

Sample Acknowledgment Letter

Customer Name: Lianxun

Project Name: S1-Q06-4G Specification Description Product

Spec: S1-4G Antenna: Length 61.2 mm, Width 13.89 mm

S1-DIV-Z antenna; length 18.5 mm, width 13.05 mm

S1-GWB-Z antenna; length 22.97 mm, width 13.4 mm

Material Number Customer P/N:

_____ edition REV: V1.0

Date: 2026-03-23

Create Drawing	Review Check	 Approved
Tan Qin-hao	Wu Xichun	Jiang Zhenhua

Customer Acknowledges | Customer Approves

Review Check	Approved	Approval

Catalogue

Index

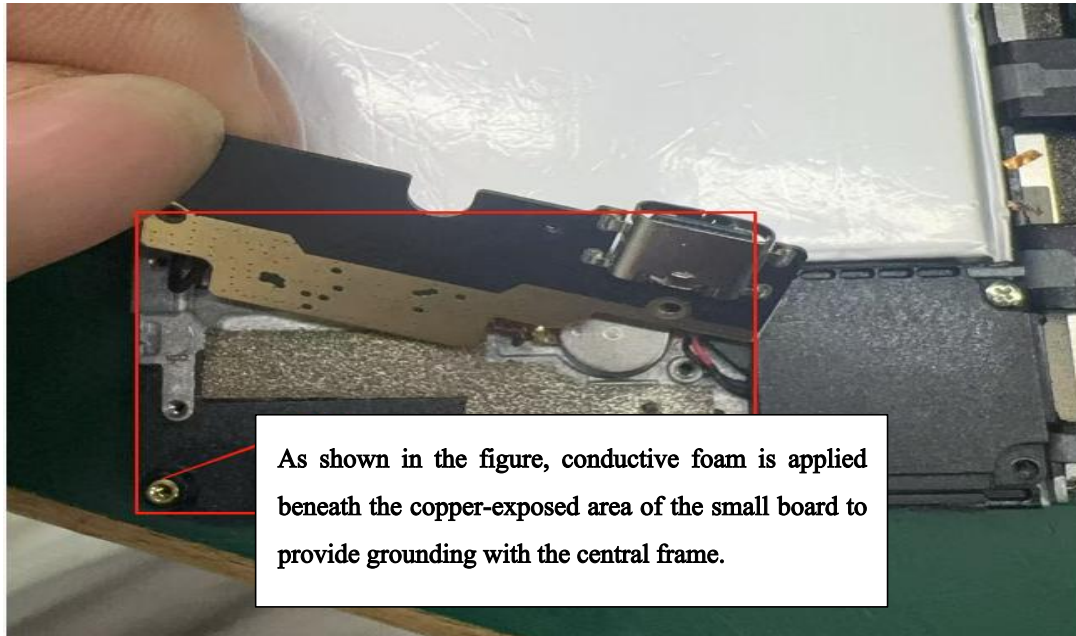
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3. Electrical Performance Index

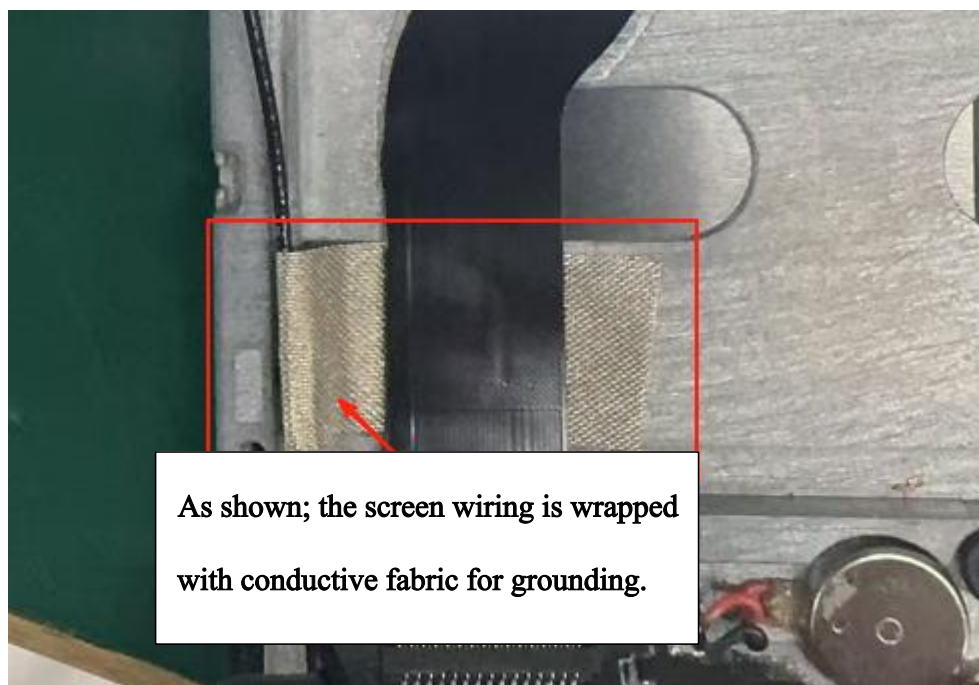
Electrical Performance Specifications		Electrical Specifications	
Frequency range: 800–960 MHz and 1700–2700 MHz		800–960 1700–2700MHz	
Voltage standing-wave ratio	≤ 2.0	VSWR	≤ 2.0
Gain	$\leq ***\text{DBI}$	GAIN	$\leq ***\text{DBI}$
Radiation mode	Omnidirectional	Radiation	OMNI
Polarization Method	Linear polarization	Polarization	LINEAR
Input impedance	50 Ω	Input Impedance	50 Ω
Mechanical Performance Indicators		Mechanical Specifications	
Interface Format	Shrapnel	Input connector	shrapnel
Antenna Material	FPC	Antenna materia	FPC
Working temperature	-30℃~+80℃	Working Temperature	-30℃~+80℃
Working Humidity	40~85%	Working Humidity	40~85%
Picture of real products			

Environmental Treatment

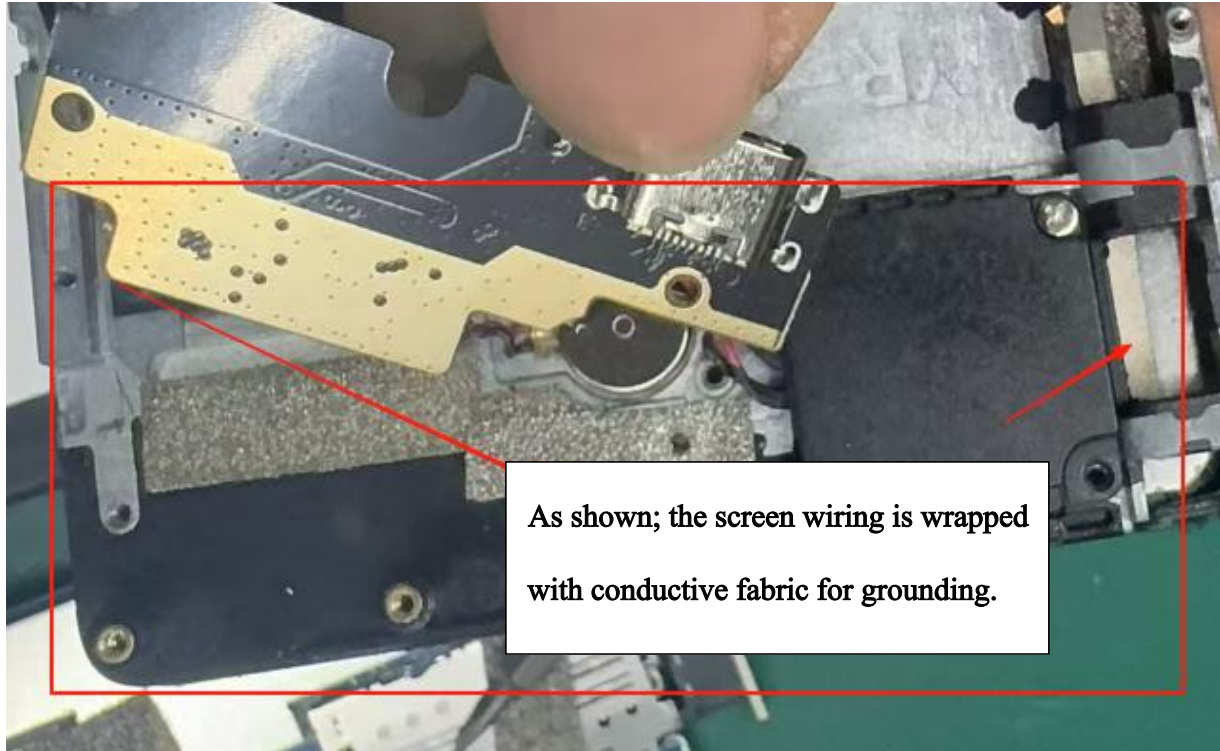
Figure 1



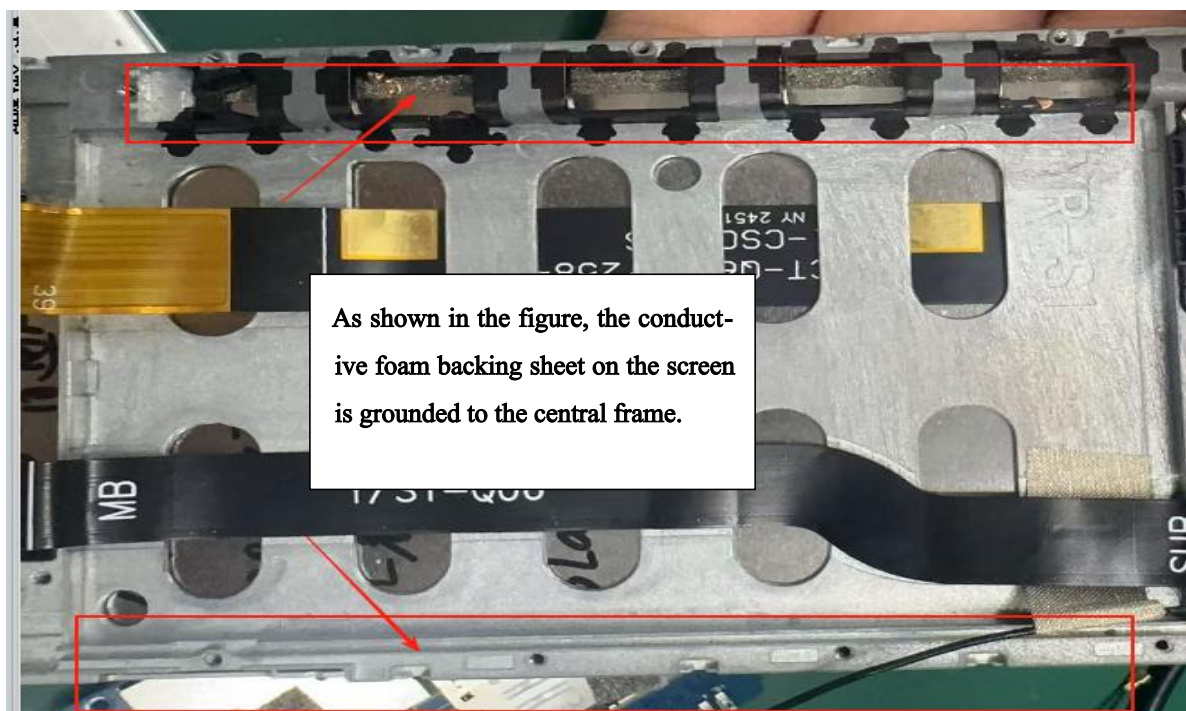
Graph 2



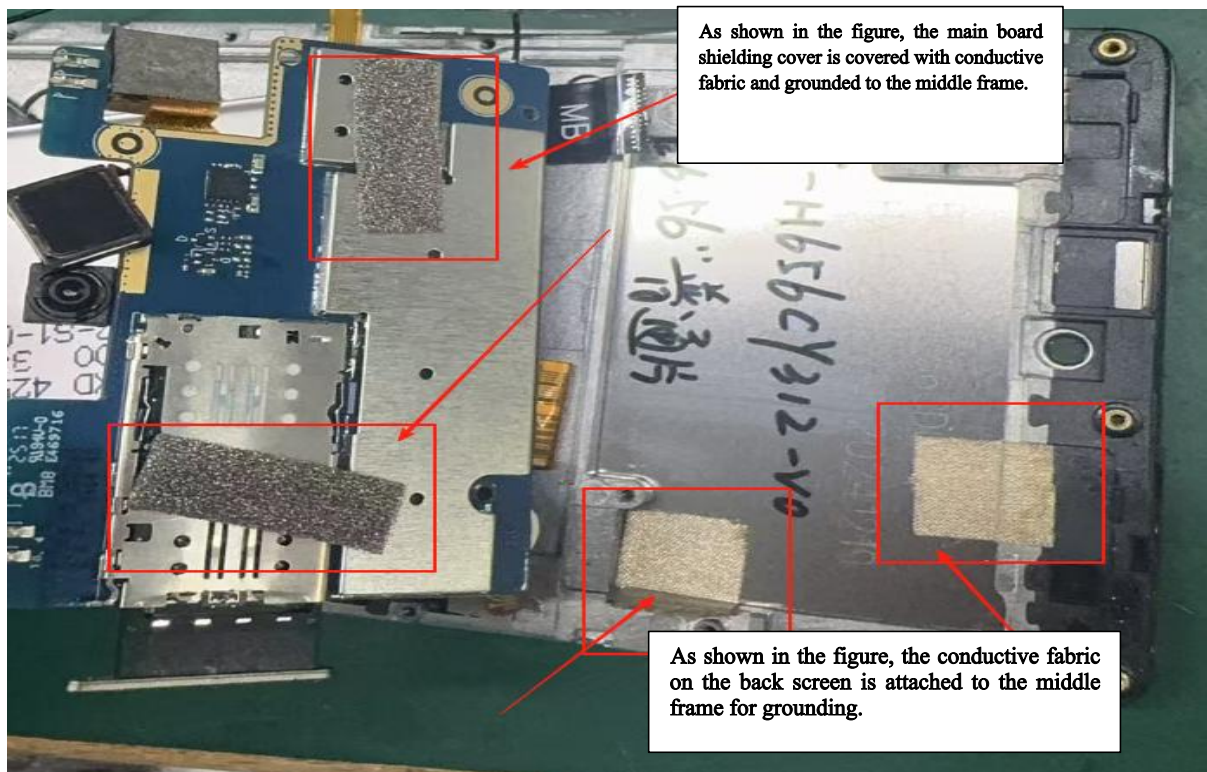
Graph 3



Graph 4



Graph 5



4、Test Report

1. OTA 2G Active Data:

Item	Measurement	Band	Frequency	Total
1	TRP	GSM850	824.2	24.88
2	TRP	GSM850	836.6	25.26
3	TRP	GSM850	848.8	24.48
4	TIS(RSSI)	GSM850	893.8	-100.36
5	TRP	GSM900	890.2	25.36
6	TRP	GSM900	902.4	25.48
7	TRP	GSM900	914.8	25.18
8	TIS(RSSI)	GSM900	959.8	-100.4
9	TRP	DCS1800	1710.2	24.36
10	TRP	DCS1800	1747.6	24.18
11	TRP	DCS1800	1784.8	24.25
12	TIS(RSSI)	DCS1800	1879.8	-100.33
13	TRP	PCS1900	1850.2	23.66
14	TRP	PCS1900	1880	23.58
15	TRP	PCS1900	1909.8	24.26
16	TIS(RSSI)	PCS1900	1989.8	-100.66

1.2 Debug Antenna 3G OTA Data:

1	TRP	WCDMA_B1	1922.4	17.36
2	TRP	WCDMA_B1	1950	17.25
3	TRP	WCDMA_B1	1977.6	16.89
4	TIS(RSSI)	WCDMA_B1	2167.6	-100.36
5	TRP	WCDMA_B2	1852.4	17.22
6	TRP	WCDMA_B2	1880	17.39
7	TRP	WCDMA_B2	1907.6	17.71
8	TIS(RSSI)	WCDMA_B2	1987.6	-99.89
9	TRP	WCDMA_B4	1712.4	17.36
10	TRP	WCDMA_B4	1732.6	17.44
11	TRP	WCDMA_B4	1752.6	17.36
12	TIS(RSSI)	WCDMA_B4	2152.6	-100.82
13	TRP	WCDMA_B5	826.4	15.36
14	TRP	WCDMA_B5	836.6	15.89
15	TRP	WCDMA_B5	846.6	15.28
16	TIS(RSSI)	WCDMA_B5	891.6	-99.8
17	TRP	WCDMA_B8	882.4	15.22
18	TRP	WCDMA_B8	897.4	15.78
19	TRP	WCDMA_B8	912.6	15.83
20	TIS(RSSI)	WCDMA_B8	957.6	-100.92

1.3 Debugging Antenna 4G OTA Data:

Item	Measurement	Band	Frequency	Total
1	TRP	FDD_B1(10MHz)	1925	17.55
2	TRP	FDD_B1(10MHz)	1950	16.36
3	TRP	FDD_B1(10MHz)	1975	16.44
4	TIS(RSSI)	FDD_B1(10MHz)	2165	-90.26
5	TRP	FDD_B2(10MHz)	1855	16.48
6	TRP	FDD_B2(10MHz)	1880	17.57
7	TRP	FDD_B2(10MHz)	1905	17.66
8	TIS(RSSI)	FDD_B2(10MHz)	1985	-88.26
9	TRP	FDD_B3(10MHz)	1715	17.22
10	TRP	FDD_B3(10MHz)	1747.5	17.36
11	TRP	FDD_B3(10MHz)	1780	18.36
12	TIS(RSSI)	FDD_B3(10MHz)	1875	-88.26
13	TRP	FDD_B4(10MHz)	1715	17.44
14	TRP	FDD_B4(10MHz)	1732.5	17.26
15	TRP	FDD_B4(10MHz)	1750	17.33
16	TIS(RSSI)	FDD_B4(10MHz)	2150	-87.98
17	TRP	FDD_B5(10MHz)	829	15.36
18	TRP	FDD_B5(10MHz)	836.5	14.98
19	TRP	FDD_B5(10MHz)	844	15.44
20	TIS(RSSI)	FDD_B5(10MHz)	889	-85.36
21	TRP	FDD_B7(10MHz)	2505	16.21
22	TRP	FDD_B7(10MHz)	2535	16.38
23	TRP	FDD_B7(10MHz)	2565	16.48
24	TIS(RSSI)	FDD_B7(10MHz)	2685	-88.66
25	TRP	FDD_B8(10MHz)	885	15.85
26	TRP	FDD_B8(10MHz)	897.5	15.66
27	TRP	FDD_B8(10MHz)	910	15.72
28	TIS(RSSI)	FDD_B8(10MHz)	955	-85.69

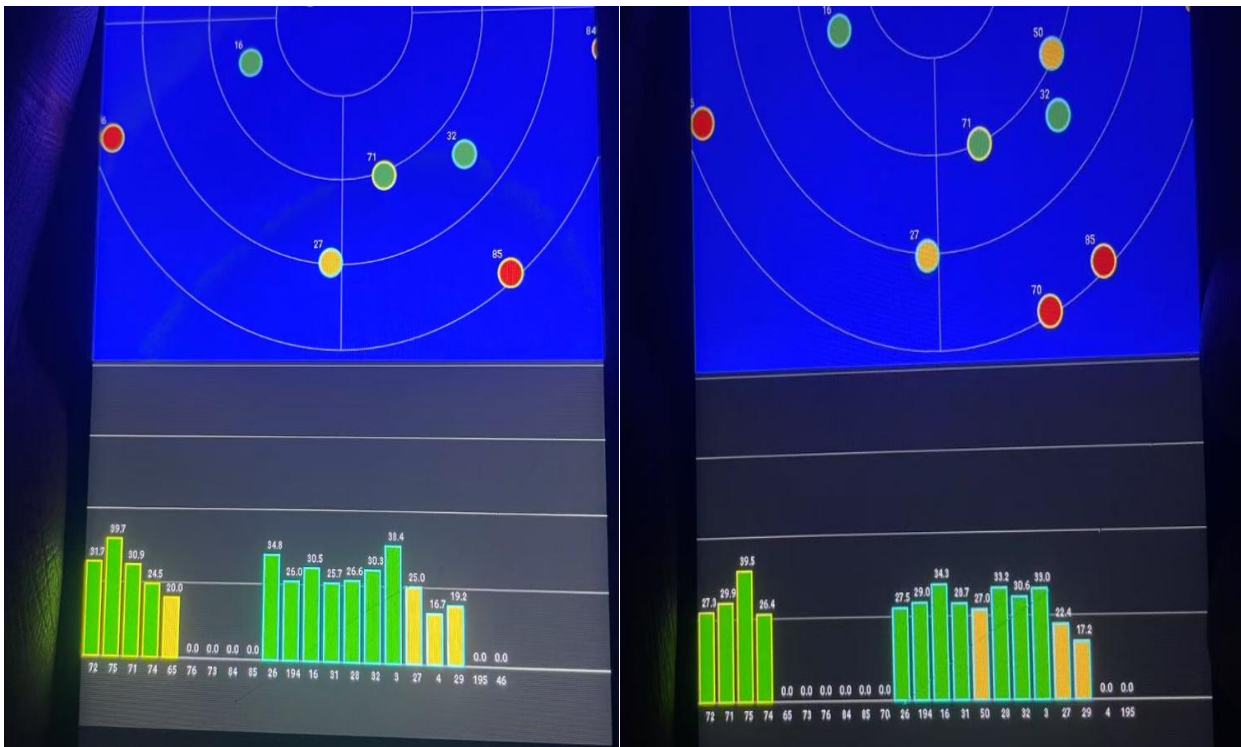
29	TRP	FDD_B12(10MHz)	704	14.36
30	TRP	FDD_B12(10MHz)	707.5	14.58
31	TRP	FDD_B12(10MHz)	711	14.36
32	TIS(RSSI)	FDD_B12(10MHz)	741	-84.89
33	TRP	FDD_B17(10MHz)	709	14.65
34	TRP	FDD_B17(10MHz)	710	14.18
35	TRP	FDD_B17(10MHz)	711	14.03
36	TIS(RSSI)	FDD_B17(10MHz)	741	-85.18
37	TRP	FDD_B20(10MHz)	837	14.99
38	TRP	FDD_B20(10MHz)	847	15.15
39	TRP	FDD_B20(10MHz)	857	15.35
40	TIS(RSSI)	FDD_B20(10MHz)	816	-86.26
41	TRP	FDD_B25(10MHz)	1855	17.36
42	TRP	FDD_B25(10MHz)	1882.5	17.58
43	TRP	FDD_B25(10MHz)	1910	17.88
44	TIS(RSSI)	FDD_B25(10MHz)	1990	-87.88
45	TRP	FDD_B26(10MHz)	819	14.41
46	TRP	FDD_B26(10MHz)	831.5	14.4
47	TRP	FDD_B26(10MHz)	844	14.45
48	TIS(RSSI)	FDD_B26(10MHz)	889	-85.34
49	TRP	FDD_B28(10MHz)	708	14.12
50	TRP	FDD_B28(10MHz)	718	14.18
51	TRP	FDD_B28(10MHz)	728	14.59
52	TIS(RSSI)	FDD_B28(10MHz)	783	-85.11
53	TRP	FDD_B28(10MHz)	723	14.69
54	TRP	FDD_B28(10MHz)	733	14.88
55	TRP	FDD_B28(10MHz)	743	14.93
56	TIS(RSSI)	FDD_B28(10MHz)	798	-84.83

5、Test Report

1. OTA WIFI Active Data:

Item	Measurement	Standard	Band	Channel	Total
1	TRP	WIFI (AP)	WIFI_B (11M)	1	11.36
2	TRP	WIFI (AP)	WIFI_B (11M)	6	11.93
3	TRP	WIFI (AP)	WIFI_B (11M)	11	11.55
4	TIS(EIRP)	WIFI (AP)	WIFI_B (11M)	11	-80.39
5	TRP	WIFI (AP)	WIFI_A (54M)	36	9.36
6	TRP	WIFI (AP)	WIFI_A (54M)	100	9.48
7	TRP	WIFI (AP)	WIFI_A (54M)	165	8.57
8	TIS(EIRP)	WIFI (AP)	WIFI_A (54M)	165	-70.69

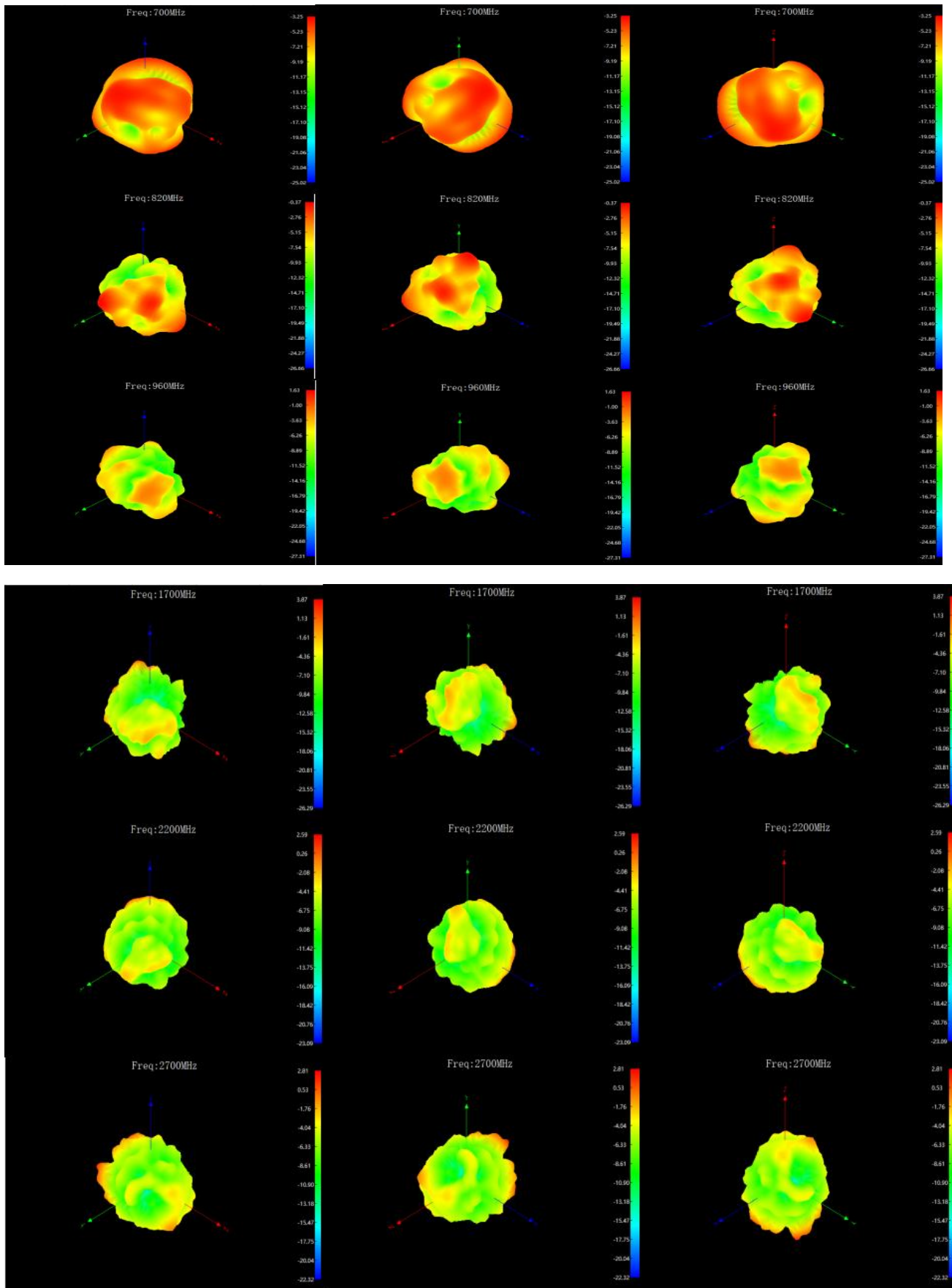
Real-world GPS cold-start performance: positioning within 55 seconds; hot-start performance: within 20 seconds, with the highest CN value reaching 39.7.



6、Passive Data

Passive Data			Passive Data		
Frequency/Mhz	Efficiency / %	MaxGain/dBi	Frequency/Mhz	Efficiency / %	MaxGain/dBi
700	16.67	0.65	1700	27.54	0.87
710	15.19	0.59	1750	24.55	0.37
720	15.75	0.45	1800	24.1	0.76
730	16.16	0.44	1850	24.55	0.83
740	18.27	0.36	1900	26.24	0.46
750	18.89	0.48	1950	30.97	0.7
760	16.82	0.55	2000	30.13	0.88
770	17.59	0.68	2050	30.83	0.73
780	16.09	0.55	2100	26.42	0.84
790	15.28	0.48	2150	23.66	0.66
800	16.07	0.42	2200	25.06	0.69
810	17.91	0.51	2250	32.73	0.71
820	20.04	0.37	2300	31.92	0.71
830	15.06	0.83	2350	26.73	0.68
840	18.97	0.48	2400	29.11	0.83
850	17.86	0.04	2450	25.76	0.79
860	18.12	0.66	2500	28.44	0.41
870	19.58	0.19	2550	24.55	0.86
880	16.28	0.8	2600	33.04	0.6
890	15.88	0.59	2650	27.86	0.59
900	15.27	0.39	2700	28.31	0.81
910	16.04	0.4			
920	16.48	0.45			
930	16.67	0.24			
940	18.68	0.41			
950	18.13	0.55			
960	18.7	0.63			

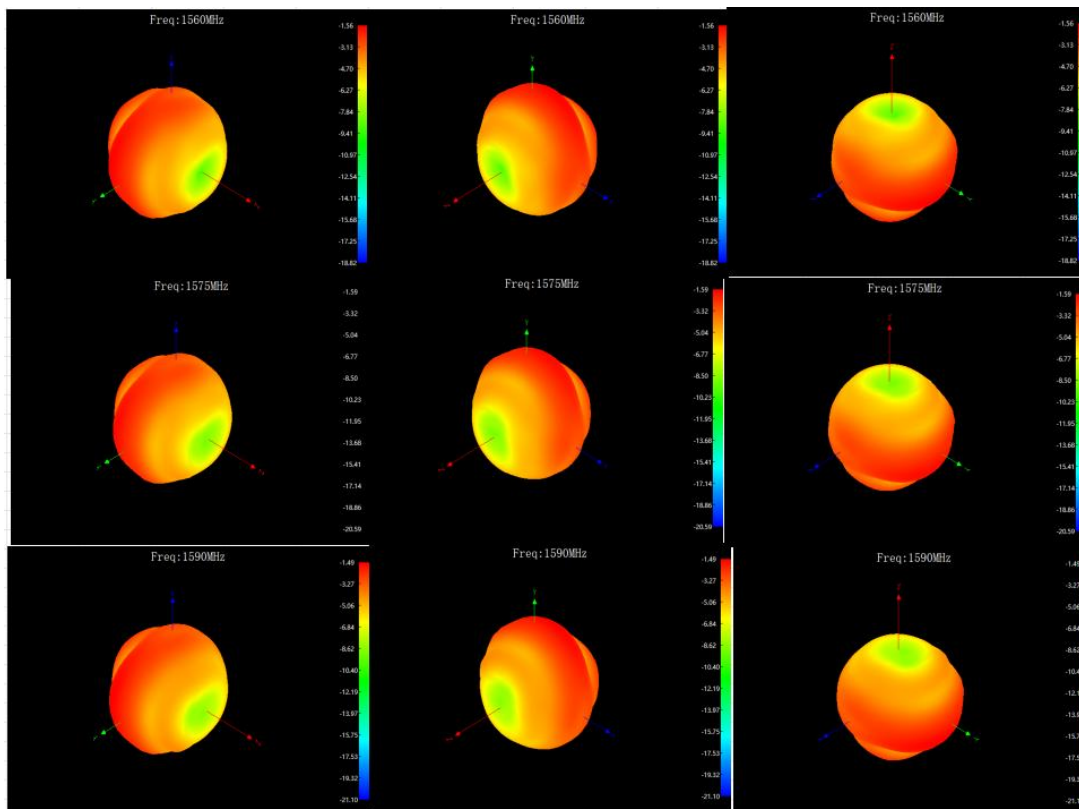
4G 3D Direction Map



GPS Passive Data:

GPS Passive Data		
Frequency/Mhz	Efficiency / %	MaxGain/dBi
1570	33.19	0.56
1575	33.04	0.75
1580	32.43	0.86
1585	32.06	0.74
1590	32.21	0.65
1595	32.58	0.59
1600	32.96	0.43
1605	33.73	0.35
1610	34.12	0.44
1615	33.65	0.48
1620	32.43	0.49

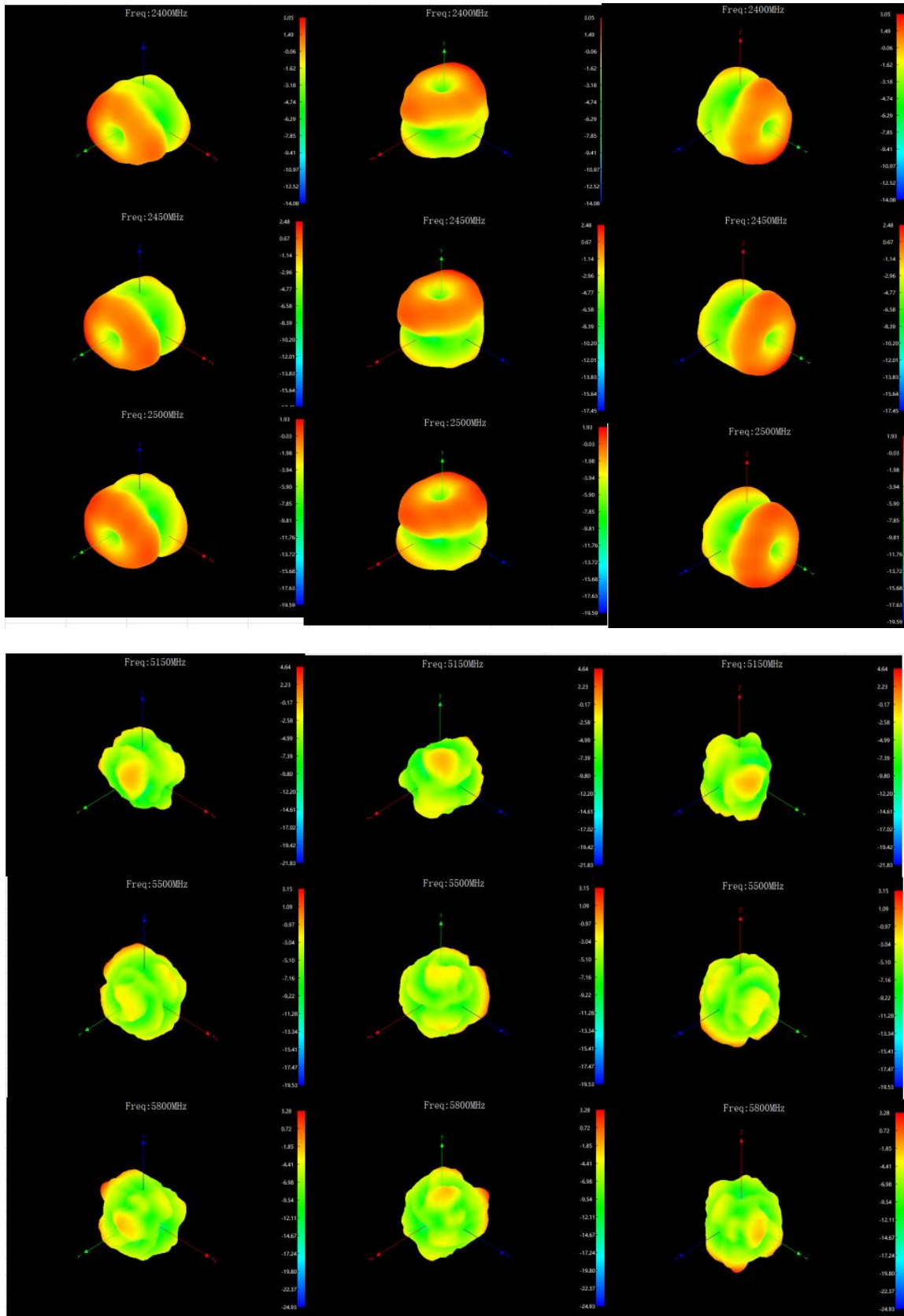
GPS 3D Direction Map



WiFi Passive Data:

Frequency/Mhz	Efficiency / %	MaxGain/dBi
2400	31.4	1.05
2410	39.32	1.06
2420	36.35	1.03
2430	35.05	1.58
2440	32.6	1.16
2450	38.31	1.48
2460	37.32	1.52
2470	30.64	1.27
2480	33.85	1.19
2490	35.64	1.49
2500	38.99	1.13
5100	35.08	1.64
5150	35.6	1.6
5200	35.08	1.8
5250	36.88	1.45
5300	35.19	1.32
5350	34.36	1.46
5400	34.87	1.83
5450	34.67	1.15
5500	36.45	1.58
5550	31.88	1.32
5600	32.46	1.2
5650	38.64	1.31
5700	38.19	1.07
5750	38.37	1.28
5800	35.4	1.05

WIFI 3D Direction Map



5. Testing Equipment and Principles

1. testing facility :

Network Analyzers:

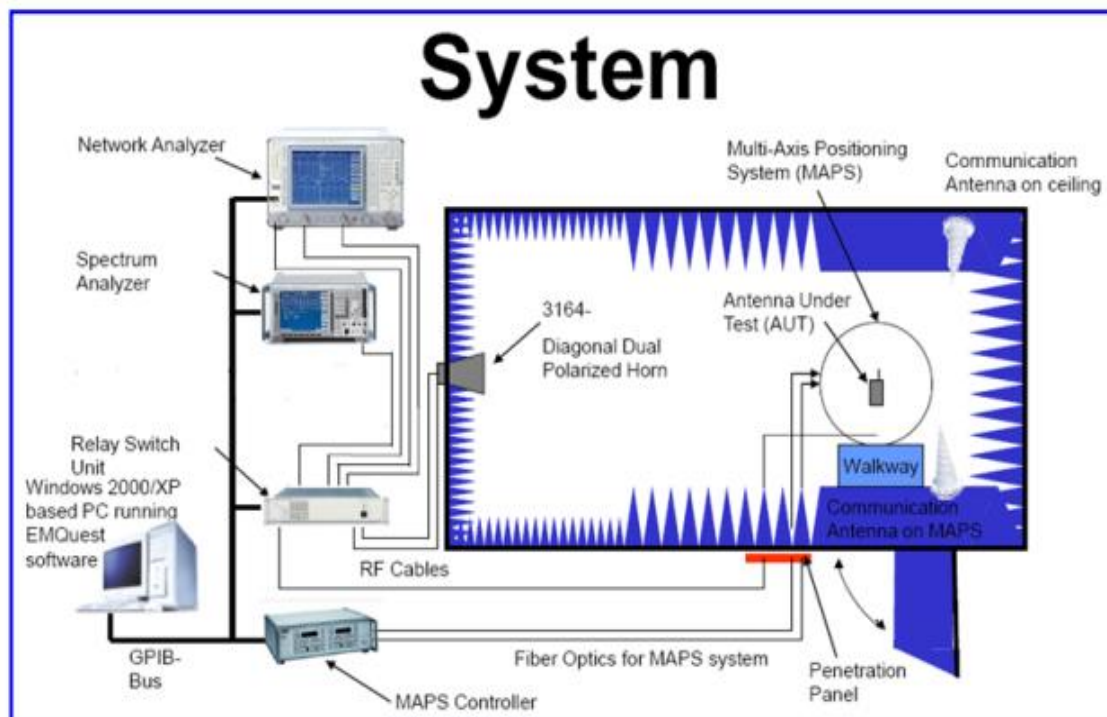
Agilent 8753D 5071B

Comprehensive Test Instrument – Communications Test Set:

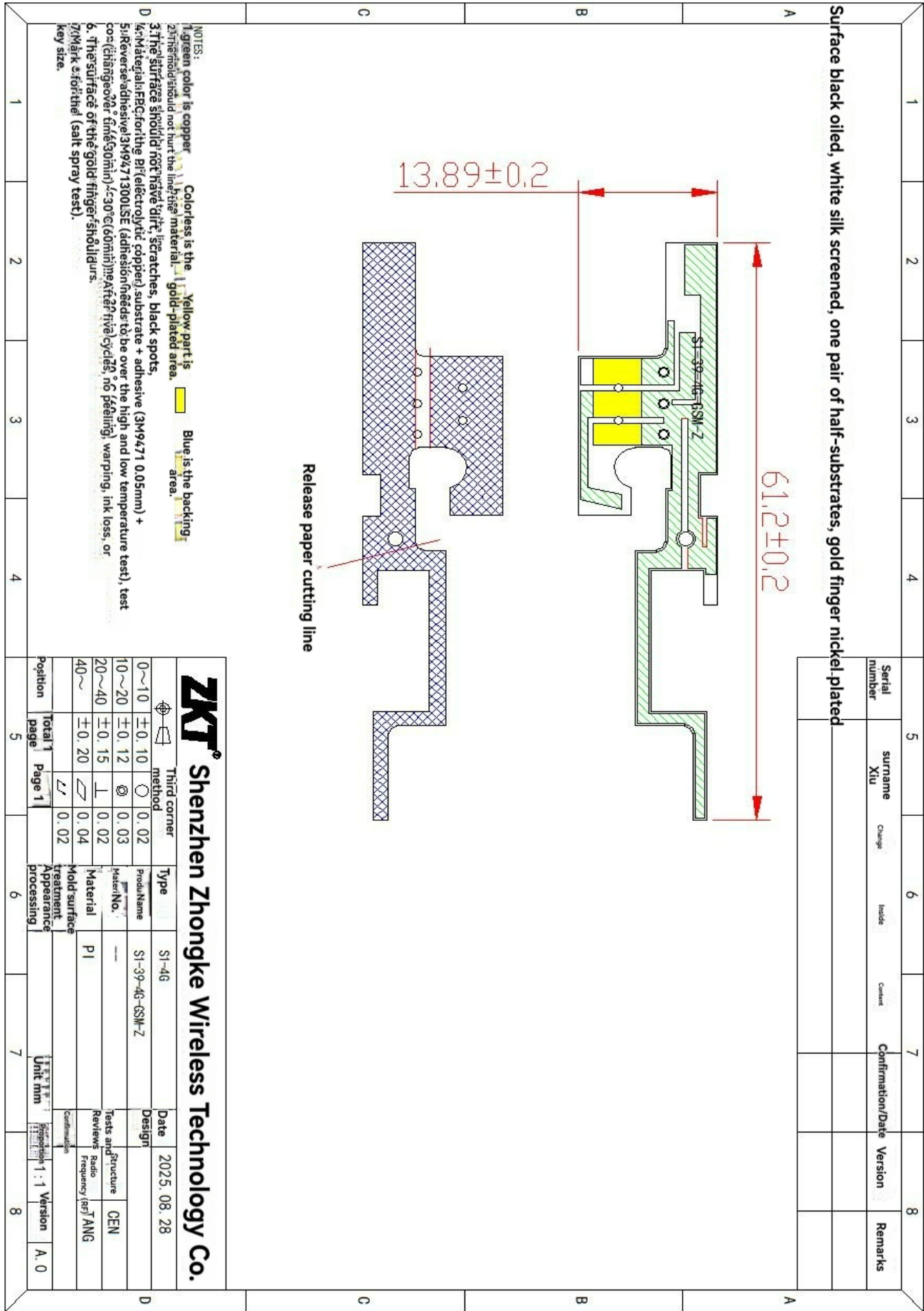
Agilent E5515C

3D Dark Chamber Test System:

2. Test Principle:



6. Engineering Drawings | Product Drawings



1	2	3	4	5	6	7	8
Black oiled surface, white silkscreen, one pair of half-substrates, gold finger-nickel plated				Serial number	modify	change	Content
							Confirmation/Date

NOTES:

1. Green is copper material. Colorless is the Yellow part is gold-plated area.

2. The mold must not hurt the line, the gold-plated area must be connected to the line, dirt, scratches, black spots.

3. Material: EPC for (electrolytic copper) substrate + adhesive (3M9471 0.05mm) + 5. Reverse adhesive backing 3M9471 + 300LS (adhesion needs to be over the high and low temperature test change over time 30min) + 30°C (60min) After five cycles; no peeling, warping; ink loss, or 6. The surface of the gold finger must pass the salt spray test.

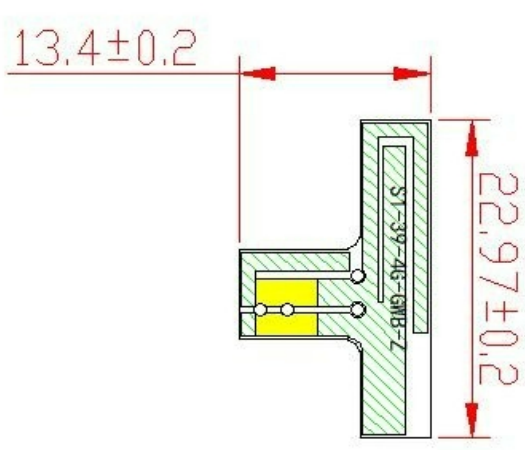
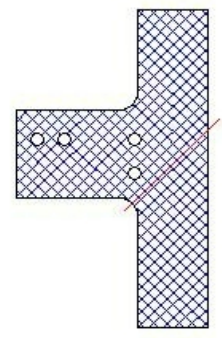
7. Mold key size.

13.05±0.2

18.5±0.2

Release paper cutting line

1	2	3	4	5	6	7	8
				ZKT® Shenzhen Zhongke Wireless Technology Co.			
				Third corner			
				method			
				machine			
				Product Name			
				Date			
				Design			
				Material			
				No.			
				Material			
				P I			
				Mold surface			
				treatment			
				Appearance			
				Processing			
				Unit: mm			
				Position 1 : 1			
				Version			
				A. 0			

1	2	3	4	5	6	7	8		
Black oiled surface, white silkscreen, one pair of half-substrates, gold finger-nickel plated				Serial number	modify	change	Content		
							Content	Content	Remarks
Release paper cutting line 								Confirmation/Date	Version
								Version	Version

NOTES:

1. green color is copper Colorless is the Yellow part is Blue is the backing material part.

2. Knife mold can not hurt the line, gold-plated area and line conduction; 3. the surface can not have dirt, scratches, black spots, gold-plated after the break and fall off and other undesirable phenomena; 4. material: PFC for the PI (electrolytic copper) substrate + adhesive (3M9471 0.05mm) + surface ink (Kaiyao/Ultimate/Dall solid) (0.01mm); 5. the reverse backing of adhesive 3M 9471 300LSE (viscosity needs to be over the high and low temperature test), test conditions: -30 °C (60min) (conversion time of 30min) ~ +70 °C (60min), ~ (conversion time 30min) ~ -30 °C (60min) ... So a total of five cycles after room temperature placed 8H days shedding, warping, ink loss, pack drums; 6. The surface of the gold finger must not have oxidized; 7. Marking is used to pass the salt spray test.

1	2	3	4	5	6	7	8
ZKT Shenzhen Zhongke Wireless Technology Co.				Third corner method	Type of machine	Date	2025. 08. 28
				0.02	S1-39-4G-GNB-Z	Design	Structure
Total 1 Page 1				0.03	---	Audit	RF
				0.02	---	Mold surface	TANG
Position				0.04	PI	Confirmation	
				0.02	---	Proposed: 1:1 Version A. 0	
Page 1				0.02	---	Unit mm	
				0.02	---	Version A. 0	

7. Reliability Test Report

Test item		Test method	Ask	Result
C1	V.S.W.R. Electric Standing Wave Ratio	Test the parameters using a network analyzer.	Meets the specifications for the test substance	pass
M1	Antenna gain	Design the antenna darkroom parameters for testing.	Meets the specifications for the test substance	pass
M2	Vibration	GB / T2423. 48-2008 Amplitude: 0.03 inches (1.5 mm); Frequency: 20-80 Hz (three directions); Duration: 2 hours per direction; Amplitude: 1.5 mm; Frequency: 20-80-20 Hz; Three directions, each lasting 2 hours	1. No Visual Damage 2. Frequency Tol. $\leq 5\%$ No significant visual defects; frequency shift $\leq 5\%$.	pass
M6	Random Drop: Falling	GB/T 2423.8-1995 Specifications: Height: 1.0 meters; 3 directions; 1 measurement per direction – a single antenna with a height of 1 m, measuring once in each of the three directions.	1. No parts separated 、 fracture 2. Frequency Tol. $\leq 5\%$ The product exhibits no detachment or fracture; frequency deviation $\leq 5\%$.	pass
E3	Dimension	Inspection of dimensions, color, material, packaging, and surface treatment.	The Directive DUT specification complies with the requirements for the product under test.	pass
E4	Temperature and Humidity Chamber – Constant Temperature and Humidity	GB / T 2423. 3-2006 Temp: 80° C / 12 H; At-40 °C and 12 hours of relative humidity (RH): $\geq 90\%$; Time: 24 hours. Test at 80 °C for 12 hours, then switch to-40 °C for another 12 hours; Humidity: $\geq 90\%$; Time: 24 hours.	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol. $\leq 5\%$ No significant visual defects were observed after 2 hours of restoration; frequency shift $\leq 5\%$.	pass
E5	Thermal Shock	GB / T 2423. 22 – 2008 – 40° C (30 minutes) to + 80° C (30 minutes); Cycles: 24 One cycle consists of a test at 40 °C for 30 minutes followed by a test at 80 °C for 30 minutes; this is repeated for a total of 24 cycles.	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol. $\leq 5\%$ No significant visual defects were observed after 2 hours of restoration; frequency shift $\leq 5\%$.	pass
R1	Aging Test	GB /T 2423. 2 – 2008 Temp: 80° C; Time: 24 hours Temperature: 80 °C; Test duration: 24 hours	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol. $\leq 5\%$ No obvious cosmetic defects; frequency shift $\leq 5\%$.	pass
M1	RoHS	With Reference to IEC 62321:2008 with flow chart Refer to the IEC 62321 testing procedure	The Directive RoHS 2015/863/EU complies with the RoHS 2015/863/EU standard.	pass

8. Product Packaging Specifications: Code for Product Packaging

Product Name/Specification

I. Label Requirements

Purchase Order Number	*****
Material code	*****
Product Name and Specifications	*****
Quantity/Unit	*****
Remarks	*****

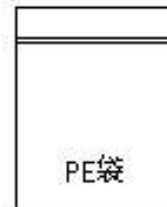
Purchase Order Number	*****
Material code	*****
Product Name and Specifications	*****
Quantity/Unit	*****
Remarks	*****

II. Packaging Requirements:

Instructions:

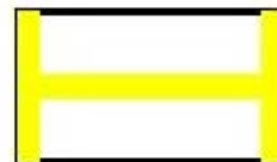
1. inner packing :

Product: 50 PCS in a small bag

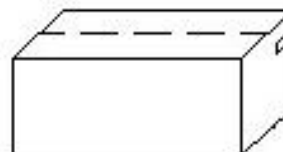


2. external packing :

Determine quantity based on actual quantity/box



纸箱



Matters Need Attention :

1. Should partition boards or foam insulation be added?
2. Application of labels, such as ROHS;