

CTIA Report (RP_2437.000_tot)

Test Information

Test Method:	Antenna Measurement
Test Condition:	FS: Free Space
Frequency:	2437.000 MHz
Test Time:	Start: 10/18/2022 10:55:44 AM; Stop: 10/18/2022 11:00:57 AM
Cal Data Phi:	48.30 dB (ZNB PORT2 to HOR MA1)
Cal Data Theta:	48.51 dB (ZNB PORT3 to VER MA1)

OTA Evaluation Results

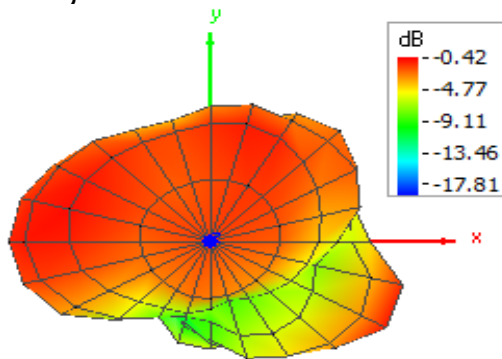
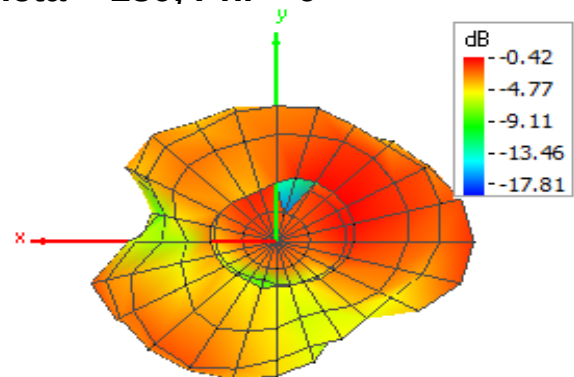
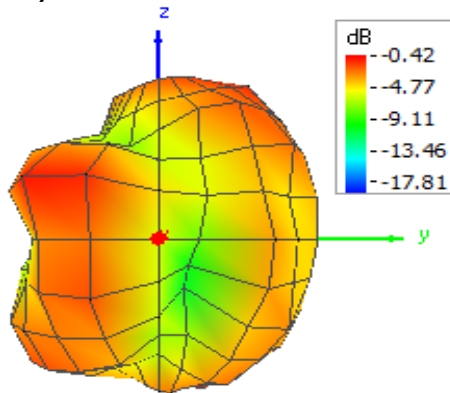
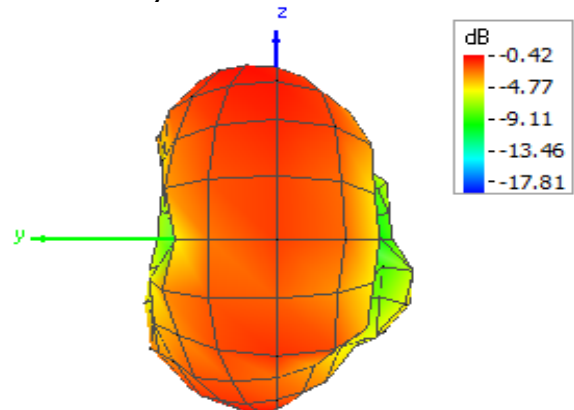
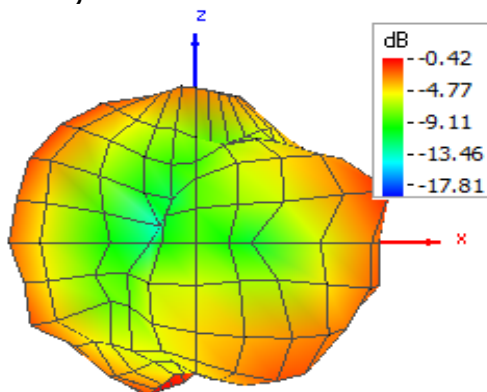
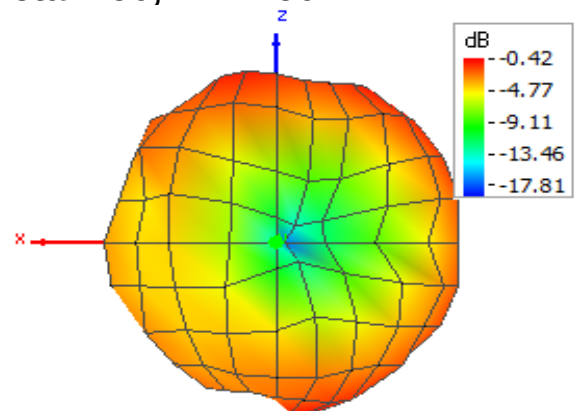
Total Radiated Power	-3.77 dBm
Directivity	3.35 dBi
Total Efficiency	-3.77 dB
Total Efficiency	41.96 %
Peak Realized Gain	-0.42 dBi
NHPRP 45°	-5.82 dBm
NHPRP 45° / TRP	-2.05 dB
NHPRP 45° / TRP	62.36 %
NHPRP 30°	-7.63 dBm
NHPRP 30° / TRP	-3.86 dB
NHPRP 30° / TRP	41.14 %
NHPRP 22.5°	-8.94 dBm
NHPRP 22.5° / TRP	-5.17 dB
NHPRP 22.5° / TRP	30.39 %
UHRP	-6.89 dBm
UHRP / TRP	-3.12 dB
UHRP / TRP	48.79 %
LHRP	-6.85 dBm
LHRP / TRP	-3.07 dB
LHRP / TRP	49.26 %
PGRP (0-120°)	-5.35 dBm
PGRP / TRP	-1.58 dB
PGRP / TRP	69.46 %
Front/Back Ratio	2.28
PhiBW	151.6 deg
PhiBW Up	76.7 deg
PhiBW Down	75.0 deg
ThetaBW	91.8 deg
ThetaBW Up	27.3 deg
ThetaBW Down	64.5 deg
Boresight Phi	150 deg
Boresight Theta	165 deg
Maximum Power	-0.42 dBm
Minimum Power	-15.81 dBm
Average Power	-3.32 dBm
Max/Min Ratio	15.38 dB
Max/Avg Ratio	2.89 dB
Min/Avg Ratio	-12.49 dB
Worst Single Value	-32.29 dBm
Worst Position	Azi = 165 deg; Elev = 90 deg; Pol = Theta
Best Single Value	-0.84 dBm
Best Position	Azi = 180 deg; Elev = 45 deg; Pol = Phi

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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	-1.52	-2.01	-3.90	-5.22	-5.51	-4.32	-5.34	-5.39	-5.64
15.00	-1.52	-1.81	-3.32	-2.99	-5.21	-5.20	-7.27	-9.45	-9.72
30.00	-1.52	-1.60	-2.47	-1.96	-3.28	-3.75	-3.13	-3.18	-3.86
45.00	-1.52	-1.41	-1.75	-2.11	-2.31	-4.48	-4.22	-4.03	-2.82
60.00	-1.52	-1.33	-1.03	-2.37	-3.03	-3.65	-4.05	-4.19	-3.93
75.00	-1.52	-1.53	-0.86	-2.18	-5.10	-6.15	-6.29	-4.99	-3.84
90.00	-1.52	-1.69	-1.22	-2.76	-6.58	-10.04	-12.34	-9.57	-4.38
105.00	-1.52	-1.89	-1.67	-3.65	-7.83	-12.62	-15.81	-11.53	-6.00
120.00	-1.52	-2.01	-1.58	-3.31	-7.33	-10.92	-10.94	-8.06	-4.98
135.00	-1.52	-1.83	-1.16	-2.18	-4.62	-6.20	-7.71	-4.85	-3.66
150.00	-1.52	-1.74	-0.77	-1.51	-2.52	-3.14	-4.68	-2.89	-2.86
165.00	-1.52	-1.81	-0.64	-0.97	-1.42	-1.86	-2.47	-1.91	-1.68
180.00	-1.52	-2.09	-0.96	-0.78	-1.01	-1.48	-1.47	-2.02	-1.22
195.00	-1.52	-2.28	-1.69	-1.44	-1.57	-2.25	-2.19	-2.90	-1.69
210.00	-1.52	-2.49	-3.16	-3.06	-3.18	-4.45	-4.46	-4.58	-3.72
225.00	-1.52	-2.61	-4.74	-5.11	-6.35	-8.12	-9.10	-7.22	-7.60
240.00	-1.52	-2.62	-5.78	-7.38	-9.42	-12.73	-11.50	-8.07	-7.16
255.00	-1.52	-2.37	-6.16	-8.45	-10.57	-9.61	-9.05	-5.79	-5.11
270.00	-1.52	-2.54	-7.01	-8.22	-7.62	-7.68	-7.72	-5.36	-4.16
285.00	-1.52	-2.74	-7.95	-6.30	-5.41	-6.48	-9.05	-6.25	-3.49
300.00	-1.52	-2.89	-7.34	-5.41	-4.35	-5.49	-9.89	-6.24	-2.90
315.00	-1.52	-2.91	-6.49	-5.34	-3.30	-2.95	-5.42	-4.40	-2.56
330.00	-1.52	-2.70	-5.43	-6.04	-2.93	-0.80	-2.78	-2.33	-2.54
345.00	-1.52	-2.42	-4.72	-6.84	-3.53	-1.09	-2.40	-1.78	-2.86
360.00	-1.52	-2.01	-3.90	-5.22	-5.51	-4.32	-5.34	-5.39	-5.64

(continuation of the "RP_2437.000_tot" table from column 10 ...)

Azimuth (deg)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)
0.00	-6.40	-6.03	-2.72
15.00	-6.39	-4.44	-2.49
30.00	-3.45	-2.90	-2.76
45.00	-2.85	-2.39	-3.07
60.00	-3.35	-2.56	-3.71
75.00	-2.85	-2.75	-3.43
90.00	-2.73	-2.34	-2.23
105.00	-2.50	-2.04	-1.01
120.00	-2.88	-1.45	-0.62
135.00	-2.77	-1.23	-0.53
150.00	-1.79	-1.32	-0.42
165.00	-1.87	-1.33	-0.59
180.00	-2.32	-1.84	-0.99
195.00	-3.33	-2.39	-1.56
210.00	-4.79	-2.96	-2.59
225.00	-5.13	-4.04	-3.29
240.00	-4.83	-5.34	-4.51
255.00	-5.16	-5.52	-4.80
270.00	-4.23	-4.53	-4.86
285.00	-2.98	-3.81	-4.32
300.00	-1.81	-3.05	-4.81
315.00	-1.82	-3.21	-4.43
330.00	-2.32	-4.42	-3.72
345.00	-3.39	-5.02	-3.25
360.00	-6.40	-6.03	-2.72

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_2462.000_tot)

Test Information

Test Method:	Antenna Measurement
Test Condition:	FS: Free Space
Frequency:	2462.000 MHz
Test Time:	Start: 10/18/2022 10:55:44 AM; Stop: 10/18/2022 11:00:57 AM
Cal Data Phi:	48.18 dB (ZNB PORT2 to HOR MA1)
Cal Data Theta:	48.20 dB (ZNB PORT3 to VER MA1)

OTA Evaluation Results

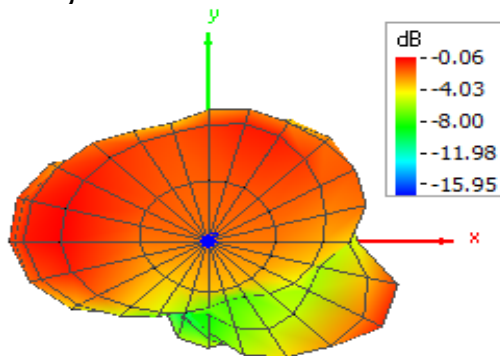
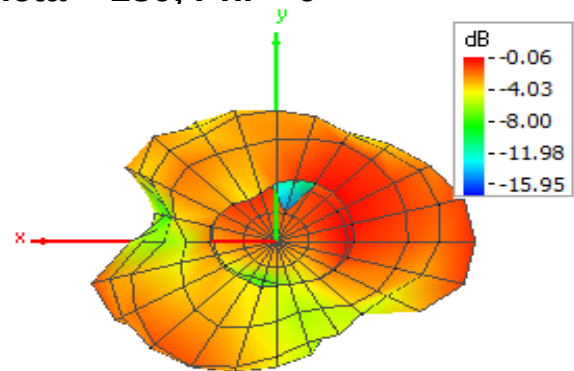
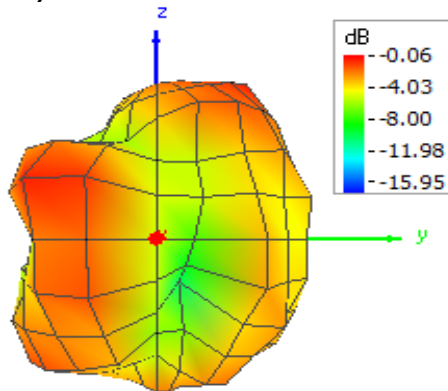
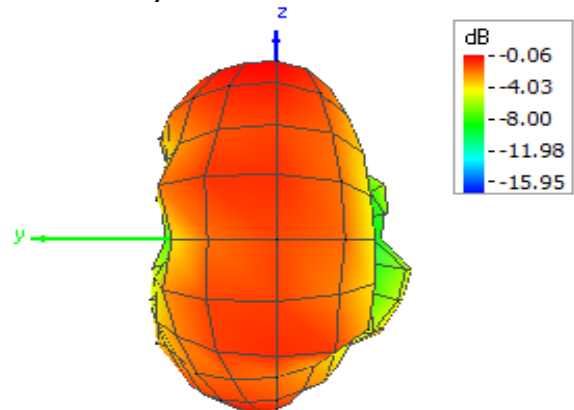
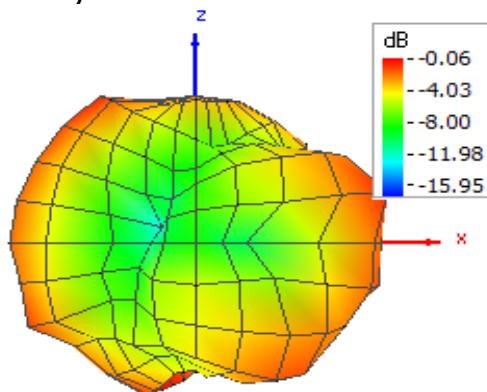
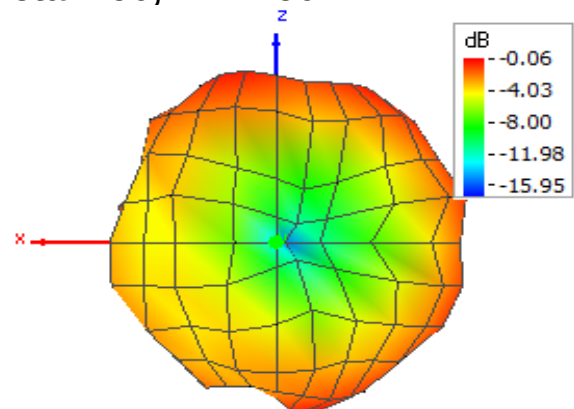
Total Radiated Power	-3.37 dBm
Directivity	3.31 dBi
Total Efficiency	-3.37 dB
Total Efficiency	46.01 %
Peak Realized Gain	-0.06 dBi
NHPRP 45°	-5.39 dBm
NHPRP 45° / TRP	-2.02 dB
NHPRP 45° / TRP	62.83 %
NHPRP 30°	-7.15 dBm
NHPRP 30° / TRP	-3.78 dB
NHPRP 30° / TRP	41.91 %
NHPRP 22.5°	-8.45 dBm
NHPRP 22.5° / TRP	-5.08 dB
NHPRP 22.5° / TRP	31.06 %
UHRP	-6.44 dBm
UHRP / TRP	-3.07 dB
UHRP / TRP	49.31 %
LHRP	-6.43 dBm
LHRP / TRP	-3.06 dB
LHRP / TRP	49.48 %
PGRP (0-120°)	-4.89 dBm
PGRP / TRP	-1.52 dB
PGRP / TRP	70.51 %
Front/Back Ratio	5.02
PhiBW	232.1 deg
PhiBW Up	43.3 deg
PhiBW Down	188.7 deg
ThetaBW	237.9 deg
ThetaBW Up	169.9 deg
ThetaBW Down	68.0 deg
Boresight Phi	180 deg
Boresight Theta	30 deg
Maximum Power	-0.06 dBm
Minimum Power	-13.95 dBm
Average Power	-3.00 dBm
Max/Min Ratio	13.90 dB
Max/Avg Ratio	2.94 dB
Min/Avg Ratio	-10.95 dB
Worst Single Value	-39.51 dBm
Worst Position	Azi = 30 deg; Elev = 90 deg; Pol = Theta
Best Single Value	-0.17 dBm
Best Position	Azi = 180 deg; Elev = 30 deg; Pol = Phi

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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	-1.91	-1.96	-2.70	-3.37	-4.88	-4.48	-4.69	-4.80	-5.34
15.00	-1.91	-1.76	-2.15	-1.83	-4.88	-4.79	-6.87	-8.45	-9.44
30.00	-1.91	-1.52	-1.47	-1.42	-3.37	-3.55	-2.96	-2.59	-3.49
45.00	-1.91	-1.40	-0.89	-1.70	-2.52	-4.00	-4.13	-3.62	-2.45
60.00	-1.91	-1.28	-0.45	-2.03	-3.36	-3.21	-4.07	-3.55	-3.77
75.00	-1.91	-1.36	-0.44	-2.05	-5.22	-5.51	-6.34	-4.58	-3.44
90.00	-1.91	-1.49	-0.92	-2.51	-6.60	-8.74	-12.01	-8.78	-4.34
105.00	-1.91	-1.55	-1.27	-3.28	-8.02	-10.68	-13.95	-10.79	-6.04
120.00	-1.91	-1.48	-1.10	-2.85	-6.81	-9.19	-10.23	-8.10	-4.33
135.00	-1.91	-1.35	-0.76	-1.85	-4.21	-4.74	-7.13	-4.55	-3.32
150.00	-1.91	-1.34	-0.38	-1.11	-2.45	-1.97	-3.70	-2.36	-2.16
165.00	-1.91	-1.56	-0.10	-0.58	-1.35	-0.86	-1.82	-1.11	-1.03
180.00	-1.91	-1.86	-0.06	-0.44	-1.10	-0.77	-1.13	-1.05	-0.71
195.00	-1.91	-2.29	-0.53	-1.19	-1.69	-1.79	-1.73	-2.06	-1.00
210.00	-1.91	-2.72	-1.64	-2.81	-3.52	-4.17	-4.19	-3.74	-2.96
225.00	-1.91	-3.17	-3.23	-4.72	-6.29	-7.67	-8.31	-6.87	-6.78
240.00	-1.91	-3.32	-4.43	-6.47	-8.72	-11.68	-10.38	-8.55	-7.05
255.00	-1.91	-3.19	-5.43	-8.08	-9.44	-9.02	-8.62	-5.60	-5.02
270.00	-1.91	-3.12	-6.27	-7.93	-7.40	-7.17	-7.75	-4.71	-4.27
285.00	-1.91	-3.15	-6.95	-6.27	-4.93	-5.79	-9.17	-5.43	-3.48
300.00	-1.91	-3.14	-6.65	-5.06	-3.57	-4.83	-9.30	-5.85	-2.66
315.00	-1.91	-2.90	-5.31	-5.00	-2.38	-2.53	-4.78	-3.73	-2.20
330.00	-1.91	-2.67	-4.18	-5.39	-2.02	-0.58	-2.03	-1.71	-2.16
345.00	-1.91	-2.36	-3.31	-5.43	-3.01	-0.90	-1.71	-1.34	-2.55
360.00	-1.91	-1.96	-2.70	-3.37	-4.88	-4.48	-4.69	-4.80	-5.34

(continuation of the "RP_2462.000_tot" table from column 10 ...)

Azimuth (deg)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)
0.00	-5.77	-5.08	-2.09
15.00	-6.04	-3.61	-2.02
30.00	-3.17	-2.19	-2.38
45.00	-2.74	-1.87	-2.87
60.00	-3.19	-2.40	-3.83
75.00	-2.63	-2.67	-3.35
90.00	-2.52	-2.27	-1.88
105.00	-2.67	-1.87	-0.87
120.00	-3.11	-1.23	-0.40
135.00	-2.65	-1.03	-0.15
150.00	-1.68	-0.94	-0.22
165.00	-1.51	-1.05	-0.31
180.00	-1.86	-1.33	-0.60
195.00	-2.71	-2.01	-1.06
210.00	-4.40	-2.51	-1.93
225.00	-4.98	-3.53	-2.69
240.00	-4.58	-4.98	-3.91
255.00	-4.80	-5.36	-4.21
270.00	-3.83	-4.58	-4.41
285.00	-2.58	-3.64	-3.74
300.00	-1.38	-2.68	-3.99
315.00	-1.30	-2.76	-3.59
330.00	-1.92	-3.41	-2.93
345.00	-2.82	-4.29	-2.59
360.00	-5.77	-5.08	-2.09

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: 10/18/2022 10:55:44 AM; Stop: 10/18/2022 11:00:57 AM
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

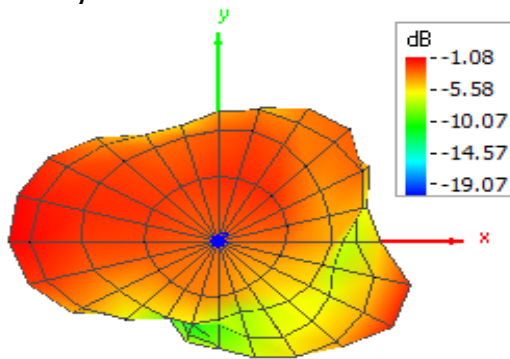
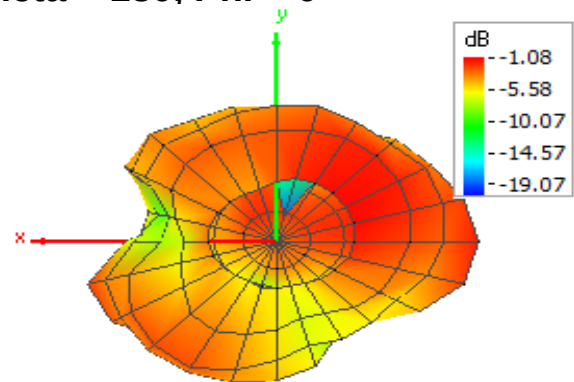
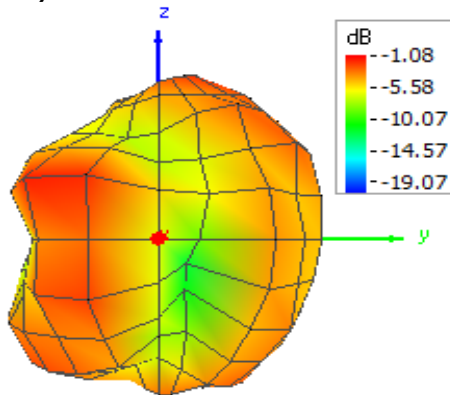
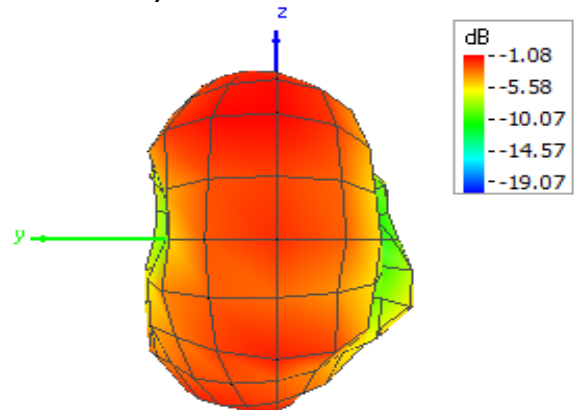
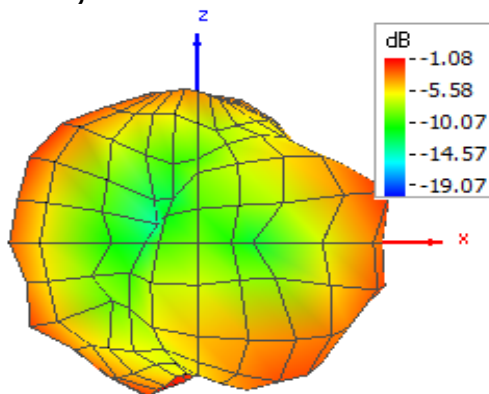
Total Radiated Power	-4.39 dBm
Directivity	3.31 dBi
Total Efficiency	-4.39 dB
Total Efficiency	36.37 %
Peak Realized Gain	-1.08 dBi
NHPRP 45°	-6.39 dBm
NHPRP 45° / TRP	-2.00 dB
NHPRP 45° / TRP	63.13 %
NHPRP 30°	-8.20 dBm
NHPRP 30° / TRP	-3.81 dB
NHPRP 30° / TRP	41.63 %
NHPRP 22.5°	-9.52 dBm
NHPRP 22.5° / TRP	-5.13 dB
NHPRP 22.5° / TRP	30.72 %
UHRP	-7.53 dBm
UHRP / TRP	-3.13 dB
UHRP / TRP	48.61 %
LHRP	-7.40 dBm
LHRP / TRP	-3.01 dB
LHRP / TRP	50.04 %
PGRP (0-120°)	-5.98 dBm
PGRP / TRP	-1.58 dB
PGRP / TRP	69.45 %
Front/Back Ratio	5.24
PhiBW	75.3 deg
PhiBW Up	29.2 deg
PhiBW Down	46.1 deg
ThetaBW	228.6 deg
ThetaBW Up	139.3 deg
ThetaBW Down	89.3 deg
Boresight Phi	180 deg
Boresight Theta	60 deg
Maximum Power	-1.08 dBm
Minimum Power	-17.07 dBm
Average Power	-4.01 dBm
Max/Min Ratio	15.99 dB
Max/Avg Ratio	2.93 dB
Min/Avg Ratio	-13.06 dB
Worst Single Value	-36.55 dBm
Worst Position	Azi = 105 deg; Elev = 90 deg; Pol = Theta
Best Single Value	-1.11 dBm
Best Position	Azi = 180 deg; Elev = 60 deg; Pol = Phi

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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	-2.86	-3.08	-4.13	-6.31	-6.67	-4.92	-6.05	-5.98	-6.32
15.00	-2.86	-2.59	-4.04	-4.17	-6.15	-5.62	-8.15	-10.96	-10.40
30.00	-2.86	-2.21	-3.69	-2.91	-4.35	-3.87	-3.74	-3.87	-4.35
45.00	-2.86	-1.83	-3.18	-3.01	-2.80	-4.62	-4.40	-4.43	-3.39
60.00	-2.86	-1.86	-2.54	-3.33	-3.25	-4.06	-4.52	-4.69	-4.47
75.00	-2.86	-1.81	-2.29	-3.36	-4.69	-6.59	-6.81	-5.23	-4.53
90.00	-2.86	-1.87	-2.64	-3.98	-5.79	-10.79	-12.85	-9.58	-5.20
105.00	-2.86	-2.08	-2.92	-4.92	-6.79	-13.39	-17.07	-12.00	-6.72
120.00	-2.86	-2.15	-2.94	-4.60	-6.16	-11.92	-10.98	-8.42	-5.64
135.00	-2.86	-2.14	-2.38	-3.35	-3.92	-7.38	-7.66	-5.48	-4.10
150.00	-2.86	-1.95	-2.00	-2.24	-2.06	-4.08	-4.90	-3.55	-3.32
165.00	-2.86	-2.12	-1.82	-1.53	-1.21	-2.53	-2.64	-2.70	-2.22
180.00	-2.86	-2.24	-2.06	-1.28	-1.08	-2.20	-1.87	-2.91	-1.56
195.00	-2.86	-2.73	-2.78	-2.00	-2.07	-2.88	-2.77	-3.67	-2.16
210.00	-2.86	-3.10	-4.08	-3.57	-4.19	-5.13	-5.06	-5.20	-4.40
225.00	-2.86	-3.27	-4.89	-5.87	-7.95	-8.66	-10.01	-7.62	-8.53
240.00	-2.86	-3.39	-5.25	-8.03	-11.68	-13.09	-11.52	-9.13	-7.75
255.00	-2.86	-3.37	-5.54	-9.30	-11.41	-10.37	-8.89	-6.71	-5.45
270.00	-2.86	-3.61	-6.48	-8.75	-7.67	-8.66	-8.04	-6.24	-4.51
285.00	-2.86	-3.94	-7.17	-7.02	-6.30	-7.60	-9.68	-7.42	-3.92
300.00	-2.86	-4.34	-6.43	-5.79	-5.07	-6.67	-10.91	-7.66	-3.46
315.00	-2.86	-4.47	-5.65	-5.55	-4.23	-3.83	-6.23	-5.03	-3.20
330.00	-2.86	-4.19	-5.05	-5.94	-4.21	-1.63	-3.53	-2.63	-3.31
345.00	-2.86	-3.74	-4.79	-6.77	-4.69	-1.81	-3.02	-2.18	-3.48
360.00	-2.86	-3.08	-4.13	-6.31	-6.67	-4.92	-6.05	-5.98	-6.32

(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	-7.20	-6.50	-3.11
15.00	-7.61	-5.17	-3.04
30.00	-4.08	-3.52	-3.20
45.00	-3.42	-2.80	-3.56
60.00	-4.00	-2.68	-3.91
75.00	-3.65	-2.77	-3.88
90.00	-3.41	-2.60	-2.80
105.00	-3.01	-2.18	-1.81
120.00	-3.27	-1.76	-1.47
135.00	-3.22	-1.60	-1.29
150.00	-2.41	-1.61	-1.22
165.00	-2.37	-1.81	-1.20
180.00	-2.75	-2.27	-1.51
195.00	-3.62	-3.04	-2.04
210.00	-5.07	-3.55	-3.25
225.00	-5.41	-4.54	-3.94
240.00	-5.58	-5.89	-5.13
255.00	-6.07	-6.22	-5.55
270.00	-4.94	-5.17	-5.32
285.00	-3.62	-4.23	-5.23
300.00	-2.46	-3.37	-5.51
315.00	-2.42	-3.53	-5.09
330.00	-2.79	-4.87	-4.34
345.00	-3.92	-5.73	-3.65
360.00	-7.20	-6.50	-3.11

Theta = 0, Phi = 0**Theta = 180, Phi = 0****Theta = 90, Phi = 0****Theta = 90, Phi = 180****Theta = 90, Phi = 270****Theta = 90, Phi = 90**