FCC Test Report

For

Applicant Name:	**Yifei Shenzhen Electronics Co., Ltd.**
Address:	The third floor of the 4-2# factory building in Tongfuyu Industrial Zone, Aiqun Road, Shangwu Community, Shiyan Street, Bao'an District, Shenzhen
EUT Name:	RF Detector
Brand Name:	N/A
Model Number:	K18
Serial Model Number:	K18+, K20

Issued By

Company Name:	**BTF Testing Lab (Shenzhen) Co., Ltd.**
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Report Number:	BTF240722R00201
Test Standards:	47 CFR Part 15, Subpart B
Test Conclusion:	Pass
FCC ID:	2BH4F-K18
Sample receipt date:	2024-07-22
Test Date:	2024-07-23 to 2024-07-30
Date of Issue:	2024-07-31
Test By:	Xing.Chen / Tester
Prepared By:	Chris Liu / Project Engineer
Approved By:	Ryan.CJ / EMC Manager

Note: All the test results in this report only related to the testing samples. Which can be duplicated completely for the legal use with approval of applicant; it shall not be reproduced except in full without the written approval of BTF Testing Lab (Shenzhen) Co., Ltd., All the objections should be raised within thirty days from the date of issue. To validate the report, you can contact us.

Revision History		
Version	Issue Date	Revisions Content
R_V0	2024-07-31	Original
Note: Once the revision has been made, then previous versions reports are invalid.		

BTF Testing Lab (Shenzhen) Co., Ltd.
F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China

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BTF Testing Lab (Shenzhen) Co., Ltd.
F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China

1 Introduction

1.1 Identification of Testing Laboratory

Company Name:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Phone Number:	+86-0755-23146130
Fax Number:	+86-0755-23146130

1.2 Identification of the Responsible Testing Location

Company Name:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Phone Number:	+86-0755-23146130
Fax Number:	+86-0755-23146130
FCC Registration Number:	518915
Designation Number:	CN1330

1.3 Announcement

(1) The test report reference to the report template version v0.
(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.
(3) The test report is invalid if there is any evidence and/or falsification.
(4) This document may not be altered or revised in any way unless done so by BTF and all revisions are duly noted in the revisions section.
(5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
(6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2 Product Information

2.1 Application Information

Company Name:	Yifei Shenzhen Electronics Co., Ltd.
Address:	The third floor of the 4-2# factory building in Tongfuyu Industrial Zone, Aiqun Road, Shangwu Community, Shiyan Street, Bao'an District, Shenzhen

2.2 Manufacturer Information

Company Name:	Shenzhen MingShang Industrial Technology Limited
Address:	3/F, building 35, Dalang tongfu industrial zone, Longhua district, Shenzhen

2.3 Factory Information

Company Name:	Shenzhen MingShang Industrial Technology Limited
Address:	3/F, building 35, Dalang tongfu industrial zone, Longhua district, Shenzhen

2.4 General Description of Equipment under Test (EUT)

EUT Name:	RF Detector
Test Model Number:	K18
Serial model Number:	K18+, K20
Model difference description	Only the model name is different, everything else is the same

2.5 Technical Information

Power Supply:	DC 5V 1A from typle C or DC 3.7V from battery
Power Adaptor:	N/A
Frequency range	1MHz-8000MHz

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3 Summary of Test Results

3.1 Test Standards

The tests were performed according to following standards: **47 CFR Part 15, Subpart B:** Unintentional Radiators

3.2 Uncertainty of Test

Item	Measurement Uncertainty
Conducted Emission (150 kHz-30 MHz)	±2.64dB
Radiated Emissions (30M - 1GHz)	±4.12dB
Radiated Emissions (above 1GHz)	1-6GHz: ±3.94dB 6-18GHz: ±4.16dB
The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3.3 Summary of Test Result

Item	Standard	Requirement	Result
Conducted emissions on AC mains	47 CFR Part 15, Subpart B	15.107, Class B	Pass
Radiated emissions (Below 1GHz)	47 CFR Part 15, Subpart B	15.109, Class B	Pass
Radiated emissions (Above 1GHz)	47 CFR Part 15, Subpart B	15.109, Class B	Pass

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4 Test Configuration

4.1 Test Equipment List

Conducted emissions on AC mains					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Pulse Limiter	SCHWARZBECK	VTSD 9561-F	00953	/	/
Coaxial Switcher	SCHWARZBECK	CX210	CX210	/	/
V-LISN	SCHWARZBECK	NSLK 8127	01073	2023-11-16	2024-11-15
LISN	AFJ	LS16/110VAC	16010020076	2023-11-16	2024-11-15
EMI Receiver	ROHDE&SCHWARZ	ESCI3	101422	2023-11-16	2024-11-15

Radiated emissions (Below 1GHz) Radiated emissions (Above 1GHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Coaxial cable Multiflex 141	Schwarzbeck	N/SMA 0.5m	517386	/	/
Preamplifier	SCHWARZBECK	BBV9744	00246	/	/
RE Cable	REBES Talent	UF1-SMASMAM-10m	21101566	/	/
RE Cable	REBES Talent	UF2-NMNM-10m	21101570	/	/
RE Cable	REBES Talent	UF1-SMASMAM-1m	21101568	/	/
RE Cable	REBES Talent	UF2-NMNM-1m	21101576	/	/
RE Cable	REBES Talent	UF2-NMNM-2.5m	21101573	/	/
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Horn Antenna	SCHWARZBECK	BBHA9170	01157	2023-11-16	2024-11-15
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI7	101032	2023-11-16	2024-11-15
SIGNAL ANALYZER	ROHDE&SCHWARZ	FSQ40	100010	2023-11-16	2024-11-15
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Broadband Preamplilifier	SCHWARZBECK	BBV9718D	00008	2023-11-16	2024-11-15
Horn Antenna	SCHWARZBECK	BBHA9120D	2597	2023-11-16	2024-11-15
EZ_EMC	Frad	FA-03A2 RE+	/	/	/
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Log periodic antenna	SCHWARZBECK	VULB 9168	01328	2023-11-16	2024-11-15

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4.2 Test Auxiliary Equipment

Title	Manufacturer	Model No.	Serial No.
Adapter	Huawei	HW-059200CHQ	/

4.3 Test Modes

No.	Test Modes	Description
1	mode_1	Charging +RF detection + vibration + laser scanning
2	mode_2	Charging +GS detection + vibration + laser scanning

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5 Emission Test Results (EMI)

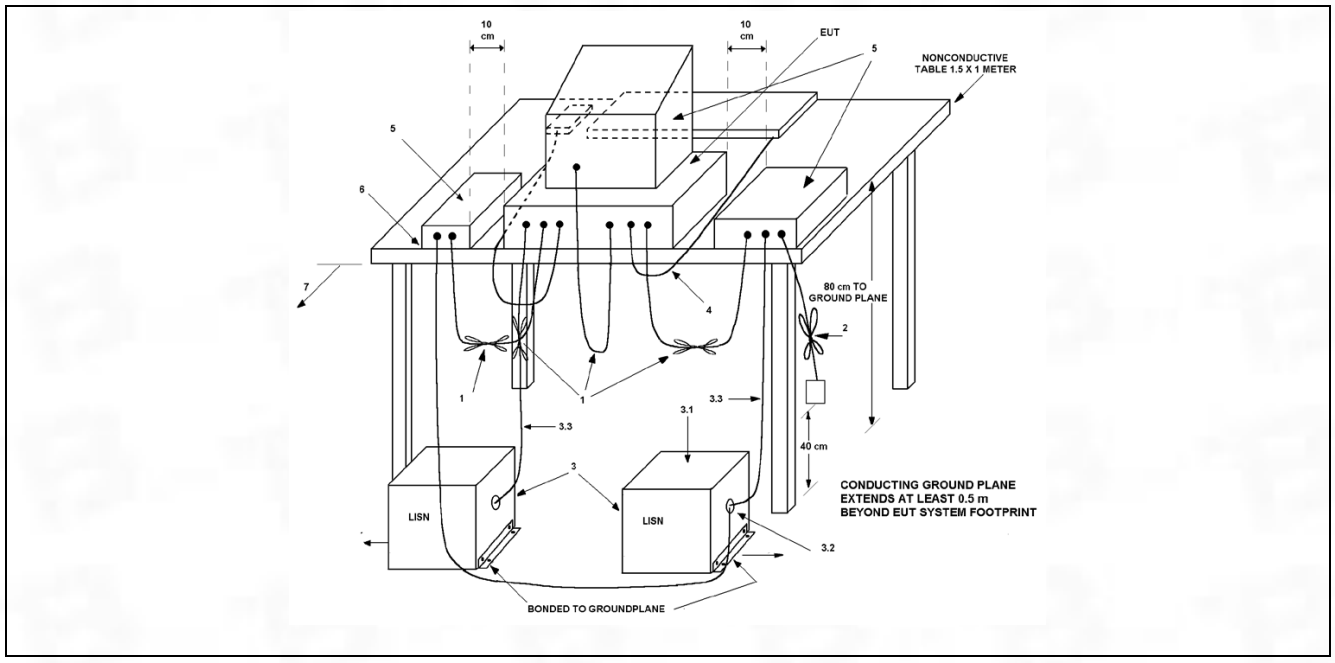
5.1 Conducted emissions on AC mains

Test Requirement:	15.107, Class B
Test Method:	ANSI C63.4-2014
Test Limit:	**Frequency of emission (MHz)** / **Conducted limit (dBμV)** — **Quasi-peak** / **Average** 0.15-0.5: 66 to 56* / 56 to 46* 0.5-5: 56 / 46 5-30: 60 / 50 *Decreases with the logarithm of the frequency.
Procedure:	An initial pre-scan was performed with peak detector.Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected. Remark: Level= Read Level+ Cable Loss+ LISN Factor

5.1.1 E.U.T. Operation:

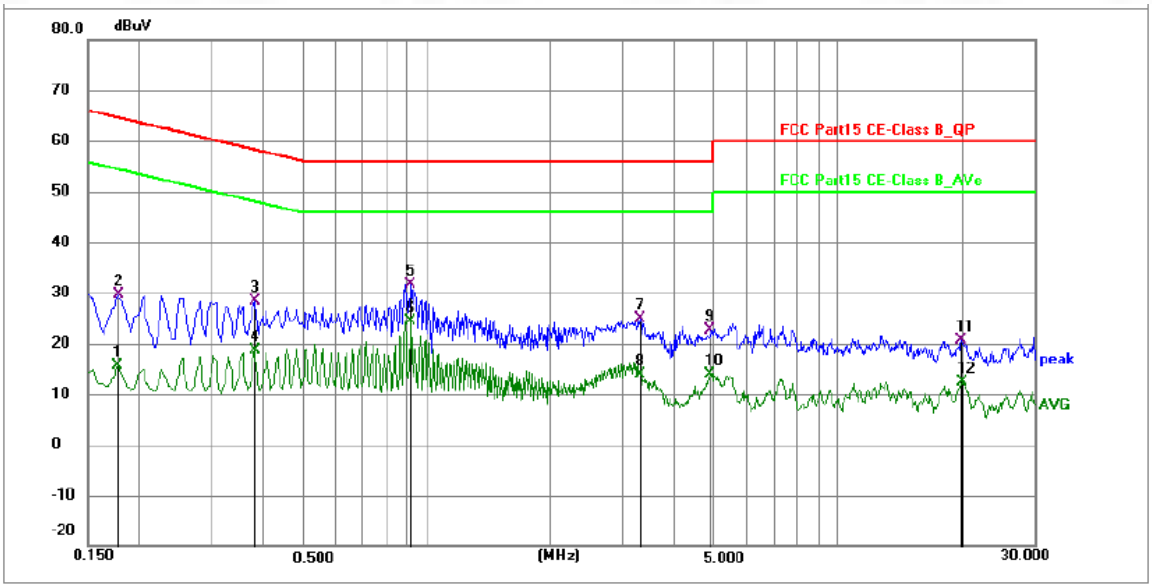
Operating Environment:	
Temperature:	22.7 °C
Humidity:	52.3 %
Atmospheric Pressure:	1010 mbar

5.1.2 Test Setup Diagram:



5.1.3 Test Data:

TM1 / Line: Line



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1766	5.17	10.51	15.68	54.64	-38.96	AVG	P	
2	0.1770	19.10	10.51	29.61	64.63	-35.02	QP	P	
3	0.3795	17.86	10.57	28.43	58.29	-29.86	QP	P	
4	0.3795	7.97	10.57	18.54	48.29	-29.75	AVG	P	
5	0.9150	20.96	10.67	31.63	56.00	-24.37	QP	P	
6 *	0.9150	13.79	10.67	24.46	46.00	-21.54	AVG	P	
7	3.3000	14.30	10.65	24.95	56.00	-31.05	QP	P	
8	3.3000	3.28	10.65	13.93	46.00	-32.07	AVG	P	
9	4.8750	11.98	10.72	22.70	56.00	-33.30	QP	P	
10	4.8750	3.07	10.72	13.79	46.00	-32.21	AVG	P	
11	19.8600	9.69	11.04	20.73	60.00	-39.27	QP	P	
12	19.9860	1.23	11.04	12.27	50.00	-37.73	AVG	P	

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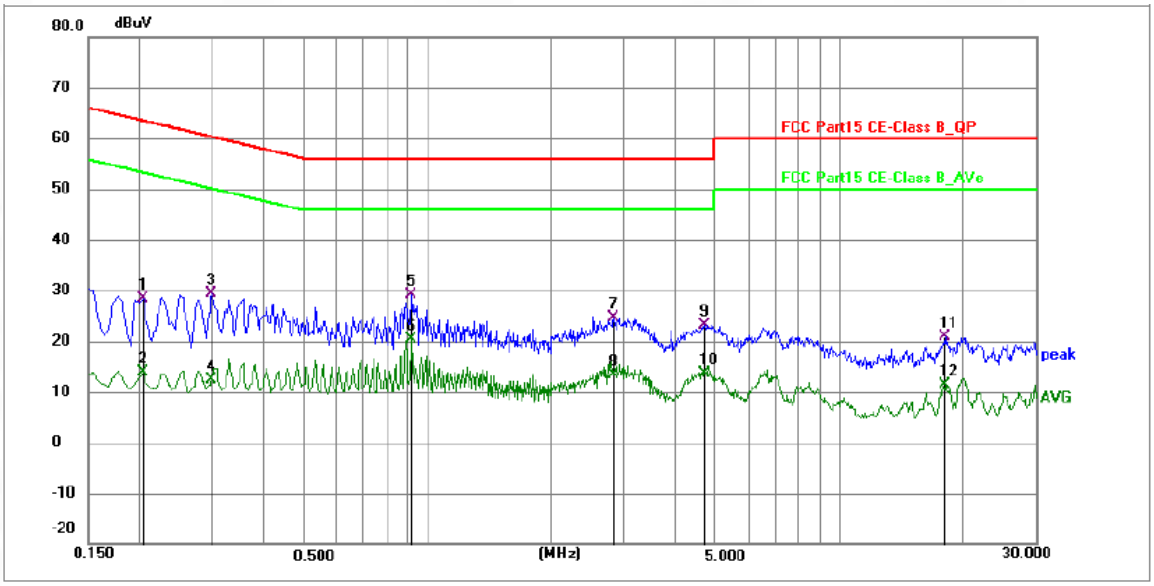
TM1 / Line: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.2040	17.71	10.56	28.27	63.45	-35.18	QP	P	
2	0.2040	3.33	10.56	13.89	53.45	-39.56	AVG	P	
3	0.2983	18.91	10.56	29.47	60.29	-30.82	QP	P	
4	0.2983	1.84	10.56	12.40	50.29	-37.89	AVG	P	
5	0.9103	18.55	10.67	29.22	56.00	-26.78	QP	P	
6 *	0.9150	9.78	10.67	20.45	46.00	-25.55	AVG	P	
7	2.8365	14.04	10.68	24.72	56.00	-31.28	QP	P	
8	2.8365	2.81	10.68	13.49	46.00	-32.51	AVG	P	
9	4.6993	12.52	10.71	23.23	56.00	-32.77	QP	P	
10	4.6993	3.01	10.71	13.72	46.00	-32.28	AVG	P	
11	18.0869	9.85	10.97	20.82	60.00	-39.18	QP	P	
12	18.0869	0.47	10.97	11.44	50.00	-38.56	AVG	P	

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5.2 Radiated emissions (Below 1GHz)

Test Requirement:	15.109, Class B
Test Method:	ANSI C63.4-2014
Test Limit:	Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

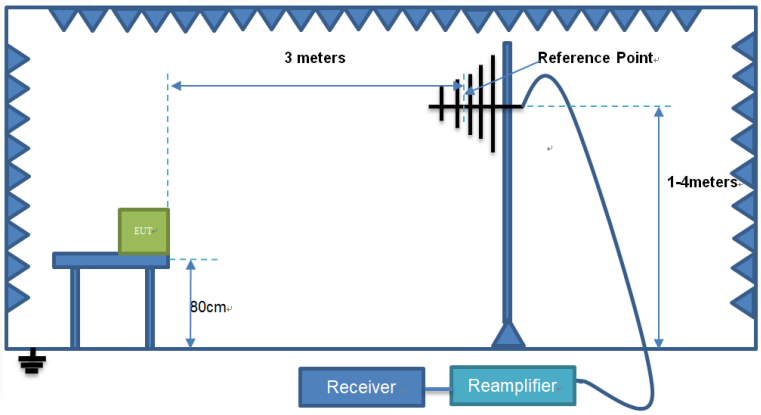
Frequency of emission (MHz)	Field strength @3m		Field strength @10m	
	(uV/m)	(dBuV/m)	(uV/m)	(dBuV/m)
30 – 88	100	40	30	29.5
88 – 216	150	43.5	45	33.1
216 – 960	200	46	60	35.6
Above 960	500	54	150	43.5

Procedure:	An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities. Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

5.2.1 E.U.T. Operation:

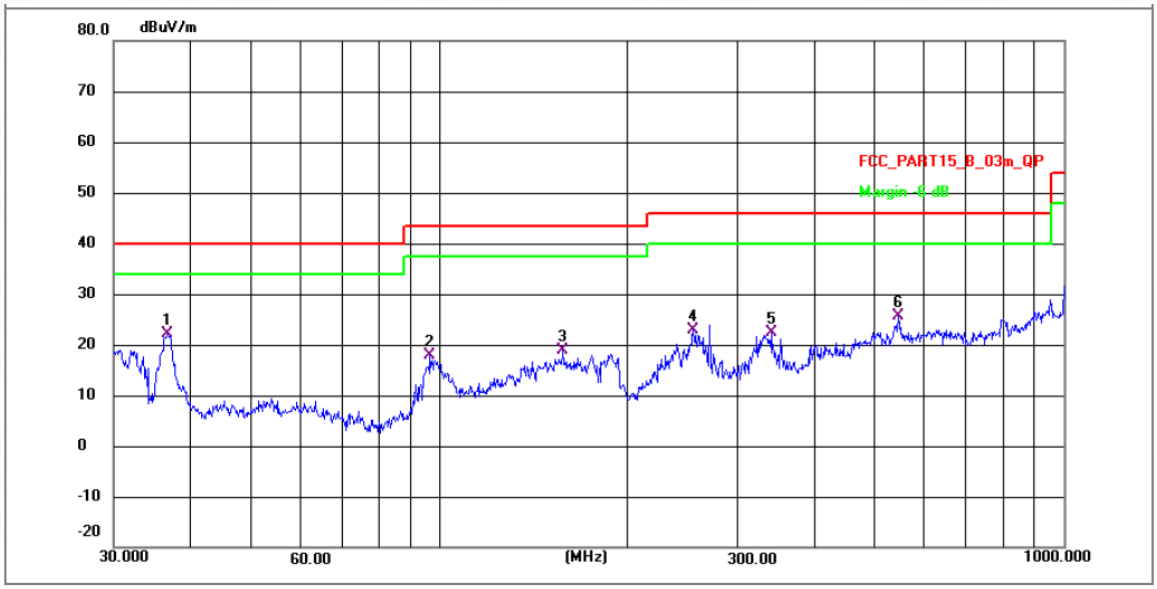
Operating Environment:	
Temperature:	22.7 °C
Humidity:	52.3 %
Atmospheric Pressure:	1010 mbar

5.2.2 Test Setup Diagram:



5.2.3 Test Data:

TM1 / Polarization: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	36.7018	40.47	-18.44	22.03	40.00	-17.97	QP	P
2	96.7749	46.59	-28.76	17.83	43.50	-25.67	QP	P
3	157.8354	46.49	-27.71	18.78	43.50	-24.72	QP	P
4	255.1754	48.60	-25.80	22.80	46.00	-23.20	QP	P
5	340.1847	47.52	-25.11	22.41	46.00	-23.59	QP	P
6	545.1826	47.22	-21.61	25.61	46.00	-20.39	QP	P

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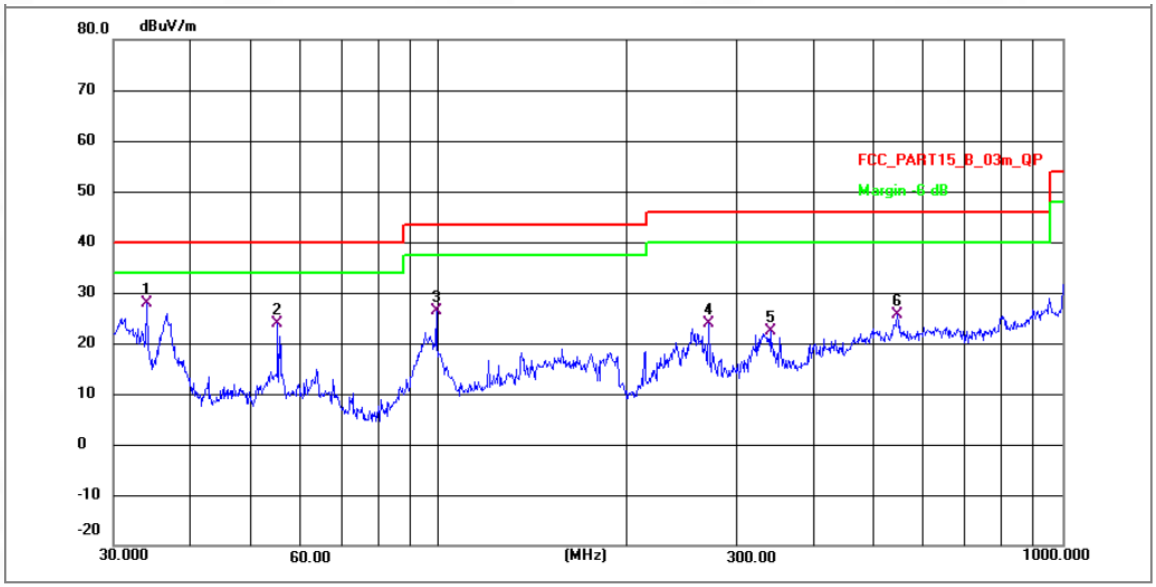
TM1 / Polarization: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	33.9769	48.41	-20.65	27.76	40.00	-12.24	QP	P
2	55.0274	44.00	-20.24	23.76	40.00	-16.24	QP	P
3	98.8326	54.75	-28.43	26.32	43.50	-17.18	QP	P
4	270.3748	49.62	-25.68	23.94	46.00	-22.06	QP	P
5	340.1847	47.52	-25.11	22.41	46.00	-23.59	QP	P
6	545.1826	47.22	-21.61	25.61	46.00	-20.39	QP	P

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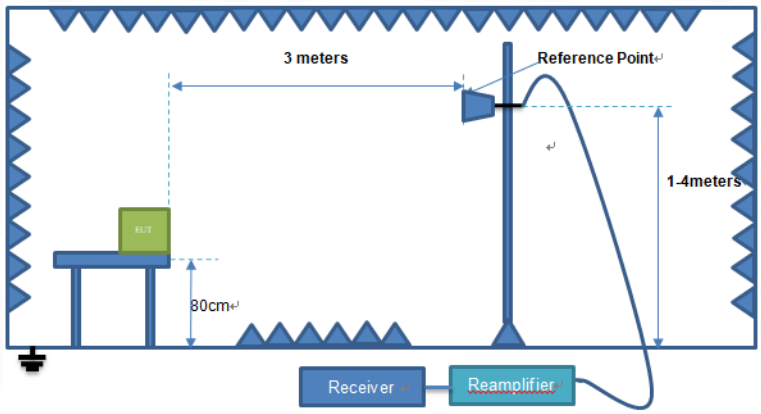
5.3 Radiated emissions (Above 1GHz)

<table>
<tr><td>Test Requirement:</td><td colspan="4">15.109, Class B</td></tr>
<tr><td>Test Method:</td><td colspan="4">ANSI C63.4-2014</td></tr>
<tr><td>Test Limit:</td><td colspan="4"><table>
<tr><th rowspan="2">Frequency of emission (MHz)</th><th colspan="3">Field strength @3m</th></tr>
<tr><th>Average (uV/m)</th><th>Average(d BuV/m)</th><th>Peak (dBuV/m)</th></tr>
<tr><td>Above 1GHz</td><td>500</td><td>54</td><td>74</td></tr>
</table></td></tr>
<tr><td>Procedure:</td><td colspan="4">An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. For below 1GHz test, Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities. For above 1GHz test, Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities.
Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor</td></tr>
</table>

5.3.1 E.U.T. Operation:

Operating Environment:	
Temperature:	22.7 °C
Humidity:	52.3 %
Atmospheric Pressure:	1010 mbar

5.3.2 Test Setup Diagram:



5.3.3 Test Data:

Note: The peak value is less than the AV limit 54dBuV/m, so the AV value is not evaluated
TM1 / Polarization: Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3123.651	86.52	-45.31	41.21	74.00	-32.79	peak	P
2	3374.680	88.31	-45.82	42.49	74.00	-31.51	peak	P
3	3594.006	89.97	-46.04	43.93	74.00	-30.07	peak	P
4	7574.276	91.54	-46.82	44.72	74.00	-29.28	peak	P
5	10707.946	94.98	-47.31	47.67	74.00	-26.33	peak	P
6	16277.676	99.94	-46.40	53.54	74.00	-20.46	peak	P

TM1 / Polarization: Vertical

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3426.950	85.98	-45.31	40.67	74.00	-33.33	peak	P
2	3677.979	87.77	-45.82	41.95	74.00	-32.05	peak	P
3	3897.305	89.43	-46.04	43.39	74.00	-30.61	peak	P
4	7877.575	91.00	-46.82	44.18	74.00	-29.82	peak	P
5	11011.245	94.44	-47.31	47.13	74.00	-26.87	peak	P
6	16580.975	99.40	-46.40	53.00	74.00	-21.00	peak	P

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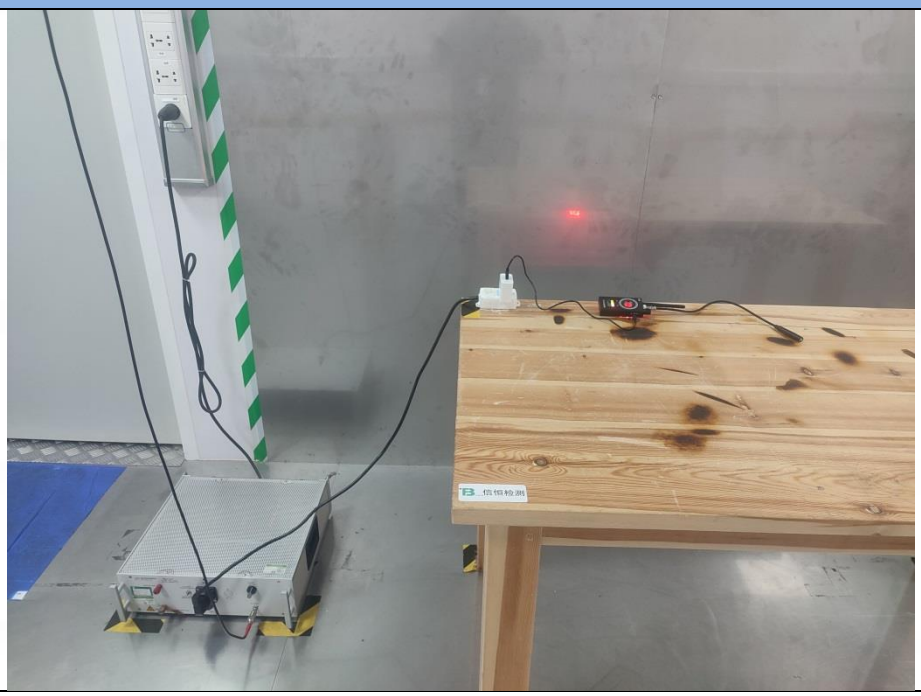
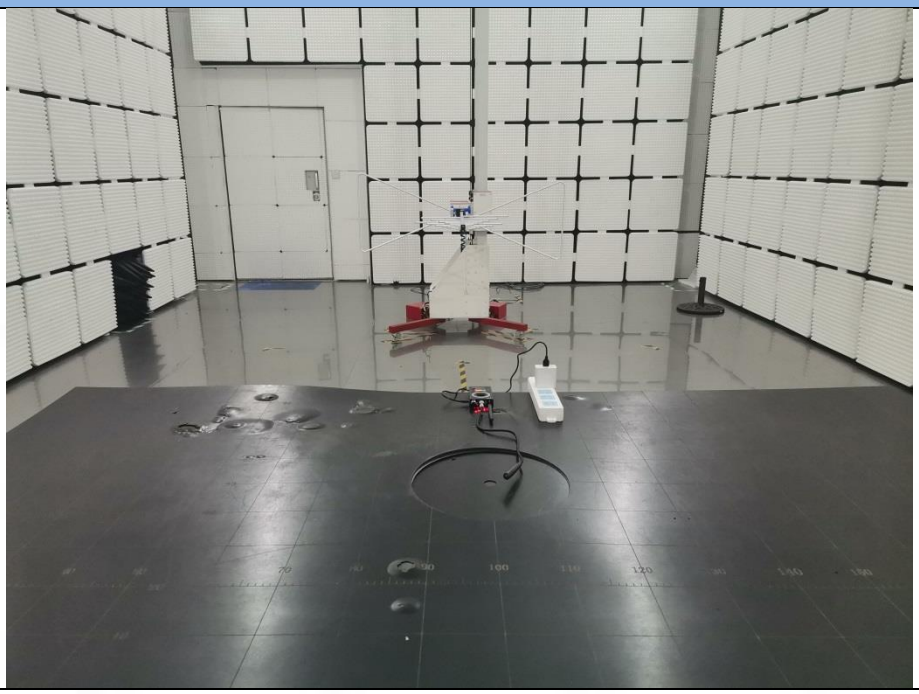
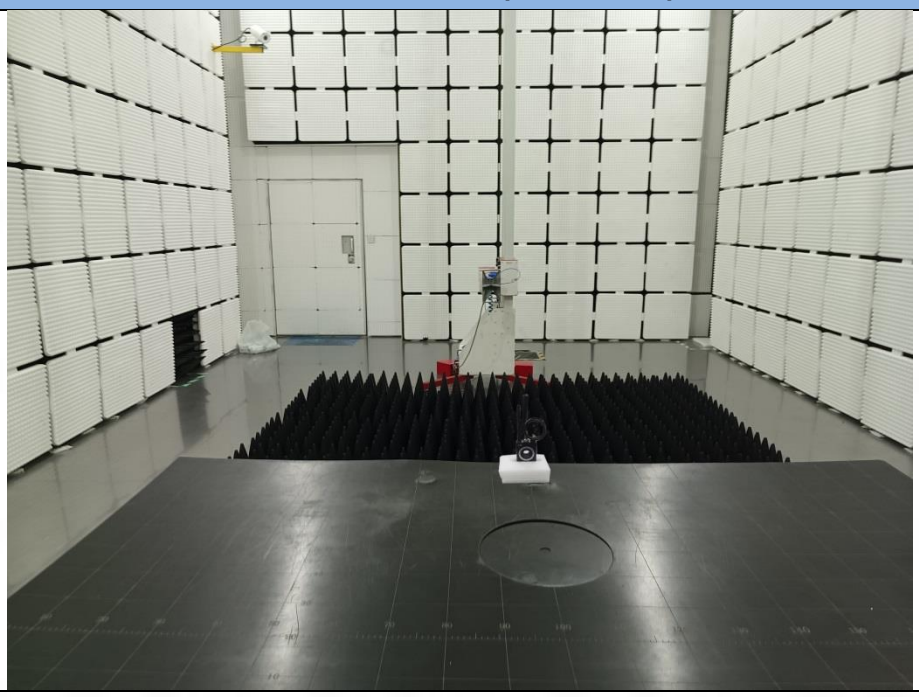
6 Test Setup Photos

Conducted emissions on AC mains


Radiated emissions (Below 1GHz)


Radiated emissions (Above 1GHz)


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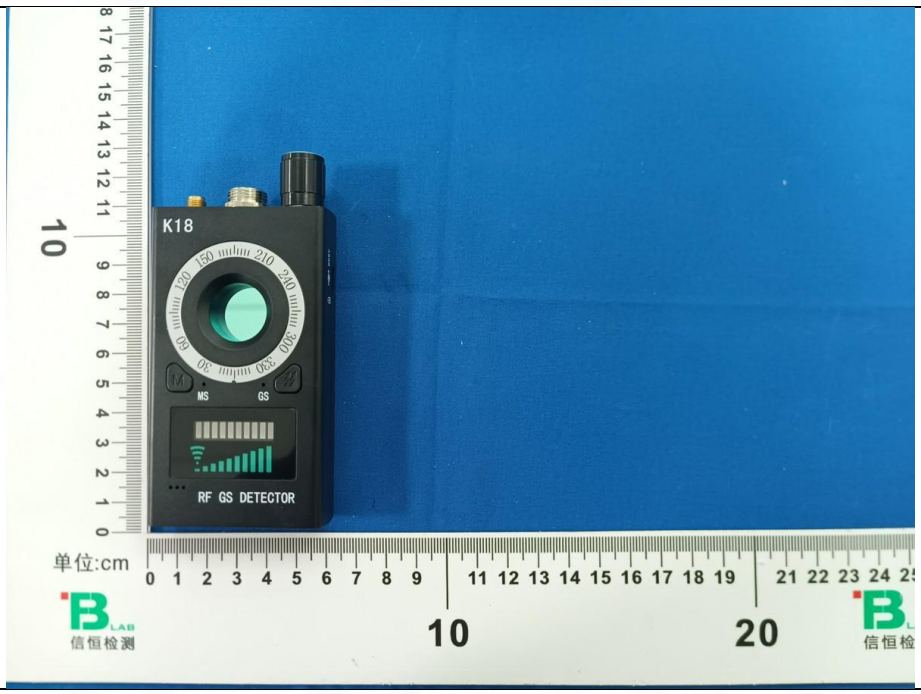
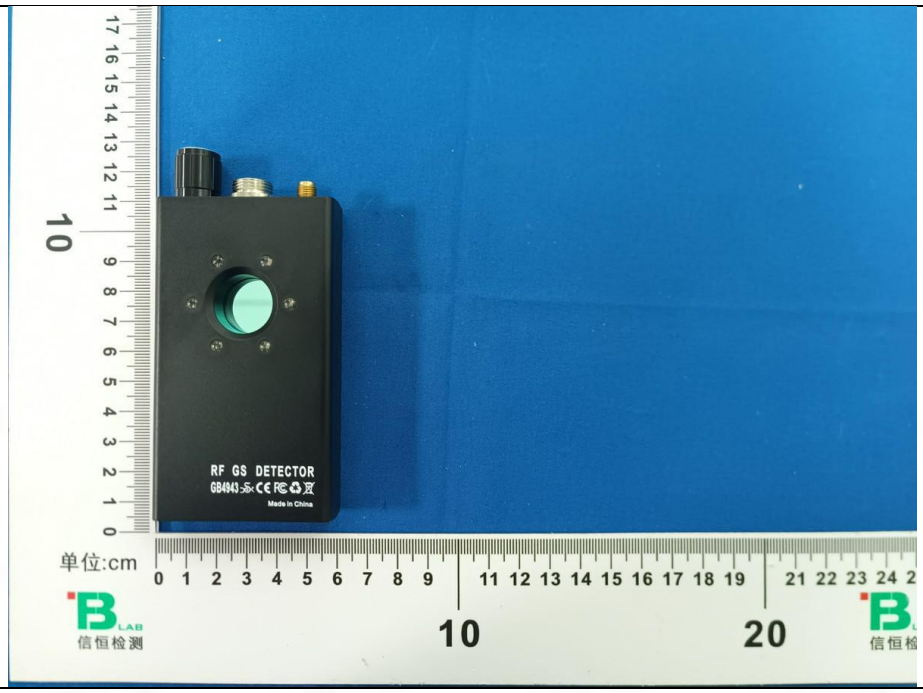
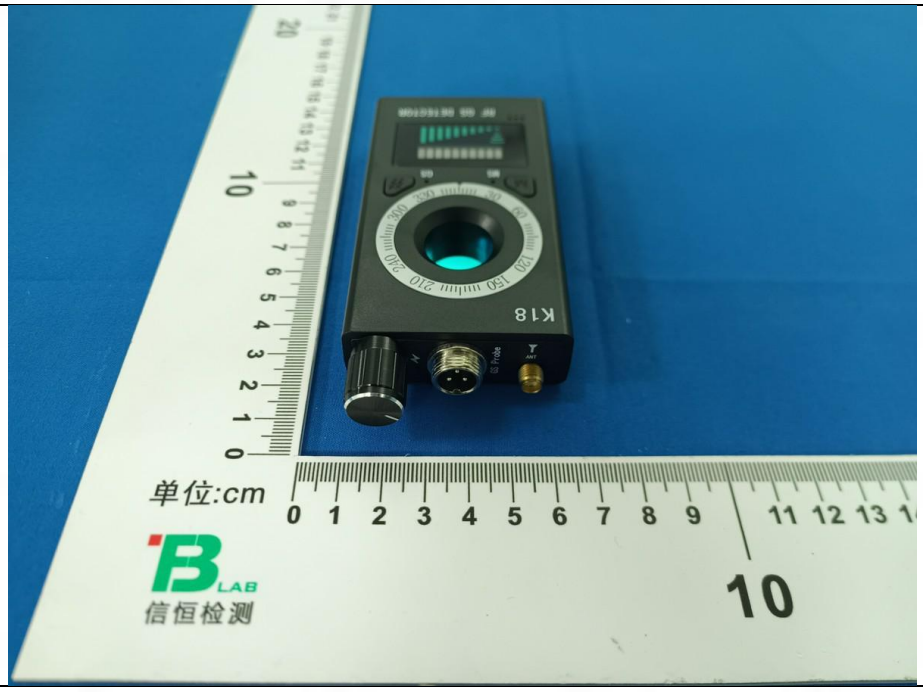
7 EUT Constructional Details (EUT Photos)

External







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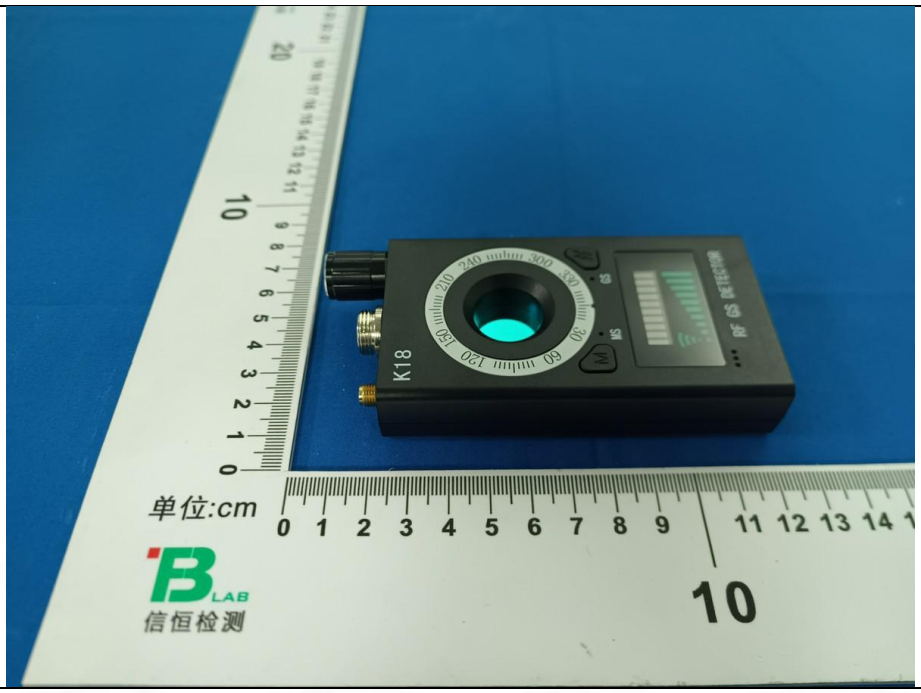

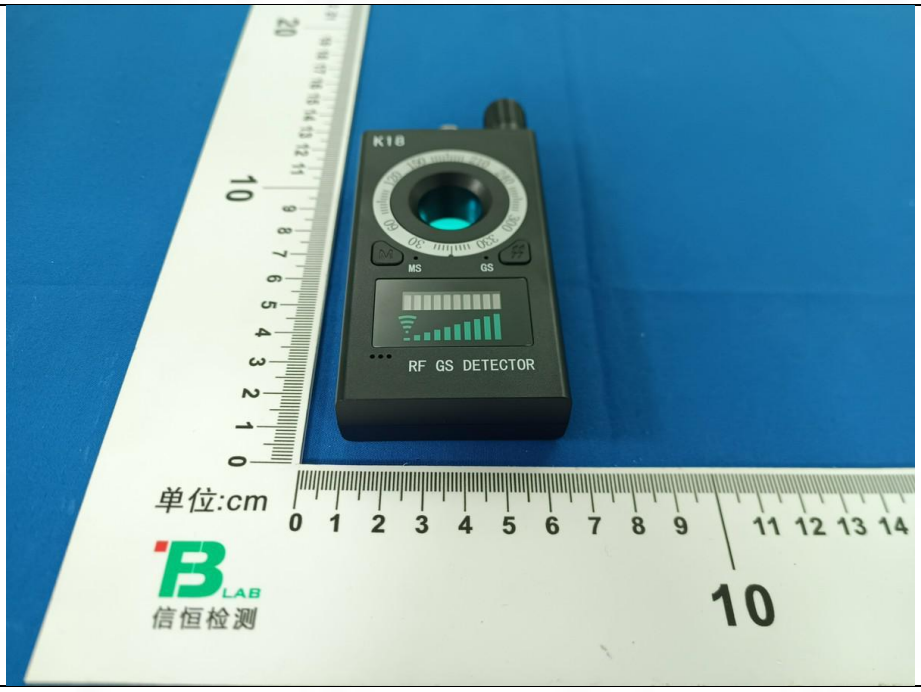

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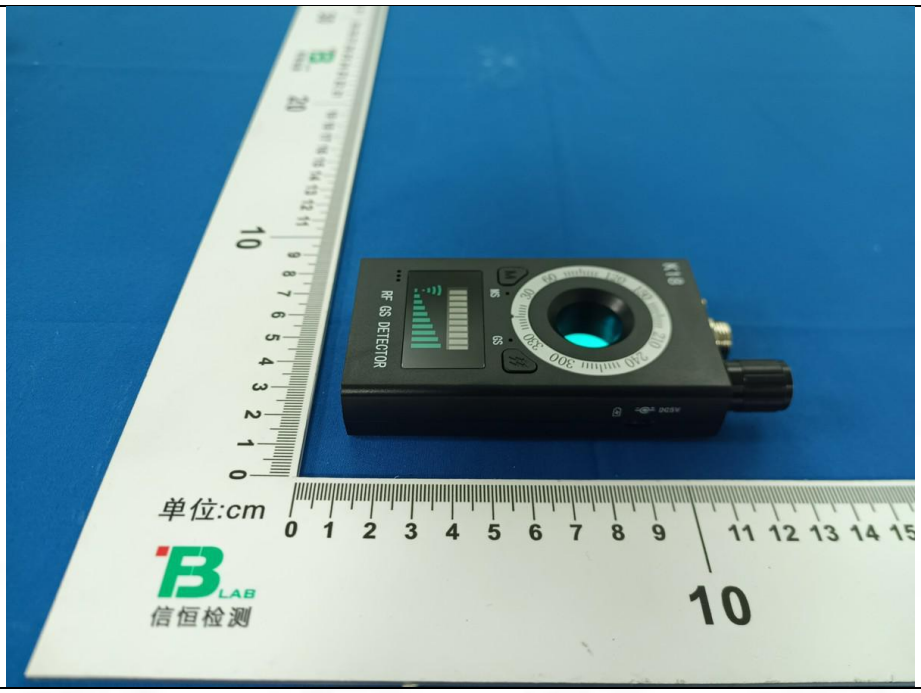

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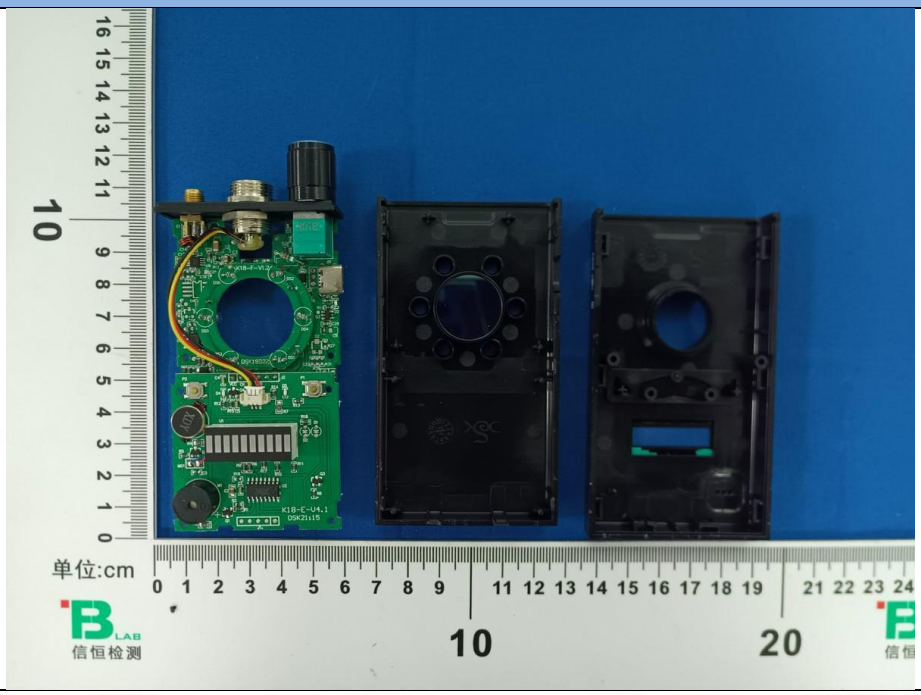

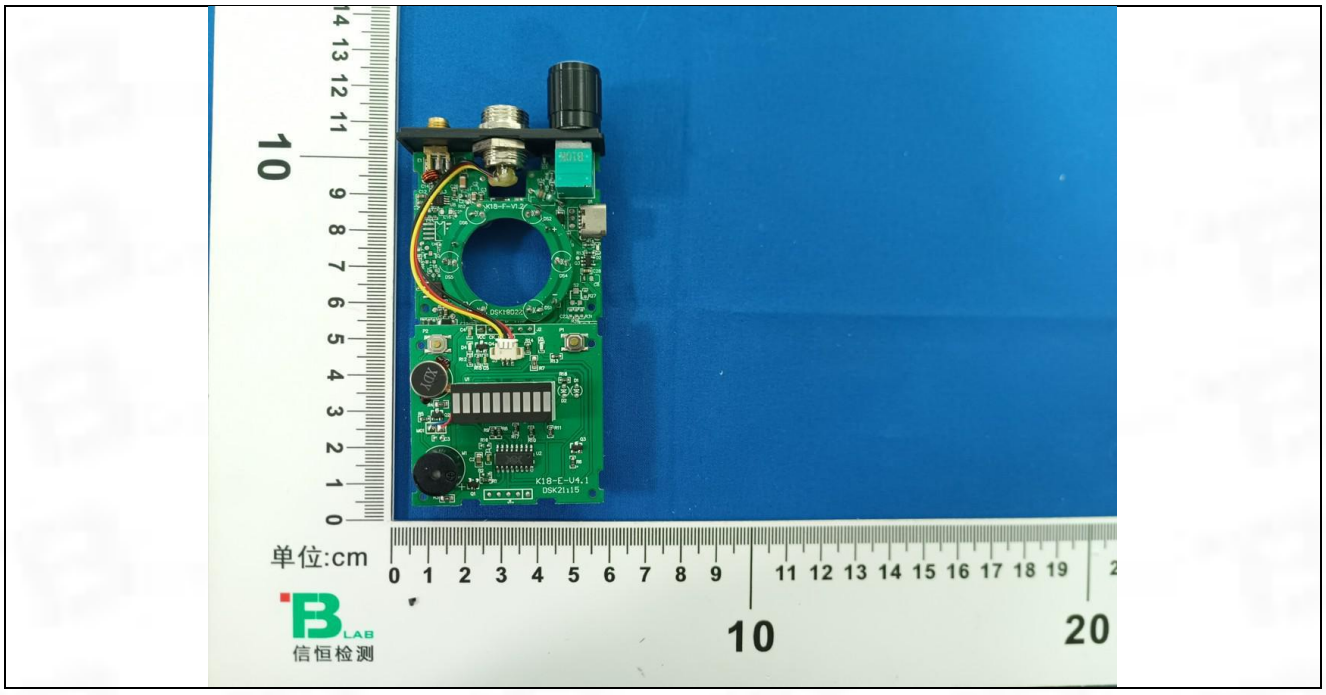
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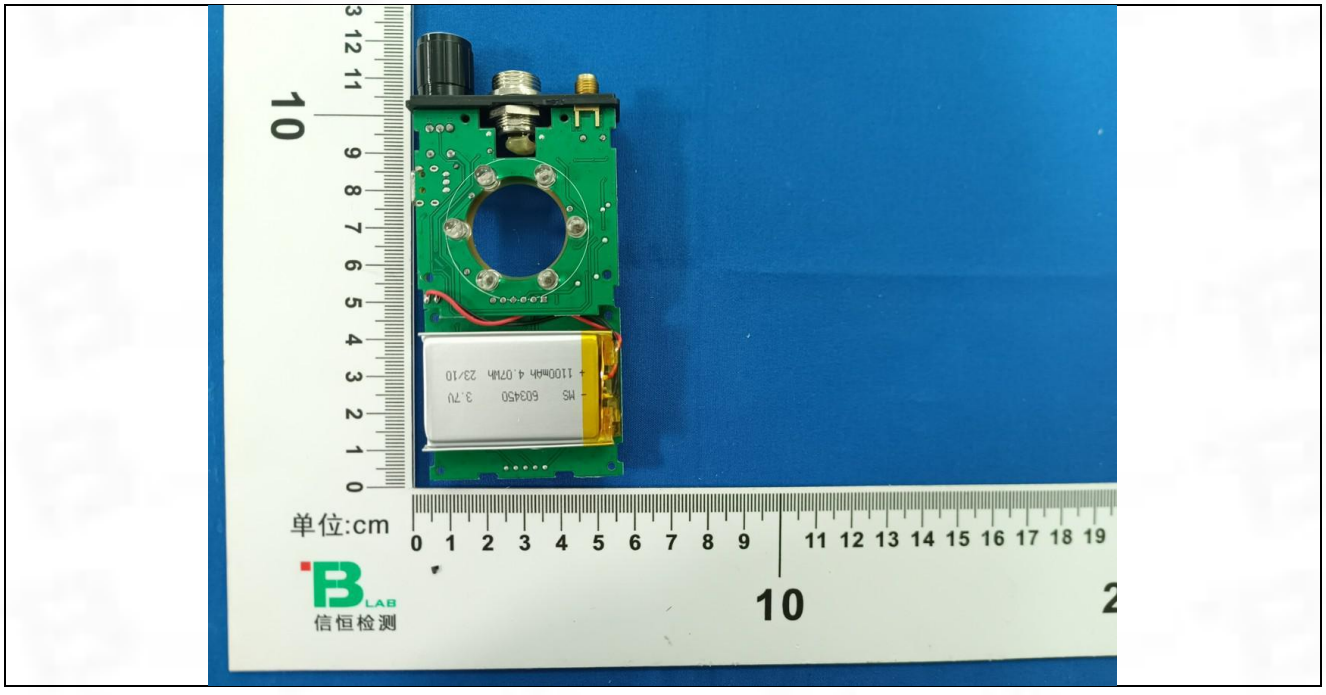
信恒检测


单位:cm
信恒检测

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