

			Document Number:
<i>Specification For Approval</i>			
Customer:	Shenzhen Tengshi Technology Co., Ltd		
Customer:	Shenzhen Guangyuanfa Electronics Co., Ltd		
Part Number:		Number:	GYF-DS04-4G-V1.0& GYF-SC20-WIFI-V1.0
Description:	FPC antenna: Material: One and a half pairs of black 3M9472 adhesive backing	Models	DS04
Supplier acknowledgement (stamp):		The customer acknowledges (stamps):	
Production: Huang Wangchun	Structure: Huang Wangchun		
Audit:	date: 2024-11-19		

(directory)

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1. (specification)

1.1 (Electrical Specifications)

(This report mainly provides the test status of various electrical and structural performance parameters of DS04 antenna.)

Specifications and models	Guangyuanfa material numbe
FPC antenna	GYF-DS04-4G-V1.0&GYF-SC20-WIFI-V1.0

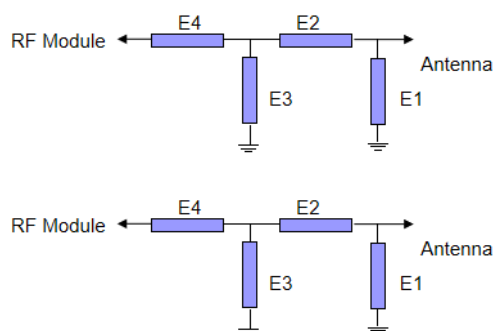
1.2 Antenna frequency range)

(The following table is the index of the electrical performance of the antenna designed and mass-produced by Guangyuanfa)

Models	DS04			
Antenna type	FPC			
Frequency band and antenna material	Main antenna	Band		Material
		2G	/	FPC
		3G	/	
		LTE	B1/B3/B5/B8/B38/B39/B40/B41	
	Other antennas	DIV	/	/
		WIFI	2400-2500MHz	FPC
		GPS	/	/
Performance requirements	Execute according to customer requirements			

2. (Matching circuit diagram)

(There are no changes to the antenna matching)



MAIN	Element	Value
	E1 (0402)	N/A
	E2 (0402)	0欧姆
	E3 (0402)	N/A
WIFI	Element	Value
	E1 (0402)	N/A
	E2 (0402)	0欧姆
	E3 (0402)	N/A
	E4 (0402)	0欧姆

3. (Structural form)

3.1 Antenna composition The antenna is mainly composed of a flexible circuit printed board.)

4. (Test the equipment)

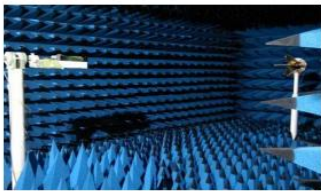
测试设备说明



24探头微波暗室



CMW500



7*4*3M ETS微波暗室



Agilent 8960



Agilent E5071B



高低温试验箱



MT8820C



HP8753ES

测试系统	测试环境	有源测试	无源测试
ETS 暗室 24探头OTA暗室	温度: 22℃±3℃ 湿度: 50%±15%	支持2G/3G/4G 支持NB-IoT/CAT-M/BT/WIFI	700MHz——6G

5. (VSWR test connection)

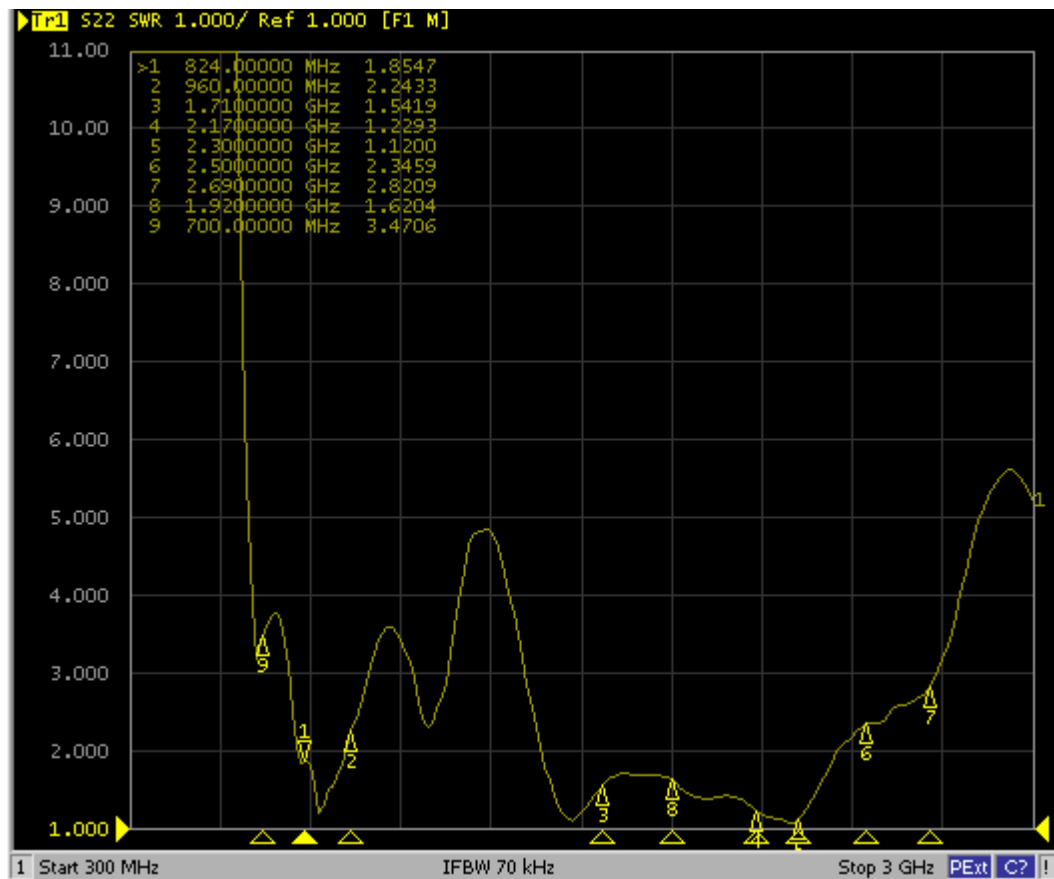
5.1 Test Connections: The VSWR test setups are connected in turn as follows:R&S ZVL Network Analyzer--Test line--Test fixtures.

6. (Test)

(6.1 Test site: Guangyuanfa microwave anechoic chamber. The test frequency range is 400MHz-6GHz, the quiet zone range is 50cm circumferential circle, and the reflectivity Less than -50 dB.

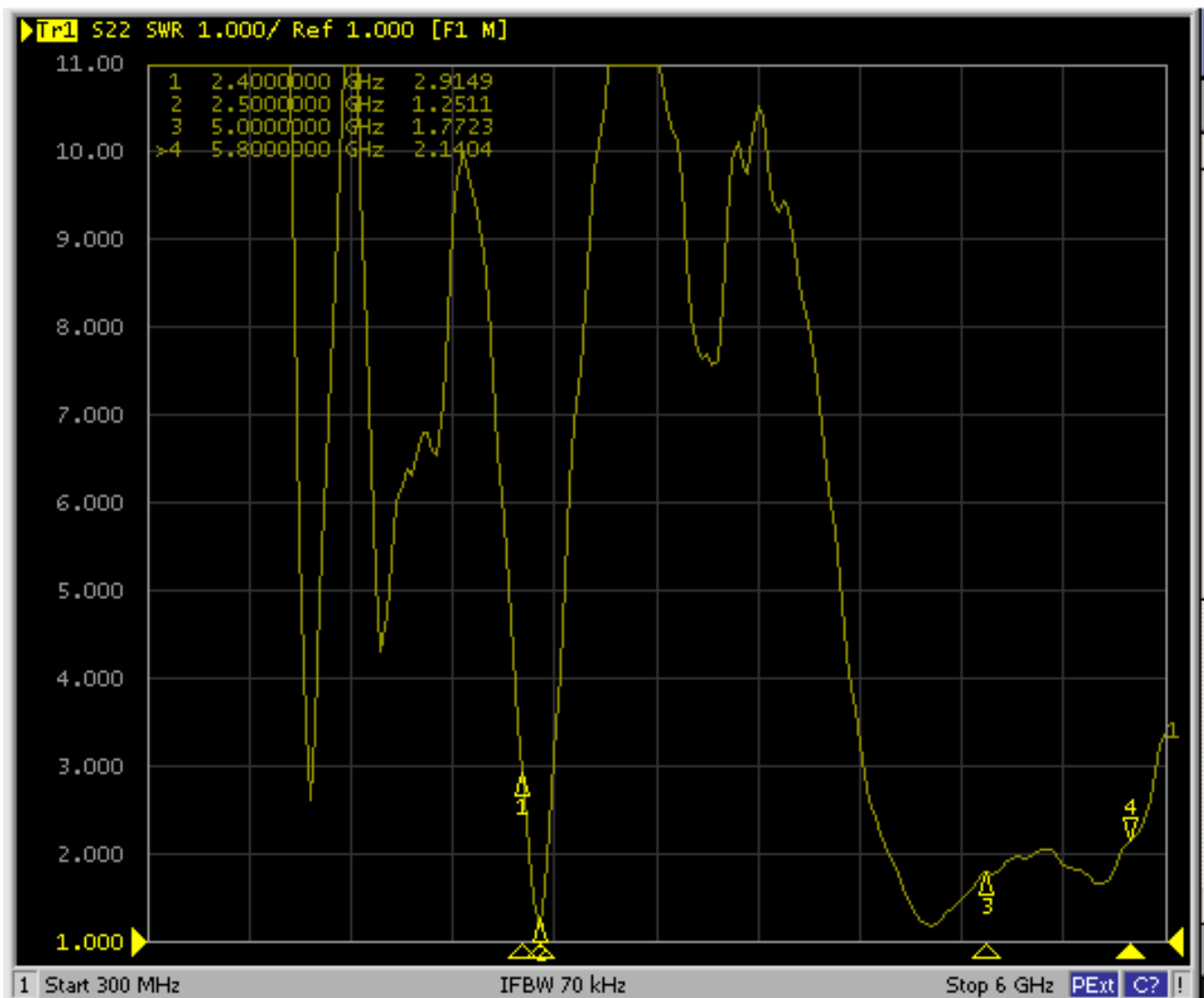
6.2 Instruments tested: Agilent5071B, CMW500, Agilent8960 E5515C, standard horn antenna, 24-probe OTA microwave chamber test system, printer, etc)

6.3 (The antenna VSWR test)



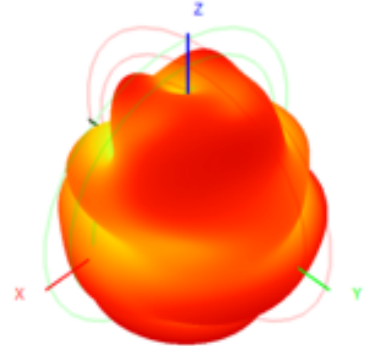
6.4 (Antenna tested data included Gain, 2D, 3D)

Frequency (MHz)	Efficiency (dBi)	Gain (dBi)	Efficiency (%)	Frequency (MHz)	Efficiency (dBi)	Gain (dBi)	Efficiency (%)
820.0	-4.80	2.20	33.10	2160.0	-2.35	3.68	58.15
830.0	-4.73	1.85	33.63	2180.0	-2.66	3.42	54.21
840.0	-4.73	0.86	33.68	2200.0	-2.72	3.16	53.47
850.0	-4.67	0.24	34.15	2220.0	-2.83	3.89	52.14
860.0	-4.49	0.74	35.53	2240.0	-2.86	3.81	51.74
870.0	-4.48	1.18	35.67	2260.0	-2.88	3.52	51.47
880.0	-4.67	1.00	34.10	2280.0	-3.15	3.35	48.38
890.0	-4.74	0.65	33.54	2300.0	-3.38	3.40	45.91
900.0	-4.83	0.54	32.87	2320.0	-3.05	3.57	49.57
910.0	-4.70	1.32	33.85	2340.0	-2.82	3.74	52.24
920.0	-4.62	1.47	34.51	2360.0	-2.96	3.75	50.53
930.0	-4.80	1.08	33.13	2380.0	-2.97	3.98	50.48
940.0	-4.89	0.85	32.45	2400.0	-2.95	4.26	50.65
950.0	-5.12	0.59	30.76	2420.0	-2.87	4.70	51.67
960.0	-5.26	0.54	29.76	2440.0	-2.63	4.78	54.58
970.0	-5.39	0.83	28.90	2460.0	-2.63	4.57	54.57
980.0	-5.36	1.33	29.08	2480.0	-2.82	4.35	52.29
990.0	-5.37	1.76	29.02	2500.0	-2.98	4.31	50.38
1000.0	-5.37	2.07	29.02	2520.0	-3.06	4.21	49.43
1700.0	-3.53	2.71	44.36	2540.0	-3.18	4.24	48.10
1720.0	-3.52	2.24	44.46	2560.0	-3.20	4.13	47.90
1740.0	-3.54	2.16	44.23	2580.0	-3.25	3.73	47.35
1760.0	-3.51	2.46	44.60	2600.0	-3.39	3.43	45.80
1780.0	-3.40	2.88	45.72	2620.0	-3.68	2.98	42.87
1800.0	-3.60	2.70	43.66	2640.0	-3.55	3.25	44.14
1820.0	-3.76	2.25	42.05	2660.0	-3.67	3.09	42.98
1840.0	-3.44	2.46	45.32	2680.0	-3.97	2.67	40.09
1860.0	-3.24	2.84	47.37	2700.0	-3.93	2.35	40.42
1880.0	-3.33	3.14	46.45				
1900.0	-3.26	3.35	47.18				
1920.0	-3.22	3.33	47.64				
1940.0	-3.02	3.37	49.85				
1960.0	-2.68	3.49	54.01				
1980.0	-2.70	3.69	53.71				
2000.0	-3.09	3.44	49.11				
2020.0	-3.15	3.22	48.38				
2040.0	-2.77	3.73	52.87				
2060.0	-2.65	3.79	54.27				
2080.0	-2.69	3.69	53.84				
2100.0	-2.59	3.73	55.12				
2120.0	-2.58	3.62	55.23				
2140.0	-2.38	3.73	57.78				

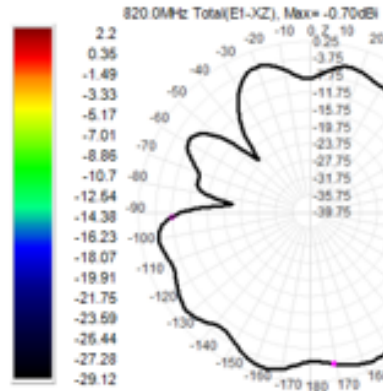
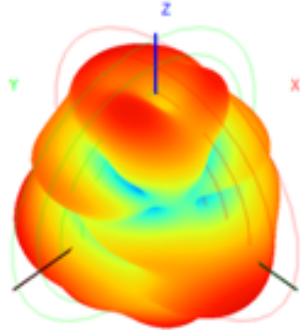


Frequency (MHz)	Efficiency (dBi)	Gain (dBi)	Efficiency (%)
2400.0	-5.18	0.59	30.31
2410.0	-5.11	0.48	30.82
2420.0	-5.24	0.28	29.94
2430.0	-5.14	0.33	30.60
2440.0	-5.20	0.12	30.21
2450.0	-4.97	0.29	31.83
2460.0	-4.79	0.54	33.19
2470.0	-4.71	0.76	33.81
2480.0	-4.77	0.81	33.37
2490.0	-4.78	1.03	33.29
2500.0	-4.76	1.31	33.41

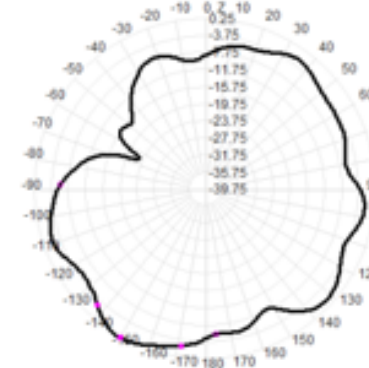
820.0MHz Total, Eff: 33.1%



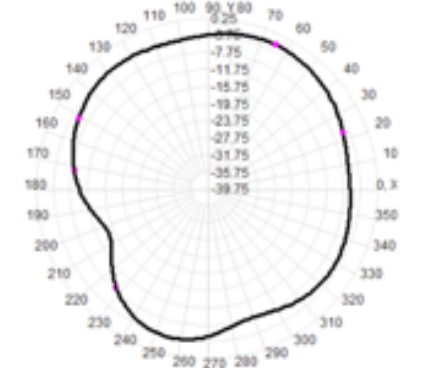
Back View



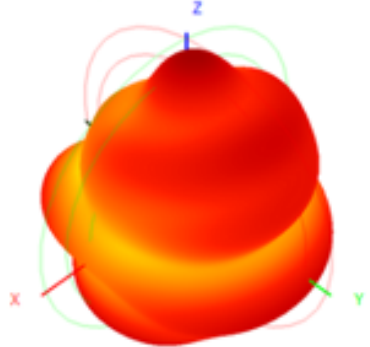
820.0MHz Total(E2-YZ), Max= 0.25dB



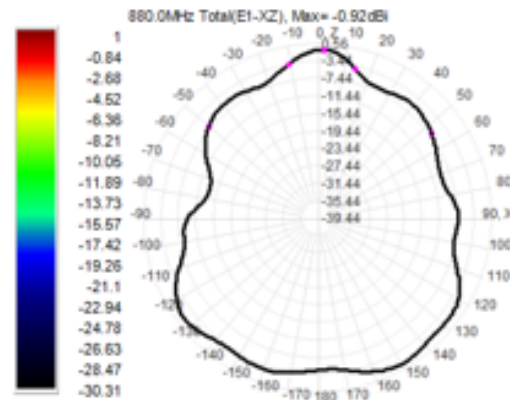
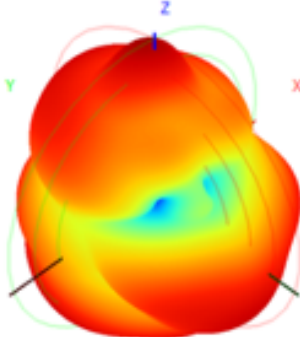
Total(H-XY), Max=-2.42dB, CrD=12.10



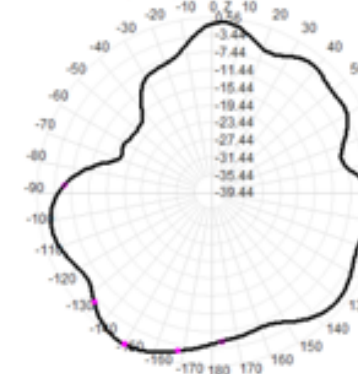
880.0MHz Total, Eff: 34.1%



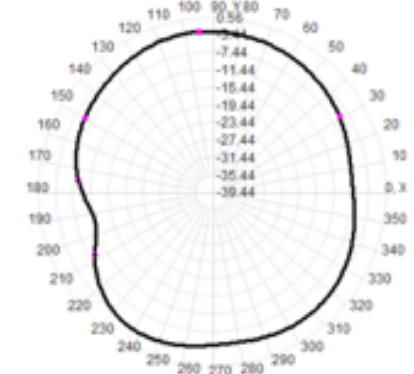
Back View



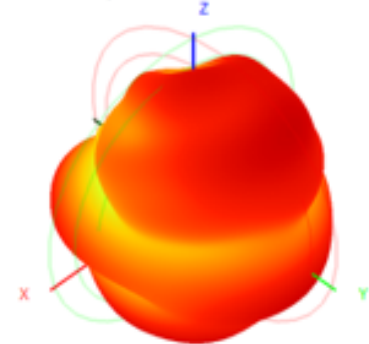
880.0MHz Total(E2-YZ), Max= 0.56dB



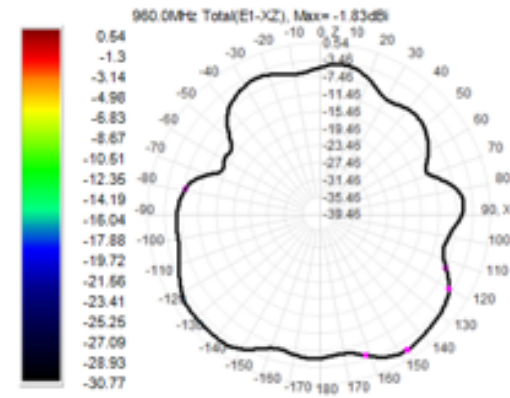
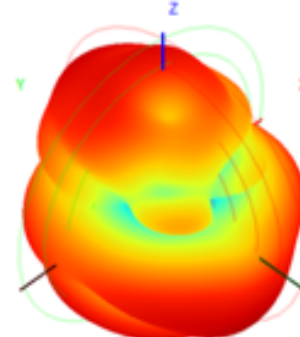
Total(H-XY), Max=-2.64dB, CrD=9.03



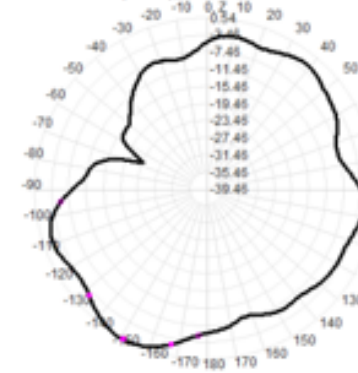
960.0MHz Total, Eff: 29.8%



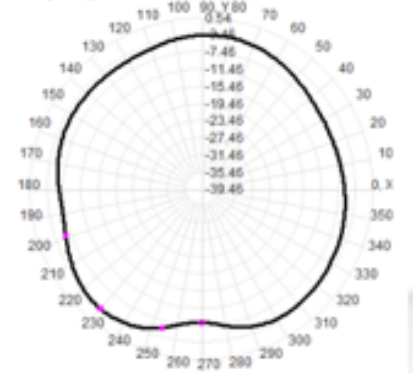
Back View



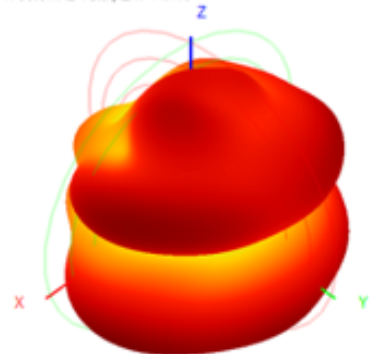
960.0MHz Total(E2-YZ), Max= 0.54dB



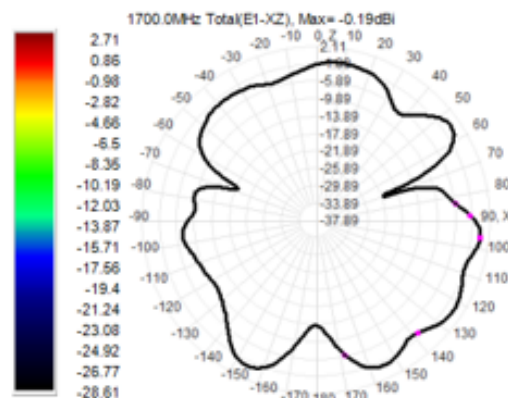
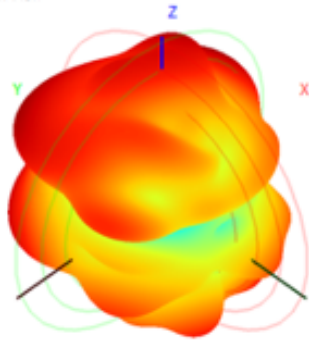
Total(H-XY), Max=-3.05dB, CrD=6.46



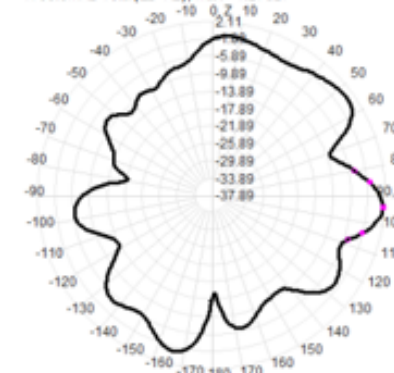
1700.0MHz Total, Eff: 44.4%



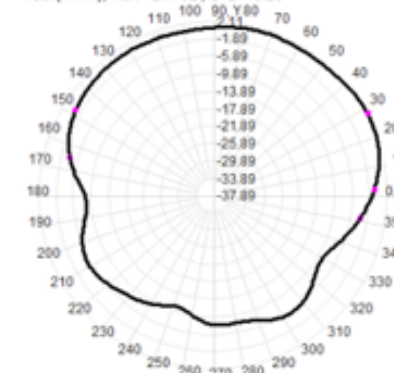
Back View



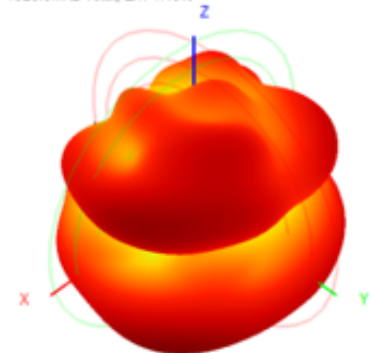
1700.0MHz Total(E2-YZ), Max= 1.27dBi



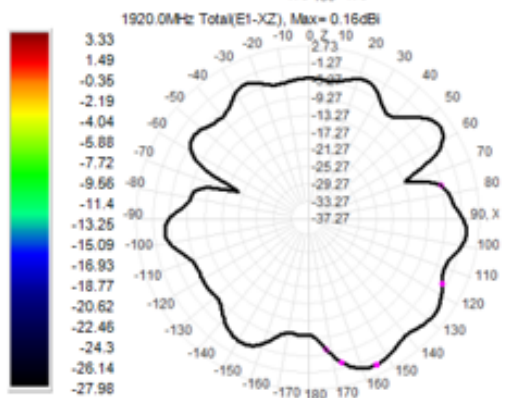
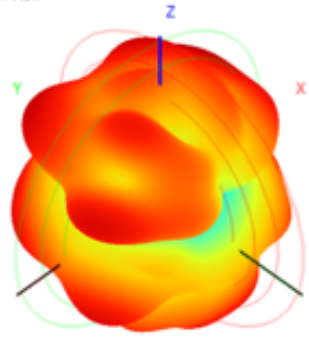
Total(H-XY), Max= 2.11dBi, CrD=13.25



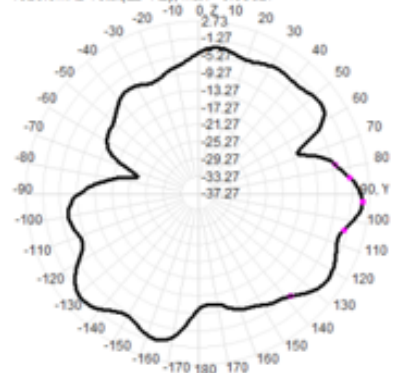
1920.0MHz Total, Eff: 47.6%



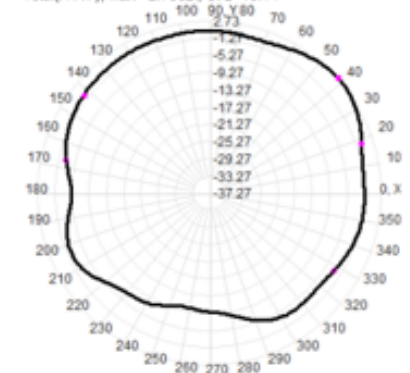
Back View



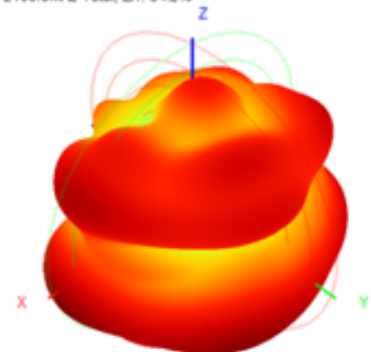
1920.0MHz Total(E2-YZ), Max= 0.83dBi



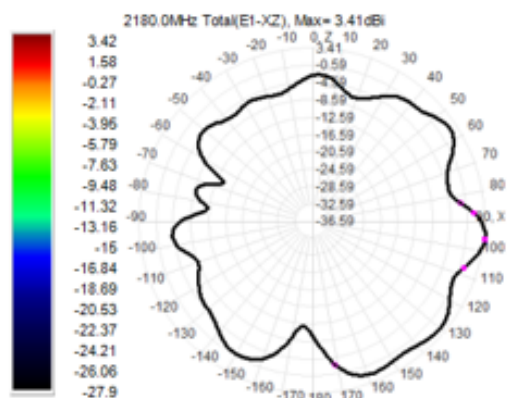
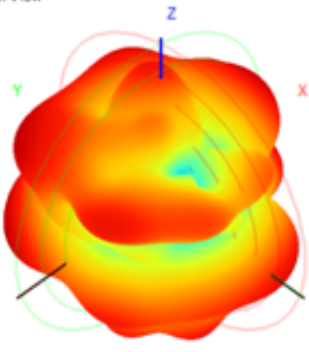
Total(H-XY), Max= 2.73dBi, CrD=13.14



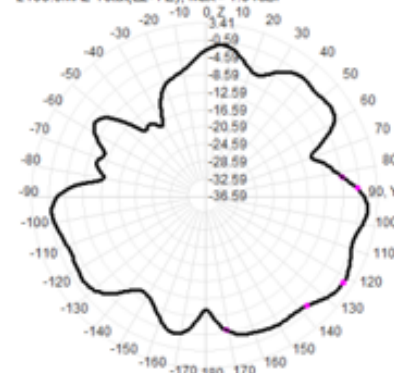
2180.0MHz Total, Eff: 54.2%



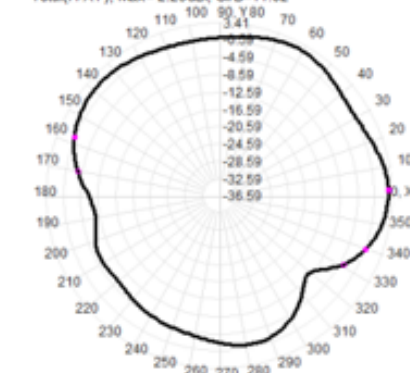
Back View

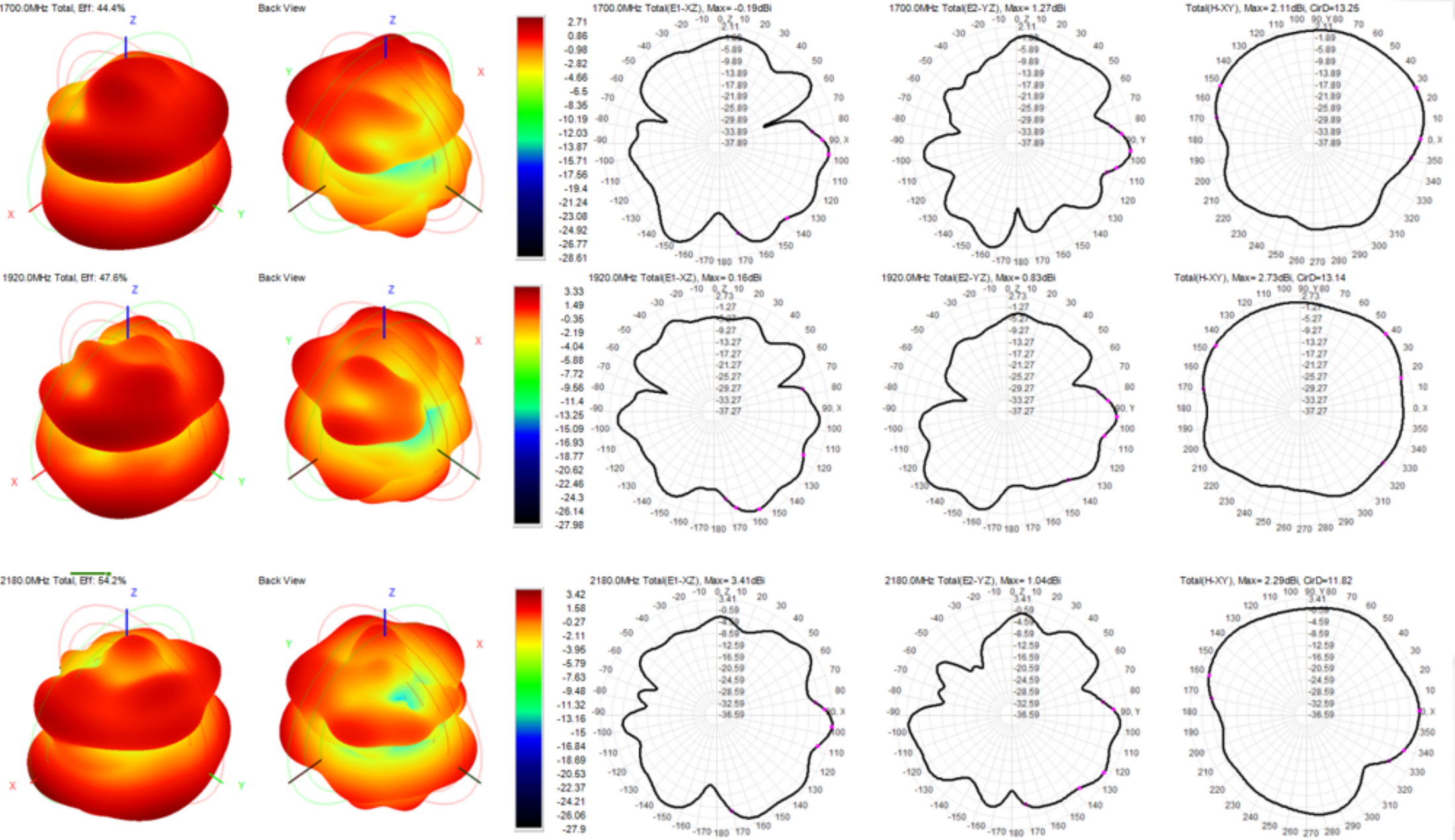


2180.0MHz Total(E2-YZ), Max= 1.04dBi



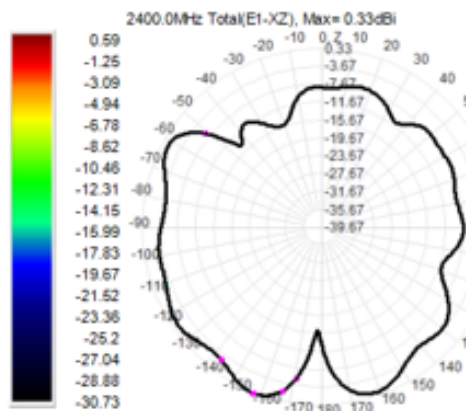
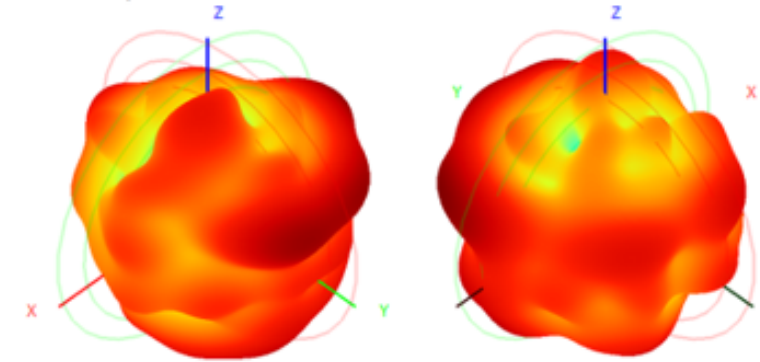
Total(H-XY), Max= 2.29dBi, CrD=11.82



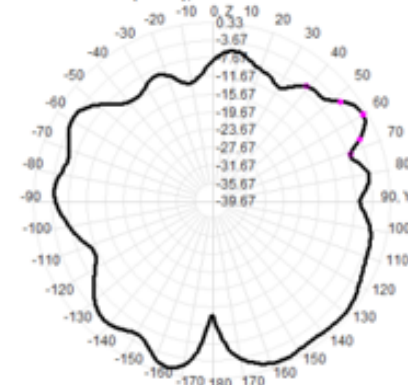


2400.0MHz Total, Eff: 30.3%

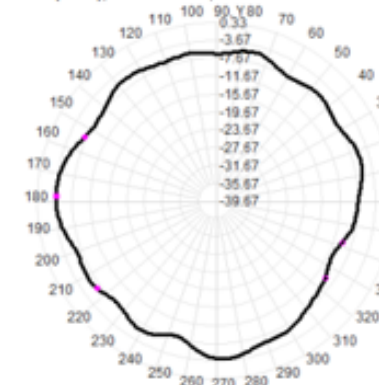
Back View



2400.0MHz Total(E2-YZ), Max=-0.81dBi

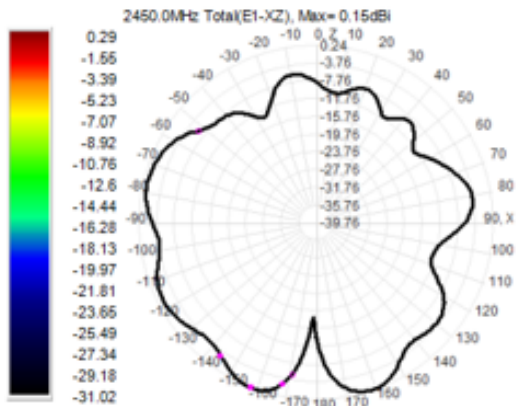
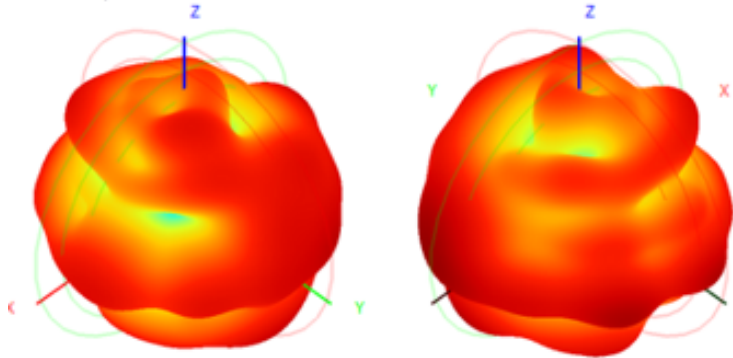


Total(H-XY), Max=-3.93dBi, CrD=7.09

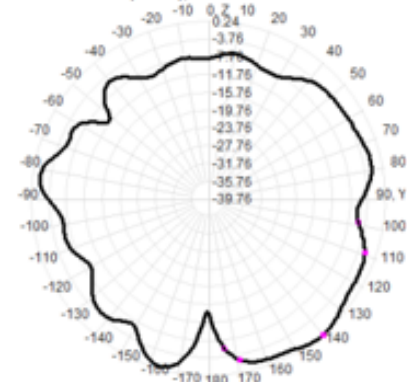


50.0MHz Total, Eff: 31.8%

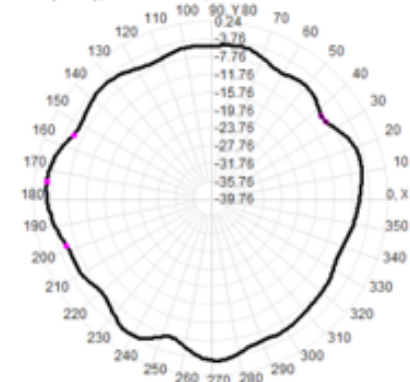
Back View



2450.0MHz Total(E2-YZ), Max=0.24dBi

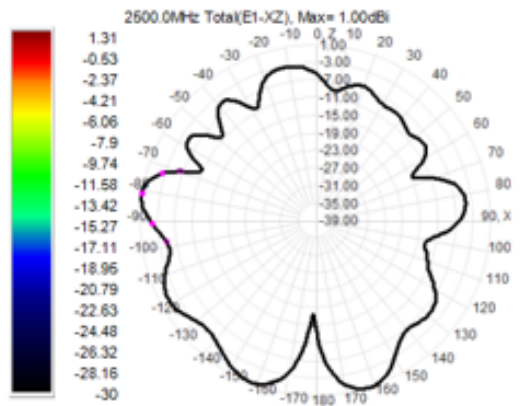
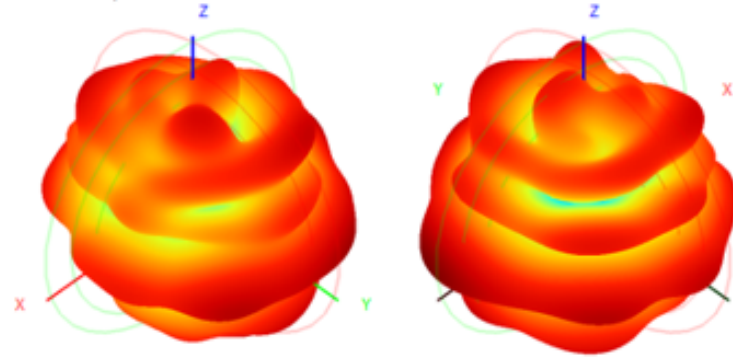


Total(H-XY), Max=-2.61dBi, CrD=6.10

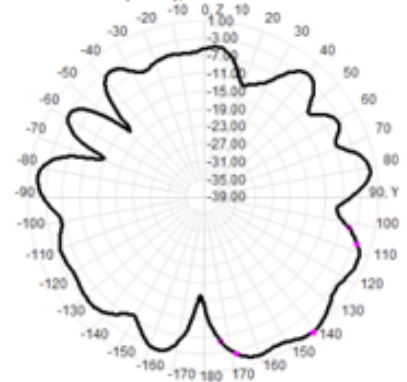


500.0MHz Total, Eff: 33.4%

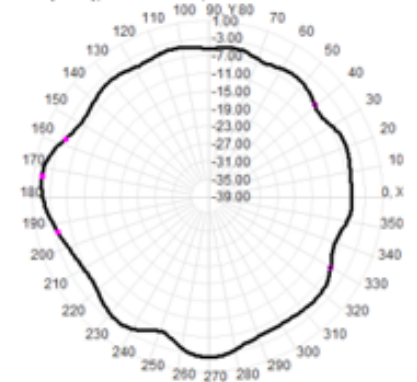
Back View



2500.0MHz Total(E2-YZ), Max=0.61dBi



Total(H-XY), Max=-0.95dBi, CrD=7.45



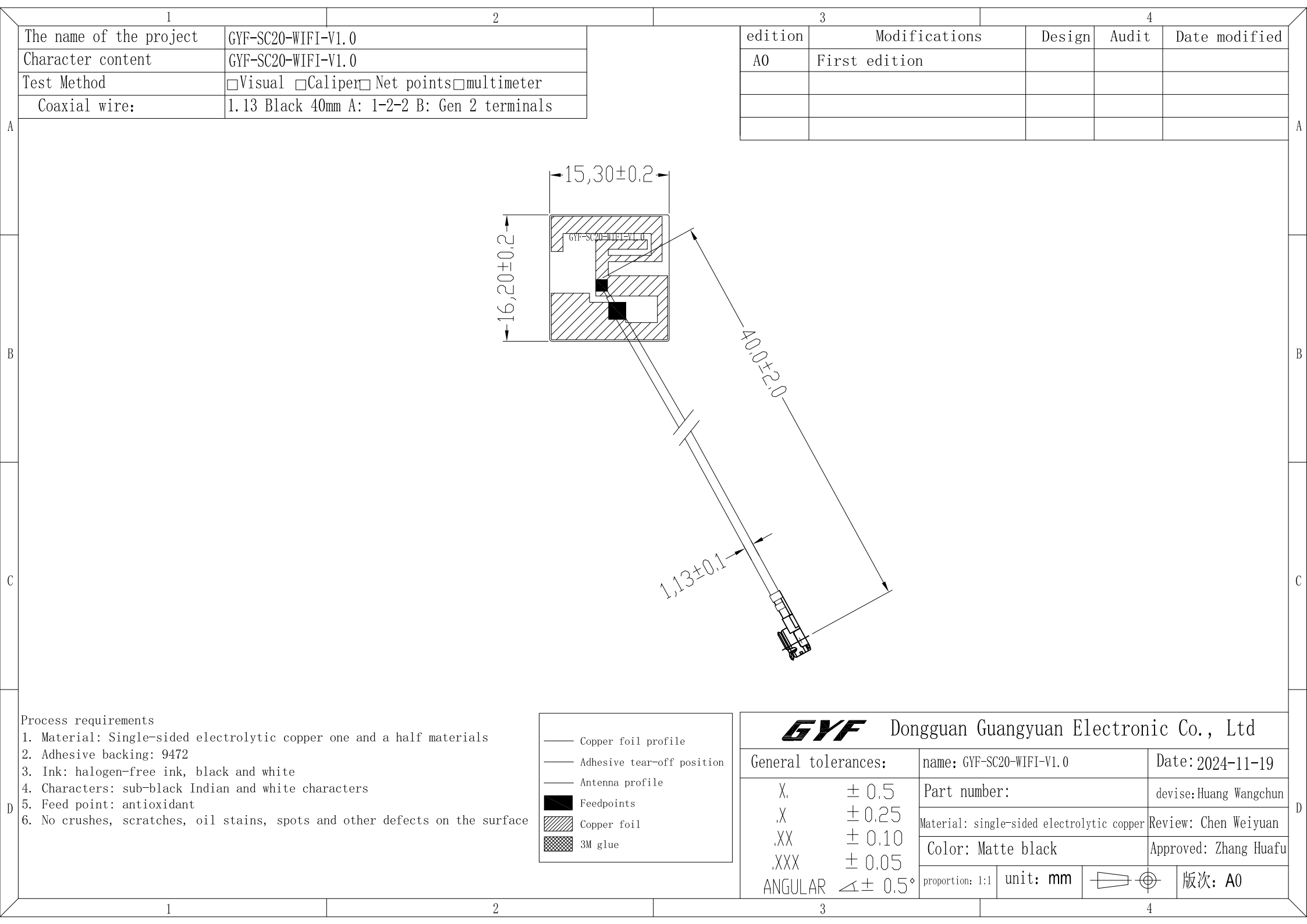
OAT Data - 4G

BAND	B1			B3		
CH	50	300	550	650	950	1150
TRP (dBm)	17.59	18.23	18.41	17.26	17.49	17.61
TIS (dBm)			-89.13			-89.41

BAND	B5			B8		
CH	2450	2525	2600	3500	3625	3750
TRP (dBm)	13.98	14.28	14.32	13.92	14.60	14.61
TIS (dBm)			-82.58			-84.26

BAND	B38			B39		
CH	37850	38000	38150	38350	38450	18550
TRP (dBm)	17.49	17.61	17.8	18.17	18.47	18.66
TIS (dBm)			-89.6			-90.1

BAND	B40			B41		
CH	38750	39150	39550	40340	40620	61140
TRP (dBm)	17.46	17.6	17.91	17.39	17.42	17.7
TIS (dBm)			-88.71			-89.72



7.2 Sample size inspection)

name	DS04		Part number	GYF-DS04-4G-V1.0 &GYF-SC20-WIFI-V1.0		date	2024-11-19	
item	specification	Measured data					decide	remark
		1	2	3	4	5		
1	64.72	64.7	64.73	64.72	64.7	64.73	OK	
2	13.05	13.01	13.05	13.04	13.02	13.05	OK	
3	16.2	16.21	16.23	16.2	16.24	16.24	OK	
4	15.3	15.31	15.31	15.3	15.35	15.3	OK	

7.3 (Bill of Materials)

Bill of Materials

name	DS04	Part number	GYF-DS04-4G-V1.0 &GYF-SC20-WIFI-V1.0	date	2024-09-03
Bill of Materials	category	Material	specification	Dosage	
1	FPC	FPC	64.72*13.05MM&16.2*15.3MM	2	
2	Coaxial wire	Cu	1.13 Black wire L = 120.0 + 1 generation terminal &1.13 Black wire L = 40.0 + 1 generation terminal	2	

8.(Reliability testing)

8.1 可靠性测试报告 (Reliability test report)

name	DS04	Part number	GYF-DS04-4G-V1.0 &GYF-SC20-WIFI-V1.0	date	2024-11-19
Number of tests	15pcs	Time	11月15日 09:15	Completion time	11月17日 11:25

Test items	Test Standards	Test PCS	Test results	remark
Salt spray corrosion test	(1) Test temperature: 35° C±2° C for salt water test; Pressure drum 47° C±1° C (2) Test conditions/methods: brine concentration more than 5%, solution PH value: 6.5~7.2, air pressure: 1.0~1.2kg/cm², test time according to product requirements (3) After the test: after 2 hours, observe the oxidation and discoloration of the surface of the product, and the appearance of the coating falling off	5pcs	OK	Test time 24H
Low temperature test	(1) Temperature: -30° C (-25° C--- pilot stage) (2) Test time: 20 hours / Packing condition: not packed (3) The tested product is not turned on and placed in the high and low temperature test chamber, the temperature in the chamber is adjusted to 25 ° C, the humidity is 65%, and the temperature is kept warm for 1 hour, and the temperature is cooled to -30 ° C within 1 hour, the humidity is turned off, the heat is kept for 20 hours, the temperature is raised for 1 hour to normal temperature, and the performance test is carried out after 2 hours. Appearance and structure: The surface of the antenna appearance is free of defects, and the antenna should not be deformed, warped and damaged, and the performance is normal, and the VSWR ratio should not exceed 10% specified in the product standard	5pcs	OK	Test time 20H
High temperature test	(1) Temperature: +70° C (+65° C ---pilot stage) Humidity 85% (80%--- pilot stage) (2) Test time: 20 hours / Packing condition: not packed (3) The tested product is placed in the high and low temperature test chamber without booting, the temperature in the chamber is adjusted to 25 ° C, the humidity is 65%, and the temperature is kept warm for 1 hour, the temperature is raised to +70 ° C within 1 hour, the humidity is 85%, the temperature is kept warm for 20 hours, the cooling temperature is 1 hour to normal temperature, and the performance test is carried out after 2 hours. Appearance and structure: The surface of the antenna appearance is free of defects, and the antenna should not be deformed, warped and damaged, and the performance is normal, and the VSWR ratio should not exceed 10% specified in the product standard	5pcs	OK	

8.2 产品储存说明 (Product Storage Instructions)

1.

(1. The exposed part of the gold hand guide body needs to be treated with surface plating (anti-rust), such as gold plating/chemical plating, OSP, tin plating, etc., and the storage environment needs to avoid corrosive gases.

2. The antenna temperature should be controlled at 21-38° C, and the humidity should be controlled by 50-70%. Excessive temperature can cause the 3M adhesive to melt, resulting in poor antenna viscosity.

3. It is recommended that if the initial bonding temperature is lower than 10° C, it is not suitable for bonding, so the adhesive is too hard to bond firmly to the object; However, if it has been bonded, the adhesion at low temperatures is also satisfactory.

4. Shelf life is 24 months from the date of manufacture in the original packaging at 21° C and 50% relative humidity.)

Antenna location)

