4.32 dBm
Max/Min Ratio	15.56 dB
Max/Avg Ratio	4.34 dB
Min/Avg Ratio	-11.18dB
Worst Single Value	-19.51 dBm
Worst Position	Azi = 210 deg; Elev = 90 deg; Pol = Theta
Best Single Value	7.88 dBm
Best Position	Azi = 285 deg; Elev = 15 deg; Pol = Theta

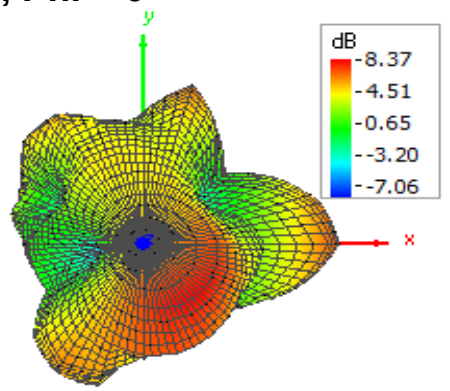
RP_2406.000_tot

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	5.36	7.26	3.77	2.92	6.61	7.36	7.03	6.53	6.97
15.00	5.36	6.55	2.53	1.75	5.20	6.40	6.50	5.56	4.86
30.00	5.36	5.86	1.31	-0.64	2.26	3.86	3.91	1.98	0.16
45.00	5.36	5.42	1.43	-2.71	-0.86	0.55	1.06	-0.34	-0.91
60.00	5.36	5.15	3.02	2.17	3.48	3.55	3.25	2.07	2.99
75.00	5.36	4.91	4.23	4.39	5.75	7.11	7.83	7.64	7.35
90.00	5.36	4.70	4.58	3.79	3.20	3.73	4.66	5.68	6.13
105.00	5.36	4.53	4.77	4.33	3.86	2.16	0.08	-0.51	0.58
120.00	5.36	4.23	4.70	4.15	5.16	5.67	5.47	3.70	0.61
135.00	5.36	3.64	3.82	2.17	3.02	5.13	5.87	6.01	4.79
150.00	5.36	2.90	2.63	0.35	-4.48	-1.08	2.47	5.01	5.90
165.00	5.36	1.91	0.79	0.99	0.00	1.22	2.93	3.48	5.13
180.00	5.36	1.01	-2.69	0.54	0.94	0.93	1.18	0.44	3.91
195.00	5.36	1.01	-5.95	-1.57	0.93	0.25	0.79	1.73	2.88
210.00	5.36	2.14	-0.71	0.09	0.71	-0.48	-4.12	-5.19	-5.05
225.00	5.36	3.65	3.33	4.52	4.31	3.45	3.11	3.41	4.01
240.00	5.36	4.97	5.21	6.28	5.84	4.48	2.60	0.72	-0.25
255.00	5.36	6.25	6.19	5.84	5.19	5.56	5.15	4.14	1.95
270.00	5.36	7.31	6.95	4.03	0.75	-0.09	-0.47	-0.36	0.54
285.00	5.36	8.02	7.19	2.17	-1.26	0.54	2.02	1.66	-0.74
300.00	5.36	8.37	6.75	1.57	-0.14	0.36	-1.49	-3.96	-5.64
315.00	5.36	8.34	6.04	1.38	0.73	-0.10	-4.14	-3.72	1.70
330.00	5.36	8.08	5.25	1.64	2.82	1.80	-0.71	0.62	4.64
345.00	5.36	7.66	4.73	2.72	5.19	5.24	3.89	3.55	5.99
360.00	5.36	7.25	3.76	2.94	6.60	7.38	7.03	6.54	6.95

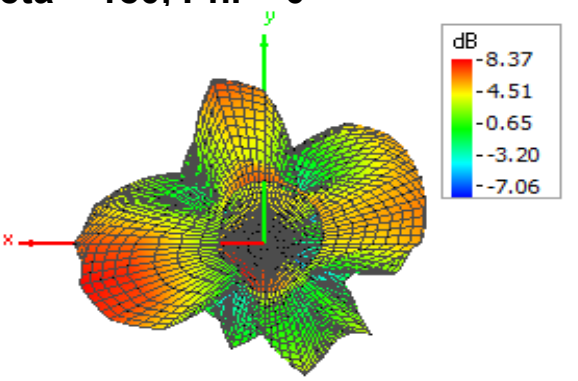
(continuation of the "RP_2406.000_tot" table from column 10 ...)

Azimuth (deg)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)
0.00	7.24	6.75	2.32
15.00	4.35	4.21	2.32
30.00	-0.01	0.92	2.95
45.00	-0.85	0.41	4.33
60.00	2.49	2.88	5.83
75.00	5.76	4.33	6.92
90.00	4.87	3.47	7.16
105.00	0.68	0.04	6.85
120.00	-2.65	0.20	6.51
135.00	2.39	3.17	6.16
150.00	5.57	5.01	5.71
165.00	6.47	5.86	5.08
180.00	5.82	4.88	4.66
195.00	2.34	1.40	4.05
210.00	-7.06	-1.23	3.41
225.00	2.24	-0.17	3.56
240.00	-0.93	-0.72	3.93
255.00	0.37	1.04	4.55
270.00	1.20	1.26	4.73
285.00	-2.02	-1.87	3.94
300.00	-2.60	-1.42	2.17
315.00	4.80	4.60	0.78
330.00	7.55	7.13	1.47
345.00	8.36	7.82	2.70
360.00	7.24	6.75	2.31

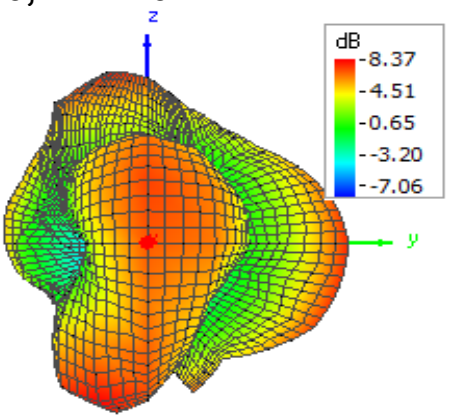
Theta = 0, Phi = 0



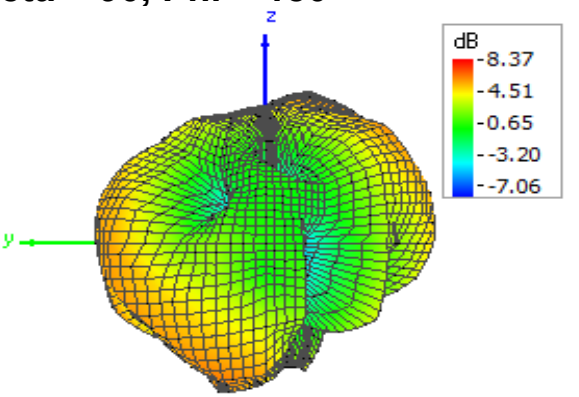
Theta = 180, Phi = 0



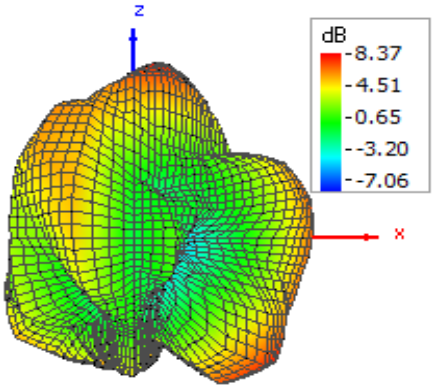
Theta = 90, Phi = 0



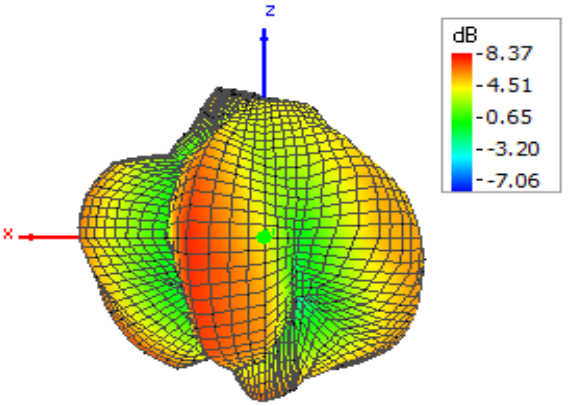
Theta = 90, Phi = 180



Theta = 90, Phi = 270



Theta = 90, Phi = 90



CTIA Report (RP_2439.000_tot)

Test Information

Test Method:	Antenna Measurement
Test Condition:	FS: Free Space
Frequency:	2439.000 MHz
Test Time:	Start: 9/29/2022 14:44:19 AM; Stop: 9/29/2022 14:46:51 AM
Cal Data Phi:	57.09 dB (FSV RFIN to Phi1, CHAMBER CAL Phi1)
Cal Data Theta:	56.35 dB (FSV RFIN to Theta1, CHAMBER CAL Theta1)

OTA Evaluation Results

Total Radiated Power	3.67 dBm
Directivity	4.47 dBi
Total Efficiency	3.25 dB
Total Efficiency	195.89 %
Peak EIRP	7.54 dBm
NHPRP 45°	1.34 dBm
NHPRP 45° / TRP	-1.65 dB
NHPRP 45° / TRP	71.66 %
NHPRP 30°	0.07 dBm
NHPRP 30° / TRP	-2.88 dB
NHPRP 30° / TRP	51.15 %
NHPRP 22.5°	-1.34 dBm
NHPRP 22.5° / TRP	-4.22 dB
NHPRP 22.5° / TRP	38.20 %
UHRP	-0.12 dBm
UHRP / TRP	-3.29 dB
UHRP / TRP	49.31 %
LHRP	0.03 dBm
LHRP / TRP	-2.49 dB
LHRP / TRP	51.46 %
PGRP (0-120°)	1.68 dBm
PGRP / TRP	-1.32 dB
PGRP / TRP	73.73 %
Front/Back Ratio	8.33
PhiBW	45.1 deg
PhiBW Up	30.7 deg
PhiBW Down	14.5 deg
ThetaBW	98.0 deg
ThetaBW Up	76.2 deg
ThetaBW Down	22.1 deg
Boresight Phi	0 deg
Boresight Theta	76 deg
Maximum Power	8.43 dBm
Minimum Power	-6.22 dBm
Average Power	3.36 dBm
Max/Min Ratio	14.65 dB
Max/Avg Ratio	4.32 dB
Min/Avg Ratio	-9.57 dB
Worst Single Value	-18.13 dBm
Worst Position	Azi = 135 deg; Elev = 15 deg; Pol = Theta
Best Single Value	7.18 dBm
Best Position	Azi = 345 deg; Elev = 135 deg; Pol = Theta

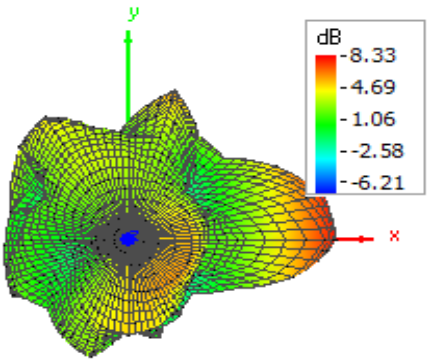
RP_2439.000_tot

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	4.81	5.71	2.09	2.94	7.46	8.33	7.32	6.76	7.46
15.00	4.81	5.48	2.28	1.72	6.10	7.87	7.50	6.88	6.50
30.00	4.81	4.95	2.15	-0.44	3.04	5.46	5.23	4.63	3.24
45.00	4.81	4.34	1.98	-1.14	-0.52	2.49	3.02	2.36	0.46
60.00	4.81	3.69	2.42	1.55	1.69	2.46	3.56	2.86	2.24
75.00	4.81	3.19	3.12	3.39	4.62	5.85	7.27	7.27	6.45
90.00	4.81	2.89	3.74	3.08	1.80	1.75	3.44	4.56	4.78
105.00	4.81	2.72	4.14	3.76	3.08	0.77	-1.12	-2.08	-1.68
120.00	4.81	2.60	3.98	3.91	4.82	5.07	5.04	3.46	0.71
135.00	4.81	2.34	3.17	2.72	2.98	3.90	4.59	5.00	4.54
150.00	4.81	1.83	2.34	1.24	-4.12	-2.65	1.19	4.48	5.60
165.00	4.81	1.28	1.60	1.79	0.02	1.42	1.71	2.95	4.41
180.00	4.81	0.78	0.57	1.88	0.54	1.56	0.92	0.00	2.90
195.00	4.81	0.71	-0.57	1.59	1.97	1.94	1.17	1.18	2.95
210.00	4.81	1.14	-0.24	0.69	2.38	2.48	1.49	-0.48	-2.13
225.00	4.81	1.97	1.50	1.06	1.32	-0.41	-1.21	-0.34	1.52
240.00	4.81	3.09	3.33	2.82	2.73	1.33	-0.64	-2.05	-2.33
255.00	4.81	4.15	4.68	3.21	3.38	3.31	3.35	1.58	-0.58
270.00	4.81	5.02	5.26	2.00	-0.19	-0.90	0.39	0.23	0.27
285.00	4.81	5.69	4.89	-0.66	-1.98	0.52	1.74	1.23	-0.45
300.00	4.81	6.10	3.78	-1.67	0.13	0.03	-2.29	-5.58	-6.21
315.00	4.81	6.17	2.35	-2.04	-0.64	-2.96	-4.97	-2.48	1.41
330.00	4.81	6.13	1.63	-1.13	1.56	-0.11	-2.85	-0.59	3.65
345.00	4.81	5.93	1.79	2.08	5.65	5.21	3.03	3.28	5.26
360.00	4.81	5.70	2.07	2.94	7.48	8.33	7.32	6.75	7.46

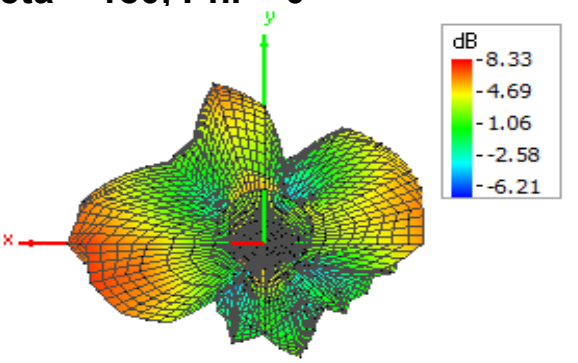
(continuation of the "RP_2439.000_tot" table from column 10 ...)

Azimuth (deg)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)
0.00	7.43	5.64	0.22
15.00	5.16	2.92	0.55
30.00	1.44	-0.86	1.59
45.00	-1.81	-1.77	3.25
60.00	1.52	1.43	4.81
75.00	4.92	3.39	5.68
90.00	3.82	2.14	5.75
105.00	-1.33	-2.17	5.14
120.00	-4.77	-2.82	4.70
135.00	2.11	1.52	4.64
150.00	5.51	4.11	4.32
165.00	6.48	5.17	3.47
180.00	6.17	3.83	2.80
195.00	3.24	-0.60	2.09
210.00	-5.20	-4.65	1.49
225.00	1.40	-2.19	1.75
240.00	-1.13	-1.86	2.66
255.00	0.14	0.64	3.53
270.00	1.85	0.88	3.86
285.00	-1.55	-2.47	2.98
300.00	-3.64	-3.90	0.99
315.00	4.01	3.10	0.07
330.00	6.53	5.72	0.66
345.00	7.55	6.75	0.99
360.00	7.42	5.64	0.22

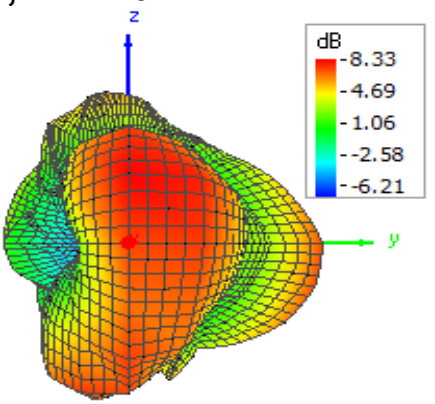
Theta = 0, Phi = 0



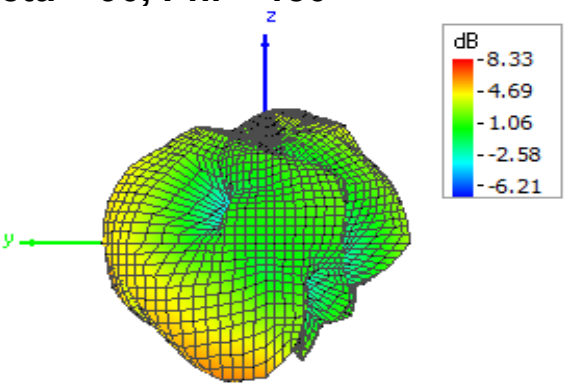
Theta = 180, Phi = 0



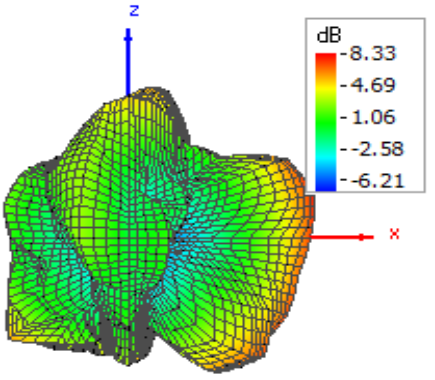
Theta = 90, Phi = 0



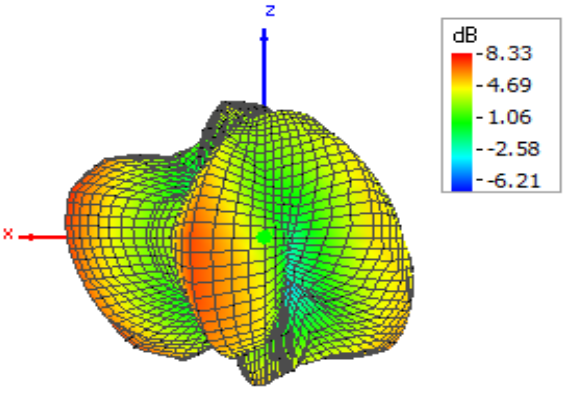
Theta = 90, Phi = 180



Theta = 90, Phi = 270



Theta = 90, Phi = 90



CTIA Report (RP_2480.000_tot)

Test Information

Test Method:	Antenna Measurement
Test Condition:	FS: Free Space
Frequency:	2480.000 MHz
Test Time:	Start: 9/29/2022 14:45:25 AM; Stop: 9/29/2022 14:48:02 AM
Cal Data Phi:	56.78 dB (FSV RFIN to Phi1, CHAMBER CAL Phi1)
Cal Data Theta:	55.67 dB (FSV RFIN to Theta1, CHAMBER CAL Theta1)

OTA Evaluation Results

Total Radiated Power	2.34 dBm
Directivity	4.50 dBi
Total Efficiency	2.15 dB
Total Efficiency	173.89 %
Peak EIRP	7.11 dBm
NHPRP 45°	0.88 dBm
NHPRP 45° / TRP	-1.75 dB
NHPRP 45° / TRP	72.19 %
NHPRP 30°	-0.41 dBm
NHPRP 30° / TRP	-2.79 dB
NHPRP 30° / TRP	51.18 %
NHPRP 22.5°	-1.56 dBm
NHPRP 22.5° / TRP	-4.11 dB
NHPRP 22.5° / TRP	37.54 %
UHRP	-0.50 dBm
UHRP / TRP	-3.11 dB
UHRP / TRP	50.99 %
LHRP	-0.69 dBm
LHRP / TRP	-3.18 dB
LHRP / TRP	48.46 %
PGRP (0-120°)	1.22 dBm
PGRP / TRP	-1.26 dB
PGRP / TRP	76.13 %
Front/Back Ratio	10.76
PhiBW	52.7 deg
PhiBW Up	40.2 deg
PhiBW Down	12.4 deg
ThetaBW	92.4 deg
ThetaBW Up	70.5 deg
ThetaBW Down	21.9 deg
Boresight Phi	0 deg
Boresight Theta	75 deg
Maximum Power	7.93 dBm
Minimum Power	-8.31 dBm
Average Power	2.58 dBm
Max/Min Ratio	16.55 dB
Max/Avg Ratio	5.20 dB
Min/Avg Ratio	-11.02 dB
Worst Single Value	-18.27 dBm
Worst Position	Azi = 45 deg; Elev = 135 deg; Pol = Theta
Best Single Value	6.22 dBm
Best Position	Azi = 15 deg; Elev = 90 deg; Pol = Phi

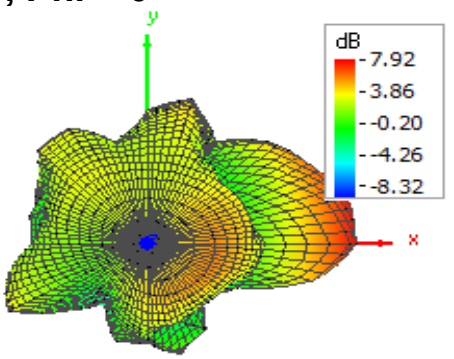
RP_2480.000_tot

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	2.71	5.68	3.91	2.03	7.44	7.93	6.29	5.51	6.64
15.00	2.71	5.47	4.07	0.69	6.18	7.89	7.00	6.27	6.33
30.00	2.71	4.98	3.99	-1.43	3.44	6.11	5.91	5.16	4.57
45.00	2.71	4.42	3.55	-0.84	0.34	4.36	5.49	5.11	3.59
60.00	2.71	3.65	3.22	1.58	0.03	0.65	2.38	2.99	2.00
75.00	2.71	3.14	3.01	3.64	4.45	5.10	5.89	5.70	4.97
90.00	2.71	2.98	2.82	2.81	2.85	3.25	4.18	5.27	4.96
105.00	2.71	3.05	3.06	2.38	1.00	-1.02	-2.19	-1.24	-0.61
120.00	2.71	3.22	3.56	3.09	3.64	3.37	2.60	0.38	-1.93
135.00	2.71	2.98	3.58	3.20	3.56	3.25	2.88	3.42	3.50
150.00	2.71	2.45	3.21	1.74	-2.42	-2.64	0.37	2.82	4.66
165.00	2.71	1.93	2.68	0.96	-1.20	0.26	0.80	1.00	3.55
180.00	2.71	1.39	2.01	1.52	-0.07	-0.20	-1.19	-2.82	2.01
195.00	2.71	1.18	1.53	2.64	2.82	1.65	0.62	-0.08	2.49
210.00	2.71	1.40	0.79	2.29	3.63	3.79	2.84	2.04	-0.37
225.00	2.71	1.92	-0.21	-1.36	-1.40	-0.47	-1.42	-2.48	-0.24
240.00	2.71	2.66	-0.13	-2.62	-2.53	-3.47	-4.47	-4.62	-1.08
255.00	2.71	3.57	1.74	0.56	0.61	0.03	-0.08	-2.11	-3.16
270.00	2.71	4.35	3.15	1.55	-0.23	-0.44	0.32	0.52	0.93
285.00	2.71	5.05	3.28	-0.88	-2.19	1.03	2.16	2.22	1.16
300.00	2.71	5.43	2.56	-2.32	-0.04	-0.02	-2.08	-4.11	-7.00
315.00	2.71	5.60	2.41	-3.36	-3.61	-4.67	-4.74	-2.89	-0.47
330.00	2.71	5.85	2.94	-2.82	-0.71	-1.58	-7.60	-1.46	2.39
345.00	2.71	5.89	3.76	1.48	5.01	4.31	1.21	0.84	4.39
360.00	2.71	5.78	3.90	2.00	7.44	7.92	6.30	5.51	6.64

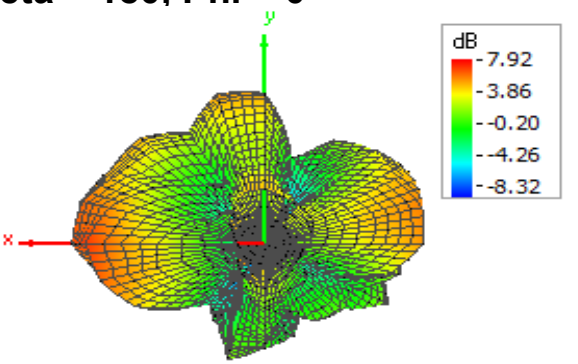
(continuation of the "RP_2480.000_tot" table from column 10 ...)

Azimuth (deg)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)
0.00	7.05	4.03	-2.80
15.00	5.68	1.65	-1.41
30.00	3.03	-1.93	0.08
45.00	-0.18	-4.58	1.88
60.00	-1.60	-0.64	3.72
75.00	2.90	2.33	4.92
90.00	3.20	2.45	4.97
105.00	-1.51	-0.95	4.35
120.00	-8.32	-3.88	3.74
135.00	1.55	0.83	3.79
150.00	4.84	3.74	3.64
165.00	5.87	4.98	2.83
180.00	5.53	4.18	1.73
195.00	3.27	0.55	0.45
210.00	-2.29	-3.49	-0.27
225.00	1.18	-1.46	0.49
240.00	0.80	-1.44	1.63
255.00	-1.21	-0.10	2.78
270.00	1.23	1.12	3.10
285.00	-0.07	-1.02	2.27
300.00	-7.60	-7.71	0.93
315.00	0.84	-1.53	-0.59
330.00	4.67	2.64	-1.98
345.00	6.31	4.54	-2.64
360.00	7.02	4.01	-2.80

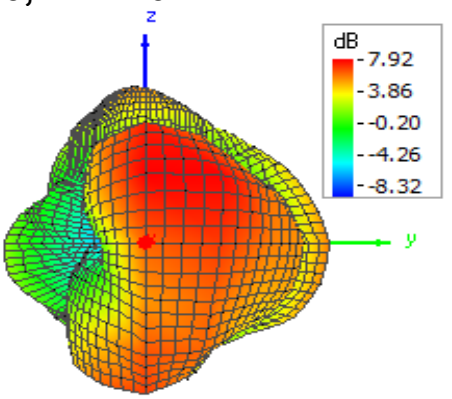
Theta = 0, Phi = 0



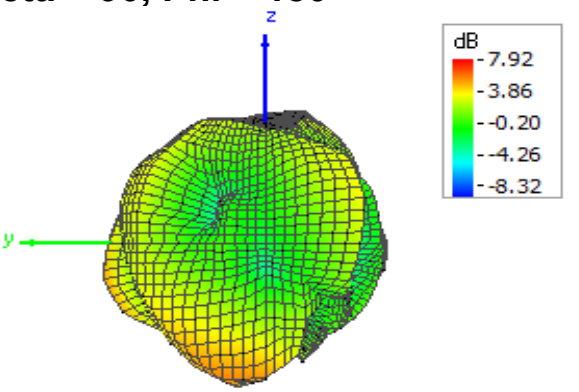
Theta = 180, Phi = 0



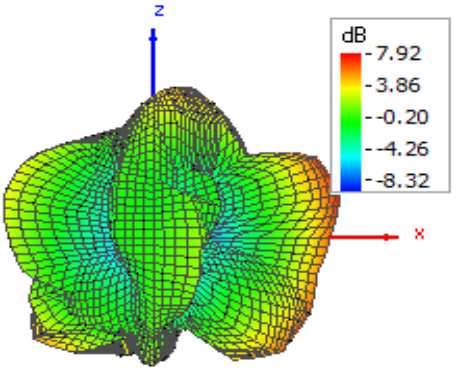
Theta = 90, Phi = 0



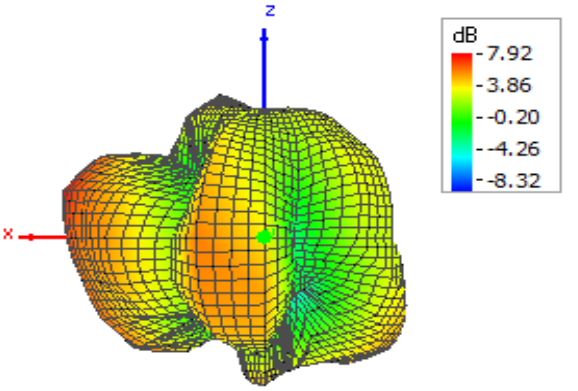
Theta = 90, Phi = 180

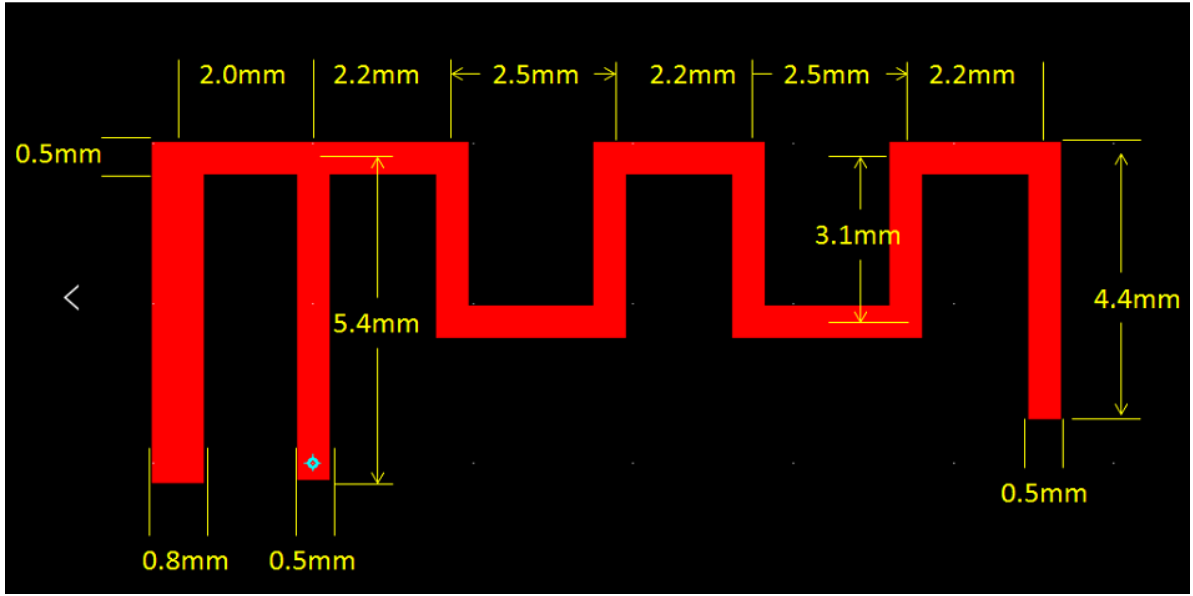


Theta = 90, Phi = 270



Theta = 90, Phi = 90





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