

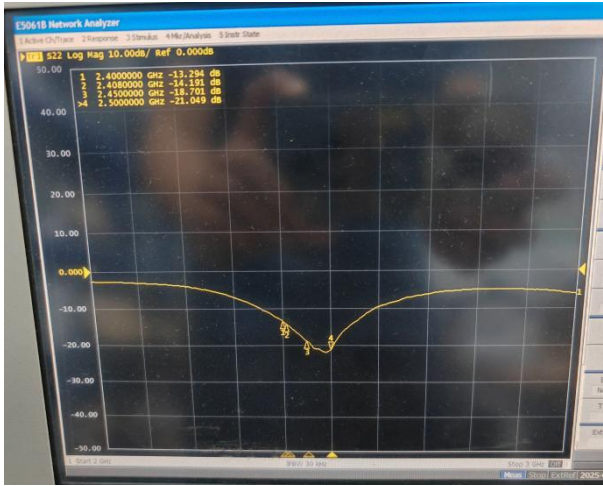
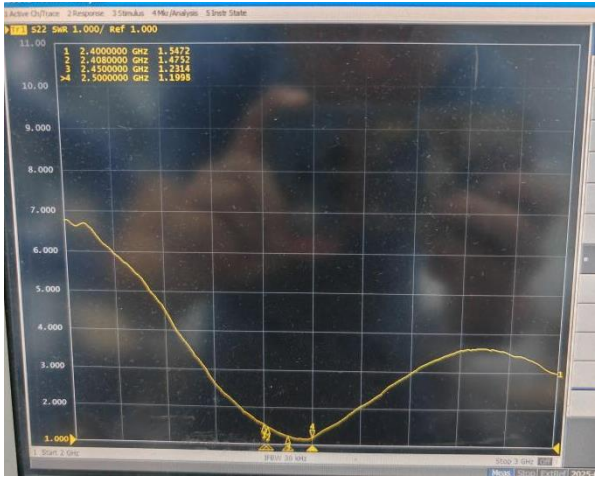
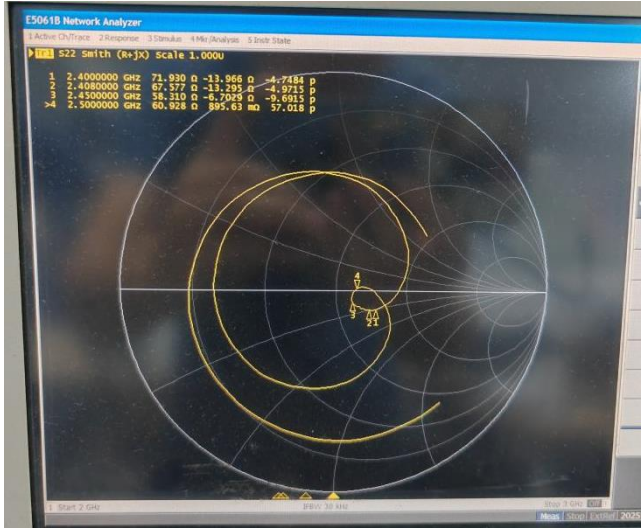
Test Reports

Sample Photo	
	
A.Electric Characteristics	
Frequency	2400MHz~2500MHz
SWR	≤2
Return Loss	> 10 dB
Antenna Gain	3.54 dBi
Polarization	Linear
Impedance	50 Ohm
B.Material & Mechanic Characteristics	
Material of Radiator	Cu
Material of Plastics	ABS
C.Enviromental	
Operation Temperature	-40°C~80°C
Storage Tempeture	-40°C~100°C

Manufacturer: Qingdao Wintec IoT Co. , Ltd.

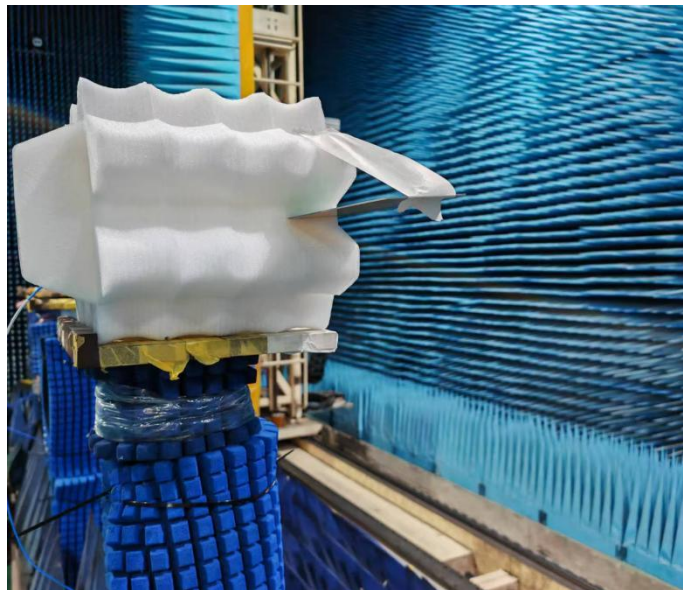
Address: Room 201, Workshop 1, No. 28 Xinye Road, High-Tech Zone, Qingdao City, Shandong Province

S Parameter Test Reports

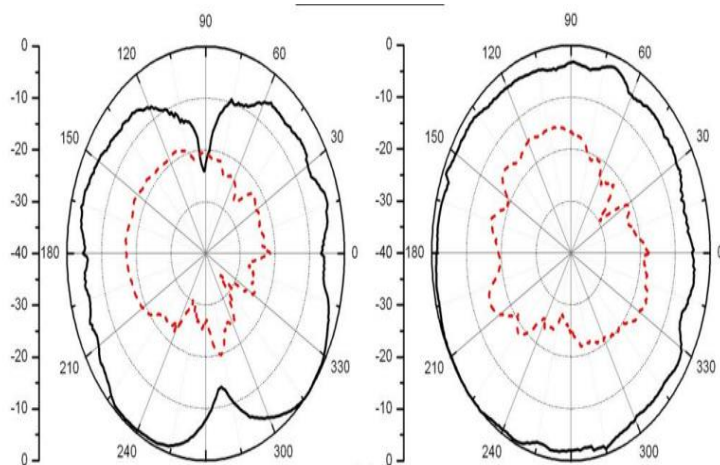
Instrument	Agilent E5061B										
S_{11}	 Agilent E5061B Network Analyzer screen showing S_{11} Log Mag plot. The plot displays a resonance dip around 2.4 GHz. The y-axis is Log Mag (dB) ranging from -50.00 to 50.00. The x-axis is frequency (GHz) ranging from 2.400000 to 2.500000. A table of data points is visible at the top: <table><thead><tr><th>Frequency (GHz)</th><th>Log Mag (dB)</th></tr></thead><tbody><tr><td>2.400000</td><td>-13.294</td></tr><tr><td>2.408000</td><td>-14.151</td></tr><tr><td>2.450000</td><td>-18.701</td></tr><tr><td>2.500000</td><td>-21.043</td></tr></tbody></table>	Frequency (GHz)	Log Mag (dB)	2.400000	-13.294	2.408000	-14.151	2.450000	-18.701	2.500000	-21.043
Frequency (GHz)	Log Mag (dB)										
2.400000	-13.294										
2.408000	-14.151										
2.450000	-18.701										
2.500000	-21.043										
SWR	 Agilent E5061B Network Analyzer screen showing SWR plot. The plot displays a resonance dip around 2.4 GHz. The y-axis is SWR ranging from 1.000 to 11.00. The x-axis is frequency (GHz) ranging from 2.400000 to 2.500000. A table of data points is visible at the top: <table><thead><tr><th>Frequency (GHz)</th><th>SWR</th></tr></thead><tbody><tr><td>2.400000</td><td>1.5472</td></tr><tr><td>2.408000</td><td>1.4733</td></tr><tr><td>2.450000</td><td>1.2316</td></tr><tr><td>2.500000</td><td>1.1998</td></tr></tbody></table>	Frequency (GHz)	SWR	2.400000	1.5472	2.408000	1.4733	2.450000	1.2316	2.500000	1.1998
Frequency (GHz)	SWR										
2.400000	1.5472										
2.408000	1.4733										
2.450000	1.2316										
2.500000	1.1998										
Z_{in}	 Agilent E5061B Network Analyzer screen showing Z_{in} Smith Chart plot. The plot displays a resonance dip around 2.4 GHz. The y-axis is Z_{in} ranging from 1.000 to 11.00. The x-axis is frequency (GHz) ranging from 2.400000 to 2.500000. A table of data points is visible at the top: <table><thead><tr><th>Frequency (GHz)</th><th>Z_{in}</th></tr></thead><tbody><tr><td>2.400000</td><td>71.930</td></tr><tr><td>2.408000</td><td>67.577</td></tr><tr><td>2.450000</td><td>58.210</td></tr><tr><td>2.500000</td><td>60.928</td></tr></tbody></table>	Frequency (GHz)	Z_{in}	2.400000	71.930	2.408000	67.577	2.450000	58.210	2.500000	60.928
Frequency (GHz)	Z_{in}										
2.400000	71.930										
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2.500000	60.928										

Radiation Pattern Test Reports

Test Environments



Antenna Radiation Pattern(Normalize d)

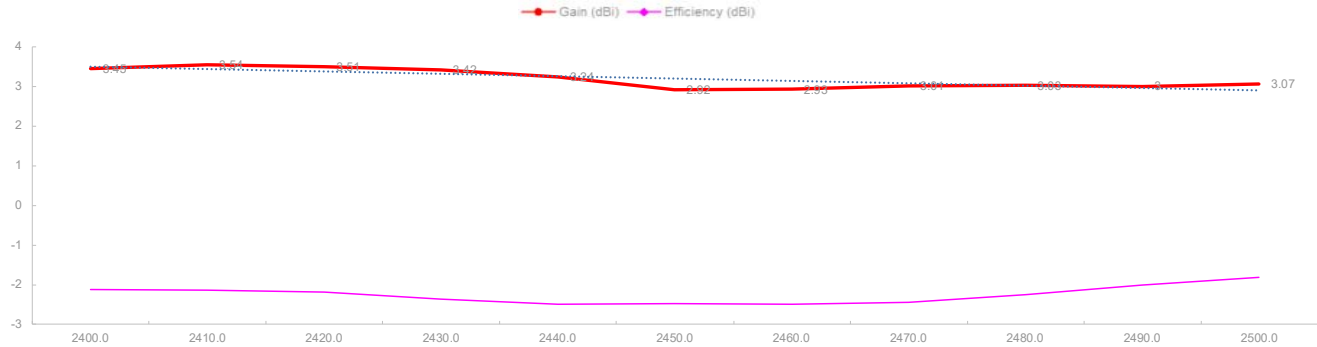
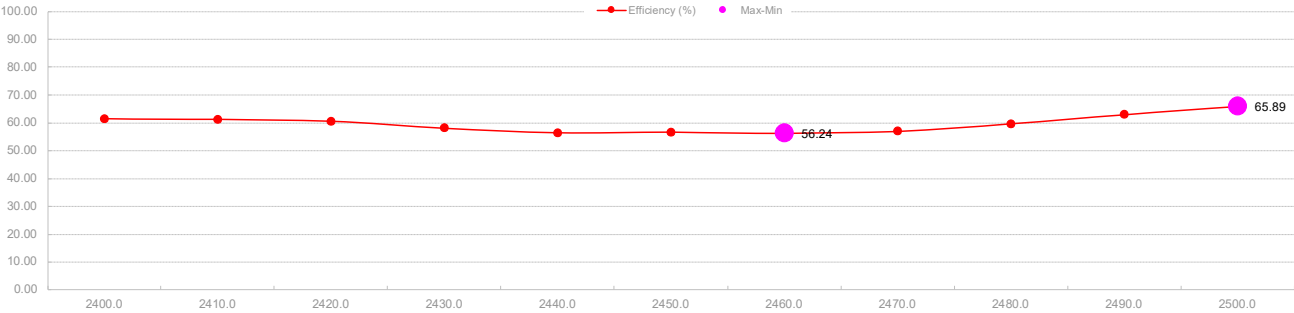


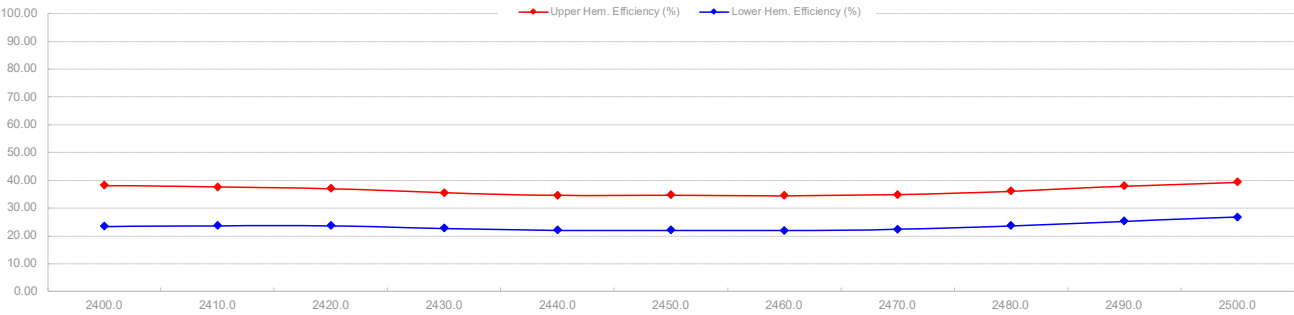
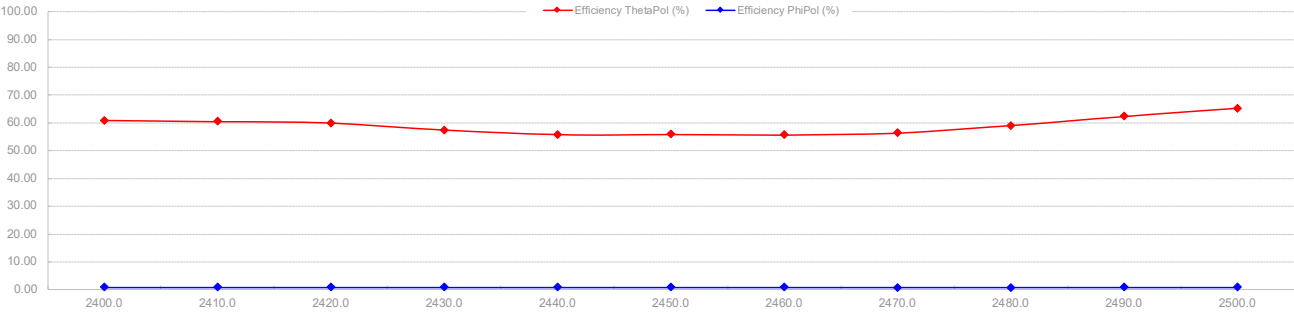
The following document is the anechoic chamber data of the antenna.

Manufacturer: Qingdao Wintec IoT Co. , Ltd.

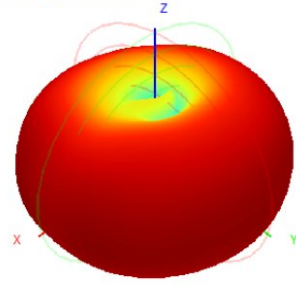
Address: Room 201, Workshop 1, No. 28 Xinye Road, High-Tech Zone, Qingdao City, Shandong Province

 Model: ANT-A											
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
Efficiency (dBi)	-2.12	-2.14	-2.18	-2.36	-2.49	-2.48	-2.50	-2.44	-2.25	-2.01	-1.81
Efficiency (%)	61.44	61.13	60.51	58.05	56.37	56.54	56.24	56.96	59.58	62.95	65.89
Gain (dBi)	3.45	3.54	3.51	3.42	3.24	2.92	2.93	3.01	3.03	3.00	3.07
Peak Gain Position (Theta)	86.00	86.00	87.00	83.00	84.00	84.00	63.00	68.00	69.00	72.00	74.00
Peak Gain Position (Phi)	339.00	340.00	340.00	87.00	89.00	90.00	92.00	298.00	246.00	299.00	302.00
Efficiency ThetaPol (%)	60.67	60.39	59.78	57.32	55.62	55.78	55.52	56.27	58.90	62.23	65.12
Efficiency PhiPol (%)	0.77	0.73	0.73	0.74	0.75	0.75	0.72	0.68	0.68	0.72	0.77
Upper Hem. Efficiency (%)	38.07	37.52	36.95	35.45	34.44	34.64	34.41	34.71	36.02	37.78	39.23
Lower Hem. Efficiency (%)	23.37	23.60	23.56	22.61	21.93	21.90	21.63	22.25	23.56	25.16	26.66
Circularity: T90 (Datum H)	0.97	0.90	0.93	0.94	0.91	0.96	0.98	0.97	1.01	1.06	1.09
Gain 15deg (dBi)											
E1 (XZ Plane) Lobe Width	59.00	57.00	63.00	63.00	65.00	66.00	66.00	65.00	65.00	66.00	69.00
E1 (XZ Plane) Front-to-Back Ratio	7.79	7.90	7.78	7.51	7.00	6.45	6.23	6.04	5.70	5.32	5.12
E2 (YZ Plane) Lobe Width	58.00	57.00	56.00	56.00	58.00	61.00	61.00	61.00	63.00	62.00	61.00
E2 (YZ Plane) Front-to-Back Ratio	6.66	6.87	6.87	6.63	6.20	5.72	5.64	5.63	5.54	5.58	5.80
Axial Ratio at Maximum Gain (°)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Worst-Case Axial Ratio (°) at Elevation Angle 10°	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
HC (XY Plane) Lobe Width	360.00	360.00	360.00	360.00	360.00	360.00	360.00	360.00	360.00	360.00	360.00
HC (XY Plane) Front-to-Back Ratio	0.68	0.70	0.72	0.70	0.69	0.65	0.50	0.41	0.39	0.43	0.47
Empty											

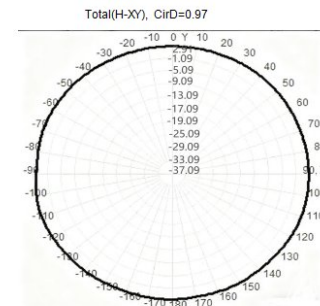
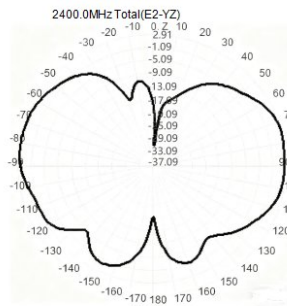
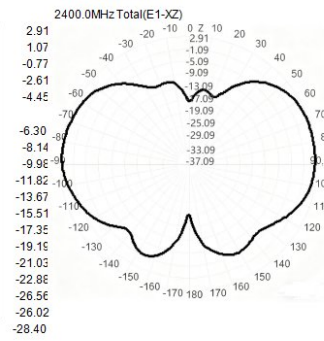
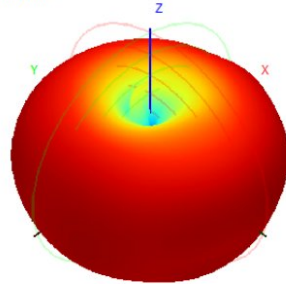




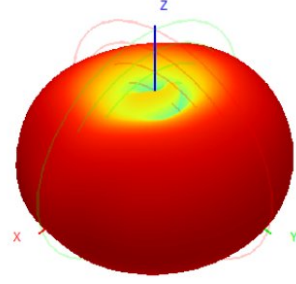
2400.0MHz H+V, Eff: 61.4%



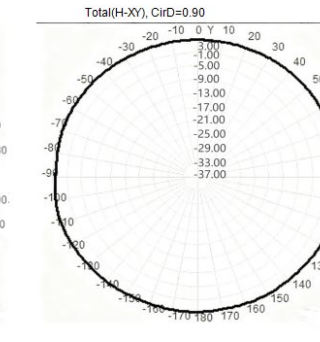
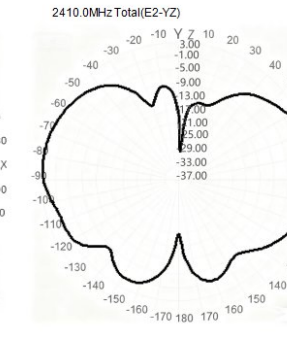
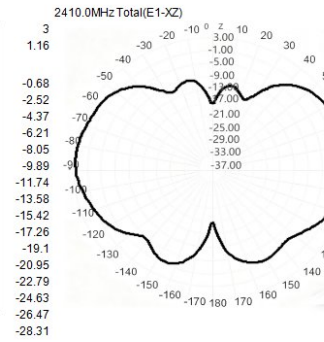
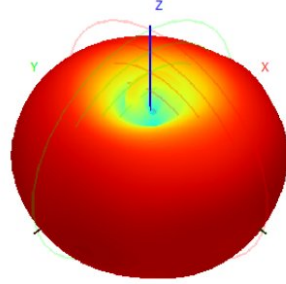
Back View



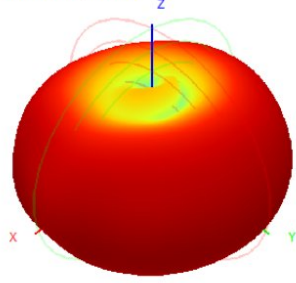
2410.0MHz H+V, Eff: 61.1%



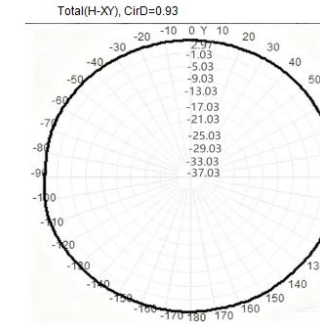
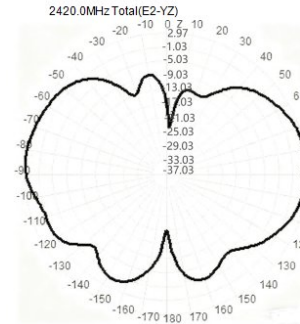
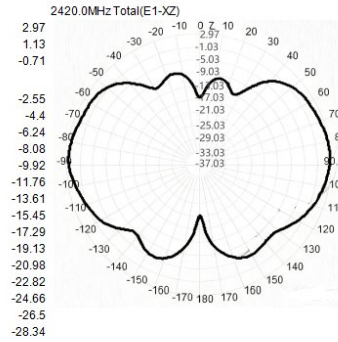
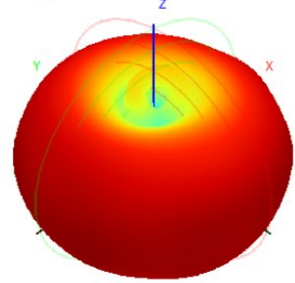
Back View



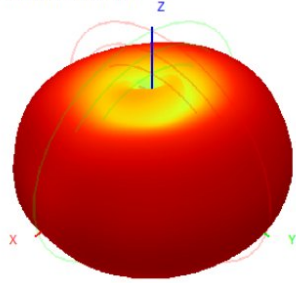
2420.0MHz H+V, Eff: 60.5%



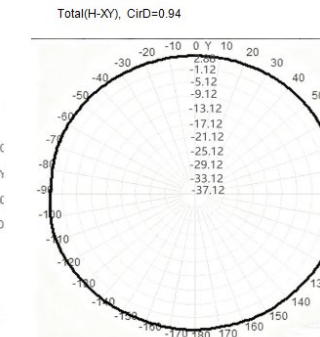
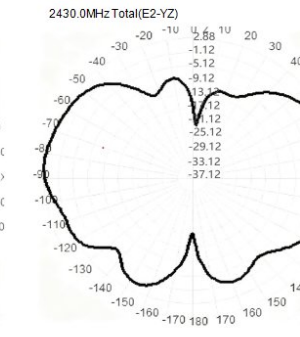
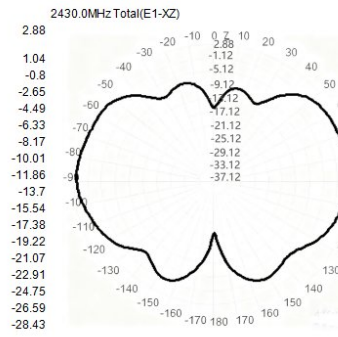
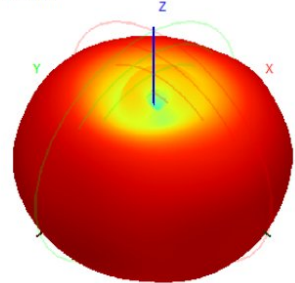
Back View



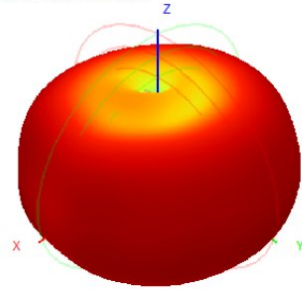
2430.0MHz H+V, Eff: 58.1%



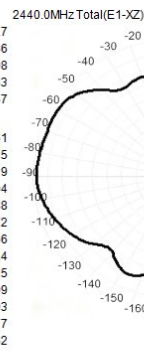
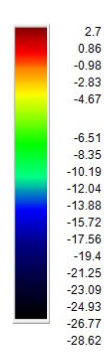
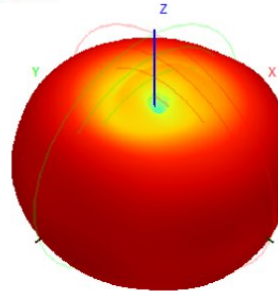
Back View



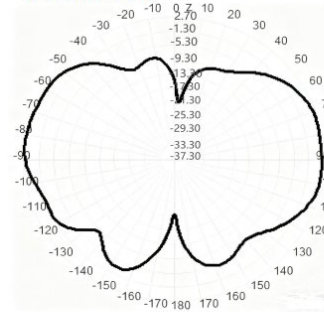
2440.0MHz H+V, Eff: 56.4%



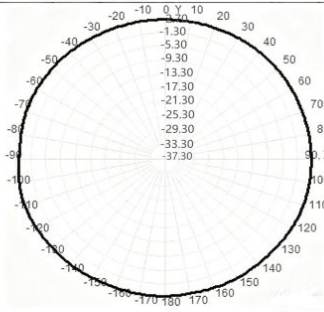
Back View



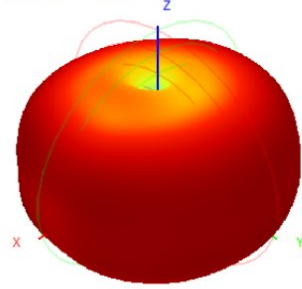
2440.0MHz Total(E2-YZ)



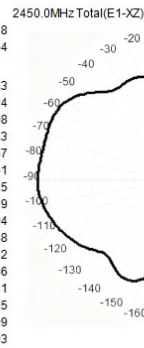
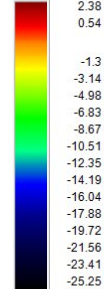
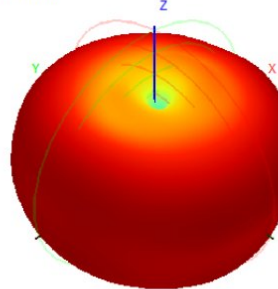
Total(H-XY), CirD=0.91



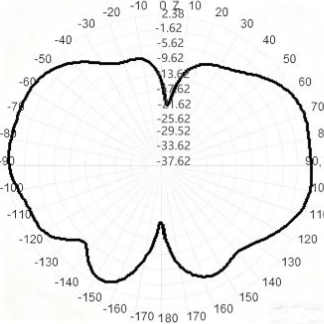
2450.0MHz H+V, Eff: 56.5%



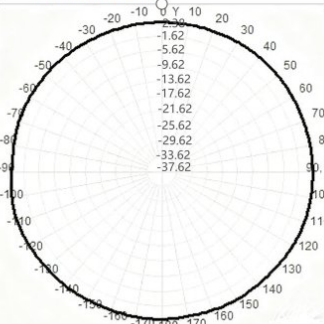
Back View



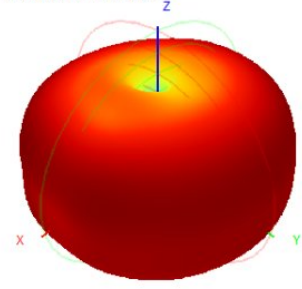
2450.0MHz Total(E2-YZ)



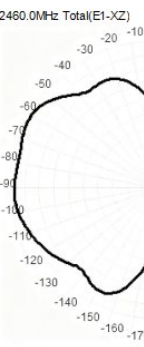
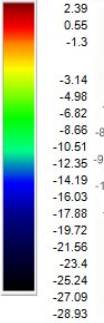
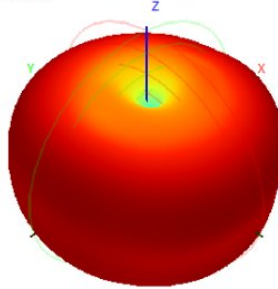
Total(H-XY), CirD=0.96



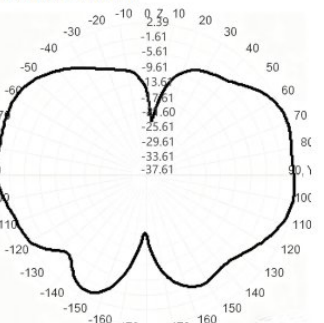
2460.0MHz H+V, Eff: 56.2%



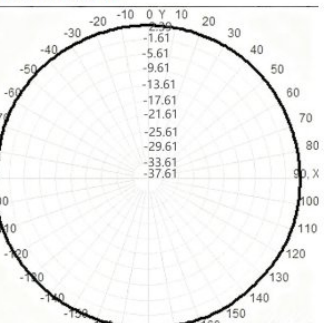
Back View



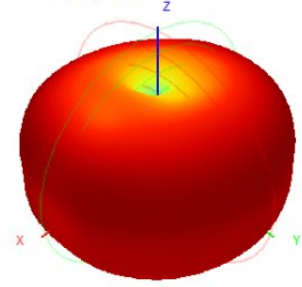
2460.0MHz Total(E2-YZ)



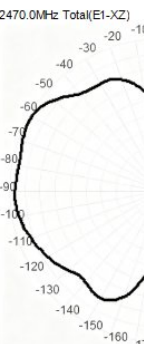
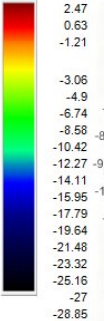
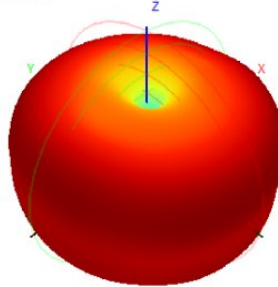
Total(H-XY), CirD=0.98



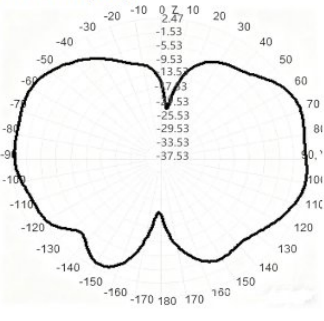
2470.0MHz H+V, Eff: 57.0%



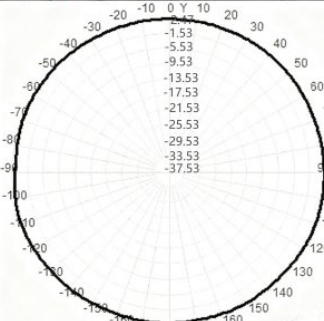
Back View



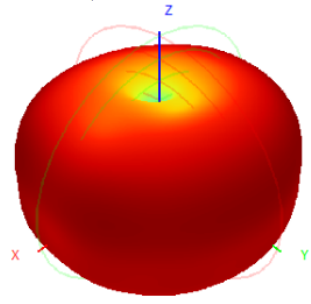
2470.0MHz Total(E2-YZ)



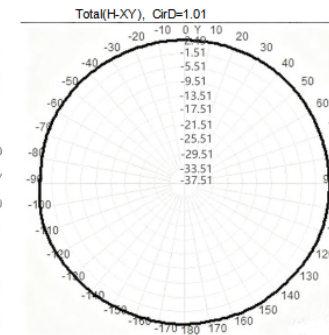
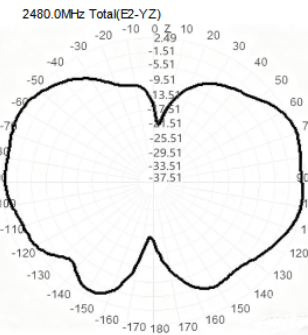
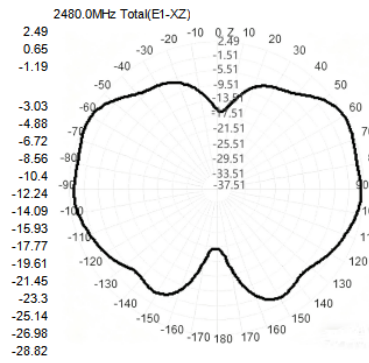
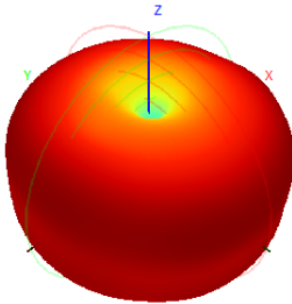
Total(H-XY), CirD=0.97



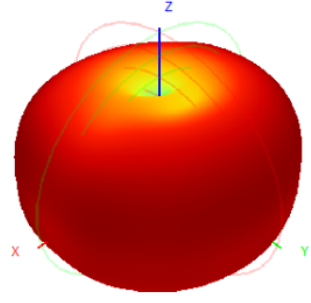
2480.0MHz H+V, Eff: 59.6%



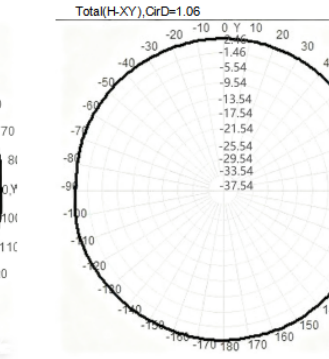
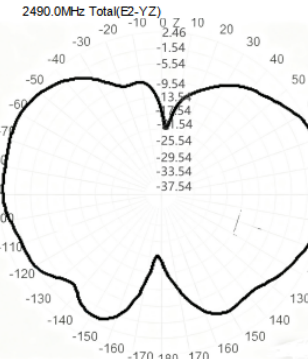
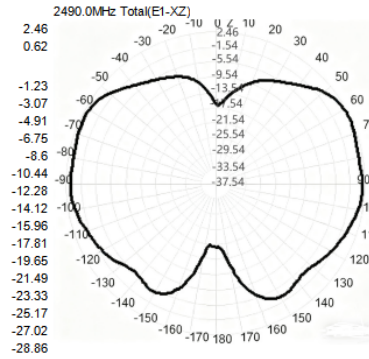
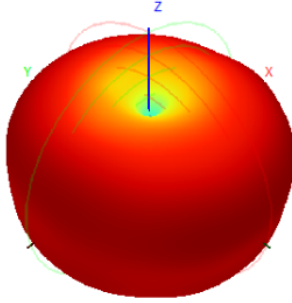
Back View



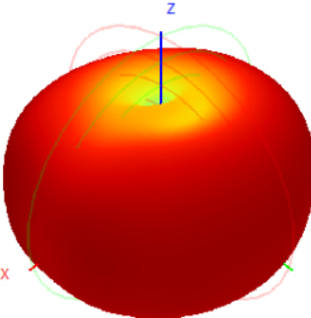
2490.0MHz H+V, Eff: 62.9%



Back View



2500.0MHz H+V, Eff: 65.9%



Back View

