





## CTIA Report (RP\_907.000\_tot)

### Test Information

Test Method:	Antenna Measurement
Test Condition:	FS: Free Space
Frequency:	907.000 MHz
Test Time:	Start: 12/7/2022 5:28:13 PM; Stop: 12/7/2022 5:33:43 PM
Cal Data Phi:	44.24 dB (VNA PORT2 to MA1 PHI, Chamber Cal_MA1 PHI)
Cal Data Theta:	44.01 dB (VNA PORT3 to MA1 THETA, Chamber Cal_MA1 THETA)

### OTA Evaluation Results

Total Efficiency	-14.96 dB
Total Efficiency	3.19 %
Directivity	5.63 dBi
Peak Realized Gain	-19.33 dBi
NHPRP 45°	-16.51 dBm
NHPRP 45° / TRP	-1.55 dB
NHPRP 45° / TRP	69.96 %
NHPRP 30°	-18.91 dBm
NHPRP 30° / TRP	-3.96 dB
NHPRP 30° / TRP	40.19 %
NHPRP 22.5°	-20.63 dBm
NHPRP 22.5° / TRP	-5.67 dB
NHPRP 22.5° / TRP	27.08 %
UHRP	-21.49 dBm
UHRP / TRP	-6.53 dB
UHRP / TRP	22.23 %
LHRP	-15.96 dBm
LHRP / TRP	-1.01 dB
LHRP / TRP	79.30 %
PGRP (0-120°)	-17.49 dBm
PGRP / TRP	-2.54 dB
PGRP / TRP	55.77 %
Front/Back Ratio	8.99
PhiBW	337.0 deg
PhiBW Up	250.5 deg
PhiBW Down	86.6 deg
ThetaBW	47.8 deg
ThetaBW Up	30.9 deg
ThetaBW Down	16.9 deg
Boresight Phi	270 deg
Boresight Theta	120 deg
Maximum Power	-9.33 dBm
Minimum Power	-28.56 dBm
Average Power	-15.14 dBm
Max/Min Ratio	19.24 dB
Max/Avg Ratio	5.82 dB
Min/Avg Ratio	-13.42 dB
Worst Single Value	-53.20 dBm
Worst Position	Azi = 15 deg; Elev = 135 deg; Pol = Phi
Best Single Value	-9.73 dBm
Best Position	Azi = 270 deg; Elev = 120 deg; Pol = Theta

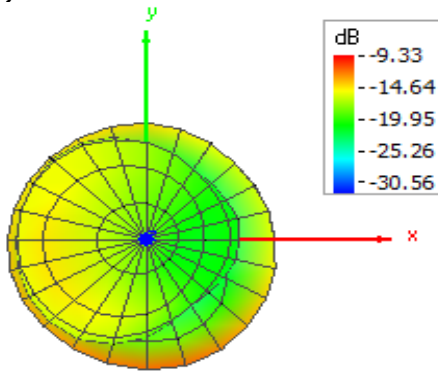
**RP 907.000 tot**

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	-17.71	-20.10	-20.46	-19.81	-20.43	-24.55	-22.84	-15.10	-11.35
15.00	-17.71	-19.82	-20.23	-19.76	-20.21	-24.11	-22.90	-15.30	-11.65
30.00	-17.71	-19.53	-19.83	-19.72	-20.52	-23.97	-22.40	-15.49	-11.91
45.00	-17.71	-18.97	-19.11	-19.28	-20.45	-24.75	-21.82	-15.44	-11.87
60.00	-17.71	-18.56	-18.24	-18.64	-20.36	-25.66	-21.27	-14.86	-11.67
75.00	-17.71	-18.01	-17.48	-17.60	-19.35	-26.39	-20.96	-14.36	-11.67
90.00	-17.71	-17.48	-16.63	-16.56	-18.32	-25.23	-21.12	-13.87	-11.37
105.00	-17.71	-17.06	-15.99	-15.83	-17.21	-23.82	-21.30	-13.92	-11.15
120.00	-17.71	-16.63	-15.32	-15.13	-16.59	-23.65	-21.38	-13.97	-11.75
135.00	-17.71	-16.23	-14.94	-14.90	-16.37	-24.44	-21.52	-14.11	-12.32
150.00	-17.71	-16.00	-14.64	-14.89	-16.57	-25.33	-21.30	-14.06	-12.00
165.00	-17.71	-15.86	-14.33	-14.96	-16.79	-26.35	-20.64	-13.95	-12.47
180.00	-17.71	-15.71	-14.15	-14.97	-16.62	-25.50	-19.75	-13.71	-12.38
195.00	-17.71	-15.69	-14.12	-14.93	-16.43	-23.55	-18.80	-13.36	-12.17
210.00	-17.71	-15.96	-14.16	-14.95	-16.10	-21.75	-18.08	-13.04	-11.66
225.00	-17.71	-16.37	-14.37	-15.04	-15.96	-20.94	-17.68	-12.78	-11.12
240.00	-17.71	-16.83	-14.65	-15.26	-16.06	-20.47	-17.70	-12.37	-10.35
255.00	-17.71	-17.40	-15.25	-15.89	-16.88	-21.24	-17.71	-11.92	-9.88
270.00	-17.71	-18.04	-16.16	-17.05	-18.04	-22.29	-17.68	-11.56	-9.33
285.00	-17.71	-18.84	-17.22	-18.21	-19.60	-23.27	-17.66	-11.48	-9.44
300.00	-17.71	-19.53	-18.61	-19.15	-20.73	-23.61	-18.26	-12.03	-9.73
315.00	-17.71	-19.87	-19.52	-19.78	-20.95	-23.82	-19.32	-12.97	-10.43
330.00	-17.71	-20.19	-20.17	-19.99	-20.75	-24.45	-20.78	-13.65	-10.60
345.00	-17.71	-20.25	-20.43	-19.94	-20.46	-24.77	-22.38	-14.35	-11.08
360.00	-17.71	-20.10	-20.46	-19.81	-20.43	-24.55	-22.84	-15.10	-11.35

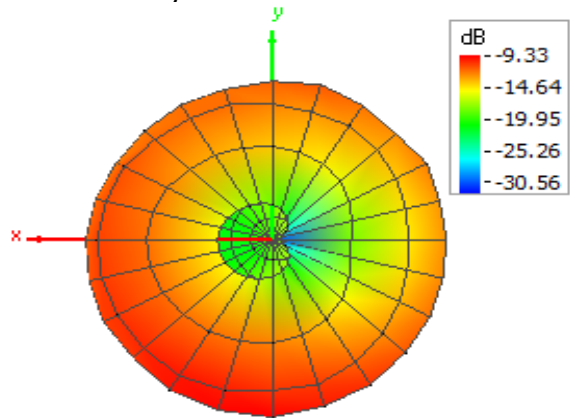
(continuation of the "RP\_907.000\_tot" table from column 10 ...)

Azimuth (deg)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)
0.00	-10.67	-11.63	-14.49
15.00	-10.93	-11.86	-14.82
30.00	-11.01	-12.10	-15.25
45.00	-11.49	-12.68	-16.03
60.00	-11.63	-12.90	-16.60
75.00	-11.61	-13.22	-17.01
90.00	-12.07	-13.52	-17.67
105.00	-12.49	-13.87	-18.92
120.00	-12.56	-14.34	-20.87
135.00	-13.04	-15.05	-23.06
150.00	-13.61	-16.00	-24.97
165.00	-14.03	-16.85	-27.10
180.00	-14.26	-17.38	-28.56
195.00	-13.91	-17.15	-28.47
210.00	-13.21	-16.02	-25.30
225.00	-12.33	-14.70	-22.43
240.00	-11.38	-13.55	-20.15
255.00	-10.50	-12.58	-18.20
270.00	-10.41	-12.02	-16.93
285.00	-9.89	-11.77	-15.87
300.00	-9.77	-11.67	-15.12
315.00	-10.09	-11.65	-14.70
330.00	-10.37	-11.59	-14.52
345.00	-10.53	-11.56	-14.44
360.00	-10.67	-11.63	-14.49

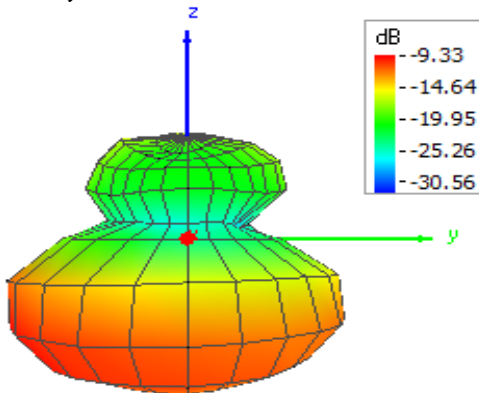
Theta = 0, Phi = 0



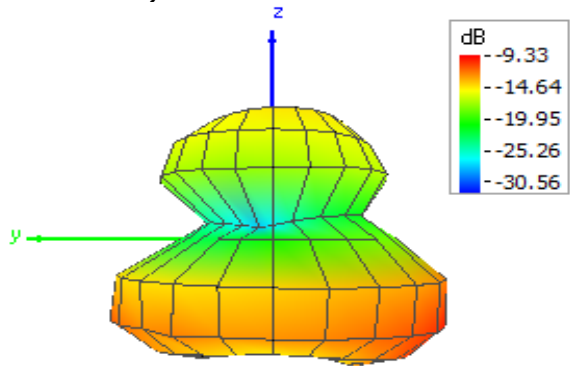
Theta = 180, Phi = 0



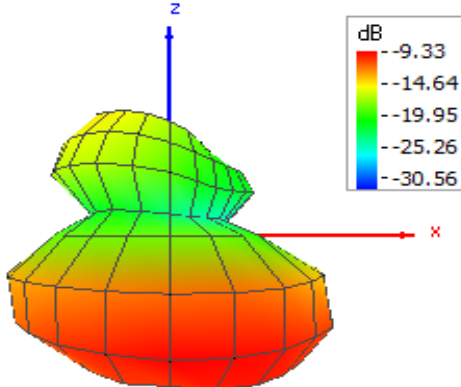
Theta = 90, Phi = 0



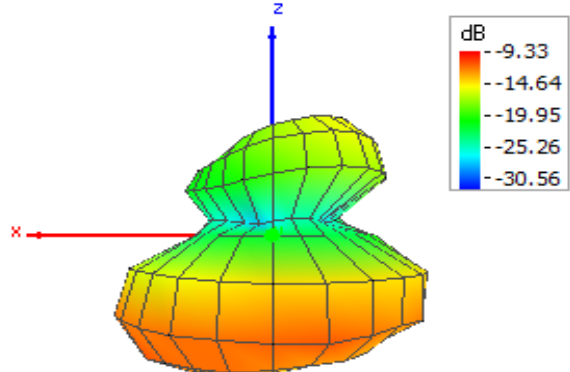
Theta = 90, Phi = 180



Theta = 90, Phi = 270



Theta = 90, Phi = 90



## CTIA Report (RP\_923.000\_tot)

### Test Information

Test Method:	Antenna Measurement
Test Condition:	FS: Free Space
Frequency:	923.000 MHz
Test Time:	Start: 12/7/2022 5:28:13 PM; Stop: 12/7/2022 5:33:43 PM
Cal Data Phi:	44.27 dB (VNA PORT2 to MA1 PHI, Chamber Cal_MA1 PHI)
Cal Data Theta:	43.93 dB (VNA PORT3 to MA1 THETA, Chamber Cal_MA1 THETA)

### OTA Evaluation Results

Total Efficiency	-15.22 dB
Total Efficiency	3.01 %
Directivity	5.41 dBi
Peak Realized Gain	-19.81 dBi
NHPRP 45°	-16.82 dBm
NHPRP 45° / TRP	-1.60 dB
NHPRP 45° / TRP	69.19 %
NHPRP 30°	-19.19 dBm
NHPRP 30° / TRP	-3.97 dB
NHPRP 30° / TRP	40.09 %
NHPRP 22.5°	-20.83 dBm
NHPRP 22.5° / TRP	-5.62 dB
NHPRP 22.5° / TRP	27.44 %
UHRP	-21.36 dBm
UHRP / TRP	-6.14 dB
UHRP / TRP	24.30 %
LHRP	-16.33 dBm
LHRP / TRP	-1.11 dB
LHRP / TRP	77.48 %
PGRP (0-120°)	-17.70 dBm
PGRP / TRP	-2.48 dB
PGRP / TRP	56.52 %
Front/Back Ratio	7.82
PhiBW	300.2 deg
PhiBW Up	198.3 deg
PhiBW Down	101.9 deg
ThetaBW	50.4 deg
ThetaBW Up	32.8 deg
ThetaBW Down	17.6 deg
Boresight Phi	285 deg
Boresight Theta	120 deg
Maximum Power	-9.81 dBm
Minimum Power	-31.59 dBm
Average Power	-15.36 dBm
Max/Min Ratio	21.78 dB
Max/Avg Ratio	5.55 dB
Min/Avg Ratio	-16.23 dB
Worst Single Value	-46.21 dBm
Worst Position	Azi = 165 deg; Elev = 90 deg; Pol = Phi
Best Single Value	-10.33 dBm
Best Position	Azi = 285 deg; Elev = 120 deg; Pol = Theta

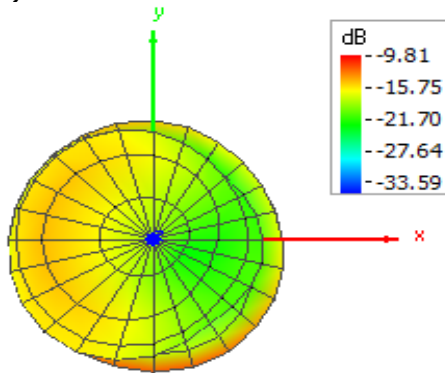
**RP 923.000 tot**

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	-17.96	-20.84	-21.08	-20.15	-20.26	-22.51	-22.37	-16.10	-12.05
15.00	-17.96	-20.27	-20.47	-20.11	-20.51	-22.19	-22.79	-16.56	-12.42
30.00	-17.96	-19.50	-19.66	-19.84	-20.88	-22.28	-22.61	-16.64	-12.69
45.00	-17.96	-18.87	-18.76	-19.32	-21.05	-22.70	-21.87	-16.35	-12.69
60.00	-17.96	-18.24	-17.67	-18.52	-21.04	-23.42	-20.74	-15.75	-12.59
75.00	-17.96	-17.69	-16.70	-17.47	-19.95	-23.89	-20.22	-14.99	-12.41
90.00	-17.96	-17.06	-15.88	-16.39	-18.67	-23.07	-19.92	-14.48	-12.33
105.00	-17.96	-16.56	-15.27	-15.68	-17.63	-21.43	-20.24	-14.25	-12.48
120.00	-17.96	-16.18	-14.91	-15.25	-17.00	-21.27	-20.45	-14.28	-12.75
135.00	-17.96	-15.93	-14.46	-15.12	-16.87	-21.70	-20.34	-14.27	-13.02
150.00	-17.96	-15.77	-14.36	-15.19	-16.77	-23.38	-20.17	-14.20	-13.14
165.00	-17.96	-15.67	-14.27	-15.11	-16.70	-25.49	-19.81	-14.02	-13.11
180.00	-17.96	-15.72	-14.20	-15.25	-16.47	-26.26	-19.08	-13.76	-12.89
195.00	-17.96	-15.85	-14.27	-15.16	-16.04	-24.73	-18.24	-13.48	-12.51
210.00	-17.96	-16.09	-14.44	-15.07	-15.61	-22.50	-17.61	-13.11	-12.10
225.00	-17.96	-16.50	-14.71	-15.15	-15.35	-21.26	-17.17	-12.91	-11.48
240.00	-17.96	-17.08	-15.13	-15.32	-15.42	-20.78	-17.20	-12.53	-10.50
255.00	-17.96	-18.00	-15.86	-16.02	-16.06	-21.25	-17.39	-12.20	-10.42
270.00	-17.96	-18.74	-17.01	-16.82	-17.11	-22.90	-17.26	-11.84	-10.06
285.00	-17.96	-19.75	-18.25	-18.01	-18.50	-24.83	-17.22	-11.90	-9.81
300.00	-17.96	-20.60	-19.57	-19.09	-19.70	-25.74	-17.68	-12.49	-10.28
315.00	-17.96	-21.21	-20.67	-19.91	-19.93	-24.85	-18.77	-13.50	-10.81
330.00	-17.96	-21.70	-21.01	-20.20	-19.95	-23.97	-20.10	-14.37	-11.27
345.00	-17.96	-21.42	-21.44	-20.06	-19.94	-23.10	-21.57	-15.30	-11.68
360.00	-17.96	-20.84	-21.08	-20.15	-20.26	-22.51	-22.37	-16.10	-12.05

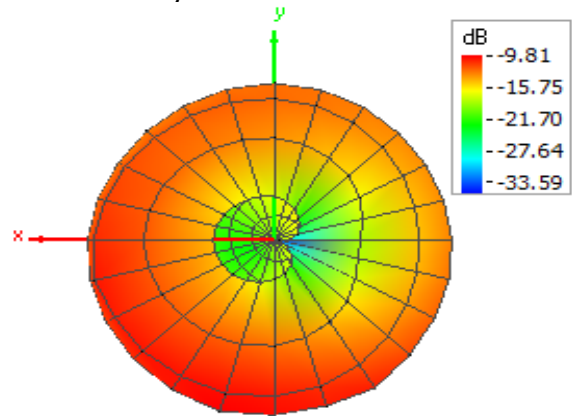
(continuation of the "RP\_923.000\_tot" table from column 10 ...)

Azimuth (deg)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)
0.00	-10.76	-11.75	-14.08
15.00	-11.27	-11.98	-14.33
30.00	-11.58	-12.10	-14.83
45.00	-11.88	-12.43	-15.42
60.00	-12.02	-12.68	-15.83
75.00	-12.08	-12.95	-16.15
90.00	-12.27	-13.20	-16.61
105.00	-12.53	-13.63	-17.69
120.00	-12.96	-14.27	-19.17
135.00	-13.47	-14.93	-21.03
150.00	-13.95	-15.90	-22.62
165.00	-14.29	-16.87	-24.57
180.00	-14.33	-17.68	-27.78
195.00	-14.05	-17.57	-31.59
210.00	-13.48	-16.64	-28.61
225.00	-12.67	-15.25	-24.32
240.00	-11.73	-14.06	-21.18
255.00	-10.86	-13.10	-18.85
270.00	-10.36	-12.43	-17.39
285.00	-10.08	-12.05	-16.10
300.00	-10.20	-11.95	-15.20
315.00	-10.28	-11.99	-14.63
330.00	-10.42	-11.89	-14.33
345.00	-10.27	-11.83	-14.09
360.00	-10.76	-11.75	-14.08

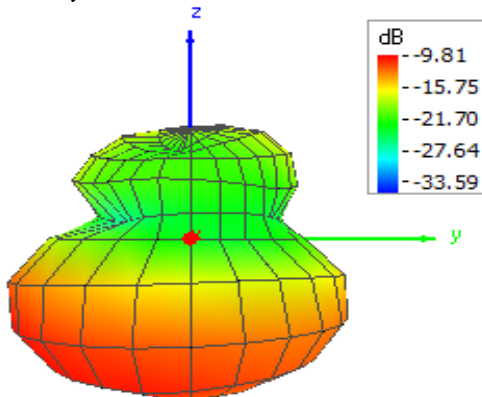
**Theta = 0, Phi = 0**



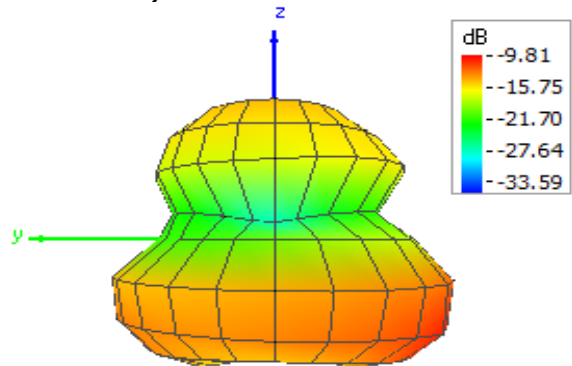
**Theta = 180, Phi = 0**



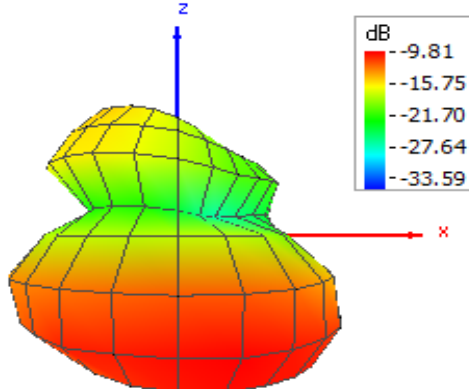
**Theta = 90, Phi = 0**



**Theta = 90, Phi = 180**



**Theta = 90, Phi = 270**



**Theta = 90, Phi = 90**

