The test report

Model Name :T0821 3in1 Antenna

Mar 26, 2022

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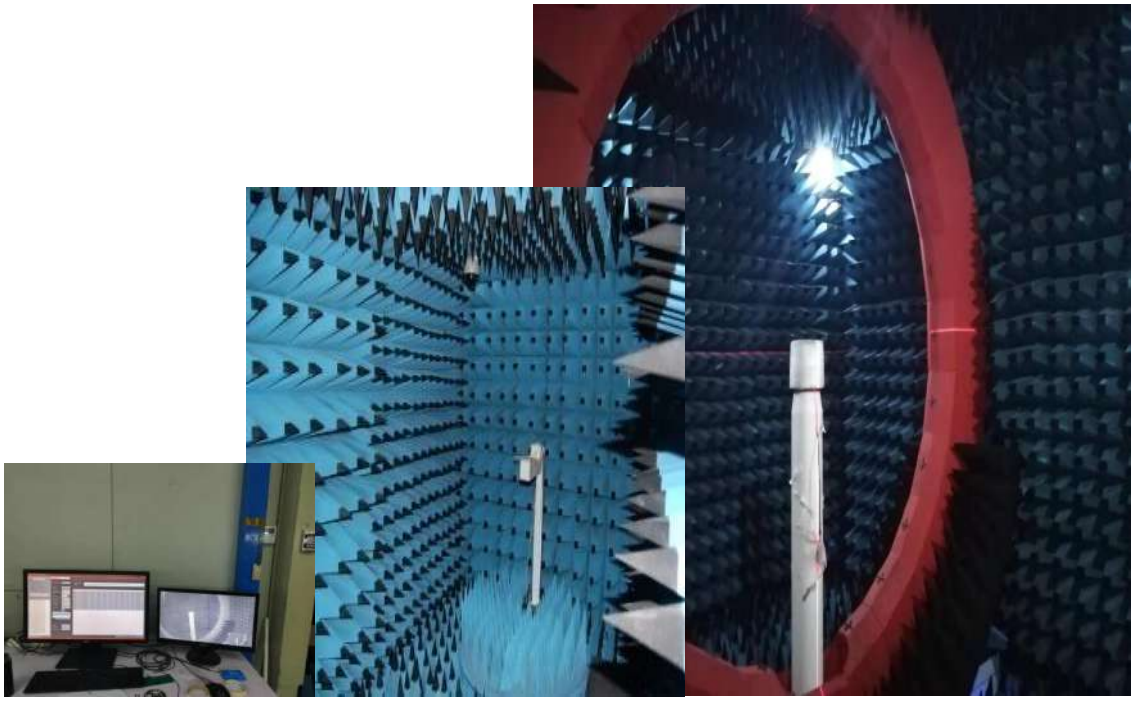


Project overview：

Prototype status		Debug the machine		product type		T0821	
Antenna overview							
	Frequency		**structural style**	**Type**	**position**	**Matching change**	**Antenna version number**
3in1 ant	WIFI	2400-2500MHz 5120-5850MHz	FPC	PIFA	housing	NO	V0.1
	GPS	L1:1575.42MHz					
other ant							
Environmental treatment				No			

Report version record

Edition	Report time	Commissioning overview
A1	2022.03.26	First sample test Report

Company profile

◆Futen Technology (Shanghai) Co., Ltd; Founded in September 2016, it is an advanced mobile terminal antenna enterprise in China, covering an area of more than 2000 square meters. R & D centers have been set up in Shanghai and Shenzhen.

◆Main business: focus on the field of wireless communication intelligent terminal antenna (I have accumulated a lot of experience in the research and development technology of 2g/3g/4g/5g full band antenna, including mobile phone built-in antenna, notebook antenna, NFC, LDS, metal frame antenna, GPS ceramic antenna, Beidou antenna, module antenna, external antenna, fixed station antenna, rod antenna, ceiling antenna, beautification antenna, base station antenna, small microwave antenna used by IOT intelligent terminal, telecom power and other antennas.) Provide products and services to meet the requirements of precision mold design and manufacturing, injection molding, surface coating and light metal shell manufacturing of the whole industry chain. The products are widely used in mobile phones, pads, wearable devices, laptops, automobiles, security monitoring and other fields.

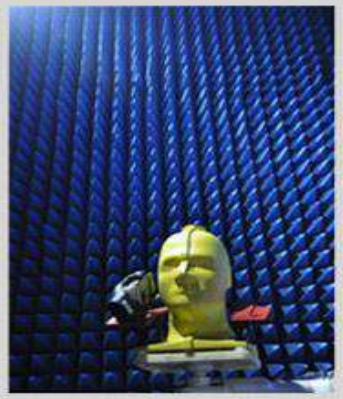
研发设备

Agilent E5071C

Agilent 8753E

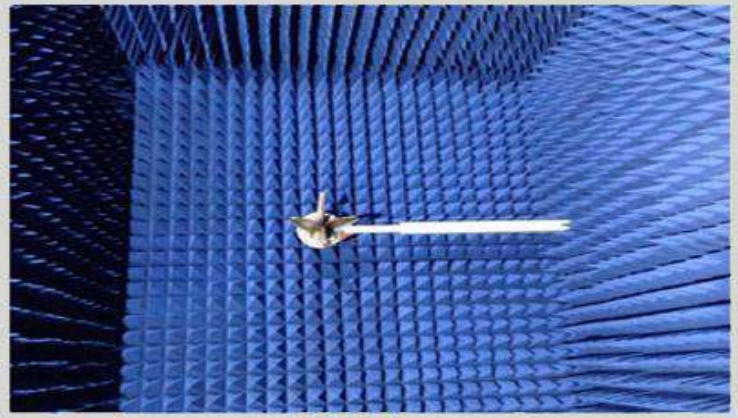
Agilent 8714ET

Agilent 8960 Series10



Satimo 暗室内景(2)

Satimo 暗室内景(2)

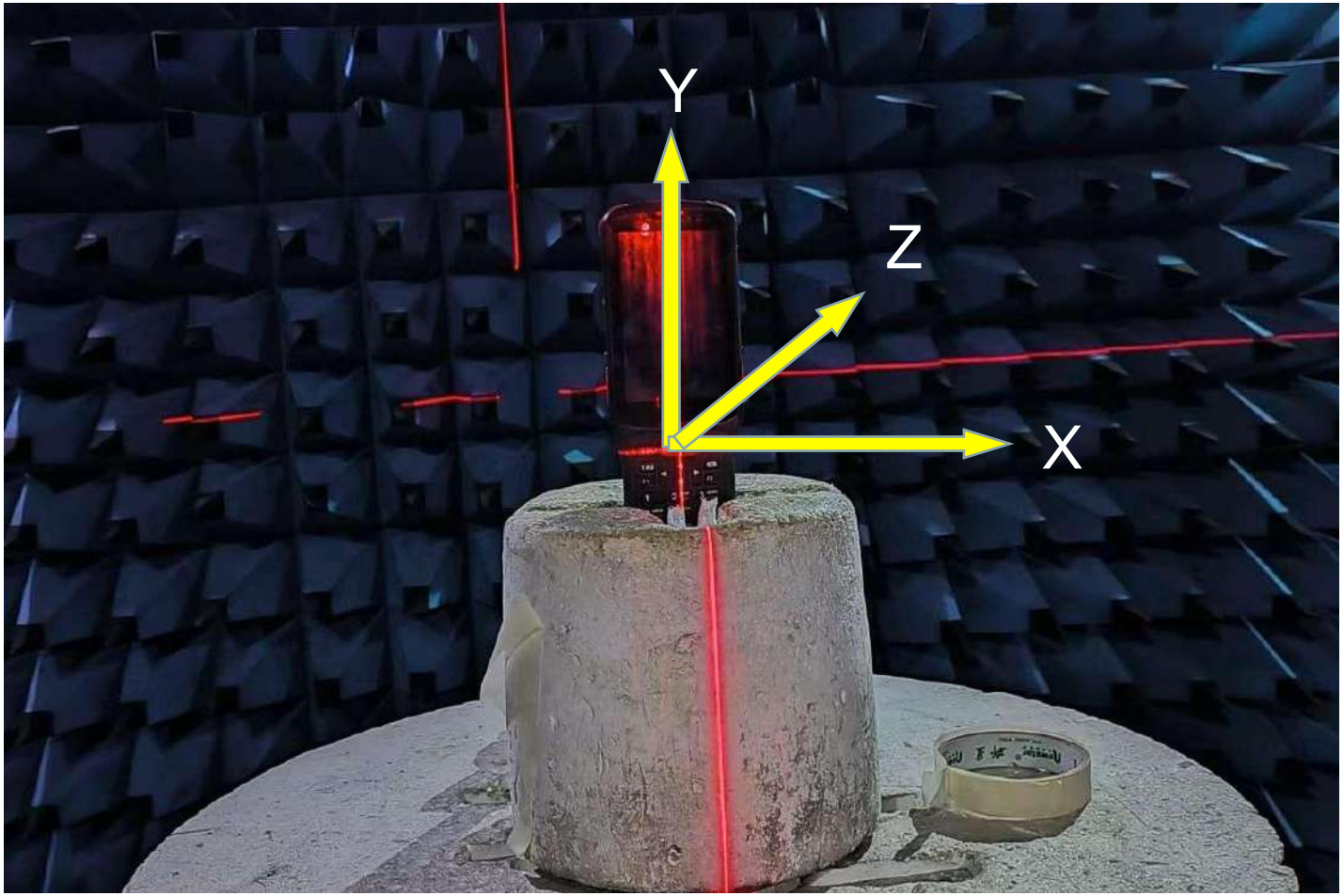


Satimo 暗室内景(3)

Satimo控制机柜

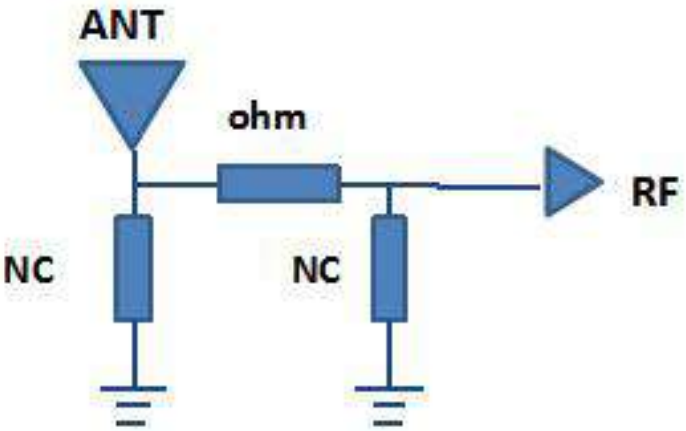
The RF test fixture picture

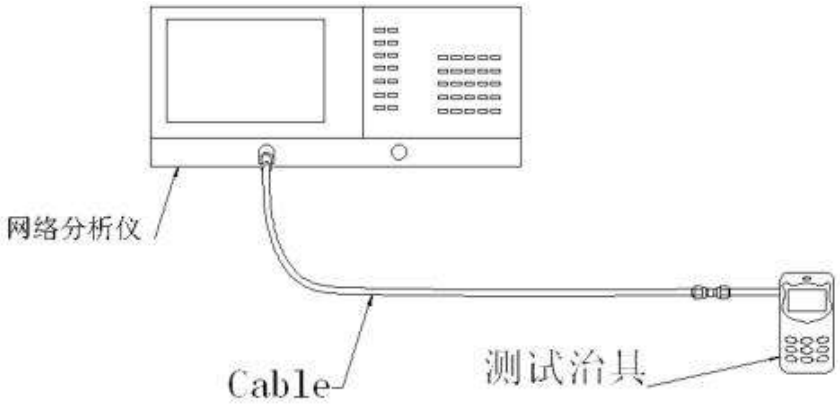
The RF test fixture picture



Matching circuit

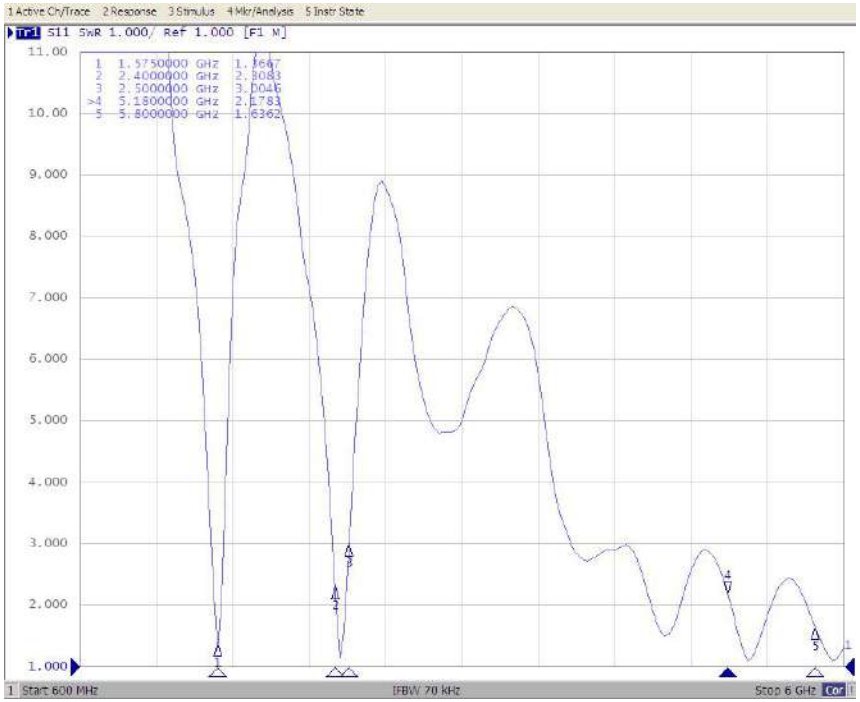
matching circuit

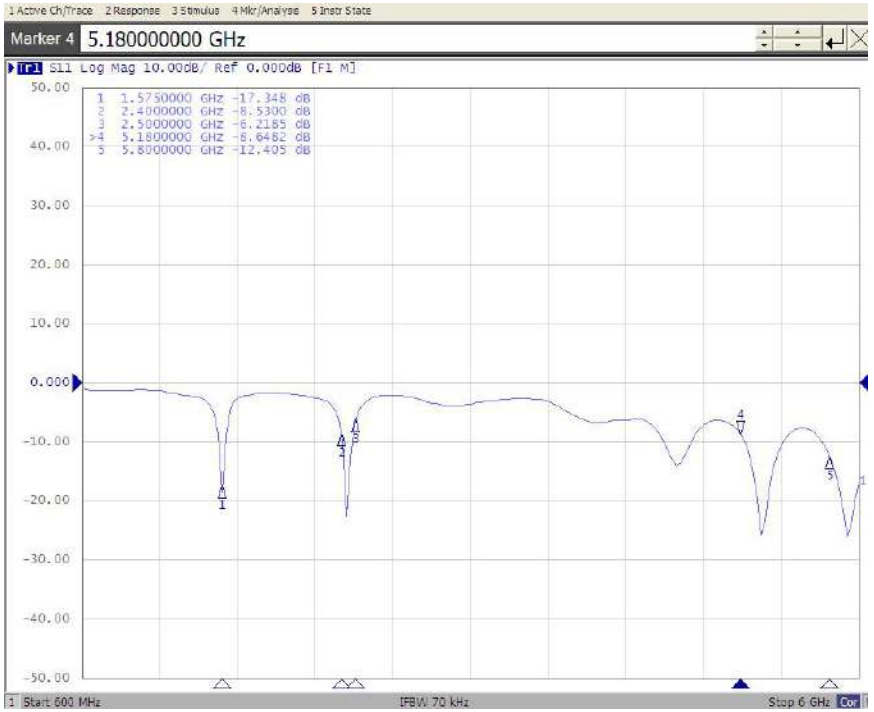




测试示意图

1）S11 parameter test data



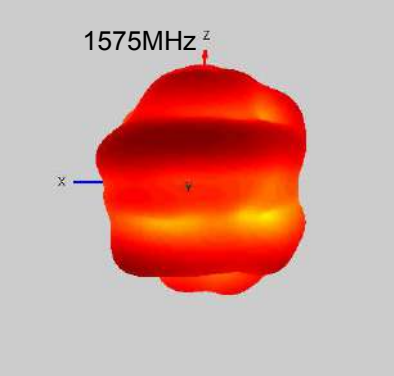


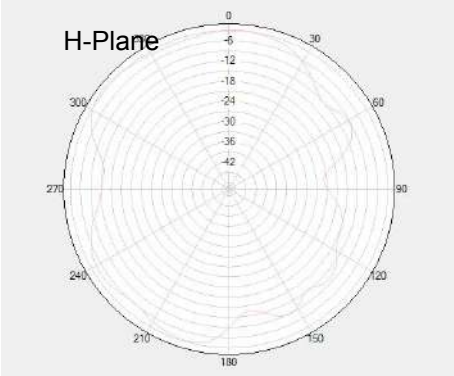
频率（MHZ）	1575	2400	2500	5180	5800	
VSWR	1.36	2.3	3.0	2.17	1.63	
Retum loss	-17.34	-8.53	-6.21	-8.64	-12.4	

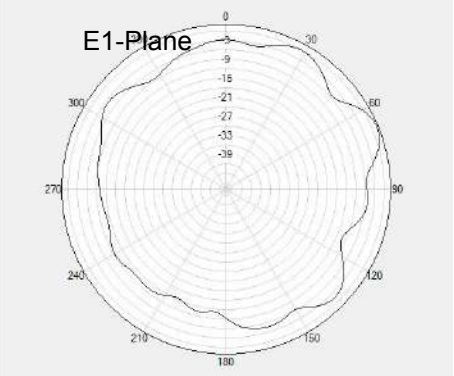
2）Gain&Efficiency test data

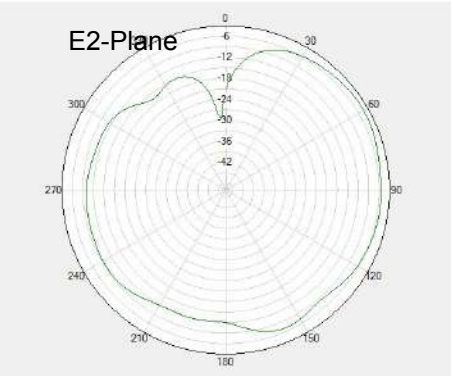
frequency 频率 (MHz)	gain 增益(dBi)	efficiency 效率(%)
1555	1.36	40.62
1565	1.95	45.71
1575	1.96	43.56
1585	1.51	39.15
1595	1.06	34.15
2400	1.07	28.11
2420	2.13	33.88
2440	1.94	33.18
2460	0.81	29.31
2480	0.9	29.90
2500	0.83	28.90
5150	1.81	32.51
5250	1.23	31.76
5350	2.18	38.49
5450	1.76	38.54
5550	1.74	35.55
5650	2.16	39.41
5750	2.88	42.88
5850	2.9	39.86
5900	3.27	43.50

Field pattern

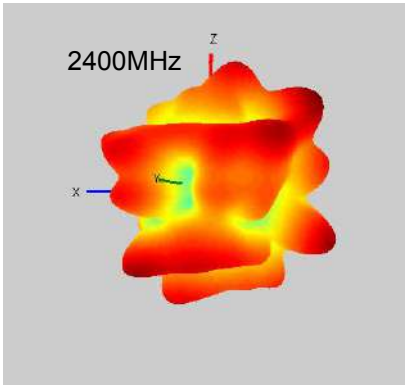


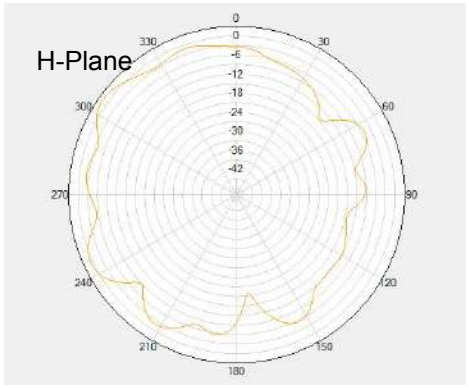


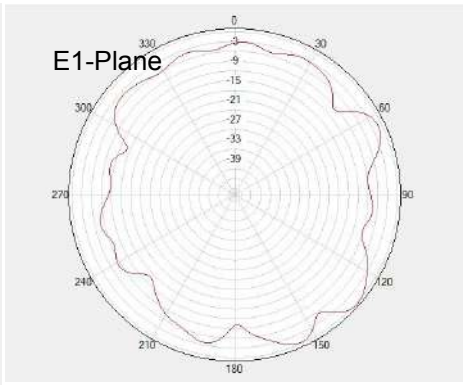


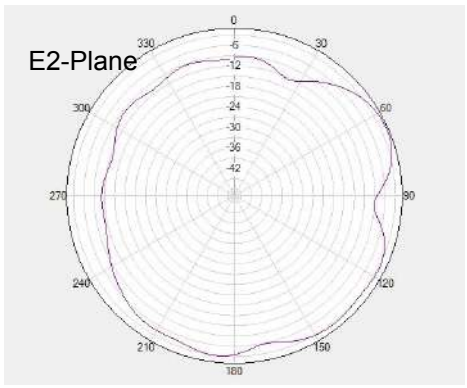


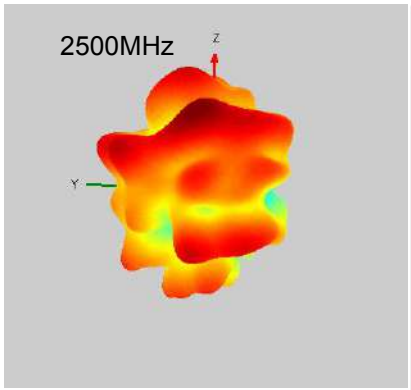
Field pattern

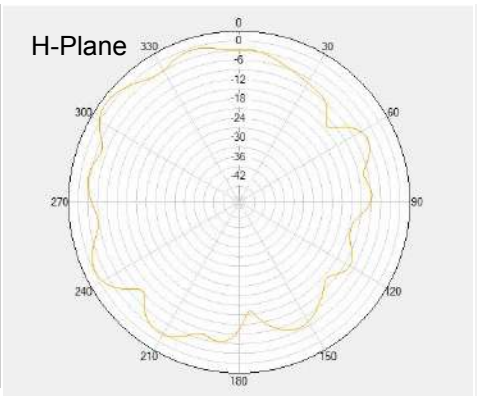


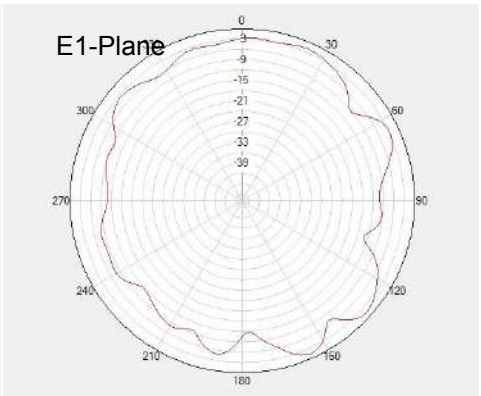


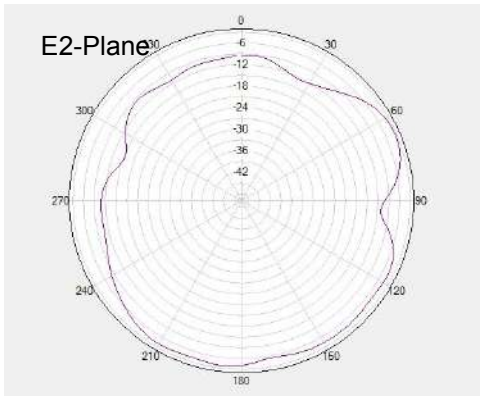






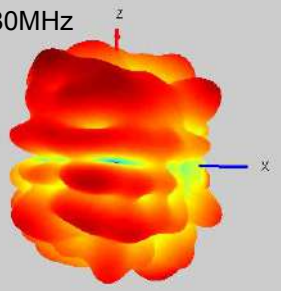




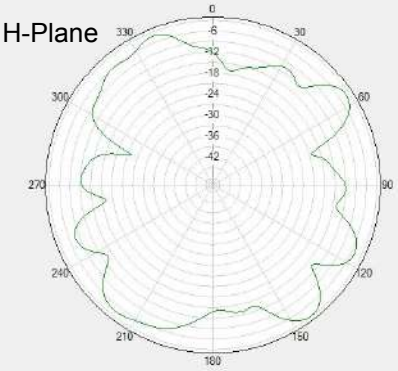


Field pattern

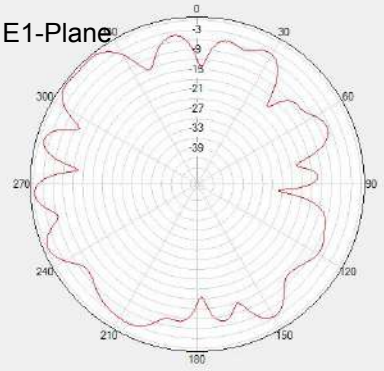
5180MHz



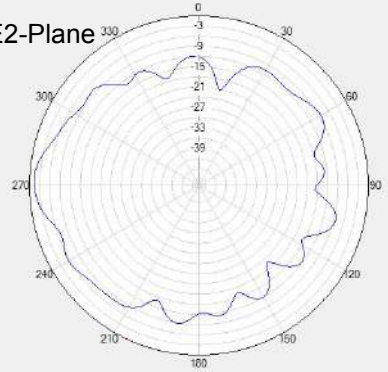
H-Plane



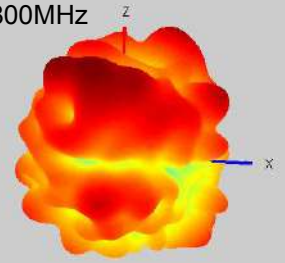
E1-Plane



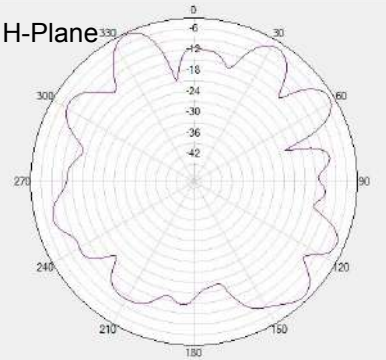
E2-Plane



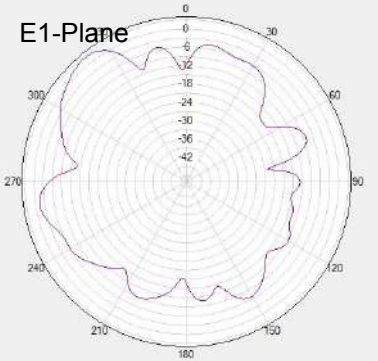
5800MHz



H-Plane



E1-Plane



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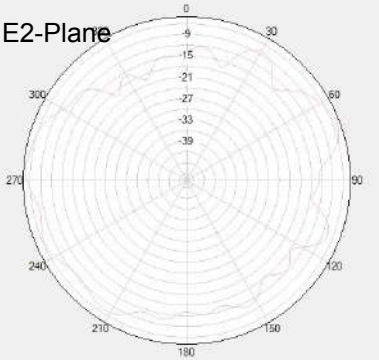


Active data

11b11M

Test	Wifi 2G TEST		
Result	1	7	11
Frequency (MHz)	2412	2442	2462
TRP(dBm)	14.13	13.74	13.73
TIS(dBm)			-83.42

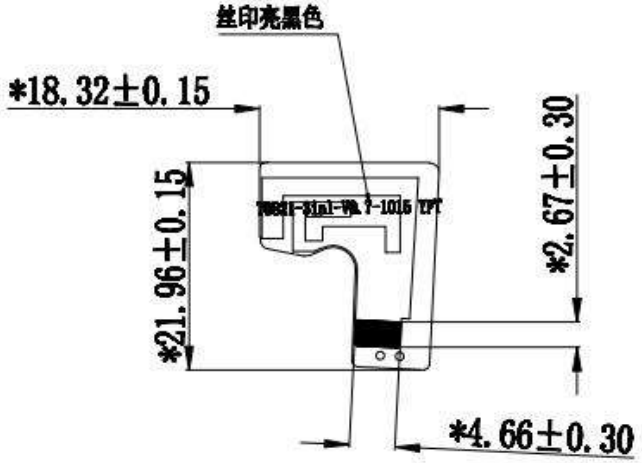
11a54M

Test	Wifi 5G TEST		
Result	36	64	165
Frequency (MHz)	5180	5320	5825
TRP(dBm)	10.1	10.41	12.27
TIS(dBm)			-72.45

GPS：	-144.52

Engineering drawing

日 期	标记	处数	修 改 内 容	变更人	备 注



铺铜走线（正面）

背胶面（反面）

技术要求：

1. 打"*"为重点尺寸，外形尺寸需要检测CPK；线形尺寸未注公差按照右边公差表；
2. 黄色部分外露镀金大于0.05um厚度，镍2~6um，盐雾试验48小时需合格；
3. 材质电解铜，PI半对半，背胶：3M 9471；
4. 边缘冲切要平整，不可有锯齿形状；
5. 符合ROHS要求。

永辅通科技（上海）有限公司
Yongfutong Technology (Shanghai) Co., LTD.

品 名	FPC	日 期	
机 种	T0621-3INL	检 图	
料 号	SH-065-030-15-GK-A	审 核	
材 质	电解铜，PI半对半，背胶3M9471		
表面处理		确 认	
位 置	单位 mm	比 例	

Thanks for your comment!

Futen Technology (ShangHai) Co.,LTD..

Phone：021-20905889

Address: Room 203, 2nd Floor, Building 1, No. 3408 xiupu Road,

Pudong New Area, Shanghai

The test report

Model Name :T0821 Main Antenna

Mar 26, 2022

contents：

1.Project overview

2.Report version record

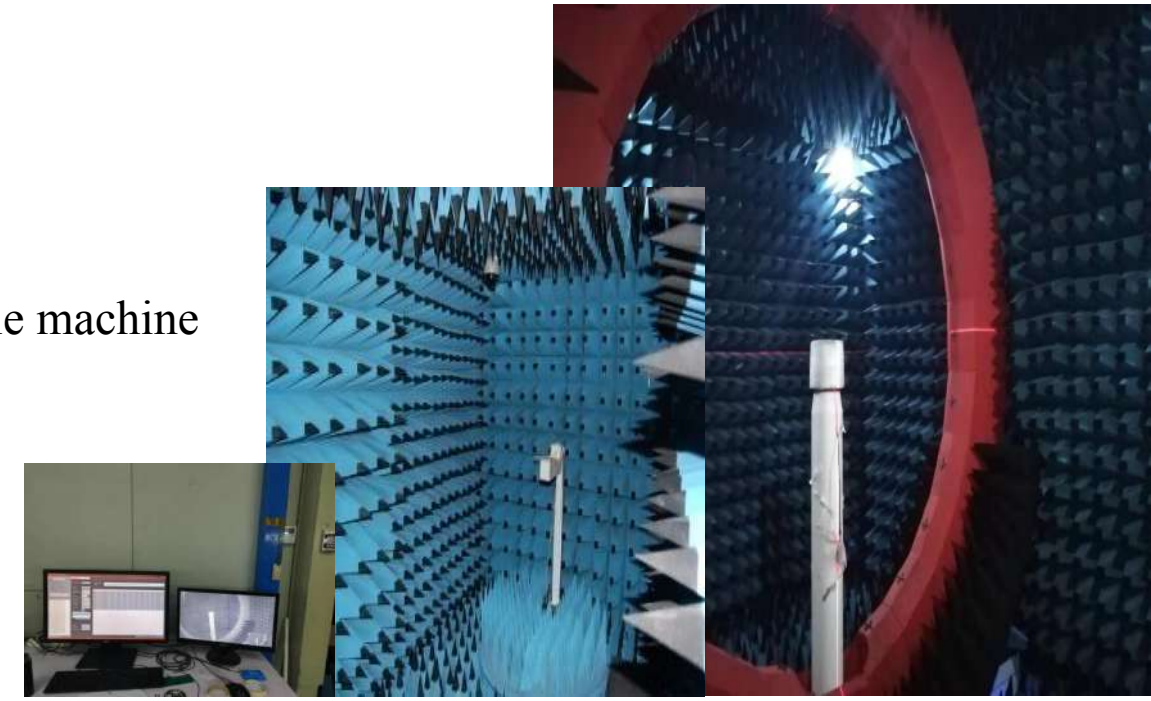
3.Company and testing environment

4.Matching circuit

5.Antenna related data

6.Environmental treatment of the whole machine

7.Engineering drawing



Project overview：

Prototype status		Debug the machine		product type		T0821	
Antenna overview							
	Frequency		**structural style**	**Type**	**position**	**Matching change**	**Antenna version number**
Main ant	LTE 4G	790-960MHz 1710-2690MHz	LDS	PIFA	housing	NO	V0.1
other ant							
Environmental treatment				No			

Report version record

Edition	Report time	Commissioning overview
A1	2022.03.26	First sample test Report

Company profile

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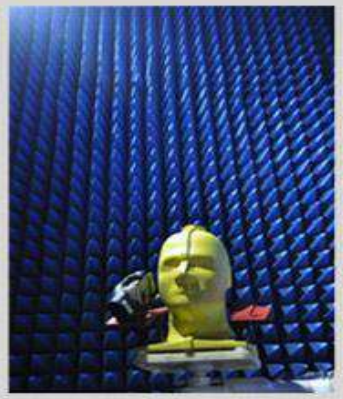
研发设备

Agilent E5071C

Agilent 8753E

Agilent 8714ET

Agilent 8960 Series10



Satimo 暗室内景(2)

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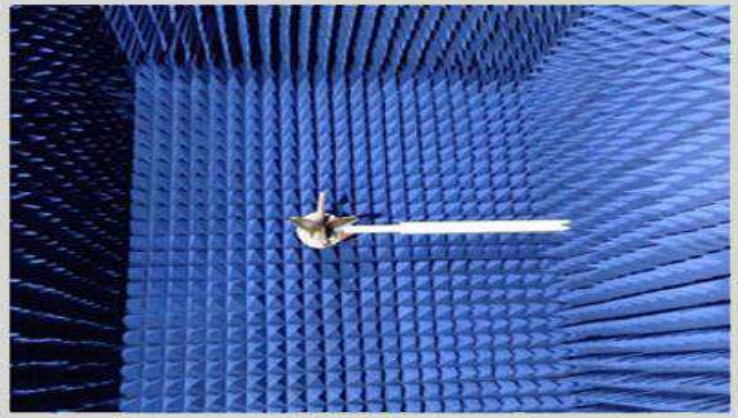
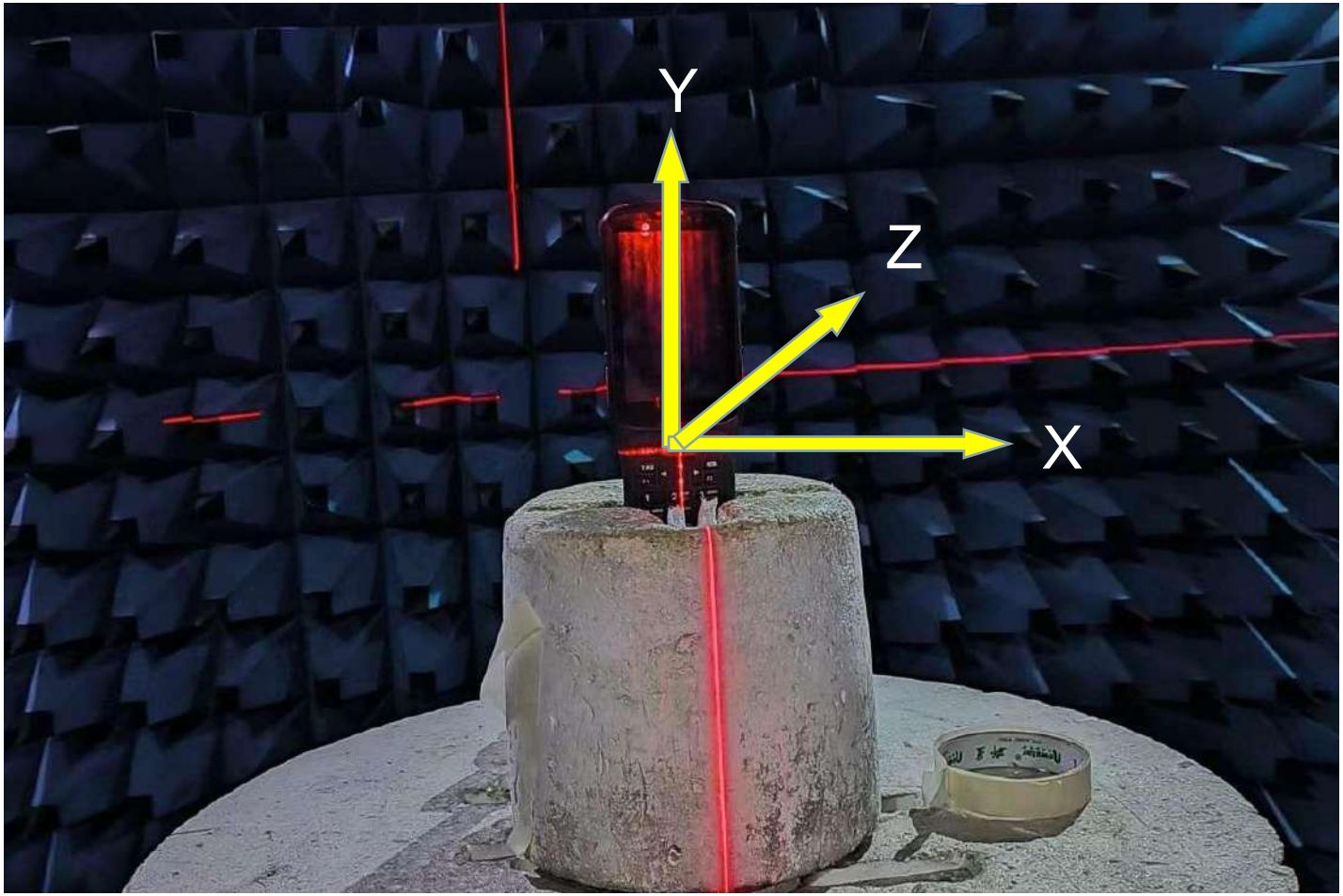


Satimo 暗室内景(3)

Satimo控制机柜

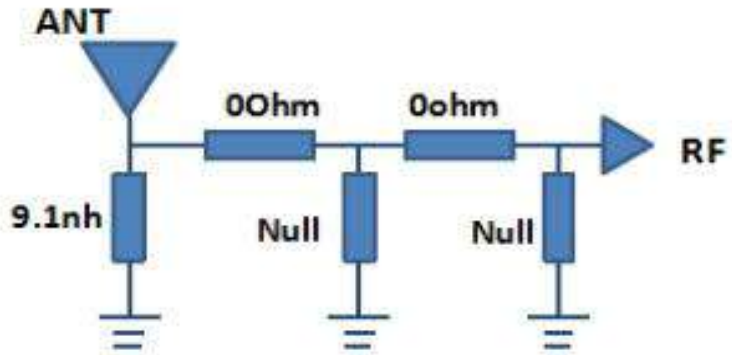
The RF test fixture picture

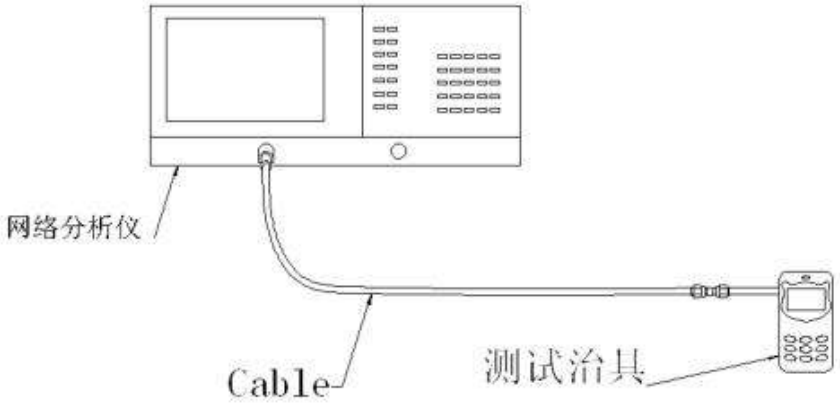
The RF test fixture picture



Matching circuit

Main matching circuit





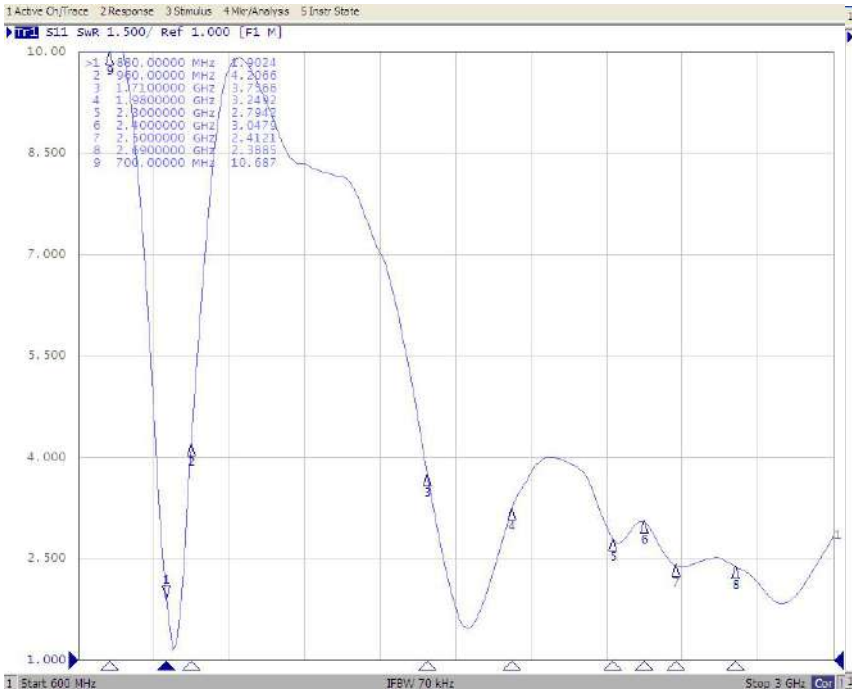
测试示意图

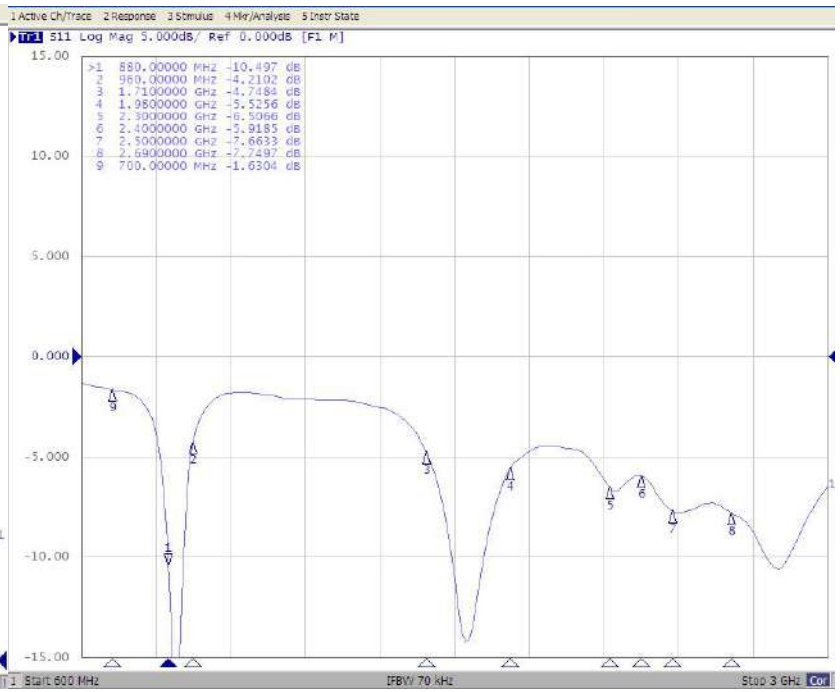
RF switching circuit

A1版本天线开关：
RF1:0欧姆
RF2:5.6NH
RF3:5.1NH
RF4: NC

E1/L1版本天线开关：
RF1:0欧姆
RF2:5.6NH
RF3:27NH
RF4: NC

1）S11 parameter test data





频率（MHZ）	880	960	1710	1980	2400	2690
VSWR	1.9	4.2	3.75	3.24	3.04	2.38
Retum loss	-10.5	-4.2	-4.7	-5.5	-5.9	-7.7

2）Gain&Efficiency test data

frequency 频率(MHz)	gain 增益 (dBi)	efficiency 效率(%)	frequency 频率(MHz)	gain 增益 (dBi)	efficiency 效率(%)	frequency 频率(MHz)	gain 增益 (dBi)	efficiency 效率(%)
880	-0.1	21.25	1710	-1	19.47	2300	0.42	30.30
900	1.86	33.94	1730	-0.75	21.63	2320	0.24	28.16
920	2.8	38.53	1750	-0.52	22.12	2340	0.57	29.33
940	2.04	29.33	1770	-0.17	24.10	2360	0.25	28.84
960	-0.28	19.70	1790	0.12	26.57	2380	0.66	30.38
			1810	0.73	33.18	2400	0.87	31.16
			1830	0.77	34.27	2420	1.68	35.56
			1850	1	34.10	2440	1.81	35.95
			1870	1.34	33.42	2460	1.84	35.47
			1890	1.17	31.51	2480	1.87	37.75
			1910	0.83	29.65	2500	2.02	40.05
			1930	0.86	29.01	2520	1.69	37.47
			1950	0.31	25.33	2540	1.71	36.27
			1970	-0.02	23.36	2560	1.73	34.94
			1990	-0.13	22.92	2580	2.49	37.91
			2010	-1.04	20.38	2600	2.98	39.68
			2030	-1.13	19.66	2620	2.83	39.33
			2050	-1.44	18.24	2640	2.95	39.95
			2070	-1.6	18.77	2660	2.85	38.43
			2090	-1.29	20.86	2680	3.19	42.49
			2110	-1.52	20.73	2690	3.18	43.38
			2130	-2.12	19.24			
			2150	-1.56	21.60			
			2170	-1.13	25.38			

2）Gain&Efficiency test data

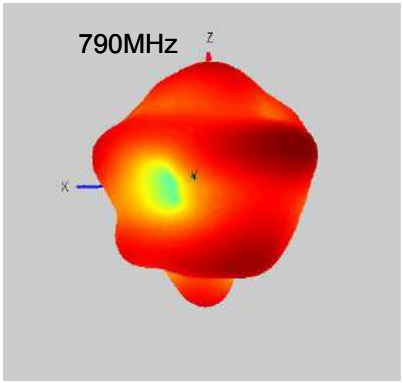
RF2:

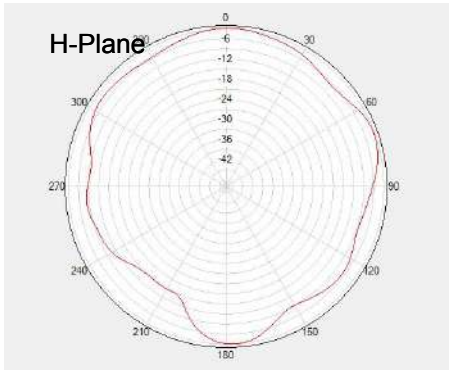
frequency 频率(MHz)	gain 增益 (dBi)	efficiency 效率(%)
820	-1.81	17.97
840	-1.34	19.06
860	-0.78	21.41
880	-1.23	20.11
900	-1.65	18.39

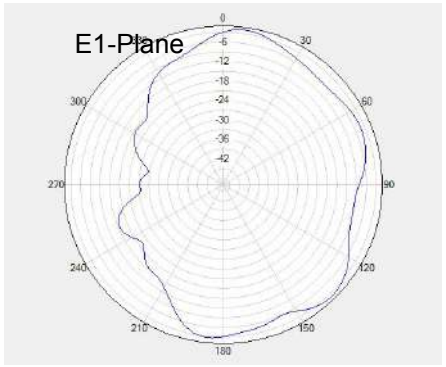
RF3:E1/L1

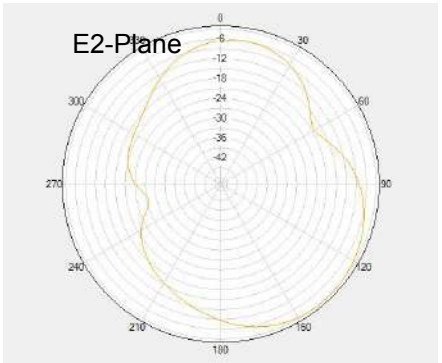
frequency 频率(MHz)	gain 增益 (dBi)	efficiency 效率(%)
700	-3.47	13.22
720	-2.7	14.89
740	-2.14	16.71
760	-2.15	16.70
780	-1.45	17.84
800	-0.69	16.95
2300	1.97	35.59
2320	1.55	33.29
2340	1.63	35.29
2360	0.99	33.77
2380	0.97	35.45
2400	1.14	35.73

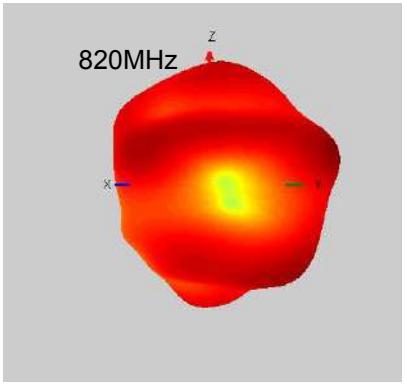
Field pattern

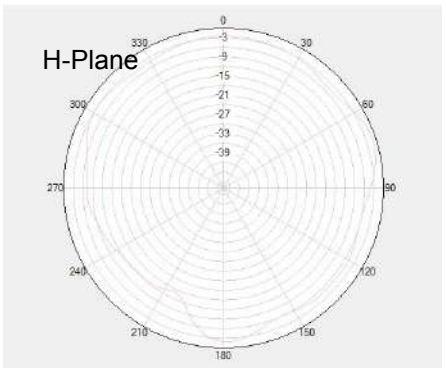


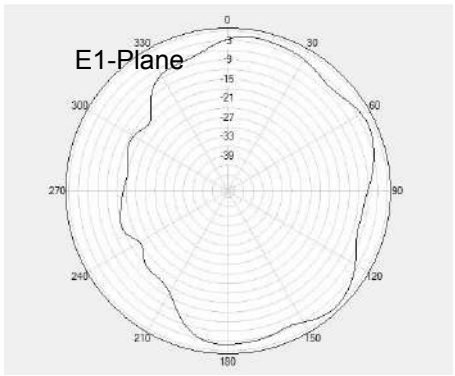


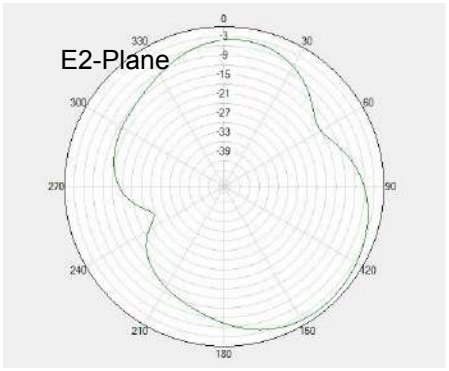






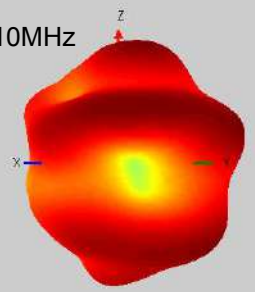




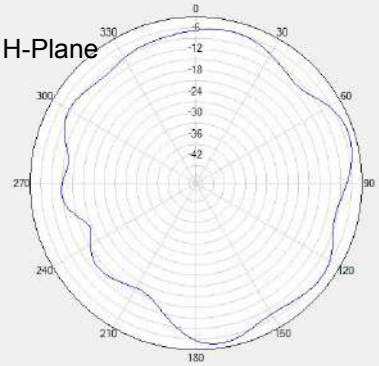


Field pattern

910MHz



H-Plane



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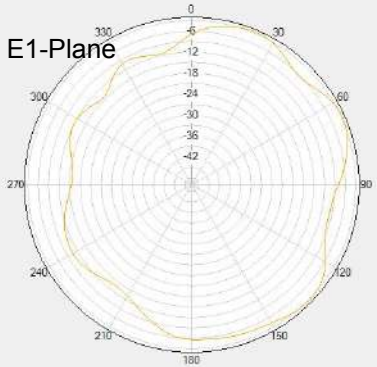

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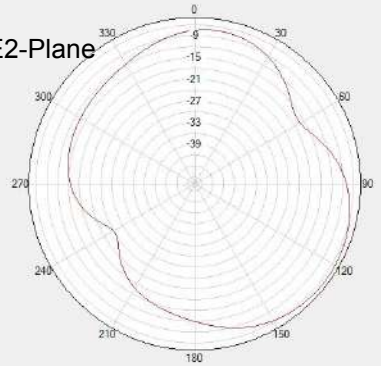
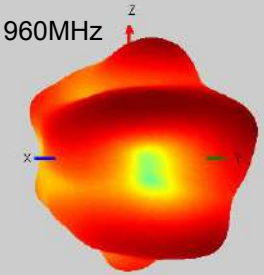


960MHz



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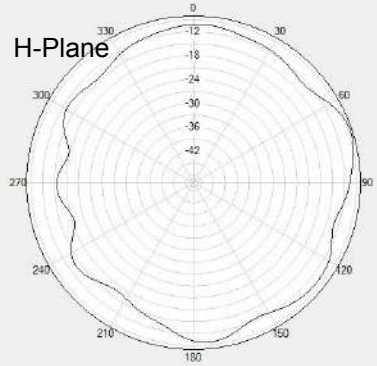

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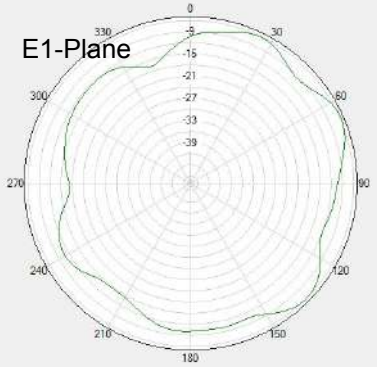

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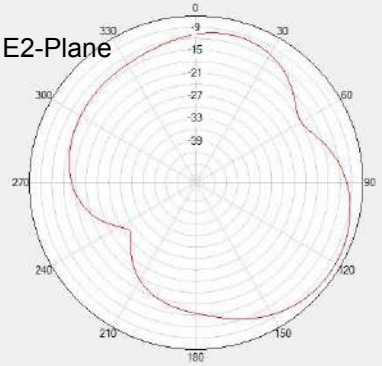
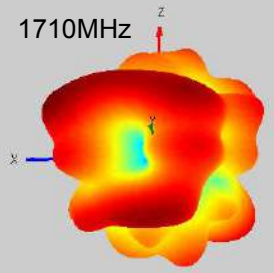


Field pattern

1710MHz



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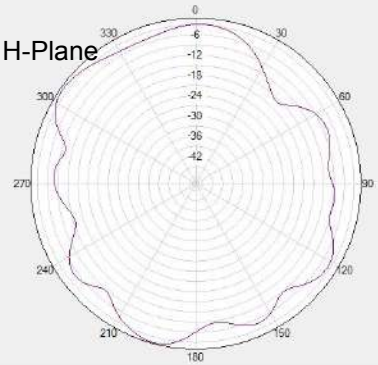

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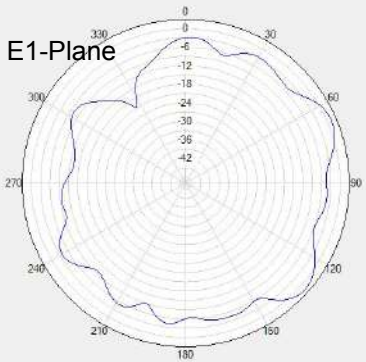

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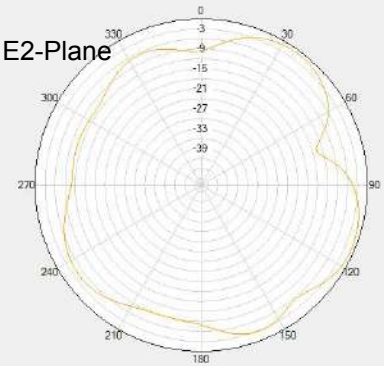
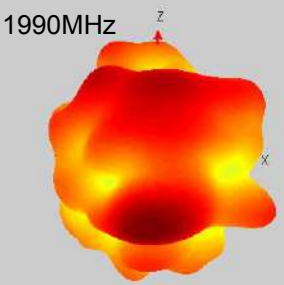


1990MHz



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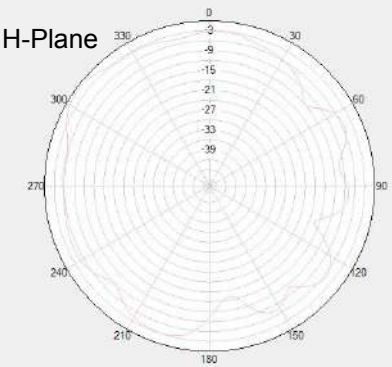

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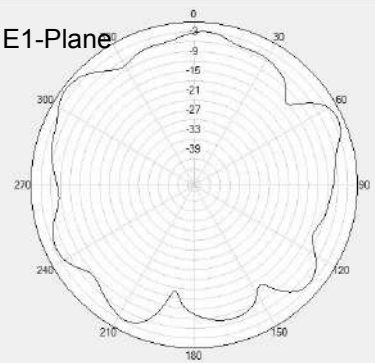

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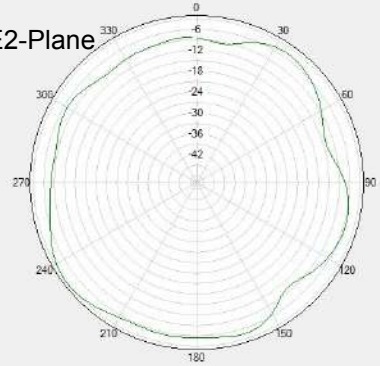

Field pattern

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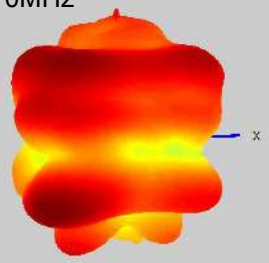

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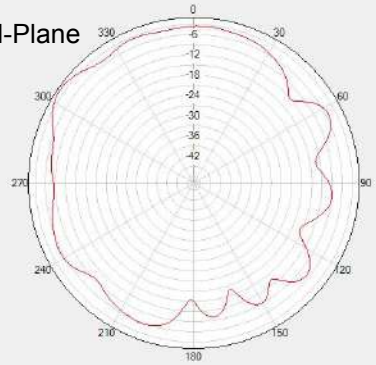

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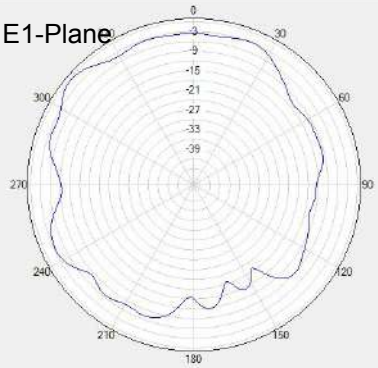

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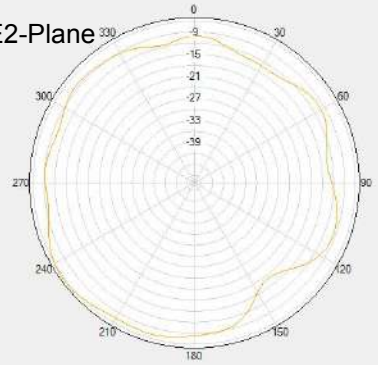
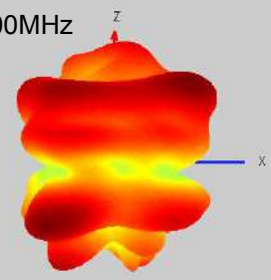


2300MHz



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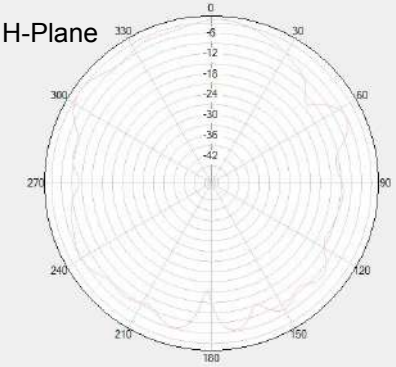

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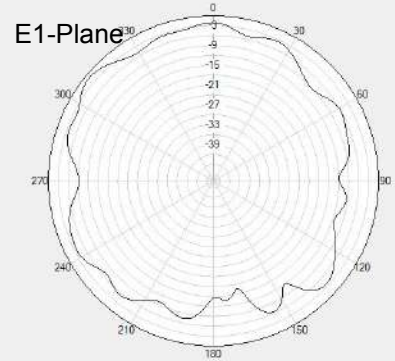

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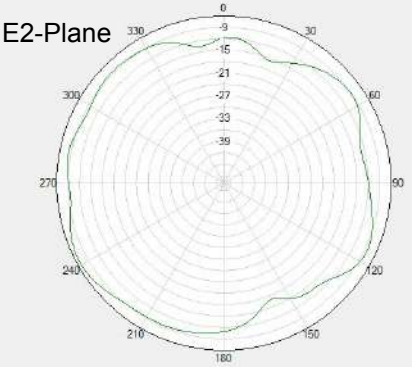
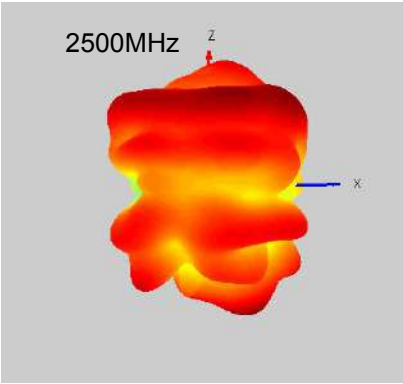
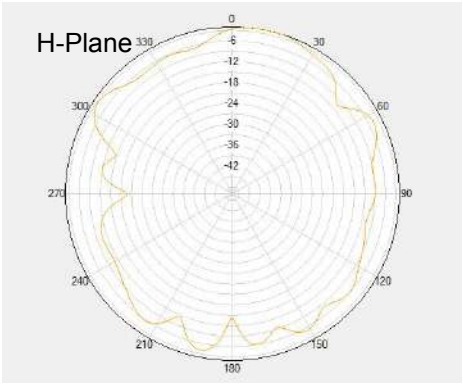
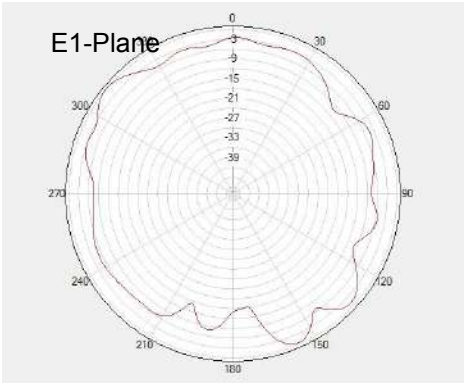
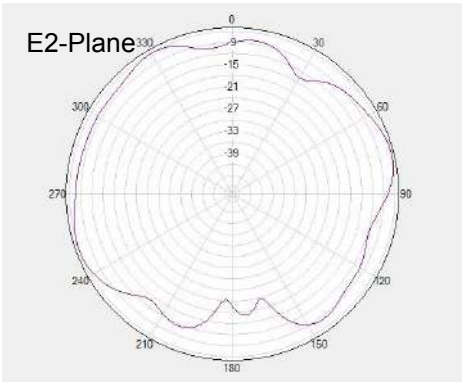


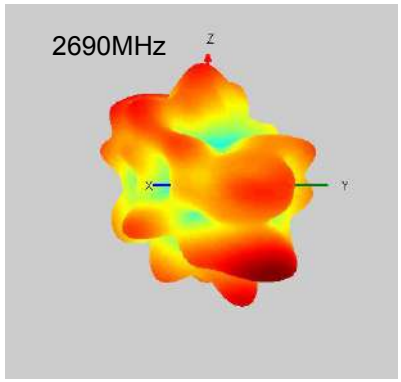
Field pattern

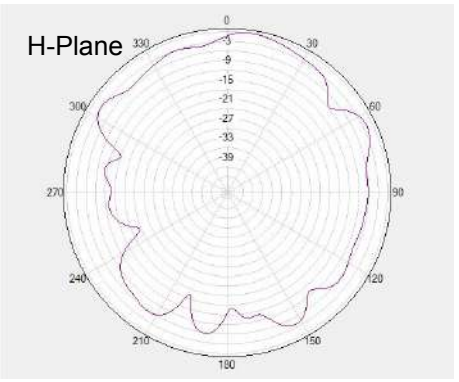


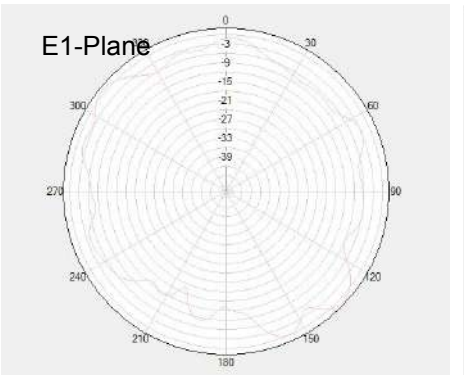


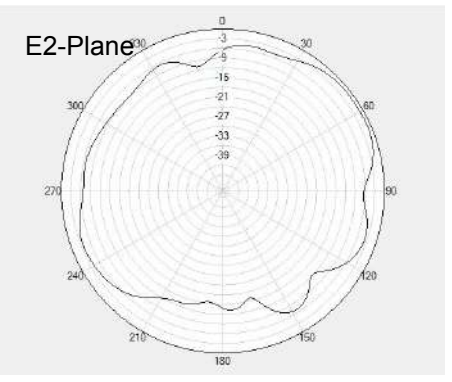








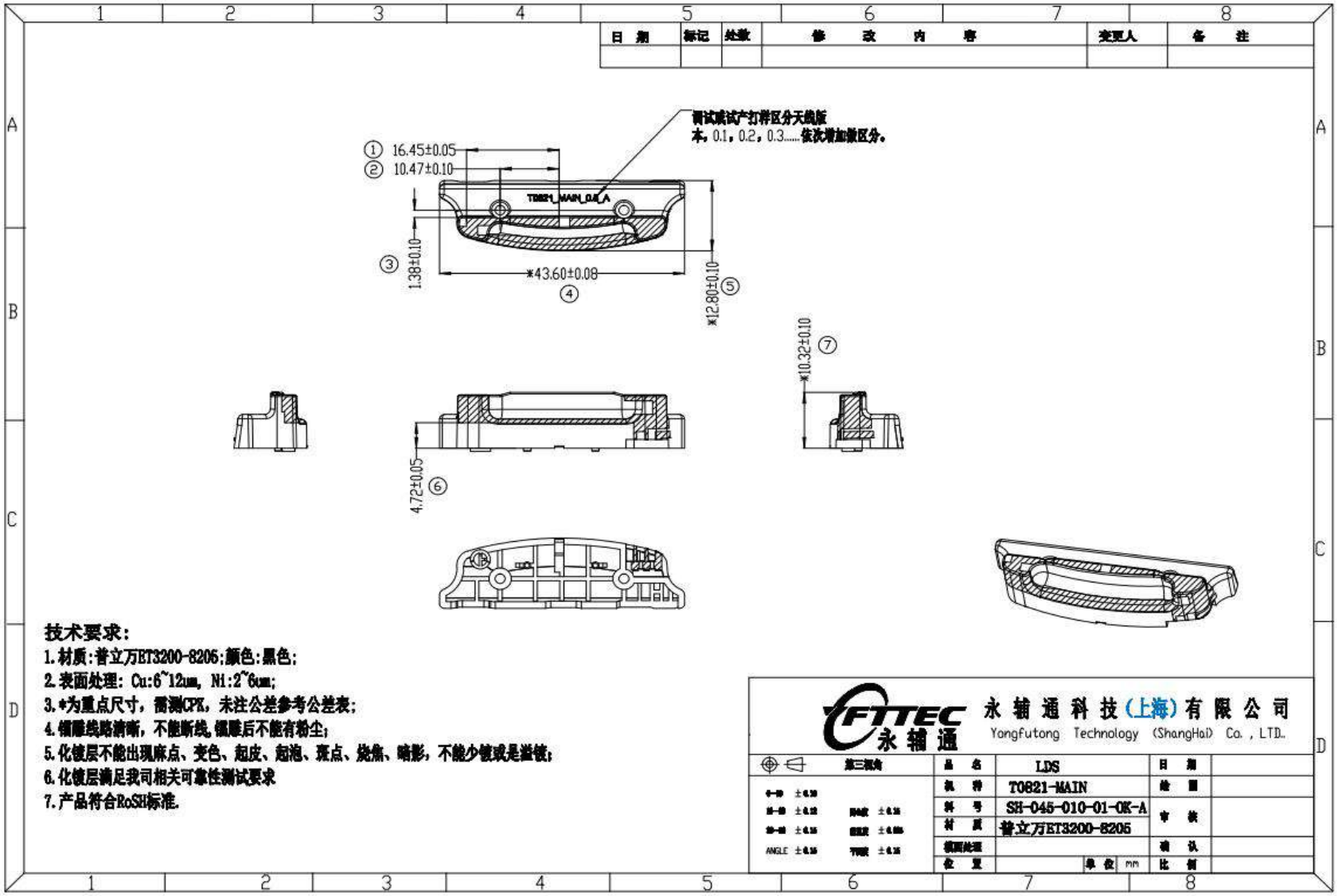




Active data

Band	TRP	TIS	Band	TRP	TIS
	26.18			18.79	
	26.72			18.71	
GSM850	26.29	102.75	FDD_B1	18.42	92.91
	27.2			17.78	
	28.27			18.73	
GSM900	27.31	104.79	FDD_B3	18.23	92.63
	25.35			17.12	
	25.87			17.52	
DCS1800	25.34	105.72	FDD_B5	17.32	91.15
	26.12			18.39	
	26.54			18.51	
PCS1900	26.87	103.24	FDD_B7	18.35	92.58
	18.44			17.14	
	18.74			18.38	
WCDMA_B1	18.62	103.59	FDD_B8	17.11	90.5
	17.2			17.11	
	17.66			17.25	
WCDMA_B5	17.49	102.44	FDD_B20	17.35	91.01
	17.65				
	18.02				
WCDMA_B8	17.53	102.2			

Engineering drawing



Thanks for your comment!

Futen Technology (ShangHai) Co.,LTD..

Phone：021-20905889

Address: Room 203, 2nd Floor, Building 1, No. 3408 xiupu Road,

Pudong New Area, Shanghai

The test report

Model Name :T0821 DIV Antenna

Mar 26, 2022

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1.Project overview

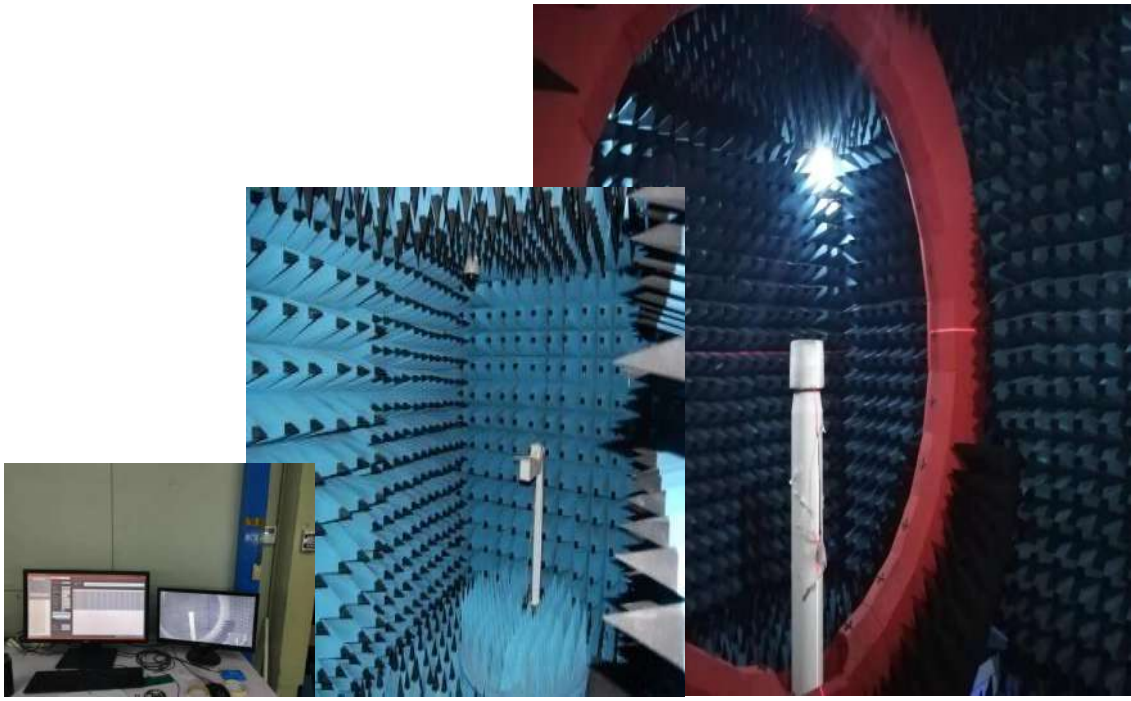
2.Report version record

3.Company and testing environment

4.Matching circuit

5.Antenna related data

6.Engineering drawing



Project overview：

Prototype status		Debug the machine		product type		T0821	
Antenna overview							
	Frequency		**structural style**	**Type**	**position**	**Matching change**	**Antenna version number**
DIV ant	LTE 4G	790-960MHz 1710-2690MHz	FPC	PIFA	housing	NO	V0.1
other ant							
Environmental treatment				No			

Report version record

Edition	Report time	Commissioning overview
A1	2022.03.26	First sample test Report

Company profile

◆Futen Technology (Shanghai) Co., Ltd; Founded in September 2016, it is an advanced mobile terminal antenna enterprise in China, covering an area of more than 2000 square meters. R & D centers have been set up in Shanghai and Shenzhen.

◆Main business: focus on the field of wireless communication intelligent terminal antenna (I have accumulated a lot of experience in the research and development technology of 2g/3g/4g/5g full band antenna, including mobile phone built-in antenna, notebook antenna, NFC, LDS, metal frame antenna, GPS ceramic antenna, Beidou antenna, module antenna, external antenna, fixed station antenna, rod antenna, ceiling antenna, beautification antenna, base station antenna, small microwave antenna used by IOT intelligent terminal, telecom power and other antennas.) Provide products and services to meet the requirements of precision mold design and manufacturing, injection molding, surface coating and light metal shell manufacturing of the whole industry chain. The products are widely used in mobile phones, pads, wearable devices, laptops, automobiles, security monitoring and other fields.

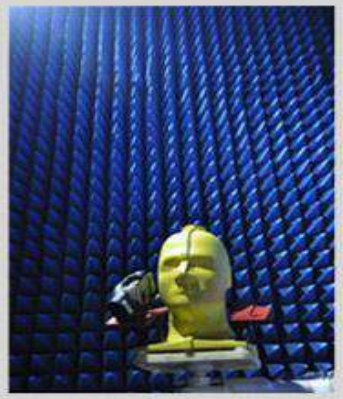
研发设备

Agilent E5071C

Agilent 8753E

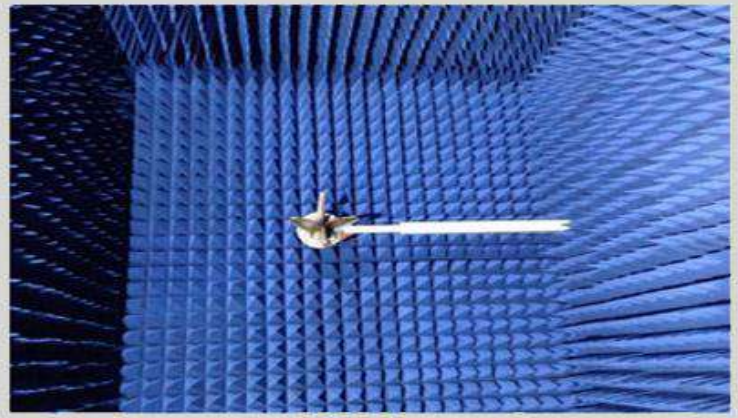
Agilent 8714ET

Agilent 8960 Series10



Satimo 暗室内景(2)

Satimo 暗室内景(2)

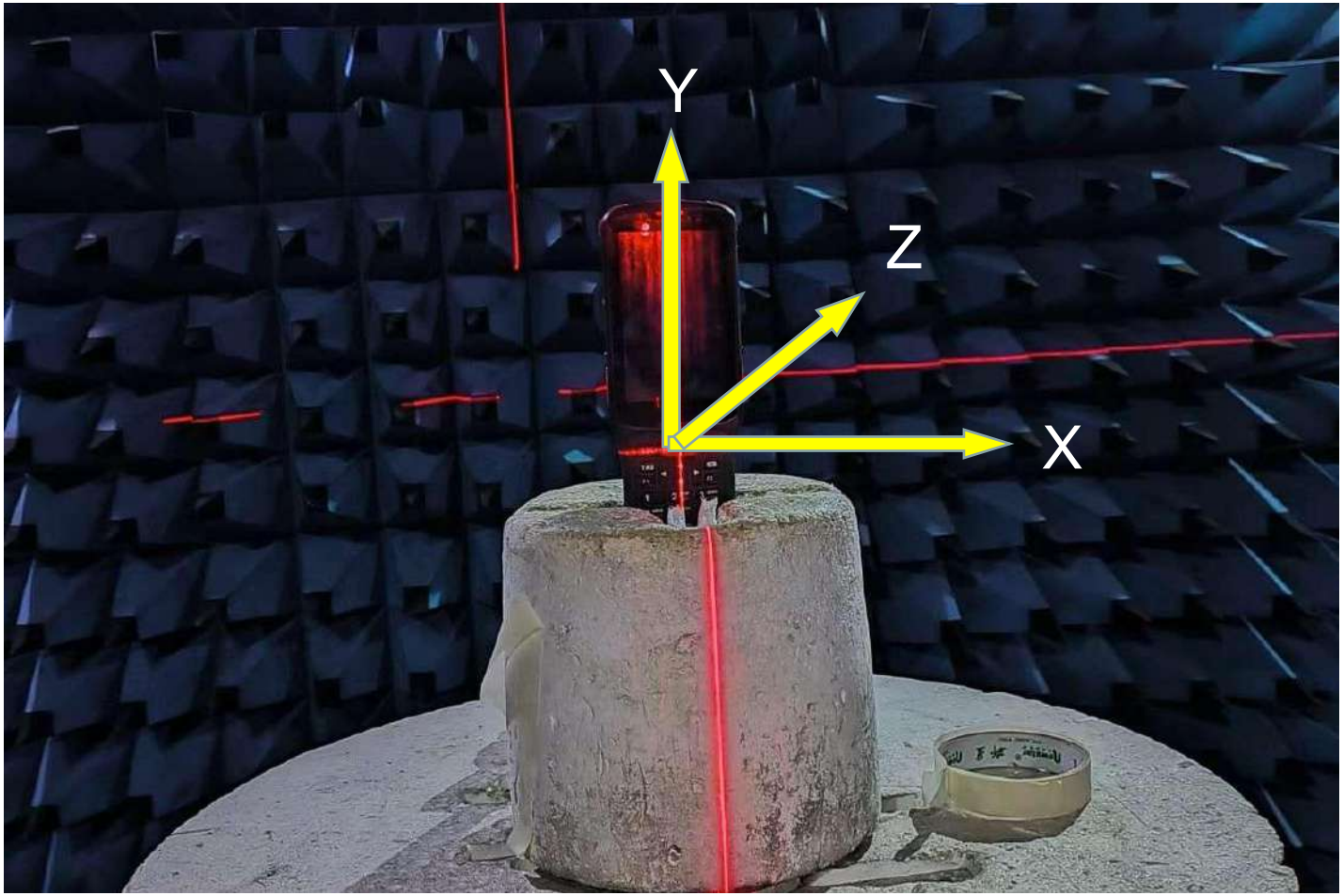


Satimo 暗室内景(3)

Satimo控制机柜

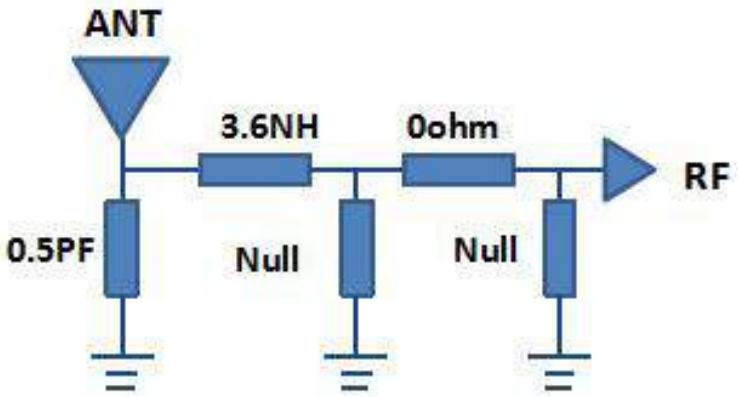
The RF test fixture picture

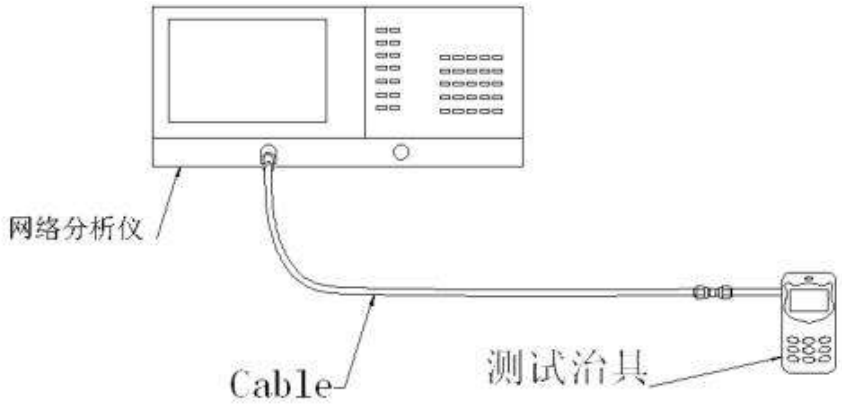
The RF test fixture picture



Matching circuit

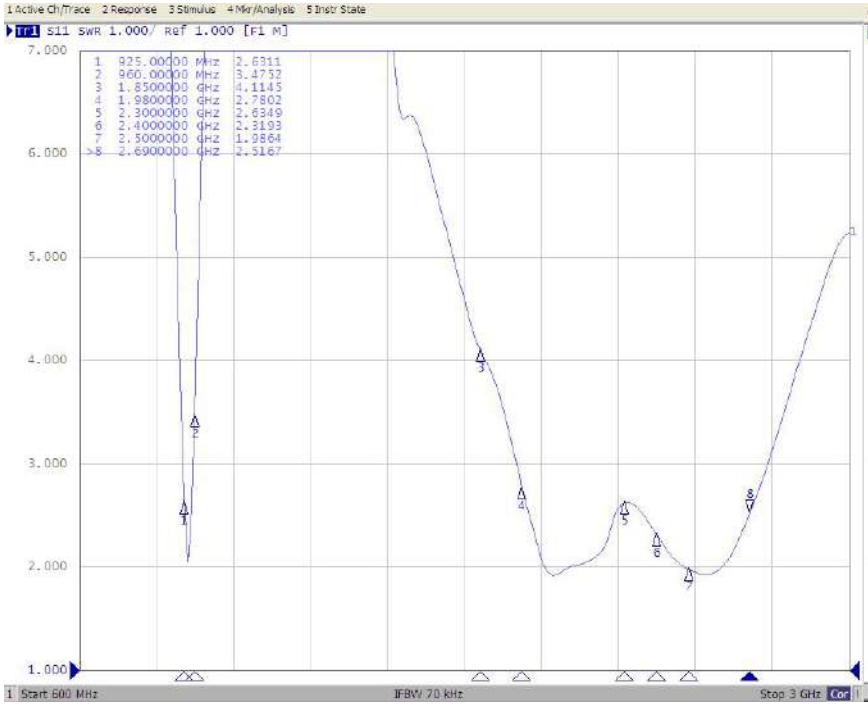
matching circuit





测试示意图

1）S11 parameter test data

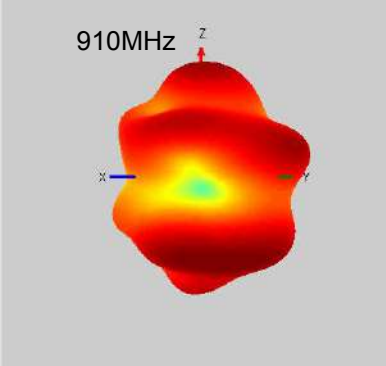


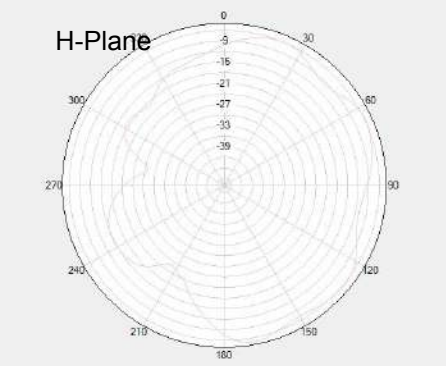
频率（MHZ）	925	960	1850	1980	2400	2690
VSWR	2.63	3.47	4.11	2.78	2.31	2.51
Retum loss	-7.03	-5.14	-4.30	-6.54	-8.01	-7.3

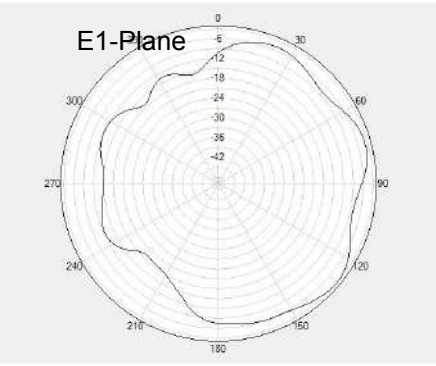
2）Gain&Efficiency test data

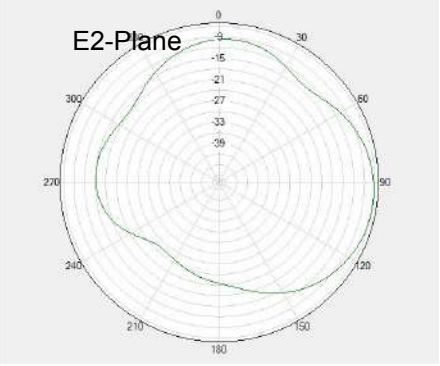
frequency 频率(MHz)	gain 增益(dBi)	efficiency 效率(%)	frequency 频率(MHz)	gain 增益(dBi)	efficiency 效率(%)
900	-2.04	10.94	2300	0.07	23.71
920	-1.55	13.33	2320	-0.15	23.16
940	-0.73	14.07	2340	0.11	25.50
960	-2.21	11.35	2360	0	26.06
1850	-2.28	16.20	2380	0.21	27.91
1870	-1.98	17.69	2400	0.5	28.11
1890	-1.6	19.47	2420	1.04	29.52
1910	-1.4	20.60	2440	0.81	28.27
1930	-0.57	21.81	2460	0.68	26.29
1950	-0.05	22.32	2480	0.39	25.65
1970	0.43	25.61	2500	0.25	23.11
1990	0.71	29.38	2520	-0.12	19.09
2010	0.87	30.38	2540	-0.21	17.65
2030	0.59	29.18	2560	-0.14	16.58
2050	0.41	28.98	2580	0.55	19.37
2070	-0.27	26.73	2600	0.31	21.05
2090	-0.92	26.07	2620	0.48	22.69
2110	-0.71	24.64	2640	0.52	22.46
2130	-0.42	25.32	2660	0.05	21.82
2150	-0.02	26.57	2680	0.6	23.92
2170	0.54	29.65	2690	0.6	23.03

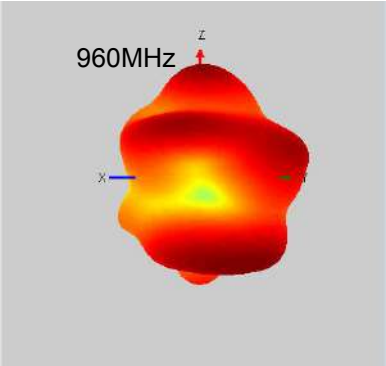
Field pattern

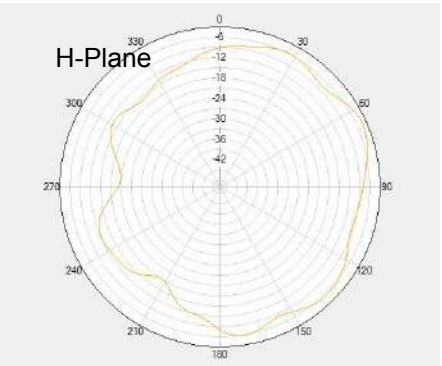


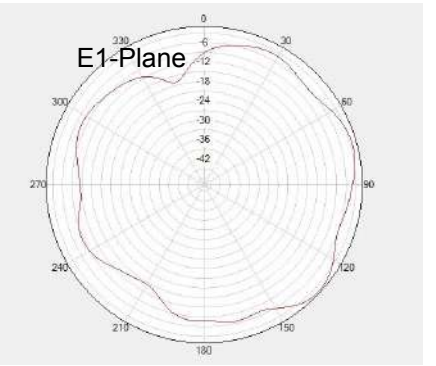


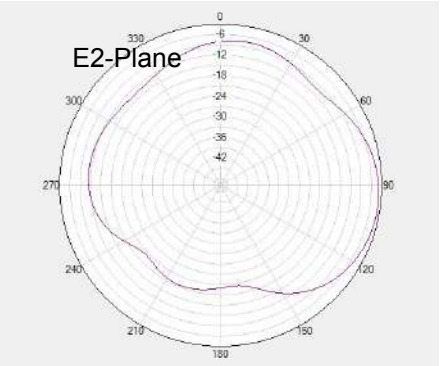




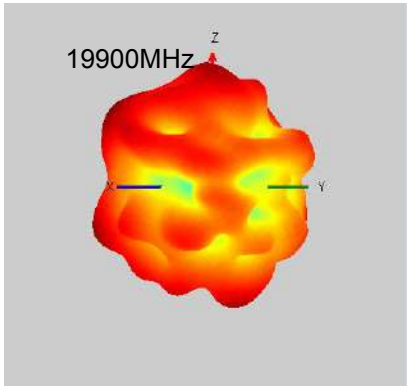


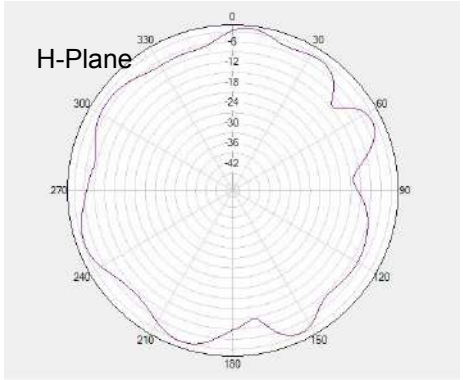


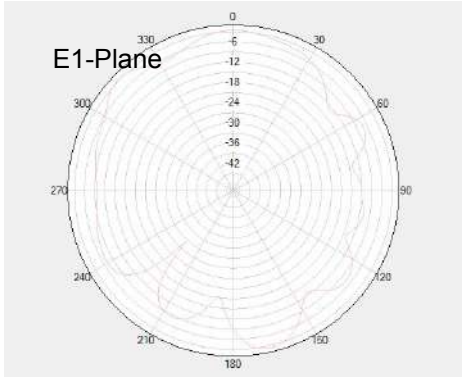


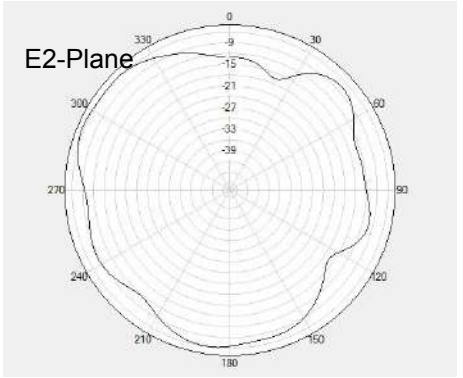


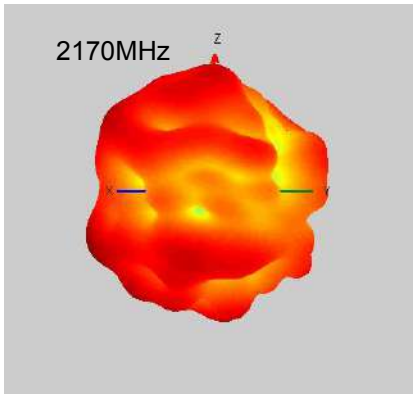
Field pattern

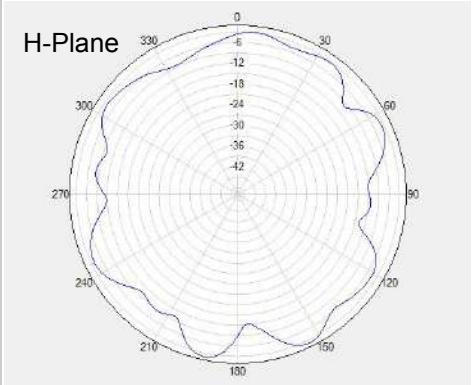


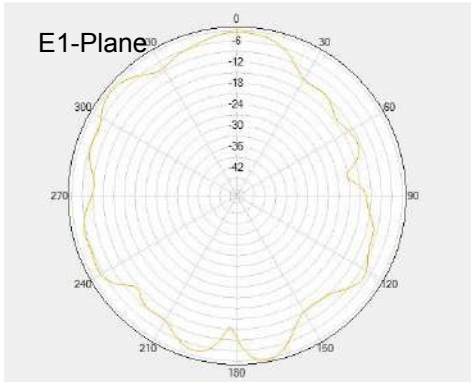


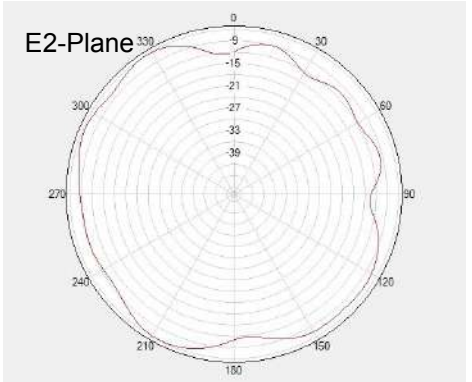






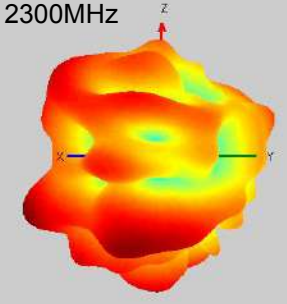


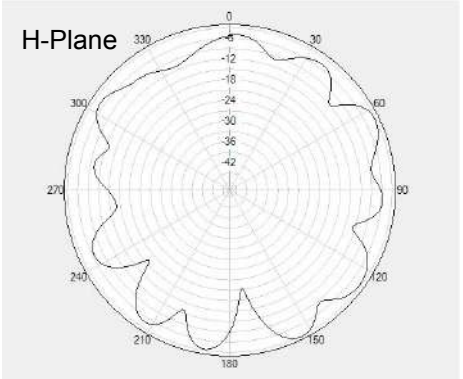


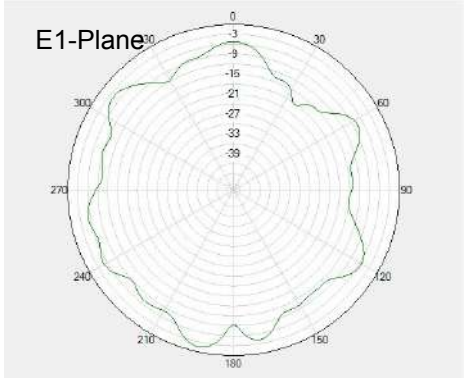


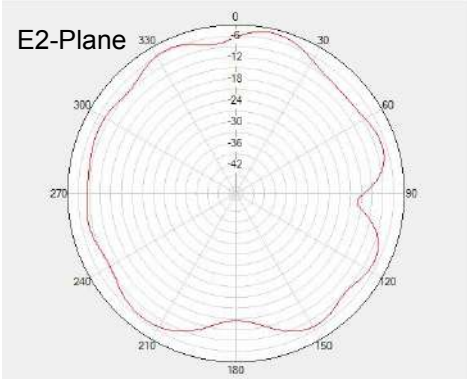
Field pattern

2300MHz

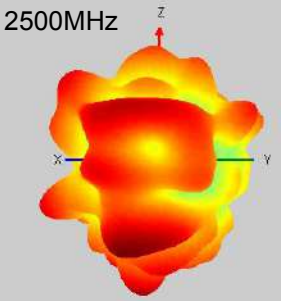


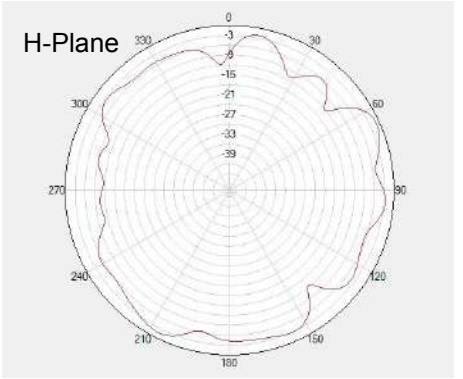


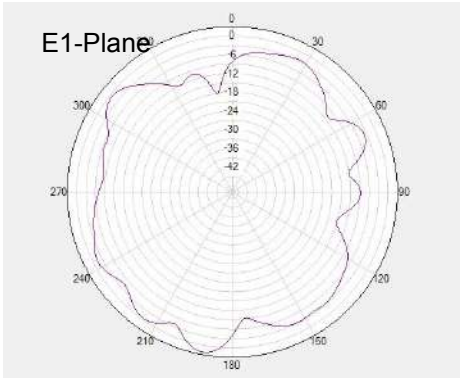


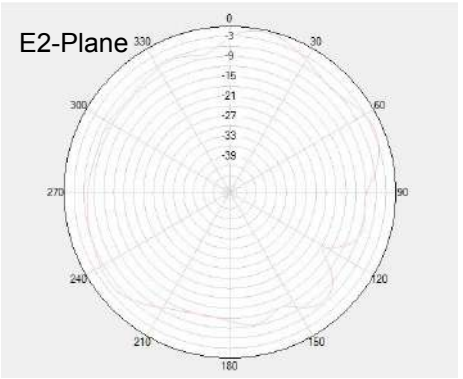


2500MHz

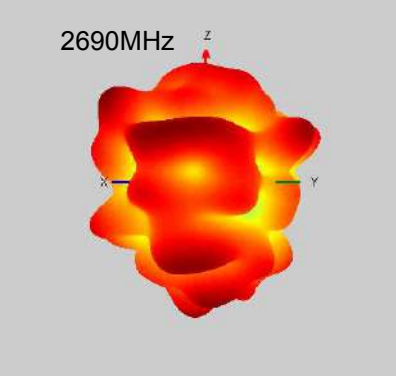


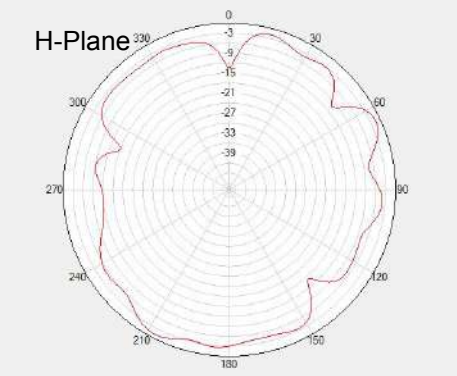


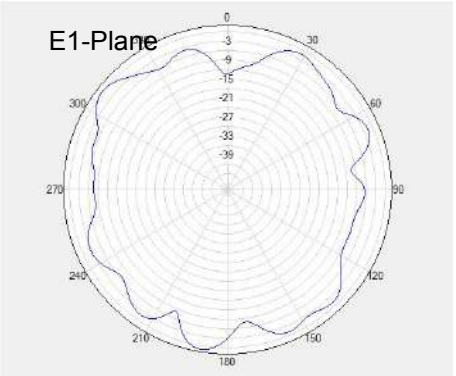


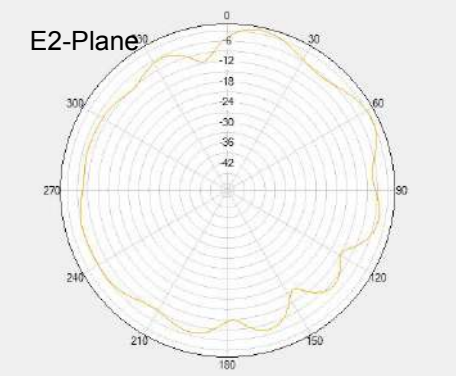


Field pattern



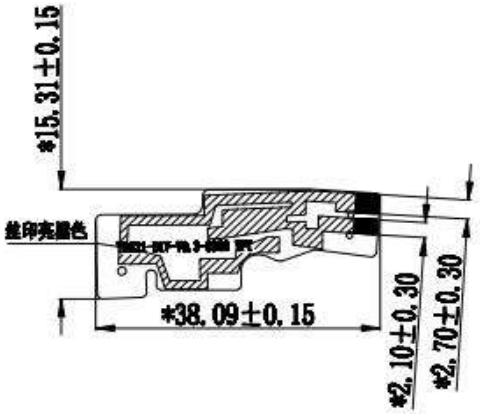




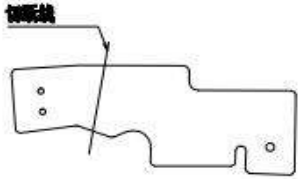


Engineering drawing

日 期	标记	处数	修 改 内 容	变更人	备 注



铺铜走线（正面）



背胶面（反面）

技术要求：

1. 打"*"为重点尺寸，外形尺寸需要检测CPK；线形尺寸未注公差按图右边公差表；
2. 黄色部分外露镀金大于0.05um厚度，镍2~6um，盐雾试验48小时需合格；
3. 材质电解铜，PI半对半，背胶：3M 9471；
4. 边缘冲切要平整，不可有锯齿形状；
5. 符合ROHS要求。

永辅通科技（上海）有限公司
Yongfutong Technology (Shanghai) Co., LTD.

第三视角	品 名	FPC	日 期	
	料 号	TO821-DIV	绘 图	
	材 质	SH-045-030-14-OE-1	审 核	
	检测处理	电解铜，PI半对半，背胶3M9471	确 认	
	处 理	单位 mm	比 例	

Thanks for your comment!

Futen Technology (ShangHai) Co.,LTD..

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