

Test Report

OTA Test Results for Frequency 868.000 MHz

OTA Evaluation Results:

Total Radiated Power	-2.09 dBm
Peak EIRP	2.88 dBm
Directivity	4.98 dBi
Efficiency	-2.09 dB
Efficiency	61.74 %
Gain	2.88 dBi
NHPRP 45°	-4.09 dBm
NHPRP 45° / TRP	-1.99 dB
NHPRP 45° / TRP	63.21 %
NHPRP 30°	-5.86 dBm
NHPRP 30° / TRP	-3.77 dB
NHPRP 30° / TRP	42.01 %
NHPRP 22.5°	-7.18 dBm
NHPRP 22.5° / TRP	-5.08 dB
NHPRP 22.5° / TRP	31.04 %
UHRP	-4.58 dBm
UHRP / TRP	-2.49 dB
UHRP / TRP	56.40 %
LHRP	-5.70 dBm
LHRP / TRP	-3.61 dB
LHRP / TRP	43.60 %
Front/Back Ratio	3.59
PhiBW	237.4 deg
PhiBW Up	163.9 deg
PhiBW Down	73.5 deg
ThetaBW	58.9 deg
ThetaBW Up	33.5 deg
ThetaBW Down	25.5 deg
Boresight Phi	240 deg
Boresight Theta	15 deg
Maximum Power	2.88 dBm
Minimum Power	-15.56 dBm
Average Power	-1.35 dBm
Max/Min Ratio	18.44 dB
Max/Avg Ratio	4.23 dB
Min/Avg Ratio	-14.21 dB
Best Single Value	2.29 dBm
Best Position	Phi = 345 deg; Theta = 60 deg; Pol = Ver

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	0.91	0.99	0.30	1.19	2.09	-0.80	0.26	-3.40
15.00	1.06	0.93	-1.09	0.52	0.80	-2.15	-1.93	-5.00
30.00	1.09	0.72	-2.39	-1.11	-1.21	-5.41	-5.07	-8.02
45.00	1.30	-0.18	-3.77	-3.67	-3.88	-9.66	-7.77	-8.95
60.00	1.32	-0.74	-5.03	-6.59	-7.47	-11.83	-7.59	-7.66
75.00	1.28	-1.77	-5.15	-7.71	-9.42	-10.93	-7.32	-7.06
90.00	1.07	-2.33	-4.68	-6.78	-11.60	-10.35	-8.03	-7.04
105.00	0.46	-3.11	-3.51	-5.38	-15.56	-9.04	-9.15	-6.55
120.00	0.32	-2.68	-2.81	-4.40	-15.03	-6.63	-7.88	-5.52
135.00	-0.08	-2.16	-1.57	-3.42	-9.60	-3.73	-5.16	-3.26
150.00	0.08	-1.47	-0.69	-2.21	-6.07	-1.62	-3.50	-1.91
165.00	0.34	-0.23	0.43	-1.17	-3.99	-0.14	-2.64	-1.22
180.00	0.39	0.85	1.07	-0.25	-2.81	0.22	-3.09	-1.17
195.00	0.95	1.69	1.84	0.04	-2.40	-0.16	-4.24	-1.61
210.00	1.27	2.25	2.17	0.35	-2.16	-0.51	-5.19	-2.97
225.00	1.37	2.73	2.38	0.49	-1.87	-1.35	-6.98	-4.12
240.00	1.34	2.88	2.34	0.35	-1.68	-1.88	-7.49	-5.15
255.00	0.84	2.33	1.92	-0.65	-2.13	-3.12	-7.36	-5.31
270.00	0.42	1.70	1.27	-1.71	-2.30	-5.03	-6.28	-5.38
285.00	0.14	1.17	0.72	-2.81	-1.21	-5.78	-3.24	-3.52
300.00	0.26	0.70	0.77	-2.17	0.17	-4.28	-1.01	-2.03
315.00	0.38	0.75	0.83	-0.78	1.33	-1.82	0.25	-0.90
330.00	0.64	0.91	1.21	0.70	2.15	-0.74	1.42	-0.20
345.00	0.93	1.29	0.90	1.47	2.47	-0.05	1.24	-0.49
360.00	1.01	1.25	0.30	1.32	2.19	-0.51	0.68	-2.09

(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	-2.43	-6.37	-6.31	-3.25	-1.10
15.00	-4.05	-6.83	-4.59	-2.78	-1.36
30.00	-4.26	-6.48	-3.44	-1.78	-1.63
45.00	-3.70	-5.44	-2.78	-1.34	-2.39
60.00	-2.66	-4.87	-2.80	-0.71	-2.89
75.00	-2.16	-3.66	-3.18	-0.19	-2.91
90.00	-1.78	-2.72	-2.79	0.37	-2.25
105.00	-1.13	-1.50	-1.43	0.95	-1.33
120.00	-0.55	-0.50	-0.35	1.49	-0.71
135.00	0.03	-0.02	0.36	1.54	-0.03
150.00	0.04	-0.22	0.50	1.48	0.09
165.00	-0.39	-0.91	0.06	1.04	-0.12
180.00	-1.49	-1.59	-0.61	0.37	-0.66
195.00	-3.08	-2.73	-1.34	-0.10	-1.01
210.00	-4.87	-3.48	-2.18	-0.67	-1.20
225.00	-6.16	-4.21	-2.79	-1.68	-1.83
240.00	-6.60	-4.70	-3.27	-2.43	-1.96
255.00	-5.55	-4.14	-3.35	-3.56	-2.25
270.00	-3.66	-4.00	-3.81	-3.73	-1.98
285.00	-1.96	-3.31	-3.41	-4.33	-1.26
300.00	-1.00	-3.09	-4.06	-4.46	-1.27
315.00	-0.33	-3.03	-4.53	-5.09	-1.35
330.00	-0.42	-3.79	-6.19	-5.54	-1.17
345.00	-0.82	-4.70	-6.64	-5.27	-1.36
360.00	-2.05	-5.84	-6.54	-4.34	-1.35

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	-11.65	-15.16	-15.36	-13.12	-15.05	-18.67	-11.78	-13.50
15.0	-5.67	-7.75	-10.11	-8.32	-14.43	-18.76	-11.57	-11.41
30.0	-2.62	-4.18	-6.60	-6.30	-12.96	-19.44	-10.46	-10.63
45.0	-0.64	-2.72	-5.04	-6.34	-11.43	-17.49	-9.90	-10.35
60.0	0.49	-2.05	-5.44	-7.63	-13.34	-14.29	-9.49	-10.22
75.0	0.97	-2.32	-6.33	-9.12	-14.30	-12.23	-9.42	-9.59
90.0	0.78	-2.92	-8.18	-10.11	-16.54	-11.60	-9.26	-8.26
105.0	-0.34	-5.43	-10.94	-10.94	-19.13	-11.25	-9.73	-7.36
120.0	-1.63	-8.01	-14.55	-10.63	-20.20	-11.76	-10.23	-7.99
135.0	-4.80	-12.91	-16.74	-12.22	-19.57	-12.09	-10.91	-8.20
150.0	-9.29	-16.14	-14.54	-13.34	-15.15	-12.25	-12.29	-9.29
165.0	-15.87	-9.94	-9.75	-12.12	-12.01	-10.91	-12.80	-11.81
180.0	-9.90	-5.53	-6.55	-10.77	-9.68	-9.73	-13.46	-13.39
195.0	-4.78	-2.57	-4.12	-8.14	-7.24	-9.36	-14.42	-14.98
210.0	-2.19	-0.93	-2.20	-6.10	-5.71	-8.32	-13.56	-15.40
225.0	-0.41	0.55	-0.85	-4.54	-4.49	-8.90	-13.16	-15.11
240.0	0.51	1.50	0.07	-3.04	-3.42	-9.21	-12.28	-14.36
255.0	0.63	1.66	0.72	-2.72	-3.50	-9.18	-12.29	-12.23
270.0	0.36	1.48	0.84	-2.52	-3.38	-10.23	-12.26	-11.74
285.0	-0.59	0.95	0.56	-3.01	-3.47	-11.59	-11.88	-10.58
300.0	-1.84	-0.47	-0.23	-4.19	-4.30	-13.28	-11.04	-10.27
315.0	-4.40	-2.55	-1.99	-6.44	-5.89	-15.94	-11.78	-11.13
330.0	-8.13	-5.75	-4.64	-10.11	-8.32	-17.91	-11.35	-13.25
345.0	-17.68	-13.35	-9.35	-18.75	-11.50	-18.94	-11.49	-15.12
360.0	-13.19	-21.07	-15.43	-14.46	-15.17	-17.87	-11.60	-14.02

(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	-10.78	-9.89	-17.87	-15.23	-11.83
15.0	-8.50	-8.07	-19.04	-12.47	-12.68
30.0	-7.31	-8.02	-17.34	-8.37	-11.33
45.0	-6.52	-7.73	-11.88	-5.75	-8.58
60.0	-5.50	-7.09	-7.89	-3.12	-6.01
75.0	-4.04	-4.90	-5.23	-1.08	-4.02
90.0	-2.68	-3.28	-3.14	0.13	-2.50
105.0	-1.61	-2.11	-1.68	0.88	-1.61
120.0	-1.54	-1.97	-1.35	1.08	-1.44
135.0	-1.69	-2.65	-1.71	0.45	-1.52
150.0	-2.97	-5.27	-3.05	-0.57	-2.29
165.0	-4.55	-8.63	-5.22	-2.47	-3.98
180.0	-7.24	-14.76	-6.60	-4.65	-6.76
195.0	-9.99	-18.46	-7.56	-6.55	-10.15
210.0	-11.94	-13.05	-7.12	-7.54	-10.74
225.0	-12.30	-9.68	-6.36	-8.16	-8.12
240.0	-12.61	-9.05	-6.05	-7.39	-5.28
255.0	-10.49	-7.97	-5.69	-7.69	-3.87
270.0	-9.15	-7.87	-6.39	-7.11	-2.77
285.0	-8.75	-8.13	-6.80	-7.80	-2.04
300.0	-9.21	-9.47	-7.74	-8.45	-2.39
315.0	-10.33	-12.14	-9.59	-10.13	-3.45
330.0	-12.63	-15.20	-12.28	-13.18	-4.75
345.0	-13.14	-13.00	-16.30	-15.86	-7.32
360.0	-11.14	-9.72	-19.58	-16.66	-10.33

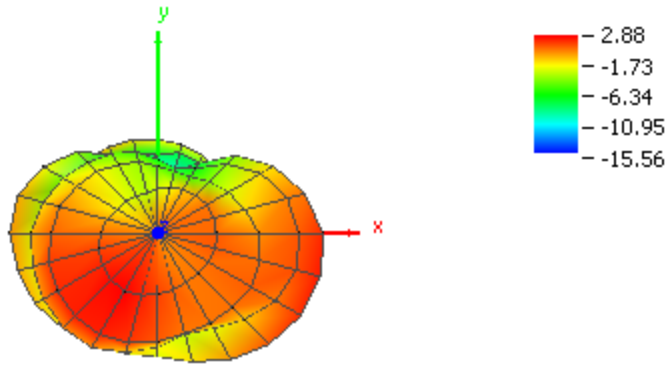
RP_868.000_ver

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	0.66	0.88	0.18	1.03	2.00	-0.87	-0.02	-3.85
15.0	0.02	0.30	-1.67	-0.08	0.67	-2.24	-2.43	-6.13
30.0	-1.31	-0.98	-4.46	-2.67	-1.51	-5.58	-6.56	-11.47
45.0	-3.14	-3.72	-9.71	-7.05	-4.71	-10.44	-11.87	-14.53
60.0	-6.27	-6.56	-15.44	-13.29	-8.77	-15.46	-12.08	-11.18
75.0	-10.38	-10.97	-11.39	-13.27	-11.13	-16.81	-11.48	-10.62
90.0	-10.72	-11.31	-7.26	-9.49	-13.27	-16.38	-14.13	-13.16
105.0	-7.32	-6.94	-4.37	-6.80	-18.08	-13.03	-18.17	-14.28
120.0	-4.10	-4.19	-3.11	-5.59	-16.60	-8.23	-11.67	-9.15
135.0	-1.87	-2.54	-1.70	-4.03	-10.06	-4.42	-6.50	-4.94
150.0	-0.45	-1.62	-0.87	-2.56	-6.65	-2.01	-4.11	-2.79
165.0	0.24	-0.72	-0.01	-1.53	-4.73	-0.52	-3.08	-1.62
180.0	-0.03	-0.29	0.25	-0.65	-3.81	-0.25	-3.51	-1.43
195.0	-0.40	-0.35	0.57	-0.68	-4.12	-0.71	-4.68	-1.81
210.0	-1.33	-0.59	0.20	-0.77	-4.68	-1.30	-5.87	-3.22
225.0	-3.35	-1.31	-0.42	-1.15	-5.31	-2.19	-8.17	-4.48
240.0	-6.25	-2.76	-1.57	-2.32	-6.48	-2.77	-9.25	-5.70
255.0	-12.43	-6.07	-4.25	-4.86	-7.81	-4.36	-9.04	-6.29
270.0	-18.79	-11.34	-8.97	-9.39	-8.86	-6.59	-7.54	-6.52
285.0	-7.95	-11.91	-13.68	-16.44	-5.13	-7.10	-3.88	-4.47
300.0	-3.91	-5.57	-6.12	-6.47	-1.75	-4.86	-1.47	-2.74
315.0	-1.39	-1.99	-2.37	-2.16	0.42	-1.99	-0.03	-1.33
330.0	0.02	-0.15	-0.10	0.32	1.74	-0.82	1.18	-0.42
345.0	0.87	1.14	0.46	1.43	2.29	-0.11	1.00	-0.64
360.0	0.84	1.23	0.19	1.20	2.11	-0.59	0.42	-2.38

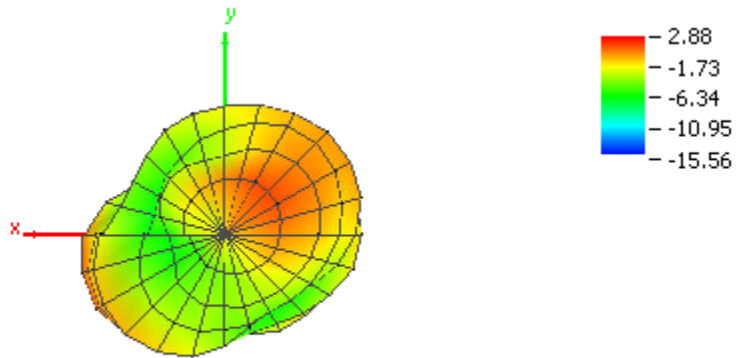
(continuation of the "RP_868.000_ver" table from column 9 ...)

Azimuth (deg)	Elevation 120 deg (dB)	Elevation 135 deg (dB)	Elevation 150 deg (dB)	Elevation 165 deg (dB)	Elevation 180 deg (dB)
0.0	-3.12	-8.91	-6.63	-3.53	-1.49
15.0	-5.98	-12.89	-4.75	-3.28	-1.69
30.0	-7.23	-11.73	-3.62	-2.85	-2.12
45.0	-6.91	-9.32	-3.35	-3.30	-3.58
60.0	-5.84	-8.84	-4.41	-4.42	-5.80
75.0	-6.71	-9.70	-7.41	-7.51	-9.36
90.0	-9.05	-11.87	-13.93	-12.30	-14.85
105.0	-10.89	-10.32	-13.91	-17.26	-13.46
120.0	-7.46	-5.94	-7.24	-8.95	-8.79
135.0	-4.81	-3.44	-3.85	-5.00	-5.42
150.0	-2.97	-1.85	-2.04	-2.76	-3.67
165.0	-2.48	-1.72	-1.46	-1.53	-2.41
180.0	-2.84	-1.81	-1.86	-1.27	-1.89
195.0	-4.07	-2.85	-2.53	-1.22	-1.57
210.0	-5.82	-3.99	-3.86	-1.67	-1.71
225.0	-7.38	-5.66	-5.31	-2.79	-2.99
240.0	-7.85	-6.69	-6.52	-4.10	-4.69
255.0	-7.22	-6.47	-7.16	-5.67	-7.31
270.0	-5.10	-6.29	-7.31	-6.40	-9.72
285.0	-2.98	-5.05	-6.07	-6.93	-9.13
300.0	-1.71	-4.23	-6.48	-6.68	-7.70
315.0	-0.78	-3.60	-6.16	-6.72	-5.53
330.0	-0.69	-4.11	-7.42	-6.36	-3.68
345.0	-1.08	-5.39	-7.13	-5.67	-2.63
360.0	-2.62	-8.13	-6.76	-4.61	-1.94

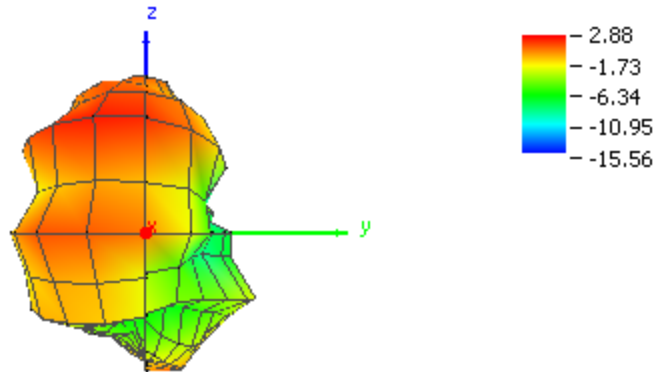
Theta = 0, Phi = 0



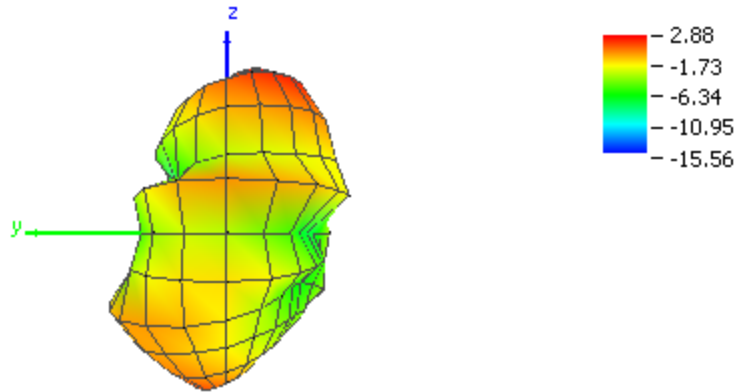
Theta = 180, Phi = 0



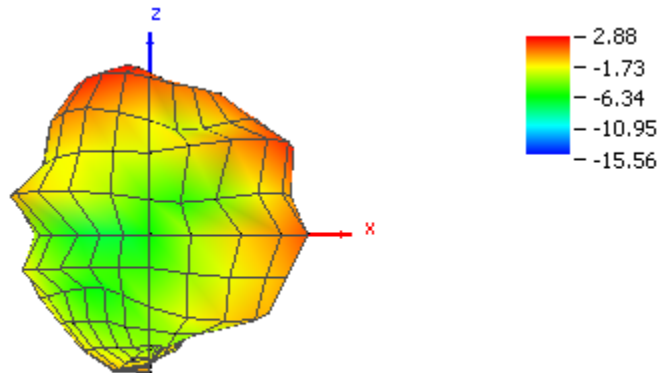
Theta = 90, Phi = 0



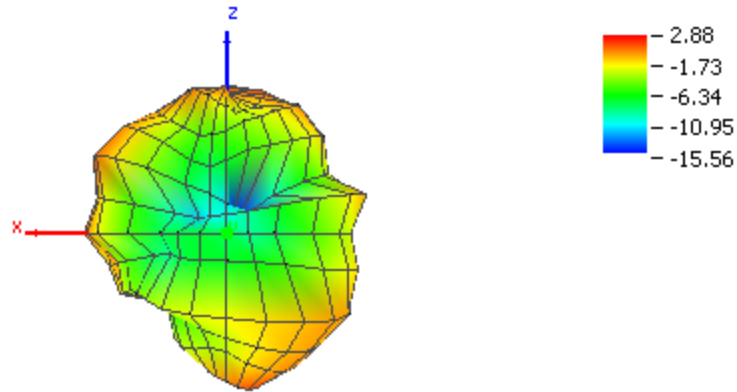
Theta = 90, Phi = 180



Theta = 90, Phi = 270



Theta = 90, Phi = 90



Document History

Revision	Date	Description/Changes
SWRA330	2010-08-12	Initial release. Chip antenna had to be positioned towards GND cavity for correct resonance at 868 MHz.
SWRA330A	2010-10-13	Updated BOM to Rev 1.0.3. – Changed match for board 4 so resonance at 868 MHz is achieved without moving chip antenna.

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