

NeoLab NWP-F40 BT ANT Passive Data 2022.10.07

RADINA Co., Ltd
MobiAn Inc.

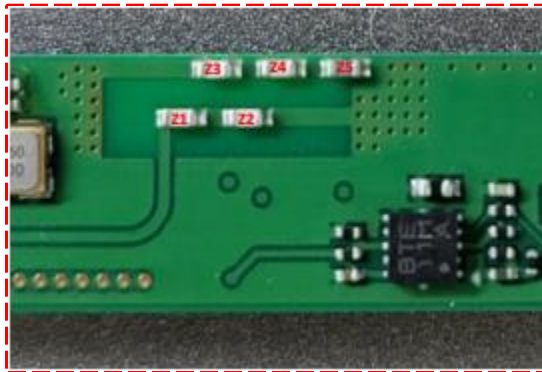
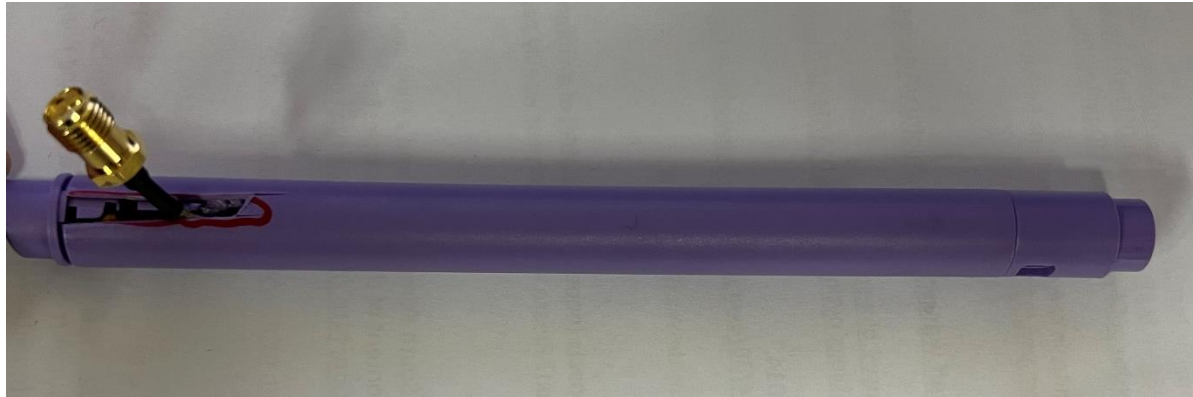
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3. Tuned Antenna Design

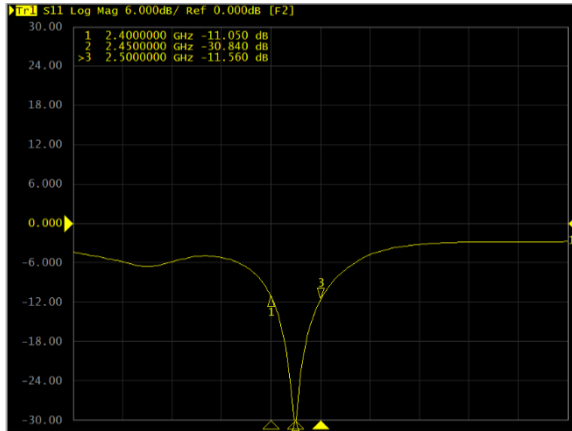


Reference

- Z1 : 1.0 pF
- Z2 : 1.5 pF
- Z3 : 1.0 pF**
- Z4 : 1.2 pF
- Z5 : 2.0 pF

4. Tuned Antenna Measurement Data (#1 normal)

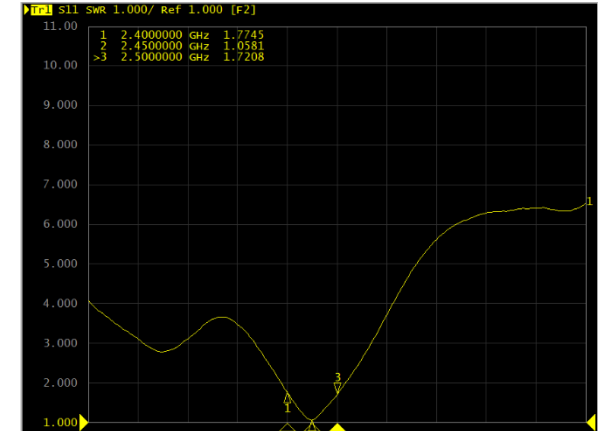
S11



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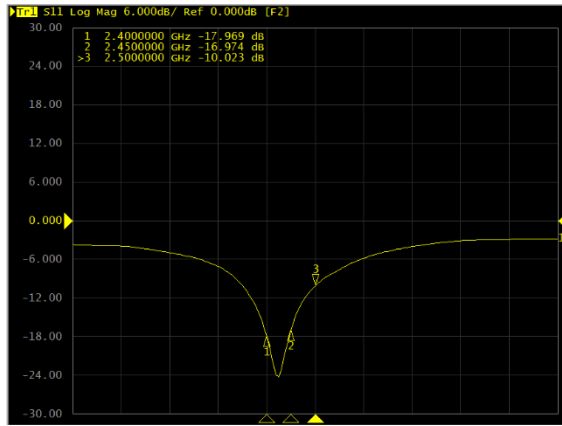
Efficiency

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Frequency(MHz)	2400	2405	2410	2415	2420	2425	2430	2435	2440	2445	2450	2455	2460	2465	2470	2475	2480	2485	2490	2497
Efficiency(dB)	-3.45	-3.37	-3.31	-3.25	-3.24	-3.28	-3.08	-3.05	-3.02	-3.06	-3.30	-3.36	-3.43	-3.53	-3.45	-3.68	-3.95	-4.53	-4.73	-4.70
Efficiency(%)	45.2	46.0	46.7	47.4	47.5	47.0	49.2	49.6	49.9	49.5	46.8	46.1	45.4	44.3	45.2	42.8	40.3	35.3	33.6	33.9
TRG_θ [dB]	-5.38	-5.21	-5.08	-4.96	-4.94	-4.96	-4.65	-4.54	-4.51	-4.47	-4.68	-4.63	-4.71	-4.76	-4.62	-4.84	-5.01	-5.59	-5.77	-5.66
Gain_{θ Peak} [dB]	1.52	1.95	2.12	2.23	2.28	2.44	2.63	2.73	2.76	2.87	2.60	2.65	2.46	2.43	2.52	2.30	2.07	1.42	1.46	1.25
Gain_{θ Min} [dB]	-17.40	-16.83	-17.46	-17.21	-16.19	-18.47	-16.85	-18.35	-18.54	-18.49	-18.49	-19.82	-18.41	-18.63	-20.17	-20.20	-21.28	-20.13	-20.46	-21.02
TRG_φ [dB]	-7.91	-7.98	-8.05	-8.12	-8.11	-8.22	-8.28	-8.41	-8.39	-8.63	-8.96	-9.31	-9.35	-9.62	-9.73	-10.00	-10.59	-11.15	-11.47	-11.70
Gain_{φ Peak} [dB]	-0.91	-0.65	-0.80	-0.51	-0.69	-0.48	-0.40	-0.37	-0.57	-0.74	-0.61	-1.16	-1.21	-1.15	-1.15	-1.64	-2.17	-2.59	-3.06	-3.74
Gain_{φ Min} [dB]	-28.38	-37.53	-31.98	-26.51	-24.65	-27.23	-30.63	-28.32	-29.40	-37.21	-25.93	-24.87	-26.86	-26.50	-27.81	-28.54	-28.94	-38.28	-40.92	-30.46
UHRG [dB]	-8.06	-8.06	-7.97	-7.91	-7.92	-8.01	-7.78	-7.81	-7.79	-7.83	-8.06	-8.11	-8.19	-8.27	-8.16	-8.43	-8.68	-9.19	-9.42	-9.33
UHRG/TRG [%]	34.6	33.9	34.2	34.2	34.0	33.7	33.9	33.4	33.3	33.4	33.5	33.4	33.5	33.6	33.8	33.5	33.6	34.2	33.9	34.4
H-Plane	-11.17	-11.08	-11.40	-11.25	-11.32	-11.69	-11.16	-11.46	-11.51	-11.65	-11.74	-12.05	-12.30	-12.59	-12.41	-12.99	-12.87	-13.59	-14.15	-13.89
E1-Plane, AVG [dB]	-5.07	-4.86	-4.76	-4.69	-4.72	-4.80	-4.45	-4.35	-4.43	-4.51	-4.52	-4.70	-4.76	-4.76	-4.64	-4.81	-5.03	-5.60	-5.84	-5.72
E2-Plane, AVG [dB]	-4.83	-4.76	-4.64	-4.41	-4.34	-4.40	-4.10	-3.95	-3.91	-3.85	-4.08	-4.11	-4.16	-4.32	-4.11	-4.27	-4.50	-5.00	-5.28	-5.16
Peak Gain [dB]	1.73	2.12	2.29	2.37	2.40	2.57	2.72	2.85	2.89	2.96	2.70	2.73	2.55	2.51	2.60	2.41	2.14	1.50	1.52	1.32
Directivity [dB]	5.18	5.48	5.59	5.61	5.64	5.85	5.80	5.90	5.91	6.02	6.00	6.09	5.98	6.04	6.05	6.09	6.09	6.03	6.25	6.02
Minimum Gain [dB]	-15.08	-13.78	-14.37	-12.99	-12.99	-14.03	-13.54	-12.65	-13.37	-12.79	-13.74	-14.30	-14.46	-15.02	-16.65	-16.32	-18.71	-16.07	-18.71	-19.10
Average Efficiency	-3.51 dB,		44.58%																	

4. Tuned Antenna Measurement Data (#1 In hand)



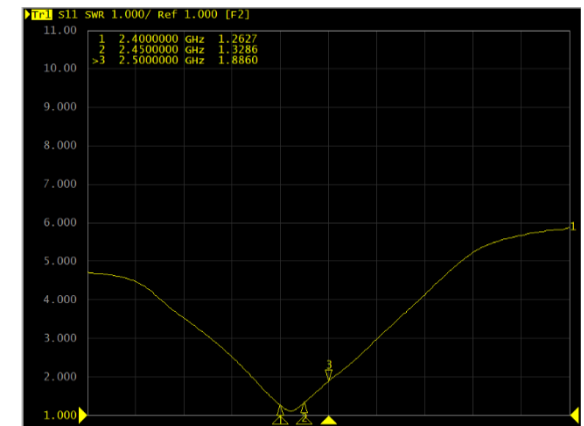
S11



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Efficiency

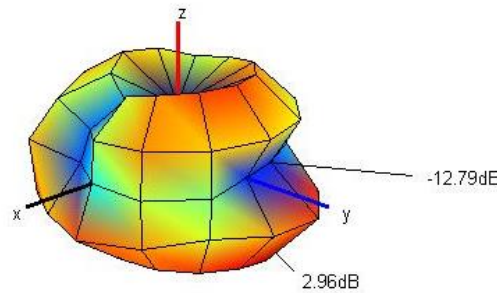
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Frequency(MHz)	2400	2405	2410	2415	2420	2425	2430	2435	2440	2445	2450	2455	2460	2465	2470	2475	2480	2485	2490	2497
Efficiency(dB)	-6.88	-6.82	-6.94	-6.95	-7.06	-7.08	-6.93	-6.92	-7.16	-7.26	-7.58	-7.68	-7.87	-7.93	-8.01	-8.39	-8.78	-9.27	-9.36	-9.53
Efficiency(%)	20.5	20.8	20.2	20.2	19.7	19.6	20.3	20.3	19.2	18.8	17.5	17.1	16.3	16.1	15.8	14.5	13.2	11.8	11.6	11.1
TRG_θ [dB]	-10.58	-10.38	-10.43	-10.38	-10.39	-10.37	-10.05	-9.93	-10.27	-10.19	-10.50	-10.48	-10.67	-10.60	-10.62	-10.98	-11.29	-11.83	-11.78	-11.84
Gain_{θ Peak} [dB]	-5.23	-5.28	-5.19	-5.20	-5.10	-5.15	-5.03	-4.53	-5.30	-4.85	-5.26	-5.44	-5.34	-6.05	-5.42	-6.05	-6.53	-6.72	-6.98	-7.04
Gain_{θ Min} [dB]	-23.03	-24.07	-26.51	-29.38	-31.44	-25.39	-28.68	-28.22	-27.50	-25.97	-32.95	-33.60	-33.17	-30.38	-32.38	-37.83	-34.83	-33.78	-32.43	-33.15
TRG_φ [dB]	-9.30	-9.35	-9.52	-9.57	-9.77	-9.82	-9.83	-9.92	-10.08	-10.36	-10.68	-10.91	-11.11	-11.30	-11.45	-11.87	-12.35	-12.78	-13.05	-13.39
Gain_{φ Peak} [dB]	-2.95	-2.94	-3.36	-3.20	-3.27	-3.32	-3.20	-3.37	-3.78	-3.73	-4.40	-4.63	-4.52	-4.71	-4.62	-5.23	-5.47	-5.81	-6.12	-6.78
Gain_{φ Min} [dB]	-26.46	-24.92	-21.20	-21.17	-23.11	-25.31	-24.55	-27.15	-29.42	-33.48	-26.88	-26.89	-29.31	-26.50	-30.43	-24.27	-27.71	-27.62	-28.58	-35.72
UHRG [dB]	-10.96	-10.85	-10.87	-10.90	-11.14	-11.03	-10.88	-10.85	-11.10	-11.23	-11.48	-11.48	-11.81	-11.77	-11.82	-12.20	-12.52	-13.07	-13.06	-13.20
UHRG/TRG [%]	39.1	39.6	40.5	40.2	39.1	40.2	40.3	40.4	40.4	40.1	40.7	41.6	40.4	41.3	41.5	41.6	42.3	41.7	42.6	43.0
H-Plane	-10.39	-10.08	-10.17	-10.23	-10.18	-10.06	-9.85	-9.69	-10.00	-9.84	-10.40	-10.32	-10.58	-10.63	-10.86	-11.06	-11.45	-12.11	-12.06	-12.16
E1-Plane, AVG [dB]	-10.21	-10.17	-10.25	-9.99	-9.90	-9.85	-9.71	-9.48	-9.93	-9.84	-10.03	-10.11	-10.22	-10.35	-10.24	-10.67	-10.80	-11.73	-11.58	-11.37
E2-Plane, AVG [dB]	-10.36	-10.29	-10.33	-10.39	-10.34	-10.39	-10.18	-10.14	-10.35	-10.30	-10.64	-10.71	-11.00	-10.82	-11.00	-11.25	-11.63	-12.19	-12.32	-12.39
Peak Gain [dB]	-2.43	-2.44	-2.60	-2.56	-2.53	-2.42	-2.41	-2.36	-2.60	-2.81	-2.76	-3.30	-3.59	-3.64	-3.70	-3.97	-4.40	-4.72	-5.03	-5.24
Directivity [dB]	4.46	4.39	4.34	4.39	4.53	4.66	4.52	4.56	4.56	4.45	4.82	4.38	4.28	4.29	4.31	4.42	4.38	4.55	4.33	4.29
Minimum Gain [dB]	-16.77	-16.83	-17.55	-17.35	-15.82	-18.04	-16.27	-15.97	-16.33	-18.15	-18.81	-18.08	-17.53	-18.57	-19.70	-18.91	-20.63	-22.84	-21.97	-24.43
Average Efficiency	-7.64 dB, 17.23%																			

4. Tuned Antenna Measurement Data (#1)

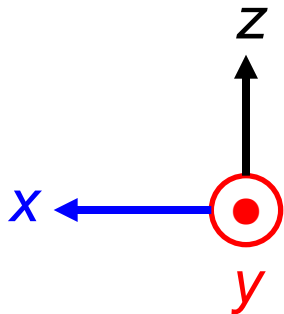
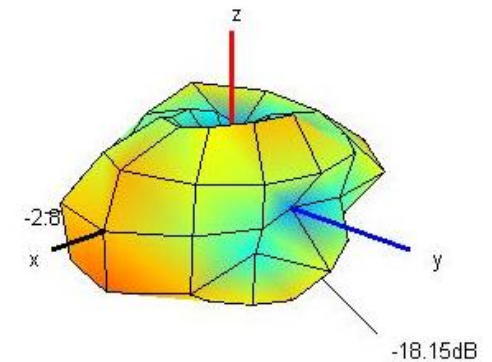
3D Plot (2445 GHz)



normal



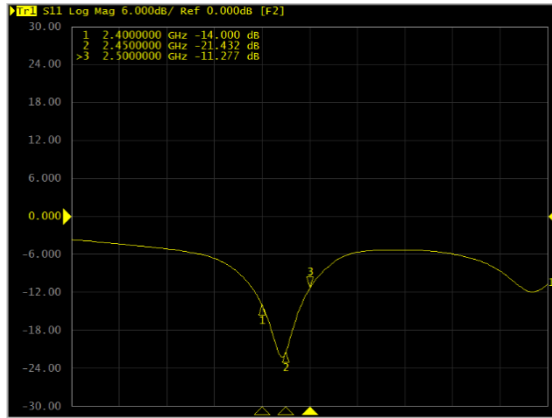
In hand



4. Tuned Antenna Measurement Data (#2 normal)



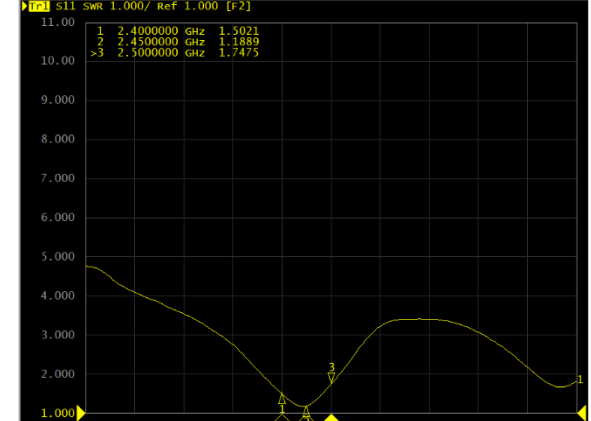
S11



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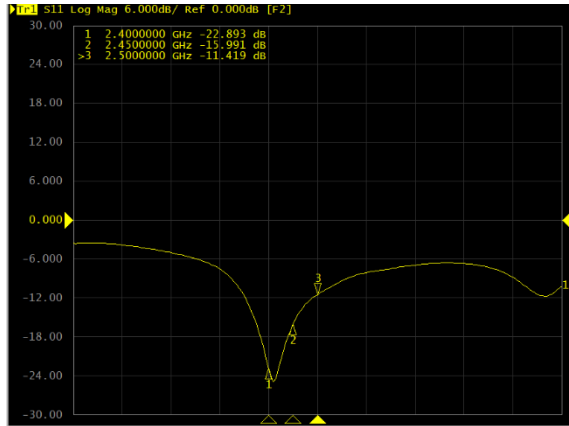
Efficiency

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Frequency(MHz)	2400	2405	2410	2415	2420	2425	2430	2435	2440	2445	2450	2455	2460	2465	2470	2475	2480	2485	2490	2497
Efficiency(dB)	-3.51	-3.43	-3.34	-3.23	-3.30	-3.38	-3.18	-3.10	-3.07	-3.05	-3.26	-3.46	-3.69	-3.76	-3.63	-3.80	-4.10	-4.78	-5.24	-5.30
Efficiency(%)	44.6	45.4	46.3	47.5	46.8	45.9	48.1	49.0	49.3	49.5	47.2	45.1	42.8	42.1	43.3	41.6	38.9	33.3	29.9	29.5
TRG _θ [dB]	-4.79	-4.66	-4.52	-4.38	-4.41	-4.50	-4.23	-4.08	-4.05	-4.01	-4.16	-4.33	-4.55	-4.61	-4.43	-4.59	-4.84	-5.55	-6.00	-6.02
Gain _{θ Peak} [dB]	1.56	1.92	2.06	2.37	2.31	2.33	2.49	2.73	2.89	2.96	2.77	2.50	2.35	2.25	2.42	2.35	1.86	1.37	0.98	0.77
Gain _{θ Min} [dB]	-18.93	-18.64	-19.32	-19.58	-18.97	-20.81	-20.55	-19.33	-19.34	-24.13	-23.11	-25.05	-24.77	-28.64	-24.32	-31.34	-28.68	-25.81	-31.49	-29.83
TRG _φ [dB]	-9.46	-9.53	-9.57	-9.58	-9.76	-9.82	-9.87	-10.04	-10.01	-10.08	-10.54	-10.90	-11.12	-11.25	-11.36	-11.62	-12.14	-12.64	-13.19	-13.47
Gain _{φ Peak} [dB]	-3.75	-4.13	-3.66	-3.58	-3.68	-3.45	-3.67	-3.31	-3.18	-2.87	-3.86	-3.98	-4.19	-4.43	-4.03	-4.44	-5.15	-5.14	-6.44	-6.86
Gain _{φ Min} [dB]	-27.65	-24.97	-27.72	-28.56	-28.39	-25.65	-27.05	-27.45	-24.18	-26.60	-31.70	-24.48	-29.88	-28.13	-25.38	-31.63	-35.31	-31.72	-29.59	-39.15
UHRG [dB]	-7.82	-7.72	-7.65	-7.52	-7.59	-7.72	-7.48	-7.41	-7.43	-7.37	-7.56	-7.80	-7.92	-8.04	-7.88	-8.12	-8.38	-9.06	-9.51	-9.55
UHRG/TRG [%]	37.0	37.3	37.1	37.2	37.2	36.8	37.1	37.1	36.7	37.0	37.2	36.8	37.7	37.4	37.6	37.0	37.4	37.3	37.4	37.6
H-Plane	-9.97	-10.03	-9.88	-9.80	-9.89	-10.17	-9.93	-10.07	-10.13	-10.05	-10.44	-10.78	-11.30	-11.51	-11.60	-11.76	-12.20	-13.47	-13.40	-13.80
E1-Plane, AVG [dB]	-4.38	-4.41	-4.25	-4.05	-4.05	-4.21	-4.05	-3.95	-3.85	-3.88	-4.02	-4.23	-4.60	-4.71	-4.40	-4.62	-4.88	-5.65	-5.98	-6.07
E2-Plane, AVG [dB]	-4.72	-4.61	-4.49	-4.33	-4.30	-4.32	-4.08	-3.91	-3.89	-3.83	-3.99	-4.13	-4.19	-4.28	-4.20	-4.33	-4.54	-5.31	-5.72	-5.76
Peak Gain [dB]	1.91	2.20	2.42	2.68	2.60	2.60	2.75	2.98	3.11	3.20	3.00	2.72	2.56	2.45	2.59	2.55	2.06	1.55	1.15	0.98
Directivity [dB]	5.42	5.63	5.76	5.91	5.90	5.98	5.93	6.08	6.18	6.25	6.26	6.18	6.25	6.21	6.22	6.35	6.16	6.33	6.40	6.29
Minimum Gain [dB]	-14.70	-14.72	-14.44	-15.47	-15.75	-16.32	-15.95	-16.55	-17.11	-16.04	-16.45	-16.53	-17.94	-20.54	-18.16	-18.24	-21.23	-20.82	-20.69	-24.24
Average Efficiency	-3.64 dB, 43.30%																			

4. Tuned Antenna Measurement Data (#2 In hand)



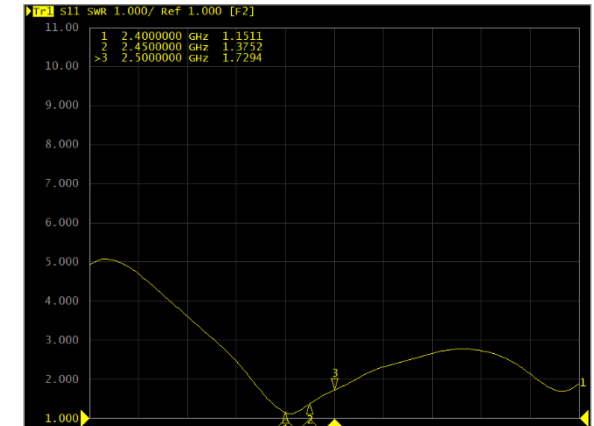
S11



SC



SWR



Efficiency

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Frequency(MHz)	2400	2405	2410	2415	2420	2425	2430	2435	2440	2445	2450	2455	2460	2465	2470	2475	2480	2485	2490	2497
Efficiency(dB)	-7.20	-7.22	-7.21	-7.29	-7.43	-7.50	-7.31	-7.18	-7.29	-7.42	-7.72	-7.92	-8.13	-8.10	-8.07	-8.29	-8.60	-9.29	-9.58	-9.74
Efficiency(%)	19.0	18.9	19.0	18.7	18.1	17.8	18.6	19.2	18.7	18.1	16.9	16.1	15.4	15.5	15.6	14.8	13.8	11.8	11.0	10.6
TRG_θ [dB]	-10.11	-10.07	-10.01	-10.10	-10.25	-10.40	-10.10	-9.92	-10.04	-10.22	-10.53	-10.68	-10.91	-10.94	-10.94	-11.17	-11.46	-12.27	-12.56	-12.64
Gain_{θ Peak} [dB]	-5.10	-4.82	-4.62	-4.63	-4.61	-4.93	-3.99	-4.24	-3.56	-4.20	-4.62	-4.50	-4.67	-4.64	-4.59	-4.86	-5.16	-5.78	-6.17	-6.17
Gain_{θ Min} [dB]	-38.81	-38.06	-26.97	-44.26	-31.22	-28.68	-31.30	-34.46	-37.11	-36.68	-39.67	-37.41	-35.07	-34.23	-31.63	-38.72	-34.19	-39.23	-41.42	-33.47
TRG_φ [dB]	-10.32	-10.41	-10.43	-10.51	-10.63	-10.62	-10.55	-10.47	-10.57	-10.64	-10.93	-11.21	-11.39	-11.30	-11.23	-11.43	-11.77	-12.33	-12.62	-12.85
Gain_{φ Peak} [dB]	-4.25	-4.27	-4.61	-4.81	-4.46	-5.11	-4.96	-4.84	-4.93	-5.10	-4.96	-5.26	-5.51	-5.24	-5.26	-4.78	-5.60	-6.31	-5.96	-6.42
Gain_{φ Min} [dB]	-28.26	-27.19	-24.23	-30.23	-28.24	-29.08	-27.61	-29.15	-35.75	-35.29	-31.42	-29.15	-45.08	-29.78	-38.07	-30.52	-29.62	-32.08	-40.89	-31.62
UHRG [dB]	-10.41	-10.47	-10.48	-10.57	-10.78	-10.81	-10.63	-10.51	-10.66	-10.80	-11.15	-11.32	-11.61	-11.57	-11.57	-11.74	-12.06	-12.80	-13.13	-13.28
UHRG/TRG [%]	47.8	47.3	47.0	46.9	46.2	46.6	46.5	46.4	46.0	45.9	45.3	45.8	44.9	45.0	44.7	45.2	45.1	44.5	44.1	44.2
H-Plane	-12.26	-12.03	-12.06	-12.36	-12.59	-12.46	-12.39	-11.97	-11.84	-12.15	-12.42	-12.39	-12.83	-12.81	-12.73	-13.31	-13.18	-14.02	-14.64	-14.50
E1-Plane, AVG [dB]	-9.24	-9.15	-9.14	-9.18	-9.21	-9.39	-9.23	-9.14	-9.27	-9.28	-9.68	-9.75	-10.21	-10.23	-9.98	-10.33	-10.79	-11.39	-11.82	-12.02
E2-Plane, AVG [dB]	-10.16	-10.06	-10.04	-10.12	-10.58	-10.59	-10.39	-10.14	-10.36	-10.55	-10.70	-10.91	-11.24	-11.25	-11.24	-11.42	-11.92	-12.71	-13.02	-12.81
Peak Gain [dB]	-3.08	-2.84	-2.71	-2.56	-2.76	-2.87	-2.69	-2.39	-2.58	-2.32	-2.79	-2.99	-2.94	-2.90	-2.74	-3.14	-3.48	-3.86	-4.24	-4.63
Directivity [dB]	4.12	4.39	4.50	4.73	4.67	4.63	4.61	4.79	4.71	5.09	4.93	4.93	5.19	5.20	5.33	5.15	5.13	5.43	5.33	5.11
Minimum Gain [dB]	-14.88	-14.81	-15.34	-14.89	-15.12	-16.39	-15.83	-15.84	-16.02	-16.97	-18.53	-18.48	-18.21	-20.02	-20.21	-20.85	-21.16	-21.40	-20.94	-19.91
Average Efficiency	-7.86 dB, 16.38%																			

4. Tuned Antenna Measurement Data (#2)

3D Plot (2445 GHz)

normal

In hand

