UANT®
好 天 线 · 优 比 造

东莞市优比电子有限公司

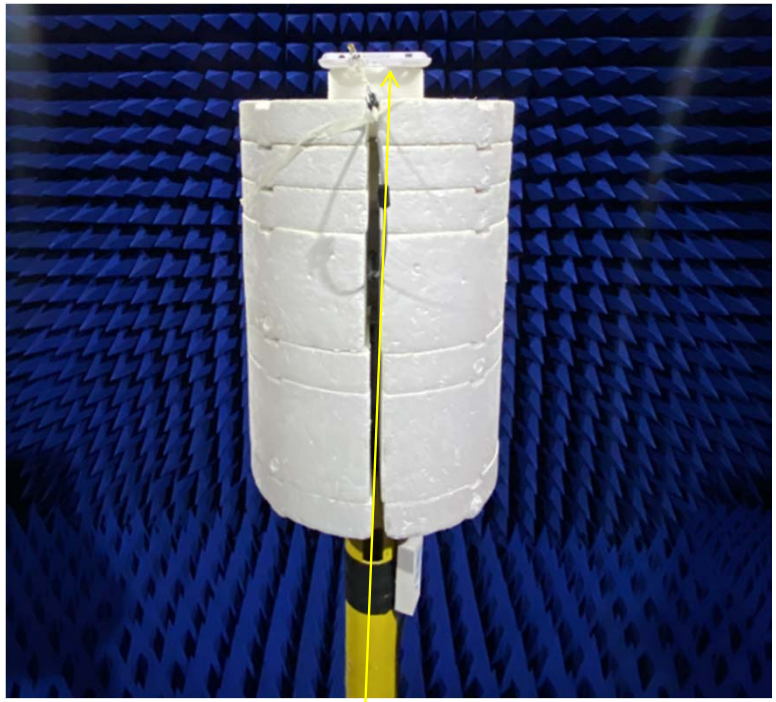
Dongguan UB Electronics Co.,Ltd

Room 101, Building 2, No. 9 Xinfa Road, Lincun, Tangxia Town, Dongguan City, Guangdong Province, China

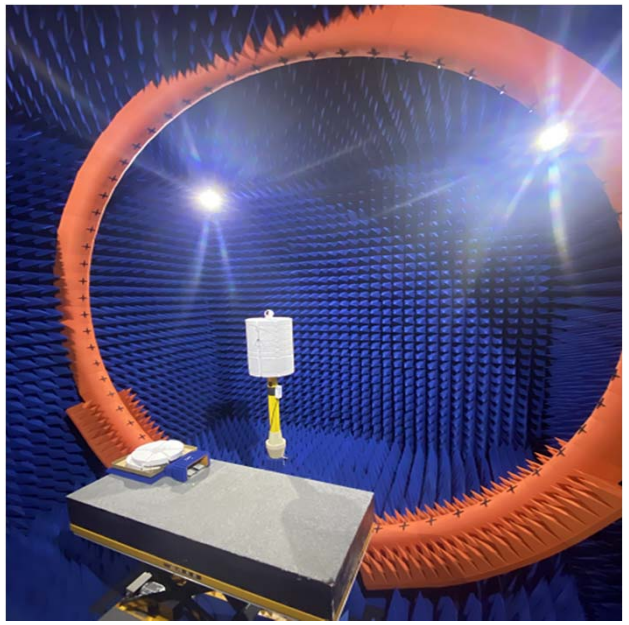
Antenna Study

- **Client Name:34ED LLC, DBA Centegix**
- **Project Name:Hub**
- **Debugging frequency band: 2.4G/BT+WIFI**
- **Valuation date： 2023.07.25**

PCB Antenna & Internal Antenna



Testing environment

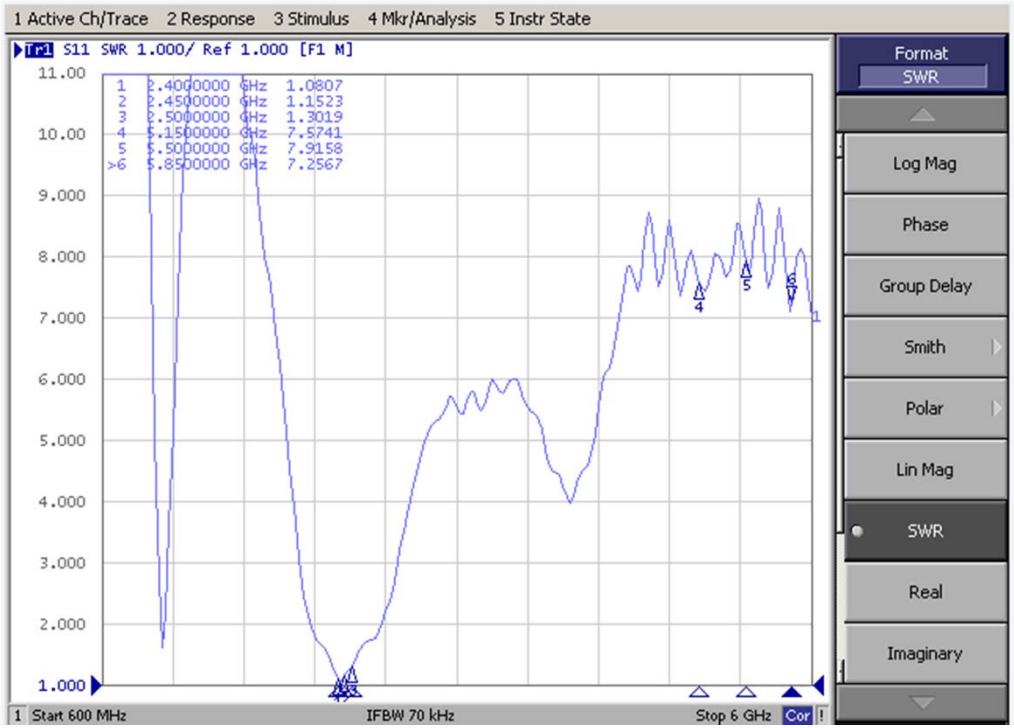


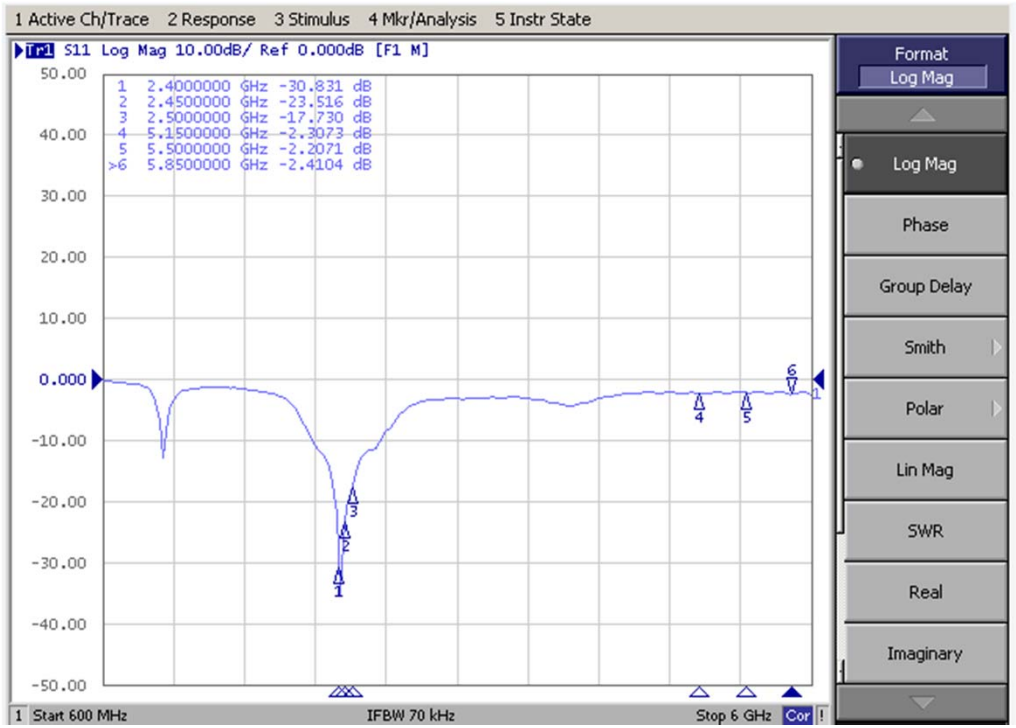
Testing 3D microwave darkroom(6m*6m*6m)

PCB Antenna & Internal Antenna

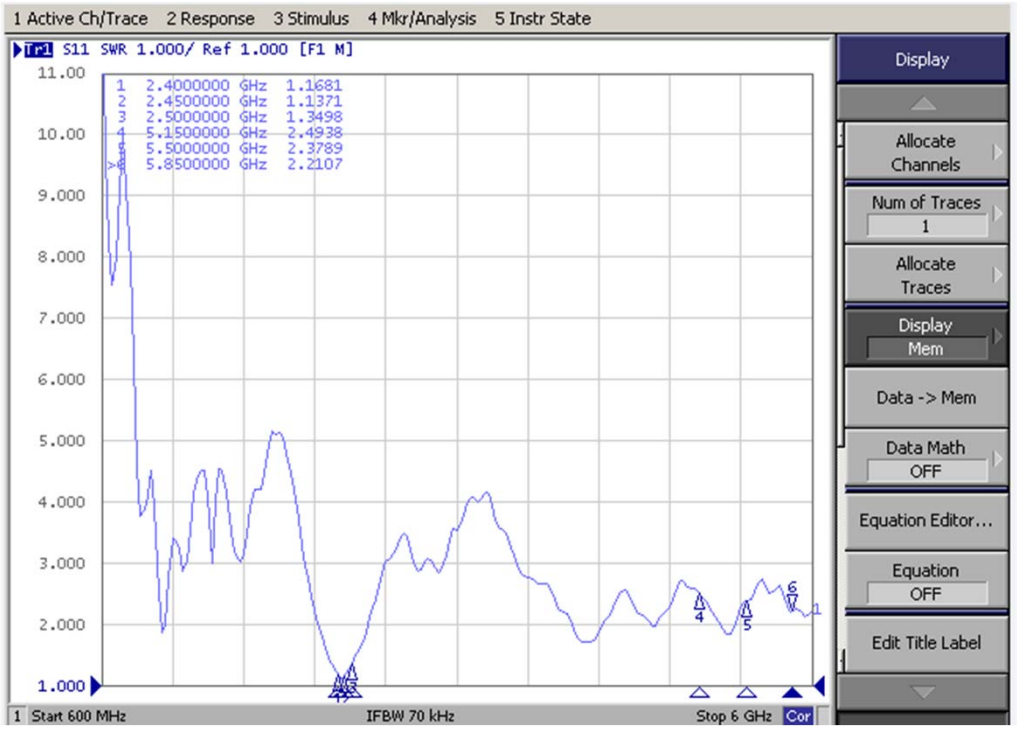
- Antenna name: 2.4G
- Covers： 2.4G

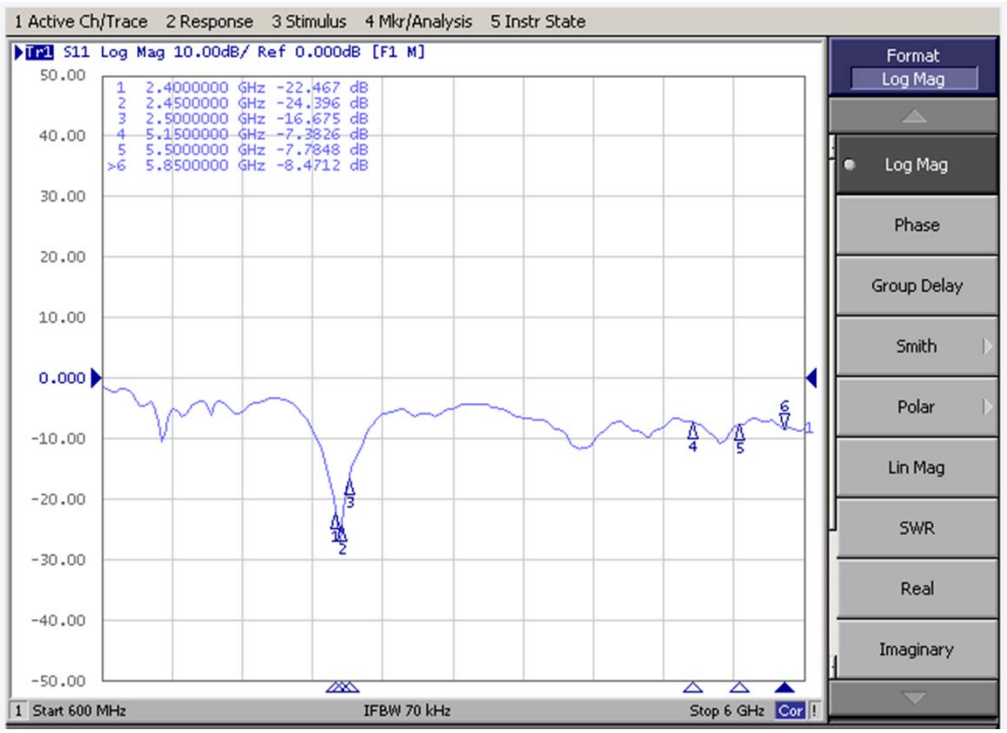
S Parameter_Return Loss&VSW（BT）



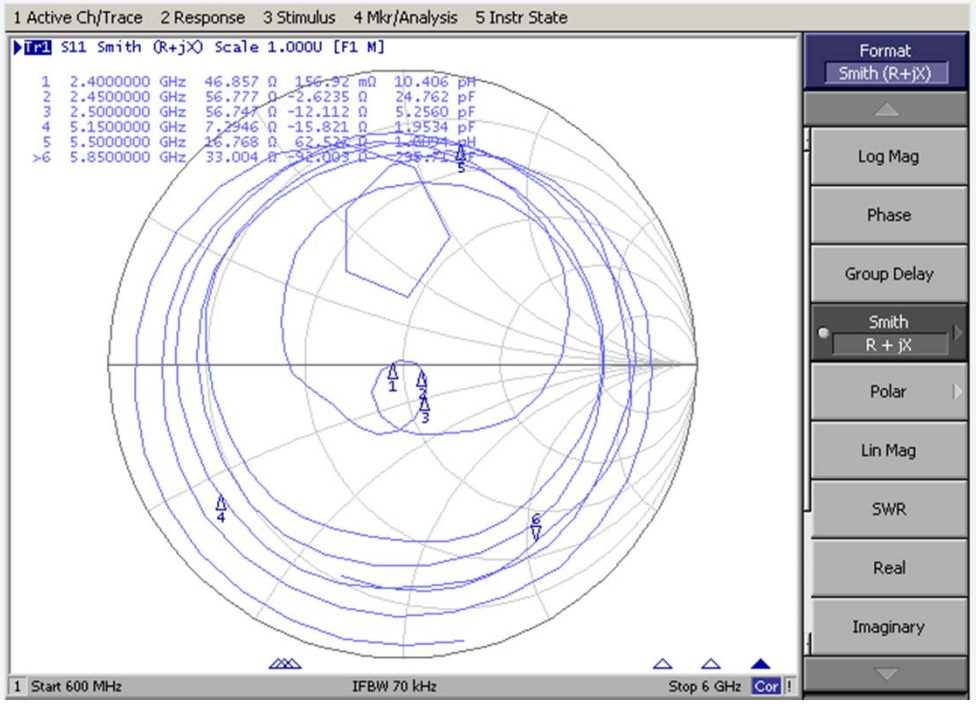


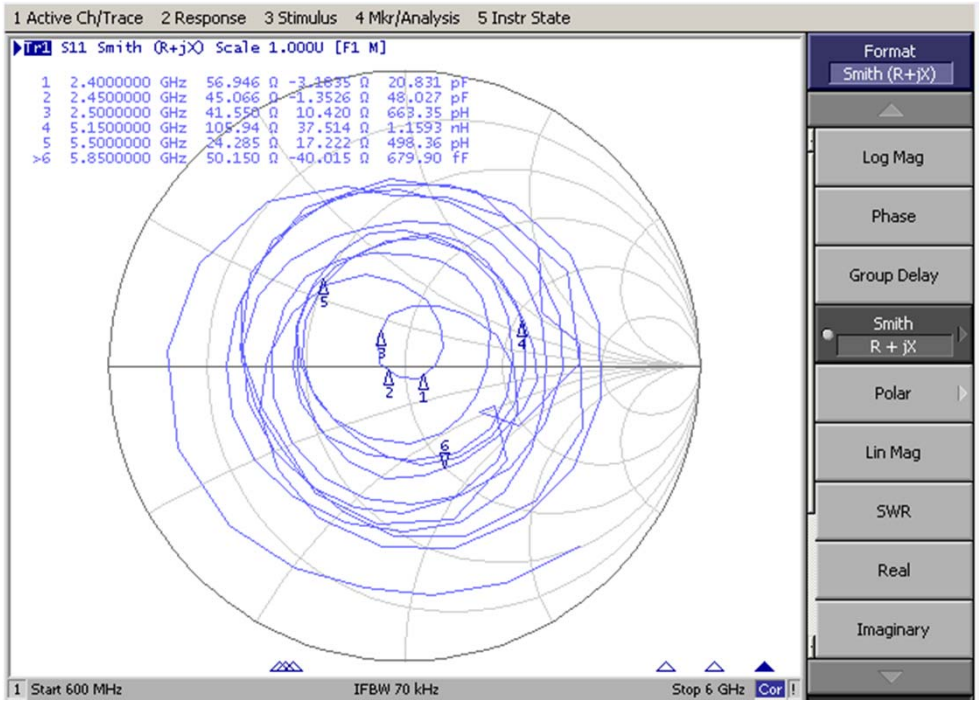
S Parameter_Return Loss&VSW（WIFI）





S Parameter_Return Loss&VSW（BT+WIFI）





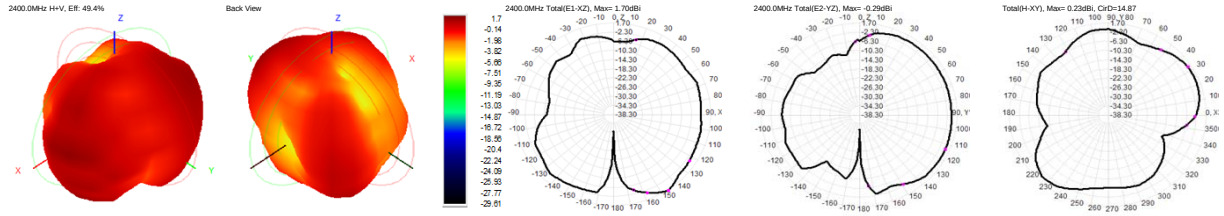
Efficiency and Gain-Smith（BT+WIFI）

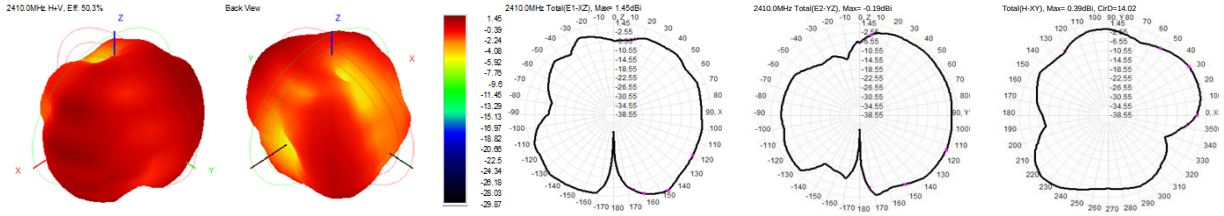
（BT）

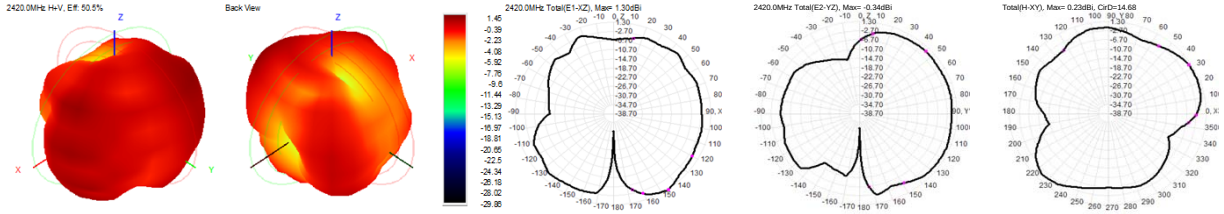
Frequency ID	1	2	3	4	5	6	7	8	9	10	11
Frequency (MHz)	2400.0	2410.0	2420.0	2430.0	2440.0	2450.0	2460.0	2470.0	2480.0	2490.0	2500.0
Gain (dBi)	1.70	1.45	1.45	1.58	1.33	1.46	1.89	1.99	1.76	1.42	1.31
Efficiency (%)	49.45	50.27	50.52	50.78	50.29	51.09	52.22	51.99	50.42	49.80	49.29

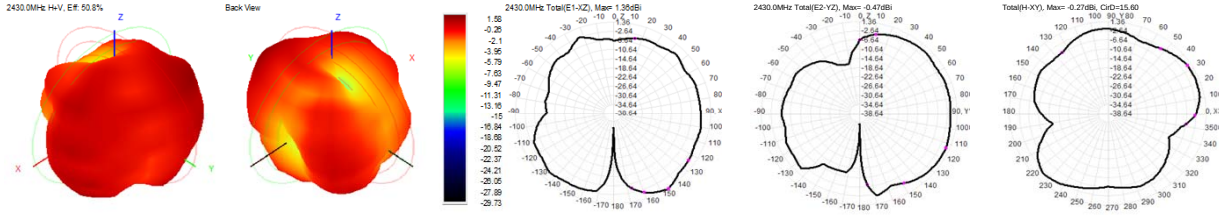
（WIFI）

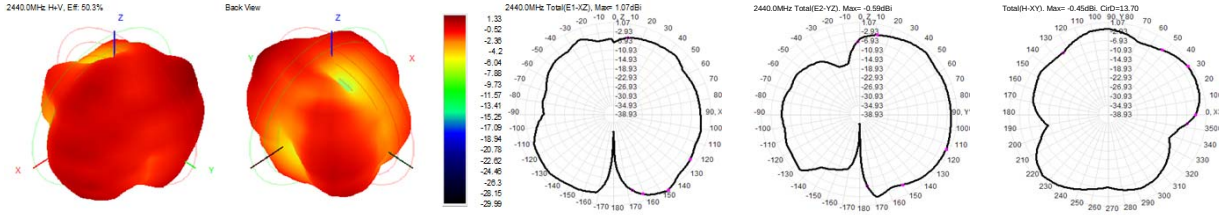
Frequency ID	1	2	3	4	5	6	7	8	9	10	11
Frequency (MHz)	2400.0	2410.0	2420.0	2430.0	2440.0	2450.0	2460.0	2470.0	2480.0	2490.0	2500.0
Gain (dBi)	4.21	4.48	4.67	4.44	3.88	3.58	3.59	3.53	3.34	2.92	2.59
Efficiency (%)	60.86	60.27	60.74	61.30	60.46	60.76	61.96	62.19	60.63	59.66	59.04

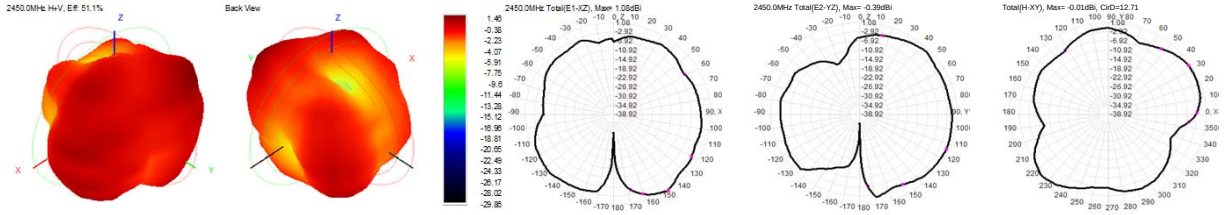

2400.0MHz H+V, Eff: 49.4%
Back View
2400.0MHz Total(E1-XZ), Max= 1.70dBi
2400.0MHz Total(E2-YZ), Max= -0.29dBi
Total(H-XY), Max= 0.23dBi, CirD=14.87

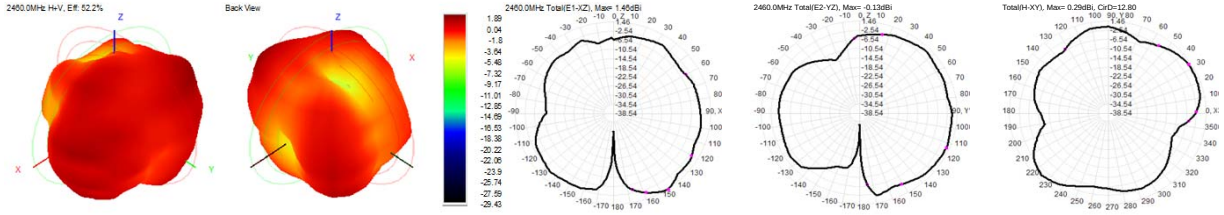

2410.0MHz H+V, Eff: 50.3%
Back View
2410.0MHz Total(E1-XZ), Max= 1.45dBi
2410.0MHz Total(E2-YZ), Max= -0.19dBi
Total(H-XY), Max= 0.39dBi, CirD=14.02

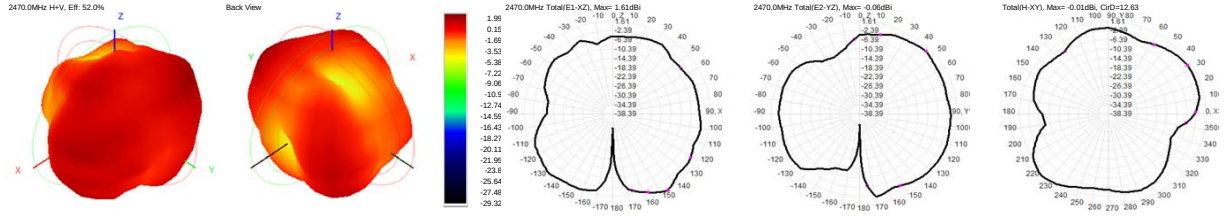

2420.0MHz H+V, Eff: 50.5%
Back View
2420.0MHz Total(E1-XZ), Max= 1.30dBi
2420.0MHz Total(E2-YZ), Max= -0.34dBi
Total(H-XY), Max= 0.23dBi, CirD=14.68

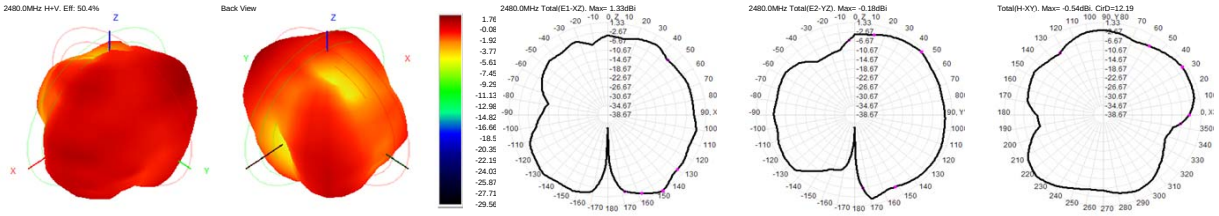

2430.0MHz H+V, Eff: 50.8%
Back View
2430.0MHz Total(E1-XZ), Max= 1.36dBi
2430.0MHz Total(E2-YZ), Max= -0.47dBi
Total(H-XY), Max= -0.27dBi, CirD=15.60

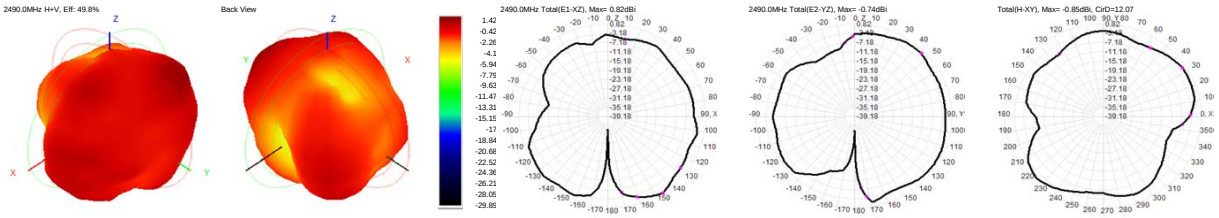

2440.0MHz H+V, Eff: 50.3%
Back View
2440.0MHz Total(E1-XZ), Max= 1.07dBi
2440.0MHz Total(E2-YZ), Max= -0.59dBi
Total(H-XY), Max= -0.45dBi, CirD=13.70

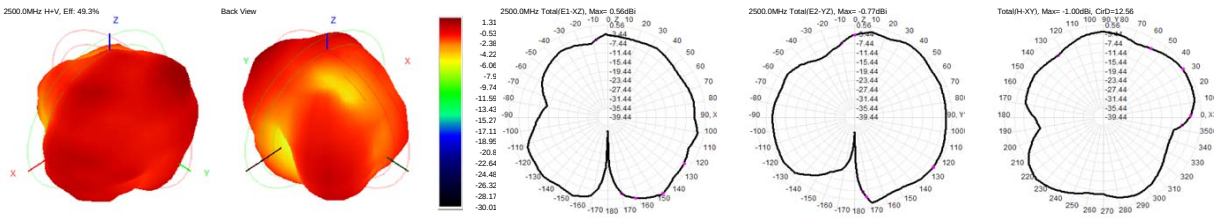

2450.0MHz H+V, Eff: 51.1%
Back View
2450.0MHz Total(E1-XZ), Max= 1.08dBi
2450.0MHz Total(E2-YZ), Max= -0.39dBi
Total(H-XY), Max= -0.01dBi, CirD=12.71

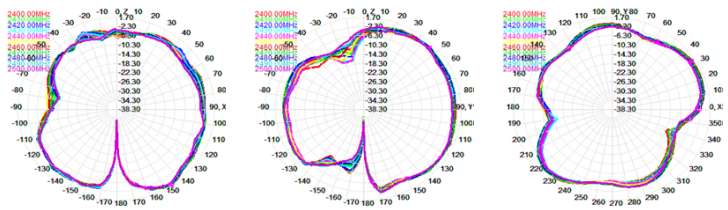

2460.0MHz H+V, Eff: 52.2%
Back View
2460.0MHz Total(E1-XZ), Max= 1.46dBi
2460.0MHz Total(E2-YZ), Max= -0.13dBi
Total(H-XY), Max= 0.29dBi, CirD=12.80

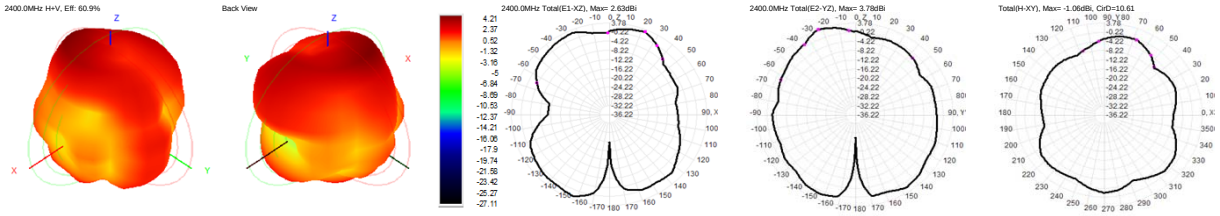

2470.0MHz H+V, Eff: 52.0%
Back View
2470.0MHz Total(E1-XZ), Max= 1.61dBi
2470.0MHz Total(E2-YZ), Max= -0.06dBi
Total(H-XY), Max= -0.01dBi, CirD=12.63

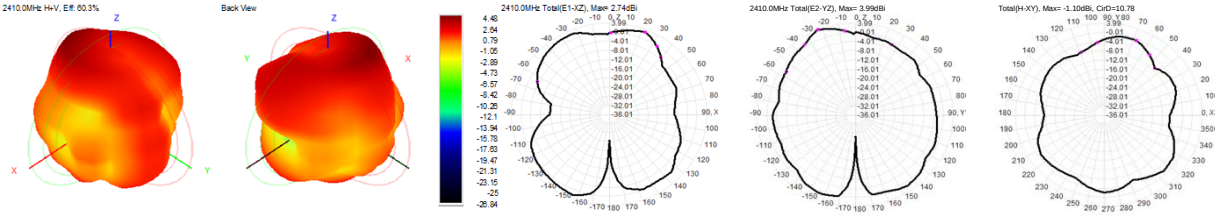

2480.0MHz H+V, Eff: 50.4%
Back View
2480.0MHz Total(E1-XZ), Max= 1.33dBi
2480.0MHz Total(E2-YZ), Max= -0.18dBi
Total(H-XY), Max= -0.54dBi, CirD=12.19

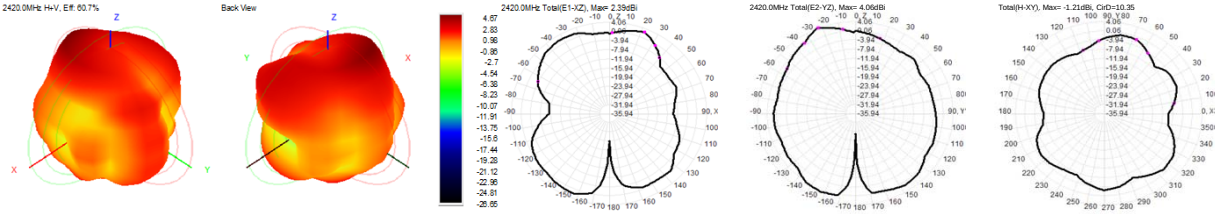

2490.0MHz H+V, Eff: 49.8%
Back View
2490.0MHz Total(E1-XZ), Max= 0.82dBi
2490.0MHz Total(E2-YZ), Max= -0.74dBi
Total(H-XY), Max= -0.85dBi, CirD=12.07

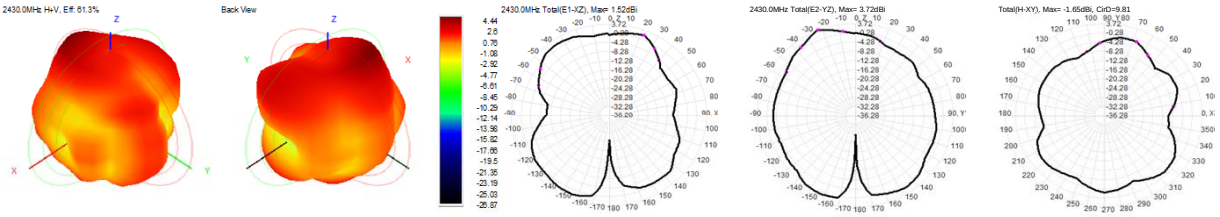

2500.0MHz H+V, Eff: 49.3%
Back View
2500.0MHz Total(E1-XZ), Max= 0.56dBi
2500.0MHz Total(E2-YZ), Max= -0.77dBi
Total(H-XY), Max= -1.00dBi, CirD=12.56

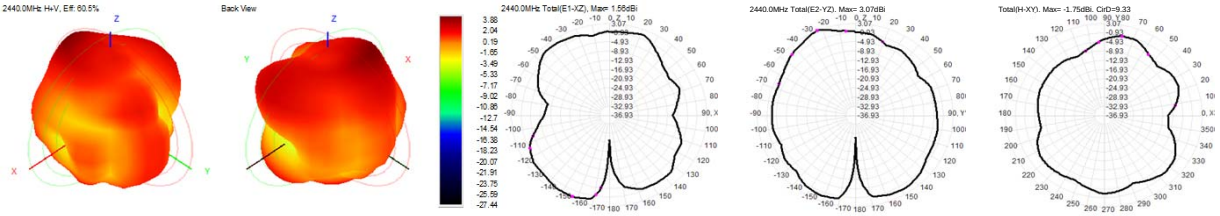

2400.00MHz
2420.00MHz
2440.00MHz
2460.00MHz
2480.00MHz
2500.00MHz

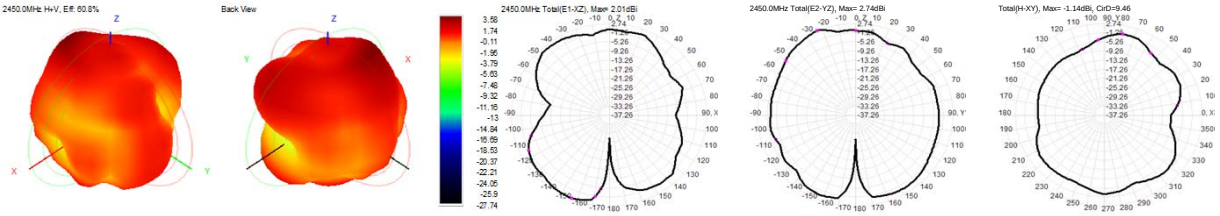

2400.0MHz H+V, Eff: 60.9%
Back View
2400.0MHz Total(E1-XZ), Max= 2.63dBi
2400.0MHz Total(E2-YZ), Max= 3.78dBi
Total(H-XY), Max= -1.06dBi, CirD=10.61

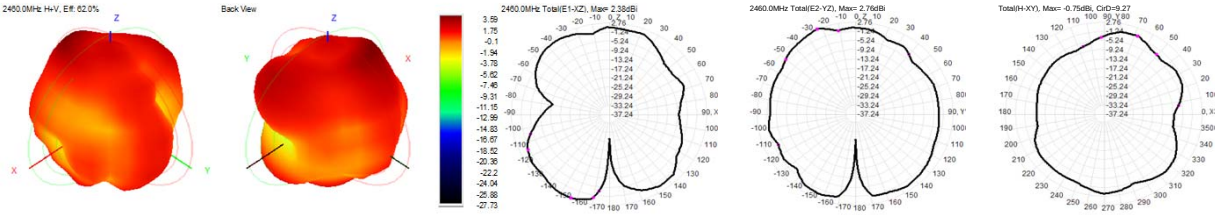

2410.0MHz H+V, Eff: 60.3%
Back View
2410.0MHz Total(E1-XZ), Max= 2.74dBi
2410.0MHz Total(E2-YZ), Max= 3.99dBi
Total(H-XY), Max= -1.10dBi, CirD=10.78

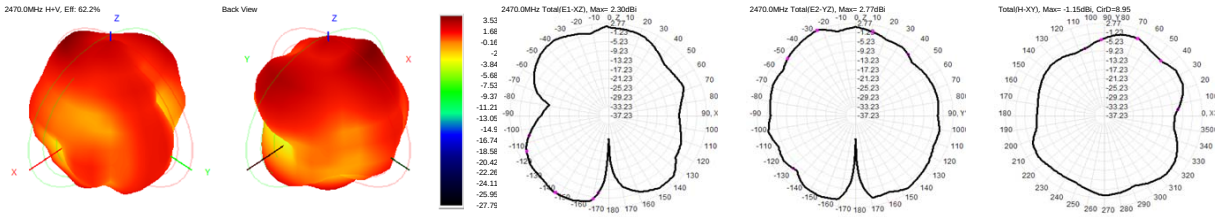

2420.0MHz H+V, Eff: 60.7%
Back View
2420.0MHz Total(E1-XZ), Max= 2.39dBi
2420.0MHz Total(E2-YZ), Max= 4.06dBi
Total(H-XY), Max= -1.21dBi, CirD=10.35

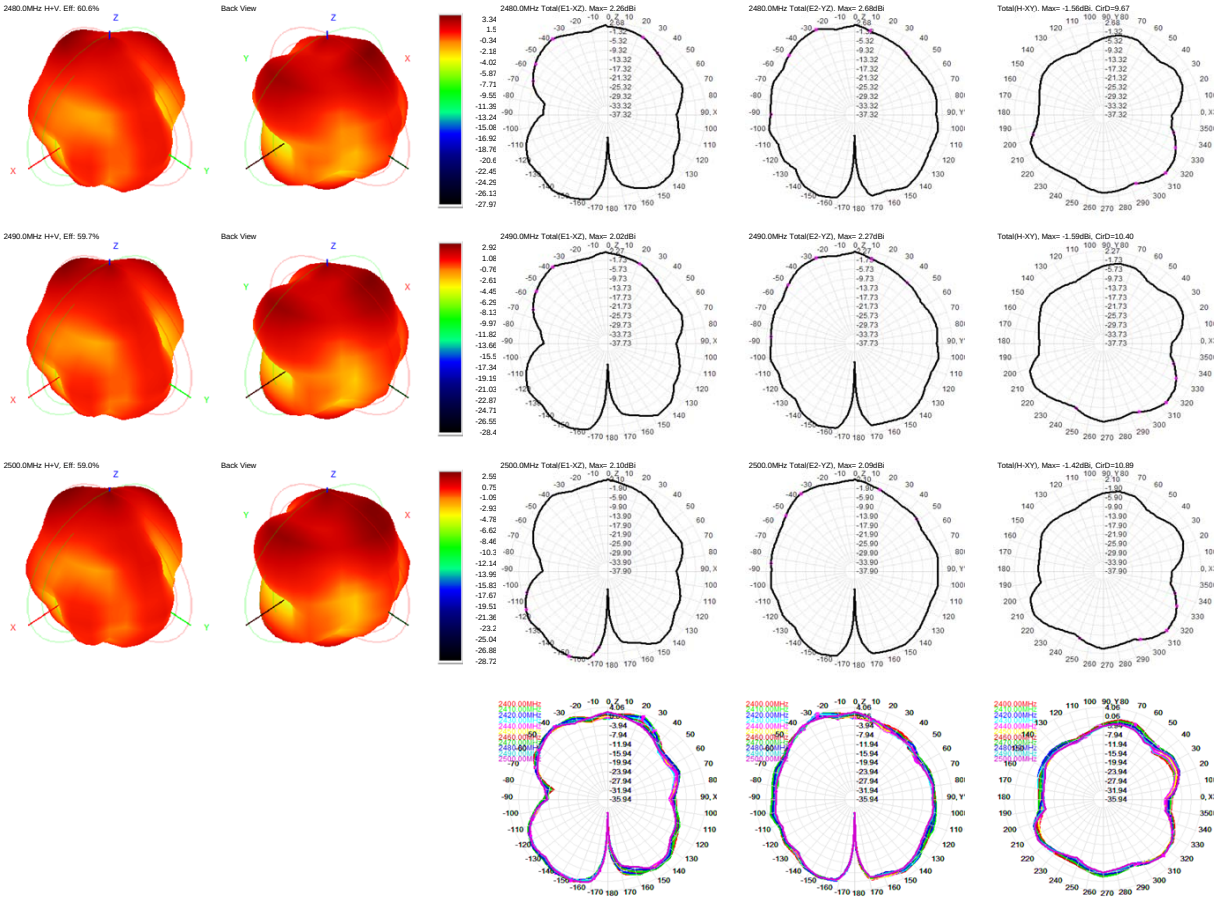

2430.0MHz H+V, Eff: 61.3%
Back View
2430.0MHz Total(E1-XZ), Max= 1.52dBi
2430.0MHz Total(E2-YZ), Max= 3.72dBi
Total(H-XY), Max= -1.65dBi, CirD=9.81


2440.0MHz H+V, Eff: 60.5%
Back View
2440.0MHz Total(E1-XZ), Max= 1.56dBi
2440.0MHz Total(E2-YZ), Max= 3.07dBi
Total(H-XY), Max= -1.75dBi, CirD=9.33


2450.0MHz H+V, Eff: 60.8%
Back View
2450.0MHz Total(E1-XZ), Max= 2.01dBi
2450.0MHz Total(E2-YZ), Max= 2.74dBi
Total(H-XY), Max= -1.14dBi, CirD=9.46


2460.0MHz H+V, Eff: 62.0%
Back View
2460.0MHz Total(E1-XZ), Max= 2.38dBi
2460.0MHz Total(E2-YZ), Max= 2.76dBi
Total(H-XY), Max= -0.75dBi, CirD=9.27


2470.0MHz H+V, Eff: 62.2%
Back View
2470.0MHz Total(E1-XZ), Max= 2.30dBi
2470.0MHz Total(E2-YZ), Max= 2.77dBi
Total(H-XY), Max= -1.15dBi, CirD=8.95


2480.0MHz H+V, Eff: 60.6%
Back View
2480.0MHz Total(E1-XZ), Max= 2.26dBi
2480.0MHz Total(E2-YZ), Max= 2.68dBi
Total(H-XY), Max= -1.56dBi, CirD=9.67
2490.0MHz H+V, Eff: 59.7%
Back View
2490.0MHz Total(E1-XZ), Max= 2.02dBi
2490.0MHz Total(E2-YZ), Max= 2.27dBi
Total(H-XY), Max= -1.59dBi, CirD=10.40
2500.0MHz H+V, Eff: 59.0%
Back View
2500.0MHz Total(E1-XZ), Max= 2.10dBi
2500.0MHz Total(E2-YZ), Max= 2.09dBi
Total(H-XY), Max= -1.42dBi, CirD=10.89
2400.00MHz
2420.00MHz
2440.00MHz
2460.00MHz
2480.00MHz
2500.00MHz