Shenzhen Guangyuanfa Electronic Co., Ltd.

Antenna Test Report

Manufacturer: Shenzhen Xtooltech Intelligent Co., Ltd

Customer name	**Yun jia**	**Project name**	**F500**
time	**2022/9/29**	**Report version**	**A0**
Commissioning engineer	**Junhua liu**	**Contact information**	**15915368033**

History

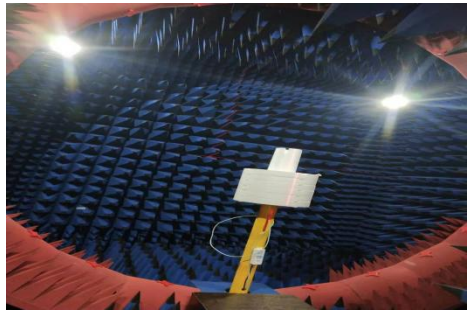
Version	Report Date	Revision Description	Prepared by
A0	2022.9.29	Antenna test report	Junhua liu

Directory

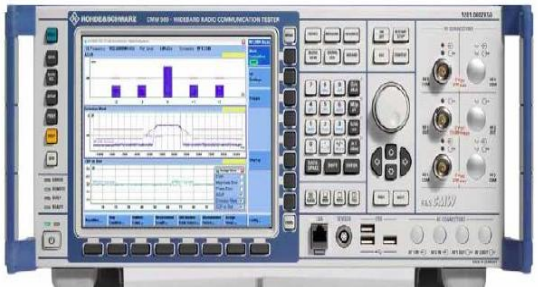
Introduction to project debugging

Machine type	F500			
Antenna type	FPC			
Frequency band and antenna material	Main antenna	Frequency band		material
		2G	/	/
		3G	/	
		LTE	/	
	Other antennas	diversity	/	/
		WIFI+GPS+BT	2.4G+5.8G WIFI	FPC
Performance requirement	Execute according to customer requirements			

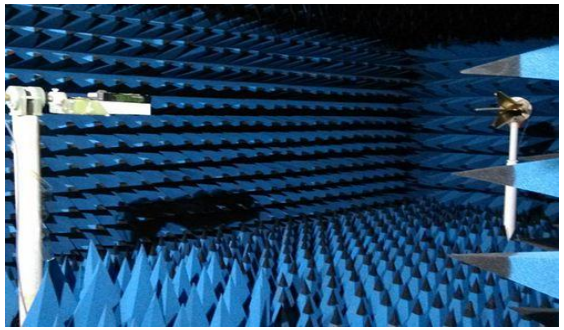
Description of test equipment



24 probe microwave darkroom

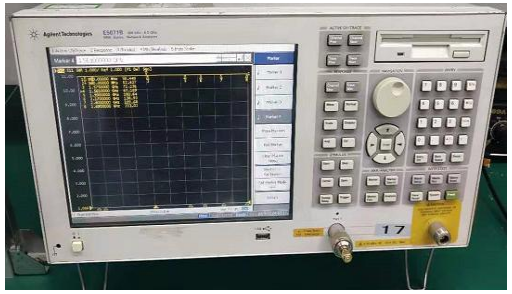


CMW500



7*4*3M ETS microwave darkroom

Agilent 8960



Agilent E5071B

High and low temperature test chamber

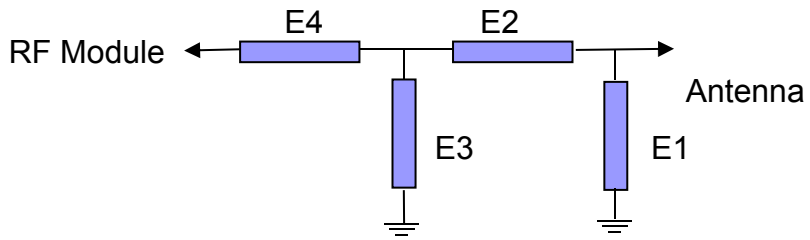
MT8820C

HP8753ES

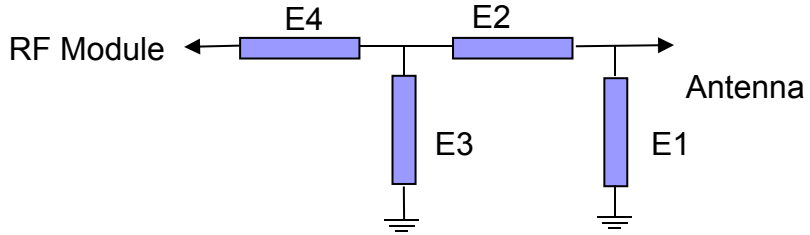
Test system	Test environment	Active test	Passive test
ETS darkroom 24 probe OTA darkroom	Temperature:22℃±3℃ Humidity: 50%±15%	Supports 2G, 3G, and 4G Support for NB-IoT/CAT-M/BT/WIFI	700MHz——6G

Matching circuit specification

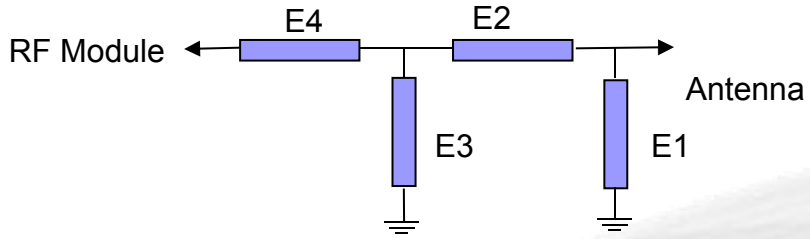
Antenna matching has not changed



	Element	Value
Main antenna	E1(0402)	N/A
	E2(0402)	0欧姆
	E3(0402)	N/A
	E4(0402)	0欧姆



	Element	Value
GWB antenna	E1(0402)	N/A
	E2(0402)	0欧姆
	E3(0402)	N/A
	E4(0402)	0欧姆



	Element	Value
DIV antenna	E1(0402)	N/A
	E2(0402)	0欧姆
	E3(0402)	N/A
	E4(0402)	0欧姆

OTAdata----WIFI

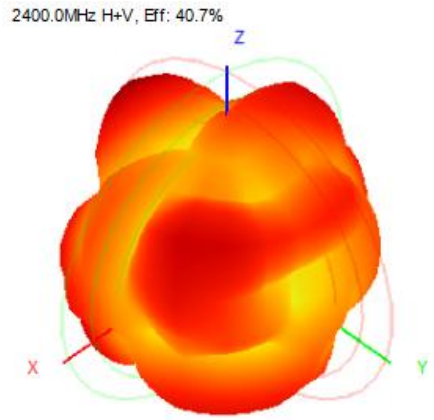
BAND	b-mode			G-mode		
CH	1	6	11	1	6	11
TRP(dBm)	12.66	12.78	12.80	12.24	12.12	12.88
(Brightening screen) TIS(dBm)	-81.31	-81.37	-81.90	-68.78	-69.83	-69.75
(Screen off) TIS(dBm)	-83.70	-84.65	-84.68	-72.17	-72.23	-72.61

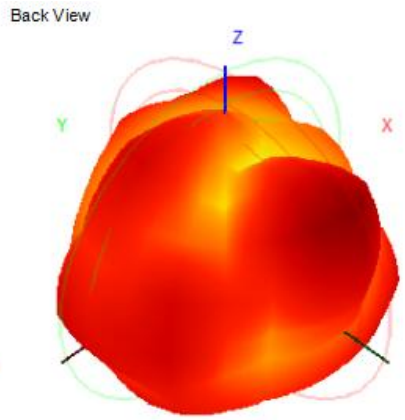
BAND	N-mode		
CH	1	6	11
TRP(dBm)	11.81	11.56	11.67
(Brightening screen) TIS(dBm)	-65.30	-65.51	-65.39
(Screen off) TIS(dBm)	-68.02	-68.18	-68.31

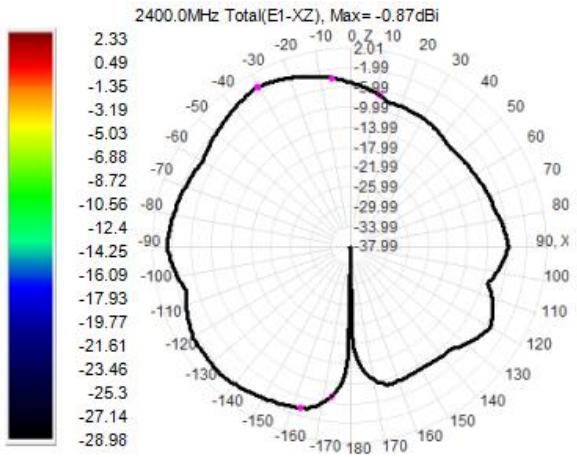
OTAdata----2.4G WIFI

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)	-3.90	-3.81	-3.74	-3.65	-3.54	-3.42	-3.31	-3.22	-3.25	-3.24	-3.31
Gain (dBi)	2.33	2.50	2.54	2.52	2.57	2.61	2.64	2.80	2.90	2.99	2.89
Efficiency (%)	40.75	41.63	42.30	43.18	44.31	45.45	46.64	47.63	47.30	47.42	46.67

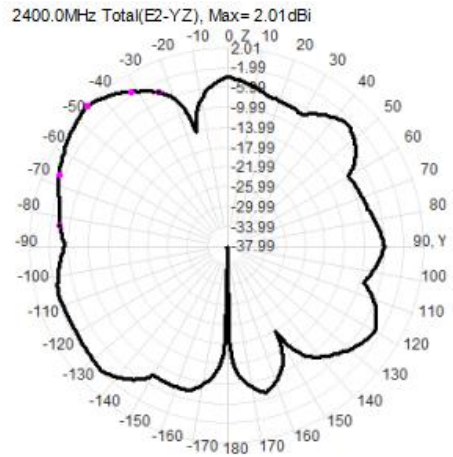
2.4G WIFI

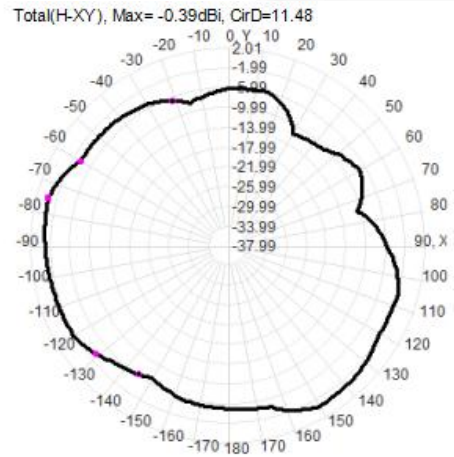

2400.0MHz H+V, Eff: 40.7%
Z
X
Y

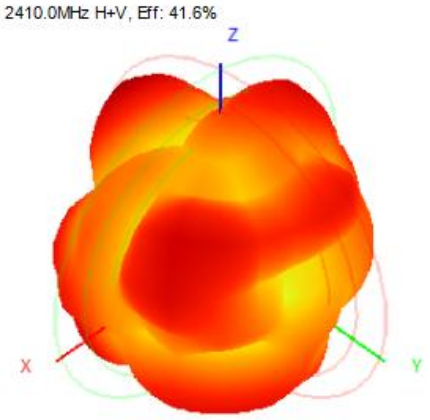

Back View
Z
Y
X

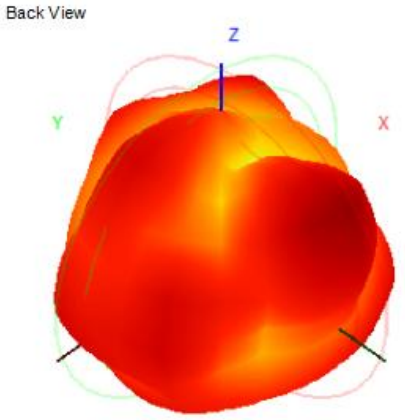

2.33
0.49
-1.35
-3.19
-5.03
-6.88
-8.72
-10.56
-12.4
-14.25
-16.09
-17.93
-19.77
-21.61
-23.46
-25.3
-27.14
-28.98

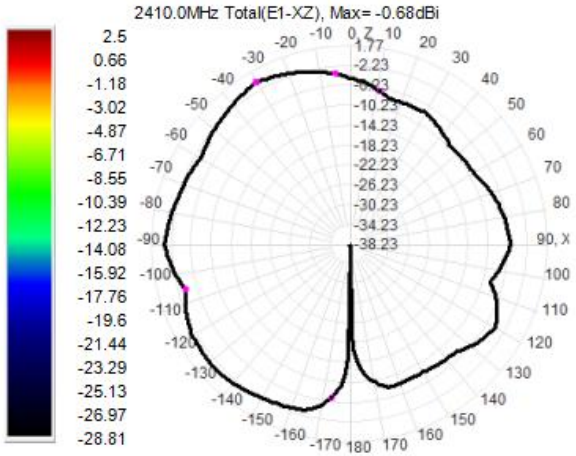
2400.0MHz Total(E1-XZ), Max= -0.87dBi


2400.0MHz Total(E2-YZ), Max= 2.01dBi

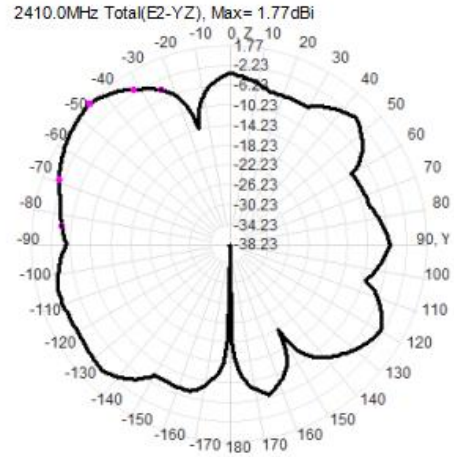

Total(H-XY), Max= -0.39dBi, CirD=11.48

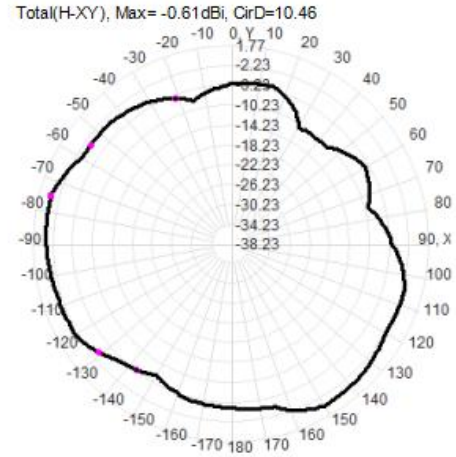

2410.0MHz H+V, Eff: 41.6%
Z
X
Y


Back View
Z
Y
X

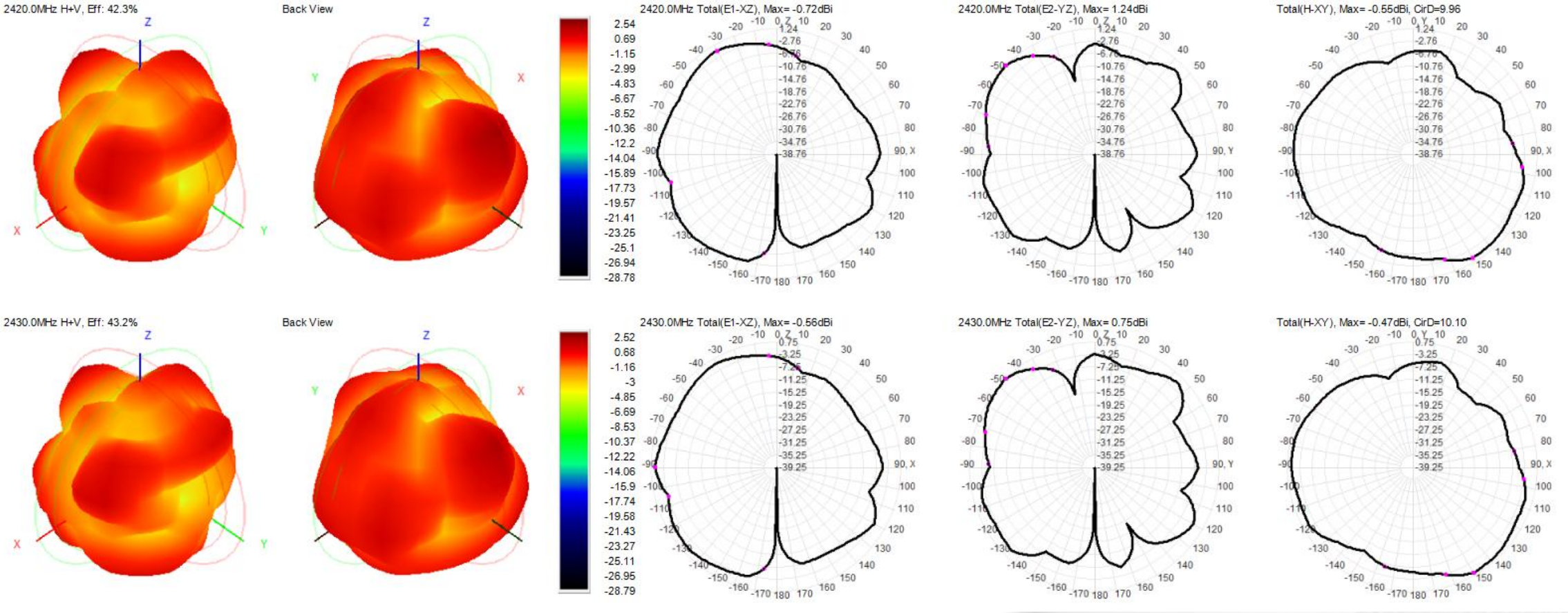

2.5
0.66
-1.18
-3.02
-4.87
-6.71
-8.55
-10.39
-12.23
-14.08
-15.92
-17.76
-19.6
-21.44
-23.29
-25.13
-26.97
-28.81

2410.0MHz Total(E1-XZ), Max= -0.68dBi


2410.0MHz Total(E2-YZ), Max= 1.77dBi

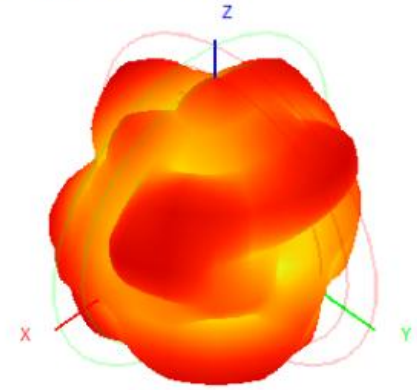

Total(H-XY), Max= -0.61dBi, CirD=10.46

2.4G WIFI

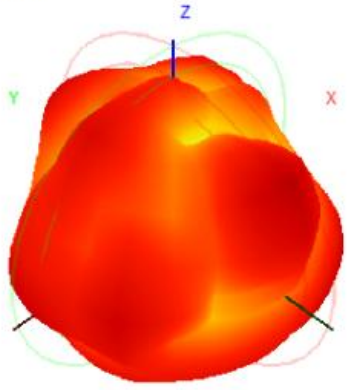

2420.0MHz H+V, Eff: 42.3%
Back View
2.54
0.69
-1.15
-2.99
-4.83
-6.67
-8.52
-10.36
-12.2
-14.04
-15.89
-17.73
-19.57
-21.41
-23.25
-25.1
-26.94
-28.78
2420.0MHz Total(E1-XZ), Max= -0.72dBi
2420.0MHz Total(E2-YZ), Max= 1.24dBi
Total(H-XY), Max= -0.55dBi, CirD=9.96
2430.0MHz H+V, Eff: 43.2%
Back View
2.52
0.68
-1.16
-3
-4.85
-6.69
-8.53
-10.37
-12.22
-14.06
-15.9
-17.74
-19.58
-21.43
-23.27
-25.11
-26.95
-28.79
2430.0MHz Total(E1-XZ), Max= -0.56dBi
2430.0MHz Total(E2-YZ), Max= 0.75dBi
Total(H-XY), Max= -0.47dBi, CirD=10.10

2.4G WIFI

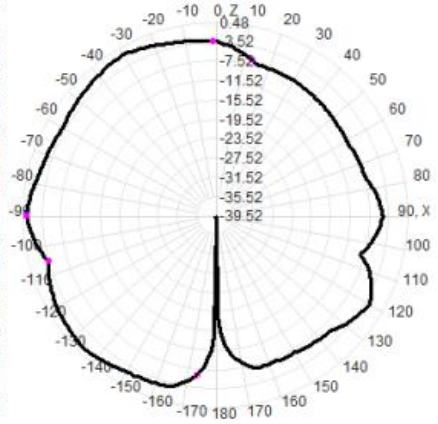
2440.0MHz H+V, Eff: 44.3%



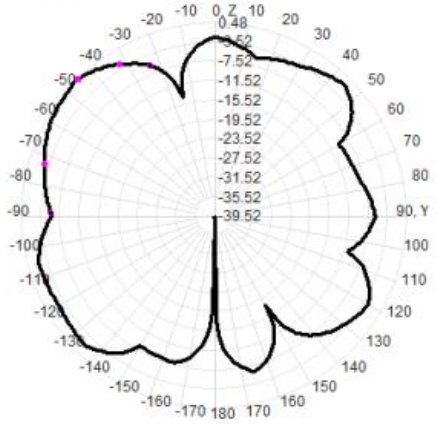
Back View



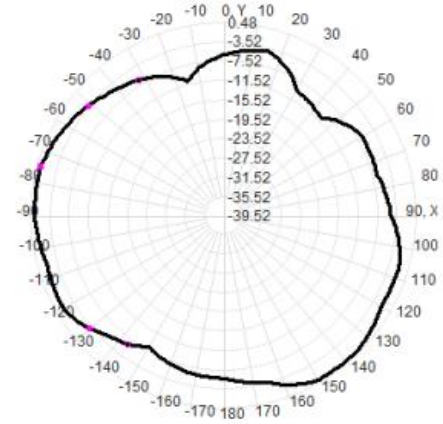
2440.0MHz Total(E1-XZ), Max= -0.35dBi



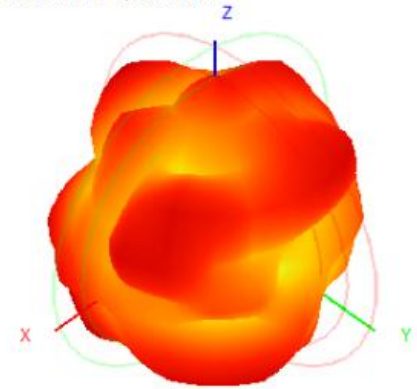
2440.0MHz Total(E2-YZ), Max= 0.48dBi



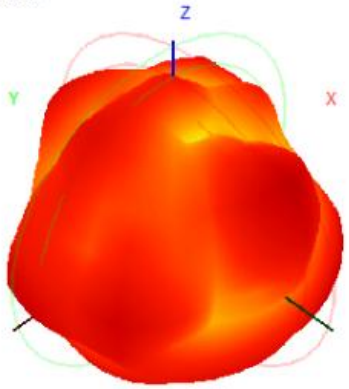
Total(H-XY), Max= -0.31dBi, CirD=10.68



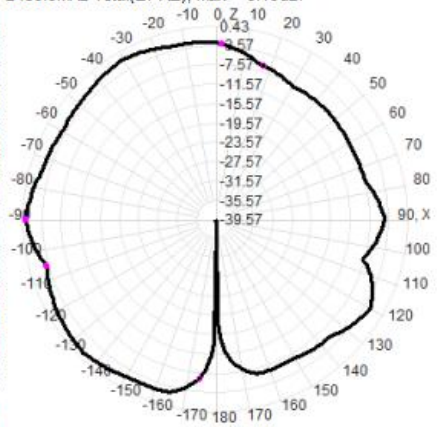
2450.0MHz H+V, Eff: 45.4%



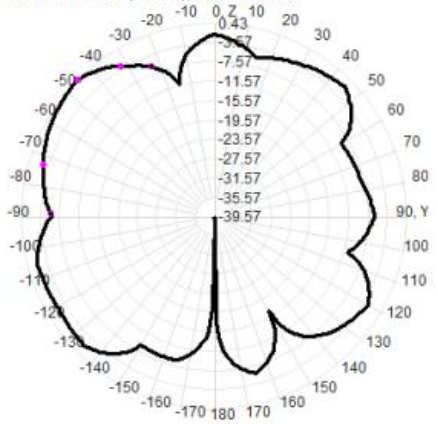
Back View



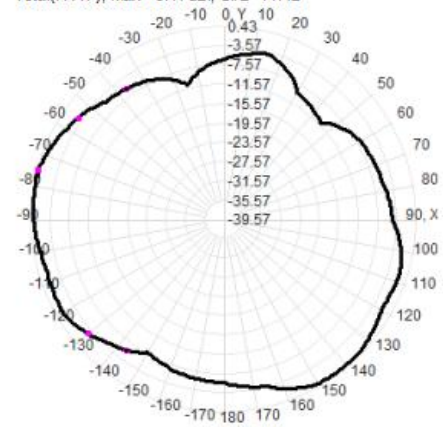
2450.0MHz Total(E1-XZ), Max= -0.19dBi



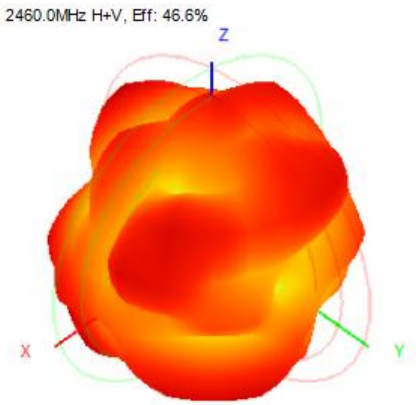
2450.0MHz Total(E2-YZ), Max= 0.43dBi

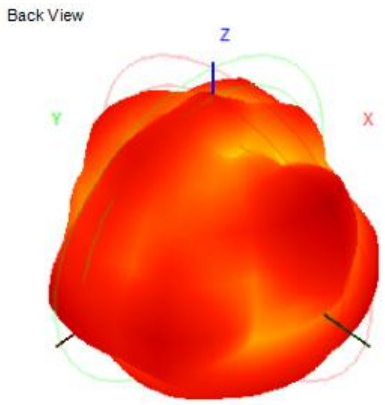


Total(H-XY), Max= 0.17dBi, CirD=11.42

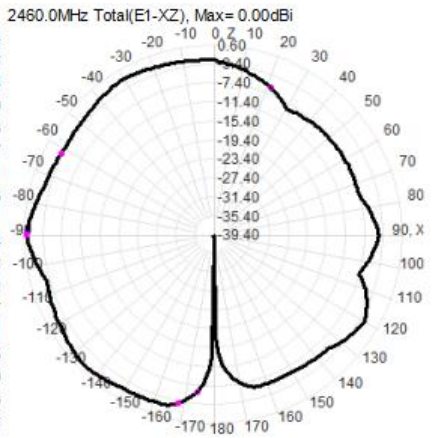


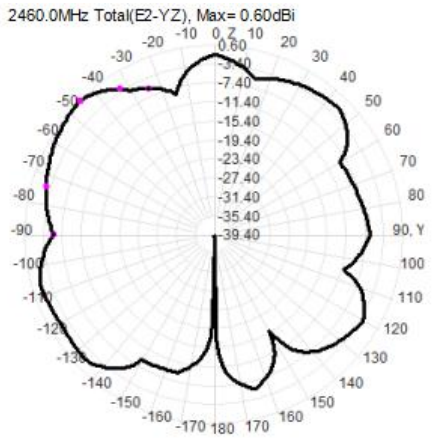
2.4G WIFI

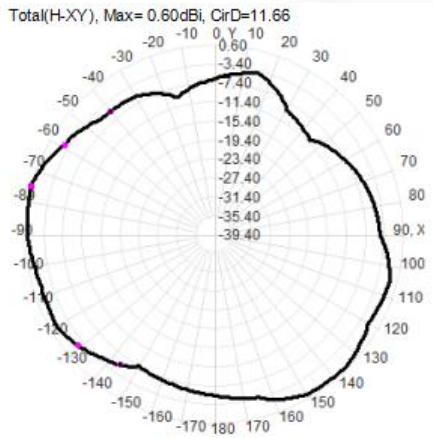

2460.0MHz H+V, Eff: 46.6%
Z
X
Y

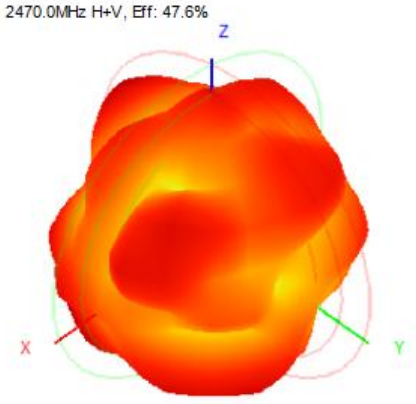

Back View
Z
Y
X

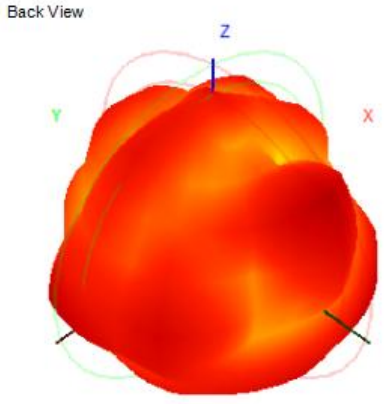

2.64
0.8
-1.04
-2.89
-4.73
-6.57
-8.41
-10.26
-12.1
-13.94
-15.78
-17.62
-19.47
-21.31
-23.15
-24.99
-26.83
-28.68


2460.0MHz Total(E1-XZ), Max= 0.00dBi


2460.0MHz Total(E2-YZ), Max= 0.60dBi


Total(H-XY), Max= 0.60dBi, CirD=11.66


2470.0MHz H+V, Eff: 47.6%
Z
X
Y


Back View
Z
Y
X


2.8
0.96
-0.89
-2.73
-4.57
-6.41
-8.26
-10.1
-11.94
-13.78
-15.62
-17.47
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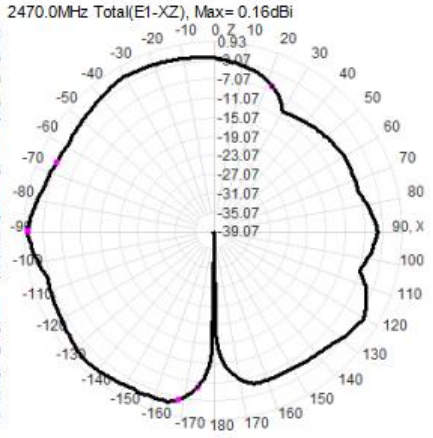
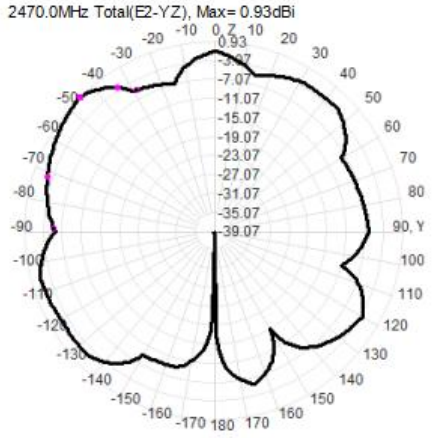
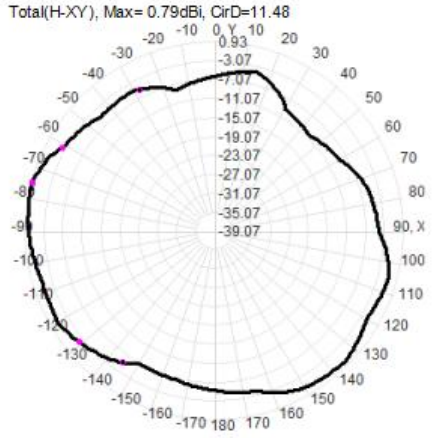
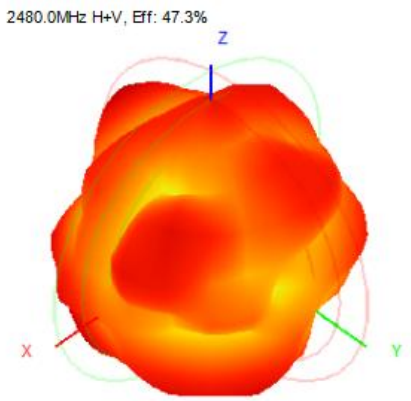
-21.15
-22.99
-24.83
-26.68
-28.52

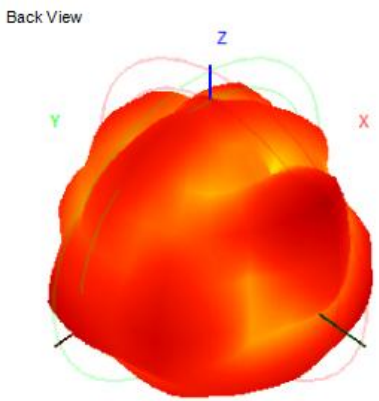

2470.0MHz Total(E1-XZ), Max= 0.16dBi

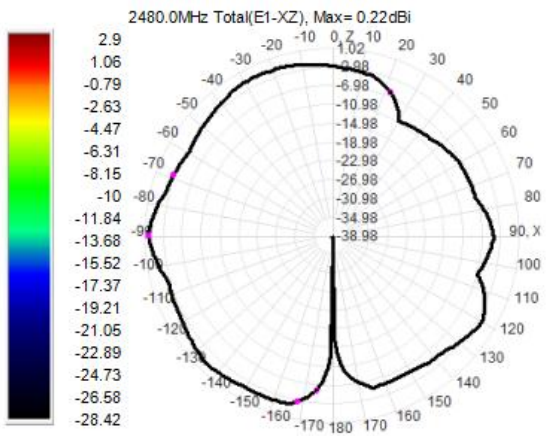

2470.0MHz Total(E2-YZ), Max= 0.93dBi

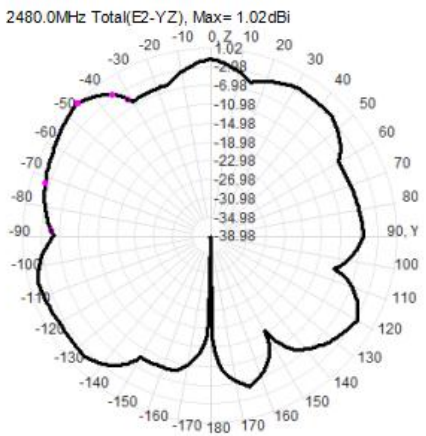

Total(H-XY), Max= 0.79dBi, CirD=11.48

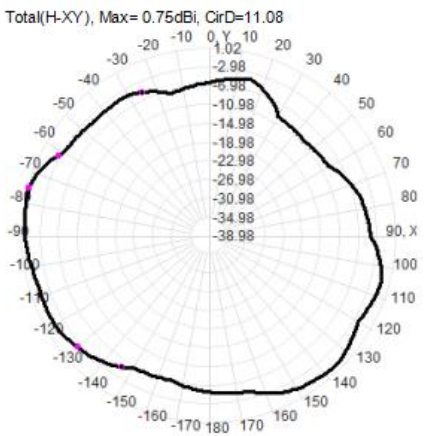
2.4G WIFI

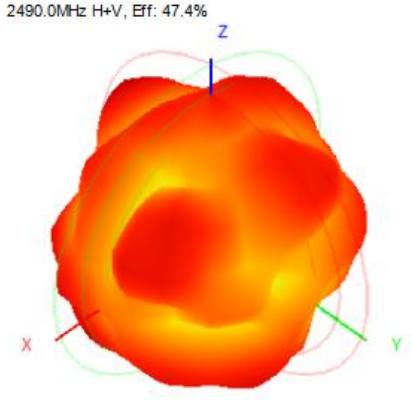

2480.0MHz H+V, Eff: 47.3%
Z
X
Y

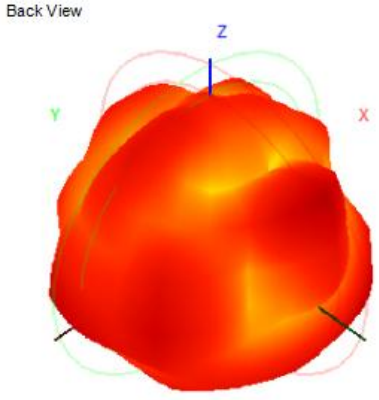

Back View
Z
Y
X

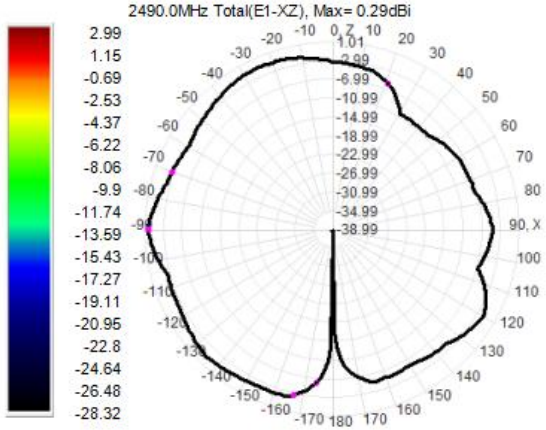

2480.0MHz Total(E1-XZ), Max= 0.22dBi
2.9
1.06
-0.79
-2.63
-4.47
-6.31
-8.15
-10
-11.84
-13.68
-15.52
-17.37
-19.21
-21.05
-22.89
-24.73
-26.58
-28.42

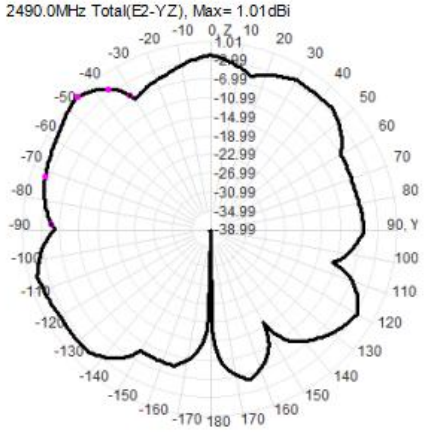

2480.0MHz Total(E2-YZ), Max= 1.02dBi

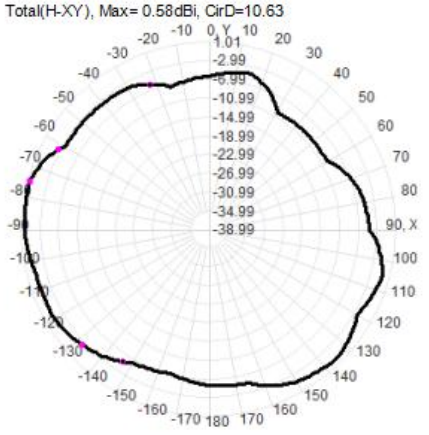

Total(H-XY), Max= 0.75dBi, CirD=11.08


2490.0MHz H+V, Eff: 47.4%
Z
X
Y

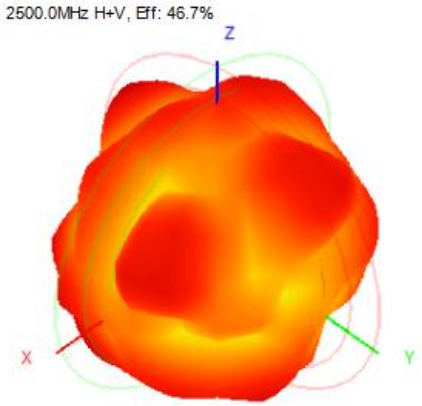

Back View
Z
Y
X

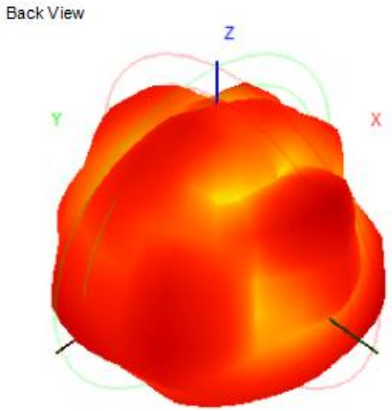

2490.0MHz Total(E1-XZ), Max= 0.29dBi
2.99
1.15
-0.69
-2.53
-4.37
-6.22
-8.06
-9.9
-11.74
-13.59
-15.43
-17.27
-19.11
-20.95
-22.8
-24.64
-26.48
-28.32

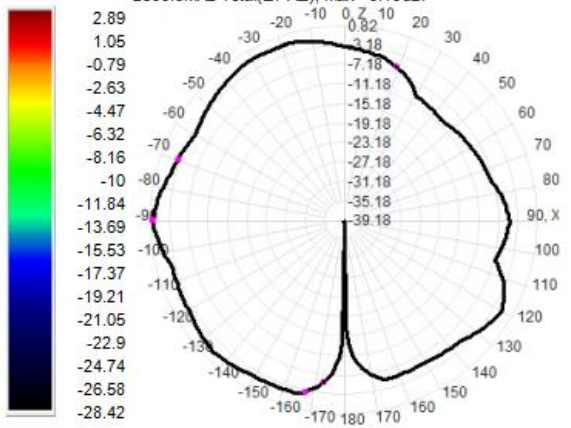

2490.0MHz Total(E2-YZ), Max= 1.01dBi


Total(H-XY), Max= 0.58dBi, CirD=10.63

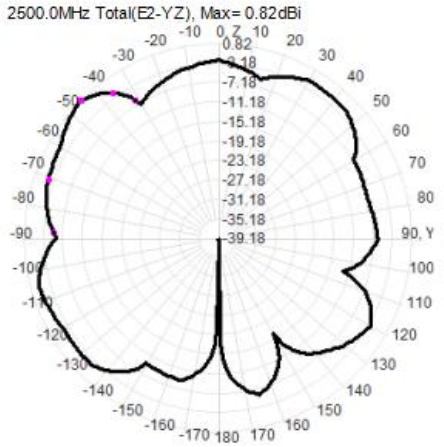
2.4G WIFI

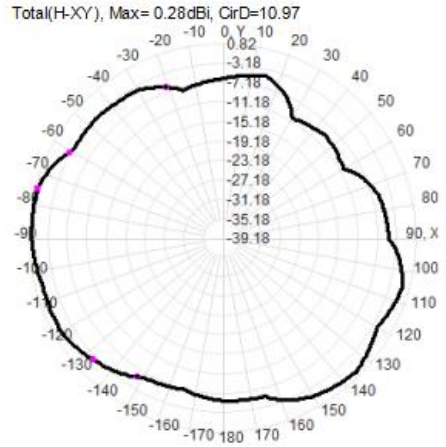

2500.0MHz H+V, Eff: 46.7%
Z
X
Y


Back View
Z
Y
X


2.89
1.05
-0.79
-2.63
-4.47
-6.32
-8.16
-10
-11.84
-13.69
-15.53
-17.37
-19.21
-21.05
-22.9
-24.74
-26.58
-28.42

2500.0MHz Total(E1-XZ), Max= 0.19dBi

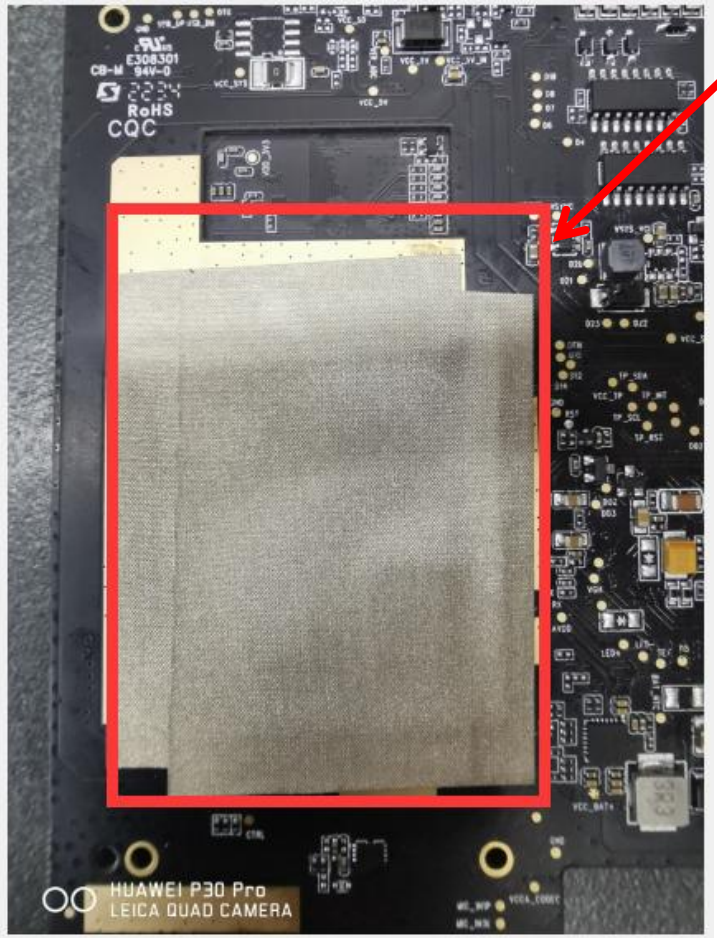

2500.0MHz Total(E2-YZ), Max= 0.82dBi


Total(H-XY), Max= 0.28dBi, CirD=10.97

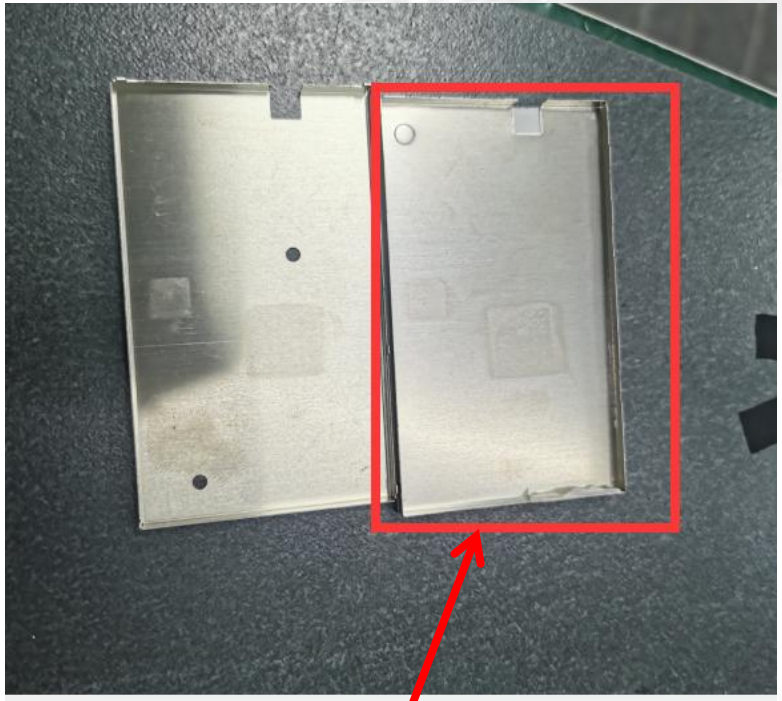
Antenna position

WIFI Antenna position

Environmental treatment



This step needs to be masked；



Adopt non-porous shield cover

Explanatory matters

1. Please confirm whether the matching and environmental treatment methods in the report are approved or not; This will directly affect the antenna performance, if you have different opinions, please contact the department in time;

2. If your company changes materials, components, updates software, changes environmental treatment, etc., please provide the machine with the latest status to our company for performance verification;

3. If your machine needs to be sent to a third party for performance verification, please provide the testing machine to our company for testing and verification. (Because motherboard, environmental treatment, antenna assembly and other consistency will affect the antenna performance deviation).以上

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Thanks.