

承認書

Customer 客 戶:

Product Name 品 名:

Dipole Antenna

Part Number 料 號:

HX-A07-WIFI

Customer 客戶料號:

Sample Delivery Date 送樣日期:

2024. 06. 11

客戶確認			Supplier 供應廠商	
工程部	品保部	採購部	核准	送樣人
			<div>趙 2024.06.11 守 剛</div>	龚银明

地址：東莞市沙田鎮楊公洲楊和路75號

TEL : 0769-81663533 FAX: 0769-89361945

E-mail:nogps@nogps.com

Http://www.nogps.com

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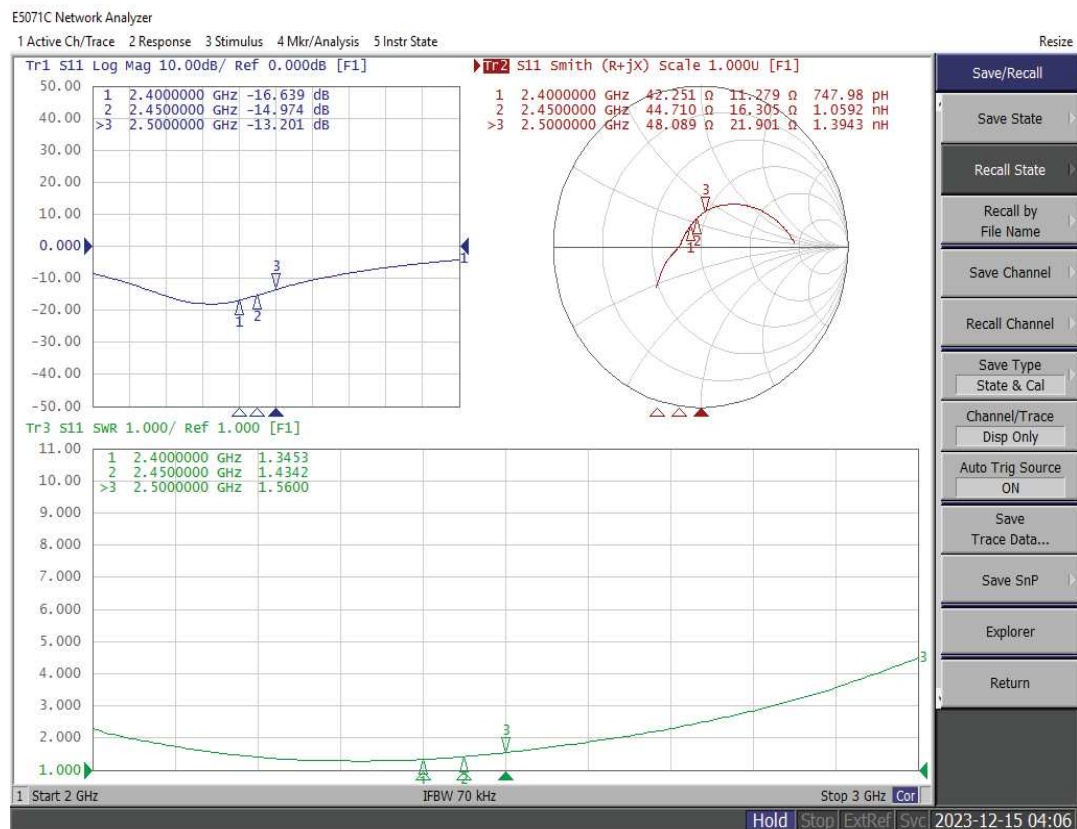
1. Reliability Testing

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 < $\pm 5\%$
3. Damp Heat	24 hours at 60°C; 90 ~ 95% RH	After 2 hours recovery: 1. no visible damage 2. bandwidth tolerance < $\pm 5\%$
4. Endurance	24 hours at 80°C	After 2 hours recovery: 1. no visible damage 2. bandwidth tolerance < $\pm 5\%$
5. Connector Pull Strength Test	≥ 1.0 Kg	Hold 2~3S: 1. no visible damage 2. bandwidth tolerance < $\pm 5\%$

2. Specification

A. Electrical Characteristics	
S.W.R.(Tested in PC)	<= 2.0 @ 2400~2500 MHz
Typical Antenna Gain	5dBi
Impedance	50 Ohm
B. Material	
Material of Radiator	CU
C. Environmental	
Operation Temperature	- 30 °C ~ + 85 °C
Storage Temperature	- 30 °C ~ + 85 °C

3. S.W.R. Testing Result



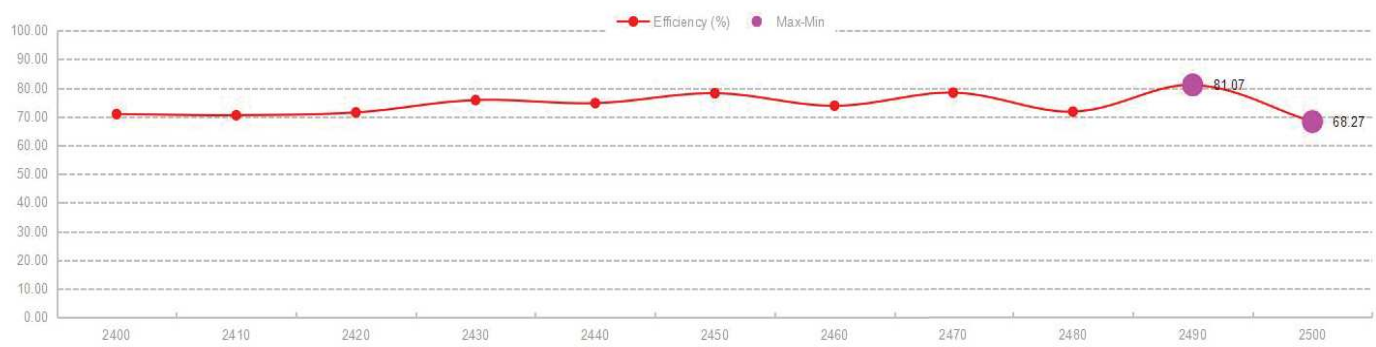
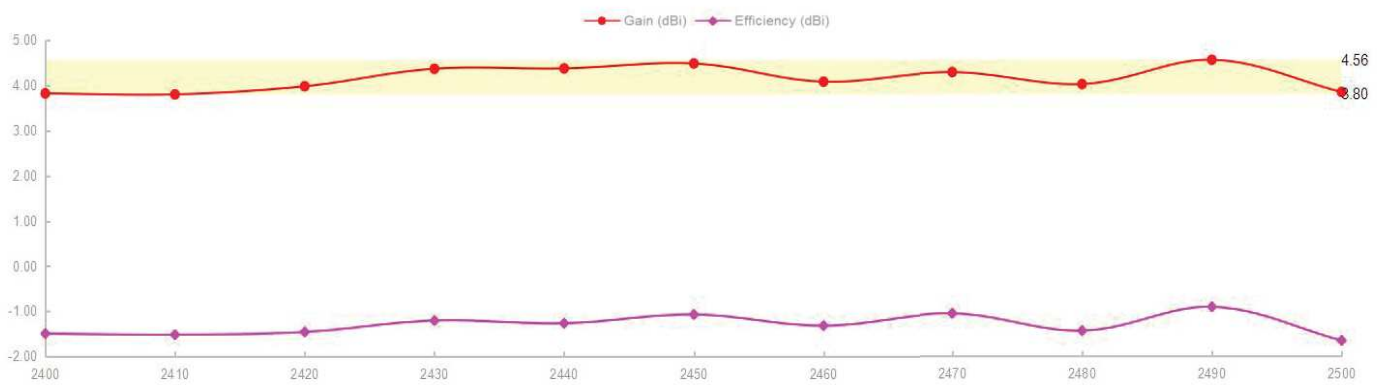
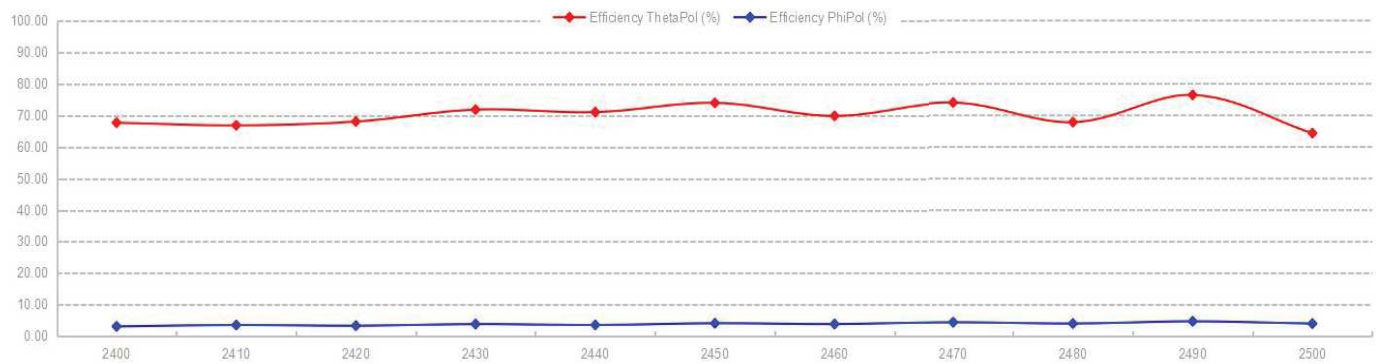
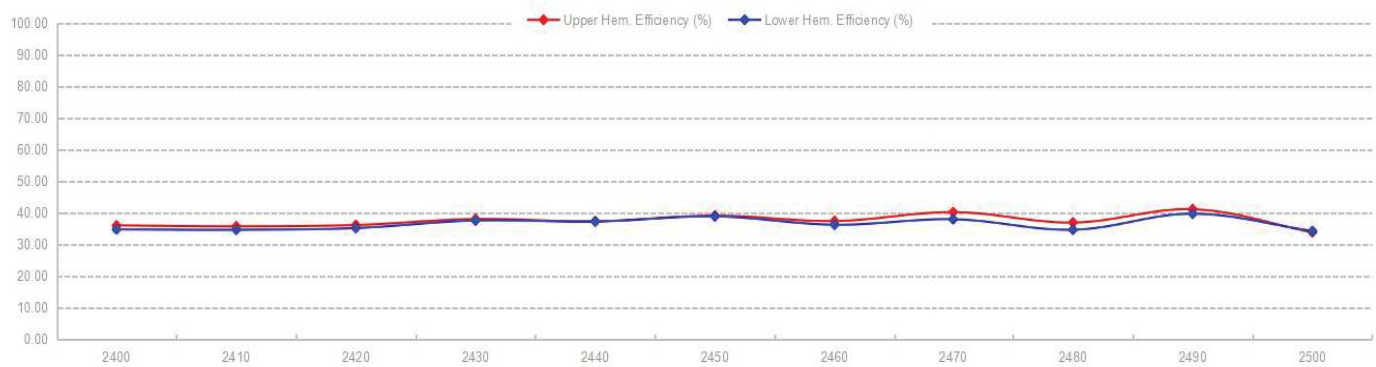


东莞亨松电子

Frequency ID	1	2	3	4	5	6	7	8	9	10	11
Frequency (MHz)	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
Efficiency (dBi)	-1.49	-1.52	-1.46	-1.20	-1.26	-1.07	-1.32	-1.06	-1.44	-0.91	-1.66
Gain (dBi)	3.83	3.80	3.98	4.37	4.38	4.49	4.09	4.29	4.02	4.56	3.85
Efficiency (%)	70.94	70.55	71.52	75.81	74.77	78.20	73.85	78.39	71.77	81.07	68.27
Directivity (dB)	5.32	5.32	5.44	5.58	5.64	5.56	5.40	5.35	5.46	5.47	5.51
Peak Gain Position (Theta)	94.00	96.00	96.00	97.00	97.00	98.00	98.00	85.00	85.00	86.00	96.00
Peak Gain Position (Phi)	30.00	300.00	300.00	300.00	300.00	300.00	300.00	240.00	240.00	240.00	30.00
Efficiency ThetaPol (%)	67.84	67.01	68.20	71.97	71.20	74.11	70.00	73.98	67.76	76.37	64.28
Efficiency PhiPol (%)	3.10	3.54	3.32	3.84	3.57	4.08	3.85	4.41	4.01	4.70	3.99
Upper Hem. Efficiency (%)	36.10	35.83	36.24	38.14	37.42	39.23	37.51	40.33	37.02	41.25	33.93
Lower Hem. Efficiency (%)	34.84	34.72	35.28	37.67	37.35	38.96	35.34	38.06	34.75	39.82	34.35

T90(H)圆度	1.14	1.25	1.26	1.19	1.20	1.29	1.41	1.63	1.67	1.71	1.69
Gain 15deg (dBi)											
E1(XZ)波瓣宽度	35.00	33.00	32.00	28.00	29.00	33.00	35.00	37.00	26.00	25.00	32.00
E1(XZ)前后比	12.63	11.51	10.91	10.28	10.22	10.00	9.84	9.45	9.22	8.90	8.39
E2(YZ)波瓣宽度	32.00	30.00	28.00	27.00	28.00	30.00	35.00	35.00	34.00	32.00	31.00
E2(YZ)前后比	8.41	8.12	7.88	7.59	7.24	6.91	5.47	6.01	5.76	5.78	5.83
最大增益处轴比(P)	17.61	27.92	32.76	21.87	21.79	19.54	25.76	45.03	36.24	33.25	22.41
顶点(Theta=0)处轴比(P)	14.52	16.73	14.04	15.62	15.82	16.58	15.77	17.95	17.59	14.99	11.58
仰角10度最差(大)轴比(P)	60.91	71.14	60.25	56.26	61.55	58.17	60.24	62.43	56.98	69.53	64.04
Hc(XY)波瓣宽度	360.00	360.00	360.00	360.00	360.00	360.00	360.00	360.00	360.00	360.00	360.00
Hc(XY)前后比	0.06	0.07	0.09	0.11	0.10	0.05	0.00	0.00	0.00	0.00	0.00
左旋圆极化效率(%)	41.72	41.89	41.88	45.05	43.88	46.22	43.15	45.96	41.46	47.16	38.78
右旋圆极化效率(%)	29.22	28.65	29.64	30.76	30.89	31.97	30.70	32.43	30.31	33.91	29.49
最大增益处交极比(+/-45极化)	0.51	8.48	7.48	7.98	8.36	10.36	11.05	1.44	1.46	0.99	0.97
最大增益处交极比(水平垂直极化)	17.38	6.81	7.81	7.03	6.69	4.95	4.88	21.66	21.41	24.28	20.51
T60度Phi一圈最差交极比(+/-45极化)	0.00	0.00	0.02	0.01	0.00	0.01	0.00	0.01	0.03	0.04	0.00
T60度Phi一圈最差交极比(水平垂直极化)	4.92	5.08	6.76	7.60	7.98	7.03	6.63	6.06	5.75	5.52	5.77
T90度(H)Phi一圈最差交极比(+/-45极化)	0.00	0.00	0.01	0.01	0.02	0.03	0.01	0.00	0.00	0.02	0.02
T90度(H)Phi一圈最差交极比(水平垂直极化)	7.40	7.60	8.47	7.84	6.74	5.41	5.39	5.99	6.82	6.75	6.23
轴对称天线主瓣下倾角度(平均值)	1.12	1.00	0.31	-0.81	-2.35	-2.44	-0.56	-0.19	0.24	-0.56	-1.18
轴向(Z+)水平垂直极化隔离度	13.59	14.43	11.04	9.76	9.27	9.12	8.54	8.22	8.52	8.29	7.58
Theta85.0一周最大增益	3.83	3.80	3.98	4.37	4.38	4.49	4.09	4.29	4.02	4.56	3.85
Theta85.0一周圆度(为最大最小增益差)	7.79	7.85	8.55	9.51	10.06	10.03	9.69	9.50	9.80	10.26	10.63

Empty



4. Antenna Radiation Pattern

Testing Equipment Specification:

Antenna Anechoic Chamber Dimension: 8 x 4 x 4 m

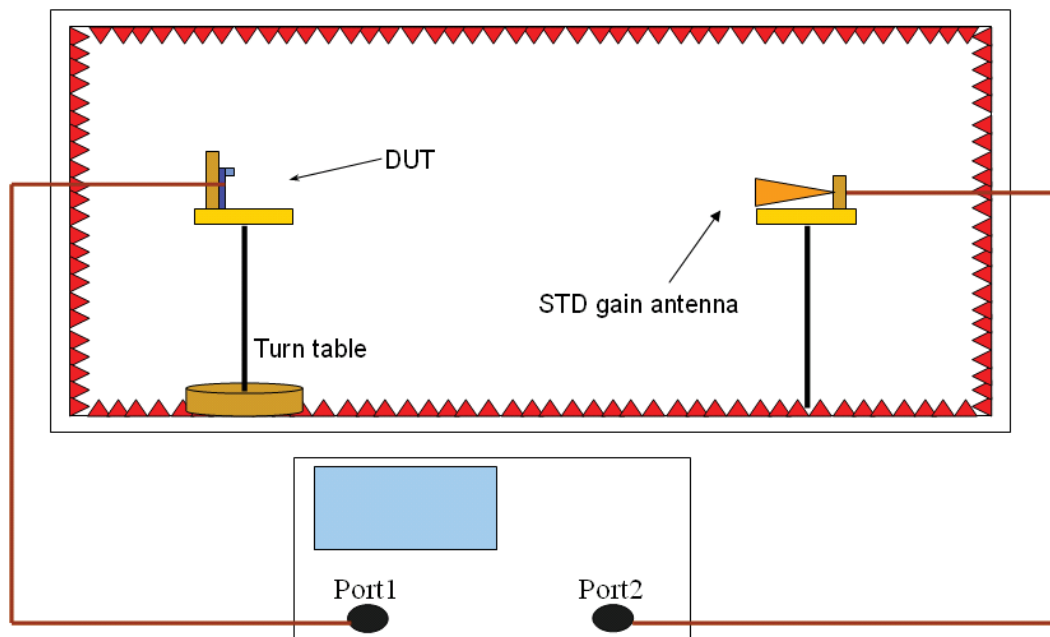
Quiet Zone: 600mm @1 GHz

Isolation: >100dB @ 1 MHz ~ 10 GHz

Testing Equipment: Agilent 5071B

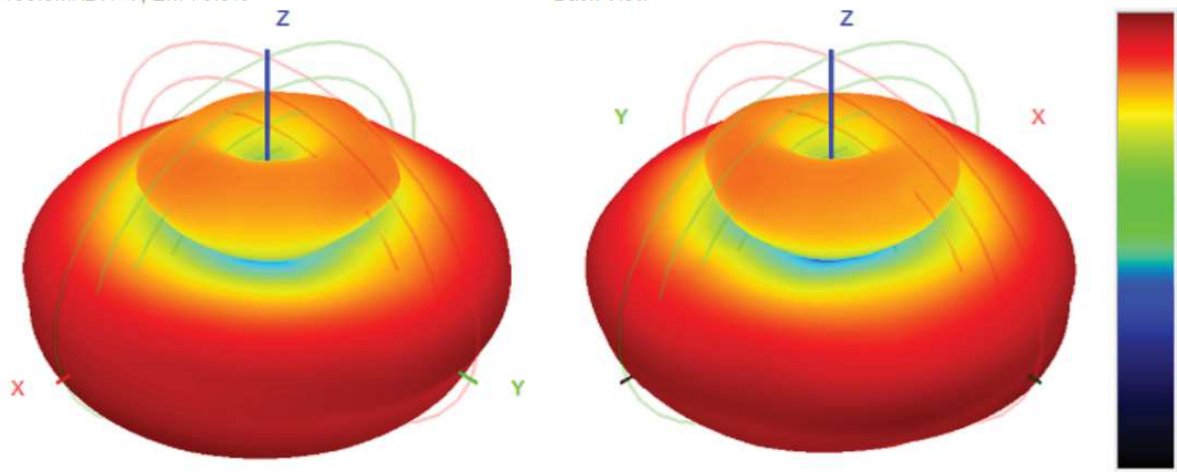
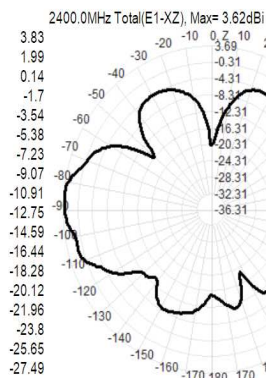
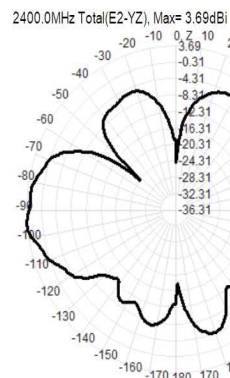
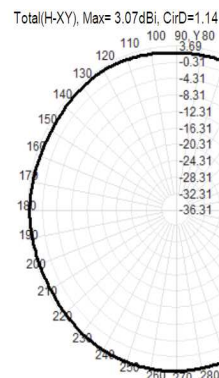
Received Antenna: 0.7 ~ 6.0 GHz for Gain Calibration

Double Ridged Horn Antenna



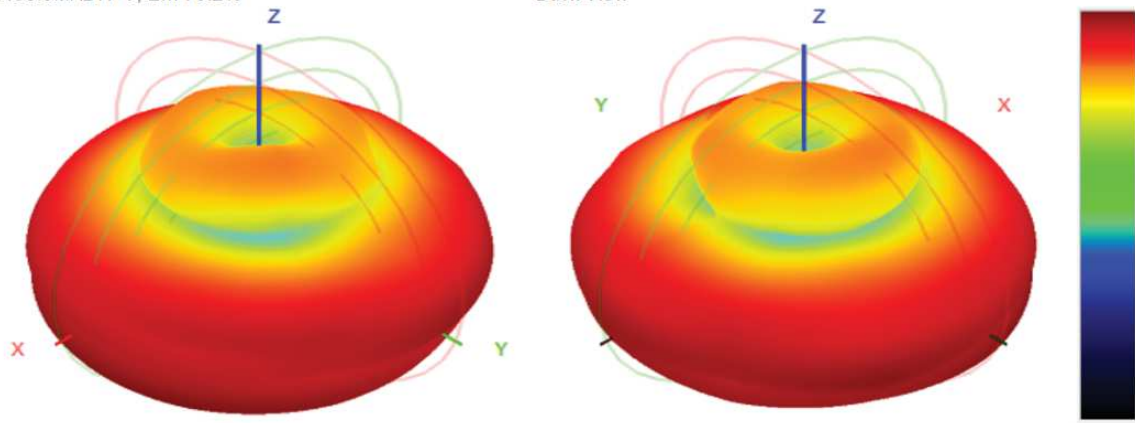
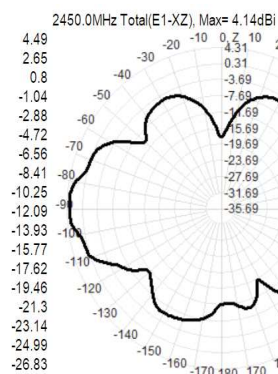
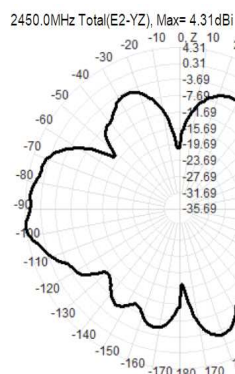
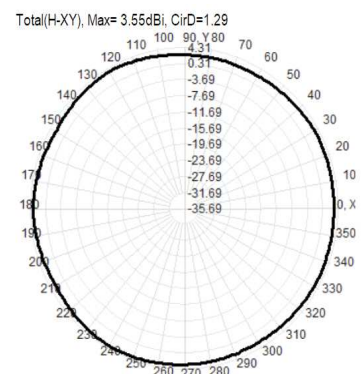
2400.0MHz H+V, Eff: 70.9%

Back View

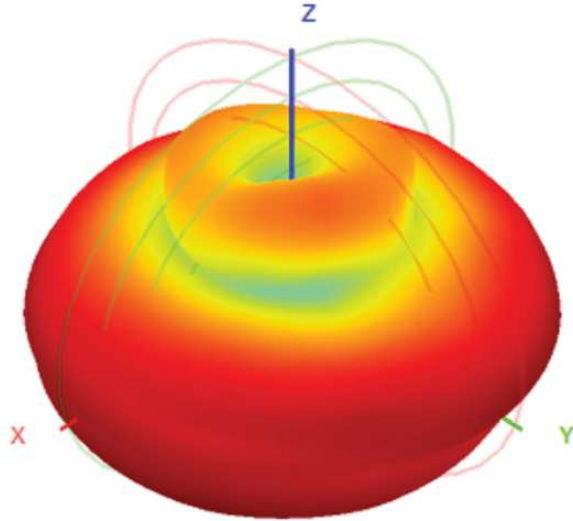


2450.0MHz H+V, Eff: 78.2%

Back View



2500.0MHz H+V, Eff: 68.3%



Back View

