Dongguan Hengxin Electronic Technology Co., Ltd.

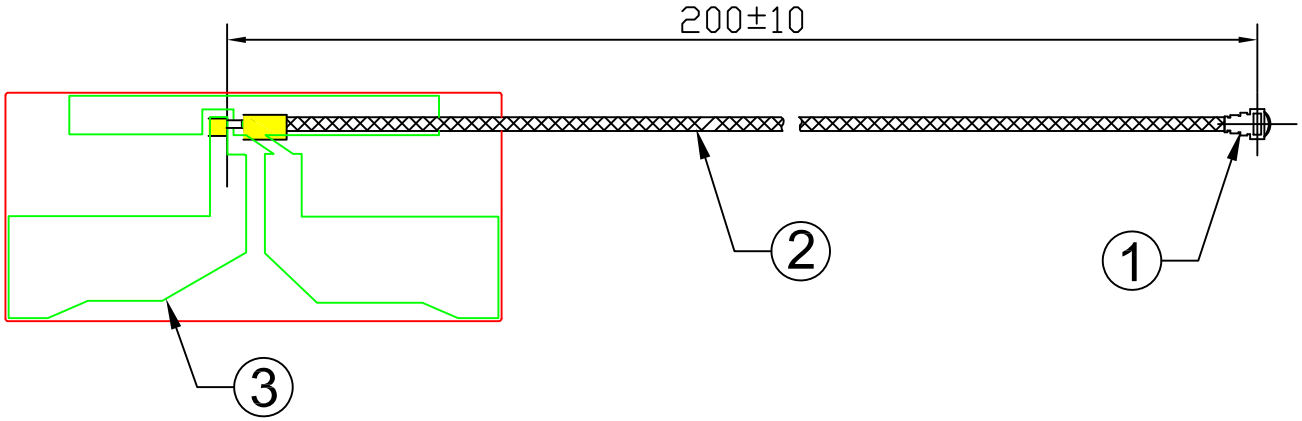
Specification For Approval

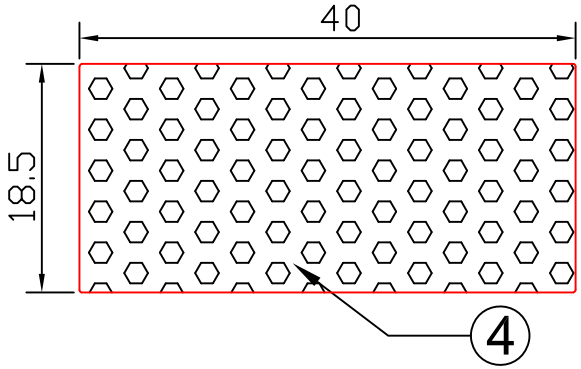
Customer	
Description	BT Antenna
ChaoWei P/N	HX-P510-UFL200B
Customer P/N	
Date	2015.06.06

Customers Confirmation			Supplier	
Engineer	QC	Purchasing	Approval	Check
				Shamoer

TEL ：0769-81663533 FAX：0769-89361945

RoHS Compatible





No.	Part Number	Name	Material	Q'ty
4	HX-3M-300LSE	AL foil	40*18.5mm	1
3	HX-P510-A01	FPCB	40*18.5mm	1
2	HX-CB-113B	Coaxial Cable	SHOWA-O.D. 1.13mm	1
1	HX-CI-UFL-01	Connector	U.FL Connector	1

Dongguan Hengxin Electronic Technology Co., Ltd.

PART NAME: BT Antenna

PART NO.: HX-P510-UFL200B .W01 | DATE: 2024-08-22

APPROVED BY	CHECKED BY	DESIDNED BY		Tolerance
	赵 2024.08.22 守刚	张雅军	UNITS: mm SCALE: 1/1 REVISION:A	X.X ±0.50 X.XX±0.15 X° ±3°

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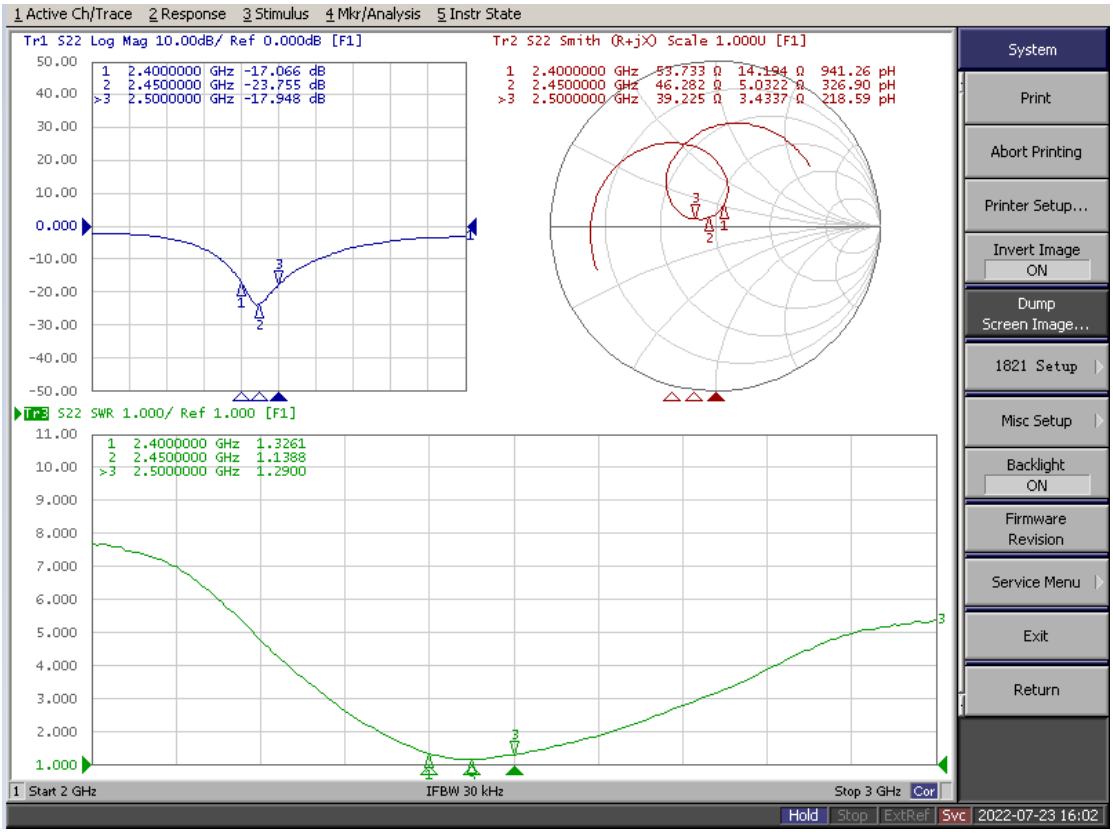
1. Reliability Testing

Test Item	Procedure	Requirement
1. Visual inspection and Dimension Check	Applicable methods using x5 magnification	follow specification
2. Rapid Changing of Temperature	-40˚C (30minutes) to 80˚C (30minutes); 24 cycles	After 2 hours recovery: 1. no visible damage 2. bandwidth tolerance < ±5%
3. Damp Heat	24 hours at 60˚C; 90 ~ 95% RH	After 2 hours recovery: 1. no visible damage 2. bandwidth tolerance < ±5%
4. Endurance	24 hours at 80˚C	After 2 hours recovery: 1. no visible damage 2. bandwidth tolerance < ±5%
5. Connector Pull Strength Test	>= 1.0 Kg	Hold 2~3S: 1. no visible damage 2. bandwidth tolerance < ±5%

2. Specification

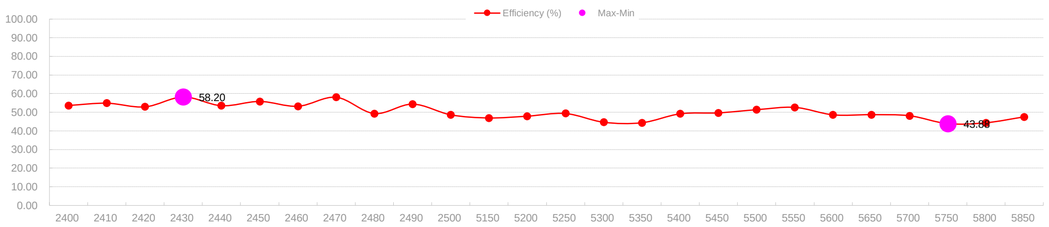
A. Electrical Characteristics	
S.W.R.(Tested in PC)	<= 2.0 @ 2400~2500 MHz
Typical Antenna Gain	2.74dBi @ 2450 MHz
Impedance	50 Ohm
B. Material	
Material of Radiator	FPC
Cable Length	200mm
Connector Type	Mini
C. Environmental	
Operation Temperature	- 40 ˚C ~ + 85 ˚C
Storage Temperature	- 40 ˚C ~ + 85 ˚C

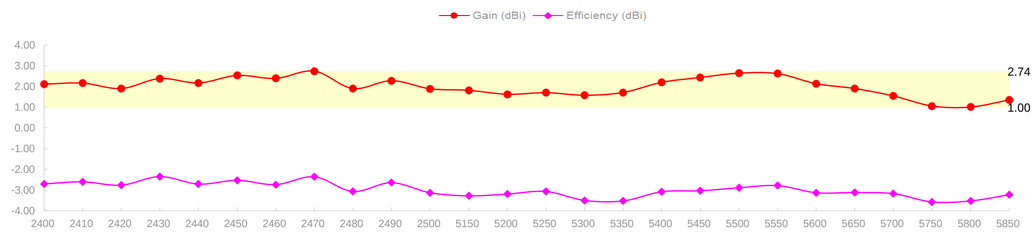
3. S.W.R. Testing Result

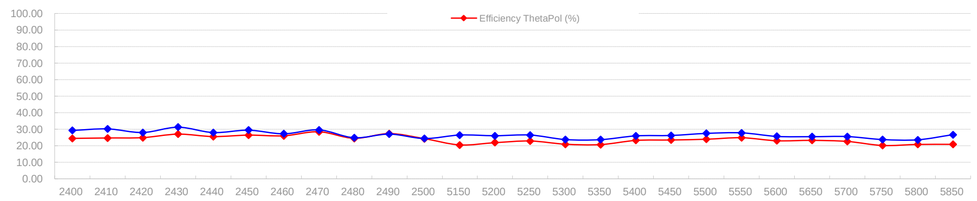


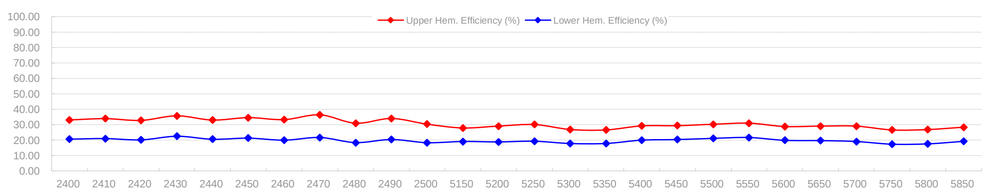
东莞市亨杺电子科技有限公司

Frequency ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Frequency (MHz)	**2400**	**2410**	**2420**	**2430**	**2440**	**2450**	**2460**	**2470**	**2480**	**2490**	**2500**	**5150**	**5200**	**5250**	**5300**	**5350**	**5400**	**5450**	**5500**	**5550**	**5600**	**5650**	**5700**	**5750**	**5800**	**5850**
Efficiency (dBi)	**-2.70**	**-2.61**	**-2.77**	**-2.35**	**-2.72**	**-2.53**	**-2.74**	**-2.36**	**-3.07**	**-2.65**	**-3.13**	**-3.28**	**-3.20**	**-3.07**	**-3.50**	**-3.53**	**-3.08**	**-3.04**	**-2.89**	**-2.79**	**-3.13**	**-3.12**	**-3.18**	**-3.58**	**-3.53**	**-3.23**
Gain (dBi)	2.11	2.16	1.90	2.38	2.17	2.53	2.39	2.74	1.90	2.28	1.89	1.82	1.62	1.70	1.58	1.71	2.20	2.44	2.64	2.62	2.13	1.90	1.54	1.06	1.00	1.35
Efficiency (%)	**53.65**	**54.87**	**52.89**	**58.20**	**53.51**	**55.81**	**53.21**	**58.04**	**49.31**	**54.36**	**48.62**	**46.95**	**47.90**	**49.32**	**44.64**	**44.38**	**49.17**	**49.68**	**51.38**	**52.62**	**48.62**	**48.71**	**48.13**	**43.88**	**44.37**	**47.54**
Directivity (dB)	**4.82**	**4.77**	**4.67**	**4.73**	**4.88**	**5.07**	**5.13**	**5.10**	**4.97**	**4.93**	**5.02**	**5.10**	**4.82**	**4.77**	**5.08**	**5.24**	**5.28**	**5.47**	**5.54**	**5.41**	**5.27**	**5.02**	**4.72**	**4.63**	**4.53**	**4.58**
Peak Gain Position (Theta)	87.00	87.00	88.00	88.00	89.00	89.00	89.00	90.00	90.00	91.00	92.00	91.00	93.00	13.00	93.00	95.00	95.00	68.00	70.00	97.00	98.00	73.00	73.00	74.00	75.00	83.00
Peak Gain Position (Phi)	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	0.00	0.00	240.00	0.00	0.00	0.00	330.00	330.00	0.00	0.00	330.00	330.00	330.00	330.00	330.00
Efficiency ThetaPol (%)	24.42	24.69	24.90	27.01	25.54	26.41	26.00	28.46	24.49	27.34	24.26	20.48	21.85	22.86	20.91	20.70	23.21	23.47	23.93	24.83	23.00	23.24	22.59	20.15	20.78	20.83
Efficiency PhiPol (%)	29.22	30.17	27.99	31.19	27.97	29.40	27.21	29.59	24.82	27.02	24.36	26.47	26.05	26.46	23.73	23.68	25.96	26.21	27.45	27.79	25.62	25.47	25.54	23.73	23.59	26.71
Upper Hem. Efficiency (%)	33.06	33.89	32.76	35.73	32.98	34.55	33.27	36.38	30.93	34.00	30.30	27.86	29.08	30.07	26.86	26.58	29.21	29.33	30.26	30.96	28.79	29.07	29.05	26.57	26.82	28.36
Lower Hem. Efficiency (%)	20.59	20.98	20.13	22.47	20.53	21.26	19.94	21.66	18.38	20.36	18.31	19.09	18.82	19.25	17.78	17.80	19.96	20.34	21.12	21.66	19.83	19.64	19.08	17.31	17.55	19.18
T90(H)圆度	8.84	8.81	8.67	8.41	8.58	8.82	9.01	8.94	8.95	9.02	9.08	15.86	14.07	12.24	13.81	12.25	11.54	11.90	10.46	9.11	9.33	8.81	8.85	9.45	9.16	8.44
Gain 15deg (dBi)																										
E1(XZ)波瓣宽度	21.00	21.00	51.00	53.00	25.00	32.00	48.00	47.00	48.00	48.00	47.00	26.00	29.00	30.00	27.00	25.00	23.00	22.00	21.00	20.00	20.00	22.00	25.00	58.00	59.00	60.00
E1(XZ)前后比	2.51	2.50	2.49	2.26	2.29	2.08	2.21	2.28	2.40	2.54	2.60	2.39	2.33	2.24	2.48	2.52	2.76	2.89	2.93	3.40	3.47	3.53	3.90	3.59	3.69	4.03
E2(YZ)波瓣宽度	58.00	58.00	60.00	61.00	61.00	64.00	70.00	82.00	95.00	94.00	86.00	14.00	14.00	54.00	56.00	55.00	62.00	64.00	20.00	20.00	20.00	22.00	23.00	95.00	96.00	98.00
E2(YZ)前后比	1.73	1.36	1.02	0.73	0.98	1.33	1.62	1.41	1.03	0.70	0.60	1.67	1.65	1.33	1.77	1.43	1.11	1.07	0.95	0.77	0.65	0.63	0.60	0.93	1.74	2.12
最大增益处轴比**(P)**	6.29	6.64	5.88	6.95	6.75	7.73	8.28	7.38	9.21	8.65	8.30	16.32	16.78	5.99	20.81	17.65	22.73	4.91	5.56	17.43	19.74	5.38	5.08	6.93	6.32	6.07
顶点**(Theta=0)**处轴比**(P)**	9.72	9.96	10.00	10.82	10.65	9.94	8.72	8.28	8.83	11.28	15.05	7.06	7.17	6.52	8.19	8.00	6.57	6.17	6.00	6.40	5.88	6.86	8.83	10.48	12.15	12.75
仰角10度最差(大)轴比**(P)**	78.87	56.58	68.03	55.16	73.55	67.34	56.83	66.33	62.51	46.57	46.56	56.90	57.10	61.99	46.74	57.56	50.05	56.98	69.78	55.02	63.28	60.89	47.28	50.07	51.18	57.14
Hc(XY)波瓣宽度	31.00	33.00	33.00	32.00	31.00	30.00	29.00	29.00	29.00	28.00	28.00	98.00	101.00	108.00	102.00	106.00	109.00	113.00	121.00	128.00	128.00	124.00	118.00	109.00	109.00	107.00
Hc(XY)前后比	5.03	5.17	5.35	5.81	6.01	6.05	5.83	5.67	5.58	5.66	5.78	3.63	3.56	3.30	3.39	3.08	2.80	2.31	1.86	1.46	1.81	2.00	2.48	3.25	3.33	3.57
左旋圆极化效率**(%)**	23.41	24.12	23.01	25.47	23.32	24.83	23.85	26.37	22.11	24.55	21.72	19.96	19.01	18.54	18.97	19.61	21.56	22.11	22.55	23.93	21.88	22.00	22.15	20.10	20.94	22.38
右旋圆极化效率**(%)**	30.24	30.75	29.88	32.73	30.19	30.98	29.36	31.67	27.21	29.81	26.90	26.99	28.88	30.78	25.67	24.77	27.60	27.57	28.83	28.69	26.74	26.71	25.98	23.78	23.43	25.16
最大增益处交极比**(+/-45极化)**	2.87	2.69	3.06	3.07	4.03	4.53	4.89	5.25	5.27	5.93	7.16	2.76	3.17	5.36	6.11	6.10	7.11	4.19	4.64	7.66	7.84	5.20	5.04	6.88	5.92	4.67
最大增益处交极比**(水平垂直极化**	5.14	5.62	4.57	5.64	4.61	5.08	5.22	4.00	5.62	4.49	2.72	12.94	12.47	2.09	8.95	8.51	7.96	2.20	2.53	6.82	6.98	1.12	0.50	0.61	1.64	3.19
T60度Phi一圈最差交极比(+/-4	0.03	0.05	0.07	0.00	0.00	0.01	0.00	0.01	0.00	0.04	0.06	0.00	0.00	0.04	0.01	0.00	0.00	0.04	0.03	0.09	0.02	0.02	0.02	0.01	0.02	0.16
T60度Phi一圈最差交极比(水平	0.02	0.01	0.01	0.01	0.08	0.00	0.06	0.08	0.01	0.04	0.00	0.05	0.01	0.02	0.05	0.01	0.00	0.04	0.02	0.01	0.03	0.00	0.03	0.01	0.05	0.03
T90度(H)Phi一圈最差交极比(+	0.00	0.02	0.03	0.05	0.01	0.02	0.00	0.02	0.09	0.01	0.22	0.01	0.20	0.22	0.28	0.07	0.02	0.00	0.03	0.28	0.40	0.12	0.21	0.11	0.01	0.09
T90度(H)Phi一圈最差交极比(7	0.06	0.01	0.00	0.05	0.01	0.10	0.02	0.02	0.02	0.03	0.04	0.01	0.02	0.00	0.01	0.00	0.03	0.03	0.02	0.03	0.01	0.04	0.02	0.00	0.02	0.03
轴对称天线主瓣下倾角度(平均值	-0.09	1.89	4.13	5.72	7.90	9.73	11.23	11.66	10.20	9.36	9.03	25.36	35.69	53.50	62.95	66.68	66.89	67.69	72.85	72.69	62.95	56.24	51.25	46.81	45.69	30.37
轴向**(Z+)水平垂直极化隔离度**	9.38	9.94	10.00	10.77	10.64	9.88	8.54	7.30	6.43	5.89	6.36	6.79	6.91	6.23	7.83	7.59	6.42	5.67	5.54	4.91	4.40	4.04	4.41	5.56	6.29	7.36
Theta85.0一周最大增益	2.11	2.16	1.90	2.38	2.17	2.53	2.39	2.74	1.90	2.28	1.89	1.82	1.62	1.56	1.58	1.71	2.20	2.38	2.52	2.62	2.13	1.78	1.50	0.99	0.78	1.28
Theta85.0一周圆度(为最大最小	14.24	13.88	13.43	13.91	14.62	14.71	14.30	13.77	13.65	13.91	14.19	17.13	17.85	17.64	16.83	19.22	18.90	21.66	23.61	21.05	15.16	11.60	12.12	12.30	11.74	11.87
Empty																										

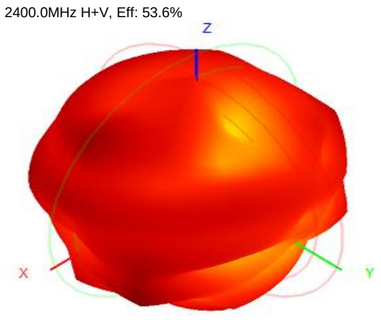








2400.0MHz H+V, Eff: 53.6%



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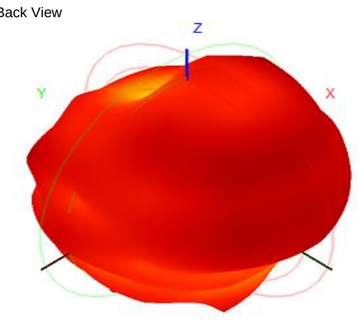
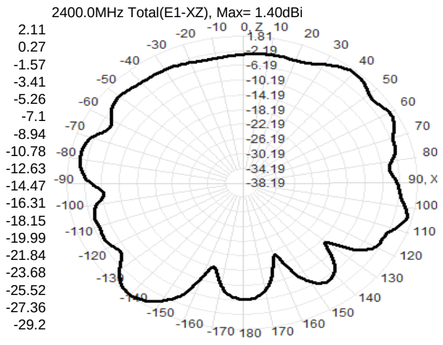


2400.0MHz Total(E1-XZ), Max= 1.40dBi



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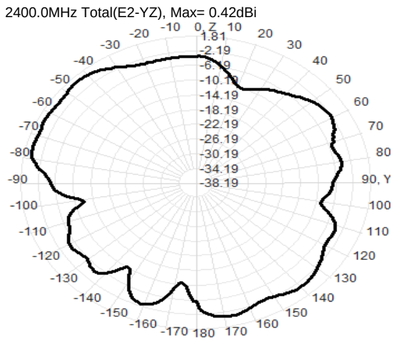
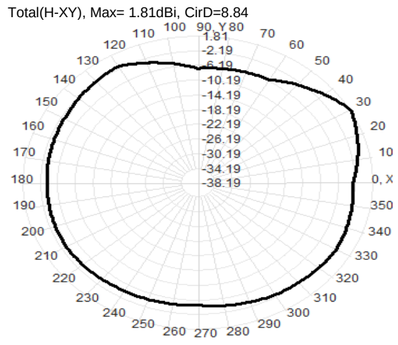
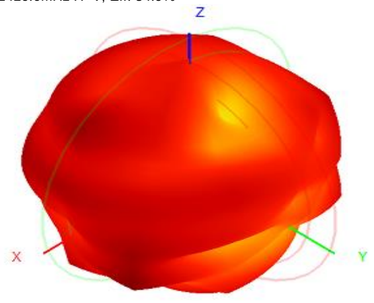


Total(H-XY), Max= 1.81dBi, CirD=8.84



2410.0MHz H+V, Eff: 54.9%



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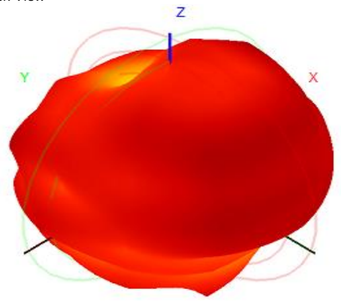

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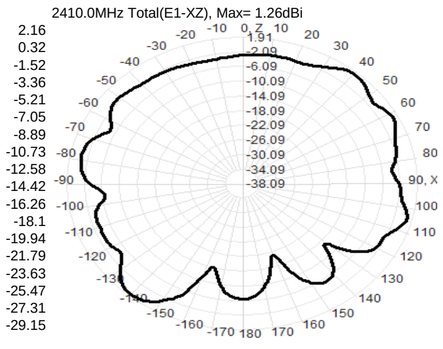
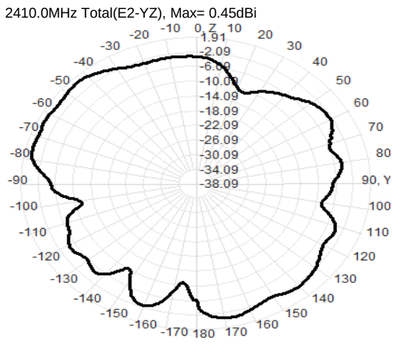
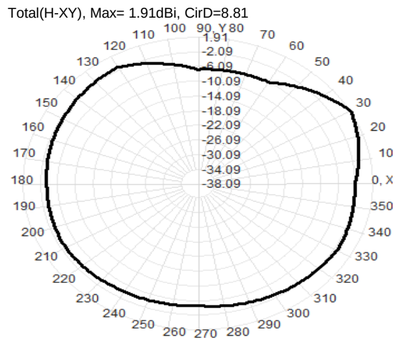


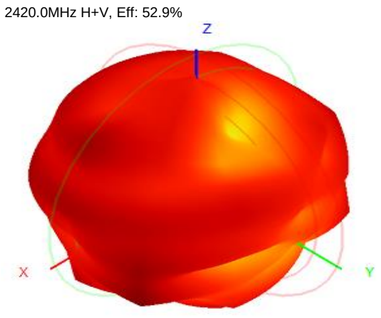
2410.0MHz Total(E2-YZ), Max= 0.45dBi



Total(H-XY), Max= 1.91dBi, CirD=8.81



2420.0MHz H+V, Eff: 52.9%



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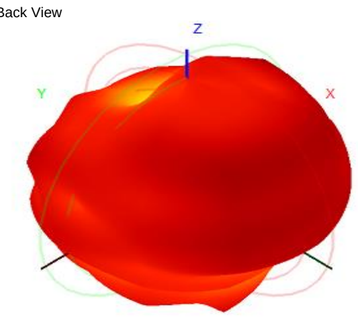

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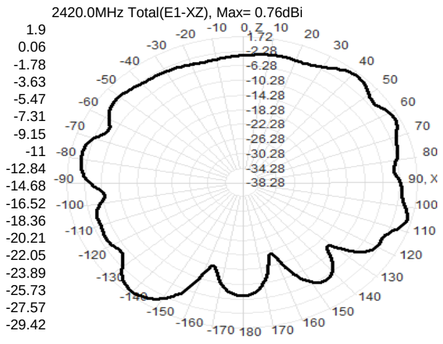
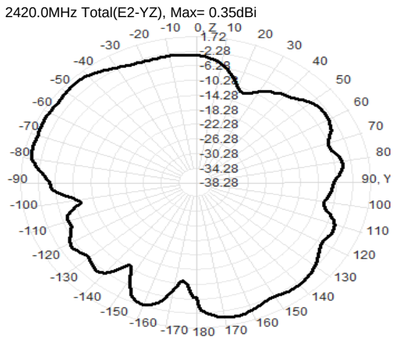
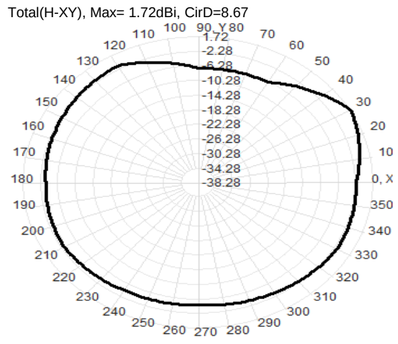


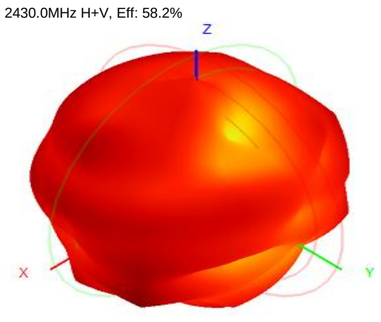
2420.0MHz Total(E2-YZ), Max= 0.35dBi



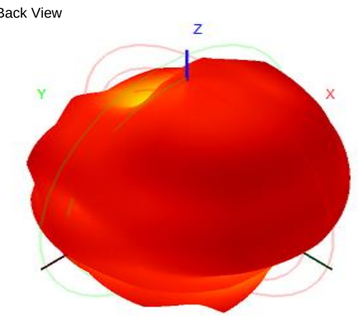
Total(H-XY), Max= 1.72dBi, CirD=8.67



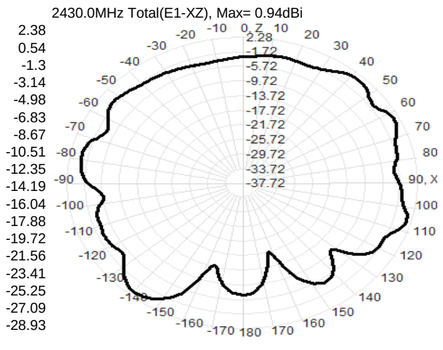
2430.0MHz H+V, Eff: 58.2%



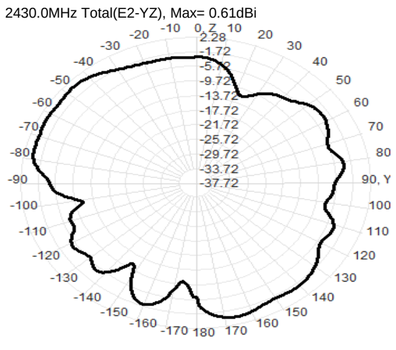
Back View



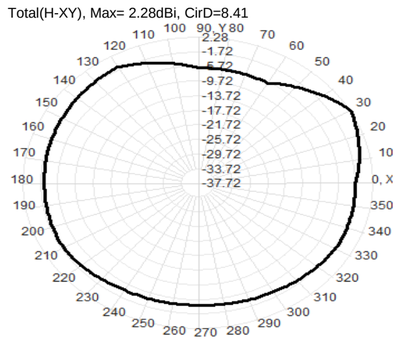
2430.0MHz Total(E1-XZ), Max= 0.94dBi



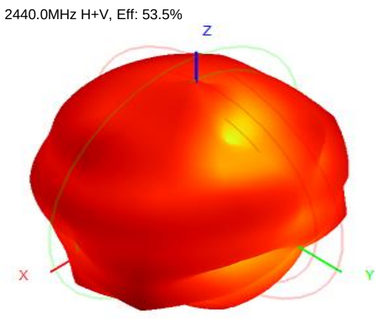
2430.0MHz Total(E2-YZ), Max= 0.61dBi



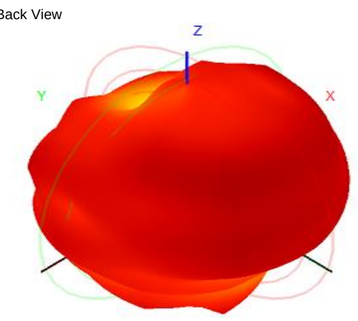
Total(H-XY), Max= 2.28dBi, CirD=8.41



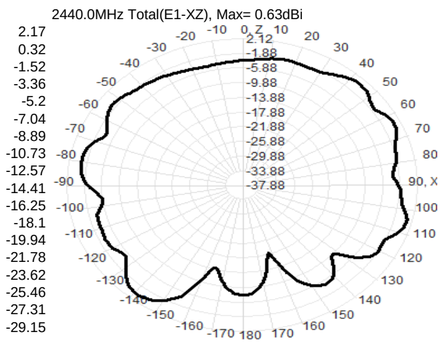
2440.0MHz H+V, Eff: 53.5%



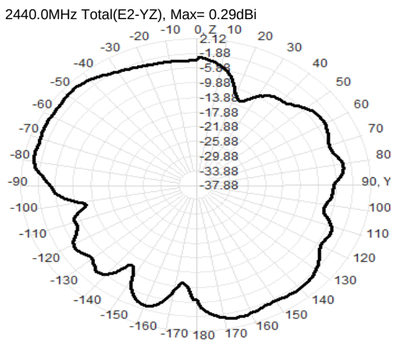
Back View



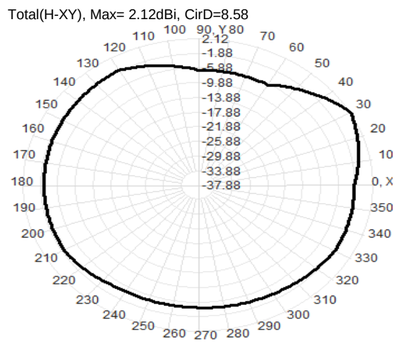
2440.0MHz Total(E1-XZ), Max= 0.63dBi



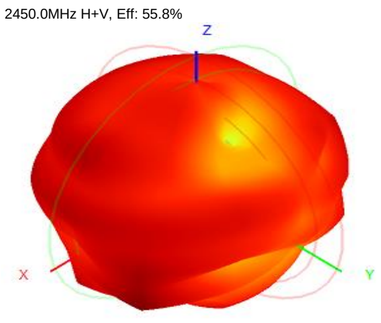
2440.0MHz Total(E2-YZ), Max= 0.29dBi



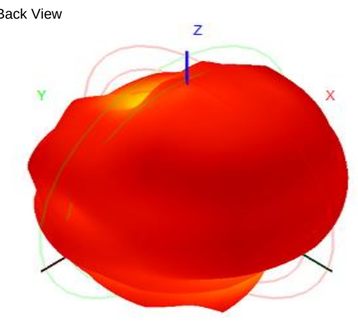
Total(H-XY), Max= 2.12dBi, CirD=8.58



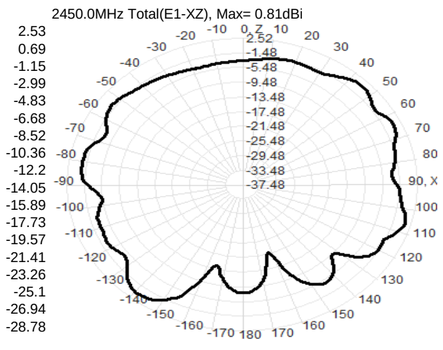
2450.0MHz H+V, Eff: 55.8%



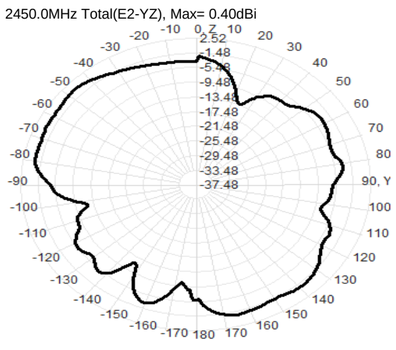
Back View



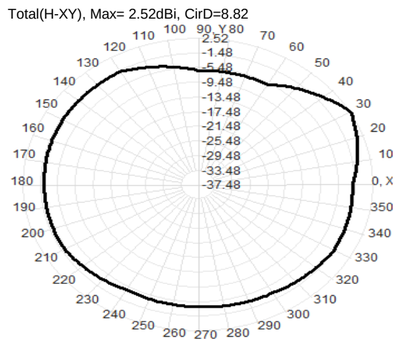
2450.0MHz Total(E1-XZ), Max= 0.81dBi



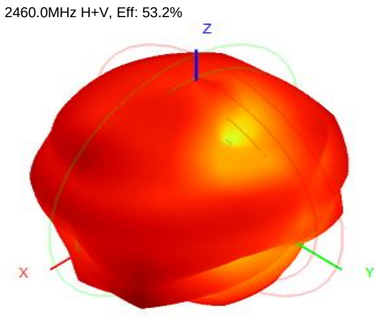
2450.0MHz Total(E2-YZ), Max= 0.40dBi



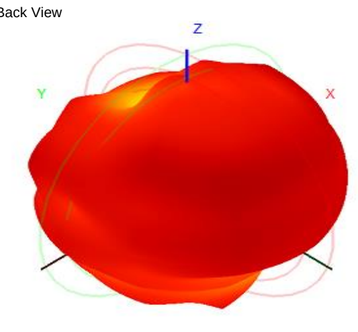
Total(H-XY), Max= 2.52dBi, CirD=8.82



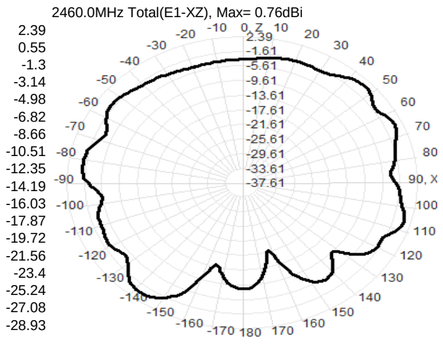
2460.0MHz H+V, Eff: 53.2%



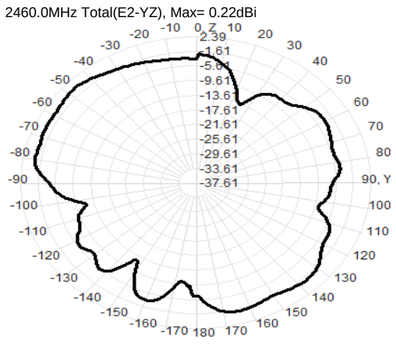
Back View



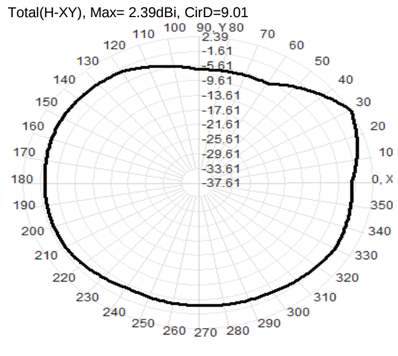
2460.0MHz Total(E1-XZ), Max= 0.76dBi



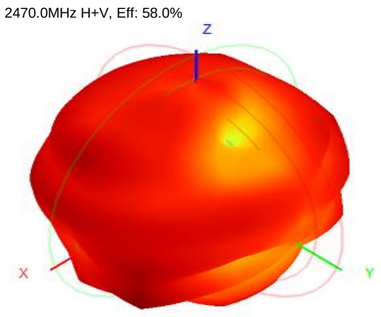
2460.0MHz Total(E2-YZ), Max= 0.22dBi



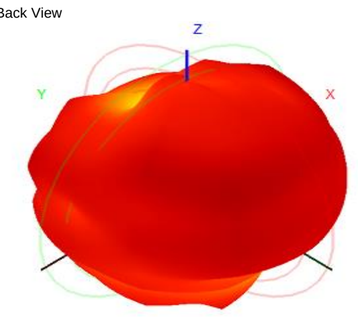
Total(H-XY), Max= 2.39dBi, CirD=9.01



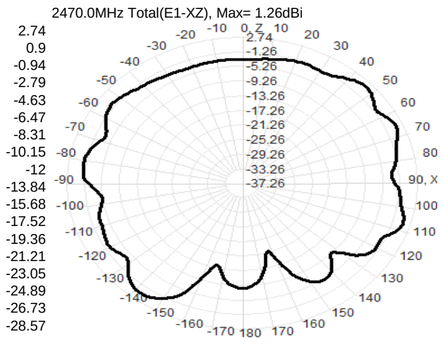
2470.0MHz H+V, Eff: 58.0%



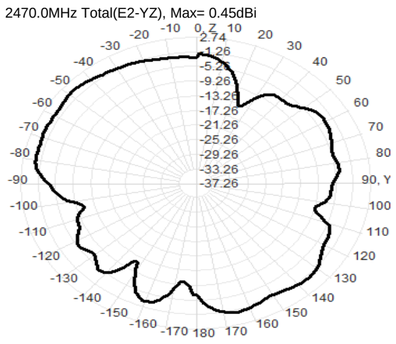
Back View



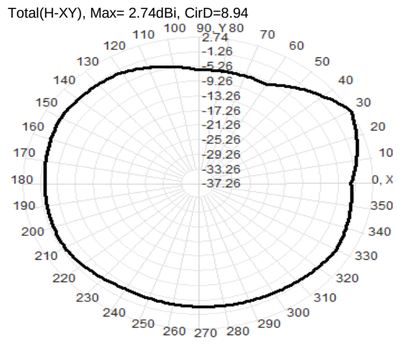
2470.0MHz Total(E1-XZ), Max= 1.26dBi



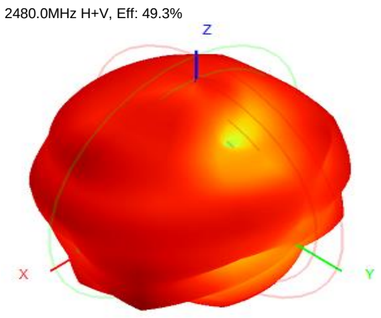
2470.0MHz Total(E2-YZ), Max= 0.45dBi



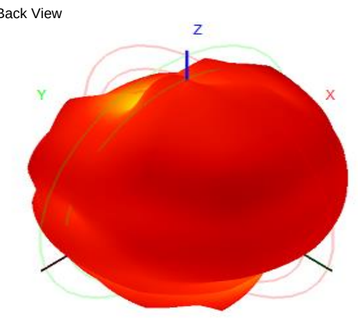
Total(H-XY), Max= 2.74dBi, CirD=8.94



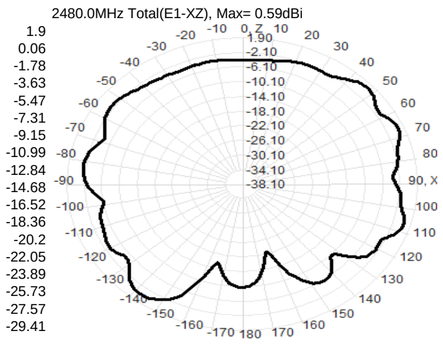
2480.0MHz H+V, Eff: 49.3%



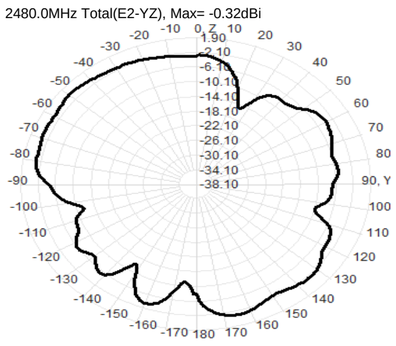
Back View



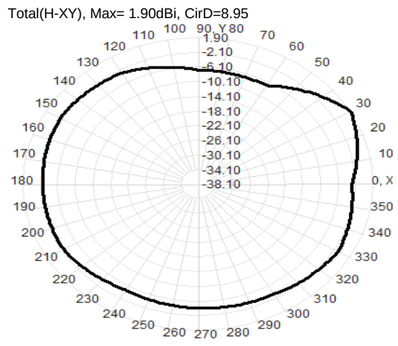
2480.0MHz Total(E1-XZ), Max= 0.59dBi



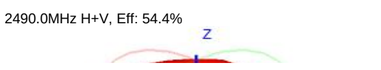
2480.0MHz Total(E2-YZ), Max= -0.32dBi



Total(H-XY), Max= 1.90dBi, CirD=8.95

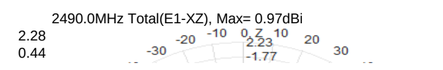


2490.0MHz H+V, Eff: 54.4%

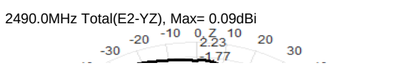


Back View

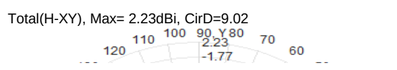
2490.0MHz Total(E1-XZ), Max= 0.97dBi

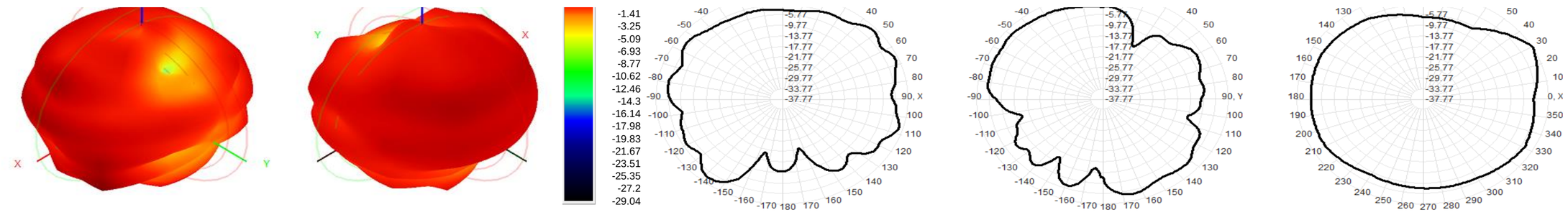


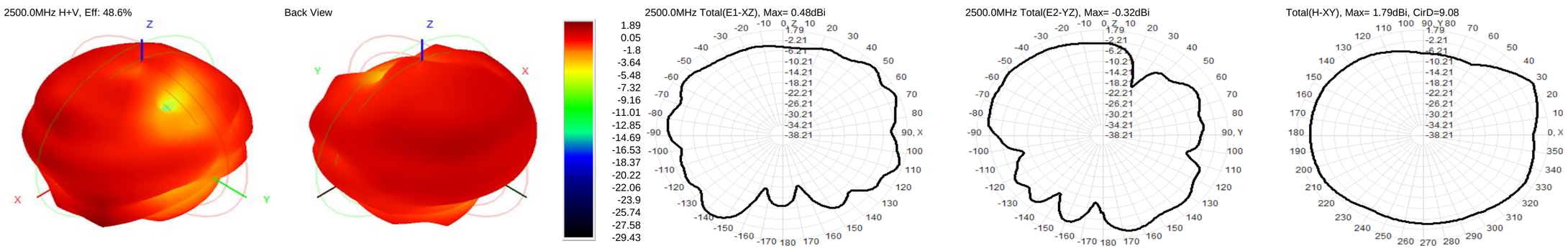
2490.0MHz Total(E2-YZ), Max= 0.09dBi

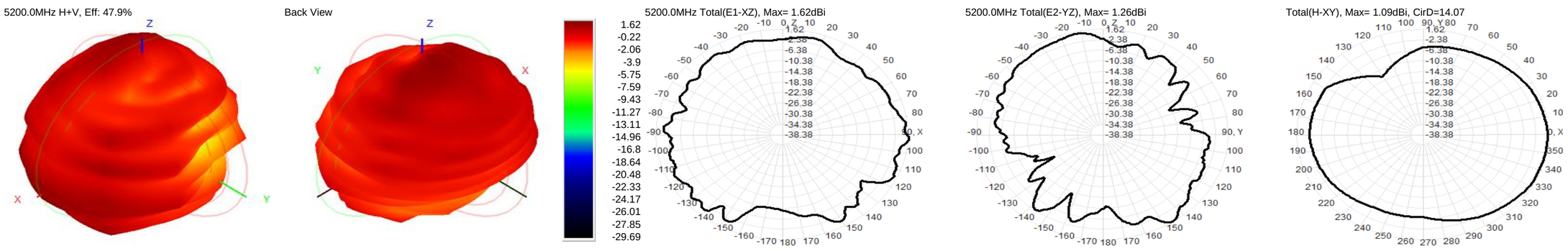


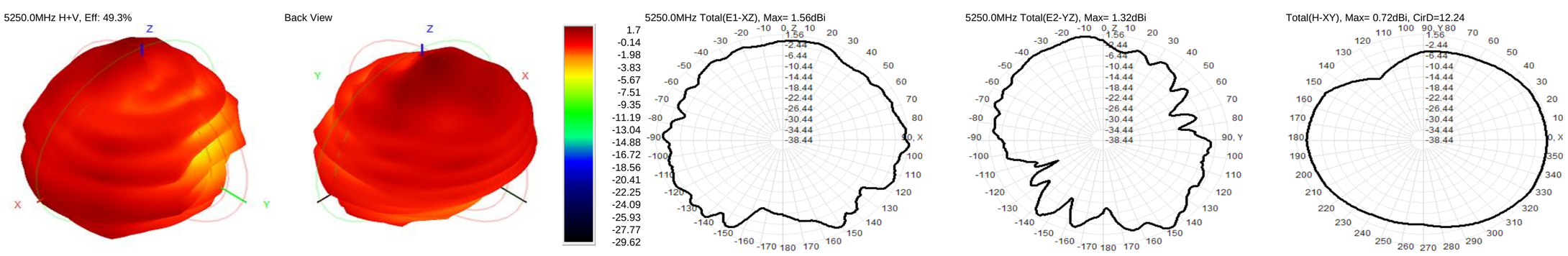
Total(H-XY), Max= 2.23dBi, CirD=9.02

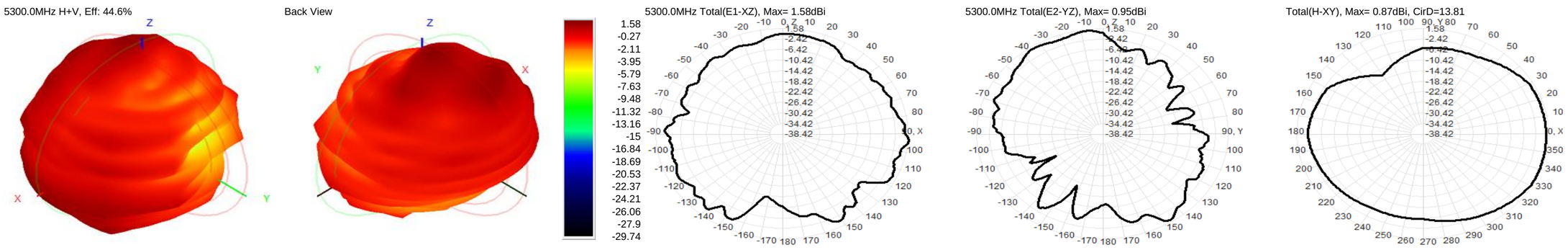


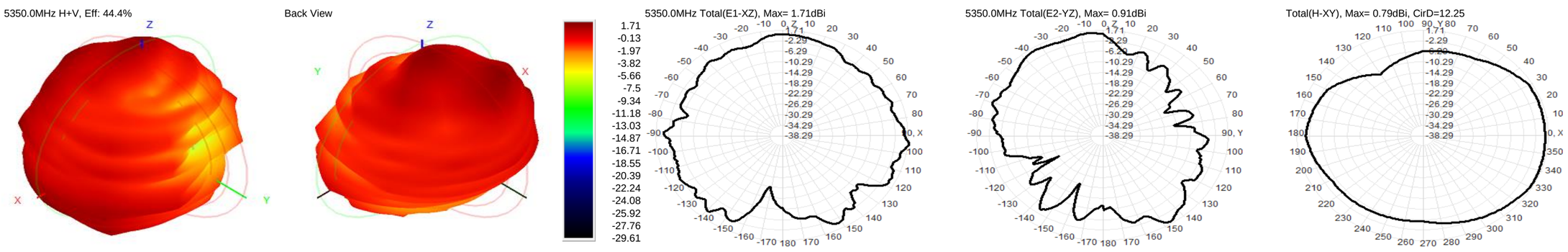

2500.0MHz H+V, Eff: 48.6%
Back View
2500.0MHz Total(E1-XZ), Max= 0.48dBi
2500.0MHz Total(E2-YZ), Max= -0.32dBi
Total(H-XY), Max= 1.79dBi, CirD=9.08

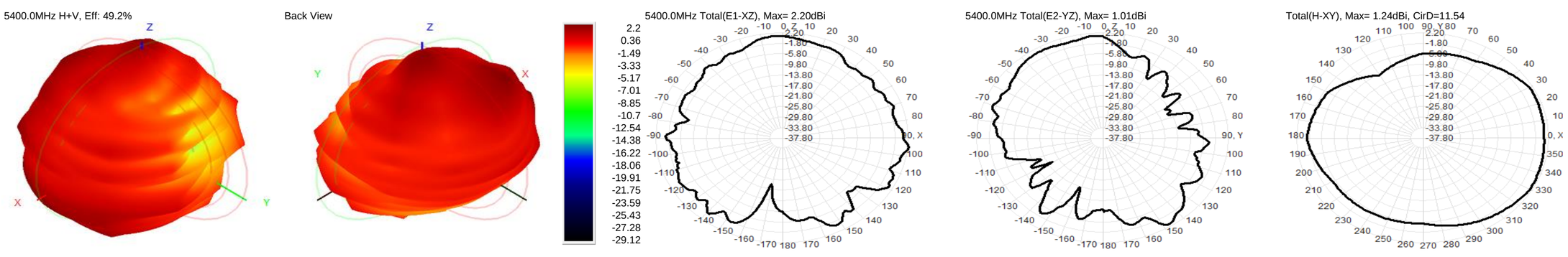

5150.0MHz H+V, Eff: 46.9%
Back View
5150.0MHz Total(E1-XZ), Max= 1.82dBi
5150.0MHz Total(E2-YZ), Max= 0.88dBi
Total(H-XY), Max= 1.58dBi, CirD=15.86

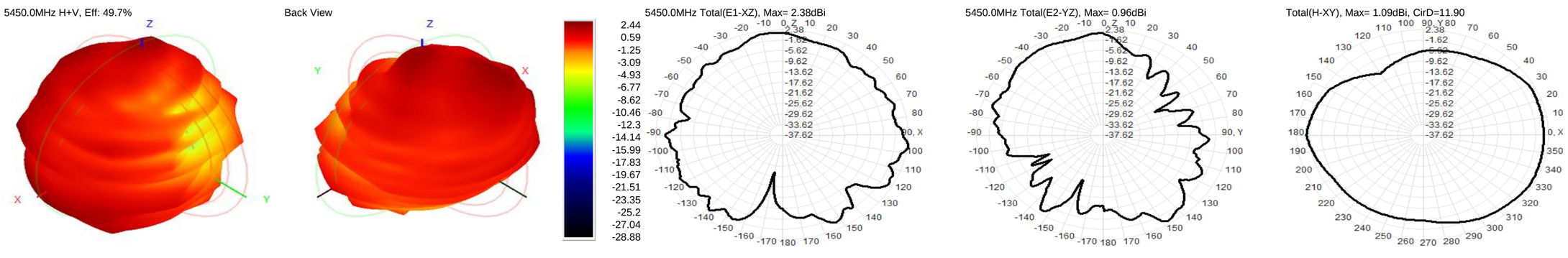

5200.0MHz H+V, Eff: 47.9%
Back View
5200.0MHz Total(E1-XZ), Max= 1.62dBi
5200.0MHz Total(E2-YZ), Max= 1.26dBi
Total(H-XY), Max= 1.09dBi, CirD=14.07

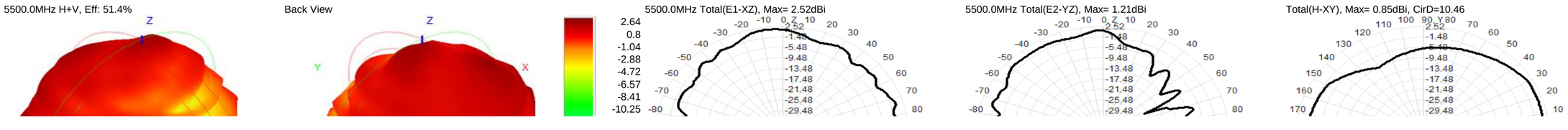

5250.0MHz H+V, Eff: 49.3%
Back View
5250.0MHz Total(E1-XZ), Max= 1.56dBi
5250.0MHz Total(E2-YZ), Max= 1.32dBi
Total(H-XY), Max= 0.72dBi, CirD=12.24

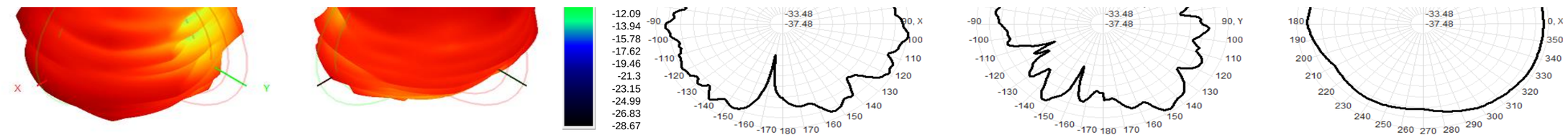

5300.0MHz H+V, Eff: 44.6%
Back View
5300.0MHz Total(E1-XZ), Max= 1.58dBi
5300.0MHz Total(E2-YZ), Max= 0.95dBi
Total(H-XY), Max= 0.87dBi, CirD=13.81


5350.0MHz H+V, Eff: 44.4%
Back View
5350.0MHz Total(E1-XZ), Max= 1.71dBi
5350.0MHz Total(E2-YZ), Max= 0.91dBi
Total(H-XY), Max= 0.79dBi, CirD=12.25

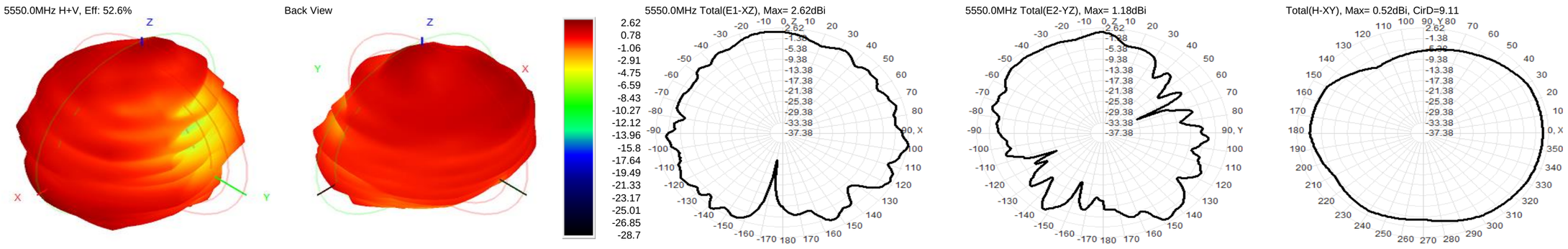

5400.0MHz H+V, Eff: 49.2%
Back View
5400.0MHz Total(E1-XZ), Max= 2.20dBi
5400.0MHz Total(E2-YZ), Max= 1.01dBi
Total(H-XY), Max= 1.24dBi, CirD=11.54


5450.0MHz H+V, Eff: 49.7%
Back View
5450.0MHz Total(E1-XZ), Max= 2.38dBi
5450.0MHz Total(E2-YZ), Max= 0.96dBi
Total(H-XY), Max= 1.09dBi, CirD=11.90

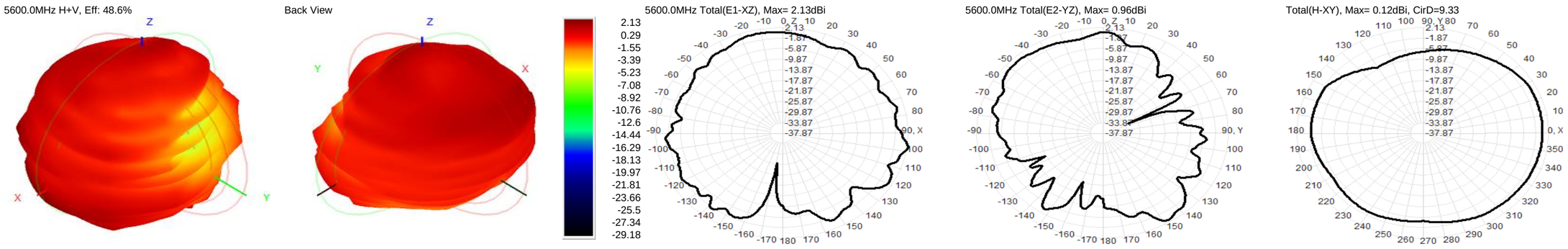

5500.0MHz H+V, Eff: 51.4%
Back View
5500.0MHz Total(E1-XZ), Max= 2.52dBi
5500.0MHz Total(E2-YZ), Max= 1.21dBi
Total(H-XY), Max= 0.85dBi, CirD=10.46



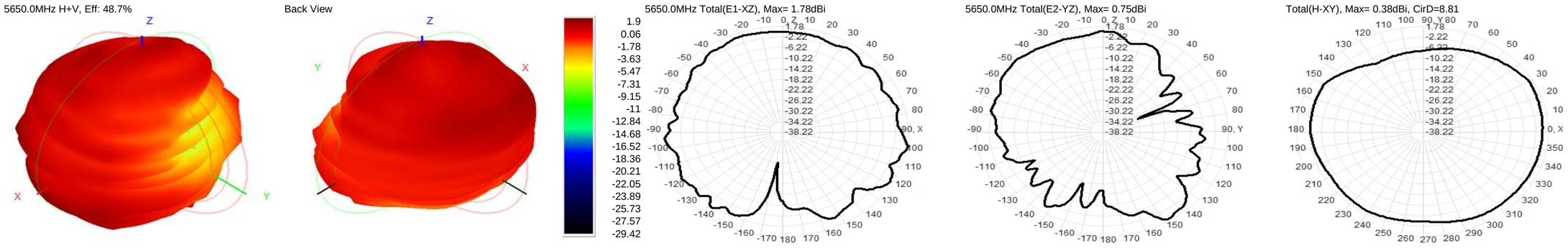
5550.0MHz H+V, Eff: 52.6%



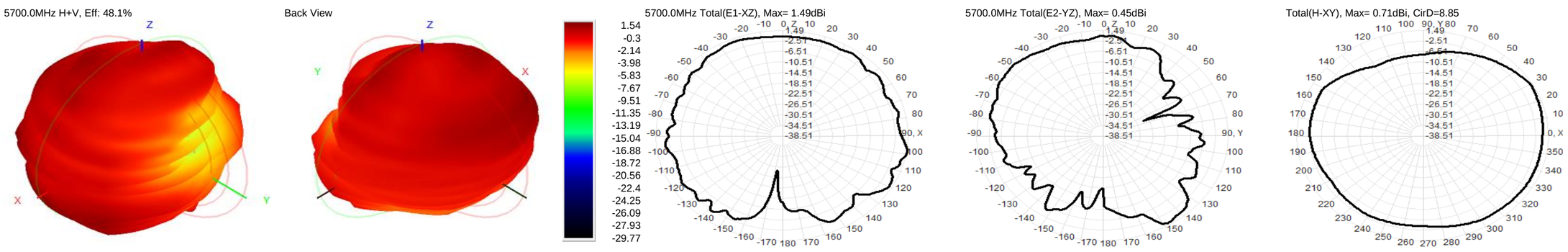
5600.0MHz H+V, Eff: 48.6%



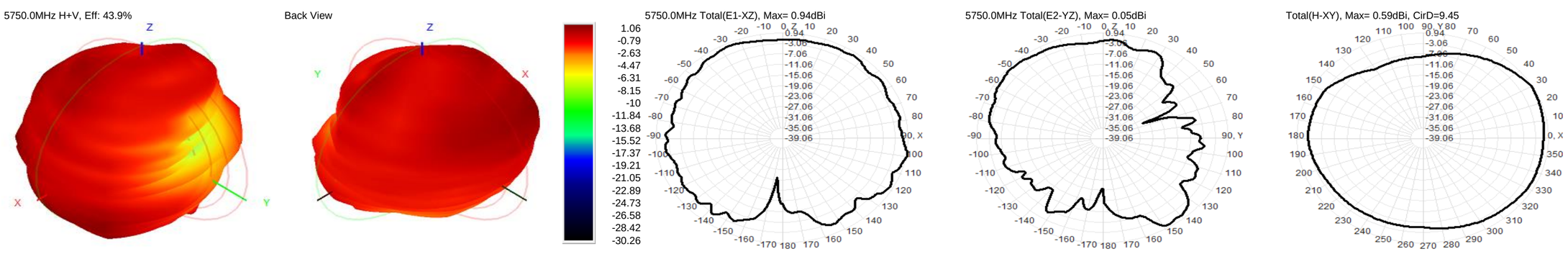
5650.0MHz H+V, Eff: 48.7%



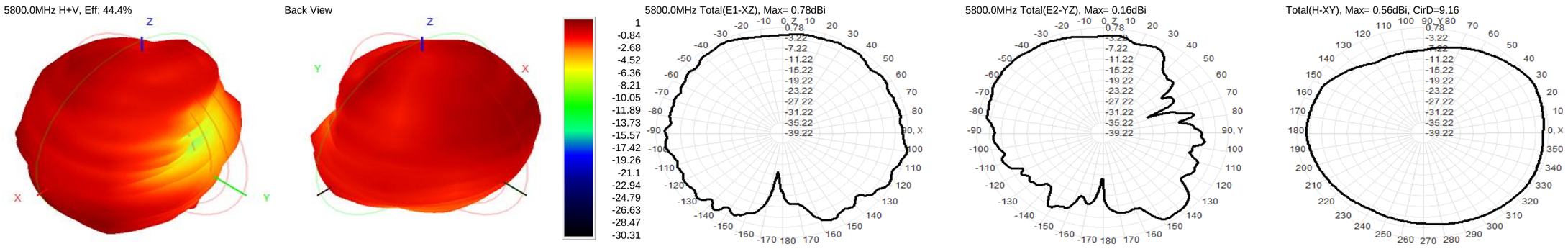
5700.0MHz H+V, Eff: 48.1%



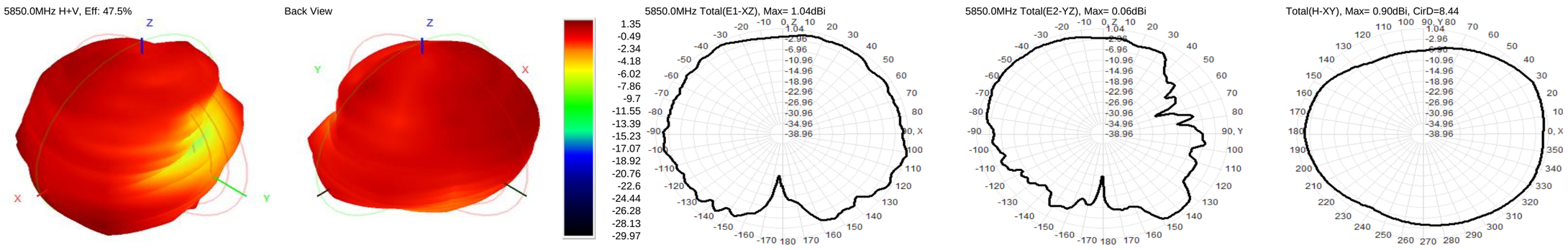
5750.0MHz H+V, Eff: 43.9%

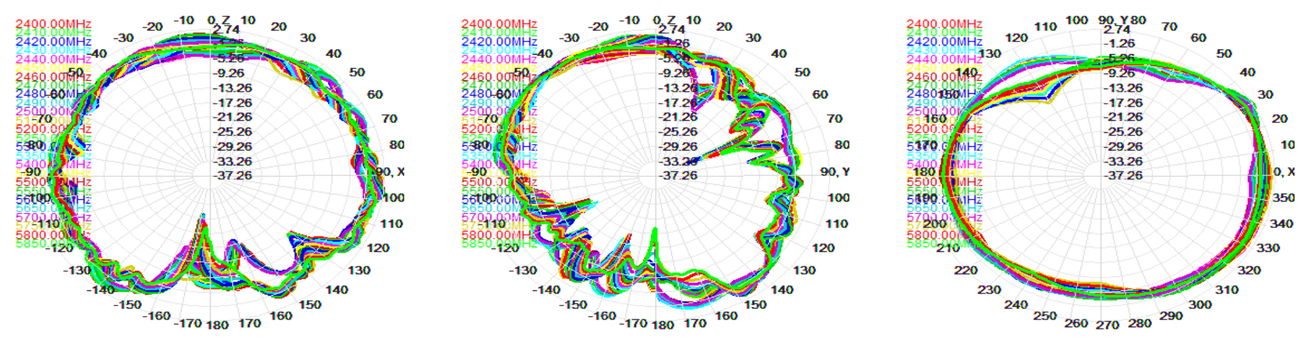


5800.0MHz H+V, Eff: 44.4%

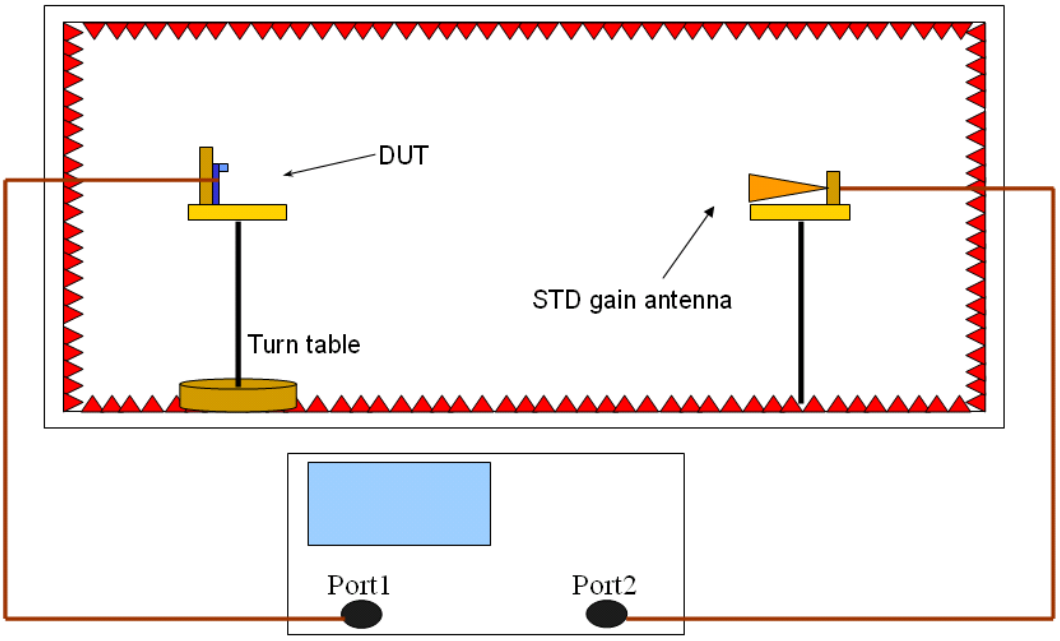


5850.0MHz H+V, Eff: 47.5%





4. Antenna Radiation Pattern

Testing Equipment Specification:

Antenna Anechoic Chamber Dimension: 8 x 4 x 4 m
Quite Zone: 600mm @1 GHz
Isolation: >100dB @ 1 MHz ~ 10 GHz
Testing Equipment: Agilent 5071B
Received Antenna: 0.7 ~ 6.0 GHz for Gain Calibration
Double Ridged Horn Antenna