

EMC TEST REPORT

For

Hanwei Electronics Group Corporation

Portable Multiple Gas Detector

Test Model: BX616

Prepared for : Hanwei Electronics Group Corporation
Address : No.169 Xuesong Road, National Hi&Tech zone,
Zhengzhou 450001 CHINA.

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
Address : Room 101, 201, Building A and Room 301, Building C,
Juji Industrial Park, Yabianxueziwei, Shajing Street,
Bao'an District, Shenzhen, Guangdong, China

Tel : (+86)755-82591330
Fax : (+86)755-82591332
Web : www.LCS-cert.com
Mail : webmaster@LCS-cert.com

Date of receipt of test sample : May 11, 2021
Number of tested samples : 1
Serial number : Prototype
Date of Test : May 11, 2021 ~ May 14, 2021
Date of Report : May 27, 2021



EMC TEST REPORT**EN 61000-6-3: 2007+A1: 2011**

Emission standard for residential, commercial and light-industrial environments

EN 61000-6-1: 2007

Immunity for residential, commercial and light-industrial environments

Report Reference No.	: LCS210506128AE
Date of Issue	: May 27, 2021
Testing Laboratory Name	: Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure	: Full application of Harmonised standards <input checked="" type="checkbox"/> Partial application of Harmonised standards <input type="checkbox"/> Other standard testing method <input type="checkbox"/>
Applicant's Name	: Hanwei Electronics Group Corporation
Address	: No.169 Xuesong Road, National Hi&Tech zone, Zhengzhou 450001 CHINA.
Test Specification	
Standard	: EN 61000-6-3: 2007+A1: 2011 EN 61000-6-1: 2007 EN IEC 61000-3-2: 2019 EN 61000-3-3: 2013+A1:2019
Test Report Form No	: LCSEMC-1.0
TRF Originator	: Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF	: Dated 2011-03
Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.	
This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen LCS Compliance Testing Laboratory Ltd. is acknowledged as copyright owner and source of the material. Shenzhen LCS Compliance Testing Laboratory Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.	
Test Item Description	: Portable Multiple Gas Detector
Trade Mark	: N/A
Test Model	: BX616
Ratings	: DC 3.7V, 1800MAH
Result	: Positive

Compiled by:

Lucky.xie

Supervised by:

Tom Wang

Approved by:



Lucky Xie/ File administrators

Tom Wang/ Technique principal

Gavin Liang/ Manager

EMC -- TEST REPORT

Test Report No. : LCS210506128AEMay 27, 2021
Date of issue

Test Model..... : BX616

EUT..... : Portable Multiple Gas Detector

Applicant..... : Hanwei Electronics Group CorporationAddress..... : No.169 Xuesong Road, National Hi&Tech zone,
Zhengzhou 450001 CHINA.

Telephone..... : /

Fax..... : /

Manufacturer..... : Hanwei Electronics Group CorporationAddress..... : No.169 Xuesong Road, National Hi&Tech zone,
Zhengzhou 450001 CHINA.

Telephone..... : /

Fax..... : /

Factory..... : Hanwei Electronics Group CorporationAddress..... : No.169 Xuesong Road, National Hi&Tech zone,
Zhengzhou 450001 CHINA.

Telephone..... : /

Fax..... : /

Test Result**Positive**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Revision	Issue Date	Revisions	Revised By
000	May 27, 2021	Initial Issue	Gavin Liang

TABLE OF CONTENTS

Test Report Description	Page
1. TEST STANDARDS.....	6
2.SUMMARY OF STANDARDS AND RESULTS.....	7
2.1. DESCRIPTION OF STANDARDS AND RESULTS.....	7
2.2. DESCRIPTION OF PERFORMANCE CRITERIA.....	8
3. GENERAL INFORMATION.....	9
3.1. DESCRIPTION OF DEVICE (EUT).....	9
3.2. SUPPORT EQUIPMENT LIST.....	9
3.3. DESCRIPTION OF TEST FACILITY.....	9
3.4. STATEMENT OF THE MEASUREMENT UNCERTAINTY.....	10
3.5. MEASUREMENT UNCERTAINTY.....	10
4. MEASURING DEVICES AND TEST EQUIPMENT.....	11
5. TEST RESULTS.....	13
5.1. POWER LINE CONDUCTED EMISSION MEASUREMENT.....	13
5.2. RADIATED EMISSION MEASUREMENT.....	17
5.3. HARMONIC CURRENT EMISSION MEASUREMENT.....	21
5.4. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT.....	22
5.5. ELECTROSTATIC DISCHARGE IMMUNITY TEST.....	23
5.6. RF FIELD STRENGTH SUSCEPTIBILITY TEST.....	26
5.7. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST.....	30
5.8. SURGE IMMUNITY TEST.....	33
5.9. INJECTED CURRENTS SUSCEPTIBILITY TEST.....	36
5.10. MAGNETIC FIELD SUSCEPTIBILITY TEST.....	39
5.11. VOLTAGE DIPS AND INTERRUPTIONS TEST.....	41
6. PHOTOGRAPHS OF TEST SETUP.....	43
7. PHOTOGRAPHS OF THE EUT.....	47

1. TEST STANDARDS

The tests were performed according to following standards:

EN 61000-6-3: 2007+A1: 2011 Emission standard for residential, commercial and light-industrial environments

EN 61000-6-1: 2007 Immunity for residential, commercial and light-industrial environments

EN IEC 61000-3-2: 2019 Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)

EN 61000-3-3: 2013+A1:2019 Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

2.SUMMARY OF STANDARDS AND RESULTS

2.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

Emission (EN 61000-6-3: 2007+A1: 2011)			
Description of Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	EN 55032: 2015	Class B	PASS
Conducted disturbance at telecommunication port	EN 55032: 2015	Class B	N/A
Radiated disturbance	EN 55032: 2015	Class B	PASS
Harmonic current emissions	EN IEC 61000-3-2: 2019	Class A	N/A
Voltage fluctuations & flicker	EN 61000-3-3: 2013+A1:2019	-----	PASS
Immunity (EN 61000-6-1: 2007)			
Description of Test Item	Basic Standard	Performance Criteria	Results
Electrostatic discharge (ESD)	EN 61000-4-2: 2009	B	PASS
Radio-frequency, Continuous radiated disturbance	EN 61000-4-3: 2006+A2: 2010	A	PASS
Electrical fast transient (EFT)	EN 61000-4-4: 2012	B	PASS
Surge (Input a.c. power ports)	EN 61000-4-5: 2014+A1: 2017	B	PASS
Surge (Telecommunication ports)		B	N/A
Radio-frequency, Continuous conducted disturbance	EN 61000-4-6: 2014+A1:2015	A	PASS
Power frequency magnetic field	EN 61000-4-8: 2010	A	PASS
Voltage dips, >95% reduction	EN IEC 61000-4-11: 2020+AC: 2020	B	PASS
Voltage dips, 30% reduction		C	PASS
Voltage interruptions		C	PASS
***Note: N/A is an abbreviation for Not Applicable.			

Test mode:		
Mode	Charging	Record

2.2. Description of Performance Criteria

General Performance Criteria

Examples of functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

- essential operational modes and states;
- tests of all peripheral access (hard disks, floppy disks, printers, keyboard, mouse, etc.);
- quality of software execution;
- quality of data display and transmission;
- quality of speech transmission.

2.2.1. Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacture when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

2.2.2. Performance criterion B

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacture, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operation state or stored data is allowed to persist after the test.

If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

2.2.3. Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacture's instructions.

Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

3. GENERAL INFORMATION

3.1. Description of Device (EUT)

EUT : Portable Multiple Gas Detector

Trade Mark : N/A

Test Model : BX616

Power Supply : DC 3.7V, 1800MAH

EUT Clock Frequency : $\leq 108\text{MHz}$

3.2. Support Equipment List

Name	Manufacturers	M/N	S/N
--	--	--	--

3.3. Description of Test Facility

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

3.4. Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

3.5. Measurement Uncertainty

Test	Parameters	Expanded uncertainty (U_{lab})	Expanded uncertainty (U_{cisp})
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 2.63 dB ± 2.35 dB	± 3.8 dB ± 3.4 dB
Power disturbance	Level accuracy (30MHz to 300MHz)	± 2.90 dB	± 4.5 dB
Electromagnetic Radiated Emission (3-loop)	Level accuracy (9kHz to 30MHz)	± 3.60 dB	± 3.3 dB
Radiated Emission	Level accuracy (9kHz to 30MHz)	± 3.68 dB	N/A
Radiated Emission	Level accuracy (30MHz to 1000MHz)	± 3.48 dB	± 5.3 dB
Radiated Emission	Level accuracy (above 1000MHz)	± 3.90 dB	± 5.2 dB
Mains Harmonic	Voltage	$\pm 0.510\%$	N/A
Voltage Fluctuations & Flicker	Voltage	$\pm 0.510\%$	N/A
EMF	/	$\pm 21.59\%$	N/A
1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus. 2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.			

4. MEASURING DEVICES AND TEST EQUIPMENT

Test Item: Conducted Disturbance

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Software	EZ	EZ-EMC	/	N/A
2	EMI Test Receiver	R&S	ESPI	101840	2020-06-22
3	Artificial Mains	R&S	ENV216	101288	2020-06-22
4	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-0032	2020-06-22
5	Impedance Stabilization Network	TESEQ	ISN T800	45130	2020-12-02

Test Item: Radiated Disturbance (Electric Field)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Software	E3	E3-EMC	/	N/A
2	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2018-07-26
3	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2018-07-02
4	EMI Test Receiver	R&S	ESR 7	101181	2020-06-22
5	Broadband Preamplifier	/	BP-01M18G	P190501	2020-06-22

Test Item: Harmonic Current

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Power Analyzer Test System	Voltech	PM6000	20000670053	2020-06-22

Test Item: Voltage fluctuation and Flicker

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Power Analyzer Test System	Voltech	PM6000	20000670053	2020-06-22

Test Item: Electrostatic Discharge

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ESD Simulator	SCHLODER	SESD 230	604035	2020-07-21

Test Item: RF Field Strength Susceptibility

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ESG Vector Signal Generator	Agilent	E4438C	MY42081396	2020-11-17
2	RF POWER AMPLIFIER	OPHIR	5225R	1052	NCR

3	RF POWER AMPLIFIER	OPHIR	5273F	1019	NCR
4	Stacked Broadband Log Periodic Antenna	SCHWARZBECK	STLP 9128	9128ES-145	NCR
5	Stacked Mikrowellen Log.-Per Antenna	SCHWARZBECK	STLP 9149	9149-484	NCR
6	Electric field probe	Narda S.TS./PMM	EP601	611WX80208	2021-03-25

Note: NCR means no calibration requirement

Test Item: Electrical Fast Transient/Burst

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Immunity Simulative Generator	EM TEST	UCS500 M4	0101-34	2020-06-22

Test Item: Surge

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Immunity Simulative Generator	EM TEST	UCS500 M4	0101-34	2020-06-22

Test Item: Conducted Susceptibility

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Simulator	FRANKONIA	CIT-10/75	A126A1195	2020-06-21
2	CDN	FRANKONIA	CDN-M2+M3	A2210177	2020-06-21
3	6dB Attenuator	FRANKONIA	DAM25W	1172040	2020-06-21

Test Item: Power Frequency Magnetic Field Susceptibility

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Power frequency mag-field generator System	EVERFINE	EMS61000-8K	906003	2020-06-21

Test Item: Voltage Dips

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2020-06-22

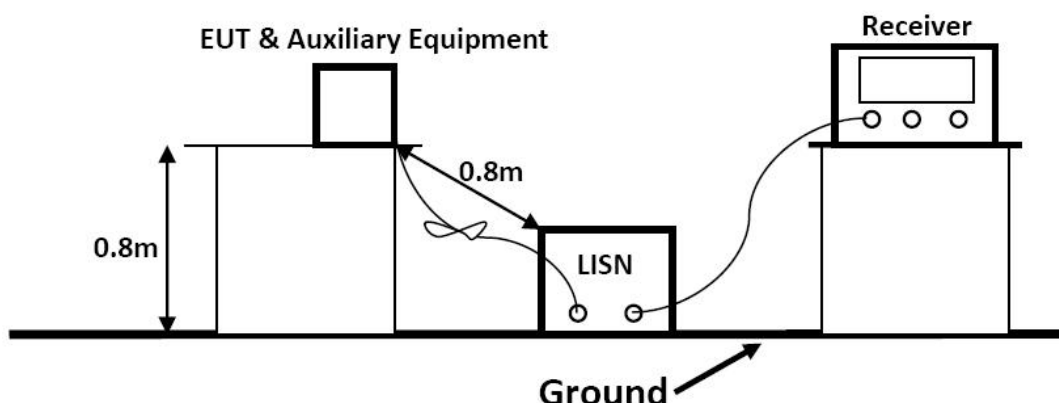
Test Item: Voltage Short Interruptions

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2020-06-22

5. TEST RESULTS

5.1. POWER LINE CONDUCTED EMISSION MEASUREMENT

5.1.1. Block Diagram of Test Setup



5.1.2. Test Standard

EN 61000-6-3: 2007+A1: 2011 (EN 55032: 2015)

Power Line Conducted Emission Limits (Class B)		
Frequency (MHz)	Limit (dB μ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0

NOTE1-The lower limit shall apply at the transition frequencies.
NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

5.1.3. EUT Configuration on Test

The following equipments are installed on Power Line Conducted Emission Measurement to meet the EN 55032 requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

5.1.4. Operating Condition of EUT

5.1.4.1. Setup the EUT as shown on Section 5.1.1

5.1.4.2. Turn on the power of all equipments.

5.1.4.3. Let the EUT work in measuring Mode 1 and measure it.

5.1.5. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided 50-ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN 55032 regulations during conducted emission measurement.

The bandwidth of the field strength meter is set at 9kHz in 150kHz~30MHz.

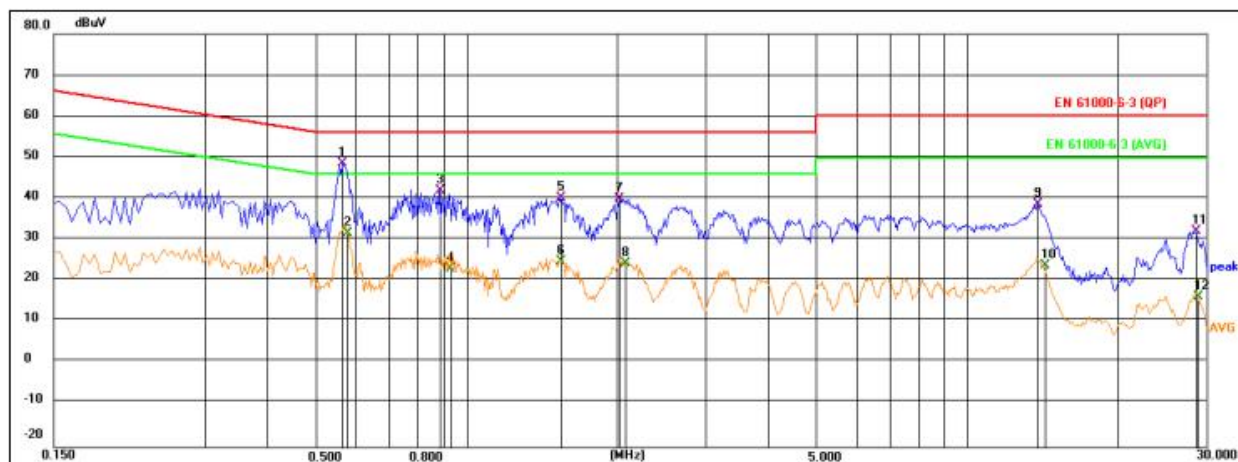
The frequency range from 150kHz to 30MHz is investigated.

5.1.6. Test Results

PASS.

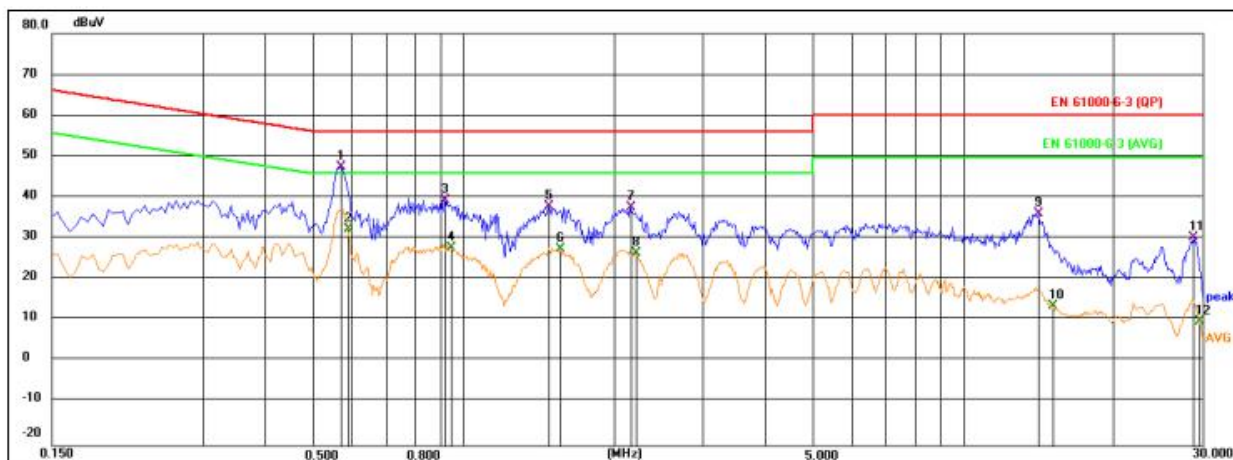
The test result please refer to the next page.

Test Model	BX616	Test Mode	Charging
Environmental Conditions	22.7°C, 53.7% RH	Test Engineer	Zq Pang
Pol.	Line	Test Voltage	AC 230V/50Hz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.5670	33.17	15.53	48.70	56.00	-7.30	QP
2	0.5792	16.25	15.51	31.76	46.00	-14.24	AVG
3	0.8850	25.92	16.07	41.99	56.00	-14.01	QP
4	0.9331	7.55	15.66	23.21	46.00	-22.79	AVG
5	1.5355	25.15	15.15	40.30	56.00	-15.70	QP
6	1.5436	9.90	15.15	25.05	46.00	-20.95	AVG
7	2.0225	24.81	15.16	39.97	56.00	-16.03	QP
8	2.0768	9.43	15.06	24.49	46.00	-21.51	AVG
9	13.8411	26.94	11.81	38.75	60.00	-21.25	QP
10	14.2127	12.27	11.71	23.98	50.00	-26.02	AVG
11	28.4519	24.95	7.40	32.35	60.00	-27.65	QP
12	28.9077	8.92	7.46	16.38	50.00	-33.62	AVG

Test Model	BX616	Test Mode	Charging
Environmental Conditions	22.7°C, 53.7% RH	Test Engineer	Zq Pang
Pol.	Neutral	Test Voltage	AC 230V/50Hz

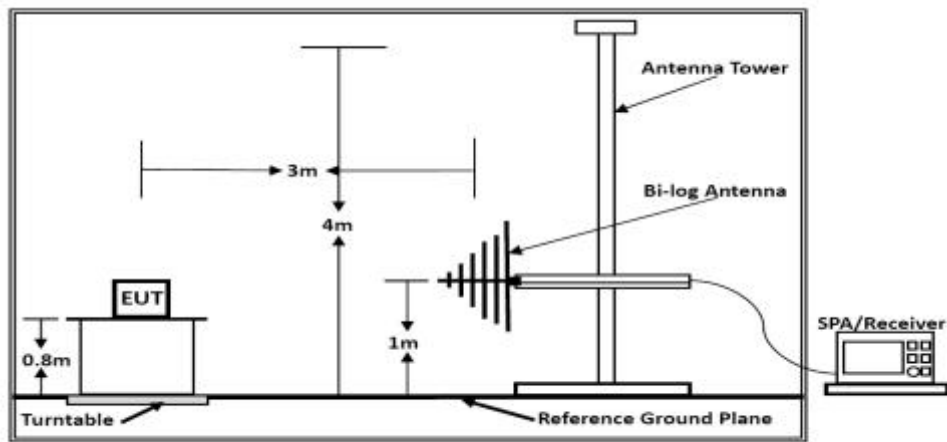


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.5686	32.10	15.53	47.63	56.00	-8.37	QP
2	0.5866	17.11	15.50	32.61	46.00	-13.39	AVG
3	0.9151	23.70	15.80	39.50	56.00	-16.50	QP
4	0.9421	12.41	15.57	27.98	46.00	-18.02	AVG
5	1.4776	22.92	15.14	38.06	56.00	-17.94	QP
6	1.5586	12.49	15.15	27.64	46.00	-18.36	AVG
7	2.1616	22.87	14.90	37.77	56.00	-18.23	QP
8	2.2021	11.86	14.83	26.69	46.00	-19.31	AVG
9	14.1901	24.59	11.71	36.30	60.00	-23.70	QP
10	15.0676	1.53	12.27	13.80	50.00	-36.20	AVG
11	28.8106	22.97	7.45	30.42	60.00	-29.58	QP
12	29.6926	2.54	7.58	10.12	50.00	-39.88	AVG

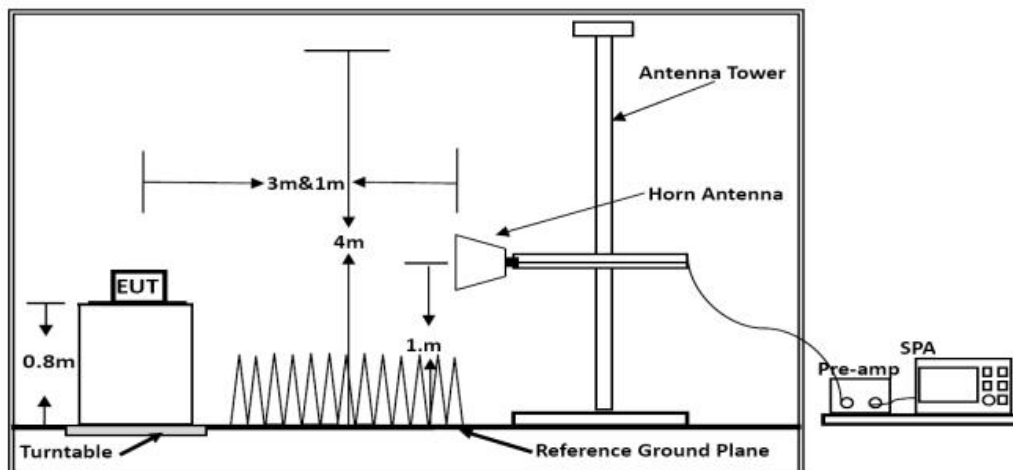
Note: Pre-Scan all mode, Thus record worse case mode result in this report.

5.2. RADIATED EMISSION MEASUREMENT

5.2.1. Block Diagram of Test Setup



Below 1GHz



Above 1GHz

5.2.2. Test Standard

EN 61000-6-3: 2007+A1: 2011 (EN 55032: 2015) Class B

All emanations from a class B device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

Limits for Radiated Emission Below 1GHz			
Frequency (MHz)	Distance (Meters)	Field Strengths Limit (dBμV/m)	
30 ~ 230	3	40	
230 ~ 1000	3	47	
***Note: (1) The smaller limit shall apply at the combination point between two frequency bands. (2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.			
Limits for Radiated Emission Above 1GHz			
Frequency (MHz)	Distance (Meters)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)
1000 ~ 3000	3	70	50
3000 ~ 6000	3	74	54
***Note: The lower limit applies at the transition frequency.			

5.2.3. EUT Configuration on Test

The EN 55032 regulations test method must be used to find the maximum emission during radiated emission measurement.

5.2.4. Operating Condition of EUT

5.2.4.1. Turn on the power.

5.2.4.2. Let the EUT work in the test Mode 1 and measure it.

5.2.5. Test Procedure

The EUT is placed on a turntable, which is 0.8 meter high above the ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. By-log antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The bandwidth of the EMI test receiver is set at RBW/VBW=120kHz/1000kHz.

The frequency range from 30MHz to 1000MHz is checked.

The bandwidth of the Spectrum analyzer is set at RBW/VBW=1MHz/3MHz.

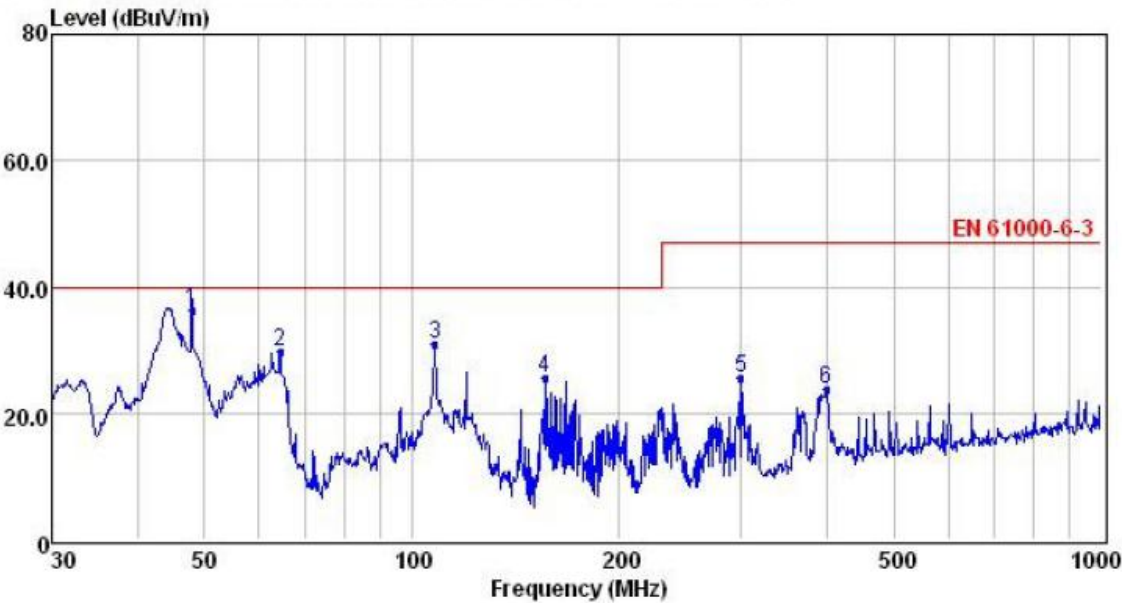
The frequency range from 1GHz to the frequency which about 5th carrier harmonic or 6GHz is checked.

5.2.6. Test Results

PASS.

The test result please refer to the next page.

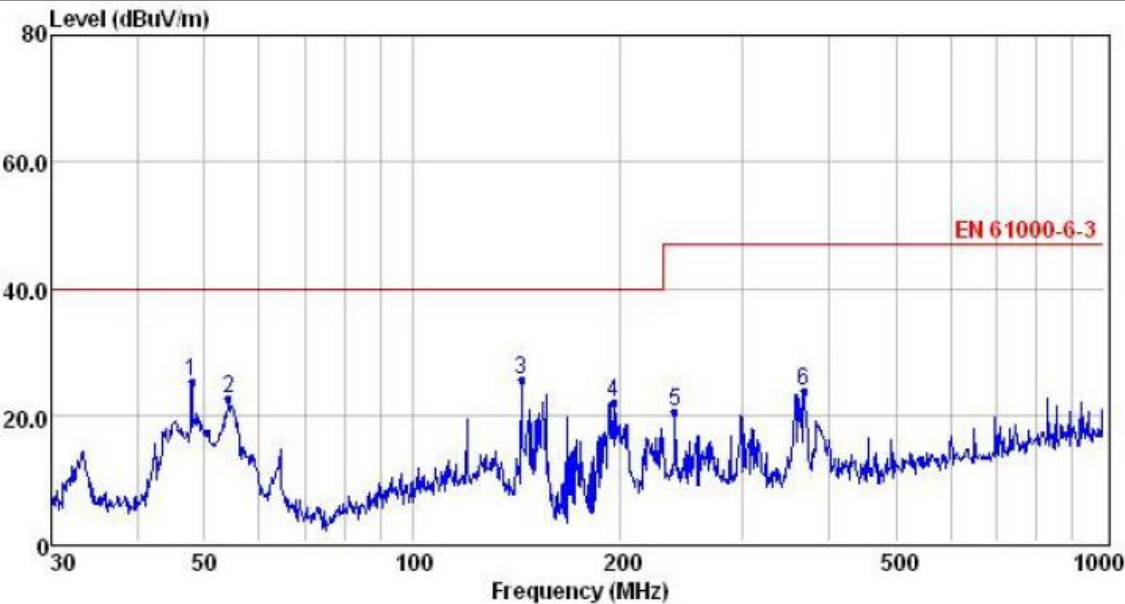
Test Model	BX616	Test Mode	Charging
Environmental Conditions	22.1℃, 53.2% RH	Detector Function	Quasi-peak
Pol.	Vertical	Distance	3m
Test Engineer	Zq Pang	Test Voltage	AC 230V/50Hz



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	47.99	52.45	0.35	13.37	36.17	40.00	-3.83	QP
2	64.43	48.30	0.52	10.93	29.70	40.00	-10.30	QP
3	107.89	47.95	0.68	12.44	30.94	40.00	-9.06	QP
4	155.91	46.43	0.76	8.50	25.43	40.00	-14.57	QP
5	300.37	41.85	1.13	13.06	25.54	47.00	-21.46	QP
6	399.03	38.36	1.22	15.04	23.78	47.00	-23.22	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that are 20db below the official limit are not reported

Test Model	BX616	Test Mode	Charging
Environmental Conditions	22.1℃, 53.2% RH	Detector Function	Quasi-peak
Pol.	Horizontal	Distance	3m
Test Engineer	Zq Pang	Test Voltage	AC 230V/50Hz



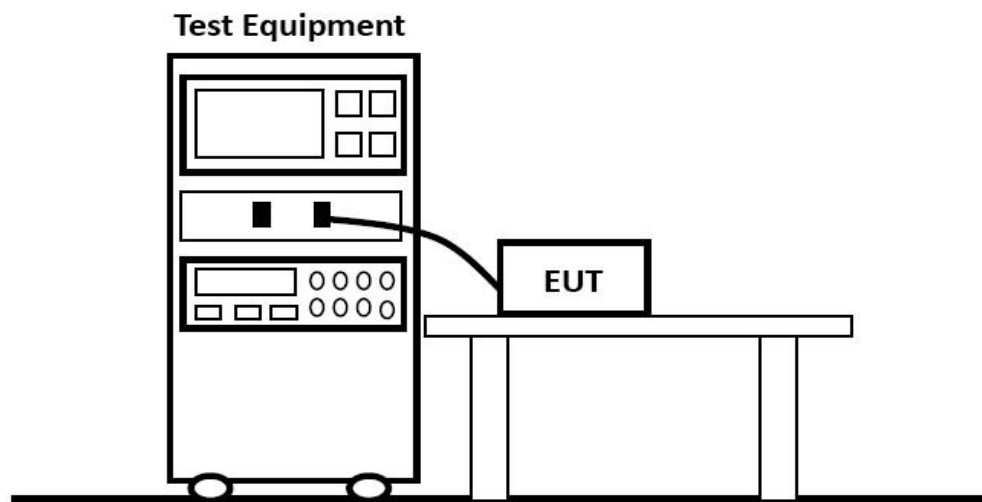
	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	47.99	41.46	0.35	13.37	25.18	40.00	-14.82	QP
2	54.26	39.00	0.46	13.05	22.49	40.00	-17.51	QP
3	143.83	46.98	0.71	8.22	25.68	40.00	-14.32	QP
4	195.14	40.79	0.96	10.57	21.98	40.00	-18.02	QP
5	239.99	37.89	1.01	12.09	20.57	47.00	-26.43	QP
6	368.11	38.73	1.22	14.49	23.70	47.00	-23.30	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that are 20db below the official limit are not reported

Note: Pre-Scan all mode, Thus record worse case mode result in this report.

5.3. HARMONIC CURRENT EMISSION MEASUREMENT

5.3.1. Block Diagram of Test Setup



5.3.2. Test Standard

EN IEC 61000-3-2: 2019

5.3.3. Operating Condition of EUT

Same as Section 5.2.4, except the test setup replaced as Section 5.3.1.

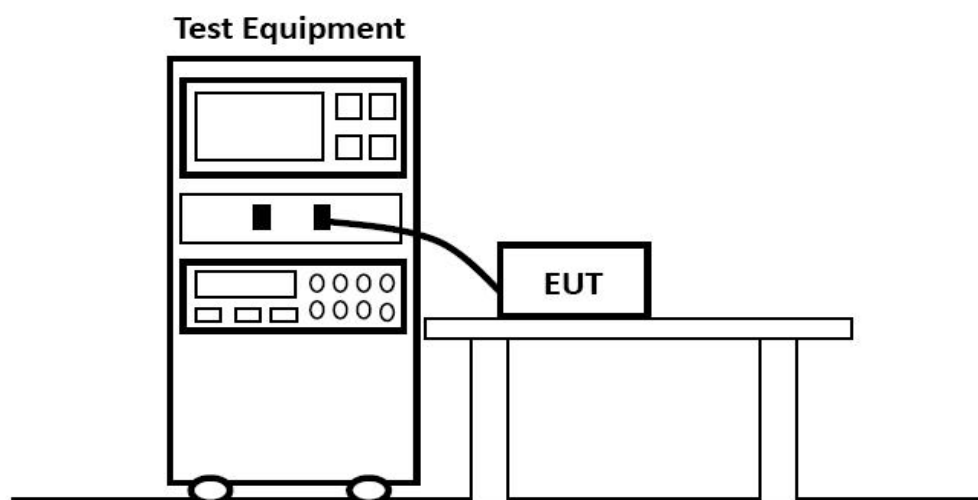
5.3.4. Test Results

N/A

Because the power of EUT is less than 75W, according to standard EN 61000-3-2, harmonic current is unnecessary to test.

5.4. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

5.4.1. Block Diagram of Test Setup



5.4.2. Test Standard

EN 61000-3-3: 2013+A1:2019

5.4.3. Operating Condition of EUT

Same as Section 5.2.4, except the test setup replaced as Section 5.4.1.

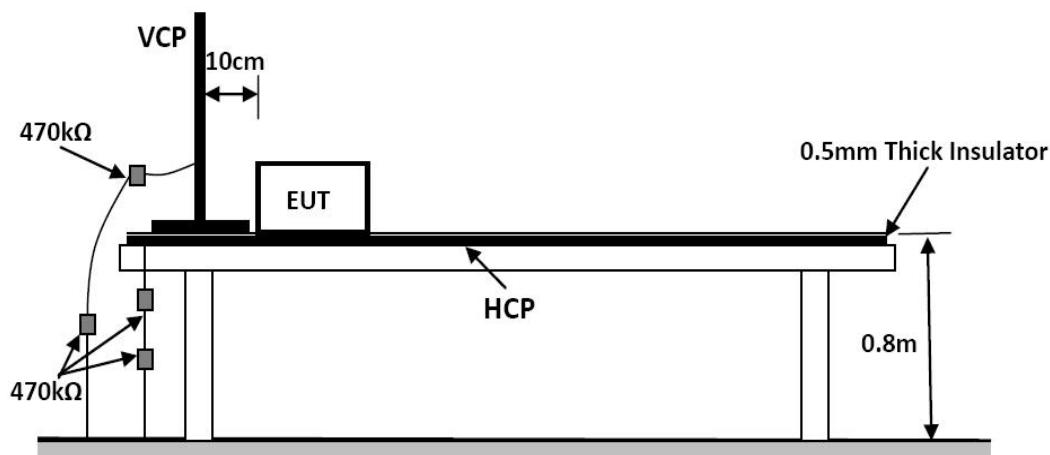
5.4.4. Test Results

PASS.

Test Model	BX616	Test Engineer	Zq Pang
Test Voltage	AC 230V/50Hz		
Overall Result: PASS	Notes: Measurement method - Voltage		

5.5. ELECTROSTATIC DISCHARGE IMMUNITY TEST

5.5.1. Block Diagram of Test Setup



5.5.2. Test Standard

EN 61000-6-1: 2007 (EN 61000-4-2: 2009, Severity Level: 3 / Air Discharge: $\pm 8\text{KV}$, Level: 2 / Contact Discharge: $\pm 4\text{KV}$)

5.5.3. Severity Levels and Performance Criterion

5.5.3.1. Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1	± 2	± 2
2	± 4	± 4
3	± 6	± 8
4	± 8	± 15
X	Special	Special

5.5.3.2. Performance Criterion

Performance Criterion: B

5.5.4. EUT Configuration on Test

The configuration of EUT is listed in Section 4.

5.5.5. Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 5.1.4. Except the test set up replaced by Section 5.5.1.

5.5.6. Test Procedure

5.5.6.1. Air Discharge

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed

5.5.6.2. Contact Discharge

All the procedure shall be same as Section 5.5.6.1. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

5.5.6.3. Indirect Discharge For Horizontal Coupling Plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

5.5.6.4. Indirect Discharge For Vertical Coupling Plane

At least 10 single discharge (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

5.5.7. Test Results

PASS.

The test result please refer to the next page.

Electrostatic Discharge Test Results

Standard	<input type="checkbox"/> IEC 61000-4-2 <input checked="" type="checkbox"/> EN 61000-4-2		
Applicant	Hanwei Electronics Group Corporation		
EUT	Portable Multiple Gas Detector	Temperature	23.8℃
M/N	BX616	Humidity	52.5%
Criterion	B	Pressure	1021mbar
Test Mode	Charging	Test Engineer	Zq Pang
Test Voltage	AC 230V/50Hz	Test voltage	AC 230V/50Hz

Air Discharge

Test Points	Test Levels			Results		
	± 2kV	± 4kV	± 8kV	Passed	Fail	Performance Criterion
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Top	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Bottom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B

Contact Discharge

Test Points	Test Levels		Results		
	± 2 kV	±4 kV	Passed	Fail	Performance Criterion
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Top	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Bottom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B

Discharge To Horizontal Coupling Plane

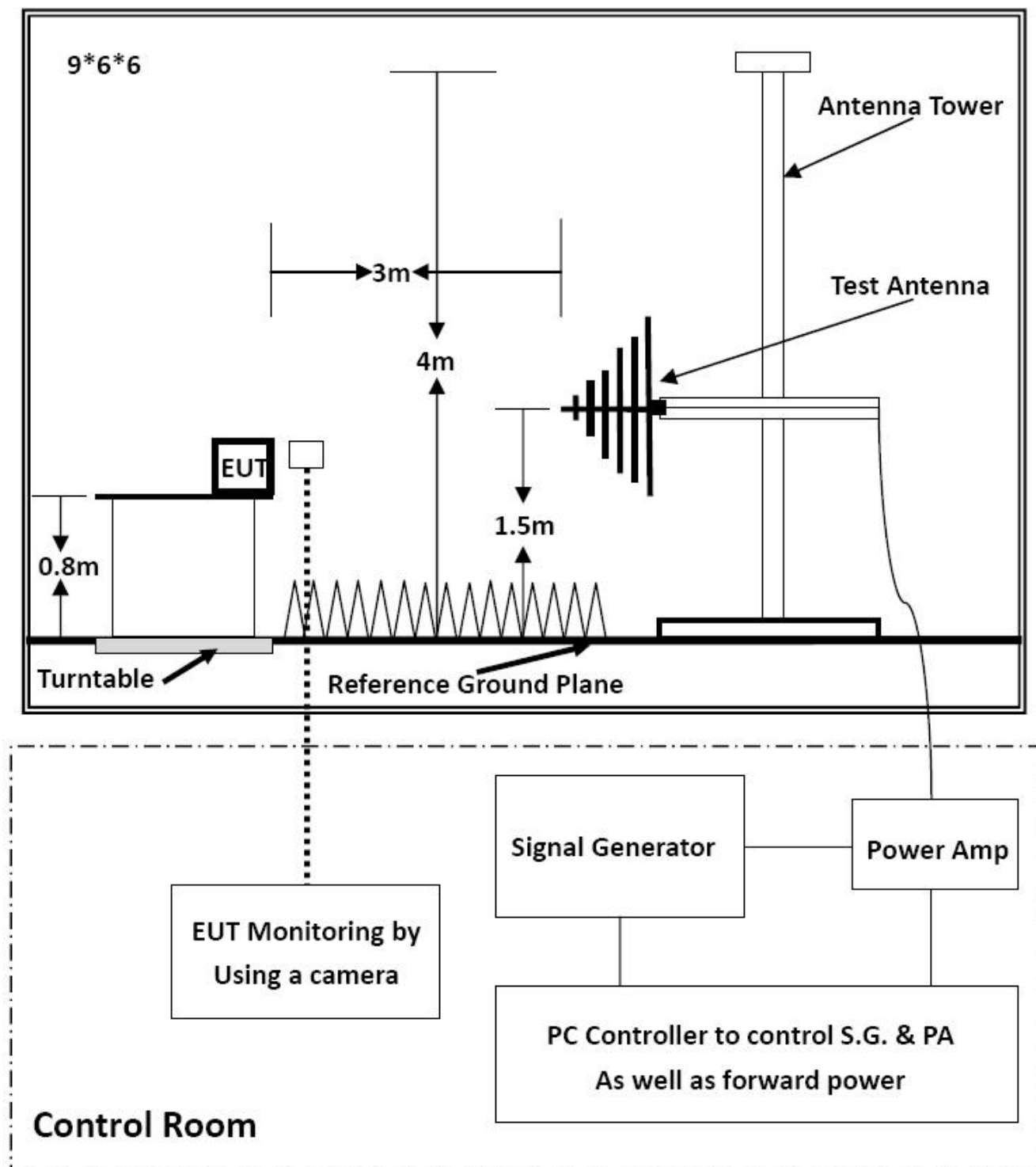
Side of EUT	Test Levels		Results		
	± 2 kV	± 4 kV	Passed	Fail	Performance Criterion
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B

Discharge To Vertical Coupling Plane

Side of EUT	Test Levels		Results		
	± 2 kV	± 4 kV	Passed	Fail	Performance Criterion
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B

5.6. RF FIELD STRENGTH SUSCEPTIBILITY TEST

5.6.1. Block Diagram of Test Setup



5.6.2. Test Standard

EN 61000-6-1: 2007 (EN 61000-4-3: 2006+A2: 2010 Severity Level 2: 3V/ m; Level 2: 3V/m; Level 1: 1V/m)

5.6.3. Severity Levels and Performance Criterion

5.6.3.1. Severity level

Level	Field Strength (V/m)
1	1
2	3
3	10
X	1

5.6.3.2. Performance Criterion

Performance Criterion: A

5.6.4. EUT Configuration on Test

The configuration of EUT is listed in Section 4

5.6.5. Operating Condition of EUT

Same as radiated emission measurement, which is listed in Section 5.2.4, except the test setup replaced as Section 5.6.1.

5.6.6. Test Procedure

The EUT are placed on a table, which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna, which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna is set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD Recording is used to monitor its screen. All the scanning conditions are as following:

Condition of Test	Remark
1. Fielded Strength	3V/m (Severity Level 2)
2. Radiated Signal	Unmodulated
3. Scanning Frequency	80-1GHz
4. Sweep Time of Radiated	0.0015 Decade/s
5. Dwell Time	3 Sec.
6. Fielded Strength	3V/m (Severity Level 2)
7. Radiated Signal	Unmodulated
8. Scanning Frequency	1.4-2.0GHz
9. Sweep time of radiated	0.0015 Decade/s
Dwell Time	3 Sec.
10. Fielded Strength	1V/m (Severity Level 1)
11. Radiated Signal	Unmodulated
12. Scanning Frequency	2.0-2.7GHz
13. Sweep time of radiated	0.0015 Decade/s
14. Dwell Time	3 Sec.

5.6.7. Test Results

PASS.

The test result please refer to the next page.

RF Field Strength Susceptibility Test Results

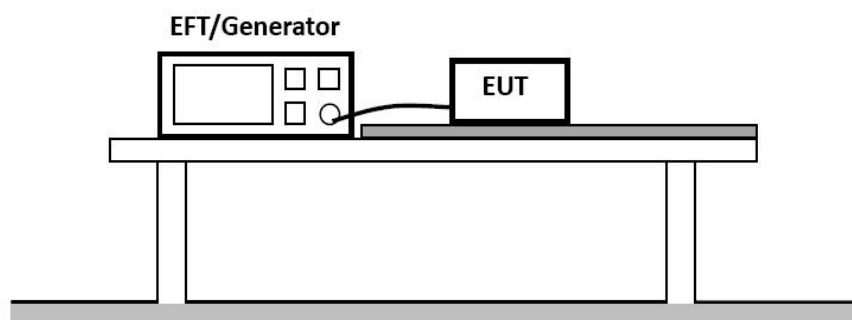
Standard	<input type="checkbox"/> IEC 61000-4-3 <input checked="" type="checkbox"/> EN 61000-4-3		
Applicant	Hanwei Electronics Group Corporation		
EUT	Portable Multiple Gas Detect or	Temperature	24.7℃
M/N	BX616	Humidity	51.6%
Test Mode	Charging	Criterion	A
Field Strength	3v/m	Frequency Range	80 MHz to1.0 GHz
	3 V/m		1.4 GHz to2.0 GHz
	1 V/m		2.0 GHz to2.7 GHz
Test Engineer	Zq Pang	Test Voltage	AC 230V/50Hz
Modulation	<input type="checkbox"/> None <input type="checkbox"/> Pulse <input checked="" type="checkbox"/> AM 1KHz 80%		
Steps	1%		

	Horizontal	Vertical
Front	PASS	PASS
Right	PASS	PASS
Rear	PASS	PASS
Left	PASS	PASS

Note:

5.7. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

5.7.1. Block Diagram of Test Setup



5.7.2. Test Standard

EN 61000-6-1: 2007 (EN 61000-4-4: 2012, Severity Level, Level 2: 1KV)

5.7.3. Severity Levels and Performance Criterion

5.7.3.1. Severity level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1	0.5 KV	0.25 KV
2	1 KV	0.5 KV
3	2 KV	1 KV
4	4 KV	2 KV
X	Special	Special

5.7.3.2. Performance Criterion

Performance Criterion: B

5.7.4. EUT Configuration on Test

The configuration of EUT is listed in Section 4

5.7.5. Operating Condition of EUT

5.7.5.1. Setup the EUT as shown in Section 5.7.1.

5.7.5.2. Turn on the power of all equipments.

5.7.5.3. Let the EUT work in test Mode 1 and measure it.

5.7.6. Test Procedure

The EUT is put on the table, which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

5.7.6.1. For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device, which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 1 mins.

5.7.6.2. For signal lines and control lines ports:

It's unnecessary to test.

5.7.6.3. For DC output line ports:

It's unnecessary to test.

5.7.7. Test Results

PASS.

The test result please refer to the next page.

Electrical Fast Transient/Burst Test Results

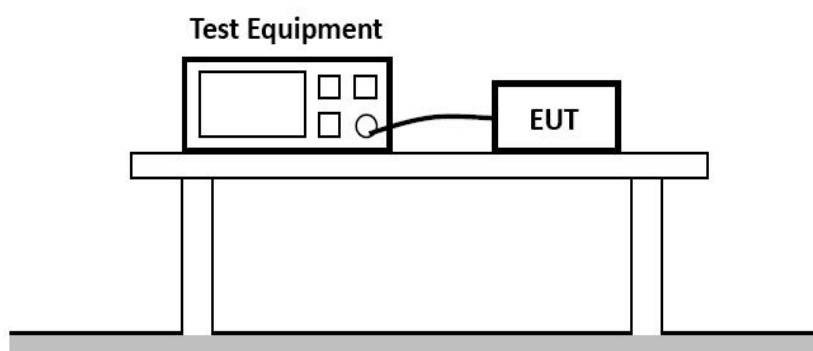
Standard	<input type="checkbox"/> IEC 61000-4-4 <input checked="" type="checkbox"/> EN 61000-4-4		
Applicant	Hanwei Electronics Group Corporation		
EUT	Portable Multiple Gas Detector	Temperature	24.6℃
M/N	BX616	Humidity	52.5%
Test Mode	Charging	Criterion	B
Test Engineer	Zq Pang	Test Voltage	AC 230V/50Hz

Line	Test Voltage	Result (+)	Result (-)
L	1KV	PASS	PASS
N	1KV	PASS	PASS
PE			
L-N	1KV	PASS	PASS
L-PE			
N-PE			
L-N-PE			
Signal Line			
I/O Cable			

Note:

5.8. SURGE IMMUNITY TEST

5.8.1. Block Diagram of Test Setup



5.8.2. Test Standard

EN 61000-6-1: 2007 (EN 61000-4-5: 2014+A1: 2017, Severity Level: Line to Line: Level 2, 1.0KV, Line to Earth: Level 3, 2.0KV)

5.8.3. Severity Levels and Performance Criterion

5.8.3.1. Severity level

Severity Level	Open-Circuit Test Voltage (KV)
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

5.8.3.2. Performance Criterion

Performance Criterion: B

5.8.4. EUT Configuration on Test

The configuration of EUT is listed in Section 4

5.8.5. Operating Condition of EUT

5.8.5.1. Setup the EUT as shown in Section 5.8.1.

5.8.5.1. Turn on the power of all equipments.

5.8.5.1. Let the EUT work in test mode and measure it.

5.8.6. Test Procedure

5.8.6.1. Set up the EUT and test generator as shown on Section 5.8.1.

5.8.6.2. For line to line coupling mode, provide a 1.0 KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.

5.8.6.3. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.

5.8.6.4. Different phase angles are done individually.

5.8.6.5. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

5.8.7. Test Results

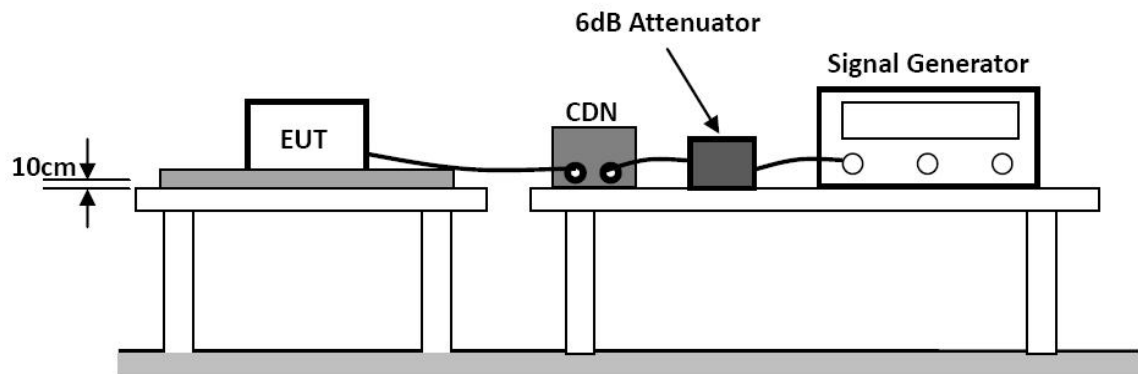
PASS.

The test result please refer to the next page.

Surge Immunity Test Result					
Standard	<input type="checkbox"/> IEC 61000-4-5 <input checked="" type="checkbox"/> EN 61000-4-5				
Applicant	Hanwei Electronics Group Corporation				
EUT	Portable Multiple Gas Detector	Temperature	24.3℃		
M/N	BX616	Humidity	51.1%		
Test Mode	Charging	Criterion	B		
Test Engineer	Zq Pang	Test Voltage	AC 230V/50Hz		
Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (KV)	Result
L-N	+	+90°, -270°	5	1.0	PASS
	-	+90°, -270°	5	1.0	PASS
L-PE					
N-PE					
Signal Line					
Note					

5.9. INJECTED CURRENTS SUSCEPTIBILITY TEST

5.9.1. Block Diagram of Test Setup



5.9.2. Test Standard

EN 61000-6-1: 2007(EN 61000-4-6: 2014+A1:2015, Severity Level: Level 2, (0.15MHz ~ 80MHz))

5.9.3. Severity Levels and Performance Criterion

5.9.3.1. Severity level

Level	Field Strength (V)
1	1
2	3
3	10
X	Special

5.9.3.2. Performance Criterion
Performance Criterion: A

5.9.4. EUT Configuration on Test

The configuration of EUT is listed in Section 4

5.9.5. Operating Condition of EUT

- 5.9.5.1.Setup the EUT as shown in Section 5.9.1.
- 5.9.5.2.Turn on the power of all equipments.
- 5.9.5.3.Let the EUT work in test Mode 1 and measure it.

5.9.6. Test Procedure

- 5.9.6.1. Set up the EUT, CDN and test generators as shown on Section 5.9.1.
- 5.9.6.2. Let the EUT work in test mode and measure it.
- 5.9.6.3. The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 5.9.6.4. The disturbance signal described below is injected to EUT through CDN.
- 5.9.6.5. The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 5.9.6.6. The frequency range is swept from 150kHz to 10MHz using 3V signal level, 10MHz to 30MHz using 3V to 1V signal level, 30MHz to 80MHz using 1V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.
- 5.9.6.7. The rate of sweep shall not exceed 1.5×10^{-3} decades/s. where the frequency is swept incrementally; the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 5.9.6.8. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

5.9.7. Test Results

PASS.

The test result please refer to the next page.

Injected Currents Susceptibility Test Results

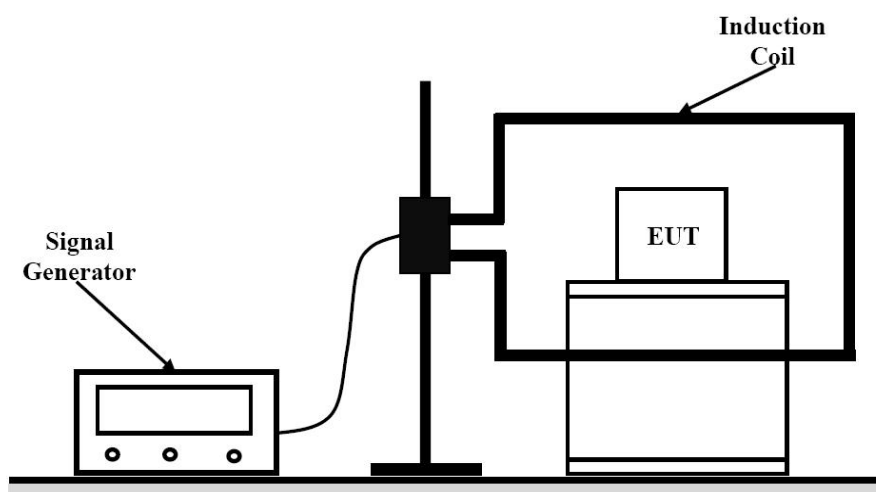
Standard	<input type="checkbox"/> IEC 61000-4-6 <input checked="" type="checkbox"/> EN 61000-4-6		
Applicant	Hanwei Electronics Group Corporation		
EUT	Portable Multiple Gas Detector	Temperature	24.6℃
M/N	BX616	Humidity	53.2%
Test Mode	Charging	Criterion	A
Test Engineer	Zq Pang	Test Voltage	AC 230V/50Hz

Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 10	AC Mains	3V	A	PASS
10 ~ 30		3V ~ 1V		
30 ~ 80		1V		

Note:

5.10. MAGNETIC FIELD SUSCEPTIBILITY TEST

5.10.1. Block Diagram of Test Setup



5.10.2. Test Standard

EN 61000-6-1: 2007 (EN 61000-4-8: 2010, Severity Level: Level 1, 3A/m)

5.10.3. Severity Levels and Performance Criterion

5.10.3.1. Severity level

Level	Field Strength (A/m)
1	1
2	3
3	10
4	30
5	100
X	Special

5.10.3.2. Performance Criterion

Performance Criterion: A

5.10.4. EUT Configuration on Test

The configuration of EUT is listed in Section 4

5.10.5. Test Procedure

The EUT is placed in the middle of a induction coil (1*1m), under which is a 1*1*0.1m (high) table, this small table is also placed on a larger table, 0.8 m above the ground. Both horizontal and vertical polarization of the induction coil is set on test, so that each side of the EUT is affected by the magnetic field. Also can reach the same aim by change the position of the EUT.

5.10.6. Test Results

PASS.

The test result please refer to the next page.

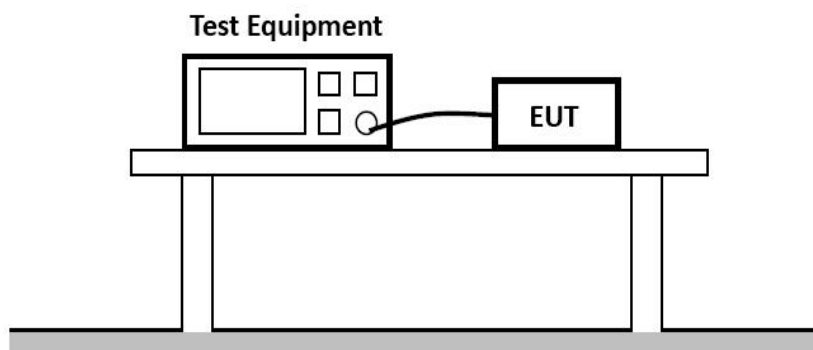
Magnetic Field Immunity Test Result			
Standard	<input type="checkbox"/> IEC 61000-4-8 <input checked="" type="checkbox"/> EN 61000-4-8		
Applicant	Hanwei Electronics Group Corporation		
EUT	Portable Multiple Gas Detector	Temperature	24.7℃
M/N	BX616	Humidity	52.1%
Test Mode	Charging	Criterion	A
Test Engineer	Zq Pang	Test Voltage	AC 230V/50Hz

Test Level (A/M)	Testing Duration	Coil Orientation	Criterion	Result
3	5 mins	X	A	PASS
3	5 mins	Y	A	PASS
3	5 mins	Z	A	PASS

Note:

5.11. VOLTAGE DIPS AND INTERRUPTIONS TEST

5.11.1. Block Diagram of Test Setup



5.11.2. Test Standard

EN 61000-6-1: 2007 (EN IEC 61000-4-11: 2020+AC: 2020)

5.11.3. Severity Levels and Performance Criterion

5.11.3.1. Severity level

Test Level		
Voltage Reduction $\%U_T$	Voltage Dips $\%U_T$	Duration (in Period)
100	0	0.5
30	70	25
Voltage Reduction $\%U_T$	Voltage Dips $\%U_T$	Duration (in Period)
100	0	250

5.11.3.2. Performance Criterion

Performance Criterion: B&C

5.11.4. EUT Configuration on Test

The configuration of EUT is listed in Section 4

5.11.5. Operating Condition of EUT

5.11.5.1. Setup the EUT as shown in Section 5.11.1.

5.11.5.2. Turn on the power of all equipments.

5.11.5.3. Let the EUT work in test mode and measure it.

5.11.6. Test Procedure

5.11.6.1. Set up the EUT and test generator as shown on Section 5.11.1.

5.11.6.2. The interruptions are introduced at selected phase angles with specified duration.

5.11.6.3. Record any degradation of performance.

5.11.7. Test Results

PASS.

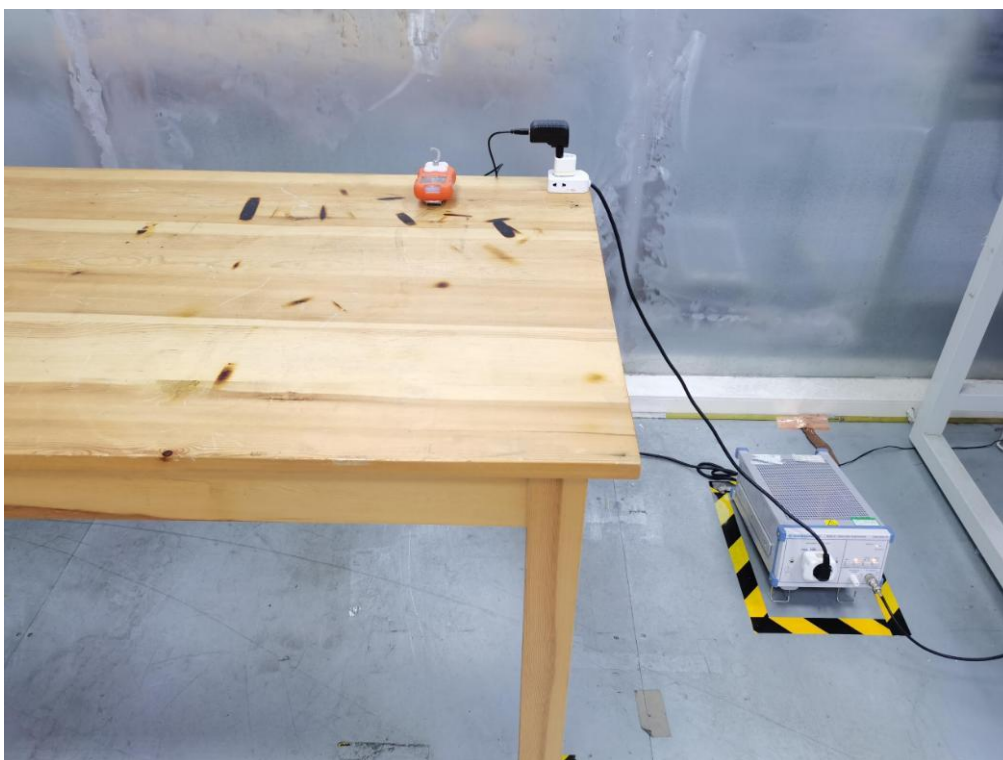
The test result please refer to the next page.

Voltage Dips And Interruptions Test Results			
Standard	<input type="checkbox"/> IEC 61000-4-11 <input checked="" type="checkbox"/> EN IEC 61000-4-11		
Applicant	Hanwei Electronics Group Corporation		
EUT	Portable Multiple Gas Detector	Temperature	24.5℃
M/N	BX616	Humidity	52.5%
Test Mode	Charging	Criterion	B&C
Test Engineer	Zq Pang	Test Voltage	AC 230V/50Hz

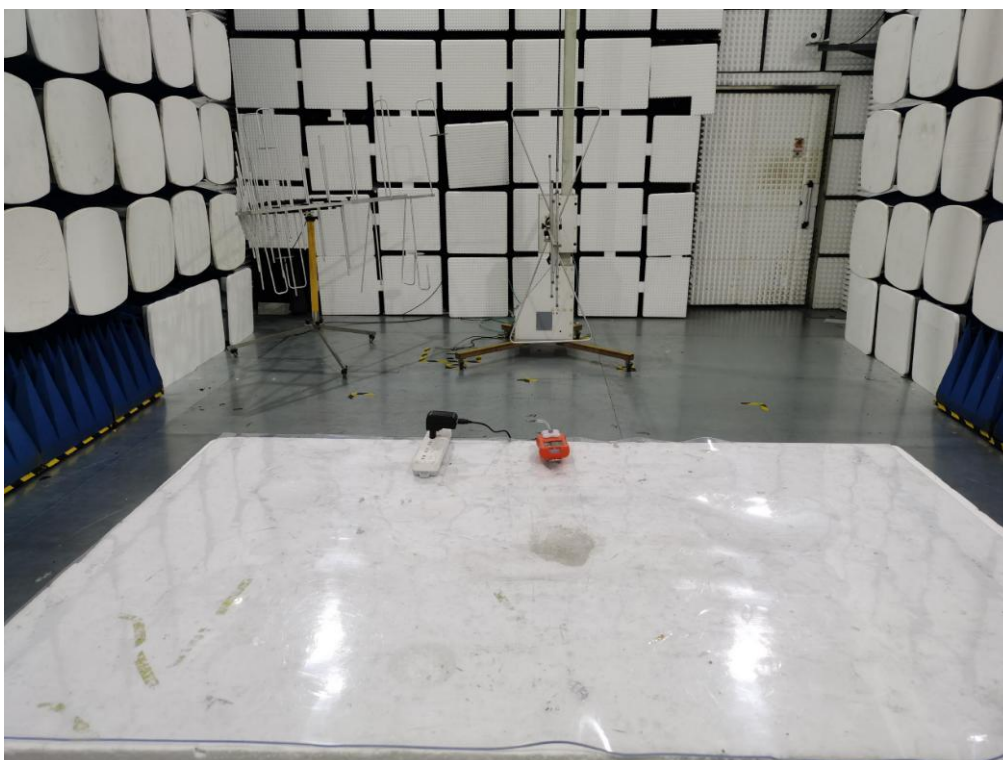
Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in periods)	Criterion	Result
0	100	0.5P	B	PASS
70	30	25P	C	PASS
0	100	250P	C	PASS

Note:

6. PHOTOGRAPHS OF TEST SETUP



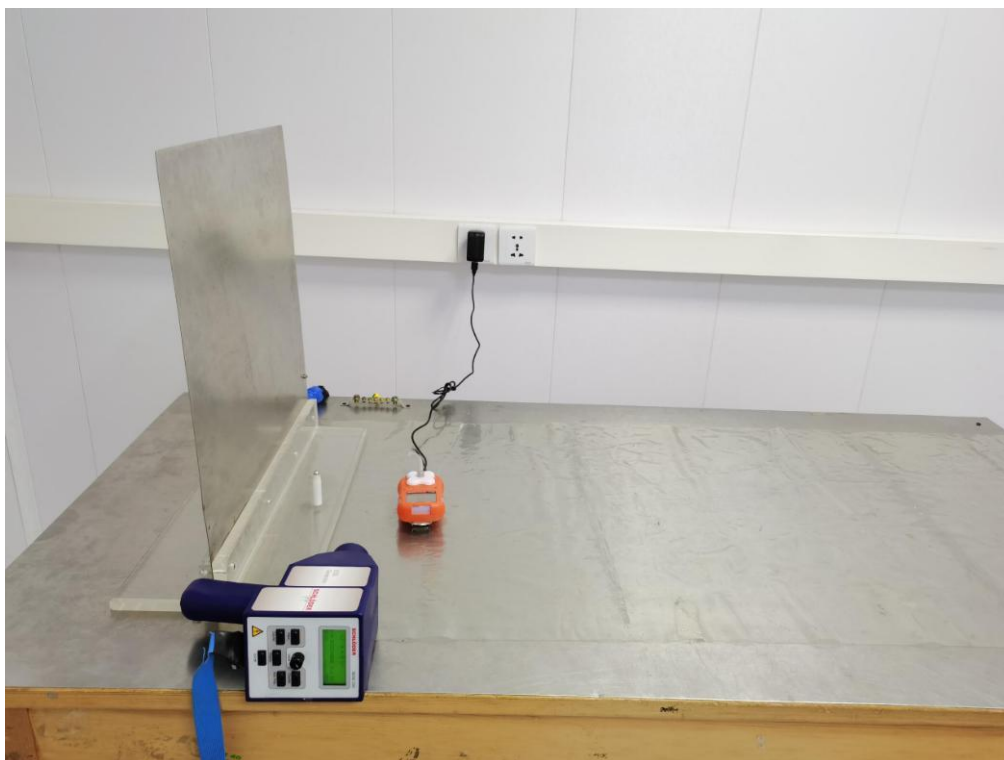
Test Setup Photo of Power Line Conducted Measurement



Test Setup Photo of Radiated Measurement (30MHz~1GHz)



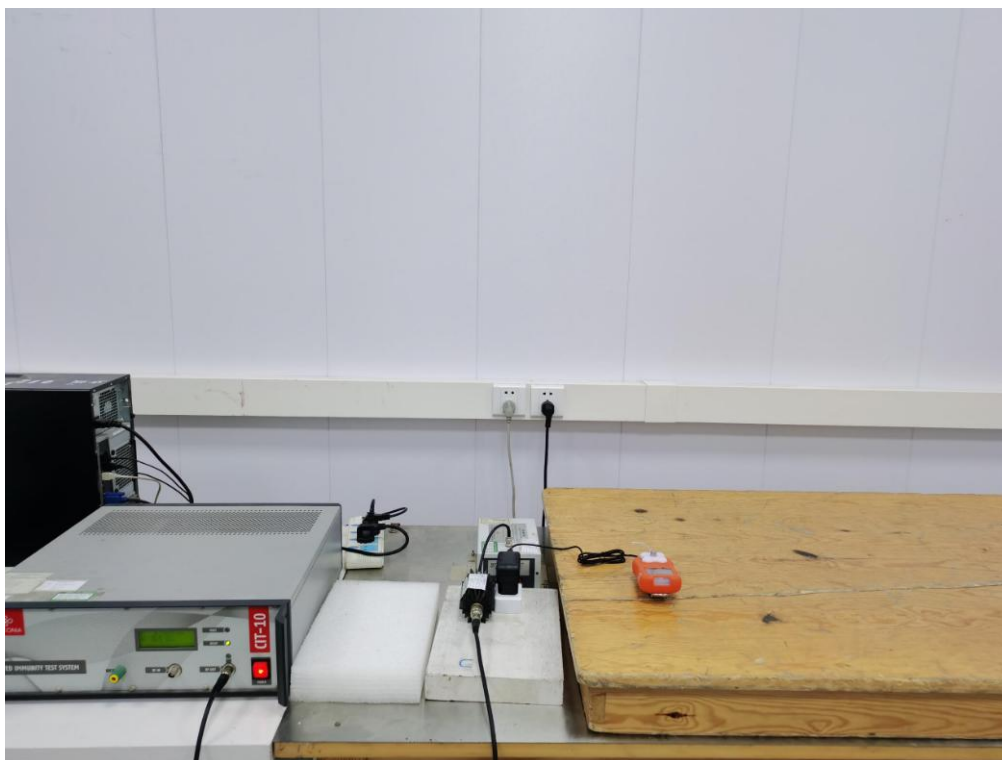
Test Setup Photo of Harmonic & Flicker Measurement



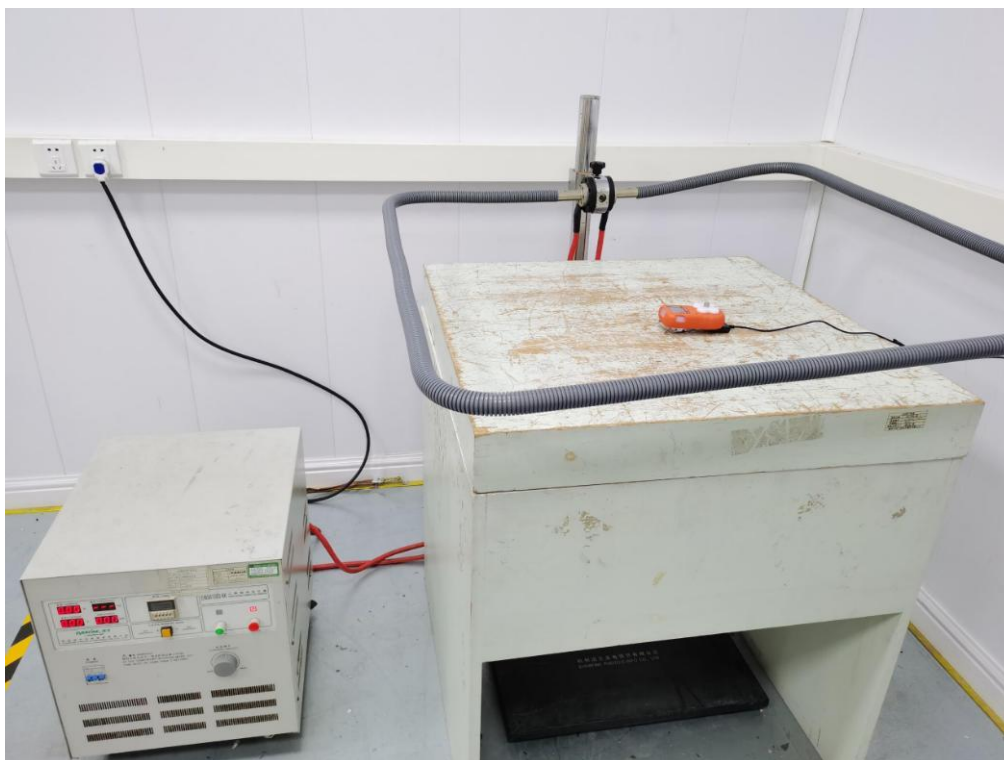
Test Setup Photo of Electrostatic Discharge Test



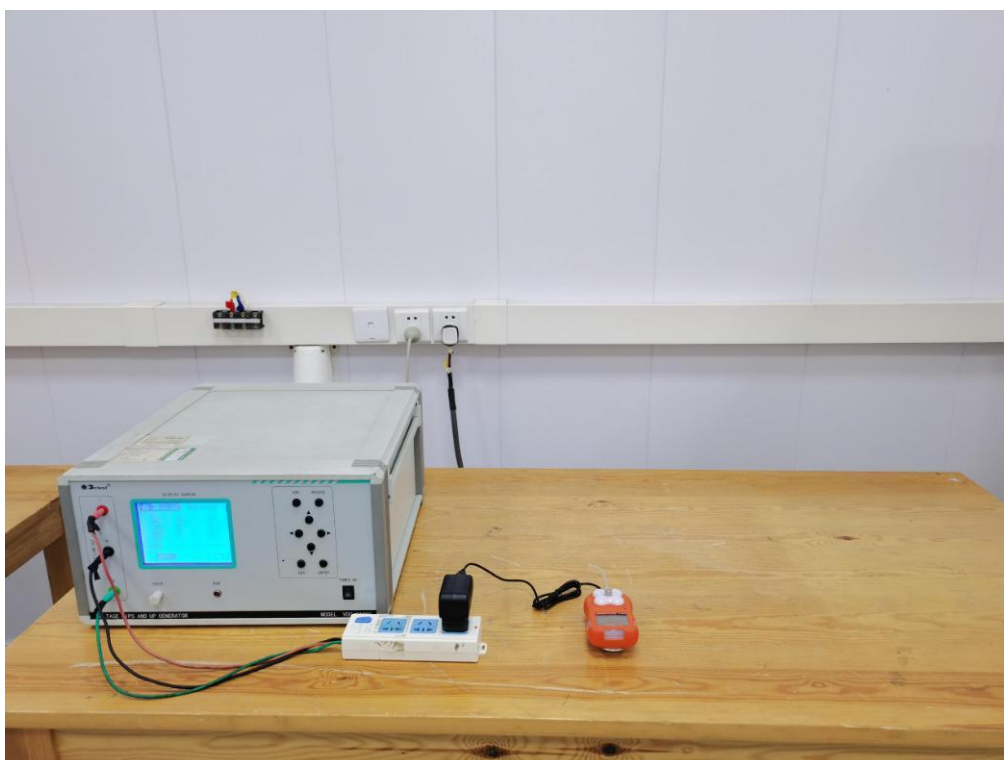
Photo of Electrical Fast Transient/Burst Test & Surge Immunity Test



Test Setup Photo of Injected Currents Susceptibility Test



Test Setup Photo of Magnetic Field Immunity Test



Test Setup Photo of Voltage Dips and Interruptions Test

7. PHOTOGRAPHS OF THE EUT



Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5



Fig. 6

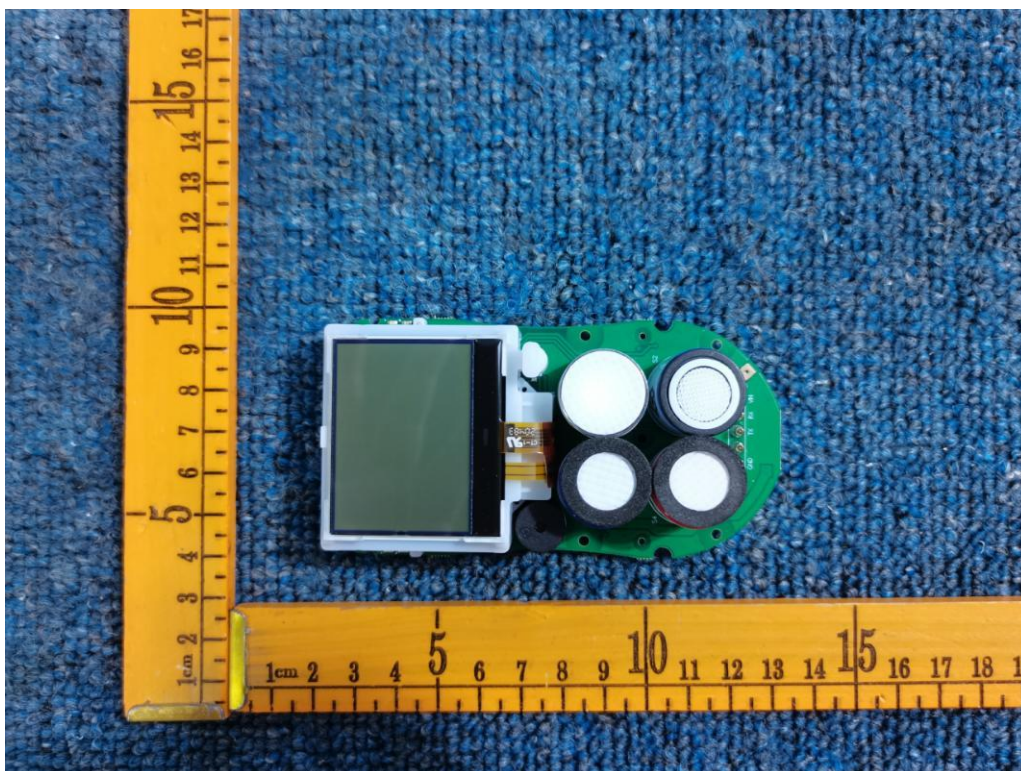


Fig. 7

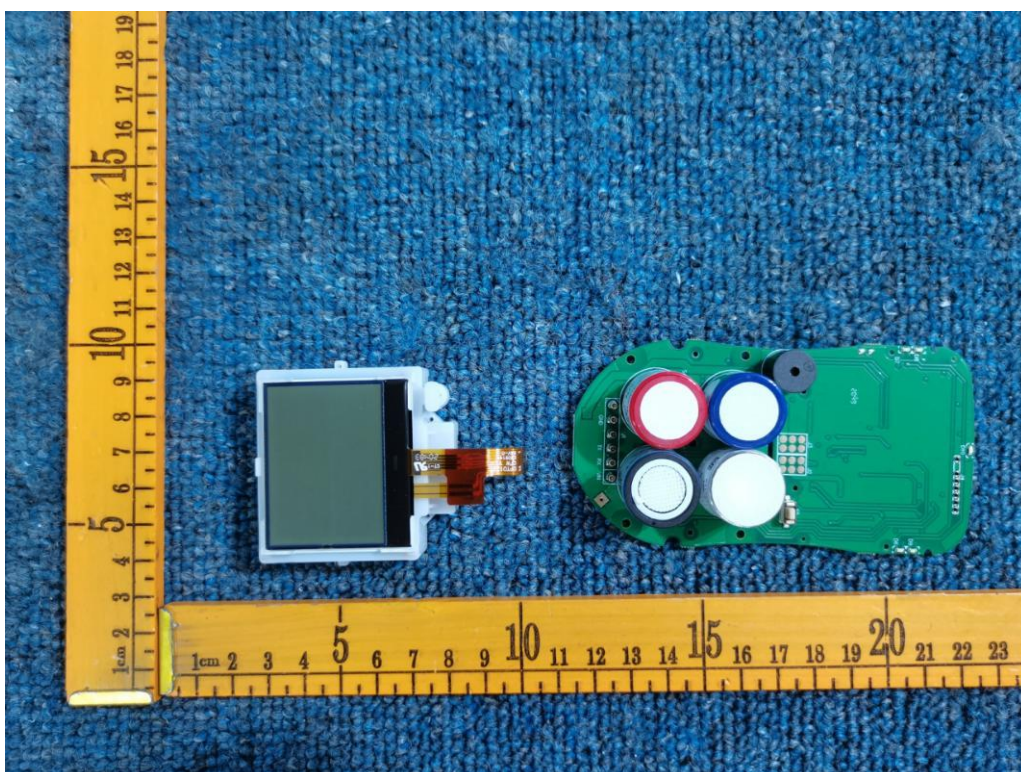


Fig. 8

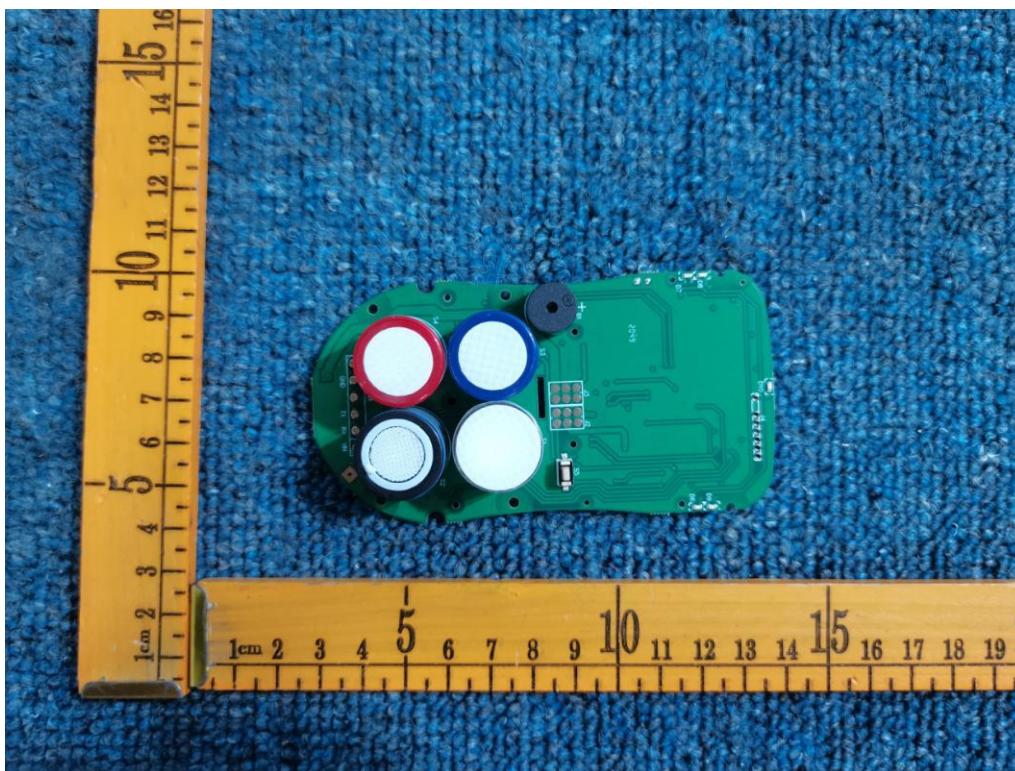


Fig. 9

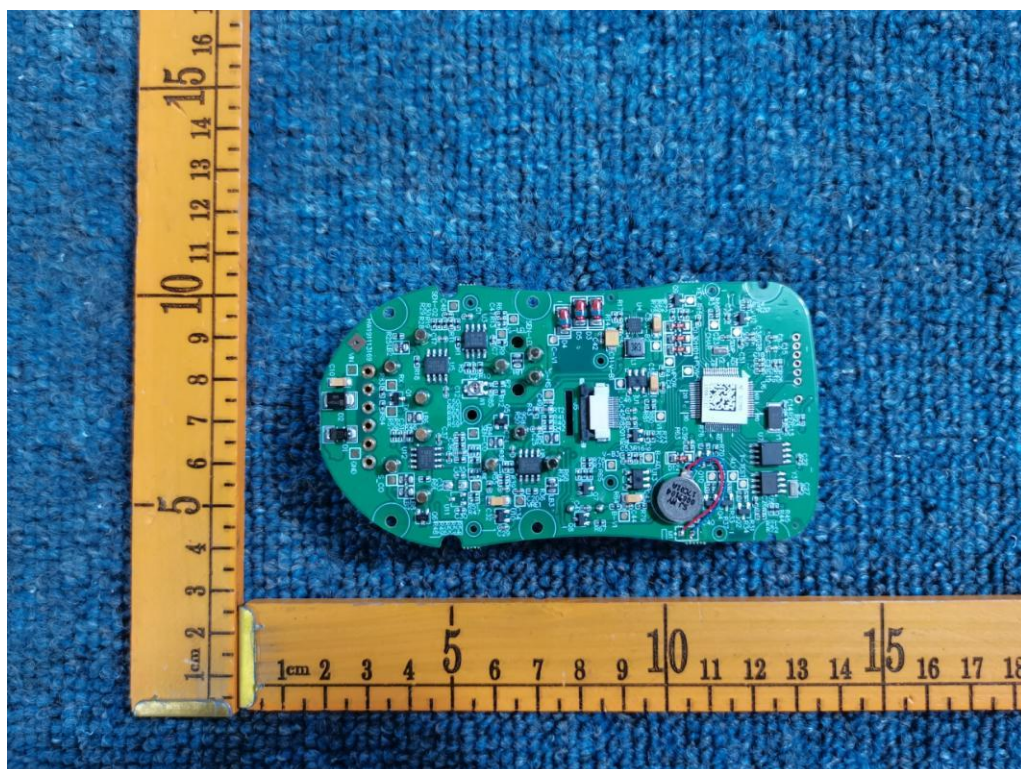


Fig. 10

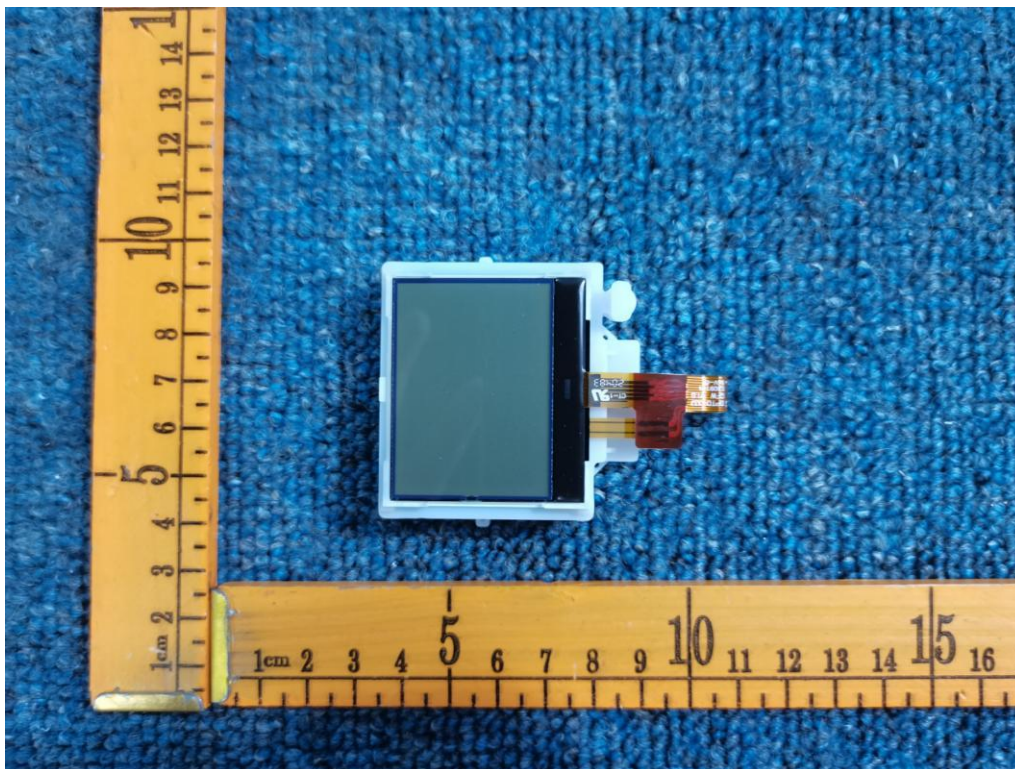


Fig. 11

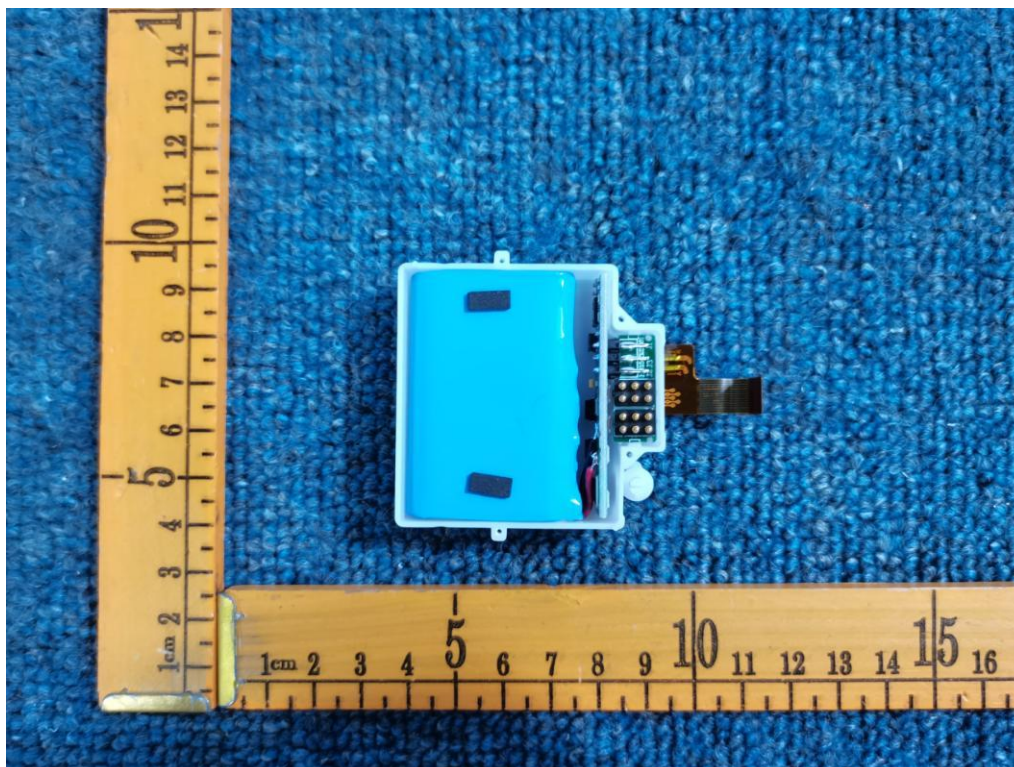


Fig. 12

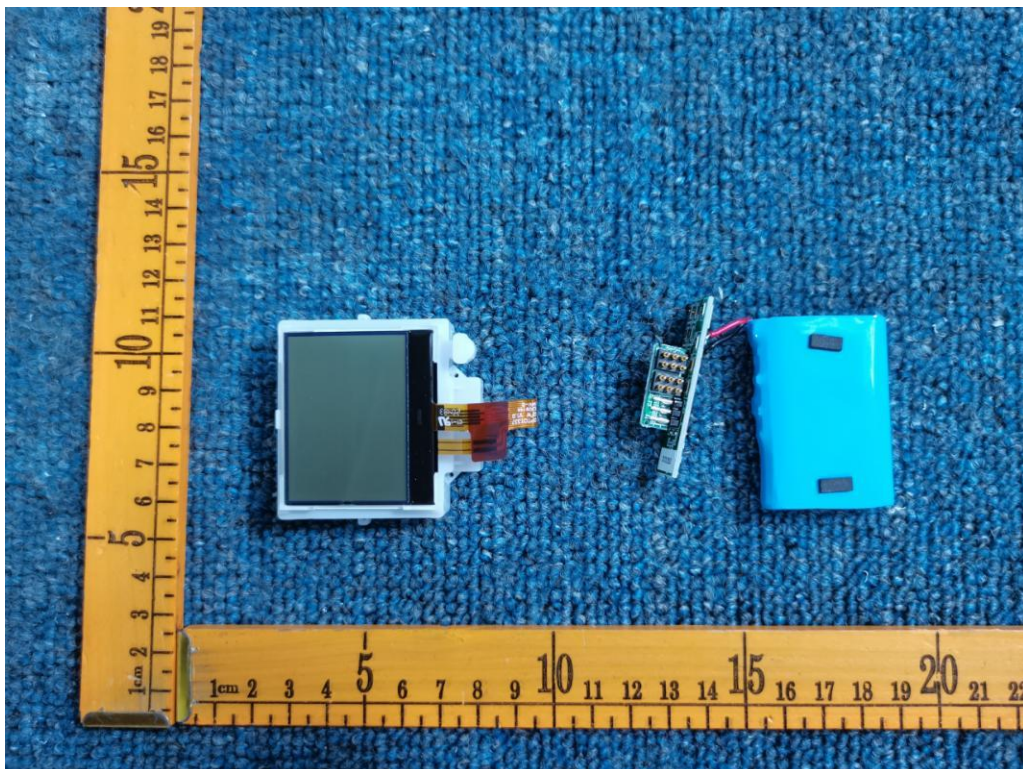


Fig. 13

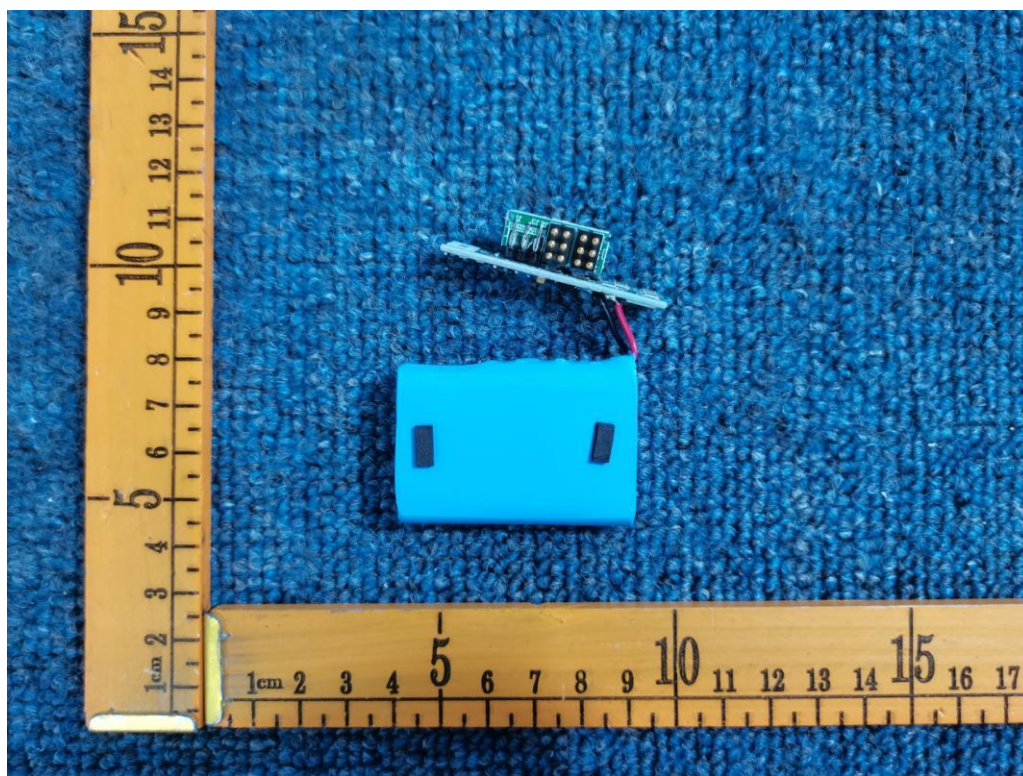


Fig. 14



Fig. 15

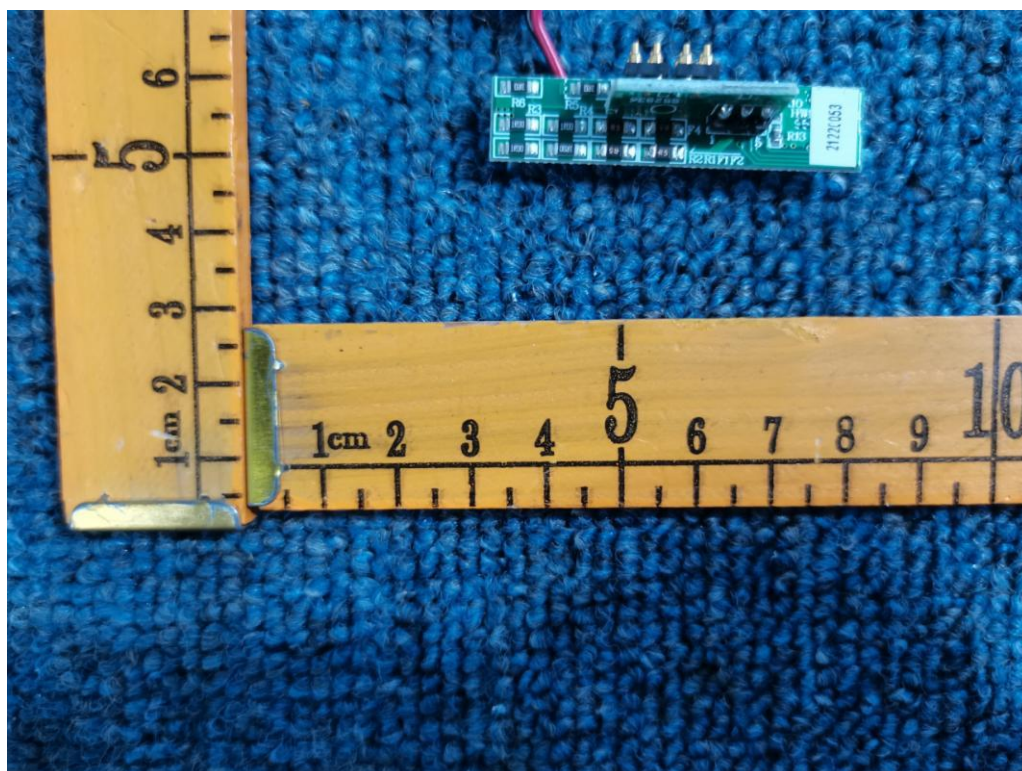


Fig. 16

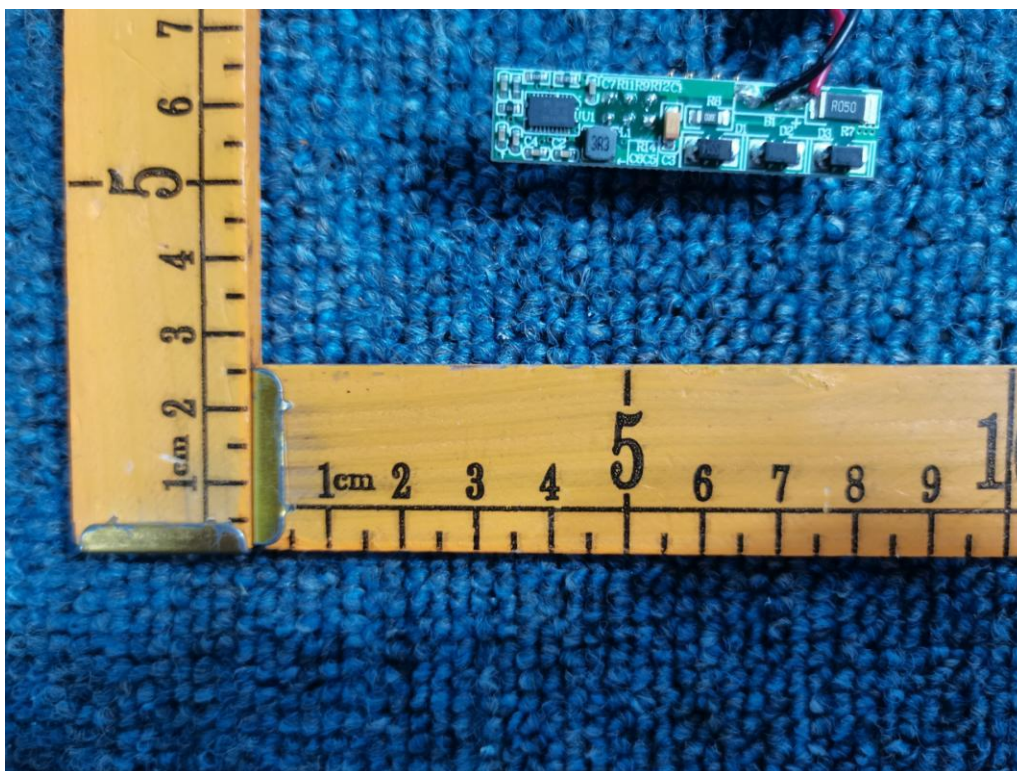


Fig. 17

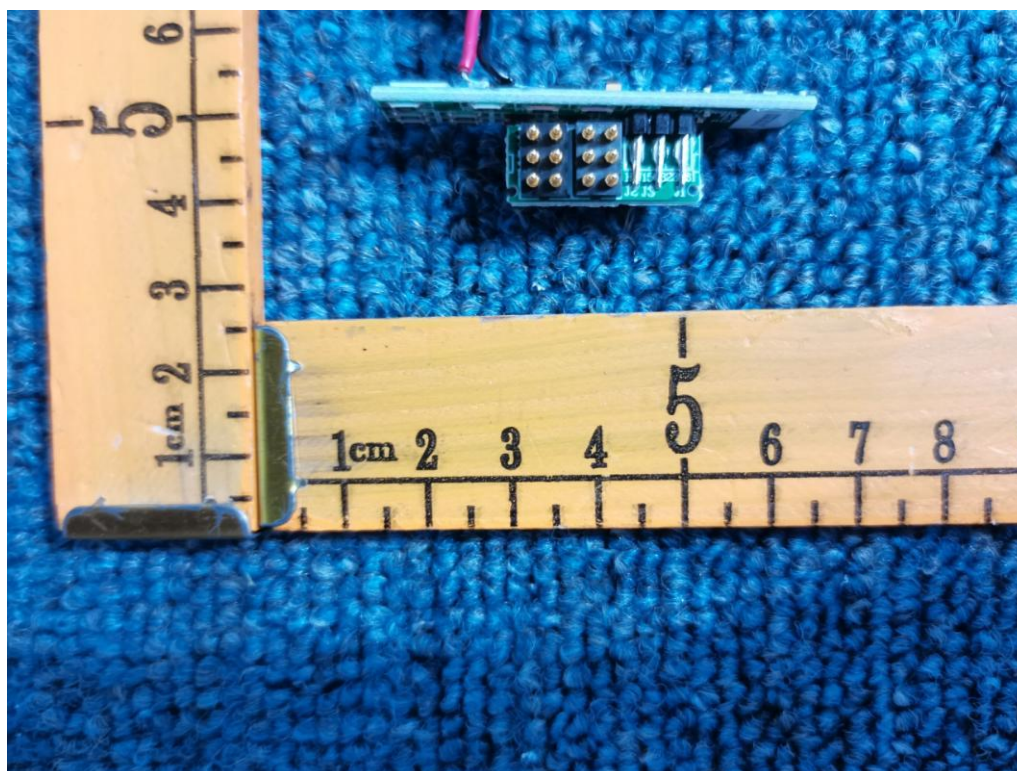


Fig. 18

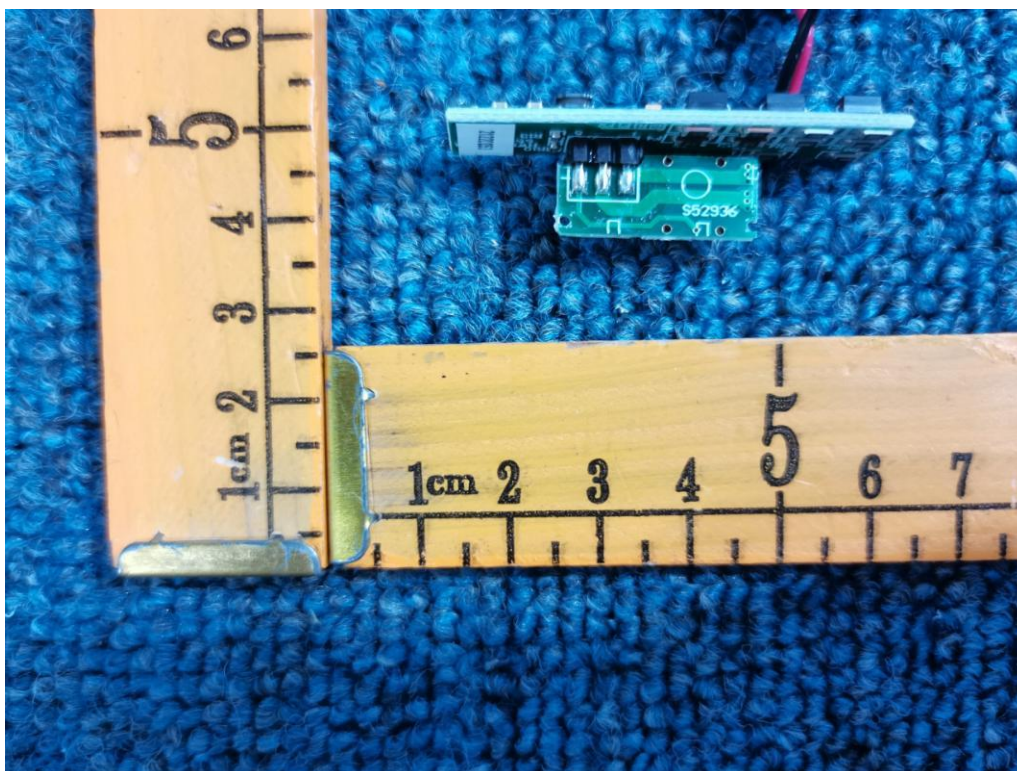


Fig. 19

----- THE END OF TEST REPORT -----