

Antenna Testing Report

Customer : sanggeer

Project Name : kp1-11

Report version: Jun. 22th, 2026 A0

Author: liuyi

Version	Report date	Remark
A0	2026.06.22	Preliminary Commissioning Report
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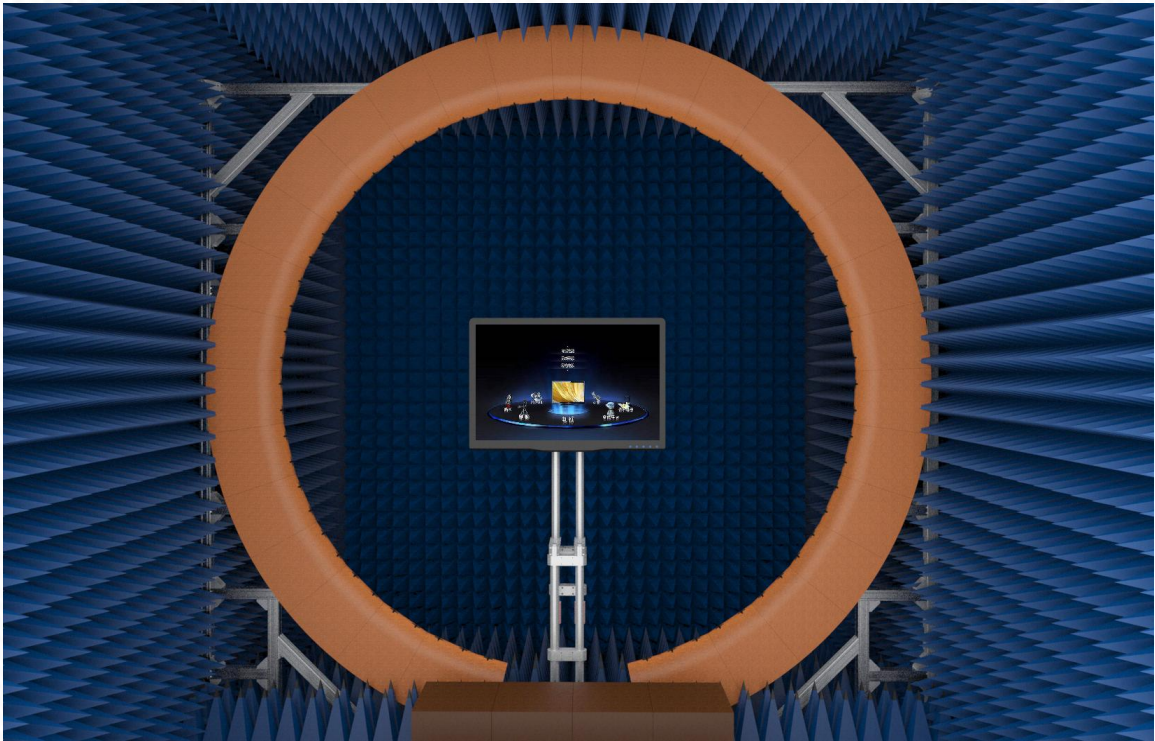
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Prototype status	Debugging machine
Device type	tablet
Number of antennas	wifi antenna
Frequency band	
	wifi2.4/5.8
Structural style	FPC+cable
Environment adjustment	change
Matching modification	No change



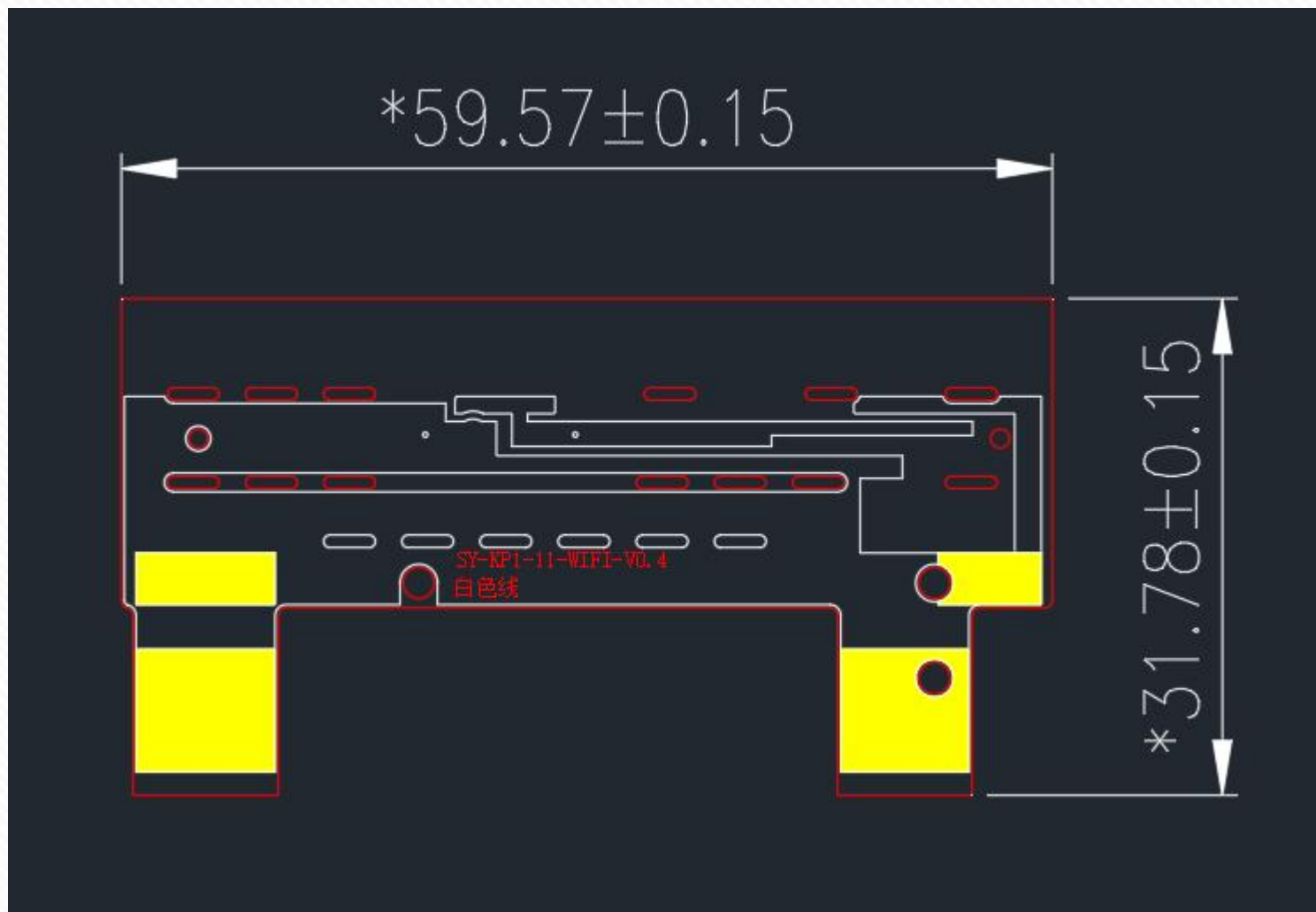
The industry's top 64 sensors OTA chamber

Frequency range: 400MHz-11GHz

Device Llimitation: 2M

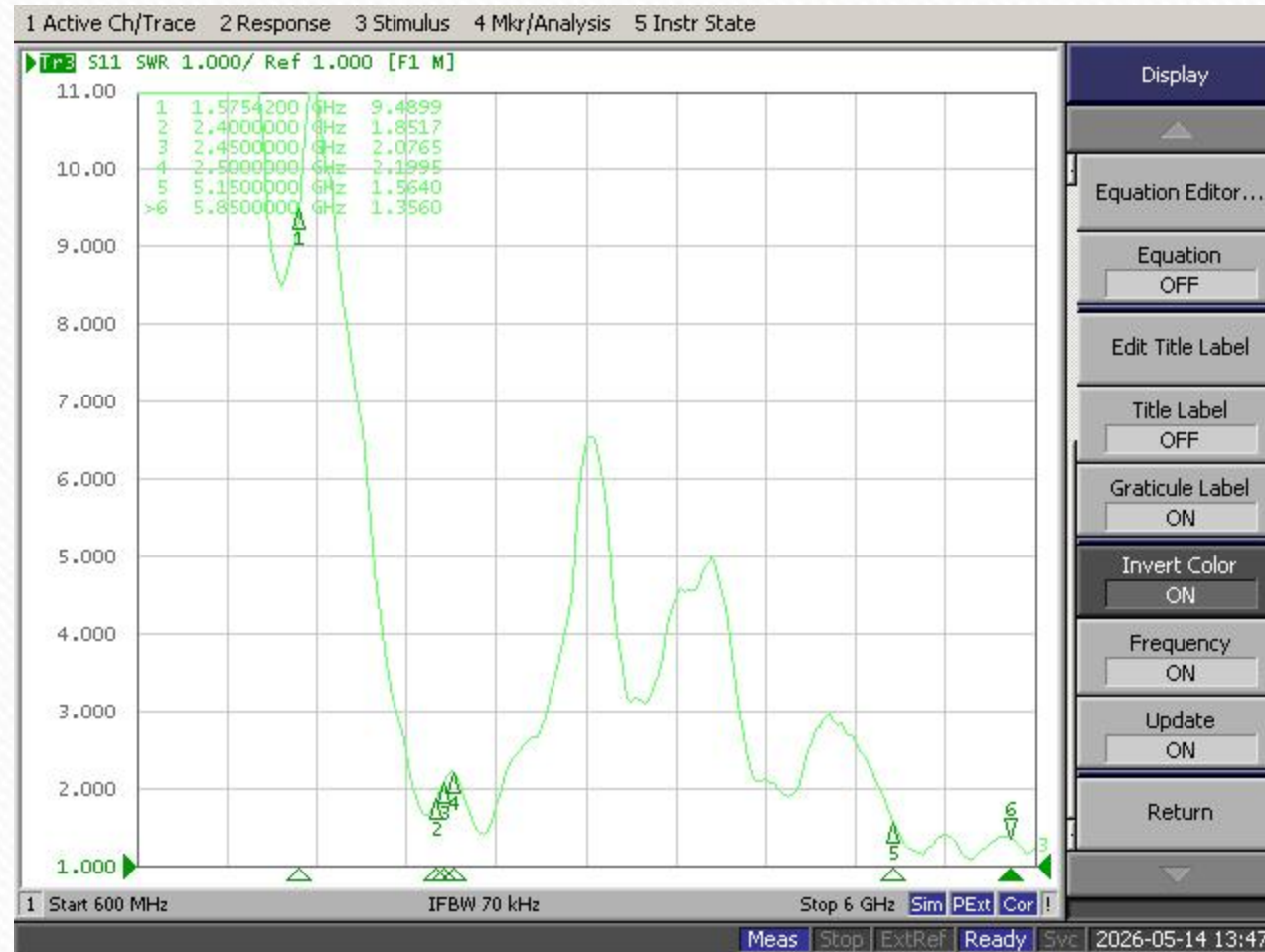
Load-bearing limitation:100KG

Equipments Items	Total Quantity	Quantity for Shanghai R&D	Quantity for Shenzhen R&D	Quantity for ChongQing R&D
OTA chamber	10	4	5	1
5G Tester (SP9500-CTS)	3	1	1	1
R&S Tester (high configuration CMW500)	6	3	2	1
Japan Anritsu Tester (Dual Channel 8820)	4	2	2	--
NB-IoT Tester (SP8315)	3	1	1	1
Agilent Tester (8960)	9	4	4	--
Agilent Network Analyzer (E5062A)	7	3	3	1
Agilent Network Analyzer (E5071C 8.5GHZ)	11	5	5	1
Agilent Network Analyzer (E5071B 8.5GHZ)	7	3	3	1
R&S Network Analyzer (ZND)	9	4	4	1
R&S Network Analyzer (ZVB)	3	1	1	1
OTA head hand / ear hand / arm hand	5	2	2	1
GPS/WIFI active test equipment	5	2	2	1

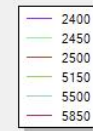
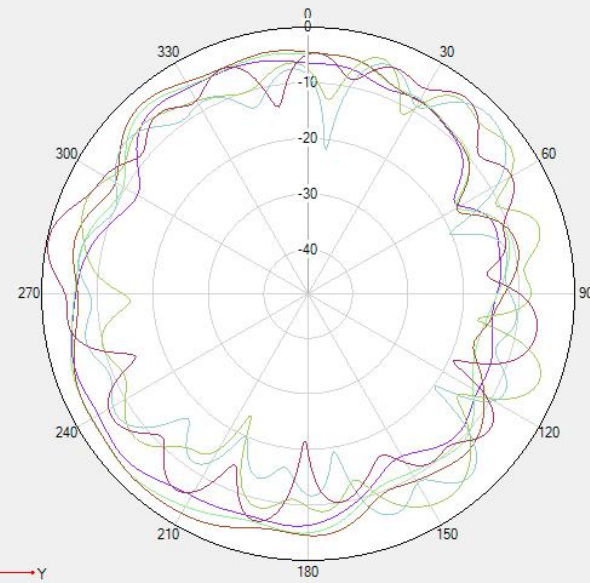
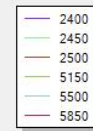
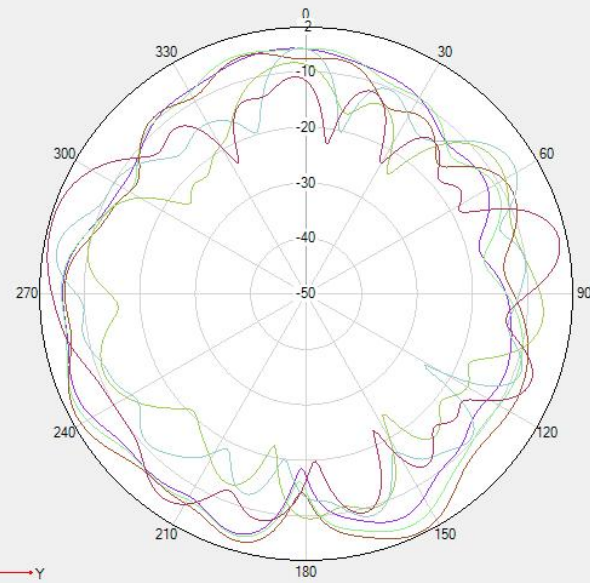
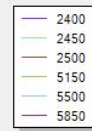
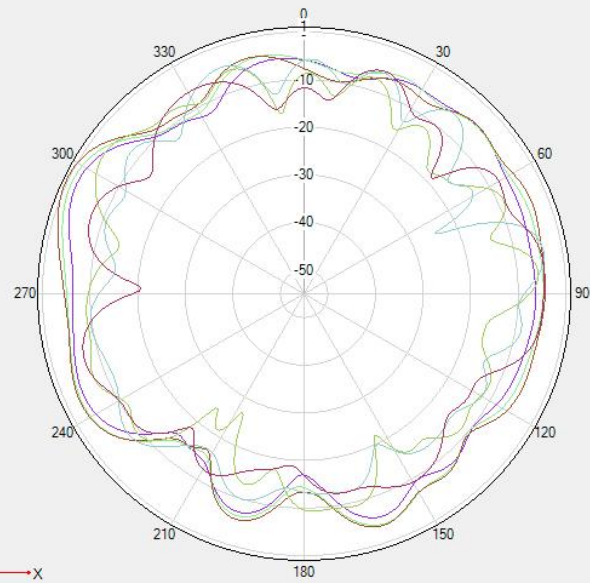


2#				3#				4#			
2.4G	信道	TRP	TIS	2.4G	信道	TRP	TIS	2.4G	信道	TRP	TIS
802.11b 11mbps	1	9.71		802.11b 11mbps	1	9.57		802.11b 11mbps	1	10.12	
	6	10.06			6	10.48			6	10.34	
	11	11.16	-81.38		11	11.06	-81.6		11	11.03	-81.49
5G	信道	TRP	TIS	5G	信道	TRP	TIS	5G	信道	TRP	TIS
802.11a 54mbps	36	11.16		802.11a 54mbps	36	10.84		802.11a 54mbps	36	11.39	
	149	11.34			149	11.11			149	11.34	
	165	11.42	-70.26		165	11.05	-70.57		165	11.26	-70.22

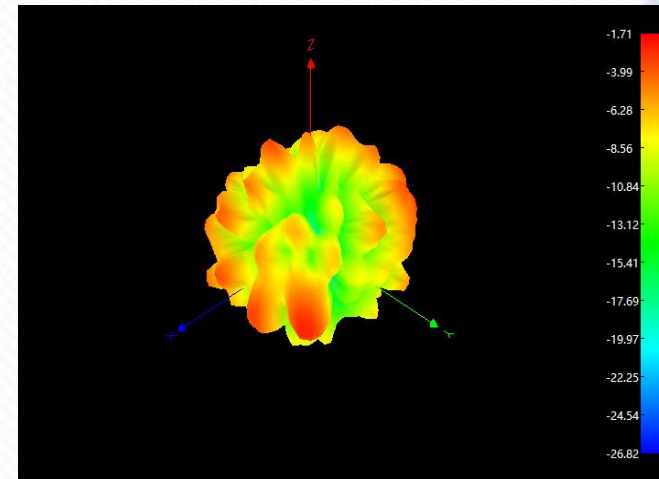
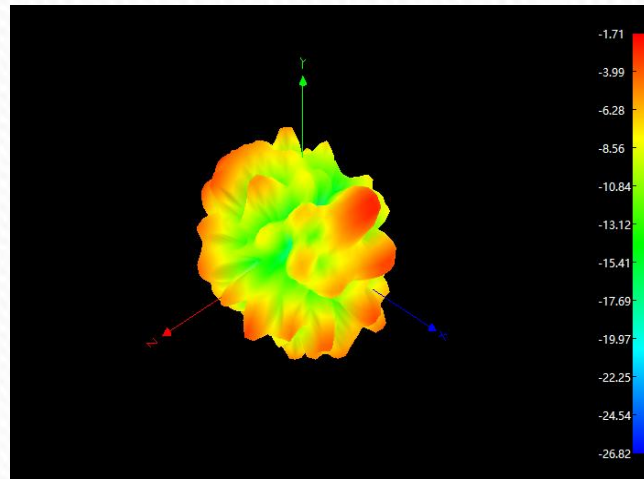
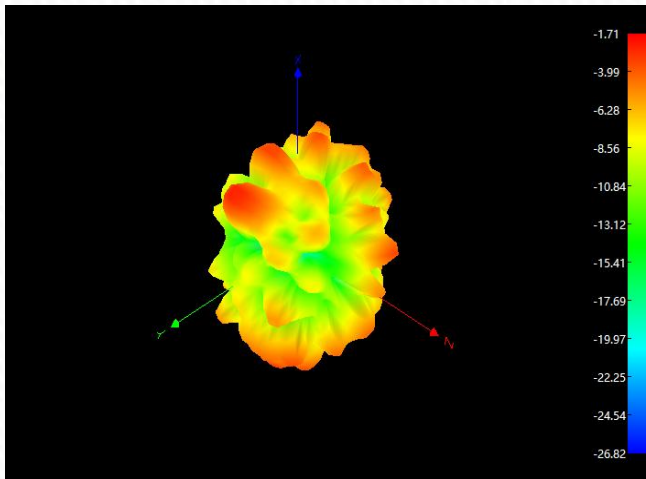
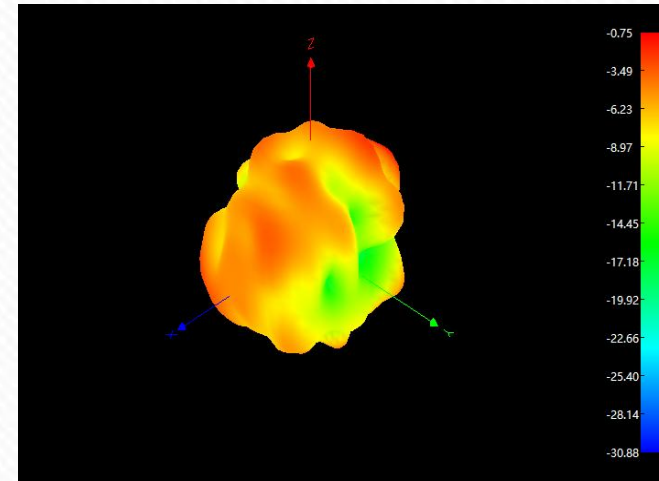
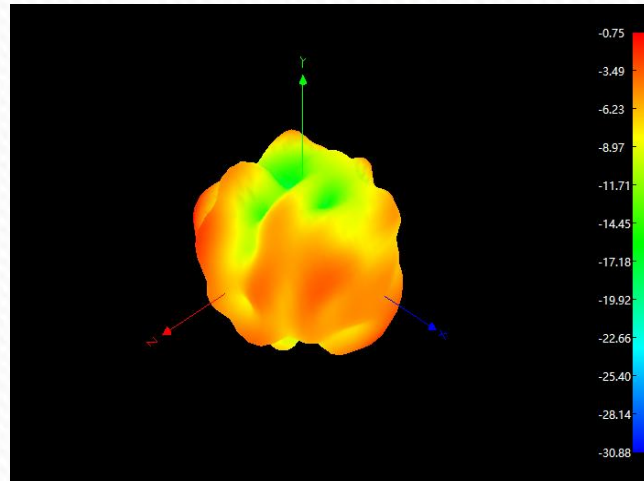
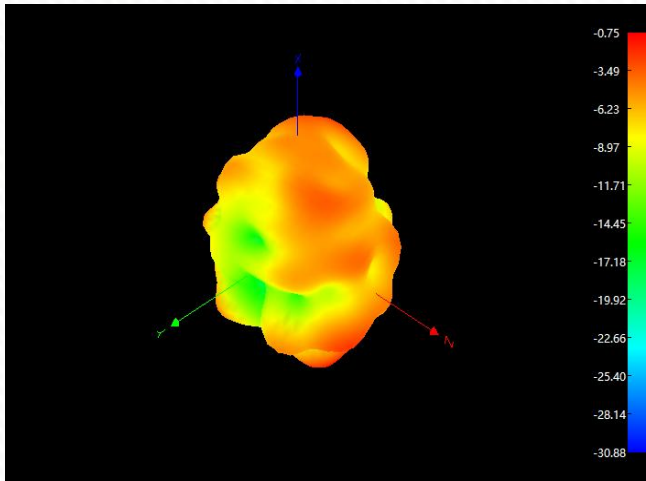
wifi Antenna



2D

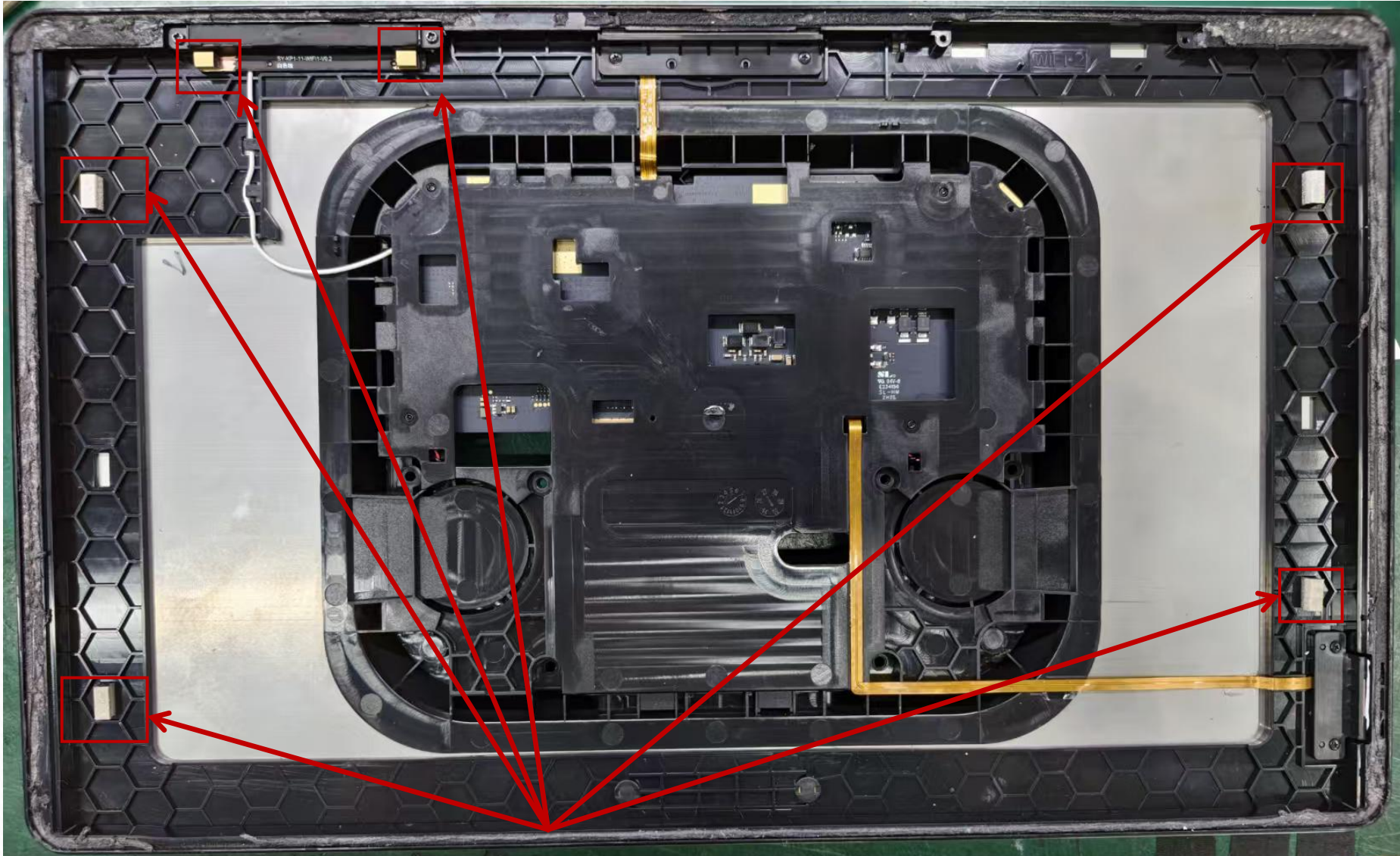


3D



Freq	Effi	Gain
(MHz)	(%)	(dB)
2400	35.92	2.28
2410	38.53	2.17
2420	32.36	1.35
2430	32.27	1.14
2440	31.88	1.41
2450	34.06	1.4
2460	38.82	1.43
2470	36.64	0.57
2480	38.02	1.2
2490	35.81	-0.04
2500	35.65	0.21

Freq	Effi	Gain
(MHz)	(%)	(dB)
5150	29.99	1.82
5200	34.91	3
5250	35.81	3.46
5300	34.67	3.55
5350	33.65	3.06
5400	39.54	3.22
5450	39.08	3.32
5500	32.28	1.93
5550	35.08	1.74
5600	32.81	1.95
5650	32.66	2.12
5700	27.8	0.61
5750	24.55	0.96
5800	30.34	2.44
5850	29.99	2.21



Six areas in the diagram are covered with conductive foam tape for grounding, while the rest do not require the use of conductive foam tape at this time.

1. The antenna match has not been modified.
2. Enhance environmental handling by applying conductive foam tape to the motherboard and grounding the screen.◦

Thank You

Shanghai R&D Center: 1F, Building 4, No.99, Lane 215, Gaoguang Road, Qingpu District, Shanghai, 201799, PRC

Shenzhen R&D Center: Room 405, Jinke Building, No.8, Qiongyu Road, Nanshan District, Shenzhen, 518057, PRC

ChongQing R&D Center: 1F, ARM Ecological Industrial Park, 19 East Datugu Road, Xiantao, Yubei District, Chongqing, 401120, PRC

Huizhou Factory: F4-6, Building 8, Xiongtao Tech Park, No.15, Qingli 2nd Rd, Huicheng Dist, Huizhou City, 516255, PRC

TEL: 021-60835368 E-mail: sales@sunnyway-iot.com

www.sunnyway-iot.com



Shen Zhen Xing Yuan Chuang Technology Co., Ltd

SPECIFICATION FOR APPROVAL

Customer	Sanggeer	DATE	2026-06-29
CUSTOMER PART NAME	WiFi Antenna	VENDOR PART NAME	WiFi Antenna
SPECIFICATION	penguin 1	SPECIFICATION	penguin 1
CUSTOMER PART NO.		VENDOR PART NO.	
(PRE.) : (CHKED BY): (APPROVED BY) :			

(APPROVAL RESULT) : ☐ Passed ☐ Limited Concession, Q' ty: Revision: Key Test Points: (REMARK):	(APPD):
	DQA(CHKED BY):
	(APPROVED BY) :

Address : Room 610-614, Building C, Ma 'anshan Jinsheng
Fortune Plaza, Ma anshan Community, Shajing
Sub-district, Bao 'an District, Shenzhen City

Tel: 0755-82103639

Fax: 0755-82103639

E--MAIL: stephdeng_Vis@126.com

Website:



Approval Sheet

Customer	Sangar	Data	2026/06/29
Product	WiFi Antenna	Models	penguin 1
P/N	F1686-21LB-158	Customer P/N	
Specifications	Black FPC, MI-113 1st-gen connector black coaxial cable, Length L=158mm		

Vender Approved By		Customer Approved By	
Checked By:		Checked By:	
Approval By:		Approval By:	

Document revision Resume					
Version	Revise The Content	Revused	Approval	Date	Note



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Specification	
1.1 Electrical Properties	
Characteristics	Specifications
Working Band	2.4GWiFi/BT 5GWiFi
Antenna From	PIFA
Impedance	50 Ω
Polarization	Linear
Peak Effi	37%@2.4G 24%@5G 17%@6-7G
Peak Gain	2.5dBi@2.4G; 0.5dBi@5G 0.1dBi@6-7G
1.2 Physical Properties	
Characteristics	Specifications
Operating Temp	-10°C~+60°C
Storage Temp	-10°C~+70°C
Humidity	10~95%RH

Antenna Placement

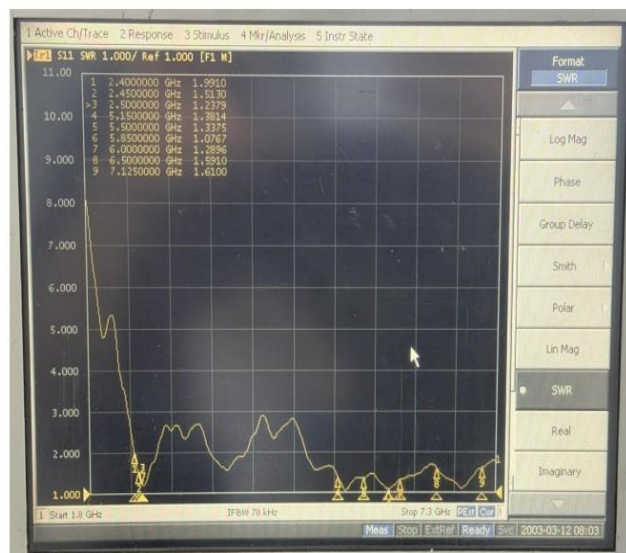


Test Data

Active test data

802.11b	Frequency	TRP		TIS (LCD ON)	
	2412	CH1 11Mbps	14.28	CH1 11Mbps	-73.86
	2437	CH6 11Mbps	13.8	CH6 11Mbps	-75.37
	2467	CH11 11Mbps	14.39	CH11 11Mbps	-76.15
802.11a	TRP		TIS		
	5180	CH36 6Mbps	13.54	CH36 54Mbps	-70.57
	5300	CH60 6Mbps	12.71	CH60 54Mbps	-69.99
	5805	CH161 6Mbps	12.71	CH161 54Mbps	-68.04

S11 Parameter-VSWR



Frequency (MHZ)	2400	2450	2500	5150	5500	5850	6000	6500	7125
VSWR	1.99	1.51	1.23	1.38	1.33	1.07	1.28	1.59	1.61
Return Loss (DB)	-9.61	-13.83	-19.48	-15.93	-16.81	-28.65	-17.96	-12.83	-12.6



Efficiency Table (2.4G/5G)

测试频段	测试频率	Efficiency-DB	Efficiency-%	Gain(dBi)
PASSIVE	2400	-4.46	35.79	2.56
PASSIVE	2410	-4.48	35.68	2.26
PASSIVE	2420	-4.5	35.49	1.98
PASSIVE	2430	-4.5	35.47	1.79
PASSIVE	2440	-4.5	35.49	1.76
PASSIVE	2450	-4.46	35.8	1.97
PASSIVE	2460	-4.46	35.82	2.1
PASSIVE	2470	-4.4	36.34	2.18
PASSIVE	2480	-4.38	36.46	2.14
PASSIVE	2490	-4.32	37.02	2.06
PASSIVE	2500	-4.27	37.4	2.27
PASSIVE	5150	-6.18	24.08	-0.7
PASSIVE	5170	-6.26	23.68	-0.25
PASSIVE	5190	-6.24	23.78	0.22
PASSIVE	5210	-6.21	23.94	0.48
PASSIVE	5230	-6.22	23.86	0.54
PASSIVE	5250	-6.21	23.94	0.53
PASSIVE	5270	-6.18	24.08	0.55
PASSIVE	5290	-6.12	24.42	0.48
PASSIVE	5310	-6.1	24.54	0.25
PASSIVE	5330	-6.14	24.34	-0.04
PASSIVE	5350	-6.31	23.38	-0.42
PASSIVE	5370	-6.43	22.73	-0.46
PASSIVE	5390	-6.5	22.41	-0.27
PASSIVE	5410	-6.5	22.37	-0.21
PASSIVE	5430	-6.49	22.43	-0.13
PASSIVE	5450	-6.52	22.29	-0.13
PASSIVE	5470	-6.59	21.92	-0.21
PASSIVE	5490	-6.8	20.91	-0.5
PASSIVE	5510	-7.08	19.61	-0.96
PASSIVE	5530	-7.37	18.32	-1.13
PASSIVE	5550	-7.36	18.38	-1.05
PASSIVE	5570	-7.37	18.31	-1.04
PASSIVE	5590	-7.35	18.42	-1.03
PASSIVE	5610	-7.36	18.36	-1.14
PASSIVE	5630	-7.3	18.62	-1.18
PASSIVE	5650	-7.29	18.68	-0.63
PASSIVE	5670	-7.35	18.4	-0.66



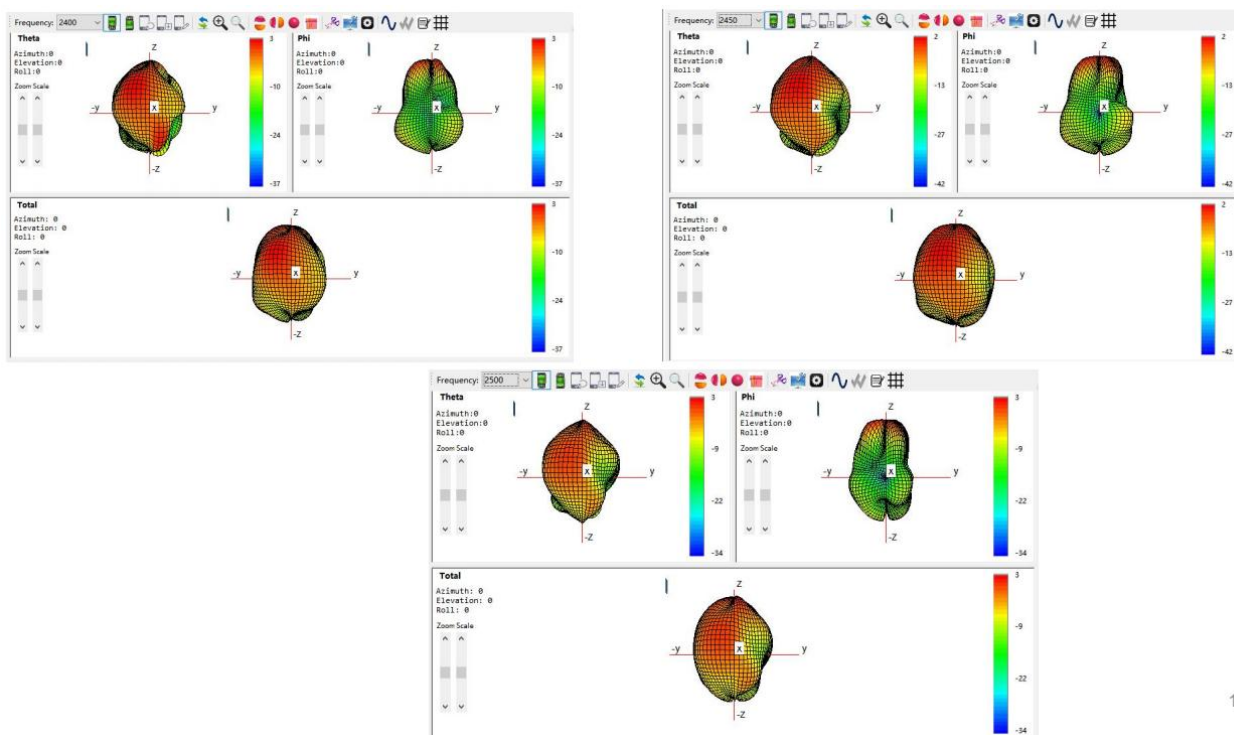
Efficiency Table (6-7G)

测试频段	测试频率	Efficiency-DB	Efficiency-%	Gain(dBi)
PASSIVE	5690	-7.31	18.57	-1.12
PASSIVE	5710	-7.29	18.69	-1.6
PASSIVE	5730	-7.27	18.74	-1.38
PASSIVE	5750	-7.35	18.4	-0.85
PASSIVE	5770	-7.36	18.35	-0.16
PASSIVE	5790	-7.49	17.81	0.27
PASSIVE	5810	-7.54	17.6	0.45
PASSIVE	5830	-7.7	16.99	0.2
PASSIVE	5850	-7.97	15.98	-0.32
PASSIVE	5870	-8.21	15.09	-0.81
PASSIVE	5890	-8.38	14.52	-1.33
PASSIVE	5910	-8.76	13.32	-2.07
PASSIVE	5930	-8.91	12.86	-2.68
PASSIVE	5950	-8.94	12.77	-3.07
PASSIVE	5970	-8.84	13.07	-2.84
PASSIVE	5990	-8.68	13.56	-2.63
PASSIVE	6010	-8.57	13.89	-2.57
PASSIVE	6030	-8.35	14.61	-2.44
PASSIVE	6050	-8.23	15.04	-2.39
PASSIVE	6070	-8.12	15.42	-2.2
PASSIVE	6090	-8.06	15.63	-2.02
PASSIVE	6110	-7.95	16.03	-1.56
PASSIVE	6130	-7.98	15.92	-1.23
PASSIVE	6150	-8.02	15.79	-0.95
PASSIVE	6170	-8.04	15.7	-0.67
PASSIVE	6190	-8.18	15.22	-0.6
PASSIVE	6210	-8.36	14.59	-0.75
PASSIVE	6230	-8.39	14.5	-0.79
PASSIVE	6250	-8.46	14.26	-0.94
PASSIVE	6270	-8.62	13.74	-1.17
PASSIVE	6290	-8.48	14.18	-1.04
PASSIVE	6310	-8.62	13.73	-1.14
PASSIVE	6330	-8.76	13.32	-1.07
PASSIVE	6350	-8.68	13.56	-0.84
PASSIVE	6370	-8.73	13.41	-0.76
PASSIVE	6390	-8.81	13.14	-0.69
PASSIVE	6410	-8.64	13.66	-0.4
PASSIVE	6430	-8.56	13.94	-0.26

Efficiency Table (6-7G)

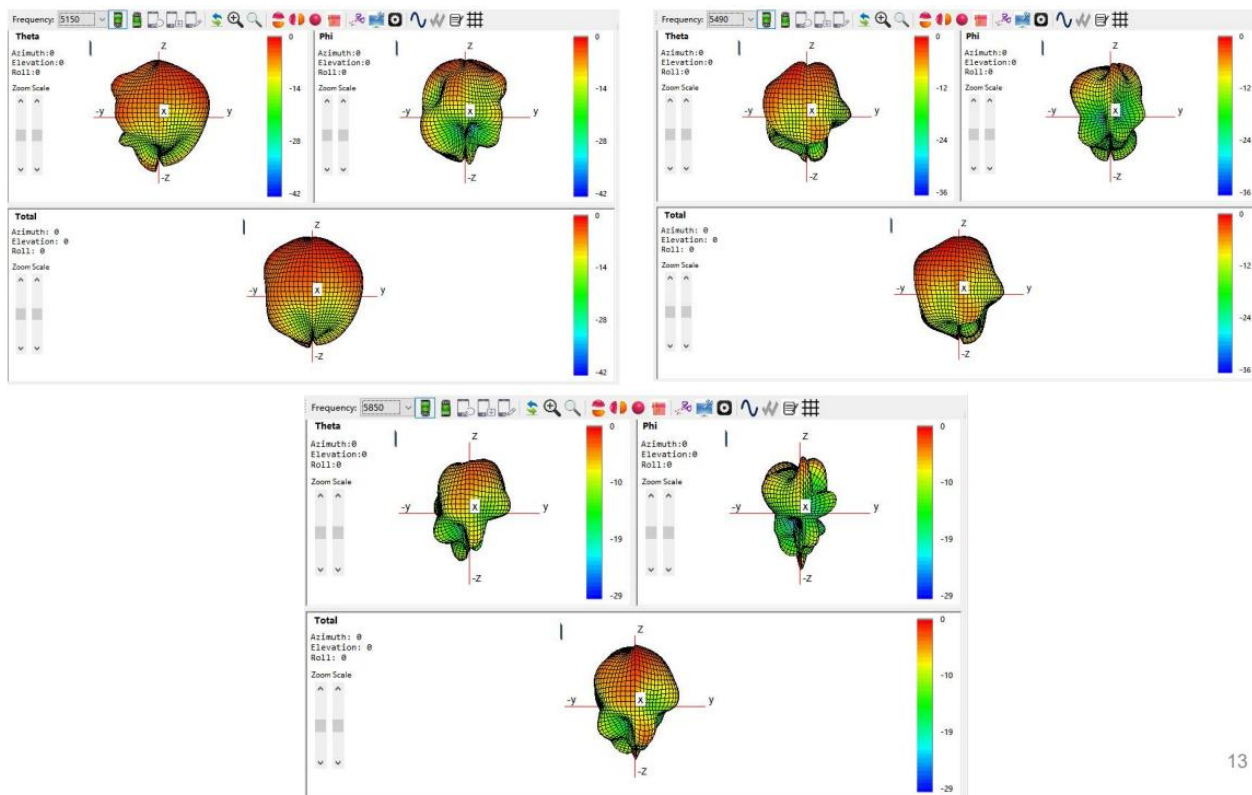
测试频段	测试频率	Efficiency-DB	Efficiency-%	Gain(dBi)
PASSIVE	6450	-8.48	14.18	-0.24
PASSIVE	6470	-8.34	14.67	-0.11
PASSIVE	6490	-8.15	15.31	-0.11
PASSIVE	6510	-7.96	16.01	-0.01
PASSIVE	6530	-7.78	16.69	0.15
PASSIVE	6550	-7.72	16.89	0.19
PASSIVE	6570	-7.74	16.84	0.07
PASSIVE	6590	-7.76	16.75	-0.12
PASSIVE	6610	-7.8	16.59	-0.33
PASSIVE	6630	-7.67	17.1	-0.23
PASSIVE	6650	-7.65	17.2	-0.25
PASSIVE	6670	-7.7	16.97	-0.4
PASSIVE	6690	-7.71	16.93	-0.59
PASSIVE	6710	-7.76	16.75	-0.91
PASSIVE	6730	-7.85	16.42	-1.19
PASSIVE	6750	-7.87	16.35	-1.29
PASSIVE	6770	-7.86	16.37	-1.47
PASSIVE	6790	-7.94	16.07	-1.73
PASSIVE	6810	-7.99	15.88	-2.08
PASSIVE	6830	-8.12	15.42	-2.59
PASSIVE	6850	-8.17	15.25	-2.42
PASSIVE	6870	-8.3	14.79	-2.37
PASSIVE	6890	-8.45	14.29	-2.6
PASSIVE	6910	-8.72	13.44	-3.26
PASSIVE	6930	-8.79	13.22	-3.47
PASSIVE	6950	-8.82	13.11	-3.06
PASSIVE	6970	-8.73	13.41	-2.71
PASSIVE	6990	-8.63	13.71	-2.41
PASSIVE	7010	-8.51	14.09	-2.3
PASSIVE	7030	-8.5	14.12	-2.52
PASSIVE	7050	-8.54	14	-3.06
PASSIVE	7070	-8.54	13.99	-3.29
PASSIVE	7090	-8.49	14.16	-2.94
PASSIVE	7110	-8.43	14.34	-2.58
PASSIVE	7130	-8.42	14.38	-2.45

Radiation Pattern (2.4G)



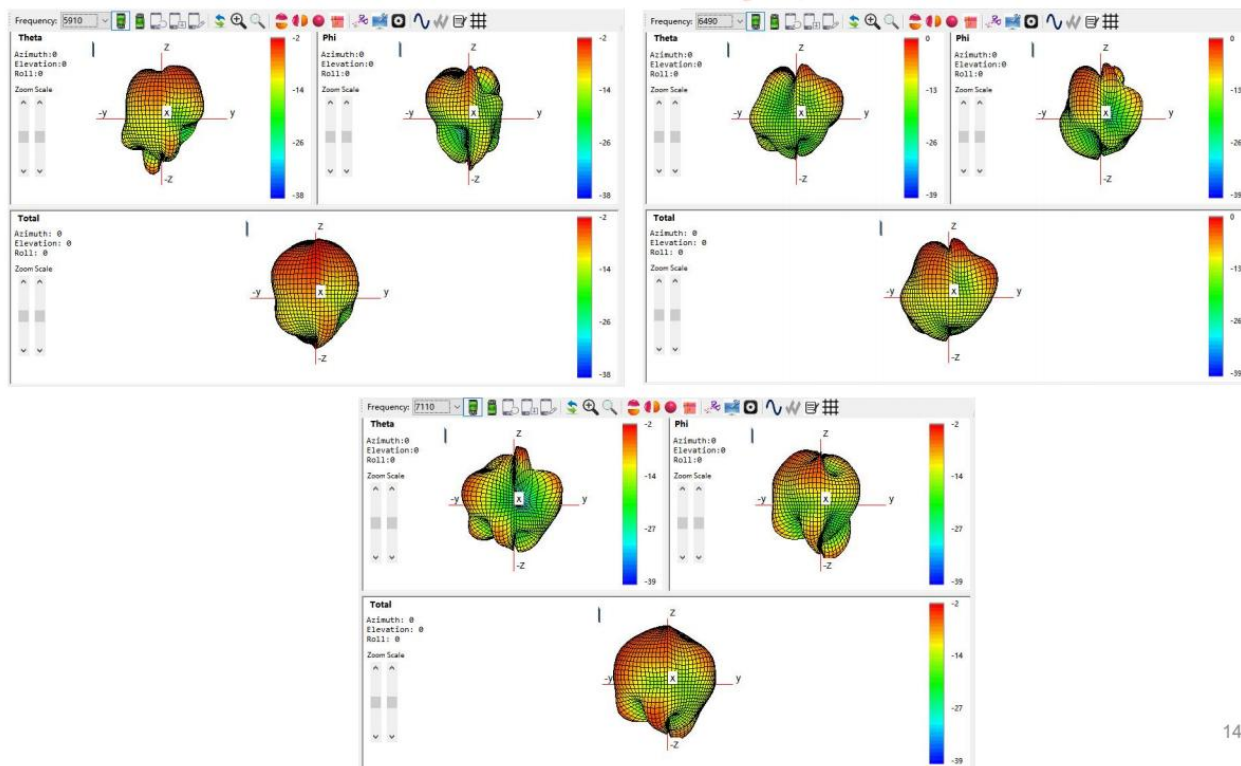
12

Radiation Pattern (5G)

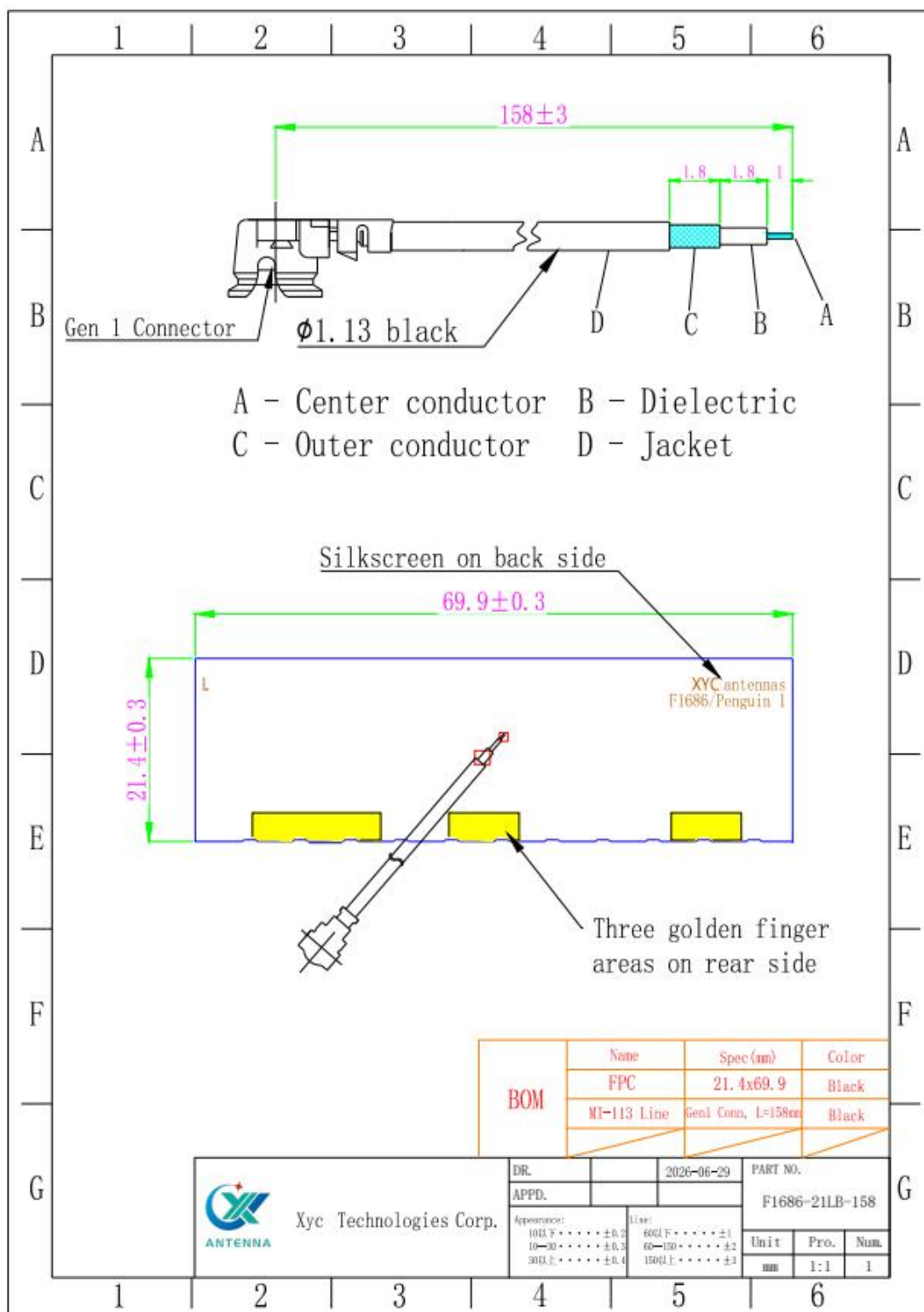


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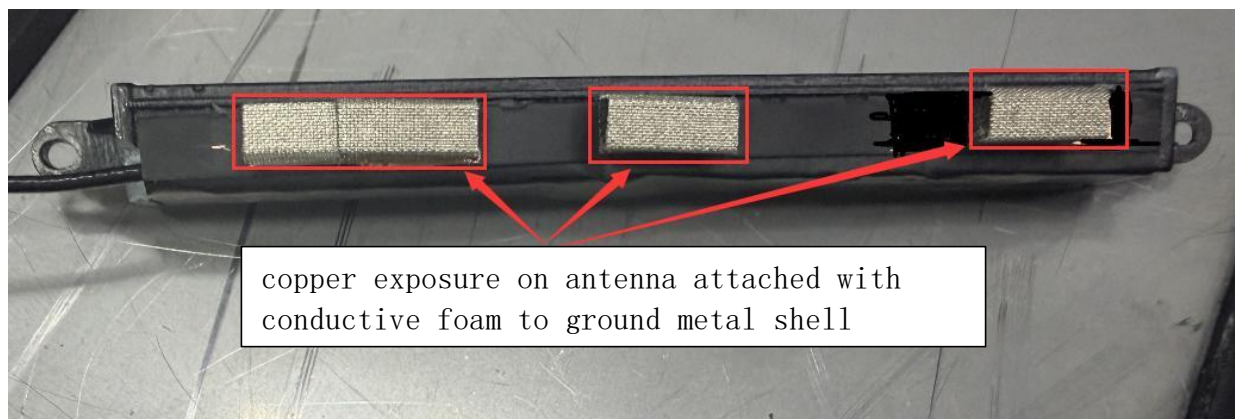
Radiation Pattern (6-7G)



Antenna Assembly



Notes





Inspection Standard

Xyc Technologies Corp.	File Cod.	XYC-WI-PZ-02	Page.
	File Vers.	A0	1 of 1
File Name	Sampling Plan		

Sampling Level Table

Special Check				General			Batch Scope	Sample Word	Sampling	0.65		1.0		1.5		2.5		4.0		6.0	
S-1	S-2	S-3	S-4	I	II	III				AC	RE	AC	RE	AC	RE	AC	RE	AC	RE	AC	RE
A	A	A	A	A	A	B	2--8	A	2	0	1	0	1	0	1	0	1	0	1	0	1
A	A	A	A	A	B	C	9--15	B	3	0	1	0	1	0	1	0	1	0	1	0	1
A	A	B	B	B	C	D	16--25	C	5	0	1	0	1	0	1	0	1	0	1	1	2
A	B	B	C	C	D	E	26--50	D	8	0	1	0	1	0	1	0	1	1	2	1	2
B	B	C	C	C	E	F	51--90	E	13	0	1	0	1	0	1	1	2	1	2	2	3
B	B	C	D	D	F	G	91--150	F	20	0	1	0	1	1	2	1	2	2	3	3	4
B	C	D	E	E	G	H	151--280	G	32	0	1	1	2	1	2	2	3	3	4	5	6
B	C	D	E	F	H	J	281--500	H	50	1	2	1	2	2	3	3	4	5	6	7	8
C	C	E	F	G	J	K	501--1200	J	80	1	2	2	3	3	4	5	6	7	8	10	11
C	D	E	G	H	K	L	1201--3200	K	125	2	3	3	4	5	6	7	8	10	11	14	15
C	D	F	G	J	L	M	3201--10000	L	200	3	4	5	6	7	8	10	11	14	15	21	22
C	D	F	H	K	M	N	10001--35000	M	315	5	6	7	8	10	11	14	15	21	22	21	22
D	E	G	J	L	N	P	35001--150000	N	500	7	8	10	11	14	15	21	22	21	22	21	22
D	E	G	J	M	P	Q	150001--500000	P	800	10	11	14	15	21	22	21	22	21	22	21	22
D	E	H	K	N	Q	R	500001and over	Q	1250	14	15	21	22	21	22	21	22	21	22	21	22
								R	2000	21	22	21	22	21	22	21	22	21	22	21	22

AC-Qualified RE-No Qualified



List Of Raw Materials

Environmental protection parts test report statistical list

The company hereby warrants that all information recorded in and attached to this Environmental Protection Parts Test Report is true and valid. Should any information be untrue (including but not limited to discrepancies between the part number and the original test report), our company shall bear full legal liability for all losses sustained by Jiangxi Sanger Electronics Co., Ltd.

Material name: Main Antennas Supplier part: F1686-21LB-158

Part number : issuer:

fiction: Legal representative:

NO.	Name	Material supplier	Mfr Part Number	Hazardous Substances Concentration in Homogeneous Material(PPM)										HF		Test Lab, organization	Test Report Number	Test Date (YY-MM-DD)	Insert a third party test report
				Cd	Pb	Hg	Cr6+	PBBs	PBDEs	DBP	BBP	DEHP	DIBP	Cl	Br				
				<100	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<900	<900				
1	WIFI Ant	XYC	FPC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Shenzhen Water Testing Technology Co., LTD	WTX25X07182050R1C WTX25X07182051R1C	2025.07.25	 WTX25X07182050R1C ROHS_exp  WTX25X07182051R1C REACH SV
			Rubber backing	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
			Text	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
			Solder shield	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
			Wire rod	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				



Sample Inspection Report

Customer	Sanggeer	Product	WIFI Main Antennas	Quantity shipped	5	Sampling quantity	2	
Models	penguin 1	P/N	F1686-21LB-158	Shipping date	2026/06/29			
Sampling standard	☒ Normal inspection ☐ Tightened inspection ☐ Decrement inspection							
Sampling mode	MIL-STD-105D (II) Single sampling Acceptance limit AQL:CR: 0 Maj: 0.4 Min: 1.5							
Quality acceptance level			CR Acc	0	Maj ACC	0	Min ACC	0
			CR REJ	1	Maj REJ	1	Min REJ	1
project	program of tests	examination requirement	test method	inspection result				decide
				1	2	3	4	
Dimensi onal inspecti on	Line length	158±3	ruler	158	158			OK
	FPC shape	21.4±0.3	calliper	21.3	21.4			OK
	FPC shape	69.9±0.3	calliper	69.9	69.9			OK
project	program of tests	examination requirement	test method	Defect description	CR	Maj	Min	decide
visual inspectio	wire sheath	There is no scratching phenomenon on the outer cover	visual	No abnormality	0	0	0	OK
	Solder pad	No oxidation, tin point and other phenomena	visual	No abnormality	0	0	0	OK
	IPEX	No color difference, shrinkage, oxidation, deformation and other undesirable phenomena	visual	No abnormality	0	0	0	OK
electrical specifica tion								
final judgment	☒ OK ☐ NG							

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Packing Specification

