



承 认 书

APPROVAL SHEET

客户名称 Customer	Aozora				
客户料号 Customer P/N					
项目名称 Project Name	K8 Active Antenna				
供应商名称 Supplier	上海圣丹纳无线科技有限公司 Shanghai Saintenna Wireless Technology Co. , Ltd.				
圣丹纳物料型号 Saintenna P/N	SAA32428A (NFC) / SAA32429A (4G) / SAA32430A (FJ) / SAA32431A(GPS/WiFi/BT)				
是否符合 RoHS ROHS Compliant	Yes				
送样日期 Providing Date	2025.02.11				
供应商 Supplier	制定 Prepared by	设计 Designer	测试员 Testers	品质 QA	批准 Approver
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NFC 规格/NFC Specification

1. 机械规格/Mechanical Specification

- 连接方式/Connect Type..... Sharpnel
- 工作温度/Work Temperature..... -40~85℃
- 存储温度/Storage Temperature..... -40~85℃
- 盐雾耐受/ Salt spray tolerance..... 48H

2. 电性能参数/Electrical Specification

- 频段/Frequency Range..... 13.56MHz
- 回损/S11..... -20.9dB
- 极化/Polarization..... Linear
- 特性阻抗/Input Impedance..... 50Ω
- 最大承载功率/Max Input Power..... 5W

4G 规格/4G Specification

1.机械规格/Mechanical Specification

- 连接方式/Connect Type..... Sharpnel
- 工作温度/Work Temperature..... -40~85℃
- 存储温度/Storage Temperature..... -40~85℃
- 盐雾耐受/ Salt spray tolerance..... 48H

2.电性能参数/Electrical Specification

- 频段/Frequency Range..... 700MHz~894MHz
1710MHz~2210MHz
- 回损/S11..... -12.8dB
- 效率/Efficiency..... <55.07%
- 增益/Peak Gain..... 2.25dBi
- 极化/Polarization..... Linear
- 特性阻抗/Input Impedance..... 50Ω
- 最大承载功率/Max Input Power..... 5W

FJ 规格/FJ Specification

1.机械规格/Mechanical Specification

- 连接方式/Connect Type..... 精元端子
- 工作温度/Work Temperature..... -40~85℃
- 存储温度/Storage Temperature..... -40~85℃
- 盐雾耐受/ Salt spray tolerance..... 48H

2.电性能参数/Electrical Specification

- 频段/Frequency Range..... 1930MHz~2200MHz
- 回损/S11..... -10.85dB
- 效率/Efficiency..... <31.7%
- 增益/Peak Gain..... 0.17dBi
- 极化/Polarization..... Linear
- 特性阻抗/Input Impedance..... 50Ω
- 最大承载功率/Max Input Power..... 5W

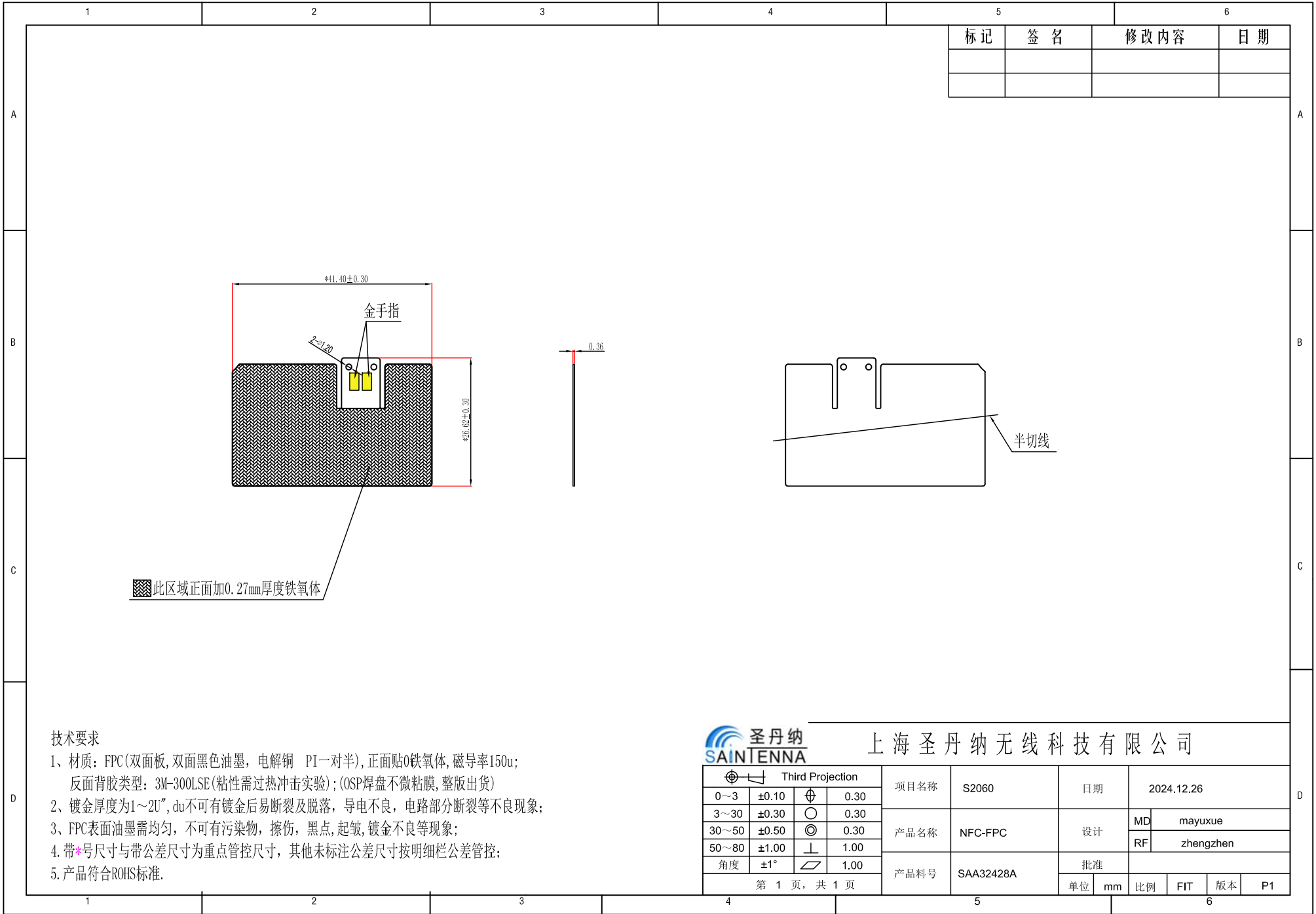
GWB规格/GWB Specification

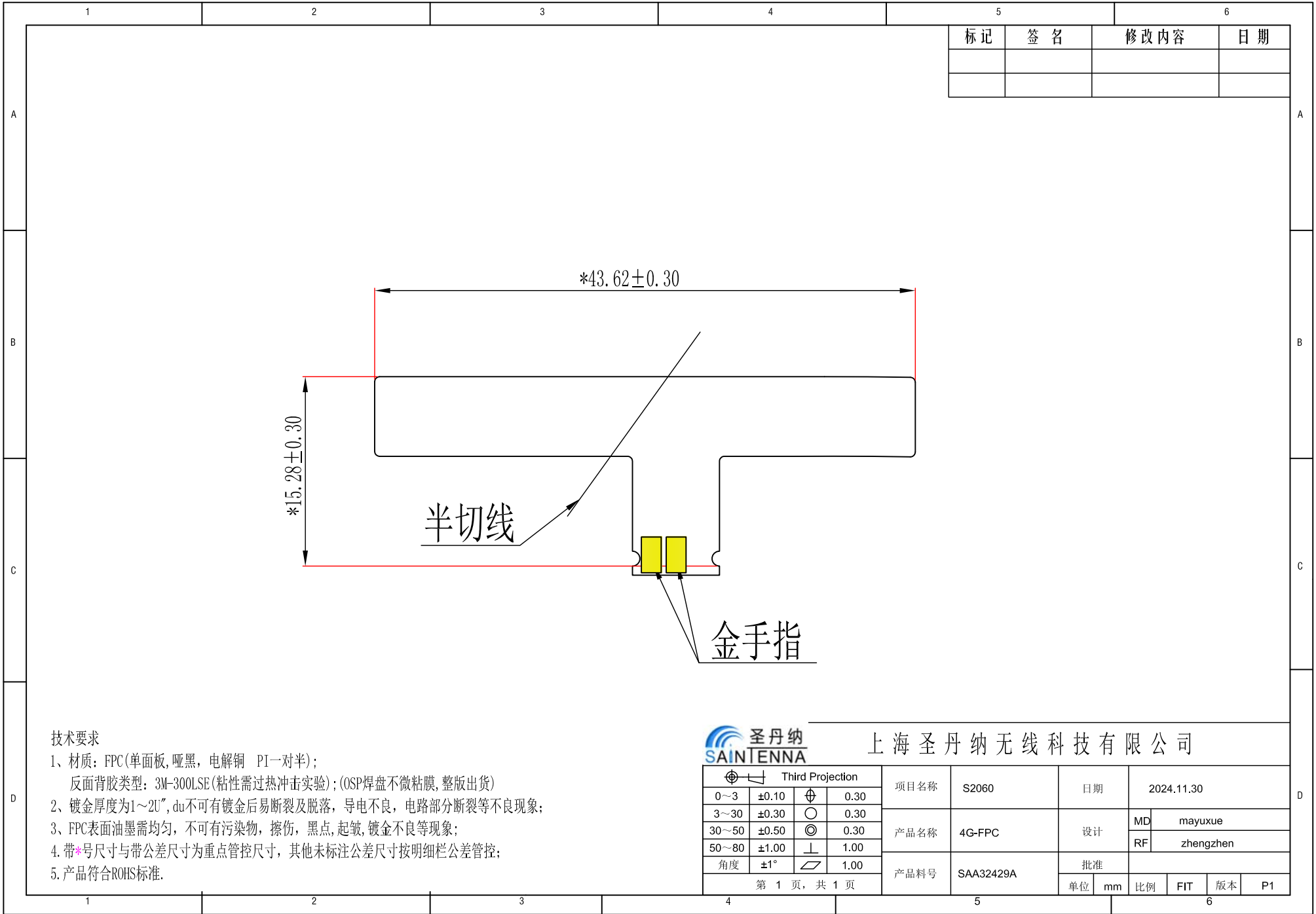
2. 机械规格/Mechanical Specification

- 连接方式/Connect Type..... Sharpnel
- 工作温度/Work Temperature..... -40~85℃
- 存储温度/Storage Temperature..... -40~85℃
- 盐雾耐受/ Salt spray tolerance..... 48H

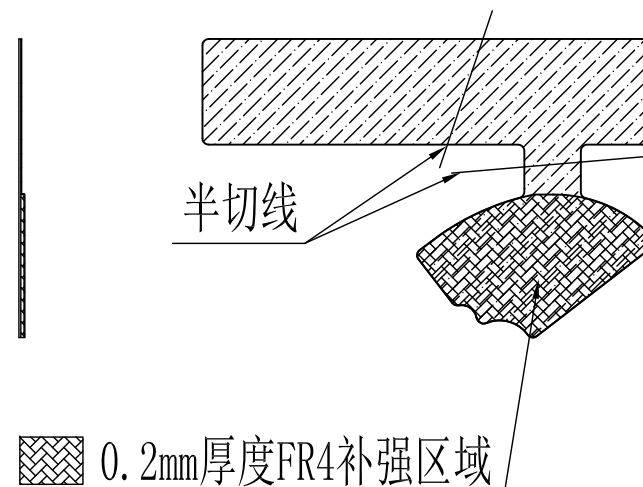
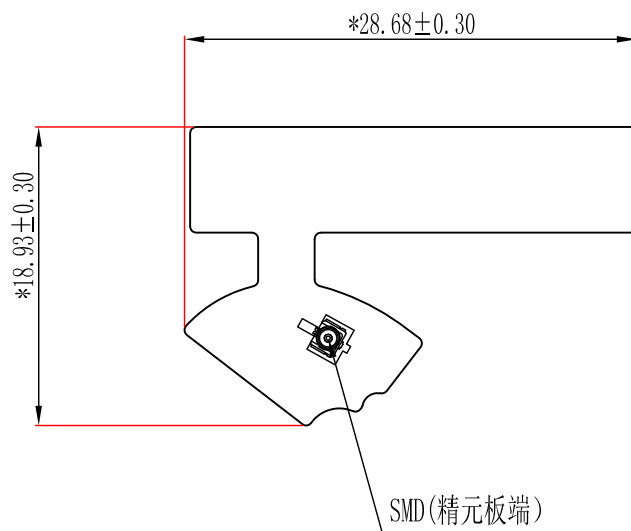
2.电性能参数/Electrical Specification

- 频段/Frequency Range..... 1560MHz~1605MHz
2400MHz~2500MHz
5150MHz~5850MHz
- 回损/S11..... -10.55dB
- 效率/Efficiency..... <43.43%
- 增益/Peak Gain..... 2.67dBi
- 极化/Polarization..... Linear
- 特性阻抗/Input Impedance..... 50Ω
- 最大承载功率/Max Input Power..... 5W





标 记	签 名	修 改 内 容	日 期



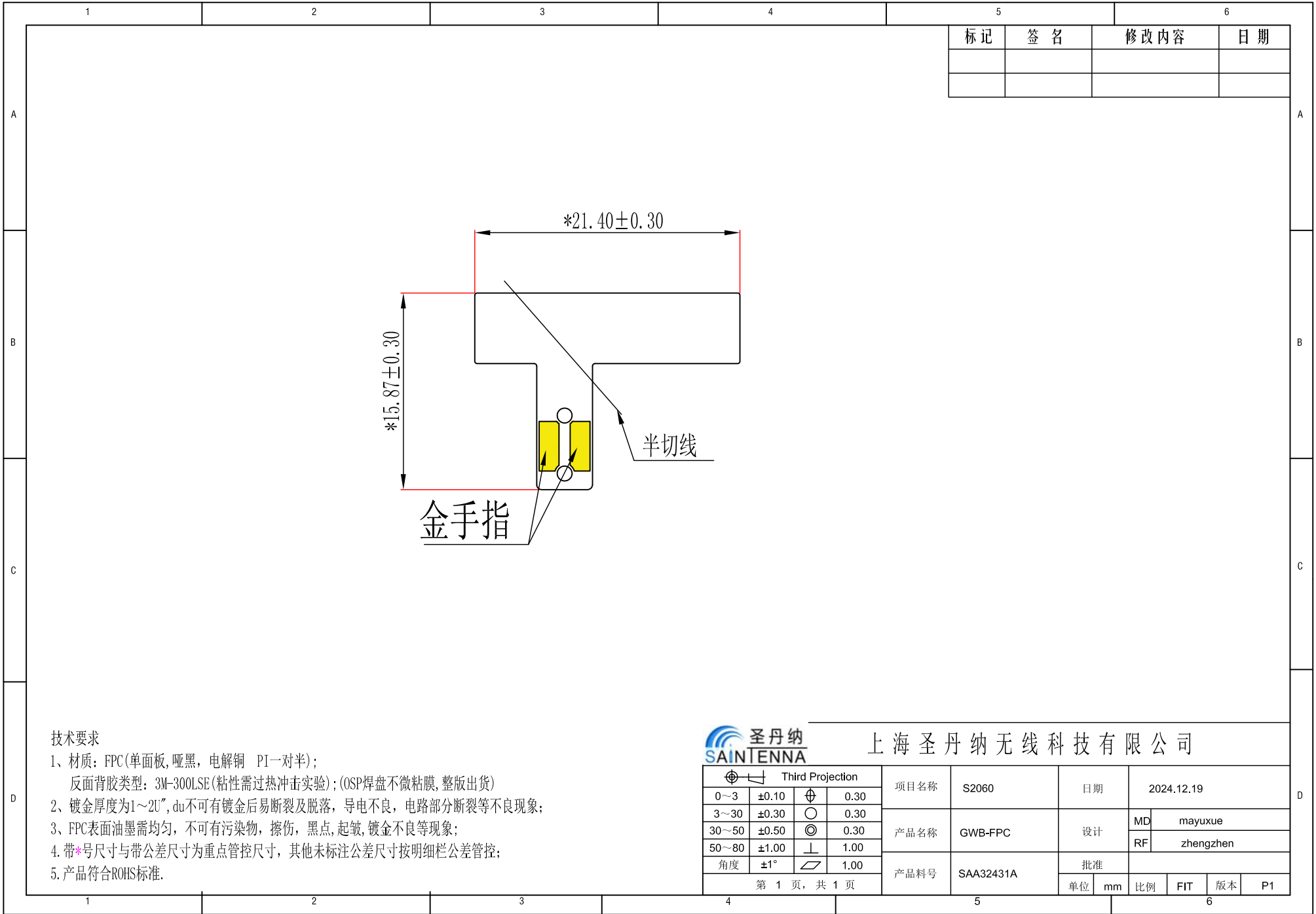
技术要求

- 1、材质：FPC(单面板, 哑黑, 电解铜 PI一対半), 反面区域加0.2mm厚度FR4补强;
反面背胶类型: 3M-300LSE(粘性需过热冲击实验); (OSP焊盘不微粘膜, 整版出货)
- 2、镀金厚度为1~2μ, du不可有镀金后易断裂及脱落, 导电不良, 电路部分断裂等不良现象;
- 3、FPC表面油墨需均匀, 不可有污染物, 擦伤, 黑点, 起皱, 镀金不良等现象;
4. 带*号尺寸与带公差尺寸为重点管控尺寸, 其他未标注公差尺寸按明细栏公差管控;
5. 产品符合ROHS标准.



上海圣丹纳无线科技有限公司

 Third Projection				项目名称	S2060	日期	2024.12.26			
0~3	±0.10		0.30							
3~30	±0.30		0.30	产品名称	FJ-FPC	设计	MD	mayuxue		
30~50	±0.50		0.30				RF	zhengzhen		
50~80	±1.00		1.00							
角度	±1°		1.00	产品料号	SAA32430A	批准				
第 1 页, 共 1 页						单位	mm	比例	FIT	版本





K8 Active天线调试报告

上海圣丹纳无线科技有限公司

Shanghai Saintenna Wireless Technology Co., LTD.

Project Information

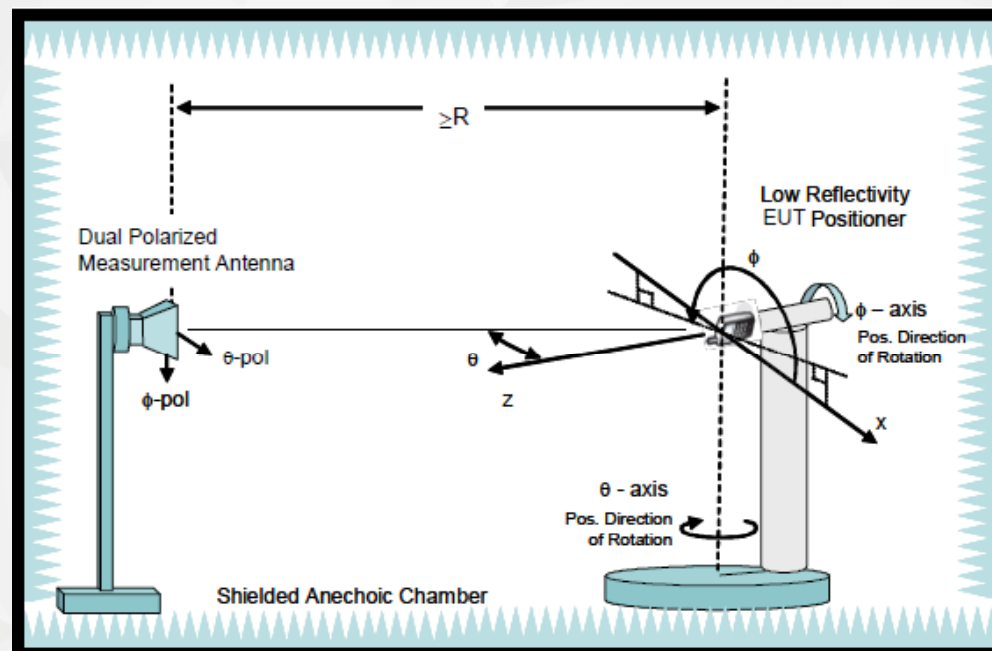
客户名称 Customer Name	Aozora
项目名称 Project Name	K8 Active
工作频段 Working Band	主天线：700-894MHz/1710-2200MHz 分集天线：1930-2200MHz 三合一天线：1575MHz/2400-2500MHz/5150-5850MHz NFC天线：13.56MHz
规格 Description	
版本 Version	V1.0
日期 Date	2025.4.9

Tuning Instrument

Network Analyzer	Agilent E5071C
Frequency Range	100KHz ~ 8.5GHz
Test Item	Return Loss/VSWR/Smith Chart /Isolation

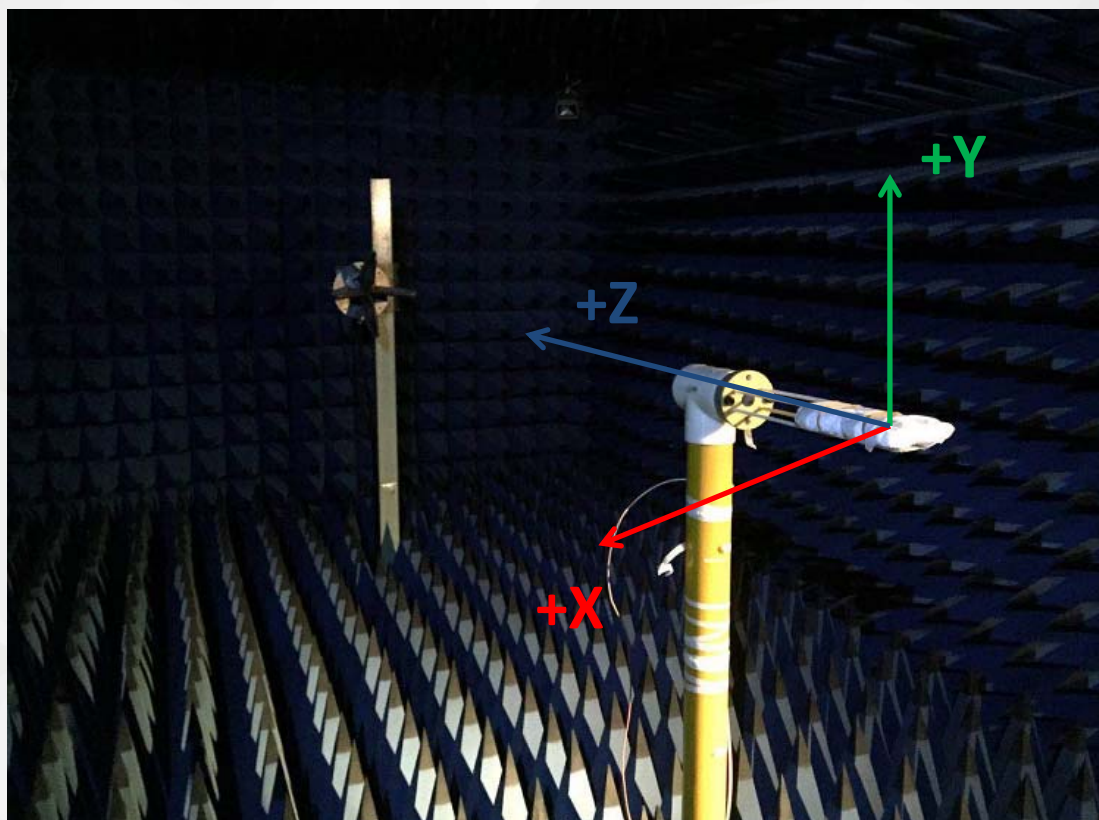


Typical Setup for Test System



Combined-Axes System

Anechoic Chamber



Combined-Axes System

Comment: E1 plane means XZ section, E2 plane means YZ section, H plane means XY section.

Antenna Sample Description

分集天线

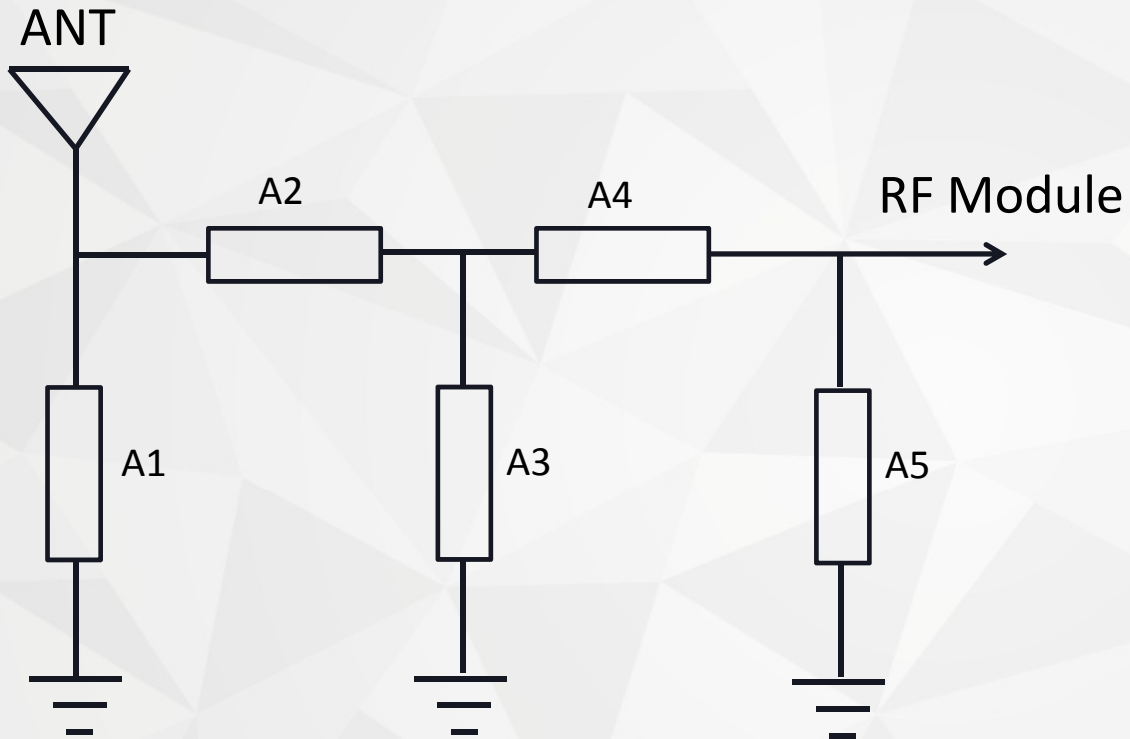
三合一天线

NFC天线

主天线



Matching Circuit (主天线)

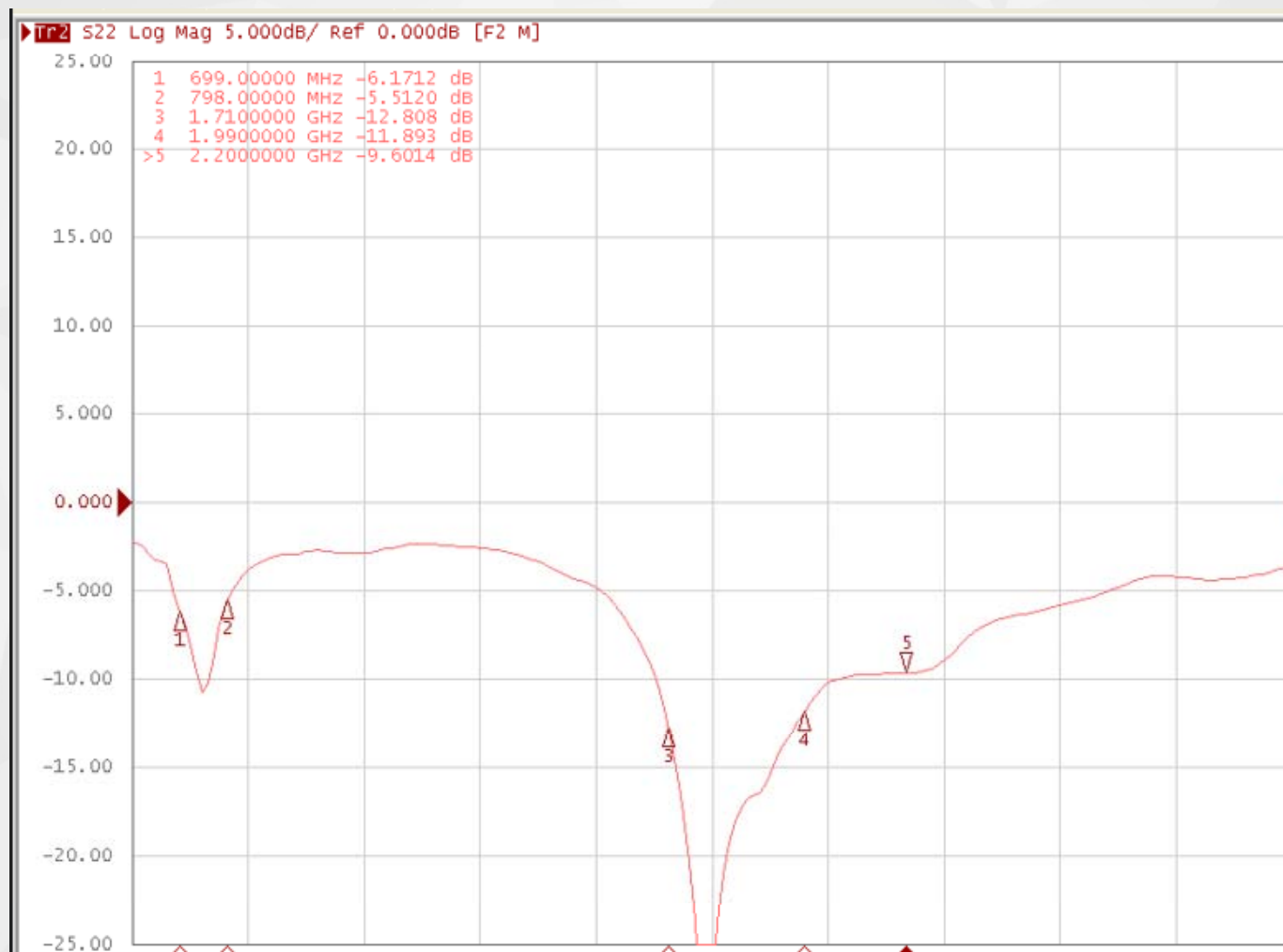


A1	/
A2	6.8pF
A3	1pF
A4	4.3nH
A5	/

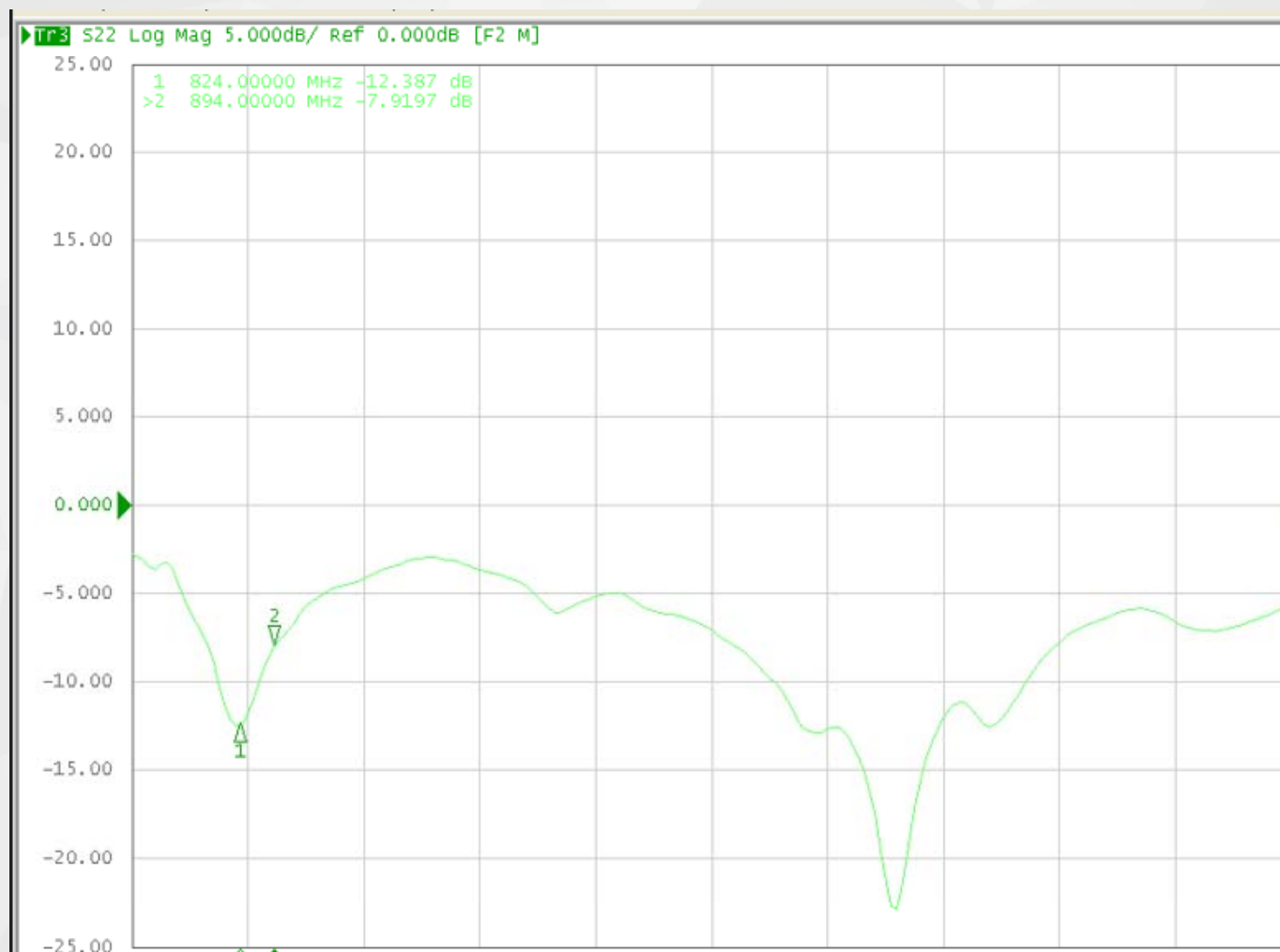
Matching Circuit（主天线开关）

RF1	0ohm	B2/B4/B66
RF3	断开	B5
RF4	0ohm	B12/B13/B14

S11 (主天线-RF1/RF4)



S11 (主天线-RF3)



Test Result – Passive（主天线RF1/RF4）

Freq. (MHz)	Gain (dBi)	Eff.	Freq. (MHz)	Gain (dBi)	Eff.	Freq. (MHz)	Gain (dBi)	Eff.
660	-3.4	13.1%	1710	0.26	50.55%	2500	-2.97	18.58%
670	-2.94	15.02%	1730	0.37	47.02%	2520	-3.4	16.87%
680	-2.82	19.38%	1750	0.07	44.37%	2540	-3.54	16.12%
690	-2.79	25.1%	1770	0.55	45.12%	2560	-4.17	13.78%
700	-1.12	30.05%	1790	1.57	46.64%	2580	-4.43	12.51%
710	-0.94	31.59%	1810	2.19	51.91%	2600	-4.79	11.61%
720	-0.57	34.65%	1830	1.82	54.75%	2620	-5.2	11.56%
730	-0.74	33.89%	1850	1.83	54.97%	2640	-5.23	11.12%
740	-0.56	35.9%	1870	1.91	55.07%	2660	-5.41	9.56%
750	-0.25	38.44%	1890	2.17	52.63%	2680	-5.52	9.32%
760	-0.32	38.73%	1910	2.2	51.61%	2700	-5.16	9.16%
770	-0.66	36.74%	1930	2.25	52.42%			
780	-1.24	35.69%	1950	2.02	52.04%			
790	-1.05	35.59%	1970	1.9	52.8%			
800	-0.81	33.29%	1990	1.71	49.54%			
			2010	1.67	48.1%			
			2030	1.39	47.41%			
			2050	1.27	47.75%			
			2070	1.36	47.35%			
			2090	1.13	45.69%			
			2110	1.37	44.2%			
			2130	1.46	45.19%			
			2150	1.47	43.76%			
			2170	1.61	44.27%			
			2190	0.8	37.18%			
			2210	0.71	34.25%			

Test Result – Passive（主天线RF3）

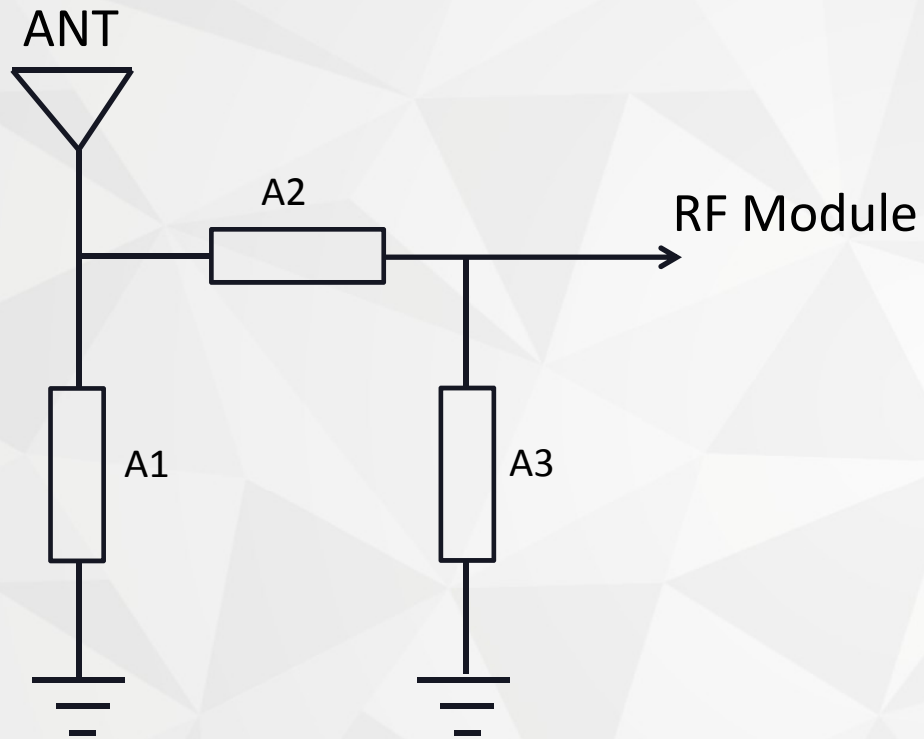
Freq. (MHz)	Gain (dBi)	Eff.
810	0.41	41.22%
820	0.5	46.14%
830	0.8	49.57%
840	0.81	50.08%
850	0.44	47.78%
860	0.05	45.84%
870	-0.09	45.42%
880	0.14	46.33%
890	0.15	40.61%
900	0.1	36.61%

Test Result – Active（主天线）

Mode	Channel	TRP	Channel	TIS
B2	18650	20.44	650	-94.19
	18900	20.83	900	-94.51
	19150	21.01	1150	-95.53
B4	20000	21.24	2000	-94.65
	20175	20.49	2175	-93.82
	20350	20.62	2350	-94.68
B5	20450	20.69	2450	-96.04
	20525	20.61	2525	-95.47
	20600	21.02	2600	-95.77
B12	23035	18.07	5035	-93.77
	23095	18.54	5095	-94.14
	23155	18.77	5155	-94.75

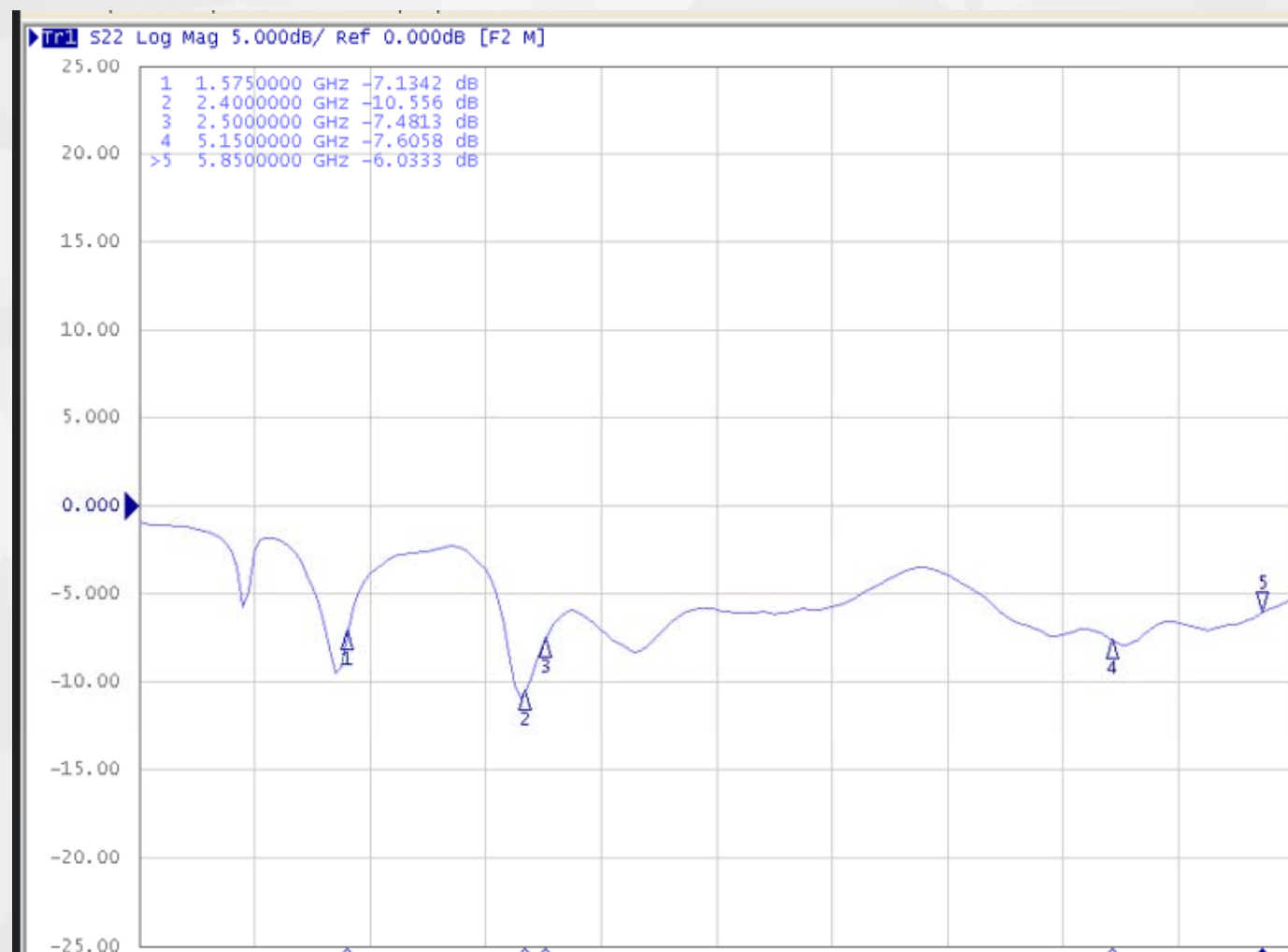
Mode	Channel	TRP	Channel	TIS
B13	23205	19.09	5205	-95.25
	23230	18.72	5230	-94.99
	23255	18.44	5255	-95.16
B14	23330	18.7	5330	-93.78
B26	26715	18.24	8715	-95.81
	26865	19.01	8865	-96.7
	27015	19.14	9015	-95.85
B66	132022	20.58	66486	-94.22
	132322	20.34	66786	-95.07
	132622	20.37	67086	-94.24
B41	40340	9.83	40340	-90.49
	40740	8.73	40740	-88.17
	41140	9.62	41140	-90.13
B71	133172	11.79	68636	-88.51
	133297	12.78	68761	-86.2
	133422	13.61	68886	-87.95

Matching Circuit (三合一天线)



A1	/
A2	0ohm
A3	/

S11 (三合一天线)



Test Result – Passive（三合一天线）

Freq. (MHz)	Gain (dBi)	Eff.
1560	0.77	42.54%
1565	0.66	41.36%
1570	0.46	41.61%
1575	0.52	40.7%
1580	0.59	40.8%
1585	0.6	38.81%
1590	0.47	38.46%
1595	0.4	37.99%
1600	0.72	41.96%
1605	0.6	41.13%

Freq. (MHz)	Gain (dBi)	Eff.
2400	1.36	39.02%
2410	1.84	41%
2420	2.09	41.59%
2430	2.24	41.64%
2440	2.45	43.43%
2450	2.4	41.82%
2460	2.46	40.7%
2470	2.67	41.68%
2480	2.61	40.34%
2490	2.59	38.65%
2500	2.57	37.64%

Freq. (MHz)	Gain (dBi)	Eff.
5150	0.49	31.99%
5200	0.96	36.33%
5250	0.95	38.05%
5300	0.47	35.5%
5350	0.31	33.84%
5400	0.92	36.07%
5450	0.39	32.82%
5500	0	33.89%
5550	0.04	33.88%
5600	-0.46	31.63%
5650	0.24	32.98%
5700	0.65	34.67%
5750	0.57	34.01%
5800	-0.52	29.82%
5850	-1.36	24.14%

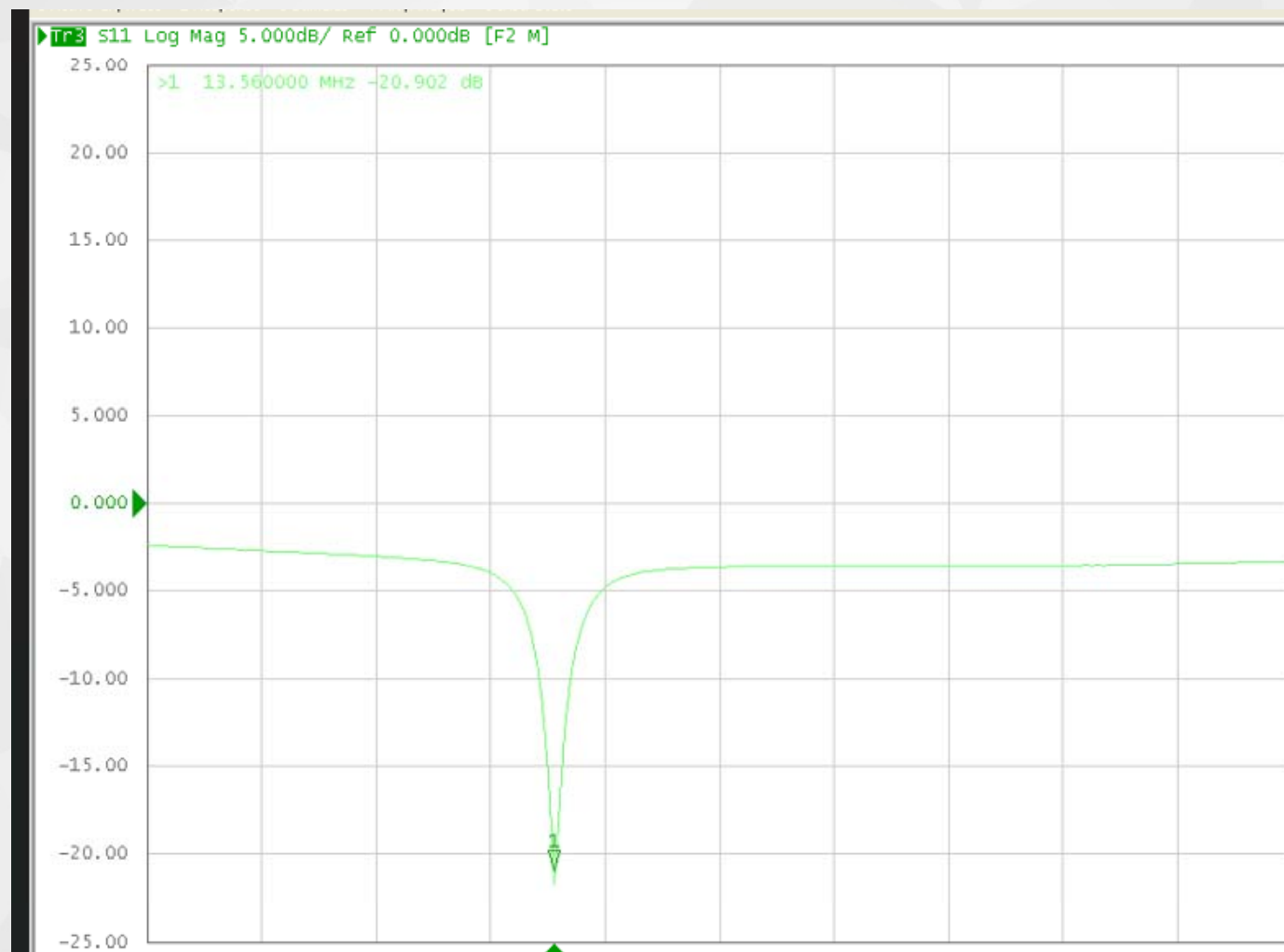
OTA（三合一天线）

	信道	TRP(11M)	TIS(11M)
11b	1	11.63	-81.39
	6	12.18	-82.36
	11	12.06	-70.51
	信道	TRP(6M)	TIS(54M)
11a	36	13.01	-69.61
	64	12.96	-69.6
	165	12.37	-67.78

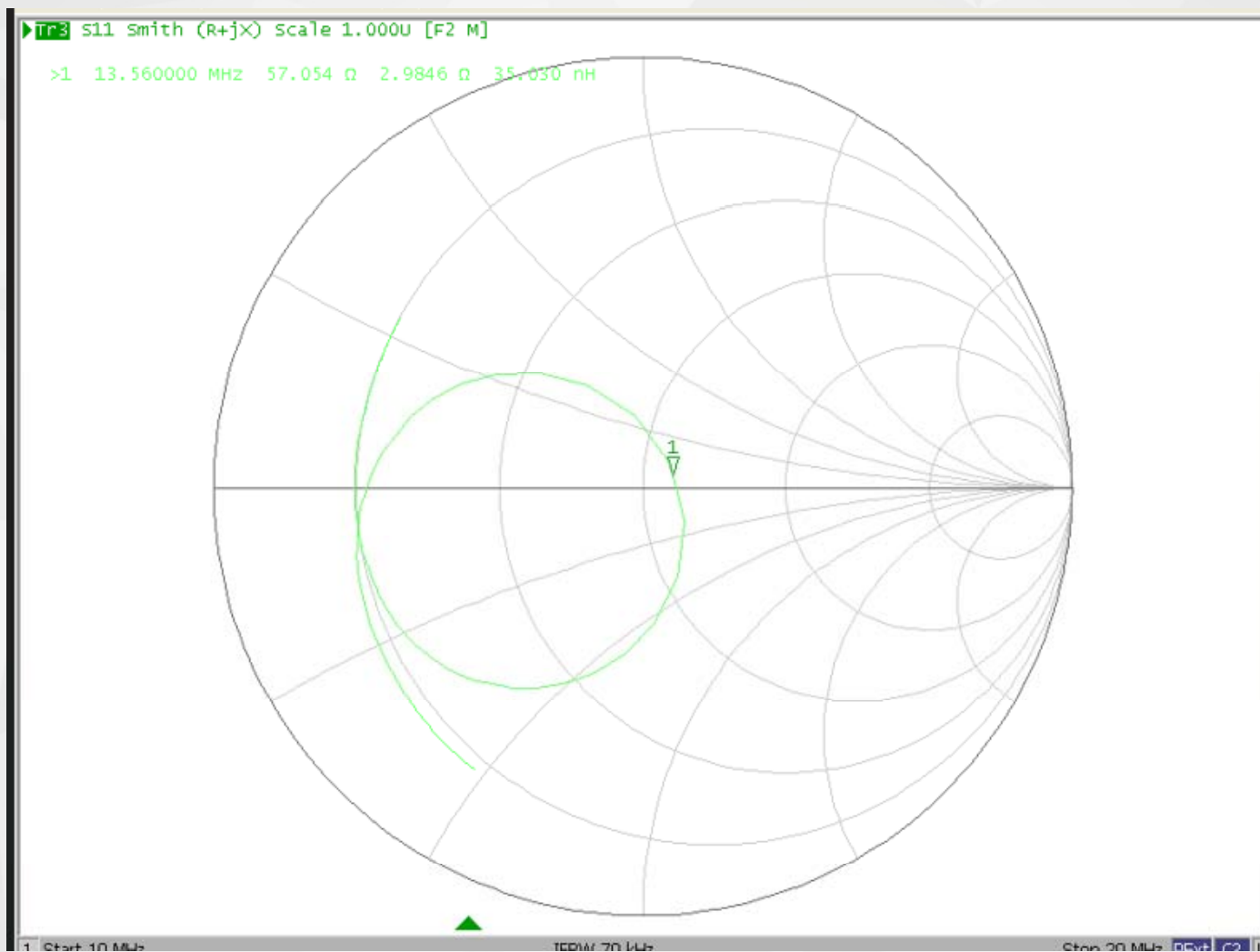
OTA（三合一天线）

	频率（MHz）	TIS
GPS	1575	-146.73

S11 (NFC天线)



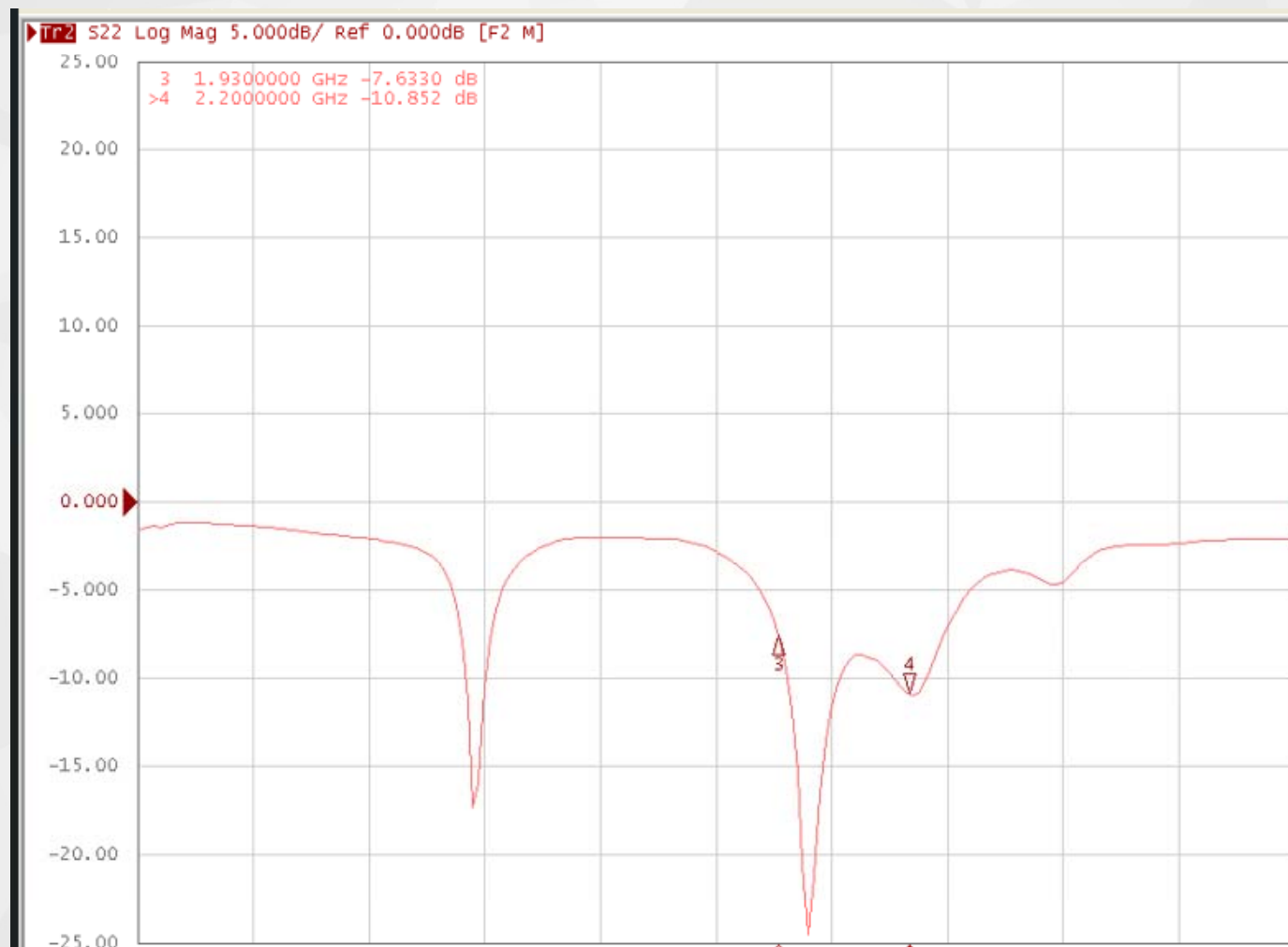
Smith (NFC天线)



匹配（NFC天线）

位号	BOM值	调试值
L1402	160nH	160nH
L1401	160nH	160nH
C1407	NC	NC
C1422	NC	NC
C1414	680pF	680pF
C1403	680pF	680pF
C1424	NC	1.5pF
C1421	NC	1.5pF
C1423	68pF	56pF
C1404	68pF	56pF
C1427	NC	47pF
C1425	NC	47pF
C1410	82pF	100pF
C1415	82pF	100pF
R1411	0R	0R
R1419	0R	0R
C1411	100pF	100pF
C1419	100pF	100pF
R1403	560R	560R
R1413	560R	560R
R1417	NC	NC
R1402	NC	NC

S11 (分集天线)



Test Result – Passive（分集天线）

Freq. (MHz)	Gain (dBi)	Eff.
1930	-1.1	22.08%
1950	-0.69	25.52%
1970	-0.7	28.14%
1990	-0.9	26.35%
2010	-0.53	27.33%
2030	-0.12	29.2%
2050	0.17	30.27%
2070	0.11	30.18%
2090	-0.27	31.72%
2110	-0.75	30.04%
2130	-0.56	27.51%
2150	-0.52	27.18%
2170	-0.43	27.3%
2190	-0.34	27.47%
2200	-0.57	26.31%